Full

SAR TEST REPORT

No. ECIT-2013-0067-FCC-SAR

For

Client : ZTE Corporation

Production : WCDMA/GSM（GPRS）
Dual-Mode Digital Mobile Phone

Model Name : ZTE OPEN/ZTE Open/ZTE
open/open/OPEN/Open

Hardware Version: p8rA_P1/120301

Software Version: OPEN_FFOS_V1.0.0B02_MOVISTAR

Issued date: 2013-5-30

FCC ID: SRQ-ZTEOPEN

Test Laboratory:
ECIT Shanghai, East China Institute of Telecommunications
Add: 7F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China
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Revision Version

Report Number	Revision	Date	Memo
ECIT-2013-0067-FCC-SAR	00	2013/5/30	Initial creation of test report

CONTENTS

1 Test Laboratory

1.1 Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7F, G Area,No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	00862163843300
Fax:	00862163843301

1.2 Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	20-75%
Ambient noise & Reflection:	< 0.012 W/kg

1.3 Project Data

Project Leader:	Liu Jianquan
Testing Start Date:	May 8, 2013
Testing End Date:	May 21, 2013

1.4 Signature

Hu Jiajing

Hu Jiajing

(Testing engineer)

Yu Naiping

Yu Naiping

(Reviewed this test report)

Zheng Zhongbin

Zheng Zhongbin

Director of the laboratory

(Approved this test report)

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for ZTE OPEN/ZTE Open/ZTE open/open/OPEN/Open are as follows (with expanded uncertainty 22.4%)

Table 2.1: Max. Reported SAR (1g)

Band	Position	Reported SAR 1g (W/Kg)
GSM 850	Head	0.947
	Body	1.480
GSM 1900	Head	0.694
	Body	0.906
WCDMA 850	Head	0.515
	Body	1.154
WCDMA 1900	Head	0.701
	Body	1.038
Wi-Fi	Head	0.112
	Body	0.075

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1g tissue according to the ANSI C95.1-1992.

For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The measurement together with the test system set-up is described in chapter 7 of this test report. A detailed description of the equipment under test can be found in chapter 3 of this test report. The maximum reported SAR value is obtained at the case of **(Table 2.1),** and the values are**: 1.480 W/kg (1g).**

Table 2.2: Simultaneous Transmission with 2.4GHz WLAN(Head)

Simult Tx	Configuration	GSM 835MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.947	0.031	0.978
	Left Cheek	0.838	0.036	0.874

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.694	0.031	0.725
	Left Cheek	0.479	0.036	0.515

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.701	0.031	0.732
	Left Cheek	0.659	0.036	0.695

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.515	0.031	0.546
	Left Cheek	0.329	0.036	0.365

Table 2.3: Simultaneous Transmission with 2.4GHz WLAN(Body)

Simult Tx	Configuration	GSM 835MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.480	0.0245	1.504
	Toward Phantom	0.861	0.00321	0.864

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	0.906	0.0245	0.930
	Toward Phantom	0.522	0.00321	0.525

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.038	0.0245	1.0625
	Toward Phantom	0.584	0.00321	0.58721

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.154	0.0245	1.1785
	Toward Phantom	0.385	0.00321	0.38821

Table 2.4: Simultaneous Transmission with BT(Head)

Simult Tx	Configuration	GSM 835MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.947	0.019	0.966
	Left Cheek	0.838	0.019	0.857

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.694	0.019	0.713
	Left Cheek	0.479	0.019	0.498

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.701	0.019	0.720
	Left Cheek	0.659	0.019	0.678

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.515	0.019	0.534
	Left Cheek	0.329	0.019	0.348

Table 2.5: Simultaneous Transmission with BT(Body)

Simult Tx	Configuration	GSM 835MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.480	0.019	1.499
	Toward Phantom	0.861	0.019	0.880

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	0.906	0.019	0.925
	Toward Phantom	0.522	0.019	0.541

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.038	0.019	1.057
	Toward Phantom	0.584	0.019	0.603

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.154	0.019	1.173
	Toward Phantom	0.385	0.019	0.404

According to the above table, the maximum sum of reported SAR values for GSM and WiFi is **1.504 W/kg (1g)**. The above numerical SAR results for all worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured simultaneous SAR summation is required per FCC KDB Publication 447498 D01 v05. The detail for simultaneous transmission consideration is described in chapter 13.

3 Client Information

3.1 Applicant Information

Company Name:	ZTE Corporation
Address /Post:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
City:	Shenzhen
Country:	China

3.2 Manufacturer Information

Company Name:	ZTE Corporation
Address /Post:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
City:	Shenzhen
Country:	China

4 Equipment Under Test (EUT) and Ancillary Equipment (AE)

4.1 About EUT

Description:	WCDMA/GSM（GPRS）Dual-Mode Digital Mobile Phone
Model name:	ZTE OPEN/ZTE Open/ZTE open/open/OPEN/Open
Operation Model(s):	GSM850/1900,WCDMA1900/850,Wifi2450
Tx Frequency:	824.2-848.8, 1850.2-1909.8MHz （GSM） 1852.4-1907.6 MHz, 826.4-846.6MHz (WCDMA) 2412-2462 MHz (Wi-Fi) 2402 ~ 2480 MHz (BT)
Test device Production information:	Production unit
GPRS Class Mode:	B
GPRS Multislot Class:	12
Device type:	Portable device
UE category:	3
Antenna type:	Inner antenna
Accessories/Body-worn configurations:	Headset
Form factor:	11.6cm×6.2cm
Hotspot Mode:	Support simultaneous transmission of hotspot and voice (or data)
FCC ID:	SRQ-ZTEOPEN

4.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version:
EUT1	IMEI:004401782483834	p8rA_P1/120301	OPEN_FFOS_V1.0.0B02_MOVISTAR

*EUT ID: is used to identify the test sample in the lab internally.

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	Li3712T42P3h654246h	40041206061012658	ZTE Corporation
AE2	Headset	N/A	N/A	N/A

*AE ID: is used to identify the test sample in the lab internally.

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

ANSI C95.1–1992: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

5.2 Applicable Measurement Standards

IC RSS-102 ISSUE4: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

IEEE 1528–2003: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.

OET Bulletin 65 (Edition 97-01) and Supplement C(Edition 01-01): Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.

KDB648474 D04 SAR Handsets Multi Xmiter and Ant v01: SAR Evaluation Considerations for Wireless Handsets.

KDB248227 SAR meas for 802.11abg v01r02: SAR measurement procedures for 802.112abg transmitters.

KDB447498 D01 General RF Exposure Guidance v05: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

KDB865664 D01: SAR Measurement Requirements for 100 MHz to 6 GHz

KDB941225 D01 SAR test for 3G devides v02: Recommended SAR Test Reduction Procedures for GSM/GPRS/EDGE.

KDB941225 D03 SAR test Redution GSM GPRS EDGE v01: Recommended SAR Test Reduction Procedures for GSM/GPRS/EDGE.

KDB941225 D06 hotspot SAR v01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities.

6 Specific Absorption Rate (SAR)

6.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

6.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ) . The equation description is as below:

$$SAR = \frac{d}{dt}(\frac{dW}{dm}) = \frac{d}{dt}(\frac{dW}{\rho dv})$$

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = c(\frac{\delta T}{\delta t})$$

Where: C is the specific head capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of tissue and E is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

7 Tissue Simulating Liquids

7.1 Targets for tissue simulating liquid

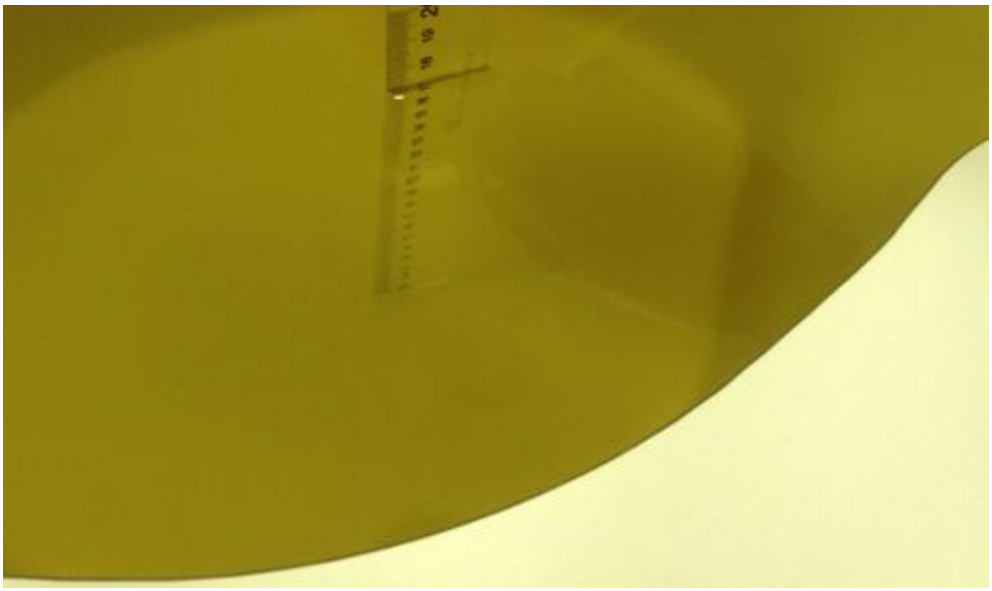
Table 7.1: Targets for tissue simulating liquid

Frequency (MHz)	Liquid Type	Conductivity (σ)	± 5% Range	Permittivity (ε)	± 5% Range
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
835	Body	0.97	0.92～1.02	55.2	52.4～58.0
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
1900	Body	1.52	1.44～1.60	53.3	50.6～56.0
2450	Head	1.80	1.71～1.89	39.2	37.2～41.2
2450	Body	1.95	1.85～2.05	52.7	50.1～55.3

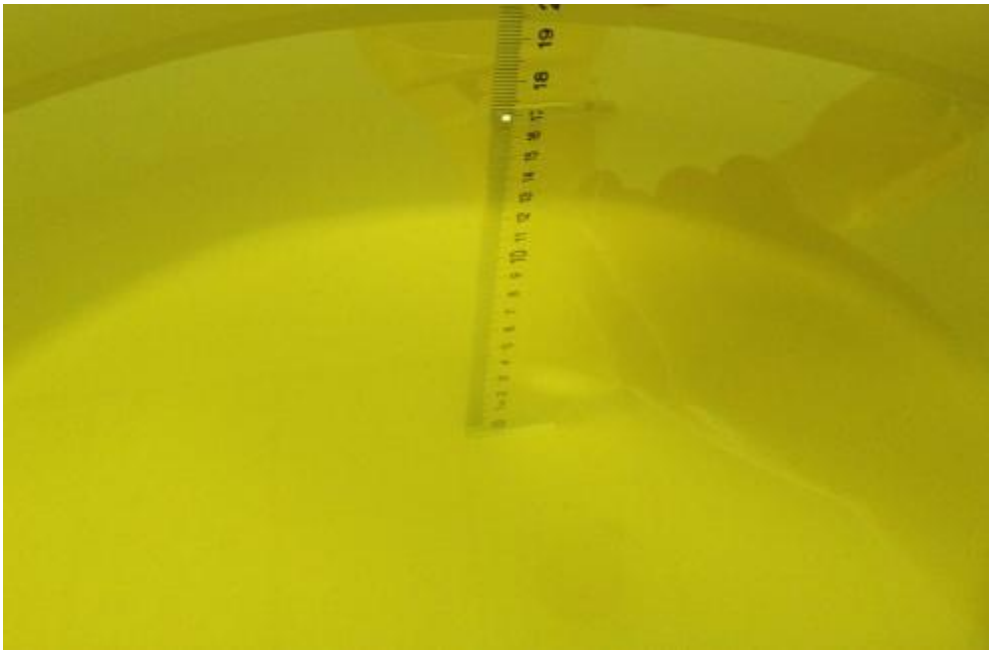
7.2 Dielectric Performance

Table 7.2: Dielectric Performance of Tissue Simulating Liquid

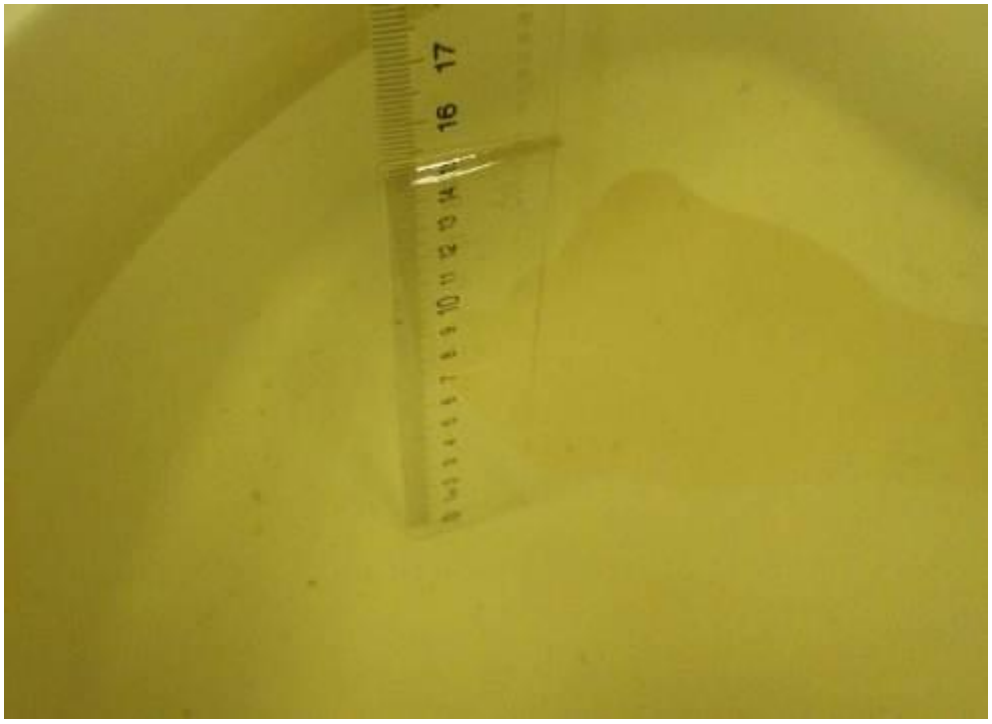
Measurement Date : 835 MHz Head **May 8, 2013** 1900 MHz Head **May 9, 2013** 2450 MHz Head **May 21, 2013** 2450 MHz Body **May 21, 2013** 835 MHz Body **May 16, 2013** 1900 MHz Body **May 13, 2013**						
/	**Type**	**Frequency**	**Permittivity ε**	**Drift (%)**	**Conductivity σ (S/m)**	**Drift (%)**
Measurement value	Head	835 MHz	41.04	-1.10%	0.917	1.88%
	Body	835 MHz	55.15	0.09%	0.9989	2.97%
	Head	1900 MHz	39.64	-0.90%	1.385	-1.07%
	Body	1900 MHz	53.24	0.11%	1.524	0.26%
	Head	2450 MHz	38.87	0.84%	1.824	1.33%
	Body	2450 MHz	53.95	2.37%	1.918	1.64%



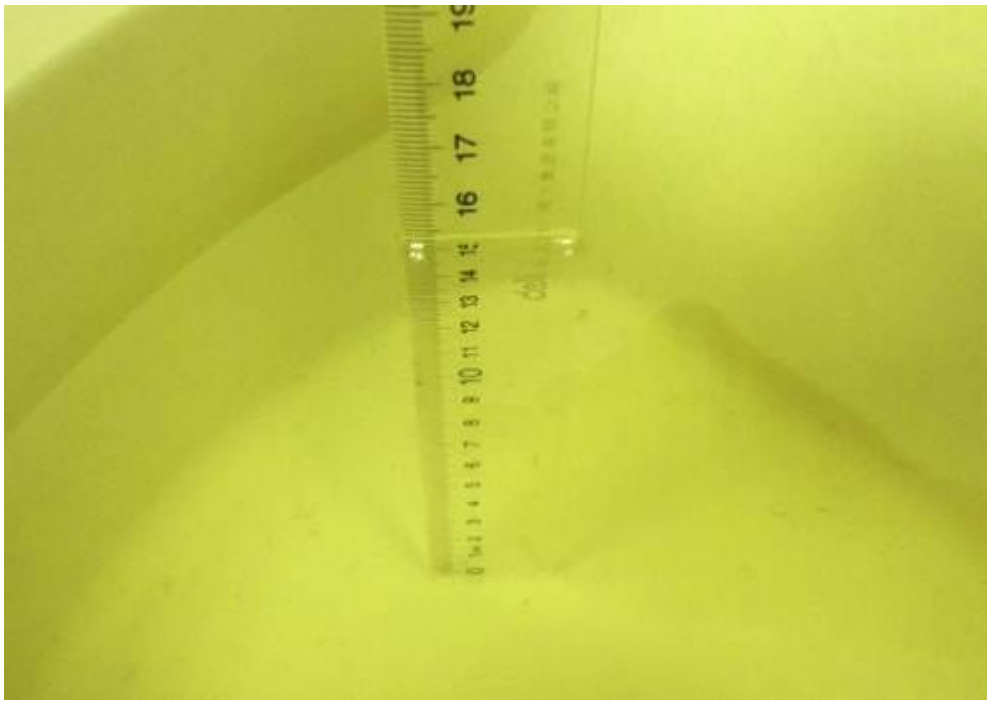
Picture 7-1: Liquid depth in the Flat Phantom (835 MHz Head)



Picture 7-2: Liquid depth in the Flat Phantom (1900 MHz Head)

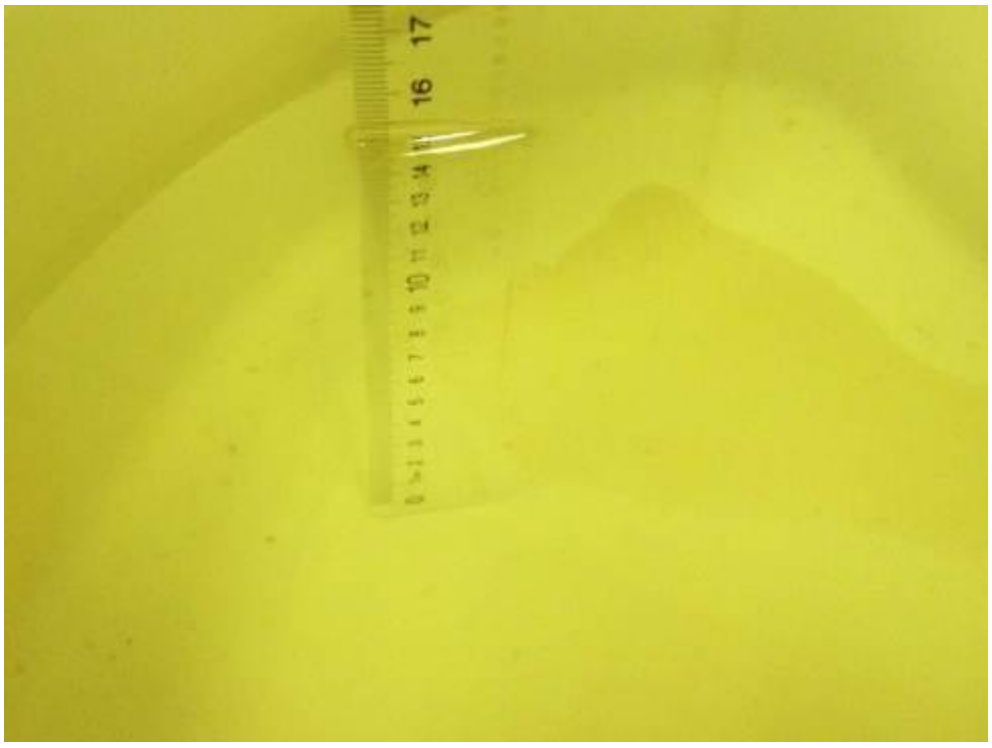


Picture 7-3: Liquid depth in the Flat Phantom (835 MHz Body)



Picture 7-4: Liquid depth in the Flat Phantom (1900 MHz Body)

Picture 7-5: Liquid depth in the Flat Phantom (2450 MHz Head)

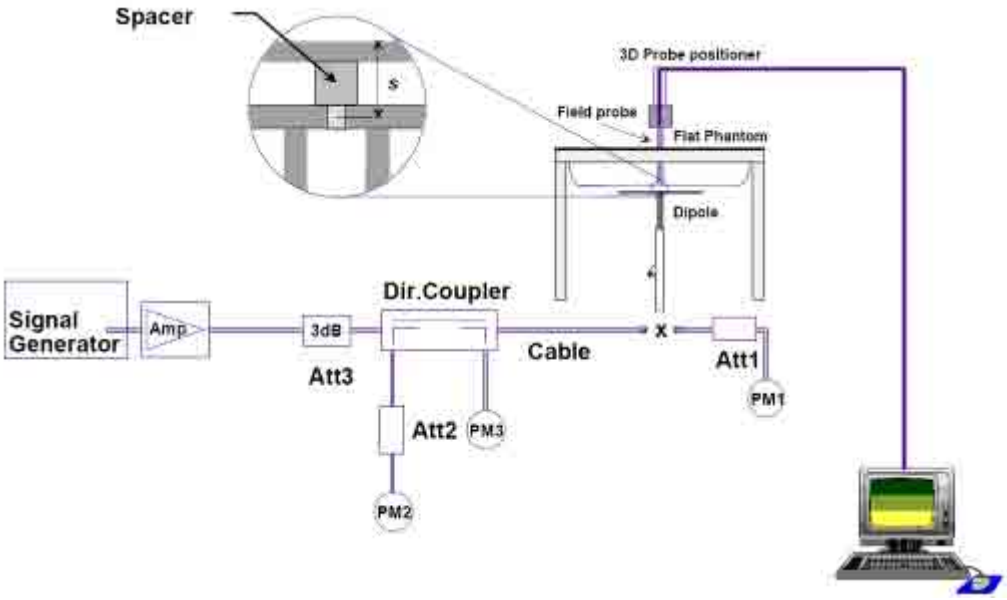


Picture 7-6: Liquid depth in the Flat Phantom (2450 MHz Body)

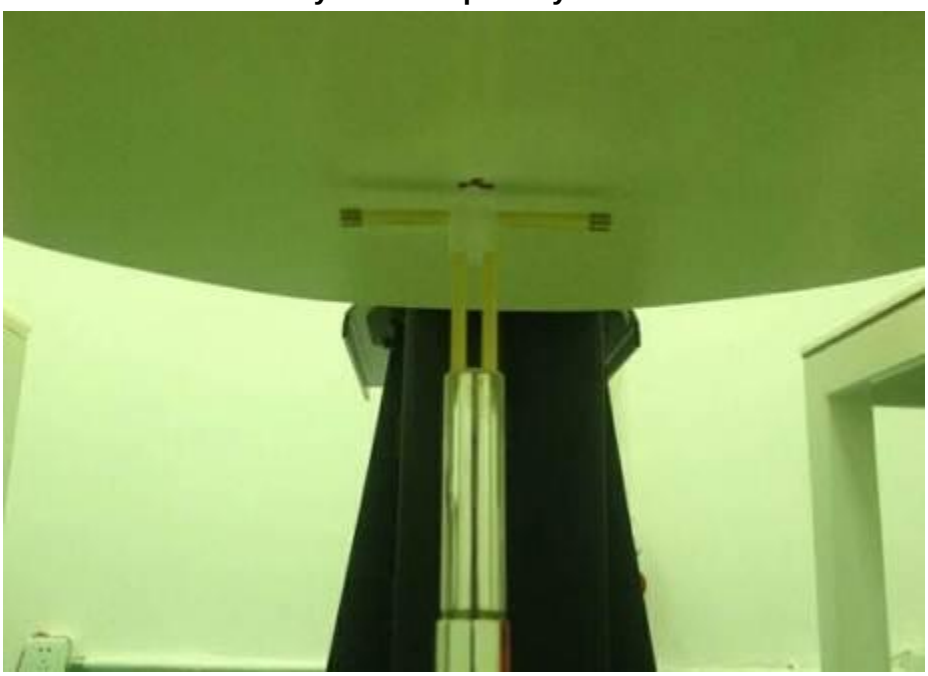
8 System verification

8.1 System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



Picture 8.1 System Setup for System Evaluation



Picture 8.2 Photo of Dipole Setup

8.2 System Verification

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device.

Table 8.1: System Verification of Head

Measurement Date : 835 MHz Head **May 8, 2013** 1900 MHz Head **May 9, 2013** 2450 MHz Head **May 21, 2013**							
Input power level: 250mW							
Verification results	**Frequency**	**Target value (W/kg)**		**Measured value (W/kg)**		**Deviation**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
	835 MHz	6.10	9.35	6.20	9.40	1.63%	0.53%
	1900 MHz	20.6	39.2	19.48	38.08	-5.43%	-2.85%
	2450 MHz	25.0	53.6	23.72	51.04	-5.12%	-4.77%

Table 8.2: System Verification of Body

Measurement Date : 2450 MHz Body **May 21, 2013** 835 MHz Body **May 16, 2013** 1900 MHz Body **May 13, 2013**							
Input power level: 250mW							
Verification results	**Frequency**	**Target value (W/kg)**		**Measured value (W/kg)**		**Deviation**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
	835 MHz	6.29	9.50	6.60	10.12	4.93%	6.53%
	1900 MHz	21.2	40.3	21.88	41.6	3.20%	3.22%
	2450 MHz	24.1	51.4	24.64	53.2	2.24%	3.50%

9 Measurement Procedures

9.1 Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in Picture 11.1.

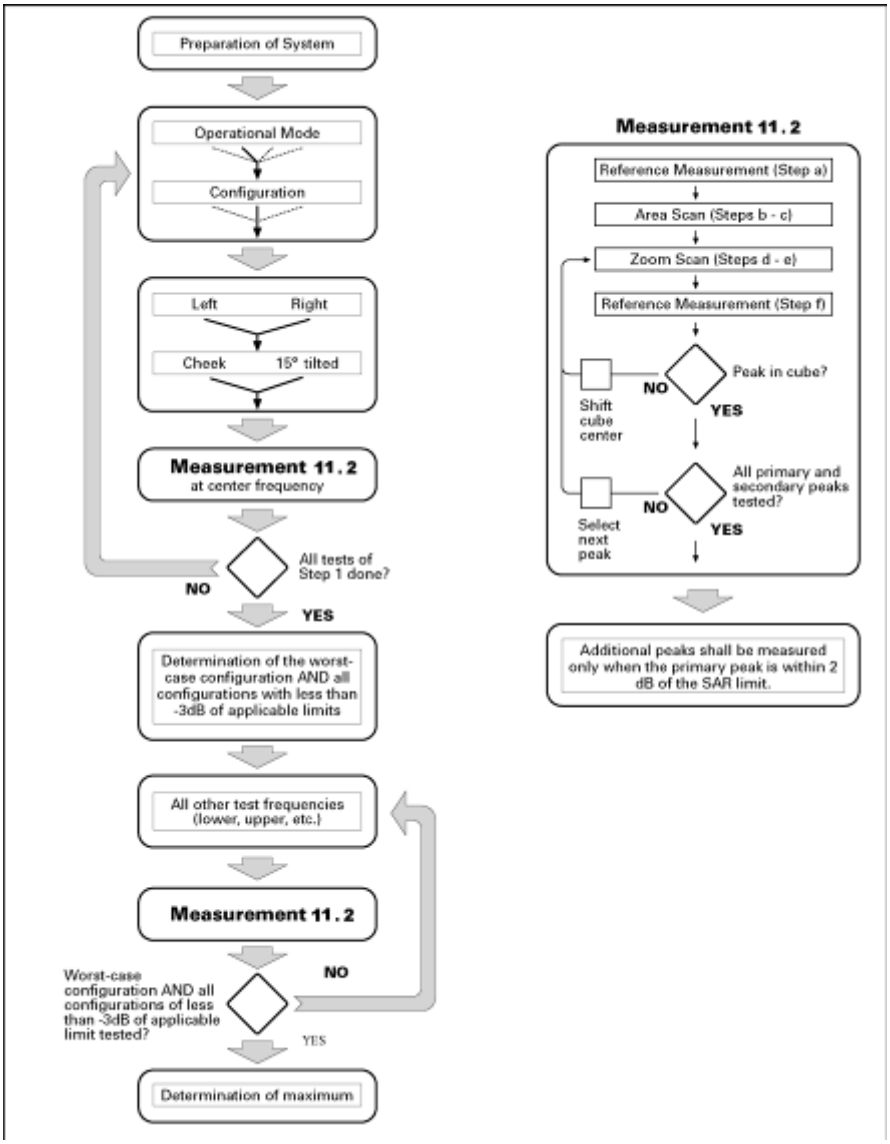
Step 1: The tests described in 11.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in Chapter 8),
b) all configurations for each device position in a), e.g., antenna extended and retracted, and
c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

If more than three frequencies need to be tested according to 11.1 (i.e., N_c > 3), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 11.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

Step 3: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.



Picture 9.1 Block diagram of the tests to be performed

9.2 General Measurement Procedure

The following procedure shall be performed for each of the test conditions (see Picture 11.1) described in 11.1:

a) Measure the local SAR at a test point within 8 mm or less in the normal direction from the inner surface of the phantom.

b) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grip spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for

frequencies below 3 GHz andδ ln(2)/2 mm for frequencies of 3 GHz and greater, whereδ is the plane wave skin depth and ln(x) is the natural logarithm. The maximum variation of the sensor-phantom surface shall be ±1 mm for frequencies below 3 GHz and ±0.5 mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5°. If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional uncertainty evaluation is needed.

c) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR limit. This is consistent with the 2 dB threshold already stated;

d) Measure the three-dimensional SAR distribution at the local maxima locations identified in step c). The horizontal grid step shall be (24/f[GHz]) mm or less but not more than 8 mm. The minimum zoom size of 30 mm by 30 mm and 30 mm for frequencies below 3 GHz. For higher frequencies, the minimum zoom size of 22 mm by 22 mm and 22 mm. The grip step in the vertical direction shall be (8-f[GHz]) mm or less but not more than 5 mm, if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell shall be (12 / f[GHz]) mm or less but not more than 4 mm, and the spacing between father points shall increase by an incremental factor not exceeding 1.5. When variable spacing is used, extrapolation routines shall be tested with the same spacing as used in measurements. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδ ln(2)/2 mm for frequencies of 3 GHz and greater, where δ is the plane wave skin depth and ln(x) is the natural logarithm. Separate grids shall be centered on each of the local SAR maxima found in step c). Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved is the distance between the phantom surface and physical tip of the probe is larger than probe tip diameter. Other methods may utilize correction procedures for these boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe with respect to the flat phantom surface shall be less than 5°. If this cannot be achieved an additional uncertainty evaluation is needed.

e) Use post processing(e.g. interpolation and extrapolation) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.

9.3 WCDMA Measurement Procedures for SAR

The following procedures are applicable to WCDMA handsets operating under 3GPP Release99, Release 5 and Release 6. The default test configuration is to measure SAR with an established radio link between the DUT and a communication test set using a 12.2kbps RMC (reference measurement channel) configured in Test Loop Mode 1. SAR is selectively confirmed for other physical channel configurations (DPCCH & $DPDCH_n$), HSDPA and HSPA (HSUPA/HSDPA) modes according to output power, exposure conditions and device operating capabilities. Both uplink and downlink should be configured with the same RMC or AMR, when required. SAR for

Release 5 HSDPA and Release 6 HSPA are measured using the applicable FRC (fixed reference channel) and E-DCH reference channel configurations. Maximum output power is verified according to applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. When Maximum Power Reduction (MPR) is not implemented according to Cubic Metric (CM) requirements for Release 6 HSPA, the following procedures do not apply.

For Release 5 HSDPA Data Devices:

Sub-test	β_c	β_d	β_d （SF）	β_c / β_d	β_{hs}	CM/dB
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15	15/15	64	12/15	24/25	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

For Release 6 HSDPA Data Devices

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

9.4 Bluetooth & Wi-Fi Measurement Procedures for SAR

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. 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 that the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a 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.

9.5 Power Drift

To control the output power stability during the SAR test, DASY4 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 14.2 to Table 14.11 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

11 Conducted Output Power

11.1 Manufacturing tolerance

Table 11.1: GSM Speech

GSM 835			
Channel	Channel 251	Channel 190	Channel 128
Target (dBm)	29.5	29.5	29.5
Tolerance ±(dB)	1.0	1.0	1.0
GSM 1900			
Channel	Channel 810	Channel 661	Channel 512
Target (dBm)	25.5	25.5	25.5
Tolerance ±(dB)	1.0	1.0	1.0

Table 11.2: GPRS (GMSK Modulation)

GSM 850 GPRS				
Channel		**251**	**190**	**128**
1 Txslots	Target (dBm)	29.5	29.5	29.5
	Tolerance ±(dB)	1.0	1.0	1.0
2 Txslots	Target (dBm)	27.5	27.5	27.5
	Tolerance ±(dB)	1.0	1.0	1.0
3 Txslots	Target (dBm)	26.0	26.0	26.0
	Tolerance ±(dB)	1.0	1.0	1.0
4 Txslots	Target (dBm)	25.0	25.0	25.0
	Tolerance ±(dB)	1.0	1.0	1.0
GSM 1900 GPRS				
Channel		**810**	**661**	**512**
1 Txslots	Target (dBm)	26.0	26.0	26.0
	Tolerance ±(dB)	1.0	1.0	1.0
2 Txslots	Target (dBm)	25.0	25.0	25.0
	Tolerance ±(dB)	1.0	1.0	1.0
3 Txslots	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
4 Txslots	Target (dBm)	22.0	22.0	22.0
	Tolerance ±(dB)	1.0	1.0	1.0

Table 11.3: E-GPRS (GMSK Modulation)

GSM 850 E-GPRS				
Channel		**251**	**190**	**128**
1 Txslots	Target (dBm)	29.5	29.5	29.5
	Tolerance ±(dB)	1.0	1.0	1.0
2 Txslots	Target (dBm)	27.5	27.5	27.5
	Tolerance ±(dB)	1.0	1.0	1.0
3 Txslots	Target (dBm)	26.0	26.0	26.0
	Tolerance ±(dB)	1.0	1.0	1.0
4 Txslots	Target (dBm)	25.0	25.0	25.0
	Tolerance ±(dB)	1.0	1.0	1.0
GSM 1900 E-GPRS				
Channel		**810**	**661**	**512**
1 Txslots	Target (dBm)	26.0	26.0	26.0
	Tolerance ±(dB)	1.0	1.0	1.0
2 Txslots	Target (dBm)	25.0	25.0	25.0
	Tolerance ±(dB)	1.0	1.0	1.0
3 Txslots	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
4 Txslots	Target (dBm)	22.0	22.0	22.0
	Tolerance ±(dB)	1.0	1.0	1.0

Table 11.4: E-GPRS (8PSK Modulation)

GSM 850 E-GPRS				
Channel		**251**	**190**	**128**
1 Txslots	Target (dBm)	24.0	24.0	24.0
	Tolerance ±(dB)	1.0	1.0	1.0
2 Txslots	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
3 Txslots	Target (dBm)	21.0	21.0	21.0
	Tolerance ±(dB)	1.0	1.0	1.0
4 Txslots	Target (dBm)	20.0	20.0	20.0
	Tolerance ±(dB)	1.0	1.0	1.0
GSM 1900 E-GPRS				
Channel		**810**	**661**	**512**
1 Txslots	Target (dBm)	22.0	22.0	22.0
	Tolerance ±(dB)	1.0	1.0	1.0
2 Txslots	Target (dBm)	21.0	21.0	21.0
	Tolerance ±(dB)	1.0	1.0	1.0
3 Txslots	Target (dBm)	19.0	19.0	19.0
	Tolerance ±(dB)	1.0	1.0	1.0
4 Txslots	Target (dBm)	18.0	18.0	18.0
	Tolerance ±(dB)	1.0	1.0	1.0

Table 11.3: WCDMA

WCDMA 850 CS			
Channel	Channel 4132	Channel 4182	Channel 4233
Target (dBm)	24.5	24.5	24.5
Tolerance ±(dB)	1.0	1.0	1.0
WCDMA 1900 CS			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	24.5	24.5	24.5
Tolerance ±(dB)	1.0	1.0	1.0

Table 11.4: HSDPA

WCDMA 850				
Channel		4132	4182	4233
1	Target (dBm)	24.0	24.0	24.0
	Tolerance ±(dB)	1.0	1.0	1.0
2	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
3	Target (dBm)	23.5	23.5	23.5
	Tolerance ±(dB)	1.0	1.0	1.0
4	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
WCDMA 1900				
Channel		9262	9400	9538
1	Target (dBm)	24.0	24.0	24.0
	Tolerance ±(dB)	1.0	1.0	1.0
2	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
3	Target (dBm)	23.5	23.5	23.5
	Tolerance ±(dB)	1.0	1.0	1.0
4	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0

Table 11.5: HSUPA

WCDMA 850				
Channel		4132	4182	4233
1	Target (dBm)	24.0	24.0	24.0
	Tolerance ±(dB)	1.0	1.0	1.0
2	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
3	Target (dBm)	23.5	23.5	23.5
	Tolerance ±(dB)	1.0	1.0	1.0
4	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
5	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
WCDMA 1900				
Channel		9262	9400	9538
1	Target (dBm)	24.0	24.0	24.0
	Tolerance ±(dB)	1.0	1.0	1.0
2	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
3	Target (dBm)	23.5	23.5	23.5
	Tolerance ±(dB)	1.0	1.0	1.0
4	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0
5	Target (dBm)	23.0	23.0	23.0
	Tolerance ±(dB)	1.0	1.0	1.0

Table 11.6: WiFi

WiFi 802.11b			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.0	14.0	14.0
Tolerance ±(dB)	1.0	1.0	1.0
WiFi 802.11g			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	12.0	12.0	12.0
Tolerance ±(dB)	1.0	1.0	1.0
WiFi 802.11n			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	10.0	10.0	10.0
Tolerance ±(dB)	1.0	1.0	1.0

11.2 GSM Measurement result

During the process of testing, the EUT was controlled via Agilent Digital Radio Communication tester (E5515C) to ensure the maximum power transmission and proper modulation. This result contains conducted output power for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

Table 11.5: The conducted power measurement results for GSM850/1900

GSM 835MHZ	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	30.15	**30.10**	**30.14**
GSM 1900MHZ	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	26.15	**26.30**	**25.69**

Table 11.6: The conducted power measurement results for GPRS and EGPRS

GSM 850 GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	**190**	**128**		**251**	**190**	**128**
1 Txslot	30.18	29.49	29.80	-9.03dB	21.15	20.46	20.77
2 Txslots	28.16	28.18	28.21	-6.02dB	22.14	22.16	22.19
3Txslots	26.72	26.51	26.56	-4.26dB	22.46	22.25	22.3
4 Txslots	25.65	25.52	25.60	-3.01dB	**22.64**	**22.51**	**22.59**
GSM 850 E-GPRS (8PSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	**190**	**128**		**251**	**190**	**128**
1 Txslot	24.68	24.10	24.37	-9.03dB	15.65	15.07	15.34
2 Txslots	23.45	23.01	23.24	-6.02dB	17.43	16.99	17.22
3Txslots	21.78	21.62	21.71	-4.26dB	17.52	17.36	17.45
4 Txslots	20.72	20.45	20.56	-3.01dB	**17.71**	**17.44**	**17.55**
GSM 850 E-GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	**190**	**128**		**251**	**190**	**128**
1 Txslot	30.02	29.34	29.65	-9.03dB	20.99	20.31	20.62
2 Txslots	28.12	28.03	28.06	-6.02dB	22.00	22.01	22.04
3Txslots	26.56	26.42	26.37	-4.26dB	22.30	22.16	22.11
4 Txslots	25.45	25.42	25.44	-3.01dB	**22.43**	**22.41**	**22.43**
PCS1900 GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	26.33	26.39	25.92	-9.03dB	17.30	17.36	16.89
2 Txslots	25.12	25.17	25.03	-6.02dB	19.10	19.15	19.01
3Txslots	23.45	23.49	23.38	-4.26dB	19.19	19.23	19.12
4 Txslots	22.51	22.55	22.43	-3.01dB	**19.50**	**19.54**	**19.42**
PCS1900 E-GPRS (8PSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	22.74	22.84	22.34	-9.03dB	13.71	13.81	13.31

2 Txslots	21.48	21.51	21.42	-6.02dB	15.46	15.49	15.40
3Txslots	19.88	19.92	19.73	-4.26dB	15.62	15.66	15.47
4 Txslots	18.72	18.75	18.63	-3.01dB	**15.71**	**15.74**	**15.62**
PCS1900	Measured Power (dBm)			calculation	Averaged Power (dBm)		
E-GPRS (GMSK)	**810**	**661**	**512**		**810**	**661**	**512**
1 Txslot	26.18	26.15	25.83	-9.03dB	17.15	17.12	16.80
2 Txslots	25.03	25.04	24.93	-6.02dB	19.01	19.02	18.91
3Txslots	23.35	23.38	23.31	-4.26dB	19.09	19.12	19.05
4 Txslots	22.40	22.45	22.38	-3.01dB	**19.39**	**19.44**	**19.36**

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

According to the conducted power as above, the body measurements are performed with GPRS 4Txslots for GSM850 and GSM1900.

11.3 WCDMA Measurement result

Table 11.7: The conducted power for WCDMA850/1900

Item	band	FDDV result(dBm)		
	ARFCN	4233 (846.6MHz)	4182 (836.4MHz)	4132 (826.4MHz)
WCDMA	RMC	25.37	25.29	25.40
HSDPA	1	24.88	24.91	24.92
	2	23.67	23.60	23.71
	3	24.16	24.10	24.12
	4	23.68	23.62	23.69
HSUPA	1	24.85	24.81	24.82
	2	23.62	23.59	23.60
	3	24.05	23.94	23.96
	4	23.61	23.52	23.54
	5	23.52	23.41	23.43
Item	band	FDDII result(dBm)		
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)
WCDMA	RMC	25.29	24.49	25.11
HSDPA	1	24.69	24.41	24.21
	2	23.48	23.22	23.01

	3	24.19	23.89	23.02
	4	23.50	23.19	23.02
HSUPA	**1**	24.61	24.37	24.27
	2	23.41	23.22	23.14
	3	24.17	23.99	23.76
	4	23.47	23.26	23.17
	5	23.41	23.31	23.09

Note: HSDPA/HSUPA body SAR are not required, because maximum average output power of each RF channel with HSDPA/HSUPA active is not 1/4 dB higher than that measured without HSDPA/HSUPA and the maximum SAR for WCDMA850 and WCDMA1900 are not above 75% of the SAR limit.

