Date/Time: 10/15/04 10:43:56

Test Laboratory: A Test Lab Techno Corp.

**04-0615-S_ASUSTeK P505_Left Tilted_PCS CH661_20041015_**

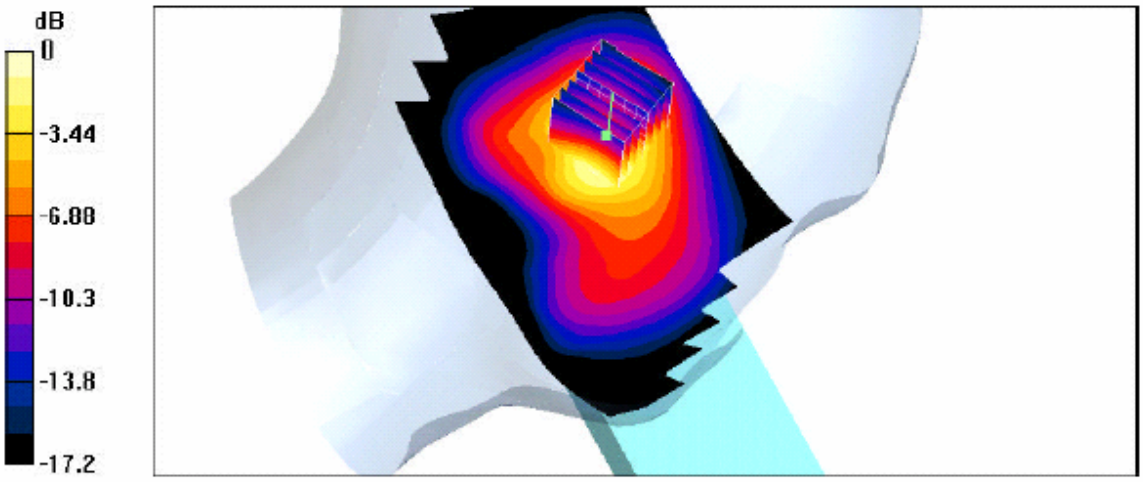
**DUT: ASUSTek P505; Type: GSM Three-Band PDA Phone; Serial: 353574000010402**

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Head 1900MHz Medium parameters used: f = 1880 MHz; s = 1.4 mho/m; $e_r$ = 40.5;
Conductivity=1000kg/m3;Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1530; ConvF(5.07, 5.07, 5.07); Calibrated: 9/1/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 1/8/2004
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

**Left Tilted/Area Scan (71x151x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.588 mW/g

**Left Tilted/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.5 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 0.883 W/kg
**SAR(1 g) = 0.533 mW/g; SAR(10 g) = 0.308 mW/g**
Maximum value of SAR (measured) = 0.581 mW/g




0 dB = 0.581mW/g

**Head-SAR Test Result for Left Tilted Position – Channel 661**

Date/Time: 10/15/04 11:11:40

Test Laboratory: A Test Lab Techno Corp.

**04-0615-S_ASUSTeK P505_Left Tilted_PCS CH810_20041015_**

**DUT: ASUSTek P505; Type: GSM Three-Band PDA Phone; Serial: 353574000010402**

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Head 1900MHz Medium parameters used (interpolated): f = 1909.8 MHz; s = 1.43 mho/m; $e_r$ = 40.4; Conductivity=1000kg/m3;Phantom section: Left Section

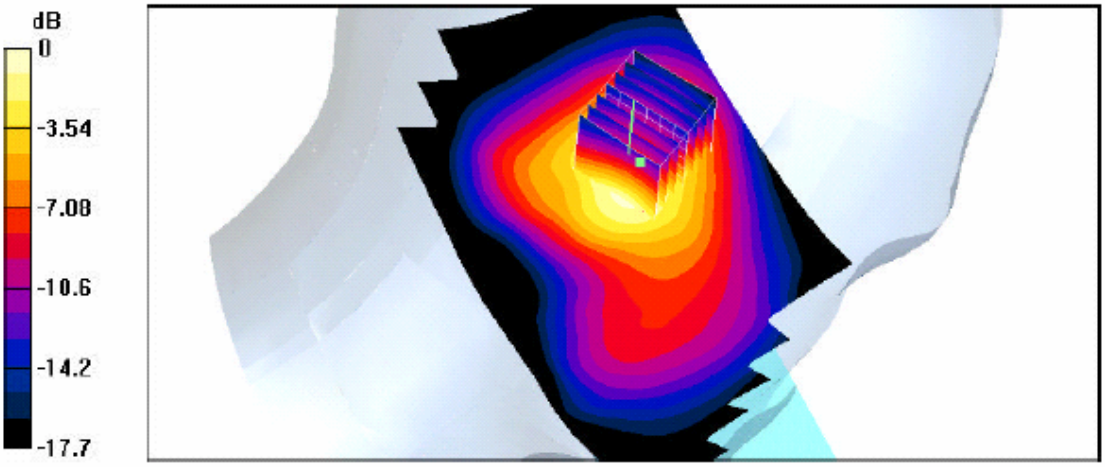
DASY4 Configuration:
- Probe: ET3DV6 - SN1530; ConvF(5.07, 5.07, 5.07); Calibrated: 9/1/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 1/8/2004
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

**Left Tilted/Area Scan (71x151x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.524 mW/g

**Left Tilted/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.8 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 0.784 W/kg
**SAR(1 g) = 0.470 mW/g; SAR(10 g) = 0.271 mW/g**

Maximum value of SAR (measured) = 0.512 mW/g




0 dB = 0.512mW/g

**Head-SAR Test Result for Left Tilted Position – Channel 810**

Date/Time: 10/18/04 09:48:13

Test Laboratory: A Test Lab Techno Corp.

**04-0615-S_ASUSTeK P505_Flat_PCS CH512_20041018_Earphone_**

**DUT: ASUSTek P505; Type: GSM Three-Band PDA Phone; Serial: 353574000010402**

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Body 1900MHz Medium parameters used (interpolated): f = 1850.2 MHz; s = 1.5 mho/m; $e_r$ = 53.1;
Conductivity=1000kg/$m^3$ ;Phantom section: Flat Section

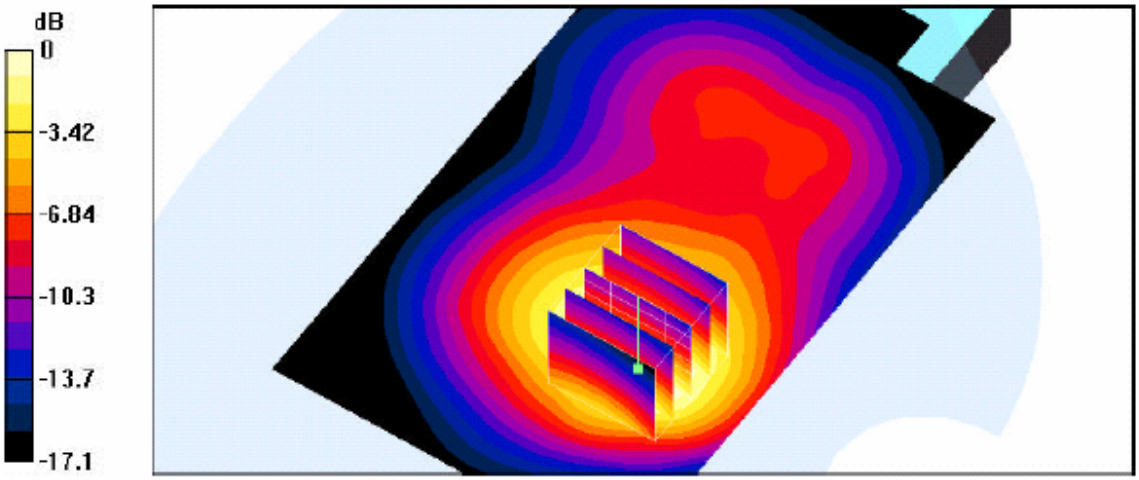
DASY4 Configuration:
- Probe: ET3DV6 - SN1530; ConvF(4.43, 4.43, 4.43); Calibrated: 9/1/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 1/8/2004
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

**Flat/Area Scan (71x151x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.581 mW/g

**Flat/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.8 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 0.793 W/kg
**SAR(1 g) = 0.501 mW/g; SAR(10 g) = 0.310 mW/g**

Maximum value of SAR (measured) = 0.533 mW/g




0 dB = 0.533mW/g

**Body-SAR Test Result for Flat Position – Channel 512**

Date/Time: 10/19/04 02:26:23

Test Laboratory: A Test Lab Techno Corp.

**04-0615-S_ASUSTeK P505_Flat_PCS CH661_20041019_Earphone_**

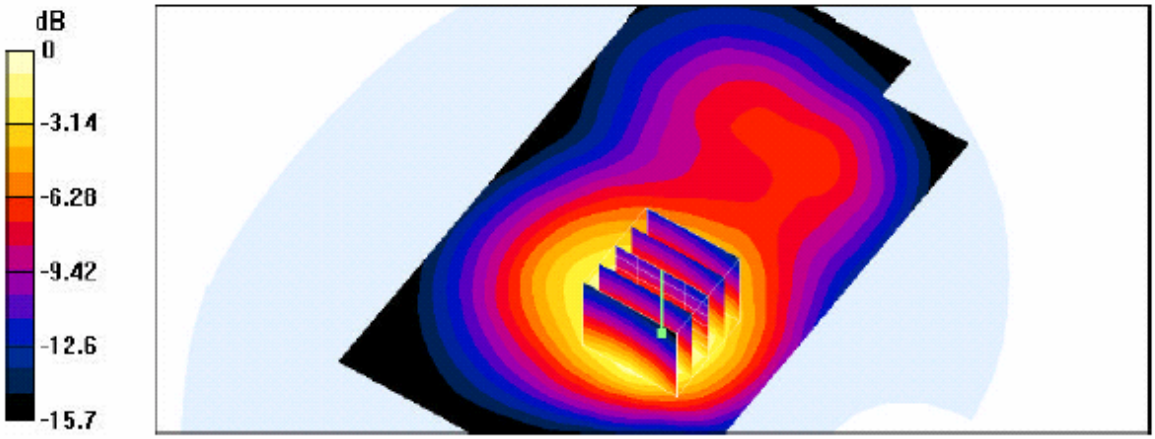
**DUT: ASUSTek P505; Type: GSM Three-Band PDA Phone; Serial: 353574000010402**

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Body 1900MHz Medium parameters used: f = 1880 MHz; s = 1.52 mho/m; $e_r$ = 53;
Conductivity=1000 kg/m3 ;Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1530; ConvF(4.43, 4.43, 4.43); Calibrated: 9/1/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 1/8/2004
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

**Flat/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.444 mW/g

**Flat/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.4 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 0.597 W/kg
**SAR(1 g) = 0.381 mW/g; SAR(10 g) = 0.238 mW/g**
Maximum value of SAR (measured) = 0.409 mW/g




0 dB = 0.409mW/g

**Body-SAR Test Result for Flat Position – Channel 661**

Date/Time: 10/18/04 11:06:52

Test Laboratory: A Test Lab Techno Corp.

