

## Calibration Certificate

### Dosimetric E-Field Probe

Type:

**ET3DV6**

Serial Number:

**1103**

Place of Calibration:

**Zurich**

Date of Calibration:

**Jan. 15, 2001**

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:

*Nikolaos Nemanja*

Approved by:

*Alvaro Katze*

# Probe ET3DV6

## SN:1103

Manufactured:	May 13, 1995
Last calibration:	April 4, 2000
Remake (PEEK):	January 15, 2001
Recalibrated:	January 15, 2001

Calibrated for System DASY3

**DASY3 - Parameters of Probe: ET3DV6 SN:1103****Sensitivity in Free Space**

NormX	<b>1.73</b> $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	<b>1.75</b> $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	<b>1.67</b> $\mu\text{V}/(\text{V}/\text{m})^2$

**Diode Compression**

DCP X	<b>99</b> mV
DCP Y	<b>99</b> mV
DCP Z	<b>99</b> mV

**Sensitivity in Tissue Simulating Liquid**

**Brain**                      **450 MHz**                       $\epsilon_r = 48 \pm 5\%$                        $\sigma = 0.50 \pm 10\%$  mho/m

ConvF X	<b>7.19</b> extrapolated	Boundary effect:	
ConvF Y	<b>7.19</b> extrapolated	Alpha	<b>0.21</b>
ConvF Z	<b>7.19</b> extrapolated	Depth	<b>2.97</b>

**Brain**                      **900 MHz**                       $\epsilon_r = 42.5 \pm 5\%$                        $\sigma = 0.86 \pm 10\%$  mho/m

ConvF X	<b>6.70</b> $\pm 7\%$ (k=2)	Boundary effect:	
ConvF Y	<b>6.70</b> $\pm 7\%$ (k=2)	Alpha	<b>0.32</b>
ConvF Z	<b>6.70</b> $\pm 7\%$ (k=2)	Depth	<b>2.77</b>

**Brain**                      **1500 MHz**                       $\epsilon_r = 41 \pm 5\%$                        $\sigma = 1.32 \pm 10\%$  mho/m

ConvF X	<b>6.04</b> interpolated	Boundary effect:	
ConvF Y	<b>6.04</b> interpolated	Alpha	<b>0.46</b>
ConvF Z	<b>6.04</b> interpolated	Depth	<b>2.51</b>