11.4 Wi-Fi and BT Measurement result

The output power of BT antenna is as following:

For GFSK

Channel	**Ch0 (2402 MHz)**	**Ch39 (2441MHz)**	**CH78 (2480MHz)**
Conducted Output Power (dBm)	-1.36	-1.30	-0.90

For π/4 DQPSK

Channel	**Ch0 (2402 MHz)**	**Ch39 (2441MHz)**	**CH78 (2480MHz)**
Conducted Output Power (dBm)	-1.22	-1.13	-0.46

For 8DPSK

Channel	**Ch0 (2402 MHz)**	**Ch39 (2441MHz)**	**CH78 (2480MHz)**
Conducted Output Power (dBm)	-1.04	-0.94	-0.48

NOTE:BT standalone SAR are not required, because maximum average output power is less than 10mW.

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.

The average conducted power for Wi-Fi is as following:

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	12.81	13.15	13.88	14.33
6	12.97	12.99	13.53	13.99
11	12.71	12.82	13.31	13.72

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	10.57	10.58	10.59	10.59	12.44	12.45	11.47	11.35
6	10.18	10.25	10.23	10.23	11.68	11.72	10.76	10.63
11	9.92	9.87	9.65	9.43	10.23	10.68	10.23	10.12

20M 802.11n（dBm）

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	10.05	10.06	8.41	10.97	9.98	10.00	10.00	8.14
6	9.74	9.73	8.21	10.22	8.58	8.65	8.65	7.56
11	8.71	8.62	8.54	9.78	8.45	8.42	8.21	7.28

The peak conducted power for Wi-Fi is as following:

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	16.70	16.73	16.79	17.10
6	16.15	16.27	16.34	16.60
11	15.01	15.22	15.25	15.27

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	18.96	19.03	18.59	18.91	19.29	19.97	19.11	18.87
6	18.82	18.92	18.45	18.72	19.11	19.22	18.93	18.64
11	18.54	18.62	18.21	18.57	18.87	19.06	18.89	18.52

802.11n（dBm）

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	19.18	18.86	18.16	18.52	18.70	18.12	17.63	17.12
6	18.26	17.92	17.88	17.32	17.79	18.03	17.35	17.09
11	17.05	16.32	16.52	16.33	16.46	17.01	16.87	16.92

SAR is not required for 802.11g/n channels if the output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels, and for each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 0.25dB higher than those measured at the lowest data rate. According to the above conducted power, the EUT should be tested for “802.11b, 11Mbps, channel 1”.

12 Simultaneous TX SAR Considerations

12.1 Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
For this device, the BT and Wi-Fi can transmit simultaneous with other transmitters.

12.2 Transmit Antenna Separation Distances

Picture 12.1 Antenna Locations

12.3 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied. The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

According to the KDB447498 appendix A, the SAR test exclusion threshold for 2450MHz at 5mm test separation distances is 10mW.

Appendix A

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

Picture 12.2 Power Thresholds

13 Evaluation of Simultaneous

Table 13.1: Summary of Transmitters

Band/Mode	F(GHz)	SAR test exclusion threshold (mW)	RF output power (mW)
Bluetooth	2.441	10	0.8995
2.4GHz WLAN 802.11 b/g	2.45	10	13.87

According to the conducted power measurement result, we can draw the conclusion that: stand-alone SAR for WiFi should be performed. Then, simultaneous transmission SAR for WiFi/BT is considered with measurement results of GSM/WCDMA and WiFi/BT.

Table 13.2: Simultaneous Transmission with 2.4GHz WLAN(Head)

Simult Tx	Configuration	GSM 835MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.947	0.031	0.978
	Left Cheek	0.838	0.036	0.874

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.694	0.031	0.725
	Left Cheek	0.479	0.036	0.515

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.701	0.031	0.732
	Left Cheek	0.659	0.036	0.695

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.515	0.031	0.546
	Left Cheek	0.329	0.036	0.365

Table 13.3: Simultaneous Transmission with 2.4GHz WLAN(Body)

Simult Tx	Configuration	GSM 835MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.480	0.0245	1.504
	Toward Phantom	0.861	0.00321	0.864

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	0.906	0.0245	0.930
	Toward Phantom	0.522	0.00321	0.525

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.038	0.0245	1.0625
	Toward Phantom	0.584	0.00321	0.58721

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.154	0.0245	1.1785
	Toward Phantom	0.385	0.00321	0.38821

Table 13.4: Simultaneous Transmission with BT(Head)

Simult Tx	Configuration	GSM 835MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.947	0.019	0.966
	Left Cheek	0.838	0.019	0.857

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.694	0.019	0.713
	Left Cheek	0.479	0.019	0.498

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.701	0.019	0.720
	Left Cheek	0.659	0.019	0.678

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.515	0.019	0.534
	Left Cheek	0.329	0.019	0.348

Table 13.5: Simultaneous Transmission with BT(Body)

Simult Tx	Configuration	GSM 835MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.480	0.019	1.499
	Toward Phantom	0.861	0.019	0.880

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	0.906	0.019	0.925
	Toward Phantom	0.522	0.019	0.541

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.038	0.019	1.057
	Toward Phantom	0.584	0.019	0.603

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	BT SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.154	0.019	1.173
	Toward Phantom	0.385	0.019	0.404

The above numerical SAR results for all worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured simultaneous SAR summation is required per FCC KDB Publication 447498 D01 v05.
According to the above table, the sum of reported SAR values for GSM and WiFi/BT ＜1.6W/kg. So the simultaneous transmission SAR is not required for WiFi/BT transmitter.

14 SAR Test Result

Table 14.1: Duty Cycle

	Duty Cycle
Speech for GSM835/1900	1:8.3
GPRS for GSM835/1900	1:2
WCDMA850/1900 and WiFi	1:1

Table 14.2: SAR Values (GSM 835 MHz Band - Head)

Frequency		Side	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
836.6	190	Left	Touch	30.5	30.10	1.096	0.765	0.838	-0.11
836.6	190	Left	Tilt	30.5	30.10	1.096	0.531	0.582	0.04
836.6	190	Right	Touch	30.5	30.10	1.096	0.864	0.947	-0.12
836.6	190	Right	Tilt	30.5	30.10	1.096	0.575	0.630	-0.11
824.2	128	Right	Touch	30.5	30.14	1.086	0.574	0.623	-0.14
848.8	251	Right	Touch	30.5	30.15	1.084	0.807	0.874	-0.07

Table 14.3: SAR Values (GSM 835 MHz Band - Body)

Frequency		Mode (number of timeslots)	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
836.6	190	GPRS (4)	Phantom	26.00	25.52	1.117	0.771	0.861	0.07
836.6	190	GPRS (4)	Ground	26.00	25.52	1.117	1.31	1.463	-0.10
836.6	190	GPRS (4)	Left	26.00	25.52	1.117	0.527	0.588	-0.19
836.6	190	GPRS (4)	Right	26.00	25.52	1.117	0.655	0.731	-0.17
836.6	190	GPRS (4)	Bottom	26.00	25.52	1.117	0.116	0.129	-0.17
848.8	251	GPRS (4)	Ground	26.00	25.65	1.084	1.17	1.268	-0.16
824.2	128	GPRS (4)	Ground	26.00	25.60	1.096	1.35	1.480	-0.17
824.2	128	E-GPRS (4)	Ground	26.00	25.60	1.096	1.33	1.458	0.03
824.2	128	Speech	Ground (Headset)	30.5	30.14	1.086	0.567	0.616	-0.12

Note:

1. The distance between the EUT and the phantom bottom is 10mm.

Table 14.4: SAR Values (GSM 1900 MHz Band - Head)

Frequency		Side	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	661	Left	Touch	26.50	26.30	1.047	0.458	0.479	0.05
1880	661	Left	Tilt	26.50	26.30	1.047	0.191	0.200	0.04
1880	661	Right	Touch	26.50	26.30	1.047	0.575	0.602	-0.04
1880	661	Right	Tilt	26.50	26.30	1.047	0.237	0.248	0.02
1909.8	810	Right	Touch	26.50	26.15	1.084	0.479	0.519	0.17
1850.2	512	Right	Touch	26.50	25.69	1.205	0.576	0.694	0.04

Table 14.5: SAR Values (GSM 1900 MHz Band - Body)

Frequency		Mode (number of timeslots)	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	661	GPRS (4)	Phantom	23.00	22.55	1.109	0.471	0.522	0.12
1880	661	GPRS (4)	Ground	23.00	22.55	1.109	0.817	0.906	-0.18
1880	661	GPRS (4)	Left	23.00	22.55	1.109	0.245	0.271	0.20
1880	661	GPRS (4)	Right	23.00	22.55	1.109	0.231	0.256	0.00
1880	661	GPRS (4)	Bottom	23.00	22.55	1.109	0.451	0.500	-0.16
1909.8	810	GPRS (4)	Ground	23.00	22.51	1.119	0.731	0.818	0.13
1850.2	512	GPRS (4)	Ground	23.00	22.43	1.140	0.780	0.889	0.02
1880	661	E-GPRS (4)	Ground	23.00	22.54	1.112	0.707	0.785	-0.11
1880	661	Speech	Ground (Headset)	26.50	26.30	1.047	0.661	0.692	-0.09

Note:The distance between the EUT and the phantom bottom is 10mm.

Table 14.6: SAR Values (WCDMA 850 MHz Band - Head)

Frequency		Side	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
836.4	4182	Left	Touch	25.50	25.29	1.050	0.313	0.329	0.17
836.4	4182	Left	Tilt	25.50	25.29	1.050	0.226	0.237	0.03
836.4	4182	Right	Touch	25.50	25.29	1.050	0.381	0.400	-0.16
836.4	4182	Right	Tilt	25.50	25.29	1.050	0.247	0.259	0.08
846.6	4233	Right	Touch	25.50	25.37	1.030	0.500	0.515	0.04
826.4	4132	Right	Touch	25.50	25.56	1.023	0.362	0.370	-0.09

Table 14.7: SAR Values (WCDMA 850 MHz Band - Body)

Frequency		Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.							
836.4	4182	Phantom	25.50	25.29	1.050	0.367	0.385	-0.01
836.4	4182	Ground	25.50	25.29	1.050	1.11	1.154	-0.01
836.4	4182	Left	25.50	25.29	1.050	0.238	0.250	-0.08
836.4	4182	Right	25.50	25.29	1.050	0.330	0.346	-0.01
836.4	4182	Bottom	25.50	25.29	1.050	0.091	0.096	-0.20
846.6	4233	Ground	25.50	25.37	1.030	1.05	1.082	-0.05
826.4	4132	Ground	25.50	25.40	1.023	0.886	0.907	-0.12
836.4	4182	Ground (Headset)	25.50	25.29	1.050	0.907	0.952	0.08

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 14.8: SAR Values (WCDMA 1900 MHz Band - Head)

Frequency		Side	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	9400	Left	Touch	25.50	24.99	1.125	0.586	0.659	0.03
1880	9400	Left	Tilt	25.50	24.99	1.125	0.241	0.271	0.09
1880	9400	Right	Touch	25.50	24.99	1.125	0.623	0.701	-0.04
1880	9400	Right	Tilt	25.50	24.99	1.125	0.291	0.327	0.07
1907.6	9538	Right	Touch	25.50	25.29	1.050	0.553	0.580	0.10
1852.4	9262	Right	Touch	25.50	25.11	1.094	0.606	0.663	-0.02

Table 14.9: SAR Values (WCDMA 1900 MHz Band - Body)

Frequency		Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.							
1880	9400	Phantom	25.50	24.99	1.125	0.519	0.584	-0.13
1880	9400	Ground	25.50	24.99	1.125	0.841	0.946	0.01
1880	9400	Left	25.50	24.99	1.125	0.214	0.241	0.11
1880	9400	Right	25.50	24.99	1.125	0.250	0.281	0.14
1880	9400	Bottom	25.50	24.99	1.125	0.511	0.575	-0.14
1907.6	9538	Ground	25.50	25.29	1.050	0.895	0.939	0.13
1852.4	9262	Ground	25.50	25.11	1.094	0.949	1.038	-0.04
1852.4	9262	Ground (Headset)	25.50	25.11	1.094	0.885	0.968	0.04

Note1: The distance between the EUT and the phantom bottom is 10mm.

Table 14.10: SAR Values (Wi-Fi 802.11b - Head)

Frequency		Side	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
2412	1	Left	Touch	15.00	14.33	1.167	0.031	0.036	0.16
2412	1	Left	Tilt	15.00	14.33	1.167	0.015	0.017	0.15
2412	1	Right	Touch	15.00	14.33	1.167	0.027	0.031	0.19
2412	1	Right	Tilt	15.00	14.33	1.167	0.011	0.012	0.10

Table 14.11: SAR Values (Wi-Fi 802.11b - Body)

Frequency		Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.							
2412	1	Phantom	15.00	14.33	1.167	0.00275	0.00321	0.11
2412	1	Ground	15.00	14.33	1.167	0.021	0.0245	0.11
2412	1	Left	15.00	14.33	1.167	0.00258	0.00301	0.18
2412	1	Right	15.00	14.33	1.167	0.00685	0.00799	0.10
2412	1	Top	15.00	14.33	1.167	0.00891	0.0104	0.10
2412	1	Bottom	15.00	14.33	1.167	0.000189	0.00022	0.02

Note1: The distance between the EUT and the phantom bottom is 10mm.

15 SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Table 15.1: SAR Measurement Variability for Head Value (1g)

Frequency		Side	Test Position	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio
MHz	Ch.					
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 15.2: SAR Measurement Variability for Head Value (1g)

Frequency		Side	Test Position	Original SAR(1g) (W/kg)	First Reported SAR(1g) (W/kg)	The Ratio
MHz	Ch.					
836.6	190	Left	Touch	0.765	0.734	1.04
836.6	190	Right	Touch	0.864	0.838	1.03
848.8	251	Right	Touch	0.807	0.798	1.01

Table 15.3: SAR Measurement Variability for Body Value (1g)

Frequency		**Mode(number of timeslots)**	**Test Position**	**Spacing (mm)**	**Original SAR (W/kg)**	**First Repeated SAR (W/kg)**	**The Ratio**
MHz	**Ch.**						
836.6	190	GPRS (4)	Phantom	10	0.771	0.760	1.01
836.6	190	GPRS (4)	Ground	10	1.31	1.25	1.05
848.8	251	GPRS (4)	Ground	10	1.17	1.13	1.04
824.2	128	GPRS (4)	Ground	10	1.35	1.31	1.03
824.2	128	E-GPRS (4)	Ground	10	1.33	1.23	1.08
1880	661	GPRS (4)	Ground	10	0.817	0.755	1.08
1850.2	512	GPRS (4)	Ground	10	0.780	0.818	1.05
1909.8	810	GPRS (4)	Ground	10	0.731	0.735	1.01
836.4	4182	Band V	Ground	10	1.11	1.10	1.01
846.6	4233	Band V	Ground	10	1.05	1.04	1.01
826.4	4132	Band V	Ground	10	0.886	0.884	1.00
836.4	4182	Band V	Ground (Headset)	10	0.907	0.902	1.01
1880	9400	Band II	Ground	10	0.841	0.844	1.00
1907.6	9538	Band II	Ground	10	0.895	0.894	1.00
1852.4	9262	Band II	Ground	10	0.949	0.950	1.00
1852.4	9262	Band II	Ground (Headset)	10	0.885	0.882	1.00

16 Measurement Uncertainty

Error Description	Unc. value, ±%	Prob. Dist.	Div.	c_i 1g	c_i 10g	Std.Unc. ±%,1g	Std.Unc. ±%,10g	V_i v_{eff}
Measurement System								
Probe Calibration	6.0	N	1	1	1	6.0	6.0	∞
Axial Isotropy	0.5	R	$\sqrt{3}$	0.7	0.7	0.2	0.2	∞
Hemispherical Isotropy	2.6	R	$\sqrt{3}$	0.7	0.7	1.1	1.1	∞
Boundary Effects	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
Linearity	0.6	R	$\sqrt{3}$	1	1	0.3	0.3	∞
System Detection Limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Readout Electronics	0.7	N	1	1	1	0.7	0.7	∞
Response Time	0	R	$\sqrt{3}$	1	1	0	0	∞
Integration Time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
RF Ambient Noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner	1.5	R	$\sqrt{3}$	1	1	0.9	0.9	∞
Probe Positioning	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
Max. SAR Eval.	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test Sample Related								
Device Positioning	2.9	N	1	1	1	2.9	2.9	145
Device Holder	3.6	N	1	1	1	3.6	3.6	5
Diople								
Power Drift	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Dipole Positioning	2.0	N	1	1	1	2.0	2.0	∞
Dipole Input Power	5.0	N	1	1	1	5.0	5.0	∞
Phantom and Setup								
Phantom Uncertainty	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
Liquid Conductivity (target)	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (meas.)	2.5	N	1	0.64	0.43	1.6	1.1	∞
Liquid Permittivity (target)	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
Liquid Permittivity	2.5	N	1	0.6	0.49	1.5	1.2	∞

(meas.)								
Combined Std Uncertainty						±11.2%	±10.9%	387
Expanded Std Uncertainty						**±22.4%**	**±21.8%**	

17 Main Test Instrument

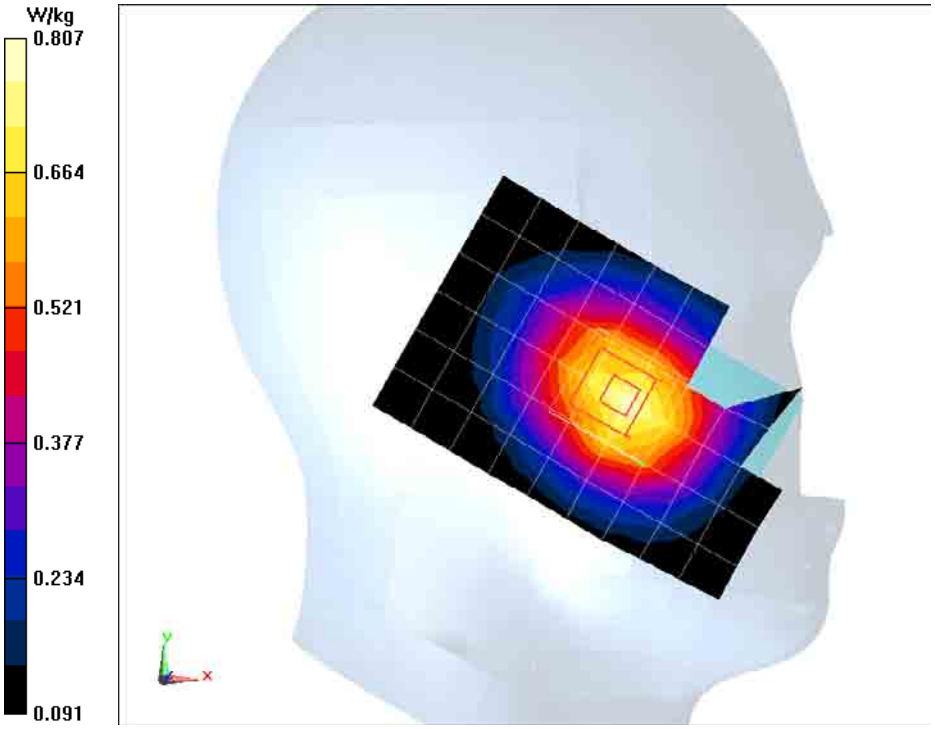
Table 16.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	N5242A	MY51221755	Aug 07, 2012	One year
02	Power meter	NRVD	102257	Aug 20, 2012	One year
03	Power sensor	NRV-Z5	100644,100241		
04	Signal Generator	E4438C	MY49072044	Aug 07, 2012	One Year
05	Amplifier	NTWPA-0086010F	12023024	No Calibration Requested	
06	Coupler	778D	MY48220551	Aug 06, 2012	One year
07	BTS	E5515C	MY50266468	Aug 04, 2012	One year
08	E-field Probe	ES3DV3	3252	Jul 24, 2012	One year
09	E-field Probe	EX3DV4	3754	Aug 17, 2012	One year
10	DAE	SPEAG DAE4	1244	Jul 20, 2012	One year
11	Dipole Validation Kit	SPEAG D835V2	4d112	Jul 25, 2012	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d134	Jul 20, 2012	One year
13	Dipole Validation Kit	SPEAG D2450V2	858	Jul 24, 2012	One year

ANNEX A GRAPH RESULTS

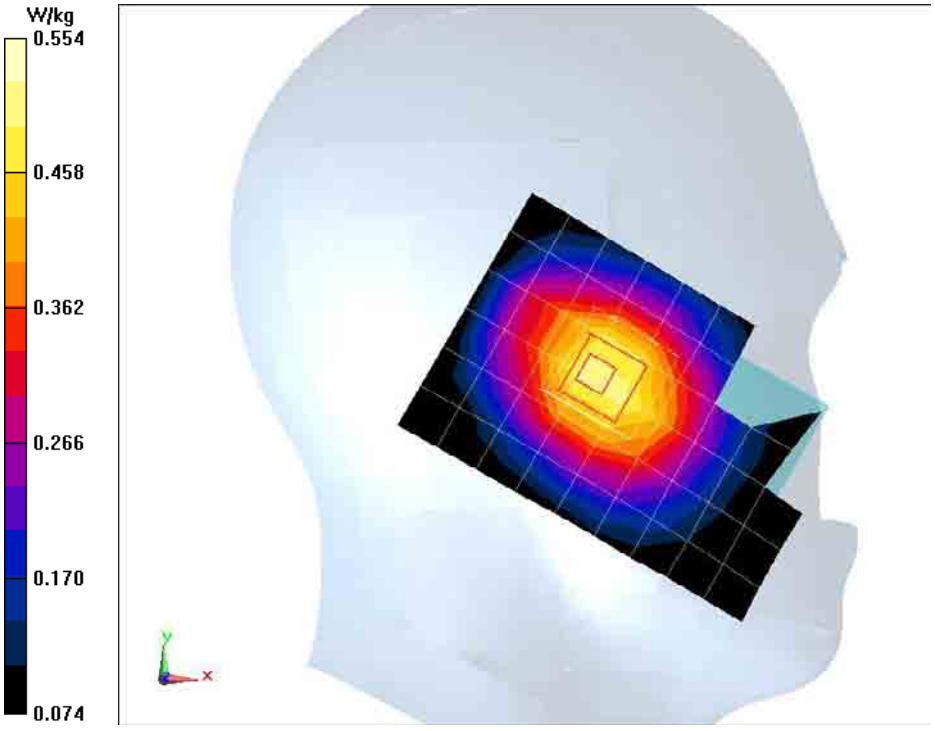
GSM835MHz Left Cheek Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Cheek Left GSM835MHz/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.795 W/kg
Middle Cheek Left GSM835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.040 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.950 W/kg
SAR(1 g) = 0.765 W/kg; SAR(10 g) = 0.563 W/kg
Maximum value of SAR (measured) = 0.807 W/kg



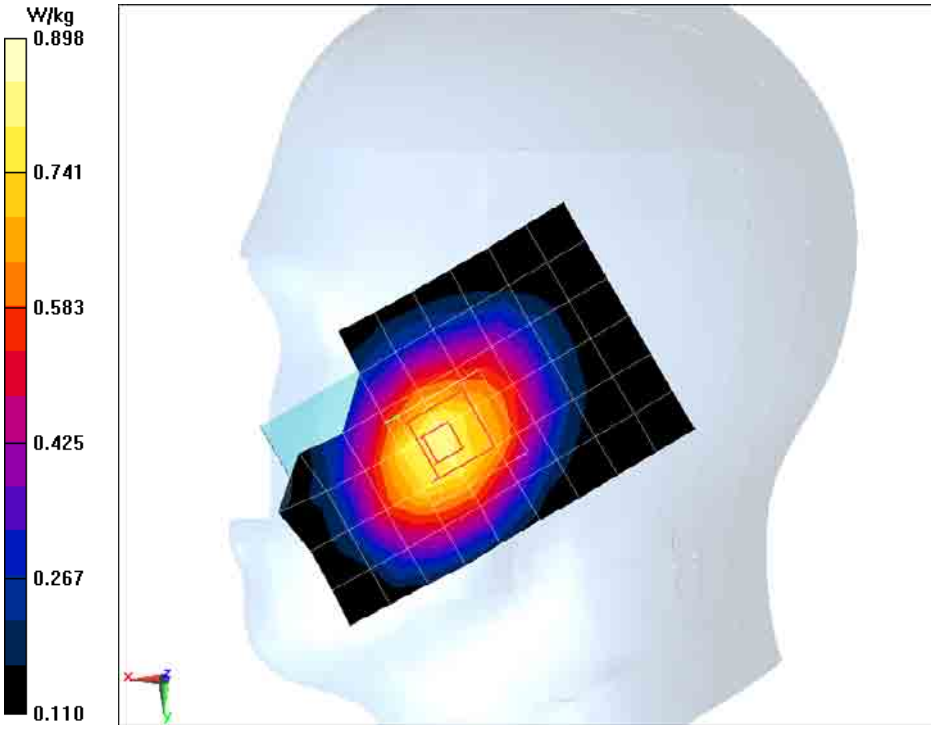
GSM835MHz Left Tilt Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Tilt Left GSM835MHz/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.513 W/kg
Middle Tilt Left GSM835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.385 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.660 W/kg
SAR(1 g) = 0.531 W/kg; SAR(10 g) = 0.396 W/kg
Maximum value of SAR (measured) = 0.554 W/kg



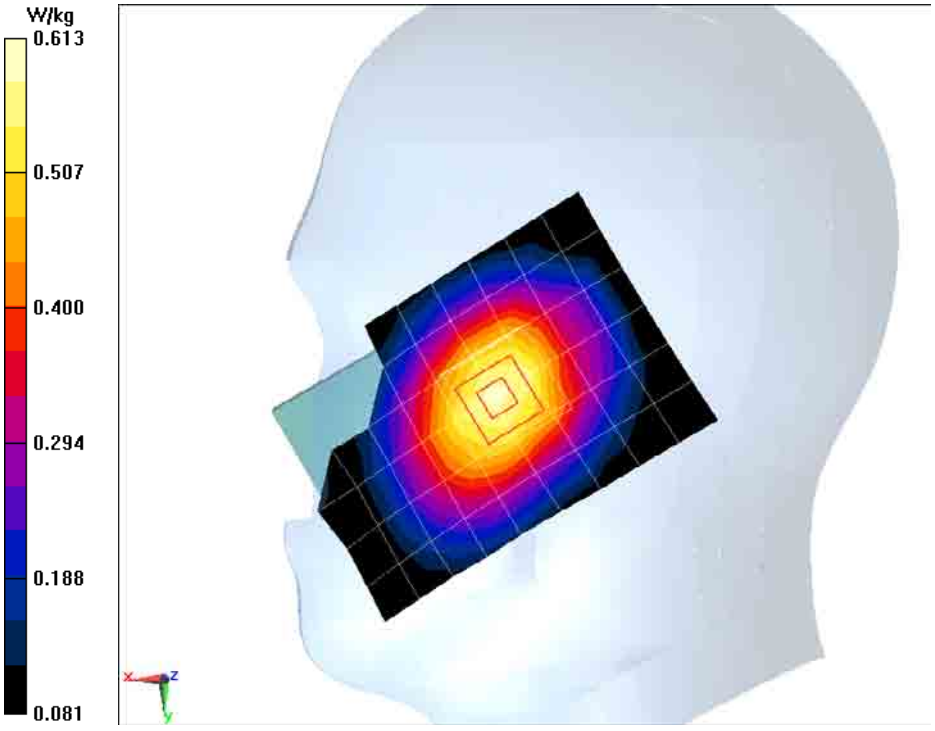
GSM835MHz Right Cheek Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Cheek Right GSM835MHz/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.848 W/kg
Middle Cheek Right GSM835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.514 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.864 W/kg; SAR(10 g) = 0.645 W/kg
Maximum value of SAR (measured) = 0.898 W/kg



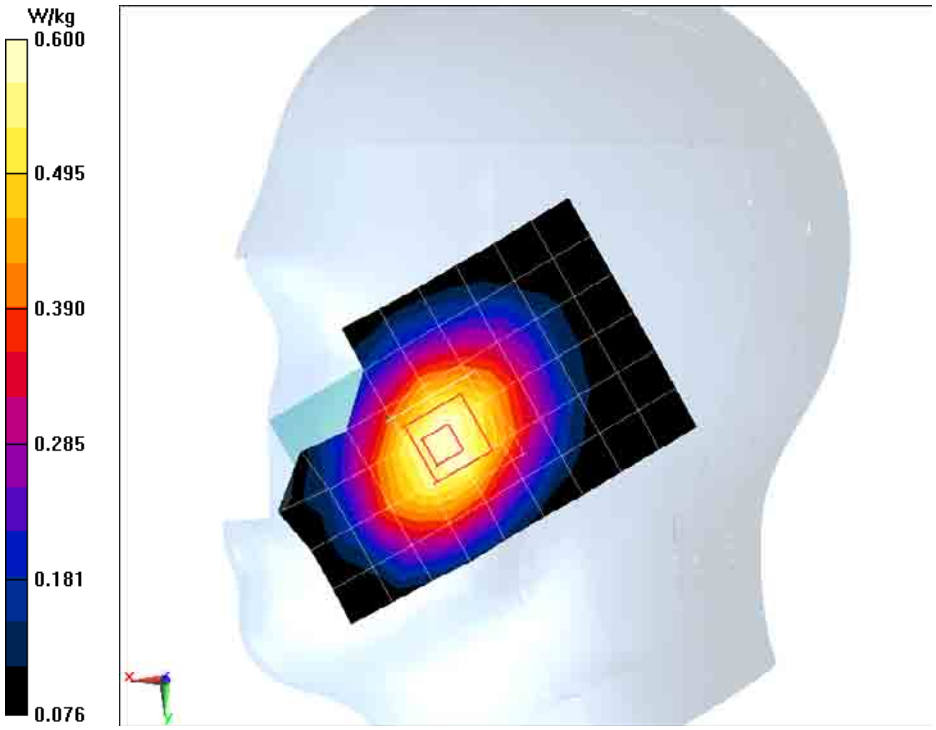
GSM835MHz Right Tilt Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Tilt Right GSM835MHz/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.603 W/kg
Middle Tilt Right GSM835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.509 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.700 W/kg
SAR(1 g) = 0.575 W/kg; SAR(10 g) = 0.431 W/kg
Maximum value of SAR (measured) = 0.613 W/kg



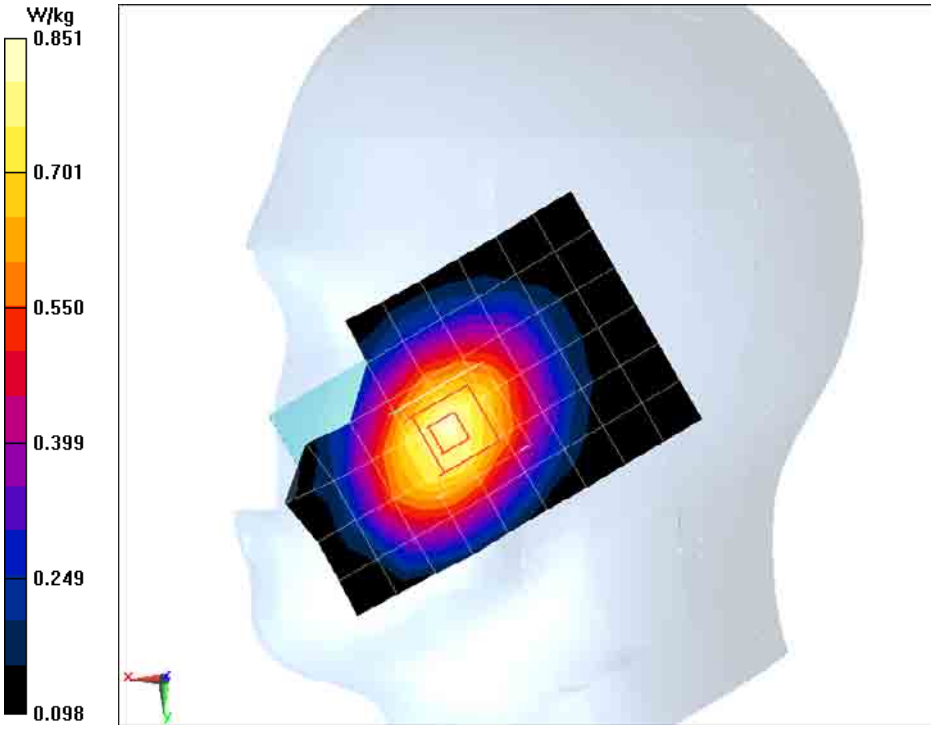
GSM835MHz Right Cheek Low

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.91 S/m; ε_r = 41.32; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Low Cheek Right GSM835MHz/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.609 W/kg
Low Cheek Right GSM835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.416 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.703 W/kg
SAR(1 g) = 0.574 W/kg; SAR(10 g) = 0.432 W/kg
Maximum value of SAR (measured) = 0.600 W/kg



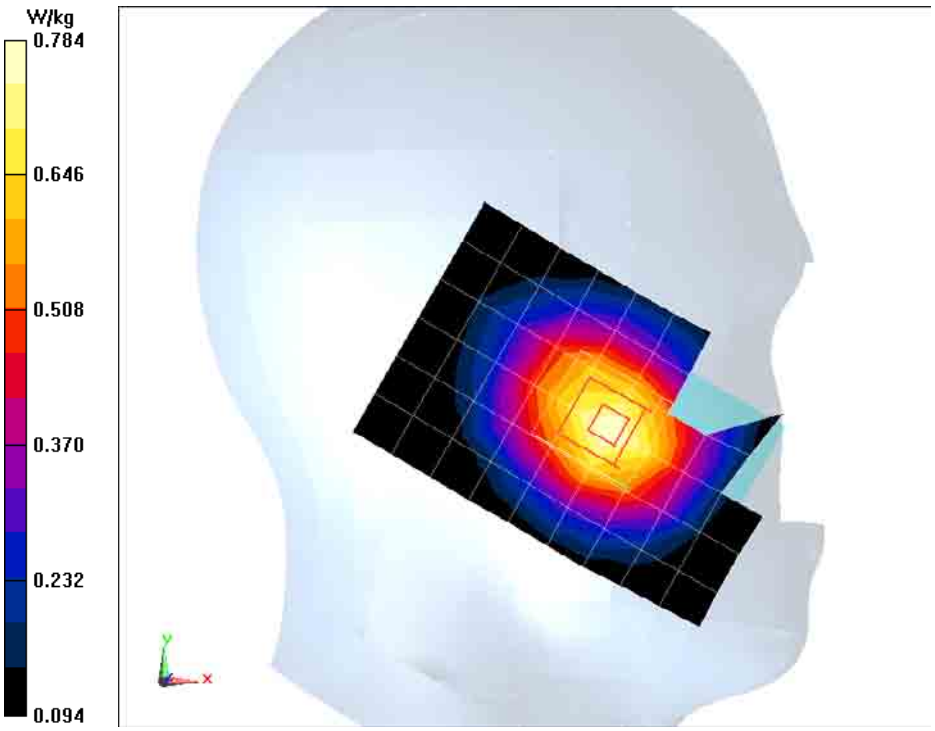
GSM835MHz Right Cheek High

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 849 MHz; σ = 0.929 S/m; ε_r = 40.788; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
High Cheek Right GSM835MHz/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.834 W/kg
High Cheek Right GSM835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.710 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.807 W/kg; SAR(10 g) = 0.598 W/kg
Maximum value of SAR (measured) = 0.851 W/kg



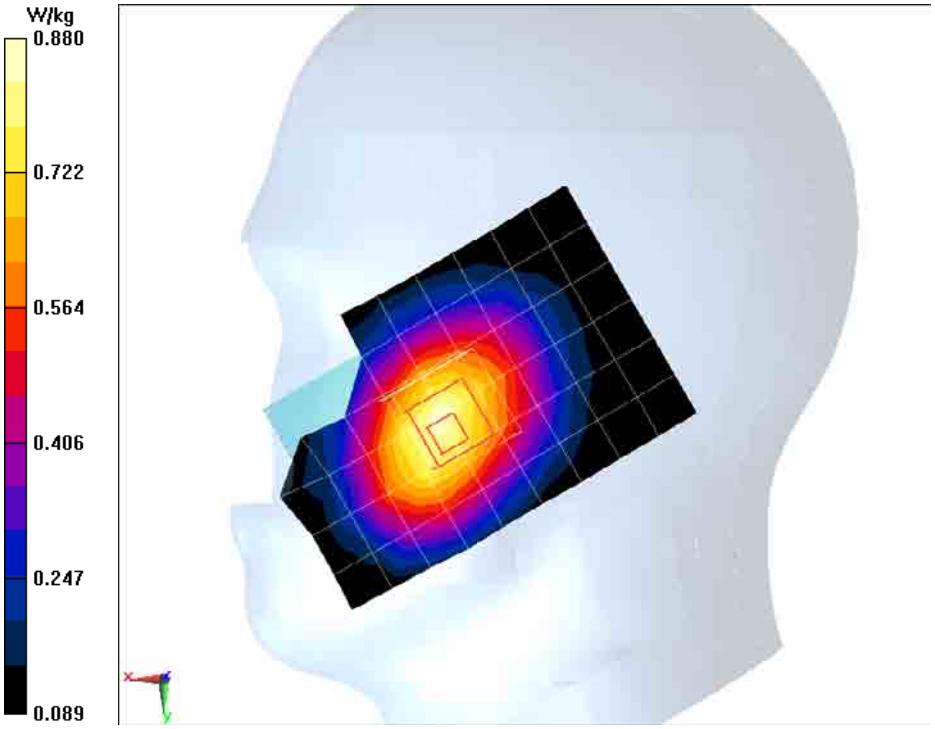
GSM835MHz 2 Left Cheek Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Cheek Left GSM835MHz 2/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.811 W/kg
Middle Cheek Left GSM835MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.118 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.930 W/kg
SAR(1 g) = 0.734 W/kg; SAR(10 g) = 0.537 W/kg
Maximum value of SAR (measured) = 0.784 W/kg



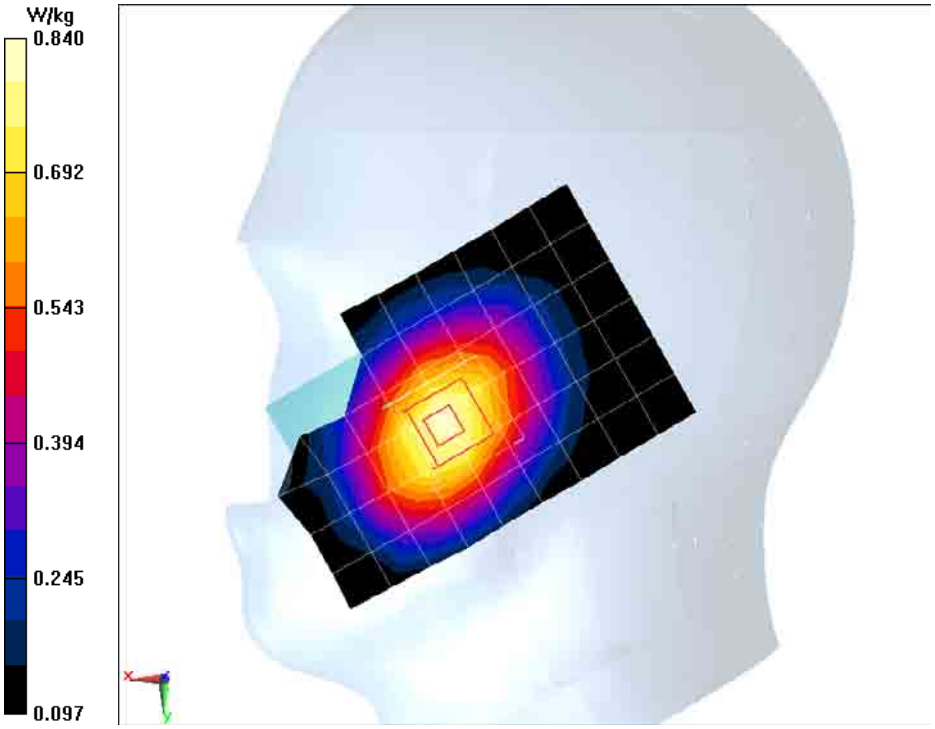
GSM835MHz 2 Right Cheek Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Cheek Right GSM835MHz 2/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.878 W/kg
Middle Cheek Right GSM835MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.306 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.838 W/kg; SAR(10 g) = 0.623 W/kg
Maximum value of SAR (measured) = 0.880 W/kg



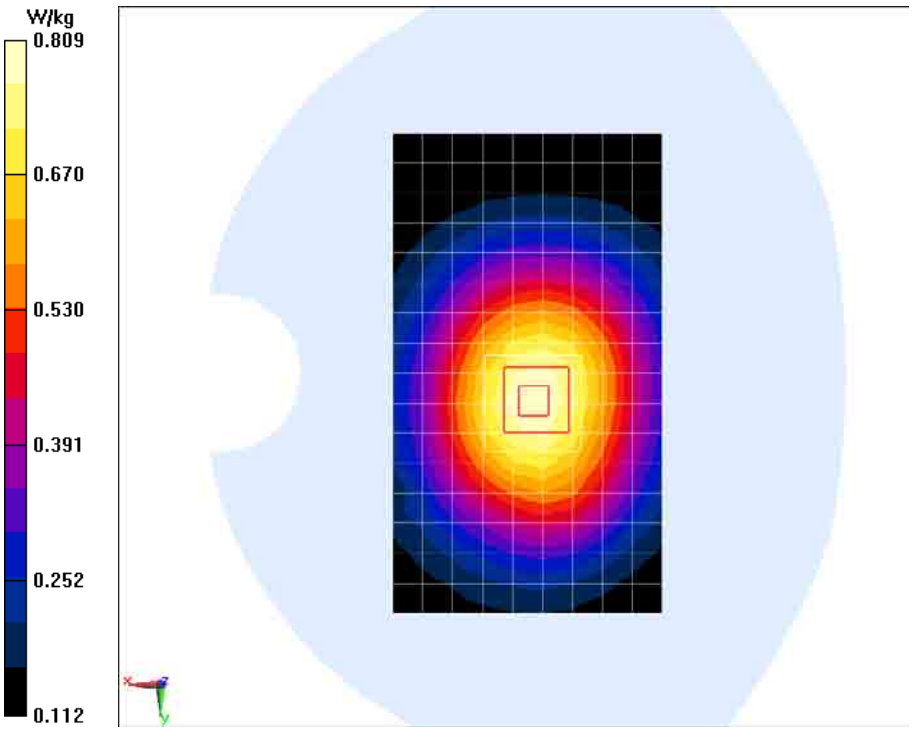
GSM835MHz 2 Right Cheek High

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 849 MHz; σ = 0.929 S/m; ε_r = 40.788; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
High Cheek Right GSM835MHz 2/Area Scan (10x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.837 W/kg
High Cheek Right GSM835MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.913 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.985 W/kg
SAR(1 g) = 0.798 W/kg; SAR(10 g) = 0.592 W/kg
Maximum value of SAR (measured) = 0.840 W/kg



