

Fig. 56 Z-Scan at power reference point (850 MHz CH251)

850 Body Towards Ground Middle

Date/Time: 2008-6-10 17:47:44

Electronics: DAE4 Sn777

Medium: 850 Body

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 1.04$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 850 Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(5.66, 5.66, 5.66)

Toward Ground Middle/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.705 mW/g

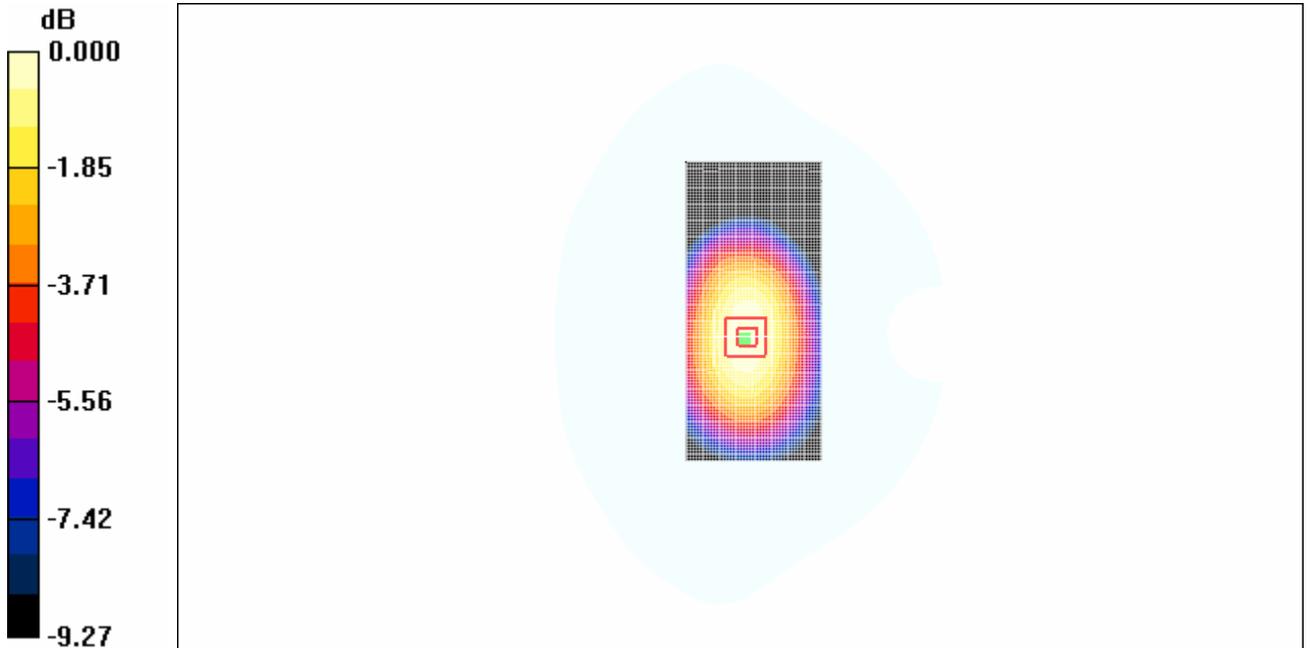
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 26.4 V/m; Power Drift = -0.083 dB

Peak SAR (extrapolated) = 0.880 W/kg

SAR(1 g) = 0.665 mW/g; SAR(10 g) = 0.478 mW/g

Maximum value of SAR (measured) = 0.705 mW/g



0 dB = 0.705mW/g

Fig. 57 850 MHz CH190

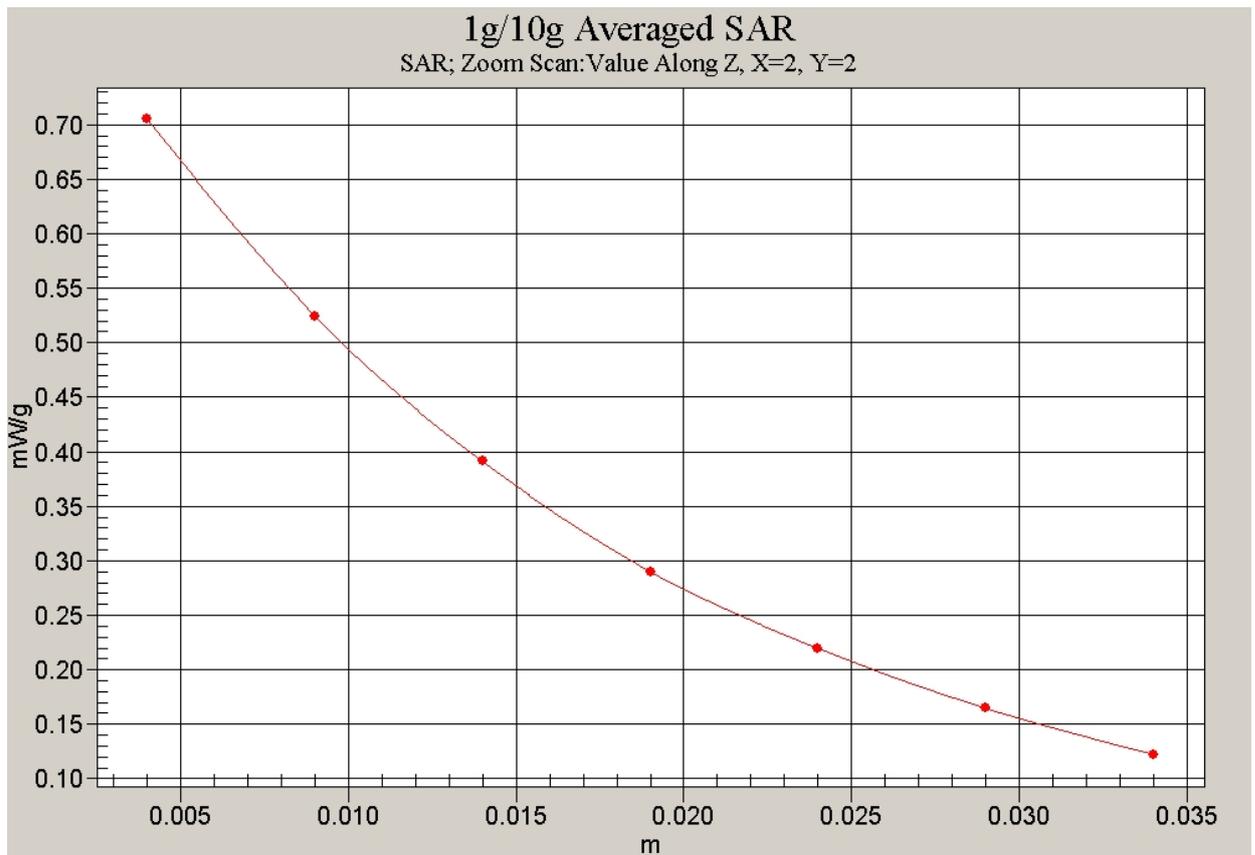


Fig. 58 Z-Scan at power reference point (850 MHz CH190)

850 Body Towards Ground Low

Date/Time: 2008-6-10 18:00:56

Electronics: DAE4 Sn777

Medium: 850 Body

Medium parameters used: $f = 825$ MHz; $\sigma = 1.03$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 850 Frequency: 824.2 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(5.66, 5.66, 5.66)

Toward Ground Low/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.766 mW/g

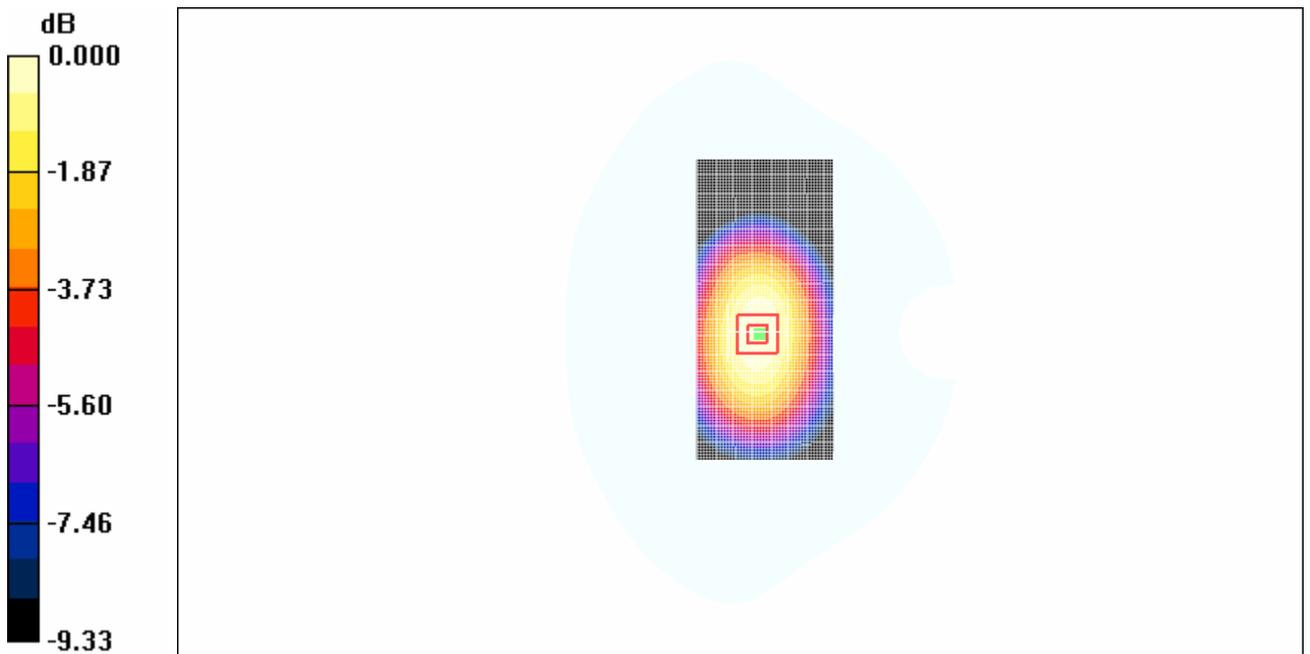
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.7 V/m; Power Drift = -0.068 dB