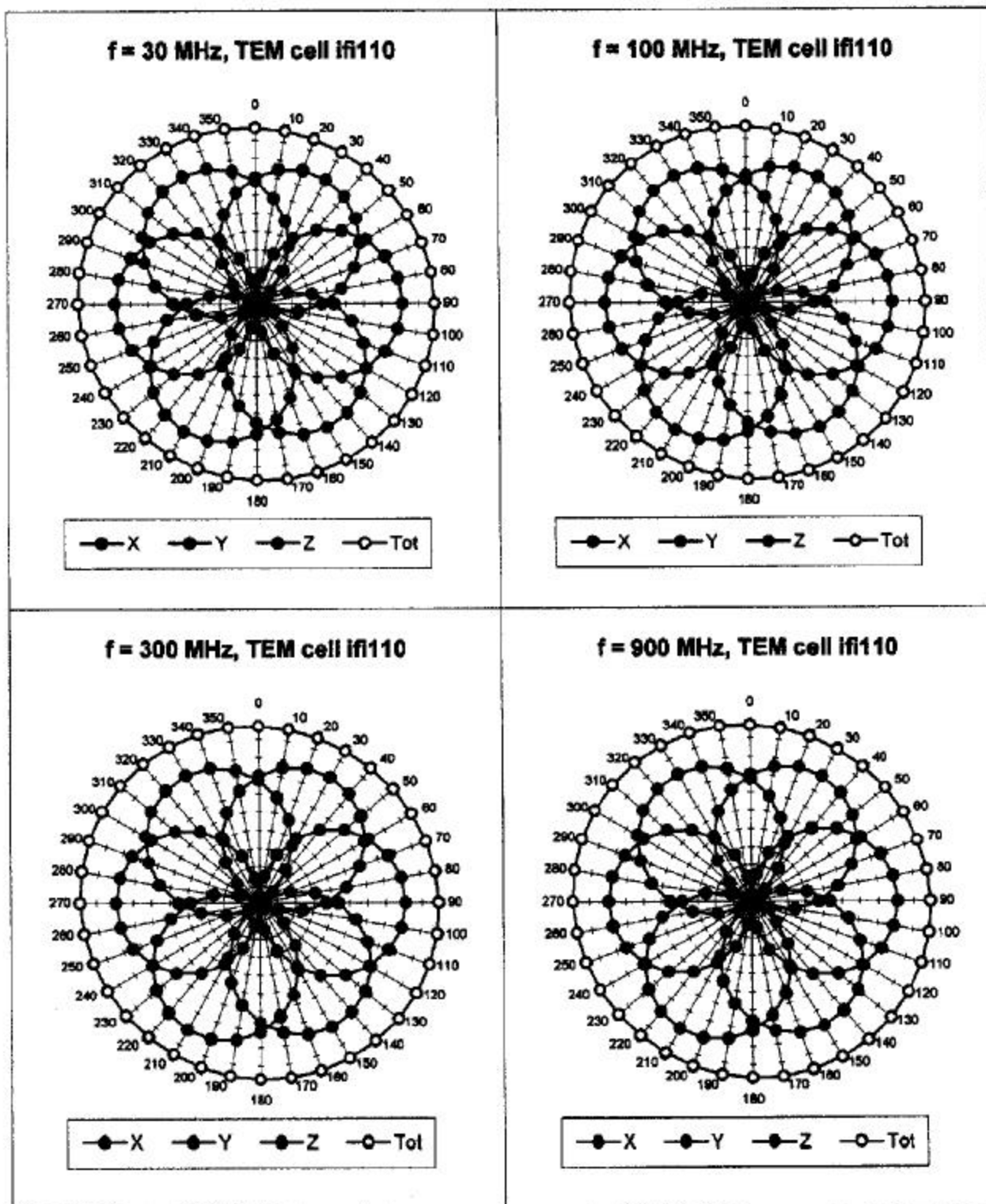
**Brain**                      **1800 MHz**                       $\epsilon_r = 41 \pm 5\%$                        $\sigma = 1.68 \pm 10\%$  mho/m

