

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.

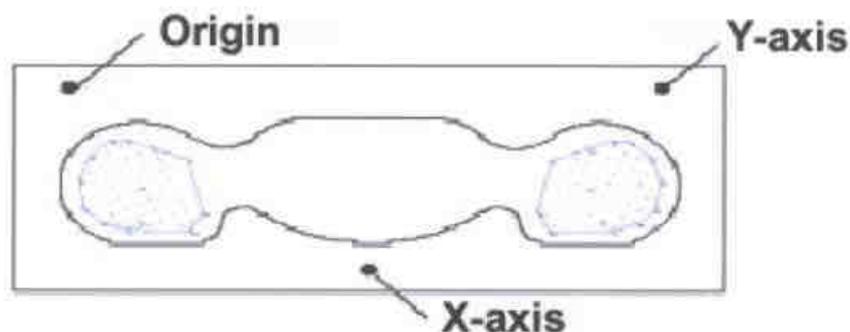
Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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.

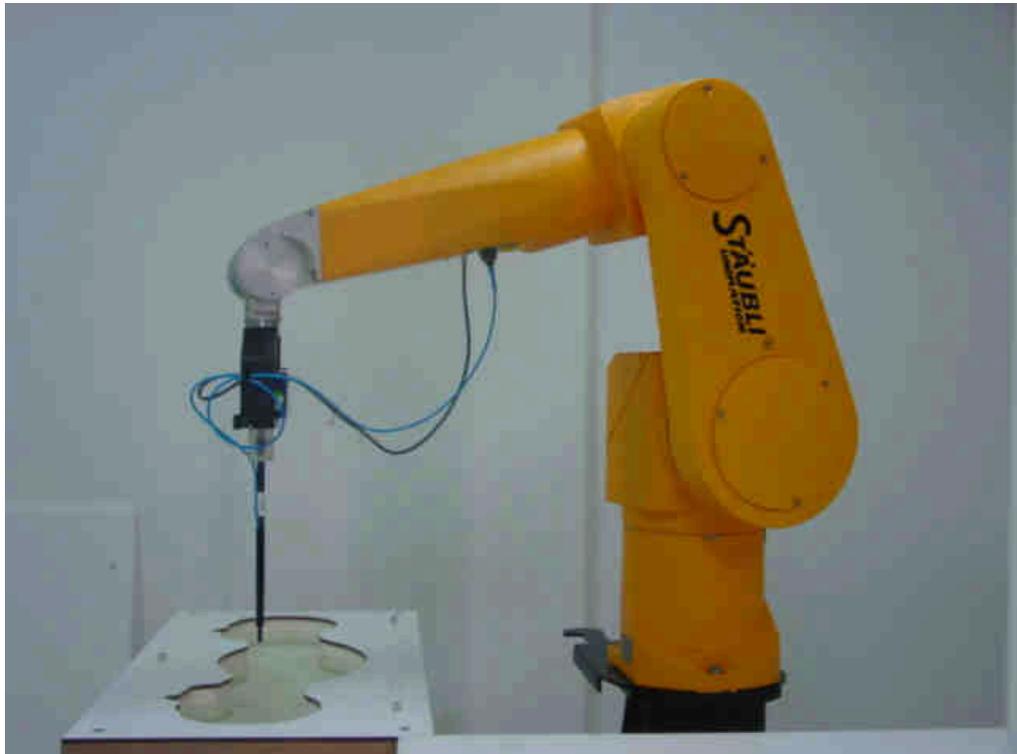
c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

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 (PCS 1900MHz)



Picture B3: Left Hand Touch Cheek Position



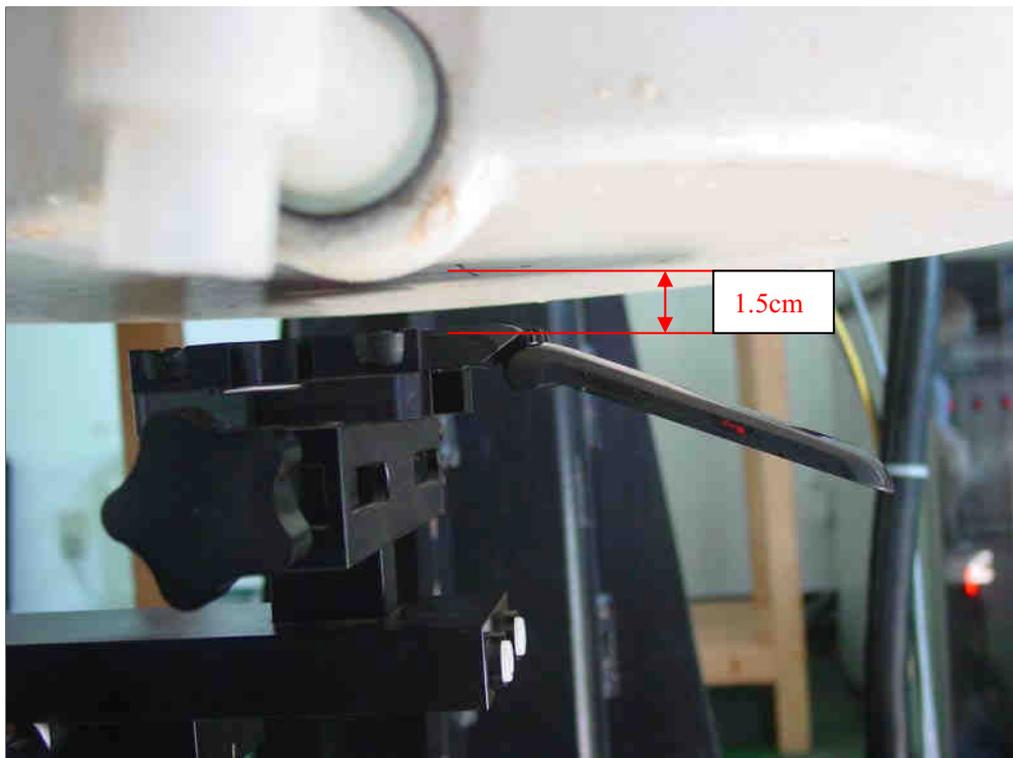
Picture B4: Left Hand Tilt 15° Position



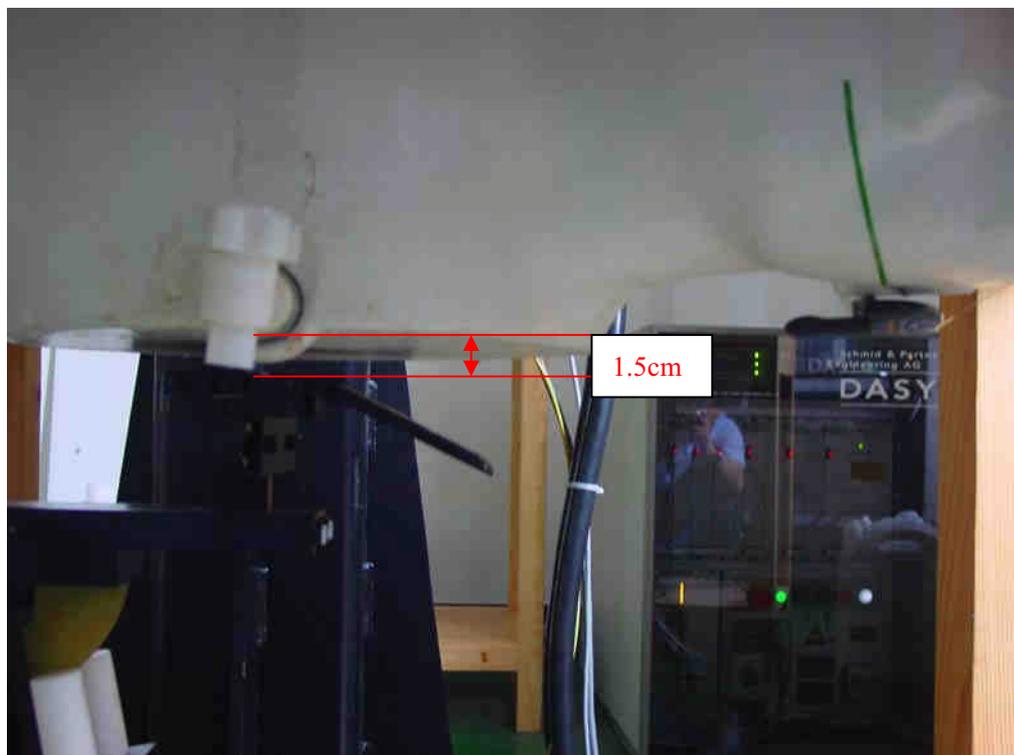
Picture B5: Right Hand Touch Cheek Position



Picture B6: Right Hand Tilt 15° Position



Picture B7: Body-worn Position (towards ground, the distance from handset to the bottom of the Phantom is 1.5cm)



Picture B8: Body-worn Position with Bluetooth transmitter on (towards ground, the distance from handset to the bottom of the Phantom is 1.5cm)

ANNEX C GRAPH RESULTS

1900 Left Cheek High

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

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

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

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

Cheek High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.169 mW/g

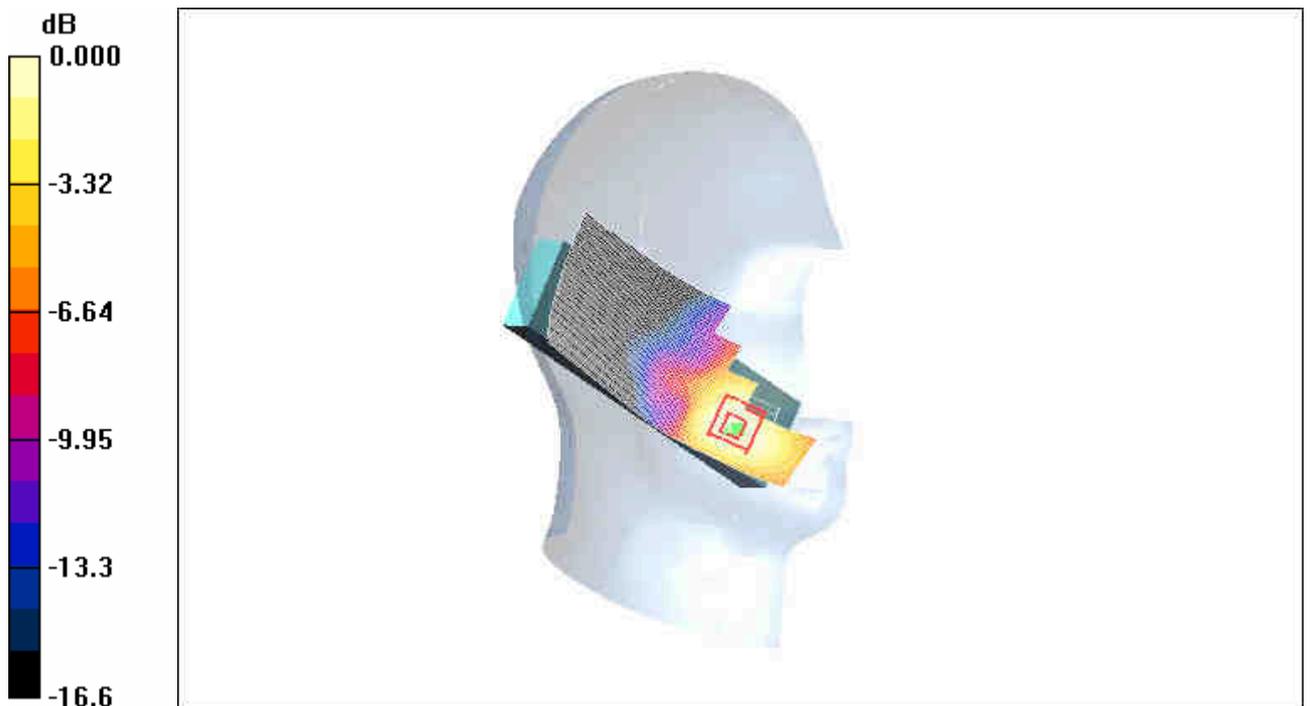
Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.56 V/m; Power Drift = -0.054dB

Peak SAR (extrapolated) = 0.227 W/kg

SAR(1 g) = 0.152 mW/g; SAR(10 g) = 0.094 mW/g

Maximum value of SAR (measured) = 0.155 mW/g



0 dB = 0.155mW/g

Fig. 1 Left Hand Touch Cheek PCS 1900MHz CH810

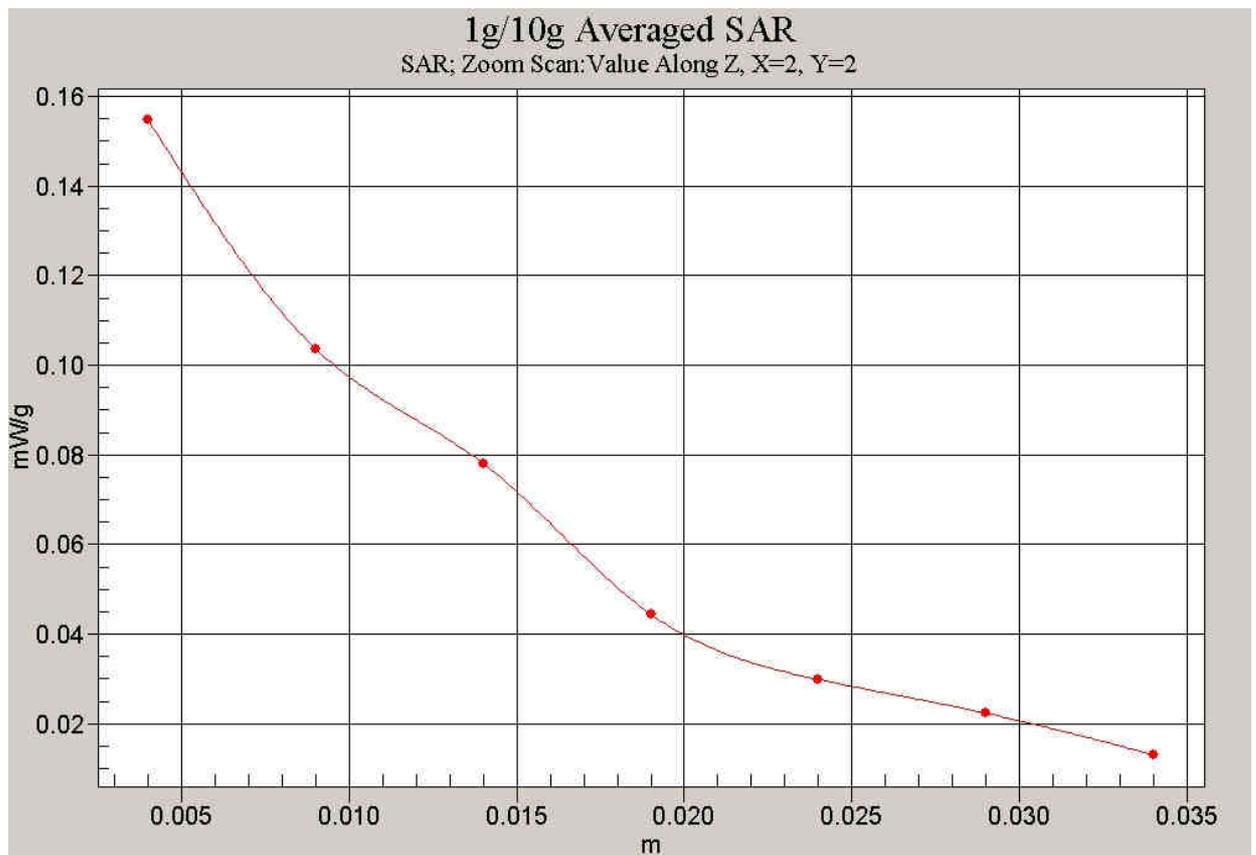


Fig. 2 Z-Scan at power reference point (PCS 1900MHz CH810)

1900 Left Cheek Middle

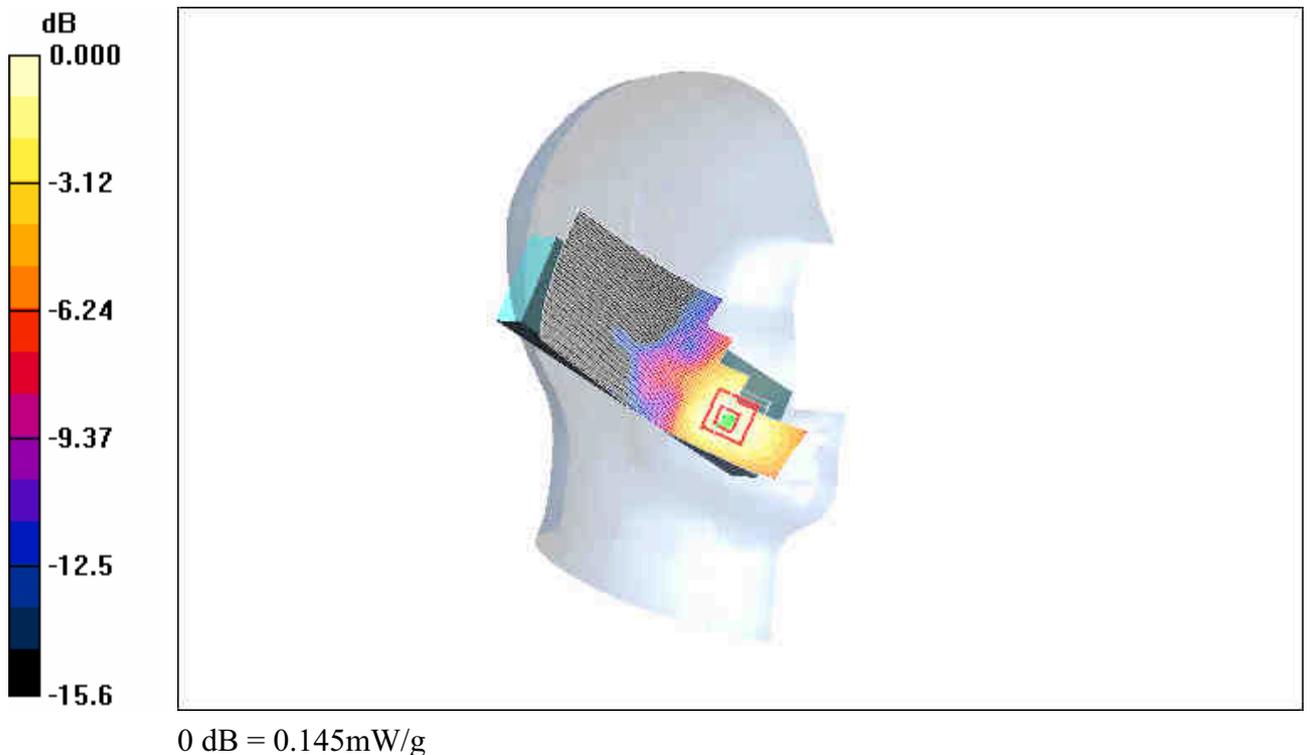
Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41$; $\rho = 1000 \text{ kg/m}^3$ Ambient Temperature: 23.3°C Liquid Temperature: 22.5°C

