

A3 : SYSTEM VALIDATION

Date/Time: 11/22/04 13:49:22

Test Laboratory: Advance Data Technology

System Validation Check-MSL 5200MHz

DUT: Dipole 5 GHz ; Type: D5GHzV2 ; Serial: 1019 ; Test Channel Frequency: 5200 MHz

Communication System: CW ; Frequency: 5200 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL5800; Medium parameters used: $f = 5200$ MHz; $\sigma = 5.37$ mho/m; $\epsilon_r = 48$; $\rho = 1000$

kg/m³ ; Liquid level : 150mm

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: EX3DV3 - SN3504 ; ConvF(4.29, 4.29, 4.29) ; Calibrated: 2004/2/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2004/8/17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

f=5200, d=10mm, Pin=250mW/Area Scan (6x6x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 20 mW/g

f=5200, d=10mm, Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid:

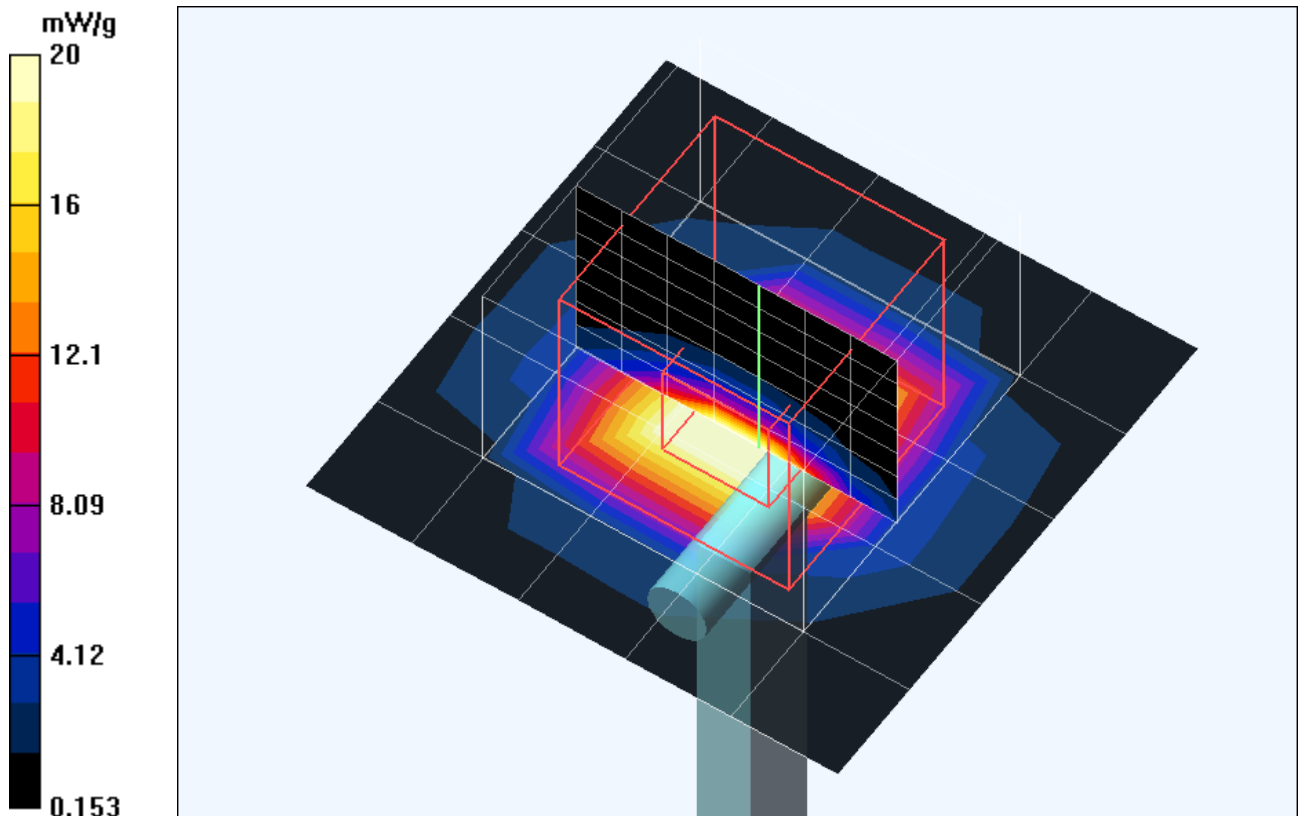
dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 88.9 V/m; Power Drift = -0.1 dB

