

3. Dipole impedance and return loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	1.148 ns	(one direction)
Transmission factor:	0.982	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance holder was in place during impedance measurements.

Feedpoint impedance at 2450 MHz:	$\text{Re}\{Z\} = 54.1 \Omega$
	$\text{Im}\{Z\} = 2.4 \Omega$
Return Loss at 2450 MHz	- 26.8 dB

4. Measurement Conditions

The measurements were performed in the flat section of the new SAM twin phantom filled with body simulating solution of the following electrical parameters at 2450 MHz:

Relative permittivity	52.4	$\pm 5\%$
Conductivity	1.99 mho/m	$\pm 10\%$

The DASY System with a dosimetric E-field probe ET3DV6 (SN:1507, conversion factor 4.5 at 2450 MHz) was used for the measurements.

The dipole feedpoint was positioned below the center marking and oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 20mm was aligned with the dipole. The 5x5x7 fine cube was chosen for cube integration. Probe isotropy errors were cancelled by measuring the SAR with normal and 90° turned probe orientations and averaging.

The dipole input power (forward power) was 250mW $\pm 3\%$. The results are normalized to 1W input power.

5.1. SAR Measurement with DASY3 System

Standard SAR-measurements were performed according to the measurement conditions described in section 4. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the worst-case extrapolation are:

averaged over 1 cm ³ (1 g) of tissue:	57.2 mW/g
averaged over 10 cm ³ (10 g) of tissue:	27.0 mW/g

5.2 SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 4. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm ³ (1 g) of tissue:	51.6 mW/g
averaged over 10 cm ³ (10 g) of tissue:	25.0 mW/g

6. Dipole impedance and return loss

The dipole was positioned at the flat phantom sections according to section 4 (with body tissue inside the phantom) and the distance holder was in place during impedance measurements.

Feedpoint impedance at 2450 MHz:	Re{Z} = 49.6 Ω
	Im {Z} = 4.2 Ω
Return Loss at 2450 MHz	- 27.5 dB



26 Sep 2002 16:04:11

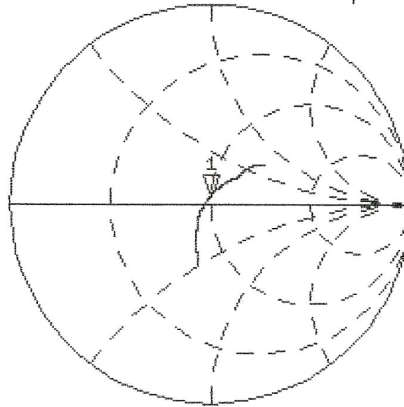
CH1 S11 1 U FS

1: 49.619 Ω 4.1934 Ω 272.41 μ H 2 450.000 000 MHz

↑

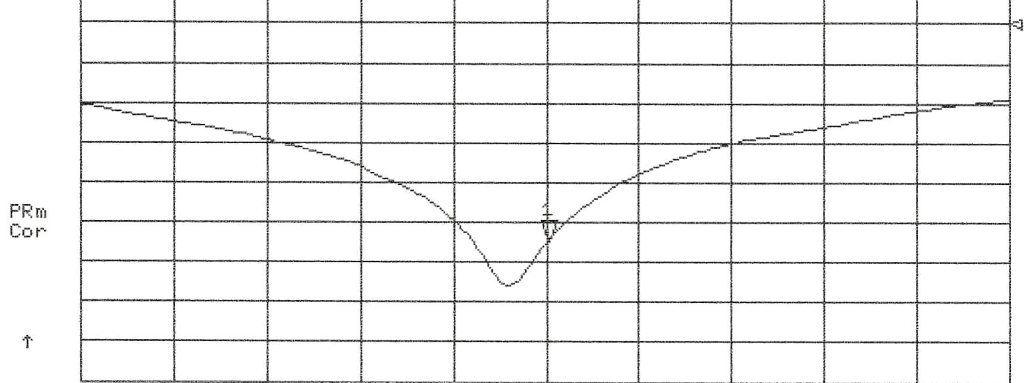
Del

PRM
Cor
AVG
16



↑

CH2 S11 LOG 5 dB/REF 0 dB 1: -27.517 dB 2 450.000 000 MHz



PRM
Cor

↑

START 2 250.000 000 MHz STOP 2 650.000 000 MHz



D3: DOSIMETRIC E-FILED PROBE

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1687

Place of Calibration:

