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

SAR EVALUATION REPORT

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

Date of Testing:
06/20/13 - 07/08/13
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1306201042-R1.A3L

FCC ID: **A3LSCHP729**

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

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SCH-P729

Equipment Class	Band & Mode	Tx Frequency	Measured Conducted Power [dBm]	SAR			
				1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)	10 gm Extremity (W/kg)
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	24.06	0.24	0.73	0.73	
PCE	GSM/GPRS 850	824.20 - 848.80 MHz	32.40	0.19	0.17	0.17	
PCE	GSM/GPRS 1900	1850.20 - 1909.80 MHz	29.68	0.58	1.09	1.09	
DTS	2.4 GHz WLAN	2412 - 2462 MHz	15.30	< 0.1	0.19	0.19	
DTS	5.8 GHz WLAN	5745 - 5825 MHz	10.09	< 0.1	0.42	0.42	
DTS	Bluetooth LE	2402 - 2480 MHz	0.59	N/A			
NII	5.2 GHz WLAN	5180 - 5240 MHz	10.15	< 0.1	0.11		0.33
NII	5.3 GHz WLAN	5260 - 5320 MHz	10.35	< 0.1	< 0.1		0.30
NII	5.5 GHz WLAN	5500 - 5700 MHz	10.00	< 0.1	0.34		0.30
DSS	Bluetooth	2402 - 2480 MHz	7.82	N/A	<0.1	N/A	N/A
Simultaneous SAR per KDB 690783 D01v01r02:				0.84	1.59	1.51	0.33

Note: Powers in the above table represent output powers for the SAR test configurations and may not represent the highest output powers for all configurations for each mode.

Note: This revised test report (S/N: 0Y1306201042-R1.A3L) supersedes and replaces the previously issued test report on the same subject DUT for the same type of testing indicated. Please discard or destroy the previously issued tests report(s) and dispose of accordingly.

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

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

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

TABLE OF CONTENTS

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
GSM/GPRS 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS 1900	Voice/Data	1850.20 - 1909.80 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
5.8 GHz WLAN	Data	5745 - 5825 MHz
Bluetooth LE	Data	2402 - 2480 MHz
5.2 GHz WLAN	Data	5180 - 5240 MHz
5.3 GHz WLAN	Data	5260 - 5320 MHz
5.5 GHz WLAN	Data	5500 - 5700 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

1.2 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 D01v05r01.

Mode / Band		Modulated Average (dBm)
PCS CDMA/EVDO	Maximum	**24.5**
	Nominal	**24.0**

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)			
		1 TX Slot	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GSM/GPRS 850	Maximum	**33.0**	**33.0**	**31.5**	**28.6**	**26.5**
	Nominal	**32.5**	**32.5**	**31.0**	**28.1**	**26.0**
GSM/GPRS 1900	Maximum	**30.0**	**30.0**	**28.5**	**26.3**	**24.8**
	Nominal	**29.5**	**29.5**	**28.0**	**25.8**	**24.3**

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	**15.5**
	Nominal	**15.0**
IEEE 802.11g (2.4 GHz)	Maximum	**13.0**
	Nominal	**12.5**
IEEE 802.11n (2.4 GHz)	Maximum	**12.0**
	Nominal	**11.5**
IEEE 802.11a (5 GHz)	Maximum	**10.5**
	Nominal	**10.0**
IEEE 802.11n (5 GHz)	Maximum	**10.5**
	Nominal	**10.0**
IEEE 802.11ac (5 GHz)	Maximum	**10.5**
	Nominal	**10.0**
Bluetooth	Maximum	**8.0**
	Nominal	**7.5**
Bluetooth LE	Maximum	**1.0**
	Nominal	**0.5**

1.3 DUT Antenna Locations

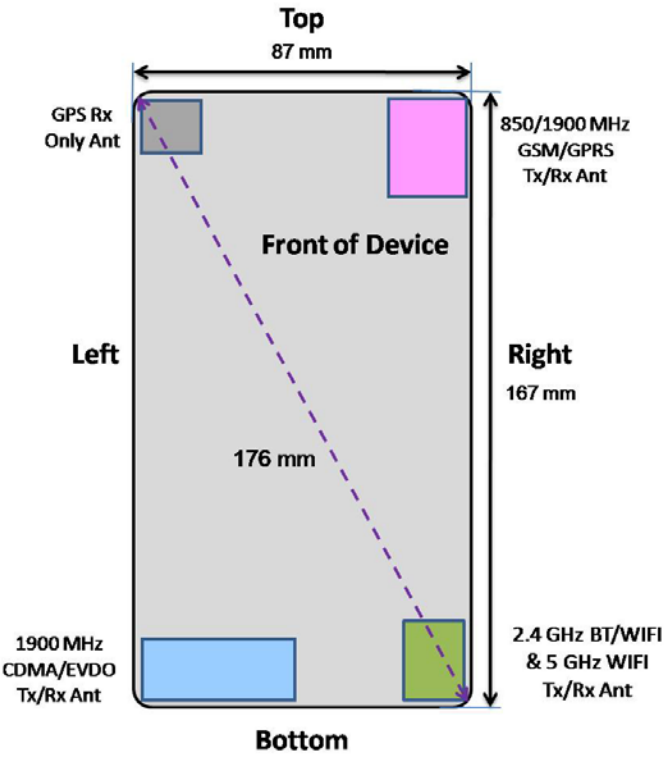


Figure 1-1
DUT Antenna Locations

Note:

1. Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC Filing.
2. Because the diagonal distance of this device is > 160 mm, it is considered a "phablet."

Table 1-1
Mobile Sides for SAR Testing

Mobile Sides for SAR Testing							
Mode	Exposure Condition	Back	Front	Top	Bottom	Right	Left
PCS CDMA/EVDO	Hotspot	Yes	Yes	No	Yes	No	Yes
GSM/GPRS 850	Hotspot	Yes	Yes	Yes	No	Yes	No
GSM/GPRS 1900	Hotspot	Yes	Yes	Yes	No	Yes	No
2.4 GHz WLAN	Hotspot	Yes	Yes	No	Yes	Yes	No
5 GHz DTS WLAN	Hotspot	Yes	Yes	No	Yes	Yes	No
5 GHz NII WLAN	Extrmeity	Yes	Yes	No	Yes	Yes	No

Note: Particular DUT edges were not required to be evaluated for Wireless Router and/or Extremity SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v01r01 guidance, page 2, and FCC KDB 648474 D04v01r01 Handset SAR v01r01.

1.4 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the battery. The SAR tests were performed with the battery (model: B700BC).

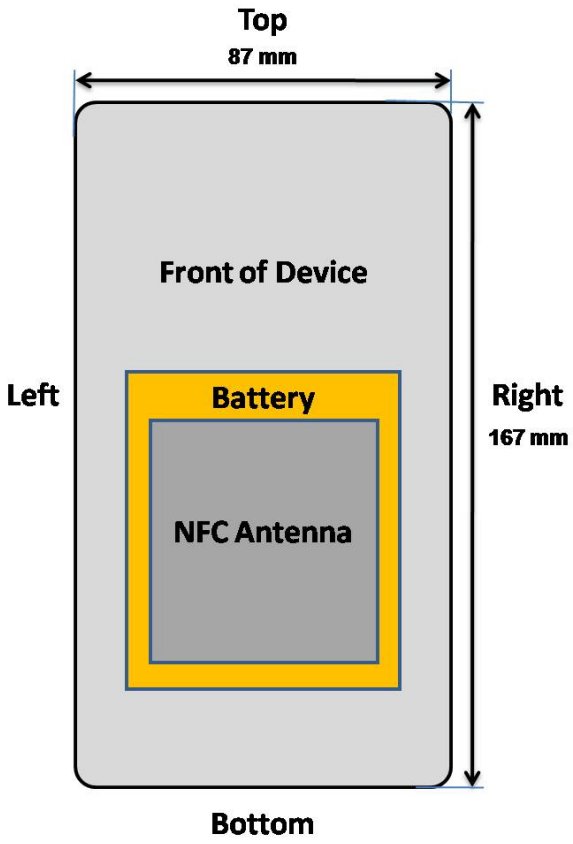


Figure 1-2
NFC Antenna Locations

1.5 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v05r01, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in Figure 1-3 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

Figure 1-3
Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v05r01 3) procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configurations	Head	Body-Worn Accessory	Hot Spot	Extremity	Note
		IEEE 1528, Supp C	Supplement C	FCC KDB 941225 D06 edges/sides	FCC KDB 648474 D04 edges/sides	
1	1X CDMA 1900 MHz Voice + 2.4 GHz WIFI	√	√	N/A	√	Voice and WiFi Data
2	1X CDMA 1900 MHz Voice + 2.4 GHz Bluetooth	N/A	√	N/A	√	
3	1X CDMA 1900 MHz Voice + 5 GHz WIFI	√	√	N/A	√	Voice and WiFi Data
4	EVDO 1900 MHz Data + 2.4 GHz WIFI	√	√	√	√	EVDO + 2.4 GHz WIFI Hotspot
5	EVDO 1900 MHz Data + 2.4 GHz Bluetooth	N/A	√	N/A	√	
6	EVDO 1900 MHz Data + 5 GHz WIFI	√	√	√	√	EVDO + 5.8 GHz WIFI Hotspot
7	GSM 850/1900 MHz Voice + 2.4 GHz WIFI	√	√	N/A	√	Voice and WiFi Data
8	GSM 850/1900 MHz Voice + 2.4 GHz Bluetooth	N/A	√	N/A	√	
9	GSM 850/1900 MHz Voice + 5 GHz WIFI	√	√	N/A	√	Voice and WiFi Data
10	GPRS 850/1900 MHz Data + 2.4 GHz WIFI	N/A	N/A	√	√	Data + 2.4 GHz WiFi Hotspot
11	GPRS 850/1900 MHz Data + 2.4 GHz Bluetooth	N/A	N/A	N/A	√	
12	GPRS 850/1900 MHz Data + 5 GHz WIFI	N/A	N/A	√	√	Data + 5.8 GHz WiFi Hotspot
13	1X CDMA 1900 MHz Voice + GPRS 850/1900 MHz Data	√	√	N/A	√	
14	1X CDMA 1900 MHz Voice + GPRS 850/1900 MHz Data + 2.4 GHz WIFI	√	√	√	√	2.4 GHz WIFI Hotspot
15	1X CDMA 1900 MHz Voice + GPRS 850/1900 MHz Data + 2.4 GHz Bluetooth	N/A	√	N/A	√	
16	1X CDMA 1900 MHz Voice + GPRS 850/1900 MHz Data + 5 GHz WIFI	√	√	√	√	5.8 GHz WIFI Hotspot
17	GSM 850/1900 MHz Voice + EVDO 1900 MHz Data	√	√	N/A	√	
18	GSM 850/1900 MHz Voice + EVDO 1900 MHz Data + 2.4 GHz WIFI	√	√	√	√	2.4 GHz WIFI Hotspot
19	GSM 850/1900 MHz Voice + EVDO 1900 MHz Data + 2.4 GHz Bluetooth	N/A	√	N/A	√	
20	GSM 850/1900 MHz Voice + EVDO 1900 MHz Data + 5 GHz WIFI	√	√	√	√	5.8 GHz WIFI Hotspot
21	1X CDMA 1900 MHz Voice + EVDO 1900 MHz Data	N/A	N/A	N/A	N/A	Not available by HW
22	EVDO 1900 MHz Data + GPRS 850/1900 MHz Data	N/A	N/A	N/A	N/A	Not available by SW

Notes:

1. CDMA and EVDO share the same antenna path and cannot transmit simultaneously. (Non-SVDO)
2. 2.4 GHz WLAN, 2.4 GHz Bluetooth, and 5 GHz WLAN share the same antenna path and cannot transmit simultaneously.
3. For 5 GHz Hotspot, S/W only support the 5.8 GHz Band, therefore al other bands were not evaluated for hotspot conditions. This cannot be changed by any S/W modification by any party after it is manufactured.
4. WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, the only new simultaneous capabilities involving WIFI direct are for hand held operations only.

1.6 SAR Test Exclusions Applied

(A) WIFI/BT

Since Wireless Router operations are not allowed by the chipset firmware using 5 GHz NII WIFI, only 2.4 GHz WIFI and 5 GHz DTS WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v01r01.

Per FCC KDB Publication 648474 D03-D04, this device is considered a "phablet" since its diagonal distance, 178 mm, is greater than 160 mm. Therefore hand SAR tests are required. When Hotspot/WIFI direct is disabled, the device is capable of operating with all 5 GHz bands (client mode). When Hotspot, WIFI direct or mobile AP operation is activated, the device is limited to 2.4 GHz and 5.8 GHz bands. Since wireless router operations are not supported for 5 GHz NII WIFI, hand SAR was evaluated for 5 GHz NII WIFI. However, hand SAR was not evaluated for 2.4 GHz WIFI and 5 GHz DTS WIFI since Hotspot SAR for 2.4 GHz WIFI and 5 GHz DTS WIFI were < 1.2 W/kg.

This device supports 20 MHz and 40 MHz Bandwidths for IEEE 802.11n for 5 GHz WIFI only. IEEE 802.11n was not evaluated for SAR since the average output power of 20 MHz and 40 MHz bandwidths was not more than 0.25 dB higher than the average output power of IEEE 802.11a.

This device supports IEEE 802.11ac with the following features:
a) Up to 80 MHz Bandwidth only
b) No aggregate channel configurations
c) 1 Tx antenna output
d) 256 QAM is supported
e) No new 5 GHz channels

Per FCC KDB 447498 D01v05r01, the SAR exclusion threshold for 1g Body SAR 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 LE (rounded to the nearest mW) and the antenna to user separation distance, Bluetooth LE SAR was not required; [(1/10)* √2.440] = 0.2 < 3.0. Per KDB Publication 447498 D01v05r01, the maximum power of the channel was rounded to the nearest mW before calculation.

Per FCC KDB 447498 D01v05r01, the SAR exclusion threshold for 10g Extremity SAR 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, Bluetooth SAR was not required; [(6/5)* √2.441] = 1.9 < 7.5. Per KDB Publication 447498 D01v05r01, the maximum power of the channel was rounded to the nearest mW before calculation.

(B) Licensed Transmitter(s)

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

Per FCC KDB Publication 648474 D04 v01r01, since all hotspot SAR was <1.2W/kg, hand SAR was not required for licensed transmitters.

1.7 Power Reduction for SAR

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

1.8 Guidance Applied

- FCC OET Bulletin 65 Supplement C [June 2001]
- IEEE 1528-2003
- FCC KDB Publication 941225 D01-D06 (2G/3G and Hotspot)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v05r01 (General SAR Guidance)
- FCC KDB Publication 865664 D01-D02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D03-D04 (Phablet Procedures)
- April 2013 TCB Workshop Notes (IEEE 802.11ac)

1.9 Device Serial Numbers

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

.

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number	Extremity Serial Number
PCS CDMA/EVDO	FK-181-A FK-181-C	FK-181-A	FK-181-A	-
GSM/GPRS 850	FK-181-C	FK-181-B FK-181-C	FK-181-B FK-181-C	-
GSM/GPRS 1900	FK-181-C	FK-181-B	FK-181-B	-
2.4 GHz WLAN	FK-181-B	FK-181-A	FK-181-A	-
2.4 GHz Bluetooth	-	FK-181-C	-	-
5 GHz DTS WLAN	FK-181-A	FK-181-A	FK-181-A	-
5 GHz NII WLAN	FK-181-A	FK-181-A	-	FK-181-A

2 INTRODUCTION

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

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [24]. 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.

2.1 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 2-1).

Equation 2-1
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]

3 DOSIMETRIC ASSESSMENT

3.1 Measurement Procedure

The evaluation was performed using the following procedure:

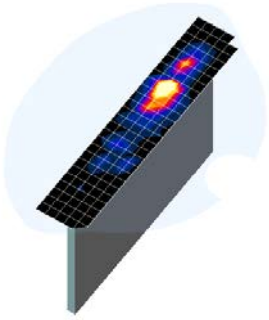


Figure 3-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01 (See Table 3-1).
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01 (See Table 3-1). 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. The data was extrapolated to the surface of the outer-shell of the phantom. The combined distance extrapolated was the combined distance from the center of the dipoles 2.7mm away from the tip of the probe housing plus the 1.2 mm distance between the surface and the lowest measuring point. 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 3-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01

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

4 DEFINITION OF REFERENCE POINTS

4.1 EAR REFERENCE POINT

Figure 4-2 shows the front, back and side views of the SAM Twin Phantom. The point "M" is the reference point for the center of the mouth, "LE" is the left ear reference point (ERP), and "RE" is the right ERP. The ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 4-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front) is perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 4-1). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

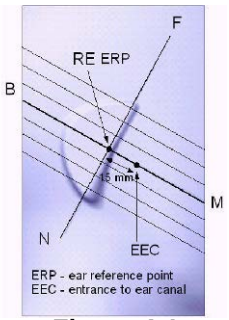


Figure 4-1
Close-Up Side view of ERP

4.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 4-3). The "test device reference point" was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at its top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

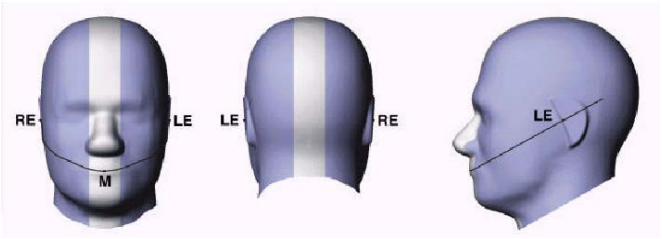


Figure 4-2
Front, back and side view of SAM Twin Phantom

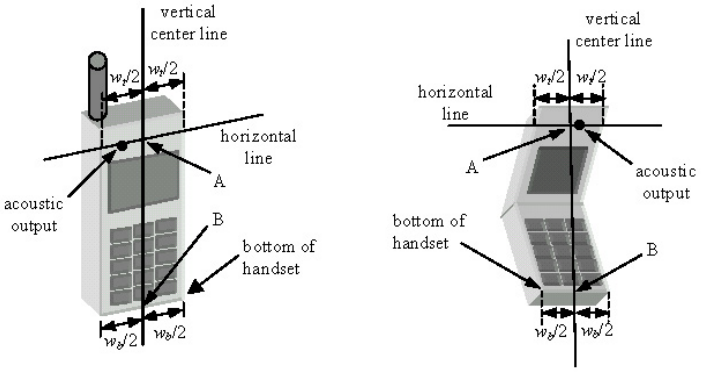


Figure 4-3
Handset Vertical Center & Horizontal Line Reference Points

5 TEST CONFIGURATION POSITIONS FOR HANDSETS

5.1 Device Holder

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

5.2 Positioning for Cheek

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 5-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

Figure 5-1 Front, Side and Top View of Cheek Position

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

5.3 Positioning for Ear / 15º Tilt

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

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. The tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 5-2).

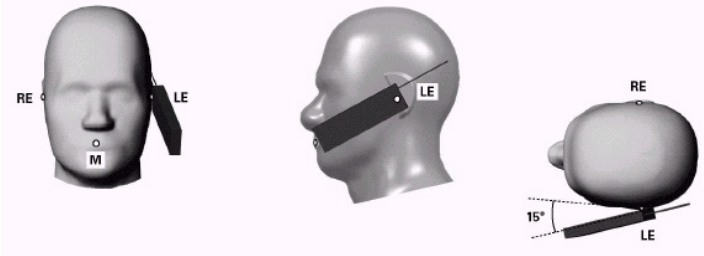


Figure 5-2 Front, Side and Top View of Ear/15º Tilt Position

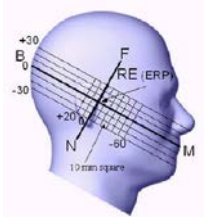


Figure 5-3
Side view w/ relevant markings

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

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01r01. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

The latest IEEE 1528 committee developments propose the usage of a tilted phantom when the antenna of the phone is mounted at the bottom or in all cases the peak absorption is in the chin region. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed individually from the table for emptying and cleaning.

Figure 5-4 Twin SAM Chin20

5.5 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 5-5). Per FCC KDB Publication 648474 D04v01r01, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v05r01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

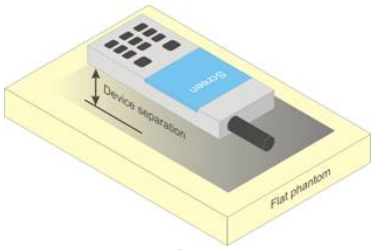


Figure 5-5
Sample Body-Worn Diagram

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

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

5.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 44798 D01v05 should be applied to determine SAR test requirements.

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC minitablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r01 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 mm from that surface or edge, in direct contact with the phantom, for 10-g SAR. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg.

5.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v01r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v05r01 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

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

7.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v05r01, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r02.

7.2 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v02r02 "SAR Measurement Procedures for 3G Devices" v02, October 2007.

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

7.3 SAR Measurement Conditions for CDMA2000

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

7.3.1 Output Power Verification

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

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 7-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH_0 and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 7-2 was applied.

Table 7-1
Parameters for Max. Power for RC1

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

Table 7-2
Parameters for Max. Power for RC3

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

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

7.3.2 Head SAR Measurements

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

Head SAR was additionally evaluated using EVDO Rev. 0 and Rev. A to support compliance for VoIP operations. See Section 7.3.4 for EVDO Rev. 0 and Rev. A configuration parameters.

7.3.3 Body SAR Measurements

SAR for body exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. SAR for multiple code channels (FCH + SCH_n) is not required when the maximum average output of each RF channel is less than ¼ dB higher than that measured with FCH only. Otherwise, SAR is measured on the maximum output channel (FCH + SCH_n) with FCH at full rate and SCH_0 enabled at 9600 bps using the exposure configuration that results in the highest SAR for that channel with FCH only. When multiple code channels are enabled, the DUT output may shift by more than 0.5 dB and lead to higher SAR drifts and SCH dropouts. Body SAR was measured using TDSO / SO32 with power control bits in the "All Up"

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

SAR was additionally evaluated for EVDO Rev. 0 to support simultaneous capabilities. See Section 7.3.4 and 7.3.5 for specific EVDO test settings.

7.3.4 Handsets with EVDO

For handsets with Ev-Do capabilities, when the maximum average output of each channel in Rev. 0 is less than ¼ dB higher than that measured in RC3 (1x RTT), body SAR for EV-DO is not required. Otherwise, SAR for Rev. 0 is measured on the maximum output channel at 153.6 kbps using the body exposure configuration that results in the highest SAR for that channel in RC3. SAR for Rev. A is not required when the maximum average output of each channel is less than that measured in Rev. 0 or less than ¼ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel for Rev. A using a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 Physical Layer configurations. A Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots would be configured in the downlink for both Rev. 0 and Rev. A.

7.3.5 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 per KDB Publication 941225 D01v02r02 procedures for “1x Ev-Do data Devices”. SAR for Subtype 2 Physical layer configurations is not required for Rev. A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for the RF channels in Rev. 0. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations.

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

7.4 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g/n /ac transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v01r02 for more details.

7.4.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

7.4.2 Frequency Channel Configurations [27]

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

For 5 GHz, the highest average RF output power channel across the default test channels at the lowest data rate was selected for SAR evaluation in 802.11a. When the adjacent channels are higher in power then the default channels, these “required channels” were considered instead of the default channels for SAR testing. 802.11n modes and higher data rates for 802.11a/n were evaluated only if the respective mode was 0.25 dB or higher than the 802.11a mode. 802.11ac SAR was evaluated for highest 802.11a configuration in each 5 GHz band and each exposure condition. 802.11ac modes were additionally evaluated for SAR if the output power for the respective mode was more than 0.25 dB higher than powers of 802.11a modes.

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

8 RF CONDUCTED POWERS

8.1 CDMA Conducted Powers

Band	Channel	Frequency	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC	MHz	RC1	RC3	FCH+SCH	FCH	(RTAP)	(RETAP)
PCS	25	1851.25	23.82	23.84	23.85	23.86	23.90	23.89
	600	1880	24.04	24.00	23.97	24.01	24.06	24.03
	1175	1908.75	23.90	23.95	23.90	23.88	23.84	23.72

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

Per KDB Publication 941225 D01v02r02:

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

Figure 8-1
Power Measurement Setup

8.2 GSM Conducted Powers

		Maximum Burst-Averaged Output Power				
		Voice	*GPRS Data (GMSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**
GSM 850	128	32.69	32.62	**30.75**	28.10	26.19
	190	32.40	32.66	**30.89**	28.32	26.38
	251	32.71	32.68	**31.01**	28.47	26.49
GSM 1900	512	29.80	29.83	**28.16**	25.81	23.76
	661	29.68	29.68	**28.10**	25.67	23.75
	810	29.55	29.56	**27.94**	25.59	23.61

		Calculated Maximum Frame-Averaged Output Power				
		Voice	*GPRS Data (GMSK)*			
Band	**Channel**	**GSM [dBm] CS (1 Slot)**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**GPRS [dBm] 3 Tx Slot**	**GPRS [dBm] 4 Tx Slot**
GSM 850	128	23.66	23.59	**24.73**	23.84	23.18
	190	23.37	23.63	**24.87**	24.06	23.37
	251	23.68	23.65	**24.99**	24.21	23.48
GSM 1900	512	20.77	20.80	**22.14**	21.55	20.75
	661	20.65	20.65	**22.08**	21.41	20.74
	810	20.52	20.53	**21.92**	21.33	20.60

Note:

1. Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
2. The bolded GPRS modes were selected for SAR testing according to the highest frame-averaged output power table according to KDB 941225 D03v01.
3. GPRS (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.

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

Figure 8-2
Power Measurement Setup

8.3 WLAN Conducted Powers

Table 8-1
IEEE 802.11b Average RF Power

Mode	Freq	Channel	802.11b (2.4 GHz) Conducted Power [dBm]			
			Data Rate [Mbps]			
	[MHz]		1	2	5.5	11
802.11b	2412	1*	15.00	15.12	14.20	14.15
802.11b	2437	6*	**15.30**	15.43	14.45	14.50
802.11b	2462	11*	15.25	15.24	14.40	14.40

Table 8-2
IEEE 802.11g Average RF Power

Mode	Freq	Channel	802.11g (2.4 GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6	9	12	18	24	36	48	54
802.11g	2412	1	12.12	12.12	12.20	12.25	12.22	11.98	12.35	12.25
802.11g	2437	6	12.42	12.35	12.42	12.32	12.30	12.28	12.32	12.50
802.11g	2462	11	12.15	12.12	12.36	12.55	12.18	12.32	12.52	12.45

Table 8-3
IEEE 802.11n Average RF Power

Mode	Freq	Channel	802.11n (2.4 GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	20	26	39	52	58	65
802.11n	2412	1	11.05	11.20	10.98	10.95	11.22	11.50	11.44	11.14
802.11n	2437	6	11.35	11.28	11.45	11.50	11.51	11.35	11.60	11.55
802.11n	2462	11	11.45	11.40	11.55	11.51	11.32	11.35	11.56	11.32

Table 8-4
IEEE 802.11a Average RF Power

Mode	Freq	Channel	802.11a (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6	9	12	18	24	36	48	54
802.11a	5180	36*	10.00	10.12	10.15	10.15	10.00	10.05	9.92	9.97
802.11a	5200	40	**10.14**	10.16	10.10	10.15	10.07	10.11	9.97	10.06
802.11a	5220	44	10.01	10.10	10.09	10.10	10.08	10.09	10.07	10.07
802.11a	5240	48*	10.08	10.01	10.02	10.04	10.00	9.95	10.05	9.99
802.11a	5260	52*	9.98	10.05	10.00	10.03	10.02	10.11	10.07	9.99
802.11a	5280	56	10.16	10.12	10.16	10.18	10.18	10.23	10.04	10.02
802.11a	5300	60	10.23	10.24	10.15	10.12	10.16	10.04	10.12	10.01
802.11a	5320	64*	**10.35**	10.22	10.22	10.17	10.16	10.03	10.08	10.05
802.11a	5500	100	9.54	9.53	9.50	9.53	9.48	9.64	9.52	9.52
802.11a	5520	104*	9.85	9.91	9.71	9.82	9.68	9.63	9.58	9.78
802.11a	5540	108	9.68	9.50	9.56	9.63	9.45	9.51	9.58	9.44
802.11a	5560	112	9.58	9.50	9.55	9.57	9.47	9.52	9.48	9.41
802.11a	5580	116*	9.88	9.85	9.88	9.96	9.73	9.70	9.58	9.61
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	9.79	9.78	9.79	9.71	9.74	9.66	9.69	9.66
802.11a	5680	136*	**10.00**	10.01	9.96	9.98	9.96	9.89	9.77	9.85
802.11a	5700	140	9.79	9.97	9.84	9.95	9.77	9.86	9.78	9.77
802.11a	5745	149*	9.76	9.82	9.82	9.68	9.72	9.55	9.54	9.59
802.11a	5765	153	9.72	9.80	9.76	9.72	9.78	9.79	9.70	9.70
802.11a	5785	157*	**10.09**	10.04	10.07	9.97	9.88	9.82	9.75	9.83
802.11a	5805	161*	9.81	9.94	9.79	9.91	9.85	9.73	9.74	9.77
802.11a	5825	165	9.73	9.71	9.66	9.54	9.73	9.63	9.69	9.61

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

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

Table 8-5
IEEE 802.11n Average RF Power – 20 MHz Bandwidth

Mode	Freq	Channel	20MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	10.16	10.26	10.25	10.23	10.19	10.16	10.09	10.05
802.11n	5200	40	10.18	10.27	10.26	10.26	10.23	10.16	10.14	10.07
802.11n	5220	44	10.17	10.27	10.22	10.18	10.08	10.05	10.10	10.12
802.11n	5240	48	10.06	10.08	10.03	10.04	10.02	10.03	10.08	10.12
802.11n	5260	52	10.29	10.17	10.16	10.17	10.13	10.09	10.05	10.11
802.11n	5280	56	10.20	10.28	10.20	10.22	10.15	10.18	10.20	10.22
802.11n	5300	60	10.29	10.32	10.14	10.18	10.10	10.14	10.10	10.14
802.11n	5320	64	10.31	10.32	10.36	10.23	10.24	10.29	10.19	10.17
802.11n	5500	100	9.54	9.61	9.51	9.48	9.52	9.52	9.59	9.43
802.11n	5520	104	9.55	9.54	9.45	9.44	9.56	9.58	9.57	9.62
802.11n	5540	108	9.45	9.47	9.39	9.30	9.31	9.45	9.26	9.25
802.11n	5560	112	9.29	9.31	9.28	9.30	9.20	9.18	9.18	9.13
802.11n	5580	116	9.65	9.64	9.59	9.43	9.46	9.48	9.53	9.52
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	9.46	9.52	9.55	9.57	9.43	9.50	9.50	9.51
802.11n	5680	136	9.70	9.87	9.66	9.76	9.66	9.73	9.61	9.66
802.11n	5700	140	9.63	9.65	9.56	9.63	9.59	9.61	9.63	9.59
802.11n	5745	149	9.44	9.54	9.38	9.45	9.43	9.24	9.47	9.45
802.11n	5765	153	9.58	9.54	9.46	9.49	9.43	9.52	9.41	9.61
802.11n	5785	157	9.81	9.81	9.72	9.72	9.81	9.68	9.69	9.71
802.11n	5805	161	9.77	9.71	9.64	9.75	9.67	9.61	9.64	9.58
802.11n	5825	165	9.45	9.56	9.49	9.44	9.46	9.35	9.47	9.45

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

Table 8-6
IEEE 802.11n Average RF Power – 40 MHz Bandwidth

Mode	Freq	Channel	40MHz BW 802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
	[MHz]		13.5	27	40.5	54	81	108	121.5	135
802.11n	5190	38	9.89	9.96	9.99	9.88	9.96	9.86	9.72	9.83
802.11n	5230	46	9.73	9.74	9.89	9.73	9.76	9.76	9.61	9.72
802.11n	5270	54	10.00	9.92	9.92	9.88	9.79	9.96	9.78	9.85
802.11n	5310	62	9.87	9.86	9.84	9.79	9.82	9.83	9.87	9.86
802.11n	5510	102	9.35	9.25	9.25	9.11	9.10	9.16	9.05	9.14
802.11n	5550	110	9.04	9.10	8.95	8.94	8.94	8.96	8.97	8.95
802.11n	5590	118	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5630	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5670	134	9.34	9.44	9.32	9.23	9.17	9.09	9.08	9.24
802.11n	5755	151	9.33	9.27	9.23	9.26	9.12	9.31	9.06	9.18
802.11n	5795	159	9.33	9.37	9.47	9.53	9.37	9.35	9.40	9.41

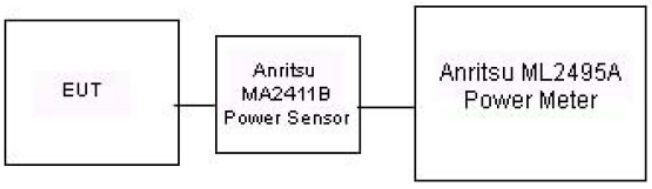


Figure 8-3
Power Measurement Setup for Bandwidths < 50 MHz

Table 8-7
IEEE 802.11ac Average RF Power – 80 MHz Bandwidth

Mode	Freq [MHz]	Channel	80MHz BW 802.11ac (5GHz) Conducted Power [dBm]									
			Data Rate [Mbps]									
			29.3	58.5	87.8	117	175.5	234	263.3	292.5	351	390
802.11ac	5210	42	**10.15**	10.22	9.92	10.04	10.09	9.97	9.78	9.87	10.07	10.24
802.11ac	5290	58	**10.01**	9.95	10.25	10.21	10.05	10.09	9.96	10.00	10.22	10.01
802.11ac	5530	106	**9.80**	9.93	9.84	10.04	9.84	10.00	9.87	9.94	9.88	9.86
802.11ac	5775	155	**9.56**	9.72	9.58	9.56	9.67	9.60	9.54	9.57	9.58	9.59

