SAR DATA SUMMARY

Mixture Type: 150MHz Brain

14.1 MEASUREMENT RESULTS (150 MHz Face SAR)

FREQUENCY		Modulation	Begin / End POWER‡			Separation Distance (cm)‡‡	Antenna Position	SAR (W/kg) 100% Duty Cycle	SAR (W/kg) 50% Duty Cycle
MHz	Ch.		(dBm)		Battery				
156.050	01	FM	37.06	36.90	Ni-MH	2.5	Fixed	**2.130**	**1.065**
156.800	16	FM	37.08	36.92	Ni-MH	2.5	Fixed	**2.200**	**1.100**
157.425	88	FM	37.10	36.93	Ni-MH	2.5	Fixed	**2.400**	**1.200**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Brain 1.6 W/kg (mW/g) **averaged over 1 gram			

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒	Conducted	☐	ERP	☐	EIRP	
4. SAR Measurement System	☒	DASY4	☐	IDX			
Phantom Configuration	☐	Left Head	☒	Flat Phantom	☐	Right Head	
5. SAR Configuration	☒	Face	☐	Body	☐	Hand	
6. Test Signal Call Mode	☒	Manu. Test Codes	☐	Base Station Simulator			
7. ‡‡Test Configuration	☐	With Belt clip	☒	Without Belt clip			

8. Tissue parameters and temperatures are listed on the SAR plots.
9. Liquid tissue depth is 21.8 cm. ± 0.1

Alfred Cirwithian
Vice President Engineering

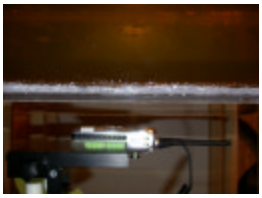

Figure 14.1 Face SAR Test Setup

SAR DATA SUMMARY (Continued)

Mixture Type: 150MHz Muscle

14.2 MEASUREMENT RESULTS (150 MHz Body SAR w/ Belt Clip)

FREQUENCY		Modulation	Begin / End POWER‡			Separation Distance (cm)‡‡	Antenna Position	SAR (W/kg) 100% Duty Cycle	SAR (W/kg) 50% Duty Cycle
MHz	Ch.		(dBm)		Battery				
156.050	01	FM	37.10	36.95	Ni-MH	2.4	Fixed	**2.780**	**1.390**
156.800	16	FM	37.12	36.98	Ni-MH	2.4	Fixed	**2.910**	**1.455**
157.425	88	FM	37.03	36.94	Ni-MH	2.4	Fixed	**2.740**	**1.370**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						**Muscle 1.6 W/kg (mW/g) averaged over 1 gram**			

NOTES:

1. The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supp.C [July 2001].
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings.

‡Power Measured	☒	Conducted	☐	ERP	☐	EIRP
4. SAR Measurement System	☒	DASY4	☐	IDX		
Phantom Configuration	☐	Left Head	☒	Flat Phantom	☐	Right Head
5. SAR Configuration	☐	Face	☒	Body	☐	Hand
6. Test Signal Call Mode	☒	Manu. Test Codes	☐	Base Station Simulator		
7. ‡‡Test Configuration	☒	With Belt clip	☐	Without Belt clip		

8. Tissue parameters and temperatures are listed on the SAR plots.
9. Liquid tissue depth is 21.8 cm. ± 0.1

Alfred Cirwithian
Vice President Engineering

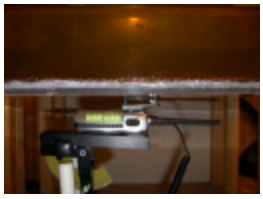

Figure 14.2 Body SAR Test Setup -- w/ Belt clip --

15. SAR TEST EQUIPMENT

Equipment Calibration

Table 15.1 Test Equipment Calibration

EQUIPMENT SPECIFICATIONS			
Type		**Calibration Date**	**Serial Number**
Stäubli Robot RX60L		February 2003	599131-01
Stäubli Robot Controller		February 2003	PCT592
Stäubli Teach Pendant (Joystick)		February 2003	3323-00161
Micron Computer, 450 MHz Pentium III, Windows NT		February 2003	PCT577
SPEAG EDC3		February 2003	321
SPEAG DAE3		February 2003	330
SPEAG E-Field Probe ET3DV6		September 2003	1560
SPEAG Dummy Probe		February 2003	PCT583
SPEAG Plexiglas Planar Phantom V1.0		February 2003	PCT150
SPEAG Light Alignment Sensor		February 2003	205
PCTEST Validation Dipole D300V2		September 2003	PCT301
SPEAG Validation Dipole D835V2		February 2003	PCT512
SPEAG Validation Dipole D1900V2		February 2003	PCT613
Brain Equivalent Matter (150MHz)		January 2004	PCTBEM501
Muscle Equivalent Matter (150MHz)		January 2004	PCTMEM501
Brain Equivalent Matter (300MHz)		January 2004	PCTBEM601
Muscle Equivalent Matter (300MHz)		January 2004	PCTMEM701
Microwave Amp. Model: 5S1G4, (800MHz - 4.2GHz)		January 2004	22332
Gigatronics 8651A Power Meter		January 2004	1835299
HP-8648D (9kHz ~ 4GHz) Signal Generator		January 2004	PCT530
Amplifier Research 5S1G4 Power Amp		January 2004	PCT540
HP-8753E (30kHz ~ 3GHz) Network Analyzer		January 2004	PCT552
HP85070B Dielectric Probe Kit		January 2004	PCT501
Ambient Noise/Reflection, etc.	January 2004	January 2003	Anechoic Room PCT01

NOTE:

The E-field probe was calibrated by SPEAG, by waveguide technique procedure. Dipole Validation measurement is performed by PCTEST Lab. before each test. The brain simulating material is calibrated by PCTEST using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material.

16. CONCLUSION

Measurement Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.[3]

17. REFERENCES

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[18] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.

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[20] Prof. Dr. Niels Kuster, ETH, Eidgenössische Technische Hoschschule Zürich, Dosimetric Evaluation of the Cellular Phone.

ATTACHMENT A – SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT:FCC ID: AMWUT919; Model: MHS350; Type: VHF Marine Radio; SN: FCC/S

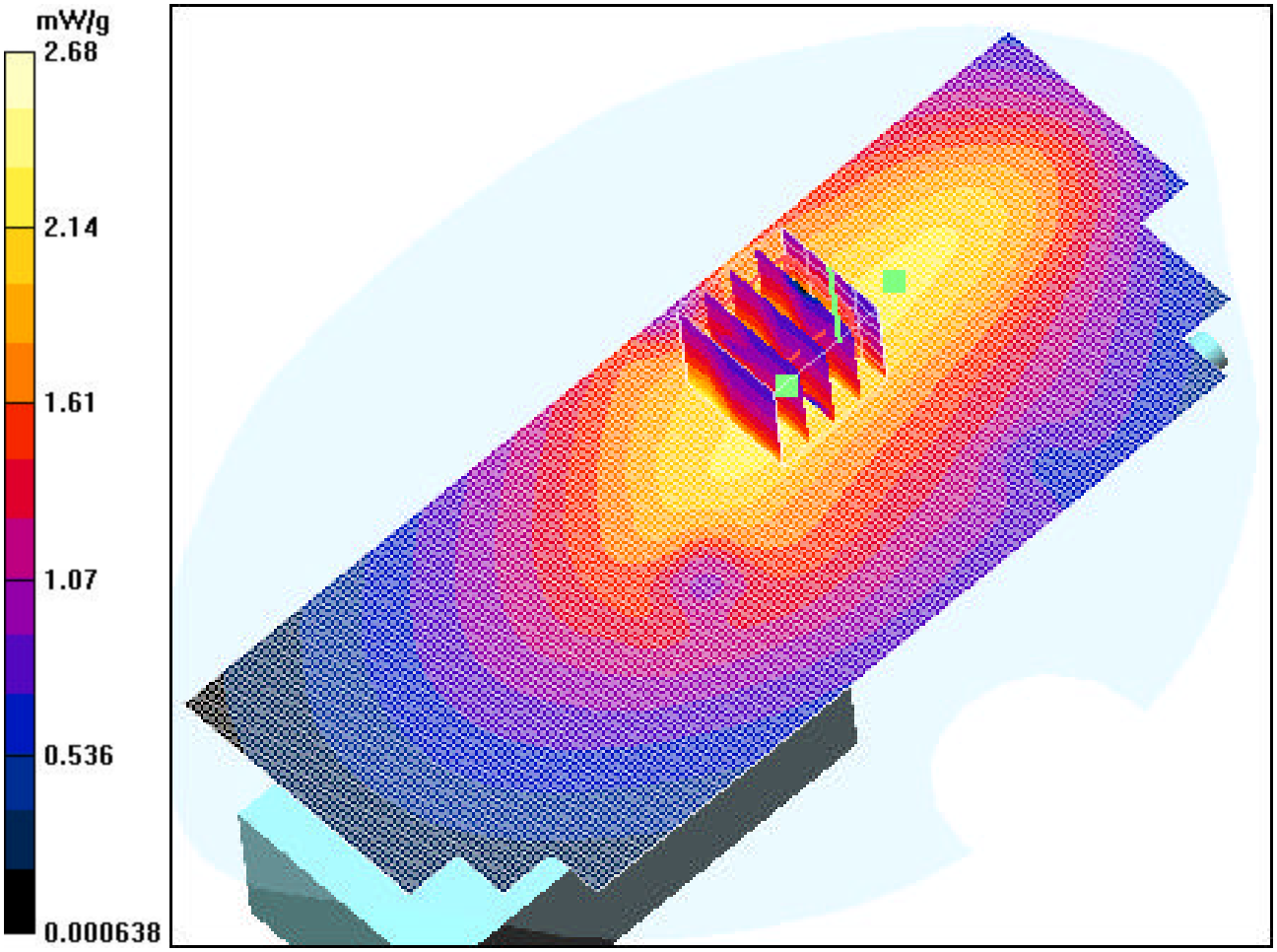
Communication System: 156MHz VHF Marine Radio; Frequency: 157.425 MHz;Duty Cycle: 1:1
Medium: 150 Brain (σ = 0.77 mho/m, ε_r = 51.8, ρ = 1000 kg/m^3)
Phantom section: Center Flat

