FCC SAR Test Report

Report No.	:	**SA120131C05**
Applicant	:	**FUJITSU LIMITED**
Address	:	**1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan**
Product	:	**Mobile Phone**
FCC ID	:	**VQK-T02D**
Brand	:	**Xi**
Model No.	:	**T-02D**
Standards	:	**FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1991 / IEEE 1528:2003** **FCC OET Bulletin 65 Supplement C (Edition 01-01)** **KDB 248227 D01 v01r02 / KDB 648474 D01 v01r05** **KDB 941225 D03 v01 / KDB 941225 D06 v01**
Date of Testing	:	**Mar. 03, 2012 ~ Mar. 05, 2012**

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch - Taiwan HwaYa Lab**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report.

This test report consists of 25 pages in total except Appendix. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agency. The test results in the report only apply to the tested sample.

Prepared By : Pettie Chen / Specialist

Approved By : Roy Wu / Manager

Table of Contents

Release Control Record

Issue No.	Reason for Change	Date Issued
R01	Original release	Apr. 25, 2012

1. Summary of Maximum SAR Value

Mode / Band	Test Position	SAR-1g (W/kg)
GSM850	Head	0.444
	Body Worn (1 cm Gap)	0.534
	Hotspot Mode (1 cm Gap)	0.655
GSM1900	Head	0.332
	Body Worn (1 cm Gap)	0.641
	Hotspot Mode (1 cm Gap)	0.753
WCDMA Band V	Head	0.809
	Body Worn (1 cm Gap)	0.75
	Hotspot Mode (1 cm Gap)	0.91
WLAN	Head	N/A
	Body Worn (1 cm Gap)	N/A
	Hotspot Mode (1 cm Gap)	N/A
Bluetooth	Head	N/A
	Body Worn (1 cm Gap)	N/A
	Hotspot Mode (1 cm Gap)	N/A

Note:

1. The SAR limit **(1.6 W/kg)** for general population/uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1991.
2. According to KDB 648474, SAR testing for WLAN/Bluetooth is not required because the antenna separation distance is larger than 5 cm and the maximum output power of WLAN/Bluetooth is less than $2P_{Ref}$.

2. Description of Equipment Under Test

EUT Type	Mobile Phone
FCC ID	VQK-T02D
Brand Name	Xi
Model Name	T-02D
IMEI Code	351537050015938
Tx Frequency Bands (Unit: MHz)	GSM850 : 824 ~ 849 GSM1900 : 1850 ~ 1910 WCDMA Band V : 824 ~ 849 WLAN : 2400 ~ 2483.5, 5150 ~ 5350, 5470 ~ 5725, 5725 ~ 5850 Bluetooth : 2400 ~ 2483.5
Uplink Modulations	GSM & GPRS : GMSK WCDMA : QPSK 802.11b : DSSS 802.11a/g/n : OFDM Bluetooth : GFSK
Maximum AVG Conducted Power (Unit: dBm)	GSM850 : 33.71 GSM1900 : 30.80 WCDMA Band V : 25.45 802.11b : 10.91 802.11g : 11.31 802.11n HT20 (2.4GHz) : 11.67 802.11a : 9.80 802.11n HT20 (5GHz) : 9.63 Bluetooth : 10.47
Antenna Type	λ/4 Monopole Antenna (Peak Gain : -11.8 dBi for 2.4GHz, -1.1 for 5GHz)
EUT Stage	ENGINEERING SAMPLE

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

List of Accessory:

AC Adapter	**Brand Name**	NTT docomo
	Model Name	TA08017-B219
	Power Rating	I/P:100-240Vac, 50-60Hz, 0.22A; O/P: 5.0Vdc, 1.8A
Battery	**Brand Name**	Fujitsu Limited
	Model Name	F25
	Power Rating	3.7Vdc, 1800mAh
	Type	Li-ion

Per KDB 941225 D04 requirement, the required test configuration for this device is as below:

1. This DUT is class B device
2. This DUT supports GPRS multi-slot class 12 (max. uplink : 4, max. downlink : 4, total timeslots : 5)
3. This DUT supports DTM multi-slot class 11 (max. uplink : 3 for 1 CS & 2 PS, max. downlink : 4, total timeslots : 5)
4. The measured maximum conducted power can be referred to section 4.5 of this report
5. For DTM multi-slot class 11 link mode, the device was linked with system emulator (Agilent E5515C) and transmit maximum power on maximum number of Tx slots (one CS timeslot and two PS timeslots per frame).

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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.

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:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

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

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

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

3.2 SPEAG DASY System

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY4/5 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

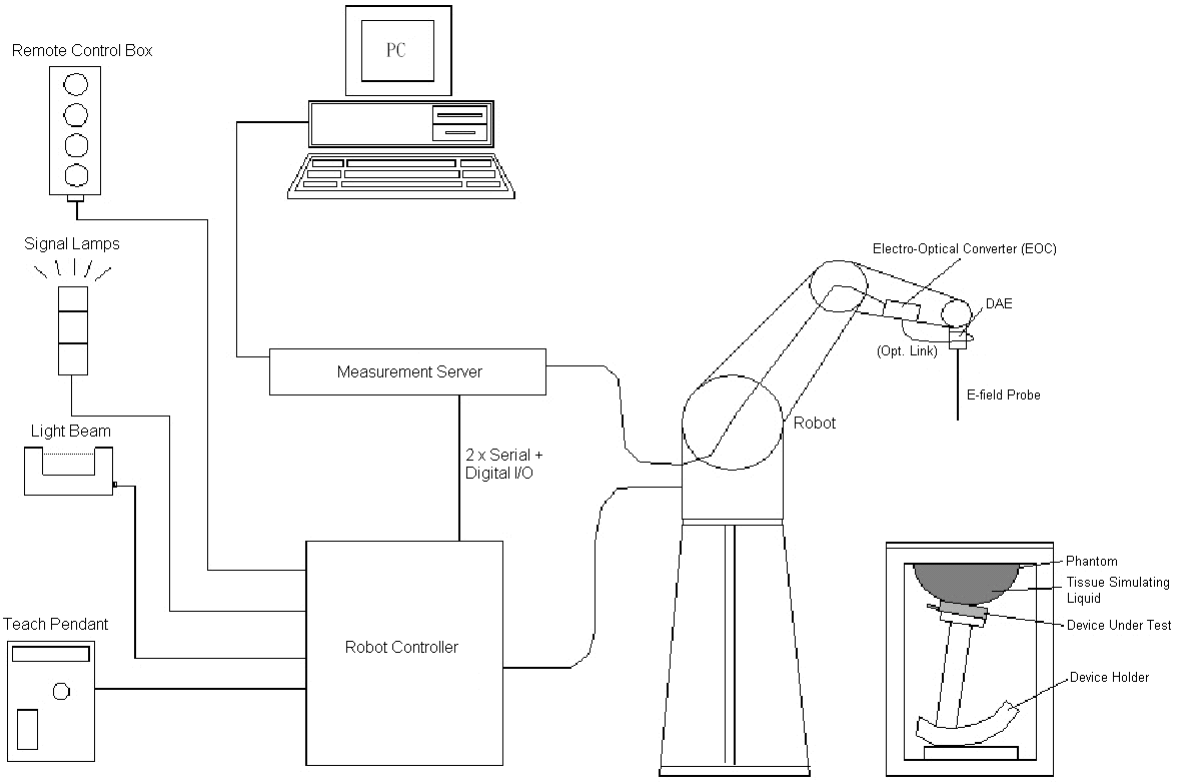


Fig-3.1 DASY System Setup

3.2.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

Fig-3.2 DASY4

Fig-3.3 DASY5

3.2.2 Probes

The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

Model	EX3DV4
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

Model	ES3DV3
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to 100 mW/g Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm

3.2.3 Data Acquisition Electronics (DAE)

Model	DAE3, DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)
Input Offset Voltage	< 5µV (with auto zero)
Input Bias Current	< 50 fA
Dimensions	60 x 60 x 68 mm

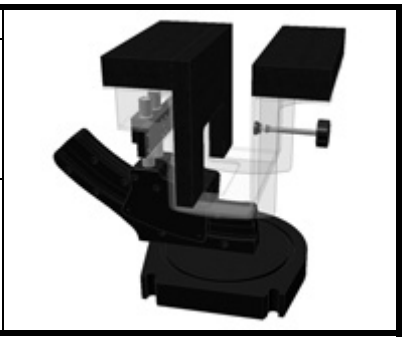
3.2.4 Phantoms

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	

3.2.5 Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

3.2.6 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with l/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

3.2.7 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.

Photo of Liquid Height for Head Position

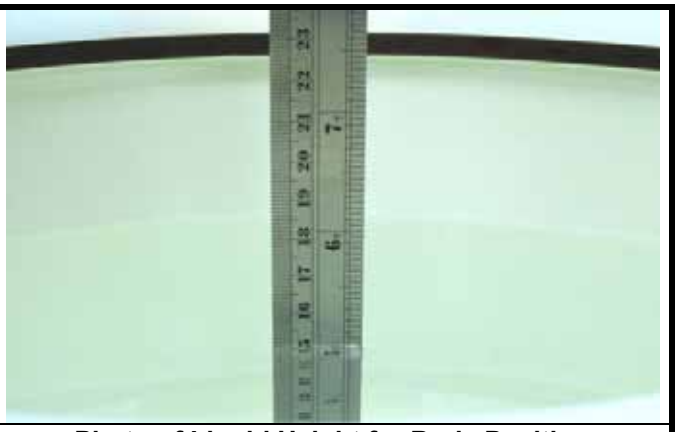


Photo of Liquid Height for Body Position

The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528 and FCC OET 65 Supplement C Appendix C. For the body tissue simulating liquids, the dielectric properties are defined in FCC OET 65 Supplement C Appendix C. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using an Agilent 85070D Dielectric Probe Kit and an Agilent Network Analyzer.

Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of ±5%	Target Conductivity	Range of ±5%
For Head				
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
For Body				
835	55.2	52.4 ~ 58.0	0.97	0.92 ~ 1.02
1900	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60

The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H835	0.2	-	0.2	1.5	57.0	-	41.1	-
H1900	-	44.5	-	0.2	-	-	55.3	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B1900	-	29.5	-	0.3	-	-	70.2	-

3.3 SAR System Verification

The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below.

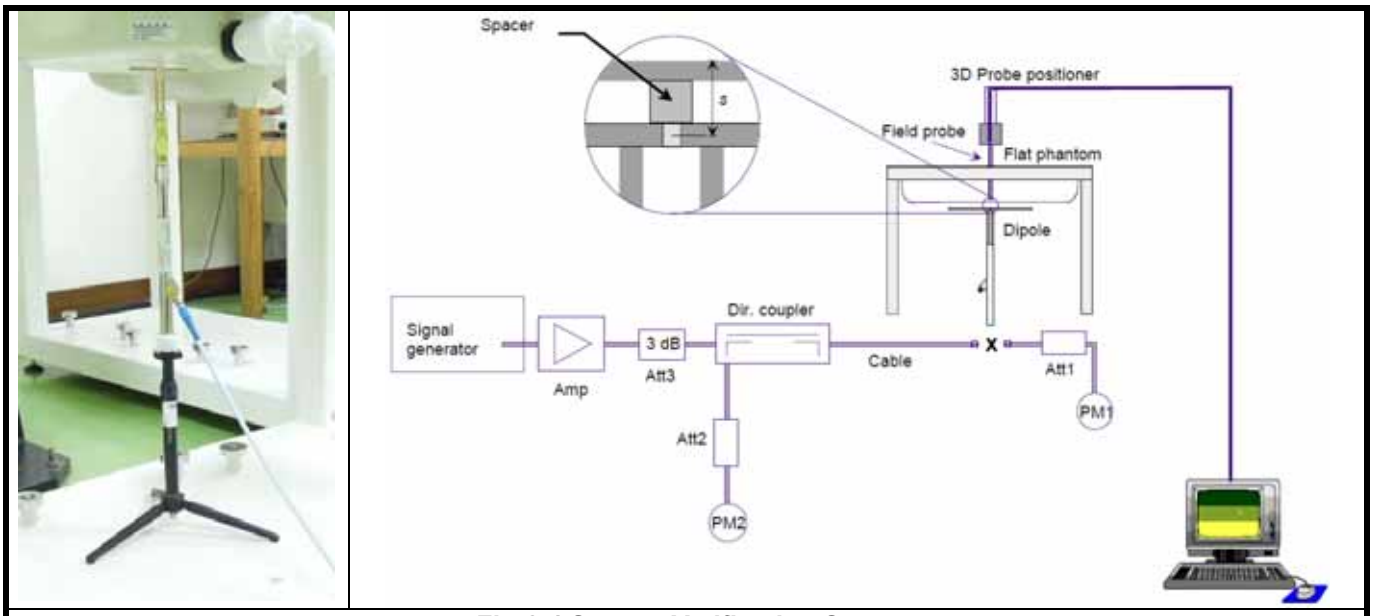


Fig-3.4 System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The power meter PM1 measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter PM2 is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

3.4 SAR Measurement Procedure

According to the SAR test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

The SAR measurement procedures for each of test conditions are as follows:

(a) Make EUT to transmit maximum output power
(b) Measure conducted output power through RF cable
(c) Place the EUT in the specific position of phantom
(d) Perform SAR testing steps on the DASY system
(e) Record the SAR value

3.4.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for below 3 GHz, and 7x7x9 points with step size 4, 4 and 2.5 mm for above 5 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

3.4.2 Volume Scan Procedure

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

3.4.3 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

3.4.4 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

3.4.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

4. SAR Measurement Evaluation

4.1 EUT Configuration and Setting

For WWAN SAR testing, the EUT was linked and controlled by base station emulator. Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

The EUT antenna location is shown in appendix D. This device supports hotspot function, so body SAR was tested under 1 cm for the surfaces / slide edges where a transmitting antenna is within 2.5 cm from the edge. Since the SAR is required for antenna located within 2.5 cm from edge, SAR testing for each antenna is listed as below.
WWAN Ant.: Front Face, Rear Face, Left Side, Right Side, Bottom Side

4.2 EUT Testing Position

This EUT was tested in **Right Cheek**, **Right Tilted**, **Left Cheek**, **Left Tilted**, **Front Face**, **Rear Face**, **Left Side**, **Right Side**, and **Bottom Side** positions as illustrated below:

1. Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

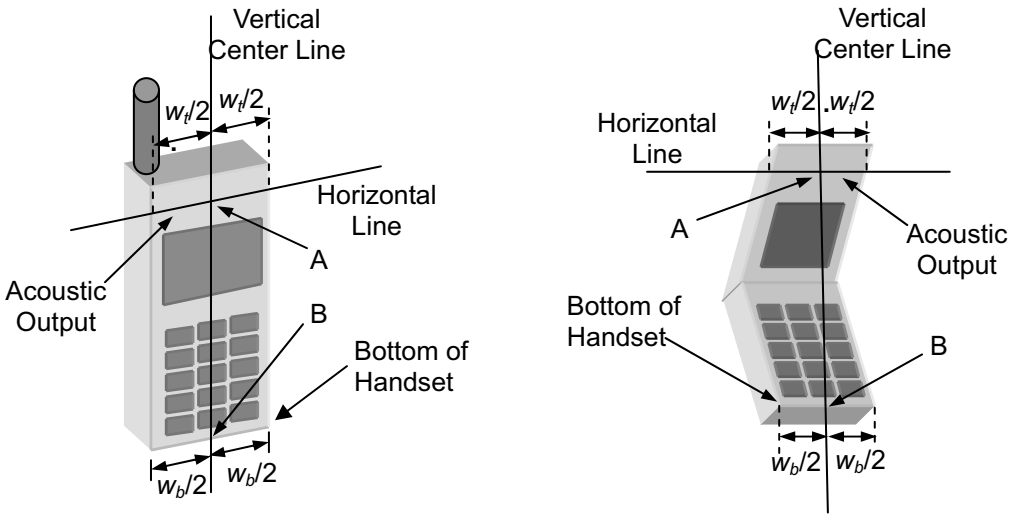


Fig-4.1 Illustration for Handset Vertical and Horizontal Reference Lines

2. Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig-4.2).

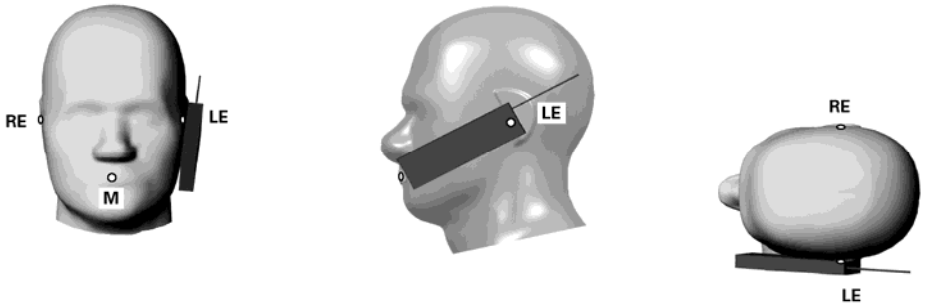


Fig-4.2 Illustration for Cheek Position

3. Tilted Position

(a) To position the device in the “cheek” position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig-4.3).

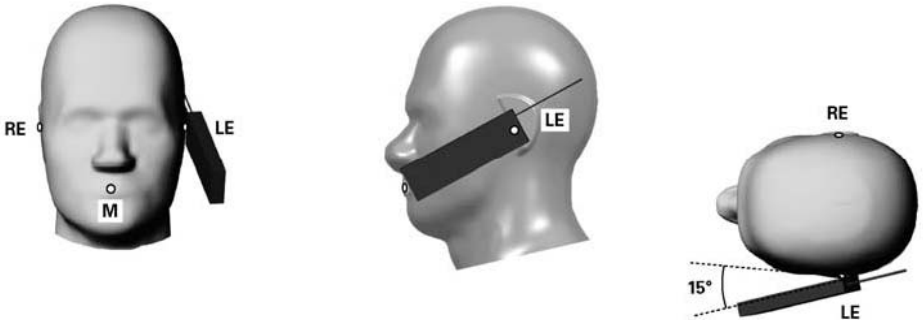


Fig-4.3 Illustration for Tilted Position

4. Body Worn Position

(a) To position the EUT parallel to the phantom surface.

(b) To adjust the EUT parallel to the flat phantom.

(c) To adjust the distance between the EUT surface and the flat phantom to 1 cm.

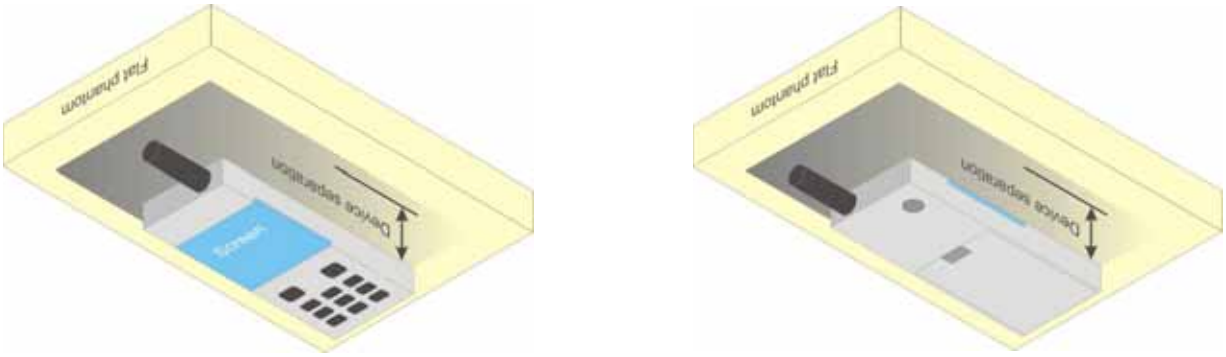


Fig-4.4 Illustration for Body Worn Position

4.3 Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)	Test Date
H835	835	20.6	0.92	43.1	0.90	41.5	2.22	3.86	Mar. 05, 2012
B835	835	20.6	0.988	54.8	0.97	55.2	1.86	-0.72	Mar. 03, 2012
H1900	1900	20.7	1.38	39.8	1.40	40.0	-1.43	-0.50	Mar. 05, 2012
B1900	1900	20.6	1.55	52.6	1.52	53.3	1.97	-1.31	Mar. 03, 2012

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. Liquid temperature during the SAR testing must be within ±2 ℃.

4.4 System Verification

The measuring results for system check are shown as below.

Test Date	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Mar. 05, 2012	835	9.65	2.51	10.04	4.04	4d021	3800	1277
Mar. 03, 2012	835	10.10	2.43	9.72	-3.76	4d021	3661	579
Mar. 05, 2012	1900	38.90	9.84	39.36	1.18	5d036	3800	1277
Mar. 03, 2012	1900	38.90	9.93	39.72	2.11	5d036	3800	1277

Note:

Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

4.5 Conducted Power Results

The measuring conducted power (Unit: dBm) are shown as below.

Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
Maximum Burst-Averaged Output Power						
GSM (GMSK, 1 slot)	33.70	33.71	33.65	30.58	30.80	30.79
GPRS 8 (GMSK, 1 slot)	33.47	33.47	33.40	30.22	30.46	30.55
GPRS 10 (GMSK, 2 slot)	30.65	30.56	30.56	27.83	28.07	28.02
GPRS 11 (GMSK, 3 slot)	29.47	29.35	29.53	26.18	26.28	26.34
GPRS 12 (GMSK, 4 slot)	26.72	26.66	26.79	24.95	24.93	25.16
DTM 11 (GMSK, 3 slot)	29.62	29.51	29.65	26.33	26.54	26.57
Maximum Frame-Averaged Output Power						
GSM (GMSK, 1 slot)	24.70	24.71	24.65	21.58	21.80	21.79
GPRS 8 (GMSK, 1 slot)	24.47	24.47	24.40	21.22	21.46	21.55
GPRS 10 (GMSK, 2 slot)	24.65	24.56	24.56	21.83	22.07	22.02
GPRS 11 (GMSK, 3 slot)	25.21	25.09	25.27	21.92	22.02	22.08
GPRS 12 (GMSK, 4 slot)	23.72	23.66	23.79	21.95	21.93	22.16
DTM 11 (GMSK, 3 slot)	25.36	25.25	25.39	22.07	22.28	22.31

Note: SAR testing was performed on the maximum frame-averaged power mode.

Band	WCDMA Band V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	25.45	25.24	25.23
HSDPA Subtest-1	24.36	24.14	24.22
HSDPA Subtest-2	22.42	22.19	22.16
HSDPA Subtest-3	21.59	21.42	21.45
HSDPA Subtest-4	21.14	21.00	21.03
HSUPA Subtest-1	22.53	22.32	22.35
HSUPA Subtest-2	24.03	23.73	23.84
HSUPA Subtest-3	21.49	21.35	21.41
HSUPA Subtest-4	24.42	24.16	24.23
HSUPA Subtest-5	22.02	21.91	21.95

Band	802.11b			802.11g		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Average Power	10.23	10.75	10.91	10.46	11.31	11.11

Band	802.11n (HT20)		
Channel	1	6	11
Frequency (MHz)	2412	2437	2462
Average Power	10.95	11.67	11.21

Band	802.11a							
Channel	36	40	44	48	52	56	60	64
Frequency (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
Average Power	8.61	8.78	9.08	9.21	8.51	8.94	9.11	9.54

Band	802.11a							
Channel	100	104	108	112	116	132	136	140
Frequency (MHz)	5500	5520	5540	5560	5580	5660	5680	5700
Average Power	9.61	9.46	9.25	9.07	8.52	9.05	8.96	8.91

Band	802.11a							
Channel	149	153	157	161	165	-	-	-
Frequency (MHz)	5745	5765	5785	5805	5825	-	-	-
Average Power	9.80	9.56	9.67	9.34	9.04	-	-	-

Band	802.11n (HT20)							
Channel	36	40	44	48	52	56	60	64
Frequency (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
Average Power	8.35	8.58	9.13	9.63	8.36	8.55	8.81	9.10

Band	802.11n (HT20)							
Channel	100	104	108	112	116	132	136	140
Frequency (MHz)	5500	5520	5540	5560	5580	5660	5680	5700
Average Power	9.55	9.36	9.11	9.05	8.86	9.20	9.04	8.83

Band	802.11n (HT20)							
Channel	149	153	157	161	165	-	-	-
Frequency (MHz)	5745	5765	5785	5805	5825	-	-	-
Average Power	9.12	9.06	9.56	9.51	9.53	-	-	-

Band	Bluetooth		
Channel	0	39	78
Frequency (MHz)	2402	2441	2480
Average Power	9.46	10.29	10.47

4.6 SAR Testing Results

4.6.1 SAR Results for Head

Plot No.	Band	Mode	Test Position	Channel	SAR-1g (W/kg)
1	GSM850	DTM11	Right Cheek	251	**0.444**
2	GSM850	DTM11	Right Tilted	251	0.253
3	GSM850	DTM11	Left Cheek	251	0.367
4	GSM850	DTM11	Left Tilted	251	0.251
7	GSM1900	DTM11	Right Cheek	810	0.301
8	GSM1900	DTM11	Right Tilted	810	0.132
9	GSM1900	DTM11	Left Cheek	810	**0.332**
10	GSM1900	DTM11	Left Tilted	810	0.205
13	WCDMA V	RMC12.2K	Right Cheek	4132	**0.809**
14	WCDMA V	RMC12.2K	Right Tilted	4132	0.459
15	WCDMA V	RMC12.2K	Left Cheek	4132	0.702
16	WCDMA V	RMC12.2K	Left Tilted	4132	0.519
17	WCDMA V	RMC12.2K	Right Cheek	4182	0.679
18	WCDMA V	RMC12.2K	Right Cheek	4233	0.722

4.6.2 SAR Results for Body

<Body Worn Mode>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	SAR-1g (W/kg)
26	GSM850	DTM11	Front Face	1	251	**0.534**
27	GSM850	DTM11	Rear Face	1	251	0.502
37	GSM1900	DTM11	Front Face	1	810	0.503
38	GSM1900	DTM11	Rear Face	1	810	**0.641**
48	WCDMA V	RMC12.2K	Front Face	1	4132	0.668
49	WCDMA V	RMC12.2K	Rear Face	1	4132	**0.75**

<Hotspot Mode>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	SAR-1g (W/kg)
19	GSM850	DTM11	Front Face	1	251	0.618
20	GSM850	DTM11	Rear Face	1	251	**0.655**
21	GSM850	DTM11	Left Side	1	251	0.313
22	GSM850	DTM11	Right Side	1	251	0.606
23	GSM850	DTM11	Bottom Side	1	251	0.346
30	GSM1900	DTM11	Front Face	1	810	0.509
31	GSM1900	DTM11	Rear Face	1	810	**0.753**
32	GSM1900	DTM11	Left Side	1	810	0.177
33	GSM1900	DTM11	Right Side	1	810	0.105
34	GSM1900	DTM11	Bottom Side	1	810	0.720
41	WCDMA V	RMC12.2K	Front Face	1	4132	0.792
42	WCDMA V	RMC12.2K	Rear Face	1	4132	0.897
43	WCDMA V	RMC12.2K	Left Side	1	4132	0.642
44	WCDMA V	RMC12.2K	Right Side	1	4132	**0.91**
45	WCDMA V	RMC12.2K	Bottom Side	1	4132	0.450
46	WCDMA V	RMC12.2K	Rear Face	1	4182	0.788
47	WCDMA V	RMC12.2K	Rear Face	1	4233	0.811
52	WCDMA V	RMC12.2K	Right Side	1	4182	0.853
53	WCDMA V	RMC12.2K	Right Side	1	4233	0.902

Test Engineer： Sam Onn and Match Tsui

4.6.3 Simultaneous Multi-band Transmission Evaluation

According to KDB 648474, the standalone SAR for WLAN/Bluetooth and simultaneous transmission SAR for WWAN and WLAN/Bluetooth were not required, because the closest separation distance between WWAN and WLAN/Bluetooth antennas is larger than 5 cm and the maximum output power of WLAN/Bluetooth is less than $2P_{Ref}$.

5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Kit	SPEAG	D835V2	4d092	Jun. 22, 2011	Annual
System Validation Kit	SPEAG	D1900V2	5d036	Jan. 26, 2012	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3661	Jan. 27, 2012	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3800	Aug. 05, 2011	Annual
Data Acquisition Electronics	SPEAG	DAE3	579	Sep. 23, 2011	Annual
Data Acquisition Electronics	SPEAG	DAE4	1277	Jul. 29, 2011	Annual
SAM Phantom	SPEAG	QD000P40CD	TP-1652	N/A	N/A
SAM Phantom	SPEAG	QD000P40CD	TP-1654	N/A	N/A
Radio Communication Tester	Agilent	E5515C	MY50266628	Sep. 26, 2011	Biennial
ENA Series Network Analyzer	Agilent	E5071C	MY46107999	Mar. 24, 2012	Annual
Signal Generator	Agilent	E8257C	MY43320668	Dec. 20, 2011	Annual
Power Meter	Anritsu	ML2487A	6K00001571	May 25, 2011	Annual
Power Sensor	Anritsu	MA2491A	030954	May 25, 2011	Annual
Dielectric Probe Kit	Agilent	85070D	N/A	N/A	N/A
Thermometer	YFE	YF-160A	110600361	Feb. 21, 2012	Annual

6. Measurement Uncertainty

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)	Vi
Measurement System						
Probe Calibration	6.0	Normal	1	1	± 6.0 %	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %	∞
Boundary Effects	1.0	Rectangular	√3	1	± 0.6 %	∞
Linearity	4.7	Rectangular	√3	1	± 2.7 %	∞
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %	∞
Readout Electronics	0.6	Normal	1	1	± 0.6 %	∞
Response Time	0.0	Rectangular	√3	1	± 0.0 %	∞
Integration Time	1.7	Rectangular	√3	1	± 1.0 %	∞
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	0.5	Rectangular	√3	1	± 0.3 %	∞
Probe Positioning	2.9	Rectangular	√3	1	± 1.7 %	∞
Max. SAR Eval.	2.3	Rectangular	√3	1	± 1.3 %	∞
Test Sample Related						
Device Positioning	3.9	Normal	1	1	± 3.9 %	31
Device Holder	2.7	Normal	1	1	± 2.7 %	19
Power Drift	5.0	Rectangular	√3	1	± 2.9 %	∞
Phantom and Setup						
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %	∞
Liquid Conductivity (Meas.)	5.0	Normal	1	0.64	± 3.2 %	29
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %	∞
Liquid Permittivity (Meas.)	5.0	Normal	1	0.6	± 3.0 %	29
Combined Standard Uncertainty					± 11.7 %	
Expanded Uncertainty (K=2)					**± 23.4 %**	

Uncertainty budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)	Vi
Measurement System						
Probe Calibration	6.55	Normal	1	1	± 6.55 %	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %	∞
Boundary Effects	2.0	Rectangular	√3	1	± 1.2 %	∞
Linearity	4.7	Rectangular	√3	1	± 2.7 %	∞
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %	∞
Readout Electronics	0.3	Normal	1	1	± 0.3 %	∞
Response Time	0.8	Rectangular	√3	1	± 0.5 %	∞
Integration Time	2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	0.8	Rectangular	√3	1	± 0.5 %	∞
Probe Positioning	9.9	Rectangular	√3	1	± 5.7 %	∞
Max. SAR Eval.	4.0	Rectangular	√3	1	± 2.3 %	∞
Test Sample Related						
Device Positioning	3.9	Normal	1	1	± 3.9 %	31
Device Holder	2.7	Normal	1	1	± 2.7 %	19
Power Drift	5.0	Rectangular	√3	1	± 2.9 %	∞
Phantom and Setup						
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %	∞
Liquid Conductivity (Meas.)	5.0	Normal	1	0.64	± 3.2 %	30
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %	∞
Liquid Permittivity (Meas.)	5.0	Normal	1	0.6	± 3.0 %	30
Combined Standard Uncertainty					± 13.4 %	
Expanded Uncertainty (K=2)					**± 26.8 %**	

Uncertainty budget for frequency range 3 GHz to 6 GHz

7. Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site. If you have any comments, please feel free to contact us at the following:

Taiwan HwaYa EMC/RF/Safety/Telecom Lab:
Add: No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil., Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
Tel: 886-3-318-3232
Fax: 886-3-327-0892

Taiwan LinKo EMC/RF Lab:
Add: No. 47, 14th Ling, Chia Pau Vil., Linkou Dist., New Taipei City 244, Taiwan, R.O.C.
Tel: 886-2-2605-2180
Fax: 886-2-2605-1924

Taiwan HsinChu EMC/RF Lab:
Add: No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Vil., Chiung Lin Township, Hsinchu County 307, Taiwan, R.O.C.
Tel: 886-3-593-5343
Fax: 886-3-593-5342

Email: service.adt@tw.bureauveritas.com
Web Site: www.adt.com.tw

The road map of all our labs can be found in our web site also.

