1900 Right Cheek Middle

Electronics: DAE3 Sn536

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

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

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

Reference Value = 11.6 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 0.375 mW/g

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

Reference Value = 11.6 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 0.387 mW/g

Peak SAR (extrapolated) = 0.699 W/kg

SAR(1 g) = 0.367 mW/g; SAR(10 g) = 0.190 mW/g

0 dB = 0.387mW/g

Fig. 63 Right Hand Touch Cheek PCS1900MHz CH661

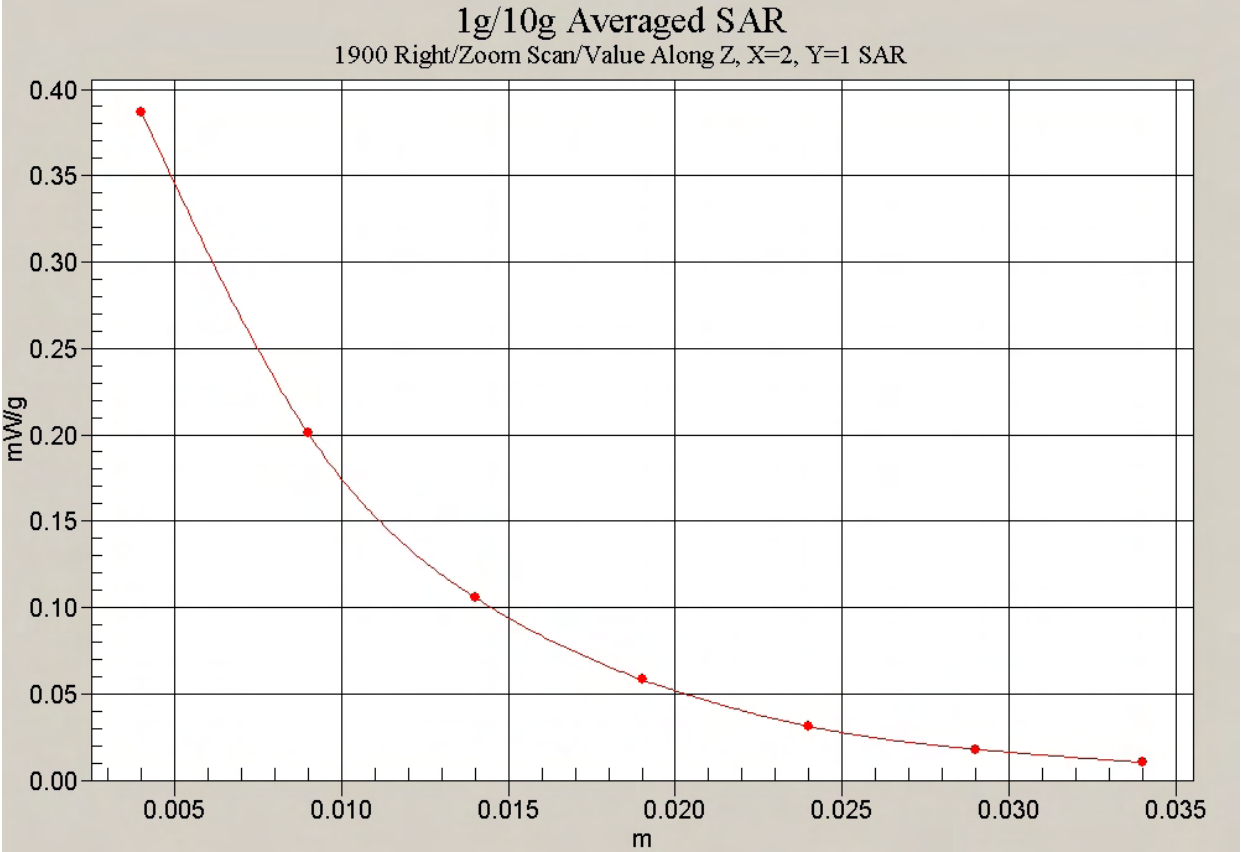


Fig. 64 Z-Scan at power reference point (Right Hand Touch Cheek 1900MHz CH661)

1900 Right Cheek Low

Electronics: DAE3 Sn536

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

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

Cheek Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm

Reference Value = 14.7 V/m; Power Drift = -0.0 dB

Maximum value of SAR (interpolated) = 0.603 mW/g

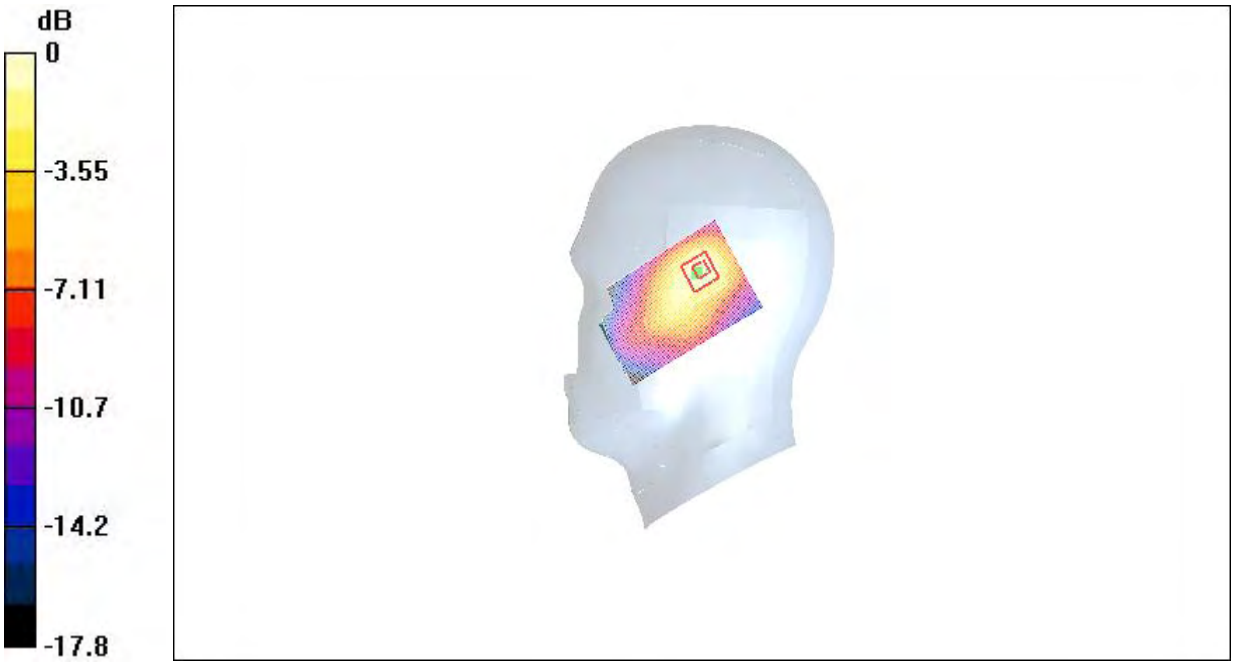
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.7 V/m; Power Drift = -0.0 dB

Maximum value of SAR (measured) = 0.636 mW/g

Peak SAR (extrapolated) = 1.1 W/kg

SAR(1 g) = 0.589 mW/g; SAR(10 g) = 0.308 mW/g



0 dB = 0.636mW/g

Fig. 65 Right Hand Touch Cheek PCS1900MHz CH512

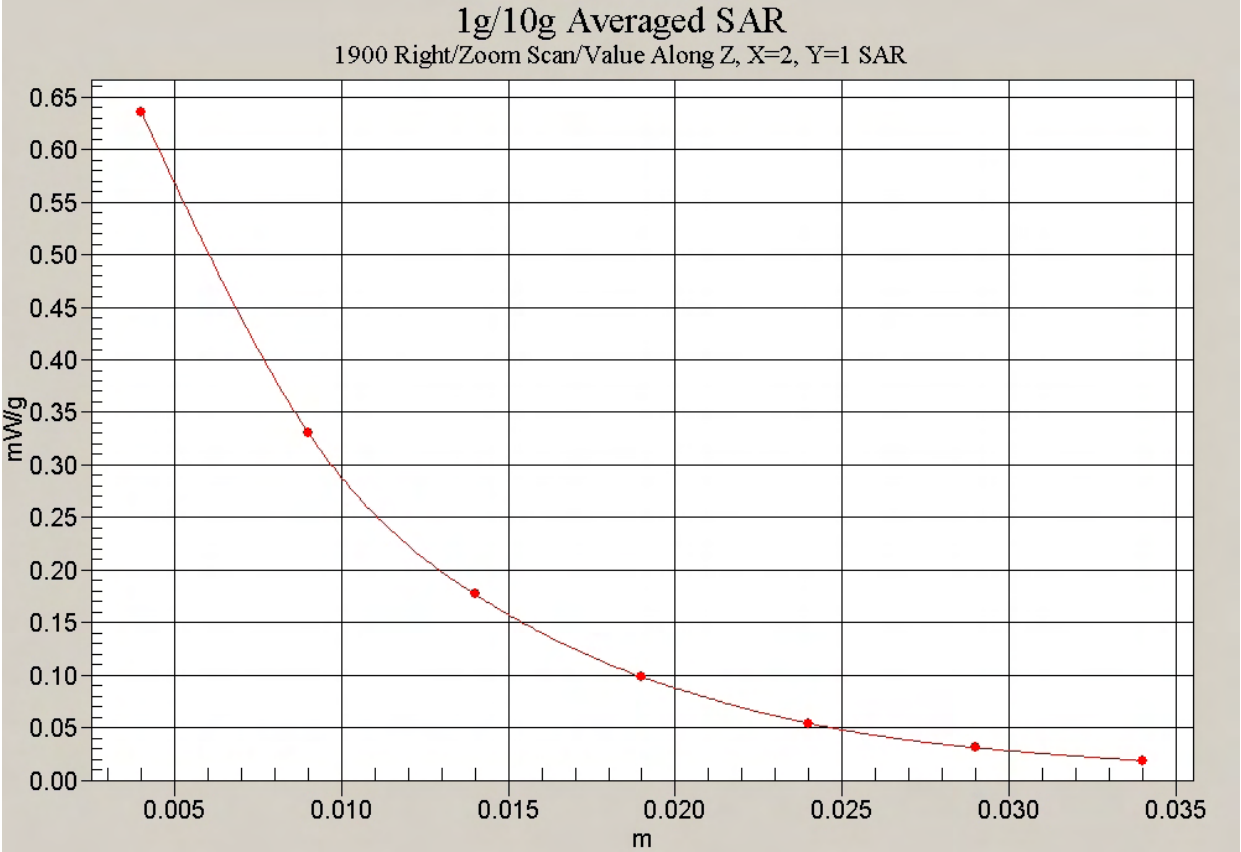


Fig. 66 Z-Scan at power reference point (Right Hand Touch Cheek 1900MHz CH512)

1900 Right Tilt High

Electronics: DAE3 Sn536

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

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

Tilt High/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm

Reference Value = 9.43 V/m; Power Drift = -0.0 dB

Maximum value of SAR (interpolated) = 0.240 mW/g

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

Reference Value = 9.43 V/m; Power Drift = -0.0 dB

Maximum value of SAR (measured) = 0.254 mW/g

Peak SAR (extrapolated) = 0.448 W/kg

SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.120 mW/g

0 dB = 0.254mW/g

Fig. 67 Right Hand Tilt 15°PCS1900MHz CH810

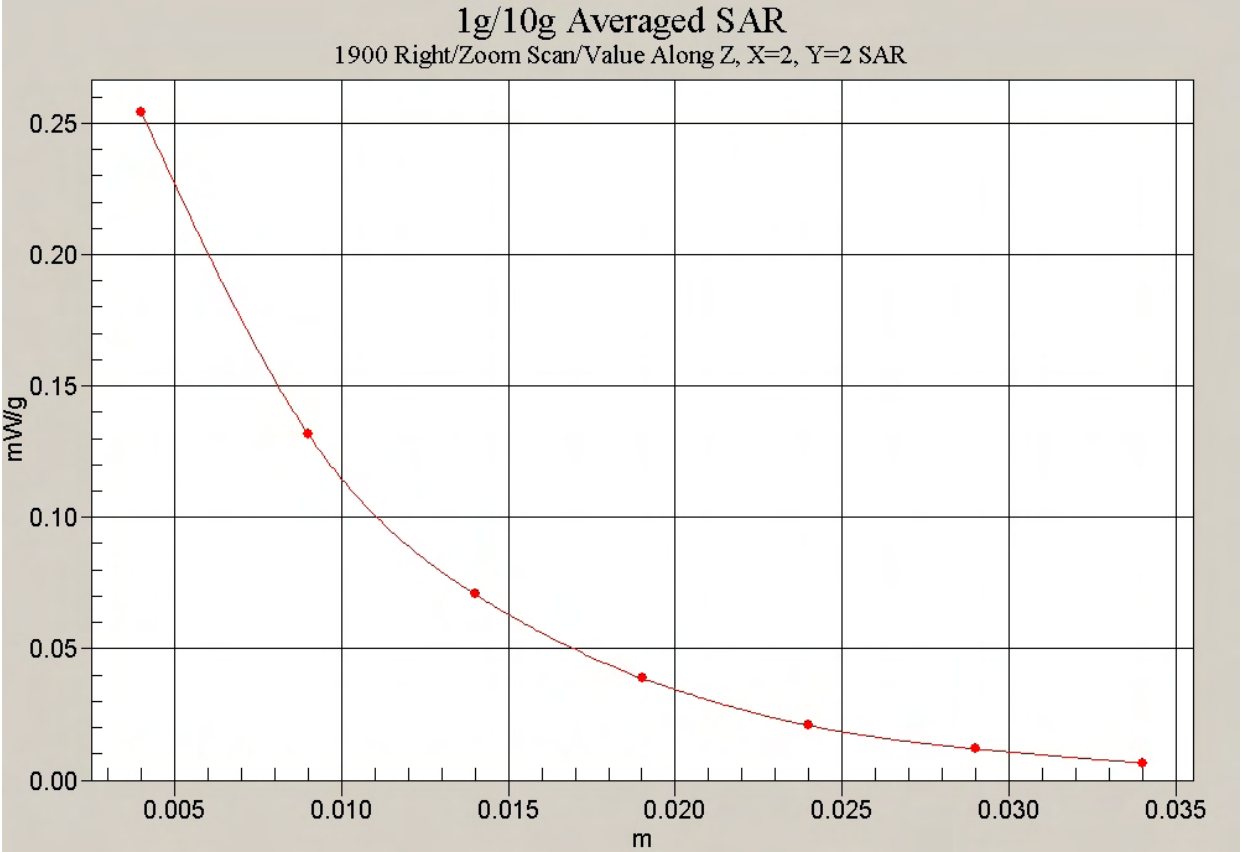


Fig. 68 Z-Scan at power reference point (Right Hand Tilt 15° 1900MHz CH810)

