

ATTACHMENT R

PROBE CALIBRATION

FCC ID: POQWTE-500

Probe ET3DV6

SN:1703

Manufactured:	July 3, 2002
Last calibration:	July 29, 2002
Recalibrated:	February 7, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1703

Sensitivity in Free Space

NormX	1.64 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.71 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.71 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression

DCP X	95	mV
DCP Y	95	mV
DCP Z	95	mV

Sensitivity in Tissue Simulating Liquid

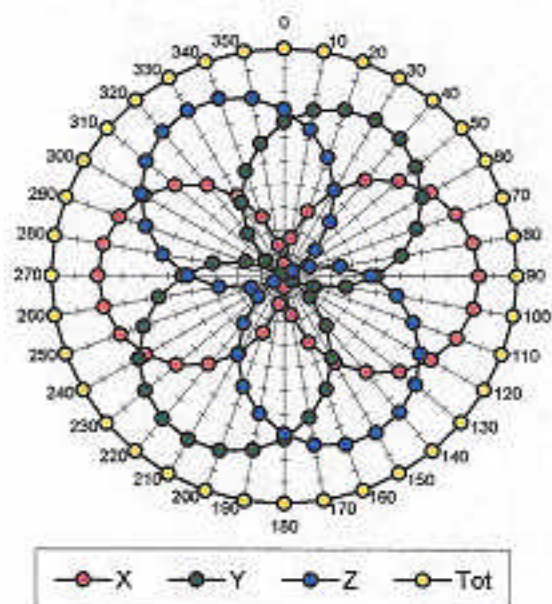
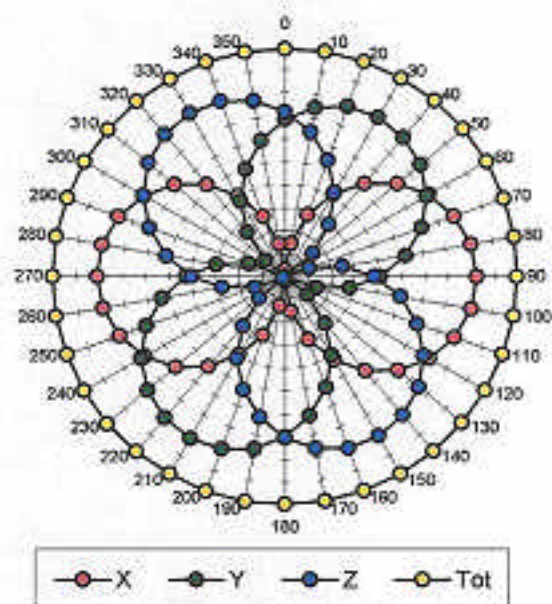
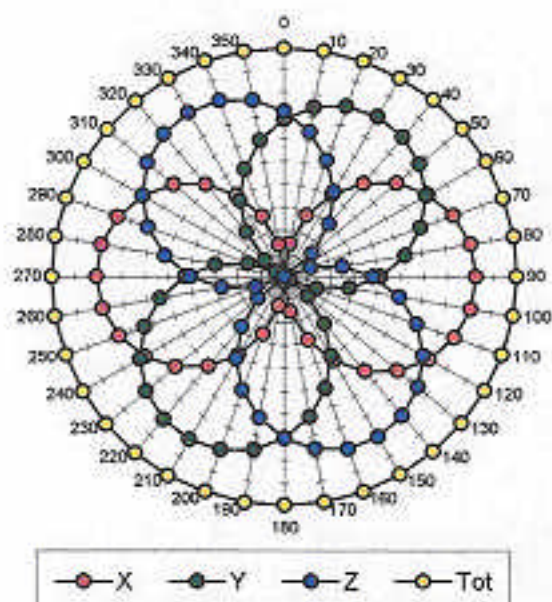
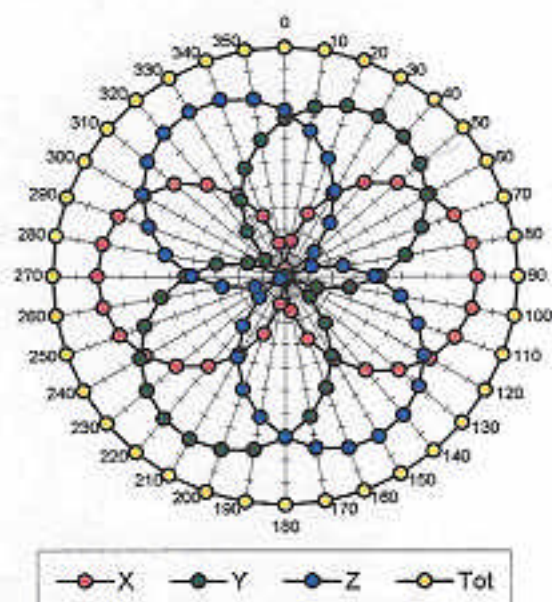
Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\% \text{ mho/m}$
ConvF X	6.8 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.8 $\pm 9.5\%$ (k=2)	Alpha	0.35
ConvF Z	6.8 $\pm 9.5\%$ (k=2)	Depth	2.73
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
Head	1900 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
ConvF X	5.4 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	5.4 $\pm 9.5\%$ (k=2)	Alpha	0.47
ConvF Z	5.4 $\pm 9.5\%$ (k=2)	Depth	2.78