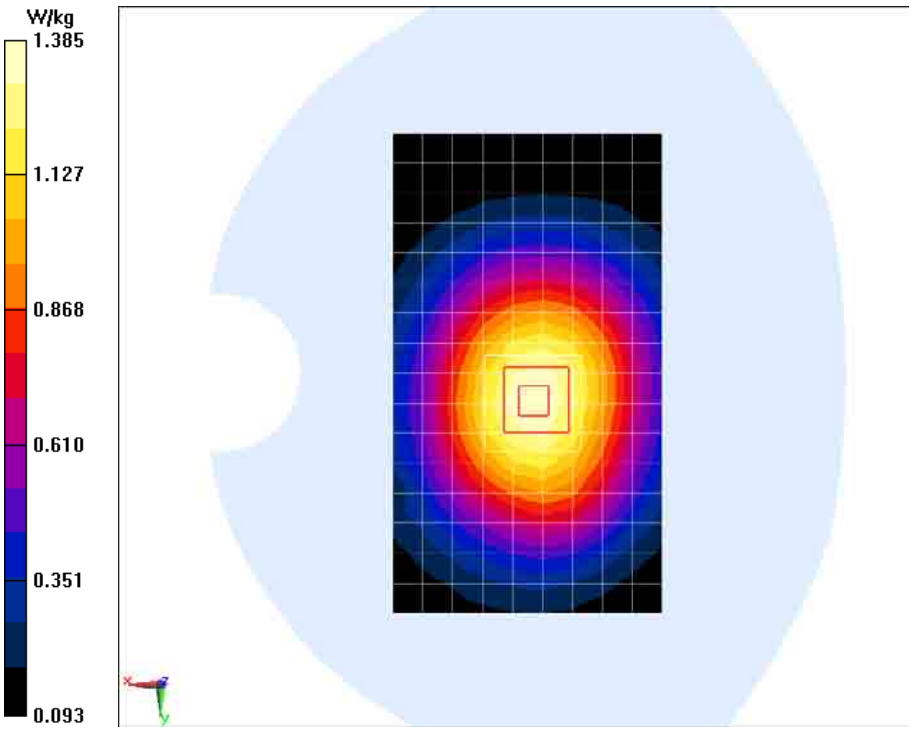
GSM 850MHz GPRS 4TS Body Toward Phantom Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Toward Phantom GPRS 4TS 850MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.829 W/kg
Middle Toward Phantom GPRS 4TS 850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.076 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.938 W/kg
SAR(1 g) = 0.771 W/kg; SAR(10 g) = 0.571 W/kg
Maximum value of SAR (measured) = 0.809 W/kg



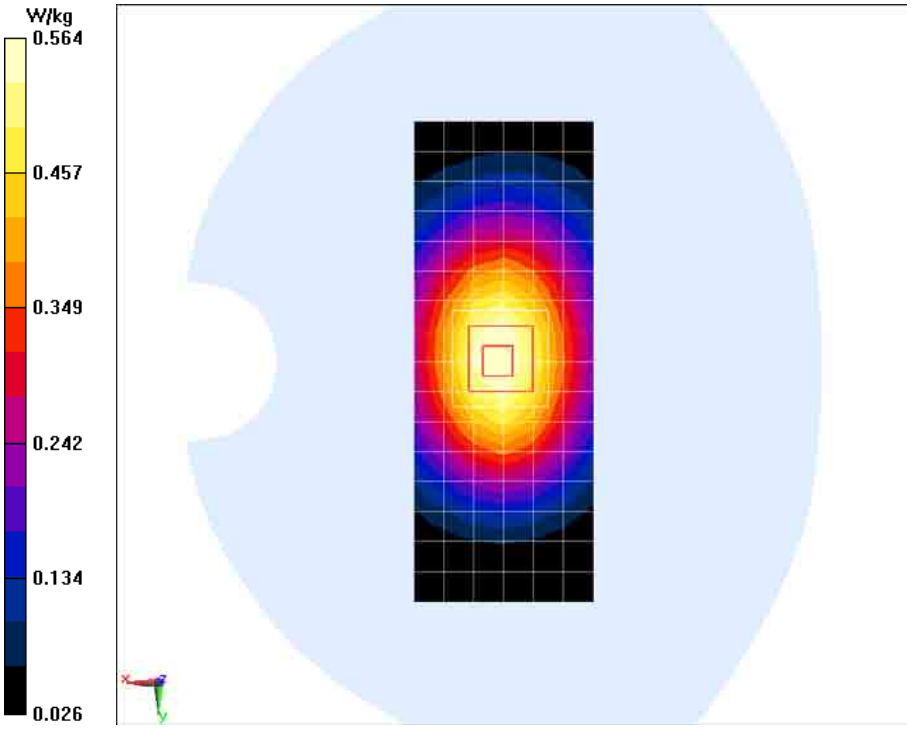
GSM 850MHz GPRS 4TS Body Toward Ground Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Toward Ground GPRS 4TS 850MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.40 W/kg
Middle Toward Ground GPRS 4TS 850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.072 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.66 W/kg
SAR(1 g) = 1.31 W/kg; SAR(10 g) = 0.978 W/kg
Maximum value of SAR (measured) = 1.39 W/kg



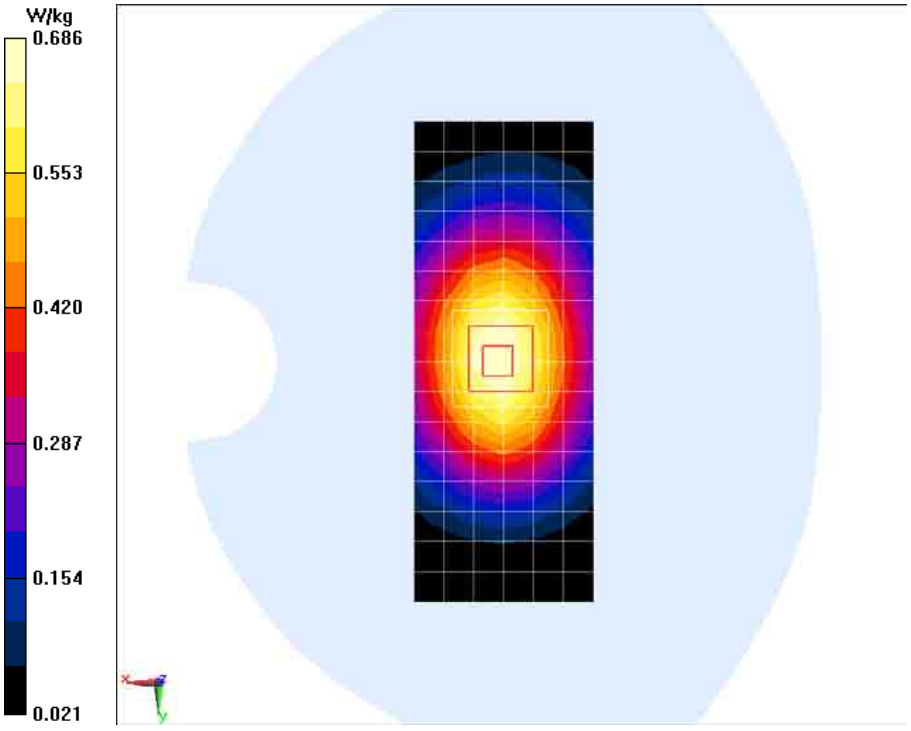
GSM 850MHz GPRS 4TS Body Left Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Left GPRS 4TS 850MHz/Area Scan (7x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.554 W/kg
Middle Left GPRS 4TS 850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.150 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.727 W/kg
SAR(1 g) = 0.527 W/kg; SAR(10 g) = 0.372 W/kg
Maximum value of SAR (measured) = 0.564 W/kg



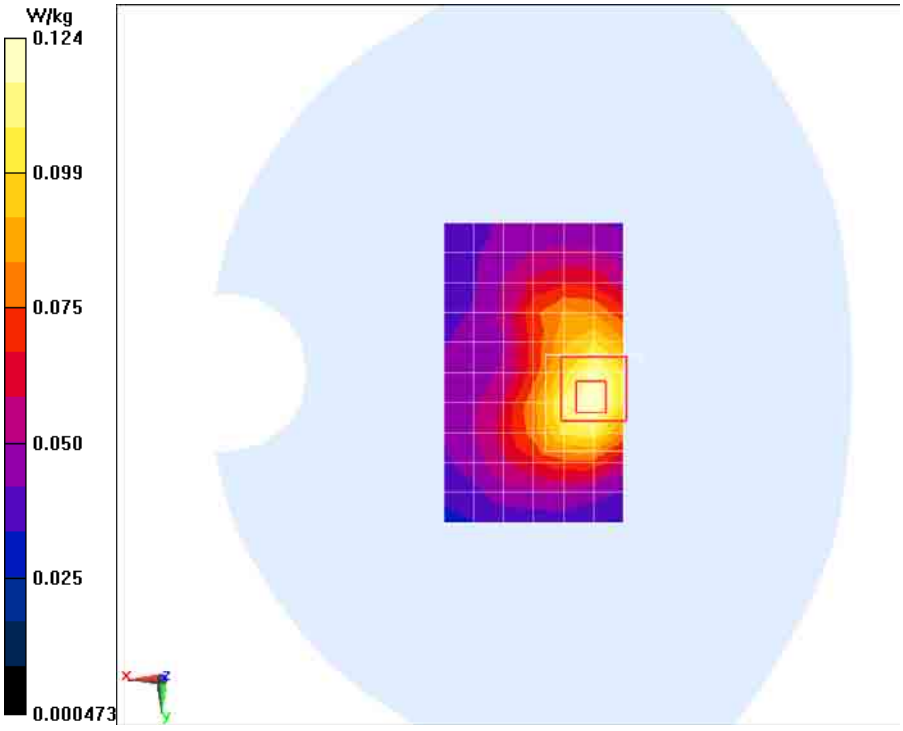
GSM 850MHz GPRS 4TS Body Right Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Right GPRS 4TS 850MHz/Area Scan (7x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.679 W/kg
Middle Right GPRS 4TS 850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.966 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.655 W/kg; SAR(10 g) = 0.466 W/kg
Maximum value of SAR (measured) = 0.686 W/kg



GSM 850MHz GPRS 4TS Body Bottom Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Bottom GPRS 4TS 850MHz/Area Scan (7x11x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.128 W/kg
Middle Bottom GPRS 4TS 850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.494 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.167 W/kg
SAR(1 g) = 0.116 W/kg; SAR(10 g) = 0.076 W/kg
Maximum value of SAR (measured) = 0.124 W/kg

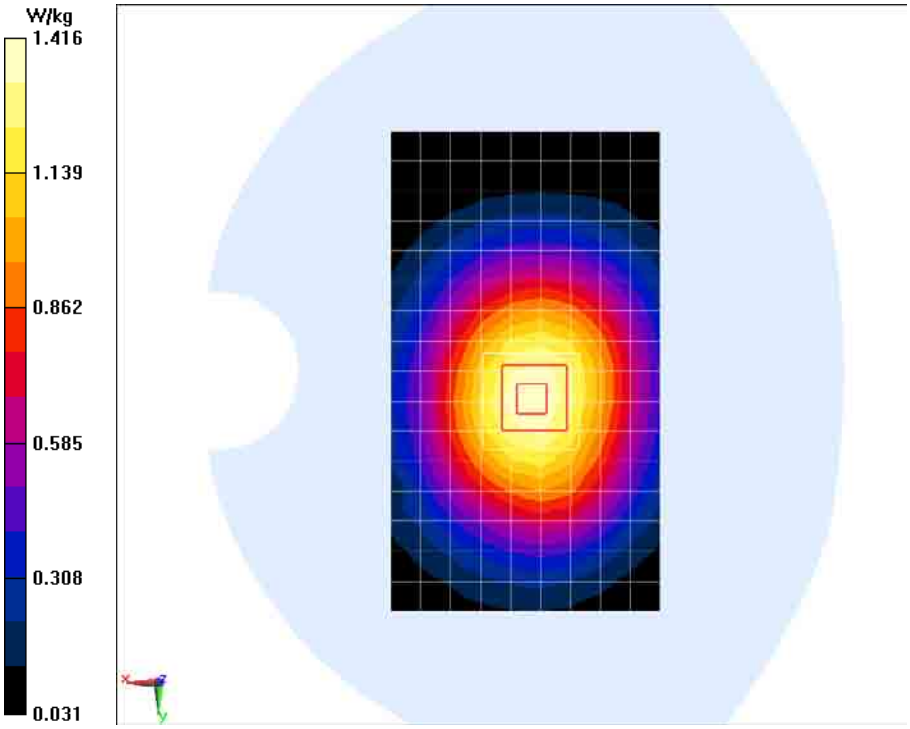


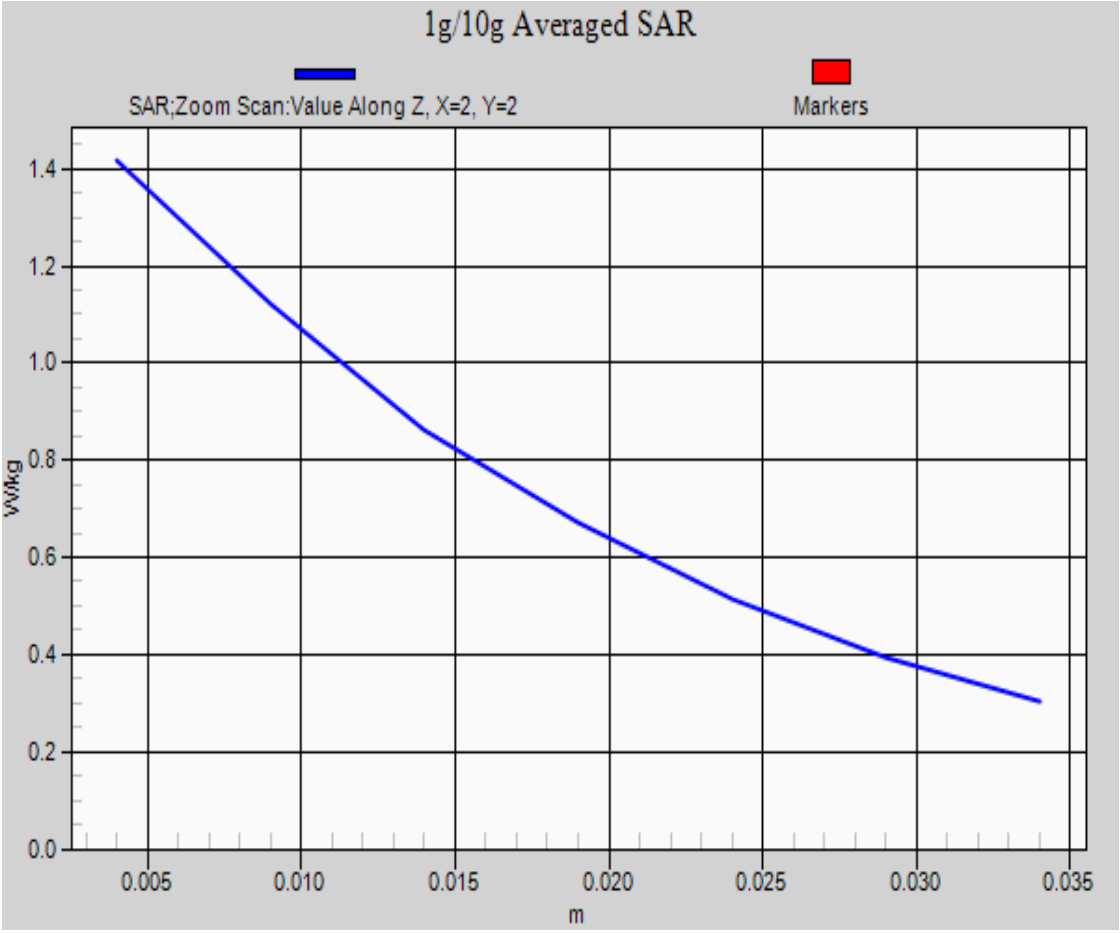
GSM 850MHz GPRS 4TS Body Toward Ground Low

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

Low Toward Ground GPRS 4TS 850MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.43 W/kg

Low Toward Ground GPRS 4TS 850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.385 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 1.35 W/kg; SAR(10 g) = 0.993 W/kg
Maximum value of SAR (measured) = 1.42 W/kg



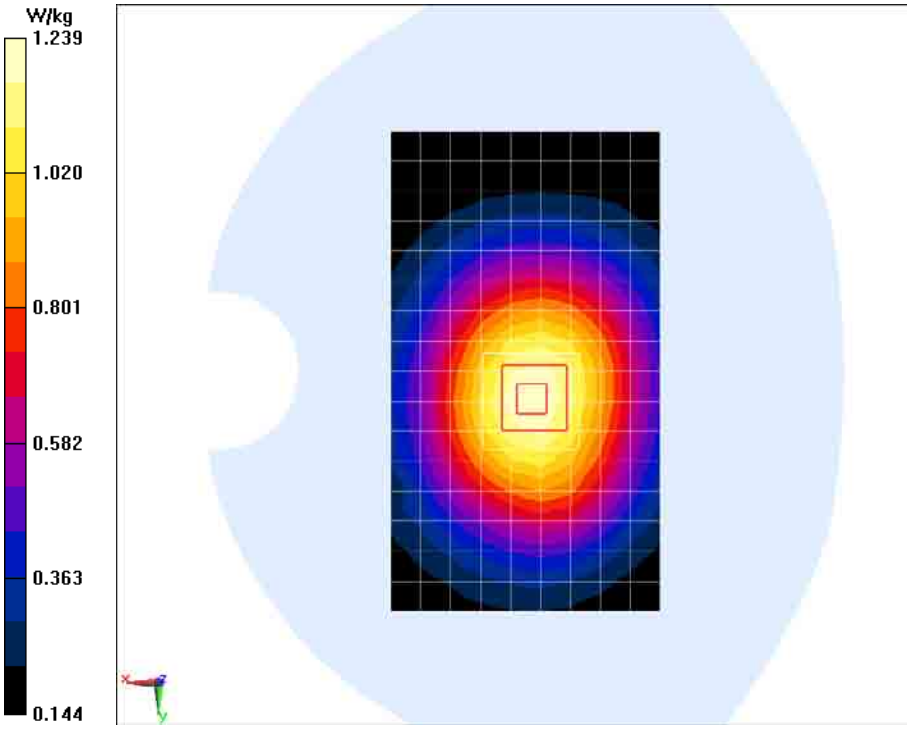

1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
W/kg
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM 850MHz GPRS 4TS Body Toward Ground High

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; ε_r = 55.205; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 848.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

High Toward Ground GPRS 4TS 850MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.29 W/kg

High Toward Ground GPRS 4TS 850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.689 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 1.17 W/kg; SAR(10 g) = 0.866 W/kg
Maximum value of SAR (measured) = 1.24 W/kg

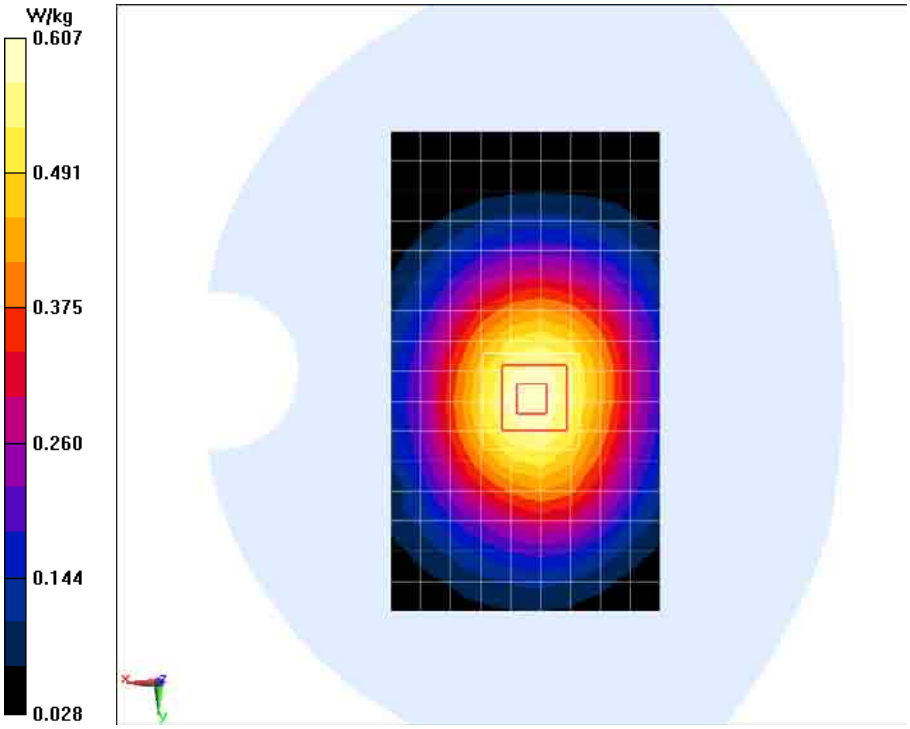


GSM850MHz With Headset Body Toward Ground Low

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

Low Toward Ground GSM850MHz With Headset/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.588 W/kg

Low Toward Ground GSM850MHz With Headset/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.441 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.833 W/kg
SAR(1 g) = 0.567 W/kg; SAR(10 g) = 0.391 W/kg
Maximum value of SAR (measured) = 0.607 W/kg

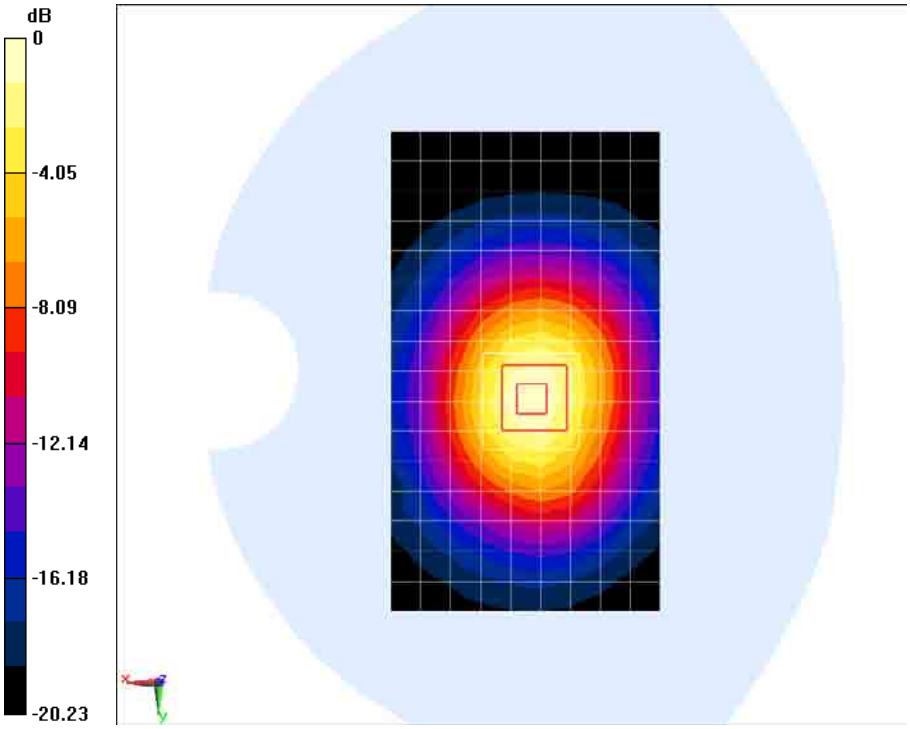


GSM 850MHz E-GPRS 4TS Body Toward Ground Low

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

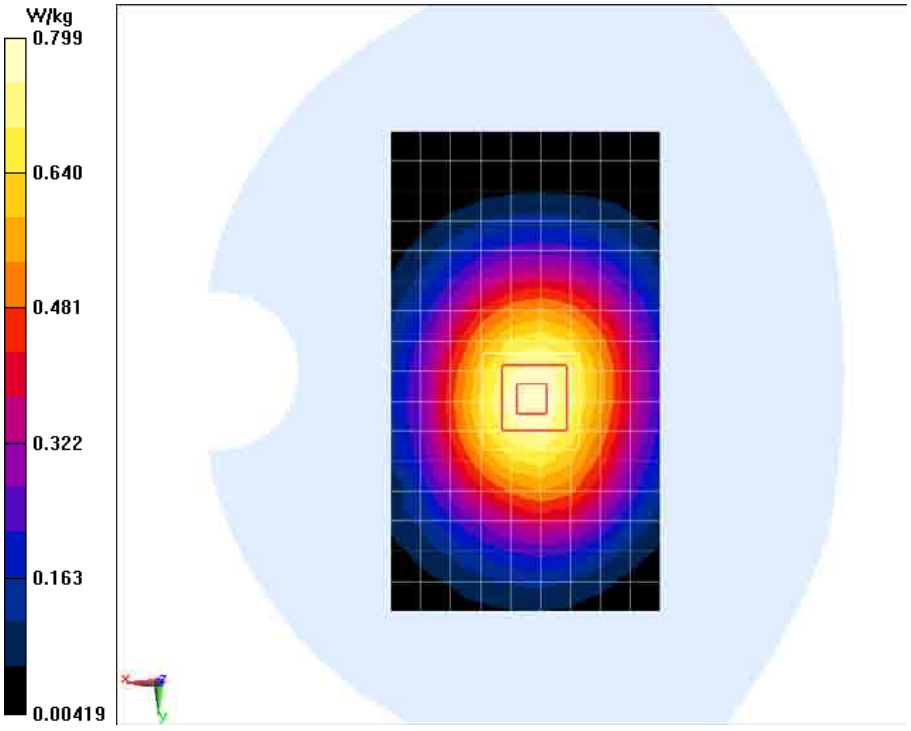
Low Toward Ground E-GPRS 4TS 850MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.26 W/kg

Low Toward Ground E-GPRS 4TS 850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.156 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 1.33 W/kg; SAR(10 g) = 0.945 W/kg
Maximum value of SAR (measured) = 1.35 W/kg



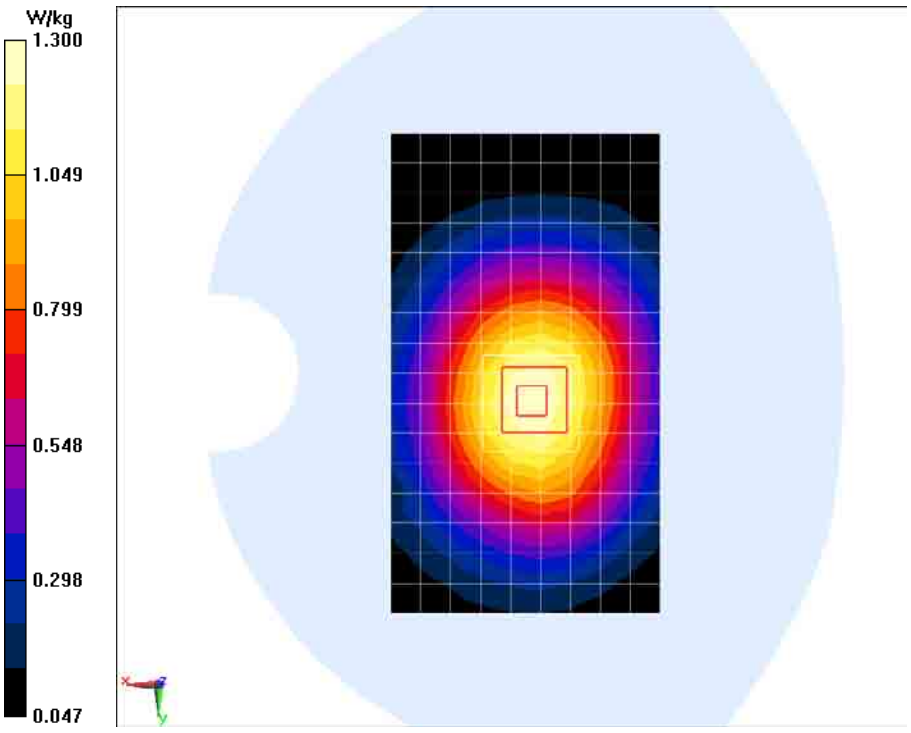
GSM 850MHz 2 GPRS 4TS Body Toward Phantom Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Toward Phantom GPRS 4TS 850MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.780 W/kg
Middle Toward Phantom GPRS 4TS 850MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.745 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.962 W/kg
SAR(1 g) = 0.760 W/kg; SAR(10 g) = 0.572 W/kg
Maximum value of SAR (measured) = 0.799 W/kg



GSM 850MHz 2 GPRS 4TS Body Toward Ground Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Toward Ground GPRS 4TS 850MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.34 W/kg
Middle Toward Ground GPRS 4TS 850MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 36.516 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 1.25 W/kg; SAR(10 g) = 0.908 W/kg
Maximum value of SAR (measured) = 1.30 W/kg

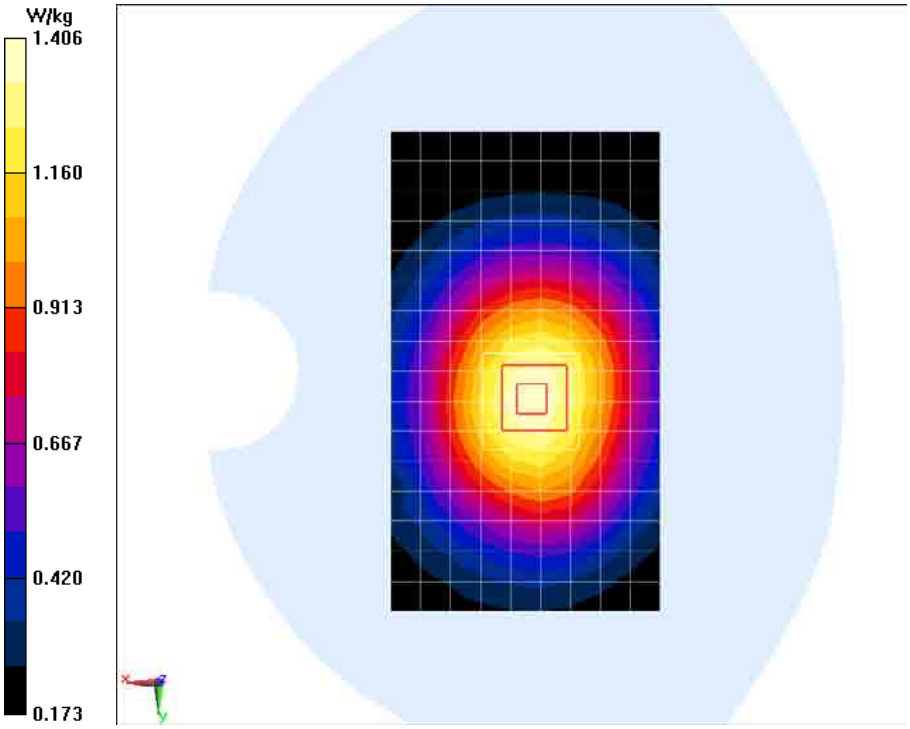


GSM 850MHz 2 GPRS 4TS Body Toward Ground Low

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

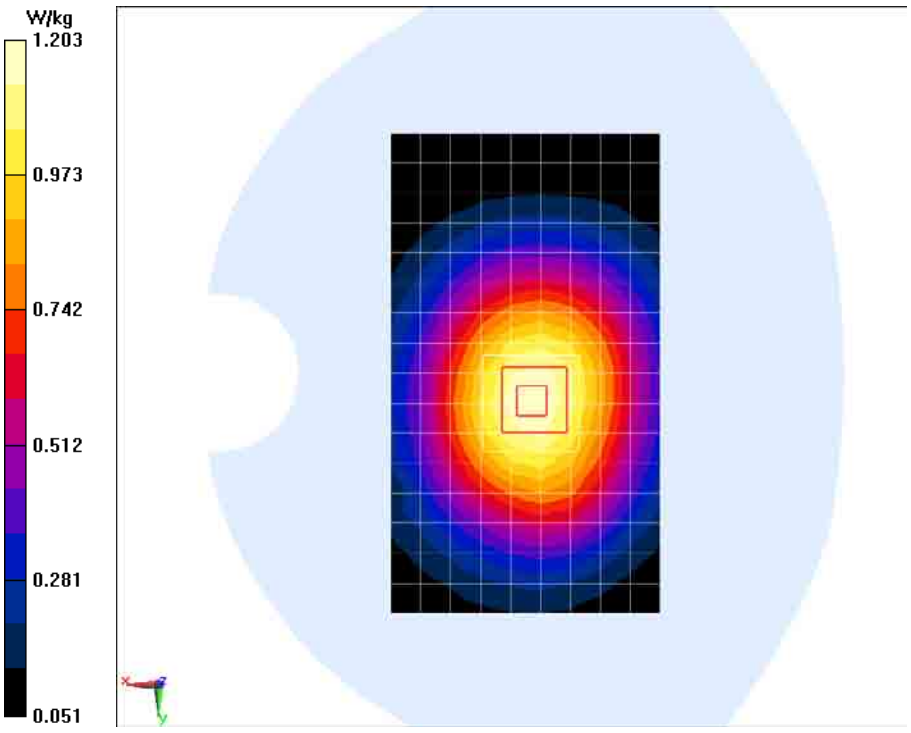
Low Toward Ground GPRS 4TS 850MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.37 W/kg

Low Toward Ground GPRS 4TS 850MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 37.496 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(1 g) = 1.31 W/kg; SAR(10 g) = 0.990 W/kg
Maximum value of SAR (measured) = 1.41 W/kg



GSM 850MHz 2 GPRS 4TS Body Toward Ground High

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; ε_r = 55.205; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 848.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
High Toward Ground GPRS 4TS 850MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.22 W/kg
High Toward Ground GPRS 4TS 850MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.347 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.766 W/kg
Maximum value of SAR (measured) = 1.20 W/kg

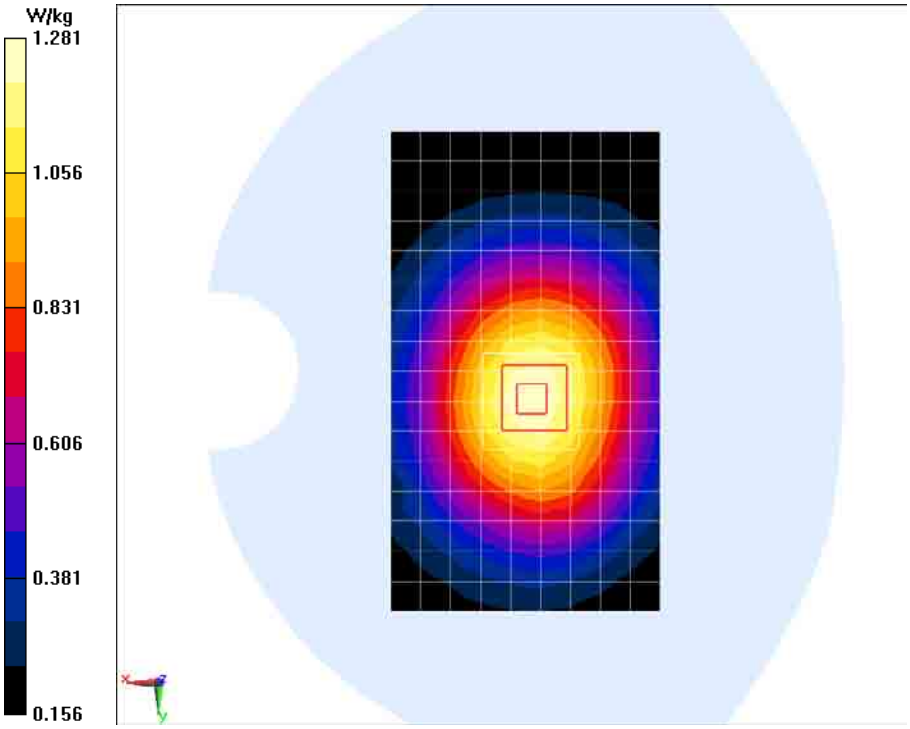


GSM 850MHz 2 E-GPRS 4TS Body Toward Ground Low

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835MHz GPRS 4TS; Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

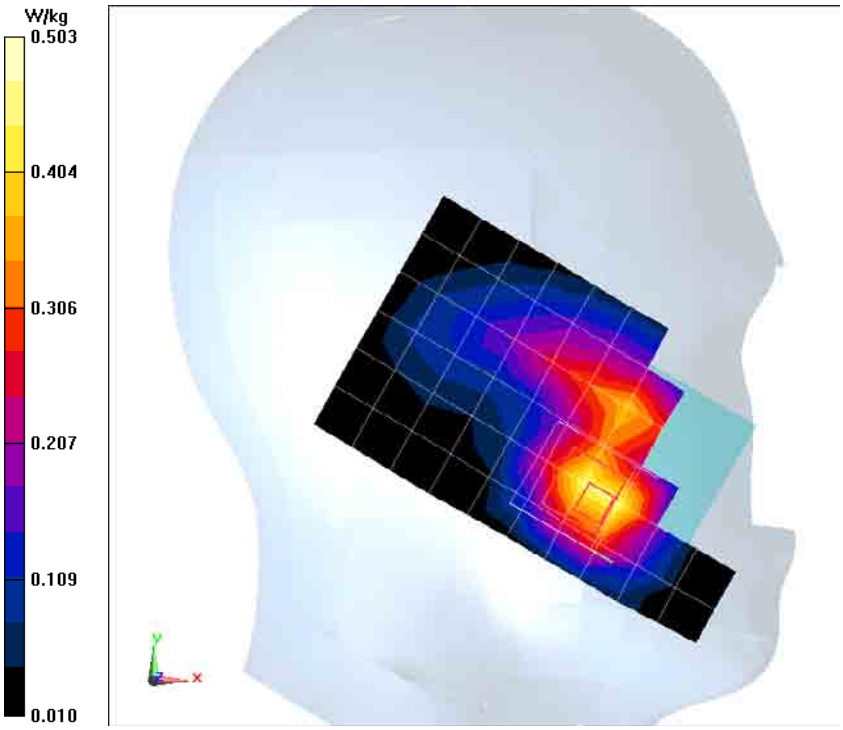
Low Toward Ground E-GPRS 4TS 850MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.31 W/kg

Low Toward Ground E-GPRS 4TS 850MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.565 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.55 W/kg
SAR(1 g) = 1.23 W/kg; SAR(10 g) = 0.919 W/kg
Maximum value of SAR (measured) = 1.28 W/kg



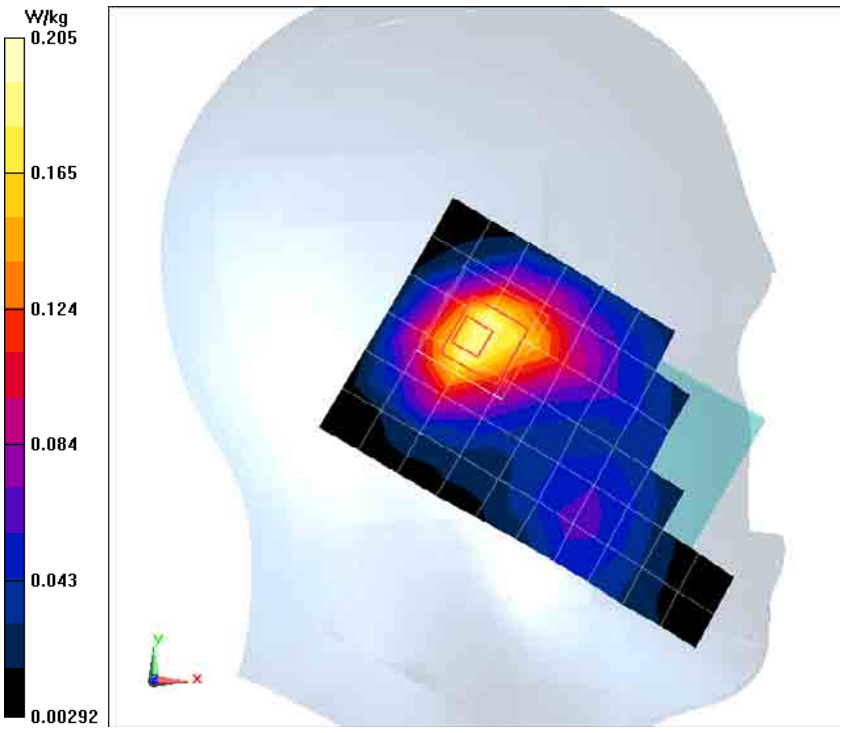
GSM1900MHz Left Cheek Middle

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Middle Cheek Left GSM1900MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.450 W/kg
Middle Cheek Left GSM1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.341 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.723 W/kg
SAR(1 g) = 0.458 W/kg; SAR(10 g) = 0.266 W/kg
Maximum value of SAR (measured) = 0.503 W/kg



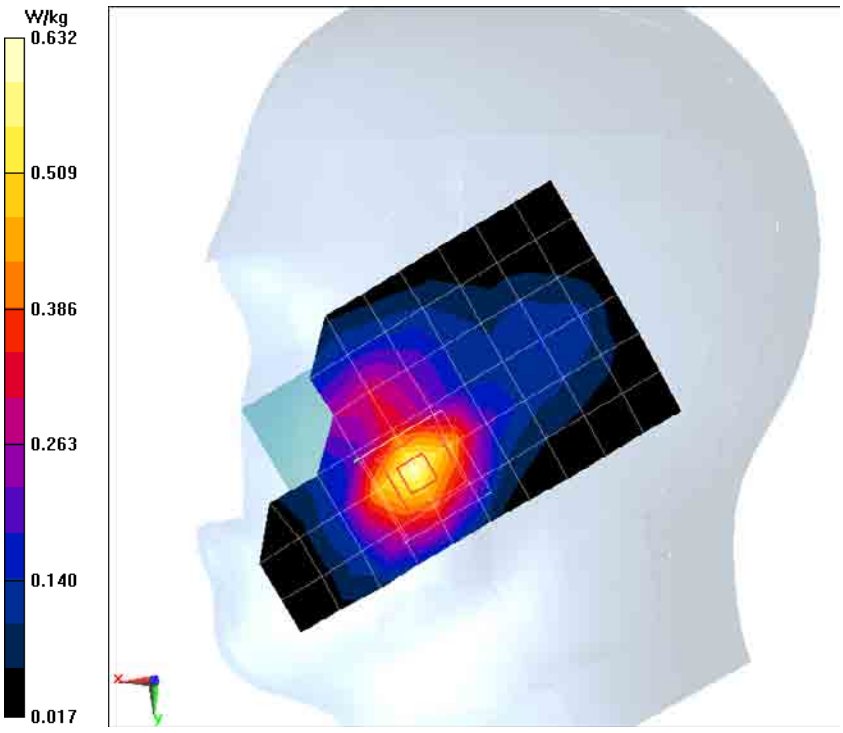
GSM1900MHz Left Tilt Middle

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Middle Tilt Left GSM1900MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.192 W/kg
Middle Tilt Left GSM1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.212 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.297 W/kg
SAR(1 g) = 0.191 W/kg; SAR(10 g) = 0.117 W/kg
Maximum value of SAR (measured) = 0.205 W/kg



