TEST REPORT

No. 2014SAR0008

For

Client : Haier Telecom(Qingdao) Co.,Ltd.

Production : WCDMA/GSM Dual-Mode Digital Mobile Phone

Model Name : W867

Hardware Version: W83_MB_B

Software Version: Haier_W867_W83B_M00_S09_131114

FCC ID: SG71401W867

Issued date: 2014-02-19

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

Add: 7F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

Tel: (+86)-021-63843300, E-Mail: welcome@ecit.org.cn

Revision Version

Report Number	Revision	Date	Memo
2014SAR0008	00	2014/02/19	Initial creation of test report

CONTENTS

1 Test Laboratory

1.1 Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7F, G Area,No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	86-21-63843300
Fax:	86-21-63843301

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:	Gong Yujuan
Testing Start Date:	02-10, 2014
Testing End Date:	02-17, 2014

1.4 Signature

Hu Jiajing
(Prepared this test report)

Yu Naiping
(Reviewed this test report)

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 W867 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	0.345
	Body	1.110
GSM 1900	Head	0.034
	Body	1.040
WCDMA Band V	Head	0.158
	Body	0.300
WCDMA Band II	Head	0.082
	Body	0.907
Wi-Fi	Head	0.343
	Body	0.075

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

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

The measurement together with the test system set-up is described in chapter 7 of this test report. A detailed description of the equipment under test can be found in chapter 3 of this test report. The maximum reported SAR value is obtained at the case of **(Table 2.1),** and the values are**:** Body-10mm **:1.110 W/kg (1g).**

NOTE: Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg

The sample has three antennas. One is main antenna for GSM/WCDMA, and the other two is for WiFi/BT and GPS. So simultaneous transmission is GSM/WCDMA and WiFi/BT.

Table 2.2: Simultaneous SAR (1g)

Simultaneous Transmission SAR(W/Kg)									
Test Position			**GSM 850**	**GSM 1900**	**WCDMA B V**	**WCDMA B II**	**WIFI**	**BT** note	**SUM**
Head	Left	Cheek	0.253	0.034	0.149	0.082	0.153	0.132	**0.406**
		Tilt 15°	0.151	0.00747	0.091	0.027	0.140	0.132	**0.291**
	Right	Cheek	0.345	0.028	0.158	0.069	0.343	0.132	**0.688**
		Tilt 15°	0.127	0.011	0.096	0.028	0.251	0.132	**0.378**
Body	Phantom Side		0.615	0.450	0.190	0.486	0.021	0.066	**0.681**
	Ground Side		1.110	1.040	0.300	0.907	0.075	0.066	**1.185**
	Left Side		0.207	0.079	0.115	0.070	0.046	0.066	**0.273**
	Right Side		0.419	0.047	0.156	0.068	0.023	0.066	**0.485**
	Top Side		N/A	N/A	N/A	N/A	0.033	0.066	**N/A**
	Bottom Side		0.133	0.795	0.029	0.684	0.00551	0.066	**0.861**

According to the above table, the maximum sum of reported SAR values for GSM and WiFi is **1.185 W/kg (1g)**. The detail for simultaneous transmission consideration is described in chapter 13.

3 Client Information

3.1 Applicant Information

Company Name:	Haier Telecom(Qingdao) Co.,Ltd.
Address /Post:	No.1,Haier Road,Haier information Property Zone,Qingdao,P.R.China
Tel:	(+86)0532-88936599-226
City:	Qingdao
Country:	China

3.2 Manufacturer Information

Company Name:	Haier Telecom(Qingdao) Co.,Ltd.
Address /Post:	No.1,Haier Road,Haier information Property Zone,Qingdao,P.R.China
Tel:	(+86)0532-88936599-226
City:	Qingdao
Country:	China

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

4.1 About EUT

Description:	WCDMA/GSM Dual-Mode Digital Mobile Phone
Model name:	W867
Operation Model(s):	GSM850/900/1800/1900,WCDMA1900/850,Wifi2450
Tx Frequency:	824-849, 880 -915MHz, 1710 -1785MHz, 1850-1910MHz（GSM） 1852-1908 MHz, 826-847MHz (WCDMA) 2412-2462 MHz (Wi-Fi) 2402 - 2480 MHz (BT)
Test device Production information:	Production unit
GPRS Class Mode:	B
GPRS Multislot Class:	12
EGPRS Multislot Class:	12
Device type:	Portable device
UE category:	3
Antenna type:	Inner antenna
Accessories/Body-worn configurations:	Headset
Form factor:	15.6cm×7.7cm
Hotspot Mode:	Support simultaneous transmission of hotspot and voice (or data)
FCC ID:	SG71401W867

4.2 Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version:
N04	IMEI: 863098020002366	W83_MB_B	Haier_W867_W83B_M00_S09_131114

*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
B05	Battery	H15287	N/A	Haier
A02	Headset	N/A	N/A	N/A

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

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

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

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

5.2 Applicable Measurement Standards

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

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

IEEE1528a-2005: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head From Wireless Communications Devices: Measurement Techniques.

KDB648474 D04 SAR Handsets Multi Xmiter and Ant v01r02: 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 v05r01: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r02: SAR Measurement Requirements for 100 MHz to 6 GHz

KDB865664 D02 RF Exposure Reporting v01r01: provides general reporting requirements as well as certain specific information required to support MPE and SAR compliance.

KDB941225 D01 SAR test for 3G devides v01r01: 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 v01r01: 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

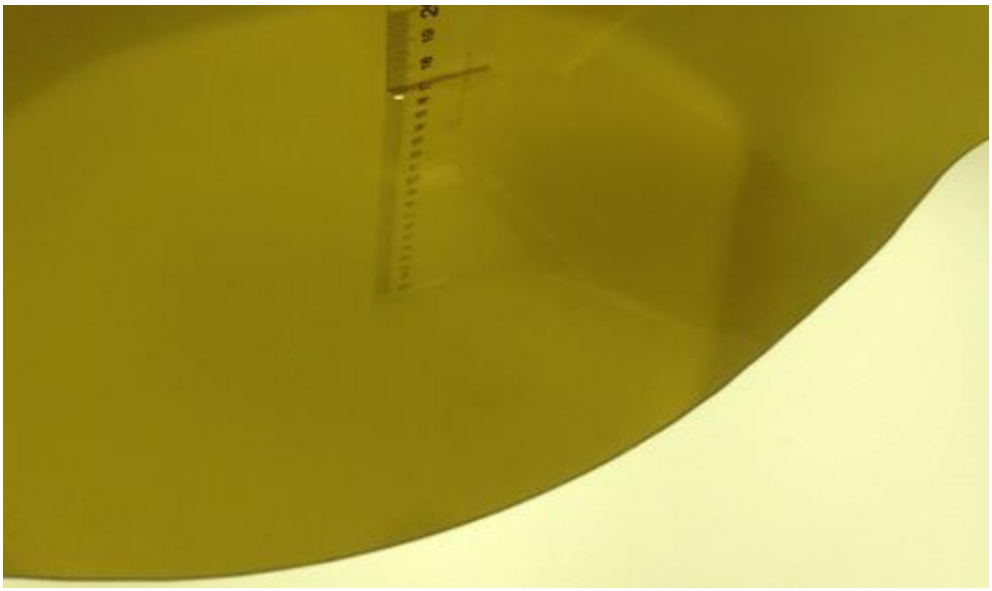
Table 7.1: Targets for tissue simulating liquid

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

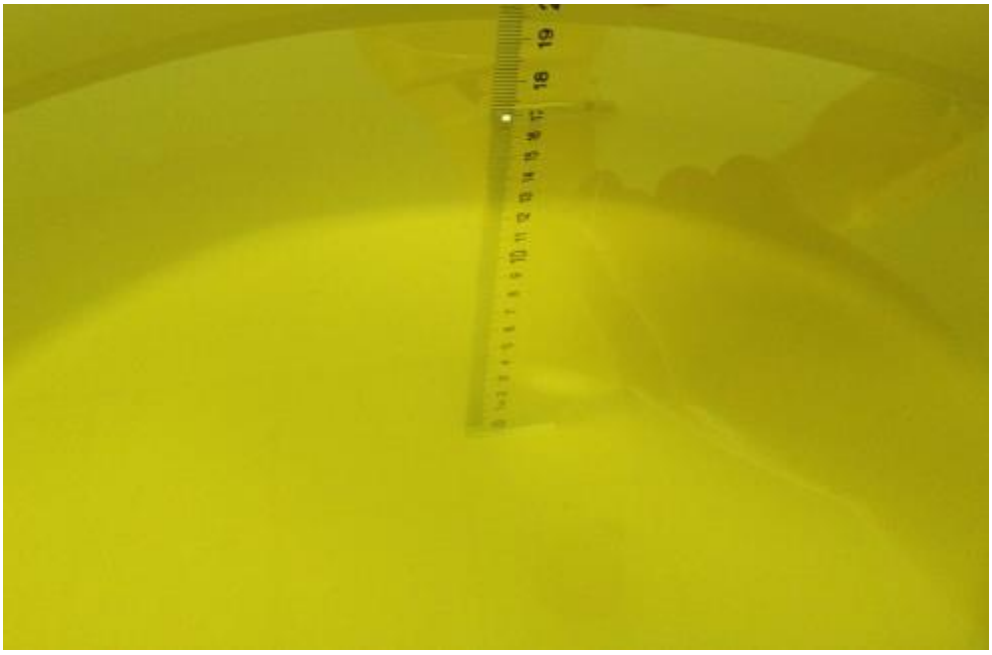
7.2 Dielectric Performance

Table 7.2: Dielectric Performance of Tissue Simulating Liquid

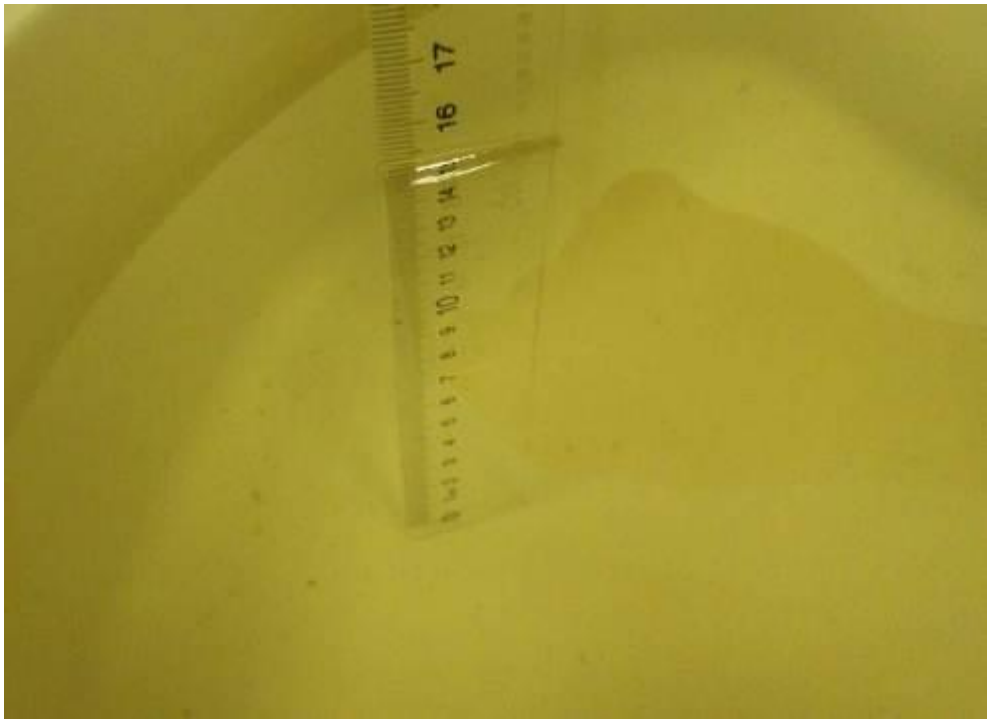
Measurement Date : 835 MHz Head **Feb 10, 2014** 1900 MHz Head **Feb 13, 2014** 835 MHz Body **Feb 11, 2014** 1900 MHz Body **Feb 15, 2014** 2450 MHz Head **Feb 16, 2014** 2450 MHz Body **Feb 17, 2014**						
/	**Type**	**Frequency**	**Permittivity ε**	**Drift (%)**	**Conductivity σ (S/m)**	**Drift (%)**
Measurement value	Head	835 MHz	41.04	-1.10%	0.917	1.88%
	Body	835 MHz	55.15	0.09%	0.9989	2.97%
	Head	1900 MHz	39.64	-0.90%	1.385	-1.07%
	Body	1900 MHz	53.24	0.11%	1.524	0.26%
	Head	2450 MHz	39.12	0.84%	1.809	1.33%
	Body	2450 MHz	53.95	2.37%	1.918	1.64%



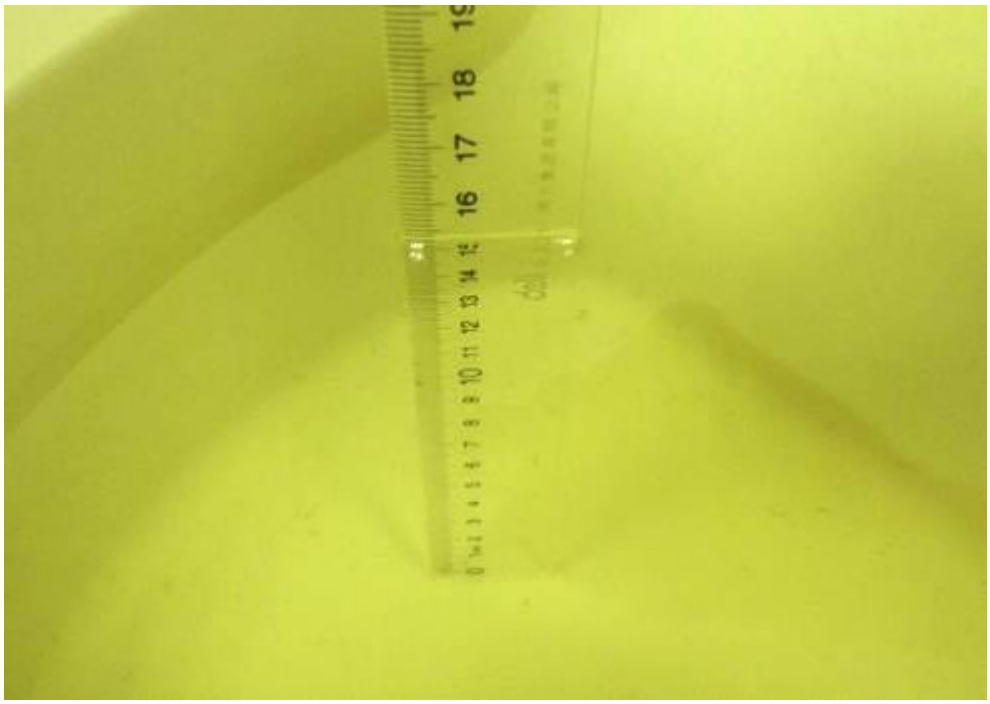
Picture 7-1: Liquid depth in the Flat Phantom (835 MHz Head)



