

1900 Body Toward Ground Middle with GPRS

Electronics: DAE3 Sn536

Medium: 1900 Body

Medium parameters used: $\sigma = 1.55$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

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

Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Ground Middle/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.605 mW/g

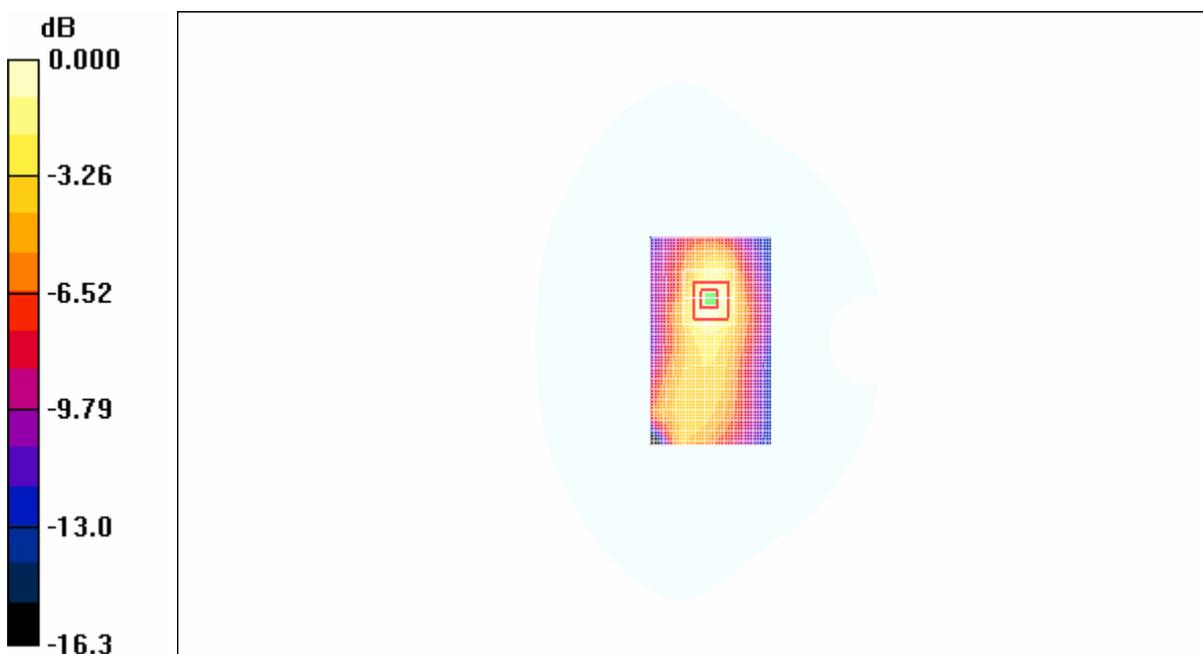
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.3 V/m; Power Drift = -0.200 dB

Peak SAR (extrapolated) = 0.890 W/kg

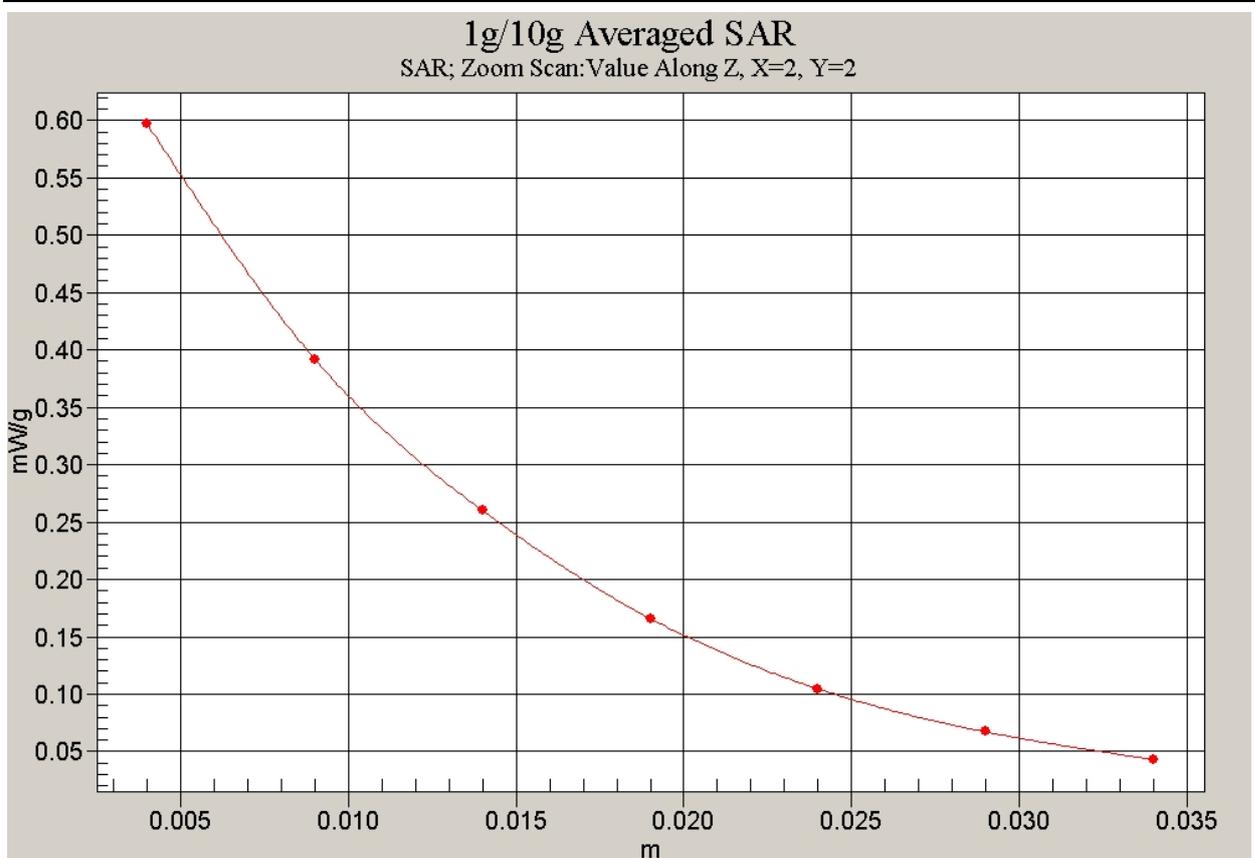
SAR(1 g) = 0.544 mW/g; SAR(10 g) = 0.318 mW/g

Maximum value of SAR (measured) = 0.597 mW/g



0 dB = 0.597mW/g

Fig. 39 PCS 1900MHz, Body, Towards Ground with GPRS, CH661



**Fig. 40 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Ground with GPRS, CH661)**

1900 Body Toward Ground Low with GPRS

Electronics: DAE3 Sn536

Medium: 1900 Body

Medium parameters used: $\sigma = 1.55$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