Peak SAR (extrapolated) = 69.2 W/kg

SAR(1 g) = 19.5 mW/g; SAR(10 g) = 5.41 mW/g

Maximum value of SAR (measured) = 32.4 mW/g



Test Laboratory: Advance Data Technology

System Validation Check-MSL 5800MHz**DUT: Dipole 5 GHz ; Type: D5GHzV2 ; Serial: 1019 ; Test Channel Frequency: 5800 MHz**

Communication System: CW ; Frequency: 5800 MHz; Duty Cycle: 1:1; Modulation type: CW
 Medium: MSL5800; Medium parameters used: $f = 5800$ MHz; $\sigma = 6.26$ mho/m; $\epsilon_r = 46.9$; $\rho = 1000$

kg/m³ ; Liquid level : 150mm

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: EX3DV3 - SN3504 ; ConvF(3.96, 3.96, 3.96) ; Calibrated: 2004/2/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2004/8/17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

f=5800, d=10mm, Pin=250mW/Area Scan (6x6x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 18.8 mW/g

f=5800, d=10mm, Pin=250mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid:

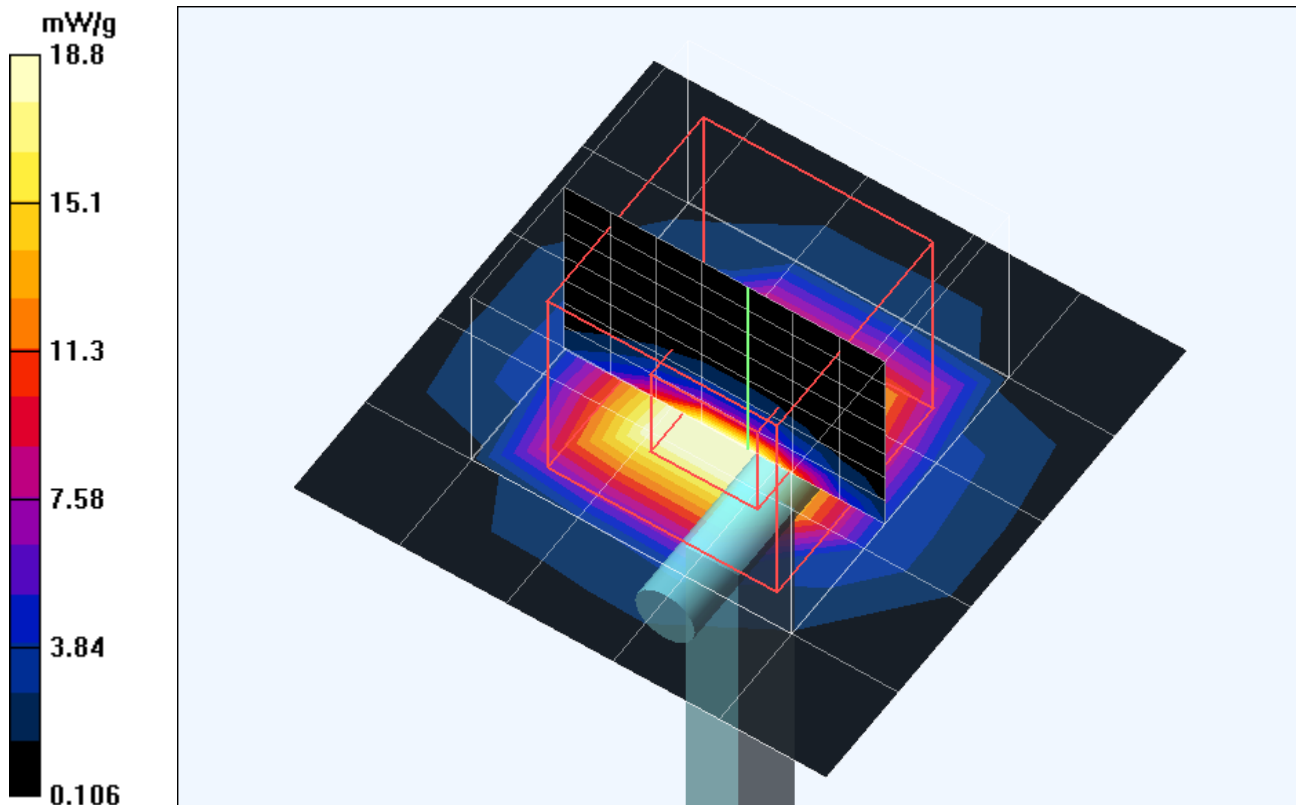
dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 79 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 73.3 W/kg