Test Date: 01-20-2004; Ambient Temp: 22.9°C; Tissue Temp: 20.3°C

Probe: ES3DV2 - SN3022; ConvF(8.5, 8.5, 8.5); Calibrated: 9/23/2003
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn445; Phantom: Plexiglas Planar V1.0; SN: PCT150
Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Face, 2.5cm.space, Ch.88, Fixed Antenna, Battery: Ni-MH

Area Scan (71x171x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 3.26 W/kg
SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.75 mW/g
Reference Value = 49.8 V/m



PCTEST ENGINEERING LABORATORY, INC.

DUT: AMWUT919; Model: MHS350; Type: VHF Marine Radio; SN: FCC/S

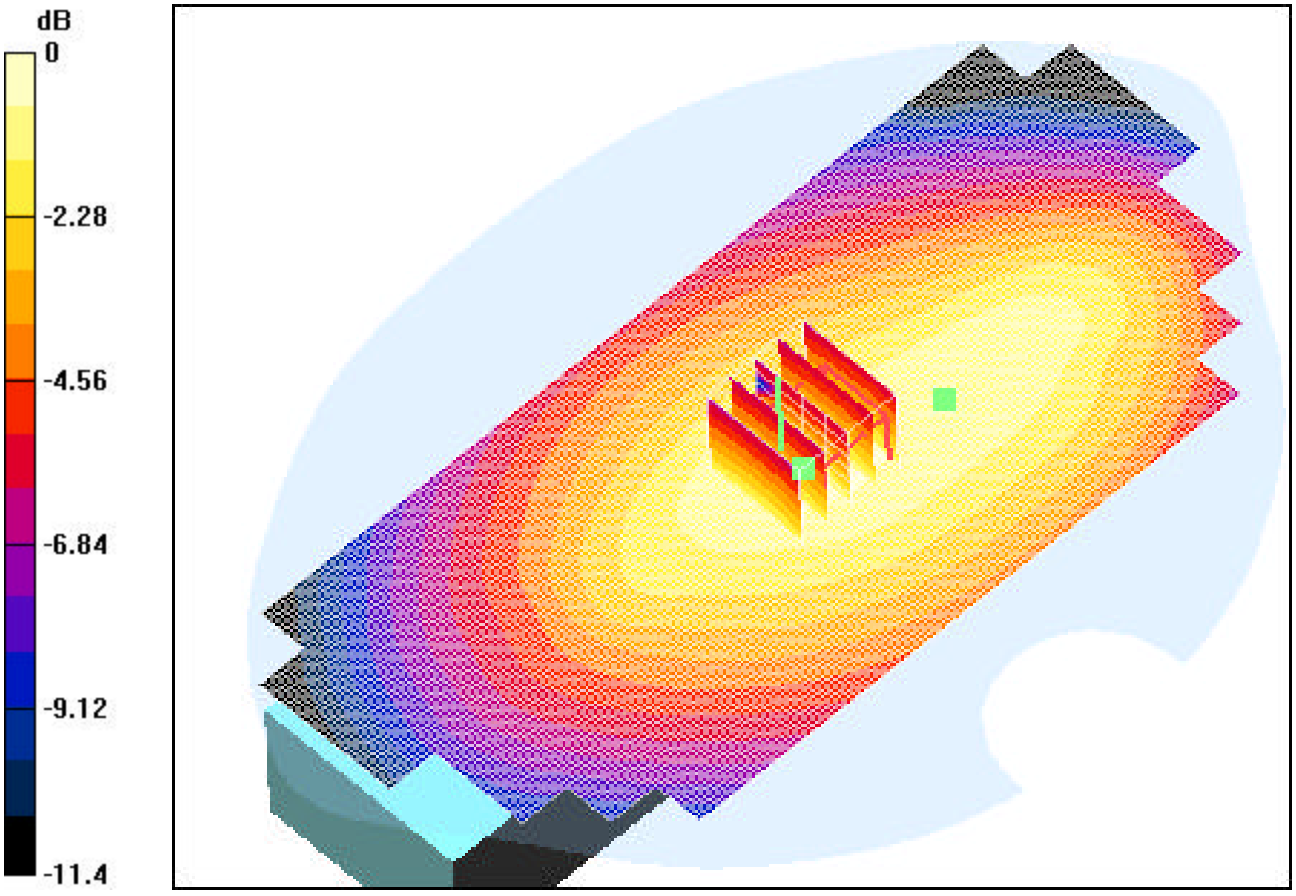
Communication System: 156MHz VHF Marine Radio; Frequency: 156.8 MHz;Duty Cycle: 1:1
Medium: 150 Muscle (σ = 0.81 mho/m; ε_r = 61.7; ρ = 1000 kg/m^3)
Phantom section: Center Flat

Test Date: 01-20-2004; Ambient Temp: 22.9°C; Tissue Temp: 20.4°C

Probe: ES3DV2 - SN3022; ConvF(8, 8, 8); Calibrated: 9/23/2003
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn445; Phantom: Plexiglas Planar V1.0; SN: PCT150
Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Body, 2.4cm.space, Ch.16, Fixed Antenna, Battery: Ni-MH

Area Scan (71x171x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 4.52 W/kg
SAR(1 g) = 2.91 mW/g; SAR(10 g) = 1.98 mW/g
Reference Value = 63.3 V/m



PCTEST ENGINEERING LABORATORY, INC.

DUT: FCC ID: AMWUT919; Model: MHS350; Type: VHF Marine Radio; SN: FCC/S

Communication System: 156MHz VHF Marine Radio; Frequency: 157.425 MHz;Duty Cycle: 1:1
Medium: 150 Brain (σ = 0.77 mho/m, ε_r = 51.8, ρ = 1000 kg/m^3)
Phantom section: Center Flat

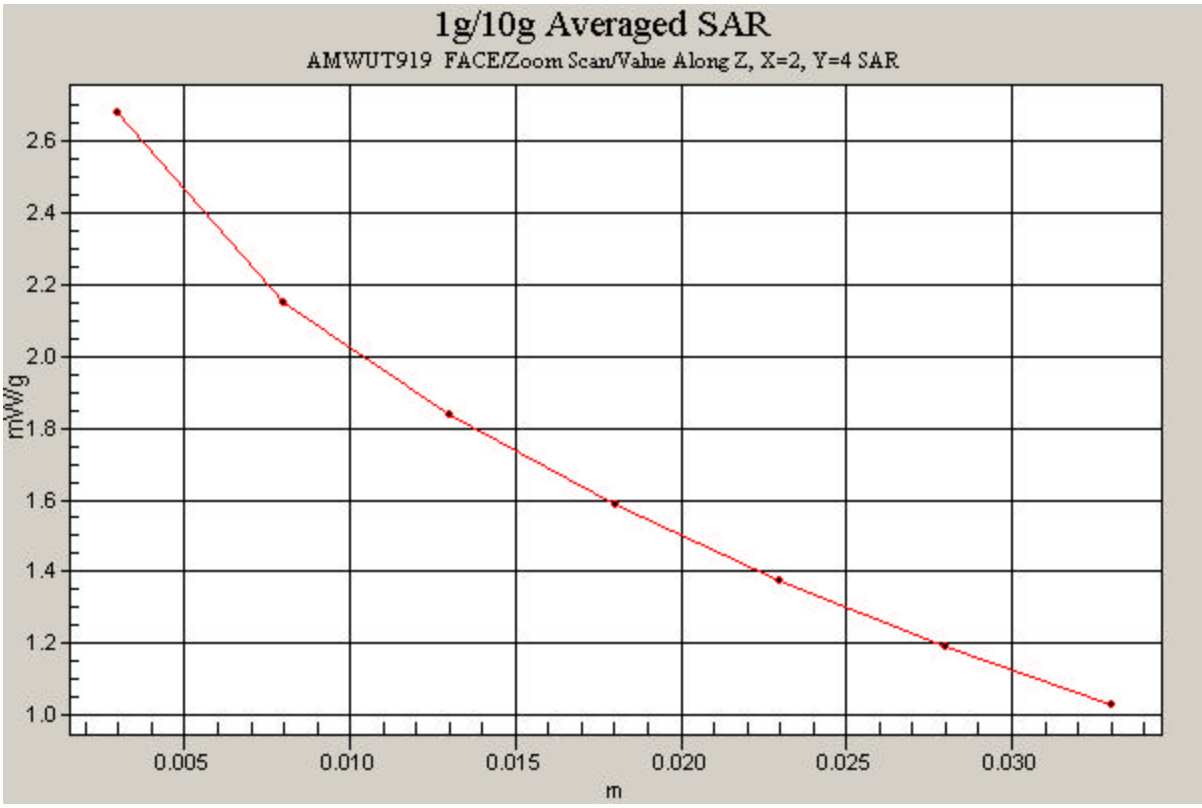
Test Date: 01-20-2004; Ambient Temp: 22.9°C; Tissue Temp: 20.3°C