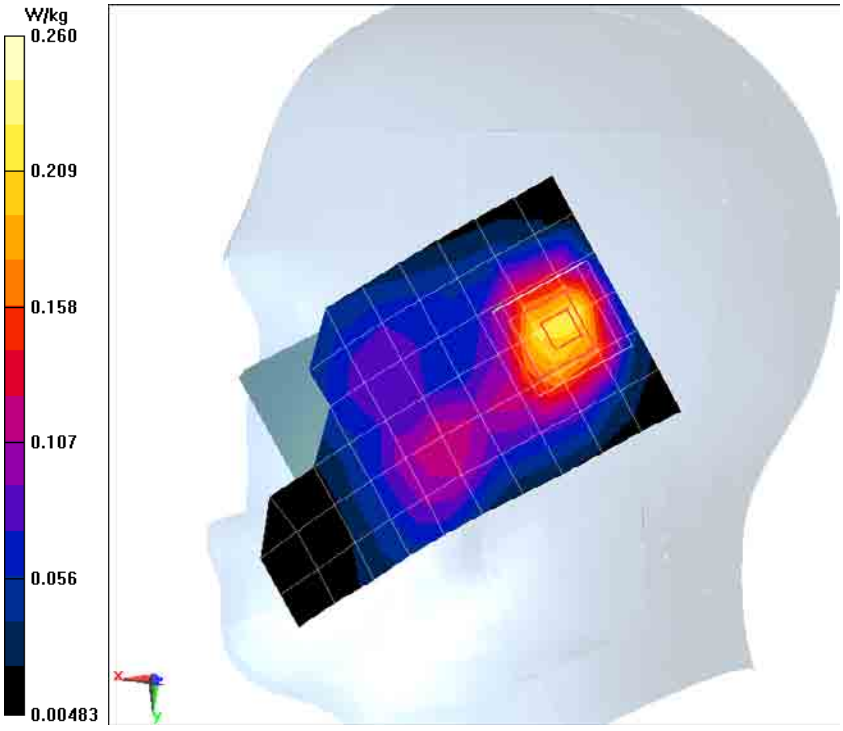
GSM1900MHz Right Cheek Middle

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1800MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Middle Cheek Right GSM1900MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.617 W/kg
Middle Cheek Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.224 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.833 W/kg
SAR(1 g) = 0.575 W/kg; SAR(10 g) = 0.348 W/kg
Maximum value of SAR (measured) = 0.632 W/kg



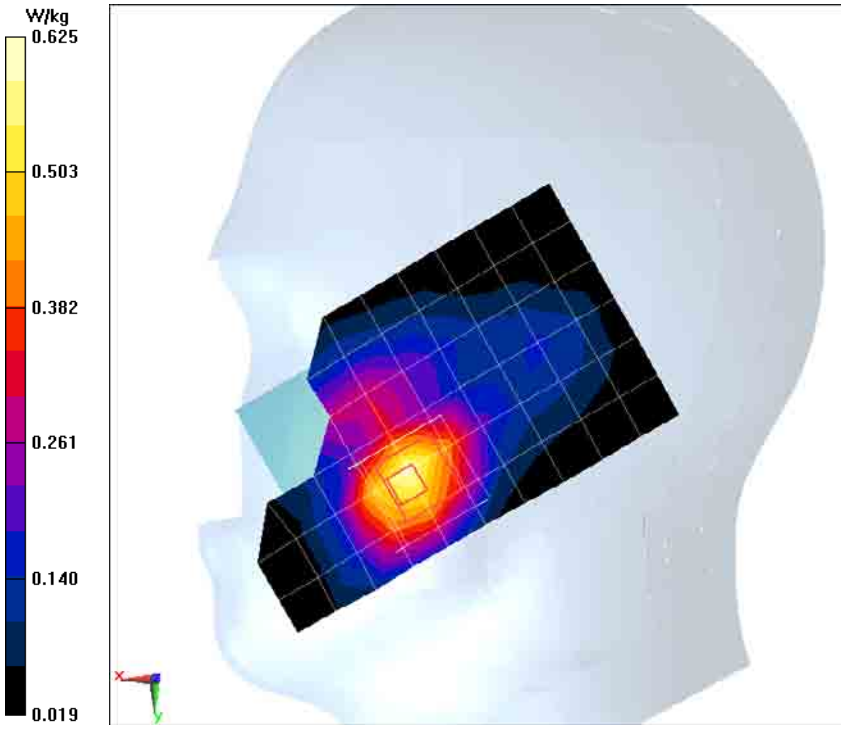
GSM1900MHz Right Tilt Middle

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1800MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Middle Tilt Right GSM1900MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.223 W/kg
Middle Tilt Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.325 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.366 W/kg
SAR(1 g) = 0.237 W/kg; SAR(10 g) = 0.141 W/kg
Maximum value of SAR (measured) = 0.260 W/kg



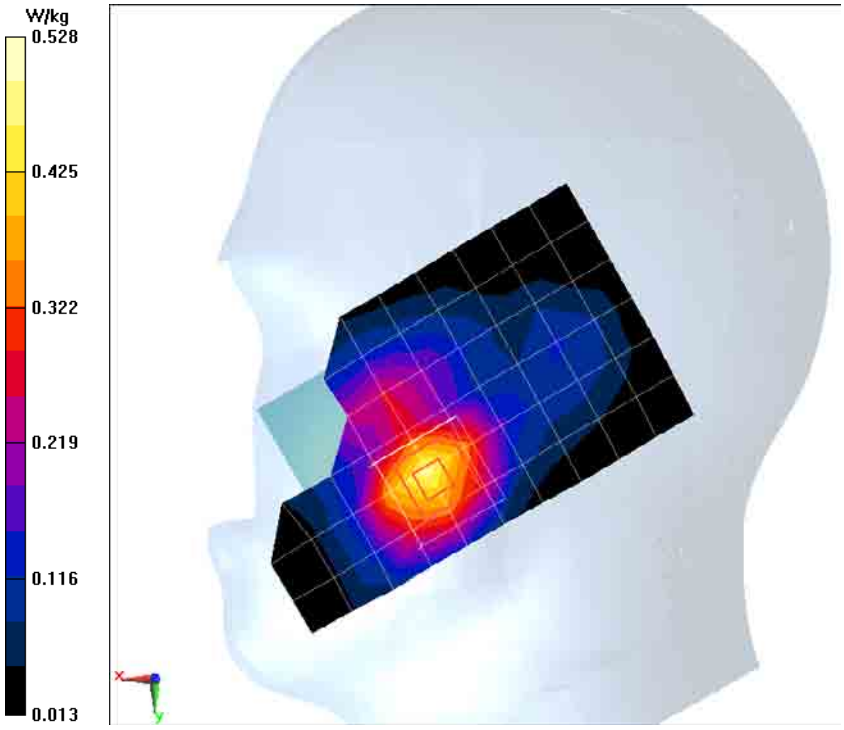
GSM1900MHz Right Cheek Low

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1800MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.373 S/m; ε_r = 40.159; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1800MHz; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Low Cheek Right GSM1900MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.608 W/kg
Low Cheek Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.951 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.840 W/kg
SAR(1 g) = 0.576 W/kg; SAR(10 g) = 0.352 W/kg
Maximum value of SAR (measured) = 0.625 W/kg



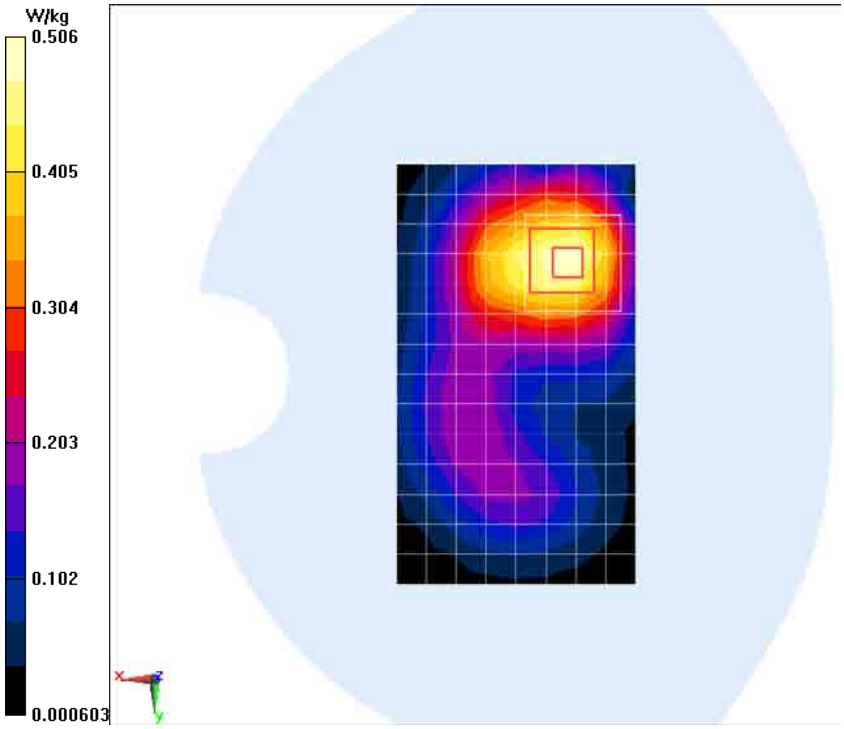
GSM1900MHz Right Cheek High

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1800MHz
Medium parameters used (extrapolated): f = 1908 MHz; σ = 1.391 S/m; ε_r = 39.62; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1800MHz; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
High Cheek Right GSM1900MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.489 W/kg
High Cheek Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.865 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.479 W/kg; SAR(10 g) = 0.291 W/kg
Maximum value of SAR (measured) = 0.528 W/kg



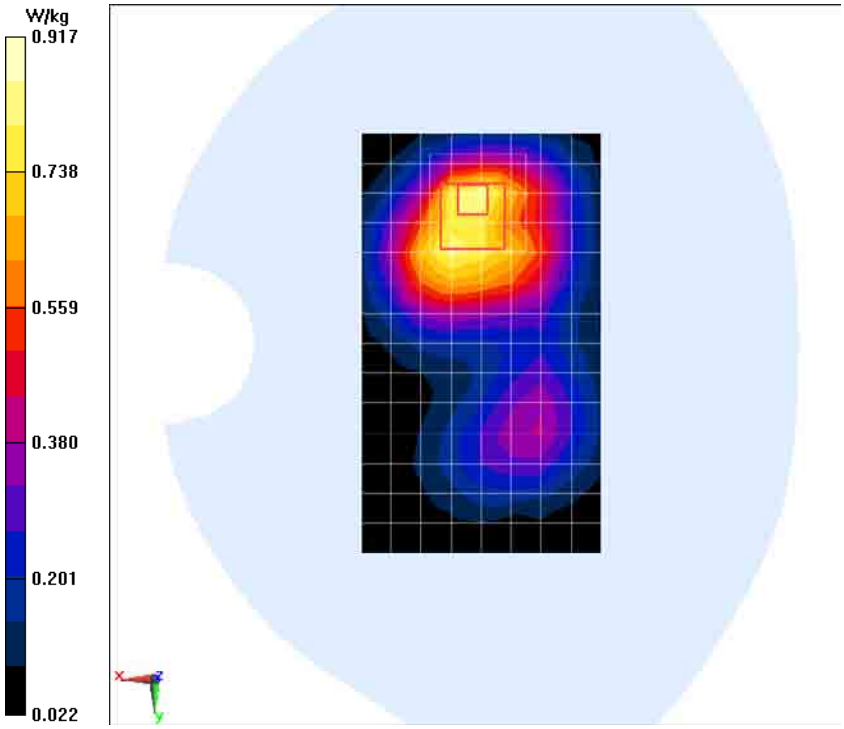
GSM 1900MHz GPRS 4TS Body Toward Phantom Middle

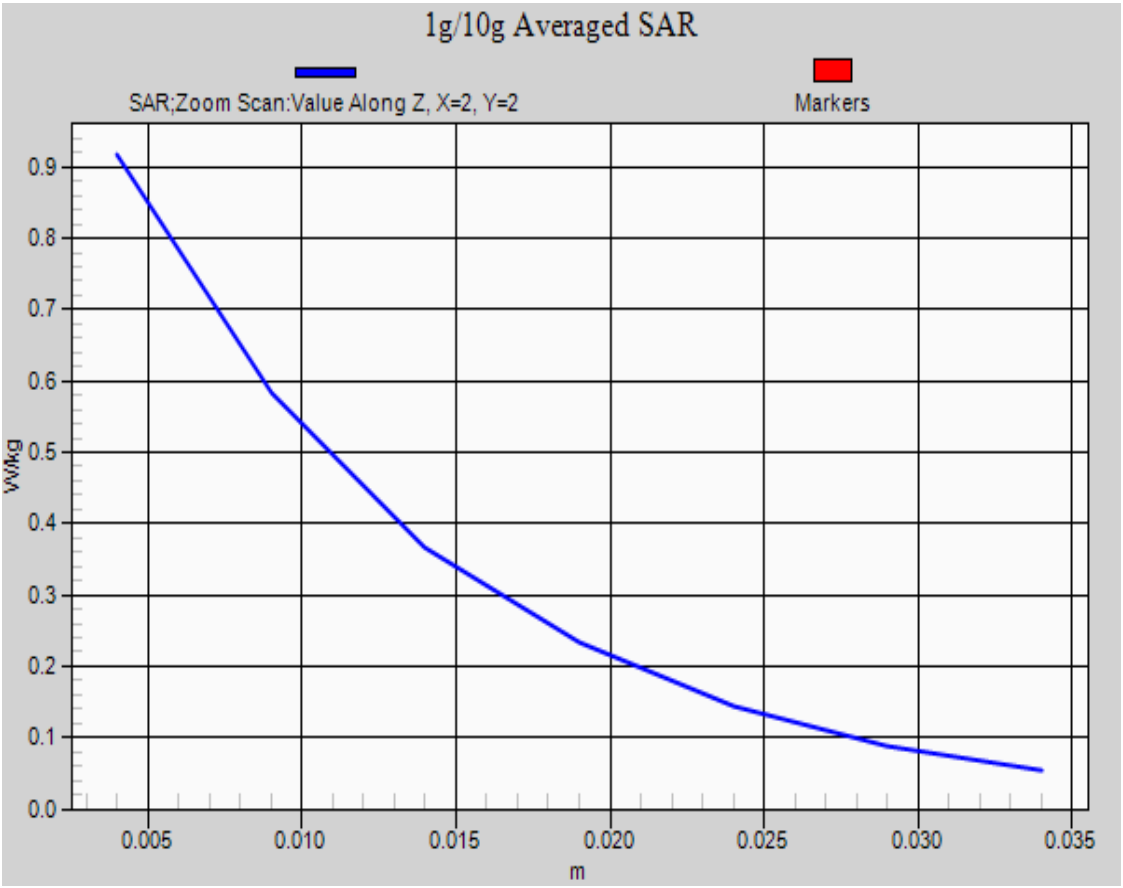
Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Toward Phantom GPRS 4TS 1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.499 W/kg
Middle Toward Phantom GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.464 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.770 W/kg
SAR(1 g) = 0.471 W/kg; SAR(10 g) = 0.287 W/kg
Maximum value of SAR (measured) = 0.506 W/kg



GSM 1900MHz GPRS 4TS Body Toward Ground Middle

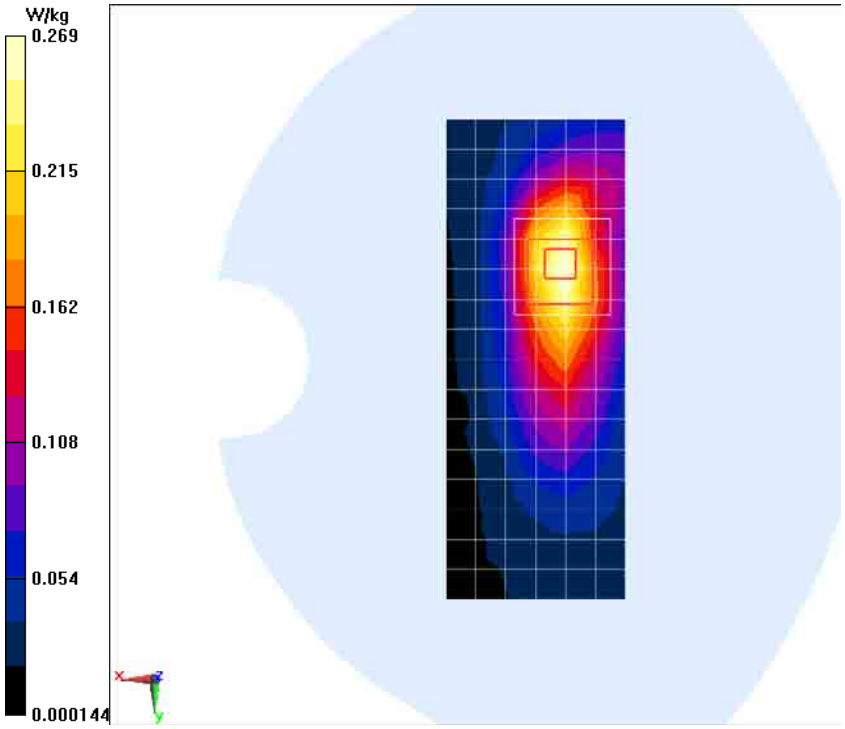
Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Toward Ground GPRS 4TS 1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.866 W/kg
Middle Toward Ground GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.587 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.817 W/kg; SAR(10 g) = 0.482 W/kg
Maximum value of SAR (measured) = 0.917 W/kg




1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
W/kg
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

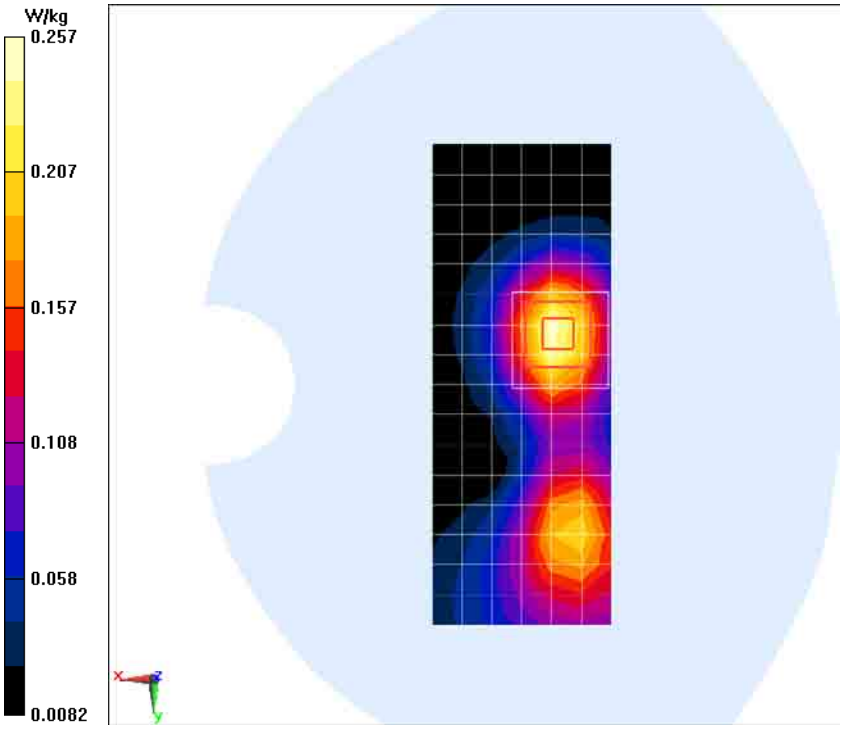
GSM 1900MHz GPRS 4TS Body Left Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Left GPRS 4TS 1900MHz/Area Scan (7x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.281 W/kg
Middle Left GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.813 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 0.485 W/kg
SAR(1 g) = 0.245 W/kg; SAR(10 g) = 0.145 W/kg
Maximum value of SAR (measured) = 0.269 W/kg



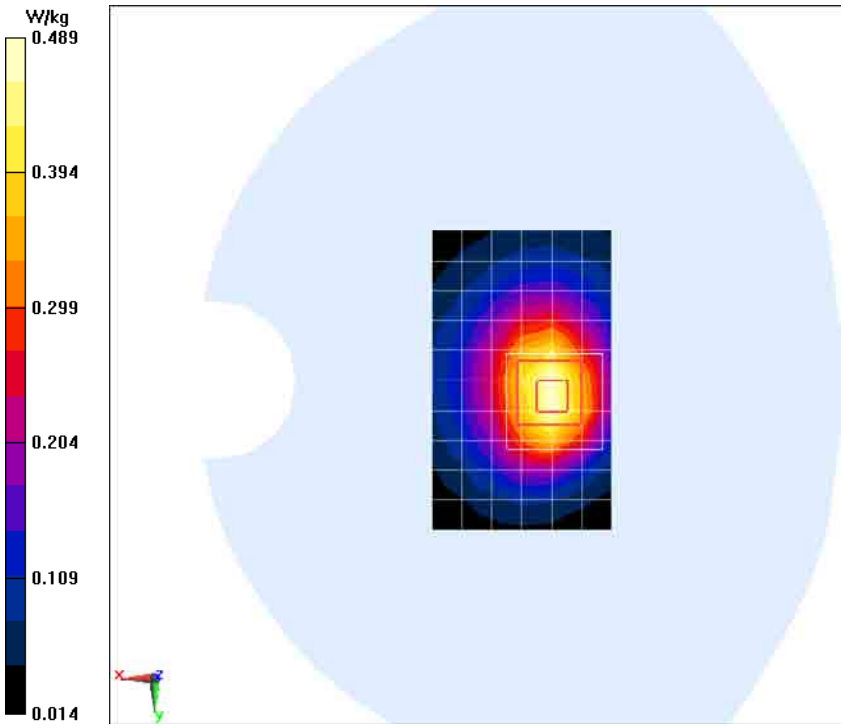
GSM 1900MHz GPRS 4TS Body Right Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Right GPRS 4TS 1900MHz/Area Scan (7x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.251 W/kg
Middle Right GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.875 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.364 W/kg
SAR(1 g) = 0.231 W/kg; SAR(10 g) = 0.138 W/kg
Maximum value of SAR (measured) = 0.257 W/kg



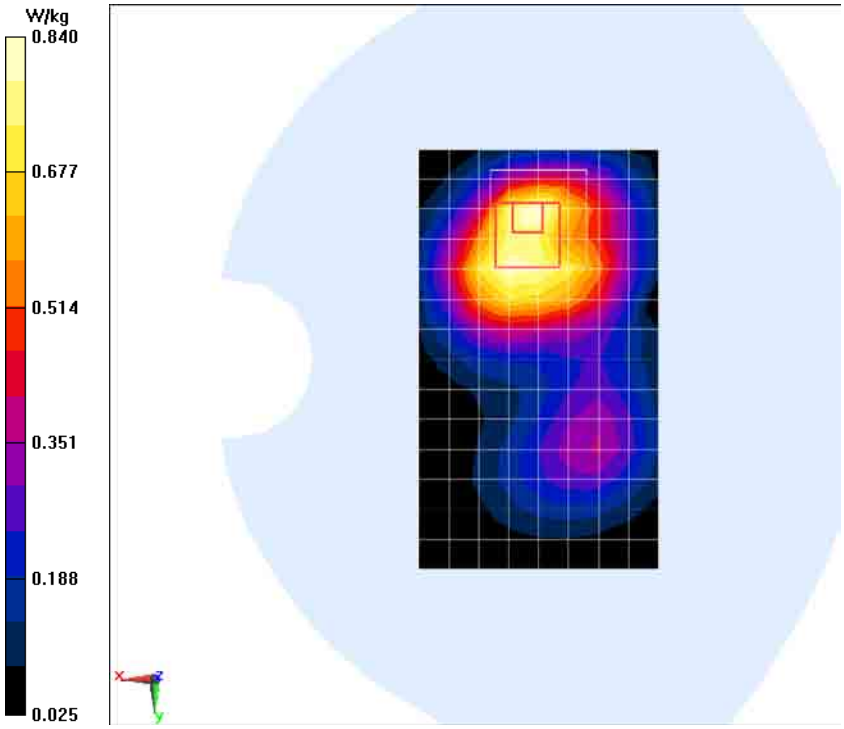
GSM 1900MHz GPRS 4TS Body Bottom Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Bottom GPRS 4TS 1900MHz/Area Scan (7x11x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.489 W/kg
Middle Bottom GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.861 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.712 W/kg
SAR(1 g) = 0.451 W/kg; SAR(10 g) = 0.273 W/kg
Maximum value of SAR (measured) = 0.489 W/kg



GSM 1900MHz GPRS 4TS Body Toward Ground Low

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.475 S/m; ε_r = 53.44; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1850.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Low Toward Ground GPRS 4TS 1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.844 W/kg
Low Toward Ground GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.105 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.780 W/kg; SAR(10 g) = 0.482 W/kg
Maximum value of SAR (measured) = 0.840 W/kg

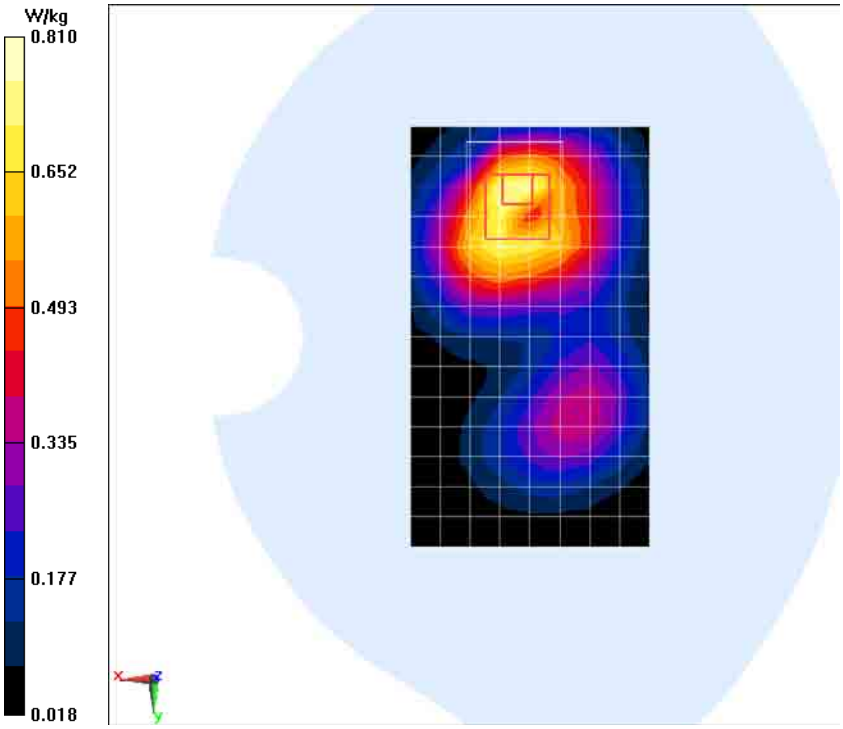


GSM 1900MHz GPRS 4TS Body Toward Ground High

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.534 S/m; ε_r = 53.187; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1909.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012

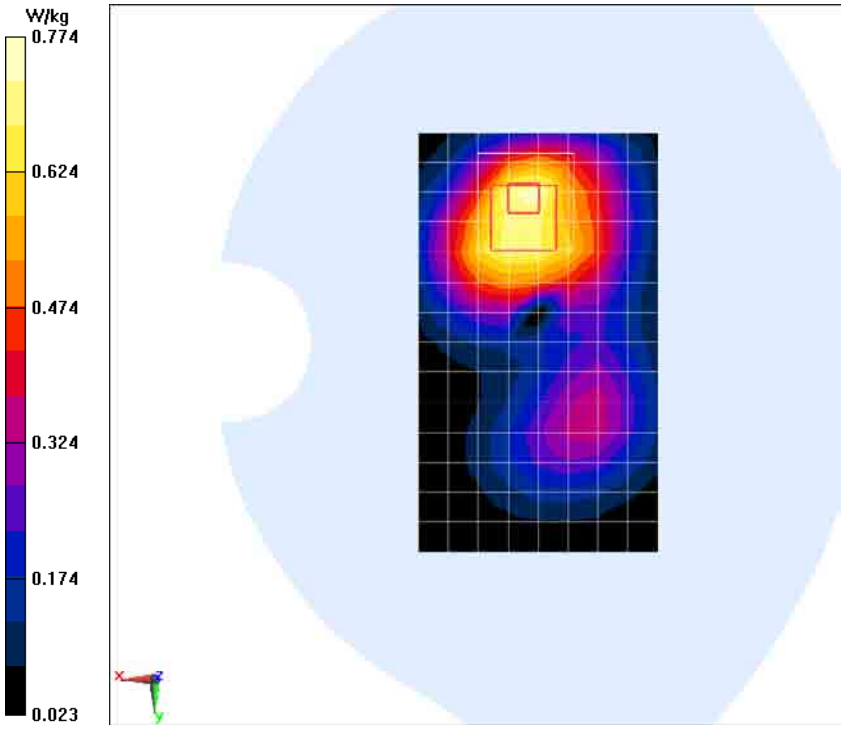
High Toward Ground GPRS 4TS 1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.768 W/kg

High Toward Ground GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.670 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.731 W/kg; SAR(10 g) = 0.448 W/kg
Maximum value of SAR (measured) = 0.810 W/kg



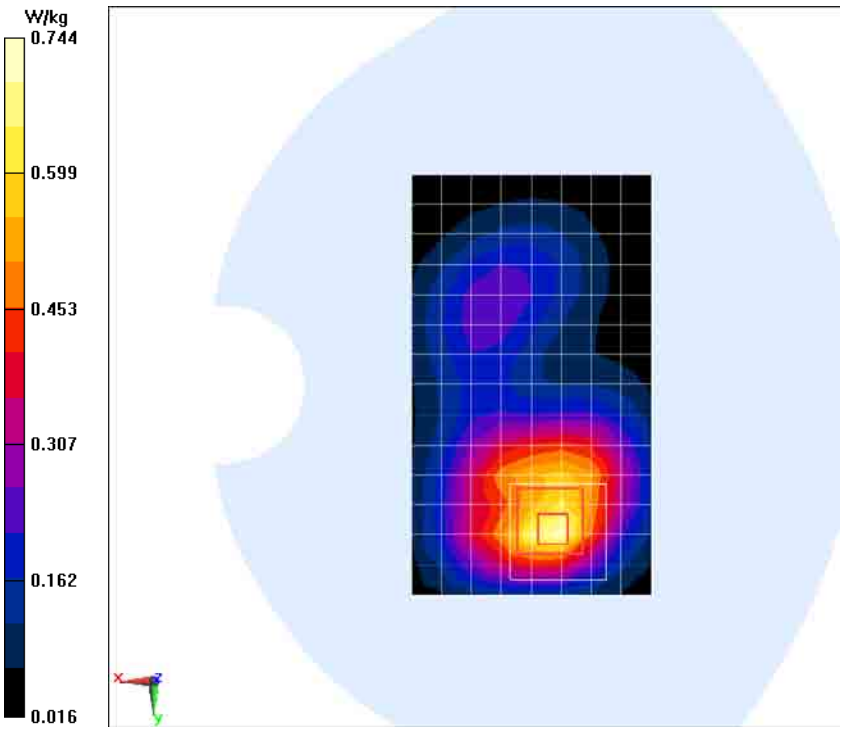
GSM 1900MHz E-GPRS 4TS Body Toward Ground Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Toward Ground E-GPRS 4TS 1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.748 W/kg
Middle Toward Ground E-GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.603 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.707 W/kg; SAR(10 g) = 0.440 W/kg
Maximum value of SAR (measured) = 0.774 W/kg



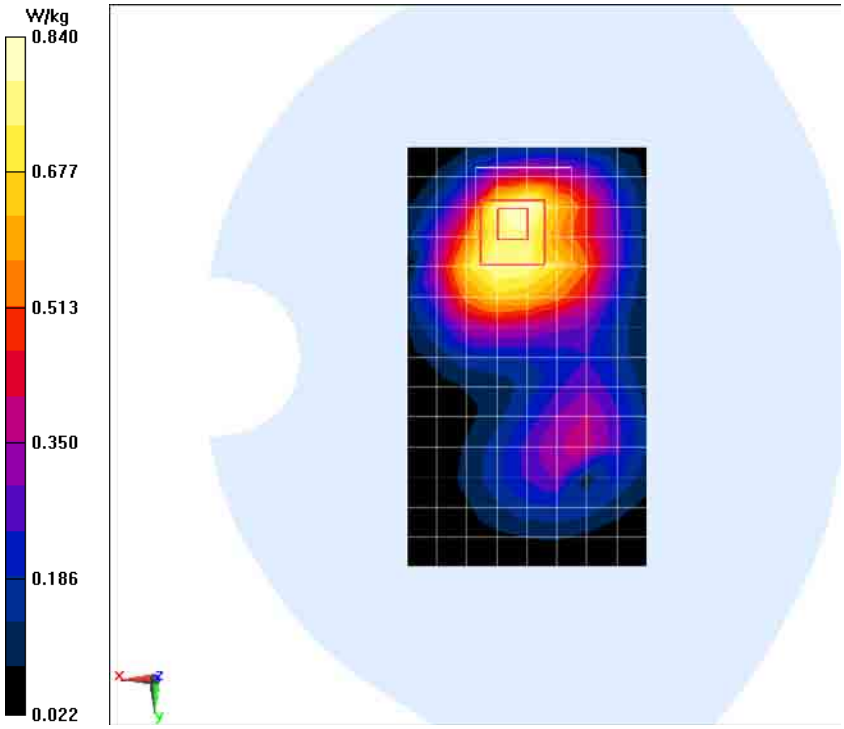
GSM1900MHz With Headset Body Toward Ground Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Toward Ground GSM1900MHz With Headset/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.724 W/kg
Middle Toward Ground GSM1900MHz With Headset/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.566 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.661 W/kg; SAR(10 g) = 0.390 W/kg
Maximum value of SAR (measured) = 0.744 W/kg



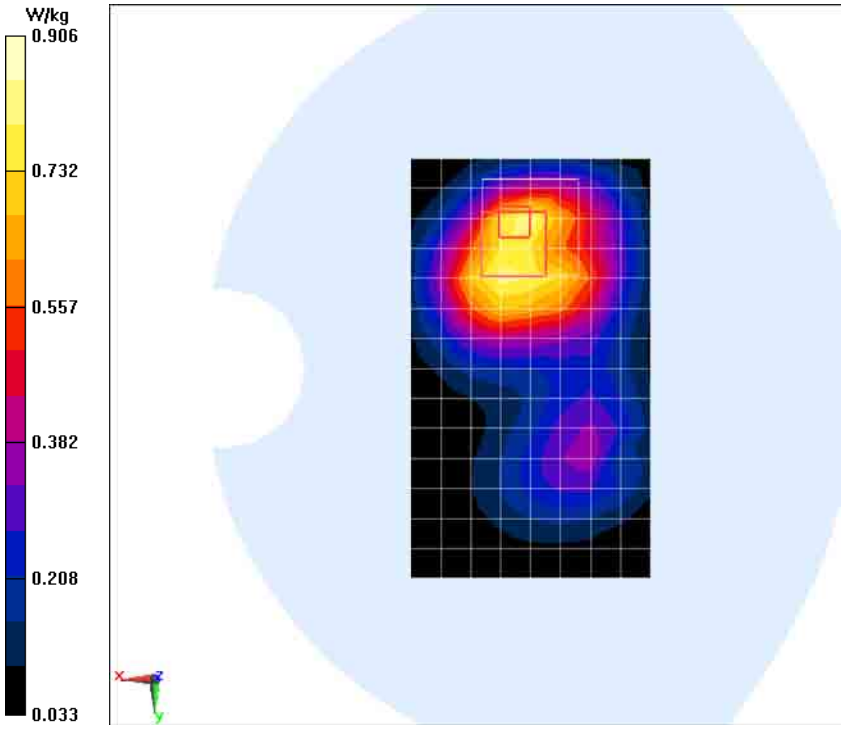
GSM 1900MHz 2 GPRS 4TS Body Toward Ground Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Toward Ground GPRS 4TS 1900MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.873 W/kg
Middle Toward Ground GPRS 4TS 1900MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.422 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.755 W/kg; SAR(10 g) = 0.464 W/kg
Maximum value of SAR (measured) = 0.840 W/kg



GSM 1900MHz 2 GPRS 4TS Body Toward Ground Low

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.475 S/m; ε_r = 53.44; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1850.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Low Toward Ground GPRS 4TS 1900MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.842 W/kg
Low Toward Ground GPRS 4TS 1900MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.038 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.818 W/kg; SAR(10 g) = 0.526 W/kg
Maximum value of SAR (measured) = 0.906 W/kg

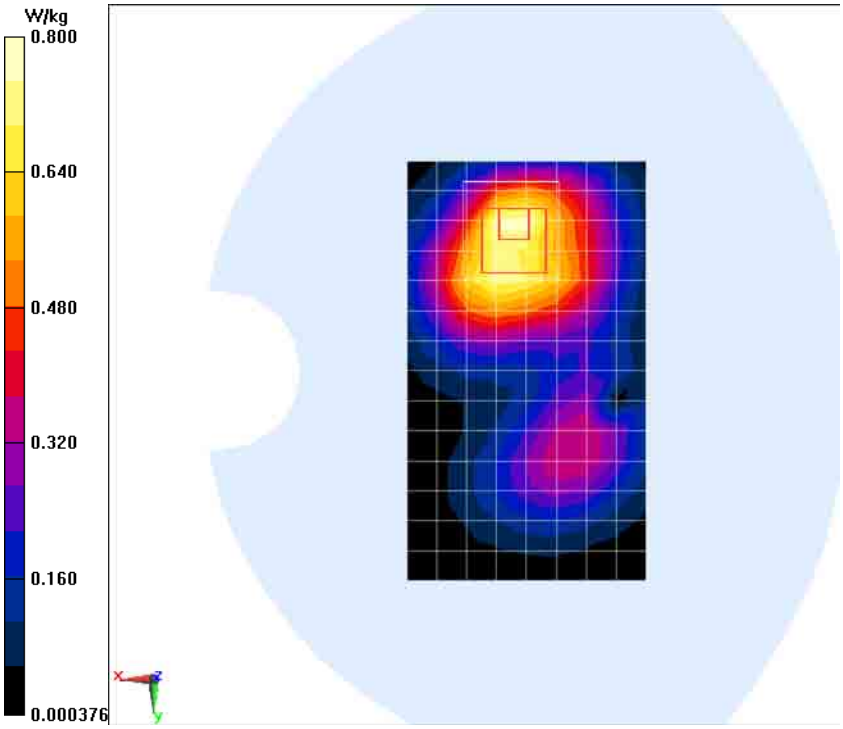


GSM 1900MHz 2 GPRS 4TS Body Toward Ground High

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.534 S/m; ε_r = 53.187; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1909.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012

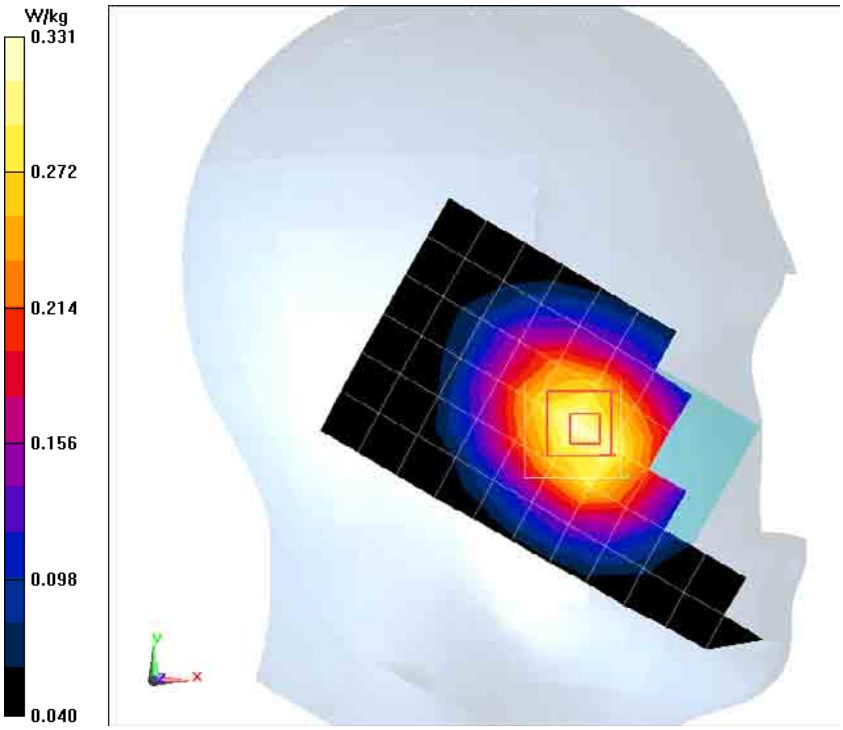
High Toward Ground GPRS 4TS 1900MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.779 W/kg

High Toward Ground GPRS 4TS 1900MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.737 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.735 W/kg; SAR(10 g) = 0.449 W/kg
Maximum value of SAR (measured) = 0.800 W/kg



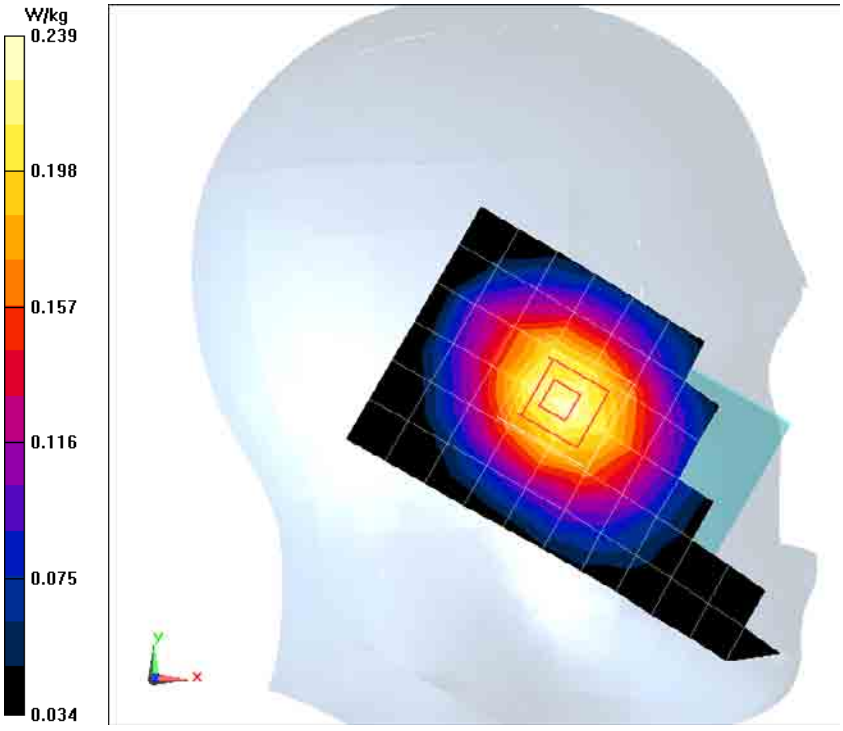
WCDMA835MHz Left Cheek Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Cheek Left WCDMA835MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.325 W/kg
Middle Cheek Left WCDMA835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.268 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.391 W/kg
SAR(1 g) = 0.313 W/kg; SAR(10 g) = 0.232 W/kg
Maximum value of SAR (measured) = 0.331 W/kg



