5.1.2 Body SAR Measurement Description

GSM Frequency Band

Because the EUT does not have speech function but only has data transfer function, the tests for GSM 850/1900 are performed only in GPRS and EGPRS mode (since the GPRS/EGPRS class is 12, the tests are performed for the case of the slots in uplink with the maximum averaged power). The tests are performed for GPRS at middle frequency first for all the 4 test positions, and according to the 3 dB rule, "if the SAR measured at the middle channel for each test configuration is at least 3 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s)." So the test channels have been set first to the middle and then to low and high if necessary. And after found the worst case, the EGPRS will be tested for that position.

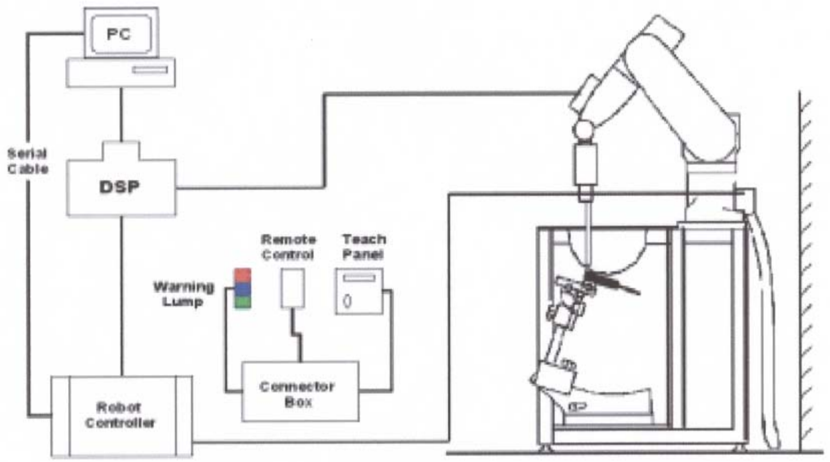
The conducted power for GPRS/EGPRS 850/1900 is as following:

GSM 850 GPRS	Measured Power (dBm)			Averaged Power (dBm)		
	Ch 251	Ch190	Ch128	Ch 251	Ch190	Ch128
	31.91	32.16	32.28	28.9	29.15	29.27
GSM 850 EGPRS	Measured Power (dBm)			Averaged Power (dBm)		
	Ch 251	Ch190	Ch128	Ch 251	Ch190	Ch128
	31.96	32.10	32.14	28.95	29.09	29.13
GSM1900 GPRS	Measured Power (dBm)			Averaged Power (dBm)		
	Ch 810	Ch661	Ch512	Ch 810	Ch661	Ch512
	27.93	27.77	27.80	24.92	24.76	24.79
GSM1900 EGPRS	Measured Power (dBm)			Averaged Power (dBm)		
	Ch 810	Ch661	Ch512	Ch 810	Ch661	Ch512
	25.96	26.18	26.05	22.95	23.17	23.04

5.2 SAR Measurement Set-up

These measurements were performed with the automated near-field scanning system DASY4 Professional from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than ± 0.02mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the Micron Pentium III 800 MHz computer with Windows 2000 system and SAR Measurement Software DASY4 Professional, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.



Picture 5: SAR Lab Test Measurement Set-up

The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

5.3 Dasy4 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the standard procedure with an accuracy of better than ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB.

ES3DV3 Probe Specification

Construction
Symmetrical design with triangular core
Interleaved sensors
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

Picture 6: ES3DV3 E-field Probe

Calibration
Basic Broad Band Calibration in air
Conversion Factors (CF) for HSL 900 and HSL 1810
Additional CF for other liquids and frequencies upon request

Frequency
10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)

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: 330 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

Picture7:ES3DV3 E-field probe

5.4 E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.
The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

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

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

Where: Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

Or

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

Picture 8: Device Holder

5.5 Other Test Equipment

5.5.1 Device Holder for Transmitters

In combination with the Generic Twin Phantom V3.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatably positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Picture 9: Generic Twin Phantom

5.5.2 Phantom

The Generic Twin Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users. 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 the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Shell Thickness	2±0. l mm
Filling Volume	Approx. 20 liters
Dimensions	810 x l000 x 500 mm (H x L x W)
Available	Special

5.6 Equivalent Tissues

The liquid used for the frequency range of 800-2000 MHz consisted of water, sugar, salt and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 4 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528.

Table 1: Composition of the Body Tissue Equivalent Matter

MIXTURE %	FREQUENCY 850MHz
Water	50.93
Sugar	45.61
Salt	1.09
Preventol	0.37
Cellulose	2.0
Dielectric Parameters Target Value	f=850MHz ε=55.2 σ=0.97

MIXTURE %	FREQUENCY 1900MHz
Water	70.52
Glycol monobutyl	29.09
Salt	0.39
Dielectric Parameters Target Value	f=1900MHz ε=53.3 σ=1.52

5.7 System Specifications

5.7.1 Robotic System Specifications

<u>**Specifications**</u>

Positioner: Stäubli Unimation Corp. Robot Model: RX90L

Repeatability: ±0.02 mm

No. of Axis: 6

<u>**Data Acquisition Electronic (DAE) System**</u>

<u>**Cell Controller**</u>

Processor: Pentium III

Clock Speed: 800 MHz

Operating System: Windows 2000

<u>**Data Converter**</u>

Features: Signal Amplifier, multiplexer, A/D converter, and control logic

Software: DASY4 software

Connecting Lines: Optical downlink for data and status info.
Optical uplink for commands and clock

6 TEST RESULTS

6.1 Dielectric Performance

Table 2: Dielectric Performance of Body Tissue Simulating Liquid

Measurement is made at temperature 23.3 °C and relative humidity 49%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz **<u>Feb 16, 2009</u>** 1900 MHz **<u>Feb 17, 2009</u>**

/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	850 MHz	55.2	0.97
	1900 MHz	53.3	1.52
Measurement value (Average of 10 tests)	850 MHz	53.7	1.01
	1900 MHz	51.1	1.53

6.2 System Validation

Table 3: System Validation

Measurement is made at temperature 23.3 °C and relative humidity 49%.
Liquid temperature during the test: 22.5°C
Measurement Date : 850 MHz **<u>Feb 16, 2009</u>** 1900 MHz **<u>Feb 17, 2009</u>**

Liquid parameters	Frequency	Permittivity ε	Conductivity σ (S/m)
	835 MHz	43.5	0.91

		1900 MHz		40.9		1.38	
Verification results	**Frequency**	**Target value (W/kg)**		**Measured value (W/kg)**		**Deviation**	
		10 g Average	**1 g Average**	**10 g Average**	**1 g Average**	**10 g Average**	**1 g Average**
	835 MHz	1.60	2.48	1.62	2.50	1.25%	0.81%
	1900 MHz	5.09	9.73	5.27	9.91	3.3%	1.9%

Note：Target values are the data of the dipole validation results, please check Annex F for the Dipole Calibration Certificate.

6.3 Summary of Measurement Results

Table 4: SAR Values (GSM 850 MHz GPRS-4 Txslots)

Limit of SAR (W/kg)	**10 g Average**	**1 g Average**	**Power Drift (dB)**
	2.0	1.6	
Test Case	**Measurement Result (W/kg)**		
	10 g Average	**1 g Average**	
Flat Phantom, Test Position 1, Mid frequency (See Figure 1)	0.429	0.742	-0.143
Flat Phantom, Test Position 2 Mid frequency (See Figure 3)	0.480	0.747	0.095
Flat Phantom, Test Position 3, Mid frequency (See Figure 5)	0.364	0.622	0.193
Flat Phantom, Test Position 4, Mid frequency (See Figure 7)	0.216	0.385	-0.034
Flat Phantom, Test Position 5, Mid frequency (See Figure 9)	0.069	0.177	0.037

Table 5: SAR Values (GSM 850 MHz EGPRS-4 Txslots)

Limit of SAR (W/kg)	**10 g Average**	**1 g Average**	**Power Drift (dB)**
	2.0	1.6	
Test Case	**Measurement Result (W/kg)**		
	10 g Average	**1 g Average**	
Flat Phantom, Test Position 2, Mid frequency (See Figure 11)	0.365	0.564	0.11

Table 6: SAR Values (GSM 1900 MHz GPRS-4 Txslots)

Limit of SAR (W/kg)	**10 g Average**	**1 g Average**	**Power Drift (dB)**
	2.0	1.6	
Test Case	**Measurement Result (W/kg)**		
	10 g Average	**1 g Average**	
Flat Phantom, Test Position 1, Mid frequency(See Figure13)	0.564	0.992	-0.155
Flat Phantom, Test Position 2 Mid frequency(See Figure15)	0.603	1.20	0.056
Flat Phantom, Test Position 3, Mid frequency(See Figure 17)	0.266	0.457	-0.158
Flat Phantom, Test Position 4, Mid frequency(See Figure 19)	0.324	0.613	-0.058
Flat Phantom, Test Position 5, Mid frequency(See Figure 21)	0.278	0.662	-0.107
Flat Phantom, Test Position 1, High frequency(See Figure 23)	0.515	0.947	0.081
Flat Phantom, Test Position 1, Low frequency(See Figure 25)	0.493	0.868	0.047
Flat Phantom, Test Position 2, High frequency(See Figure 27)	0.593	1.19	0.062
Flat Phantom, Test Position 2, Low frequency(See Figure 29)	0.583	1.17	0.143

Table 7: SAR Values (DCS 1900 MHz EGPRS-4 Txslots)

Limit of SAR (W/kg)	**10 g Average**	**1 g Average**	**Power Drift (dB)**
	2.0	1.6	
Test Case	**Measurement Result (W/kg)**		
	10 g Average	**1 g Average**	
Flat Phantom, Test Position 2, Mid frequency(See Figure37)	0.493	0.982	-0.054

6.4 Conclusion

Localized Specific Absorption Rate (SAR) of this portable wireless device has been measured in all cases requested by the relevant standards cited in Clause 4.2 of this report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 4.1 of this test report.

7 Measurement Uncertainty

SN	a	Type	c	d	e = f(d,k)	f	h = c x f / e	k
	Uncertainty Component		Tol. (± %)	Prob. Dist.	Div.	c_i (1 g)	1 g u_i (±%)	v_i
1	System repetivity	A	0.5	N	1	1	0.5	9
	Measurement System							
2	Probe Calibration	B	5	N	2	1	2.5	∞
3	Axial Isotropy	B	4.7	R	√3	$(1-cp)^{1/2}$	4.3	∞
4	Hemispherical Isotropy	B	9.4	R	√3	$\sqrt{c_p}$		∞
5	Boundary Effect	B	0.4	R	√3	1	0.23	∞
6	Linearity	B	4.7	R	√3	1	2.7	∞
7	System Detection Limits	B	1.0	R	√3	1	0.6	∞
8	Readout Electronics	B	1.0	N	1	1	1.0	∞
9	RF Ambient Conditions	B	3.0	R	√3	1	1.73	∞
10	Probe Positioner Mechanical Tolerance	B	0.4	R	√3	1	0.2	∞
11	Probe Positioning with respect to Phantom Shell	B	2.9	R	√3	1	1.7	∞
12	Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	B	3.9	R	√3	1	2.3	∞
	Test sample Related							
13	Test Sample Positioning	A	4.9	N	1	1	4.9	N-1
14	Device Holder Uncertainty	A	6.1	N	1	1	6.1	N-1

15	Output Power Variation - SAR drift measurement	B	5.0	R	√3	1	2.9	∞
	Phantom and Tissue Parameters							
16	Phantom Uncertainty (shape and thickness tolerances)	B	1.0	R	√3	1	0.6	∞
17	Liquid Conductivity - deviation from target values	B	5.0	R	√3	0.64	1.7	∞
18	Liquid Conductivity - measurement uncertainty	B	5.0	N	1	0.64	1.7	M
19	Liquid Permittivity - deviation from target values	B	5.0	R	√3	0.6	1.7	∞
20	Liquid Permittivity - measurement uncertainty	B	5.0	N	1	0.6	1.7	M
	Combined Standard Uncertainty			RSS			11.25	
	Expanded Uncertainty (95% CONFIDENCE INTERVAL)			K=2			22.5	

8 MAIN TEST INSTRUMENTS

Table 8: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	HP 8753E	US38433212	August 30,2008	One year
02	Power meter	NRVD	101253	June 20, 2008	One year
03	Power sensor	NRV-Z5	100333		
04	Power sensor	NRV-Z6	100011	September 2, 2008	One year
05	Signal Generator	E4433B	US37230472	September 4, 2008	One Year
06	Amplifier	VTL5400	0505	No Calibration Requested	
07	BTS	CMU 200	105948	August 15, 2008	One year
08	E-field Probe	SPEAG ES3DV3	3149	October 1, 2008	One year
09	DAE	SPEAG DAE4	771	November 20, 2008	One year
10	Dipole Validation Kit	SPEAG D835V2	443	February 19, 2007	Two years
11	Dipole Validation Kit	SPEAG D1900V2	541	February 20, 2007	Two years

END OF REPORT BODY

ANNEX A MEASUREMENT PROCESS

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the reference point was measured and was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of the phantom was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the flat phantom and the horizontal grid spacing was 10 mm x 10 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

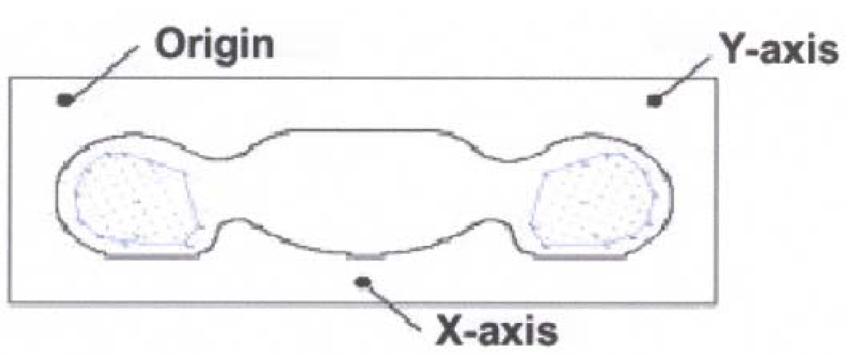
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

b. The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x ~ y and z-directions). The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

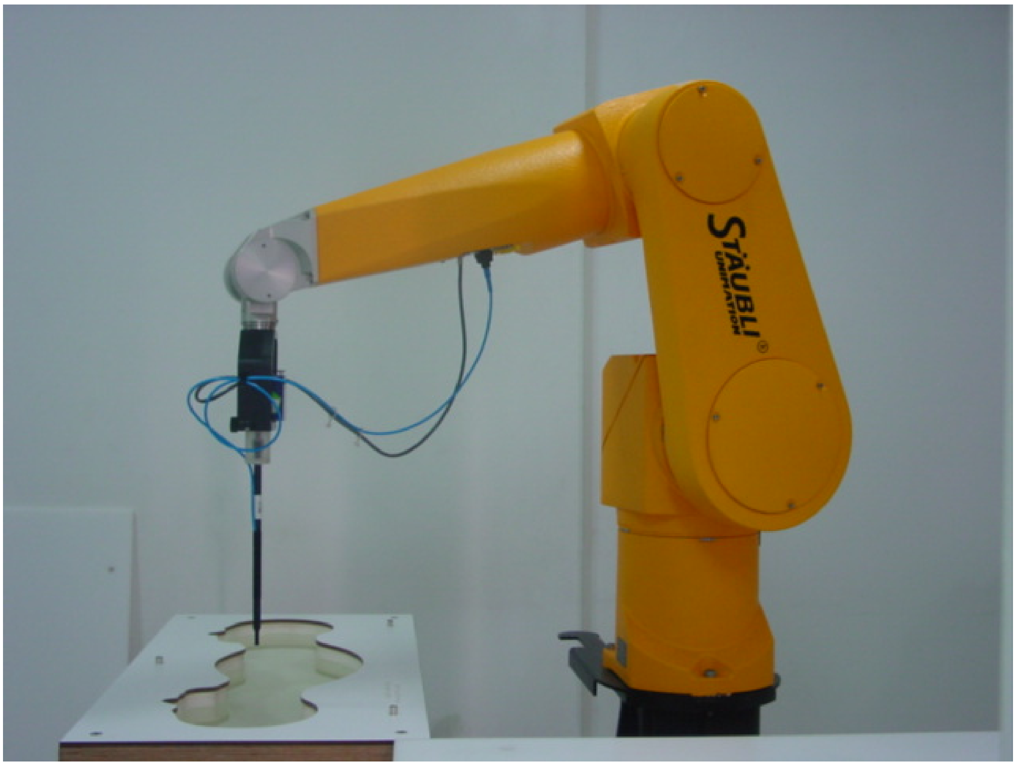
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation is repeated.