Peak SAR (extrapolated) = 0.959 W/kg

SAR(1 g) = 0.722 mW/g; SAR(10 g) = 0.521 mW/g

Maximum value of SAR (measured) = 0.764 mW/g



0 dB = 0.764mW/g

Fig. 59 850 MHz CH128

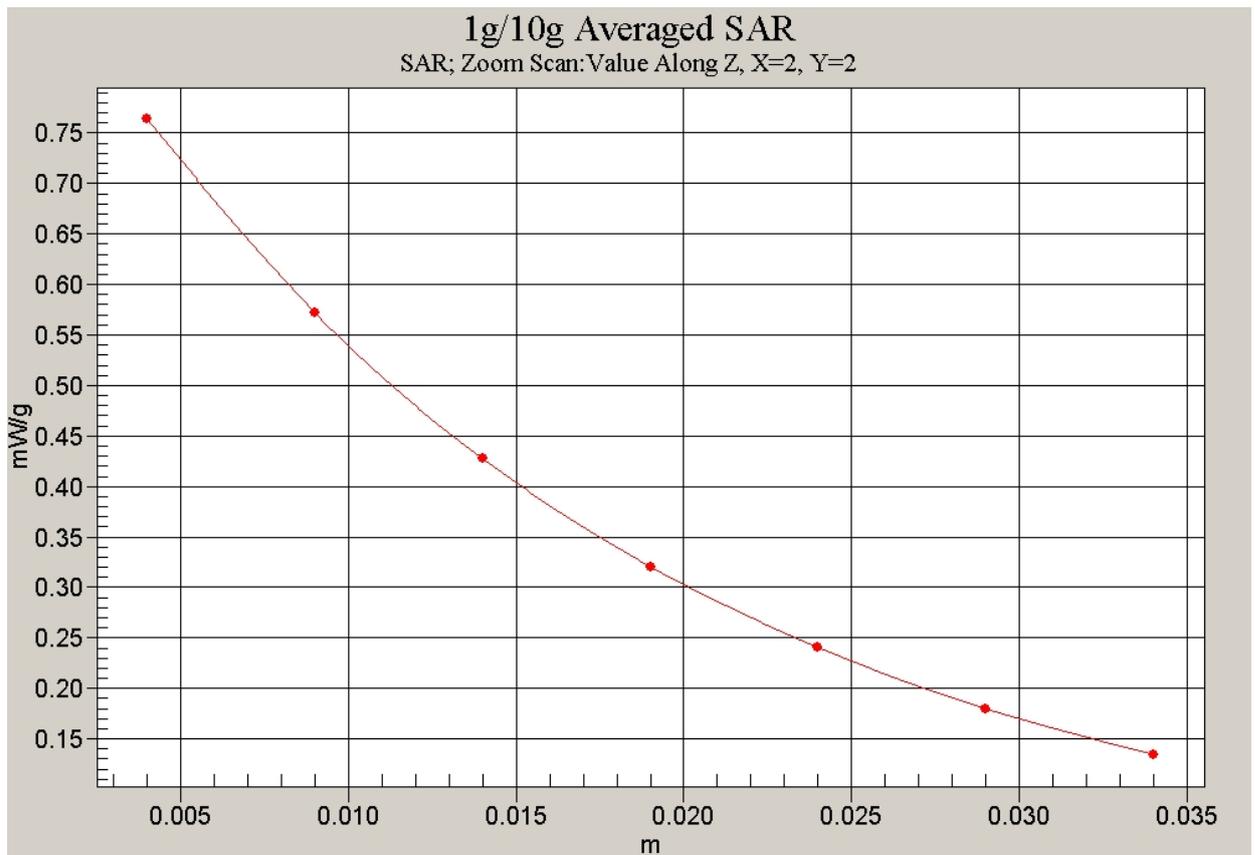


Fig. 60 Z-Scan at power reference point (850 MHz CH128)

850 Body Towards Ground Low with headset

Date/Time: 2008-6-10 17:12:39

Electronics: DAE4 Sn777

Medium: 850 Body

Medium parameters used: $f = 825 \text{ MHz}$; $\sigma = 1.03 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 850 Frequency: 824.2 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(5.66, 5.66, 5.66)

Toward Ground Low/Area Scan (51x111x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 0.565 mW/g

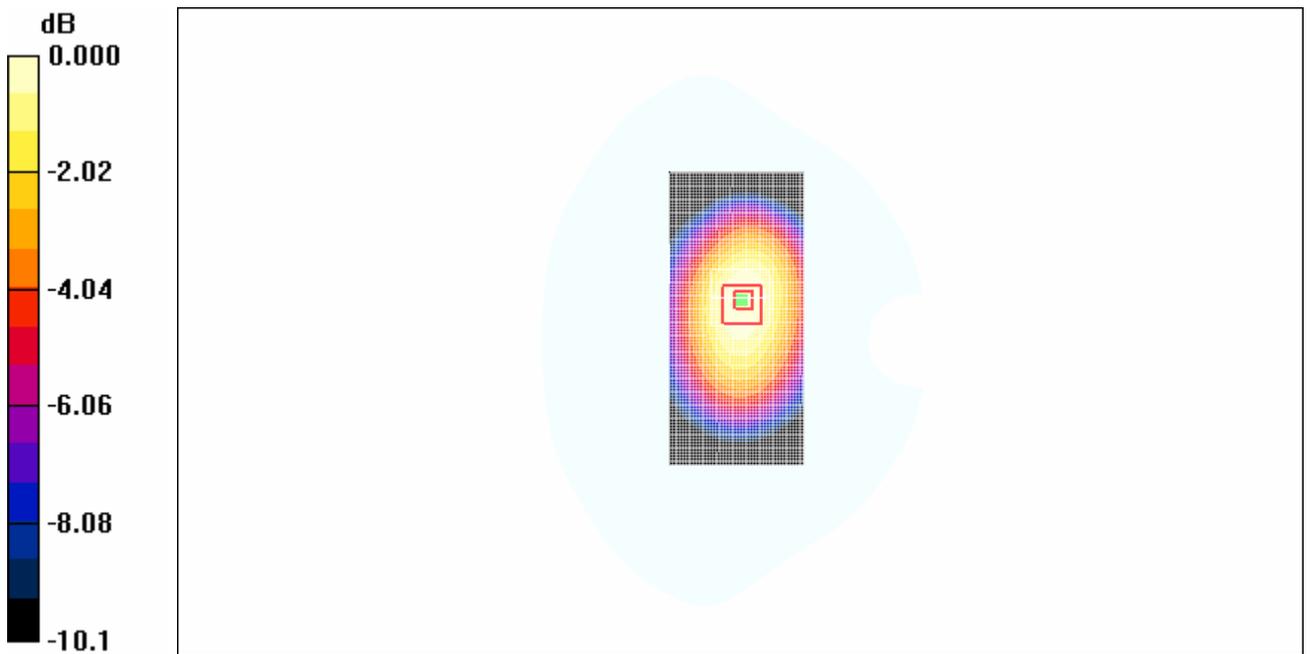
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.1 V/m ; Power Drift = -0.200 dB