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

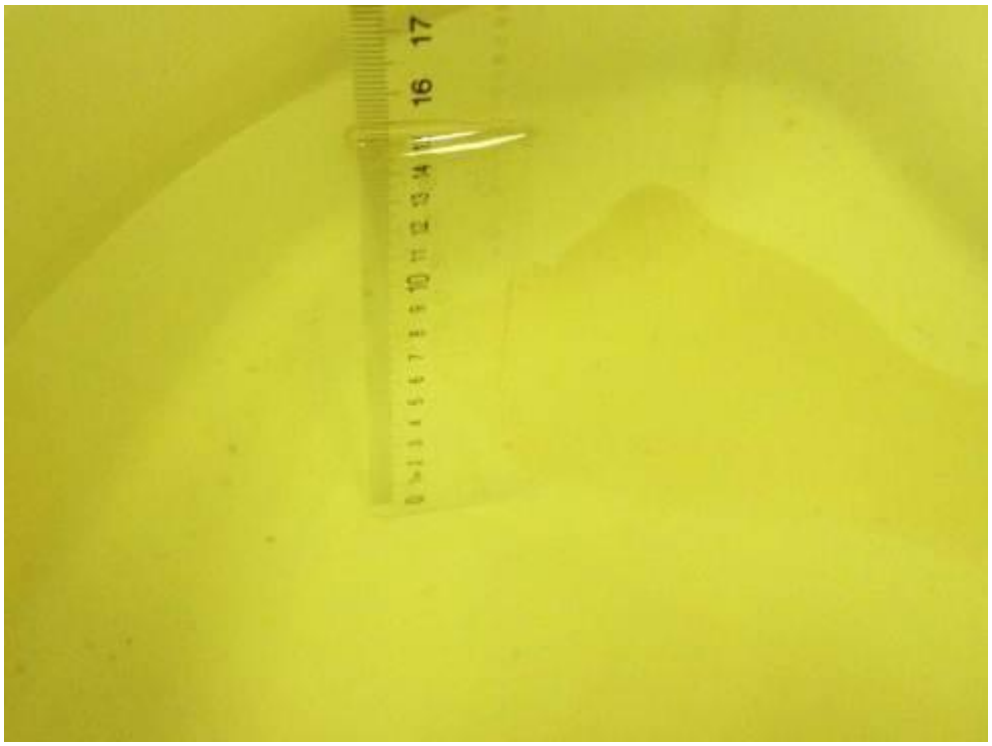


Picture 7-3: Liquid depth in the Flat Phantom (835 MHz Body)



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

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

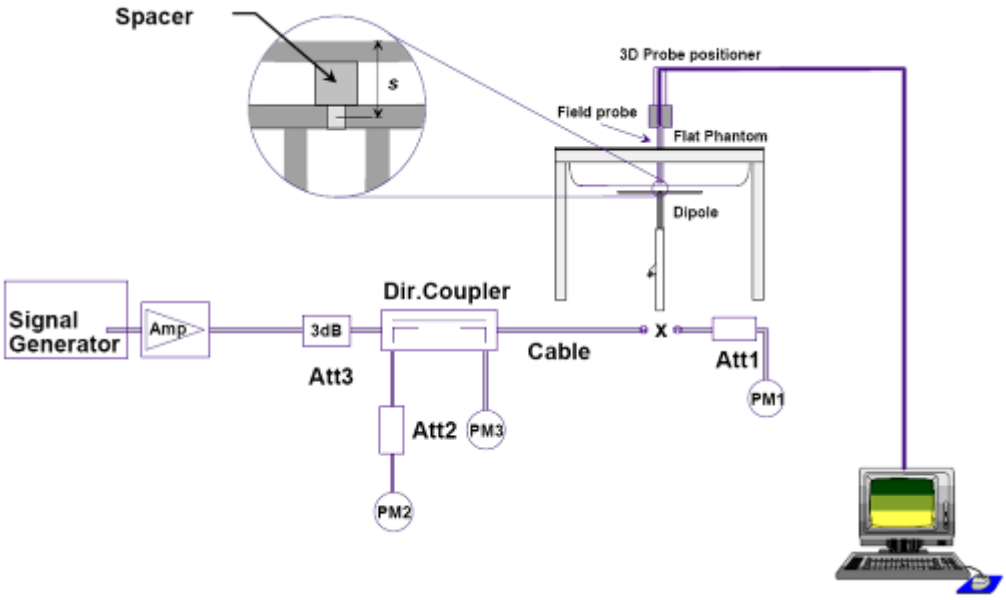


Picture 7-6: Liquid depth in the Flat Phantom (2450 MHz Body)

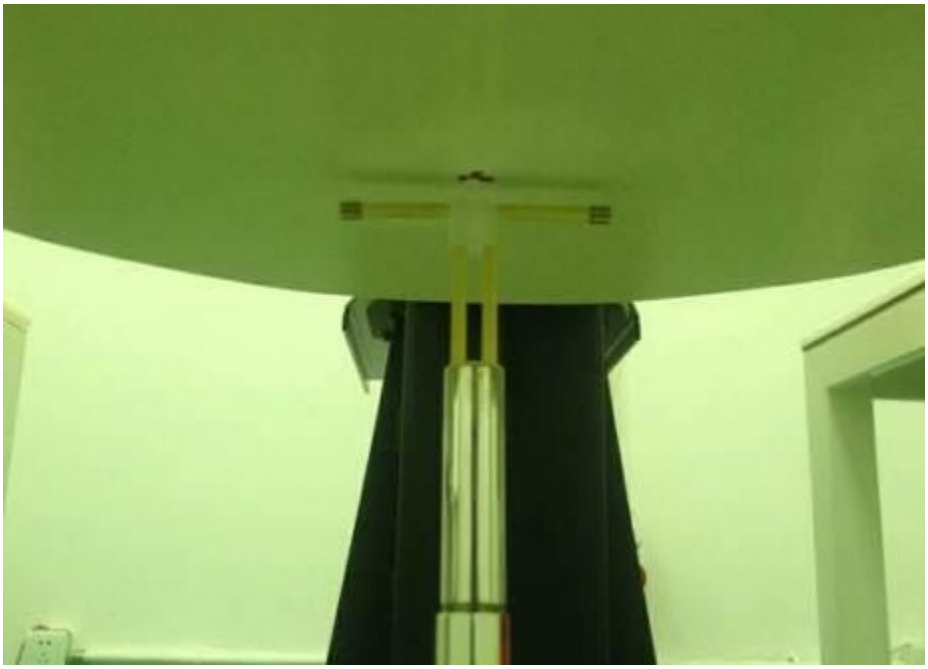
8 System verification

8.1 System Setup

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



Picture 8.1 System Setup for System Evaluation



Picture 8.2 Photo of Dipole Setup

8.2 System Verification

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

Table 8.1: System Verification of Head

Measurement Date : 835 MHz Head **Feb 10, 2014** 1900 MHz Head **Feb 13, 2014** 2450 MHz Head **Feb 16, 2014**							
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	5.98	9.12	6.08	9.56	1.67%	4.82%
	1900 MHz	22.2	42.7	21.52	41.12	-3.06%	-3.70%
	2450 MHz	23.0	49.5	23.84	50.28	3.65%	1.58%

Table 8.2: System Verification of Body

Measurement Date : 835 MHz Body **Feb 11, 2014** 1900 MHz Body **Feb 15, 2014** 2450 MHz Body **Feb 17, 2014**							
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	6.06	9.15	6.32	9.96	4.29%	8.85%
	1900 MHz	22.7	43.4	23.04	41.8	1.50%	-3.69%
	2450 MHz	22.2	47.7	23.00	48.48	3.60%	1.64%

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.

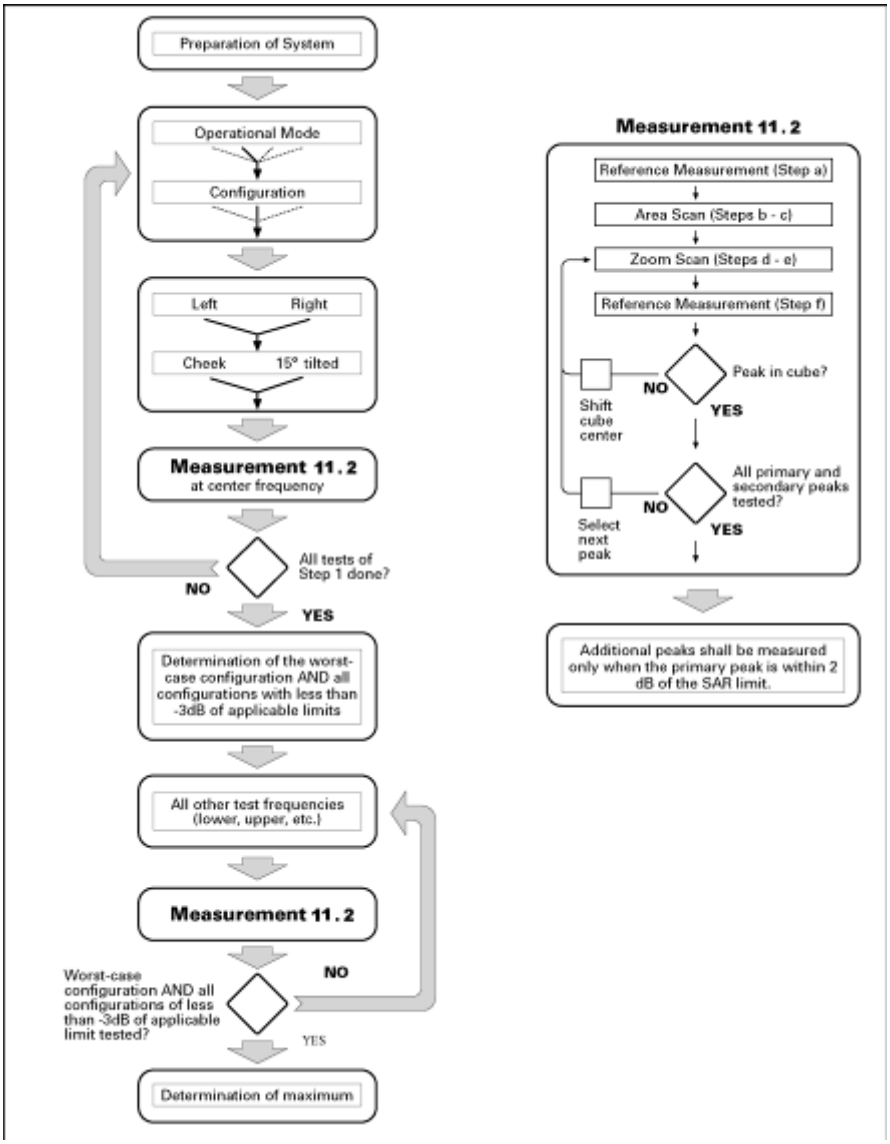
Step 1: The tests described in 11.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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 and δ 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. 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 and δ 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 HSUPA 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, DASY5 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 13.2 to Table 13.11 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

10 Conducted Output Power

10.1 Manufacturing tolerance

Table 10.1: GSM Speech

GSM 835			
Channel	Channel 251	Channel 190	Channel 128
Maximum Target Value (dBm)	31.5	31.5	31.5
GSM 1900			
Channel	Channel 810	Channel 661	Channel 512
Maximum Target Value (dBm)	28.0	28.0	28.0

Table 10.2: GPRS (GMSK Modulation)

GSM 850 GPRS				
Channel		**251**	**190**	**128**
1 Txslots	Maximum Target Value (dBm)	31.5	31.5	31.5
2 Txslots	Maximum Target Value (dBm)	31.0	31.0	31.0
3 Txslots	Maximum Target Value (dBm)	30.0	30.0	30.0
4 Txslots	Maximum Target Value (dBm)	29.0	29.0	29.0
GSM 1900 GPRS				
Channel		**810**	**661**	**512**
1 Txslots	Maximum Target Value (dBm)	28.0	28.0	28.0
2 Txslots	Maximum Target Value (dBm)	27.5	27.5	27.5
3 Txslots	Maximum Target Value (dBm)	27.0	27.0	27.0
4 Txslots	Maximum Target Value (dBm)	26.0	26.0	26.0

Table 10.3: E-GPRS (GMSK Modulation)

GSM 850 E-GPRS				
Channel		**251**	**190**	**128**
1 Txslots	Maximum Target Value (dBm)	31.5	31.5	31.5
2 Txslots	Maximum Target Value (dBm)	31.0	31.0	31.0
3 Txslots	Maximum Target Value (dBm)	30.0	30.0	30.0
4 Txslots	Maximum Target Value (dBm)	29.0	29.0	29.0
GSM 1900 E-GPRS				
Channel		**810**	**661**	**512**
1 Txslots	Maximum Target Value (dBm)	28.0	28.0	28.0
2 Txslots	Maximum Target Value (dBm)	27.5	27.5	27.5
3 Txslots	Maximum Target Value (dBm)	27.0	27.0	27.0
4 Txslots	Maximum Target Value (dBm)	26.0	26.0	26.0

Table 10.4: WCDMA

WCDMA Band V CS			
Channel	Channel 4132	Channel 4182	Channel 4233
Maximum Target Value (dBm)	22.5	22.5	22.5
WCDMA Band II CS			
Channel	Channel 9262	Channel 9400	Channel 9538
Maximum Target Value (dBm)	21.5	21.5	21.5

Table 10.5: HSDPA

WCDMA Band V				
Channel		4132	4182	4233
1	Maximum Target Value (dBm)	21.5	21.5	21.5
2	Maximum Target Value (dBm)	21.5	21.5	21.5
3	Maximum Target Value (dBm)	21.5	21.5	21.5
4	Maximum Target Value (dBm)	21.5	21.5	21.5
WCDMA Band II				
Channel		9262	9400	9538
1	Maximum Target Value (dBm)	21.5	21.5	21.5
2	Maximum Target Value (dBm)	21.5	21.5	21.5
3	Maximum Target Value (dBm)	21.5	21.5	21.5
4	Maximum Target Value (dBm)	21.5	21.5	21.5

Table 10.6: HSUPA

WCDMA Band V				
Channel		4132	4182	4233
1	Maximum Target Value (dBm)	21.5	21.5	21.5
2	Maximum Target Value (dBm)	21.5	21.5	21.5
3	Maximum Target Value (dBm)	21.5	21.5	21.5
4	Maximum Target Value (dBm)	21.5	21.5	21.5
5	Maximum Target Value (dBm)	21.5	21.5	21.5
WCDMA Band II				
Channel		9262	9400	9538
1	Maximum Target Value (dBm)	21.5	21.5	21.5
2	Maximum Target Value (dBm)	21.5	21.5	21.5
3	Maximum Target Value (dBm)	21.5	21.5	21.5
4	Maximum Target Value (dBm)	21.5	21.5	21.5
5	Maximum Target Value (dBm)	21.5	21.5	21.5

Table 10.7: WiFi

WiFi 802.11b			
Channel	Channel 1	Channel 6	Channel 11
Maximum Target Value (dBm)	12.0	12.0	12.0
WiFi 802.11g			
Channel	Channel 1	Channel 6	Channel 11
Maximum Target Value (dBm)	10.0	10.0	10.0
WiFi 802.11n			
Channel	Channel 1	Channel 6	Channel 11
Maximum Target Value (dBm)	10.5	10.5	10.5

For BT,The Maximum Target Value of tune up power is 5dBm.