**04-0615-S_ASUSTeK P505_Flat_PCS CH810_20041018_Earphone_**

**DUT: ASUSTek P505; Type: GSM Three-Band PDA Phone; Serial: 353574000010402**

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Body 1900MHz Medium parameters used (interpolated): f = 1909.8 MHz; s = 1.56 mho/m; $e_r$ = 53.1;
Conductivity=1000 kg/$m^3$ ;Phantom section: Flat Section

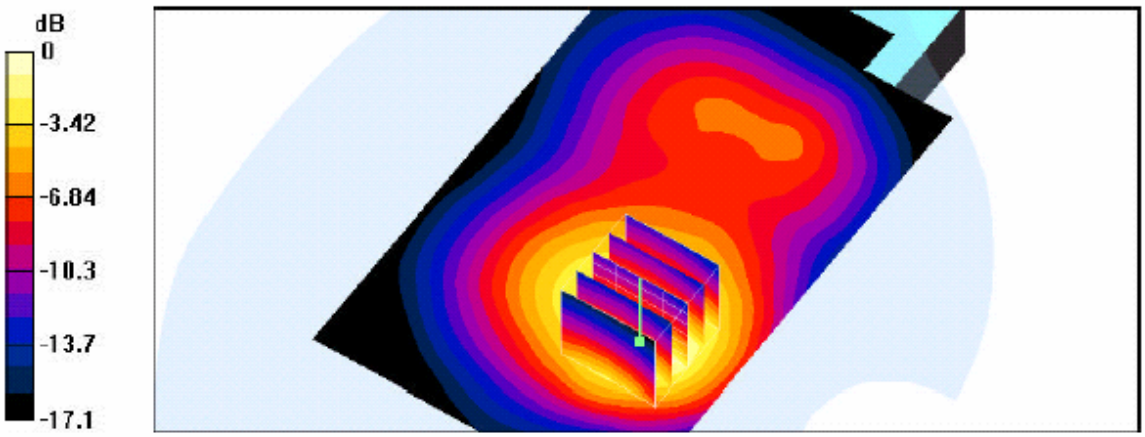
DASY4 Configuration:
- Probe: ET3DV6 - SN1530; ConvF(4.43, 4.43, 4.43); Calibrated: 9/1/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 1/8/2004
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

**Flat/Area Scan (71x151x1):** Measurement grid: dx=15mm, dy=15mm

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

**Flat/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.9 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 0.538 W/kg
**SAR(1 g) = 0.325 mW/g; SAR(10 g) = 0.195 mW/g**

Maximum value of SAR (measured) = 0.351 mW/g




0 dB = 0.351mW/g

**Body-SAR Test Result for Flat Position – Channel 810**

Date/Time: 10/18/04 11:48:23

Test Laboratory: A Test Lab Techno Corp.

**04-0615-S_ASUSTeK P505_Flat_PCS CH512_20041018_GPRS_Earphone_**

**DUT: ASUSTek P505; Type: GSM Three-Band PDA Phone; Serial: 353574000010402**

Communication System: PCS 1900 GPRS(2Down,2Up); Frequency: 1850.2 MHz;Duty Cycle: 1:4.2
Medium: Body 1900MHz Medium parameters used (interpolated): f = 1850.2 MHz; s = 1.5 mho/m; $e_r$ = 53.1;
Conductivity=1000kg/$m^3$ ;Phantom section: Flat Section

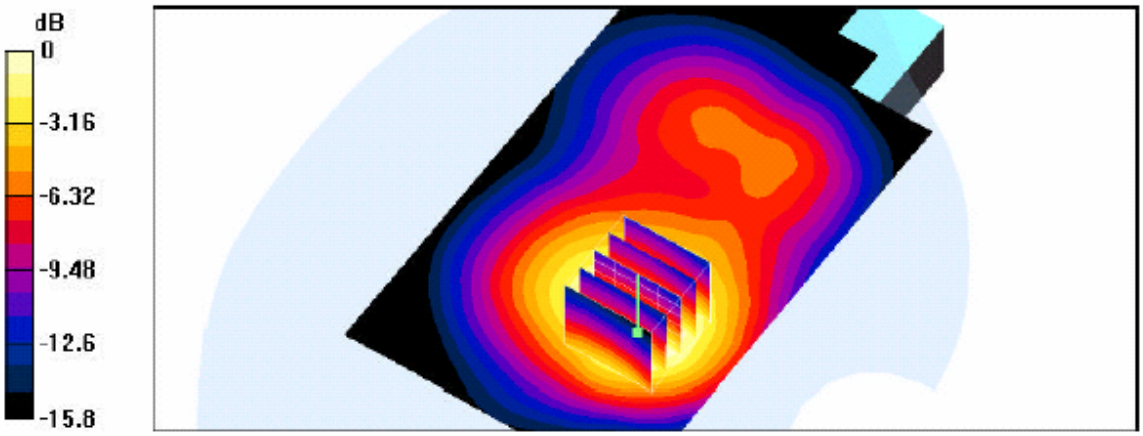
DASY4 Configuration:
- Probe: ET3DV6 - SN1530; ConvF(4.43, 4.43, 4.43); Calibrated: 9/1/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 1/8/2004
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

**Flat/Area Scan (71x151x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.819 mW/g

**Flat/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 44.3 V/m; Power Drift = -0.2 dB
Peak SAR (extrapolated) = 1.1 W/kg
**SAR(1 g) = 0.703 mW/g; SAR(10 g) = 0.440 mW/g**

Maximum value of SAR (measured) = 0.740 mW/g




0 dB = 0.740mW/g

**Body-GPRS SAR Test Result for Flat Position – Channel 512**

Date/Time: 10/19/04 02:26:23

Test Laboratory: A Test Lab Techno Corp.

**04-0615-S_ASUSTeK P505_Flat_PCS CH661_20041019_GPRS_Earphone_**

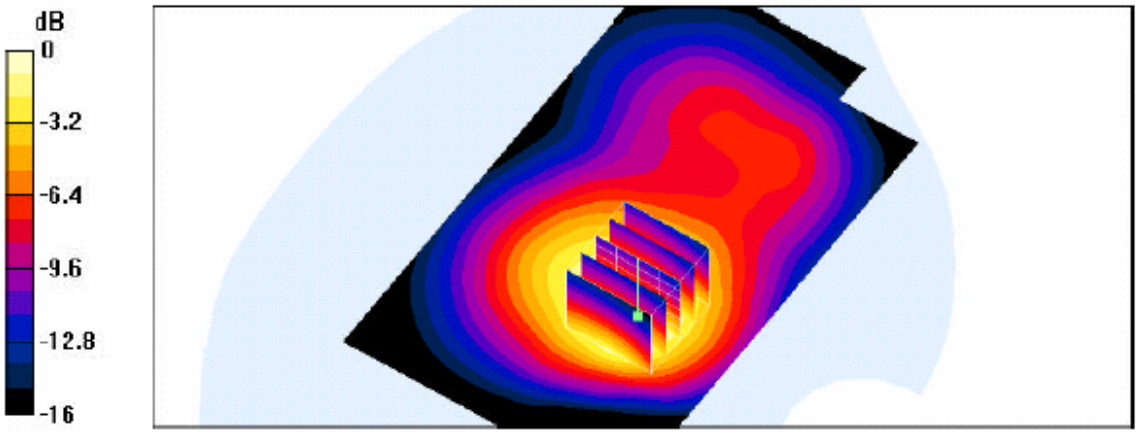
**DUT: ASUSTek P505; Type: GSM Three-Band PDA Phone; Serial: 353574000010402**

Communication System: PCS 1900 GPRS(2Down,2Up); Frequency: 1880 MHz;Duty Cycle: 1:4.2
Medium: Body 1900MHz Medium parameters used: f = 1880 MHz; s = 1.52 mho/m; $e_r$ = 53;
Conductivity=1000 kg/m3 ;Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1530; ConvF(4.43, 4.43, 4.43); Calibrated: 9/1/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 1/8/2004
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

**Flat/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.793 mW/g

**Flat/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 43.9 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 1.13 W/kg
**SAR(1 g) = 0.686 mW/g; SAR(10 g) = 0.419 mW/g**
Maximum value of SAR (measured) = 0.741 mW/g




0 dB = 0.741mW/g

**Body-GPRS SAR Test Result for Flat Position – Channel 661**

Date/Time: 10/19/04 02:26:23

Test Laboratory: A Test Lab Techno Corp.

