

BODY_WLAN802.11 g_CH6

DUT: RHOD 210;

Communication System: Wireless LAN; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: Muscle 2450 Medium parameters used: $f = 2437$ MHz; $\sigma = 2.03$ mho/m; $\epsilon_r = 51.2$;
 $\rho = 1000$ kg/m³
Phantom section: Flat Section

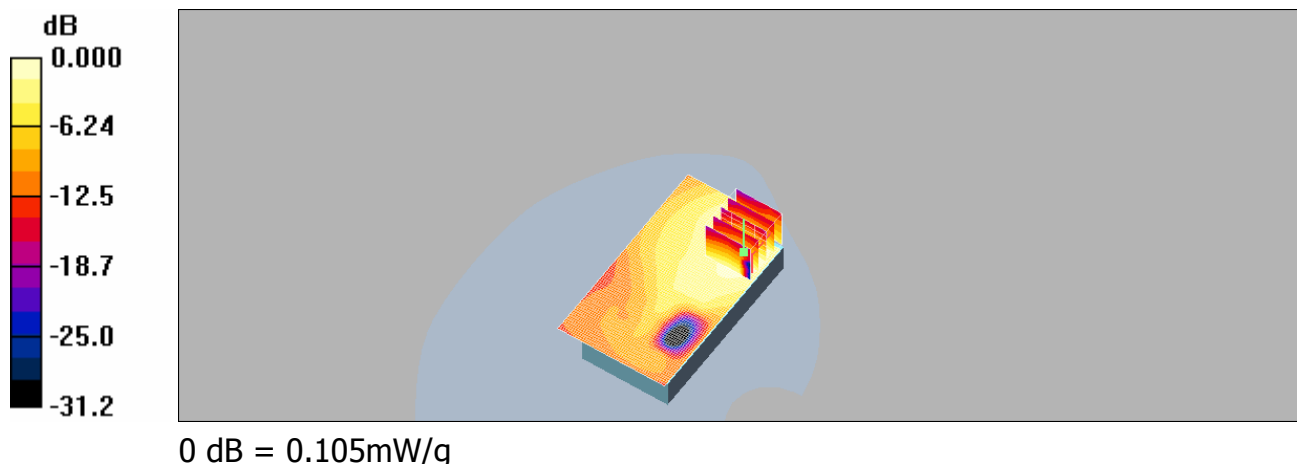
DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(8.18, 8.18, 8.18); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.109 mW/g

BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.41 V/m; Power Drift = -0.153 dB
Peak SAR (extrapolated) = 0.206 W/kg

SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.053 mW/g
Maximum value of SAR (measured) = 0.105 mW/g



BODY_WLAN802.11 g_CH11

DUT: RHOD 210;

Communication System: Wireless LAN; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: Muscle 2450 Medium parameters used: $f = 2462$ MHz; $\sigma = 2.06$ mho/m; $\epsilon_r = 51.1$;
 $\rho = 1000$ kg/m³
Phantom section: Flat Section

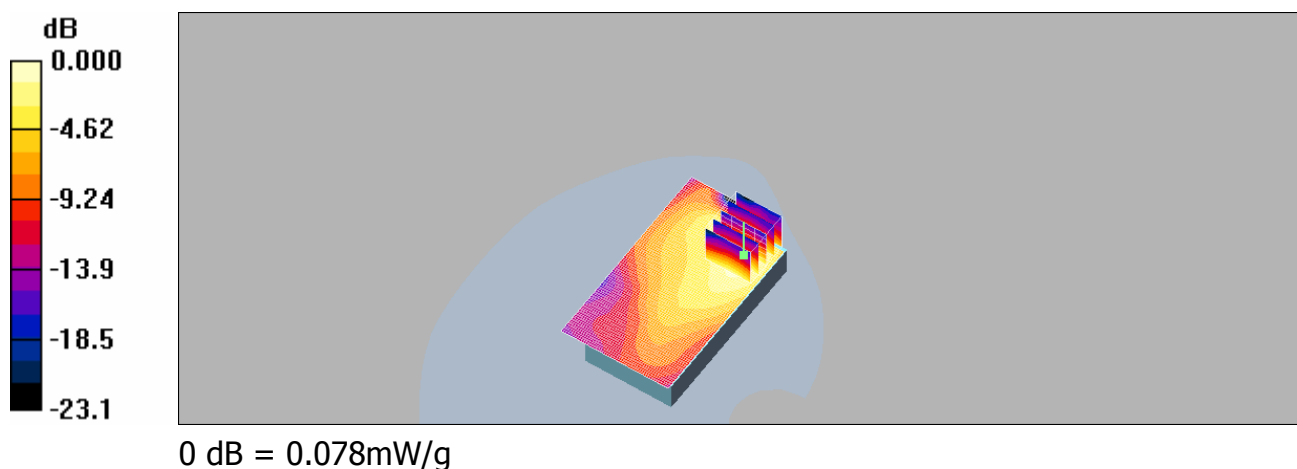
DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(8.18, 8.18, 8.18); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

BODY/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.082 mW/g

BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm,
dz=5mm
Reference Value = 1.91 V/m; Power Drift = -0.175 dB
Peak SAR (extrapolated) = 0.132 W/kg

SAR(1 g) = 0.070 mW/g; SAR(10 g) = 0.037 mW/g
Maximum value of SAR (measured) = 0.078 mW/g



5. System Verification

Date/Time: 2009/2/12 00:36:23

DUT: Dipole 835 MHz;

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

Medium: Head 900 MHz Medium parameters used: $f = 835$ MHz; $\sigma = 0.871$ mho/m; $\epsilon_r = 40.5$;
 $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(10.93, 10.93, 10.93); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.44 mW/g

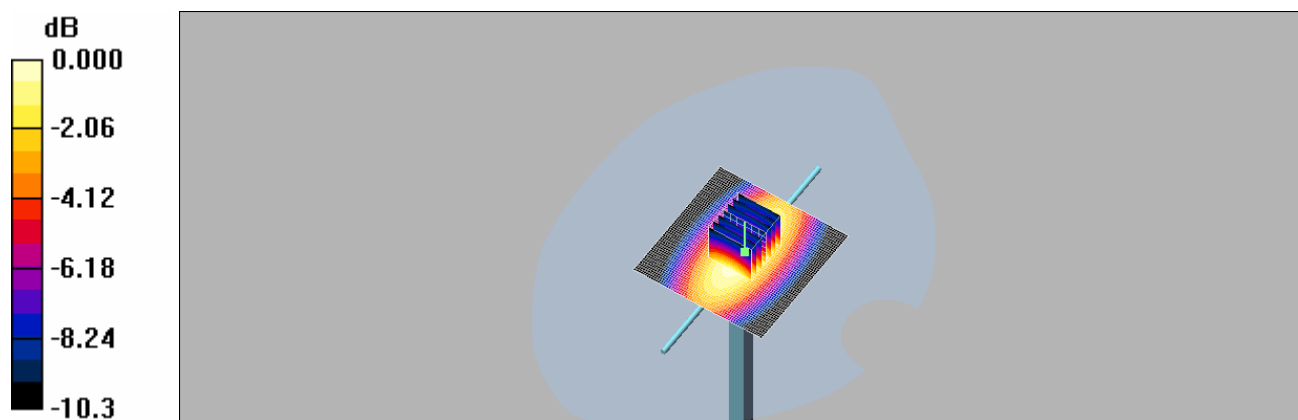
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm,
dy=5mm, dz=5mm