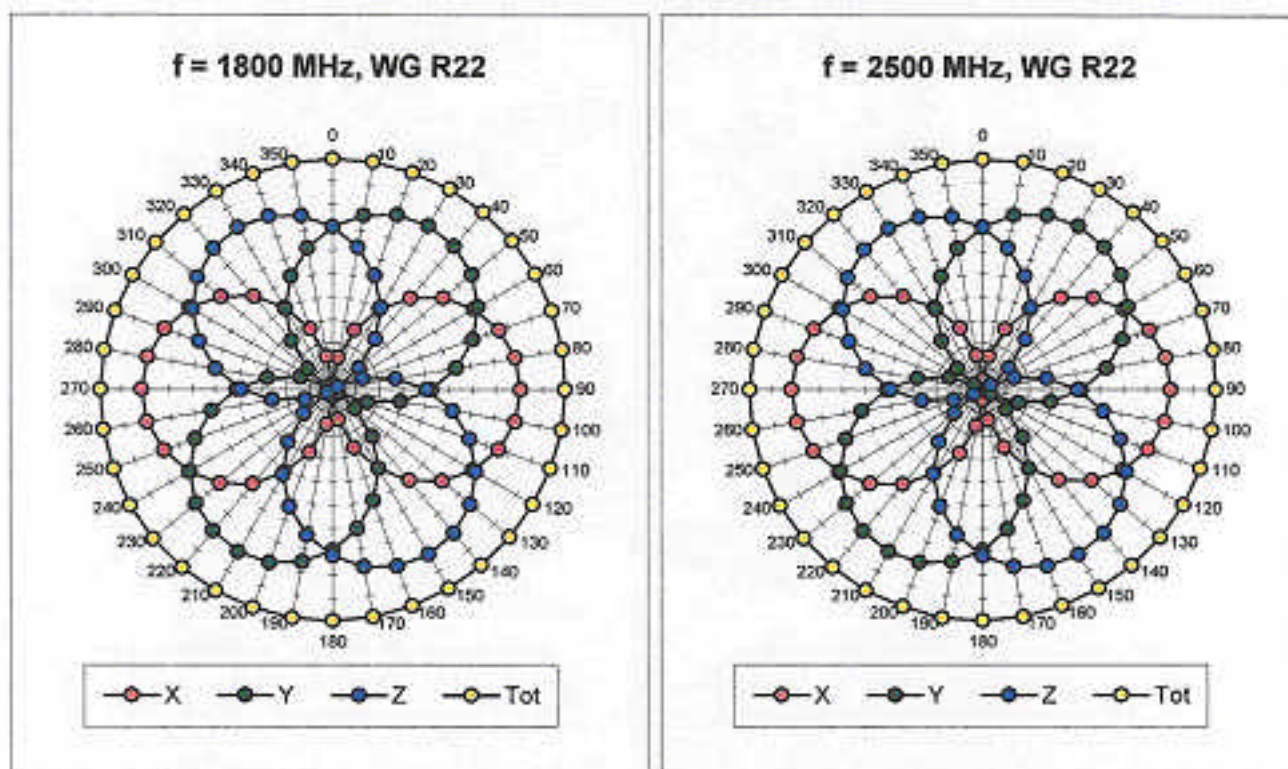
Boundary Effect

Head	900 MHz	Typical SAR gradient: 5 % per mm	
Probe Tip to Boundary		1 mm	2 mm
SAR _{be} [%]	Without Correction Algorithm	10.3	6.0
SAR _{be} [%]	With Correction Algorithm	0.4	0.6
Head	1800 MHz	Typical SAR gradient: 10 % per mm	
Probe Tip to Boundary		1 mm	2 mm
SAR _{be} [%]	Without Correction Algorithm	13.8	9.5
SAR _{be} [%]	With Correction Algorithm	0.2	0.1