---END---

Appendix A. SAR Plots of System Verification

The plots for system verification are shown as follows.

System Check_H835_120305

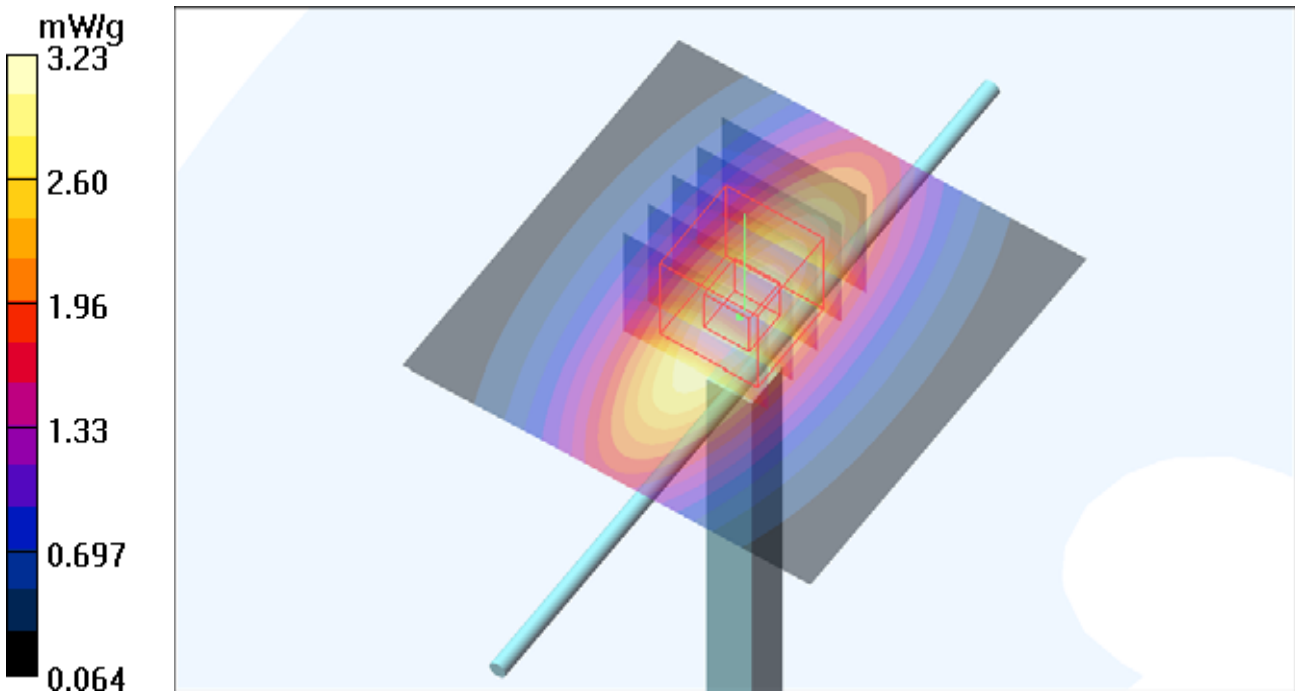
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d021

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: H835_0305 Medium parameters used: f = 835 MHz; σ = 0.92 mho/m; ε_r = 43.1; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.23 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 56.8 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 2.51 mW/g; SAR(10 g) = 1.65 mW/g
Maximum value of SAR (measured) = 3.18 mW/g



System Check_B835_120303

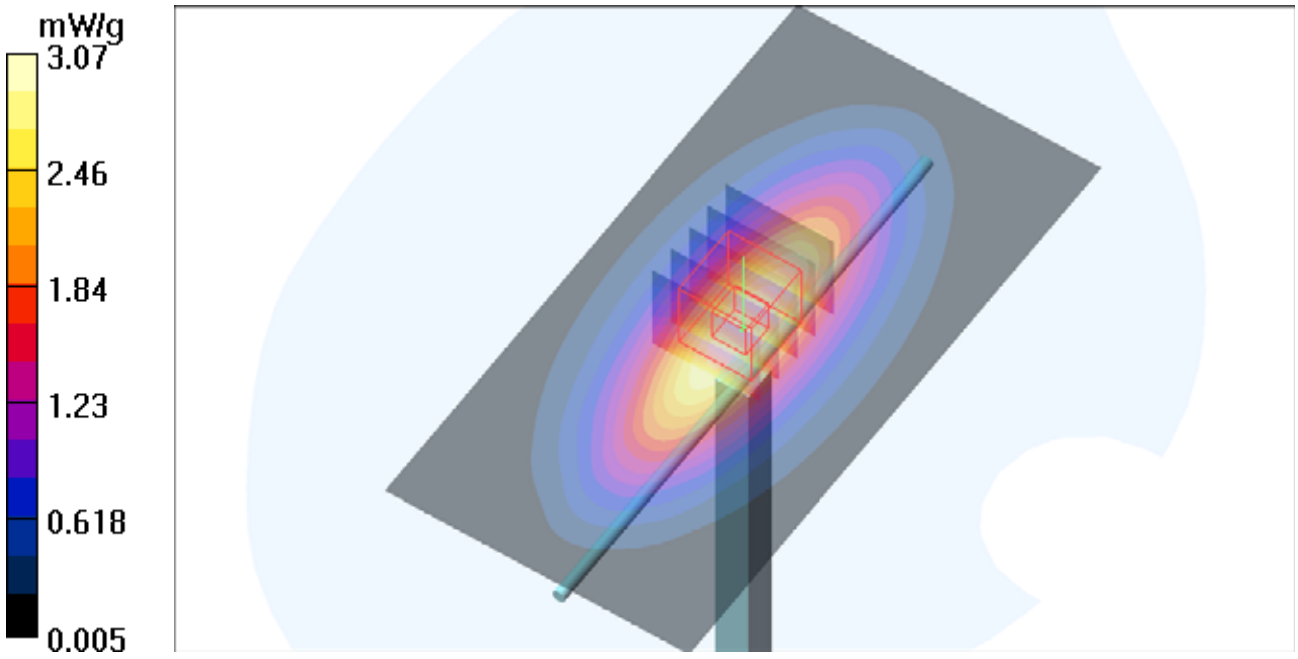
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d021

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used: f = 835 MHz; σ = 0.988 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3661; ConvF(9.64, 9.64, 9.64); Calibrated: 2012/01/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.07 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.0 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 3.57 W/kg
SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 3.06 mW/g



System Check_H1900_120305

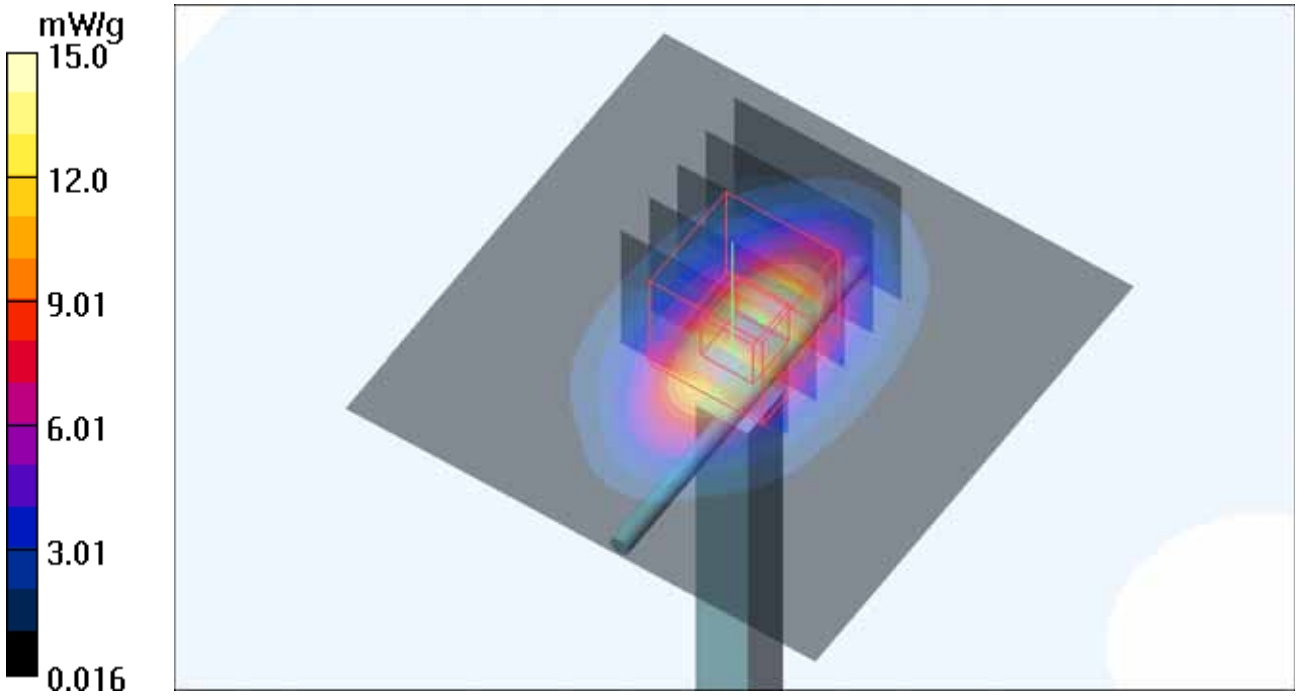
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: H1900_0305 Medium parameters used: f = 1900 MHz; σ = 1.38 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Ambient Temperature：21.6 ℃; Liquid Temperature：20.7 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(7.46, 7.46, 7.46); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 15.0 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 103.3 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 9.84 mW/g; SAR(10 g) = 5.09 mW/g
Maximum value of SAR (measured) = 14.0 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/03/03

System Check_B1900_120303

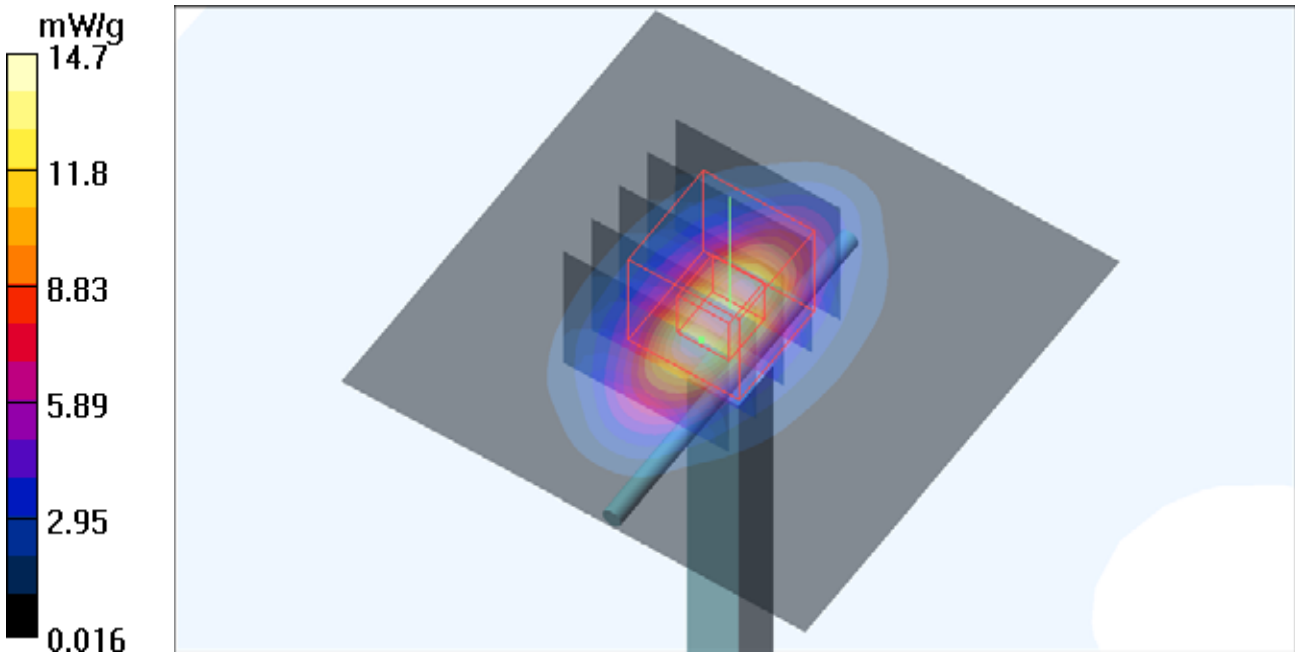
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B1900_0303 Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.7 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 96.5 V/m; Power Drift = 0.040 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 9.93 mW/g; SAR(10 g) = 5.11 mW/g
Maximum value of SAR (measured) = 14.2 mW/g



Appendix B. SAR Plots of SAR Measurement

The plots for SAR measurement are shown as follows.

P01 GSM850_DTM11_Right Cheek_Ch251

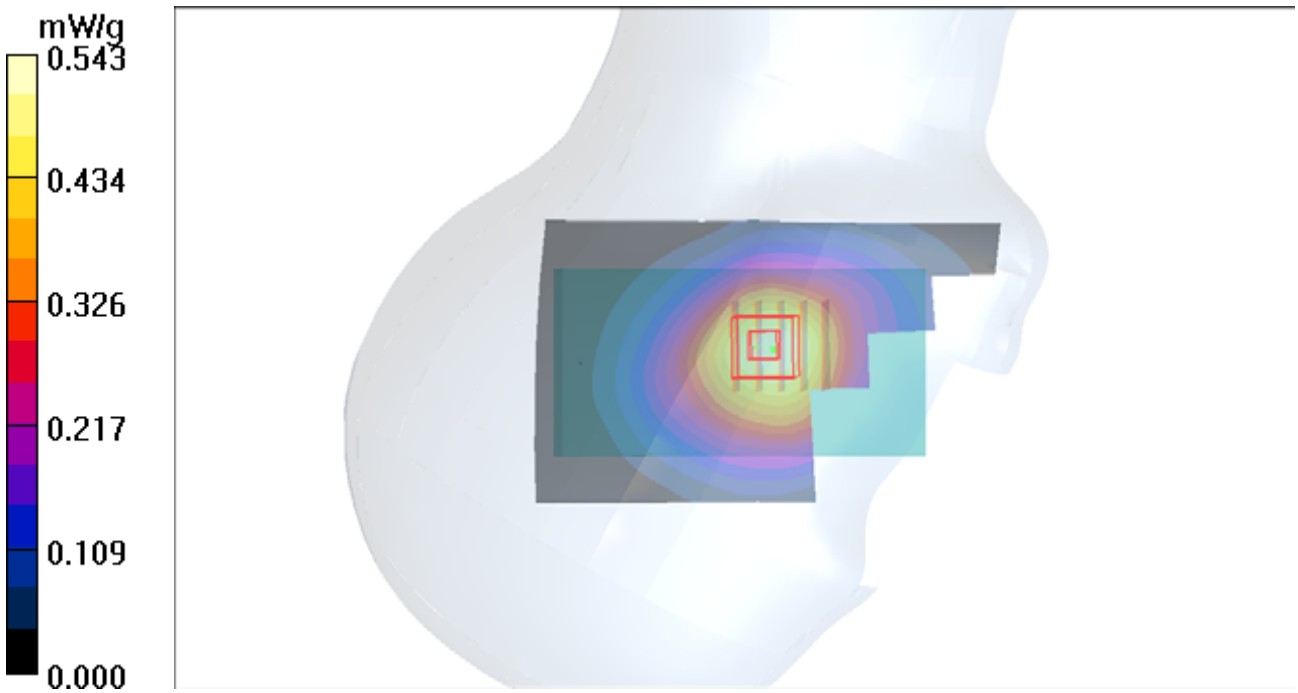
DUT: 120131C05

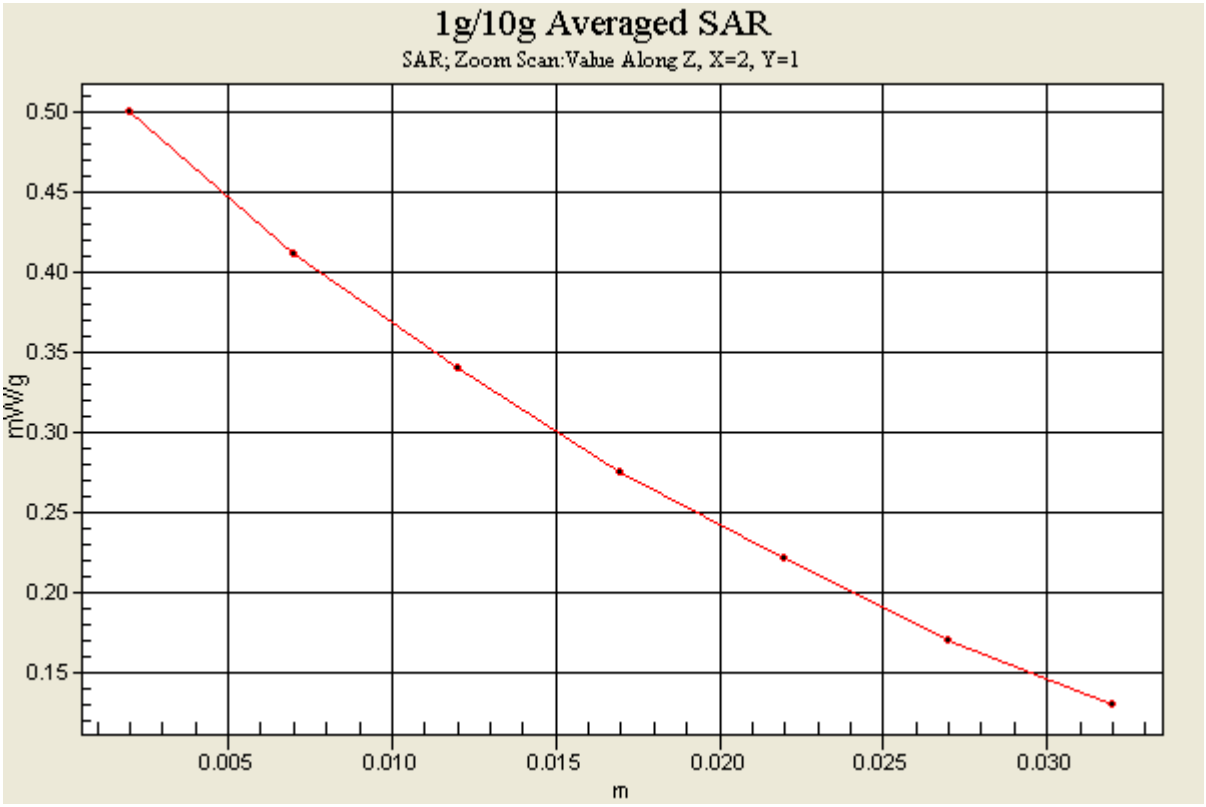
Communication System: GSM850 DTM 11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: H835_0305 Medium parameters used: f = 849 MHz; σ = 0.937 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.543 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.18 V/m; Power Drift = 0.137 dB
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.444 mW/g; SAR(10 g) = 0.339 mW/g
Maximum value of SAR (measured) = 0.500 mW/g




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

P02 GSM850_DTM11_Right Tilted_Ch251

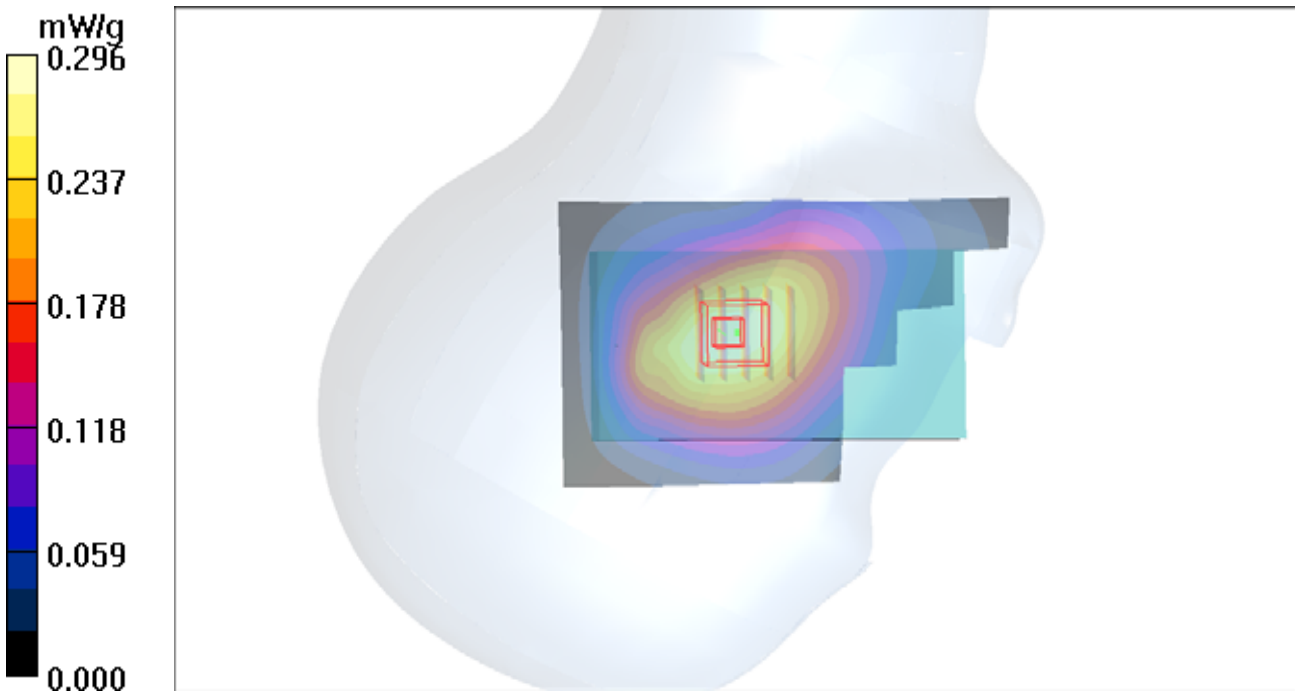
DUT: 120131C05

Communication System: GSM850 DTM 11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: H835_0305 Medium parameters used: f = 849 MHz; σ = 0.937 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.296 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.109 dB
Peak SAR (extrapolated) = 0.315 W/kg
SAR(1 g) = 0.253 mW/g; SAR(10 g) = 0.195 mW/g
Maximum value of SAR (measured) = 0.289 mW/g



P03 GSM850_DTM11_Left Cheek_Ch251

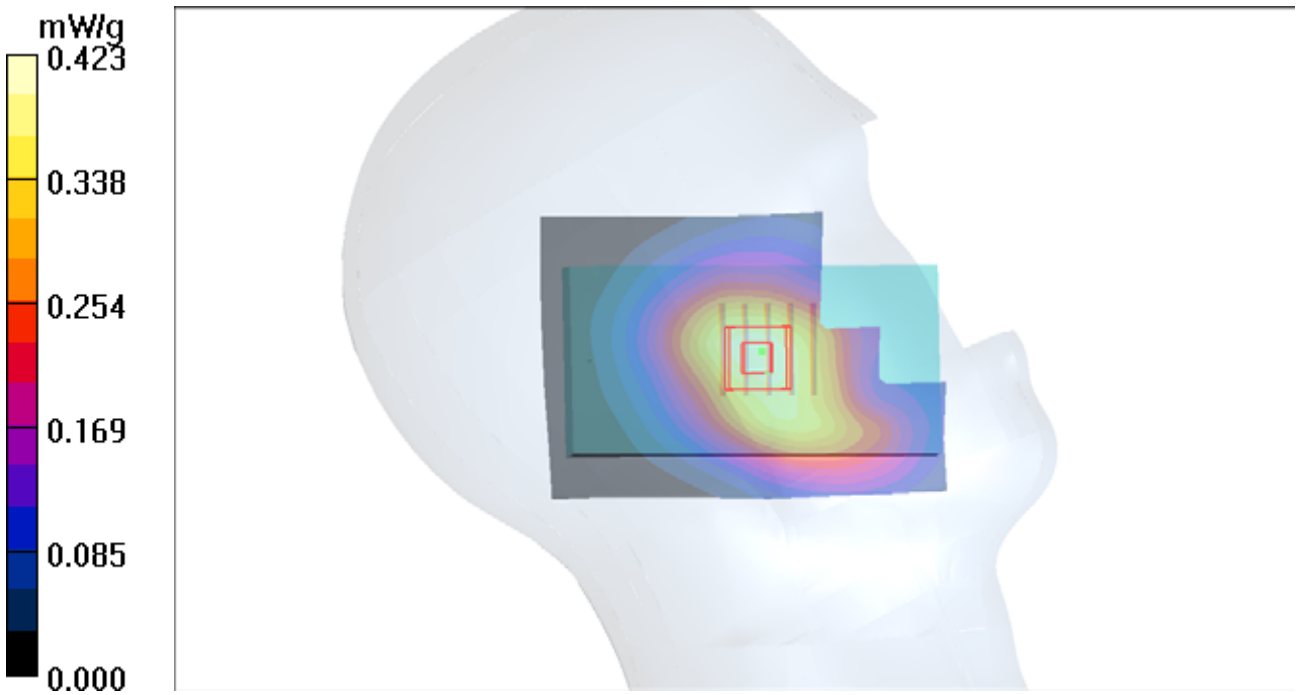
DUT: 120131C05

Communication System: GSM850 DTM 11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: H835_0305 Medium parameters used: f = 849 MHz; σ = 0.937 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.423 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.10 V/m; Power Drift = -0.124 dB
Peak SAR (extrapolated) = 0.452 W/kg
SAR(1 g) = 0.367 mW/g; SAR(10 g) = 0.278 mW/g
Maximum value of SAR (measured) = 0.412 mW/g



P04 GSM850_DTM11_Left Tilted_Ch251

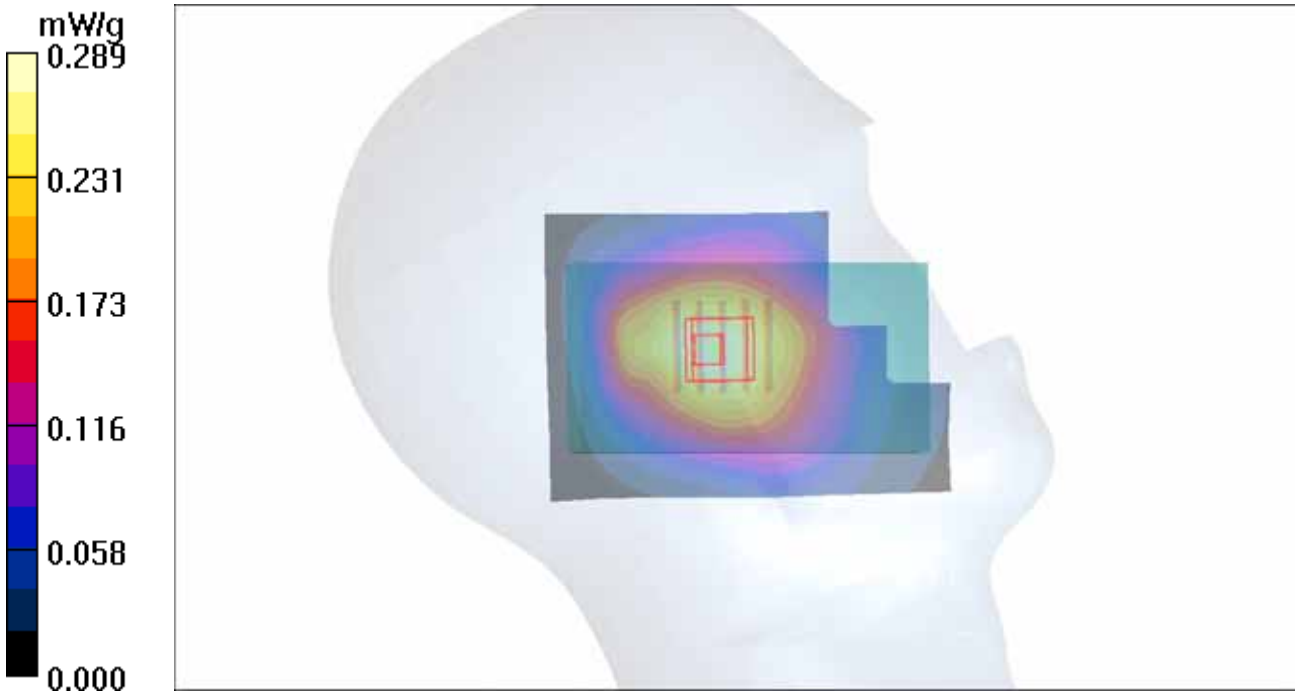
DUT: 120131C05

Communication System: GSM850 DTM 11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: H835_0305 Medium parameters used: f = 849 MHz; σ = 0.937 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.289 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.2 V/m; Power Drift = -0.158 dB
Peak SAR (extrapolated) = 0.316 W/kg
SAR(1 g) = 0.251 mW/g; SAR(10 g) = 0.191 mW/g
Maximum value of SAR (measured) = 0.287 mW/g



