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### ANNEX D: PROBE CALIBRATION CERTIFICATE

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





Schweizerischer Kalibrierdienst S Service suisse d'étalonnage C

Issued: November 25, 2008

Servizio svizzero di taratura S **Swiss Calibration Service** 

Accreditation No.: SCS 108

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

TA Shanghai (Auden) Certificate No: ET3-1737\_Nov08 CALIBRATION CERTIFICATE Object ET3DV6 - SN:1737 Calibration procedure(s) QA CAL-01.v6, QA CAL-12.v5 and QA CAL-23.v3 Calibration procedure for dosimetric E-field probes Calibration date: November 25, 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 9-Sep-08 (No. DAE4-660\_Sep08) Sep-09 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-08) In house check: Oct-09 Function Calibrated by: **Technical Manager** Katja Pokovic Approved by: Niels Kuster Quality Manage

Certificate No: ET3-1737\_Nov08

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

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### Calibration Laboratory of

Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





C

Schweizerischer Kalibrierdienst

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### Glossary:

TSL tissue simulating liquid NORMx,y,z sensitivity in free space

ConvF sensitivity in TSL / NORMx,y,z
DCP diode compression point
Polarization φ rotation around probe axis

Polarization 9 9 rotation around an axis that is in the plane normal to probe axis (at

measurement center), i.e., 9 = 0 is normal to probe axis

#### Calibration is Performed According to the Following Standards:

 a) 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



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ET3DV6 SN:1737

November 25, 2008

# Probe ET3DV6

SN:1737

Manufactured:

September 27, 2002

Last calibrated:

February 19, 2007

Repaired:

November 18, 2008

Recalibrated:

November 25, 2008

### Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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ET3DV6 SN:1737

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### DASY - Parameters of Probe: ET3DV6 SN:1737

Sensitivity in Free Space <sup>A</sup>			Diode Compression <sup>B</sup>		
	NormX	1.42 ± 10.1%	$\mu V/(V/m)^2$	DCP X	93 mV
	NormY	1.68 ± 10.1%	$\mu V/(V/m)^2$	DCP Y	94 mV
	NormZ	1.63 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	85 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

### **Boundary Effect**

900 MHz

Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR <sub>be</sub> [%]	Without Correction Algorithm	10.7	6.9
SAR <sub>be</sub> [%]	With Correction Algorithm	0.3	0.4

#### TSL

1750 MHz

Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR <sub>be</sub> [%]	Without Correction Algorithm	12.5	8.4
SAR <sub>be</sub> [%]	With Correction Algorithm	0.8	0.5

### Sensor Offset

Probe Tip to Sensor Center

2.7 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%.

<sup>&</sup>lt;sup>^</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

Numerical linearization parameter: uncertainty not required.

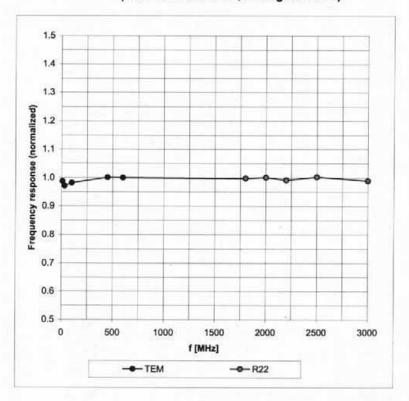
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### Frequency Response of E-Field

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



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)