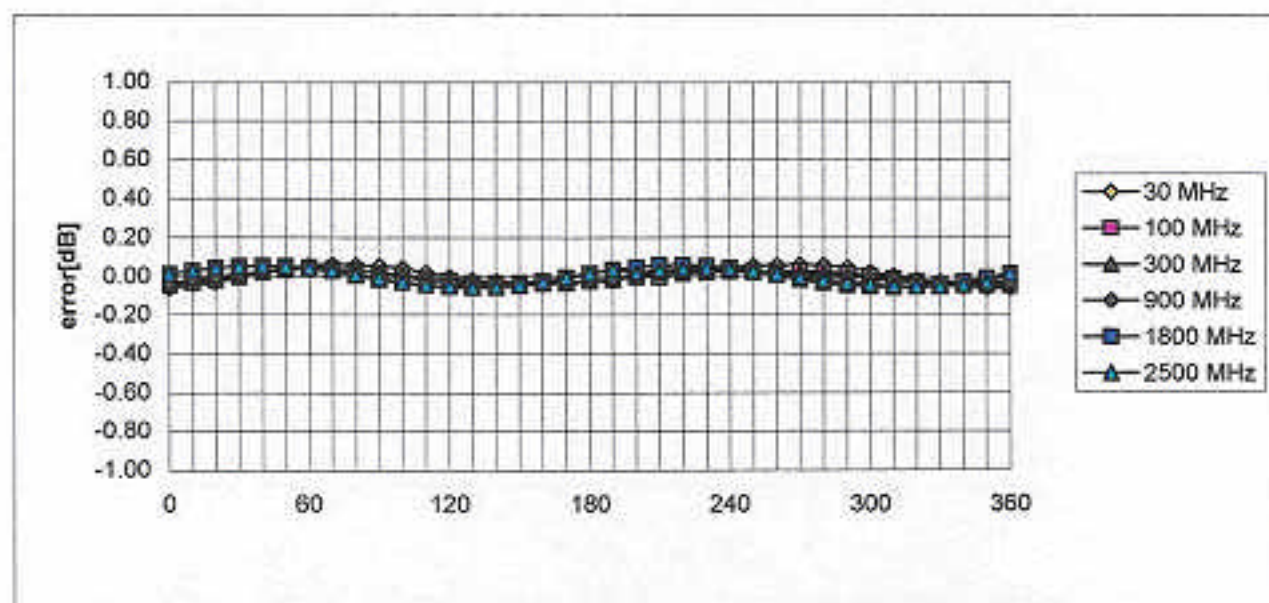
Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.6 $\pm$ 0.2	mm

Receiving Pattern (ϕ), $\theta = 0^\circ$ $f = 30$ MHz, TEM cell if110 $f = 100$ MHz, TEM cell if110 $f = 300$ MHz, TEM cell if110 $f = 900$ MHz, TEM cell if110

