SAR TEST REPORT
FULL REPORT
No. I12GW7125-FCC-SAR

For

Huawei Technologies Co., Ltd.

HUAWEI Ascend Y 101;HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth

HUAWEI U8186-5/U8186-5

With

Software Version: B8186-7V100R001C00B816T

Hardware Version: HD1U8186M.VerB

FCC ID:QISU8186-5

Issued Date:2012-06-18

Deutscher Akkreditierungs Rat
DAR
DAT-PL-162/04-01

ilac-MRA

CNAS
TESTING
No. L0570

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 China Telecommunication Technology Labs. Beijing.

Test Laboratory:

China Telecommunication Technology Labs.

No. 11, Yue Tan Nan Jie, Xi Cheng District, Beijing, P. R. China 100191.

Tel:+86(0)10-68094053, Fax:+86(0)10-68011404 Email: emc@chinattl.com

©Copyright. All rights reserved by CTTL Beijing.

Revision Version

Report Number	Revision	Date	Memo
I12GW7125-FCC-SAR	00	2012/06/18	Initial creation of test report

TABLE OF CONTENT

1 TEST LABORATORY 6

1.1 TESTING LOCATION 6

1.2 TESTING ENVIRONMENT 6

1.3 PROJECT DATA 6

1.4 SIGNATURE 6

2 STATEMENT OF COMPLIANCE 7

3 CLIENT INFORMATION 8

3.1 APPLICANT INFORMATION 8

3.2 MANUFACTURER INFORMATION 8

4 EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) 9

4.1 ABOUT EUT 9

4.2 INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST 10

4.3 INTERNAL IDENTIFICATION OF AE USED DURING THE TEST 10

5 TEST METHODOLOGY 11

5.1 APPLICABLE LIMIT REGULATIONS 11

5.2 APPLICABLE MEASUREMENT STANDARDS 11

6 SPECIFIC ABSORPTION RATE (SAR) 12

6.1 INTRODUCTION 12

6.2 SAR DEFINITION 12

7 SAR MEASUREMENT SETUP 13

7.1 MEASUREMENT SET-UP 13

7.2 DASY5 E-FIELD PROBE SYSTEM 14

7.3 E-FIELD PROBE CALIBRATION 14

7.4 OTHER TEST EQUIPMENT 15

7.4.1 DATA ACQUISITION ELECTRONICS(DAE) 15

7.4.2 ROBOT 16

7.4.3 MEASUREMENT SERVER 17

7.4.4 DEVICE HOLDER FOR PHANTOM 17

7.4.5 PHANTOM 18

8. POSITION OF THE WIRELESS DEVICE IN RELATION TO THE PHANTOM 19

8.1 GENERAL CONSIDERATIONS 19

8.2 BODY-WORN DEVICE 20

8.3 DESKTOP DEVICE 20

8.4 DUT SETUP PHOTOS 22

9 TISSUE SIMULATING LIQUIDS 28

9.1 EQUIVALENT TISSUES 28

9.2 DIELECTRIC PERFORMANCE 28

10 SYSTEM VALIDATION 33

10.1 SYSTEM VALIDATION 33

10.2 SYSTEM SETUP 33

11 MEASUREMENT PROCEDURES 36

11.1 TESTS TO BE PERFORMED 36

11.2 MEASUREMENT PROCEDURE 37

11.3 WCDMA MEASUREMENT PROCEDURES FOR SAR 39

11.4 BLUETOOTH & WI-FI MEASUREMENT PROCEDURES FOR SAR 39

11.5 POWER DRIFT 40

12 CONDUCTED OUTPUT POWER 41

12.1 GSM MEASUREMENT RESULT 41

12.2 WCDMA MEASUREMENT RESULT 42

12.3 WI-FI AND BT MEASUREMENT RESULT 42

13 SIMULTANEOUS TX SAR CONSIDERATIONS 44

13.1 INTRODUCTION 44

13.2 TRANSMIT ANTENNA SEPARATION DISTANCES 44

13.3 SIMULTANEOUS TRANSMISSION FOR (EUT MODEL NAME) 46

14 SAR TEST RESULT 48

15 MEASUREMENT UNCERTAINTY 53

16 MAIN TEST INSTRUMENTS 55

ANNEX A GRAPH RESULTS 56

ANNEX B SYSTEM VALIDATION RESULTS 198

ANNEX C CALIBRATION CERTIFICATE 205

1 Test Laboratory

1.1 Testing Location

Company Name:	China Telecommunication Technology Labs.
Address:	No. 11, Yue Tan Nan Jie, Xi Cheng District,BEIJING
Postal Code:	100045
Telephone:	+86 10 68094053
Fax:	+86 10 68011404

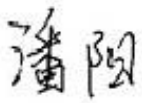
1.2 Testing Environment

Temperature:	Min. = 19 °C, Max. = 22 °C
Relative humidity:	Min. = 30%, Max. = 70%
Ground system resistance:	< 0.5 Ω
Ambient noise & Reflection:	< 0.012 W/kg

1.3 Project Data

Project Leader:	Li Guoqing
Test Engineer:	Li Guoqing
Testing Start Date:	June 6, 2012
Testing End Date:	June 15, 2012

1.4 Signature



Pan Yang

(Prepared this test report)

Zou Dongyi

(Reviewed this test report)

Deputy Director of the laboratory

(Approved this test report)

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for HUAWEI U8186-5/U8186-5 are as follows (with expanded uncertainty 22.4%)

Table 1: Max. SAR Measured(1g)

Band	Position	SAR 1g (W/Kg)
GSM 850	Head	0.997
	Body	0.724
PCS 1900	Head	0.659
	Body	0.347
WCDMA Band II	Head	0.815
	Body	0.425
WCDMA Band V	Head	1.01
	Body	0.722
Wifi 2450	Head	0.094
	Body	0.196

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 C95.1-1999.

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 SAR value is obtained at the case of **(Table 1)**, and the values are:**1.01mW/g (1g).**

3 Client Information

3.1 Applicant Information

Company Name:	Huawei Technologies Co., Ltd.
Address /Post:	Bantian,Longgang District,Shenzhen,51829 Guangdong,P.R.China
City:	Shenzhen
Country:	China
Telephone:	+86-0755-36837455
Fax:	+86-0755-36834770
Contact:	KangYing
Email:	kangying@huawei.com

3.2 Manufacturer Information

Company Name:	Huawei Technologies Co., Ltd.
Address /Post:	Bantian,Longgang District,Shenzhen,51829 Guangdong,P.R.China
City:	Shenzhen
Country:	China
Telephone:	+86-0755-36837455
Fax:	+86-0755-36834770
Contact:	KangYing
Email:	kangying@huawei.com

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

4.1 About EUT

Description:	HUAWEI Ascend Y 101; HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth;
Model name:	HUAWEI U8186-5/U8186-5
Operation Model(s):	GSM850/1900,WCDMA1900/850
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)
GPRS Class Mode:	B
GPRS Multislot Class:	10
EGPRS Multislot Class:	10
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Inner antenna
Accessories/Body-worn configurations:	Headset
Hotspot mode:	Support simultaneous transmission of hotspot and voice (or data)
Form factor:	10.5cm×5.5cm

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: 863758010003571	HD1U8186M.VerB	B8186-7V100R001C00B816T

*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	HB4J1	BAAC224B89209000	HUAWEI
AE2	Headset	/	/	HUAWEI

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

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

ANSI C95.1–1999: 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 D01 SAR Handsets Multi Xmiter and Ant, v01r05: SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas.

KDB248227: SAR measurement procedures for 802.11abg transmitters.

KDB941225 D01: SAR measurement procedures for 3G devices.

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

KDB941225 D06: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

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

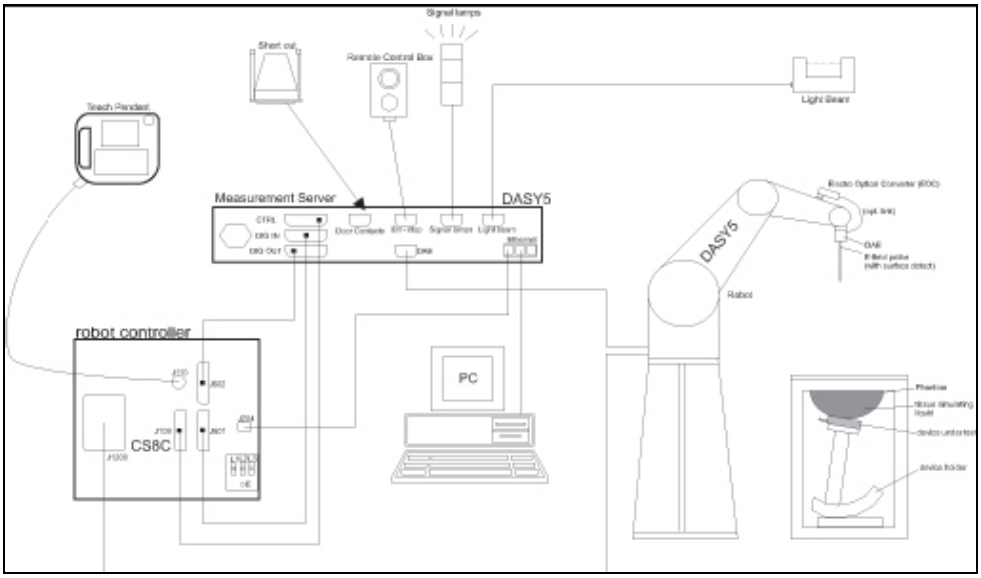
Where: σ is the conductivity of the tissue, ρ is the mass density of tissue and E is the RMS electrical field strength.

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

7 SAR MEASUREMENT SETUP

7.1 Measurement Set-up

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



Picture 2 SAR Lab Test Measurement Set-up

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

7.2 DASY5 E-field Probe System

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

Probe Specifications:

Model: **ES3DV3**
Frequency Range: **10MHz — 2.6GHz(ES3DV3)**
Calibration: **In head and body simulating tissue at Frequencies from 835 up to 5800MHz**
Linearity: **± 0.2 dB(30 MHz to 2.6 GHz) for ES3DV3**

Picture 3 Near-field Probe

Dynamic Range: 10 mW/kg — 100W/kg
Probe Length: **330 mm**
Probe Tip Length: **20 mm**
Body Diameter: **12 mm**
Tip Diameter: **2.5 mm (3.9 mm for ES3DV3)**
Tip-Center: **1 mm (2.0mm for ES3DV3)**
Application: **SAR Dosimetry Testing**
Compliance tests of mobile phones
Dosimetry in strong gradient fields

Picture 4 E-field Probe

7.3 E-field Probe Calibration

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

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

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

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

Where:

Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

7.4 Other Test Equipment

7.4.1 Data Acquisition Electronics(DAE)

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

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

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

Picture5: DAE

7.4.2 Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

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

Picture6: DASY 5

7.4.3 Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Picture 7: Server for DASY 5

7.4.4 Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

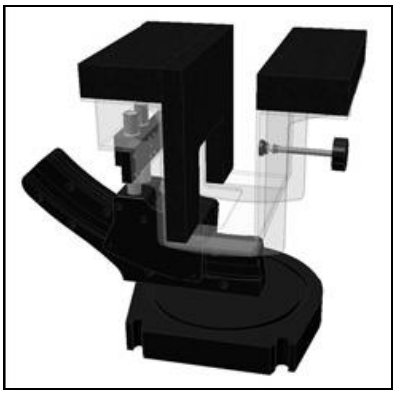
The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε =3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with

the Twin-SAM and ELI phantoms.

Picture 8-1: Device Holder

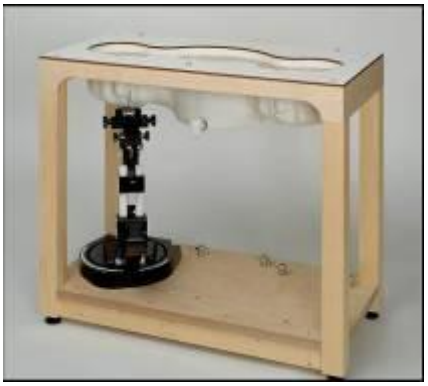


Picture 8-2: Laptop Extension Kit

7.4.5 Phantom

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

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

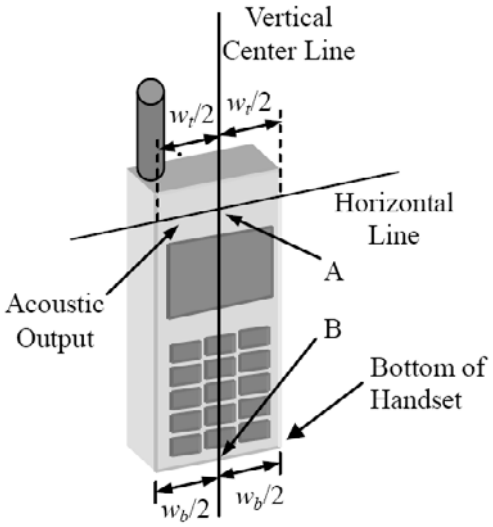


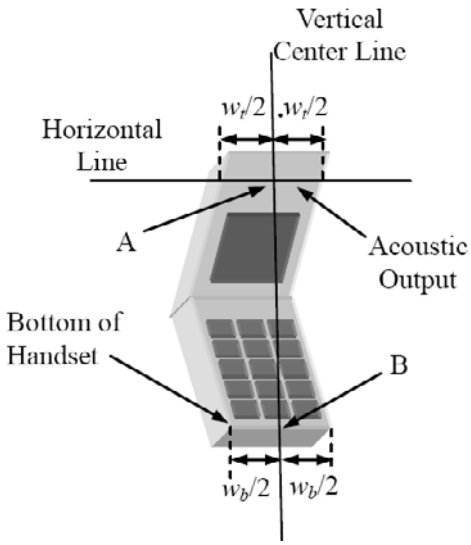
Picture 9: SAM Twin Phantom

8. Position of the wireless device in relation to the phantom

8.1 General considerations

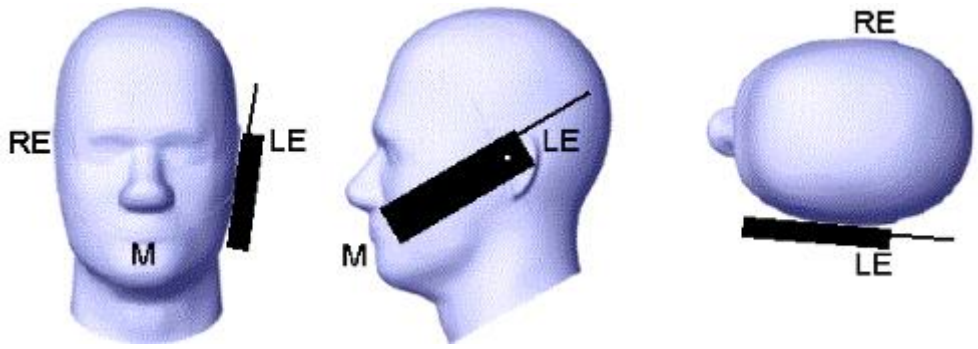
This standard specifies two handset test positions against the head phantom – the "cheek" position and the "tilt" position.



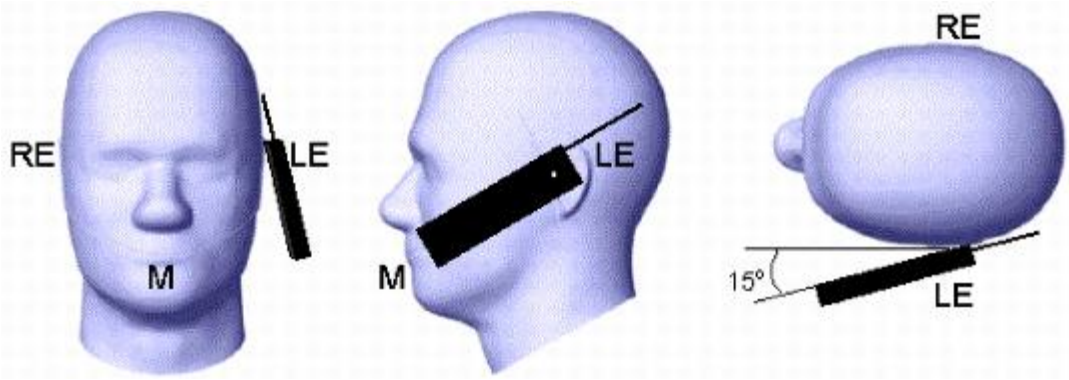


w_t	Width of the handset at the level of the acoustic
w_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width w_b of the bottom of the handset

Picture 10-a Typical "fixed" case handset **Picture 10-b Typical "clam-shell" case handset**



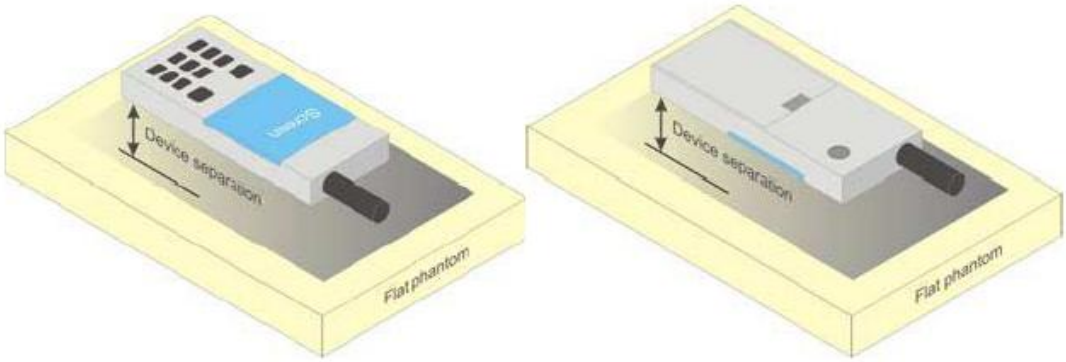
Picture 11 Cheek position of the wireless device on the left side of SAM



Picture 12 Tilt position of the wireless device on the left side of SAM

8.2 Body-worn device

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

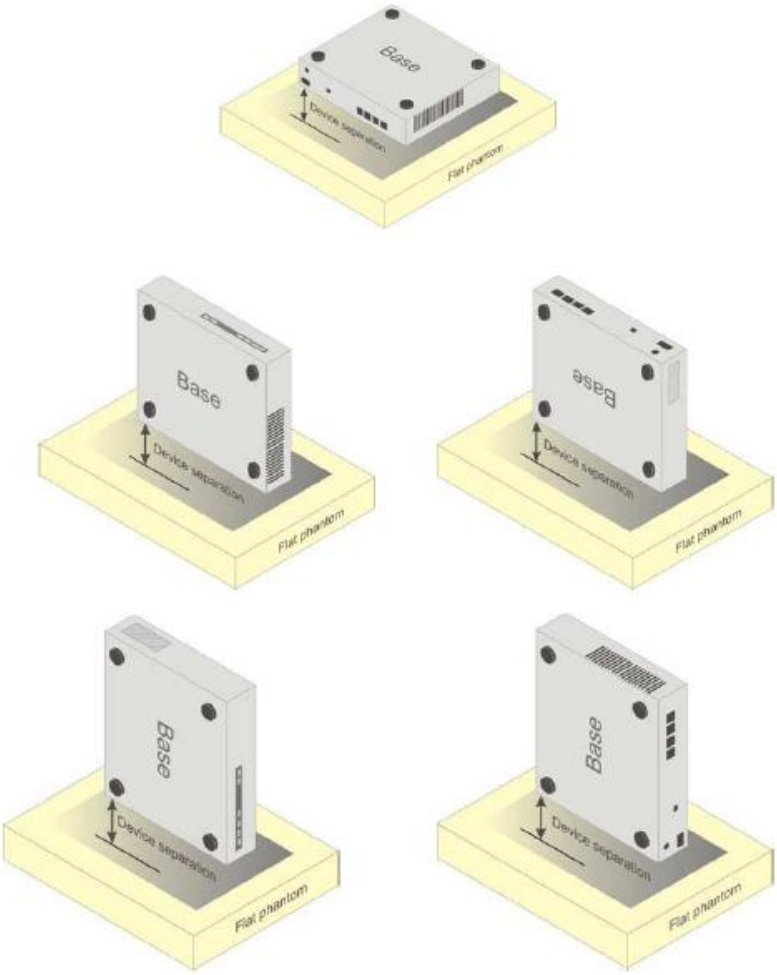


Picture 13 Test positions for body-worn devices

8.3 Desktop device

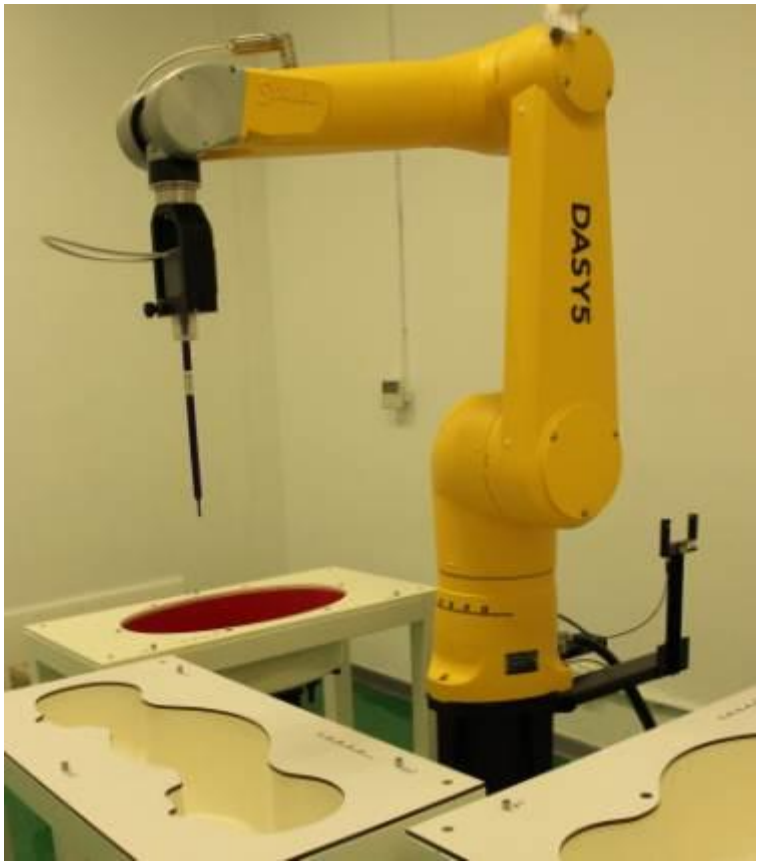
A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture 14 shows positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.

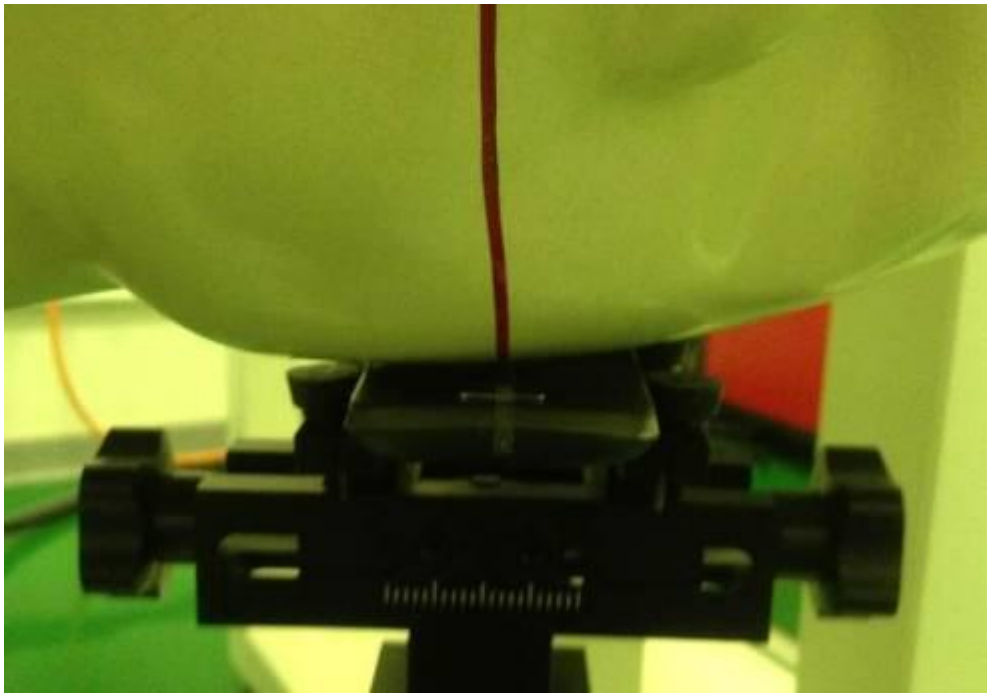


Picture 14 Test positions for desktop devices

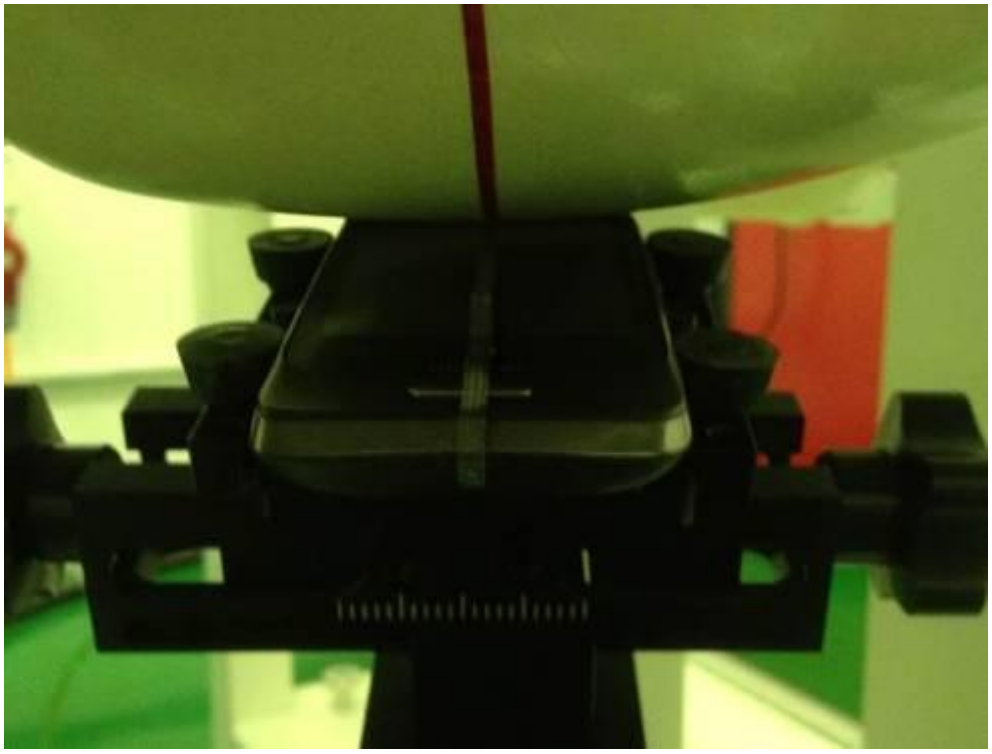
8.4 DUT Setup Photos



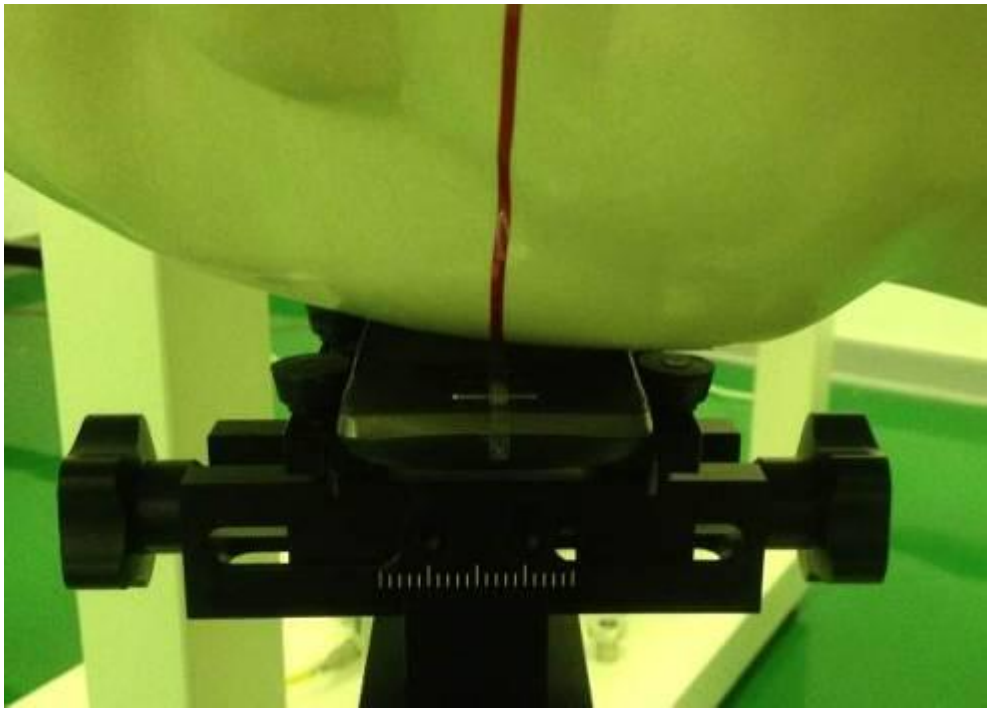
Picture 15-1: Specific Absorption Rate Test Layout



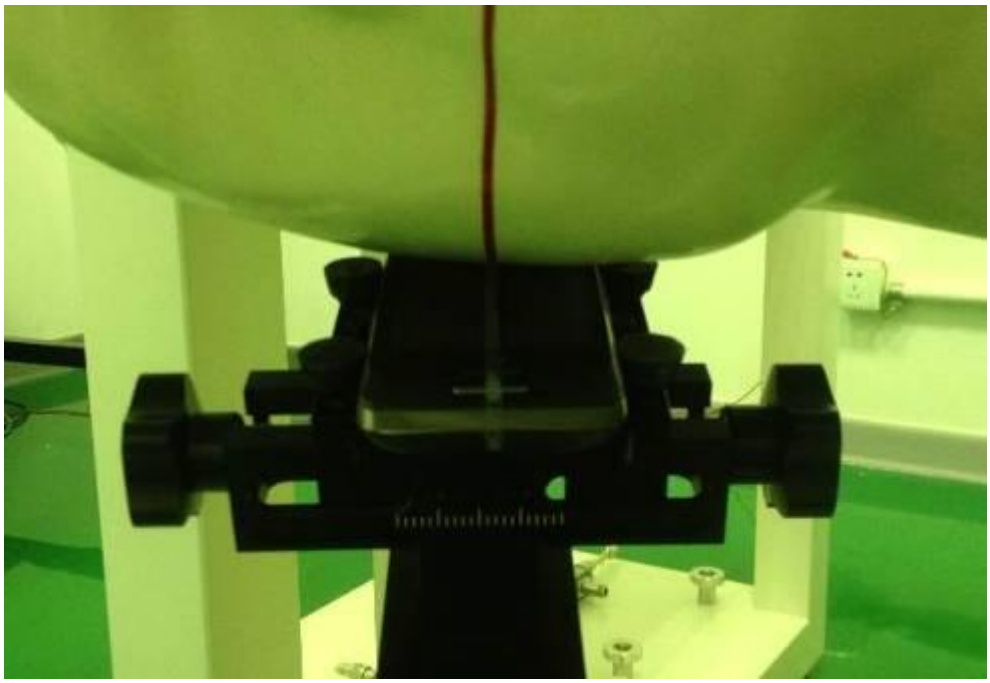
Picture 15-2: Left Head Touch Cheek Position



Picture 15-3: Left Head Tilt 15° Position



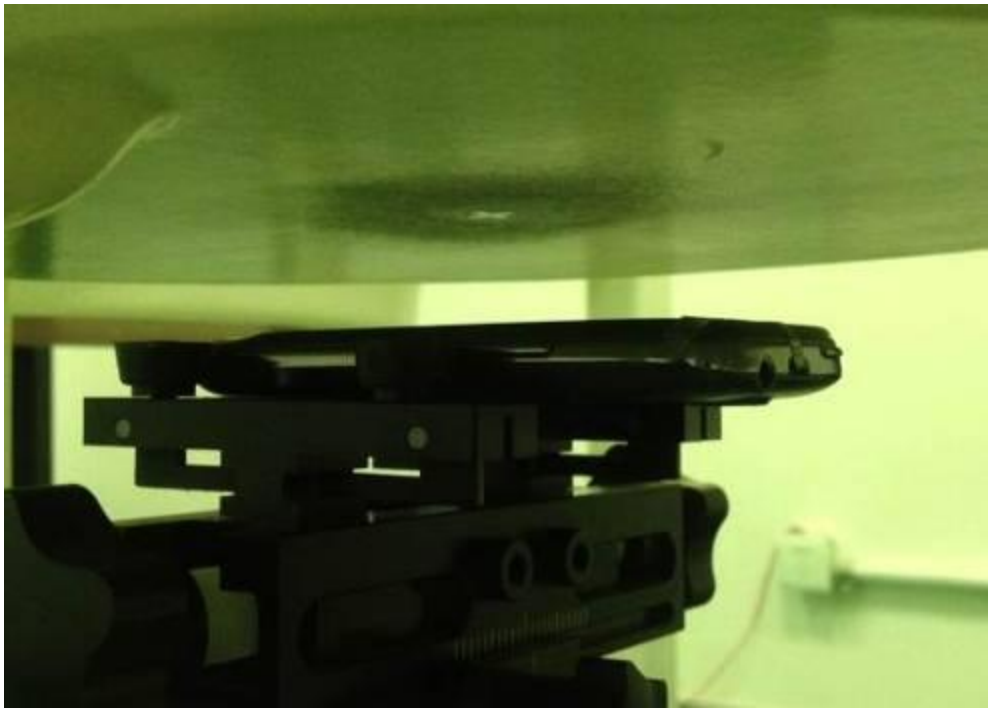
Picture 15-4: Right Head Touch Cheek Position



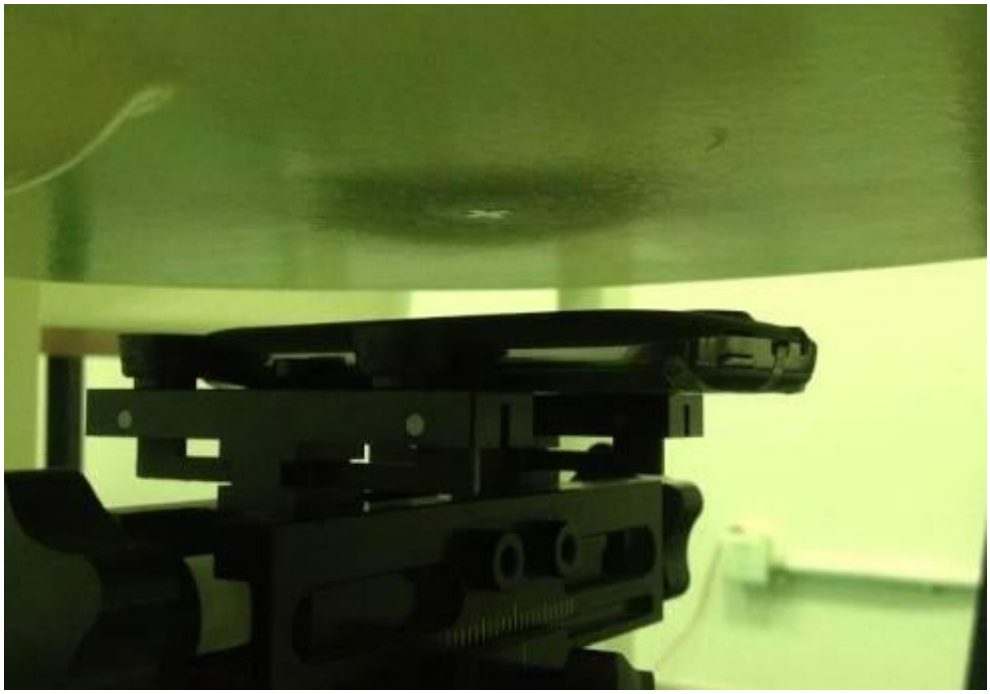
Picture 15-5: Right Head Tilt 15° Position

<u>Test positions for body:</u>

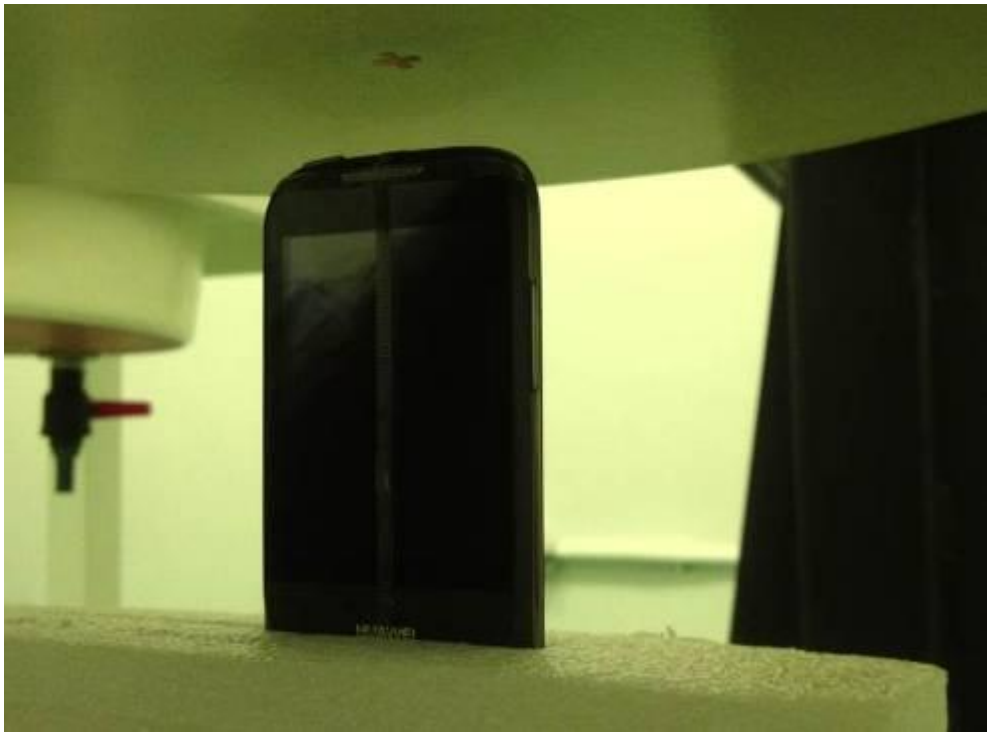
The Body SAR is tested at the following 6 test positions all with the distance =10mm between the EUT and the phantom bottom :



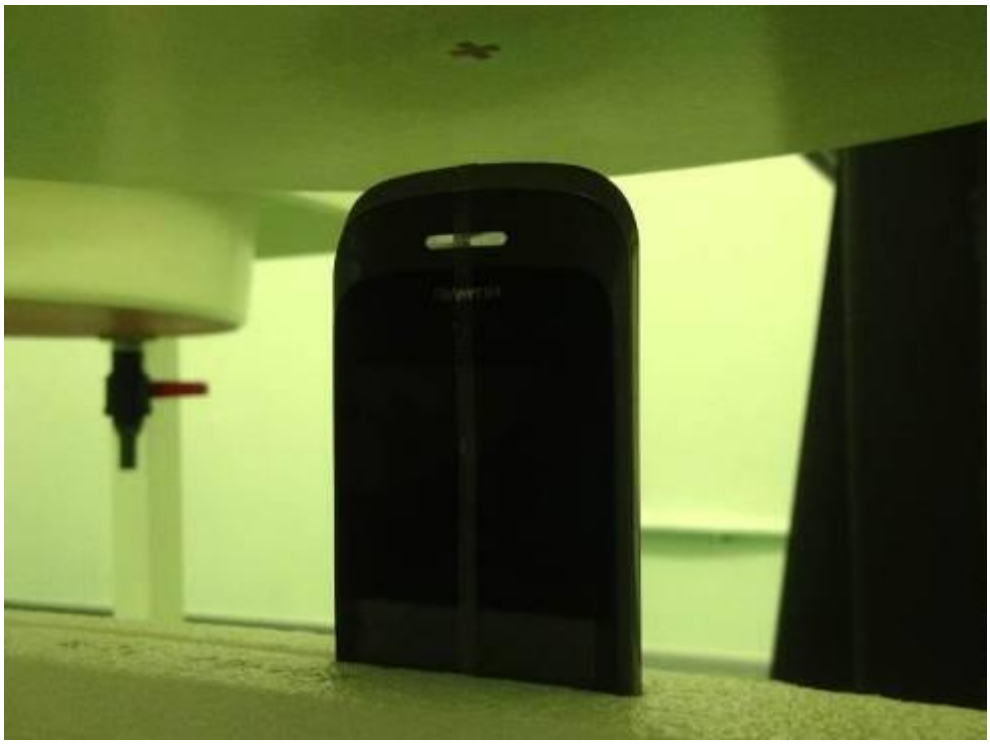
Picture 15-6: Toward Phantom



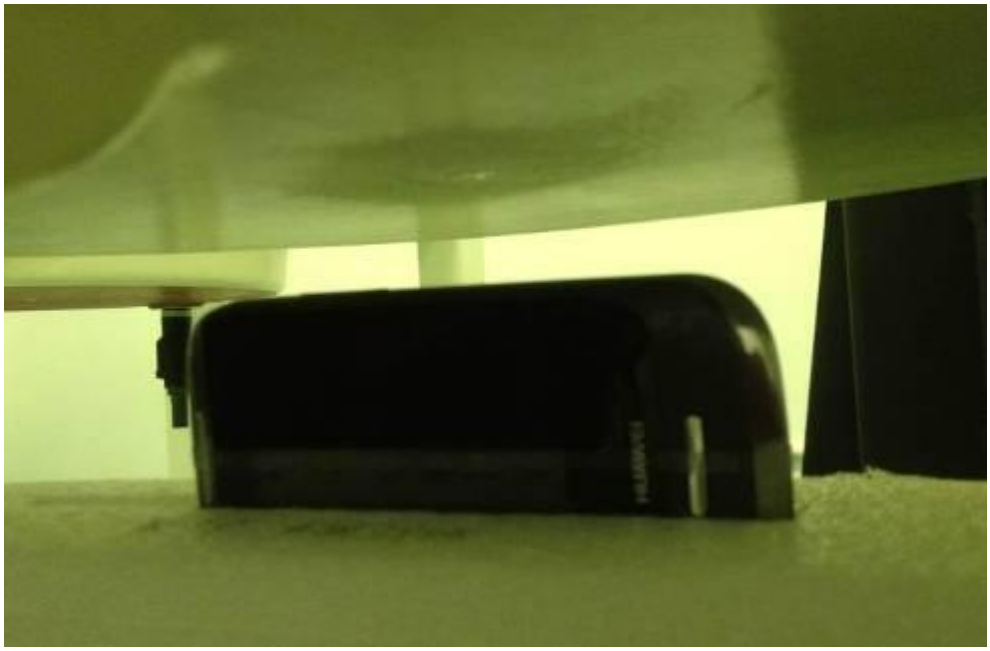
Picture 15-7: Toward Ground



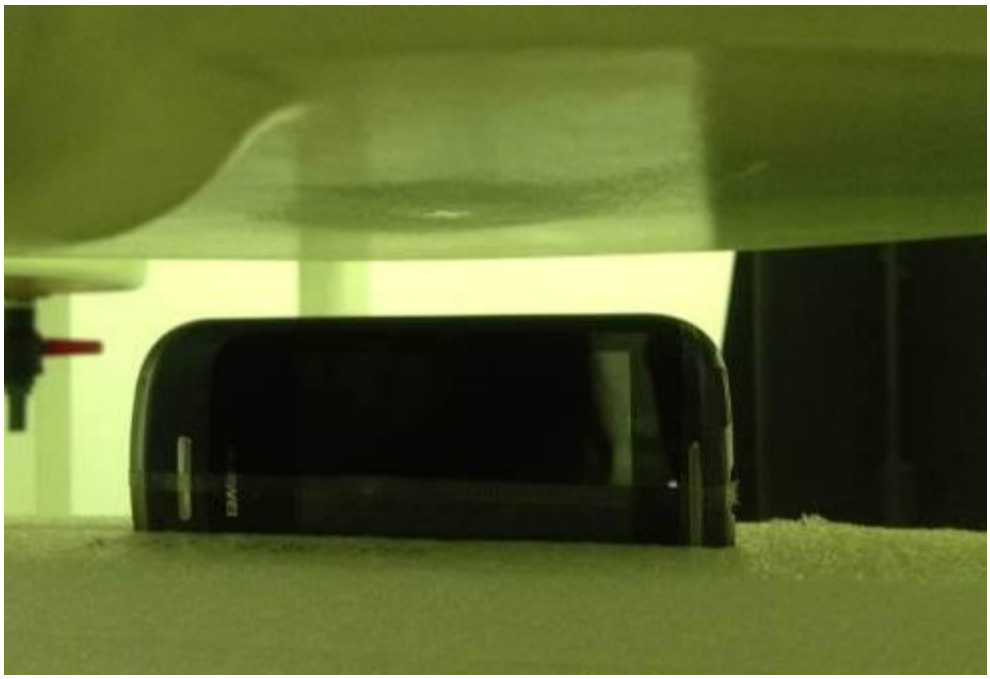
Picture 15-8: Toward Top



Picture 15-9: Toward Bottom



Picture 15-10: Toward Left



Picture 15-11: Toward Right

9 Tissue Simulating Liquids

9.1 Equivalent Tissues

The liquid used for the frequency range of 800-3000 MHz consisted of water, sugar, salt and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 3 and 4 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

Table 3. Composition of the Head Tissue Equivalent Matter

Frequency (MHz)	850 Head	850 Body	1900 Head	1900 Body	2450 Head	2450 Body
Ingredients (% by weight)						
Water	41.45	52.5	55.242	69.91	58.79	72.60
Sugar	56.0	45.0	\	\	\	\
Salt	1.45	1.4	0.306	0.13	0.06	0.18
Preventol	0.1	0.1	\	\	\	\
Cellulose	1.0	1.0	\	\	\	\
Clycol Monobutyl	\	\	44.452	29.96	41.15	27.22
Dielectric Parameters Target Value	f=850MHz ε=41.5 σ=0.90	f=850MHz ε=55.2 σ=0.97	f=1900MHz ε=40.0 σ=1.40	f=1900MHz ε=53.3 σ=1.52	f=2450MHz ε=39.2 σ=1.80	f=2450MHz ε=52.7 σ=1.95

Table 4. Targets for tissue simulating liquid

Frequency (MHz)	Liquid Type	Conductivity (σ)	± 5% Range	Permittivity (ε)	± 5% Range
850	Head	0.90	0.86～0.95	41.5	39.4～43.6
850	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

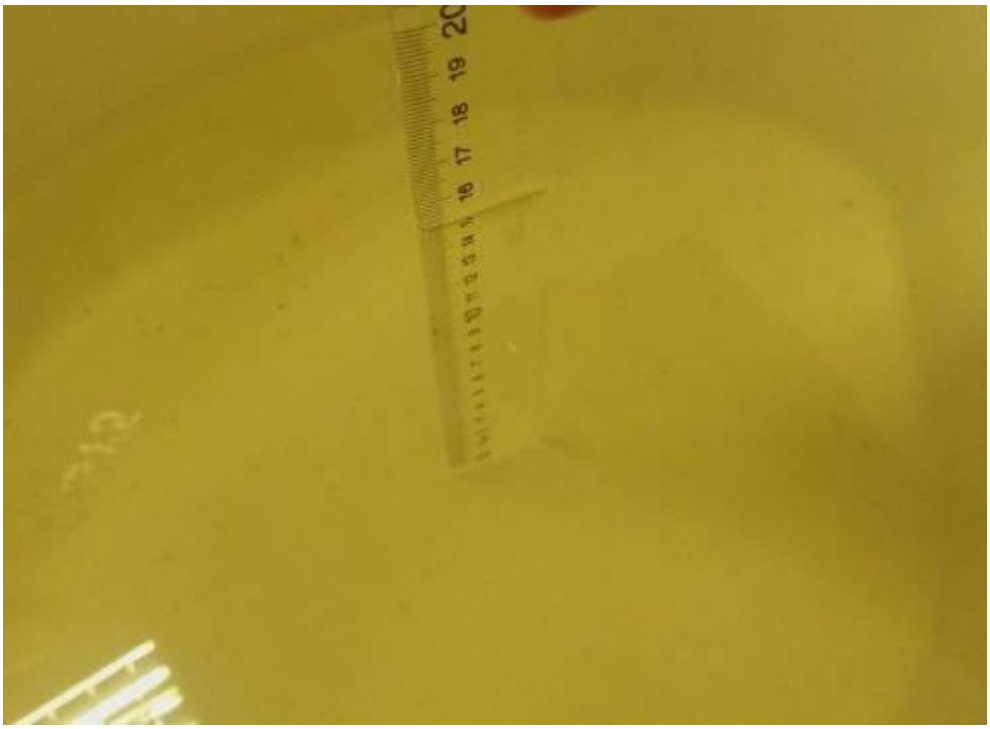
9.2 Dielectric Performance

Table 5: Dielectric Performance of Head Tissue Simulating Liquid

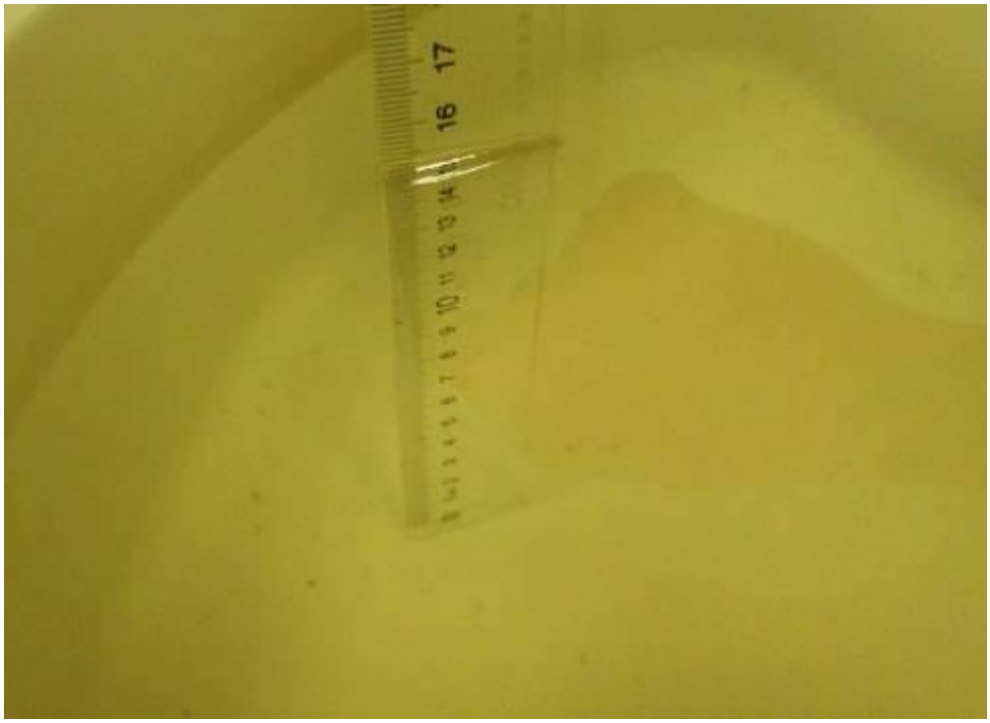
Measurement is made at temperature 22.5 °C and relative humidity 45%.
Liquid temperature during the test: 22.5°C
Measurement Date :850 MHz Head June. 6th,2012 850 MHz Body June.7th,2012
1900 MHz Head June. 8th,2012 1900 MHz Body June.11th,2012
2450 MHz Head June. 8th,2012 2450 MHz Body June. 9th,2012

/	Frequency	Permittivity ε	Conductivity σ (S/m)
Measurement value	850 MHz Head	40.67	0.909

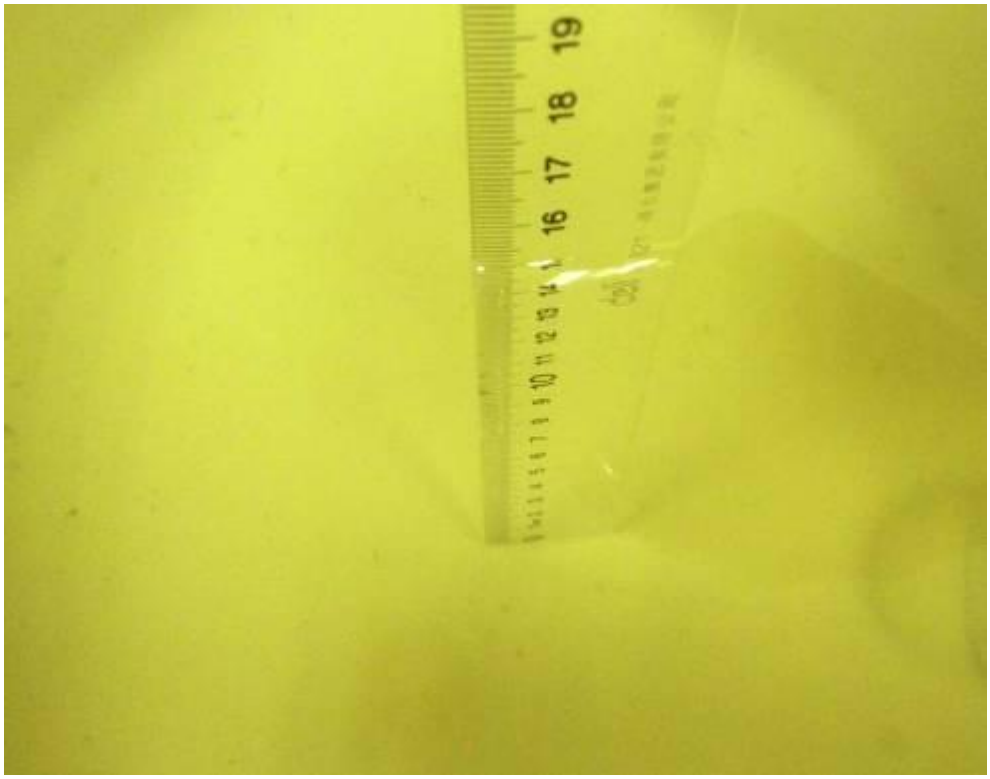
Measurement value	850 MHz Body	55.15	0.9989
	1900 MHz Head	40.53	1.459
	1900 MHz Body	53.24	1.524
	2450 MHz Head	38.87	1.824
	2450 MHz Body	53.95	1.918



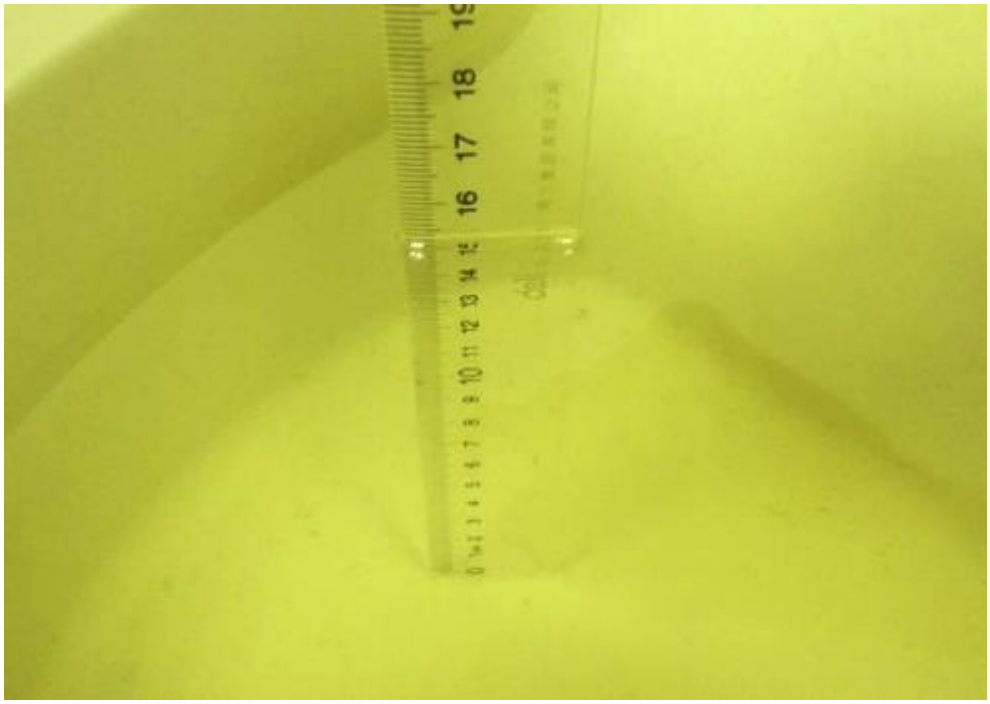
Picture 16-1: Liquid depth in the Flat Phantom (850 MHz Head)



Picture 16-2: Liquid depth in the Flat Phantom (850MHz Body)

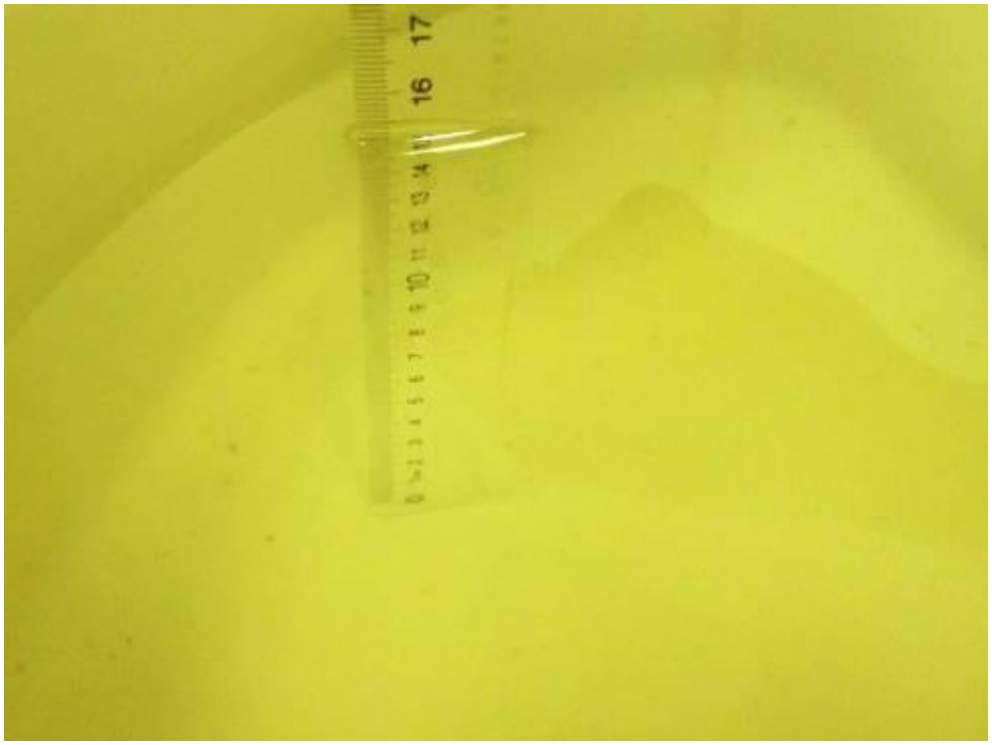


Picture 16-3: Liquid depth in the Flat Phantom (1900 MHz Head)



Picture 16-3: Liquid depth in the Flat Phantom (1900 MHz Body)

Picture 16-3: Liquid depth in the Flat Phantom (2450 MHz Head)



Picture 16-3: Liquid depth in the Flat Phantom (2450 MHz Body)

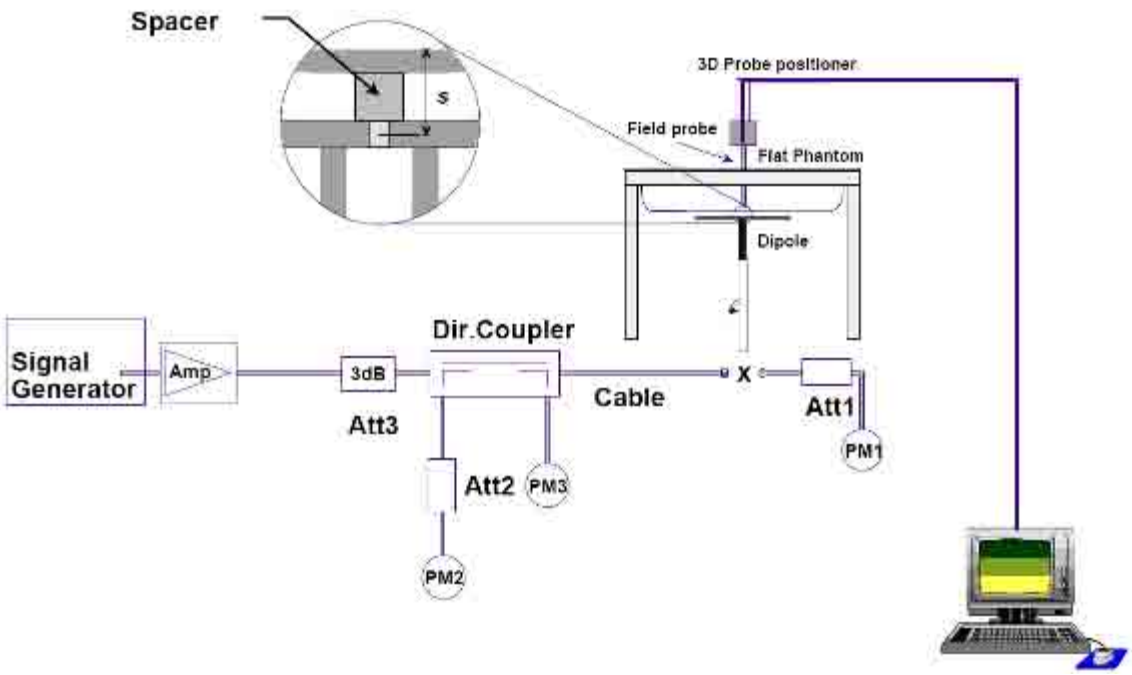
10 System Validation

10.1 System Validation

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performace check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

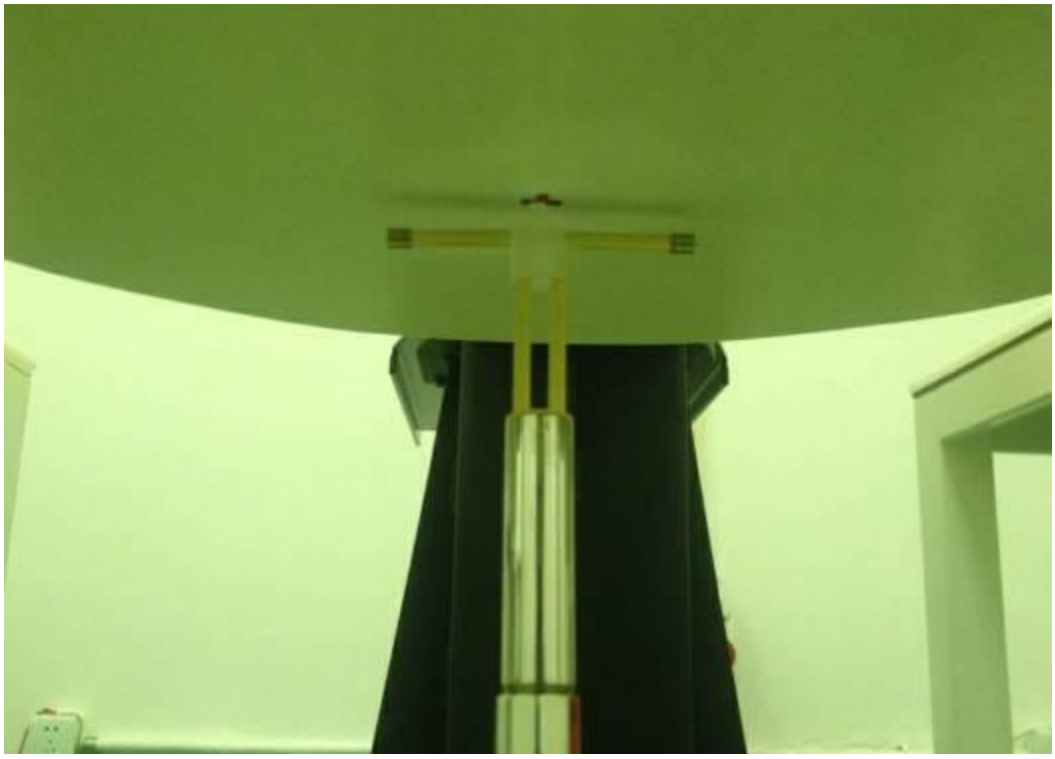
10.2 System Setup

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 17 System Setup for System Evaluation

The output power on dipole port must be calibrated to 24 dBm (250mW) before dipole is connected.



Picture 18 Photo of Dipole Setup

Table 6: System Validation of Head

Measurement is made at temperature 22.5 °C and relative humidity 45%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz June. 6th,2012 1900 MHz June. 8th,2012
2450 MHz Head June. 8th,2012 1900 MHz June. 11th,2012

	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
Verification results	850MHz	1.52	2.32	1.55	2.35	1.97%	1.29%
	1900 MHz	5.22	10.0	4.76	9.28	-8.82%	-7.21%
	1900 MHz	5.22	10.0	4.87	9.52	-6.70%	-4.81%
	2450 MHz	6.18	13.1	5.93	12.76	-4.05%	-2.60%

Table 6-2: System Validation of Body

Measurement is made at temperature 22.5 °C and relative humidity 45%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz June.7th,2012 1900 MHz June.11th,2012
2450 MHz Head June. 9th,2012

	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
Verification results	850MHz	1.60	2.43	1.75	2.63	9.38%	8.23%
	1900 MHz	5.29	10.1	5.47	10.4	3.40%	2.97%
	2450 MHz	5.91	12.7	6.16	13.1	4.23%	3.15%

11 Measurement Procedures

11.1 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 19

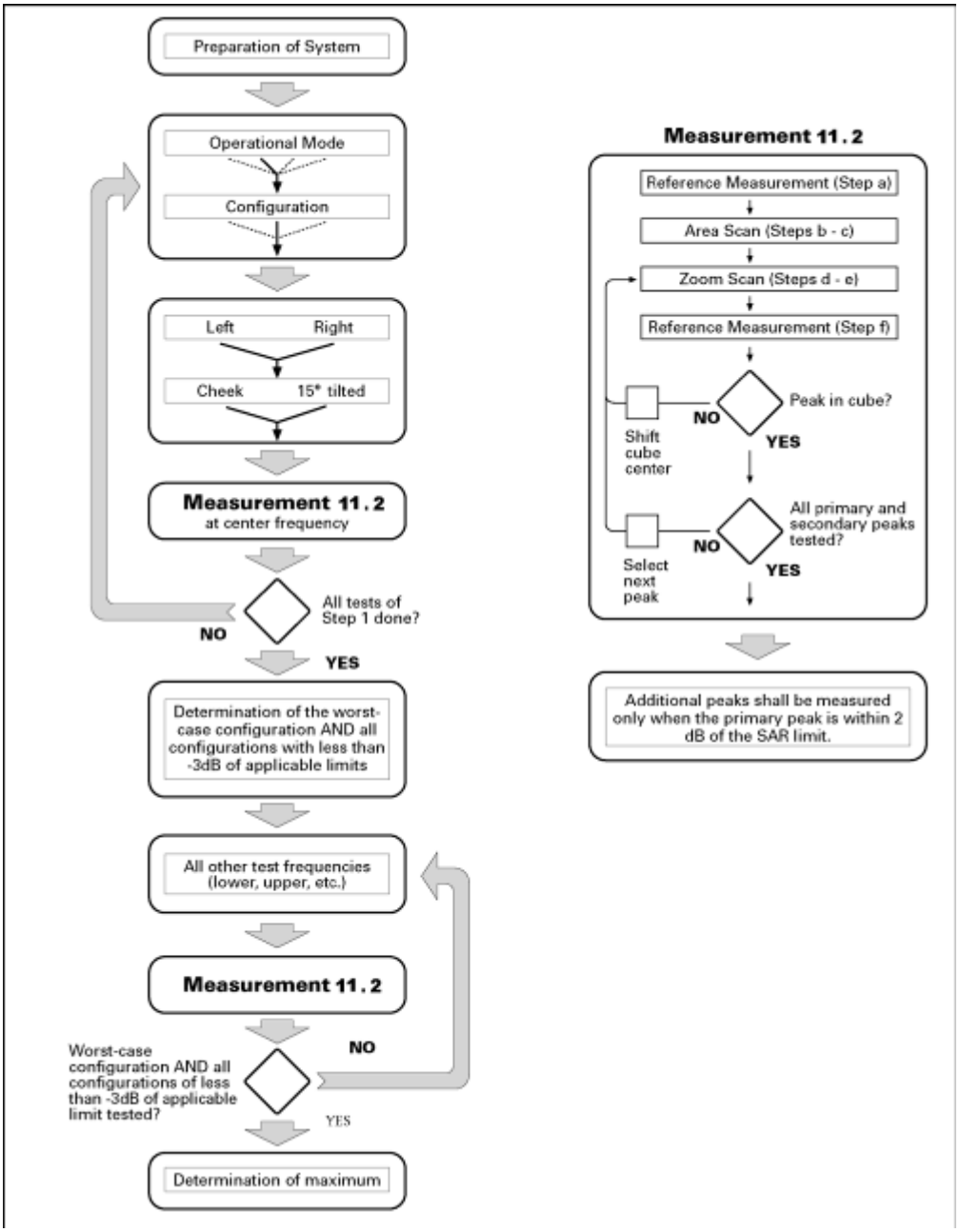
Step 1: The tests described in 11.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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 19 Block diagram of the tests to be performed

11.2 Measurement procedure

The following procedure shall be performed for each of the test conditions (see Picture 19) 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 In(2)/2 mm for frequencies of 3 GHz and greater, whereδ is the plane wave skin depth and In(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 In(2)/2 mm for frequencies of 3 GHz and greater, where δ is the plane wave skin depth and In(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.

f) In the process of SAR test, Test handest must be for wireless connection with BTS.The test handsets should be set to the maximum output power level that is defined by the system and/or the operating requirements of the subscriber unit. And test handsets must be distance BTS in 50 centimeters of above.