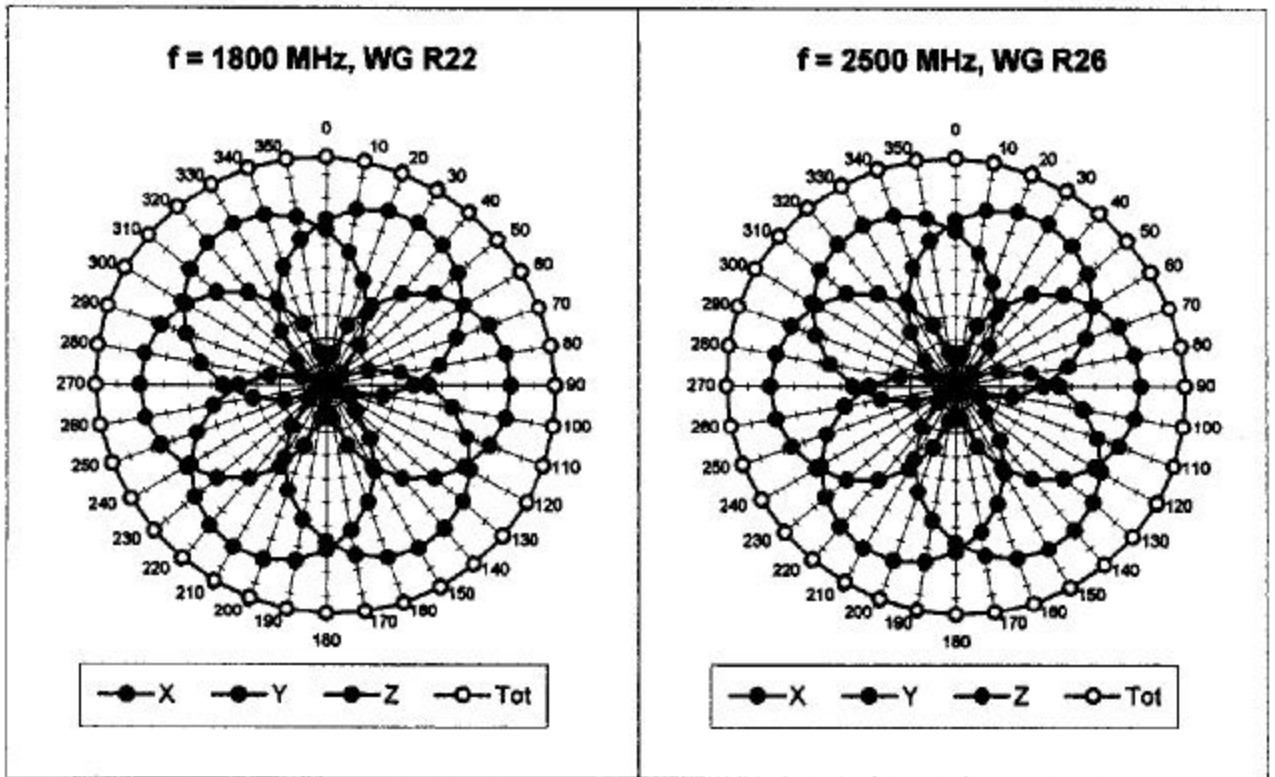
ConvF X	<b>5.71</b> $\pm 7\%$ (k=2)	Boundary effect:	
ConvF Y	<b>5.71</b> $\pm 7\%$ (k=2)	Alpha	<b>0.53</b>
ConvF Z	<b>5.71</b> $\pm 7\%$ (k=2)	Depth	<b>2.38</b>

**Sensor Offset**

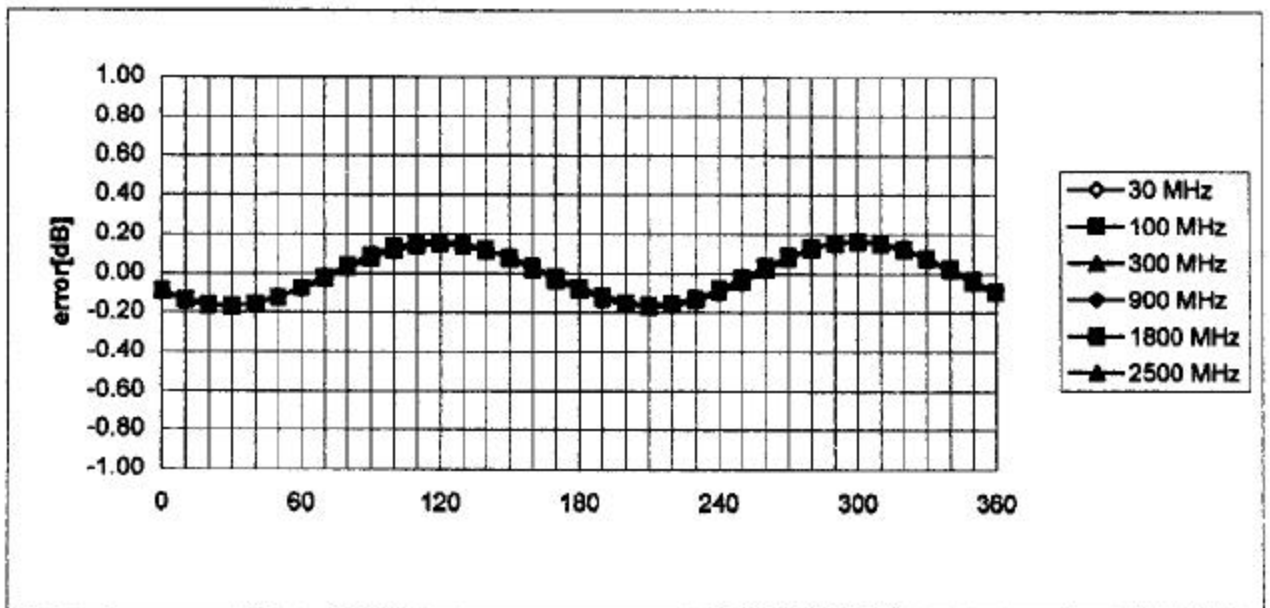
Probe Tip to Sensor Center	<b>2.7</b>	mm
Optical Surface Detection	<b>2.2 <math>\pm</math> 0.2</b>	mm

