



May 16, 2002

Federal Communications Commission
Equipment Approval Services
7435 Oakland Mills Road
Columbia, MD 21046
Attn: Martin Perrine

SUBJECT: Modottel Co., Ltd.
FCC ID: POQWPE-2100
731 Confirmation No.: TC358969
Correspondence Ref. No.: 4161

Dear Martin:

On behalf of Modottel Co., Ltd., is our response to your e-mail dated May 14, 2002 requesting additional information for the subject application.

1. Attached is the retested SAR data using 1900MHz liquid parameters and certified probe conversion factors. The attached data was retested at the two highest SAR points for left and right head, and body. Also attached are dipole validation, printouts of the measured liquid parameters, and the manufacturer's probe calibration certification for the probe used during the evaluation.
2. For this particular clamshell type device the SAR "Hot Spot" resided near the bottom of the LCD when placed in the cheek touch position against the phantom. This translates to the "Hot Spot" being in the chin area of the phantom. In order to maintain the E-field probe to within +/- 30 degrees normal to the inner surface of the phantom, the DASY3 had to tilted towards the chin area. This results in a smaller than usual area scan available due to possible E-field probe collisions with the phantom. The device was previously inspected throughout the entire area of the phantom head in order to determine the area of SAR concentration.

If you have any questions or comments concerning the above, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn McMillen".

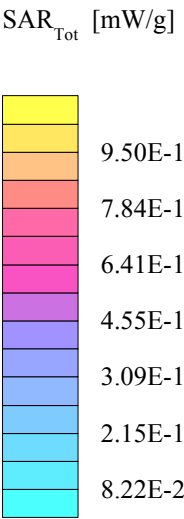
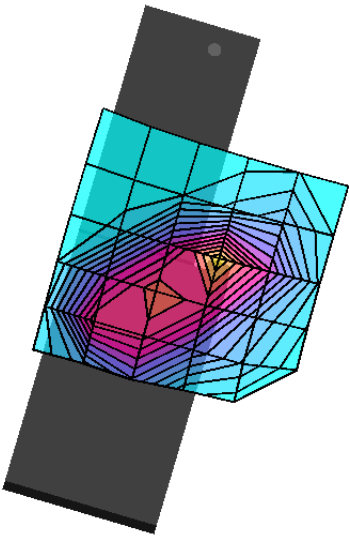
Shawn McMillen
General Manager
Celltech Research Inc.
Testing & Engineering Lab

cc: Modottel Co., Ltd.
American TCB

Modottel Co., Ltd. FCC ID: POQWPE-2100

SAM Phantom; Left Cheek Section; Position: (75°,180°)
Probe: ET3DV6 - SN1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0
1900 MHz Brain: $\sigma = 1.42 \text{ mho/m}$ $\epsilon_r = 40.4$ $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.19 dB
SAR (1g): 1.04 mW/g, SAR (10g): 0.588 mW/g

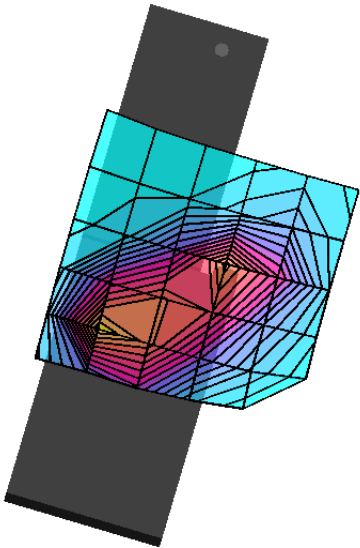
Head SAR - Left Cheek/Touch Position
Antenna In
Model: WPE-2100
PCS CDMA Mode
Standard Battery
Channel 25 [1851.25 MHz]
Conducted Power: 24.55 dBm
Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C
Date Tested: May 15, 2002



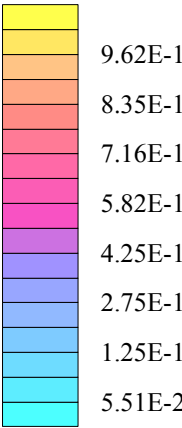
Modottel Co., Ltd. FCC ID: POQWPE-2100

SAM Phantom; Left Cheek Section; Position: (75°,180°)
Probe: ET3DV6 - SN1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0
1900 MHz Brain: $\sigma = 1.42 \text{ mho/m}$ $\epsilon_r = 40.4$ $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.11 dB
SAR (1g): 0.954 mW/g, SAR (10g): 0.553 mW/g

Head SAR - Left Cheek/Touch Position
Antenna In
Model: WPE-2100
PCS CDMA Mode
Standard Battery
Channel 600 [1880.00 MHz]
Conducted Power: 24.53 dBm
Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C
Date Tested: May 15, 2002



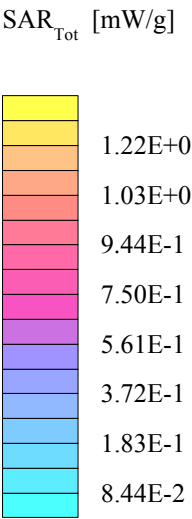
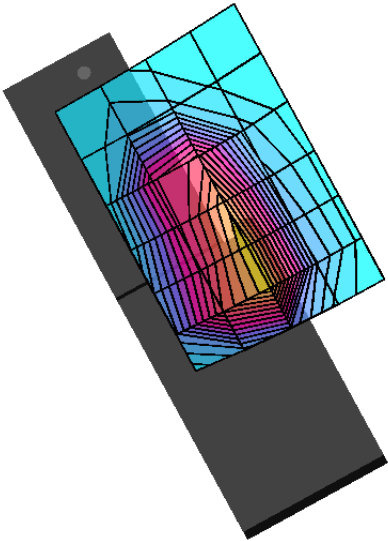
SAR_{Tot} [mW/g]



Modottel Co., Ltd. FCC ID: POQWPE-2100

SAM Phantom; Right Cheek Section; Position: (75°,230°)
Probe: ET3DV6 - SN1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0
1900 MHz Brain: $\sigma = 1.42 \text{ mho/m}$ $\epsilon_r = 40.4$ $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: 0.00 dB
SAR (1g): 1.28 mW/g, SAR (10g): 0.777 mW/g

Head SAR - Right Cheek/Touch Position
Antenna In
Model: WPE-2100
PCS CDMA Mode
Standard Battery
Channel 25 [1851.25 MHz]
Conducted Power: 24.53 dBm
Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C
Date Tested: May 15, 2002



Modottel Co., Ltd. FCC ID: POQWPE-2100

SAM Phantom; Right Cheek Section

Probe: ET3DV6 - SN1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0;

1900 MHz Brain: $\sigma = 1.42$ mho/m $\epsilon_r = 40.4$ $\rho = 1.00$ g/cm³

Z-Axis Extrapolation at Peak SAR Location

Head SAR - Right Cheek/Touch Position

Antenna In

Model: WPE-2100

PCS CDMA Mode

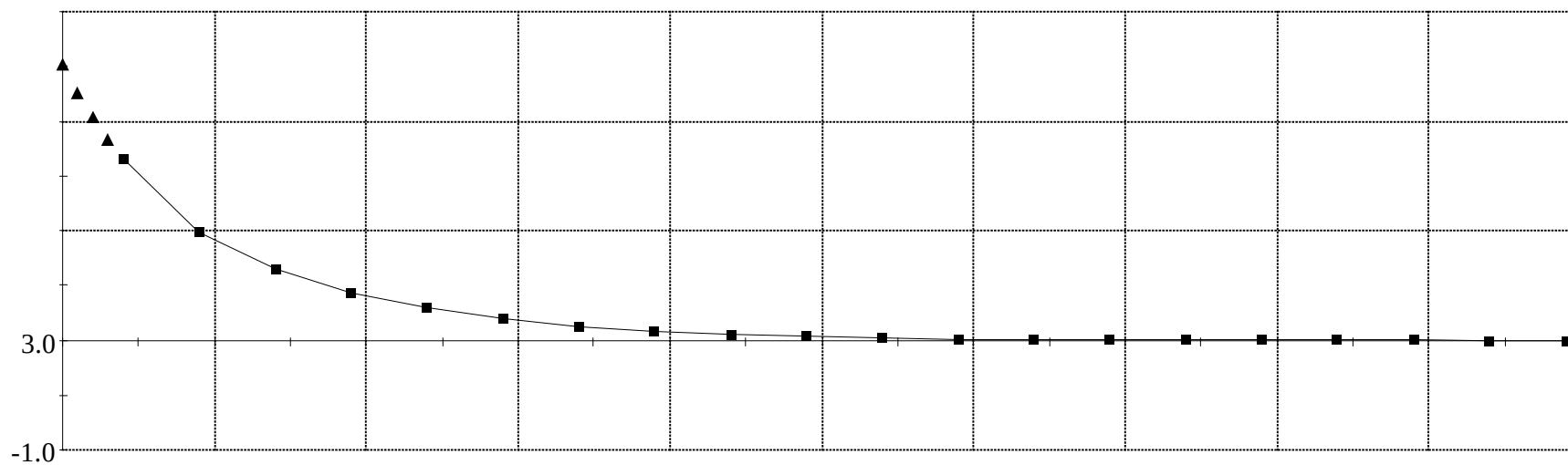
Standard Battery

Channel 25 [1851.25 MHz]

