Full

SAR TEST REPORT

No. ECIT-2013-0138-SAR

For

Client : CT Asia

Production : Digital Mobile Phone

Model Name : DASH4.0

Hardware Version: Q203_MAIN_PCB_V2.1

Software Version: Q203_PUBLIC_V0.5.5_S1026

Issued date: 2013-1-31

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

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Revision Version

Report Number	Revision	Date	Memo
ECIT-2013-0138-SAR	00	2013/1/31	Initial creation of test report

CONTENTS

1 Test Laboratory

1.1 Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
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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:	Jan 18, 2013
Testing End Date:	Jan 30, 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 DASH4.0 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	0.166
	Body	1.035
GSM 1900	Head	0.283
	Body	0.860
WCDMA 850	Head	0.321
	Body	1.027
WCDMA 1900	Head	0.566
	Body	1.078
Wi-Fi	Head	0.179
	Body	0.266

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**: 1.078 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	0.166	0.142	0.308
	Right Tilt	0.104	0.029	0.133
	Left Cheek	0.153	0.096	0.249
	Left Tilt	0.100	0.024	0.124

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.150	0.142	0.292
	Right Tilt	0.070	0.029	0.099
	Left Cheek	0.283	0.096	0.379
	Left Tilt	0.089	0.024	0.113

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.300	0.142	0.442
	Right Tilt	0.121	0.029	0.150
	Left Cheek	0.566	0.096	0.662
	Left Tilt	0.172	0.024	0.196

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.206	0.142	0.348
	Right Tilt	0.153	0.029	0.182
	Left Cheek	0.321	0.096	0.417
	Left Tilt	0.153	0.024	0.177

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	1.035	0.211	1.246
	Toward Phantom	0.264	0.0012	0.2652

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	0.860	0.211	1.077
	Toward Phantom	0.212	0.0012	0.2132

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.078	0.211	1.289
	Toward Phantom	0.165	0.0012	0.1662

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.027	0.211	1.238
	Toward Phantom	0.313	0.0012	0.3142

According to the above table, the maximum sum of reported SAR values for GSM and WiFi is **1.289 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:	CT Asia
Address /Post:	Unit 01, 15/F, Seaview Centre, 139-141 Hoi bun road, Kwun Tong, Kowloon,Hongkong
City:	Hongkong
Country:	China
Contact	Edward Phan
Tel	852-27931198

3.2 Manufacturer Information

Company Name:	Shanghai Ragentek Communication Technology Co. ,Ltd.
Address /Post:	Building D10-D11,No. 58-60, Lane 3188, Xiupu Road, PuDong District, Shanghai,PRC
City:	Shanghai
Country:	China
Contact	Jin xinjuan
Tel	+86-21-60352626

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

4.1 About EUT

Description:	WCDMA/GSM（GPRS）Digital Mobile Phone
Model name:	DASH4.0
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)
Test device Production information:	Production unit
GPRS Class Mode:	B
GPRS Multislot Class:	12
Device type:	Portable device
UE category:	3
Release Version:	R5
Antenna type:	Inner antenna
Accessories/Body-worn configurations:	Headset
Form factor:	12cm×6.8cm
Hotspot Mode:	Support simultaneous transmission of hotspot and voice (or data)

Picture 1: Constituents of the sample

4.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version:
EUT1	IMEI:864171010000135	Q203_MAIN_PCB_V2.1	Q203_PUBLIC_V0.5.5_S1026

*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	N/A	G2330000166LA	NINGBO VEKEN BATTERY CO., LTD
AE2	Headset	N/A	G7260010070LA	ZheJiang MEEYON Techology CO.,LTD

*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

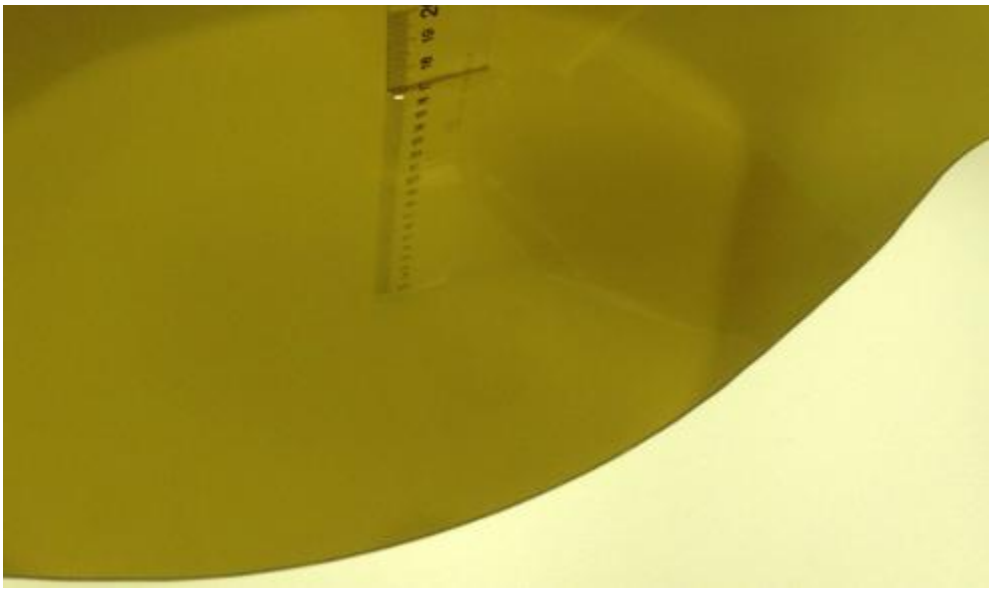
Table 7.1: Targets for tissue simulating liquid

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

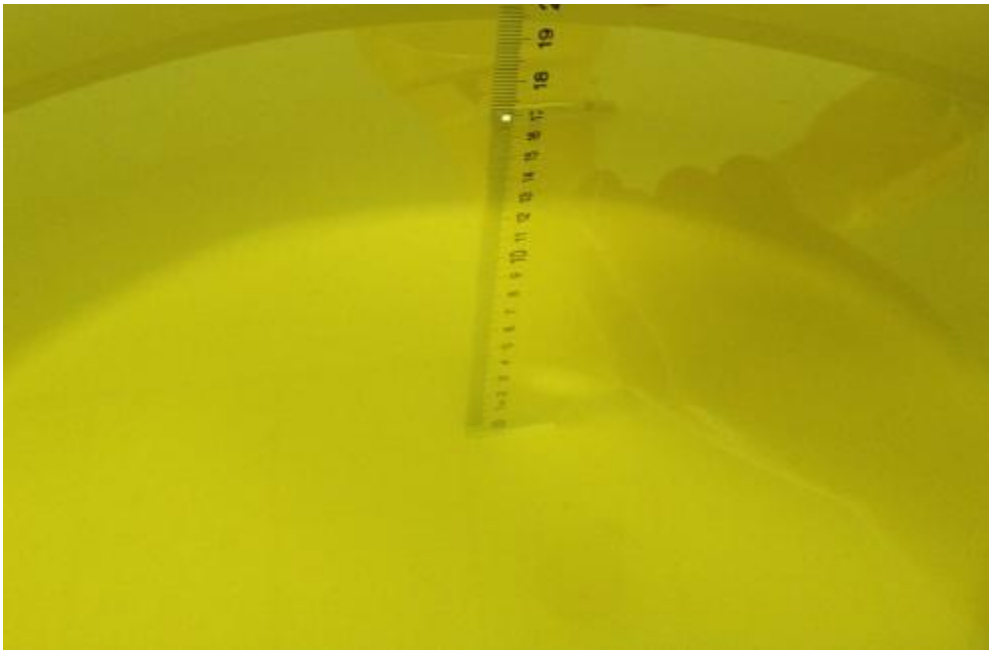
7.2 Dielectric Performance

Table 7.2: Dielectric Performance of Tissue Simulating Liquid

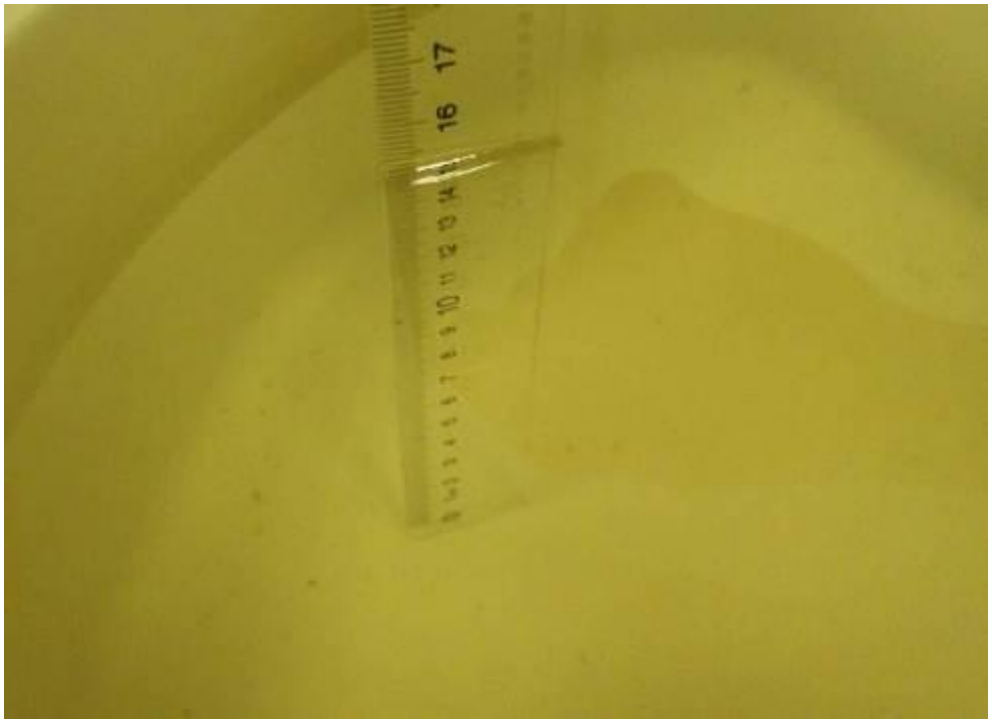
Measurement Date : 835 MHz Head **January 18, 2013** 1900 MHz Head **January 18, 2013** 2450 MHz Head **January 30, 2013** 2450 MHz Body **January 30, 2013** 835 MHz Body **January 21, 2013** 1900 MHz Body **January 22, 2013**						
/	**Type**	**Frequency**	**Permittivity ε**	**Drift (%)**	**Conductivity σ (S/m)**	**Drift (%)**
Measurement value	Head	835 MHz	40.67	2.00%	0.909	1.00%
	Body	835 MHz	55.15	0.09%	0.9989	2.97%
	Head	1900 MHz	40.53	1.33%	1.459	4.21%
	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%



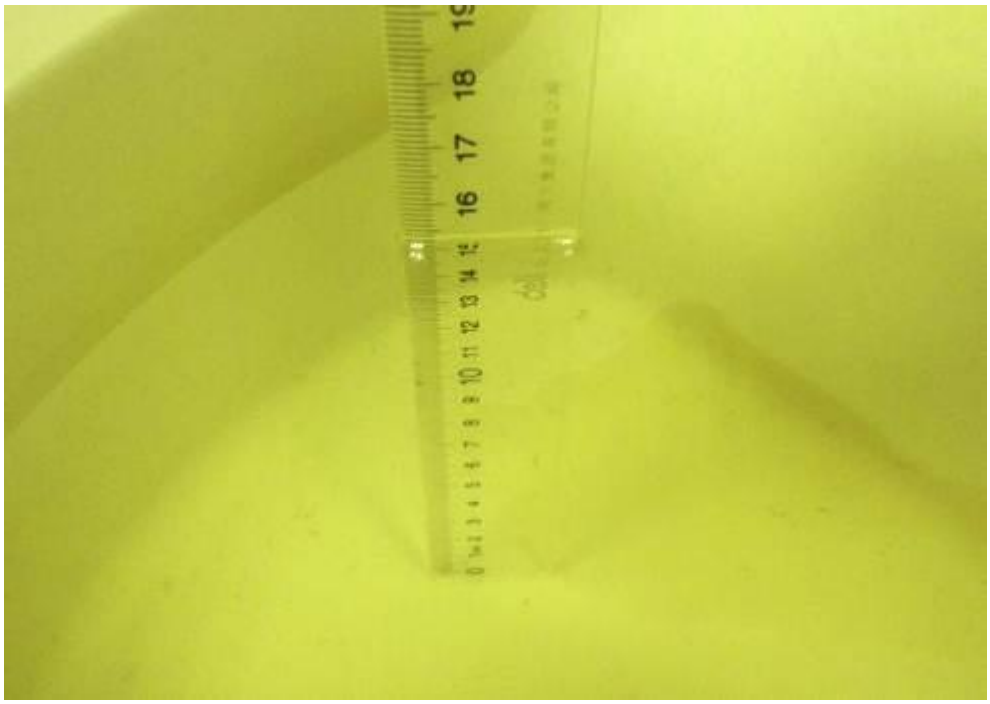
Picture 7-1: Liquid depth in the Flat Phantom (835 MHz Head)



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

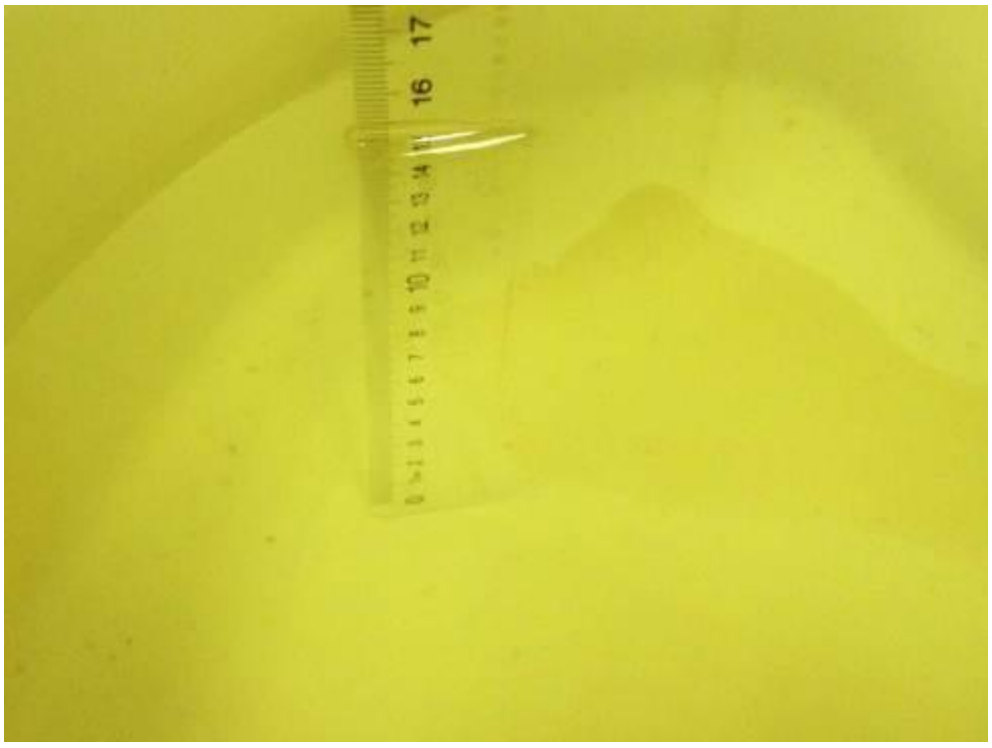


Picture 7-3: Liquid depth in the Flat Phantom (835 MHz Body)



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

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

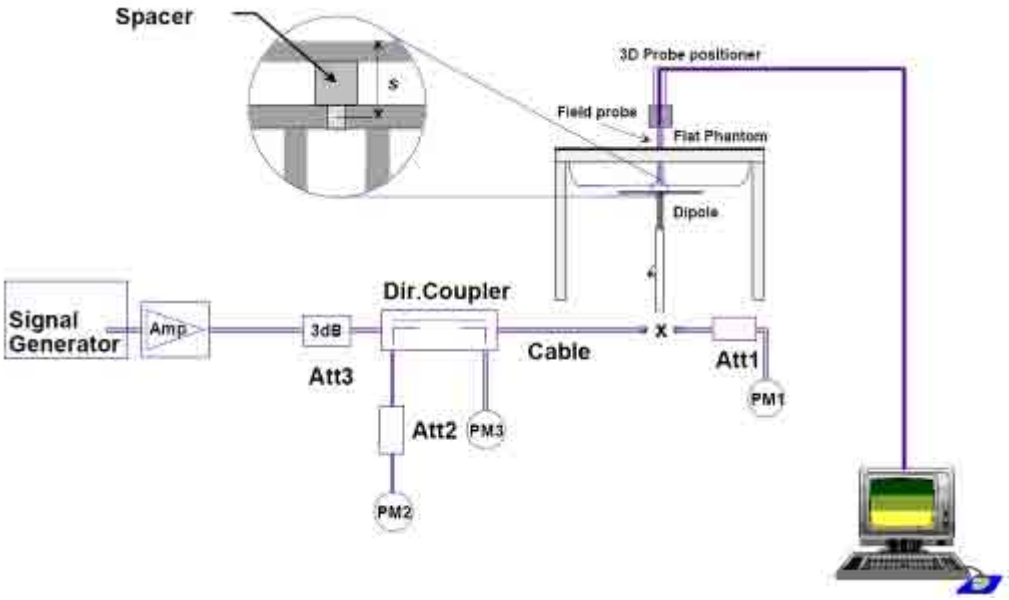


Picture 7-6: Liquid depth in the Flat Phantom (2450 MHz Body)

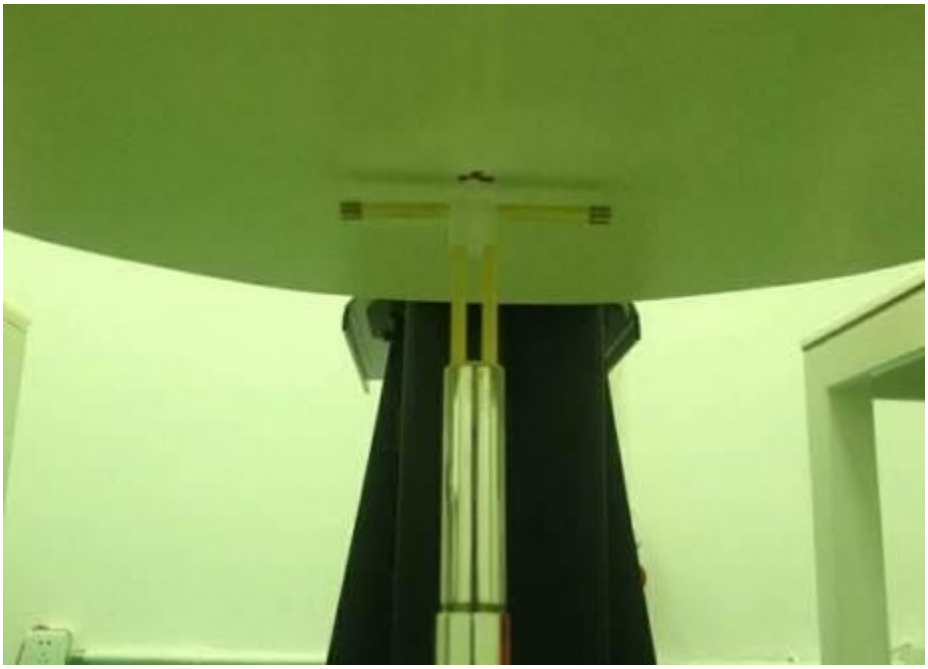
8 System verification

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 **January 18, 2013** 1900 MHz **January 18, 2013** 2450 MHz **January 30, 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 **January 30, 2013** 835 MHz **January 21, 2013** 1900 MHz **January 22, 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.