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



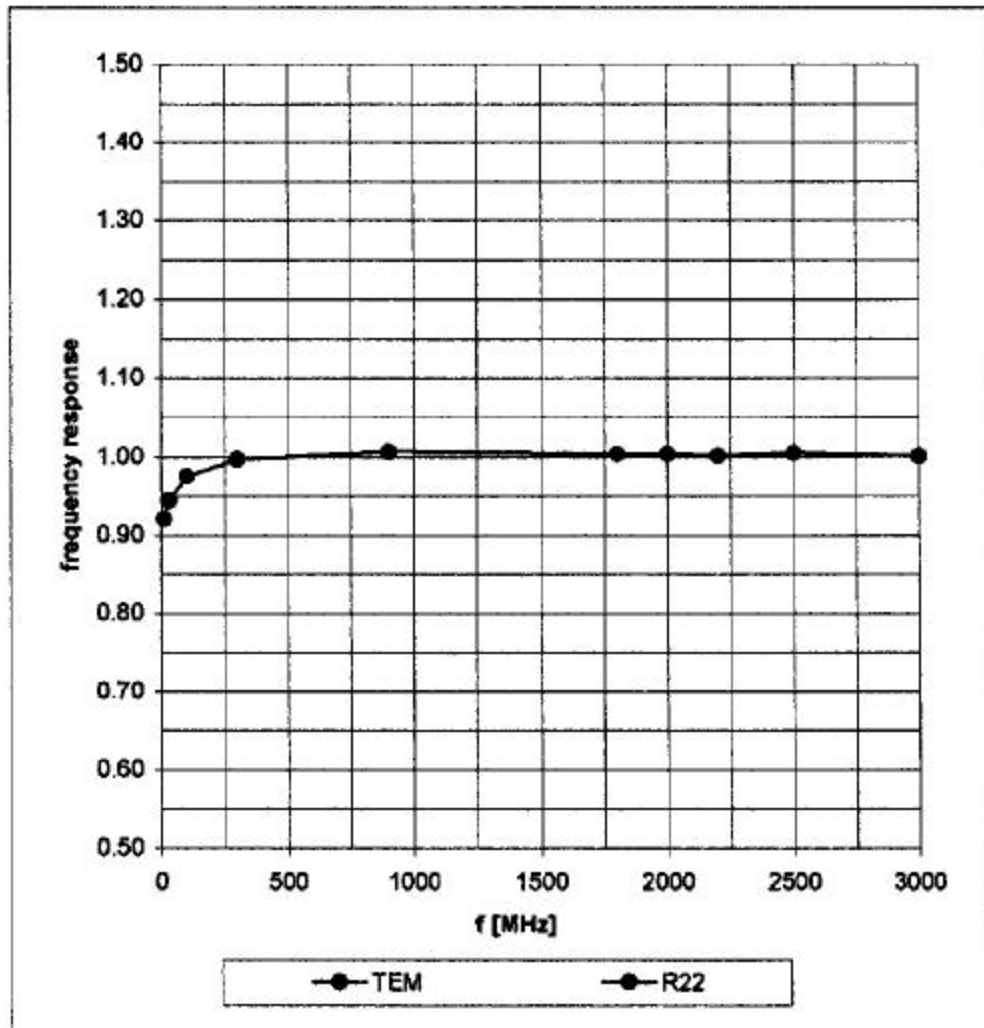