P07 GSM1900_DTM11_Right Cheek_Ch810

DUT: 120131C05

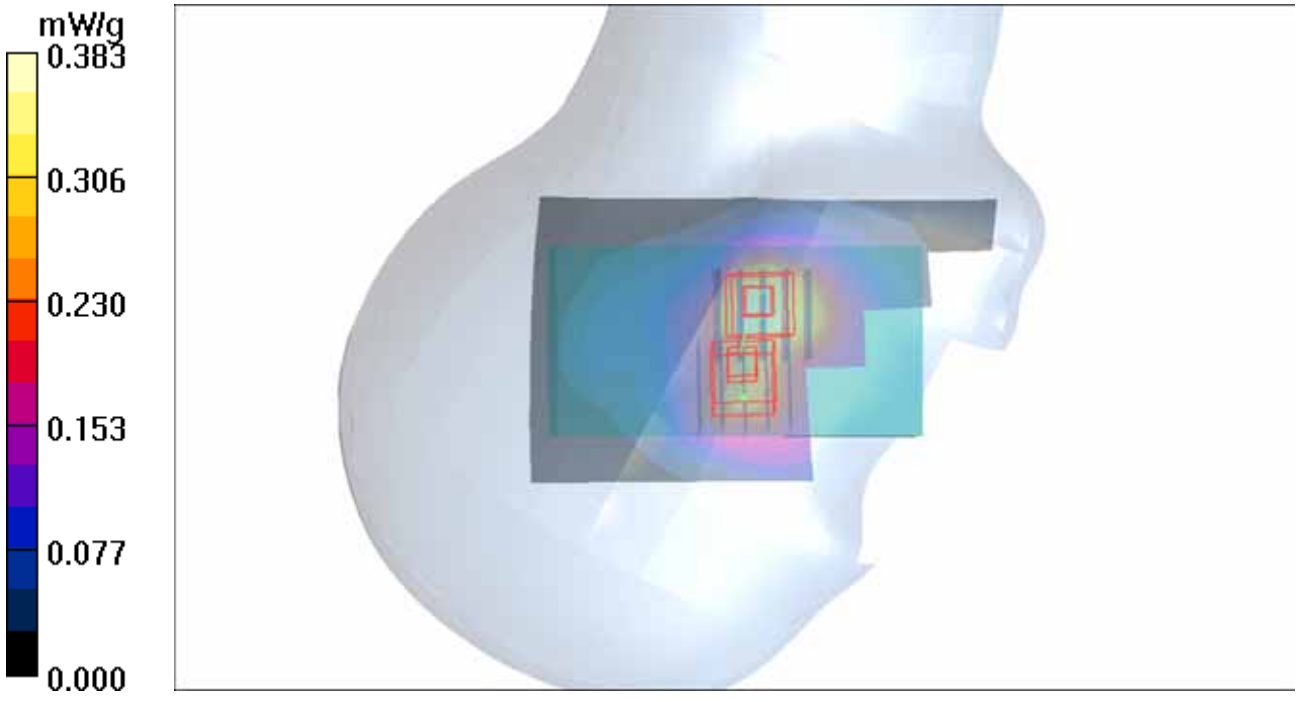
Communication System: GSM1900 DTM 11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: H1900_0305 Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Ambient Temperature：21.6 ℃; Liquid Temperature：20.7 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(7.46, 7.46, 7.46); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.383 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.56 V/m; Power Drift = -0.119 dB
Peak SAR (extrapolated) = 0.452 W/kg
SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.188 mW/g
Maximum value of SAR (measured) = 0.381 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.56 V/m; Power Drift = -0.119 dB
Peak SAR (extrapolated) = 0.295 W/kg
SAR(1 g) = 0.193 mW/g; SAR(10 g) = 0.125 mW/g
Maximum value of SAR (measured) = 0.254 mW/g



P08 GSM1900_DTM11_Right Tilted_Ch810

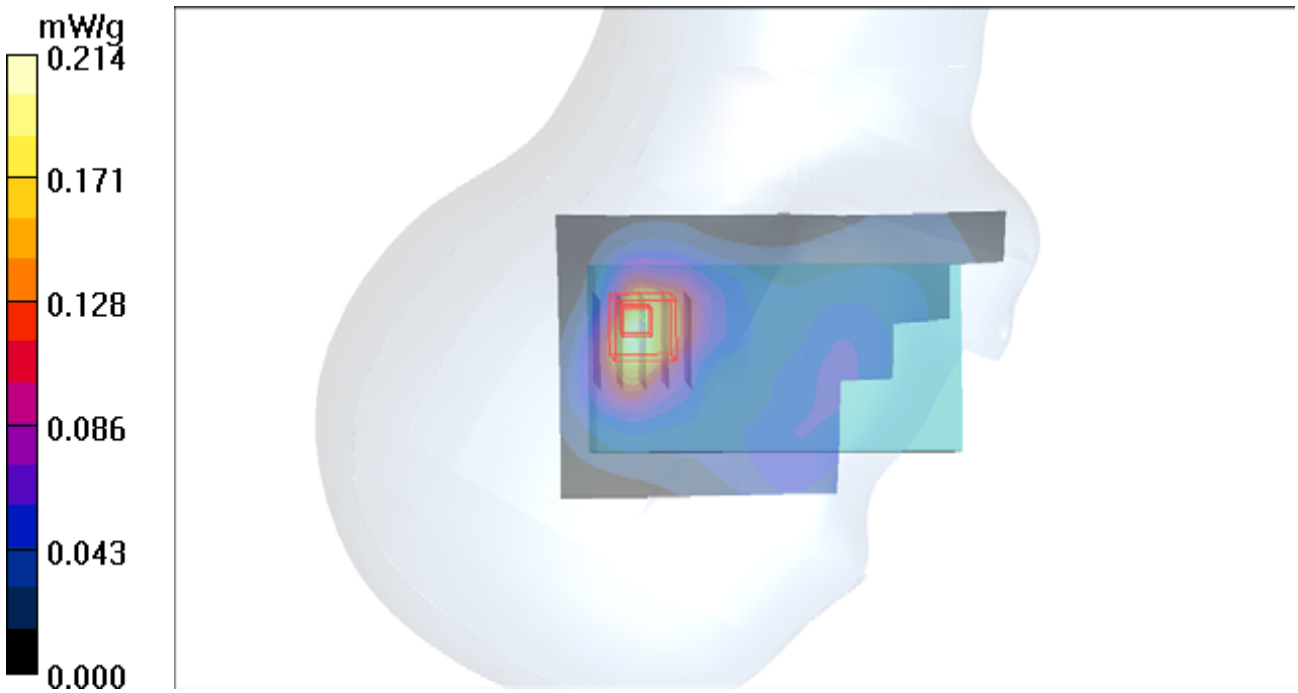
DUT: 120131C05

Communication System: GSM1900 DTM 11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: H1900_0305 Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Ambient Temperature：21.6 ℃; Liquid Temperature：20.7 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(7.46, 7.46, 7.46); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.214 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = -0.118 dB
Peak SAR (extrapolated) = 0.205 W/kg
SAR(1 g) = 0.132 mW/g; SAR(10 g) = 0.080 mW/g
Maximum value of SAR (measured) = 0.170 mW/g



P09 GSM1900_DTM11_Left Cheek_Ch810

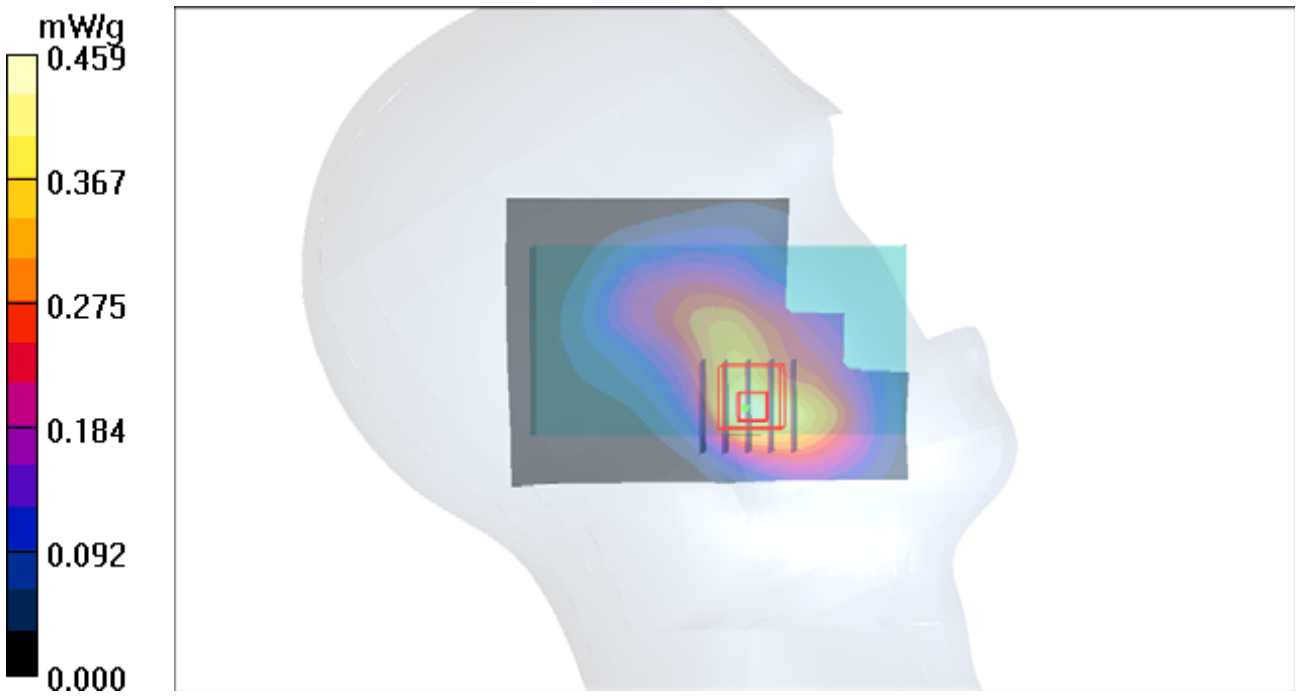
DUT: 120131C05

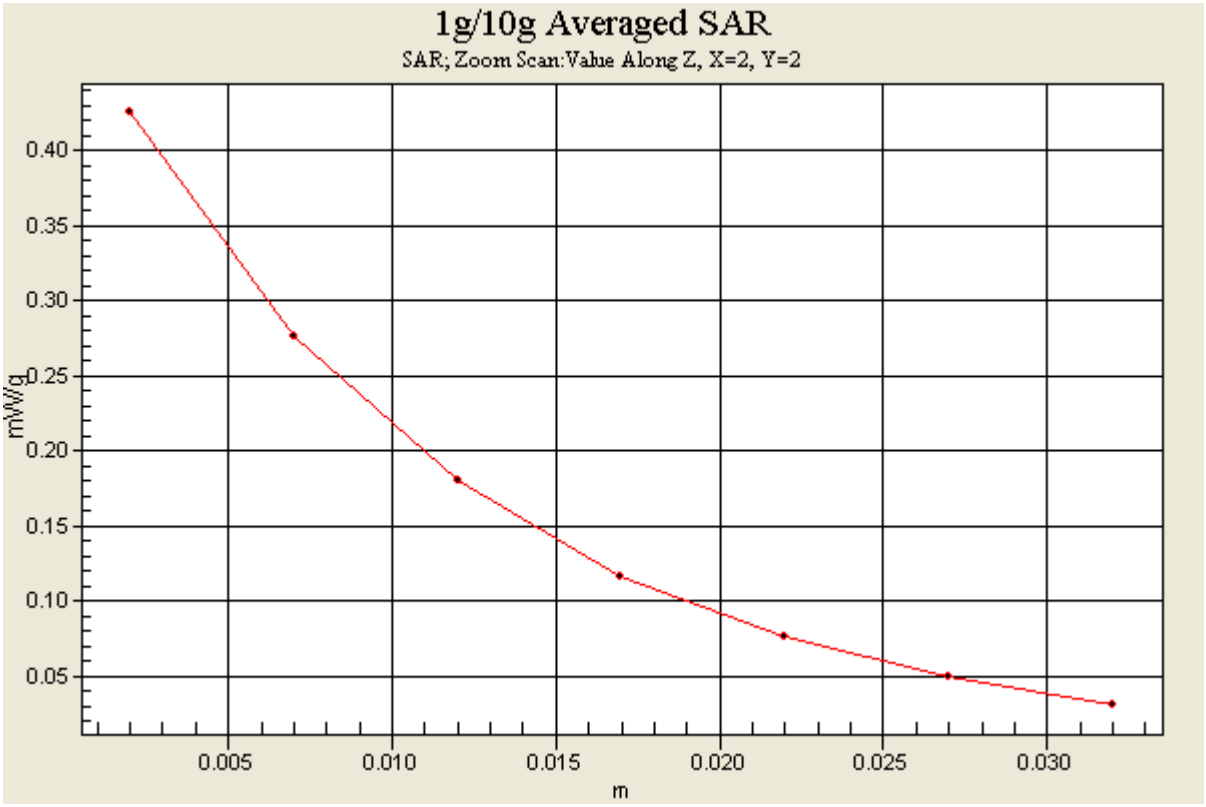
Communication System: GSM1900 DTM 11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: H1900_0305 Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Ambient Temperature：21.6 ℃; Liquid Temperature：20.7 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(7.46, 7.46, 7.46); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.459 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.07 V/m; Power Drift = -0.194 dB
Peak SAR (extrapolated) = 0.517 W/kg
SAR(1 g) = 0.332 mW/g; SAR(10 g) = 0.209 mW/g
Maximum value of SAR (measured) = 0.425 mW/g




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

P10 GSM1900_DTM11_Left Tilted_Ch810

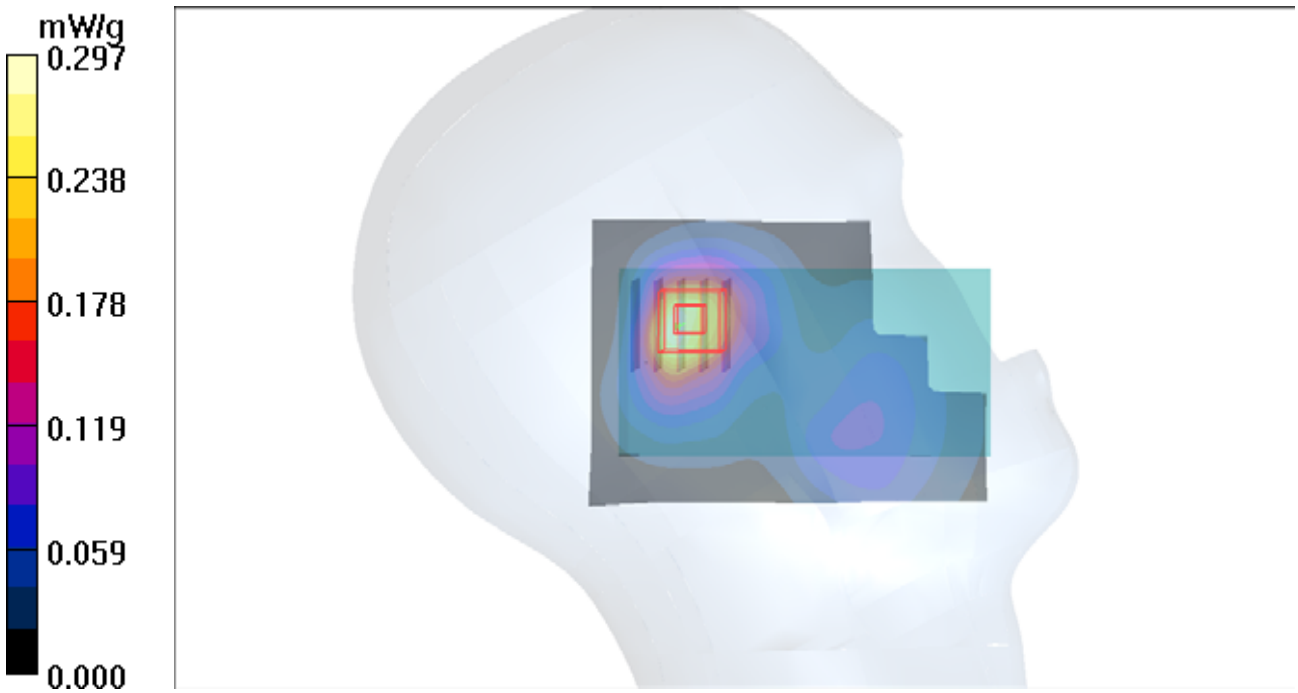
DUT: 120131C05

Communication System: GSM1900 DTM 11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: H1900_0305 Medium parameters used: f = 1910 MHz; σ = 1.4 mho/m; ε_r = 39.8; ρ = 1000 kg/m^3
Ambient Temperature：21.6 ℃; Liquid Temperature：20.7 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(7.46, 7.46, 7.46); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.297 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.58 V/m; Power Drift = -0.131 dB
Peak SAR (extrapolated) = 0.314 W/kg
SAR(1 g) = 0.205 mW/g; SAR(10 g) = 0.122 mW/g
Maximum value of SAR (measured) = 0.249 mW/g



P13 WCDMA V_RMC12.2K_Right Cheek_Ch4132

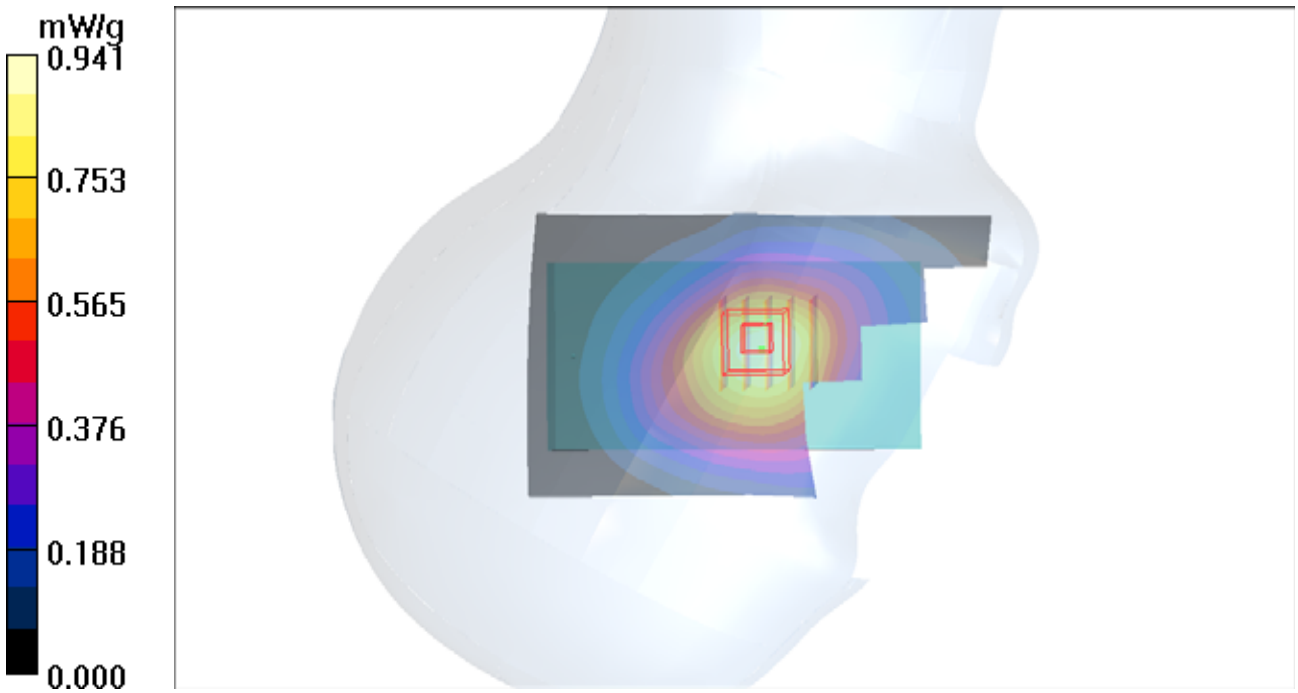
DUT: 120131C05

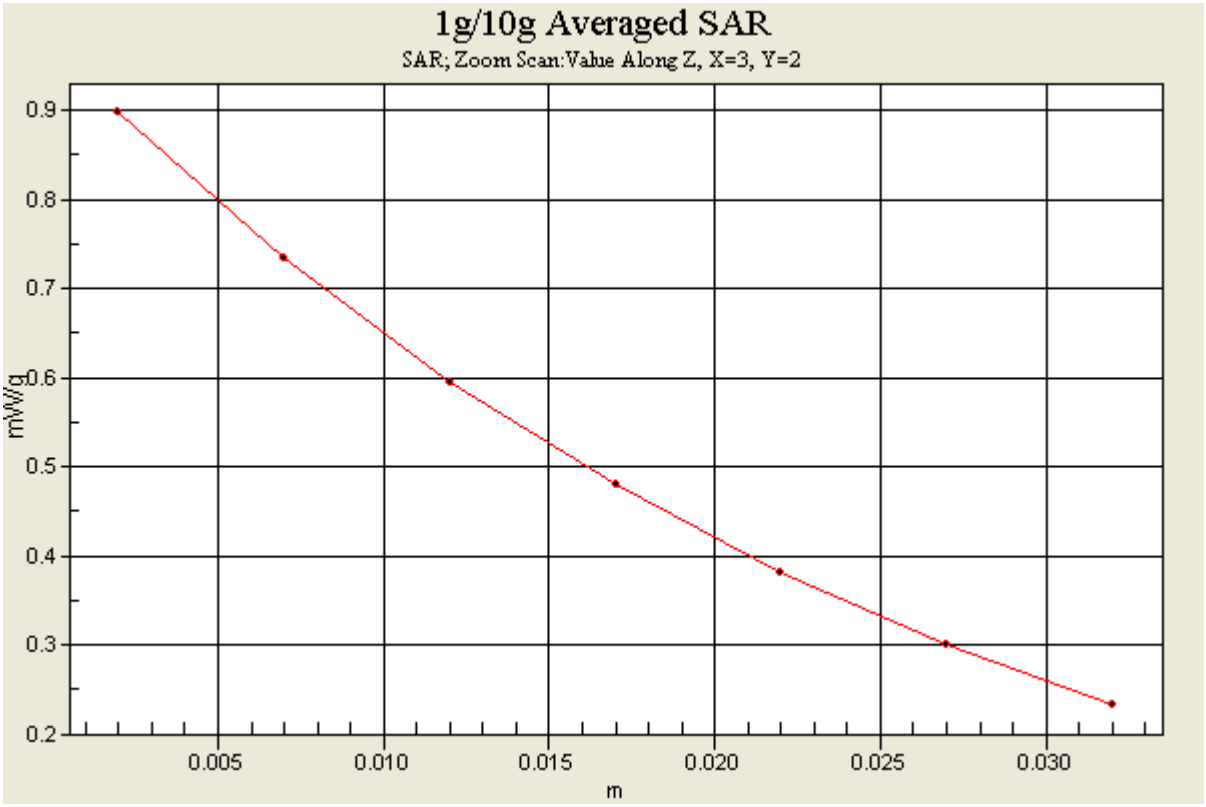
Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: H835_0305 Medium parameters used : f = 826.4 MHz; σ = 0.91 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃； Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.941 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.83 V/m; Power Drift = 0.143 dB
Peak SAR (extrapolated) = 0.982 W/kg
SAR(1 g) = 0.809 mW/g; SAR(10 g) = 0.625 mW/g
Maximum value of SAR (measured) = 0.896 mW/g




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

P14 WCDMA V_RMC12.2K_Right Tilted_Ch4132

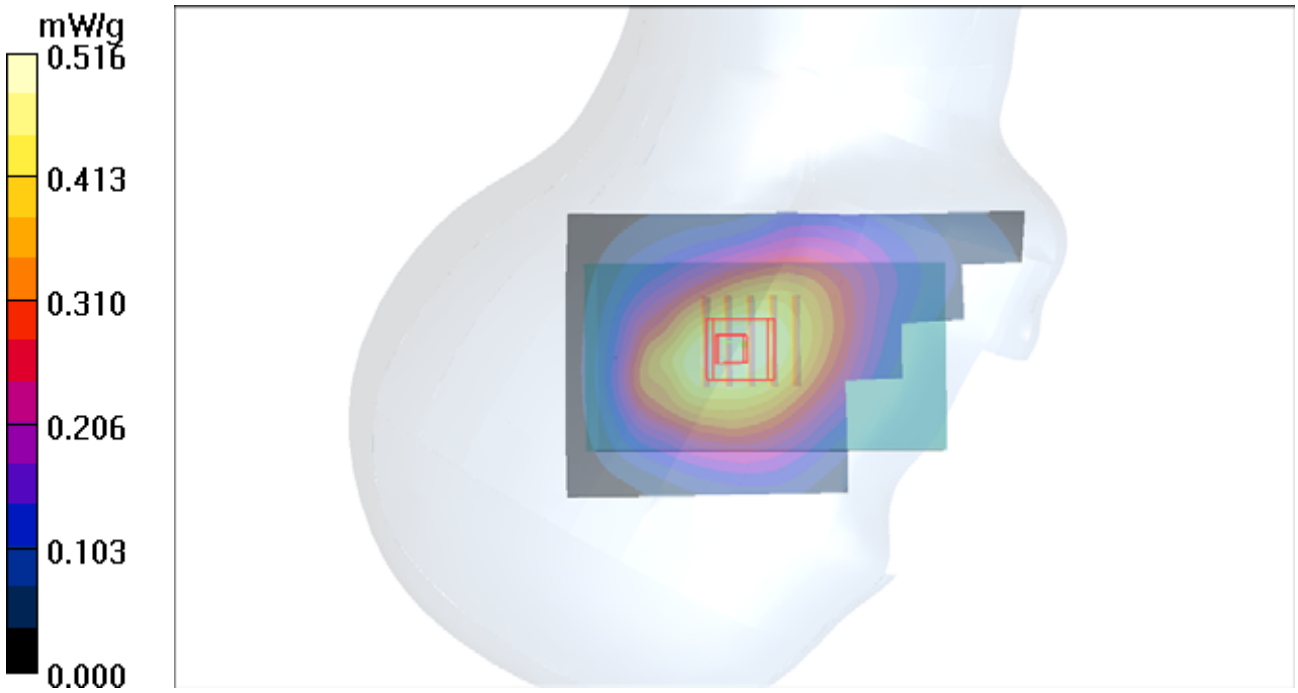
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: H835_0305 Medium parameters used : f = 826.4 MHz; σ = 0.91 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.516 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = -0.134 dB
Peak SAR (extrapolated) = 0.559 W/kg
SAR(1 g) = 0.459 mW/g; SAR(10 g) = 0.358 mW/g
Maximum value of SAR (measured) = 0.515 mW/g



P15 WCDMA V_RMC12.2K_Left Cheek_Ch4132

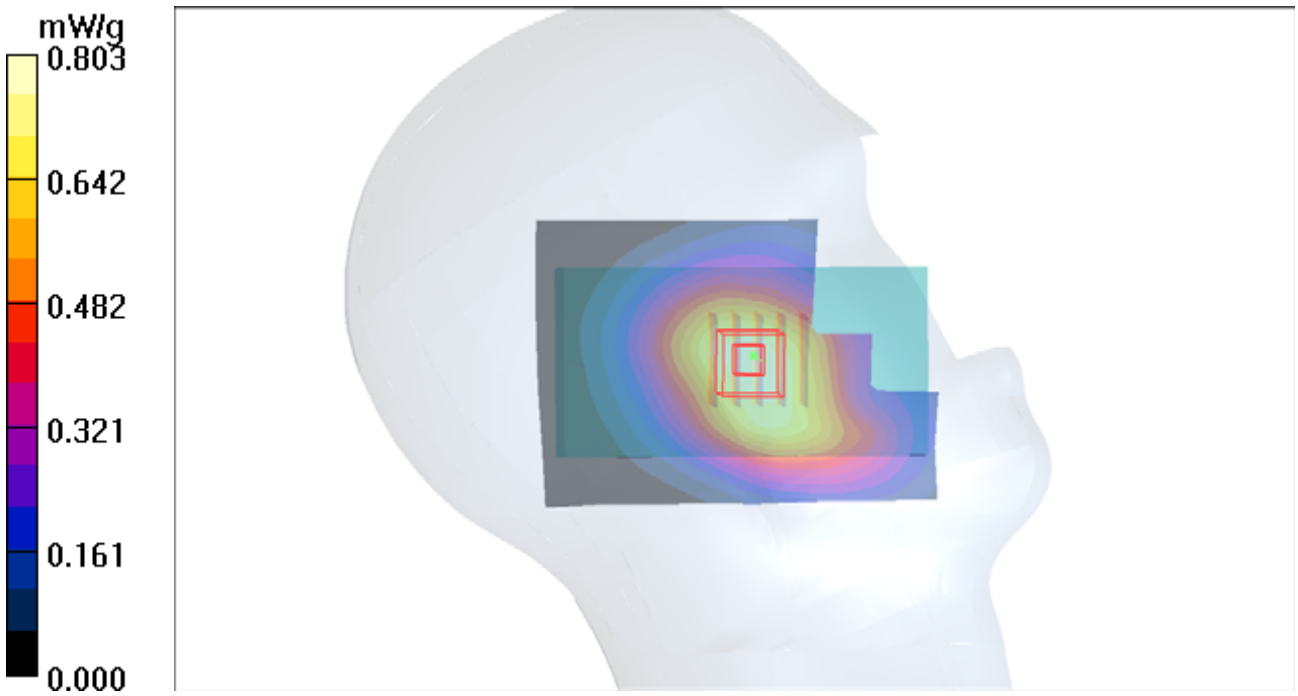
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: H835_0305 Medium parameters used : f = 826.4 MHz; σ = 0.91 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.803 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.11 V/m; Power Drift = -0.162 dB
Peak SAR (extrapolated) = 0.863 W/kg
SAR(1 g) = 0.702 mW/g; SAR(10 g) = 0.538 mW/g
Maximum value of SAR (measured) = 0.796 mW/g