10.2 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 10.8: The conducted power measurement results for GSM850/1900

GSM 835MHZ	Conducted Power (dBm)		
	Channel 251(848.8MHz)	Channel 190(836.6MHz)	Channel 128(824.2MHz)
	31.49	**31.44**	**31.40**
GSM 1900MHZ	Conducted Power (dBm)		
	Channel 810(1909.8MHz)	Channel 661(1880MHz)	Channel 512(1850.2MHz)
	27.99	**27.85**	**27.81**

Table 10.9: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	31.47	31.43	31.38	-9.03dB	22.44	22.40	22.35
2 Txslots	30.94	30.90	30.88	-6.02dB	24.92	24.88	24.86
3Txslots	29.99	29.95	29.92	-4.26dB	25.73	25.69	25.66
4 Txslots	28.96	28.92	28.89	-3.01dB	**25.95**	**25.91**	**25.88**
GSM 850 E-GPRS(GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	251	**190**	**128**		**251**	**190**	**128**
1 Txslot	31.38	31.33	31.31	-9.03dB	22.35	22.30	22.28
2 Txslots	30.85	30.79	30.77	-6.02dB	24.83	24.77	24.75
3Txslots	29.89	29.85	29.83	-4.26dB	25.63	25.59	25.57
4 Txslots	28.92	28.90	28.88	-3.01dB	**25.91**	**25.89**	**25.87**
PCS1900 GPRS (GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	27.94	27.81	27.77	-9.03dB	18.91	18.78	18.74
2 Txslots	27.86	27.64	27.60	-6.02dB	21.84	21.62	21.58
3 Txslots	26.95	26.77	26.71	-4.26dB	22.69	22.51	22.45
4 Txslots	25.99	25.96	25.92	-3.01dB	**22.98**	**22.95**	**22.91**
PCS1900 E-GPRS(GMSK)	Measured Power (dBm)			calculation	Averaged Power (dBm)		
	810	**661**	**512**		**810**	**661**	**512**
1 Txslot	27.84	27.77	27.73	-9.03dB	18.81	18.74	18.7
2 Txslots	27.67	27.52	27.46	-6.02dB	21.65	21.5	21.44
3Txslots	26.88	26.76	26.70	-4.26dB	22.62	22.5	22.44
4 Txslots	25.93	25.90	25.86	-3.01dB	**22.92**	**22.89**	**22.85**

NOTES:

1) Division Factors

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

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

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

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

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

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

10.3 WCDMA Measurement result

Table 10.10: The conducted power for WCDMA850/1900

Item	band	FDDV result(dBm)		
	ARFCN	4233 (846.6MHz)	4182 (836.4MHz)	4132 (826.4MHz)
WCDMA	RMC	22.47	22.45	22.43
HSDPA	1	21.61	21.47	21.59
	2	21.69	21.56	21.67
	3	21.64	21.51	21.63
	4	21.67	21.58	21.65
HSUPA	1	21.62	21.49	21.59
	2	21.69	21.57	21.68
	3	21.65	21.54	21.62
	4	21.67	21.55	21.66
	5	21.61	21.47	21.60
Item	band	FDDII result(dBm)		
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)
WCDMA	RMC	21.39	21.45	21.48
HSDPA	1	20.34	20.51	20.53
	2	20.38	20.59	20.60
	3	20.35	20.53	20.56
	4	20.37	20.60	20.62
HSUPA	1	20.38	20.49	20.51
	2	20.39	20.68	20.63
	3	20.35	20.53	20.56
	4	20.40	20.61	20.61
	5	20.35	20.50	20.52

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

10.4 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)	4.091	4.297	3.634

For π/4 DQPSK

Channel	Ch0 (2402 MHz)	Ch39 (2441MHz)	CH78 (2480MHz)
Conducted Output Power (dBm)	3.283	3.428	2.680

For 8DPSK

Channel	Ch0 (2402 MHz)	Ch39 (2441MHz)	CH78 (2480MHz)
Conducted Output Power (dBm)	3.283	3.435	2.672

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

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

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
So,
SAR head value of BT is 0.132W/Kg. SAR body value of BT is 0.066W/Kg.

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

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	11.60	11.49	11.39	11.69
6	11.11	11.07	10.91	11.18
11	10.28	10.20	10.11	10.44

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	9.43	9.38	9.41	9.38	9.54	9.66	9.56	9.52
6	9.07	8.90	9.05	8.91	9.11	9.17	9.11	9.10
11	8.19	8.01	8.14	8.02	8.39	8.48	8.42	8.43

20M 802.11n（dBm）

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	8.97	8.59	8.02	8.73	10.07	10.11	9.79	9.68
6	8.04	7.87	7.26	7.71	9.13	9.28	8.81	8.69
11	7.64	6.97	6.57	7.16	8.63	8.75	7.97	7.88

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

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	13.31	13.28	12.96	13.40
6	13.48	13.60	13.32	13.69
11	12.11	12.01	11.86	12.29

802.11g（dBm）

Channel\data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	18.61	17.98	18.27	17.93	18.94	19.04	18.66	18.56
6	18.56	17.94	18.26	17.90	18.89	19.03	18.59	18.54
11	17.77	16.99	17.23	16.99	17.87	18.07	17.50	17.38

802.11n（dBm）

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	14.12	14.06	13.68	14.08	19.29	19.30	18.54	18.40
6	14.23	14.20	13.59	14.20	19.31	19.32	18.55	18.43
11	13.13	13.07	12.69	13.23	18.29	18.13	17.44	17.40

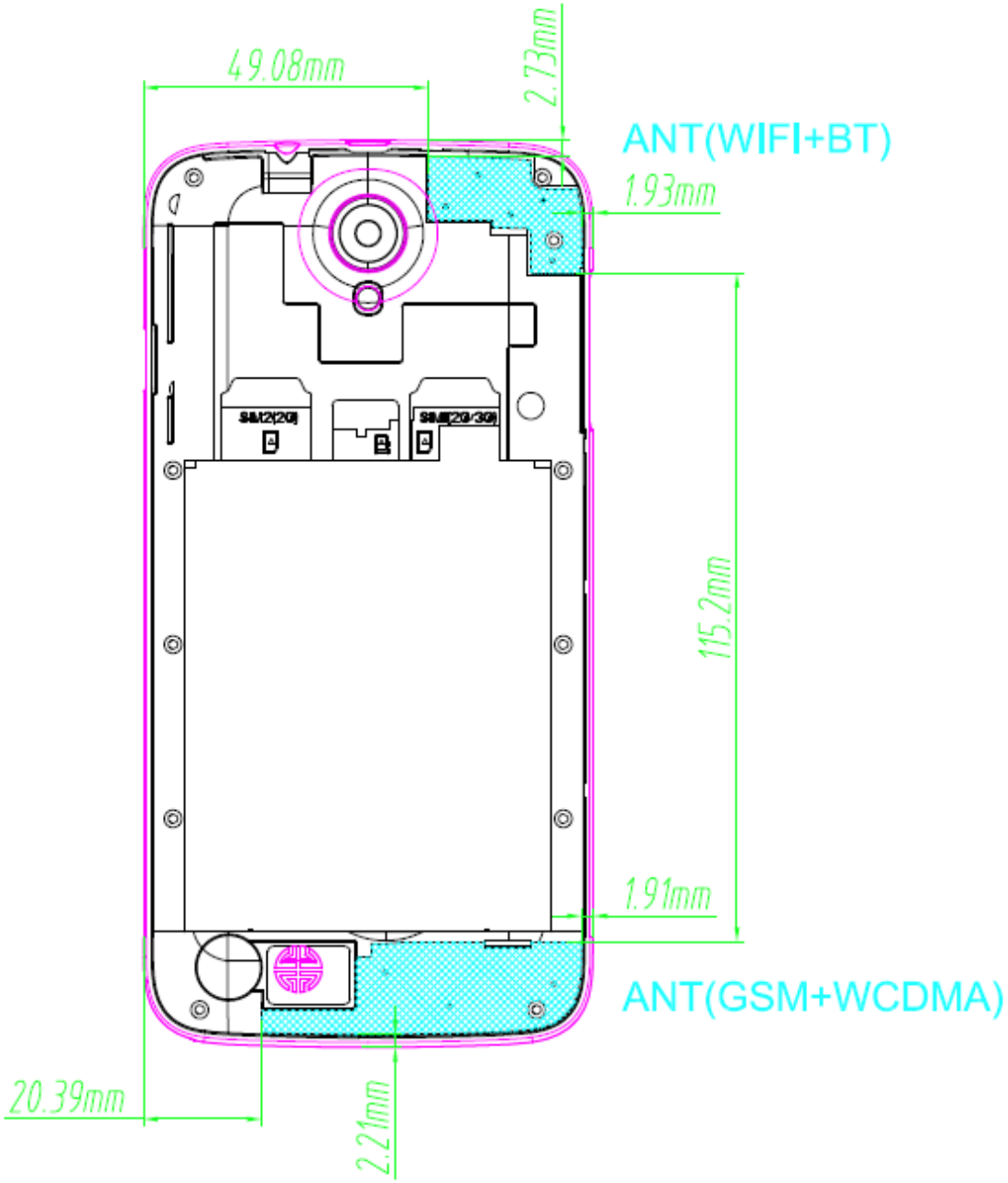
SAR is not required for 802.11g/n channels if the output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels, and for each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of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

11 Simultaneous TX SAR Considerations

11.1 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.

11.2 Transmit Antenna Separation Distances



Picture 11.1 Antenna Locations

11.3 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 D01, the SAR test exclusion threshold for distance＜5mm is defined by the following equation:

$$\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} * \sqrt{\text{Frequency (GHz)}} \leqslant 3.0$$

Based on the above equation, Bluetooth SAR was not required:

Evaluation=0.987＜3.0

Based on the above equation, WiFi SAR was required:

Evaluation=4.953＞3.0

12 Evaluation of Simultaneous

Table 12.1: Summary of Transmitters

Band/Mode	F(GHz)	SAR test exclusion threshold (mW)	RF output power (mW)
Bluetooth	2.441	10	3.16
2.4GHz WLAN 802.11 b	2.45	10	15.85

Table12.2 Simultaneous transmission SAR

Simultaneous Transmission SAR(W/Kg)									
Test Position			**GSM 850**	**GSM 1900**	**WCDMA B V**	**WCDMA B II**	**WIFI**	**BT** note	**SUM**
Head	Left	Cheek	0.253	0.034	0.149	0.082	0.153	0.132	**0.406**
		Tilt 15°	0.151	0.00747	0.091	0.027	0.140	0.132	**0.291**
	Right	Cheek	0.345	0.028	0.158	0.069	0.343	0.132	**0.688**
		Tilt 15°	0.127	0.011	0.096	0.028	0.251	0.132	**0.378**
Body	Phantom Side		0.615	0.450	0.190	0.486	0.021	0.066	**0.681**
	Ground Side		1.110	1.040	0.300	0.907	0.075	0.066	**1.185**
	Left Side		0.207	0.079	0.115	0.070	0.046	0.066	**0.273**
	Right Side		0.419	0.047	0.156	0.068	0.023	0.066	**0.485**
	Top Side		N/A	N/A	N/A	N/A	0.033	0.066	**N/A**
	Bottom Side		0.133	0.795	0.029	0.684	0.00551	0.066	**0.861**

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

13 SAR Test Result

Table 13.1: Duty Cycle

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

Table 13.2: 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	31.44	1.014	0.250	0.253	0.14
836.6	190	Left	Tilt	31.5	31.44	1.014	0.149	0.151	-0.01
836.6	190	Right	Touch	31.5	31.44	1.014	0.257	0.261	-0.07
836.6	190	Right	Tilt	31.5	31.44	1.014	0.125	0.127	-0.03
824.2	128	Right	Touch	31.5	31.40	1.023	0.238	0.244	-0.14
848.8	251	Right	Touch	31.5	31.49	1.002	0.344	0.345	0.00

Table 13.3: 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	29.0	28.92	1.019	0.604	0.615	-0.08
836.6	190	GPRS (4)	Ground	29.0	28.92	1.019	1.00	1.019	0.03
836.6	190	GPRS (4)	Left	29.0	28.92	1.019	0.203	0.207	-0.00
836.6	190	GPRS (4)	Right	29.0	28.92	1.019	0.411	0.419	-0.03
836.6	190	GPRS (4)	Bottom	29.0	28.92	1.019	0.131	0.133	-0.09
848.8	251	GPRS (4)	Ground	29.0	28.96	1.009	1.10	1.110	0.05
824.2	128	GPRS (4)	Ground	29.0	28.89	1.026	0.964	0.989	-0.06
824.2	128	E-GPRS (4)	Ground	29.0	28.88	1.028	0.837	0.860	-0.10
836.6	190	E-GPRS (4)	Ground	29.0	28.90	1.023	0.883	0.904	-0.05
848.8	251	E-GPRS (4)	Ground	29.0	28.92	1.019	1.08	1.100	-0.11
848.8	251	Speech	Ground (Headset)	31.5	31.49	1.002	0.621	0.622	0.07

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

Table 13.4: SAR Values (GSM 1900 MHz Band - Head)

Frequency		Side	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	661	Left	Touch	28.0	27.85	1.035	0.031	0.032	0.01
1880	661	Left	Tilt	28.0	27.85	1.035	0.00722	0.00747	0.09
1880	661	Right	Touch	28.0	27.85	1.035	0.027	0.028	0.12
1880	661	Right	Tilt	28.0	27.85	1.035	0.011	0.011	0.07
1909.8	810	Left	Touch	28.0	27.99	1.002	0.026	0.026	0.00
1850.2	512	Left	Touch	28.0	27.81	1.045	0.033	0.034	0.03

Table 13.5: 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	26.0	25.96	1.009	0.446	0.450	0.03
1880	661	GPRS (4)	Ground	26.0	25.96	1.009	1.03	1.040	0.14
1880	661	GPRS (4)	Left	26.0	25.96	1.009	0.078	0.079	0.06
1880	661	GPRS (4)	Right	26.0	25.96	1.009	0.047	0.047	0.07
1880	661	GPRS (4)	Bottom	26.0	25.96	1.009	0.788	0.795	0.09
1909.8	810	GPRS (4)	Ground	26.0	25.99	1.002	1.020	1.022	0.17
1850.2	512	GPRS (4)	Ground	26.0	25.92	1.019	0.958	0.967	-0.02
1909.8	810	E-GPRS (4)	Ground	26.0	25.93	1.016	1.01	1.030	0.18
1880	661	E-GPRS (4)	Ground	26.0	25.90	1.023	1.00	1.023	0.08
1850.2	512	E-GPRS (4)	Ground	26.0	25.86	1.033	0.989	1.02	0.11
1880	661	Speech	Ground (Headset)	28.0	27.85	1.035	0.283	0.246	0.15

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

Table 13.6: SAR Values (WCDMA Band 5- Head)

Frequency		Side	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
836.4	4182	Left	Touch	22.50	22.45	1.012	0.147	0.149	-0.04
836.4	4182	Left	Tilt	22.50	22.45	1.012	0.090	0.091	-0.02
836.4	4182	Right	Touch	22.50	22.45	1.012	0.156	0.158	0.09
836.4	4182	Right	Tilt	22.50	22.45	1.012	0.095	0.096	-0.01
846.6	4233	Right	Touch	22.50	22.47	1.007	0.147	0.148	0.12
826.4	4132	Right	Touch	22.50	22.43	1.016	0.152	0.154	0.07

Table 13.7: SAR Values (WCDMA Band 5– 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	22.50	22.45	1.012	0.188	0.190	0.01
836.4	4182	Ground	22.50	22.45	1.012	0.283	0.286	-0.04
836.4	4182	Left	22.50	22.45	1.012	0.114	0.115	-0.05
836.4	4182	Right	22.50	22.45	1.012	0.154	0.156	-0.11
836.4	4182	Bottom	22.50	22.45	1.012	0.029	0.029	-0.09
846.6	4233	Ground	22.50	22.47	1.007	0.282	0.284	-0.06
826.4	4132	Ground	22.50	22.43	1.016	0.295	0.300	0.04
826.4	4132	Ground (Headset)	22.50	22.43	1.016	0.250	0.254	-0.03

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

Table 13.8: SAR Values (WCDMA Band 2- Head)

Frequency		Side	Test Position	Maximum allowed Power (dBm)	Measured average power (dBm)	Scaling factor	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1880	9400	Left	Touch	21.50	21.45	1.012	0.081	0.082	0.09
1880	9400	Left	Tilt	21.50	21.45	1.012	0.027	0.027	0.00
1880	9400	Right	Touch	21.50	21.45	1.012	0.068	0.069	0.08
1880	9400	Right	Tilt	21.50	21.45	1.012	0.028	0.028	0.05
1907.6	9538	Left	Touch	21.50	21.39	1.026	0.052	0.053	0.08
1852.4	9262	Left	Touch	21.50	21.48	1.005	0.069	0.069	0.16

Table 13.9: SAR Values (WCDMA Band 2– 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	21.50	21.45	1.012	0.480	0.486	0.04
1880	9400	Ground	21.50	21.45	1.012	0.897	0.907	0.13
1880	9400	Left	21.50	21.45	1.012	0.069	0.070	0.07
1880	9400	Right	21.50	21.45	1.012	0.067	0.068	0.02
1880	9400	Bottom	21.50	21.45	1.012	0.676	0.684	0.08
1907.6	9538	Ground	21.50	21.39	1.026	0.755	0.774	0.07
1852.4	9262	Ground	21.50	21.48	1.005	0.859	0.863	0.01
1880	9400	Ground (Headset)	21.50	21.45	1.012	0.776	0.785	0.00