Conducted Power: 24.53 dBm

Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C

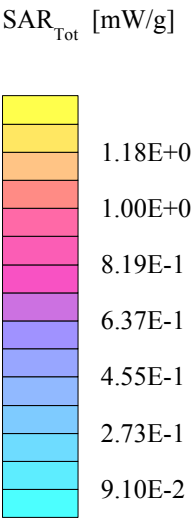
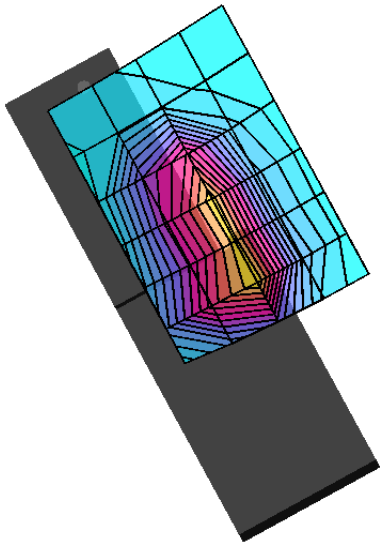
Date Tested: May 15, 2002



Modottel Co., Ltd. FCC ID: POQWPE-2100

SAM Phantom; Right Cheek Section; Position: (75°,230°)
Probe: ET3DV6 - SN1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0
1900 MHz Brain: $\sigma = 1.42 \text{ mho/m}$ $\epsilon_r = 40.4$ $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: 0.09 dB
SAR (1g): 1.15 mW/g, SAR (10g): 0.658 mW/g

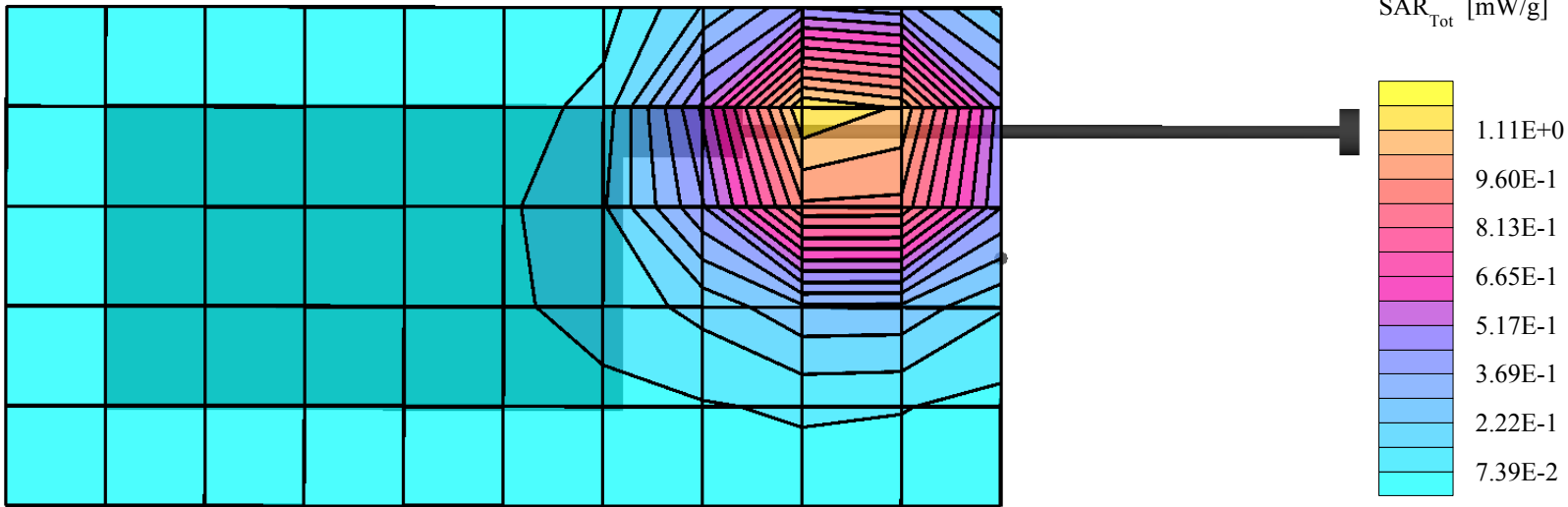
Head SAR - Right Cheek/Touch Position
Antenna In
Model: WPE-2100
PCS CDMA Mode
Standard Battery
Channel 600 [1880.00 MHz]
Conducted Power: 24.55 dBm
Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C
Date Tested: May 15, 2002



Modottel Co., Ltd. FCC ID: POQWPE-2100

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1387; ConvF(5.00,5.00,5.00); Crest factor: 1.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$ $\epsilon_r = 52.3$ $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.08 dB
SAR (1g): 1.07 mW/g, SAR (10g): 0.596 mW/g

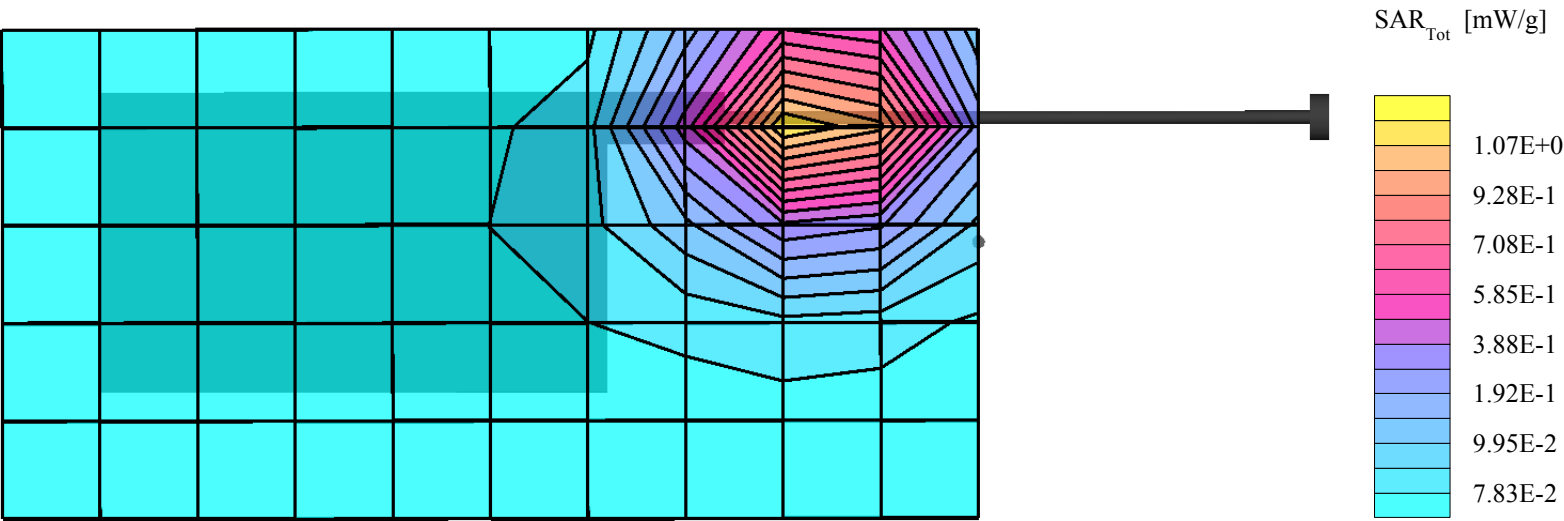
Body SAR at 1.5 cm Separation Distance
Antenna out
Withus Model: WPE-2100
PCS CDMA Mode
Standard Battery
Channel 25 [1851.25 MHz]
Conducted Power: 24.57 dBm
Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C
Date Tested: May 15, 2002