Reference Value = 52.6 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 3.39 W/kg

SAR(1 g) = 2.25 mW/g; SAR(10 g) = 1.47 mW/g

Maximum value of SAR (measured) = 2.43 mW/g



0 dB = 2.43mW/g

DUT: Dipole 835 MHz;

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Muscle 900 MHz Medium parameters used: $f = 835$ MHz; $\sigma = 0.951$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

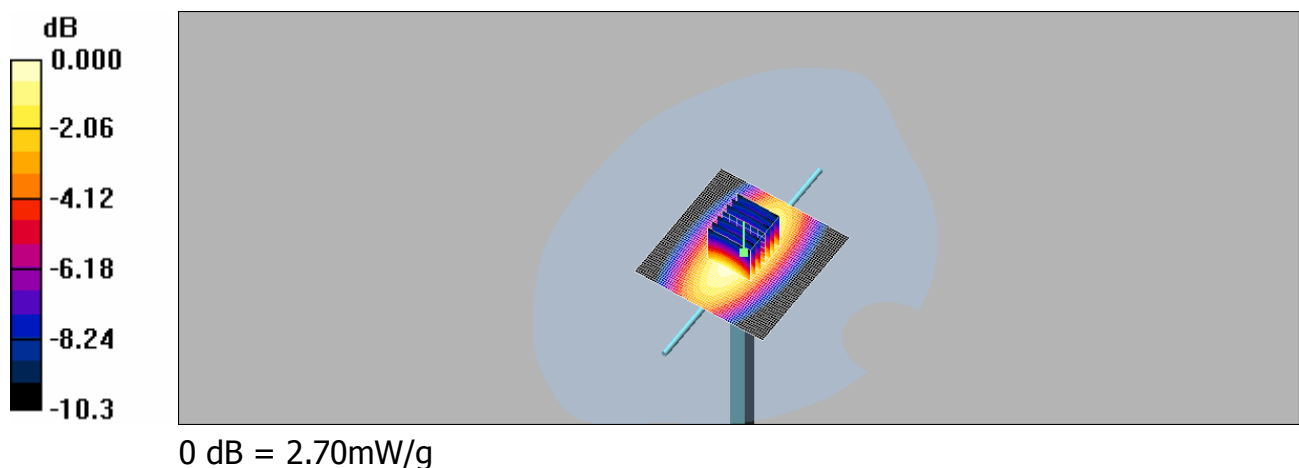
DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(10.87, 10.87, 10.87); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.71 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.4 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 3.75 W/kg

SAR(1 g) = 2.51 mW/g; SAR(10 g) = 1.65 mW/g
Maximum value of SAR (measured) = 2.70 mW/g



DUT: Dipole 1900 MHz;

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: Head 1900MHz Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

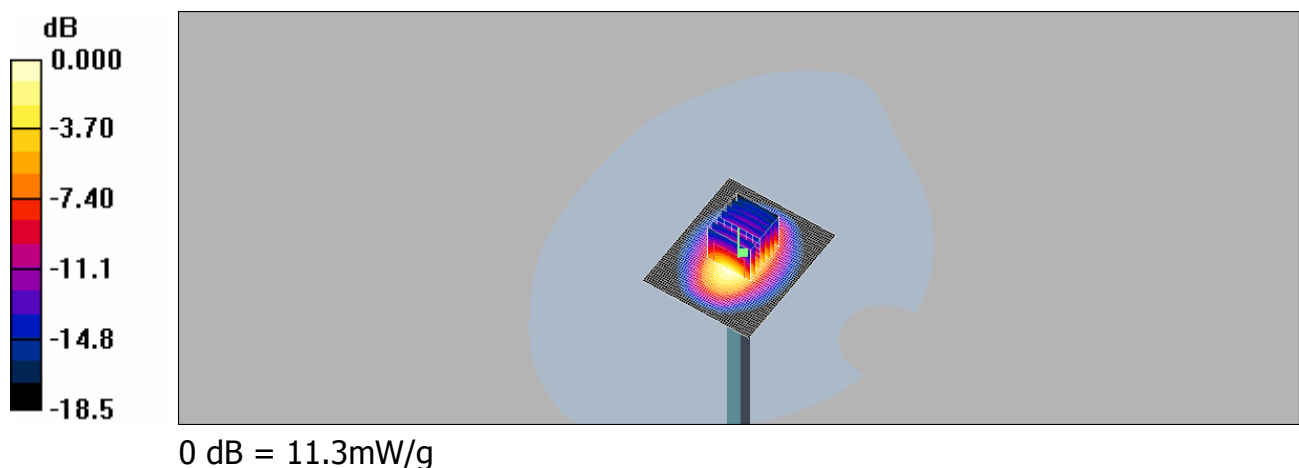
DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(9.46, 9.46, 9.46); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mw/Area Scan (51x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.1 mW/g

Pin=250mw/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.4 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 19.1 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.2 mW/g
Maximum value of SAR (measured) = 11.3 mW/g



DUT: Dipole 1900 MHz;

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 53.3$;
 $\rho = 1000$ kg/m³
Phantom section: Flat Section

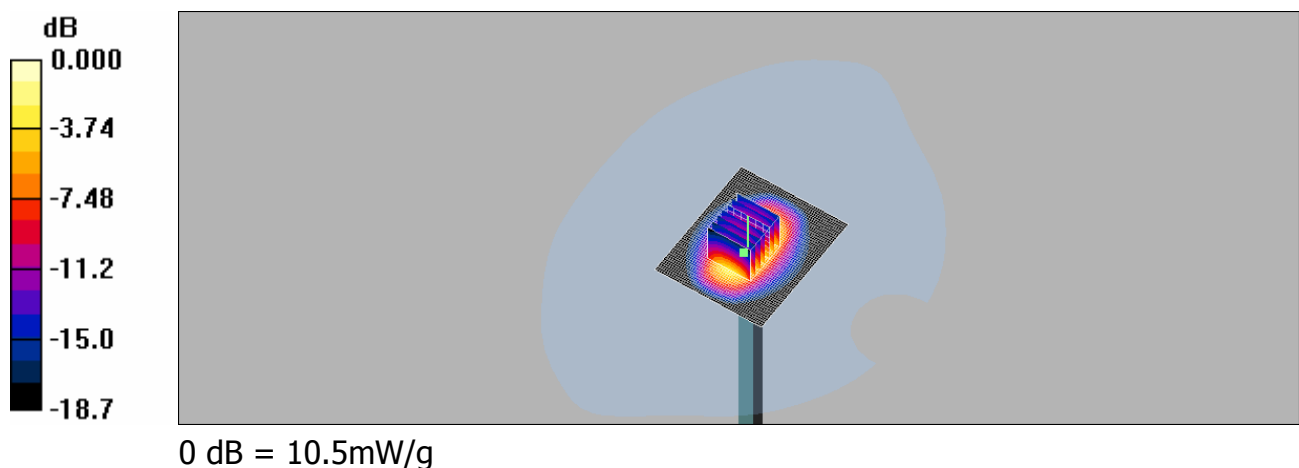
DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(9.28, 9.28, 9.28); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW/Area Scan (51x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.2 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm,
dy=5mm, dz=5mm
Reference Value = 82.3 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 17.3 W/kg

SAR(1 g) = 9.39 mW/g; SAR(10 g) = 4.84 mW/g
Maximum value of SAR (measured) = 10.5 mW/g



DUT: Dipole 1800 MHz;