Probe: ES3DV2 - SN3022; ConvF(8.5, 8.5, 8.5); Calibrated: 9/23/2003
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn445; Phantom: Plexiglas Planar V1.0; SN: PCT150
Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Face, 2.5cm.space,Ch.88,Fixed Antenna, Battery: Ni-MH

Area Scan (71x171x1): Measurement grid: dx=15mm, dy=15mm

Ch.88,Face/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 3.26 W/kg
SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.75 mW/g
Reference Value = 49.8 V/m



PCTEST ENGINEERING LABORATORY, INC.

DUT: AMWUT919; Model: MHS350; Type: VHF Marine Radio; SN: FCC/S

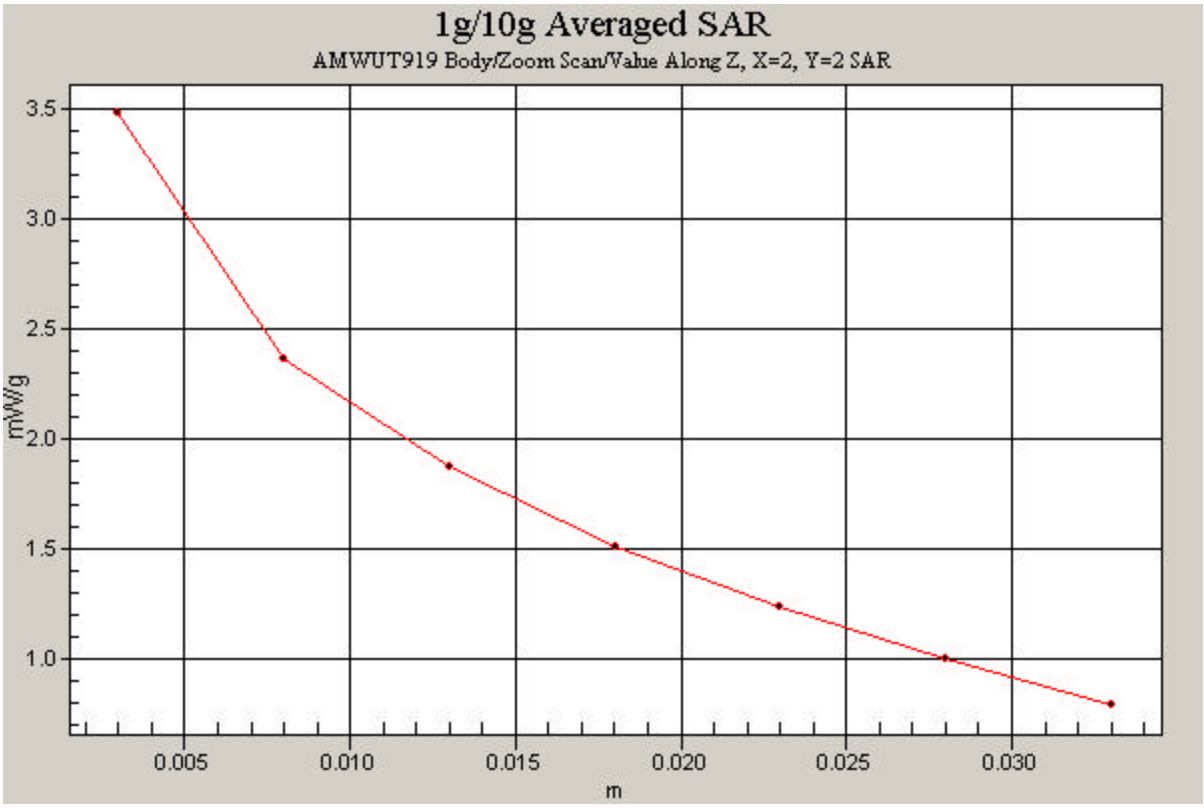
Communication System: 156MHz VHF Marine Radio; Frequency: 156.8 MHz;Duty Cycle: 1:1
Medium: 150 Muscle (σ = 0.81 mho/m; ε_r = 61.7; ρ = 1000 kg/m^3)
Phantom section: Center Flat

Test Date: 01-20-2004; Ambient Temp: 22.9°C; Tissue Temp: 20.4°C

Probe: ES3DV2 - SN3022; ConvF(8, 8, 8); Calibrated: 9/23/2003
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn445; Phantom: Plexiglas Planar V1.0; SN: PCT150
Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

Body, 2.4cm.space, Ch.16, Fixed Antenna, Battery: Ni-MH

Area Scan (71x171x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 4.52 W/kg
SAR(1 g) = 2.91 mW/g; SAR(10 g) = 1.98 mW/g
Reference Value = 63.3 V/m



ATTACHMENT B – SAR TEST SETUP PHOTOGRAPHS

ATTACHMENT C – PROBE CALIBRATION

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

Client PC Test

CALIBRATION CERTIFICATE

Object(s)	ES3DV2 - SN:3022
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	September 23, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	GB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Reference 20 dB Attenuator	SN: 5086 (20b)	3-Apr-03 (METAS No. 251-0340	Apr-04
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (Agilent, No. 20020918)	In house check: Oct 03
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (Agilent, No. 24BR1033101)	In house check: Oct 03

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Laboratory Director	
Approved by:	Niels Kuster	Quality Manager	

Date issued: October 5, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Schmid & Partner Engineering AG
s p e a g
Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Probe ES3DV2

SN:3022

Manufactured: April 15, 2003
Last calibration: September 23, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ES3DV2 SN:3022

Sensitivity in Free Space

Diode Compression

NormX	**1.00** $\mu V/(V/m)^2$	DCP X	**95**	mV
NormY	**1.04** $\mu V/(V/m)^2$	DCP Y	**95**	mV
NormZ	**0.98** $\mu V/(V/m)^2$	DCP Z	**95**	mV

Sensitivity in Tissue Simulating Liquid

Head **900 MHz** ε_r **= 41.5 ± 5%** σ **= 0.97 ± 5% mho/m**

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**6.1** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.1** ± 9.5% (k=2)	Alpha	**0.32**
ConvF Z	**6.1** ± 9.5% (k=2)	Depth	**1.65**

Head **1800 MHz** ε_r **= 40.0 ± 5%** σ **= 1.40 ± 5% mho/m**

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**5.0** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.0** ± 9.5% (k=2)	Alpha	**0.25**
ConvF Z	**5.0** ± 9.5% (k=2)	Depth	**2.30**

Boundary Effect

Head **900 MHz** **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	5.5	2.5
SAR_{be} [%]	With Correction Algorithm	0.1	0.4