SAR(1 g) = 17.9 mW/g; SAR(10 g) = 4.98 mW/g

Maximum value of SAR (measured) = 30.1 mW/g



Test Laboratory: Advance Data Technology

System Validation Check-MSL 2450MHz**DUT: Dipole 2450 MHz ; Type: D2450V2 ; Serial: 716 ; Test Channel Frequency: 2450 MHz**

Communication System: CW ; Frequency: 2450 MHz; Duty Cycle: 1:1; Modulation type: CW
 Medium: MSL2450; Medium parameters used: $f = 2450$ MHz; $\sigma = 2.03$ mho/m; $\epsilon_r = 52$; $\rho = 1000$

kg/m^3 ; Liquid level : 150mm

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 ; ConvF(4.23, 4.23, 4.23) ; Calibrated: 2004/8/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn510; Calibrated: 2004/8/17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP 1202
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

d=10mm, Pin=250mW/Area Scan (5x6x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (measured) = 12.9 mW/g

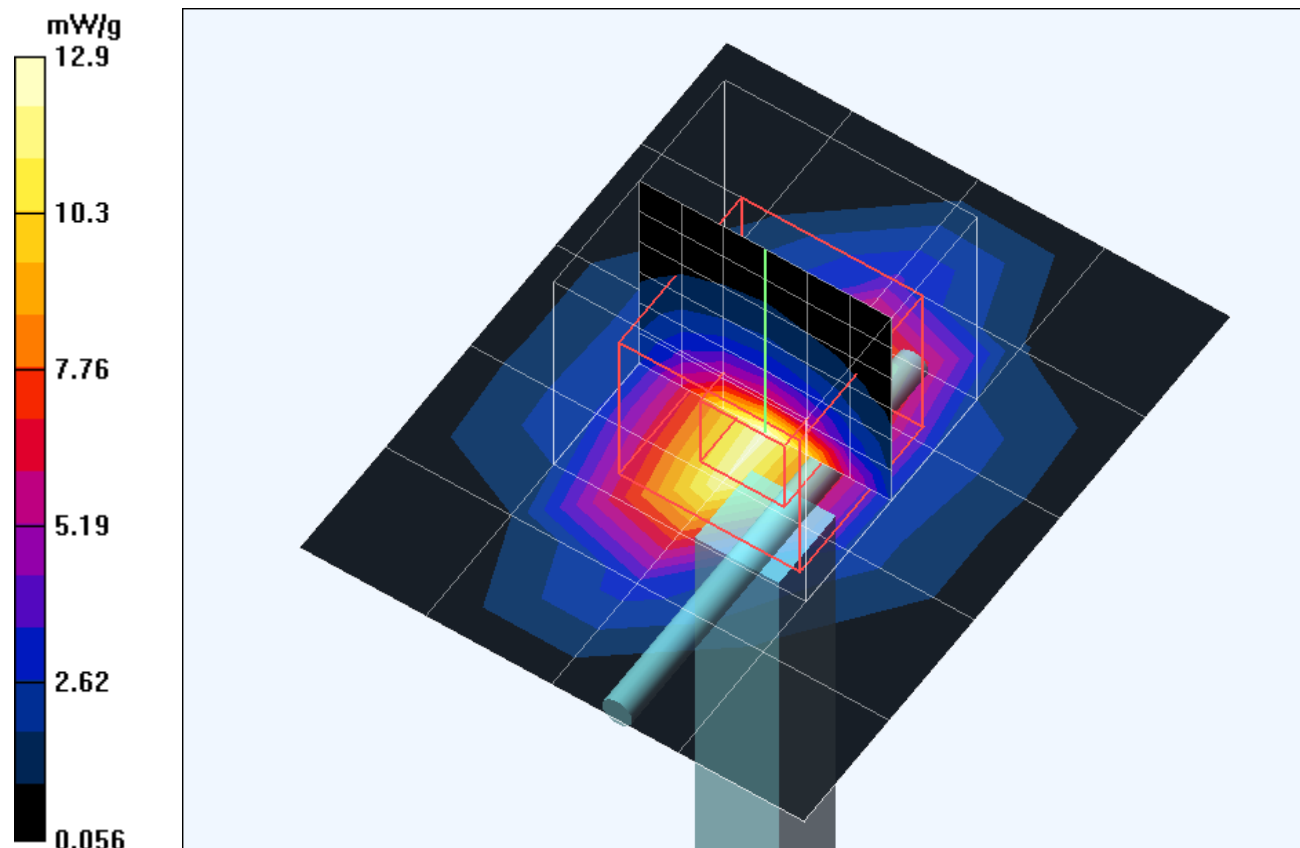
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.1 V/m; Power Drift = -0.1 dB