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1
Medium: Head 1800 MHz Medium parameters used: $f = 1800$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

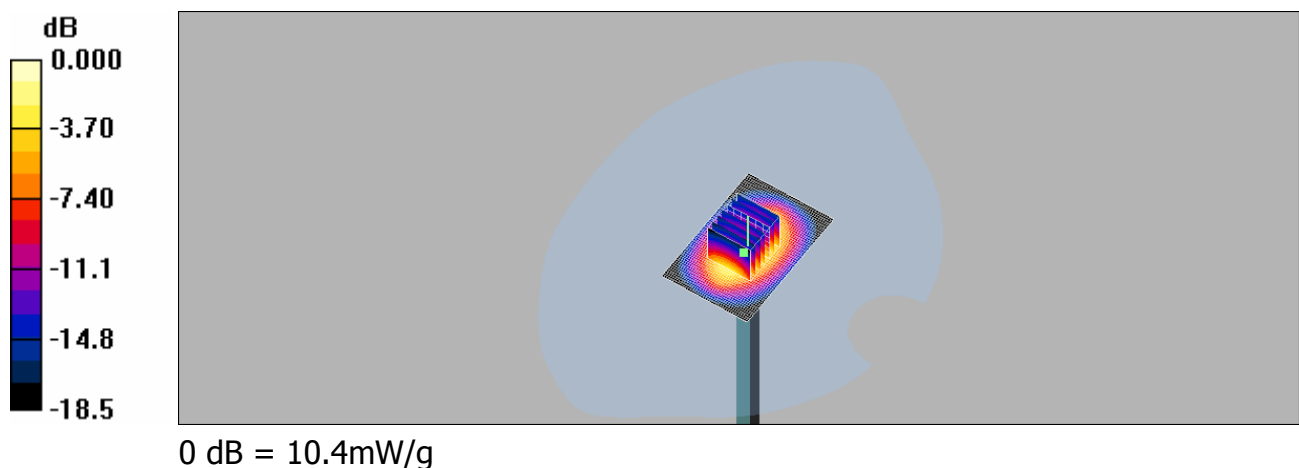
DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(9.46, 9.46, 9.46); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 10.6 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.9 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 9.38 mW/g; SAR(10 g) = 4.86 mW/g
Maximum value of SAR (measured) = 10.4 mW/g



DUT: Dipole 1800 MHz;

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1
Medium: M1800 & 1900 Medium parameters used: $f = 1800$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 53.7$;
 $\rho = 1000$ kg/m³
Phantom section: Flat Section

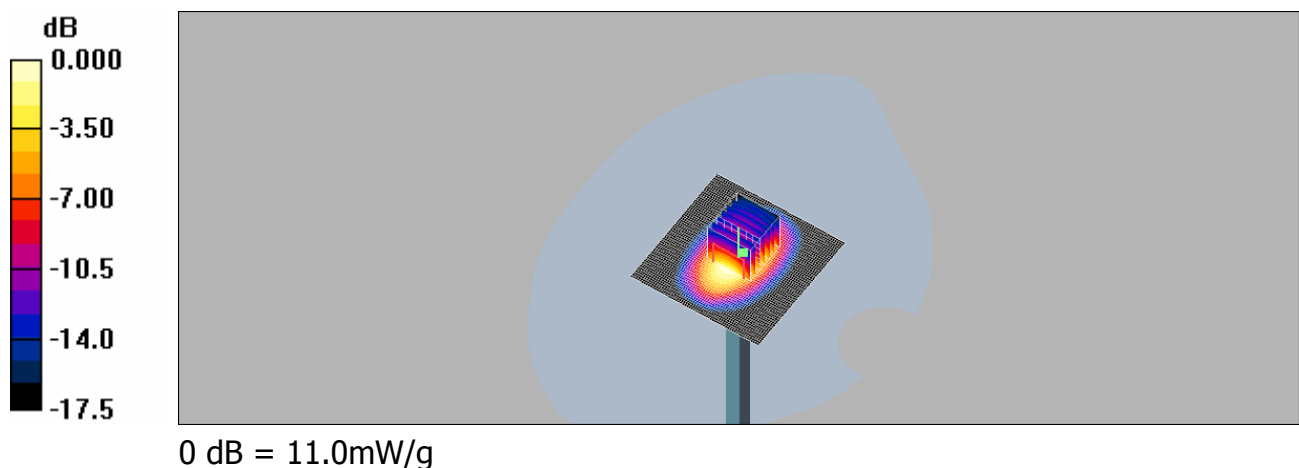
DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(9.28, 9.28, 9.28); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phantom: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

20081001/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.6 mW/g

20081001/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm,
dz=5mm
Reference Value = 86.6 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.83 mW/g; SAR(10 g) = 5.19 mW/g
Maximum value of SAR (measured) = 11.0 mW/g



DUT: Dipole 2450 MHz;

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: M 2450 Medium parameters used: $f = 2450$ MHz; $\sigma = 2.04$ mho/m; $\epsilon_r = 51.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

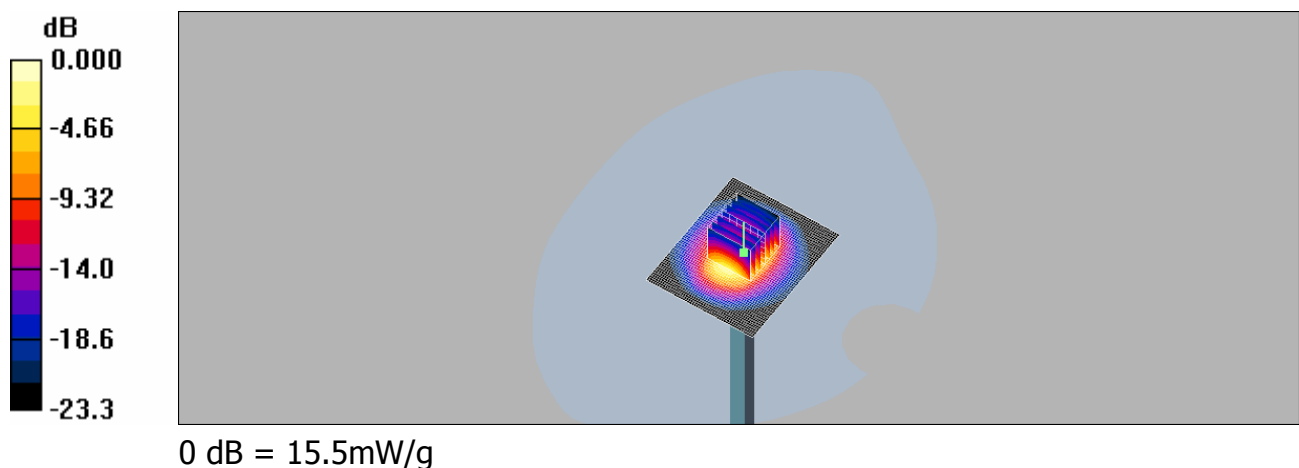
DASY4 Configuration:

- Probe: EX3DV3 - SN3526; ConvF(8.18, 8.18, 8.18); Calibrated: 2008/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2009/1/20
- Phant m: SAM2; Type: SAM 4.0; Serial: TP:1270
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW/Area Scan (51x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 18.3 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.6 V/m; Power Drift = -0.087 dB
Peak SAR (extrapolated) = 29.2 W/kg

SAR(1 g) = 13.6 mW/g; SAR(10 g) = 6.15 mW/g
Maximum value of SAR (measured) = 15.5 mW/g



