APPENDIX C: PROBE CALIBRATION CERTIFICATE

Calibration Certificate

Dosimetric E-Field Probe

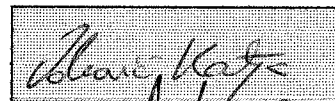|	
Type:	ET3DV6
Serial Number:	1618
Place of Calibration:	Zurich
Date of Calibration:	February 21, 2002
Calibration Interval:	12 months

asset #
039924

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:

Approved by:

Probe ET3DV6

SN:1618

Manufactured:	January 25, 2002
Last calibration:	February 21, 2002

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1618

Sensitivity in Free Space

		Diode Compression		
NormX	$1.80\ \mu V/(V/m)^2$	DCP X	97	mV
NormY	$1.75\ \mu V/(V/m)^2$	DCP Y	97	mV
NormZ	$1.88\ \mu V/(V/m)^2$	DCP Z	97	mV

Sensitivity in Tissue Simulating Liquid

Head	900 MHz	$\varepsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
Head	835 MHz	$\varepsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\%$ mho/m

ConvF X	6.8	$\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.8	$\pm 9.5\%$ (k=2)	Alpha	0.32
ConvF Z	6.8	$\pm 9.5\%$ (k=2)	Depth	2.69

Head	1800 MHz	$\varepsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
Head	1900 MHz	$\varepsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m

ConvF X	5.3	$\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	5.3	$\pm 9.5\%$ (k=2)	Alpha	0.45
ConvF Z	5.3	$\pm 9.5\%$ (k=2)	Depth	2.37

Boundary Effect

Head   900 MHz   Typical SAR gradient: 5 % per mm

	1 mm	2 mm
Probe Tip to Boundary		
SAR_{be} [%] Without Correction Algorithm	9.3	5.4
SAR_{be} [%] With Correction Algorithm	0.3	0.5

Head   1800 MHz   Typical SAR gradient: 10 % per mm

	1 mm	2 mm
Probe Tip to Boundary		
SAR_{be} [%] Without Correction Algorithm	10.2	6.7
SAR_{be} [%] With Correction Algorithm	0.2	0.2

Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.3 ± 0.2	mm

Receiving Pattern (φ), θ = 0°

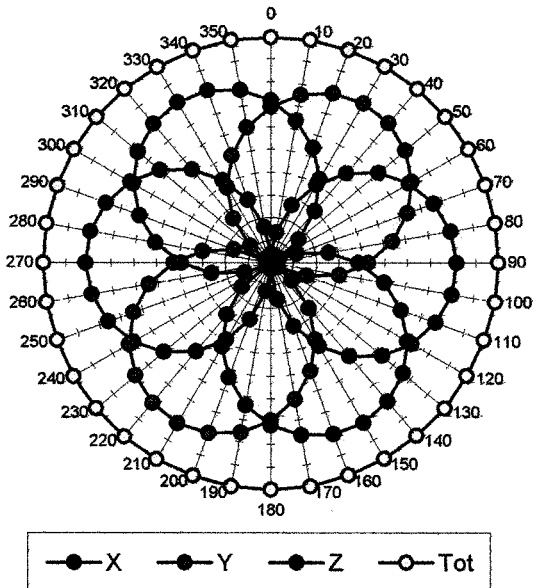### f = 30 MHz, TEM cell ifi110
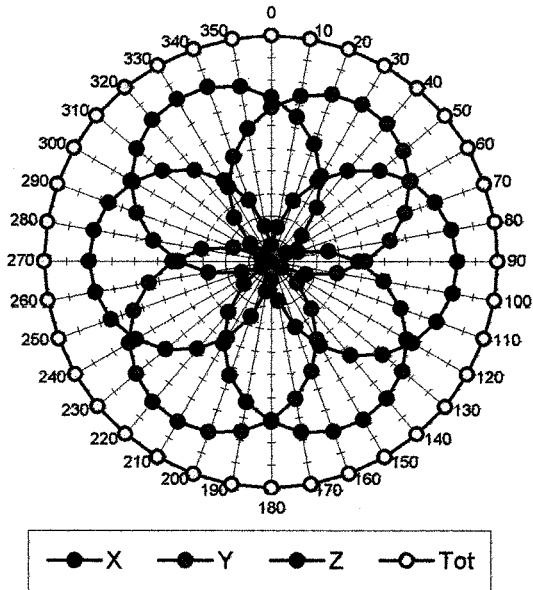