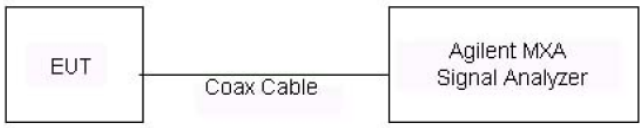


Figure 8-4
Power Measurement Setup for Bandwidths > 50 MHz

Table 8-8
Bluetooth RF Conducted Powers

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Peak Conducted Power		Avg Conducted Power	
			[dBm]	[mW]	[dBm]	[mW]
2402	1.0	0	7.92	6.200	7.62	5.774
2441	1.0	39	8.03	6.349	7.79	6.012
2480	1.0	78	8.03	3.356	**7.82**	**6.060**
2402	2.0	0	8.89	7.741	6.27	4.236
2441	2.0	39	8.99	7.916	6.41	4.373
2480	2.0	78	9.01	7.952	6.38	4.347
2402	3.0	0	9.15	8.228	6.39	4.351
2441	3.0	39	9.25	8.410	6.55	4.517
2480	3.0	78	9.26	8.439	6.61	4.580

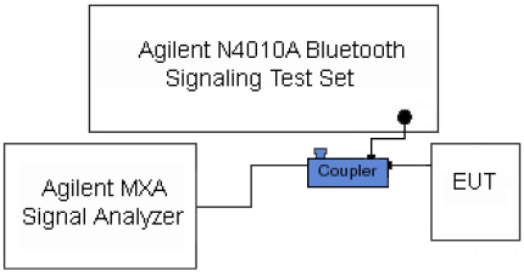


Figure 8-5
Power Measurement Setup

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

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

9 SYSTEM VERIFICATION

9.1 Tissue Verification

Table 9-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
06/27/2013	835H	23.1	820	0.896	40.867	0.898	41.571	-0.22%	-1.69%
			835	0.910	40.679	0.900	41.500	1.11%	-1.98%
			850	0.925	40.503	0.916	41.500	0.98%	-2.40%
06/20/2013	1900H	23.2	1850	1.394	38.878	1.400	40.000	-0.43%	-2.81%
			1880	1.422	38.735	1.400	40.000	1.57%	-3.16%
			1910	1.460	38.614	1.400	40.000	4.29%	-3.47%
07/01/2013	1900H	21.8	1850	1.342	40.138	1.400	40.000	-4.14%	0.34%
			1880	1.371	40.056	1.400	40.000	-2.07%	0.14%
			1910	1.401	39.955	1.400	40.000	0.07%	-0.11%
06/21/2013	2450H	22.0	2401	1.809	39.065	1.758	39.298	2.90%	-0.59%
			2450	1.870	38.874	1.800	39.200	3.89%	-0.83%
			2499	1.940	38.629	1.852	39.135	4.75%	-1.29%
07/01/2013	5200H-5800H	21.5	5200	4.700	35.756	4.660	36.000	0.86%	-0.68%
			5220	4.742	35.448	4.680	35.980	1.32%	-1.48%
			5280	4.721	35.316	4.740	35.920	-0.40%	-1.68%
			5300	4.806	35.425	4.760	35.900	0.97%	-1.32%
			5320	4.836	35.112	4.780	35.880	1.17%	-2.14%
			5500	5.033	34.692	4.965	35.650	1.37%	-2.69%
			5520	5.061	34.569	4.986	35.620	1.50%	-2.95%
			5540	5.099	34.474	5.007	35.590	1.84%	-3.14%
			5600	5.170	34.304	5.070	35.500	1.97%	-3.37%
			5680	5.284	34.098	5.150	35.420	2.60%	-3.73%
			5765	5.402	33.942	5.235	35.335	3.19%	-3.94%
			5785	5.420	33.839	5.255	35.315	3.14%	-4.18%
			5800	5.438	33.927	5.270	35.300	3.19%	-3.89%

Table 9-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
06/24/2013	835B	23.4	820	0.996	55.968	0.969	55.258	2.79%	1.28%
			835	1.011	55.799	0.970	55.200	4.23%	1.09%
			850	1.027	55.659	0.988	55.154	3.95%	0.92%
06/25/2013	1900B	23.6	1850	1.447	53.178	1.520	53.300	-4.80%	-0.23%
			1880	1.480	53.071	1.520	53.300	-2.63%	-0.43%
			1910	1.512	52.964	1.520	53.300	-0.53%	-0.63%
07/01/2013	1900B	23.7	1850	1.468	52.002	1.520	53.300	-3.42%	-2.44%
			1880	1.497	51.920	1.520	53.300	-1.51%	-2.59%
			1910	1.539	51.762	1.520	53.300	1.25%	-2.89%
06/26/2013	2450B	23.9	2401	1.944	52.261	1.903	52.765	2.15%	-0.96%
			2450	2.008	52.116	1.950	52.700	2.97%	-1.11%
			2499	2.074	51.956	2.019	52.638	2.72%	-1.30%
07/08/2013	2450B	23.2	2401	1.941	53.298	1.903	52.765	2.00%	1.01%
			2450	2.015	53.219	1.950	52.700	3.33%	0.98%
			2499	2.081	52.924	2.019	52.638	3.07%	0.54%
06/24/2013	5200B-5800B	23.0	5200	5.345	47.494	5.299	49.014	0.87%	-3.10%
			5220	5.408	47.423	5.323	48.987	1.60%	-3.19%
			5280	5.450	47.223	5.393	48.879	1.06%	-3.39%
			5300	5.483	47.275	5.416	48.851	1.24%	-3.23%
			5320	5.534	47.215	5.439	48.607	1.75%	-2.86%
			5500	5.740	46.926	5.650	48.580	1.59%	-3.40%
			5520	5.762	46.867	5.673	48.553	1.57%	-3.47%
			5540	5.811	46.832	5.696	48.526	2.02%	-3.49%
			5580	5.864	46.774	5.743	48.471	2.11%	-3.50%
			5600	5.882	46.744	5.766	48.444	2.01%	-3.51%
			5680	6.016	46.605	5.860	48.336	2.66%	-3.58%
			5765	6.108	46.449	5.959	48.220	2.50%	-3.67%
			5785	6.146	46.390	5.982	48.242	2.74%	-3.84%
			5800	6.156	46.371	6.000	48.200	2.60%	-3.79%
07/01/2013	5200B-5800B	23.1	5200	5.335	47.080	5.299	49.014	0.68%	-3.95%
			5220	5.362	47.009	5.323	48.987	0.73%	-4.04%
			5280	5.422	46.756	5.393	48.879	0.54%	-4.34%
			5300	5.438	46.810	5.416	48.851	0.41%	-4.18%
			5320	5.483	46.713	5.439	48.607	0.81%	-3.90%
			5500	5.732	46.335	5.650	48.580	1.45%	-4.62%
			5520	5.782	46.255	5.673	48.553	1.92%	-4.73%
			5540	5.817	46.208	5.696	48.526	2.12%	-4.78%
			5600	5.914	46.136	5.766	48.444	2.57%	-4.76%
			5680	6.044	46.032	5.860	48.336	3.14%	-4.77%
			5765	6.199	45.924	5.959	48.220	4.03%	-4.76%
			5785	6.207	45.987	5.982	48.242	3.76%	-4.67%
			5800	6.224	45.887	6.000	48.200	3.73%	-4.80%

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 IEEE 1528 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 9-3
System Verification Results

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
D	835	HEAD	06/27/2013	24.5	23.8	0.100	4d132	3288	0.977	9.660	9.770	1.14%
A	1900	HEAD	06/20/2013	24.0	23.3	0.100	5d080	3589	4.250	39.400	42.500	7.87%
G	1900	HEAD	07/01/2013	24.3	22.5	0.100	5d148	3209	3.760	39.700	37.600	-5.29%
B	2450	HEAD	06/21/2013	23.8	22.0	0.100	719	3287	5.610	52.700	56.100	6.45%
A	5200	HEAD	07/01/2013	23.1	21.6	0.100	1057	3589	7.400	75.900	74.000	-2.50%
A	5300	HEAD	07/01/2013	23.1	21.6	0.100	1057	3589	7.150	76.900	71.500	-7.02%
A	5500	HEAD	07/01/2013	23.1	21.6	0.100	1057	3589	7.610	80.100	76.100	-4.99%
A	5600	HEAD	07/01/2013	23.3	21.8	0.100	1057	3589	7.640	80.400	76.400	-4.98%
A	5800	HEAD	07/01/2013	23.3	21.4	0.100	1057	3589	7.160	76.100	71.600	-5.91%
G	835	BODY	06/24/2013	24.5	23.4	0.100	4d132	3209	1.010	9.360	10.100	7.91%
C	1900	BODY	06/25/2013	23.2	23.8	0.040	5d080	3022	1.640	40.300	41.000	1.74%
C	1900	BODY	07/02/2013	23.5	23.7	0.100	5d080	3022	4.020	40.300	40.200	-0.25%
B	2450	BODY	06/26/2013	23.2	22.9	0.100	719	3287	5.240	51.600	52.400	1.55%
C	2450	BODY	07/08/2013	23.8	23.2	0.100	719	3022	5.170	51.600	51.700	0.19%
A	5200	BODY	06/24/2013	24.3	23.2	0.100	1057	3589	7.340	75.500	73.400	-2.78%
A	5300	BODY	06/24/2013	24.3	23.2	0.100	1057	3589	7.750	75.300	77.500	2.92%
A	5500	BODY	06/24/2013	24.3	23.2	0.100	1057	3589	7.750	80.800	77.500	-4.08%
A	5600	BODY	06/24/2013	24.4	23.3	0.100	1057	3589	8.230	80.300	82.300	2.49%
A	5800	BODY	06/24/2013	24.4	23.3	0.100	1057	3589	7.440	75.100	74.400	-0.93%
A	5200	BODY	07/01/2013	24.3	23.1	0.100	1057	3589	7.510	75.500	75.100	-0.53%
A	5300	BODY	07/01/2013	24.3	23.1	0.100	1057	3589	7.980	75.300	79.800	5.98%
A	5500	BODY	07/01/2013	24.3	23.2	0.100	1057	3589	8.150	80.800	81.500	0.87%
A	5600	BODY	07/01/2013	24.2	23.2	0.100	1057	3589	8.440	80.300	84.400	5.11%
A	5800	BODY	07/01/2013	24.2	23.2	0.100	1057	3589	7.200	75.100	72.000	-4.13%

Table 9-4
System Verification Results: Extremity SAR

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)	$Deviation_{10g}$ (%)
A	5200	BODY	07/01/2013	24.3	23.1	0.100	1057	3589	2.100	21.100	21.000	-0.47%
A	5300	BODY	07/01/2013	24.3	23.1	0.100	1057	3589	2.210	21.100	22.100	4.74%
A	5500	BODY	07/01/2013	24.3	23.2	0.100	1057	3589	2.220	22.400	22.200	-0.89%
A	5600	BODY	07/01/2013	24.2	23.2	0.100	1057	3589	2.300	22.300	23.000	3.14%

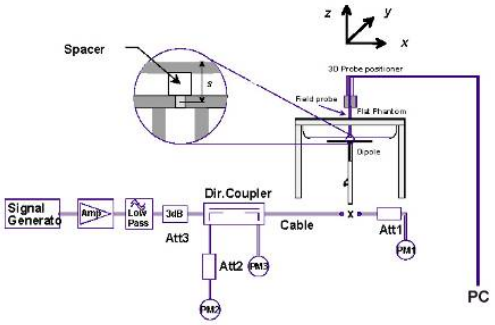


Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

10 SAR DATA SUMMARY

10.1 Standalone Head SAR Data

Table 10-1
PCS CDMA Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	RC3 / SO55	24.5	24.00	0.02	Right	Cheek	FK-181-A	1:1	0.148	1.122	0.166	
1880.00	600	PCS CDMA	RC3 / SO55	24.5	24.00	0.05	Right	Tilt	FK-181-A	1:1	0.134	1.122	0.150	
1880.00	600	PCS CDMA	RC3 / SO55	24.5	24.00	-0.01	Left	Cheek	FK-181-A	1:1	0.217	1.122	0.243	A1
1880.00	600	PCS CDMA	RC3 / SO55	24.5	24.00	0.06	Left	Tilt	FK-181-A	1:1	0.162	1.122	0.182	
1880.00	600	PCS CDMA	EVDO Rev. A	24.5	24.03	0.02	Right	Cheek	FK-181-C	1:1	0.152	1.114	0.169	
1880.00	600	PCS CDMA	EVDO Rev. A	24.5	24.03	0.06	Right	Tilt	FK-181-C	1:1	0.140	1.114	0.156	
1880.00	600	PCS CDMA	EVDO Rev. A	24.5	24.03	0.13	Left	Cheek	FK-181-C	1:1	0.204	1.114	0.227	
1880.00	600	PCS CDMA	EVDO Rev. A	24.5	24.03	0.12	Left	Tilt	FK-181-C	1:1	0.153	1.114	0.170	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	-0.02	Right	Cheek	FK-181-C	1:1	0.134	1.107	0.148	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	-0.01	Right	Tilt	FK-181-C	1:1	0.132	1.107	0.146	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	0.11	Left	Cheek	FK-181-C	1:1	0.210	1.107	0.232	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	-0.05	Left	Tilt	FK-181-C	1:1	0.168	1.107	0.186	
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
GSM 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.0	32.40	0.01	Right	Cheek	FK-181-C	1	1:8.3	0.059	1.148	0.068	
836.60	190	GSM 850	GSM	33.0	32.40	0.09	Right	Tilt	FK-181-C	1	1:8.3	0.039	1.148	0.045	
836.60	190	GSM 850	GSM	33.0	32.40	0.04	Left	Cheek	FK-181-C	1	1:8.3	0.086	1.148	0.099	
836.60	190	GSM 850	GSM	33.0	32.40	0.06	Left	Tilt	FK-181-C	1	1:8.3	0.059	1.148	0.068	
836.60	190	GSM 850	GPRS	31.5	30.89	-0.01	Right	Cheek	FK-181-C	2	1:4.15	0.099	1.151	0.114	
836.60	190	GSM 850	GPRS	31.5	30.89	0.03	Right	Tilt	FK-181-C	2	1:4.15	0.066	1.151	0.076	
836.60	190	GSM 850	GPRS	31.5	30.89	0.02	Left	Cheek	FK-181-C	2	1:4.15	0.162	1.151	0.186	A2
836.60	190	GSM 850	GPRS	31.5	30.89	0.05	Left	Tilt	FK-181-C	2	1:4.15	0.107	1.151	0.123	
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
GSM 1900 Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.0	29.68	-0.01	Right	Cheek	FK-181-C	1	1:8.3	0.237	1.076	0.255	
1880.00	661	GSM 1900	GSM	30.0	29.68	-0.04	Right	Tilt	FK-181-C	1	1:8.3	0.271	1.076	0.292	
1880.00	661	GSM 1900	GSM	30.0	29.68	0.02	Left	Cheek	FK-181-C	1	1:8.3	0.422	1.076	0.454	
1880.00	661	GSM 1900	GSM	30.0	29.68	0.06	Left	Tilt	FK-181-C	1	1:8.3	0.298	1.076	0.321	
1880.00	661	GSM 1900	GPRS	28.5	28.10	0.02	Right	Cheek	FK-181-C	2	1:4.15	0.337	1.096	0.369	
1880.00	661	GSM 1900	GPRS	28.5	28.10	-0.06	Right	Tilt	FK-181-C	2	1:4.15	0.345	1.096	0.378	
1880.00	661	GSM 1900	GPRS	28.5	28.10	0.05	Left	Cheek	FK-181-C	2	1:4.15	0.526	1.096	**0.576**	A3
1880.00	661	GSM 1900	GPRS	28.5	28.10	0.04	Left	Tilt	FK-181-C	2	1:4.15	0.393	1.096	0.431	
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 10-4
DTS Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	15.5	15.30	-0.19	Right	Cheek	FK-181-B	1	1:1	0.037	1.047	**0.039**	A4
2437	6	IEEE 802.11b	DSSS	15.5	15.30	-0.11	Right	Tilt	FK-181-B	1	1:1	0.023	1.047	0.024	
2437	6	IEEE 802.11b	DSSS	15.5	15.30	0.14	Left	Cheek	FK-181-B	1	1:1	0.022	1.047	0.023	
2437	6	IEEE 802.11b	DSSS	15.5	15.30	0.02	Left	Tilt	FK-181-B	1	1:1	0.029	1.047	0.030	
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.15	Right	Cheek	FK-181-A	6	1:1	0.000	1.099	0.000	
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.08	Right	Tilt	FK-181-A	6	1:1	0.000	1.099	0.000	
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.21	Left	Cheek	FK-181-A	6	1:1	0.000	1.099	0.000	A5
5775	155	IEEE 802.11ac	OFDM	10.5	9.56	0.15	Left	Cheek	FK-181-A	29.3	1:1	0.000	1.242	0.000	
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.16	Left	Tilt	FK-181-A	6	1:1	0.000	1.099	0.000	
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 10-5
NII Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5200	40	IEEE 802.11a	OFDM	10.5	10.14	0.18	Right	Cheek	FK-181-A	6	1:1	0.000	1.086	0.000	
5200	40	IEEE 802.11a	OFDM	10.5	10.14	0.14	Right	Tilt	FK-181-A	6	1:1	0.000	1.086	0.000	
5200	40	IEEE 802.11a	OFDM	10.5	10.14	0.06	Left	Cheek	FK-181-A	6	1:1	0.000	1.086	0.000	
5210	42	IEEE 802.11ac	OFDM	10.5	10.15	0.18	Left	Cheek	FK-181-A	29.3	1:1	0.000	1.084	0.000	
5200	40	IEEE 802.11a	OFDM	10.5	10.14	0.17	Left	Tilt	FK-181-A	6	1:1	0.000	1.086	0.000	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	0.21	Right	Cheek	FK-181-A	6	1:1	0.000	1.035	0.000	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	0.15	Right	Tilt	FK-181-A	6	1:1	0.000	1.035	0.000	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	0.17	Left	Cheek	FK-181-A	6	1:1	0.000	1.035	0.000	
5290	58	IEEE 802.11ac	OFDM	10.5	10.01	0.16	Left	Cheek	FK-181-A	29.3	1:1	0.000	1.119	0.000	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	0.18	Left	Tilt	FK-181-A	6	1:1	0.000	1.035	0.000	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	0.15	Right	Cheek	FK-181-A	6	1:1	0.000	1.122	0.000	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	0.11	Right	Tilt	FK-181-A	6	1:1	0.000	1.122	0.000	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	0.16	Left	Cheek	FK-181-A	6	1:1	0.000	1.122	0.000	A6
5530	106	IEEE 802.11ac	OFDM	10.5	9.80	0.13	Left	Cheek	FK-181-A	29.3	1:1	0.000	1.175	0.000	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	0.12	Left	Tilt	FK-181-A	6	1:1	0.000	1.122	0.000	
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 Body-Worn SAR Data

Table 10-6
CDMA/GSM Body-Worn SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	TDSO / SO32	24.5	24.01	-0.20	10 mm	FK-181-A	N/A	1:1	back	0.569	1.119	0.637	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	0.02	10 mm	FK-181-A	N/A	1:1	back	0.657	1.107	0.727	A7
836.60	190	GSM 850	GSM	33.0	32.40	0.00	10 mm	FK-181-B	1	1:8.3	back	0.125	1.148	0.144	
836.60	190	GSM 850	GPRS	31.5	30.89	0.00	10 mm	FK-181-C	2	1:4.15	back	0.143	1.151	0.165	A8
1880.00	661	GSM 1900	GSM	30.0	29.68	0.02	10 mm	FK-181-B	1	1:8.3	back	0.743	1.076	0.799	
1850.20	512	GSM 1900	GPRS	28.5	28.16	0.06	10 mm	FK-181-B	2	1:4.15	back	1.010	1.081	**1.092**	A9
1880.00	661	GSM 1900	GPRS	28.5	28.10	0.01	10 mm	FK-181-B	2	1:4.15	back	0.978	1.096	1.072	
1909.80	810	GSM 1900	GPRS	28.5	27.94	0.02	10 mm	FK-181-B	2	1:4.15	back	0.820	1.138	0.933	
1850.20	512	GSM 1900	GPRS	28.5	28.16	0.07	10 mm	FK-181-B	2	1:4.15	back	0.893	1.081	0.965	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Note: Blue entry represents repeatability measurement.

Table 10-7
DTS Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	15.5	15.30	-0.04	10 mm	FK-181-A	1	back	1:1	0.182	1.047	0.191	A10
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.18	10 mm	FK-181-A	6	back	1:1	0.277	1.099	0.304	
5775	155	IEEE 802.11ac	OFDM	10.5	9.56	0.02	10 mm	FK-181-A	29.3	back	1:1	0.335	1.242	**0.416**	A12
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram								

Table 10-8
NII Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5200	40	IEEE 802.11a	OFDM	10.5	10.14	0.14	10 mm	FK-181-A	6	back	1:1	0.033	1.086	0.036	
5210	42	IEEE 802.11ac	OFDM	10.5	10.15	0.10	10 mm	FK-181-A	29.3	back	1:1	0.097	1.084	0.105	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	0.19	10 mm	FK-181-A	6	back	1:1	0.018	1.035	0.019	
5290	58	IEEE 802.11ac	OFDM	10.5	10.01	0.06	10 mm	FK-181-A	29.3	back	1:1	0.066	1.119	0.074	
5520	104	IEEE 802.11a	OFDM	10.5	9.85	0.19	10 mm	FK-181-A	6	back	1:1	0.036	1.161	0.042	
5580	116	IEEE 802.11a	OFDM	10.5	9.88	0.14	10 mm	FK-181-A	6	back	1:1	0.081	1.153	0.093	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	-0.03	10 mm	FK-181-A	6	back	1:1	0.302	1.122	**0.339**	A13
5530	106	IEEE 802.11ac	OFDM	10.5	9.80	0.17	10 mm	FK-181-A	29.3	back	1:1	0.169	1.175	0.199	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram								

Table 10-9
DSS Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2480	78	Bluetooth	FHSS	8.0	7.82	-0.14	10 mm	FK-181-C	1	back	1:1	0.062	1.042	0.065	A11
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**							**Body** **1.6 W/kg (mW/g)** averaged over 1 gram								

10.3 Standalone Wireless Router SAR Data

Table 10-10
CDMA/EVDO/GSM/GPRS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	TDSO / SO32	24.5	24.01	-0.20	10 mm	FK-181-A	N/A	1:1	back	0.569	1.119	0.637	
1880.00	600	PCS CDMA	TDSO / SO32	24.5	24.01	0.04	10 mm	FK-181-A	N/A	1:1	front	0.302	1.119	0.338	
1880.00	600	PCS CDMA	TDSO / SO32	24.5	24.01	0.00	10 mm	FK-181-A	N/A	1:1	bottom	0.252	1.119	0.282	
1880.00	600	PCS CDMA	TDSO / SO32	24.5	24.01	-0.04	10 mm	FK-181-A	N/A	1:1	left	0.231	1.119	0.258	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	0.02	10 mm	FK-181-A	N/A	1:1	back	0.657	1.107	0.727	A7
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	0.00	10 mm	FK-181-A	N/A	1:1	front	0.376	1.107	0.416	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	0.01	10 mm	FK-181-A	N/A	1:1	bottom	0.220	1.107	0.244	
1880.00	600	PCS CDMA	EVDO Rev. 0	24.5	24.06	0.01	10 mm	FK-181-A	N/A	1:1	left	0.302	1.107	0.334	
836.60	190	GSM 850	GSM	33.0	32.40	0.00	10 mm	FK-181-B	1	1:8.3	back	0.125	1.148	0.144	
836.60	190	GSM 850	GSM	33.0	32.40	0.00	10 mm	FK-181-B	1	1:8.3	front	0.031	1.148	0.036	
836.60	190	GSM 850	GSM	33.0	32.40	0.04	10 mm	FK-181-B	1	1:8.3	top	0.031	1.148	0.036	
836.60	190	GSM 850	GSM	33.0	32.40	0.00	10 mm	FK-181-B	1	1:8.3	right	0.027	1.148	0.031	
836.60	190	GSM 850	GPRS	31.5	30.89	0.00	10 mm	FK-181-C	2	1:4.15	back	0.143	1.151	0.165	A8
836.60	190	GSM 850	GPRS	31.5	30.89	-0.03	10 mm	FK-181-C	2	1:4.15	front	0.047	1.151	0.054	
836.60	190	GSM 850	GPRS	31.5	30.89	-0.02	10 mm	FK-181-C	2	1:4.15	top	0.060	1.151	0.069	
836.60	190	GSM 850	GPRS	31.5	30.89	-0.07	10 mm	FK-181-C	2	1:4.15	right	0.041	1.151	0.047	
1880.00	661	GSM 1900	GSM	30.0	29.68	0.02	10 mm	FK-181-B	1	1:8.3	back	0.743	1.076	0.799	
1880.00	661	GSM 1900	GSM	30.0	29.68	0.01	10 mm	FK-181-B	1	1:8.3	front	0.103	1.076	0.111	
1880.00	661	GSM 1900	GSM	30.0	29.68	0.00	10 mm	FK-181-B	1	1:8.3	top	0.200	1.076	0.215	
1880.00	661	GSM 1900	GSM	30.0	29.68	-0.02	10 mm	FK-181-B	1	1:8.3	right	0.176	1.076	0.189	
1850.20	512	GSM 1900	GPRS	28.5	28.16	0.06	10 mm	FK-181-B	2	1:4.15	back	1.010	1.081	**1.092**	A9
1880.00	661	GSM 1900	GPRS	28.5	28.10	0.01	10 mm	FK-181-B	2	1:4.15	back	0.978	1.096	1.072	
1909.80	810	GSM 1900	GPRS	28.5	27.94	0.02	10 mm	FK-181-B	2	1:4.15	back	0.820	1.138	0.933	
1880.00	661	GSM 1900	GPRS	28.5	28.10	-0.03	10 mm	FK-181-B	2	1:4.15	front	0.189	1.096	0.207	
1880.00	661	GSM 1900	GPRS	28.5	28.10	-0.02	10 mm	FK-181-B	2	1:4.15	top	0.271	1.096	0.297	
1880.00	661	GSM 1900	GPRS	28.5	28.10	-0.01	10 mm	FK-181-B	2	1:4.15	right	0.233	1.096	0.255	
1850.20	512	GSM 1900	GPRS	28.5	28.16	0.07	10 mm	FK-181-B	2	1:4.15	back	0.893	1.081	0.965	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram							

Note: Blue entry represents repeatability measurement.

Table 10-11
WLAN Hotspot SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2437	6	IEEE 802.11b	DSSS	15.5	15.30	-0.04	10 mm	FK-181-A	1	back	1:1	0.182	1.047	0.191	A10
2437	6	IEEE 802.11b	DSSS	15.5	15.30	-0.11	10 mm	FK-181-A	1	front	1:1	0.144	1.047	0.151	
2437	6	IEEE 802.11b	DSSS	15.5	15.30	-0.04	10 mm	FK-181-A	1	bottom	1:1	0.069	1.047	0.072	
2437	6	IEEE 802.11b	DSSS	15.5	15.30	0.00	10 mm	FK-181-A	1	right	1:1	0.095	1.047	0.099	
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.18	10 mm	FK-181-A	6	back	1:1	0.277	1.099	0.304	
5775	155	IEEE 802.11ac	OFDM	10.5	9.56	0.02	10 mm	FK-181-A	29.3	back	1:1	0.335	1.242	0.416	A12
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.16	10 mm	FK-181-A	6	front	1:1	0.025	1.099	0.027	
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.18	10 mm	FK-181-A	6	bottom	1:1	0.060	1.099	0.066	
5785	157	IEEE 802.11a	OFDM	10.5	10.09	0.13	10 mm	FK-181-A	6	right	1:1	0.016	1.099	0.018	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram							

10.4 Standalone Hand SAR Data

Table 10-12
NII Hand SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (10g)	Scaling Factor	Scaled SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
5200	40	IEEE 802.11a	OFDM	10.5	10.14	-0.08	0 mm	FK-181-A	6	back	1:1	0.053	1.086	0.058	
5210	42	IEEE 802.11ac	OFDM	10.5	10.15	0.13	0 mm	FK-181-A	29.3	back	1:1	0.306	1.084	**0.332**	A14
5200	40	IEEE 802.11a	OFDM	10.5	10.14	0.17	0 mm	FK-181-A	6	front	1:1	0.002	1.086	0.002	
5200	40	IEEE 802.11a	OFDM	10.5	10.14	0.03	0 mm	FK-181-A	6	bottom	1:1	0.002	1.086	0.002	
5200	40	IEEE 802.11a	OFDM	10.5	10.14	-0.14	0 mm	FK-181-A	6	right	1:1	0.000	1.086	0.000	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	0.04	0 mm	FK-181-A	6	back	1:1	0.072	1.035	0.075	
5290	58	IEEE 802.11ac	OFDM	10.5	10.01	0.01	0 mm	FK-181-A	29.3	back	1:1	0.265	1.119	0.297	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	0.19	0 mm	FK-181-A	6	front	1:1	0.003	1.035	0.003	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	0.08	0 mm	FK-181-A	6	bottom	1:1	0.003	1.035	0.003	
5320	64	IEEE 802.11a	OFDM	10.5	10.35	-0.16	0 mm	FK-181-A	6	right	1:1	0.000	1.035	0.000	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	0.18	0 mm	FK-181-A	6	back	1:1	0.195	1.122	0.219	
5530	106	IEEE 802.11ac	OFDM	10.5	9.80	0.13	0 mm	FK-181-A	29.3	back	1:1	0.257	1.175	0.302	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	0.17	0 mm	FK-181-A	6	front	1:1	0.062	1.122	0.070	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	0.01	0 mm	FK-181-A	6	bottom	1:1	0.129	1.122	0.145	
5680	136	IEEE 802.11a	OFDM	10.5	10.00	-0.09	0 mm	FK-181-A	6	right	1:1	0.025	1.122	0.028	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Hand 4.0 W/kg (mW/g) averaged over 10 grams							

10.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, FCC/OET Bulletin 65, Supplement C [June 2001] and FCC KDB Publication 447498 D01v05r01.
2. Batteries are fully charged at the beginning of the SAR measurements. A battery with NFC operations was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05r01.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r01, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 0.8 W/kg or when the measured 10 gram SAR results for a frequency band were greater than 2.0 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v01r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 5.7 for more details).

CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v02r02. EVDO Rev 0 was evaluated for Head SAR to support simultaneous capabilities.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH and EVDO Rev 0. TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers, per FCC KDB Publication 941225 D01v02r02. EVDO Rev 0 was evaluated for Body-Worn exposure to support simultaneous capabilities.
3. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01 procedures for data devices. Since the average output power of Subtype 2 for Rev. A is less than the Rev. 0 power levels, then EVDO Rev. A SAR is not required. SAR is not required for 1x RTT for Ev-Do hotspot devices when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0.
4. Head SAR was additionally evaluated using EVDO Rev. A to determine compliance for VoIP operations.
5. CDMA 1x-RTT Hotspot SAR was additionally evaluated for Hotspot exposure to support simultaneous capabilities.
6. Per FCC KDB Publication 447498 D01v05r01, since the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg, testing at the other channels is not required for such test configuration(s). Since the maximum output power variation across the required test channels is ≤ ½ dB, only middle channel was used.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR. Additionally, GPRS data was evaluated for body-worn SAR to support simultaneous capabilities.
2. GSM Voice Hotspot SAR was additionally evaluated for Hotspot exposure to support simultaneous capabilities.
3. Justification for reduced test configurations per KDB Publication 941225 D03v01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power was evaluated for SAR for hotspot SAR.
4. Per FCC KDB Publication 447498 D01v05r01, when the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is > 0.8 W/kg, testing at the other channels is required for such test configuration(s). Since the maximum output power variation across the required test channels is ≤ ½ dB, middle channel is the default channel used.

WLAN/BT Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11n 20 MHz and 40 MHz bandwidths) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
3. Per FCC KDB Publication 648474 D04v01r01, this device is considered a "phablet" since the diagonal distance is > 160mm. When Hotspot/WIFI direct is disabled, the device is capable of operating with all 5 GHz bands (client mode). When Hotspot, WIFI direct or mobile AP operation is activated, the device is limited to 2.4 GHz and 5.8 GHz bands. Since wireless router operations are not supported for 5 GHz NII WIFI, hand SAR was evaluated for 5 GHz NII WIFI. However, hand SAR was not evaluated for 2.4 GHz WIFI and 5 GHz DTS WIFI since Hotspot SAR for 2.4 GHz WIFI and 5 GHz DTS WIFI were < 1.2 W/kg.
4. Per April 2013 TCB Workshop notes, full SAR tests for all IEEE 802.11ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11a mode. IEEE 802.11ac was evaluated for the highest IEEE 802.11a position in each 5 GHz band and exposure condition.
5. This device only supports hotspot for 2.4 GHz and 5.8 GHz Bands, therefore all other bands were not evaluated for hotspot conditions.
6. WIFI transmission was verified using an uncalibrated spectrum analyzer.
7. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg and the reported 10g averaged SAR is <2.0 W/kg, SAR testing on other default channels was not required. When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is >1.6 W/kg other default channels were tested.

11 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05r01 are applicable to handsets with built-in unlicensed transmitters such as 802.11a/b/g/n/ac and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

11.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05r01 IV.C.1.iii, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v05r01 4.3.2 2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

Main Antenna SAR testing was not required per FCC KDB 648474 for extremity exposure conditions. Therefore, no further analysis was required to determine that possible simultaneous scenarios (including those with WIFI direct) would not exceed the SAR Limit.

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

Table 11-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth LE	2440	1.00	10	**0.021**

Note:

1. Held-to ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. Per KDB Publication 447498 D01v05r01, the maximum power of the channel was rounded to the nearest mW before calculation.
2. Tested Bluetooth SAR value represents the worst case and was used to evaluate potential simultaneous combinations.