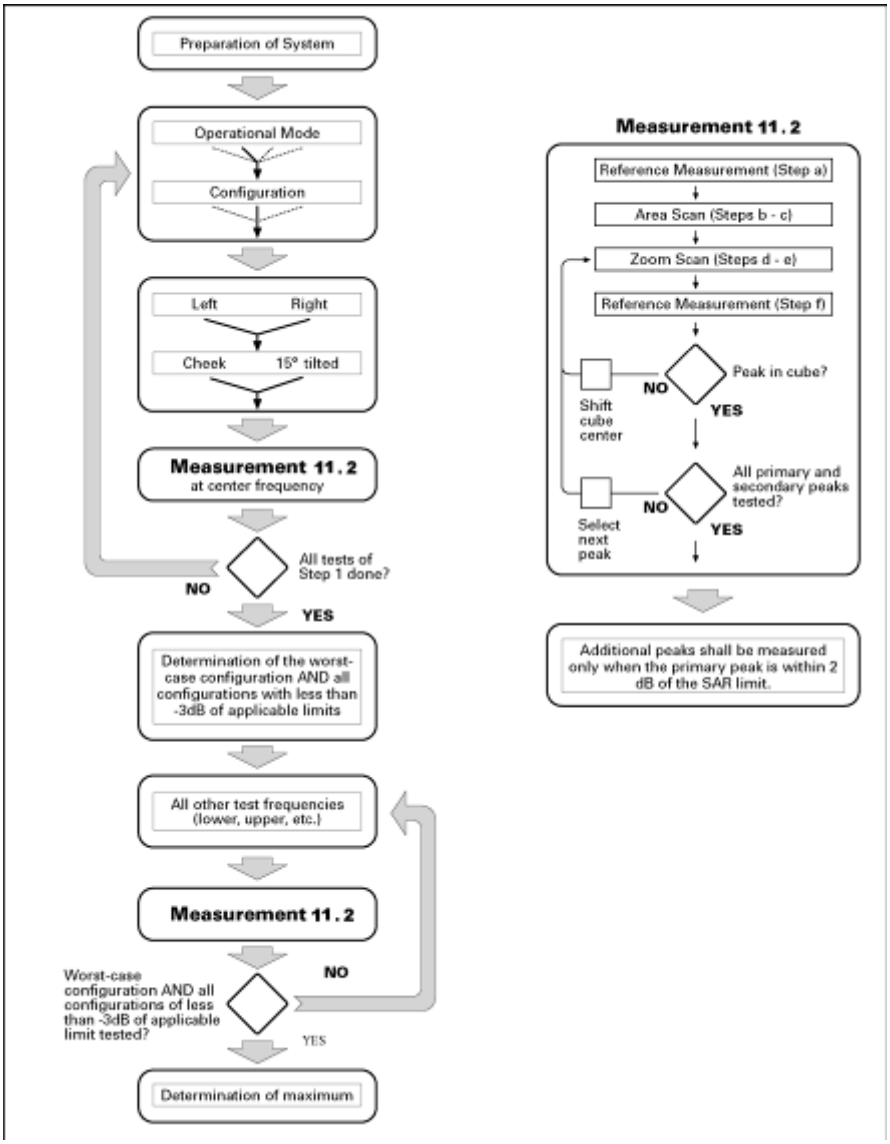
Step 1: The tests described in 11.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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)	31.5	31.5	31.5
Tolerance ±(dB)	0.4	0.4	0.3
GSM 1900			
Channel	Channel 810	Channel 661	Channel 512
Target (dBm)	29.5	29.5	29.5
Tolerance ±(dB)	1.0	0.9	0.7

Table 11.2: GPRS (GMSK Modulation)

GSM 850 GPRS				
Channel		**251**	**190**	**128**
1 Txslots	Target (dBm)	32.5	32.5	32.5
	Tolerance ±(dB)	1.3	0.9	1.3
2 Txslots	Target (dBm)	31.0	31.0	31.0
	Tolerance ±(dB)	1.2	1.0	1.2
3 Txslots	Target (dBm)	30.0	30.0	30.0
	Tolerance ±(dB)	1.5	1.3	1.5
4 Txslots	Target (dBm)	28.5	28.5	28.5
	Tolerance ±(dB)	1.1	0.9	1.1
GSM 1900 GPRS				
Channel		**810**	**661**	**512**
1 Txslots	Target (dBm)	28.0	28.0	28.0
	Tolerance ±(dB)	0.7	0.4	0.2
2 Txslots	Target (dBm)	27.0	27.0	27.0
	Tolerance ±(dB)	1.1	0.8	0.6
3 Txslots	Target (dBm)	26.0	26.0	26.0
	Tolerance ±(dB)	1.4	1.1	0.9
4 Txslots	Target (dBm)	25.0	25.0	25.0
	Tolerance ±(dB)	1.5	1.2	1.0

Table 11.3: WCDMA

WCDMA 850 CS			
Channel	Channel 4132	Channel 4182	Channel 4233
Target (dBm)	23.5	23.5	23.5
Tolerance ±(dB)	0.56	0.54	0.51
WCDMA 1900 CS			
Channel	Channel 9262	Channel 9400	Channel 9538
Target (dBm)	23.5	23.5	23.5
Tolerance ±(dB)	1.21	1.01	0.72

Table 11.4: WiFi

WiFi 802.11b			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	15.00	15.00	15.00
Tolerance ±(dB)	13.15	13.09	13.11
WiFi 802.11g			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.00	14.00	14.00
Tolerance ±(dB)	11.83	11.62	11.74
WiFi 802.11n			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	13.00	13.00	13.00
Tolerance ±(dB)	1.46	1.46	1.23

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 850MHZ	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	31.1	**31.1**	**31.2**
GSM 1900MHZ	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	28.5	**28.6**	**28.8**

Table 11.6: The conducted power measurement results for GPRS

GSM 850 GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	**190**	**128**		**251**	**190**	**128**
1 Txslot	31.2	31.4	31.2	-9.03dB	22.17	22.37	22.17
2 Txslots	29.8	30.0	29.8	-6.02dB	23.78	23.98	23.78
3Txslots	28.5	28.7	28.5	-4.26dB	24.24	24.44	24.24
4 Txslots	27.4	27.6	27.4	-3.01dB	**24.39**	**24.59**	**24.39**
PCS1900 GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	27.3	27.6	27.8	-9.03dB	18.27	18.57	18.77
2 Txslots	25.9	26.2	26.4	-6.02dB	19.88	20.18	20.38
3Txslots	24.6	24.9	25.1	-4.26dB	20.34	20.64	20.84
4 Txslots	23.5	23.8	24.0	-3.01dB	**20.49**	**20.79**	**20.99**

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 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	22.94	22.96	22.99
HSDPA	sub1	22.88	22.91	22.92
	sub2	21.67	21.60	21.71
	sub3	22.16	22.10	22.12
	sub4	21.68	21.62	21.69
Item	band	FDDII result(dBm)		
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)
WCDMA	RMC	22.78	22.49	22.29
HSDPA	sub1	22.69	22.41	22.21
	sub2	21.48	21.22	21.01
	sub3	22.19	21.89	21.02
	sub4	21.50	21.19	21.02

Note: HSDPA body SAR are not required, because maximum average output power of each RF channel with HSDPA active is not 1/4 dB higher than that measured without HSDPA 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)	3.57	3.30	3.13

For π/4 DQPSK

Channel	Ch0 (2402 MHz)	Ch39 (2441MHz)	CH78 (2480MHz)
Conducted Output Power (dBm)	3.48	3.27	3.31

For 8DPSK

Channel	Ch0 (2402 MHz)	Ch39 (2441MHz)	CH78 (2480MHz)
Conducted Output Power (dBm)	3.82	3.72	3.29

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

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	12.20	12.10	13.15	12.74
6	11.71	11.64	13.09	12.68
11	11.88	12.19	13.11	12.72

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	11.83	11.16	11.10	11.12	11.57	11.69	10.79	10.65
6	11.62	11.63	11.62	11.62	11.73	11.73	10.19	10.19
11	11.74	11.77	11.77	11.79	11.63	11.71	10.38	10.37

20M 802.11n（dBm）

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	11.11	11.22	11.19	11.54	9.79	9.76	7.86	7.95
6	11.53	11.54	11.52	11.10	9.12	9.11	7.16	7.20
11	11.77	11.75	11.74	11.33	9.34	9.35	7.42	7.43

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

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	13.69	13.69	13.66	14.13
6	14.72	14.68	14.77	14.63
11	14.65	14.64	14.72	14.63

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	18.23	18.42	17.35	17.12	17.82	18.59	17.42	17.50
6	18.19	18.24	17.42	17.46	17.97	18.30	16.84	16.94
11	18.03	18.13	17.37	17.44	17.95	18.14	16.76	16.86

802.11n（dBm）

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	18.23	18.42	17.35	17.12	17.82	18.59	17.42	17.50
6	18.19	18.24	17.42	17.46	17.97	18.30	16.84	16.94
11	18.03	18.13	17.37	17.44	17.95	18.14	16.76	16.86

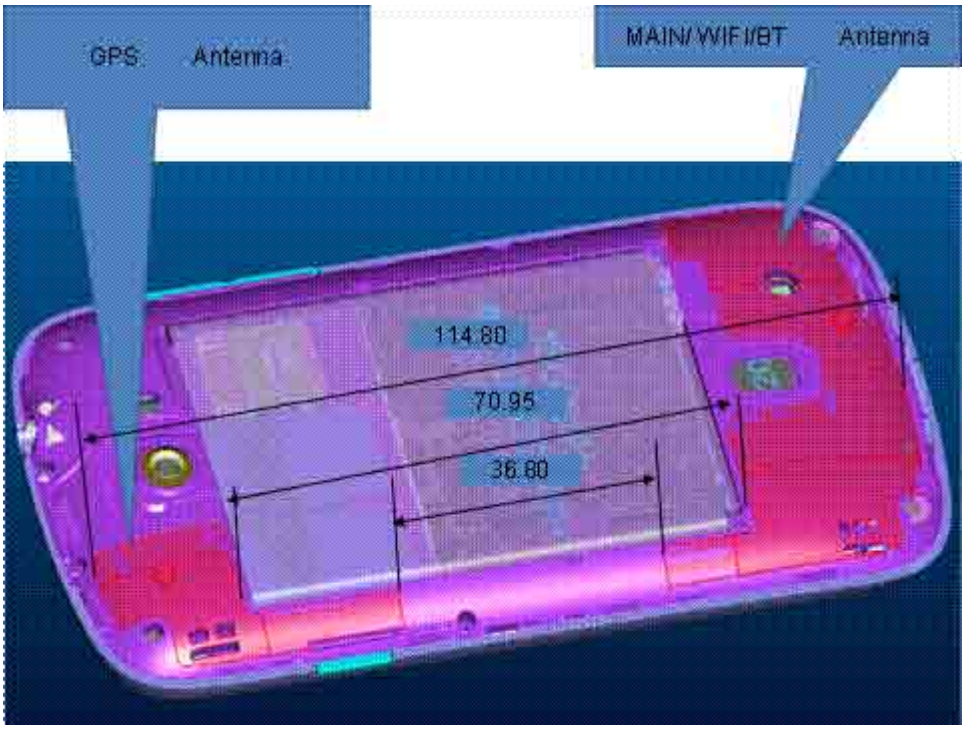
SAR is not required for 802.11g/n channels if the output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels, and for each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of 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, 5.5Mbps, 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	2.410
2.4GHz WLAN 802.11 b/g	2.45	10	20.65

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 is considered with measurement results of GSM/WCDMA and WiFi.

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	0.166	0.142	0.308
	Right Tilt	0.104	0.029	0.133
	Left Cheek	0.153	0.096	0.249
	Left Tilt	0.100	0.024	0.124

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.150	0.142	0.292
	Right Tilt	0.070	0.029	0.099
	Left Cheek	0.283	0.096	0.379
	Left Tilt	0.089	0.024	0.113

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.300	0.142	0.442
	Right Tilt	0.121	0.029	0.150
	Left Cheek	0.566	0.096	0.662
	Left Tilt	0.172	0.024	0.196

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Head SAR	Right Cheek	0.206	0.142	0.348
	Right Tilt	0.153	0.029	0.182
	Left Cheek	0.321	0.096	0.417
	Left Tilt	0.153	0.024	0.177

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	1.035	0.211	1.246
	Toward Phantom	0.264	0.0012	0.2652

Simult Tx	Configuration	GSM 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	0.860	0.211	1.077
	Toward Phantom	0.212	0.0012	0.2132

Simult Tx	Configuration	WCDMA 1900MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.078	0.211	1.289
	Toward Phantom	0.165	0.0012	0.1662

Simult Tx	Configuration	WCDMA 850MHz SAR(W/Kg)	2.4 GHz WLAN SAR(W/Kg)	SUM SAR(W/Kg)
Body SAR	Toward Ground	1.027	0.211	1.238
	Toward Phantom	0.313	0.0012	0.3142

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 ＜1.6W/kg. So the simultaneous transmission SAR is not required for WiFi 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	31.5	31.1	1.096	0.140	0.153	0.11
836.6	190	Left	Tilt	31.5	31.1	1.096	0.092	0.100	-0.08
848.8	251	Right	Touch	31.5	31.1	1.096	0.152	0.166	0.14
836.6	190	Right	Touch	31.5	31.1	1.096	0.148	0.162	-0.18
824.2	128	Right	Touch	31.5	31.2	1.072	0.104	0.111	0.11
836.6	190	Right	Tilt	31.5	31.1	1.096	0.095	0.104	-0.14
SIM2 SAR value(test in worst-case of SIM1)									
848.8	251	Right	Touch	31.5	31.1	1.096	0.147	0.161	0.04

Note: According to the values in the above table, SIM1 SAR value is higher than SIM2. SIM1 is the primary. So we'll perform the measurement with SIM1.

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	28.5	27.6	1.230	0.215	0.264	-0.17
848.8	251	GPRS (4)	Ground	28.5	27.4	1.288	0.804	1.035	-0.01
836.6	190	GPRS (4)	Ground	28.5	27.6	1.230	0.634	0.779	-0.01
824.2	128	GPRS (4)	Ground	28.5	27.4	1.288	0.571	0.735	-0.00
836.6	190	GPRS (4)	Left	28.5	27.6	1.230	0.154	0.189	-0.15
836.6	190	GPRS (4)	Right	28.5	27.6	1.230	0.159	0.195	0.06
836.6	190	GPRS (4)	Bottom	28.5	27.6	1.230	0.039	0.047	0.19
848.8	251	Speech	Ground (Headset)	31.5	31.1	1.096	0.749	0.821	-0.14
SIM2 SAR value(test in worst-case of SIM1)									
848.8	251	GPRS (4)	Ground	28.5	27.4	1.288	0.793	1.021	0.11

Note:

1. The distance between the EUT and the phantom bottom is 5mm.

According to the values in the above table, SIM1 SAR value is higher than SIM2. SIM1 is the

primary. So we'll perform the measurement with SIM1.

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.								
1909.8	810	Left	Touch	29.5	28.5	1.259	0.163	0.205	0.12
1880	661	Left	Touch	29.5	28.6	1.230	0.142	0.174	-0.12
1850.2	512	Left	Touch	29.5	28.8	1.175	0.241	0.283	0.15
1880	661	Left	Tilt	29.5	28.6	1.230	0.073	0.089	0.12
1880	661	Right	Touch	29.5	28.6	1.230	0.122	0.150	0.11
1880	661	Right	Tilt	29.5	28.6	1.230	0.057	0.070	0.15
SIM2 SAR value(test in worst-case of SIM1)									
1850.2	512	Left	Touch	29.5	28.8	1.175	0.235	0.276	-0.16

Note: According to the values in the above table, SIM1 SAR value is higher than SIM2. SIM1 is the primary. So we'll perform the measurement with SIM1.

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	25.0	23.8	1.318	0.161	0.212	0.11
1909.8	810	GPRS (4)	Ground	25.0	23.5	1.413	0.600	0.847	-0.13
1880	661	GPRS (4)	Ground	25.0	23.8	1.318	0.653	0.860	0.13
1850.2	512	GPRS (4)	Ground	25.0	24.0	1.259	0.663	0.834	0.16
1880	661	GPRS (4)	Left	25.0	23.8	1.318	0.092	0.121	0.05
1880	661	GPRS (4)	Right	25.0	23.8	1.318	0.022	0.029	0.18
1880	661	GPRS (4)	Bottom	25.0	23.8	1.318	0.188	0.247	-0.05
1850.2	512	Speech	Ground (Headset)	29.5	28.8	1.175	0.173	0.203	0.17
SIM2 SAR value(test in worst-case of SIM1)									
1850.2	512	GPRS (4)	Ground	25.0	24.0	1.259	0.652	0.820	-0.12

Note:

2. The distance between the EUT and the phantom bottom is 5mm.
3. According to the values in the above table, SIM1 SAR value is higher than SIM2. SIM1 is the primary. So we'll perform the measurement with SIM1.

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.								
846.6	4233	Left	Touch	23.5	22.94	1.138	0.282	0.321	0.12
836.4	4182	Left	Touch	23.5	22.96	1.132	0.225	0.255	0.10
826.4	4132	Left	Touch	23.5	22.99	1.125	0.277	0.312	0.17
836.4	4182	Left	Tilt	23.5	22.96	1.132	0.135	0.153	0.15
836.4	4182	Right	Touch	23.5	22.96	1.132	0.182	0.206	-0.13
836.4	4182	Right	Tilt	23.5	22.96	1.132	0.135	0.153	-0.06

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	23.5	22.96	1.132	0.276	0.313	-0.11
846.6	4233	Ground	23.5	22.94	1.138	0.903	1.027	0.00
836.4	4182	Ground	23.5	22.96	1.132	0.729	0.826	0.01
826.4	4132	Ground	23.5	22.99	1.125	0.754	0.927	-0.02
836.4	4182	Left	23.5	22.96	1.132	0.087	0.099	-0.04
836.4	4182	Right	23.5	22.96	1.132	0.098	0.111	-0.19
836.4	4182	Bottom	23.5	22.96	1.132	0.021	0.024	0.17
846.6	4233	Ground (Headset)	23.5	22.94	1.138	0.798	0.908	0.02

Note1: The distance between the EUT and the phantom bottom is 5mm.

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.								
1907.6	9538	Left	Touch	23.5	22.78	1.180	0.334	0.394	0.18
1880	9400	Left	Touch	23.5	22.49	1.262	0.344	0.434	-0.04
1852.4	9262	Left	Touch	23.5	22.29	1.321	0.428	0.566	0.17
1880	9400	Left	Tilt	23.5	22.49	1.262	0.136	0.172	0.14
1880	9400	Right	Touch	23.5	22.49	1.262	0.238	0.300	0.12
1880	9400	Right	Tilt	23.5	22.49	1.262	0.096	0.121	0.08

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	23.5	22.49	1.262	0.131	0.165	0.13
1907.6	9538	Ground	23.5	22.78	1.180	0.913	1.078	0.12
1880	9400	Ground	23.5	22.49	1.262	0.795	1.003	-0.09
1852.4	9262	Ground	23.5	22.29	1.321	0.595	0.786	0.11
1880	9400	Left	23.5	22.49	1.262	0.108	0.212	0.13
1880	9400	Right	23.5	22.49	1.262	0.026	0.033	0.14
1880	9400	Bottom	23.5	22.49	1.262	0.244	0.308	0.13
1907.6	9538	Ground (Headset)	23.5	22.78	1.180	0.768	0.847	0.13

Note1: The distance between the EUT and the phantom bottom is 5mm.

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	13.15	1.531	0.063	0.096	0.11
2412	1	Left	Tilt	15.00	13.15	1.531	0.016	0.024	0.19
2412	1	Right	Touch	15.00	13.15	1.531	0.093	0.142	0.20
2412	1	Right	Tilt	15.00	13.15	1.531	0.019	0.029	0.16

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	13.15	1.531	0.000786	0.0012	0.04
2412	1	Ground	15.00	13.15	1.531	0.138	0.211	-0.02
2412	1	Left	15.00	13.15	1.531	0.00114	0.00175	-0.07
2412	1	Right	15.00	13.15	1.531	0.000179	0.00027	-0.11
2412	1	Top	15.00	13.15	1.531	0.000655	0.001	-0.14
2412	1	Bottom	15.00	13.15	1.531	0.00026	0.0004	-0.09

Note1: The distance between the EUT and the phantom bottom is 5mm.

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 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.						
848.8	251	GPRS (4)	Ground	5	0.804	0.815	1.01
848.8	251	Speech	Ground (Headset)	5	0.749	0.725	1.03
1909.8	810	GPRS (4)	Ground	5	0.600	0.646	1.07
1880	661	GPRS (4)	Ground	5	0.653	0.602	1.08
1850.2	512	GPRS (4)	Ground	5	0.663	0.682	1.02
846.6	4233	WCDMA	Ground	5	0.903	0.862	1.04
836.4	4182	WCDMA	Ground	5	0.729	0.775	1.06
826.4	4132	WCDMA	Ground	5	0.754	0.682	1.10
846.6	4233	WCDMA	Ground (Headset)	5	0.798	0.780	1.02
1907.6	9538	WCDMA	Ground	5	0.913	0.912	1.00
1880	9400	WCDMA	Ground	5	0.795	0.794	1.00
1907.6	9538	WCDMA	Ground (Headset)	5	0.768	0.768	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

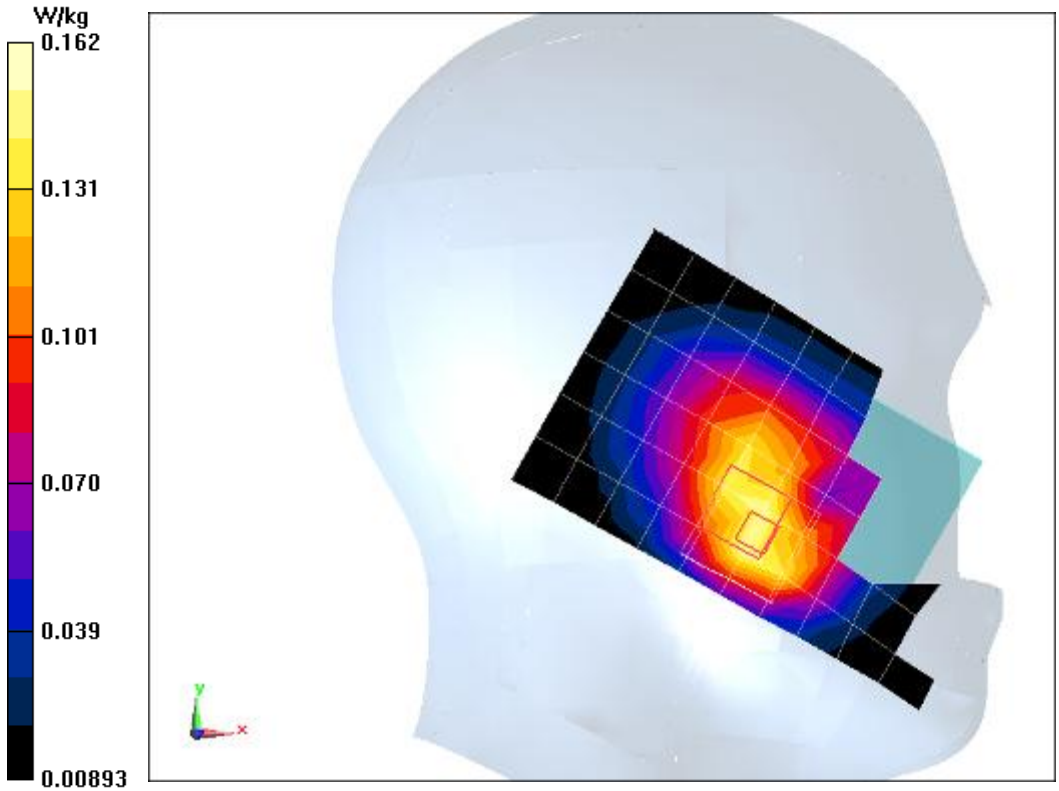
Table 16.1: List of Main Instruments

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

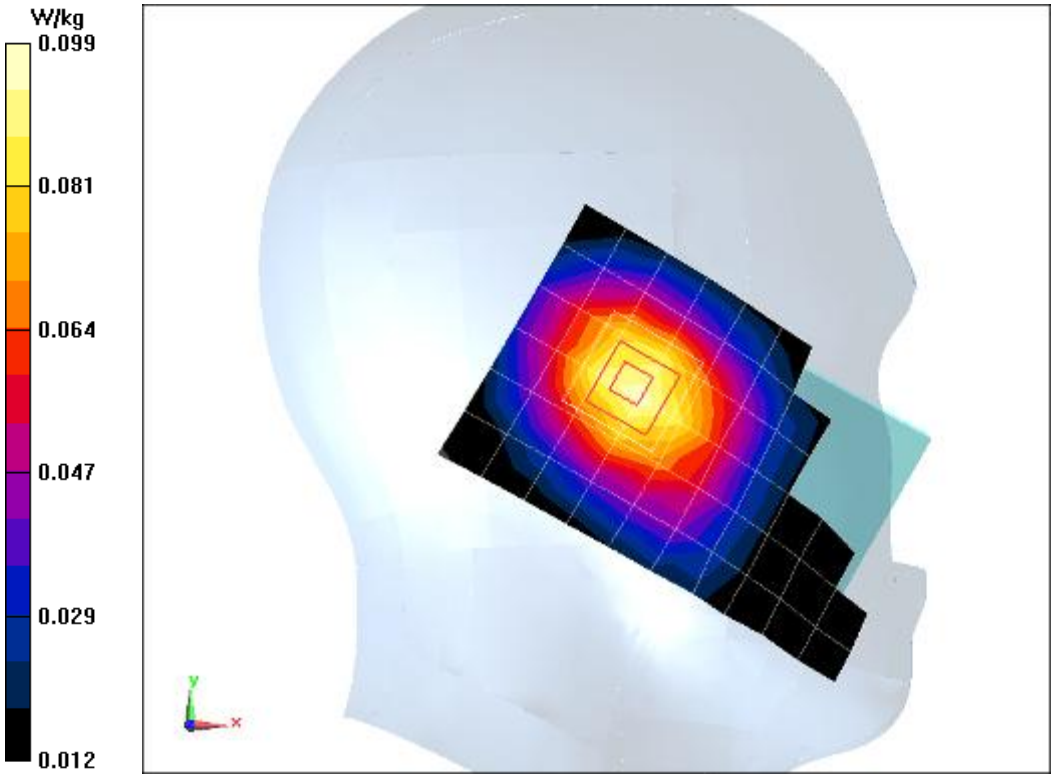
GSM835 Left Cheek Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.91 S/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 MHz; 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 (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.151 W/kg
Middle Cheek Left GSM835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.280 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.238 W/kg
SAR(1 g) = 0.140 W/kg; SAR(10 g) = 0.095 W/kg
Maximum value of SAR (measured) = 0.162 W/kg