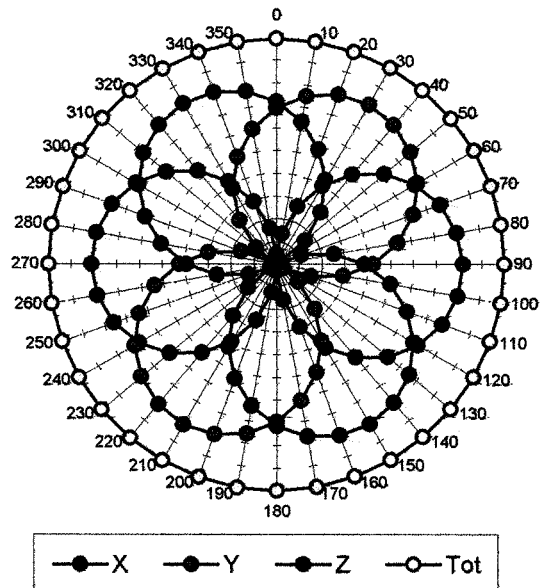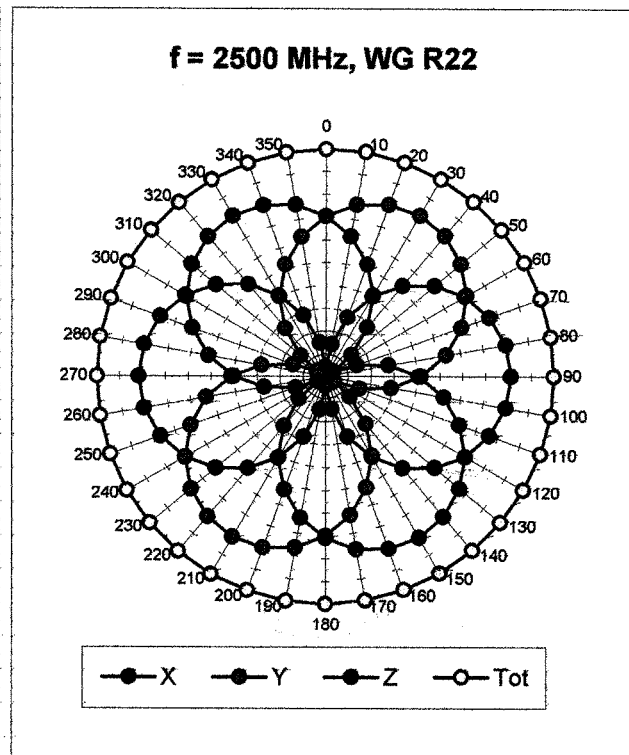### f = 100 MHz, TEM cell ifi110
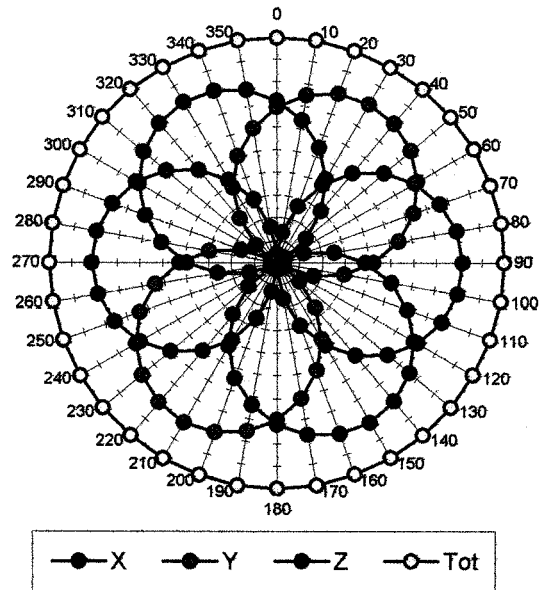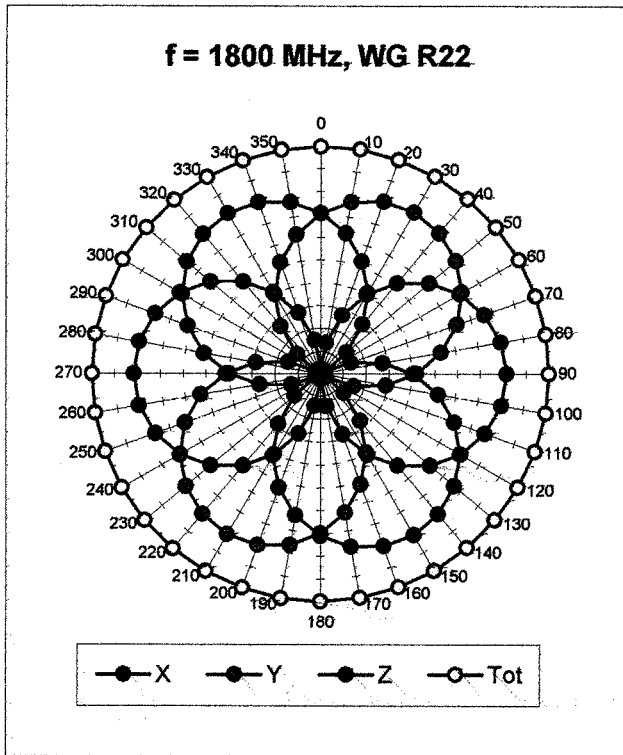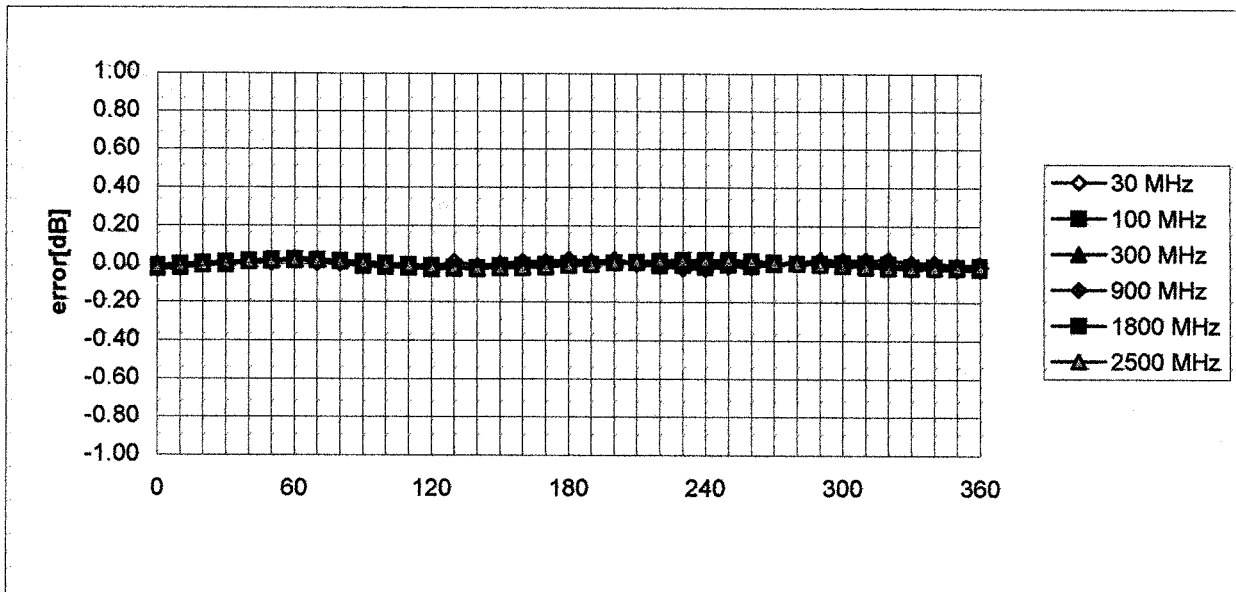