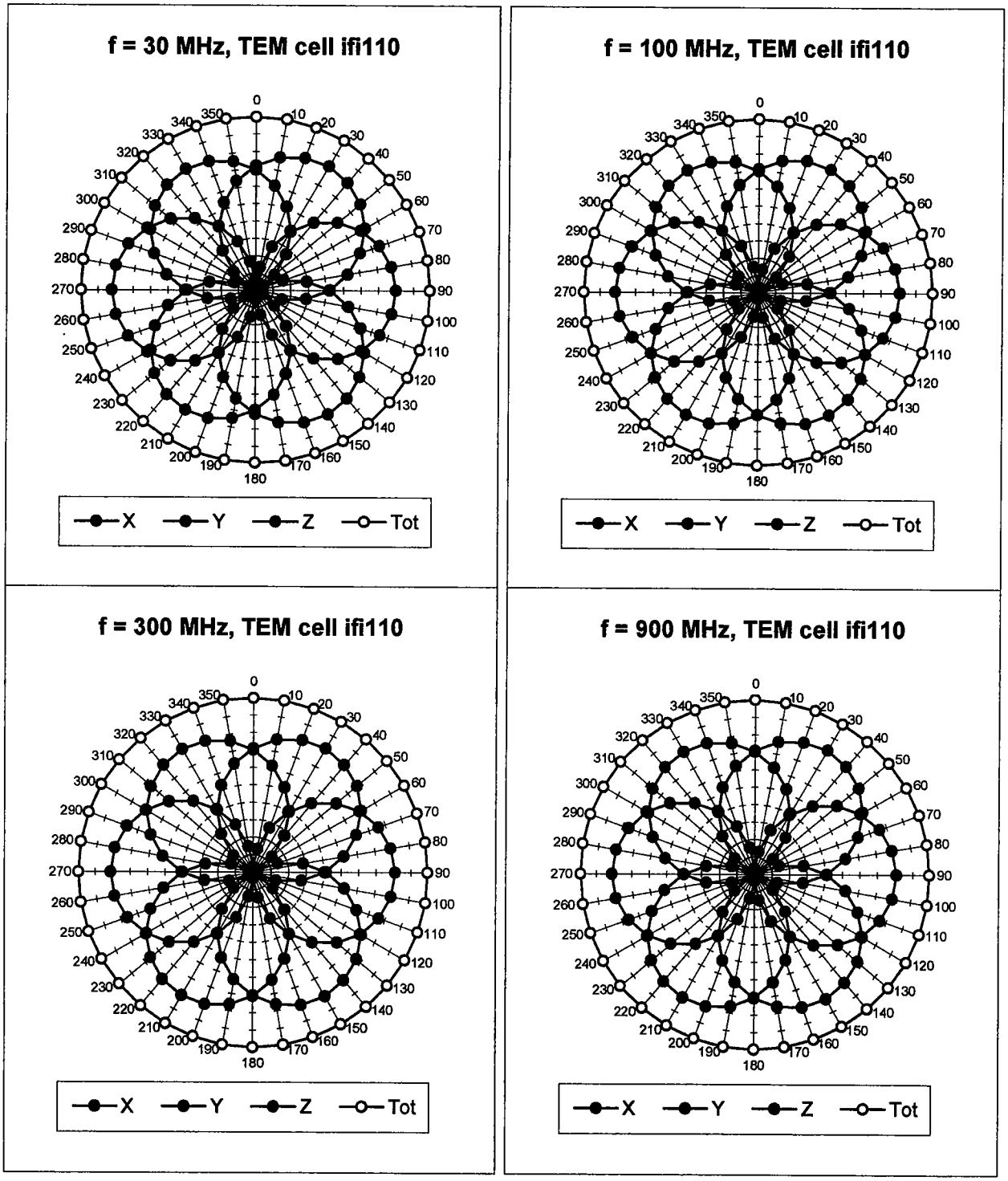
Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

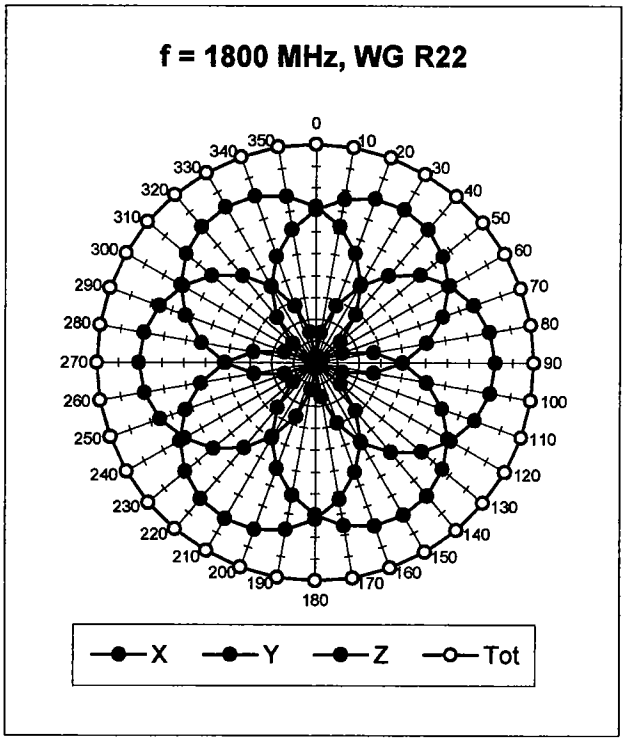
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	7.1	4.4
SAR_{be} [%]	With Correction Algorithm	0.0	0.1