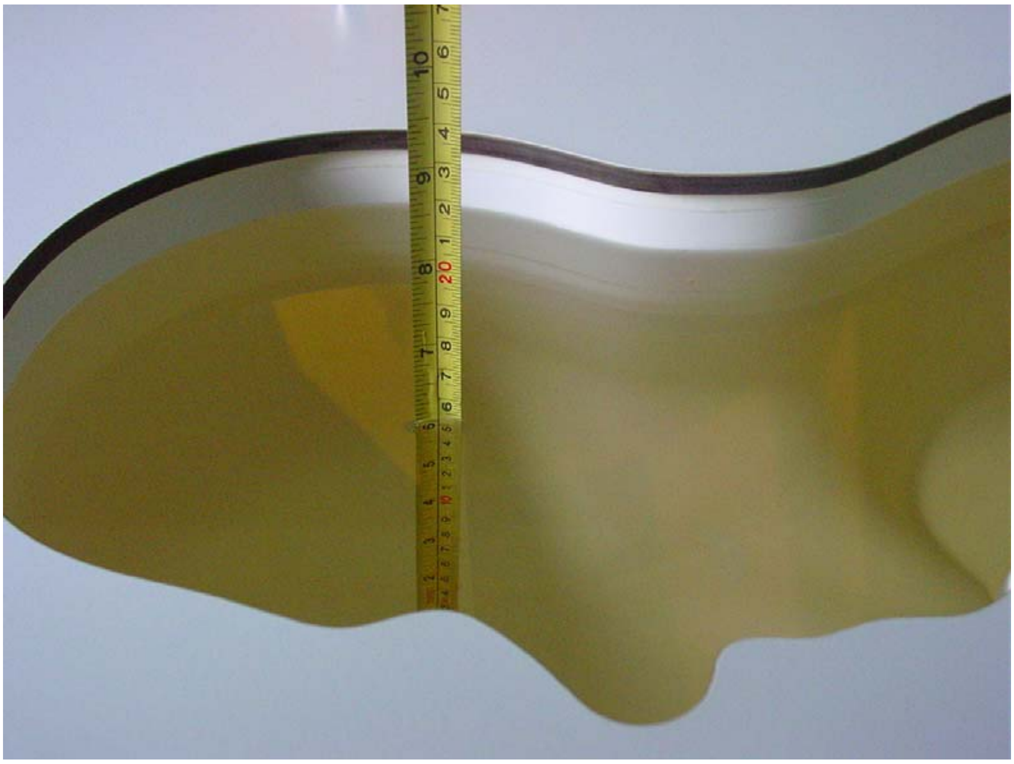


Picture A: SAR Measurement Points in Area Scan

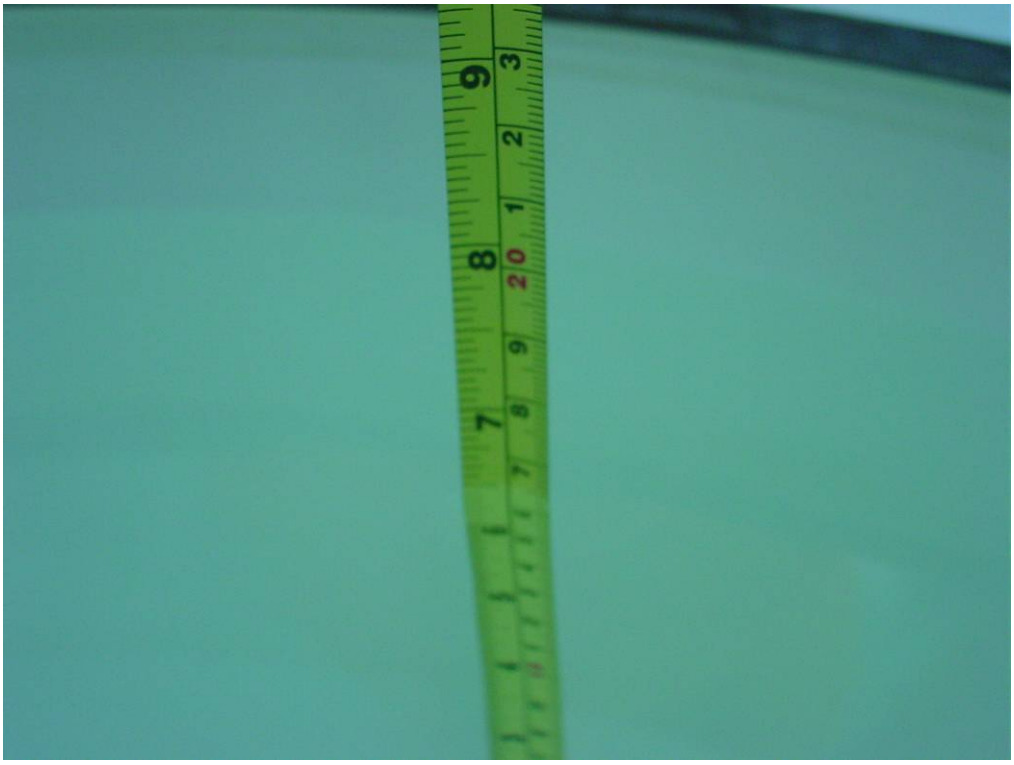
ANNEX B TEST LAYOUT



Picture B1: Specific Absorption Rate Test Layout



Picture B2: Liquid depth in the Flat Phantom (850 MHz)



Picture B3 Liquid depth in the Flat Phantom (1900MHz)

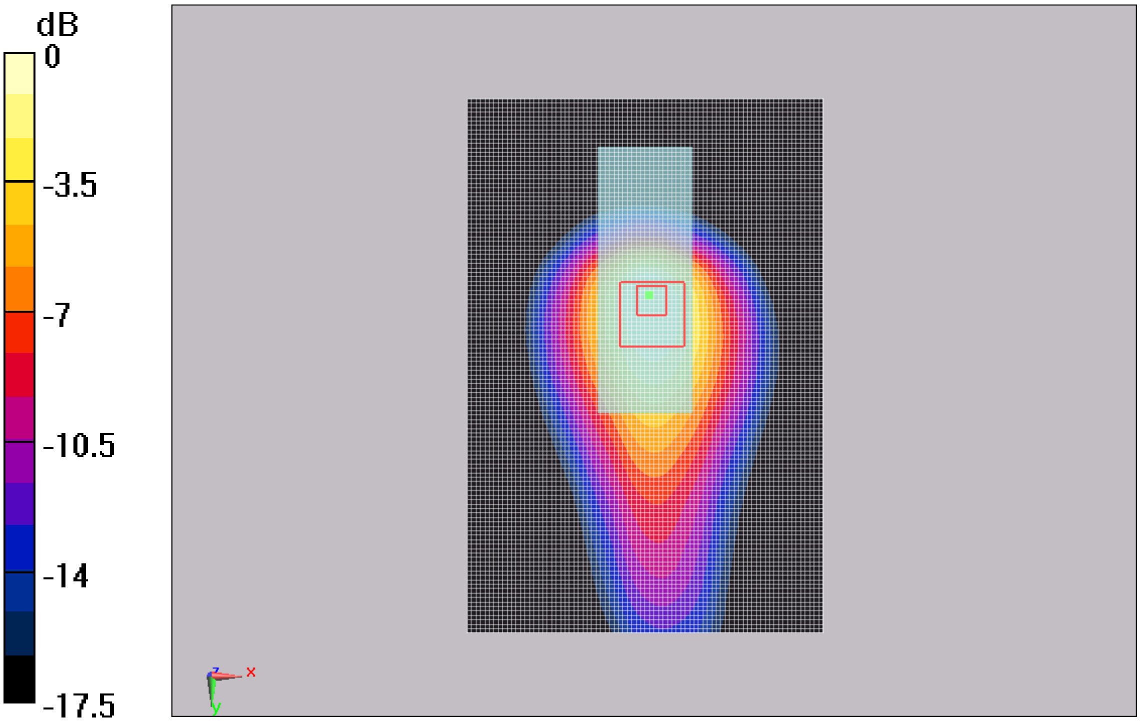
ANNEX C GRAPH RESULTS

GSM 850 Test Position 1 Middle with GPRS

Date/Time: 2009-2-16 8:43:39
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.01 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Test Position 1_ Channel Middle /Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.917 mW/g

Test Position 1_ Channel Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.5 V/m; Power Drift = -0.143 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.742 mW/g; SAR(10 g) = 0.429 mW/g
Maximum value of SAR (measured) = 0.795 mW/g



0 dB = 0.795mW/g

Fig.1 850MHz CH190 Test Position 1-GPRS

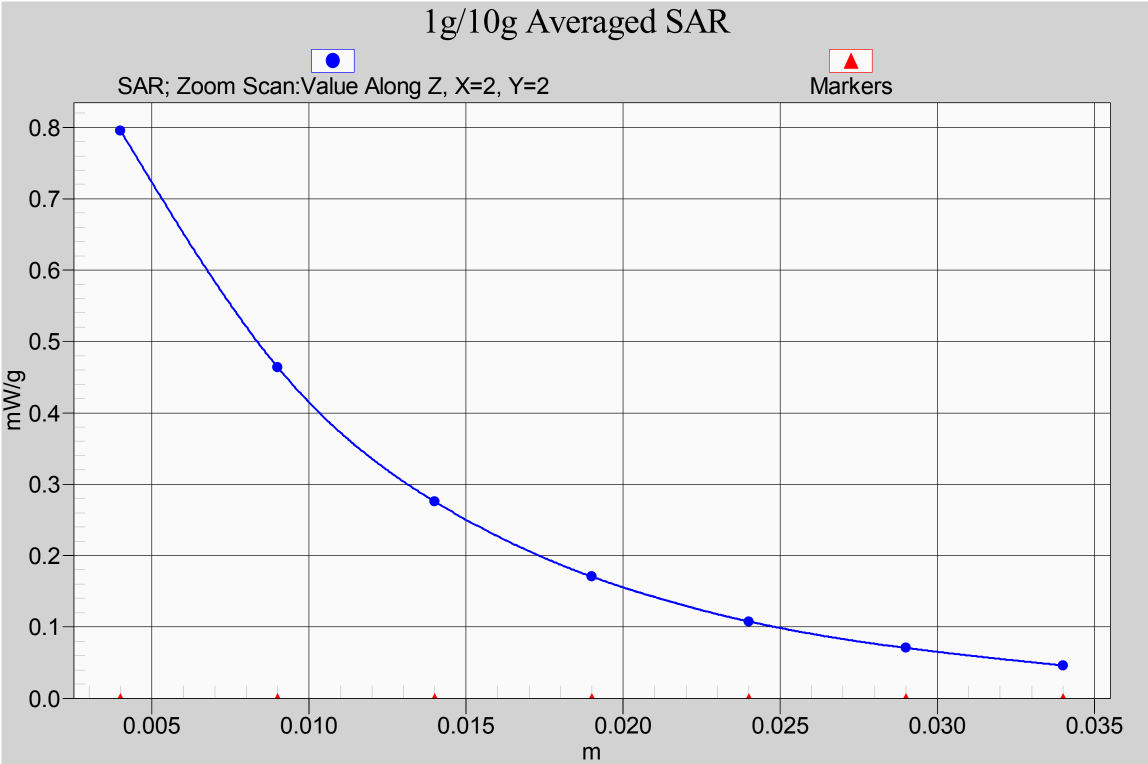


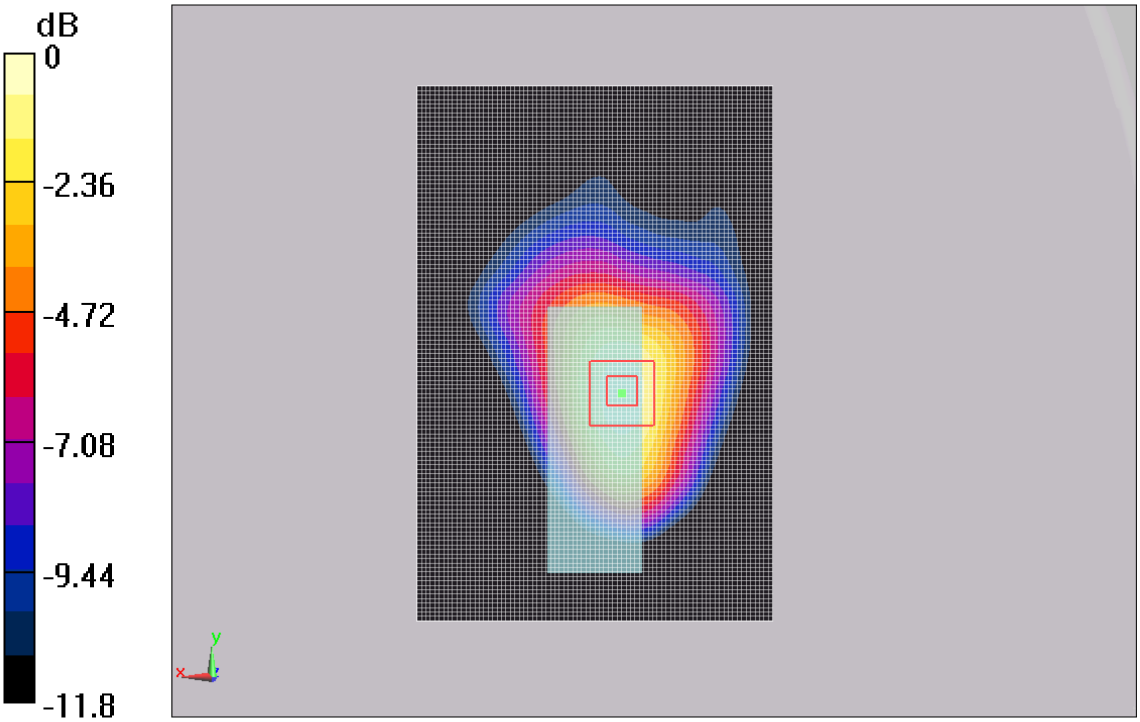
Fig.2 Z-Scan at power reference point (850MHz CH190 Test Position 1-GPRS)

GSM 850 Test Position 2 Middle with GPRS

Date/Time: 2009-2-16 9:31:20
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.01 mho/m; ε_r = 53.8; ρ = 1000 kg/m³
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Test Position 2_ Channel Middle /Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.779 mW/g

Test Position 2_ Channel Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.4 V/m; Power Drift = 0.095 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.747 mW/g; SAR(10 g) = 0.480 mW/g
Maximum value of SAR (measured) = 0.815 mW/g