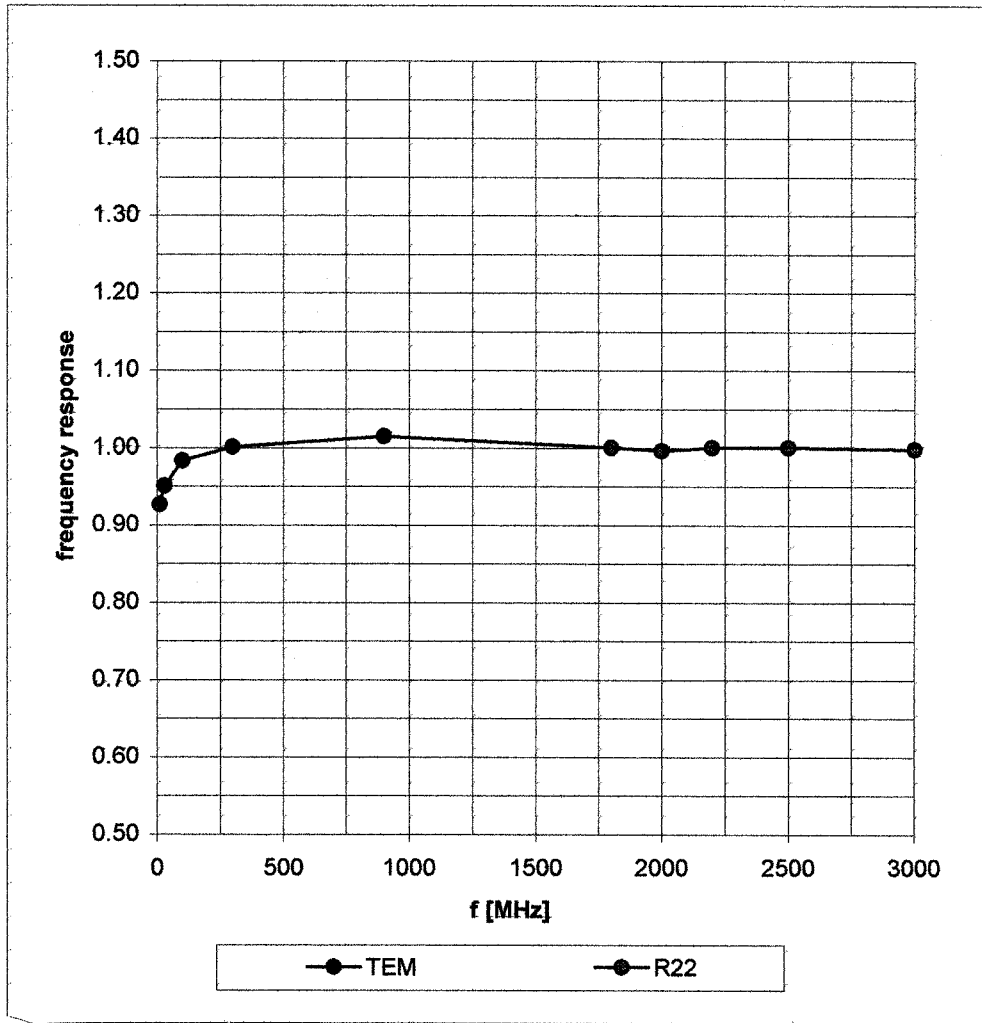### f = 300 MHz, TEM cell ifi110

f = 900 MHz, TEM cell ifi110