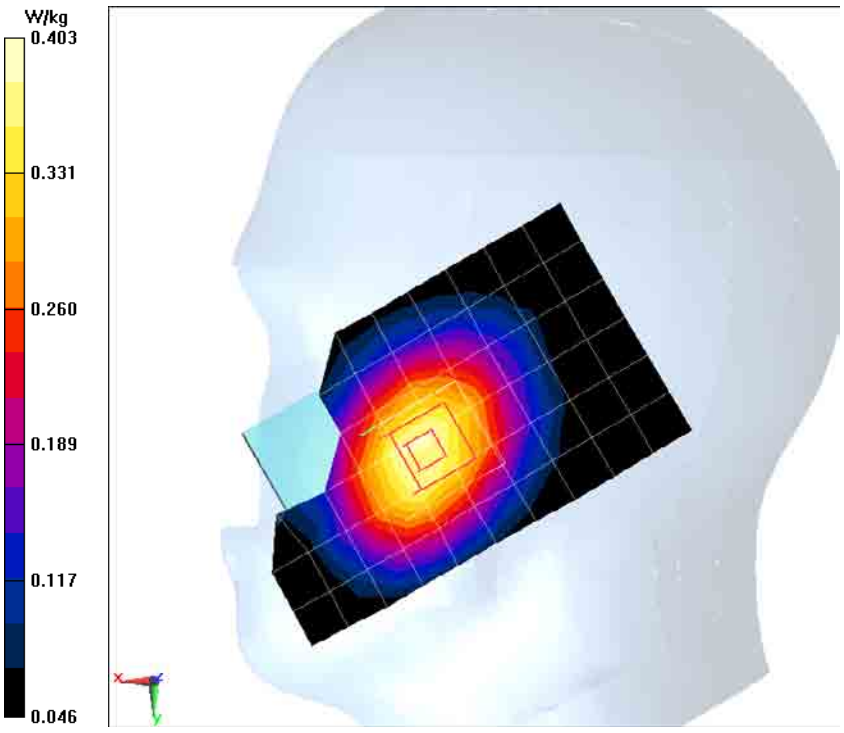
WCDMA835MHz Left Tilt Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Tilt Left WCDMA835MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.235 W/kg
Middle Tilt Left WCDMA835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.339 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.278 W/kg
SAR(1 g) = 0.226 W/kg; SAR(10 g) = 0.170 W/kg
Maximum value of SAR (measured) = 0.239 W/kg



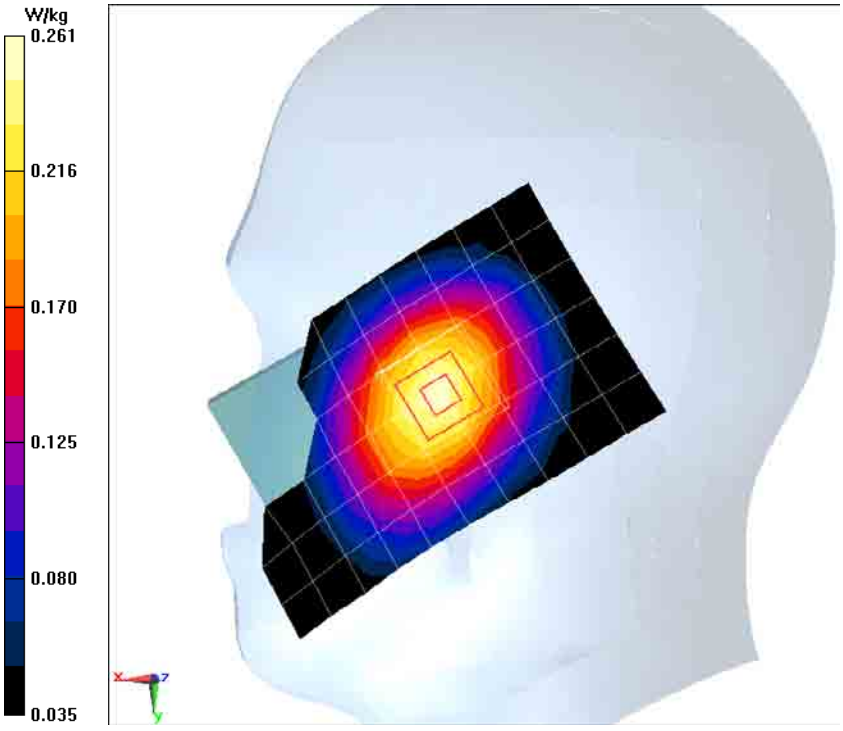
WCDMA835MHz Right Cheek Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Cheek Right WCDMA835MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.382 W/kg
Middle Cheek Right WCDMA835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.286 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.474 W/kg
SAR(1 g) = 0.381 W/kg; SAR(10 g) = 0.284 W/kg
Maximum value of SAR (measured) = 0.403 W/kg



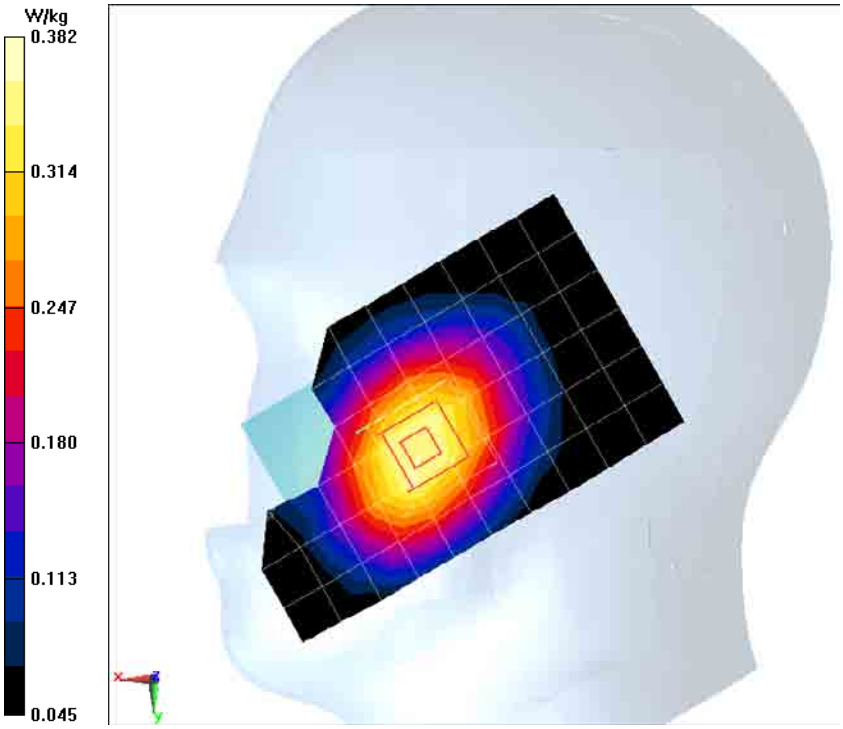
WCDMA835MHz Right Tilt Middle

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Tilt Right WCDMA835MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.265 W/kg
Middle Tilt Right WCDMA835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.327 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.305 W/kg
SAR(1 g) = 0.247 W/kg; SAR(10 g) = 0.186 W/kg
Maximum value of SAR (measured) = 0.261 W/kg



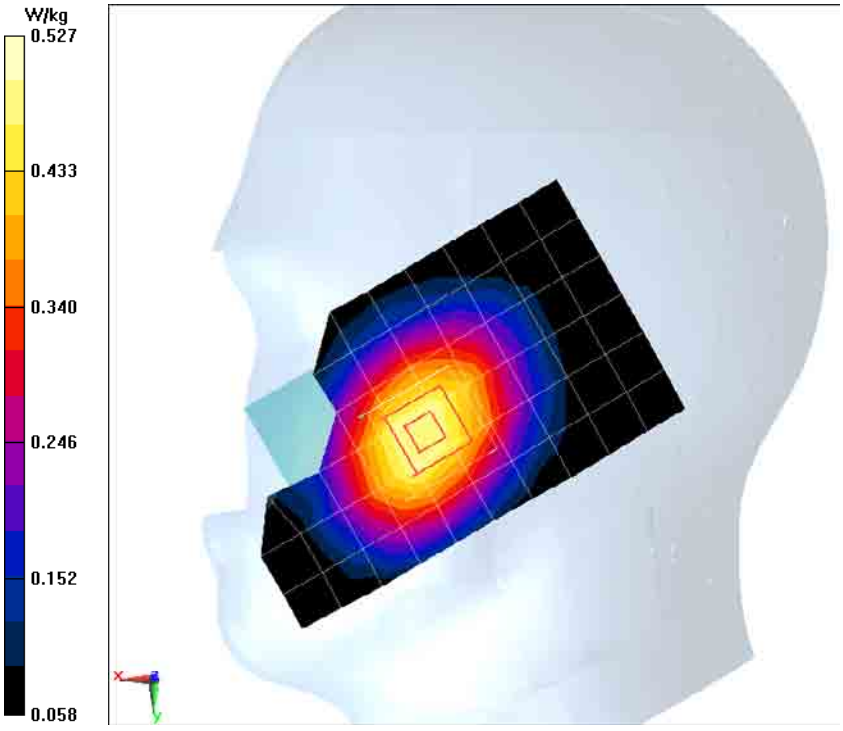
WCDMA835MHz Right Cheek Low

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.911 S/m; ε_r = 41.264; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 826.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Low Cheek Right WCDMA835MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.361 W/kg
Low Cheek Right WCDMA835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.442 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.448 W/kg
SAR(1 g) = 0.362 W/kg; SAR(10 g) = 0.271 W/kg
Maximum value of SAR (measured) = 0.382 W/kg



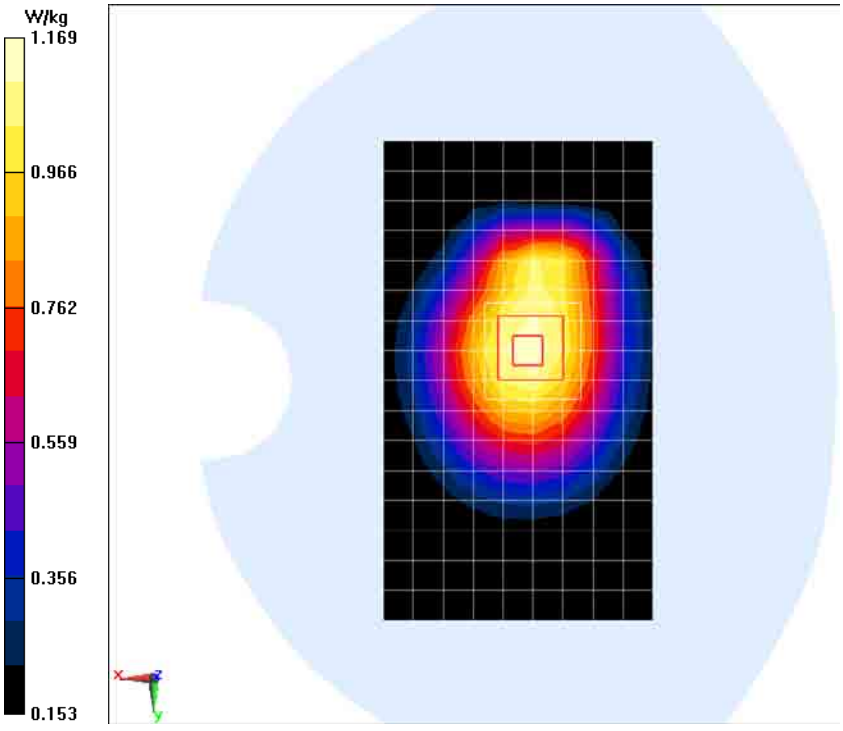
WCDMA835MHz Right Cheek High

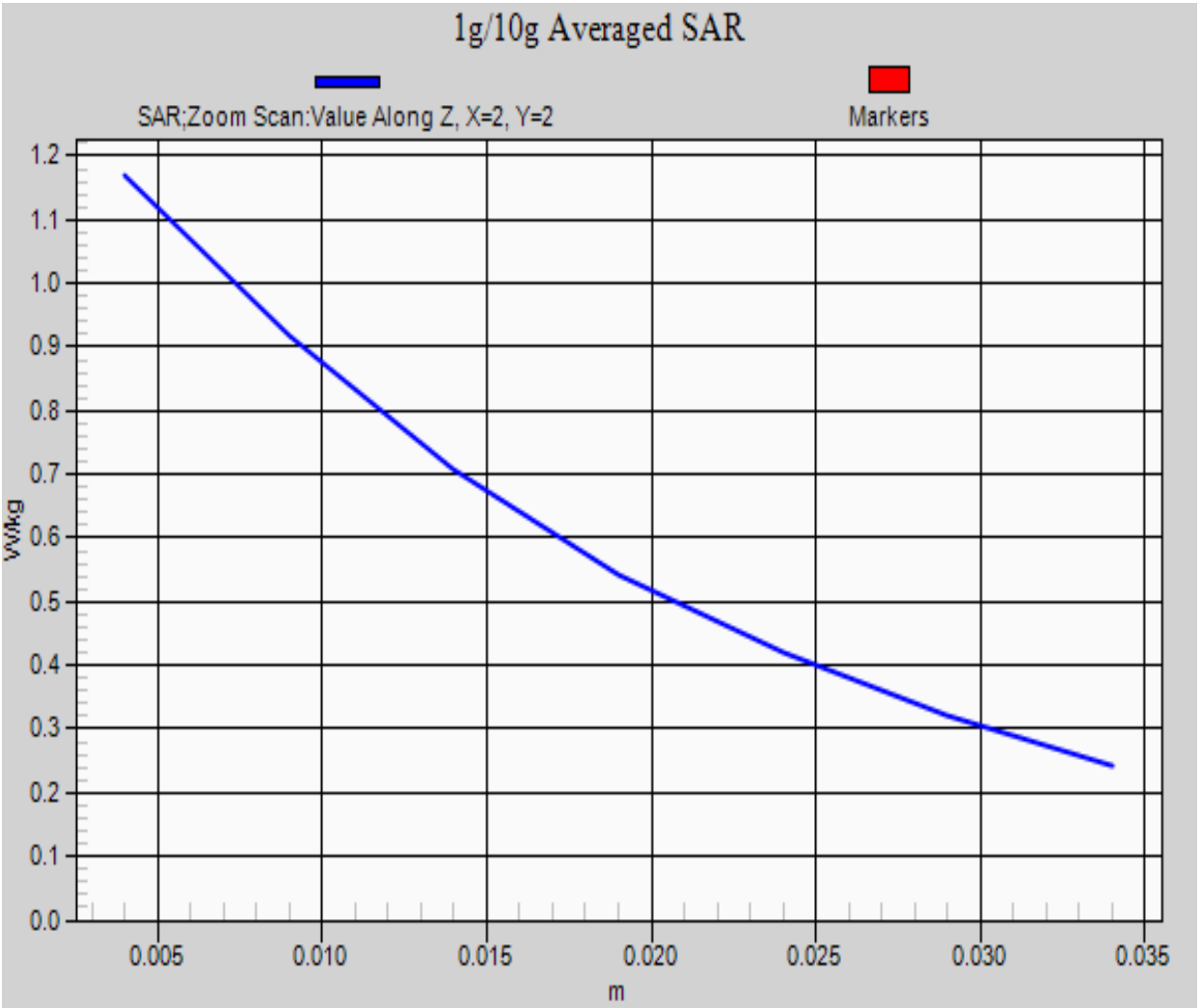
Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 847 MHz; σ = 0.927 S/m; ε_r = 40.809; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 846.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
High Cheek Right WCDMA835MHz/Area Scan (12x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.497 W/kg
High Cheek Right WCDMA835MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.407 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.624 W/kg
SAR(1 g) = 0.500 W/kg; SAR(10 g) = 0.372 W/kg
Maximum value of SAR (measured) = 0.527 W/kg



WCDMA850MHz Body Toward Ground Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Toward Ground WCDMA850MHz/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.17 W/kg
Middle Toward Ground WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.776 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.827 W/kg
Maximum value of SAR (measured) = 1.169 W/kg



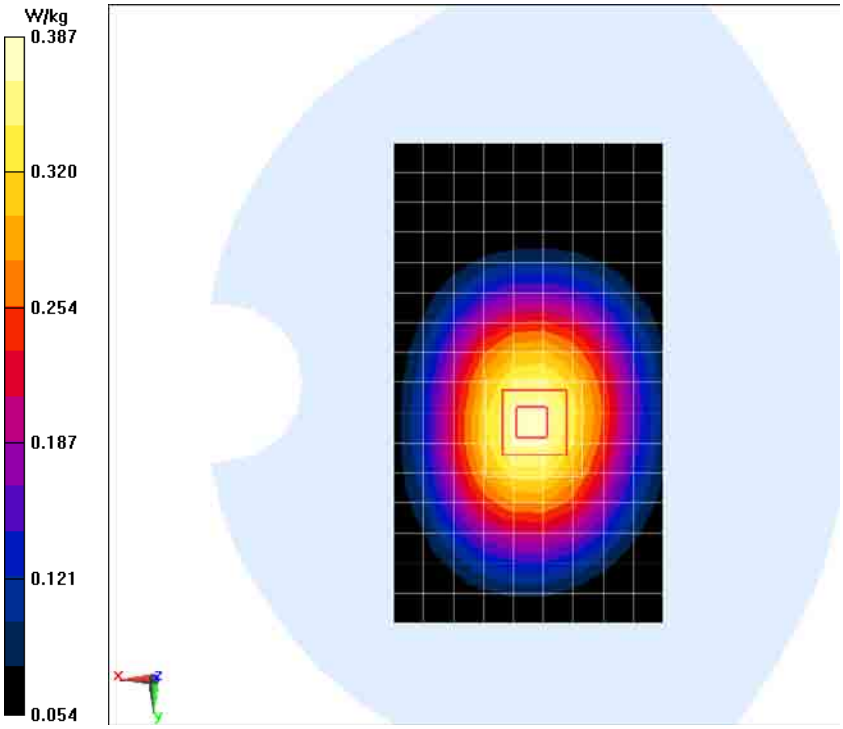

1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
W/kg
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850MHz Body Toward Phantom Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

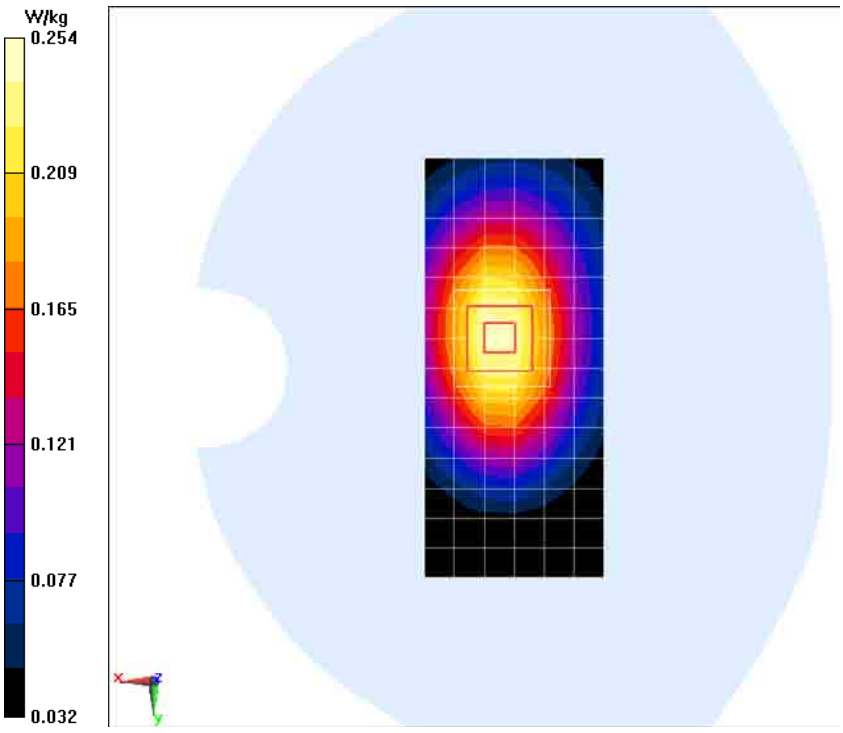
Middle Toward Phantom WCDMA850MHz/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.377 W/kg

Middle Toward Phantom WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.221 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.454 W/kg
SAR(1 g) = 0.367 W/kg; SAR(10 g) = 0.277 W/kg
Maximum value of SAR (measured) = 0.387 W/kg



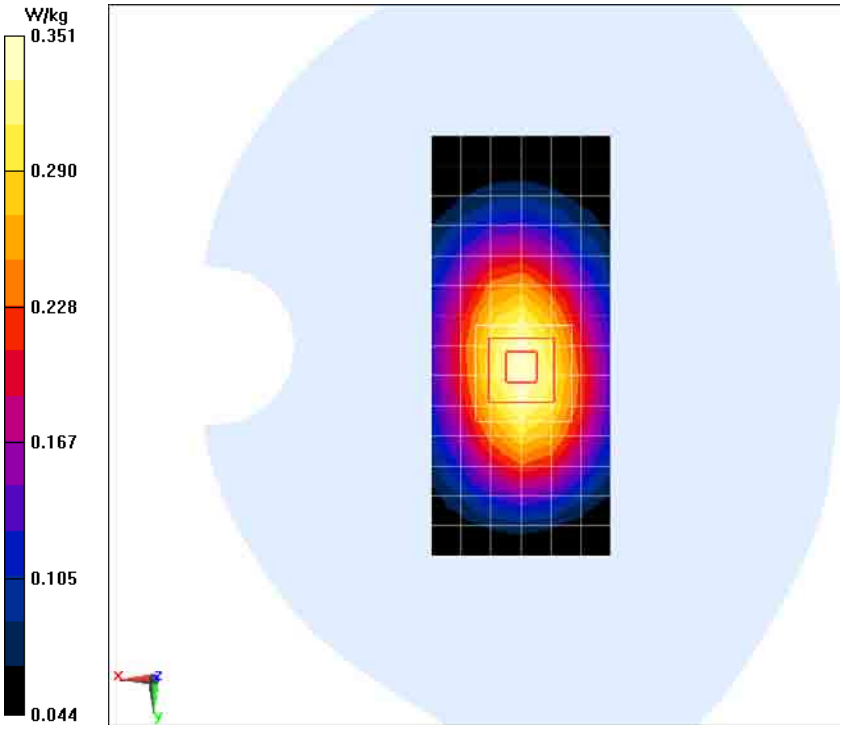
WCDMA850MHz Body Left Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Left WCDMA850MHz/Area Scan (7x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.246 W/kg
Middle Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.591 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.320 W/kg
SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.168 W/kg
Maximum value of SAR (measured) = 0.254 W/kg



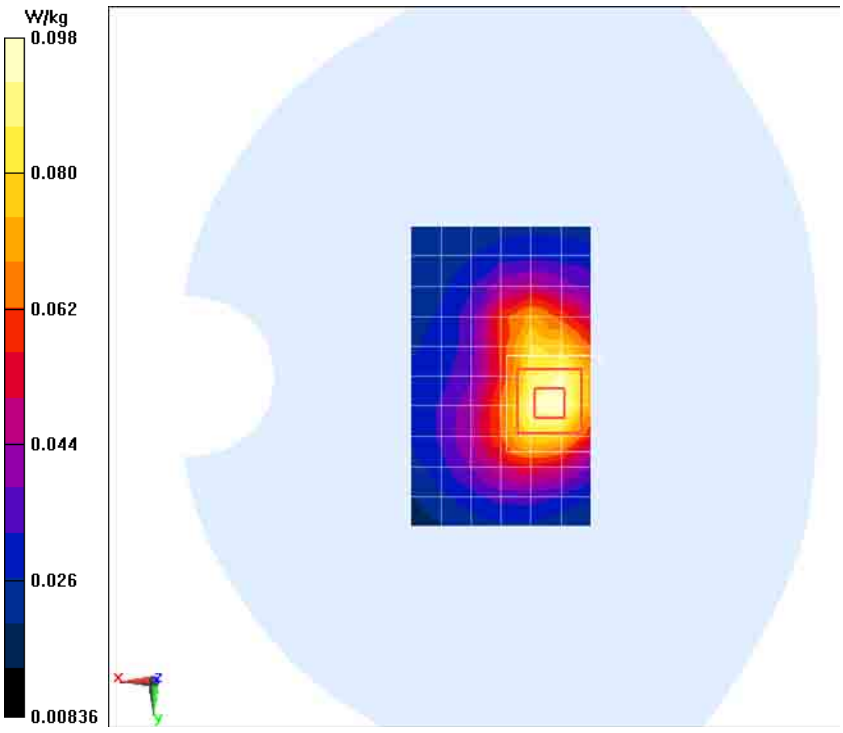
WCDMA850MHz Body Right Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Right WCDMA850MHz/Area Scan (7x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.354 W/kg
Middle Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.876 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.438 W/kg
SAR(1 g) = 0.330 W/kg; SAR(10 g) = 0.237 W/kg
Maximum value of SAR (measured) = 0.351 W/kg



WCDMA850MHz Body Bottom Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Bottom WCDMA850MHz/Area Scan (7x11x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.0976 W/kg
Middle Bottom WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.869 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 0.133 W/kg
SAR(1 g) = 0.091 W/kg; SAR(10 g) = 0.061 W/kg
Maximum value of SAR (measured) = 0.0982 W/kg

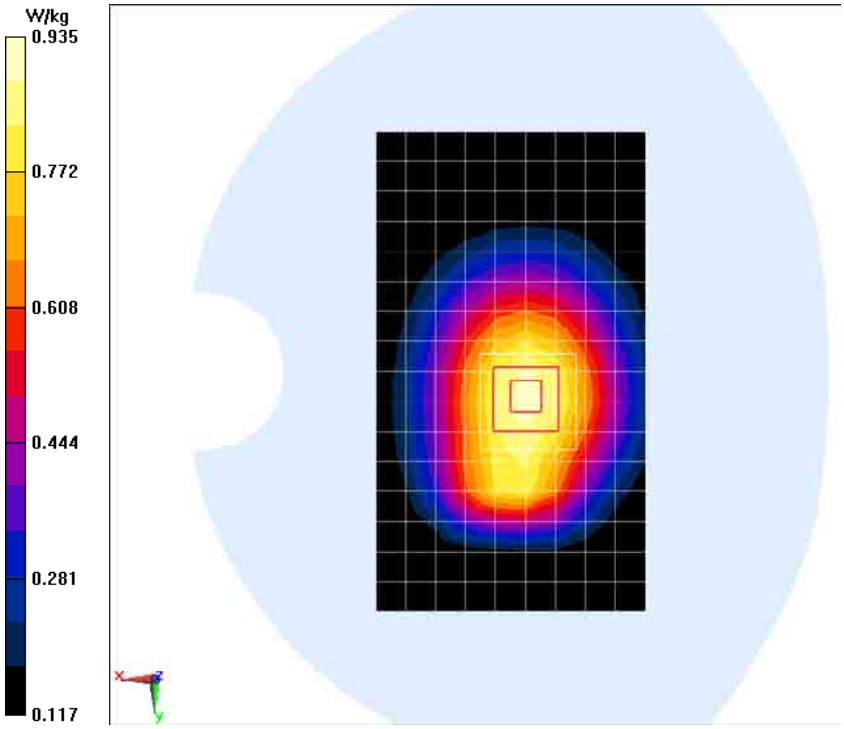


WCDMA850MHz Body Toward Ground Low

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.994 S/m; ε_r = 55.147; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 826.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

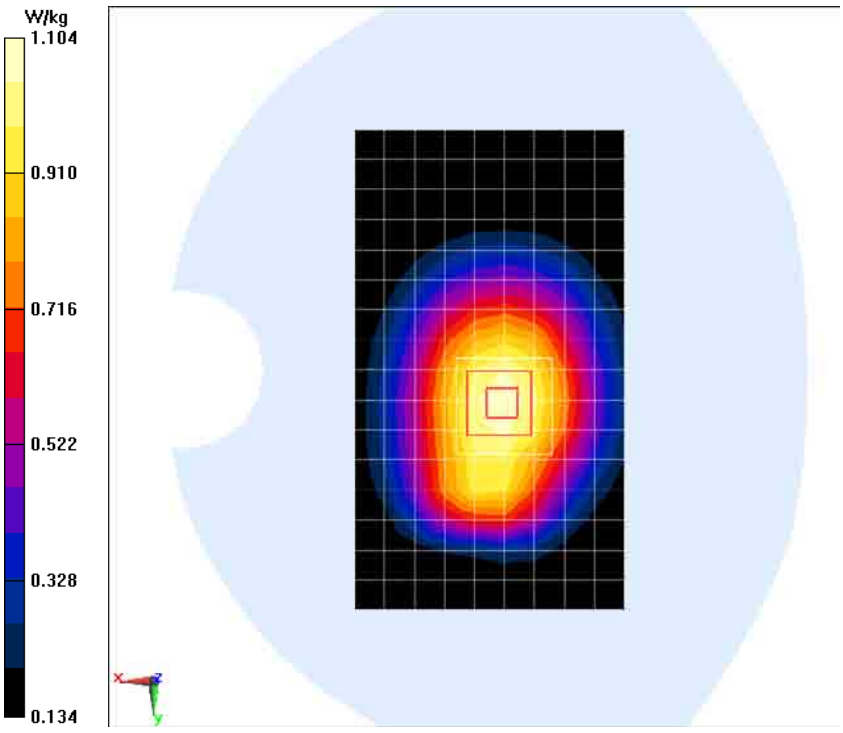
Low Toward Ground WCDMA850MHz/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.927 W/kg

Low Toward Ground WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.706 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.886 W/kg; SAR(10 g) = 0.661 W/kg
Maximum value of SAR (measured) = 0.935 W/kg



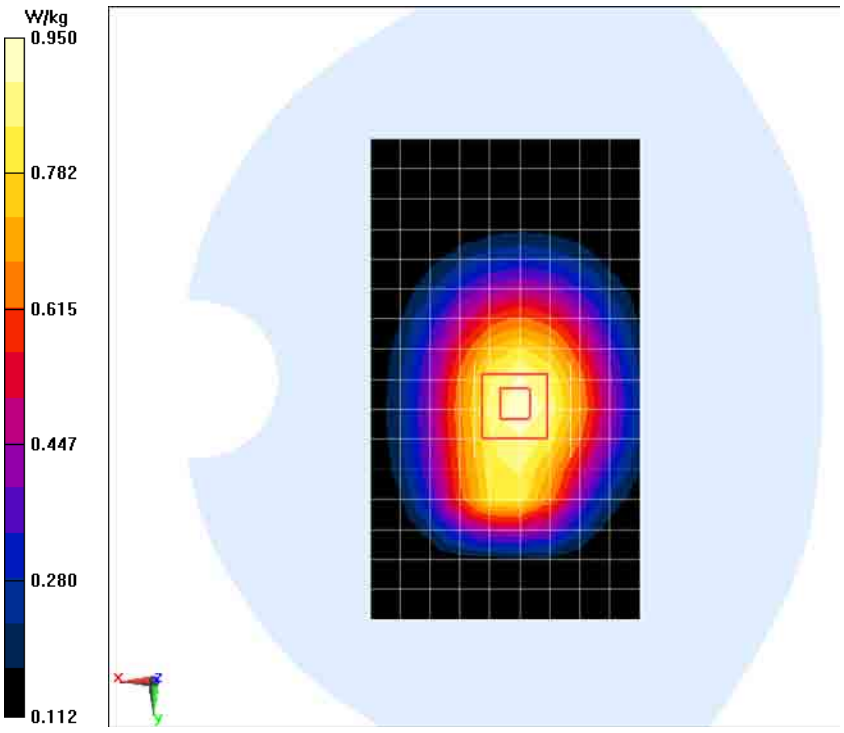
WCDMA850MHz Body Toward Ground High

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 847 MHz; σ = 1.012 S/m; ε_r = 55.214; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 846.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
High Toward Ground WCDMA850MHz/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.11 W/kg
High Toward Ground WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.619 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.781 W/kg
Maximum value of SAR (measured) = 1.10 W/kg



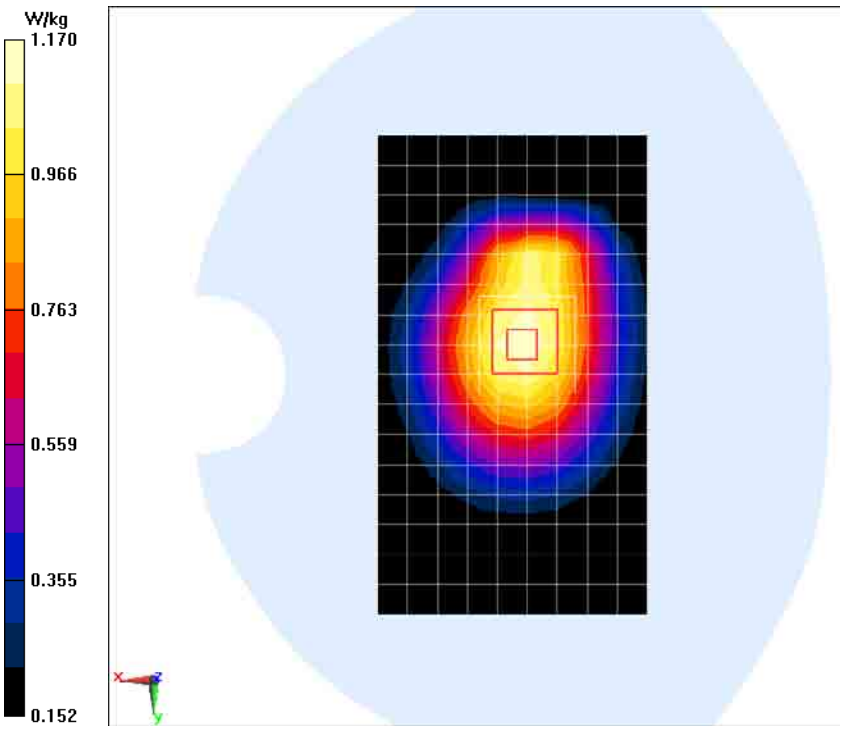
WCDMA850MHz With Headset Body Toward Ground Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Toward Ground WCDMA850MHz With Headset/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.943 W/kg
Middle Toward Ground WCDMA850MHz With Headset/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.283 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.907 W/kg; SAR(10 g) = 0.677 W/kg
Maximum value of SAR (measured) = 0.950 W/kg



WCDMA850MHz 2 Body Toward Ground Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Toward Ground WCDMA850MHz 2/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.17 W/kg
Middle Toward Ground WCDMA850MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.644 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 1.10 W/kg; SAR(10 g) = 0.828 W/kg
Maximum value of SAR (measured) = 1.17 W/kg

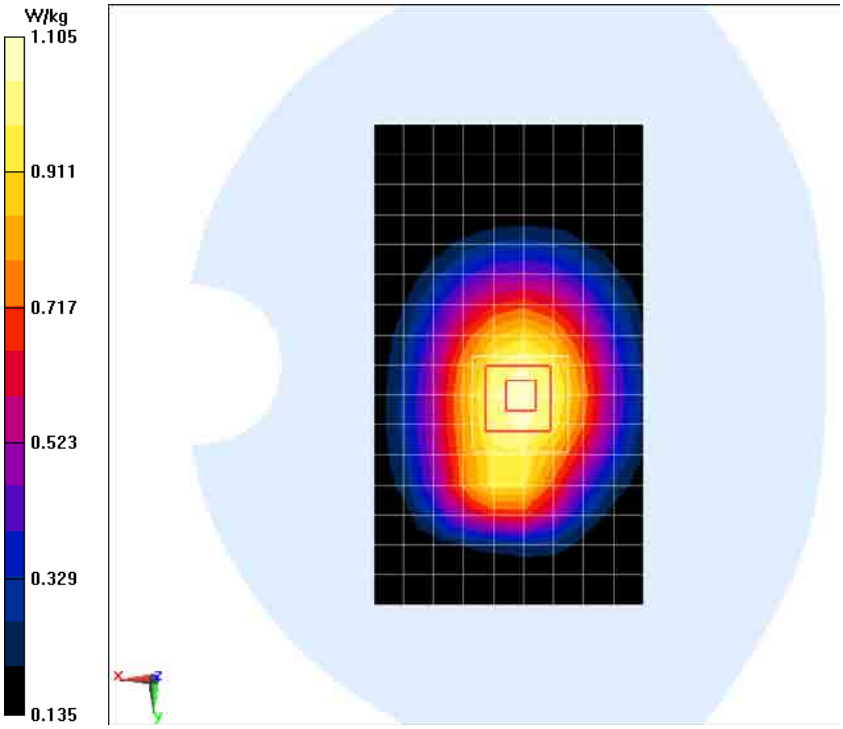


WCDMA850MHz 2 Body Toward Ground High

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 847 MHz; σ = 1.012 S/m; ε_r = 55.214; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 846.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

High Toward Ground WCDMA850MHz 2/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.09 W/kg

High Toward Ground WCDMA850MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.517 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.782 W/kg
Maximum value of SAR (measured) = 1.11 W/kg

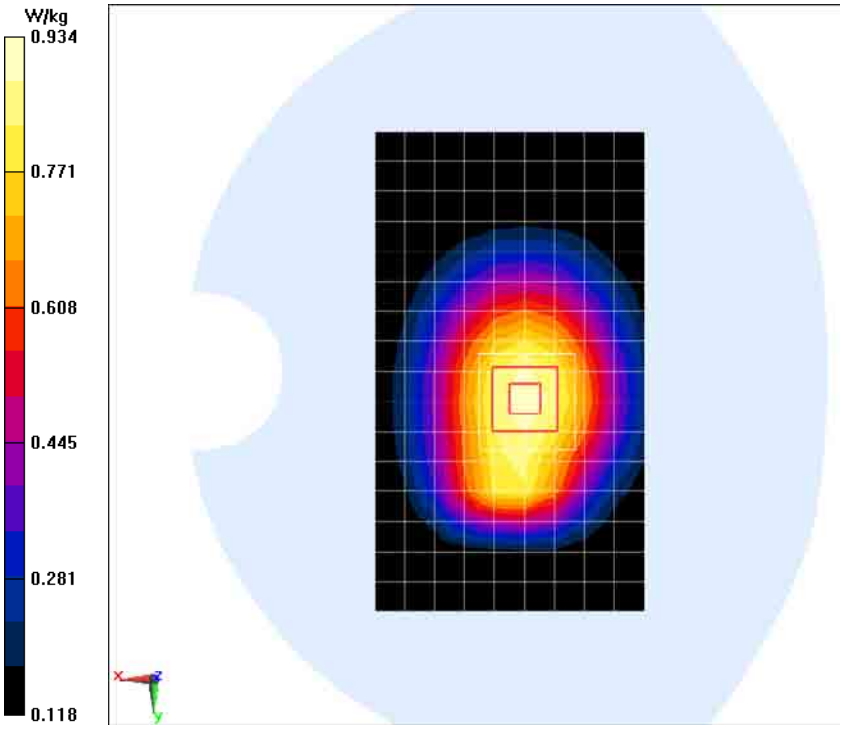


WCDMA850MHz 2 Body Toward Ground Low

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.994 S/m; ε_r = 55.147; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 826.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012

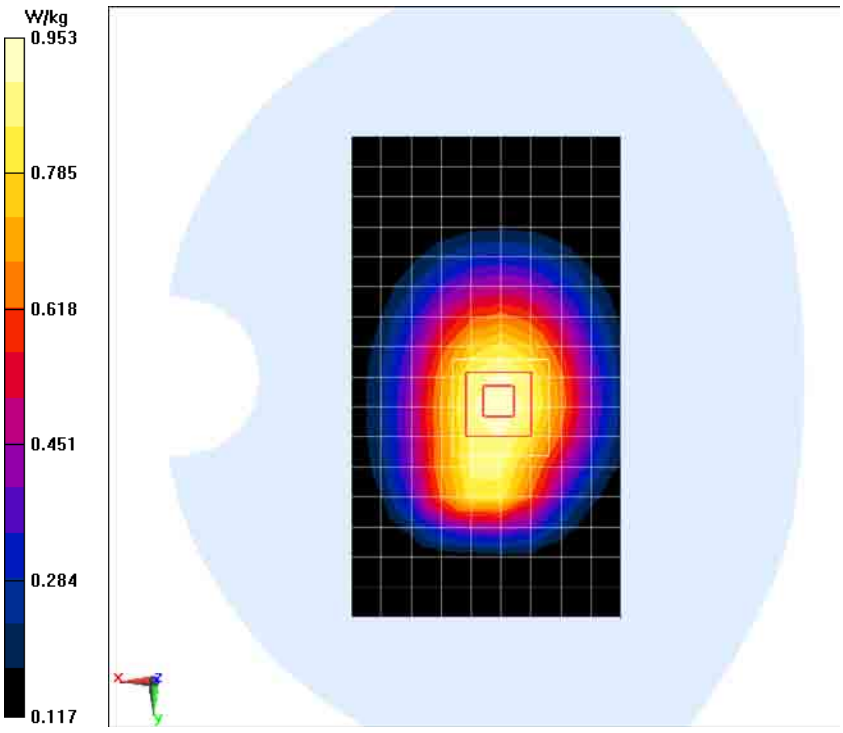
Low Toward Ground WCDMA850MHz 2/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.932 W/kg

Low Toward Ground WCDMA850MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.204 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.884 W/kg; SAR(10 g) = 0.661 W/kg
Maximum value of SAR (measured) = 0.934 W/kg