11.3 Head SAR Simultaneous Transmission Analysis

Table 11-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.166	0.039	0.205
	Right Tilt	0.150	0.024	0.174
	Left Cheek	0.243	0.023	**0.266**
	Left Tilt	0.182	0.030	0.212

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.169	0.039	0.208
	Right Tilt	0.156	0.024	0.180
	Left Cheek	0.227	0.023	**0.250**
	Left Tilt	0.170	0.030	0.200

Simult Tx	Configuration	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.068	0.039	0.107
	Right Tilt	0.045	0.024	0.069
	Left Cheek	0.099	0.023	**0.122**
	Left Tilt	0.068	0.030	0.098

Simult Tx	Configuration	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.255	0.039	0.294
	Right Tilt	0.292	0.024	0.316
	Left Cheek	0.454	0.023	**0.477**
	Left Tilt	0.321	0.030	0.351

Table 11-3
Triple Sum Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.166	0.114	0.039	0.280	0.319
	Right Tilt	0.150	0.076	0.024	0.226	0.250
	Left Cheek	0.243	0.186	0.023	0.429	**0.452**
	Left Tilt	0.182	0.123	0.030	0.305	0.335

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.166	0.369	0.039	0.535	0.574
	Right Tilt	0.150	0.378	0.024	0.528	0.552
	Left Cheek	0.243	0.576	0.023	0.819	**0.842**
	Left Tilt	0.182	0.431	0.030	0.613	0.643

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.148	0.068	0.039	0.216	0.255
	Right Tilt	0.146	0.045	0.024	0.191	0.215
	Left Cheek	0.232	0.099	0.023	0.331	**0.354**
	Left Tilt	0.186	0.068	0.030	0.254	0.284

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.148	0.255	0.039	0.403	0.442
	Right Tilt	0.146	0.292	0.024	0.438	0.462
	Left Cheek	0.232	0.454	0.023	0.686	**0.709**
	Left Tilt	0.186	0.321	0.030	0.507	0.537

Table 11-4
Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.166	0.000	0.166
	Right Tilt	0.150	0.000	0.150
	Left Cheek	0.243	0.000	**0.243**
	Left Tilt	0.182	0.000	0.182

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.169	0.000	0.169
	Right Tilt	0.156	0.000	0.156
	Left Cheek	0.227	0.000	**0.227**
	Left Tilt	0.170	0.000	0.170

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.068	0.000	0.068
	Right Tilt	0.045	0.000	0.045
	Left Cheek	0.099	0.000	**0.099**
	Left Tilt	0.068	0.000	0.068

Simult Tx	Configuration	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.255	0.000	0.255
	Right Tilt	0.292	0.000	0.292
	Left Cheek	0.454	0.000	**0.454**
	Left Tilt	0.321	0.000	0.321

Table 11-5
Triple Sum Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.166	0.114	0.000	0.280	0.280
	Right Tilt	0.150	0.076	0.000	0.226	0.226
	Left Cheek	0.243	0.186	0.000	**0.429**	**0.429**
	Left Tilt	0.182	0.123	0.000	0.305	0.305

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.166	0.369	0.000	0.535	0.535
	Right Tilt	0.150	0.378	0.000	0.528	0.528
	Left Cheek	0.243	0.576	0.000	**0.819**	**0.819**
	Left Tilt	0.182	0.431	0.000	0.613	0.613

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.148	0.068	0.000	0.216	0.216
	Right Tilt	0.146	0.045	0.000	0.191	0.191
	Left Cheek	0.232	0.099	0.000	**0.331**	**0.331**
	Left Tilt	0.186	0.068	0.000	0.254	0.254

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.148	0.255	0.000	0.403	0.403
	Right Tilt	0.146	0.292	0.000	0.438	0.438
	Left Cheek	0.232	0.454	0.000	**0.686**	**0.686**
	Left Tilt	0.186	0.321	0.000	0.507	0.507

Note: The worst case 5 GHz SAR value was used to evaluate potential combinations.

11.4 Body-Worn Simultaneous Transmission Analysis

Table 11-6
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	CDMA/GSM SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	PCS CDMA	0.637	0.191	0.828
Back Side	GSM 850	0.144	0.191	0.335
Back Side	GSM 1900	0.799	0.191	**0.990**

Table 11-7
Triple Sum Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	PCS CDMA SAR (W/kg)	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.637	0.165	0.191	0.802	**0.993**	N/A	N/A	N/A

Configuration	PCS CDMA SAR (W/kg)	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.637	1.092	0.191	see note	see note	0.02	0.01	0.01

Configuration	PCS EVDO SAR (W/kg)	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.727	0.144	0.191	0.871	**1.062**	N/A	N/A	N/A

Configuration	PCS EVDO SAR (W/kg)	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.727	0.799	0.191	**1.526**	see note	0.01	0.01	0.01

Note: No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was below 0.04 per FCC KDB 447498 D01v05r01. See Section 11.6 for detailed SPLS ratio analysis.

Table 11-8
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.0 cm)

Configuration	Mode	CDMA/GSM SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	PCS CDMA	0.637	0.065	0.702
Back Side	GSM 850	0.144	0.065	0.209
Back Side	GSM 1900	0.799	0.065	**0.864**

Table 11-9
Triple Sum Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.0 cm)

Configuration	PCS CDMA SAR (W/kg)	GPRS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.637	0.165	0.065	0.802	**0.867**	N/A	N/A	N/A

Configuration	PCS CDMA SAR (W/kg)	GPRS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.637	1.092	0.065	see note	see note	0.02	0.01	0.01

Configuration	PCS EVDO SAR (W/kg)	GSM 850 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.727	0.144	0.065	0.871	**0.936**	N/A	N/A	N/A

Configuration	PCS EVDO SAR (W/kg)	GSM 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.727	0.799	0.065	1.526	**1.591**	N/A	N/A	N/A

Note: No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was below 0.04 per FCC KDB 447498 D01v05r01. See Section 11.6 for detailed SPLS ratio analysis.

Table 11-10
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	CDMA/GSM SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	PCS CDMA	0.637	0.416	1.053
Back Side	GSM 850	0.144	0.416	0.560
Back Side	GSM 1900	0.799	0.416	**1.215**

Note: The worst case 5 GHz SAR value was used to evaluate potential combinations.

Table 11-11
Triple Sum Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	PCS CDMA SAR (W/kg)	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.637	0.165	0.416	0.802	**1.218**	N/A	N/A	N/A

Configuration	PCS CDMA SAR (W/kg)	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.637	1.092	0.416	see note	see note	0.02	0.02	0.01

Configuration	PCS EVDO SAR (W/kg)	GSM 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.727	0.144	0.416	0.871	**1.287**	N/A	N/A	N/A

Configuration	PCS EVDO SAR (W/kg)	GSM 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)		SPLSR		
	1	2	3	1+2	1+2+3	1+2	1+3	2+3
Back	0.727	0.799	0.416	**1.526**	see note	0.01	0.02	0.01

Note: No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was below 0.04 per FCC KDB 447498 D01v05r01. See Section 11.6 for detailed SPLS ratio analysis.

11.5 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v01r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

Table 11-12
Simultaneous Transmission Scenario (2.4 GHz Hotspot at 1.0 cm)

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.727	0.191	**0.918**
	Front	0.416	0.151	0.567
	Top	-	-	0.000
	Bottom	0.244	0.072	0.316
	Right	-	0.099	0.099
	Left	0.334	-	0.334

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.165	0.191	**0.356**
	Front	0.054	0.151	0.205
	Top	0.069	-	0.069
	Bottom	-	0.072	0.072
	Right	0.047	0.099	0.146
	Left	-	-	0.000

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.092	0.191	**1.283**
	Front	0.207	0.151	0.358
	Top	0.297	-	0.297
	Bottom	-	0.072	0.072
	Right	0.255	0.099	0.354
	Left	-	-	0.000

Table 11-13
Triple Sum Simultaneous Transmission Scenario (2.4 GHz Hotspot at 1.0 cm)

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.637	0.165	0.191	**0.993**	N/A	N/A	N/A
	Front	0.338	0.054	0.151	0.543	N/A	N/A	N/A
	Top	-	0.069	-	0.069	N/A	N/A	N/A
	Bottom	0.282	-	0.072	0.354	N/A	N/A	N/A
	Right	-	0.047	0.099	0.146	N/A	N/A	N/A
	Left	0.258	-	-	0.258	N/A	N/A	N/A

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.637	1.092	0.191	see note	0.02	0.01	0.01
	Front	0.338	0.207	0.151	0.696	N/A	N/A	N/A
	Top	-	0.297	-	0.297	N/A	N/A	N/A
	Bottom	0.282	-	0.072	0.354	N/A	N/A	N/A
	Right	-	0.255	0.099	0.354	N/A	N/A	N/A
	Left	0.258	-	-	0.258	N/A	N/A	N/A

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	GSM 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.727	0.144	0.191	**1.062**	N/A	N/A	N/A
	Front	0.416	0.036	0.151	0.603	N/A	N/A	N/A
	Top	-	0.036	-	0.036	N/A	N/A	N/A
	Bottom	0.244	-	0.072	0.316	N/A	N/A	N/A
	Right	-	0.031	0.099	0.130	N/A	N/A	N/A
	Left	0.334	-	-	0.334	N/A	N/A	N/A

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	GSM 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.727	0.799	0.191	see note	0.01	0.01	0.01
	Front	0.416	0.111	0.151	0.678	N/A	N/A	N/A
	Top	-	0.215	-	0.215	N/A	N/A	N/A
	Bottom	0.244	-	0.072	0.316	N/A	N/A	N/A
	Right	-	0.189	0.099	0.288	N/A	N/A	N/A
	Left	0.334	-	-	0.334	N/A	N/A	N/A

Note: No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was below 0.04 per FCC KDB 447498 D01v05r01. See Section 11.6 for detailed SPLS ratio analysis.

Table 11-14
Simultaneous Transmission Scenario (5.8 GHz Hotspot at 1.0 cm)

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.727	0.416	**1.143**
	Front	0.416	0.027	0.443
	Top	-	-	0.000
	Bottom	0.244	0.066	0.310
	Right	-	0.018	0.018
	Left	0.334	-	0.334

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.165	0.416	**0.581**
	Front	0.054	0.027	0.081
	Top	0.069	-	0.069
	Bottom	-	0.066	0.066
	Right	0.047	0.018	0.065
	Left	-	-	0.000

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5.8 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	1.092	0.416	**1.508**
	Front	0.207	0.027	0.234
	Top	0.297	-	0.297
	Bottom	-	0.066	0.066
	Right	0.255	0.018	0.273
	Left	-	-	0.000

Table 11-15
Triple Sum Simultaneous Transmission Scenario (5.8 GHz Hotspot at 1.0 cm)

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	GPRS 850 SAR (W/kg)	5.8 GHz SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.637	0.165	0.416	**1.218**	N/A	N/A	N/A
	Front	0.338	0.054	0.027	0.419	N/A	N/A	N/A
	Top	-	0.069	-	0.069	N/A	N/A	N/A
	Bottom	0.282	-	0.066	0.348	N/A	N/A	N/A
	Right	-	0.047	0.018	0.065	N/A	N/A	N/A
	Left	0.258	-	-	0.258	N/A	N/A	N/A

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	GPRS 1900 SAR (W/kg)	5.8 GHz SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.637	1.092	0.416	see note	0.02	0.02	0.01
	Front	0.338	0.207	0.027	0.572	N/A	N/A	N/A
	Top	-	0.297	-	0.297	N/A	N/A	N/A
	Bottom	0.282	-	0.066	0.348	N/A	N/A	N/A
	Right	-	0.255	0.018	0.273	N/A	N/A	N/A
	Left	0.258	-	-	0.258	N/A	N/A	N/A

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	GSM 850 SAR (W/kg)	5.8 GHz SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.727	0.144	0.416	**1.287**	N/A	N/A	N/A
	Front	0.416	0.036	0.027	0.479	N/A	N/A	N/A
	Top	-	0.036	-	0.036	N/A	N/A	N/A
	Bottom	0.244	-	0.066	0.310	N/A	N/A	N/A
	Right	-	0.031	0.018	0.049	N/A	N/A	N/A
	Left	0.334	-	-	0.334	N/A	N/A	N/A

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	GSM 1900 SAR (W/kg)	5.8 GHz SAR (W/kg)	Σ SAR (W/kg)	SPLSR		
		1	2	3	1+2+3	1+2	1+3	2+3
Body SAR	Back	0.727	0.799	0.416	see note	0.01	0.02	0.01
	Front	0.416	0.111	0.027	0.554	N/A	N/A	N/A
	Top	-	0.215	-	0.215	N/A	N/A	N/A
	Bottom	0.244	-	0.066	0.310	N/A	N/A	N/A
	Right	-	0.189	0.018	0.207	N/A	N/A	N/A
	Left	0.334	-	-	0.334	N/A	N/A	N/A

Note: No evaluation was performed to determine the aggregate 1g SAR for these configurations as the SPLS ratio between the antenna pairs was below 0.04 per FCC KDB 447498 D01v05r01. See Section 11.6 for detailed SPLS ratio analysis.

11.6 SPLSR Evaluation Analysis

Per FCC KDB Publication 447498 D01v05r01, when the sum of the standalone transmitters is more than 1.6 W/kg, the SAR sum to peak locations can be analyzed to determine SAR distribution overlaps. When the SAR peak to location ratio (shown below) for each pair of antennas is ≤ 0.04, simultaneous SAR evaluation is not required. For a sum of more than two standalone transmitters, the simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion, even if the sum of a pair is < 1.6 W/kg. The distance between the transmitting antenna pairs was calculated using the following formula.

$$\text{Distance}_{Tx1\text{-}Tx2} = R_i = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

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

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with GPRS1900.

Figure 11-1
Peak SAR Location Plot of PCS CDMA and GPRS1900

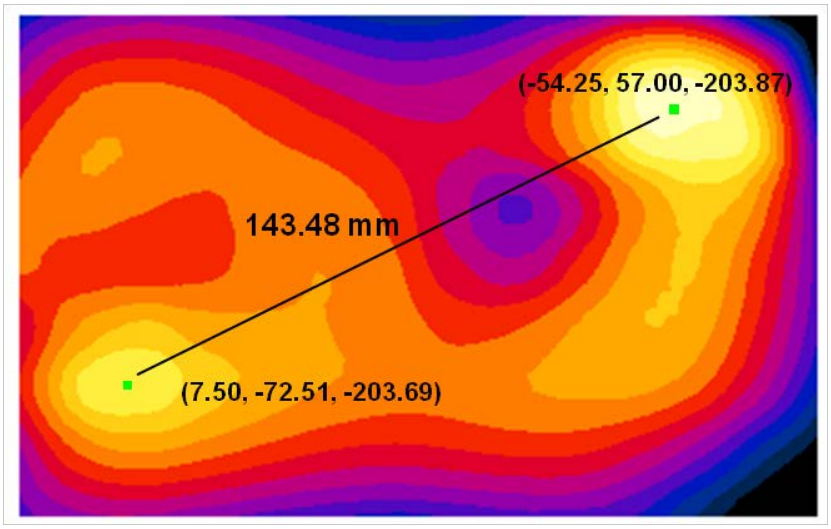


Table 11-16
Peak SAR Locations for Body Back Side PCS CDMA and GPRS1900

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	7.50	-72.51	-203.69
GPRS1900	-54.25	57.00	-203.87

Table 11-17
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS CDMA	GPRS1900	0.637	1.092	1.729	143.48	0.02

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with 2.4 GHz WLAN.

Figure 11-2
Peak SAR Location Plot of PCS CDMA and 2.4 GHz WLAN

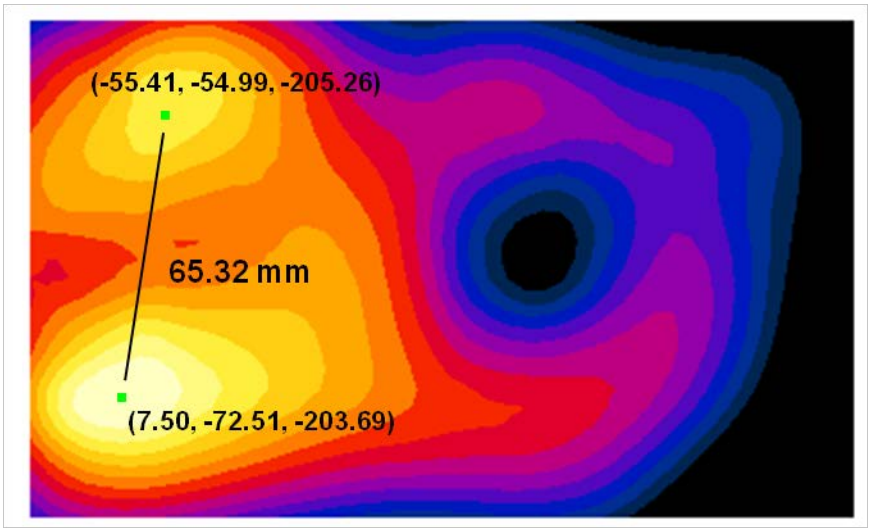


Table 11-18
Peak SAR Locations for Body Back Side PCS CDMA and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	7.50	-72.51	-203.69
2.4 GHz WLAN	-55.41	-54.99	-205.26

Table 11-19
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS CDMA	2.4 GHz WLAN	0.637	0.191	0.828	65.32	0.01

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with GPRS1900 potentially operating with 2.4 GHz WLAN.

Figure 11-3
Peak SAR Location Plot of GPRS1900 and 2.4 GHz WLAN

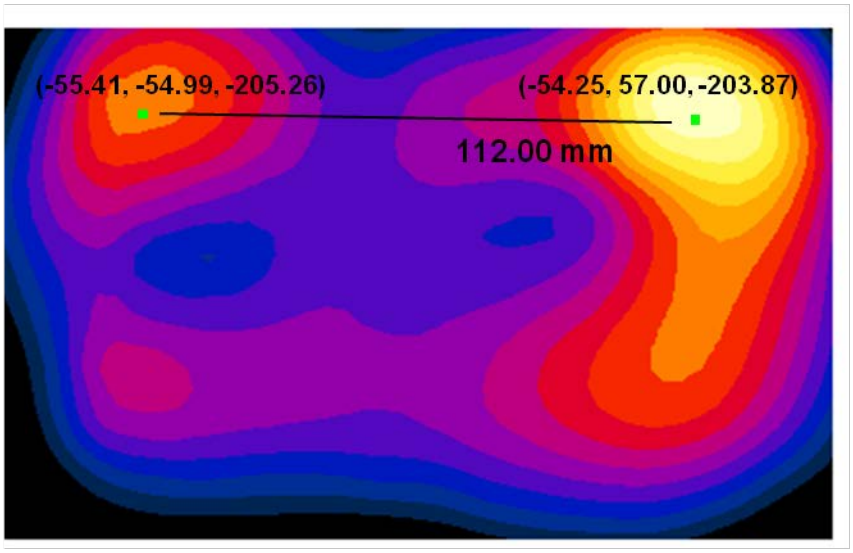


Table 11-20
Peak SAR Locations for Body Back Side GPRS900 and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
GPRS1900	-54.25	57.00	-203.87
2.4 GHz WLAN	-55.41	-54.99	-205.26

Table 11-21
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GPRS1900	2.4 GHz WLAN	1.092	0.191	1.283	112.00	0.01

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with PCS EVDO potentially operating with GSM1900.

Figure 11-4
Peak SAR Location Plot of PCS EVDO and GSM1900

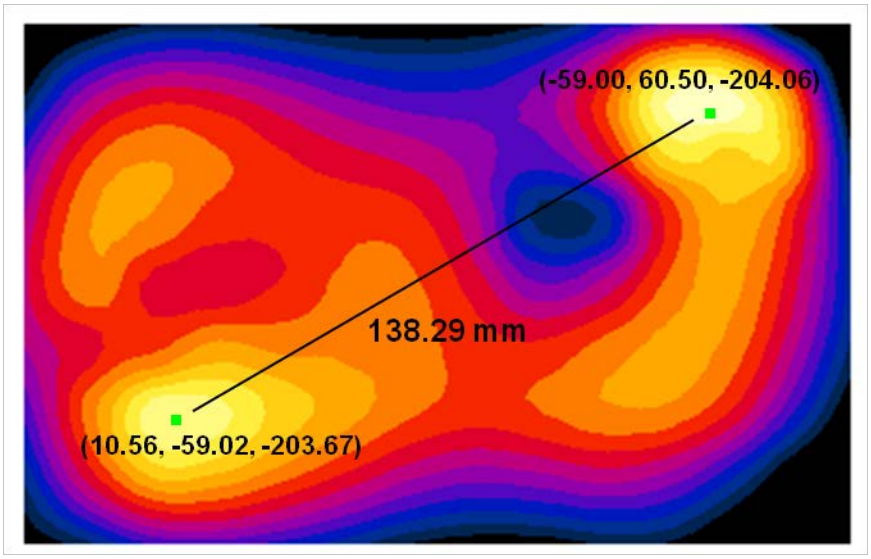


Table 11-22
Peak SAR Locations for Body Back Side PCS EVDO and GSM1900

Mode/Band	x (mm)	y (mm)	z (mm)
PCS EVDO	10.56	-59.02	-203.67
GSM1900	-59.00	60.50	-204.06

Table 11-23
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS EVDO	GSM1900	0.727	0.799	1.526	138.29	0.01

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with PCS EVDO potentially operating with 2.4 GHz WLAN.

Figure 11-5
Peak SAR Location Plot of PCS EVDO and 2.4 GHz WLAN

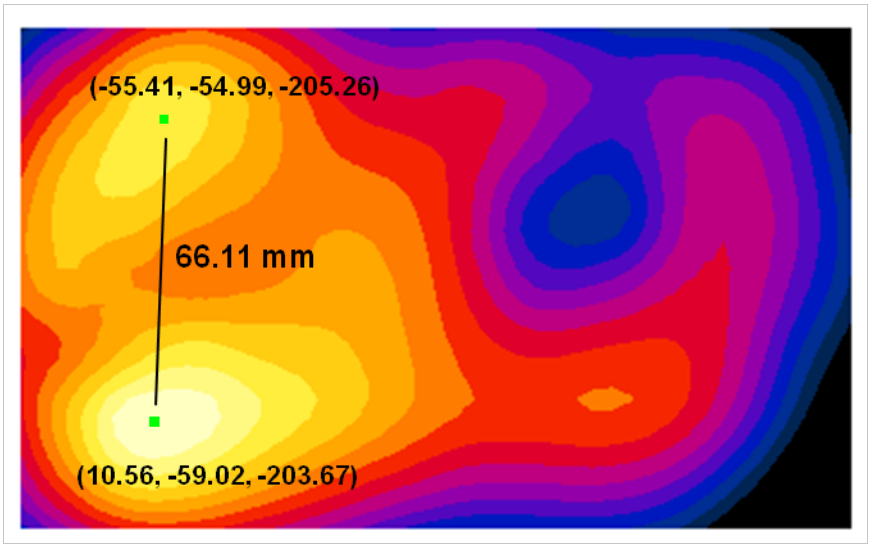


Table 11-24
Peak SAR Locations for Body Back Side PCS EVDO and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
PCS EVDO	10.56	-59.02	-203.67
2.4 GHz WLAN	-55.41	-54.99	-205.26

Table 11-25
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS EVDO	2.4 GHz WLAN	0.727	0.191	0.918	66.11	0.01

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with GSM1900 potentially operating with 2.4 GHz WLAN.

Figure 11-6
Peak SAR Location Plot of GSM1900 and 2.4 GHz WLAN

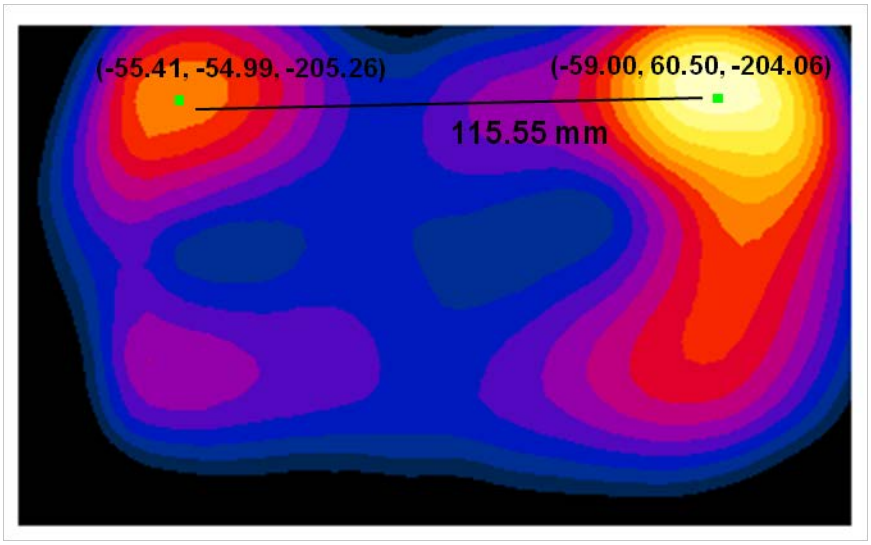


Table 11-26
Peak SAR Locations for Body Back Side GSM1900 and 2.4 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
GSM1900	-59.00	60.50	-204.06
2.4 GHz WLAN	-55.41	-54.99	-205.26

Table 11-27
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GSM1900	2.4 GHz WLAN	0.799	0.191	0.99	115.55	0.01

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with 2.4 GHz Bluetooth.

Figure 11-7
Peak SAR Location Plot of PCS CDMA and 2.4 GHz Bluetooth

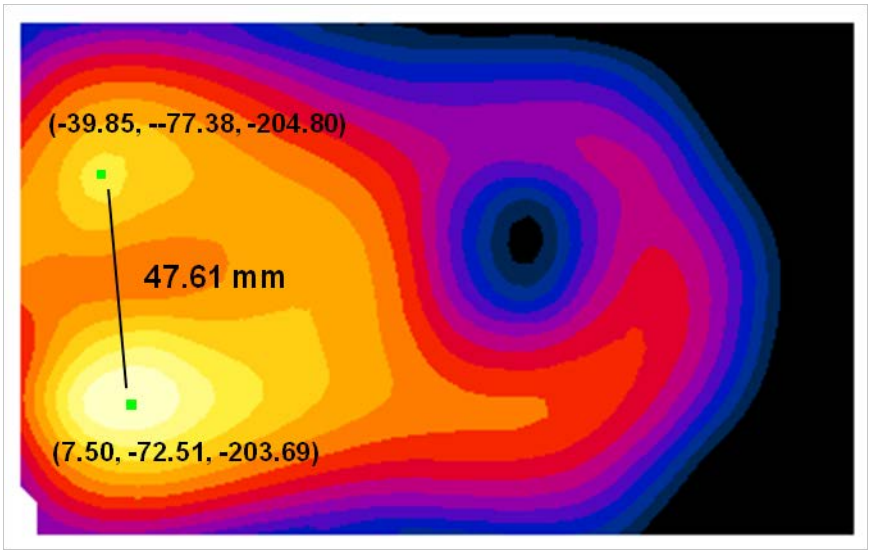


Table 11-28
Peak SAR Locations for Body Back Side PCS CDMA and 2.4 GHz Bluetooth

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	7.50	-72.51	-203.69
2.4 GHz Bluetooth	-39.85	-77.38	-204.80

Table 11-29
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS CDMA	2.4 GHz Bluetooth	0.637	0.065	0.702	47.61	0.01

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with GPRS1900 potentially operating with 2.4 GHz Bluetooth.

Figure 11-8
Peak SAR Location Plot of GPRS1900 and 2.4 GHz Bluetooth

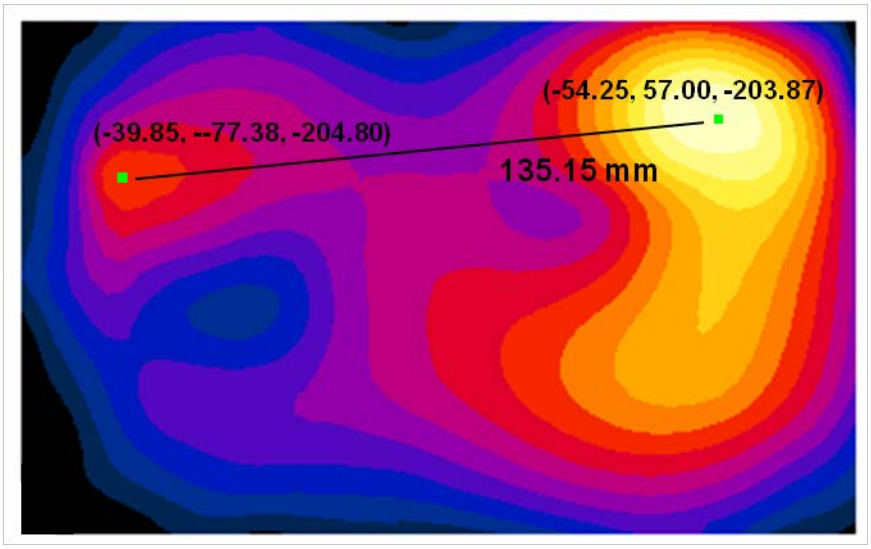


Table 11-30
Peak SAR Locations for Body Back Side GPRS1900 and 2.4 GHz Bluetooth

Mode/Band	x (mm)	y (mm)	z (mm)
GPRS1900	-54.25	57.00	-203.87
2.4 GHz Bluetooth	-39.85	-77.38	-204.80

Table 11-31
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GPRS1900	2.4 GHz Bluetooth	1.092	0.065	1.157	135.15	0.01

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with PCS CDMA potentially operating with 5 GHz WLAN.

Figure 11-9
Peak SAR Location Plot of PCS CDMA and 5 GHz WLAN

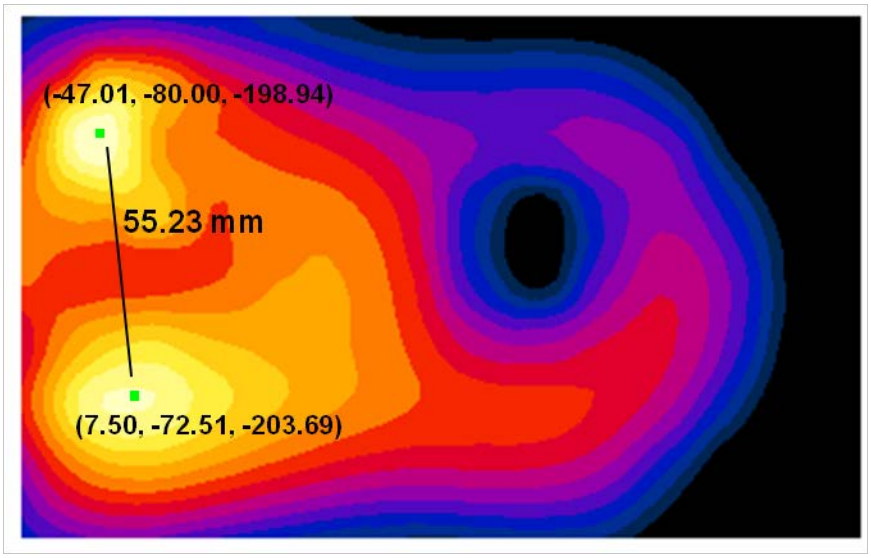


Table 11-32
Peak SAR Locations for Body Back Side PCS CDMA and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
PCS CDMA	7.50	-72.51	-203.69
5 GHz WLAN	-47.01	-80.00	-198.94

Table 11-33
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS CDMA	5 GHz WLAN	0.637	0.416	1.053	55.23	0.02

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with GPRS1900 potentially operating with 5 GHz WLAN.

Figure 11-10
Peak SAR Location Plot of GPRS1900 and 5 GHz WLAN

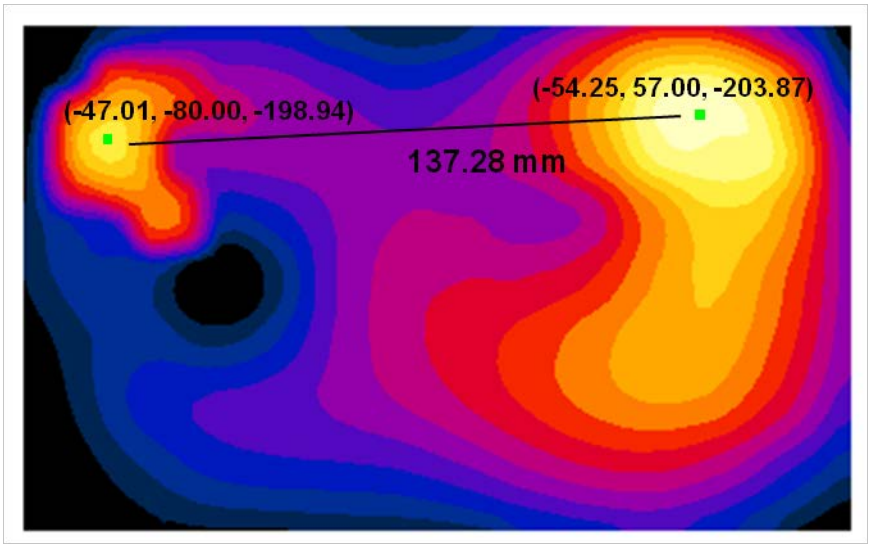


Table 11-34
Peak SAR Locations for Body Back Side GPRS1900 and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
GPRS1900	-54.25	57.00	-203.87
5 GHz WLAN	-47.01	-80.00	-198.94

Table 11-35
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GPRS1900	5 GHz WLAN	1.092	0.416	1.508	137.28	0.01

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with PCS EVDO potentially operating with 5 GHz WLAN.

Figure 11-11
Peak SAR Location Plot of PCS EVDO and 5 GHz WLAN

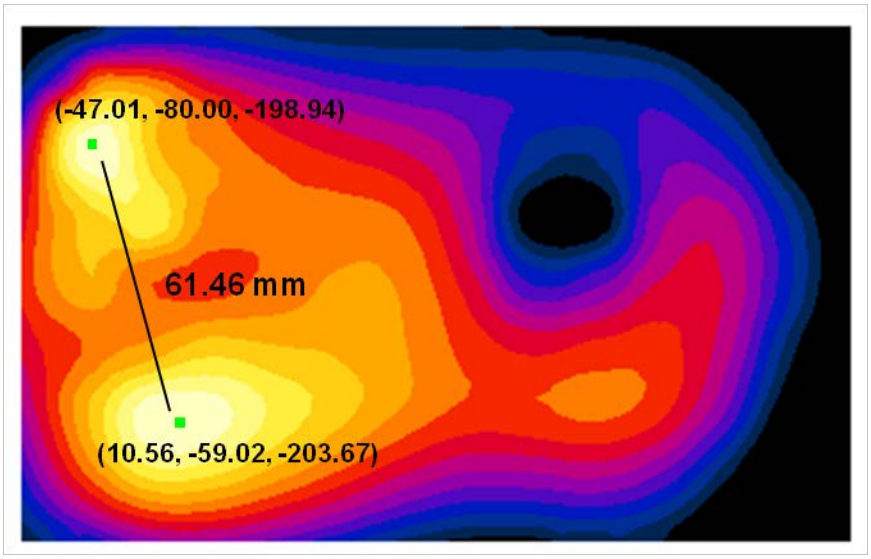


Table 11-36
Peak SAR Locations for Body Back Side PCS EVDO and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
PCS EVDO	10.56	-59.02	-203.67
5 GHz WLAN	-47.01	-80.00	-198.94

Table 11-37
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
PCS EVDO	5 GHz WLAN	0.727	0.416	1.143	61.46	0.02

The following is the SAR sum to peak location ratio analysis for Body Back Side configuration at a separation distance of 1.0 cm with GSM1900 potentially operating with 5 GHz WLAN.