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

Table 13.10: 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	12.0	11.69	1.074	0.142	0.153	0.20
2412	1	Left	Tilt	12.0	11.69	1.074	0.130	0.140	0.03
2412	1	Right	Touch	12.0	11.69	1.074	0.319	0.343	0.05
2412	1	Right	Tilt	12.0	11.69	1.074	0.234	0.251	0.06

Table 13.11: 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	12.0	11.69	1.074	0.020	0.021	0.08
2412	1	Ground	12.0	11.69	1.074	0.070	0.075	0.01
2412	1	Left	12.0	11.69	1.074	0.043	0.046	0.03
2412	1	Right	12.0	11.69	1.074	0.021	0.023	0.19
2412	1	Top	12.0	11.69	1.074	0.031	0.033	0.06
2412	1	Bottom	12.0	11.69	1.074	0.00513	0.00551	0.04

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

14 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 14.1: 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 14.2: 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.						
836.6	190	GPRS (4)	Ground	10	1.00	0.994	1.01
848.8	251	GPRS (4)	Ground	10	1.10	1.09	1.01
824.2	128	GPRS (4)	Ground	10	0.964	0.956	1.01
824.2	128	E-GPRS (4)	Ground	10	0.837	0.836	1.00
836.6	190	E-GPRS (4)	Ground	10	0.883	0.875	1.01
848.8	251	E-GPRS (4)	Ground	10	1.08	1.08	1.00
1880	661	GPRS (4)	Ground	10	1.03	1.02	1.01
1909.8	810	GPRS (4)	Ground	10	1.02	1.01	1.01
1850.2	512	GPRS (4)	Ground	10	0.958	0.949	1.01
1909.8	810	E-GPRS (4)	Ground	10	1.01	1.01	1.00
1880	661	E-GPRS (4)	Ground	10	1.00	1.00	1.00
1850.2	512	E-GPRS (4)	Ground	10	0.989	0.988	1.00
1880	9400	WCDMA Band 2	Ground	10	0.897	0.891	1.01
1852.4	9262	WCDMA Band 2	Ground	10	0.859	0.854	1.01

15 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%**	

16 Main Test Instrument

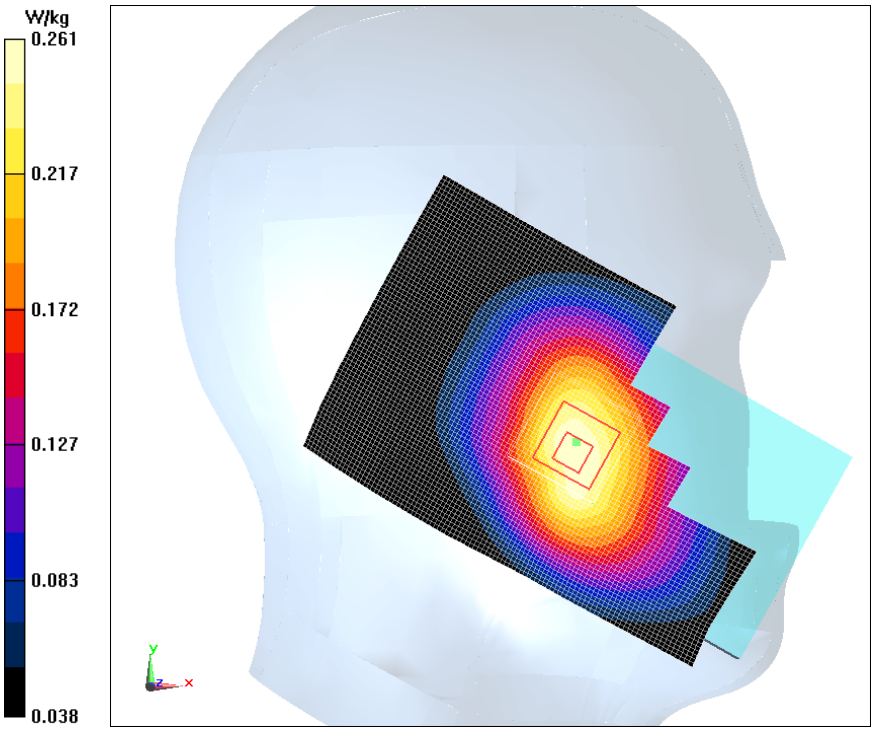
Table 16.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	N5242A	MY51221755	May 21, 2013	One year
02	Power meter	NRVD	102257	Aug 31, 2013	One year
03	Power sensor	NRV-Z5	100644,100241		
04	Signal Generator	E4438C	MY49072044	May 21, 2013	One Year
05	Amplifier	NTWPA-0086010F	12023024	No Calibration Requested	
06	Coupler	778D	MY48220551	Aug 23, 2013	One year
07	BTS	E5515C	MY50266468	May 21, 2013	One year
08	E-field Probe	ES3DV3	3252	Aug 5, 2013	One year
09	E-field Probe	EX3DV4	3754	Aug 8, 2013	One year
10	DAE	SPEAG DAE4	1244	Jul 9, 2013	One year
11	Dipole Validation Kit	SPEAG D835V2	4d092	Oct 9, 2013	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d134	Jul 12, 2013	One year
13	Dipole Validation Kit	SPEAG D2450V2	858	Jul 13, 2013	One year

ANNEX A GRAPH RESULTS

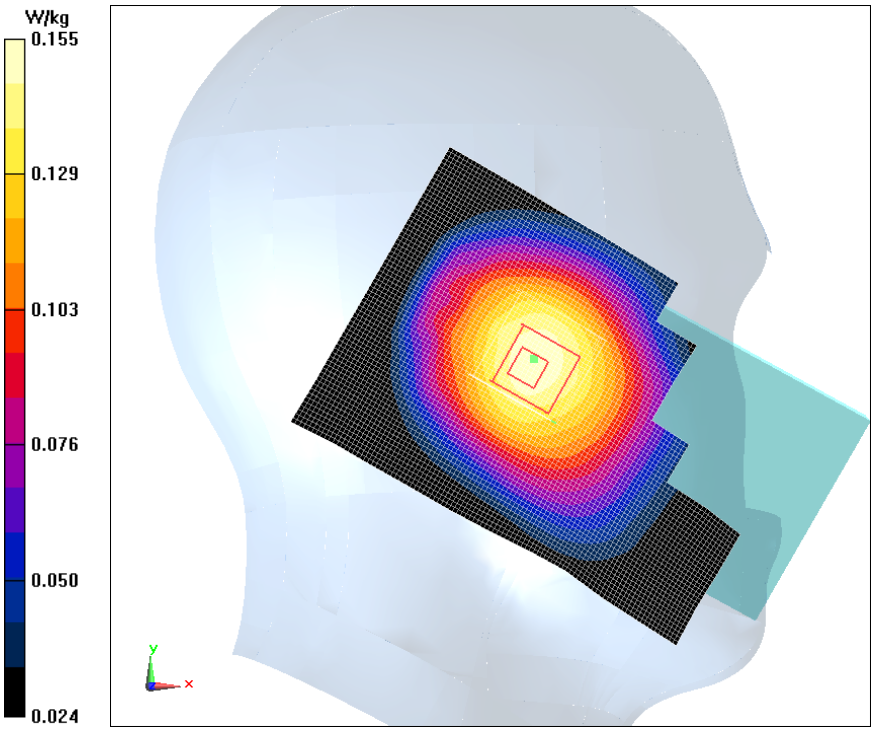
GSM 850MHz Left Cheek Middle

Date/Time: 2014/2/10
Electronics: DAE4 Sn1244
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.1, 6.1, 6.1); Calibrated: 8/5/2013
GSM 850MHz Left Cheek Middle/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.260 W/kg
GSM 850MHz Left Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.583 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.306 W/kg
SAR(1 g) = 0.250 W/kg; SAR(10 g) = 0.191 W/kg
Maximum value of SAR (measured) = 0.261 W/kg



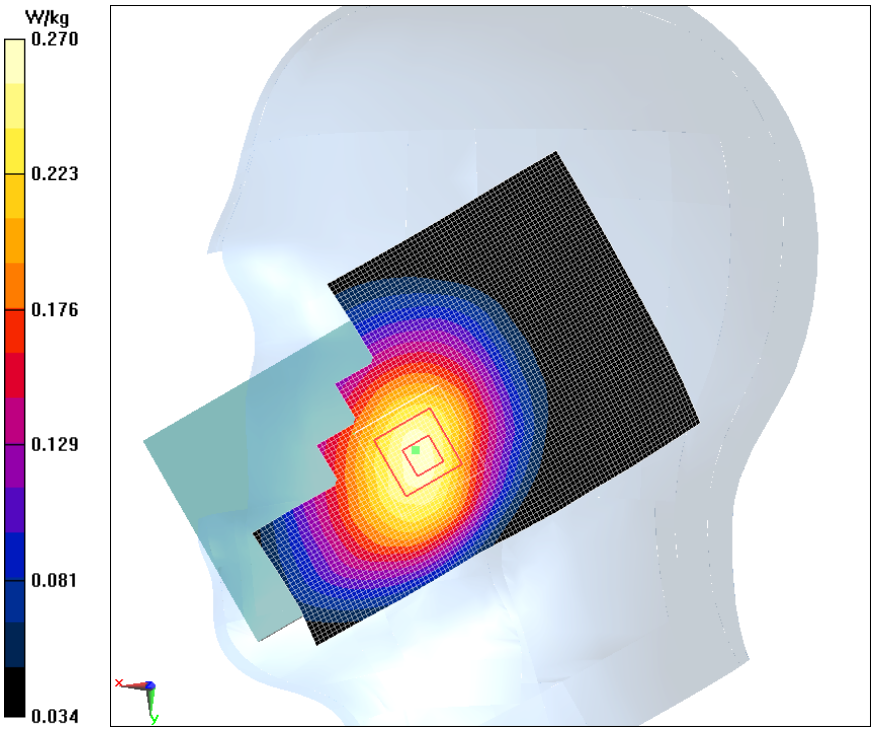
GSM 850MHz Left Tilt Middle

Date/Time: 2014/2/10
Electronics: DAE4 Sn1244
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.1, 6.1, 6.1); Calibrated: 8/5/2013
GSM 850MHz Left Tilt Middle/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.154 W/kg
GSM 850MHz Left Tilt Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.089 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.183 W/kg
SAR(1 g) = 0.149 W/kg; SAR(10 g) = 0.117 W/kg
Maximum value of SAR (measured) = 0.155 W/kg



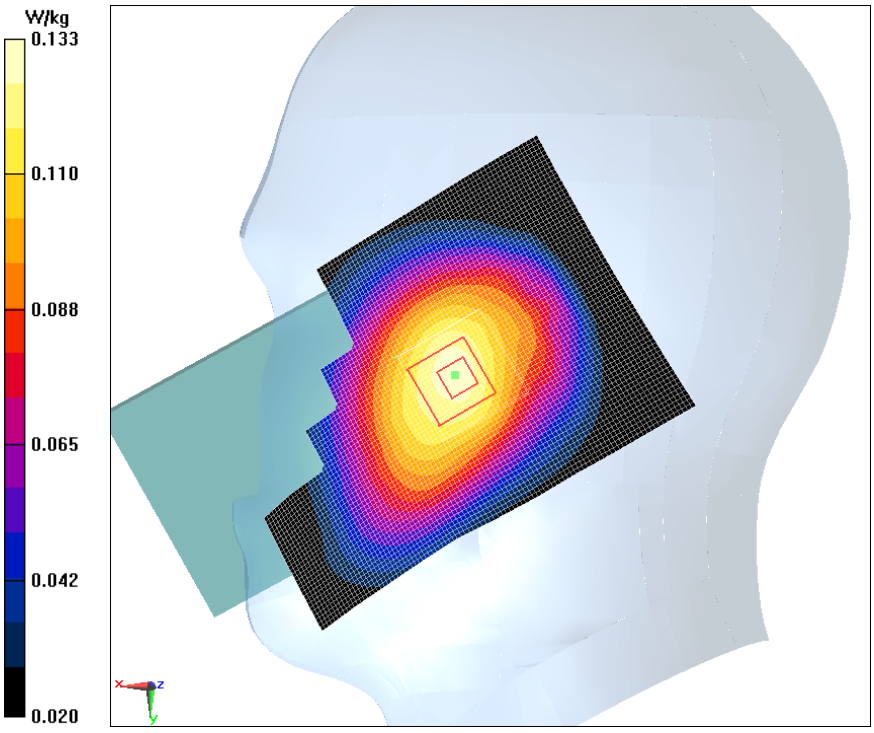
GSM 850MHz Right Cheek Middle

Date/Time: 2014/2/10
Electronics: DAE4 Sn1244
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.1, 6.1, 6.1); Calibrated: 8/5/2013
GSM 850MHz Right Cheek Middle/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.264 W/kg
GSM 850MHz Right Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.346 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.313 W/kg
SAR(1 g) = 0.257 W/kg; SAR(10 g) = 0.197 W/kg
Maximum value of SAR (measured) = 0.270 W/kg



GSM 850MHz Right Tilt Middle

Date/Time: 2014/2/10
Electronics: DAE4 Sn1244
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.919 S/m; ε_r = 40.986; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.1, 6.1, 6.1); Calibrated: 8/5/2013
GSM 850MHz Right Tilt Middle/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.131 W/kg
GSM 850MHz Right Tilt Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.891 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.151 W/kg
SAR(1 g) = 0.125 W/kg; SAR(10 g) = 0.096 W/kg
Maximum value of SAR (measured) = 0.133 W/kg

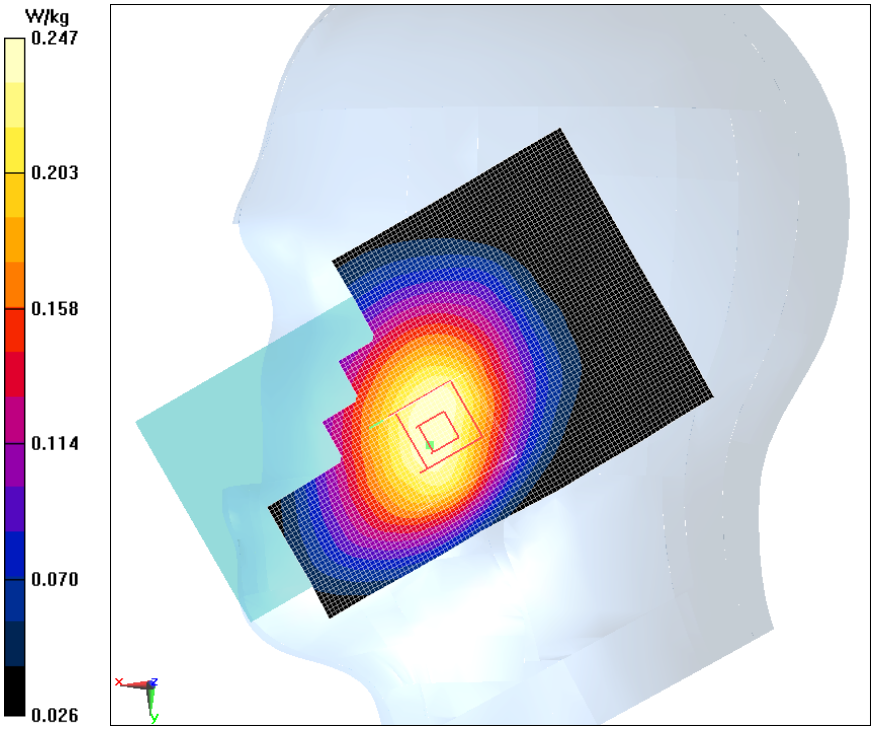


GSM 850MHz Right Cheek Low

Date/Time: 2014/2/10
Electronics: DAE4 Sn1244
Medium: Head 850MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.91 S/m; ε_r = 41.32; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.1, 6.1, 6.1); Calibrated: 8/5/2013