Zurich

Date of Calibration:

June 5, 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. Vellen

Approved by:

Adrian Kutz

Probe ET3DV6

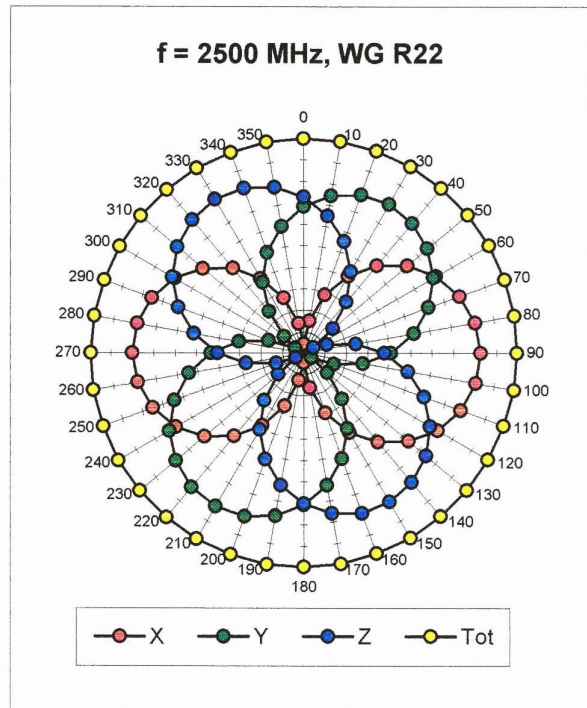
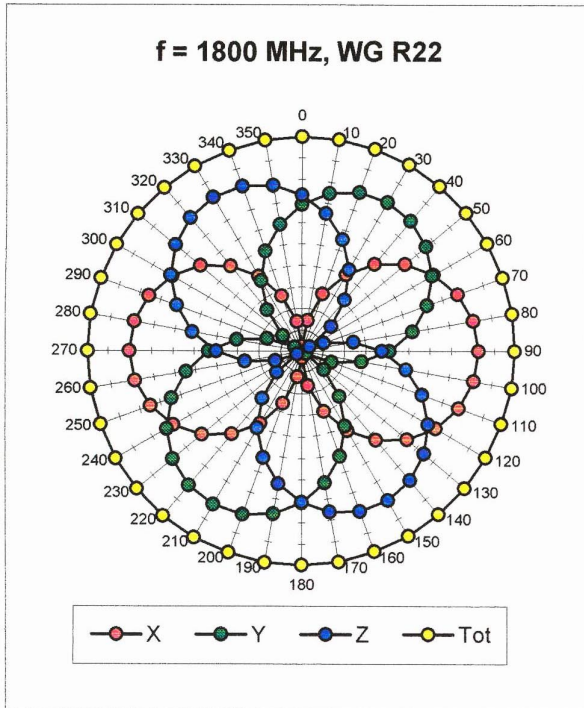
SN:1687