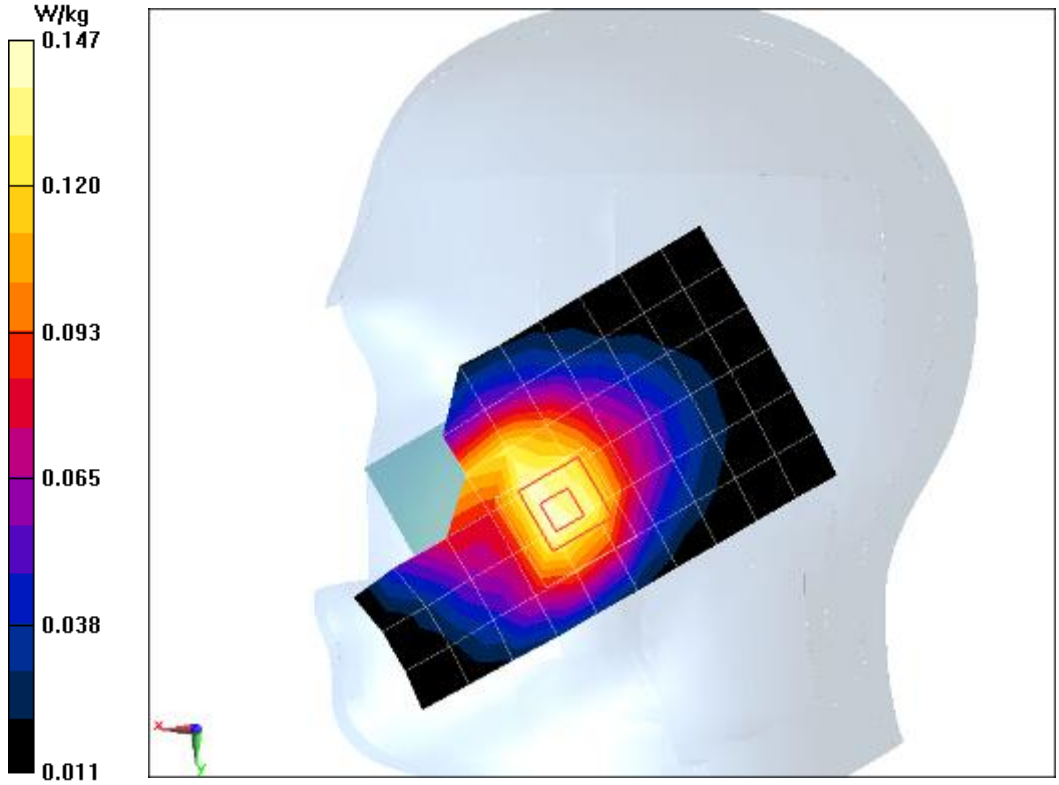
GSM835 Left Tilt Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.91 S/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 MHz; 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 (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0971 W/kg
Middle Tilt Left GSM835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.630 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.118 W/kg
SAR(1 g) = 0.092 W/kg; SAR(10 g) = 0.069 W/kg
Maximum value of SAR (measured) = 0.0986 W/kg



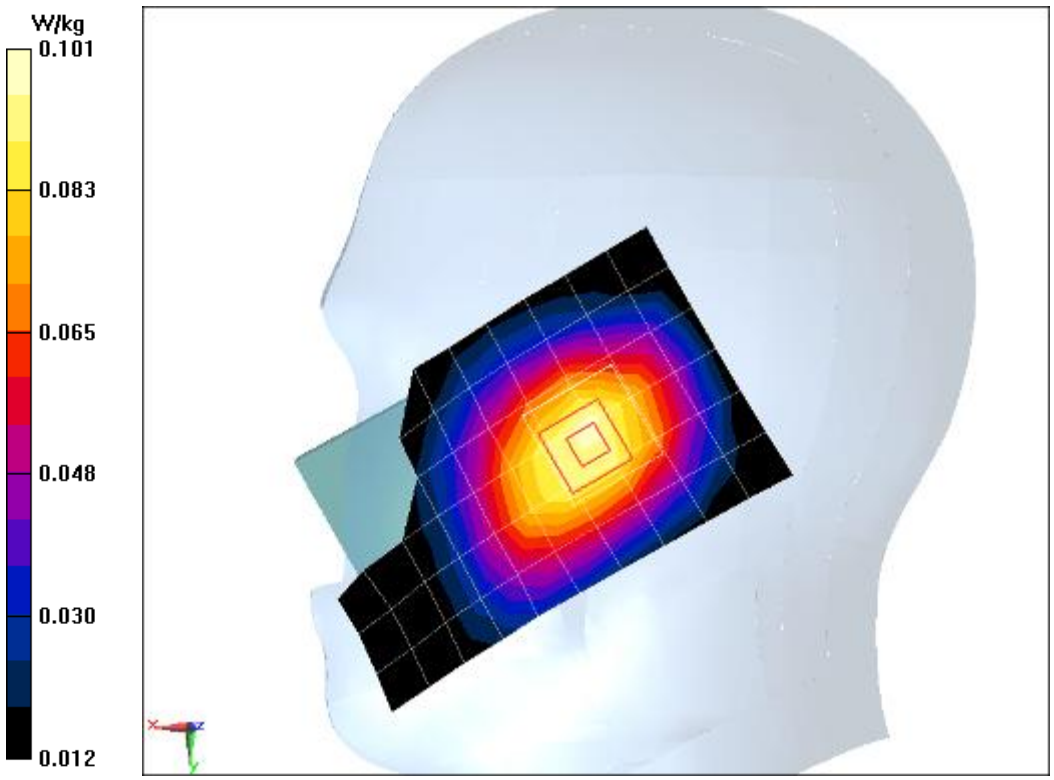
GSM835 Right Cheek Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.91 S/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 MHz; 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 (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.145 W/kg
Middle Cheek Right GSM835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.442 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.188 W/kg
SAR(1 g) = 0.148 W/kg; SAR(10 g) = 0.100 W/kg
Maximum value of SAR (measured) = 0.147 W/kg



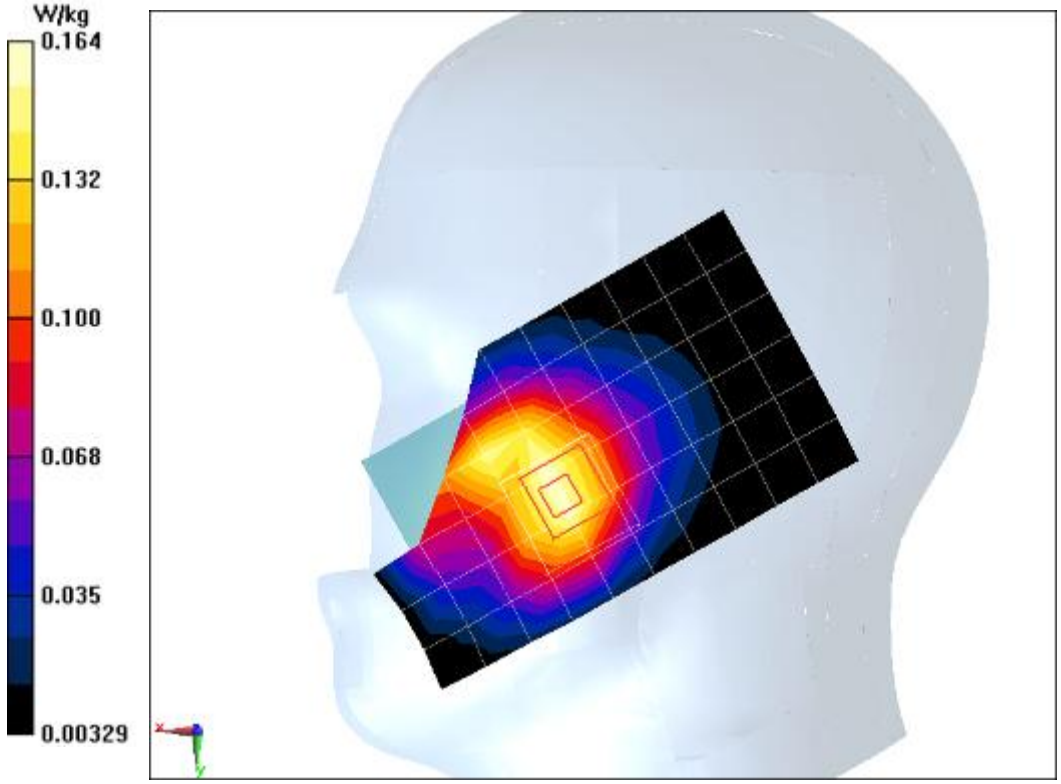
GSM835 Right Tilt Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.91 S/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 MHz; 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 (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0979 W/kg
Middle Tilt Right GSM835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.002 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.119 W/kg
SAR(1 g) = 0.095 W/kg; SAR(10 g) = 0.071 W/kg
Maximum value of SAR (measured) = 0.101 W/kg



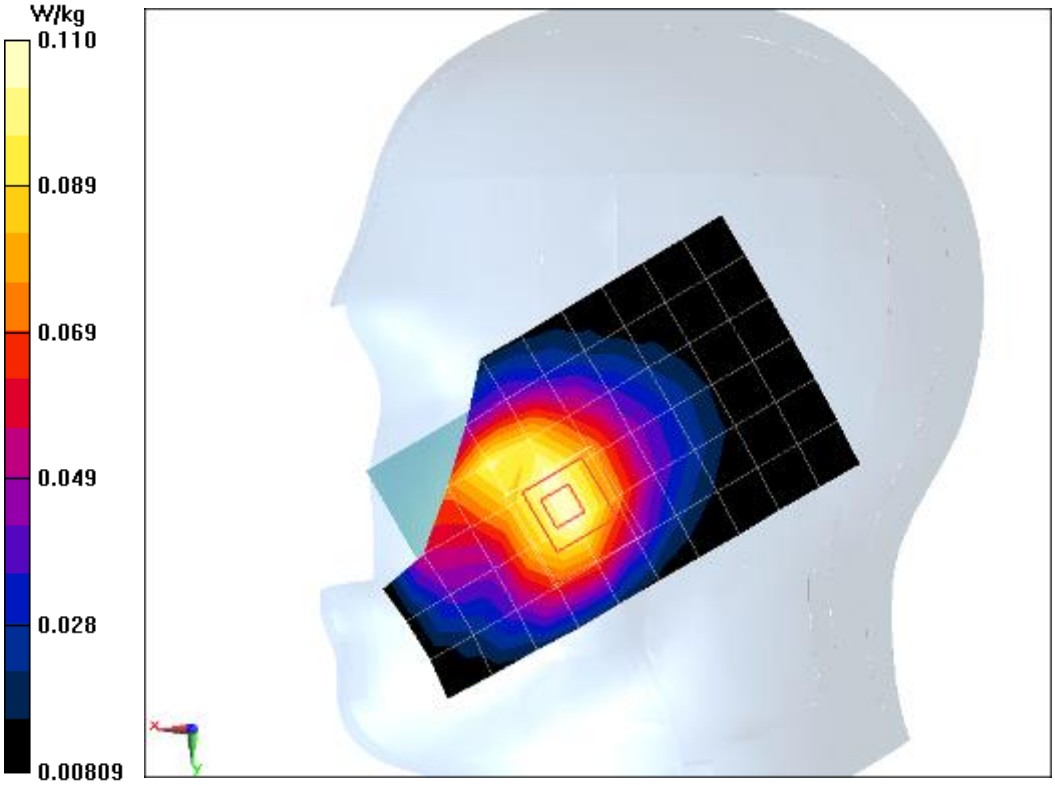
GSM835 Right Cheek High

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 849 MHz; σ = 0.919 S/m; εr = 40.508; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 MHz; 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 (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.159 W/kg
High Cheek Right GSM835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.088 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.234 mW/g
SAR(1 g) = 0.152 W/kg; SAR(10 g) = 0.108 W/kg
Maximum value of SAR (measured) = 0.164 W/kg



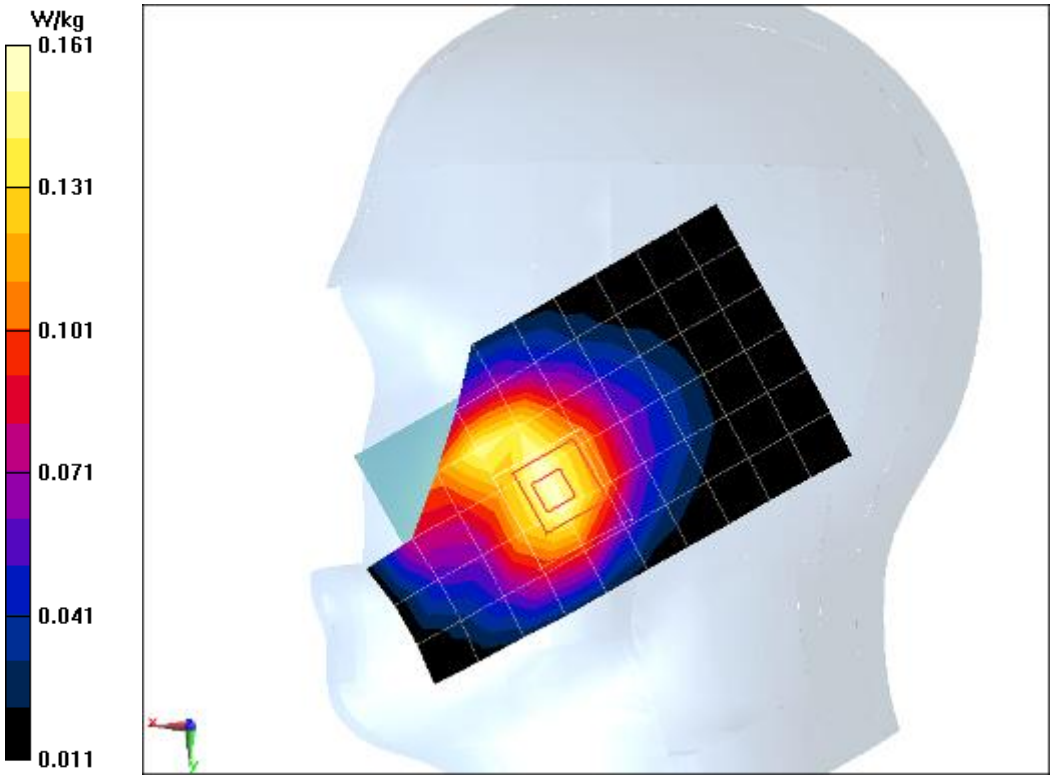
GSM835 Right Cheek Low

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 824.2 MHz; σ = 0.9 S/m; εr = 40.801; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 MHz; 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 (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.109 W/kg
Low Cheek Right GSM835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.762 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.143 W/kg
SAR(1 g) = 0.104 W/kg; SAR(10 g) = 0.074 W/kg
Maximum value of SAR (measured) = 0.110 W/kg



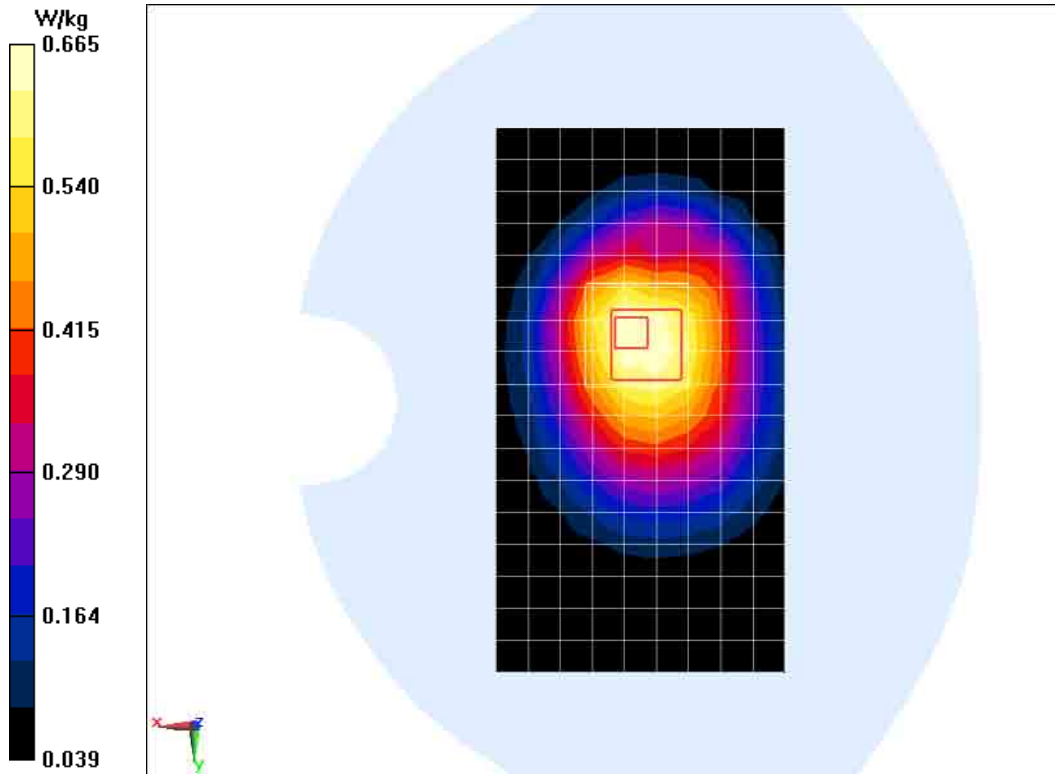
GSM835 Right Cheek High SIM2

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 849 MHz; σ = 0.919 S/m; εr = 40.508; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 MHz; 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 SIM2/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.148 W/kg
High Cheek Right GSM835MHz SIM2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.088 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.214 W/kg
SAR(1 g) = 0.147 mW/g; SAR(10 g) = 0.085 mW/g
Maximum value of SAR (measured) = 0.161 W/kg



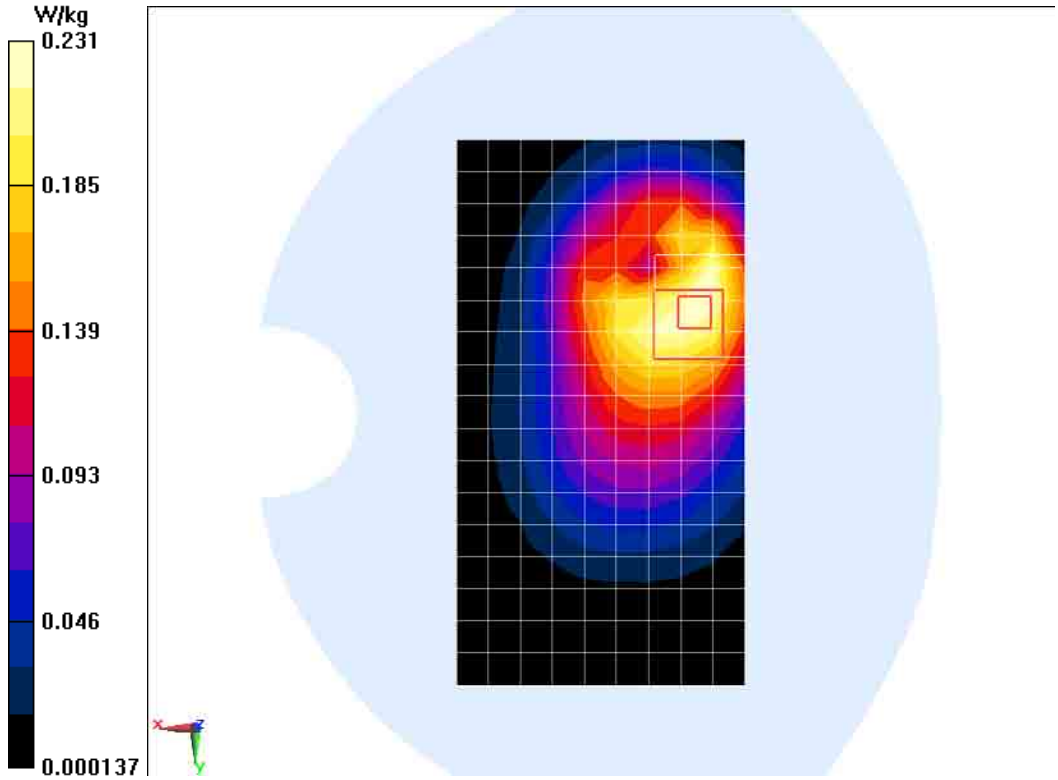
GSM835 Body Toward Ground GPRS 4TS Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 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 835MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.668 W/kg
Middle Toward Ground GPRS 4TS 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.187 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.878 W/kg
SAR(1 g) = 0.634 W/kg; SAR(10 g) = 0.457 W/kg
Maximum value of SAR (measured) = 0.665 W/kg