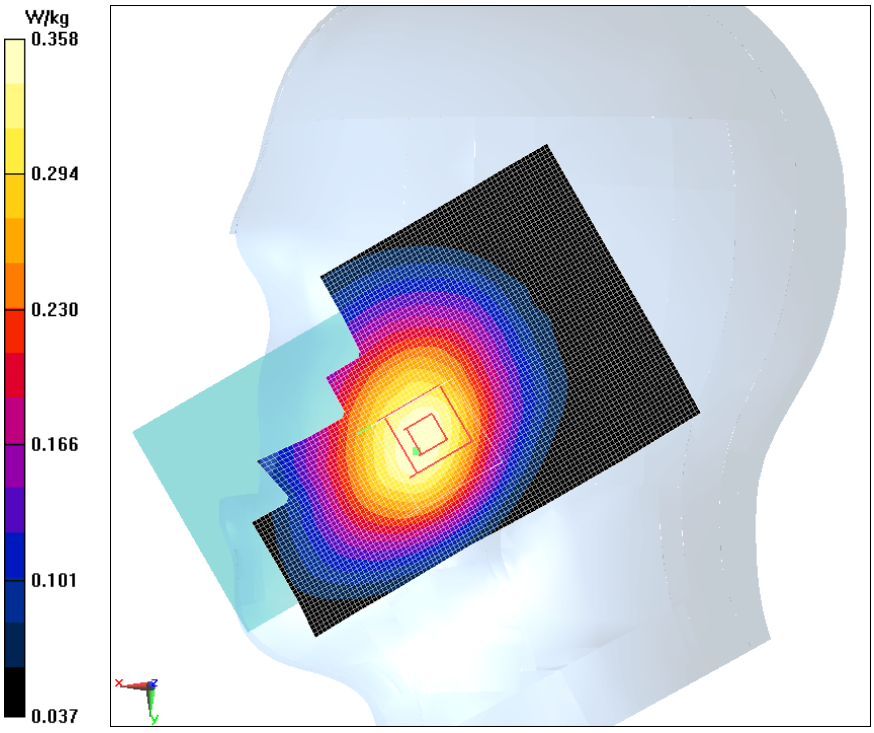
GSM 850MHz Right Cheek Low/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.250 W/kg

GSM 850MHz Right Cheek Low/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.444 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.293 W/kg
SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.182 W/kg
Maximum of SAR (measured) = 0.247 W/kg



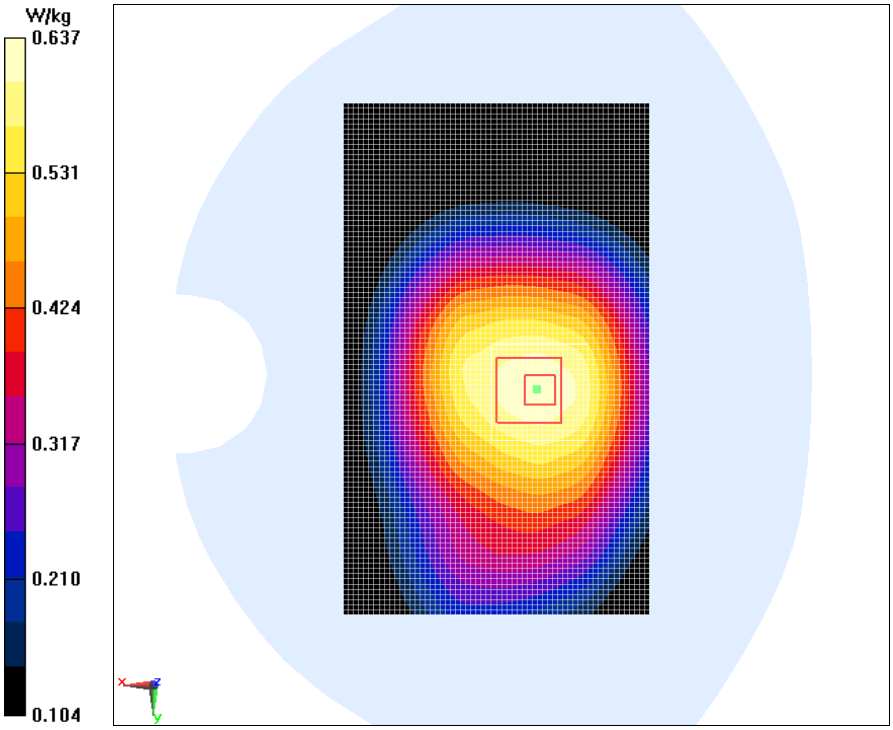
GSM 850MHz Right Cheek High

Date/Time: 2014/2/10
Electronics: DAE4 Sn1244
Medium: Head 850MHz
Medium parameters used: f = 849 MHz; σ = 0.929 S/m; ε_r = 40.788; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.1, 6.1, 6.1); Calibrated: 8/5/2013
GSM 850MHz Right Cheek High/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.357 W/kg
GSM 850MHz Right Cheek High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.490 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.430 W/kg
SAR(1 g) = 0.344 W/kg; SAR(10 g) = 0.261 W/kg
Maximum of SAR (measured) = 0.358 W/kg



GPRS 850MHz 4TS Phantom Mode Middle

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013
GPRS 850MHz 4TS Phantom Mode Middle/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.627 W/kg
GPRS 850MHz 4TS Phantom Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.239 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.736 W/kg
SAR(1 g) = 0.604 W/kg; SAR(10 g) = 0.468 W/kg
Maximum value of SAR (measured) = 0.637 W/kg

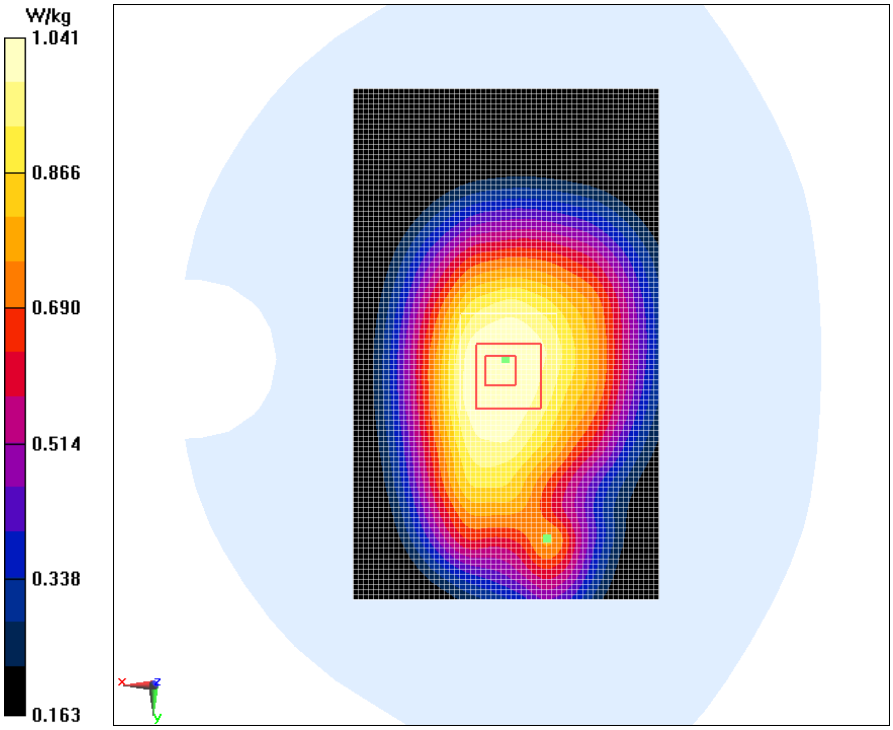


GPRS 850MHz 4TS Ground Mode Middle

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

GPRS 850MHz 4TS Ground Mode Middle/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.06 W/kg

GPRS 850MHz 4TS Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.783 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 1 W/kg; SAR(10 g) = 0.774 W/kg
Maximum value of SAR (measured) = 1.04 W/kg

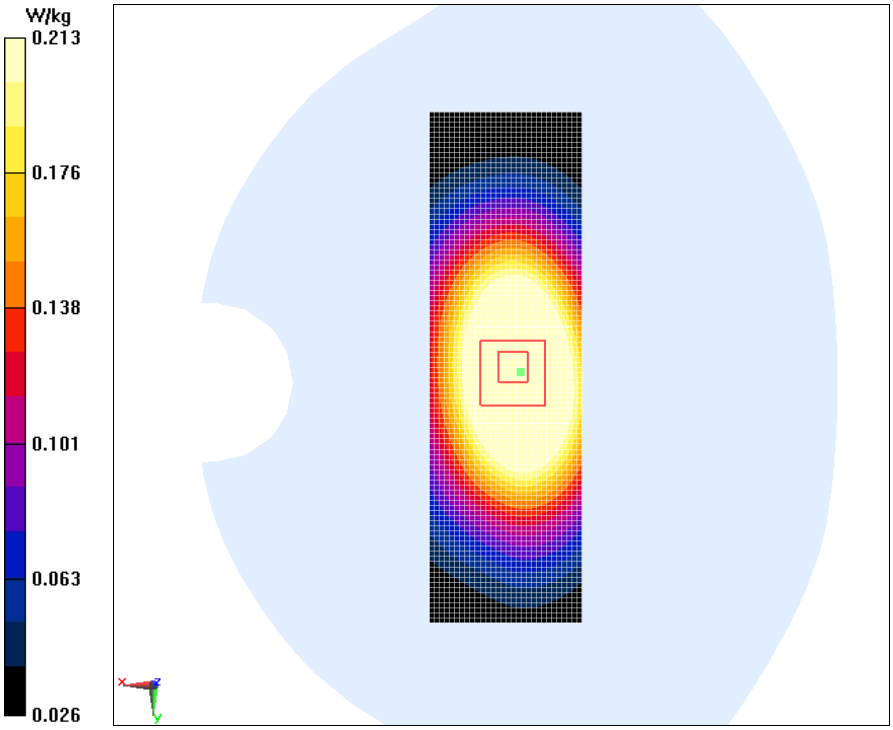


GPRS 850MHz 4TS Left Mode Middle

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

GPRS 850MHz 4TS Left Mode Middle/Area Scan (31x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.309 W/kg

GPRS 850MHz 4TS Left Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.011 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.269 W/kg
SAR(1 g) = 0.203 W/kg; SAR(10 g) = 0.146 W/kg
Maximum value of SAR (measured) = 0.213 W/kg

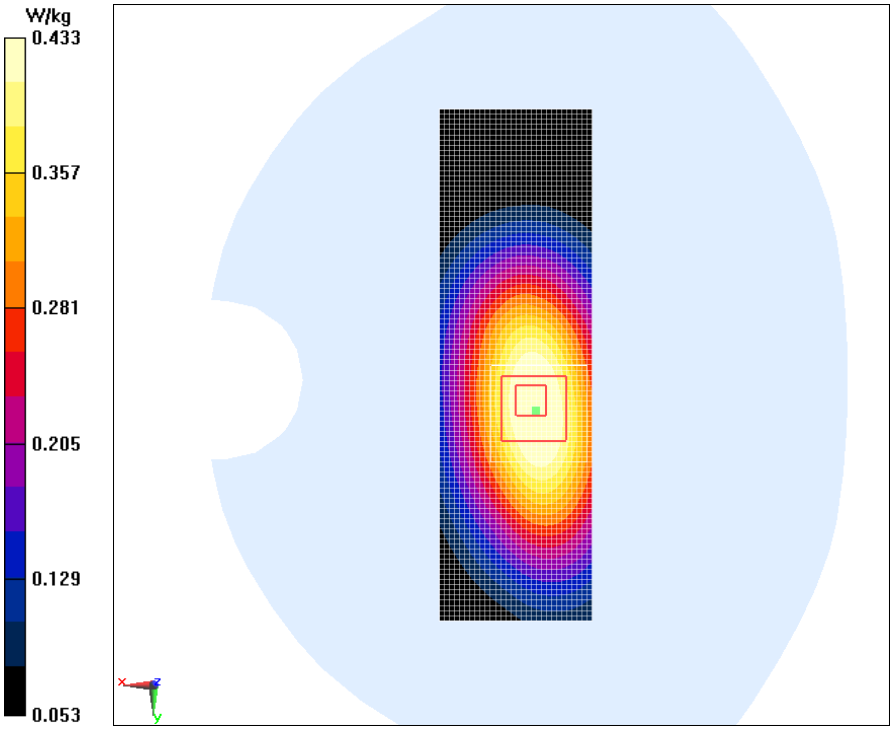


GPRS 850MHz 4TS Right Mode Middle

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

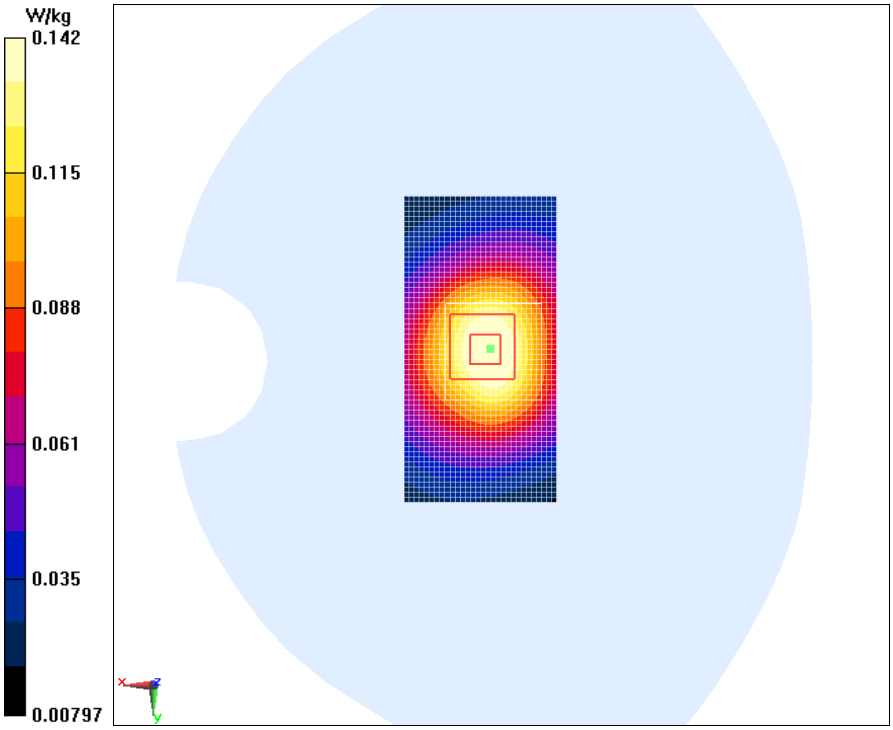
GPRS 850MHz 4TS Right Mode Middle/Area Scan (31x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.455 W/kg

GPRS 850MHz 4TS Right Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.096 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.551 W/kg
SAR(1 g) = 0.411 W/kg; SAR(10 g) = 0.290 W/kg
Maximum value of SAR (measured) = 0.433 W/kg



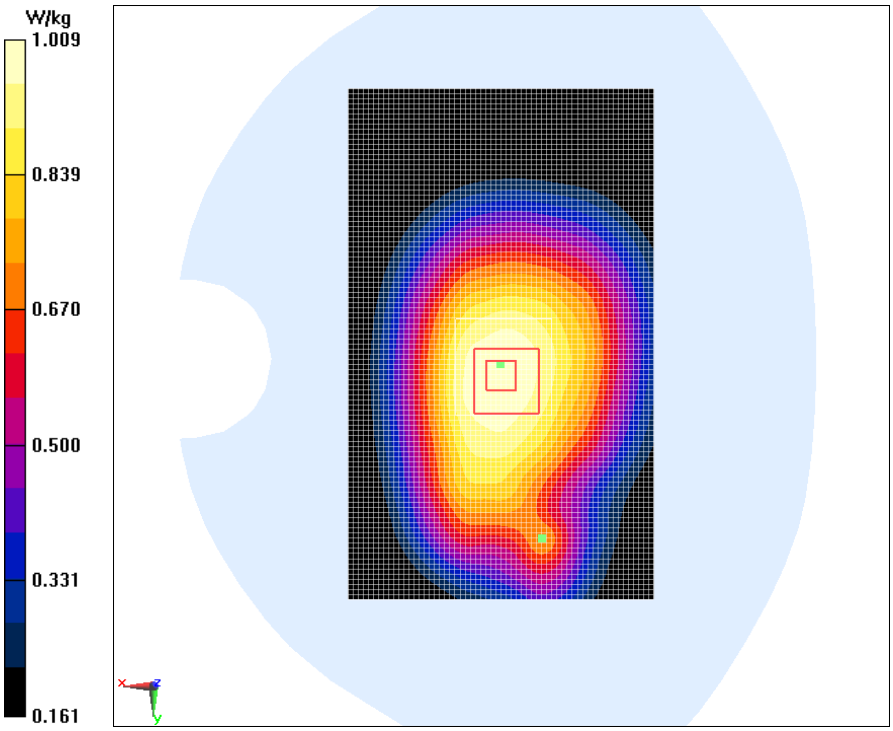
GPRS 850MHz 4TS Bottom Mode Middle

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013
GPRS 850MHz 4TS Bottom Mode Middle/Area Scan (31x61x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.150 W/kg
GPRS 850MHz 4TS Bottom Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.843 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.197 W/kg
SAR(1 g) = 0.131 W/kg; SAR(10 g) = 0.086 W/kg
Maximum value of SAR (measured) = 0.142 W/kg