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

Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Ground Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.532 mW/g

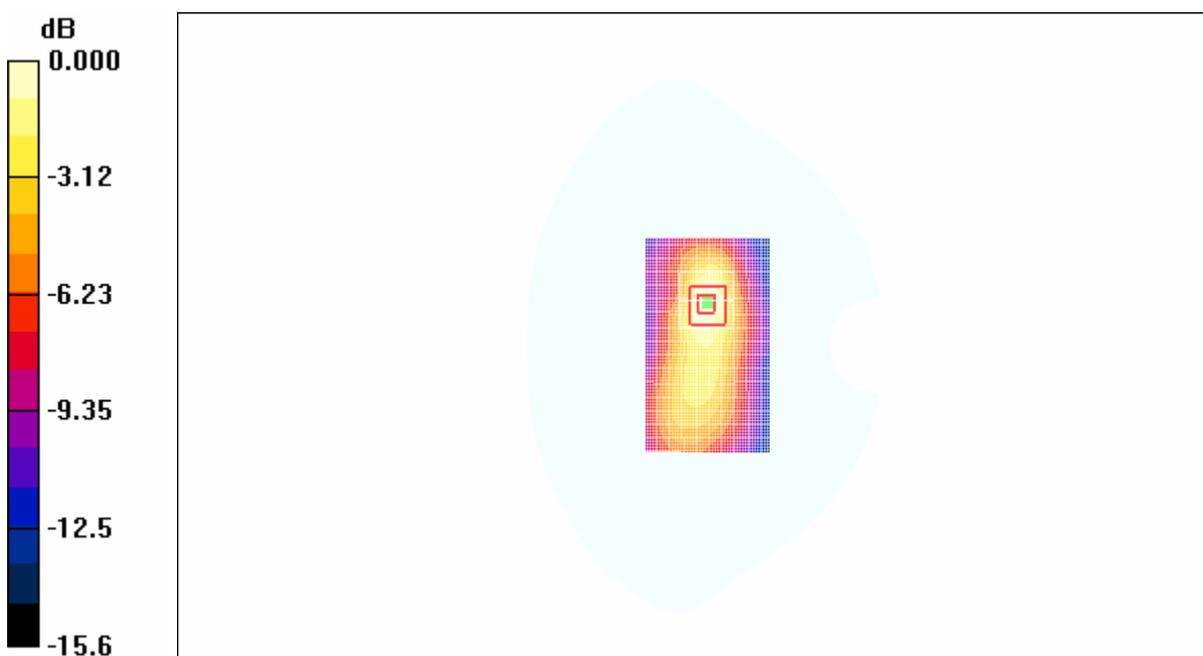
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.2 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 0.746 W/kg

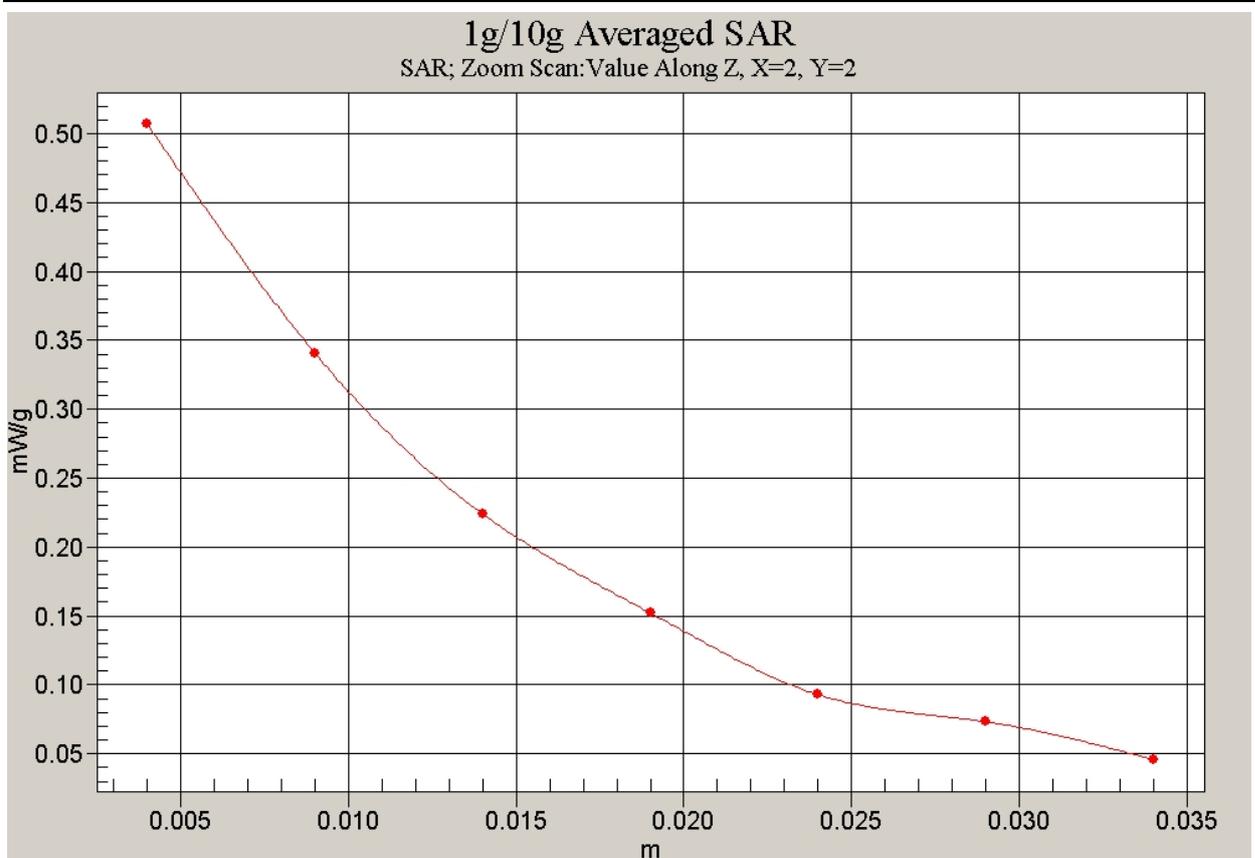
SAR(1 g) = 0.467 mW/g; SAR(10 g) = 0.275 mW/g

Maximum value of SAR (measured) = 0.507 mW/g



0 dB = 0.507mW/g

Fig. 41 PCS 1900MHz, Body, Towards Ground with GPRS, CH512



**Fig. 42 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Ground with GPRS, CH512)**

1900 Body Toward Phantom High with GPRS

Electronics: DAE3 Sn536

Medium: 1900 Body

Medium parameters used: $\sigma = 1.55$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

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

Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Phantom High/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.200 mW/g