Modottel Co., Ltd. FCC ID: POQWPE-2100

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1387; ConvF(5.00,5.00,5.00); Crest factor: 1.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$ $\epsilon_r = 52.3$ $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 1.19 mW/g, SAR (10g): 0.698 mW/g

Body SAR at 1.5 cm Separation Distance
Antenna out
Model: WPE-2100
PCS CDMA Mode
Standard Battery
Channel 600 [1880.00 MHz]
Conducted Power: 24.58 dBm
Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C
Date Tested: May 15, 2002



Modottel Co., Ltd. FCC ID: POQWPE-2100

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1387; ConvF(5.00,5.00,5.00); Crest factor: 1.0;

1900 MHz Muscle: $\sigma = 1.54$ mho/m $\epsilon_r = 52.3$ $\rho = 1.00$ g/cm³

Z-Axis Extrapolation at Peak SAR Location

Body SAR at 1.5 cm Separation Distance

Antenna out

Model: WPE-2100

PCS CDMA Mode

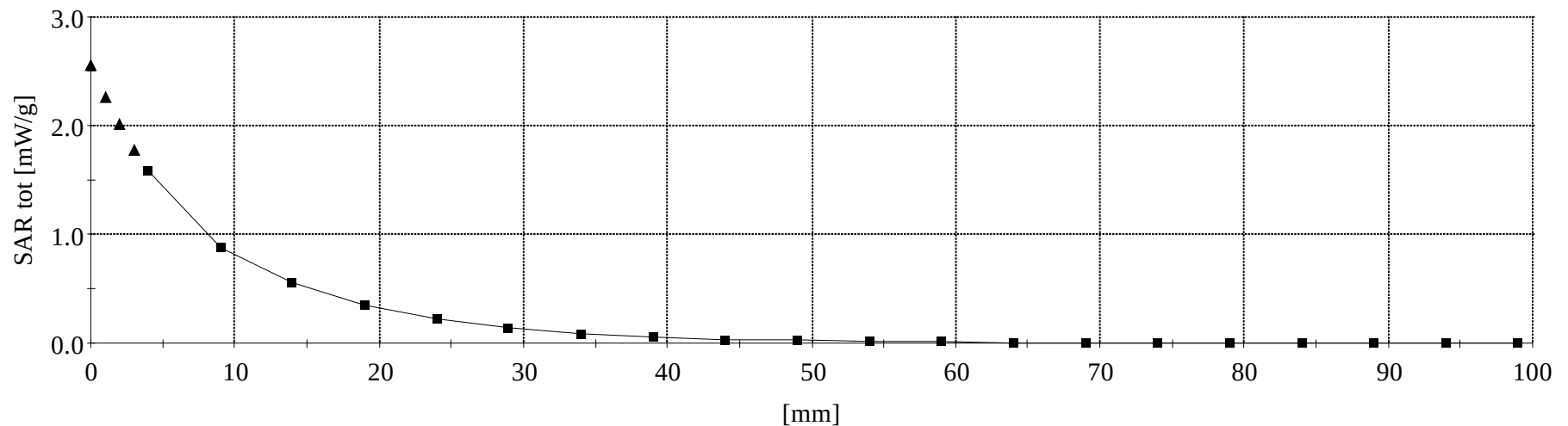
Standard Battery

Channel 600 [1880.00 MHz]

Conducted Power: 24.58 dBm

Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C

Date Tested: May 15, 2002



Dipole 1800MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0; 1800 MHz Brain: $\sigma = 1.41 \text{ mho/m}$ $\epsilon_r = 38.9$ $\rho = 1.00 \text{ g/cm}^3$

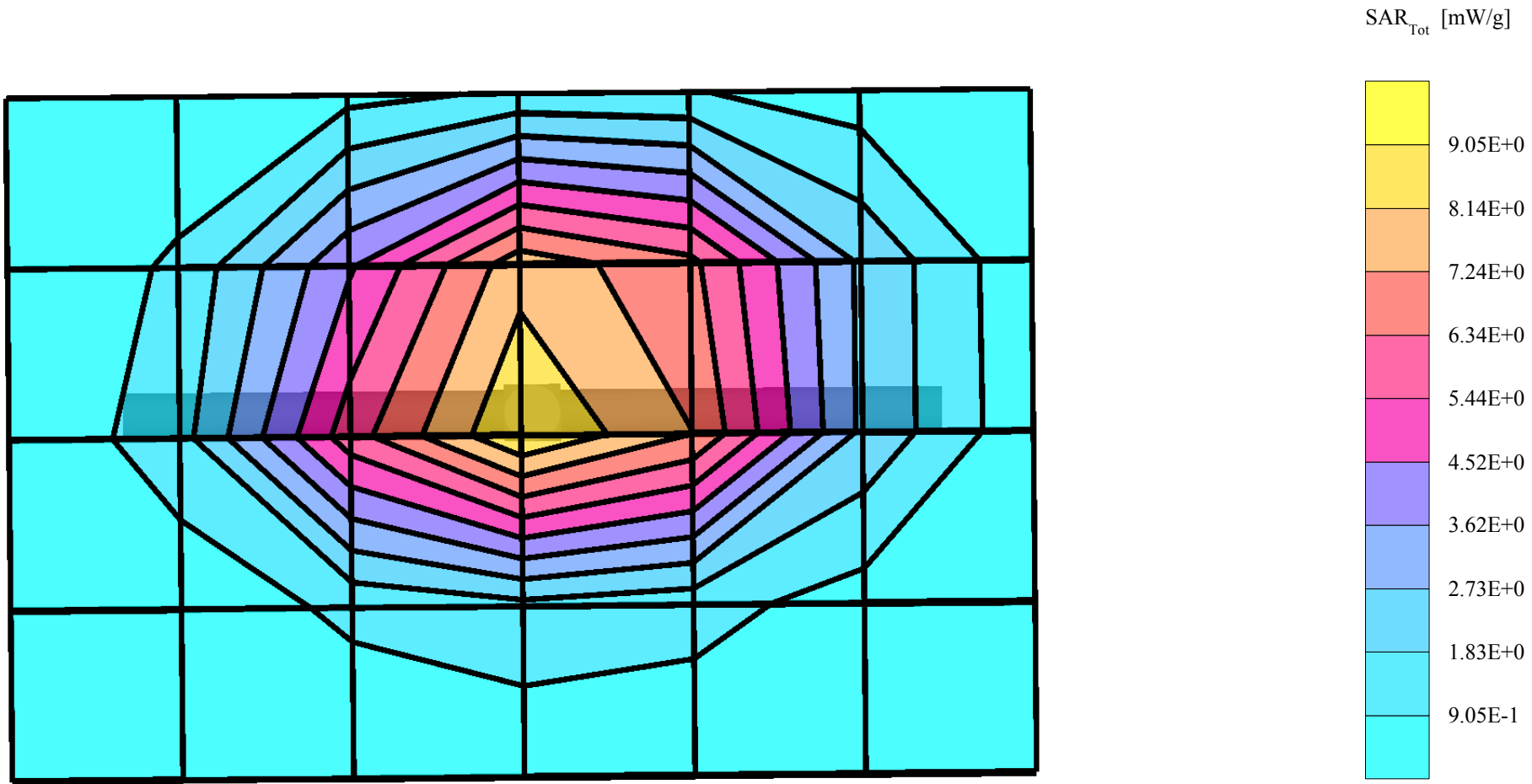
Cube 5x5x7: Peak: 18.8 mW/g, SAR (1g): 9.68 mW/g, SAR (10g): 4.90 mW/g, (Worst-case extrapolation)

Penetration depth: 7.5 (7.2, 8.5) [mm]; Ambient Temp. 22.8 °C; Fluid Temp. 23.0 °C

Powerdrift: 0.02 dB

Conducted Power: 250mW

Validation Date: May 15, 2002



Validation Dipole D1800V2 SN:247, d = 10 mm

Frequency: 1800 MHz; Antenna Input Power: 250 [mW]