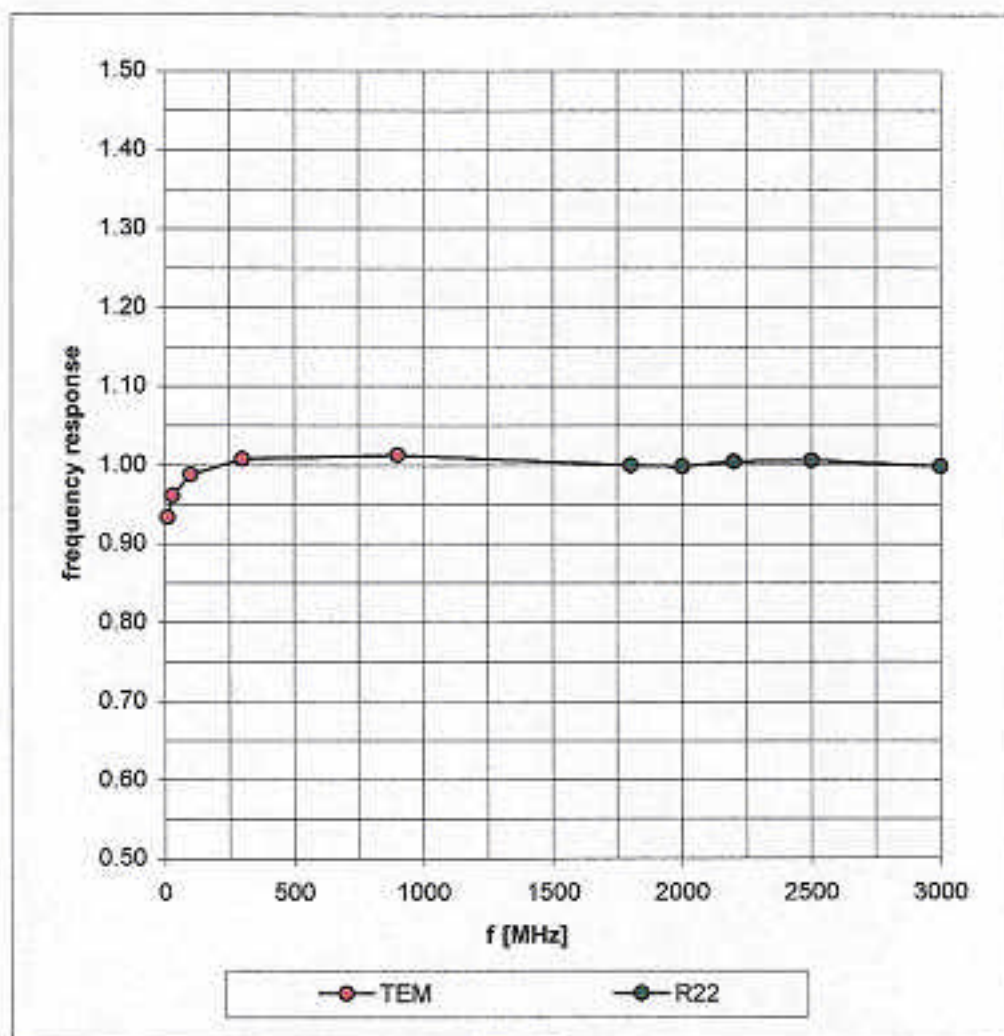


Isotropy Error (ϕ), $\theta = 0^\circ$

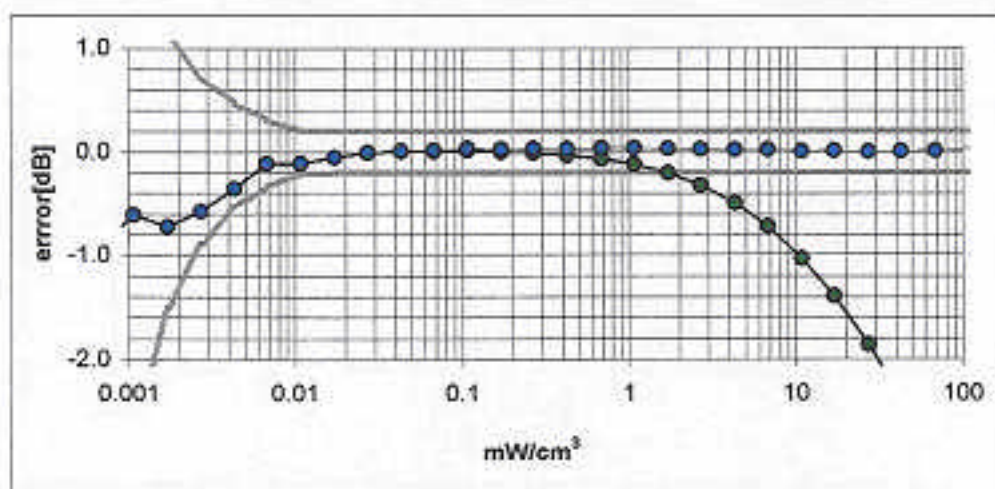
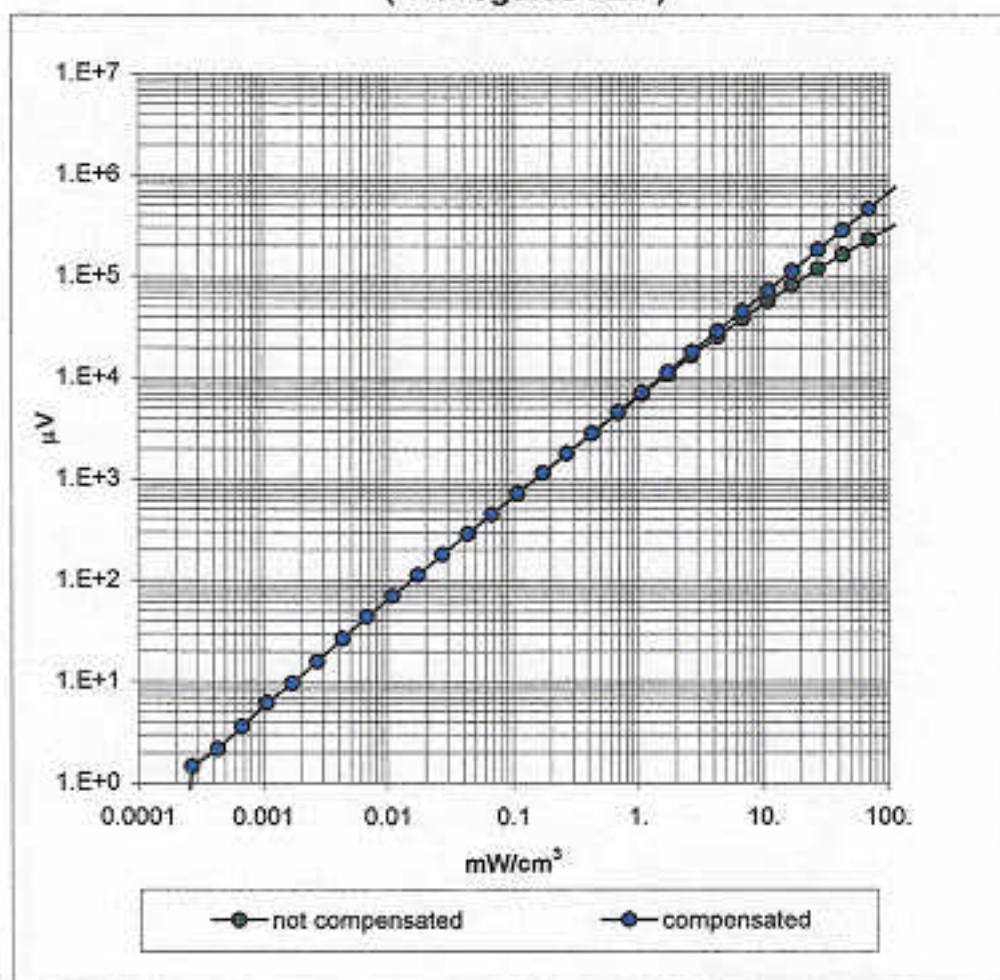