P16 WCDMA V_RMC12.2K_Left Tilted_Ch4132

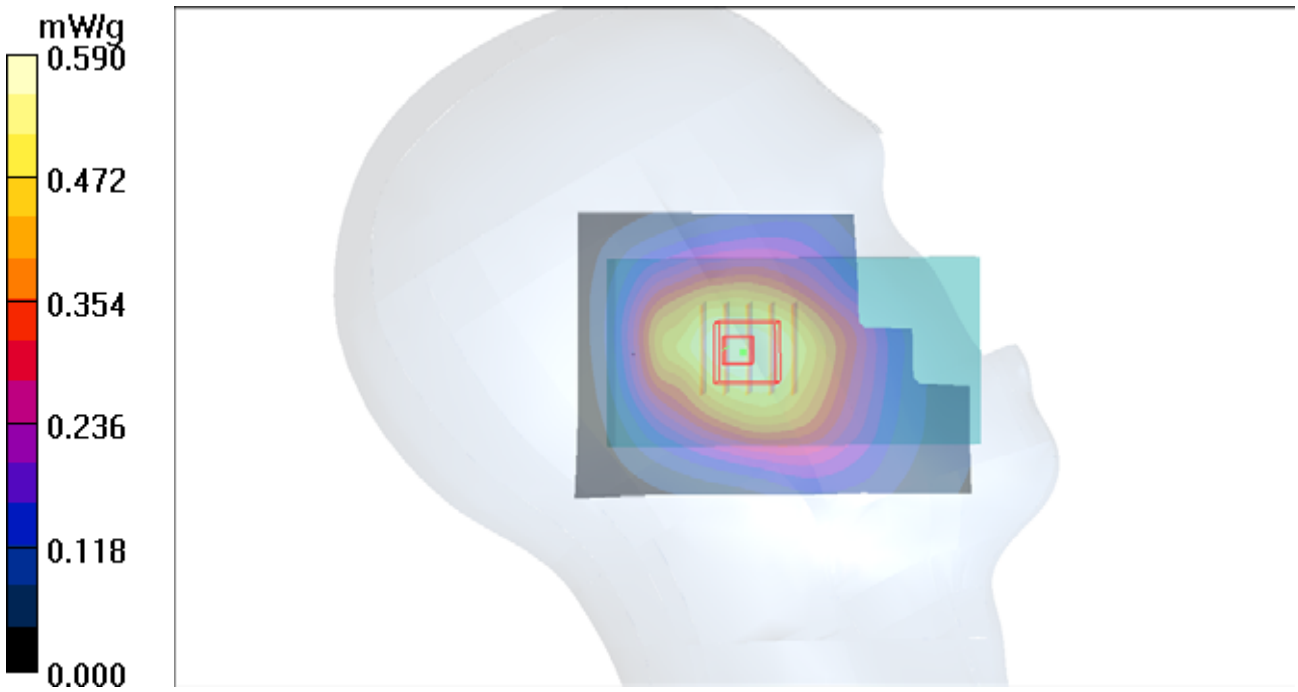
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: H835_0305 Medium parameters used : f = 826.4 MHz; σ = 0.91 mho/m; ε_r = 43.2; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃； Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.590 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 0.642 W/kg
SAR(1 g) = 0.519 mW/g; SAR(10 g) = 0.402 mW/g
Maximum value of SAR (measured) = 0.586 mW/g



P17 WCDMA V_RMC12.2K_Right Cheek_Ch4182

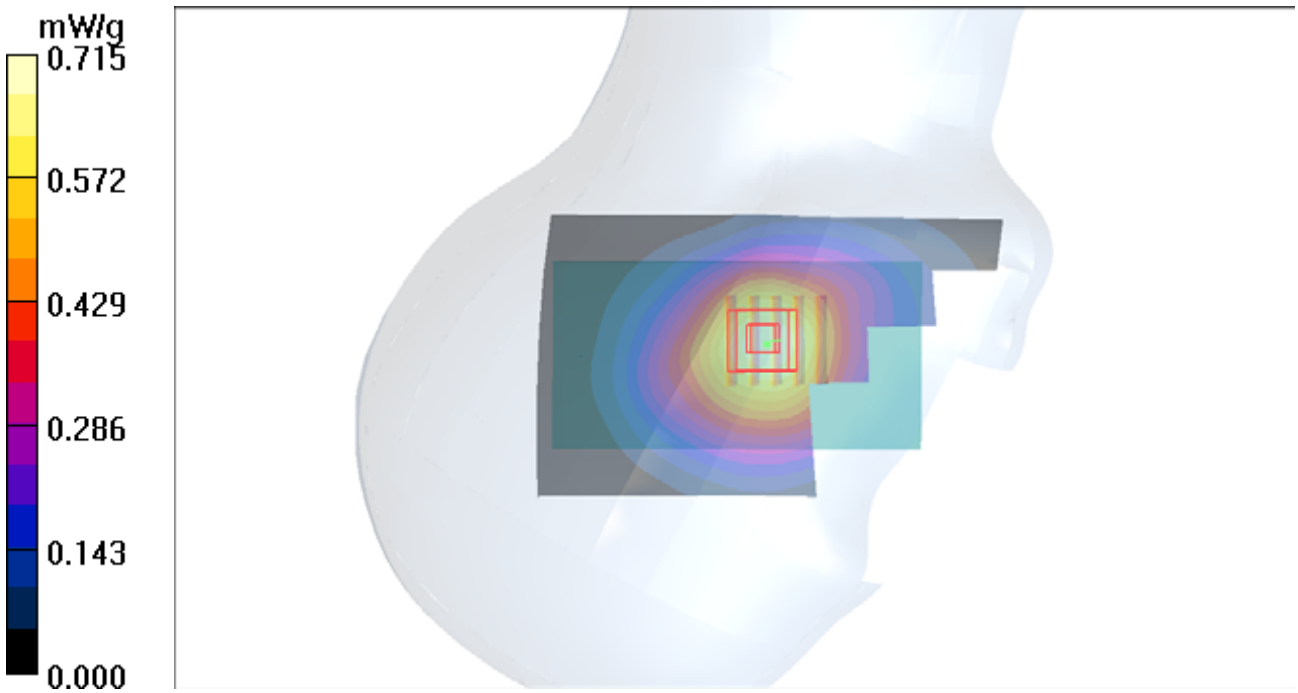
DUT: 120131C05

Communication System: WCDMA V; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: H835_0305 Medium parameters used : f = 836.4 MHz; σ = 0.922 mho/m; ε_r = 43; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4182/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.715 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.38 V/m; Power Drift = 0.112 dB
Peak SAR (extrapolated) = 0.827 W/kg
SAR(1 g) = 0.679 mW/g; SAR(10 g) = 0.523 mW/g
Maximum value of SAR (measured) = 0.756 mW/g



P18 WCDMA V_RMC12.2K_Right Cheek_Ch4233

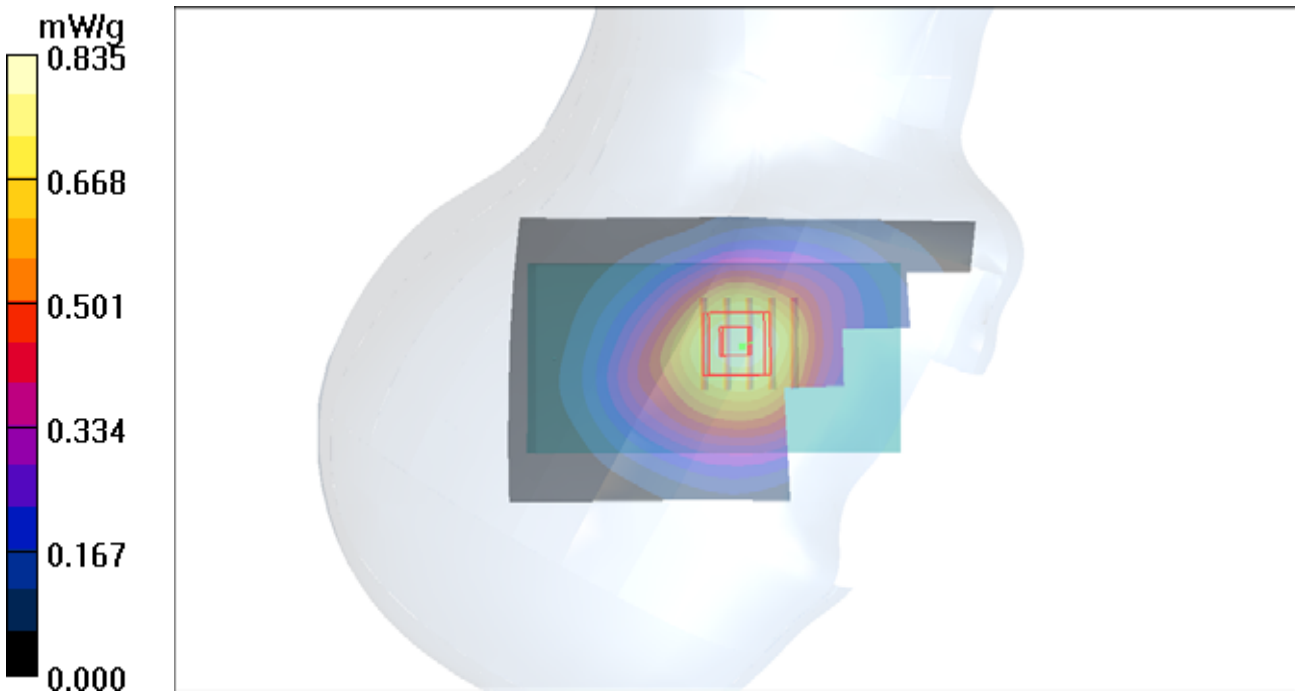
DUT: 120131C05

Communication System: WCDMA V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: H835_0305 Medium parameters used: f = 847 MHz; σ = 0.935 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.835 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.44 V/m; Power Drift = 0.165 dB
Peak SAR (extrapolated) = 0.885 W/kg
SAR(1 g) = 0.722 mW/g; SAR(10 g) = 0.555 mW/g
Maximum value of SAR (measured) = 0.804 mW/g



P19 GSM850_DTM11_Front Face_1cm_Ch251

DUT: 120131C05

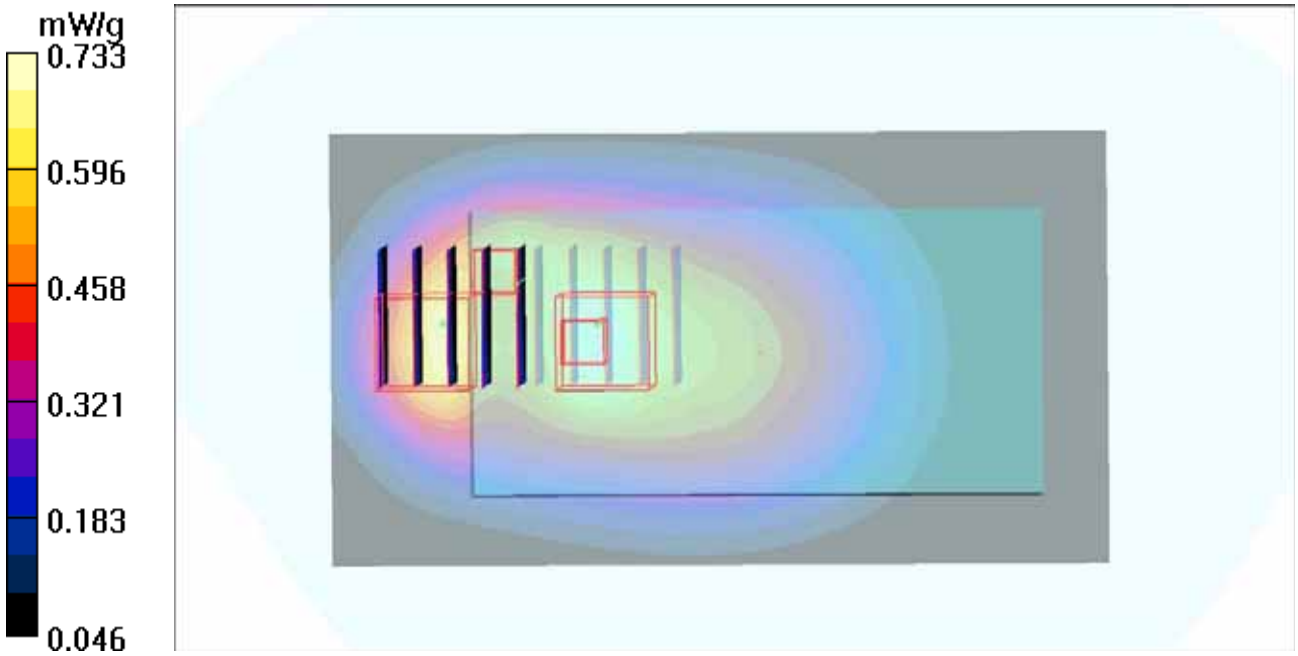
Communication System: GSM850 GPRS11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: B835_0303 Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3661; ConvF(9.64, 9.64, 9.64); Calibrated: 2012/01/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x91x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.728 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.6 V/m; Power Drift = -0.151 dB
Peak SAR (extrapolated) = 0.830 W/kg
SAR(1 g) = 0.618 mW/g; SAR(10 g) = 0.452 mW/g
Maximum value of SAR (measured) = 0.733 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.6 V/m; Power Drift = -0.151 dB
Peak SAR (extrapolated) = 0.802 W/kg
SAR(1 g) = 0.447 mW/g; SAR(10 g) = 0.253 mW/g
Maimum value of SAR (measured) = 0.636 mW/g



P20 GSM850_DTM11_Rear Face_1cm_Ch251

DUT: 120131C05

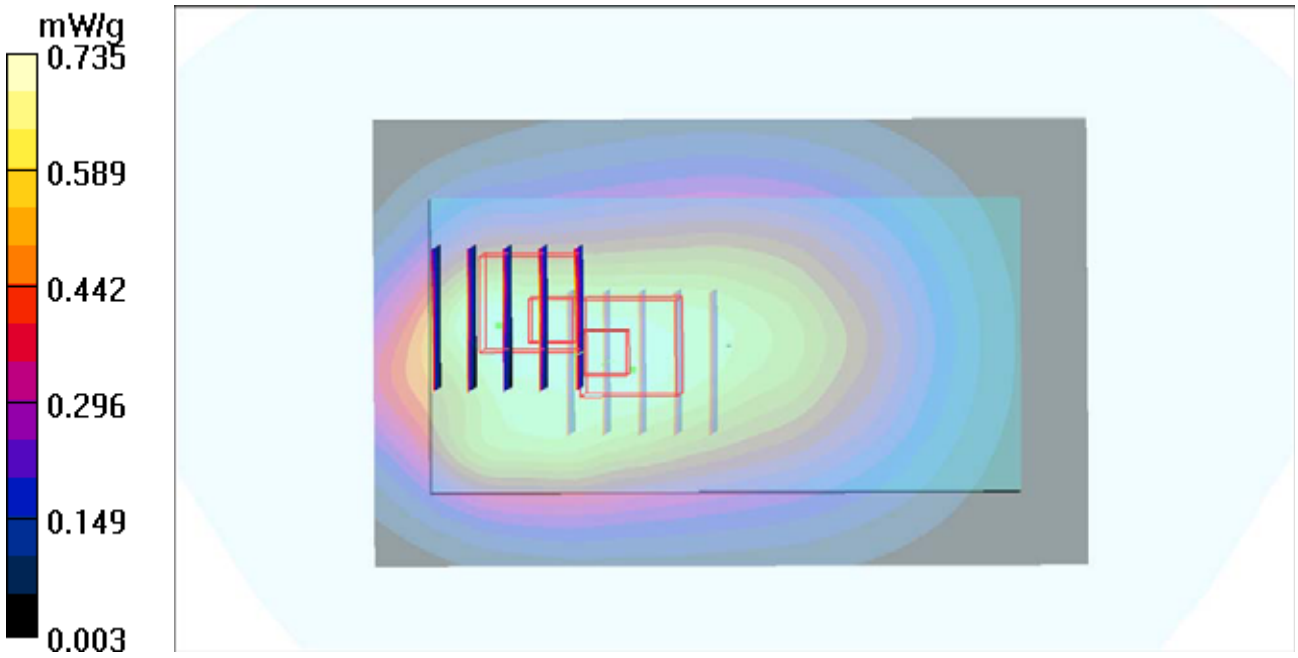
Communication System: GSM850 GPRS11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: B835_0303 Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

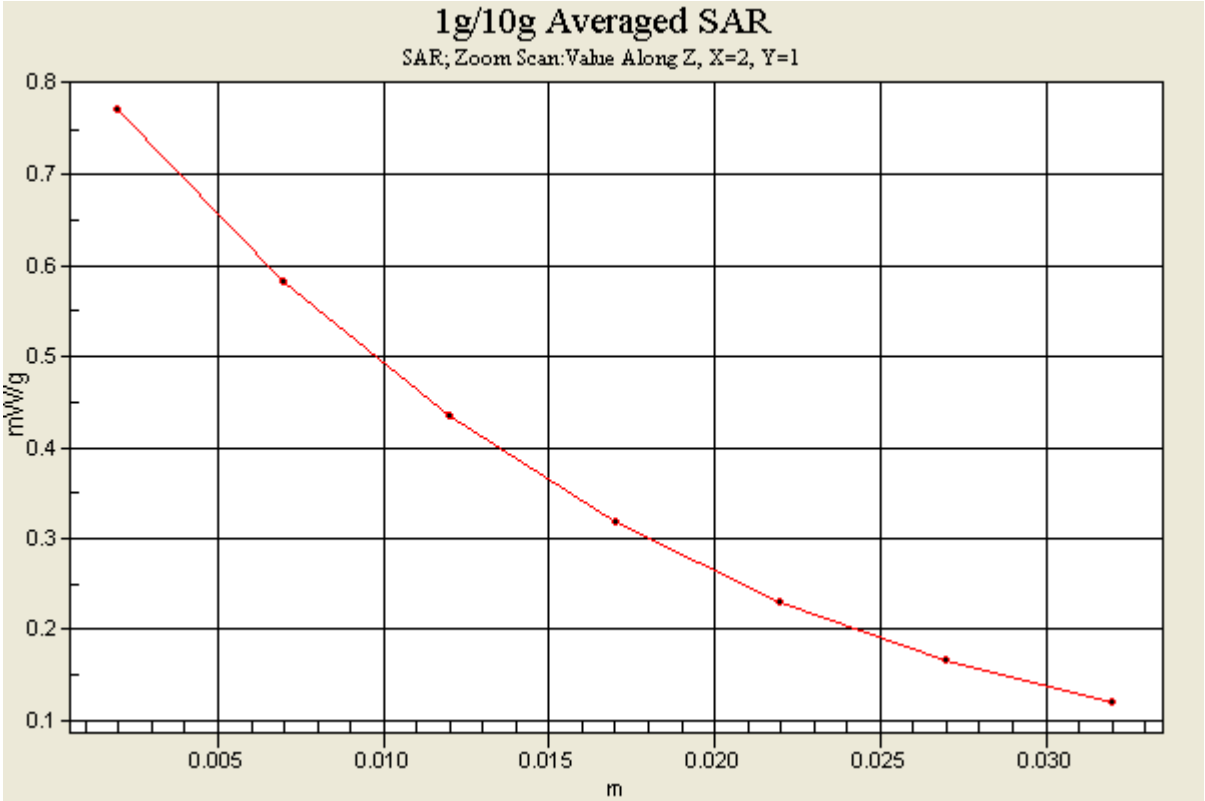
DASY4 Configuration:
- Probe: EX3DV4 - SN3661; ConvF(9.64, 9.64, 9.64); Calibrated: 2012/01/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.735 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.8 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 0.871 W/kg
SAR(1 g) = 0.655 mW/g; SAR(10 g) = 0.481 mW/g
Maximum value of SAR (measured) = 0.770 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.8 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 0.967 W/kg
SAR(1 g) = 0.566 mW/g; SAR(10 g) = 0.355 mW/g
Maximum value of SAR (measured) = 0.768 mW/g




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

P21 GSM850_DTM11_Left Side_1cm_Ch251

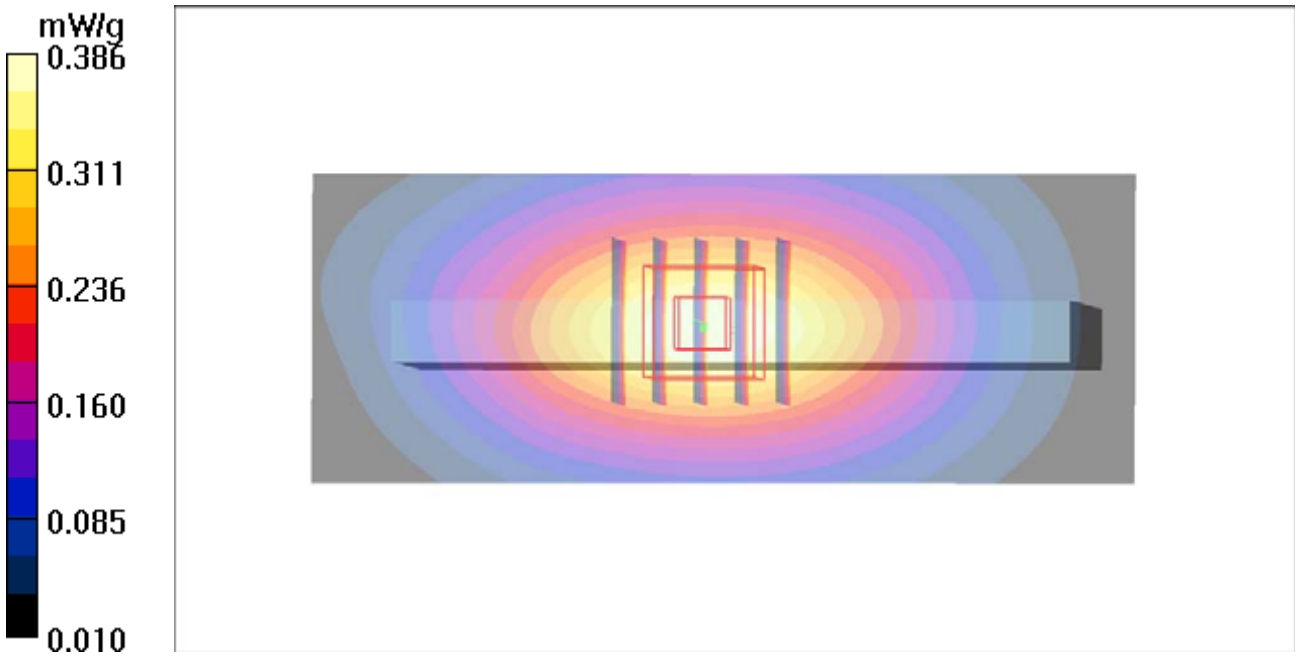
DUT: 120131C05

Communication System: GSM850 GPRS11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: B835_0303 Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3661; ConvF(9.64, 9.64, 9.64); Calibrated: 2012/01/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.386 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.3 V/m; Power Drift = -0.109 dB
Peak SAR (extrapolated) = 0.434 W/kg
SAR(1 g) = 0.313 mW/g; SAR(10 g) = 0.218 mW/g
Maximum value of SAR (measured) = 0.381 mW/g



P22 GSM850_DTM11_Right Side_1cm_Ch251

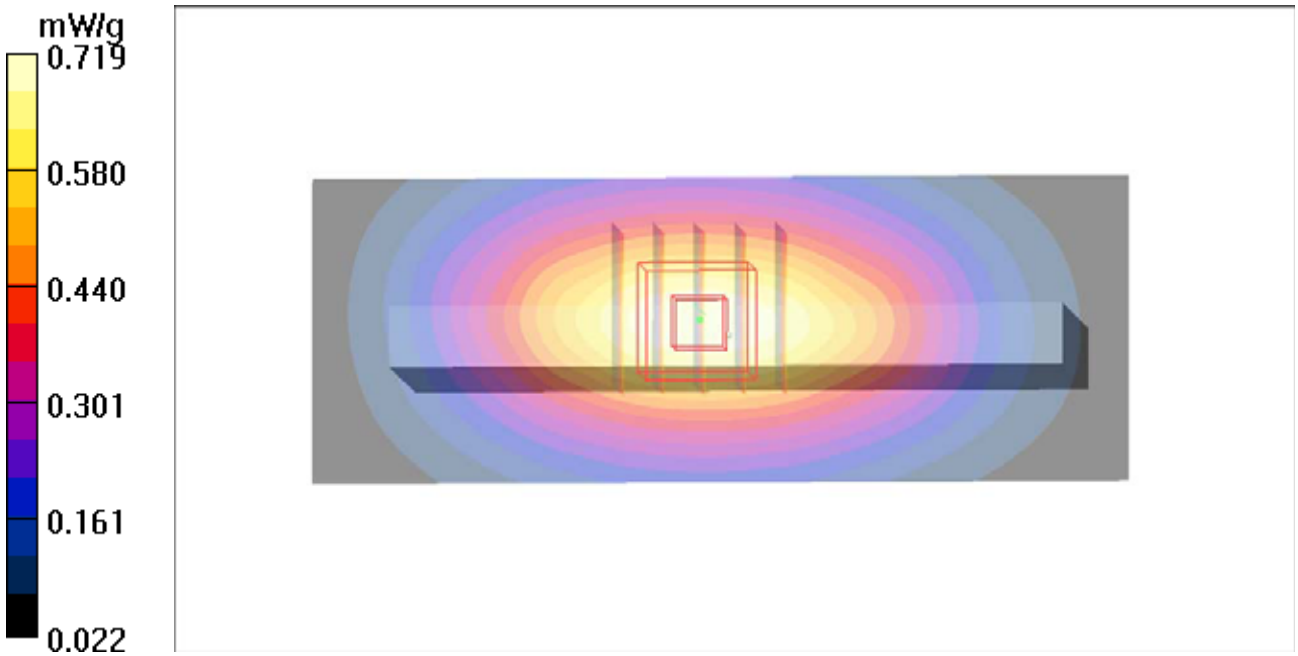
DUT: 120131C05

Communication System: GSM850 GPRS11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: B835_0303 Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3661; ConvF(9.64, 9.64, 9.64); Calibrated: 2012/01/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.719 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.7 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 0.840 W/kg
SAR(1 g) = 0.606 mW/g; SAR(10 g) = 0.425 mW/g
Maximum value of SAR (measured) = 0.733 mW/g



P23 GSM850_DTM11_Bottom Side_1cm_Ch251

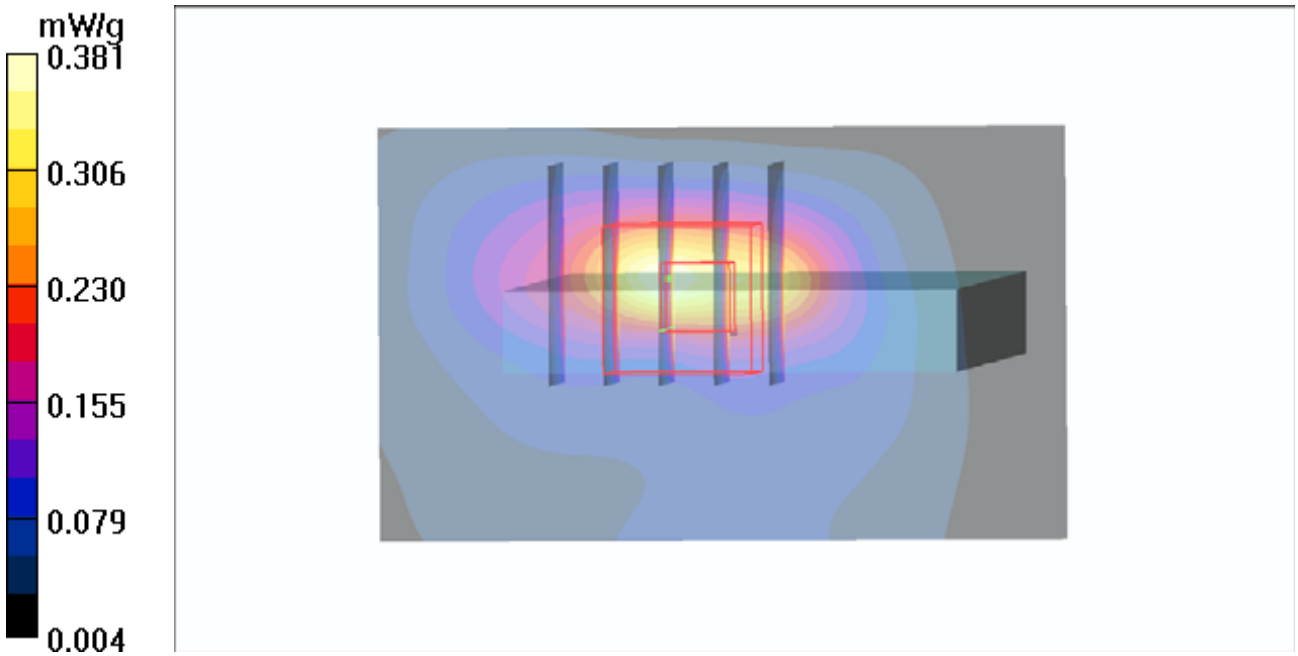
DUT: 120131C05

Communication System: GSM850 GPRS11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: B835_0303 Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3661; ConvF(9.64, 9.64, 9.64); Calibrated: 2012/01/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (31x51x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.381 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.1 V/m; Power Drift = 0.056 dB
Peak SAR (extrapolated) = 0.637 W/kg
SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.178 mW/g
Maximum value of SAR (measured) = 0.412 mW/g



P26 GSM850_DTM11_Front Face_1cm_Ch251_Earphone

DUT: 120131C05

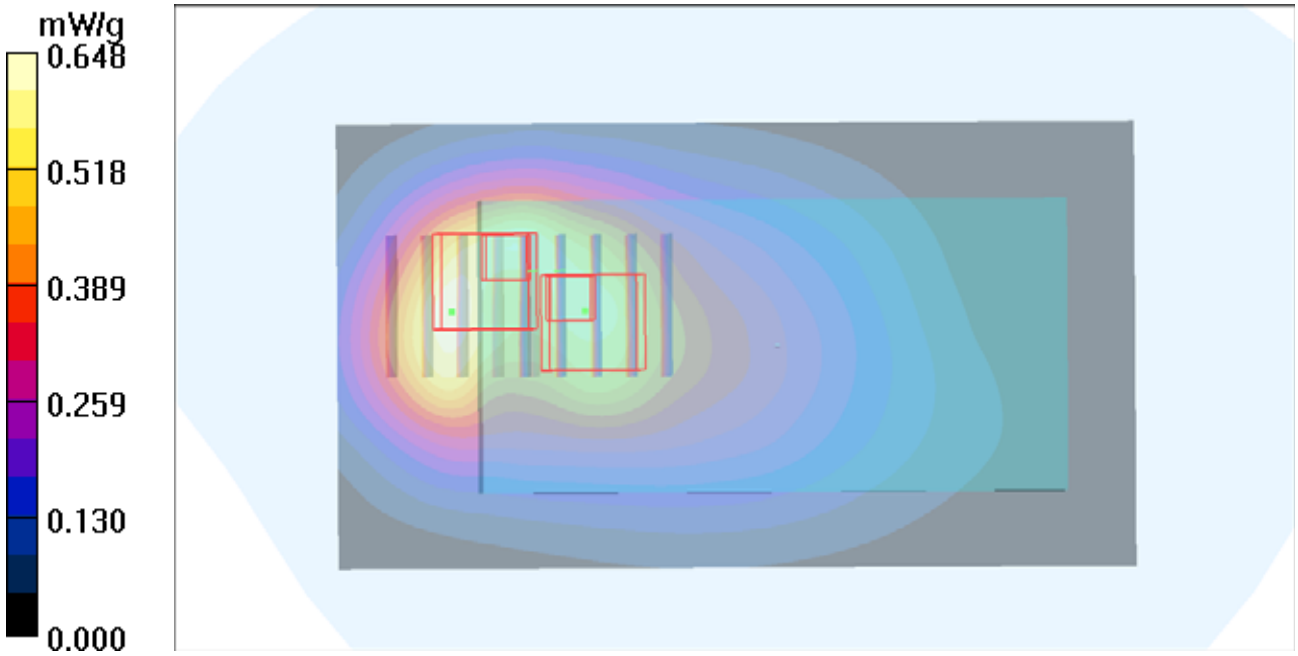
Communication System: GSM850 GPRS11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: B835_0303 Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3661; ConvF(9.64, 9.64, 9.64); Calibrated: 2012/01/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x91x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.648 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.6 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 0.806 W/kg
SAR(1 g) = 0.534 mW/g; SAR(10 g) = 0.364 mW/g
Maximum value of SAR (measured) = 0.662 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.6 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 0.841 W/kg
SAR(1 g) = 0.489 mW/g; SAR(10 g) = 0.265 mW/g
Maximum value of SAR (measured) = 0.678 mW/g