Peak SAR (extrapolated) = 0.690 W/kg

SAR(1 g) = 0.530 mW/g ; SAR(10 g) = 0.383 mW/g

Maximum value of SAR (measured) = 0.560 mW/g



0 dB = 0.560mW/g

Fig. 61 850 MHz CH128

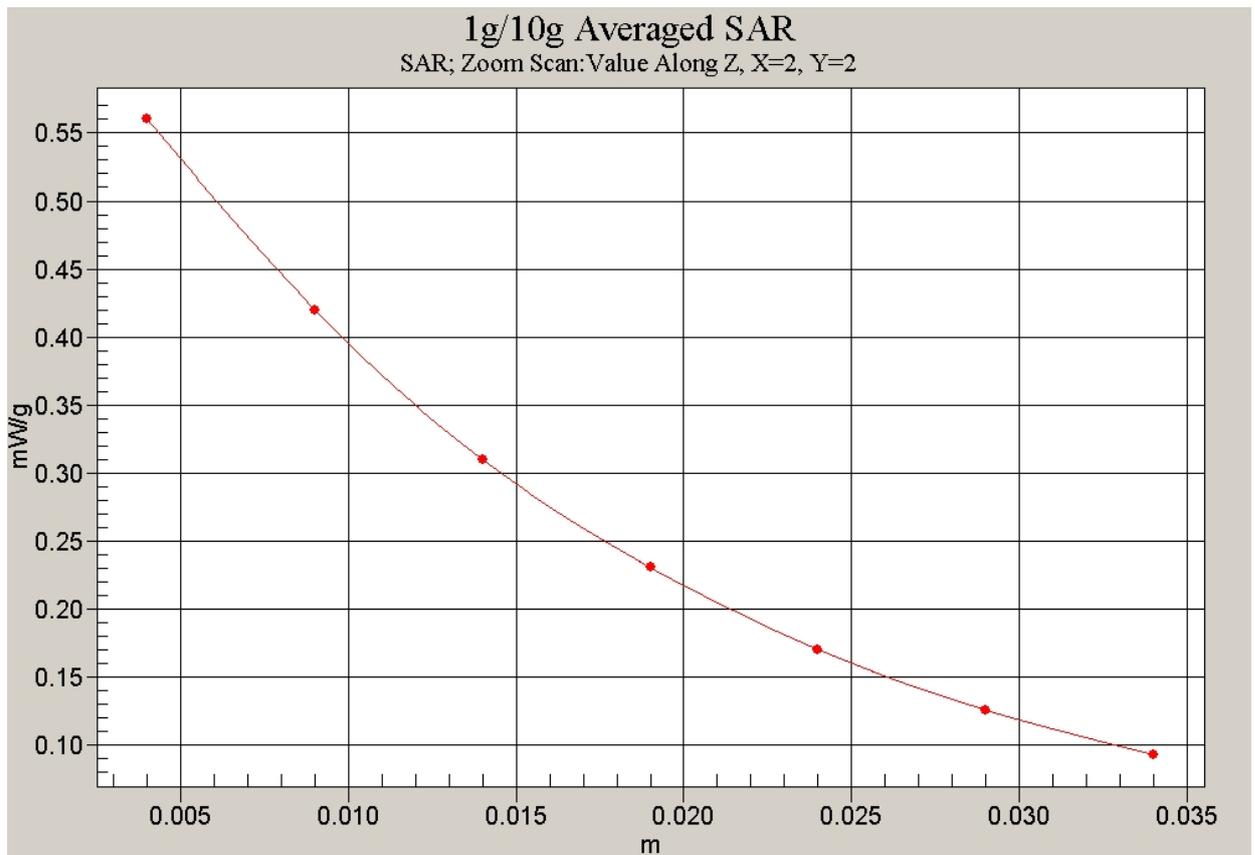


Fig. 62 Z-Scan at power reference point (850 MHz CH128)

1900 Body Toward Phantom High

Date/Time: 2008-6-11 9:06:14

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz new Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

Toward Phantom High/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.189 mW/g

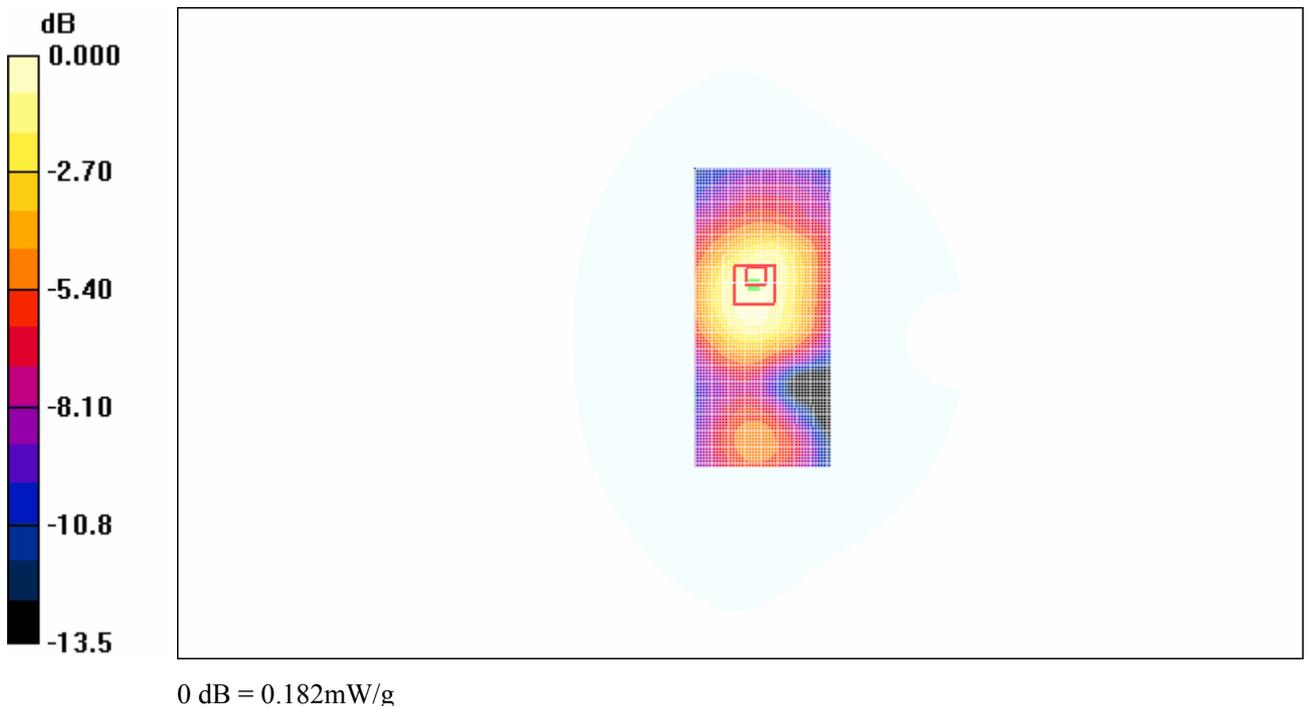
Toward Phantom High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

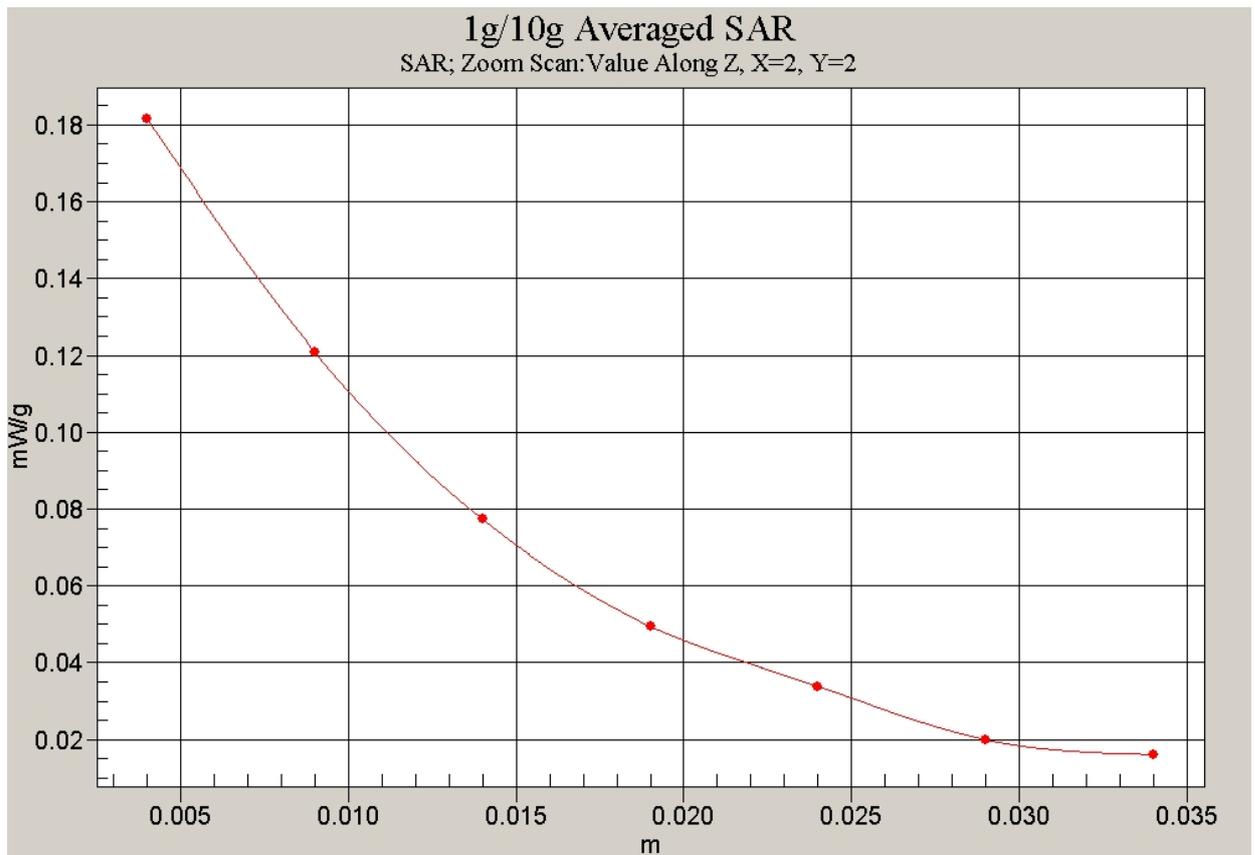
Reference Value = 8.48 V/m; Power Drift = 0.035 dB

Peak SAR (extrapolated) = 0.271 W/kg

SAR(1 g) = 0.172 mW/g; SAR(10 g) = 0.108 mW/g

Maximum value of SAR (measured) = 0.182 mW/g

**Fig. 63 PCS 1900MHz, Body, Towards Phantom, CH810**



**Fig. 64 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Phantom, CH810)**

1900 Body Toward Phantom Middle

Date/Time: 2008-6-11 9:19:28

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

Toward Phantom Middle/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.198 mW/g