Peak SAR (extrapolated) = 26 W/kg

SAR(1 g) = 12.4 mW/g; SAR(10 g) = 5.81 mW/g

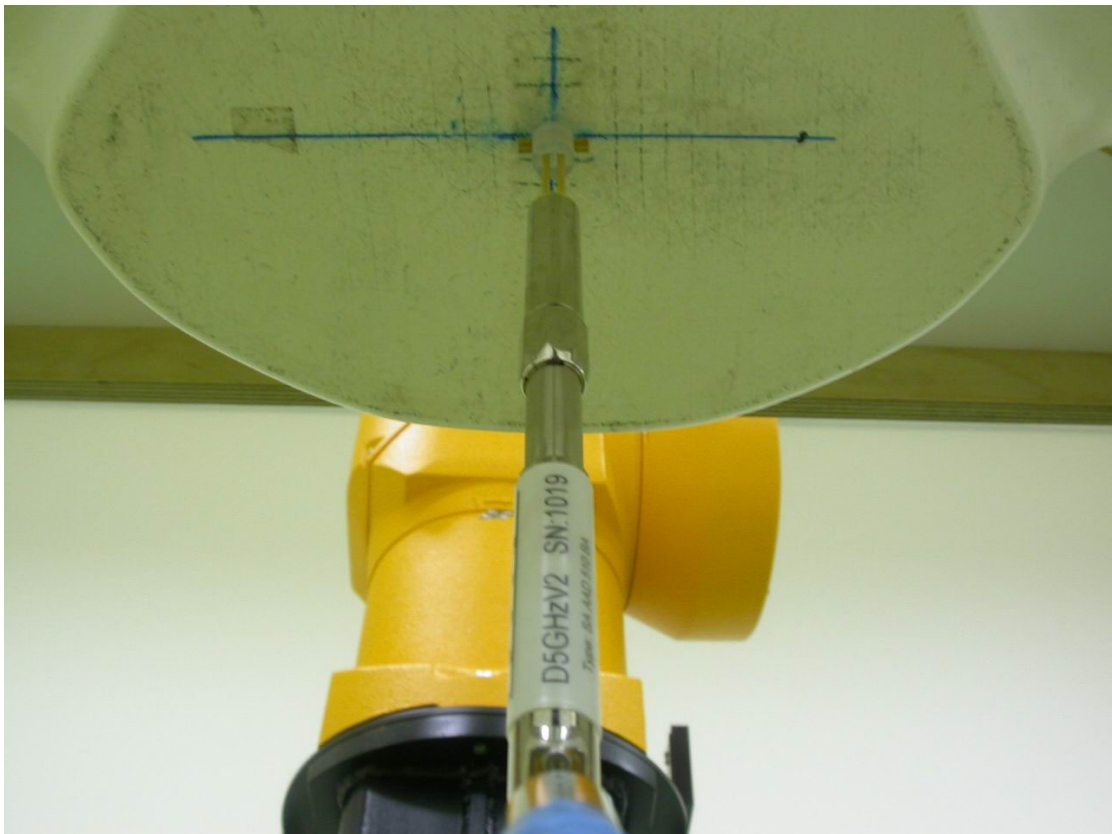
Maximum value of SAR (measured) = 14.1 mW/g