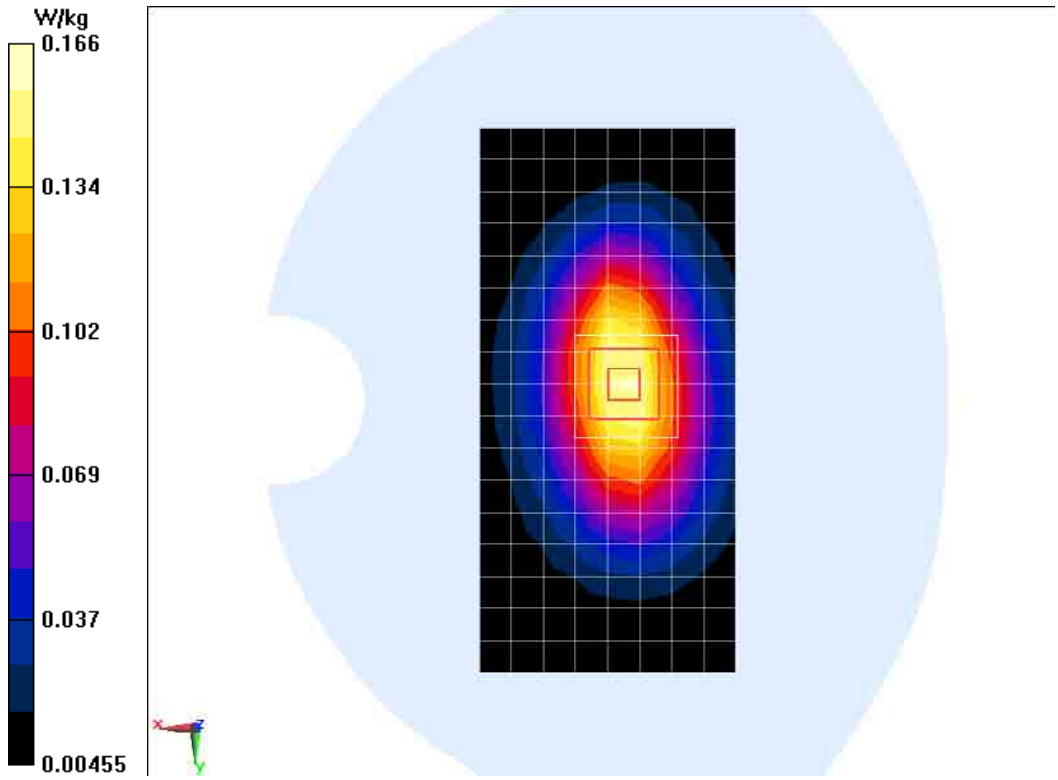
GSM835 Body Toward Phantom GPRS 4TS Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 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 835MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.225 W/kg
Middle Toward Phantom GPRS 4TS 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.036 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.359 W/kg
SAR(1 g) = 0.215 W/kg; SAR(10 g) = 0.138 W/kg
Maximum value of SAR (measured) = 0.231 W/kg



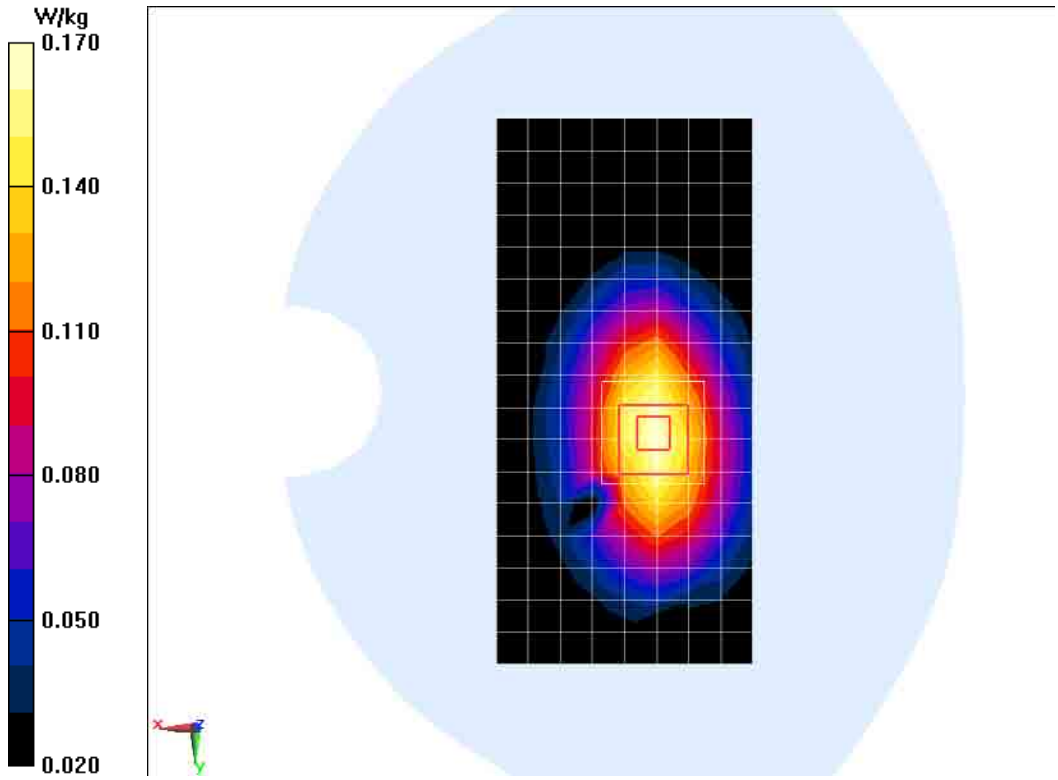
GSM835 Body Left GPRS 4TS Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 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 835MHz/Area Scan (9x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.158 W/kg
Middle Left GPRS 4TS 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.852 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.154 W/kg; SAR(10 g) = 0.104 W/kg
Maximum value of SAR (measured) = 0.166 W/kg



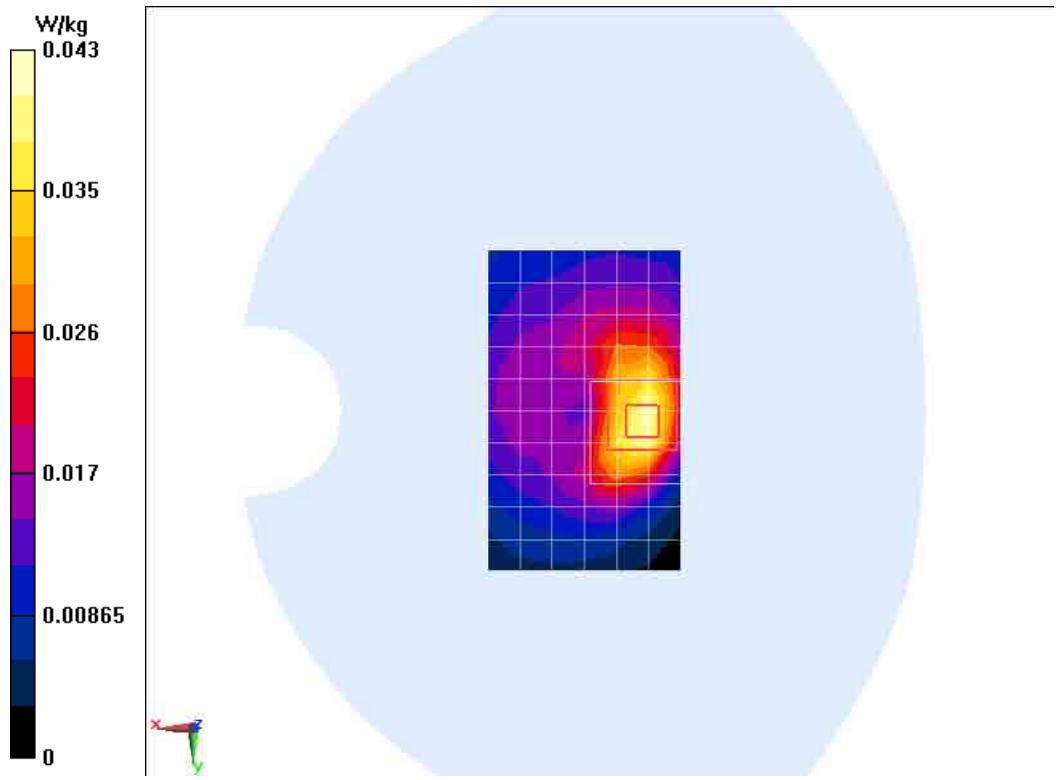
GSM835 Body Right GPRS 4TS Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 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 835MHz/Area Scan (9x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.169 W/kg
Middle Right GPRS 4TS 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.769 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.226 W/kg
SAR(1 g) = 0.159 W/kg; SAR(10 g) = 0.108 W/kg
Maximum value of SAR (measured) = 0.170 W/kg



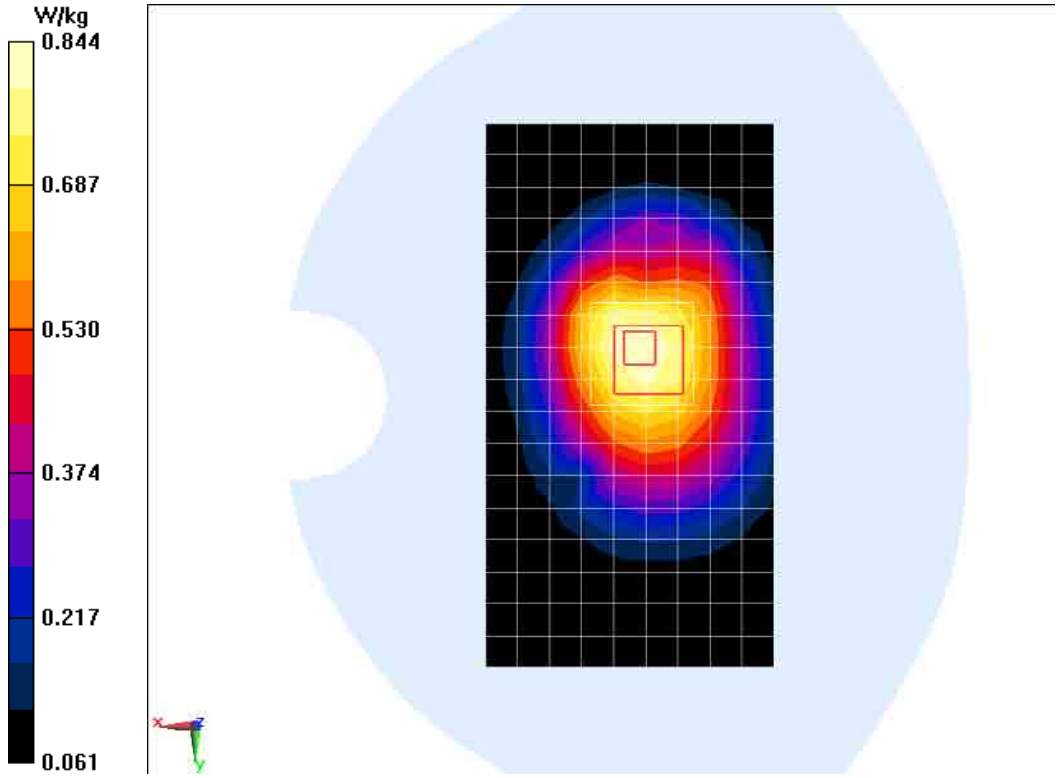
GSM835 Body Bottom GPRS 4TS Middle

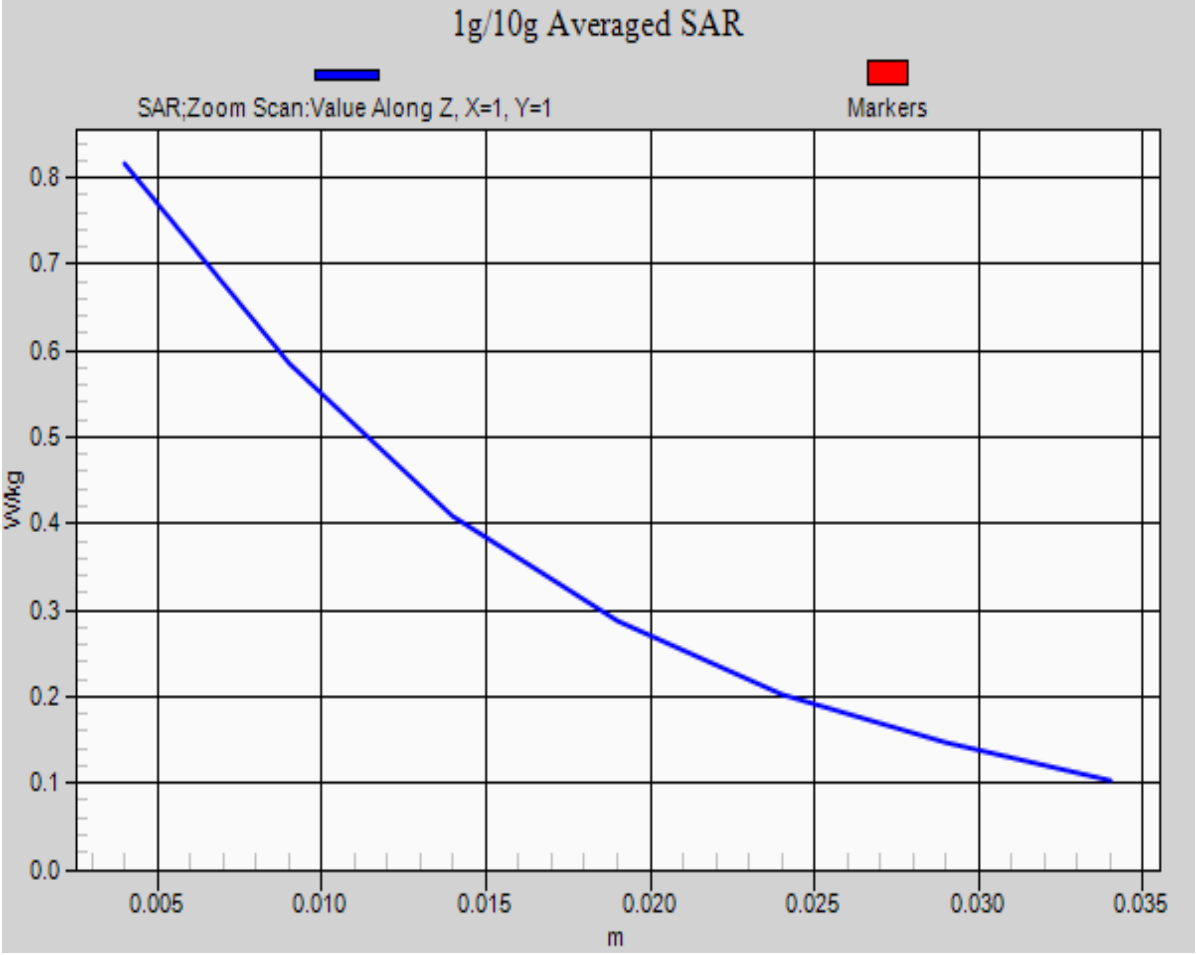
Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
Middle Bottom GPRS 4TS 835MHz/Area Scan (7x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.0421 W/kg
Middle Bottom GPRS 4TS 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.790 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.0650 W/kg
SAR(1 g) = 0.039 W/kg; SAR(10 g) = 0.023 W/kg
Maximum value of SAR (measured) = 0.0432 W/kg



GSM835 Body Toward Ground GPRS 4TS High

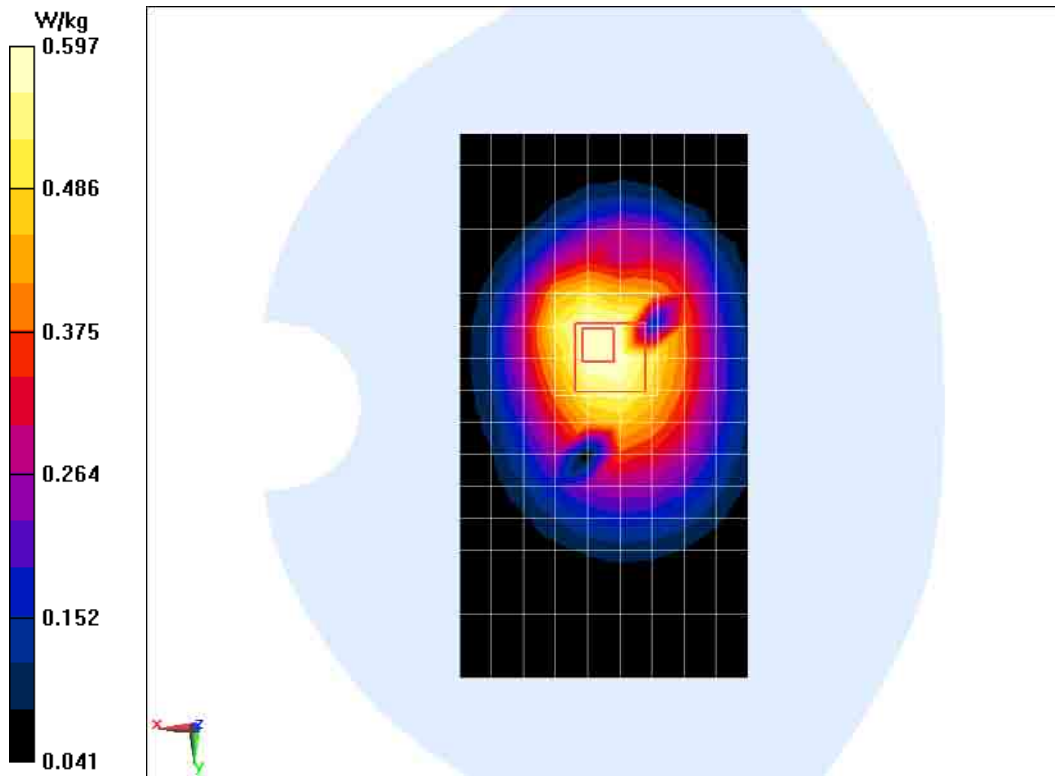
Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; εr = 55.205; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 GPRS 4TS; Frequency: 848.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
High Toward Ground GPRS 4TS 835MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.854 W/kg
High Toward Ground GPRS 4TS 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.652 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.804 W/kg; SAR(10 g) = 0.589 W/kg
Maximum value of SAR (measured) = 0.844 W/kg




1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=1, Y=1
Markers
W/kg
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

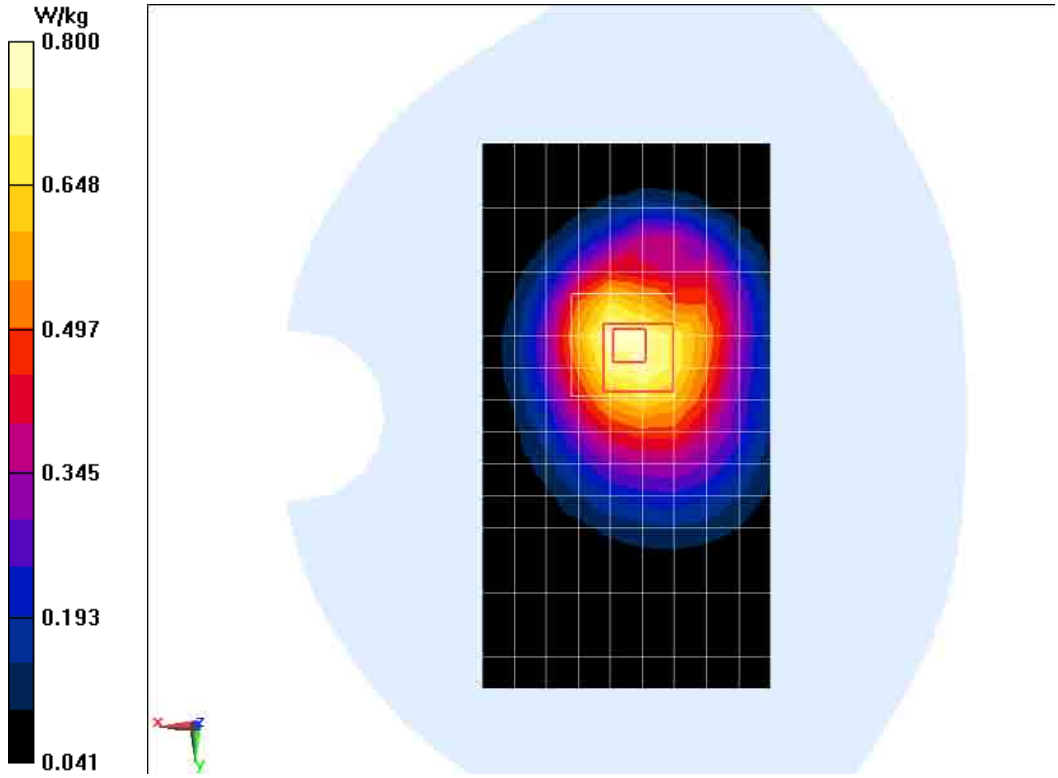
GSM835 Body Toward Ground GPRS 4TS Low

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 824.2 MHz; σ = 0.993 S/m; εr = 55.149; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 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 835MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.601 W/kg
Low Toward Ground GPRS 4TS 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.071 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.782 W/kg
SAR(1 g) = 0.571 W/kg; SAR(10 g) = 0.418 W/kg
Maximum value of SAR (measured) = 0.597 W/kg