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

Reference Value = 6.36 V/m; Power Drift = -0.198 dB

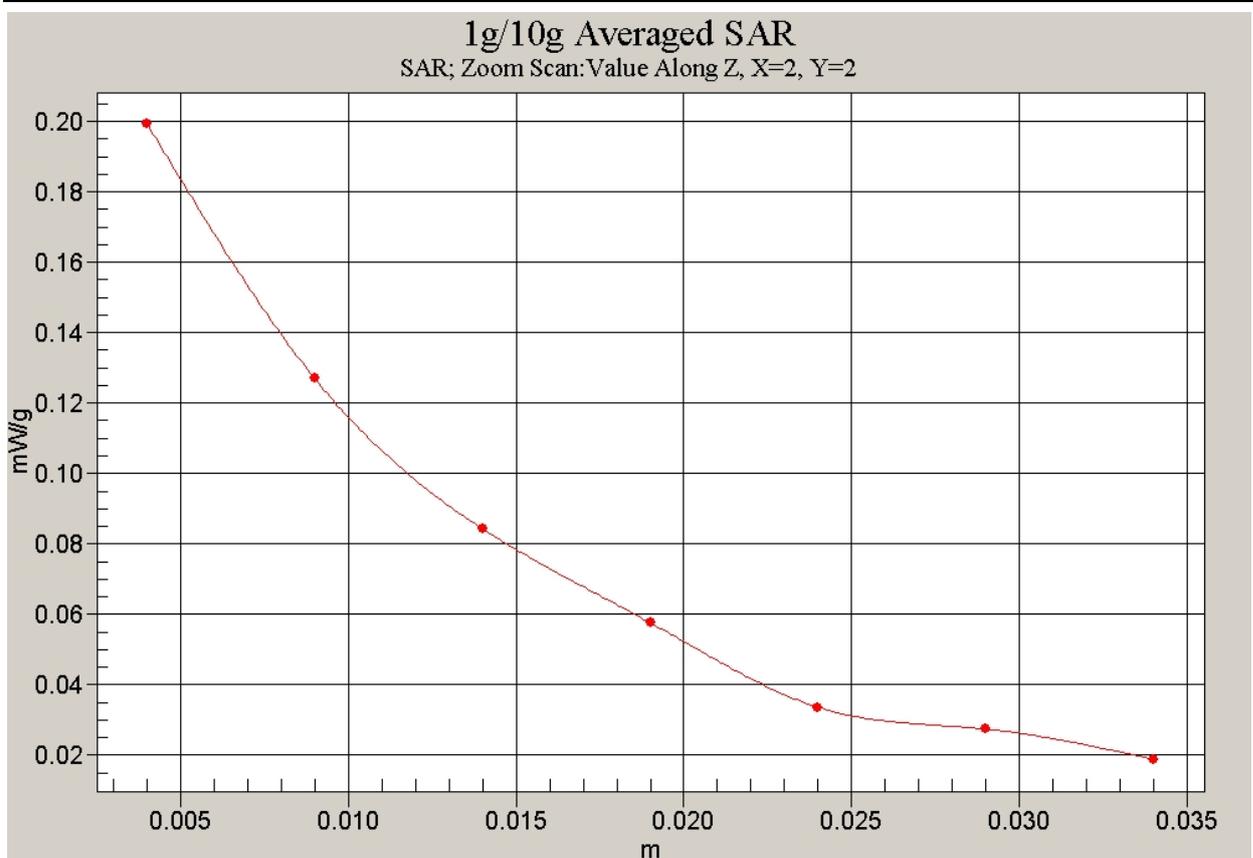
Peak SAR (extrapolated) = 0.290 W/kg

SAR(1 g) = 0.184 mW/g; SAR(10 g) = 0.115 mW/g

Maximum value of SAR (measured) = 0.199 mW/g



Fig. 43 PCS 1900MHz, Body, Towards Phantom with GPRS, CH810



**Fig. 44 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Phantom with GPRS, CH810)**

1900 Body Toward Phantom Middle with GPRS

Electronics: DAE3 Sn536

Medium: 1900 Body

Medium parameters used: $\sigma = 1.55$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

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

Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Phantom Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.129 mW/g

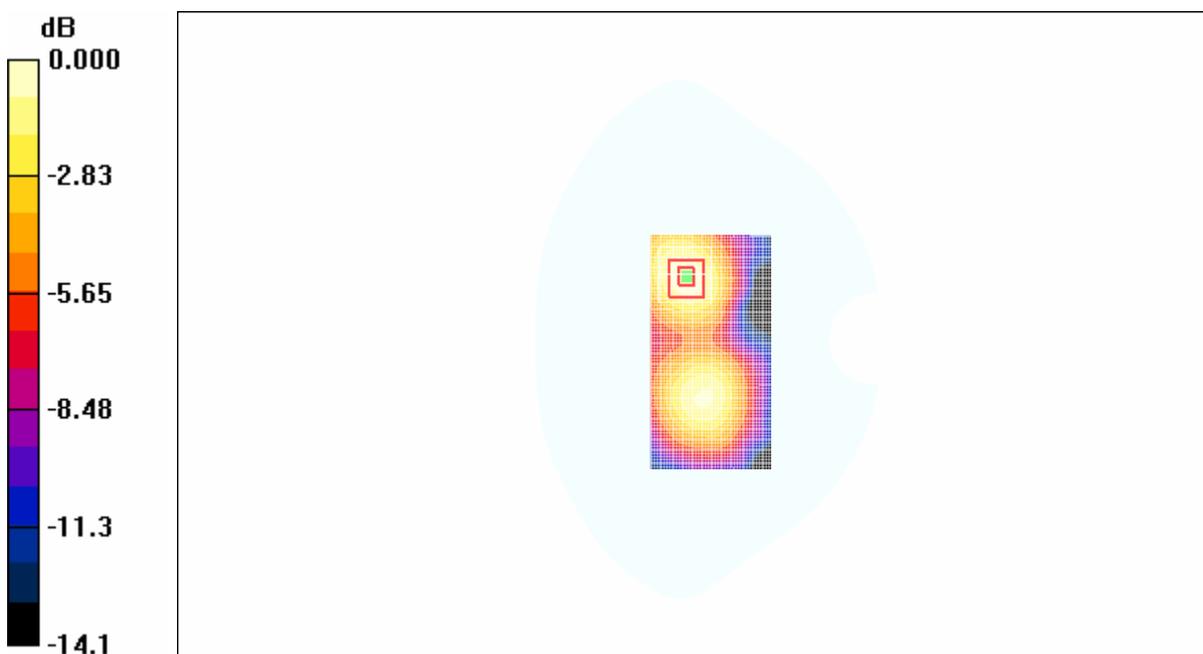
Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.05 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 0.201 W/kg