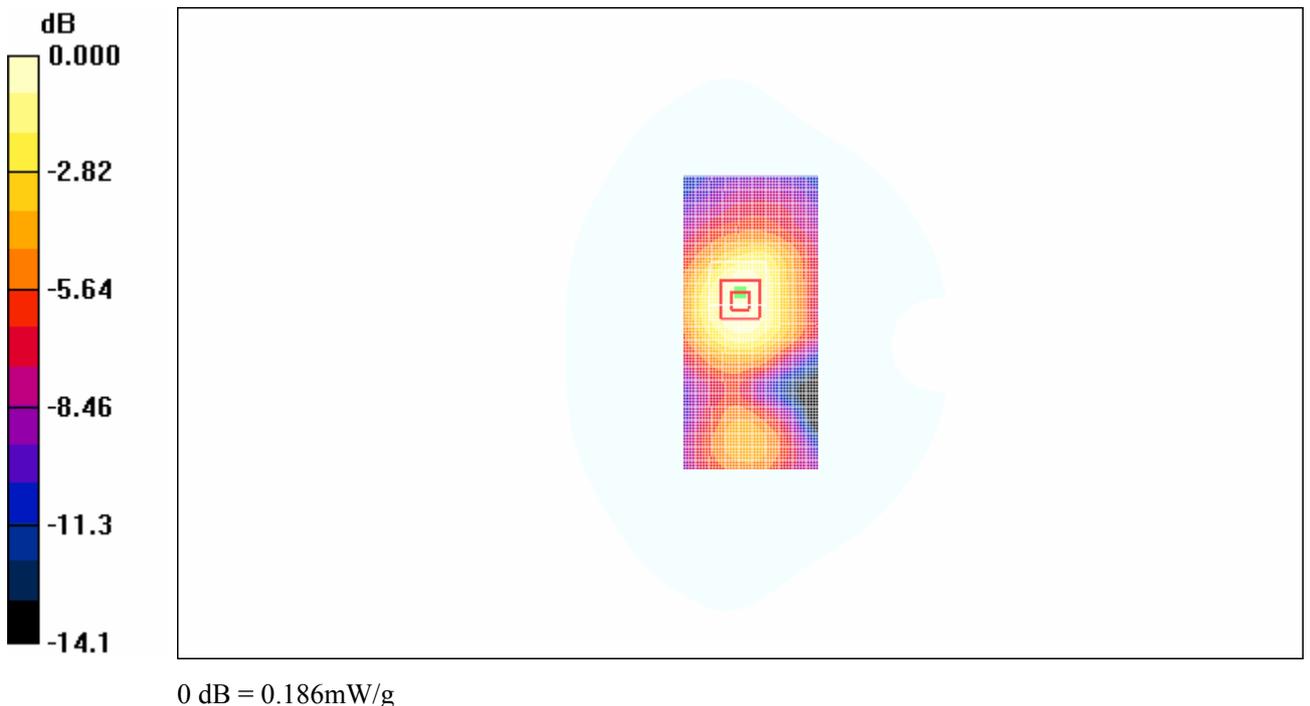
Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

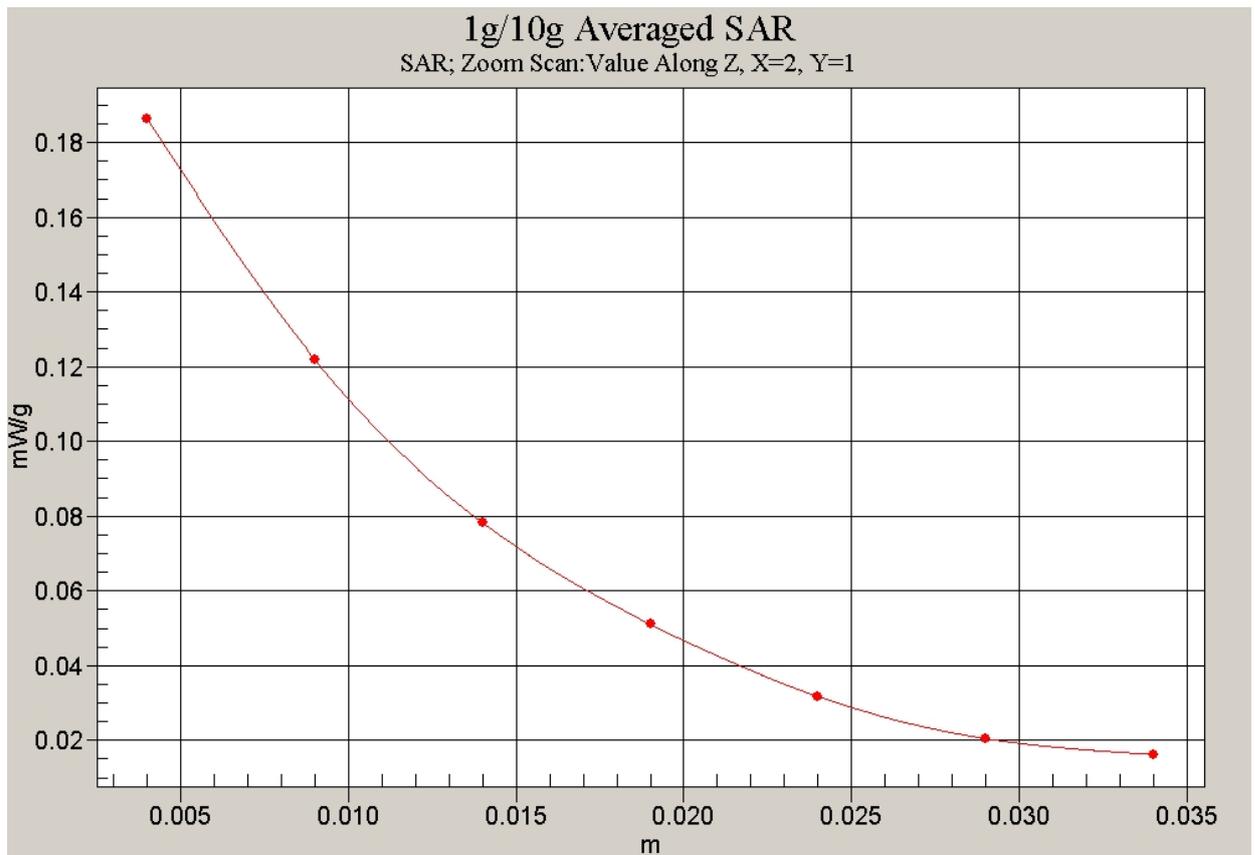
Reference Value = 8.74 V/m; Power Drift = 0.069 dB

Peak SAR (extrapolated) = 0.277 W/kg

SAR(1 g) = 0.174 mW/g; SAR(10 g) = 0.112 mW/g

Maximum value of SAR (measured) = 0.186 mW/g

**Fig. 65 PCS 1900MHz, Body, Towards Phantom, CH661**



**Fig. 66 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Phantom, CH661)**

1900 Body Toward Phantom Low

Date/Time: 2008-6-11 9:33:52

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz new Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

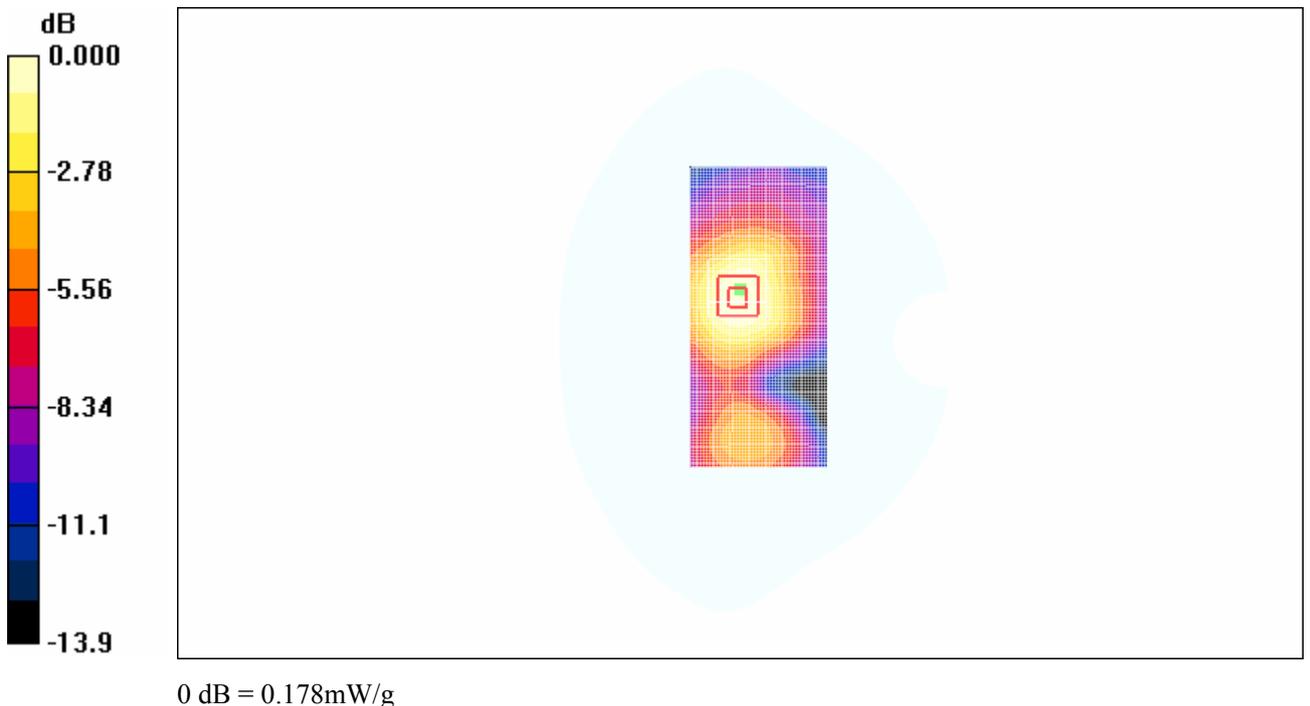
Toward Phantom Low/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.181 mW/g**Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