1900 Right Tilt Middle

Electronics: DAE3 Sn536

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

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

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

Reference Value = 11.9 V/m; Power Drift = 0.1 dB

Maximum value of SAR (interpolated) = 0.370 mW/g

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

Reference Value = 11.9 V/m; Power Drift = 0.1 dB

Maximum value of SAR (measured) = 0.389 mW/g

Peak SAR (extrapolated) = 0.674 W/kg

SAR(1 g) = 0.355 mW/g; SAR(10 g) = 0.184 mW/g

0 dB = 0.389mW/g

Fig. 69 Right Hand Tilt 15°PCS1900MHz CH661

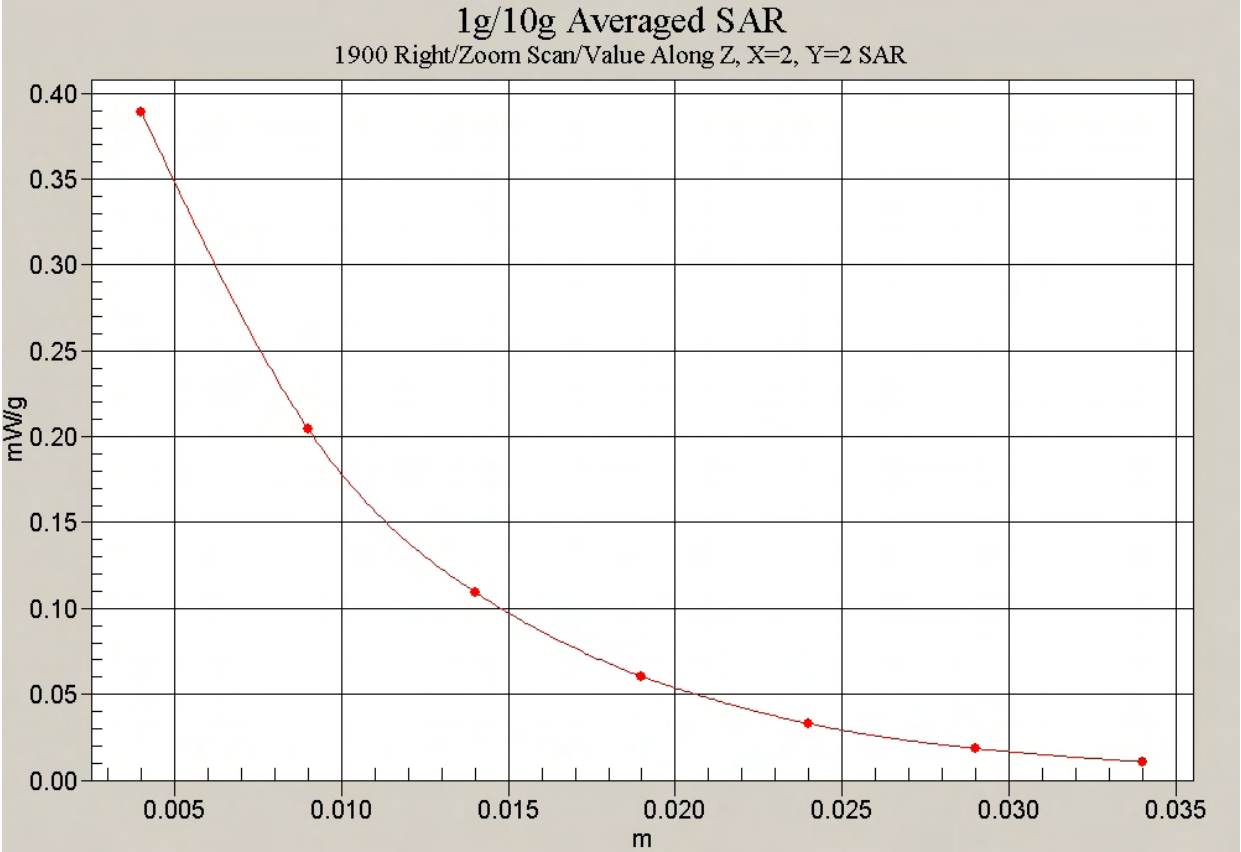


Fig. 70 Z-Scan at power reference point (Right Hand Tilt 15° 1900MHz CH661)

1900 Right Tilt Low

Electronics: DAE3 Sn536

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

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

Tilt Low/Area Scan (51x81x1): Measurement grid: dx=10mm, dy=10mm

Reference Value = 15.4 V/m; Power Drift = 0.1 dB

Maximum value of SAR (interpolated) = 0.579 mW/g

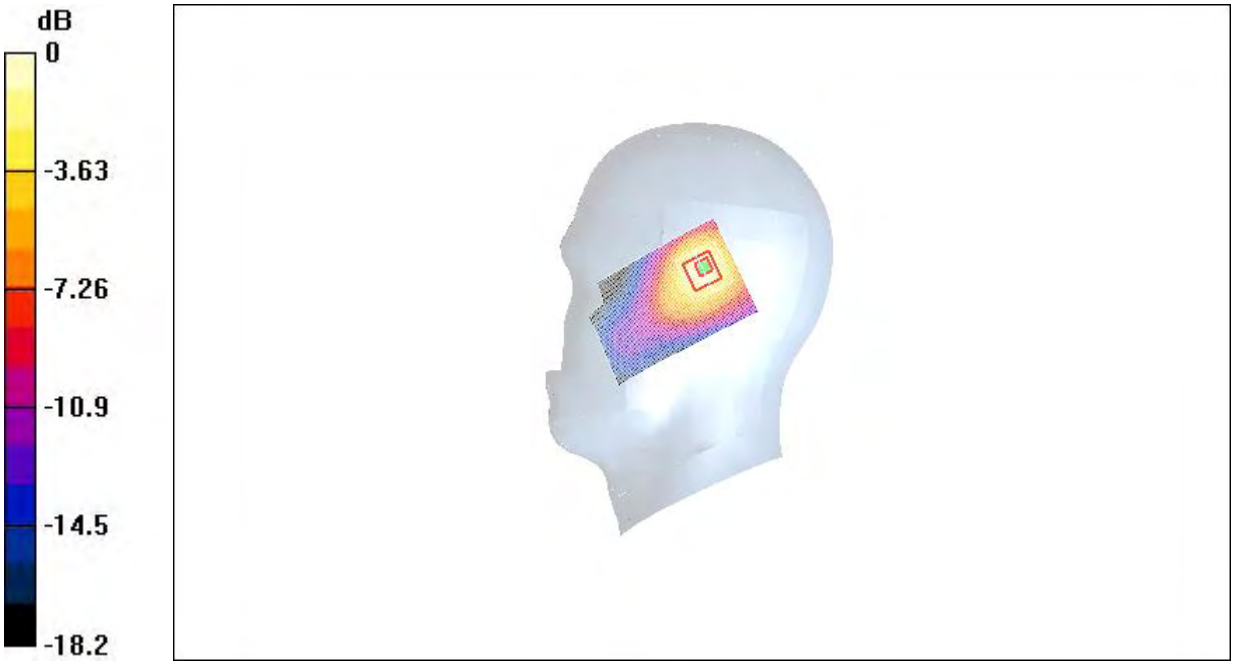
Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.4 V/m; Power Drift = 0.1 dB

Maximum value of SAR (measured) = 0.615 mW/g

Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.556 mW/g; SAR(10 g) = 0.290 mW/g



0 dB = 0.615mW/g

Fig. 71 Right Hand Tilt 15°PCS1900MHz CH512

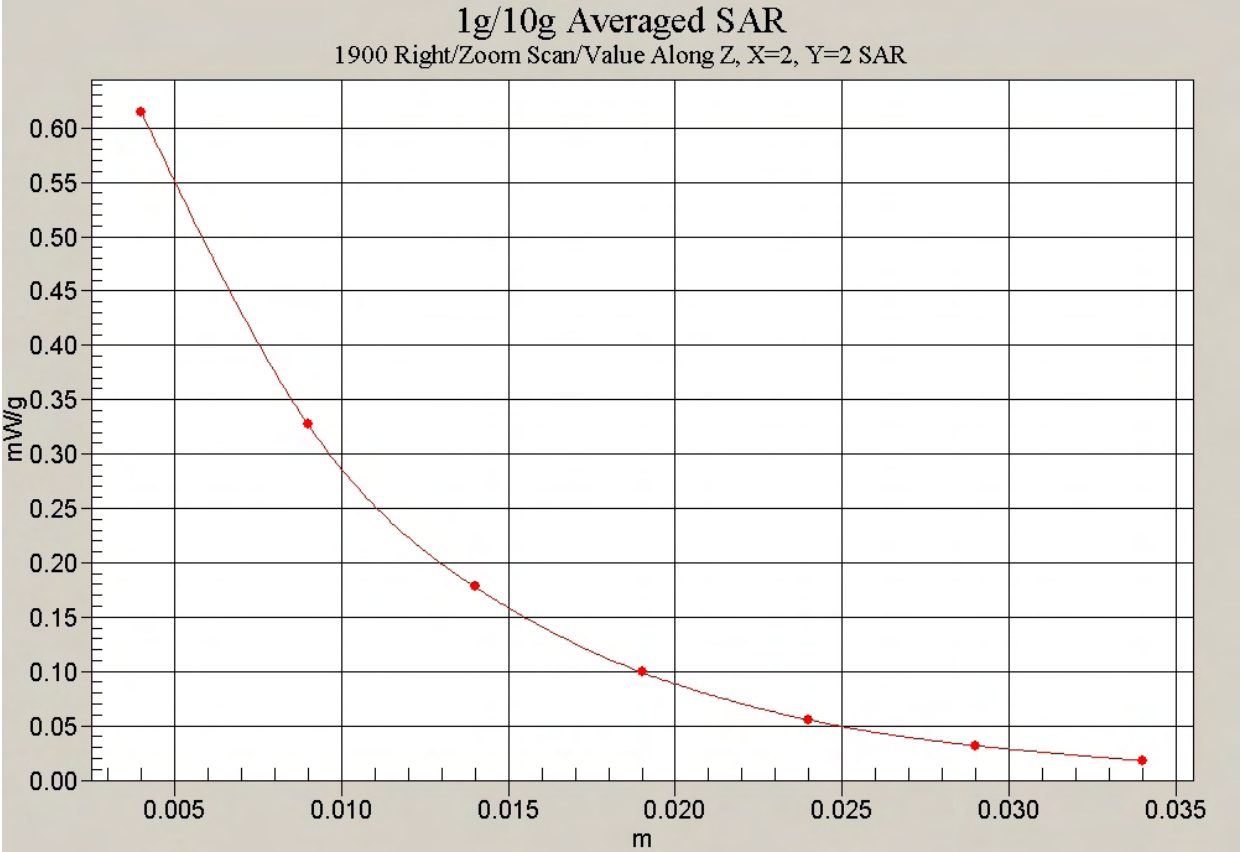


Fig. 72 Z-Scan at power reference point (Right Hand Tilt 15° 1900MHz CH512)

1900 Body Towards Ground High

Electronics: DAE3 Sn536

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

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

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

Reference Value = 8.02 V/m; Power Drift = 0.0 dB

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

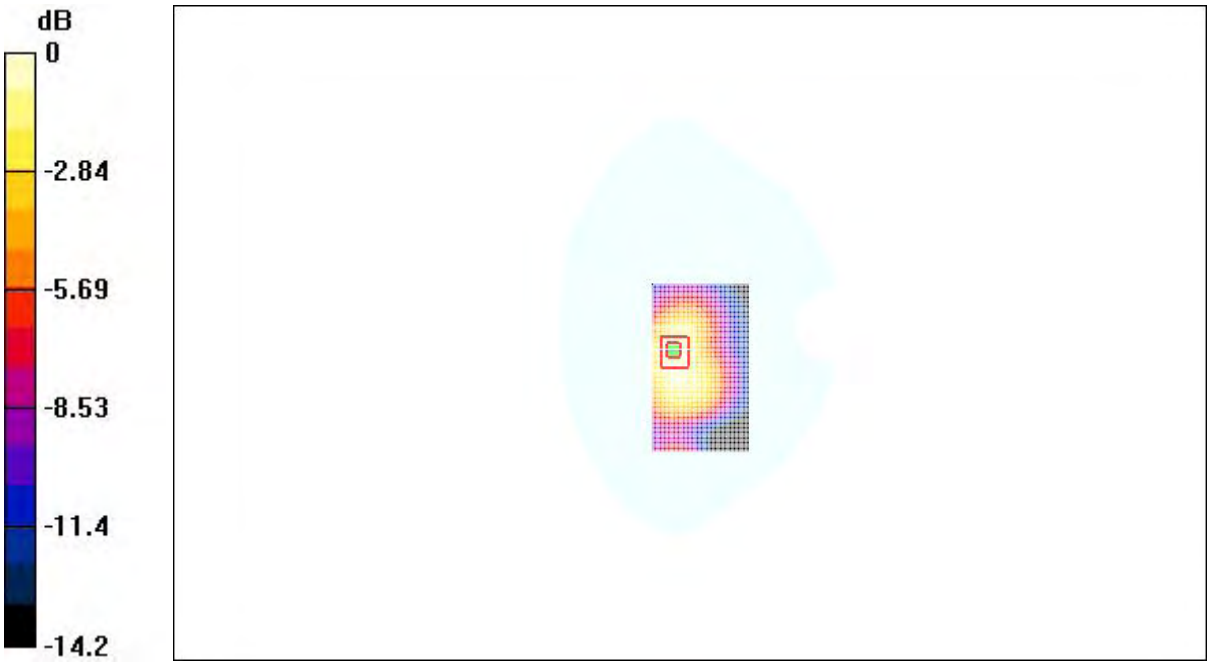
Toward Ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.02 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.184 mW/g

Peak SAR (extrapolated) = 0.251 W/kg

SAR(1 g) = 0.169 mW/g; SAR(10 g) = 0.107 mW/g



0 dB = 0.184mW/g

Fig. 73 Flat Phantom Body-worn Position 1900MHz CH810 with the display of the handset towards the ground

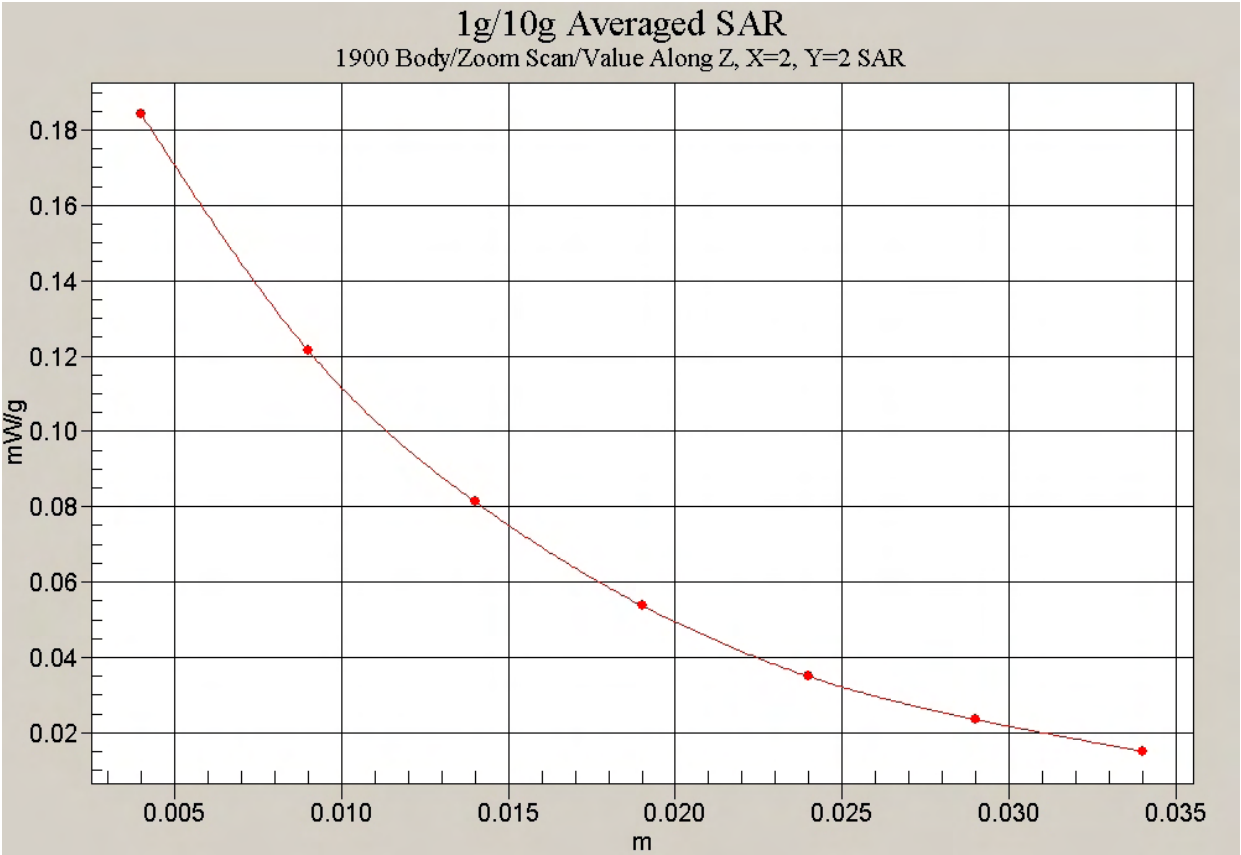


Fig. 74 Z-Scan at power reference point (Flat Phantom 1900MHz CH810 with the display of the handset towards the ground)