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 (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$ Maximum value of SAR (interpolated) = 0.155 mW/g **Cheek Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 1.11 V/m ; Power Drift = -0.127dB Peak SAR (extrapolated) = 0.212 W/kg **SAR(1 g) = 0.144 mW/g ; SAR(10 g) = 0.090 mW/g** Maximum value of SAR (measured) = 0.145 mW/g **Fig. 3 Left Hand Touch Cheek PCS 1900MHz CH661**

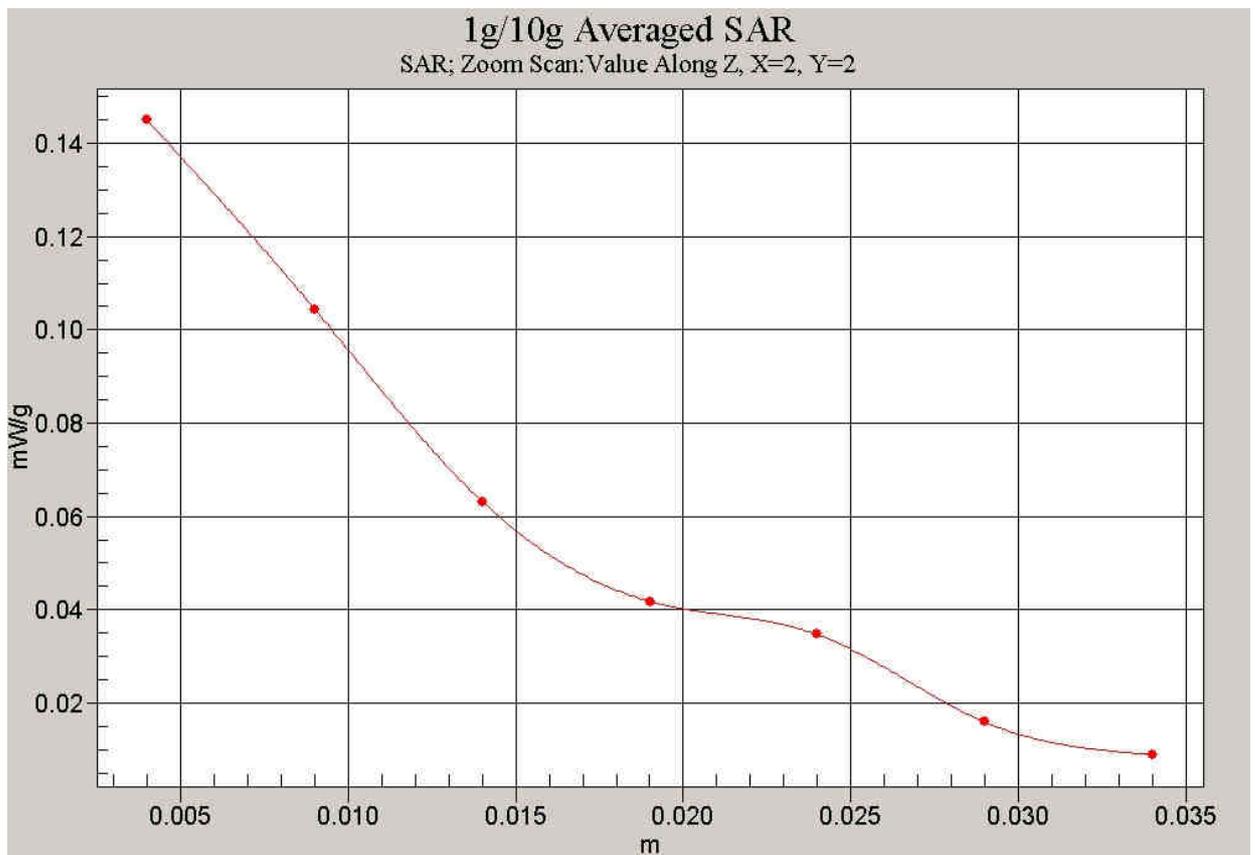


Fig. 4 Z-Scan at power reference point (PCS 1900MHz CH661)

1900 Left Cheek Low

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.36$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

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

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 (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.181 mW/g

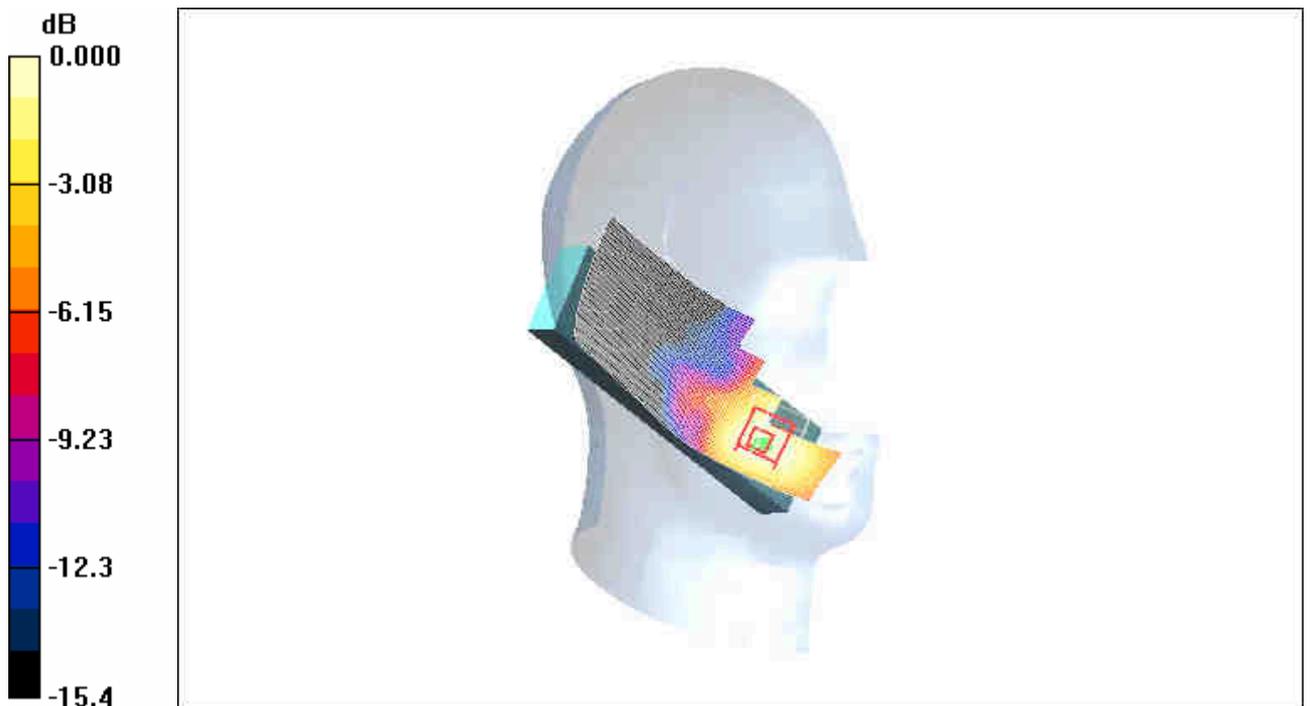
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.45 V/m; Power Drift = -0.061dB

Peak SAR (extrapolated) = 0.237 W/kg

SAR(1 g) = 0.161 mW/g; SAR(10 g) = 0.102 mW/g

Maximum value of SAR (measured) = 0.163 mW/g



0 dB = 0.163mW/g

Fig. 5 Left Hand Touch Cheek PCS 1900MHz CH512

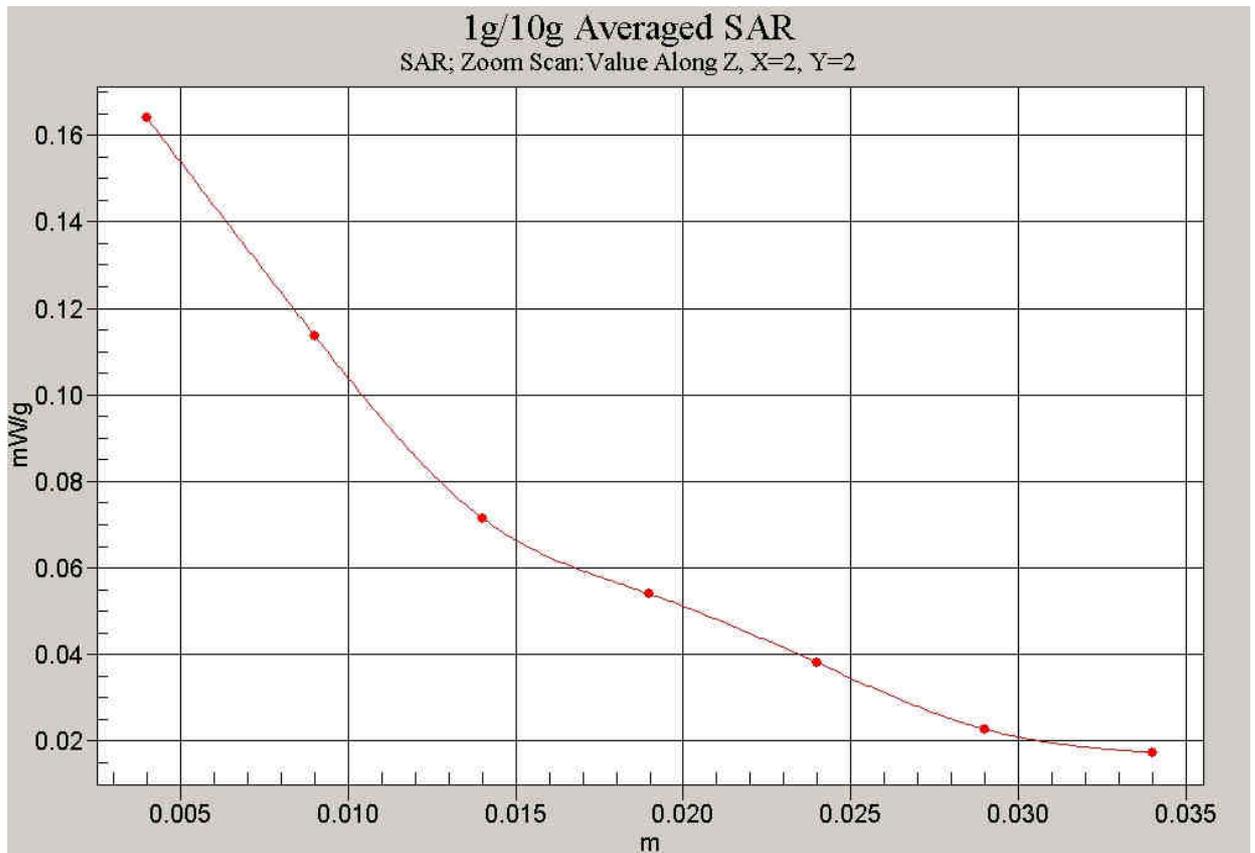


Fig. 6 Z-Scan at power reference point (PCS 1900MHz CH512)

1900 Left Tilt High

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C

Liquid Temperature: 22.5°C

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 (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.030 mW/g

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

Reference Value = 2.63 V/m; Power Drift = -0.200 dB

Peak SAR (extrapolated) = 0.049 W/kg

SAR(1 g) = 0.030 mW/g; SAR(10 g) = 0.020 mW/g

Maximum value of SAR (measured) = 0.033 mW/g

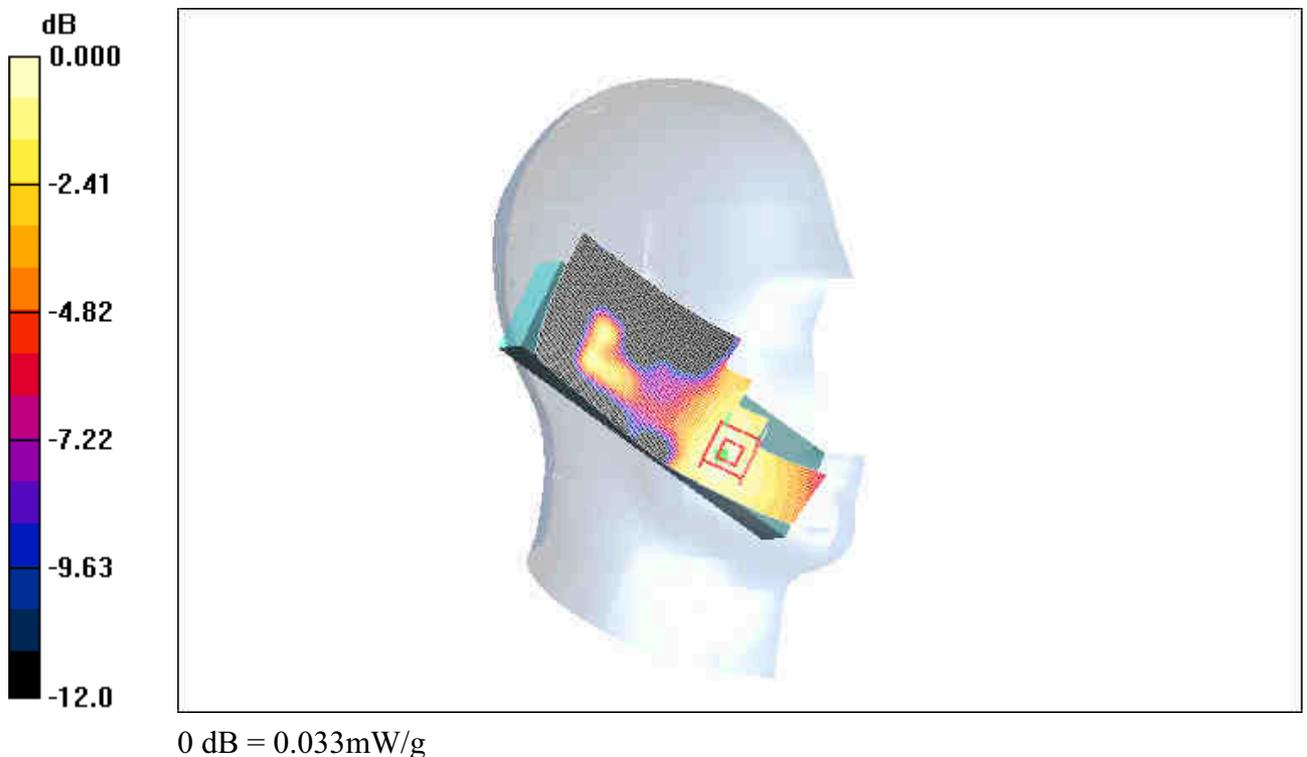


Fig. 7 Left Hand Tilt 15° PCS 1900MHz CH810

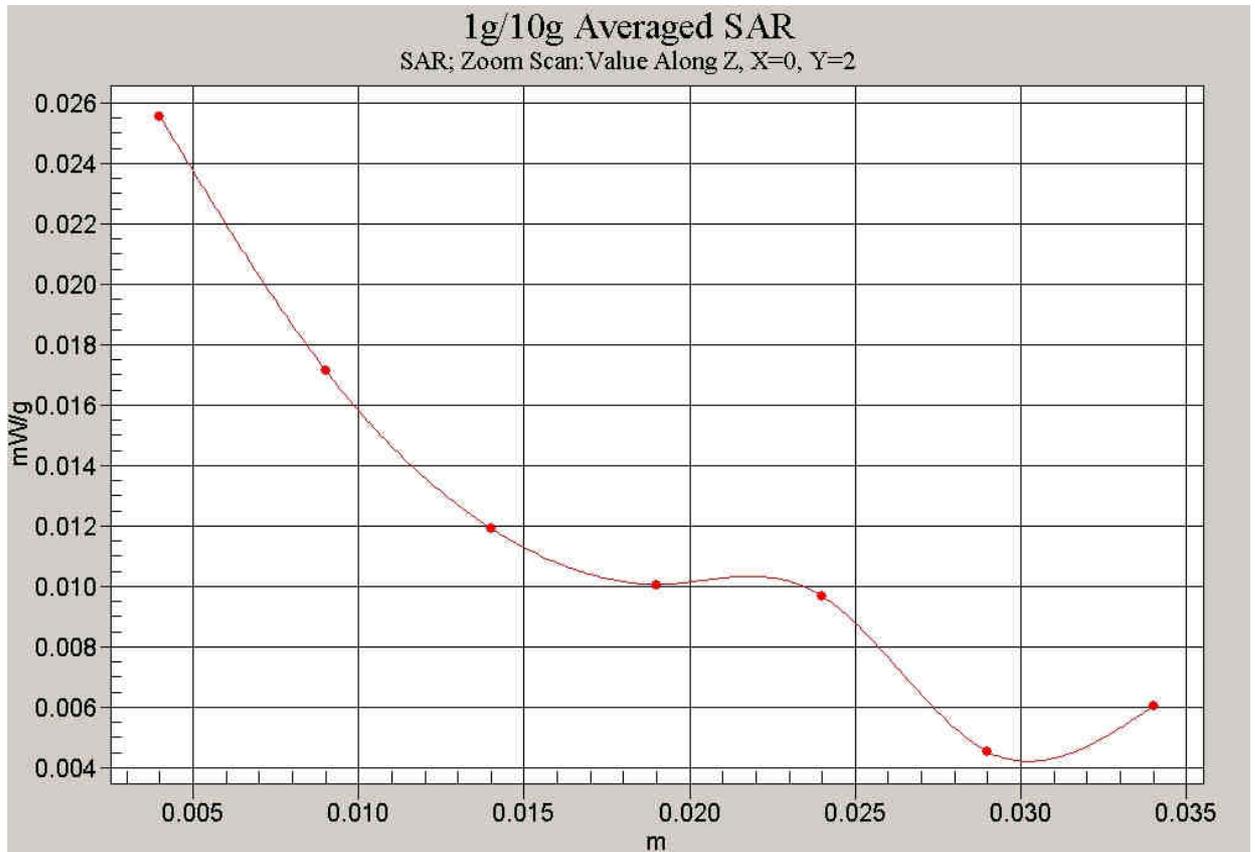


Fig. 8 Z-Scan at power reference point (PCS 1900MHz CH810)

1900 Left Tilt Middle

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C

Liquid Temperature: 22.5°C

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 (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.029 mW/g

