

**Additional Conversion Factors**  
for Dosimetric E-Field Probe

Type:

**ET3DV6**

Serial Number:

**1521**

Place of Assessment:

**Zurich**

Date of Assessment:

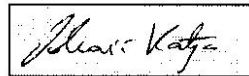
**June 24, 2002**

Probe Calibration Date:

**June 20, 2002**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1800 MHz.

Assessed by:



# Probe ET3DV6

**SN:1521**

Manufactured:	February 1, 2000
Last calibration:	May 24, 2001
Recalibrated:	June 20, 2002

Calibrated for System DASY3

**DASY3 - Parameters of Probe: ET3DV6 SN:1521****Sensitivity in Free Space**

NormX	<b>1.83</b> $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	<b>1.66</b> $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	<b>1.72</b> $\mu\text{V}/(\text{V}/\text{m})^2$

**Diode Compression**

DCP X	<b>97</b>	mV
DCP Y	<b>97</b>	mV
DCP Z	<b>97</b>	mV

**Sensitivity in Tissue Simulating Liquid**

Head	<b>900 MHz</b>	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
Head	<b>835 MHz</b>	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\%$ mho/m
ConvF X	<b>6.5</b> $\pm 9.5\%$ (k=2)		Boundary effect:
ConvF Y	<b>6.5</b> $\pm 9.5\%$ (k=2)		Alpha <b>0.48</b>
ConvF Z	<b>6.5</b> $\pm 9.5\%$ (k=2)		Depth <b>2.12</b>
Head	<b>1800 MHz</b>	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
Head	<b>1900 MHz</b>	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
ConvF X	<b>5.4</b> $\pm 9.5\%$ (k=2)		Boundary effect:
ConvF Y	<b>5.4</b> $\pm 9.5\%$ (k=2)		Alpha <b>0.56</b>
ConvF Z	<b>5.4</b> $\pm 9.5\%$ (k=2)		Depth <b>2.17</b>