1900 Body Towards Ground Middle

Electronics: DAE3 Sn536

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

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

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

Reference Value = 9.92 V/m; Power Drift = -0.003 dB

Maximum value of SAR (interpolated) = 0.286 mW/g

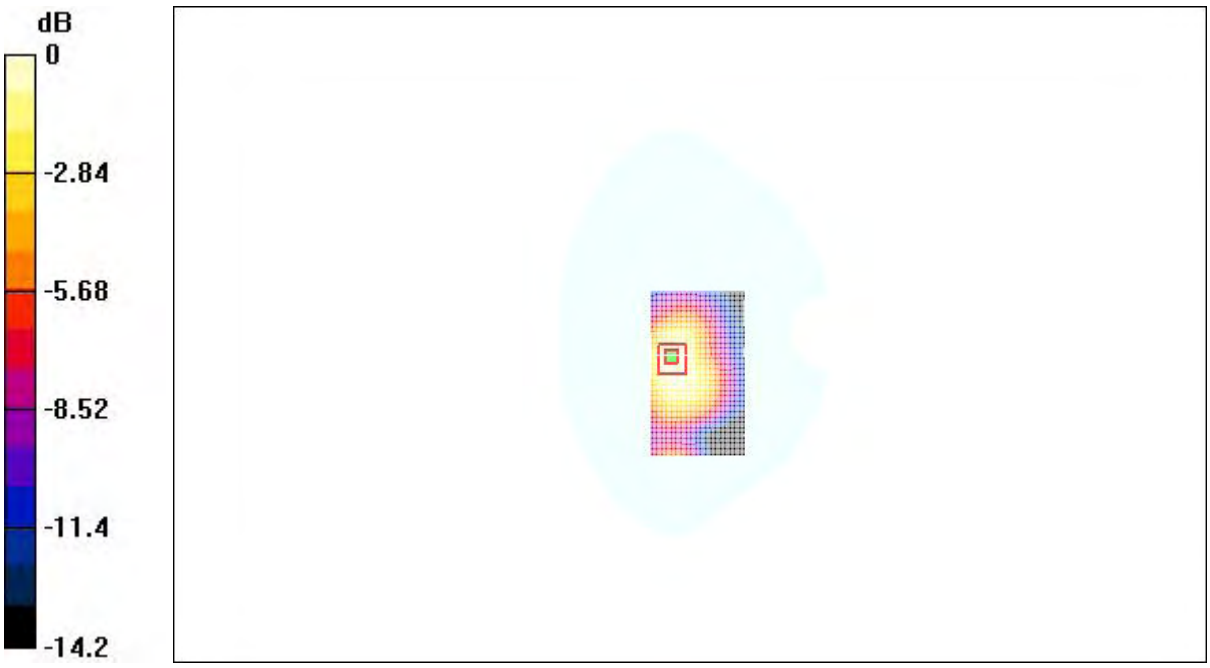
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.92 V/m; Power Drift = -0.003 dB

Maximum value of SAR (measured) = 0.276 mW/g

Peak SAR (extrapolated) = 0.369 W/kg

SAR(1 g) = 0.254 mW/g; SAR(10 g) = 0.162 mW/g



0 dB = 0.276mW/g

Fig. 75 Flat Phantom Body-worn Position 1900MHz CH661 with the display of the handset towards the ground

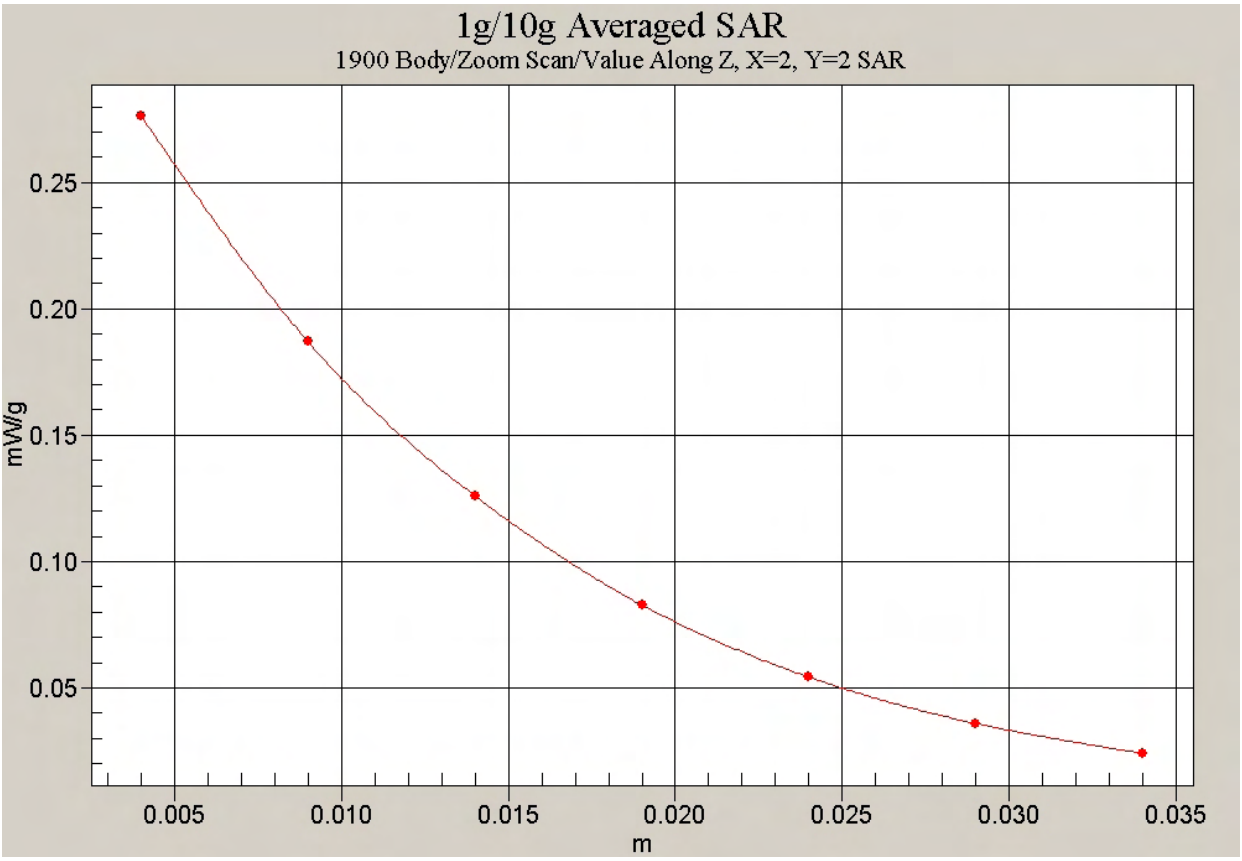


Fig. 76 Z-Scan at power reference point (Flat Phantom 1900MHz CH661 with the display of the handset towards the ground)

1900 Body Towards Ground Low

Electronics: DAE3 Sn536

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

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

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

Reference Value = 11.4 V/m; Power Drift = -0.0 dB

Maximum value of SAR (interpolated) = 0.381 mW/g

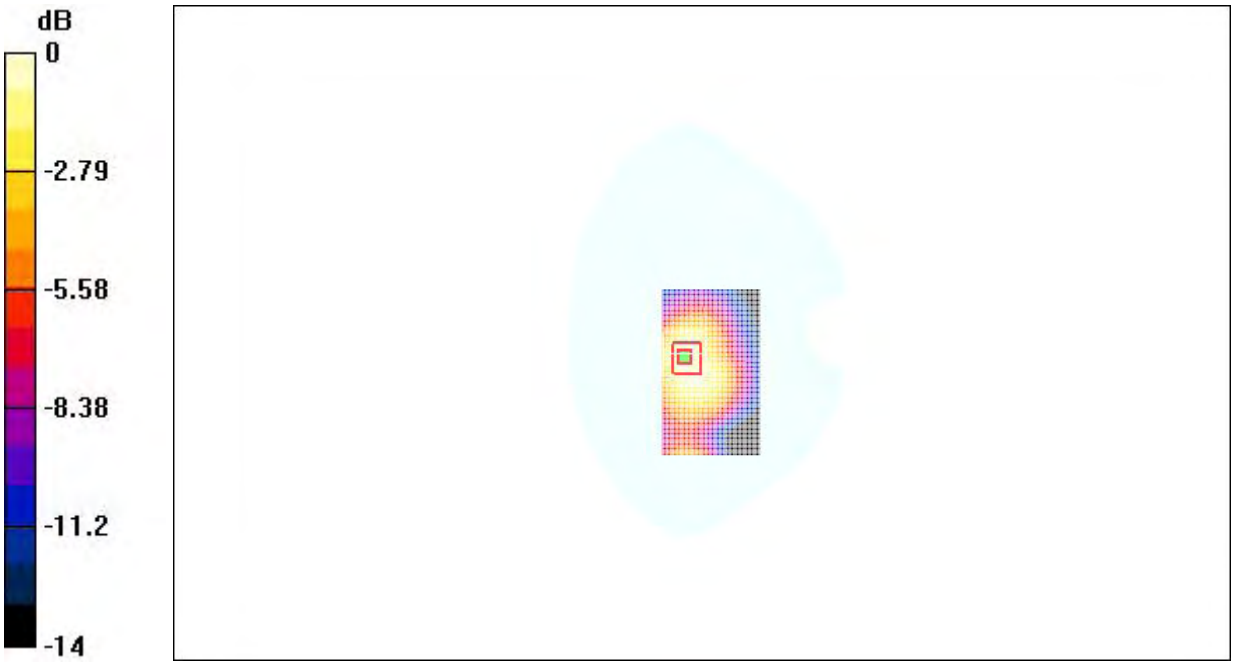
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.4 V/m; Power Drift = -0.0 dB

Maximum value of SAR (measured) = 0.363 mW/g

Peak SAR (extrapolated) = 0.483 W/kg

SAR(1 g) = 0.335 mW/g; SAR(10 g) = 0.216 mW/g



0 dB = 0.363mW/g

Fig. 77 Flat Phantom Body-worn Position 1900MHz CH512 with the display of the handset towards the ground

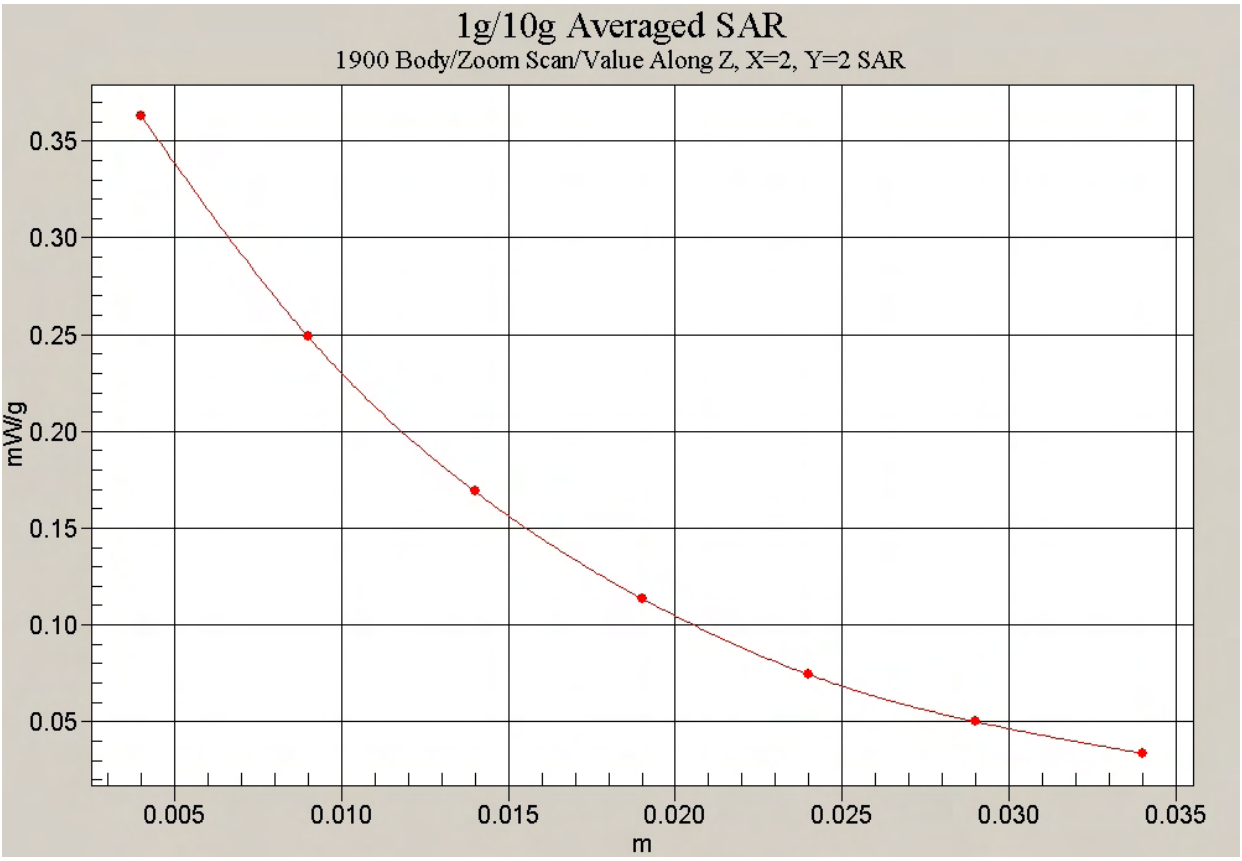


Fig. 78 Z-Scan at power reference point (Flat Phantom 1900MHz CH512 with the display of the handset towards the ground)

1900 Body Towards Phantom High

Electronics: DAE3 Sn536

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

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

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

Reference Value = 3.97 V/m; Power Drift = -0.2 dB

Maximum value of SAR (interpolated) = 0.063 mW/g

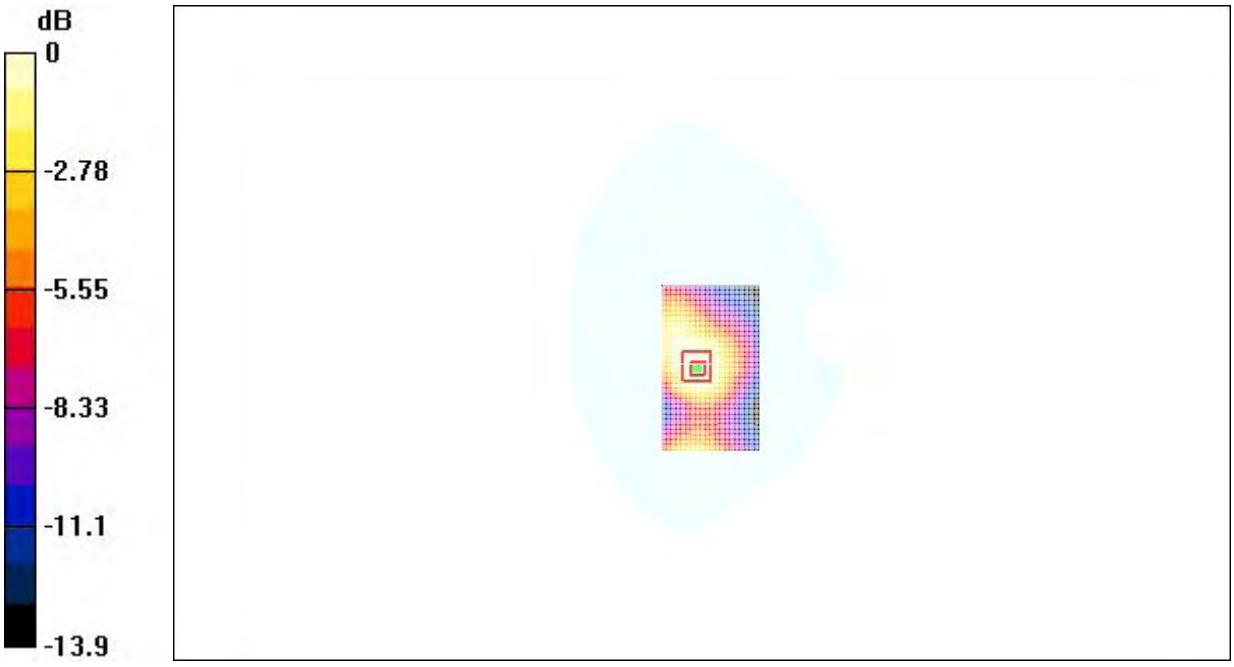
Toward Phantom High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.97 V/m; Power Drift = -0.2 dB