0 dB = 0.815mW/g

Fig.3 850MHz CH190 Test Position 2-GPRS

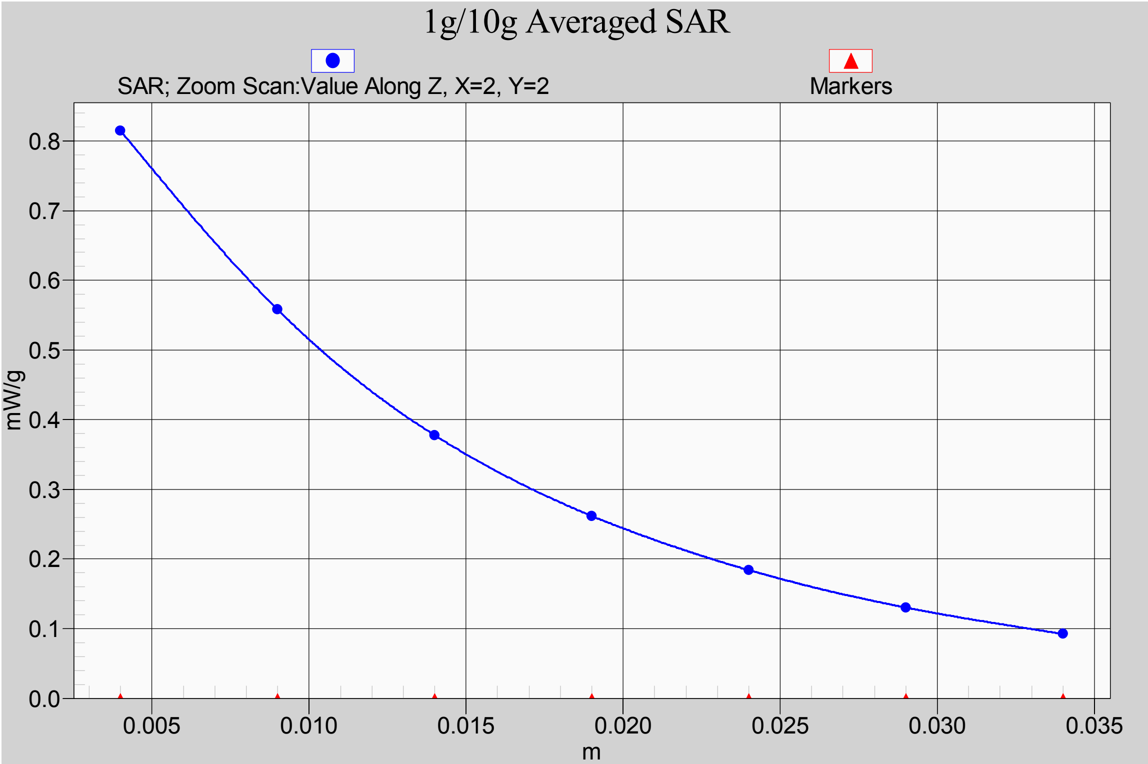


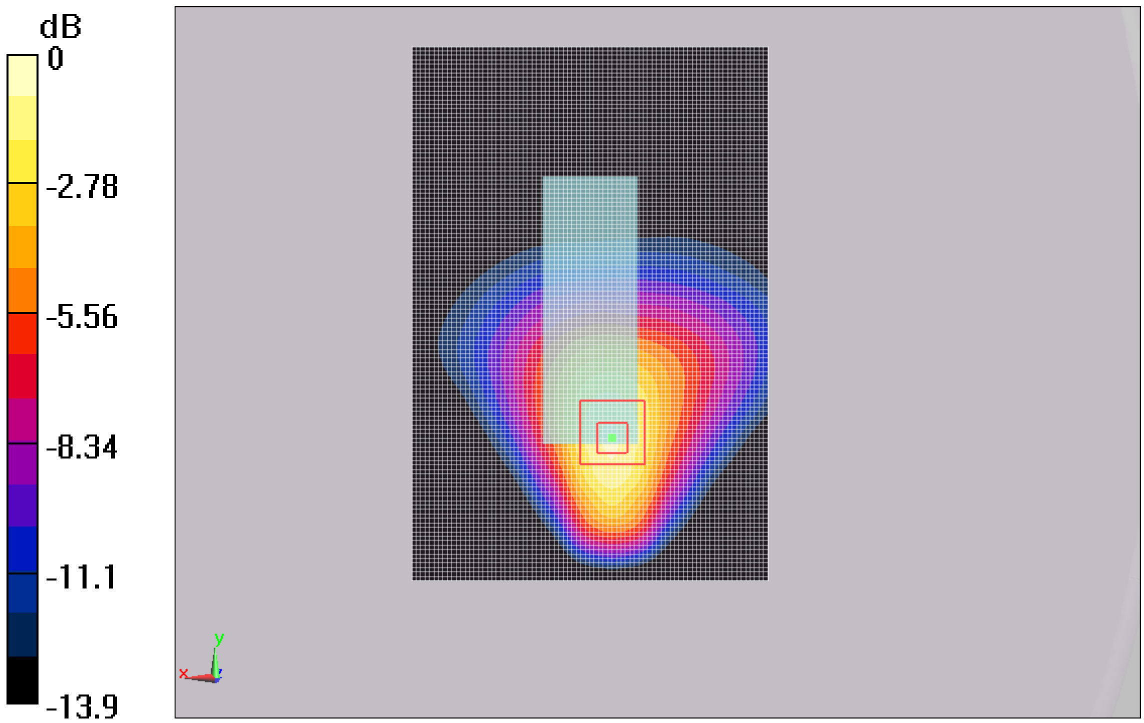
Fig.4 Z-Scan at power reference point (850MHz CH190 Test Position 2-GPRS)

GSM 850 Test Position 3 Middle with GPRS

Date/Time: 2009-2-16 10:22:05
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.01 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Test Position 3_ Channel Middle/Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.595 mW/g

Test Position 3_ Channel Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.8 V/m; Power Drift = 0.193 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.622 mW/g; SAR(10 g) = 0.364 mW/g
Maximum value of SAR (measured) = 0.714 mW/g



0 dB = 0.714mW/g

Fig.5 850MHz CH190 Test Position 3-GPRS

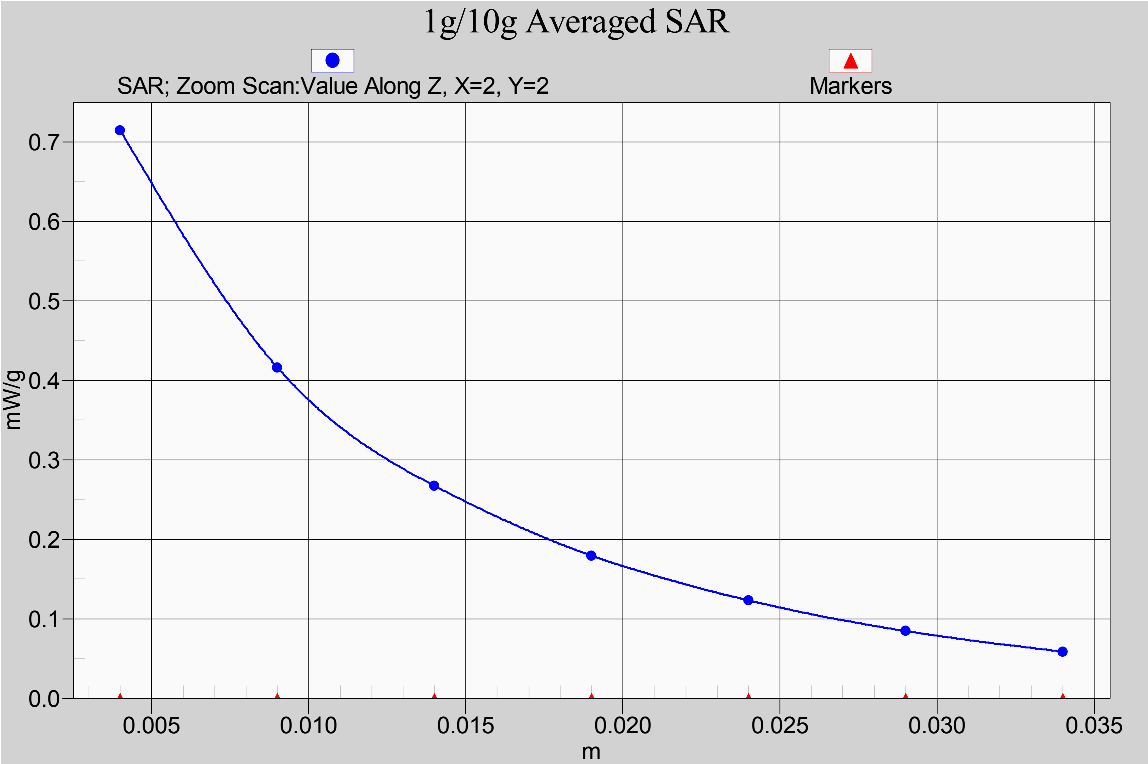


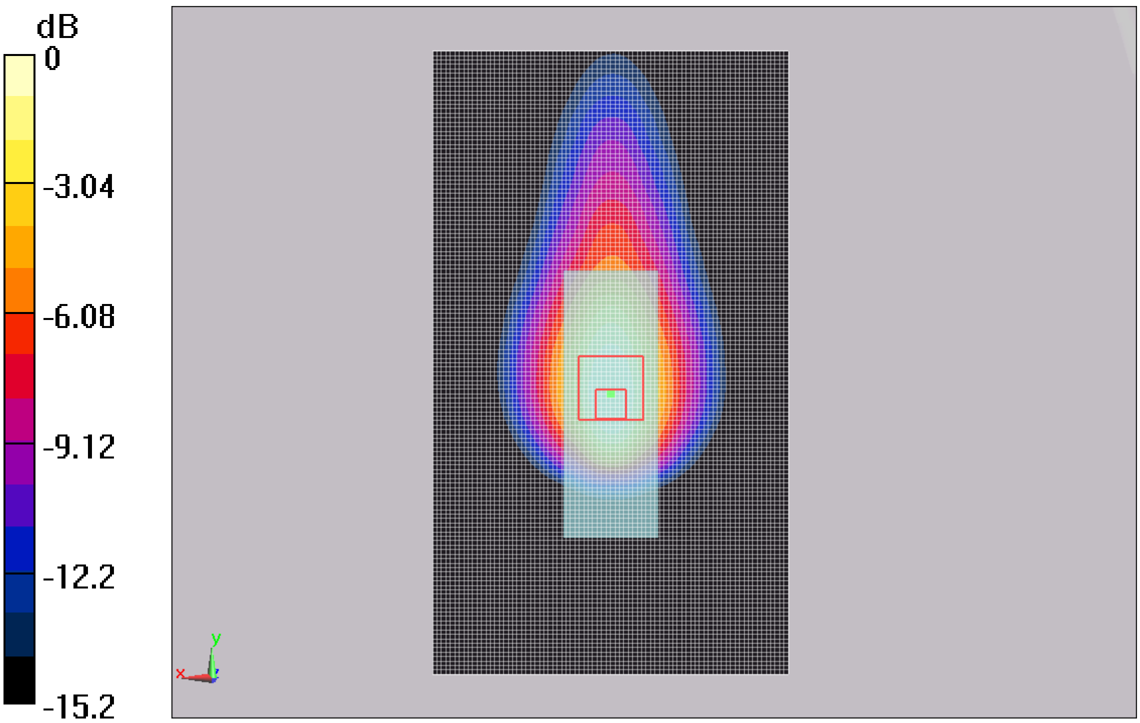
Fig.6 Z-Scan at power reference point (850MHz CH190 Test Position 3-GPRS)

GSM 850 Test Position 4 Middle with GPRS

Date/Time: 2009-2-16 11:20:16
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.01 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Test Position 4_ Channel Middle /Area Scan (81x141x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.473 mW/g

Test Position 4_ Channel Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.4 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 0.747 W/kg
SAR(1 g) = 0.385 mW/g; SAR(10 g) = 0.216 mW/g
Maximum value of SAR (measured) = 0.429 mW/g



0 dB = 0.429mW/g

Fig.7 850MHz CH190 Test Position 4-GPRS

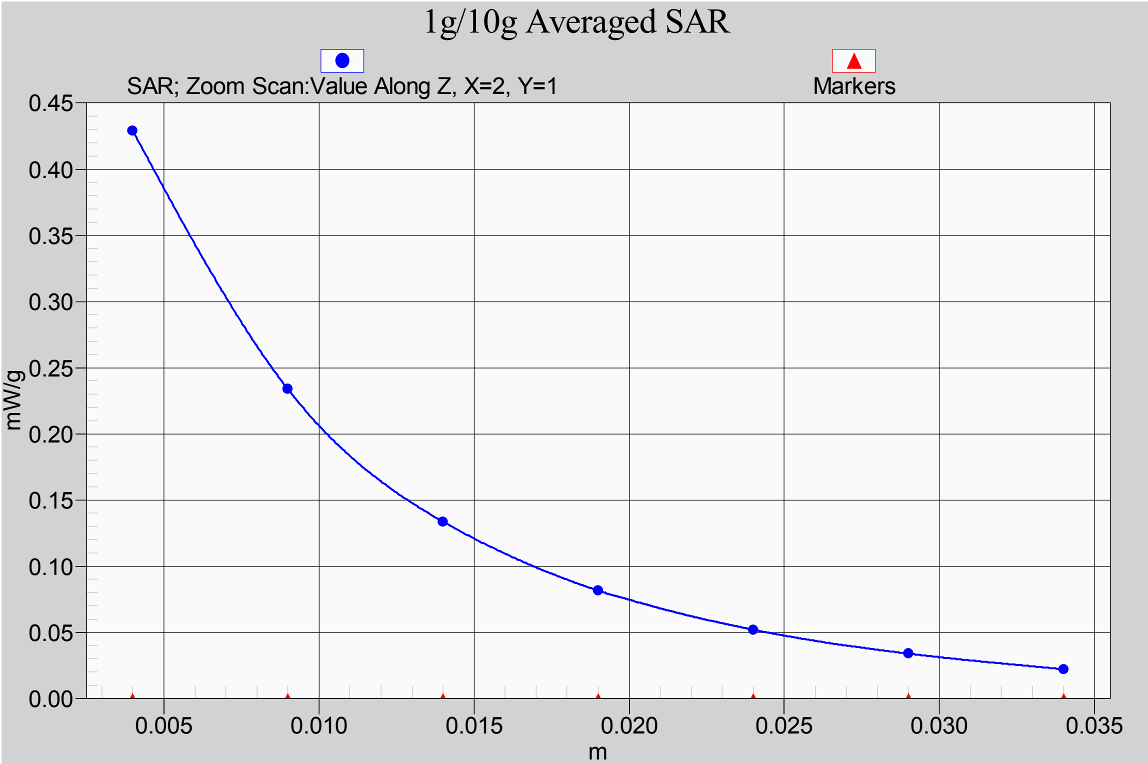


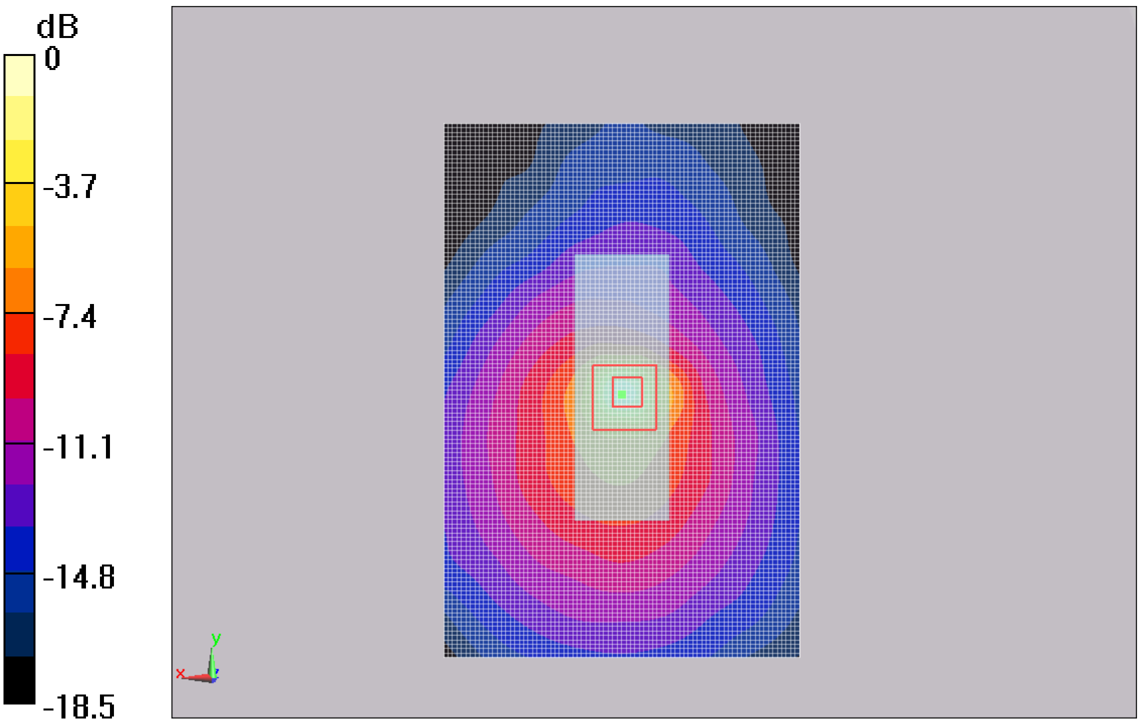
Fig.8 Z-Scan at power reference point (850MHz CH190 Test Position 4-GPRS)

GSM 850 Test Position 5 Middle with GPRS

Date/Time: 2009-2-16 12:23:36
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.01 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Test Position 5_ Channel Middle /Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.236 mW/g

Test Position 5_ Channel Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15 V/m; Power Drift = 0.037 dB
Peak SAR (extrapolated) = 0.543 W/kg
SAR(1 g) = 0.177 mW/g; SAR(10 g) = 0.069 mW/g
Maximum value of SAR (measured) = 0.245 mW/g