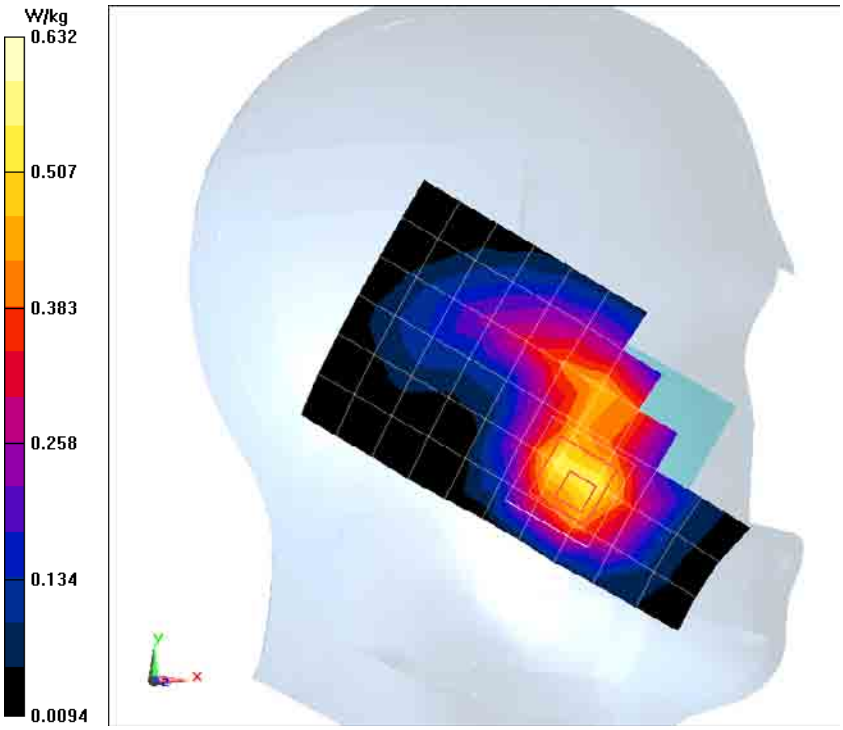
WCDMA850MHz With Headset 2 Body Toward Ground Middle

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA 835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Toward Ground WCDMA850MHz With Headset 2/Area Scan (10x17x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.956 W/kg
Middle Toward Ground WCDMA850MHz With Headset 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.461 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.902 W/kg; SAR(10 g) = 0.675 W/kg
Maximum value of SAR (measured) = 0.953 W/kg



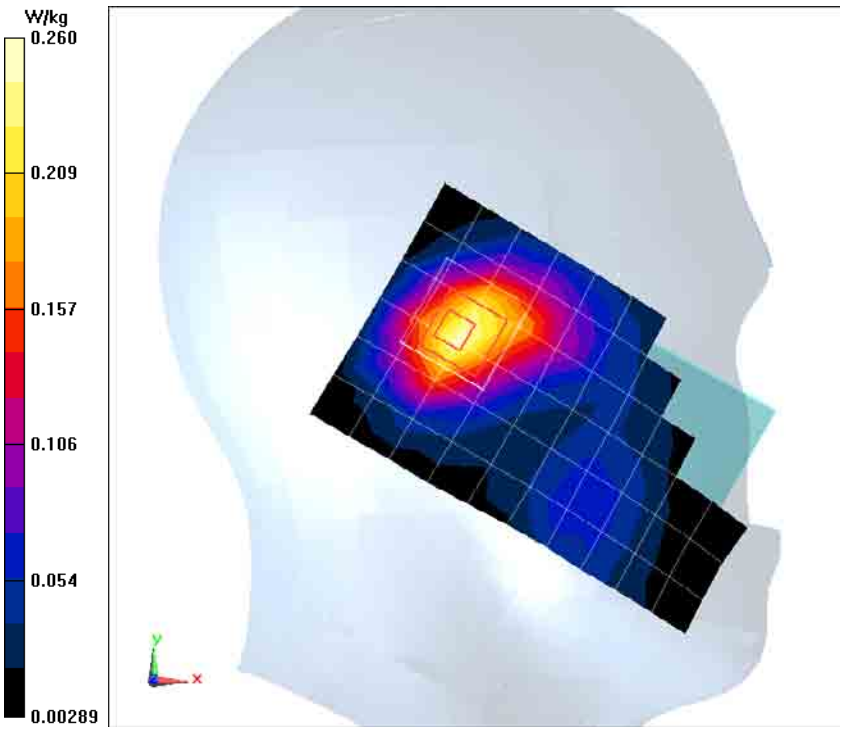
WCDMA1900MHz Left Cheek Middle

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Middle Cheek Left WCDMA1900MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.560 W/kg
Middle Cheek Left WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.407 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.985 W/kg
SAR(1 g) = 0.586 W/kg; SAR(10 g) = 0.334 W/kg
Maximum value of SAR (measured) = 0.632 W/kg



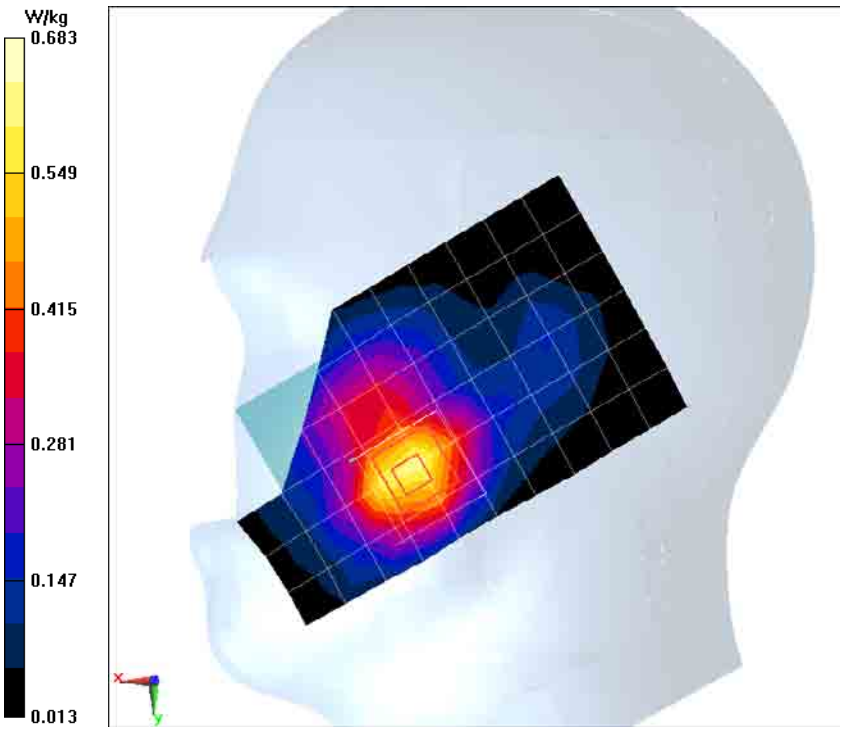
WCDMA1900MHz Left Tilt Middle

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Middle Tilt Left WCDMA1900MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.255 W/kg
Middle Tilt Left WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.859 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.390 W/kg
SAR(1 g) = 0.241 W/kg; SAR(10 g) = 0.142 W/kg
Maximum value of SAR (measured) = 0.260 W/kg



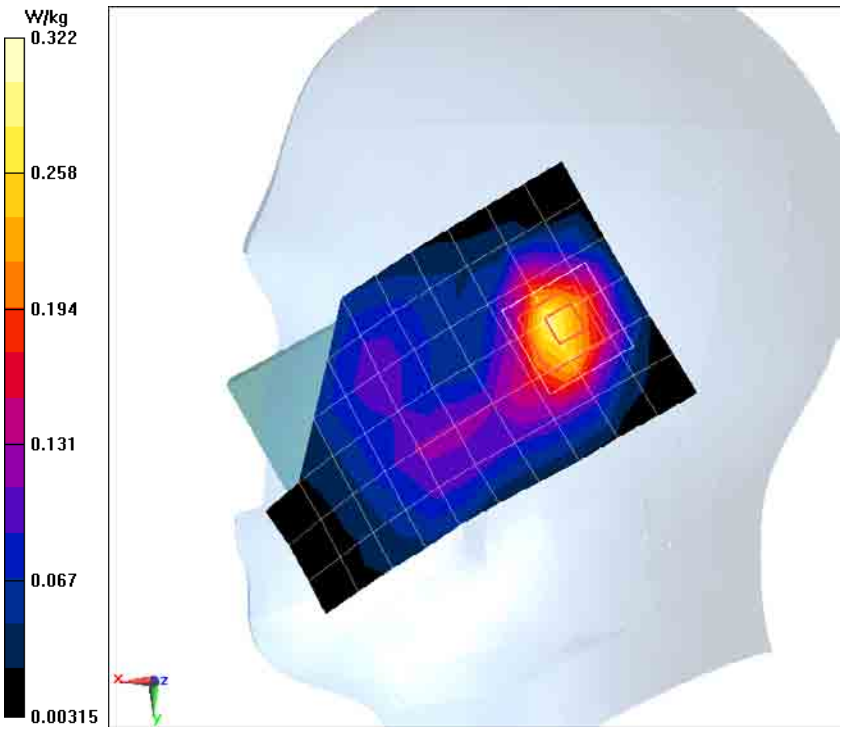
WCDMA1900MHz Right Cheek Middle

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Middle Cheek Right WCDMA1900MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.637 W/kg
Middle Cheek Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.954 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.929 W/kg
SAR(1 g) = 0.623 W/kg; SAR(10 g) = 0.377 W/kg
Maximum value of SAR (measured) = 0.683 W/kg



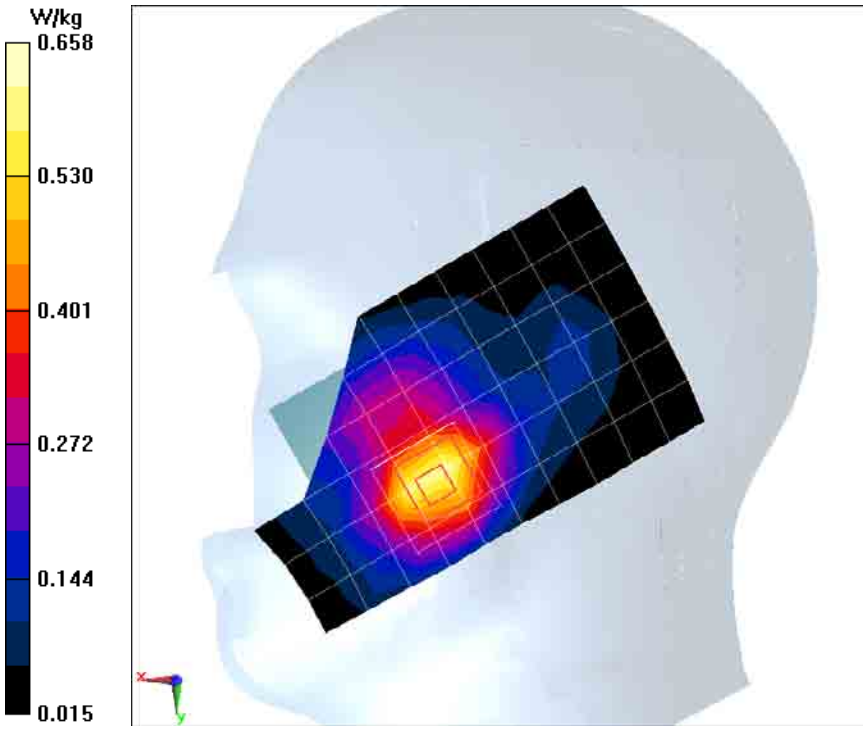
WCDMA1900MHz Right Tilt Middle

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Middle Tilt Right WCDMA1900MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.295 W/kg
Middle Tilt Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.352 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.474 W/kg
SAR(1 g) = 0.291 W/kg; SAR(10 g) = 0.165 W/kg
Maximum value of SAR (measured) = 0.322 W/kg



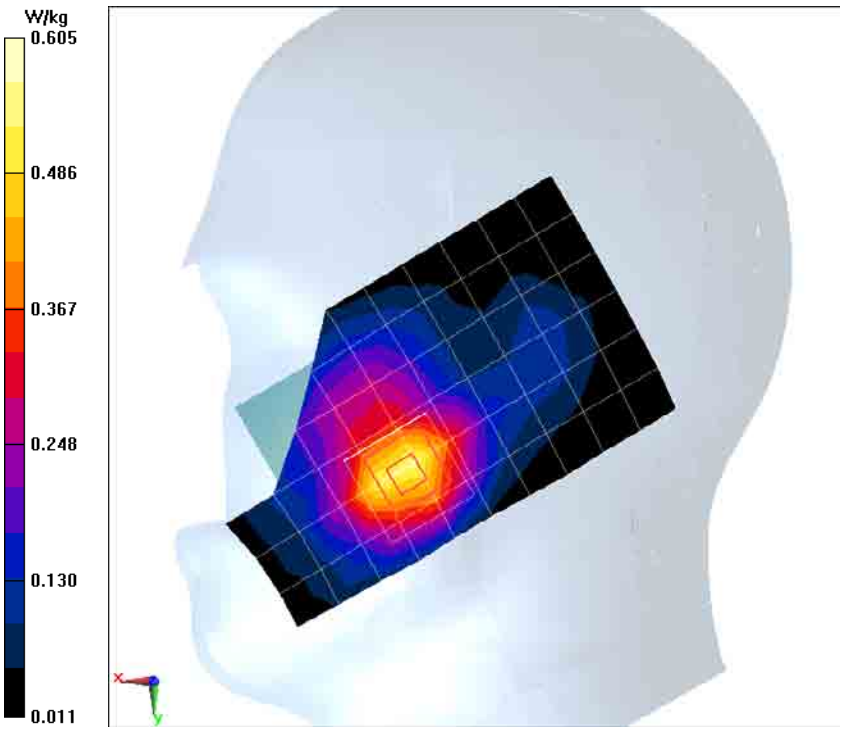
WCDMA1900MHz Right Cheek Low

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.373 S/m; ε_r = 40.159; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Low Cheek Right WCDMA1900MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.651 W/kg
Low Cheek Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.706 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.931 W/kg
SAR(1 g) = 0.606 W/kg; SAR(10 g) = 0.381 W/kg
Maximum value of SAR (measured) = 0.658 W/kg



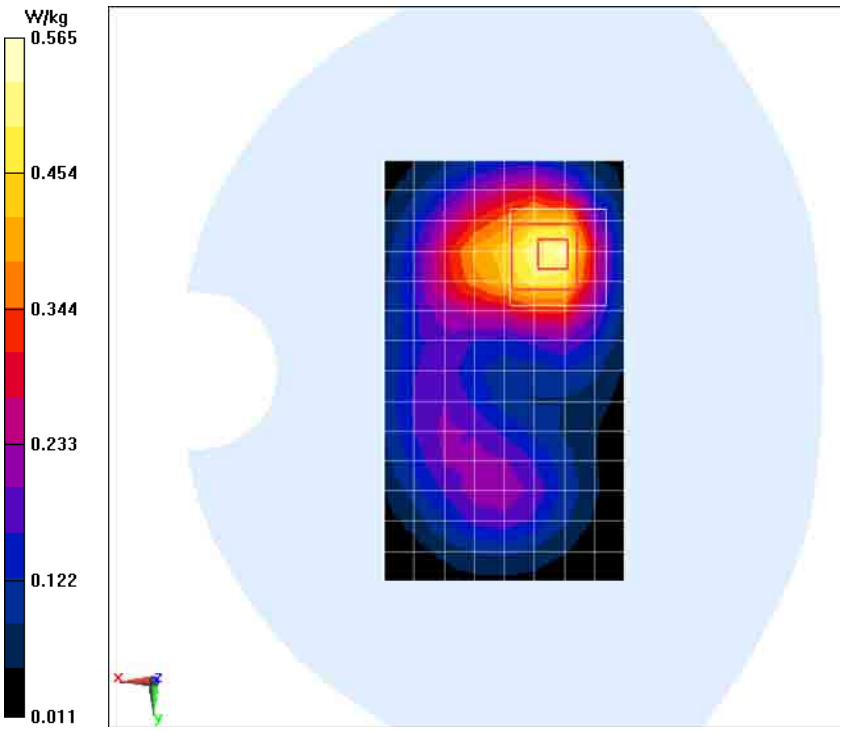
WCDMA1900MHz Right Cheek High

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1908 MHz; σ = 1.391 S/m; ε_r = 39.62; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
High Cheek Right WCDMA1900MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.552 W/kg
High Cheek Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.809 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.831 W/kg
SAR(1 g) = 0.553 W/kg; SAR(10 g) = 0.332 W/kg
Maximum value of SAR (measured) = 0.605 W/kg



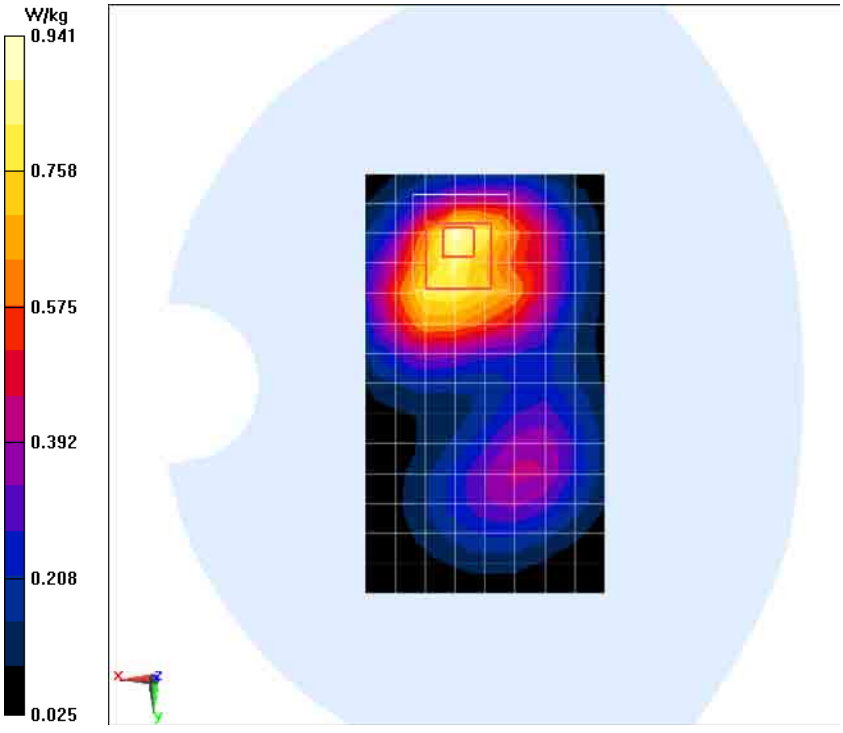
WCDMA1900MHz Body Toward Phantom Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Toward Phantom WCDMA1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.540 W/kg
Middle Toward Phantom WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.146 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.870 W/kg
SAR(1 g) = 0.519 W/kg; SAR(10 g) = 0.309 W/kg
Maximum value of SAR (measured) = 0.565 W/kg



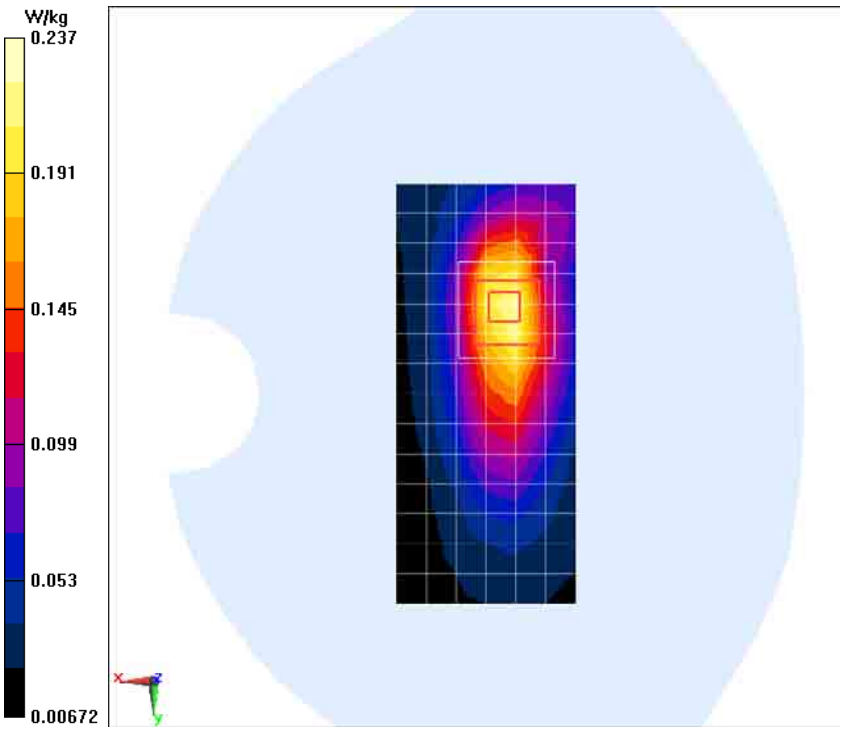
WCDMA1900MHz Body Toward Ground Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Toward Ground WCDMA1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.915 W/kg
Middle Toward Ground WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.807 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.841 W/kg; SAR(10 g) = 0.505 W/kg
Maximum value of SAR (measured) = 0.941 W/kg



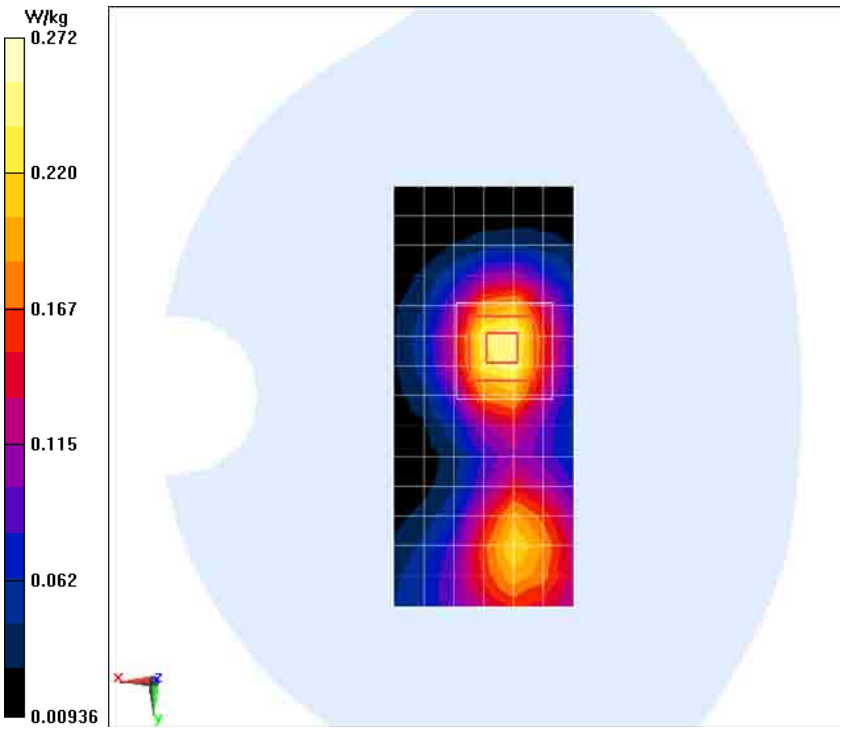
WCDMA1900MHz Body Left Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Left WCDMA1900MHz/Area Scan (7x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.225 W/kg
Middle Left WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.799 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.361 W/kg
SAR(1 g) = 0.214 W/kg; SAR(10 g) = 0.124 W/kg
Maximum value of SAR (measured) = 0.237 W/kg



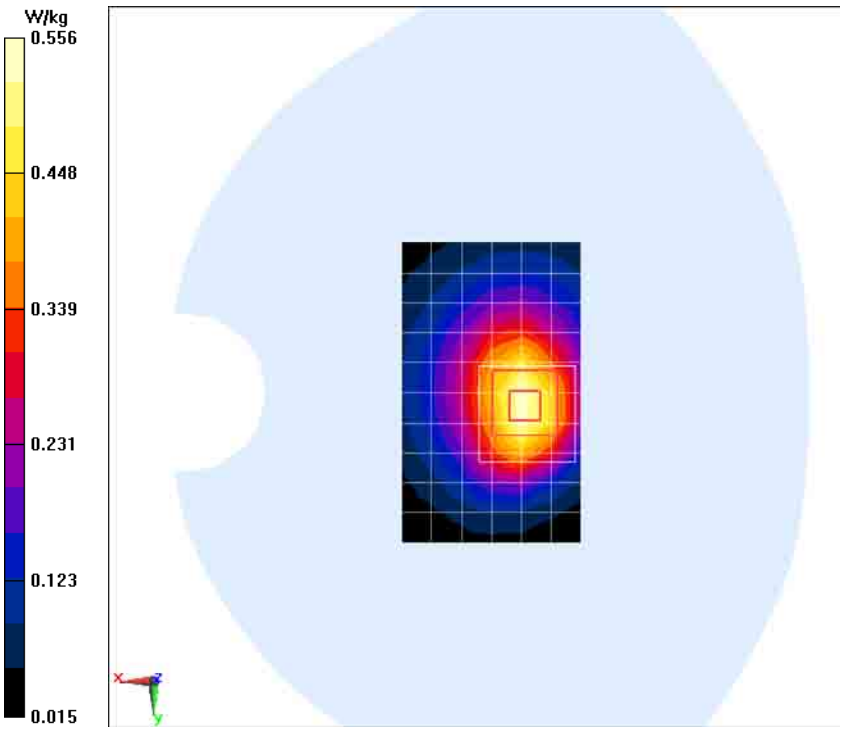
WCDMA1900MHz Body Right Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Right WCDMA1900MHz/Area Scan (7x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.253 W/kg
Middle Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.029 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.399 W/kg
SAR(1 g) = 0.250 W/kg; SAR(10 g) = 0.149 W/kg
Maximum value of SAR (measured) = 0.272 W/kg



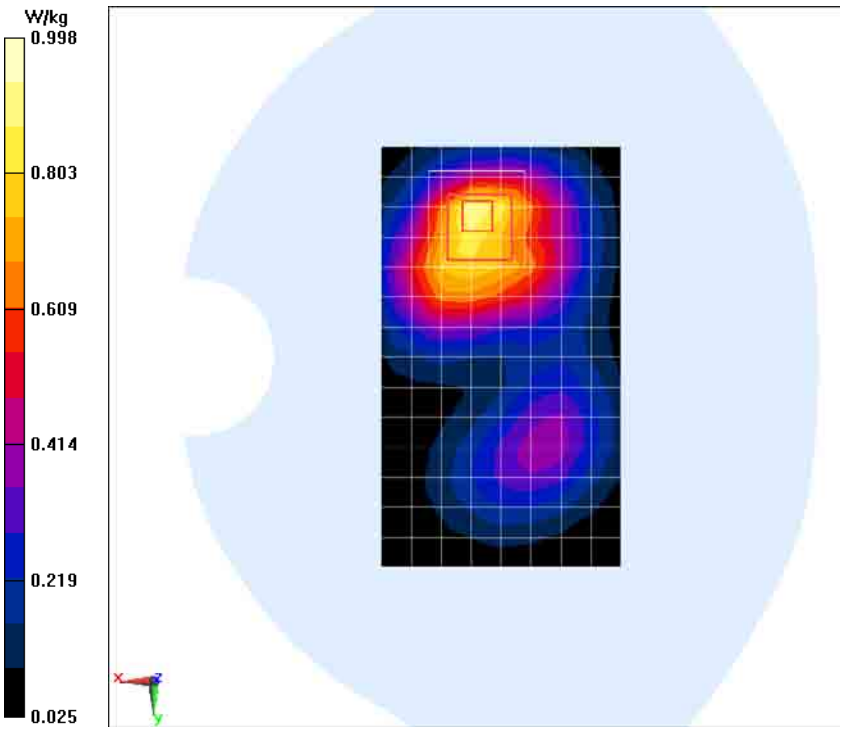
WCDMA1900MHz Body Bottom Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Bottom WCDMA1900MHz/Area Scan (7x11x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.553 W/kg
Middle Bottom WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.323 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.816 W/kg
SAR(1 g) = 0.511 W/kg; SAR(10 g) = 0.308 W/kg
Maximum value of SAR (measured) = 0.556 W/kg



WCDMA1900MHz Body Toward Ground High

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1908 MHz; σ = 1.532 S/m; ε_r = 53.199; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
High Toward Ground WCDMA1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.938 W/kg
High Toward Ground WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.179 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.895 W/kg; SAR(10 g) = 0.531 W/kg
Maximum value of SAR (measured) = 0.998 W/kg

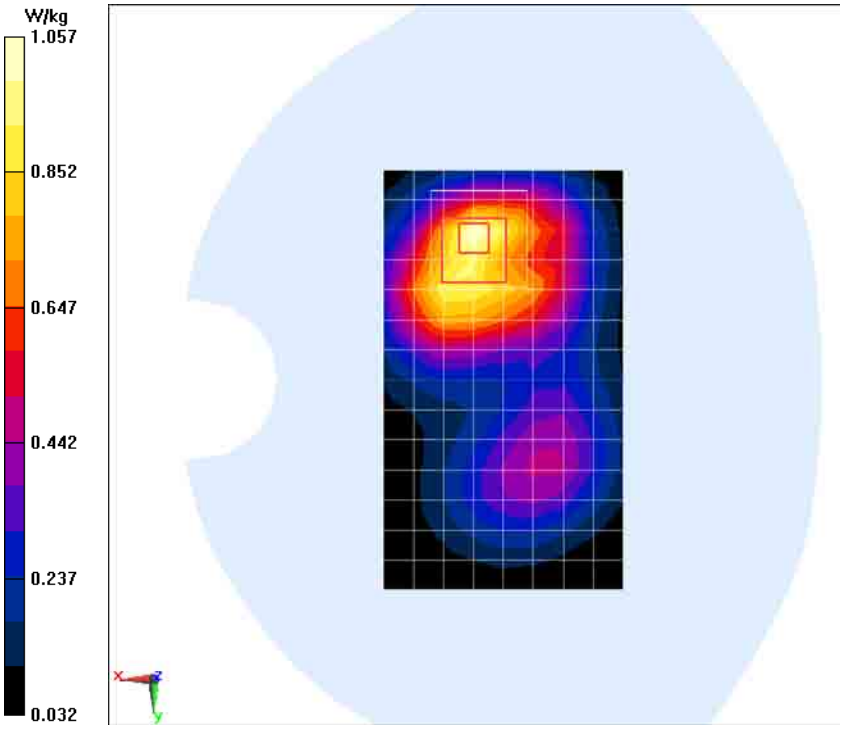


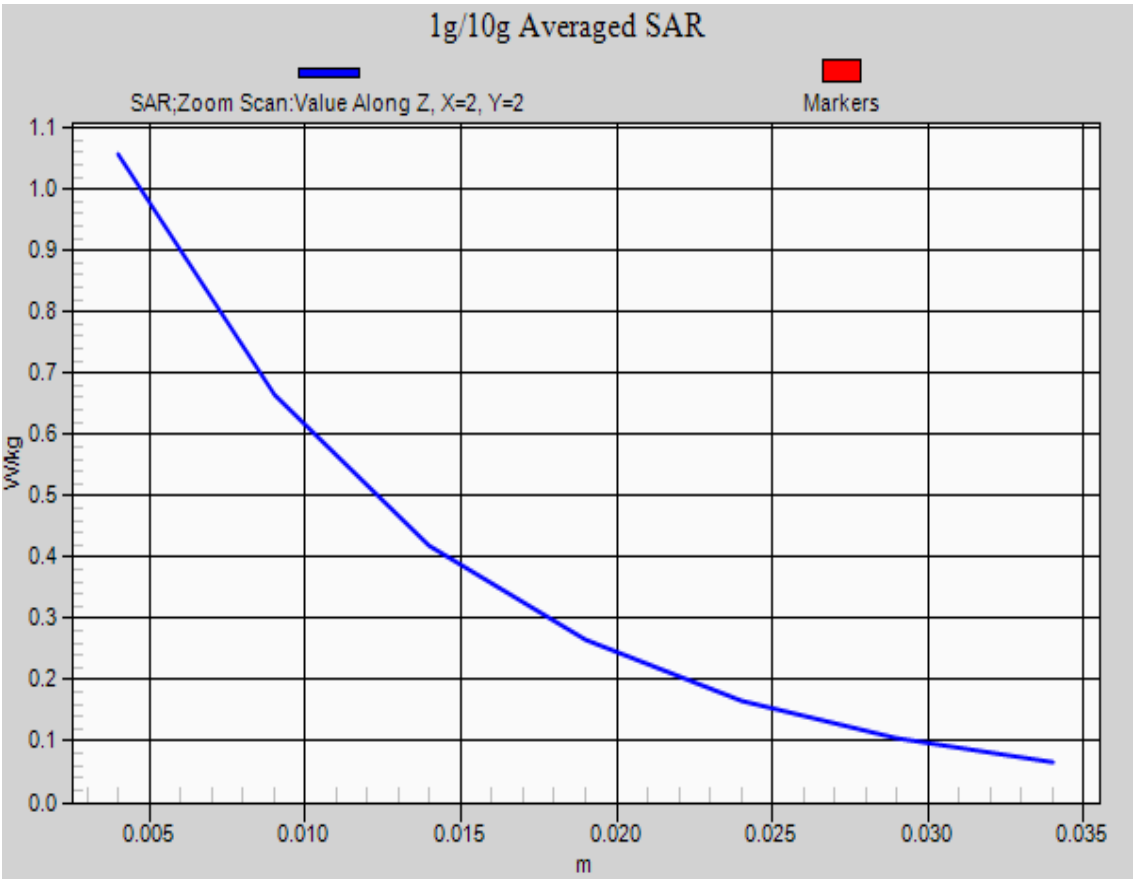
WCDMA1900MHz Body Toward Ground Low

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.477 S/m; ε_r = 53.431; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012

Low Toward Ground WCDMA1900MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.07 W/kg

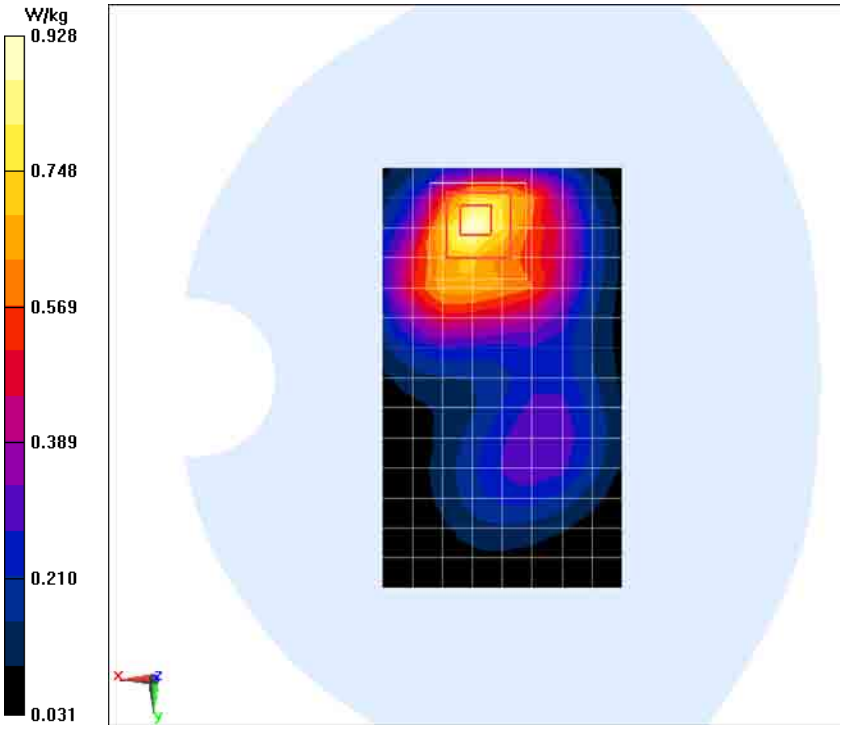
Low Toward Ground WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.902 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 0.949 W/kg; SAR(10 g) = 0.567 W/kg
Maximum value of SAR (measured) = 1.06 W/kg




1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
W/kg
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

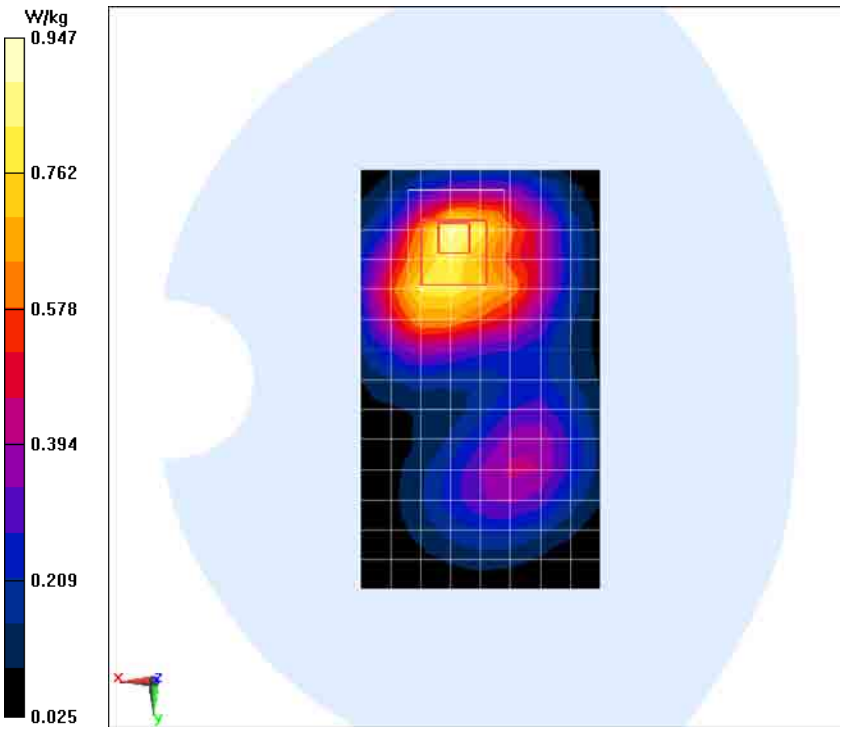
WCDMA1900MHz With Headset Body Toward Ground Low

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.477 S/m; ε_r = 53.431; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Low Toward Ground WCDMA1900MHz With Headset/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.957 W/kg
Low Toward Ground WCDMA1900MHz With Headset/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.685 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.885 W/kg; SAR(10 g) = 0.507 W/kg
Maximum value of SAR (measured) = 0.928 W/kg



WCDMA1900MHz 2 Body Toward Ground Middle

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Middle Toward Ground WCDMA1900MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.909 W/kg
Middle Toward Ground WCDMA1900MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.749 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.844 W/kg; SAR(10 g) = 0.506 W/kg
Maximum value of SAR (measured) = 0.947 W/kg

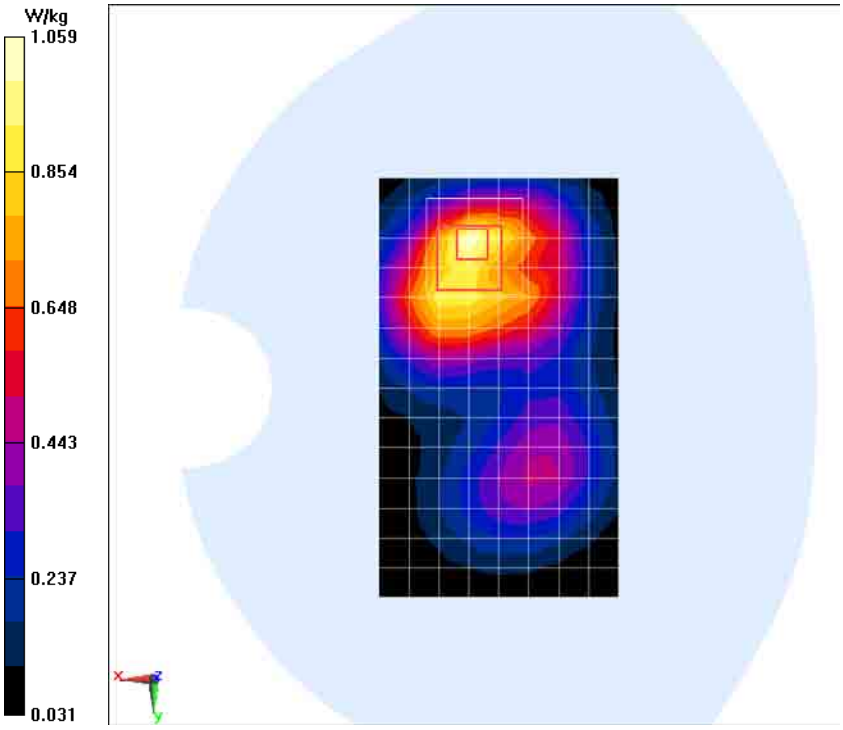


WCDMA1900MHz 2 Body Toward Ground Low

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.477 S/m; ε_r = 53.431; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012

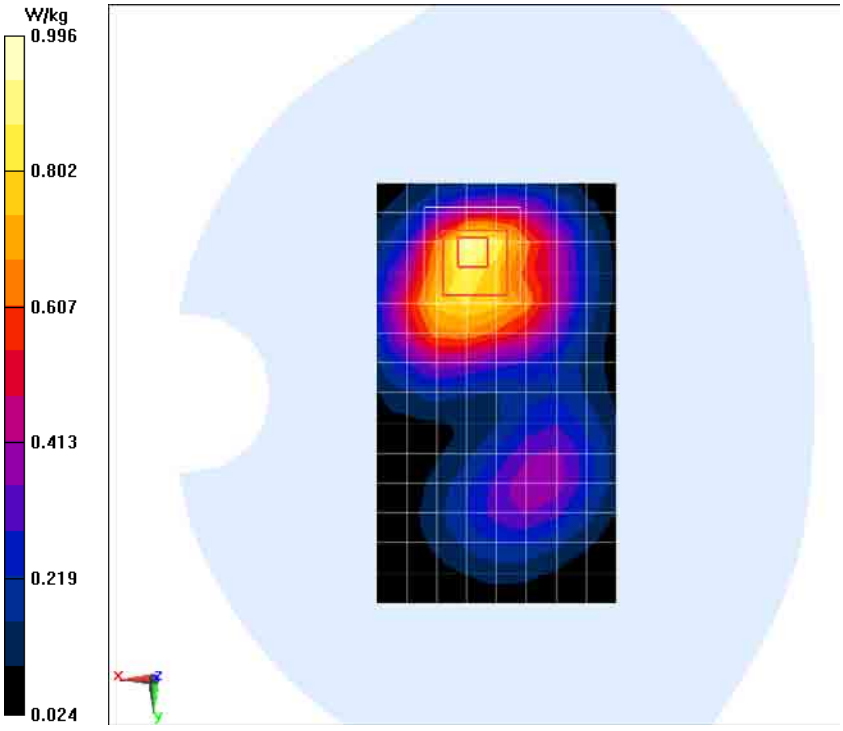
Low Toward Ground WCDMA1900MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.05 W/kg

Low Toward Ground WCDMA1900MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.791 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 0.950 W/kg; SAR(10 g) = 0.567 W/kg
Maximum value of SAR (measured) = 1.06 W/kg