Frequency Response of E-Field

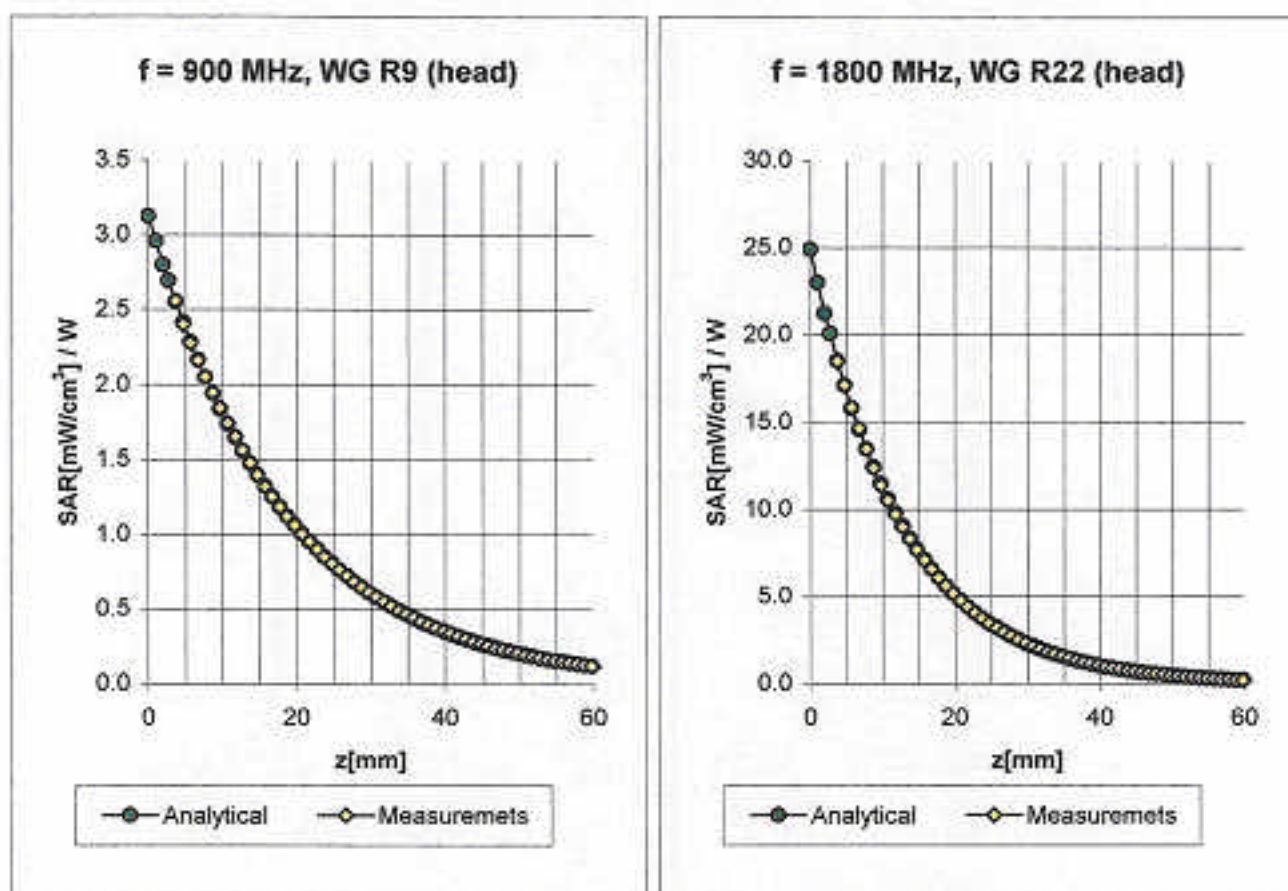
(TEM-Cell:ifi110, Waveguide R22)



Dynamic Range $f(\text{SAR}_{\text{brain}})$ (Waveguide R22)