6. DAE & Probe Calibration certificate

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



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Accreditation No.: **SCS 108**

Client **SGS (Auden)**

Certificate No: **DAE4-547_Jan09**

CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BJ - SN: 547**

Calibration procedure(s) **QA CAL-06.v12
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **January 19, 2009**

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 (Certificate No.) | Scheduled Calibration |
|-----------------------------------|-------------|----------------------------|-----------------------|
| Fluke Process Calibrator Type 702 | SN: 6295803 | 30-Sep-08 (No: 7673) | Sep-09 |
| Keithley Multimeter Type 2001 | SN: 0810278 | 30-Sep-08 (No: 7670) | Sep-09 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---------------------|--------------------|----------------------------|------------------------|
| Calibrator Box V1.1 | SE UMS 006 AB 1004 | 06-Jun-08 (in house check) | In house check: Jun-09 |

| | Name | Function | Signature |
|----------------|-------------|------------|----------------|
| Calibrated by: | Daniel Hess | Technician | <i>D. Hess</i> |

| | | | |
|--------------|--------------|--------------|--------------------|
| Approved by: | Fin Bornholt | R&D Director | <i>F. Bornholt</i> |
|--------------|--------------|--------------|--------------------|

Issued: January 20, 2009

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

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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **SGS (Auden)**

Certificate No: **EX3-3526_Aug08**

CALIBRATION CERTIFICATE

Object: **EX3DV3 - SN:3526**

Calibration procedure(s): **QA CAL-01.v6, QA CAL-14.v3 and QA CAL-23.v3
 Calibration procedure for dosimetric E-field probes**

Calibration date: **August 26, 2008**

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 (Certificate No.) | Scheduled Calibration |
|----------------------------|-----------------|-----------------------------------|------------------------|
| Power meter E4419B | GB41293874 | 1-Apr-08 (No. 217-00788) | Apr-09 |
| Power sensor E4412A | MY41495277 | 1-Apr-08 (No. 217-00788) | Apr-09 |
| Power sensor E4412A | MY41498087 | 1-Apr-08 (No. 217-00788) | Apr-09 |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 1-Jul-08 (No. 217-00865) | Jul-09 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 31-Mar-08 (No. 217-00787) | Apr-09 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 1-Jul-08 (No. 217-00866) | Jul-09 |
| Reference Probe ES3DV2 | SN: 3013 | 2-Jan-08 (No. ES3-3013_Jan08) | Jan-09 |
| DAE4 | SN: 660 | 3-Sep-07 (No. DAE4-660_Sep07) | Sep-08 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| RF generator HP 8648C | US3642U01700 | 4-Aug-99 (in house check Oct-07) | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (in house check Oct-07) | In house check: Oct-08 |

Calibrated by: **Katja Pokovic** (Name), **Technical Manager** (Function), *[Signature]* (Signature)

Approved by: **Niels Kuster** (Name), **Quality Manager** (Function), *[Signature]* (Signature)

Issued: August 26, 2008

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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 |
| ConvF | sensitivity in TSL / NORM _{x,y,z} |
| DCP | diode compression point |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis |

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}:** Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}:** DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters:** Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy):** in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset:** The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

EX3DV3 SN:3526

August 26, 2008

Probe EX3DV3

SN:3526

| | |
|------------------|-----------------|
| Manufactured: | March 19, 2004 |
| Last calibrated: | August 29, 2007 |
| Recalibrated: | August 26, 2008 |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

EX3DV3 SN:3526

August 26, 2008

DASY - Parameters of Probe: EX3DV3 SN:3526

| Sensitivity in Free Space ^A | | | Diode Compression ^B | |
|--|--------------|-----------------------|--------------------------------|-------|
| NormX | 0.99 ± 10.1% | μV/(V/m) ² | DCP X | 93 mV |
| NormY | 0.81 ± 10.1% | μV/(V/m) ² | DCP Y | 94 mV |
| NormZ | 0.89 ± 10.1% | μV/(V/m) ² | DCP Z | 94 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 | 2.0 mm | 3.0 mm | |
| | SAR _{be} [%] Without Correction Algorithm | 8.9 | 5.3 | |
| | SAR _{be} [%] With Correction Algorithm | 0.8 | 0.4 | |
| TSL | 1810 MHz | Typical SAR gradient: 10 % per mm | | |
| | Sensor Center to Phantom Surface Distance | 2.0 mm | 3.0 mm | |
| | SAR _{be} [%] Without Correction Algorithm | 6.8 | 3.6 | |
| | SAR _{be} [%] With Correction Algorithm | 0.5 | 0.2 | |

Sensor Offset

Probe Tip to Sensor Center **1.0 mm**

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

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).

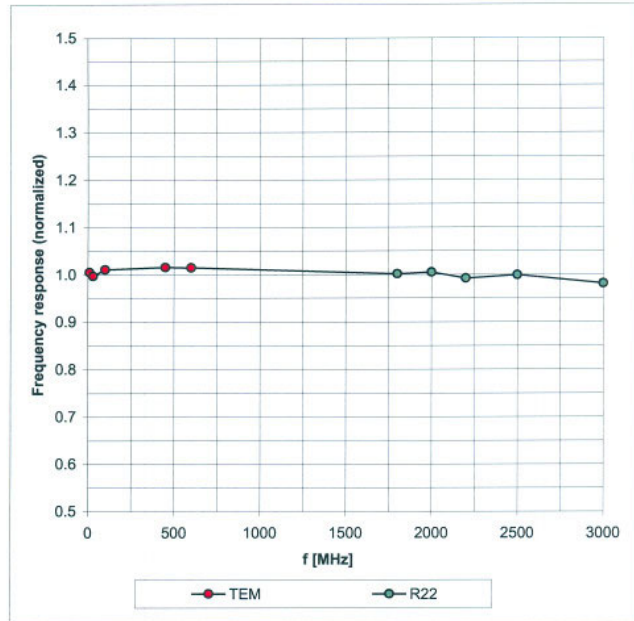
^B Numerical linearization parameter: uncertainty not required.

EX3DV3 SN:3526

August 26, 2008

Frequency Response of E-Field

(TEM-Cell:if1110 EXX, Waveguide: R22)

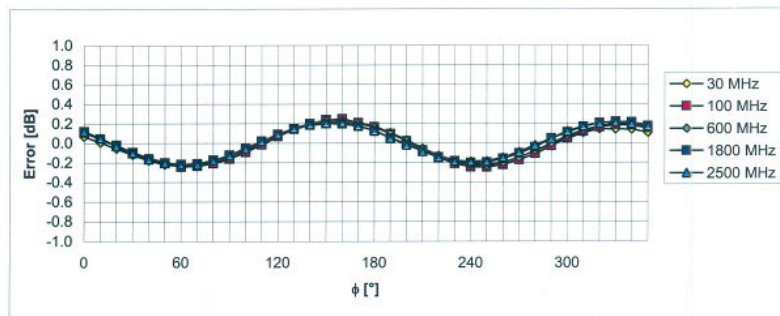
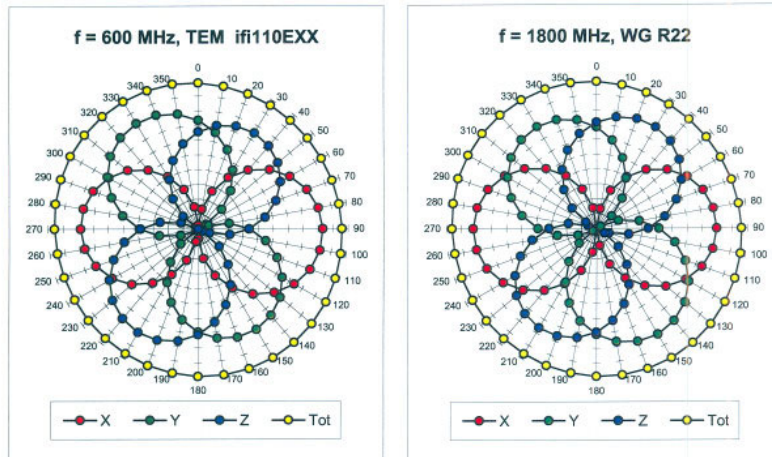