Figure 11-12
Peak SAR Location Plot of GSM1900 and 5 GHz WLAN

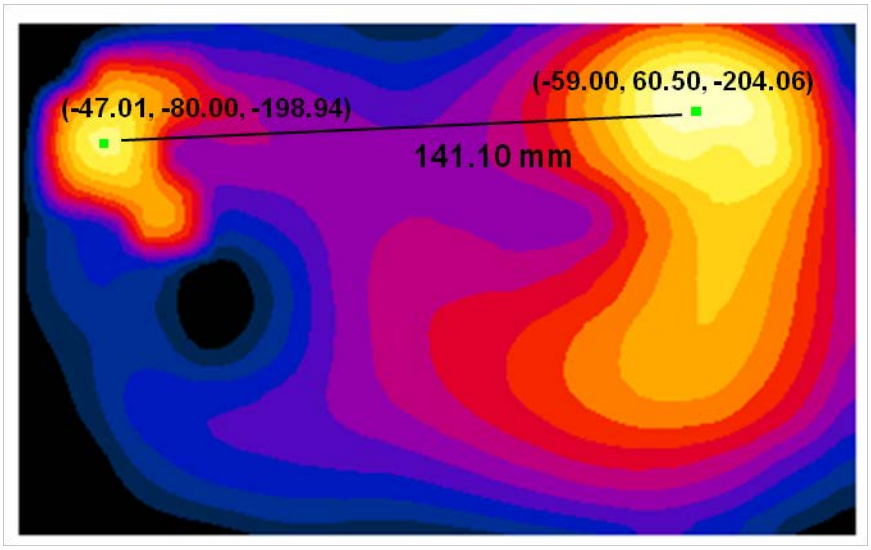


Table 11-38
Peak SAR Locations for Body Back Side GSM1900 and 5 GHz WLAN

Mode/Band	x (mm)	y (mm)	z (mm)
GSM1900	-59.00	60.50	-204.06
5 GHz WLAN	-47.01	-80.00	-198.94

Table 11-39
SAR Sum to Peak Location Separation Ratio Calculation

Antenna Pair		Standalone 1g SAR (W/kg)		Standalone SAR Sum (W/kg)	Peak SAR Separation Distance (mm)	SPLS Ratio
Ant "a"	Ant "b"	a	b	a+b	D_{a-b}	$(a+b)^{1.5}/D_{a-b}$
GSM1900	5 GHz WLAN	0.799	0.416	1.215	141.1	0.01

11.7 Simultaneous Transmission Conclusion

Based on the simultaneous transmission analysis guidance described in KDB Publication 865664 D01 and the April 2012 TCB/ FCC Workshop, the above simultaneous transmission SAR analyses indicate that the device operating in any simultaneous transmission scenarios will note exceed SAR limit.

12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

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

Table 12-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS															
Band	FREQUENCY		Mode	Service	# of Time Slots	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.						(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	1850.20	512	GSM 1900	GPRS	2	back	10 mm	1.010	0.893	1.13	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram							

12.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01r01, the extended measurement uncertainty analysis per IEEE 1528-2003 was not required.

13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/16/2013	Annual	4/16/2014	MY45470194
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/16/2013	Annual	4/16/2014	JP38020182
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/17/2013	Annual	4/17/2014	3629U00687
Agilent	85070C	Dielectric Probe Kit	2/14/2013	Annual	2/14/2014	MY44300633
Agilent	N9020A	MXA Signal Analyzer	10/9/2012	Annual	10/9/2013	US46470561
Agilent	85047A	S-Parameter Test Set	N/A	N/A	N/A	2904A00579
Agilent	E5515C	Wireless Communications Test Set	10/18/2012	Biennial	10/18/2014	GB43193563
Agilent	E5515C	Wireless Communications Test Set	5/9/2013	Biennial	5/9/2015	GB43304447
Agilent	N4010A	Wireless Connectivity Test Set	CBT	N/A	CBT	GB44450273
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT	N/A	CBT	21910
Anritsu	ML2495A	Power Meter	10/11/2012	Annual	10/11/2013	1039008
Anritsu	ML2438A	Power Meter	12/4/2012	Annual	12/4/2013	1070030
Anritsu	MA2481A	Power Sensor	2/14/2013	Annual	2/14/2014	5318
Anritsu	MA2481A	Power Sensor	2/14/2013	Annual	2/14/2014	5821
Anritsu	MA2411B	Pulse Power Sensor	12/5/2012	Annual	12/5/2013	1126066
Anritsu	MA2411B	Pulse Power Sensor	12/4/2012	Annual	12/4/2013	1207364
Anritsu	MT8820C	Radio Communication Analyzer	6/28/2013	Annual	6/28/2014	6201240328
Anritsu	MT8820C	Radio Communication Tester	11/6/2012	Annual	11/6/2013	6200901190
Anritsu	MA2481D	Universal Sensor	12/17/2012	Annual	12/17/2013	1204343
Anritsu	MA2481D	Universal Sensor	12/17/2012	Annual	12/17/2013	1204419
Anritsu	MA24106A	USB Power Sensor	8/22/2012	Annual	8/22/2013	1231535
Anritsu	MA24106A	USB Power Sensor	8/22/2012	Annual	8/22/2013	1231538
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
Control Company	4353	Long Stem Thermometer	9/25/2012	Biennial	9/25/2014	122539615
Control Company	36934-158	Wall-Mounted Thermometer	1/4/2012	Biennial	1/4/2014	122014497
Fisher Scientific	15-078J	Long Stem Thermometer	10/30/2012	Biennial	10/30/2014	122626059
Fisher Scientific	15-077-960	Thermometer	11/6/2012	Biennial	11/6/2014	122640025
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/10/2012	Annual	10/10/2013	1833460
Gigatronics	8651A	Universal Power Meter	10/10/2012	Annual	10/10/2013	8650319
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	5/3/2013	Annual	5/3/2014	836371/0079
Rohde & Schwarz	SME06	Signal Generator	10/11/2012	Annual	10/11/2013	832026
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
SPEAG	D835V2	835 MHz SAR Dipole	1/7/2013	Annual	1/7/2014	4d132
SPEAG	D1900V2	1900 MHz SAR Dipole	7/20/2012	Annual	7/20/2013	5d080
SPEAG	D1900V2	1900 MHz SAR Dipole	2/6/2013	Annual	2/6/2014	5d148
SPEAG	D2450V2	2450 MHz SAR Dipole	8/23/2012	Annual	8/23/2013	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/11/2013	Annual	1/11/2014	1057
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/17/2013	Annual	1/17/2014	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/24/2012	Annual	8/24/2013	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/19/2012	Annual	9/19/2013	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/13/2012	Annual	11/13/2013	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2013	Annual	3/8/2014	1334
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/14/2013	Annual	5/14/2014	1070
SPEAG	DAK-3.5	Dielectric Assessment Kit	12/11/2012	Annual	12/11/2013	1091
SPEAG	ES3DV2	SAR Probe	8/28/2012	Annual	8/28/2013	3022
SPEAG	ES3DV3	SAR Probe	3/15/2013	Annual	3/15/2014	3209
SPEAG	ES3DV3	SAR Probe	11/15/2012	Annual	11/15/2013	3287
SPEAG	ES3DV3	SAR Probe	9/20/2012	Annual	9/20/2013	3288
SPEAG	EX3DV4	SAR Probe	1/17/2013	Annual	1/17/2014	3589
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/17/2013	Annual	4/17/2014	B010177
VWR	23226-658	Long Stem Thermometer	3/30/2012	Biennial	3/30/2014	122179874
VWR	62344-925	Mini-Thermometer	10/24/2011	Biennial	10/24/2013	111886414
VWR	36934-158	Wall-Mounted Thermometer	9/30/2011	Biennial	9/30/2013	111859332

Note: 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

Applicable for frequencies less than 3000 MHz.

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

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

Applicable for frequencies up to 6 GHz.

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

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

15 CONCLUSION

15.1 Measurement Conclusion

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

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

16 REFERENCES

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

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

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

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

[5] Federal Communications Commission, OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, June 2001.

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

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

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

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

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

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

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

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

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

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

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

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

[18] Federal Communications Commission, OET Bulletin 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. Supplement C, Dec. 1997.

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

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

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

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

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

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

[25] FCC Public Notice DA-02-1438. Office of Engineering and Technology Announces a Transition Period for the Phantom Requirements of Supplement C to OET Bulletin 65, June 19, 2002

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

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

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

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

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

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

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

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

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-A

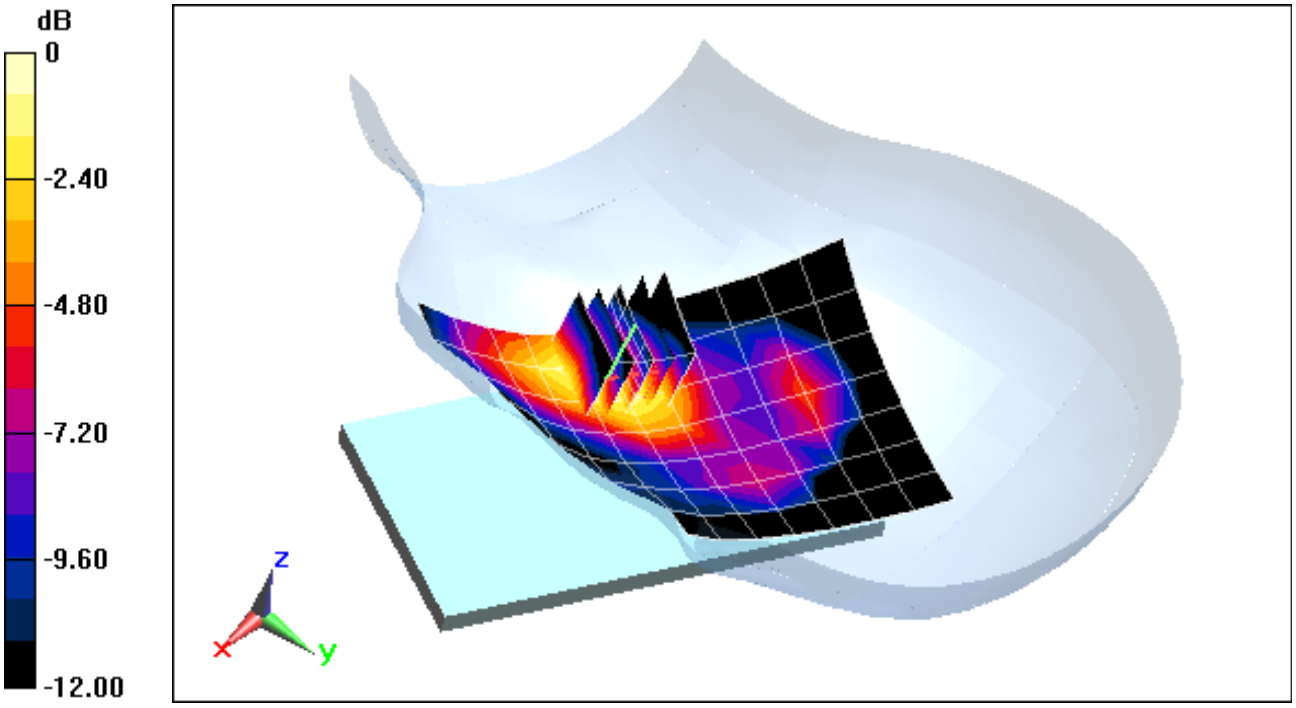
Communication System: PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used:
f = 1880 MHz; σ = 1.422 S/m; ε_r = 38.735; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-20-2013; Ambient Temp: 24.0°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3589; ConvF(7.09, 7.09, 7.09); Calibrated: 1/17/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.064 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.325 W/kg
SAR(1 g) = 0.217 W/kg



0 dB = 0.237 W/kg = -6.25 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-C

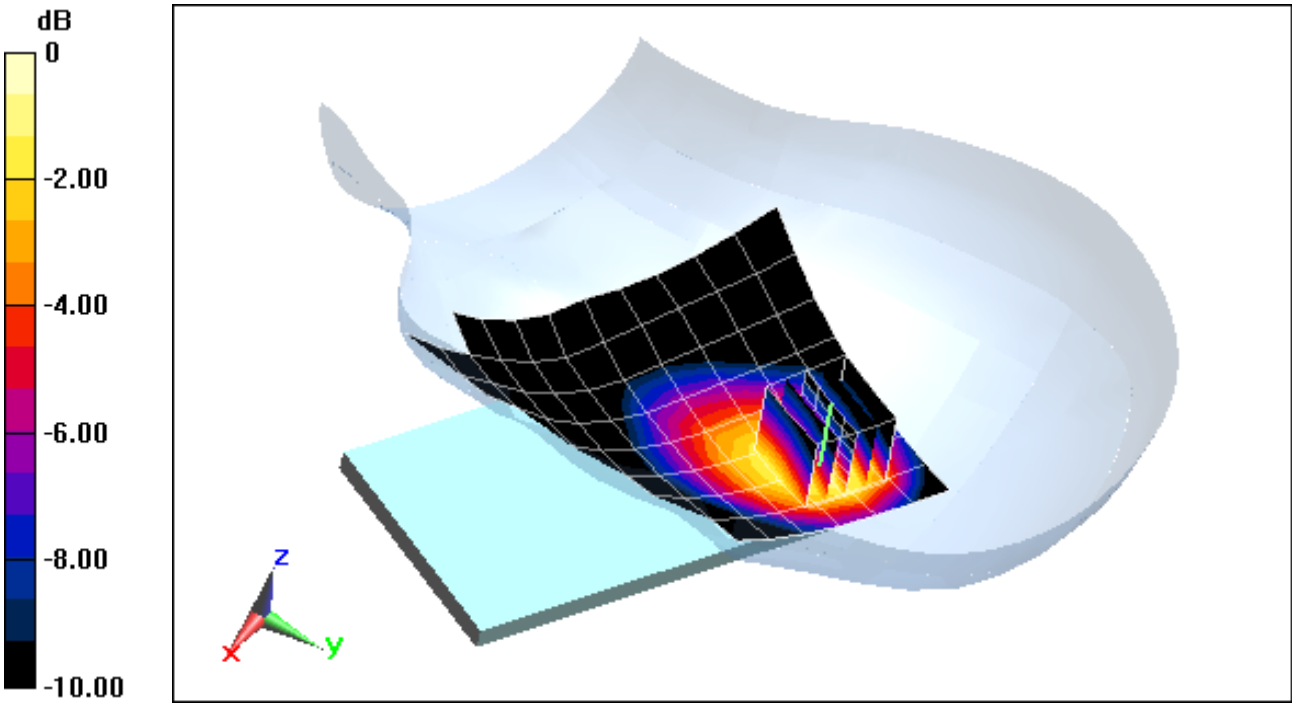
Communication System: GSM GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Medium: 835 Head, Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.912 S/m; ε_r = 40.66; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 06-27-2013; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3288; ConvF(6.41, 6.41, 6.41); Calibrated: 9/20/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/19/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 850, Left Head, Cheek, 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 = 14.064 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.249 W/kg
SAR(1 g) = 0.162 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-C

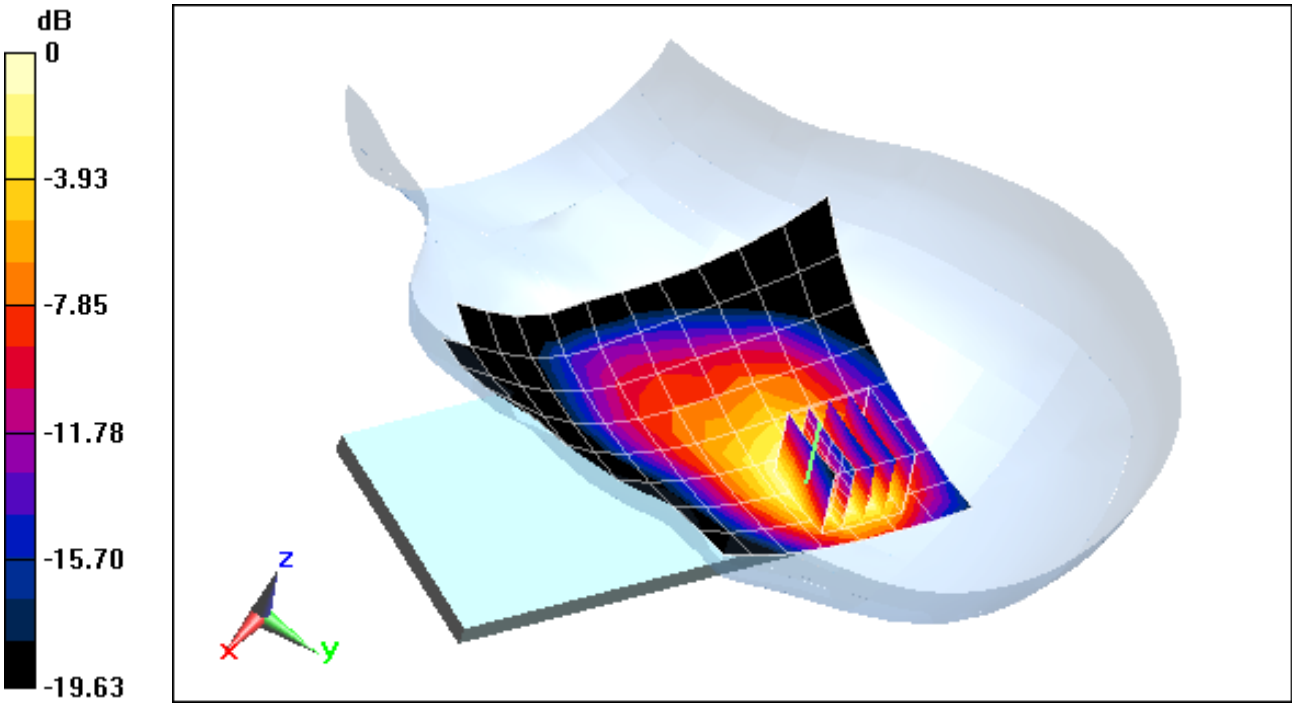
Communication System: GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15
Medium: 1900 Head, Medium parameters used:
f = 1880 MHz; σ = 1.371 S/m; ε_r = 40.056; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-01-2013; Ambient Temp: 24.3°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3209; ConvF(5.21, 5.21, 5.21); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Right; Type: QD000P40CD; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 1900, Left Head, Cheek, Mid.ch, 2 Tx. Slots

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.315 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.526 W/kg



0 dB = 0.587 W/kg = -2.31 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-B

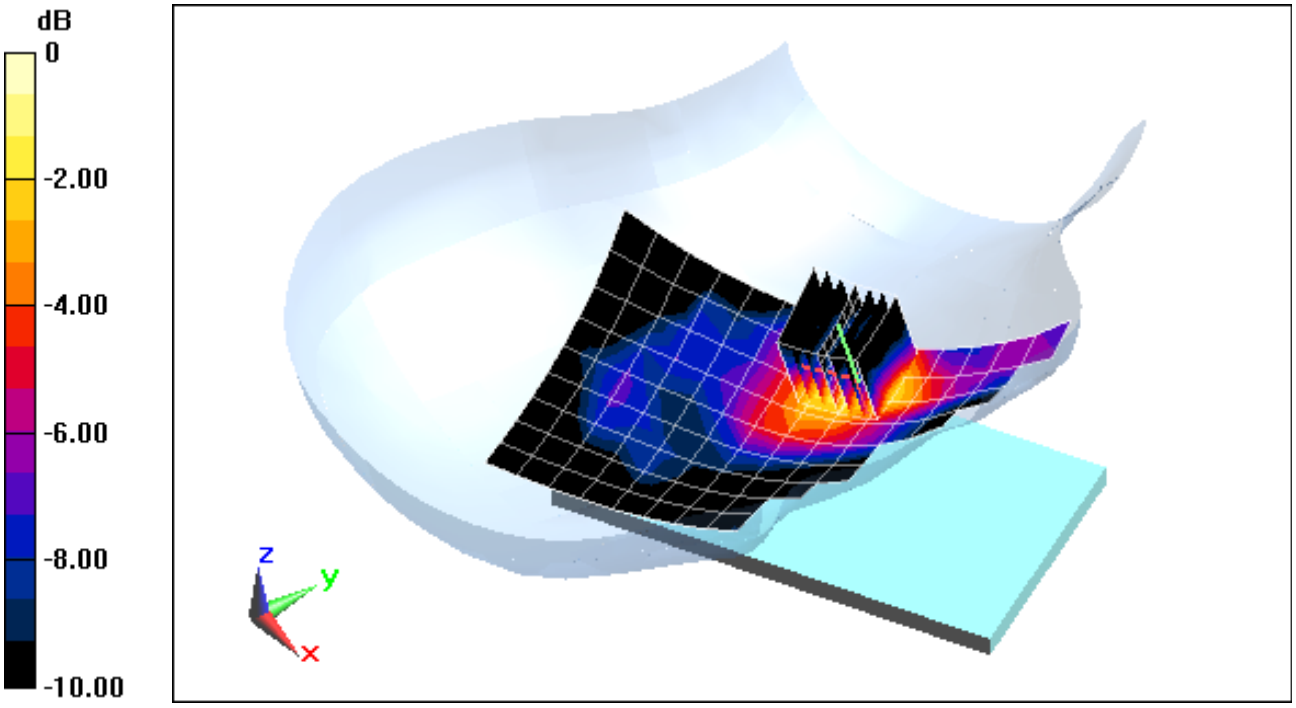
Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Head, Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.854 S/m; ε_r = 38.925; ρ = 1000 kg/m^3
Phantom section: Right Section

Test Date: 06-21-2013; Ambient Temp: 23.8°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3287; ConvF(4.3, 4.3, 4.3); Calibrated: 11/15/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Right Head, Cheek, Ch 06, 1 Mbps

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.814 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.0630 W/kg
SAR(1 g) = 0.037 W/kg



0 dB = 0.0445 W/kg = -13.52 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-A

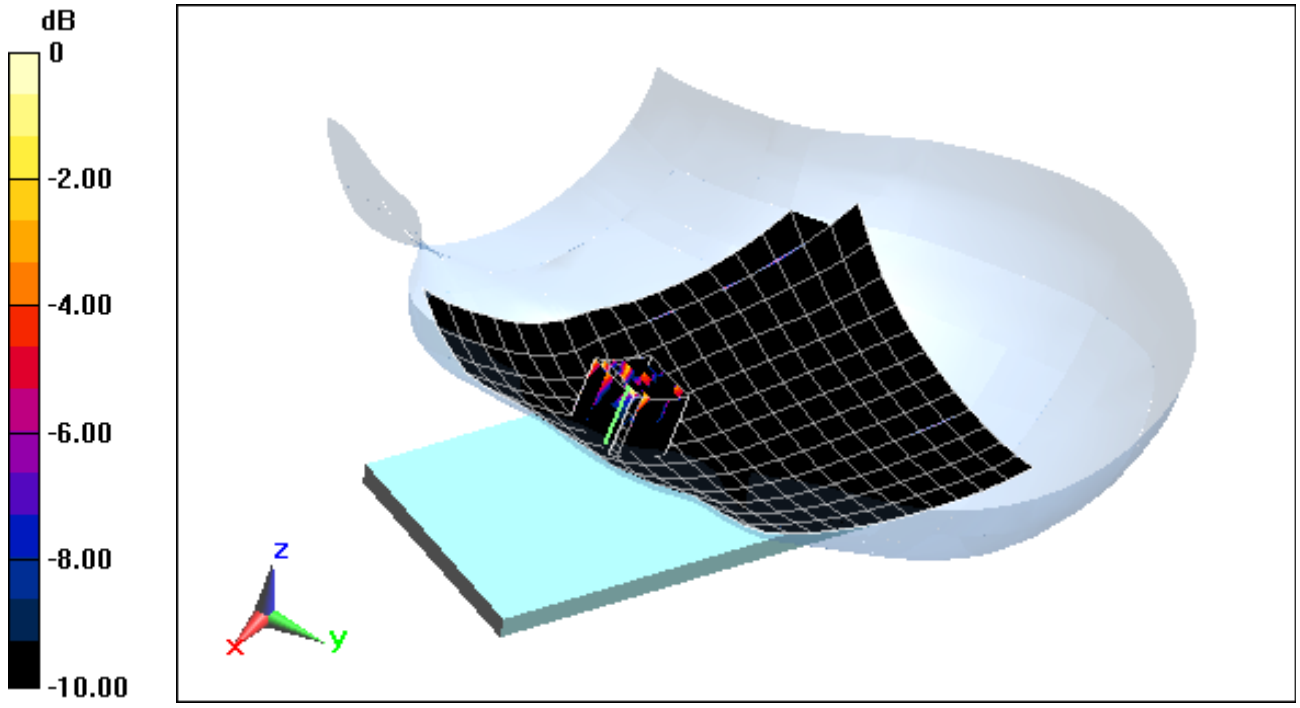
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5785 MHz; σ = 5.42 S/m; ε_r = 33.839; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-01-2013; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(3.85, 3.85, 3.85); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.8 GHz Left Head, Cheek, Ch 157, 6 Mbps

Area Scan (14x18x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 0 V/m; Power Drift = 0.21 dB
Peak SAR (extrapolated) = 0 W/kg
SAR(1 g) = 0.000



0 dB = 0.0186 W/kg = -17.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-A

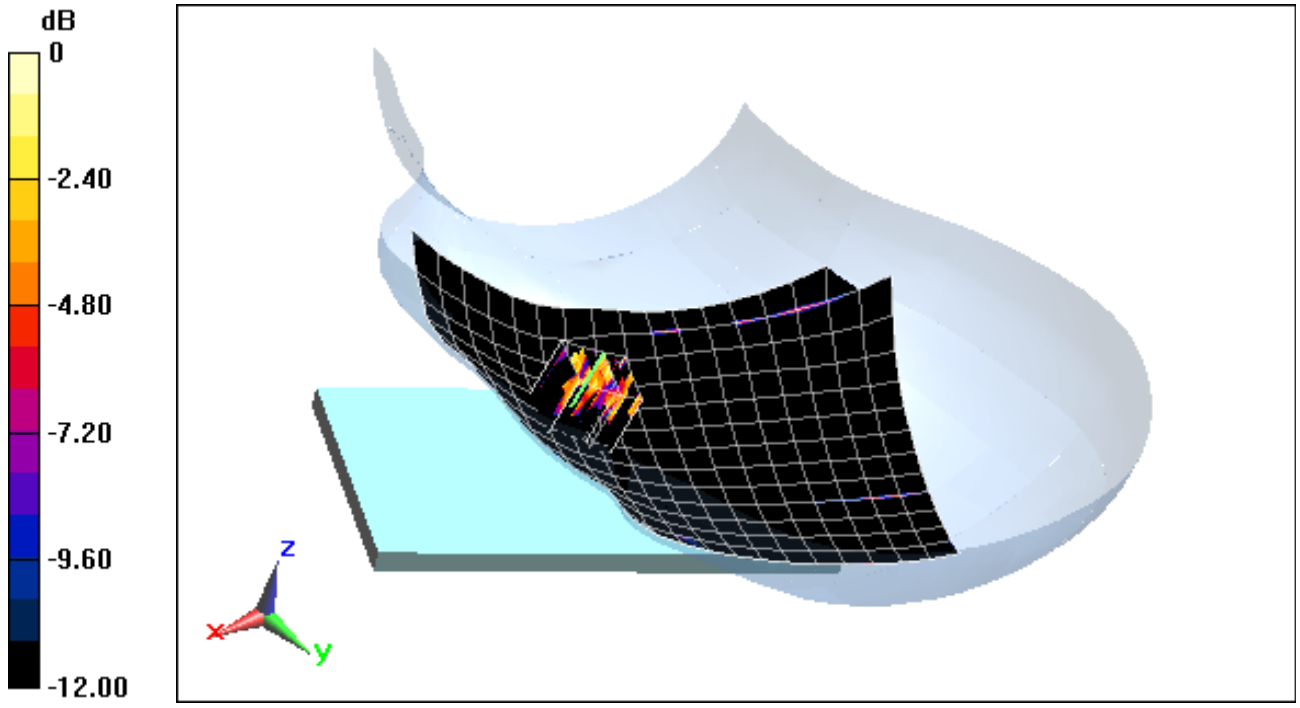
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5680 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5680 MHz; σ = 5.284 S/m; ε_r = 34.098; ρ = 1000 kg/m^3
Phantom section: Left Section

Test Date: 07-01-2013; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3589; ConvF(3.81, 3.81, 3.81); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11a, 5.5-5.7 GHz Left Head, Cheek, Ch 136, 6 Mbps

Area Scan (14x18x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 0 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0 W/kg
SAR(1 g) = 0.000



0 dB = 0.0129 W/kg = -18.89 dBW/kg

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-A

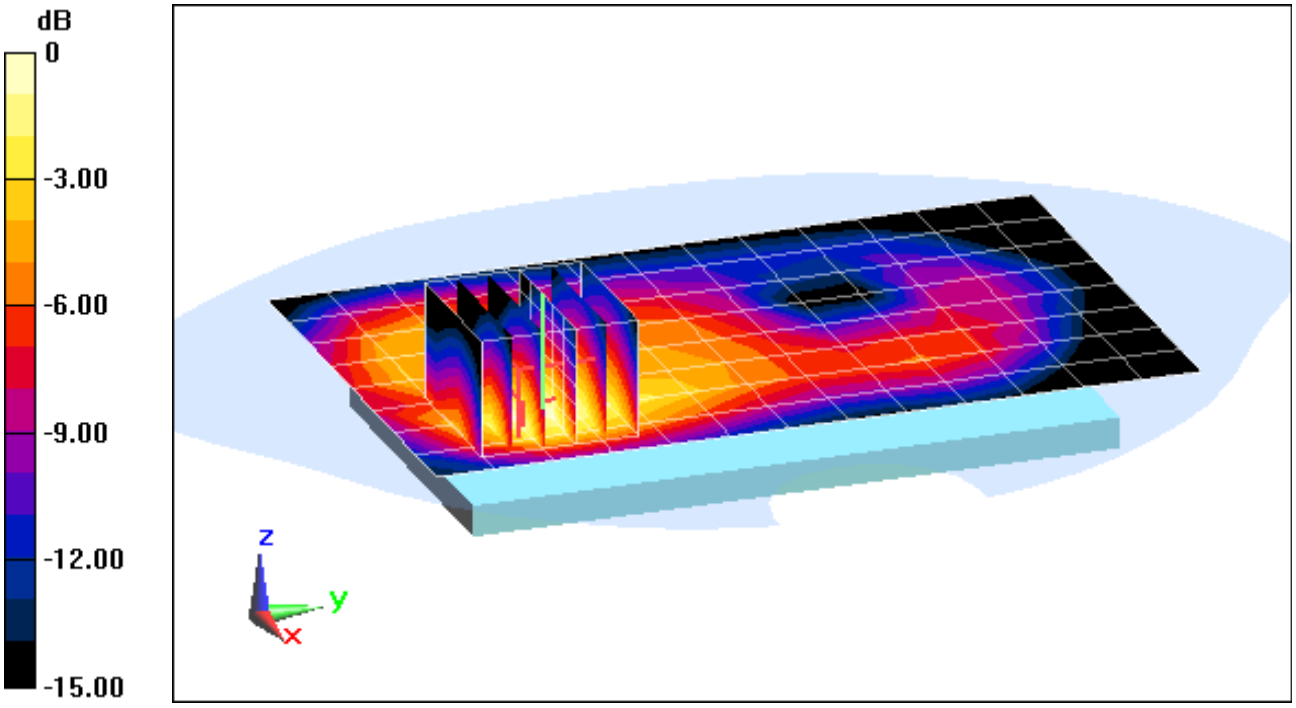
Communication System: PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used:
f = 1880 MHz; σ = 1.48 S/m; ε_r = 53.071; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-25-2013; Ambient Temp: 23.2°C; Tissue Temp: 23.8°C

Probe: ES3DV2 - SN3022; ConvF(4.43, 4.43, 4.43); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: PCS EVDO, Body SAR, Back Side, Mid.ch

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.134 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.657 W/kg