Maximum value of SAR (measured) = 0.061 mW/g

Peak SAR (extrapolated) = 0.083 W/kg

SAR(1 g) = 0.057 mW/g; SAR(10 g) = 0.037 mW/g



0 dB = 0.061mW/g

Fig. 79 Flat Phantom Body-worn Position 1900MHz CH810 with the display of the handset towards the phantom

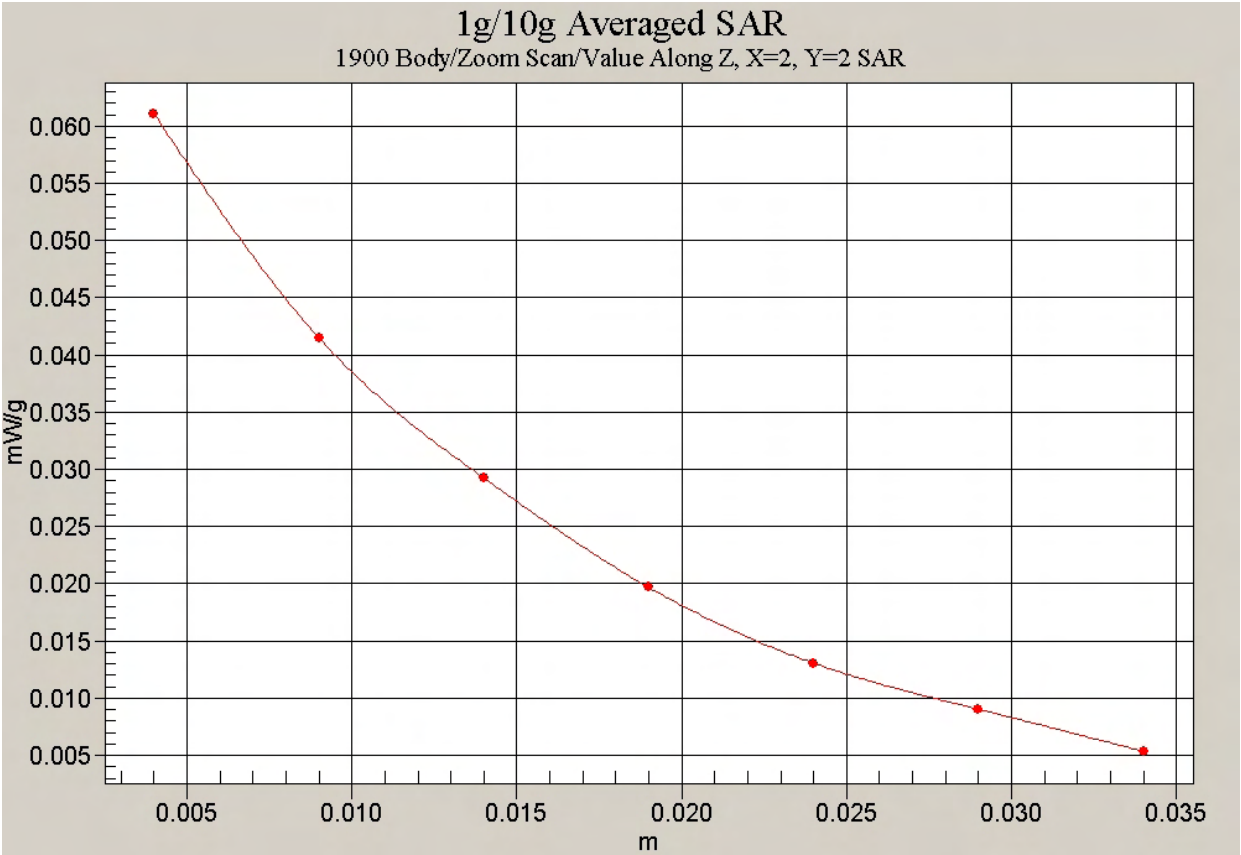


Fig. 80 Z-Scan at power reference point (Flat Phantom 1900MHz CH810 with the display of the handset towards the phantom)

1900 Body Towards phantom Middle

Electronics: DAE3 Sn536

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

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

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

Reference Value = 5.28 V/m; Power Drift = 0.0 dB

Maximum value of SAR (interpolated) = 0.100 mW/g

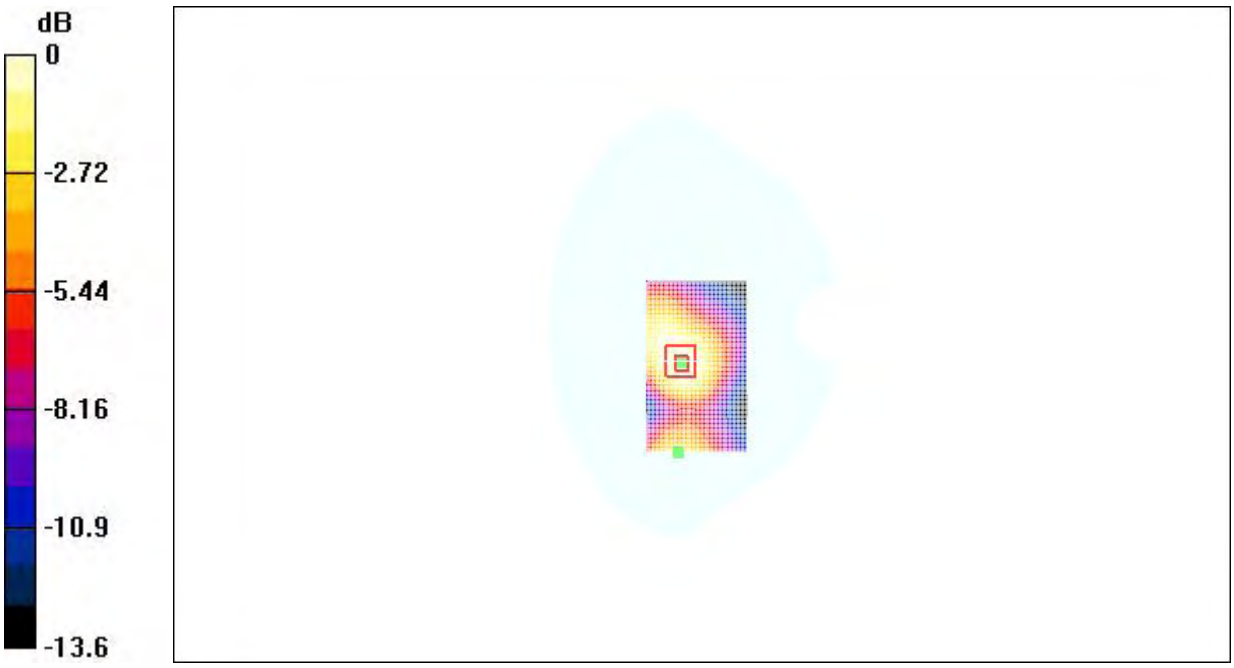
Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.28 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.098 mW/g

Peak SAR (extrapolated) = 0.130 W/kg

SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.061 mW/g



0 dB = 0.098mW/g

Fig. 81 Flat Phantom Body-worn Position 1900MHz CH661 with the display of the handset towards the phantom

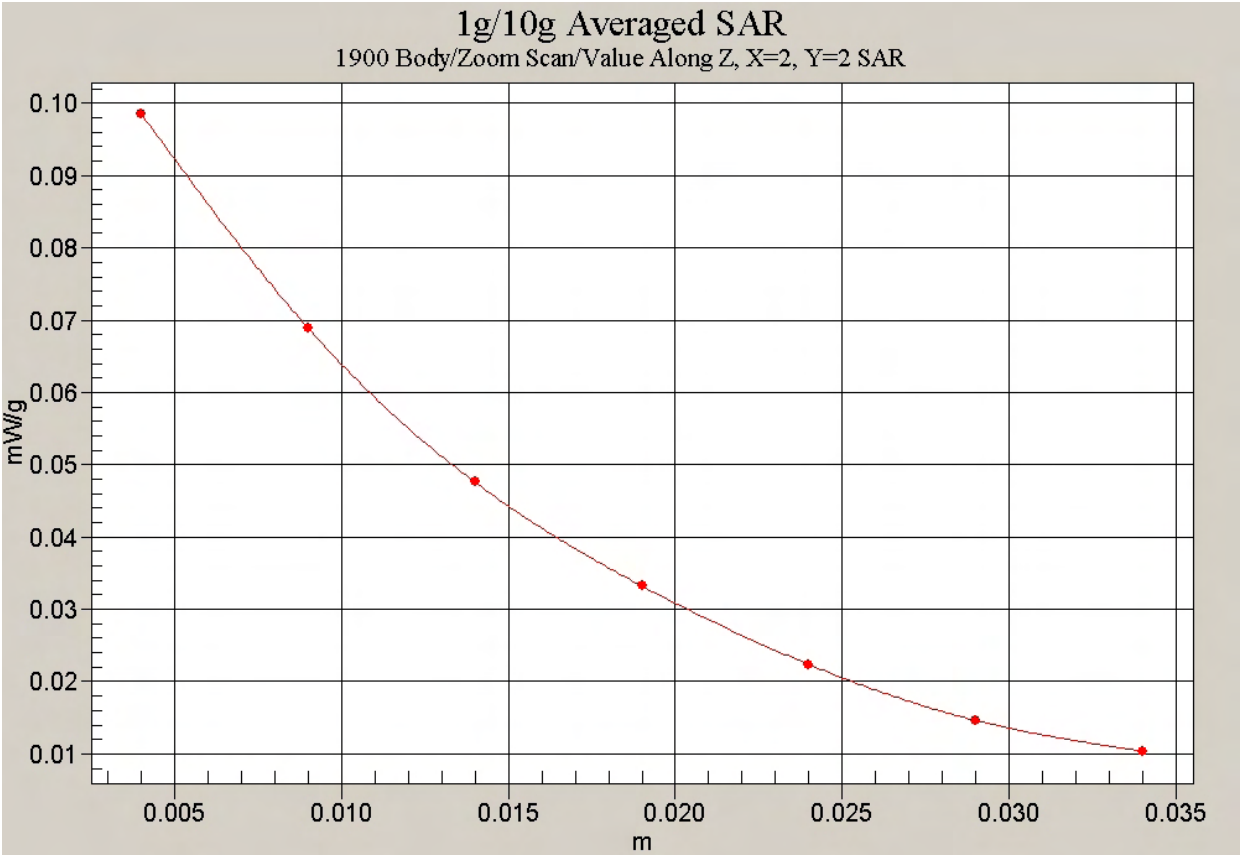


Fig. 82 Z-Scan at power reference point (Flat Phantom 1900MHz CH661 with the display of the handset towards the phantom)

1900 Body Towards phantom Low

Electronics: DAE3 Sn536

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

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

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

Reference Value = 7.11 V/m; Power Drift = -0.0 dB

Maximum value of SAR (interpolated) = 0.157 mW/g

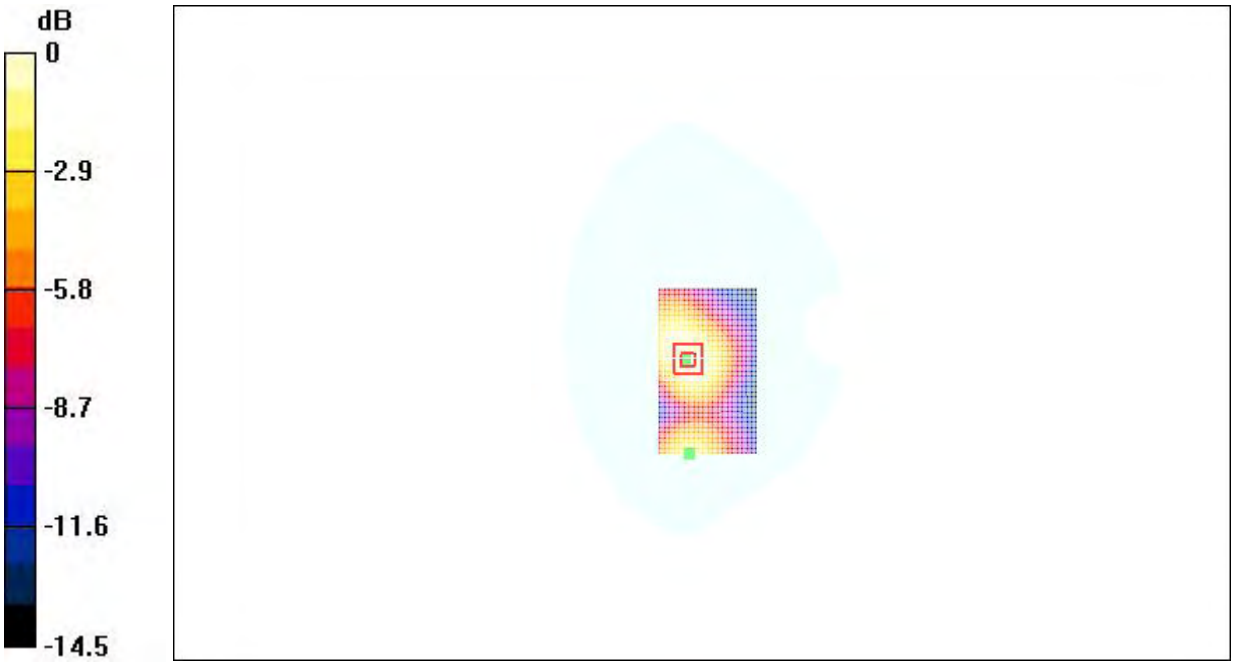
Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.11 V/m; Power Drift = -0.0 dB

Maximum value of SAR (measured) = 0.151 mW/g

Peak SAR (extrapolated) = 0.202 W/kg

SAR(1 g) = 0.142 mW/g; SAR(10 g) = 0.094 mW/g



0 dB = 0.151mW/g

Fig. 83 Flat Phantom Body-worn Position 1900MHz CH512 with the display of the handset towards the phantom