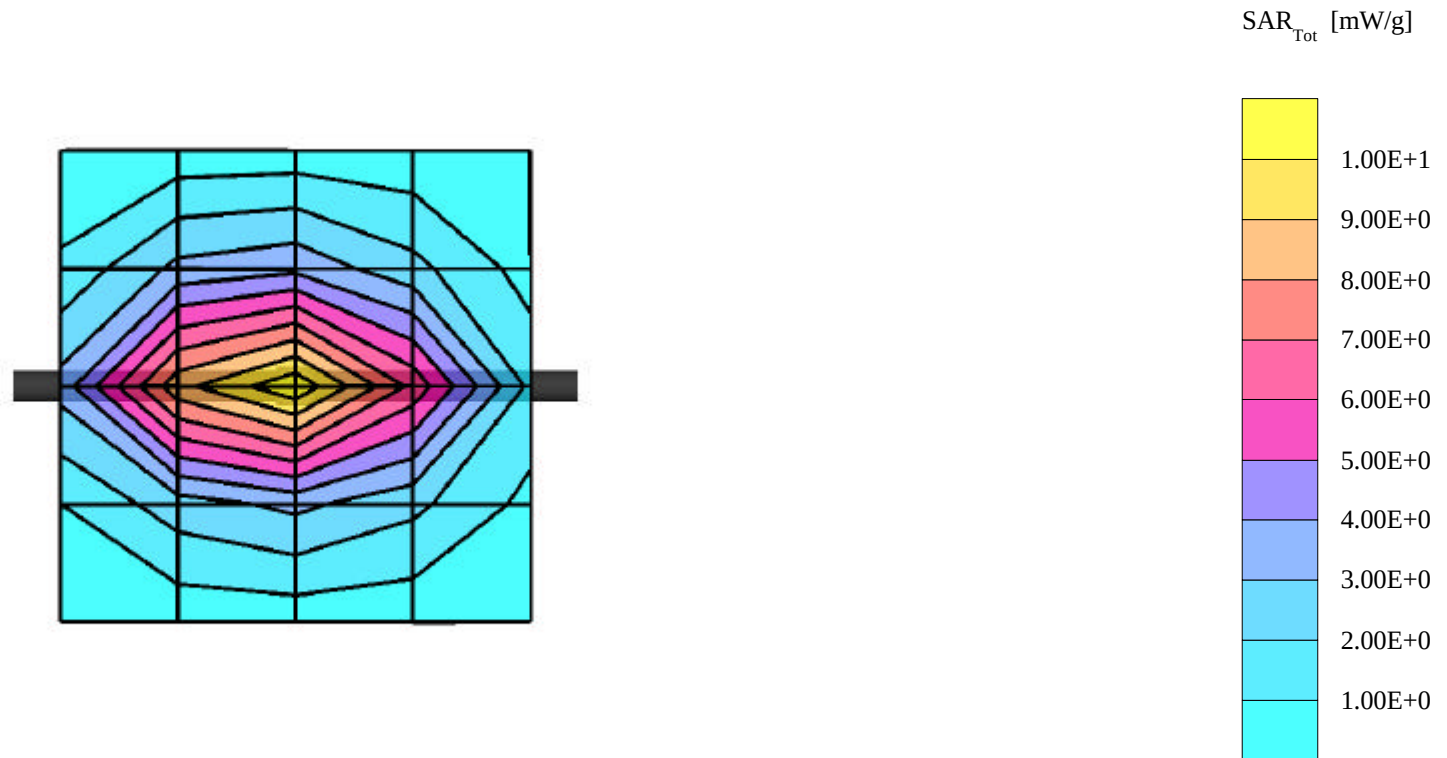
Generic Twin Phantom; Flat Section; Grid Spacing: Dx = 15.0, Dy = 15.0, Dz = 10.0

Probe: ET3DV6 - SN1507; ConvF(5.57,5.57,5.57); Crest factor: 1.0; IEEE1528 1800 MHz : $\sigma = 1.36$ mho/m $\epsilon_r = 40.0$ $\rho = 1.00$ g/cm³

Cubes (2): Peak: 18.2 mW/g ± 0.04 dB, SAR (1g): 9.66 mW/g ± 0.03 dB, SAR (10g): 5.02 mW/g ± 0.03 dB, (Worst-case extrapolation)

Penetration depth: 8.2 (7.6, 9.4) [mm]

Powerdrift: -0.01 dB



1800MHz System Validation

Measured Fluid Dielectric Parameters (Brain)

May 15, 2002

Frequency	e'	e''
1.750000000 GHz	39.1252	14.0797
1.755000000 GHz	39.1144	14.0973
1.760000000 GHz	39.0865	14.1062
1.765000000 GHz	39.0646	14.1086
1.770000000 GHz	39.0472	14.1239
1.775000000 GHz	39.0261	14.1321
1.780000000 GHz	38.9943	14.1373
1.785000000 GHz	38.9515	14.1491
1.790000000 GHz	38.9398	14.1458
1.795000000 GHz	38.9174	14.1550
1.800000000 GHz	38.8970	14.1722
1.805000000 GHz	38.8540	14.1814
1.810000000 GHz	38.8395	14.1921
1.815000000 GHz	38.8119	14.1955
1.820000000 GHz	38.7867	14.1974
1.825000000 GHz	38.7560	14.2149
1.830000000 GHz	38.7505	14.2234
1.835000000 GHz	38.7282	14.2238
1.840000000 GHz	38.7116	14.2330
1.845000000 GHz	38.6925	14.2376
1.850000000 GHz	38.6802	14.2382
1.855000000 GHz	38.6606	14.2462
1.860000000 GHz	38.6475	14.2593
1.865000000 GHz	38.6314	14.2623
1.870000000 GHz	38.6111	14.2678
1.875000000 GHz	38.6043	14.2802
1.880000000 GHz	38.5858	14.2877
1.885000000 GHz	38.5650	14.3056
1.890000000 GHz	38.5539	14.3145
1.895000000 GHz	38.5347	14.3196
1.900000000 GHz	38.5211	14.3331
1.905000000 GHz	38.5052	14.3570
1.910000000 GHz	38.4858	14.3652
1.915000000 GHz	38.4499	14.3748
1.920000000 GHz	38.4264	14.3946

1900MHz EUT Evaluation (Head)

Measured Fluid Dielectric Parameters (Brain)

May 15, 2002

Frequency	e'	e''
1.750000000 GHz	40.9900	13.1757
1.755000000 GHz	40.9810	13.1828
1.760000000 GHz	40.9784	13.1796
1.765000000 GHz	40.9615	13.1883
1.770000000 GHz	40.9539	13.1912
1.775000000 GHz	40.9506	13.2008
1.780000000 GHz	40.9200	13.2057
1.785000000 GHz	40.8907	13.2221
1.790000000 GHz	40.8772	13.2287
1.795000000 GHz	40.8642	13.2504
1.800000000 GHz	40.8415	13.2659
1.805000000 GHz	40.8009	13.2865
1.810000000 GHz	40.7752	13.3254
1.815000000 GHz	40.7361	13.3422
1.820000000 GHz	40.6958	13.3566
1.825000000 GHz	40.6650	13.3805
1.830000000 GHz	40.6621	13.3898
1.835000000 GHz	40.6407	13.3986
1.840000000 GHz	40.6271	13.3903
1.845000000 GHz	40.6275	13.4035
1.850000000 GHz	40.6197	13.4036
1.855000000 GHz	40.6234	13.4117
1.860000000 GHz	40.6158	13.4208
1.865000000 GHz	40.6148	13.4256
1.870000000 GHz	40.5956	13.4392
1.875000000 GHz	40.5823	13.4428
1.880000000 GHz	40.5557	13.4582
1.885000000 GHz	40.5371	13.4714
1.890000000 GHz	40.5188	13.4845
1.895000000 GHz	40.5014	13.4940
1.900000000 GHz	40.4744	13.5158
1.905000000 GHz	40.4421	13.5382
1.910000000 GHz	40.3968	13.5632
1.915000000 GHz	40.3499	13.5714
1.920000000 GHz	40.2962	13.6142