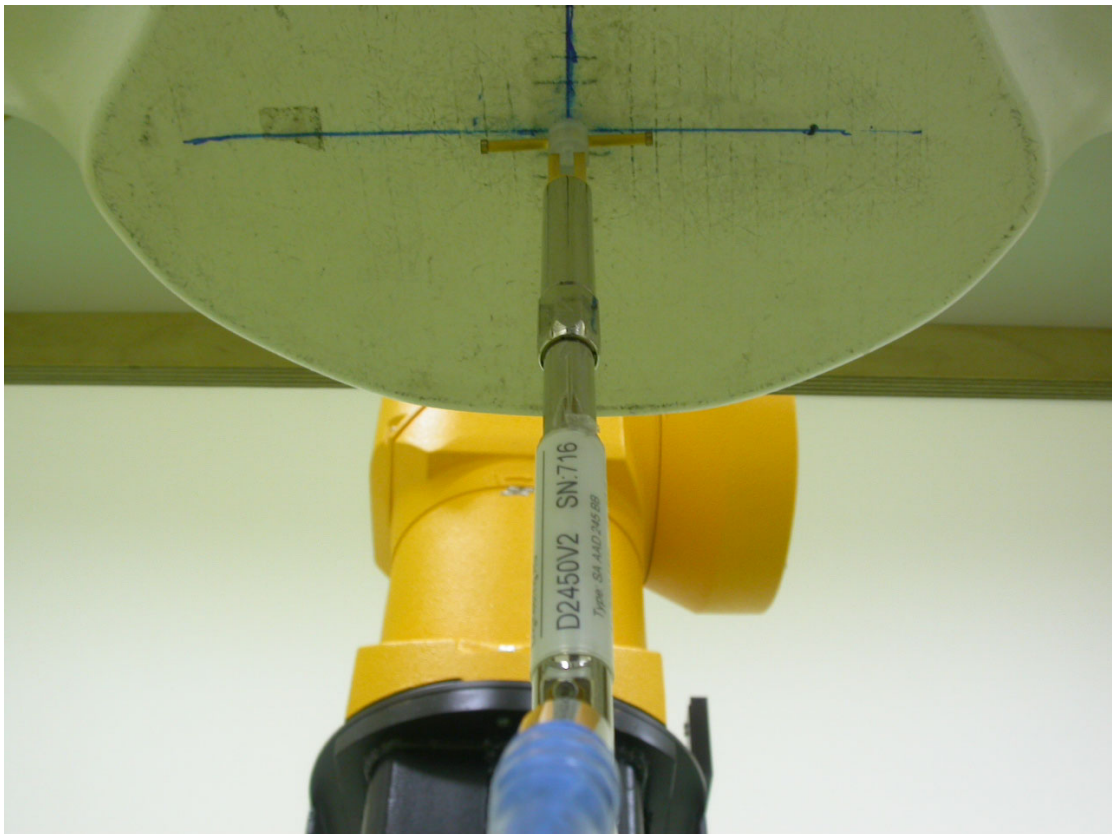


APPENDIX B : ADT SAR MEASUREMENT SYSTEM



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 Hauptstr. 69 CH-8559 Fruthwilen 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 Relative permittivity < 5 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

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Volker Kofe



D2: DOSIMETRIC E-FIELD PROBE

EX3DV3 - SN:3504 ☐

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.

s p e a g

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Schmid & Partner Engineering AG

January 2004

Client **ADT (Auden)**

CALIBRATION CERTIFICATE

Object(s) **EX3DV3 - SN:3504**

Calibration procedure(s) **QA CAL-01.v2**
Calibration procedure for dosimetric E-field probes

Calibration date: **February 20, 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	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

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Laboratory Director	
Approved by:	Fin Bomholt	R&D Director	

Date issued: February 26, 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.