0 dB = 0.245mW/g

Fig.9 850MHz CH190 Test Position 5-GPRS

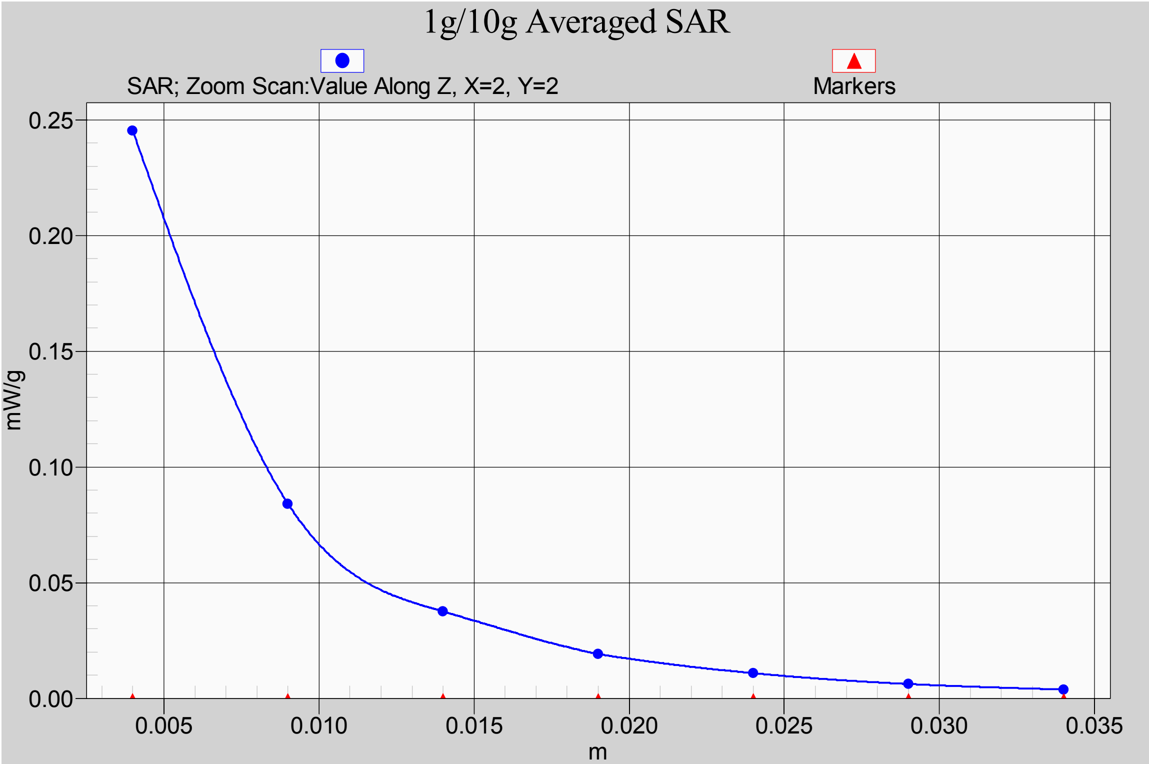


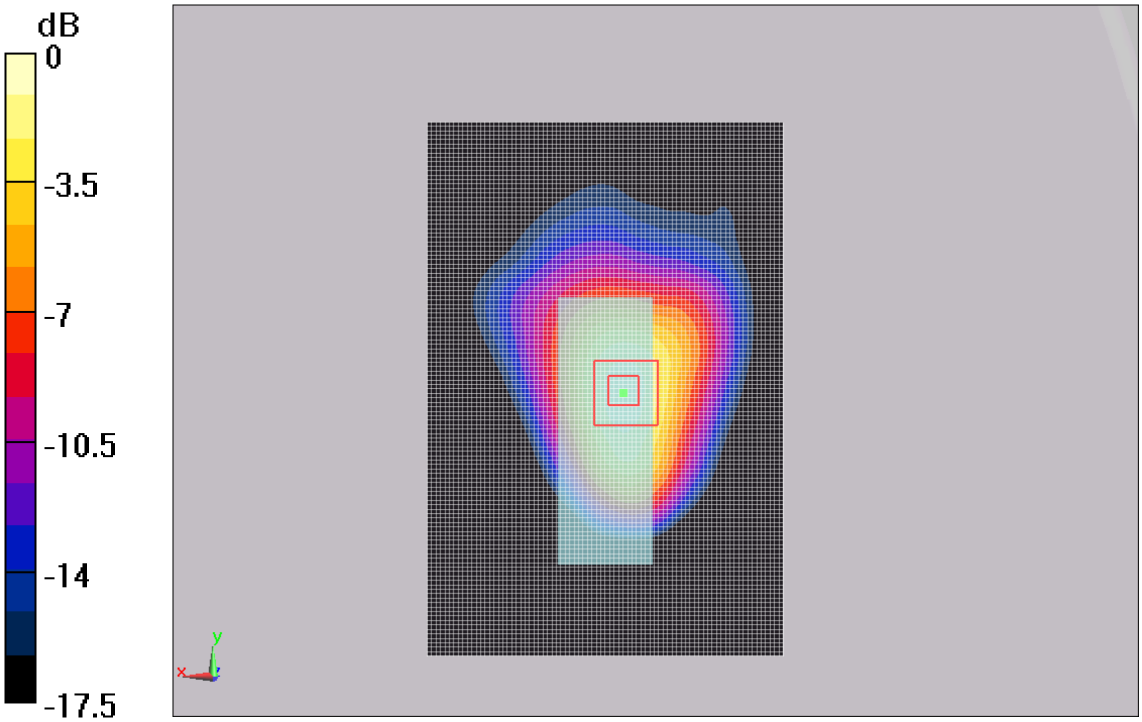
Fig.10 Z-Scan at power reference point (850MHz CH190 Test Position 5-GPRS)

GSM 850 Test Position 2 Middle with EGPRS

Date/Time: 2009-2-16 13:55:42
Electronics: DAE4 Sn771
Medium: 850 Body
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.01 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 850 GPRS Frequency: 836.6 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(6.22, 6.22, 6.22)

Test Position 2_ Channel Middle/Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.578 mW/g

Test Position 2_ Channel Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.6 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.822 W/kg
SAR(1 g) = 0.564 mW/g; SAR(10 g) = 0.365 mW/g
Maximum value of SAR (measured) = 0.610 mW/g



0 dB = 0.610mW/g

Fig.11 850MHz CH190 Test Position 2-EGPRS

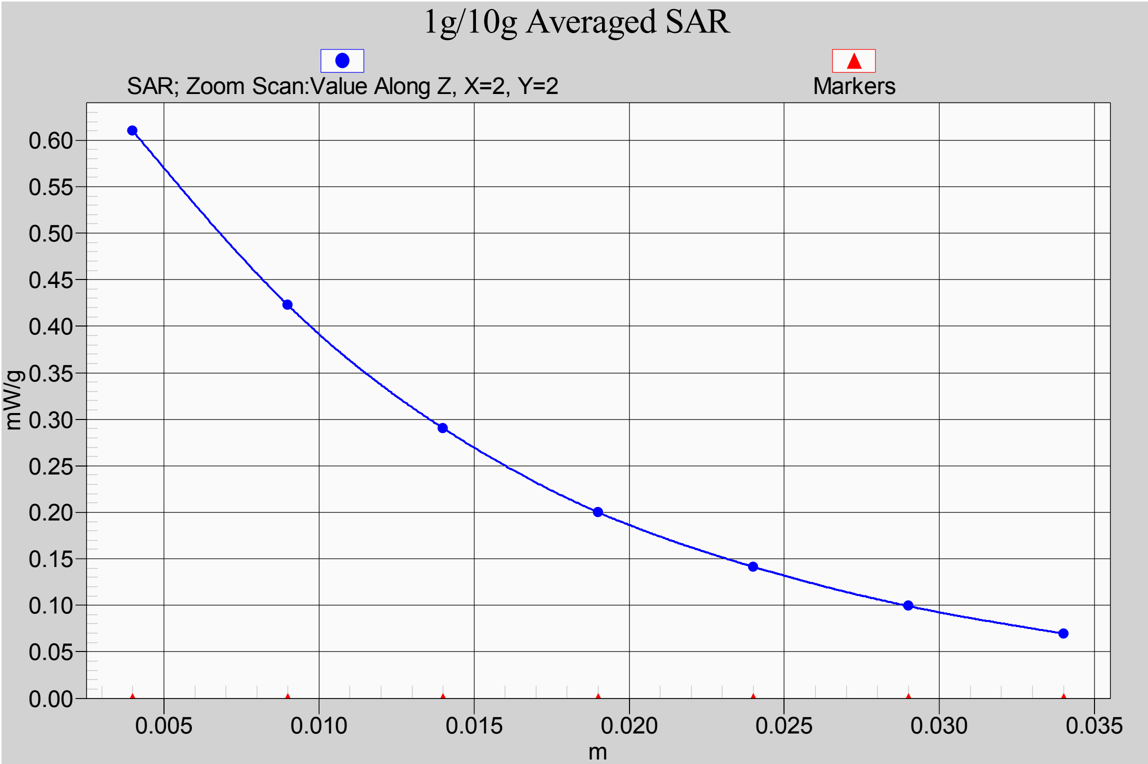


Fig.12 Z-Scan at power reference point (850MHz CH190 Test Position 2-EGPRS)

GSM 1900 Test Position 1 Middle with GPRS

Date/Time: 2009-2-17 9:23:11

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3

Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃

Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 1_ Channel Middle/Area Scan (101x141x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.15 mW/g

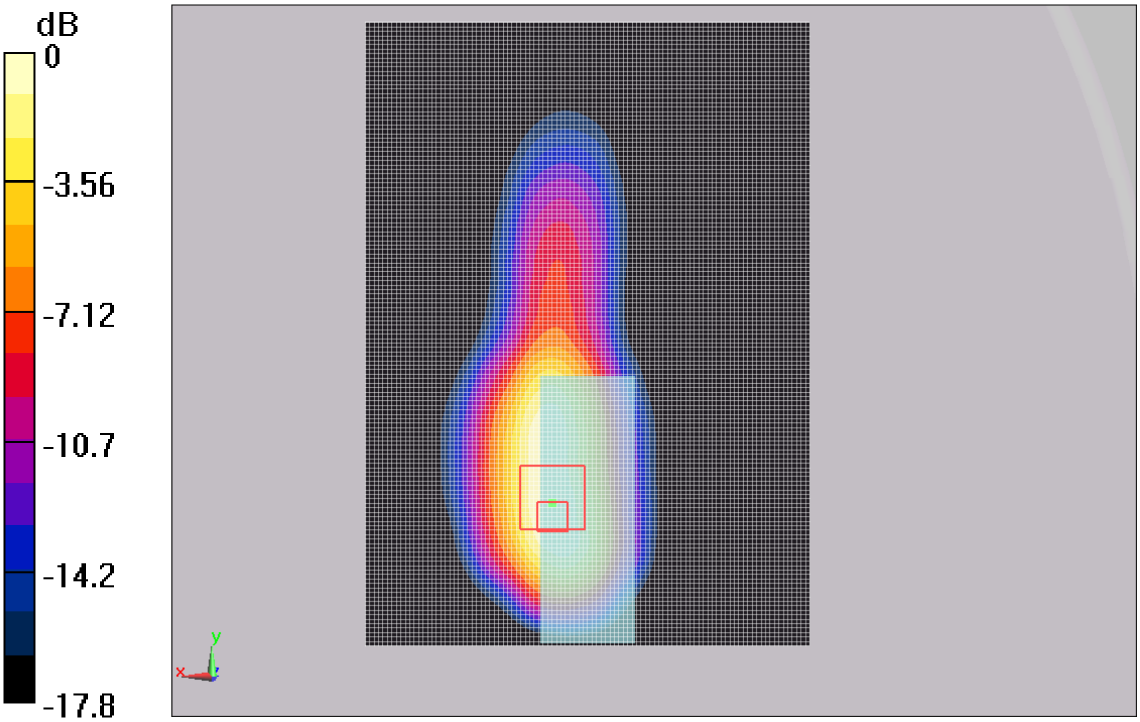
Test Position 1_ Channel Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.6 V/m; Power Drift = -0.155 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 0.992 mW/g; SAR(10 g) = 0.564 mW/g

Maximum value of SAR (measured) = 1.09 mW/g



0 dB = 1.09mW/g

Fig.13 1900 MHz CH661 Test Position 1-GPRS

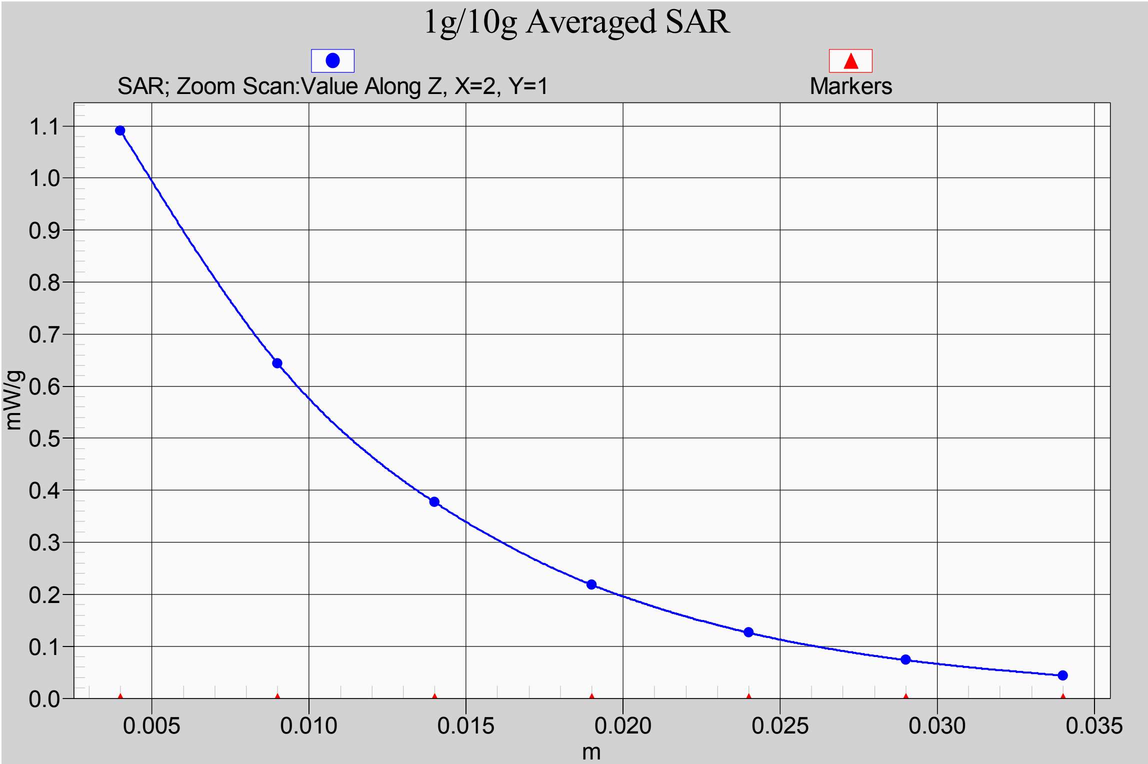


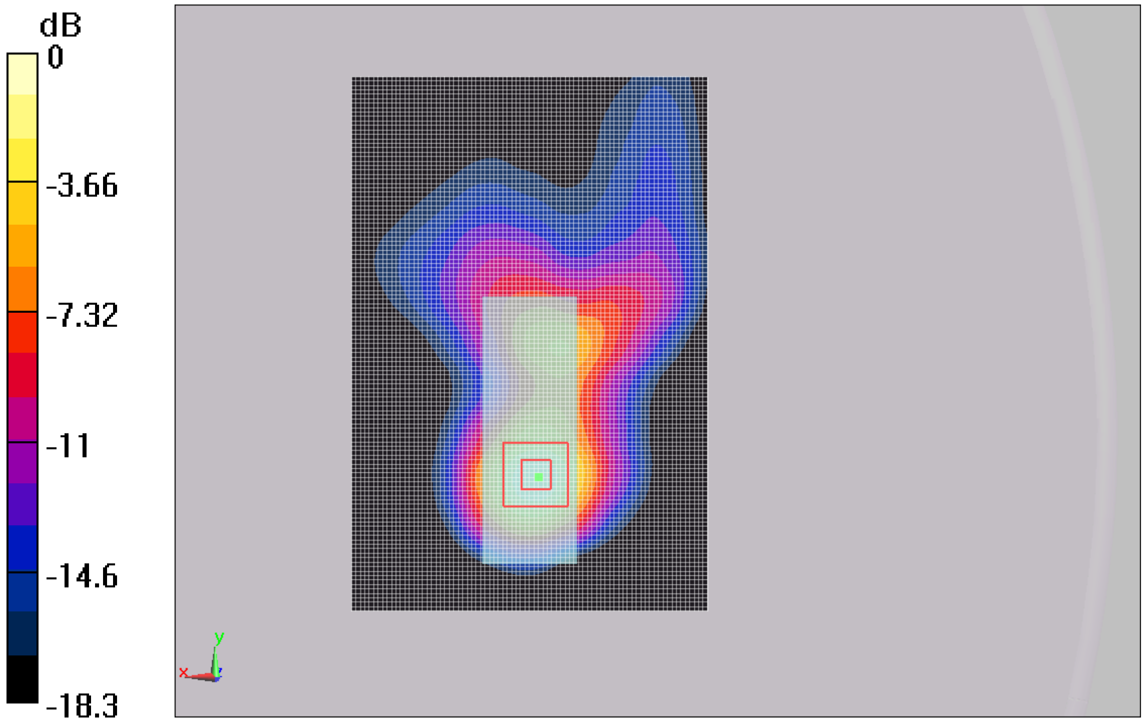
Fig.14 Z-Scan at power reference point (1900 MHz CH661 Test Position 1-GPRS)