f = 1800 MHz, WG R22

f = 2500 MHz, WG R22
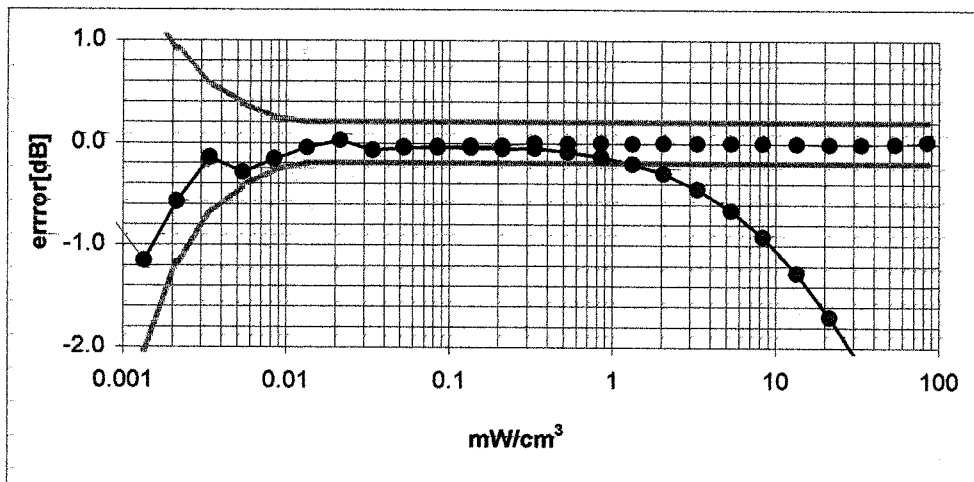
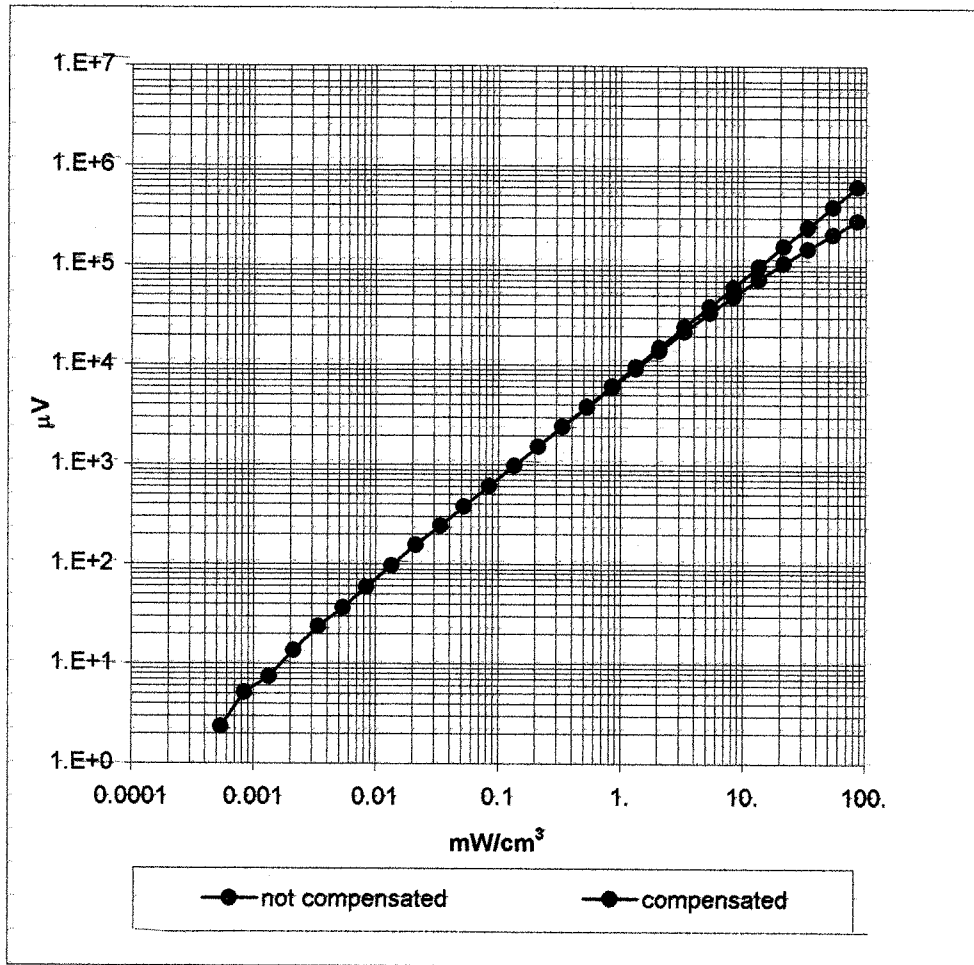