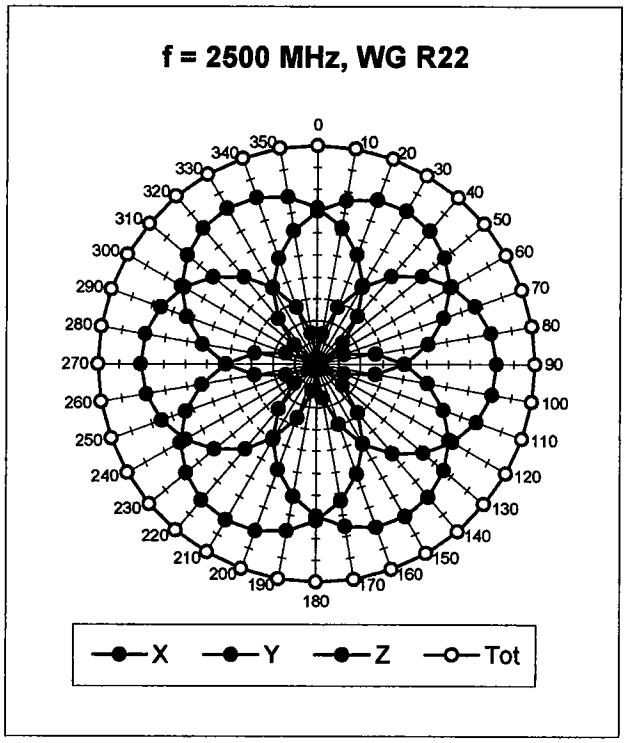
Sensor Offset

Probe Tip to Sensor Center	**2.0**	mm

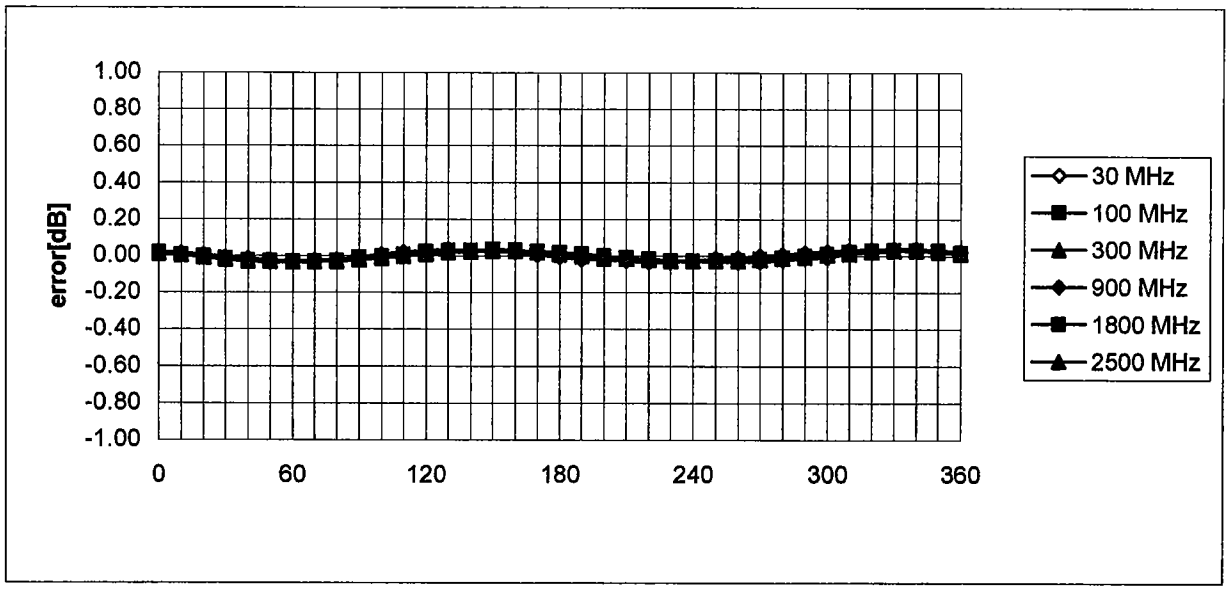
Receiving Pattern (ϕ , θ = 0°





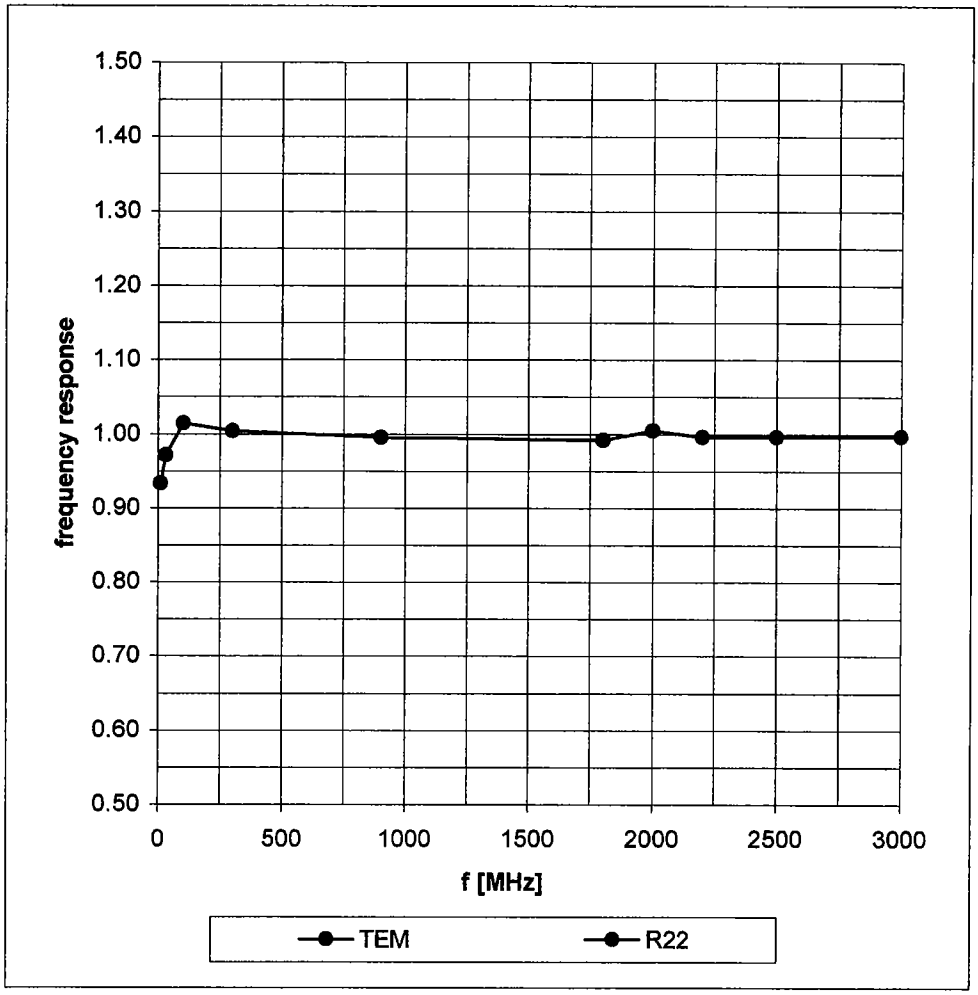


Isotropy Error (ϕ), θ = 0°



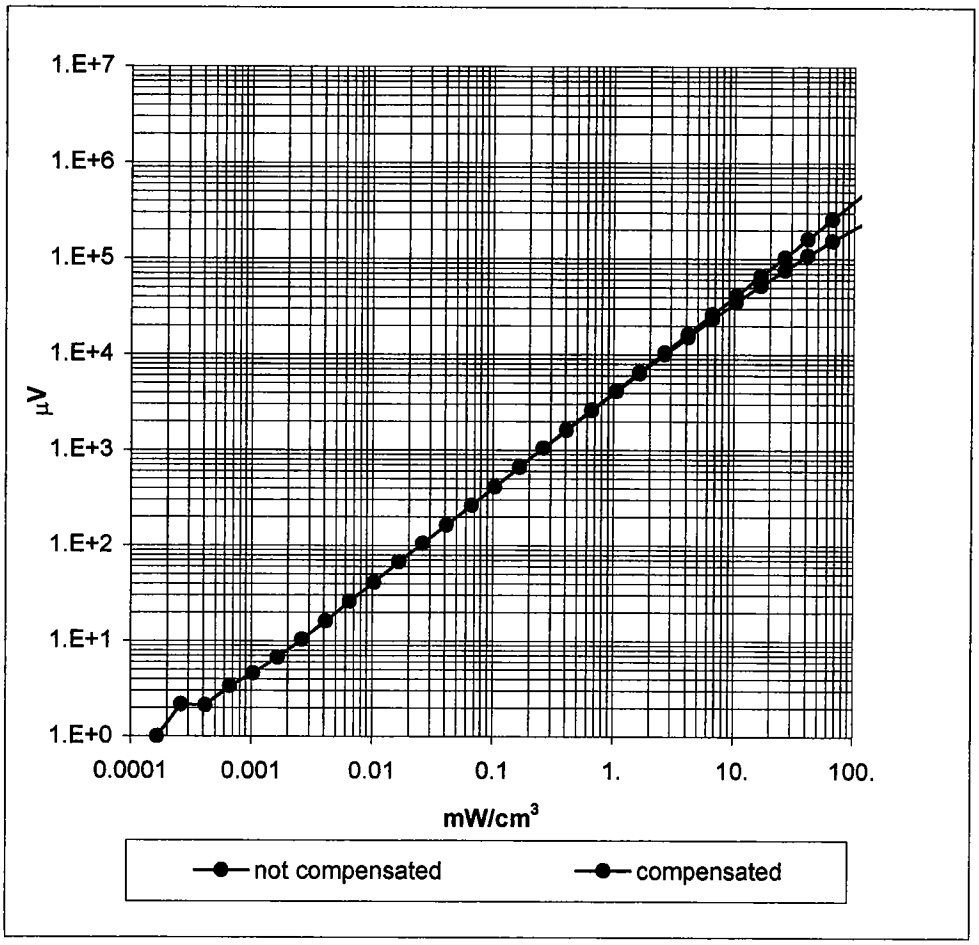
Frequency Response of E-Field

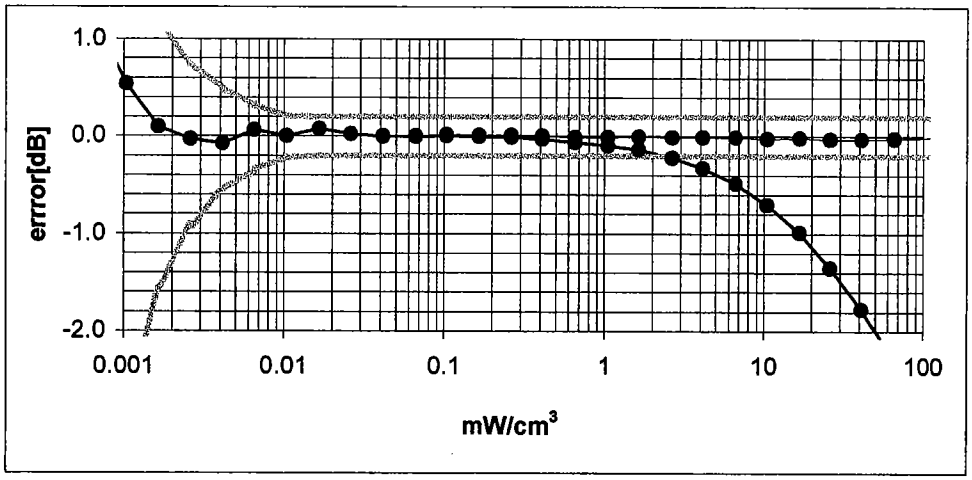
(TEM-Cell:ifi110, Waveguide R22)



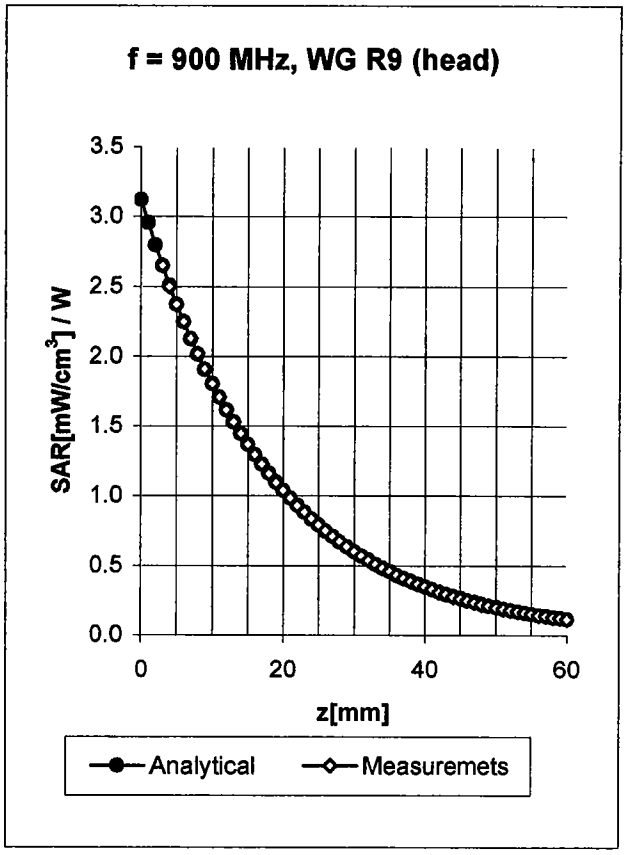
Dynamic Range f(SAR_{brain})