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

EX3DV3 SN:3526

August 26, 2008

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

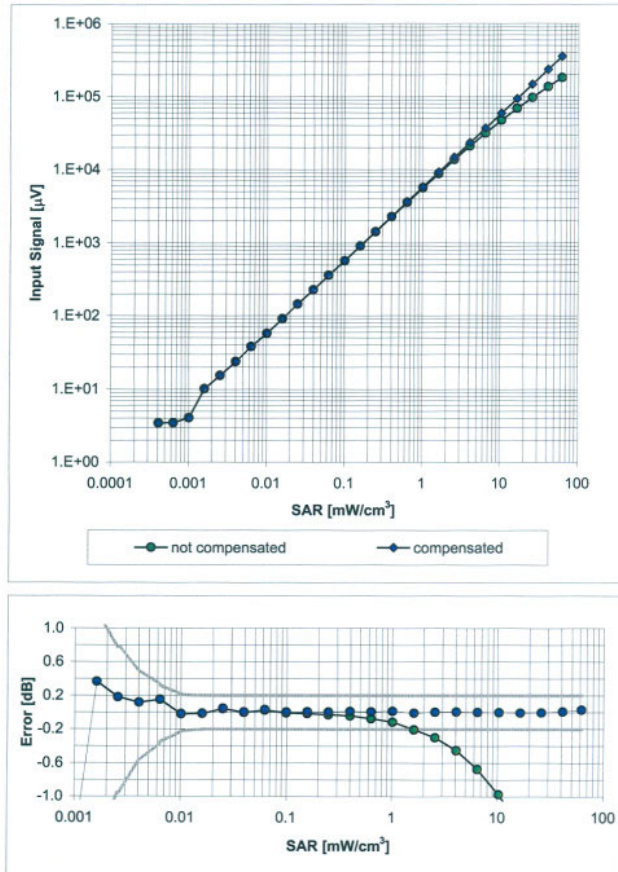


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

EX3DV3 SN:3526

August 26, 2008

Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800$ MHz)



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

EX3DV3 SN:3526

August 26, 2008

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% | 0.54 | 0.76 | 10.93 ± 11.0% (k=2) |
| 1810 | ± 50 / ± 100 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.52 | 0.68 | 9.46 ± 11.0% (k=2) |
| 1950 | ± 50 / ± 100 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.58 | 0.61 | 9.15 ± 11.0% (k=2) |
| 2450 | ± 50 / ± 100 | Head | 39.2 ± 5% | 1.80 ± 5% | 0.42 | 0.74 | 8.49 ± 11.0% (k=2) |
| 2600 | ± 50 / ± 100 | Head | 39.0 ± 5% | 1.96 ± 5% | 0.42 | 0.75 | 8.53 ± 11.0% (k=2) |
| 3500 | ± 50 / ± 100 | Head | 37.9 ± 5% | 2.91 ± 5% | 0.30 | 1.20 | 8.15 ± 13.1% (k=2) |
| 5200 | ± 50 / ± 100 | Head | 36.0 ± 5% | 4.66 ± 5% | 0.40 | 1.65 | 5.68 ± 13.1% (k=2) |
| 5500 | ± 50 / ± 100 | Head | 35.6 ± 5% | 4.96 ± 5% | 0.40 | 1.65 | 5.01 ± 13.1% (k=2) |
| 5800 | ± 50 / ± 100 | Head | 35.3 ± 5% | 5.27 ± 5% | 0.40 | 1.65 | 4.90 ± 13.1% (k=2) |
| 900 | ± 50 / ± 100 | Body | 55.0 ± 5% | 1.05 ± 5% | 0.66 | 0.68 | 10.87 ± 11.0% (k=2) |
| 1810 | ± 50 / ± 100 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.50 | 0.74 | 9.28 ± 11.0% (k=2) |
| 1950 | ± 50 / ± 100 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.45 | 0.78 | 9.17 ± 11.0% (k=2) |
| 2450 | ± 50 / ± 100 | Body | 52.7 ± 5% | 1.95 ± 5% | 0.44 | 0.80 | 8.18 ± 11.0% (k=2) |
| 2600 | ± 50 / ± 100 | Body | 52.5 ± 5% | 2.16 ± 5% | 0.47 | 0.76 | 8.14 ± 11.0% (k=2) |
| 3500 | ± 50 / ± 100 | Body | 51.3 ± 5% | 3.31 ± 5% | 0.30 | 1.20 | 7.36 ± 13.1% (k=2) |
| 5200 | ± 50 / ± 100 | Body | 49.0 ± 5% | 5.30 ± 5% | 0.40 | 1.70 | 4.89 ± 13.1% (k=2) |
| 5500 | ± 50 / ± 100 | Body | 48.6 ± 5% | 5.65 ± 5% | 0.40 | 1.70 | 4.39 ± 13.1% (k=2) |
| 5800 | ± 50 / ± 100 | Body | 48.2 ± 5% | 6.00 ± 5% | 0.40 | 1.70 | 4.44 ± 13.1% (k=2) |

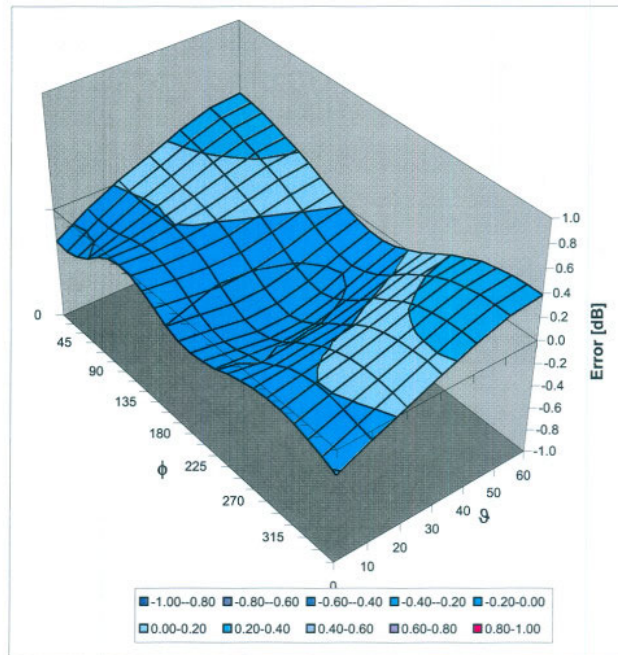
^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