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

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-C

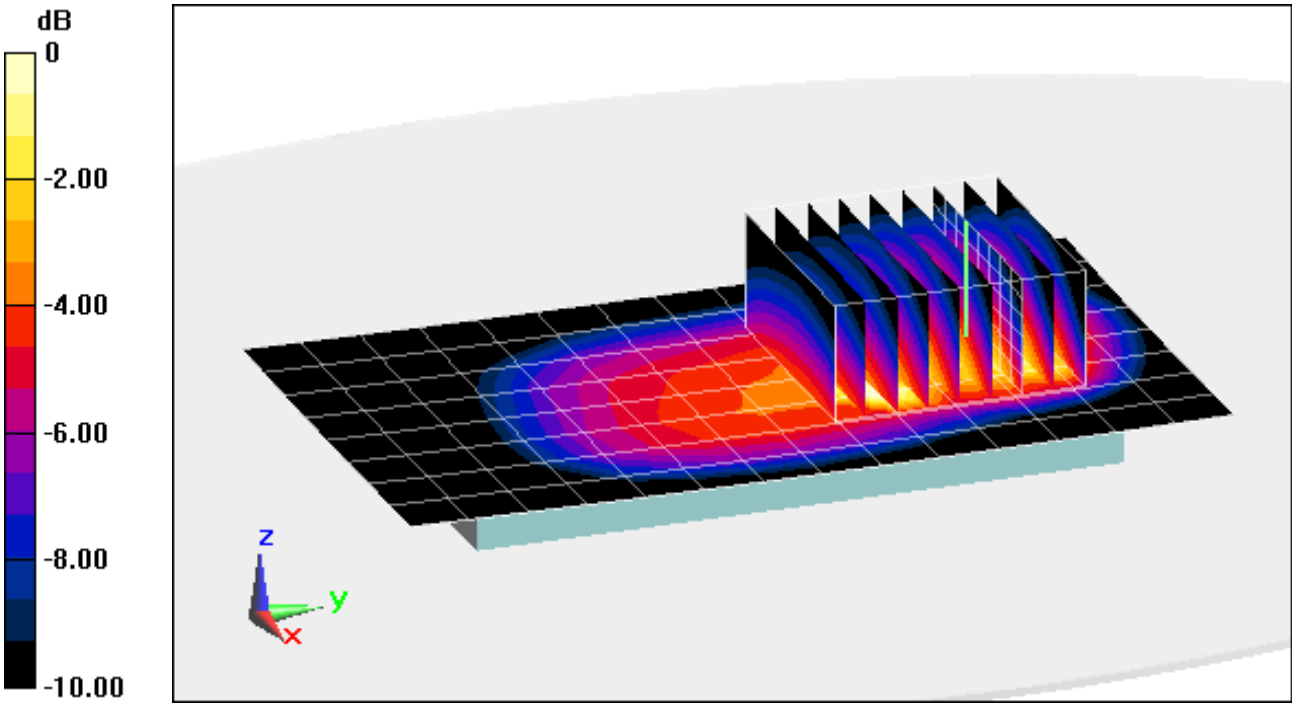
Communication System: GSM GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Medium: 835 Body, Medium parameters used (interpolated):
f = 836.6 MHz; σ = 1.018 S/m; ε_r = 55.851; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-24-2013; Ambient Temp: 24.5°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.080 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.199 W/kg
SAR(1 g) = 0.143 W/kg



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

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-B

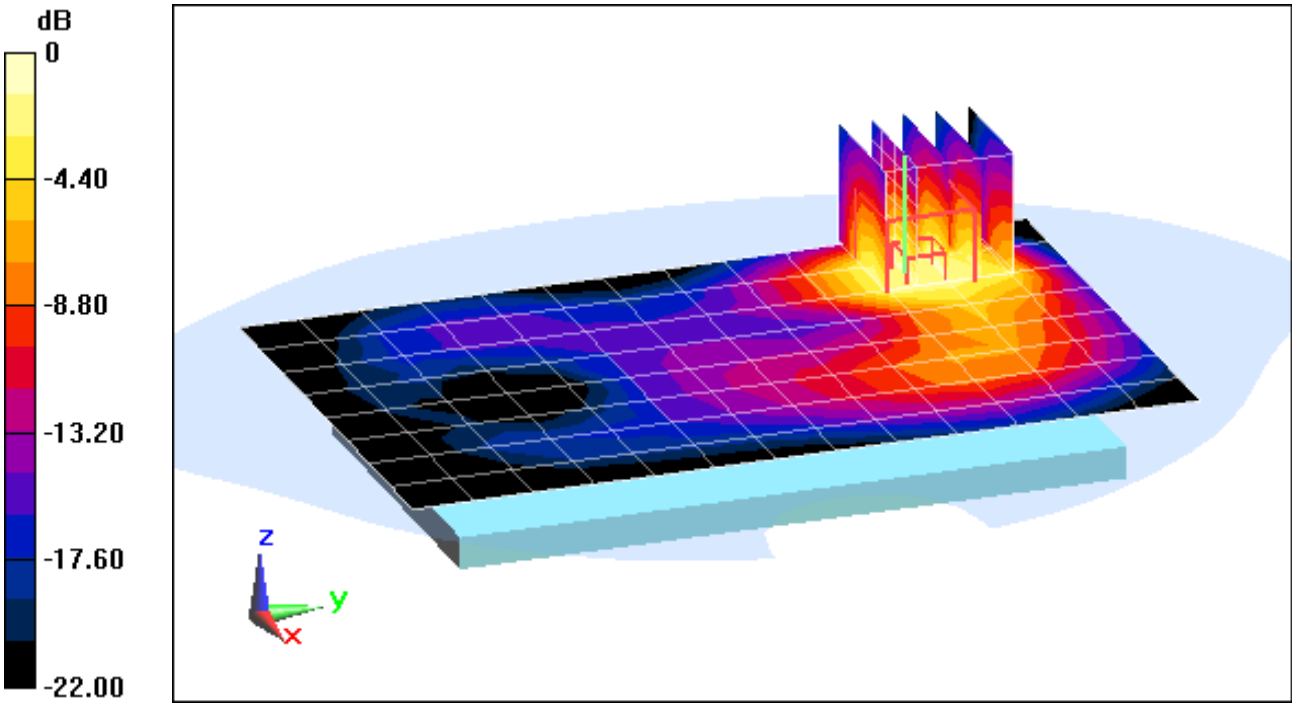
Communication System: GSM1900 GPRS; 2 Tx slots; Frequency: 1850.2 MHz; Duty Cycle: 1:4.15
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1850.2 MHz; σ = 1.447 S/m; ε_r = 53.177; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-25-2013; Ambient Temp: 23.2°C; Tissue Temp: 23.8°C

Probe: ES3DV2 - SN3022; ConvF(4.43, 4.43, 4.43); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 1900, Body SAR, Back Side, Low.ch, 2 Tx Slots

Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.492 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.92 W/kg
SAR(1 g) = 1.01 W/kg



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

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-A

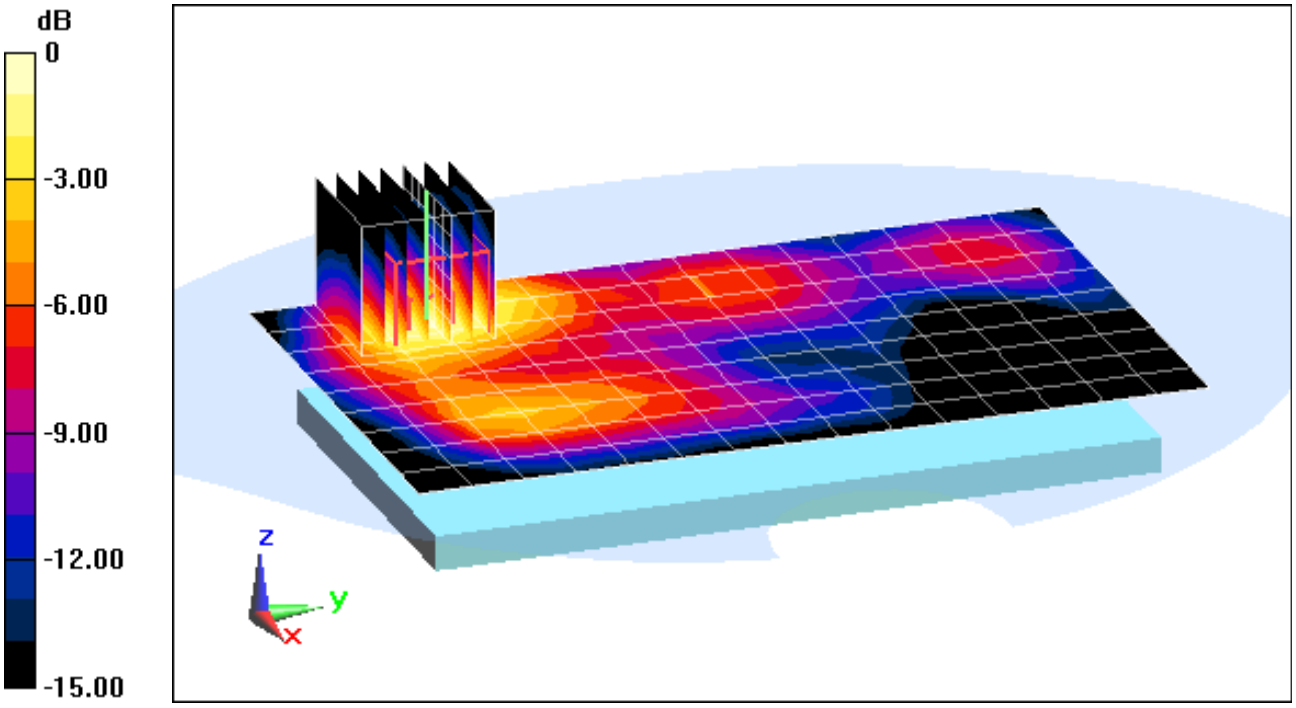
Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.991 S/m; ε_r = 52.154; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-26-2013; Ambient Temp: 23.2°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3287; ConvF(4.29, 4.29, 4.29); Calibrated: 11/15/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.958 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.355 W/kg
SAR(1 g) = 0.182 W/kg



0 dB = 0.225 W/kg = -6.48 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-C

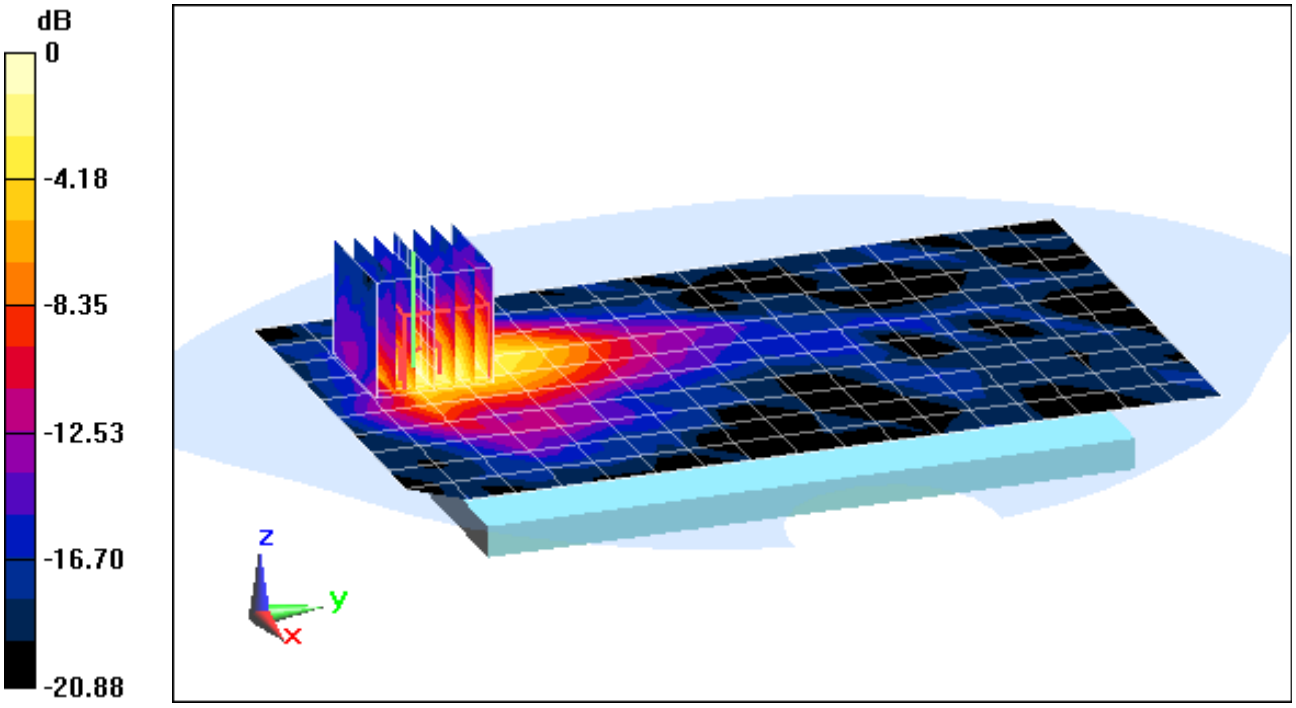
Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
f = 2480 MHz; σ = 2.055 S/m; ε_r = 53.039; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 23.8°C; Tissue Temp: 23.2°C

Probe: ES3DV2 - SN3022; ConvF(3.97, 3.97, 3.97); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: Bluetooth, Body SAR, Ch 78, 1 Mbps, Back Side

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.741 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.227 W/kg
SAR(1 g) = 0.062 W/kg



0 dB = 0.0820 W/kg = -10.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-A

Communication System: IEEE 802.11ac 5.2-5.8 GHz Band; Frequency: 5775 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used (interpolated):
f = 5775 MHz; σ = 6.203 S/m; ε_r = 45.956; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 24.2°C; Tissue Temp: 23.2°C

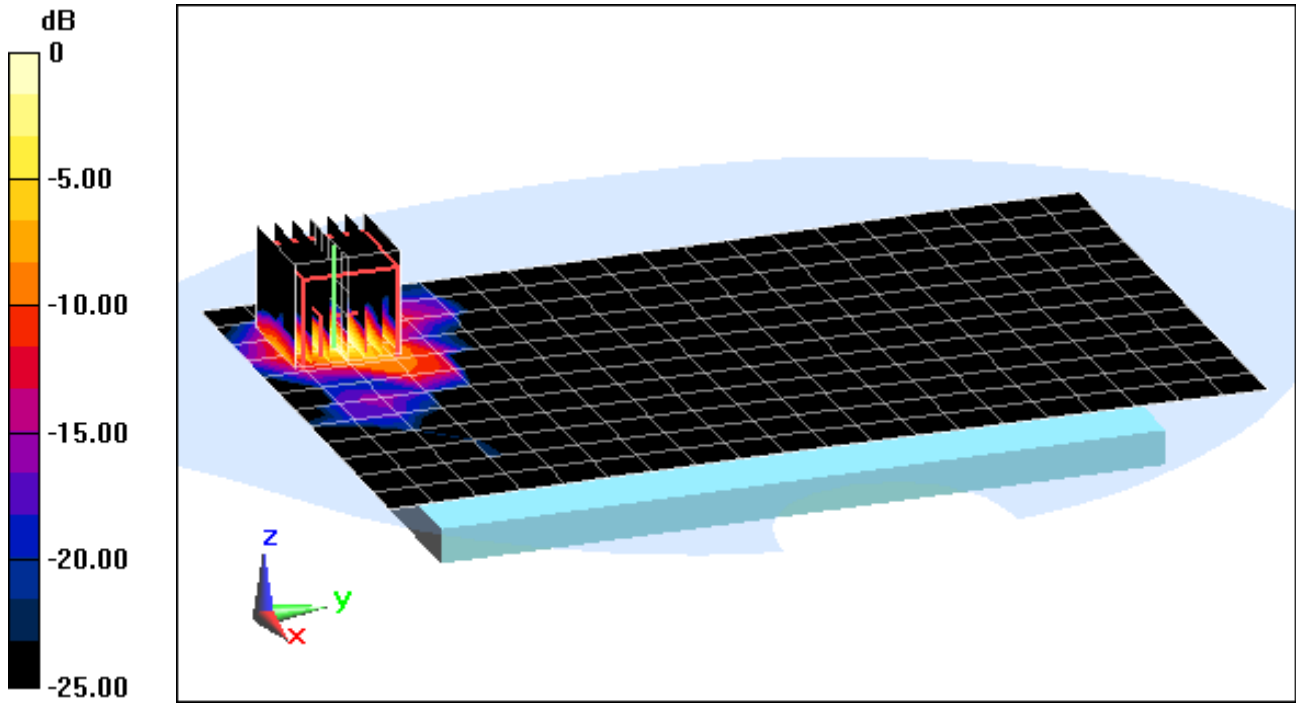
Probe: EX3DV4 - SN3589; ConvF(3.66, 3.66, 3.66); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11ac, 5.8 GHz, Body SAR, Ch 155, 29.3 Mbps, Back Side

Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 7.882 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.335 W/kg



0 dB = 0.871 W/kg = -0.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-A

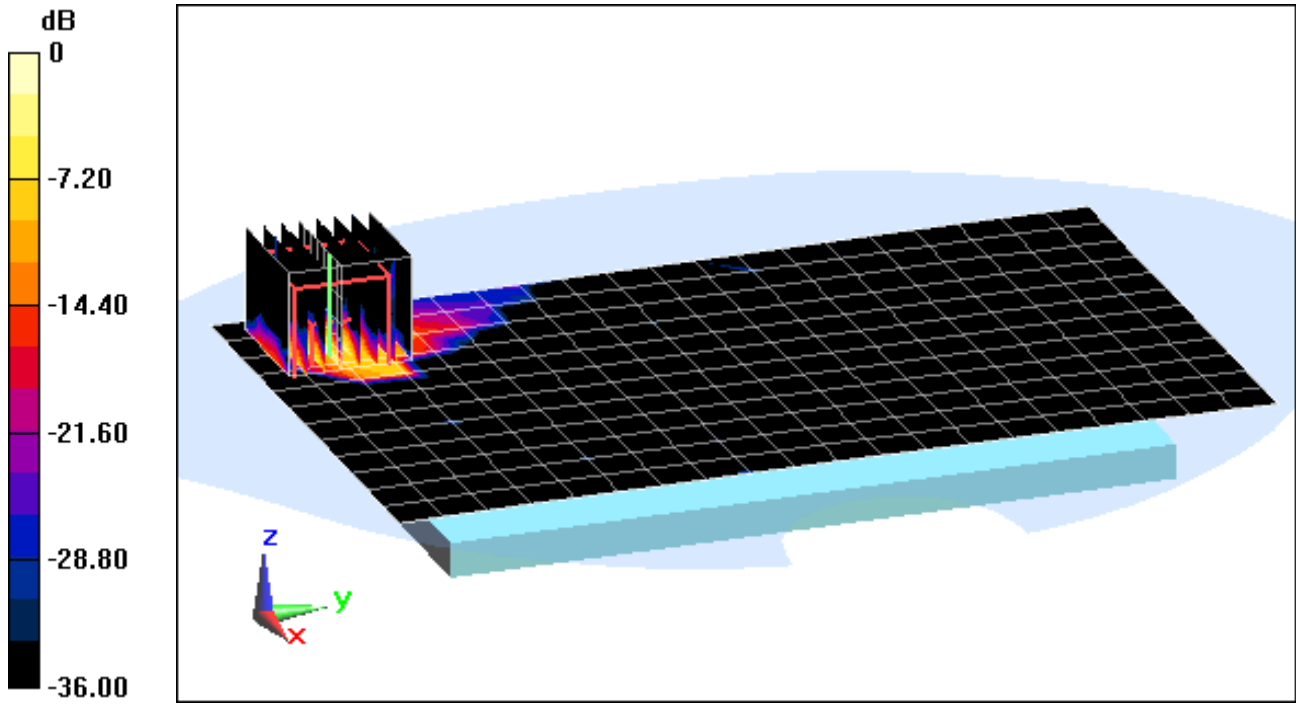
Communication System: IEEE 802.11a 5.2-5.8 GHz Band; Frequency: 5680 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5680 MHz; σ = 6.016 S/m; ε_r = 46.605; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-24-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3589; ConvF(3.32, 3.32, 3.32); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

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

Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 7.201 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 0.302 W/kg



0 dB = 0.877 W/kg = -0.57 dBW/kg

DUT: A3LSCHP729; Type: Portable Handset; Serial: FK-181-A

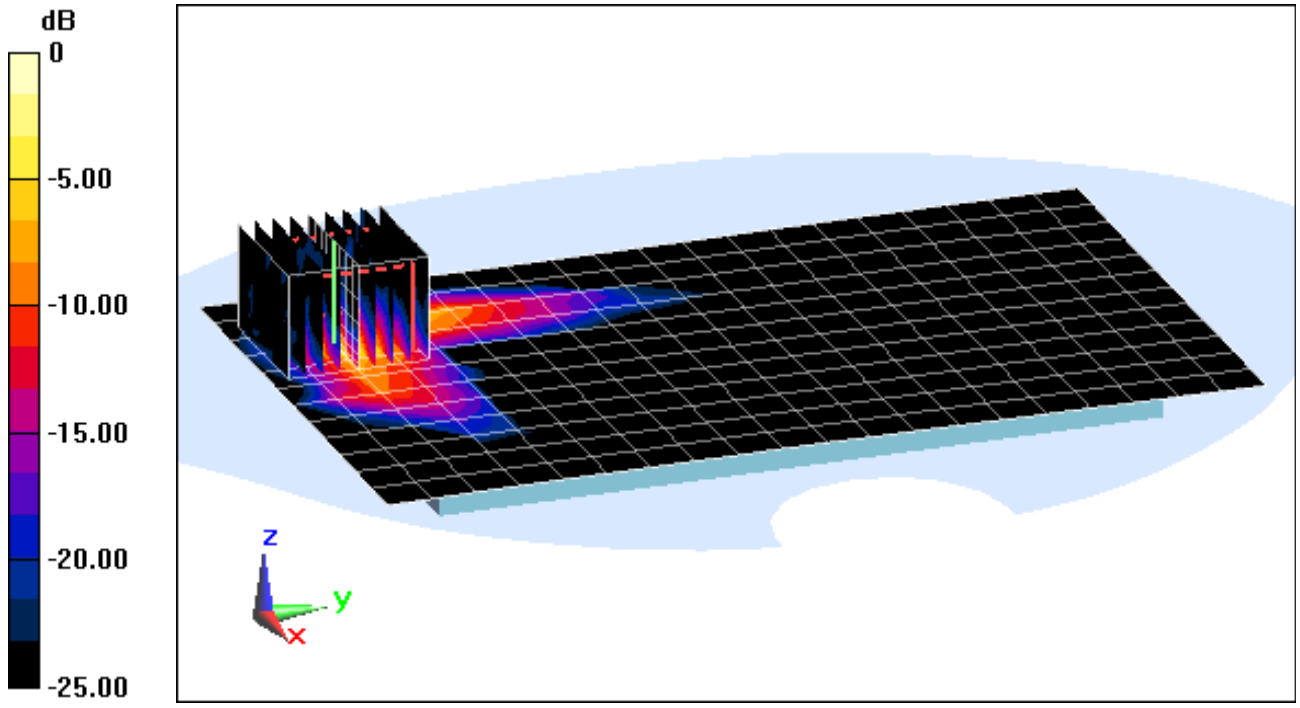
Communication System: IEEE 802.11ac 5.2-5.8 GHz Band; Frequency: 5210 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used (interpolated):
f = 5210 MHz; σ = 5.348 S/m; ε_r = 47.044; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 07-01-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3589; ConvF(3.99, 3.99, 3.99); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11ac, 5.2 GHz, Hand SAR, Ch 42, 29.3 Mbps, Back Side

Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 21.484 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 12.6 W/kg
SAR(10 g) = 0.306 W/kg



0 dB = 6.04 W/kg = 7.81 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

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

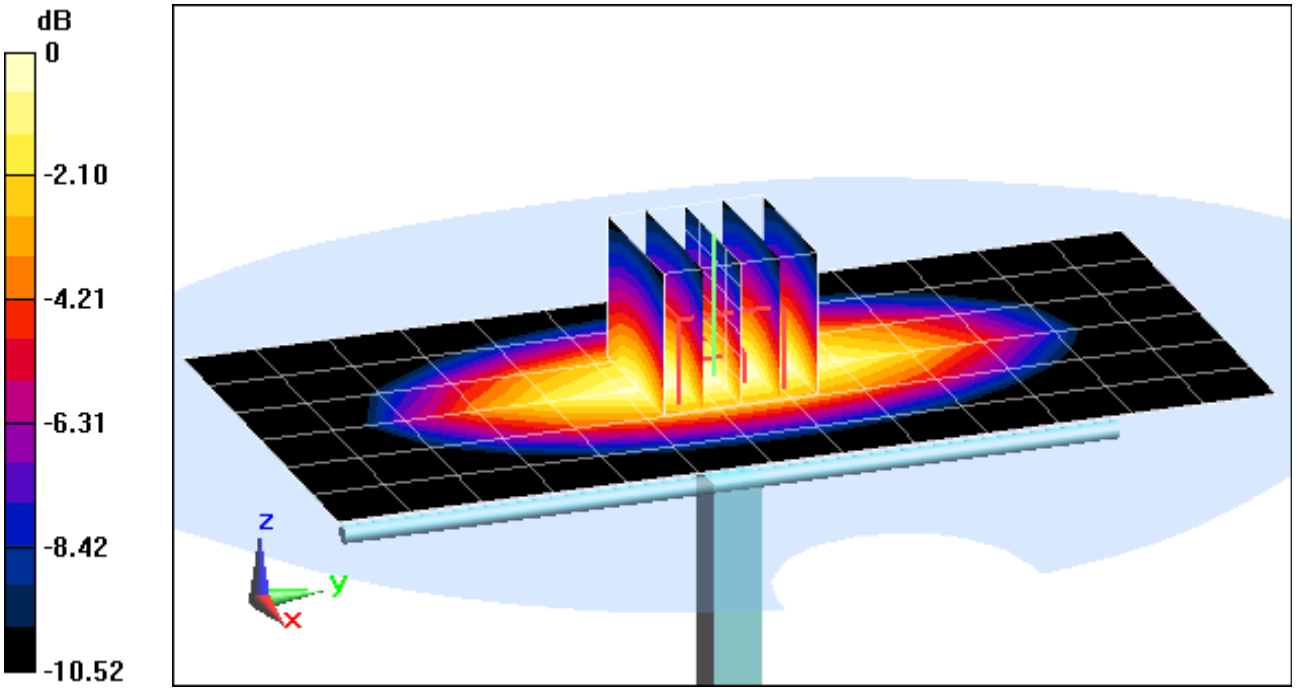
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used:
f = 835 MHz; σ = 0.91 S/m; ε_r = 40.679; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-27-2013; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3288; ConvF(6.41, 6.41, 6.41); Calibrated: 9/20/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/19/2012
Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.977 W/kg
Deviation = 1.14%



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

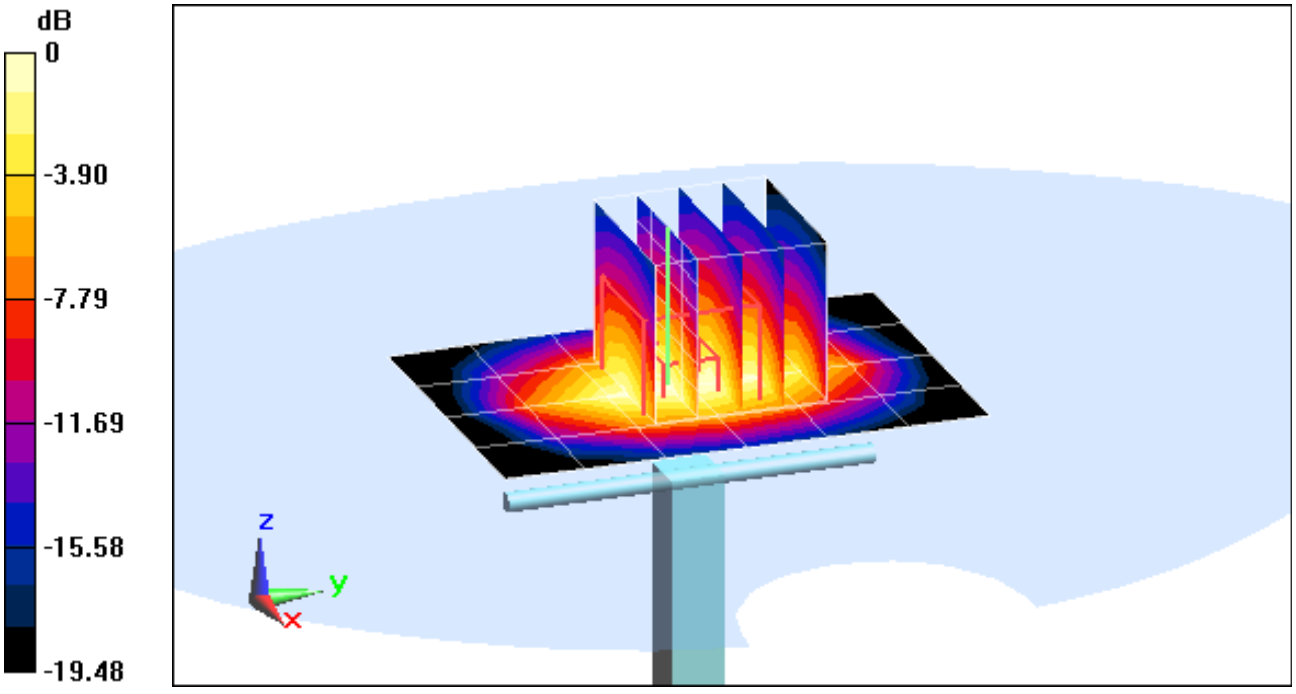
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.447 S/m; ε_r = 38.654; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-20-2013; Ambient Temp: 24.0°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3589; ConvF(7.09, 7.09, 7.09); Calibrated: 1/17/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 8.06 W/kg
SAR(1 g) = 4.25 W/kg
Deviation = 7.87%



0 dB = 4.76 W/kg = 6.78 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

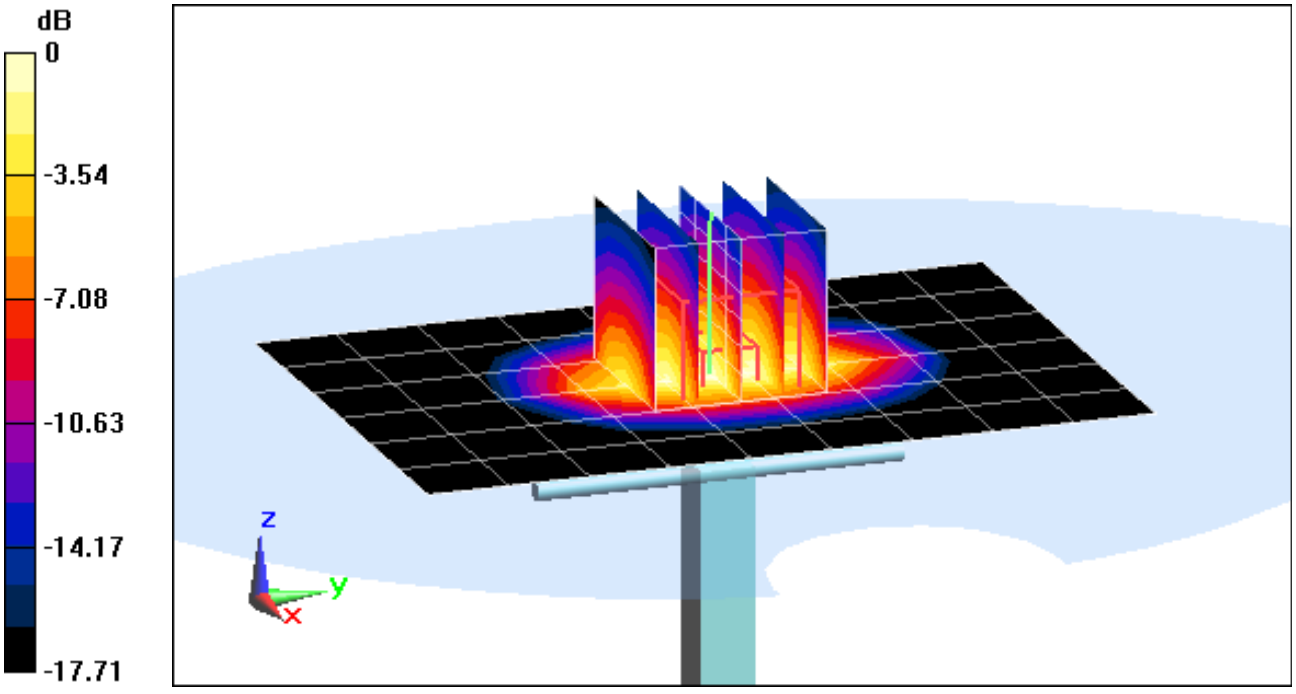
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.391 S/m; ε_r = 39.989; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 24.3°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3209; ConvF(5.21, 5.21, 5.21); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: SAM Right; Type: QD000P40CD; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 6.88 W/kg
SAR(1 g) = 3.76 W/kg
Deviation = -5.29%



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

PCTEST ENGINEERING LABORATORY, INC.