11.3 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

11.4 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.

11.5 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 to Table 22 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

12 Conducted Output Power

12.1 GSM Measurement result

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) 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 7: The conducted power measurement results for GSM850/GSM1900

GSM 850MHZ	**Conducted Power (dBm)**		
	Channel 251(848.8MHz)	**Channel190(836.6.4MHz)**	**Channel 128(824.2MHz)**
	33.9	33.6	33.8
GSM 1900MHZ	**Conducted Power (dBm)**		
	Channel 810(1909.8MHz)	**Channel 661(1880MHz)**	**Channel 512(1850.2MHz)**
	30.3	30.0	29.9

Table 8: The conducted power measurement results for GPRS and EGPRS

GSM 850	Measured Power (dBm)			calculation	Averaged Power (dBm)		
GPRS	**251**	**190**	**128**		**251**	**190**	**128**
1 Txslot	33.8	33.6	33.6	-9.03dB	24.77	24.57	24.57
2 Txslots	31.2	30.8	30.8	-6.02dB	25.18	24.78	24.78
GSM 850	Measured Power (dBm)				Averaged Power (dBm)		
EGPRS	**251**	**190**	**128**		**251**	**190**	**128**
1 Txslot	33.7	33.6	33.6	-9.03dB	24.67	24.57	24.57
2 Txslots	31.1	30.7	30.7	-6.02dB	25.08	24.68	24.68
PCS1900	Measured Power (dBm)				Averaged Power (dBm)		
GPRS	**810**	**661**	**512**		**810**	**661**	**512**
1 Txslot	30.2	29.9	29.8	-9.03dB	21.17	20.87	20.77
2 Txslots	27.5	27.4	27.2	-6.02dB	21.48	21.38	21.18
PCS1900	Measured Power (dBm)				Averaged Power (dBm)		
EGPRS	**810**	**661**	**512**		**810**	**661**	**512**
1 Txslot	30.2	29.9	29.9	-9.03dB	21.17	20.87	20.87
2 Txslots	27.3	27.3	27.2	-6.02dB	21.28	21.28	21.18

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

According to the conducted power as above, the body measurements are performed with 2 Txslots for 850MHz and 2 Txslots for 1900MHz.

12.2 WCDMA Measurement result

Table 9: The conducted Power for WCDMA

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	22.68	22.61	22.72
	sub2	22.67	22.60	22.71
	sub3	22.66	22.60	22.72
	sub4	22.68	22.62	22.69
Item	band	FDDII result(dBm)		
	ARFCN	9538 (1907.6MHz)	9400 (1880MHz)	9262 (1852.4MHz)
WCDMA	RMC	22.78	22.49	22.29
HSDPA	sub1	22.49	22.21	22.01
	sub2	22.48	22.22	22.01
	sub3	22.49	22.19	22.02
	sub4	22.50	22.19	22.02

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 WCDMA1900 and WCDMA850 are not above 75% of the SAR limit.

12.3 Wi-Fi and BT Measurement result

Table 10: The output power of BT antenna

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz
Conducted Output Power(dBm)	6.47	6.54	6.57

Table 11-1:The peak conducted power for WiFi

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	18.36	18.34	18.29	18.36
6	18.53	18.51	18.52	18.43
11	18.86	18.82	18.80	18.86

802.11g（dBm）

Channel\ data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	20.09	20.01	19.95	19.82	19.80	19.74	19.90	19.81
6	20.20	20.16	20.01	19.87	19.92	19.85	19.66	19.78
11	20.42	20.40	20.38	20.26	20.24	20.35	20.39	20.19

20M 802.11n（dBm）

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	11.93	11.86	11.82	11.73	11.92	11.52	11.23	11.20
6	12.30	12.06	12.10	11.94	11.91	11.84	11.81	11.70
11	12.67	12.60	12.54	12.42	12.30	12.24	12.56	12.06

Table 11-2:The average conducted power for WiFi

802.11b（dBm）

Channel\data rate	1Mbps	2Mbps	5.5Mbps	11Mbps
1	14.36	14.25	14.27	14.35
6	14.35	14.34	14.33	14.25
11	14.25	14.20	14.24	14.23

802.11g（dBm）

Channel\ data rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	12.39	12.25	12.32	12.20	12.46	12.33	12.16	12.14
6	12.86	12.57	12.34	12.56	12.25	12.33	12.40	12.13
11	12.94	12.82	12.56	12.57	12.64	12.35	12.40	12.33

20M 802.11n（dBm）

Channel\data rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	5.25	5.16	5.24	5.30	5.22	5.10	5.13	5.20
6	5.35	5.23	5.26	5.31	5.24	5.20	5.13	5.06
11	5.33	5.16	5.20	5.03	4.92	4.35	4.96	4.83

According to the above WiFi average power, WiFi 802.11b SAR should be tested in the lowest rate, high channel. SAR is not required for 802.11n 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, 1Mbps, channel 11”.The head and body SAR tests of 802.11g are according to the maximum SAR values in the test mode of 802.11b situation.

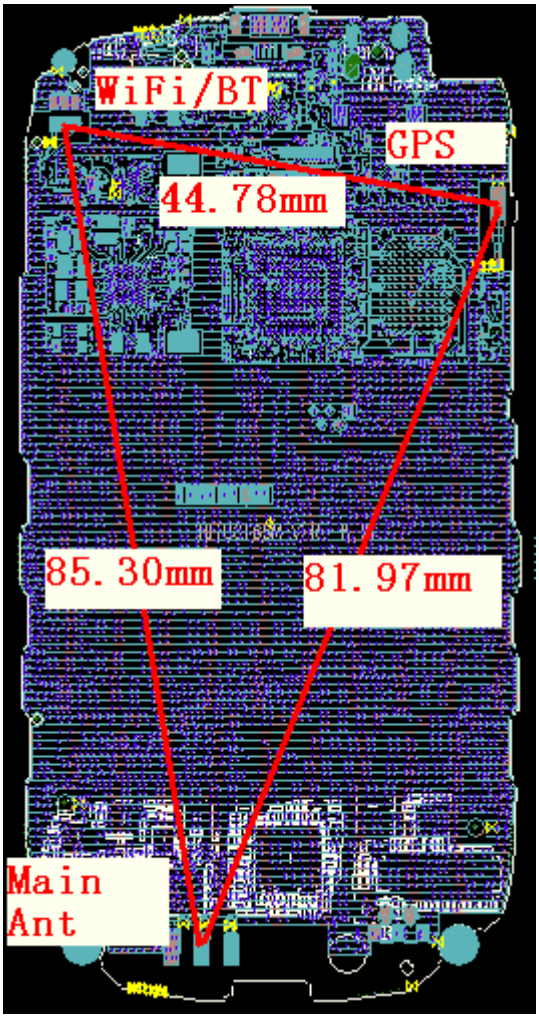
13 Simultaneous TX SAR Considerations

13.1 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,

13.2 Transmit Antenna Separation Distances

The distance between BT/WiFi antenna and main antenna is ＞5cm. The location of the antennas inside mobile phone is shown below:



Picture 20: Antenna Locations

	TOP	BOTTOM	LEFT	RIGHT
WIFI ANT distance	10mm	72mm	46mm	0.5mm
MAIN ANT distance	95mm	0.8mm	1.0mm	1.2mm

13.3 Simultaneous Transmission for (EUT Model Name)

Table 12-1: Summary of Transmitters

Band/Mode	F(GHz)	60/f power threshold (mW)	RF output power (mW)
Bluetooth	2.441	24.6	4.54
2.4GHz WLAN 802.11 b/g	2.45	24.5	110.15

According to the output power measurement results and the distance between BT/WiFi antanna and GSM/WCDMA antenna we can draw the conclusion that:

stand-alone SAR evaluation is not required for BT,because the output power of BT unlicensed transmitter is 4.44 dBm<2.P_{Ref}(13.8dBm) and its antenna is 10.9cm>5.0 cm from main antenna.

Stand-alone SAR evaluation isrequired for WiFi, because the output power of WiFi unlicensed transmitter is 15.87dBm>2. P_{Ref}(13.8dBm).

Table 12-2 SAR Evaluation Requirements for Multiple Transmitter Handsets

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	Routine evaluation required	SAR not required: Unlicensed only ○ when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed ○ when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas ○ when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – ○ output ≤ 60/f: SAR not required ○ output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when ○ output ≤ $2 \cdot P_{Ref}$ and antenna is ≥ 5.0 cm from other antennas ○ output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas ○ output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required ○ test SAR on highest output channel for each wireless mode and exposure condition ○ if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	

Table 12-3: The sum of SAR values for GSM/WCDMA and WiFi

	Position	GSM/WCDMA	WiFi	Sum
Maximum SAR value for Head(mW/g)	Left hand, Touch cheek	0.822	0.060	0.882
	Right hand, Touch cheek	1.01	0.094	1.104
Maximum SAR value for Body(mW/g)	Toward Ground	0.724	0.196	0.920

According to the above table, the sum of SAR values for 3G and WiFi antenna ＜1.6W/kg. So simultaneous transmission SAR is not required.

14 SAR Test Result

Table 13: SAR Values (GSM 850 MHz Band)

Frequency		Mode/Band	Side	Test Position	SAR(1g)	Power Drift(dB)
MHz	Ch.				(W/kg)	
836.6	190	GSM850	Right	Touch	0.997	-0.18
836.6	190	GSM850	Right	Tilt	0.458	-0.036
848.8	251	GSM850	Right	Touch	0.939	-0.10
824.2	128	GSM850	Right	Touch	0.674	-0.035
836.6	190	GSM850	Left	Touch	0.822	-0.03
836.6	190	GSM850	Left	Tilt	0.375	0.18
848.8	251	GSM850	Left	Touch	0.749	-0.18
824.2	128	GSM850	Left	Touch	0.709	-0.02

Table 14: SAR Values (GSM 850 MHz Band-Body)

Frequency		Mode/Band	Service/Headset	Test Position	Spacing (mm)	SAR(1g)	Power Drift(dB)
MHz	Ch.					(W/kg)	
836.6	190	GPRS 2TS	Class10	Toward Ground	10	0.724	-0.12
836.6	190	GPRS 2TS	Class10	Toward Phantom	10	0.591	-0.19
836.6	190	GPRS 2TS	Class10	Toward Left	10	0.264	-0.16
836.6	190	GPRS 2TS	Class10	Toward Right	10	0.288	-0.0022
836.6	190	GPRS 2TS	Class10	Toward Bottom	10	0.052	0.065
848.8	251	GPRS 2TS	Class10	Toward Ground	10	0.650	0.18
824.2	128	GPRS 2TS	Class10	Toward Ground	10	0.570	0.067
836.6	190	EGPRS 2TS	Class10	Toward Ground	10	0.629	-0.12
836.6	190	GSM850	Headset	Toward Ground	10	0.417	-0.14

Table 15: SAR Values (GSM 1900 MHz Band)

Frequency		Mode/Band	Side	Test Position	SAR(1g)	Power Drift(dB)
MHz	Ch.				(W/kg)	
1880	661	PCS1900	Right	Touch	0.659	-0.17
1880	661	PCS1900	Right	Tilt	0.323	-0.022
1880	661	PCS1900	Left	Touch	0.622	-0.011
1880	661	PCS1900	Left	Tilt	0.314	0.082
1909.8	810	PCS1900	Right	Touch	0.650	0.027
1850.2	512	PCS1900	Right	Touch	0.488	-0.079

Table 16: SAR Values (GSM 1900 MHz Band-Body)

Frequency		Mode/Band	Service/Headset	Test Position	Spacing (mm)	SAR(1g)	Power Drift(dB)
MHz	Ch.					(W/kg)	
1880	661	GPRS 2TS	Class10	Toward Ground	10	0.272	0.025
1880	661	GPRS 2TS	Class10	Toward Phantom	10	0.208	0.12
1880	661	GPRS 2TS	Class10	Toward Left	10	0.045	0.12
1880	661	GPRS 2TS	Class10	Toward Right	10	0.059	0.20
1880	661	GPRS 2TS	Class10	Toward Bottom	10	0.268	-0.12
1909.8	810	GPRS 2TS	Class10	Toward Ground	10	0.347	-0.068
1850.2	512	GPRS 2TS	Class10	Toward Ground	10	0.214	-0.0071
1909.8	810	EGPRS 2TS	Class10	Toward Ground	10	0.314	0.19
1909.8	810	PCS1900	Headset	Toward Ground	10	0.267	0.10

Table 17: SAR Values (WCDMA 1900 MHz Band)

Frequency		Mode/Band	Side	Test Position	SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.					
1880	9400	Band II	Right	Touch	0.771	0.17
1880	9400	Band II	Right	Tilt	0.414	0.047
1880	9400	Band II	Left	Touch	0.709	0.16
1880	9400	Band II	Left	Tilt	0.379	0.067
1907.6	9538	Band II	Right	Touch	0.746	0.062
1852.4	9262	Band II	Right	Touch	0.815	-0.13

Table 18: SAR Values (WCDMA 1900 MHz Band-Body)

Frequency		Mode/Band	Service/Headset	Test Position	Spacing (mm)	SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.						
1880	9400	Band II	12.2kbps RMC	Toward Ground	10	0.380	0.15
1880	9400	Band II	12.2kbps RMC	Toward Phantom	10	0.253	0.11
1880	9400	Band II	12.2kbps RMC	Toward Left	10	0.078	-0.19
1880	9400	Band II	12.2kbps RMC	Toward Right	10	0.109	0.045
1880	9400	Band II	12.2kbps RMC	Toward Bottom	10	0.279	-0.12
1907.6	9538	Band II	12.2kbps RMC	Toward Ground	10	0.425	-0.041
1852.4	9262	Band II	12.2kbps RMC	Toward Ground	10	0.409	0.13
1907.6	9538	Band II	Headset	Toward Ground	10	0.345	0.16

Table 19: SAR Values (WCDMA 850 MHz Band)

Frequency		Mode/Band	Side	Test Position	SAR(1g)	Power Drift(dB)
MHz	Ch.				(W/kg)	
836.6	4175	Band V	Right	Touch	0.937	-0.046
836.6	4175	Band V	Right	Tilt	0.446	-0.073
836.6	4175	Band V	Left	Touch	0.766	0.087
836.6	4175	Band V	Left	Tilt	0.409	0.032
846.6	4232	Band V	Right	Touch	1.01	-0.021
826.4	4133	Band V	Right	Touch	0.764	0.16

Table 20: SAR Values (WCDMA 850 MHz Band-Body)

Frequency		Mode/Band	Service/Headset	Test Position	Spacing (mm)	SAR(1g)	Power Drift(dB)
MHz	Ch.					(W/kg)	
836.6	4175	Band V	12.2kbps RMC	Toward Ground	10	0.722	-0.039
836.6	4175	Band V	12.2kbps RMC	Toward Phantom	10	0.637	0.19
836.6	4175	Band V	12.2kbps RMC	Toward Left	10	0.238	-0.021
836.6	4175	Band V	12.2kbps RMC	Toward Right	10	0.305	0.094
836.6	4175	Band V	12.2kbps RMC	Toward Bottom	10	0.084	0.15
846.6	4232	Band V	12.2kbps RMC	Toward Ground	10	0.720	0.043
826.4	4133	Band V	12.2kbps RMC	Toward Ground	10	0.650	-0.026
836.6	4175	Band V	Headset	Toward Ground	10	0.423	0.083

Table 21: SAR Values (FCC Wifi 2450 MHz Band)

Frequency		Mode/Band	Side	Test Position	SAR(1g)	Power Drift(dB)
MHz	Ch.				(W/kg)	
2462	11	802.11b	Right	Touch	0.094	0.11
2462	11	802.11b	Right	Tilt	0.054	0.15
2462	11	802.11b	Left	Touch	0.056	-0.15
2462	11	802.11b	Left	Tilt	0.060	0.19
2462	11	802.11g	Right	Touch	0.068	-0.18

Table 22: SAR Values (FCC Wifi 2450 MHz Band-Body)

Frequency		Mode/Band	Service/Headset	Test Position	Spacing (mm)	SAR(1g)	Power Drift(dB)
MHz	Ch.					(W/kg)	
2462	11	802.11b	1Mbps	Toward Ground	10	0.196	0.035
2462	11	802.11b	1Mbps	Toward Phantom	10	0.021	-0.17
2462	11	802.11b	1Mbps	Toward Left	10	0.099	0.16
2462	11	802.11b	1Mbps	Toward Right	10	0.023	0.17
2462	11	802.11b	1Mbps	Toward Top	10	0.037	0.15
2462	11	802.11g	6Mbps	Toward Ground	10	0.073	0.20

15 Measurement Uncertainty

Measurement uncertainty evaluation for SAR test

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
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 (meas.)	2.5	N	1	0.6	0.49	1.5	1.2	∞

Measurement uncertainty evaluation for system validation

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	∞
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 (meas.)	2.5	N	1	0.6	0.49	1.5	1.2	∞
Combined Std Uncertainty						±11.2%	±10.9%	387
Expanded Std Uncertainty						**±22.4%**	**±21.8%**	

16 MAIN TEST INSTRUMENTS

Table 23: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	N5242A	MY51221755	September 17, 2011	One year
02	Power meter	NRVD	102257	October 06, 2010	Two year
03	Power sensor	NRV-Z5	100644,100241	October 12, 2010	
04	Signal Generator	E4438C	MY49072044	September 08, 2011	One Year
05	Amplifier	150W1000	150W1000	No Calibration Requested	
06	BTS	CMU200	123102	September/20/2011	One year
07	E-field Probe	SPEAG ES3DV3	3158	June 16,2011	One year
09	DAE	SPEAG DAE4	549	June 22,2011	One year
10	Dipole Validation Kit	SPEAG D835V2	473	June 14,2011	Two years
11	Dipole Validation Kit	SPEAG D1900V2	5d024	June 16,2011	Two years
12	Dipole Validation Kit	SPEAG D2450V2	803	June 22,2011	Two years

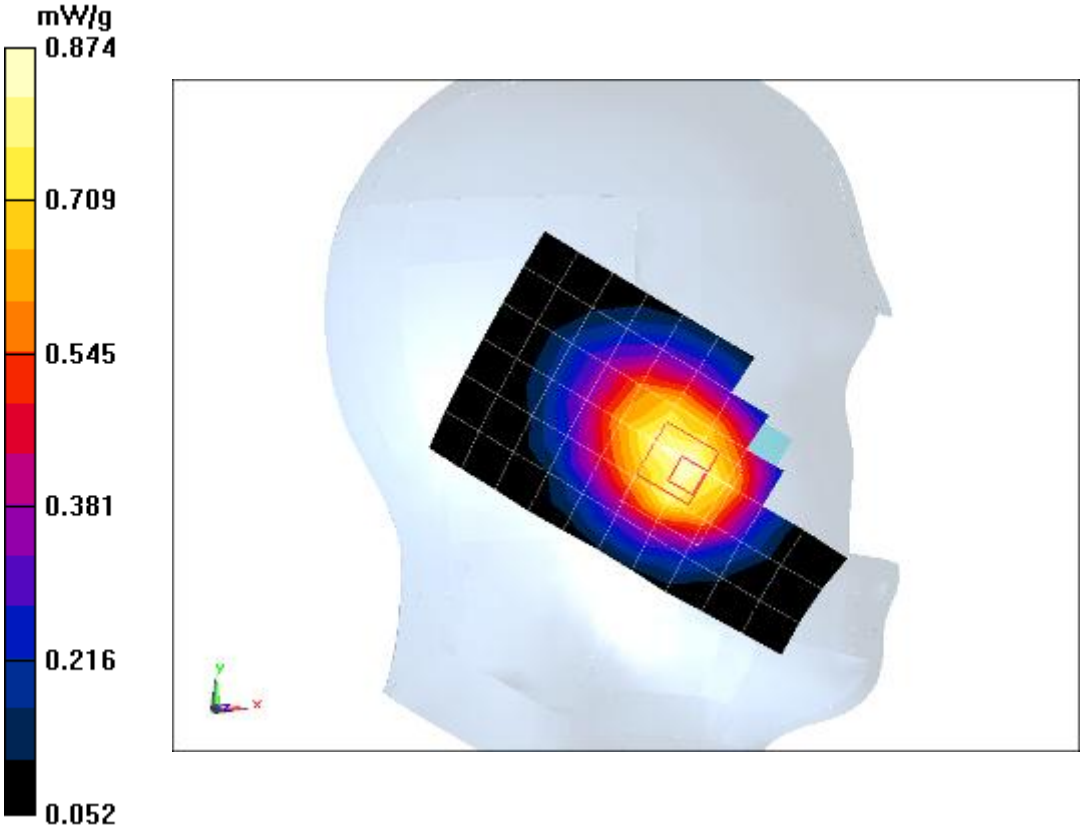
NOTE: The dipole for SAR system validation is calibrated every two years.And we self-calibrated the dipole every year according to the KDB 450824 D02. All the parameters we calibrated meets the requirements.

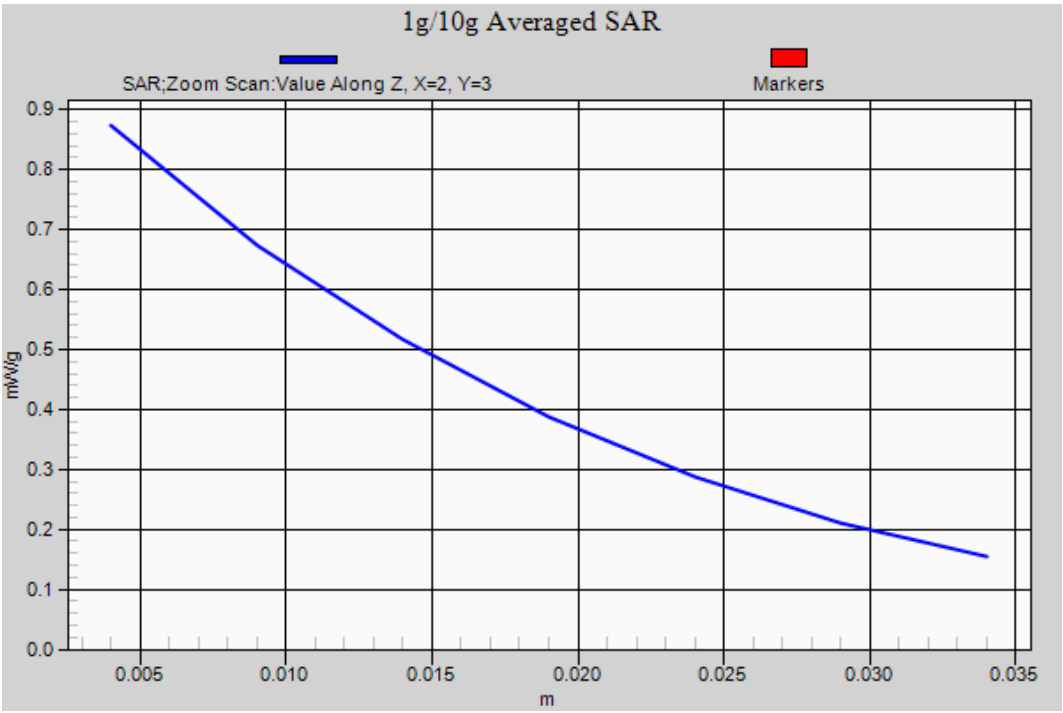
END OF REPORT BODY

ANNEX A GRAPH RESULTS

GSM850 Left Cheek Middle

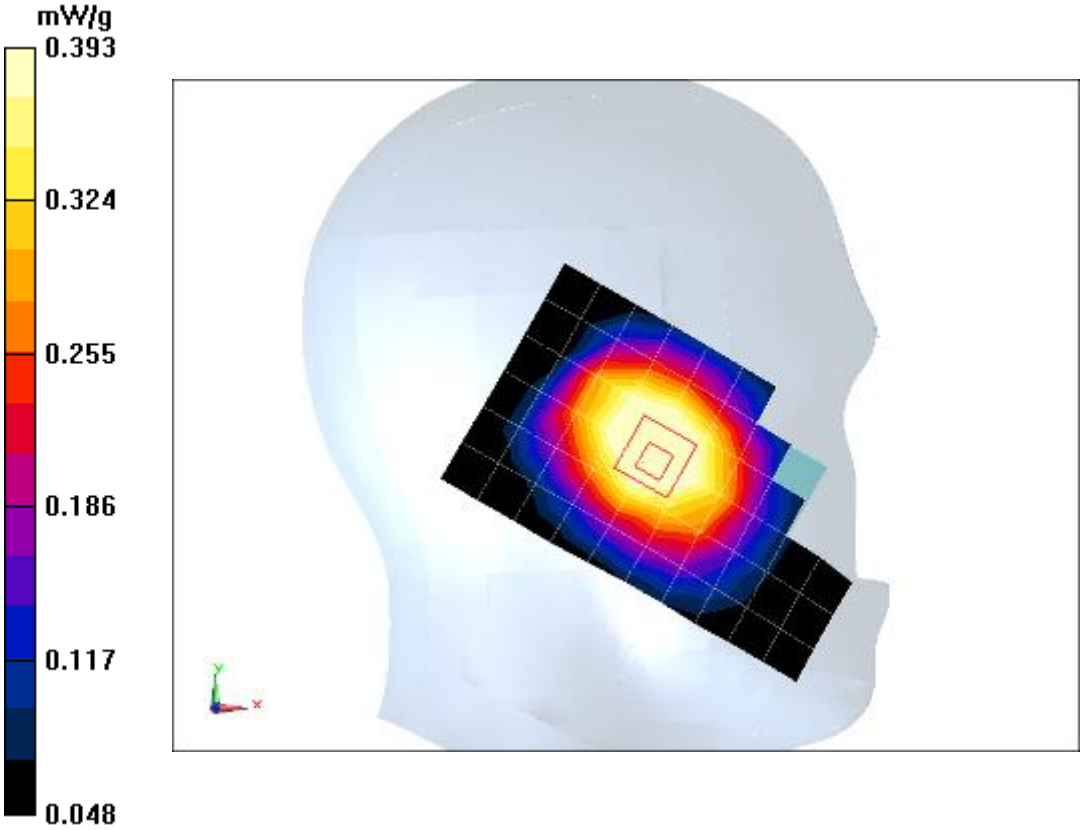
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.91 mho/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Cheek Left GSM850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.873 mW/g
Middle Cheek Left GSM850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.834 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.068 mW/g
SAR(1 g) = 0.822 mW/g; SAR(10 g) = 0.599 mW/g
Maximum value of SAR (measured) = 0.874 mW/g

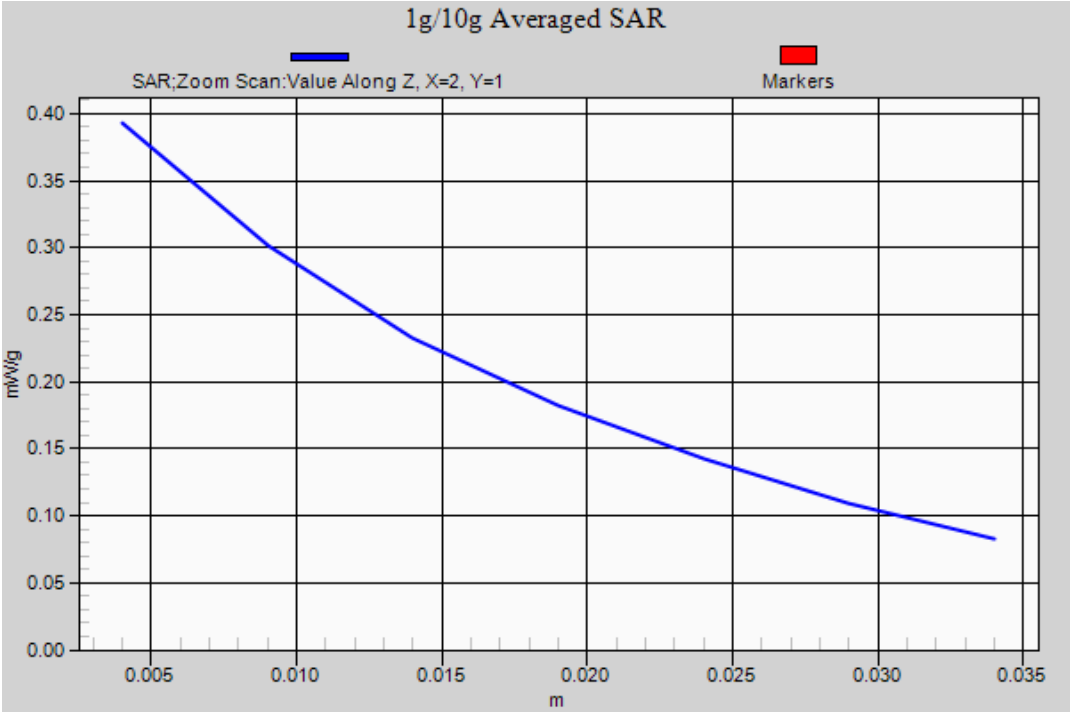

mW/g
0.874
0.709
0.545
0.381
0.216
0.052


1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=3
Markers
mW/g
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Left Tilt Middle

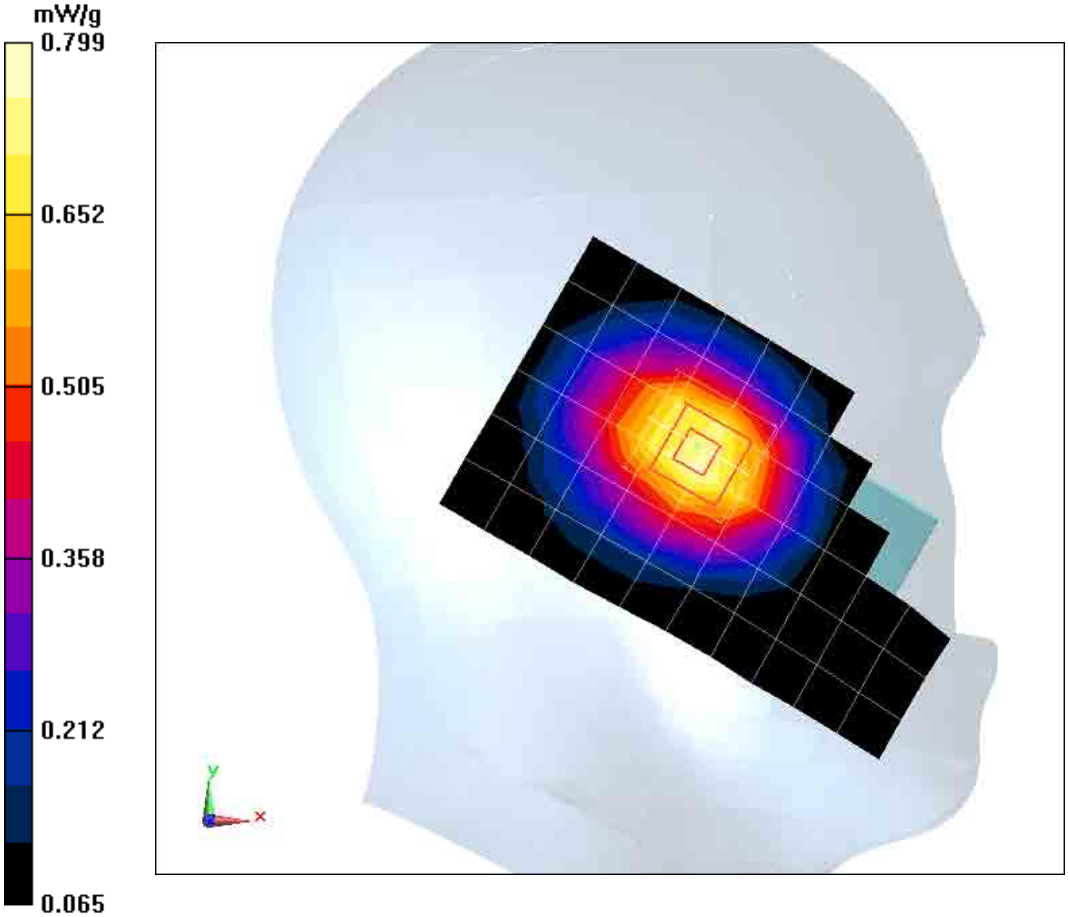
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.91 mho/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Tilt Left GSM850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.477 mW/g
Middle Tilt Left GSM850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.711 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.485 mW/g
SAR(1 g) = 0.375 mW/g; SAR(10 g) = 0.278 mW/g
Maximum value of SAR (measured) = 0.393 mW/g

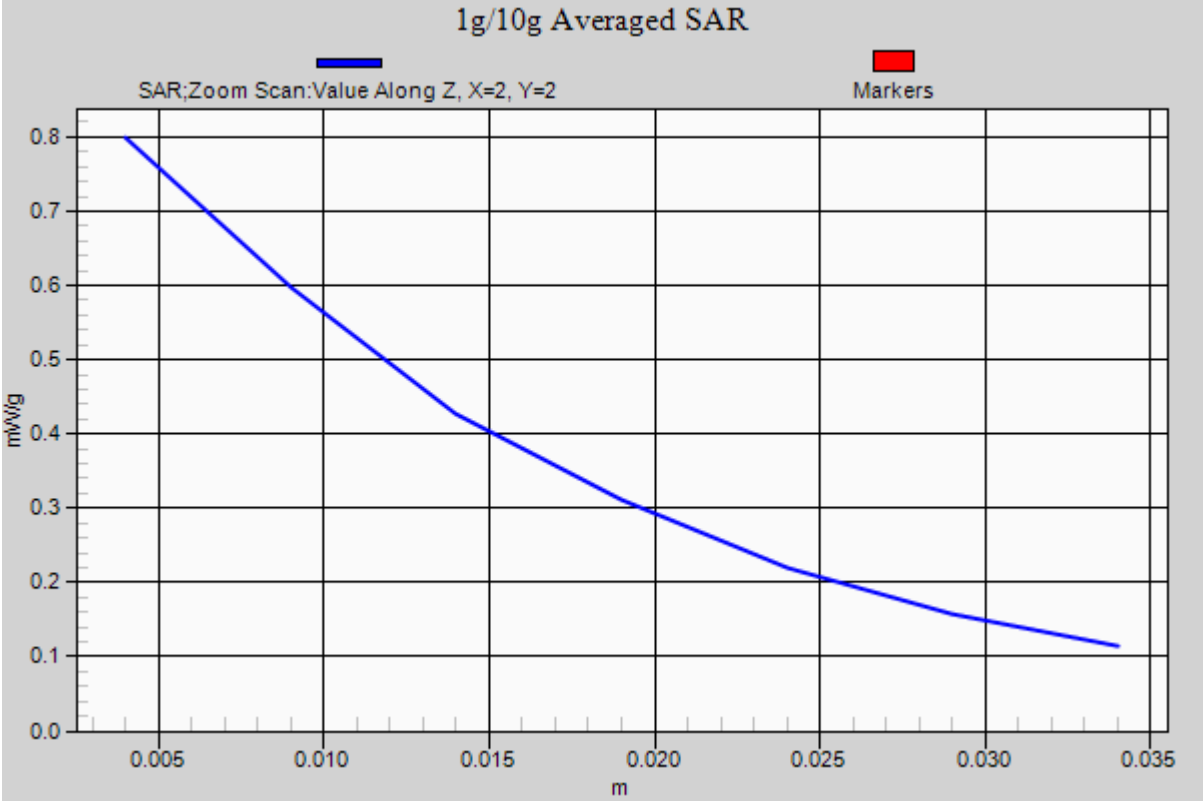



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=1
Markers
mW/g
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Left Cheek High

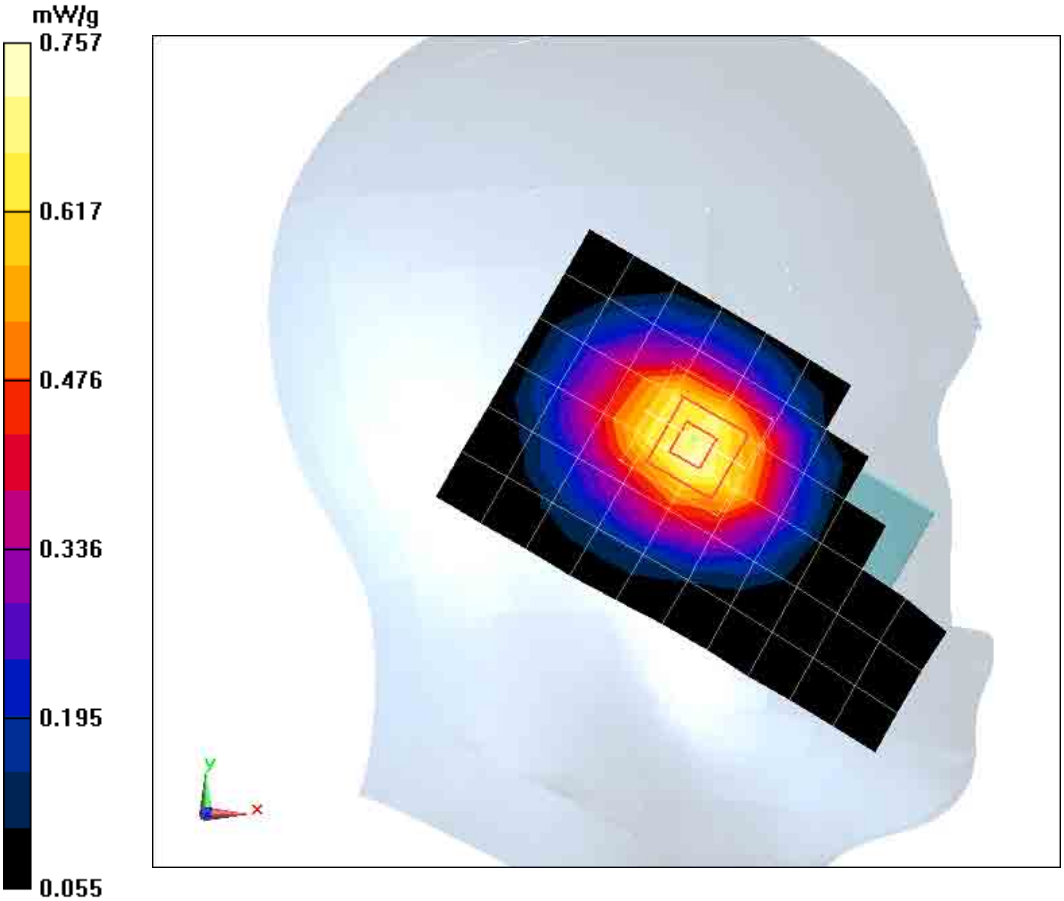
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 849 MHz; σ = 0.919 mho/m; εr = 40.508; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
High Cheek Left GSM850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.800 mW/g
High Cheek Left GSM850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.879 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.984 mW/g
SAR(1 g) = 0.749 mW/g; SAR(10 g) = 0.520 mW/g
Maximum value of SAR (measured) = 0.799 mW/g

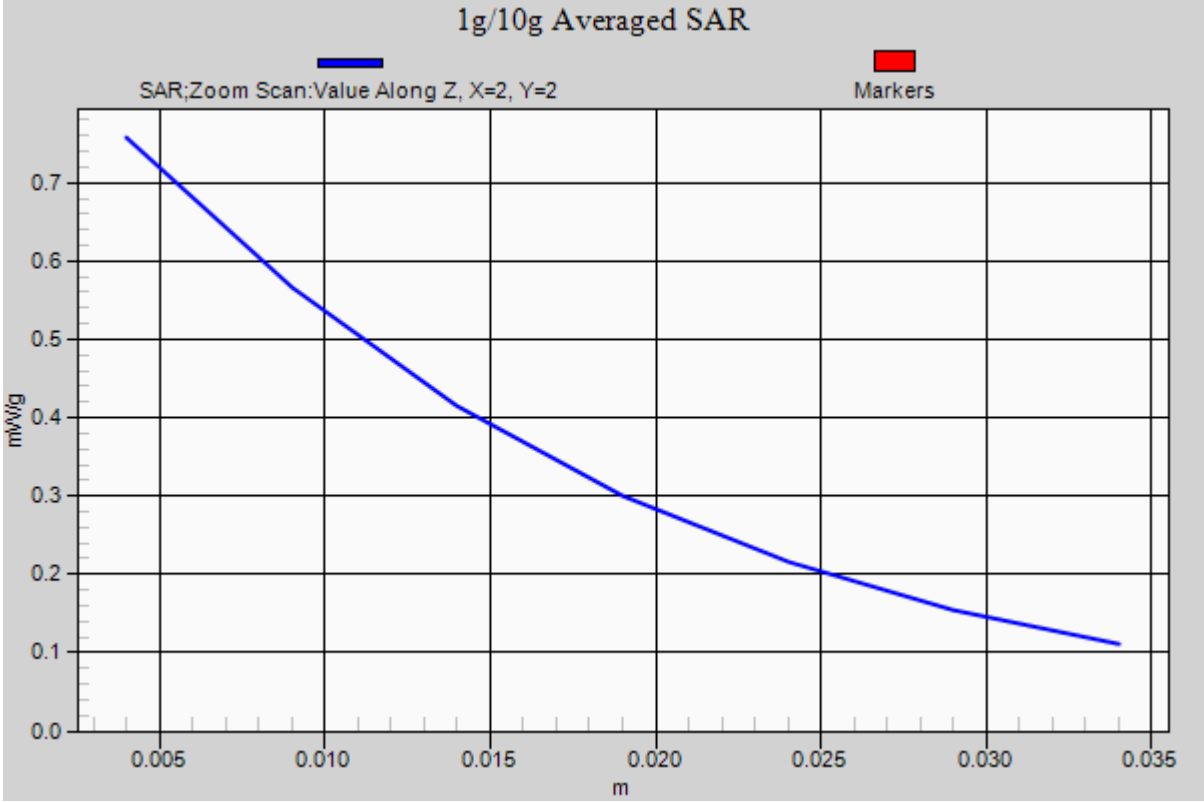



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Left Cheek Low

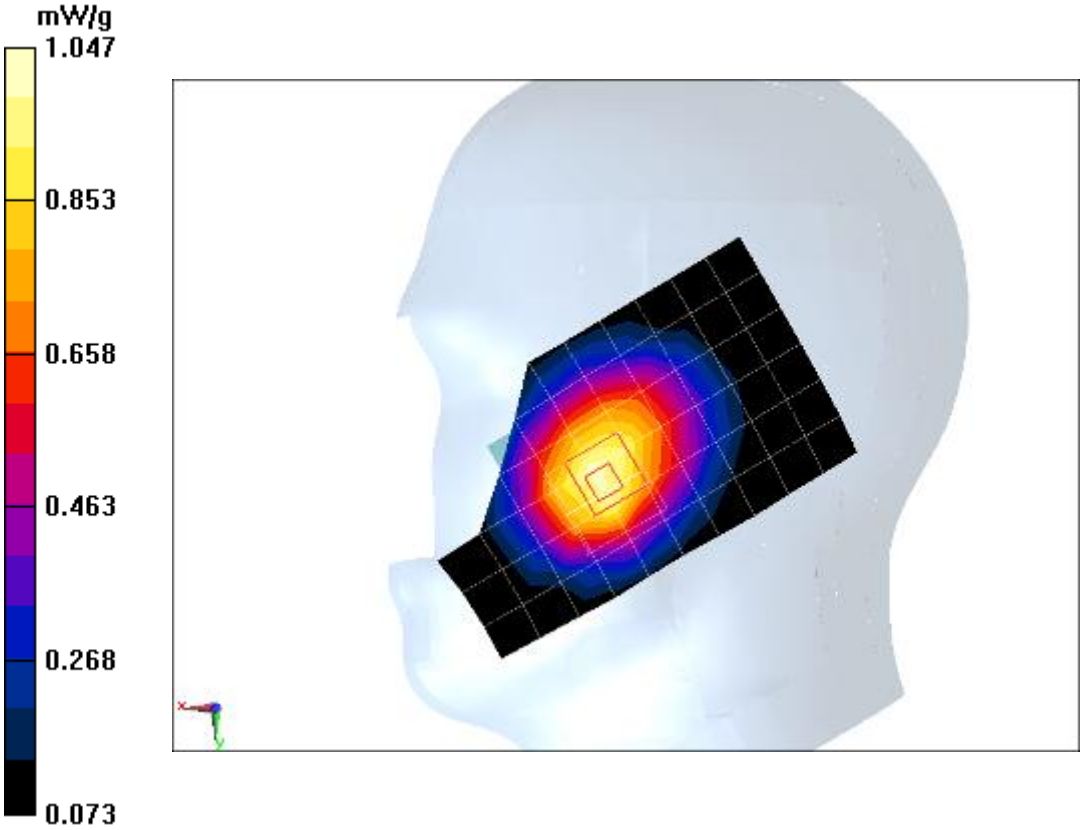
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 824.2 MHz; σ = 0.9 mho/m; εr = 40.801; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Low Cheek Left GSM850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.735 mW/g
Low Cheek Left GSM850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.889 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.934 mW/g
SAR(1 g) = 0.709 mW/g; SAR(10 g) = 0.495 mW/g
Maximum value of SAR (measured) = 0.757 mW/g

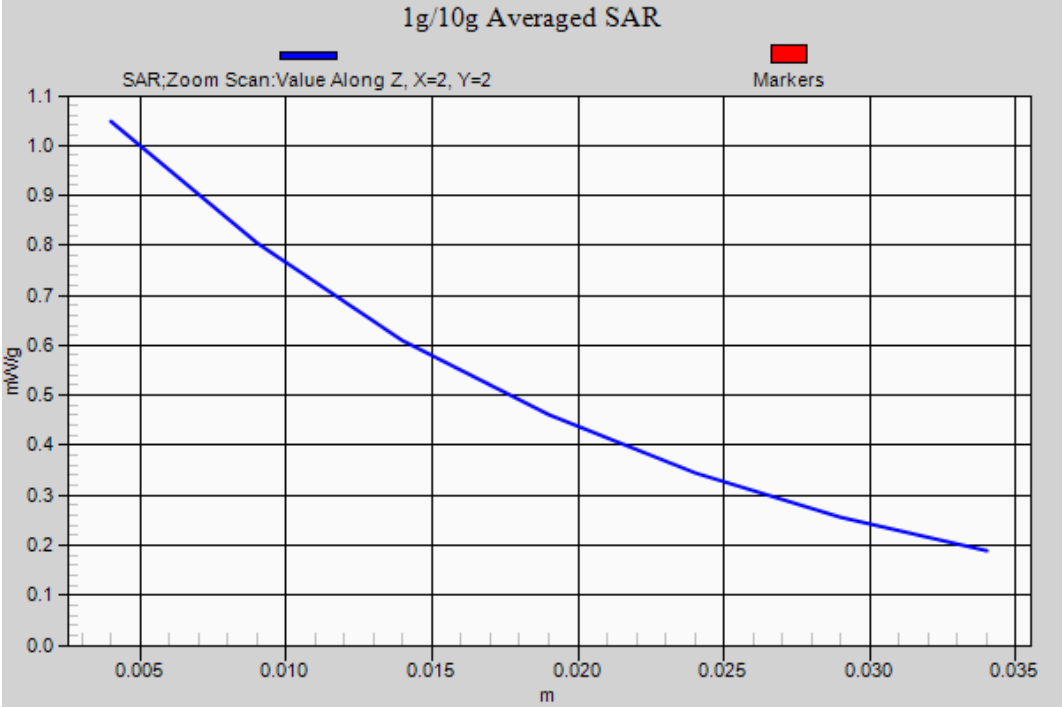



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Right Cheek Middle

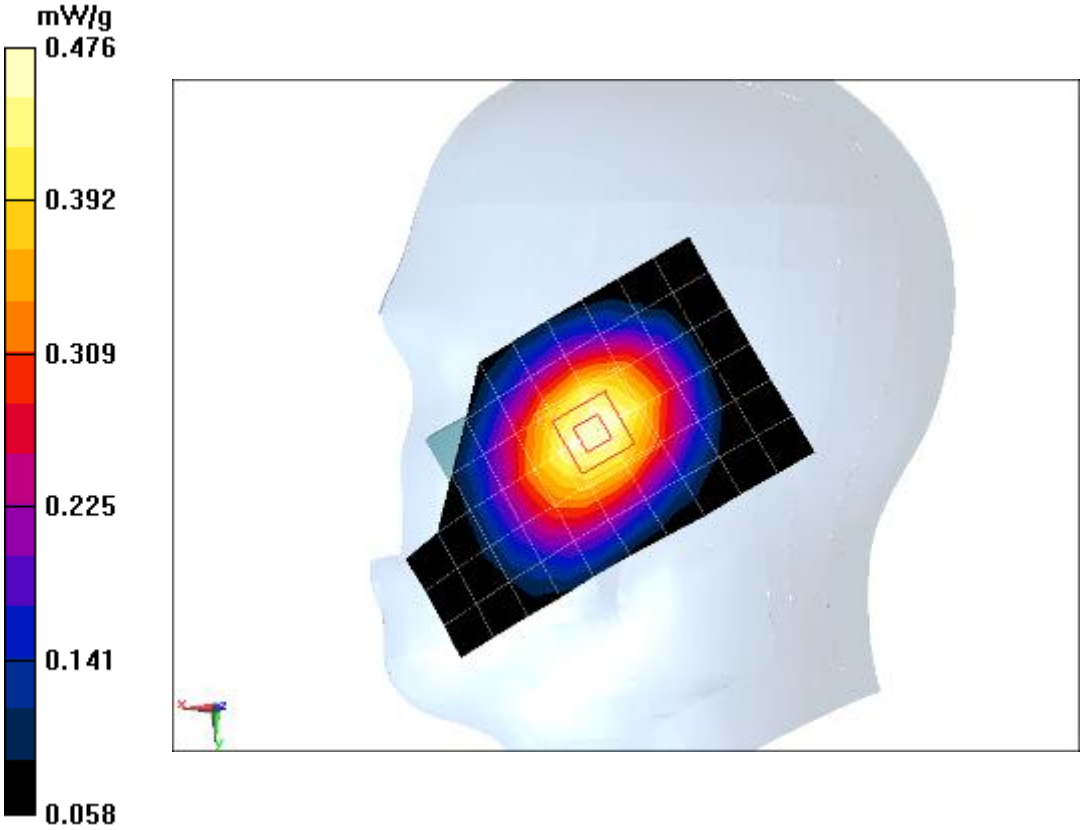
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.91 mho/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Cheek Right GSM850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.013 mW/g
Middle Cheek Right GSM850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.874 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 1.284 mW/g
SAR(1 g) = 0.997 mW/g; SAR(10 g) = 0.731 mW/g
Maximum value of SAR (measured) = 1.047 mW/g

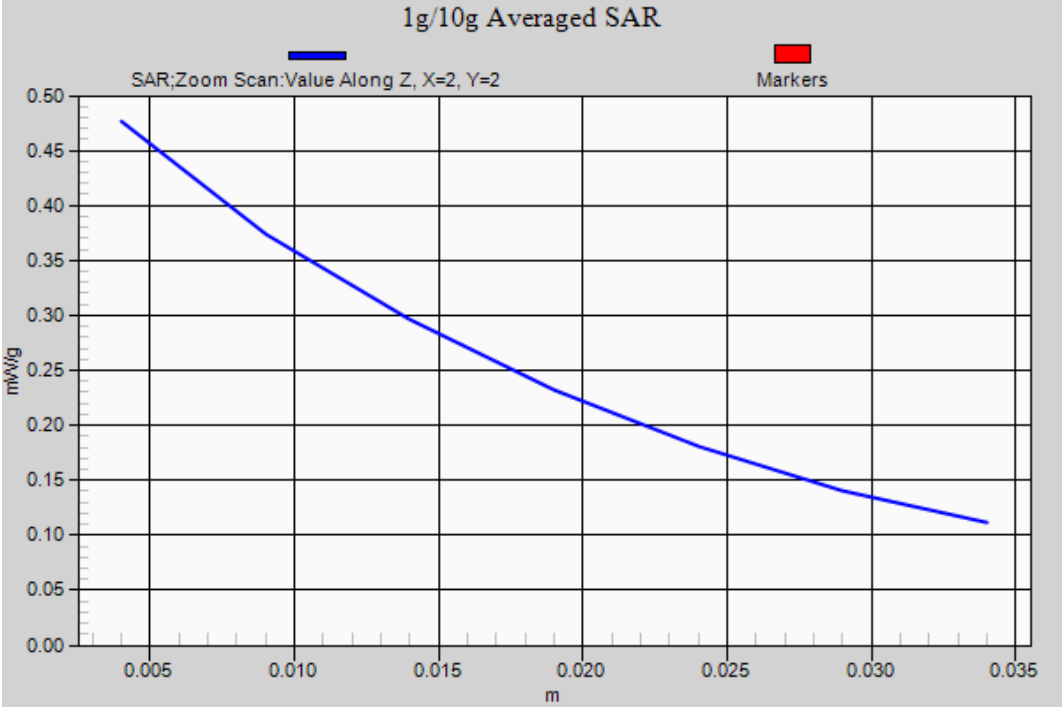



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Right Tilt Middle

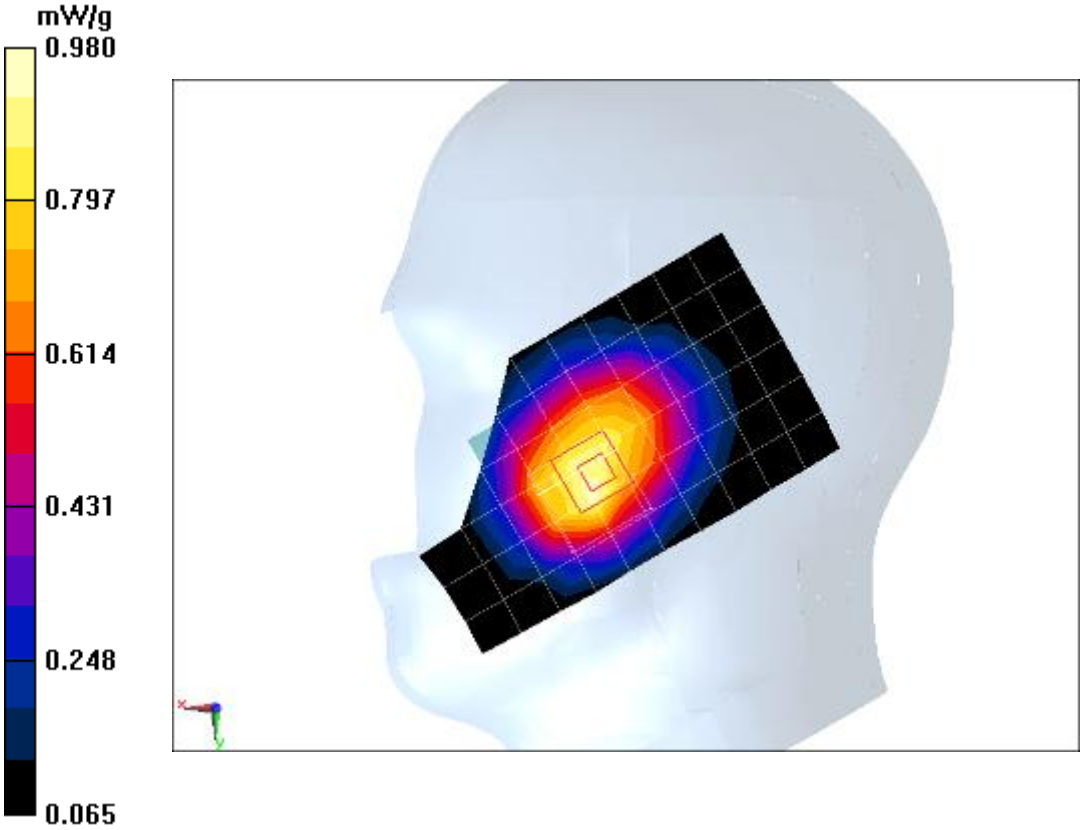
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.91 mho/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Tilt Right GSM850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.495 mW/g
Middle Tilt Right GSM850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.427 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.574 mW/g
SAR(1 g) = 0.458 mW/g; SAR(10 g) = 0.346 mW/g
Maximum value of SAR (measured) = 0.476 mW/g

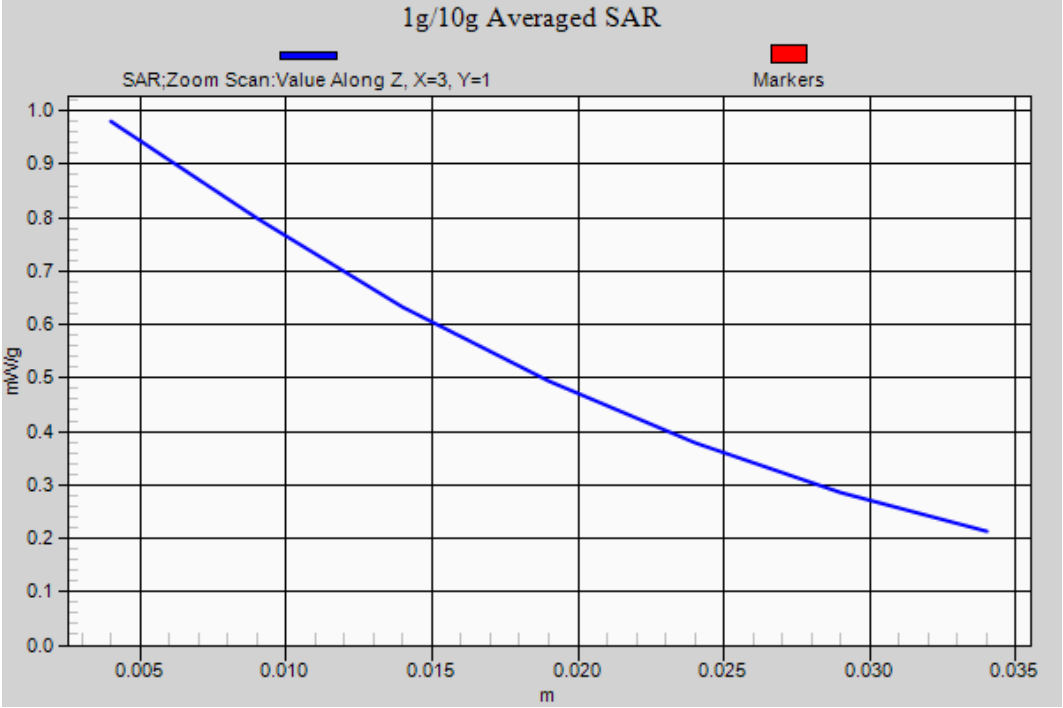



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Right Cheek High

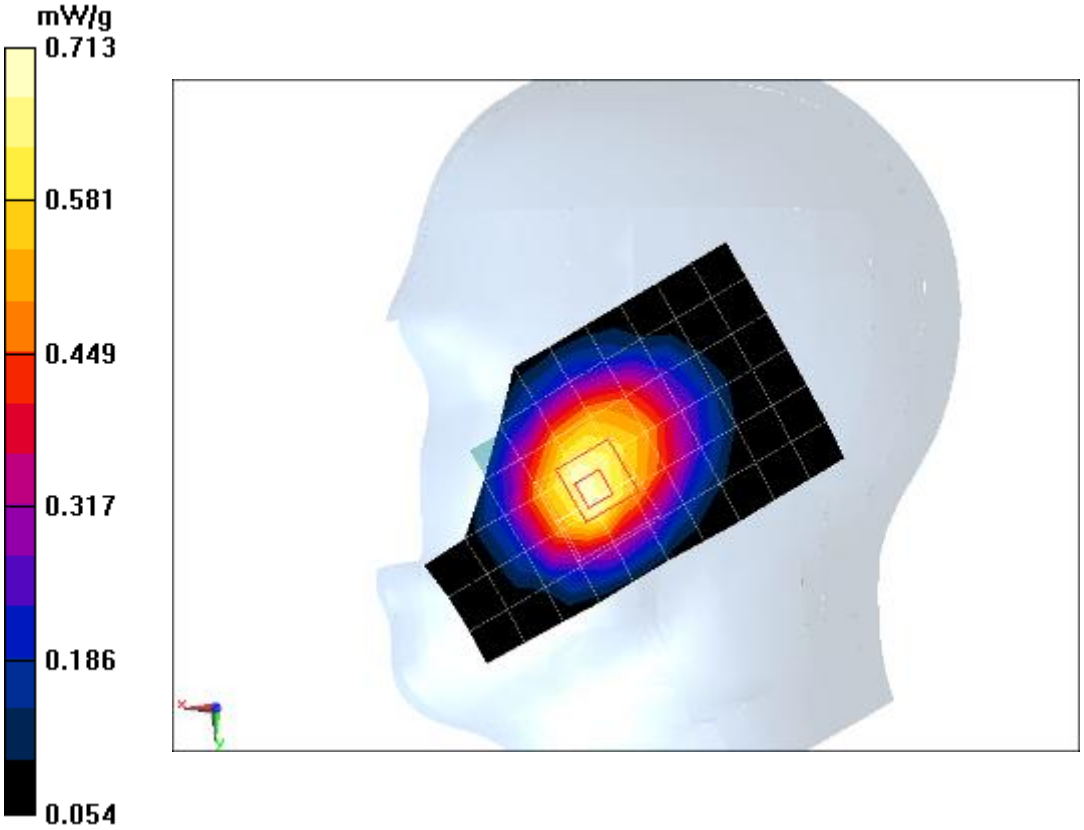
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 849 MHz; σ = 0.919 mho/m; εr = 40.508; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
High Cheek Right GSM850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.955 mW/g
High Cheek Right GSM850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.521 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.197 mW/g
SAR(1 g) = 0.939 mW/g; SAR(10 g) = 0.695 mW/g
Maximum value of SAR (measured) = 0.980 mW/g

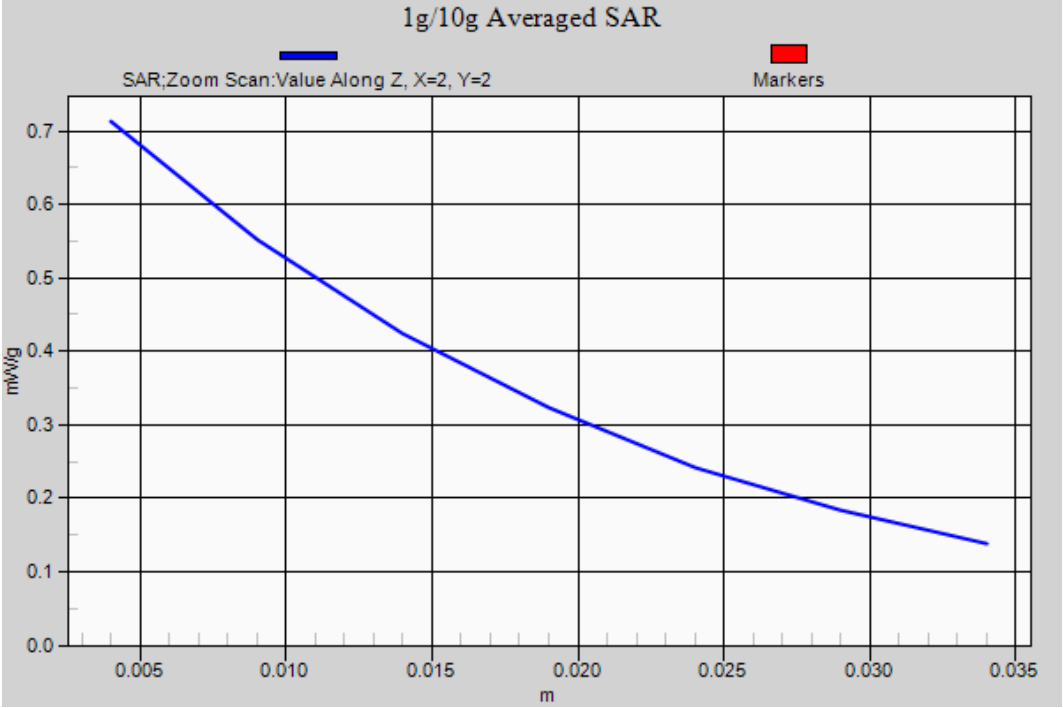



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=3, Y=1
Markers
mW/g
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Right Cheek Low