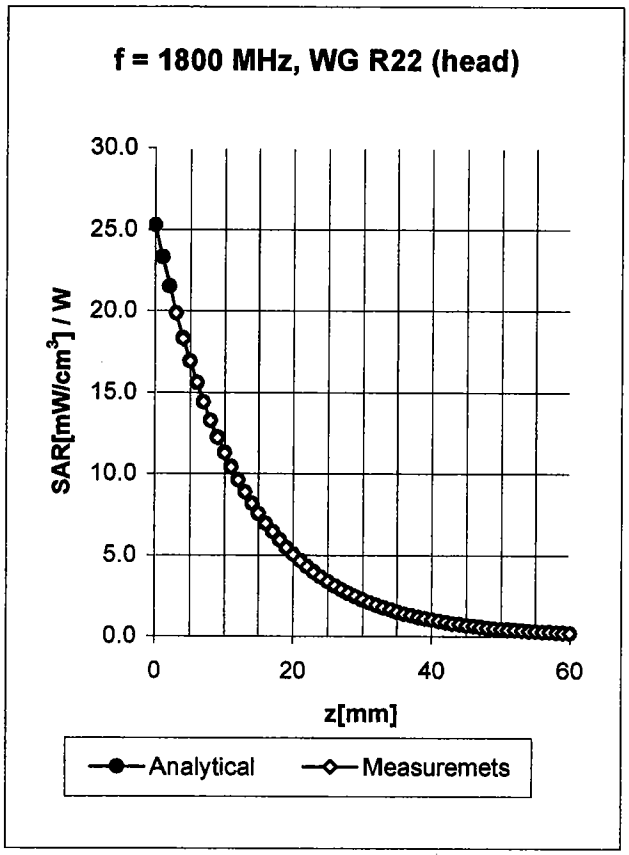
(Waveguide R22)





Conversion Factor Assessment





Head **900 MHz** ε_r **= 41.5 ± 5%** σ **= 0.97 ± 5% mho/m**

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

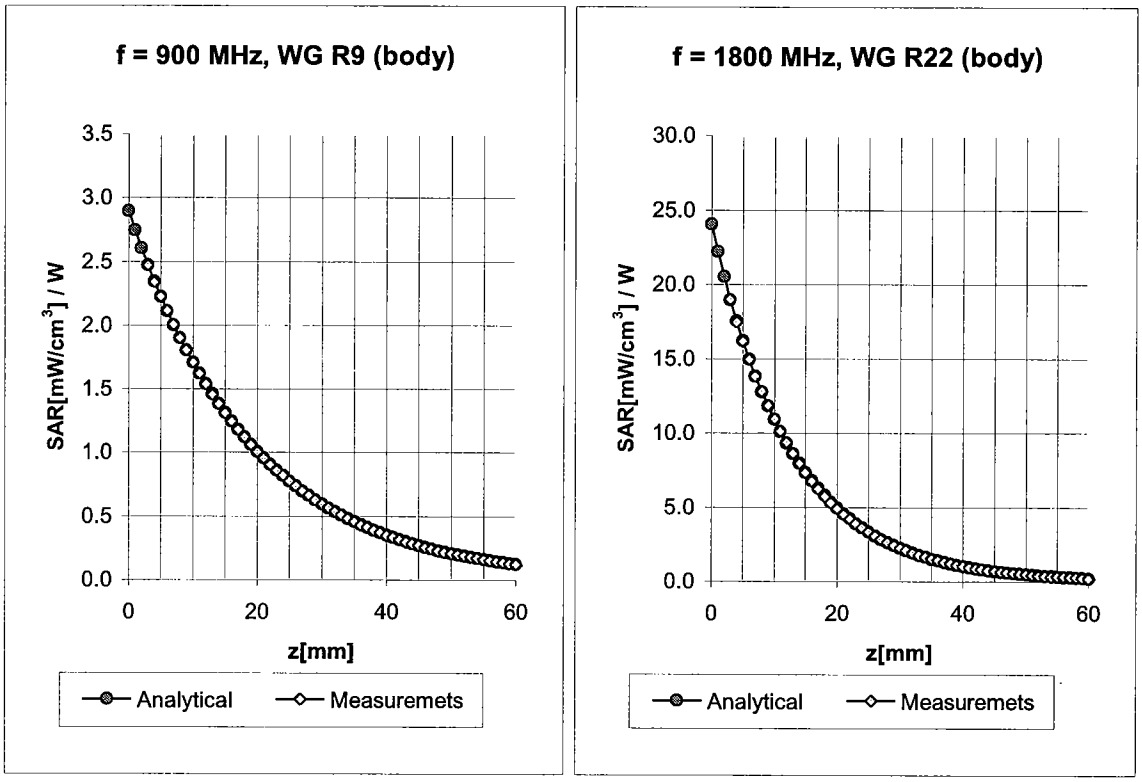
ConvF X	**6.1** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.1** ± 9.5% (k=2)	Alpha	**0.32**
ConvF Z	**6.1** ± 9.5% (k=2)	Depth	**1.65**

Head **1800 MHz** ε_r **= 40.0 ± 5%** σ **= 1.40 ± 5% mho/m**

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**5.0** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.0** ± 9.5% (k=2)	Alpha	**0.25**
ConvF Z	**5.0** ± 9.5% (k=2)	Depth	**2.30**

Conversion Factor Assessment



Body **900 MHz** ε_r = 55.0 ± 5% σ = 1.05 ± 5% mho/m

Valid for f=800-1000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

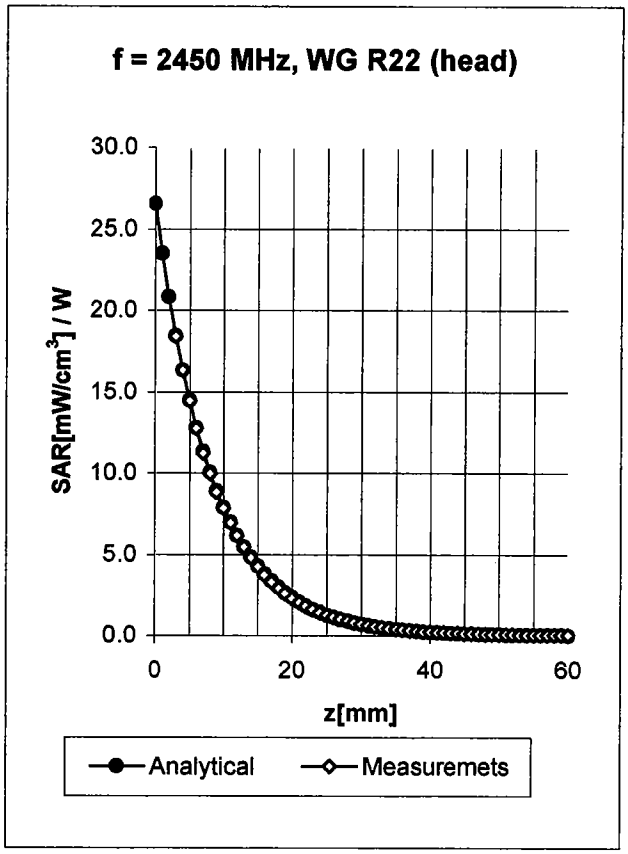
ConvF X	**6.0** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.0** ± 9.5% (k=2)	Alpha	**0.38**
ConvF Z	**6.0** ± 9.5% (k=2)	Depth	**1.47**

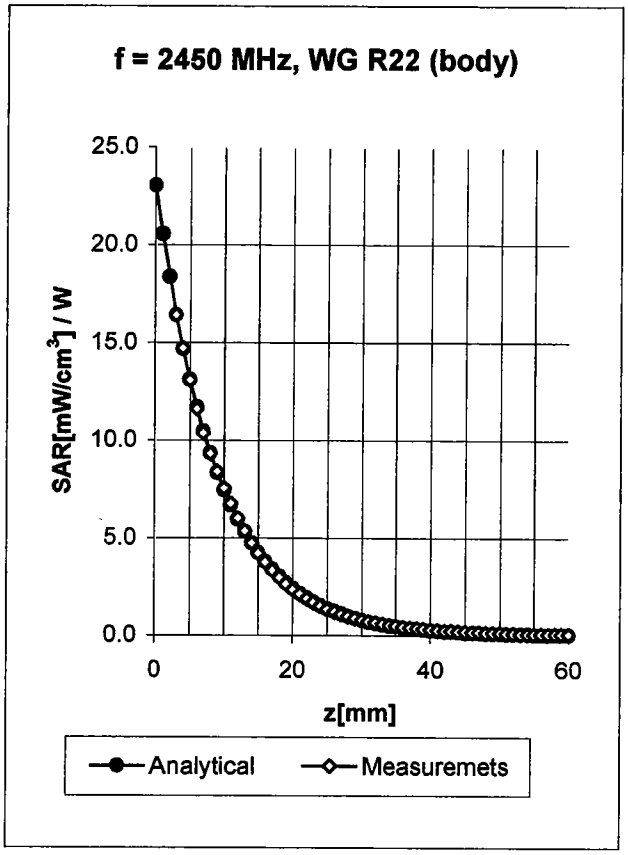
Body **1800 MHz** ε_r = 53.3 ± 5% σ = 1.52 ± 5% mho/m