GPRS 850MHz 4TS Ground Mode Low

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS; Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013
GPRS 850MHz 4TS Ground Mode Low/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.01 W/kg
GPRS 850MHz 4TS Ground Mode Low/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.413 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.964 W/kg; SAR(10 g) = 0.750 W/kg
Maximum value of SAR (measured) = 1.01 W/kg

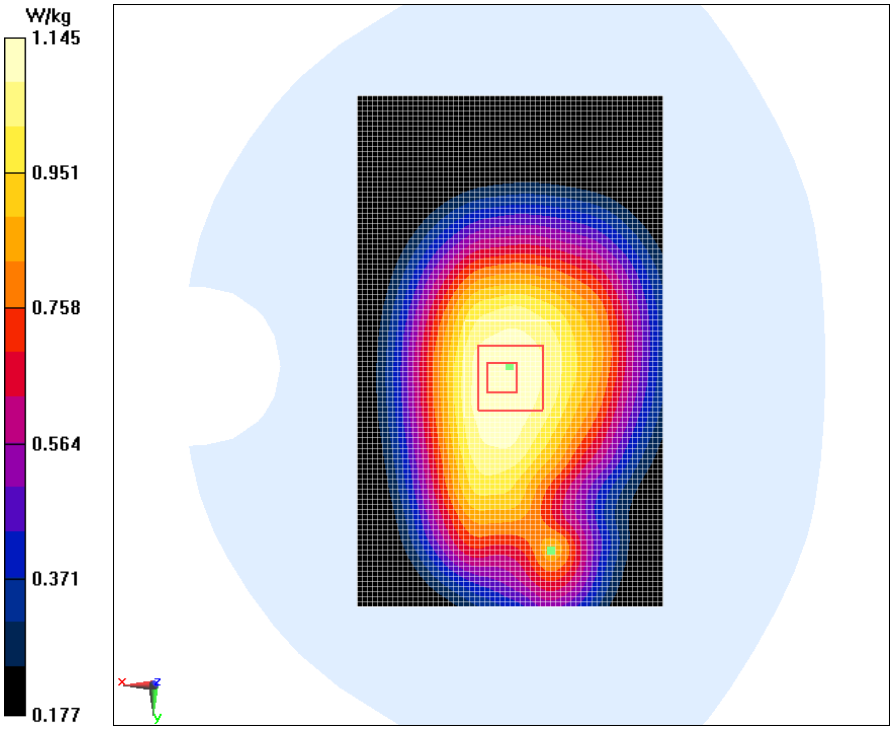


GPRS 850MHz 4TS Ground Mode high

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; ε_r = 55.205; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS (0); Frequency: 848.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

GPRS 850MHz 4TS Ground Mode high/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.14 W/kg

GPRS 850MHz 4TS Ground Mode high/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.159 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.844 W/kg
Maximum value of SAR (measured) = 1.14 W/kg

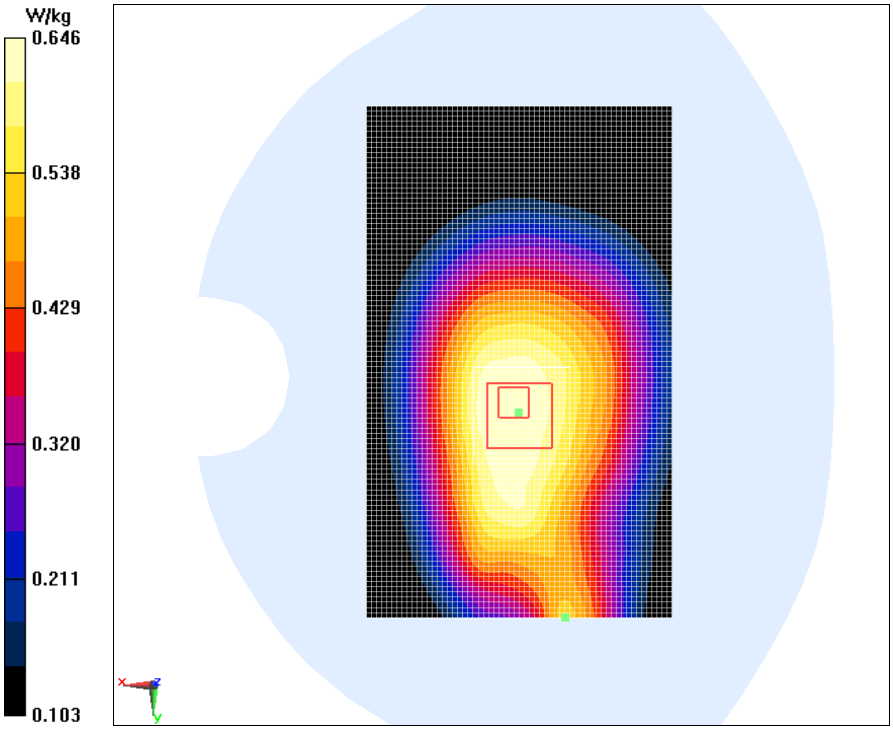


GSM 850MHz Ground Mode High With Headset

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; ε_r = 55.205; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM Professional 850MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

GSM 850MHz Ground Mode High With Headset/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.648 W/kg

GSM 850MHz Ground Mode High With Headset/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.388 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.771 W/kg
SAR(1 g) = 0.621 W/kg; SAR(10 g) = 0.477 W/kg
Maximum value of SAR (measured) = 0.646 W/kg

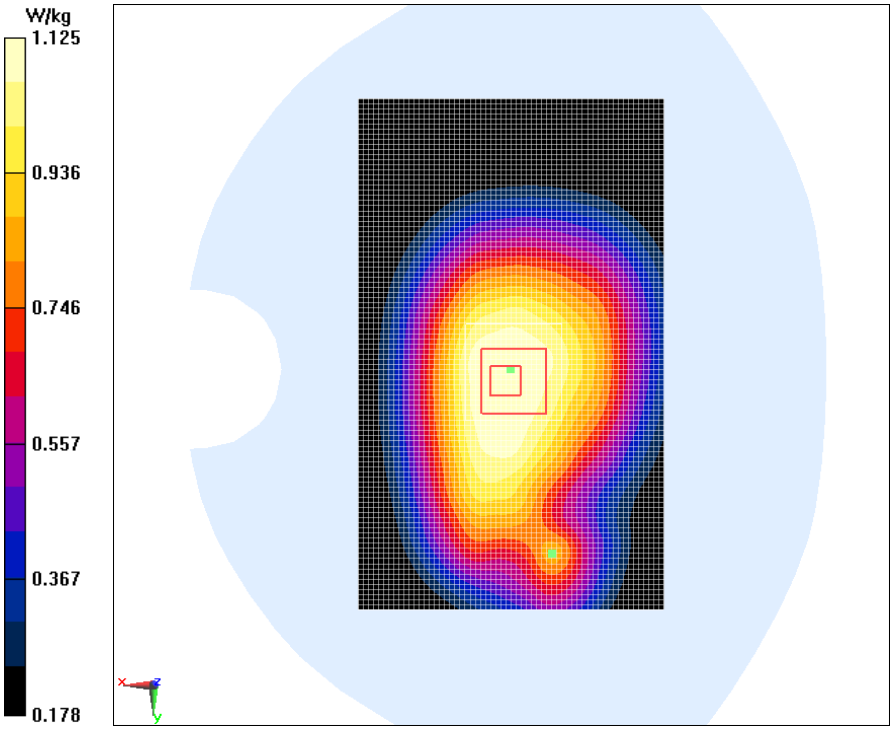


E-GPRS 850MHz 4TS Ground Mode High

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; ε_r = 55.205; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS (0); Frequency: 848.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

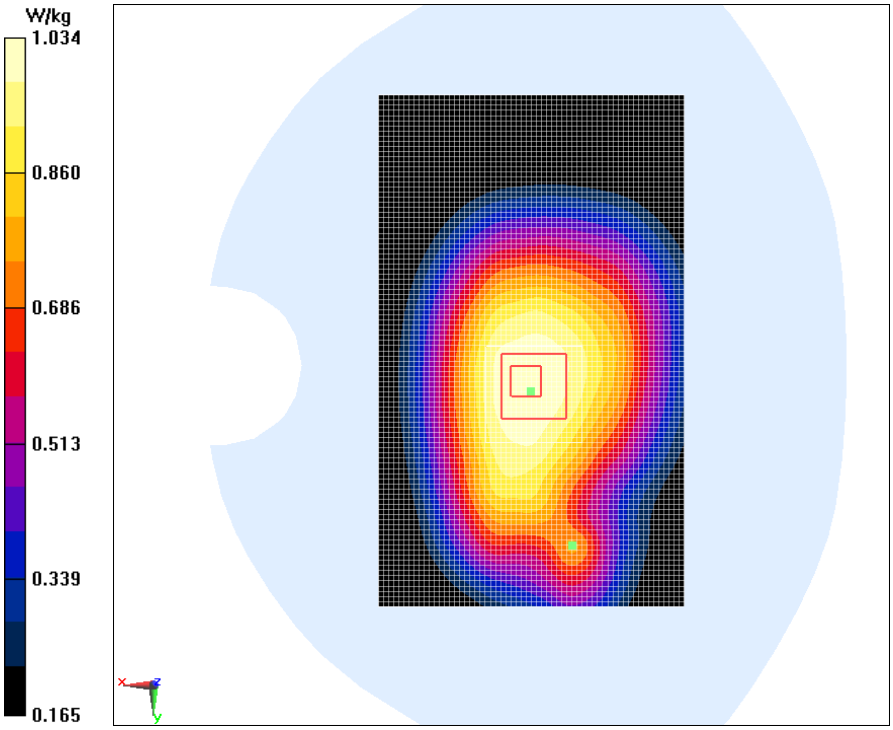
E-GPRS 850MHz 4TS Ground Mode High/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.13 W/kg

E-GPRS 850MHz 4TS Ground Mode High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.368 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.834 W/kg
Maximum value of SAR (measured) = 1.13 W/kg



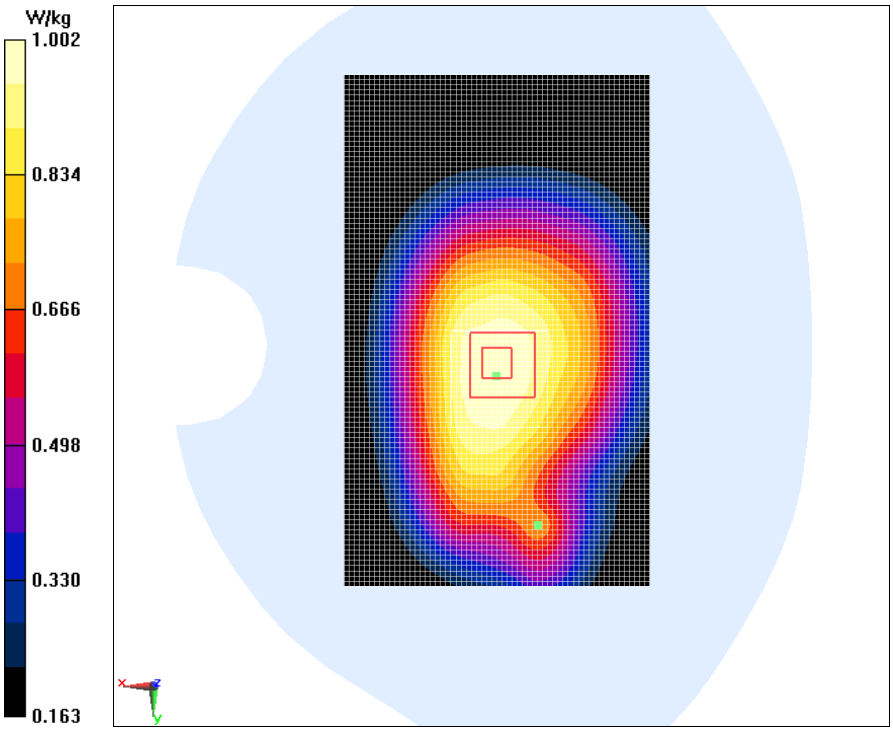
GPRS 850MHz 4TS Ground Mode Middle 2

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS; Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013
GPRS 850MHz 4TS Ground Mode Middle 2/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.03 W/kg
GPRS 850MHz 4TS Ground Mode Middle 2/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.917 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.994 W/kg; SAR(10 g) = 0.770 W/kg
Maximum value of SAR (measured) = 1.03 W/kg



GPRS 850MHz 4TS Ground Mode Low 2

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS; Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013
GPRS 850MHz 4TS Ground Mode Low 2/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.01 W/kg
GPRS 850MHz 4TS Ground Mode Low 2/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.238 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.956 W/kg; SAR(10 g) = 0.745 W/kg
Maximum value of SAR (measured) = 1.00 W/kg

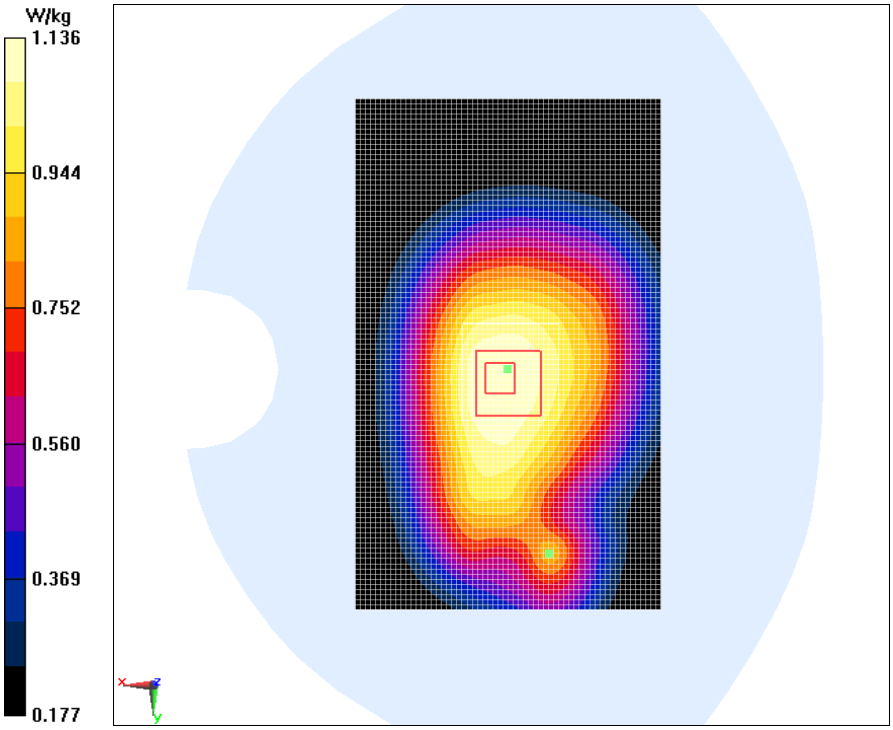


GPRS 850MHz 4TS Ground Mode high 2

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; ε_r = 55.205; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS (0); Frequency: 848.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