GSM 1900 Test Position 2 Middle with GPRS

Date/Time: 2009-2-17 10:11:18
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 2_ Channel Middle /Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.35 mW/g

Test Position 2_ Channel Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.8 V/m; Power Drift = 0.056 dB
Peak SAR (extrapolated) = 2.28 W/kg
SAR(1 g) = 1.20 mW/g; SAR(10 g) = 0.603 mW/g
Maximum value of SAR (measured) = 1.35 mW/g



0 dB = 1.35mW/g

Fig.15 1900 MHz CH661 Test Position 2-GPRS

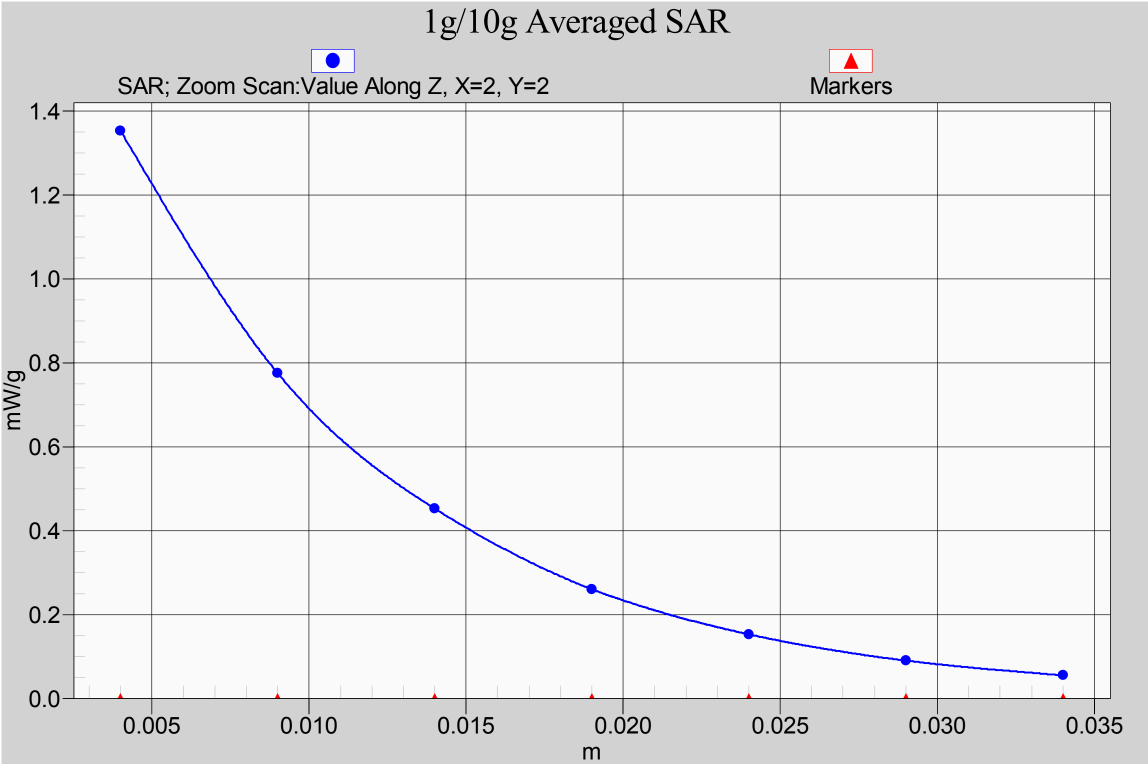


Fig.16 Z-Scan at power reference point (1900 MHz CH661 Test Position 2-GPRS)

GSM 1900 Test Position 3 Middle with GPRS

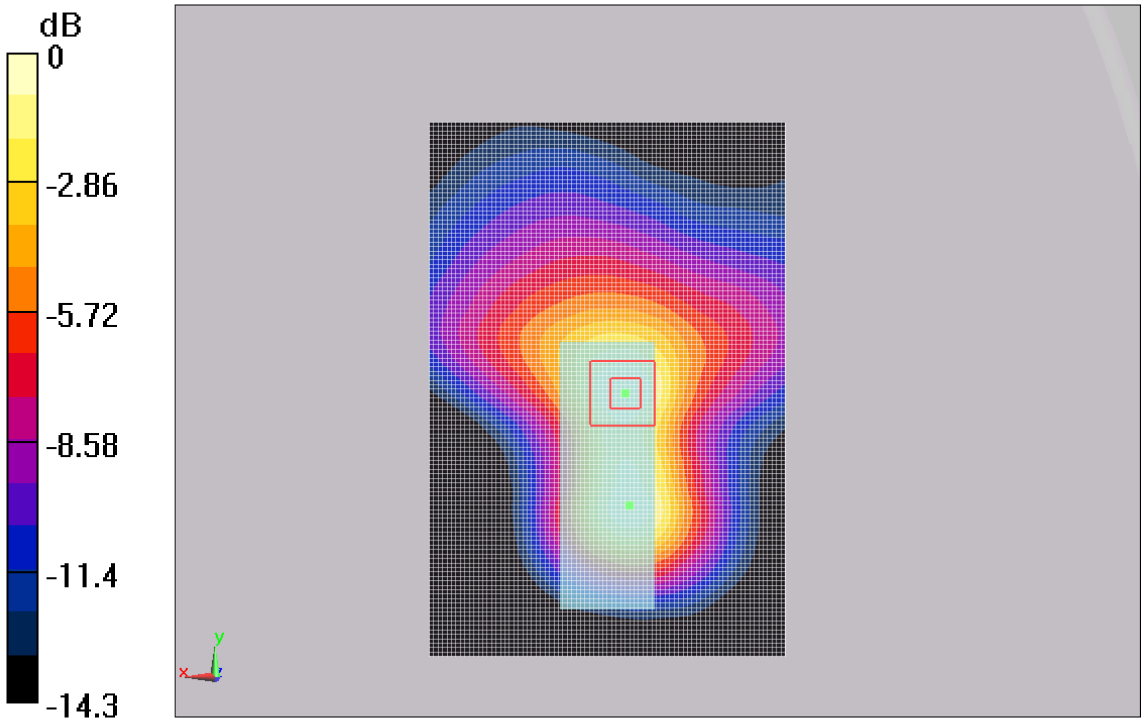
Date/Time: 2009-2-17 11:01:21
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 3_ Channel Middle/Area Scan (81x121x1): Measurement grid:

dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.512 mW/g

Test Position 3_ Channel Middle/Zoom Scan (7x7x7)/Cube 0: Measurement

grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.3 V/m; Power Drift = -0.158 dB
Peak SAR (extrapolated) = 0.753 W/kg
SAR(1 g) = 0.457 mW/g; SAR(10 g) = 0.266 mW/g
Maximum value of SAR (measured) = 0.508 mW/g



0 dB = 0.508mW/g

Fig.17 1900 MHz CH661 Test Position 3-GPRS

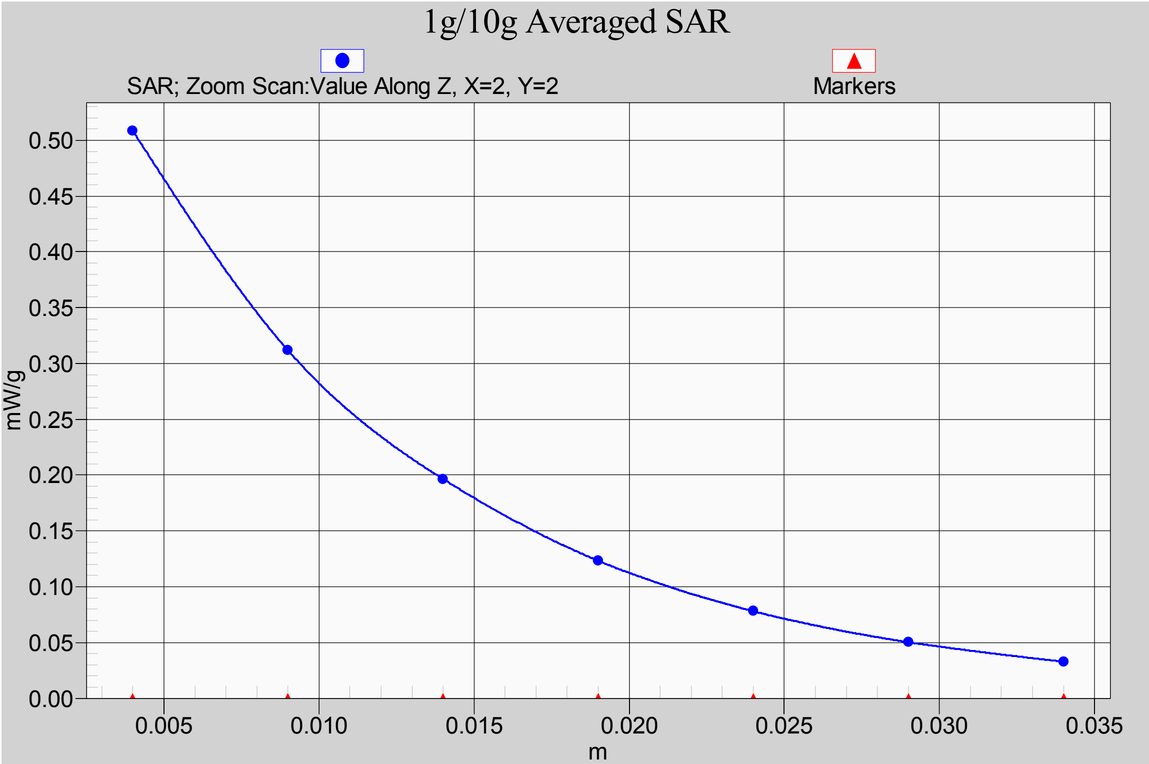


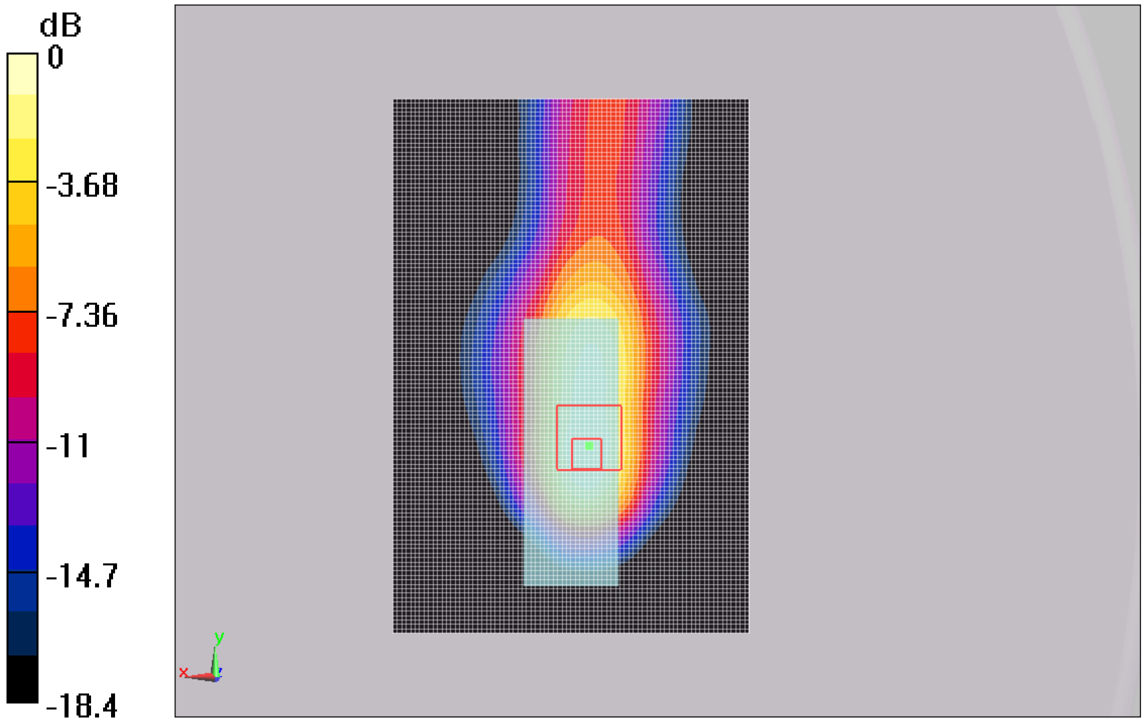
Fig.18 Z-Scan at power reference point (1900 MHz CH661 Test Position 3-GPRS)

GSM 1900 Test Position 4 Middle with GPRS

Date/Time: 2009-2-17 12:21:33
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 4_ Channel Middle /Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.732 mW/g

Test Position 4_ Channel Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.6 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.613 mW/g; SAR(10 g) = 0.324 mW/g
Maximum value of SAR (measured) = 0.665 mW/g