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

Reference Value = 2.86 V/m; Power Drift = 0.188 dB

Peak SAR (extrapolated) = 0.044 W/kg

SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.019 mW/g

Maximum value of SAR (measured) = 0.031 mW/g

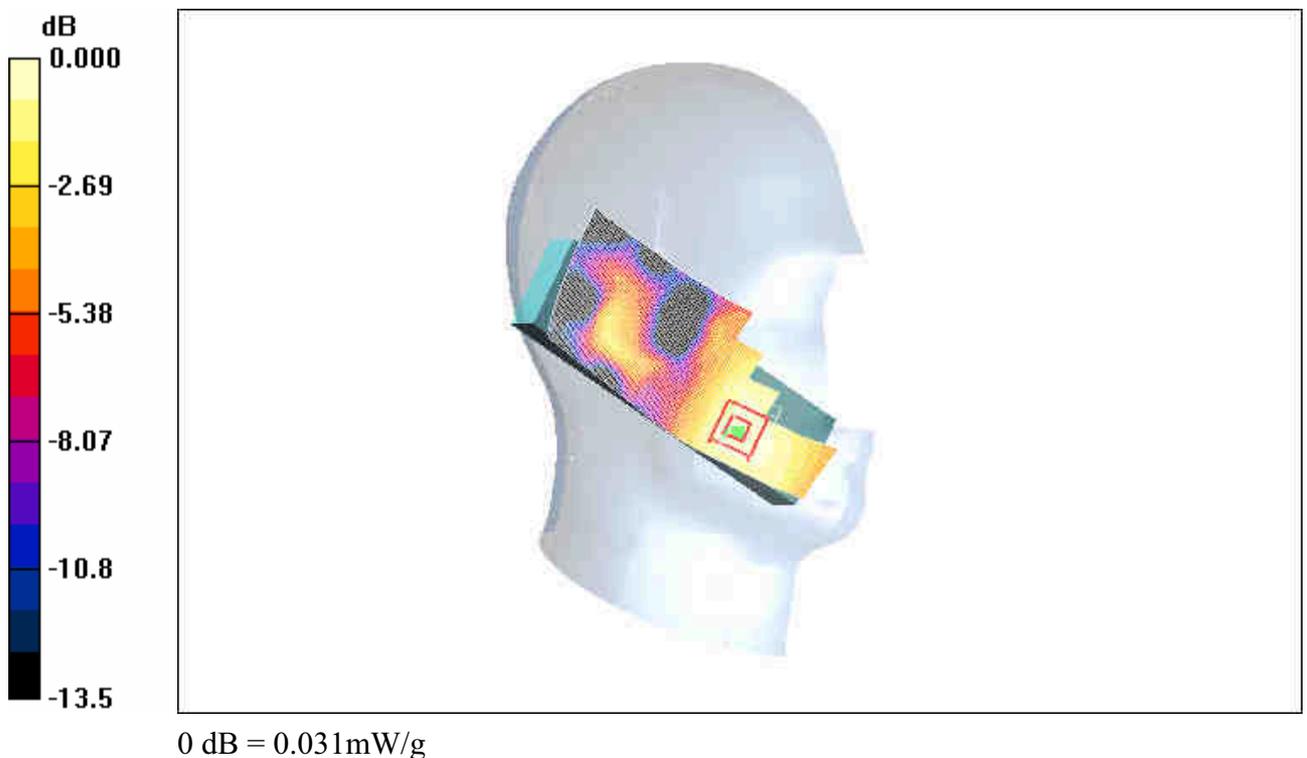


Fig. 9 Left Hand Tilt 15°PCS 1900MHz CH661

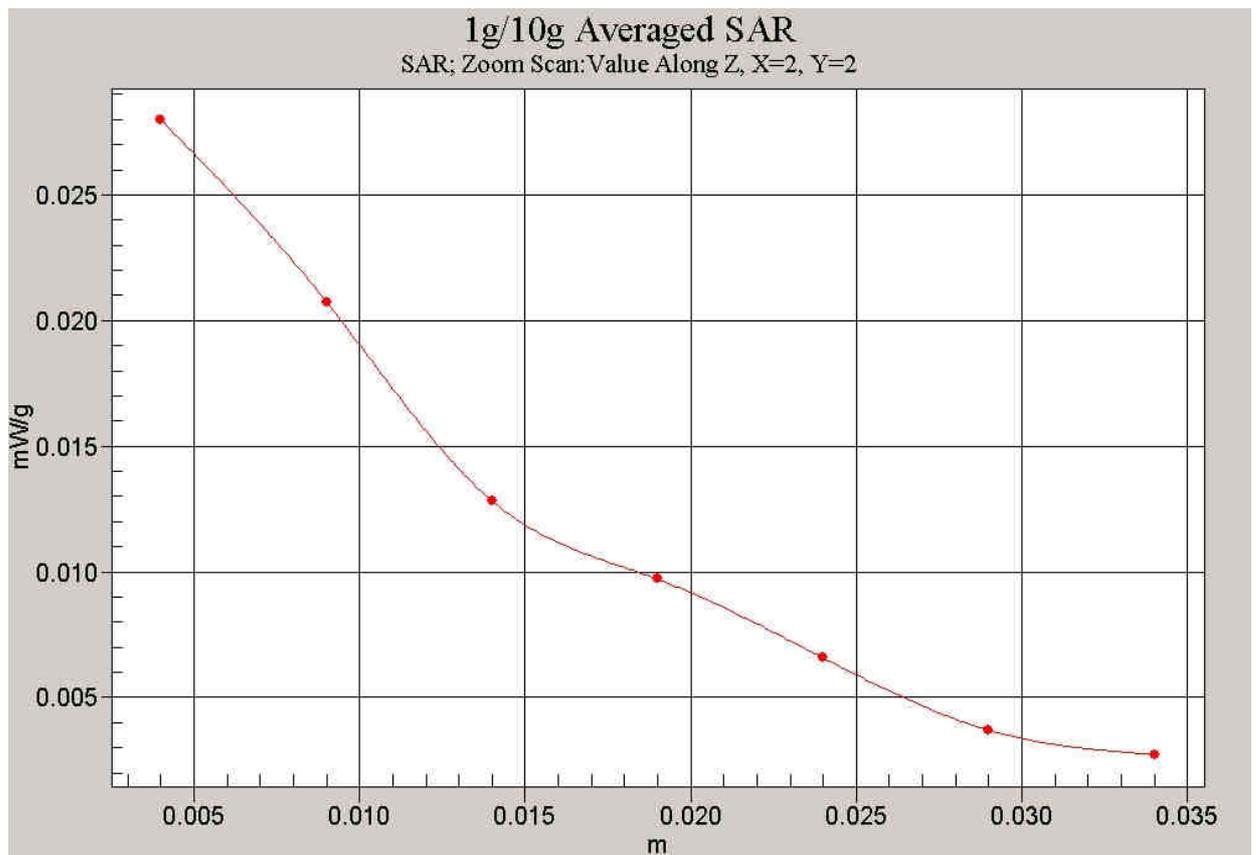


Fig. 10 Z-Scan at power reference point (PCS 1900MHz CH661)

1900 Left Tilt Low

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.36$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

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

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 (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.032 mW/g

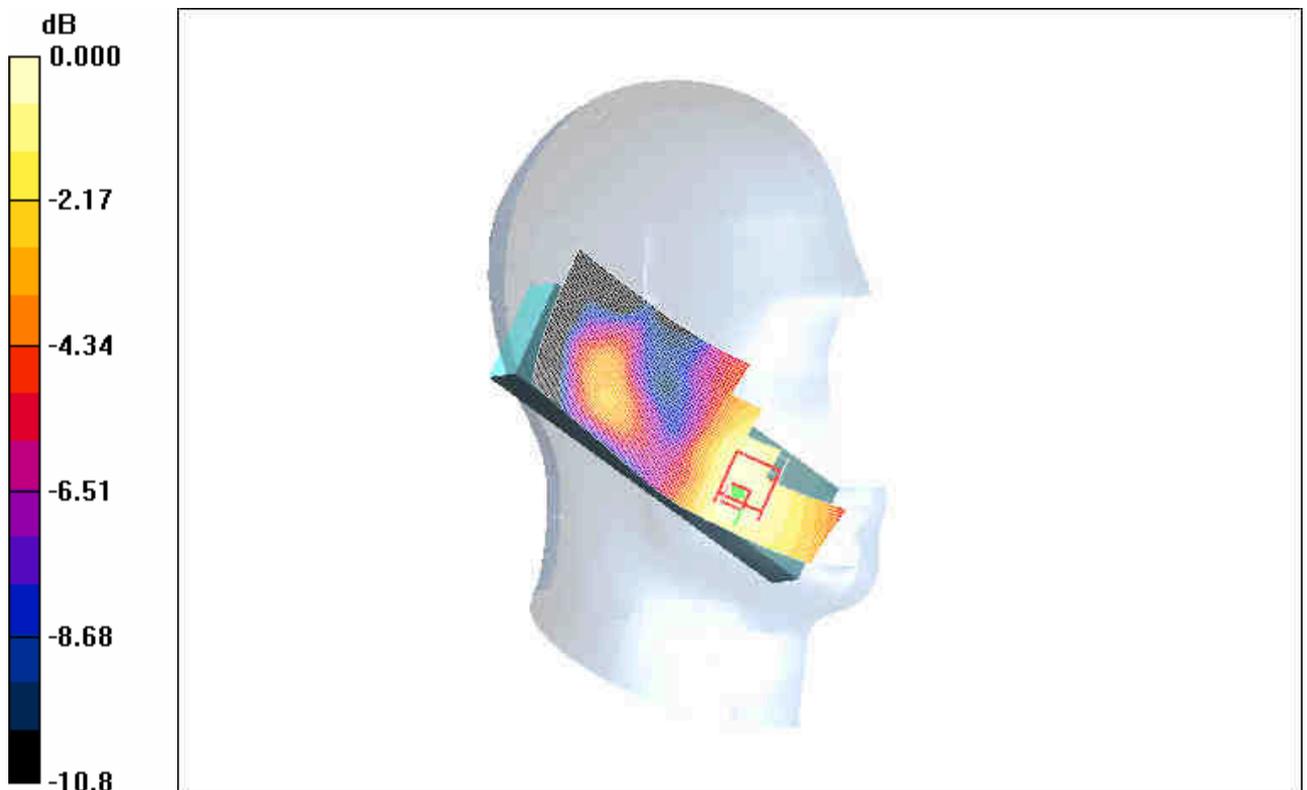
Tilt Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.06 V/m; Power Drift = -0.162 dB

Peak SAR (extrapolated) = 0.052 W/kg

SAR(1 g) = 0.030 mW/g; SAR(10 g) = 0.021 mW/g

Maximum value of SAR (measured) = 0.032 mW/g



0 dB = 0.032mW/g

Fig. 11 Left Hand Tilt 15°PCS 1900MHz CH512

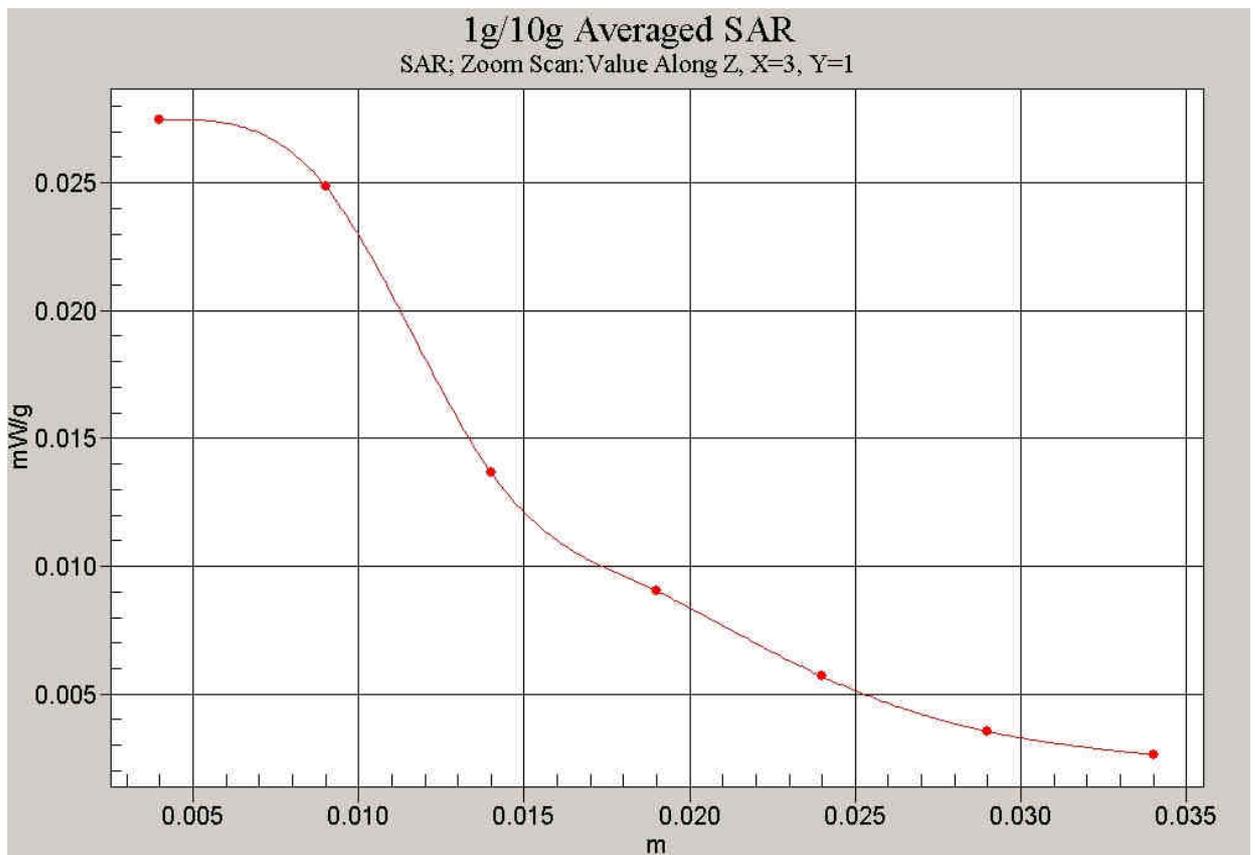


Fig. 12 Z-Scan at power reference point (PCS 1900MHz CH512)

1900 Right Cheek High

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

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

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

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

Cheek High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

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

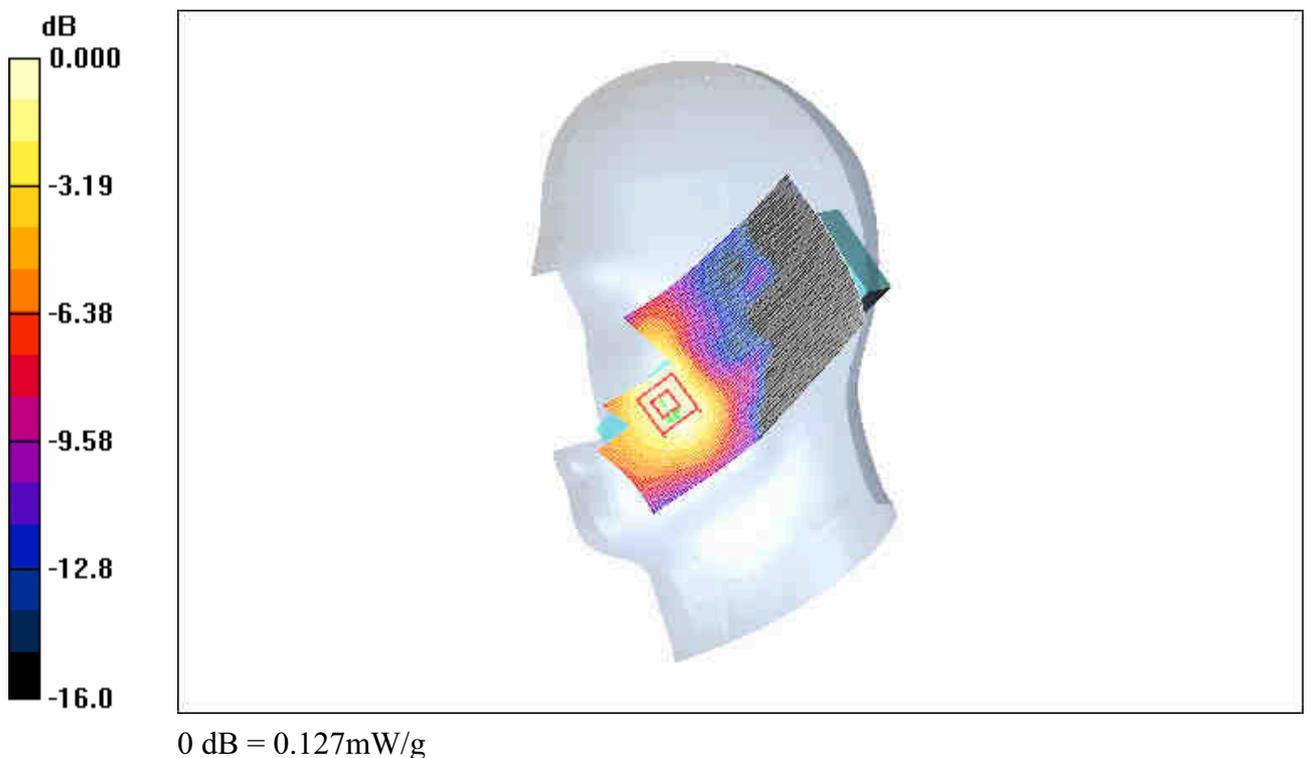
Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.24 V/m; Power Drift = -0.098 dB