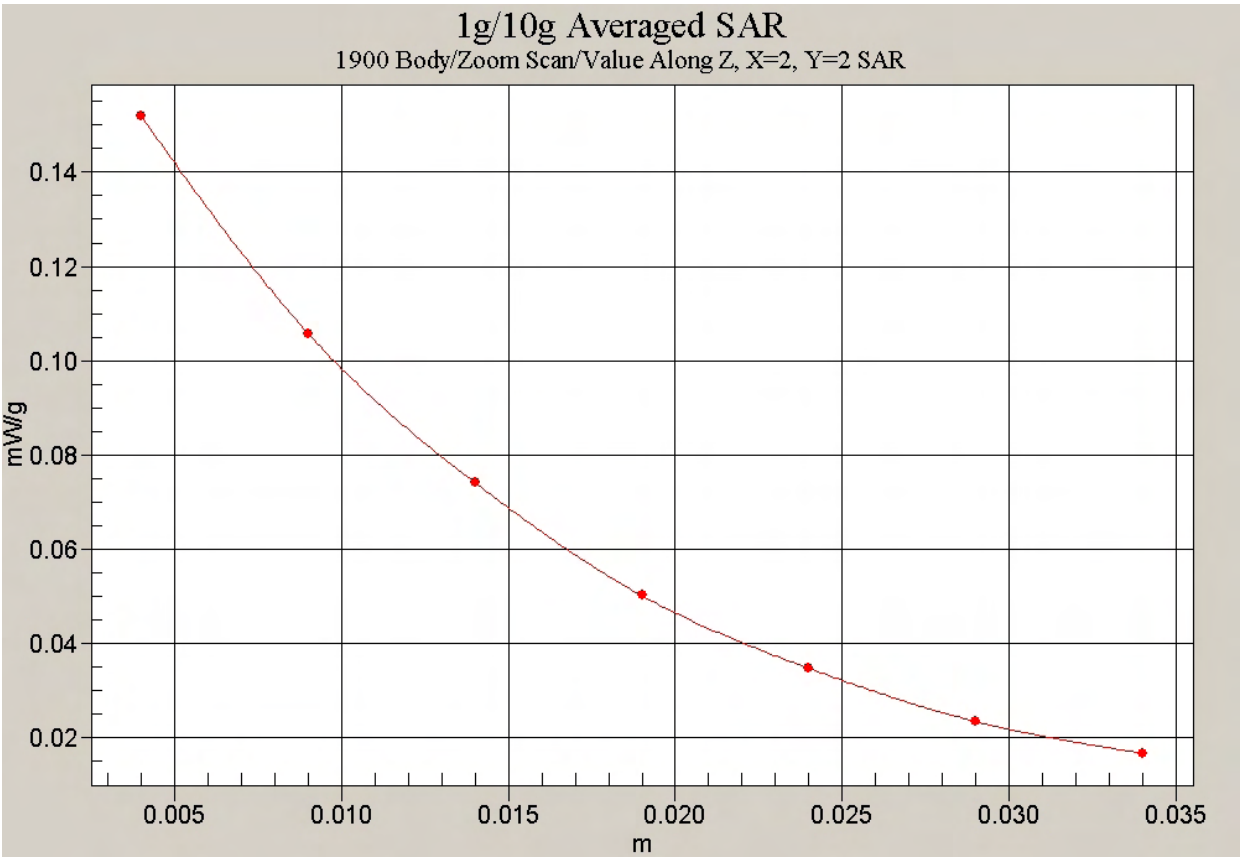


Fig. 84 Z-Scan at power reference point (Flat Phantom 1900MHz CH512 with the display of the handset towards the phantom)

1900 Body Towards Ground High With GPRS

Electronics: DAE3 Sn536

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

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

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

Reference Value = 9.6 V/m; Power Drift = -0.0 dB

Maximum value of SAR (interpolated) = 0.262 mW/g

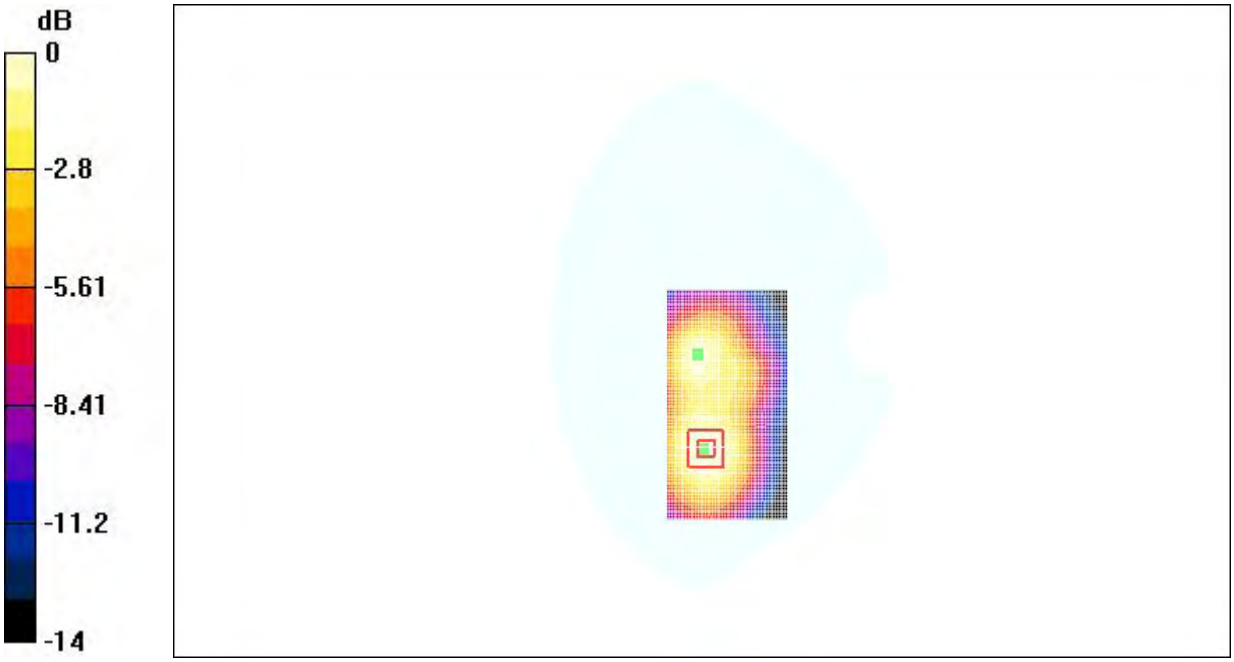
Toward ground High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.6 V/m; Power Drift = -0.0 dB

Maximum value of SAR (measured) = 0.261 mW/g

Peak SAR (extrapolated) = 0.355 W/kg

SAR(1 g) = 0.243 mW/g; SAR(10 g) = 0.156 mW/g



0 dB = 0.261mW/g

Fig. 85 Flat Phantom Body-worn Position 1900MHz CH810 GPRS with the display of the handset towards the ground

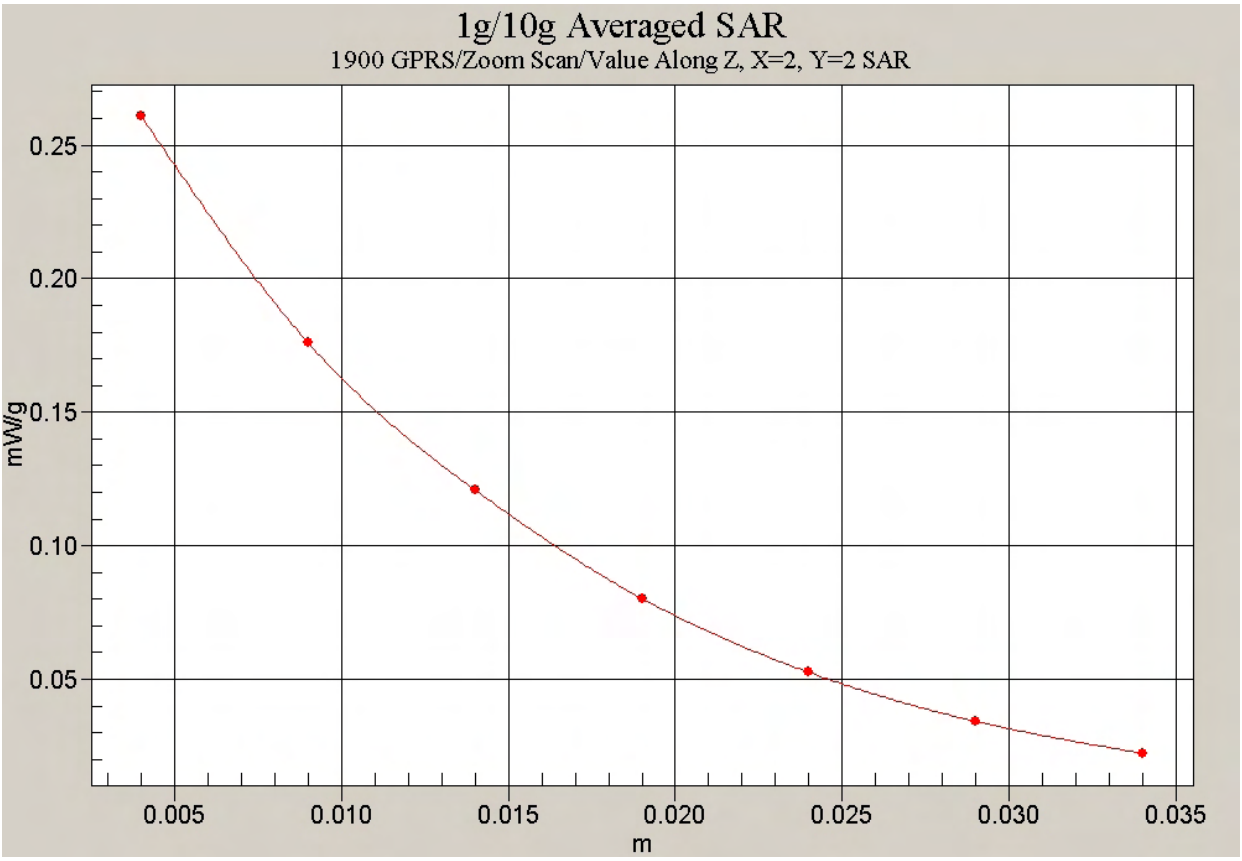


Fig. 86 Z-Scan at power reference point (Flat Phantom 1900MHz CH810 GPRS with the display of the handset towards the ground)

1900 Body Towards Ground Middle With GPRS

Electronics: DAE3 Sn536

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

Reference Value = 9.2 V/m; Power Drift = 0.0 dB

Maximum value of SAR (interpolated) = 0.386 mW/g

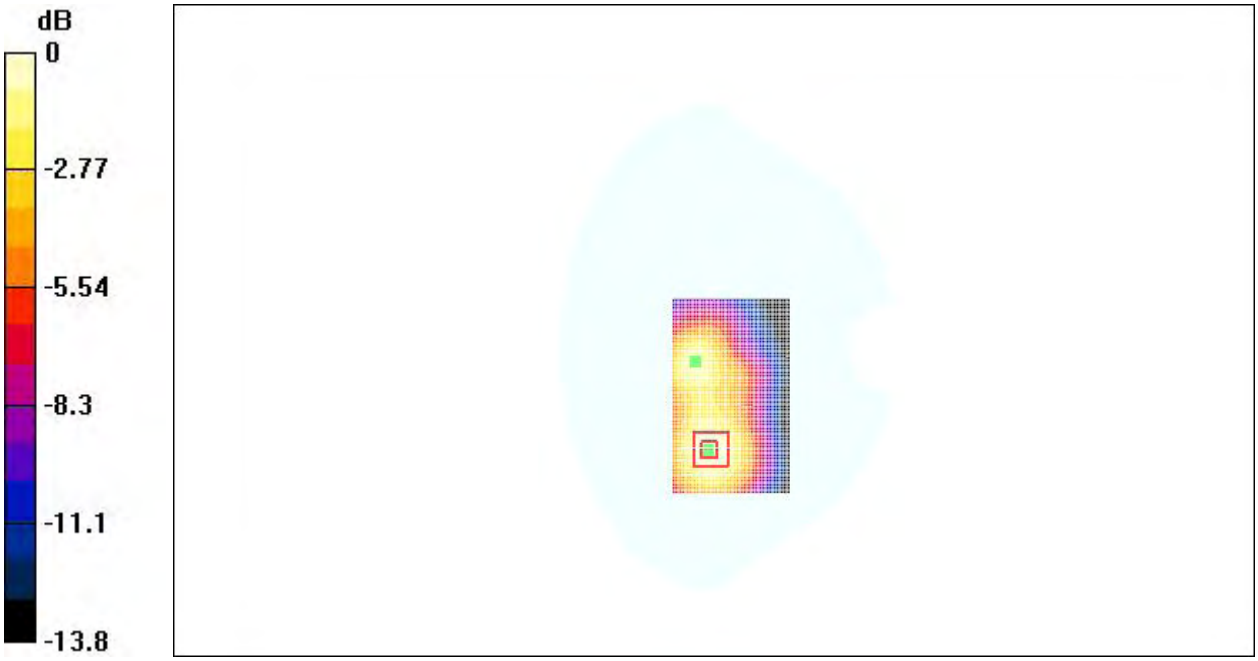
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.2 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.388 mW/g

Peak SAR (extrapolated) = 0.526 W/kg

SAR(1 g) = 0.360 mW/g; SAR(10 g) = 0.230 mW/g



0 dB = 0.388mW/g

Fig. 87 Flat Phantom Body-worn Position 1900MHz CH661 GPRS with the display of the handset towards the ground

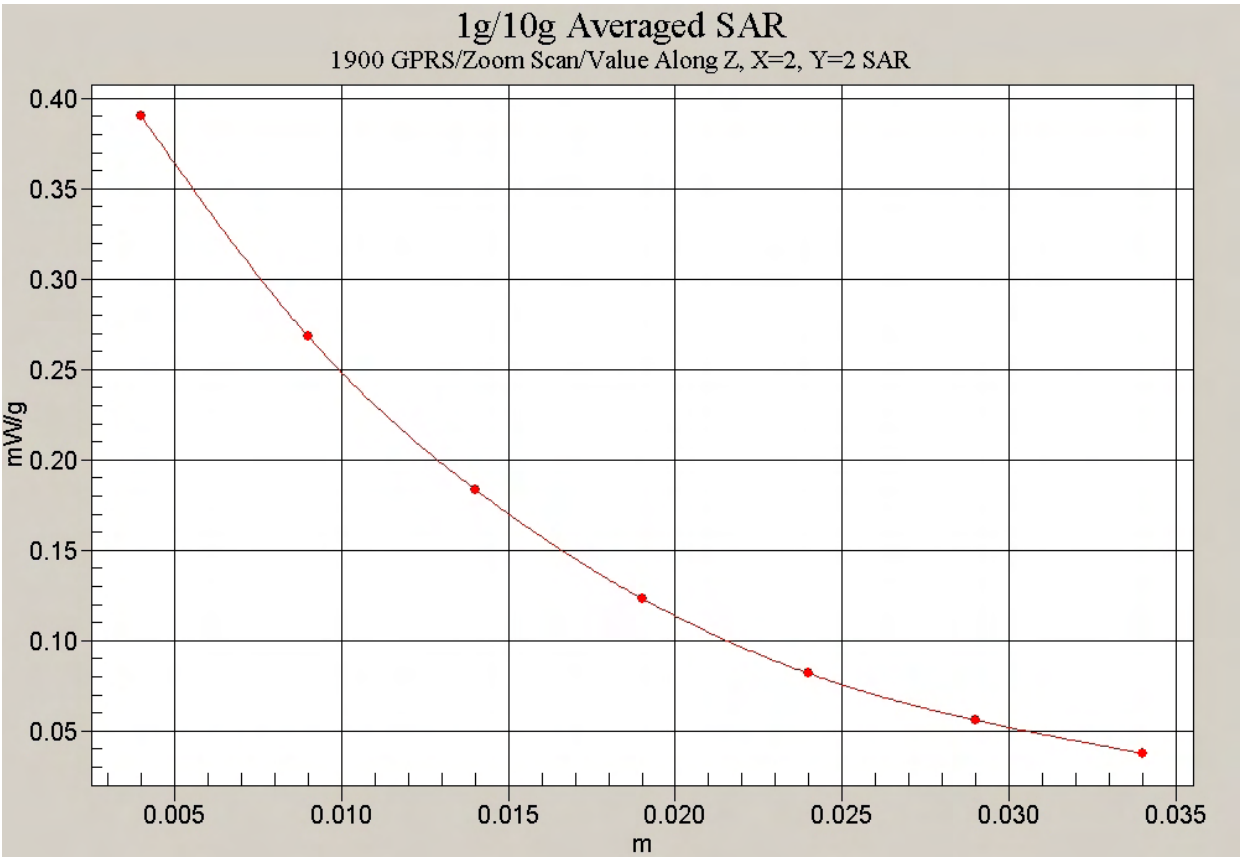


Fig. 88 Z-Scan at power reference point (Flat Phantom 1900MHz CH661 GPRS with the display of the handset towards the ground)

1900 Body Towards Ground Low With GPRS

Electronics: DAE3 Sn536

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

Reference Value = 18.8 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 0.824 mW/g