0 dB = 0.665mW/g

Fig.19 1900 MHz CH661 Test Position 4-GPRS

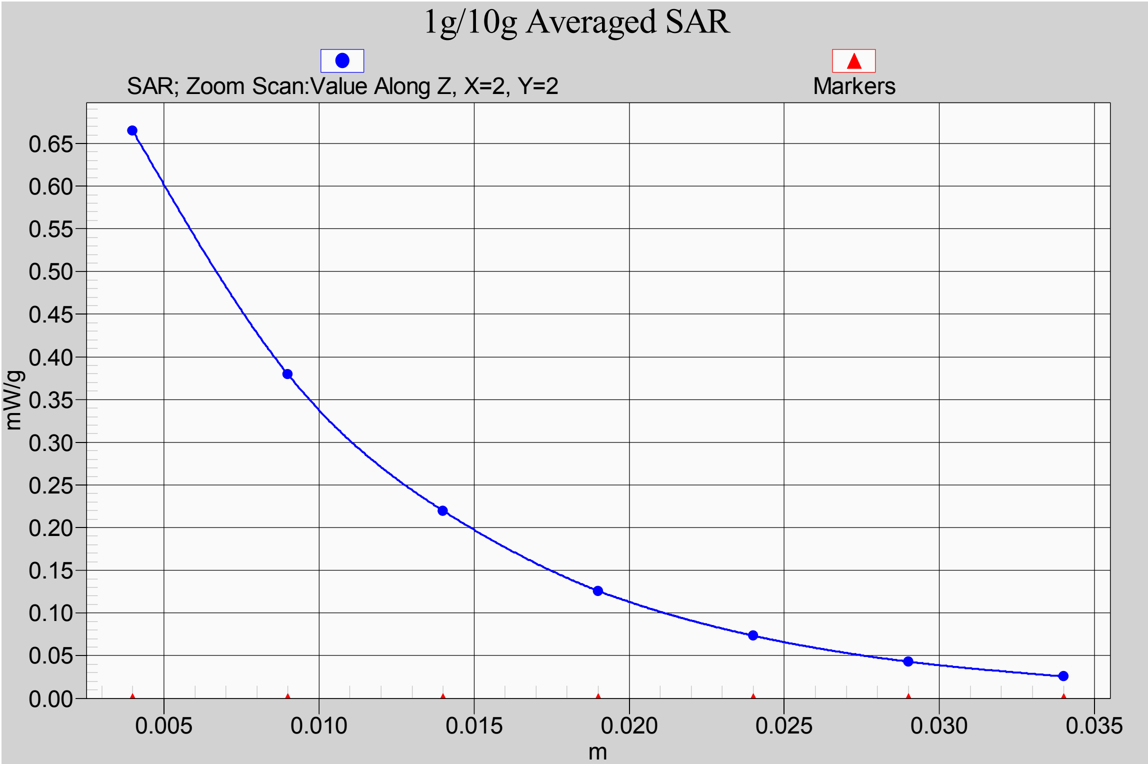


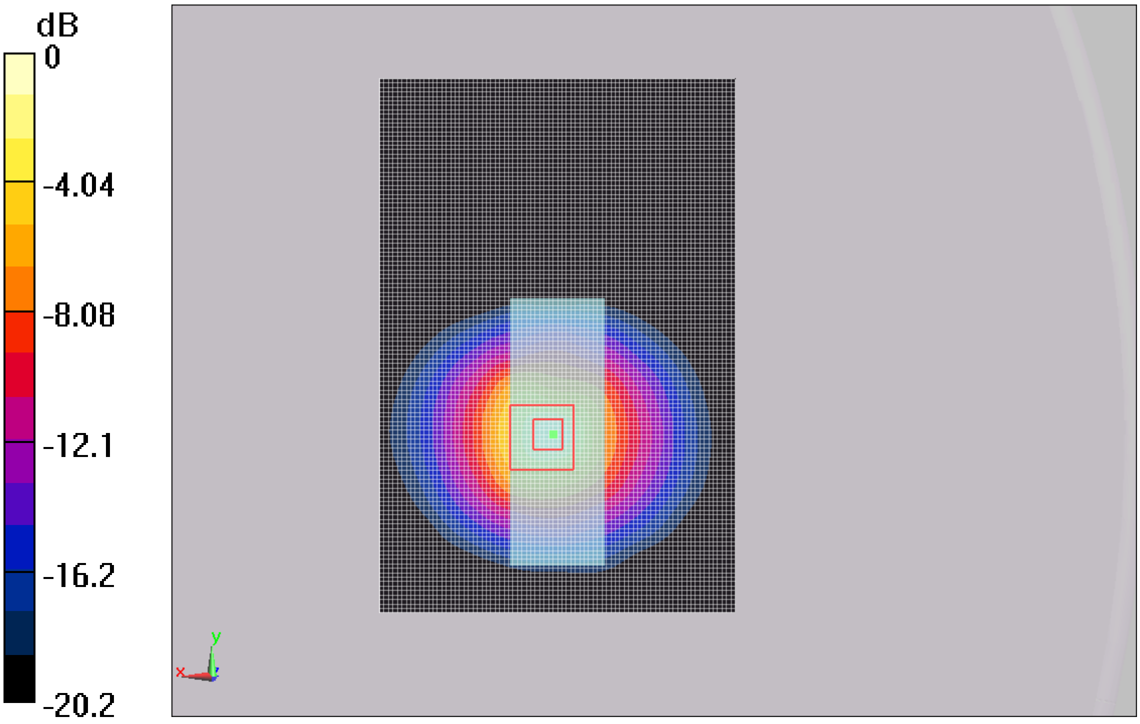
Fig. 20 Z-Scan at power reference point (1900 MHz CH661 Test Position 4-GPRS)

GSM 1900 Test Position 1 Middle with GPRS

Date/Time: 2009-2-17 13:14:52
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 5_ Channel Middle/Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.952 mW/g

Test Position 5_ Channel Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.1 V/m; Power Drift = -0.107 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.662 mW/g; SAR(10 g) = 0.278 mW/g
Maximum value of SAR (measured) = 0.968 mW/g



0 dB = 0.968mW/g

Fig.21 1900 MHz CH661 Test Position 5-GPRS

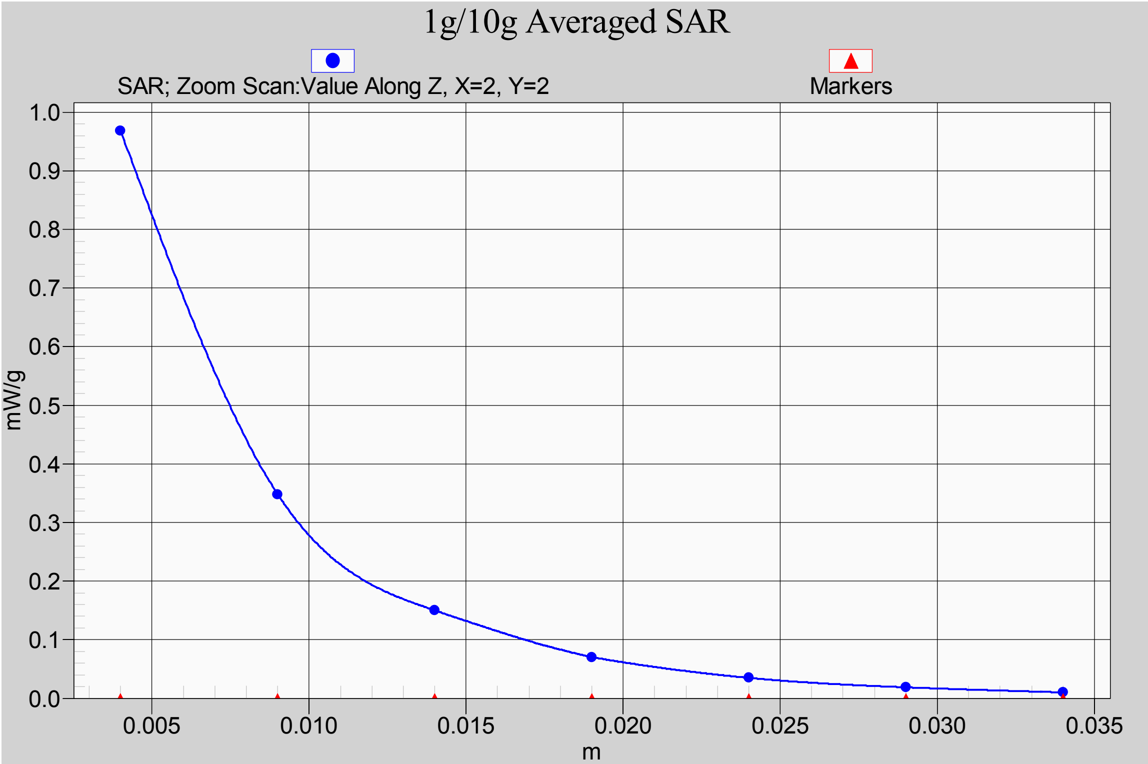


Fig. 22 Z-Scan at power reference point (1900 MHz CH661 Test Position 5-GPRS)

GSM 1900 Test Position 1 High with GPRS

Date/Time: 2009-2-17 14:02:42

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: f = 1910 MHz; σ = 1.54 mho/m; ε_r = 51; ρ = 1000 kg/m³

Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃

Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:2

Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 1_ Channel High/Area Scan (101x141x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.16 mW/g

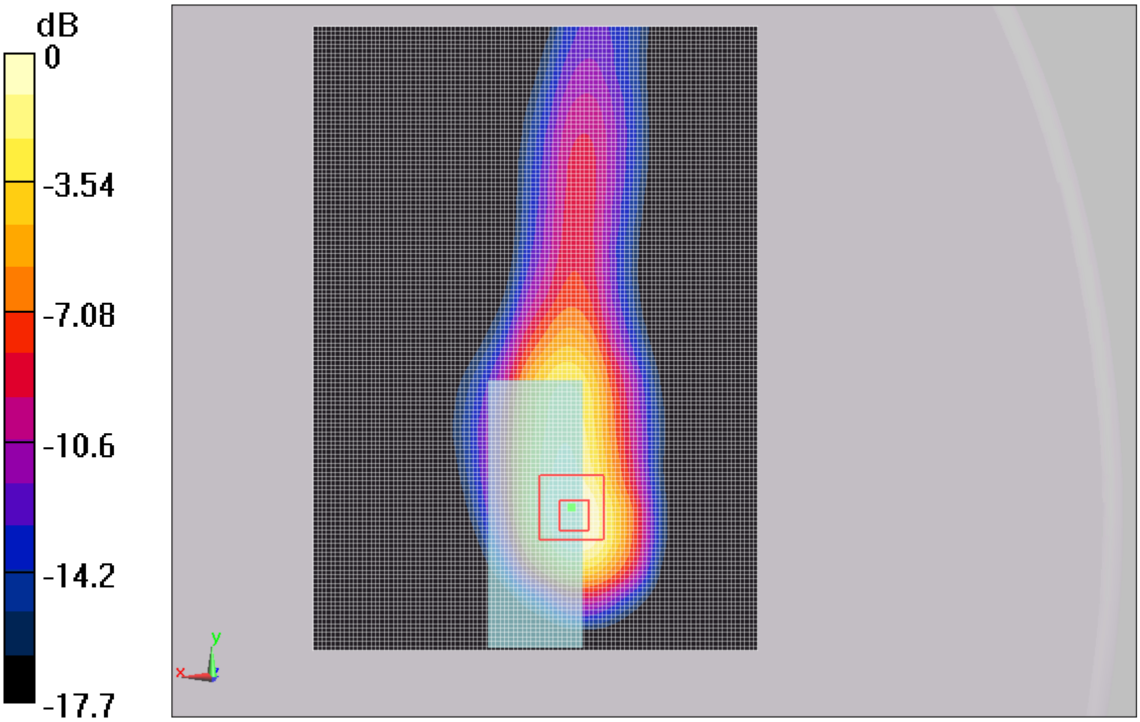
Test Position 1_ Channel High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.1 V/m; Power Drift = 0.081 dB

Peak SAR (extrapolated) = 1.68 W/kg

SAR(1 g) = 0.947 mW/g; SAR(10 g) = 0.515 mW/g

Maximum value of SAR (measured) = 1.02 mW/g



0 dB = 1.02mW/g

Fig.23 1900 MHz CH810 Test Position 1-GPRS

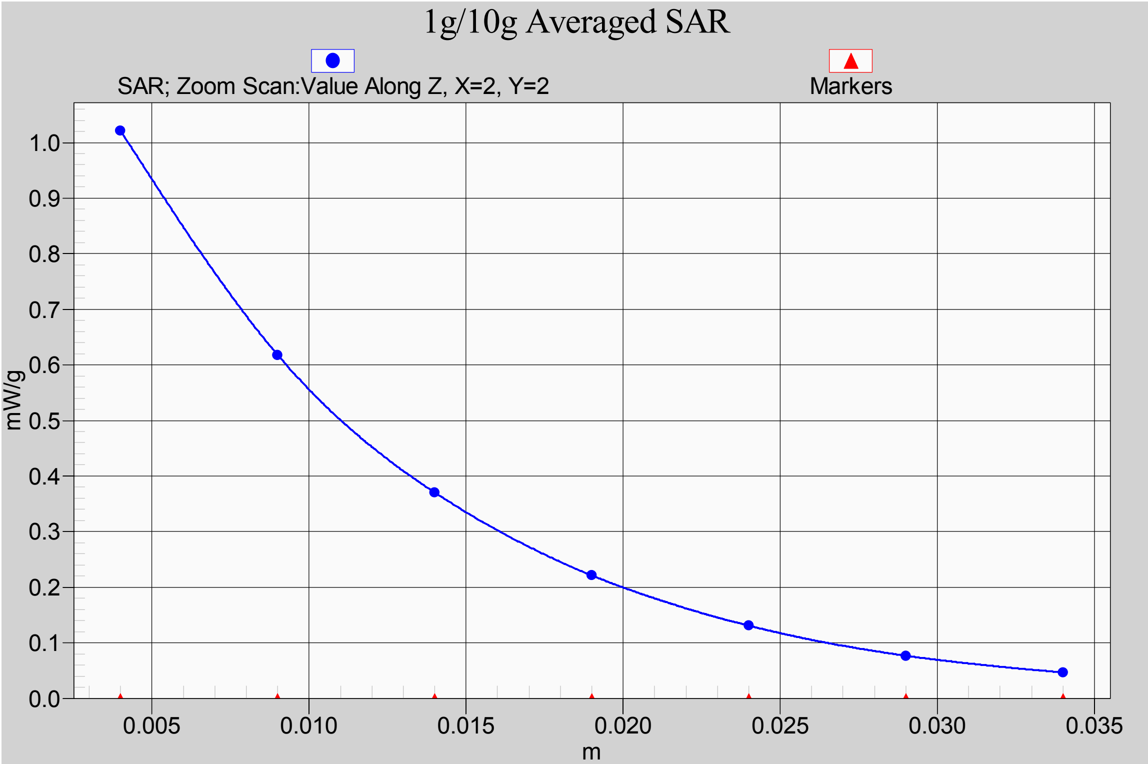


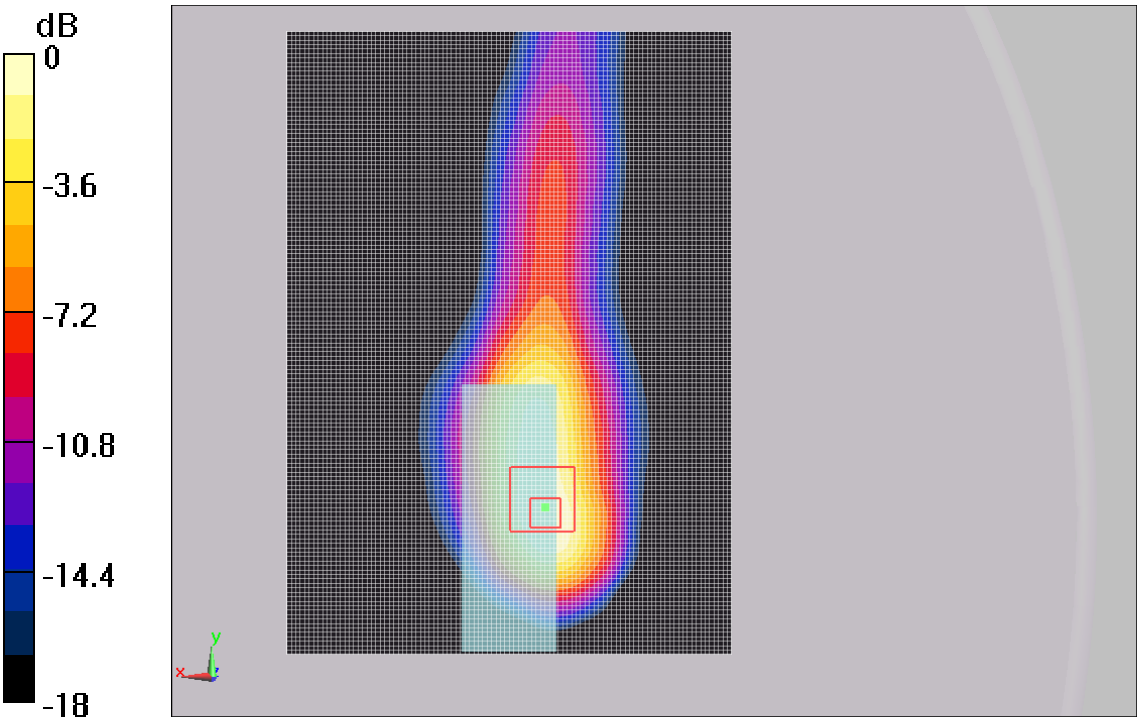
Fig.24 Z-Scan at power reference point (1900 MHz CH810 Test Position 1-GPRS)

GSM 1900 Test Position 1 Low with GPRS

Date/Time: 2009-2-17 14:51:24
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.48 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 1_ Channel Low /Area Scan (101x141x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.06 mW/g

Test Position 1_ Channel Low /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.2 V/m; Power Drift = 0.047 dB
Peak SAR (extrapolated) = 1.49 W/kg
SAR(1 g) = 0.868 mW/g; SAR(10 g) = 0.493 mW/g
Maximum value of SAR (measured) = 0.934 mW/g



