CERTIFICATE OF COMPLIANCE
SAR EVALUATION

Test Lab:	Applicant Information:
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FCC ID:	**O9GGMRS480**
Model(s):	**GMRS380**
EUT Type:	**Portable GMRS PTT Radio Transceiver**
Modulation:	**FM (UHF)**
Tx Frequency Range:	**462.5500 - 462.7250 MHz**
Power Level Tested:	**1.7 Watts (ERP)**
No. of Channels:	**15**
Battery Type(s):	**1. Alkaline (x4)** **2. Nickel-Metal Hydride**

Celltech Research Inc. declares under its sole responsibility that this device was found to be in compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC OET Bulletin 65, Supplement C (Edition 01-01), and RSS-102 Issue 1 of Industry Canada, and was tested in accordance with the appropriate measurement standards, guidelines, and recommended practices specified in American National Standards Institute C95.1-1992.

I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Research Inc.
The results and statements contained in this report pertain only to the device(s) evaluated.

Shawn McMillen
General Manager
Celltech Research Inc.

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1.0 INTRODUCTION

This measurement report shows compliance of the TRISQUARE COMMUNICATIONS INC. Model: GMRS380 Portable GMRS UHF PTT Radio Transceiver FCC ID: O9GGMRS380 complies with the regulations and procedures specified in FCC Rule Part 2.1093, ET Docket 96-326 for mobile and portable devices. The test procedures, as described in American National Standards Institute C95.1-1992 (See Reference [1]), and FCC OET Bulletin 65, Supplement C, Edition 01-01 (See Reference [2]) were employed. A description of the product, operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the various provisions of the rules are included within this test report.

2.0 DESCRIPTION of Equipment Under Test (EUT)

Rule Part(s)	FCC 2.1093 ET Docket 96-326	**Modulation**	FM (UHF)
EUT Type	Portable GMRS PTT Radio Transceiver	**Tx Frequency Range (MHz)**	462.5500 - 462.7250
Model No.(s)	GMRS380	**Power Level Tested**	1.7 Watts (ERP)
Serial No.	Pre-production	**Battery Type(s)**	1.5V AAA Alkaline (x4) 4.8V (700mAh) NiMH

Left Side of EUT

Right Side of EUT

Back of EUT with Belt-Clip

Front of EUT

EUT with Speaker-Microphone

NiMH Battery

3.0 SAR MEASUREMENT SYSTEM

Celltech Research SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, SAM phantom, and various planar phantoms for brain or body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilizes a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

DASY3 SAR Measurement System with SAM Phantom

4.0 MEASUREMENT SUMMARY

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the EUT are reported in Appendix A.

Face-Held SAR Measurement Results

Freq. (MHz)	Chan.	Mode	Output Power Tested (ERP)	Antenna Position	Battery Type	Separ. Dist. (cm)	Measured SAR (w/kg)		Power Drift (dB)	Adjusted SAR (w/kg) (Due to Drift*)	
							100% Duty Cycle	50% Duty Cycle		100% Duty Cycle	50% Duty Cycle
462.6300	Mid	CW	1.7 W	Fixed	Alkaline	2.5	0.484	0.242	- 1.35	0.660	0.330
462.6300	Mid	CW	1.7 W	Fixed	NiMH	2.5	0.517	0.259	- 0.98	0.648	0.324
Mixture Type: Brain Dielectric Constant: 44.4 Conductivity: 0.86 (Measured)				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Uncontrolled Exposure / General Population BRAIN: 1.6 W/kg (averaged over 1 gram)**							

Notes:
1. The SAR values measured were below the maximum limit of 1.6 w/kg (uncontrolled exposure).
2. The highest face-held SAR value measured was 0.517 w/kg (100% duty cycle, NiMH battery).
3. The EUT was tested for face-held SAR with a 2.5cm separation distance between the front of the EUT and the outer surface of the planar phantom.
4. Ambient TEMPERATURE: 22.8 °C
   Relative HUMIDITY: 38.2 %
   Atmospheric PRESSURE: 103.0 kPa
5. Fluid Temperature ˜ 23.0 °C
6. The transmission band of the EUT is less than 10MHz, therefore mid channel data only is reported (per OET Bulletin 65, Supplement C, Edition 01-01 - see reference [2]).

* See Appendix B for explanation of adjusted SAR data due to power drift.

Face-Held SAR Test Setup
2.5cm Separation Distance

Body-Worn SAR Measurement Results

Freq. (MHz)	Chan.	Mode	Output Power Tested (ERP)	Antenna Position	Battery Type	Belt-Clip Separ. Dist. (cm)	Measured SAR (w/kg)		Power Drift (dB)	Adjusted SAR (w/kg) (Due to Drift*)	
							100% Duty Cycle	50% Duty Cycle		100% Duty Cycle	50% Duty Cycle
462.6300	Mid	CW	1.7 W	Fixed	Alkaline	0.7	0.761	0.381	- 1.75	1.14	0.570
462.6300	Mid	CW	1.7 W	Fixed	NiMH	0.7	0.751	0.376	- 0.95	0.935	0.468
Mixture Type: Body Dielectric Constant: 58.3 Conductivity: 0.92 (Measured)				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Uncontrolled Exposure / General Population BODY: 1.6 W/kg (averaged over 1 gram)**							

Notes:
1. The SAR values measured were below the maximum limit of 1.6 w/kg (uncontrolled exposure).
2. The highest body-worn SAR value measured was 0.761 w/kg (100% duty cycle, Alkaline batteries).
3. The EUT was tested for body-worn SAR with the attached belt-clip providing a 0.7cm separation distance between the back of the EUT and the outer surface of the planar phantom.
4. A speaker-microphone accessory was connected to the EUT.
5. Ambient TEMPERATURE: 22.8 °C
   Relative HUMIDITY: 38.2 %
   Atmospheric PRESSURE: 103.0 kPa
6. Fluid Temperature ˜ 23.0 °C
7. The transmission band of the EUT is less than 10MHz, therefore mid channel data only is reported (per OET Bulletin 65, Supplement C, Edition 01-01 - see reference [2]).

* See Appendix B for explanation of adjusted SAR data due to power drift.

Body-worn SAR Test Setup
0.7cm Belt-Clip Separation

5.0 DETAILS OF SAR EVALUATION

The TRISQUARE COMMUNICATIONS INC. Model: GMRS380 Portable GMRS UHF PTT Radio Transceiver was found to be compliant for localized Specific Absorption Rate (Uncontrolled Exposure) based on the following test provisions and conditions:

1. The EUT was evaluated in a face-held configuration with the front of the device placed parallel to the outer surface of the planar phantom. A 2.5cm separation distance was maintained between the front of the EUT and the outer surface of the planar phantom for the duration of the test.
2. The EUT was tested in a body-worn configuration with the attached belt-clip touching the outer surface of the planar phantom and providing a 0.7cm separation distance between the back of the EUT and the outer surface of the planar phantom. A speaker-microphone accessory was connected to the EUT for the duration of the test.
3. The EUT was tested at the maximum conducted power level set by the manufacturer.
4. During the RF exposure evaluation it was found that the RF output power of the EUT did not meet the maximum permissible drift of +/- 5%. Since the RF conducted output power of this EUT could not be measured, a "Time Sweep" was performed in order to characterize the RF output power with respect to SAR (see Appendix B). The device was placed next to the planar phantom in the body worn position. A constant external power was applied to the device to minimize drift due to supply power variations. The SAR systems' E-field probe was positioned at a reference location close to the inner surface of the phantom at a location where the body SAR peak was observed. The transmitter of the EUT was turned on from a cold state and an internal E-field reference voltage was obtained. Immediately afterwards, with the probe held in the same position, the internal voltage was measured at 10-second intervals for a period of 20 minutes, or until the output power stabilized. It was determined that after a period of 20 minutes the RF output power of the EUT remained fairly constant. The total exponential RF output power drift from the time the device was turned on from a cold state until the device stabilized was approximately 1.6dB. For this particular device, since it was not intended for continuous operation, the unit was cooled between subsequent SAR tests in order to minimize damage to the transmitter. In order to insure the internal E-field distribution was accurately recorded the following procedure was followed. Immediately after the transmitter was keyed, the internal reference voltage was obtained. With the transmitter still keyed, a period of 60 seconds was allowed to pass before the course scan was initiated. It was assumed that due to the large size of the course scan used, and the fact that the E-field probe was firstly positioned in an area where little internal field was generated, plus the additional time delay before the course scan was initiated, and the time required for the E-field probe to reach the area where the hot spot of the EUT resided, that the drift in the RF output power of the EUT would be stabilized, therefore minimizing measurement uncertainty.
5. The EUT was tested with the transmitter in continuous operation (100% duty cycle) throughout the SAR evaluation. As this is a push-to-talk device the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
6. The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the device and its antenna.
7. The EUT was tested with fully charged NiMH and alkaline batteries.

6.0 EVALUATION PROCEDURES

The Specific Absorption Rate (SAR) evaluation was performed as follows:

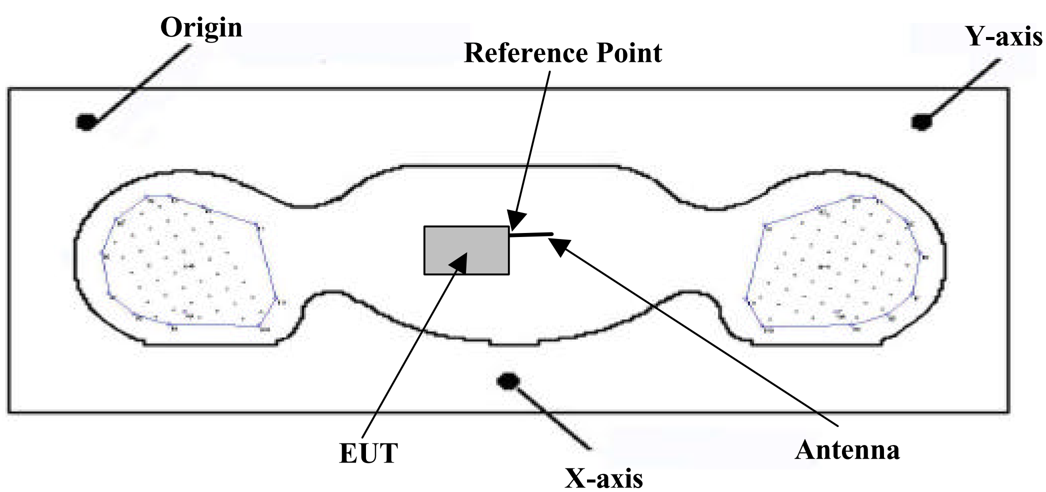
a. (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation, both the left and right ear positions were evaluated in accordance with FCC OET Bulletin 65, Supplement C (Edition 01-01) using the SAM phantom.

(ii) For body-worn and face-held devices a planar phantom was used. Depending on the phantom used for the evaluation, all other phantoms were drained of fluid.

b. The SAR was determined by a pre-defined procedure within the DASY3 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface with a grid spacing of 20mm x 20mm.

c. A 5x5x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.

d. The depth of the simulating tissue in the planar phantom used for the SAR evaluation and system validation was no less than 15.0 cm.



Phantom Reference Point & EUT Positioning

7.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified with a plexiglas planar phantom and 450MHz dipole. A forward power of 250mW was applied to the dipole and the system was verified to a tolerance of ±10%. The applicable verifications are listed below (see Appendix C for dipole validation test plot and Appendix D for dipole calibration information).

Dipole Validation Kit	Target SAR 1g (w/kg)	Measured SAR 1g (w/kg)	Fluid Temperature	Ambient Temperature	Validation Date
450MHz	1.34	1.32	≈21.0 °C	22.8°C	03/21/02

8.0 TISSUE PARAMETERS

The dielectric parameters of the fluids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an 8753E Network Analyzer. The dielectric parameters of the fluid are shown below.

BRAIN TISSUE PARAMETERS - DIPOLE VALIDATION & EUT EVALUATION			
Equivalent Tissue	**Dielectric Constant ε_r**	**Conductivity σ (mho/m)**	**ρ (Kg/m^3)**
450MHz Brain (Target)	43.5 ± 5%	0.87 ± 5%	1000
450MHz Brain (Measured - 03/21/02)	44.4	0.86	1000

BODY TISSUE PARAMETERS - EUT EVALUATION			
Equivalent Tissue	**Dielectric Constant ε_r**	**Conductivity σ (mho/m)**	**ρ (Kg/m^3)**
450MHz Body (Target)	56.7 ± 5%	0.94 ± 5%	1000
450MHz Body (Measured - 03/21/02)	58.3	0.92	1000

9.0 EQUIVALENT SIMULATED TISSUES

The brain and body mixtures consist of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution. Preservation with a bactericide is added and visual inspection is made to ensure air bubbles are not trapped during the mixing process. The fluid was prepared according to standardized procedures and measured for dielectric parameters (permittivity and conductivity).

TISSUE MIXTURES - DIPOLE VALIDATION & EUT EVALUATION		
INGREDIENT	**450MHz Brain Mixture (Validation & EUT Evaluation) %**	**450MHz Body Mixture (EUT Evaluation) %**
Water	38.56	52.00
Sugar	56.32	45.65
Salt	3.95	1.75
HEC	0.98	0.50
Bactericide	0.19	0.10

10.0 SAR SAFETY LIMITS

EXPOSURE LIMITS	**SAR (W/Kg)**	
	(General Population / Uncontrolled Exposure Environment)	**(Occupational / Controlled Exposure Environment)**
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10g)	4.0	20.0

Notes: 1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

11.0 ROBOT SYSTEM SPECIFICATIONS

Specifications

POSITIONER:	Stäubli Unimation Corp. Robot Model: RX60L
Repeatability:	0.02 mm
No. of axis:	6

Data Acquisition Electronic (DAE) System

Cell Controller	
Processor:	Pentium III
Clock Speed:	450 MHz
Operating System:	Windows NT
Data Card:	DASY3 PC-Board
Data Converter	
Features:	Signal Amplifier, multiplexer, A/D converter, and control logic
Software:	DASY3 software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock

PC Interface Card

Function:	24 bit (64 MHz) DSP for real time processing Link to DAE3 16-bit A/D converter for surface detection system serial link to robot direct emergency stop output for robot

E-Field Probe

Model:	ET3DV6
Serial No.:	1387
Construction:	Triangular core fiber optic detection system
Frequency:	10 MHz to 6 GHz
Linearity:	± 0.2 dB (30 MHz to 3 GHz)

Evaluation Phantom

Type:	SAM V4.0C
Shell Material:	Fiberglass
Thickness:	2.0 ±0.1 mm
Volume:	Approx. 20 liters

Validation Phantom (for devices ≤ 450MHz)

Type:	Large Planar Phantom
Shell Material:	Plexiglas
Bottom Thickness:	6.2 mm ± 0.1mm
Dimensions:	83.5cm (L) x 36.9cm (W) x 21.8cm (H)

12.0 PROBE SPECIFICATION (ET3DV6)

Construction: Symmetrical design with triangular core
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g. glycol)
Calibration: In air from 10 MHz to 2.5 GHz
In brain simulating tissue at frequencies of 900 MHz
and 1.8 GHz (accuracy ± 8%)
Frequency: 10 MHz to > 6 GHz; Linearity: ± 0.2 dB
(30 MHz to 3 GHz)
Directivity: ± 0.2 dB in brain tissue (rotation around probe axis)
± 0.4 dB in brain tissue (rotation normal to probe axis)
Dynam. Rnge: 5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Srfce. Detect. ± 0.2 mm repeatability in air and clear liquids over
diffuse reflecting surfaces
Dimensions: Overall length: 330 mm
Tip length: 16 mm
Body diameter: 12 mm
Tip diameter: 6.8 mm
Distance from probe tip to dipole centers: 2.7 mm
Application: General dosimetry up to 3 GHz
Compliance tests of mobile phone


ET3DV6 E-Field Probe

13.0 LARGE PLANAR PHANTOM

The large planar phantom is constructed of Plexiglas material with a 6.0 mm shell thickness for SAR validations at and below 450MHz. The large planar phantom is mounted in the DASY3 compact system in place of the SAM phantom.


Large Planar Phantom

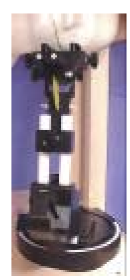
14.0 SAM PHANTOM V4.0C

The SAM phantom V4.0C is a fiberglass shell phantom with a 2.0mm shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard measurement positions in the three sections.


SAM Phantom

15.0 DEVICE HOLDER

The DASY3 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.


Device Holder

16.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
EQUIPMENT	***SERIAL NO.***	***CALIBRATION DATE***
DASY3 System -Robot -ET3DV6 E-Field Probe -300MHz Validation Dipole -450MHz Validation Dipole -900MHz Validation Dipole -1800MHz Validation Dipole -2450MHz Validation Dipole -SAM Phantom V4.0C -Validation Phantom	 599396-01 1387 135 136 054 247 150 N/A N/A	 N/A Feb 2002 Oct 2001 Mar 2002 June 2001 June 2001 Oct 2001 N/A N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Feb 2002 Feb 2002 Mar 2002
E4408B Spectrum Analyzer	US39240170	Feb 2002
8594E Spectrum Analyzer	3543A02721	Mar 2002
8753E Network Analyzer	US38433013	Feb 2002
8648D Signal Generator	3847A00611	Feb 2002
5S1G4 Amplifier Research Power Amplifier	26235	N/A

17.0 MEASUREMENT UNCERTAINTIES

Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	c_i 1g	Standard Uncertainty ±% (1g)	v_i or v_{eff}
Measurement System						
Probe calibration	± 4.8	Normal	1	1	± 4.8	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	$(1-c_p)$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	(c_p)	± 3.9	∞
Spatial resolution	± 0.0	Rectangular	√3	1	± 0.0	∞
Boundary effects	± 5.5	Rectangular	√3	1	± 3.2	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Readout electronics	± 1.0	Normal	1	1	± 1.0	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 1.4	Rectangular	√3	1	± 0.8	∞
RF ambient conditions	± 3.0	Rectangular	√3	1	± 1.7	∞
Mech. constraints of robot	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Extrap. & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 6.0	Normal	0.89	1	± 6.7	12
Device holder uncertainty	± 5.0	Normal	0.84	1	± 5.9	8
Power drift	± 5.0	Rectangular	√3		± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (measured)	± 10.0	Rectangular	√3	0.6	± 3.5	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Combined Standard Uncertainty					**± 13.7**	
Expanded Uncertainty (k=2)					**± 27.5**	

The divisor for device positioning uncertainty and holder uncertainty are based on the procedure defined in IEEE Std 1528 (draft) (see reference [6]), or based on the degrees of freedom for each error source.

For estimation of Device Positioning Uncertainty (divisor=0.89) 12 different devices were used (see last column - i.e. degrees of freedom). The corresponding k_p factor for v_{eff}=12 is 2.23, therefore the divisor is 2/2.23=0.89.

For estimation of Device Holder Uncertainty (divisor=0.84) 8 different devices were used (see last column - i.e. degrees of freedom). The corresponding k_p factor for v_{eff}=8 is 2.37, therefore the divisor is 2/2.37=0.84.

18.0 REFERENCES

[1] ANSI, ANSI/IEEE C95.1: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 Ghz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY: 1992.

[2] Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, Supplement C, Edition 01-01, FCC, Washington, D.C.: June 2001.

[3] Thomas Schmid, Oliver Egger, and Niels Kuster, "Automated E-field scanning system for dosimetric assessments", IEEE Transaction on Microwave Theory and Techniques, Vol. 44, pp. 105 – 113: January 1996.

[4] Niels Kuster, Ralph Kastle, and Thomas Schmid, "Dosimetric evaluation of mobile communications equipment with know precision", IEICE Transactions of Communications, vol. E80-B, no. 5, pp. 645 – 652: May 1997.

[5] Industry Canada, "Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields", Radio Standards Specification RSS-102 Issue 1 (Provisional): September 1999.

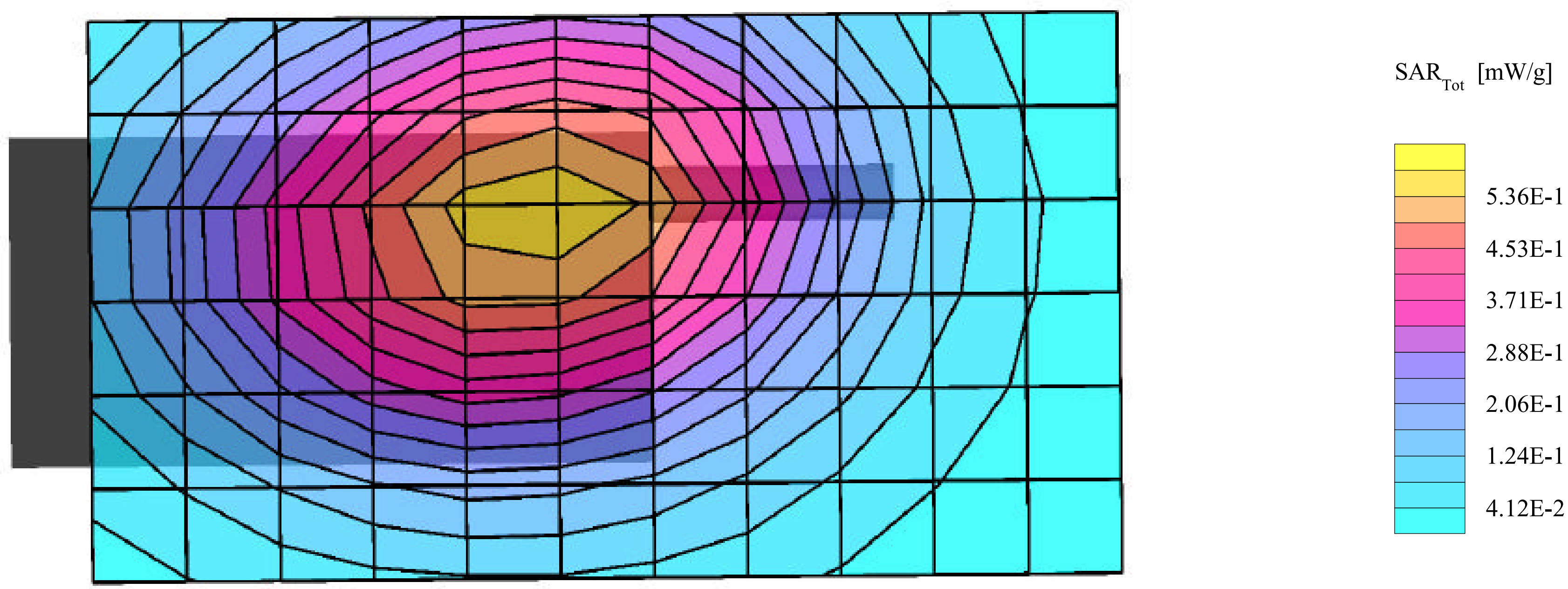
[6] IEEE Standards Coordinating Committee 34, Std 1528, DRAFT Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques: Draft, December 2001.

APPENDIX A - SAR MEASUREMENT DATA

Trisquare Communications Inc. FCC ID: O9GGMRS380

SAM Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(7.30,7.30,7.30); Crest factor: 1.0
450 MHz Brain: $\sigma = 0.86$ mho/m $\varepsilon_r = 44.4$ $\rho = 1.00$ g/cm³
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -1.35 dB
SAR (1g): 0.484 mW/g, SAR (10g): 0.343 mW/g

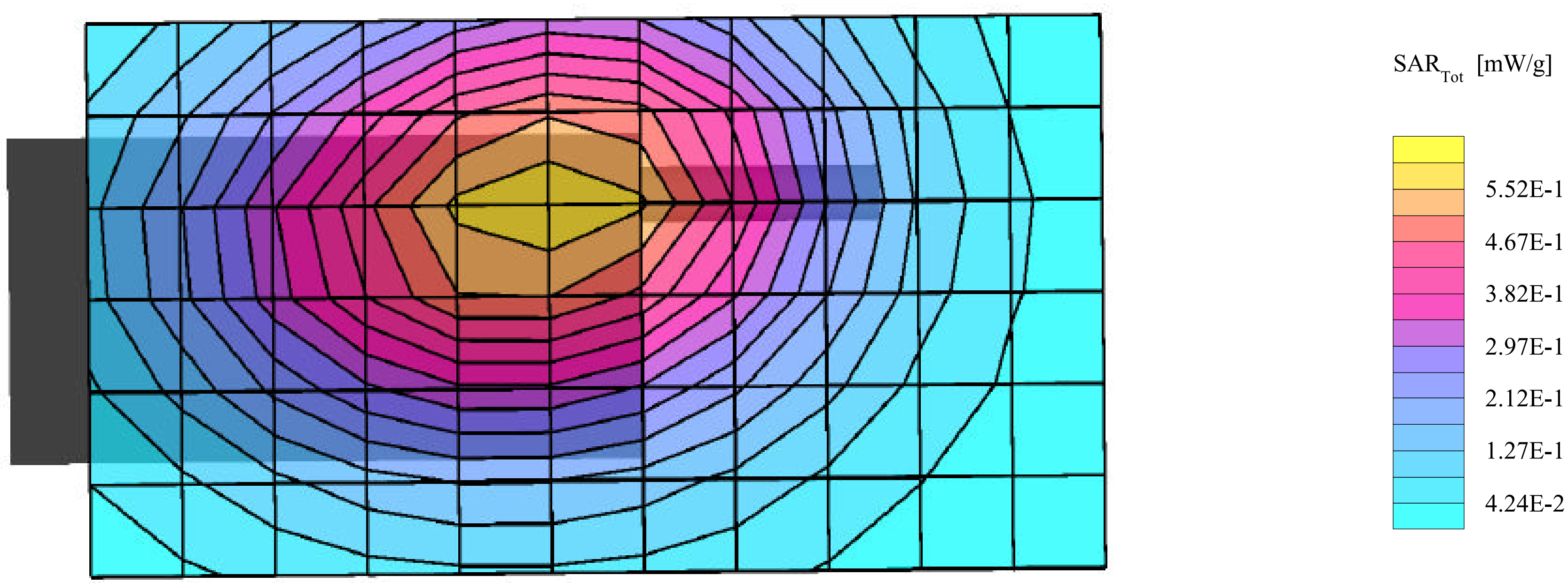
Face-Held SAR at 2.5 cm Separation Distance
GMRS Radio Transceiver Model: GMRS380
Alkaline Batteries (x4)
Continuous Wave Mode
Mid Channel [462.6300 MHz]
Power Level: 1.7 Watts (ERP)
Date Tested: March 21, 2002



Trisquare Communications Inc. FCC ID: O9GGMRS380

SAM Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(7.30,7.30,7.30); Crest factor: 1.0
450 MHz Brain: $\sigma = 0.86$ mho/m $\varepsilon_r = 44.4$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.98 dB
SAR (1g): 0.517 mW/g, SAR (10g): 0.366 mW/g

Face-Held SAR at 2.5 cm Separation Distance
GMRS Radio Transceiver Model: GMRS380
NiMH Battery
Continuous Wave Mode
Mid Channel [462.6300 MHz]
Power Level: 1.7 Watts (ERP)
Date Tested: March 21, 2002

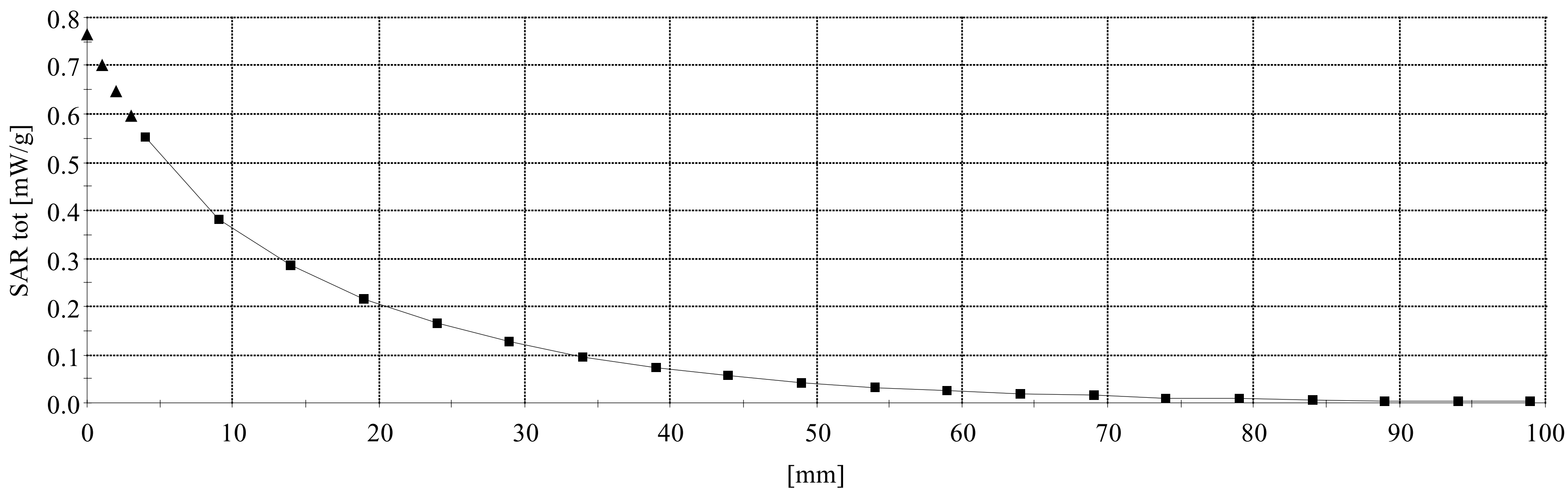


Trisquare Communications Inc. FCC ID: O9GGMRS380

SAM Phantom; Flat Section
Probe: ET3DV6 - SN1387; ConvF(7.30,7.30,7.30); Crest factor: 1.0;
450 MHz Brain: $\sigma = 0.86$ mho/m $\varepsilon_r = 44.4$ $\rho = 1.00$ g/cm³

Z-Axis Extrapolation at Peak SAR Location

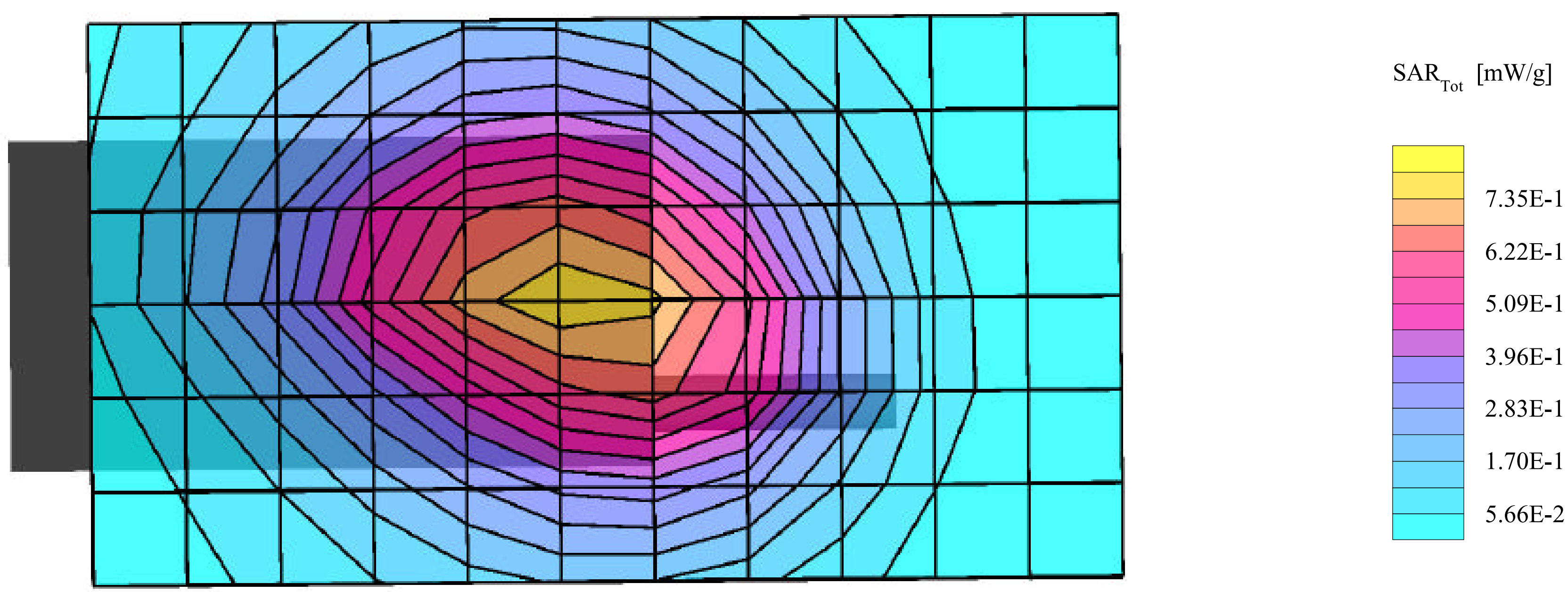
Face-Held SAR at 2.5 cm Separation Distance
GMRS Radio Transceiver Model: GMRS380
NiMH Battery
Continuous Wave Mode
Mid Channel [462.6300 MHz]
Power Level: 1.7 Watts (ERP)
Date Tested: March 21, 2002



Trisquare Communications Inc. FCC ID: O9GGMRS380

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1387; ConvF(7.70,7.70,7.70); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.92$ mho/m $\varepsilon_r = 58.3$ $\rho = 1.00$ g/cm³
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -1.75 dB
SAR (1g): 0.761 mW/g, SAR (10g): 0.528 mW/g

Body-Worn SAR with 0.7 cm Belt-Clip Separation
GMRS Radio Transceiver Model: GMRS380
Alkaline Batteries (x4)
Continuous Wave Mode
Mid Channel [462.6300 MHz]
Power Level: 1.7 Watts (ERP)
Date Tested: March 21, 2002

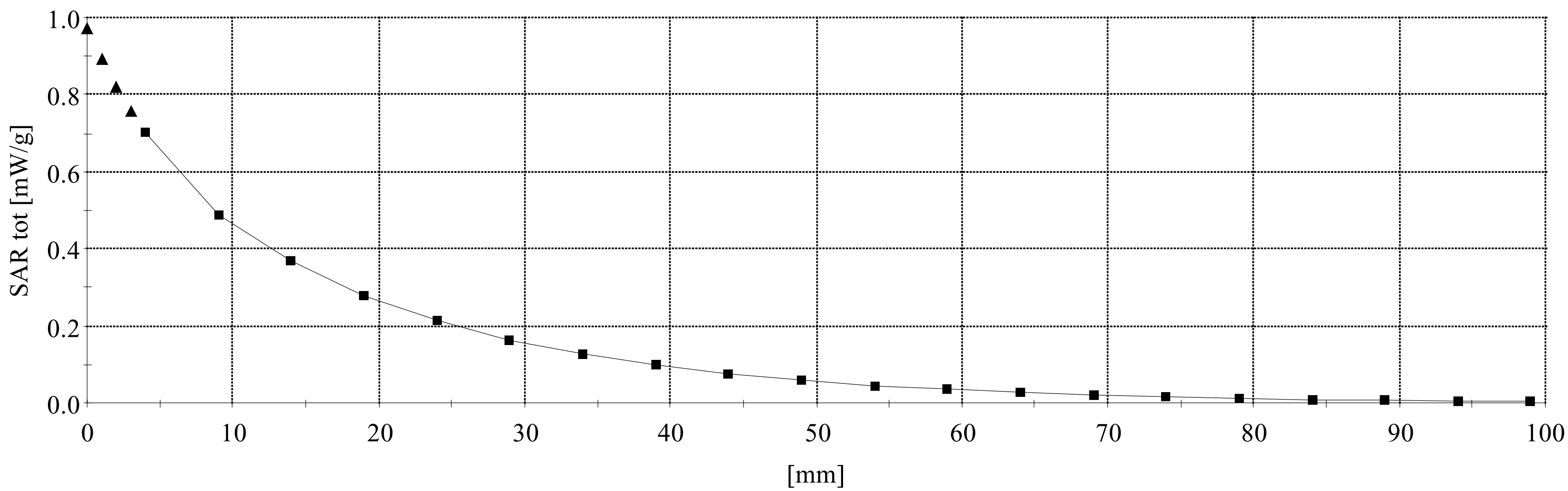


Trisquare Communications Inc. FCC ID: O9GGMRS380

SAM Phantom; Flat Section
Probe: ET3DV6 - SN1387; ConvF(7.70,7.70,7.70); Crest factor: 1.0;
450 MHz Muscle: $\sigma = 0.92$ mho/m $\varepsilon_r = 58.3$ $\rho = 1.00$ g/cm^3

Z-Axis Extrapolation at Peak SAR Location

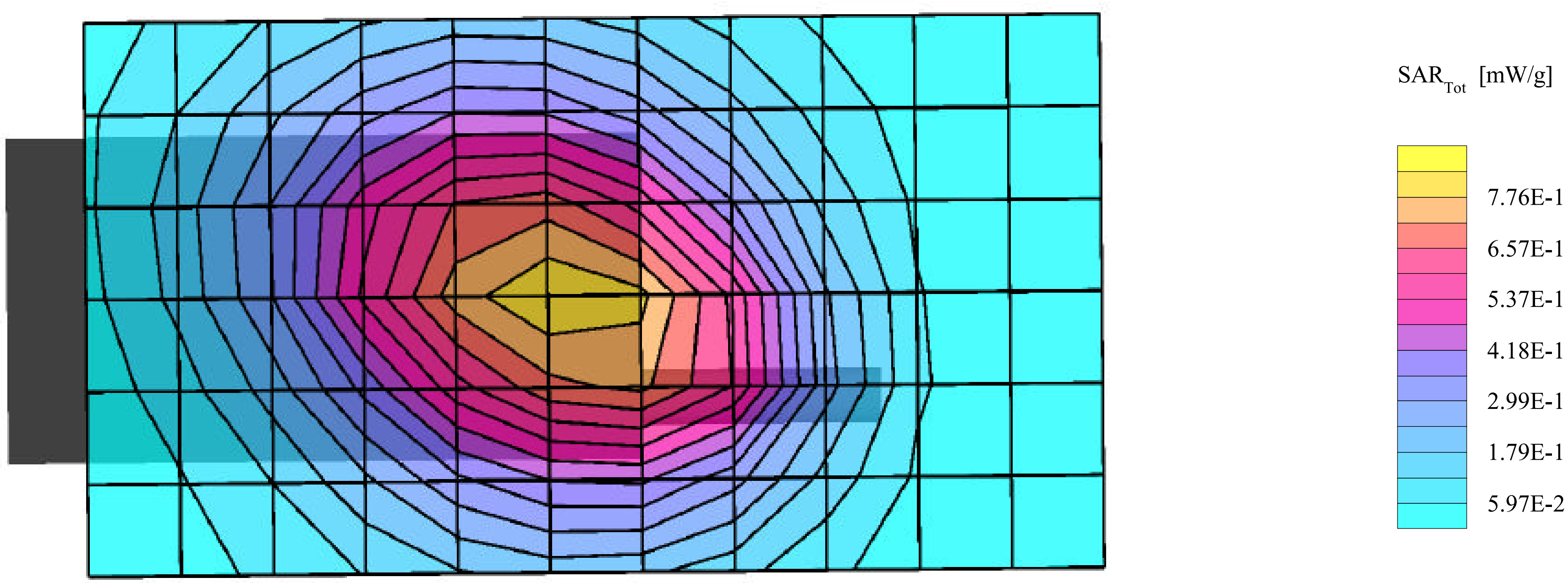
Body-Worn SAR with 0.7 cm Belt-Clip Separation
GMRS Radio Transceiver Model: GMRS380
Alkaline Batteries (x4)
Continuous Wave Mode
Mid Channel [462.6300 MHz]
Power Level: 1.7 Watts (ERP)
Date Tested: March 21, 2002



Trisquare Communications Inc. FCC ID: O9GGMRS380

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1387; ConvF(7.70,7.70,7.70); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.92$ mho/m $\varepsilon_r = 58.3$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.95 dB
SAR (1g): 0.751 mW/g, SAR (10g): 0.533 mW/g

Body-Worn SAR with 0.7 cm Belt-Clip Separation
GMRS Radio Transceiver Model: GMRS380
NiMH Battery
Continuous Wave Mode
Mid Channel [462.6300 MHz]
Power Level: 1.7 Watts (ERP)
Date Tested: March 21, 2002



APPENDIX B - "TIME SWEEP" DATA

During the RF exposure evaluation it was found that this EUT's RF output power did not meet the maximum permissible drift of +/- 5%. Since the RF conducted output power of this EUT could not be measured, a "Time Sweep" was performed in order to characterize the RF output power with respect to SAR. The device was placed next to the planar phantom in the body worn position. A constant external power was applied to the device to minimize drift due to supply power variations. The SAR systems' E-field probe was positioned at a reference location close to the inner surface of the phantom at a location where the body SAR peak was observed. The transmitter of the EUT was turned on from a cold state and an internal E-field reference voltage was obtained. Immediately afterwards, with the probe held in the same position, the internal voltage was measured at 10-second intervals for a period of 20 minutes, or until the output power stabilized. It was determined that after a period of 20 minutes the RF output power of the EUT remained fairly constant. The total exponential RF output power drift from the time the device was turned on from a cold state until the device stabilized was approximately 1.6dB. For this particular device, since it was not intended for continuous operation, the unit was cooled between subsequent SAR tests in order to minimize damage to the transmitter. In order to insure the internal E-field distribution was accurately recorded the following procedure was followed. Immediately after the transmitter was keyed, the internal reference voltage was obtained. With the transmitter still keyed, a period of 60 seconds was allowed to pass before the course scan was initiated. It was assumed that due to the large size of the course scan used, and the fact that the E-field probe was firstly positioned in an area where little internal field was generated, plus the additional time delay before the course scan was initiated, and the time required for the E-field probe to reach the area where the hot spot of the EUT resided, that the drift in the RF output power of the EUT would be stabilized, therefore minimizing measurement uncertainty.

Trisquare Comm. Inc. FCC ID: O9GGMRS380

Small Planar Phantom

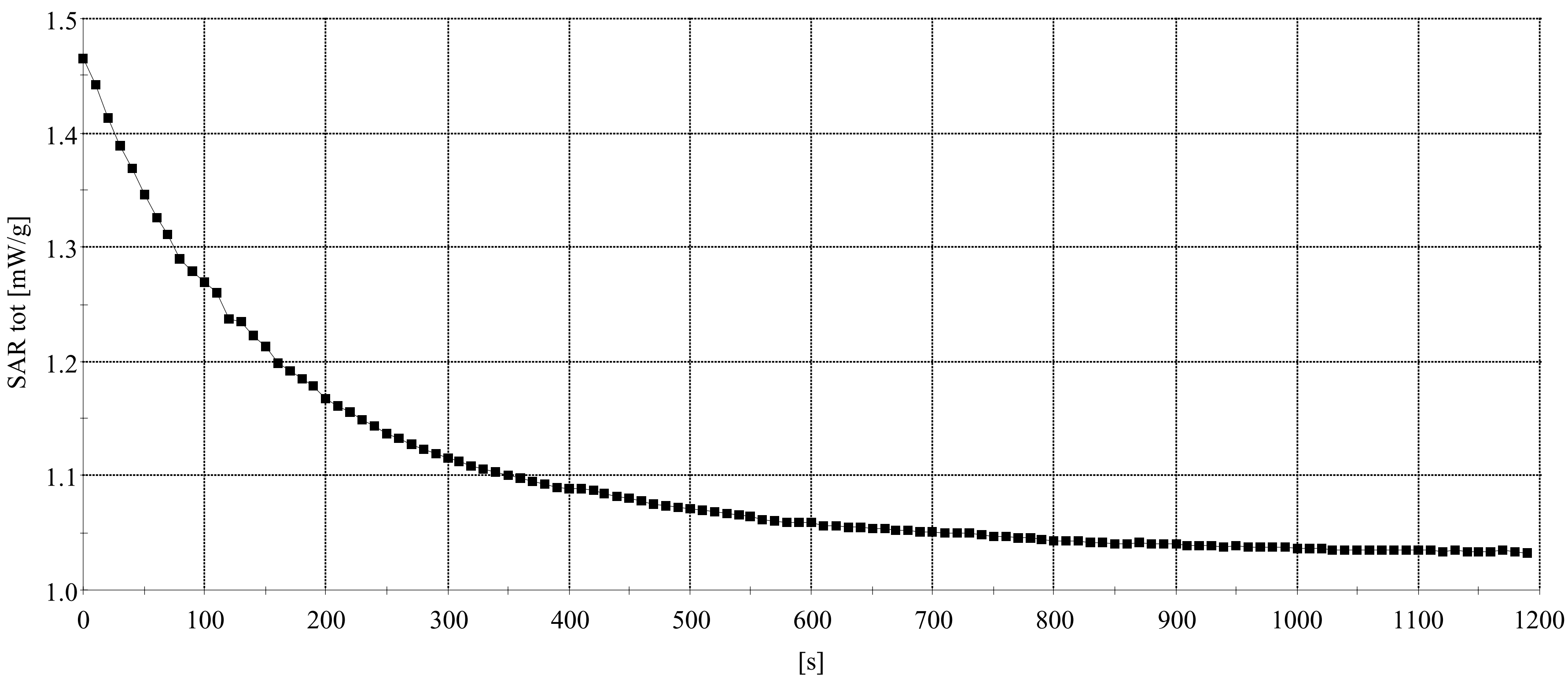
Probe: ET3DV6 - SN1387; ConvF(7.70,7.70,7.70); Crest factor: 1.0

450 MHz Muscle: $\sigma = 0.92$ mho/m $\varepsilon_r = 58.3$ $\rho = 1.00$ g/cm³

Time sweep: Dx = 0.0, Dy = 0.0, Dz = 0.0

Powerdrift: -1.60 dB

Characterization of RF Output Power with respect to SAR

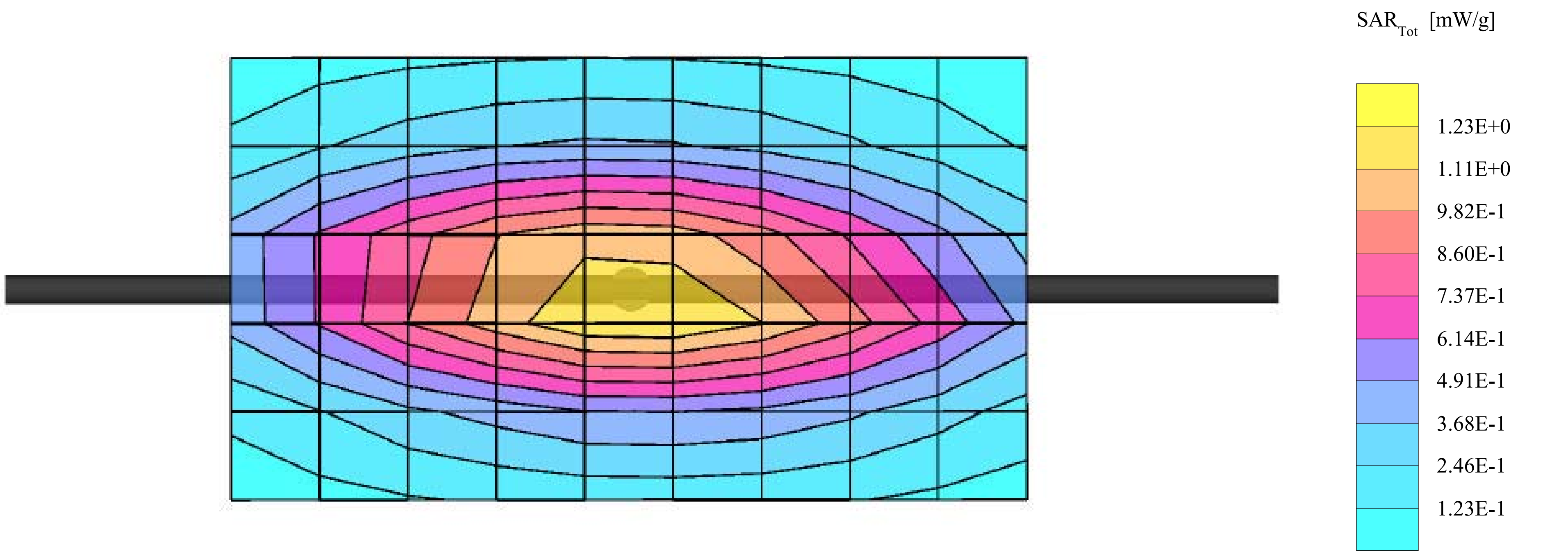


APPENDIX C - DIPOLE VALIDATION

Dipole 450MHz

Large Planar Phantom; Planar Section
Probe: ET3DV6 - SN1387; ConvF(7.30,7.30,7.30); Crest factor: 1.0; 450 MHz Brain: $\sigma = 0.86$ mho/m $\varepsilon_r = 44.4$ $\rho = 1.00$ g/cm^3
Cube 5x5x7: Peak: 2.10 mW/g, SAR (1g): 1.32 mW/g, SAR (10g): 0.869 mW/g, (Worst-case extrapolation)
Penetration depth: 12.5 (10.7, 14.9) [mm]
Powerdrift: -0.01 dB

Validation Date: March 21, 2002
Conducted Power: 250 mW



APPENDIX D - DIPOLE CALIBRATION

450MHz SYSTEM VALIDATION DIPOLE

Type:	**450MHz Validation Dipole**
Serial Number:	**136**
Place of Calibration:	**Celltech Research Inc.**
Date of Calibration:	**March 18, 2002**

Celltech Research Inc. hereby certifies that this device has been calibrated on the date indicated above.

Calibrated by:

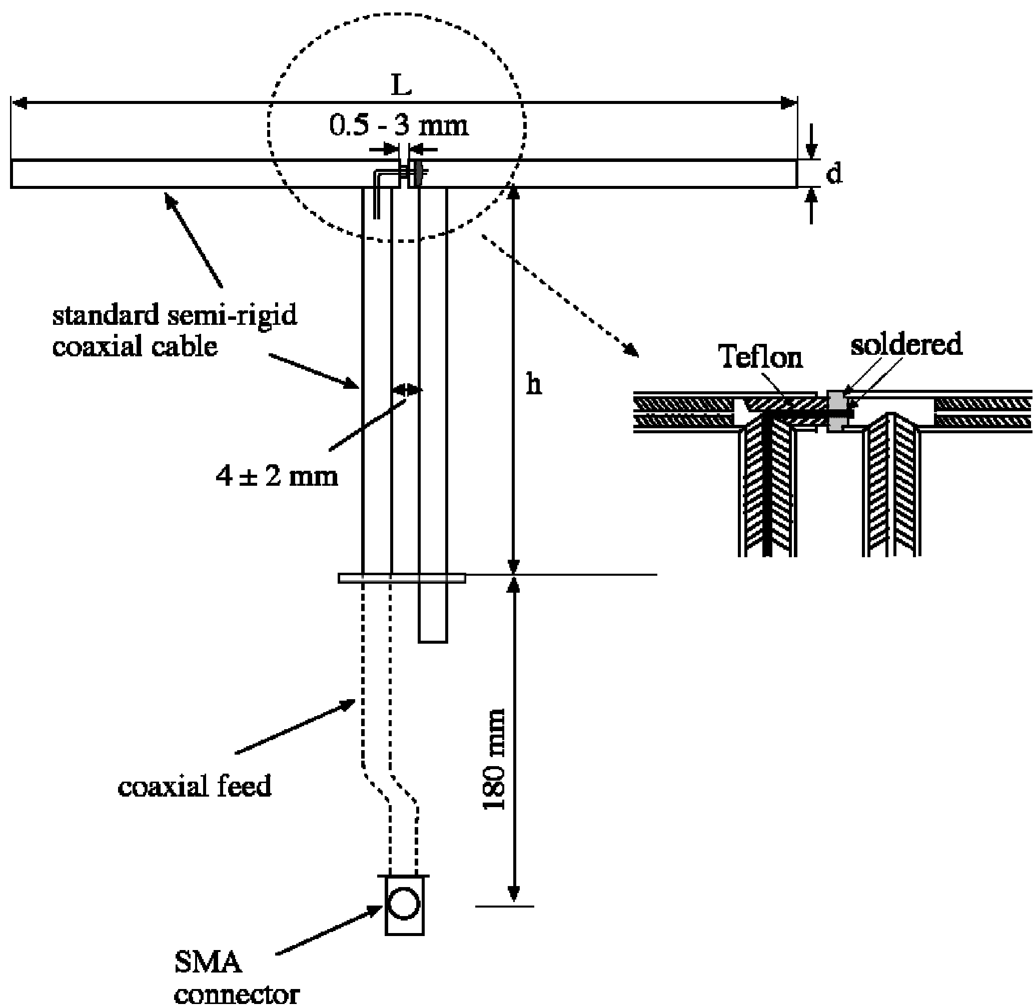
Approved by:

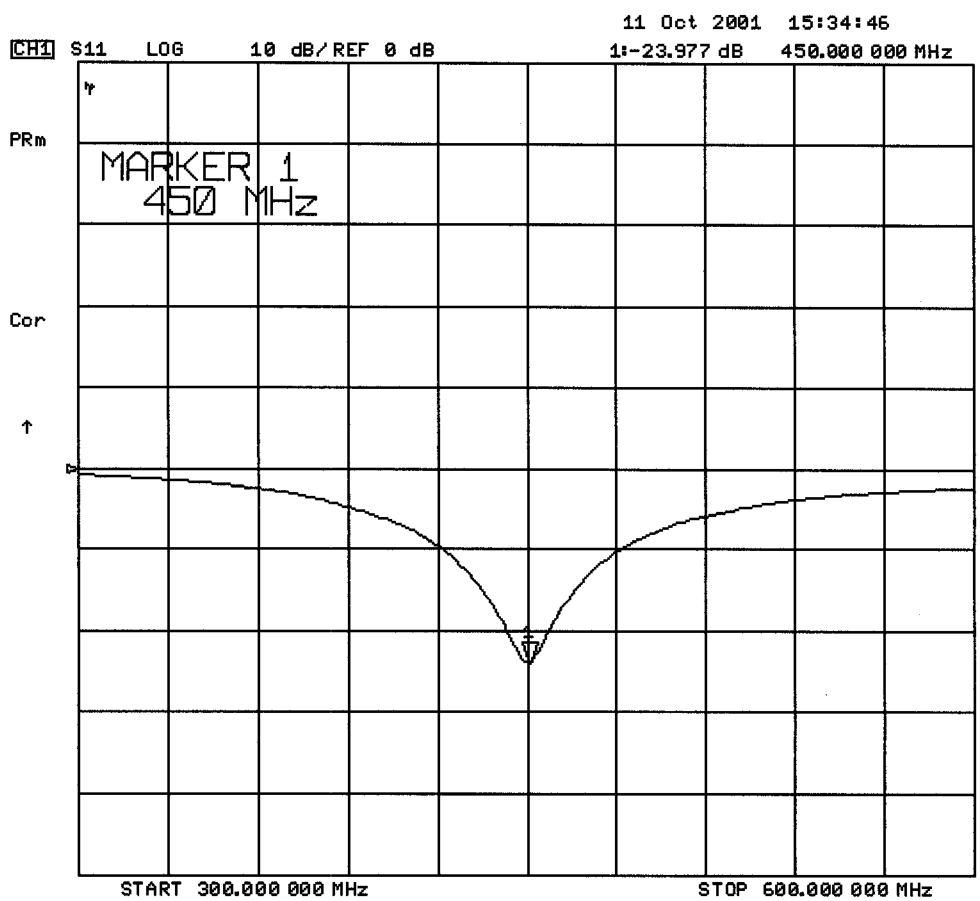
Celltech Research Inc. 1955 Moss Court, Kelowna, B.C. Canada V1Y 9L3
Tel. 250-860-3130 • Fax. 250-860-3110 • e-mail: info@celltechlabs.com
www.celltechlabs.com

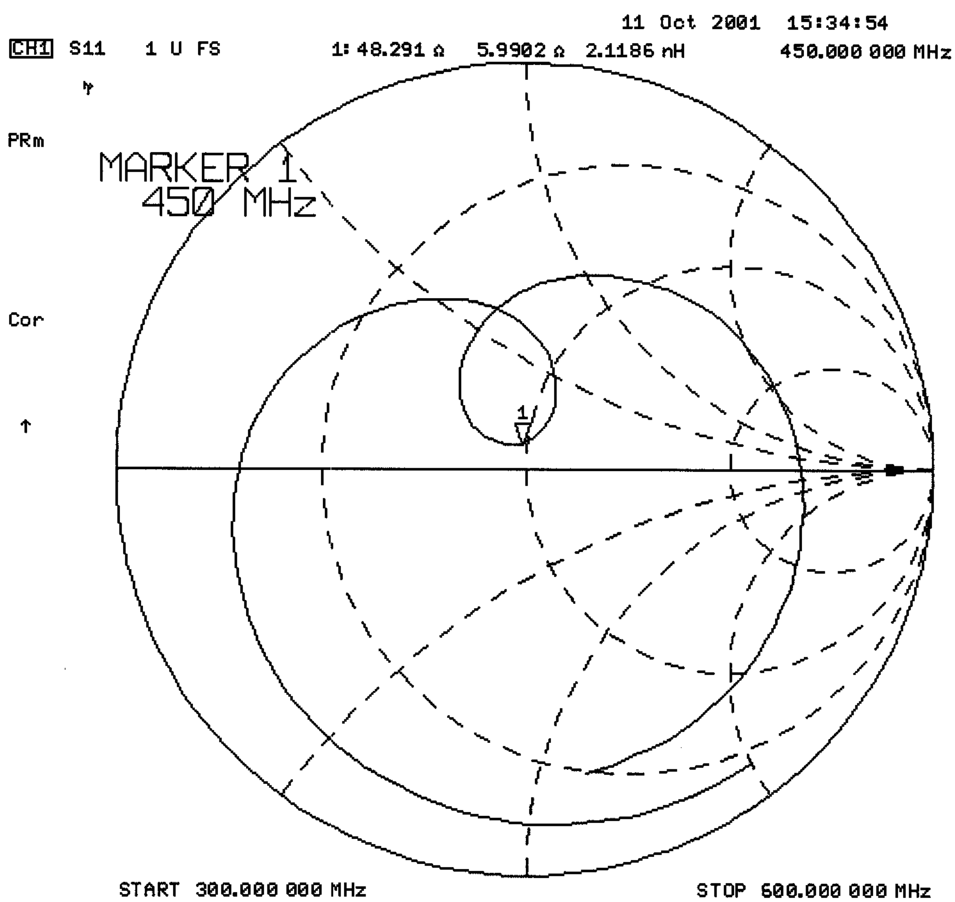
1. Dipole Construction & Electrical Characteristics