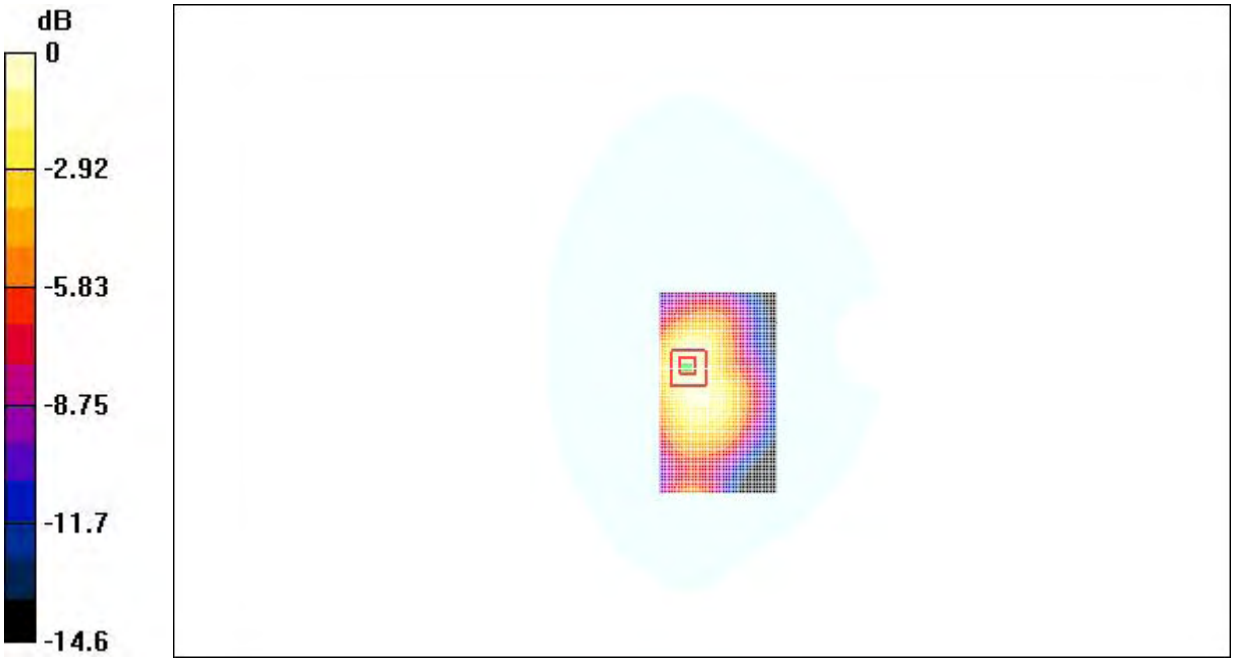
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.8 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 0.802 mW/g

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.734 mW/g; SAR(10 g) = 0.455 mW/g



0 dB = 0.802mW/g

Fig. 89 Flat Phantom Body-worn Position 1900MHz CH512 GPRS with the display of the handset towards the ground

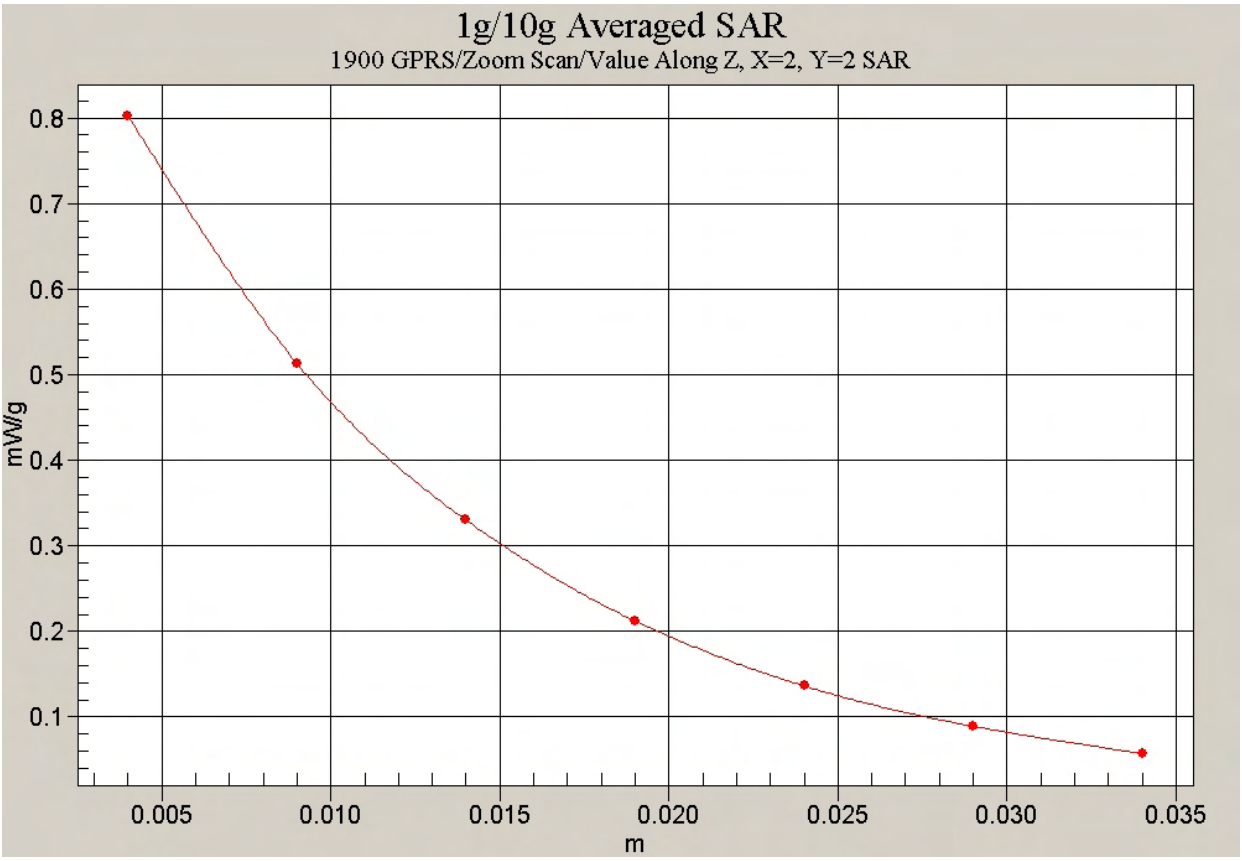


Fig. 90 Z-Scan at power reference point (Flat Phantom 1900MHz CH512 GPRS with the display of the handset towards the ground)

1900 Body Towards Phantom High With GPRS

Electronics: DAE3 Sn536

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 (101x141x1): Measurement grid: dx=10mm, dy=10mm

Reference Value = 5.51 V/m; Power Drift = -0.2 dB

Maximum value of SAR (interpolated) = 0.096 mW/g

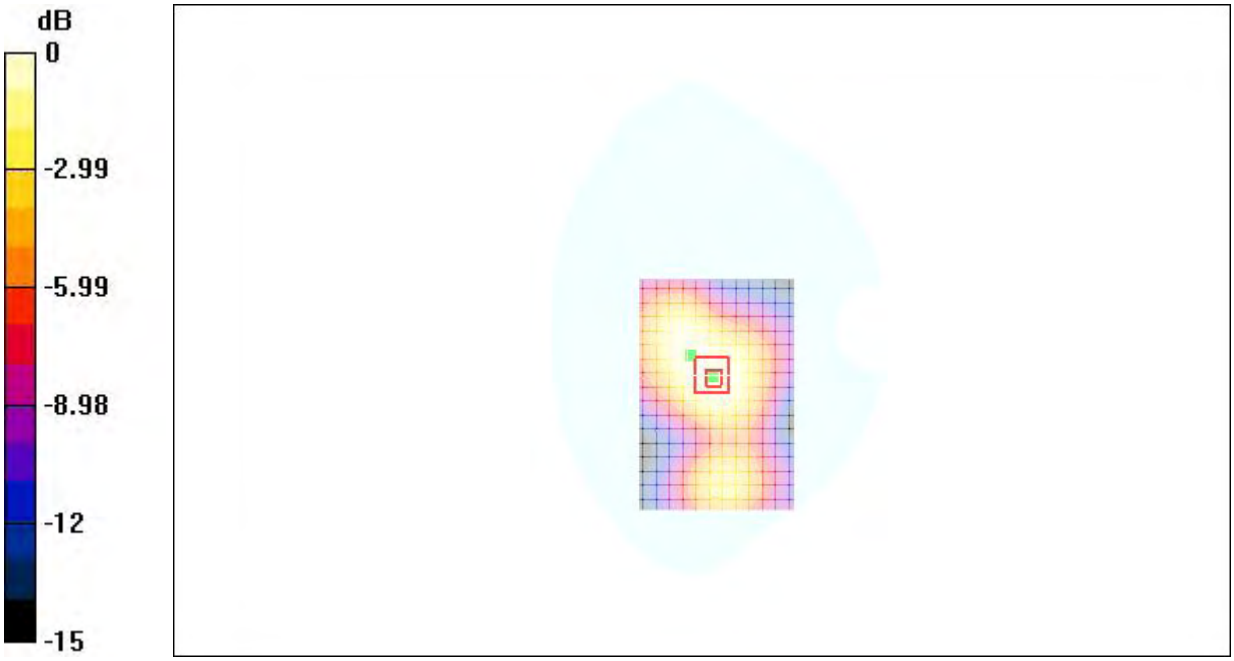
Toward Phantom High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.51 V/m; Power Drift = -0.2 dB

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

Peak SAR (extrapolated) = 0.135 W/kg

SAR(1 g) = 0.087 mW/g; SAR(10 g) = 0.056 mW/g



0 dB = 0.092mW/g

Fig. 91 Flat Phantom Body-worn Position 1900MHz CH810 GPRS with the display of the handset towards the phantom

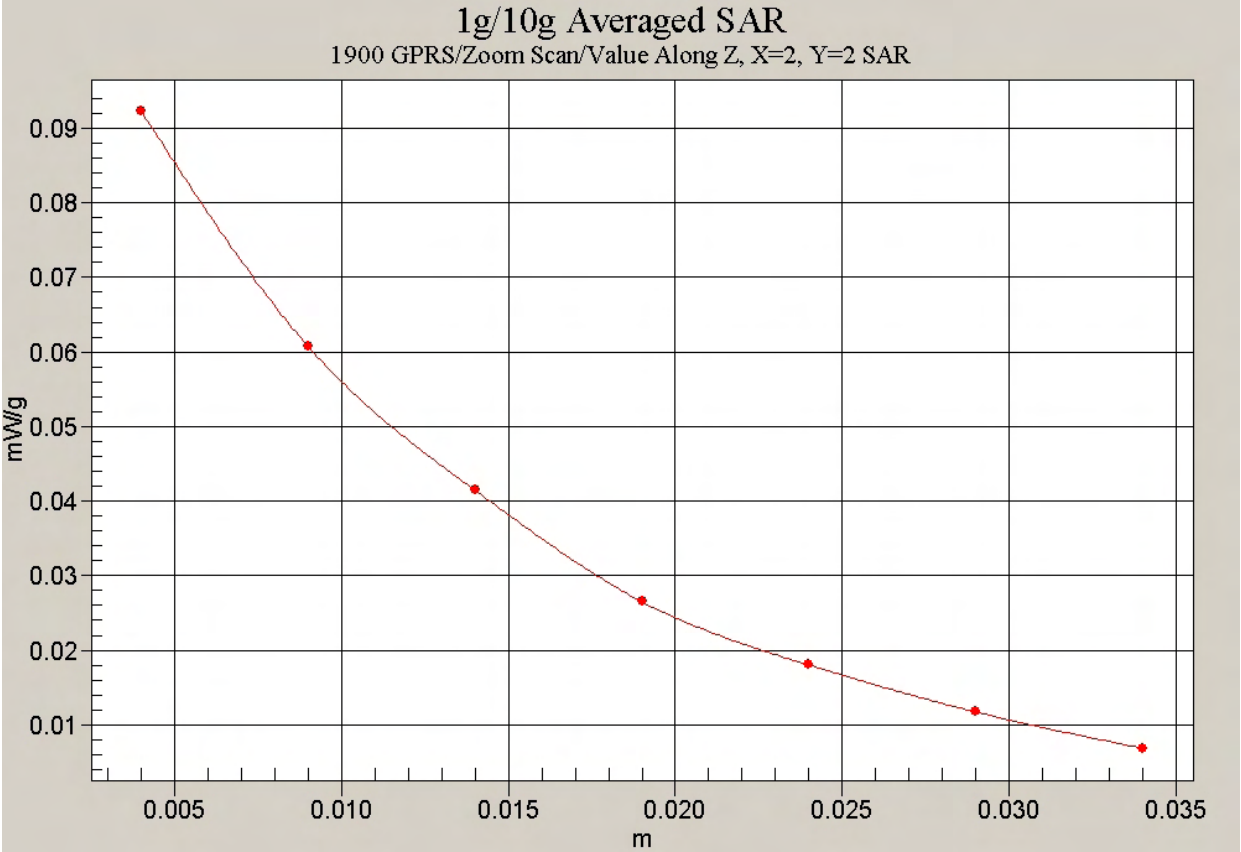


Fig. 92 Z-Scan at power reference point (Flat Phantom 1900MHz CH810 GPRS with the display of the handset towards the phantom)

1900 Body Towards phantom Middle With GPRS

Electronics: DAE3 Sn536

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 (51x81x1): Measurement grid: dx=10mm, dy=10mm

Reference Value = 8.2 V/m; Power Drift = 0.1 dB

Maximum value of SAR (interpolated) = 0.171 mW/g

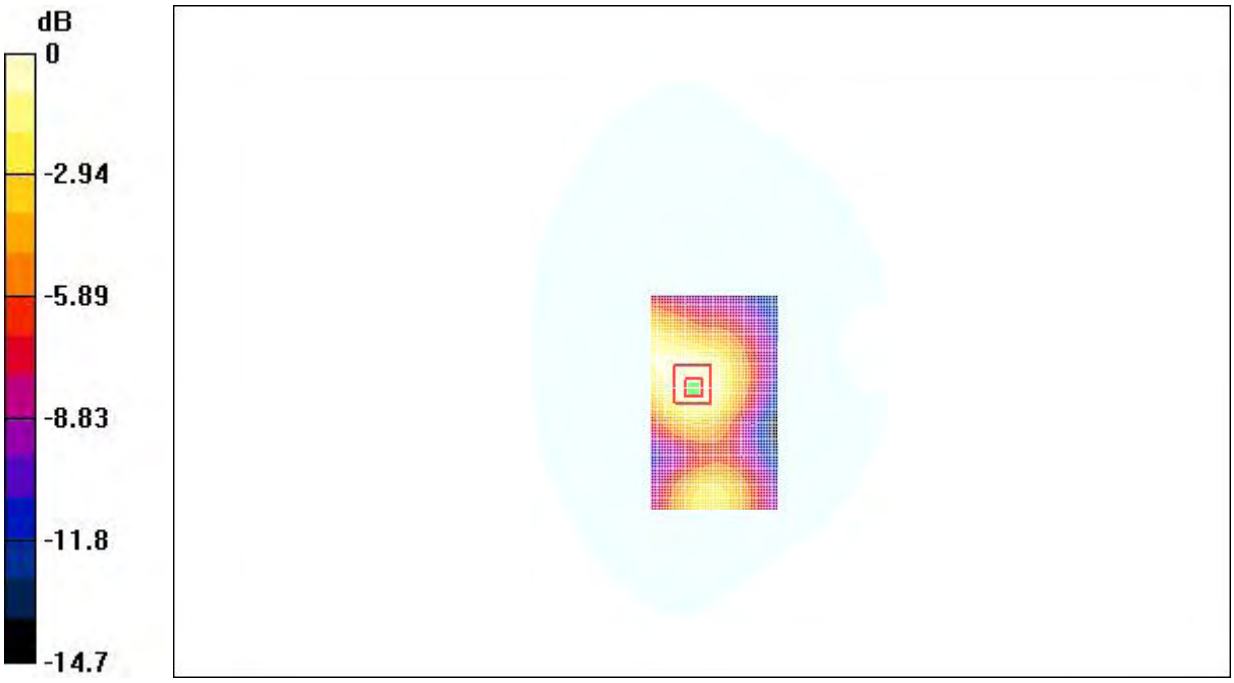
Toward Phantom Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.2 V/m; Power Drift = 0.1 dB