Peak SAR (extrapolated) = 0.166 W/kg

SAR(1 g) = 0.117 mW/g; SAR(10 g) = 0.077 mW/g

Maximum value of SAR (measured) = 0.127 mW/g

**Fig. 13 Right Hand Touch Cheek PCS 1900MHz CH810**

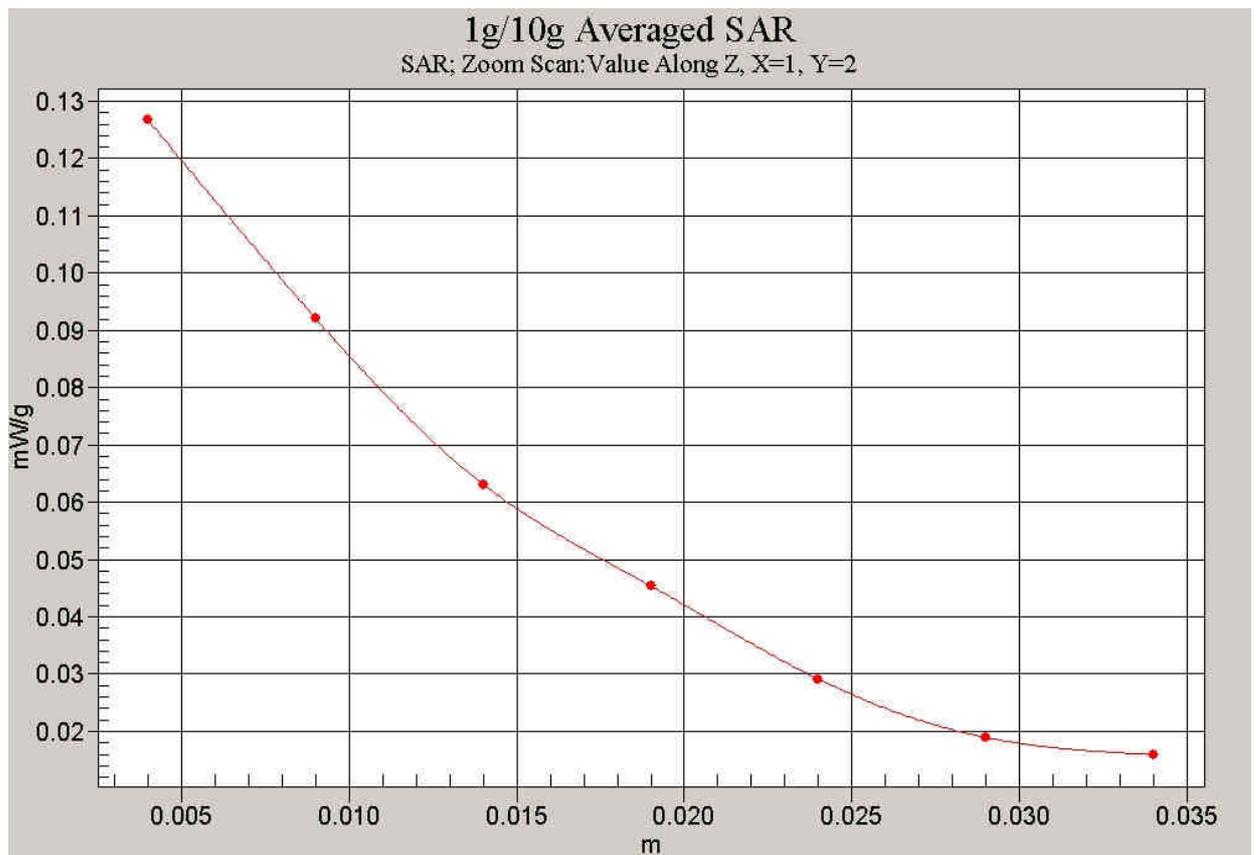


Fig. 14 Z-Scan at power reference point (PCS 1900MHz CH810)

1900 Right Cheek Middle

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

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

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 (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.125 mW/g

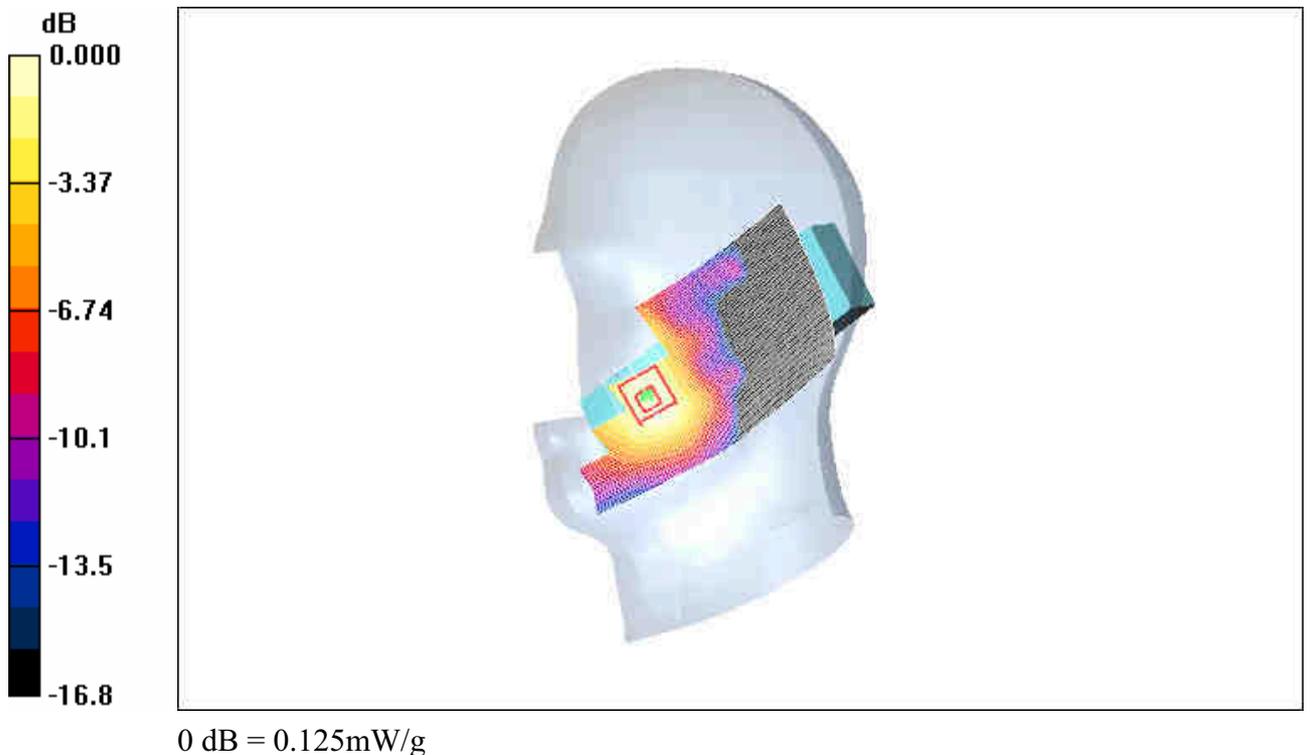
Cheek Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.32 V/m; Power Drift = -0.114dB

Peak SAR (extrapolated) = 0.164 W/kg

SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.075 mW/g

Maximum value of SAR (measured) = 0.125 mW/g

**Fig.15 Right Hand Touch Cheek PCS 1900MHz CH661**

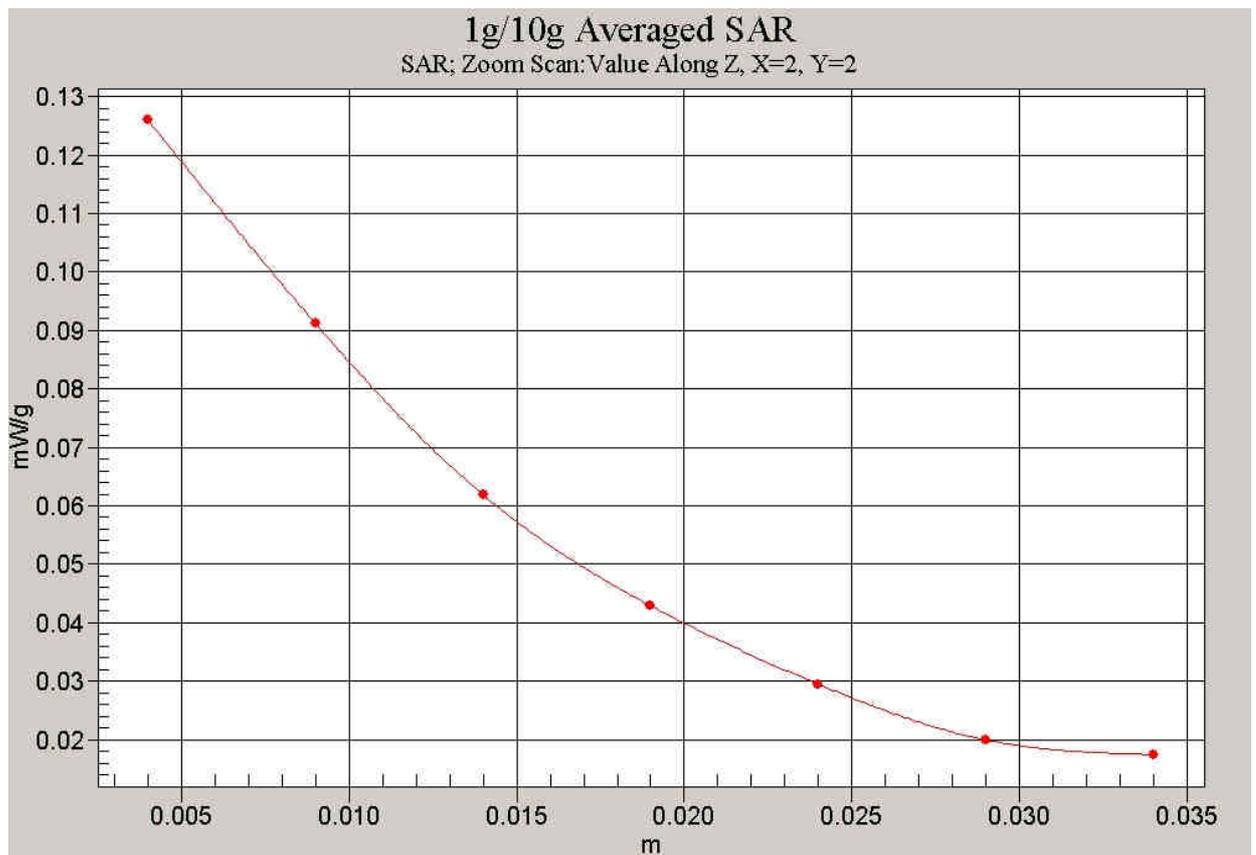


Fig. 16 Z-Scan at power reference point (PCS 1900MHz CH661)

1900 Right Cheek Low

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.36$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

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

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 (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.157 mW/g

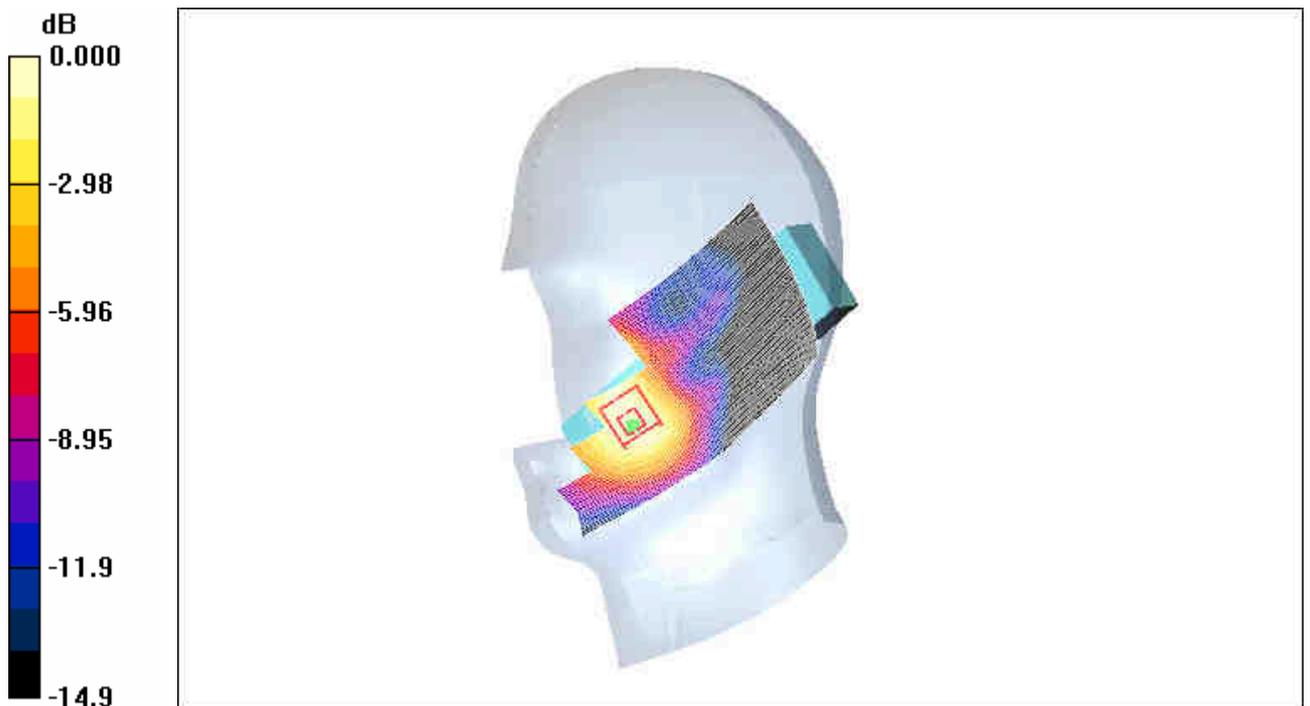
Cheek Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.61 V/m; Power Drift = -0.136dB

Peak SAR (extrapolated) = 0.204 W/kg

SAR(1 g) = 0.142 mW/g; SAR(10 g) = 0.092 mW/g

Maximum value of SAR (measured) = 0.153 mW/g



0 dB = 0.153mW/g

Fig. 17 Right Hand Touch Cheek PCS 1900MHz CH512

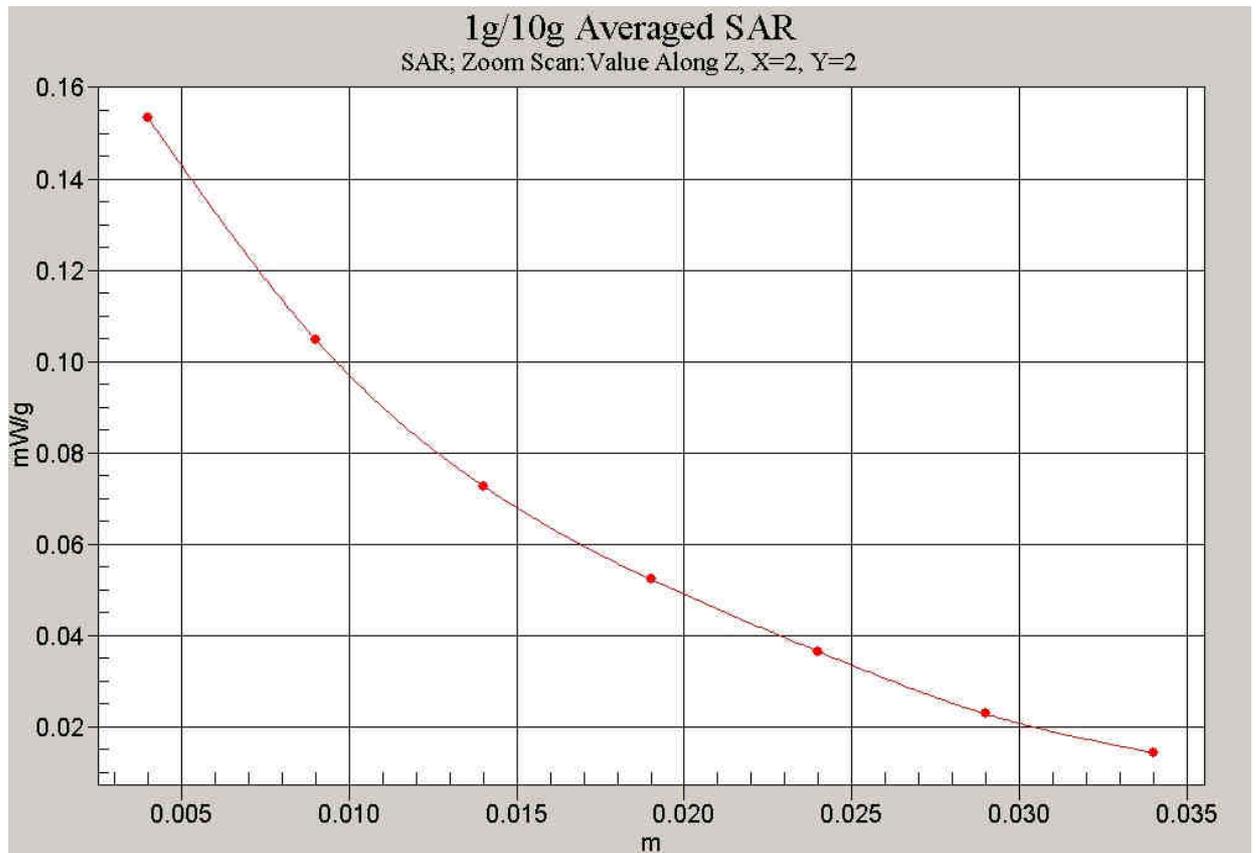


Fig. 18 Z-Scan at power reference point (PCS 1900MHz CH512)

1900 Right Tilt High

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C

Liquid Temperature: 22.5°C

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 (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.029 mW/g

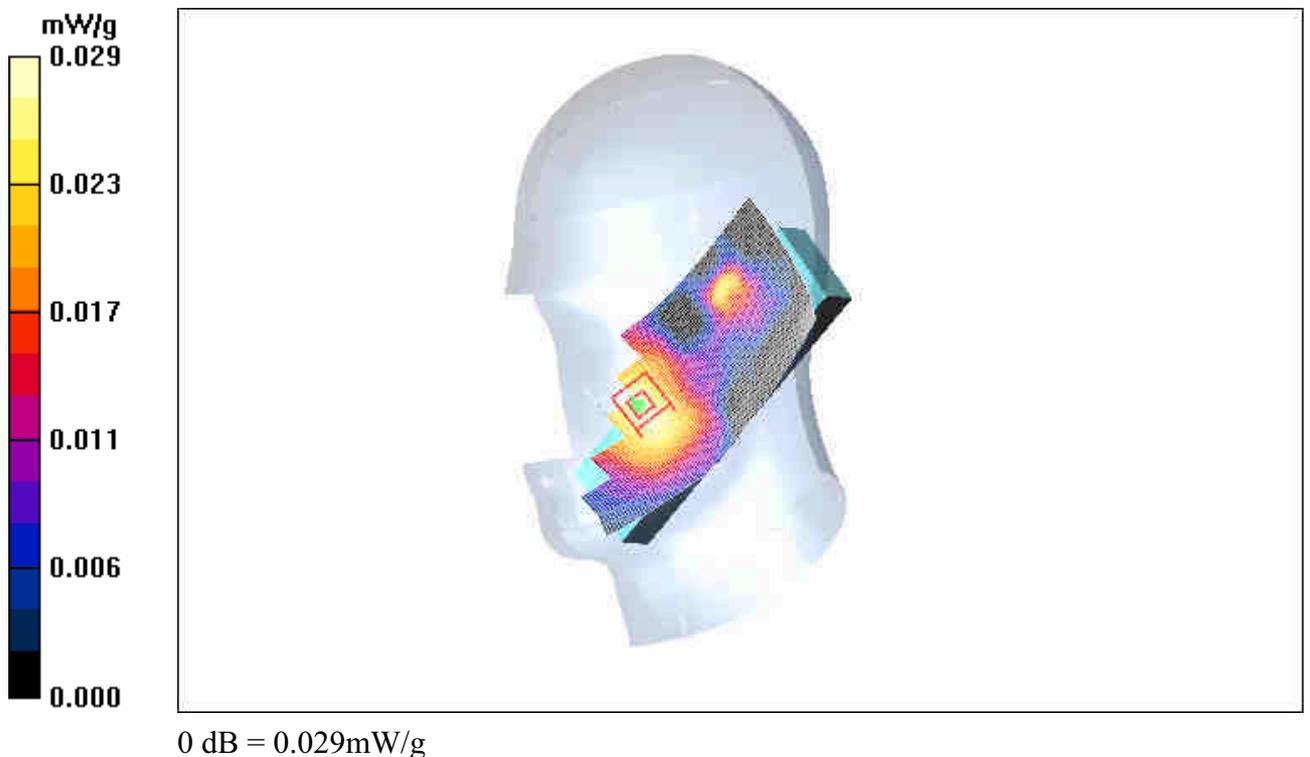
Tilt High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.87 V/m; Power Drift = 0.083 dB