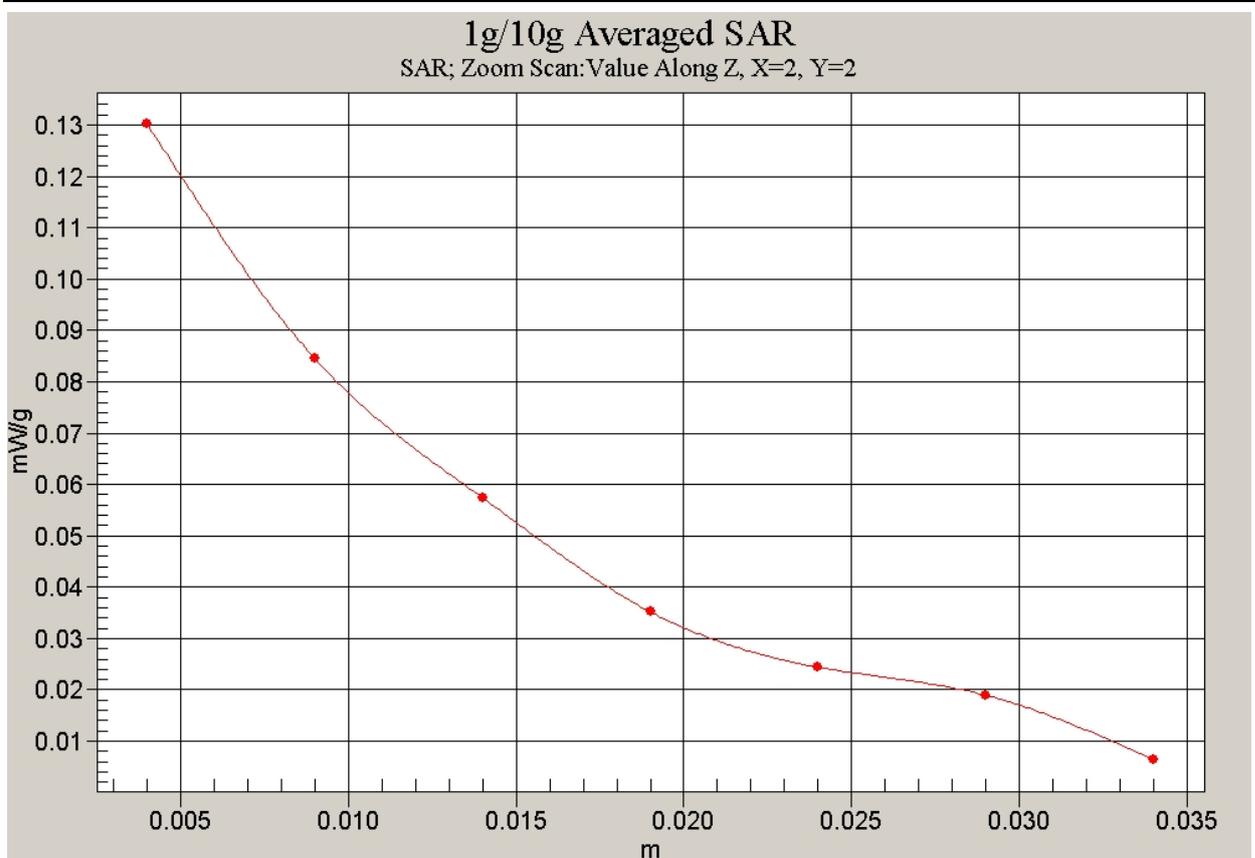
SAR(1 g) = 0.121 mW/g; SAR(10 g) = 0.075 mW/g

Maximum value of SAR (measured) = 0.130 mW/g



0 dB = 0.130mW/g

Fig. 45 PCS 1900MHz, Body, Towards Phantom with GPRS, CH661



**Fig. 46 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Phantom with GPRS, CH661)**

1900 Body Toward Phantom Low with GPRS

Electronics: DAE3 Sn536

Medium: 1900 Body

Medium parameters used: $\sigma = 1.55$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

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

Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:4

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Phantom Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.090 mW/g

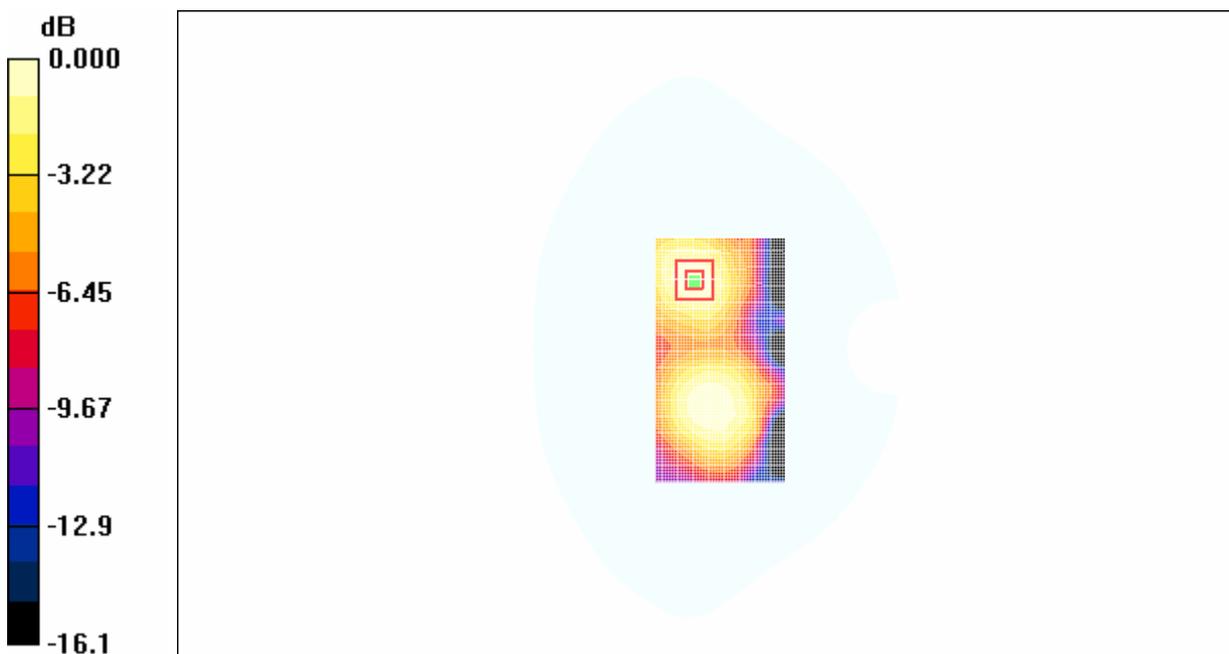
Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.55 V/m; Power Drift = 0.157 dB