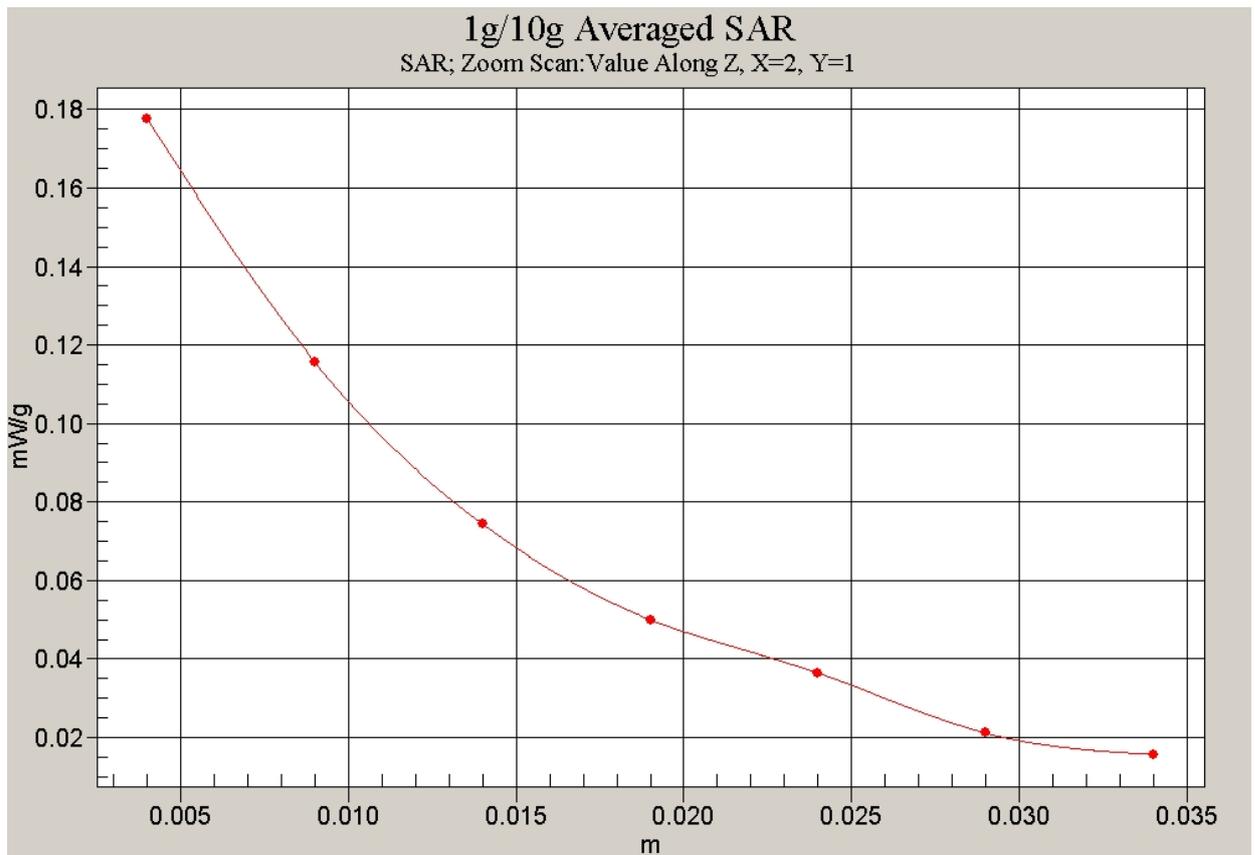
Reference Value = 8.69 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 0.252 W/kg

SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.107 mW/g

Maximum value of SAR (measured) = 0.178 mW/g

**Fig. 67 PCS 1900MHz, Body, Towards Phantom, CH512**



**Fig. 68 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Phantom, CH512)**

1900 Body Toward Ground High

Date/Time: 2008-6-11 10:28:27

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz new Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

Toward Ground High/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.194 mW/g

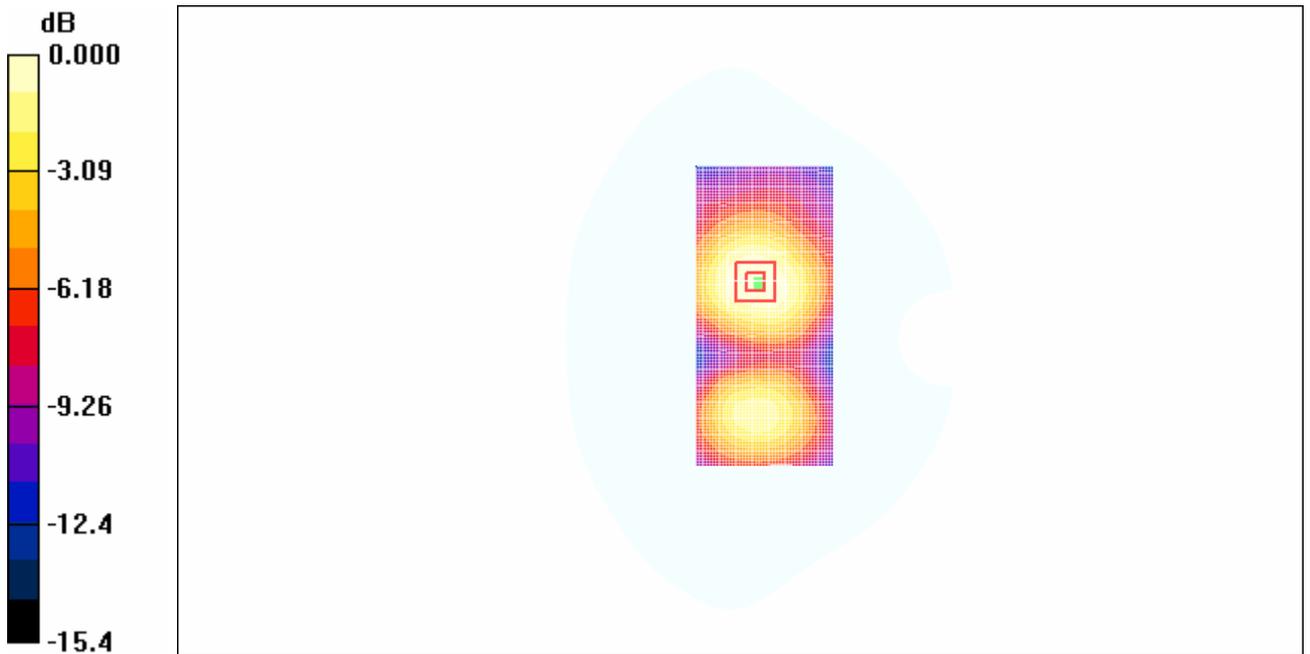
Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.16 V/m; Power Drift = 0.081 dB

Peak SAR (extrapolated) = 0.292 W/kg

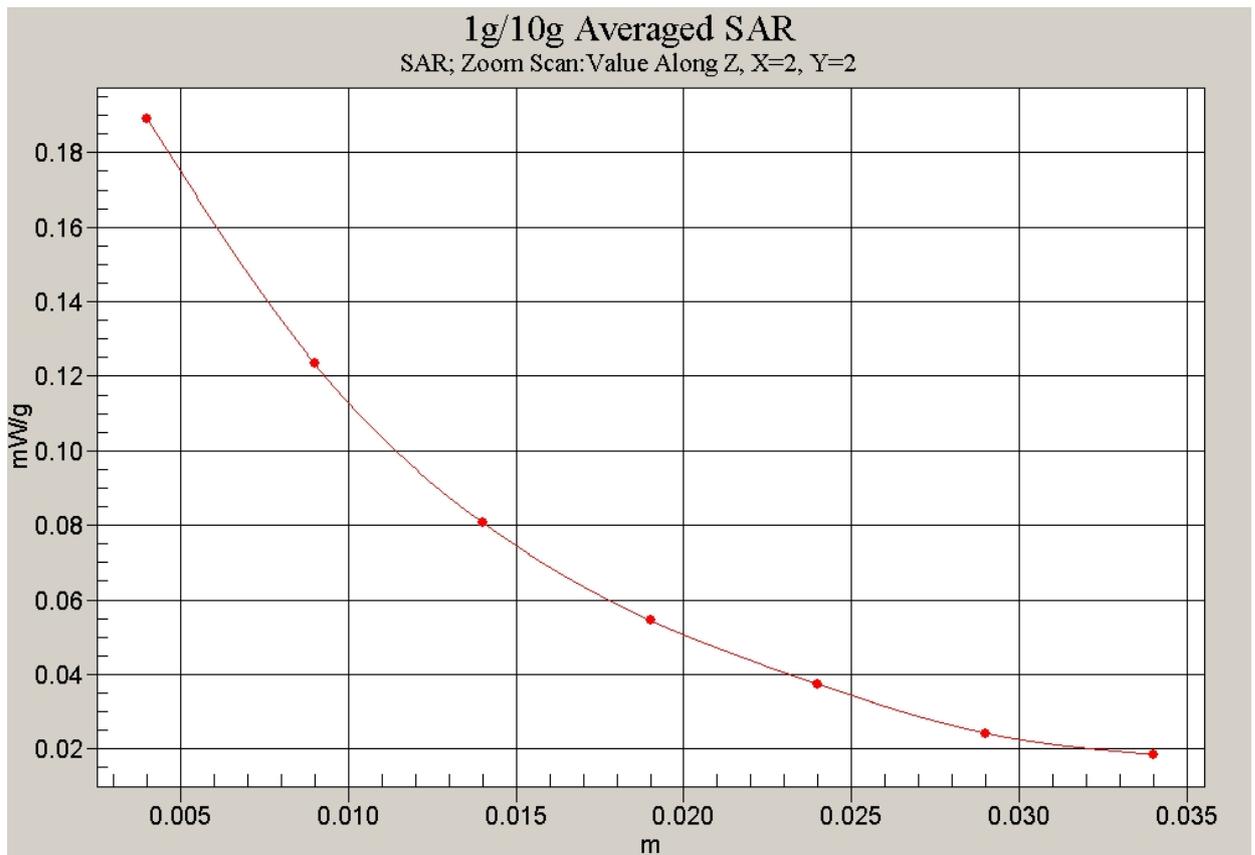
SAR(1 g) = 0.179 mW/g; SAR(10 g) = 0.115 mW/g