Peak SAR (extrapolated) = 0.045 W/kg

SAR(1 g) = 0.027 mW/g; SAR(10 g) = 0.018 mW/g

Maximum value of SAR (measured) = 0.029 mW/g

**Fig. 19 Right Hand Tilt 15°PCS 1900MHz CH810**

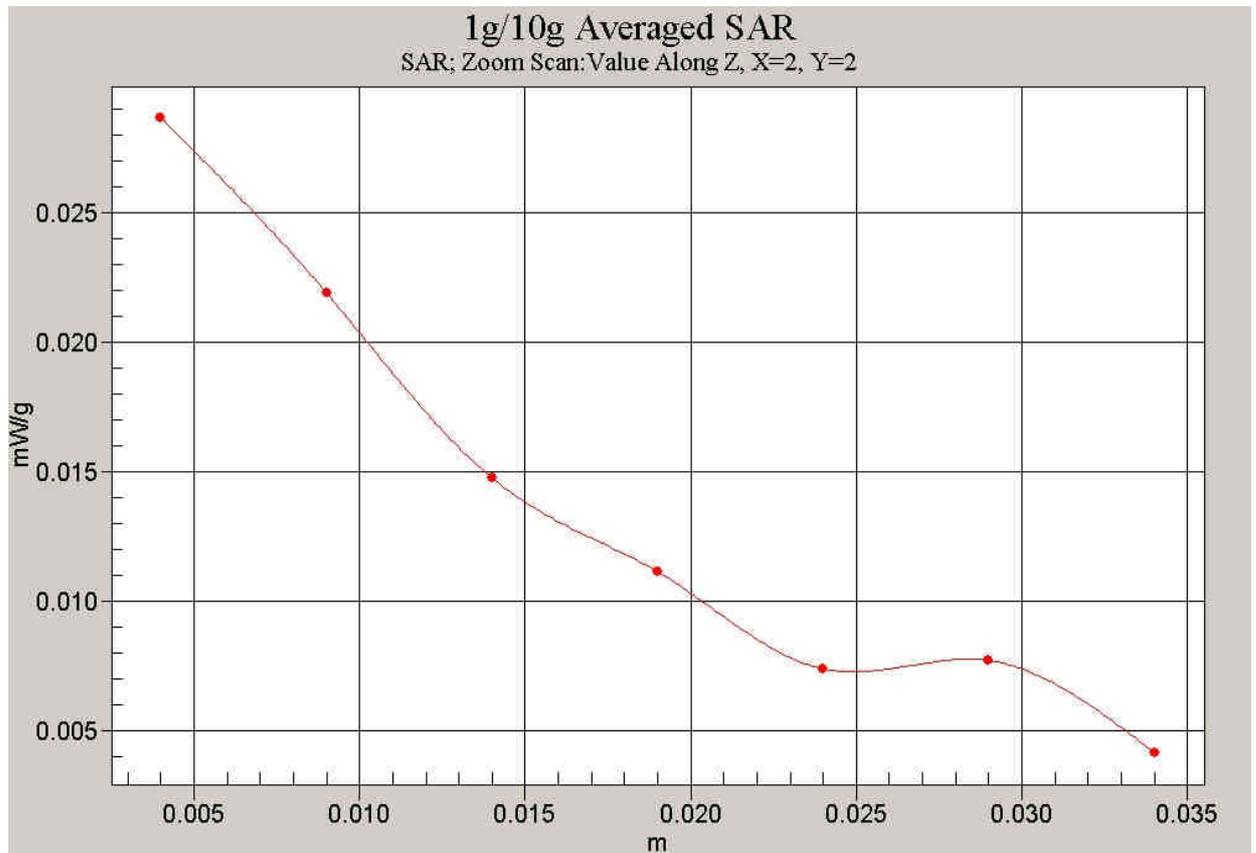


Fig. 20 Z-Scan at power reference point (PCS 1900MHz CH810)

1900 Right Tilt Middle

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

Ambient Temperature: 23.3°C

Liquid Temperature: 22.5°C

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 (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.026 mW/g

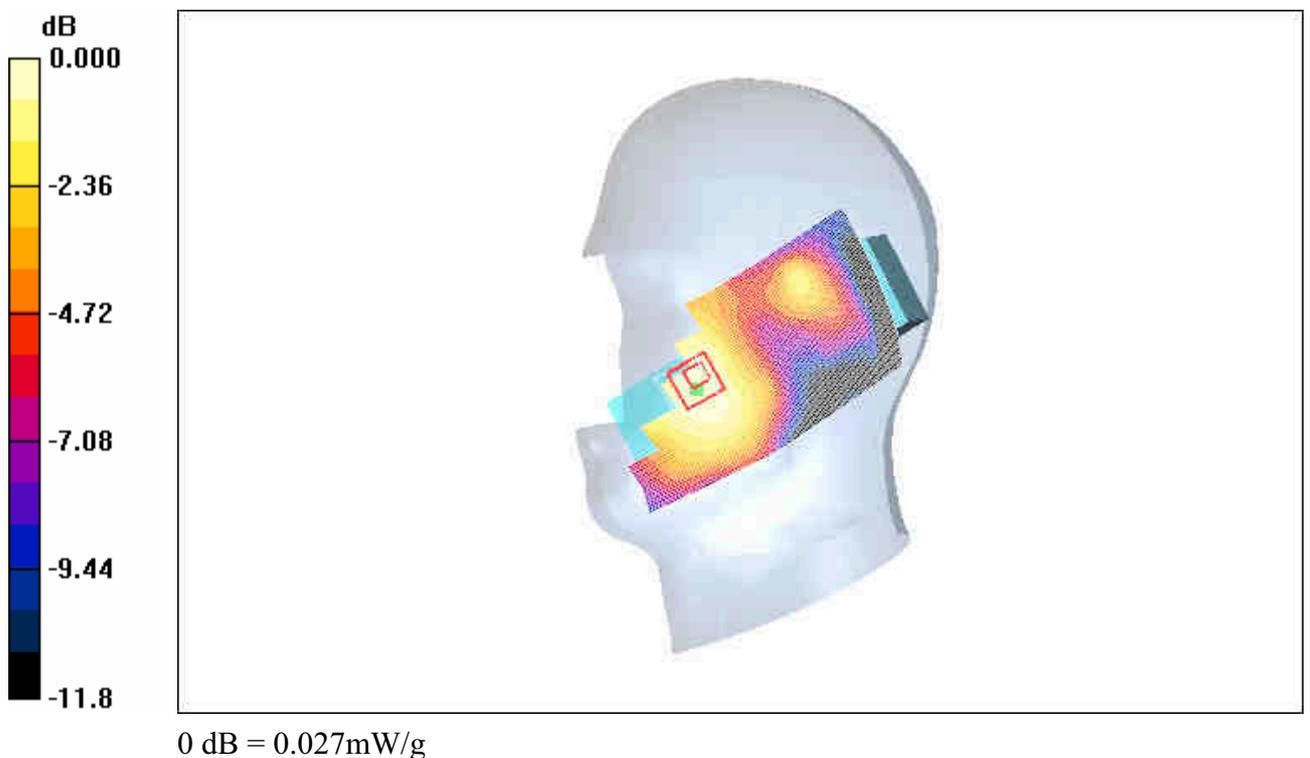
Tilt Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.45 V/m; Power Drift = 0.174dB

Peak SAR (extrapolated) = 0.048 W/kg

SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.017 mW/g

Maximum value of SAR (measured) = 0.027 mW/g

**Fig. 21 Right Hand Tilt 15°PCS 1900MHz CH661**

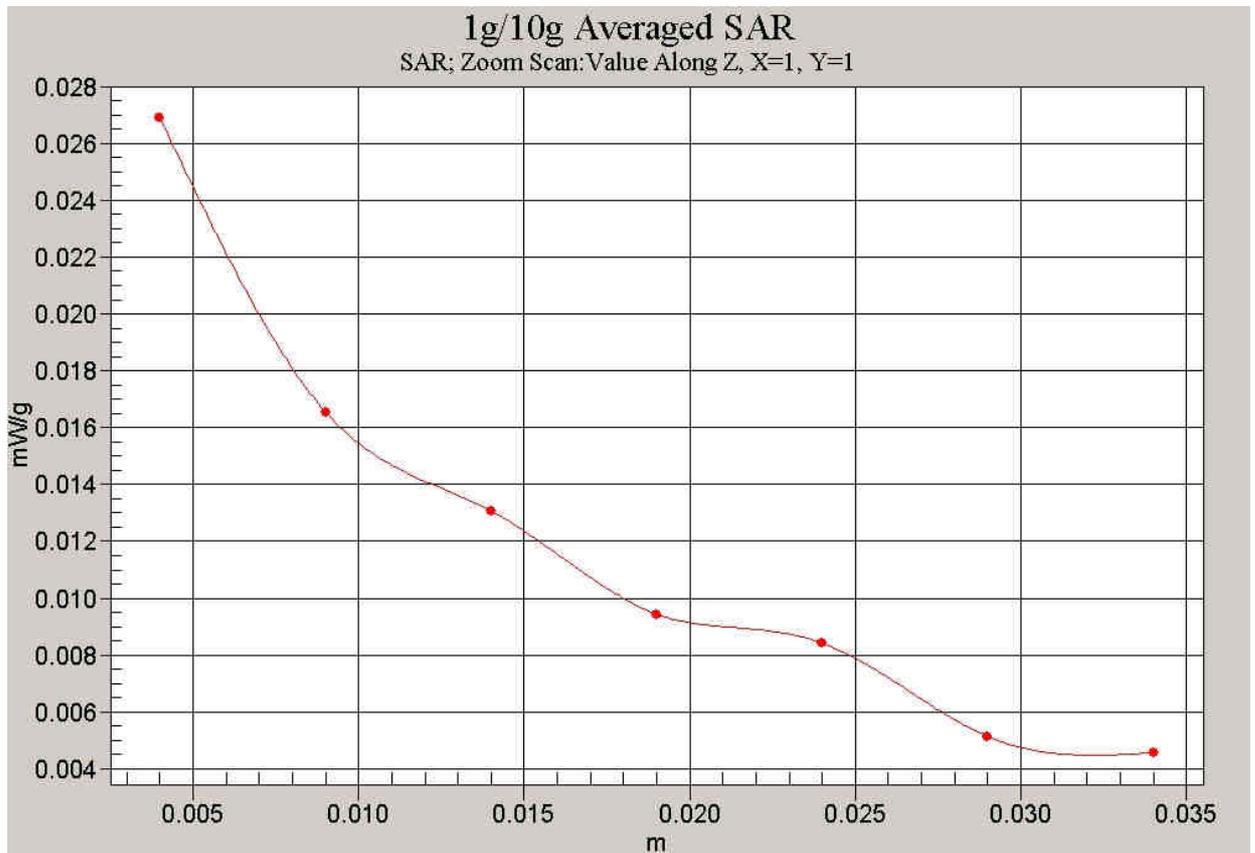


Fig. 22 Z-Scan at power reference point (PCS 1900MHz CH661)

1900 Right Tilt Low

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.36$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

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

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

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

TiltLow/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.032 mW/g

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

Reference Value = 3.02 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 0.051 W/kg

SAR(1 g) = 0.028 mW/g; SAR(10 g) = 0.018 mW/g

Maximum value of SAR (measured) = 0.031 mW/g

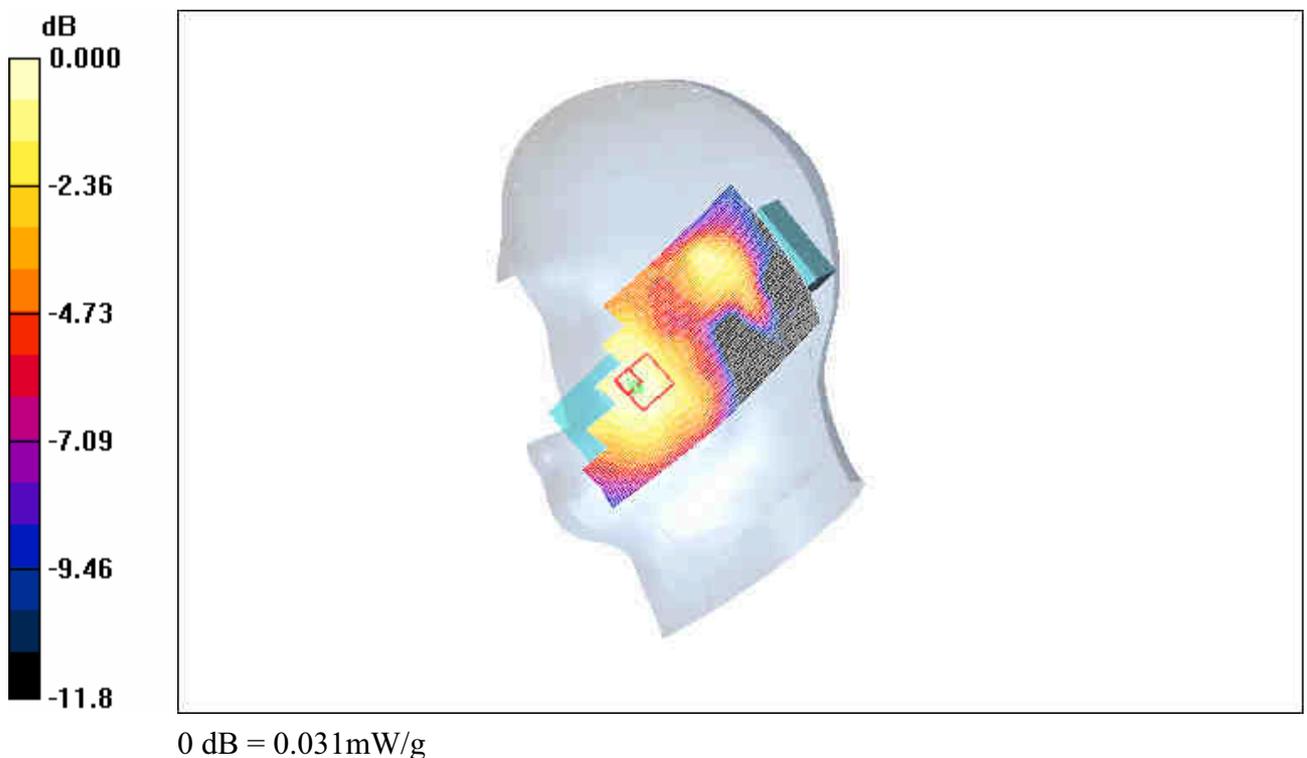


Fig. 23 Right Hand Tilt 15°PCS 1900MHz CH512

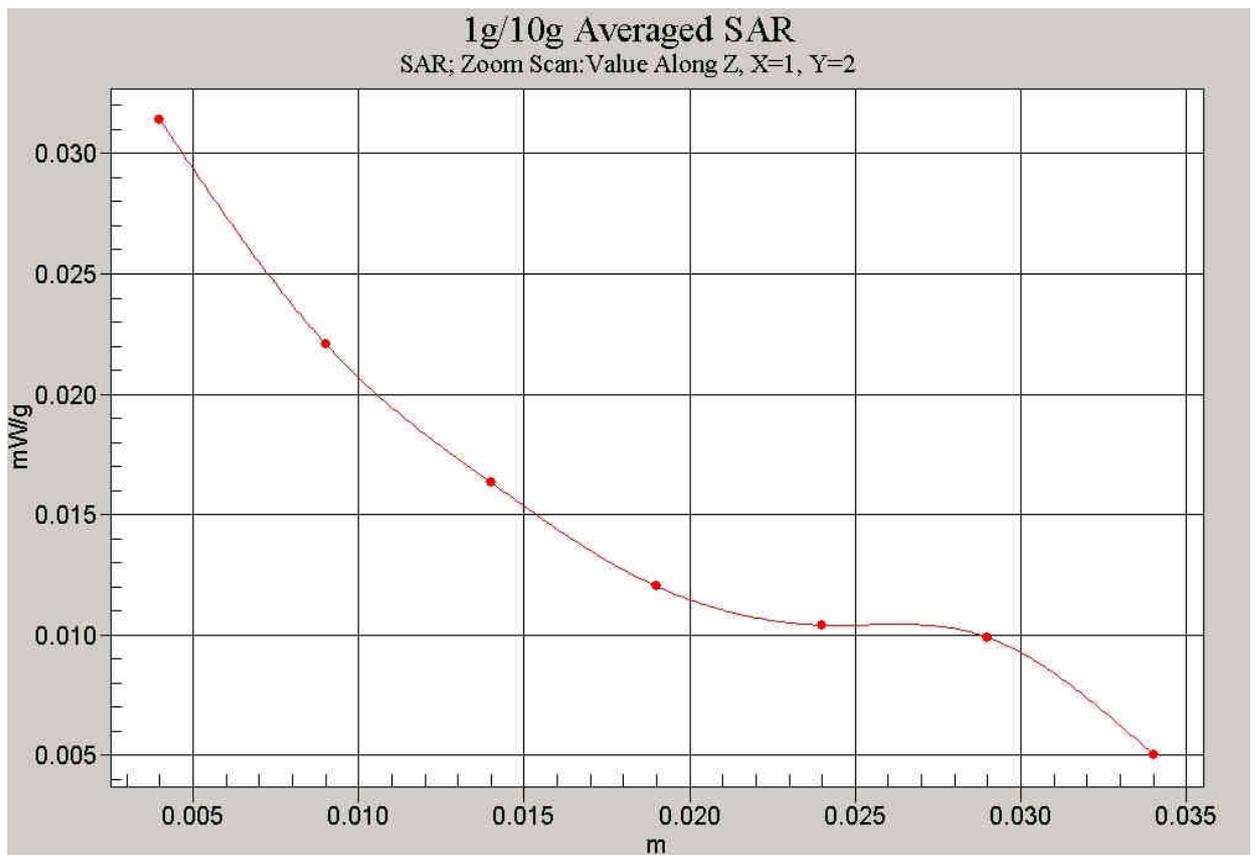


Fig. 24 Z-Scan at power reference point (PCS 1900MHz CH512)