Peak SAR (extrapolated) = 0.130 W/kg

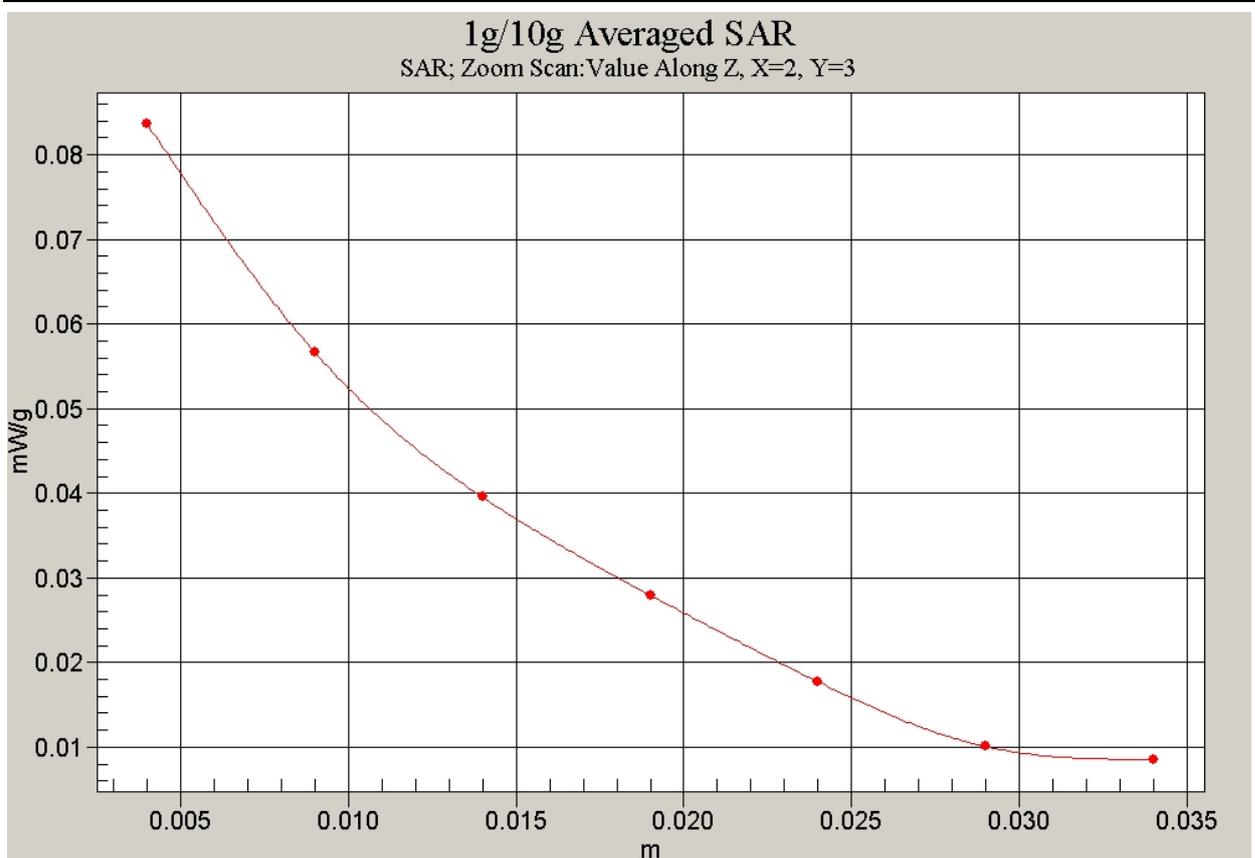
SAR(1 g) = 0.083 mW/g; SAR(10 g) = 0.054 mW/g

Maximum value of SAR (measured) = 0.092 mW/g



0 dB = 0.092mW/g

Fig. 47 PCS 1900MHz, Body, Towards Phantom with GPRS, CH512



**Fig. 48 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Phantom with GPRS, CH512)**

1900 Body Toward Ground High with Bluetooth Function

Electronics: DAE3 Sn536

Medium: 1900 Body

Medium parameters used: $\sigma = 1.55$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

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

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

Probe: ET3DV6 - SN1736 ConvF(4.88, 4.88, 4.88)

Toward Ground High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.429 mW/g

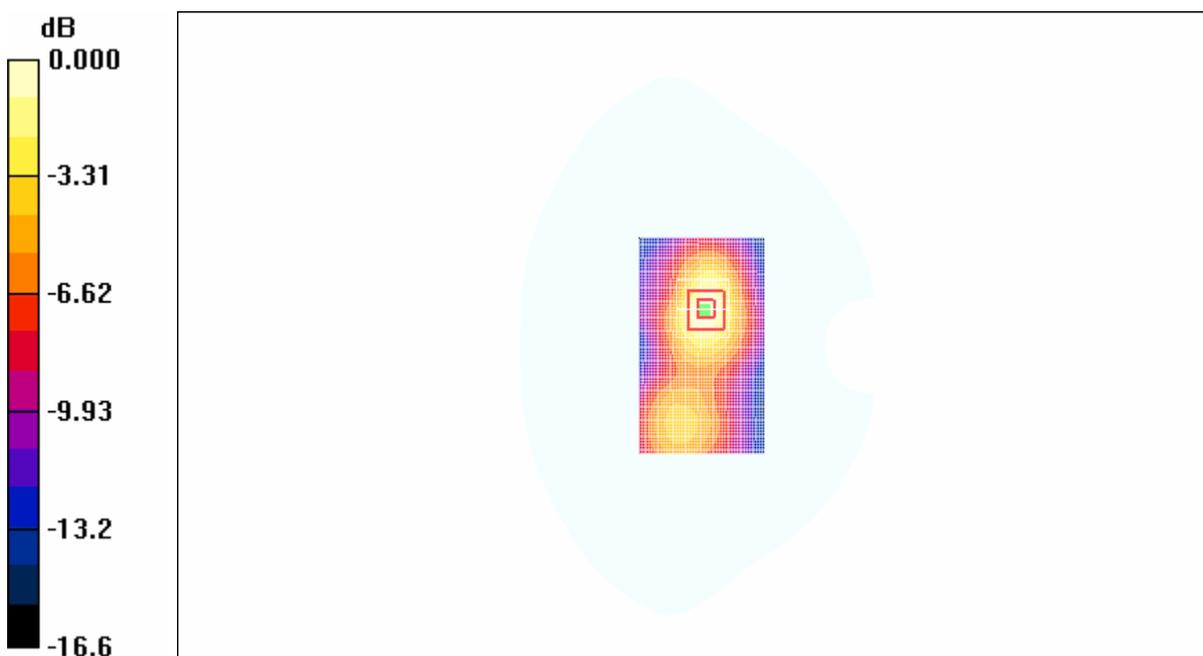
Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.1 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.617 W/kg