P27 GSM850_DTM11_Rear Face_1cm_Ch251_Earphone

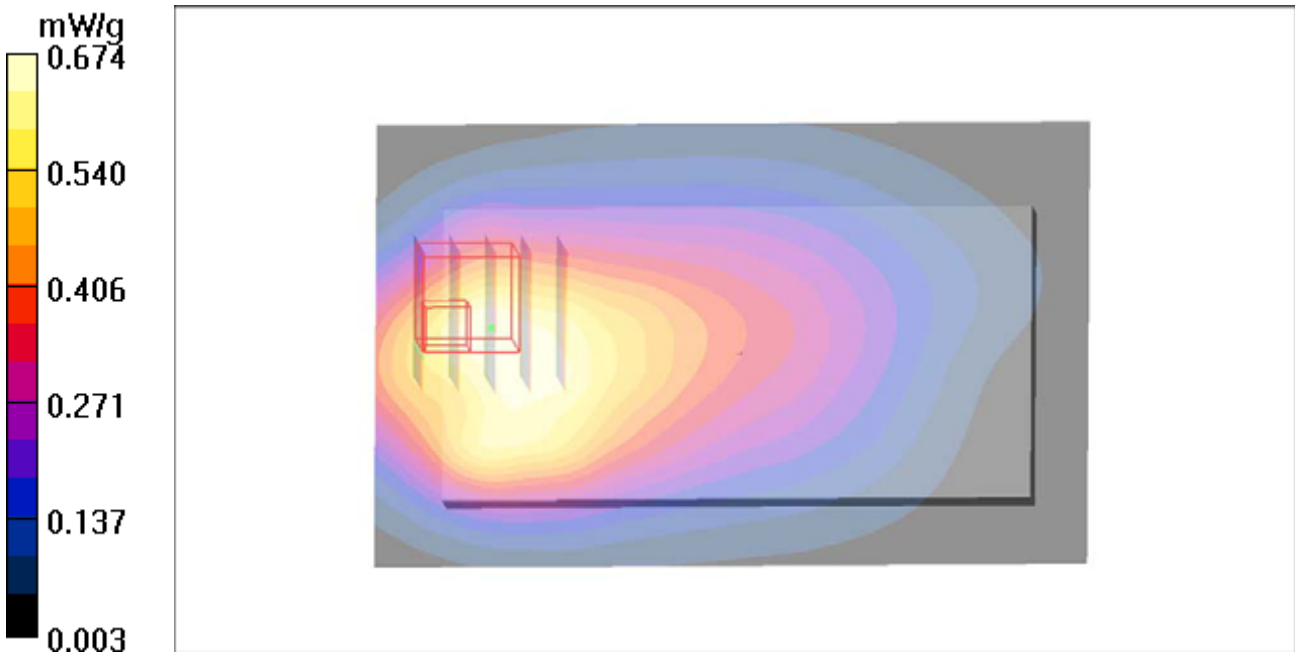
DUT: 120131C05

Communication System: GSM850 GPRS11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: B835_0303 Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3661; ConvF(9.64, 9.64, 9.64); Calibrated: 2012/01/27
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch251/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.674 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.6 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.502 mW/g; SAR(10 g) = 0.285 mW/g
Maximum value of SAR (measured) = 0.793 mW/g



P30 GSM1900_DTM11_Front Face_1cm_Ch810

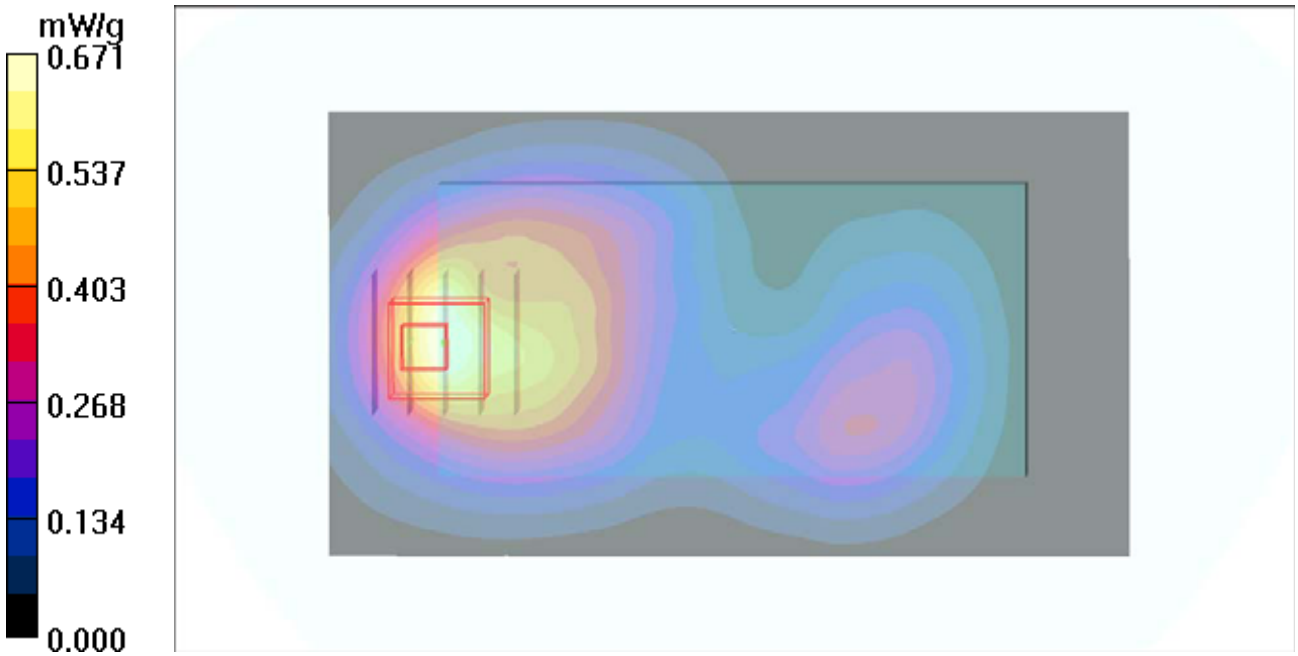
DUT: 120131C05

Communication System: GSM1900 GPRS11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: B1900_0303 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (51x91x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.671 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.64 V/m; Power Drift = -0.189 dB
Peak SAR (extrapolated) = 0.810 W/kg
SAR(1 g) = 0.509 mW/g; SAR(10 g) = 0.313 mW/g
Maximum value of SAR (measured) = 0.668 mW/g



P31 GSM1900_DTM11_Rear Face_1cm_Ch810

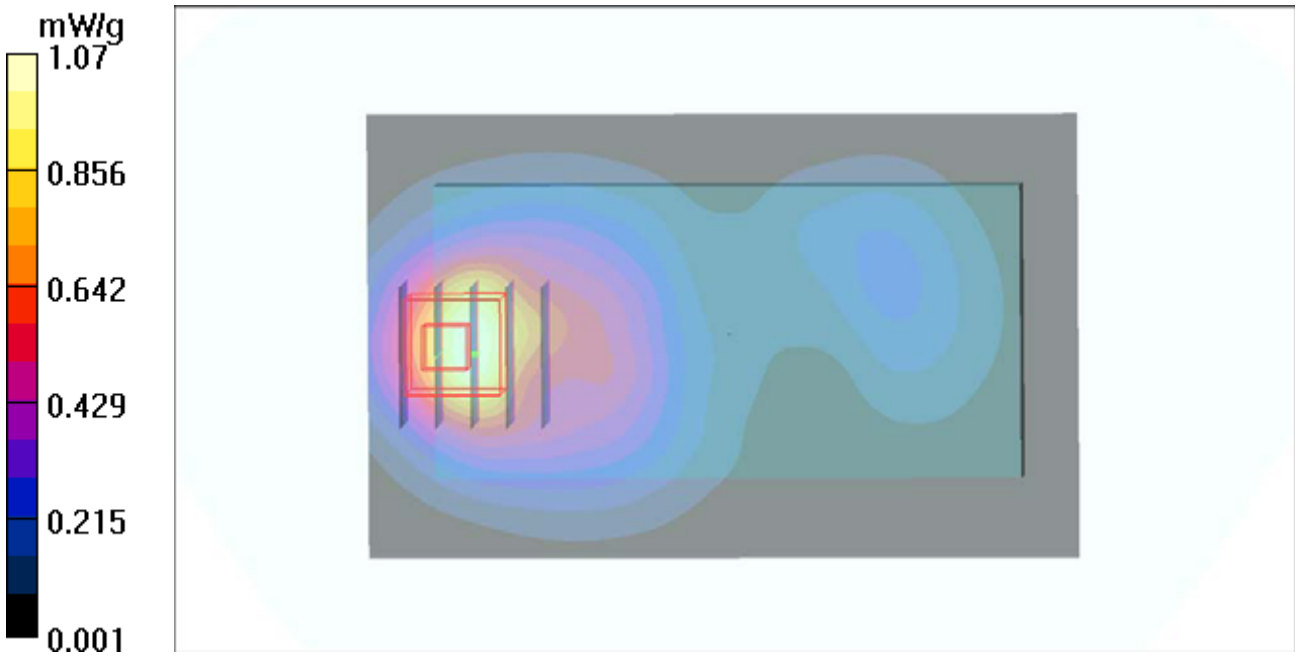
DUT: 120131C05

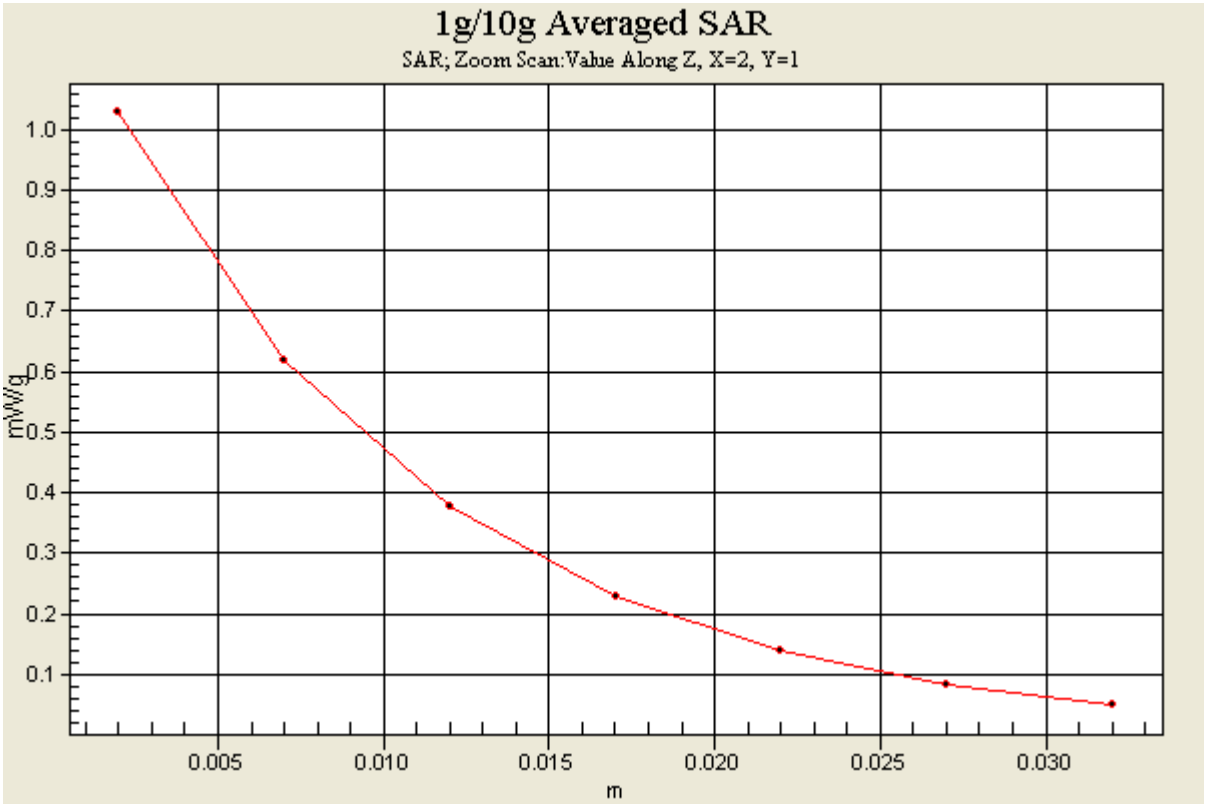
Communication System: GSM1900 GPRS11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: B1900_0303 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.07 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.92 V/m; Power Drift = -0.103 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.753 mW/g; SAR(10 g) = 0.433 mW/g
Maximum value of SAR (measured) = 1.03 mW/g




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

P32 GSM1900_DTM11_Left Side_1cm_Ch810

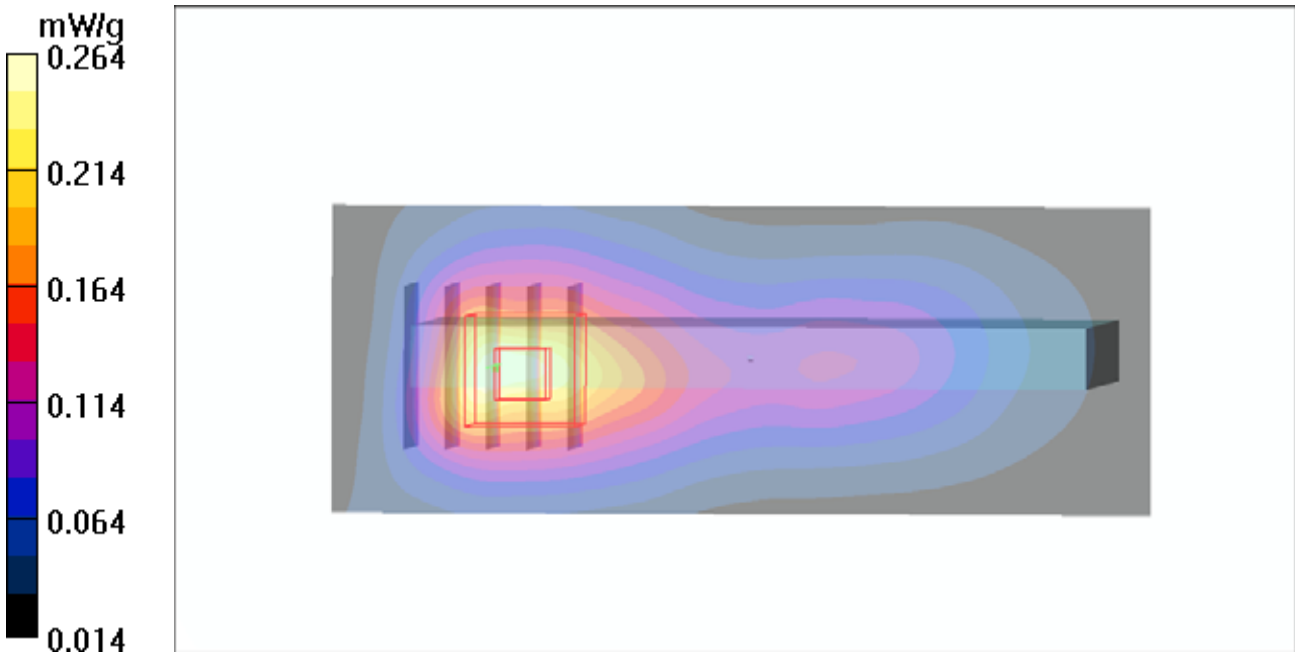
DUT: 120131C05

Communication System: GSM1900 GPRS11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: B1900_0303 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.264 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.01 V/m; Power Drift = -0.180 dB
Peak SAR (extrapolated) = 0.285 W/kg
SAR(1 g) = 0.177 mW/g; SAR(10 g) = 0.107 mW/g
Maximum value of SAR (measured) = 0.230 mW/g



P33 GSM1900_DTM11_Right Side_1cm_Ch810

DUT: 120131C05

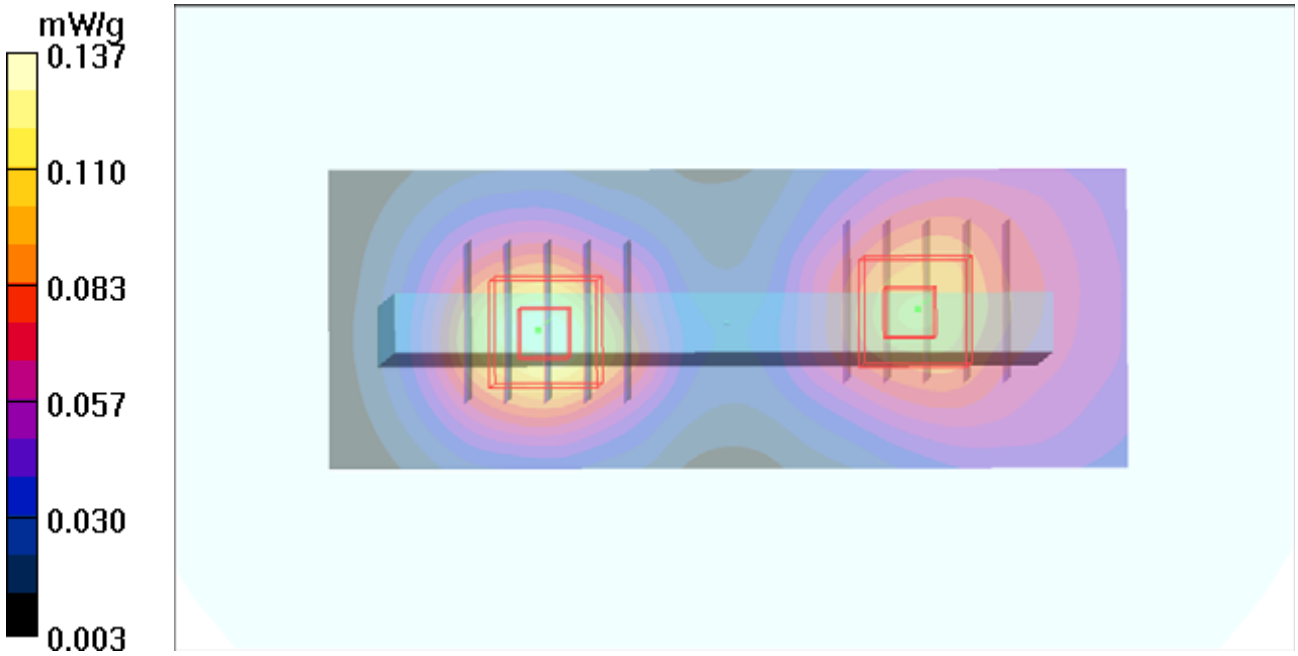
Communication System: GSM1900 GPRS11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: B1900_0303 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.137 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.45 V/m; Power Drift = -0.171 dB
Peak SAR (extrapolated) = 0.171 W/kg
SAR(1 g) = 0.105 mW/g; SAR(10 g) = 0.061 mW/g
Maximum value of SAR (measured) = 0.140 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.45 V/m; Power Drift = -0.171 dB
Peak SAR (extrapolated) = 0.135 W/kg
SAR(1 g) = 0.084 mW/g; SAR(10 g) = 0.051 mW/g
Maximum value of SAR (measured) = 0.108 mW/g



P34 GSM1900_DTM11_Bottom Side_1cm_Ch810

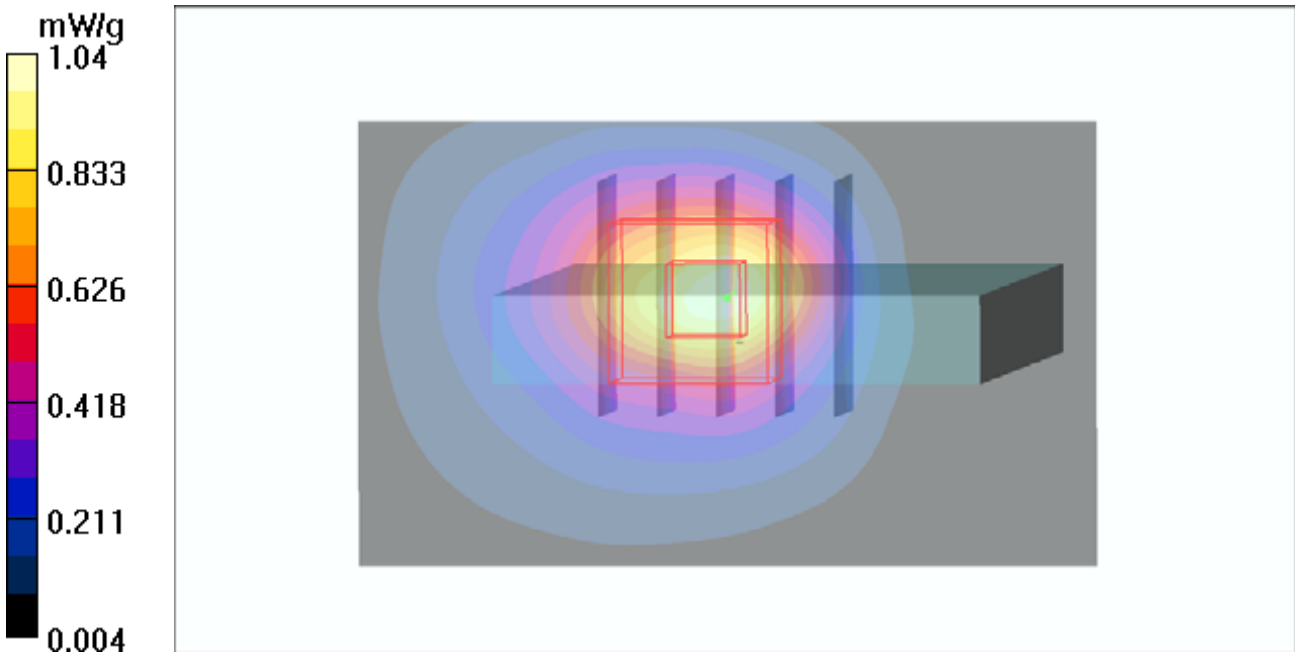
DUT: 120131C05

Communication System: GSM1900 GPRS11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: B1900_0303 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (31x51x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.04 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.1 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.720 mW/g; SAR(10 g) = 0.395 mW/g
Maximum value of SAR (measured) = 0.963 mW/g



P37 GSM1900_DTM11_Front Face_1cm_Ch810_Earphone

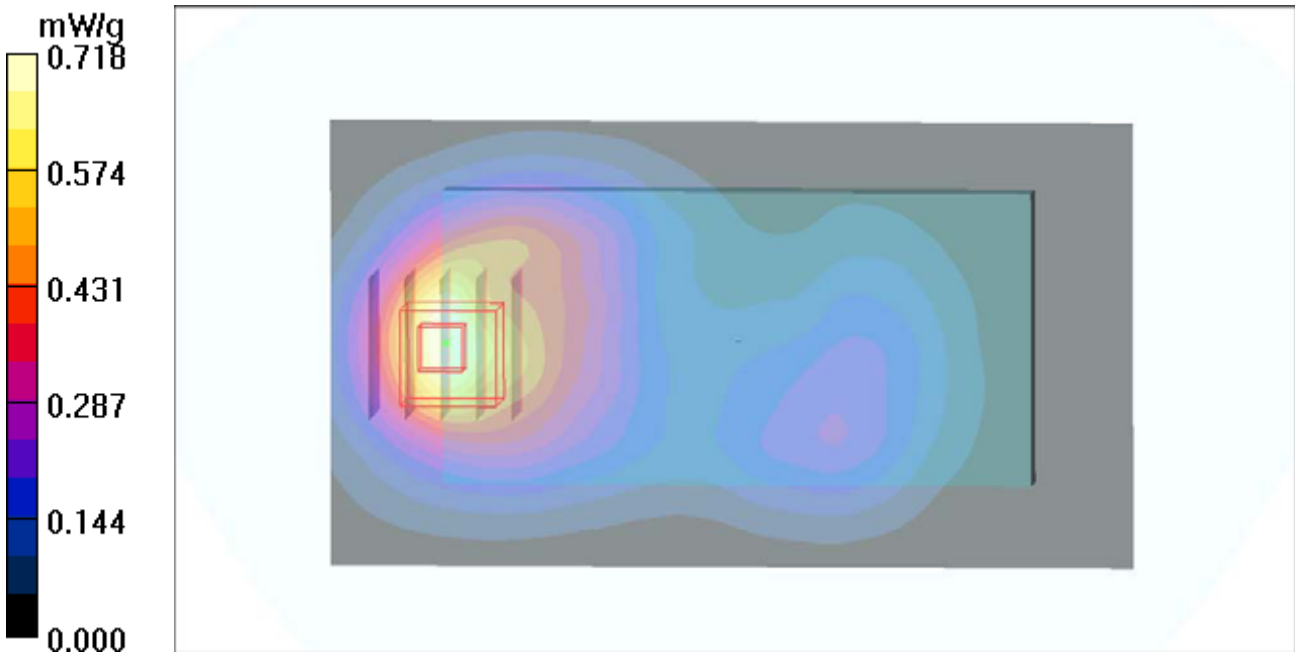
DUT: 120131C05

Communication System: GSM1900 GPRS11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: B1900_0303 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (51x91x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.718 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.38 V/m; Power Drift = -0.196 dB
Peak SAR (extrapolated) = 0.790 W/kg
SAR(1 g) = 0.503 mW/g; SAR(10 g) = 0.308 mW/g
Maximum value of SAR (measured) = 0.642 mW/g



P38 GSM1900_DTM11_Rear Face_1cm_Ch810_Earphone

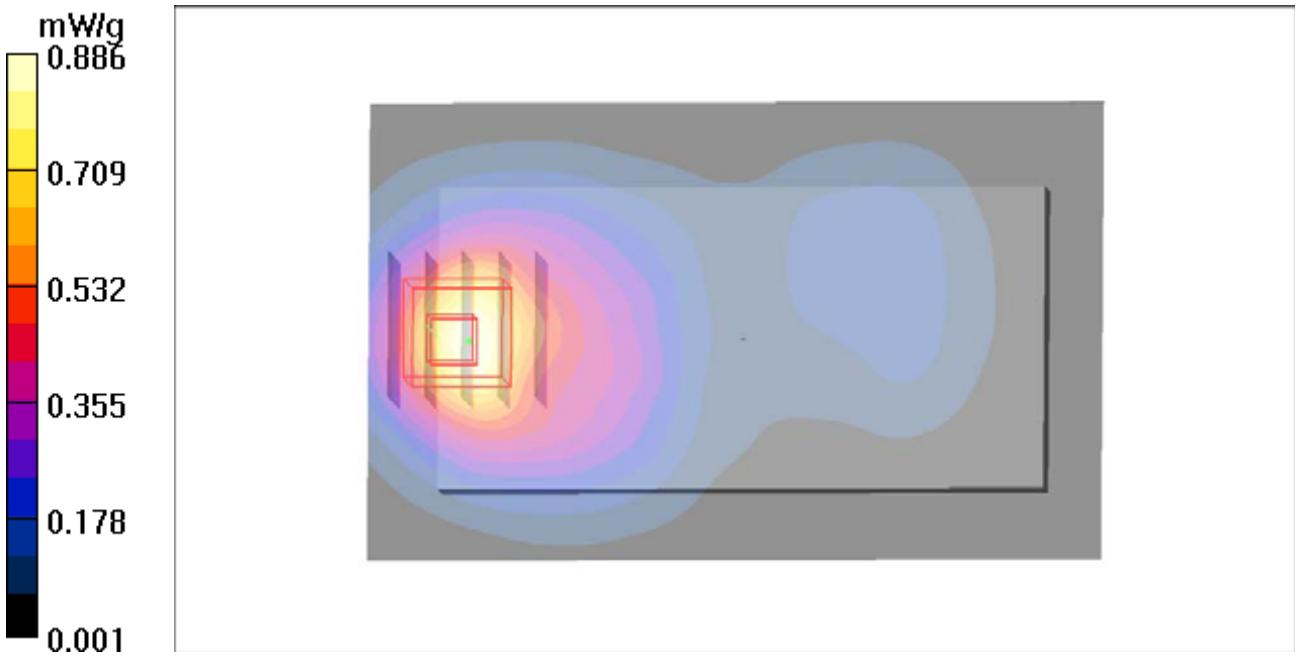
DUT: 120131C05

Communication System: GSM1900 GPRS11; Frequency: 1909.8 MHz;Duty Cycle: 1:2.67
Medium: B1900_0303 Medium parameters used: f = 1910 MHz; σ = 1.56 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch810/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.886 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.17 V/m; Power Drift = -0.104 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.641 mW/g; SAR(10 g) = 0.375 mW/g
Maximum value of SAR (measured) = 0.835 mW/g