0 dB = 0.934mW/g

Fig.25 1900 MHz CH512 Test Position 1-GPRS

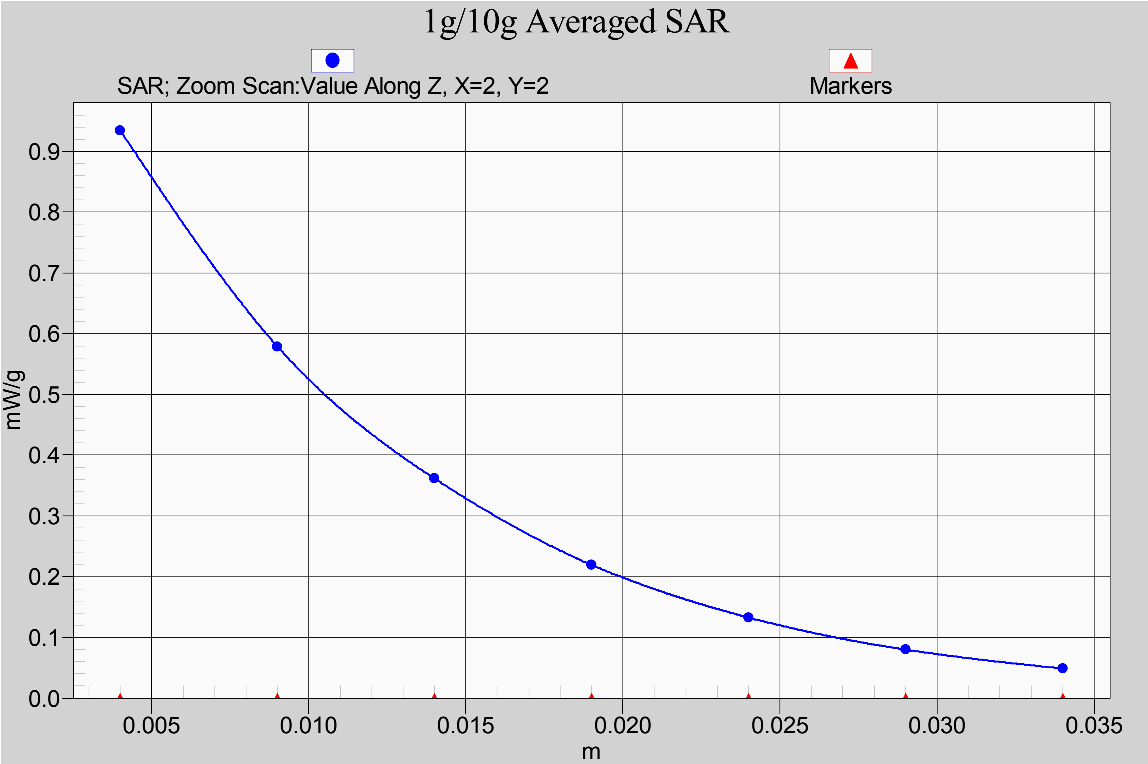


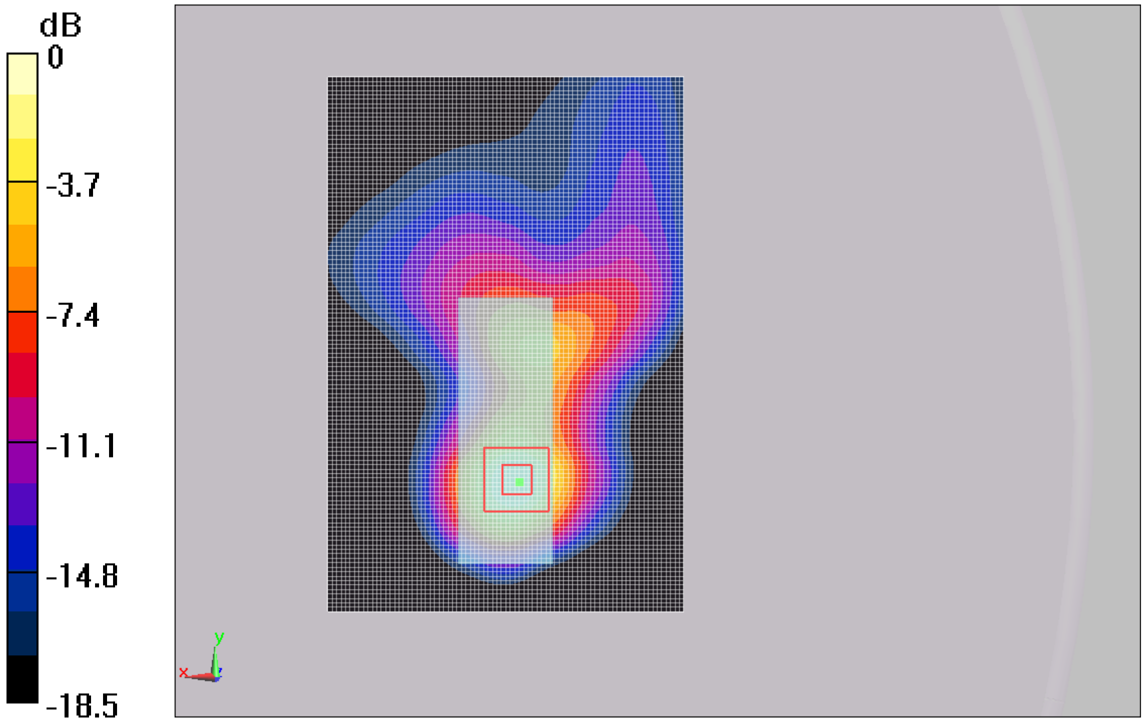
Fig.26 Z-Scan at power reference point (1900 MHz CH512 Test Position 1-GPRS)

GSM 1900 Test Position 2 High with GPRS

Date/Time: 2009-2-17 15:56:17
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1910 MHz; σ = 1.54 mho/m; ε_r = 51; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 2_ Channel High/Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.37 mW/g

Test Position 2_ Channel High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.3 V/m; Power Drift = 0.062 dB
Peak SAR (extrapolated) = 2.22 W/kg
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.593 mW/g
Maximum value of SAR (measured) = 1.32 mW/g



0 dB = 1.32mW/g

Fig.27 1900 MHz CH810 Test Position 2-GPRS

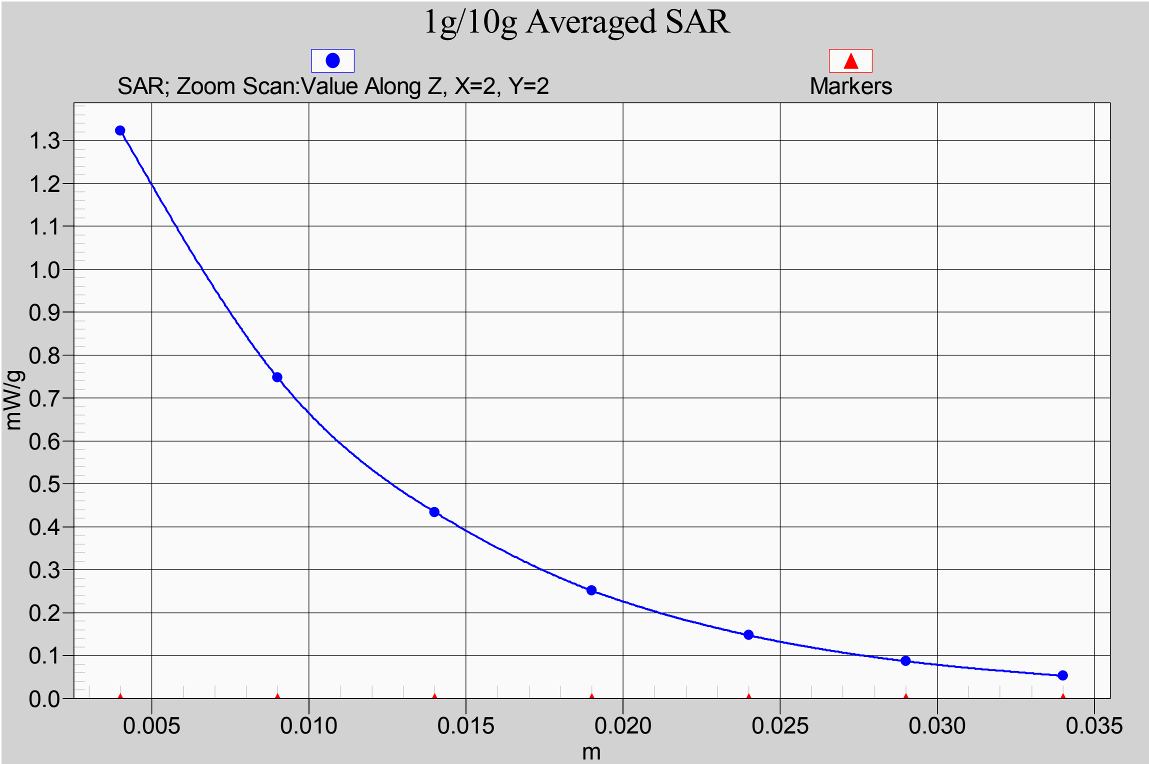
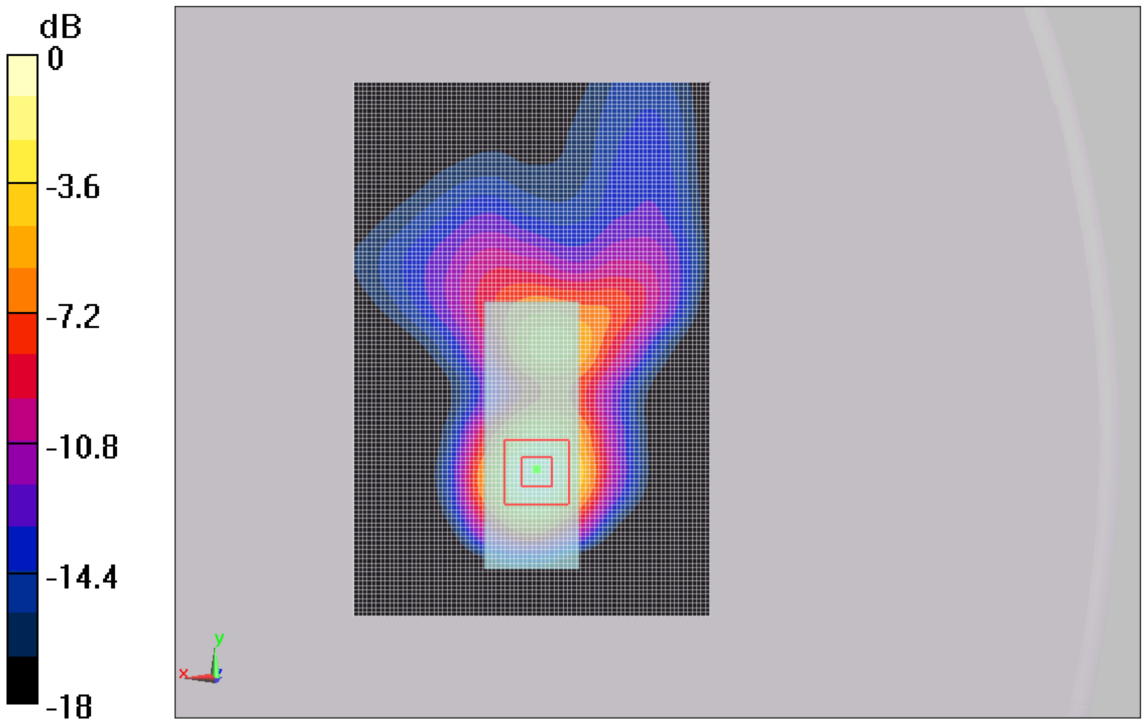


Fig.28 Z-Scan at power reference point (1900 MHz CH810 Test Position 2-GPRS)

GSM 1900 Test Position 1 Low with GPRS
Date/Time: 2009-2-17 16:41:32
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.48 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 2_ Channel Low /Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.32 mW/g

Test Position 2_ Channel Low /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.5 V/m; Power Drift = 0.143 dB
Peak SAR (extrapolated) = 2.19 W/kg
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.583 mW/g
Maximum value of SAR (measured) = 1.31 mW/g



0 dB = 1.31mW/g

Fig.29 1900 MHz CH512 Test Position 2-GPRS

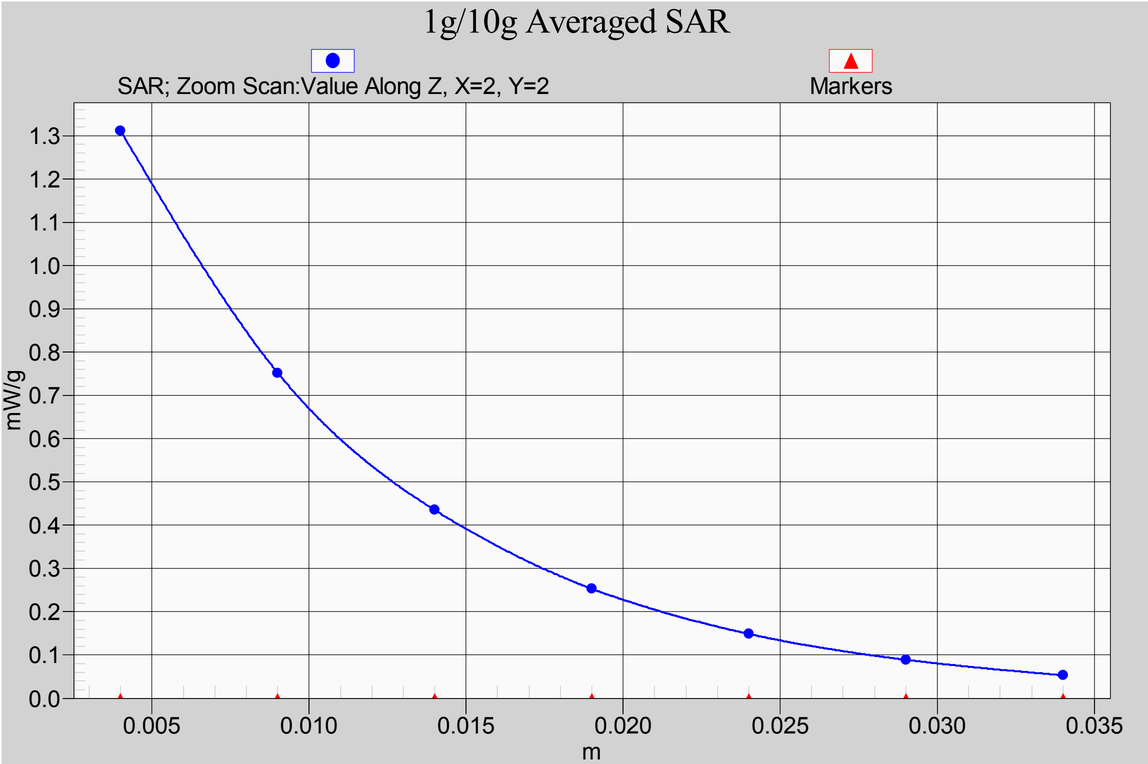


Fig.30 Z-Scan at power reference point (1900 MHz CH512 Test Position 2-GPRS)

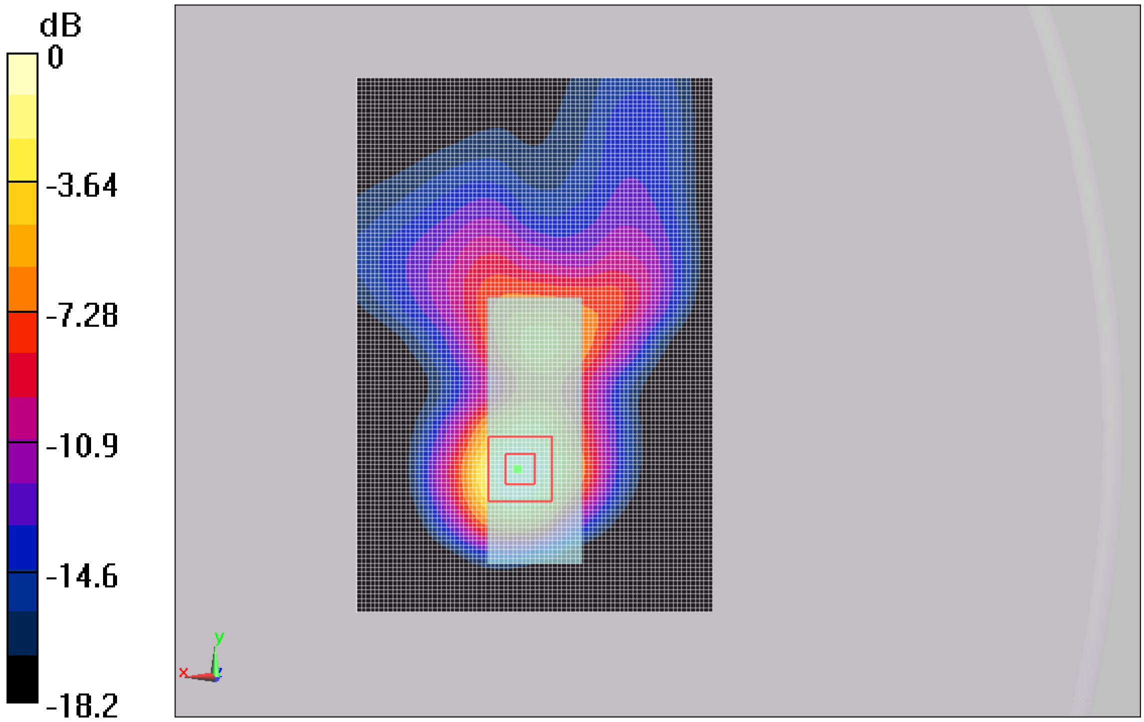
GSM 1900 Test Position 2 Middle with EGPRS