1900 Body Toward Ground High with GPRS

Electronics: DAE3 Sn536

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ 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 Ground High/Area Scan (51x131x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.041 mW/g

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

Reference Value = 3.85 V/m; Power Drift = 0.200 dB

Peak SAR (extrapolated) = 0.045 W/kg

SAR(1 g) = 0.031 mW/g; SAR(10 g) = 0.015 mW/g

Maximum value of SAR (measured) = 0.036 mW/g

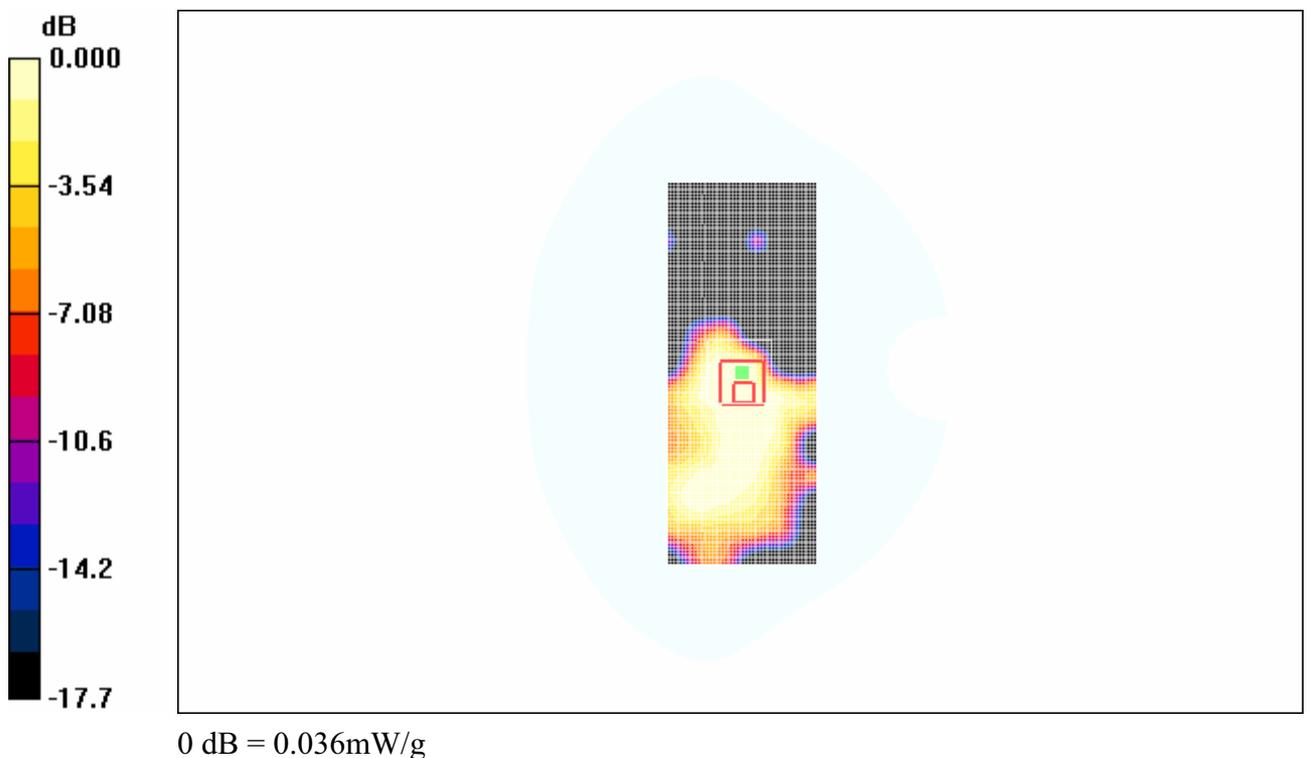
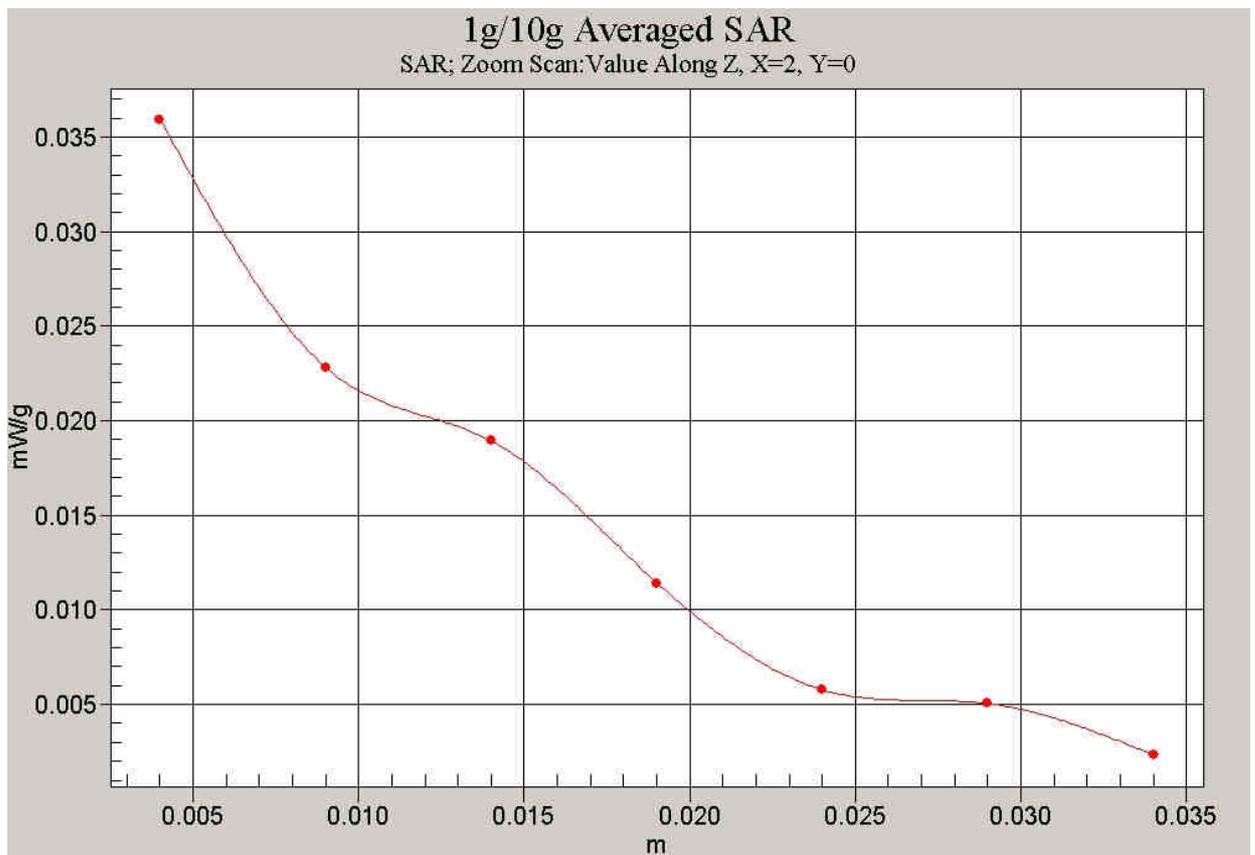


Fig. 25 PCS 1900MHz, Body, Towards Ground with GPRS, CH810



**Fig. 26 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Ground with GPRS, CH810)**

1900 Body Toward Ground Middle with GPRS

Electronics: DAE3 Sn536

Medium: Body 1900 MHz

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.51 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

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 (51x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.042 mW/g

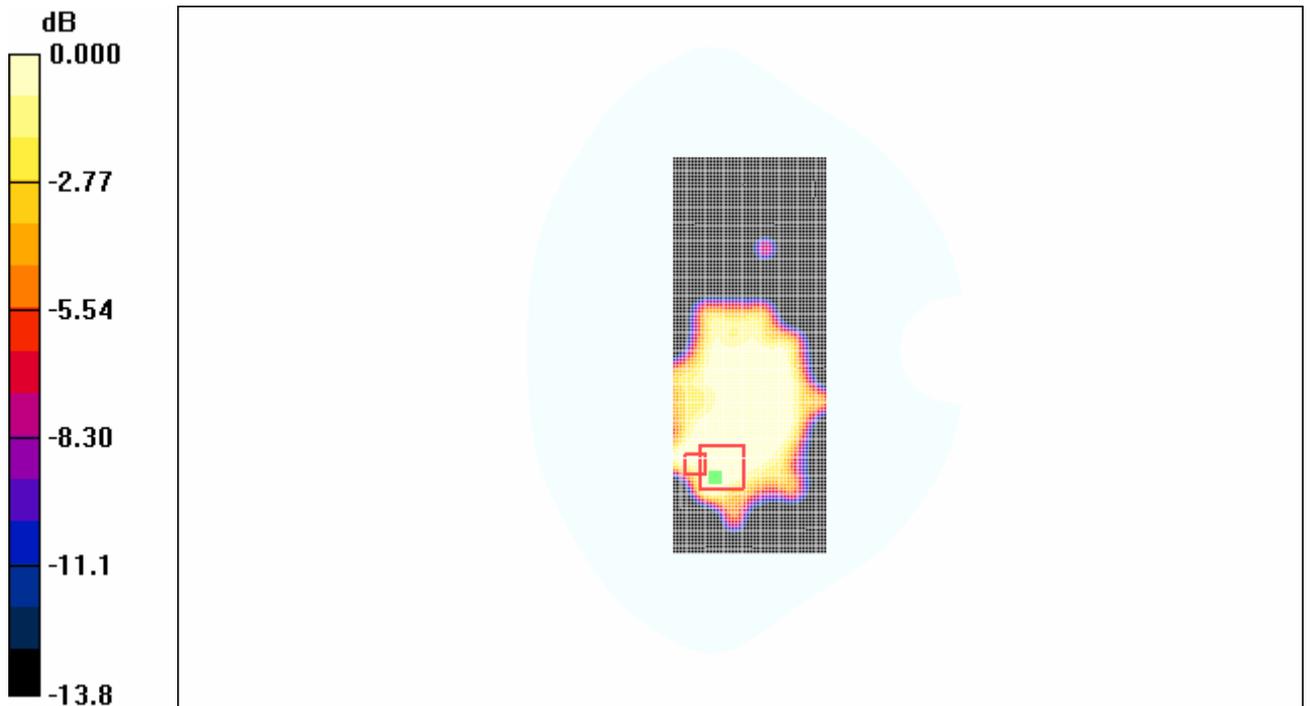
Toward Ground Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.30 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 0.076 W/kg

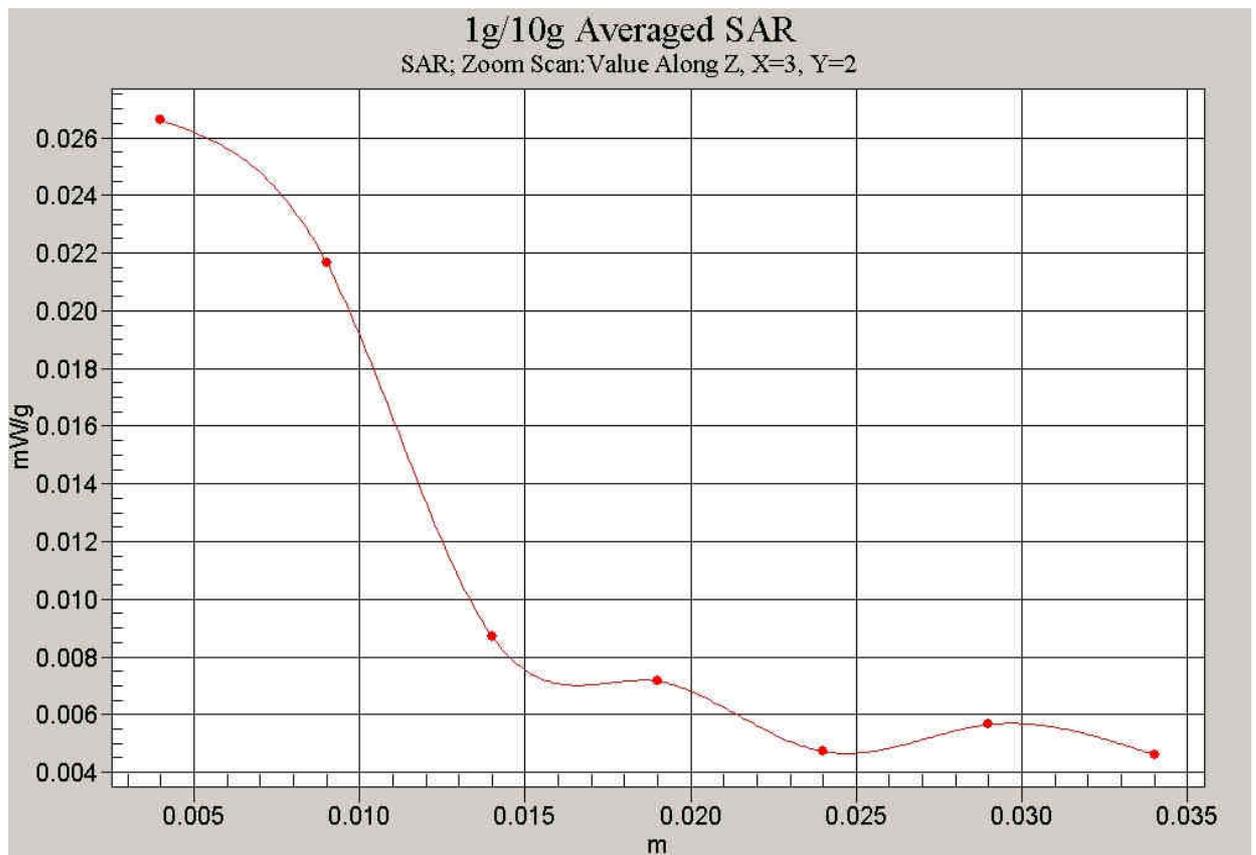
SAR(1 g) = 0.027 mW/g; SAR(10 g) = 0.015 mW/g

Maximum value of SAR (measured) = 0.029 mW/g



0 dB = 0.029mW/g

Fig. 27 PCS 1900MHz, Body, Towards Ground with GPRS, CH661



**Fig. 28 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: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ 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 (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.045 mW/g

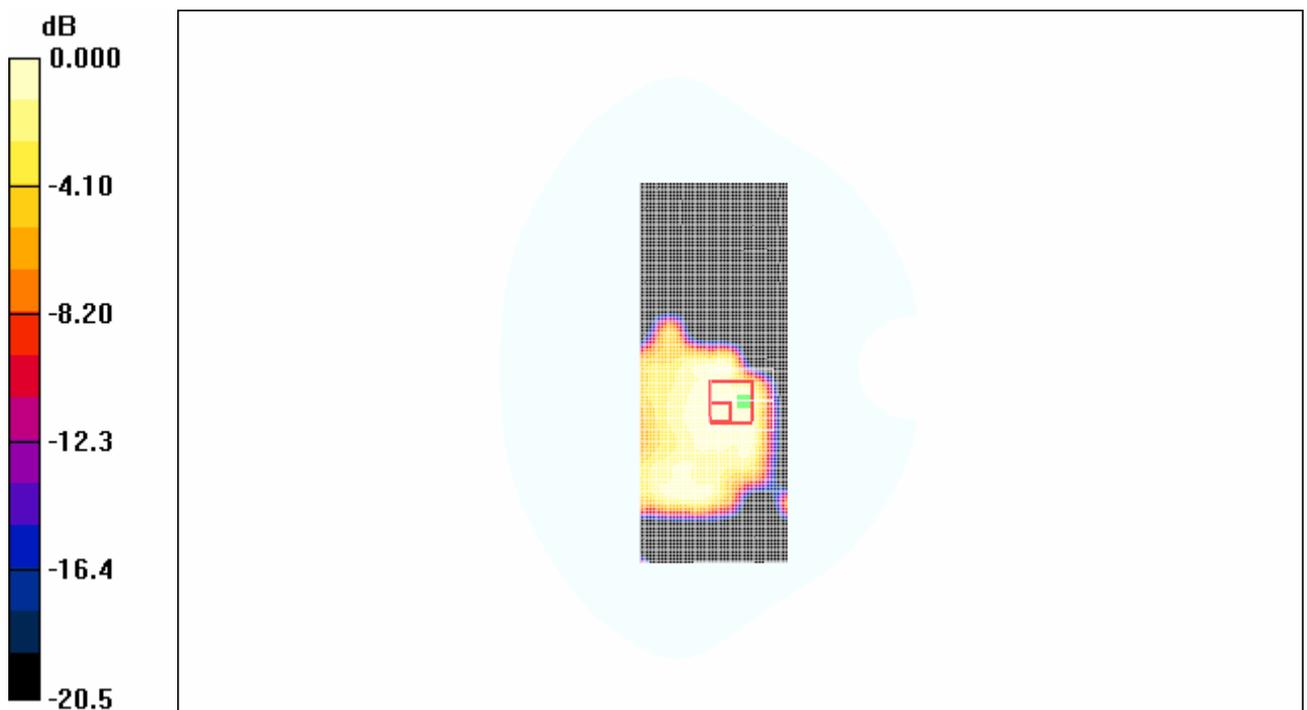
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.14 V/m; Power Drift = -0.038 dB