P41 WCDMA V_RMC12.2K_Front Face_1cm_Ch4132

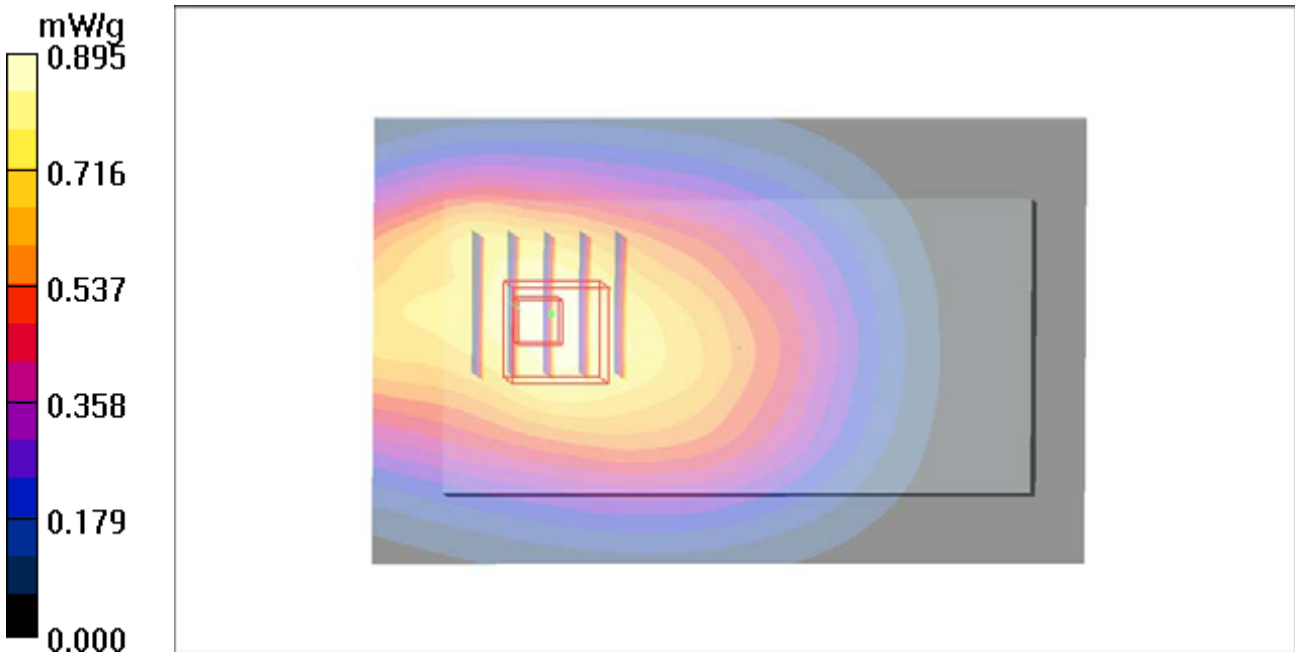
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 826.4 MHz; σ = 0.976 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.895 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.4 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.792 mW/g; SAR(10 g) = 0.585 mW/g
Maximum value of SAR (measured) = 0.936 mW/g



P42 WCDMA V_RMC12.2K_Rear Face_1cm_Ch4132

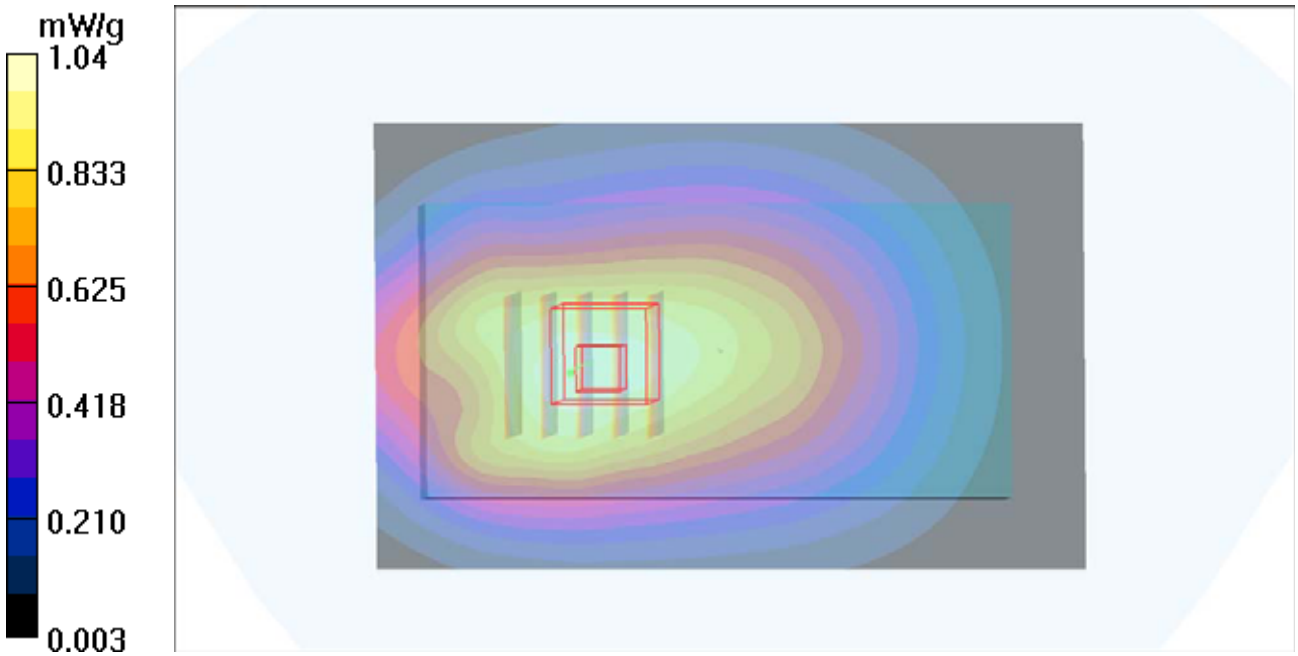
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 826.4 MHz; σ = 0.976 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.04 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.9 V/m; Power Drift = 0.040 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.897 mW/g; SAR(10 g) = 0.651 mW/g
Maximum value of SAR (measured) = 1.06 mW/g



P43 WCDMA V_RMC12.2K_Left Side_1cm_Ch4132

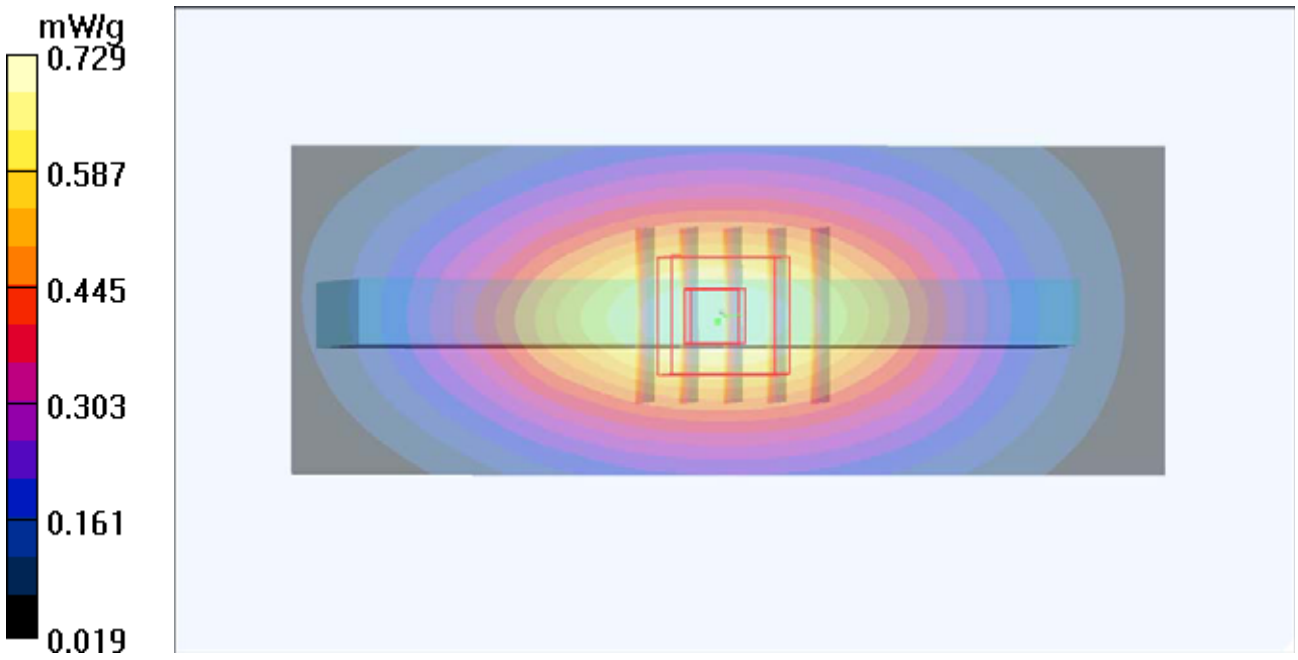
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 826.4 MHz; σ = 0.976 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.729 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.2 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 0.895 W/kg
SAR(1 g) = 0.642 mW/g; SAR(10 g) = 0.443 mW/g
Maximum value of SAR (measured) = 0.787 mW/g



P44 WCDMA V_RMC12.2K_Right Side_1cm_Ch4132

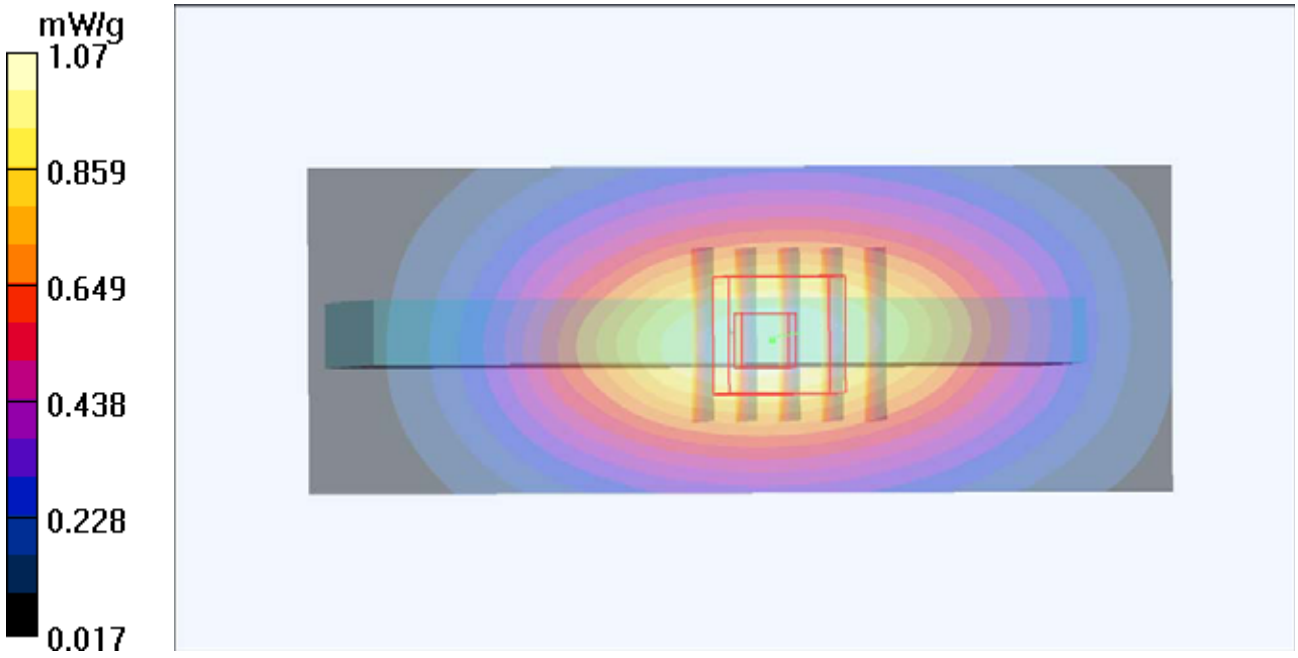
DUT: 120131C05

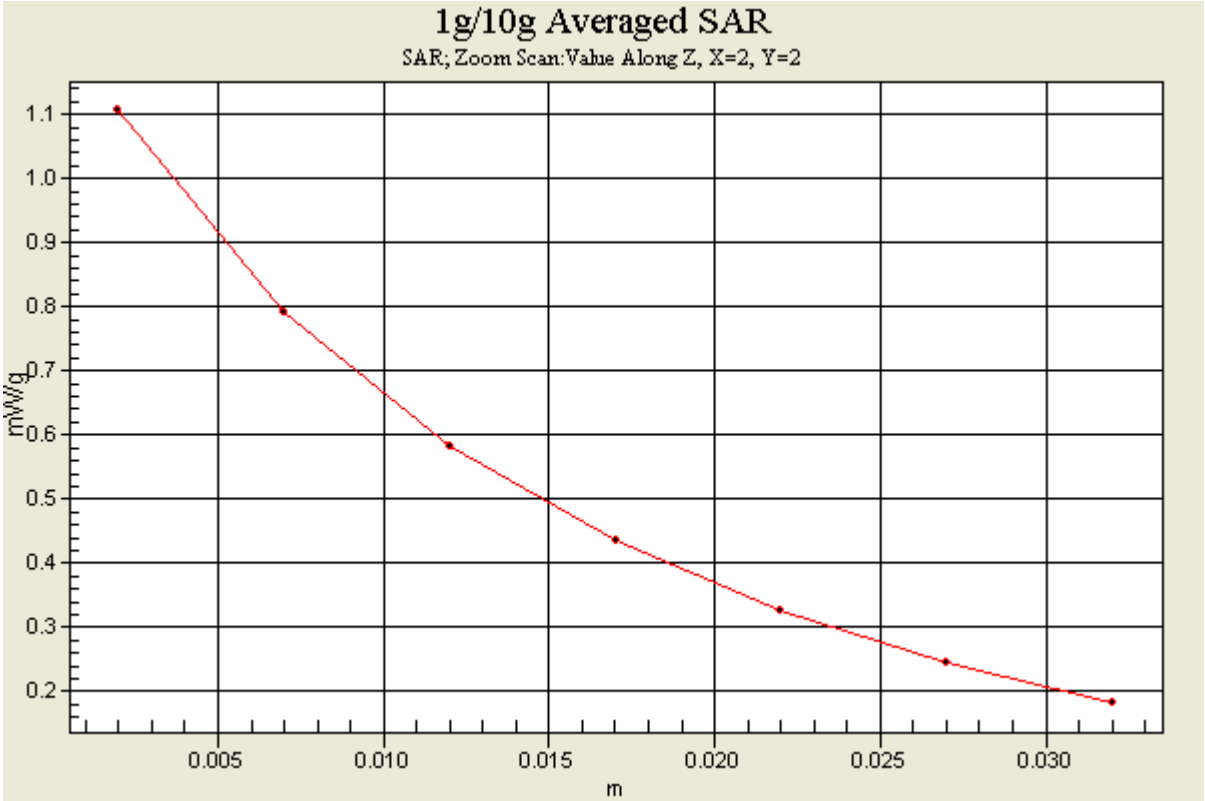
Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 826.4 MHz; σ = 0.976 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.07 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.0 V/m; Power Drift = 0.109 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.910 mW/g; SAR(10 g) = 0.642 mW/g
Maximum value of SAR (measured) = 1.11 mW/g




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

P45 WCDMA V_RMC12.2K_Bottom Side_1cm_Ch4132

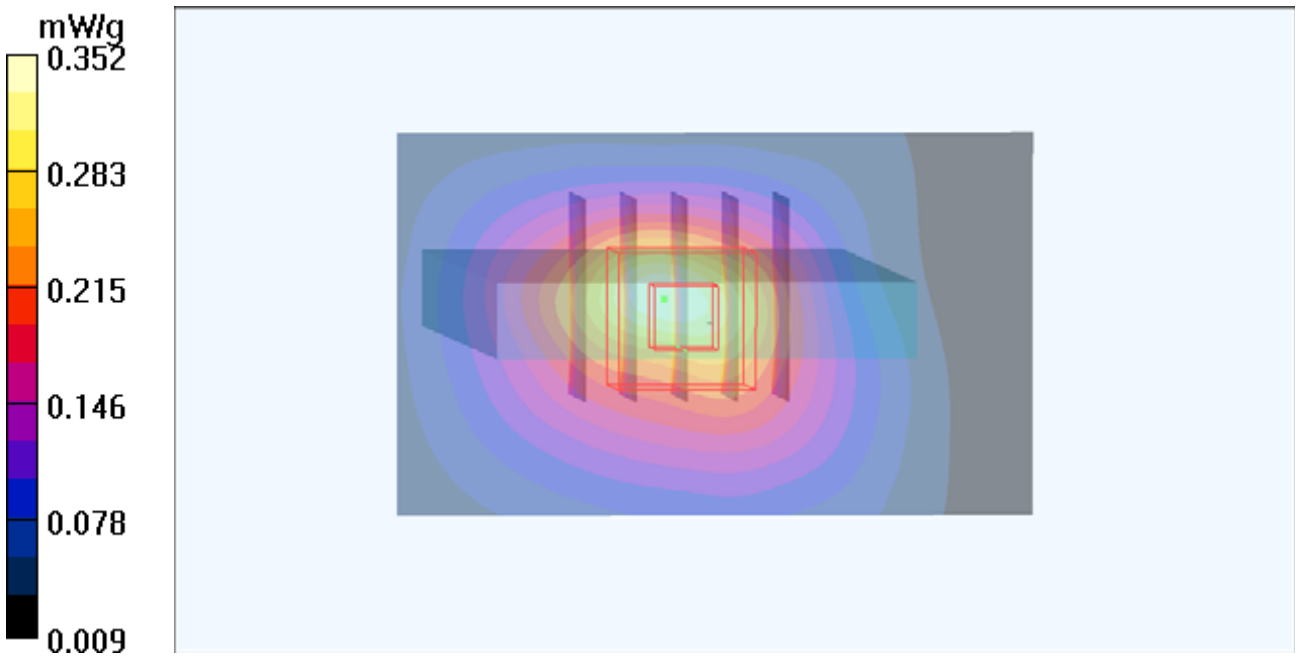
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 826.4 MHz; σ = 0.976 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (31x51x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.352 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.1 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 0.840 W/kg
SAR(1 g) = 0.450 mW/g; SAR(10 g) = 0.229 mW/g
Maximum value of SAR (measured) = 0.548 mW/g



P46 WCDMA V_RMC12.2K_Rear Face_1cm_Ch4182

DUT: 120131C05

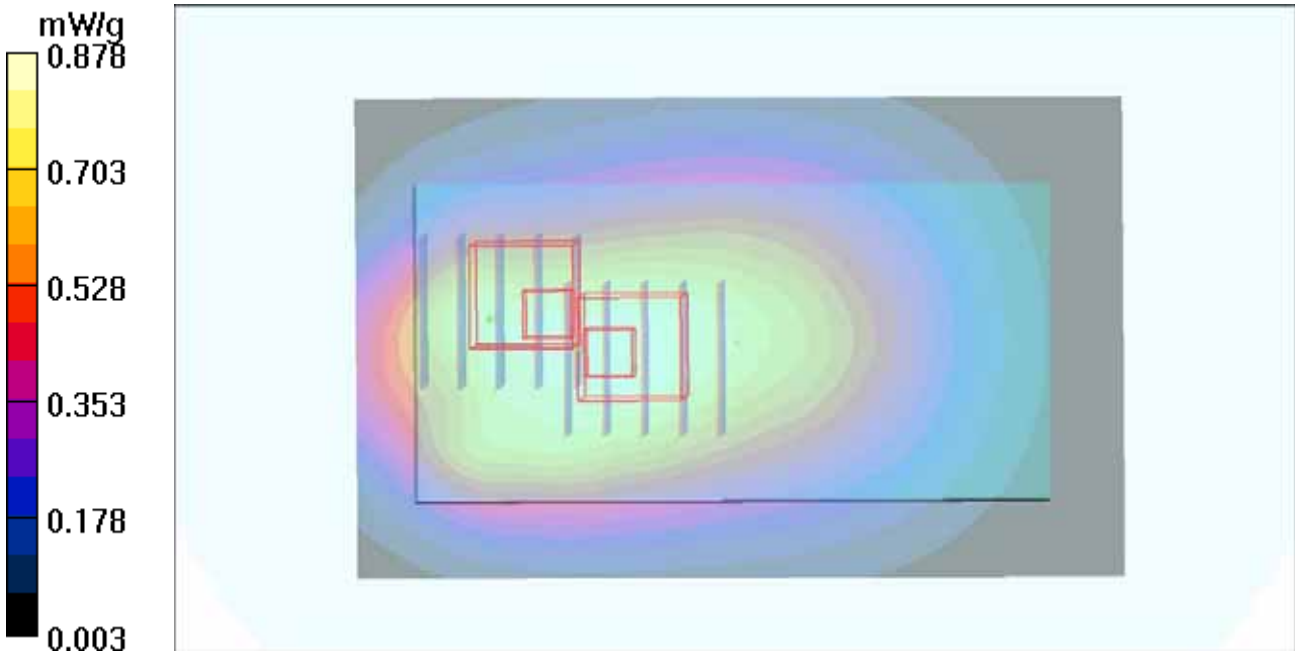
Communication System: WCDMA V; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 836.4 MHz; σ = 0.99 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4182/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.878 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.2 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.788 mW/g; SAR(10 g) = 0.578 mW/g
Maximum value of SAR (measured) = 0.932 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.2 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.660 mW/g; SAR(10 g) = 0.412 mW/g
Maximum value of SAR (measured) = 0.905 mW/g



P47 WCDMA V_RMC12.2K_Rear Face_1cm_Ch4233

DUT: 120131C05

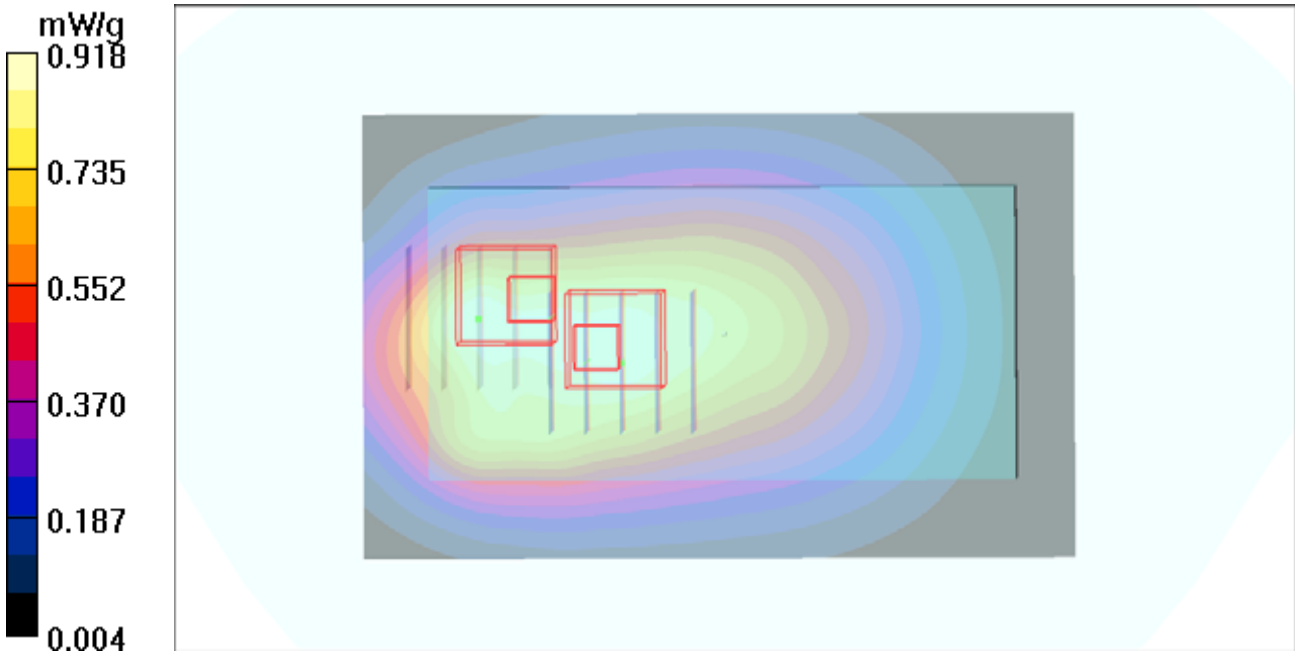
Communication System: WCDMA V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used: f = 847 MHz; σ = 1 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.918 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.6 V/m; Power Drift = -0.067 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.811 mW/g; SAR(10 g) = 0.594 mW/g
Maximum value of SAR (measured) = 0.958 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.6 V/m; Power Drift = -0.067 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.671 mW/g; SAR(10 g) = 0.419 mW/g
Maximum value of SAR (measured) = 1.02 mW/g



P52 WCDMA V_RMC12.2K_Right Side_1cm_Ch4182

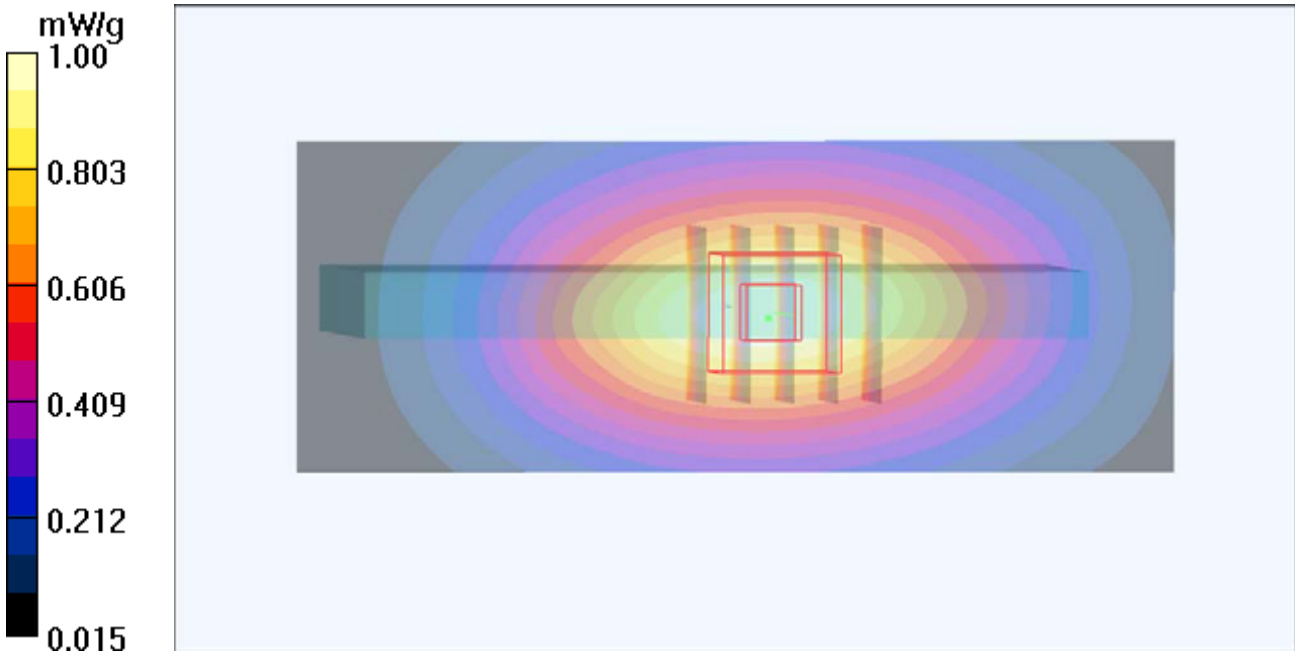
DUT: 120131C05

Communication System: WCDMA V; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 836.4 MHz; σ = 0.99 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃； Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4182/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.000 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.9 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.853 mW/g; SAR(10 g) = 0.599 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



P53 WCDMA V_RMC12.2K_Right Side_1cm_Ch4233

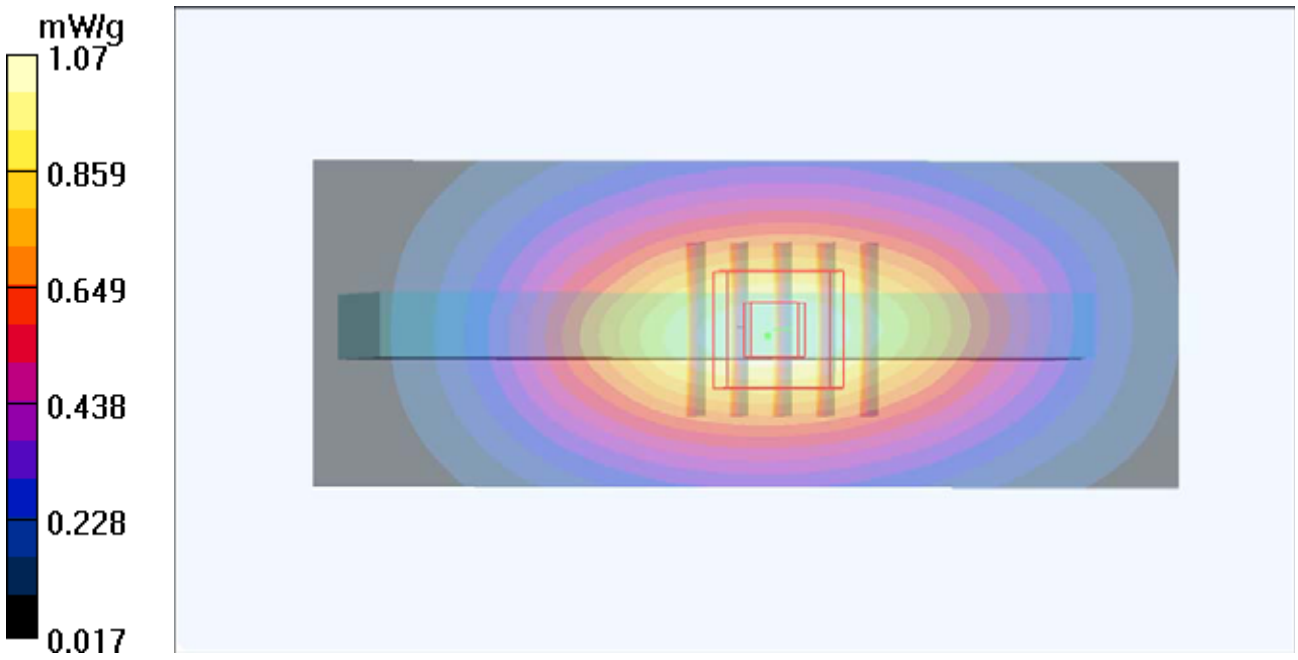
DUT: 120131C05

Communication System: WCDMA V; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used: f = 847 MHz; σ = 1 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4233/Area Scan (31x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.07 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.7 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.902 mW/g; SAR(10 g) = 0.632 mW/g
Maximum value of SAR (measured) = 1.10 mW/g