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

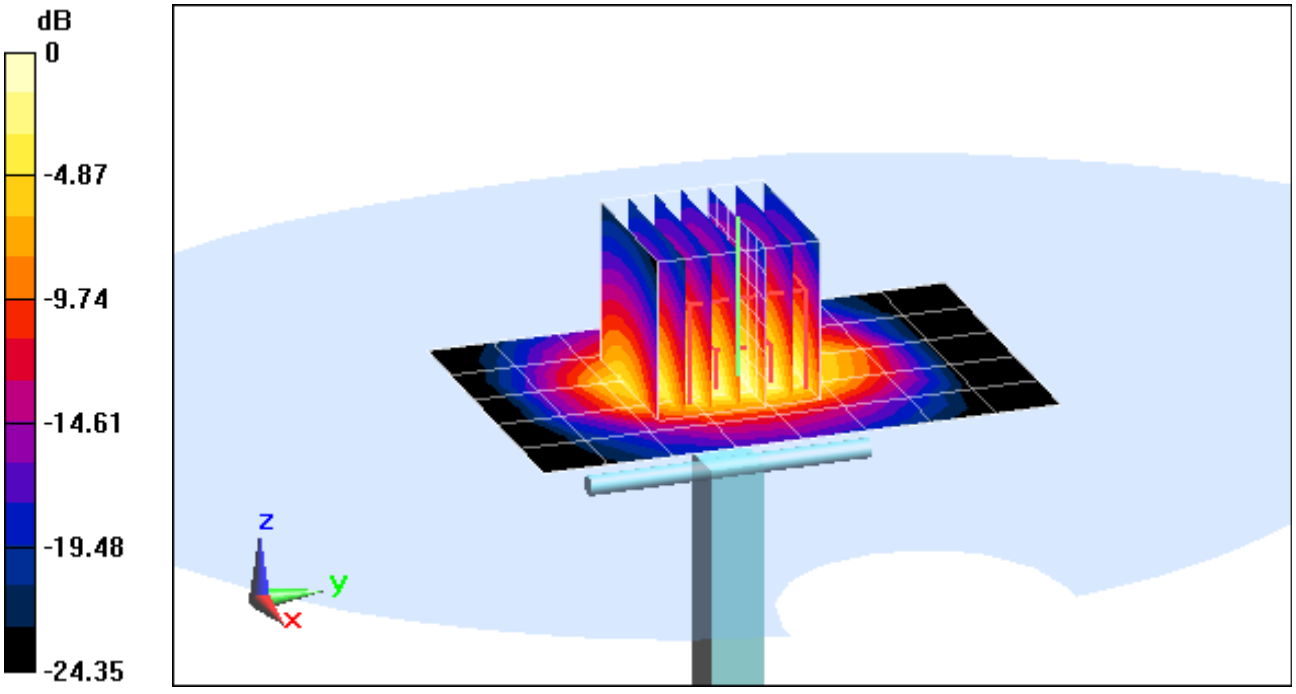
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head, Medium parameters used:
f = 2450 MHz; σ = 1.87 S/m; ε_r = 38.874; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-21-2013; Ambient Temp: 23.8°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3287; ConvF(4.3, 4.3, 4.3); Calibrated: 11/15/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (6x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 11.7 W/kg
SAR(1 g) = 5.61 W/kg
Deviation = 6.45%



0 dB = 7.29 W/kg = 8.63 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

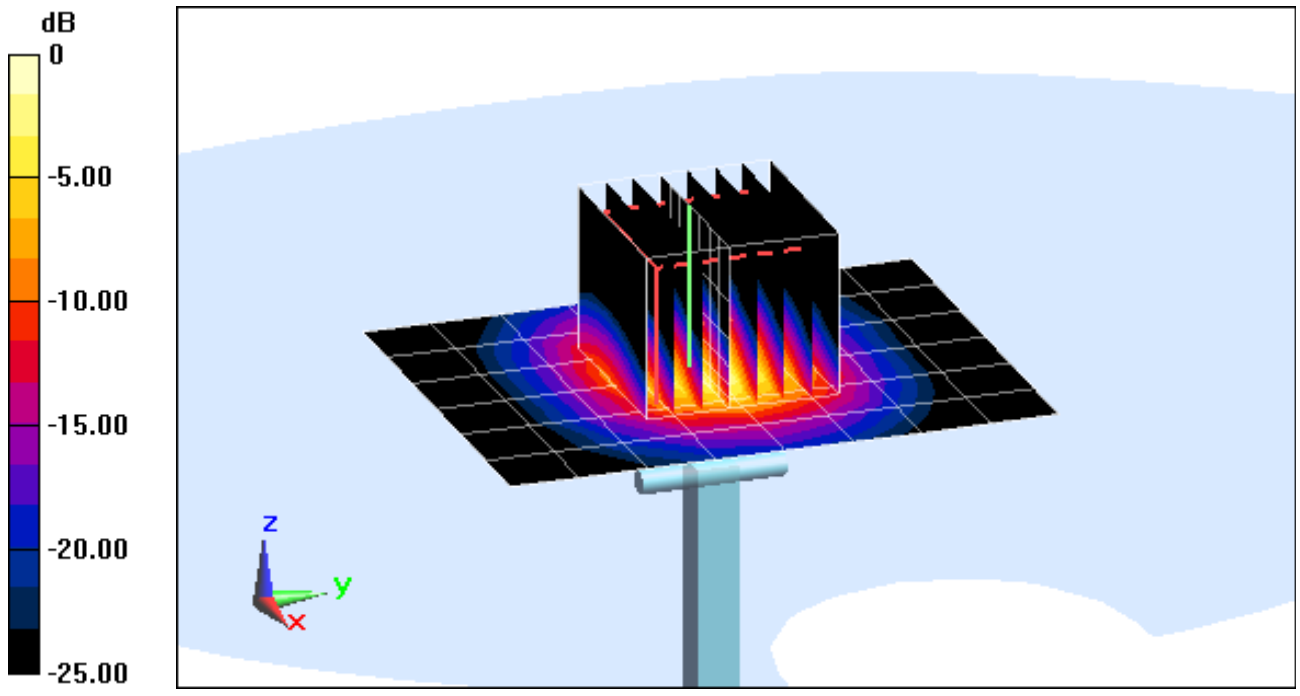
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5200 MHz; σ = 4.7 S/m; ε_r = 35.756; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 23.1°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3589; ConvF(4.48, 4.48, 4.48); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 30.5 W/kg
SAR(1 g) = 7.40 W/kg
Deviation = -2.50%



0 dB = 18.0 W/kg = 12.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

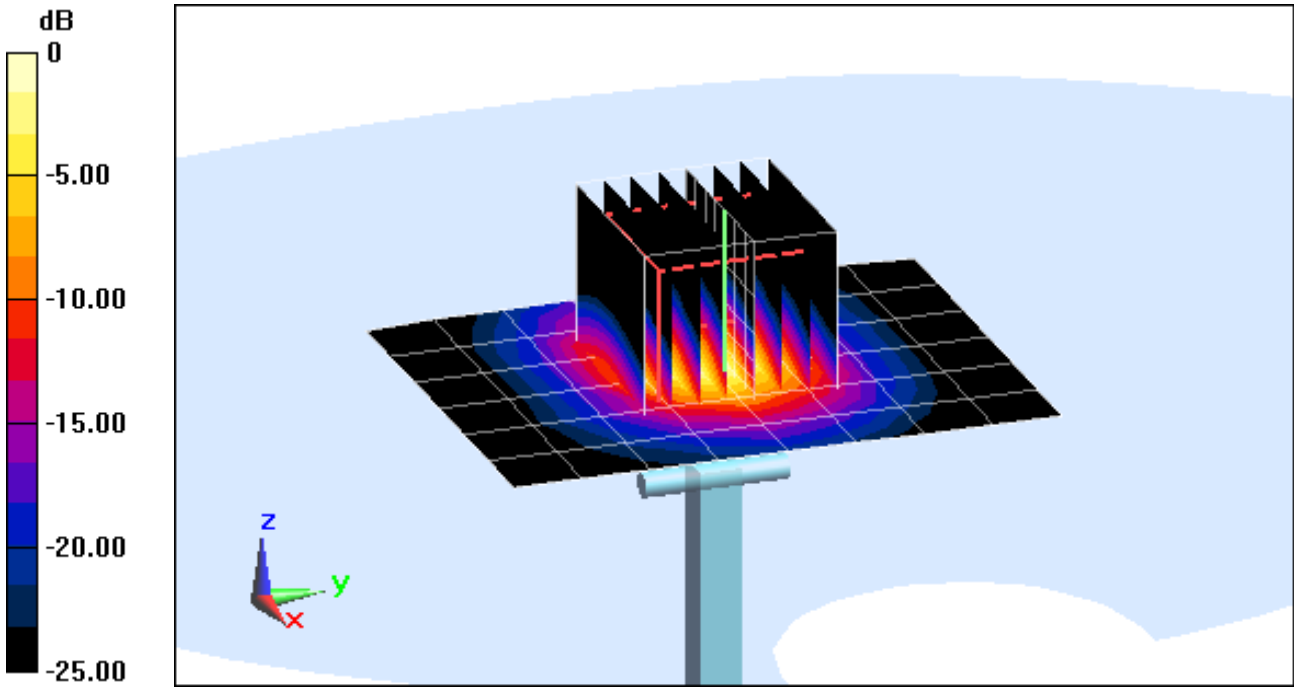
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5300 MHz; σ = 4.806 S/m; ε_r = 35.425; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 23.1°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3589; ConvF(4.27, 4.27, 4.27); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 34.7 W/kg
SAR(1 g) = 7.15 W/kg
Deviation = -7.02%



0 dB = 16.3 W/kg = 12.12 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

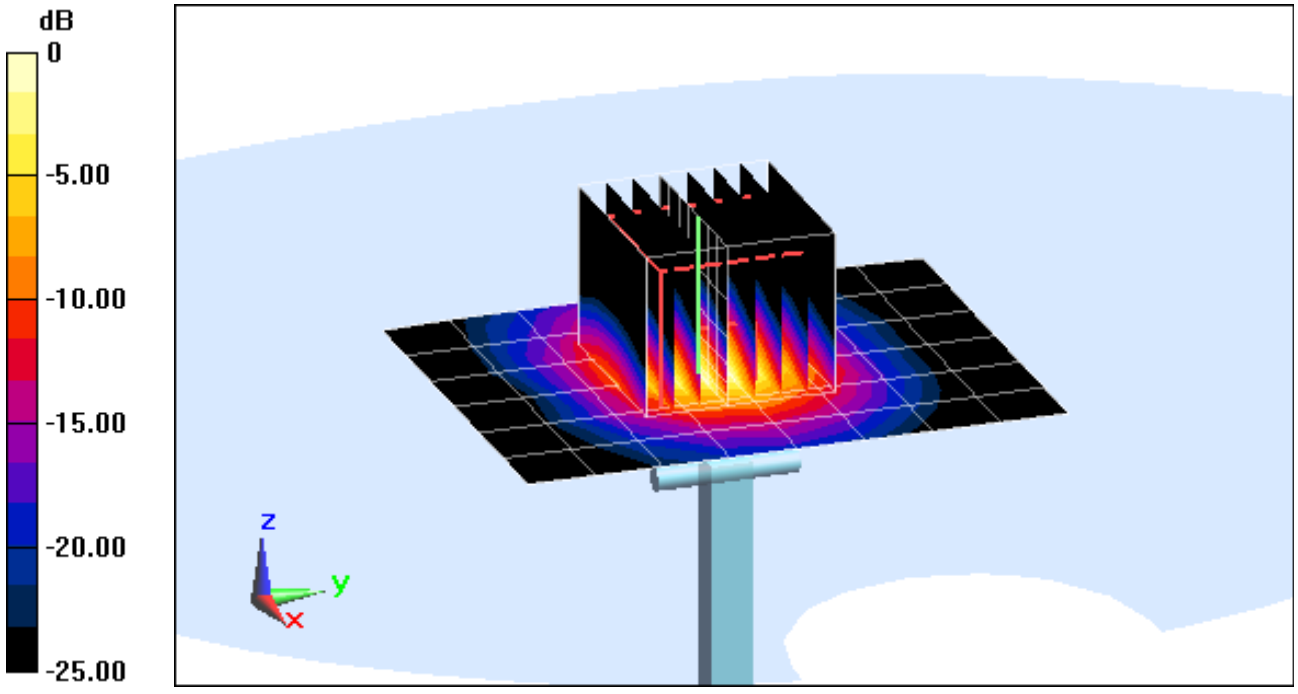
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5500 MHz; σ = 5.033 S/m; ε_r = 34.692; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 23.1°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3589; ConvF(4.14, 4.14, 4.14); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 37.9 W/kg
SAR(1 g) = 7.61 W/kg
Deviation = -4.99%



0 dB = 18.0 W/kg = 12.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

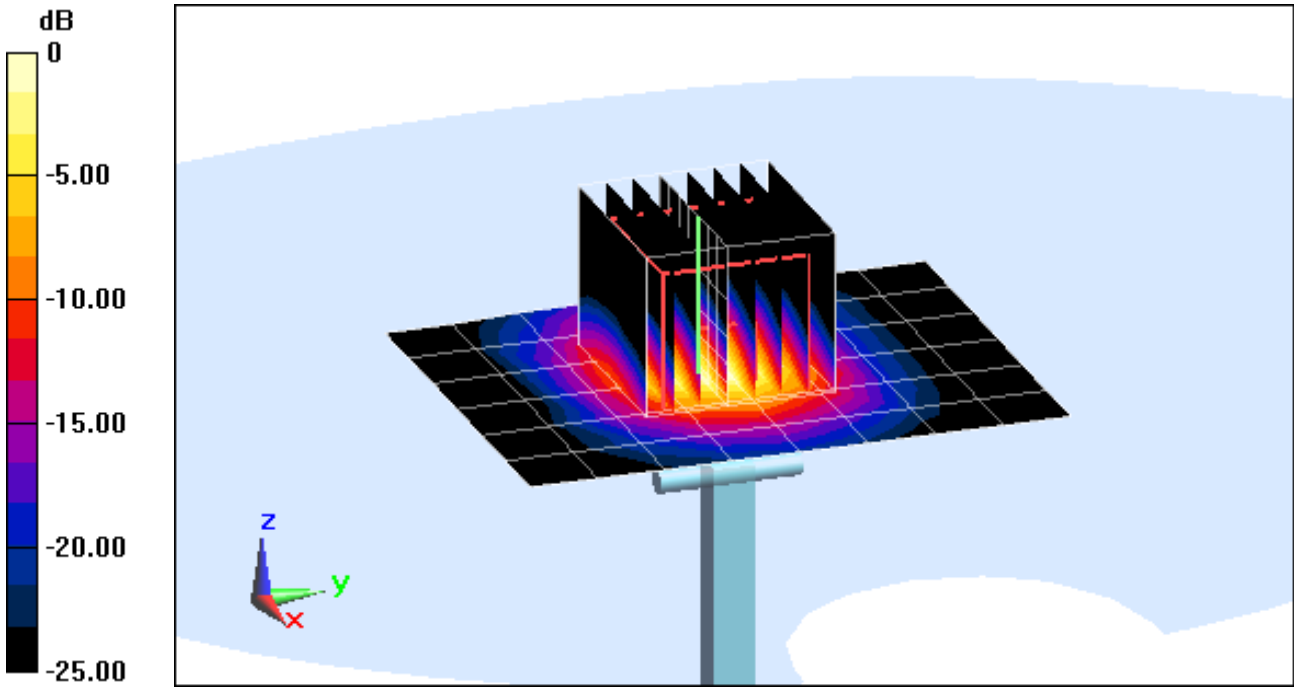
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5600 MHz; σ = 5.17 S/m; ε_r = 34.304; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 23.3°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3589; ConvF(3.81, 3.81, 3.81); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 37.0 W/kg
SAR(1 g) = 7.64 W/kg
Deviation = -4.98%



0 dB = 18.1 W/kg = 12.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

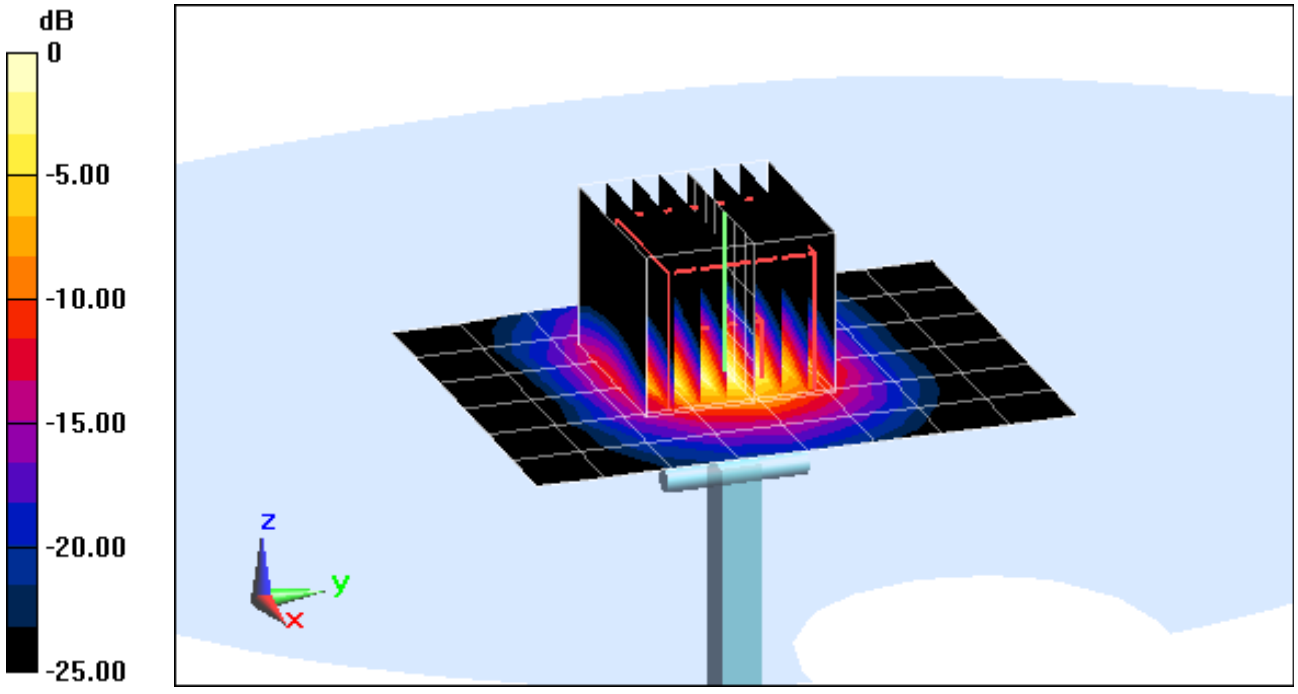
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Head, Medium parameters used:
f = 5800 MHz; σ = 5.438 S/m; ε_r = 33.927; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(3.85, 3.85, 3.85); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 33.8 W/kg
SAR(1 g) = 7.16 W/kg
Deviation = -5.91%



0 dB = 17.8 W/kg = 12.50 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

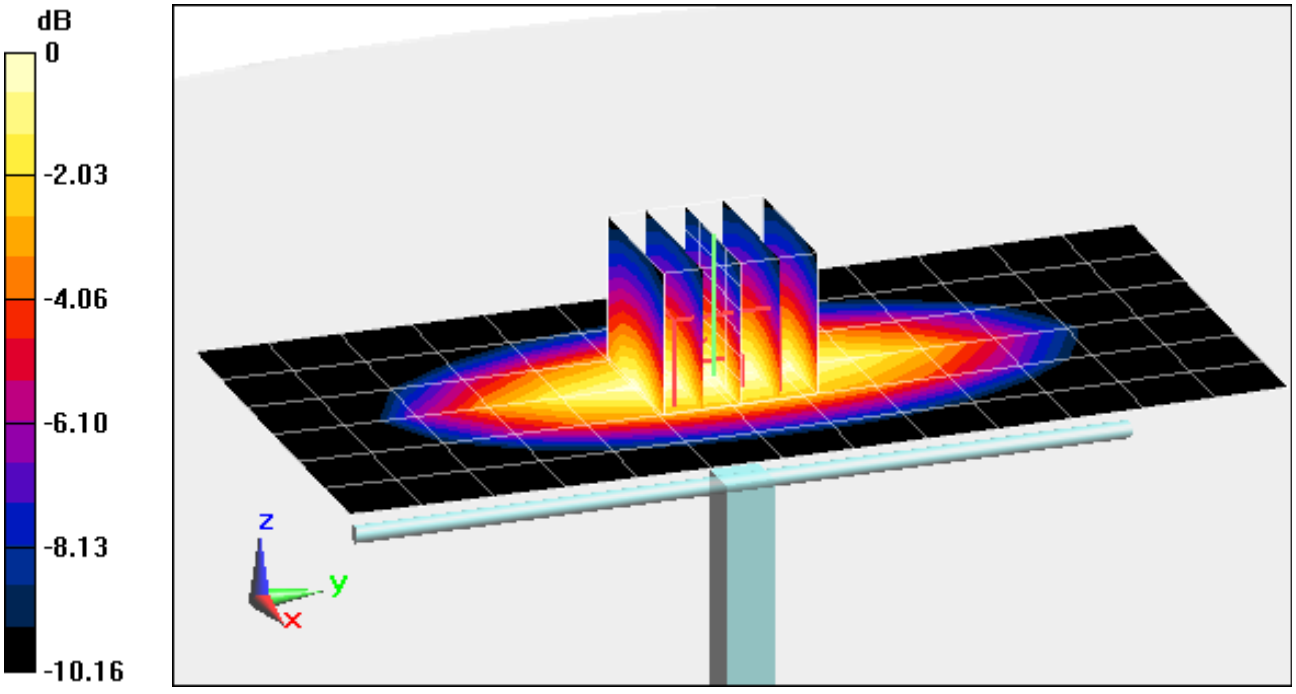
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used:
f = 835 MHz; σ = 1.011 S/m; ε_r = 55.799; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06-24-2013; Ambient Temp: 24.5°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3209; ConvF(6.28, 6.28, 6.28); Calibrated: 3/15/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 3/8/2013
Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP-1158
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 1.01 W/kg
Deviation = 7.91%



0 dB = 1.08 W/kg = 0.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

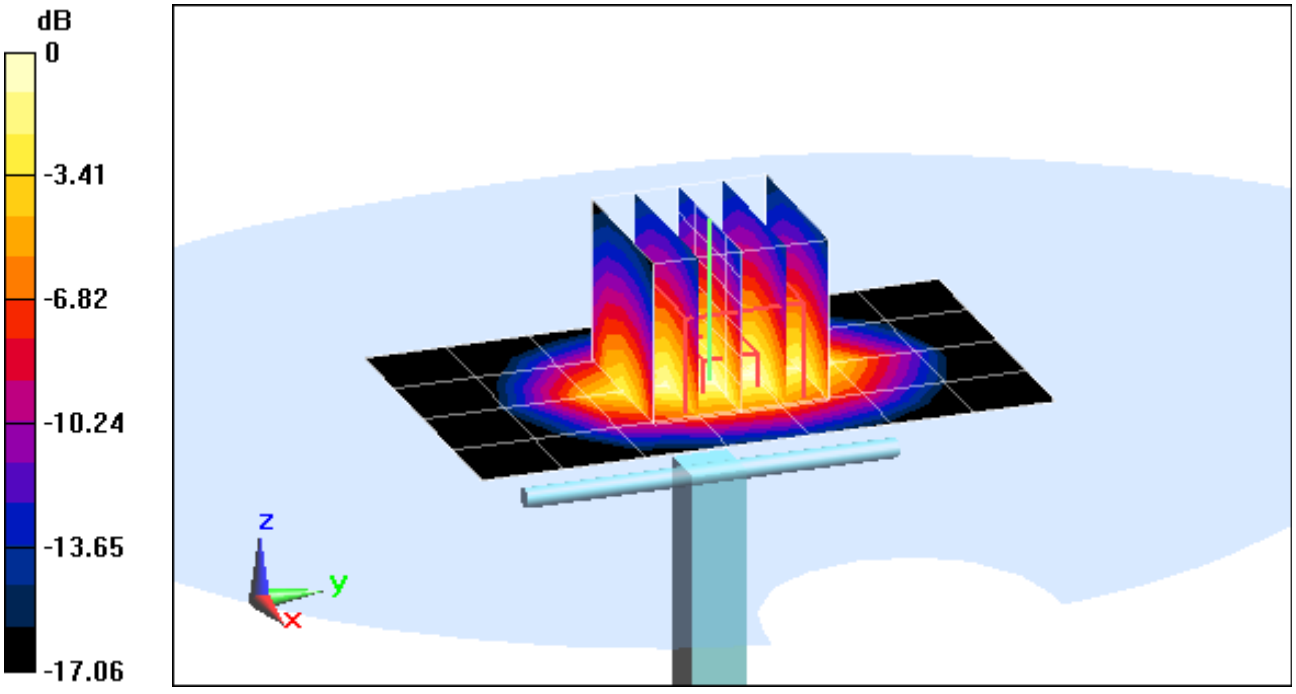
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.501 S/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-25-2013; Ambient Temp: 23.2°C; Tissue Temp: 23.8°C

Probe: ES3DV2 - SN3022; ConvF(4.43, 4.43, 4.43); Calibrated: 8/28/2012;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (5x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 16.0 dBm (40 mW)
Peak SAR (extrapolated) = 2.78 W/kg
SAR(1 g) = 1.64 W/kg
Deviation = 1.74%



0 dB = 1.83 W/kg = 2.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

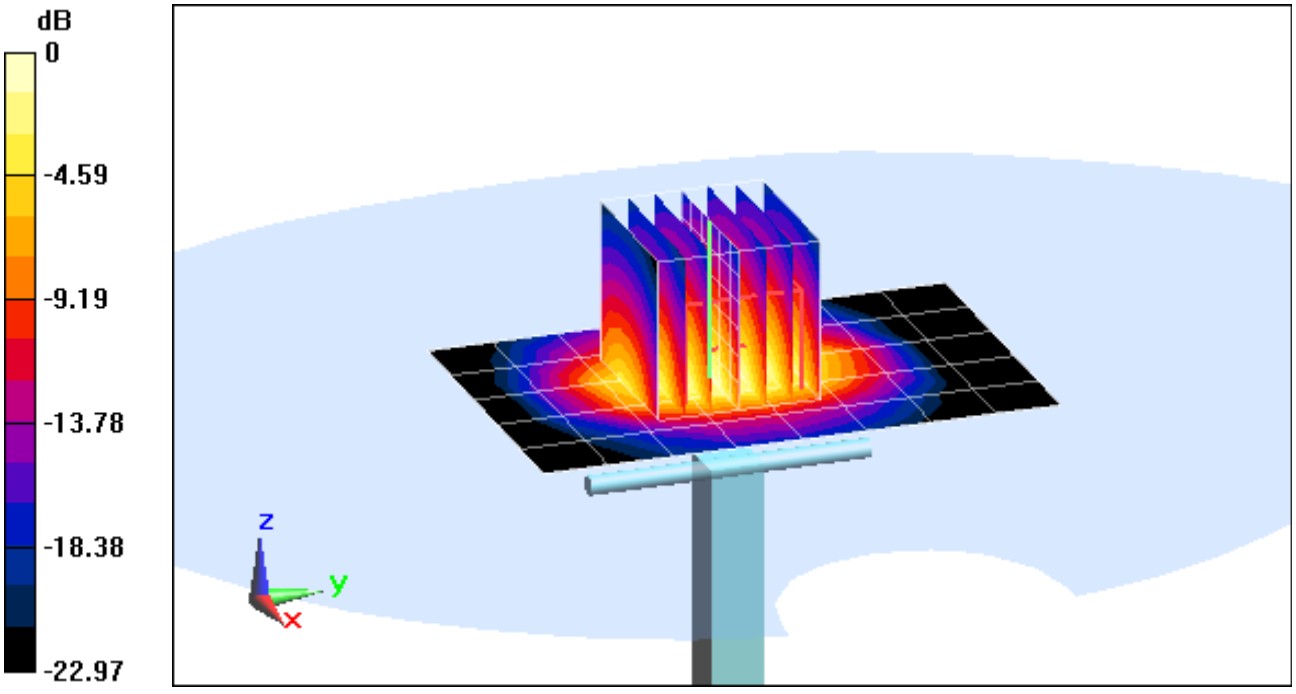
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used:
f = 2450 MHz; σ = 2.008 S/m; ε_r = 52.116; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-26-2013; Ambient Temp: 23.2°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3287; ConvF(4.29, 4.29, 4.29); Calibrated: 11/15/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 11/13/2012
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (6x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 11.2 W/kg
SAR(1 g) = 5.24 W/kg
Deviation = 1.55%



0 dB = 6.71 W/kg = 8.27 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

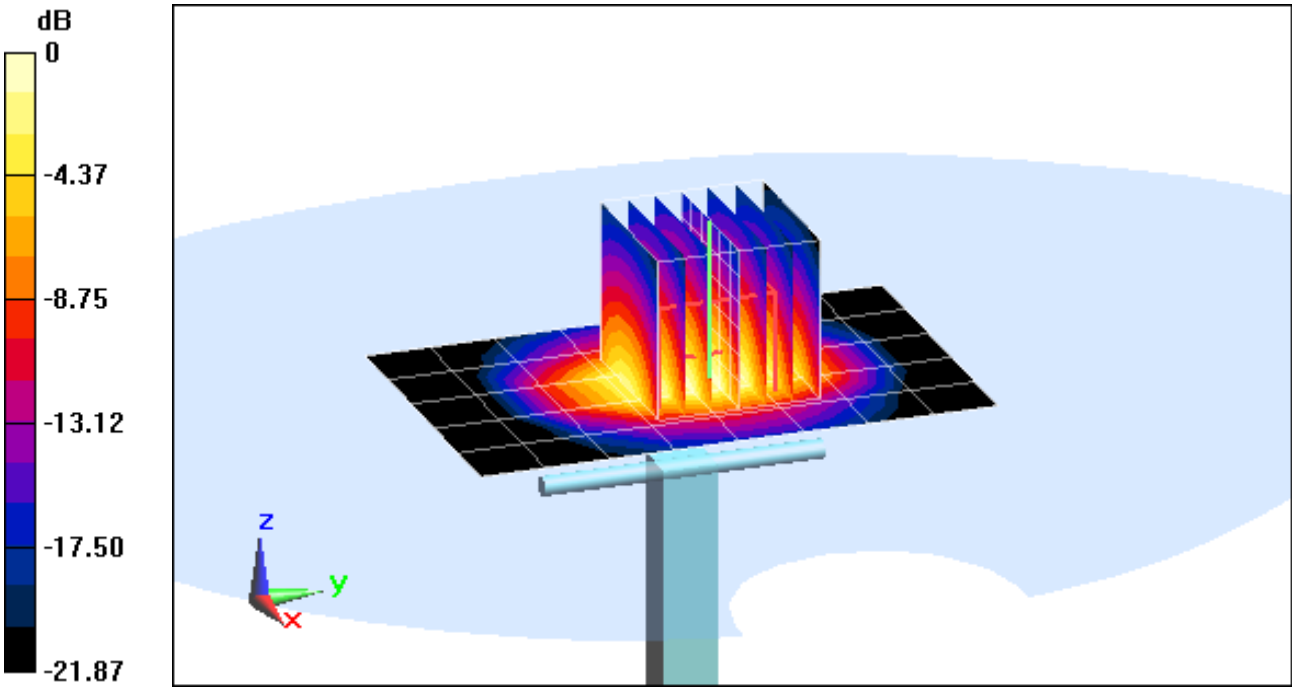
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used:
f = 2450 MHz; σ = 2.015 S/m; ε_r = 53.219; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-08-2013; Ambient Temp: 23.8°C; Tissue Temp: 23.2°C

Probe: ES3DV2 - SN3022; ConvF(3.97, 3.97, 3.97); Calibrated: 8/28/2012;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/24/2012
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (6x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 11.1 W/kg
SAR(1 g) = 5.17 W/kg
Deviation = 0.19%



0 dB = 6.65 W/kg = 8.23 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

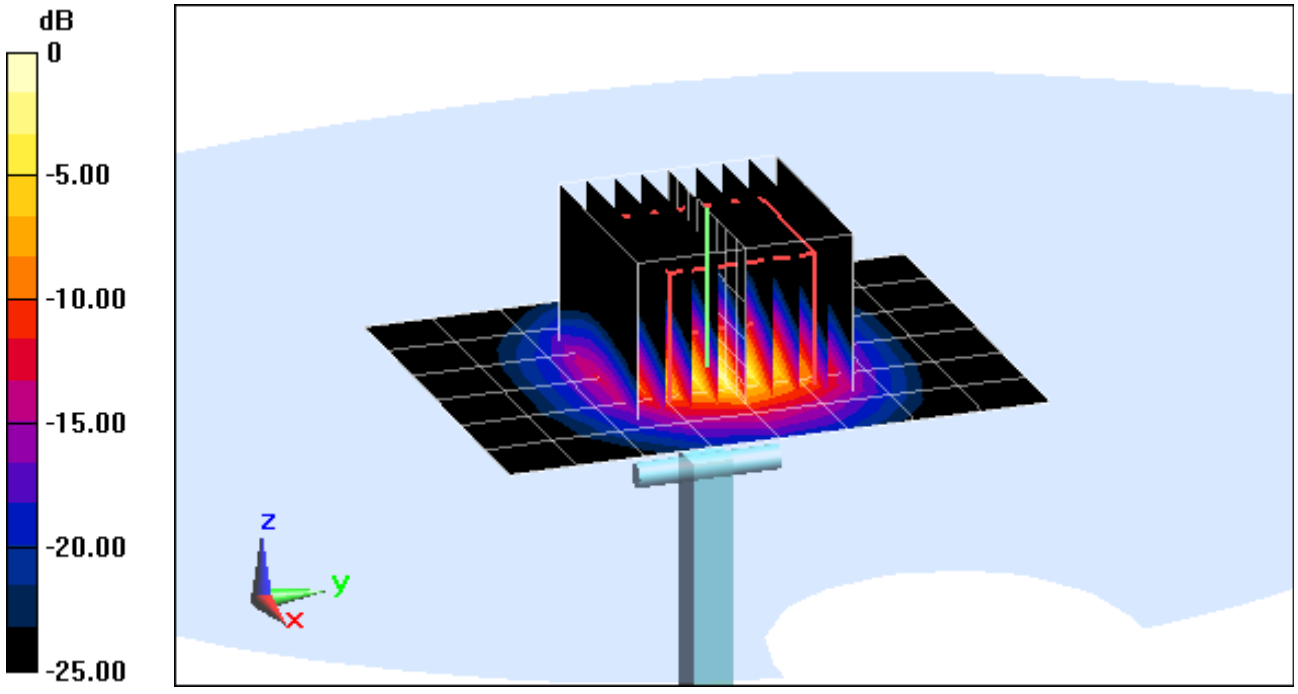
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5200 MHz; σ = 5.345 S/m; ε_r = 47.494; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-24-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3589; ConvF(3.99, 3.99, 3.99); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 32.9 W/kg
SAR(1 g) = 7.34 W/kg
Deviation = -2.78%