WCDMA1900MHz 2 Body Toward Ground High

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1908 MHz; σ = 1.532 S/m; ε_r = 53.199; ρ = 1000 kg/m^3
Ambient Temperature:22.5℃ Liquid Temperature:22.5℃
Communication System: WCDMA Band Ⅱ; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
High Toward Ground WCDMA1900MHz 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.955 W/kg
High Toward Ground WCDMA1900MHz 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.283 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.894 W/kg; SAR(10 g) = 0.531 W/kg
Maximum value of SAR (measured) = 0.996 W/kg

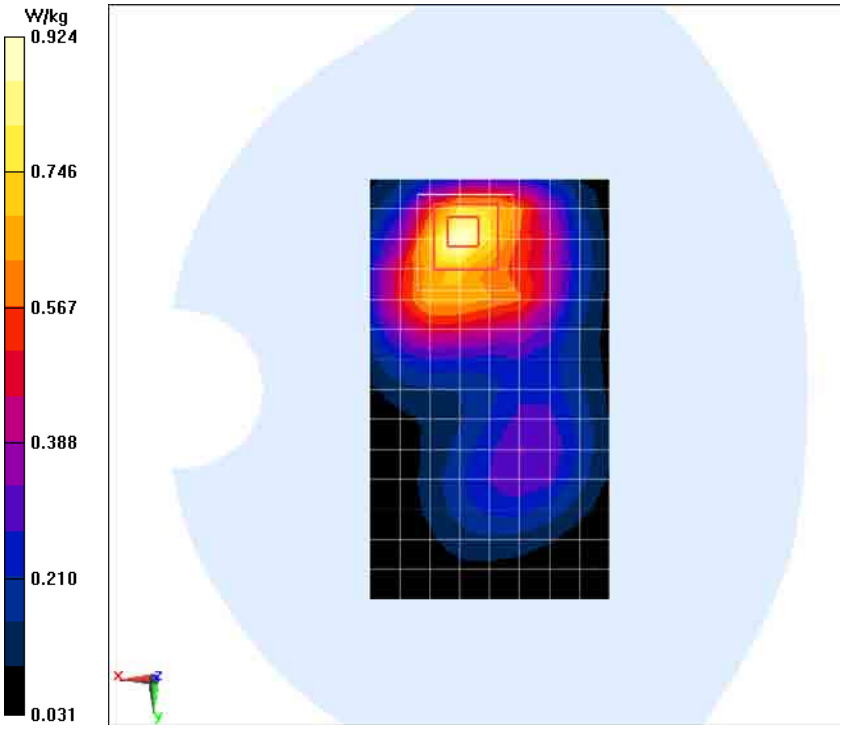


WCDMA1900MHz With Headset 2 Body Toward Ground Low

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.477 S/m; ε_r = 53.431; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA Band Ⅱ; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012

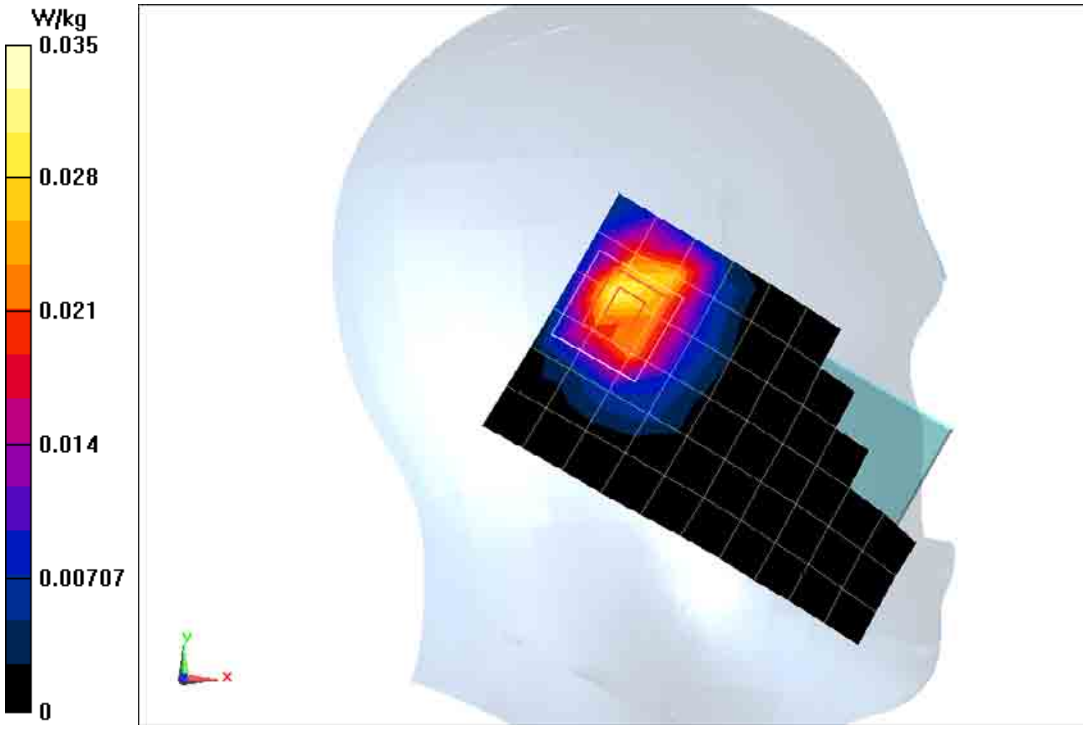
Low Toward Ground WCDMA1900MHz With Headset 2/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.958 W/kg

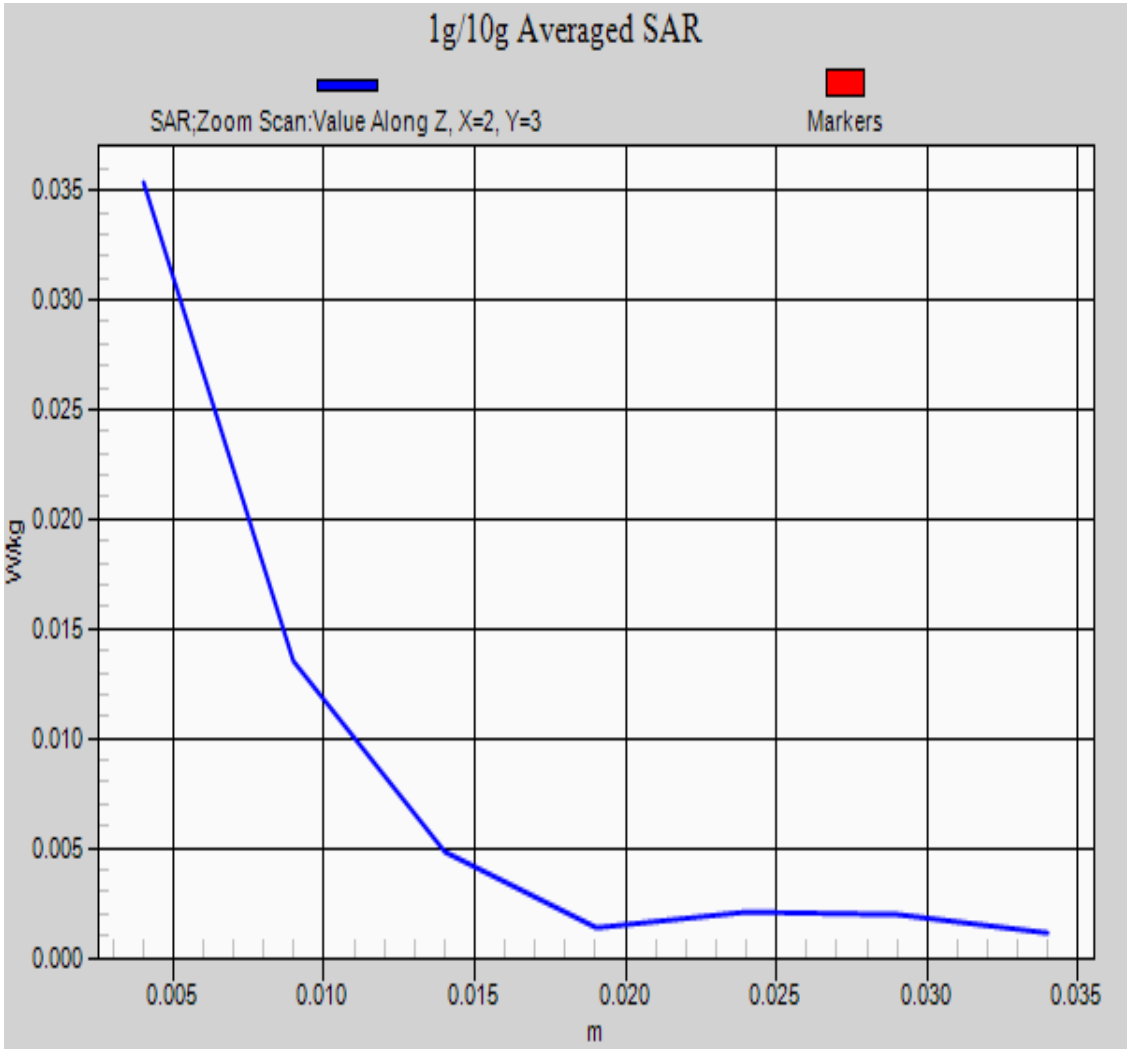
Low Toward Ground WCDMA1900MHz With Headset 2/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.702 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.882 W/kg; SAR(10 g) = 0.506 W/kg
Maximum value of SAR (measured) = 0.924 W/kg



WiFi2450MHz Left Cheek Low

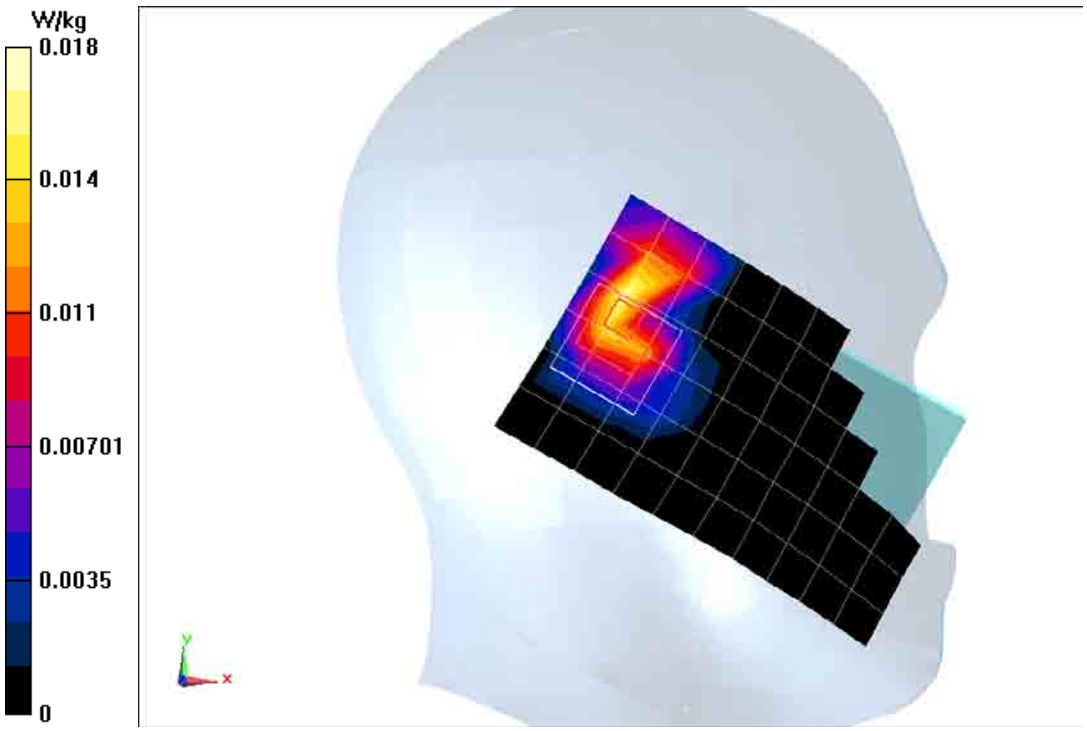
Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Head 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.787 S/m; ε_r = 39.095; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(6.74, 6.74, 6.74); Calibrated: 8/17/2012
Low Cheek Left WiFi2450MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0316 W/kg
Low Cheek Left WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.798 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.0610 W/kg
SAR(1 g) = 0.031 W/kg; SAR(10 g) = 0.014 W/kg
Maximum value of SAR (measured) = 0.0353 W/kg




1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=3
Markers
W/kg
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

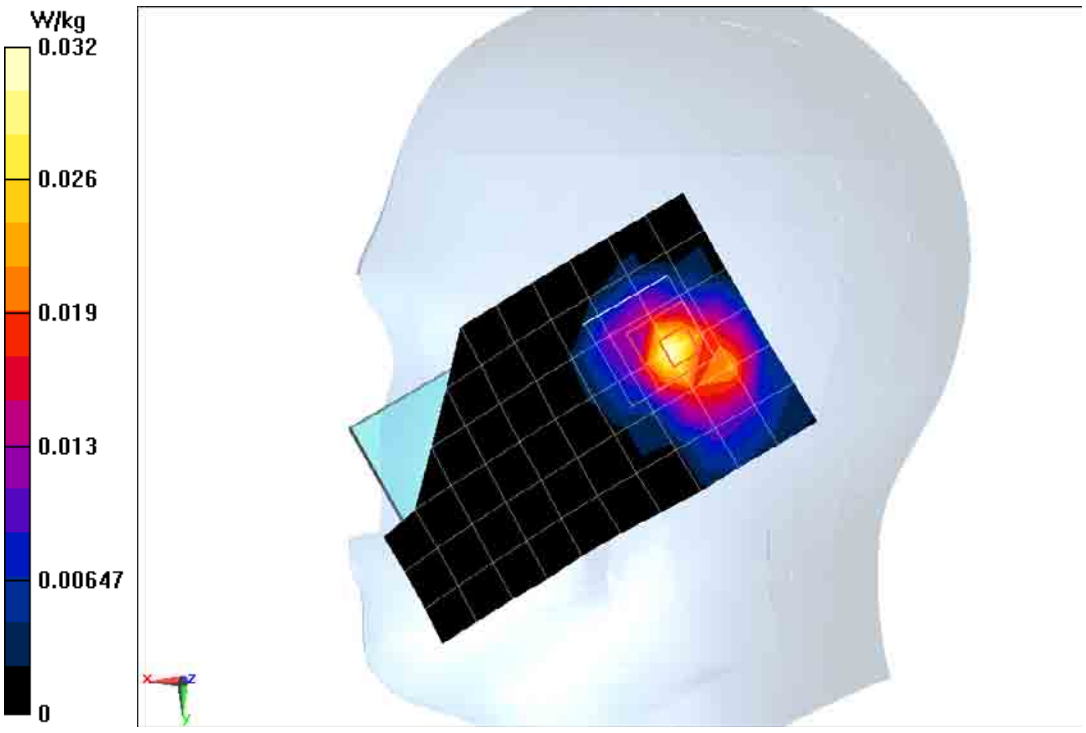
WiFi2450MHz Left Tilt Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Head 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.787 S/m; εr = 39.095; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(6.74, 6.74, 6.74); Calibrated: 8/17/2012
Low Tilt Left WiFi2450MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0161 W/kg
Low Tilt Left WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.864 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.0350 W/kg
SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.00596 W/kg
Maximum value of SAR (measured) = 0.0175 W/kg



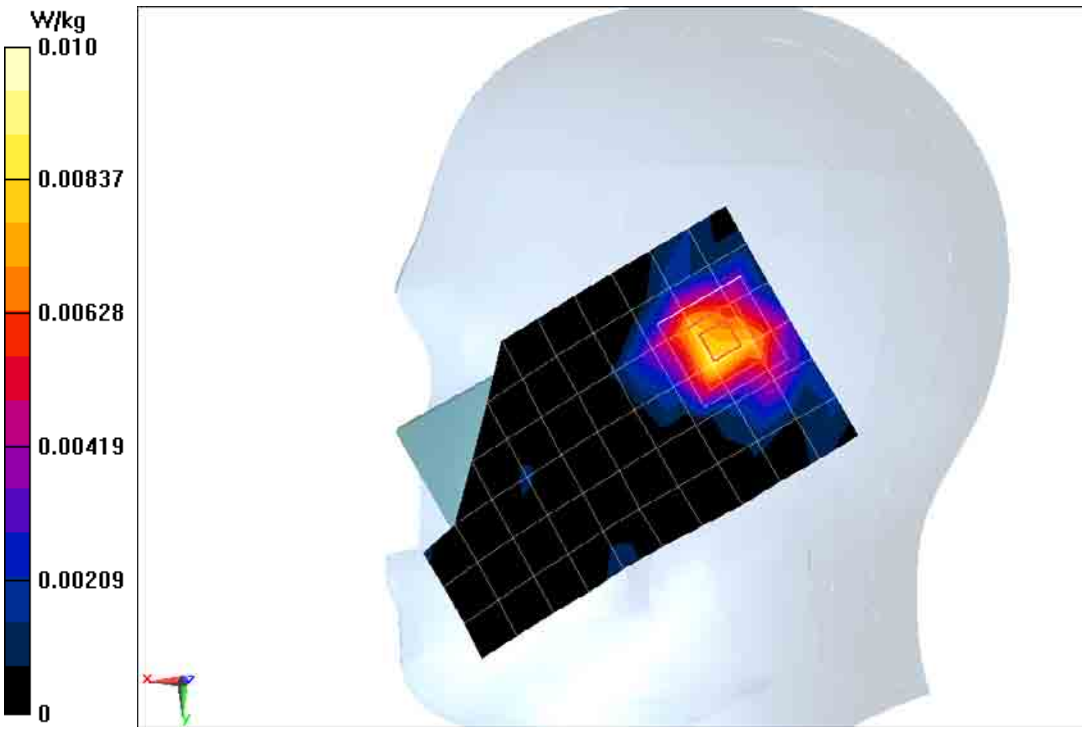
WiFi2450MHz Right Cheek Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Head 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.787 S/m; εr = 39.095; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(6.74, 6.74, 6.74); Calibrated: 8/17/2012
Low Cheek Right WiFi2450MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0328 W/kg
Low Cheek Right WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.258 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.0620 W/kg
SAR(1 g) = 0.027 W/kg; SAR(10 g) = 0.013 W/kg
Maximum value of SAR (measured) = 0.0324 W/kg



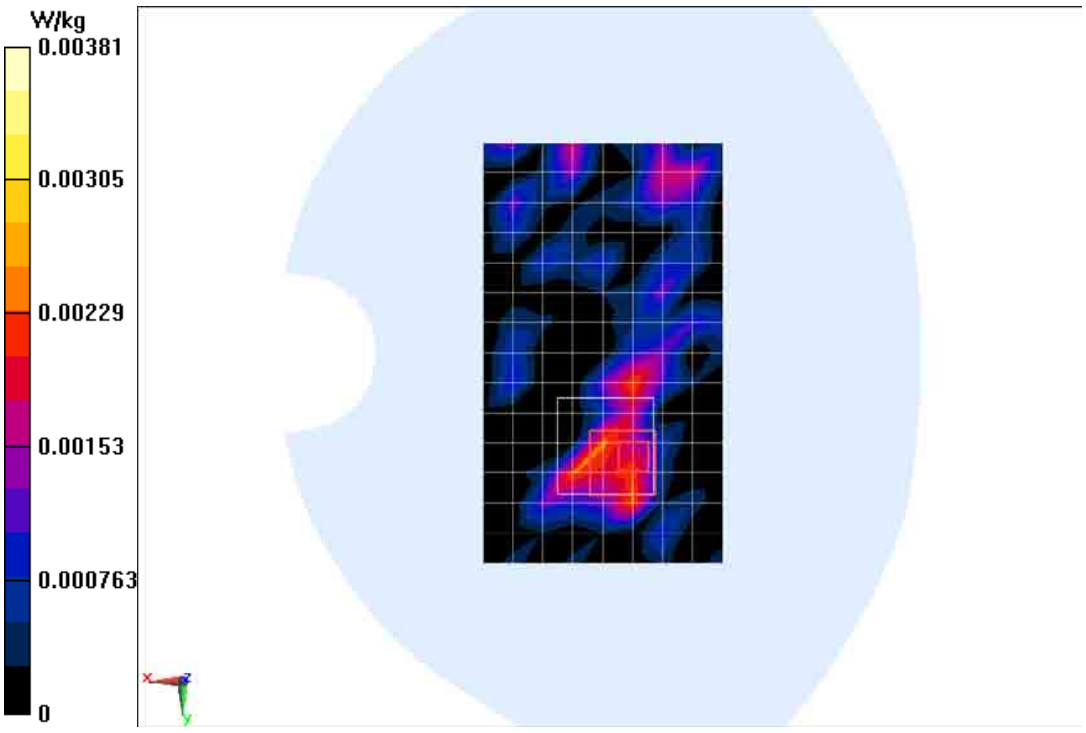
WiFi2450MHz Right Tilt Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Head 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.787 S/m; εr = 39.095; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(6.74, 6.74, 6.74); Calibrated: 8/17/2012
Low Tilt Right WiFi2450MHz/Area Scan (11x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.00892 W/kg
Low Tilt Right WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.851 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.0430 W/kg
SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.00436 W/kg
Maximum value of SAR (measured) = 0.0105 W/kg



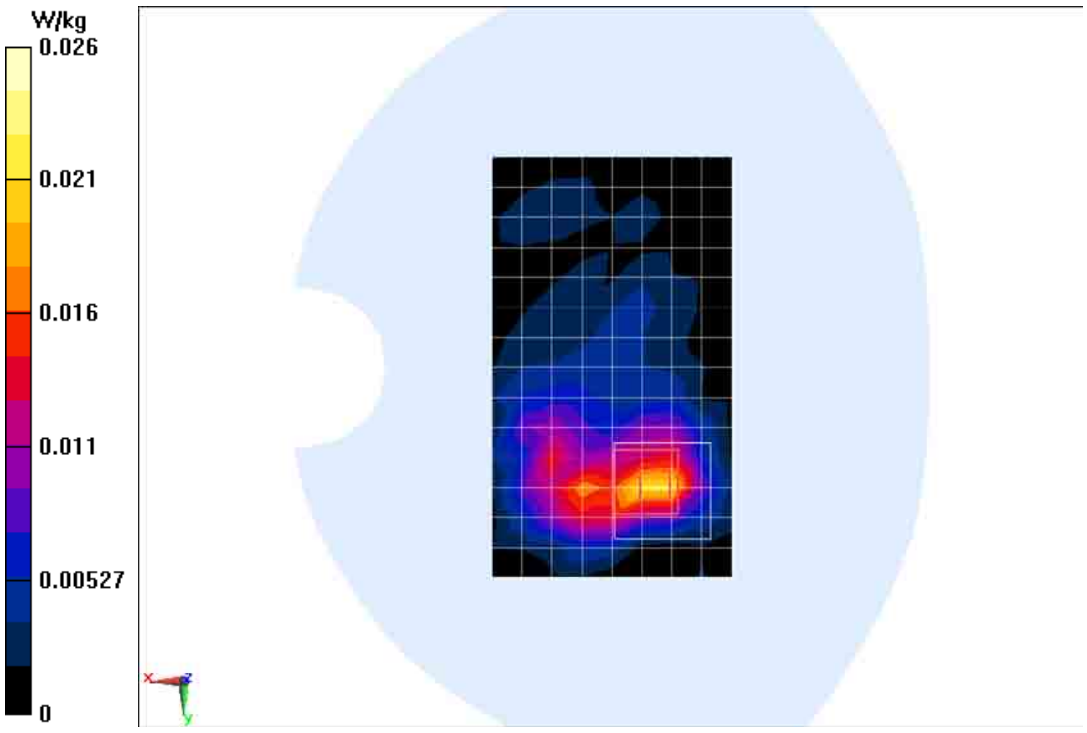
WiMax2450MHz Body Phantom Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Body 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.869 S/m; ε_r = 53.925; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(7.25, 7.25, 7.25); Calibrated: 8/17/2012
Low Phantom WiMax2450MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.00239 W/kg
Low Phantom WiMax2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.673 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.00971 W/kg
SAR(1 g) = 0.00275 W/kg; SAR(10 g) = 0.00128 W/kg
Maximum value of SAR (measured) = 0.00381 W/kg



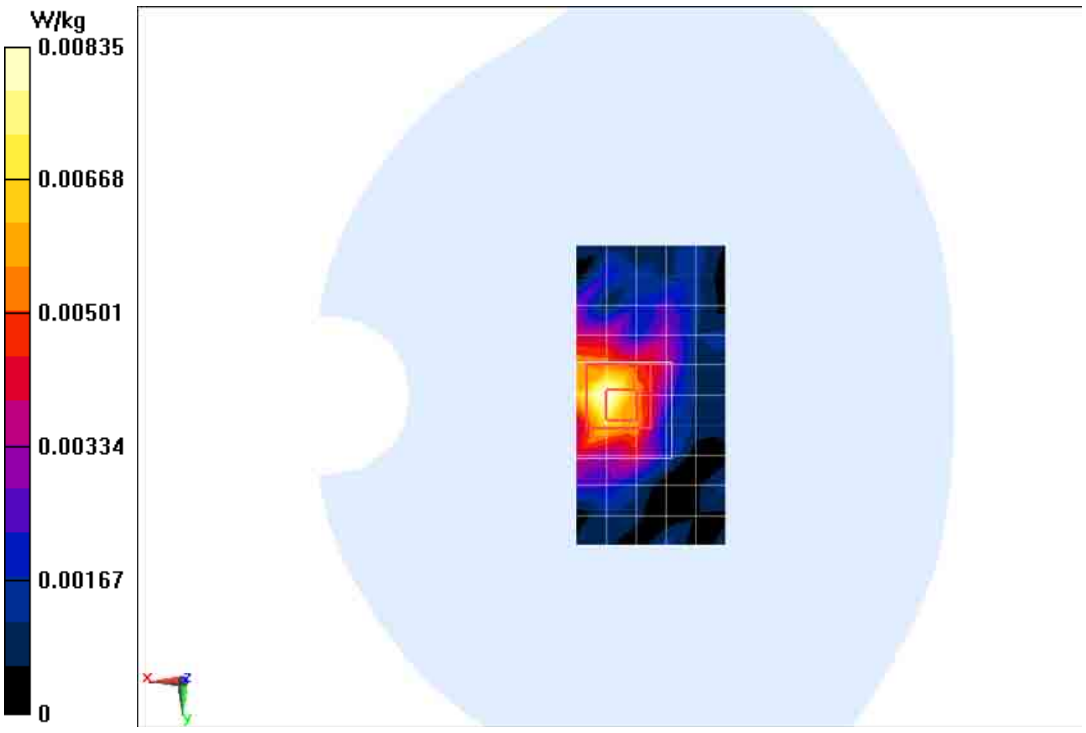
WiMax2450MHz Body Toward Ground Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Body 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.869 S/m; εr = 53.925; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(7.25, 7.25, 7.25); Calibrated: 8/17/2012
Low Toward Ground WiMax2450MHz/Area Scan (9x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.0216 W/kg
Low Toward Ground WiMax2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.602 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.0380 W/kg
SAR(1 g) = 0.021 W/kg; SAR(10 g) = 0.00959 W/kg
Maximum value of SAR (measured) = 0.0264 W/kg



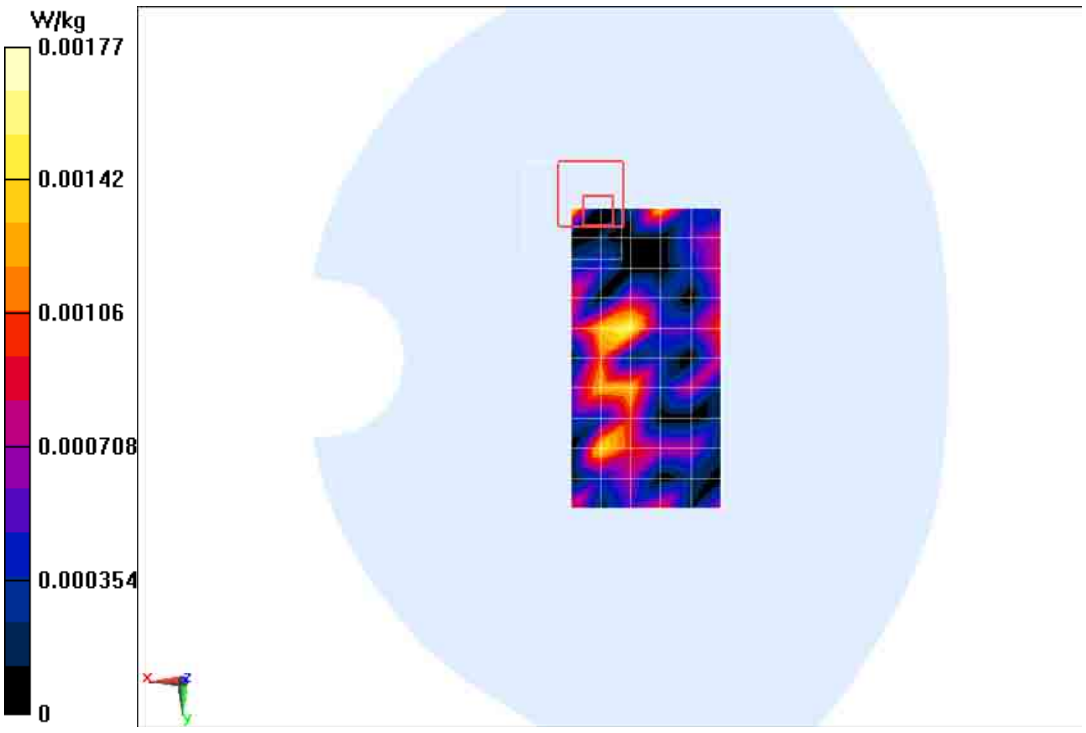
WiMax2450MHz Body Top Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Body 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.869 S/m; εr = 53.925; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(7.25, 7.25, 7.25); Calibrated: 8/17/2012
Low Top WiMax2450MHz/Area Scan (6x11x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.00887 W/kg
Low Top WiMax2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.951 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.0410 W/kg
SAR(1 g) = 0.00891 W/kg; SAR(10 g) = 0.00359 W/kg
Maximum value of SAR (measured) = 0.00835 W/kg



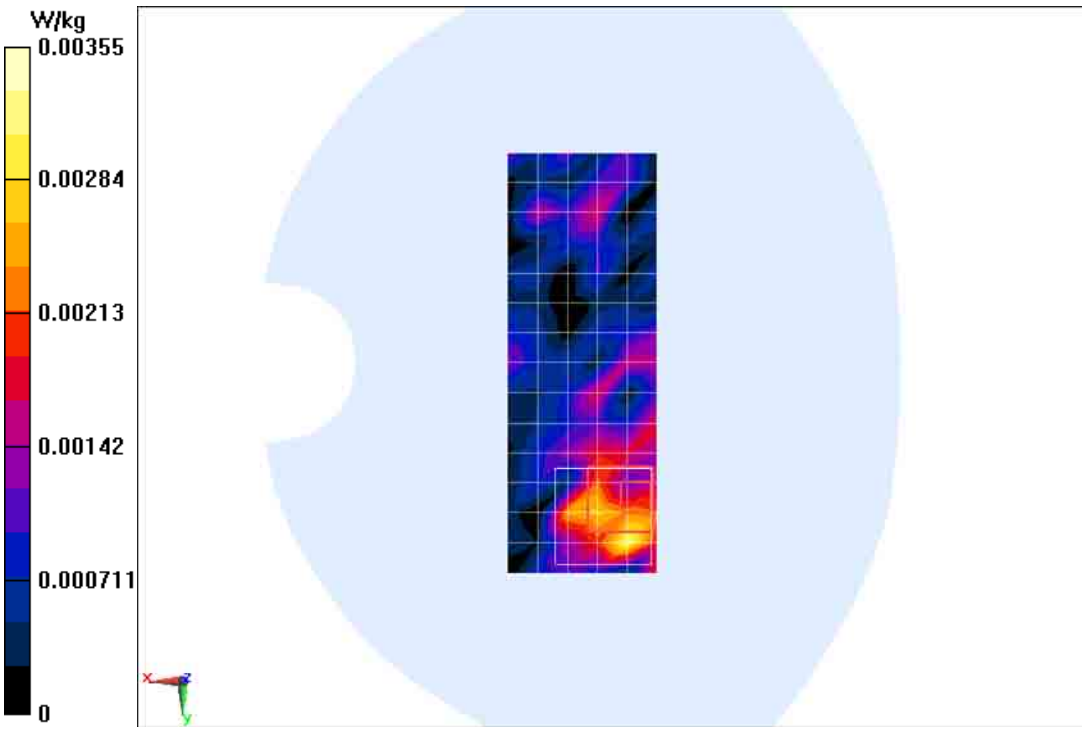
WiMax2450MHz Body Bottom Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Body 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.869 S/m; εr = 53.925; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(7.25, 7.25, 7.25); Calibrated: 8/17/2012
Low Bottom WiMax2450MHz/Area Scan (6x11x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.00157 W/kg
Low Bottom WiMax2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.771 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.00177 W/kg
SAR(1 g) = 0.000189 W/kg; SAR(10 g) = 2.31e-005 W/kg
Maximum value of SAR (measured) = 0.00177 W/kg



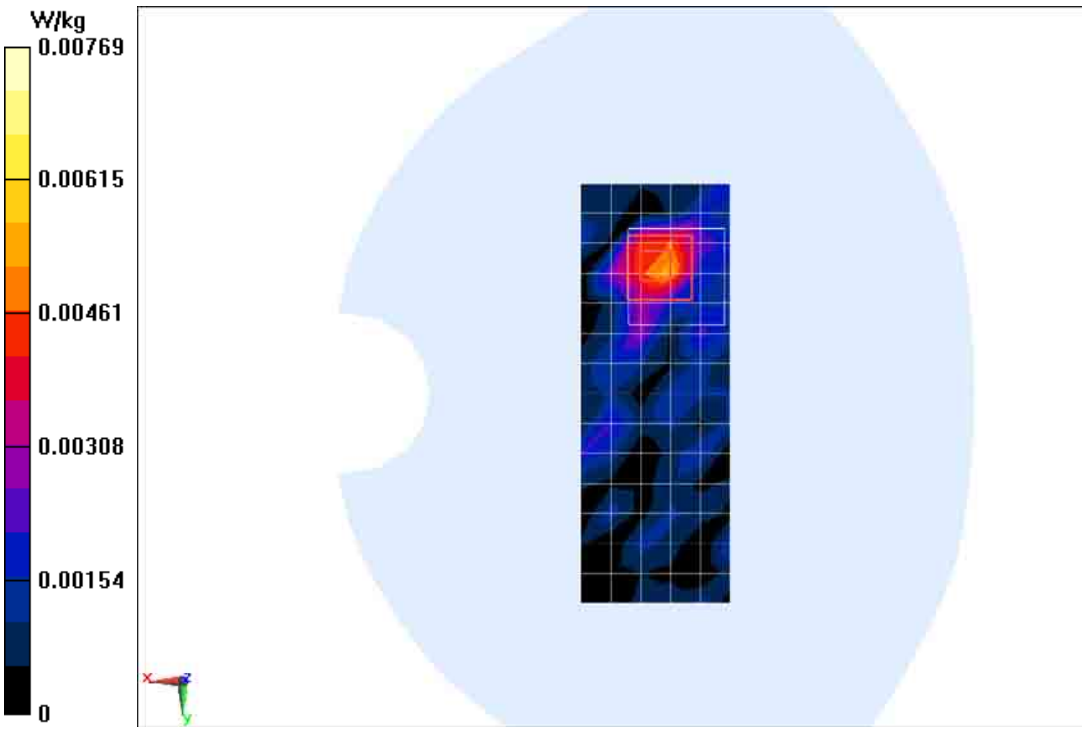
WiMax2450MHz Body Left Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Body 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.869 S/m; εr = 53.925; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(7.25, 7.25, 7.25); Calibrated: 8/17/2012
Low Left WiMax2450MHz/Area Scan (6x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.00326 W/kg
Low Left WiMax2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.673 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.0110 W/kg
SAR(1 g) = 0.00258 W/kg; SAR(10 g) = 0.000717 W/kg
Maximum value of SAR (measured) = 0.00355 W/kg



WiMax2450MHz Body Right Low

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Body 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.869 S/m; εr = 53.925; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System:WiFi 2450MHz; Frequency: 2412 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(7.25, 7.25, 7.25); Calibrated: 8/17/2012
Low Right WiMax2450MHz/Area Scan (6x15x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.00553 W/kg
Low Right WiMax2450MHz/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.969 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.0260 W/kg
SAR(1 g) = 0.00685 W/kg; SAR(10 g) = 0.00255 W/kg
Maximum value of SAR (measured) = 0.00769 W/kg



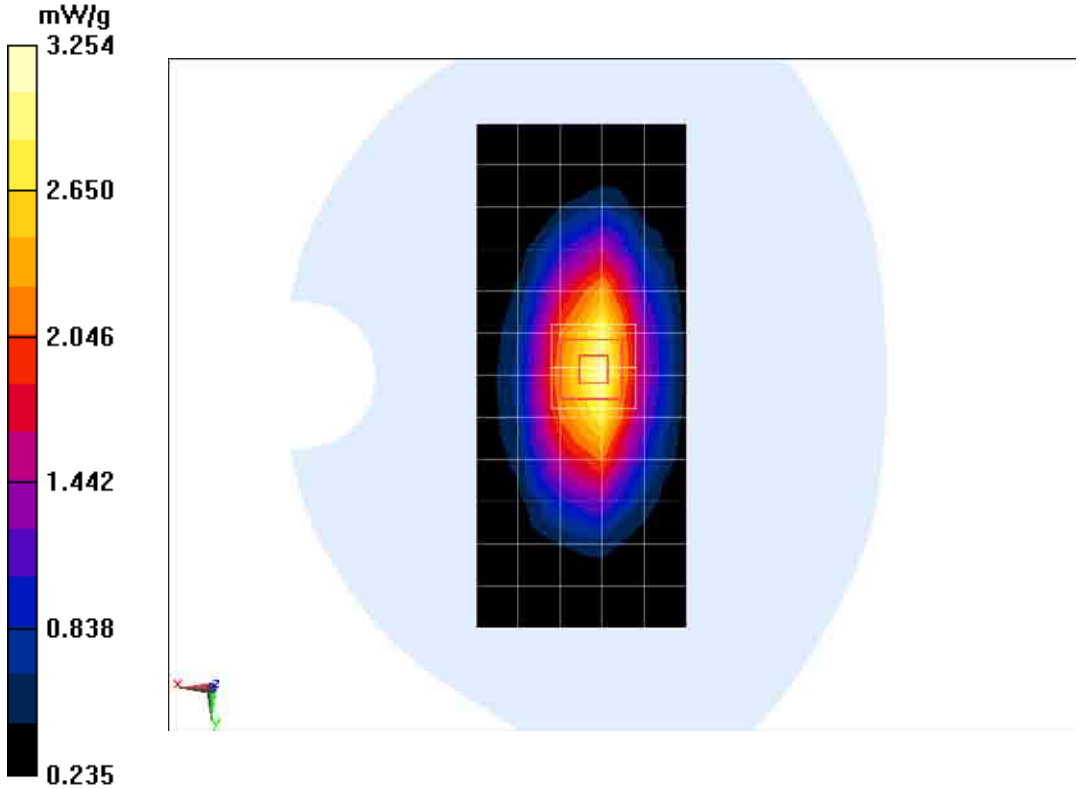
ANNEX B SYSTEM VALIDATION RESULTS

835MHz-Head

Date/Time: 5/8/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 835 MHz; σ = 0.917 mho/m; εr = 41.04; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09)

System Validation/Area Scan(101x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.153 mW/g

System Validation/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.235 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.857 mW/g
SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.55 mW/g
Maximum value of SAR (measured) = 3.254 mW/g

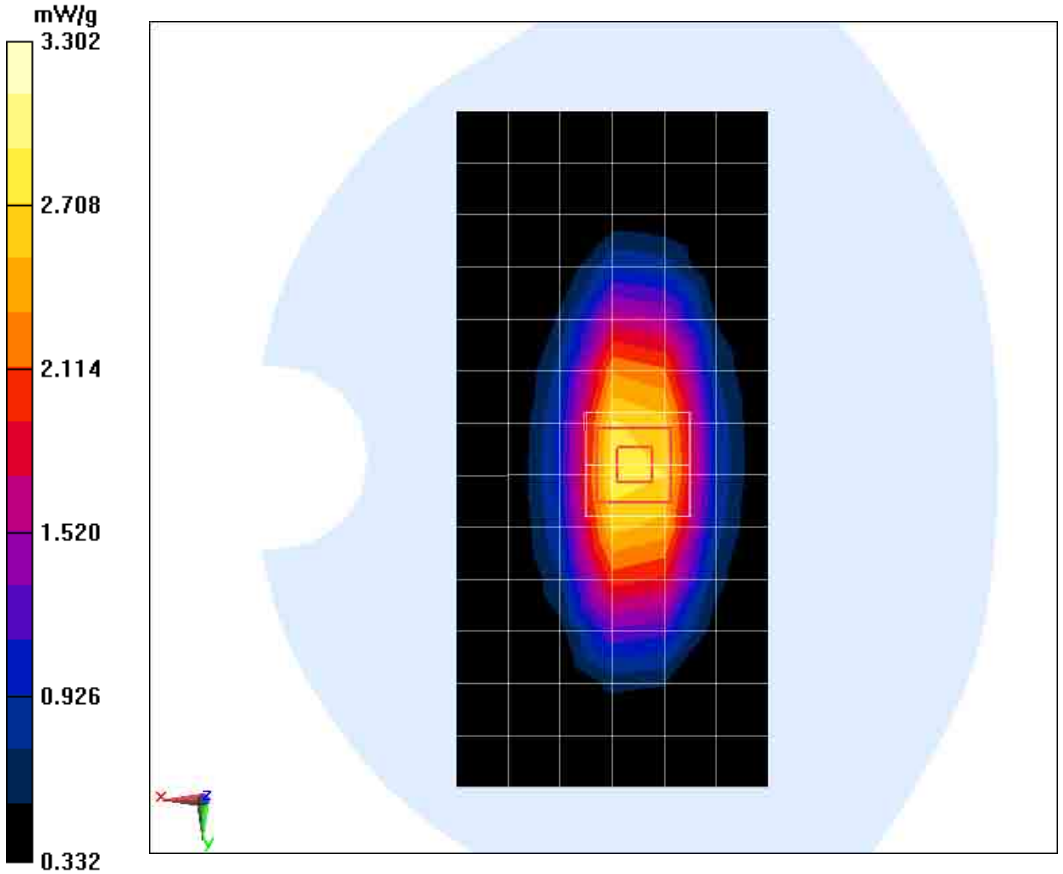


835MHz-Body

Date/Time: 5/16/2013
Electronics: DAE4 Sn1244
Medium: Body 850 MHz
Medium parameters used: f = 835 MHz; σ = 0.999 mho/m; εr = 55.15; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06)