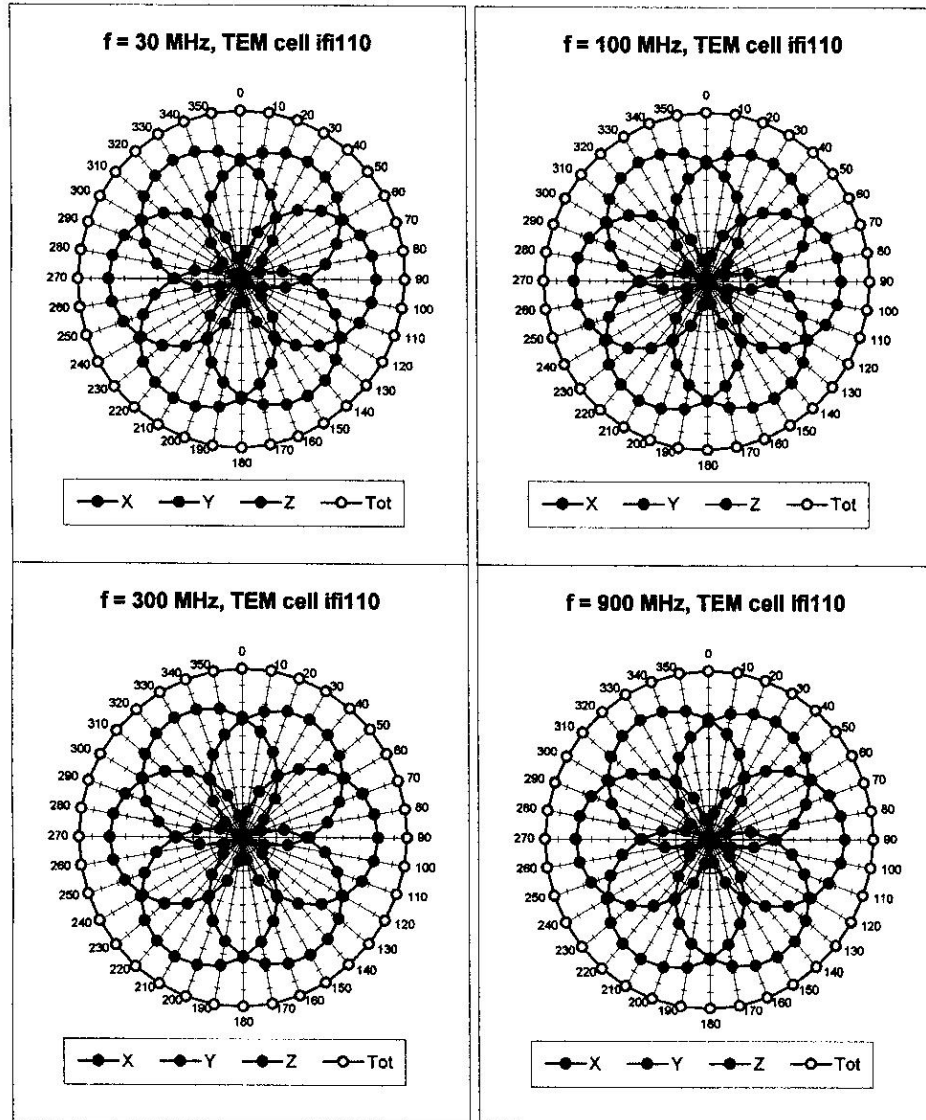
**Boundary Effect**

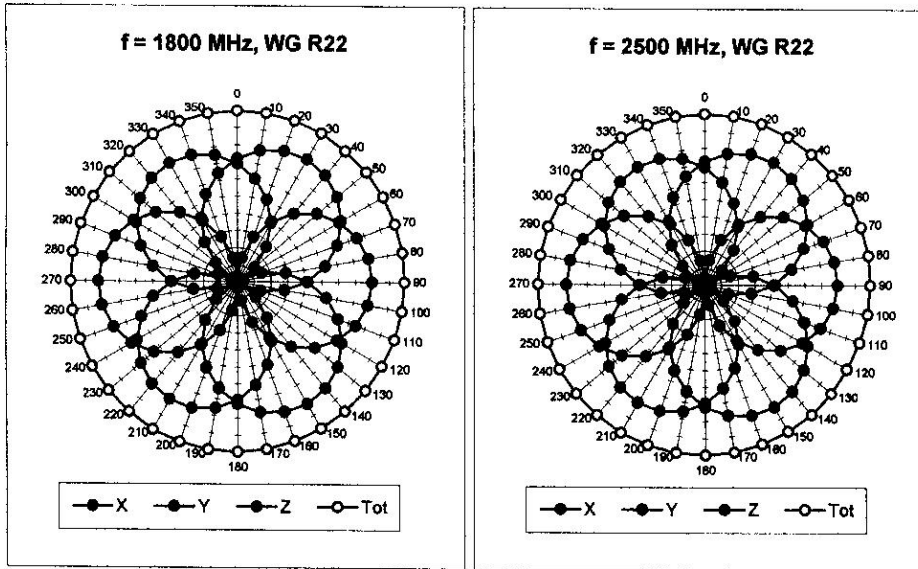
Head	<b>900 MHz</b>	<b>Typical SAR gradient: 5 % per mm</b>	
	Probe Tip to Boundary	<b>1 mm</b>	<b>2 mm</b>
	SAR <sub>be</sub> [%] Without Correction Algorithm	<b>9.2</b>	<b>5.0</b>
	SAR <sub>be</sub> [%] With Correction Algorithm	<b>0.2</b>	<b>0.4</b>
Head	<b>1800 MHz</b>	<b>Typical SAR gradient: 10 % per mm</b>	
	Probe Tip to Boundary	<b>1 mm</b>	<b>2 mm</b>
	SAR <sub>be</sub> [%] Without Correction Algorithm	<b>11.0</b>	<b>7.0</b>
	SAR <sub>be</sub> [%] With Correction Algorithm	<b>0.2</b>	<b>0.2</b>