Peak SAR (extrapolated) = 0.091 W/kg

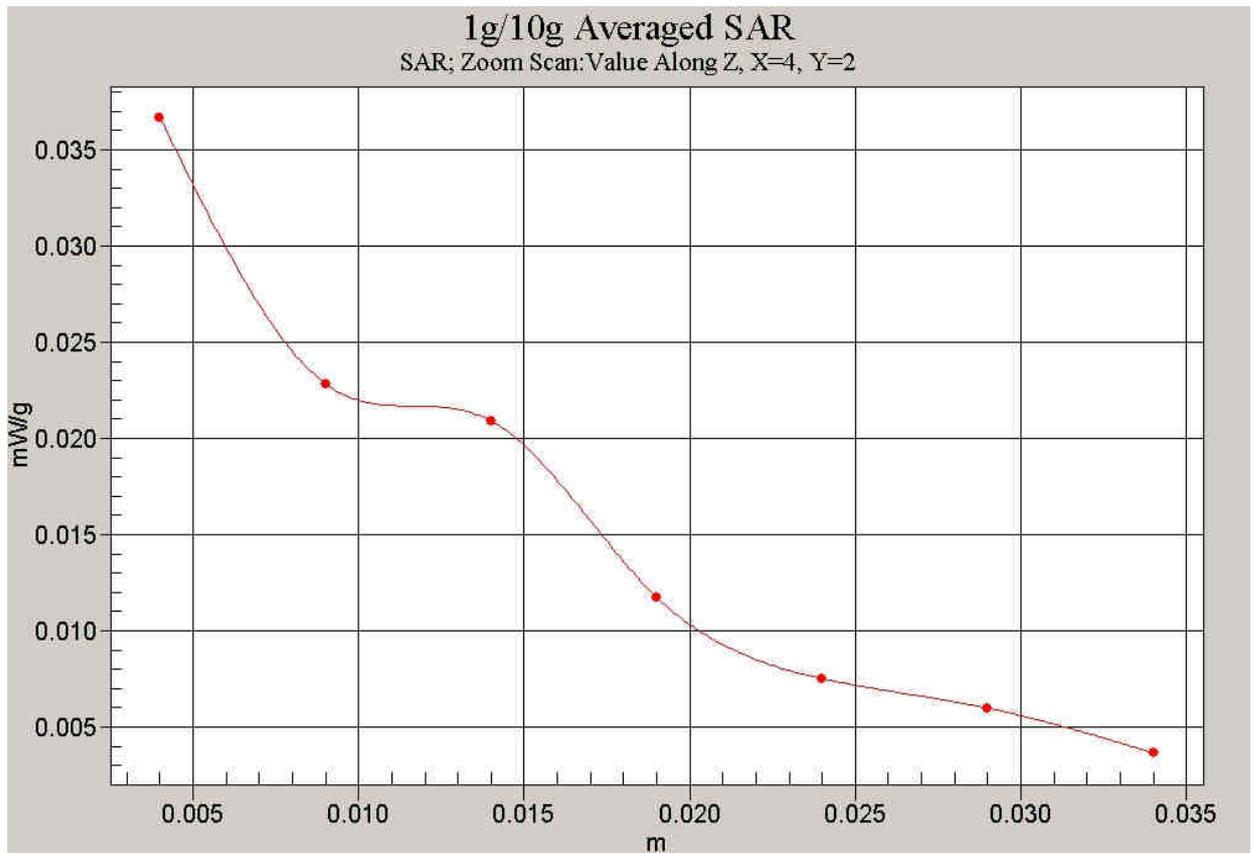
SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.018 mW/g

Maximum value of SAR (measured) = 0.037 mW/g



0 dB = 0.037mW/g

Fig. 29 PCS 1900MHz, Body, Towards Ground with GPRS, CH512



**Fig. 30 Z-Scan at power reference point
(PCS 1900MHz, Body Towards Ground with GPRS, CH512)**

1900 Body Toward Ground Low with EGPRS

Electronics: DAE3 Sn536

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ 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 (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.043 mW/g

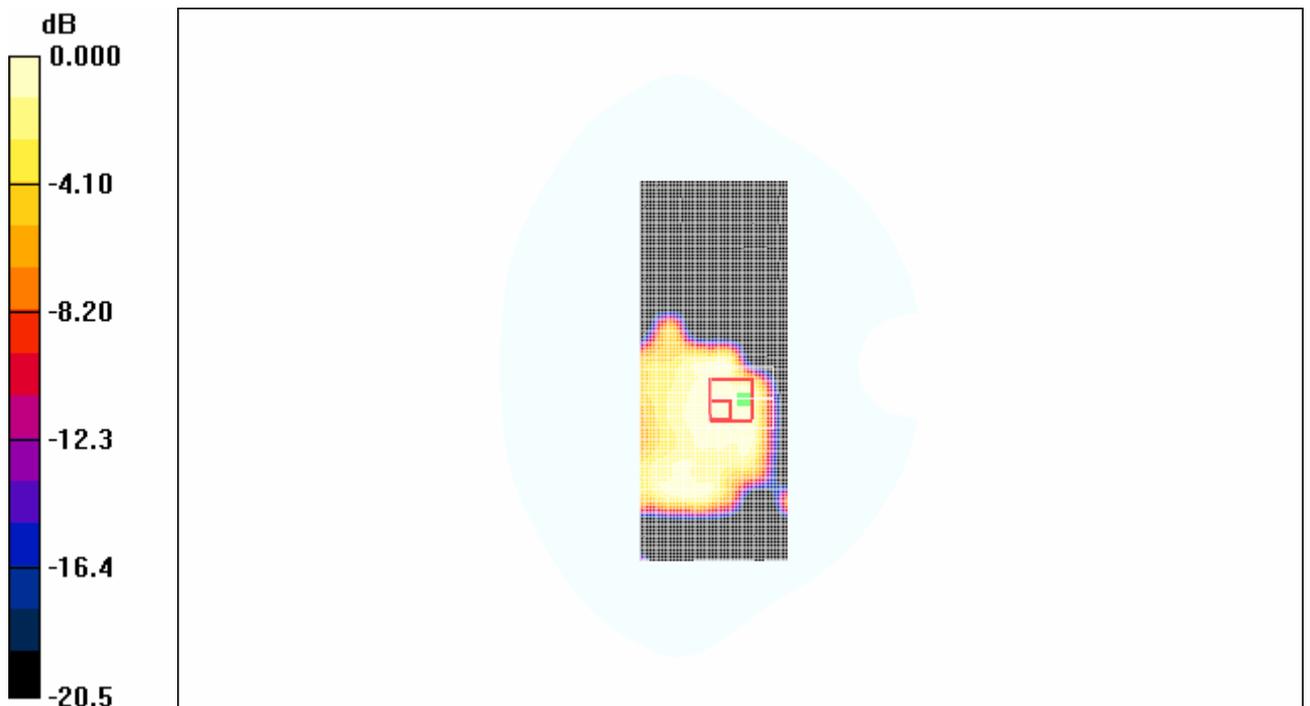
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.14 V/m; Power Drift = -0.065 dB

Peak SAR (extrapolated) = 0.088 W/kg

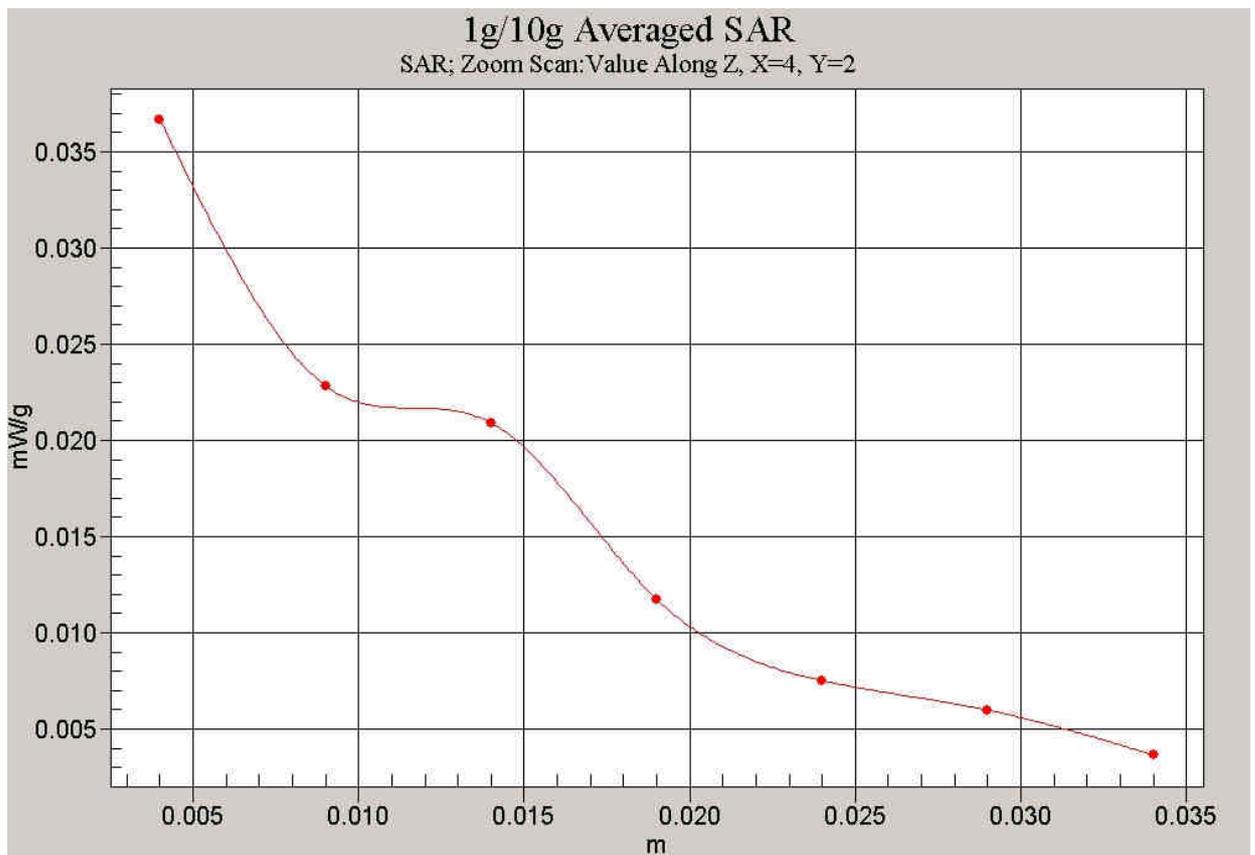
SAR(1 g) = 0.0332 mW/g; SAR(10 g) = 0.0175 mW/g

Maximum value of SAR (measured) = 0.036 mW/g



0 dB = 0.036mW/g

Fig. 31 PCS 1900MHz, Body, Towards Ground with EGPRS, CH512



**Fig. 32 Z-Scan at power reference point
(PCS 1900MHz, Body, Towards Ground with EGPRS, CH512)**

1900 Body Toward Ground Low with Bluetooth Function

Electronics: DAE3 Sn536

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ 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 (51x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.046 mW/g

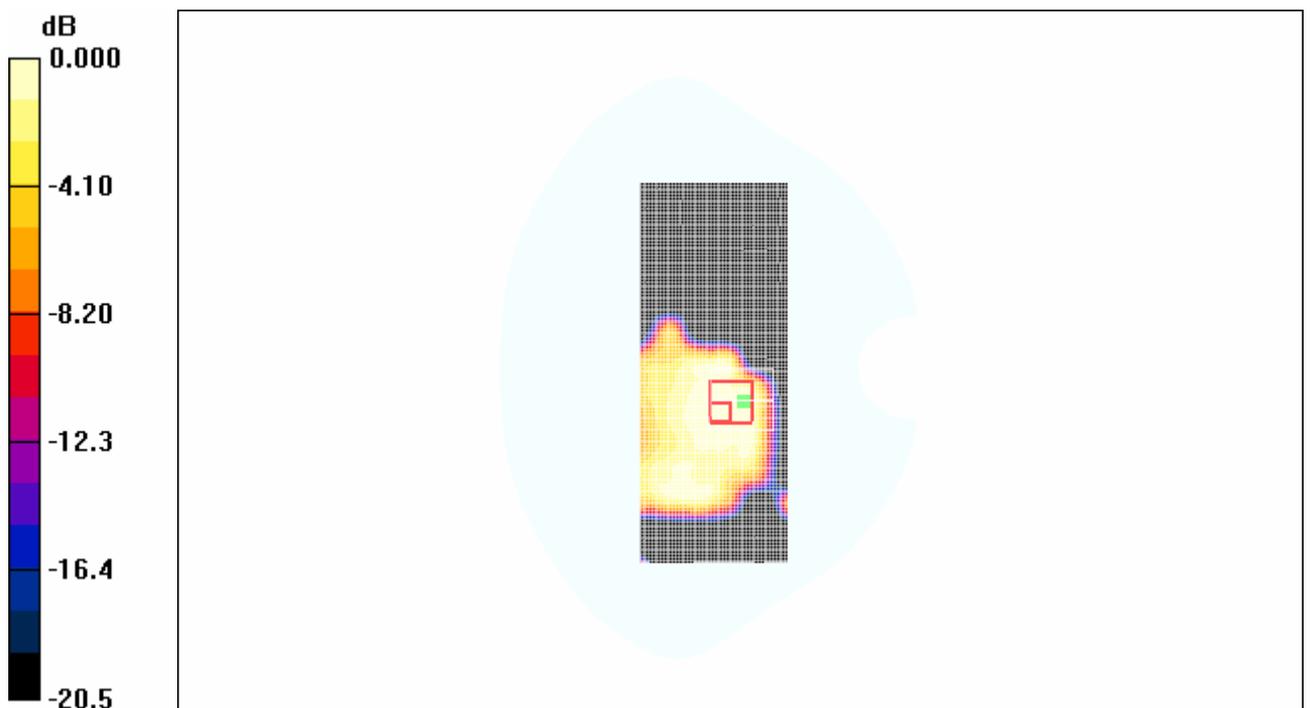
Toward Ground Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.14 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 0.093 W/kg

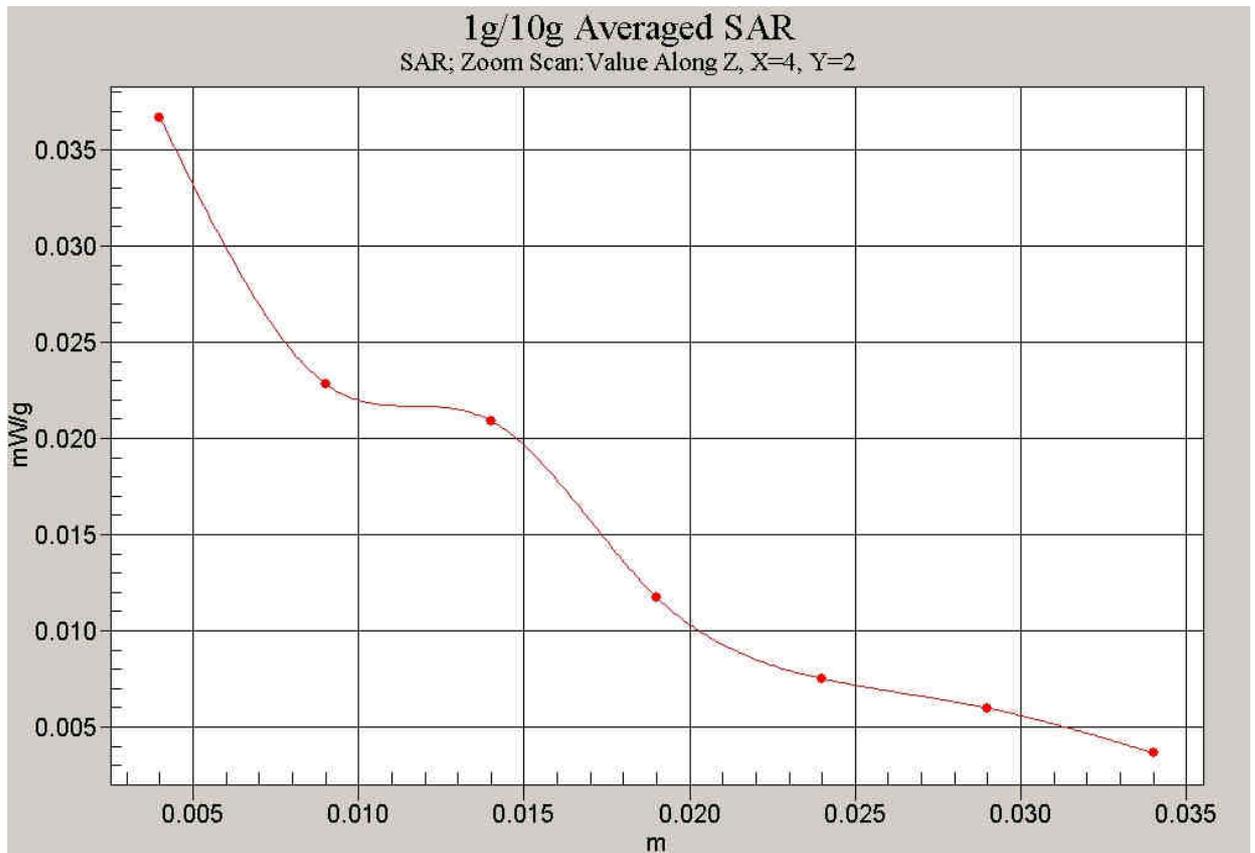
SAR(1 g) = 0.0351 mW/g; SAR(10 g) = 0.0185 mW/g

Maximum value of SAR (measured) = 0.038 mW/g



0 dB = 0.038mW/g

Fig. 33 PCS 1900MHz, Body, Towards Ground with Bluetooth, CH512



**Fig. 34 Z-Scan at power reference point
(PCS 1900MHz, Body, Towards Ground with Bluetooth, CH512)**

ANNEX D SYSTEM VALIDATION RESULTS

1900MHzDAE536Probe1736

Electronics: DAE3 Sn536

Medium: Head 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ 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