SAR(1 g) = 0.384 mW/g; SAR(10 g) = 0.224 mW/g

Maximum value of SAR (measured) = 0.422 mW/g



0 dB = 0.422mW/g

Fig. 49 PCS 1900MHz, Body, Towards Ground with Bluetooth, CH810

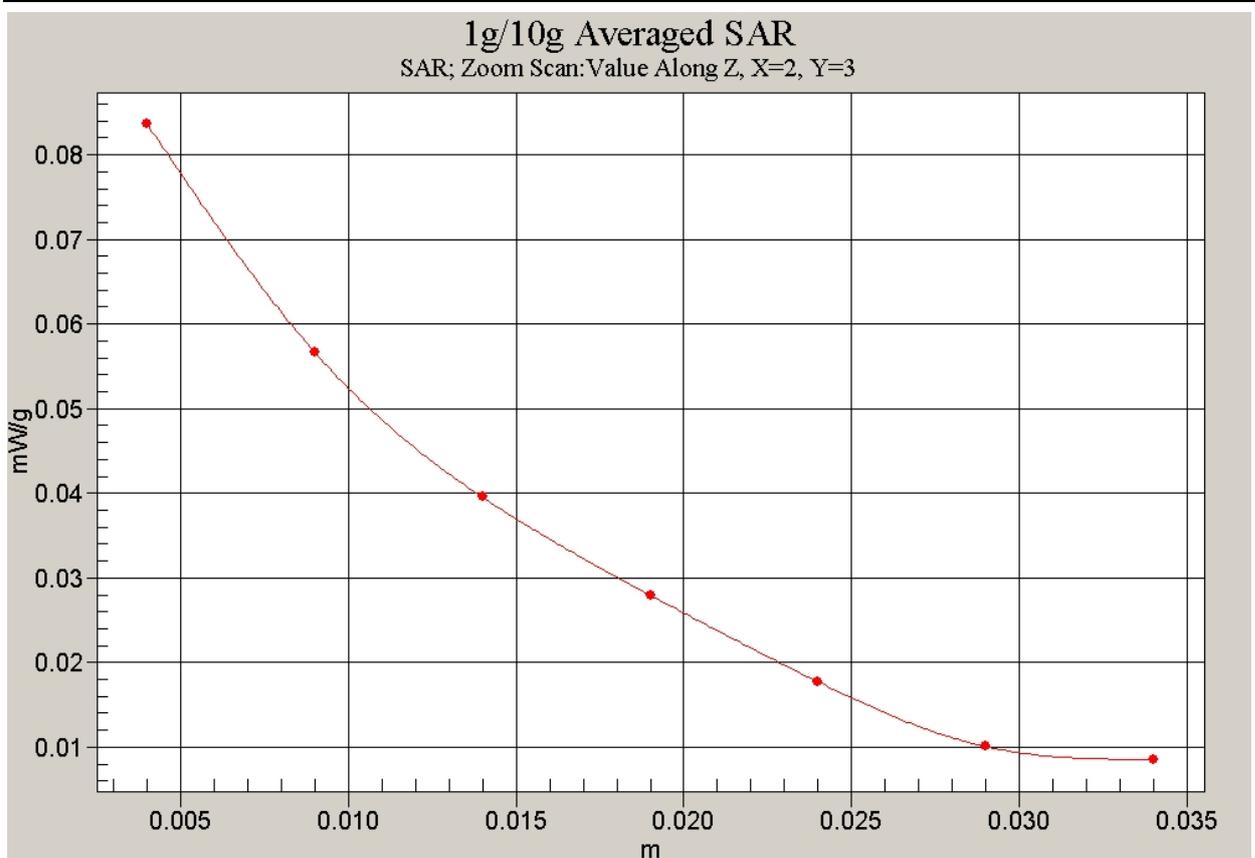


Fig. 50 Z-Scan at power reference point
(PCS 1900MHz, Body, Towards Ground with Bluetooth, CH810
)

ANNEX D SYSTEM VALIDATION RESULTS

1900MHzDAE536Probe1736

Electronics: DAE3 Sn536

Medium: 1900 Head

Medium parameters used: $\sigma = 1.45$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

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

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

Probe: ET3DV6 - SN1736 ConvF(5.4, 5.4, 5.4)

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

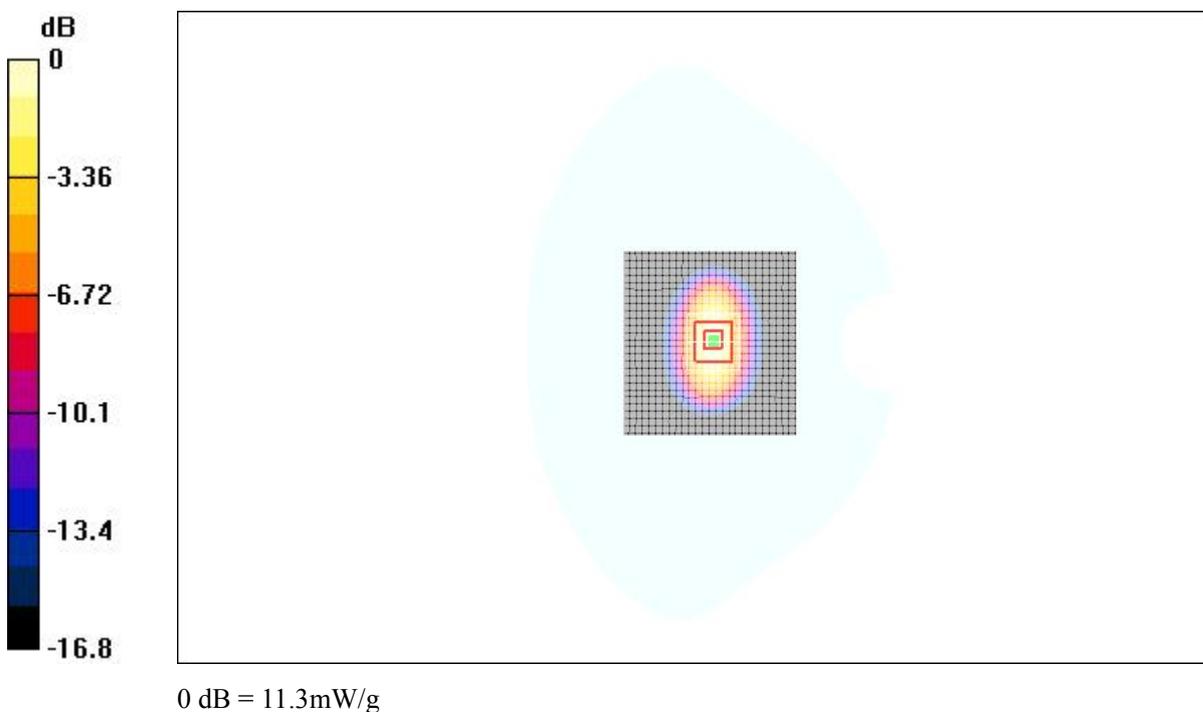


Fig.51 validation 1900MHz 250mW

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
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 China**