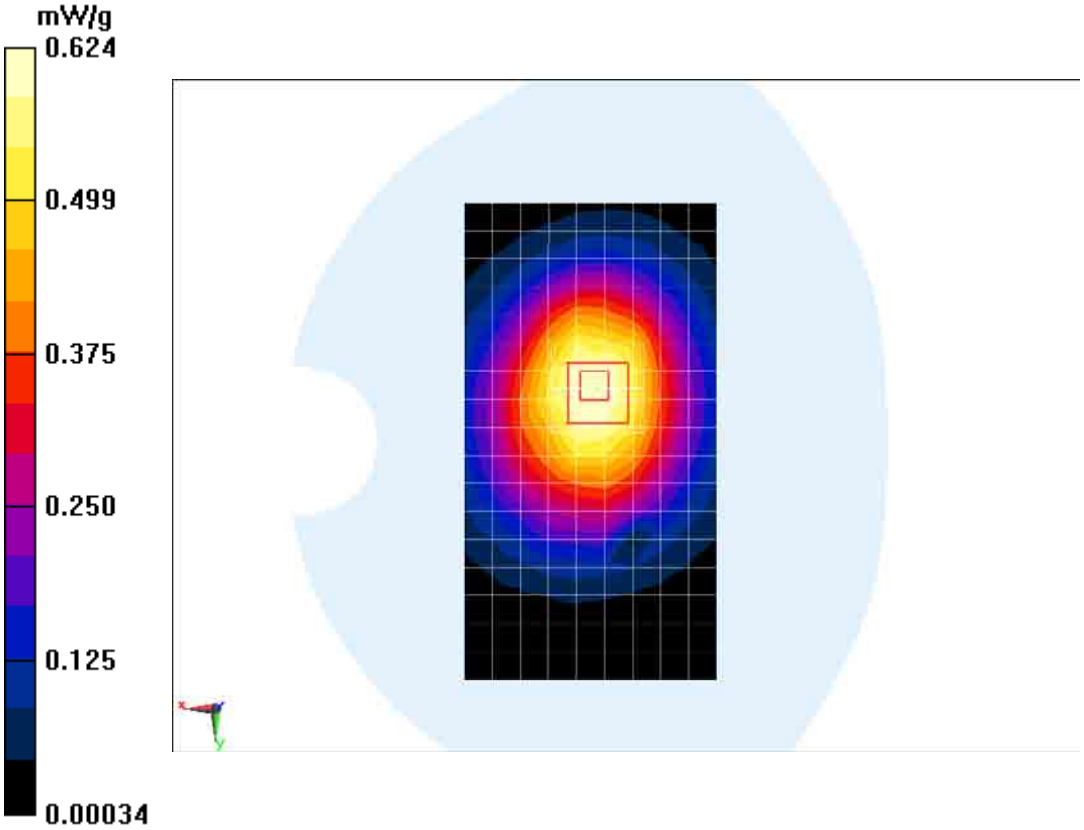
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 824.2 MHz; σ = 0.9 mho/m; εr = 40.801; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 824.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Low Cheek Right GSM850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.700 mW/g
Low Cheek Right GSM850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.792 V/m; Power Drift = -0.035 dB
Peak SAR (extrapolated) = 0.869 mW/g
SAR(1 g) = 0.674 mW/g; SAR(10 g) = 0.496 mW/g
Maximum value of SAR (measured) = 0.713 mW/g

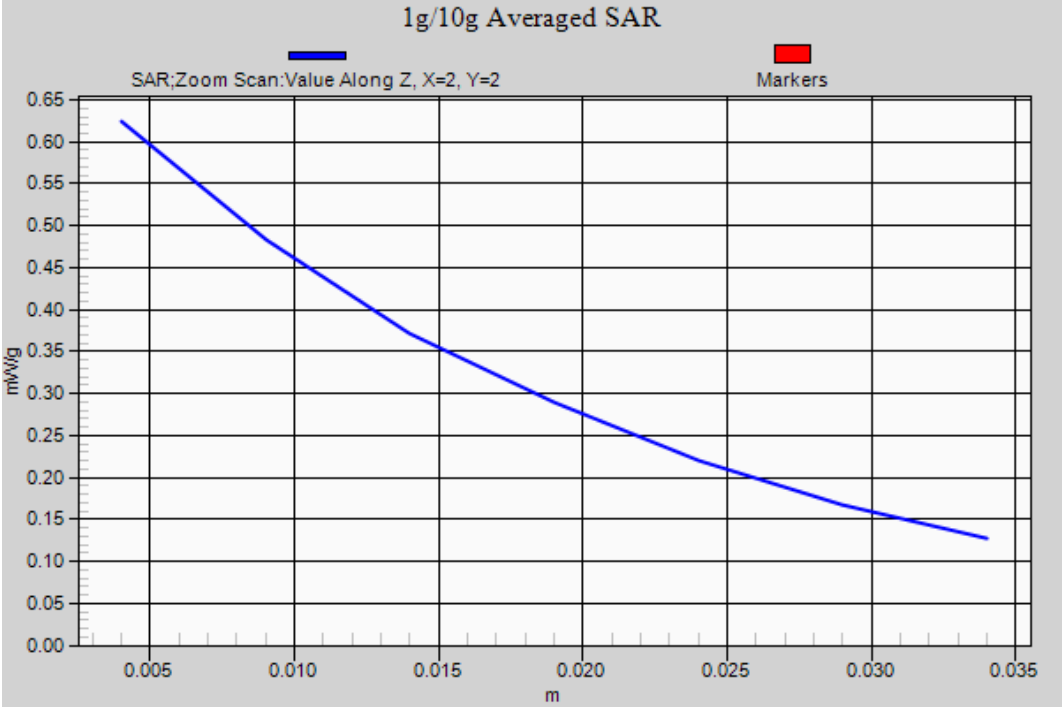



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Toward Phontom Middle GPRS 2TS

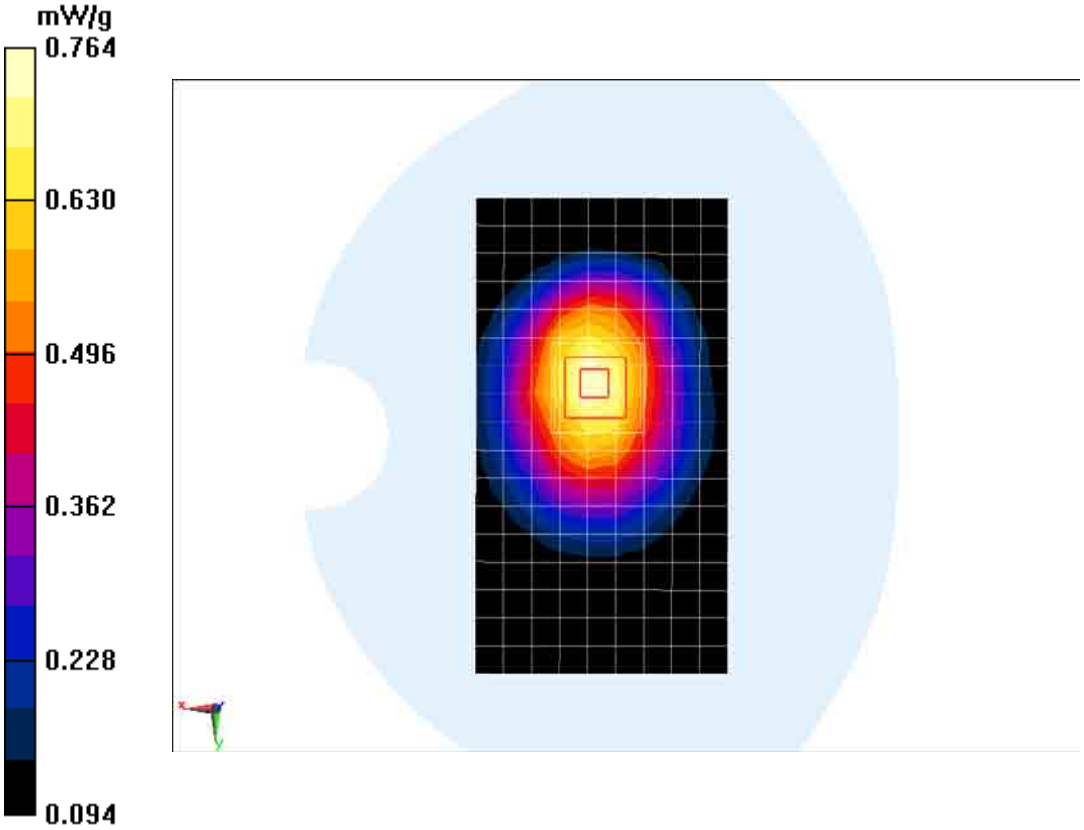
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 850 GPRS 2TS; Frequency: 836.6 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Toward Phontom GPRS 2TS 850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.627 mW/g
Middle Toward Phontom GPRS 2TS 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.924 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.282 mW/g
SAR(1 g) = 0.591 mW/g; SAR(10 g) = 0.439 mW/g
Maximum value of SAR (measured) = 0.624 mW/g

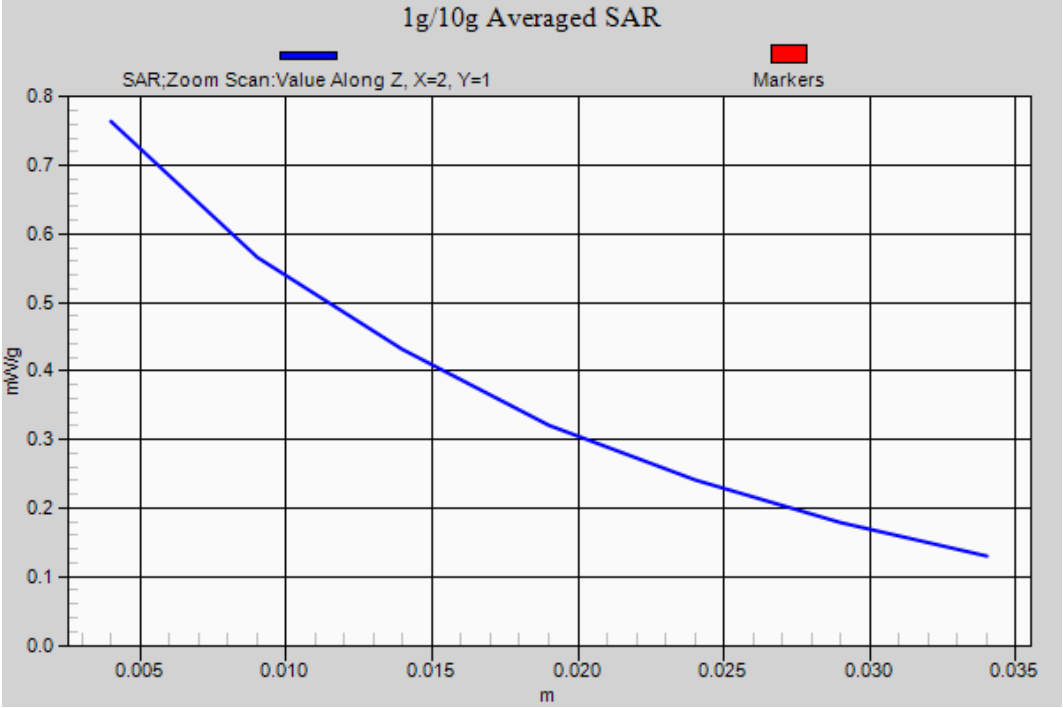



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Toward Ground Middle GPRS 2TS

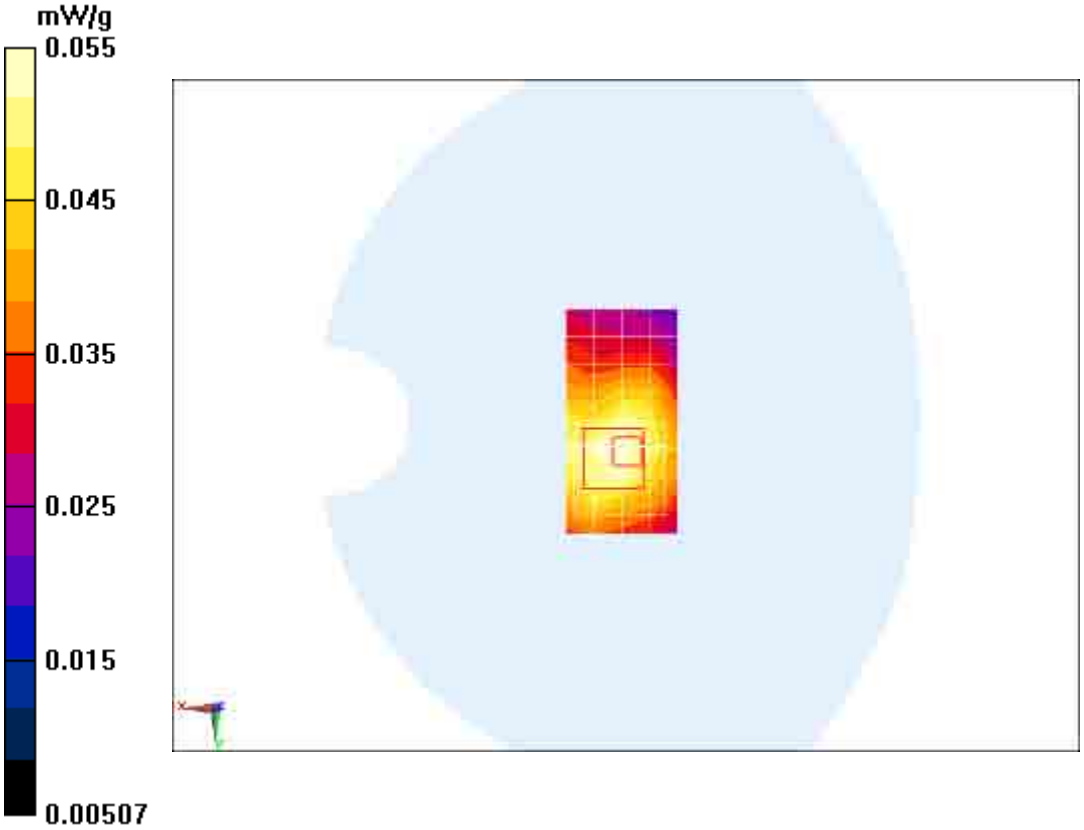
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 850 GPRS 2TS; Frequency: 836.6 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Toward Ground GPRS 2TS 850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.771 mW/g
Middle Toward Ground GPRS 2TS 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.994 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.963 mW/g
SAR(1 g) = 0.724 mW/g; SAR(10 g) = 0.530 mW/g
Maximum value of SAR (measured) = 0.764 mW/g

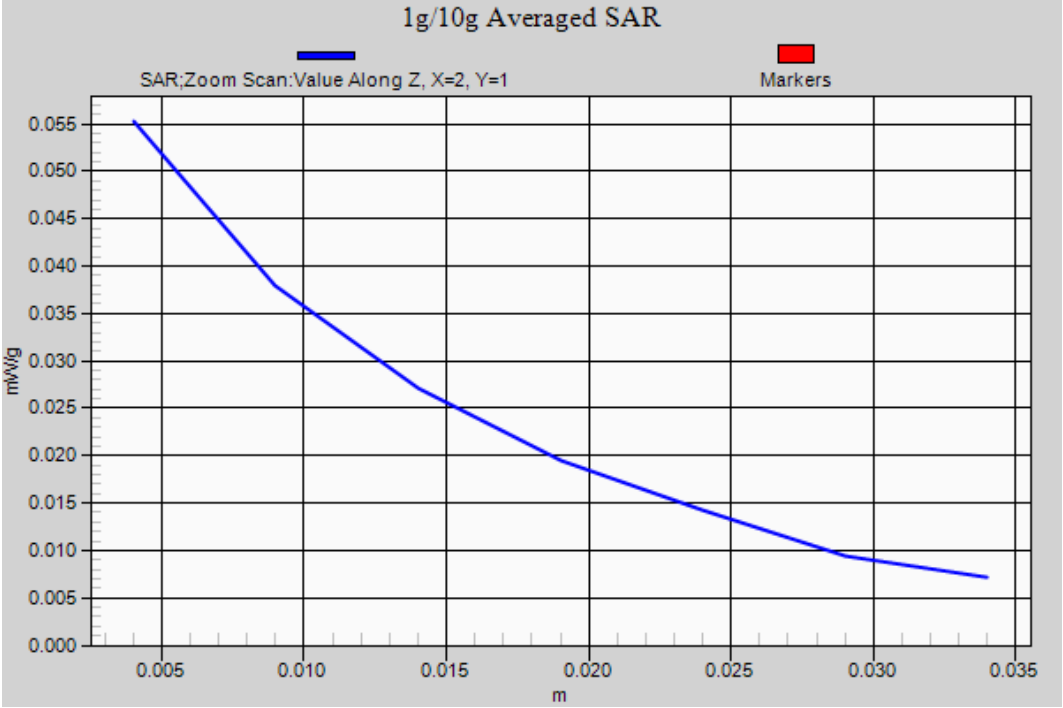



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=1
Markers
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Bottom Middle GPRS 2TS

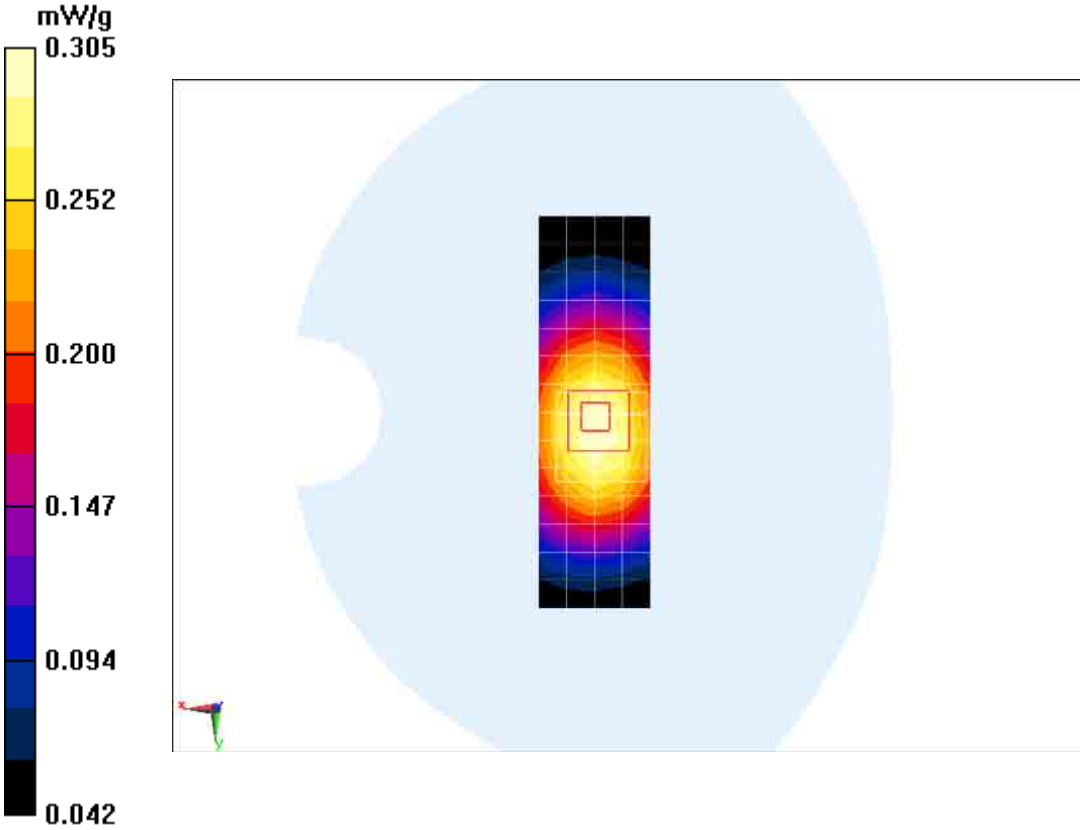
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 850 GPRS 2TS; Frequency: 836.6 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Bottom GPRS 2TS 850MHz/Area Scan (5x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.054 mW/g
Middle Bottom GPRS 2TS 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.212 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 0.078 mW/g
SAR(1 g) = 0.052 mW/g; SAR(10 g) = 0.037 mW/g
Maximum value of SAR (measured) = 0.055 mW/g

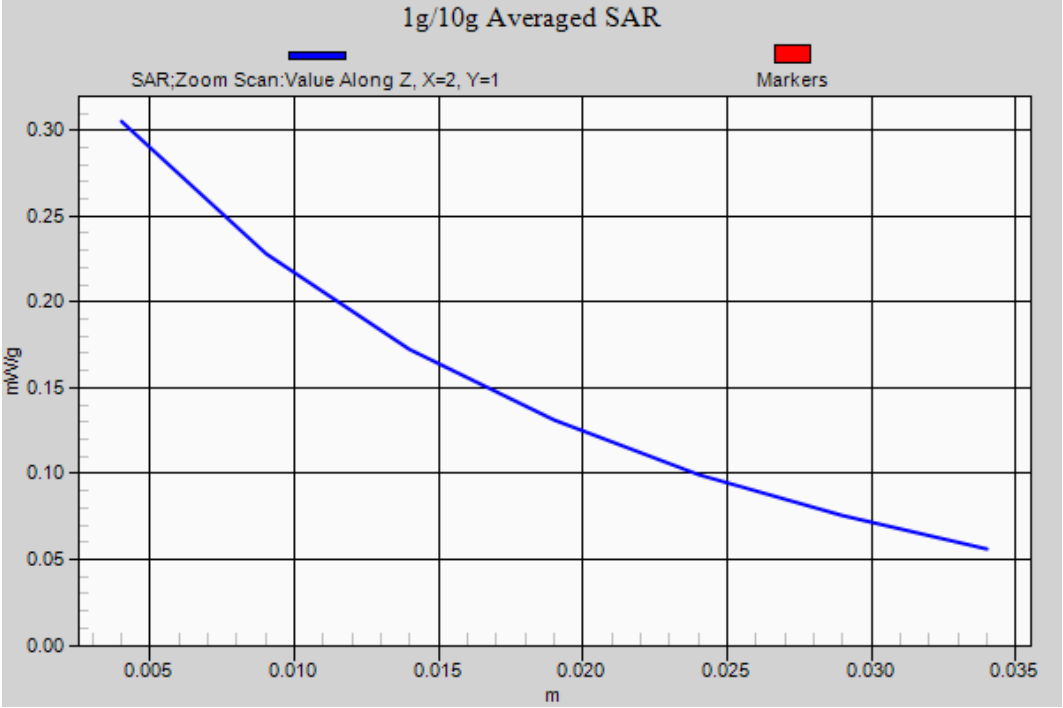



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=1
Markers
mW/g
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Right Middle GPRS 2TS

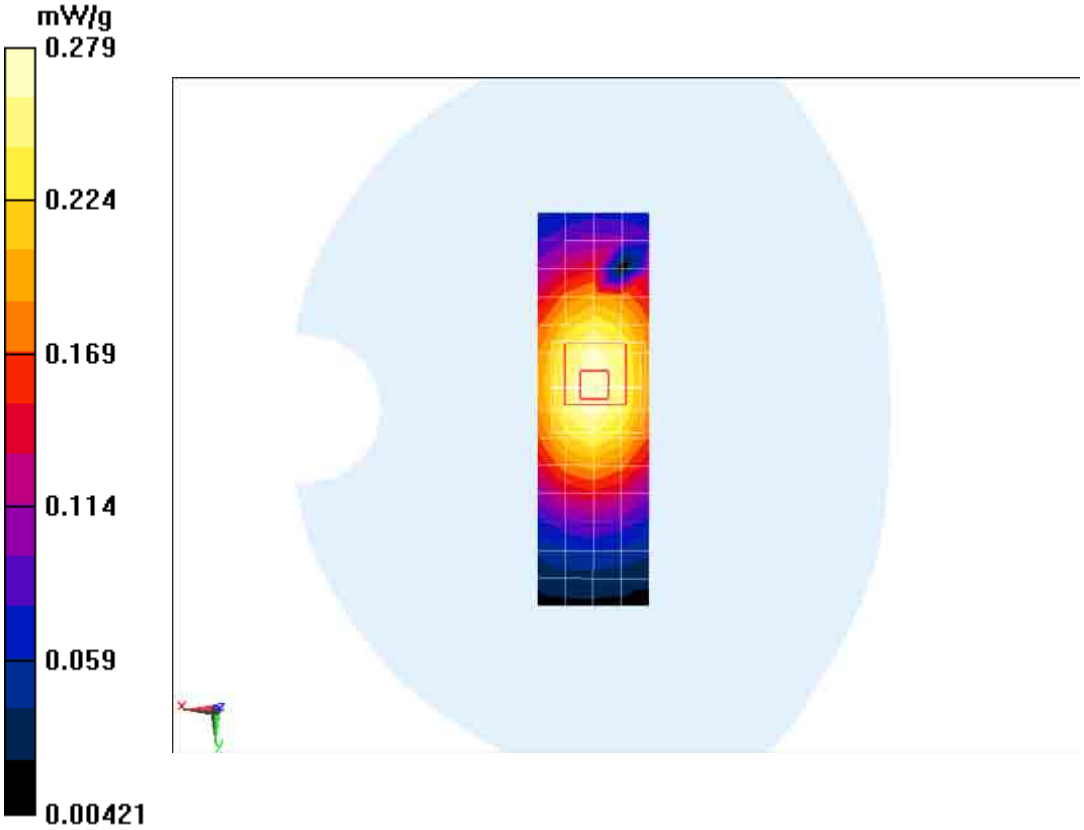
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 850 GPRS 2TS; Frequency: 836.6 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Right GPRS 2TS 850MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.308 mW/g
Middle Right GPRS 2TS 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.493 V/m; Power Drift = -0.0022 dB
Peak SAR (extrapolated) = 0.383 mW/g
SAR(1 g) = 0.288 mW/g; SAR(10 g) = 0.206 mW/g
Maximum value of SAR (measured) = 0.305 mW/g

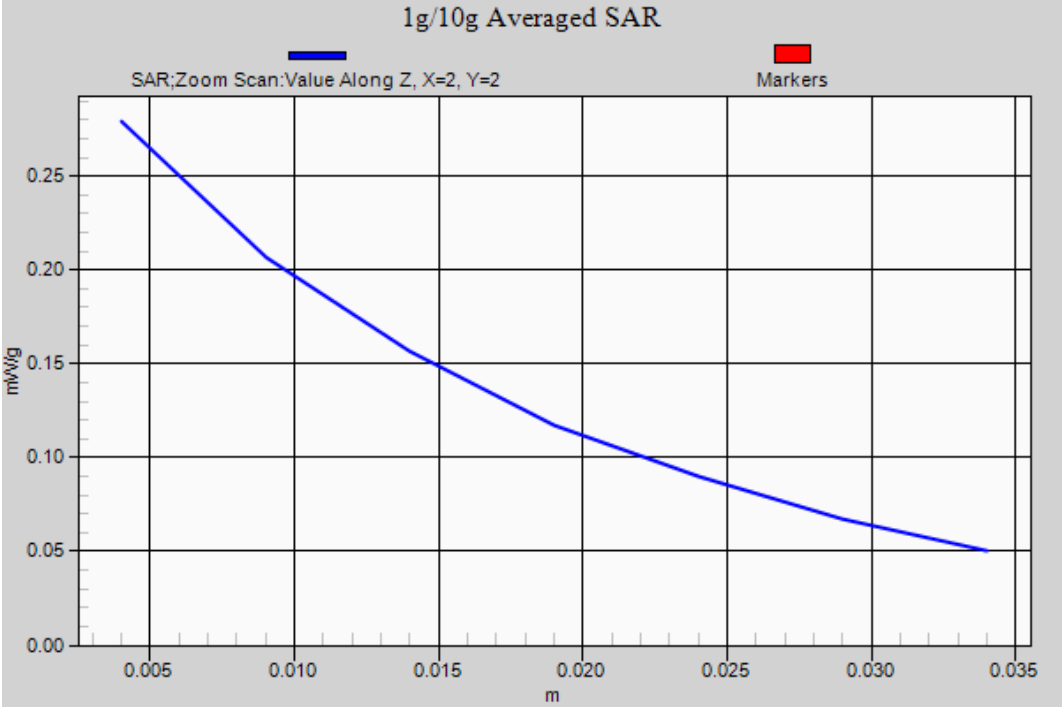



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=1
Markers
mW/g
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Left Middle GPRS 2TS

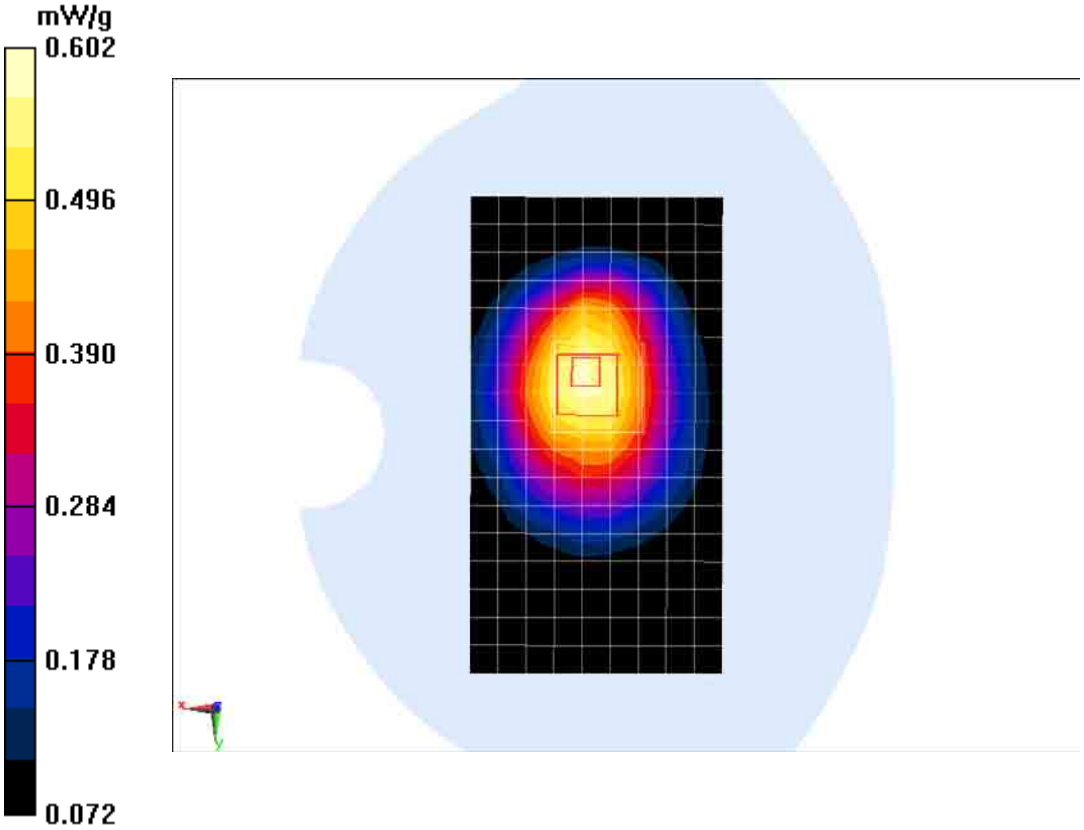
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 850 GPRS 2TS; Frequency: 836.6 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Left GPRS 2TS 850MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.283 mW/g
Middle Left GPRS 2TS 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.731 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.355 mW/g
SAR(1 g) = 0.264 mW/g; SAR(10 g) = 0.189 mW/g
Maximum value of SAR (measured) = 0.279 mW/g

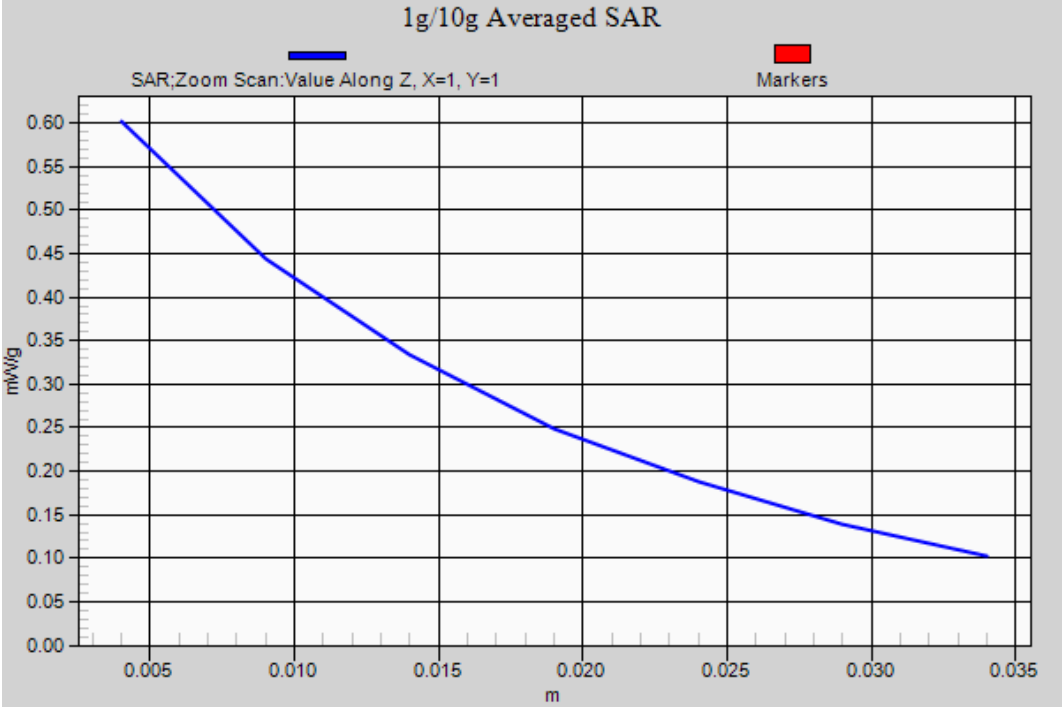



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Toward Ground Low GPRS 2TS

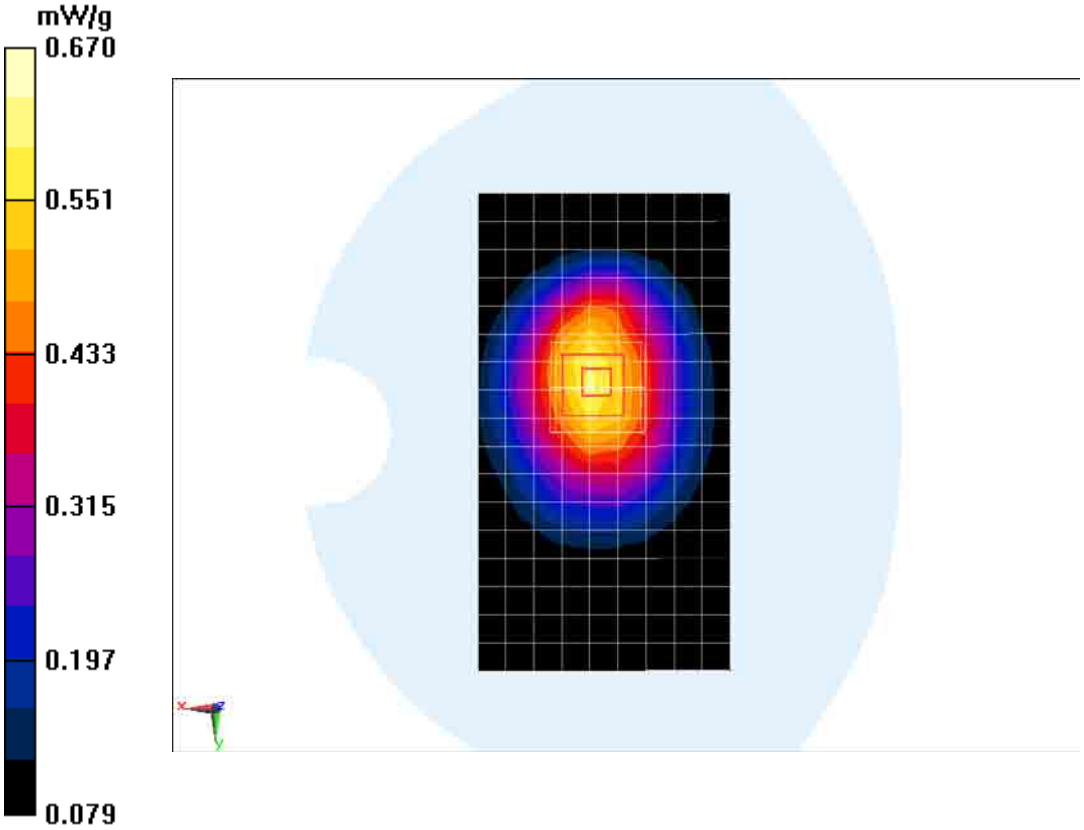
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 824.2 MHz; σ = 0.993 mho/m; εr = 55.149; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 850 GPRS 2TS; Frequency: 824.2 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Low Toward Ground GPRS 2TS 850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.579 mW/g
Low Toward Ground GPRS 2TS 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.968 V/m; Power Drift = 0.067 dB
Peak SAR (extrapolated) = 0.763 mW/g
SAR(1 g) = 0.570 mW/g; SAR(10 g) = 0.415 mW/g
Maximum value of SAR (measured) = 0.602 mW/g

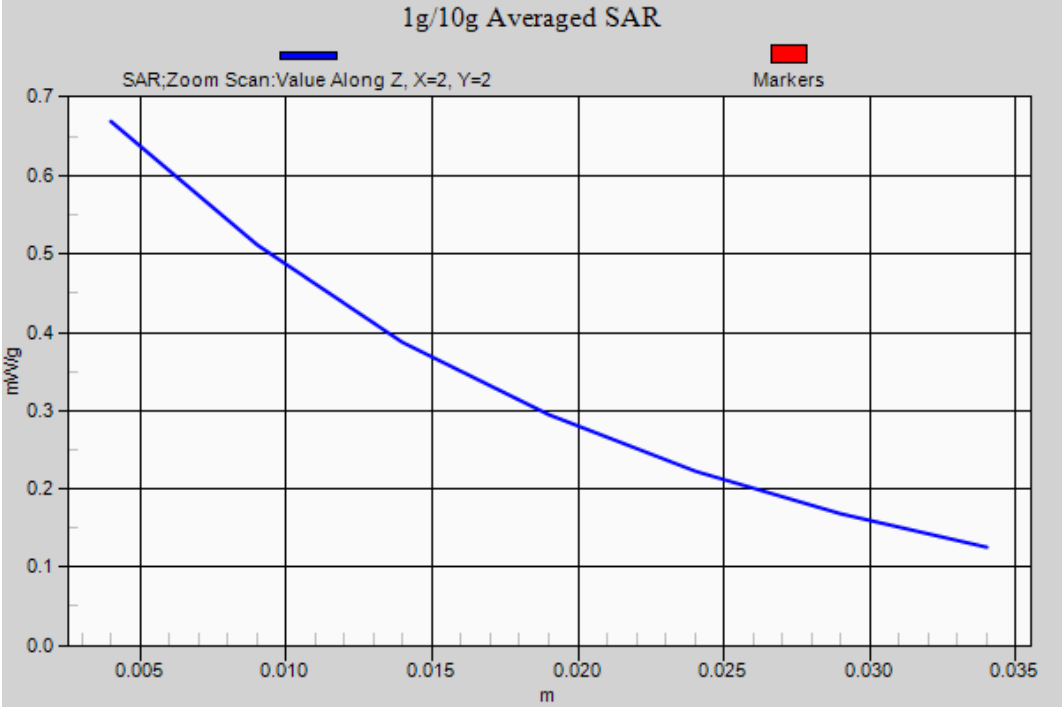



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=1, Y=1
Markers
mW/g
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Toward Ground High GPRS 2TS

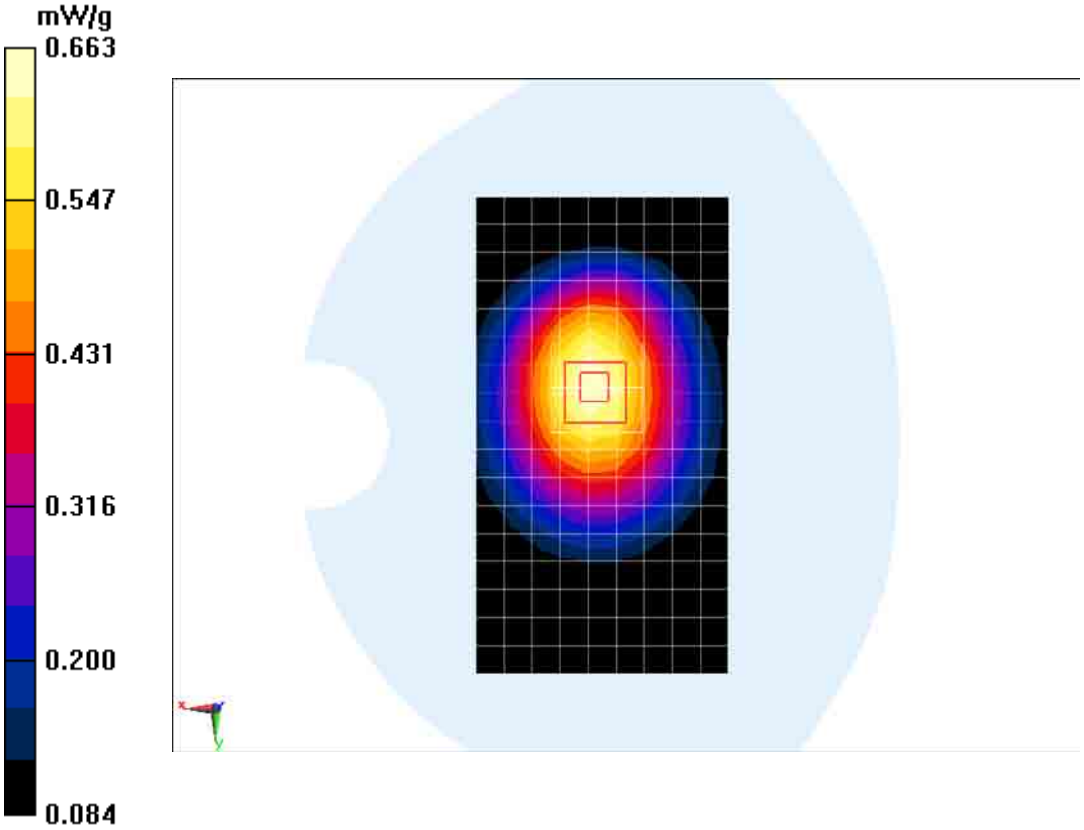
Date/Time: 6/7/2012 10:29:54
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 849 MHz; σ = 1.015 mho/m; εr = 55.205; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 850 GPRS 2TS; Frequency: 848.8 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
High Toward Ground GPRS 2TS 850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.608 mW/g
High Toward Ground GPRS 2TS 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.458 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.875 mW/g
SAR(1 g) = 0.650 mW/g; SAR(10 g) = 0.464 mW/g
Maximum value of SAR (measured) = 0.670 mW/g

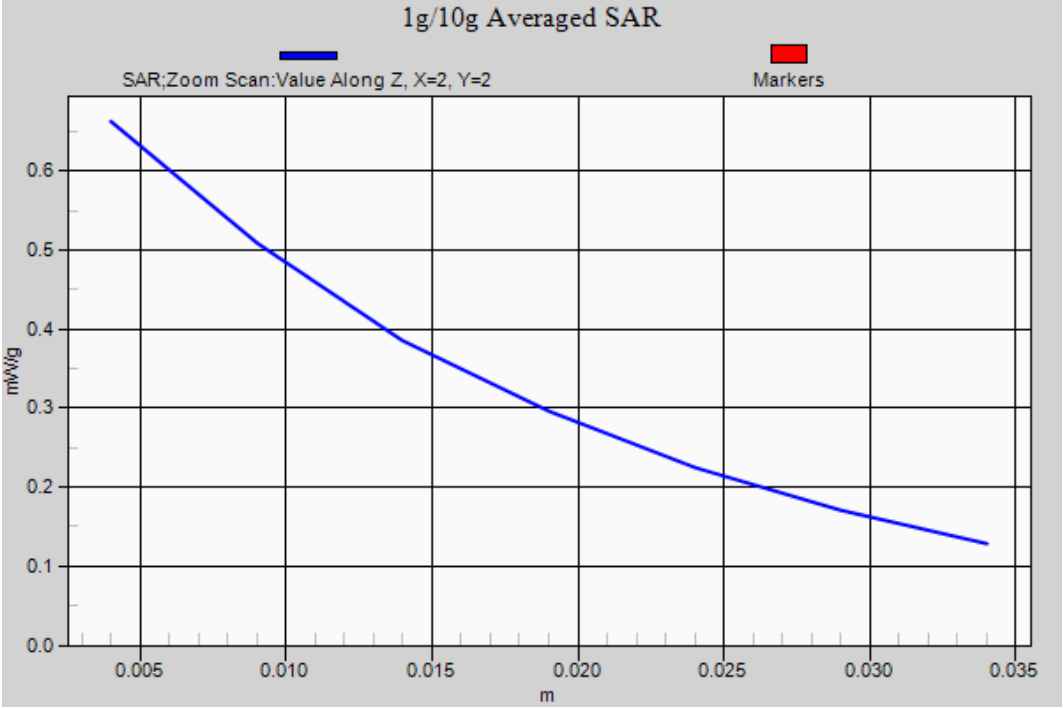



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Toward Ground Middle E-GPRS 2TS

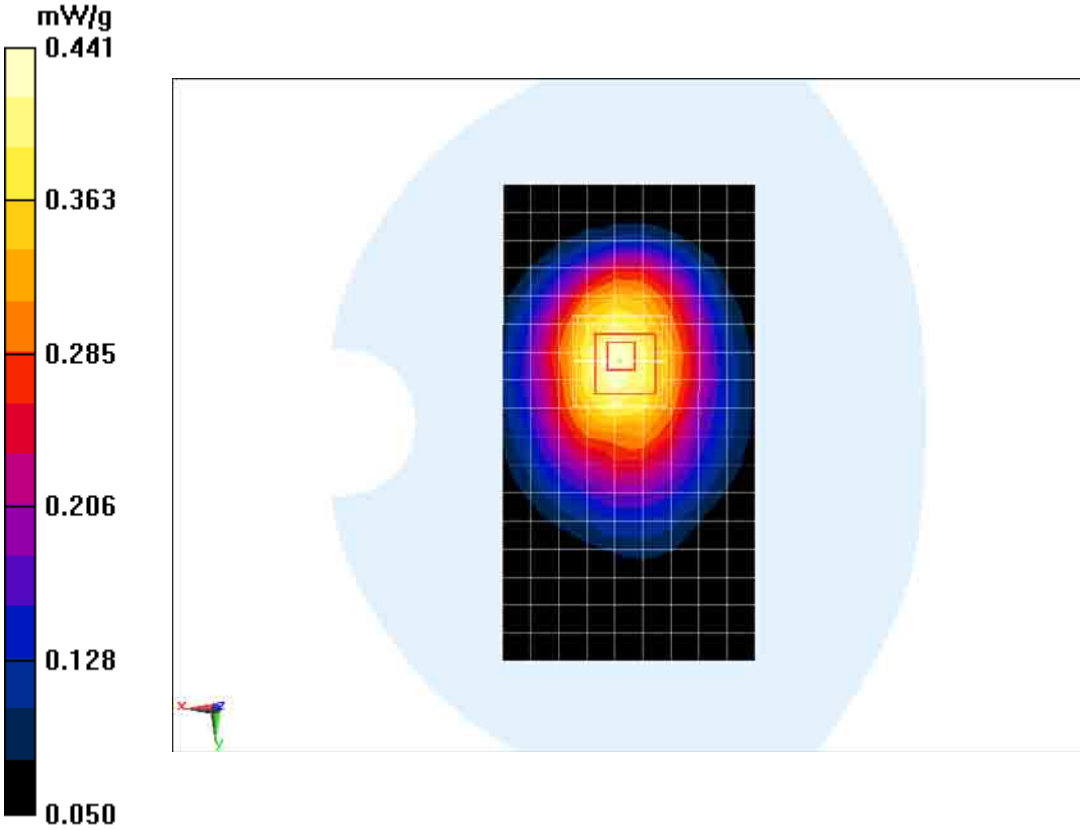
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 850 E-GPRS 2TS; Frequency: 836.6 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Toward Ground E-GPRS 2TS 850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.665 mW/g
Middle Toward Ground E-GPRS 2TS 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.261 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.827 mW/g
SAR(1 g) = 0.629 mW/g; SAR(10 g) = 0.460 mW/g
Maximum value of SAR (measured) = 0.663 mW/g

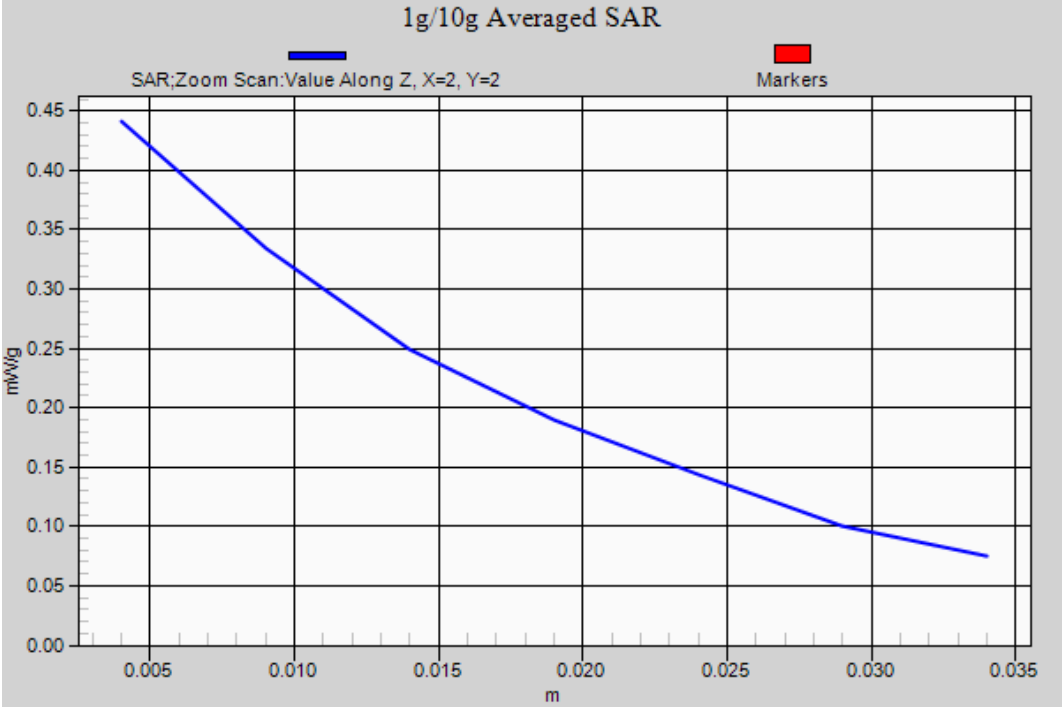



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM850 Body Toward Ground Middle With Headset

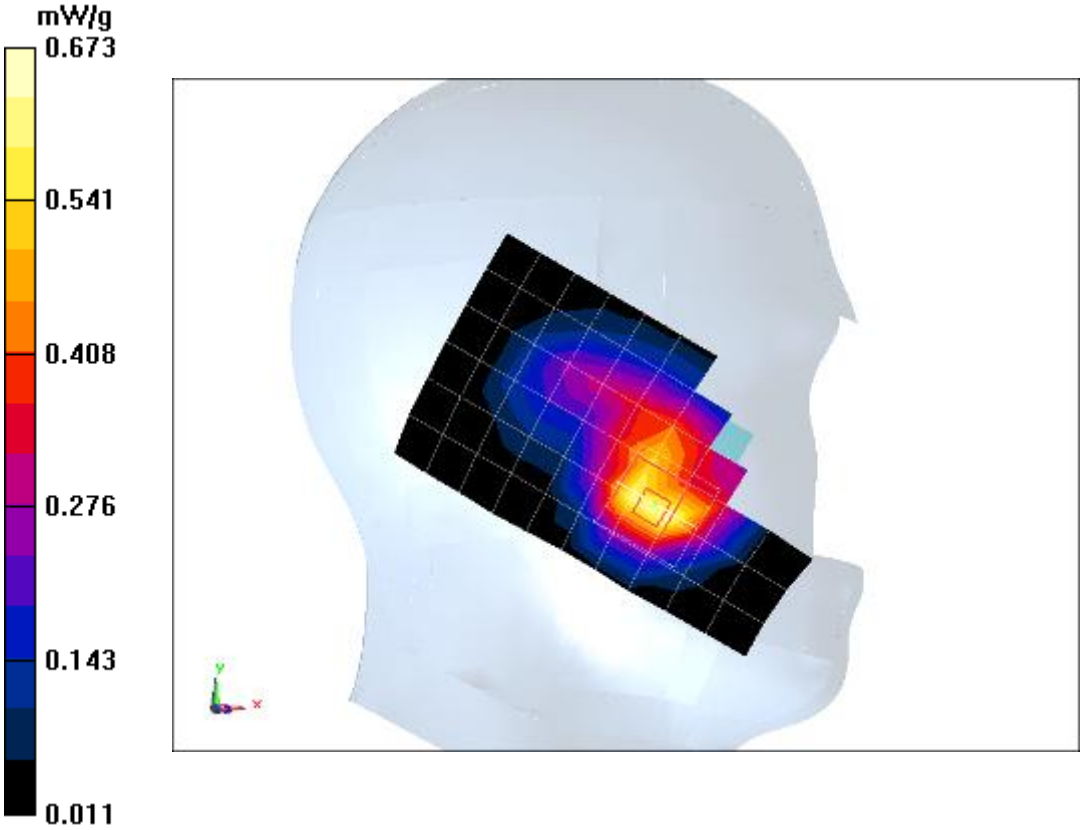
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Toward Ground With Headset 850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.443 mW/g
Middle Toward Ground With Headset 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.960 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.546 mW/g
SAR(1 g) = 0.417 mW/g; SAR(10 g) = 0.304 mW/g
Maximum value of SAR (measured) = 0.441 mW/g

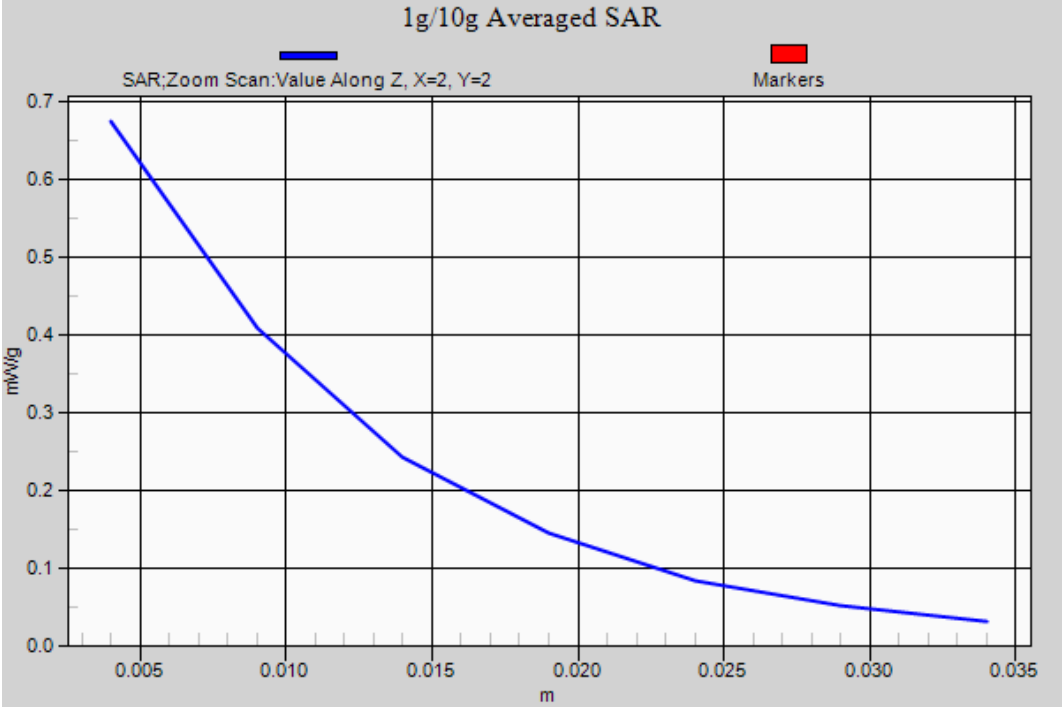



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Left Cheek Middle

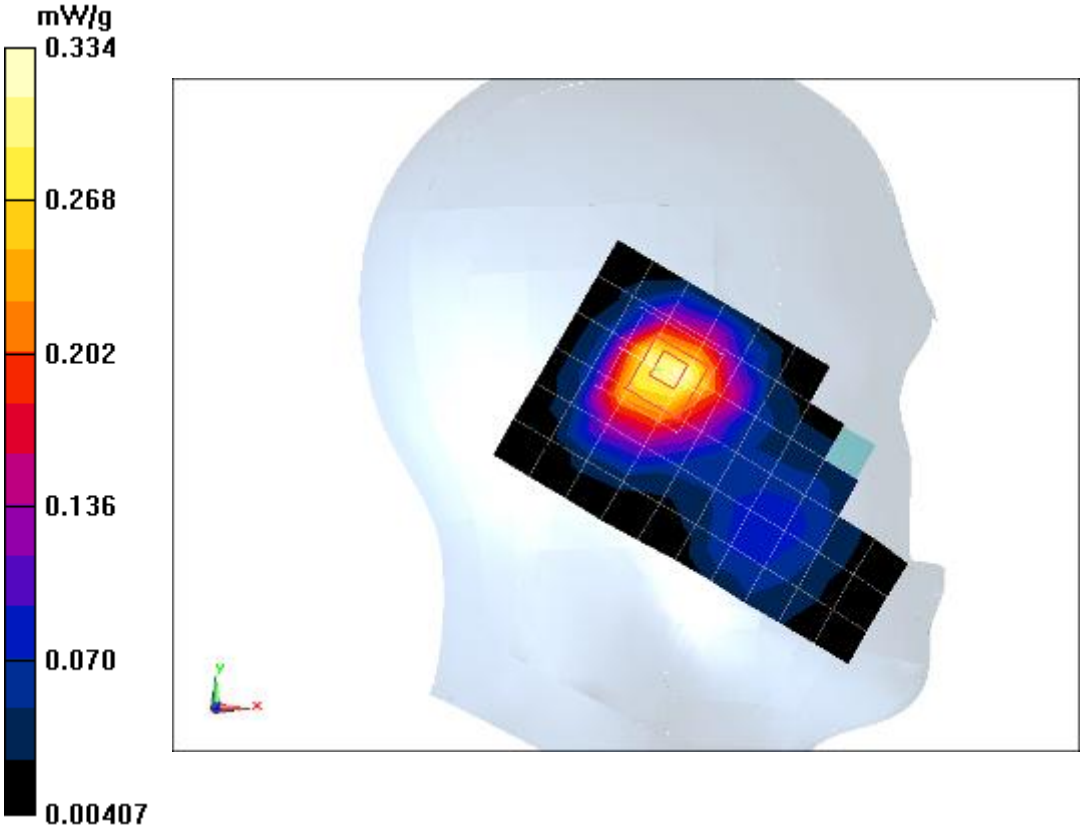
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 mho/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Middle Cheek Left GSM1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.642 mW/g
Middle Cheek Left GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.926 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 1.051 mW/g
SAR(1 g) = 0.622 mW/g; SAR(10 g) = 0.358 mW/g
Maximum value of SAR (measured) = 0.673 mW/g

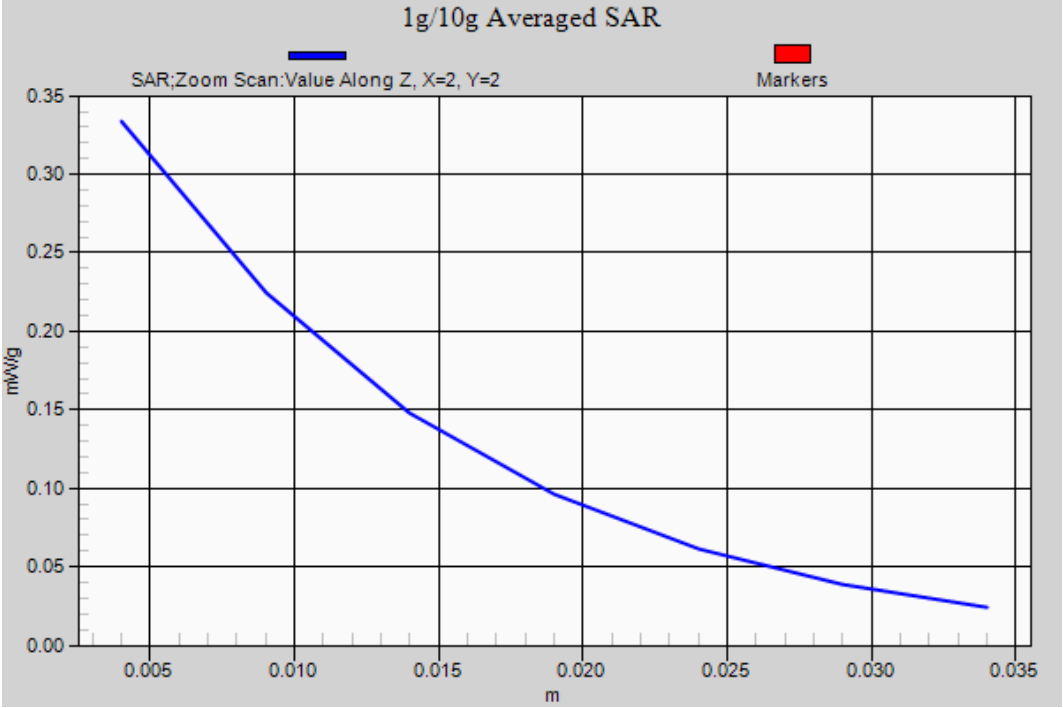



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Left Tilt Middle

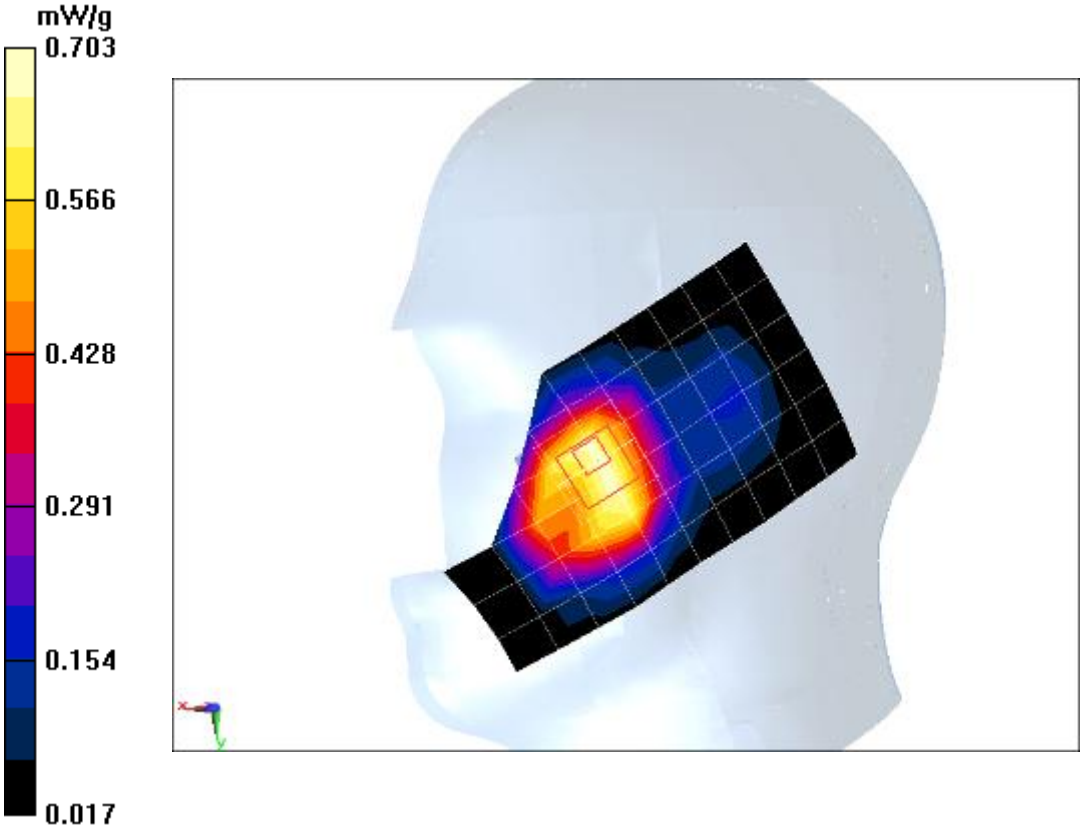
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 mho/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Middle Tilt Left GSM1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.323 mW/g
Middle Tilt Left GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.151 V/m; Power Drift = 0.082 dB
Peak SAR (extrapolated) = 0.472 mW/g
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.194 mW/g
Maximum value of SAR (measured) = 0.334 mW/g

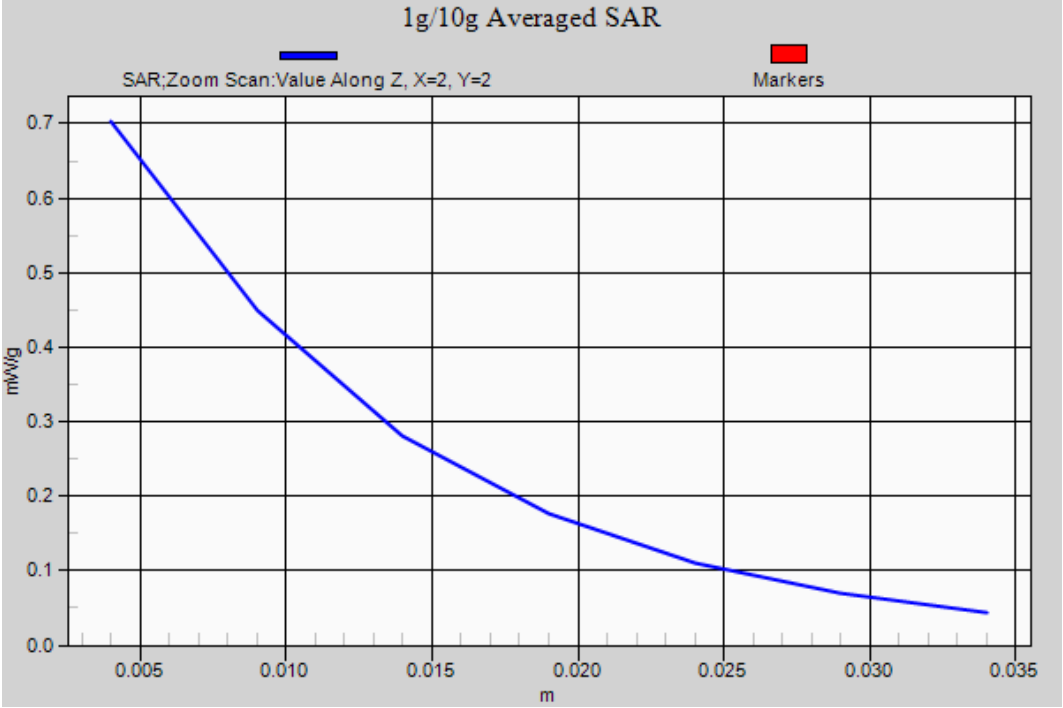



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Right Cheek Middle

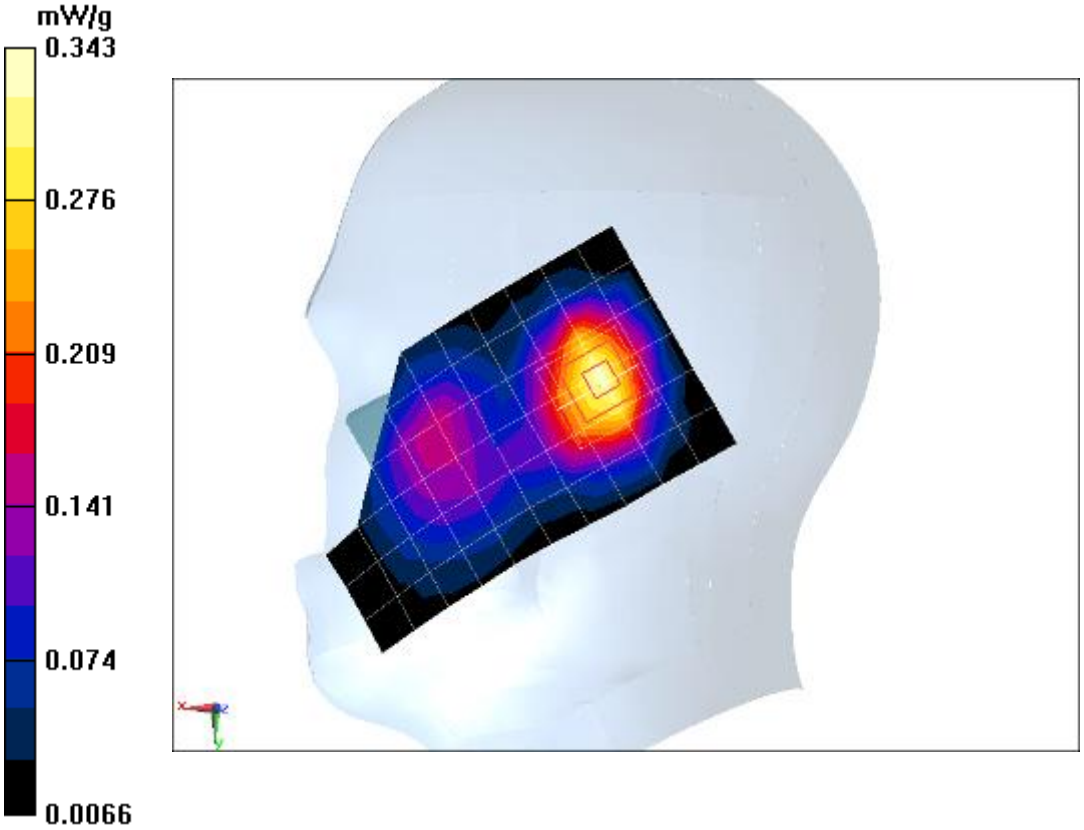
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 mho/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Middle Cheek Right GSM1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.700 mW/g
Middle Cheek Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.532 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 1.063 mW/g
SAR(1 g) = 0.659 mW/g; SAR(10 g) = 0.407 mW/g
Maximum value of SAR (measured) = 0.703 mW/g