P48 WCDMA V_RMC12.2K_Front Face_1cm_Ch4132_Earphone

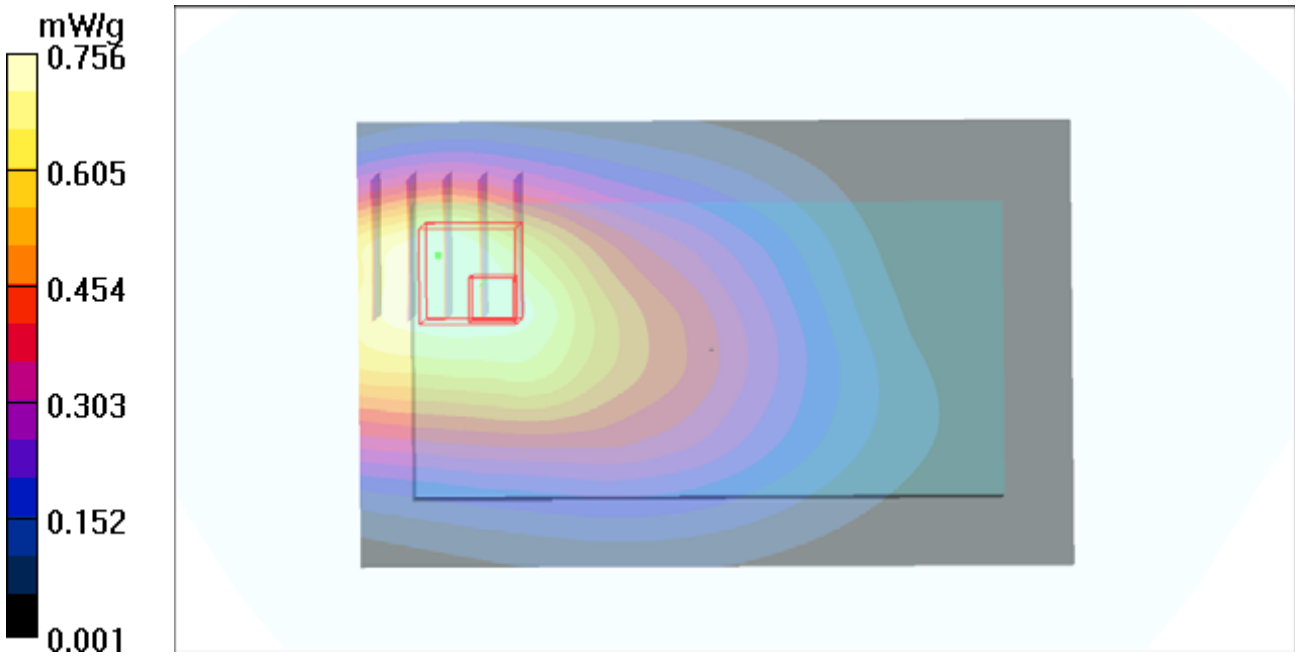
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 826.4 MHz; σ = 0.976 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.756 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.6 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 1.00 W/kg
SAR(1 g) = 0.668 mW/g; SAR(10 g) = 0.428 mW/g
Maximum value of SAR (measured) = 0.819 mW/g



P49 WCDMA V_RMC12.2K_Rear Face_1cm_Ch4132_Earphone

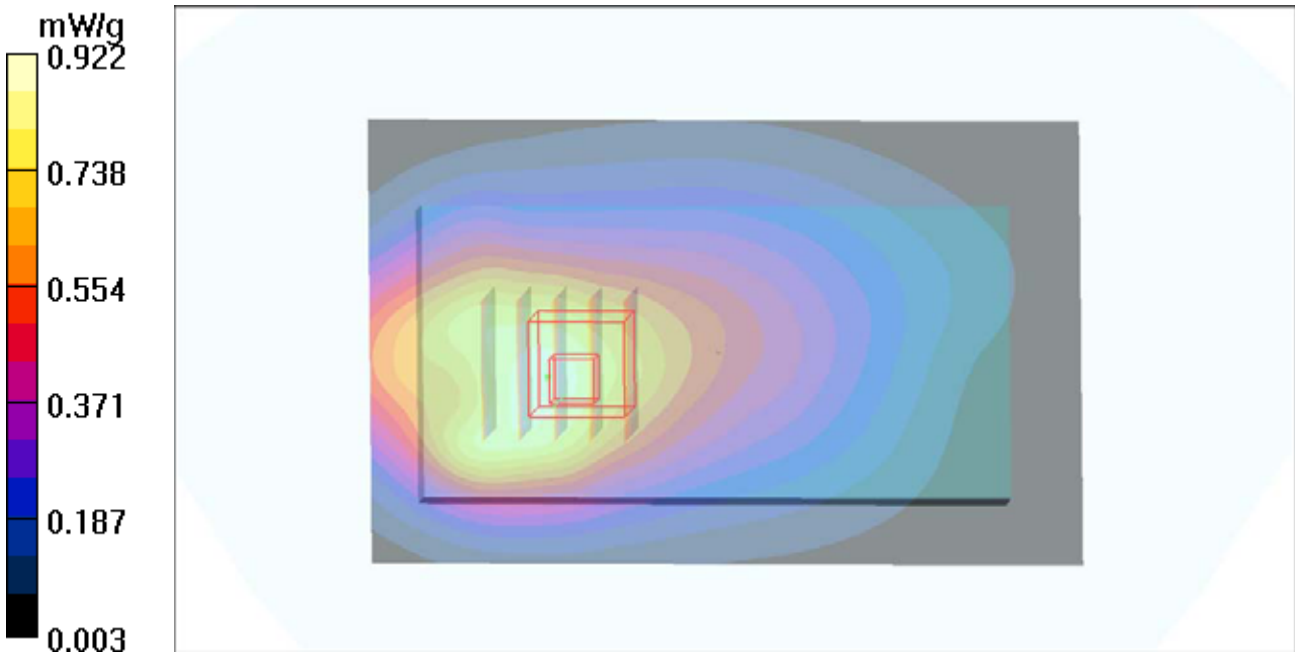
DUT: 120131C05

Communication System: WCDMA V; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: B835_0303 Medium parameters used : f = 826.4 MHz; σ = 0.976 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Ambient Temperature：21.5 ℃; Liquid Temperature：20.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.94, 8.94, 8.94); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM V4.0; Serial: TP 1654
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch4132/Area Scan (51x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.922 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.9 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.750 mW/g; SAR(10 g) = 0.510 mW/g
Maximum value of SAR (measured) = 0.933 mW/g



Appendix C. Calibration Certificate for Probe and Dipole

The SPEAG calibration certificates are shown as follows.

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

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

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

Accreditation No.: **SCS 108**

Client **B.V. ADT (Auden)**

Certificate No: **D835V2-4d021_Mar11**

CALIBRATION CERTIFICATE

Object D835V2 - SN: 4d021

Calibration procedure(s) QA CAL-05.v8
Calibration procedure for dipole validation kits

Calibration date: March 23, 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: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

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: March 23, 2011

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 V4.9	
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	41.0 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature during test	(21.8 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 mW / g
SAR normalized	normalized to 1W	9.60 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.65 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.57 mW / g
SAR normalized	normalized to 1W	6.28 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.31 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	54.3 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature during test	(21.7 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.56 mW / g
SAR normalized	normalized to 1W	10.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**10.1 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.68 mW / g
SAR normalized	normalized to 1W	6.72 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.63 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.0 Ω - 2.0 jΩ
Return Loss	- 31.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.9 Ω - 4.2 jΩ
Return Loss	- 26.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.393 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.

Design Modification by End User

The dipole has been modified with Teflon Rings (TR) placed within identified markings close to the end of each dipole arm. Calibration has been performed with TR attached to the dipole.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 22, 2004

DASY5 Validation Report for Head TSL

Date/Time: 18.03.2011 11:51:13

Test Laboratory: SPEAG, Zurich, Switzerland

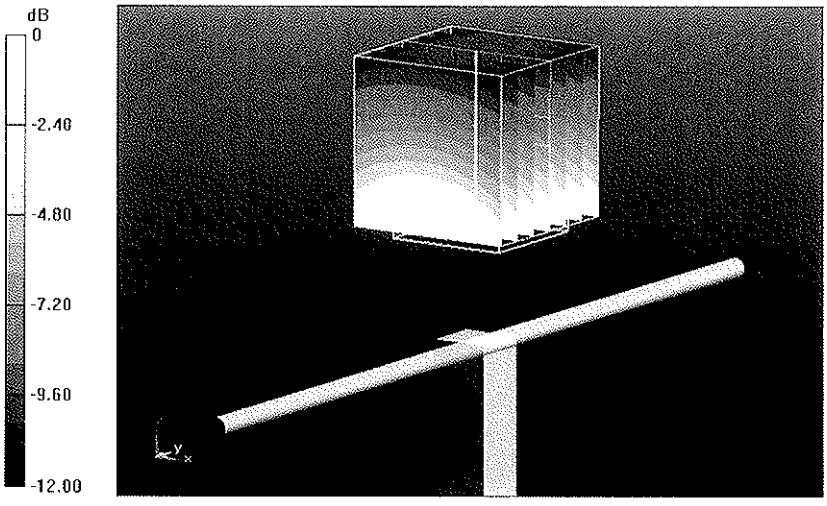
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d021

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL900
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

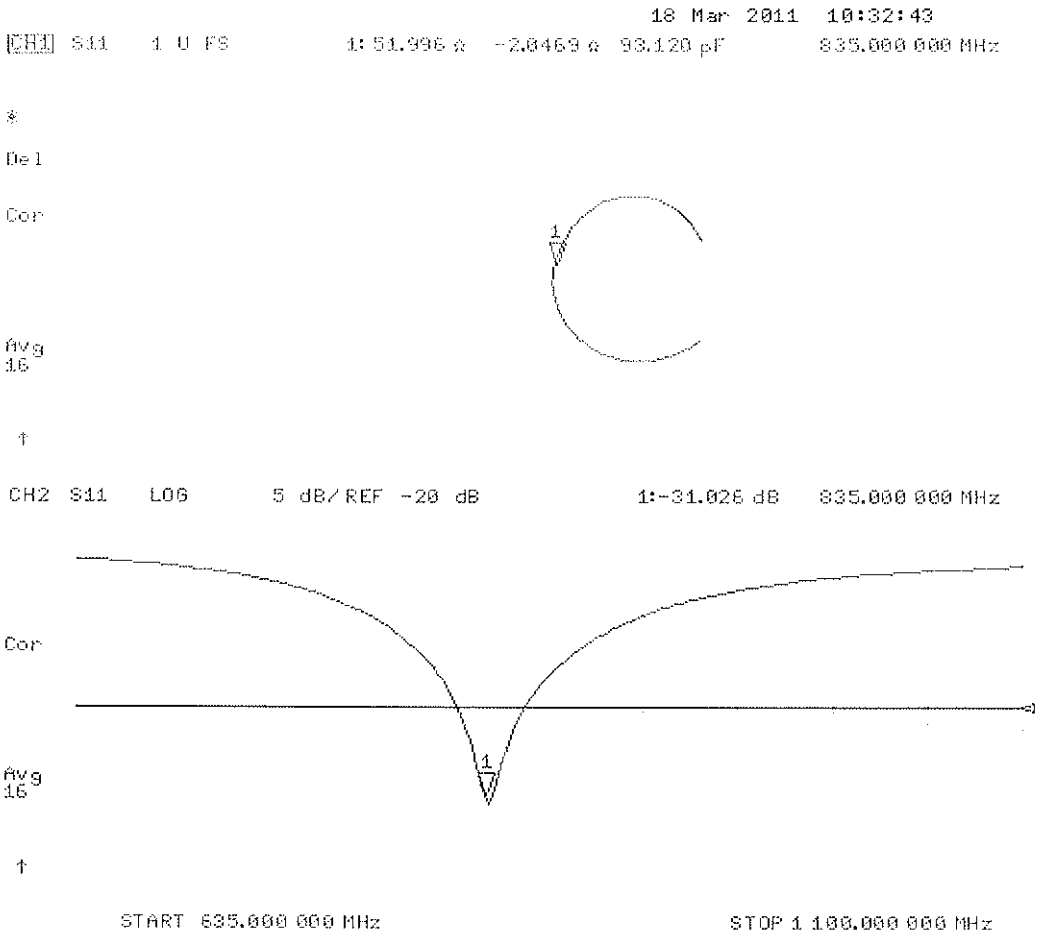
- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.571 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.583 W/kg
SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.57 mW/g
Maximum value of SAR (measured) = 2.792 mW/g



0 dB = 2.790mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 23.03.2011 10:45:49

Test Laboratory: SPEAG, Zurich, Switzerland

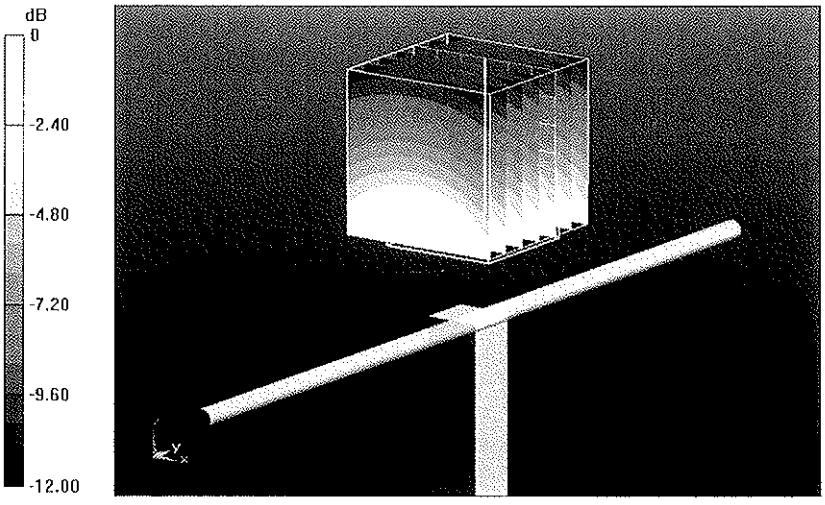
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d021

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: MSL900
Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

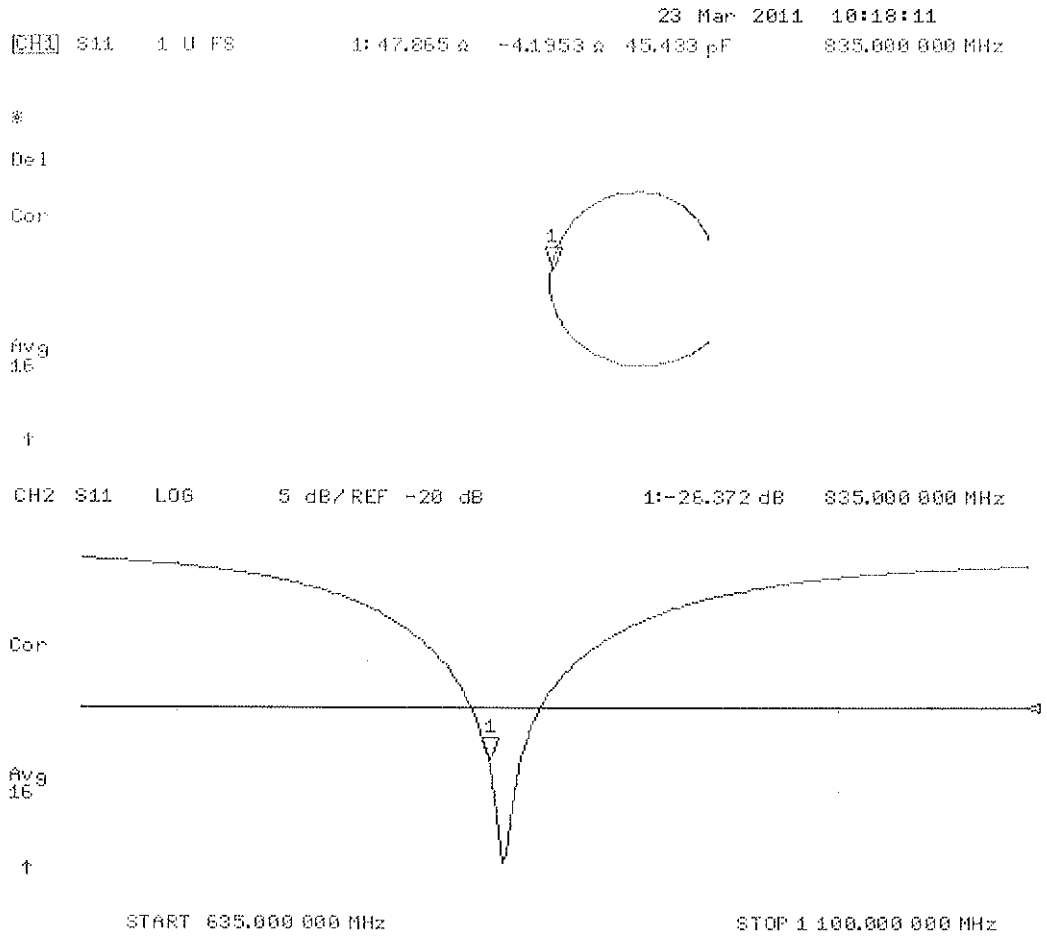
- Probe: ES3DV3 - SN3205; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.615 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.794 W/kg
SAR(1 g) = 2.56 mW/g; SAR(10 g) = 1.68 mW/g
Maximum value of SAR (measured) = 2.981 mW/g



0 dB = 2.980mW/g

Impedance Measurement Plot for Body TSL



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

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

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

Accreditation No.: SCS 108

Client **B.V.ADT (Auden)**

Certificate No: D1900V2-5d036_Jan12

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d036
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	January 26, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5086 (20g)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

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

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

Issued: January 26, 2012

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	V52.8.0
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	40.8 ± 6 %	1.39 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.65 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**38.9 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.05 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.3 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	52.9 ± 6 %	1.52 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.74 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**38.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.10 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**20.4 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.0 Ω + 4.9 jΩ
Return Loss	- 26.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.3 Ω + 5.6 jΩ
Return Loss	- 23.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.195 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	May 08, 2003

Date: 26.01.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d036

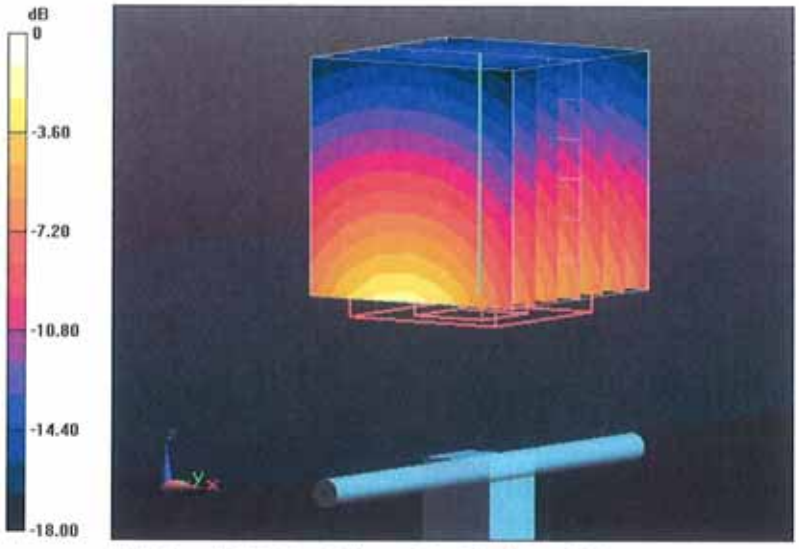
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.39 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

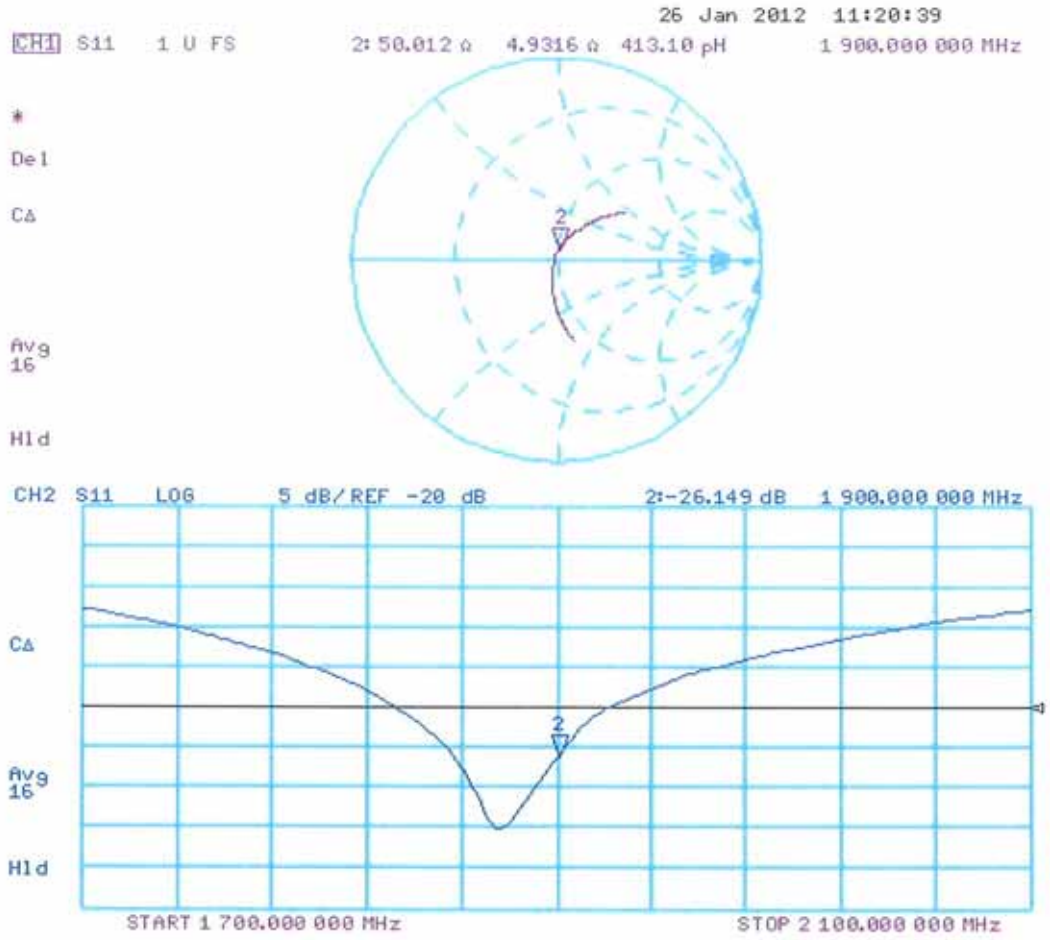
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.850 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 17.7040
SAR(1 g) = 9.65 mW/g; SAR(10 g) = 5.05 mW/g
Maximum value of SAR (measured) = 12.055 mW/g



0 dB = 12.060mW/g = 21.63 dB mW/g

Impedance Measurement Plot for Head TSL



Date: 26.01.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d036

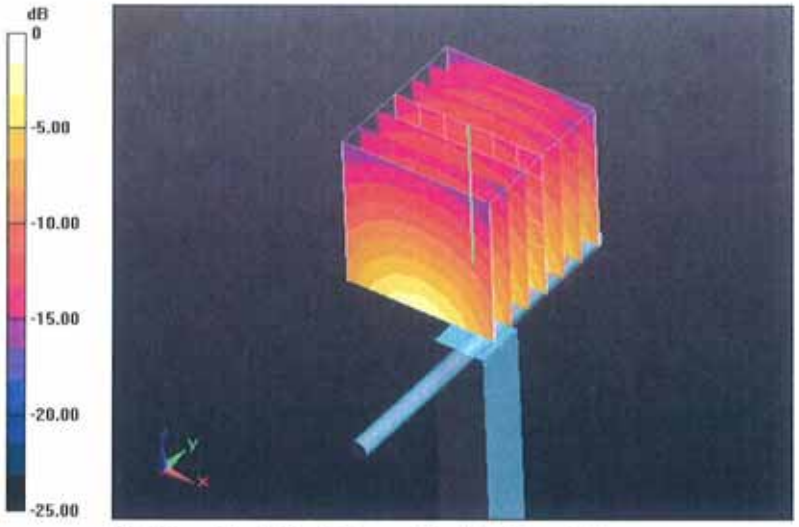
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

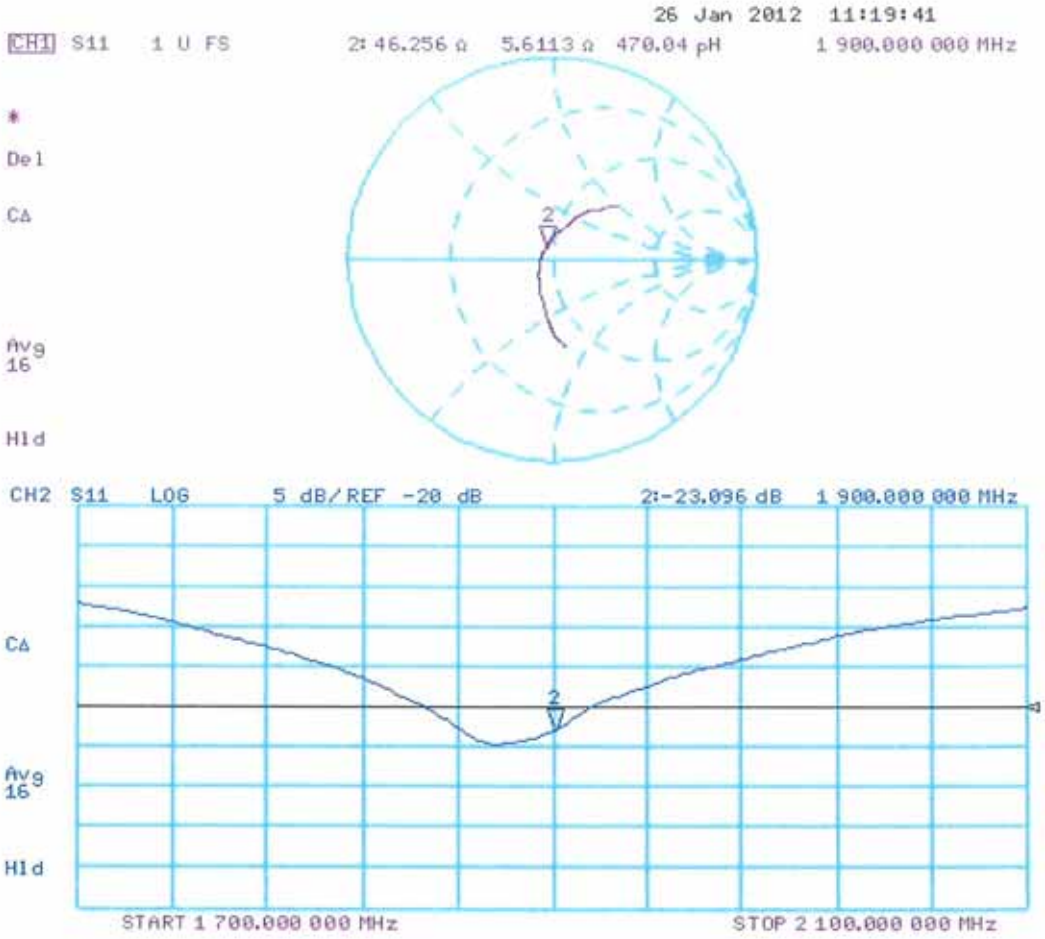
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.423 V/m; Power Drift = -0.0044 dB
Peak SAR (extrapolated) = 17.2700
SAR(1 g) = 9.74 mW/g; SAR(10 g) = 5.1 mW/g
Maximum value of SAR (measured) = 12.419 mW/g



0 dB = 12.420mW/g = 21.88 dB mW/g

Impedance Measurement Plot for Body TSL



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

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

Certificate No: EX3-3661_Jan12

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3661

Calibration procedure(s): QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: January 27, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	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-11 (No. ES3-3013_Dec11)	Dec-12
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 Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: January 27, 2012

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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., $\vartheta = 0$ 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 $\vartheta = 0$ ($f \leq 900$ 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 $f \leq 800$ 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 EX3DV4

SN:3661

Manufactured: October 20, 2008
Calibrated: January 27, 2012

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3661

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.50	0.50	0.47	± 10.1 %
DCP (mV)[B]	96.9	96.3	98.0	

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	109.1	±2.5 %
			Y	0.00	0.00	1.00	117.7	
			Z	0.00	0.00	1.00	109.3	

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.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3661

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	9.92	9.92	9.92	0.50	0.73	± 12.0 %
835	41.5	0.90	9.46	9.46	9.46	0.23	1.18	± 12.0 %
1750	40.1	1.37	8.64	8.64	8.64	0.80	0.57	± 12.0 %
1900	40.0	1.40	8.33	8.33	8.33	0.49	0.72	± 12.0 %
2450	39.2	1.80	7.48	7.48	7.48	0.27	0.97	± 12.0 %
5200	36.0	4.66	5.11	5.11	5.11	0.32	1.80	± 13.1 %
5300	35.9	4.76	4.83	4.83	4.83	0.35	1.80	± 13.1 %
5500	35.6	4.96	4.77	4.77	4.77	0.35	1.80	± 13.1 %
5600	35.5	5.07	4.27	4.27	4.27	0.46	1.80	± 13.1 %
5800	35.3	5.27	4.41	4.41	4.41	0.45	1.80	± 13.1 %

[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.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3661

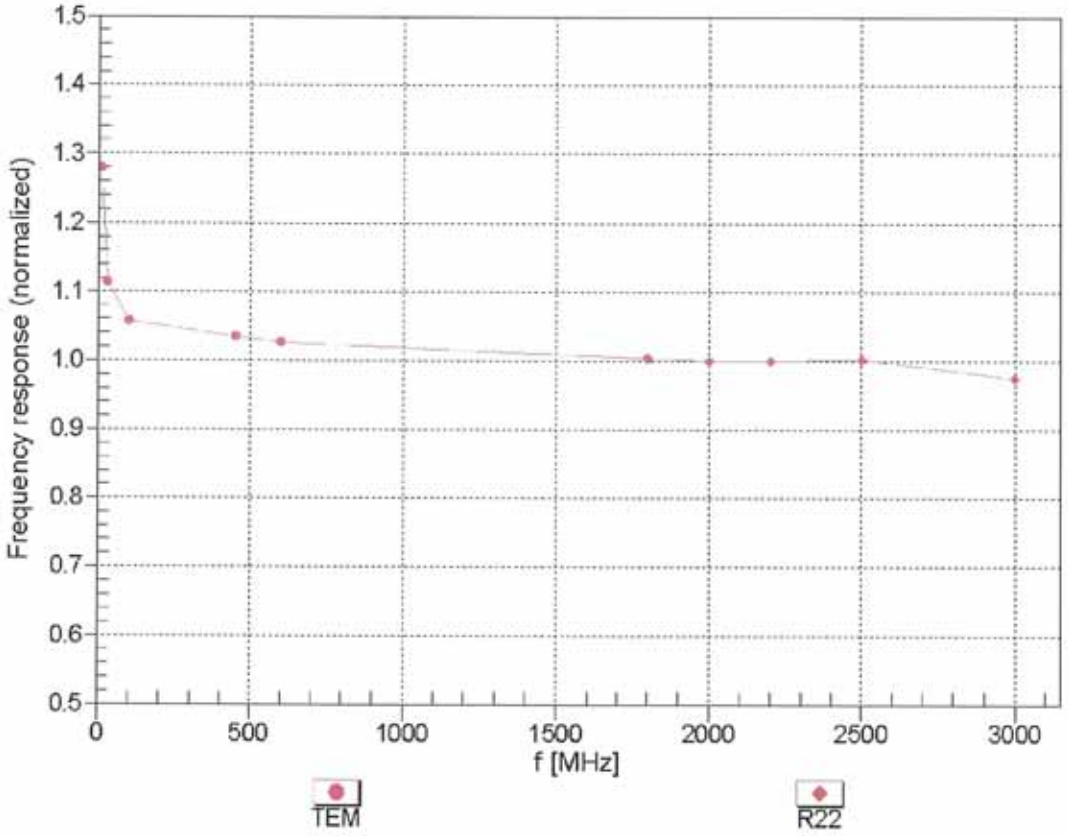
Calibration Parameter Determined in Body Tissue Simulating Media

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	9.82	9.82	9.82	0.46	0.79	± 12.0 %
835	55.2	0.97	9.64	9.64	9.64	0.20	1.41	± 12.0 %
1750	53.4	1.49	8.39	8.39	8.39	0.63	0.72	± 12.0 %
1900	53.3	1.52	7.89	7.89	7.89	0.31	0.99	± 12.0 %
2450	52.7	1.95	7.50	7.50	7.50	0.80	0.50	± 12.0 %
5200	49.0	5.30	4.62	4.62	4.62	0.48	1.90	± 13.1 %
5300	48.9	5.42	4.24	4.24	4.24	0.55	1.90	± 13.1 %
5500	48.6	5.65	4.01	4.01	4.01	0.55	1.90	± 13.1 %
5600	48.5	5.77	3.73	3.73	3.73	0.60	1.90	± 13.1 %
5800	48.2	6.00	4.02	4.02	4.02	0.60	1.90	± 13.1 %

[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.