### Isotropy Error ( $\phi$ ), $\theta = 0^\circ$

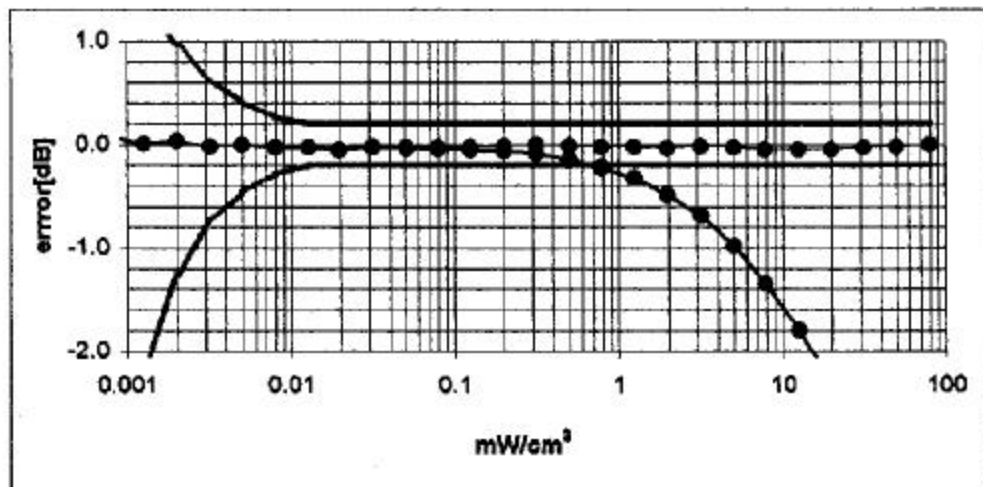
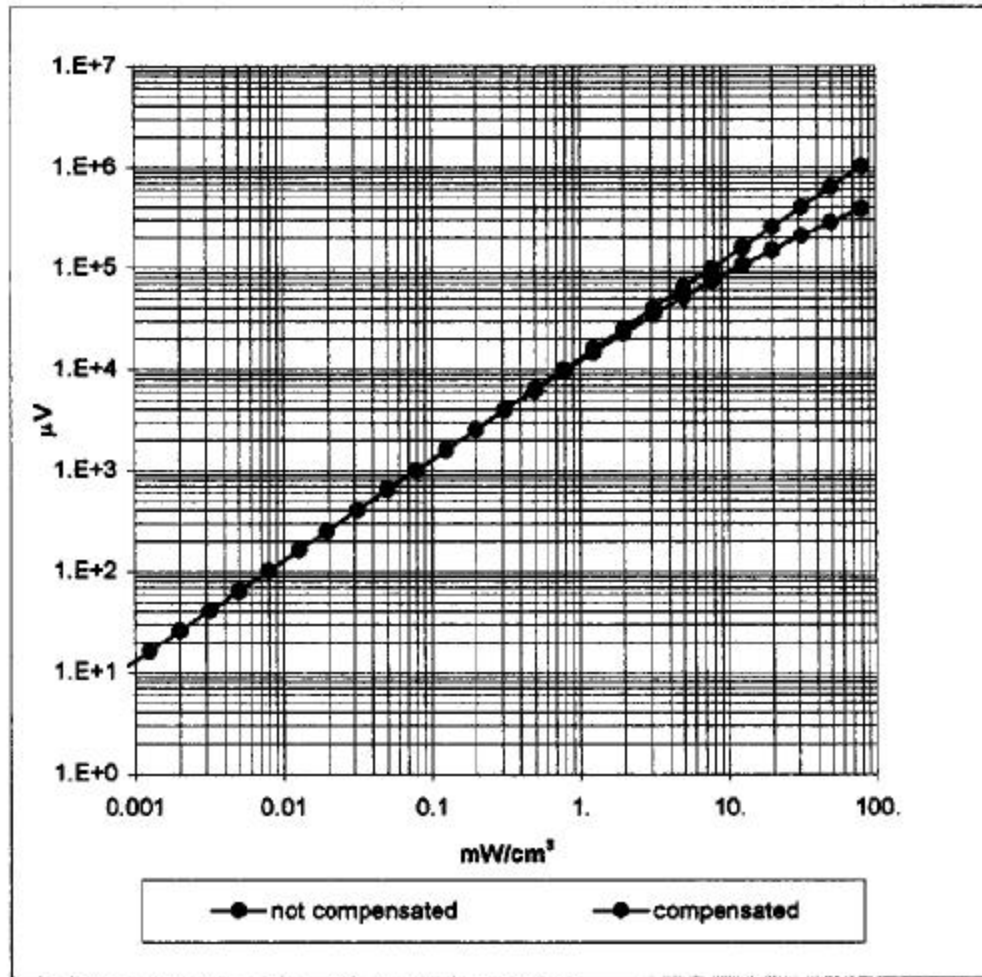