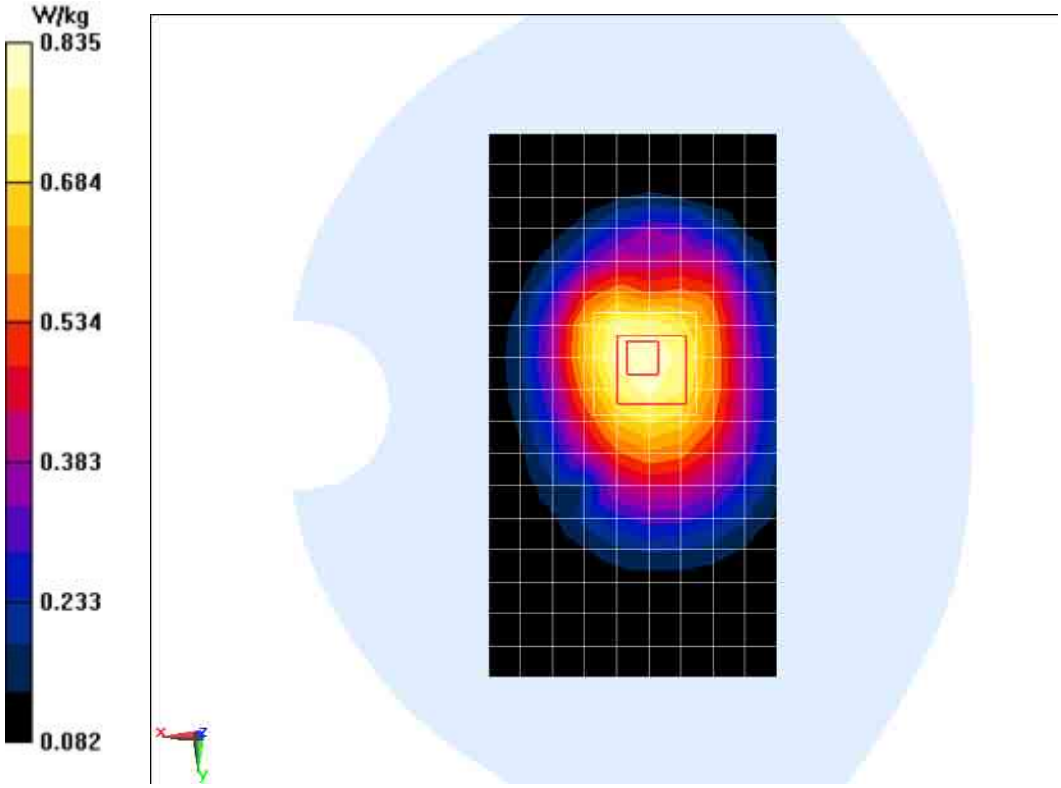
GSM835 Body Toward Ground High With Headset

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; εr = 55.205; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.06, 6.06, 6.06); Calibrated: 7/24/2012
High Toward Ground GSM835MHz With Headset/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.785 W/kg
High Toward Ground GSM835MHz With Headset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.816 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.749 W/kg; SAR(10 g) = 0.516 W/kg
Maximum value of SAR (measured) = 0.800 W/kg



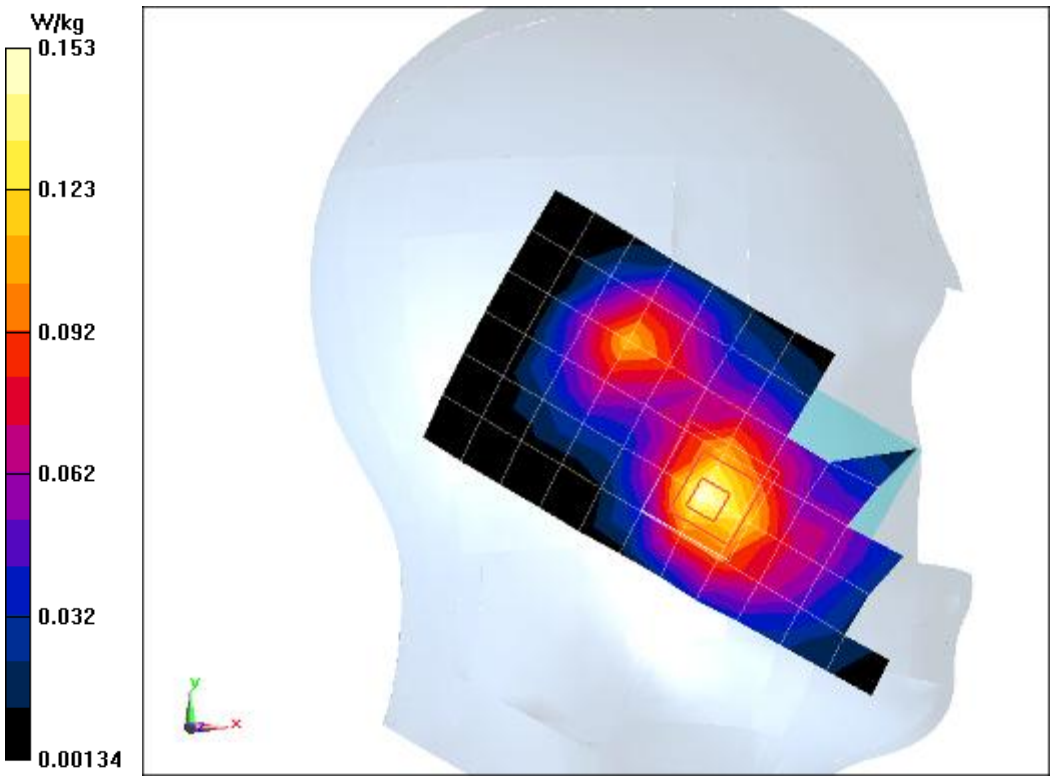
GSM835 Body Toward Ground GPRS 4TS High SIM2

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; εr = 55.205; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 835 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 835MHz SIM2/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.842 W/kg
High Toward Ground GPRS 4TS 835MHz SIM2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.343 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.020 mW/g
SAR(1 g) = 0.793 mW/g; SAR(10 g) = 0.577 mW/g
Maximum value of SAR (measured) = 0.835 W/kg



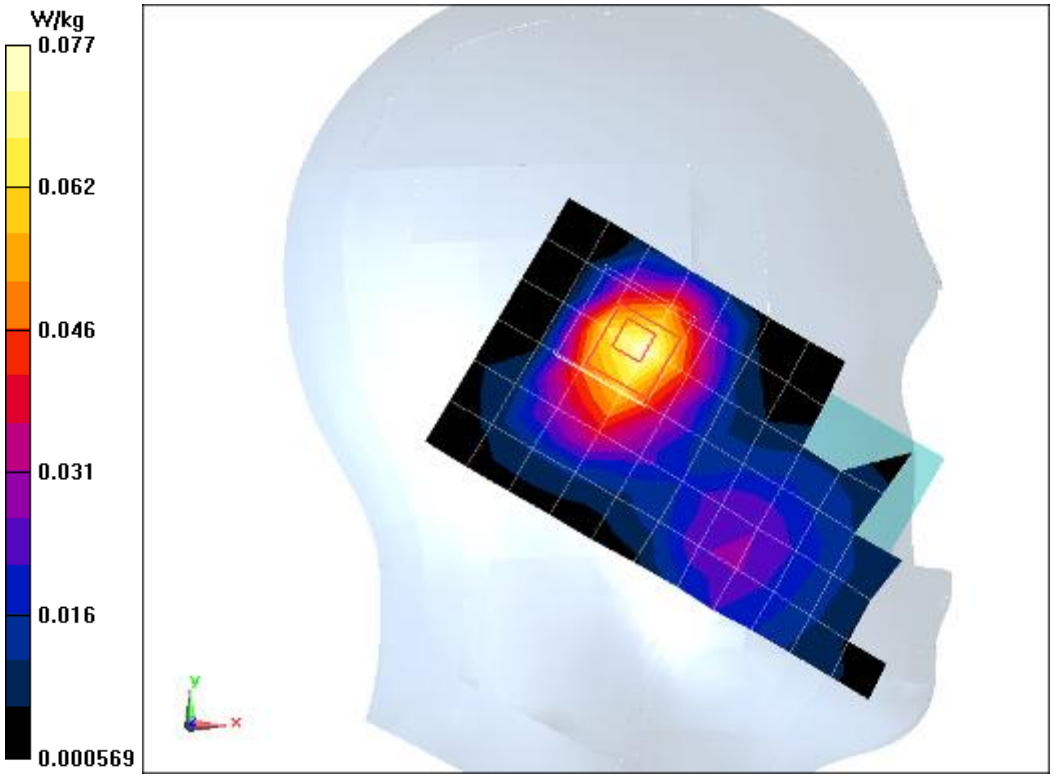
GSM1900 Left Cheek Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 S/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900 MHz; 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) = 0.154 W/kg
Middle Cheek Left GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.229 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.223 W/kg
SAR(1 g) = 0.142 W/kg; SAR(10 g) = 0.086 W/kg
Maximum value of SAR (measured) = 0.153 W/kg



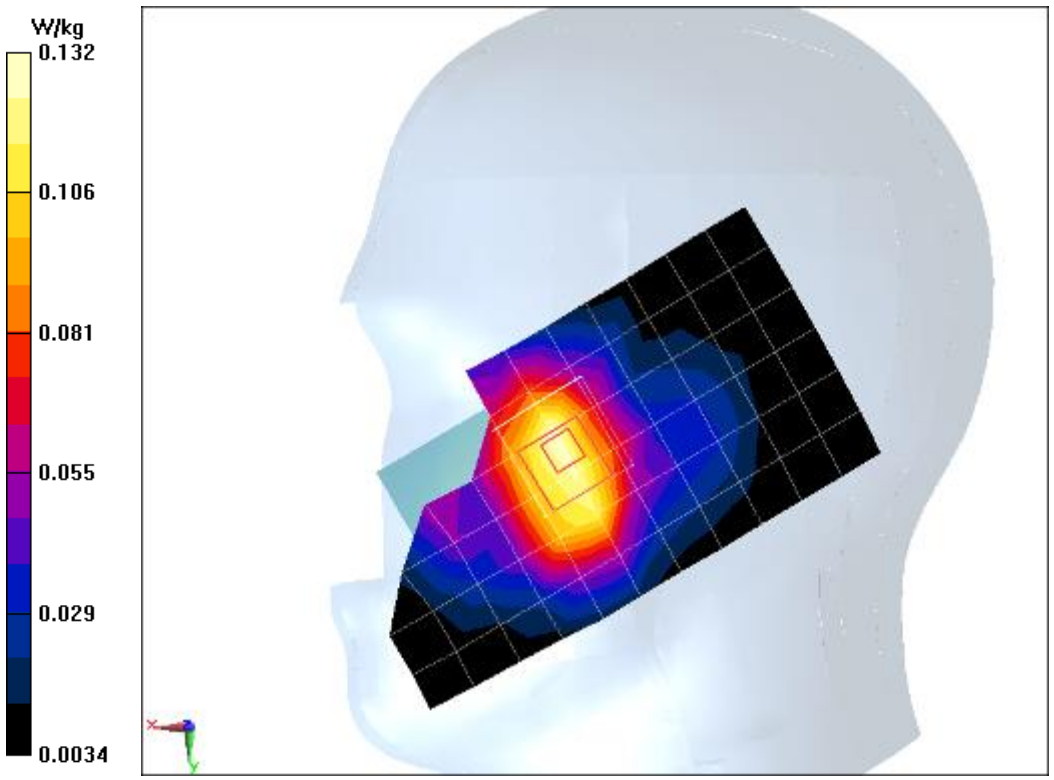
GSM1900 Left Tilt Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 S/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900 MHz; 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) = 0.0772 W/kg
Middle Tilt Left GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.937 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.117 W/kg
SAR(1 g) = 0.073 W/kg; SAR(10 g) = 0.044 W/kg
Maximum value of SAR (measured) = 0.0768 W/kg



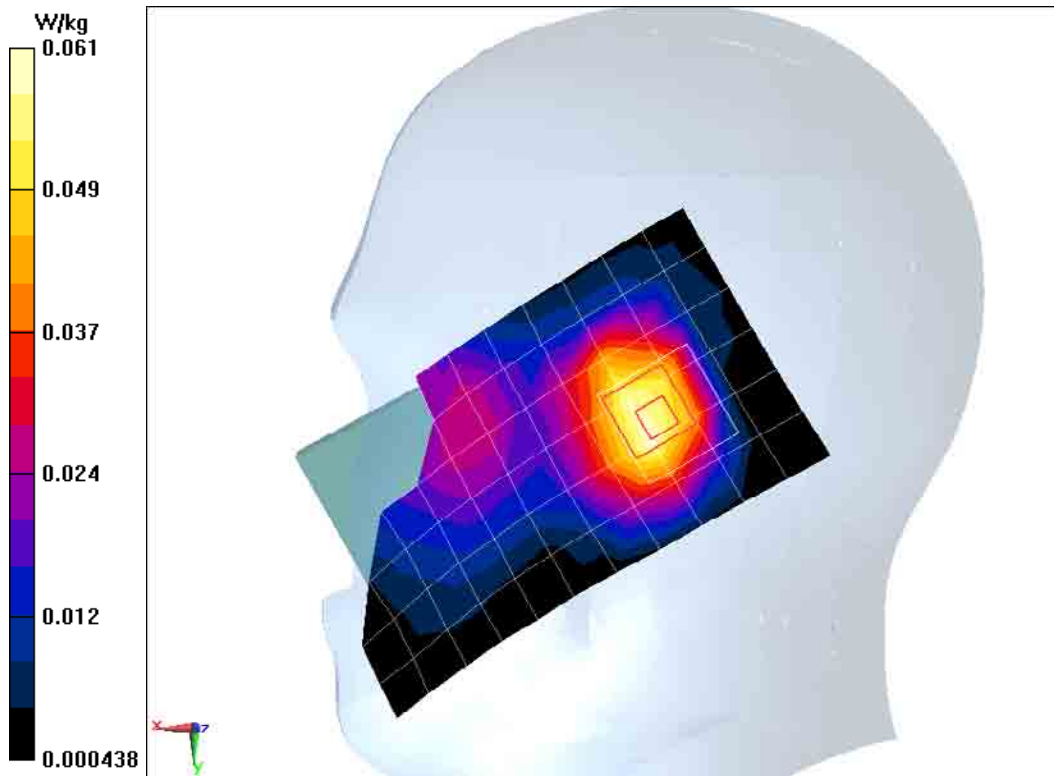
GSM1900 Right Cheek Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 S/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900 MHz; 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) = 0.131 W/kg
Middle Cheek Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.314 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.189 W/kg
SAR(1 g) = 0.122 W/kg; SAR(10 g) = 0.077 W/kg
Maximum value of SAR (measured) = 0.132 W/kg



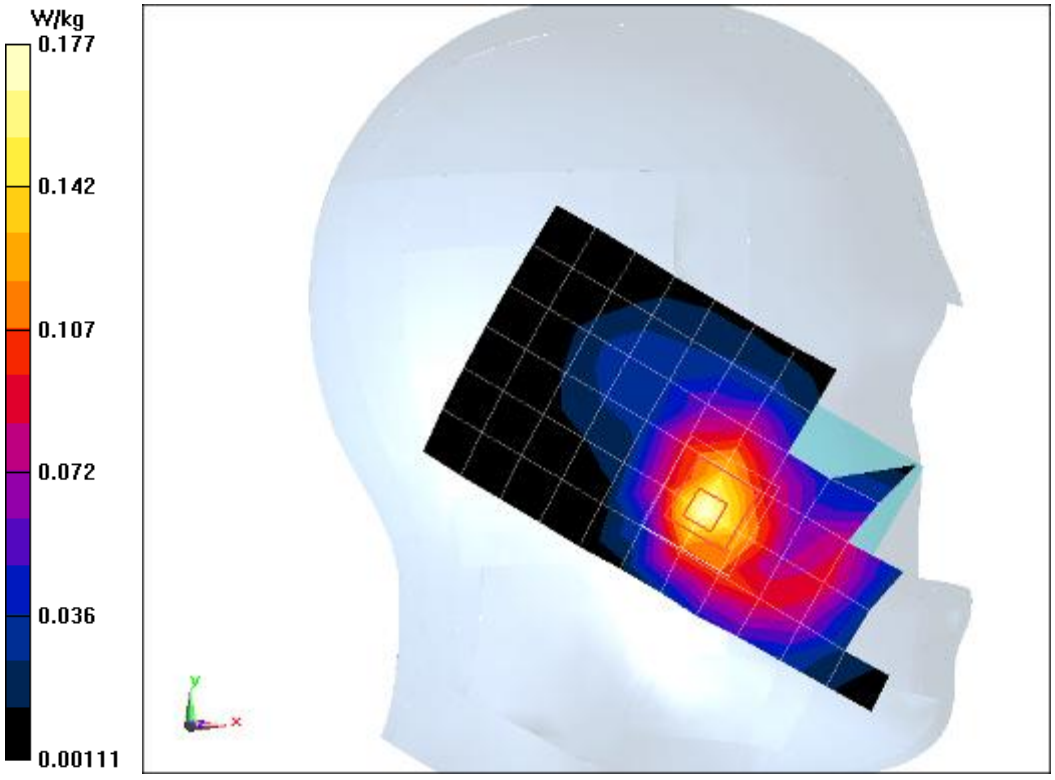
GSM1900 Right Tilt Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 S/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900 MHz; 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) = 0.0601 W/kg
Middle Tilt Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.952 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.0910 W/kg
SAR(1 g) = 0.057 W/kg; SAR(10 g) = 0.036 W/kg
Maximum value of SAR (measured) = 0.0605 W/kg



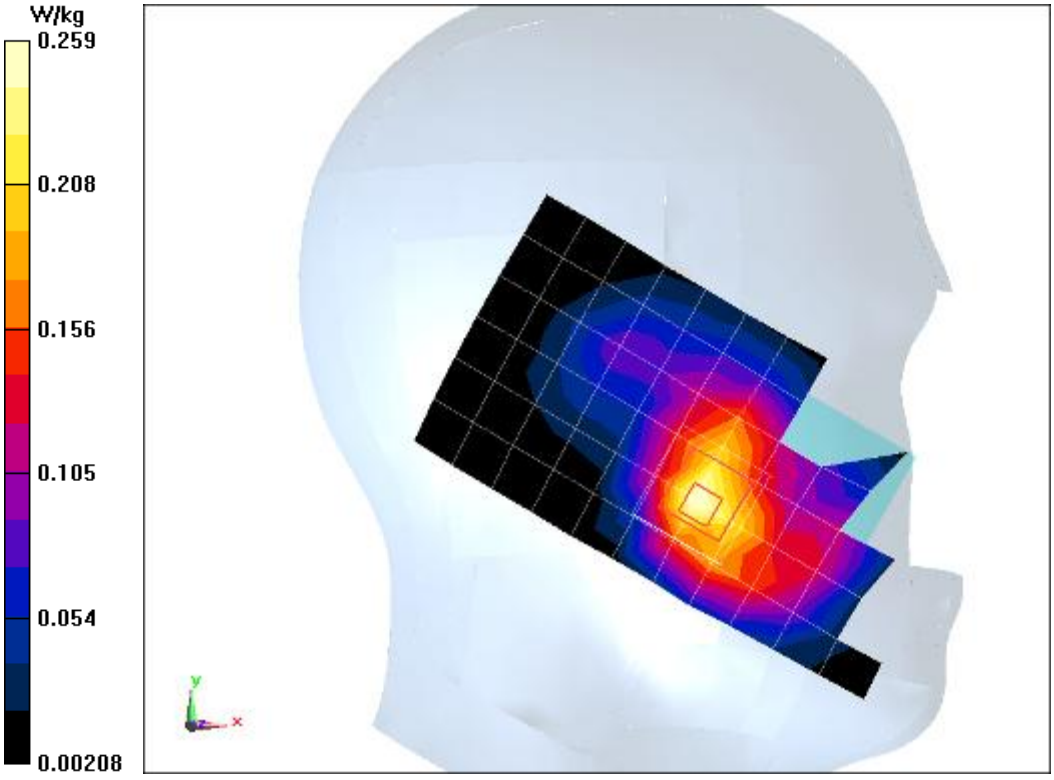
GSM1900 Left Cheek High

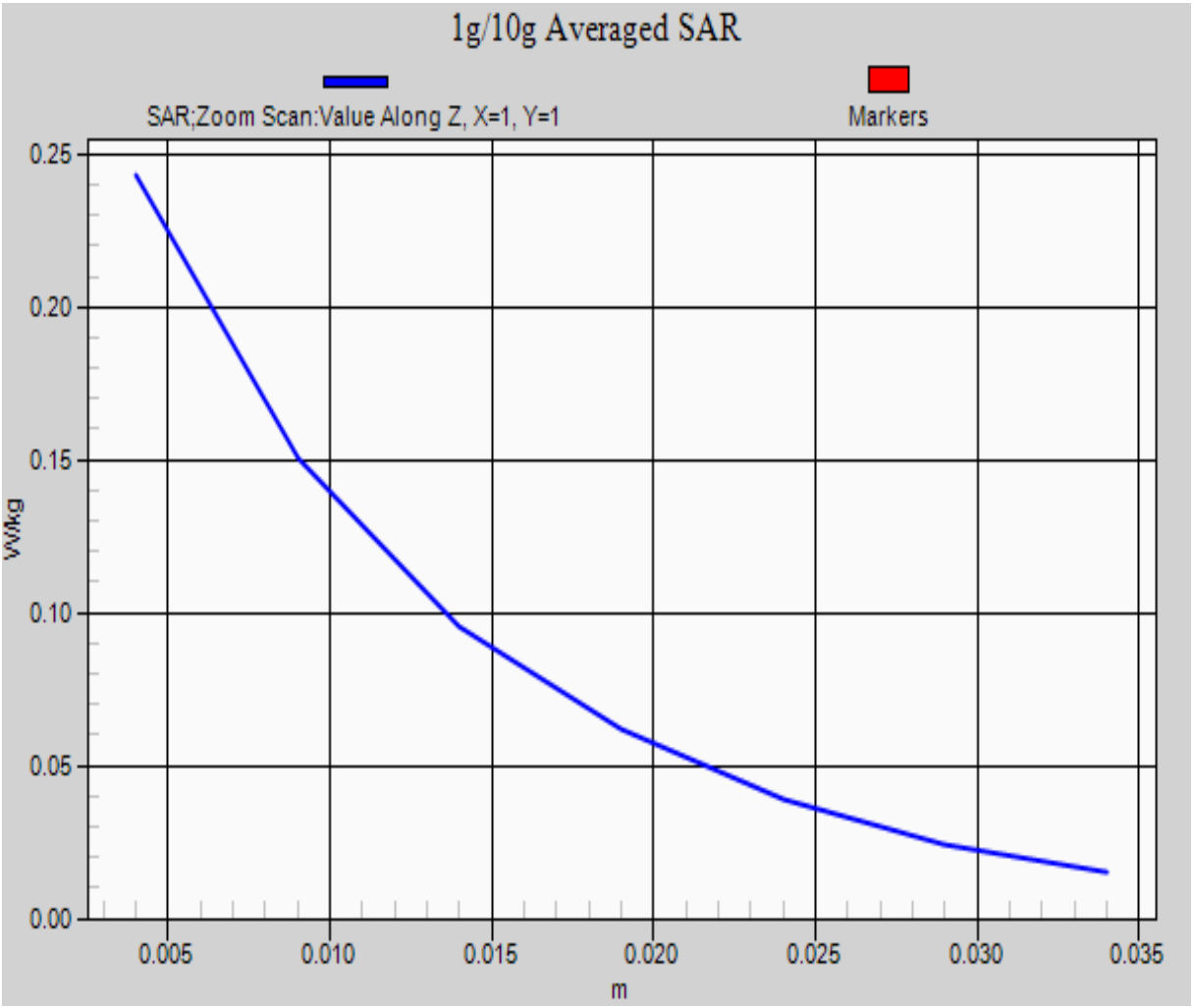
Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.469 S/m; εr = 40.495; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900 MHz; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
High Cheek Left GSM1900MHz/Area Scan (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.181 W/kg
High Cheek Left GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.555 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.260 W/kg
SAR(1 g) = 0.163 W/kg; SAR(10 g) = 0.097 W/kg
Maximum value of SAR (measured) = 0.177 W/kg