Frequency Response of E-Field

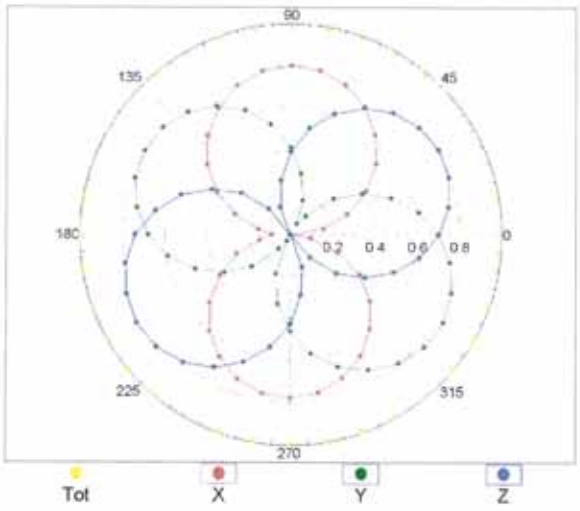
(TEM-Cell:ifi110 EXX, Waveguide: R22)



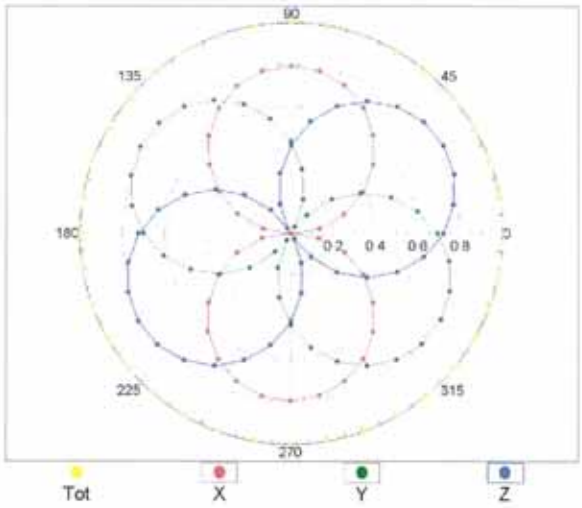
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

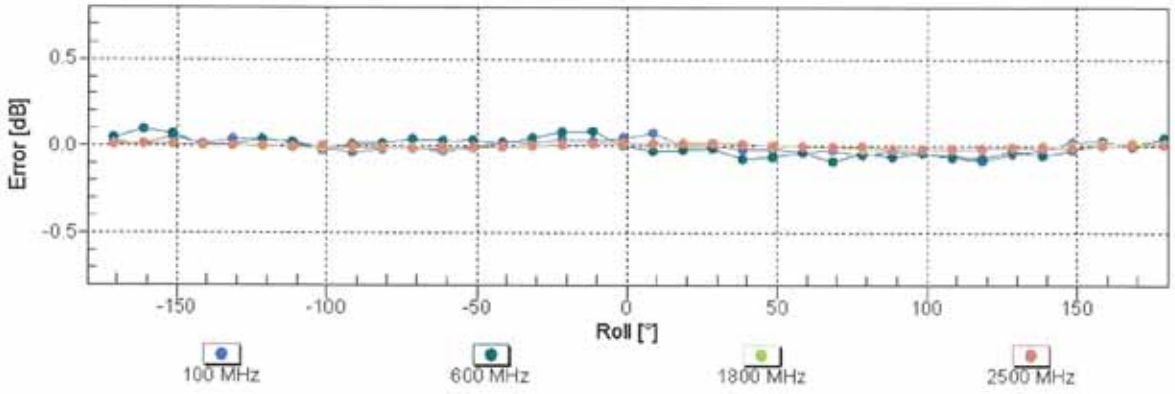
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



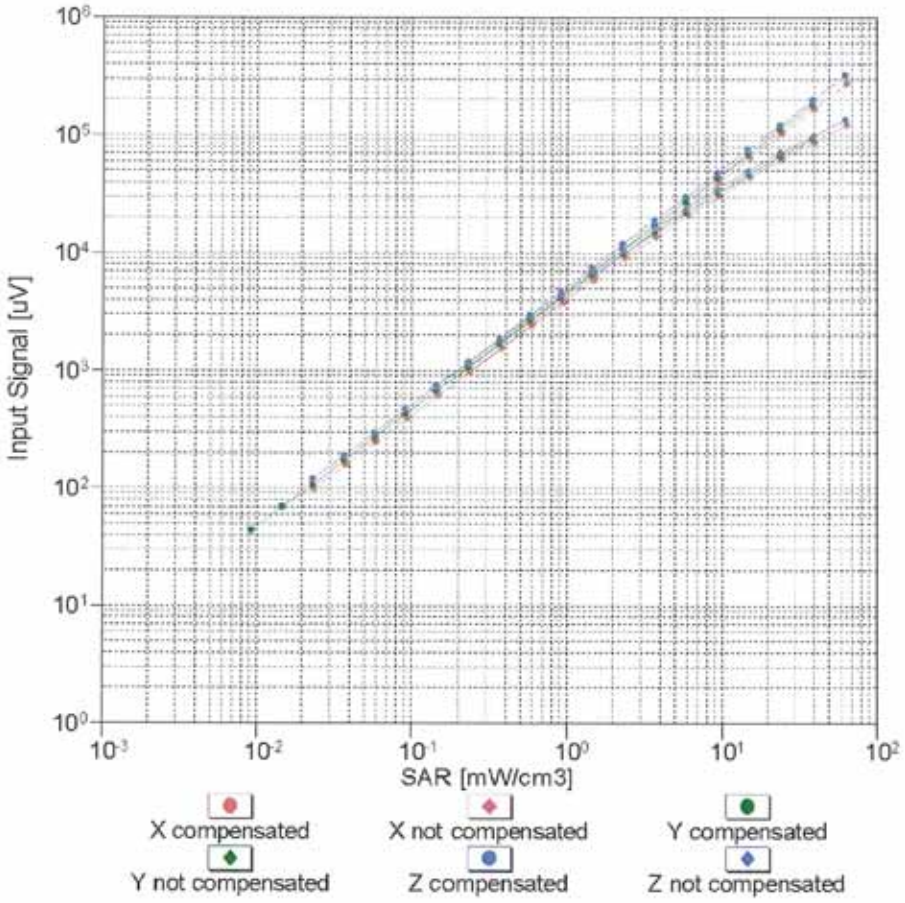
f=1800 MHz,R22

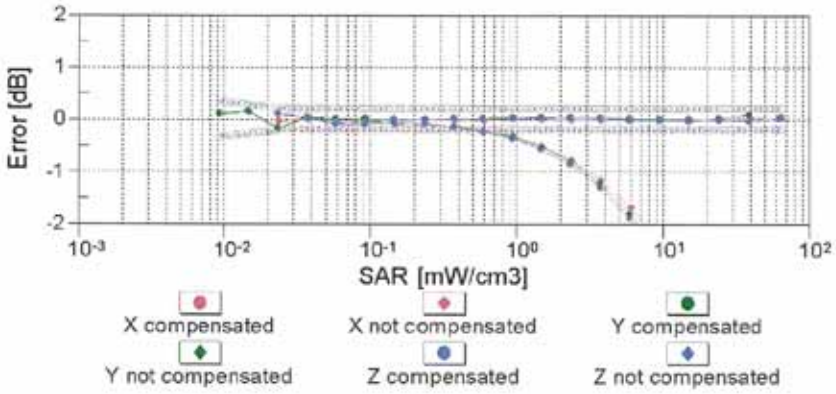




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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

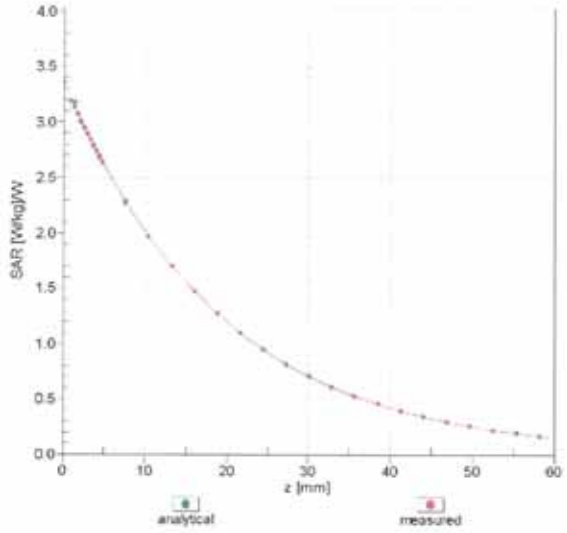




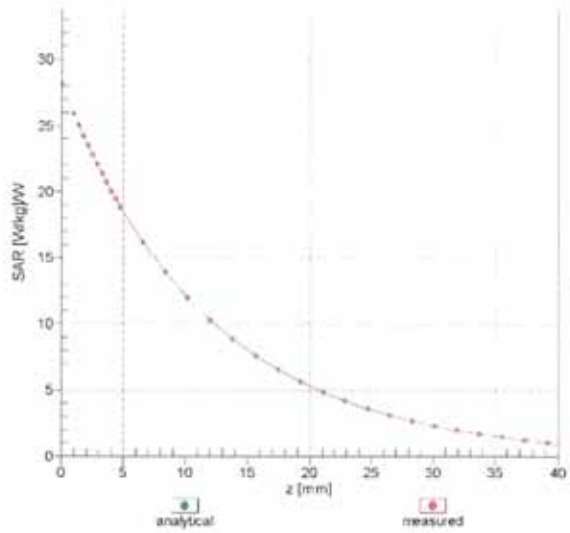
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

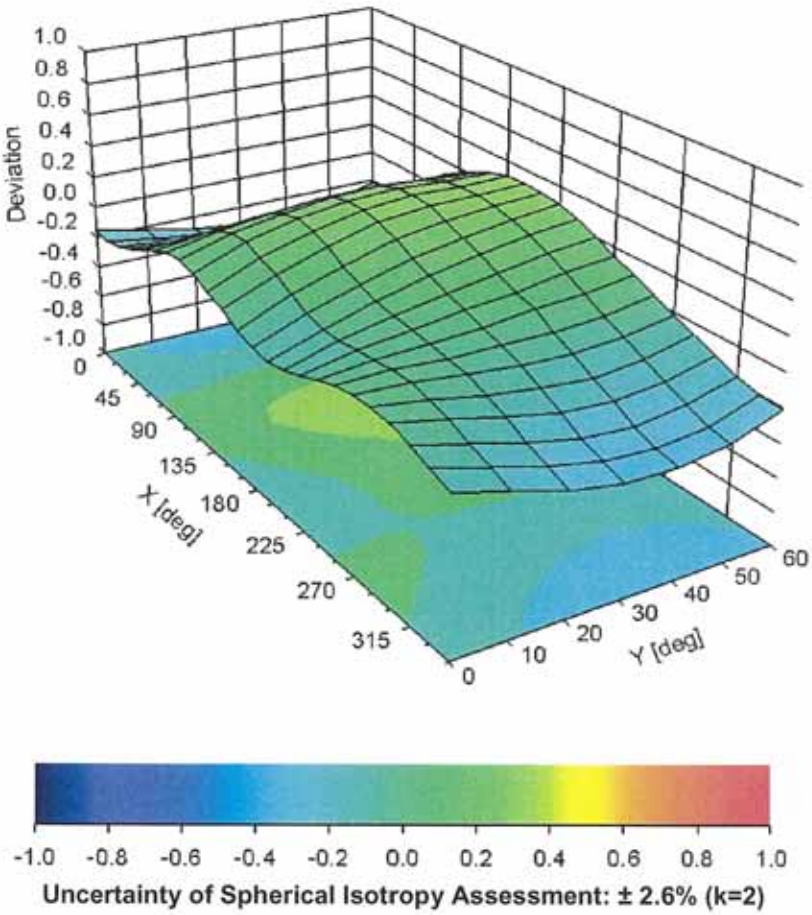


f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3661

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	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

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

Client B.V. ADT (Auden)

Certificate No: EX3-3800_Aug11

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3800

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

Calibration date: August 5, 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:	Katja Pokovic	Technical Manager	
Approved by:	Fin Bomholt	R&D Director	

Issued: August 8, 2011

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) Accreditation No.: **SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

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., $\vartheta = 0$ 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 $\vartheta = 0$ ($f \leq 900$ 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 $f \leq 800$ 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 EX3DV4

SN:3800

Manufactured: April 5, 2011
Calibrated: August 5, 2011

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3800

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.42	0.58	0.55	± 10.1 %
DCP (mV)[B]	100.6	96.7	98.8	

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	102.6	±3.0 %
			Y	0.00	0.00	1.00	124.9	
			Z	0.00	0.00	1.00	120.1	

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

[A] The uncertainties of 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.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3800

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	9.02	9.02	9.02	0.15	1.41	± 12.0 %
835	41.5	0.90	8.70	8.70	8.70	0.24	1.03	± 12.0 %
900	41.5	0.97	8.51	8.51	8.51	0.13	1.52	± 12.0 %
1640	40.3	1.29	7.95	7.95	7.95	0.15	1.37	± 12.0 %
1750	40.1	1.37	7.79	7.79	7.79	0.13	1.56	± 12.0 %
1900	40.0	1.40	7.46	7.46	7.46	0.45	0.76	± 12.0 %
2450	39.2	1.80	6.71	6.71	6.71	0.32	0.89	± 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.

DASY/EASY - Parameters of Probe: EX3DV4- SN:3800

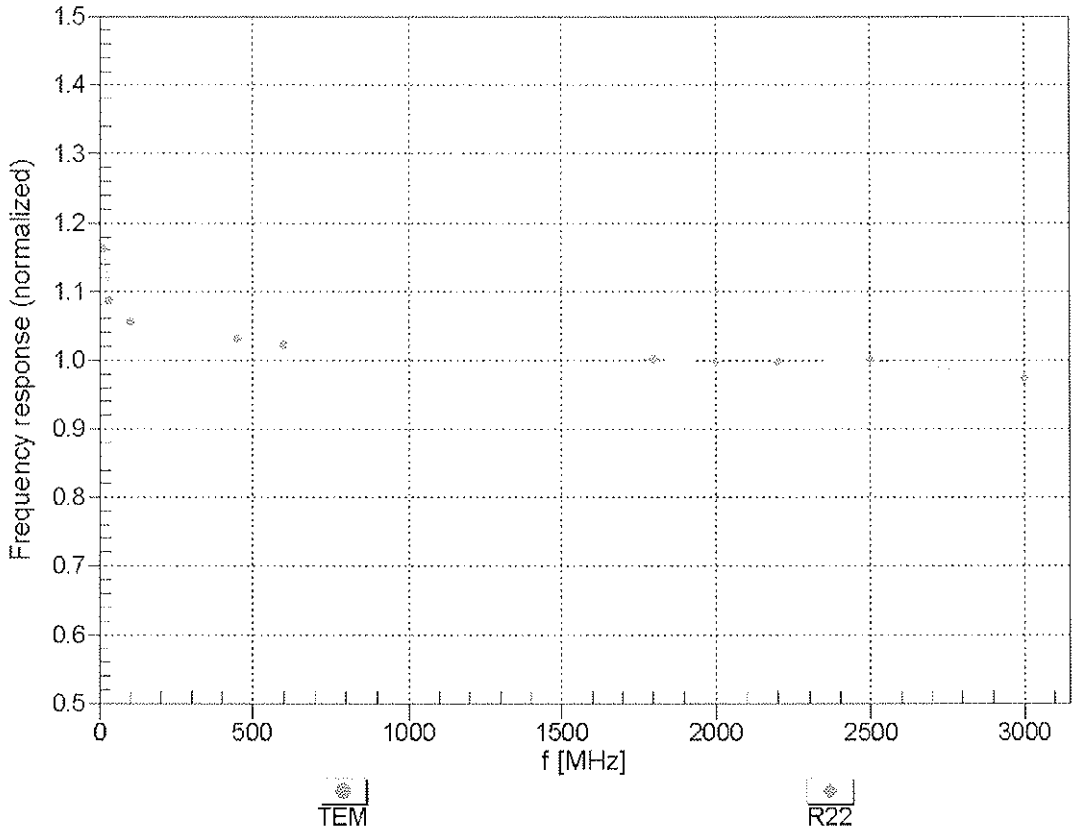
Calibration Parameter Determined in Body Tissue Simulating Media

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	9.34	9.34	9.34	0.10	2.61	± 12.0 %
835	55.2	0.97	8.94	8.94	8.94	0.11	2.46	± 12.0 %
900	55.0	1.05	8.67	8.67	8.67	0.13	2.08	± 12.0 %
1640	53.8	1.40	8.07	8.07	8.07	0.16	1.57	± 12.0 %
1750	53.4	1.49	7.43	7.43	7.43	0.15	1.76	± 12.0 %
1900	53.3	1.52	6.97	6.97	6.97	0.13	1.56	± 12.0 %
2450	52.7	1.95	6.75	6.75	6.75	0.80	0.53	± 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.

Frequency Response of E-Field

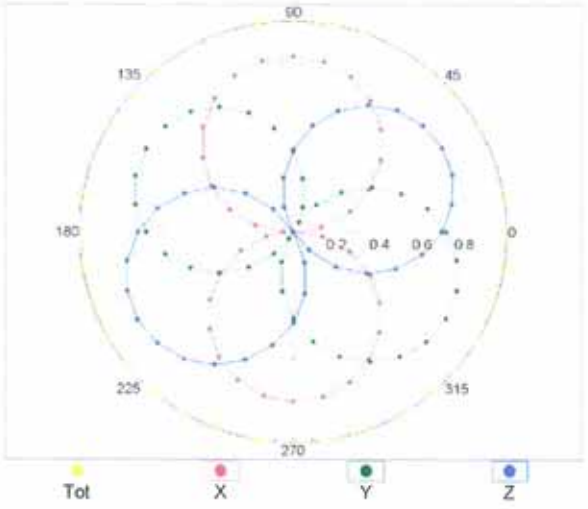
(TEM-Cell:ifi110 EXX, Waveguide: R22)



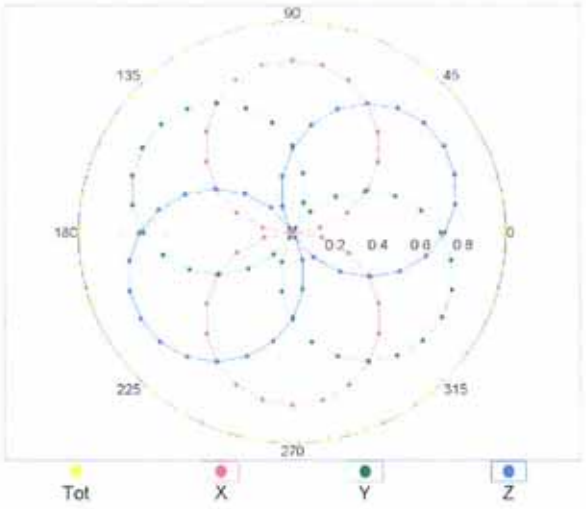
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

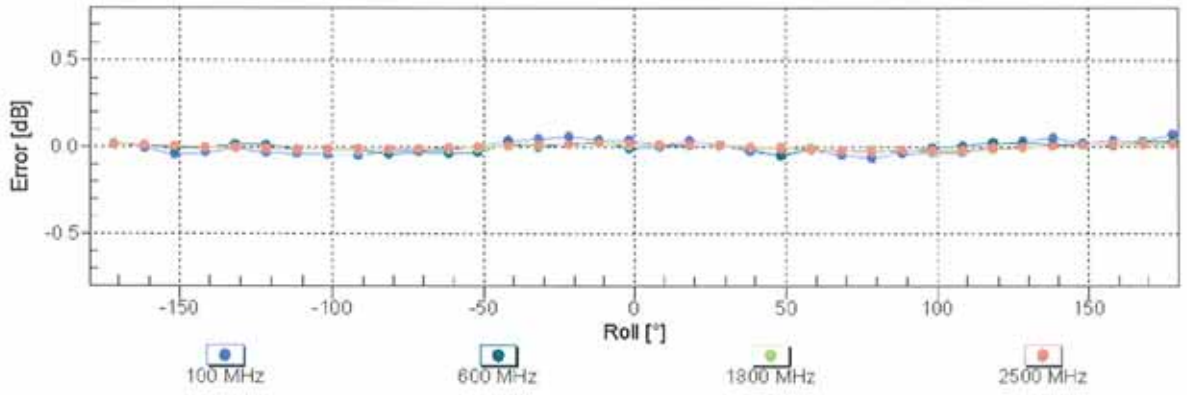
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



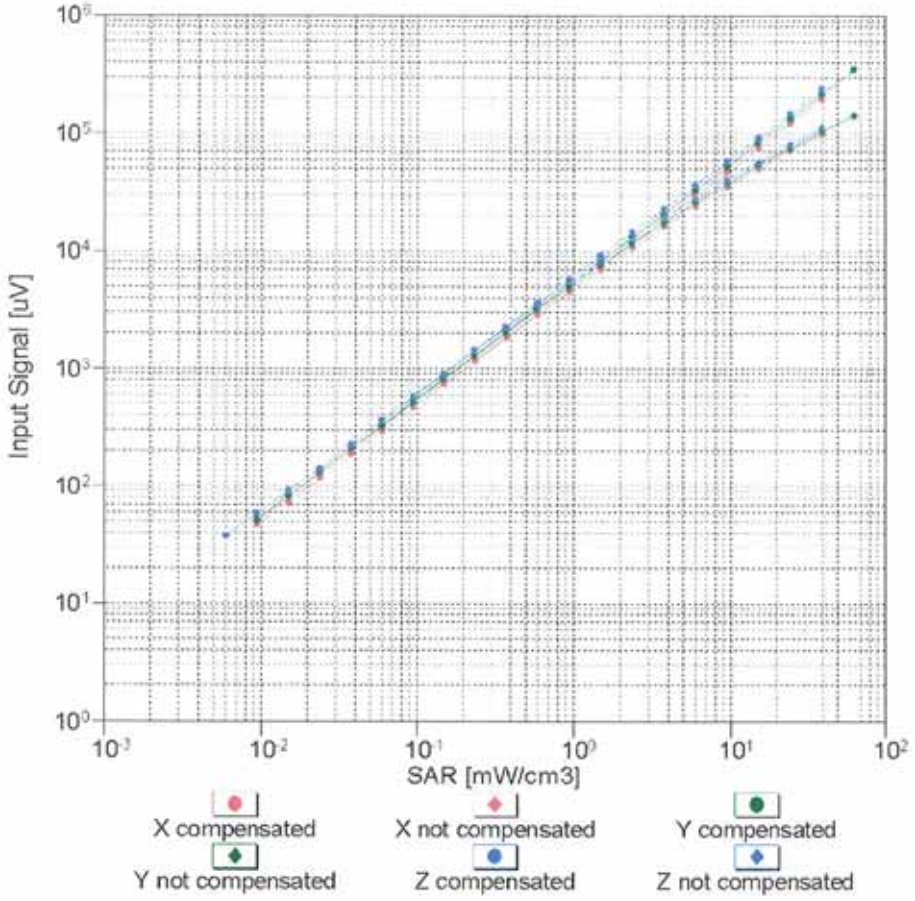
f=1800 MHz,R22

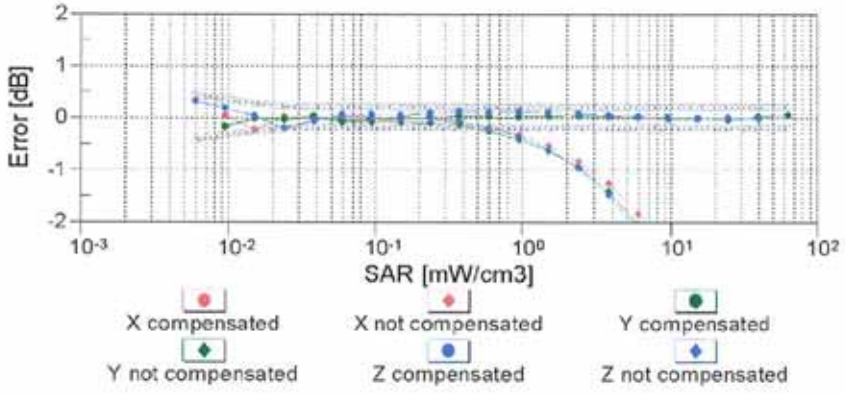




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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

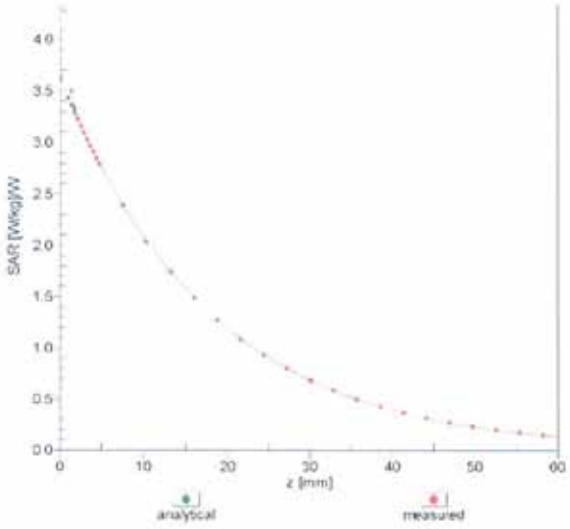




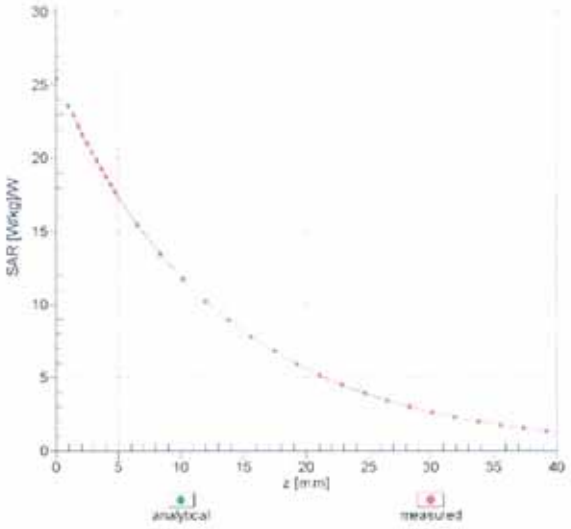
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF)

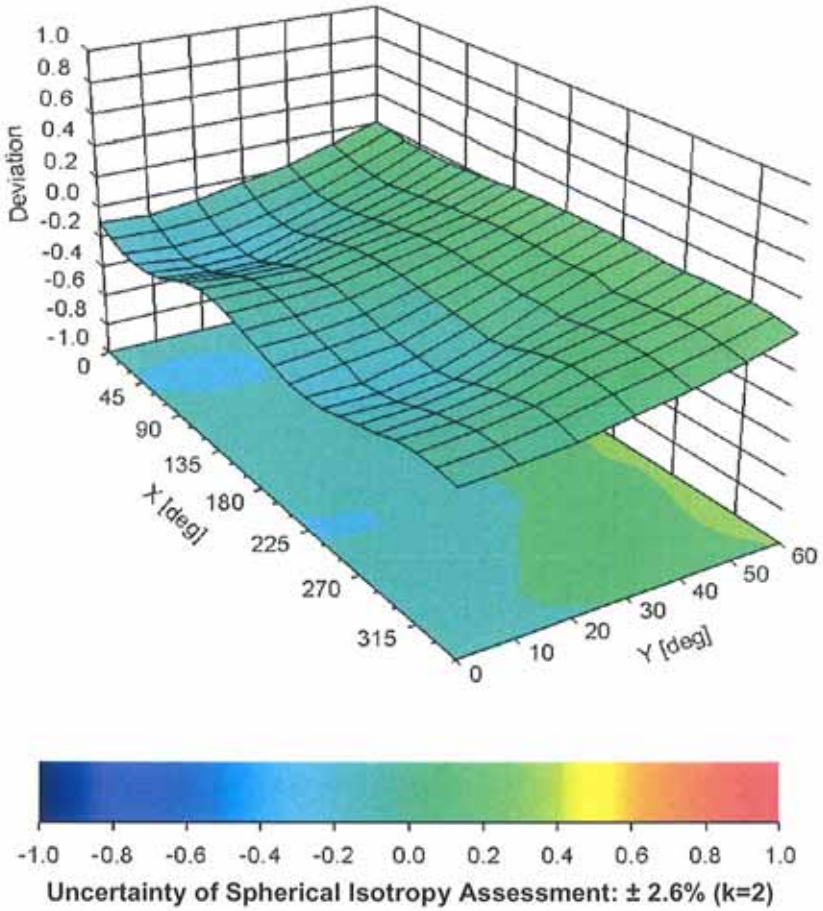


f = 1750 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3800

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	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm