

## APPENDIX A: TEST CONFIGURATIONS AND TEST DATA

### A1: TEST CONFIGURATION

#### Mode 1



The bottom of the EUT to the flat phantom distance 15 mm

## Mode 2



**The tip of the EUT to the flat phantom distance 0 mm**

## EUT Photo



## Liquid Level Photo

2450MHz D=155mm



## A2 : TEST DATA

Date/Time: 07/22/04 11:51:54

Test Laboratory: Advance Data Technology

### ASS2101 Mode 1 Bottom Ch 1

**DUT: Wireless USB Adapter ; Type: ASS2101 ; Test Channel Frequency: 2412 MHz**

Communication System: 802.11b ; Frequency: 2412 MHz; Duty Cycle: 1:1; Modulation type: CCK  
Medium: MSL2450 ( $\sigma = 1.9036$  mho/m,  $\epsilon_r = 50.6142$ ,  $\rho = 1000$  kg/m<sup>3</sup>) ; Liquid level : 155mm

Phantom section: Flat Section ; Separation distance : 15 mm (The bottom side of the EUT to the Phantom)

Antenna type : Internal Antenna ; Air temp. : 22.0 degrees ; Liquid temp. : 21.0 degrees

DASY4 Configuration:

- Probe: ET3DV6 - SN1687; Calibrated: 2003/11/24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2003/8/15
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

**Low Channel/Area Scan (7x9x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 3.19 V/m

Power Drift = 0.07 dB

Maximum value of SAR = 0.107 mW/g

**Low Channel/Zoon Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

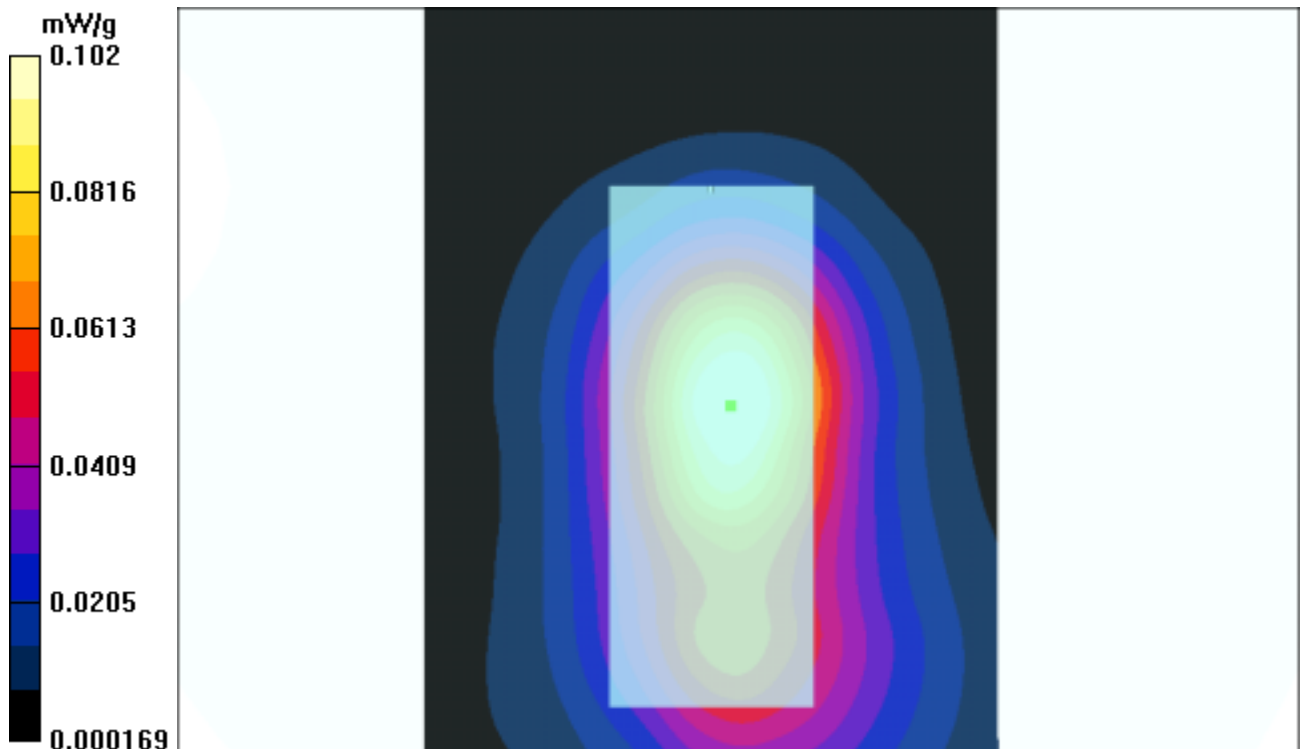
Peak SAR (extrapolated) = 0.204 W/kg

SAR(1 g) = 0.0973 mW/g; SAR(10 g) = 0.0508 mW/g

Reference Value = 3.19 V/m

Power Drift = 0.07 dB

Maximum value of SAR = 0.102 mW/g



Test Laboratory: Advance Data Technology

## ASS2101 Mode 1 Bottom Ch 6

**DUT: Wireless USB Adapter ; Type: ASS2101 ; Test Channel Frequency: 2437 MHz**

Communication System: 802.11b ; Frequency: 2437 MHz; Duty Cycle: 1:1; Modulation type: CCK  
Medium: MSL2450 ( $\sigma = 1.9373$  mho/m,  $\epsilon_r = 50.5805$ ,  $\rho = 1000$  kg/m<sup>3</sup>) ; Liquid level : 155mm

Phantom section: Flat Section ; Separation distance : 15 mm (The bottom side of the EUT to the Phantom)

Antenna type : Internal Antenna ; Air temp. : 22.0 degrees ; Liquid temp. : 21.0 degrees

DASY4 Configuration:

- Probe: ET3DV6 - SN1687; Calibrated: 2003/11/24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2003/8/15
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

**Middle Channel/Area Scan (7x9x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 3.39 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.102 mW/g

**Middle Channel/Zoon Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

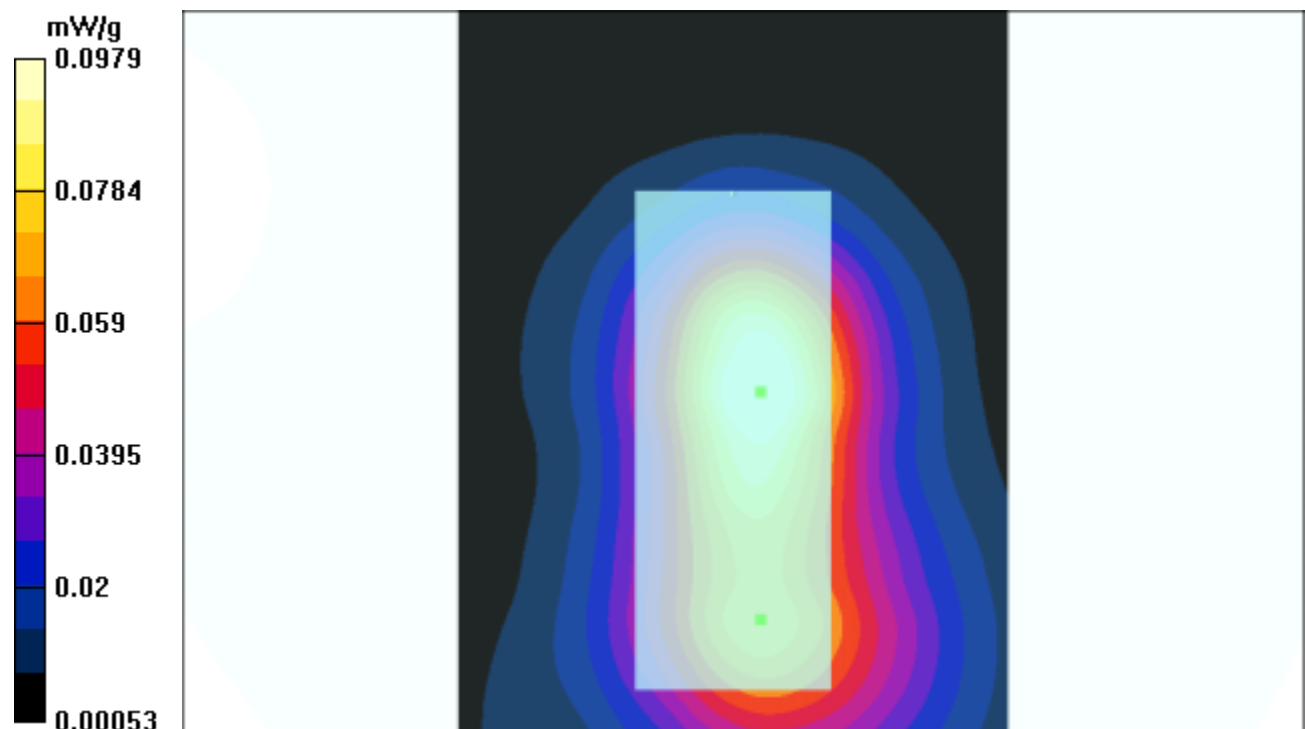
Peak SAR (extrapolated) = 0.204 W/kg

SAR(1 g) = 0.0943 mW/g; SAR(10 g) = 0.0486 mW/g

Reference Value = 3.39 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.0979 mW/g



Test Laboratory: Advance Data Technology

## ASS2101 Mode 1 Bottom Ch 11

**DUT: Wireless USB Adapter ; Type: ASS2101 ; Test Channel Frequency: 2462 MHz**

Communication System: 802.11b ; Frequency: 2462 MHz; Duty Cycle: 1:1; Modulation type: CCK  
Medium: MSL2450 ( $\sigma = 1.9682$  mho/m,  $\epsilon_r = 50.5625$ ,  $\rho = 1000$  kg/m<sup>3</sup>) ; Liquid level : 155mm

Phantom section: Flat Section ; Separation distance : 15 mm (The bottom side of the EUT to the Phantom)

Antenna type : Internal Antenna ; Air temp. : 22.0 degrees ; Liquid temp. : 21.0 degrees

DASY4 Configuration:

- Probe: ET3DV6 - SN1687; Calibrated: 2003/11/24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2003/8/15
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

**High Channel/Area Scan (7x9x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 2.73 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.0518 mW/g

**High Channel/Zoon Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

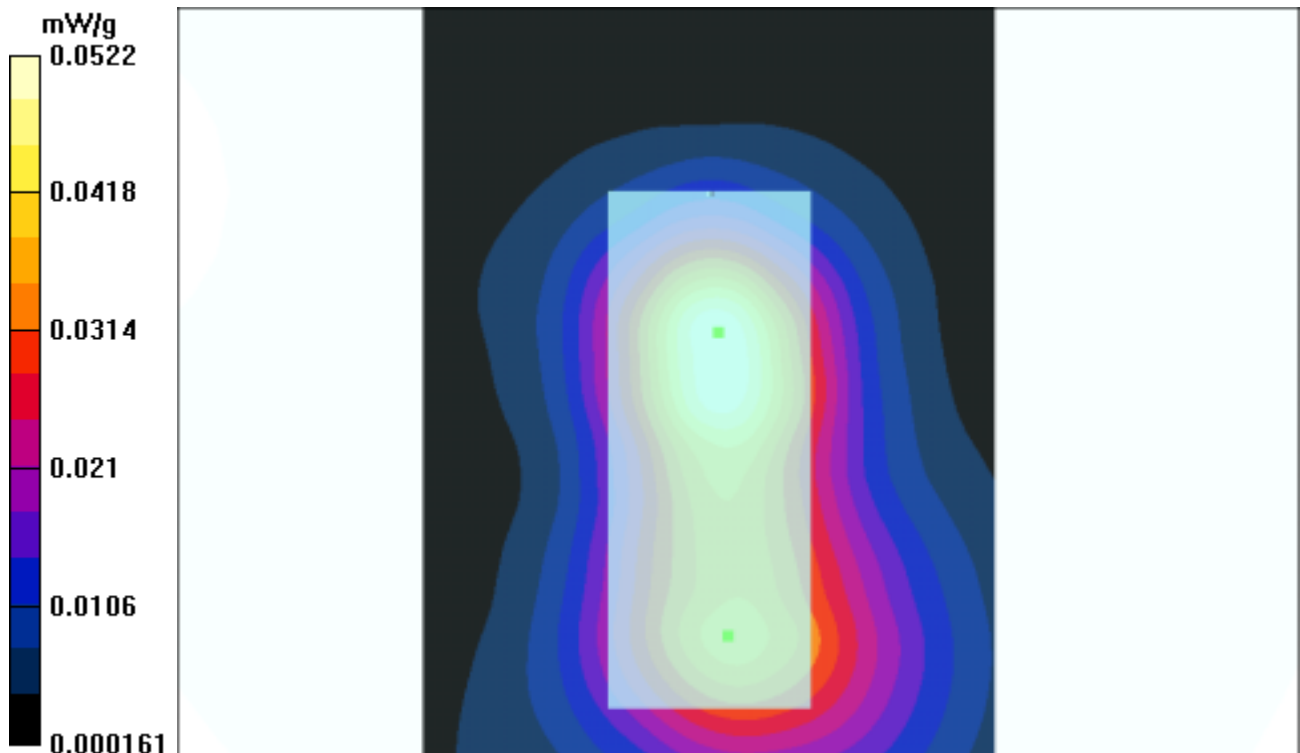
Peak SAR (extrapolated) = 0.109 W/kg

SAR(1 g) = 0.05 mW/g; SAR(10 g) = 0.0248 mW/g

Reference Value = 2.73 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.0522 mW/g



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## ASS2101 Mode 2 Tip Ch 1

**DUT: Wireless USB Adapter ; Type: ASS2101 ; Test Channel Frequency: 2412 MHz**

Communication System: 802.11b ; Frequency: 2412 MHz; Duty Cycle: 1:1; Modulation type: CCK

Medium: MSL2450 ( $\sigma = 1.9036$  mho/m,  $\epsilon_r = 50.6142$ ,  $\rho = 1000$  kg/m<sup>3</sup>) ; Liquid level : 155 mm

Phantom section: Flat Section ; Separation distance : 0 mm (The tip of the EUT to the Phantom)

Antenna type : Internal Antenna ; Air temp. : 22.0 degrees ; Liquid temp. : 21.0 degrees

DASY4 Configuration:

- Probe: ET3DV6 - SN1687; Calibrated: 2003/11/24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2003/8/15
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

**Low Channel/Area Scan (7x7x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 2.97 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.0226 mW/g

**Low Channel/Zoon Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

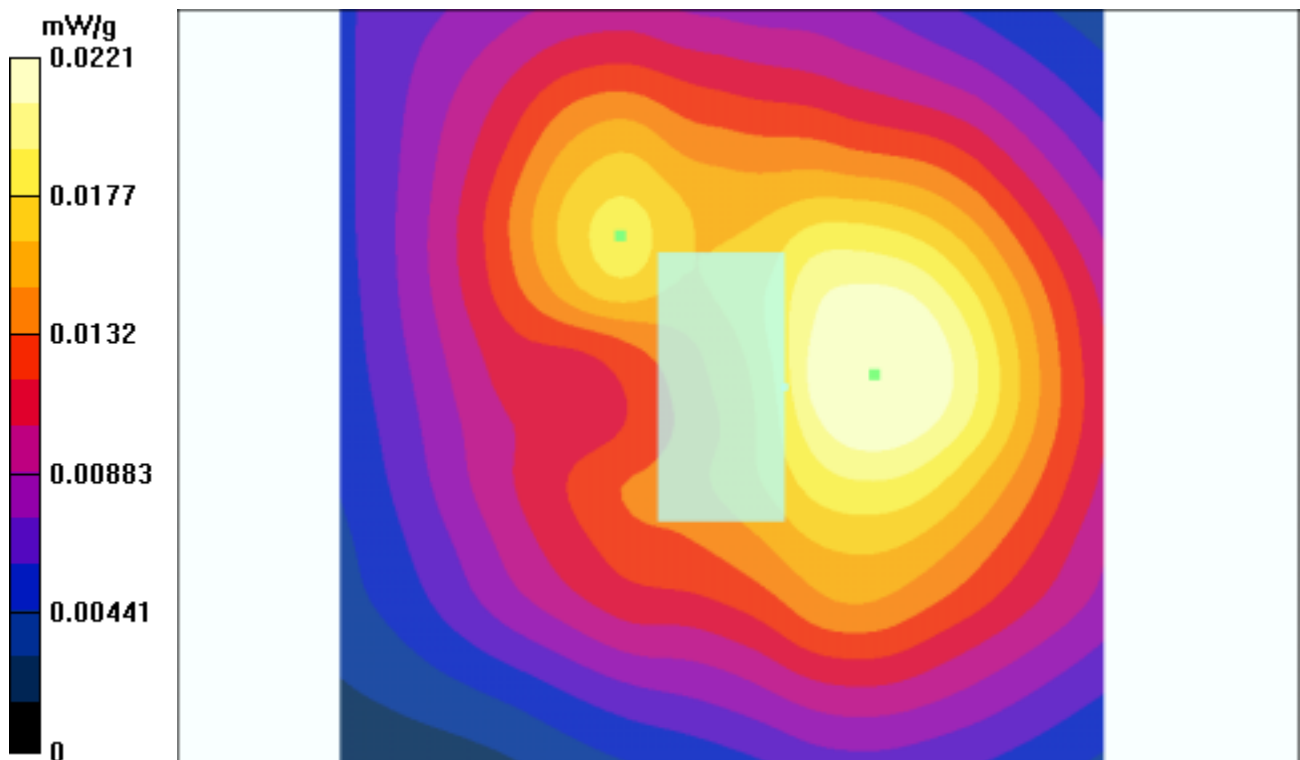
Peak SAR (extrapolated) = 0.045 W/kg

SAR(1 g) = 0.0213 mW/g; SAR(10 g) = 0.011 mW/g

Reference Value = 2.97 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.0221 mW/g



Test Laboratory: Advance Data Technology

## ASS2101 Mode 2 Tip Ch 6

**DUT: Wireless USB Adapter ; Type: ASS2101 ; Test Channel Frequency: 2437 MHz**

Communication System: 802.11b ; Frequency: 2437 MHz; Duty Cycle: 1:1; Modulation type: CCK

Medium: MSL2450 ( $\sigma = 1.9373$  mho/m,  $\epsilon_r = 50.5805$ ,  $\rho = 1000$  kg/m<sup>3</sup>) ; Liquid level : 155 mm

Phantom section: Flat Section ; Separation distance : 0 mm (The tip of the EUT to the Phantom)

Antenna type : Internal Antenna ; Air temp. : 22.0 degrees ; Liquid temp. : 21.0 degrees

DASY4 Configuration:

- Probe: ET3DV6 - SN1687; Calibrated: 2003/11/24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2003/8/15
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

**Middle Channel/Area Scan (7x7x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 2.99 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.0199 mW/g

**Middle Channel/Zoon Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

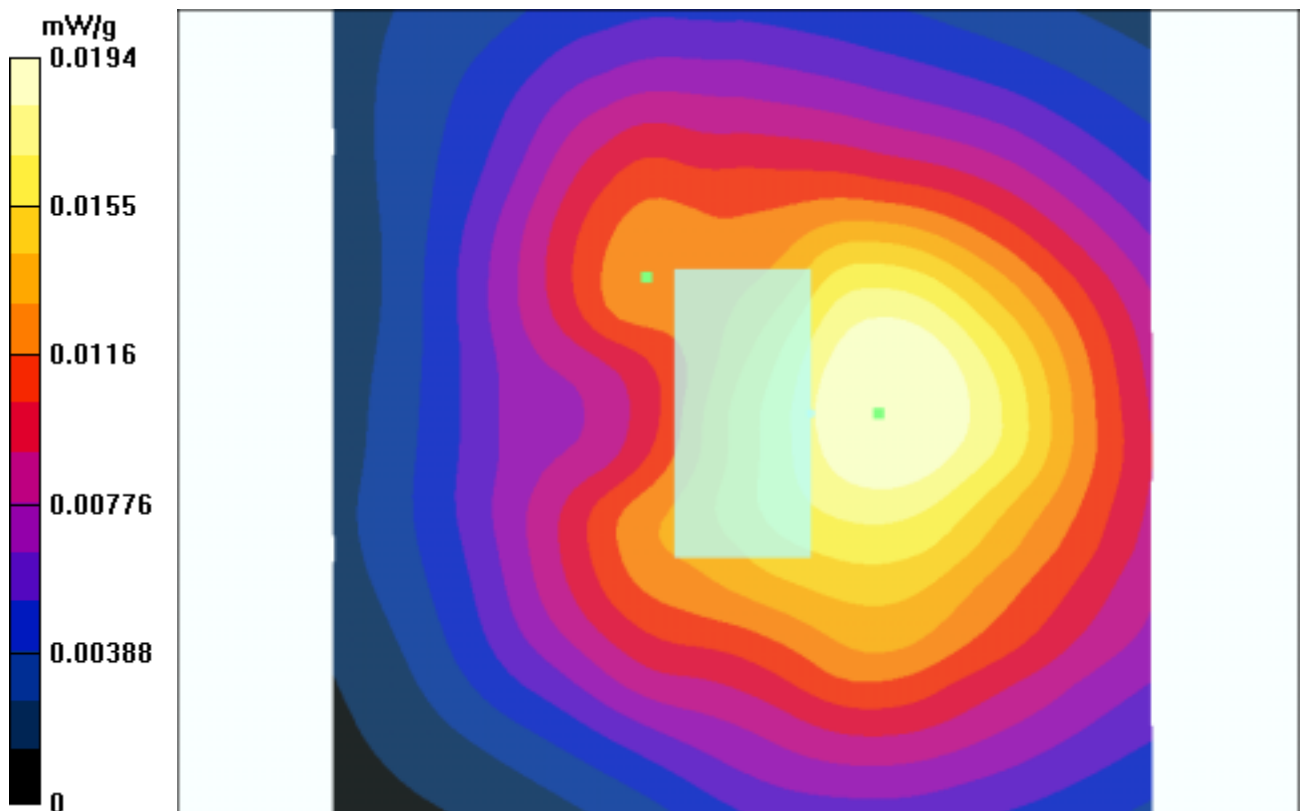
Peak SAR (extrapolated) = 0.0479 W/kg

SAR(1 g) = 0.0186 mW/g; SAR(10 g) = 0.00971 mW/g

Reference Value = 2.99 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.0194 mW/g



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## ASS2101 Mode 2 Tip Ch 11

**DUT: Wireless USB Adapter ; Type: ASS2101 ; Test Channel Frequency: 2462 MHz**

Communication System: 802.11b ; Frequency: 2462 MHz; Duty Cycle: 1:1; Modulation type: CCK  
Medium: MSL2450 ( $\sigma = 1.9682$  mho/m,  $\epsilon_r = 50.5625$ ,  $\rho = 1000$  kg/m<sup>3</sup>) ; Liquid level : 155 mm

Phantom section: Flat Section ; Separation distance : 0 mm (The tip of the EUT to the Phantom)

Antenna type : Internal Antenna ; Air temp. : 22.0 degrees ; Liquid temp. : 21.0 degrees

DASY4 Configuration:

- Probe: ET3DV6 - SN1687; Calibrated: 2003/11/24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2003/8/15
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

**High Channel/Area Scan (7x7x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 1.93 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.00922 mW/g

**High Channel 2/Zoon Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

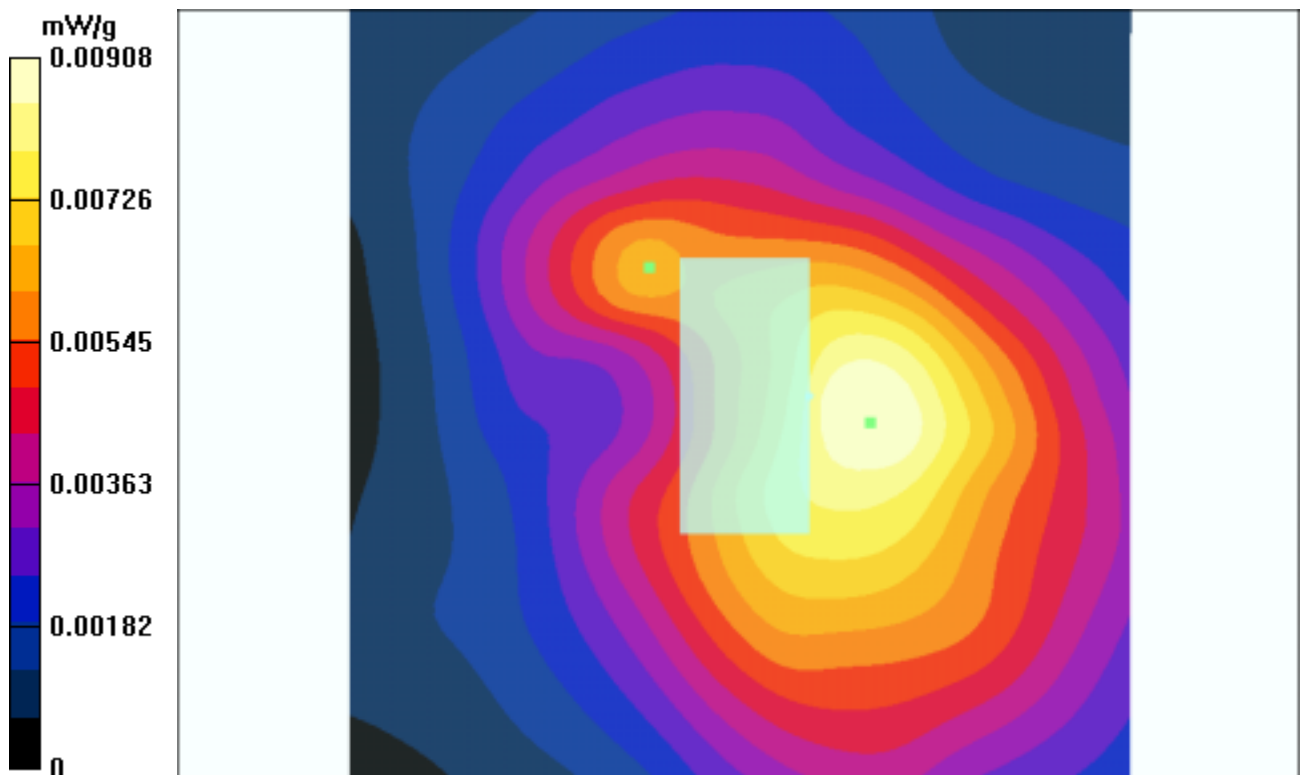
Peak SAR (extrapolated) = 0.0451 W/kg

SAR(1 g) = 0.0085 mW/g; SAR(10 g) = 0.00412 mW/g

Reference Value = 1.93 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.00908 mW/g



Test Laboratory: Advance Data Technology

## ASS2101 Mode 1 Bottom Ch 1

**DUT: Wireless USB Adapter ; Type: ASS2101 ; Test Channel Frequency: 2412 MHz**

Communication System: 802.11b ; Frequency: 2412 MHz; Duty Cycle: 1:1; Modulation type: CCK  
Medium: MSL2450 ( $\sigma = 1.9036$  mho/m,  $\epsilon_r = 50.6142$ ,  $\rho = 1000$  kg/m<sup>3</sup>) ; Liquid level : 155mm

Phantom section: Flat Section ; Separation distance : 15 mm (The bottom of the EUT to the Phantom)

Antenna type : Internal Antenna ; Air temp. : 22.0 degrees ; Liquid temp. : 21.0 degrees

DASY4 Configuration:

- Probe: ET3DV6 - SN1687; Calibrated: 2003/11/24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2003/8/15
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

**Low Channel/Area Scan (7x9x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 3.19 V/m

Power Drift = 0.07 dB

Maximum value of SAR = 0.107 mW/g

**Low Channel/Zoon Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

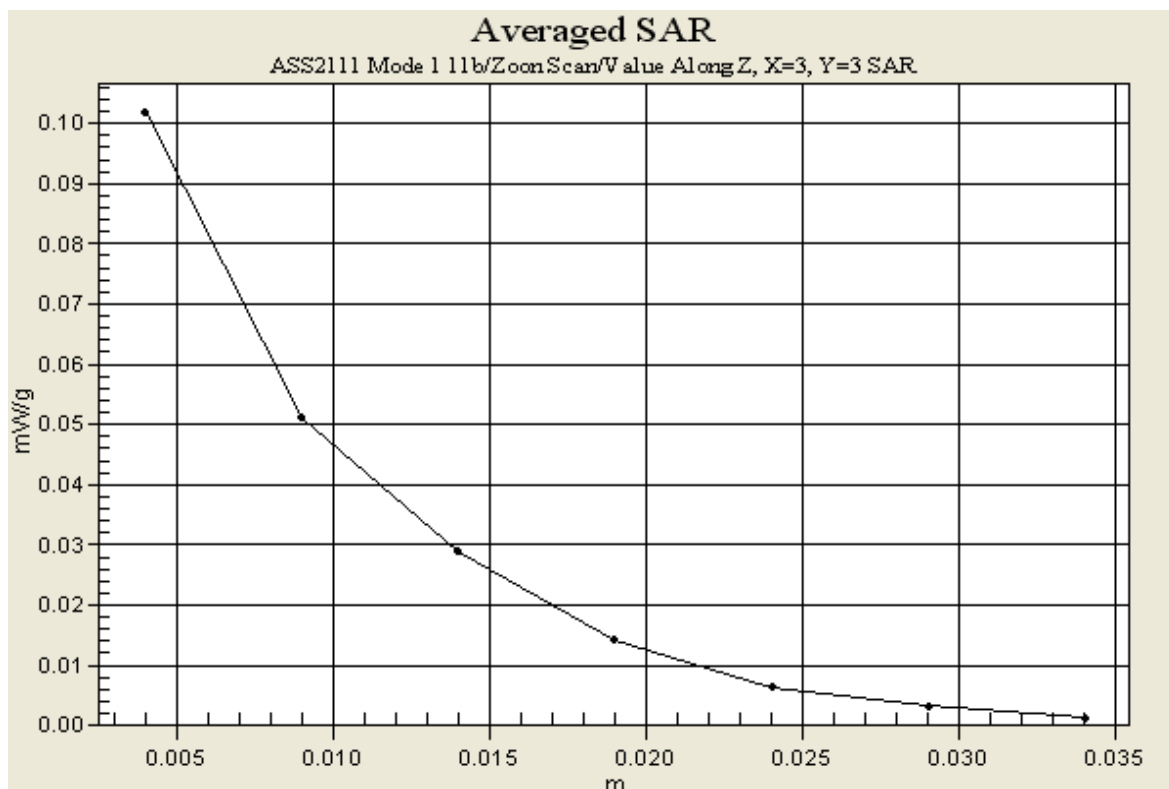
Peak SAR (extrapolated) = 0.204 W/kg

SAR(1 g) = 0.0973 mW/g; SAR(10 g) = 0.0508 mW/g

Reference Value = 3.19 V/m

Power Drift = 0.07 dB

Maximum value of SAR = 0.102 mW/g



## A3 : SYSTEM VALIDATION

Date/Time: 07/22/04 09:10:26

Test Laboratory: Advance Data Technology

### System Validation Check-MSL 2450MHz

**DUT: Dipole 2450 MHz ; Type: D2450V2 ; Test Channel Frequency: 2450 MHz**

Communication System: CW ; Frequency: 2450 MHz; Duty Cycle: 1:1; Modulation type: CW  
Medium: MSL2450 ( $\sigma = 1.9531$  mho/m,  $\epsilon_r = 50.5702$ ,  $\rho = 1000$  kg/m<sup>3</sup>) ; Liquid level : 155mm  
Phantom section: Flat Section ; Separation distance : 10 mm (The feetpoint of the dipole to the Phantom)Air temp. : 22.0 degrees ; Liquid temp. : 21.0 degrees

DASY4 Configuration:

- Probe: ET3DV6 - SN1687; Calibrated: 2003/11/24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2003/8/15
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

**d=10mm, Pin=250mW/Area Scan (7x7x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 95.7 V/m

Power Drift = -0.04 dB

Maximum value of SAR = 16.6 mW/g

**d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

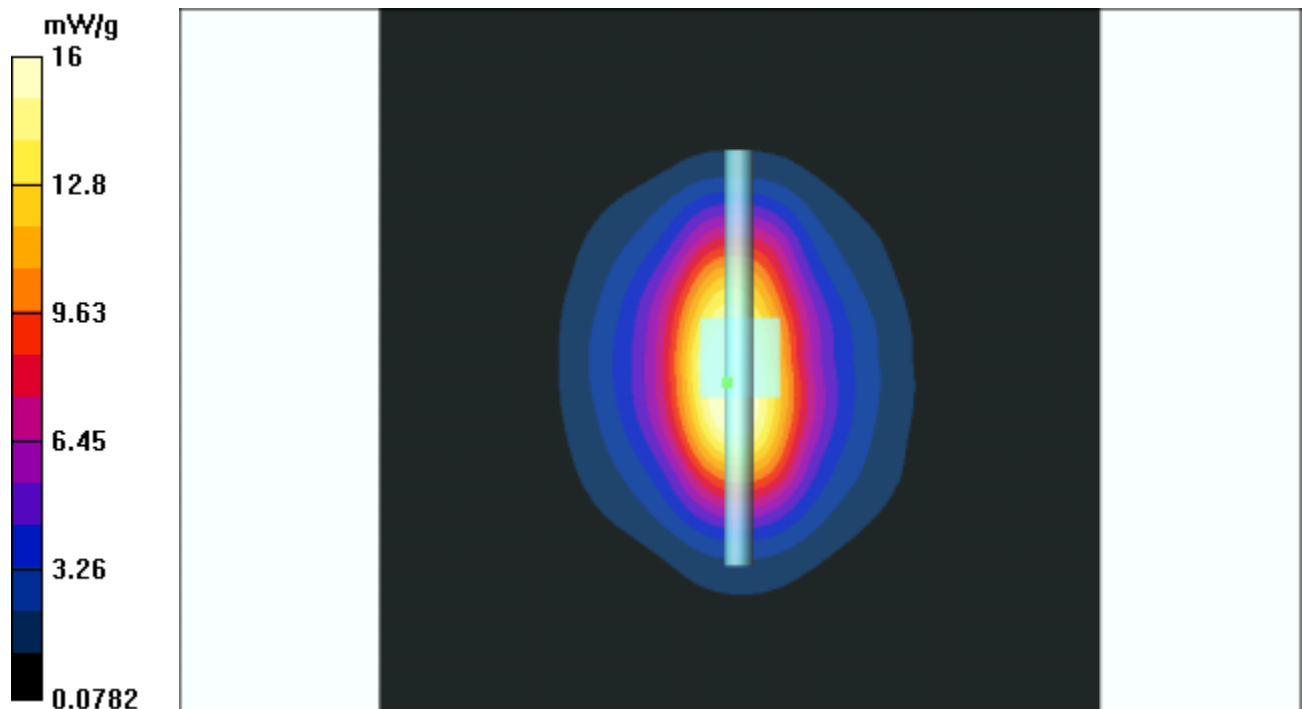
Peak SAR (extrapolated) = 32.8 W/kg

SAR(1 g) = 14.7 mW/g; SAR(10 g) = 6.55 mW/g

Reference Value = 95.7 V/m

Power Drift = -0.04 dB

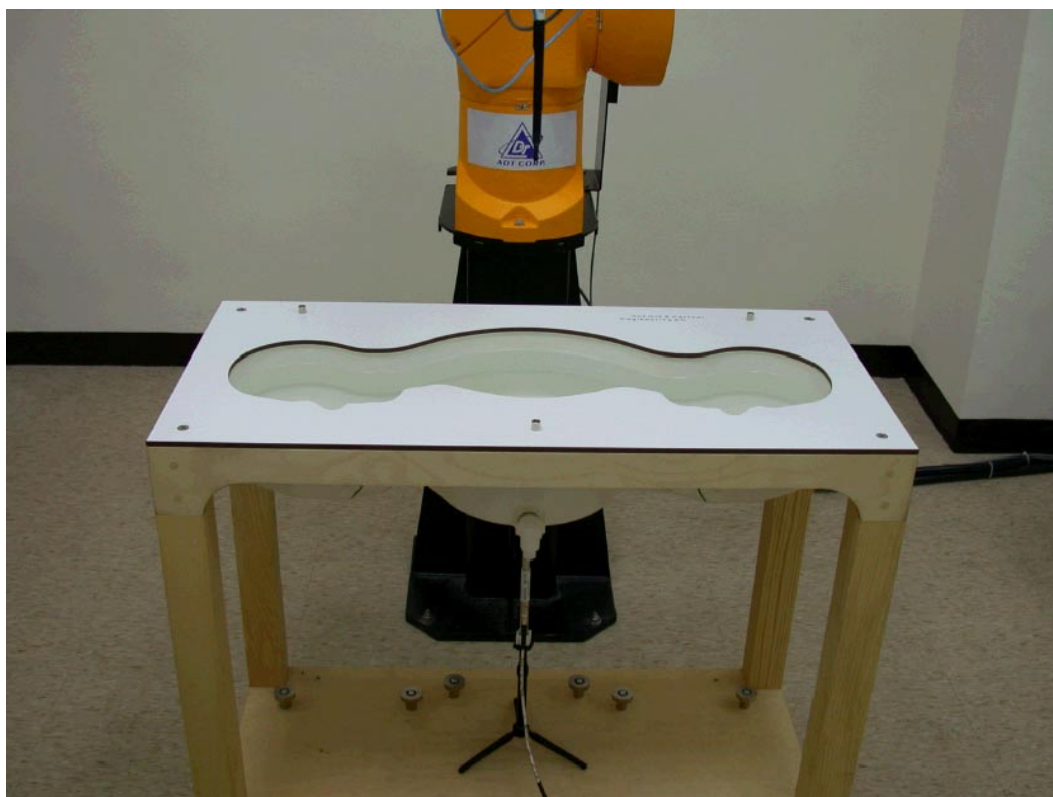
Maximum value of SAR = 16 mW/g



## APPENDIX B: ADT SAR MEASUREMENT SYSTEM



## APPENDIX C: PHOTOGRAPHS OF SYSTEM VALIDATION





## **APPENDIX D: SYSTEM CERTIFICATE & CALIBRATION**

### **D1: SAM PHANTOM**

# Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

## Certificate of conformity / First Article Inspection

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| Item                  | SAM Twin Phantom V4.0                                                    |
| Type No               | QD 000 P40 CA                                                            |
| Series No             | TP-1150 and higher                                                       |
| Manufacturer / Origin | Untersee Composites<br>Hauptstr. 69<br>CH-8559 Fruthwilen<br>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 units (called samples).

| Test                 | Requirement                                                                             | Details                                                              | Units tested              |
|----------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------|
| Shape                | Compliance with the geometry according to the CAD model.                                | IT'IS CAD File (*)                                                   | First article, Samples    |
| Material thickness   | Compliant with the requirements according to the standards                              | 2mm +/- 0.2mm in specific areas                                      | First article, Samples    |
| Material parameters  | Dielectric parameters for required frequencies                                          | 200 MHz – 3 GHz<br>Relative permittivity < 5<br>Loss tangent < 0.05. | Material sample TP 104-5  |
| Material resistivity | The material has been tested to be compatible with the liquids defined in the standards | Liquid type HSL 1800 and others according to the standard.           | Pre-series, First article |

### Standards

- [1] CENELEC EN 50361
- [2] IEEE P1528-200x draft 6.5
- [3] IEC PT 62209 draft 0.9

(\*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

### Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date 28.02.2002

Signature / Stamp

*F. Bombault*

**Schmid & Partner  
Engineering AG**

Zeughausstrasse 43, CH-8004 Zurich  
Tel. +41 1 245 97 00, Fax +41 1 245 97 79

*Thomas Kappeler*



## D2: DOSIMETRIC E-FIELD PROBE

## IMPORTANT NOTICE

### USAGE OF PROBES IN ORGANIC SOLVENTS

Diethylene Glycol 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
- ES3DV2
- 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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info@speag.com, <http://www.speag.com>

Schmid & Partner Engineering AG

Client

ADT (Auden)

## CALIBRATION CERTIFICATE

Object(s)

ET3DV6 - SN:1687

Calibration procedure(s)

QA CAL-01.v2  
Calibration procedure for dosimetric E-field probes

Calibration date:

November 24, 2003

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 E4419B            | GB41293874     | 2-Apr-03 (METAS, No 252-0250)             | Apr-04                 |
| Power sensor E4412A               | MY41495277     | 2-Apr-03 (METAS, No 252-0250)             | Apr-04                 |
| Reference 20 dB Attenuator        | SN: 5086 (20b) | 3-Apr-03 (METAS No. 251-0340)             | Apr-04                 |
| Fluke Process Calibrator Type 702 | SN: 6295803    | 8-Sep-03 (Sintrel SCS No. E-030020)       | Sep-04                 |
| Power sensor HP 8481A             | MY41092180     | 18-Sep-02 (SPEAG, in house check Oct-03)  | In house check: Oct 05 |
| RF generator HP 8684C             | US3642U01700   | 4-Aug-99 (SPEAG, in house check Aug-02)   | In house check: Aug-05 |
| Network Analyzer HP 8753E         | US37390585     | 18-Oct-01 (SPEAG, in house check Oct-03)  | In house check: Oct 05 |

|                |               |            |                                                                                       |
|----------------|---------------|------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Name          | Function   | Signature                                                                             |
|                | Nico Vetterli | Technician |  |

|              |               |                     |
|--------------|---------------|---------------------|
| Approved by: | Katja Pokovic | Laboratory Director |
|--------------|---------------|---------------------|



Date issued: November 24, 2003

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.

# Probe ET3DV6

## SN:1687

|                   |                   |
|-------------------|-------------------|
| Manufactured:     | May 28, 2002      |
| Last calibration: | June 5, 2002      |
| Recalibrated:     | November 24, 2003 |

**Calibrated for DASY Systems**

(Note: non-compatible with DASY2 system!)