Maximum value of SAR (measured) = 0.170 mW/g

Peak SAR (extrapolated) = 0.238 W/kg

SAR(1 g) = 0.157 mW/g; SAR(10 g) = 0.101 mW/g



0 dB = 0.170mW/g

Fig. 93 Flat Phantom Body-worn Position 1900MHz CH661 GPRS with the display of the handset towards the phantom

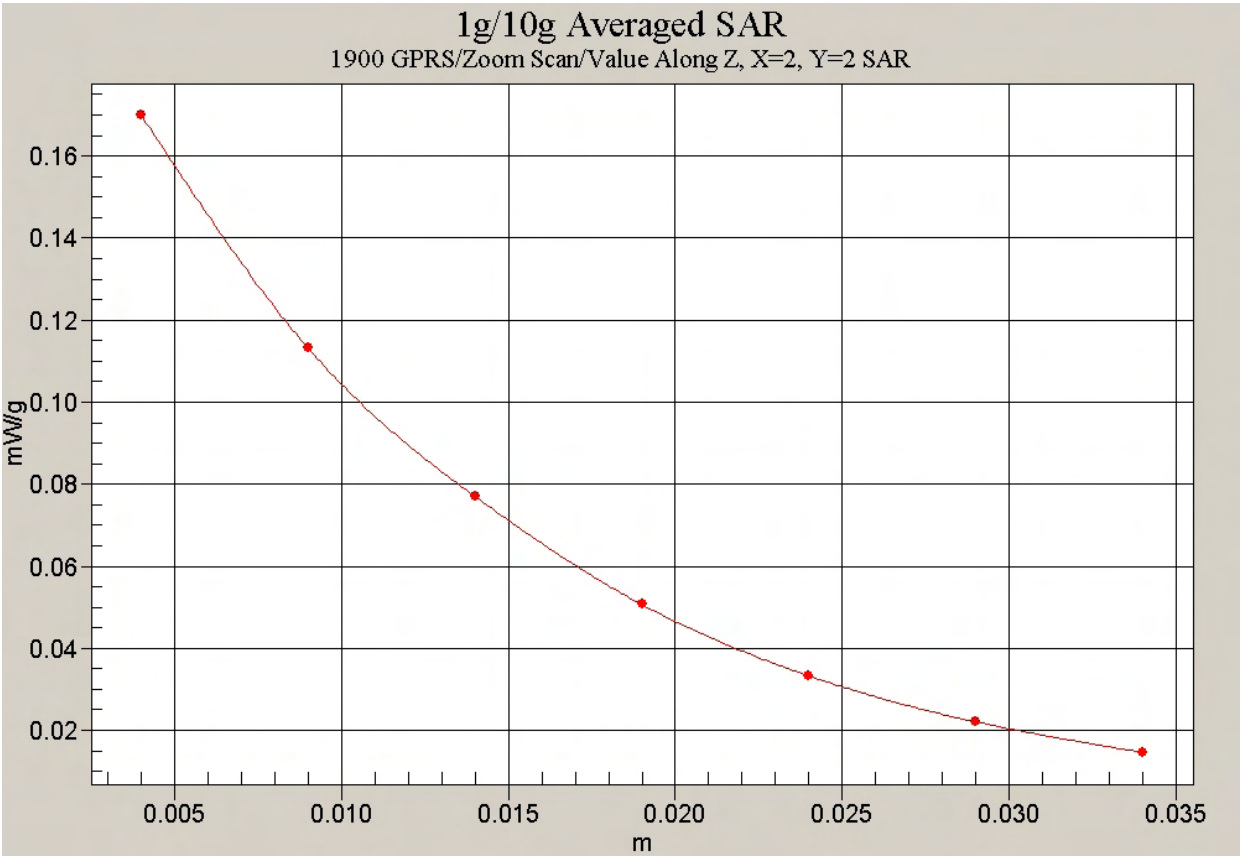


Fig. 94 Z-Scan at power reference point (Flat Phantom 1900MHz CH661 GPRS with the display of the handset towards the phantom)

1900 Body Towards phantom Low With GPRS

Electronics: DAE3 Sn536

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 (51x81x1): Measurement grid: dx=10mm, dy=10mm

Reference Value = 10.1 V/m; Power Drift = 0.0 dB

Maximum value of SAR (interpolated) = 0.258 mW/g

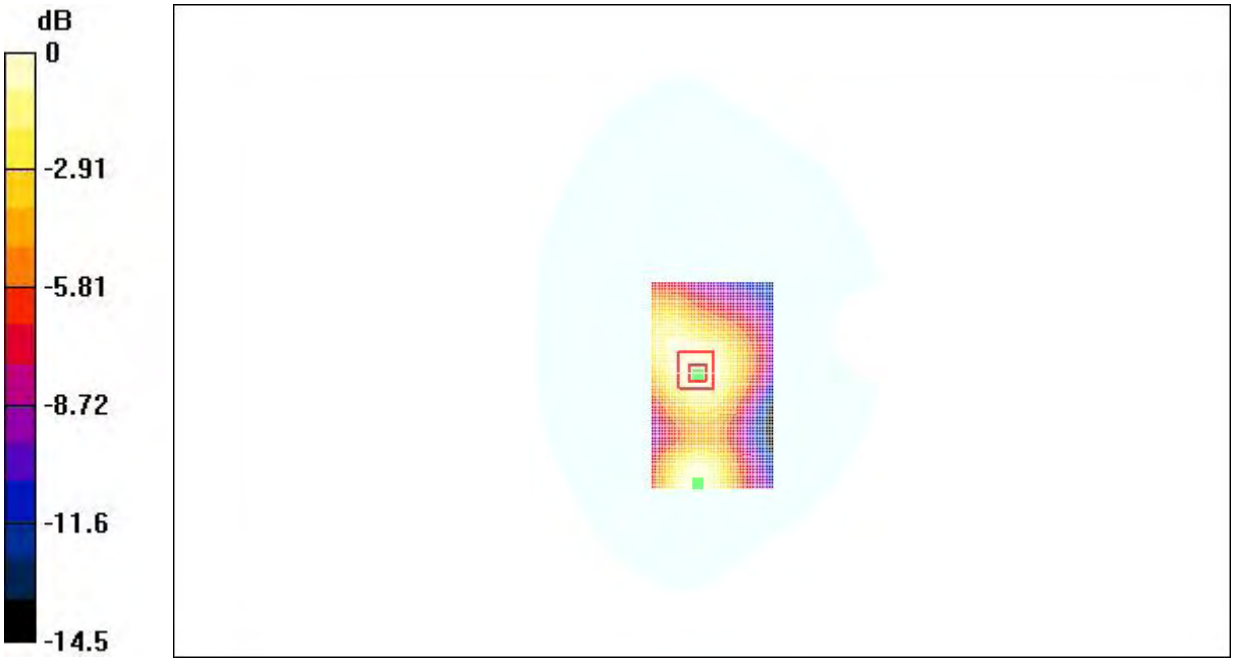
Toward Phantom Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.1 V/m; Power Drift = 0.0 dB

Maximum value of SAR (measured) = 0.253 mW/g

Peak SAR (extrapolated) = 0.353 W/kg

SAR(1 g) = 0.236 mW/g; SAR(10 g) = 0.153 mW/g



0 dB = 0.253mW/g

Fig. 95 Flat Phantom Body-worn Position 1900MHz CH512 GPRS with the display of the handset towards the phantom

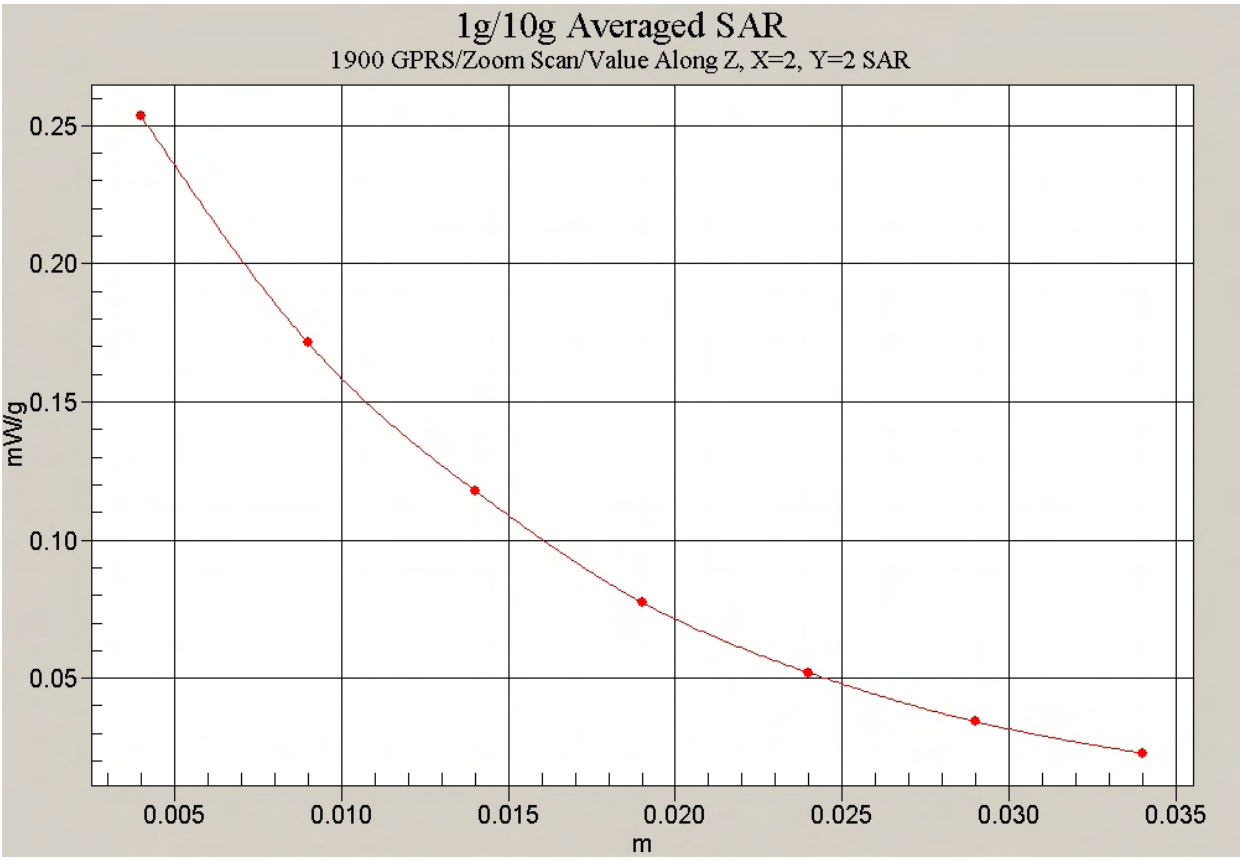


Fig. 96 Z-Scan at power reference point (Flat Phantom 1900MHz CH512 GPRS with the display of the handset towards the phantom)

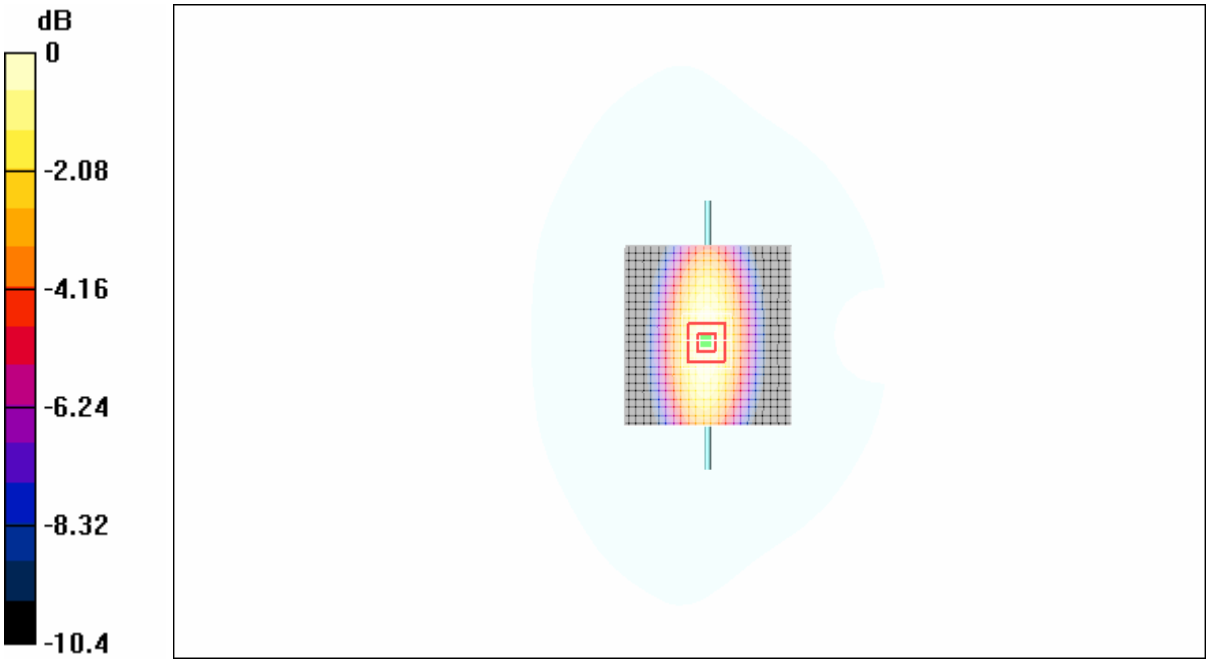
ANNEX D SYSTEM VALIDATION RESULTS

835MHzDAE536Probe1736

Electronics: DAE3 Sn536
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: ET3DV6 - SN1736 ConvF(6.51, 6.51, 6.51)

835MHz/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Reference Value = 56.8 V/m; Power Drift = -0.0 dB
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 = -0.0 dB
Maximum value of SAR (measured) = 2.69 mW/g
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.62 mW/g



0 dB = 2.69mW/g

Fig.97 validation 850MHz 250mW

1900MHzDAE536Probe1736

Electronics: DAE3 Sn536

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

Reference Value = 92.1 V/m; Power Drift = 0.1 dB

Maximum value of SAR (interpolated) = 11.2 mW/g

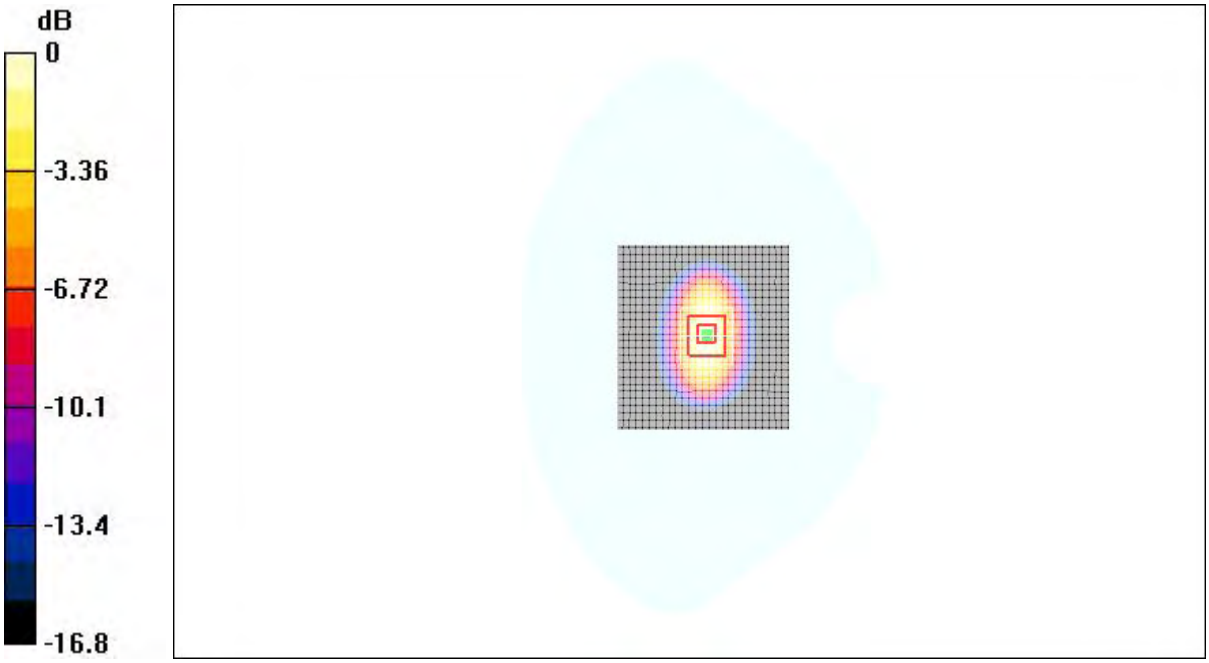
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.1 V/m; Power Drift = 0.1 dB

Maximum value of SAR (measured) = 11.3 mW/g

Peak SAR (extrapolated) = 16.9 W/kg

SAR(1 g) = 9.91 mW/g; SAR(10 g) = 5.27 mW/g



0 dB = 11.3mW/g

Fig.98 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-Auden**

Certificate No: **ET3-1736_Jul05**

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1736
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	July 14, 2005
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	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-04 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-04 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN: 3013	7-Jan-05 (SPEAG, No. ES3-3013_Jan05)	Jan-06
DAE4	SN: 907	21-Jun-05 (SPEAG, No. DAE4-907_Jun05)	Jun-06

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 18, 2005

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
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., $\vartheta = 0$ 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) CENELEC 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:

- *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 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 $f \leq 800$ 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 ET3DV6

SN:1736

Manufactured:	September 27, 2002
Last calibrated:	November 25, 2004
Recalibrated:	July 14, 2005

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1736 **July 14, 2005**

DASY - Parameters of Probe: ET3DV6 SN:1736

Sensitivity in Free Space[A] Diode Compression[B]

NormX	**1.86** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**97** mV
NormY	**1.90** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**97** mV
NormZ	**1.89** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**97** 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	8.3	4.4
SAR_{be} [%]	With Correction Algorithm	0.1	0.2

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	13.6	9.5
SAR_{be} [%]	With Correction Algorithm	0.9	0.1

Sensor Offset

Probe Tip to Sensor Center	**2.7** 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 distribution corresponds to a coverage probability of approximately 95%.