EX3DV3 SN:3526

August 26, 2008

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



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

7. Uncertainty Analysis

| DASY4 Uncertainty Budget According to IEEE P1528 [1] | | | | | | | | |
|--|-------------------|-------------|------------|-----------------|------------------|-------------------|--------------------|------------------------|
| Error Description | Uncertainty value | Prob. Dist. | Div. | (c_i) 1g | (c_i) 10g | Std. Unc. (1g) | Std. Unc. (10g) | (v_i) v_{eff} |
| Measurement System | | | | | | | | |
| Probe Calibration | ±4.8 % | N | 1 | 1 | 1 | ±4.8 % | ±4.8 % | ∞ |
| Axial Isotropy | ±4.7 % | R | $\sqrt{3}$ | 0.7 | 0.7 | ±1.9 % | ±1.9 % | ∞ |
| Hemispherical Isotropy | ±9.6 % | R | $\sqrt{3}$ | 0.7 | 0.7 | ±3.9 % | ±3.9 % | ∞ |
| Boundary Effects | ±1.0 % | R | $\sqrt{3}$ | 1 | 1 | ±0.6 % | ±0.6 % | ∞ |
| Linearity | ±4.7 % | R | $\sqrt{3}$ | 1 | 1 | ±2.7 % | ±2.7 % | ∞ |
| System Detection Limits | ±1.0 % | R | $\sqrt{3}$ | 1 | 1 | ±0.6 % | ±0.6 % | ∞ |
| Readout Electronics | ±1.0 % | N | 1 | 1 | 1 | ±1.0 % | ±1.0 % | ∞ |
| Response Time | ±0.8 % | R | $\sqrt{3}$ | 1 | 1 | ±0.5 % | ±0.5 % | ∞ |
| Integration Time | ±2.6 % | R | $\sqrt{3}$ | 1 | 1 | ±1.5 % | ±1.5 % | ∞ |
| RF Ambient Conditions | ±3.0 % | R | $\sqrt{3}$ | 1 | 1 | ±1.7 % | ±1.7 % | ∞ |
| Probe Positioner | ±0.4 % | R | $\sqrt{3}$ | 1 | 1 | ±0.2 % | ±0.2 % | ∞ |
| Probe Positioning | ±2.9 % | R | $\sqrt{3}$ | 1 | 1 | ±1.7 % | ±1.7 % | ∞ |
| Max. SAR Eval. | ±1.0 % | R | $\sqrt{3}$ | 1 | 1 | ±0.6 % | ±0.6 % | ∞ |
| Test Sample Related | | | | | | | | |
| Device Positioning | ±2.9 % | N | 1 | 1 | 1 | ±2.9 % | ±2.9 % | 875 |
| Device Holder | ±3.6 % | N | 1 | 1 | 1 | ±3.6 % | ±3.6 % | 5 |
| Power Drift | ±5.0 % | R | $\sqrt{3}$ | 1 | 1 | ±2.9 % | ±2.9 % | ∞ |
| Phantom and Setup | | | | | | | | |
| Phantom Uncertainty | ±4.0 % | R | $\sqrt{3}$ | 1 | 1 | ±2.3 % | ±2.3 % | ∞ |
| Liquid Conductivity (target) | ±5.0 % | R | $\sqrt{3}$ | 0.64 | 0.43 | ±1.8 % | ±1.2 % | ∞ |
| Liquid Conductivity (meas.) | ±2.5 % | N | 1 | 0.64 | 0.43 | ±1.6 % | ±1.1 % | ∞ |
| Liquid Permittivity (target) | ±5.0 % | R | $\sqrt{3}$ | 0.6 | 0.49 | ±1.7 % | ±1.4 % | ∞ |
| Liquid Permittivity (meas.) | ±2.5 % | N | 1 | 0.6 | 0.49 | ±1.5 % | ±1.2 % | ∞ |
| Combined Std. Uncertainty | | | | | | ±10.3 % | ±10.0 % | 331 |
| Expanded STD Uncertainty | | | | | | ±20.6 % | ±20.1 % | |

8. Phantom description

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Certificate of Conformity / First Article Inspection

| | |
|--------------|--|
| Item | SAM Twin Phantom V4.0 |
| Type No | QD 000 P40 C |
| Series No | TP-1150 and higher |
| Manufacturer | SPEAG Zeughausstrasse 43 CH-8004 Zürich Switzerland |

Tests

The series production process used allows the limitation to test of first articles. Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

| Test | Requirement | Details | Units tested |
|-----------------------------|--|--|---|
| Dimensions | Compliant with the geometry according to the CAD model. | IT'IS CAD File (*) | First article, Samples |
| Material thickness of shell | Compliant with the requirements according to the standards | 2mm +/- 0.2mm in flat and specific areas of head section | First article, Samples, TP-1314 ff. |
| Material thickness at ERP | Compliant with the requirements according to the standards | 6mm +/- 0.2mm at ERP | First article, All items |
| Material parameters | Dielectric parameters for required frequencies | 300 MHz – 6 GHz: Relative permittivity < 5, Loss tangent < 0.05 | Material samples |
| Material resistivity | The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility. | DEGMBE based simulating liquids | Pre-series, First article, Material samples |
| Sagging | Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid. | < 1% typical < 0.8% if filled with 155mm of HSL900 and without DUT below | Prototypes, Sample testing |

Standards

- [1] CENELEC EN 50361
 - [2] IEEE Std 1528-2003
 - [3] IEC 62209 Part I
 - [4] FCC OET Bulletin 65, Supplement C, Edition 01-01
- (*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].

Date 07.07.2005

Signature / Stamp

s p e a g

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info@speag.com, http://www.speag.com

9. System Validation from Original equipment supplier

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



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

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

Accreditation No.: **SCS 108**

Client **SGS (Auden)**

Certificate No: **D835V2-4d063_Jun08**

CALIBRATION CERTIFICATE

Object: **D835V2 - SN: 4d063**

Calibration procedure(s): **QA CAL-05.v7
 Calibration procedure for dipole validation kits**

Calibration date: **June 06, 2008**

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 EPM-442A | GB37480704 | 04-Oct-07 (METAS, No. 217-00736) | Oct-08 |
| Power sensor HP 8481A | US37292783 | 04-Oct-07 (METAS, No. 217-00736) | Oct-08 |
| Reference 20 dB Attenuator | SN: 5086 (20g) | 07-Aug-07 (METAS, No. 217-00716) | Aug-08 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 08-Aug-07 (No. 217-00721) | Aug-08 |
| Reference Probe ES3DV2 | SN: 3025 | 28-Apr-08 (No. ES3-3025_Apr08) | Apr-09 |
| DAE4 | SN: 601 | 14-Mar-08 (No. DAE4-601_Mar08) | Mar-09 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (SPEAG, in house check Oct-07) | In house check: Oct-09 |
| RF generator R&S SMT-06 | 100005 | 04-Aug-99 (SPEAG, in house check Oct-07) | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (SPEAG, in house check Oct-07) | In house check: Oct-08 |

| | Name | Function | Signature |
|----------------|---------------|-----------------------|-----------|
| Calibrated by: | Jeton Kastrat | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: June 13, 2008