1900MHz EUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

May 15, 2002

Frequency	e'	e''
1.750000000 GHz	52.7728	14.1604
1.755000000 GHz	52.7741	14.1807
1.760000000 GHz	52.7563	14.1950
1.765000000 GHz	52.7491	14.2040
1.770000000 GHz	52.7259	14.2192
1.775000000 GHz	52.7137	14.2253
1.780000000 GHz	52.6950	14.2405
1.785000000 GHz	52.6628	14.2562
1.790000000 GHz	52.6448	14.2710
1.795000000 GHz	52.6448	14.2850
1.800000000 GHz	52.6299	14.2936
1.805000000 GHz	52.6000	14.3223
1.810000000 GHz	52.5820	14.3517
1.815000000 GHz	52.5523	14.3624
1.820000000 GHz	52.5228	14.3729
1.825000000 GHz	52.5081	14.3998
1.830000000 GHz	52.5055	14.4234
1.835000000 GHz	52.4919	14.4421
1.840000000 GHz	52.4761	14.4411
1.845000000 GHz	52.4632	14.4594
1.850000000 GHz	52.4738	14.4751
1.855000000 GHz	52.4522	14.4866
1.860000000 GHz	52.4381	14.5060
1.865000000 GHz	52.4360	14.5220
1.870000000 GHz	52.4039	14.5322
1.875000000 GHz	52.3932	14.5415
1.880000000 GHz	52.3783	14.5618
1.885000000 GHz	52.3595	14.5893
1.890000000 GHz	52.3323	14.6028
1.895000000 GHz	52.3068	14.6257
1.900000000 GHz	52.2840	14.6390
1.905000000 GHz	52.2584	14.6766
1.910000000 GHz	52.2343	14.6914
1.915000000 GHz	52.2073	14.6945
1.920000000 GHz	52.1832	14.7239

Calibration Certificate

Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1387

Place of Calibration:

Zurich

Date of Calibration:

February 22, 2002

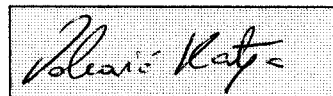
Calibration Interval:

12 months

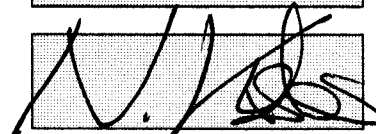
Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

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:



Approved by:



Probe ET3DV6

SN:1387

Manufactured:	September 21, 1999
Last calibration:	September 22, 1999
Recalibrated:	February 22, 2002

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1387

Sensitivity in Free Space

NormX	1.58 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.67 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.67 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression

DCP X	97	mV
DCP Y	97	mV
DCP Z	97	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	6.6 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.6 $\pm 9.5\%$ (k=2)	Alpha	0.40
ConvF Z	6.6 $\pm 9.5\%$ (k=2)	Depth	2.38
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	0.57
ConvF Z	5.4 $\pm 9.5\%$ (k=2)	Depth	2.18

Boundary Effect

Head	900 MHz	Typical SAR gradient: 5 % per mm	
Probe Tip to Boundary		1 mm	2 mm
SAR _{be} [%]	Without Correction Algorithm	9.7	5.4
SAR _{be} [%]	With Correction Algorithm	0.3	0.6

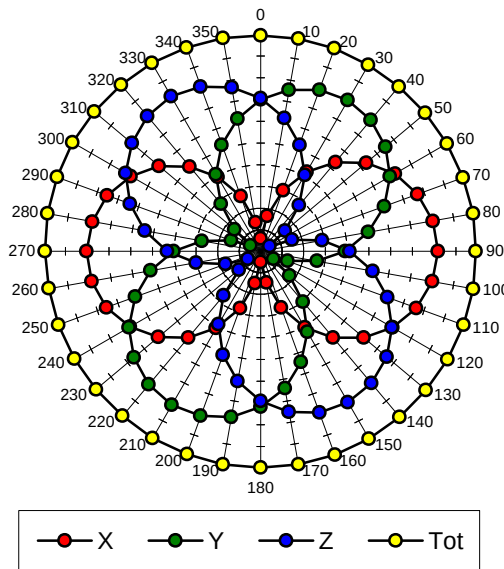
Head	1800 MHz	Typical SAR gradient: 10 % per mm	
Probe Tip to Boundary		1 mm	2 mm
SAR _{be} [%]	Without Correction Algorithm	11.5	7.3
SAR _{be} [%]	With Correction Algorithm	0.1	0.3

Sensor Offset

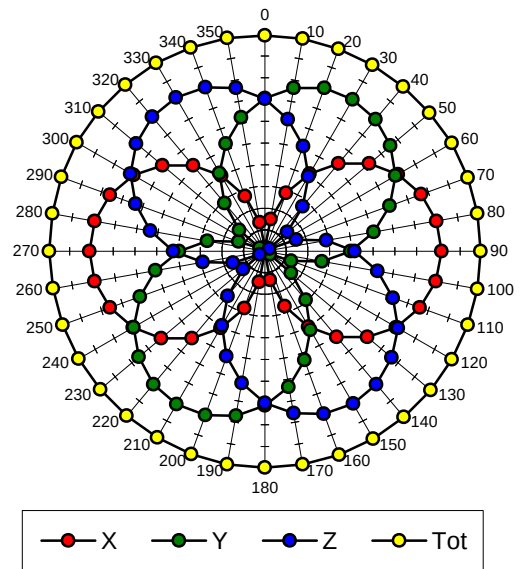
Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.3 $\pm$ 0.2	mm