Isotropy Error (φ), θ = 0°
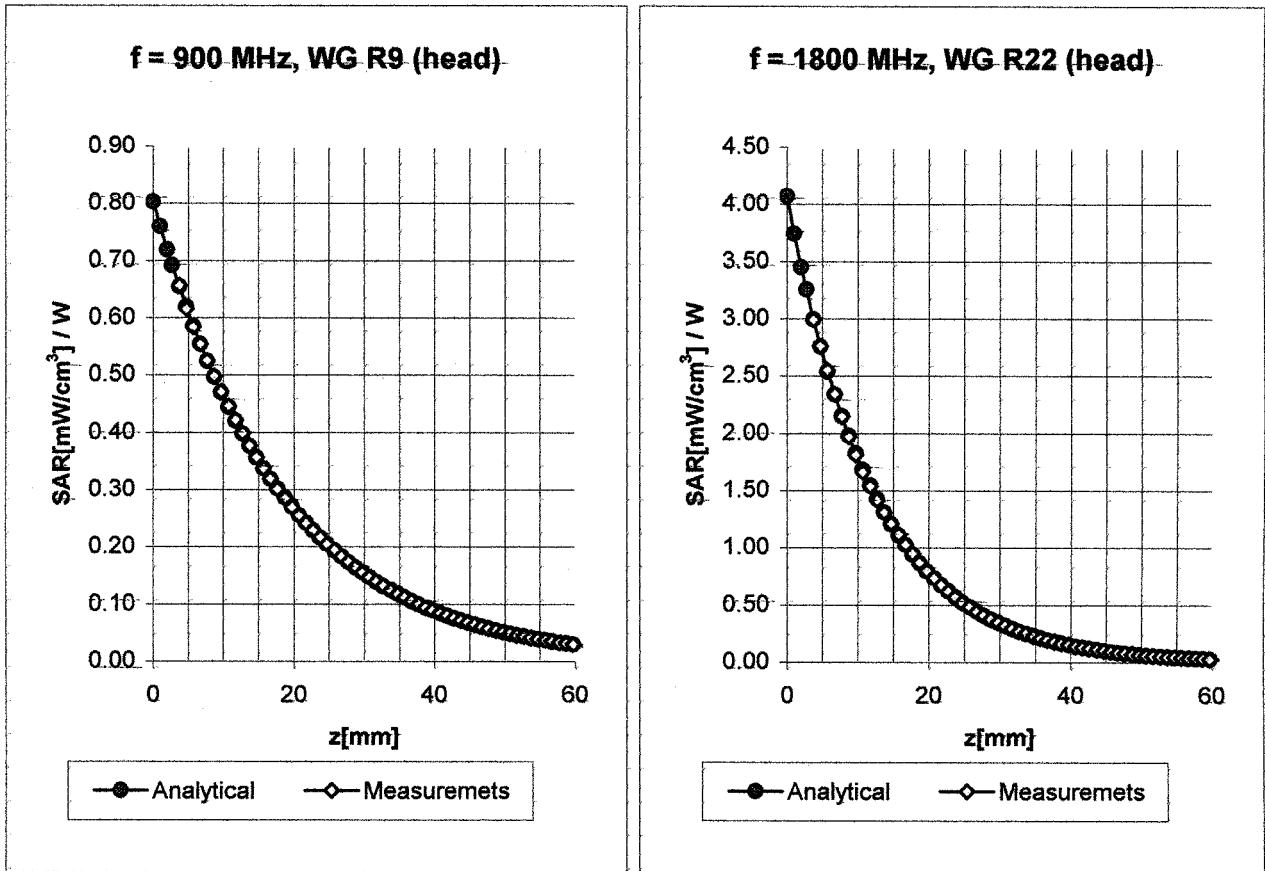
Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)

Dynamic Range f(SAR$_{brain}$)

(Waveguide R22)

Conversion Factor Assessment

Head	900 MHz	$\varepsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
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ConvF Y	6.8 ± 9.5% (k=2)		Alpha 0.32
ConvF Z	6.8 ± 9.5% (k=2)		Depth 2.69

Head	1800 MHz	$\varepsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
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ConvF X	5.3 ± 9.5% (k=2)		Boundary effect:
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Deviation from Isotropy in HSL

Error (θ,φ), f = 900 MHz