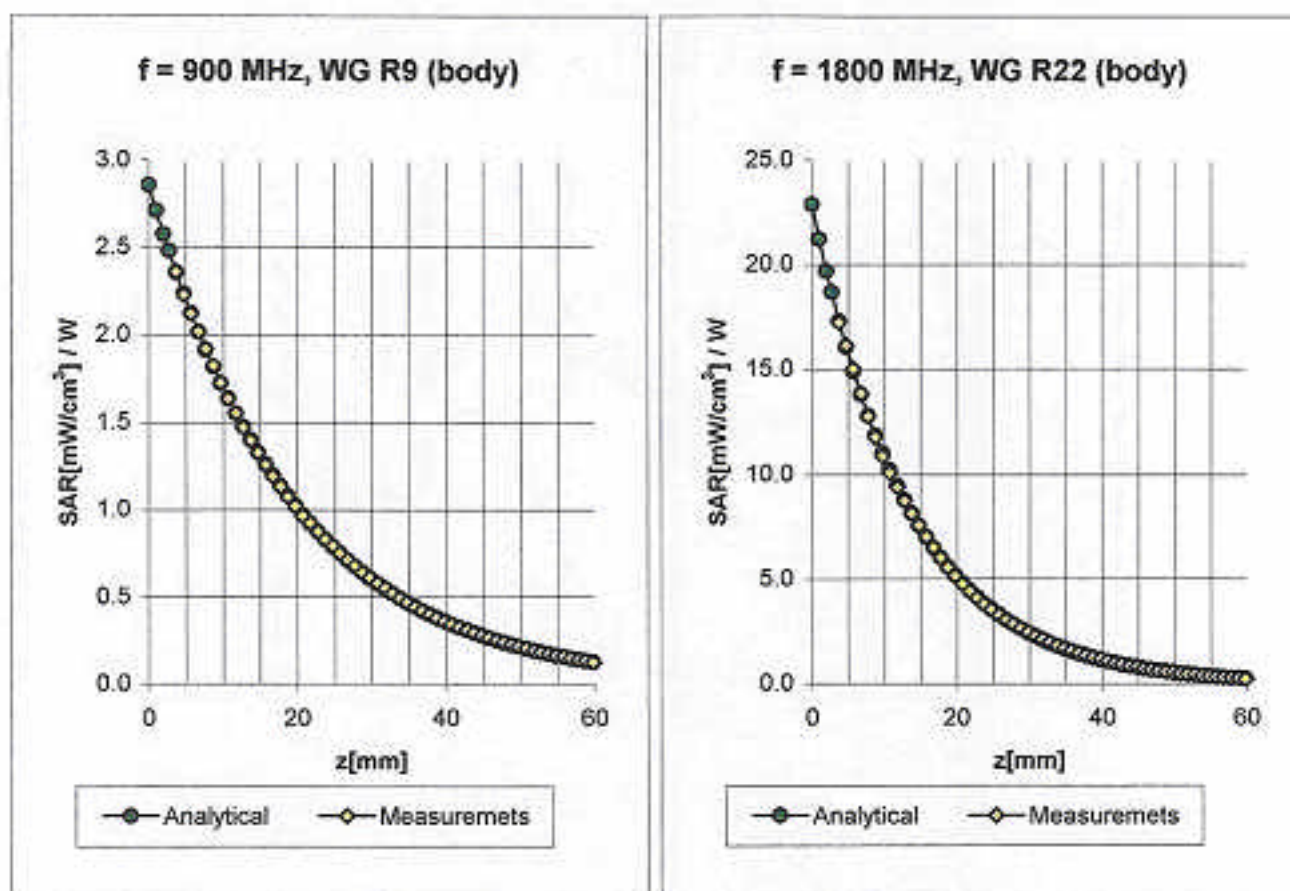


Conversion Factor Assessment



Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\% \text{ mho/m}$
	ConvF X	$6.8 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$6.8 \pm 9.5\% (k=2)$	Alpha 0.35
	ConvF Z	$6.8 \pm 9.5\% (k=2)$	Depth 2.73
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
Head	1900 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
	ConvF X	$5.4 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$5.4 \pm 9.5\% (k=2)$	Alpha 0.47
	ConvF Z	$5.4 \pm 9.5\% (k=2)$	Depth 2.78