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

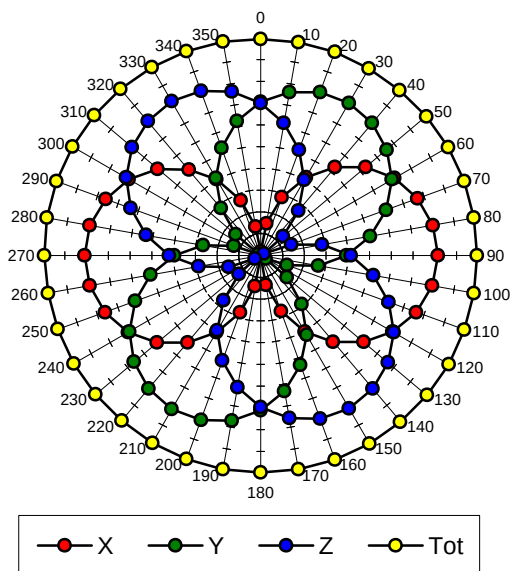
f = 30 MHz, TEM cell ifi110



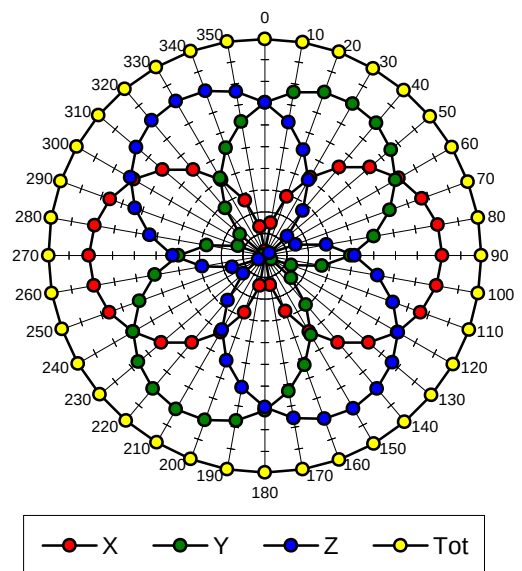
f = 100 MHz, TEM cell ifi110

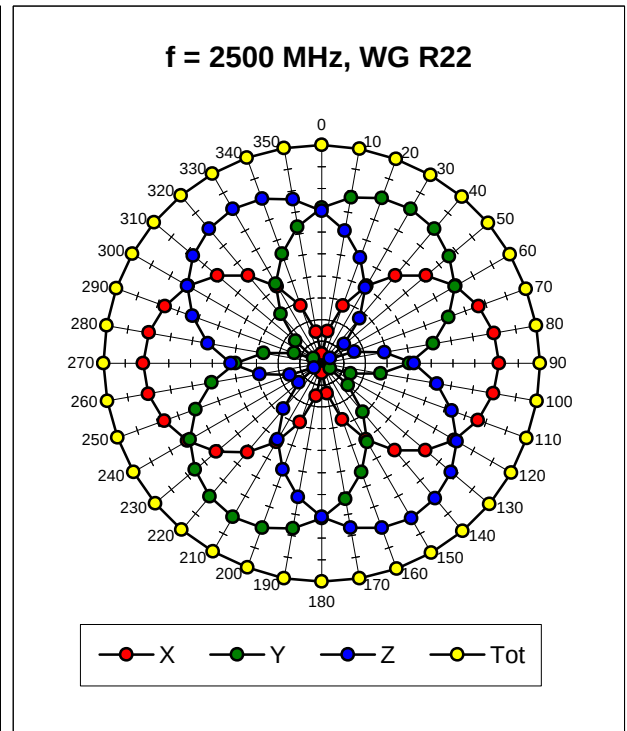
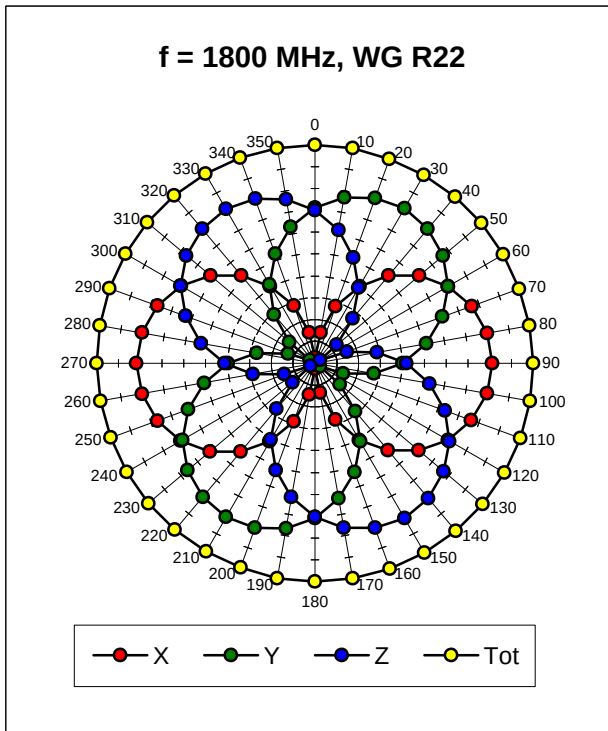