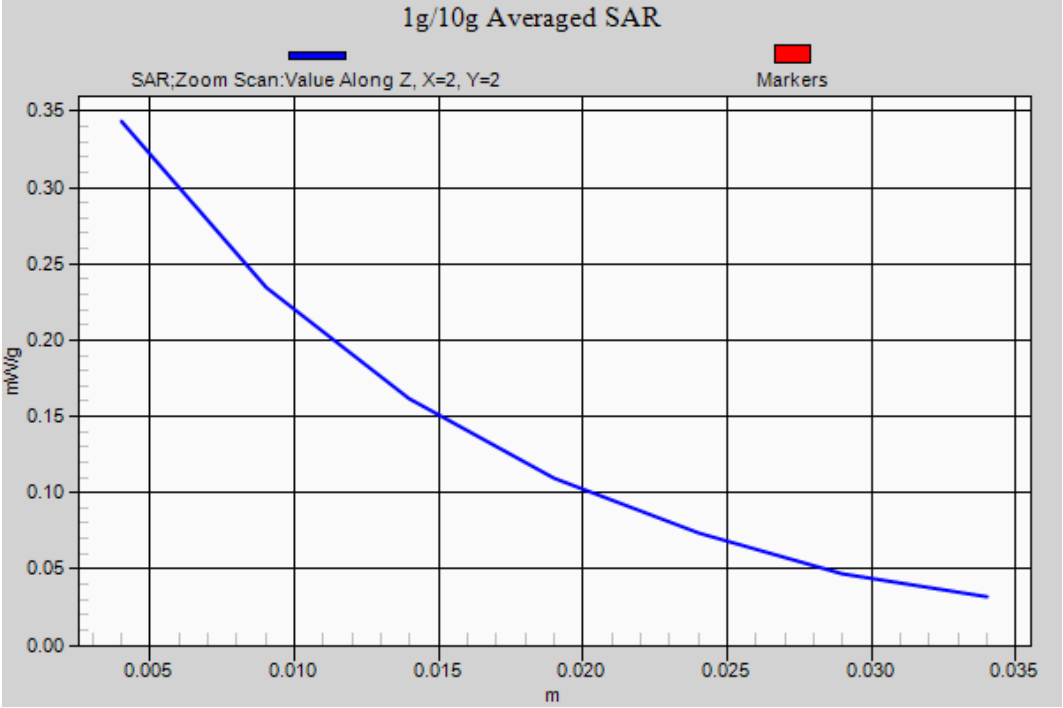



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Right Tilt Middle

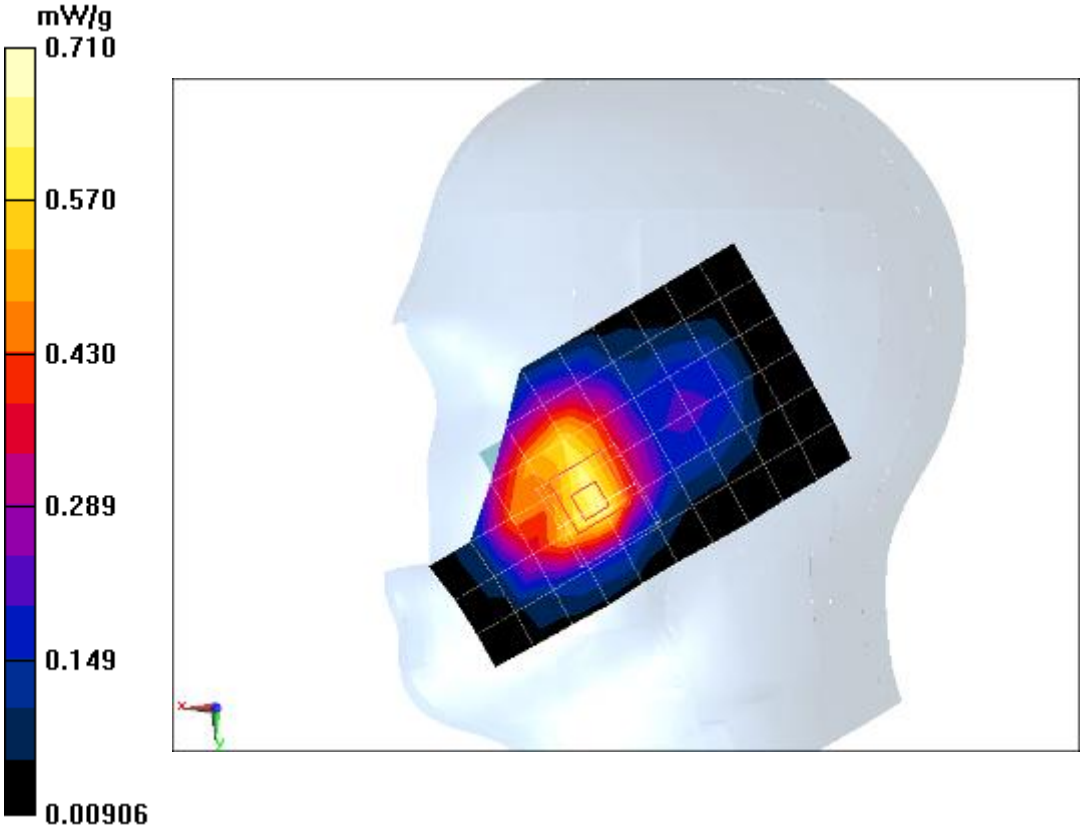
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 mho/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Middle Tilt Right GSM1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.344 mW/g
Middle Tilt Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.309 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 0.471 mW/g
SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.202 mW/g
Maximum value of SAR (measured) = 0.343 mW/g

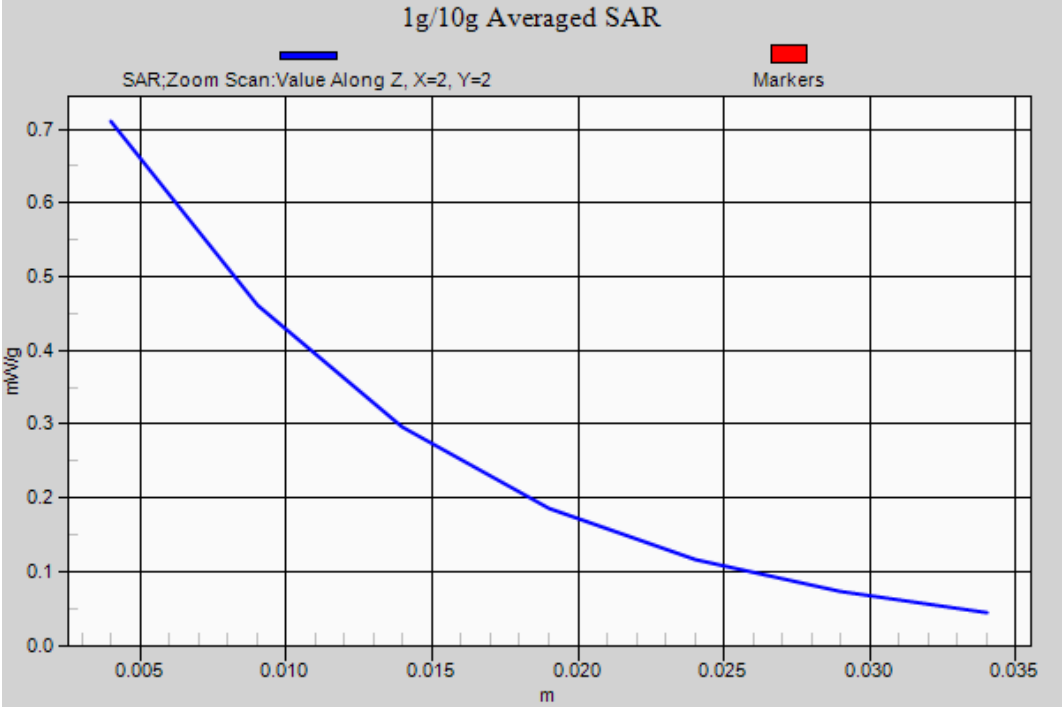



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Right Cheek High

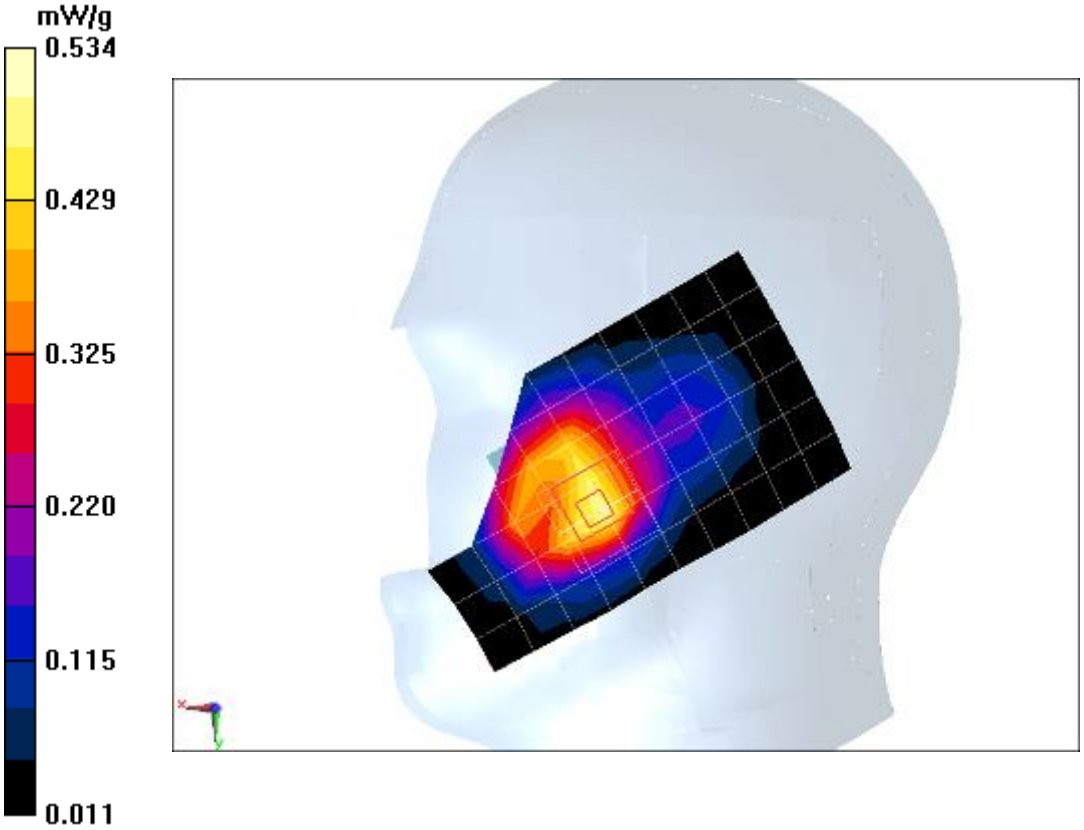
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.469 mho/m; εr = 40.495; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
High Cheek Right GSM1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.642 mW/g
High Cheek Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.668 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 1.020 mW/g
SAR(1 g) = 0.650 mW/g; SAR(10 g) = 0.396 mW/g
Maximum value of SAR (measured) = 0.710 mW/g

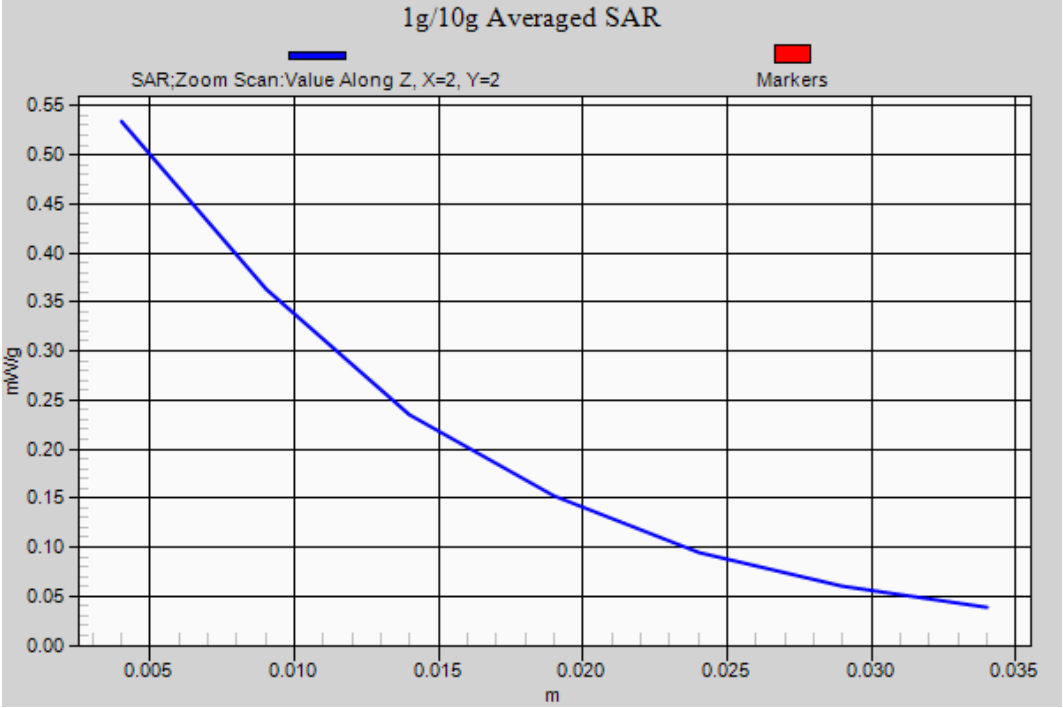



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Right Cheek Low

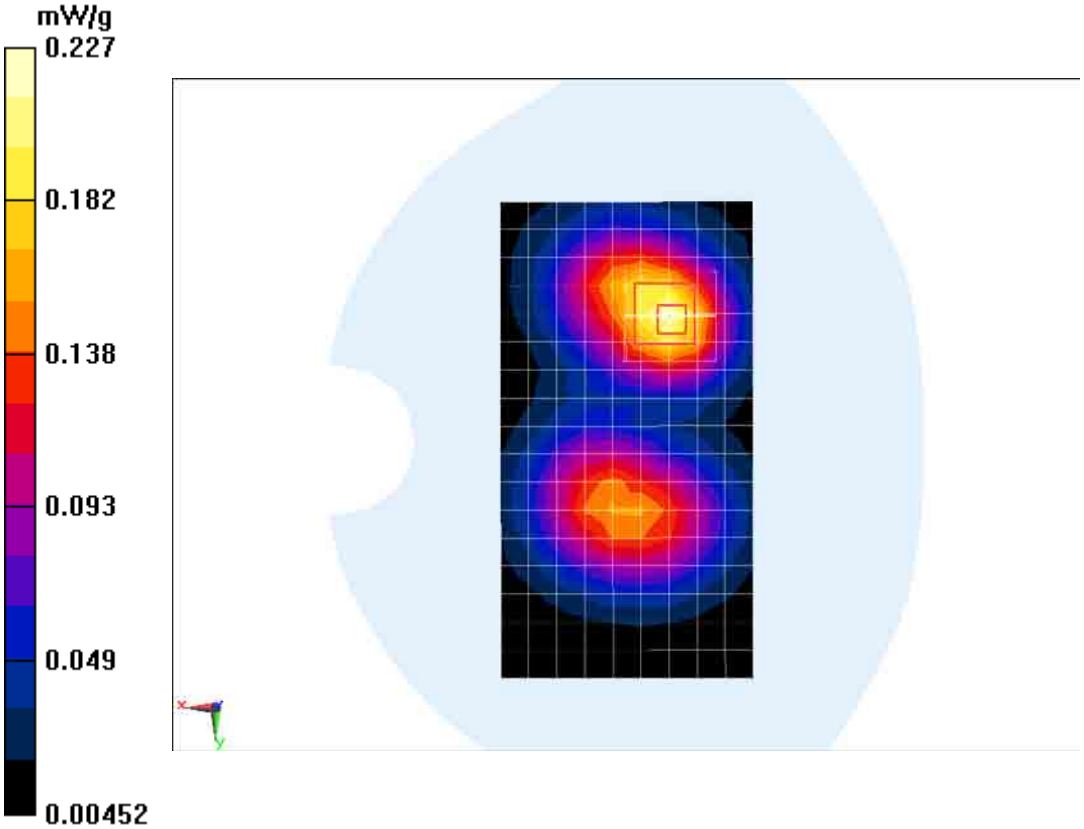
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.415 mho/m; εr = 40.792; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Low Cheek Right GSM1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.487 mW/g
Low Cheek Right GSM1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.087 V/m; Power Drift = -0.079 dB
Peak SAR (extrapolated) = 0.746 mW/g
SAR(1 g) = 0.488 mW/g; SAR(10 g) = 0.300 mW/g
Maximum value of SAR (measured) = 0.534 mW/g

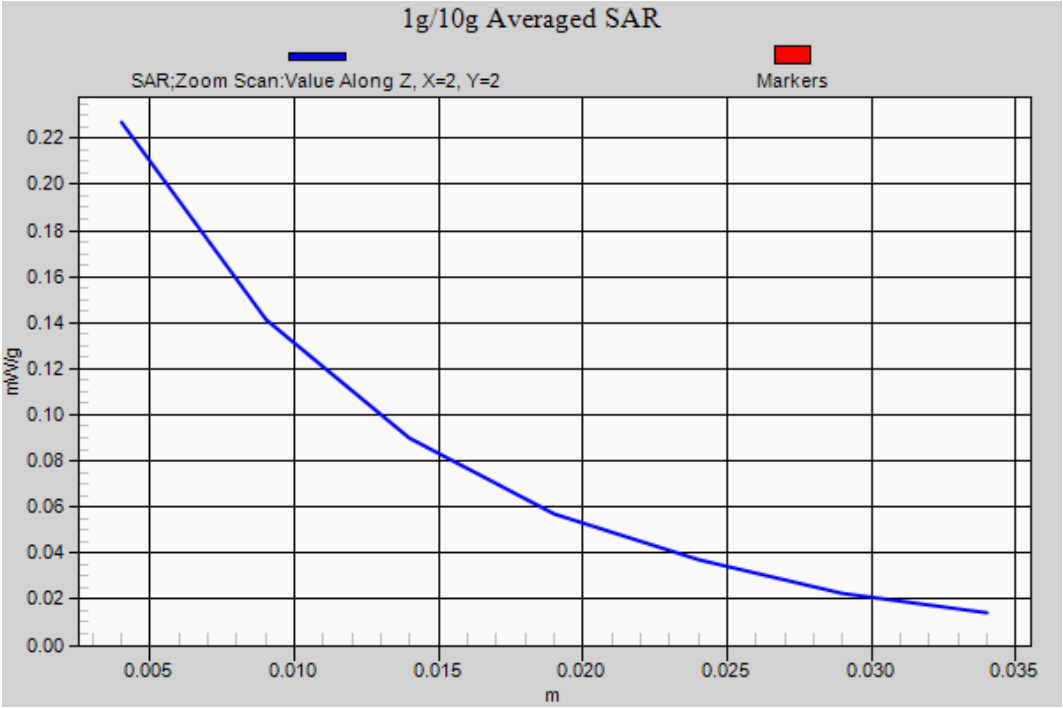



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Toward Phontom Middle GPRS 2TS

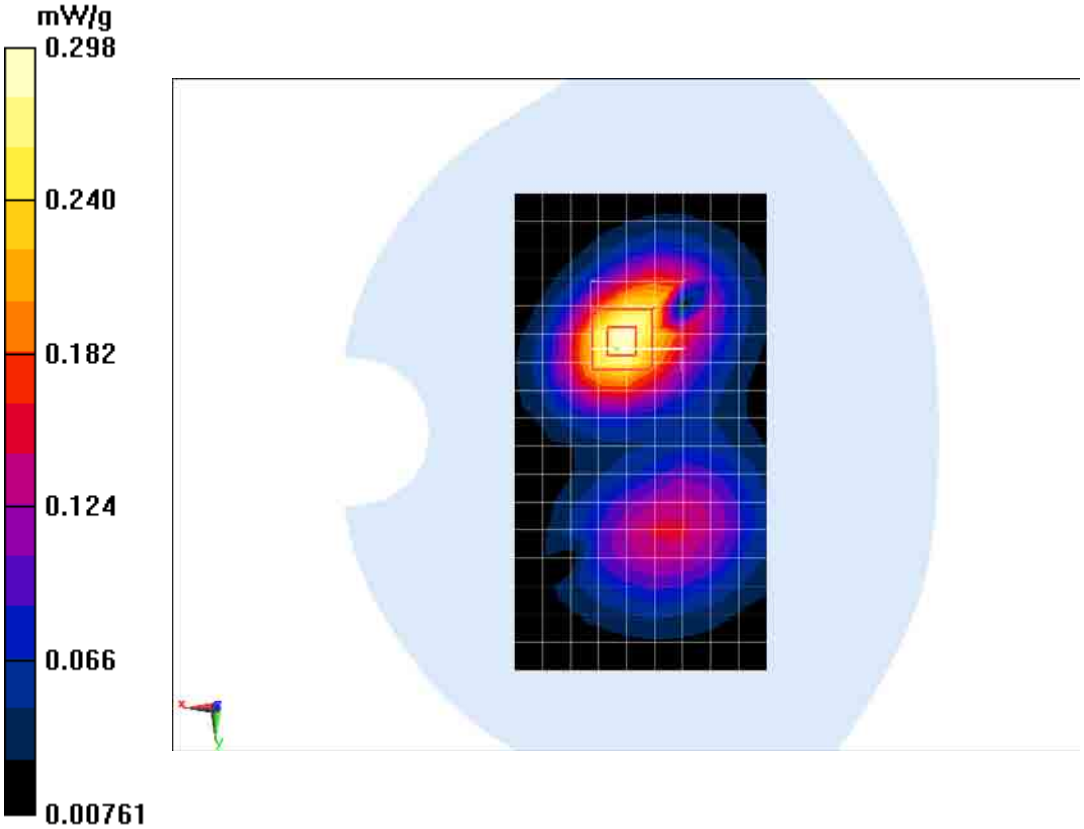
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 1900MHz GPRS 2TS; Frequency: 1880 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Toward Phontom GPRS 2TS 1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.224 mW/g
Middle Toward Phontom GPRS 2TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.893 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.345 mW/g
SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.126 mW/g
Maximum value of SAR (measured) = 0.227 mW/g

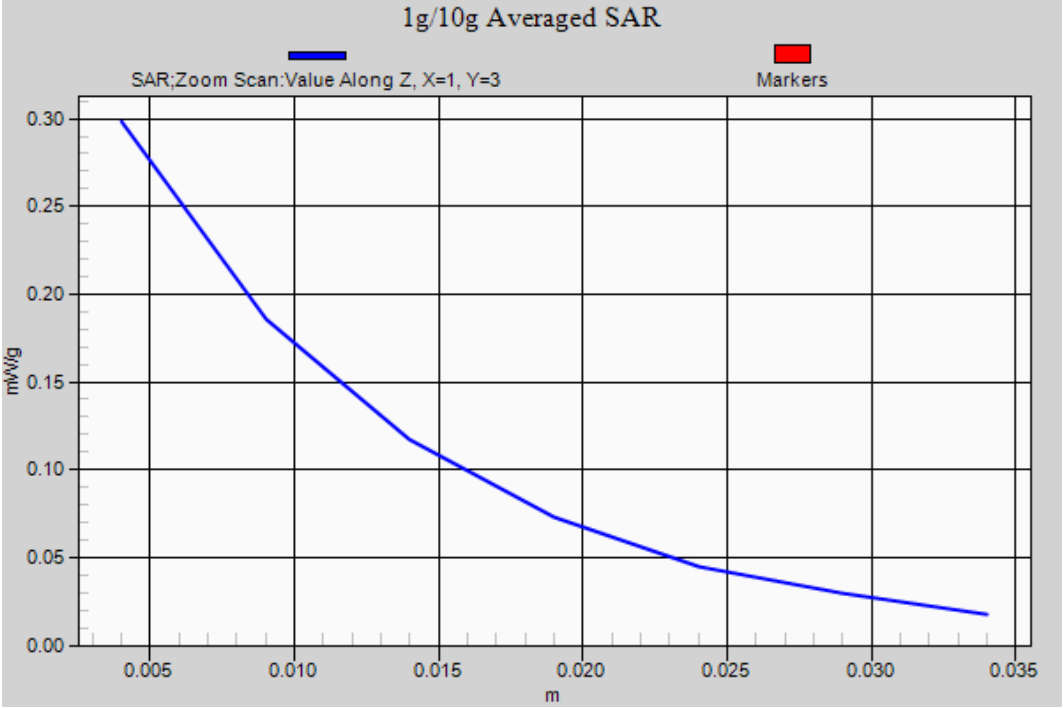



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Toward Ground Middle GPRS 2TS

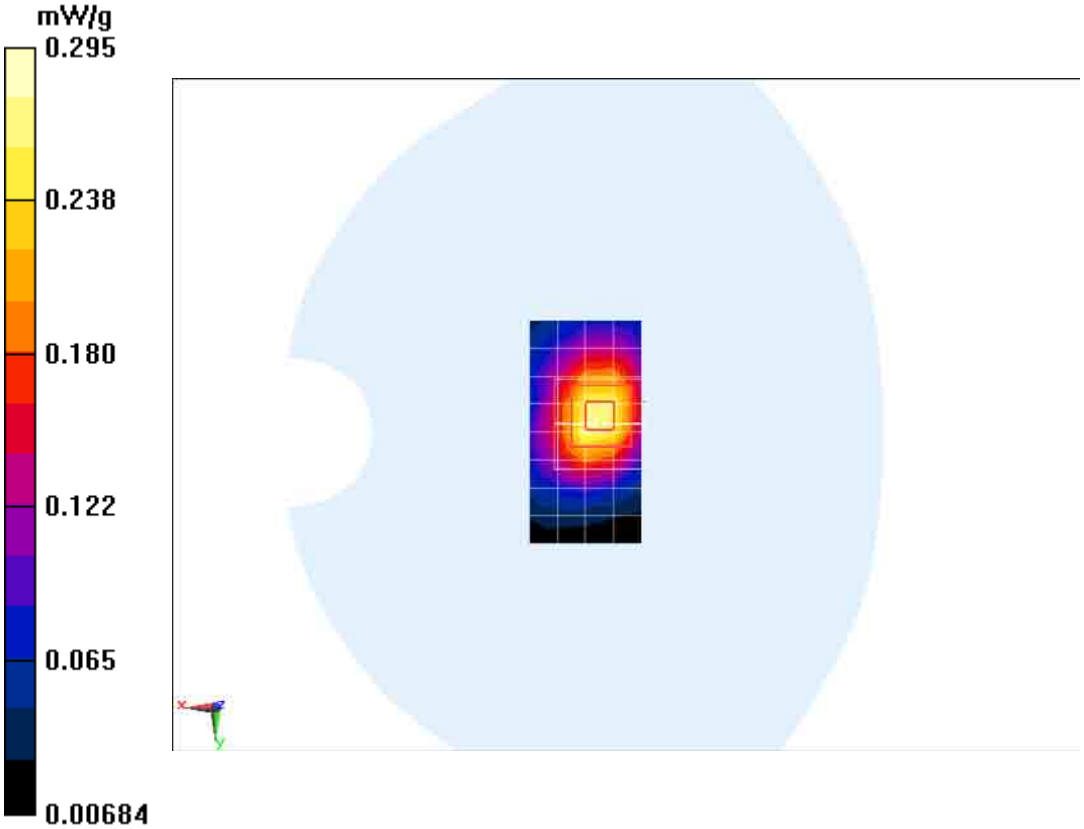
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 1900MHz GPRS 2TS; Frequency: 1880 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Toward Ground GPRS 2TS 1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.302 mW/g
Middle Toward Ground GPRS 2TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.034 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 0.444 mW/g
SAR(1 g) = 0.272 mW/g; SAR(10 g) = 0.162 mW/g
Maximum value of SAR (measured) = 0.298 mW/g

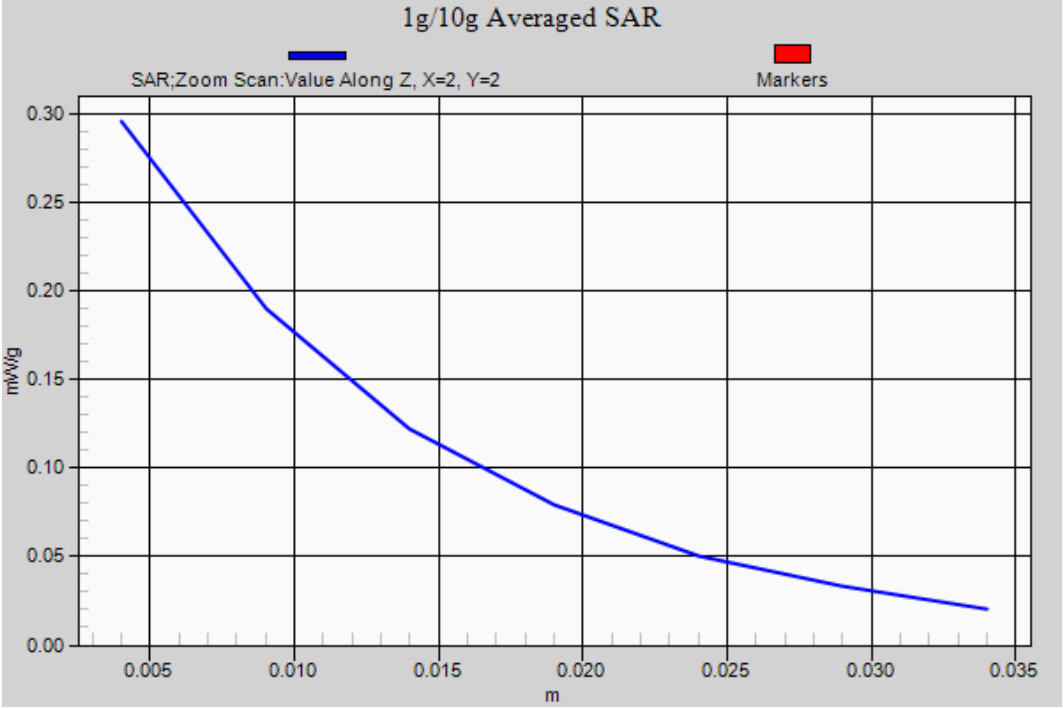



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=1, Y=3
Markers
mW/g
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Bottom Middle GPRS 2TS

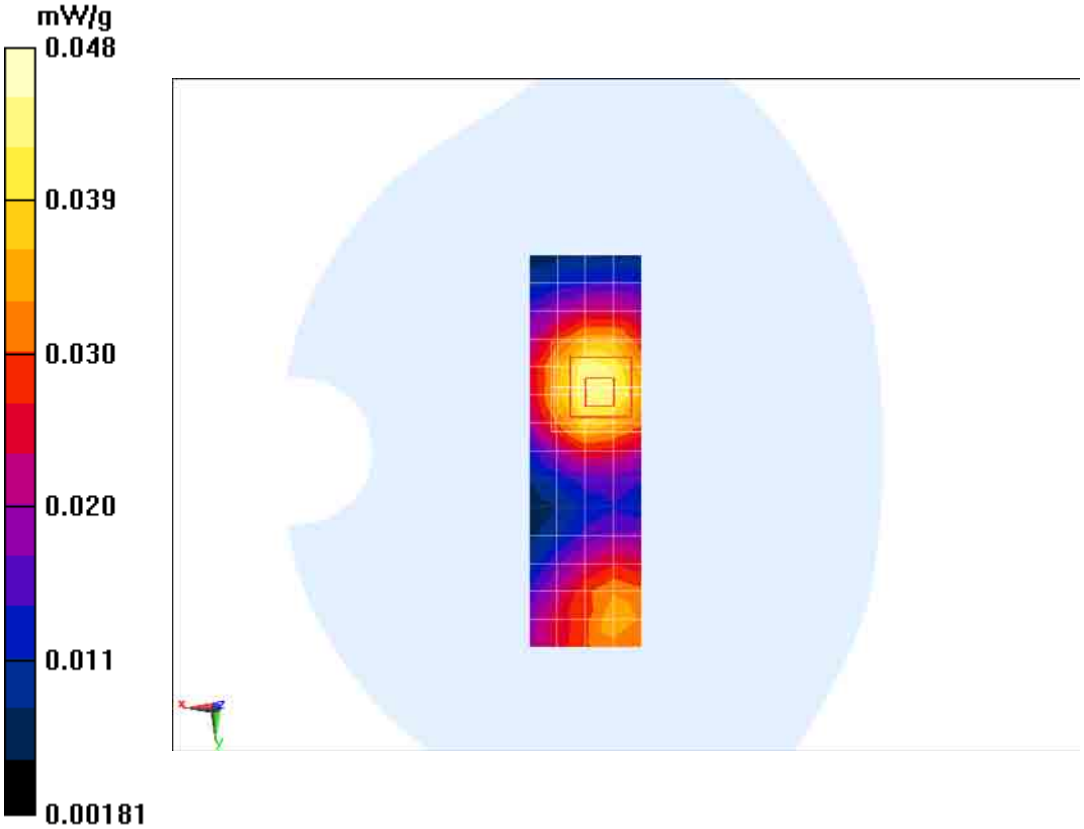
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 1900MHz GPRS 2TS; Frequency: 1880 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Bottom GSM GPRS 2TS 1900MHz/Area Scan (5x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.271 mW/g
Middle Bottom GPRS 2TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.195 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.425 mW/g
SAR(1 g) = 0.268 mW/g; SAR(10 g) = 0.159 mW/g
Maximum value of SAR (measured) = 0.295 mW/g

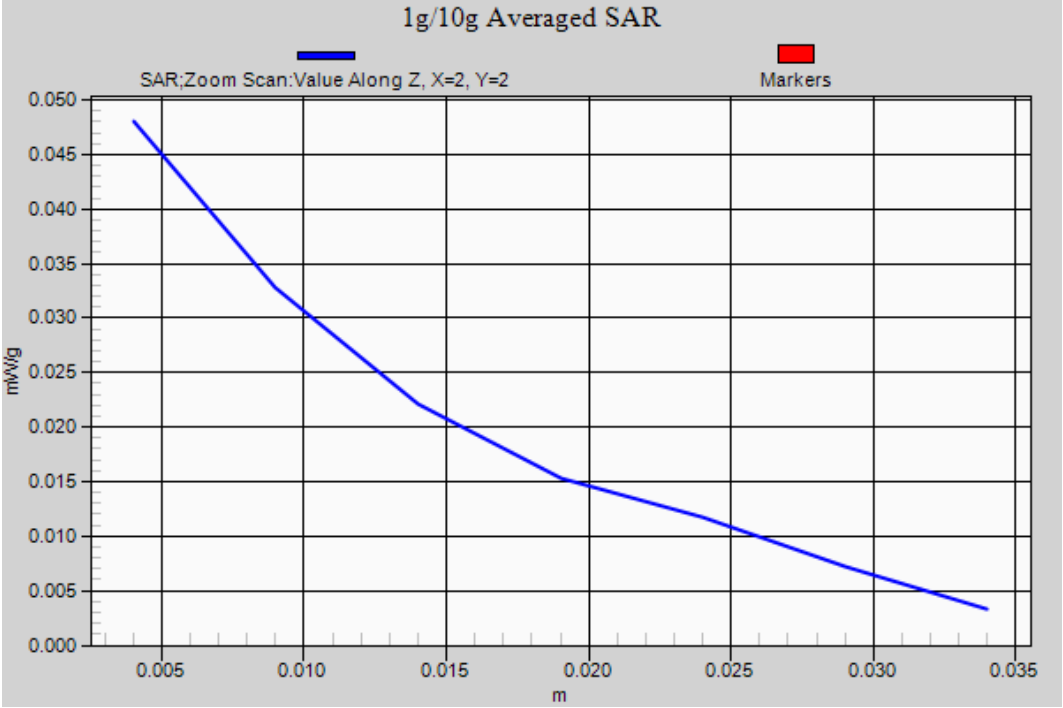



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Left Middle GPRS 2TS

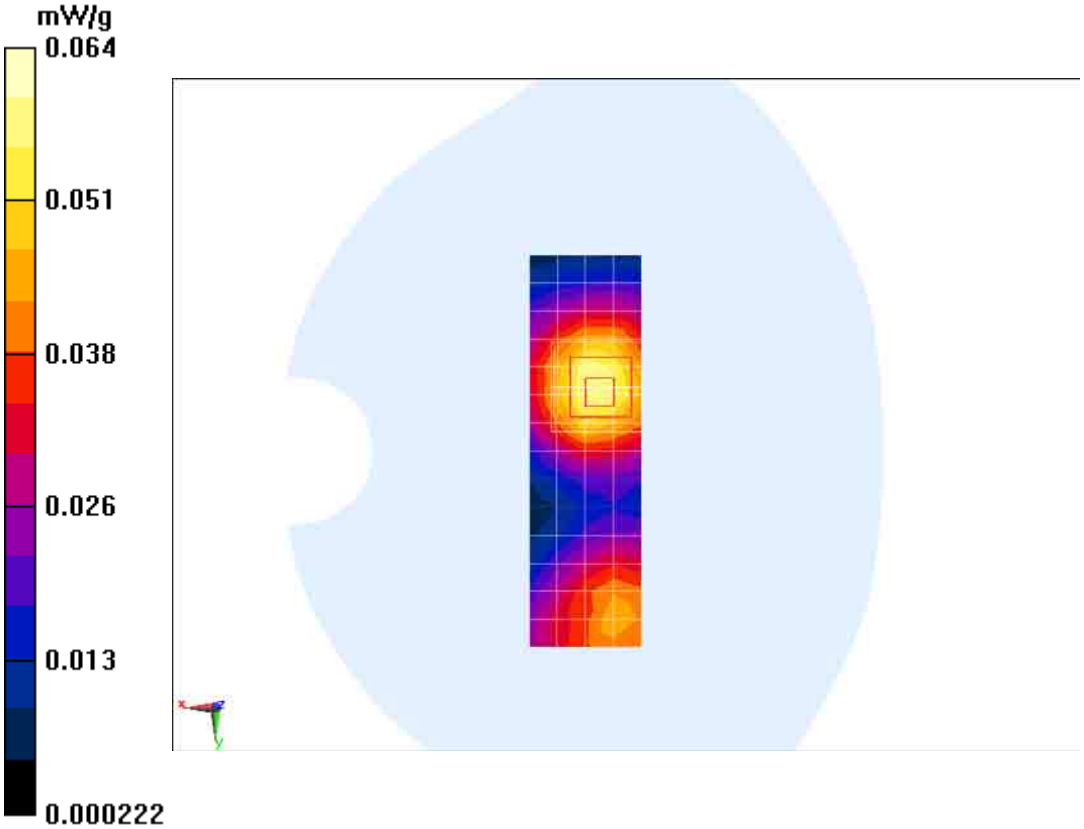
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 1900MHz GPRS 2TS; Frequency: 1880 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Left GPRS 2TS 1900MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.048 mW/g
Middle Left GPRS 2TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.858 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.064 mW/g
SAR(1 g) = 0.045 mW/g; SAR(10 g) = 0.029 mW/g
Maximum value of SAR (measured) = 0.048 mW/g

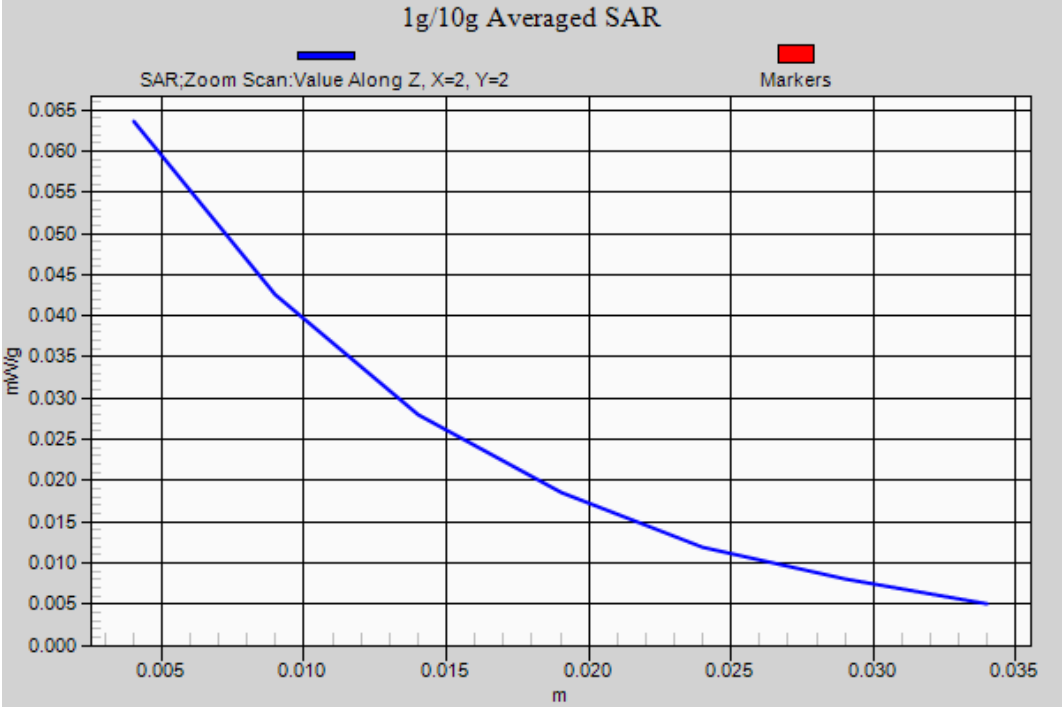



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Right Middle GPRS 2TS

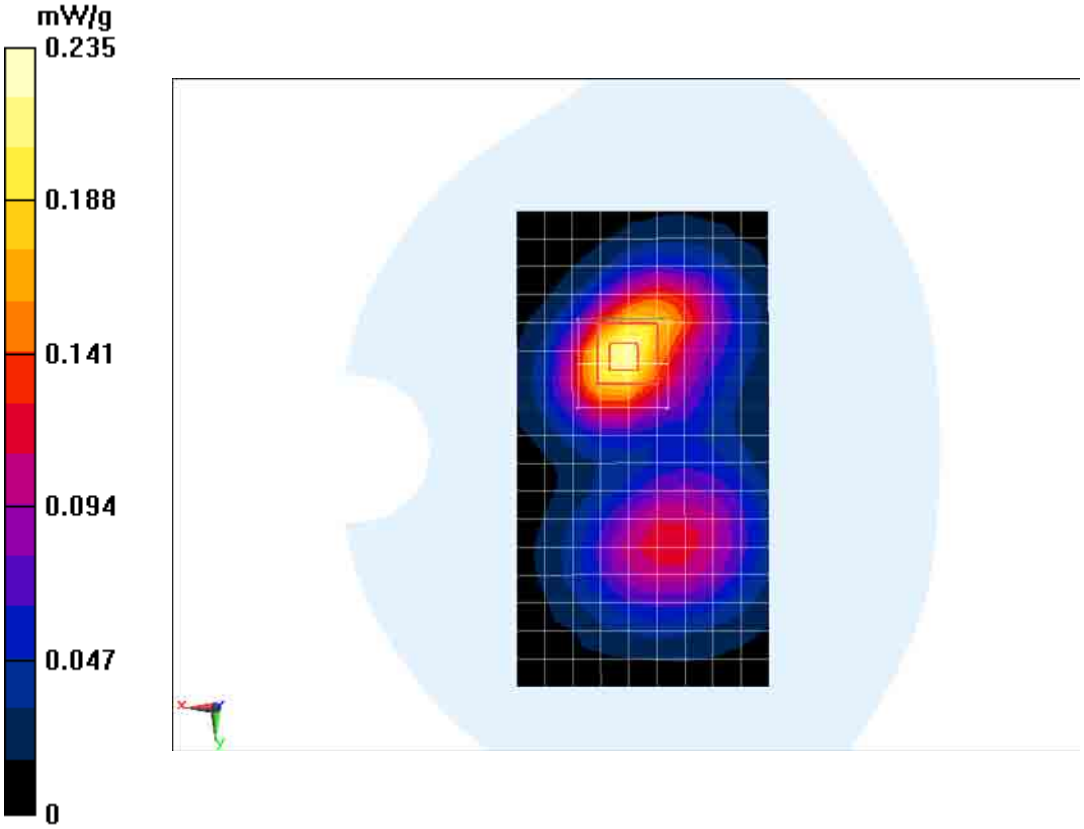
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 1900MHz GPRS 2TS; Frequency: 1880 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Right GPRS 2TS 1900MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.059 mW/g
Middle Right GPRS 2TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.845 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 0.090 mW/g
SAR(1 g) = 0.059 mW/g; SAR(10 g) = 0.038 mW/g
Maximum value of SAR (measured) = 0.064 mW/g

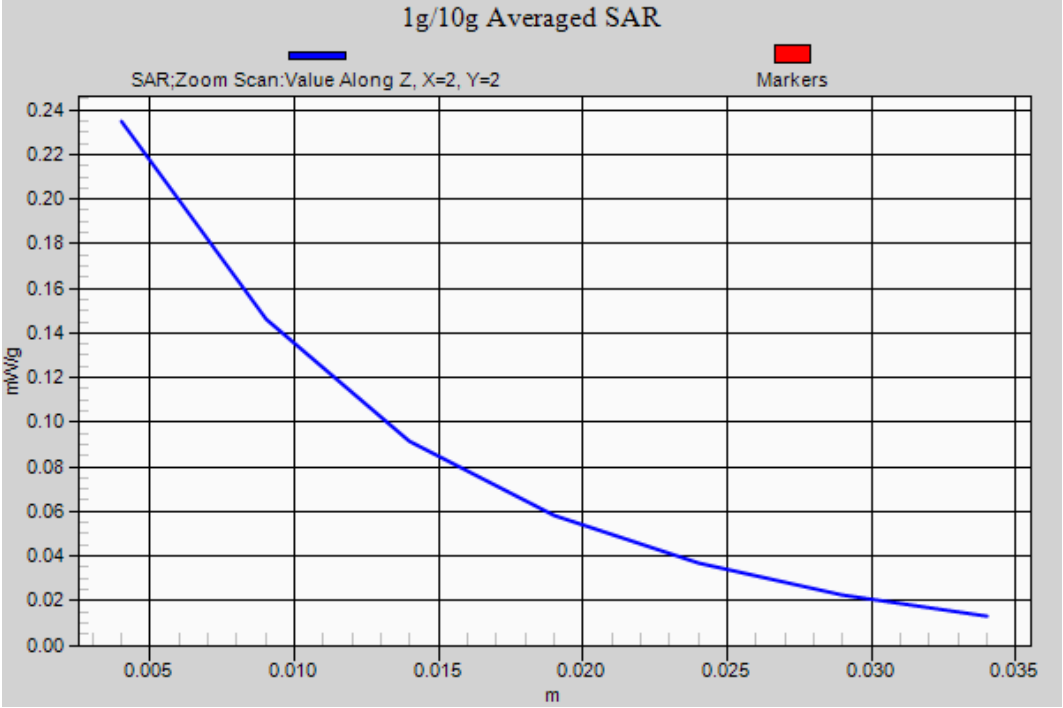



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Toward Ground Low GPRS 2TS

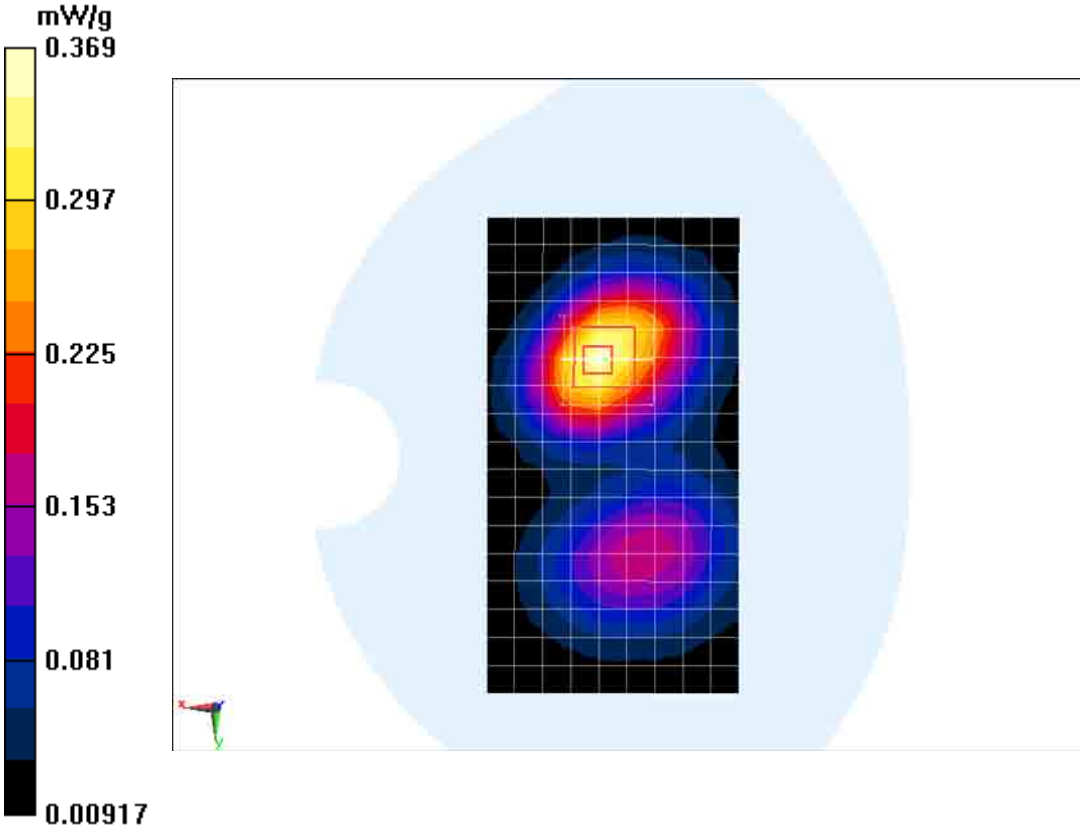
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.475 mho/m; εr = 53.44; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 1900MHz GPRS 2TS; Frequency: 1850.2 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Low Toward Ground GPRS 2TS 1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.227 mW/g
Low Toward Ground GPRS 2TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.651 V/m; Power Drift = -0.0071 dB
Peak SAR (extrapolated) = 0.353 mW/g
SAR(1 g) = 0.214 mW/g; SAR(10 g) = 0.126 mW/g
Maximum value of SAR (measured) = 0.235 mW/g

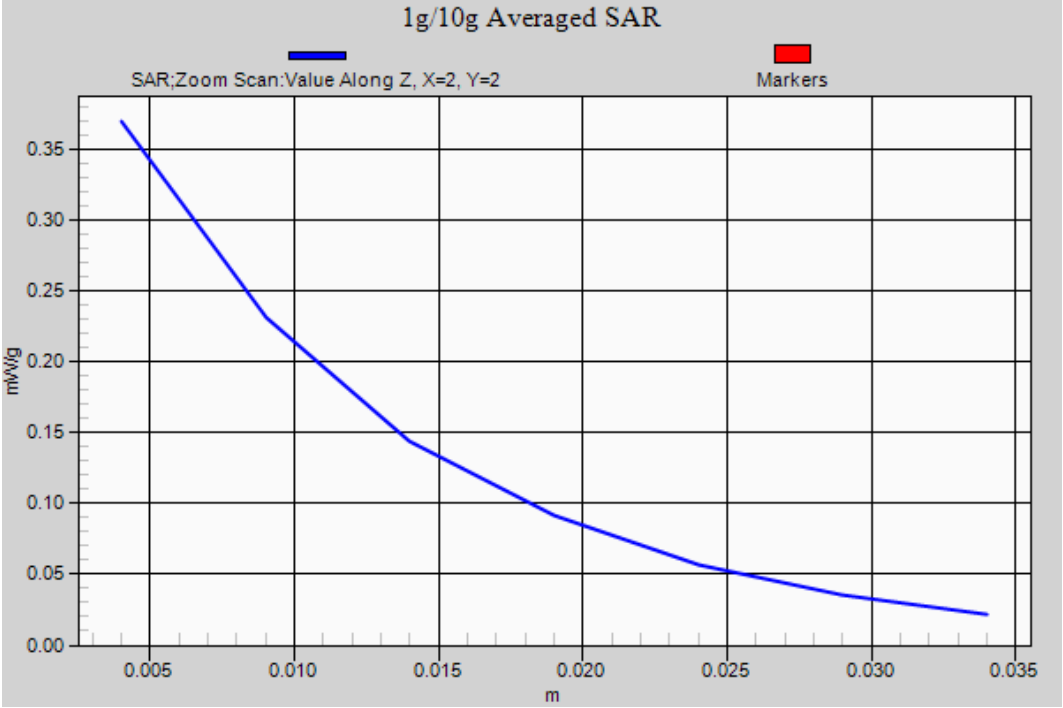



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Toward Ground High GPRS 2TS

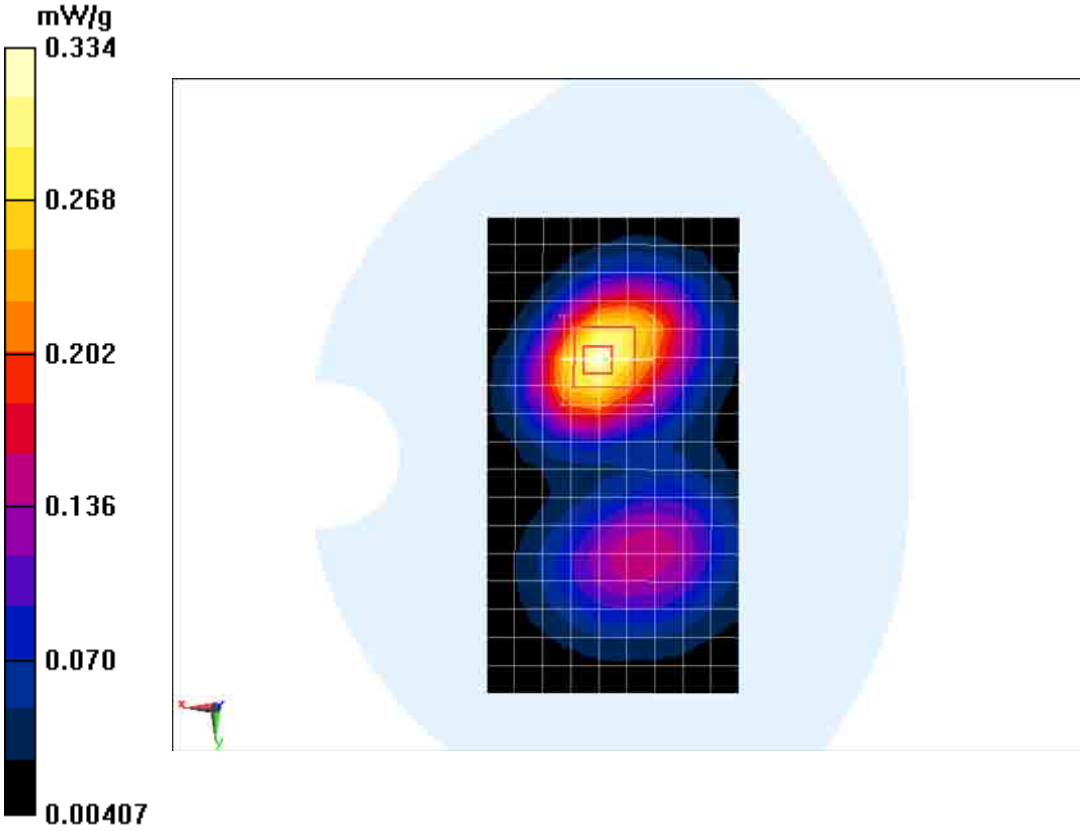
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.534 mho/m; εr = 53.187; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 1900MHz GPRS 2TS; Frequency: 1909.8 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
High Toward Ground GPRS 2TS 1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.366 mW/g
High Toward Ground GPRS 2TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.586 V/m; Power Drift = -0.068 dB
Peak SAR (extrapolated) = 0.573 mW/g
SAR(1 g) = 0.347 mW/g; SAR(10 g) = 0.207 mW/g
Maximum value of SAR (measured) = 0.369 mW/g

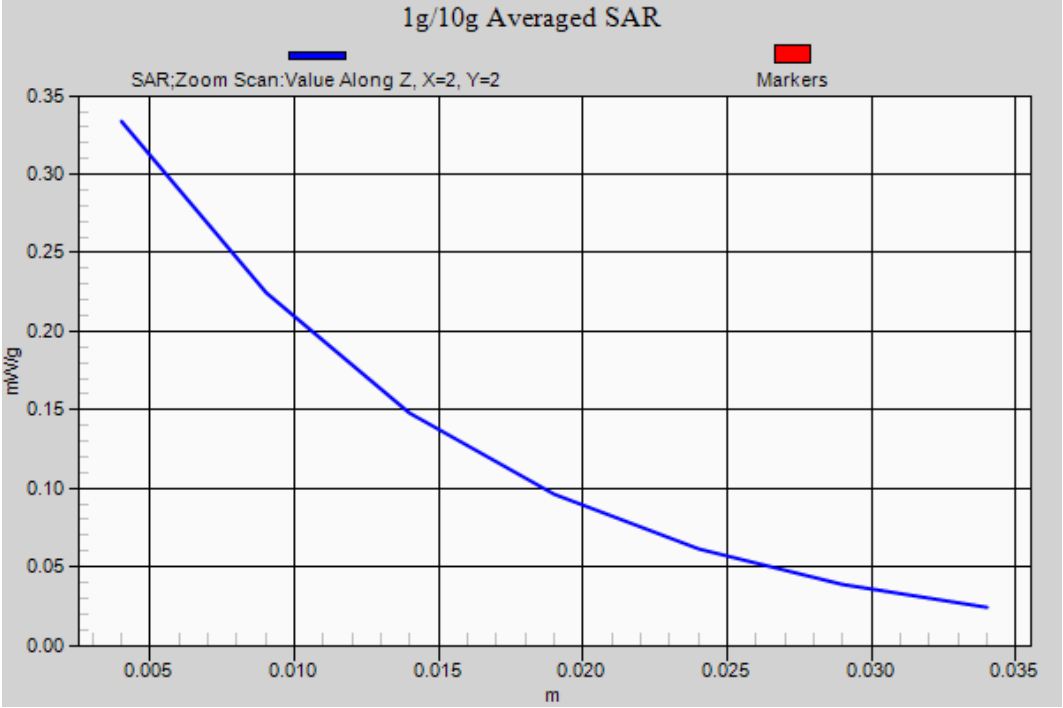



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Toward Ground High E-GPRS 2TS

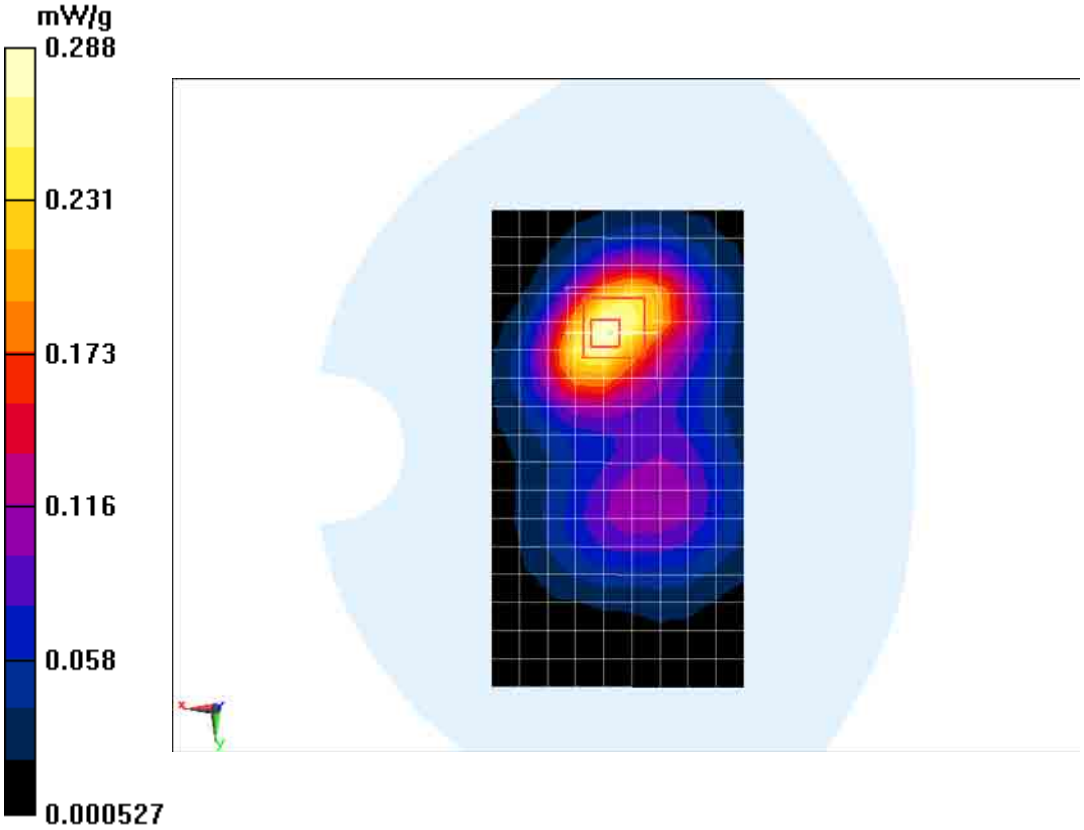
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.534 mho/m; εr = 53.187; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM 1900MHz E-GPRS 2TS; Frequency: 1909.8 MHz; Duty Cycle: 1:4
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
High Toward Ground E-GPRS 2TS 1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.366 mW/g
High Toward Ground E-GPRS 2TS 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.137 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.563 mW/g
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.198 mW/g
Maximum value of SAR (measured) = 0.334 mW/g

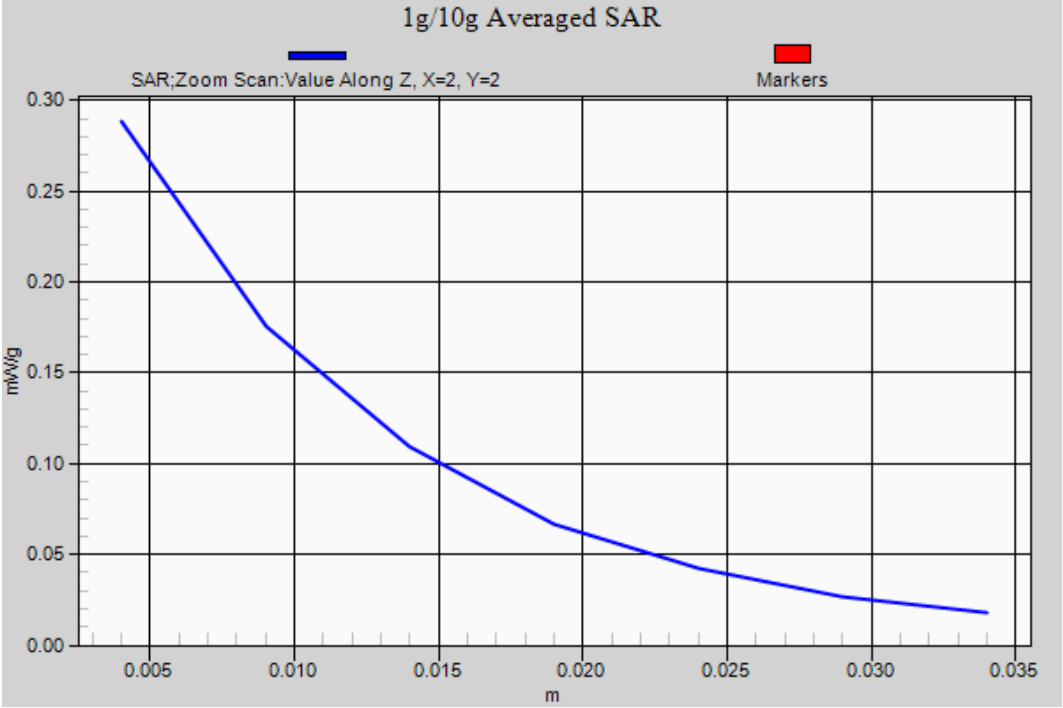



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

GSM1900 Body Toward Ground High With Headset

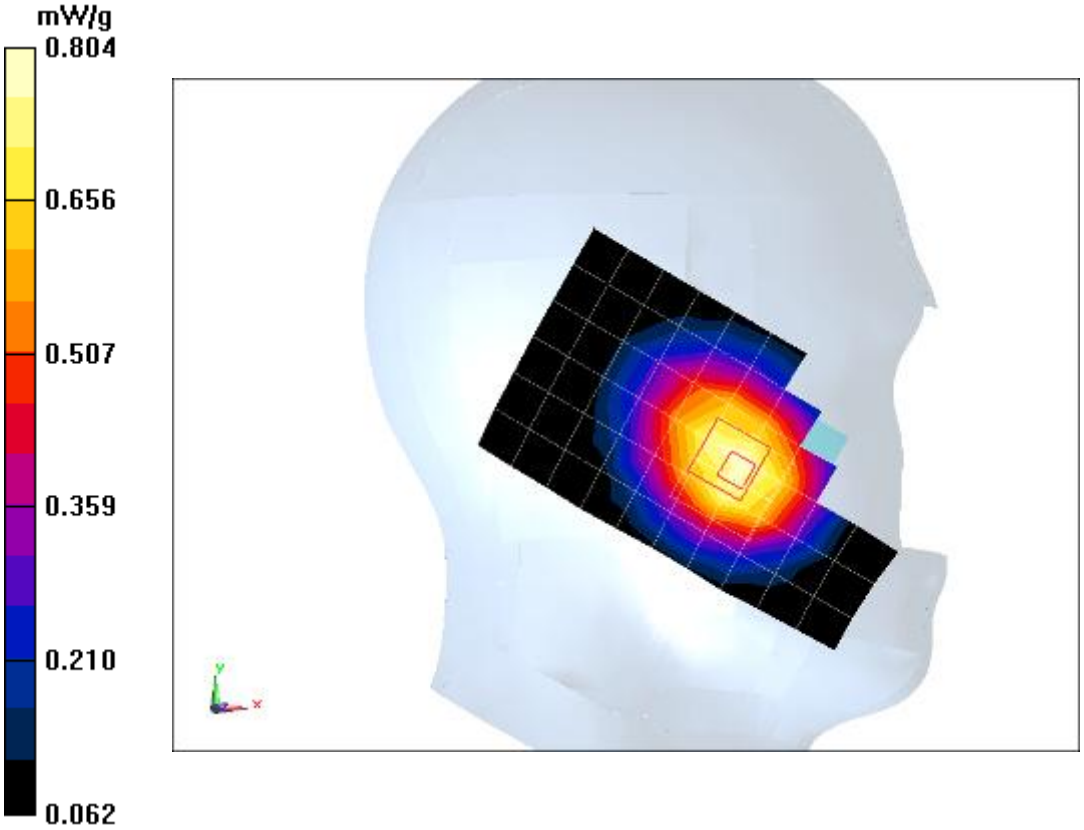
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.475 mho/m; εr = 53.44; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: GSM Professional; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
High Toward Ground GSM1900MHz With Headset/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.285 mW/g
High Toward Ground GSM1900MHz With Headset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.392 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.442 mW/g
SAR(1 g) = 0.267 mW/g; SAR(10 g) = 0.160 mW/g
Maximum value of SAR (measured) = 0.288 mW/g