Date/Time: 2009-2-17 17:31:15
Electronics: DAE4 Sn771
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Ambient Temperature:23.3℃ Liqiud Temperature: 22.5℃
Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2
Probe: ES3DV3 - SN3149 ConvF(4.68, 4.68, 4.68)

Test Position 2_ Channel Middle EGPRS/Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.25 mW/g

Test Position 2_ Channel Middle EGPRS/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.2 V/m; Power Drift = -0.054 dB
Peak SAR (extrapolated) = 1.81 W/kg
SAR(1 g) = 0.982 mW/g; SAR(10 g) = 0.493 mW/g
Maximum value of SAR (measured) = 1.12 mW/g



0 dB = 1.12mW/g

Fig.31 1900 MHz CH661 Test Position 2-EGPRS

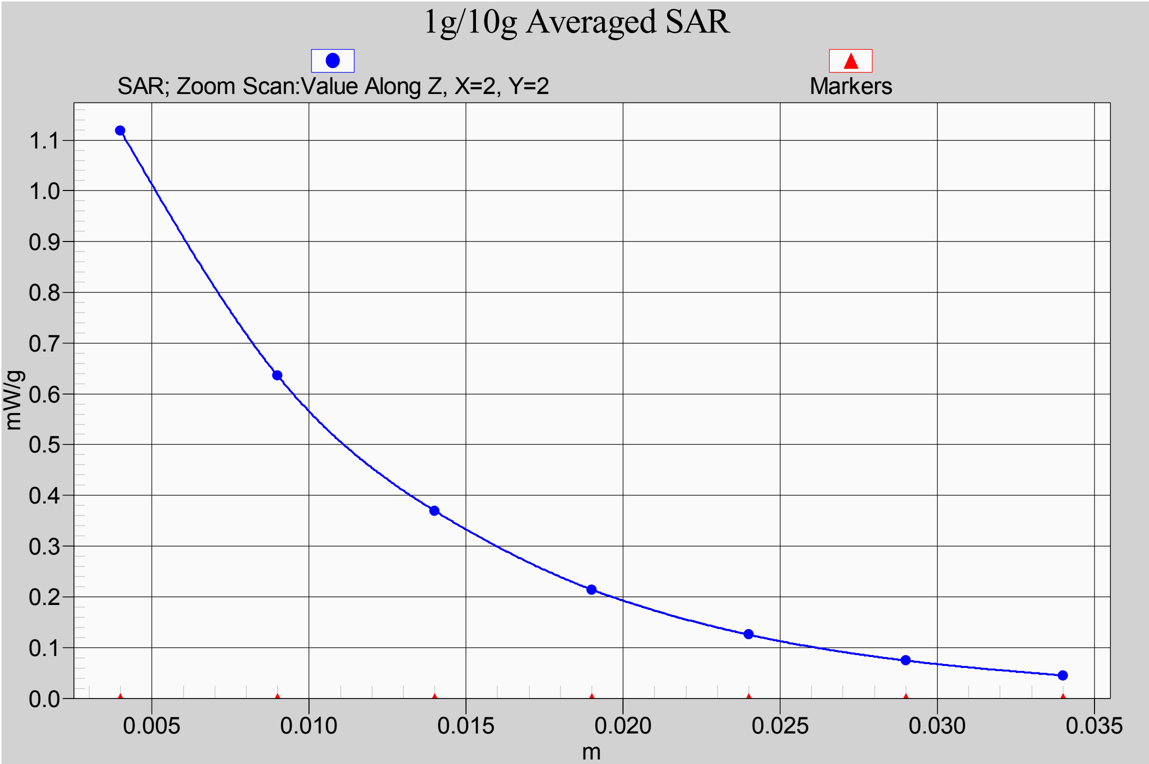


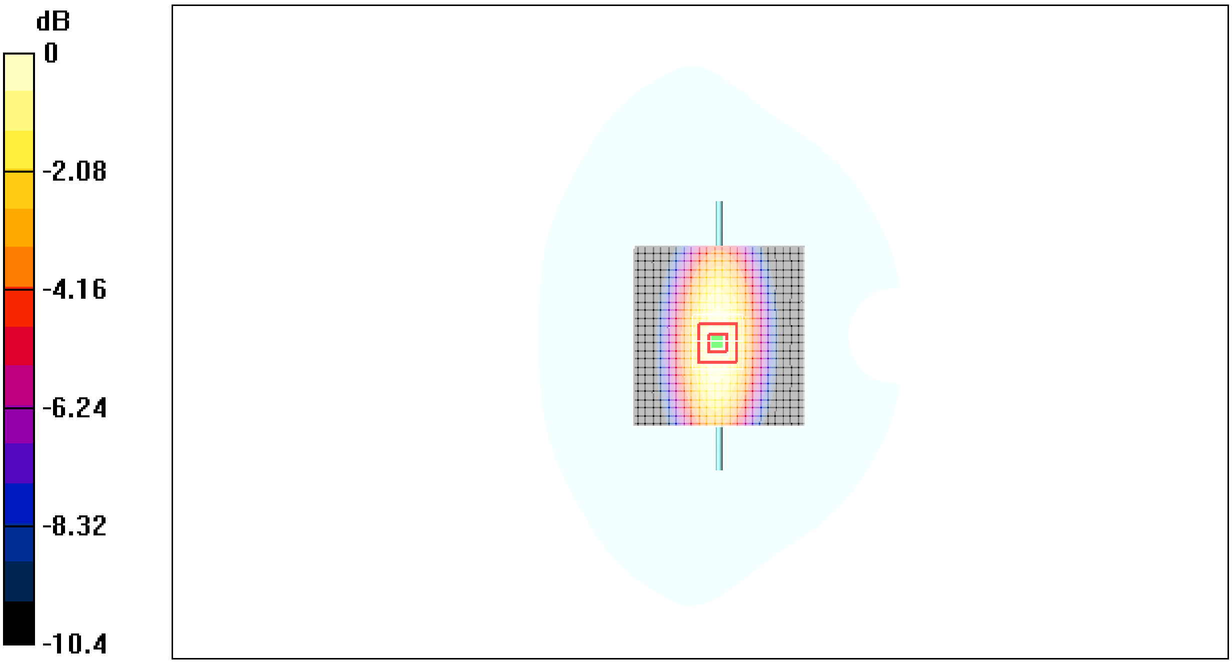
Fig.32 Z-Scan at power reference point (1900 MHz CH661 Test Position 2-EGPRS)

ANNEX D SYSTEM VALIDATION RESULTS

835MHz

Date/Time: 2009-2-16 7:32:09
Electronics: DAE4 Sn771
Medium: Head 835
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 43.5; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: ES3DV3 – SN3149 ConvF(6.56, 6.56, 6.56)
Dipole：835V2-SN：443
835MHz/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 2.68 mW/g

835MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.8 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.50 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.69 mW/g



0 dB = 2.69mW/g

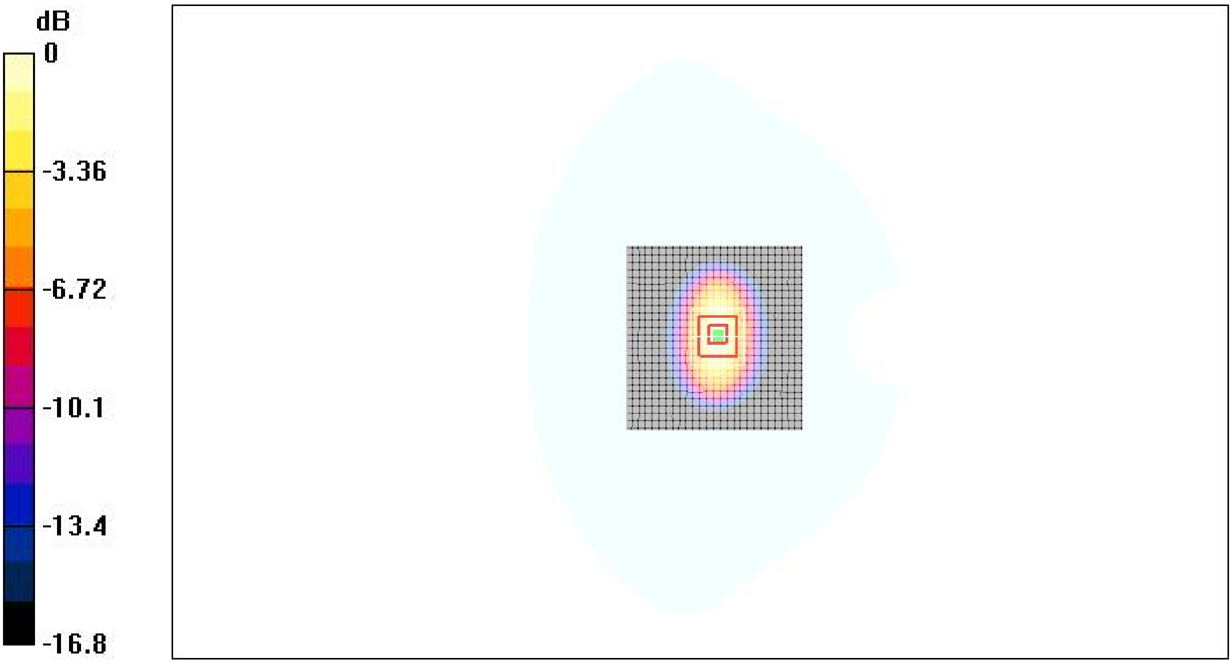
Fig.33 validation 835MHz 250mW

1900MHz

Date/Time: 2009-2-17 8:08:52
Electronics: DAE4 Sn771
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Ambient Temperature:23.3°C Liqiud Temperature: 22.5°C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: ES3DV3 - SN3149 ConvF(5.03, 5.03, 5.03)
Dipole： D1900V2-SN： 541

System Validation/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 11.2 mW/g

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.1 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.91 mW/g; SAR(10 g) = 5.27 mW/g
Maximum value of SAR (measured) = 11.3 mW/g



0 dB = 11.3mW/g

Fig.34 validation 1900MHz 250mW

ANNEX E PROBE CALIBRATION CERTIFICATE

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

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

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

Accreditation No.: **SCS 108**

Client TMC China

Certificate No: ES3DV3-3149_Oct08

CALIBRATION CERTIFICATE

Object	**ES3DV3-SN: 3149**
Calibration procedure(s)	**QA CAL-01.v6** **Calibration procedure for dosimetric E-field probes**
Calibration date:	**October 1, 2008**
Condition of the calibrated item	**In Tolerance**

This calibration certify 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 at an environment temperature (22±3)°C and humidity<70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Data (Calibrated by, Certification NO.)	Scheduled Calibration
Power meter E4419B	GB41293874	6-May-08 (METAS, NO. 251-00388)	May-09
Power sensor E4412A	MY41495277	6-May-08 (METAS, NO. 251-00388)	May-09
Reference 3 dB Attenuator	SN:S5054 (3c)	11-Aug-08 (METAS, NO. 251-00403)	Aug-09
Reference 20 dB Attenuator	SN:S5086 (20b)	4-May-08 (METAS, NO. 251-00389)	May-09
Reference 30 dB Attenuator	SN:S5129 (30b)	11-Aug-08 (METAS, NO. 251-00404)	Aug-09
DAE4	SN:617	11-Jun-08 (SPEAG, NO.DAE4-907_Jun08)	Jun-09
Reference Probe ES3DV2	SN: 3013	13-Jan-08 (SPEAG, NO. ES3-3013_Jan08)	Jan-09

Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Aug-99(SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01(SPEAG, in house check Nov-07)	In house check: Nov-09

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

Issued: October 1, 2008

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

Calibration Laboratory of
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Engineering AG
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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect 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 (no uncertainty required). DCP does not depend on frequency nor media.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN: 3149

Manufactured: June 12, 2007

Calibrated: October 1, 2008

Calibrated for DASY4 System

DASY – Parameters of Probe: ES3DV3 SN:3149

Sensitivity in Free Space[A]

NormX	1.14±10.1%	$\mu V/(V/m)^2$
NormY	1.23±10.1%	$\mu V/(V/m)^2$
NormZ	1.29±10.1%	$\mu V/(V/m)^2$

Diode Compression[B]

DCP X	94mV
DCP Y	95mV
DCP Z	91mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)
Please see Page 8

Boundary Effect

TSL 900MHz Typical SAR gradient: 5% per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SARbe[%]	Without Correction Algorithm	3.8	1.6
SARbe[%]	With Correction Algorithm	0.8	0.7

TSL 1810MHz Typical SAR gradient: 10% per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SARbe[%]	Without Correction Algorithm	6.8	3.6
SARbe[%]	With Correction Algorithm	0.4	0.2

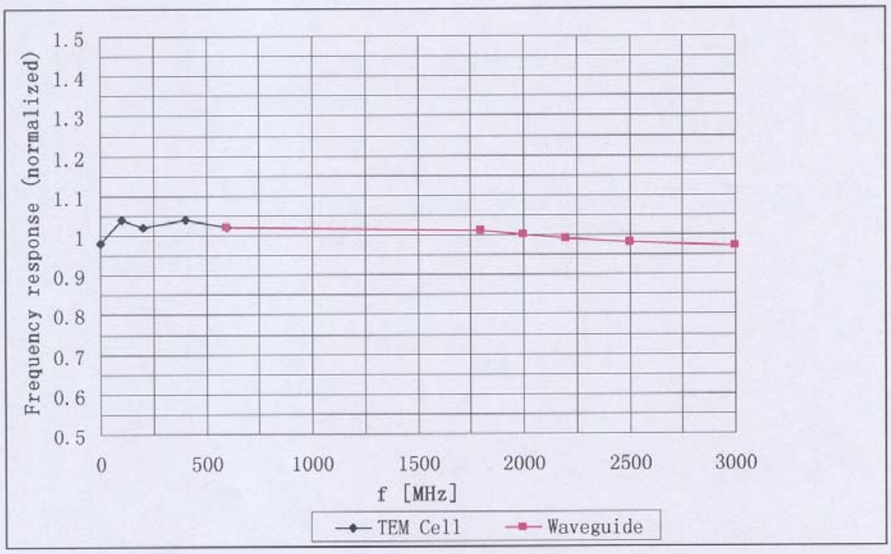
Sensor Offset

Probe Tip to Sensor Center 2.0 mm

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

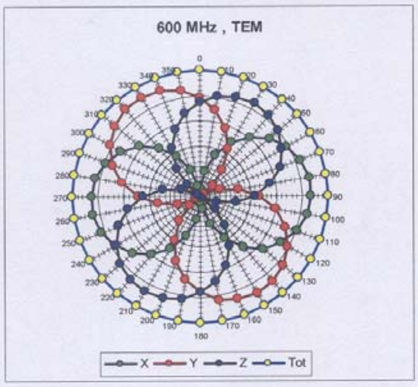
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).
[B] Numerical linearization parameter: uncertainty not required.

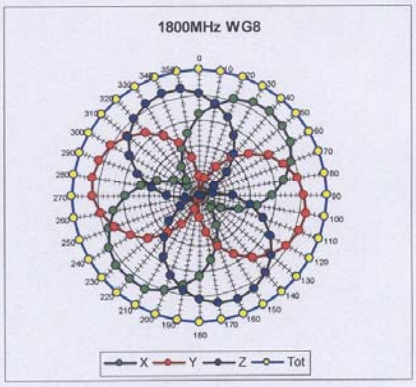
Frequency Response of E-Field

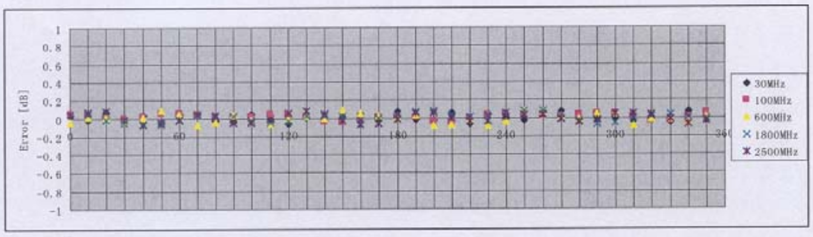


Uncertainty of Frequency Response of E-field: ±5.0% (k=2)

Receiving Pattern (Φ), θ =0°







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