Maximum value of SAR (measured) = 0.188 mW/g



0 dB = 0.188mW/g

Fig. 69 PCS 1900MHz, Body, Towards Ground, CH810



**Fig. 70 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Ground, CH810)**

1900 Body Toward Ground Middle

Date/Time: 2008-6-11 10:13:03

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

Toward Ground Middle/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.238 mW/g

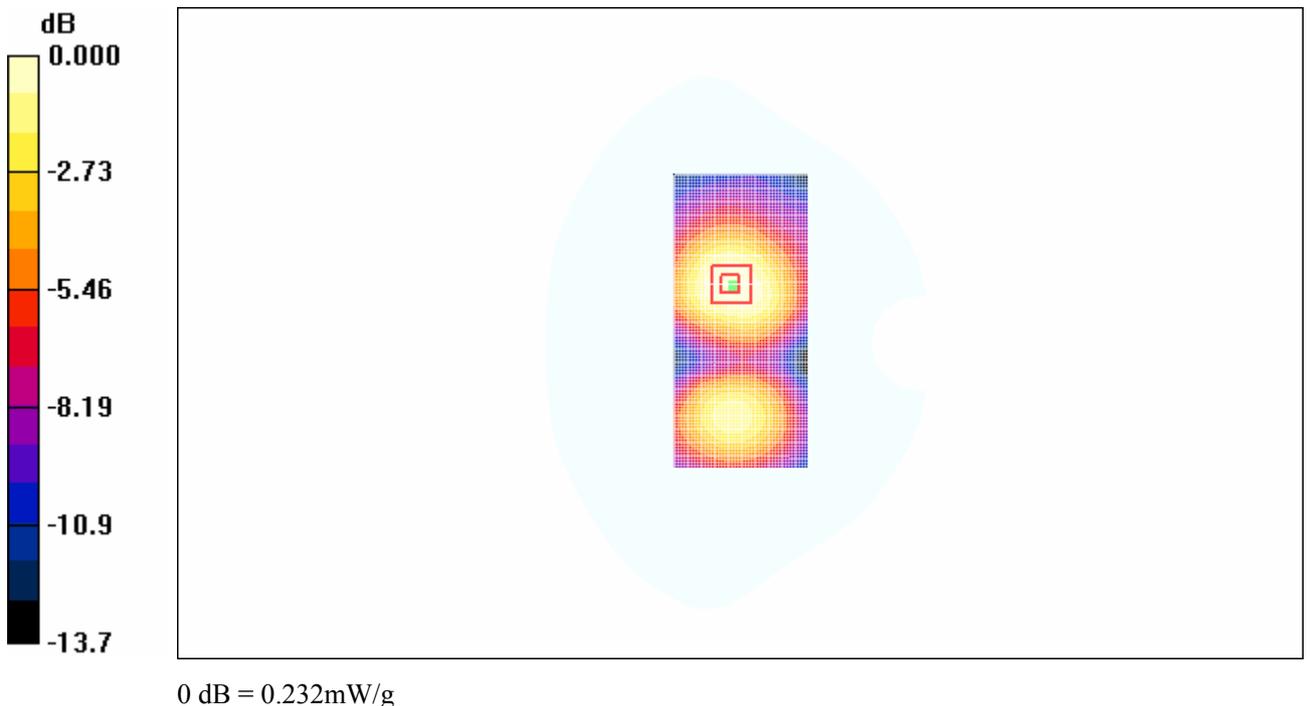
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

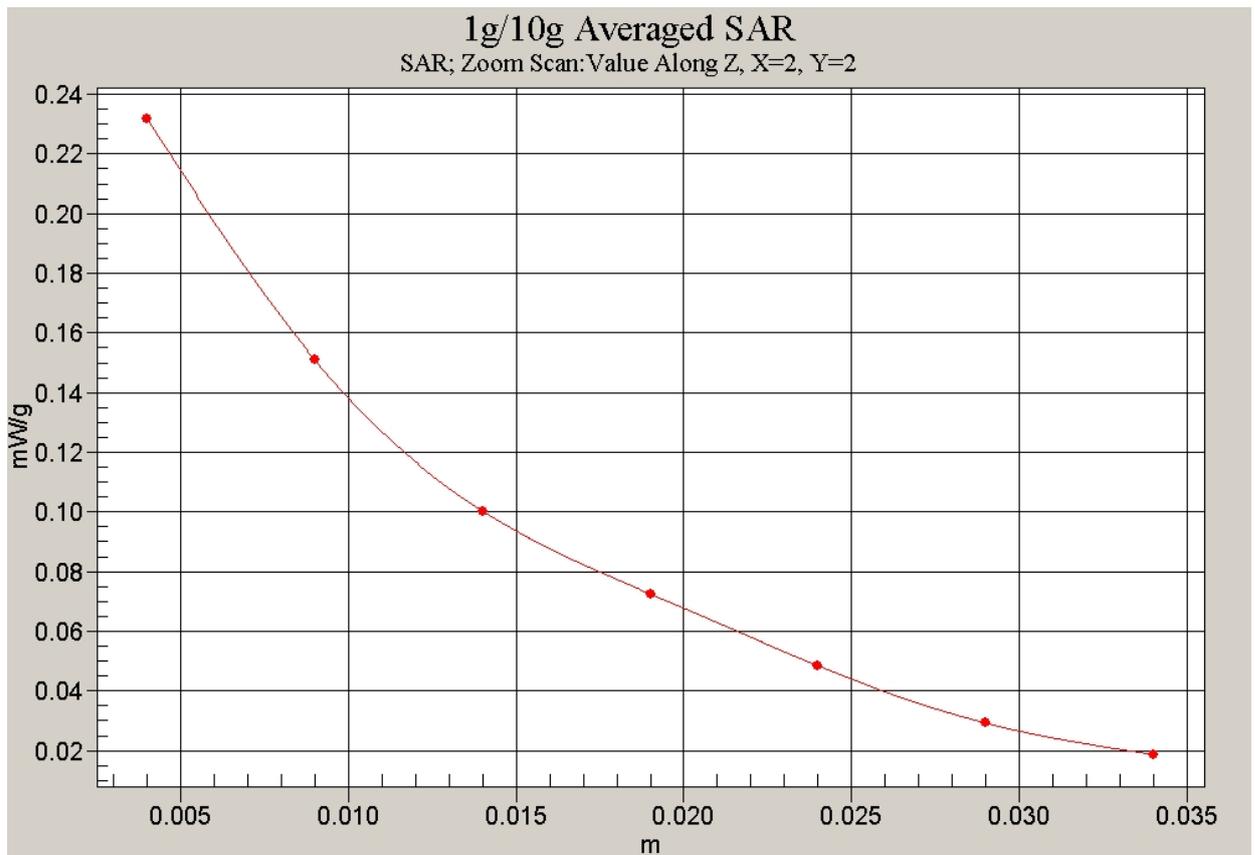
Reference Value = 6.48 V/m; Power Drift = 0.141 dB

Peak SAR (extrapolated) = 0.345 W/kg

SAR(1 g) = 0.218 mW/g; SAR(10 g) = 0.140 mW/g

Maximum value of SAR (measured) = 0.232 mW/g

**Fig. 71 PCS 1900MHz, Body, Towards Ground, CH661**



**Fig. 72 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Ground, CH661)**

1900 Body Toward Ground Low

Date/Time: 2008-6-11 9:49:01

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz new Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

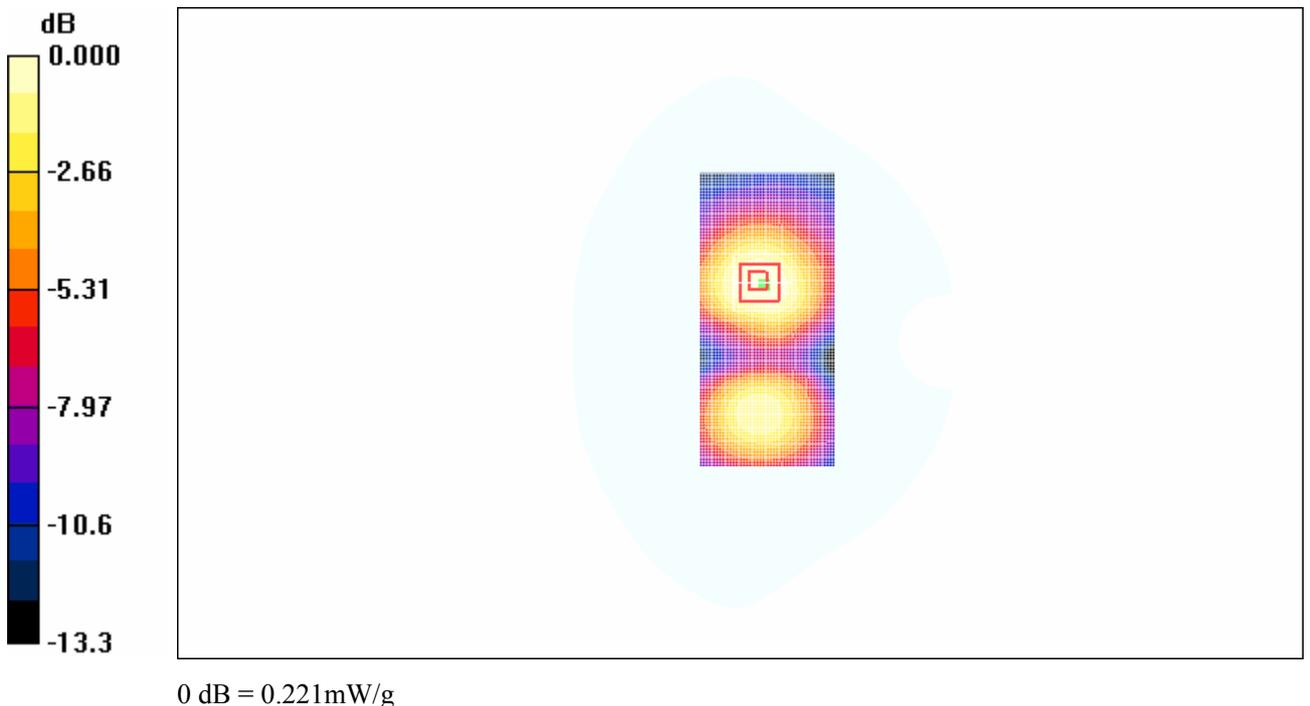
Toward Ground Low/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.228 mW/g**Toward Ground Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