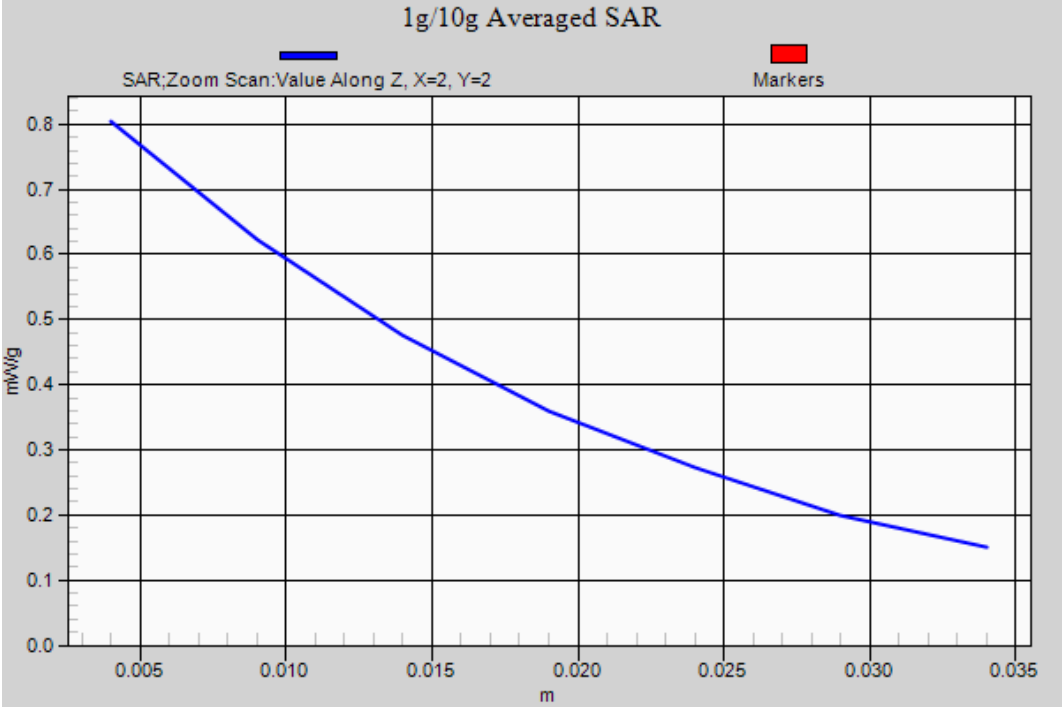



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Left Cheek Middle

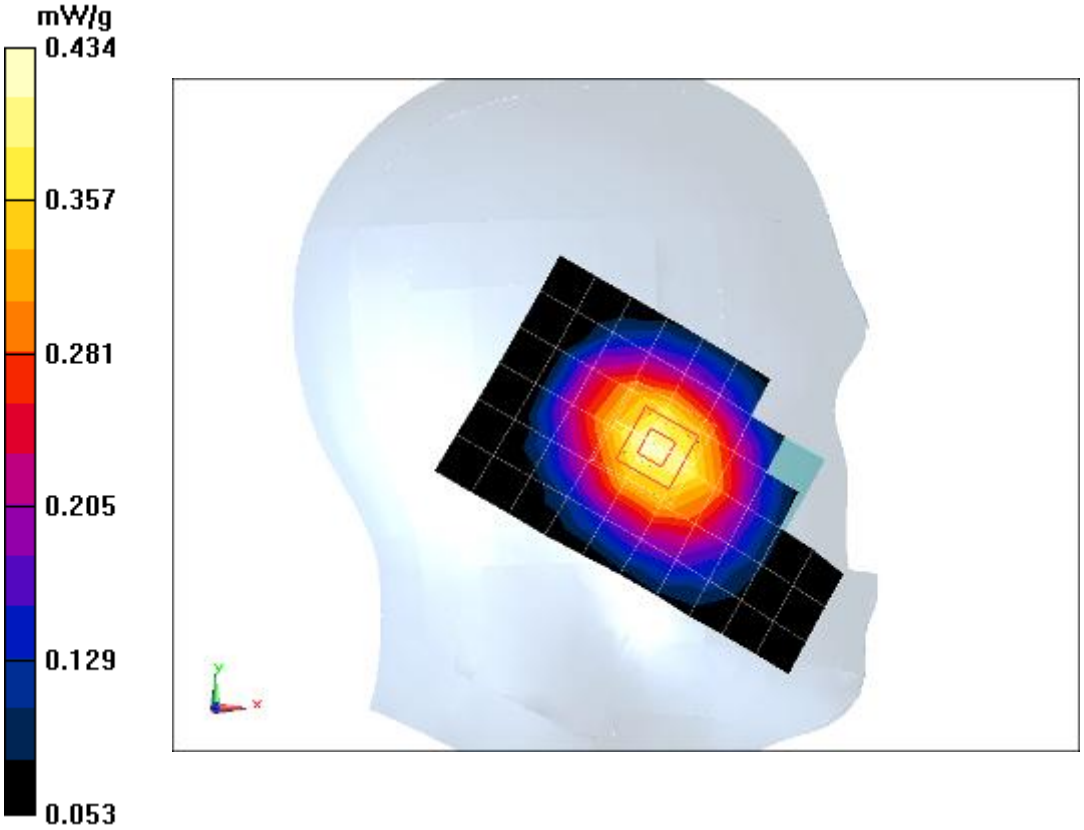
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.91 mho/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Cheek Left WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.805 mW/g
Middle Cheek Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.709 V/m; Power Drift = 0.087 dB
Peak SAR (extrapolated) = 0.991 mW/g
SAR(1 g) = 0.766 mW/g; SAR(10 g) = 0.574 mW/g
Maximum value of SAR (measured) = 0.804 mW/g

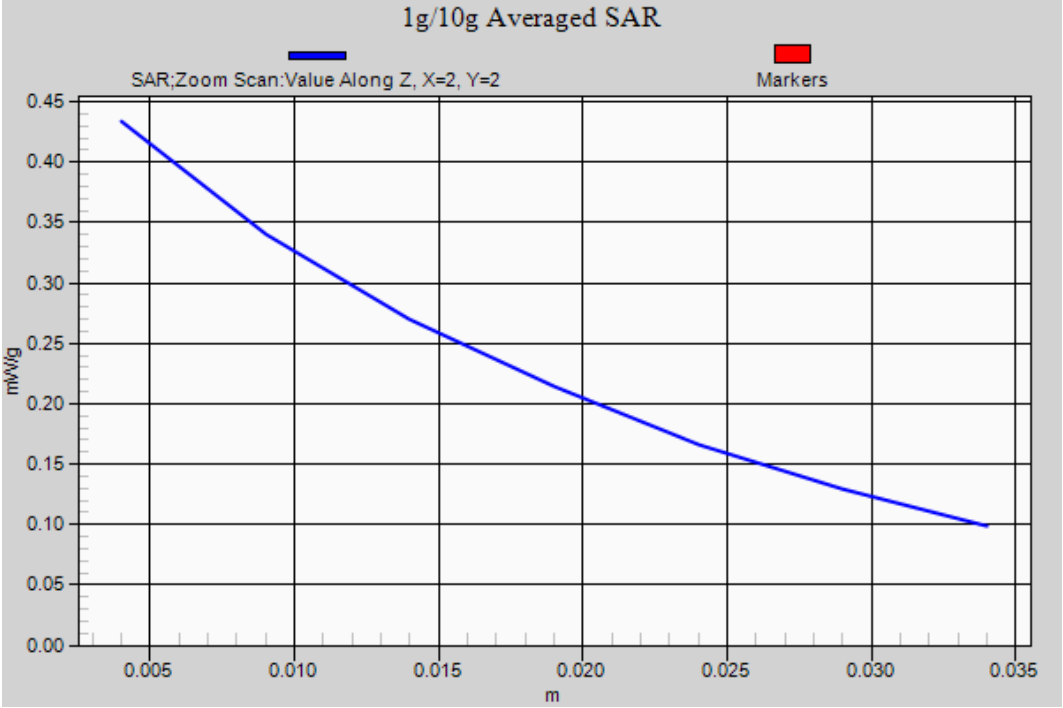



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Left Tilt Middle

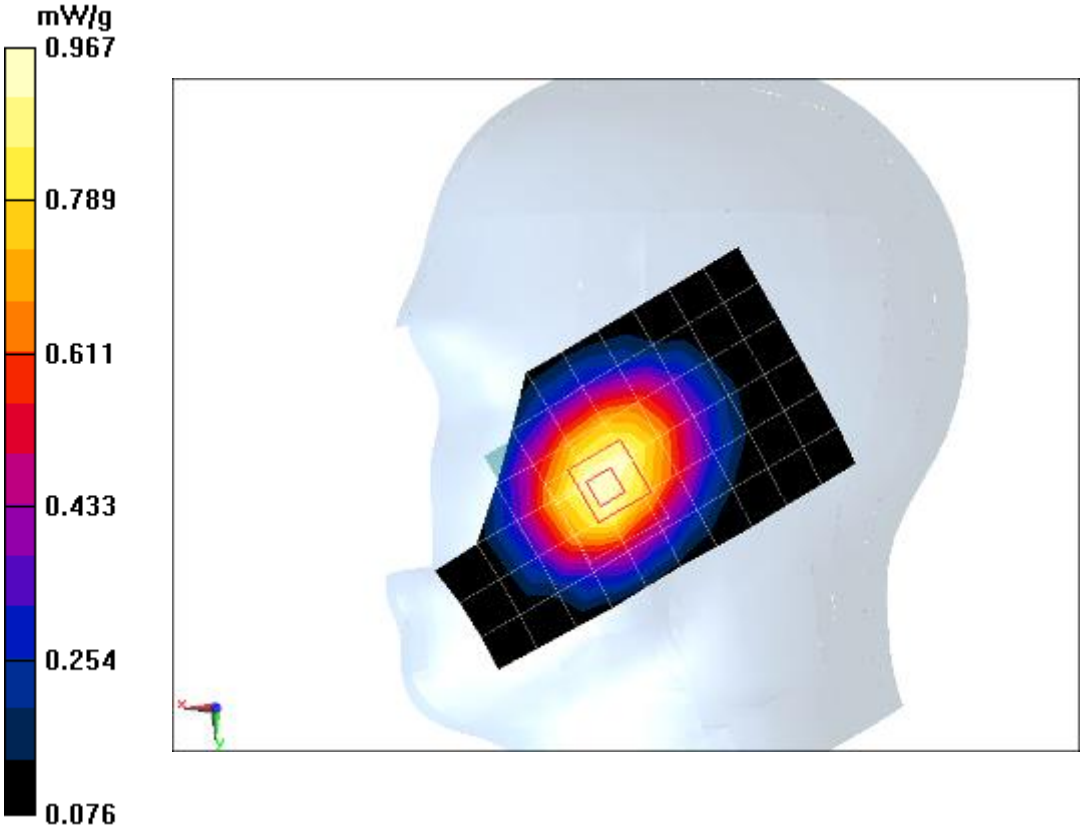
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.91 mho/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Tilt Left WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.429 mW/g
Middle Tilt Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.140 V/m; Power Drift = 0.032 dB
Peak SAR (extrapolated) = 0.516 mW/g
SAR(1 g) = 0.409 mW/g; SAR(10 g) = 0.307 mW/g
Maximum value of SAR (measured) = 0.434 mW/g

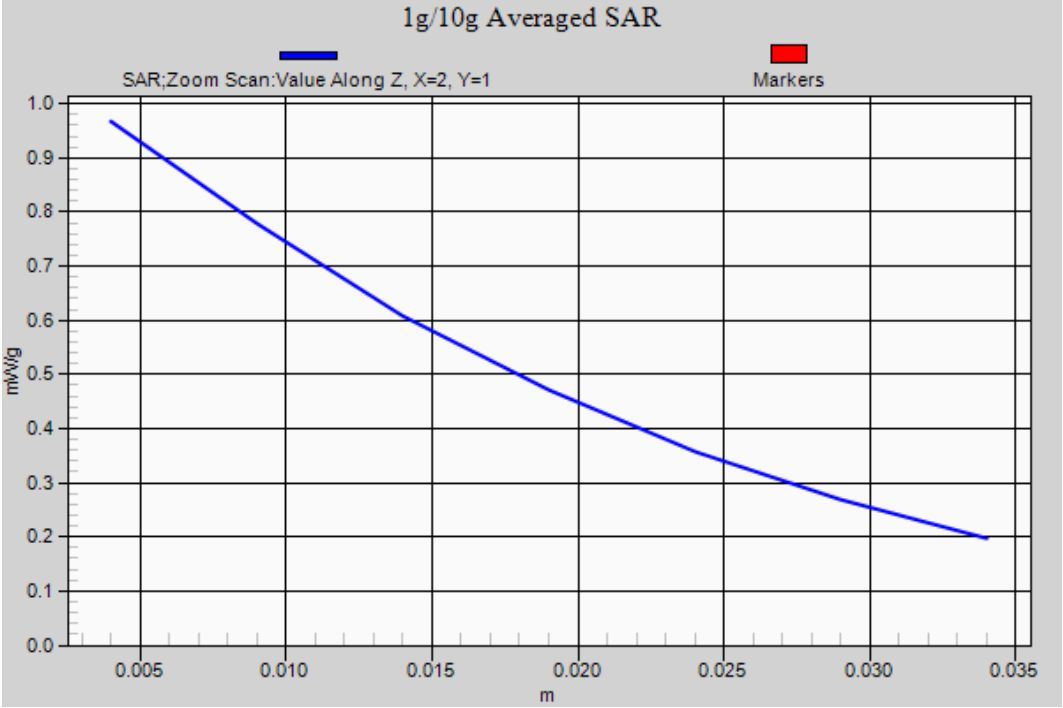



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Right Cheek Middle

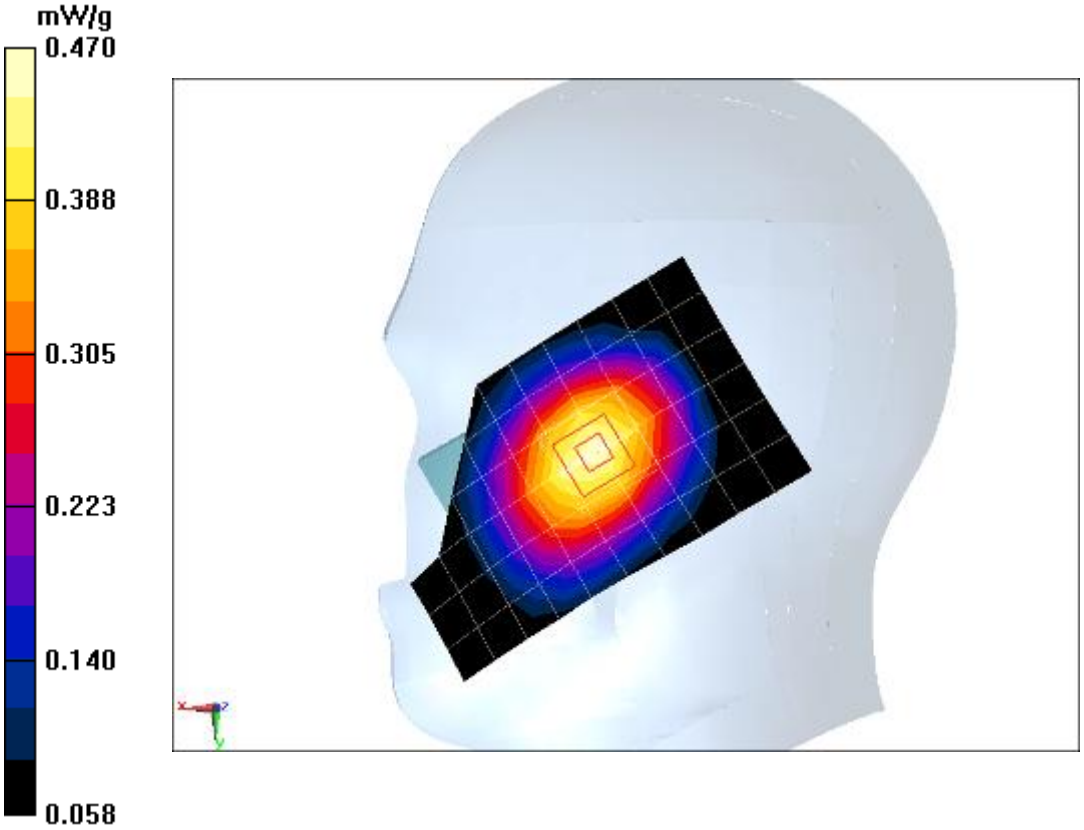
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.91 mho/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Cheek Right WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.957 mW/g
Middle Cheek Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.786 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 1.159 mW/g
SAR(1 g) = 0.937 mW/g; SAR(10 g) = 0.700 mW/g
Maximum value of SAR (measured) = 0.967 mW/g

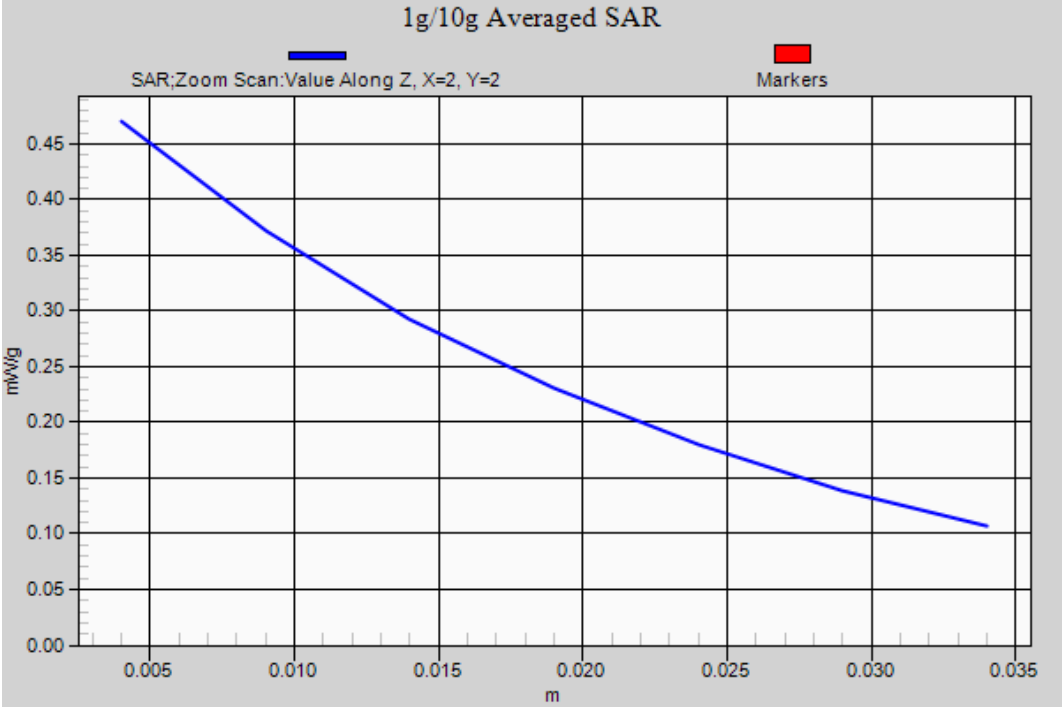



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=1
Markers
mW/g
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Right Tilt Middle

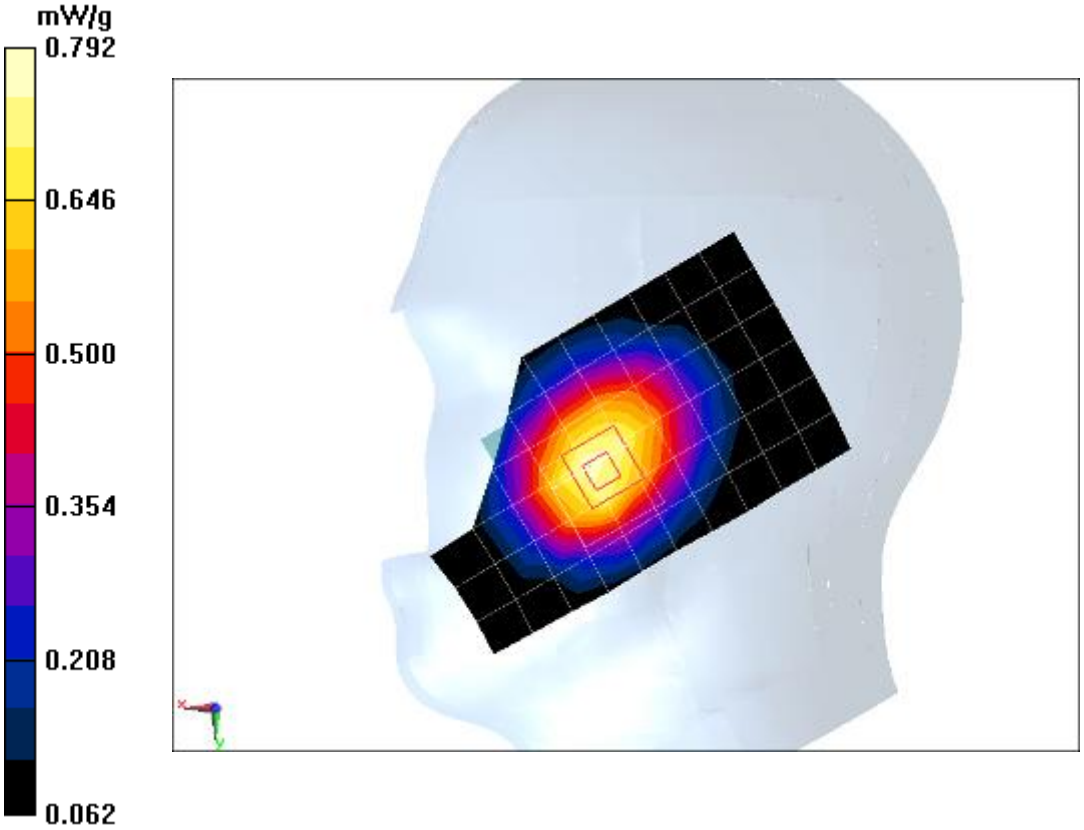
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 837 MHz; σ = 0.91 mho/m; εr = 40.663; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Tilt Right WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.471 mW/g
Middle Tilt Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.214 V/m; Power Drift = -0.073 dB
Peak SAR (extrapolated) = 0.557 mW/g
SAR(1 g) = 0.446 mW/g; SAR(10 g) = 0.335 mW/g
Maximum value of SAR (measured) = 0.470 mW/g

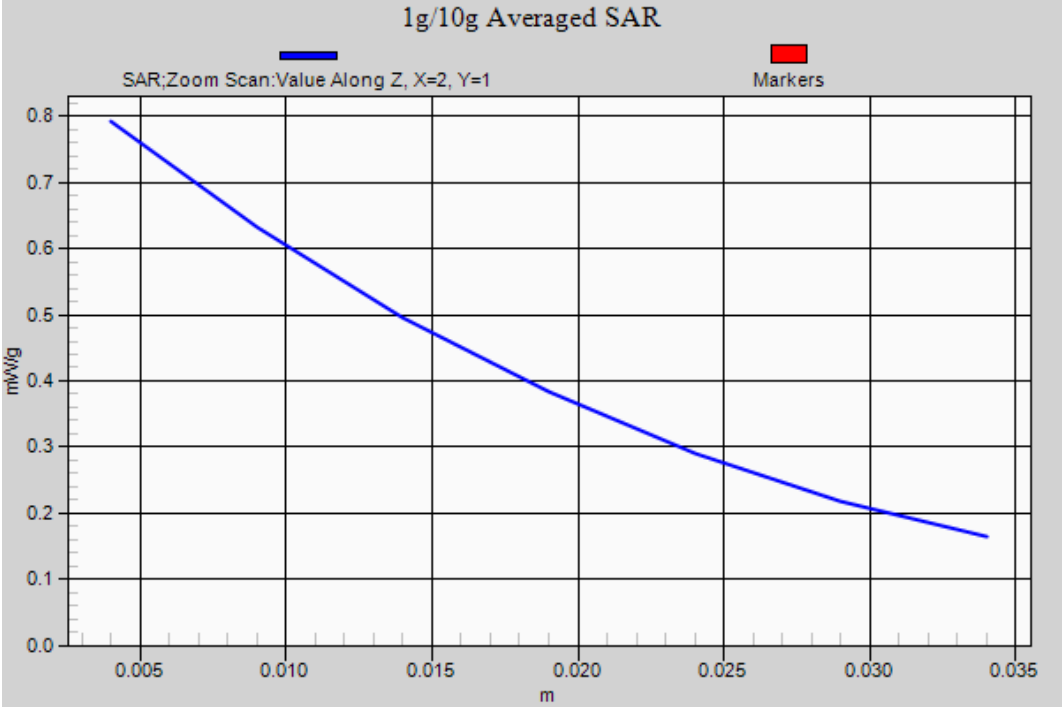



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Right Cheek Low

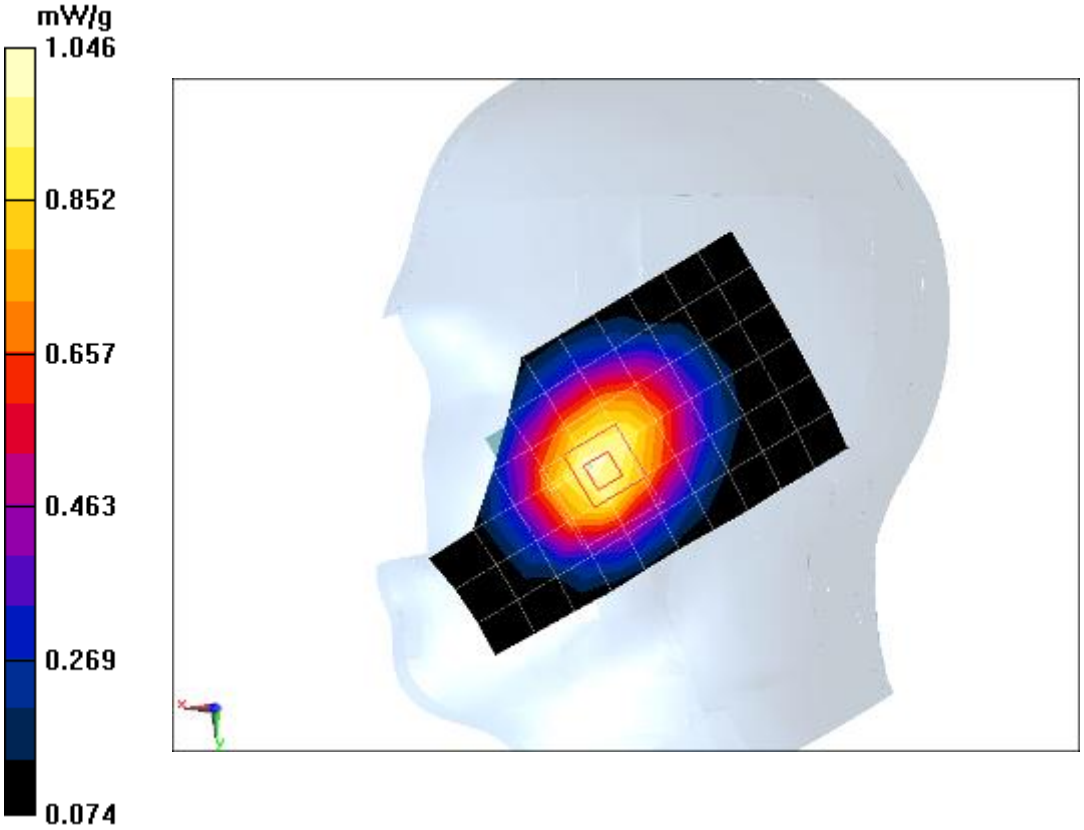
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 826.4 MHz; σ = 0.903 mho/m; εr = 40.784; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 826.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Low Cheek Right WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.773 mW/g
Low Cheek Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.276 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.957 mW/g
SAR(1 g) = 0.764 mW/g; SAR(10 g) = 0.566 mW/g
Maximum value of SAR (measured) = 0.792 mW/g

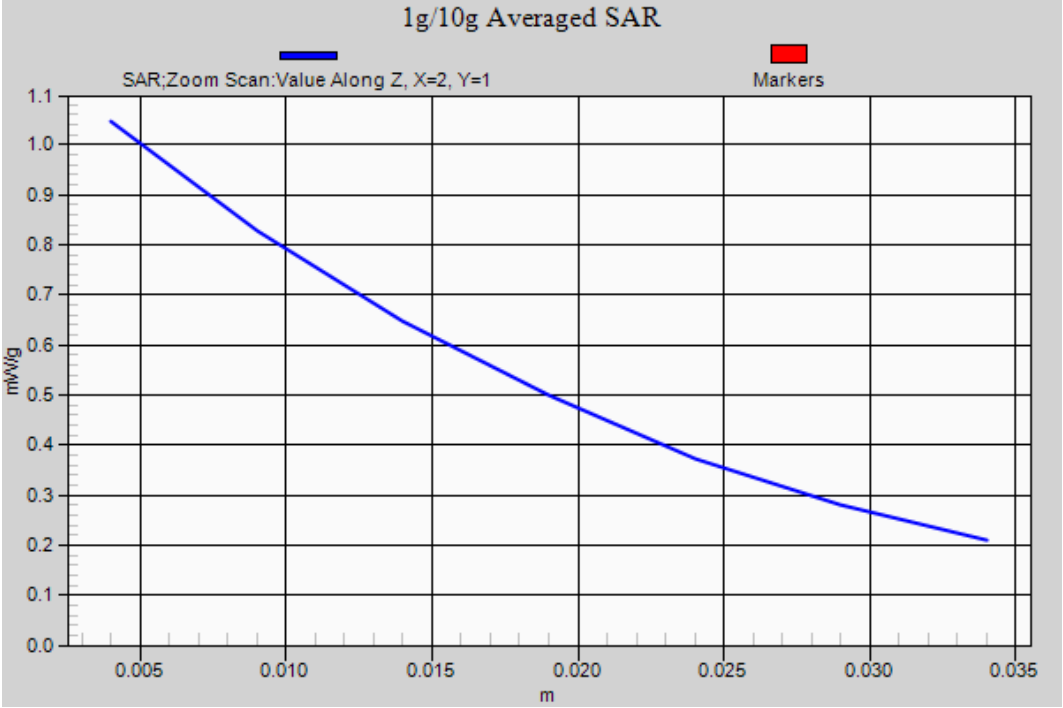



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=1
Markers
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Right Cheek High

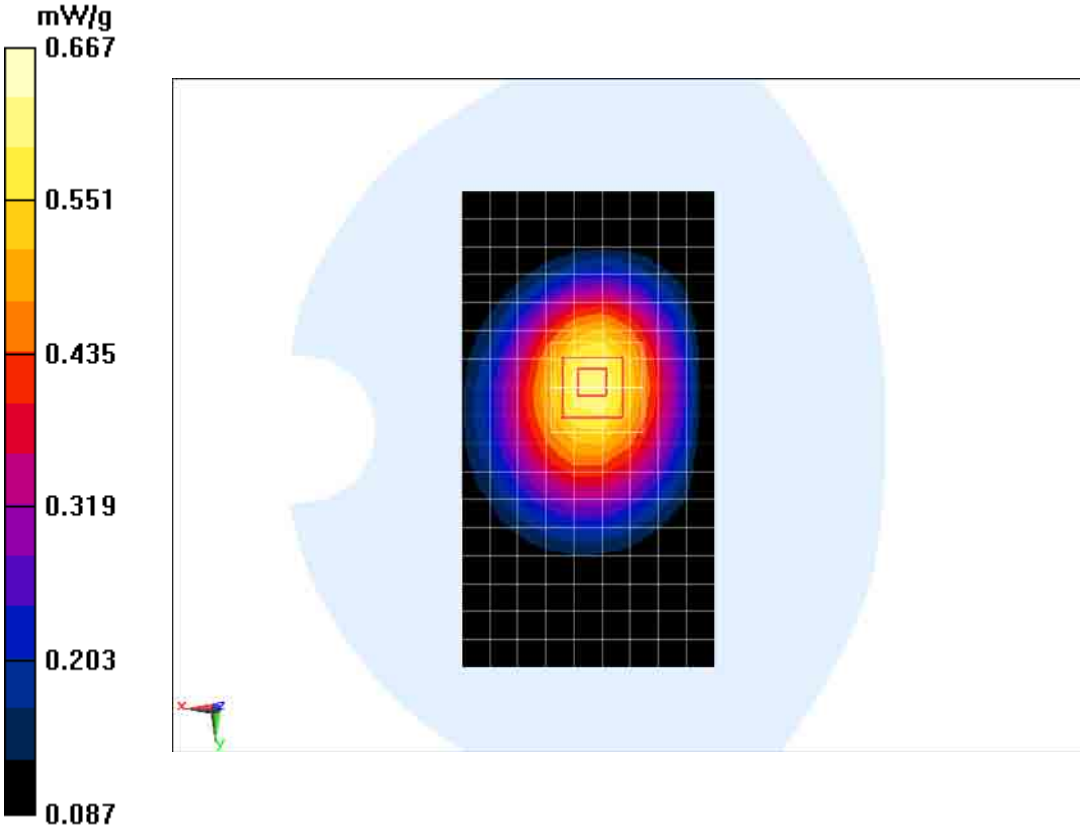
Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 850MHz
Medium parameters used: f = 847 MHz; σ = 0.917 mho/m; εr = 40.54; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 846.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
High Cheek Right WCDMA850MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.016 mW/g
High Cheek Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.814 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 1.285 mW/g
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.742 mW/g
Maximum value of SAR (measured) = 1.046 mW/g

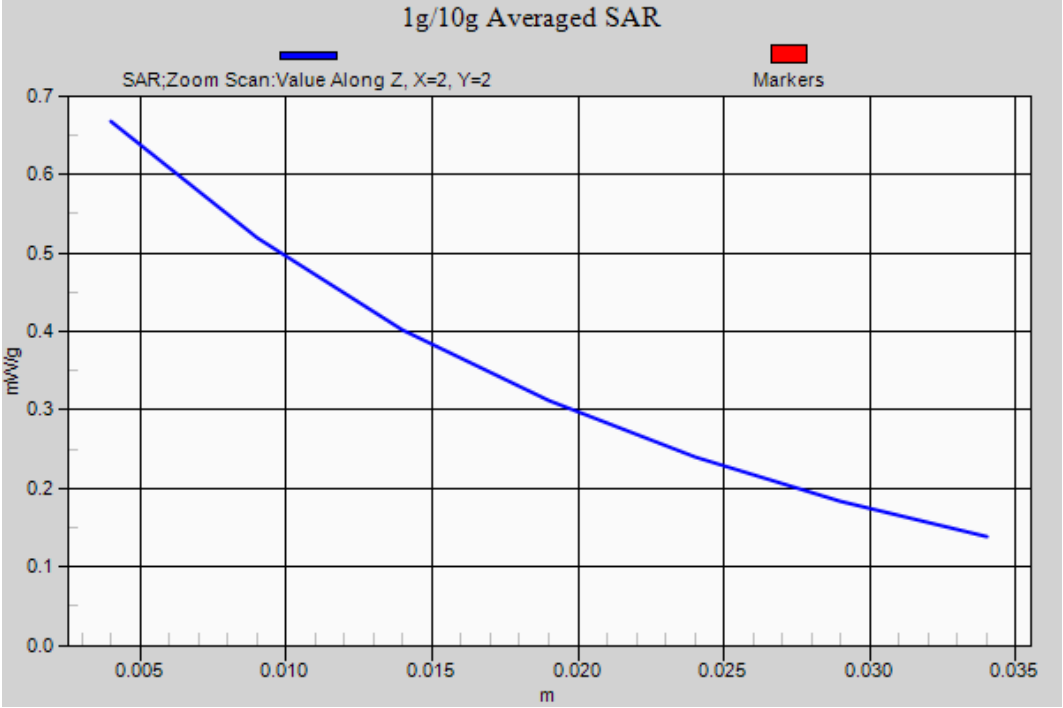



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=1
Markers
mW/g
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Body Toward Phontom Middle

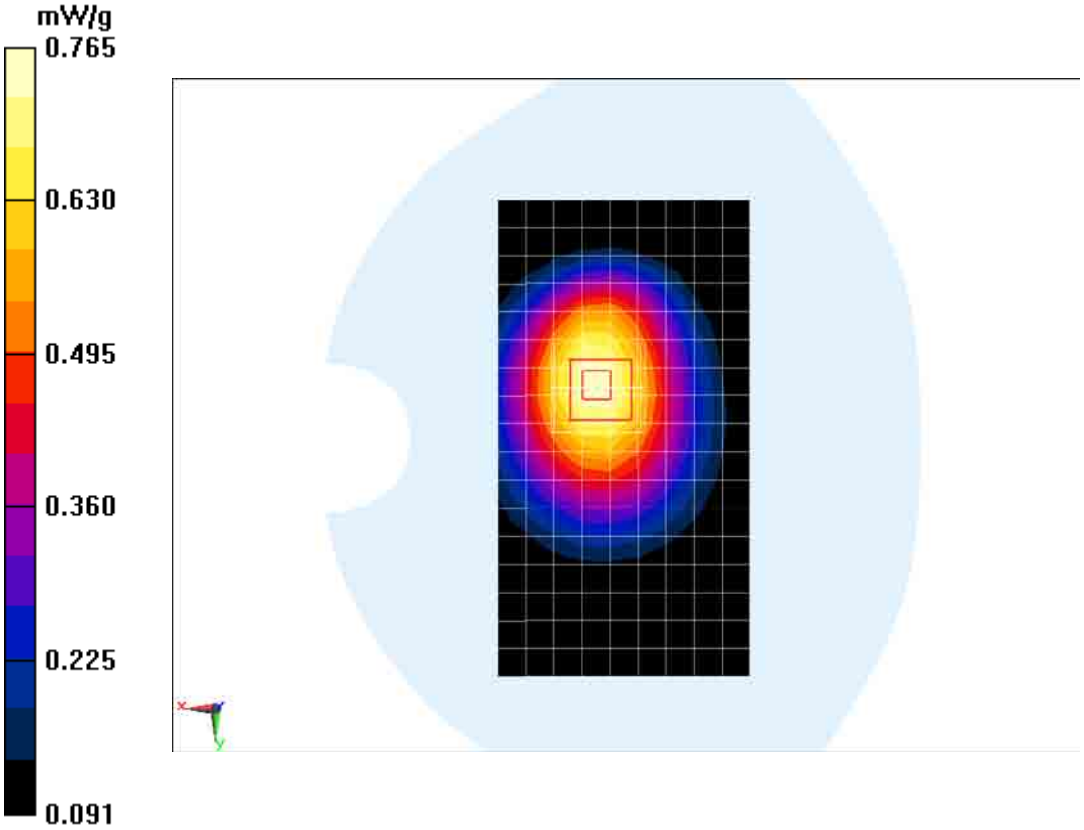
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Toward Phontom WCDMA850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.622 mW/g
Middle Toward Phontom WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.764 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.813 mW/g
SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.475 mW/g
Maximum value of SAR (measured) = 0.667 mW/g

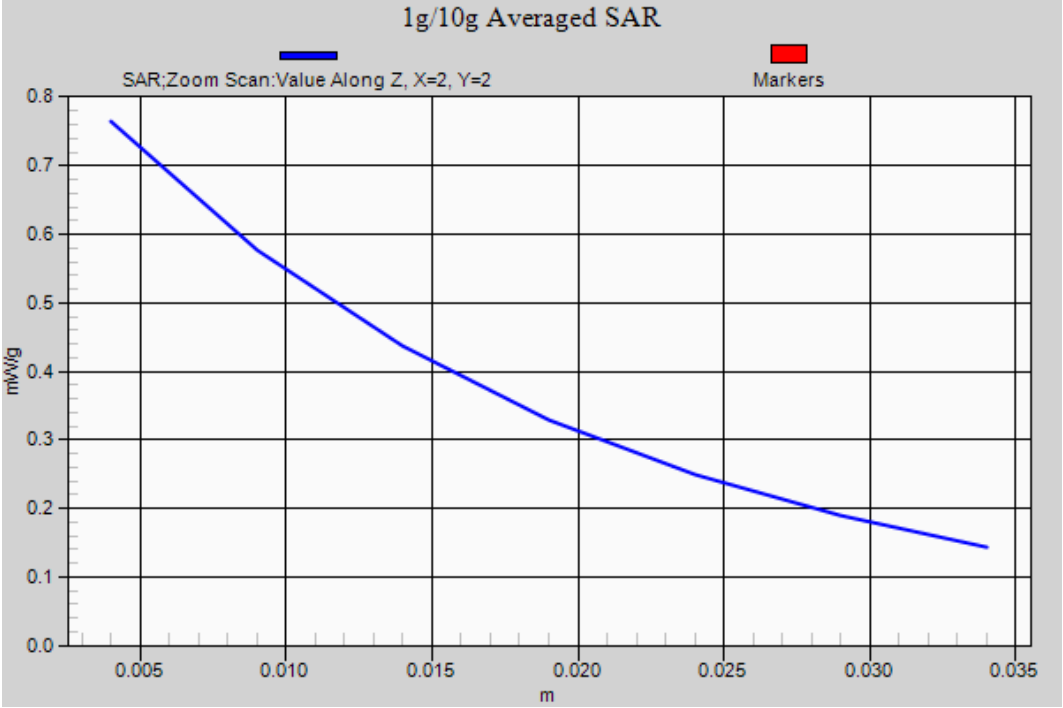



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Body Toward Ground Middle

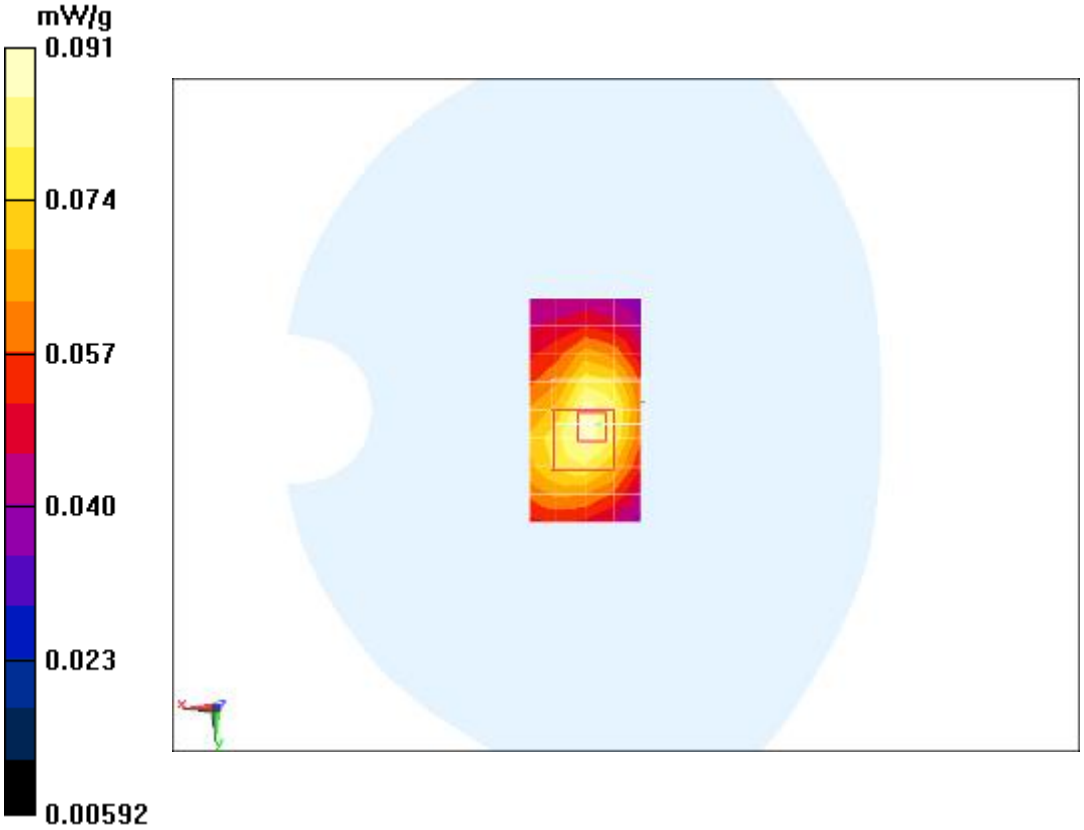
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Toward Ground WCDMA850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.746 mW/g
Middle Toward Ground WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.624 V/m; Power Drift = -0.039 dB
Peak SAR (extrapolated) = 0.950 mW/g
SAR(1 g) = 0.722 mW/g; SAR(10 g) = 0.526 mW/g
Maximum value of SAR (measured) = 0.765 mW/g

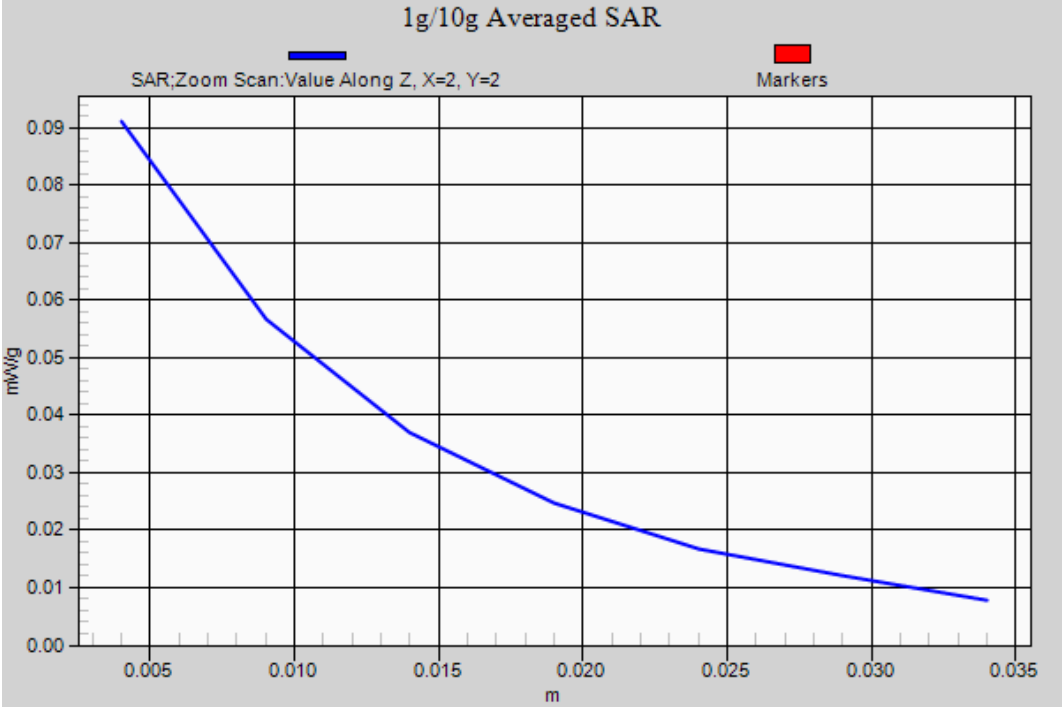



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Body Bottom Middle

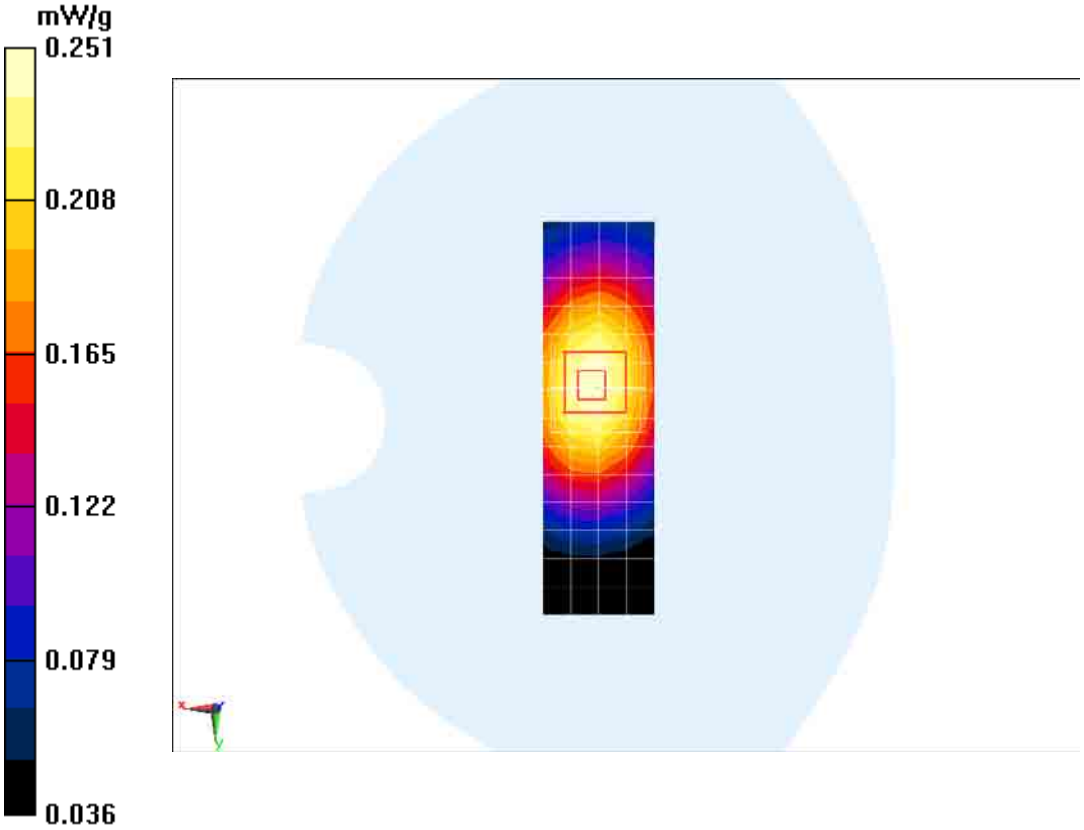
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Bottom WCDMA 850MHz/Area Scan (5x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.089 mW/g
Middle Bottom WCDMA 850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.089 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.134 mW/g
SAR(1 g) = 0.084 mW/g; SAR(10 g) = 0.056 mW/g
Maximum value of SAR (measured) = 0.091 mW/g

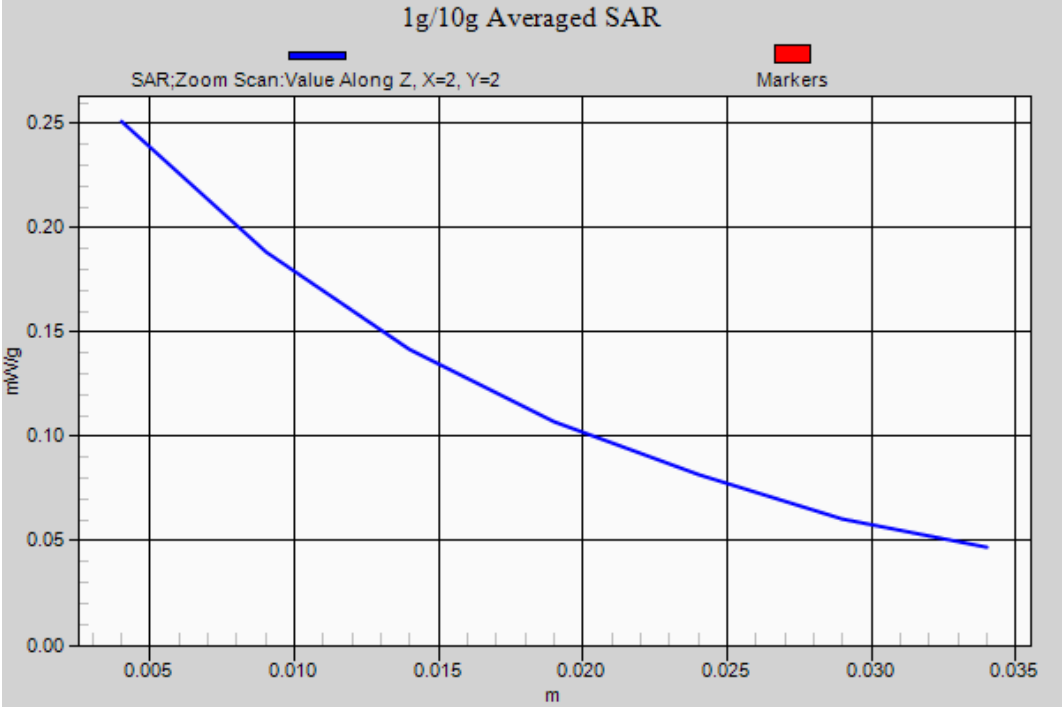



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Body Left Middle

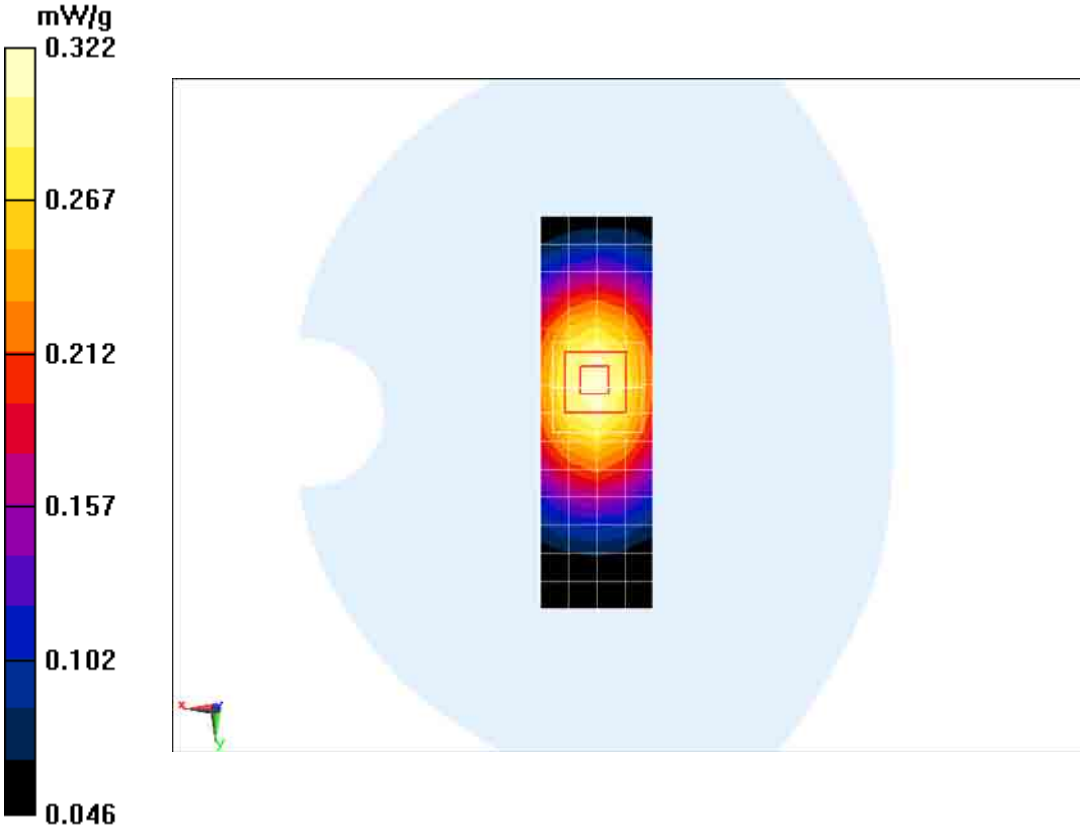
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Left WCDMA850MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.252 mW/g
Middle Left WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.489 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.315 mW/g
SAR(1 g) = 0.238 mW/g; SAR(10 g) = 0.173 mW/g
Maximum value of SAR (measured) = 0.251 mW/g

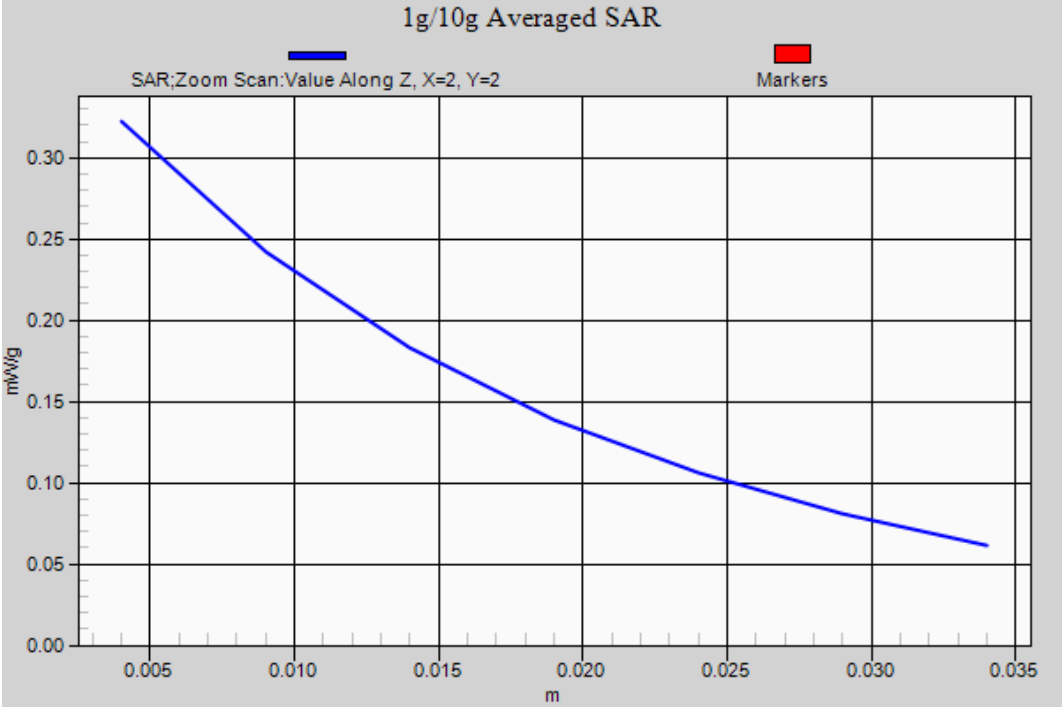



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Body Right Middle

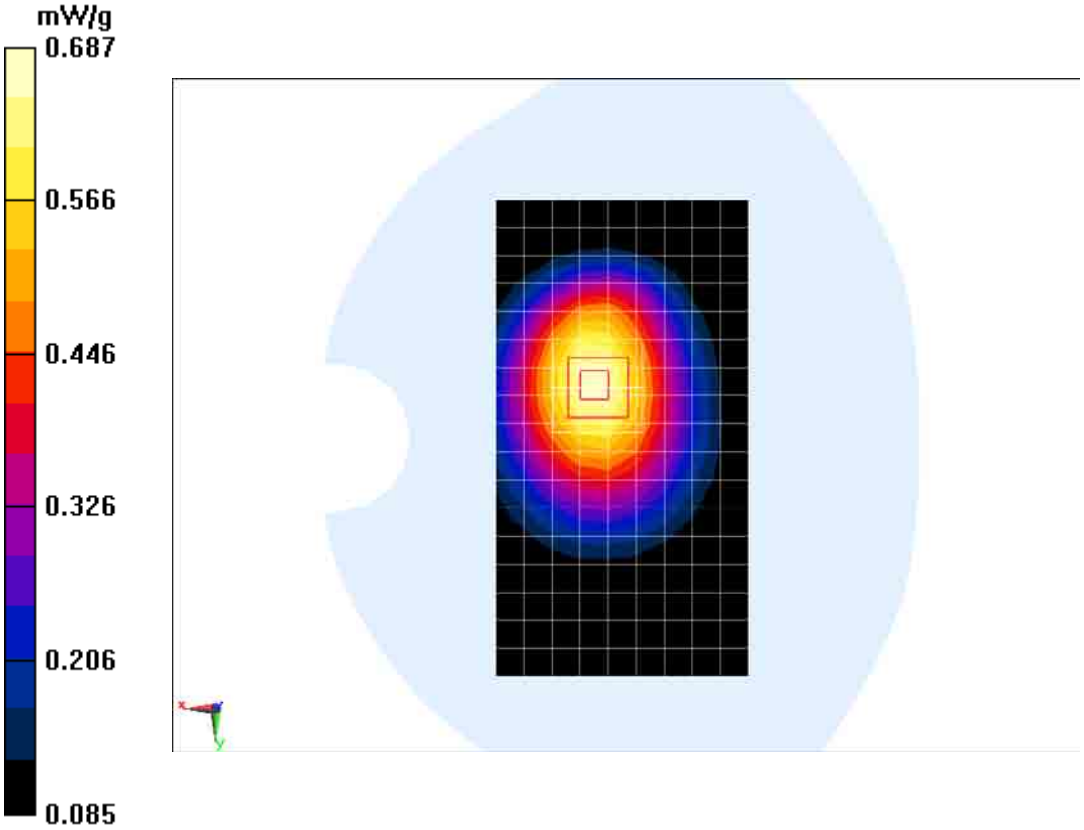
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Middle Right WCDMA850MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.324 mW/g
Middle Right WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.399 V/m; Power Drift = 0.094 dB
Peak SAR (extrapolated) = 0.403 mW/g
SAR(1 g) = 0.305 mW/g; SAR(10 g) = 0.223 mW/g
Maximum value of SAR (measured) = 0.322 mW/g

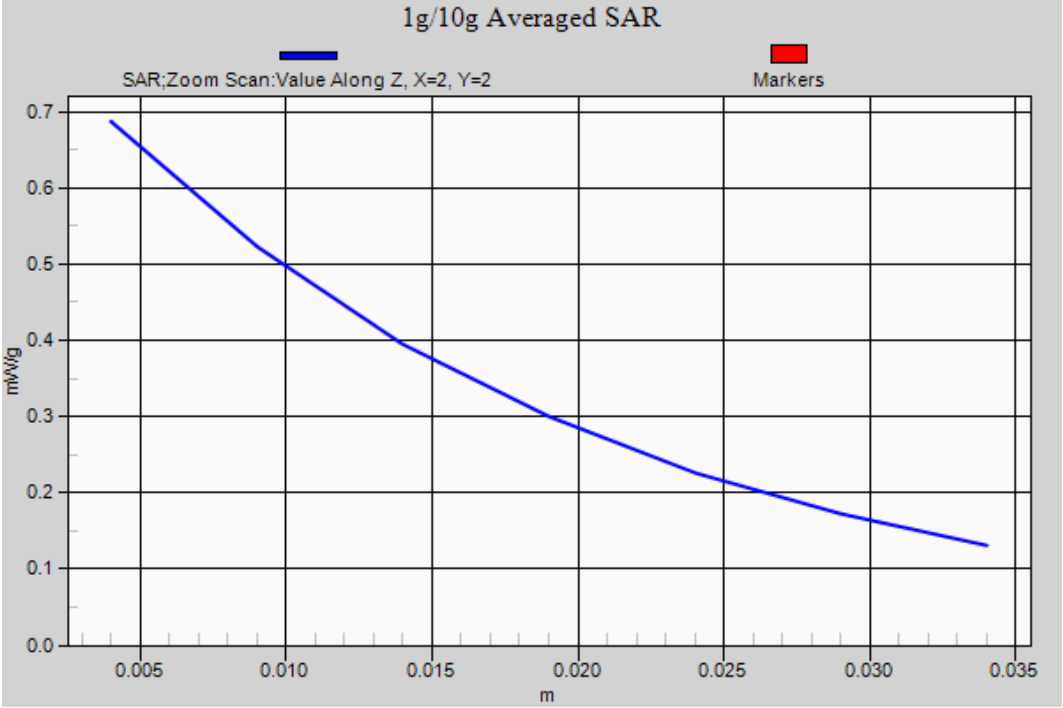



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Body Toward Ground Low

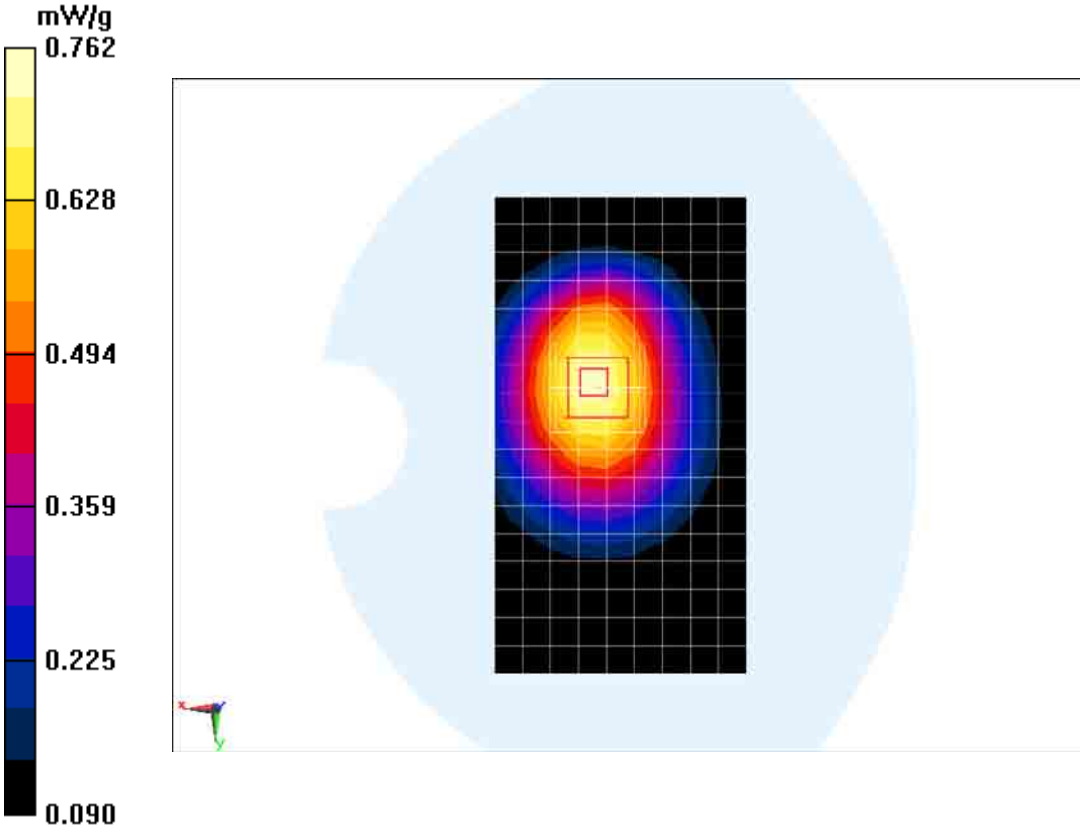
Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 826.4 MHz; σ = 0.994 mho/m; εr = 55.147; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 826.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
Low Toward Ground WCDMA850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.666 mW/g
Low Toward Ground WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.328 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 0.853 mW/g
SAR(1 g) = 0.650 mW/g; SAR(10 g) = 0.473 mW/g
Maximum value of SAR (measured) = 0.687 mW/g