GPRS 850MHz 4TS Ground Mode high 2/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.14 W/kg

GPRS 850MHz 4TS Ground Mode high 2/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.194 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 1.09 W/kg; SAR(10 g) = 0.839 W/kg
Maximum value of SAR (measured) = 1.14 W/kg

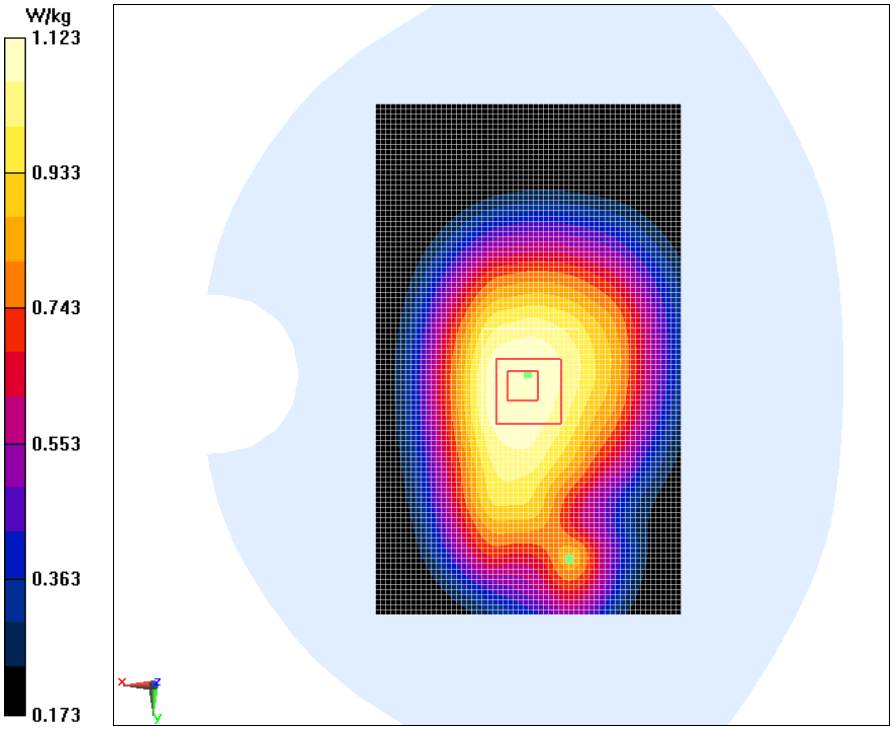


E-GPRS 850MHz 4TS Ground Mode High 2

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 849 MHz; σ = 1.015 S/m; ε_r = 55.205; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS (0); Frequency: 848.8 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

E-GPRS 850MHz 4TS Ground Mode High 2/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 1.13 W/kg

E-GPRS 850MHz 4TS Ground Mode High 2/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.151 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.830 W/kg
Maximum value of SAR (measured) = 1.12 W/kg

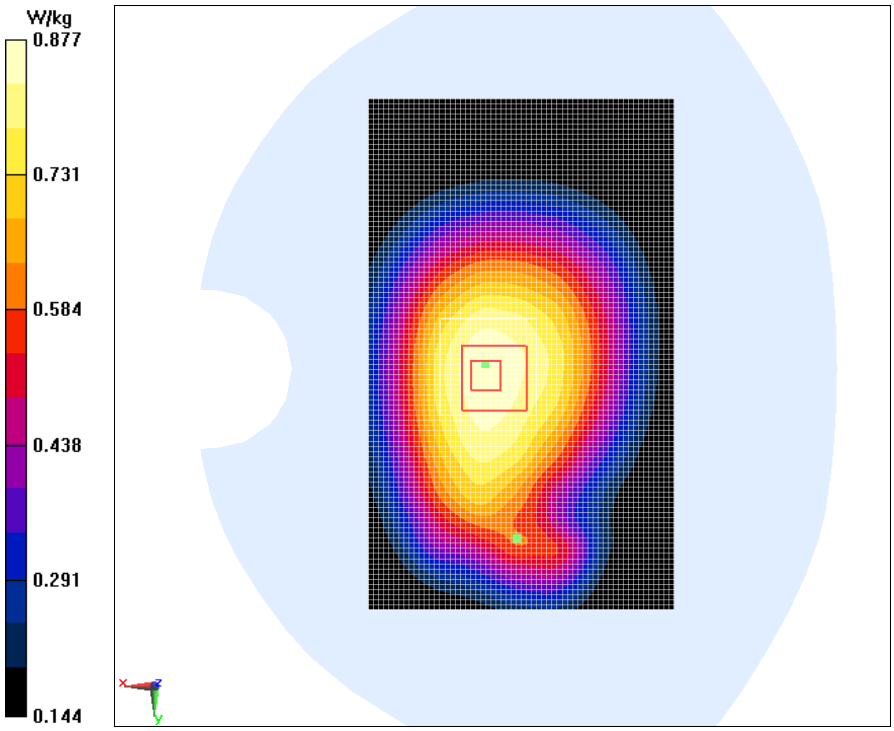


E-GPRS 850MHz 4TS Ground Mode Low

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS (0); Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

E-GPRS 850MHz 4TS Ground Mode Low/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.875 W/kg

E-GPRS 850MHz 4TS Ground Mode Low/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.033 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.837 W/kg; SAR(10 g) = 0.652 W/kg
Maximum value of SAR (measured) = 0.877 W/kg

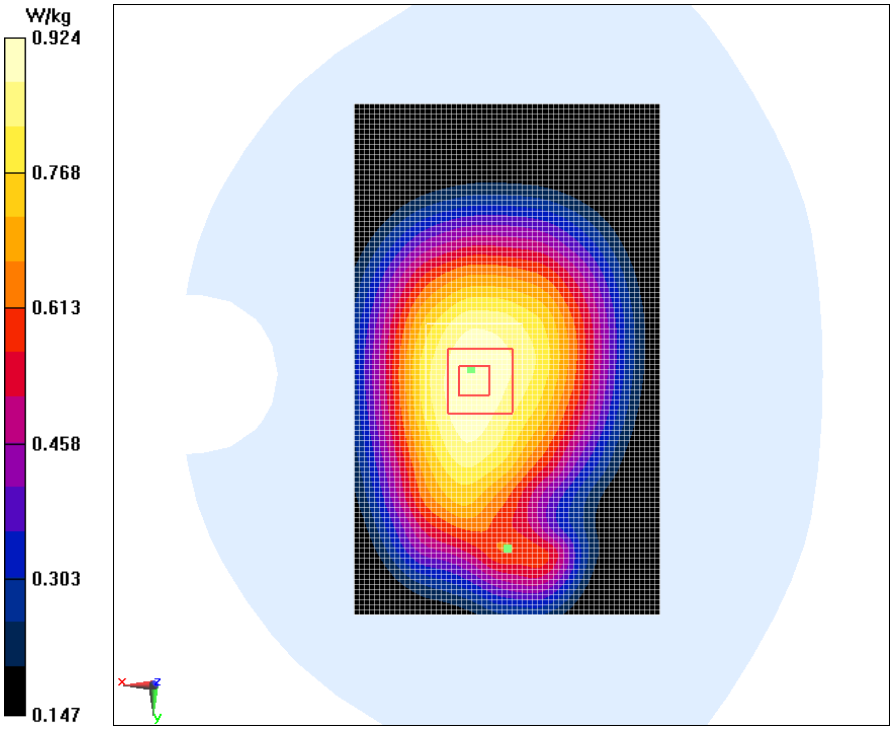


E-GPRS 850MHz 4TS Ground Mode Middle

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS (0); Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

E-GPRS 850MHz 4TS Ground Mode Middle/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.924 W/kg

E-GPRS 850MHz 4TS Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.284 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.883 W/kg; SAR(10 g) = 0.683 W/kg
Maximum value of SAR (measured) = 0.924 W/kg

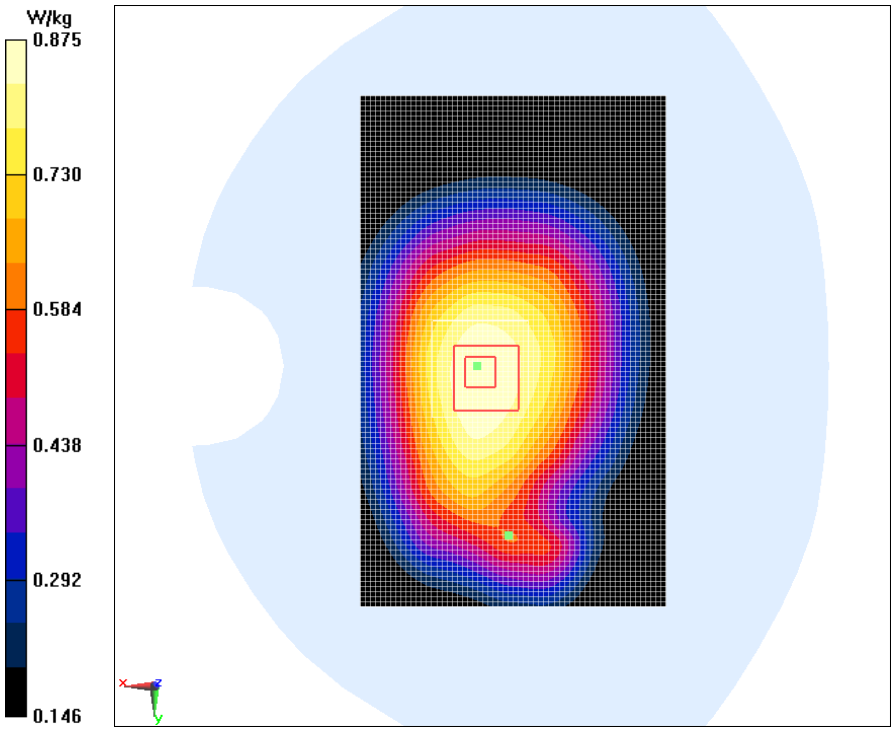


E-GPRS 850MHz 4TS Ground Mode Low 2

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.993 S/m; ε_r = 55.149; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS (0); Frequency: 824.2 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

E-GPRS 850MHz 4TS Ground Mode Low 2/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.882 W/kg

E-GPRS 850MHz 4TS Ground Mode Low 2/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.797 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.836 W/kg; SAR(10 g) = 0.650 W/kg
Maximum value of SAR (measured) = 0.875 W/kg

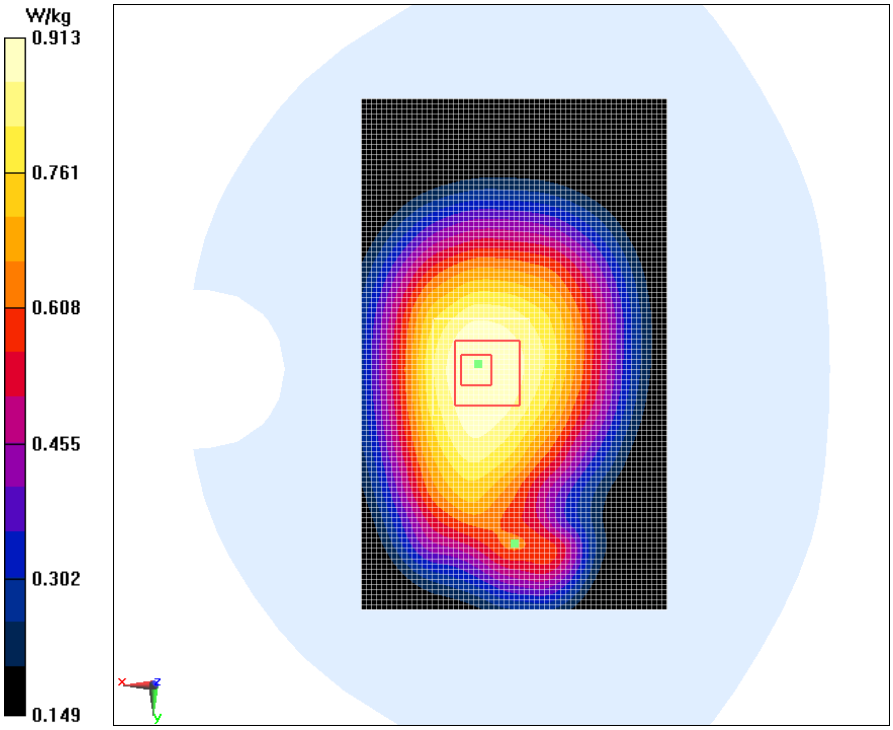


E-GPRS 850MHz 4TS Ground Mode Middle 2

Date/Time: 2014/2/11
Electronics: DAE4 Sn1244
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 S/m; ε_r = 55.152; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 850MHz GPRS 4TS (0); Frequency: 836.6 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(6.14, 6.14, 6.14); Calibrated: 8/5/2013

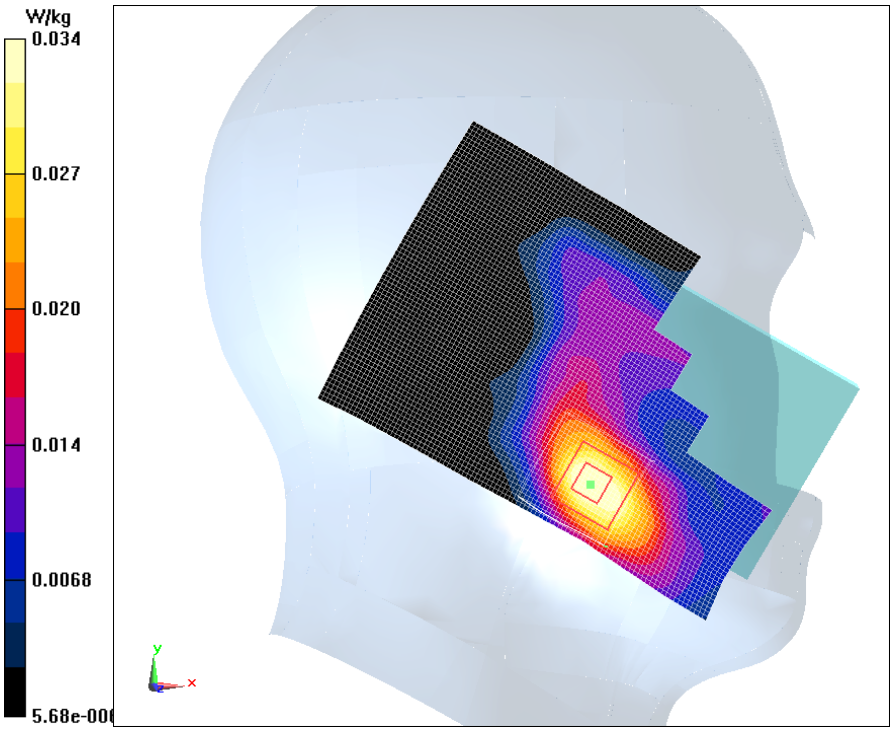
E-GPRS 850MHz 4TS Ground Mode Middle 2/Area Scan (61x101x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.937 W/kg

E-GPRS 850MHz 4TS Ground Mode Middle 2/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.503 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.875 W/kg; SAR(10 g) = 0.679 W/kg
Maximum value of SAR (measured) = 0.913 W/kg