The validation dipole was constructed in accordance with the IEEE Std "Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques". The electrical properties were measured using an HP 8753E Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector feed point using an HP85032E Type N calibration kit. The dipole was placed parallel to a planar phantom at a separation distance of 15.0mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

Feed point impedance at 450MHz	Re{Z} = 49.982Ω
	Im{Z} = 5.8594Ω
Return Loss at 450MHz	-24.714dB




11 Oct 2001 15:34:46
CH1 S11 LOG 10 dB/ REF 0 dB 1:-23.977 dB 450.000 000 MHz
PRm
MARKER 1
450 MHz
Cor
START 300.000 000 MHz
STOP 600.000 000 MHz


11 Oct 2001 15:34:54
CH1 S11 1 U FS
1: 48.291 Ω 5.9902 Ω 2.1186 nH 450.000 000 MHz
PRm
MARKER 1
450 MHz
Cor
START 300.000 000 MHz
STOP 600.000 000 MHz

Validation Dipole Dimensions

Frequency (MHz)	L (mm)	h (mm)	d (mm)
300	420.0	250.0	6.2
450	288.0	167.0	6.2
835	161.0	89.8	3.6
900	149.0	83.3	3.6
1450	89.1	51.7	3.6
1800	72.0	41.7	3.6
1900	68.0	39.5	3.6
2000	64.5	37.5	3.6
2450	51.8	30.6	3.6
3000	41.5	25.0	3.6

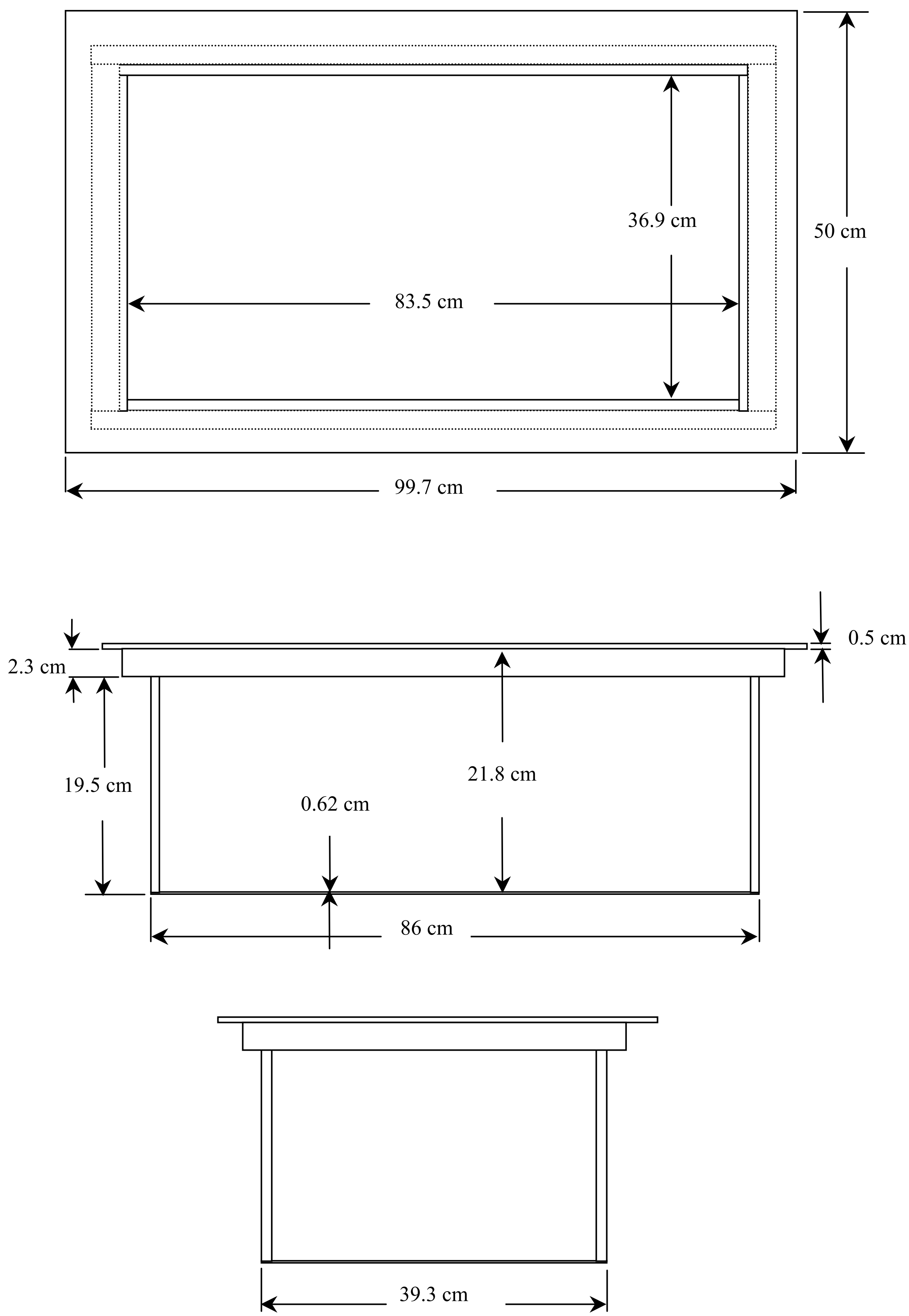
2. Validation Phantom

The validation phantom was constructed using relatively low-loss tangent Plexiglas material. The dimensions of the phantom are as follows:

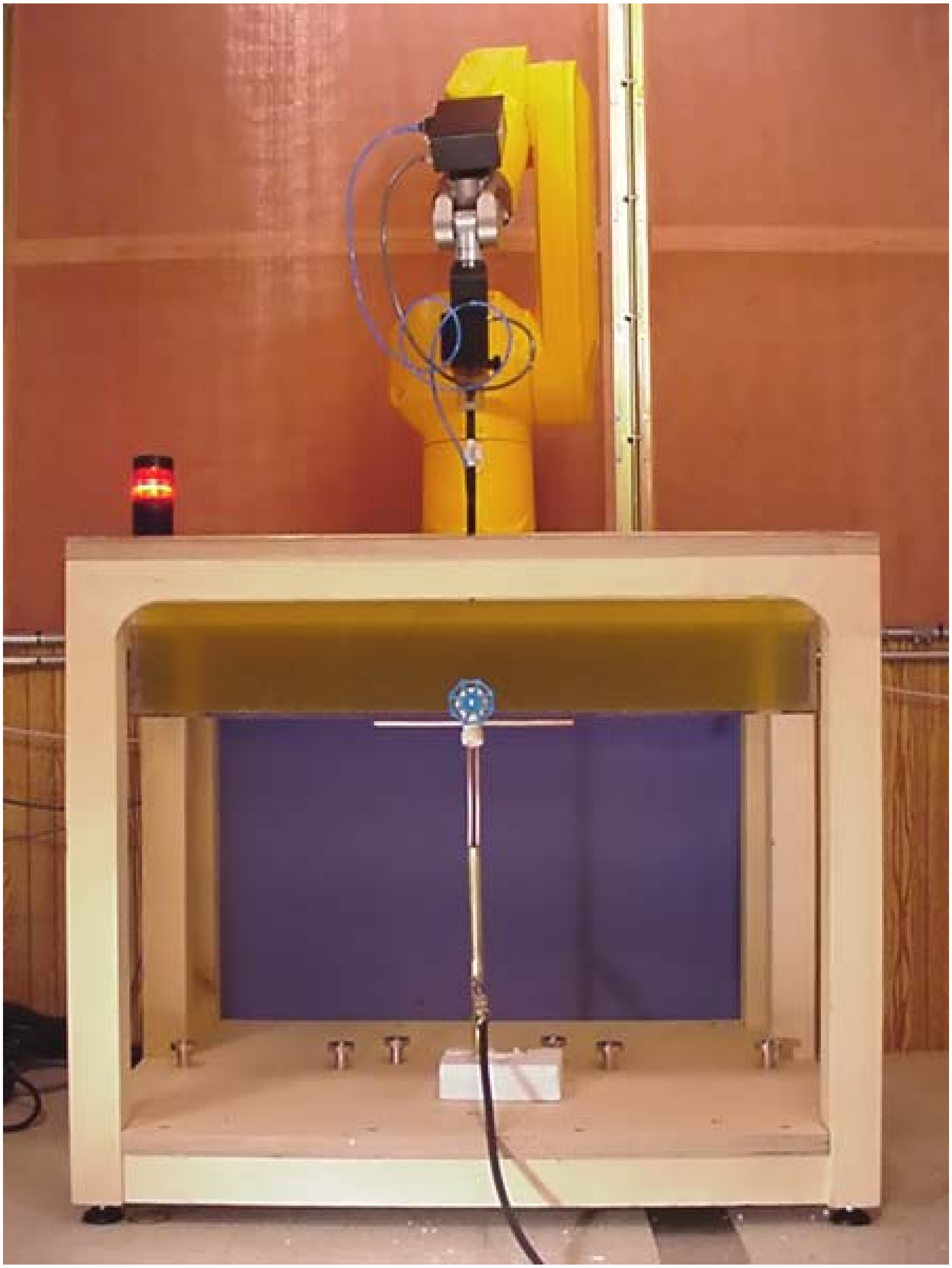
Length: 83.5 cm
Width: 36.9 cm
Height: 21.8 cm

The bottom of the phantom is constructed of 6.2 ± 0.1mm Plexiglas.