**04-0615-S_ASUSTeK P505_Flat_PCS CH810_20041019_GPRS_Earphone_**

**DUT: ASUSTek P505; Type: GSM Three-Band PDA Phone; Serial: 353574000010402**

Communication System: PCS 1900 GPRS(2Down,2Up); Frequency: 1909.8 MHz;Duty Cycle: 1:4.2
Medium: Body 1900MHz Medium parameters used (interpolated): f = 1909.8 MHz; s = 1.56 mho/m; $e_r$ = 53.1;
Conductivity=1000 kg/$m^3$ ;Phantom section: Flat Section

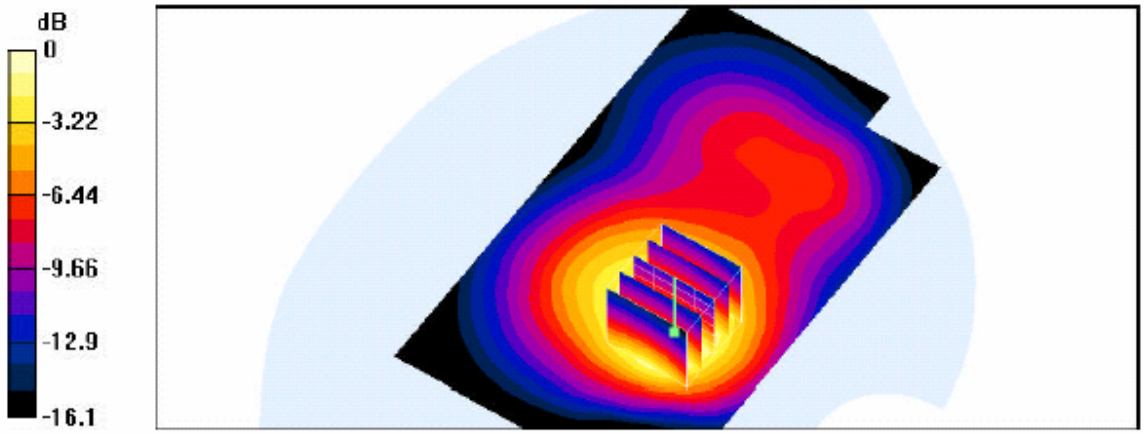
DASY4 Configuration:
- Probe: ET3DV6 - SN1530; ConvF(4.43, 4.43, 4.43); Calibrated: 9/1/2004
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 1/8/2004
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

**Flat/Area Scan (71x121x1):** Measurement grid: dx=15mm, dy=15mm

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

**Flat/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.8 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 0.838 W/kg
**SAR(1 g) = 0.518 mW/g; SAR(10 g) = 0.315 mW/g**

Maximum value of SAR (measured) = 0.558 mW/g




0 dB = 0.558mW/g

**Body-GPRS SAR Test Result for Flat Position – Channel 810**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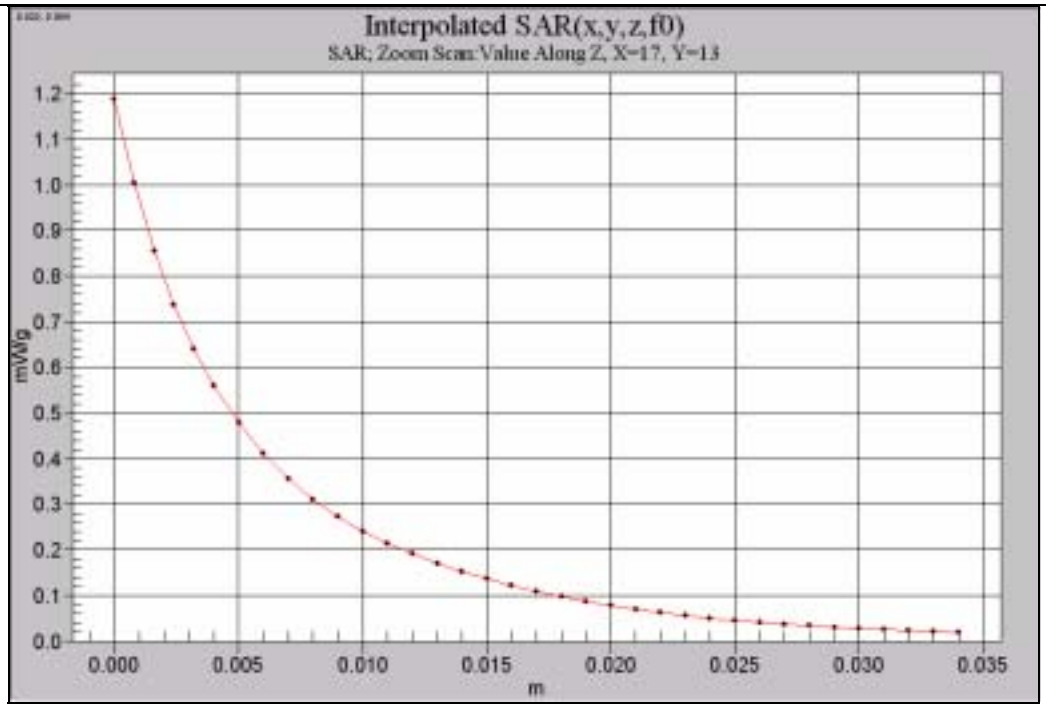
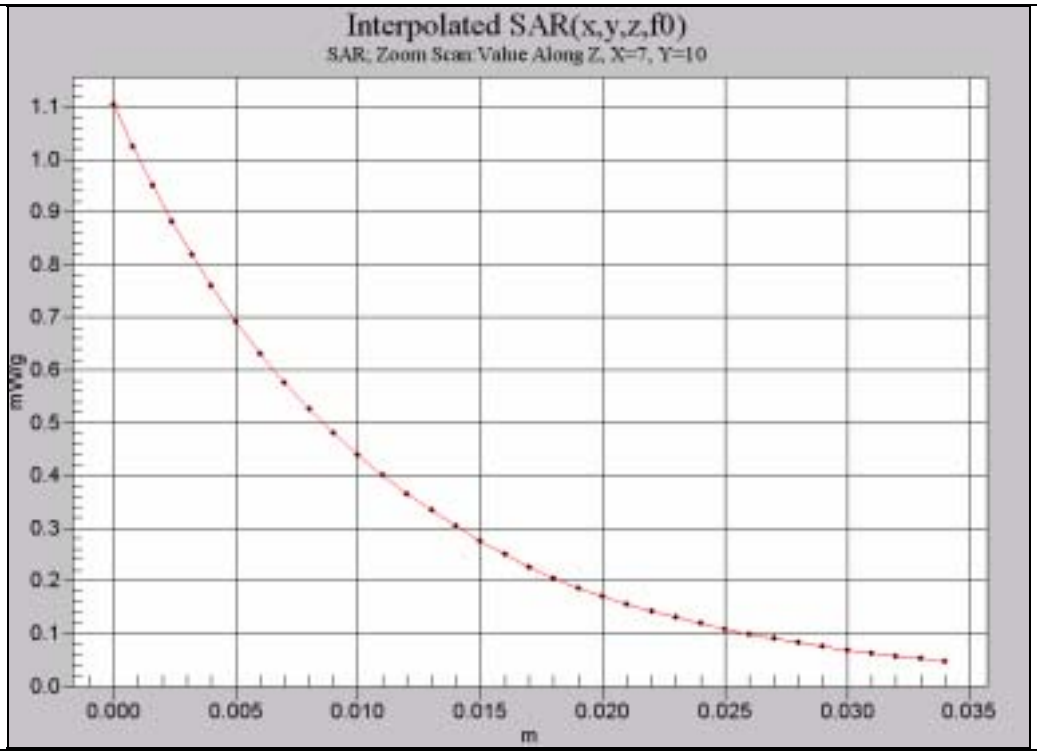
## *Z-axis Plot for Maximum SAR*




**Head-SAR Test Result for Right Cheek Position – Channel 661**

**Body-SAR Test Result for Flat Position – Channel 512**




**Body-GPRS SAR Test Result for Flat Position – Channel 661**

## *Appendix C – Dipole Calibration*

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

Client Auden

### CALIBRATION CERTIFICATE

| | |
|---|---|
| Object(s) | D900V2 - SN:172 |
| Calibration procedure(s) | QA CAL-05.v2<br>Calibration procedure for dipole validation kits |
| Calibration date: | January 13, 2004 |
| Condition of the calibrated item | In Tolerance (according to the specific calibration document) |

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM E442 | GB37480704 | 6-Nov-03 (METAS, No. 252-0254) | Nov-04 |
| Power sensor HP 8481A | US37292783 | 6-Nov-03 (METAS, No. 252-0254) | Nov-04 |
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (Agilent, No. 20021018) | Oct-04 |
| RF generator R&S SML-03 | 100698 | 27-Mar-2002 (R&S, No. 20-92389) | In house check: Mar-05 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (SPEAG, in house check Nov-03) | In house check: Oct 05 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Judith Mueller | Technician | |
| Approved by: | Katja Pokovic | Laboratory Director | |

Date issued: January 19, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

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880-KP0301061-A

Page 1 (1)

Schmid & Partner Engineering AG

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Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

# DASY

## Dipole Validation Kit

## Type: D900V2

## Serial: 172

Manufactured: September 23, 2002
Calibrated: January 13, 2004

## 1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **head simulating solution** of the following electrical parameters at 900 MHz:

| | | |
|---|---|---|
| Relative Dielectricity | **40.3** | ± 5% |
| Conductivity | **0.94 mho/m** | ± 5% |

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.6 at 900 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole center to the solution surface. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

## 2. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 1. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

| | |
|---|---|
| averaged over 1 $cm^3$ (1 g) of tissue: | **10.3 mW/g** ± 16.8 % (k=2)[1] |
| averaged over 10 $cm^3$ (10 g) of tissue: | **6.68 mW/g** ± 16.2 % (k=2)[1] |

[1] validation uncertainty

## 3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

| | | |
|---|---|---|
| Electrical delay: | **1.399 ns** | (one direction) |
| Transmission factor: | **0.987** | (voltage transmission, one direction) |

The dipole was positioned at the flat phantom sections according to section 1 and the distance spacer was in place during impedance measurements.

| | |
|---|---|
| Feedpoint impedance at 900 MHz: | Re{Z} = **51.0 Ω** |
| | Im {Z} = **-4.3 Ω** |
| Return Loss at 900 MHz | **-27.1 dB** |

## 4. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **body simulating solution** of the following electrical parameters at 900 MHz:

| | | |
|---|---|---|
| Relative Dielectricity | **54.4** | ± 5% |
| Conductivity | **1.04 mho/m** | ± 5% |

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.3 at 900 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole center to the solution surface. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

## 5. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 4. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

| | |
|---|---|
| averaged over 1 $cm^3$ (1 g) of tissue: | **10.8 mW/g** ± 16.8 % (k=2)[2] |
| averaged over 10 $cm^3$ (10 g) of tissue: | **7.00 mW/g** ± 16.2 % (k=2)[2] |

## 6. Dipole Impedance and Return Loss

The dipole was positioned at the flat phantom sections according to section 4 and the distance spacer was in place during impedance measurements.

| | |
|---|---|
| Feedpoint impedance at 900 MHz: | Re{Z} = **46.1 Ω** |
| | Im {Z} = **-6.4 Ω** |
| Return Loss at 900 MHz | **-22.2 dB** |

## 7. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

## 8. Design

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.

## 9. Power Test

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

[2] validation uncertainty

Date/Time: 01/13/04 15:34:21

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN172**

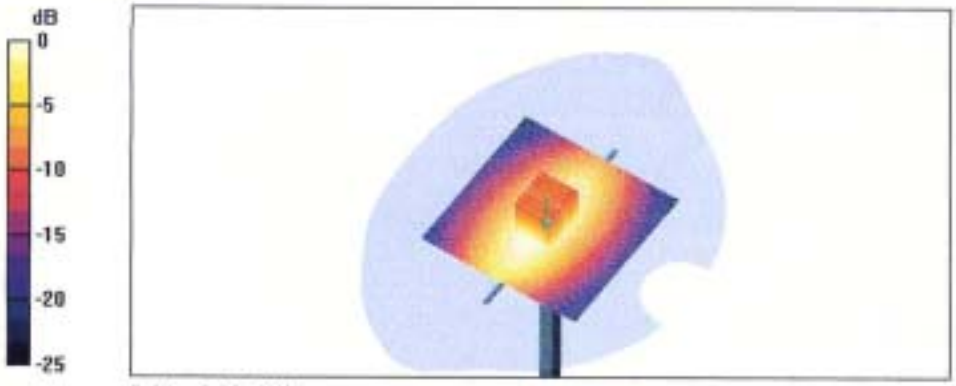
Communication System: CW-900; Frequency: 900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; $\sigma$ = 0.94 mho/m; $\varepsilon_r$ = 40.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

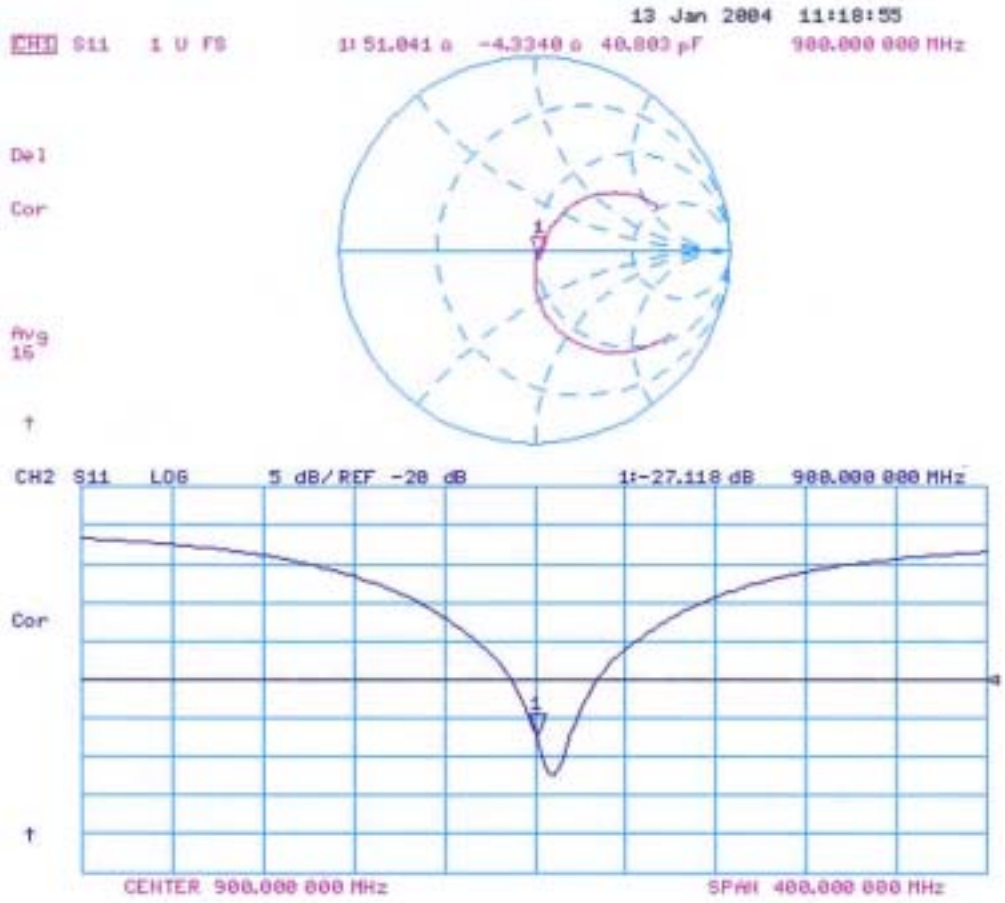
- Probe: ET3DV6 - SN1507; ConvF(6.6, 6.6, 6.6); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

**Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm
Reference Value = 56.5 V/m
Power Drift = 0.002 dB
Maximum value of SAR = 2.8 mW/g

**Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 3.86 W/kg
**SAR(1 g) = 2.58 mW/g; SAR(10 g) = 1.67 mW/g**
Reference Value = 56.5 V/m
Power Drift = 0.002 dB
Maximum value of SAR = 2.79 mW/g




0 dB = 2.79mW/g


13 Jan 2004 11:18:55
CH1 S11 1 U FS
1: 51.041 Ω -4.3340 Ω 40.803 pF
900.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 5 dB/ REF -20 dB
1:-27.118 dB 900.000 000 MHz
Cor
CENTER 900.000 000 MHz
SPAN 400.000 000 MHz

Page 1 of 1

Date/Time: 01/12/04 15:05:23

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN172**

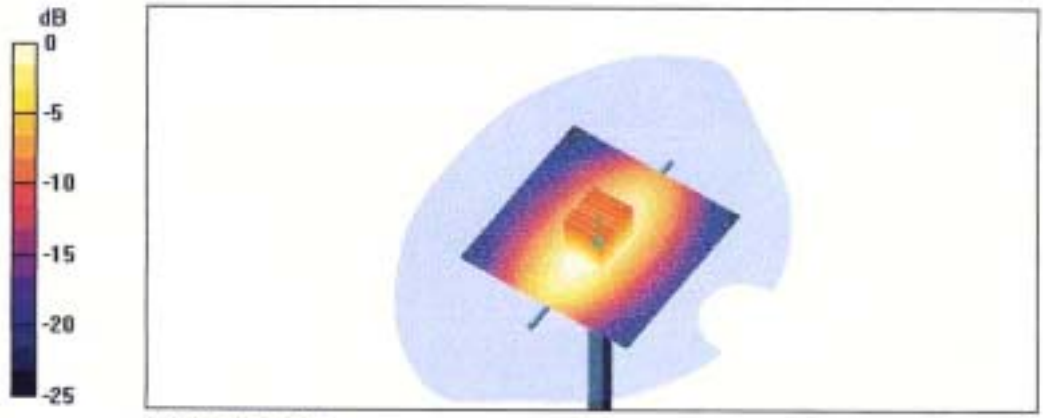
Communication System: CW-900; Frequency: 900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; $\sigma$ = 1.04 mho/m; $\varepsilon_r$ = 54.4; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

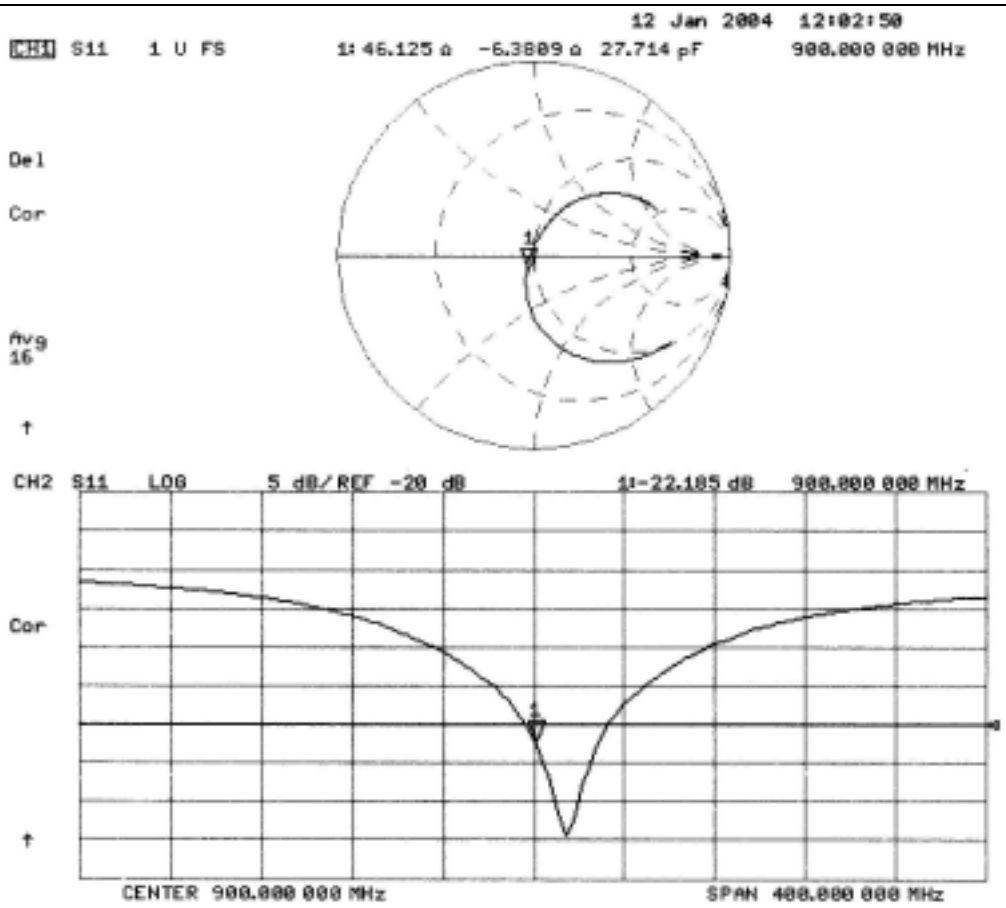
- Probe: ET3DV6 - SN1507; ConvF(6.3, 6.3, 6.3); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

**Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm
Reference Value = 55 V/m
Power Drift = 0.0 dB
Maximum value of SAR = 2.89 mW/g

**Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 4.01 W/kg
**SAR(1 g) = 2.7 mW/g; SAR(10 g) = 1.75 mW/g**
Reference Value = 55 V/m
Power Drift = 0.0 dB
Maximum value of SAR = 2.93 mW/g




0 dB = 2.93mW/g


12 Jan 2004 12:02:50
CH1 S11 1 U FS
1: 46.125 Ω -6.3809 Ω 27.714 pF 900.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 5 dB/ REF -20 dB 1:-22.185 dB 900.000 000 MHz
Cor
CENTER 900.000 000 MHz
SPAN 400.000 000 MHz

AEL 035

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

**Client** **Auden**

## CALIBRATION CERTIFICATE

| | |
|---|---|
| Object(s) | D1800V2 - SN:2d057 |
| Calibration procedure(s) | QA CAL-05.v2<br>Calibration procedure for dipole validation kits |
| Calibration date: | February 9, 2004 |
| Condition of the calibrated item | In Tolerance (according to the specific calibration document) |

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM E442 | GB37480704 | 6-Nov-03 (METAS, No. 252-0254) | Nov-04 |
| Power sensor HP 8481A | US37292783 | 6-Nov-03 (METAS, No. 252-0254) | Nov-04 |
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (Agilent, No. 20021018) | Oct-04 |
| RF generator R&S SML-03 | 100698 | 27-Mar-2002 (R&S, No. 20-92389) | In house check: Mar-05 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (SPEAG, in house check Nov-03) | In house check: Oct 05 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Judith Mueller | Technician | |
| Approved by: | Katja Pokovic | Laboratory Director | |

Date issued: February 18, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

合格
93.2.09
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專用章

880-KP0301061-A

Page 1 (1)

Schmid & Partner Engineering AG

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# DASY

## Dipole Validation Kit

## Type: D1800V2

## Serial: 2d057

Manufactured: Octobre 16, 2002
Calibrated: February 9, 2004

## 1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **head simulating solution** of the following electrical parameters at 1800 MHz:

| | | |
|---|---|---|
| Relative Dielectricity | **39.2** | ± 5% |
| Conductivity | **1.37 mho/m** | ± 5% |

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 5.08 at 1800 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

## 2. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 1. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

| | |
|---|---|
| averaged over 1 $cm^3$ (1 g) of tissue: | **39.6 mW/g** ± 16.8 % (k=2)[1] |
| averaged over 10 $cm^3$ (10 g) of tissue: | **21.1 mW/g** ± 16.2 % (k=2)[1] |

[1] validation uncertainty

## 3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

| | | |
|---|---|---|
| Electrical delay: | **1.201 ns** | (one direction) |
| Transmission factor: | **0.997** | (voltage transmission, one direction) |

The dipole was positioned at the flat phantom sections according to section 1 and the distance spacer was in place during impedance measurements.

| | |
|---|---|
| Feedpoint impedance at 1800 MHz: | Re{Z} = **48.9 Ω** |
| | Im {Z} = **-5.0 Ω** |
| Return Loss at 1800 MHz | **-25.8 dB** |

## 4. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **body simulating solution** of the following electrical parameters at 1800 MHz:

| | | |
|---|---|---|
| Relative Dielectricity | **53.0** | ± 5% |
| Conductivity | **1.49 mho/m** | ± 5% |

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 4.61 at 1800 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250 mW ± 3 %. The results are normalized to 1W input power.

## 5. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 4. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

| | |
|---|---|
| averaged over 1 $cm^3$ (1 g) of tissue: | **39.8 mW/g** ± 16.8 % (k=2)[2] |
| averaged over 10 $cm^3$ (10 g) of tissue: | **21.6 mW/g** ± 16.2 % (k=2)[2] |

## 6. Dipole Impedance and Return Loss

The dipole was positioned at the flat phantom sections according to section 4 and the distance spacer was in place during impedance measurements.

| | |
|---|---|
| Feedpoint impedance at 1800 MHz: | Re{Z} = **44.8 Ω** |
| | Im {Z} = **-3.9 Ω** |
| Return Loss at 1800 MHz | **-23.2 dB** |

## 7. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

## 8. Design

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.

## 9. Power Test

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

[2] validation uncertainty

Page 1 of 1

Date/Time: 02/05/04 14:15:32

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN2d057**

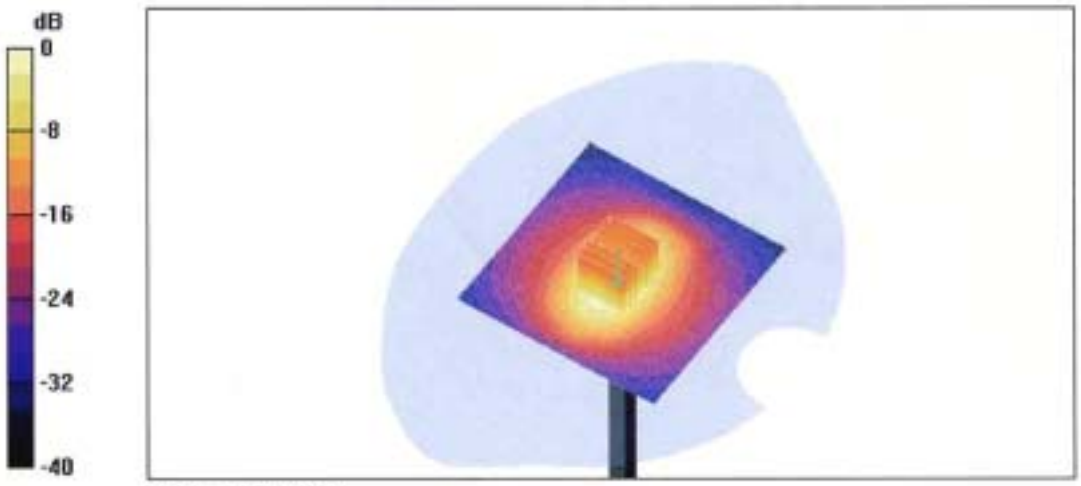
Communication System: CW-1800; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: HSL 1800 MHz
Medium parameters used: f = 1800 MHz; $\sigma$ = 1.37 mho/m; $\varepsilon_r$ = 39.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

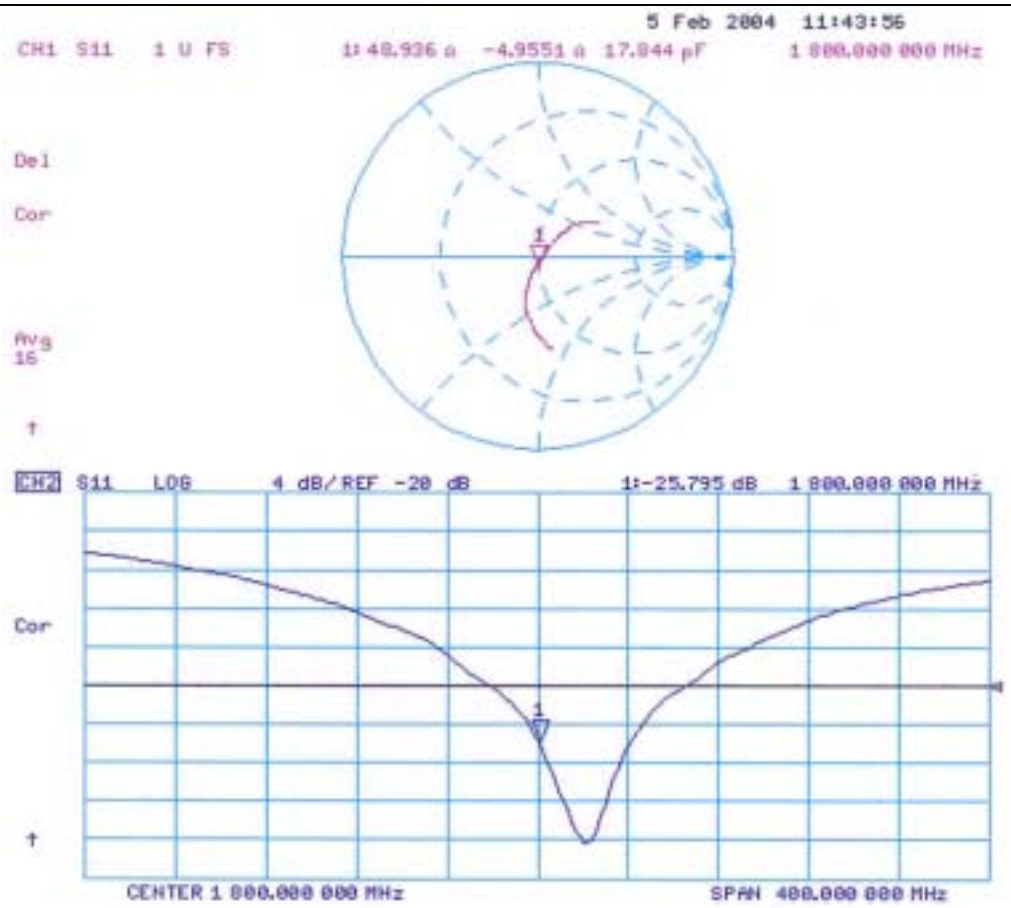
- Probe: ET3DV6 - SN1507; ConvF(5.08, 5.08, 5.08); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn411; Calibrated: 11/6/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.2 Build 25; Postprocessing SW: SEMCAD, V1.8 Build 93

**Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm
Reference Value = 93.5 V/m
Power Drift = 0.0 dB
Maximum value of SAR = 11.2 mW/g

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 17.6 W/kg
**SAR(1 g) = 9.9 mW/g; SAR(10 g) = 5.27 mW/g**
Reference Value = 93.5 V/m
Power Drift = 0.0 dB
Maximum value of SAR = 11.2 mW/g




0 dB = 11.2mW/g


5 Feb 2004 11:43:56
CH1 S11 1 U FS
1: 48.936 Ω -4.9551 Ω 17.844 pF 1 800.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 4 dB/ REF -20 dB 1:-25.795 dB 1 800.000 000 MHz
Cor
CENTER 1 800.000 000 MHz
SPAN 400.000 000 MHz

Page 1 of 1

Date/Time: 02/09/04 13:04:47

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN2d057**

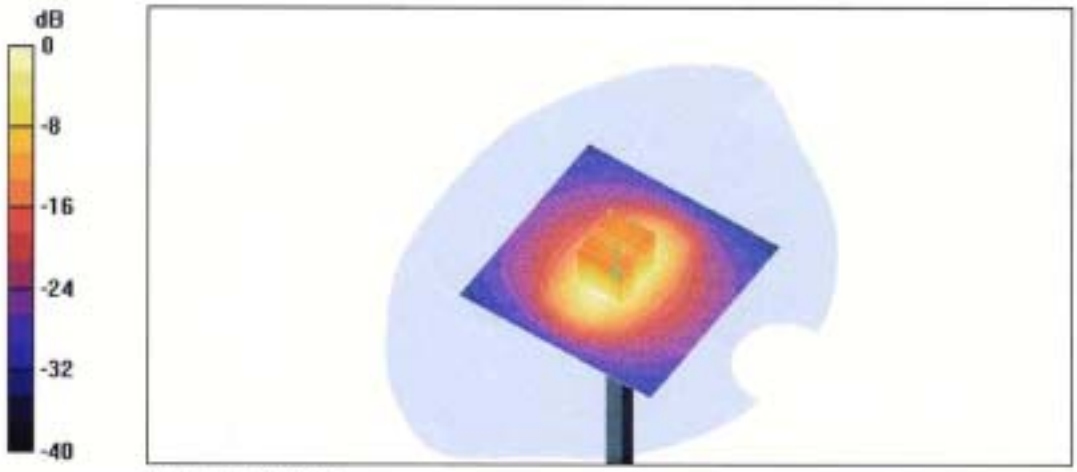
Communication System: CW-1800; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: Muscle 1800 MHz;
Medium parameters used: f = 1800 MHz; $\sigma$ = 1.49 mho/m; $\varepsilon_r$ = 53; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

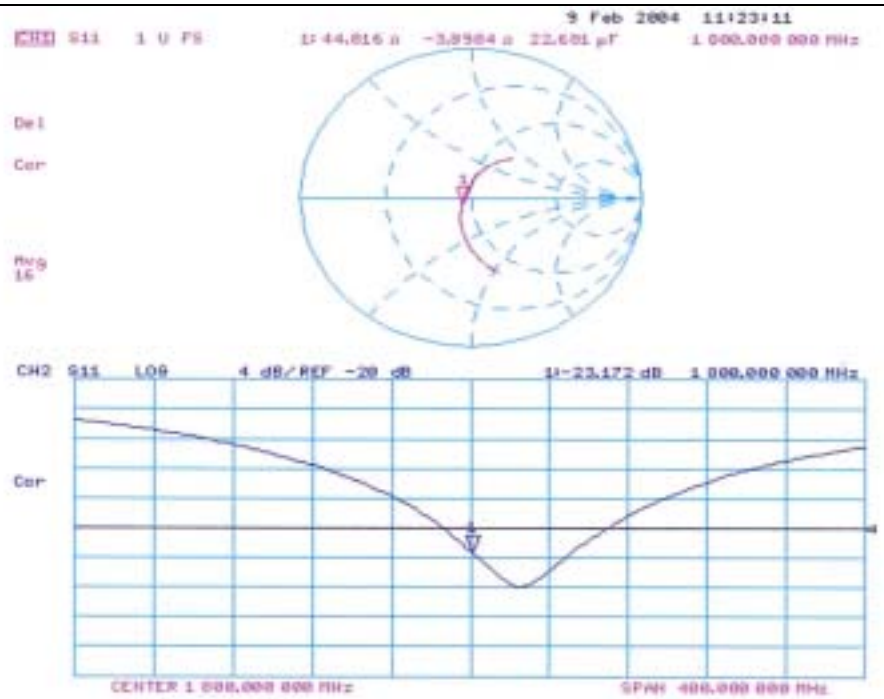
- Probe: ET3DV6 - SN1507; ConvF(4.61, 4.61, 4.61); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 11/6/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006;
- Measurement SW: DASY4, V4.2 Build 25; Postprocessing SW: SEMCAD, V1.8 Build 101

**Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm
Reference Value = 93.4 V/m; Power Drift = -0.002 dB
Maximum value of SAR (interpolated) = 11.2 mW/g

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.4 V/m; Power Drift = -0.002 dB
Maximum value of SAR (measured) = 11.2 mW/g
Peak SAR (extrapolated) = 16.6 W/kg
**SAR(1 g) = 9.95 mW/g; SAR(10 g) = 5.39 mW/g**




0 dB = 11.2mW/g


9 Feb 2004 11:23:11
S11 1 U FS
1: 44.016 Ω -3.8984 Ω 22.601 pF 1 000.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG 4 dB/ REF -20 dB 1:-23.172 dB 1 000.000 000 MHz
Cor
CENTER 1 000.000 000 MHz
SPAN 400.000 000 MHz

## *Appendix D – Probe Calibration*

Schmid & Partner Engineering AG

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# IMPORTANT NOTICE

## USAGE OF PROBES IN ORGANIC SOLVENTS

Diethylene Gycol Monobuthy Ether (the basis for liquids above 1 GHz), as many other organic solvents, is a very effective softener for synthetic materials. These solvents can cause irreparable damage to certain SPEAG products, except those which are explicitly declared as compliant with organic solvents.

**Compatible Probes:**
- ET3DV6
- ET3DV6R
- ES3DVx
- ER3DV6
- H3DV6

**Important Note for ET3DV6 Probes:**
**The ET3DV6 probes shall not be exposed to solvents longer than necessary for the measurements and shall be cleaned daily after use with warm water and stored dry.**

s p e a g

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Technical Note 01.06.15-1 June 2002

Schmid & Partner Engineering AG

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# IMPORTANT NOTICE

## UNCERTAINTY OF THE PROBE CONVERSION FACTOR

**Important Note:**

**The Swiss accreditation body (METAS) has requested an additional uncertainty for narrow bandwidth probe calibration compared to the uncertainty table of IEEE/IEC defined for a single frequency. SPEAG and the IT'IS foundation are currently investigating the most appropriate method for narrow and broadband uncertainty assessment.**

**A preliminary uncertainty value for the indicated frequency bandwidth is included in the attached probe calibration document.**

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Schmid & Partner Engineering AG

January 2004

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

**Client** Auden

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object(s) | ET3DV6 - SN:1530 |
| Calibration procedure(s) | QA CAL-01.v2<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | September1, 2004 |
| Condition of the calibrated item | In Tolerance (according to the specific calibration document) |

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 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM E4419B | GB41293874 | 5-May-04 (METAS, No 251-00388) | May-05 |
| Power sensor E4412A | MY41495277 | 5-May-04 (METAS, No 251-00388) | May-05 |
| Reference 20 dB Attenuator | SN: 5086 (20b) | 3-May-04 (METAS, No 251-00389) | May-05 |
| Fluke Process Calibrator Type 702 | SN: 6295803 | 8-Sep-03 (Sintrel SCS No. E030020) | Sep-04 |
| Power sensor HP 8481A | MY41092180 | 18-Sep-02 (SPEAG, in house check Oct03) | In house check: Oct 05 |
| RF generator HP 8684C | US3642U01700 | 4-Aug-99 (SPEAG, in house check Aug02) | In house check: Aug05 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (SPEAG, in house check Oct03) | In house check: Oct 05 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Nico Vetterli | Technician | N.Vetterli |
| Approved by: | Katja Pokovic | Laboratory Director | |

Date issued September1, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

880-KP0301061-A Page 1 of 8

# Probe ET3DV6

## SN:1530

| | |
|---|---|
| Manufactured: | July 15, 2000 |
| Last calibrated: | May 3, 2002 |
| Recalibrated: | September 1, 2004 |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Page 2 of 8

**ET3DV6 SN:1530** **September 1, 2004**

# DASY - Parameters of Probe: ET3DV6 SN:1530

## Sensitivity in Free Space

| | | | | | |
|---|---|---|---|---|---|
| NormX | 1.44 µV/(V/m)$^2$ | Diode Compression[A] | DCP X | 95 | mV |
| NormY | 1.47 µV/(V/m)$^2$ | | DCP Y | 95 | mV |
| NormZ | 1.45 µV/(V/m)$^2$ | | DCP Z | 95 | mV |

## Sensitivity in Tissue Simulating Liquid (Conversion Factors)

**Please see Page 7.**

## Boundary Effect

**Head** **900 MHz** **Typical SAR gradient: 5 % per mm**

| Sensor Center to Phantom Surface Distance | | 3.7 mm | 4.7 mm |
|---|---|---|---|
| $SAR_{be}$ [%] | Without Correction Algorithm | 9.9 | 5.3 |
| $SAR_{be}$ [%] | With Correction Algorithm | 0.1 | 0.3 |

**Head** **1800 MHz** **Typical SAR gradient: 10 % per mm**

| Sensor Center to Phantom Surface Distance | | 3.7 mm | 4.7 mm |
|---|---|---|---|
| $SAR_{be}$ [%] | Without Correction Algorithm | 13.8 | 9.1 |
| $SAR_{be}$ [%] | With Correction Algorithm | 0.1 | 0.1 |

## Sensor Offset

| | |
|---|---|
| Probe Tip to Sensor Center | 2.7 mm |
| Optical Surface Detection | **in tolerance** |

**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%.**

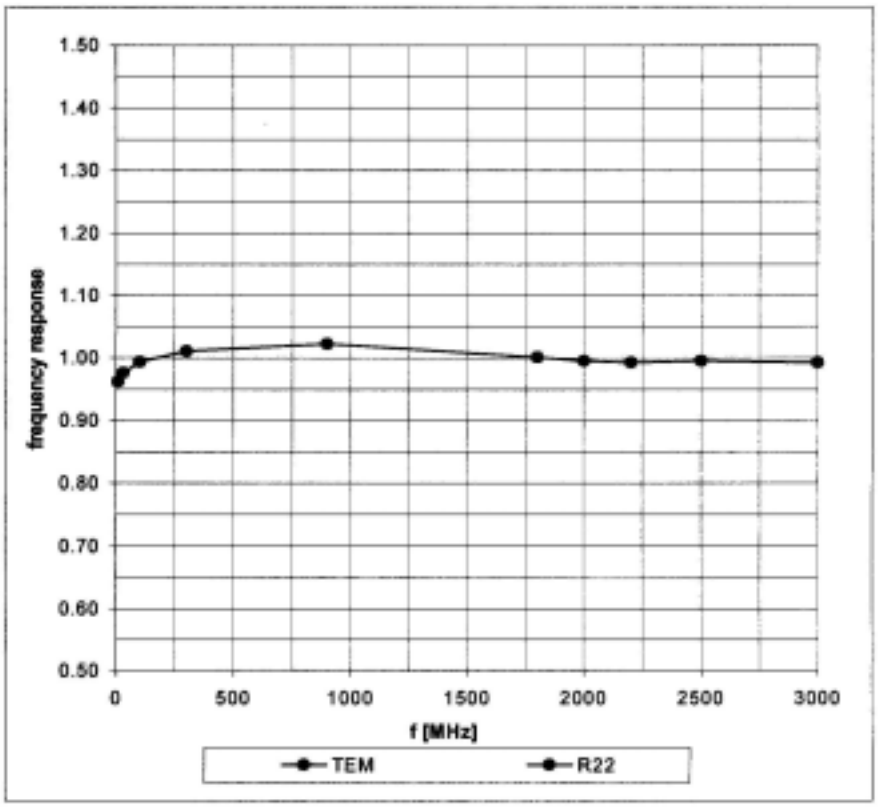
[A] numerical linearization parameter: uncertainty not required

Page 3 of 8

**ET3DV6 SN:1530** **September 1, 2004**

# Frequency Response of E-Field

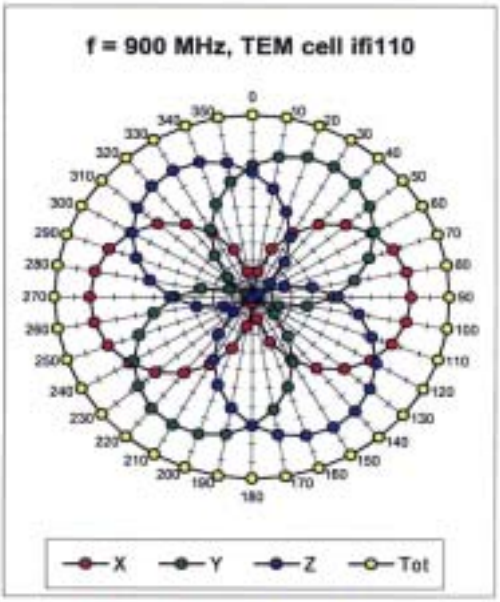
**( TEM-Cell:ifi110, Waveguide R22)**

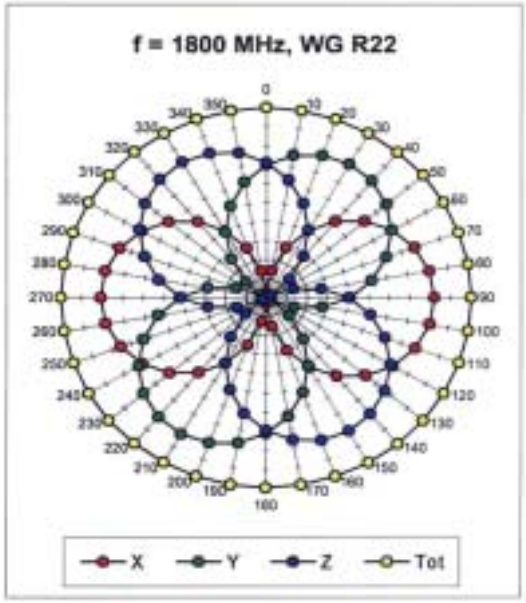


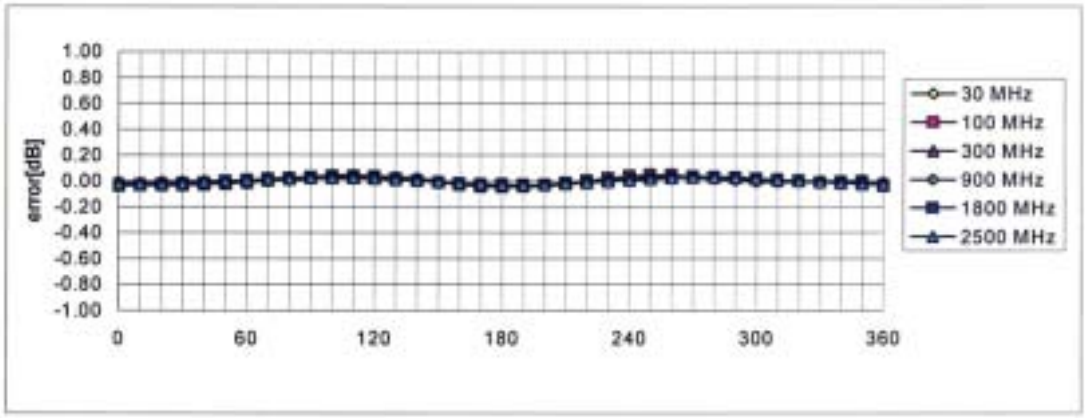

Page 4 of 8

**ET3DV6 SN:1530** **September 1, 2004**

## Receiving Pattern (ϕ ), θ = 0°



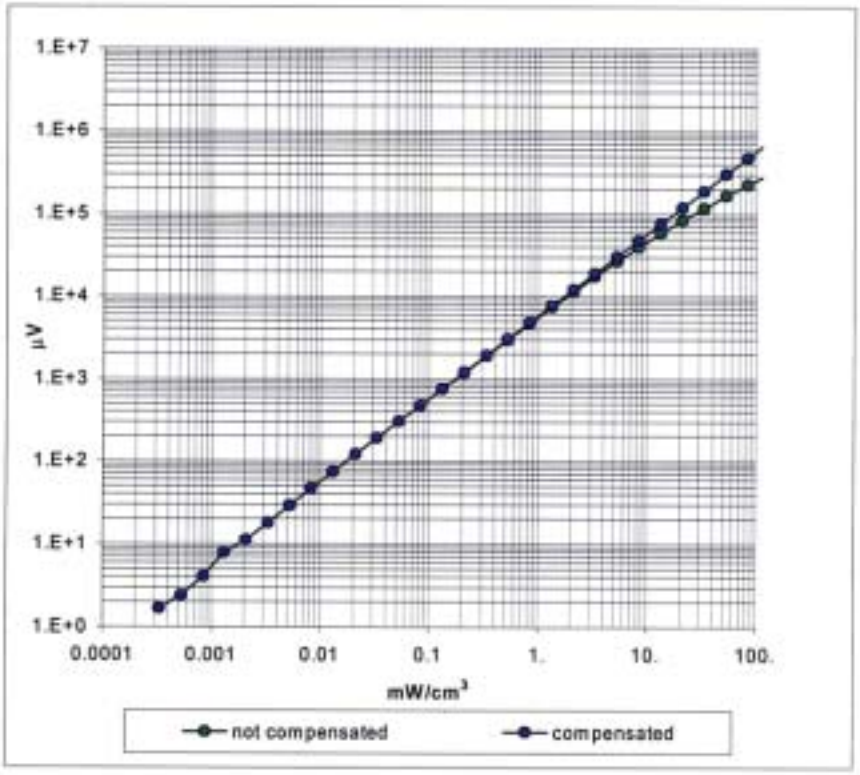

**Axial Isotropy Error < ± 0.2 dB**

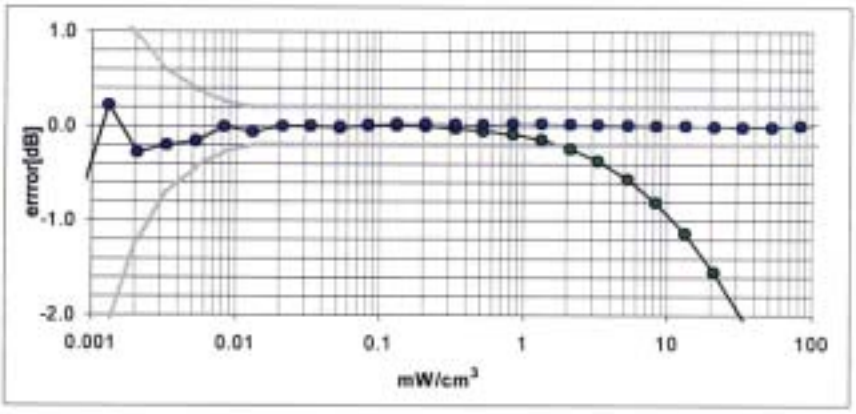
Page 5 of 8

**ET3DV6 SN:1530** **September 1, 2004**

## Dynamic Range f($SAR_{head}$)

**( Waveguide R22 )**



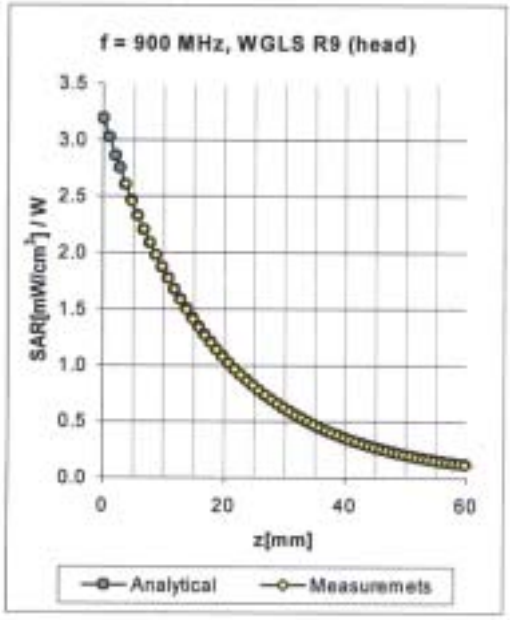



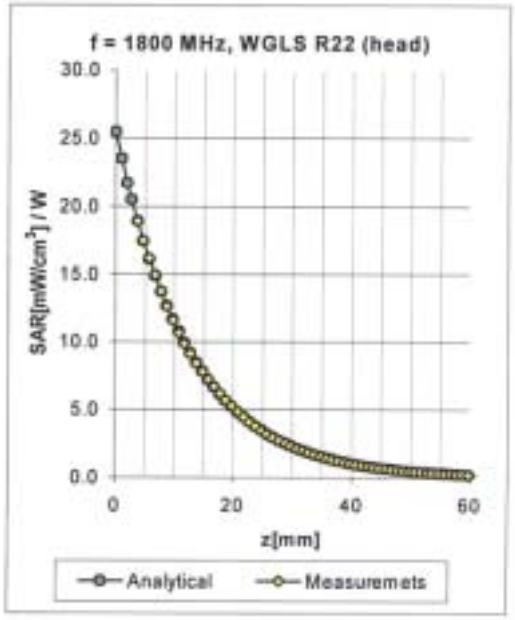

**Probe Linearity Error < ± 0.2 dB**

Page 6 of 8

**ET3DV6 SN:1530** **September 1, 2004**

# Conversion Factor Assessment




| f [MHz] | Validity [MHz][B] | Tissue | Permittivity | Conductivity | Alpha | Depth | ConvF | Uncertainty |
|---|---|---|---|---|---|---|---|---|
| 900 | 800-1000 | Head | 41.5 ± 5% | 0.97 ± 5% | 0.57 | 1.99 | 6.20 | ± 11.3% (k=2) |
| 1800 | 1710-1910 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.51 | 2.60 | 5.07 | ± 11.7% (k=2) |
| 2000 | 1900-2100 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.56 | 2.63 | 4.64 | ± 11.3% (k=2) |
| 2450 | 2400-2500 | Head | 39.2 ± 5% | 1.80 ± 5% | 1.03 | 1.86 | 4.43 | ± 9.7% (k=2) |
| 900 | 800-1000 | Body | 55.0 ± 5% | 1.05 ± 5% | 0.52 | 2.18 | 5.82 | ± 11.3% (k=2) |
| 1800 | 1710-1910 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.56 | 2.79 | 4.43 | ± 11.7% (k=2) |
| 2000 | 1900-2100 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.72 | 2.34 | 4.39 | ± 11.3% (k=2) |
| 2450 | 2400-2500 | Body | 52.7 ± 5% | 1.95 ± 5% | 1.41 | 1.39 | 4.22 | ± 9.7% (k=2) |

[B] The total standard uncertainty is calculated as root-sum-square of standard uncertainty of the Conversion Factor at calibration frequency and the standard uncertainty for the indicated frequency band.



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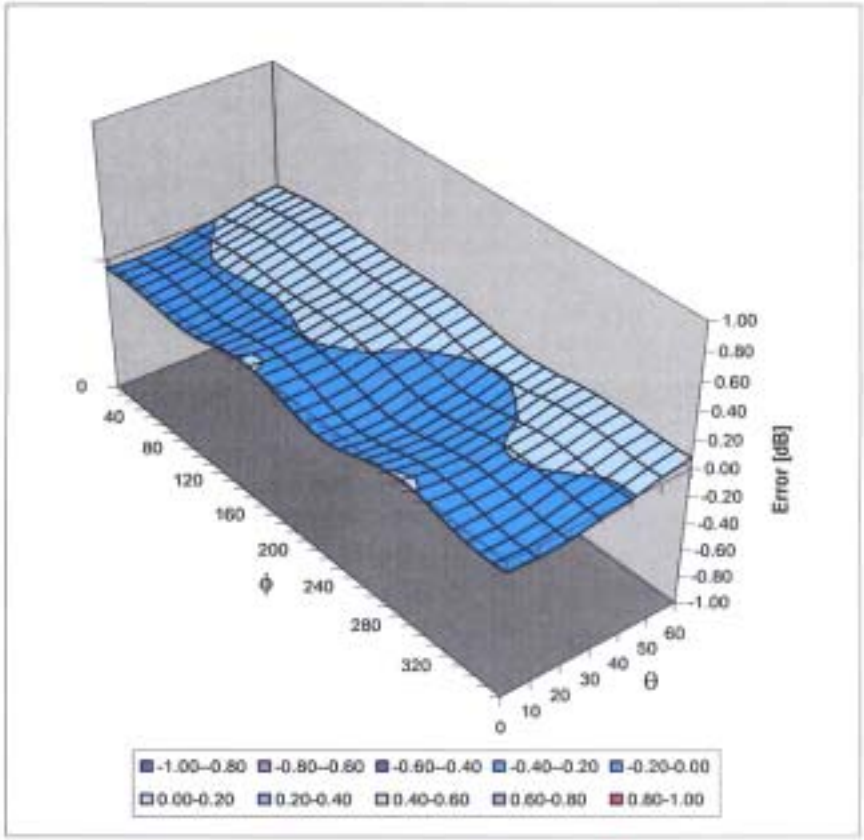
## Deviation from Isotropy in HSL

**Error (θ, ϕ), f = 900 MHz**




**Spherical Isotropy Error < ± 0.4 dB**

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s p e a g

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## PROBE REPAIR REPORT – SPEAG Production Center

| | | | |
|---|---|---|---|
| PRODUCT: | ET3DV6 Probe | | |
| SERIAL Nr.: | 1530 | IN DATE: | 11-Aug-2004 |
| CUSTOMER: | Auden | | |

| PROBE REPAIR MATERIAL | WORK DESCRIPTION | | | | | | WORKING TIME (h) | |
|---|---|---|---|---|---|---|---|---|
| Proximity Sensor (PEEK) | fixed | O | exchanged | O | ..... | O | | hours |
| Core replacement: | fixed | O | exchanged | O | ..... | O | | hours |
| Dipole sensor: | fixed | O | exchanged | O | ..... | O | | hours |
| Substrate: | fixed | O | exchanged | O | | | | hours |
| Components (diodes) | fixed | O | exchanged | O | | O | | hours |
| Components (capacitors) | fixed | O | exchanged | O | | O | | hours |
| Bonding R-lines - substrate | fixed | O | exchanged | X | | O | | hours |
| Probe tip: | fixed | O | exchanged | O | New sealing | X | 0.50 | hours |
| Probe connector: | fixed | O | exchanged | O | ..... | O | | hours |
| Probe tube | fixed | O | exchanged | O | ..... | O | | hours |
| Analysis: | | | | | | | | hours |
| Final Assembly: | | | | | | | | hours |
| Total hours | | | | | | | 0.50 | hours |

**COMMENTS:**

Probe was sent for calibration. Initial inspection showed that the sealing of the optical sensor at the probe tip is slightly defective. We therefore installed a new probe tip seal.

| | | | |
|---|---|---|---|
| CONDUCTED BY: | | APPROVED BY: | |
| DATE: | 17. Aug 04 | DATE: | 18. Aug 04 |

**REPAIR COST:**

| | | USD | Euro |
|---|---|---|---|
| MATERIAL COST: | 0.00 | O | X |
| REPAIR: | 75.00 | O | X |

| | | | |
|---|---|---|---|
| TOTAL COST: | s&m (free) | QUOTATION #: | — |

APPROVED BY:

DATE: 19. Aug 04

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## *Appendix E – Data Acquisition Electronic (DAE) Calibration*

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

**Client** **Auden**

### CALIBRATION CERTIFICATE

| | |
|---|---|
| Object(s) | DAE3 – SD 000 D03 AA – SN:393 |
| Calibration procedure(s) | QA CAL-06.v5a<br>Calibration procedure for the data acquisition unit (DAE) |
| Calibration date: | 08.01.2004 |
| Condition of the calibrated item | In Tolerance (according to the specific calibration document) |

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type | ID # | Cal Date | Scheduled Calibration |
|---|---|---|---|
| Fluke Process Calibrator Type 702 | SN: 6295803 | 8-Sep-03 | Sep-04 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Philipp Storchenegger | Technician | |
| Approved by: | Fin Bomholt | R&D Director | F. Bomholt |

Date issued: 08.01.2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

合格
93.1.08
慣量科技品保部
專用章

DAE3 SN: 393 DATE: 08.01.2004

## 1. Cal Lab. Incoming Inspection & Pre Test

| | | |
|---|---|---|
| **Modification Status** | Note Status here → → → → | BC |
| **Visual Inspection** | Note anomalies..... | None |
| | ..... | ..... |
| **Pre Test** | **Indication** | **Yes/No** |
| **Probe Touch** | Function | Yes |
| **Probe Collision** | Function | Yes |
| **Probe Touch&Collision** | Function | Yes |

## 2. DC Voltage Measurement

A/D - Converter Resolution nominal
High Range: 1LSB = 6.1µV , full range = 400 mV
Low Range: 1LSB = 61nV , full range = 4 mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| **Calibration Factors** | **X** | **Y** | **Z** |
|---|---|---|---|
| **High Range** | 403.989 | 404.251 | 404.118 |
| **Low Range** | 3.96967 | 3.95088 | 3.95250 |
| **Connector Angle** to be used | in DASY System | 15 ° | |

| **High Range** | **Input** | **Reading in µV** | **% Error** |
|---|---|---|---|
| **Channel X + Input** | 200mV | 199999.5 | 0.00 |
| | 20mV | 19999.8 | 0.00 |
| **Channel X - Input** | 20mV | -19992.4 | -0.04 |
| **Channel Y + Input** | 200mV | 200000.2 | 0.00 |
| | 20mV | 19996.1 | -0.02 |
| **Channel Y - Input** | 20mV | -19992.5 | -0.04 |
| **Channel Z + Input** | 200mV | 200000.0 | 0.00 |
| | 20mV | 20001.4 | 0.01 |
| **Channel Z - Input** | 20mV | -19998.8 | -0.01 |

| **Low Range** | **Input** | **Reading in µV** | **% Error** |
|---|---|---|---|
| **Channel X + Input** | 2mV | 1999.91 | 0.00 |
| | 0.2mV | 199.98 | -0.01 |
| **Channel X - Input** | 0.2mV | -200.39 | 0.19 |
| **Channel Y + Input** | 2mV | 1999.94 | 0.00 |
| | 0.2mV | 199.28 | -0.36 |
| **Channel Y - Input** | 0.2mV | -200.58 | 0.29 |
| **Channel Z + Input** | 2mV | 2000.03 | 0.00 |
| | 0.2mV | 199.19 | -0.41 |
| **Channel Z - Input** | 0.2mV | -201.21 | 0.61 |

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DAE3 SN: 393 DATE: 08.01.2004

## 6. Input Offset Measurement

DASY measurement parameters:
Auto Zero Time: 3 sec, Measuring time: 3 sec
Number of measurements: 100, Low Range

Input 10MΩ

| in µV | Average | min. Offset | max. Offset | Std. Deviation |
|---|---|---|---|---|
| Channel X | 1.27 | 0.41 | 1.94 | 0.27 |
| Channel Y | -1.15 | -2.03 | -0.01 | 0.32 |
| Channel Z | -0.17 | -2.91 | 1.44 | 0.42 |

Input shorted

| in µV | Average | min. Offset | max. Offset | Std. Deviation |
|---|---|---|---|---|
| Channel X | 0.14 | -0.33 | 0.69 | 0.18 |
| Channel Y | -0.77 | -1.88 | -0.17 | 0.22 |
| Channel Z | -0.87 | -2.76 | 0.98 | 0.38 |

## 7. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

## 8. Input Resistance

| In MOhm | Calibrating | Measuring |
|---|---|---|
| Channel X | 0.1999 | 198.3 |
| Channel Y | 0.2001 | 198.4 |
| Channel Z | 0.1998 | 198.6 |

## 9. Low Battery Alarm Voltage

| in V | Alarm Level |
|---|---|
| Supply (+ Vcc) | 8.01 |
| Supply (- Vcc) | -7.74 |

## 10. Power Consumption

| in mA | Switched off | Stand by | Transmitting |
|---|---|---|---|
| Supply (+ Vcc) | 0.00 | 5.43 | 13.8 |
| Supply (- Vcc) | -0.01 | -7.60 | -8.79 |

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