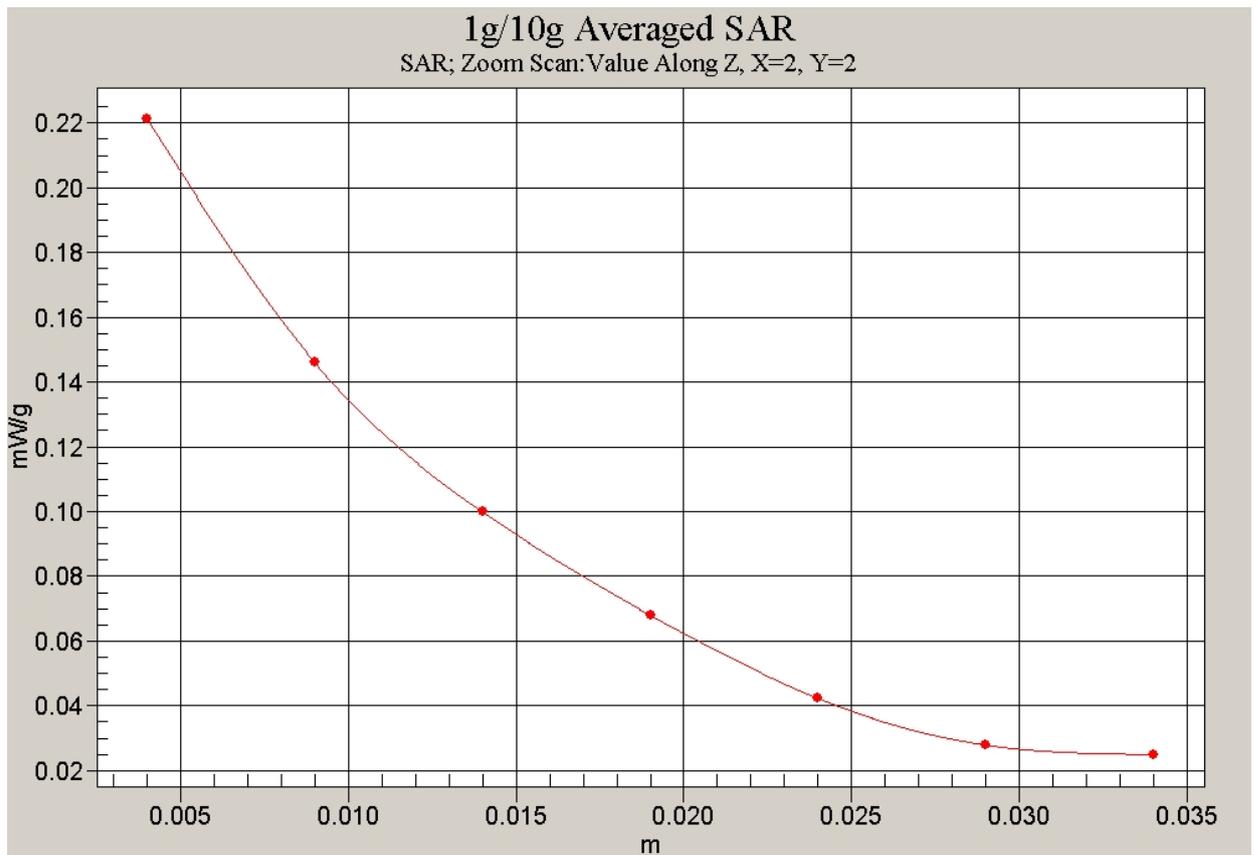
Reference Value = 6.10 V/m; Power Drift = 0.002 dB

Peak SAR (extrapolated) = 0.317 W/kg

SAR(1 g) = 0.209 mW/g; SAR(10 g) = 0.136 mW/g

Maximum value of SAR (measured) = 0.221 mW/g

**Fig. 73 PCS 1900MHz, Body, Towards Ground, CH512**



**Fig.74 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Ground, CH512)**

1900 Body Toward Ground Middle with Headset

Date/Time: 2008-6-11 11:36:47

Electronics: DAE4 Sn777

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

Communication System: GSM 1900MHz new Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3142 ConvF(4.61, 4.61, 4.61)

Toward Ground Middle/Area Scan (51x111x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.243 mW/g

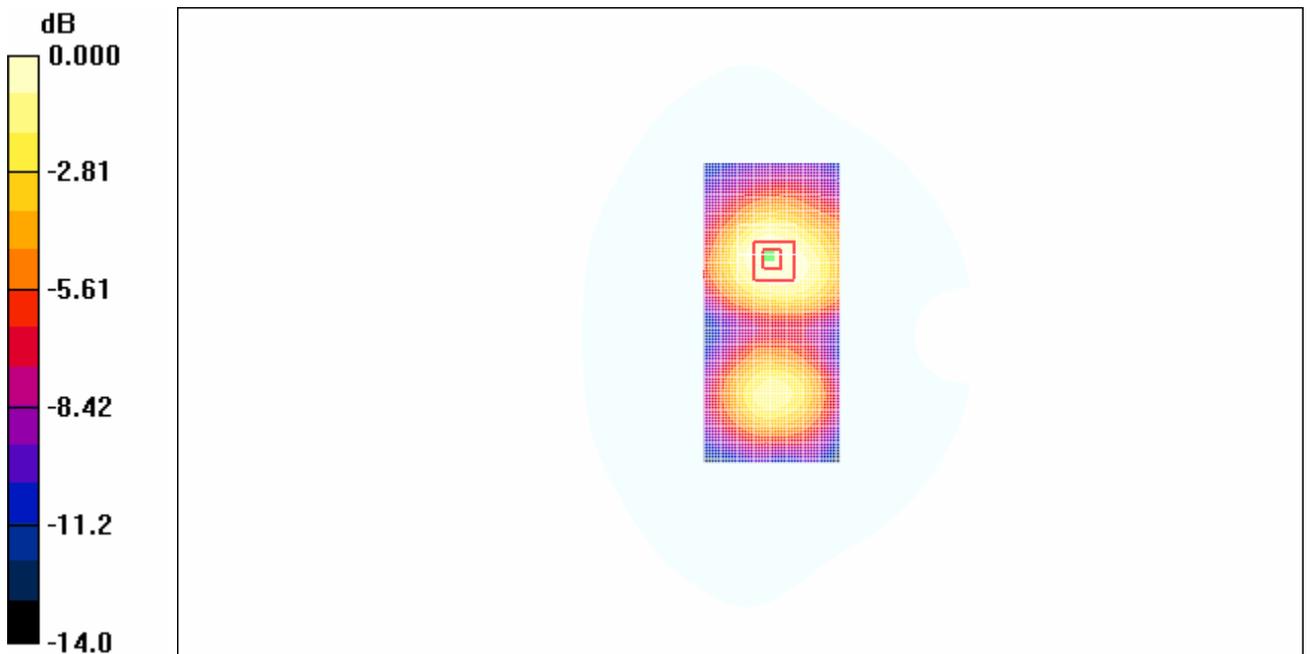
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.70 V/m; Power Drift = -0.151 dB