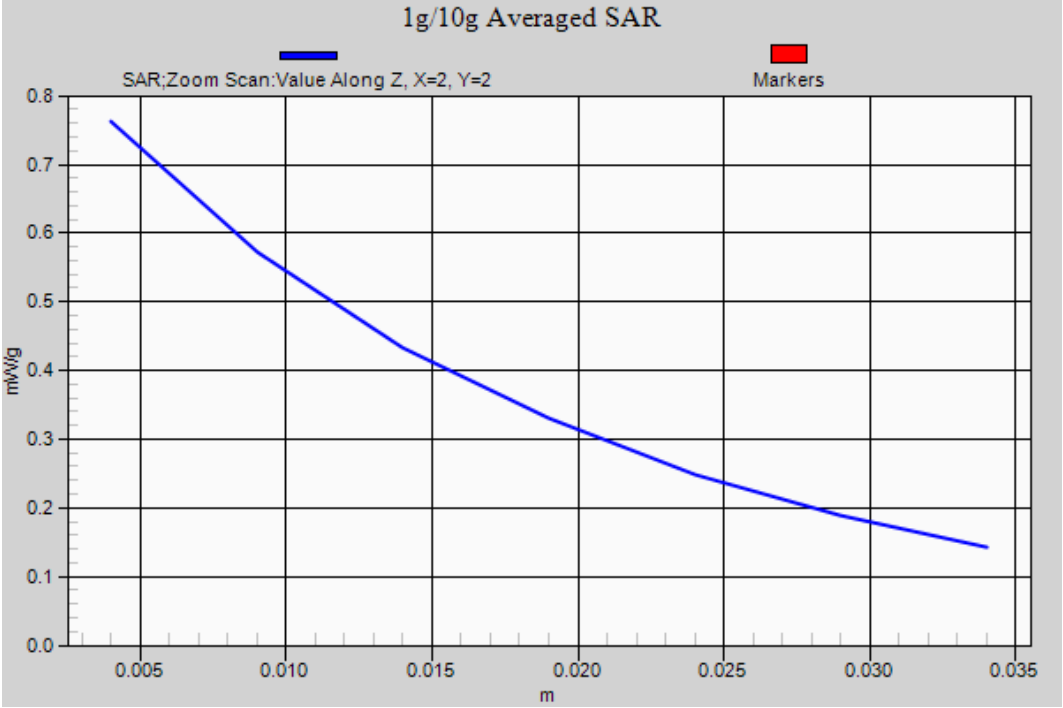



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA850 Body Toward Ground High

Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 847 MHz; σ = 1.012 mho/m; εr = 55.214; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 846.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)
High Toward Ground WCDMA850MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.735 mW/g
High Toward Ground WCDMA850MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.371 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 0.949 mW/g
SAR(1 g) = 0.720 mW/g; SAR(10 g) = 0.523 mW/g
Maximum value of SAR (measured) = 0.762 mW/g



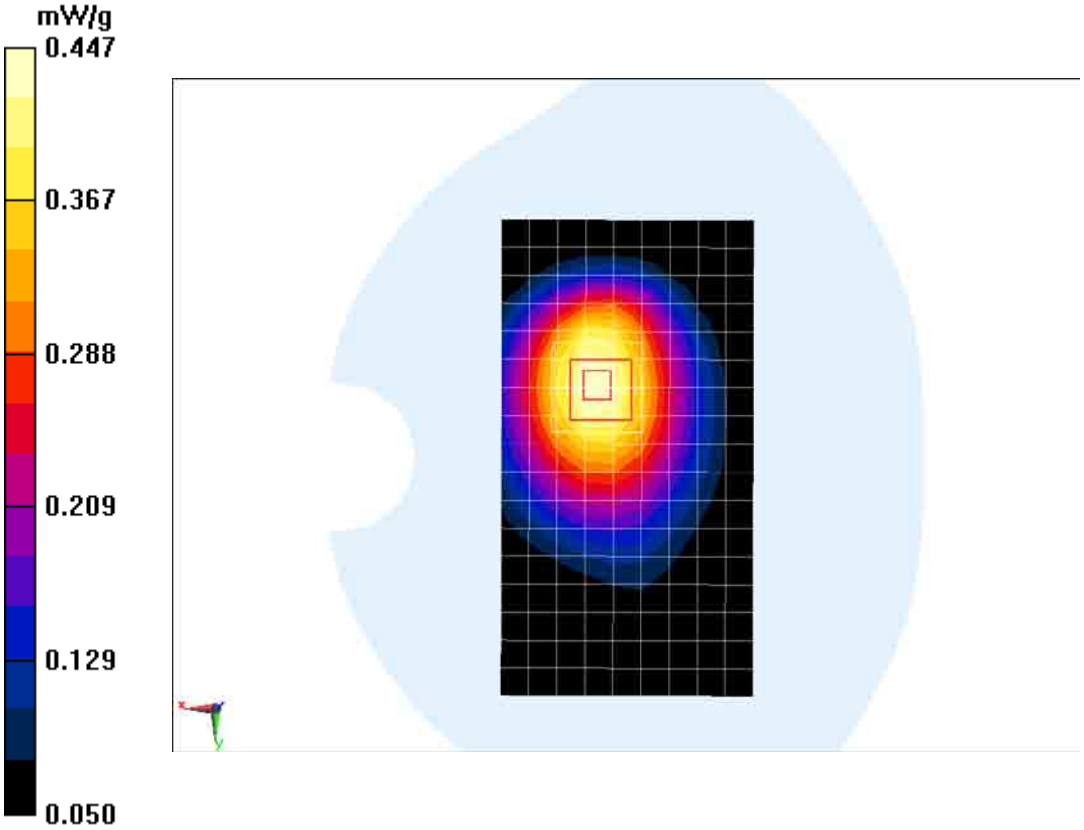

1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

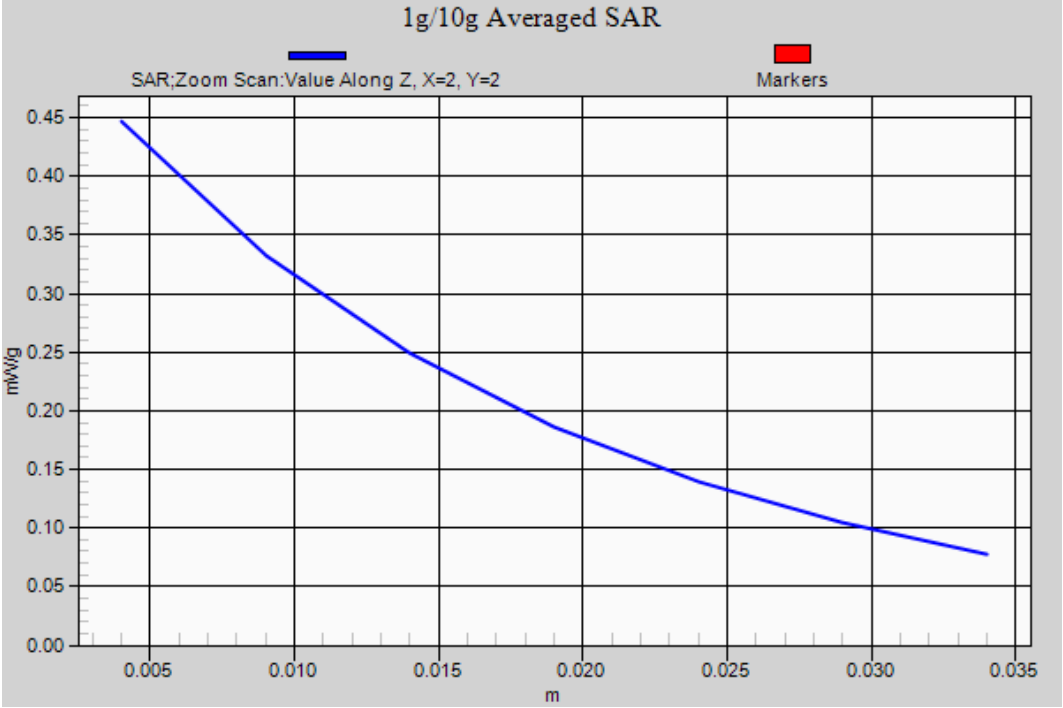
WCDMA850 Body Toward Ground Middle With Headset

Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 850MHz
Medium parameters used: f = 837 MHz; σ = 1.001 mho/m; εr = 55.152; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 836.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)

Middle Toward Ground WCDMA850MHz With Headset/Area Scan (10x18x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.445 mW/g

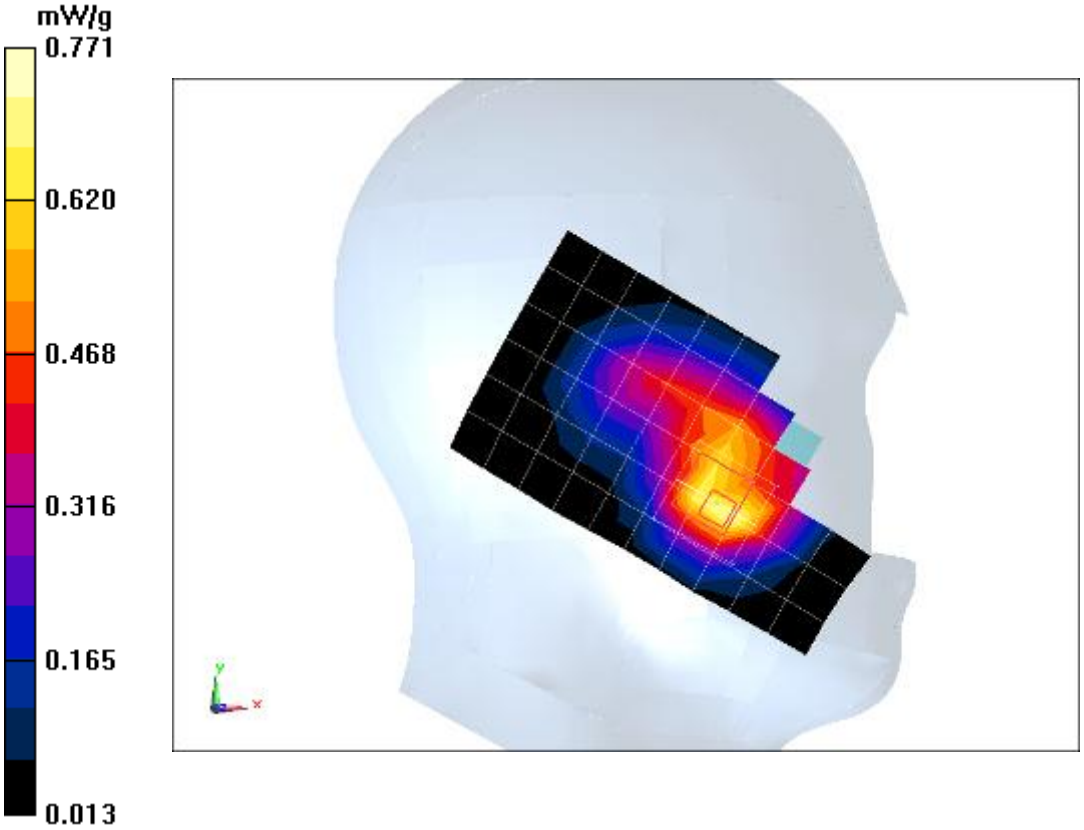
Middle Toward Ground WCDMA850MHz With Headset/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.554 V/m; Power Drift = 0.083 dB
Peak SAR (extrapolated) = 0.572 mW/g
SAR(1 g) = 0.423 mW/g; SAR(10 g) = 0.307 mW/g
Maximum value of SAR (measured) = 0.447 mW/g

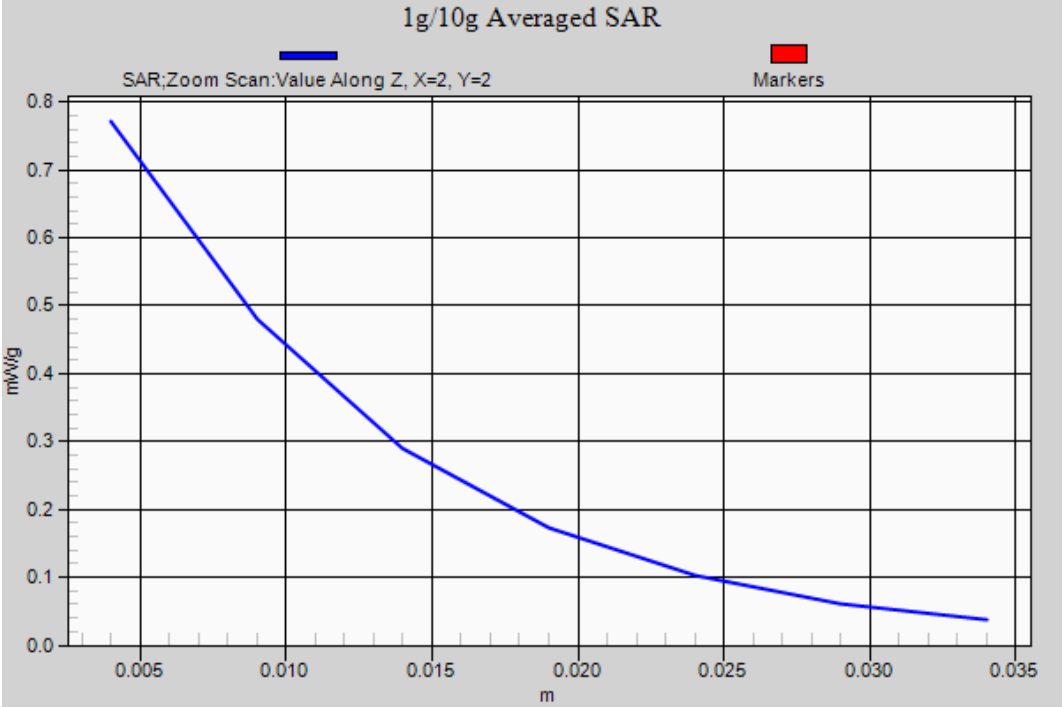



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Left Cheek Middle

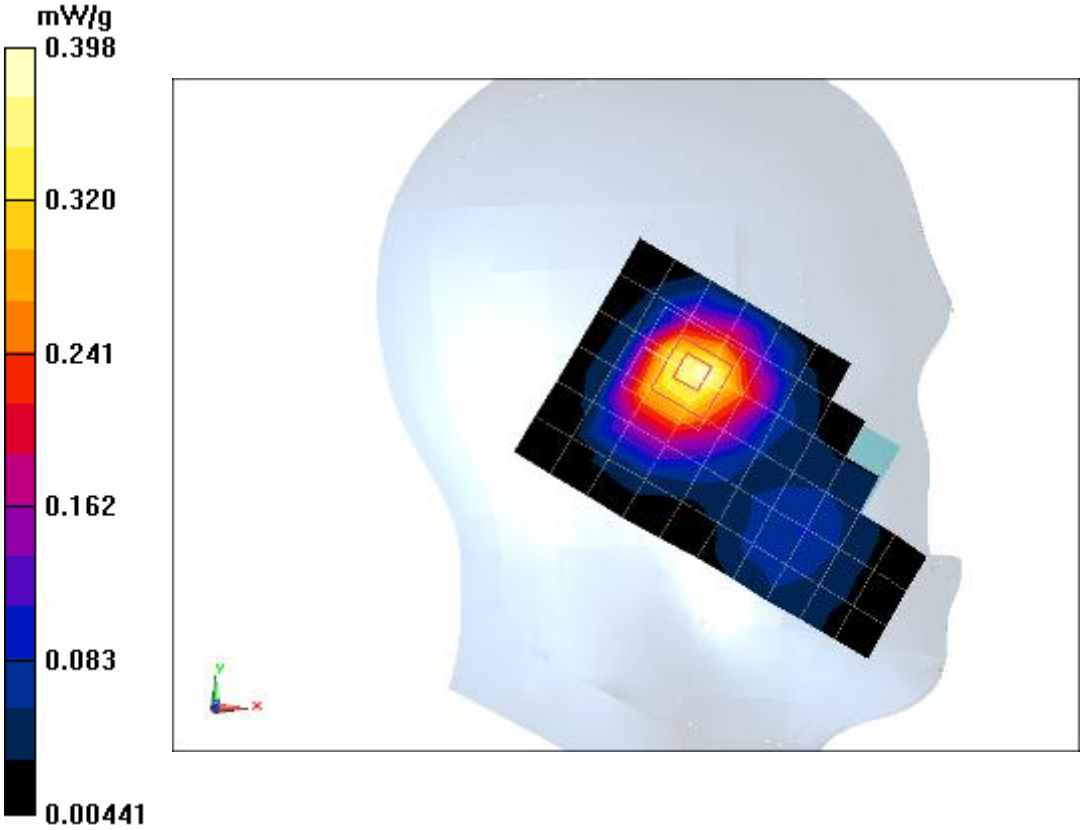
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 mho/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Middle Cheek Left WCDMA1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.735 mW/g
Middle Cheek Left WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.447 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.175 mW/g
SAR(1 g) = 0.709 mW/g; SAR(10 g) = 0.417 mW/g
Maximum value of SAR (measured) = 0.771 mW/g

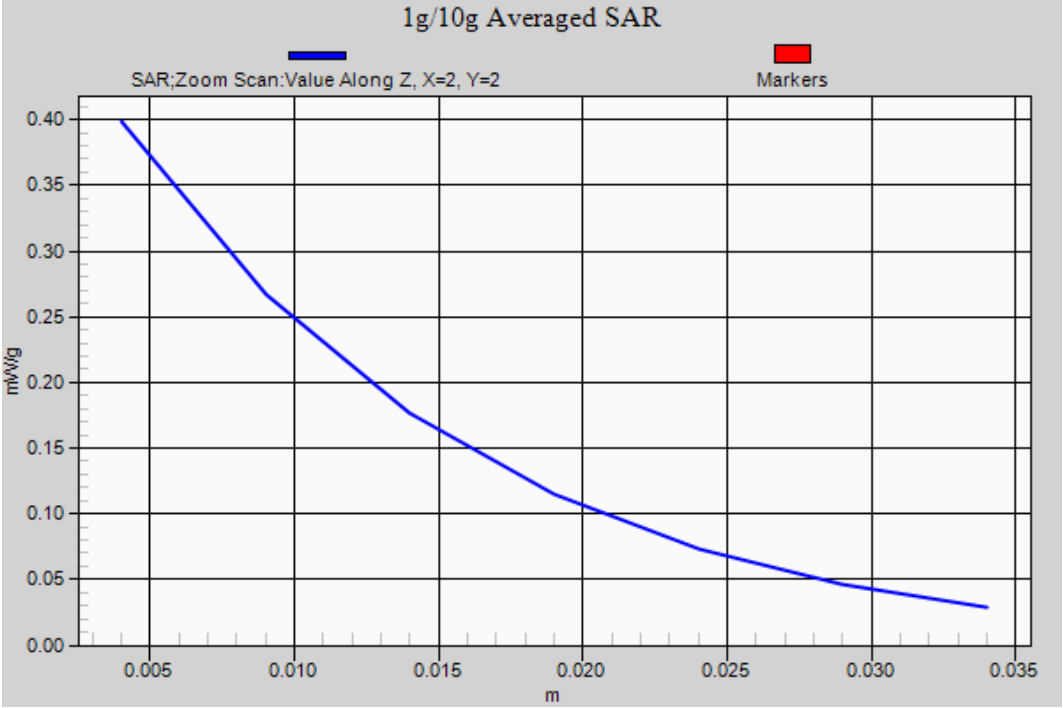



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Left Tilt Middle

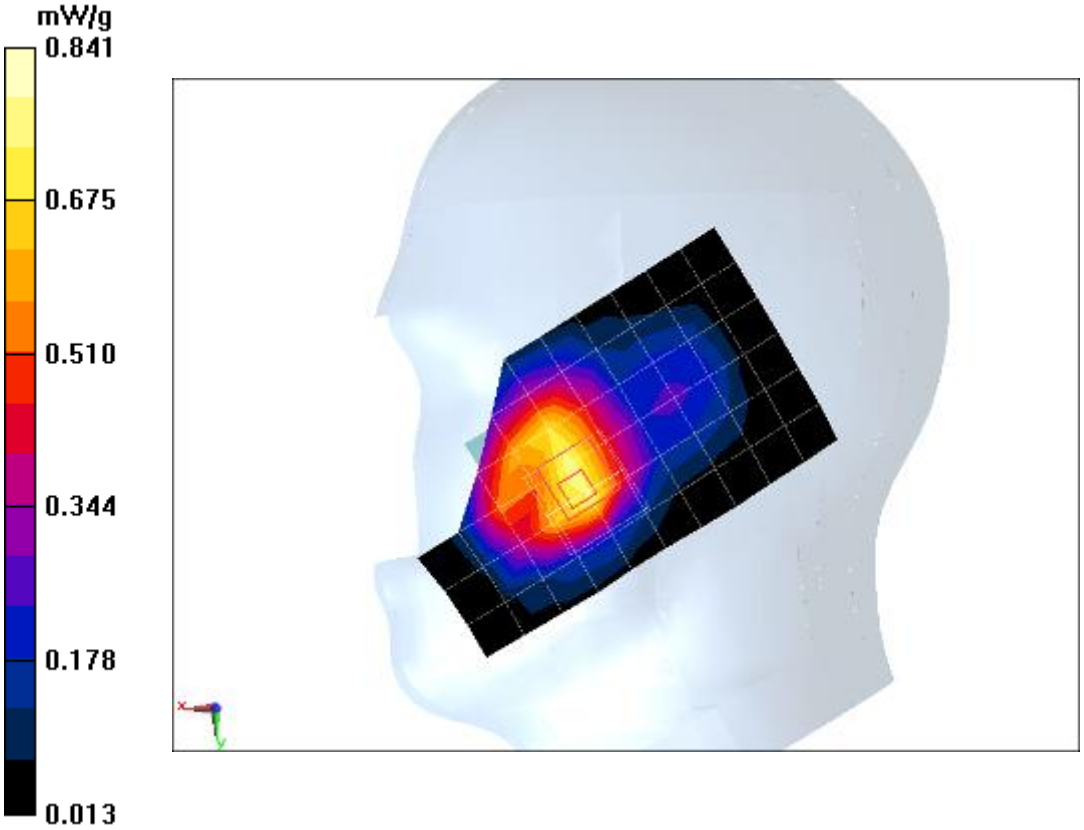
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 mho/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Middle Tilt Left WCDMA1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.396 mW/g
Middle Tilt Left WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.680 V/m; Power Drift = 0.067 dB
Peak SAR (extrapolated) = 0.570 mW/g
SAR(1 g) = 0.379 mW/g; SAR(10 g) = 0.236 mW/g
Maximum value of SAR (measured) = 0.398 mW/g

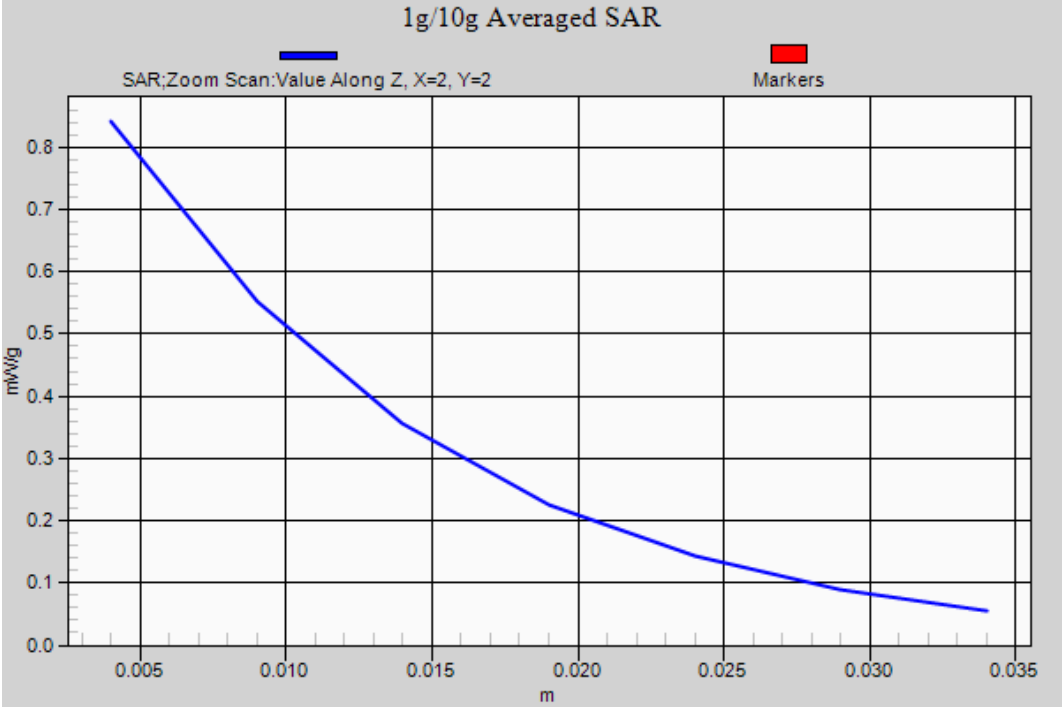



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Right Cheek Middle

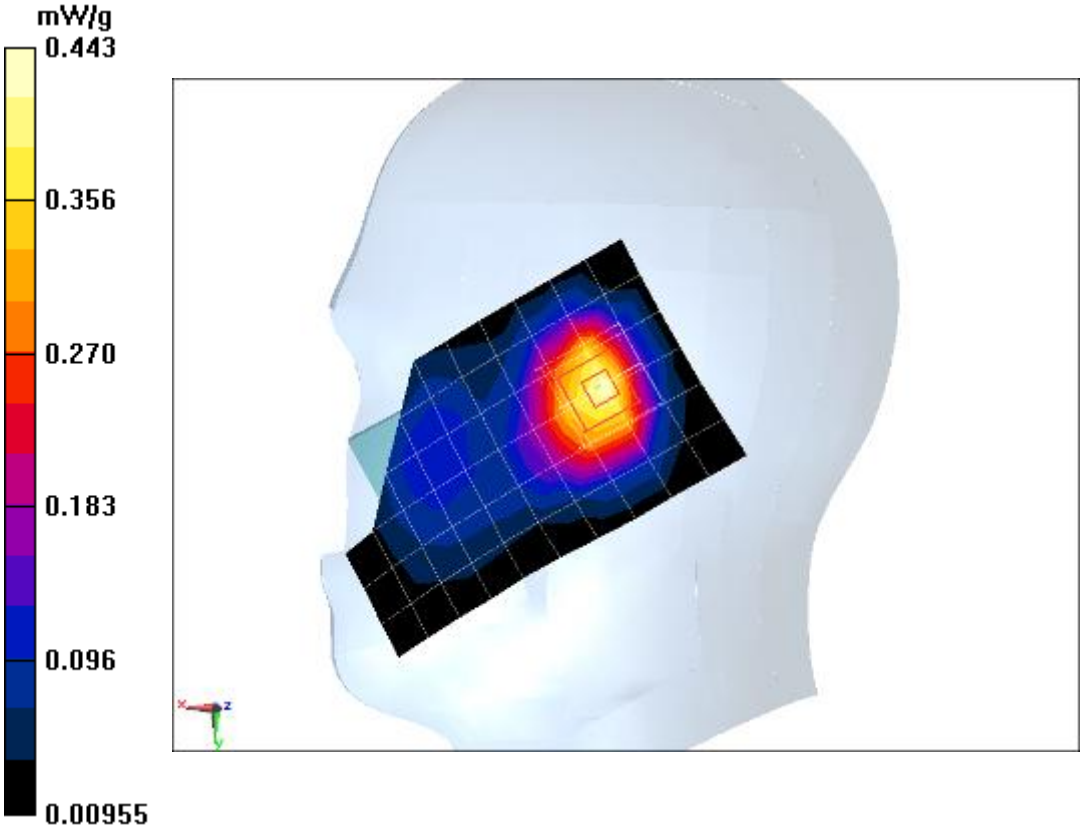
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 mho/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Middle Cheek Right WCDMA1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.772 mW/g
Middle Cheek Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.540 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 1.199 mW/g
SAR(1 g) = 0.771 mW/g; SAR(10 g) = 0.473 mW/g
Maximum value of SAR (measured) = 0.841 mW/g

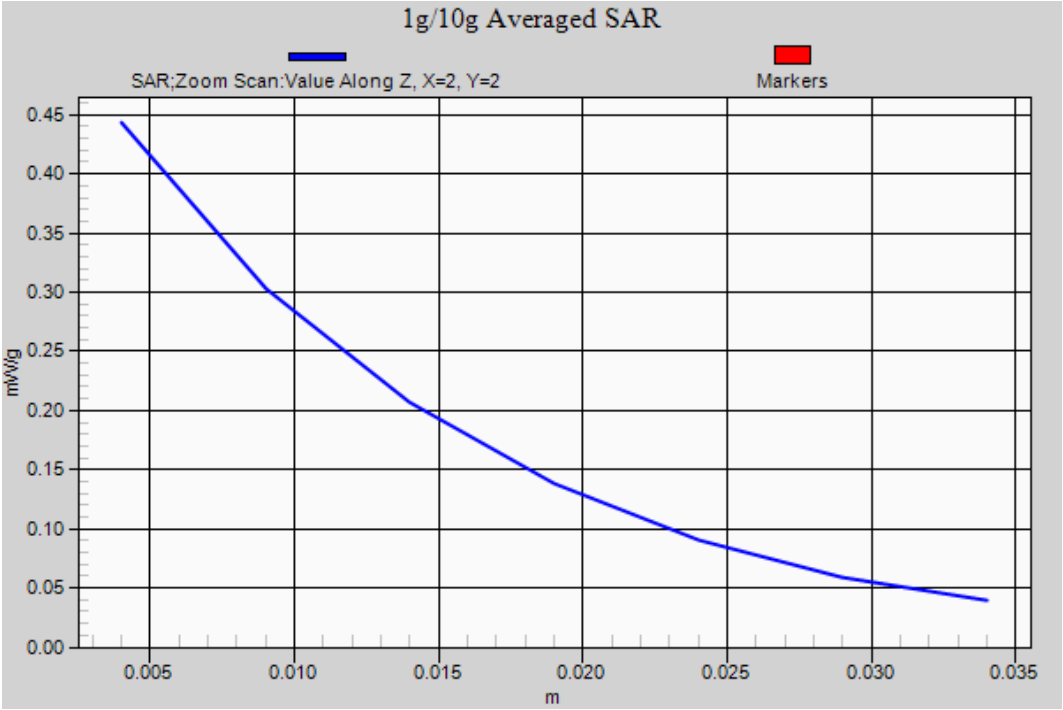



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Right Tilt Middle

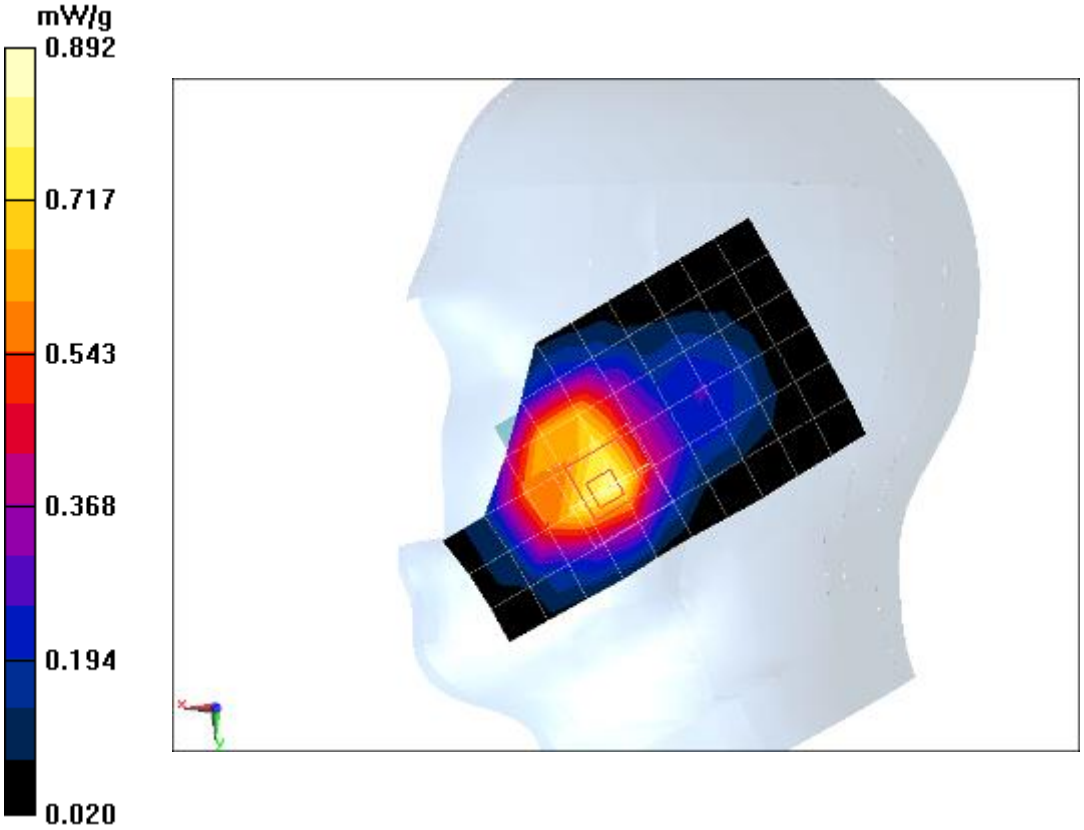
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.442 mho/m; εr = 40.614; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Middle Tilt Right WCDMA1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.439 mW/g
Middle Tilt Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.463 V/m; Power Drift = 0.047 dB
Peak SAR (extrapolated) = 0.609 mW/g
SAR(1 g) = 0.414 mW/g; SAR(10 g) = 0.259 mW/g
Maximum value of SAR (measured) = 0.443 mW/g

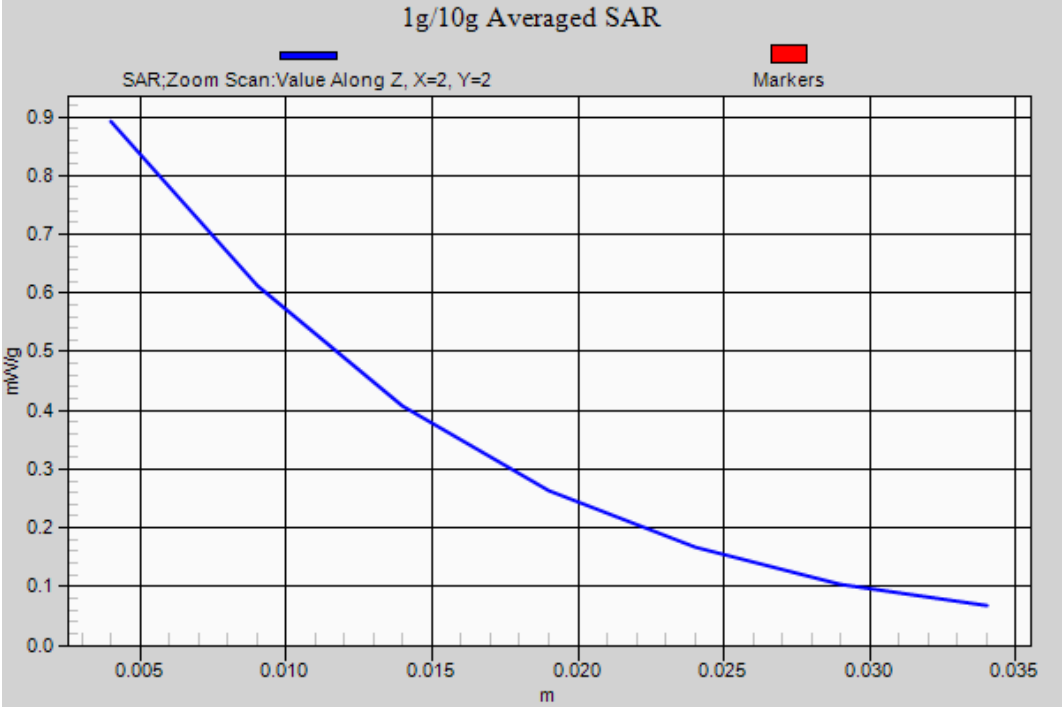



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Right Cheek Low

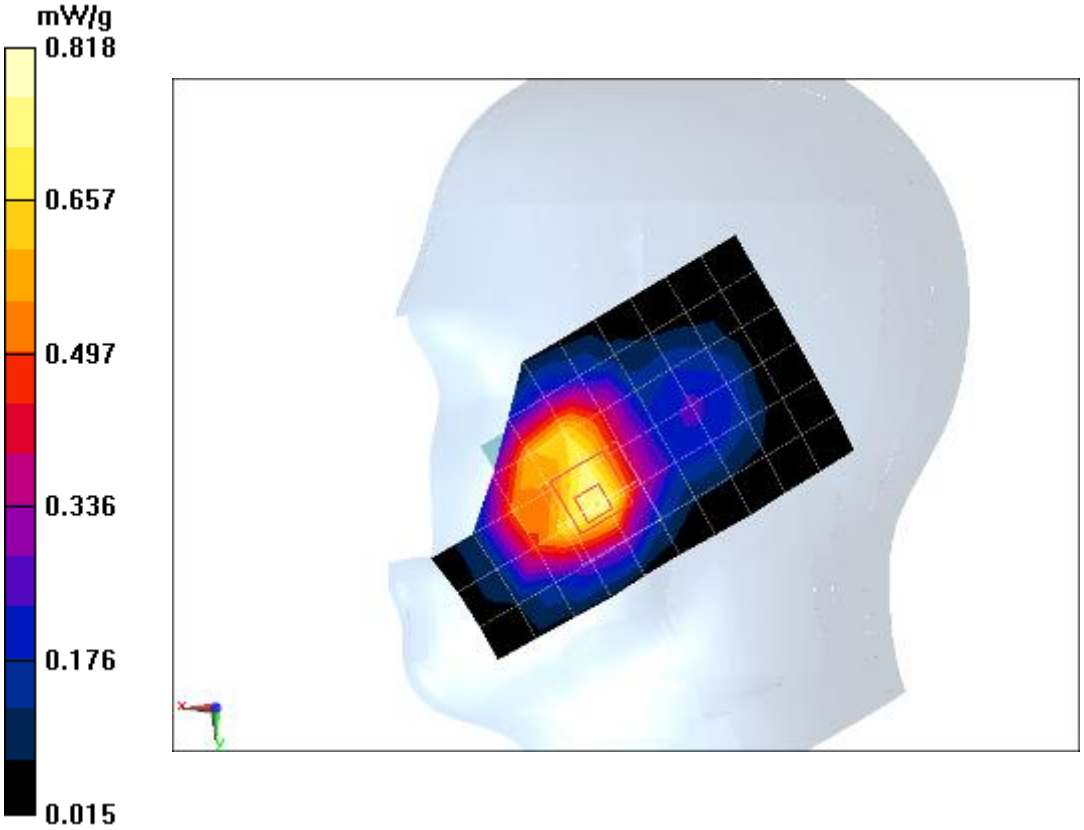
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.418 mho/m; εr = 40.782; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA 1900; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
Low Cheek Right WCDMA1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.809 mW/g
Low Cheek Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.911 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.239 mW/g
SAR(1 g) = 0.815 mW/g; SAR(10 g) = 0.503 mW/g
Maximum value of SAR (measured) = 0.892 mW/g

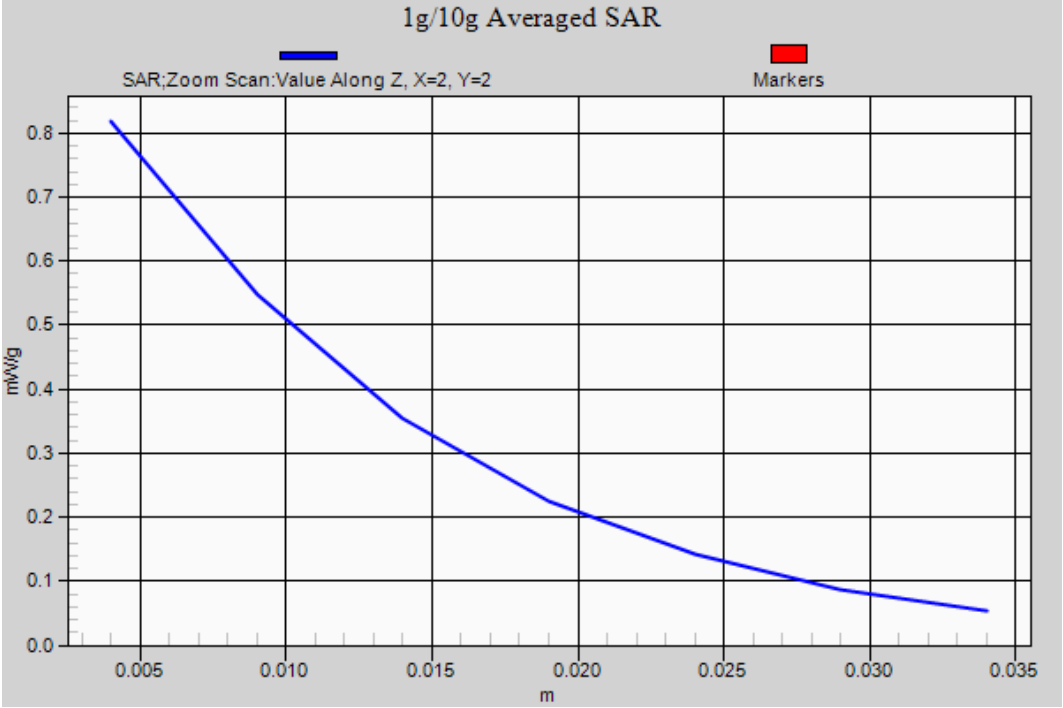



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Right Cheek High

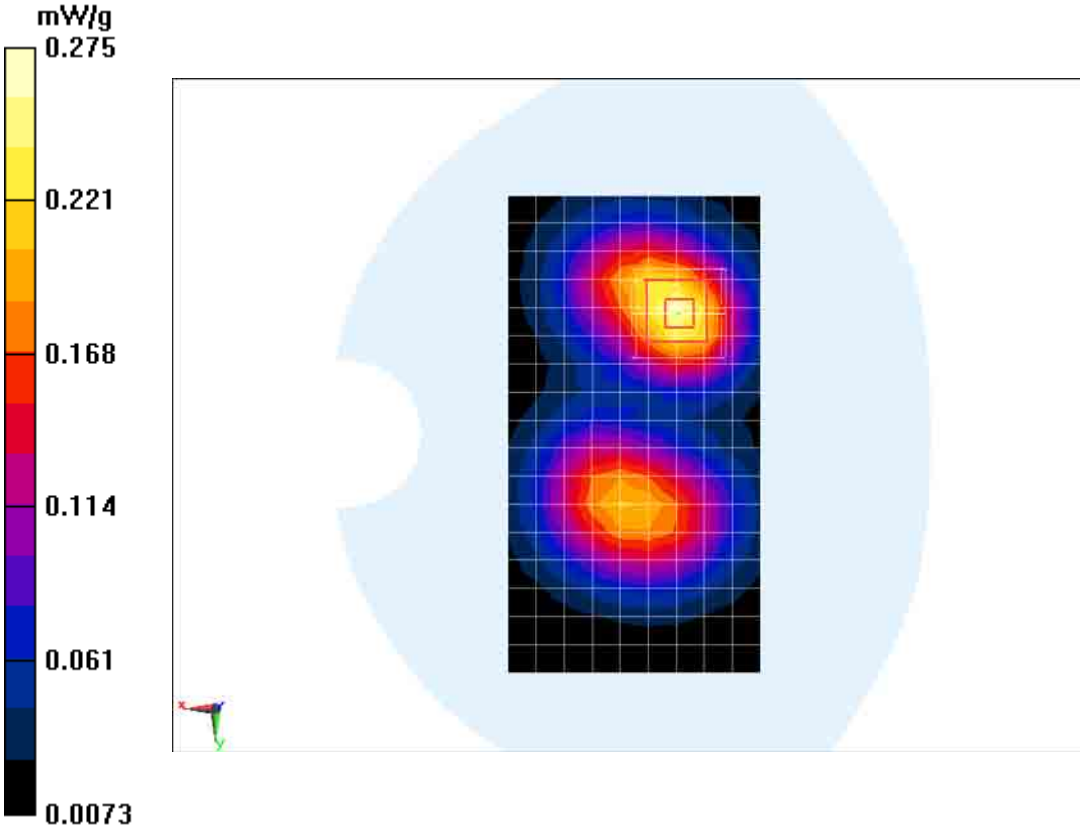
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1908 MHz; σ = 1.467 mho/m; εr = 40.502; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA 1900; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)
High Cheek Right WCDMA1900MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.755 mW/g
High Cheek Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.906 V/m; Power Drift = 0.062 dB
Peak SAR (extrapolated) = 1.145 mW/g
SAR(1 g) = 0.746 mW/g; SAR(10 g) = 0.462 mW/g
Maximum value of SAR (measured) = 0.818 mW/g

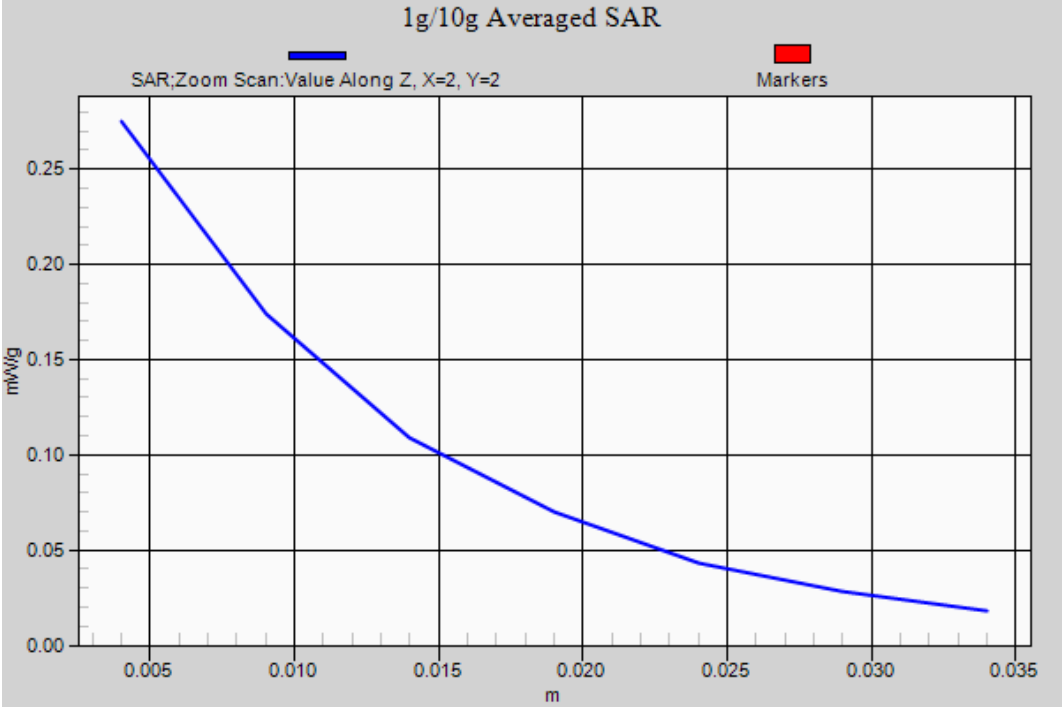



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Body Toward Phontom Middle

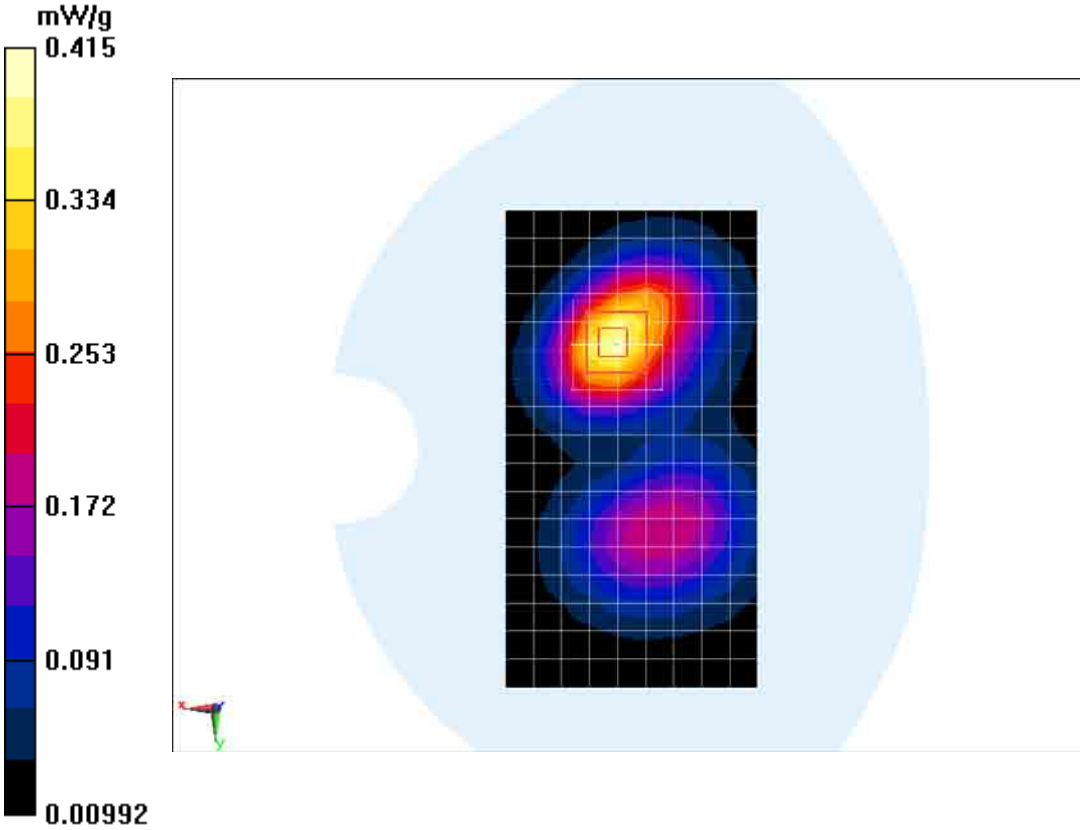
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Toward Phontom WCDMA1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.270 mW/g
Middle Toward Phontom WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.472 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.396 mW/g
SAR(1 g) = 0.253 mW/g; SAR(10 g) = 0.155 mW/g
Maximum value of SAR (measured) = 0.275 mW/g

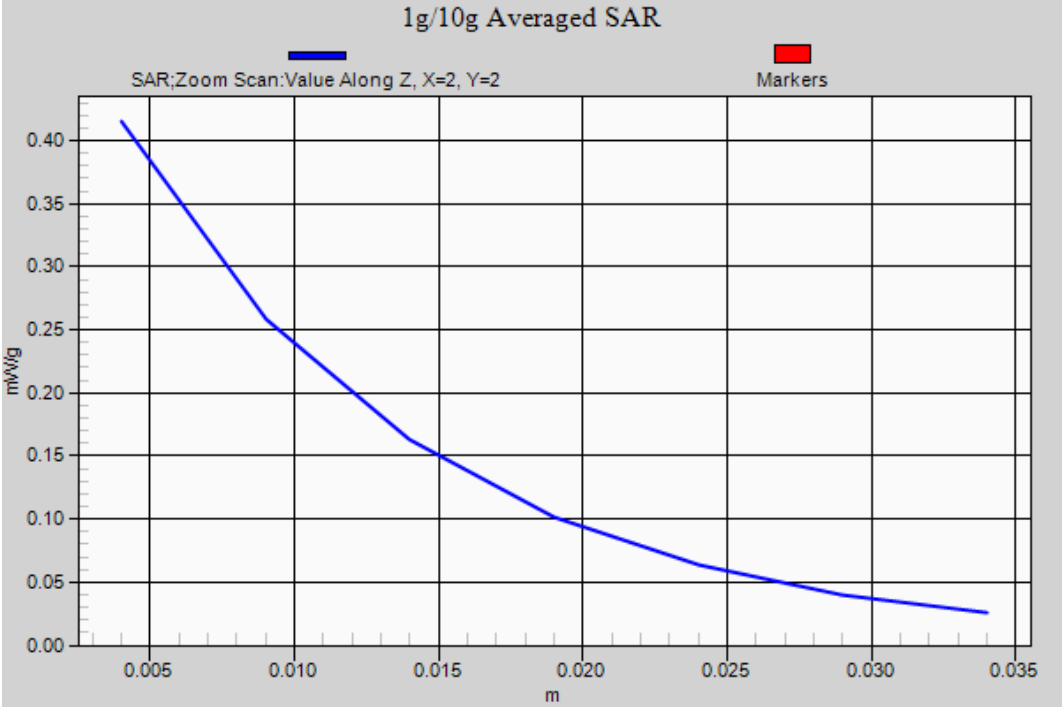



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Body Toward Ground Middle

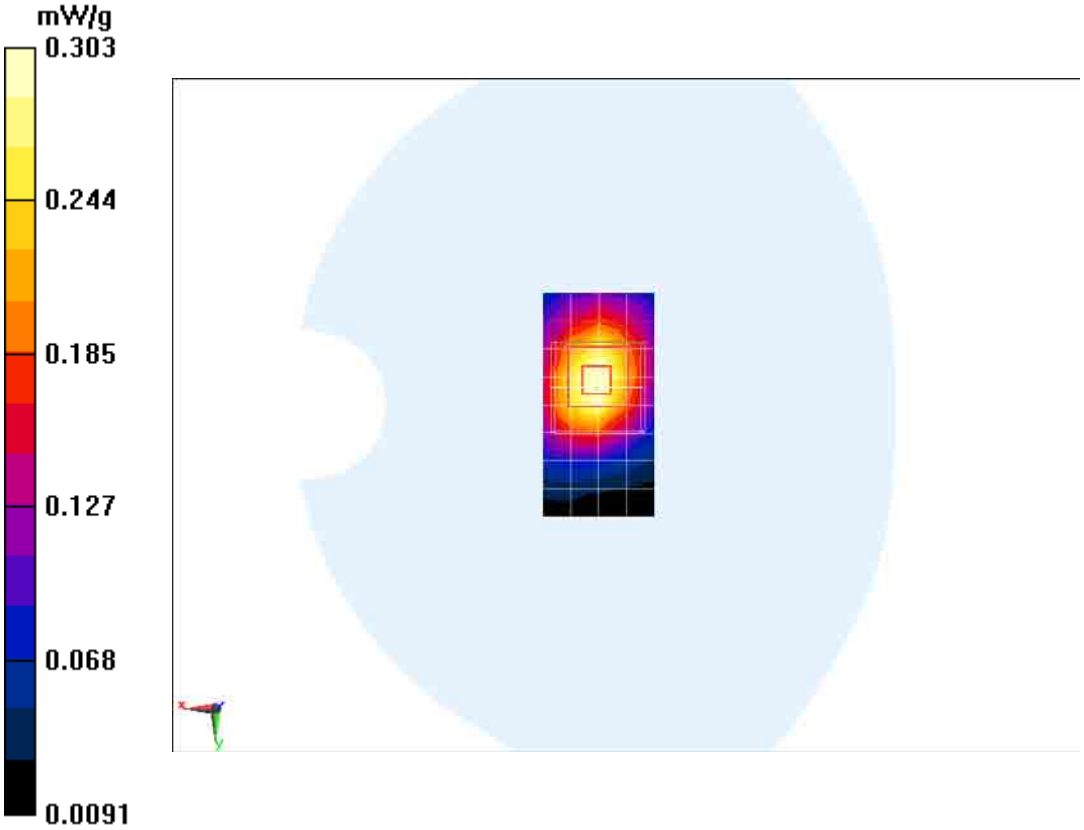
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Toward Ground WCDMA1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.403 mW/g
Middle Toward Ground WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.201 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.615 mW/g
SAR(1 g) = 0.380 mW/g; SAR(10 g) = 0.225 mW/g
Maximum value of SAR (measured) = 0.415 mW/g

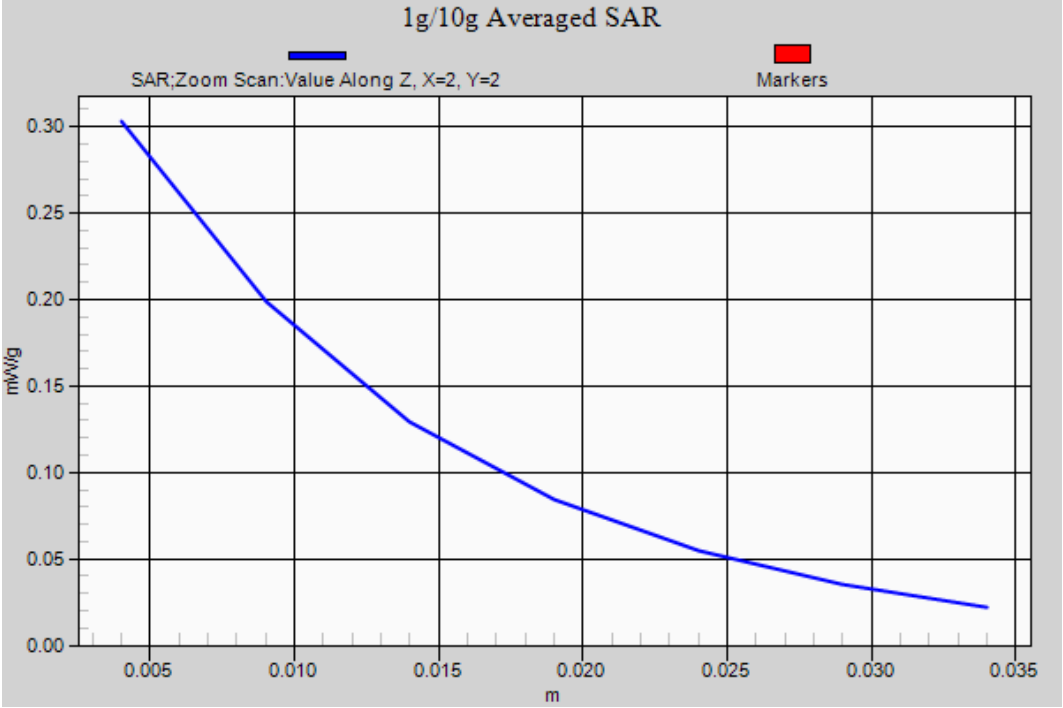



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Body Bottom Middle

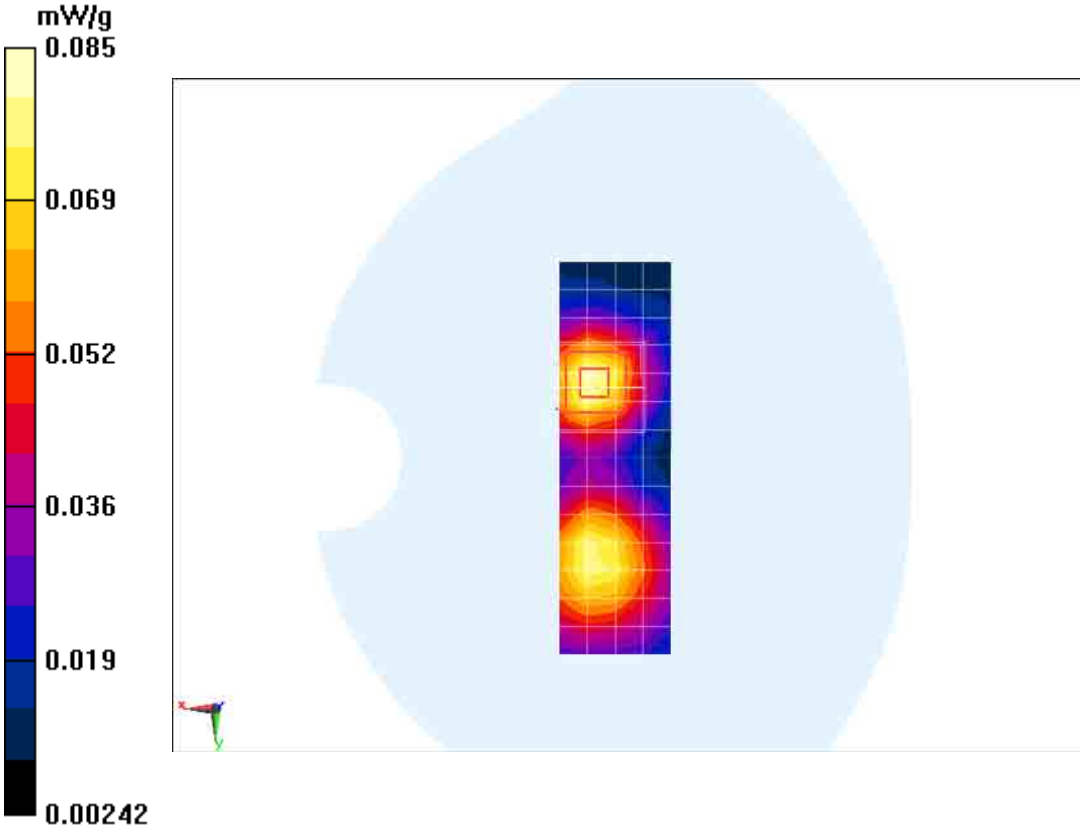
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Bottom WCDMA1900MHz/Area Scan (5x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.319 mW/g
Middle Bottom WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.252 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.428 mW/g
SAR(1 g) = 0.279 mW/g; SAR(10 g) = 0.170 mW/g
Maximum value of SAR (measured) = 0.303 mW/g

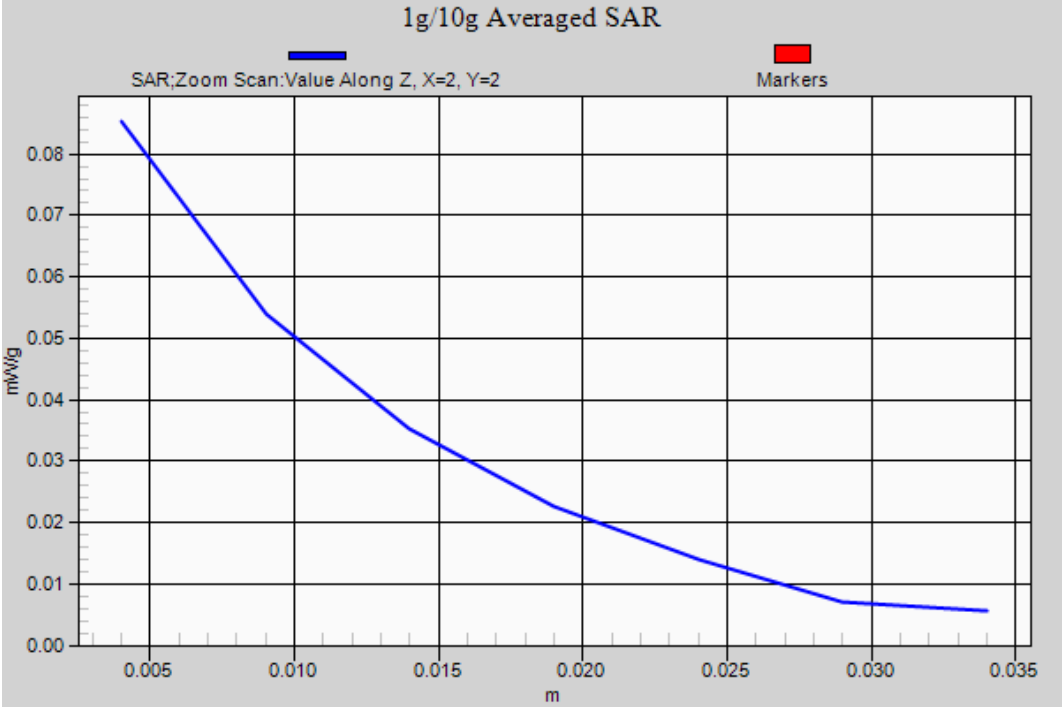



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Body Left Middle

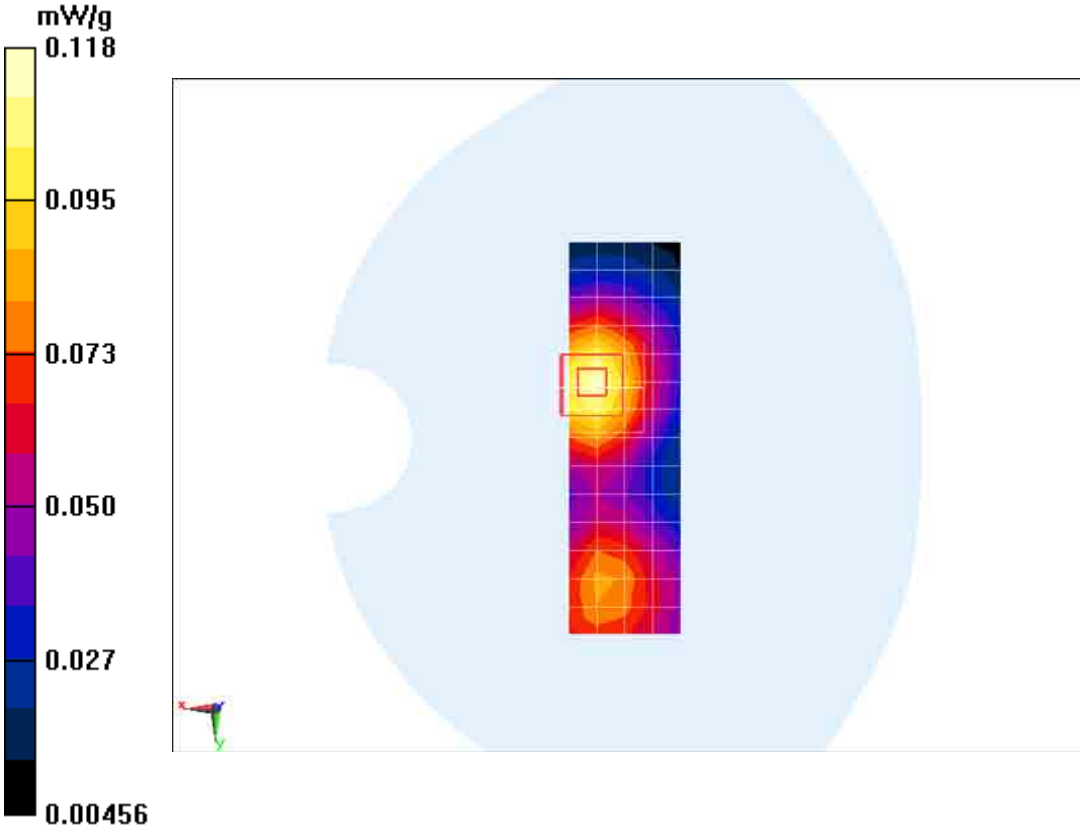
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Left WCDMA1900MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.083 mW/g
Middle Left WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.451 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.124 mW/g
SAR(1 g) = 0.078 mW/g; SAR(10 g) = 0.047 mW/g
Maximum value of SAR (measured) = 0.085 mW/g

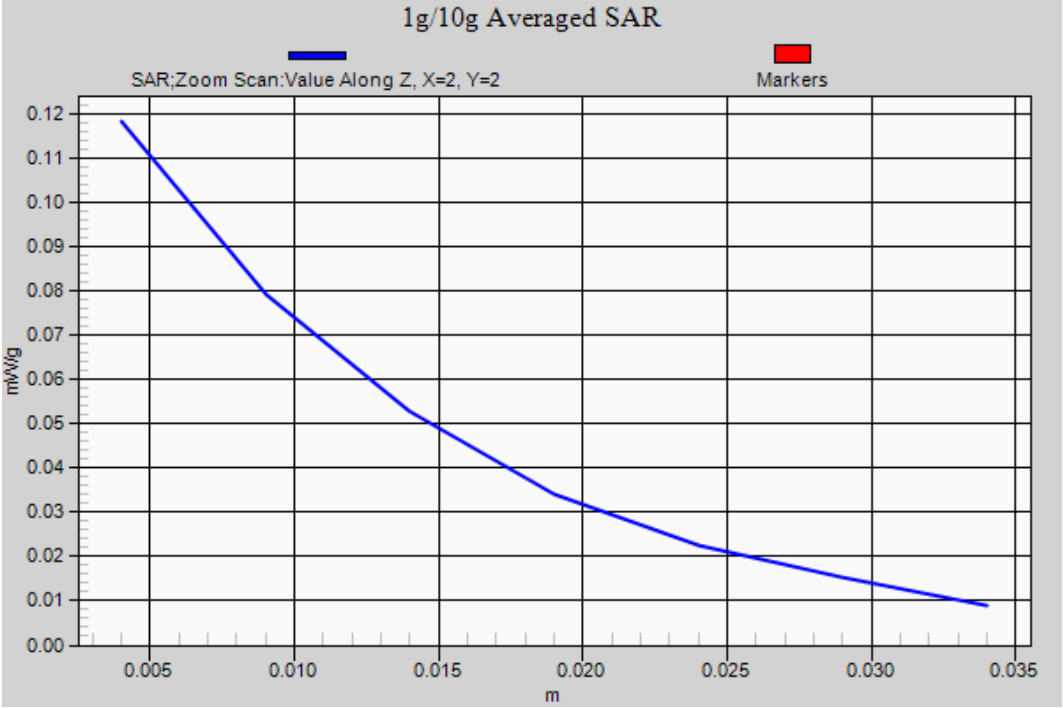



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Body Right Middle

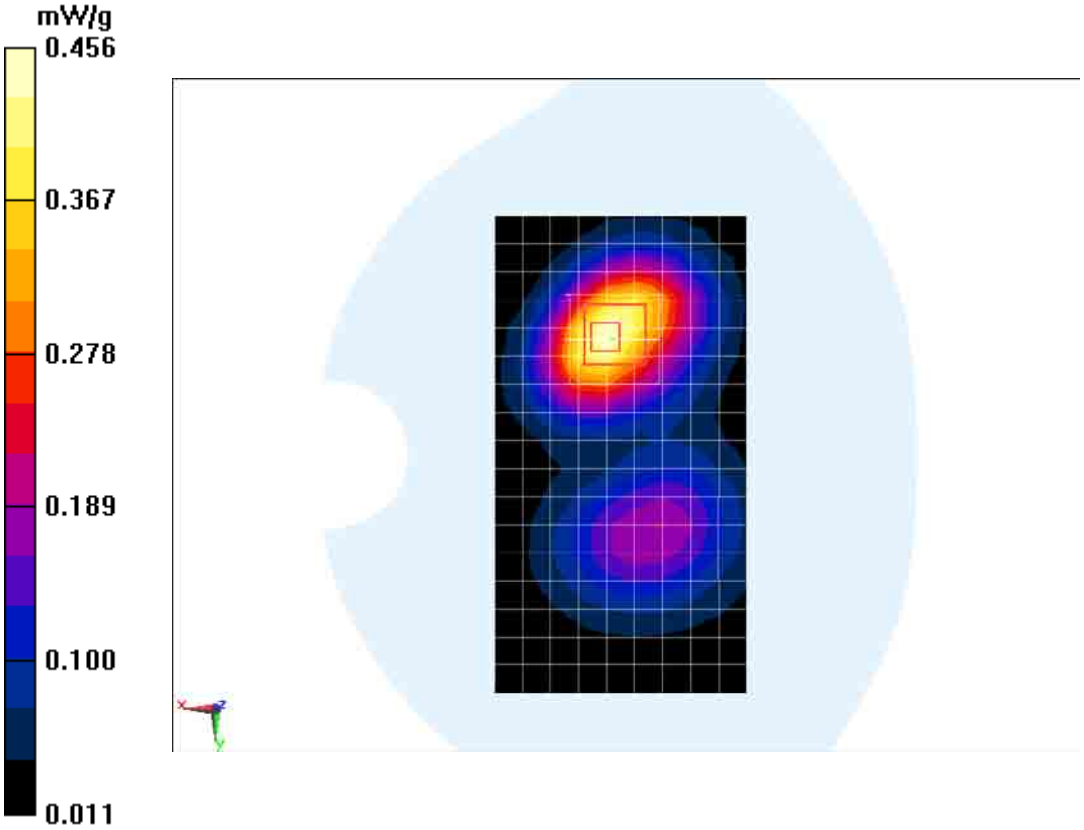
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1880 MHz; σ = 1.504 mho/m; εr = 53.319; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 1880 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Middle Right WCDMA1900MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.116 mW/g
Middle Right WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.742 V/m; Power Drift = 0.045 dB
Peak SAR (extrapolated) = 0.164 mW/g
SAR(1 g) = 0.109 mW/g; SAR(10 g) = 0.070 mW/g
Maximum value of SAR (measured) = 0.118 mW/g

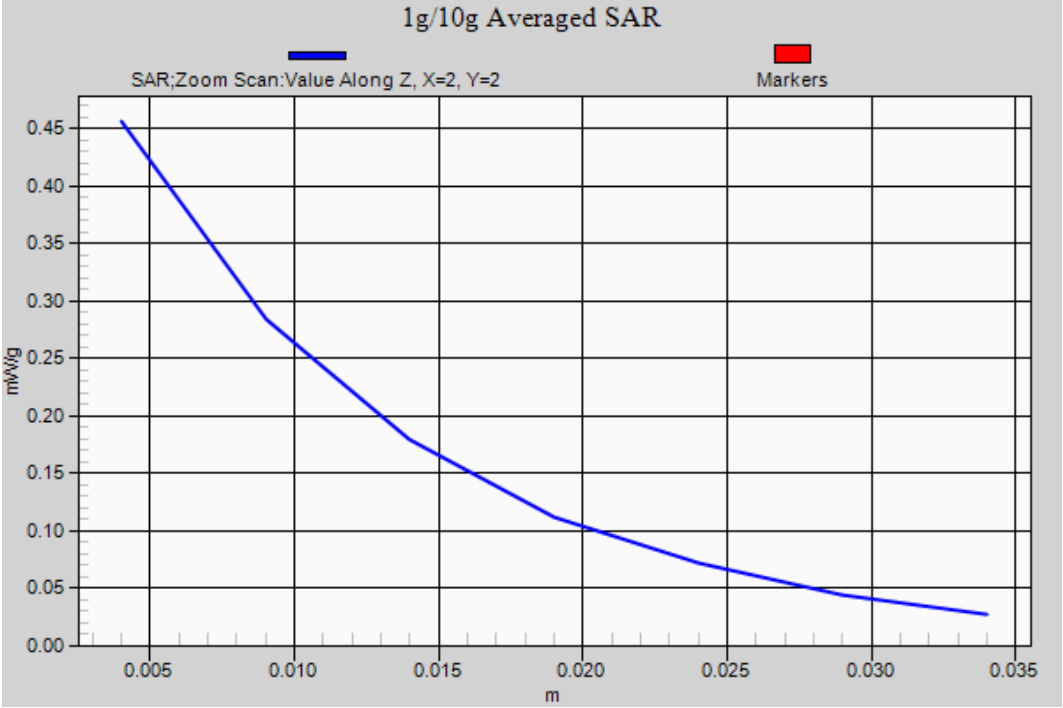



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Body Toward Ground High

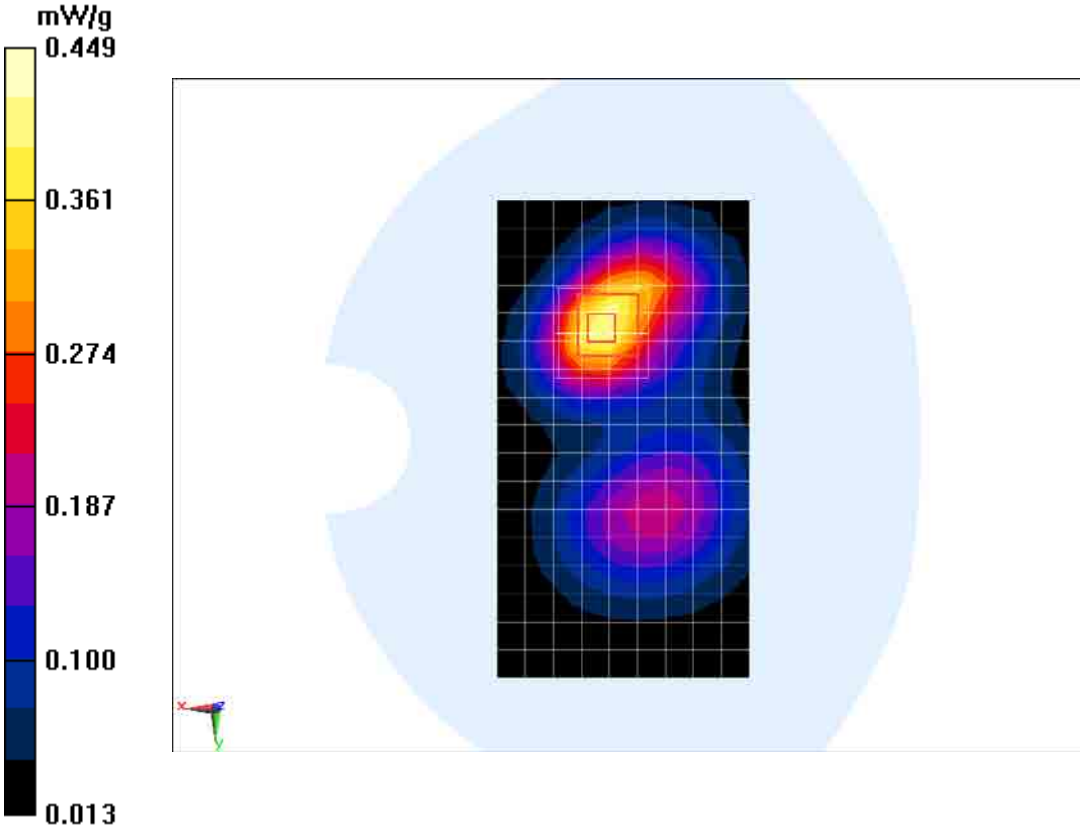
Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1908 MHz; σ = 1.532 mho/m; εr = 53.199; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
High Toward Ground WCDMA1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.455 mW/g
High Toward Ground WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.656 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 0.688 mW/g
SAR(1 g) = 0.425 mW/g; SAR(10 g) = 0.257 mW/g
Maximum value of SAR (measured) = 0.456 mW/g

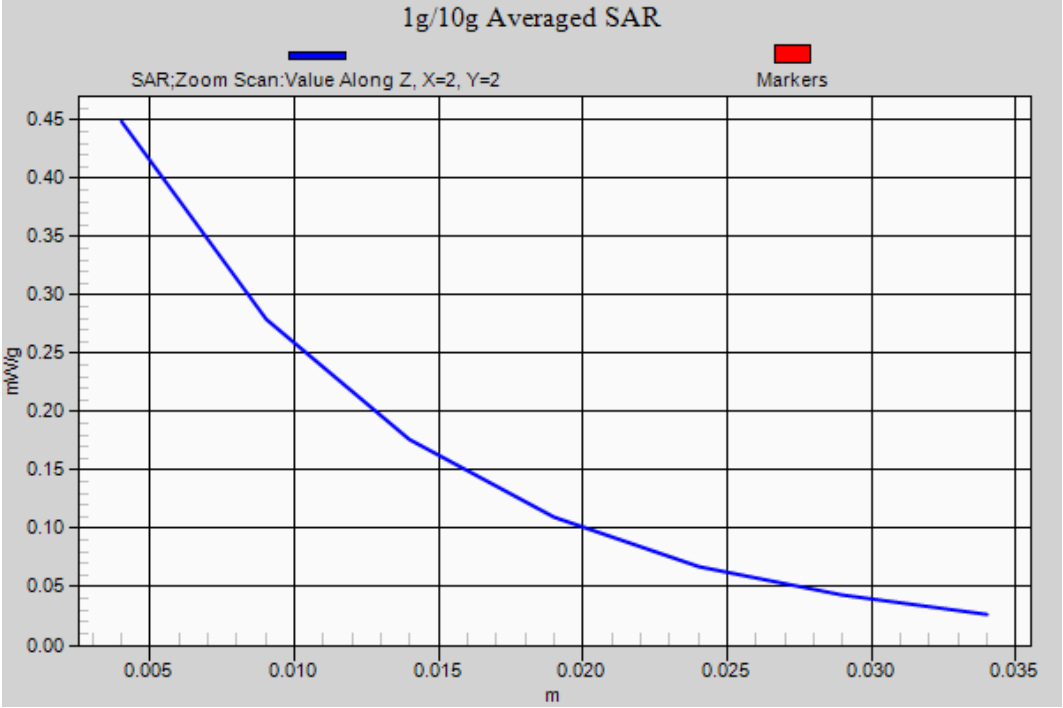



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WCDMA1900 Body Toward Ground Low

Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.477 mho/m; εr = 53.431; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)
Low Toward Ground WCDMA1900MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.422 mW/g
Low Toward Ground WCDMA1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.510 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.669 mW/g
SAR(1 g) = 0.409 mW/g; SAR(10 g) = 0.241 mW/g
Maximum value of SAR (measured) = 0.449 mW/g



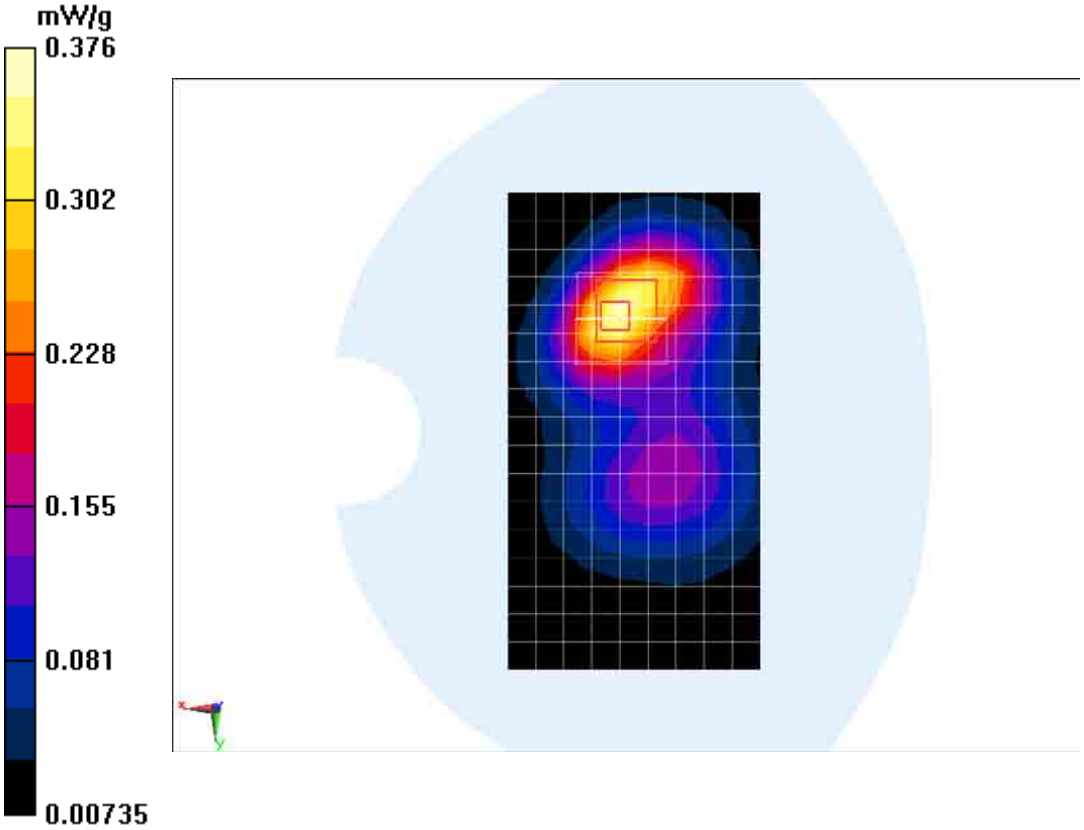

1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

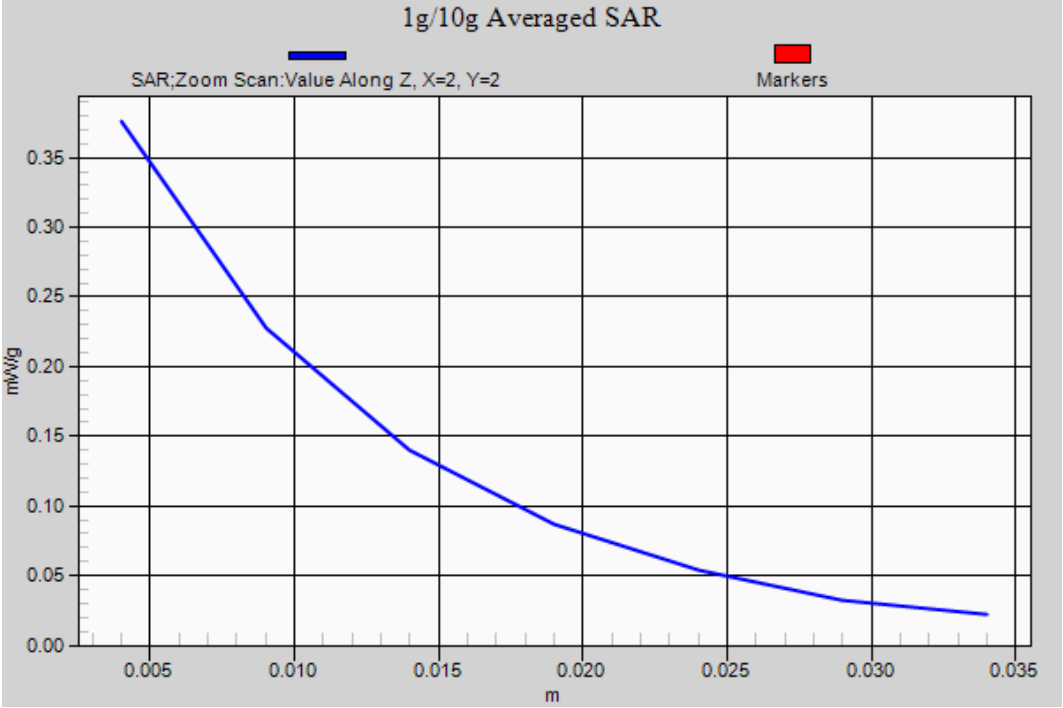
WCDMA1900 Body Toward Ground High With Headset

Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.477 mho/m; εr = 53.431; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WCDMA Professional; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)

High Toward Ground WCDMA1900MHz With Headset/Area Scan (10x18x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.363 mW/g

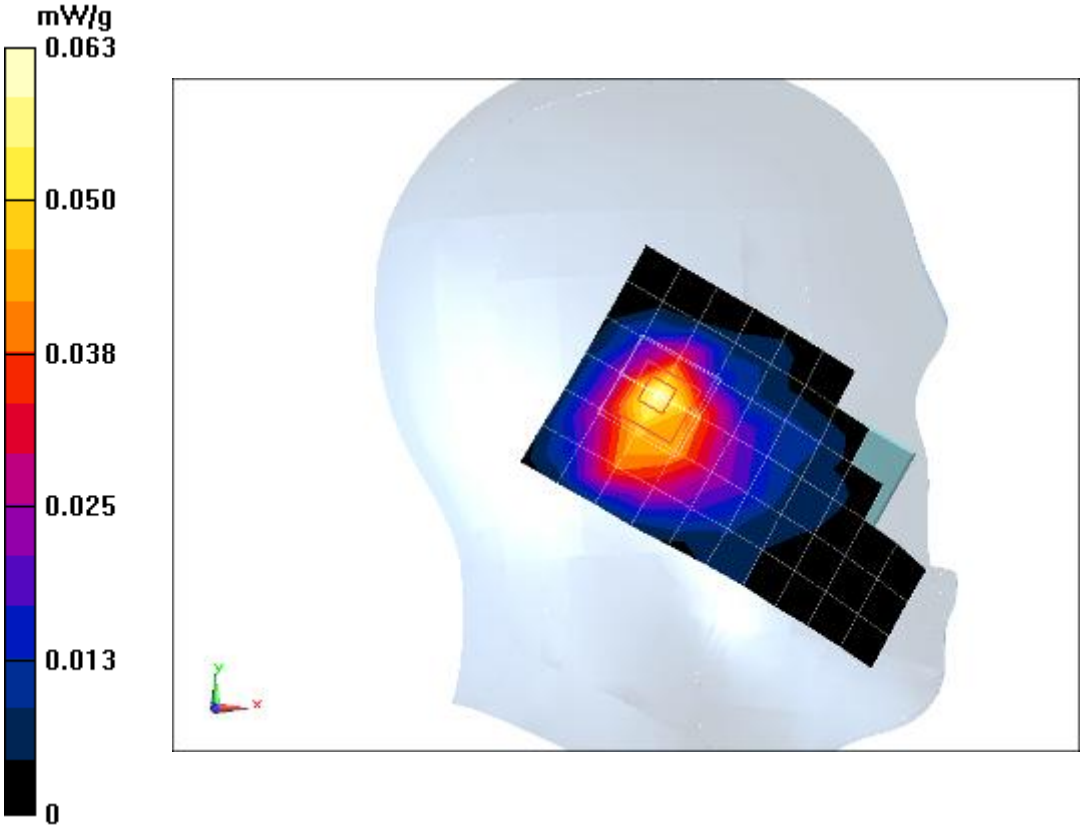
High Toward Ground WCDMA1900MHz With Headset/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.518 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.573 mW/g
SAR(1 g) = 0.345 mW/g; SAR(10 g) = 0.205 mW/g
Maximum value of SAR (measured) = 0.376 mW/g

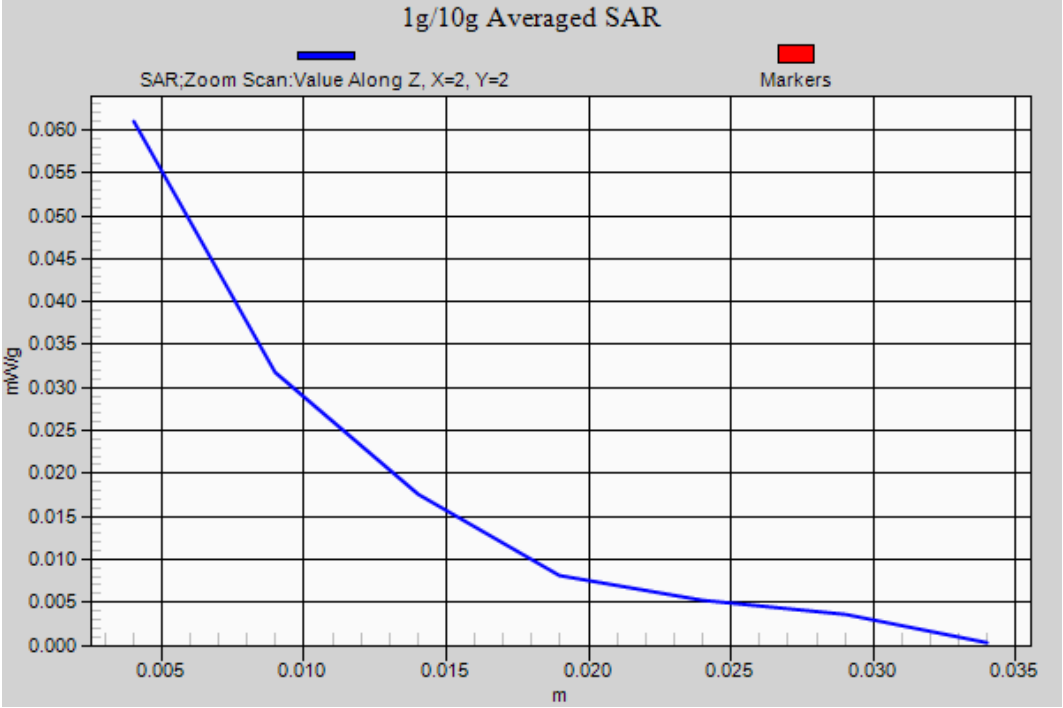



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Left Cheek High

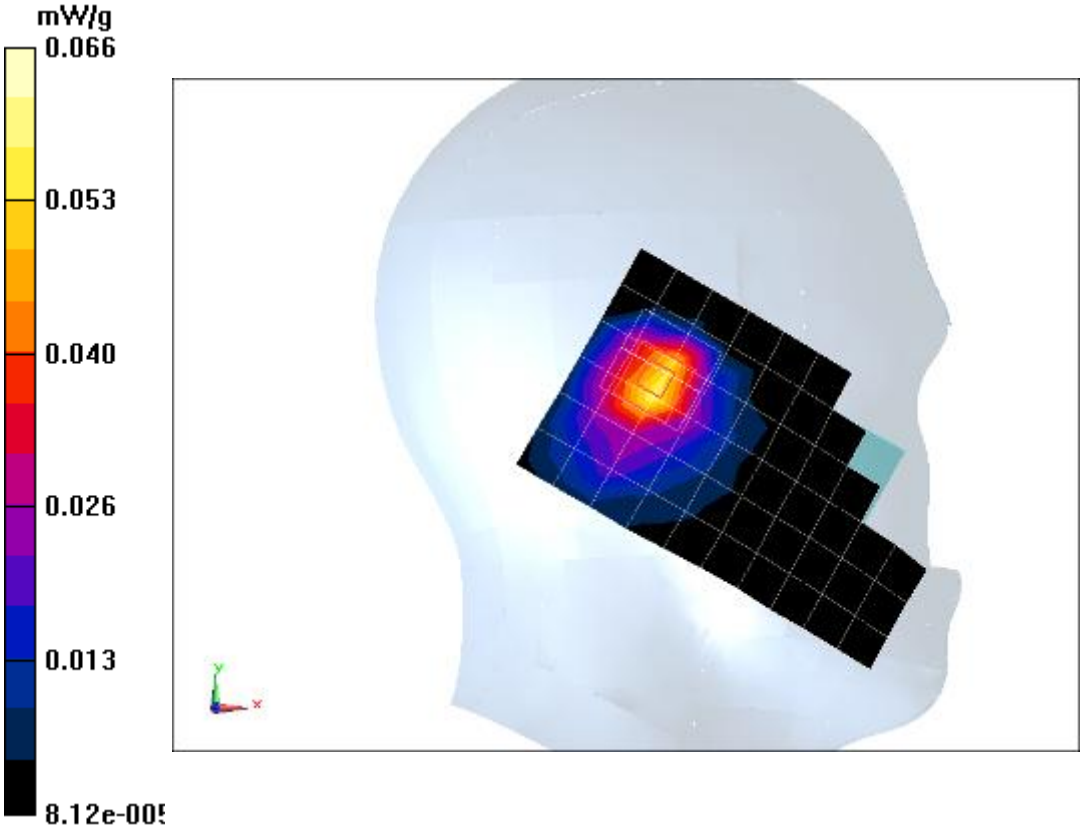
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.836 mho/m; εr = 38.788; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.41, 4.41, 4.41)
802.11b/High Cheek Left WiFi2450MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.062 mW/g
802.11b/High Cheek Left WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.084 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.104 mW/g
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.030 mW/g
Maximum value of SAR (measured) = 0.063 mW/g

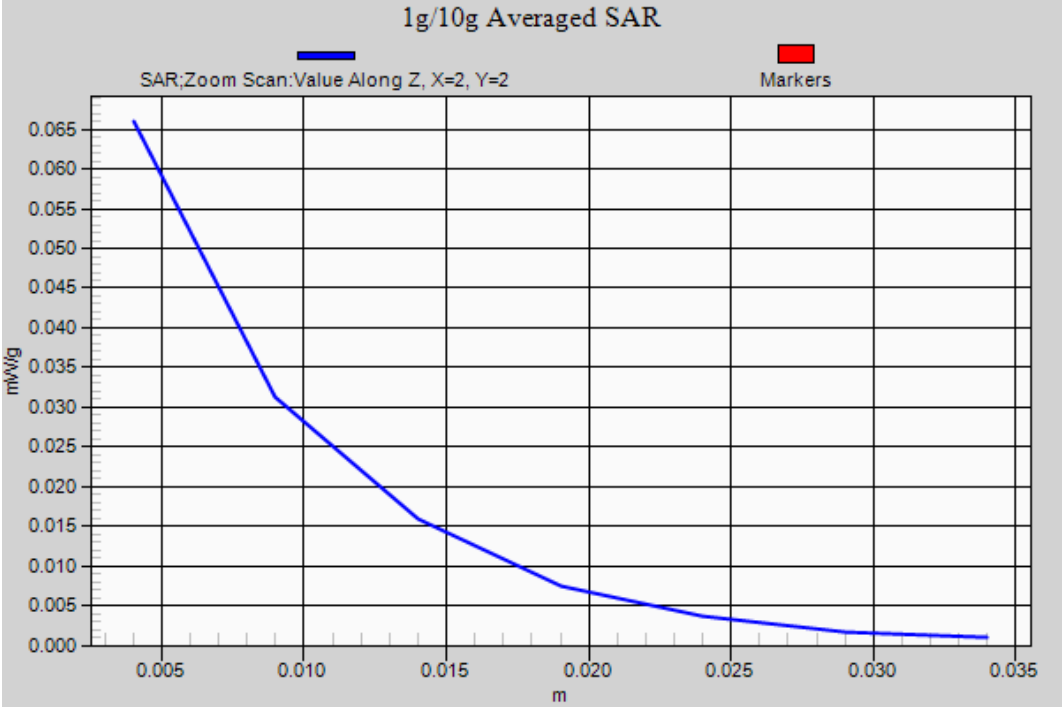



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Left Tilt High

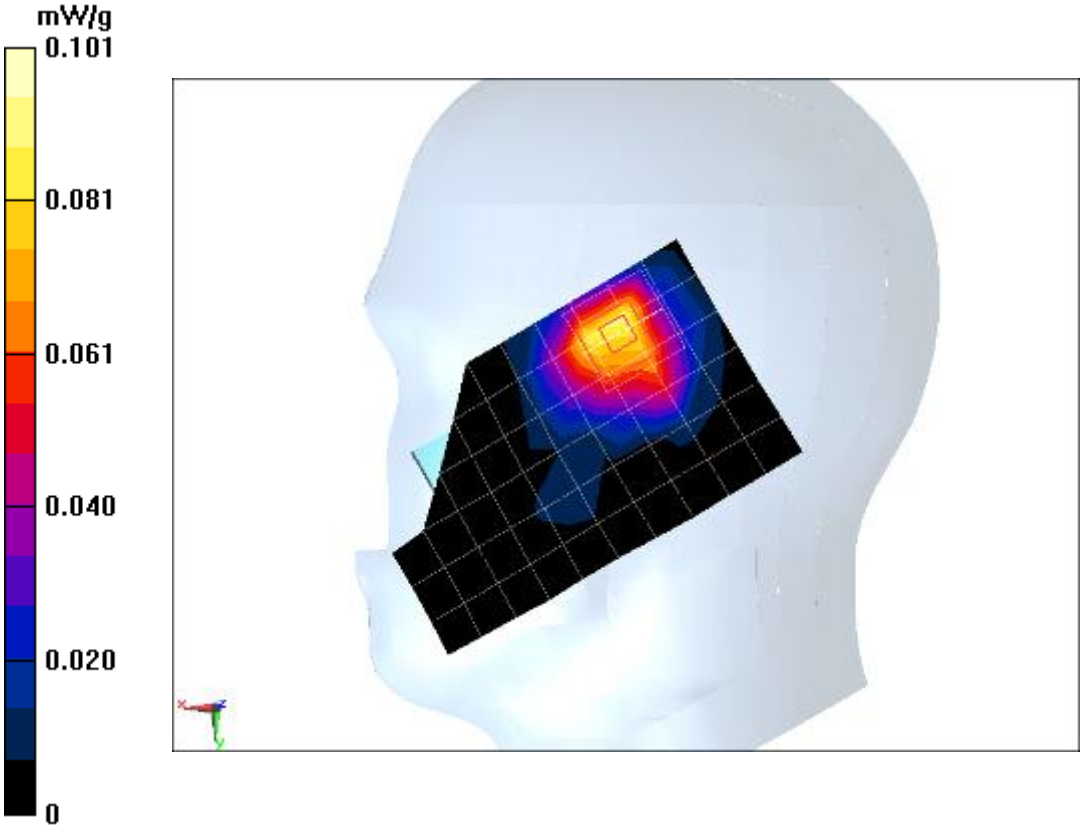
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.836 mho/m; εr = 38.788; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.41, 4.41, 4.41)
802.11b/High Tilt Left WiFi2450MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.058 mW/g
802.11b/High Tilt Left WiFi 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.698 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.129 mW/g
SAR(1 g) = 0.060 mW/g; SAR(10 g) = 0.029 mW/g
Maximum value of SAR (measured) = 0.066 mW/g

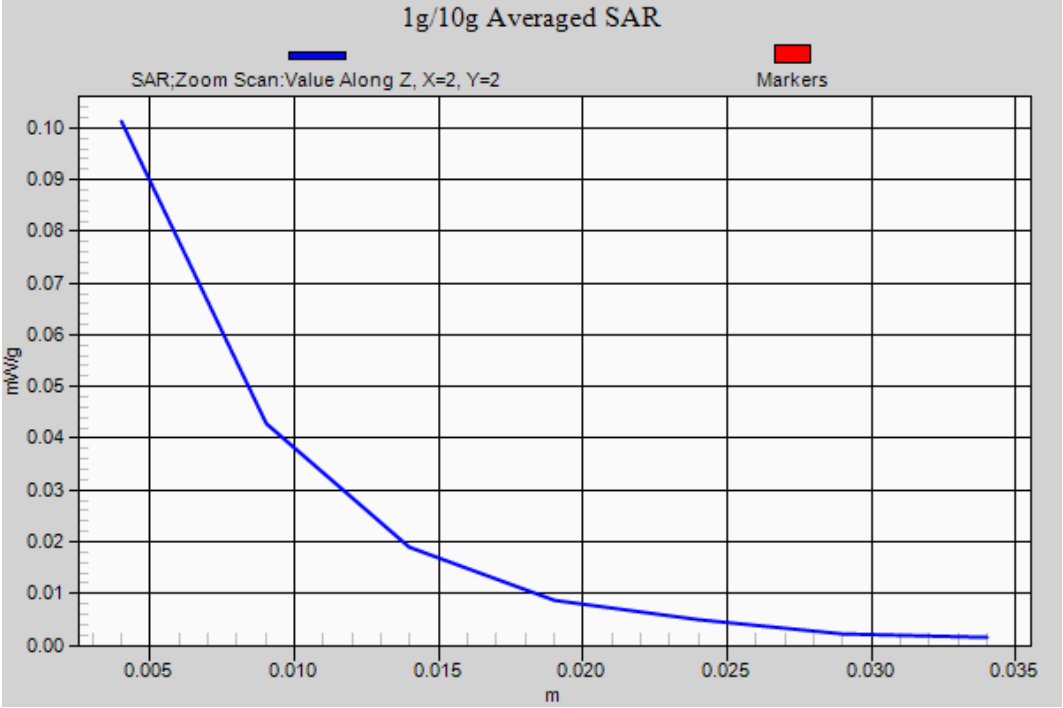



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Right Cheek High

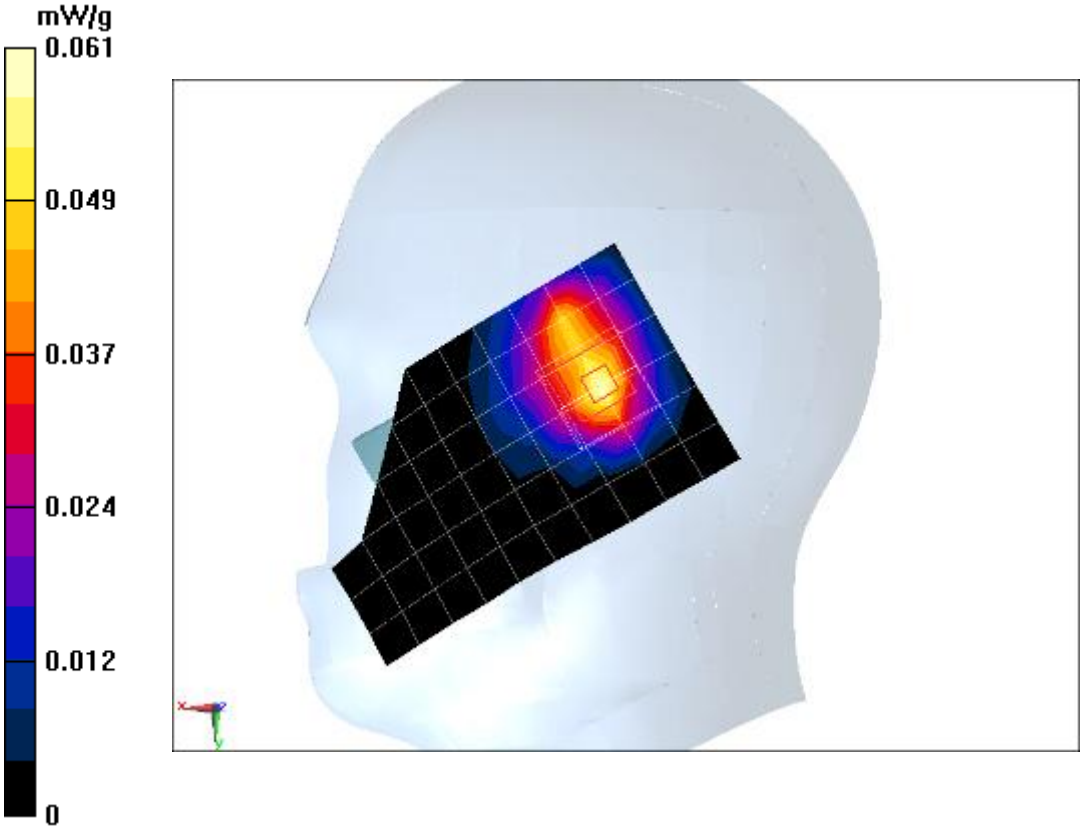
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.836 mho/m; εr = 38.788; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.41, 4.41, 4.41)
802.11b/High Cheek Right WiFi2450MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.091 mW/g
802.11b/High Cheek Right WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.933 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.215 mW/g
SAR(1 g) = 0.094 mW/g; SAR(10 g) = 0.047 mW/g
Maximum value of SAR (measured) = 0.101 mW/g

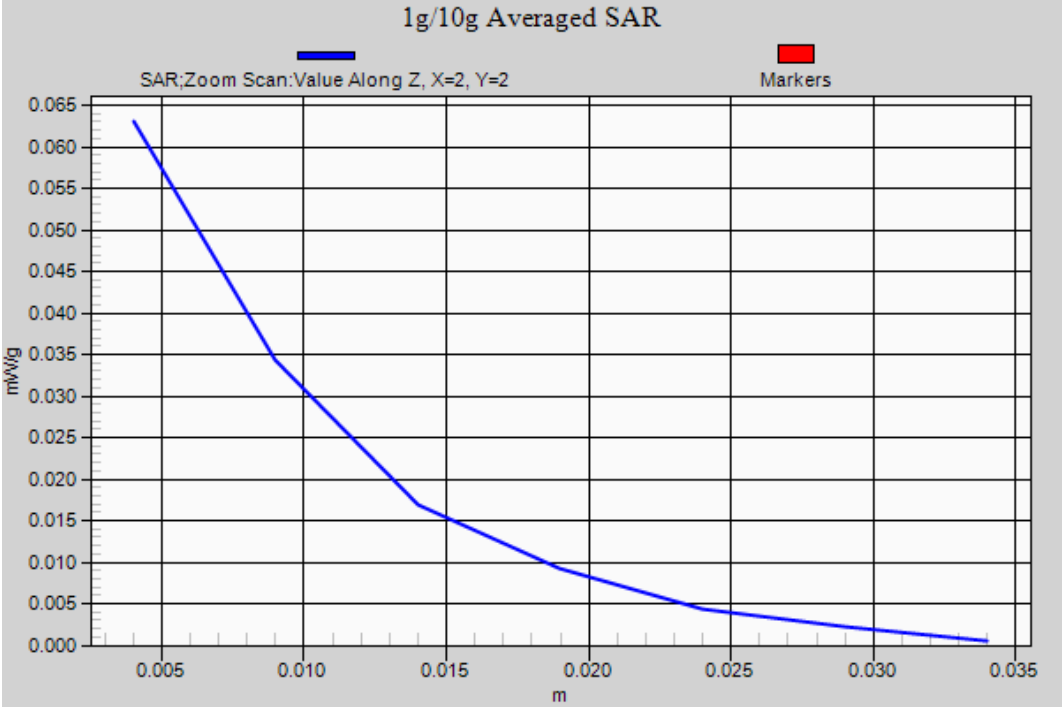



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Right Tilt High

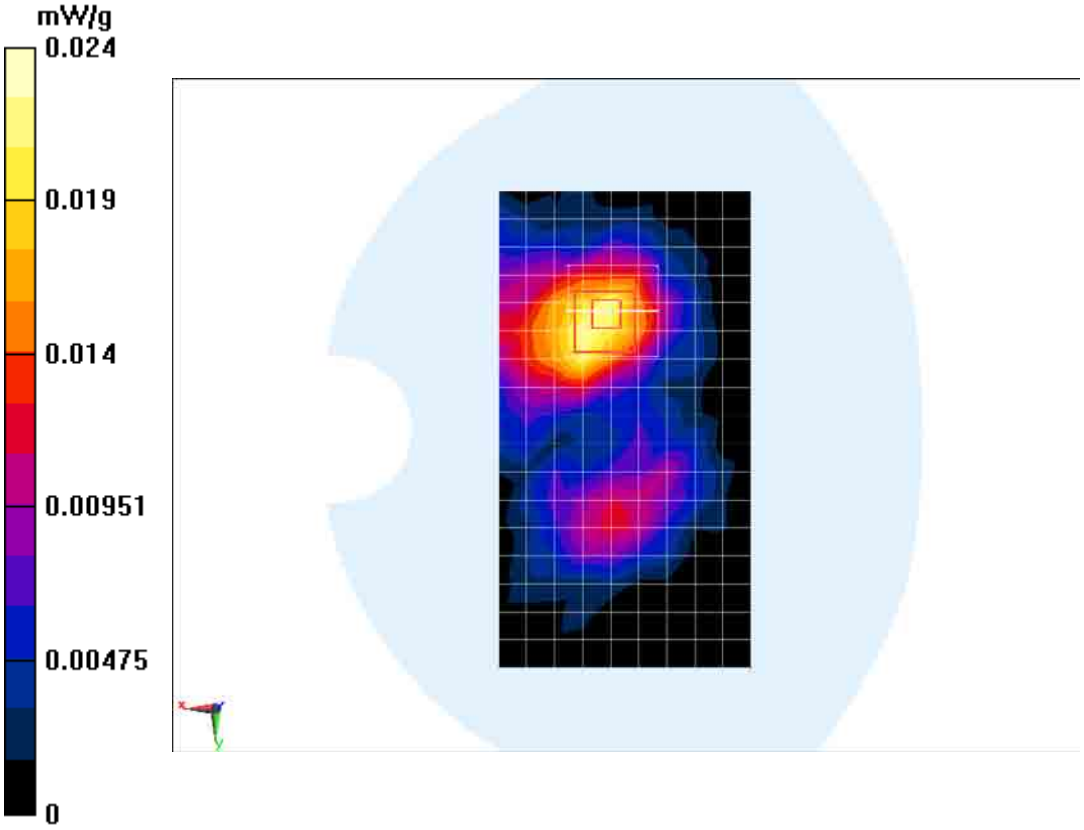
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.836 mho/m; εr = 38.788; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.41, 4.41, 4.41)
802.11b/High Tilt Right WiFi2450MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.061 mW/g
802.11b/High Tilt Right WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.584 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.117 mW/g
SAR(1 g) = 0.054 mW/g; SAR(10 g) = 0.029 mW/g

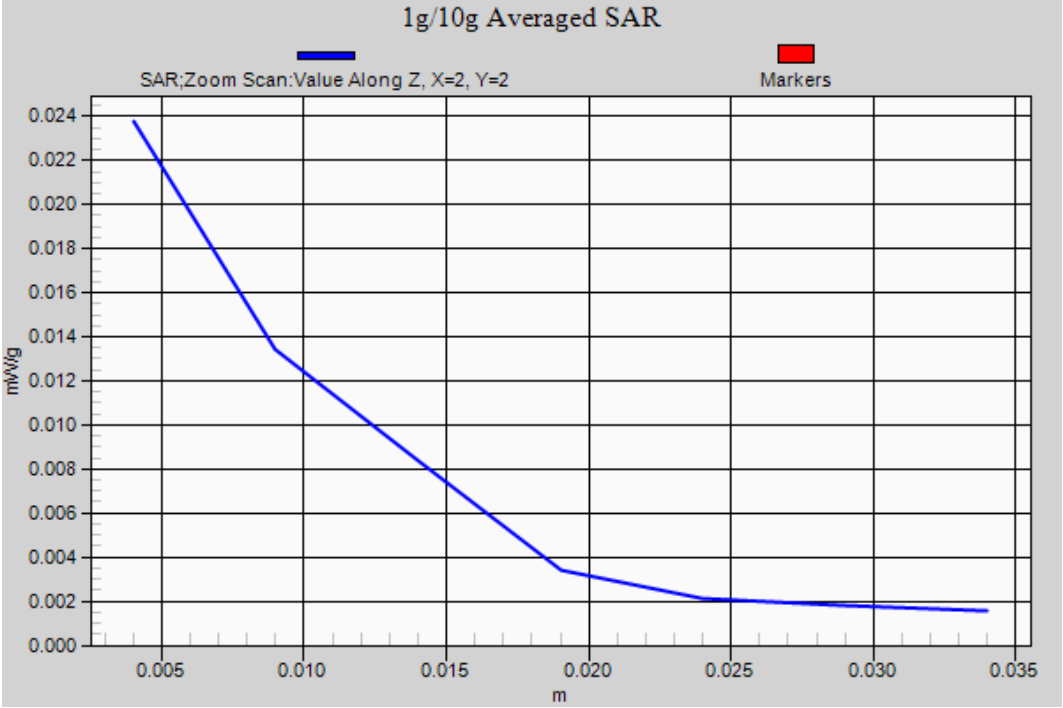



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Body Toward Phontom High

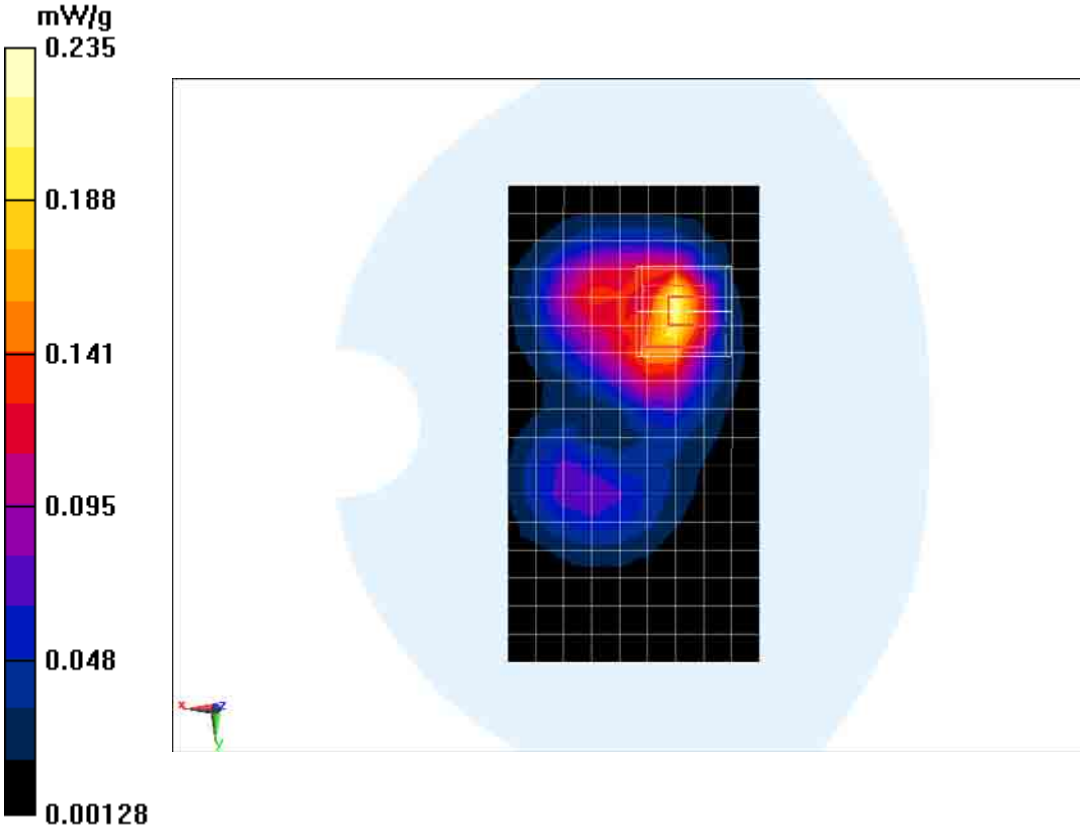
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Body 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.931 mho/m; εr = 53.917; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2437 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.37, 4.37, 4.37)
802.11b/High Toward Phontom WiFi2450MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.022 mW/g
802.11b/High Toward Phontom WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.728 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.040 mW/g
SAR(1 g) = 0.021 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.024 mW/g

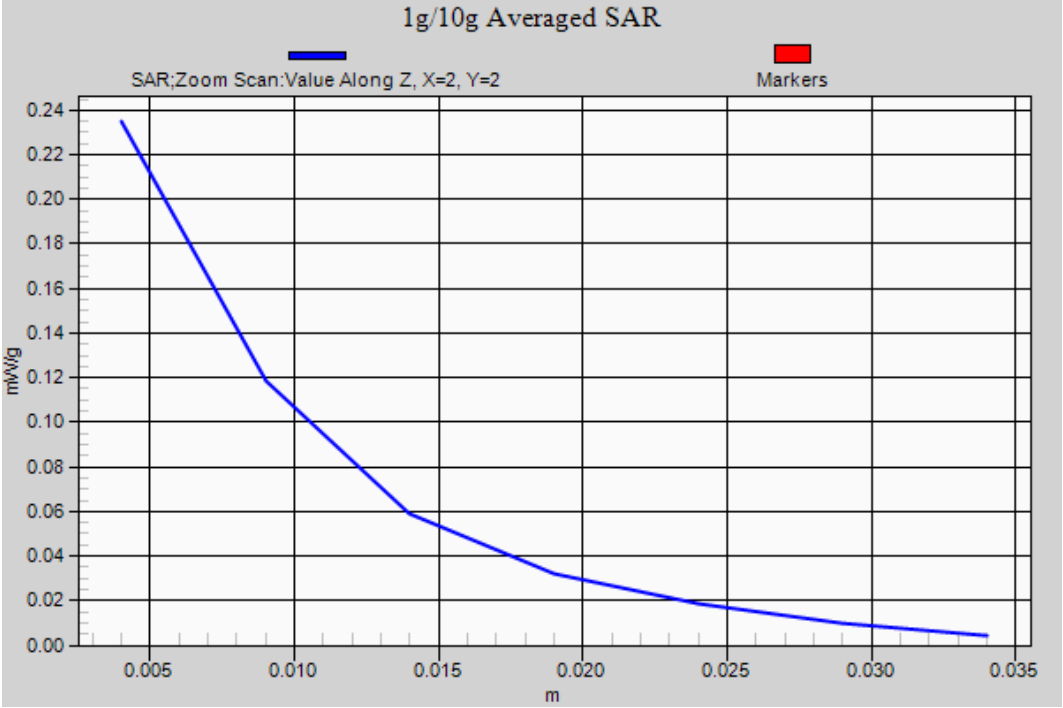



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.024
0.022
0.020
0.018
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Body Toward Ground High

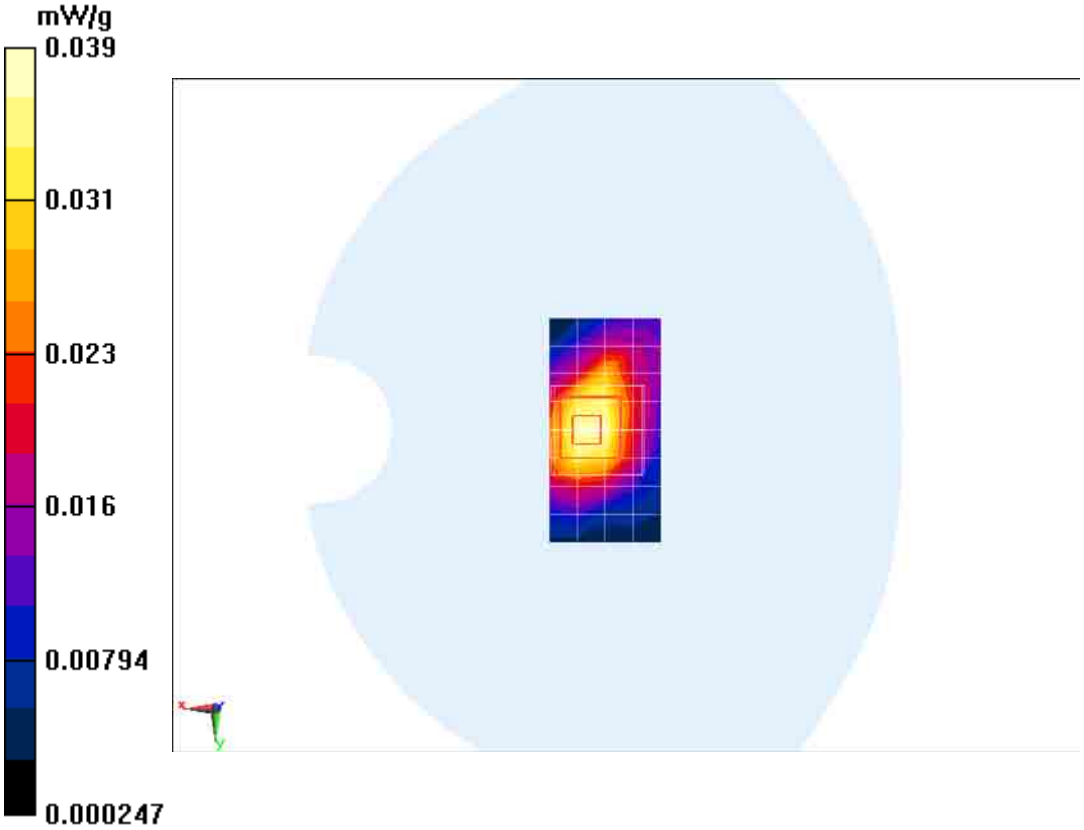
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Body 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.931 mho/m; εr = 53.917; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.37, 4.37, 4.37)
802.11b/High Toward Ground WiFi2450MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.215 mW/g
802.11b/High Toward Ground WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.961 V/m; Power Drift = 0.035 dB
Peak SAR (extrapolated) = 0.398 mW/g
SAR(1 g) = 0.196 mW/g; SAR(10 g) = 0.098 mW/g
Maximum value of SAR (measured) = 0.235 mW/g

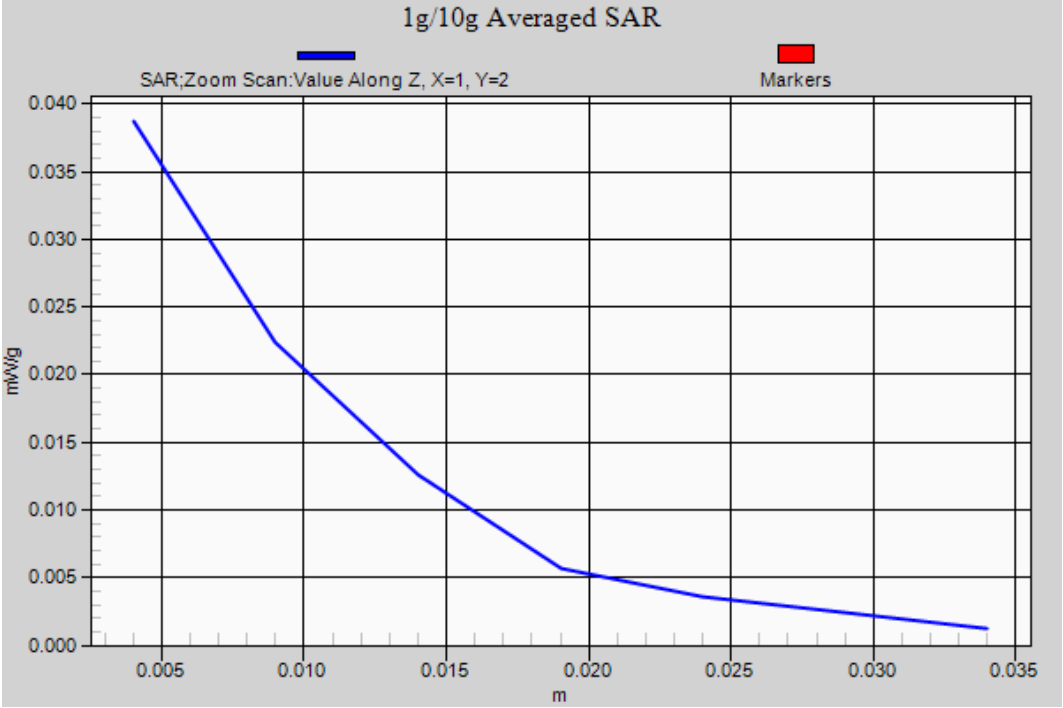



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Body Top High

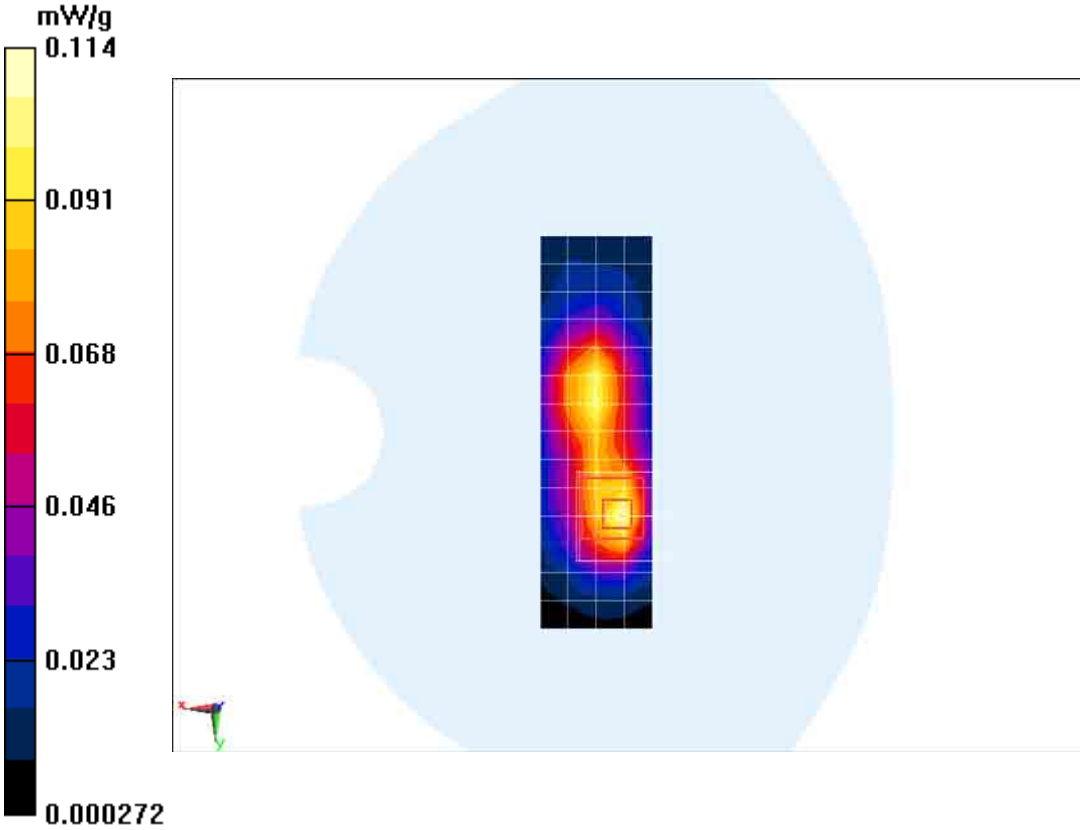
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Body 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.931 mho/m; εr = 53.917; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.37, 4.37, 4.37)
802.11b/High Top WiFi2450MHz/Area Scan (5x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.037 mW/g
802.11b/High Top WiFi 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.249 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.062 mW/g
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.021 mW/g
Maximum value of SAR (measured) = 0.039 mW/g

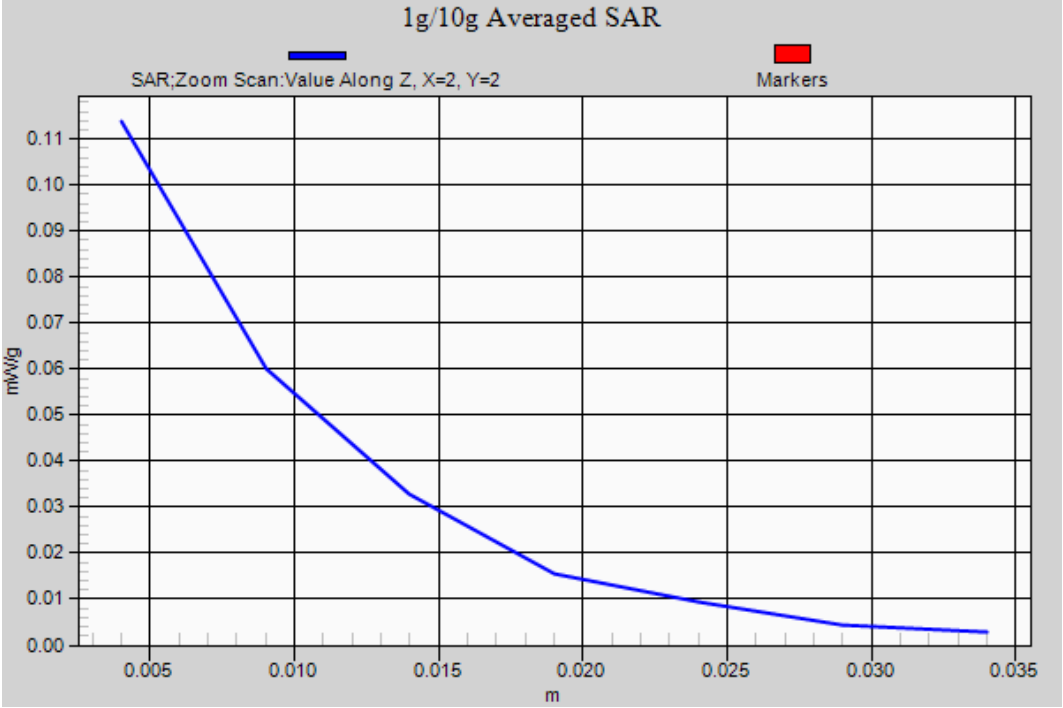



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=1, Y=2
Markers
mW/g
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Body Left High

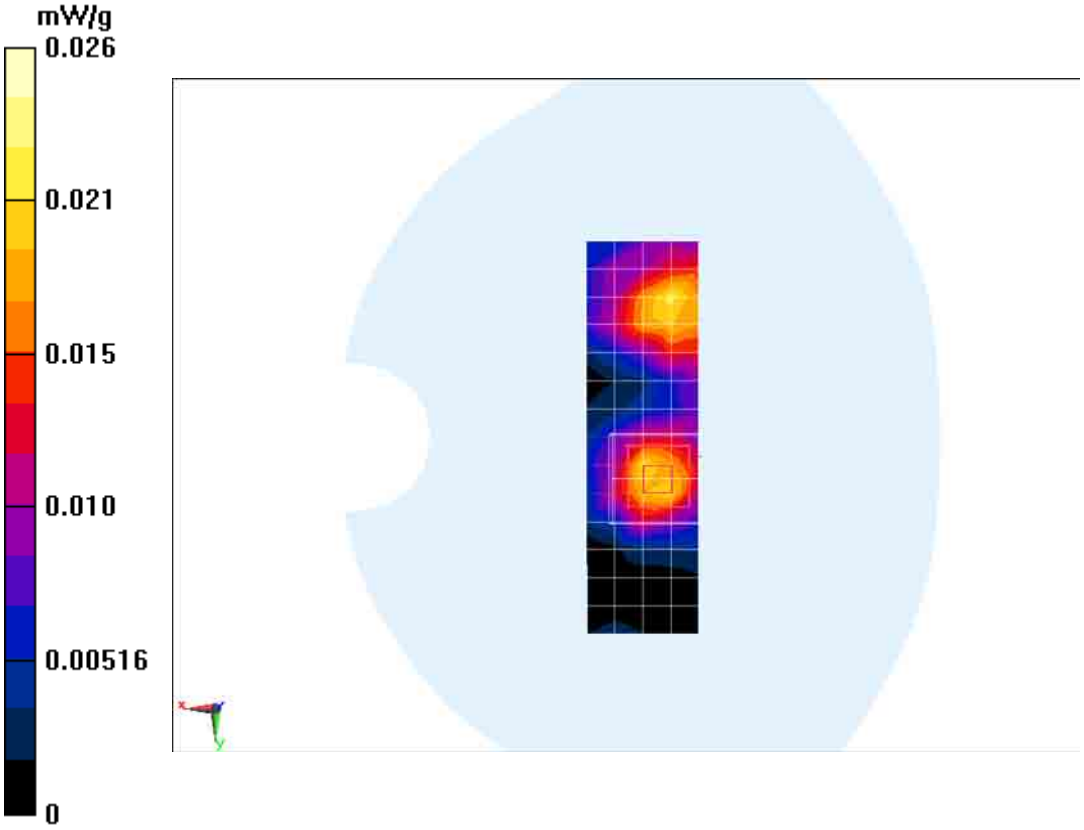
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Body 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.931 mho/m; εr = 53.917; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.37, 4.37, 4.37)
802.11b/High Left WiFi2450MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.110 mW/g
802.11b /High Left WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.777 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.192 mW/g
SAR(1 g) = 0.099 mW/g; SAR(10 g) = 0.051 mW/g
Maximum value of SAR (measured) = 0.114 mW/g