GSM1900 Left Cheek Low

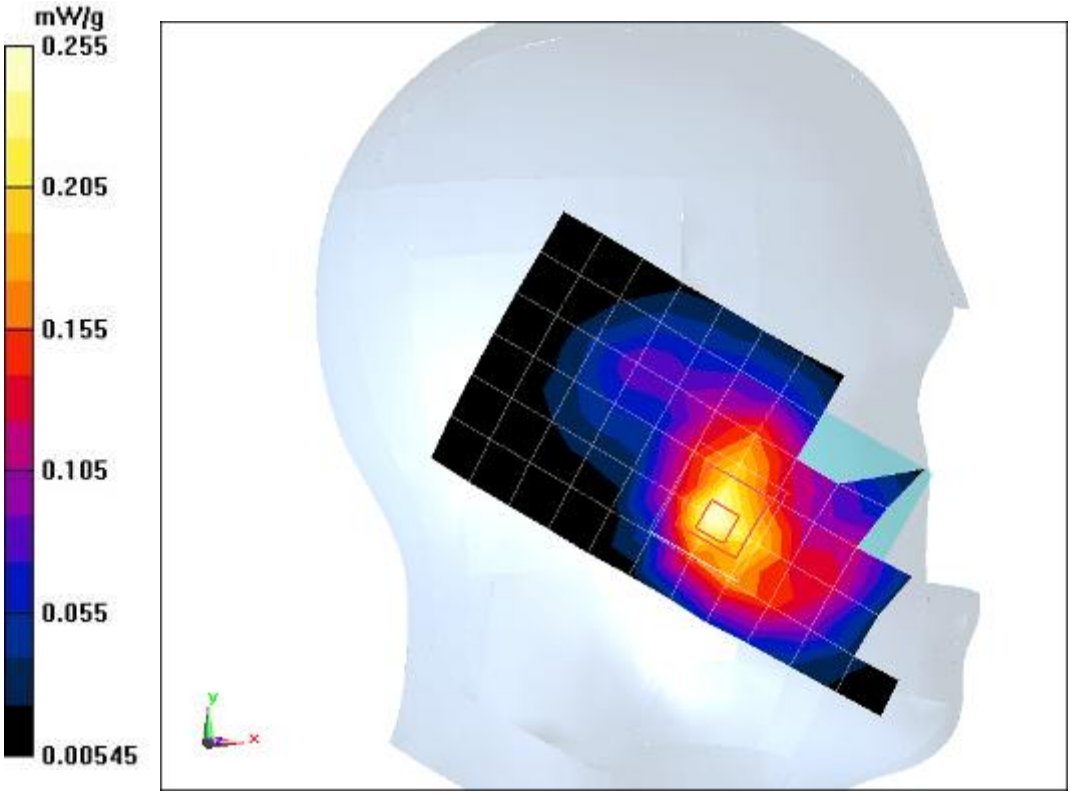
Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.415 S/m; εr = 40.792; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900 MHz; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Low Cheek Left GSM1900MHz/Area Scan (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.269 W/kg
Low Cheek Left GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.249 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.381 W/kg
SAR(1 g) = 0.241 W/kg; SAR(10 g) = 0.146 W/kg
Maximum value of SAR (measured) = 0.259 W/kg




1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=1, Y=1
Markers
0.25
0.20
0.15
0.10
0.05
0.00
W/Kg
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

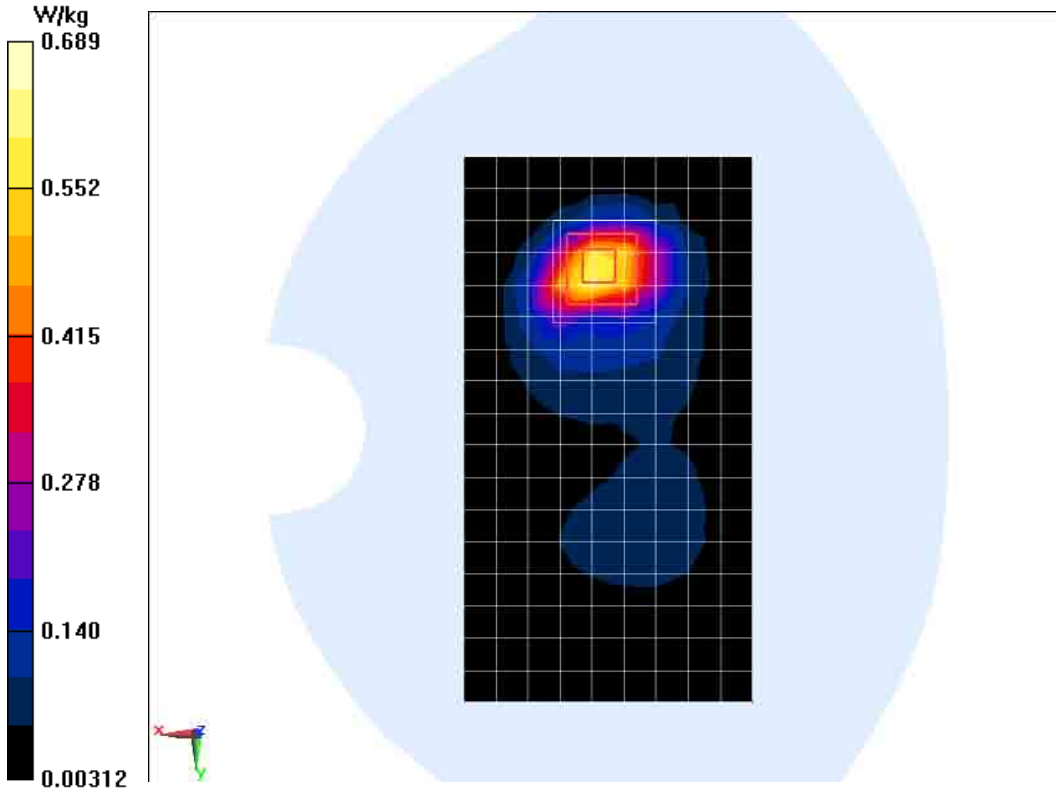
GSM1900 Left Cheek Low SIM2

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.415 S/m; εr = 40.792; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900 MHz; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.1, 5.1, 5.1); Calibrated: 7/24/2012
Low Cheek Left GSM1900MHz SIM2/Area Scan (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.269 W/kg
Low Cheek Left GSM1900MHz SIM2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.787 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.378 mW/g
SAR(1 g) = 0.235 mW/g; SAR(10 g) = 0.139 mW/g
Maximum value of SAR (measured) = 0.255mW/g



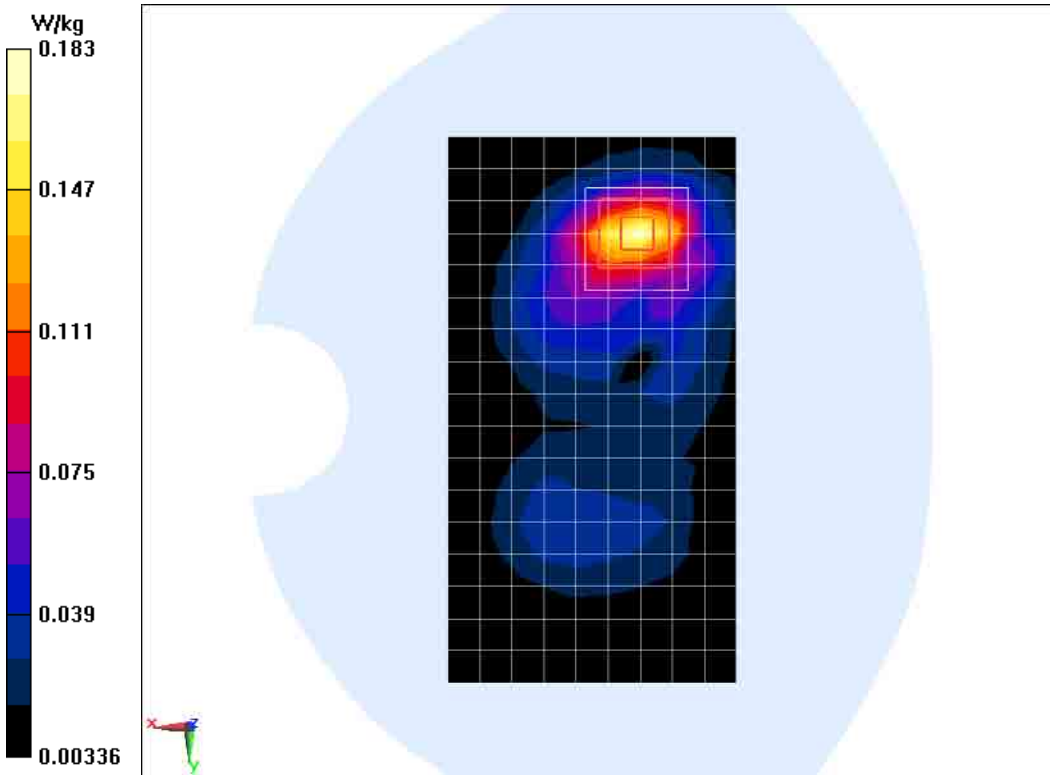
GSM1900 Body Toward Ground GPRS 4TS Middle

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; εr = 53.319; ρ = 1000 kg/m3
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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.614 W/kg
Middle Toward Ground GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.736 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 2.48 W/kg
SAR(1 g) = 0.653 W/kg; SAR(10 g) = 0.328 W/kg
Maximum value of SAR (measured) = 0.689 W/kg



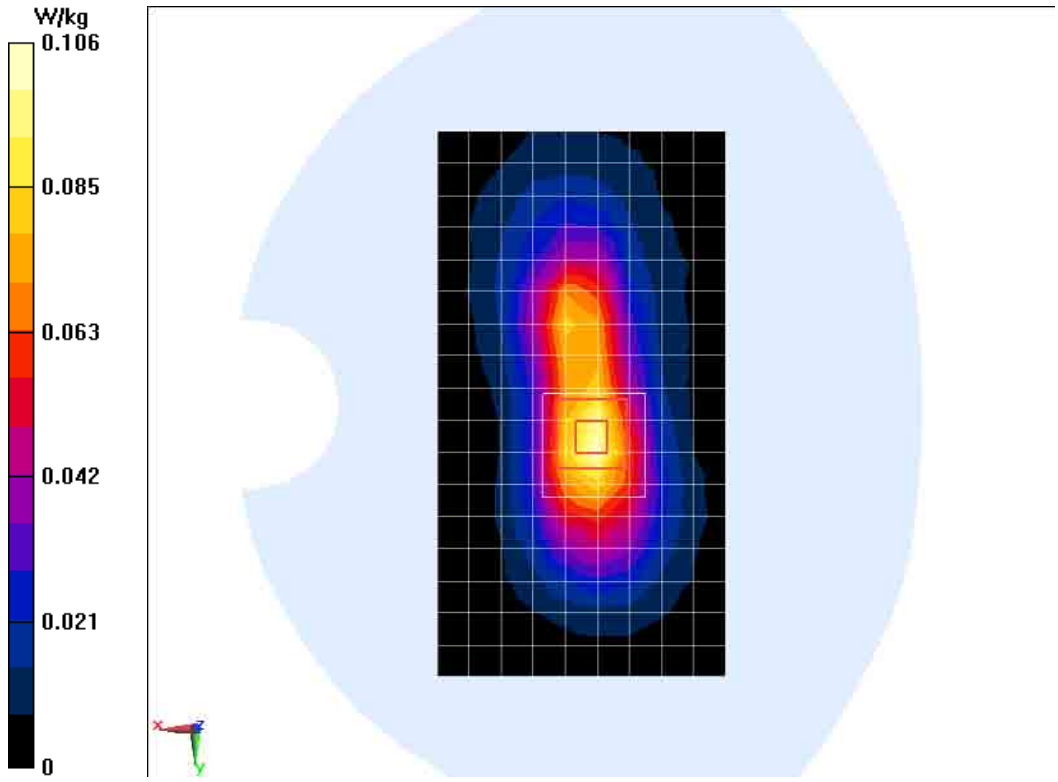
GSM1900 Body Toward Phantom GPRS 4TS Middle

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; εr = 53.319; ρ = 1000 kg/m3
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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.181 W/kg
Middle Toward Phantom GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.584 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.305 W/kg
SAR(1 g) = 0.161 W/kg; SAR(10 g) = 0.082 W/kg
Maximum value of SAR (measured) = 0.183 W/kg



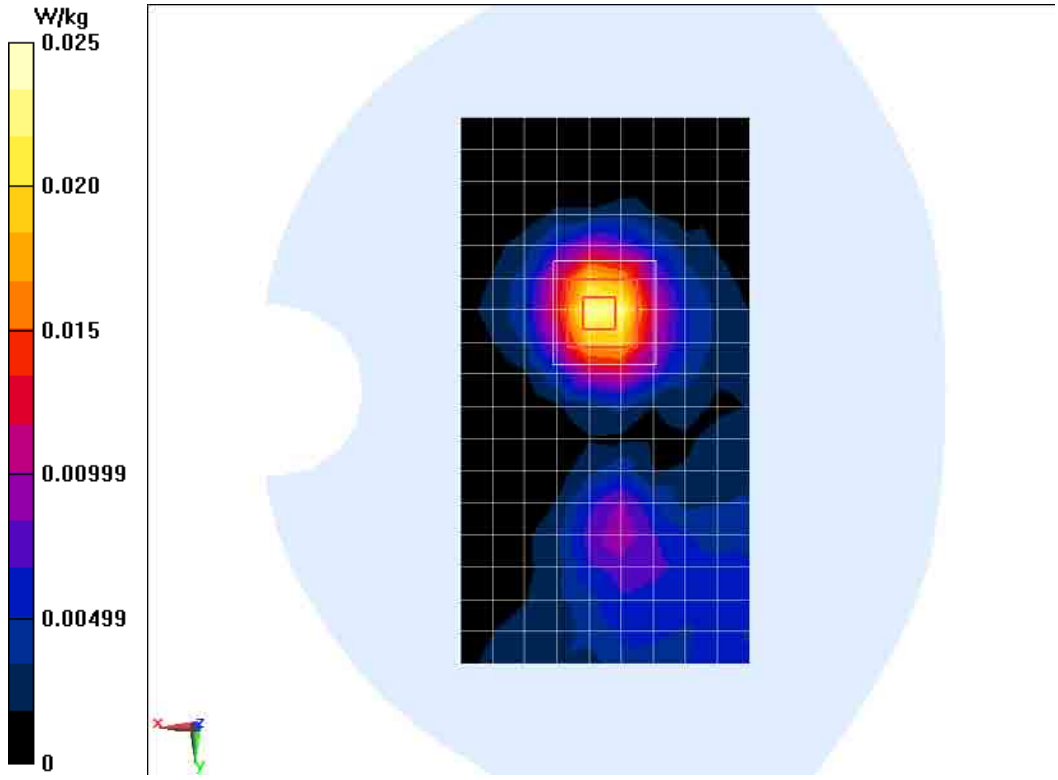
GSM1900 Body Left GPRS 4TS Middle

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; εr = 53.319; ρ = 1000 kg/m3
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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.104 W/kg
Middle Left GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.947 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.148 W/kg
SAR(1 g) = 0.092 W/kg; SAR(10 g) = 0.053 W/kg
Maximum value of SAR (measured) = 0.106 W/kg



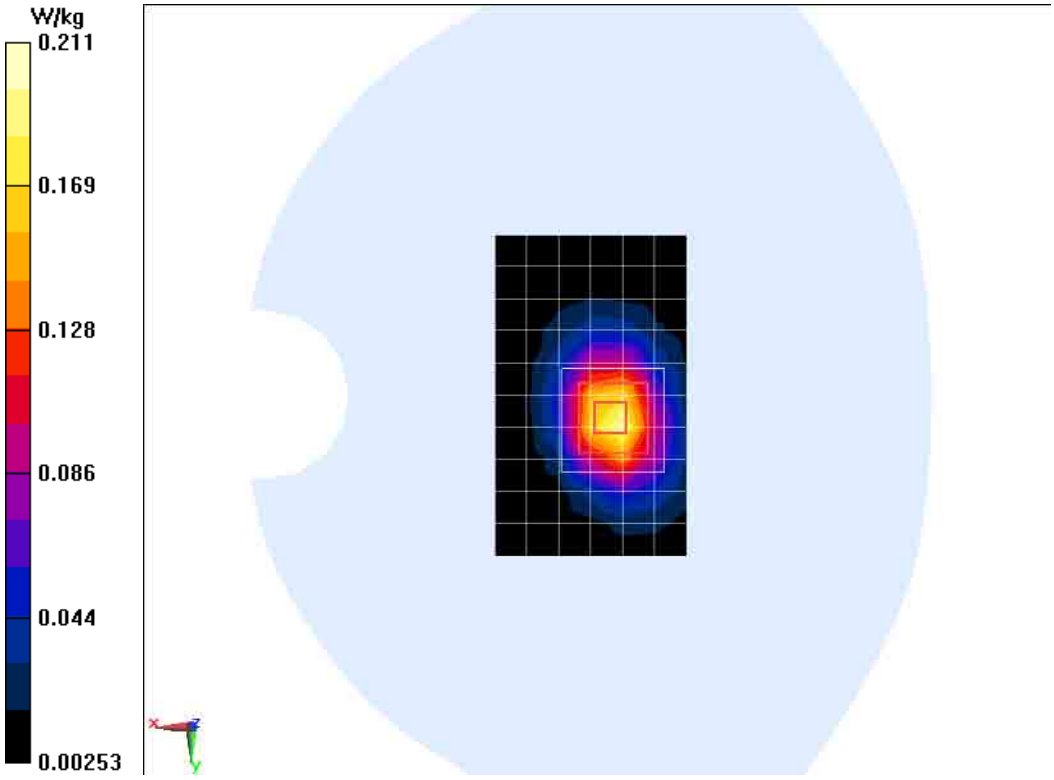
GSM1900 Body Right GPRS 4TS Middle

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; εr = 53.319; ρ = 1000 kg/m3
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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.0235 W/kg
Middle Right GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.211 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.0370 W/kg
SAR(1 g) = 0.022 W/kg; SAR(10 g) = 0.013 W/kg
Maximum value of SAR (measured) = 0.0250 W/kg



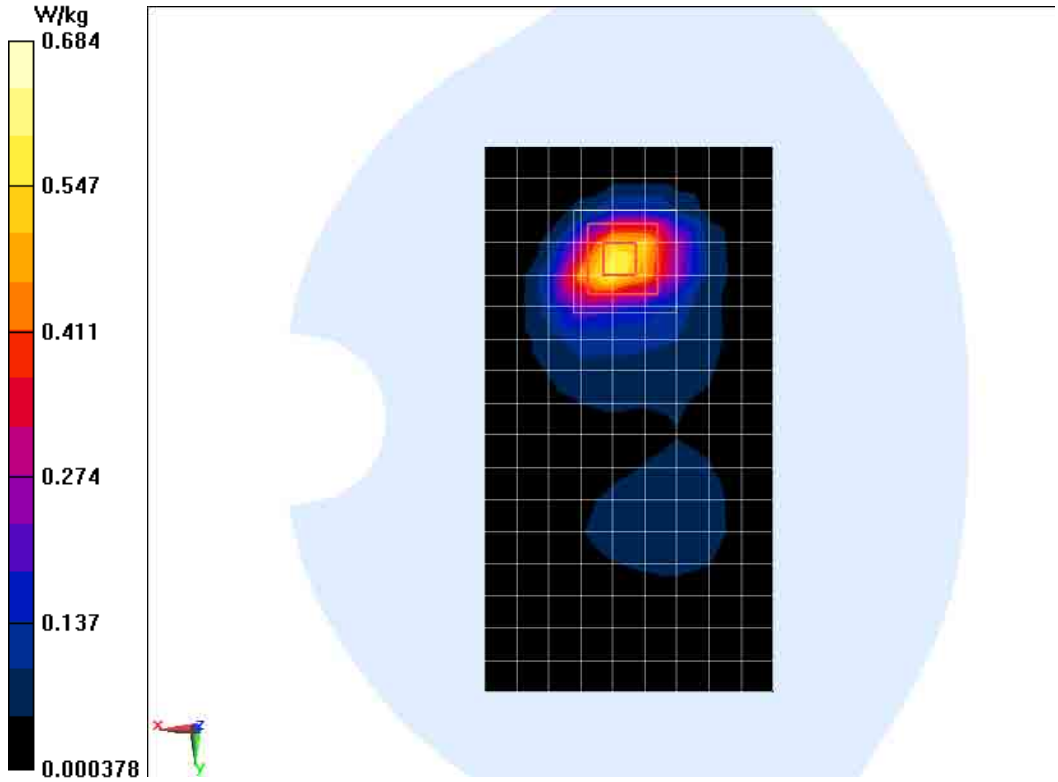
GSM1900 Body Bottom GPRS 4TS Middle

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; εr = 53.319; ρ = 1000 kg/m3
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) = 0.199 W/kg
Middle Bottom GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.483 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.188 W/kg; SAR(10 g) = 0.100 W/kg
Maximum value of SAR (measured) = 0.211 W/kg



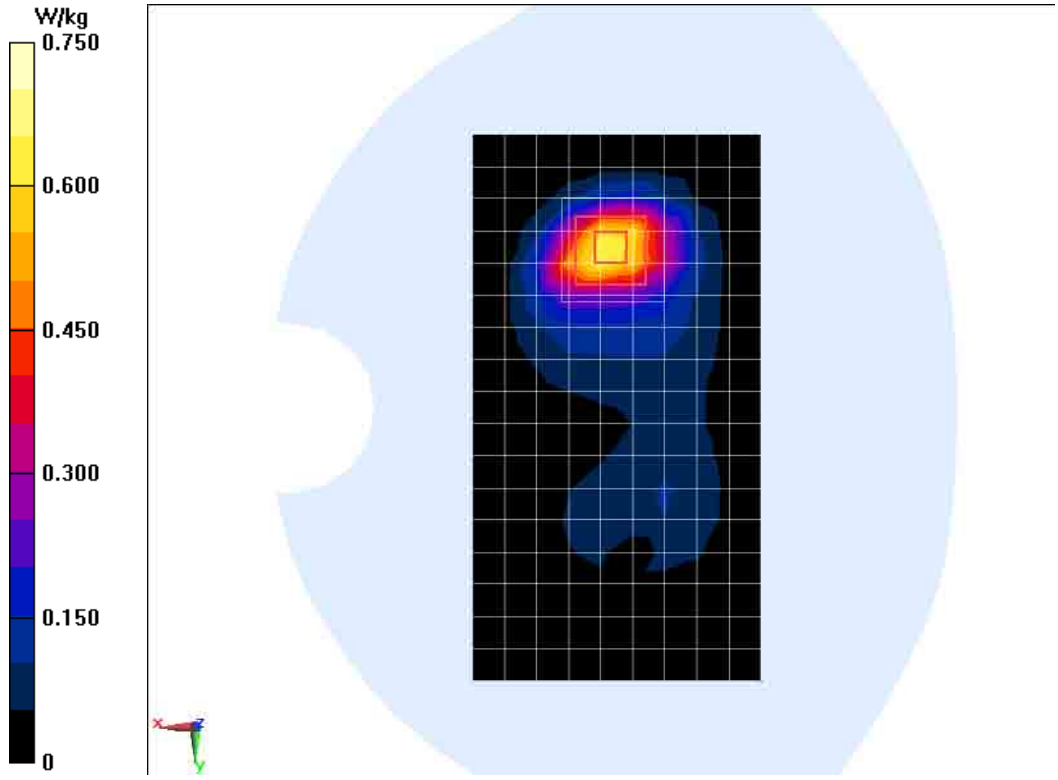
GSM1900 Body Toward Ground GPRS 4TS High

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.534 S/m; εr = 53.187; ρ = 1000 kg/m3
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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.602 W/kg
High Toward Ground GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.383 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.600 W/kg; SAR(10 g) = 0.299 W/kg
Maximum value of SAR (measured) = 0.684 W/kg



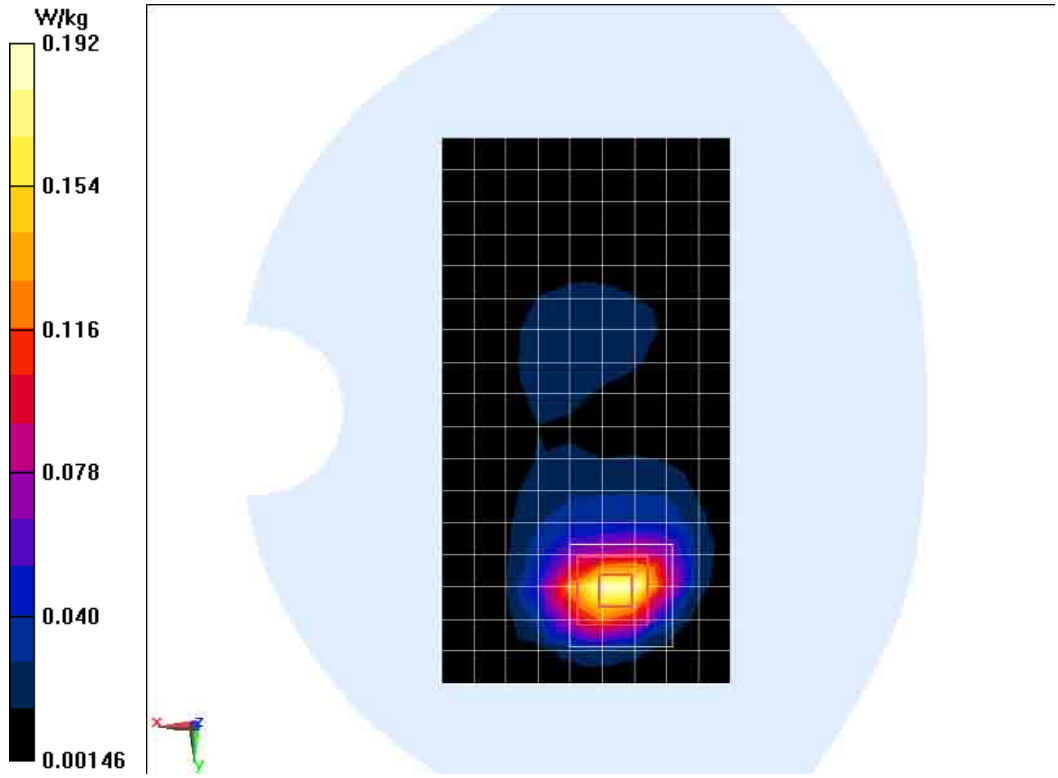
GSM1900 Body Toward Ground GPRS 4TS Low

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.475 S/m; εr = 53.44; ρ = 1000 kg/m3
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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.663 W/kg
Low Toward Ground GPRS 4TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.969 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.663 W/kg; SAR(10 g) = 0.346 W/kg
Maximum value of SAR (measured) = 0.750 W/kg



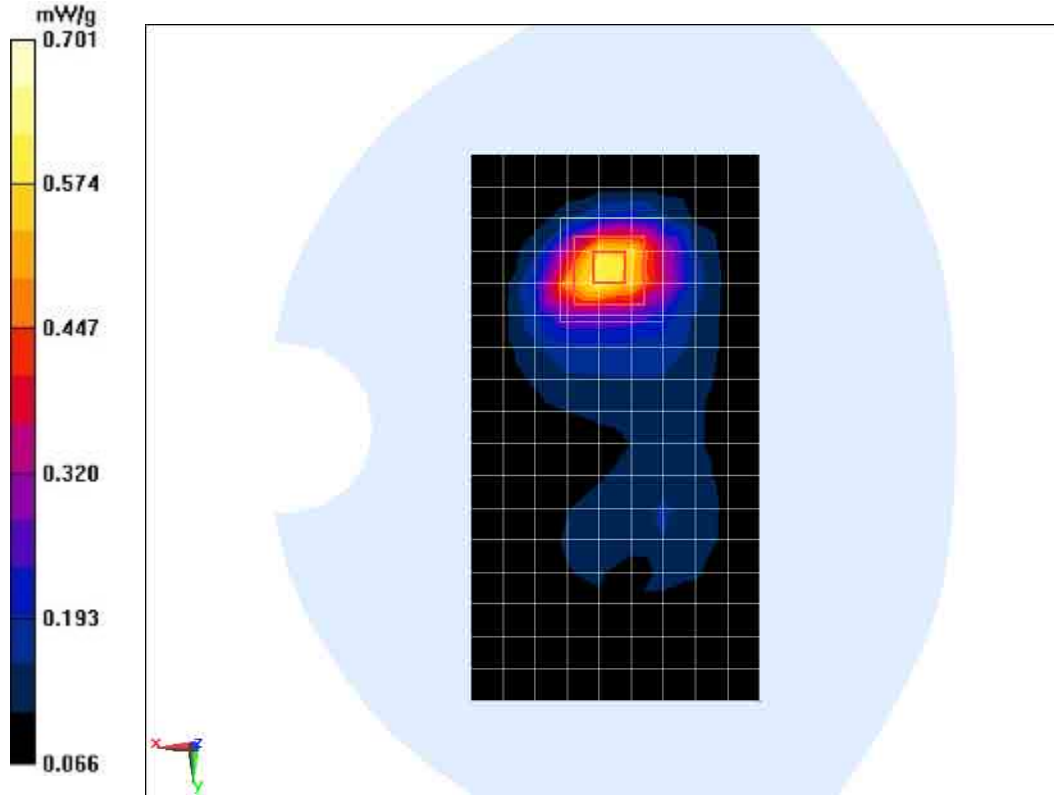
GSM1900 Body Toward Ground Low With Headset

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.475 S/m; εr = 53.44; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900 MHz; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(4.64, 4.64, 4.64); Calibrated: 7/24/2012
Low Toward Ground GSM1900MHz With Headset/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.187 W/kg
Low Toward Ground GSM1900MHz With Headset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.115 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.308 W/kg
SAR(1 g) = 0.173 W/kg; SAR(10 g) = 0.090 W/kg
Maximum value of SAR (measured) = 0.192 W/kg



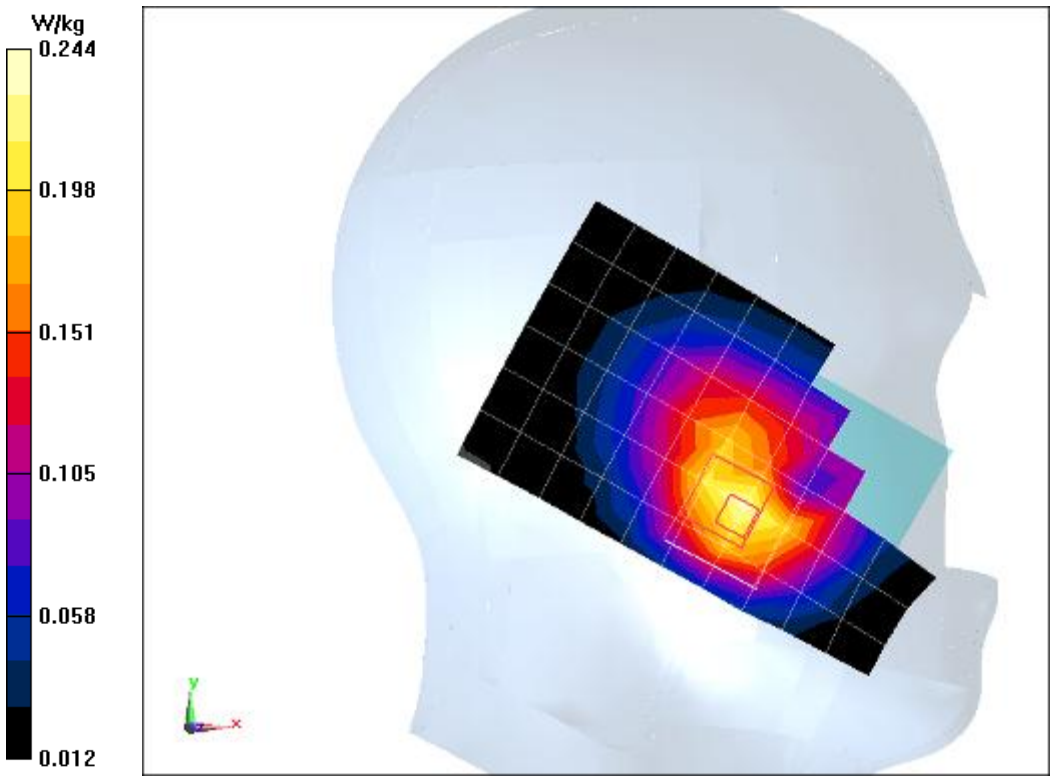
GSM1900 Body Toward Ground GPRS 4TS Low SIM2

Date/Time: 1/22/2013
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.475 S/m; εr = 53.44; ρ = 1000 kg/m3
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 SIM2/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.663 W/kg
Low Toward Ground GPRS 4TS 1900MHz SIM2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.525 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.889 mW/g
SAR(1 g) = 0.652 mW/g; SAR(10 g) = 0.326 mW/g
Maximum value of SAR (measured) = 0.701 W/kg



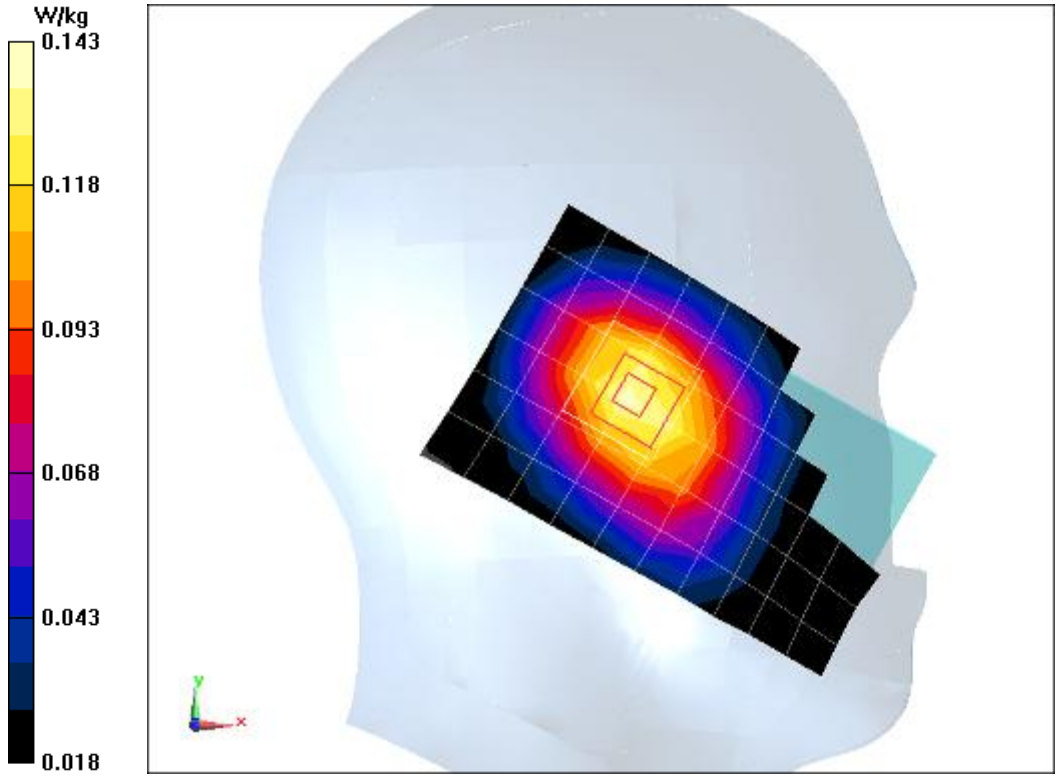
WCDMA850 Left Cheek Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; εr = 40.986; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Cheek Left WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.236 W/kg
Middle Cheek Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.799 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.357 W/kg
SAR(1 g) = 0.225 W/kg; SAR(10 g) = 0.141 W/kg
Maximum value of SAR (measured) = 0.244 W/kg



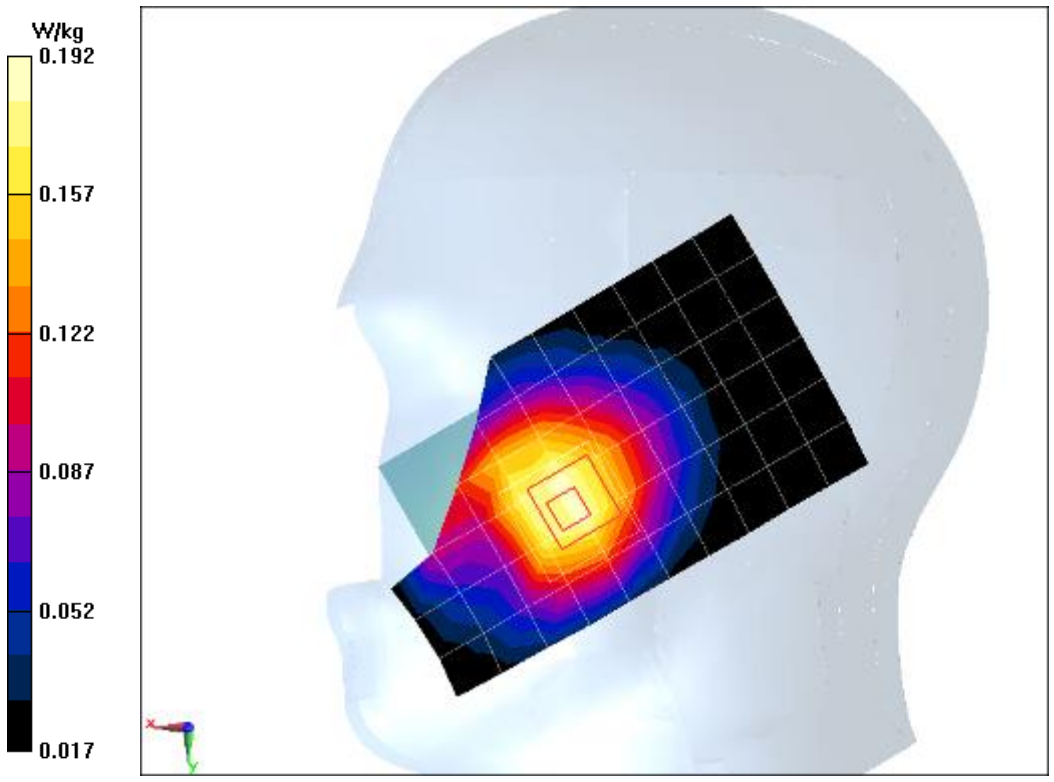
WCDMA850 Left Tilt Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; εr = 40.986; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Tilt Left WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.140 W/kg
Middle Tilt Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.019 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.170 W/kg
SAR(1 g) = 0.135 W/kg; SAR(10 g) = 0.101 W/kg
Maximum value of SAR (measured) = 0.143 W/kg



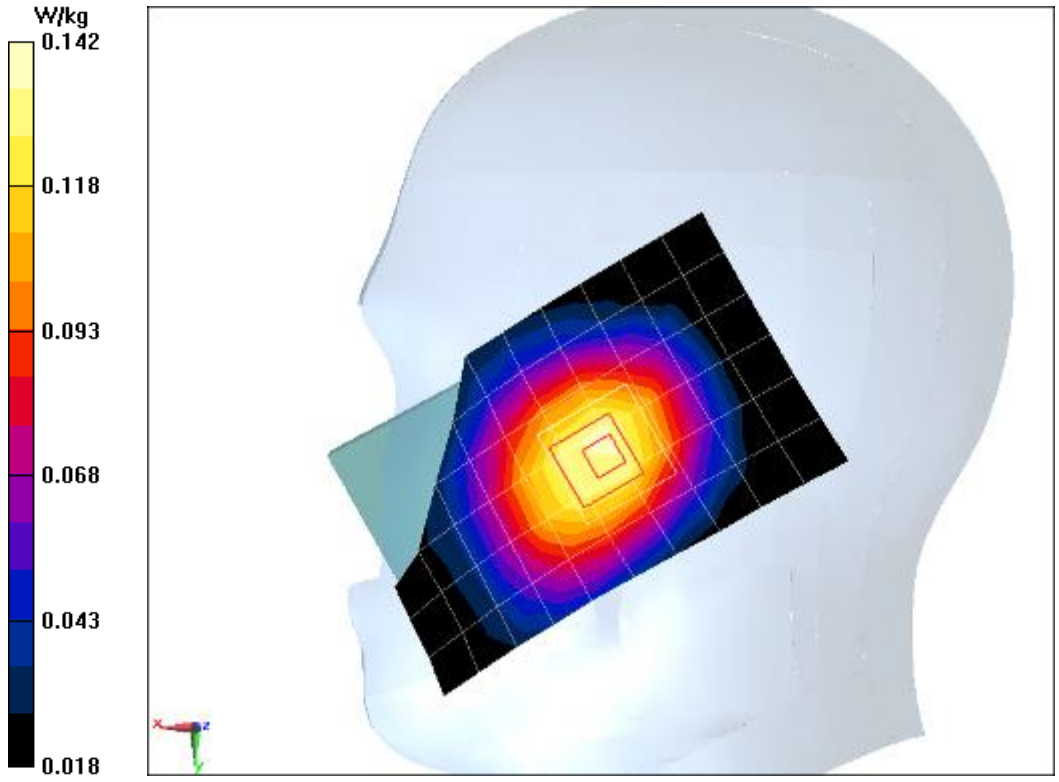
WCDMA850 Right Cheek Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.91 S/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Cheek Right WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.185 W/kg
Middle Cheek Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.762 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.225 W/kg
SAR(1 g) = 0.182 W/kg; SAR(10 g) = 0.135 W/kg
Maximum value of SAR (measured) = 0.192 W/kg



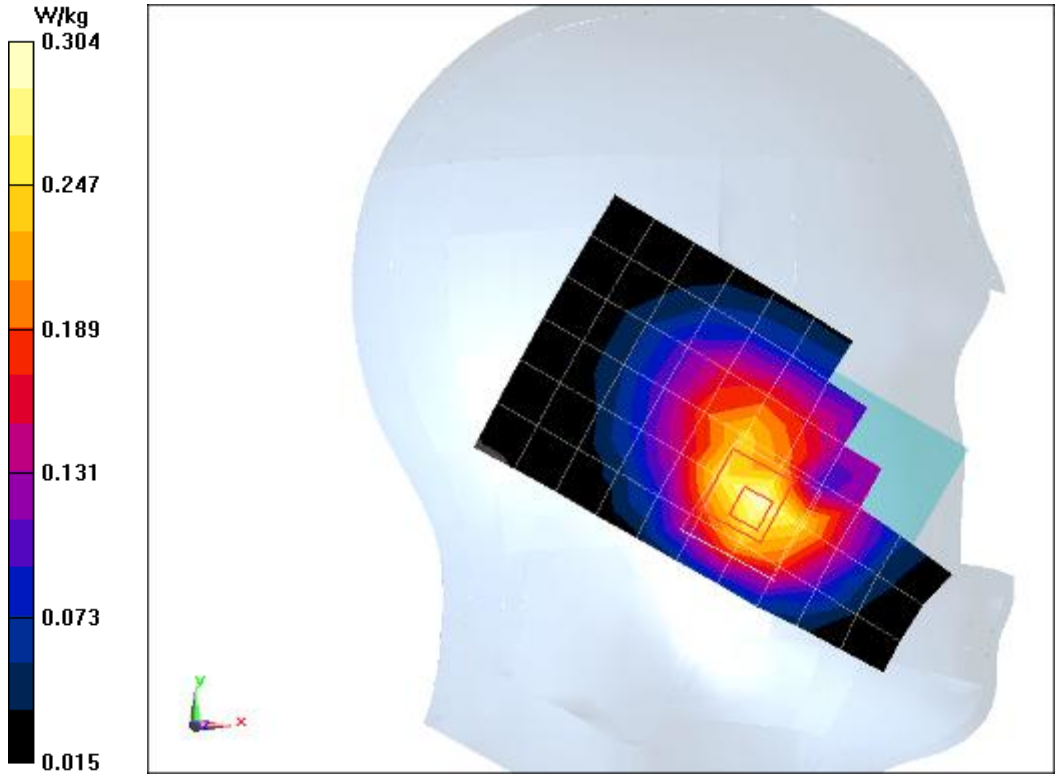
WCDMA850 Right Tilt Middle

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 837 MHz; σ = 0.91 S/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Middle Tilt Right WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.138 W/kg
Middle Tilt Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.987 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.166 W/kg
SAR(1 g) = 0.135 W/kg; SAR(10 g) = 0.103 W/kg
Maximum value of SAR (measured) = 0.142 W/kg



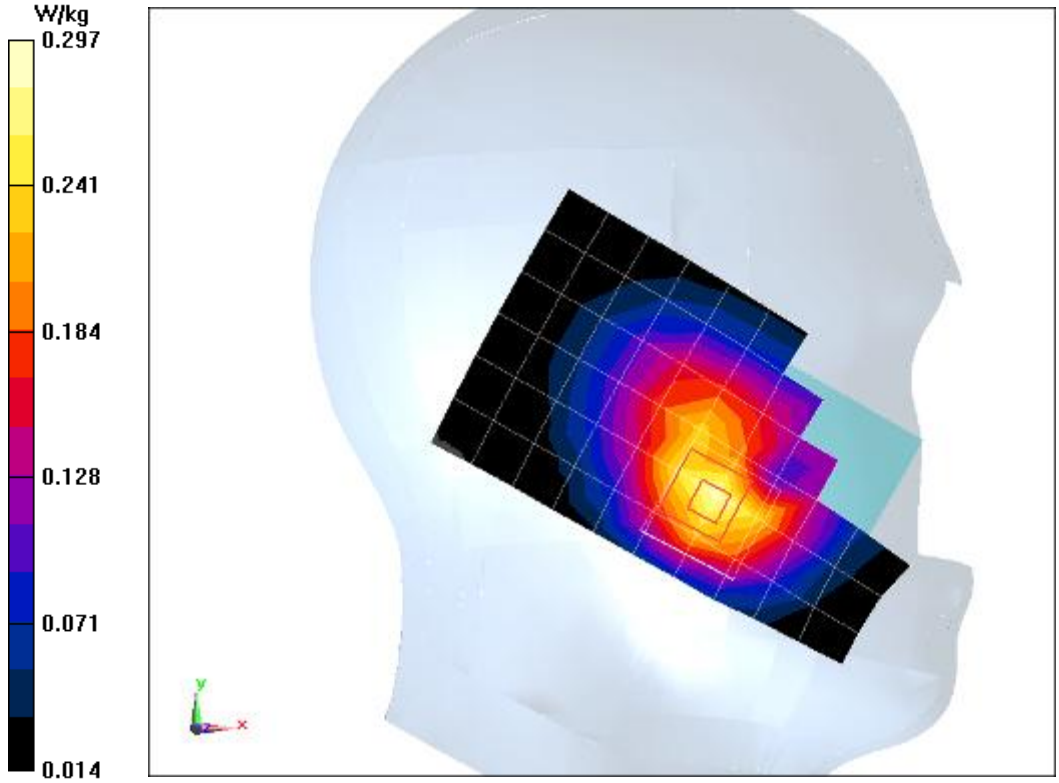
WCDMA850 Left Cheek High

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 847 MHz; σ = 0.927 S/m; εr = 40.809; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; Frequency: 846.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
High Cheek Left WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.300 W/kg
High Cheek Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.614 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.449 W/kg
SAR(1 g) = 0.282 W/kg; SAR(10 g) = 0.177 W/kg
Maximum value of SAR (measured) = 0.304 W/kg



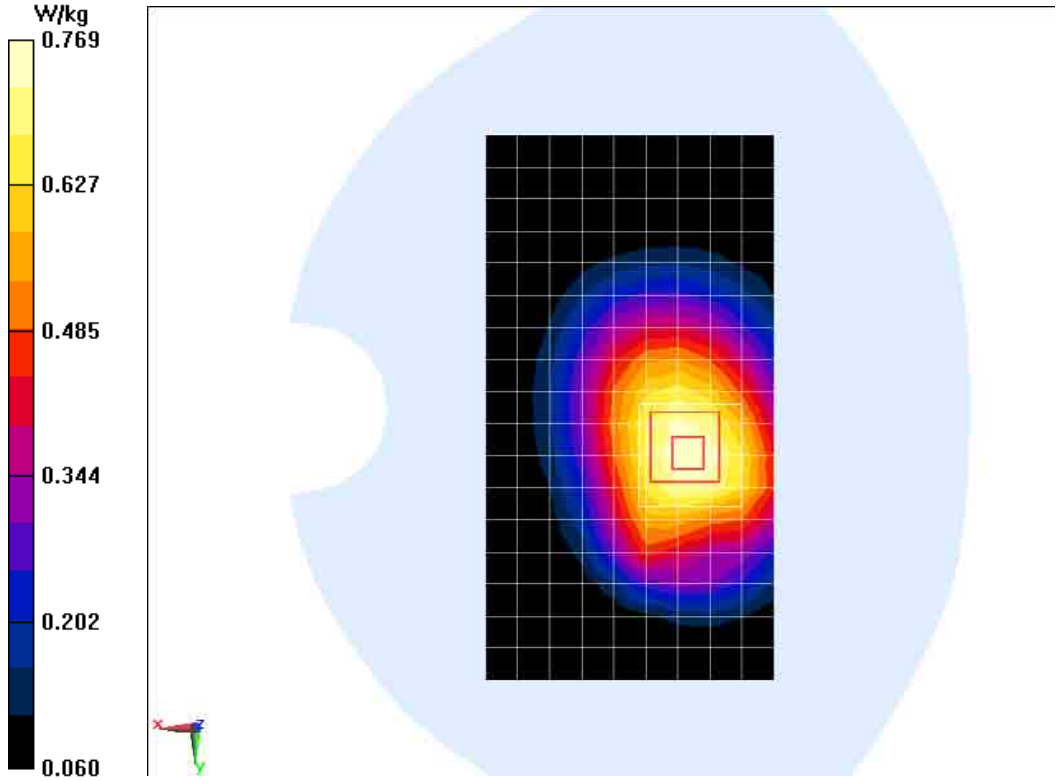
WCDMA850 Left Cheek Low

Date/Time: 1/18/2013
Electronics: DAE4 Sn1244
Medium: Head 835MHz
Medium parameters used: f = 826.4 MHz; σ = 0.911 S/m; εr = 41.264; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; Frequency: 826.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3252ConvF(6.09, 6.09, 6.09); Calibrated: 7/24/2012
Low Cheek Left WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.288 W/kg
Low Cheek Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.682 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.436 W/kg
SAR(1 g) = 0.277 W/kg; SAR(10 g) = 0.172 W/kg
Maximum value of SAR (measured) = 0.297 W/kg



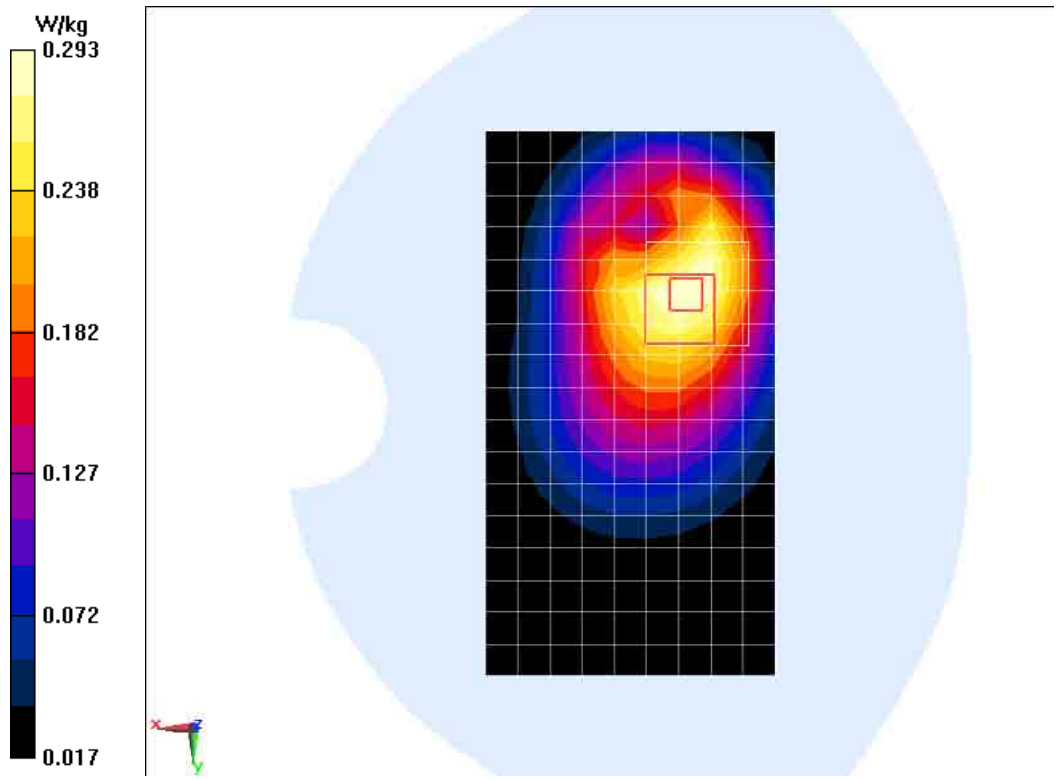
WCDMA850 Body Toward Ground Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; 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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.776 W/kg
Middle Toward Ground WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.780 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.929 W/kg
SAR(1 g) = 0.729 W/kg; SAR(10 g) = 0.542 W/kg
Maximum value of SAR (measured) = 0.769 W/kg



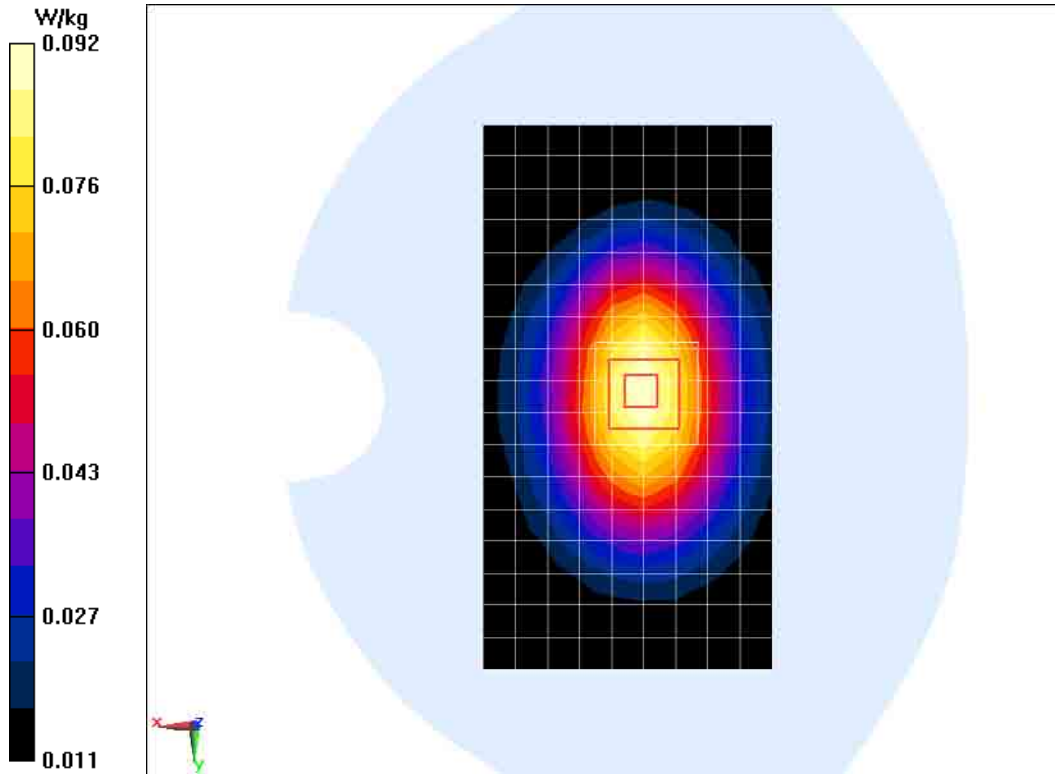
WCDMA850 Body Toward Phantom Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; 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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.294 W/kg
Middle Toward Phantom WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.307 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.425 W/kg
SAR(1 g) = 0.276 W/kg; SAR(10 g) = 0.189 W/kg
Maximum value of SAR (measured) = 0.293 W/kg



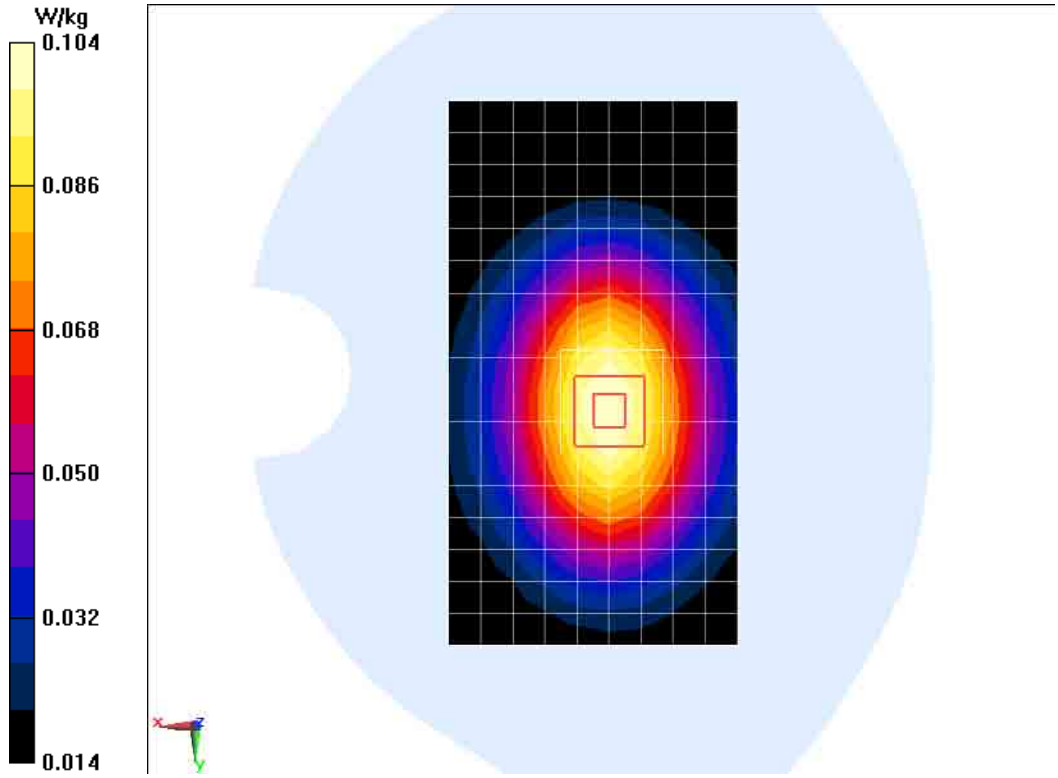
WCDMA850 Body Left Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; 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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.0930 W/kg
Middle Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.766 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.116 W/kg
SAR(1 g) = 0.087 W/kg; SAR(10 g) = 0.062 W/kg
Maximum value of SAR (measured) = 0.0924 W/kg



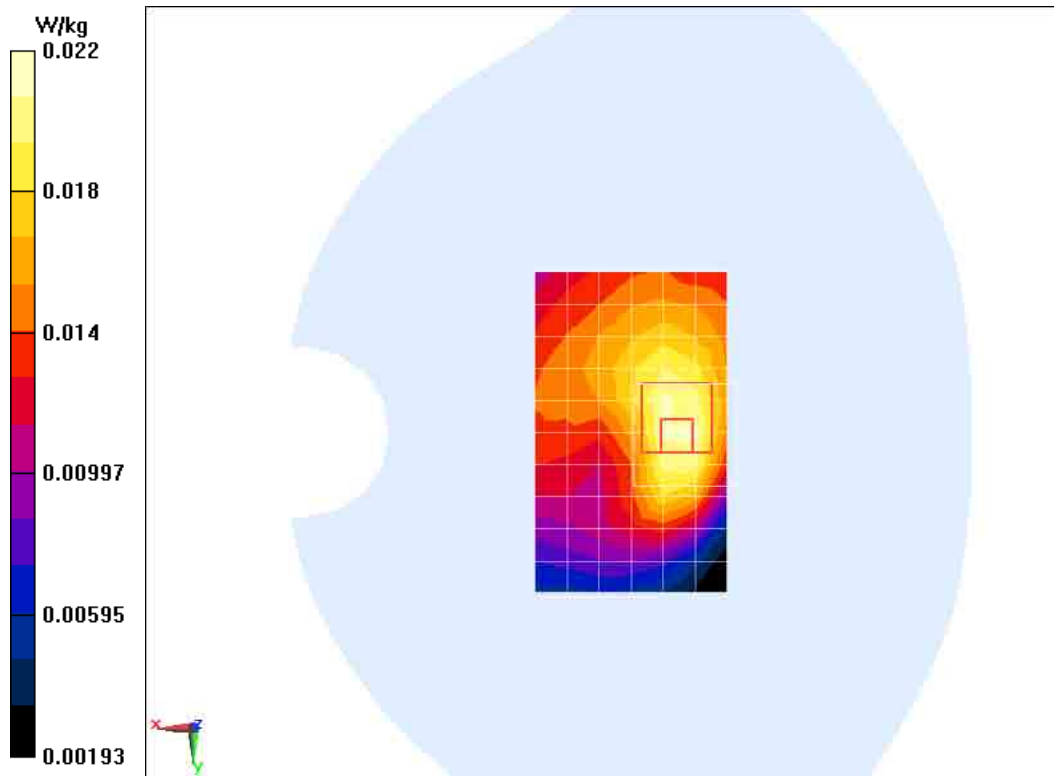
WCDMA850 Body Right Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; 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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.106 W/kg
Middle Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.457 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.098 W/kg; SAR(10 g) = 0.072 W/kg
Maximum value of SAR (measured) = 0.104 W/kg



WCDMA850 Body Bottom Middle

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; 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) = 0.0211 W/kg
Middle Bottom WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.987 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.0280 W/kg
SAR(1 g) = 0.021 W/kg; SAR(10 g) = 0.015 W/kg
Maximum value of SAR (measured) = 0.0220 W/kg



WCDMA850 Body Toward Ground High

Date/Time: 1/21/2013
Electronics: DAE4 Sn1244
Medium: Body 835MHz
Medium parameters used: f = 847 MHz; σ = 1.012 S/m; εr = 55.214; ρ = 1000 kg/m3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: WCDMA band V; 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 (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.947 W/kg
High Toward Ground WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.195 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.903 W/kg; SAR(10 g) = 0.657 W/kg
Maximum value of SAR (measured) = 0.956 W/kg