Valid for f=1710-1910 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.5** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.5** ± 9.5% (k=2)	Alpha	**0.22**
ConvF Z	**4.5** ± 9.5% (k=2)	Depth	**3.42**

Conversion Factor Assessment





Head **2450 MHz** ε_r **= 39.2 ± 5%** σ **= 1.80 ± 5% mho/m**

Valid for f=2400-2500 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

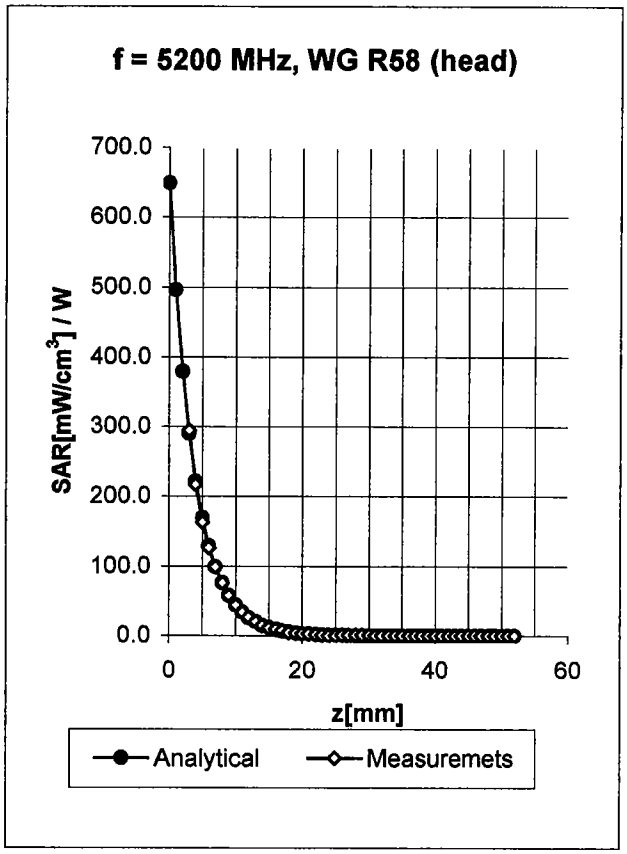
ConvF X	**4.5** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.5** ± 9.5% (k=2)	Alpha	**0.42**
ConvF Z	**4.5** ± 9.5% (k=2)	Depth	**1.56**

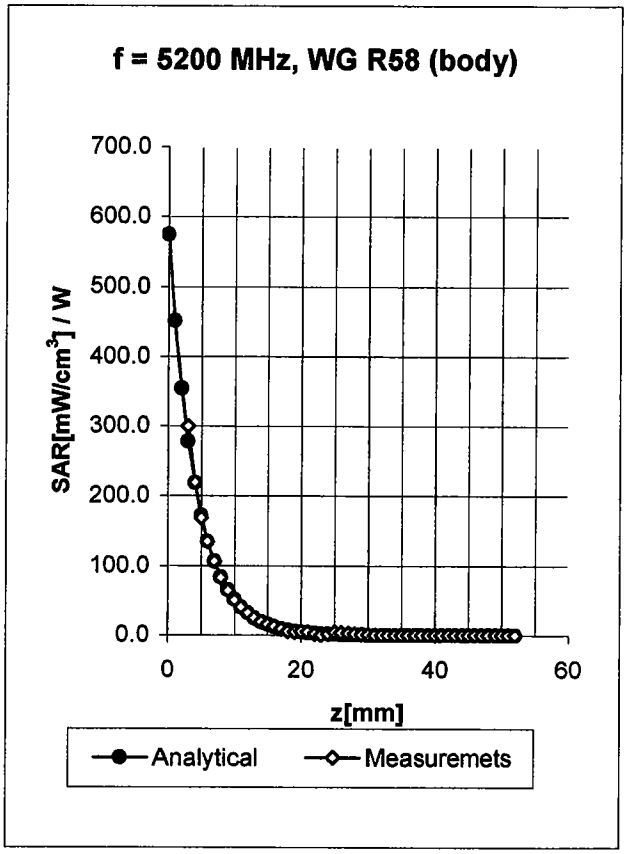
Body **2450 MHz** ε_r **= 52.7 ± 5%** σ **= 1.95 ± 5% mho/m**

Valid for f=2400-2500 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.2** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.2** ± 9.5% (k=2)	Alpha	**0.42**
ConvF Z	**4.2** ± 9.5% (k=2)	Depth	**1.65**

Conversion Factor Assessment





Head **5200 MHz** ε_r **= 36.0 ± 5%** σ **= 4.66 ± 5% mho/m**

Valid for f=4940-5460 MHz with Head Tissue Simulating Liquid according to OET65-SuppC

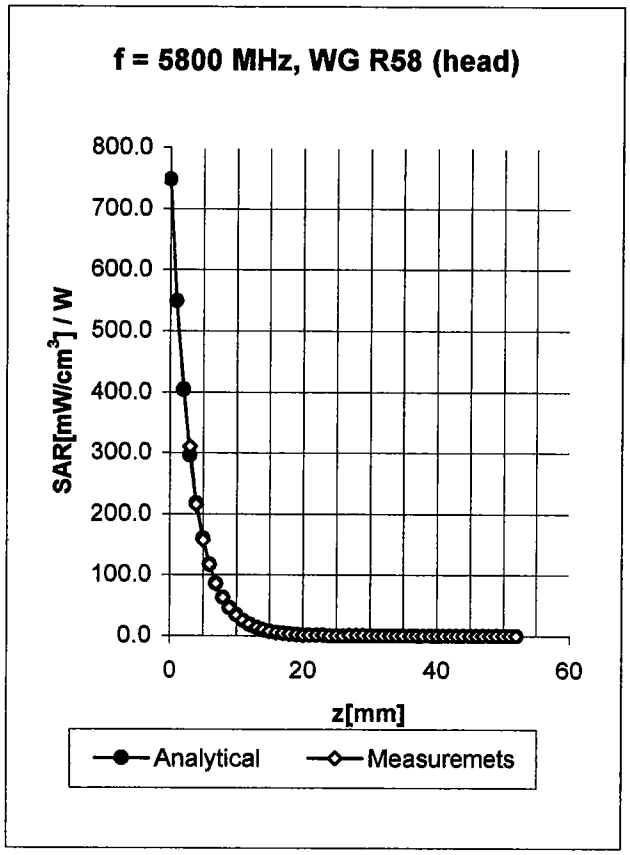
ConvF X	**2.60** ± 16.6% (k=2)	Boundary effect:	
ConvF Y	**2.60** ± 16.6% (k=2)	Alpha	**0.93**
ConvF Z	**2.60** ± 16.6% (k=2)	Depth	**1.50**

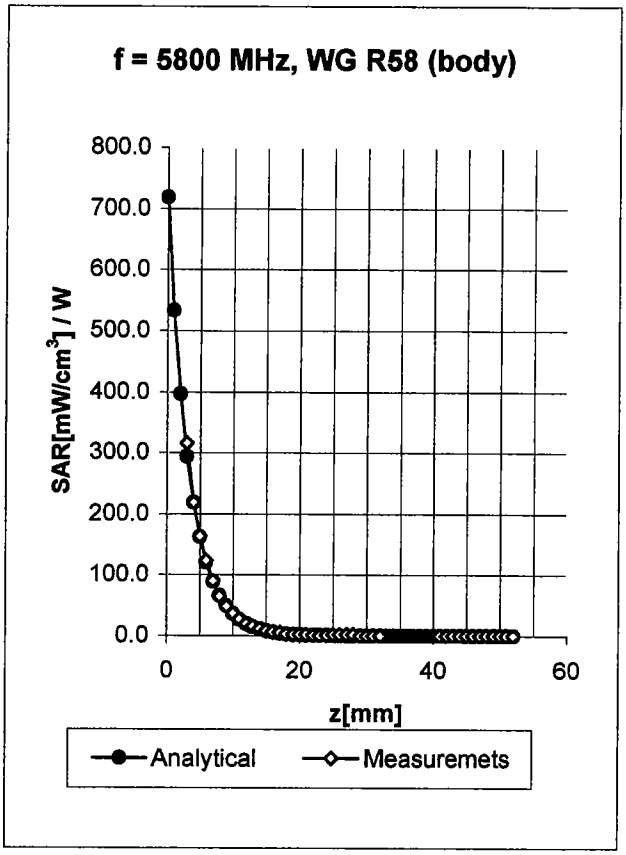
Body **5200 MHz** ε_r **= 49.0 ± 5%** σ **= 5.30 ± 5% mho/m**