System Validation/Area Scan(101x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.849 mW/g

System Validation/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.728 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.871 mW/g
SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.65 mW/g
Maximum value of SAR (measured) = 3.302 mW/g

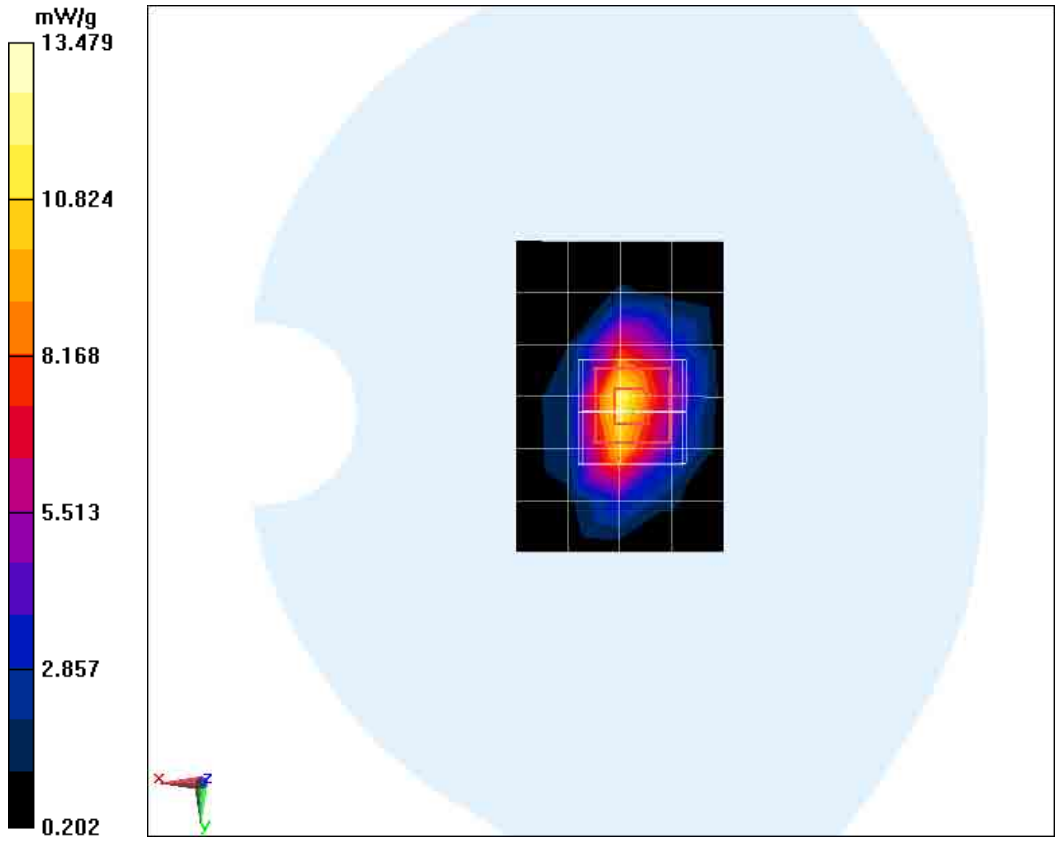


1900MHz-Head

Date/Time: 5/9/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.385 mho/m; εr = 39.64; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1)

System Validation/Area Scan(101x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.141 mW/g

System Validation/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.766 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 17.602 mW/g
SAR(1 g) = 9.52 mW/g; SAR(10 g) = 4.87 mW/g
Maximum value of SAR (measured) = 13.479 mW/g

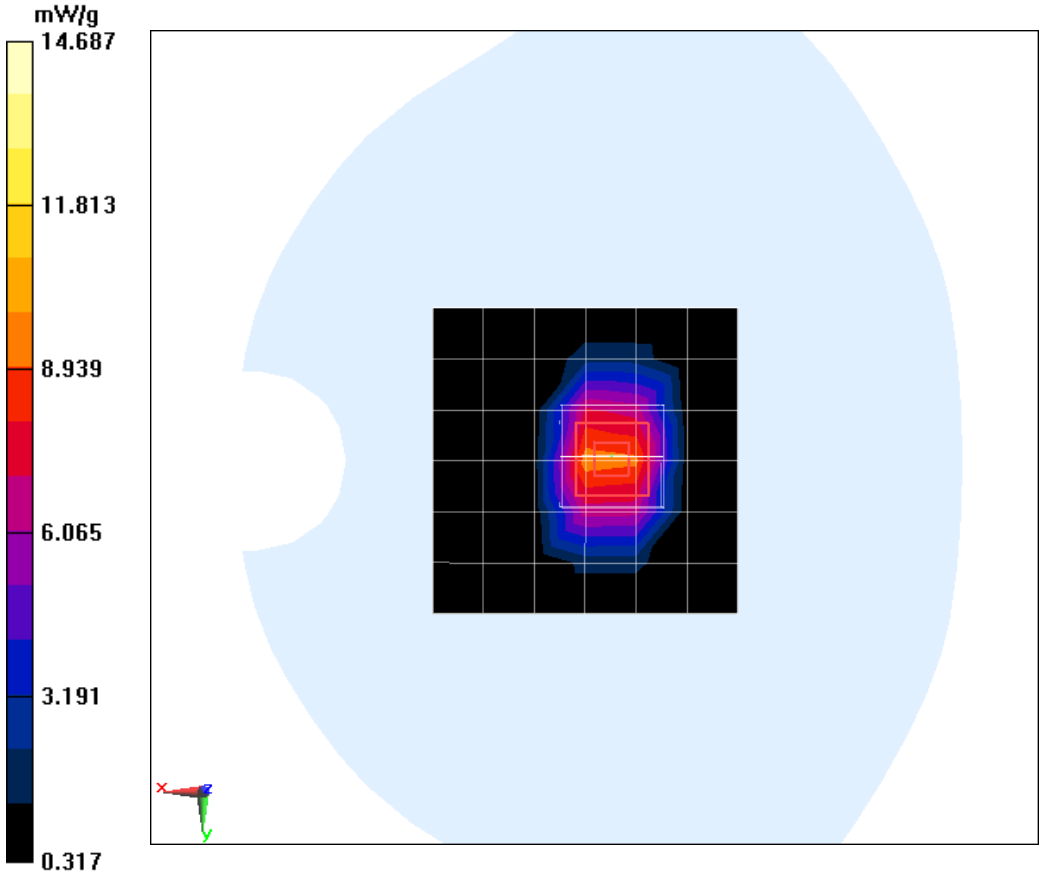


1900MHz-Body

Date/Time: 5/13/2013
Electronics: DAE4 Sn1244
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.524 mho/m; εr = 53.237; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64)

System Validation/Area Scan(101x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 9.585 mW/g

System Validation/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.021 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 18.419 mW/g
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.47 mW/g
Maximum value of SAR (measured) = 14.687 mW/g

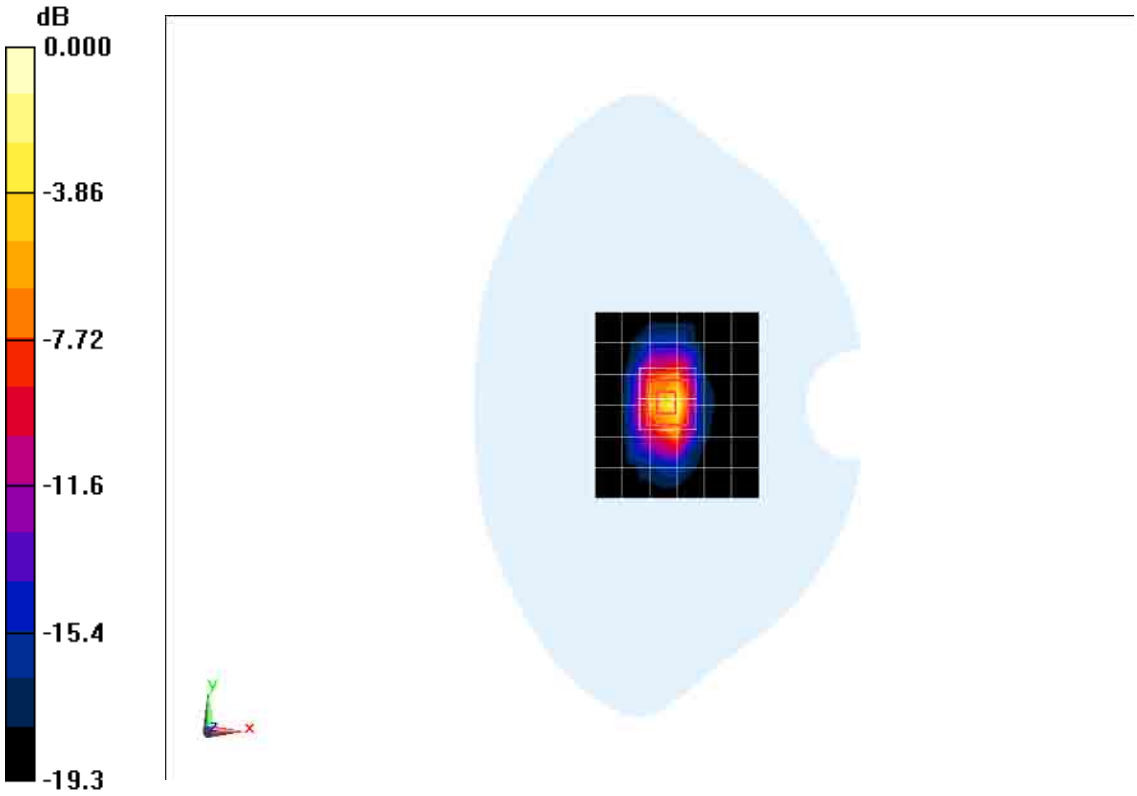


2450MHz-Head

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Head 2450MHz
Medium parameters used: f = 2450 MHz; σ = 1.824 mho/m; εr = 38.87; ρ = 1000 kg/m3
Ambien Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(6.74, 6.74, 6.74)

System Validation/ Area Scan (101x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.79 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.872 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 17.651 mW/g
SAR(1 g) = 12.76 mW/g; SAR(10 g) = 5.93 mW/g
Maximum value of SAR (measured) = 13.563 mW/g

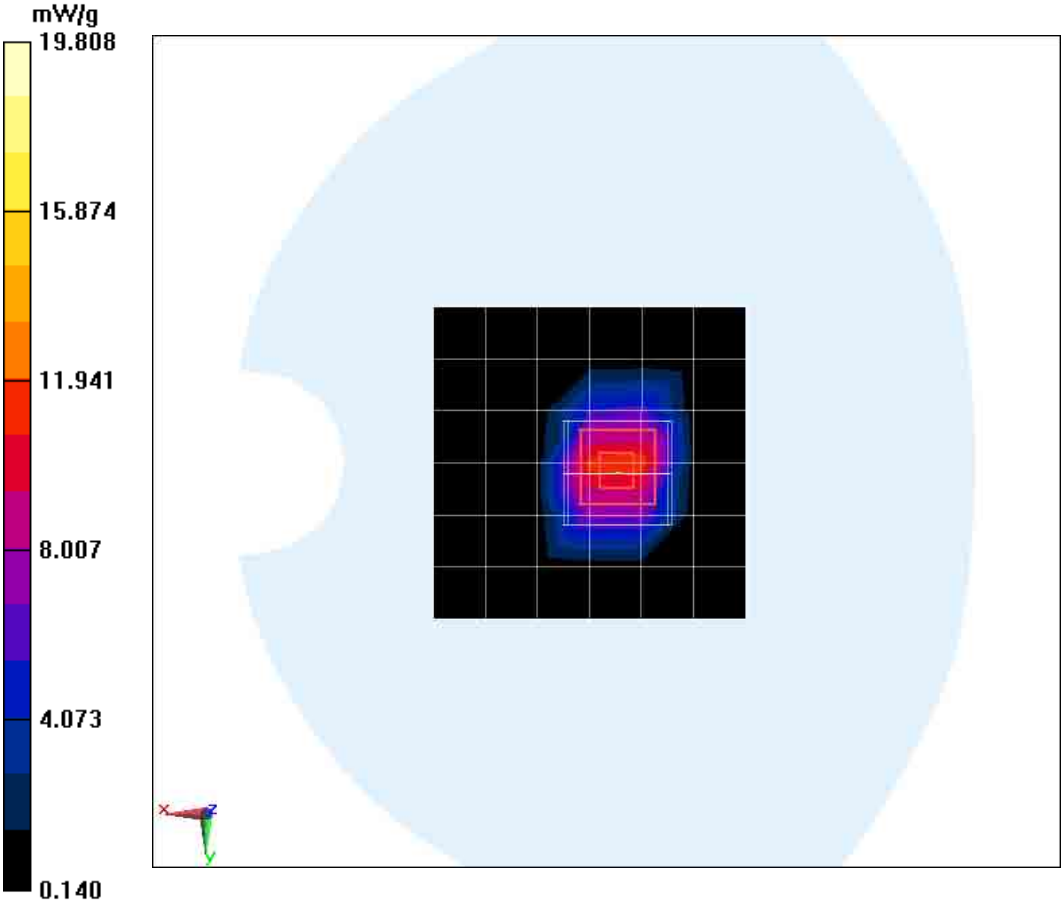


2450MHz-Body

Date/Time: 5/21/2013
Electronics: DAE4 Sn1244
Medium: Body 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.918 mho/m; εr = 53.946; ρ = 1000 kg/m3
Ambien Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Probe: EX3DV4 - SN3754ConvF(7.25, 7.25, 7.25)

System Validation/ Area Scan (101x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 11.758 mW/g

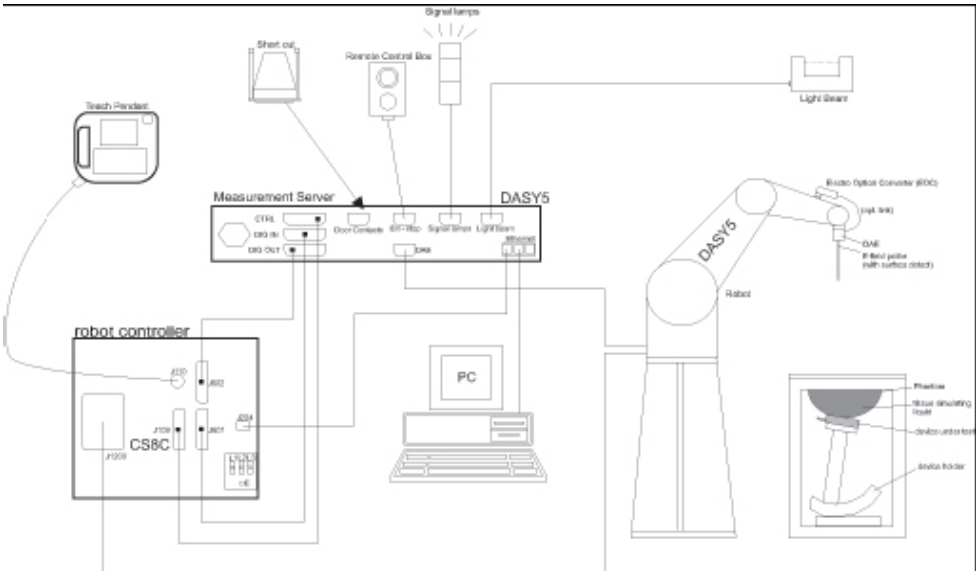
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.005 V/m; Power Drift = 0.26 dB
Peak SAR (extrapolated) = 26.396 mW/g
SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.16 mW/g
Maximum value of SAR (measured) = 19.808 mW/g



ANNEX C SAR Measurement Setup

C.1 Measurement Set-up

The DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture C.1 SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

C.2 DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection durning a software approach and looks for the maximum using 2nd ord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:

Model: ES3DV3, EX3DV4
Frequency 2.0GHz — 3.0GHz(EX3DV4)
Range: 700MHz — 2.0GHz(ES3DV3)
Calibration: In head and body simulating tissue at Frequencies from 835 up to 2450MHz
Linearity: ± 0.2 dB(2.0GHz — 3.0GHz) for EX3DV4
± 0.2 dB(700MHz — 2.0GHz) for ES3DV3
Dynamic Range: 10 mW/kg — 100W/kg
Probe Length: 330 mm
Probe Tip Length: 20 mm
Body Diameter: 12 mm
Tip Diameter: 2.5 mm (3.9 mm for ES3DV3)
Tip-Center: 1 mm (2.0mm for ES3DV3)
Application: SAR Dosimetry Testing
Compliance tests of mobile phones
Dosimetry in strong gradient fields

Picture C.2 Near-field Probe

Picture C.3 E-field Probe

C.3 E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/ cm^2.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

C.4 Other Test Equipment

C.4.1 Data Acquisition Electronics(DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

PictureC.4: DAE

C.4.2 Robot

The SPEAG DASY system uses the high precision robots (DASY5: RX90L) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture C.5 DASY 5

C.4.3 Measurement Server

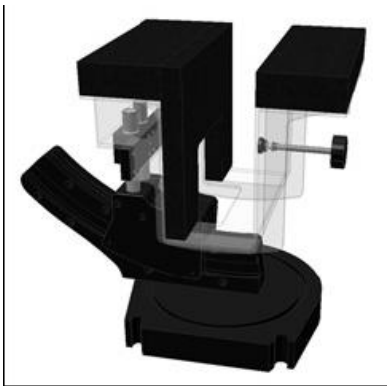
The Measurement server is based on a PC/104 CPU broad with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.
The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Picture C.6 Server for DASY 5

C.4.4 Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
The DASY device holder is constructed of low-loss
POM material having the following dielectric
parameters: relative permittivity ε =3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.
<Laptop Extension Kit>
The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.

Picture C.7: Device Holder



Picture C.8: Laptop Extension Kit

C.4.5 Phantom

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to
Represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

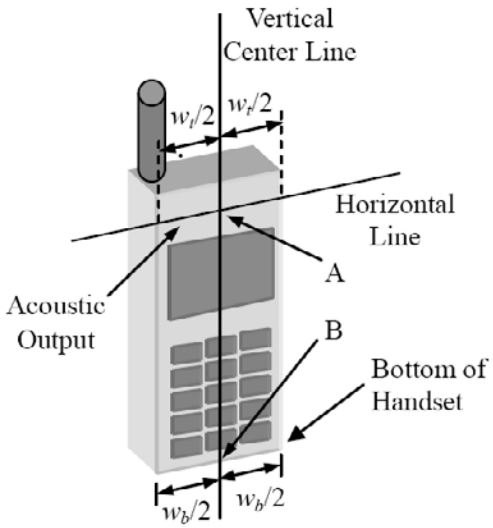
Shell Thickness: 2 ± 0. 2 mm
Filling Volume: Approx. 25 liters
Dimensions: 810 x l000 x 500 mm (H x L x W)
Available: Special

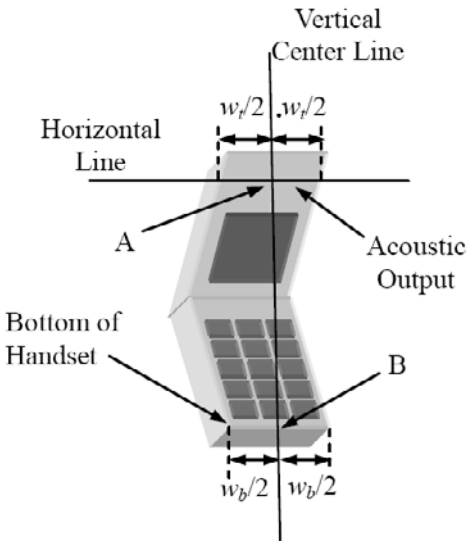
Picture C.9: SAM Twin Phantom

ANNEX D Position of the wireless device in relation to the phantom

D.1 General considerations

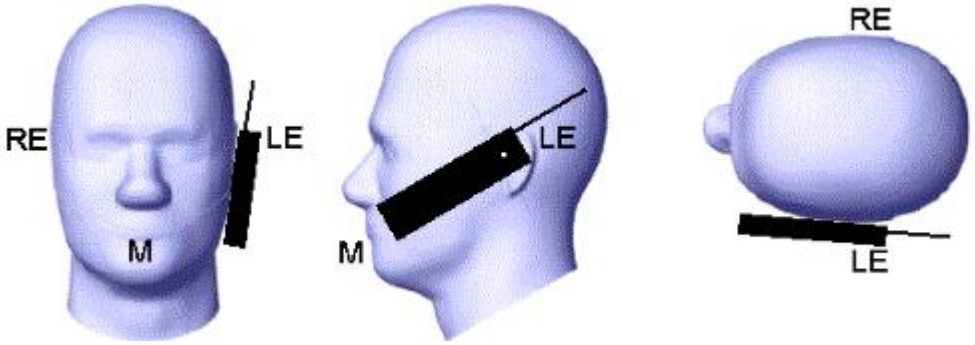
This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.



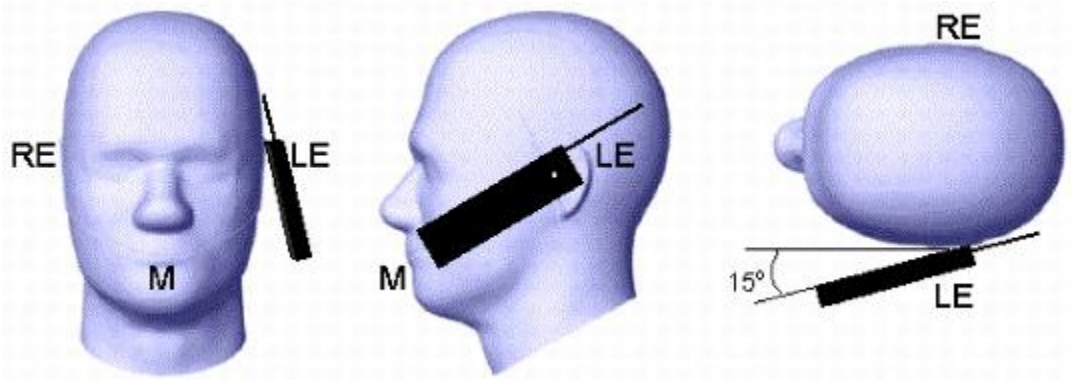


w_t	Width of the handset at the level of the acoustic
w_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width w_b of the bottom of the handset

Picture D.1-a Typical “fixed” case handset **Picture D.1-b Typical “clam-shell” case handset**



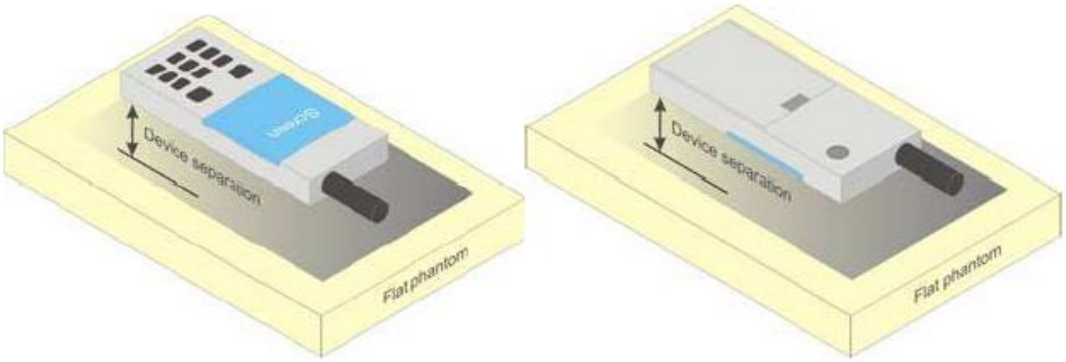
Picture D.2 Cheek position of the wireless device on the left side of SAM



Picture D.3 Tilt position of the wireless device on the left side of SAM

D.2 Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.

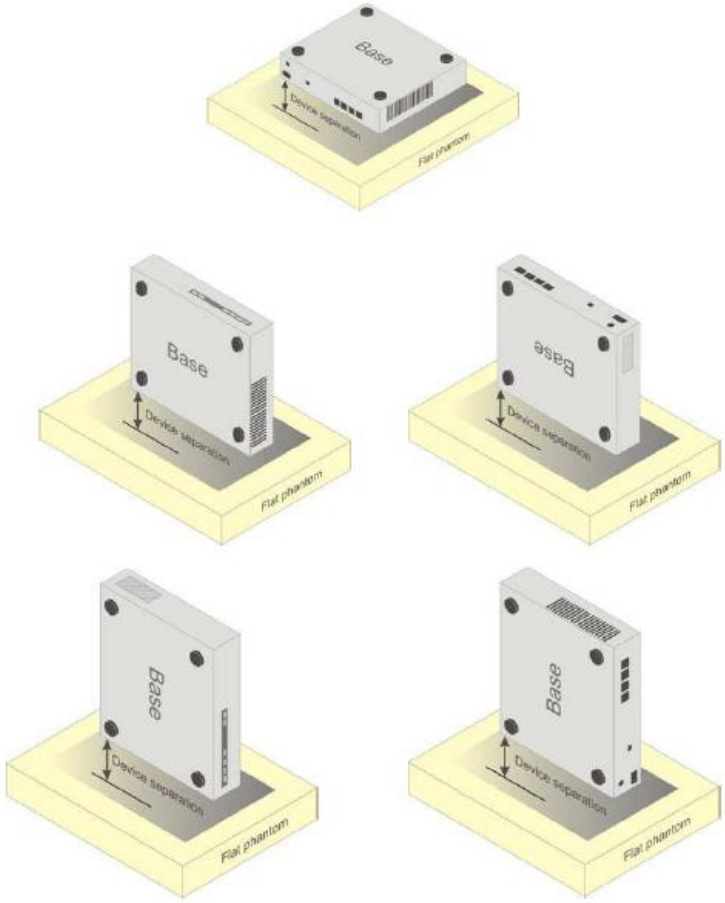


Picture D.4 Test positions for body-worn devices

D.3 Desktop device

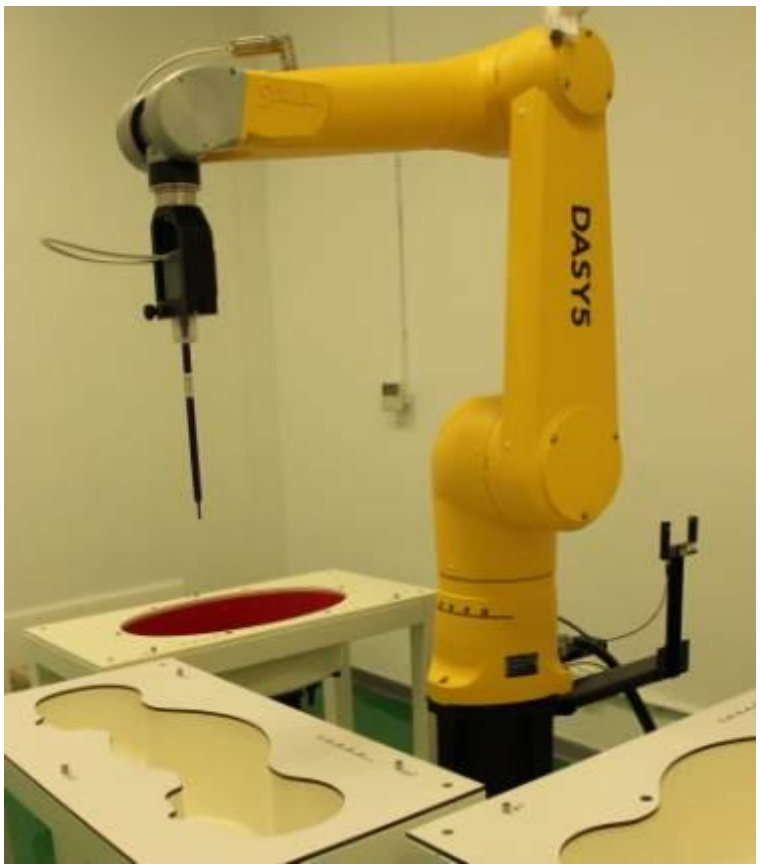
A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture 8.5 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.



Picture D.5 Test positions for desktop devices

D.4 DUT Setup Photos



Picture D.6 DSY5 system Set-up

Note:
The photos of test sample and test positions show in additional document.

ANNEX E Equivalent Media Recipes

The liquid used for the frequency range of 800-3000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table E.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

Table E.1: Composition of the Tissue Equivalent Matter

Frequency (MHz)	835 Head	835 Body	1900 Head	1900 Body	2450 Head	2450 Body
Ingredients (% by weight)						
Water	41.45	52.5	55.242	69.91	58.79	72.60
Sugar	56.0	45.0	\	\	\	\
Salt	1.45	1.4	0.306	0.13	0.06	0.18
Preventol	0.1	0.1	\	\	\	\
Cellulose	1.0	1.0	\	\	\	\
Glycol Monobutyl	\	\	44.452	29.96	41.15	27.22
Dielectric Parameters Target Value	ε=41.5 σ=0.90	ε=55.2 σ=0.97	ε=40.0 σ=1.40	ε=53.3 σ=1.52	ε=39.2 σ=1.80	ε=52.7 σ=1.95

ANNEX F System Validation

The SAR system must be validated against its performance specifications before it is deployed. When SAR probes, system components or software are changed, upgraded or recalibrated, these must be validated with the SAR system(s) that operates with such components.

Table F.1: System Validation

System No.	Probe SN.	Liquid name	Validation date	Frequency point	Status (OK or Not)
	3252	Head 835MHz	Jan 18,2013	835MHz	OK
	3252	Head 1900MHz	Jan 18,2013	1900MHz	OK
	3754	Head 2450MHz	Jan 30,2013	2450MHz	OK
	3252	Body 835MHz	Jan 21,2013	835MHz	OK
	3252	Body 1900MHz	Jan 22,2013	1900MHz	OK
	3754	Body 2450MHz	Jan 30,2013	2450MHz	OK

NOTE: The parameters of tissue simulating liquids can be found in chapter 7 of this test report.

ANNEX G Probe and DAE Calibration Certificate

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 TMC-SH (Auden) Certificate No: DAE4-1244_Jul12

CALIBRATION CERTIFICATE

Object DAE4 - SD 000 D04 BJ - SN: 1244

Calibration procedure(s) QA CAL-06.v24
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: July 20, 2012

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
Keithley Multimeter Type 2001	SN: 0810278	29-Sep-11 (No:11456)	Sep-12
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V2.1	SE UWS 053 AA 1001	05-Jan-12 (in house check)	In house check: Jan-13

	Name	Function	Signature
Calibrated by:	R.Meyerst	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: July 20, 2012

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: DAE4-1244_Jul12 Page 1 of 5

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Accreditation No.: SCS 108

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	403.841 ± 0.1% (k=2)	405.693 ± 0.1% (k=2)	404.505 ± 0.1% (k=2)
Low Range	3.96892 ± 0.7% (k=2)	3.97050 ± 0.7% (k=2)	4.01239 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	45.5 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199997.08	0.00	0.00
Channel X	+ Input	20002.35	2.59	0.01
Channel X	- Input	-19997.06	4.36	-0.02
Channel Y	+ Input	199996.68	-0.29	-0.00
Channel Y	+ Input	19999.86	0.07	0.00
Channel Y	- Input	-19998.39	3.03	-0.02
Channel Z	+ Input	199996.50	-0.35	0.00
Channel Z	+ Input	19998.20	-1.56	-0.0'
Channel Z	- Input	-20002.03	-0.50	0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.29	0.25	0.01
Channel X	+ Input	201.01	0.46	0.23
Channel X	+ Input	-199.00	-0.47	0.23
Channel Y	+ Input	2000.71	0.66	0.03
Channel Y	+ Input	198.89	-1.70	-0.85
Channel Y	- Input	-200.66	-1.36	0.68
Channel Z	+ Input	2000.11	0.07	0.00
Channel Z	+ Input	199.67	-0.86	-0.43
Channel Z	- Input	-199.69	-0.57	0.29

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-4.41	-5.40
	- 200	7.55	6.87
Channel Y	200	-4.78	-5.08
	- 200	2.80	2.66
Channel Z	200	-8.32	-7.96
	- 200	6.93	6.70

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	0.17	-3.06
Channel Y	200	6.29	-	2.00
Channel Z	200	9.82	3.54	-

4. **AD-Converter Values with inputs shorted**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16888	16969
Channel Y	16436	16195
Channel Z	15834	15572

5. **Input Offset Measurement**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input: 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.95	-0.58	2.65	0.60
Channel Y	-0.87	-2.92	0.70	0.66
Channel Z	-0.36	-2.83	1.72	0.73

6. **Input Offset Current**

Nominal input circuitry offset current on all channels: <25fA

7. **Input Resistance** (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. **Low Battery Alarm Voltage** (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. **Power Consumption** (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

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Accreditation No.: SCS 108

Client: TMC-SH (Auden)

Certificate No: ES3-3252_Jul12

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3252

Calibration procedure(s): QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: July 24, 2012

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 E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41495087	29-Mar-12 (No. 217-01506)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3b)	27-Mar-12 (No. 217-01631)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 24, 2012

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; VRx,y,z:* A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3252

Manufactured: June 29, 2009
Calibrated: July 24, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3252

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.26	1.35	1.40	± 10.1 %
DCP (mV)[B]	98.1	100.8	100.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
0	CW	0.00	X	0.00	0.00	1.00	156.5	±4.1 %
			Y	0.00	0.00	1.00	164.0	
			Z	0.00	0.00	1.00	165.1	

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%.

[A] The uncertainties of NormXYZ do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3252

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	41.5	0.90	6.09	6.09	6.09	0.56	1.36	± 12.0 %
900	41.5	0.97	6.04	6.04	6.04	0.30	1.89	± 12.0 %
1750	40.1	1.37	5.34	5.34	5.34	0.73	1.28	± 12.0 %
1900	40.0	1.40	5.10	5.10	5.10	0.66	1.38	± 12.0 %

[C] Frequency validity above ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be extended to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

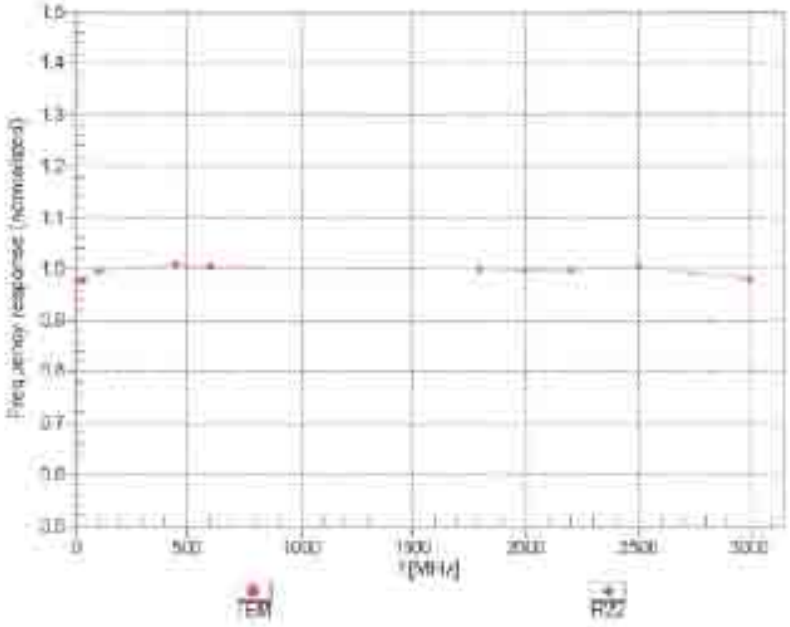
DASY/EASY - Parameters of Probe: ES3DV3 - SN:3252

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	55.2	0.97	6.06	6.06	6.06	0.49	1.48	± 12.0 %
900	55.0	1.05	6.06	6.06	6.06	0.46	1.51	± 12.0 %
1750	53.4	1.49	4.93	4.93	4.93	0.49	1.67	± 12.0 %
1900	53.3	1.52	4.64	4.64	4.64	0.58	1.48	± 12.0 %

[C] Frequency validity of ± 100MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for measured target tissue parameters.

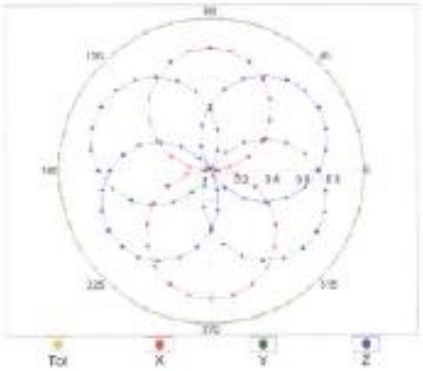
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



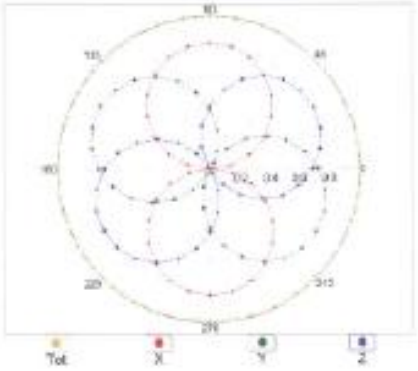
Uncertainty of Frequency Response of E-Field: ± 6.3% (k=2)

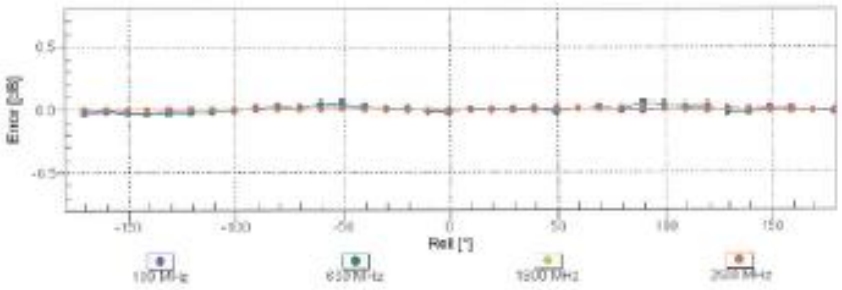
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



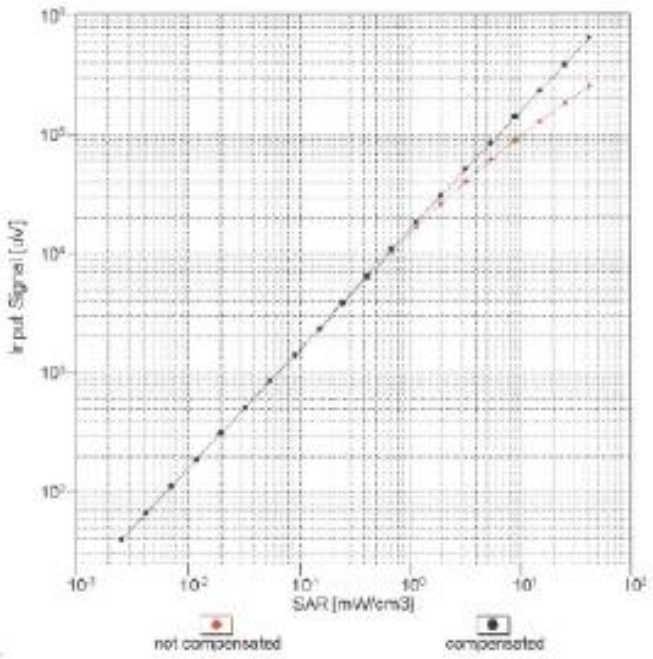
f=1800 MHz,R22

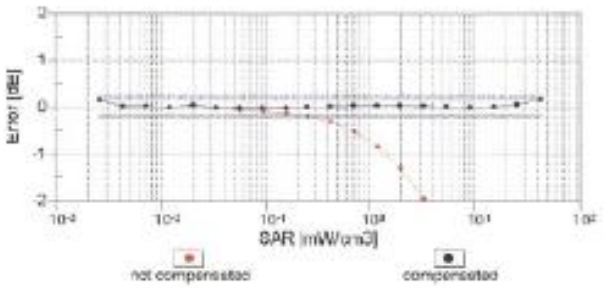




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

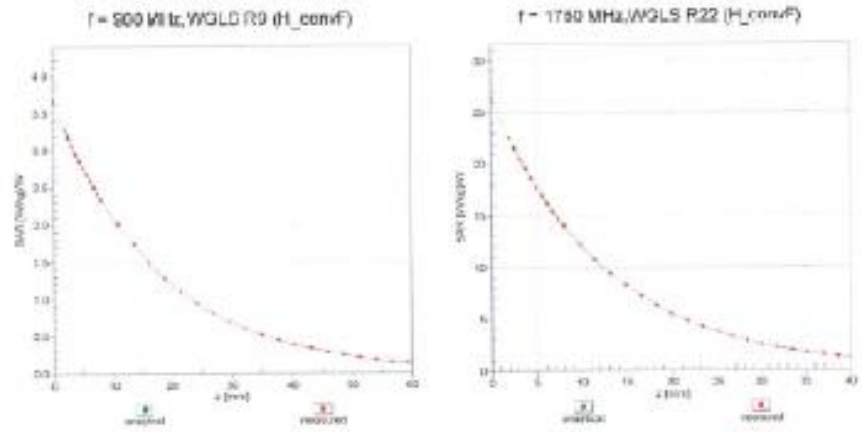
Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)





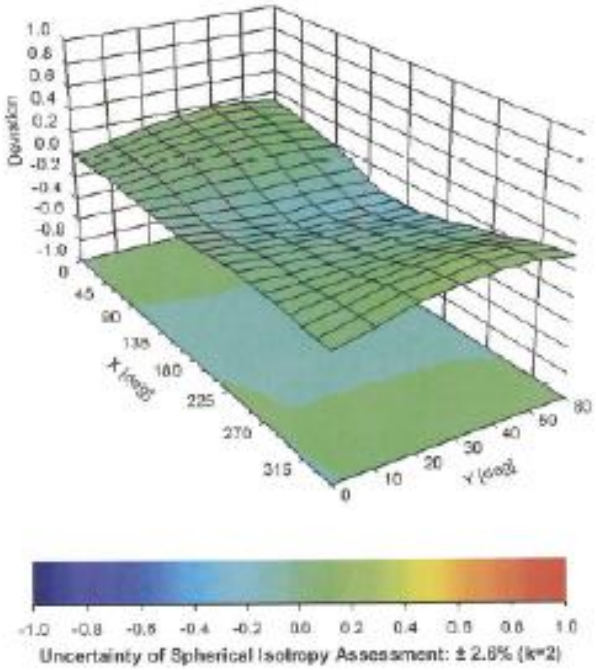
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (φ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.8% (k=2)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3252

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	129.2
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Accreditation No.: SCS 108

Client TMC-SH (Auden)

Certificate No: EX3-3754_Aug12

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3754

Calibration procedure(s): QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: August 17, 2012

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%.

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Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 18, 2012

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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

Methods Applied and Interpretation of Parameters:

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- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z*: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR*: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; VRx,y,z*: A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
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