# Frequency Response of E-Field

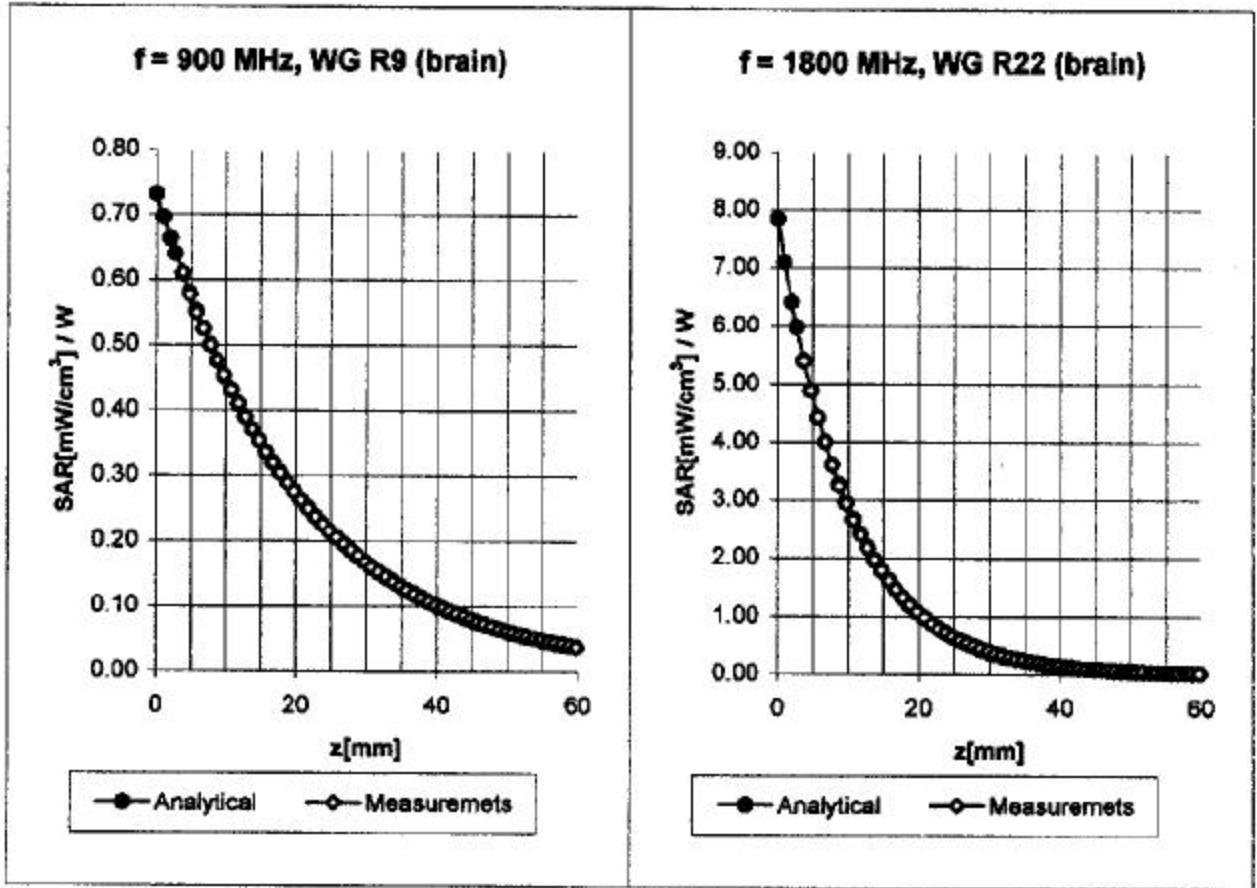
( TEM-Cell:ifi110, Waveguide R22)