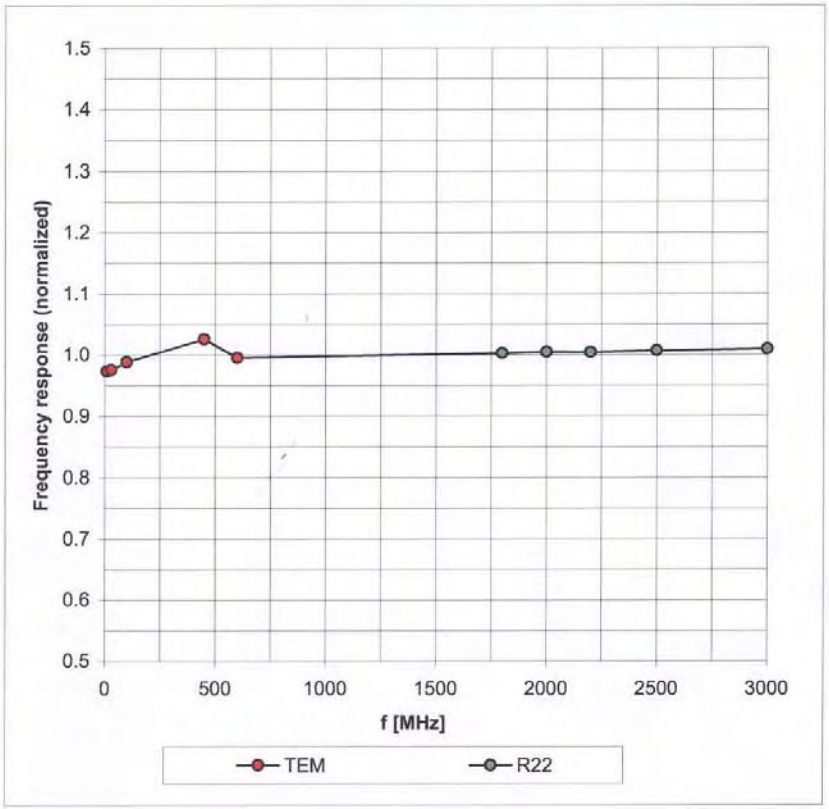
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

ET3DV6 SN:1736 **July 14, 2005**

Frequency Response of E-Field

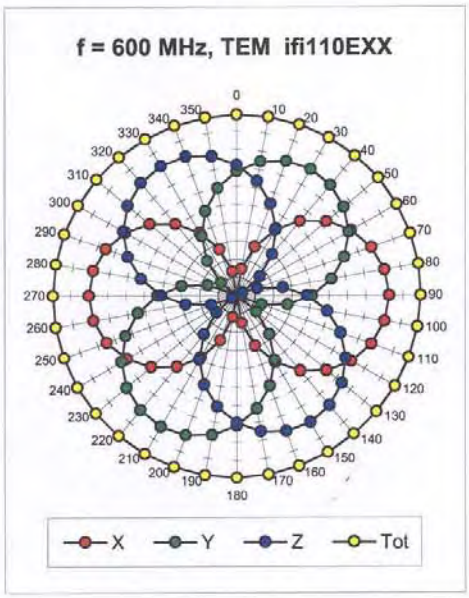
(TEM-Cell:ifi110 EXX, Waveguide: R22)

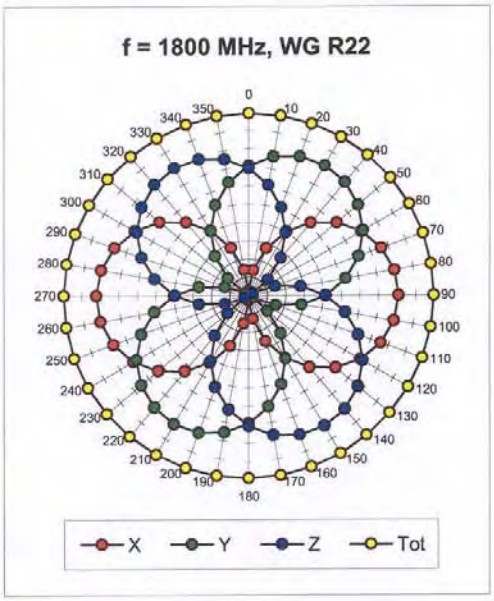


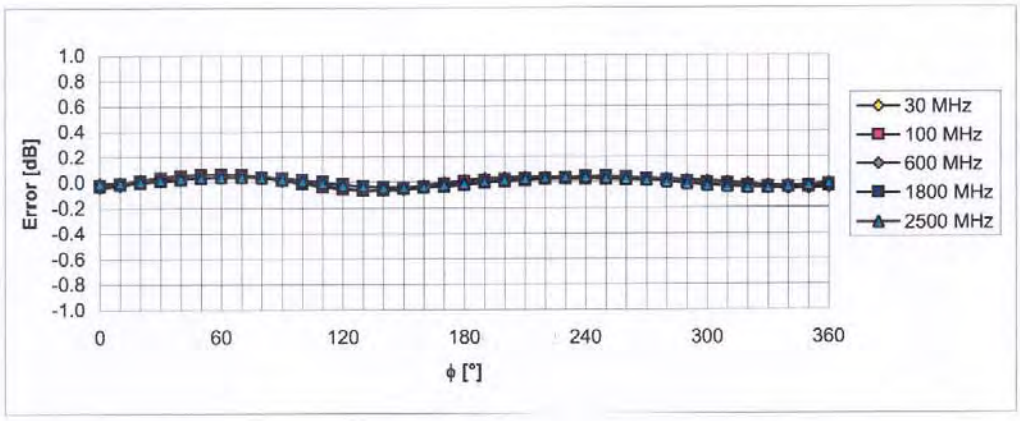
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ET3DV6 SN:1736 **July 14, 2005**

Receiving Pattern (ϕ), ϑ = 0°





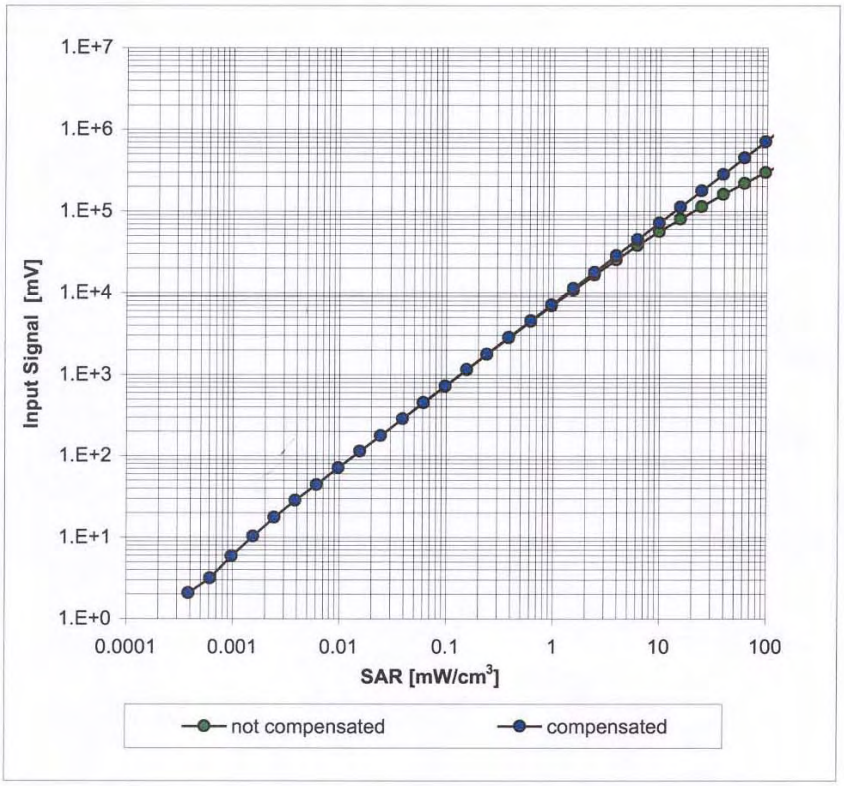


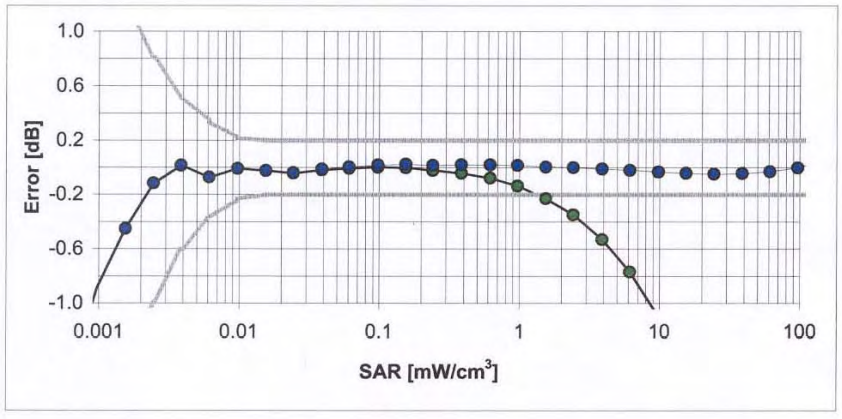
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ET3DV6 SN:1736 **July 14, 2005**

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)

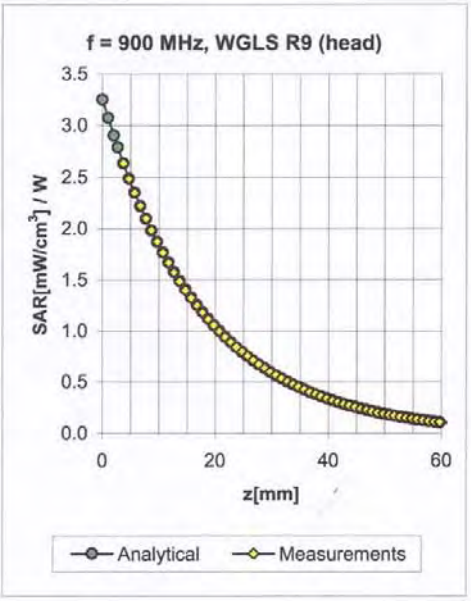


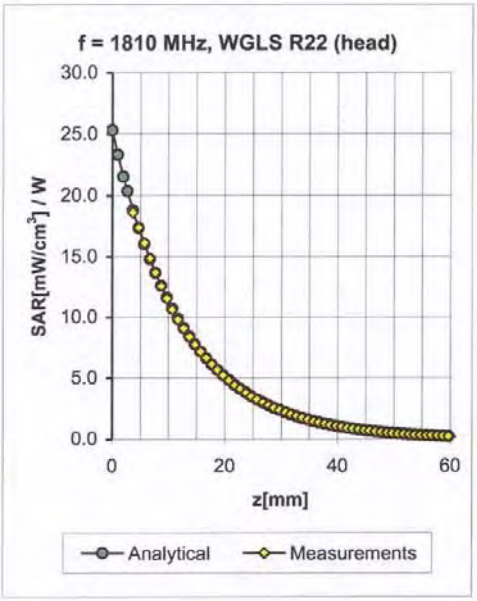


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ET3DV6 SN:1736 **July 14, 2005**

Conversion Factor Assessment





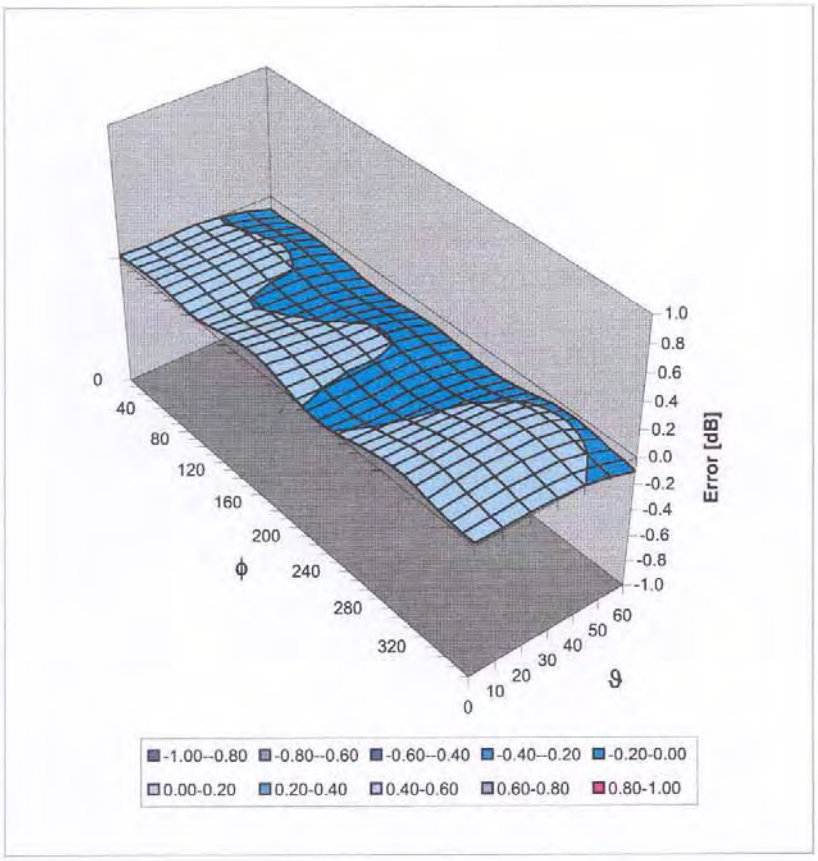
f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.56	1.85	6.51 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.47	5.40 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.62	2.29	4.67 ± 11.8% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.72	1.94	4.39 ± 11.8% (k=2)

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ET3DV6 SN:1736 July 14, 2005

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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