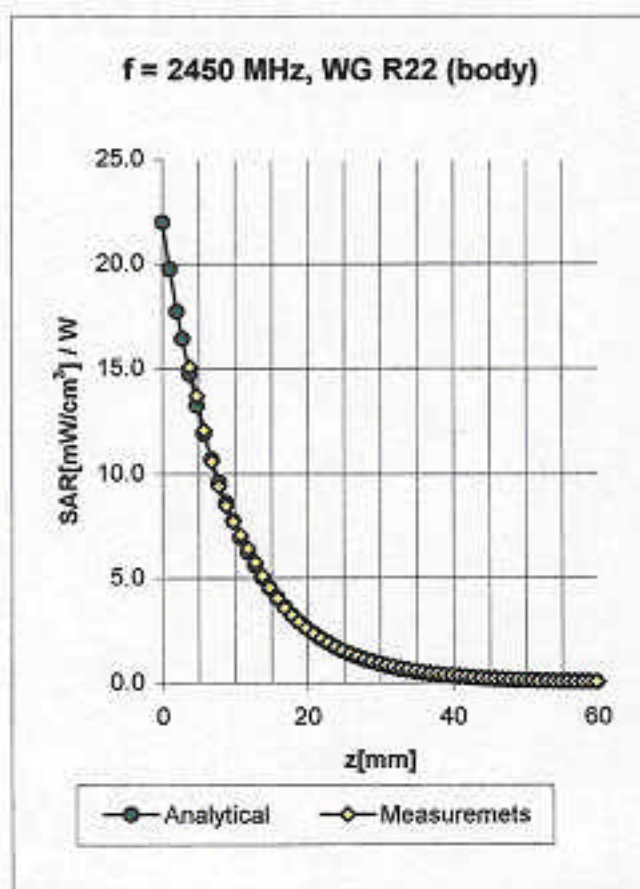
Conversion Factor Assessment



Body	900 MHz	$\epsilon_r = 55.0 \pm 5\%$	$\sigma = 1.05 \pm 5\%$ mho/m
Body	835 MHz	$\epsilon_r = 55.2 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
ConvF X	6.6 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.6 $\pm 9.5\%$ (k=2)	Alpha	0.42
ConvF Z	6.6 $\pm 9.5\%$ (k=2)	Depth	2.37

Body	1800 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 5\%$ mho/m
Body	1900 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 5\%$ mho/m
ConvF X	4.9 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	4.9 $\pm 9.5\%$ (k=2)	Alpha	0.53
ConvF Z	4.9 $\pm 9.5\%$ (k=2)	Depth	2.77