Valid for f=4940-5460 MHz with Body Tissue Simulating Liquid according to OET65-SuppC

ConvF X	**1.80** ± 16.6% (k=2)	Boundary effect:	
ConvF Y	**1.80** ± 16.6% (k=2)	Alpha	**1.05**
ConvF Z	**1.80** ± 16.6% (k=2)	Depth	**1.60**

Conversion Factor Assessment





Head **5800 MHz** ε_r **= 35.3 ± 5%** σ **= 5.27 ± 5% mho/m**

Valid for f=5510-6090 MHz with Head Tissue Simulating Liquid according to OET65-SuppC

ConvF X	**2.15** ± 16.6% (k=2)	Boundary effect:	
ConvF Y	**2.15** ± 16.6% (k=2)	Alpha	**1.04**
ConvF Z	**2.15** ± 16.6% (k=2)	Depth	**1.50**

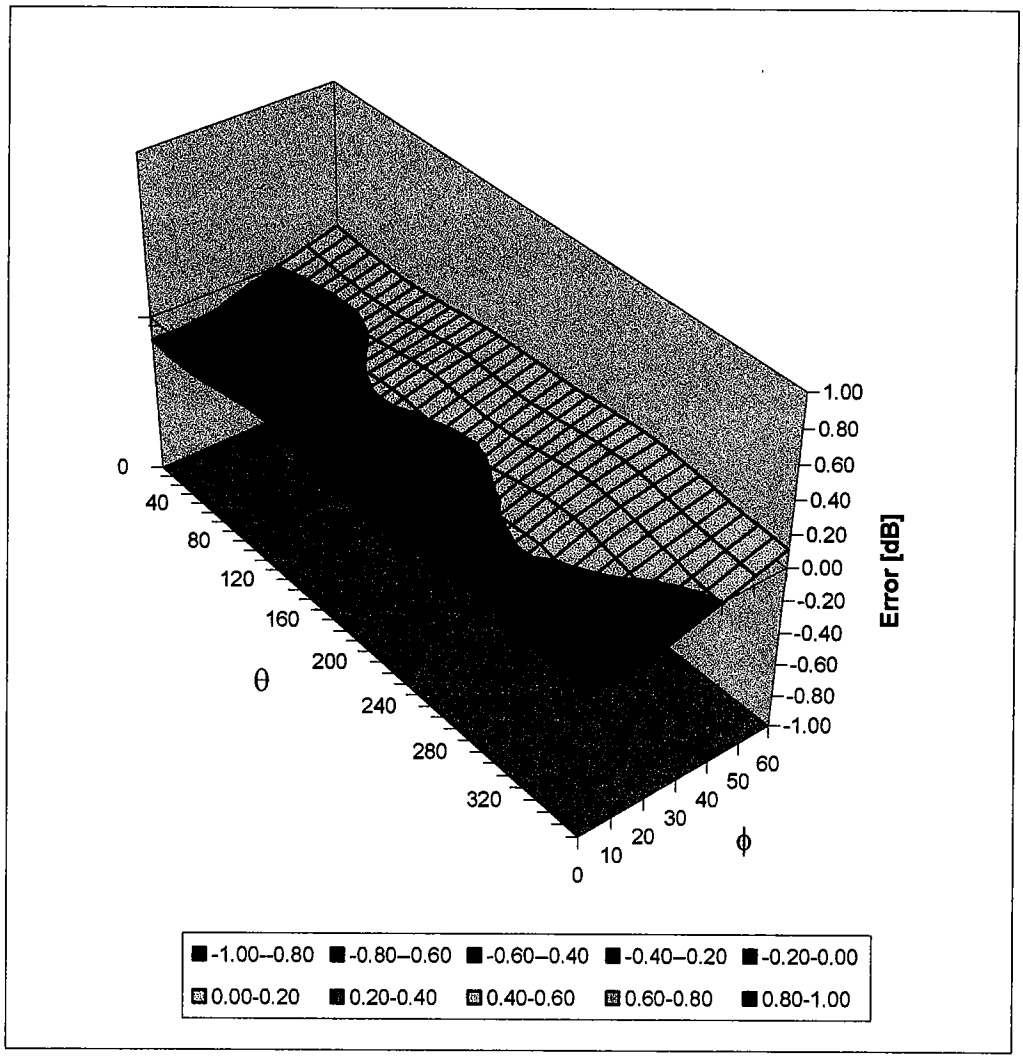
Body **5800 MHz** ε_r **= 48.2 ± 5%** σ **= 6.0 ± 5% mho/m**

Valid for f=5510-6090 MHz with Body Tissue Simulating Liquid according to OET65-SuppC

ConvF X	**1.57** ± 16.6% (k=2)	Boundary effect:	
ConvF Y	**1.57** ± 16.6% (k=2)	Alpha	**1.15**
ConvF Z	**1.57** ± 16.6% (k=2)	Depth	**1.70**

Deviation from Isotropy in HSL

Error ($\theta\phi$), f = 900 MHz



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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV2**
Serial Number:	**3022**
Place of Assessment:	**Zurich**
Date of Assessment:	**December 3, 2003**
Probe Calibration Date:	**September 23, 2003**

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:

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Dosimetric E-Field Probe ES3DV2 SN:3022

Conversion factor (± standard deviation)

1950 MHz	ConvF	**4.7 ± 9.5%**	**= 40.0 ± 5%** **= 1.40 ± 5% mho/m** (head tissue)
1950 MHz	ConvF	**4. 3± 9.5%**	**= 53.3 ± 5%** **= 1.52 ± 5% mho/m** (body tissue)

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV2**
Serial Number:	**3022**
Place of Assessment:	**Zurich**
Date of Assessment:	**October 3, 2003**
Probe Calibration Date:	**September 23, 2003**

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.

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Dosimetric E-Field Probe ES3DV2 SN:3022

Conversion factor (± standard deviation)

150 MHz	ConvF	**8.5 ± 8%**	ε_r = **52.3 ± 5%** σ = **0.76 ± 5% mho/m** (head tissue)
150 MHz	ConvF	**8.0 ± 8%**	ε_r = **61.9 ± 5%** σ = **0.80 ± 5% mho/m** (body tissue)
450 MHz	ConvF	**7.1 ± 8%**	ε_r = **43.5 ± 5%** σ = **0.87 ± 5% mho/m** (head tissue)
450 MHz	ConvF	**7.2 ± 8%**	ε_r = **56.7 ± 5%** σ = **0.94 ± 5% mho/m** (body tissue)

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV2**
Serial Number:	**3022**
Place of Assessment:	**Zurich**
Date of Assessment:	**November 28, 2003**
Probe Calibration Date:	**September 23, 2003**

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.

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Dosimetric E-Field Probe ES3DV2 SN:3022

Conversion factor (± standard deviation)

1600 MHz	ConvF	**5.2 ± 8%**	**ε_r = 40.3 ± 5%** **σ = 1.29 ± 5% mho/m** (head tissue)
1600 MHz	ConvF	**4.9 ± 8%**	**ε_r = 53.8 ± 5%** **σ = 1.40 ± 5% mho/m** (body tissue)

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV2**
Serial Number:	**3022**
Place of Assessment:	**Zurich**
Date of Assessment:	**December 9, 2003**
Probe Calibration Date:	**September 23, 2003**

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.

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Dosimetric E-Field Probe ES3DV2 SN:3022

Conversion factor (± standard deviation)

2140 MHz	ConvF	**4.5 ± 8%**	**= 39.8 ± 5%** **= 1.49 ± 5% mho/m** (brain tissue)

ATTACHMENT D – DIPOLE VALIDATION

PCTEST ENGINEERING LABORATORY, INC.

DUT: 300 MHz. Dipole; Type: D300V2; Serial: 301
Program: 300 MHz. Dipole Validation

Communication System: 300MHz.; Frequency: 300 MHz;Duty Cycle: 1:1
Medium: 300MHz. Brain (σ = 0.84 mho/m, ε_r = 45.2, ρ = 1300 kg/m^3)
Phantom section: Flat Section

Test Date: 01-20-2004; Ambient Temp: 22.9°C; Tissue Temp: 20.3°C

Probe: ES3DV2 - SN3022; ConvF(8.5, 8.5, 8.5); Calibrated: 9/23/2003
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn445; Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197
Measurement SW: DASY4, V4.2 Build 12; Postprocessing SW: SEMCAD, V1.8 Build 93

300MHz. CW Dipole Validation @ 250mW

Area Scan (51x111x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 3.61 W/kg
SAR(1 g) = 0.784 mW/g; SAR(10 g) = 0.86 mW/g
Reference Value = 52.8 V/m