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

DASY4 Validation Report for Head TSL

Date/Time: 05.06.2008 14:11:53

Test Laboratory: SPEAG, Zurich, Switzerland

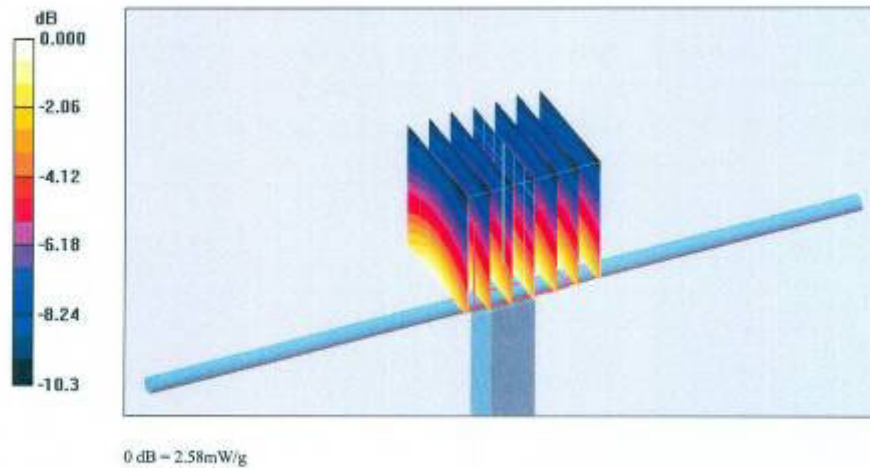
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL 900 MHz;
Medium parameters used: $f = 835$ MHz; $\sigma = 0.879$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.3 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 3.36 W/kg
SAR(1 g) = 2.29 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.58 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 06.06.2008 14:01:1

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

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

Medium: MSL900;

Medium parameters used: $f = 835$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.9, 5.9, 5.9); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

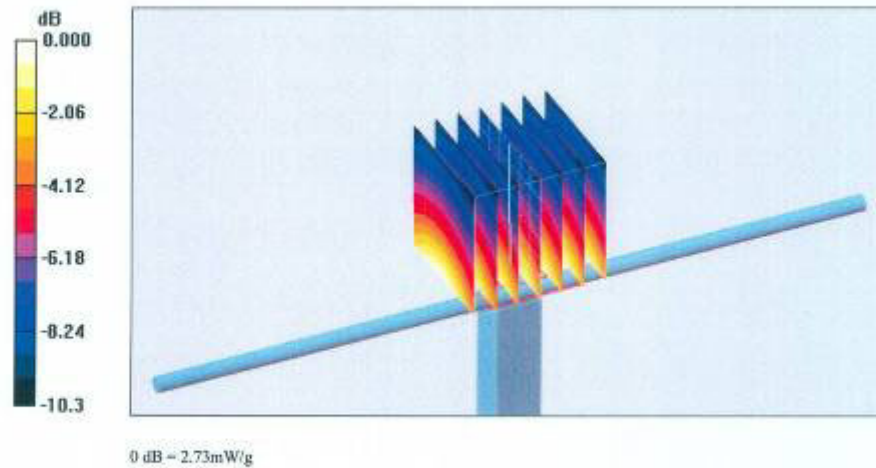
Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.6 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.61 mW/g

Maximum value of SAR (measured) = 2.73 mW/g



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

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

Accreditation No.: **SCS 108**

Client **SGS (Auden)**

Certificate No: **D1800V2-2d061_Apr08**

CALIBRATION CERTIFICATE

Object: **D1800V2 - SN: 2d061**

Calibration procedure(s): **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **April 15, 2008**

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 EPM-442A | GB37480704 | 04-Oct-07 (No. 217-00736) | Oct-08 |
| Power sensor HP 8481A | US37292783 | 04-Oct-07 (No. 217-00736) | Oct-08 |
| Reference 20 dB Attenuator | SN: 5086 (20g) | 07-Aug-07 (No. 217-00718) | Aug-08 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 08-Aug-07 (No. 217-00721) | Aug-08 |
| Reference Probe ES3DV2 | SN: 3025 | 01-Mar-08 (No. ES3-3025_Mar08) | Mar-09 |
| DAE4 | SN: 601 | 14-Mar-08 (No. DAE4-601_Mar08) | Mar-09 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (in house check Oct-07) | In house check: Oct-08 |
| RF generator R&S SMT-06 | 100005 | 4-Aug-99 (in house check Oct-07) | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-07) | In house check: Oct-08 |

Calibrated by: **Name: Marcel Fehr, Function: Laboratory Technician, Signature: [Signature]**

Approved by: **Name: Katja Pokovic, Function: Technical Manager, Signature: [Signature]**

Issued: April 16, 2008

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

DASY4 Validation Report for Head TSL

Date/Time: 08.04.2008 11:57:19

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: SN:2d061

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB;

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.96, 4.96, 4.96); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

**Pin = 250 mW; dip = 10 mm, scan at 3.4mm/Zoom Scan (dist=3.4mm, probe 0deg)
(7x7x7)/Cube 0:**

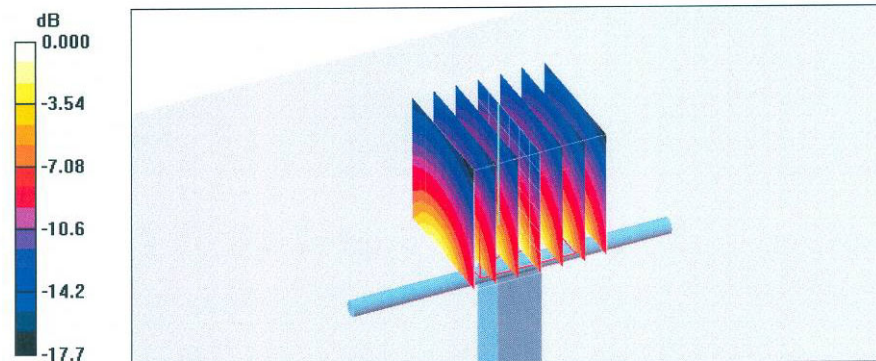
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.0 V/m; Power Drift = 0.040 dB

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 9.86 mW/g; SAR(10 g) = 5.14 mW/g

Maximum value of SAR (measured) = 11.7 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 15.04.2008 10:21:05

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: SN:2d061

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: MSL U10;

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 51.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.73, 4.73, 4.73); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

**Pin = 250 mW; dip = 10 mm, scan at 3.4mm/Zoom Scan (dist=3.4mm, probe 0deg)
(7x7x7)/Cube 0:**

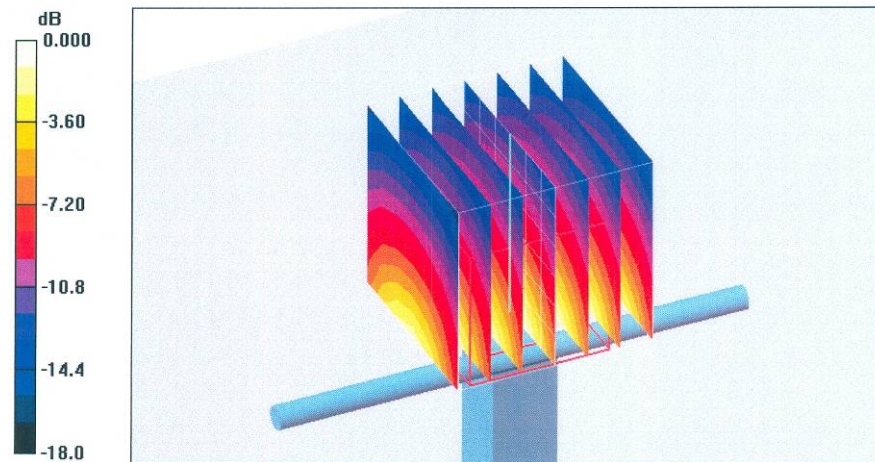
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.2 V/m; Power Drift = 0.005 dB

Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 9.87 mW/g; SAR(10 g) = 5.25 mW/g