Peak SAR (extrapolated) = 0.335 W/kg

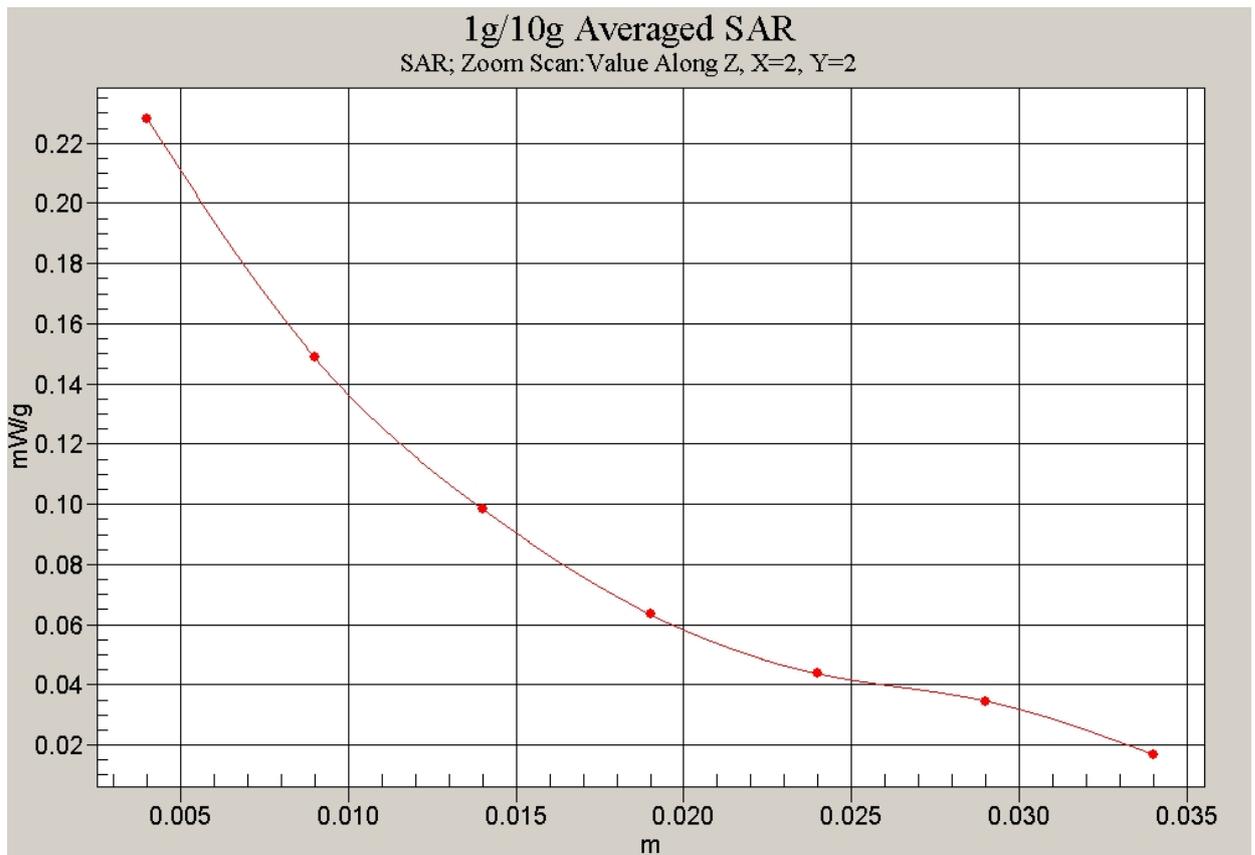
SAR(1 g) = 0.217 mW/g; SAR(10 g) = 0.139 mW/g

Maximum value of SAR (measured) = 0.228 mW/g



0 dB = 0.228mW/g

Fig. 75 PCS 1900MHz, Body, Towards Ground with headset, CH661



**Fig. 76 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Ground with headset, CH661)**

ANNEX D SYSTEM VALIDATION RESULTS

835MHzDAE777Probe3142

Date/Time: 2008-6-10 7:38:29

Electronics: DAE4 Sn777

Medium: 835 Head

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.90 \text{ mho/m}$; $\epsilon_r = 43.9$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 24.5°C Liquid Temperature: 24.0°C

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3142 ConvF(5.97, 5.97, 5.97)

835MHz/Area Scan (101x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 2.68 mW/g

835MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

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

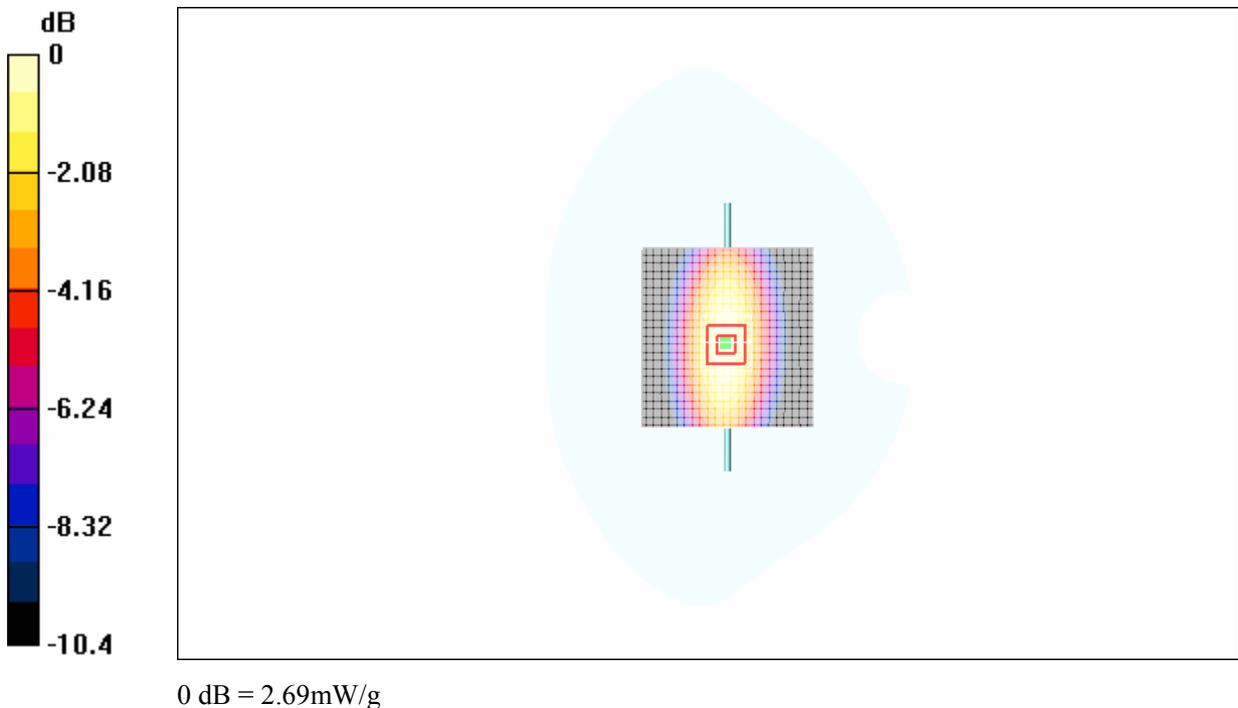


Fig.77 validation 835MHz 250mW

1900MHz DAE777Probe3142

Date/Time: 2008-6-11 7:52:47

Electronics: DAE4 Sn777

Medium: Head 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 39.3$; $\rho = 1000$ kg/m³

Ambient Temperature: 24.5°C Liquid Temperature: 24.0°C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: ES3DV3 – SN3142 ConvF(5.66, 5.66, 5.66)

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

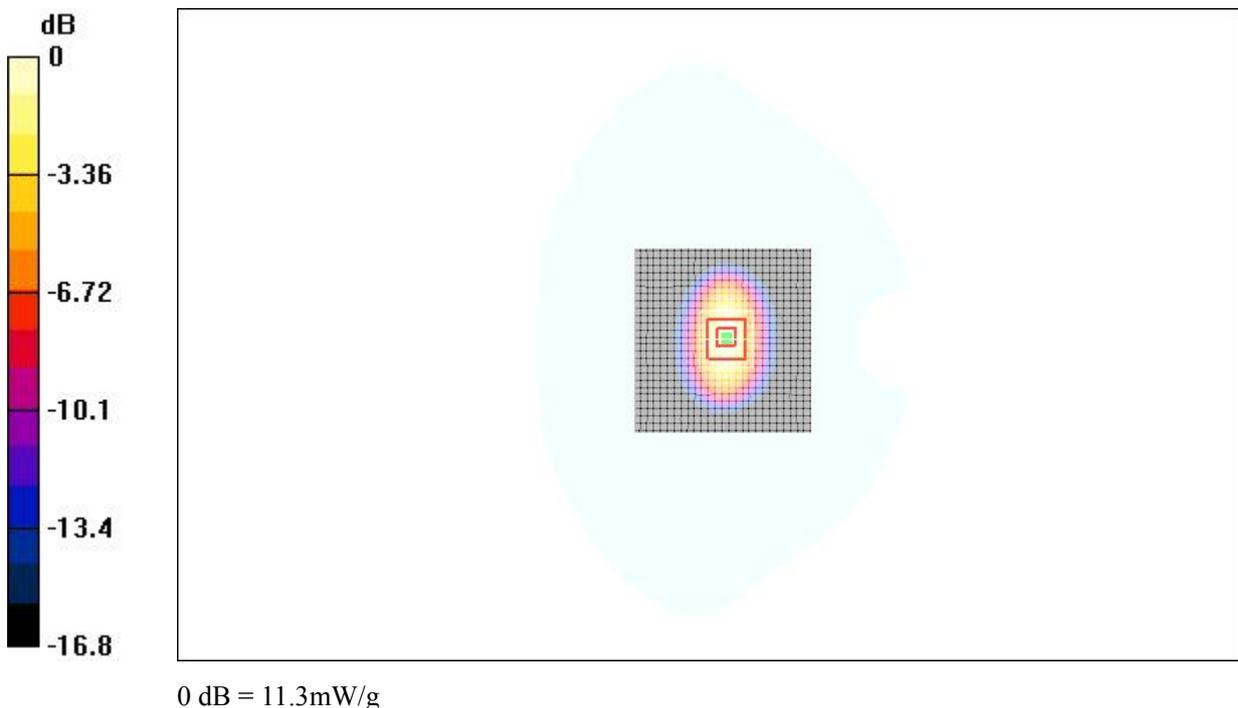
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

**Fig.78 validation 1900MHz 250mW**

ANNEX E PROBE CALIBRATION CERTIFICATE

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



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

Accredited by the Swiss Federal Office of Metrology and Accreditation
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 Beijing**

Certificate No: **ES3-3142_Sep07**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3142**

Calibration procedure(s) **QA CAL-01.v6 and QA CAL-12.v5
Calibration procedure for dosimetric E-field probes**

Calibration date: **September 7, 2007**

Condition of the calibrated item **In Tolerance**

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

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

Issued: September 10, 2007

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

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



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

Accredited by the Swiss Federal Office of Metrology and Accreditation
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
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- 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
- 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:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z}** = NORM_{x,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*.
- DCP_{x,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 $f \leq 800$ 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 NORM_{x,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.