f = 300 MHz, TEM cell ifi110

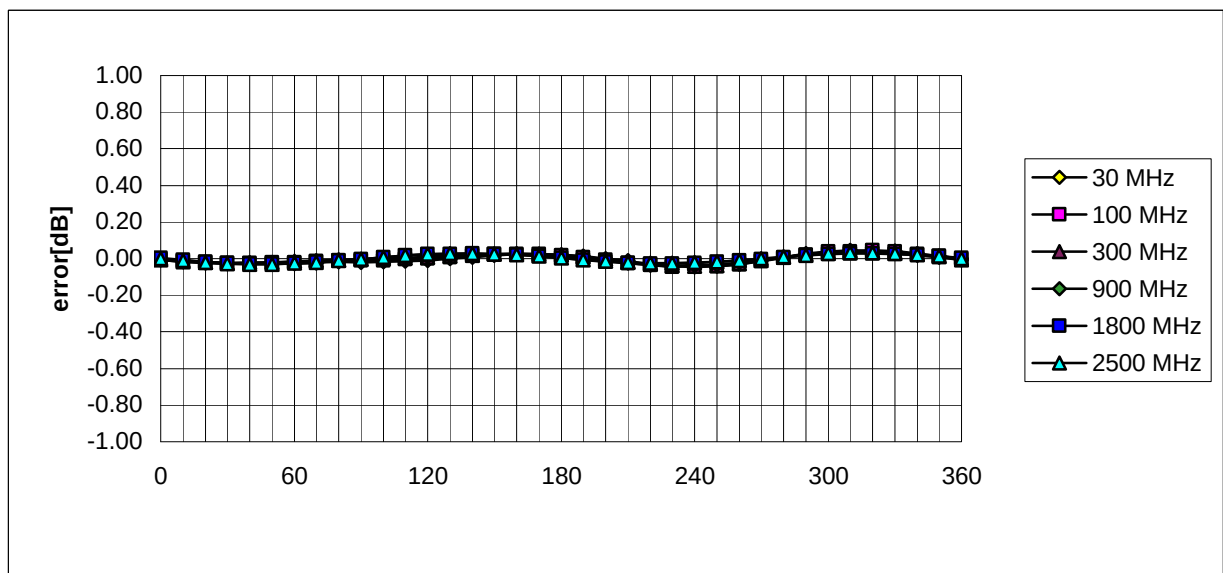


f = 900 MHz, TEM cell ifi110



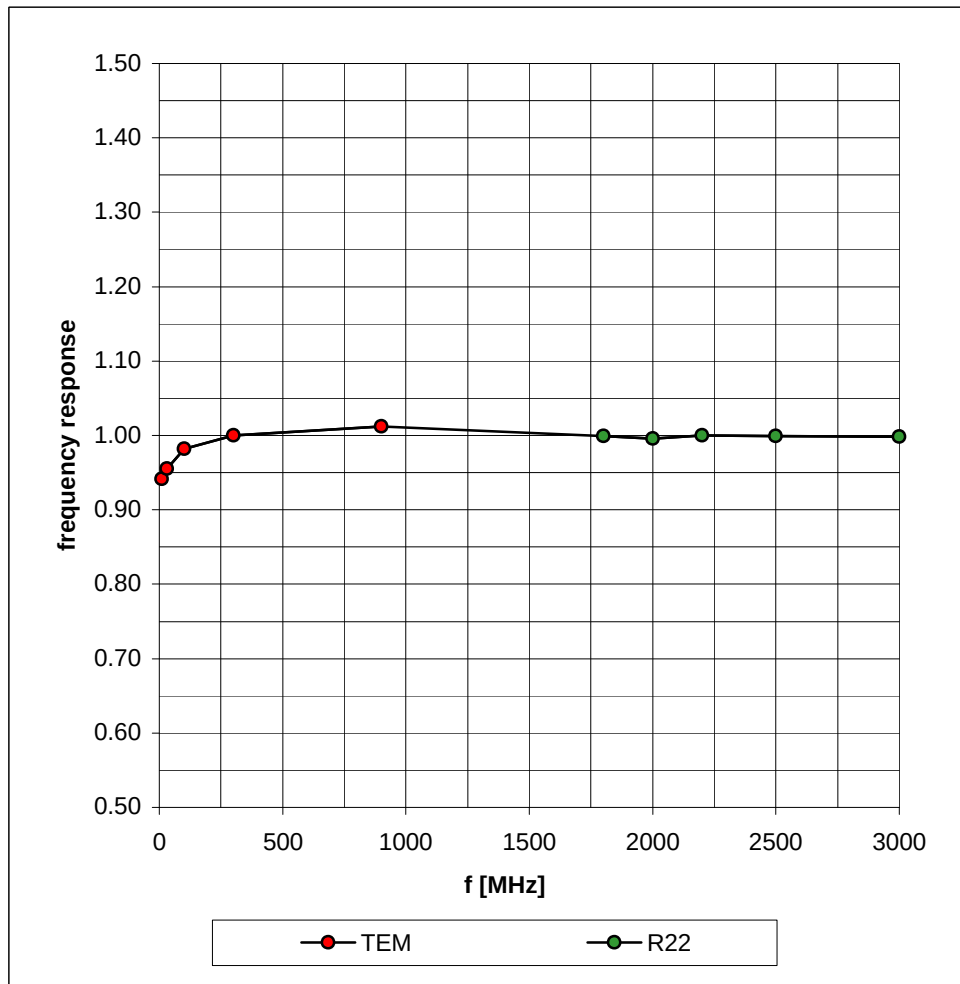


Isotropy Error (f), $q = 0^\circ$

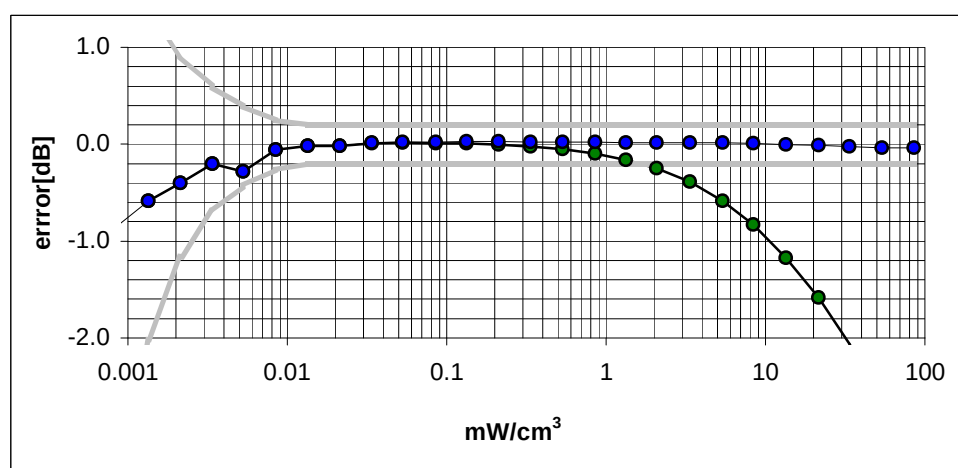
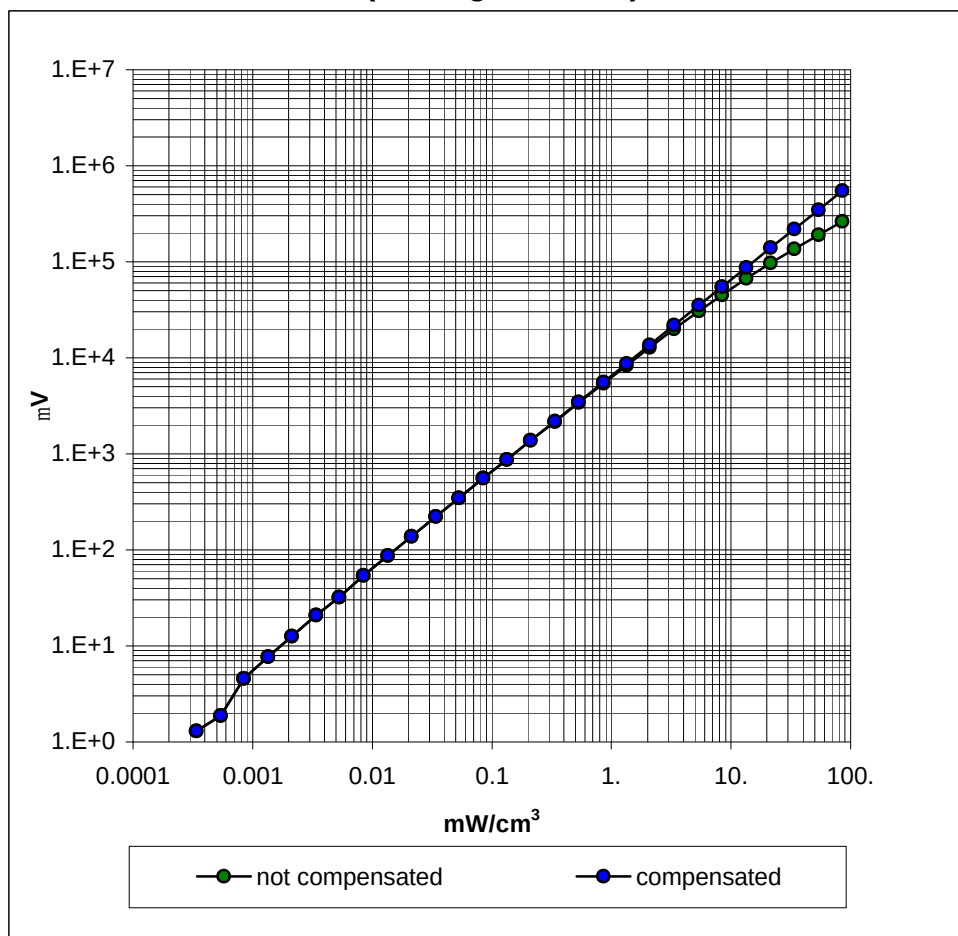


Frequency Response of E-Field

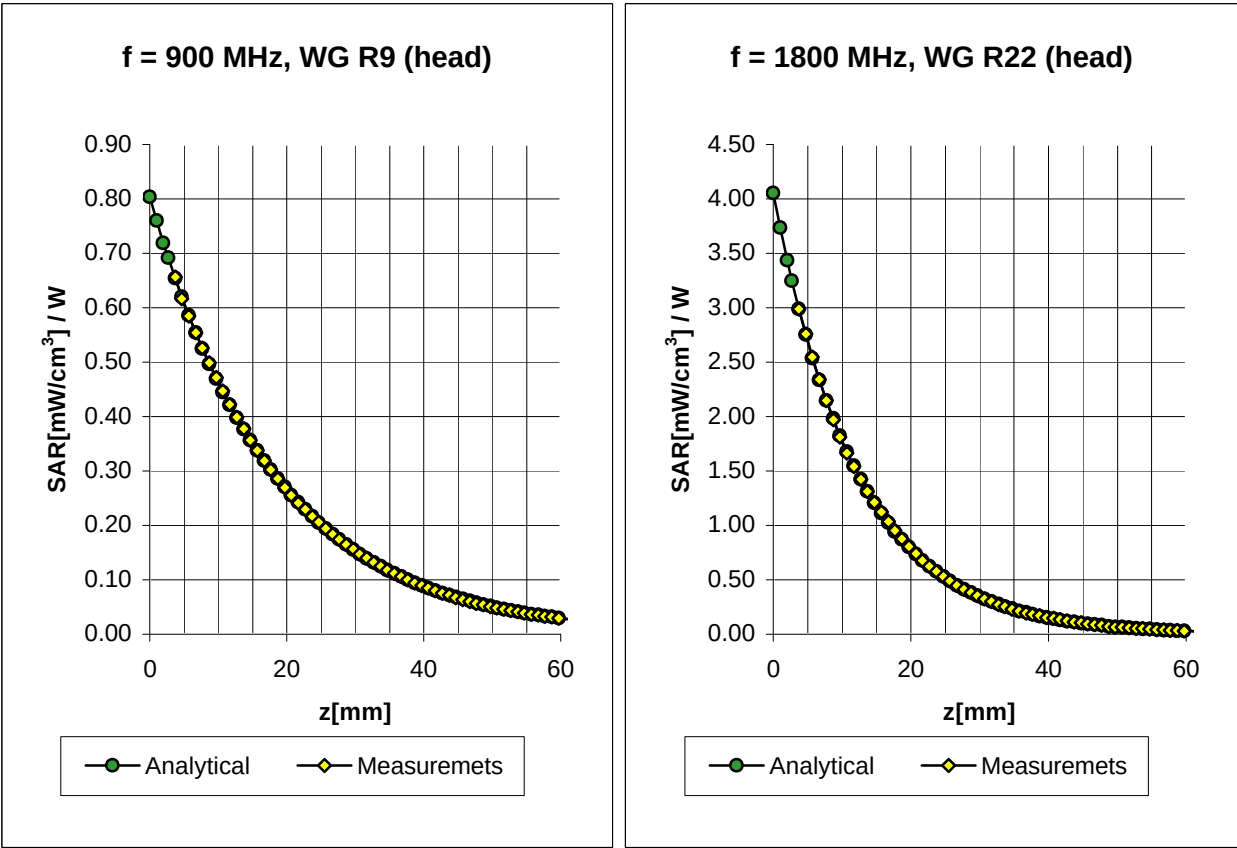
(TEM-Cell:ifi110, Waveguide R22)