Maximum value of SAR (measured) = 11.9 mW/g



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



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C Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **SGS (Auden)**

Certificate No: **D1900V2-5d027_Apr08**

CALIBRATION CERTIFICATE

Object: **D1900V2 - SN: 5d027**

Calibration procedure(s): **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **April 15, 2008**

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 EPM-442A | GB37480704 | 04-Oct-07 (No. 217-00736) | Oct-08 |
| Power sensor HP 8481A | US37292783 | 04-Oct-07 (No. 217-00736) | Oct-08 |
| Reference 20 dB Attenuator | SN: 5086 (20g) | 07-Aug-07 (No. 217-00718) | Aug-08 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 08-Aug-07 (No. 217-00721) | Aug-08 |
| Reference Probe ES3DV2 | SN: 3025 | 01-Mar-08 (No. ES3-3025_Mar08) | Mar-09 |
| DAE4 | SN: 601 | 14-Mar-08 (No. DAE4-601_Mar08) | Mar-09 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power sensor HP 8481A | MY41082317 | 18-Oct-02 (in house check Oct-07) | In house check: Oct-08 |
| RF generator R&S SMT-06 | 100005 | 4-Aug-99 (in house check Oct-07) | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-07) | In house check: Oct-08 |

| | | | |
|----------------|---------------|-----------------------|-----------|
| | Name | Function | Signature |
| Calibrated by: | Marcel Fehr | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: April 17, 2008

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

DASY4 Validation Report for Head TSL

Date/Time: 08.04.2008 13:49:58

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027

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

Medium: HSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; CorvF(4.9, 4.9, 4.9); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

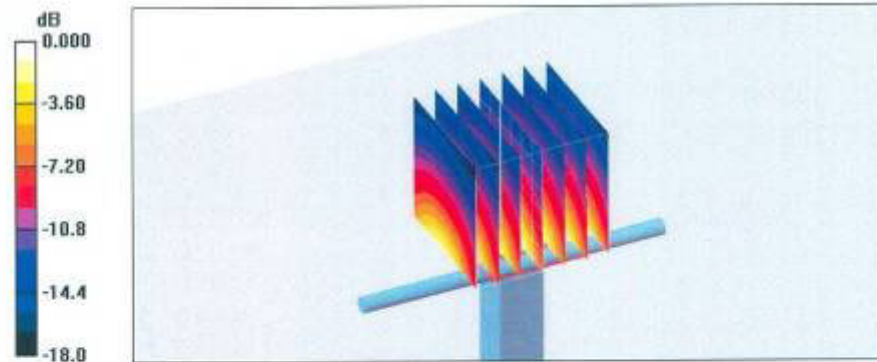
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.2 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 19.1 W/kg

SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.3 mW/g

Maximum value of SAR (measured) = 11.9 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 15.04.2008 13:51:25

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027

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

Medium: MSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.5, 4.5, 4.5); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

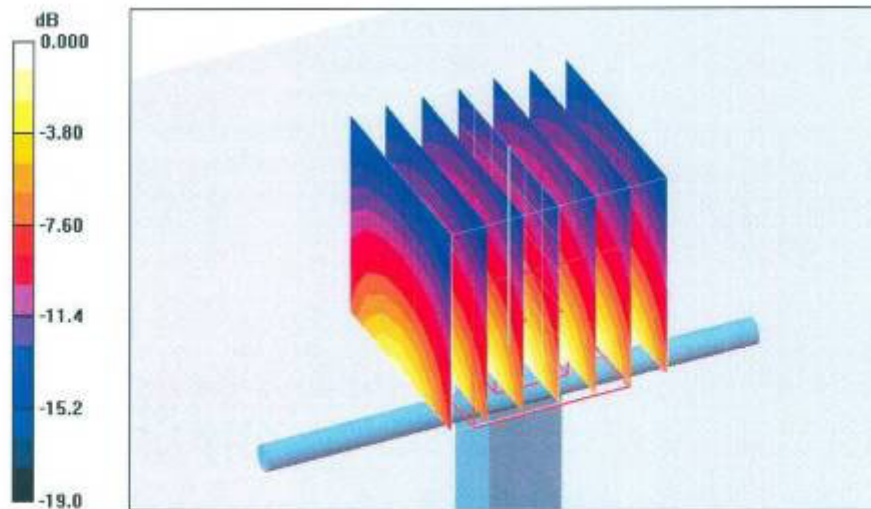
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.3 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 17.4 W/kg

SAR(1 g) = 9.64 mW/g; SAR(10 g) = 5.07 mW/g

Maximum value of SAR (measured) = 11.7 mW/g



0 dB = 11.7mW/g

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

Accreditation No.: **SCS 108**

Client **SGS (Auden)**

Certificate No: **D2450V2-727_Apr08**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 727**

Calibration procedure(s) **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **April 11, 2008**

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 (Certificate No.) | Scheduled Calibration |
|----------------------------|------------------|-----------------------------------|------------------------|
| Power meter EPM-442A | GB37480704 | 04-Oct-07 (No. 217-00736) | Oct-08 |
| Power sensor HP 8481A | US37292783 | 04-Oct-07 (No. 217-00736) | Oct-08 |
| Reference 20 dB Attenuator | SN: 5086 (20g) | 07-Aug-07 (No 217-00718) | Aug-08 |
| Reference Probe ES3DV2 | SN: 3025 | 01-Mar-08 (No. ES3-3025_Mar08) | Mar-09 |
| DAE4 | SN: 601 | 14-Mar-08 (No. DAE4-601_Mar08) | Mar-09 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (in house check Oct-07) | In house check: Oct-09 |
| RF generator R&S SMT-06 | 100005 | 4-Aug-99 (in house check Oct-07) | In house check: Oct-09 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-07) | In house check: Oct-08 |

| | Name | Function | Signature |
|----------------|---------------|-----------------------|-----------|
| Calibrated by: | Mike Meili | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: April 14, 2008

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

DASY4 Validation Report for Body TSL

Date/Time: 11.04.2008 15:23:03

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN727

Communication System: CW-2450; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U10;

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.07, 4.07, 4.07); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

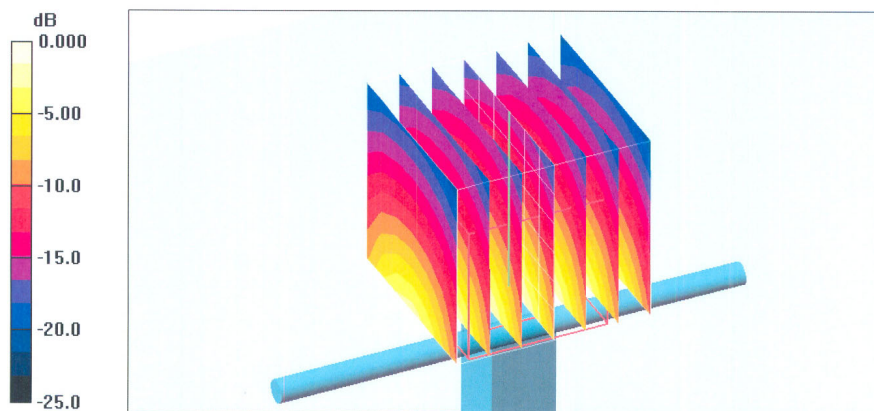
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.5 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 26.5 W/kg

SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.15 mW/g

Maximum value of SAR (measured) = 16.5 mW/g



0 dB = 16.5mW/g

End of 1st part of report