0 dB = 16.5 W/kg = 12.17 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

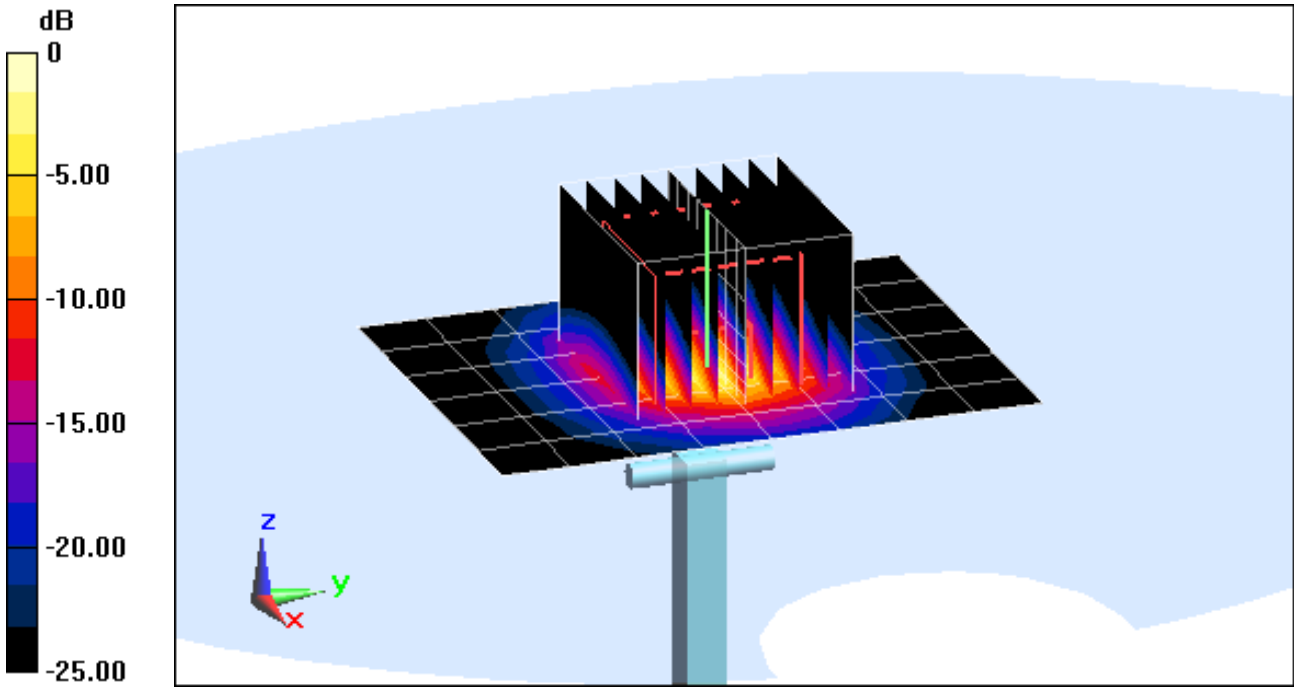
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5300 MHz; σ = 5.483 S/m; ε_r = 47.275; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-24-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3589; ConvF(3.81, 3.81, 3.81); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 33.9 W/kg
SAR(1 g) = 7.75 W/kg
Deviation = 2.92%



0 dB = 17.9 W/kg = 12.53 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

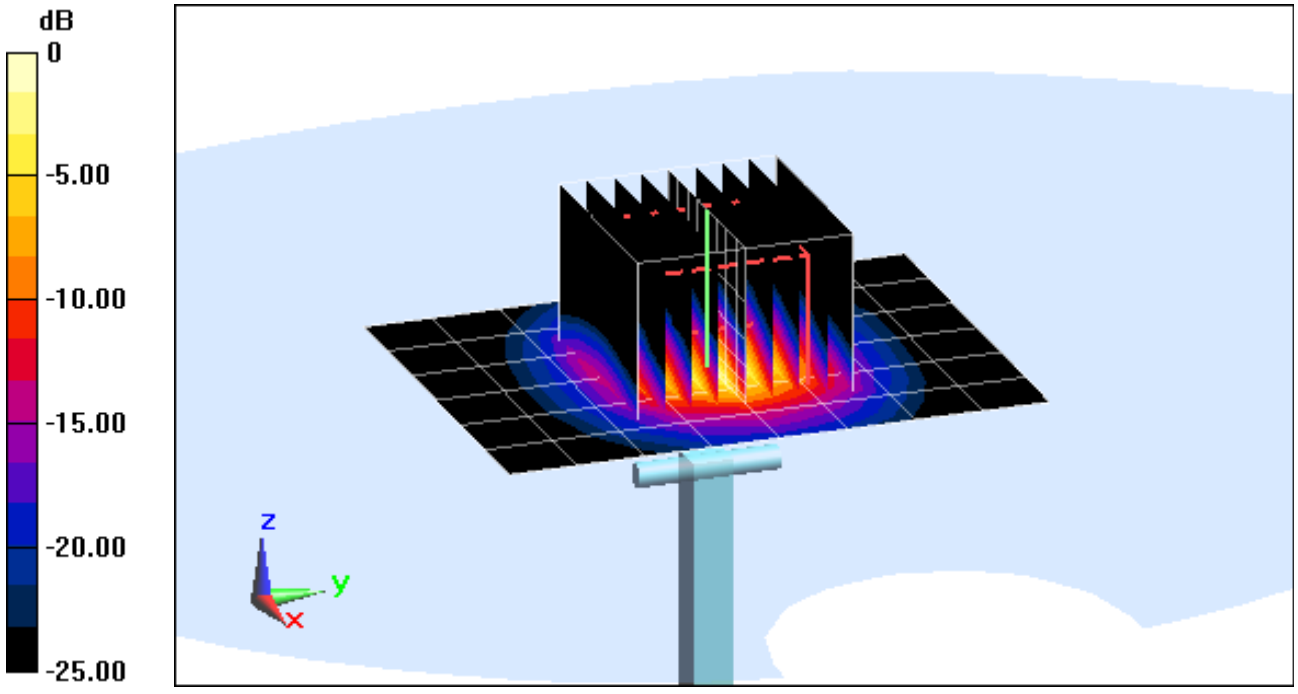
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5500 MHz; σ = 5.74 S/m; ε_r = 46.926; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-24-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3589; ConvF(3.52, 3.52, 3.52); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 34.4 W/kg
SAR(1 g) = 7.75 W/kg
Deviation = -4.08%



0 dB = 18.5 W/kg = 12.67 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

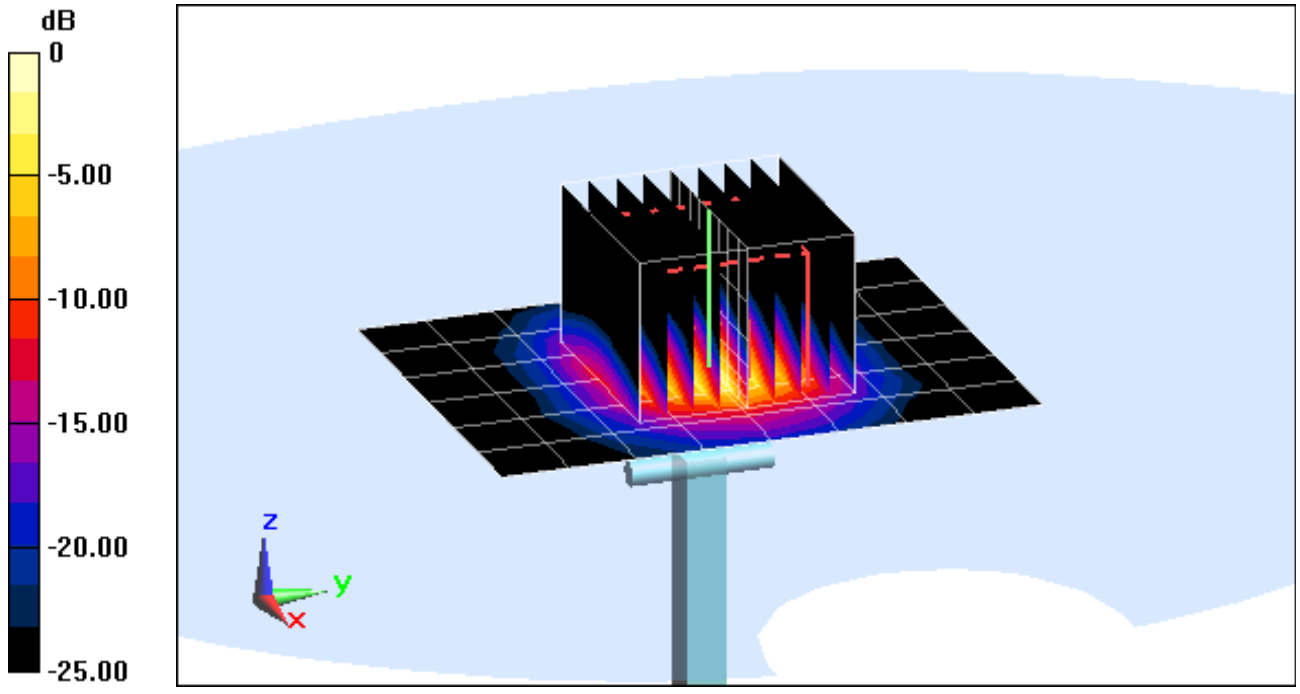
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5600 MHz; σ = 5.882 S/m; ε_r = 46.744; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-24-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3589; ConvF(3.32, 3.32, 3.32); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 31.7 W/kg
SAR(1 g) = 8.23 W/kg
Deviation = 2.49%



0 dB = 20.7 W/kg = 13.16 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

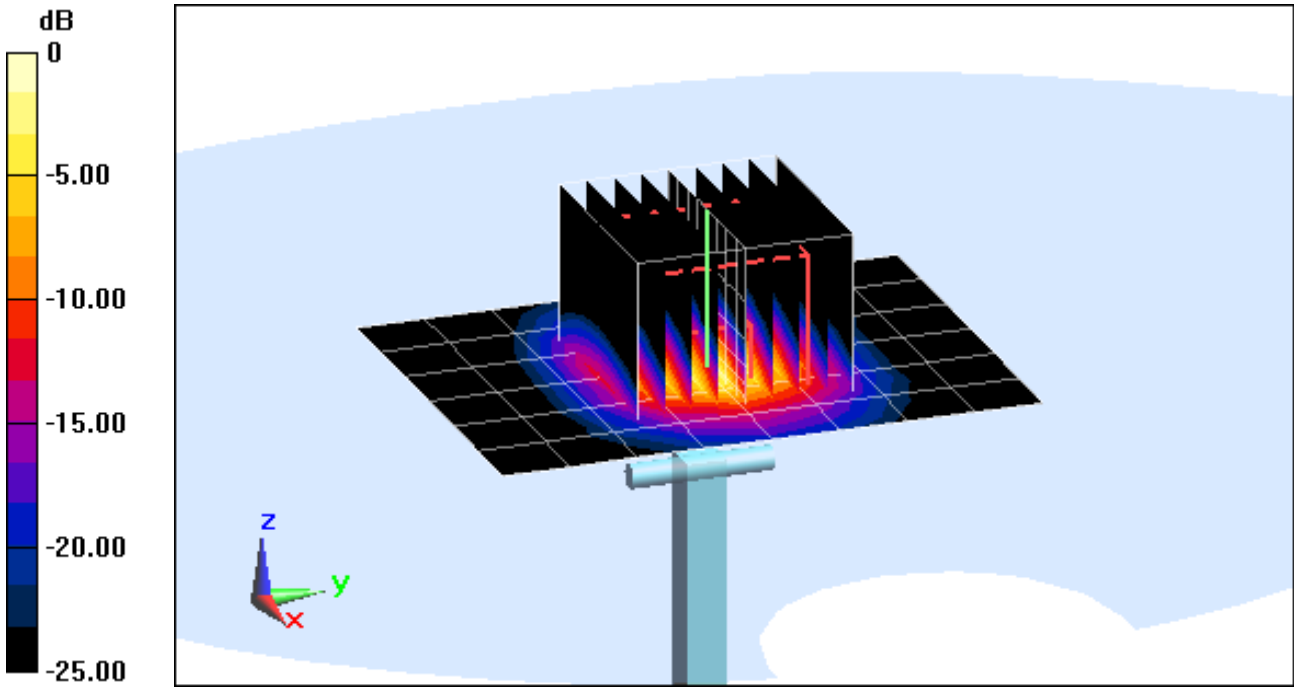
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5800 MHz; σ = 6.156 S/m; ε_r = 46.371; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-24-2013; Ambient Temp: 24.4°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN3589; ConvF(3.66, 3.66, 3.66); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 36.5 W/kg
SAR(1 g) = 7.44 W/kg
Deviation = -0.93%



0 dB = 17.5 W/kg = 12.43 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5200 MHz; σ = 5.335 S/m; ε_r = 47.08; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

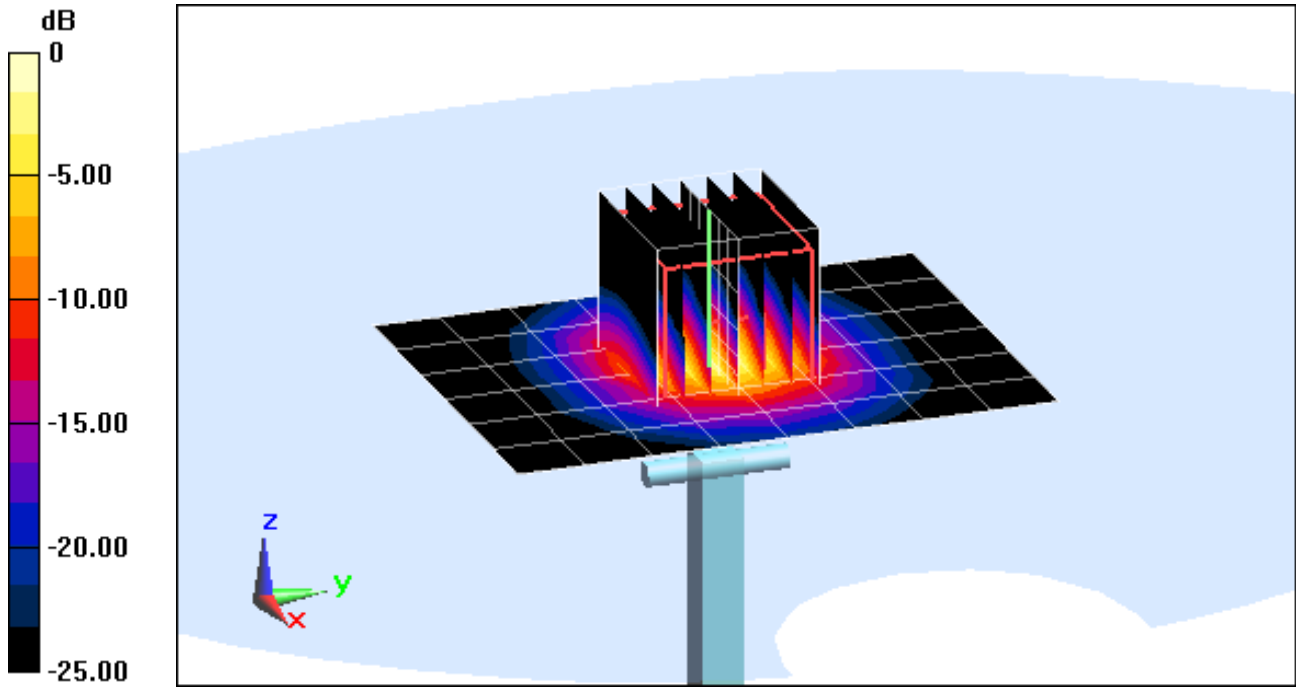
Probe: EX3DV4 - SN3589; ConvF(3.99, 3.99, 3.99); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5200 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 28.7 W/kg

SAR(1 g) = 7.51 W/kg; SAR(10 g) = 2.10 W/kg
1g Deviation = -0.53%; 10g Deviation = -0.47%



0 dB = 18.7 W/kg = 12.72 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

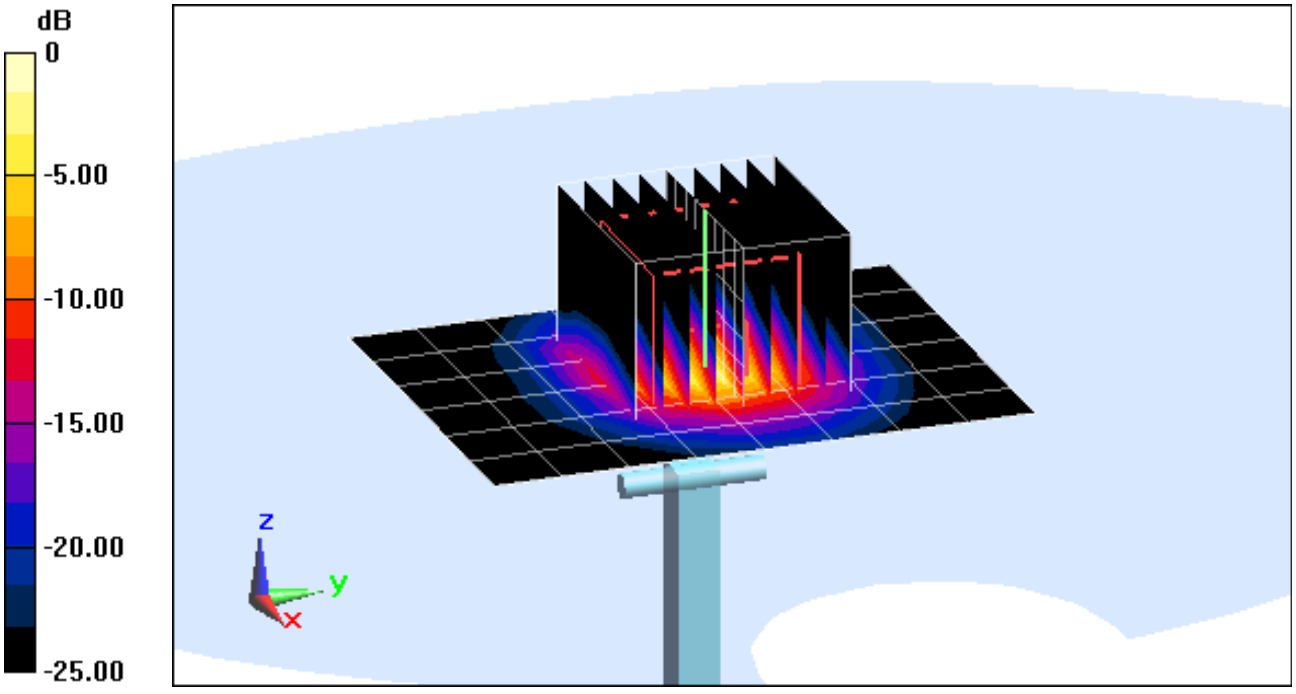
Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5300 MHz; σ = 5.438 S/m; ε_r = 46.81; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN3589; ConvF(3.81, 3.81, 3.81); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5300 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 33.0 W/kg
SAR(1 g) = 7.98 W/kg; SAR(10 g) = 2.21 W/kg
1g Deviation = 5.98%; 10g Deviation = 4.74%



0 dB = 19.1 W/kg = 12.81 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

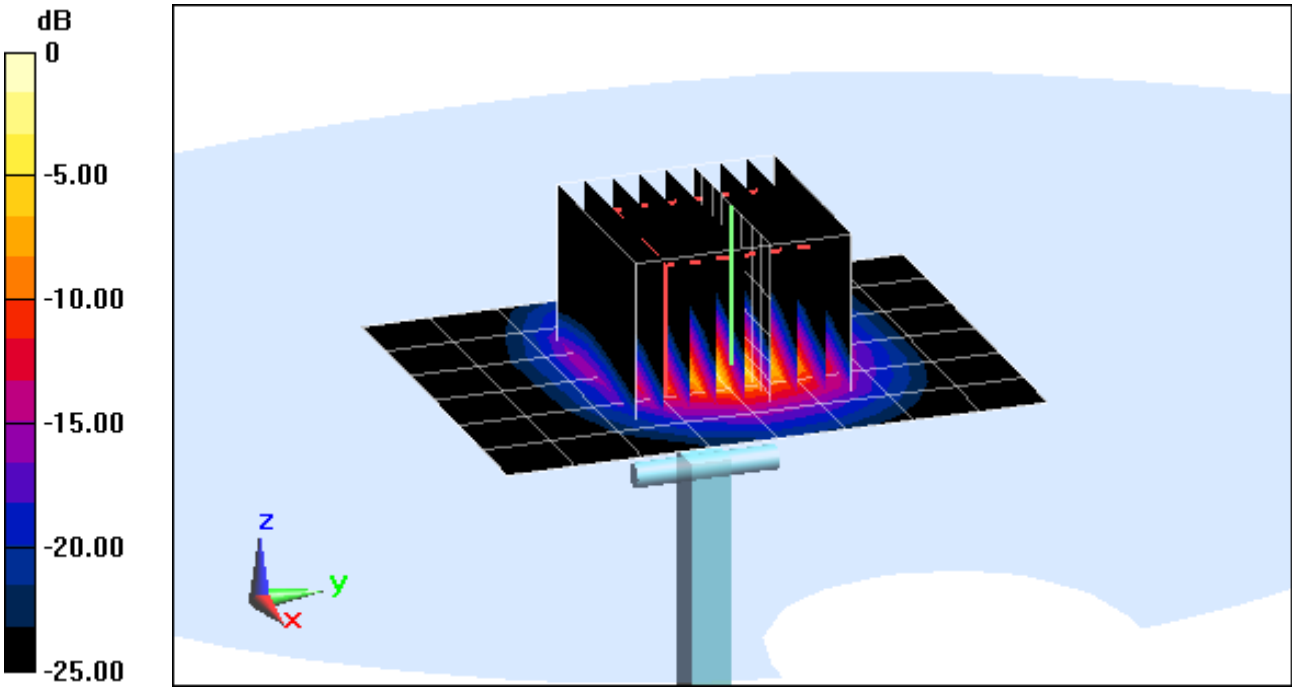
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5500 MHz; σ = 5.732 S/m; ε_r = 46.335; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 24.3°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3589; ConvF(3.52, 3.52, 3.52); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5500 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 39.7 W/kg
SAR(1 g) = 8.15 W/kg; SAR(10 g) = 2.22 W/kg
1g Deviation = 0.87%; 10g Deviation = -0.89%



0 dB = 20.4 W/kg = 13.10 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

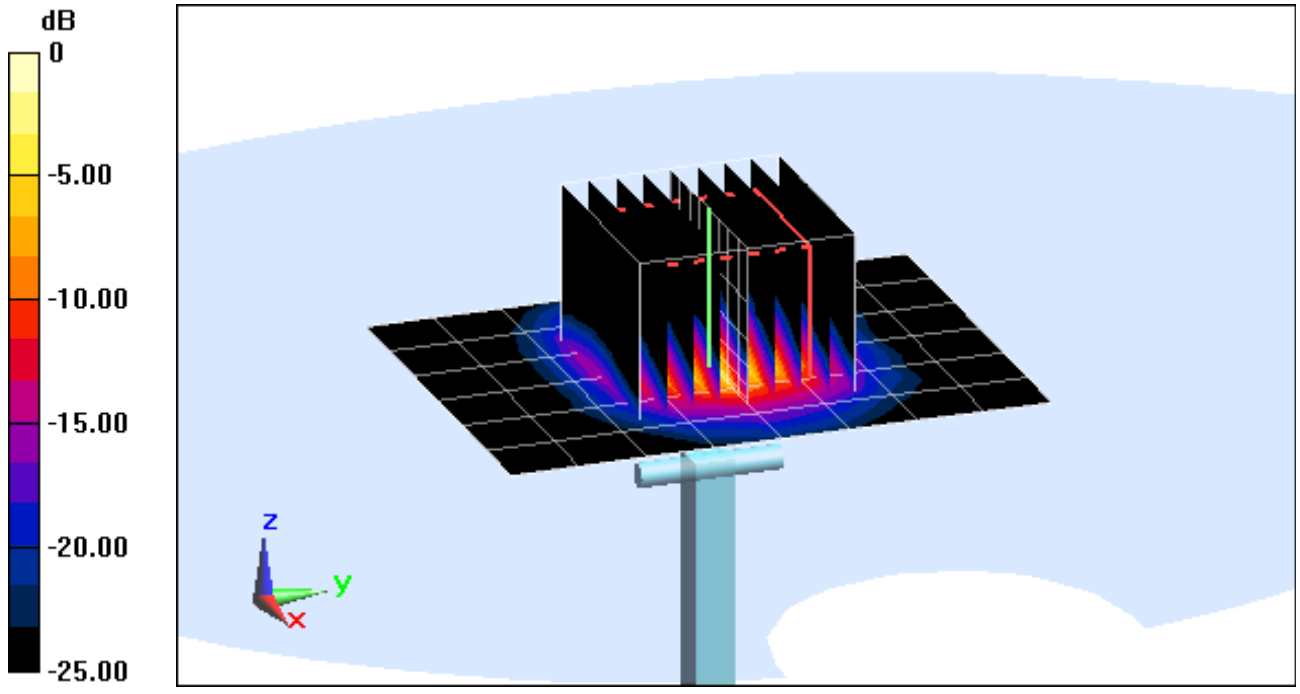
Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5600 MHz; σ = 5.914 S/m; ε_r = 46.136; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 24.2°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN3589; ConvF(3.32, 3.32, 3.32); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5600 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 40.9 W/kg
SAR(1 g) = 8.44 W/kg; SAR(10 g) = 2.30 W/kg
1g Deviation = 5.11%; 10g Deviation = 3.14%



0 dB = 21.4 W/kg = 13.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: 5 GHz Body, Medium parameters used:
f = 5800 MHz; σ = 6.224 S/m; ε_r = 45.956; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-01-2013; Ambient Temp: 24.2°C; Tissue Temp: 23.2°C

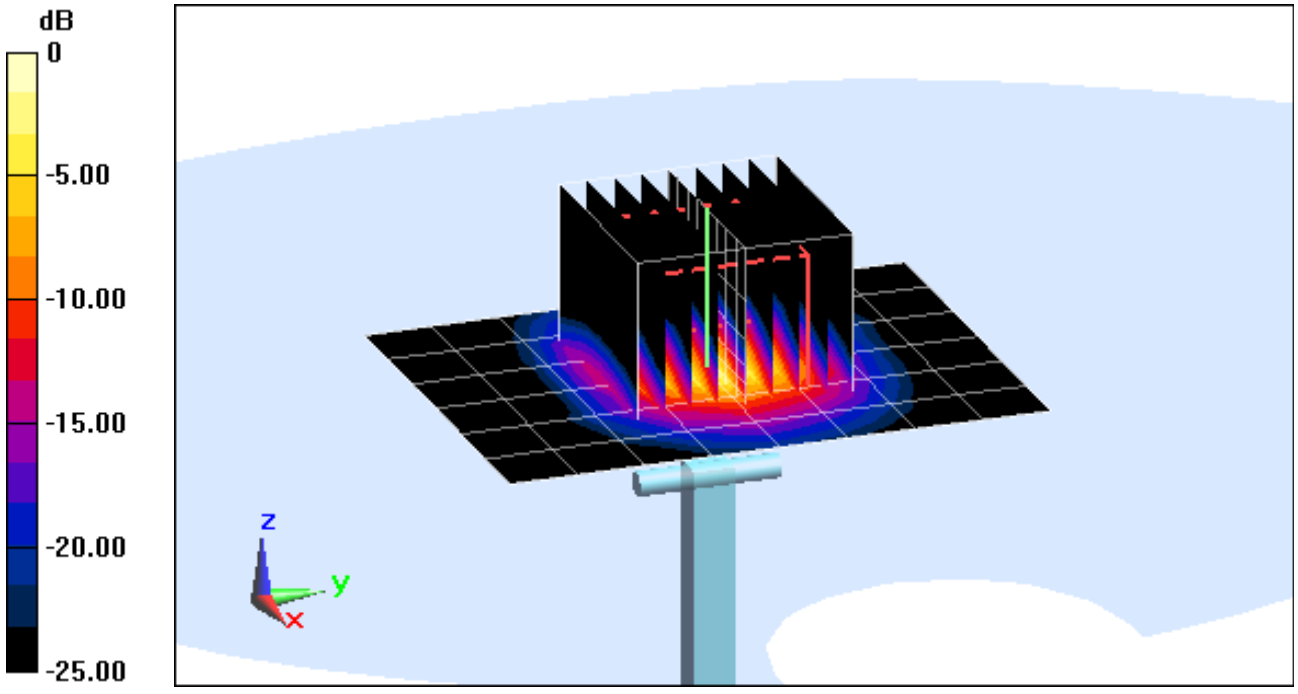
Probe: EX3DV4 - SN3589; ConvF(3.66, 3.66, 3.66); Calibrated: 1/17/2013;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 1/17/2013
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1357
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

5800 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Input Power = 20.0 dBm (100 mW)
Peak SAR (extrapolated) = 32.2 W/kg

SAR(1 g) = 7.20 W/kg

Deviation = -4.13%



0 dB = 17.8 W/kg = 12.50 dBW/kg

APPENDIX C: PROBE CALIBRATION

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **PC Test**

Certificate No: D835V2-4d132_Jan13

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 4d132

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: January 07, 2013

OK 1/28/13

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Nov-12 (No. 217-01640)	Oct-13
Power sensor HP 8481A	US37292783	01-Nov-12 (No. 217-01640)	Oct-13
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.3 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	28-Dec-12 (No. ES3-3205_Dec12)	Dec-13
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 8, 2013

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.0 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.45 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.66 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.29 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.7 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.38 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.36 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.20 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.2 Ω + 1.3 jΩ
Return Loss	- 27.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.8 Ω - 1.3 jΩ
Return Loss	- 34.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 22, 2011

DASY5 Validation Report for Head TSL

Date: 07.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

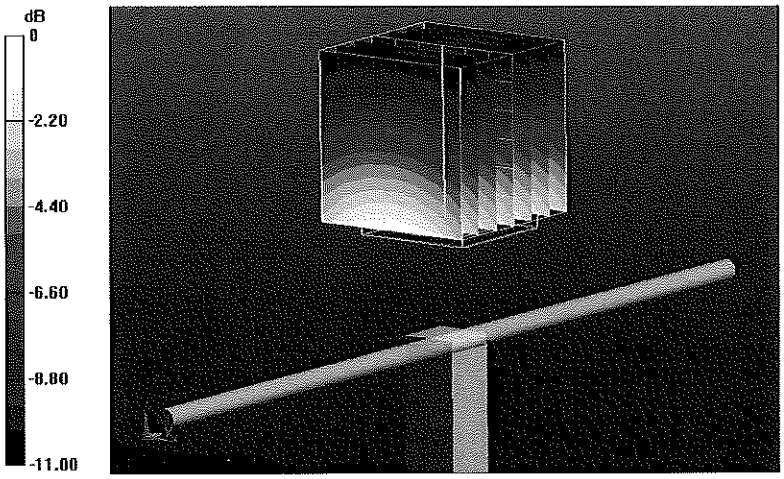
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.92 S/m; ε_r = 42; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.05, 6.05, 6.05); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

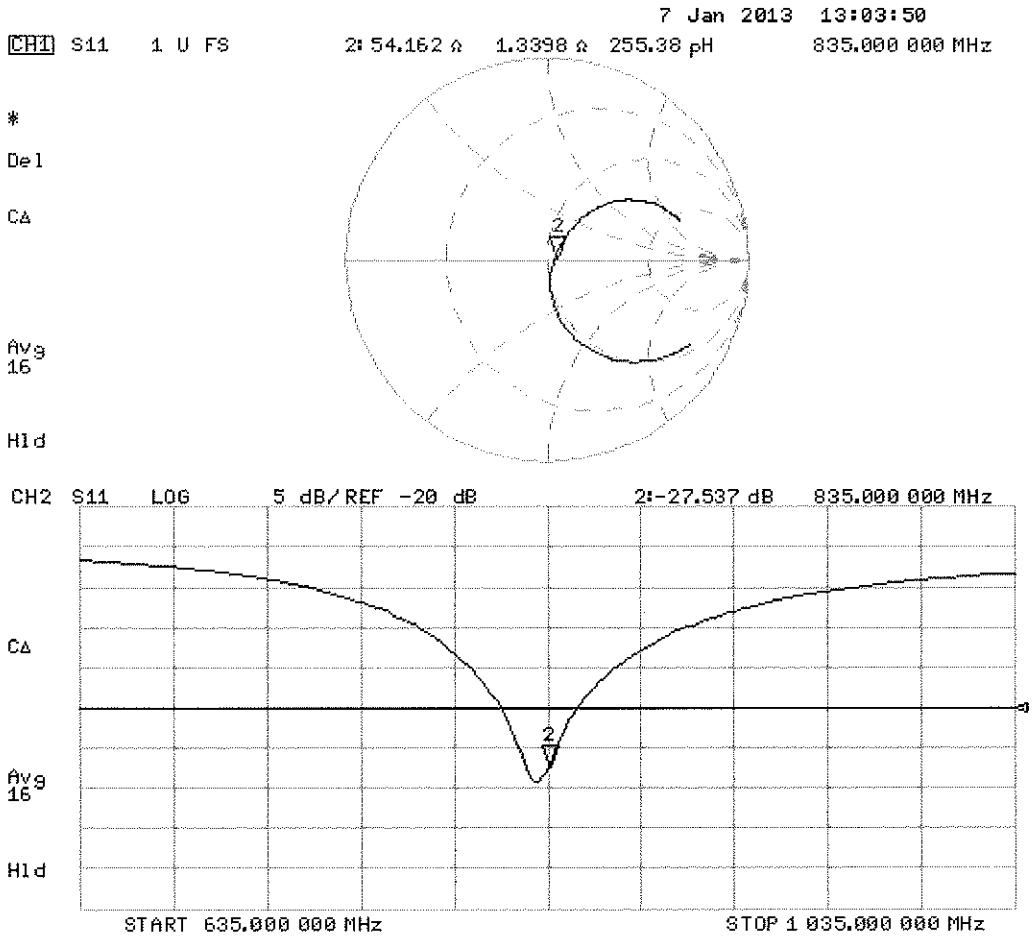
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.542 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 3.71 W/kg
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 2.88 W/kg



0 dB = 2.88 W/kg = 4.59 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 07.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

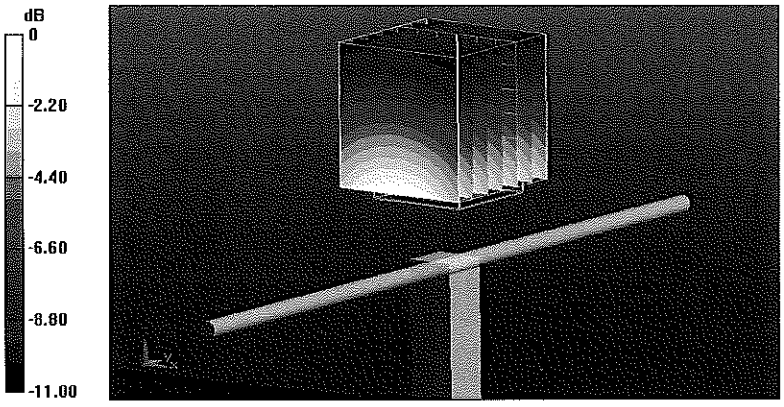
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.04, 6.04, 6.04); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