**Sensor Offset**

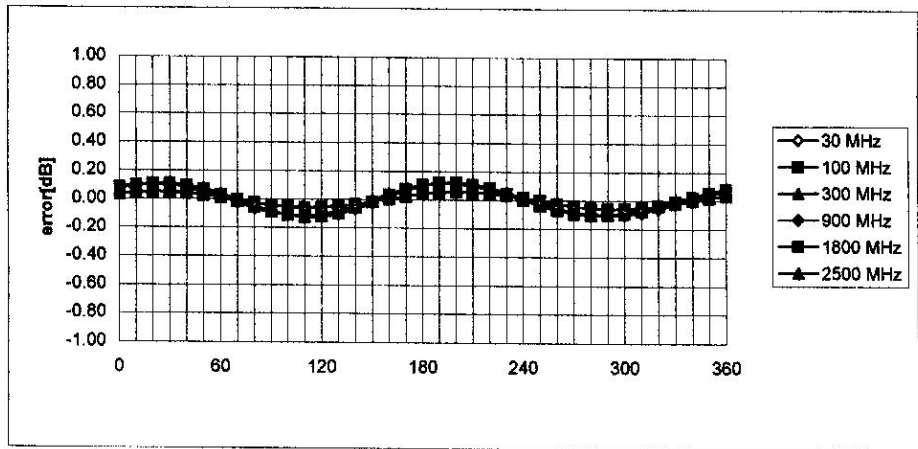
Probe Tip to Sensor Center	<b>2.7</b>	mm
Optical Surface Detection	<b>Non Functional</b>	

### Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$



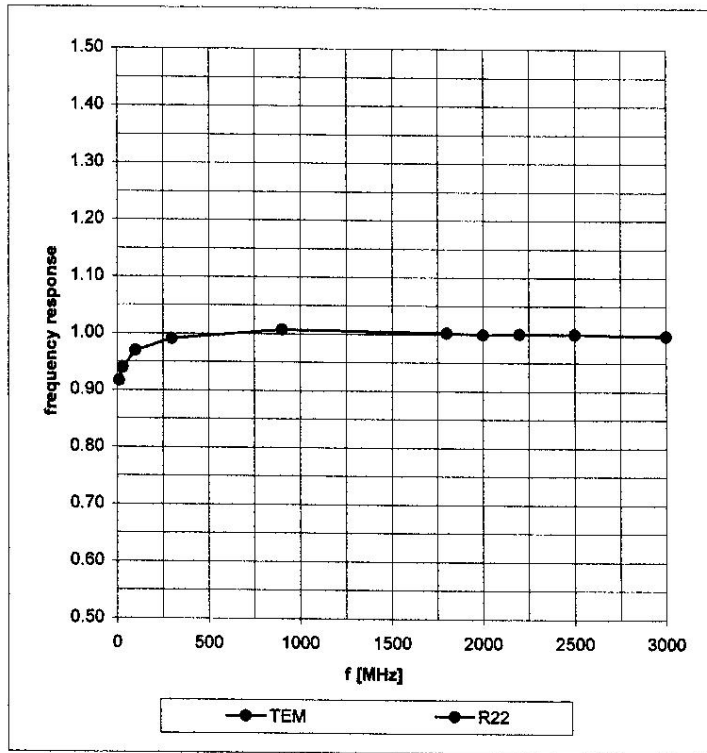


Isotropy Error ( $\phi$ ),  $\theta = 0^\circ$

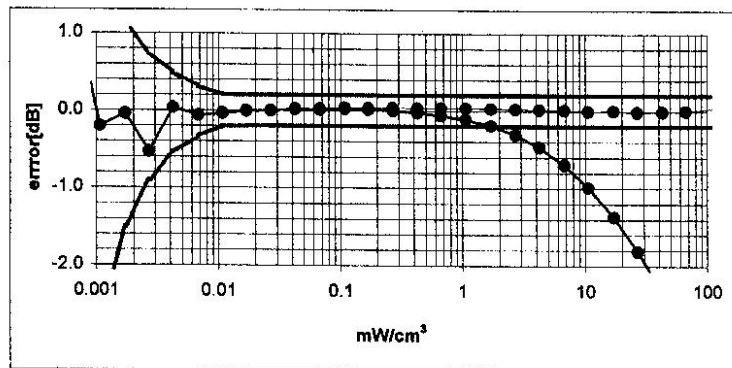
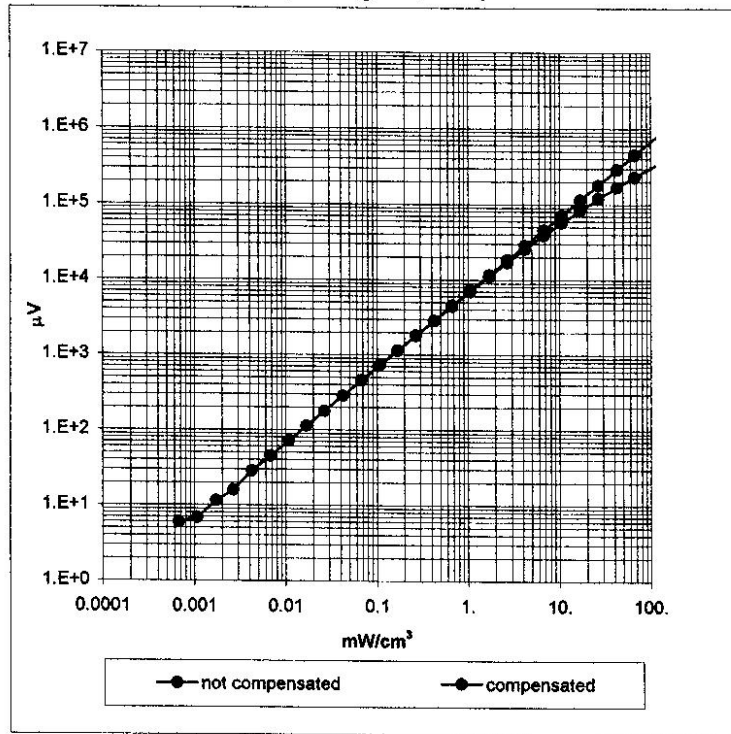


### Frequency Response of E-Field

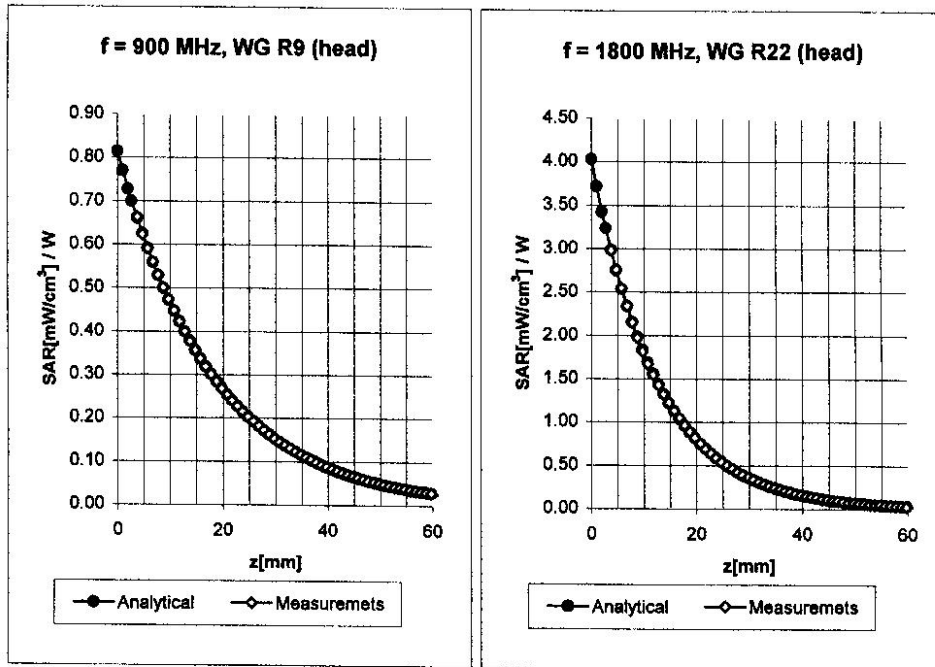
( TEM-Cell:ifi110, Waveguide R22)