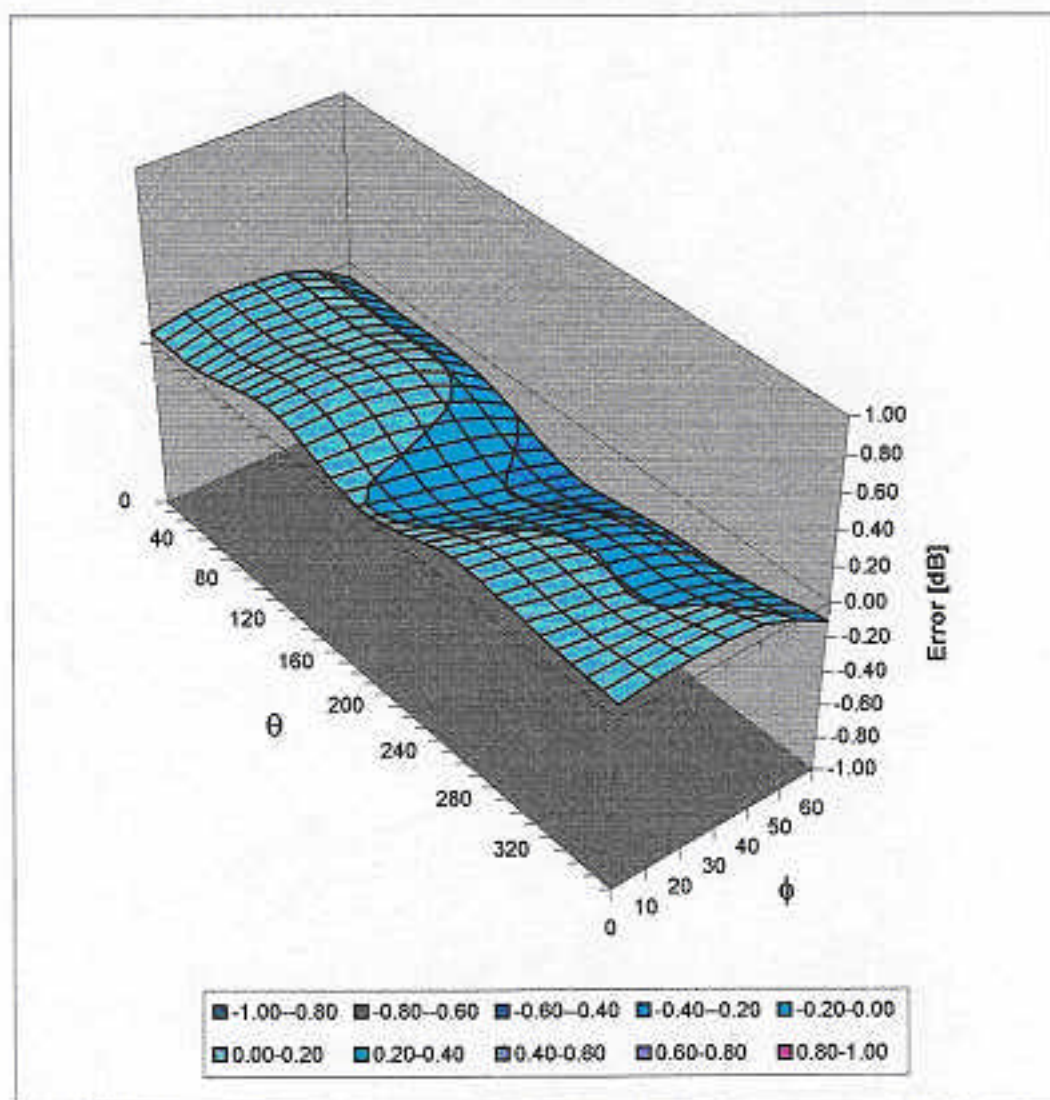
Conversion Factor Assessment



2450	Body	MHz	$\epsilon_r = 52.7 \pm 5\%$	$\sigma = 1.95 \pm 5\% \text{ mho/m}$
ConvF X			$4.7 \pm 8.9\% (k=2)$	Boundary effect:
ConvF Y			$4.7 \pm 8.9\% (k=2)$	Alpha 1.50
ConvF Z			$4.7 \pm 8.9\% (k=2)$	Depth 1.45

Deviation from Isotropy in HSL

Error (θ, ϕ), $f = 900$ MHz



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Additional Conversion Factor

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DASY - Parameters of Probe: ET3DV6 SN:1703

Sensitivity in Free Space

NormX	1.64 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.71 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.71 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression

DCP X	95	mV
DCP Y	95	mV
DCP Z	95	mV

Sensitivity in Tissue Simulating Liquid

Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$s = 0.97 \pm 5\% \text{ mho/m}$
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$s = 0.90 \pm 5\% \text{ mho/m}$
ConvF X	6.8 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.8 $\pm 9.5\%$ (k=2)	Alpha	0.35
ConvF Z	6.8 $\pm 9.5\%$ (k=2)	Depth	2.73
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$s = 1.40 \pm 5\% \text{ mho/m}$
Head	1900 MHz	$\epsilon_r = 40.0 \pm 5\%$	$s = 1.40 \pm 5\% \text{ mho/m}$
ConvF X	5.4 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	5.4 $\pm 9.5\%$ (k=2)	Alpha	0.47
ConvF Z	5.4 $\pm 9.5\%$ (k=2)	Depth	2.78

Boundary Effect

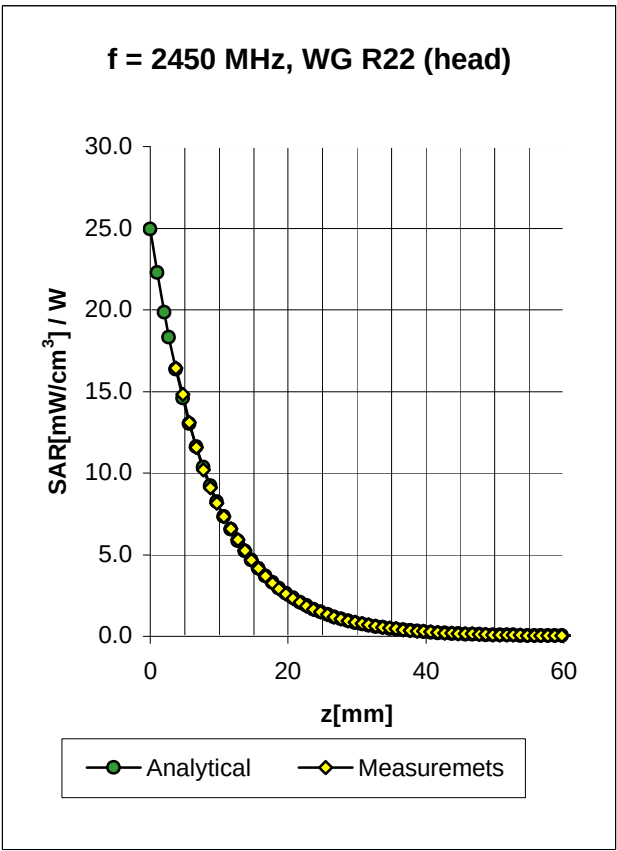
Head	900 MHz	Typical SAR gradient: 5 % per mm	
Probe Tip to Boundary		1 mm	2 mm
SAR _{be} [%]	Without Correction Algorithm	10.3	6.0
SAR _{be} [%]	With Correction Algorithm	0.4	0.6

Head	1800 MHz	Typical SAR gradient: 10 % per mm	
Probe Tip to Boundary		1 mm	2 mm
SAR _{be} [%]	Without Correction Algorithm	13.8	9.5
SAR _{be} [%]	With Correction Algorithm	0.2	0.1

Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.6 $\pm$ 0.2	mm

Conversion Factor Assessment



Head	2450	MHz	$\epsilon_r = 39.2 \pm 5\%$	$s = 1.80 \pm 5\%$ mho/m
ConvF X	5.1	$\pm 8.9\%$ (k=2)	Boundary effect:	
ConvF Y	5.1	$\pm 8.9\%$ (k=2)	Alpha	0.90
ConvF Z	5.1	$\pm 8.9\%$ (k=2)	Depth	1.93