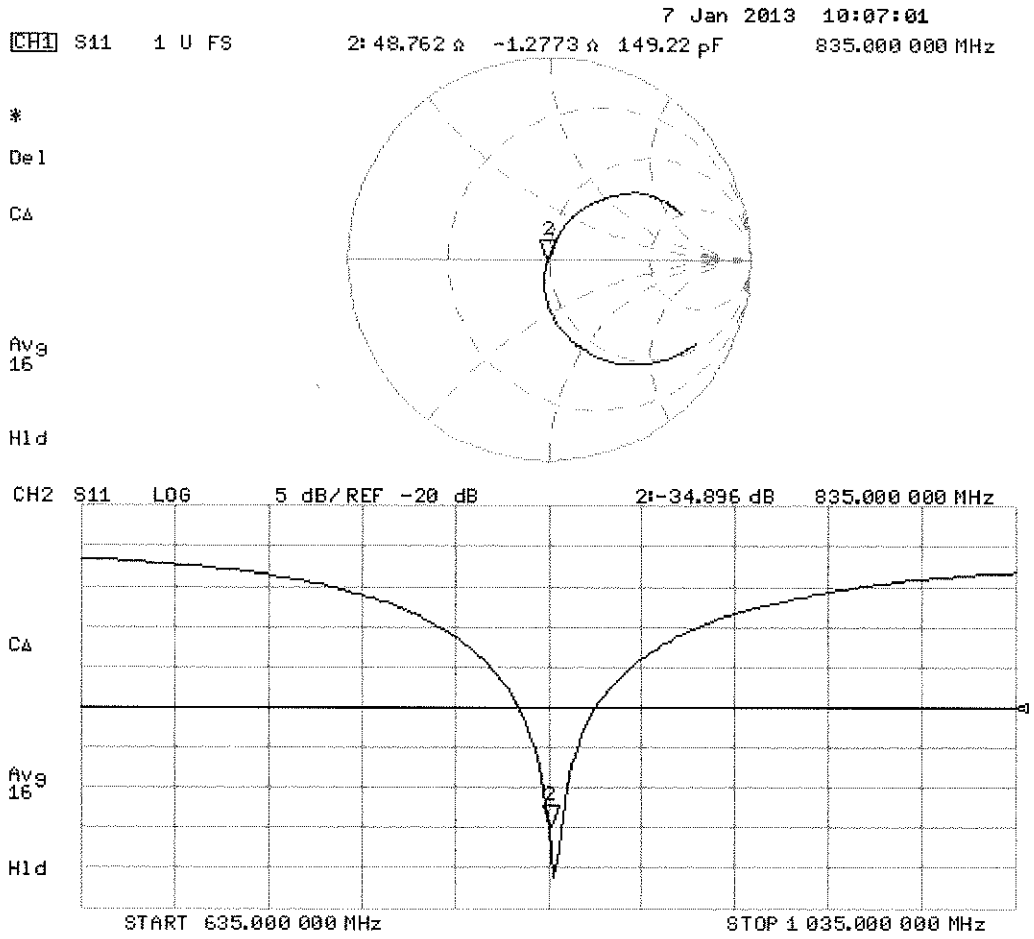
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.512 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 3.47 W/kg
SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 2.77 W/kg



0 dB = 2.77 W/kg = 4.42 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **PC Test**

Certificate No: D1900V2-5d080_Jul12

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d080
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 20, 2012

OK 8/13/12

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 20, 2012

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.9 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.78 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**39.4 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.17 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.8 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.6 ± 6 %	1.52 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**40.3 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.35 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.4 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.9 Ω + 5.7 jΩ
Return Loss	- 24.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.9 Ω + 6.0 jΩ
Return Loss	- 23.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.191 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	June 28, 2006

DASY5 Validation Report for Head TSL

Date: 20.07.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d080

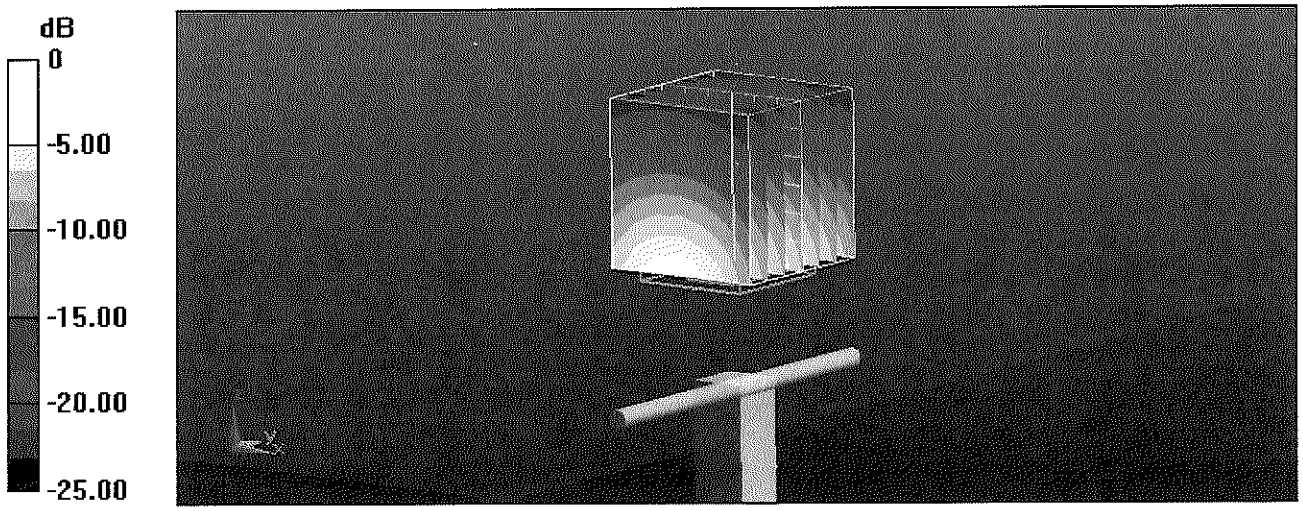
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

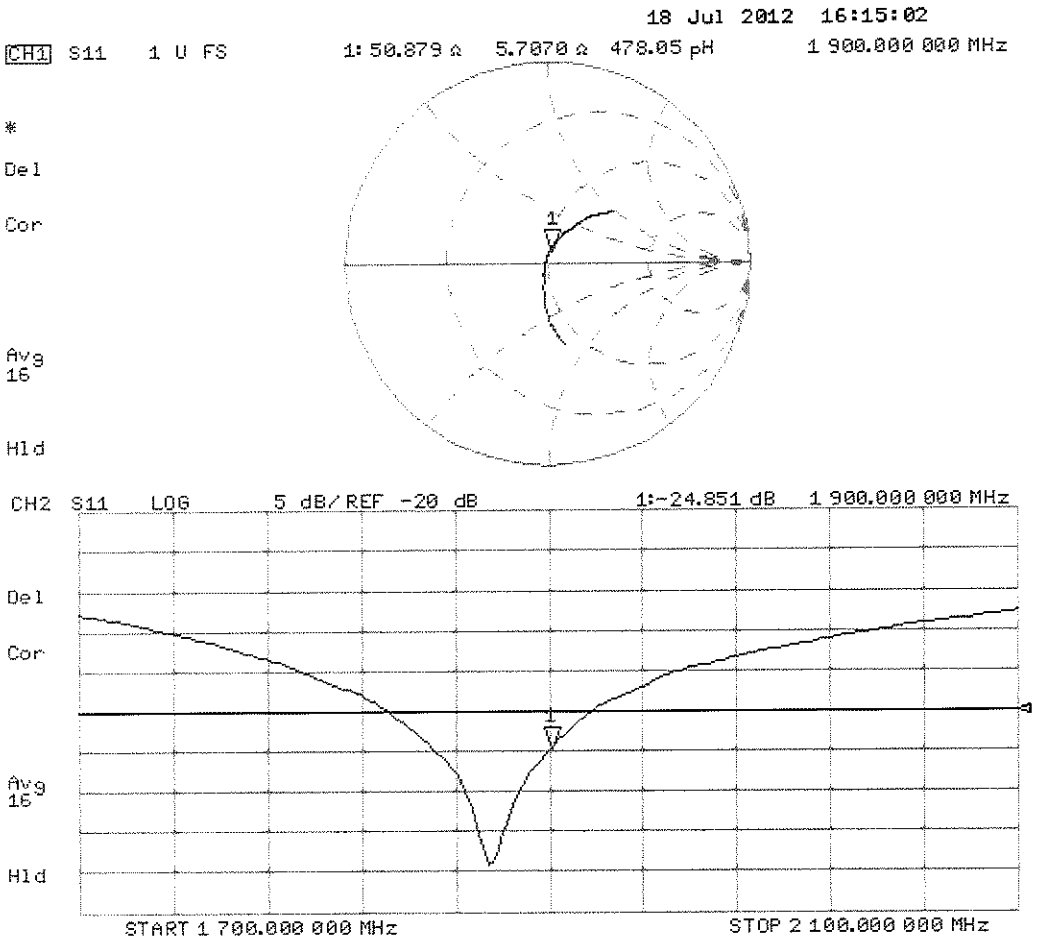
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.586 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 17.454 mW/g
SAR(1 g) = 9.78 mW/g; SAR(10 g) = 5.17 mW/g
Maximum value of SAR (measured) = 12.2 mW/g



0 dB = 12.2 mW/g = 21.73 dB mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 20.07.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d080

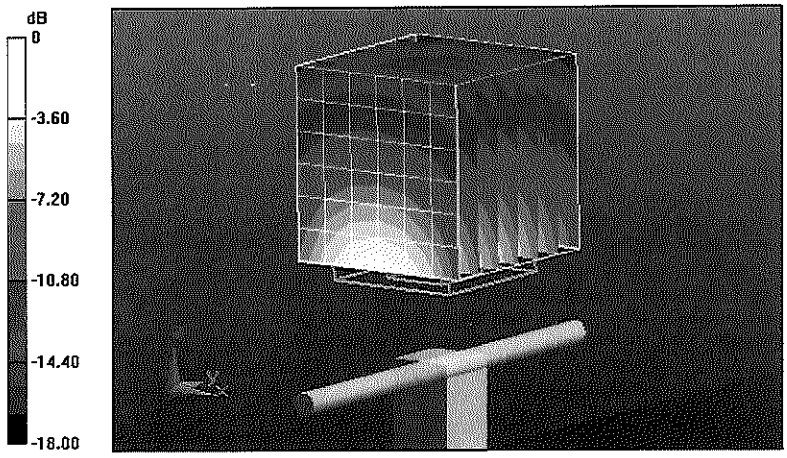
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

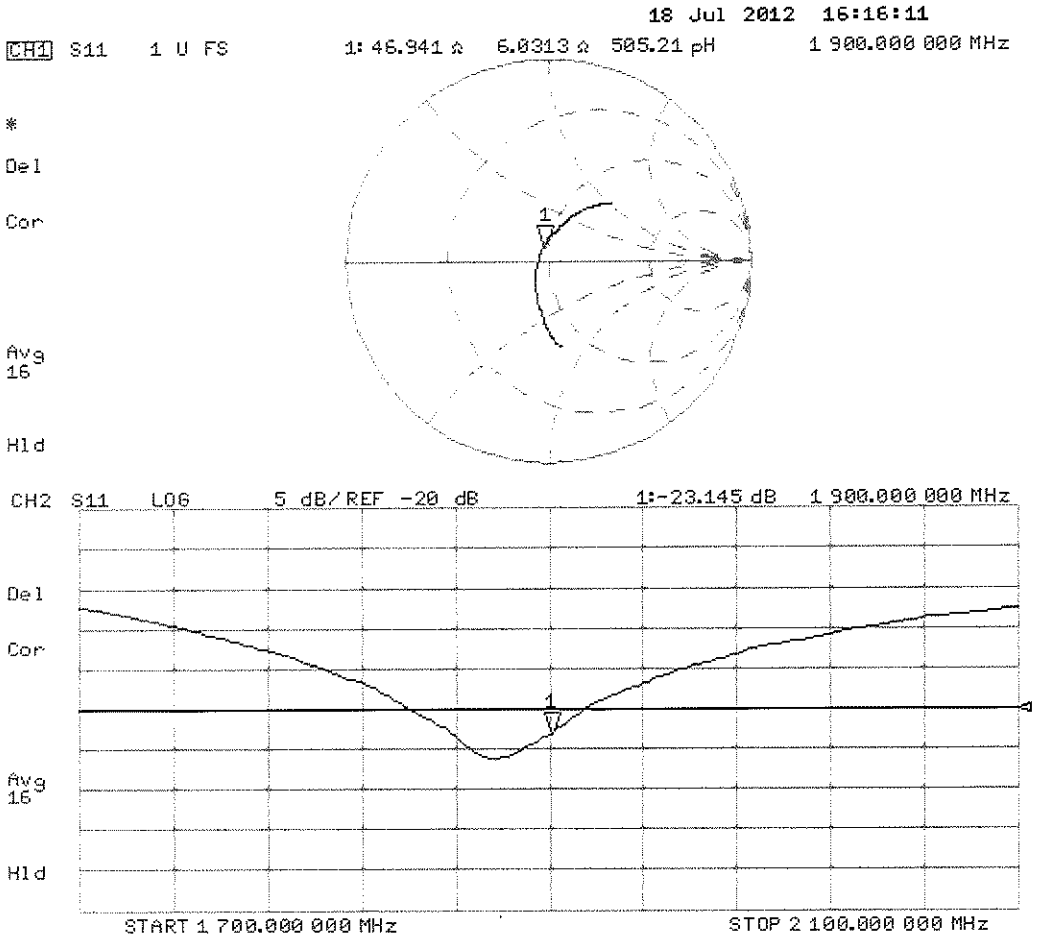
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.688 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 17.552 mW/g
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.35 mW/g
Maximum value of SAR (measured) = 12.8 mW/g



0 dB = 12.8 mW/g = 22.14 dB mW/g

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client PC Test

Certificate No: D1900V2-5d148_Feb13

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d148

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: February 06, 2013

KOK 2/21/13

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Nov-12 (No. 217-01640)	Oct-13
Power sensor HP 8481A	US37292783	01-Nov-12 (No. 217-01640)	Oct-13
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.3 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	28-Dec-12 (No. ES3-3205_Dec12)	Dec-13
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 6, 2013

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.5
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.4 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.87 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.8 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.9 ± 6 %	1.53 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.3 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**40.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω + 5.9 jΩ
Return Loss	- 24.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω + 6.3 jΩ
Return Loss	- 23.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 11, 2011

DASY5 Validation Report for Head TSL

Date: 06.02.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

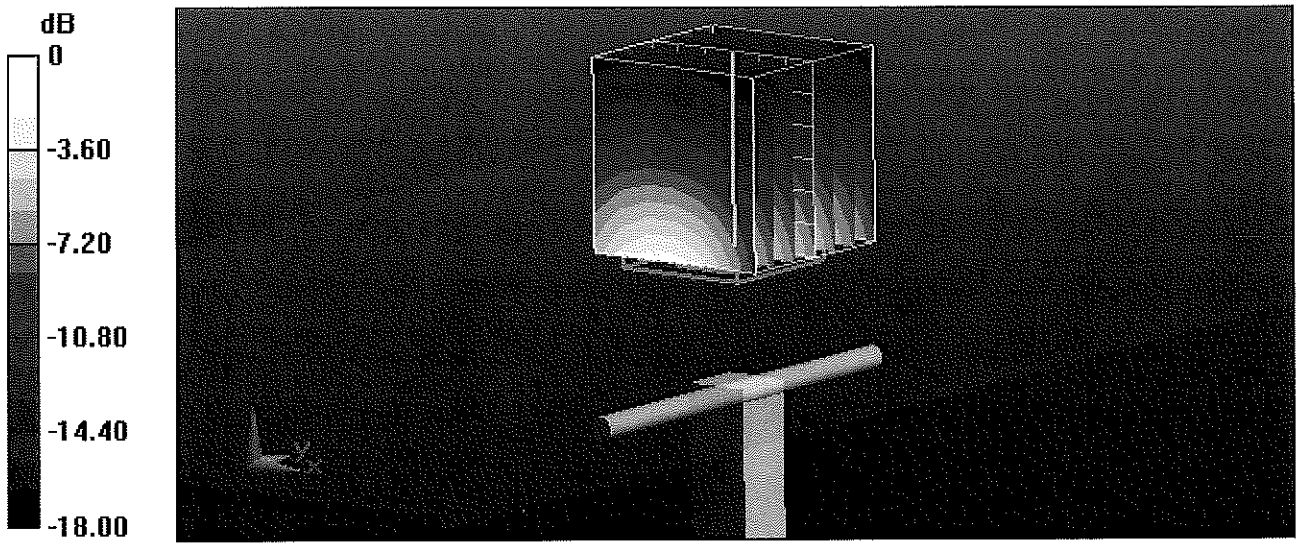
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 S/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.98, 4.98, 4.98); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.5(1059); SEMCAD X 14.6.8(7028)

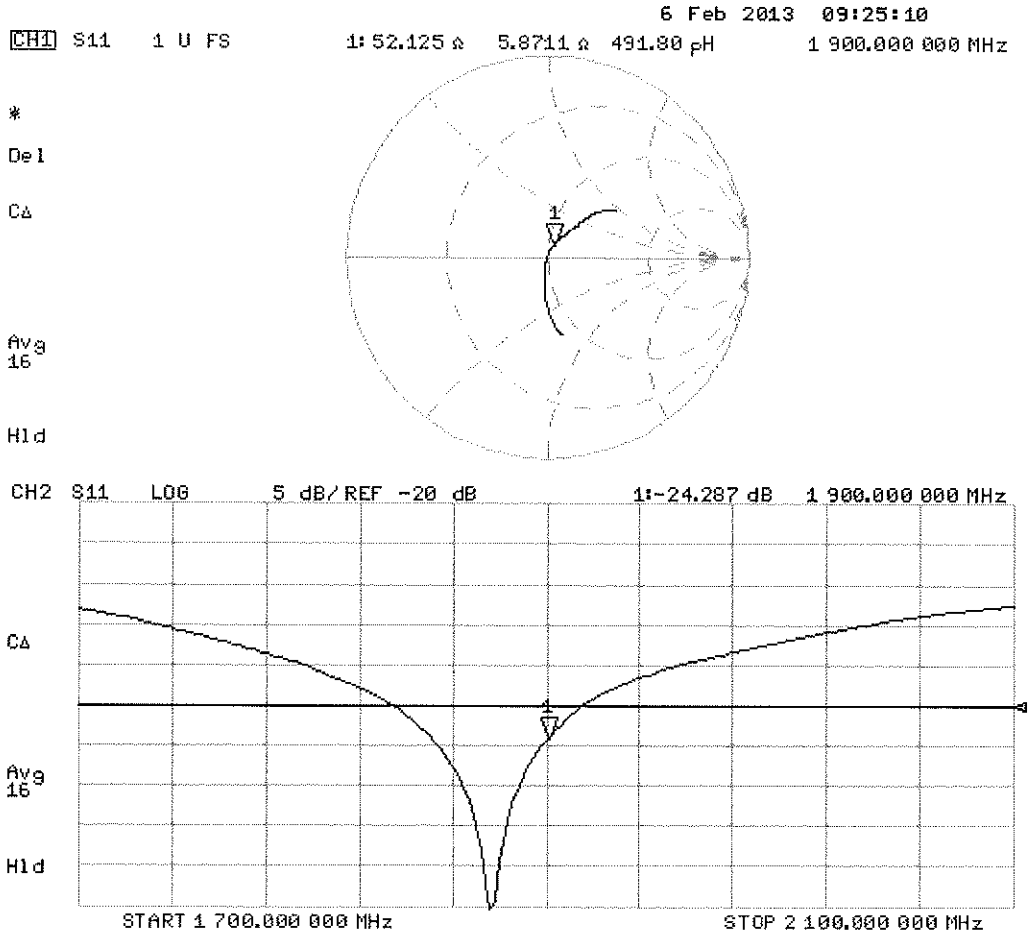
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.534 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.87 W/kg; SAR(10 g) = 5.18 W/kg
Maximum value of SAR (measured) = 12.1 W/kg



0 dB = 12.1 W/kg = 10.83 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 06.02.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

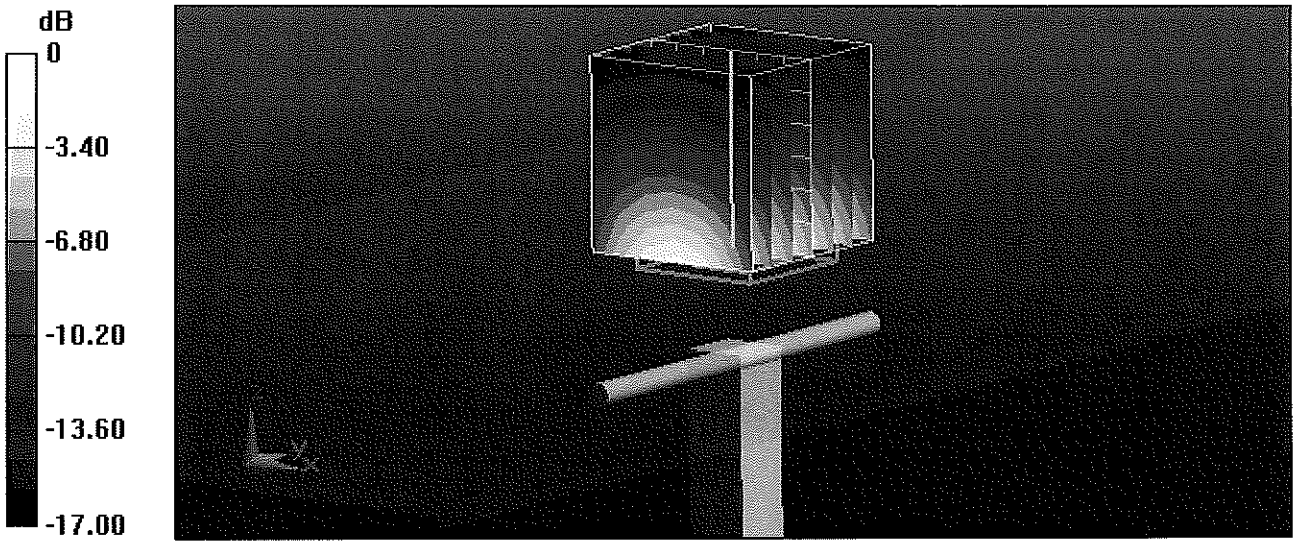
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.53 S/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.6, 4.6, 4.6); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.5(1059); SEMCAD X 14.6.8(7028)

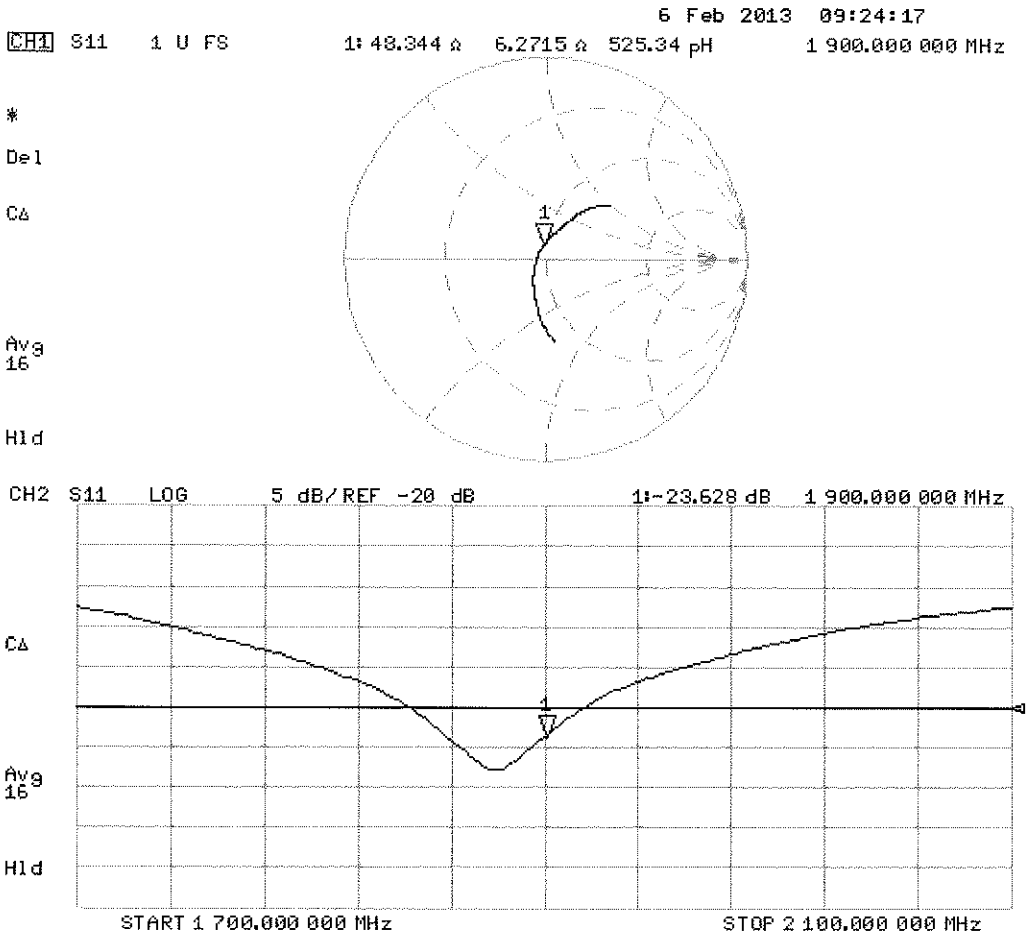
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.534 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.45 W/kg
Maximum value of SAR (measured) = 13.1 W/kg



0 dB = 13.1 W/kg = 11.17 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **PC Test**

Certificate No: D2450V2-719_Aug12

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 719
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	August 23, 2012

kot 9/17/12

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	Israe El-Naouq
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 23, 2012

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.2 ± 6 %	1.81 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**52.7 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.19 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.7 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.3 ± 6 %	1.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**51.6 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.16 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**24.4 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.4 Ω + 3.8 jΩ
Return Loss	- 25.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.7 Ω + 5.9 jΩ
Return Loss	- 24.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.150 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 10, 2002

DASY5 Validation Report for Head TSL

Date: 23.08.2012

Test Laboratory: SPEAG, Zurich, Switzerland

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

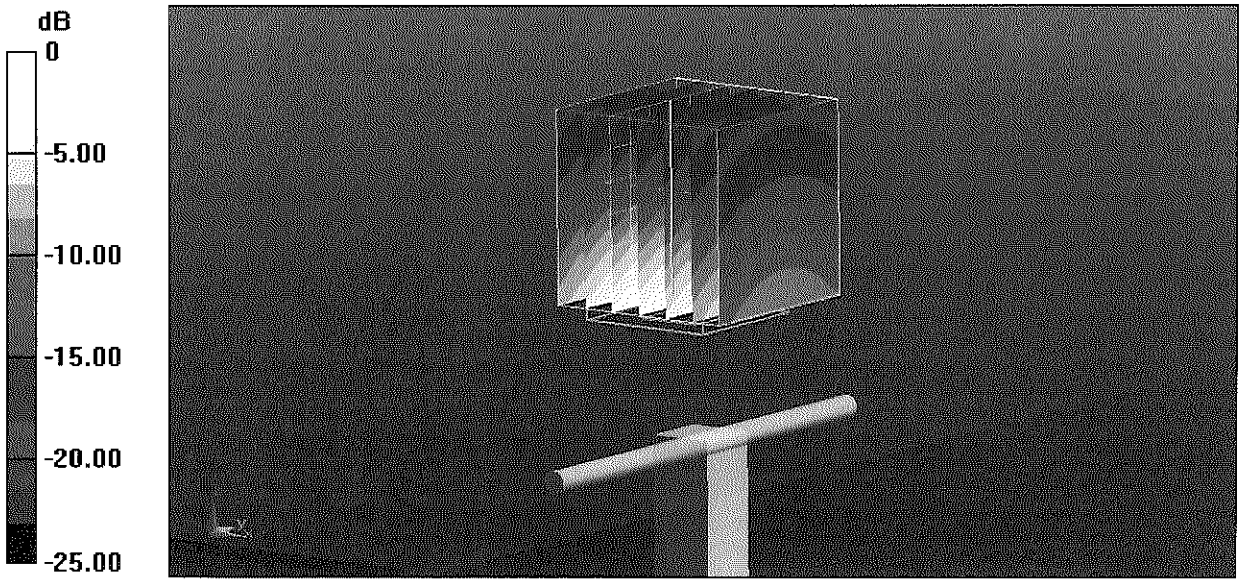
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.81 mho/m; ε_r = 39.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

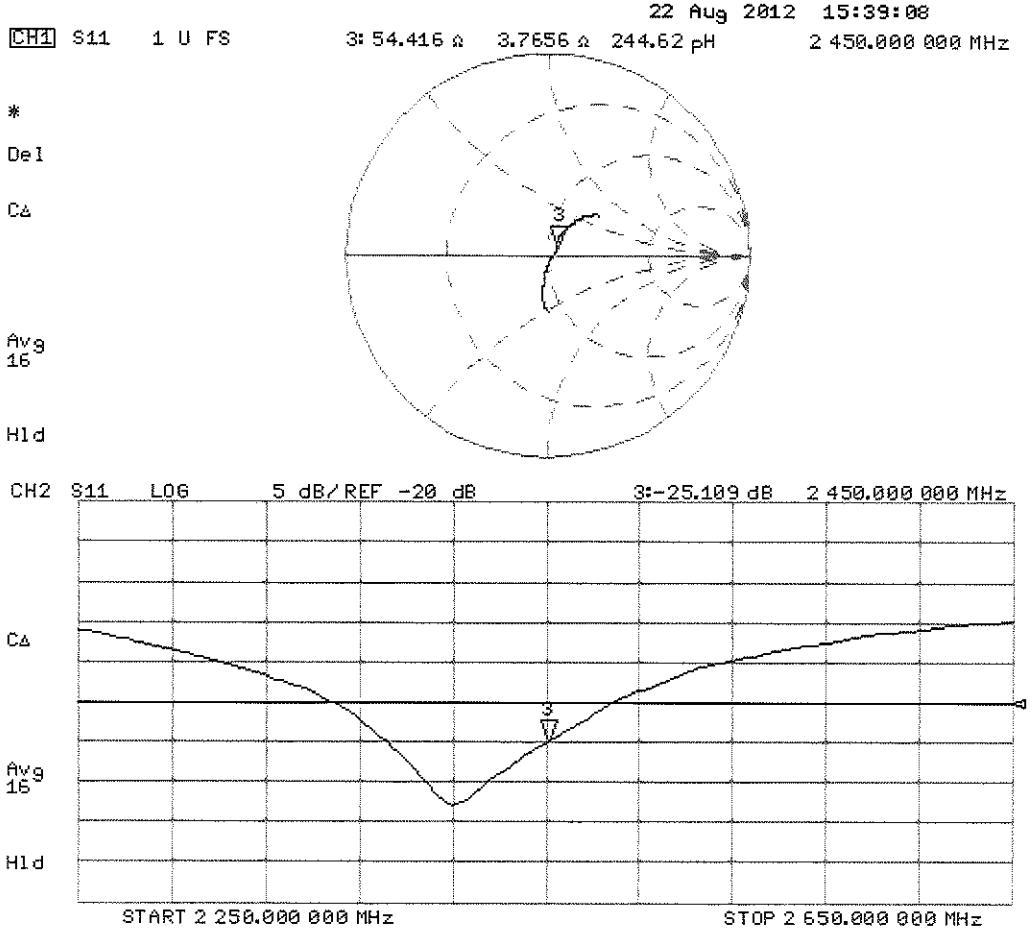
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.219 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 26.633 mW/g
SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.19 mW/g
Maximum value of SAR (measured) = 16.5 W/kg



0 dB = 16.5 W/kg = 24.35 dB W/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 22.08.2012

Test Laboratory: SPEAG, Zurich, Switzerland

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

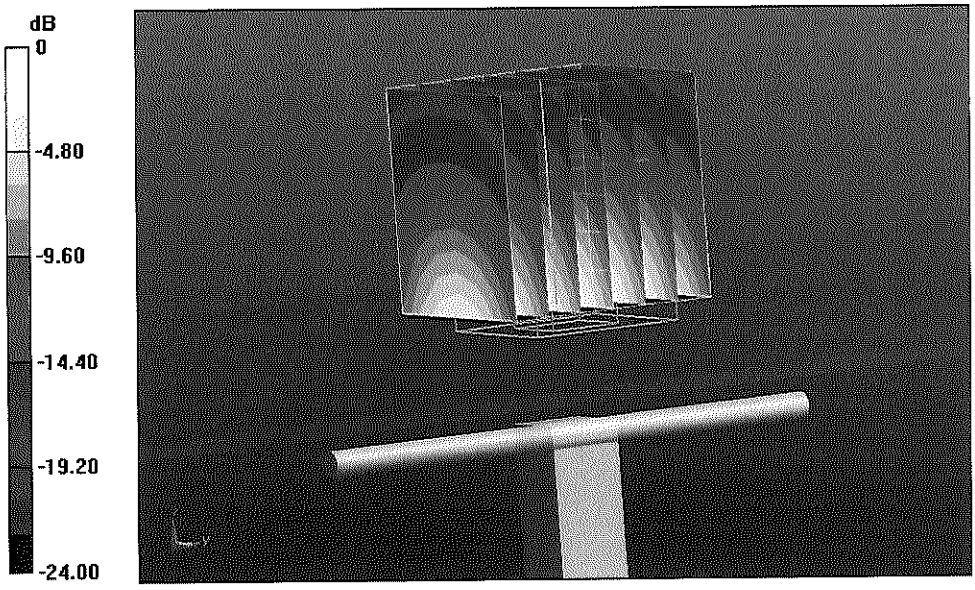
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.99 mho/m; ε_r = 51.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.970 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 26.692 mW/g
SAR(1 g) = 13.1 mW/g; SAR(10 g) = 6.16 mW/g
Maximum value of SAR (measured) = 17.1 W/kg



0 dB = 17.1 W/kg = 24.66 dB W/kg

Impedance Measurement Plot for Body TSL