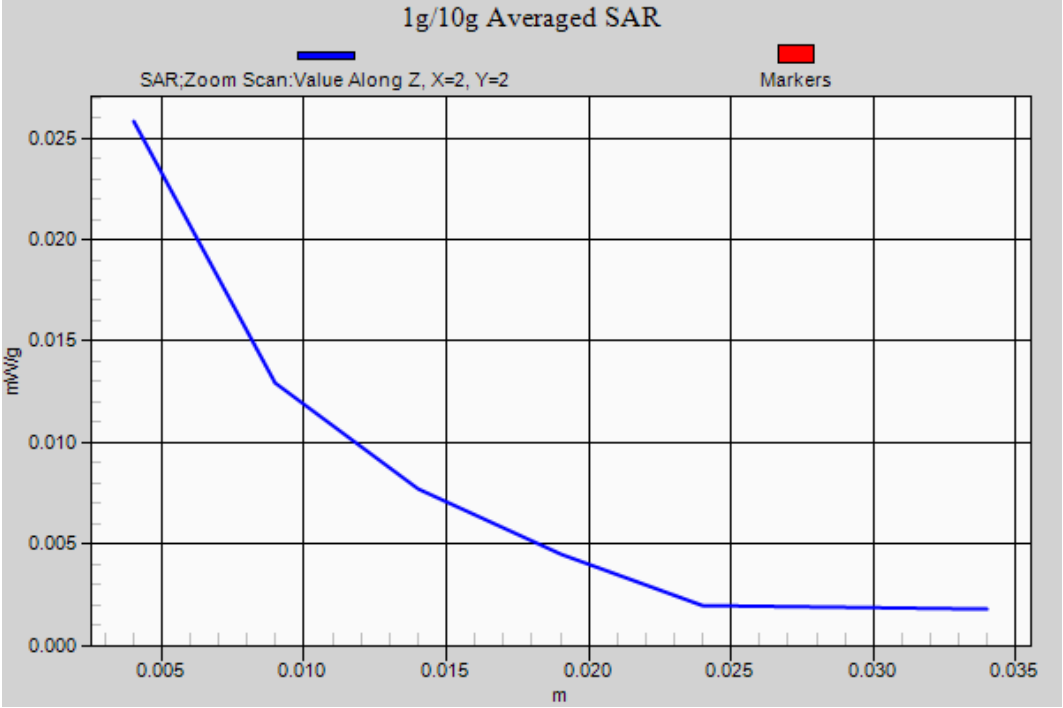



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11b Body Right High

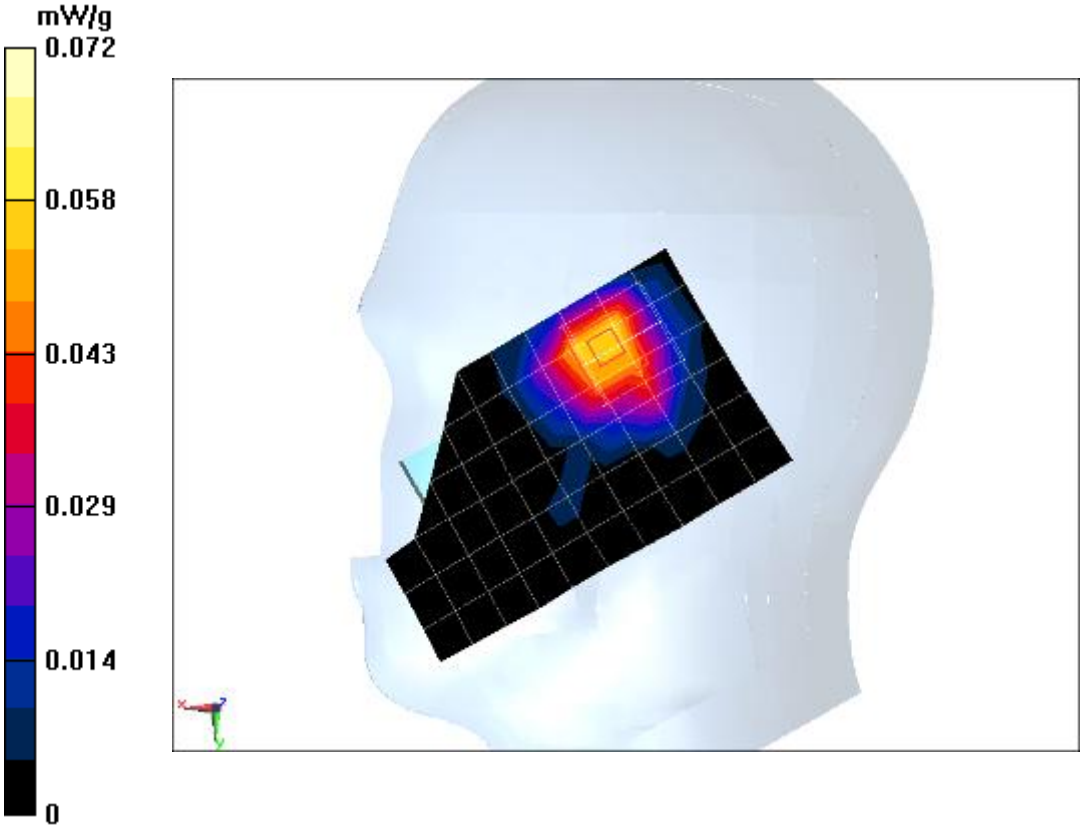
Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Body 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.931 mho/m; εr = 53.917; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.37, 4.37, 4.37)
802.11b/High Right WiFi 2450MHz/Area Scan (5x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.021 mW/g
802.11b/High Right WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.704 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.043 mW/g
SAR(1 g) = 0.023 mW/g; SAR(10 g) = 0.013 mW/g
Maximum value of SAR (measured) = 0.026 mW/g

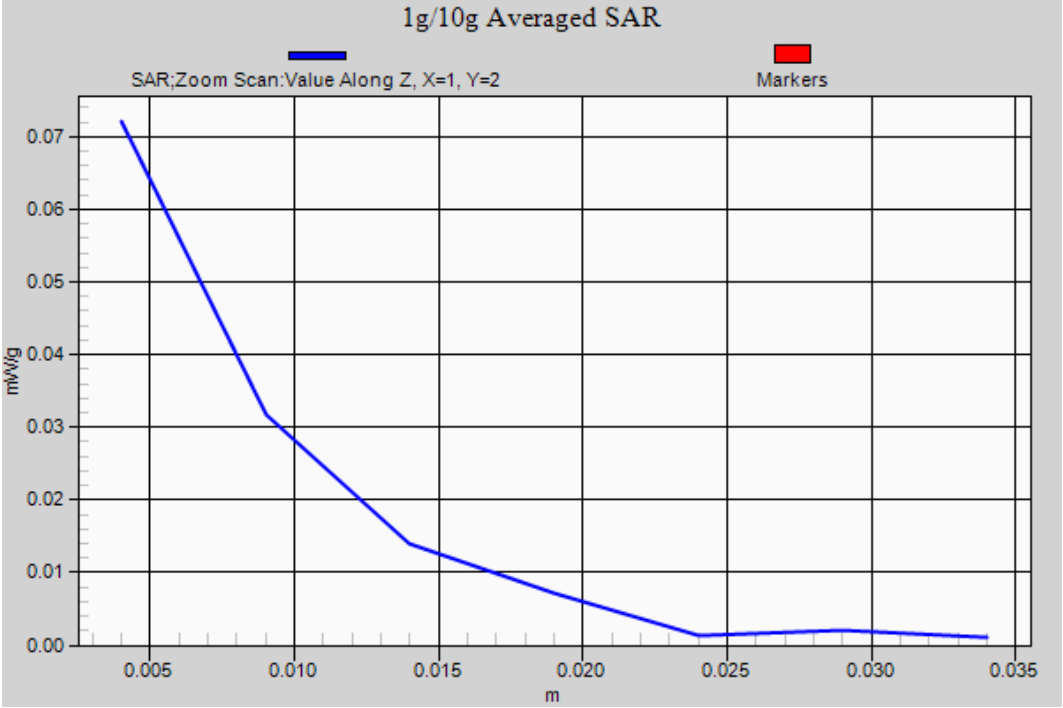



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.025
0.020
0.015
0.010
0.005
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11g Right Cheek High

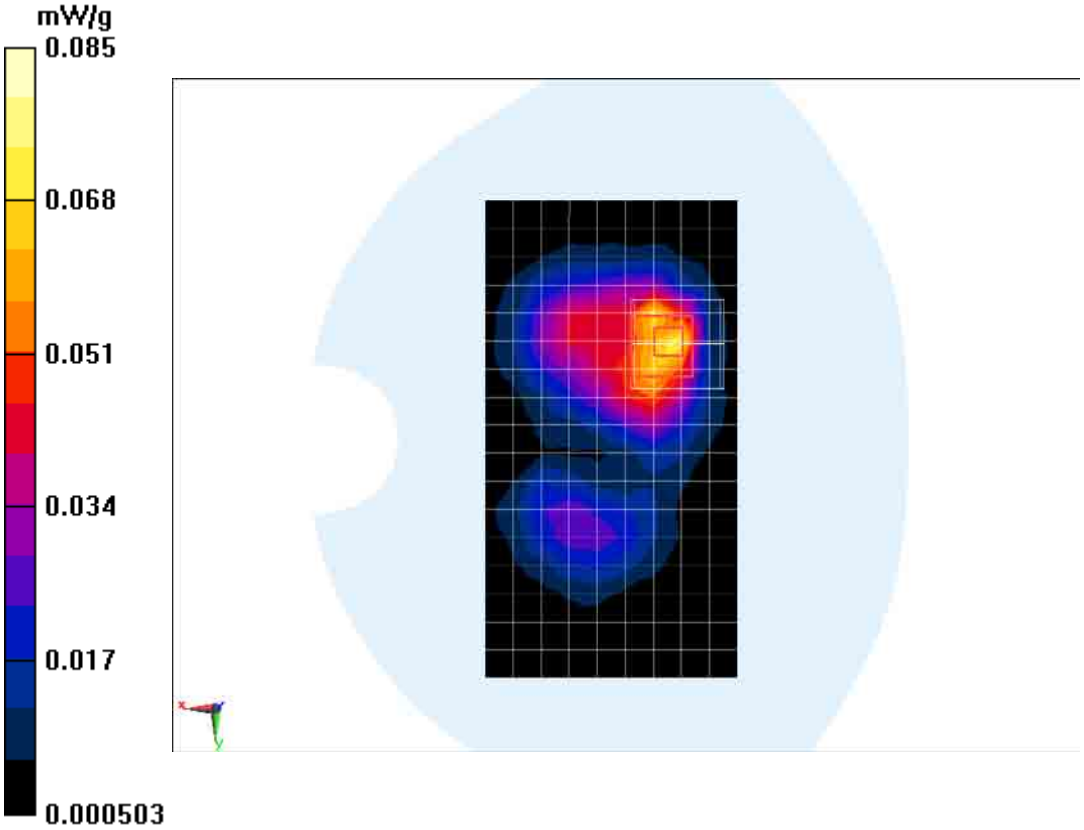
Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.836 mho/m; εr = 38.788; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.41, 4.41, 4.41)
802.11g/High Cheek Right WiFi 2450MHz/Area Scan (11x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.059 mW/g
802.11g/High Cheek Right WiFi2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.620 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.150 mW/g
SAR(1 g) = 0.068 mW/g; SAR(10 g) = 0.033 mW/g
Maximum value of SAR (measured) = 0.072 mW/g

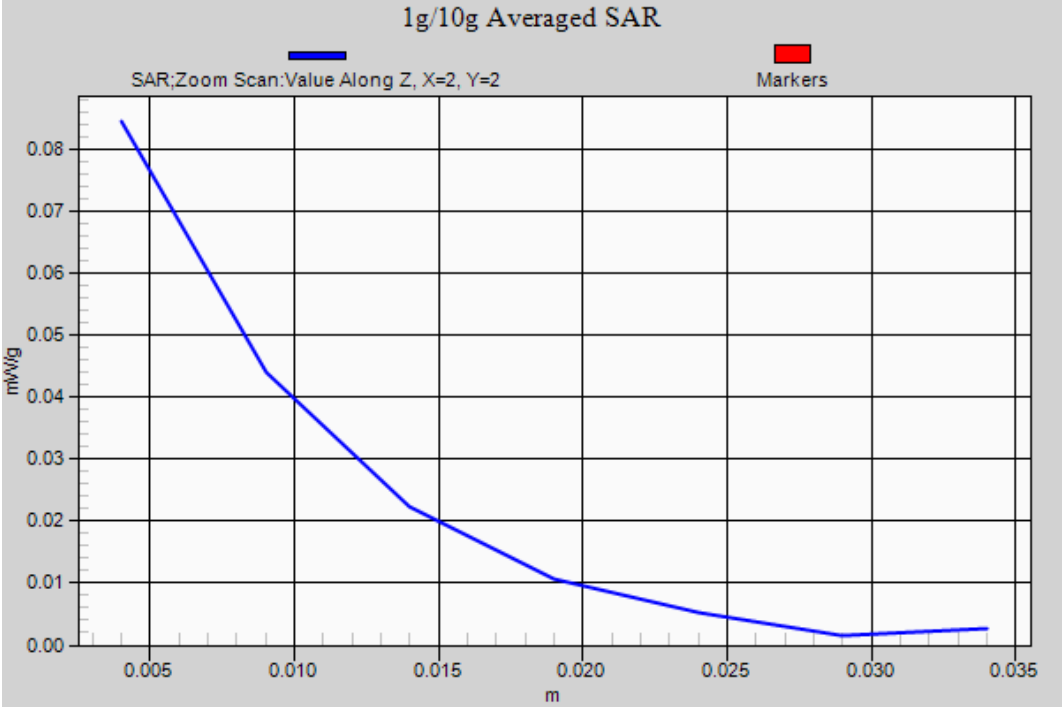



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=1, Y=2
Markers
mW/g
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

WiFi2450 802.11g Body Toward Ground High

Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Body 2450MHz
Medium parameters used: f = 2462 MHz; σ = 1.931 mho/m; εr = 53.917; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: WiFi 2450; Frequency: 2462 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.37, 4.37, 4.37)
802.11g/High Toward Ground WiFi2450MHz/Area Scan (10x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.073 mW/g
802.11g/High Toward Ground WiFi 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.631 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 0.144 mW/g
SAR(1 g) = 0.073 mW/g; SAR(10 g) = 0.037 mW/g
Maximum value of SAR (measured) = 0.085 mW/g




1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

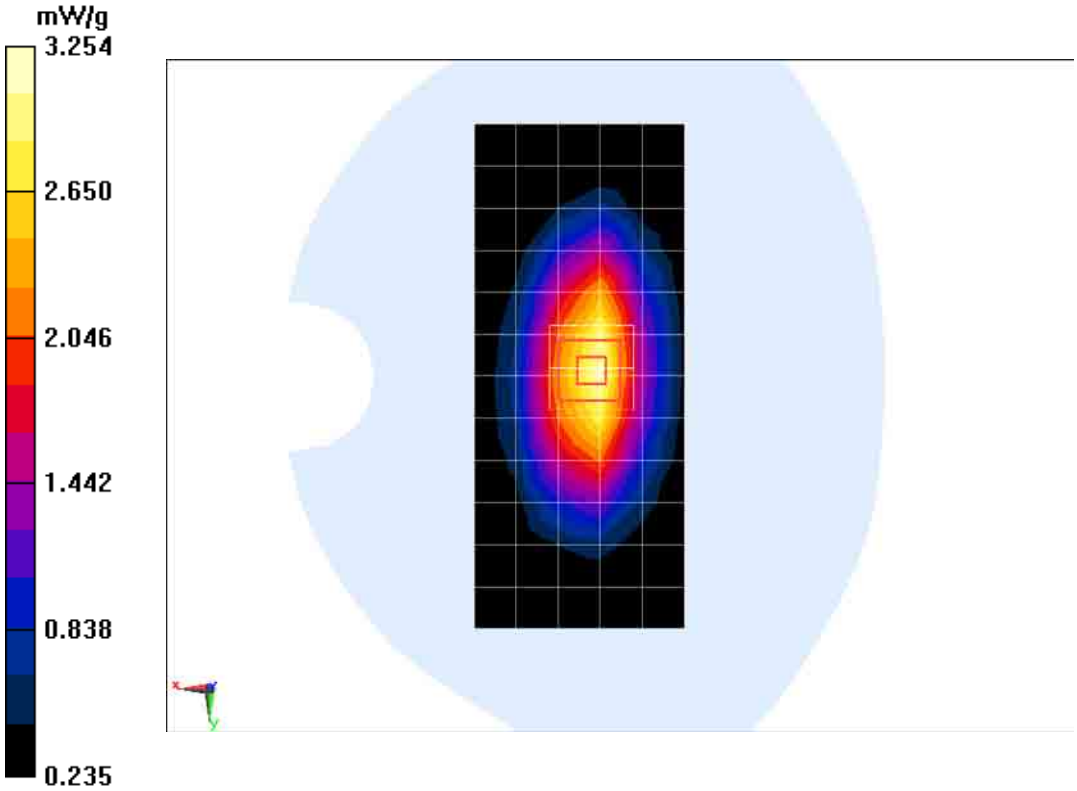
ANNEX B SYSTEM VALIDATION RESULTS

835MHz-Head

Date/Time: 6/6/2012
Electronics: DAE4 Sn549
Medium: Head 835MHz
Medium parameters used: f = 835 MHz; σ = 0.909 mho/m; εr = 40.67; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)

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

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

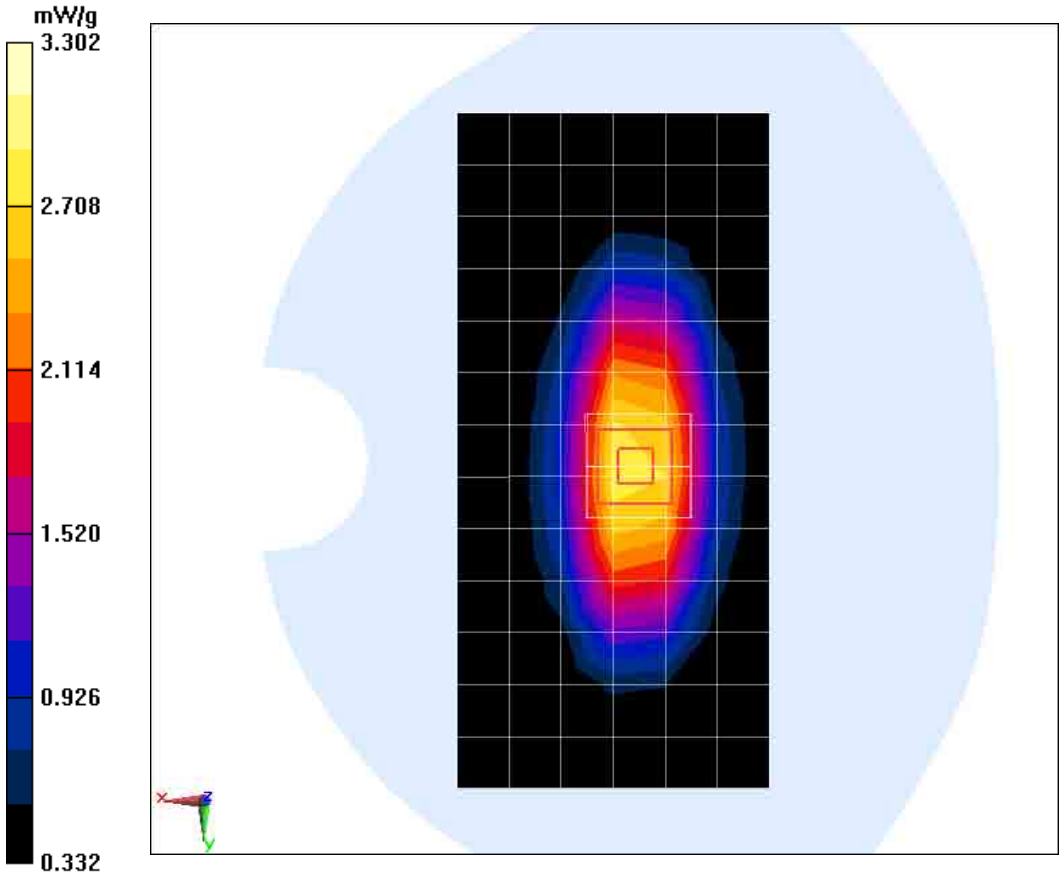


835MHz-Body

Date/Time: 6/7/2012
Electronics: DAE4 Sn549
Medium: Body 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.999 mho/m; εr = 55.15; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.98, 5.98, 5.98)

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

System Validation/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.728 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.871 mW/g
SAR(1 g) = 2.63 mW/g; SAR(10 g) = 1.75 mW/g
Maximum value of SAR (measured) = 3.302 mW/g

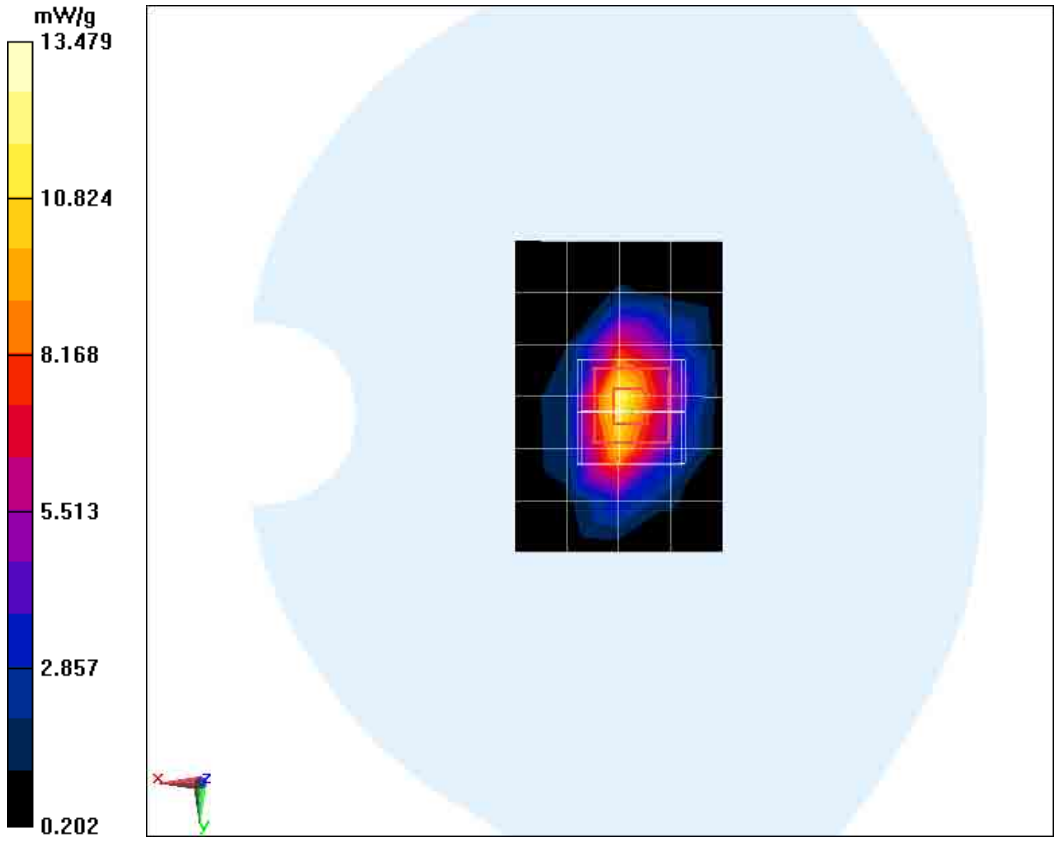


1900MHz-Head-1

Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.459 mho/m; εr = 40.531; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)

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

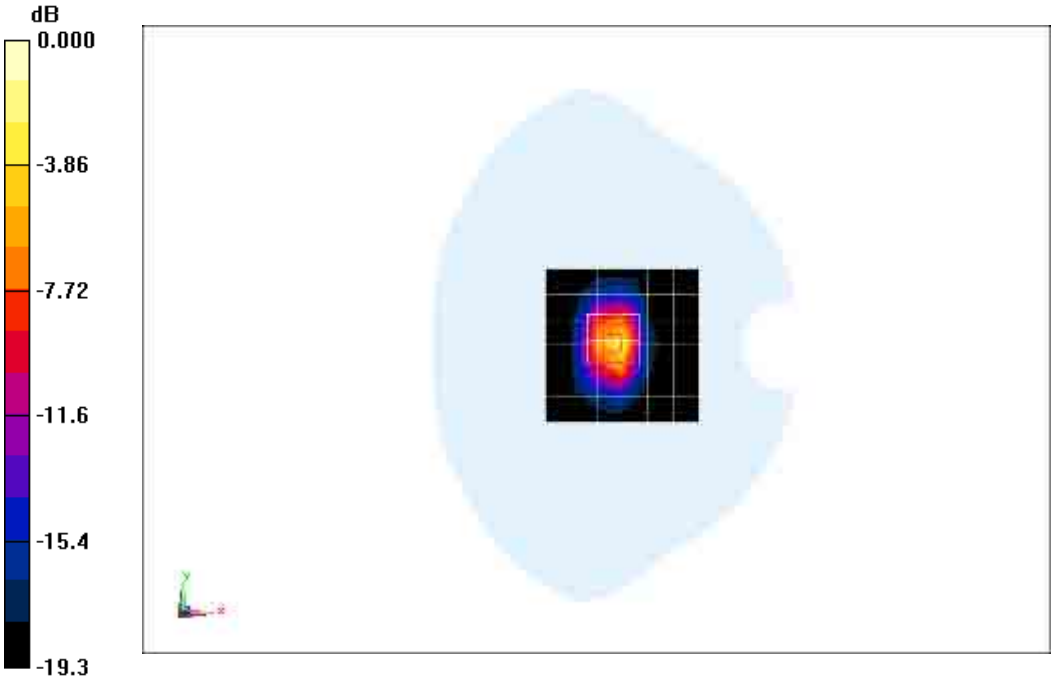
System Validation/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.766 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 17.602 mW/g
SAR(1 g) = 9.28 mW/g; SAR(10 g) = 4.76 mW/g
Maximum value of SAR (measured) = 13.479 mW/g



2450MHz-Head

Date/Time: 6/8/2012
Electronics: DAE4 Sn549
Medium: Head 2450MHz
Medium parameters used: f = 2450 MHz; σ = 1.824 mho/m; εr = 38.87; ρ = 1000 kg/m3
Ambien Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Probe: ES3DV3 - SN3158ConvF(4.41, 4.41, 4.41)
System Validation/ Area Scan (101x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.79 mW/g

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

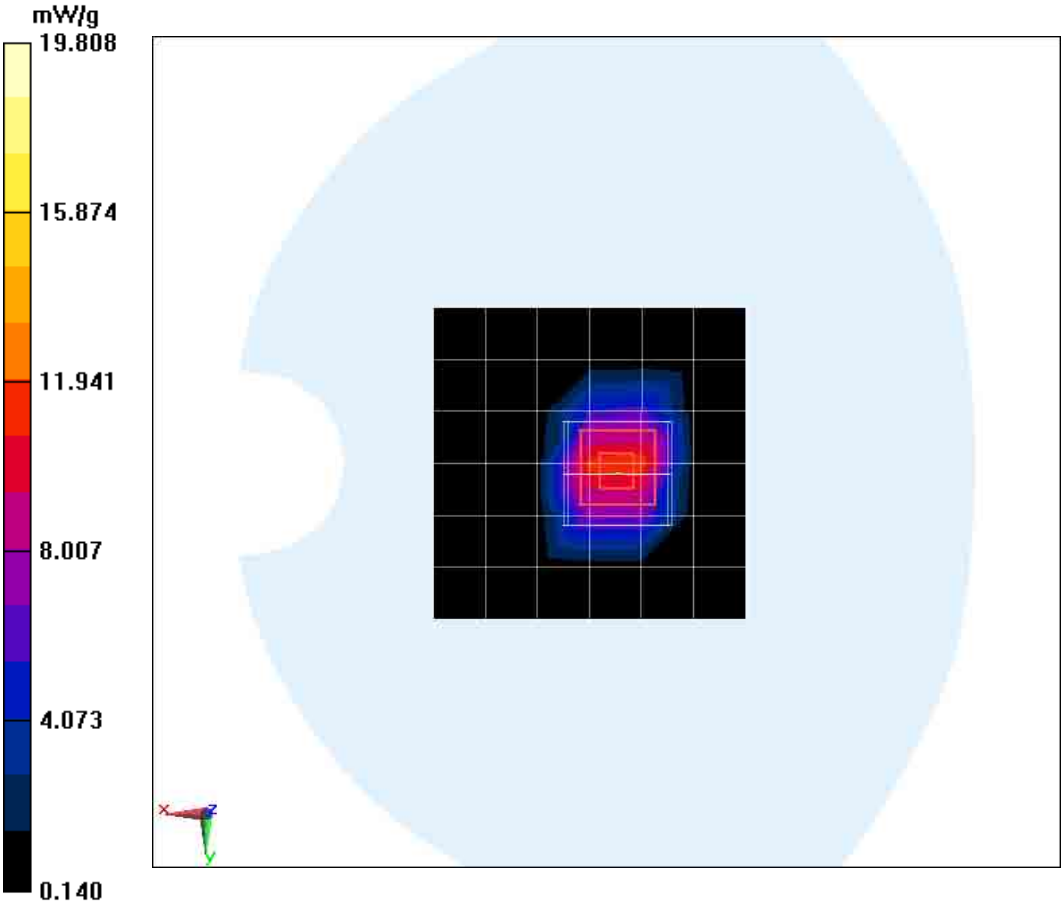


2450MHz-Body

Date/Time: 6/9/2012
Electronics: DAE4 Sn549
Medium: Body 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.918 mho/m; εr = 53.946; ρ = 1000 kg/m3
Ambien Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.37, 4.37, 4.37)

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

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.005 V/m; Power Drift = 0.26 dB
Peak SAR (extrapolated) = 26.396 mW/g
SAR(1 g) = 13.1 mW/g; SAR(10 g) = 6.16 mW/g
Maximum value of SAR (measured) = 19.808 mW/g

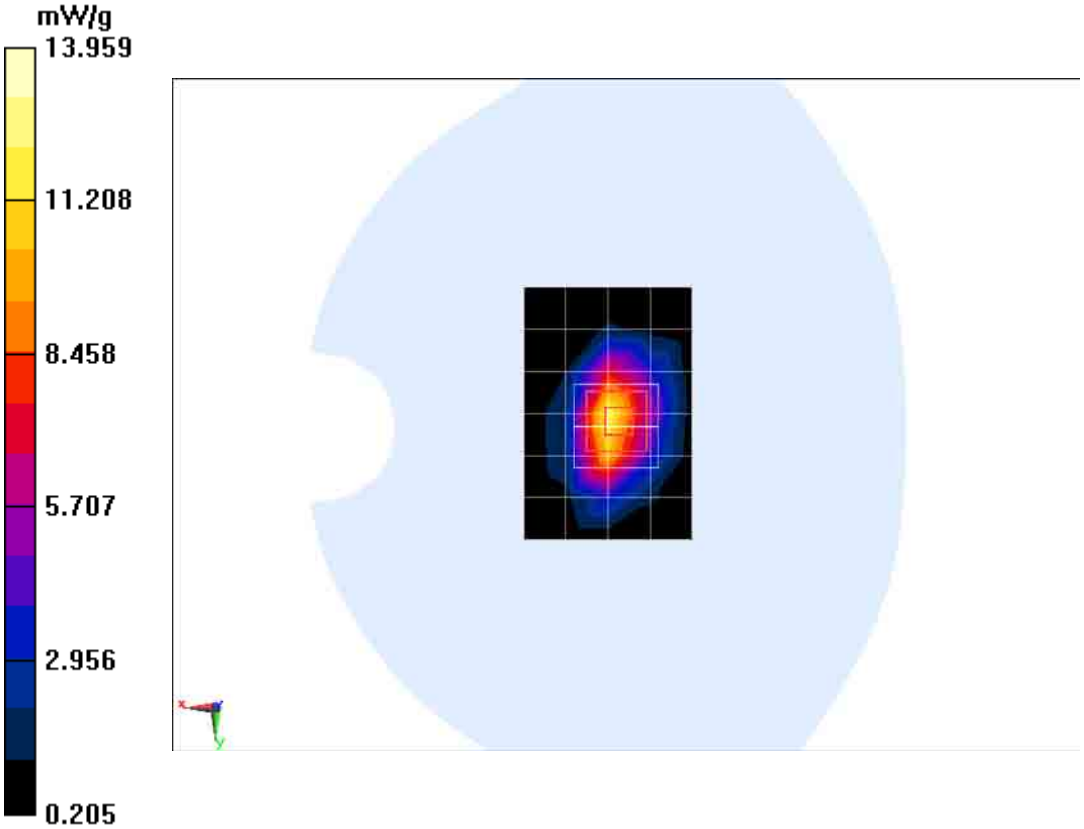


1900MHz-Head-2

Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.459 mho/m; εr = 40.531; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(5.01, 5.01, 5.01)

System Validation/Area Scan(101x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.517 mW/g

System Validation/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.737 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 18.1980
SAR(1 g) = 9.52 mW/g; SAR(10 g) = 4.87 mW/g
Maximum value of SAR (measured) = 13.959 mW/g

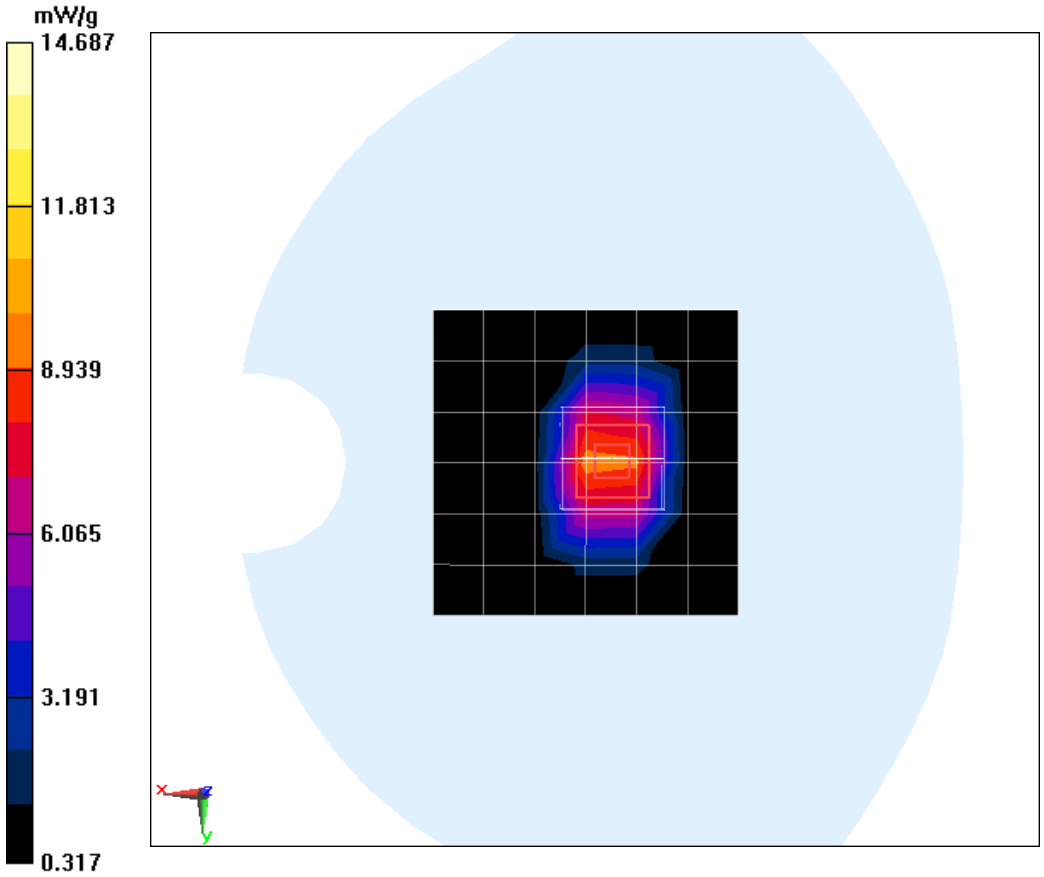


1900MHz-Body

Date/Time: 6/11/2012
Electronics: DAE4 Sn549
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.524 mho/m; εr = 53.237; ρ = 1000 kg/m3
Ambient Temperature:22.5° C Liquid Temperature:22.5° C
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Probe: ES3DV3 – SN3158ConvF(4.81, 4.81, 4.81)

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

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



ANNEX C Calibration certificate

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

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

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

Accreditation No.: SCS 108

Client CTTL (Auden)

Certificate No: D835V2-473_Jun11

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 473
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	June 14, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	8-Jun-11 (No. DAE4-601_Jun11)	Jun-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: June 14, 2011

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

Certificate No: D835V2-473_Jun11 Page 1 of 8

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

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

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

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Certificate No: D835V2-473_Jun11 Page 2 of 8

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.8 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.32 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.32 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.52 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.10 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.1 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.43 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.49 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.30 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.2 Ω - 4.8 jΩ
Return Loss	- 26.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.3 Ω - 6.8 jΩ
Return Loss	- 22.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 15, 2002

DASY5 Validation Report for Head TSL

Date: 14.06.2011

Test Laboratory: SPEAG, Zurich, Switzerland

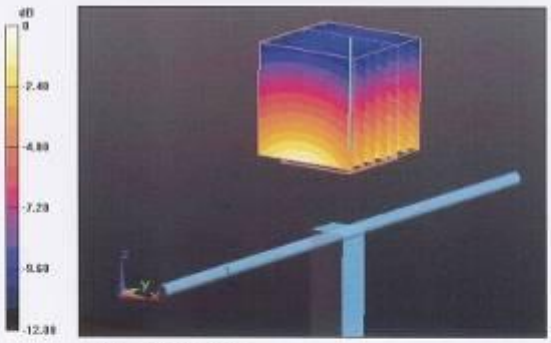
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 473

Communication System: CW; Frequency: 835 MHz
Medium: HSL900V2
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

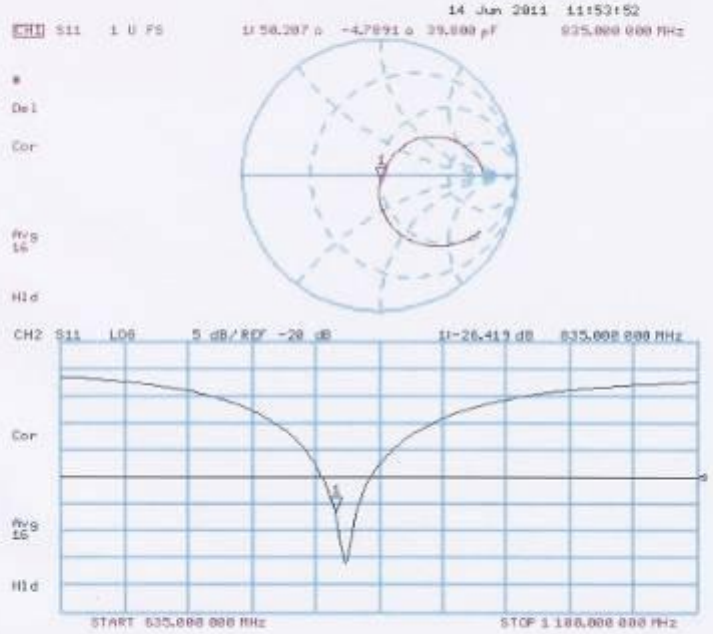
- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 08.06.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.870 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.431 W/kg
SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.696 mW/g



0 dB = 2.700mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 14.06.2011

Test Laboratory: SPEAG, Zurich, Switzerland

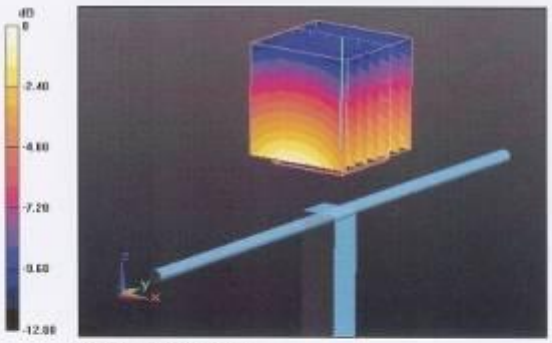
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 473

Communication System: CW; Frequency: 835 MHz
Medium: MSL900V2
Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

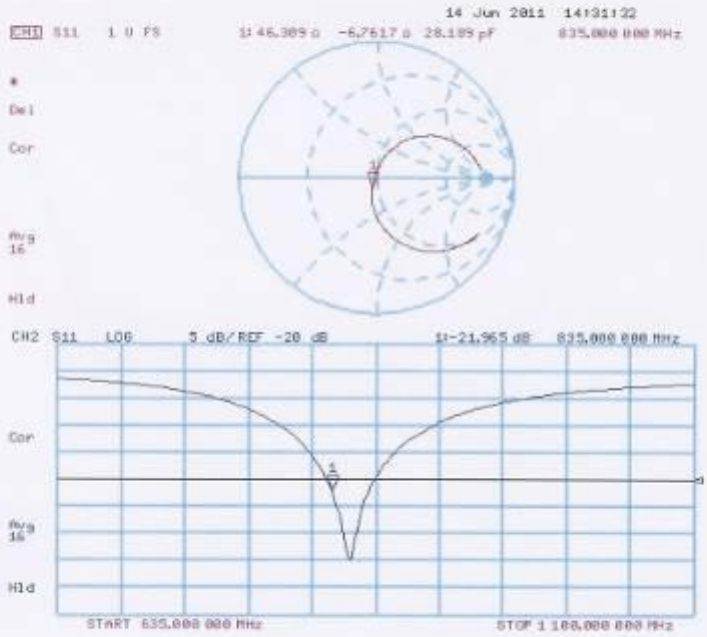
- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 08.06.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.428 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.544 W/kg
SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.6 mW/g
Maximum value of SAR (measured) = 2.826 mW/g



0 dB = 2.830mW/g

Impedance Measurement Plot for Body TSL



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

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

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

Accreditation No.: SCS 108

Client CTTL (Auden)

Certificate No: D1900V2-5d024_Jun11

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d024
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	June 16, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	8-Jun-11 (No. DAE4-601_Jun11)	Jun-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: June 16, 2011

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

Certificate No: D1900V2-5d024_Jun11 Page 1 of 8

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

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

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Certificate No: D1900V2-5d024_Jun11 Page 2 of 8

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.40 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**39.8 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.22 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.8 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.3 ± 6 %	1.53 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**40.1 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.29 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.1 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.3 Ω + 7.6 jΩ
Return Loss	- 22.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.7 Ω + 6.4 jΩ
Return Loss	- 23.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.200 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 28, 2002

DASY5 Validation Report for Head TSL

Date: 15.06.2011

Test Laboratory: SPEAG, Zurich, Switzerland

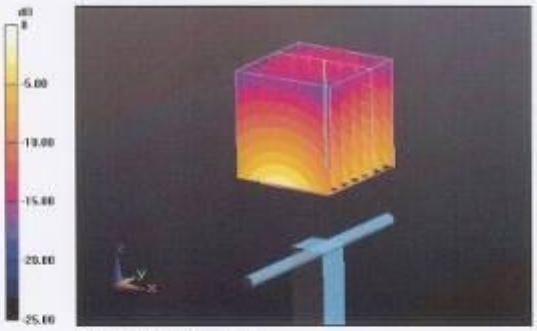
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d024

Communication System: CW; Frequency: 1900 MHz
Medium: HSL U12 BB
Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

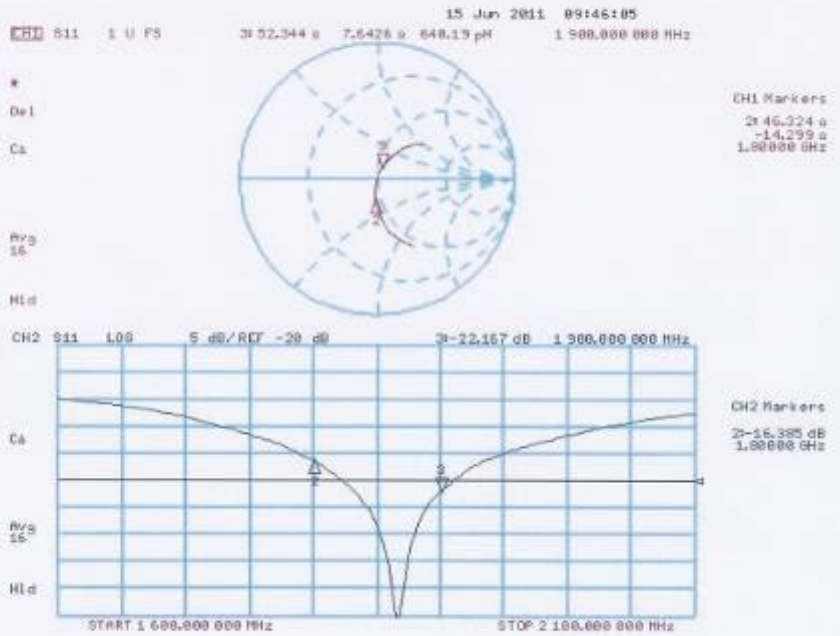
- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 08.06.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.650 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 18.248 W/kg
SAR(1 g) = 10 mW/g; SAR(10 g) = 5.22 mW/g
Maximum value of SAR (measured) = 12.469 mW/g



0 dB = 12.470mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.06.2011

Test Laboratory: SPEAG, Zurich, Switzerland

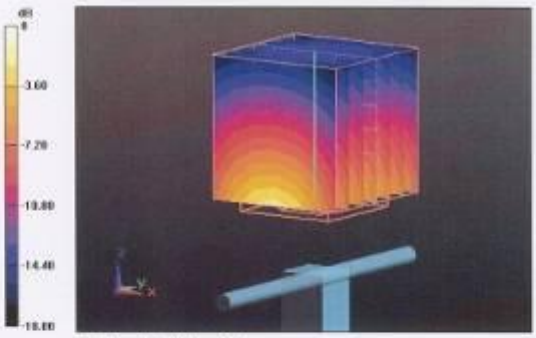
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d024

Communication System: CW; Frequency: 1900 MHz
Medium: MSL U12 BB
Medium parameters used: f = 1900 MHz; σ = 1.53 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

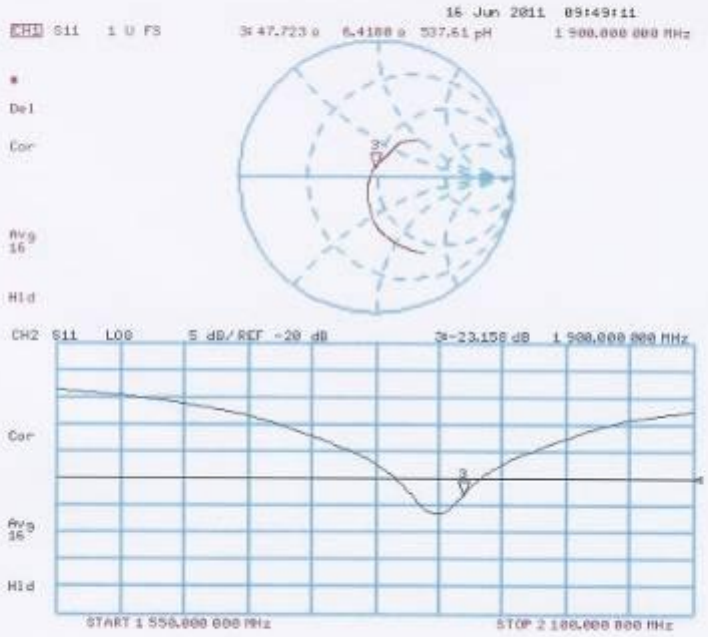
- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 08.06.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.492 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 18.002 W/kg
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.29 mW/g
Maximum value of SAR (measured) = 12.872 mW/g



0 dB = 12.870mW/g

Impedance Measurement Plot for Body TSL



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

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

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

Accreditation No.: SCS 108

Client **CTTL (Auden)** **Certificate No: D2450V2-803_Jun11**

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 803
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	June 22, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	8-Jun-11 (No. DAE4-601_Jun11)	Jun-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: June 23, 2011

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

Certificate No: D2450V2-803_Jun11 Page 1 of 8

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

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

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

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.4 ± 6 %	1.72 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.1 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**53.3 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.18 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.8 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.7 ± 6 %	1.93 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.7 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**50.8 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.91 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**23.6 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.7 Ω + 2.2 jΩ
Return Loss	- 26.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.2 Ω + 4.3 jΩ
Return Loss	- 27.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.156 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 02, 2006

DASY5 Validation Report for Head TSL

Date: 15.06.2011

Test Laboratory: SPEAG, Zurich, Switzerland

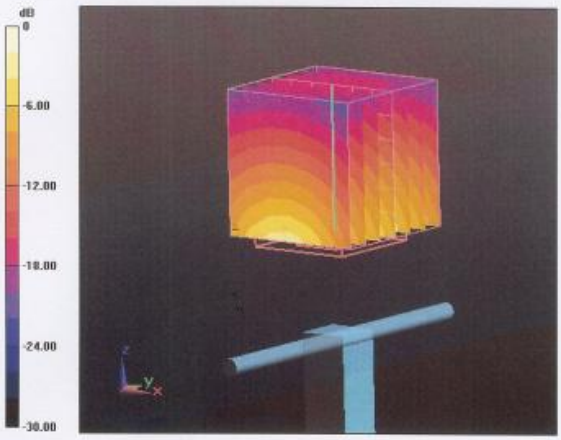
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 803

Communication System: CW; Frequency: 2450 MHz
Medium: HSL U12 BB
Medium parameters used: f = 2450 MHz; σ = 1.72 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

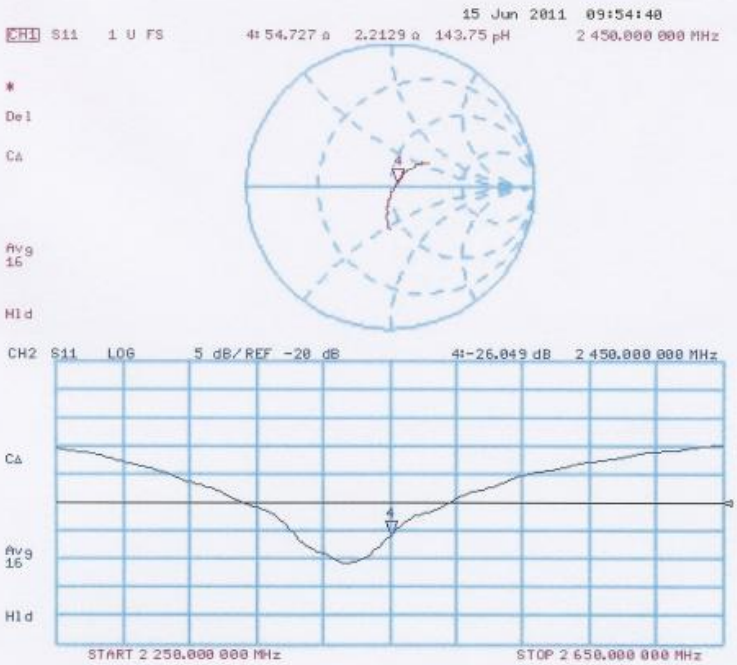
- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 08.06.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.9 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 26.664 W/kg
SAR(1 g) = 13.1 mW/g; SAR(10 g) = 6.18 mW/g
Maximum value of SAR (measured) = 16.858 mW/g



0 dB = 16.860mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 22.06.2011

Test Laboratory: SPEAG, Zurich, Switzerland

D2450_803_M_110622_CL

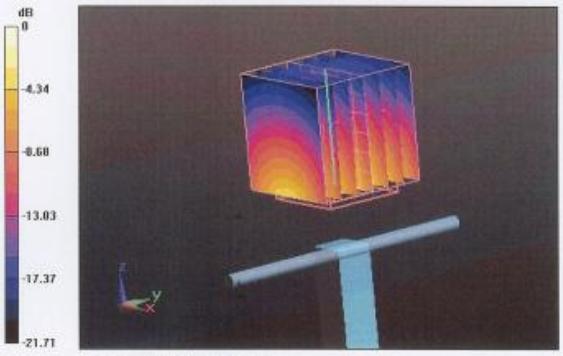
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 803

Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.93 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

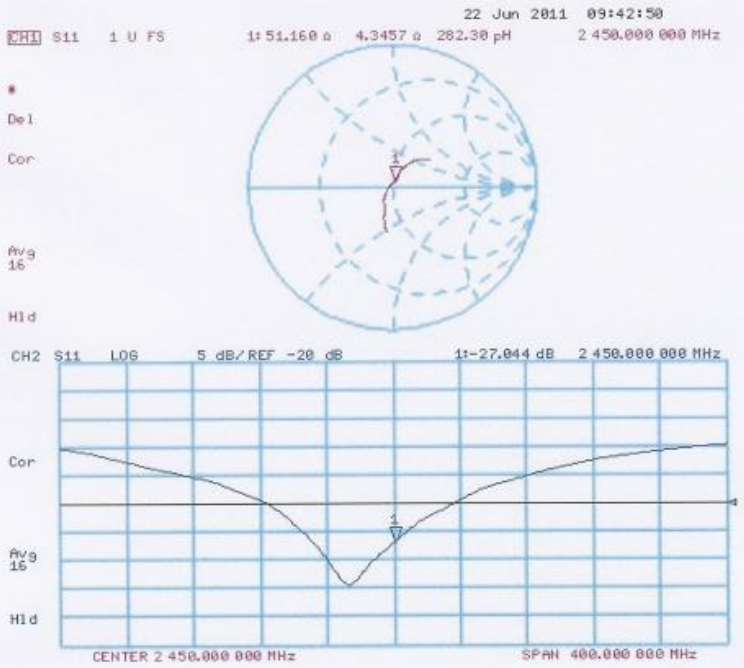
- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 08.06.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.554 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 26.042 W/kg
SAR(1 g) = 12.7 mW/g; SAR(10 g) = 5.91 mW/g
Maximum value of SAR (measured) = 16.663 mW/g



0 dB = 16.660mW/g

Impedance Measurement Plot for Body TSL



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

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

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

Accreditation No.: SCS 108

Client **CTTL (Auden)**

Certificate No: DAE4-549_Jun11

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 549
Calibration procedure(s)	QA CAL-06.v23 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	June 22, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	08-Jun-11 (in house check)	In house check: Jun-12

	Name	Function	Signature
Calibrated by:	Andrea Guntli	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: June 22, 2011

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

Certificate No: DAE4-549_Jun11 Page 1 of 5

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

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

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

Accreditation No.: **SCS 108**

Glossary

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

Methods Applied and Interpretation of Parameters

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

Address: 11 YUE TAN NAN JIE, BEIJING, P.R.C,100045 Tel:+86 10 68094053 FAX:+86 10 68011404 web:http://www.chinattl.com

DC Voltage Measurement

A/D - Converter Resolution nominal

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

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

Calibration Factors	X	Y	Z
High Range	404.470 ± 0.1% (k=2)	403.469 ± 0.1% (k=2)	403.594 ± 0.1% (k=2)
Low Range	3.90758 ± 0.7% (k=2)	3.95949 ± 0.7% (k=2)	3.95790 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	352.0 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	200001.4	-1.54	-0.00
Channel X	+ Input	20002.89	2.79	0.01
Channel X	- Input	-19996.55	3.25	-0.02
Channel Y	+ Input	200001.4	0.05	0.00
Channel Y	+ Input	20002.21	2.41	0.01
Channel Y	- Input	-19994.29	6.41	-0.03
Channel Z	+ Input	199990.0	-1.26	-0.00
Channel Z	+ Input	19996.94	-2.86	-0.01
Channel Z	- Input	-20001.50	-0.90	0.00

Low Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	2000.1	0.15	0.01
Channel X	+ Input	201.16	1.16	0.58
Channel X	- Input	-199.29	0.61	-0.31
Channel Y	+ Input	2000.3	0.42	0.02
Channel Y	+ Input	200.53	0.53	0.27
Channel Y	- Input	-199.55	0.35	-0.18
Channel Z	+ Input	2000.5	0.39	0.02
Channel Z	+ Input	200.17	0.17	0.09
Channel Z	- Input	-199.87	0.13	-0.07

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	-7.13	-9.39
	- 200	11.29	9.35
Channel Y	200	20.22	20.09
	- 200	-21.96	-21.86
Channel Z	200	16.11	15.99
	- 200	-17.46	-17.70

3. Channel separation

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

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200	-	2.75	0.31
Channel Y	200	2.47	-	3.12
Channel Z	200	1.17	-0.36	-

4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	16274	14336
Channel Y	15691	16180
Channel Z	16059	15797

5. Input Offset Measurement

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

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.25	-0.62	1.79	0.39
Channel Y	0.58	-0.17	1.65	0.28
Channel Z	-2.22	-2.97	-1.78	0.23

6. Input Offset Current

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

7. Input Resistance (Typical values for information)

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

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

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

9. Power Consumption (Typical values for information)

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

Address: 11 YUE TAN NAN JIE, BEIJING, P.R.C,100045 Tel:+86 10 68094053 FAX:+86 10 68011404 web:http://www.chinattl.com

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

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

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

Accreditation No.: SCS 108

Client **CTTL (Auden)**

Certificate No: ES3-3158_Jun11

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3158
Calibration procedure(s)	QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4 Calibration procedure for dosimetric E-field probes
Calibration date:	June 16, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: June 16, 2011

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

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

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

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

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

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

Probe ES3DV3

SN:3158

Manufactured: August 13, 2007
Calibrated: June 16, 2011

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

ES3DV3– SN:3158 June 16, 2011

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3158

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.09	1.23	1.22	± 10.1 %
DCP (mV)[B]	104.2	98.6	99.2	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	103.8	±1.9 %
			Y	0.00	0.00	1.00	109.6	
			Z	0.00	0.00	1.00	105.7	

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

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

ES3DV3– SN:3158 June 16, 2011

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3158

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.24	6.24	6.24	1.00	1.00	± 12.0 %
835	41.5	0.90	5.98	5.98	5.98	1.00	1.10	± 12.0 %
900	41.5	0.97	5.86	5.86	5.86	1.00	1.10	± 12.0 %
1750	40.1	1.37	5.24	5.24	5.24	0.88	1.20	± 12.0 %
1900	40.0	1.40	5.01	5.01	5.01	0.82	1.24	± 12.0 %
1950	40.0	1.40	4.88	4.88	4.88	0.89	1.19	± 12.0 %
2450	39.2	1.80	4.41	4.41	4.41	0.75	1.30	± 12.0 %

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

Certificate No: ES3-3158_Jun11 Page 5 of 11

ES3DV3– SN:3158 June 16, 2011

DASY/EASY - Parameters of Probe: ES3DV3- SN:3158

Calibration Parameter Determined in Body Tissue Simulating Media

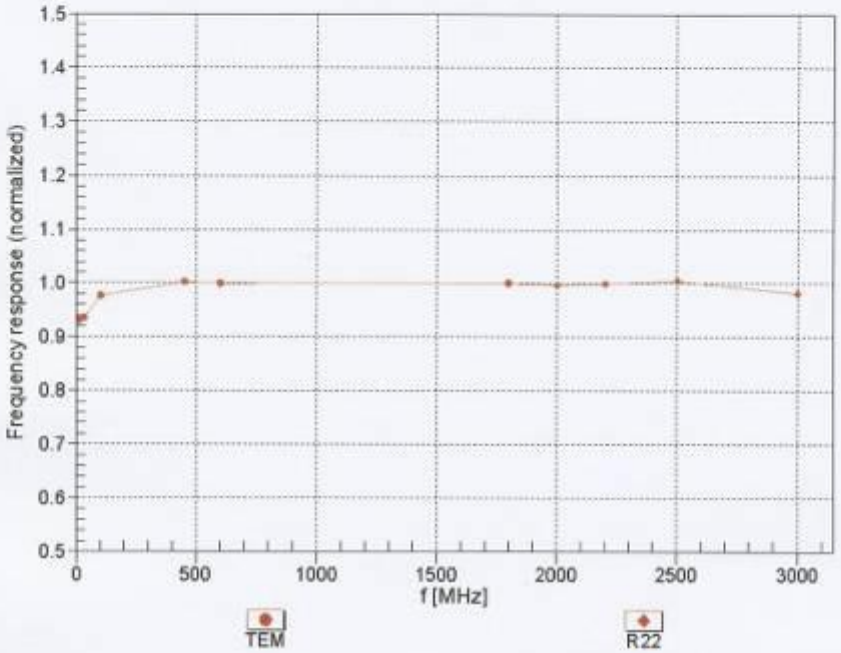
f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.08	6.08	6.08	1.00	1.14	± 12.0 %
835	55.2	0.97	5.98	5.98	5.98	1.00	1.16	± 12.0 %
900	55.0	1.05	5.90	5.90	5.90	1.00	1.14	± 12.0 %
1750	53.4	1.49	5.13	5.13	5.13	0.81	1.38	± 12.0 %
1900	53.3	1.52	4.81	4.81	4.81	0.82	1.35	± 12.0 %
1950	53.3	1.52	4.90	4.90	4.90	0.71	1.44	± 12.0 %
2450	52.7	1.95	4.37	4.37	4.37	0.96	1.09	± 12.0 %

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

Certificate No: ES3-3158_Jun11 Page 6 of 11

ES3DV3– SN:3158 June 16, 2011

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



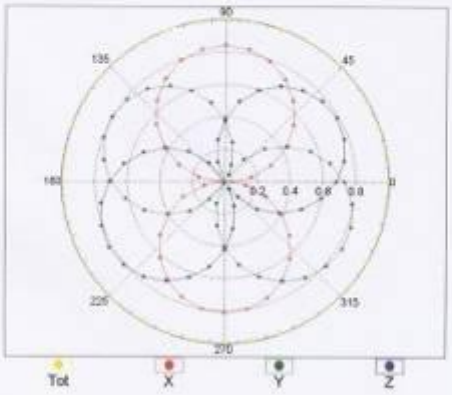
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Address: 11 YUE TAN NAN JIE, BEIJING, P.R.C,100045 Tel:+86 10 68094053 FAX:+86 10 68011404 web:http://www.chinattl.com

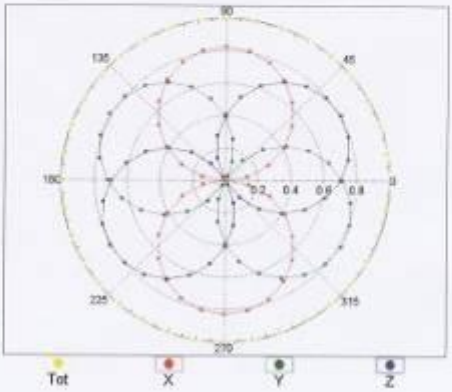
ES3DV3– SN:3158 June 16, 2011

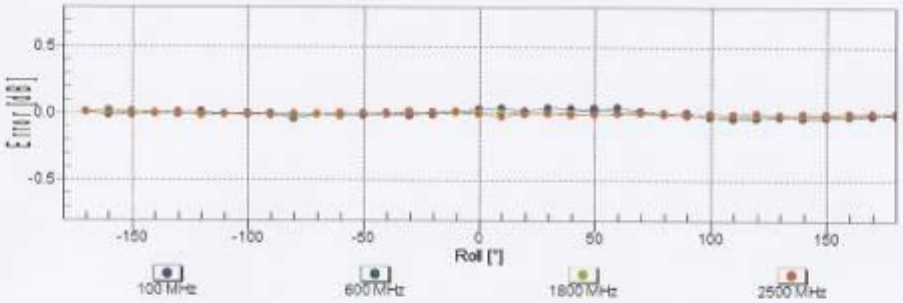
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22



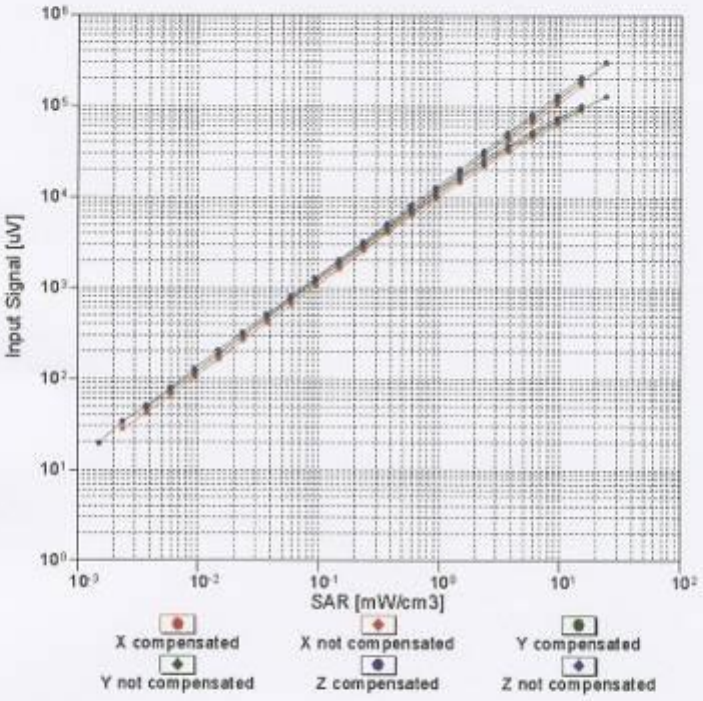


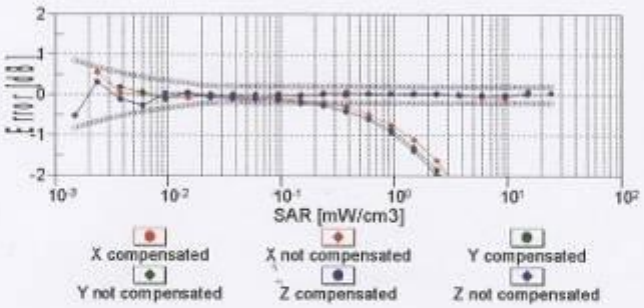
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: ES3-3158_Jun11 Page 8 of 11

ES3DV3– SN:3158 June 16, 2011

Dynamic Range f(SAR$_{head}$)
(TEM cell , f = 900 MHz)





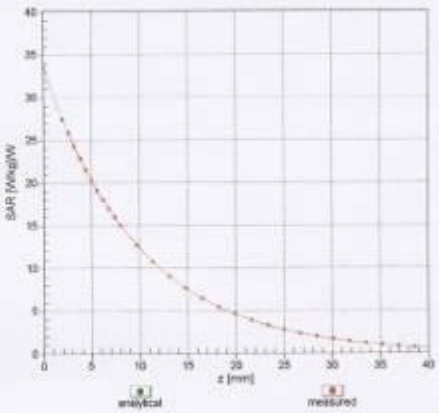
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ES3-3158_Jun11 Page 9 of 11

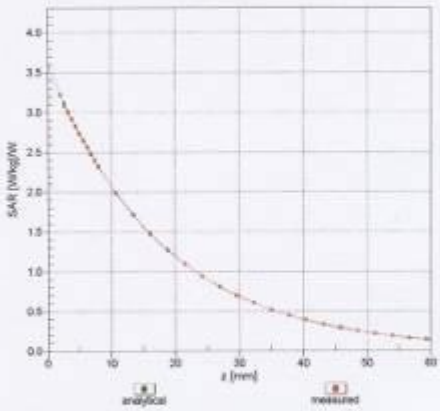
ES3DV3– SN:3158 June 16, 2011

Conversion Factor Assessment

f = 2450 MHz,WGLS R22 (H_convF)

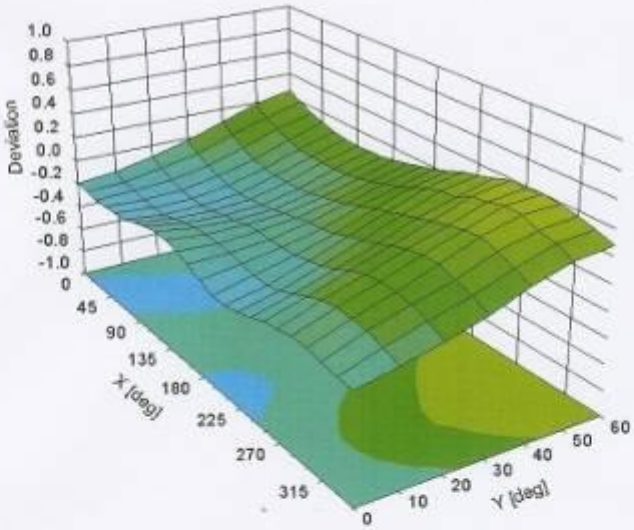


f = 900 MHz,WGLS R9 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

ES3DV3– SN:3158 June 16, 2011

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3158

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Certificate No: ES3-3158_Jun11 Page 11 of 11

The End of this Report