Manufactured:	May 28, 2002
Last calibration:	June 5, 2002

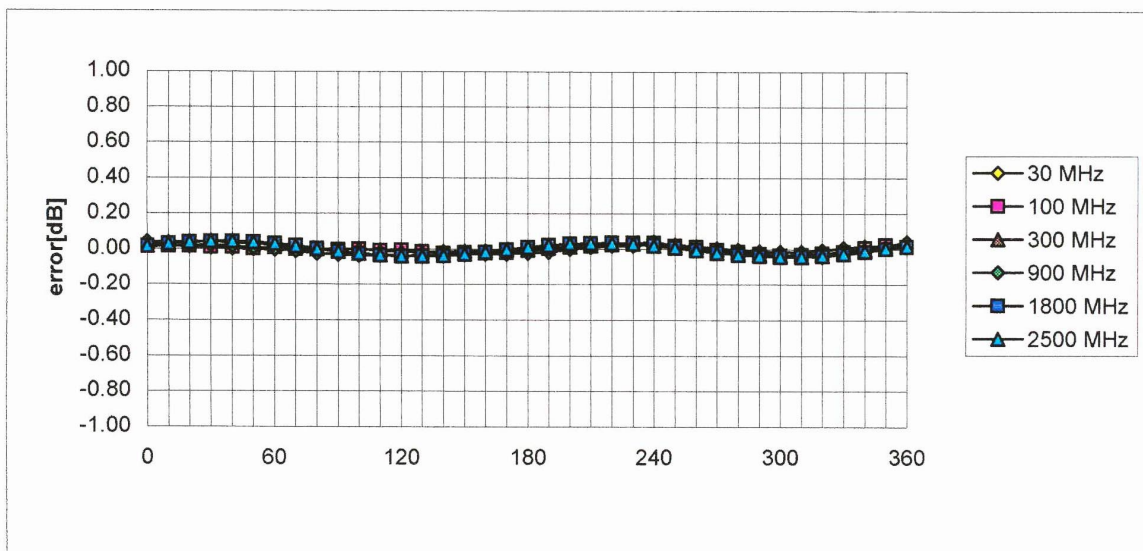
Calibrated for System DASY3

ET3DV6 SN:1687

June 5, 2002



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



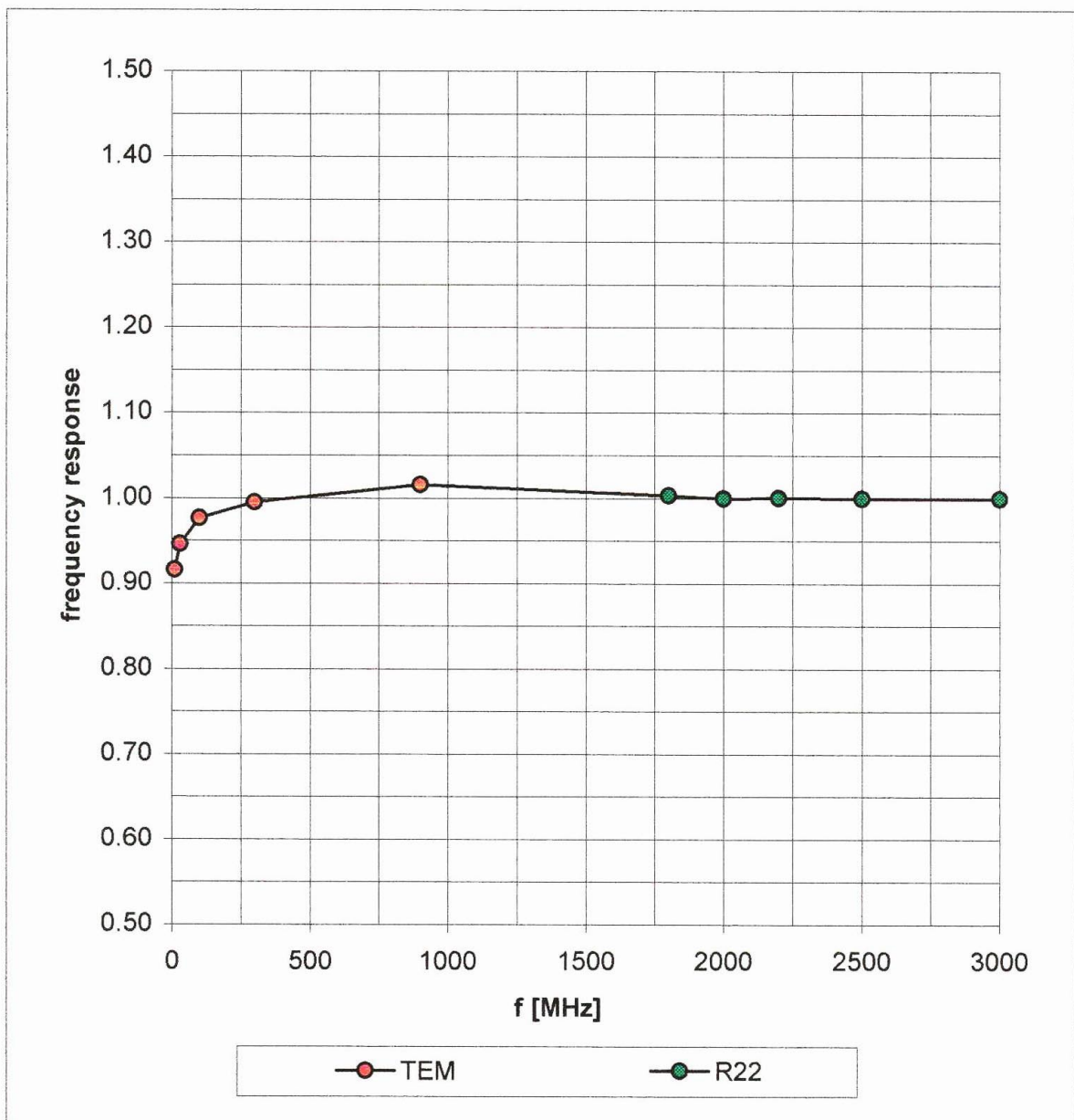


ET3DV6 SN:1687

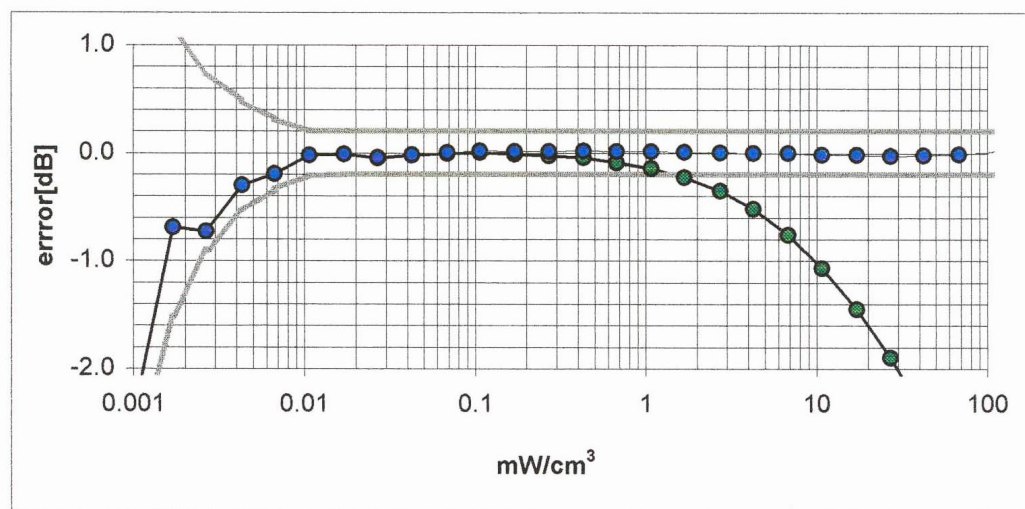
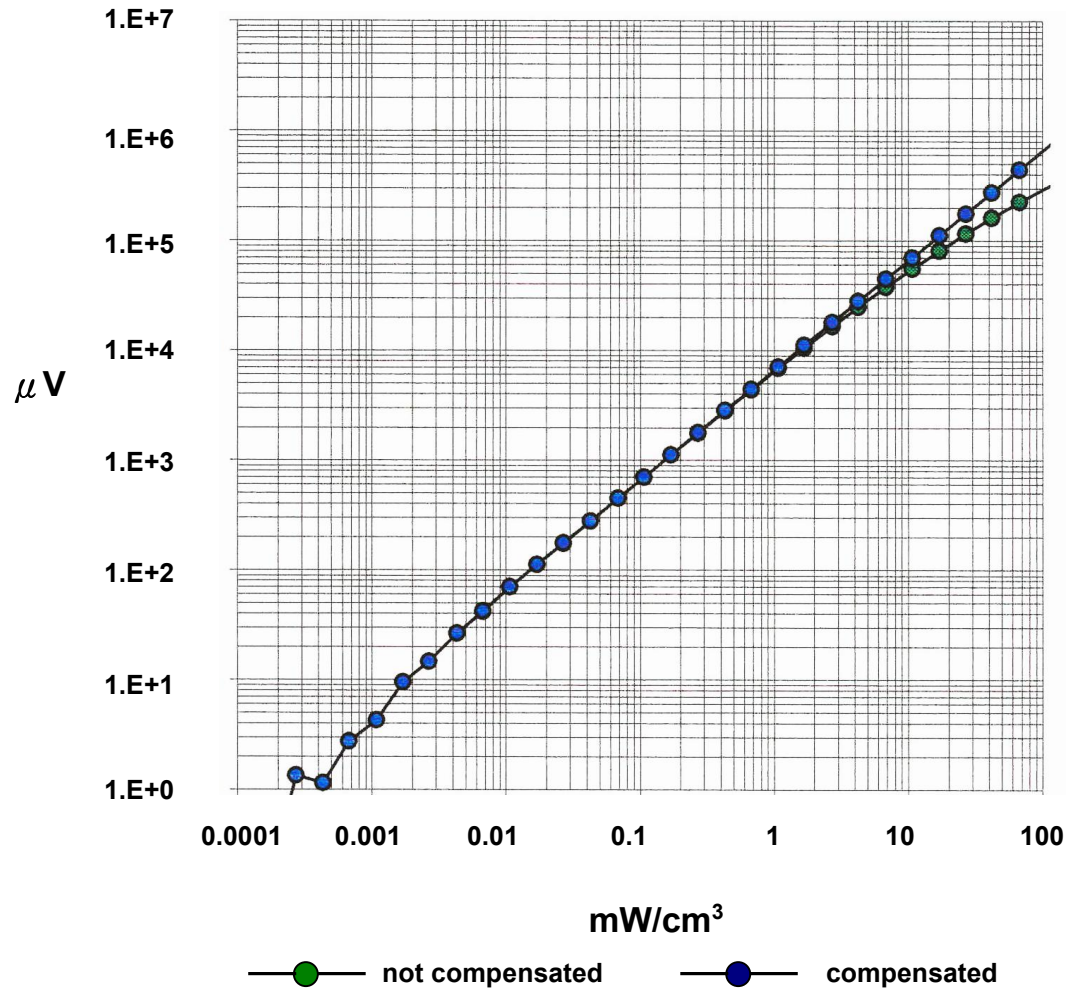
June 5, 2002

Frequency Response of E-Field

(TEM – Cell:ifi110, Waveguide R22)



Dynamic Range f (SAR_{brain}) (Waveguide R22)



Calibration Certificate

Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1687

Place of Calibration:

Zurich

Date of Calibration:

September 28, 2002

Calibration Interval:

12 months

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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:

Alain Klotz

Probe ET3DV6

SN:1687

Additional Conversion Factors

Calibrated: September 28, 2002

Calibrated for DASY Systems

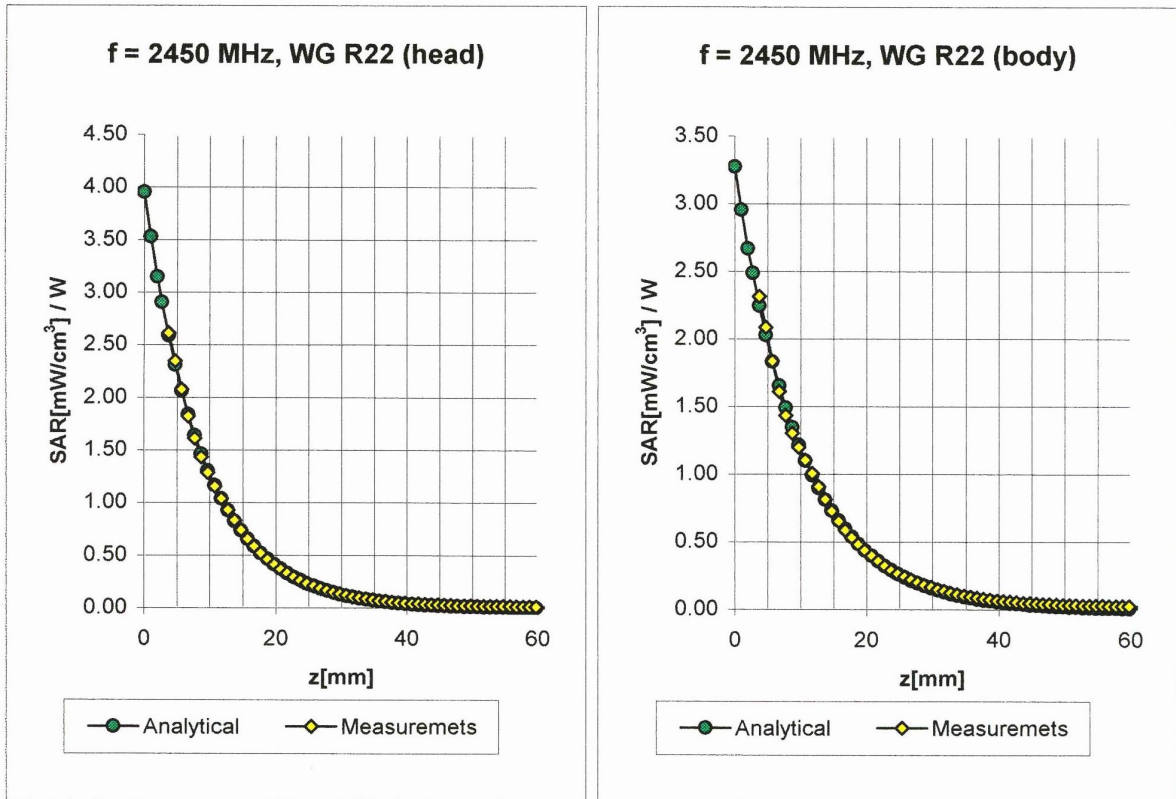
(Note: non-compatible with DASY2 system!)



ET3DV6 SN:1687

September 28, 2002

Conversion Factor Assessment



Head	2450 MHz	$\epsilon_r = 39.2 \pm 5\%$	$\sigma = 1.80 \pm 5\% \text{ mho/m}$
ConvF X	4.9 $\pm 8.9\%$ (k=2)	Boundary effect:	
ConvF Y	4.9 $\pm 8.9\%$ (k=2)	Alpha	1.00
ConvF Z	4.9 $\pm 8.9\%$ (k=2)	Depth	1.70
Body	2450 MHz	$\epsilon_r = 52.7 \pm 5\%$	$\sigma = 1.95 \pm 5\% \text{ mho/m}$
ConvF X	4.4 $\pm 8.9\%$ (k=2)	Boundary effect:	
ConvF Y	4.4 $\pm 8.9\%$ (k=2)	Alpha	1.00
ConvF Z	4.4 $\pm 8.9\%$ (k=2)	Depth	1.65