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



Conversion Factor Assessment

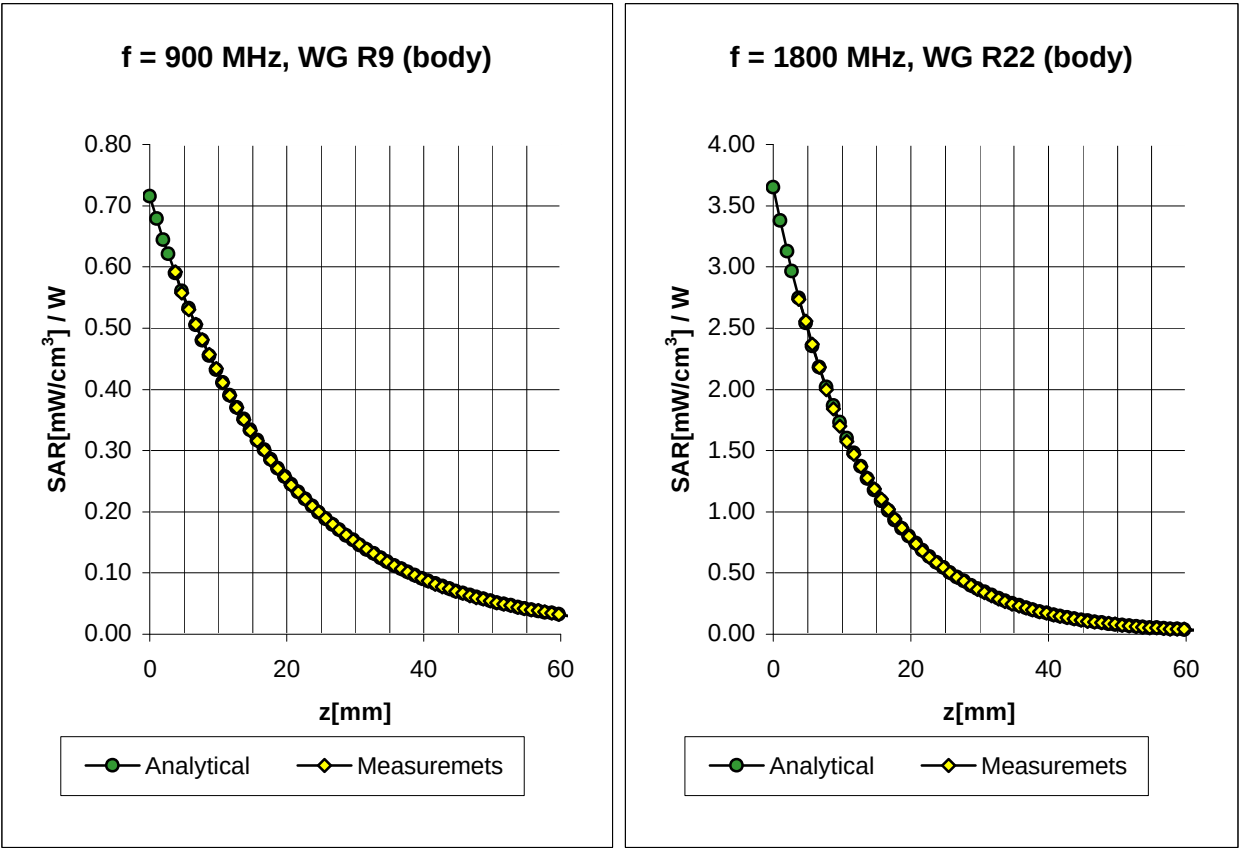


Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$s = 0.97 \pm 5\% \text{ mho/m}$
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$s = 0.90 \pm 5\% \text{ mho/m}$
	ConvF X	$6.6 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$6.6 \pm 9.5\% (k=2)$	Alpha 0.40
	ConvF Z	$6.6 \pm 9.5\% (k=2)$	Depth 2.38
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$s = 1.40 \pm 5\% \text{ mho/m}$
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 0.57
	ConvF Z	$5.4 \pm 9.5\% (k=2)$	Depth 2.18

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Conversion Factor Assessment



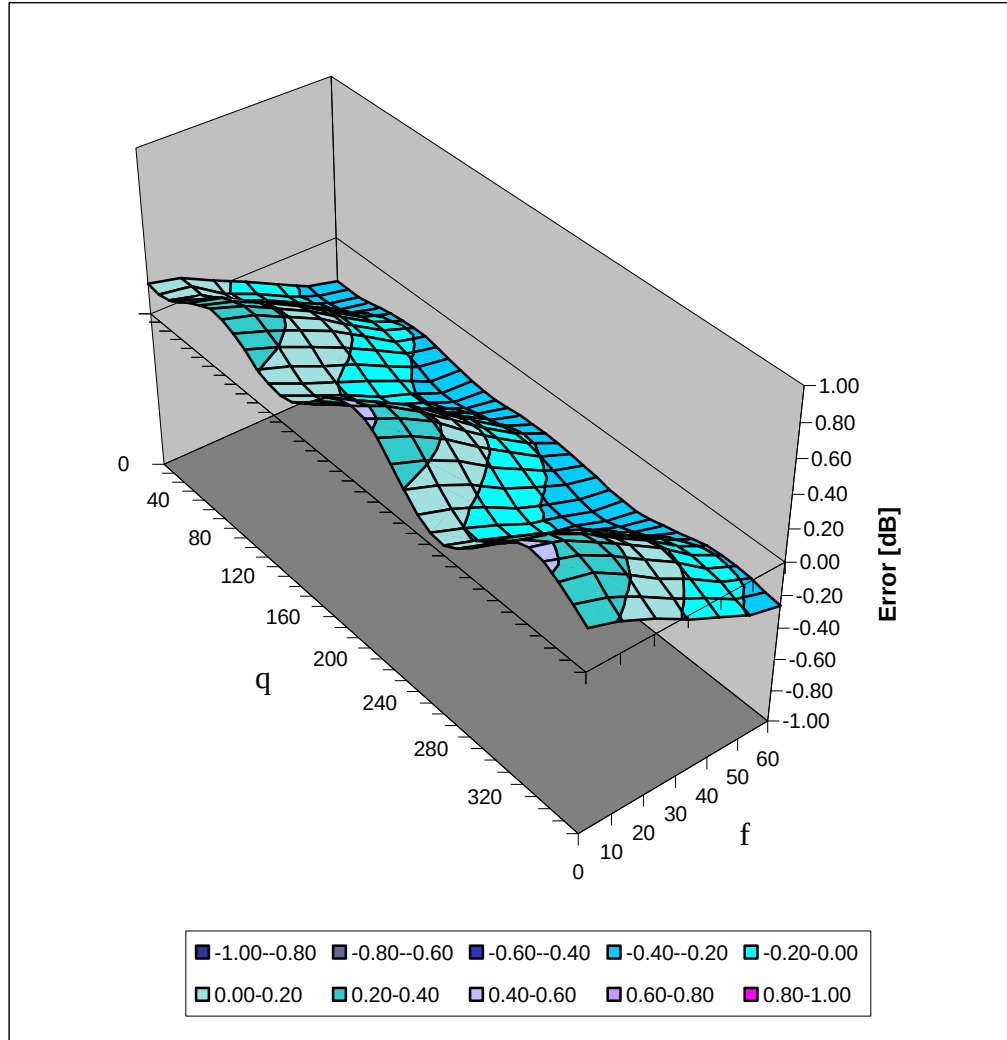
Body	900 MHz	$\epsilon_r = 55.0 \pm 5\%$	$s = 1.05 \pm 5\% \text{ mho/m}$
Body	835 MHz	$\epsilon_r = 55.2 \pm 5\%$	$s = 0.97 \pm 5\% \text{ mho/m}$
	ConvF X	$6.3 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$6.3 \pm 9.5\% (k=2)$	Alpha 0.42
	ConvF Z	$6.3 \pm 9.5\% (k=2)$	Depth 2.44
Body	1800 MHz	$\epsilon_r = 53.3 \pm 5\%$	$s = 1.52 \pm 5\% \text{ mho/m}$
Body	1900 MHz	$\epsilon_r = 53.3 \pm 5\%$	$s = 1.52 \pm 5\% \text{ mho/m}$
	ConvF X	$5.0 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$5.0 \pm 9.5\% (k=2)$	Alpha 0.76
	ConvF Z	$5.0 \pm 9.5\% (k=2)$	Depth 2.01

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Deviation from Isotropy in HSL

Error (q^f), $f = 900$ MHz



Additional Conversion Factors for Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1387

Place of Assessment:

Zurich

Date of Assessment:

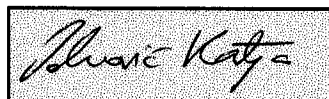
February 25, 2002

Probe Calibration Date:

February 22, 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:



Dosimetric E-Field Probe ET3DV6 SN:1387

Conversion Factor ($\pm$ standard deviation)

150 MHz	ConvF	$9.2 \pm 8\%$	$\epsilon_r = 52.3$ $s = 0.76 \text{ mho/m}$ (head tissue)
300 MHz	ConvF	$8.0 \pm 8\%$	$\epsilon_r = 45.3$ $s = 0.87 \text{ mho/m}$ (head tissue)
450 MHz	ConvF	$7.3 \pm 8\%$	$\epsilon_r = 43.5$ $s = 0.87 \text{ mho/m}$ (head tissue)
2450 MHz	ConvF	$4.7 \pm 8\%$	$\epsilon_r = 39.2$ $s = 1.80 \text{ mho/m}$ (head tissue)
150 MHz	ConvF	$8.8 \pm 8\%$	$\epsilon_r = 61.9$ $s = 0.80 \text{ mho/m}$ (body tissue)
450 MHz	ConvF	$7.7 \pm 8\%$	$\epsilon_r = 56.7$ $s = 0.94 \text{ mho/m}$ (body tissue)
2450 MHz	ConvF	$4.3 \pm 8\%$	$\epsilon_r = 52.7$ $s = 1.95 \text{ mho/m}$ (body tissue)