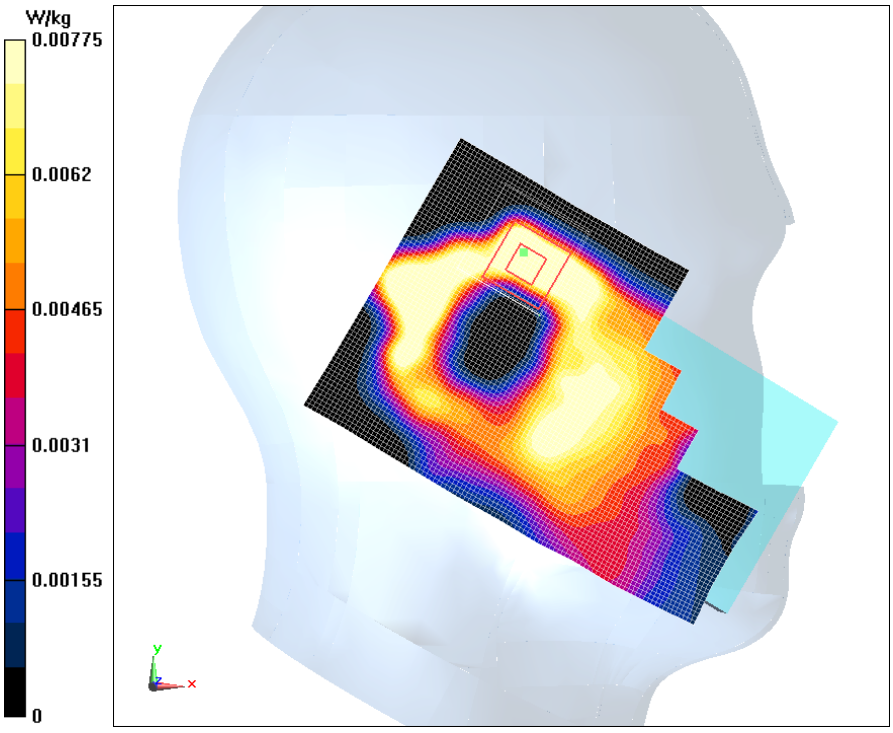
GSM 1900MHz Left Cheek Middle

Date/Time: 2014/2/13
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.24, 5.24, 5.24); Calibrated: 7/28/2013
GSM 1900MHz Left Cheek Middle/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0363 W/kg
GSM 1900MHz Left Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.603 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.0480 W/kg
SAR(1 g) = 0.031 W/kg; SAR(10 g) = 0.018 W/kg
Maximum value of SAR (measured) = 0.0340 W/kg



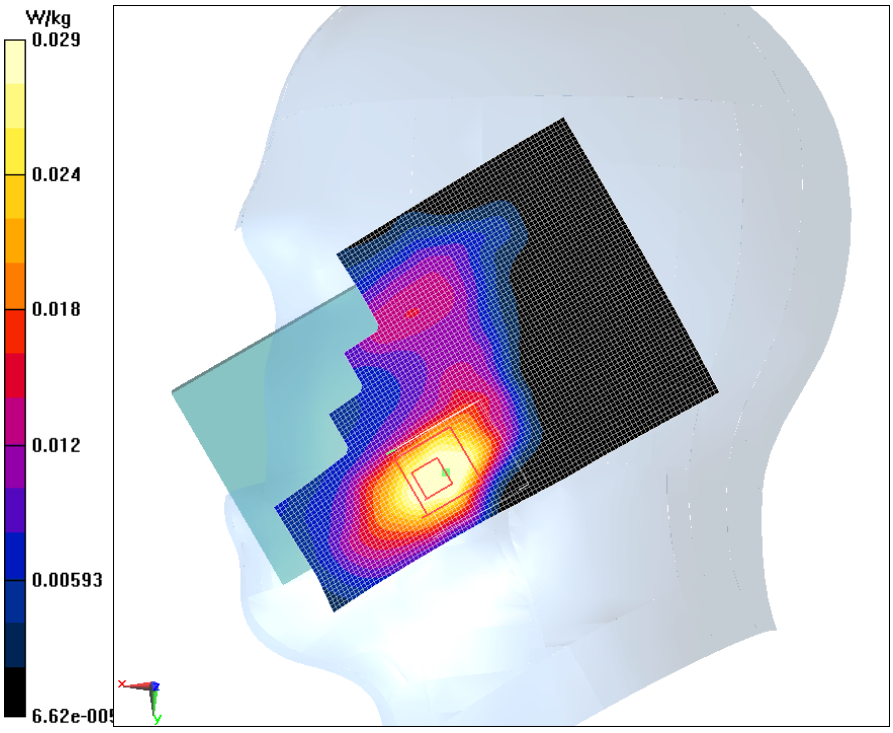
GSM 1900MHz Left Tilt Middle

Date/Time: 2014/2/13
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.24, 5.24, 5.24); Calibrated: 7/28/2013
GSM 1900MHz Left Tilt Middle/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0173 W/kg
GSM 1900MHz Left Tilt Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.429 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.0120 W/kg
SAR(1 g) = 0.00722 W/kg; SAR(10 g) = 0.00382 W/kg
Maximum value of SAR (measured) = 0.00775 W/kg



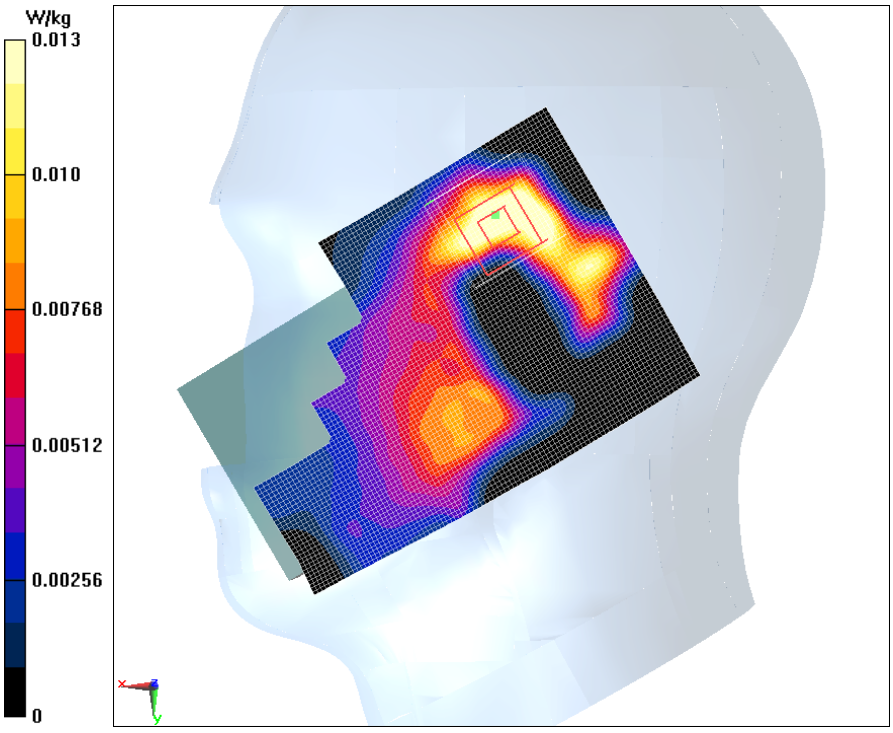
GSM 1900MHz Right Cheek Middle

Date/Time: 2014/2/13
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.24, 5.24, 5.24); Calibrated: 7/28/2013
GSM 1900MHz Right Cheek Middle/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0346 W/kg
GSM 1900MHz Right Cheek Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.723 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.0430 W/kg
SAR(1 g) = 0.027 W/kg; SAR(10 g) = 0.016 W/kg
Maximum of SAR (measured) = 0.0294 W/kg



GSM 1900MHz Right Tilt Middle

Date/Time: 2014/2/13
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.379 S/m; ε_r = 39.867; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.24, 5.24, 5.24); Calibrated: 7/28/2013
GSM 1900MHz Right Tilt Middle/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0167 W/kg
GSM 1900MHz Right Tilt Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.473 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.0190 W/kg
SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.00588 W/kg
Maximum value of SAR (measured) = 0.0128 W/kg

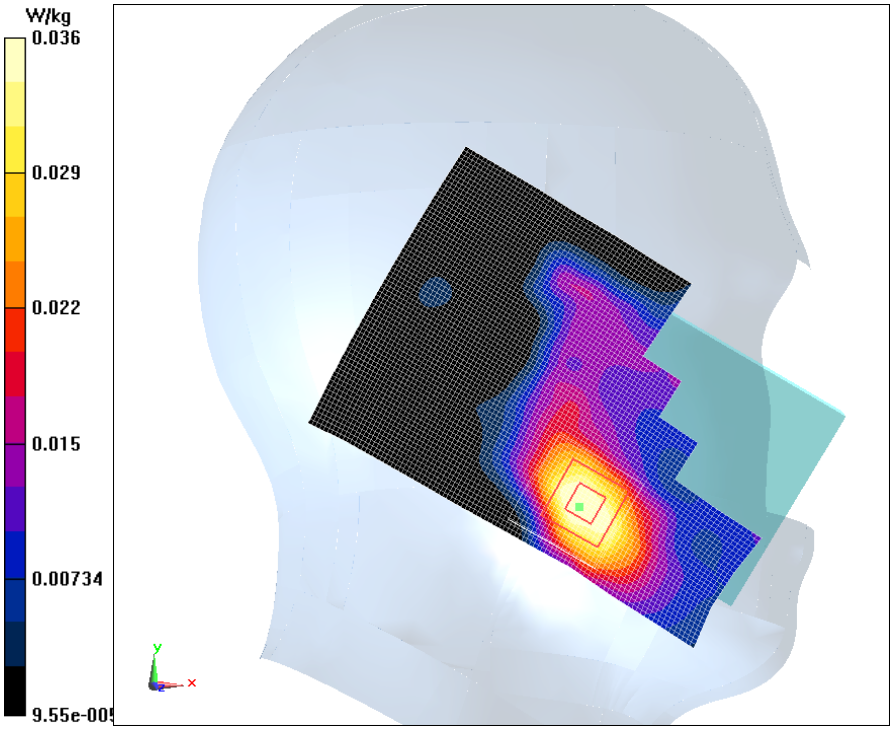


GSM 1900MHz Left Cheek Low

Date/Time: 2014/2/13
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.372 S/m; ε_r = 40.172; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.24, 5.24, 5.24); Calibrated: 7/28/2013

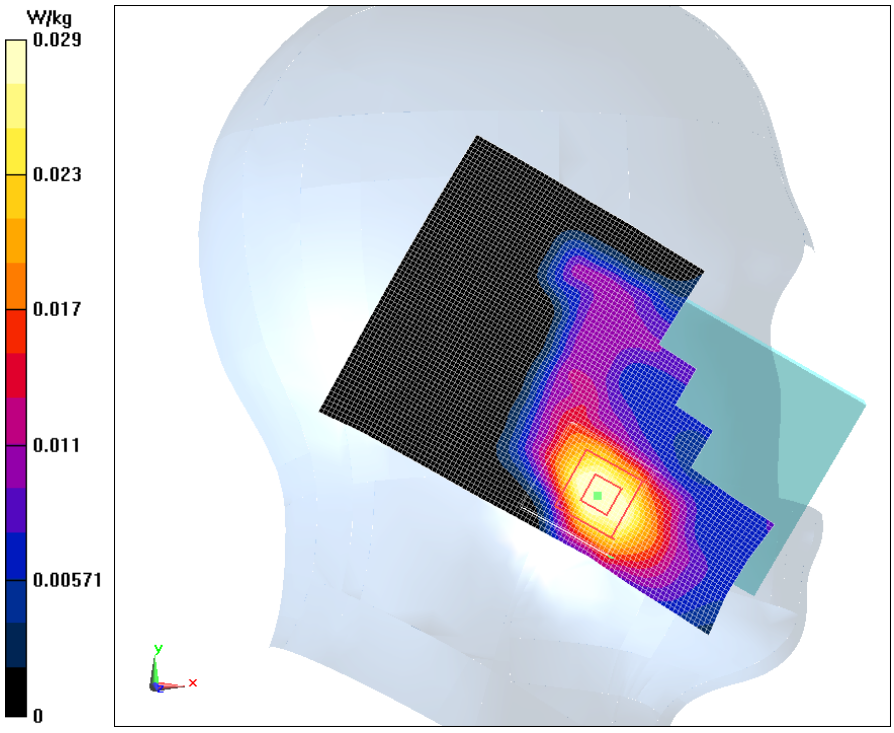
GSM 1900MHz Left Cheek Low/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0393 W/kg

GSM 1900MHz Left Cheek Low/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.417 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.0530 W/kg
SAR(1 g) = 0.033 W/kg; SAR(10 g) = 0.020 W/kg
Maximum value of SAR (measured) = 0.0363 W/kg



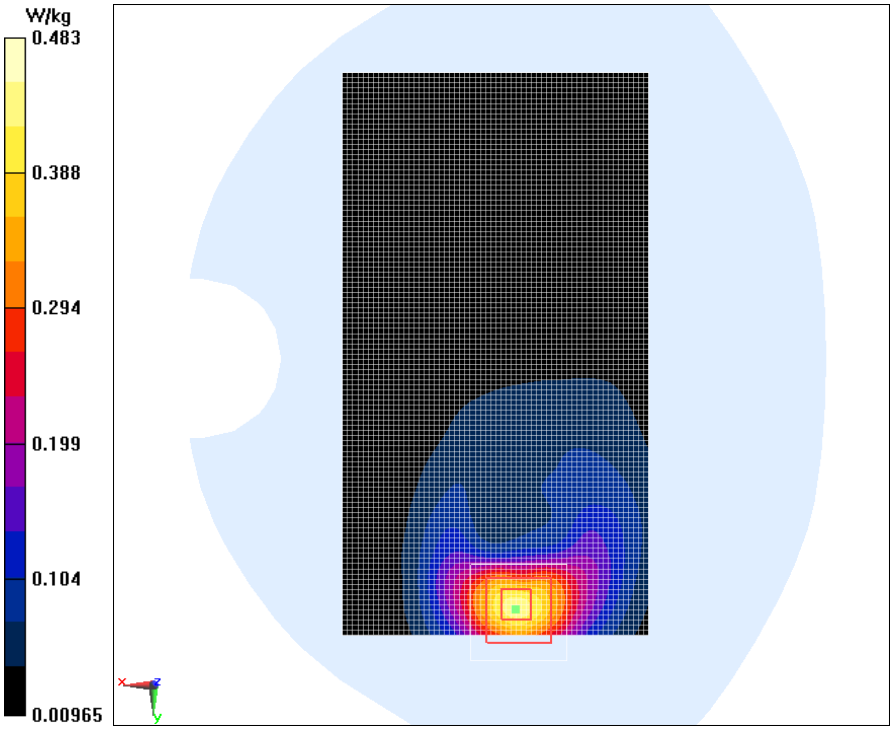
GSM 1900MHz Left Cheek High

Date/Time: 2014/2/13
Electronics: DAE4 Sn1244
Medium: Head 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.393 S/m; ε_r = 39.622; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 - SN3252ConvF(5.24, 5.24, 5.24); Calibrated: 7/28/2013
GSM 1900MHz Left Cheek High/Area Scan (121x71x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.0314 W/kg
GSM 1900MHz Left Cheek High/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.0430 W/kg
SAR(1 g) = 0.026 W/kg; SAR(10 g) = 0.015 W/kg
Maximum value of SAR (measured) = 0.0285 W/kg



GPRS 1900MHz 4TS Phantom Mode Middle

Date/Time: 2014/2/15
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(5.03, 5.03, 5.03); Calibrated: 7/26/2013
GPRS 1900MHz 4TS Phantom Mode Middle/Area Scan (61x111x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.444 W/kg
GPRS 1900MHz 4TS Phantom Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.709 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.739 W/kg
SAR(1 g) = 0.446 W/kg; SAR(10 g) = 0.242 W/kg
Maximum value of SAR (measured) = 0.483 W/kg



GPRS 1900MHz 4TS Ground Mode Middle

Date/Time: 2014/2/15
Electronics: DAE4 Sn1244
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 S/m; ε_r = 53.319; ρ = 1000 kg/m^3
Ambient Temperature:22.5 ℃ Liquid Temperature:22.5 ℃
Communication System: GSM 1900MHz GPRS 4TS; Frequency: 1880 MHz; Duty Cycle: 1:2
Probe: ES3DV3 - SN3252ConvF(5.03, 5.03, 5.03); Calibrated: 7/26/2013
GPRS 1900MHz 4TS Ground Mode Middle/Area Scan (61x111x1):
Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (Measurement) = 0.951 W/kg
GPRS 1900MHz 4TS Ground Mode Middle/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.864 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.536 W/kg
Maximum value of SAR (measured) = 1.12 W/kg