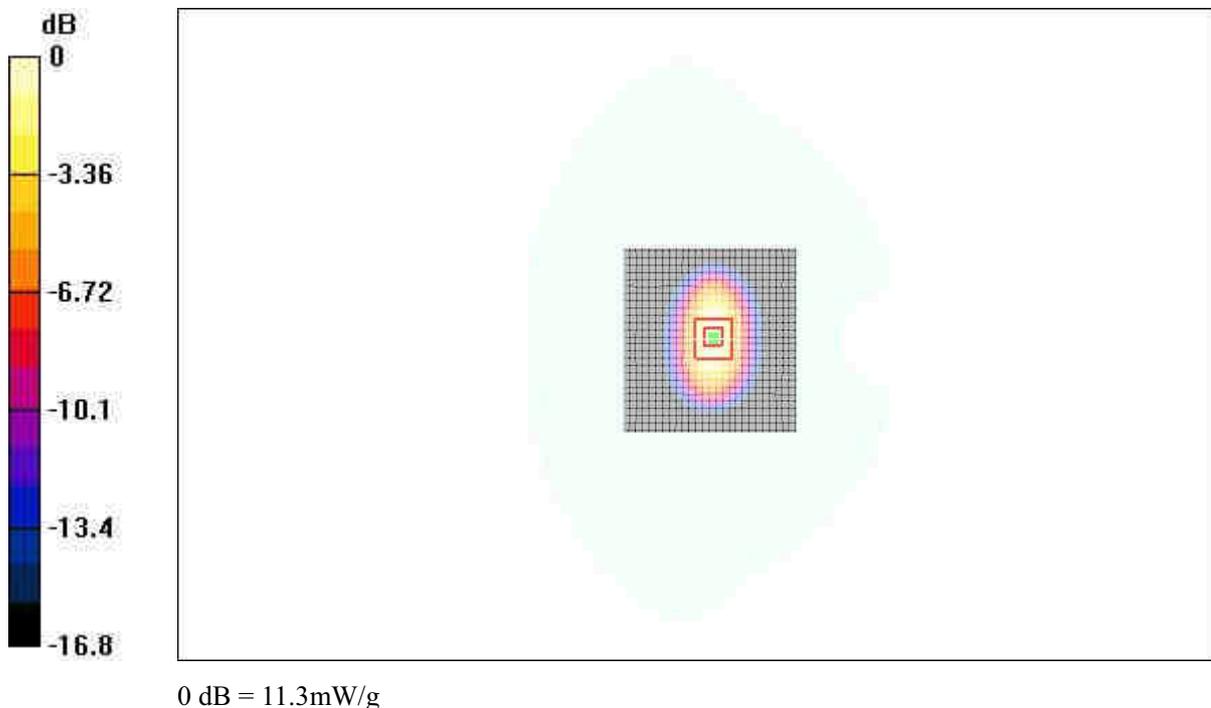


Fig.35 validation 1900MHz 250mW

ANNEX E PROBE CALIBRATION CERTIFICATE

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



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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																																																										
<p>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)⁰C and humidity<70%</p> <p>Calibration Equipment used (M&TE critical for calibration)</p> <table border="1"> <thead> <tr> <th>Primary Standards</th> <th>ID#</th> <th>Cal Data (Calibrated by, Certification NO.)</th> <th>Scheduled Calibration</th> </tr> </thead> <tbody> <tr> <td>Power meter E4419B</td> <td>GB341293874</td> <td>22-May-06 (METAS, NO. 251-00466)</td> <td>May-07</td> </tr> <tr> <td>Power sensor E4412A</td> <td>MY41495277</td> <td>22-May-06 (METAS, NO. 251-00466)</td> <td>May-07</td> </tr> <tr> <td>Power sensor E4412A</td> <td>MY41498087</td> <td>22-May-06 (METAS, NO. 251-00466)</td> <td>May-07</td> </tr> <tr> <td>Reference 20 dB Attenuator</td> <td>SN:S5086 (20b)</td> <td>22-May-06 (METAS, NO. 251-00467)</td> <td>May-07</td> </tr> <tr> <td>Reference Probe ES3DV2</td> <td>SN:S5086 (20b)</td> <td>22-May-06 (METAS, NO. 251-00467)</td> <td>May-07</td> </tr> <tr> <td>DAE4</td> <td>SN:3013</td> <td>13-Jan-06 (SPEAG, NO. ES3-3013_Jan06)</td> <td>Jan-07</td> </tr> <tr> <td>Reference Probe ES3DV2</td> <td>SN: 907</td> <td>11-Jun-06 (SPEAG, NO.DAE4-907_Jun06)</td> <td>Jun-07</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Secondary Standards</th> <th>ID#</th> <th>Check Data (in house)</th> <th>Scheduled Calibration</th> </tr> </thead> <tbody> <tr> <td>RF generator HP8648C</td> <td>US3642U01700</td> <td>4-Dec-05(SPEAG, in house check Dec-03)</td> <td>In house check: Dec-09</td> </tr> <tr> <td>Network Analyzer HP 8753E</td> <td>US37390585</td> <td>10-Nov-05(SPEAG, NO. DAE4-901_Nov-04)</td> <td>In house check: Nov-09</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th></th> <th>Name</th> <th>Function</th> <th>Signature</th> </tr> </thead> <tbody> <tr> <td>Calibrated by:</td> <td>Nico Vetterli</td> <td>Laboratory Technician</td> <td></td> </tr> <tr> <td>Approved by:</td> <td>Katja Pokovic</td> <td>Technical Director</td> <td></td> </tr> </tbody> </table> <p style="text-align: right;">Issued: December 1, 2006</p> <p>This calibration certificate shall not be reported except in full without written approval of the laboratory.</p>				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		Name	Function	Signature	Calibrated by:	Nico Vetterli	Laboratory Technician		Approved by:	Katja Pokovic	Technical Director	
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Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



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The Swiss Accreditation Service is one of the signatories to the EA
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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

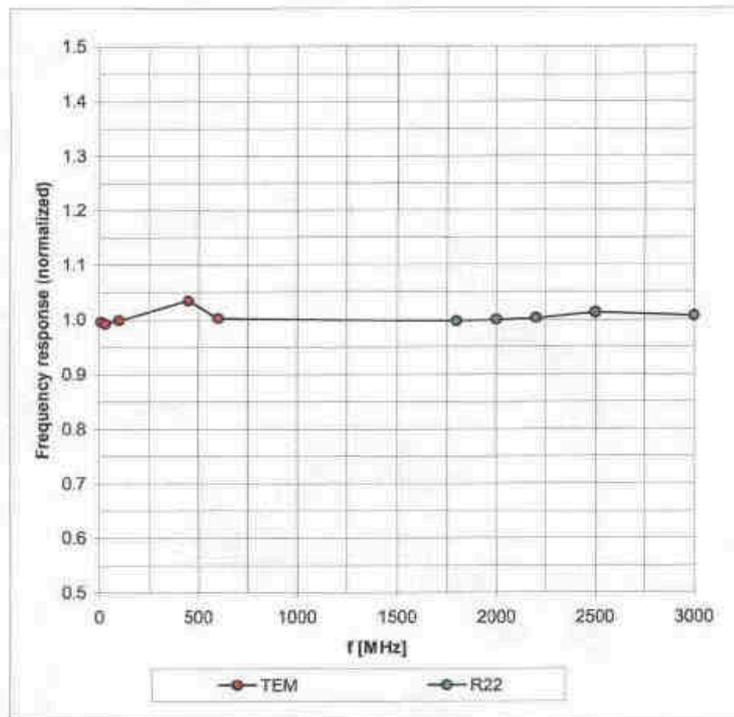
Calibrated for DASY System

ET3DV6 SN: 1736

December 1, 2006

Frequency Response of E-Field

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

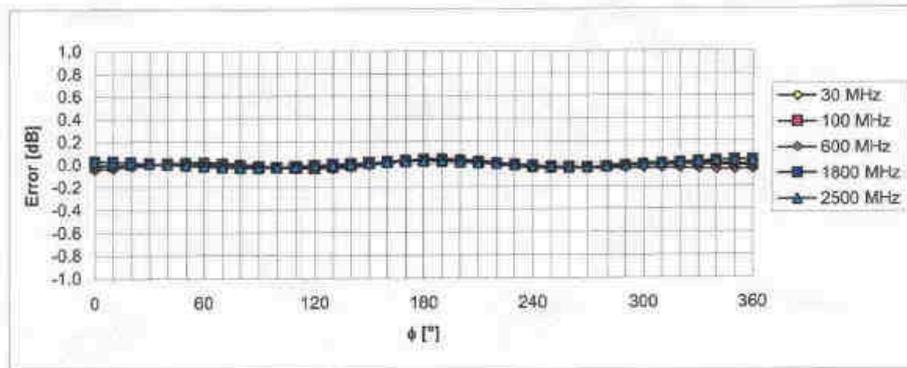
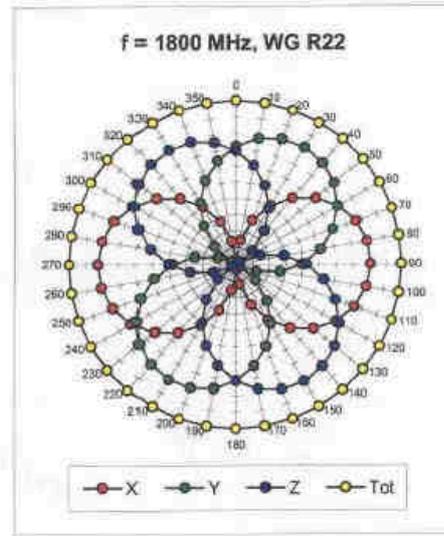
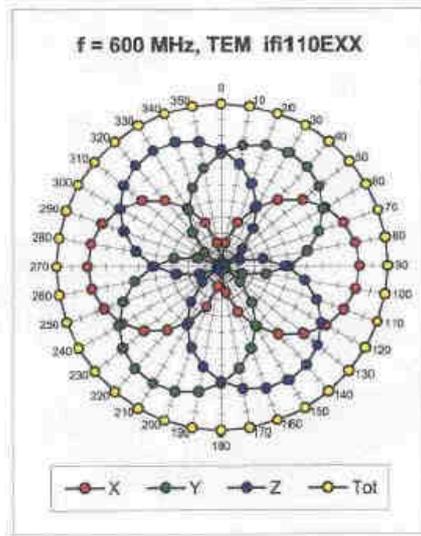


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

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

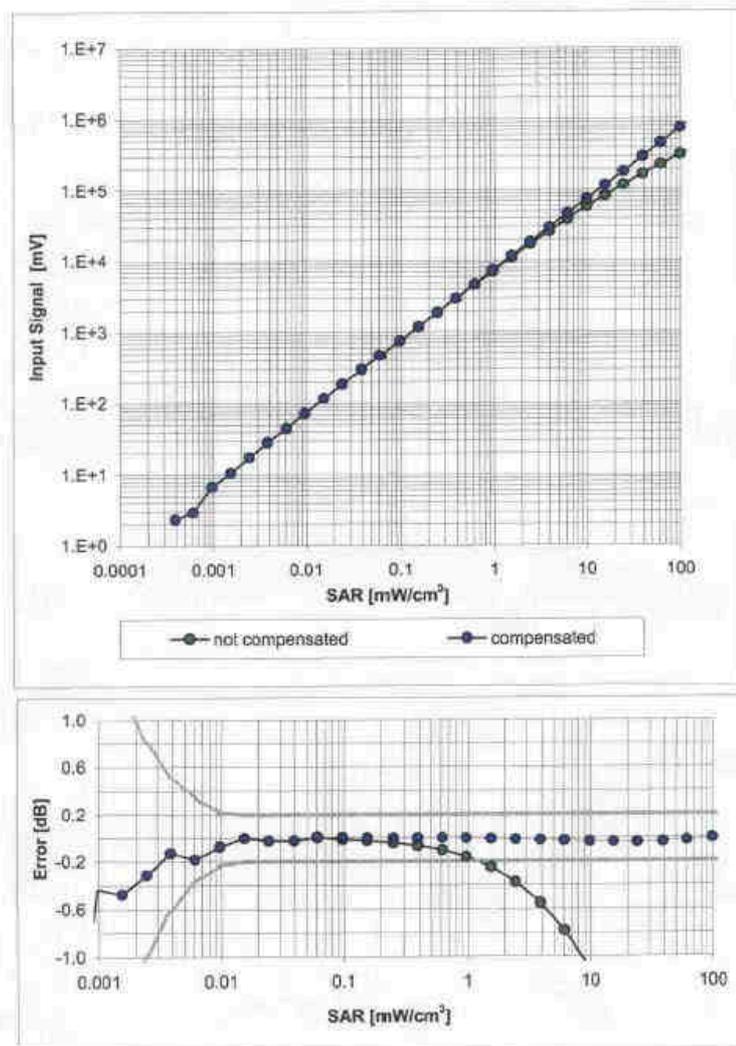


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

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December 1, 2006

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

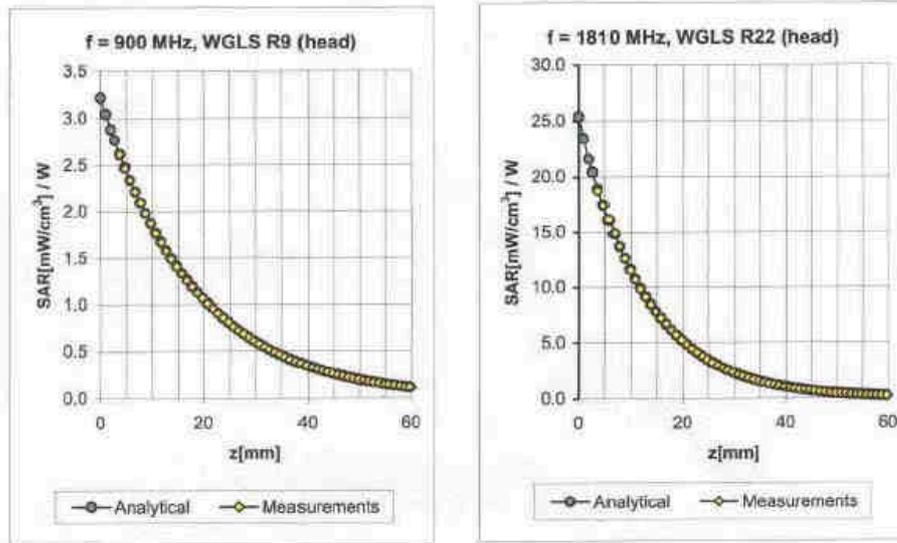


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

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December 1, 2006

Conversion Factor Assessment



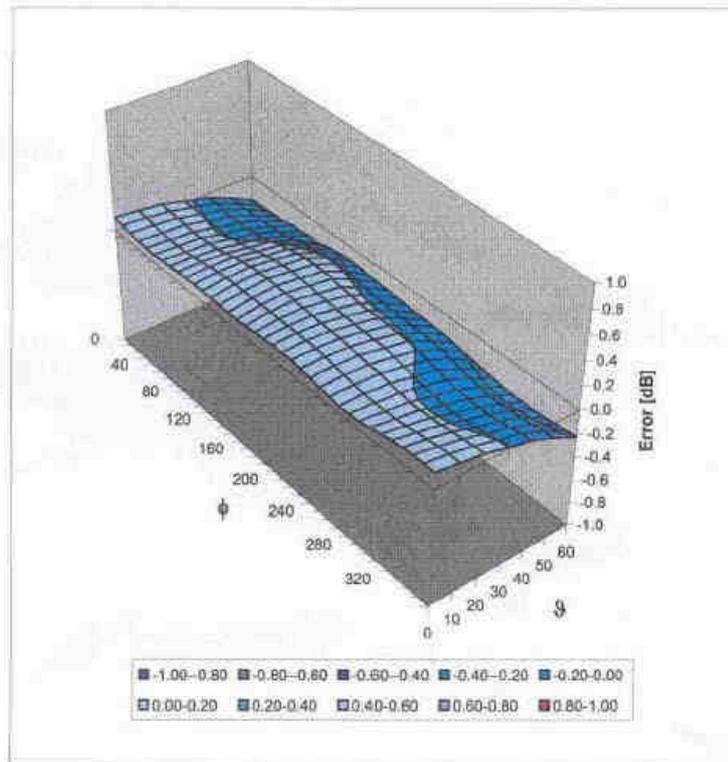
f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.56	1.85	6.51 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.47	5.40 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.62	2.29	4.67 ± 11.8% (k=2)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

ET3DV6 SN: 1736

December 1, 2006

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



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

ANNEX F DIPOLE CALIBRATION CERTIFICATE

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



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 C Service suisse d'étalonnage
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 Multilateral Agreement for the recognition of calibration certificates
 Client: TMC China

Accreditation no.: SCS 168

Certificate No.: D1900V2-541_Feb07

CALIBRATION CERTIFICATE																																																													
Object	D1900V2-SN: 541																																																												
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits																																																												
Calibration date:	February 20, 2007																																																												
Condition of the calibrated item	In Tolerance																																																												
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Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
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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
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

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
- 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
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	$dx, dy, dz = 5 \text{ mm}$	
Frequency	1900 MHz $\pm 1 \text{ MHz}$	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	38.8 \pm 6 %	1.35 mho/m \pm 6 %
Head TSL temperature during test	(22.1 \pm 0.2) °C	—	—

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	8.73 mW /g
SAR normalized	normalized to 1W	38.9 mW /g
SAR for nominal Head TSL parameters [†]	normalized to 1W	38.8 mW / g \pm 17.8 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.09 mW /g
SAR normalized	normalized to 1W	20.4 mW /g
SAR for nominal Head TSL parameters [†]	normalized to 1W	20.2 mW / g \pm 15.5 % (k=2)

[†] Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	45.4 Ω - 8.9 jΩ
Return Loss	-26.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.214 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by:	SPEAG
Manufactured on:	October 4 , 2001

DASY4 Validation Report for Head TSL

Date/Time: 20.02.2007 09:25:37

Test laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; serial: D1900V2-SN: 541

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

Medium: HSL 1900 MHz;

Medium parameters used: $f=1900$ MHz; $\sigma=1.38$ mho/m; $\epsilon_r=38.9$; $\rho=1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6-SN1507(HF); ConvF(5.03, 5.03, 5.03); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.1_2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA;
- Measurement SW: DASY, V4.7 Build 53; Post processing SW: SEMCAD, V1.8 Build 172

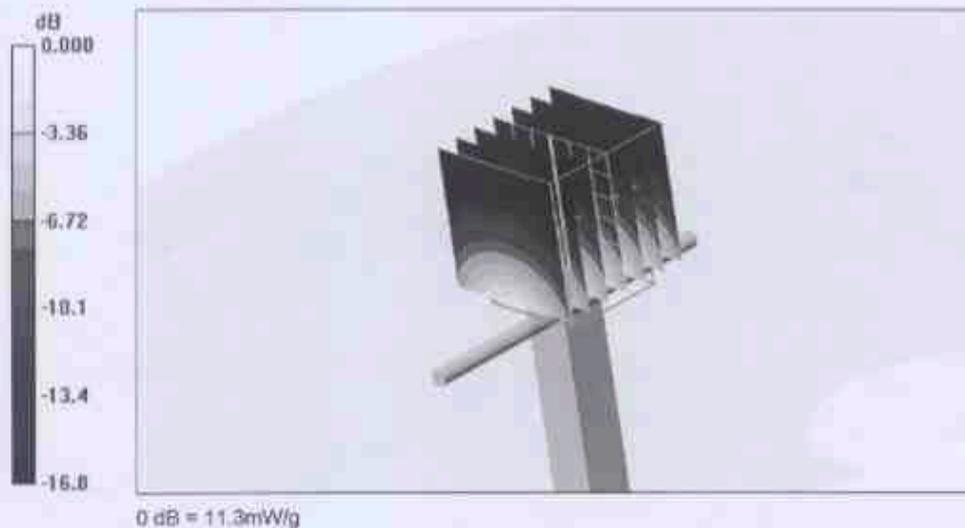
Pin = 250 mW; $d = 15$ mm/Zoom Scan (7x7x7)/Cube 0; Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.1 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 15.9 W/kg

SAR(1 g) = 9.73 mW/g; SAR(10 g) = 5.09 mW/g

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



Impedance measurement Plot for Head TSL