### Dynamic Range f(SAR<sub>brain</sub>) ( Waveguide R22 )



### Conversion Factor Assessment

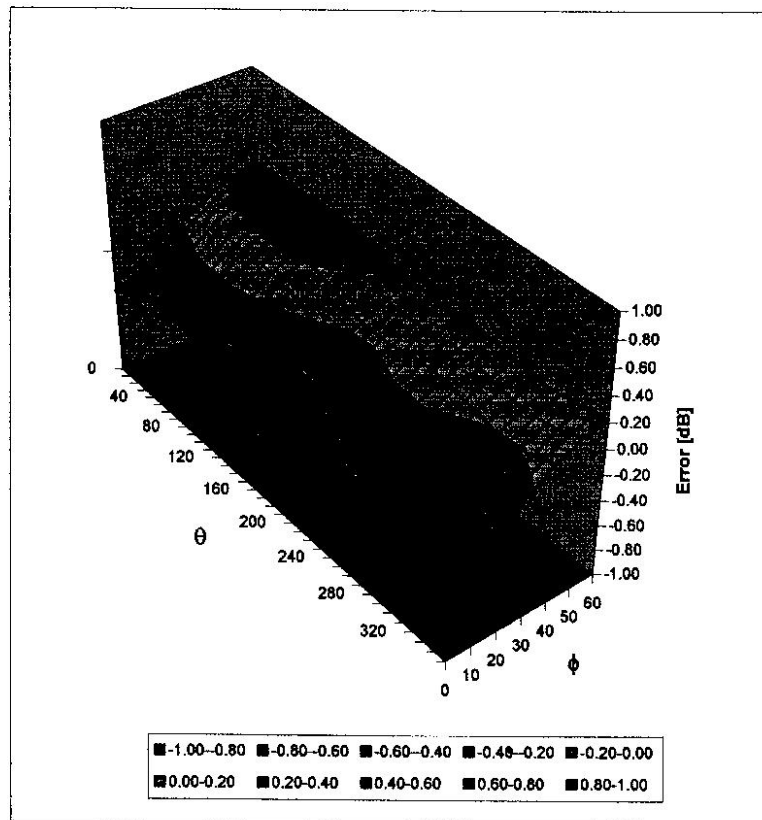


Head	<b>900 MHz</b>	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
Head	<b>835 MHz</b>	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\%$ mho/m
	ConvF X	<b>6.5</b> $\pm 9.5\%$ (k=2)	Boundary effect:
	ConvF Y	<b>6.5</b> $\pm 9.5\%$ (k=2)	Alpha <b>0.48</b>
	ConvF Z	<b>6.5</b> $\pm 9.5\%$ (k=2)	Depth <b>2.12</b>
Head	<b>1800 MHz</b>	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
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	ConvF Y	<b>5.4</b> $\pm 9.5\%$ (k=2)	Alpha <b>0.56</b>
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### Deviation from Isotropy in HSL

Error ( $\theta, \phi$ ),  $f = 900$  MHz



# Schmid & Partner Engineering AG

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## Calibration Certificate

### Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1521

Place of Calibration:

Zurich

Date of Calibration:

June 20, 2002

Calibration Interval:

12 months

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:

D. Vetter

Approved by:

Alexis Katya

### Dosimetric E-Field Probe ET3DV6 SN:1521

Conversion factor ( $\pm$  standard deviation)

1950 MHz	ConvF	5.1 $\pm$ 8%	$\epsilon_r = 40.0 \pm 5\%$ $\sigma = 1.40 \pm 5\%$ mho/m (head tissue)
835 MHz	ConvF	6.4 $\pm$ 8%	$\epsilon_r = 55.2 \pm 5\%$ $\sigma = 0.97 \pm 5\%$ mho/m (body tissue)
900 MHz	ConvF	6.3 $\pm$ 8%	$\epsilon_r = 55.0 \pm 5\%$ $\sigma = 1.05 \pm 5\%$ mho/m (body tissue)
1800 MHz	ConvF	5.0 $\pm$ 8%	$\epsilon_r = 53.3 \pm 5\%$ $\sigma = 1.52 \pm 5\%$ mho/m (body tissue)
1950 MHz	ConvF	4.7 $\pm$ 8%	$\epsilon_r = 53.3 \pm 5\%$ $\sigma = 1.52 \pm 5\%$ mho/m (body tissue)