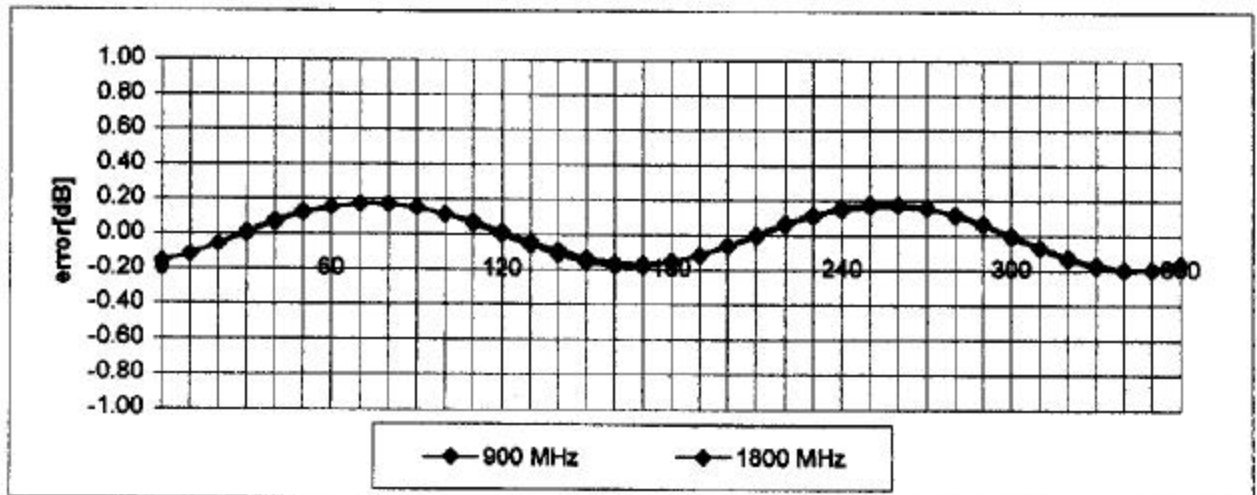
## Dynamic Range f(SAR<sub>brain</sub>) ( TEM-Cell:ifi110 )



## Conversion Factor Assessment



## Receiving Pattern ( $\phi$ ) ( in brain tissue, z = 5 mm )



## Dosimetric E-Field Probe ET3DV6 SN:1103

Conversion factor ( $\pm$  standard deviation)

835 MHz	ConvF	6.8 $\pm$ 8%	$\epsilon_r = 44.0$ $\sigma = 0.90$ mho/m (brain tissue)
835 MHz	ConvF	6.8 $\pm$ 8%	$\epsilon_r = 52.0$ $\sigma = 1.10$ mho/m (muscle tissue)
925 MHz	ConvF	6.7 $\pm$ 8%	$\epsilon_r = 44.0$ $\sigma = 0.93$ mho/m (brain tissue)
925 MHz	ConvF	6.6 $\pm$ 8%	$\epsilon_r = 52.0$ $\sigma = 1.20$ mho/m (muscle tissue)
1800 MHz	ConvF	5.6 $\pm$ 8%	$\epsilon_r = 40.3$ $\sigma = 1.35$ mho/m (brain tissue)
1900 MHz	ConvF	5.4 $\pm$ 8%	$\epsilon_r = 39.9$ $\sigma = 1.42$ mho/m (brain tissue)
1800 MHz	ConvF	5.3 $\pm$ 8%	$\epsilon_r = 50.0$ $\sigma = 1.58$ mho/m (muscle tissue)
1900 MHz	ConvF	5.2 $\pm$ 8%	$\epsilon_r = 50.0$ $\sigma = 1.64$ mho/m (muscle tissue)