Certificate No: **ET3DV6-1736_Dec06**

CALIBRATION CERTIFICATE			
Object	ET3DV6-SN: 1736		
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes		
Calibration date:	December 1, 2006		
Condition of the calibrated item	In Tolerance		
This calibration certify documents the traceability to national standards, which realize the physical units of measurements(SI). All calibrations have been conducted at an environment temperature (22±3) ^o 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	GB341293874	22-May-06 (METAS, NO. 251-00466)	May-07
Power sensor E4412A	MY41495277	22-May-06 (METAS, NO. 251-00466)	May-07
Power sensor E4412A	MY41498087	22-May-06 (METAS, NO. 251-00466)	May-07
Reference 20 dB Attenuator	SN:S5086 (20b)	22-May-06 (METAS, NO. 251-00467)	May-07
Reference Probe ES3DV2	SN:S5086 (20b)	22-May-06 (METAS, NO. 251-00467)	May-07
DAE4	SN:3013	13-Jan-06 (SPEAG, NO. ES3-3013_Jan06)	Jan-07
Reference Probe ES3DV2	SN: 907	11-Jun-06 (SPEAG, NO.DAE4-907_Jun06)	Jun-07
Secondary Standards	ID#	Check Data (in house)	Scheduled Calibration
RF generator HP8648C	US3642U01700	4-Dec-05(SPEAG, in house check Dec-03)	In house check: Dec-09
Network Analyzer HP 8753E	US37390585	10-Nov-05(SPEAG, NO. DAE4-901_Nov-04)	In house check: Nov-09
Calibrated by:	Name Nico Vetterli	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Director	Signature
Issued: December 1, 2006			
This calibration certificate shall not be reported 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
- GENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

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.

ET3DV6 SN: 1736

December 1, 2006

Probe ET3DV6

SN: 1736

Manufactured: September 27, 2002

Last calibrated: November 25, 2005

Recalibrated: December 1, 2006

Calibrated for DASY System

ET3DV6 SN: 1736

December 1, 2006

DASY - Parameters of Probe: ET3DV6 SN:1736

Sensitivity in Free Space^A

Diode Compression^B

NormX	1.97 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	93 mV
NormY	1.75 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	93 mV
NormZ	1.97 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL 900 MHz Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	9.6	5.0
SAR _{be} [%]	With Correction Algorithm	0.1	0.3

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	13.2	8.8
SAR _{be} [%]	With Correction Algorithm	0.6	0.1

Sensor Offset

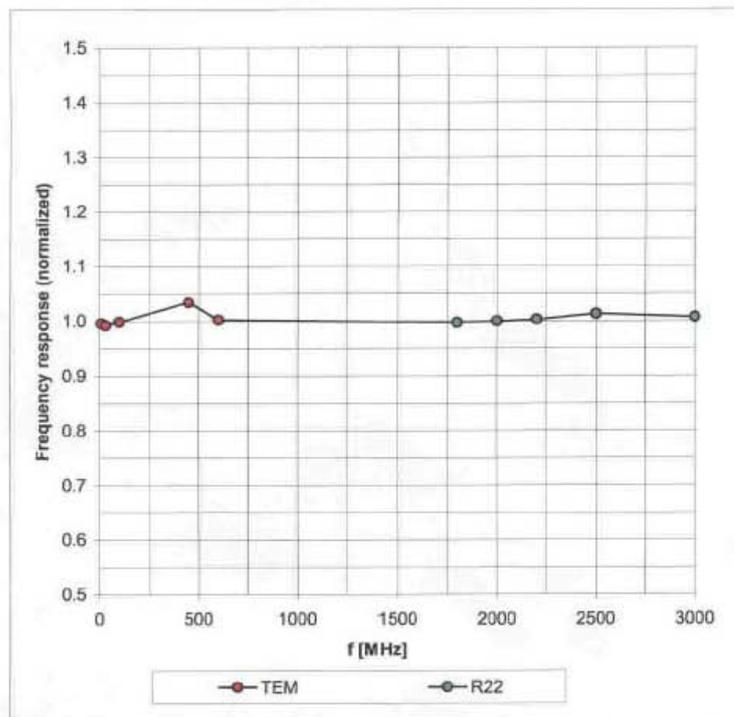
Probe Tip to Sensor Center	2.7 mm
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ET3DV6 SN: 1736

December 1, 2006

Frequency Response of E-Field

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

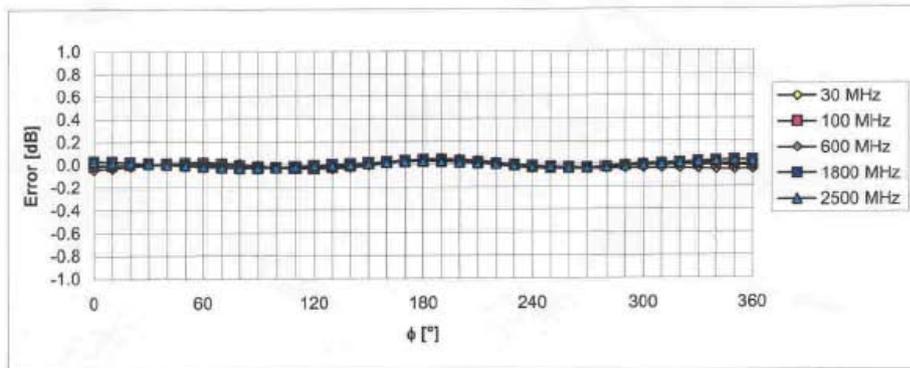
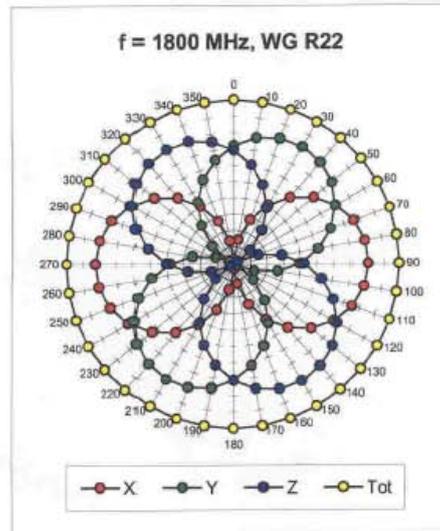
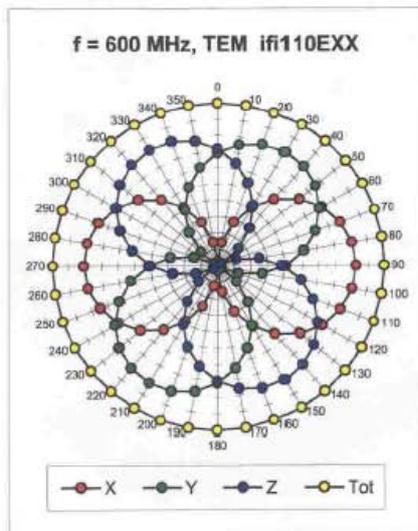


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

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December 1, 2006

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

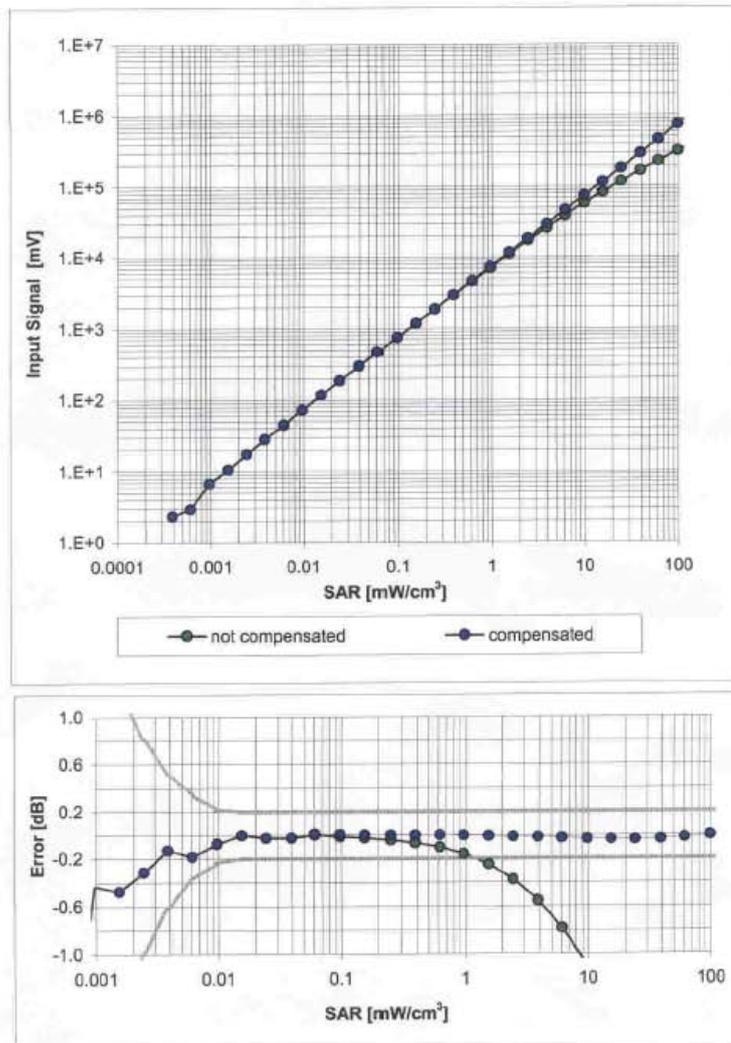


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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Dynamic Range $f(SAR_{head})$ (Waveguide R22, $f = 1800$ MHz)

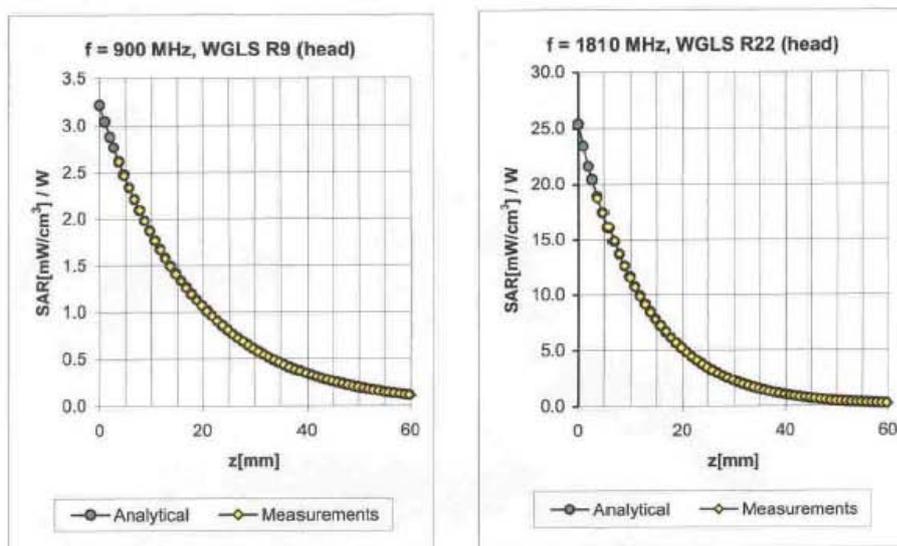


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

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December 1, 2006

Conversion Factor Assessment



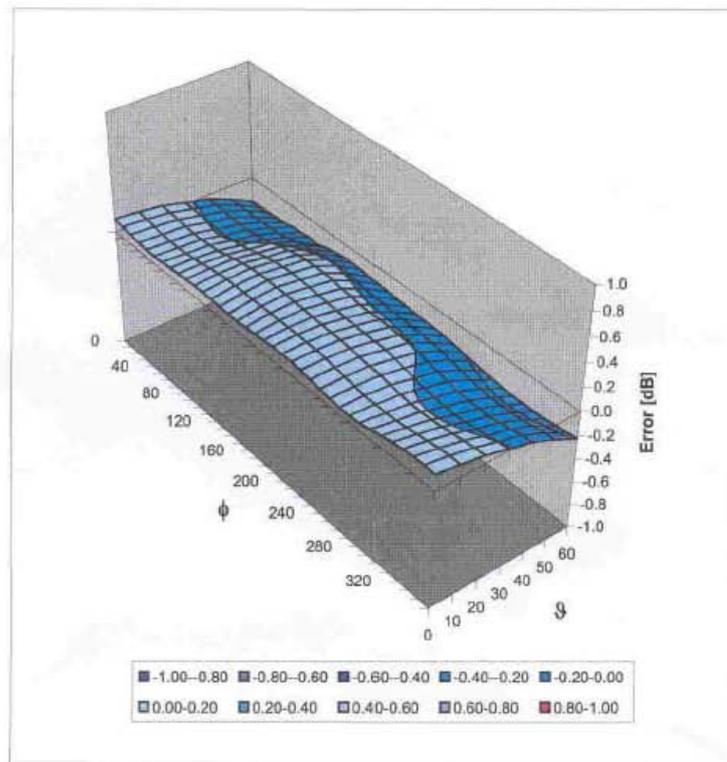
f [MHz]	Validity [MHz] ^C	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.56	1.85	6.51 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.47	5.40 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.62	2.29	4.67 ± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.12	1.61	7.74 ± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.47	2.15	6.45 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.53	2.78	4.88 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.65	2.11	4.35 ± 11.8% (k=2)

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December 1, 2006

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)