Dimensions of Plexiglas Planar Phantom



450MHz Dipole Calibration Photo



450MHz Dipole Calibration Photo

3. Measurement Conditions

The planar phantom was filled with brain simulating tissue having the following electrical parameters at 450MHz:

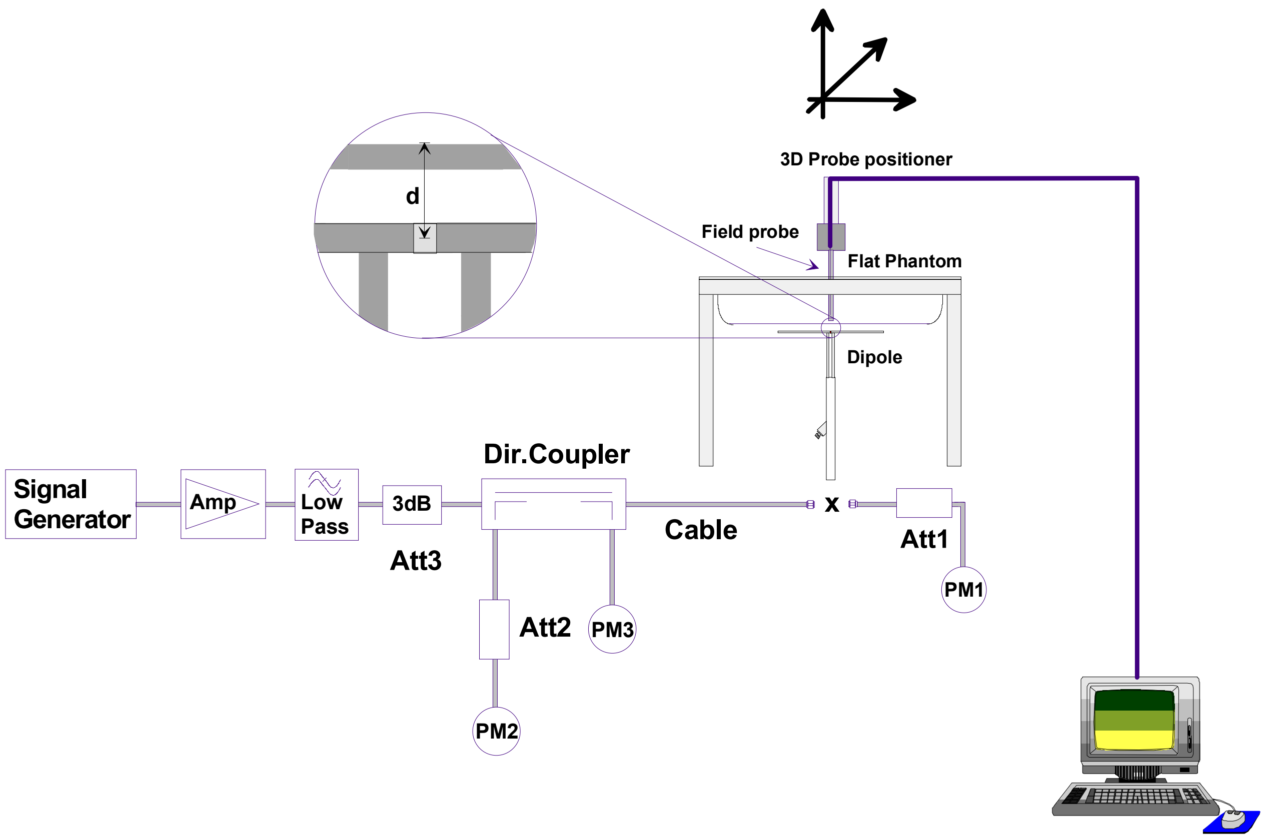
Relative Permitivity:	44.1	± 5%
Conductivity:	0.87 mho/m	± 5%
Temperature:	23.0°C	

The 450MHz simulating tissue consists of the following ingredients:

Ingredient	Percentage by weight
Water	38.56%
Sugar	56.32%
Salt	3.95%
HEC	0.98%
Dowicil 75	0.19%
Target Dielectric Parameters at 22°C	$\varepsilon_r = 43.5$ $\sigma = 0.87$ S/m

4. SAR Measurement

The SAR measurement was performed with the E-field probe in mechanical detection mode only. The setup and determination of the forward power into the dipole was performed using the following procedures.



First the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at the dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed from the previous value. The reflected power should be 20dB below the forward power.

Ten SAR measurements were performed in order to achieve repeatability and to establish an average target value.

Validation Dipole SAR Test Results

Validation Measurement	SAR @ 0.25W Input averaged over 1g	SAR @ 1W Input averaged over 1g	SAR @ 0.25W Input averaged over 10g	SAR @ 1W Input averaged over 10g	Peak SAR @ 0.25W Input
Test 1	1.36	5.43	0.897	3.58	2.13
Test 2	1.32	5.28	0.876	3.51	2.08
Test 3	1.34	5.36	0.887	3.55	2.10
Test 4	1.33	5.32	0.881	3.53	2.09
Test 5	1.35	5.39	0.895	3.58	2.11
Test 6	1.31	5.25	0.867	3.47	2.06
Test 7	1.34	5.36	0.887	3.55	2.10
Test 8	1.30	5.21	0.857	3.43	2.05
Test 9	1.32	5.28	0.877	3.51	2.08
Test10	1.35	5.39	0.897	3.58	2.11
Average Value	1.33	5.36	0.874	3.53	2.09

The results have been normalized to 1W (forward power) into the dipole.

Averaged over 1cm (1g) of tissue: 5.36 mW/g

Averaged over 10cm (10g) of tissue: 3.52 mW/g

Dipole 450MHz

Large Planar Phantom; Planar Section

Probe: ET3DV6 - SN1387; ConvF(7.30,7.30,7.30); Crest factor: 1.0; 450 MHz Brain: $\sigma = 0.87$ mho/m $\varepsilon_r = 44.1$ $\rho = 1.00$ g/cm³

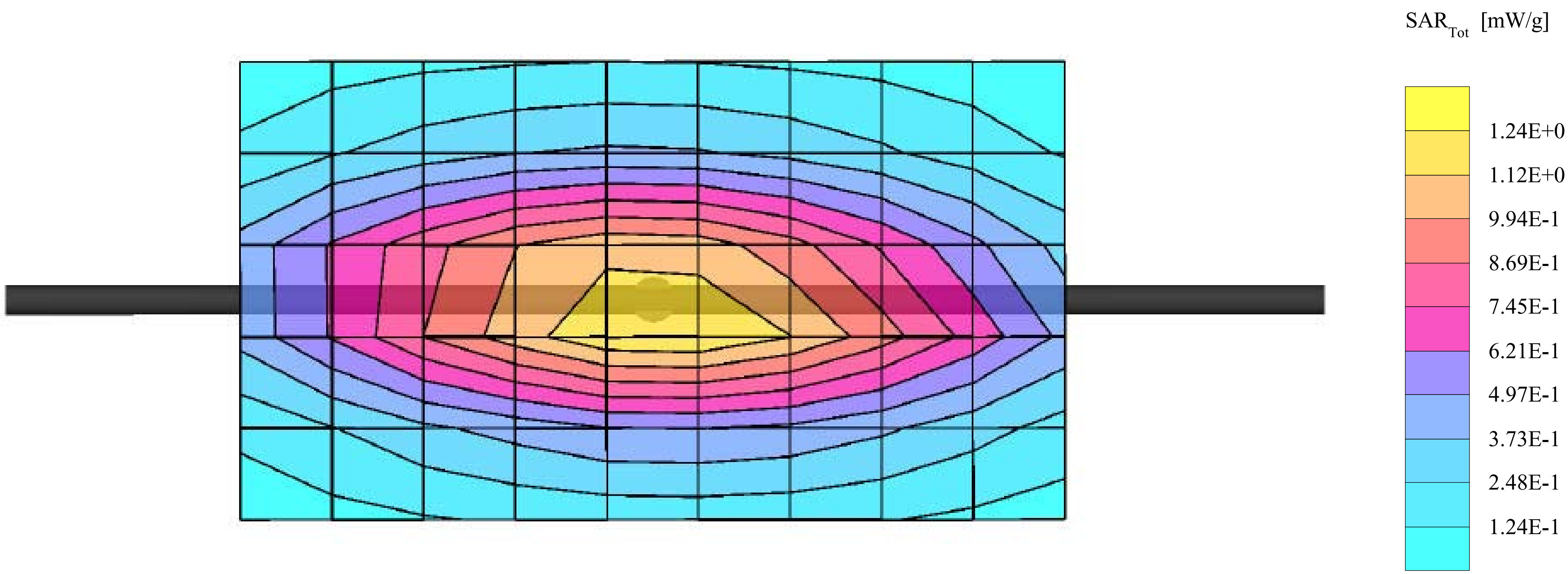
Cube 5x5x7: Peak: 2.13 mW/g, SAR (1g): 1.34 mW/g, SAR (10g): 0.879 mW/g, (Worst-case extrapolation)

Penetration depth: 12.5 (10.7, 14.9) [mm]

Powerdrift: -0.01 dB

Calibration Date: March 18, 2002

Antenna Input Power: 250 mW

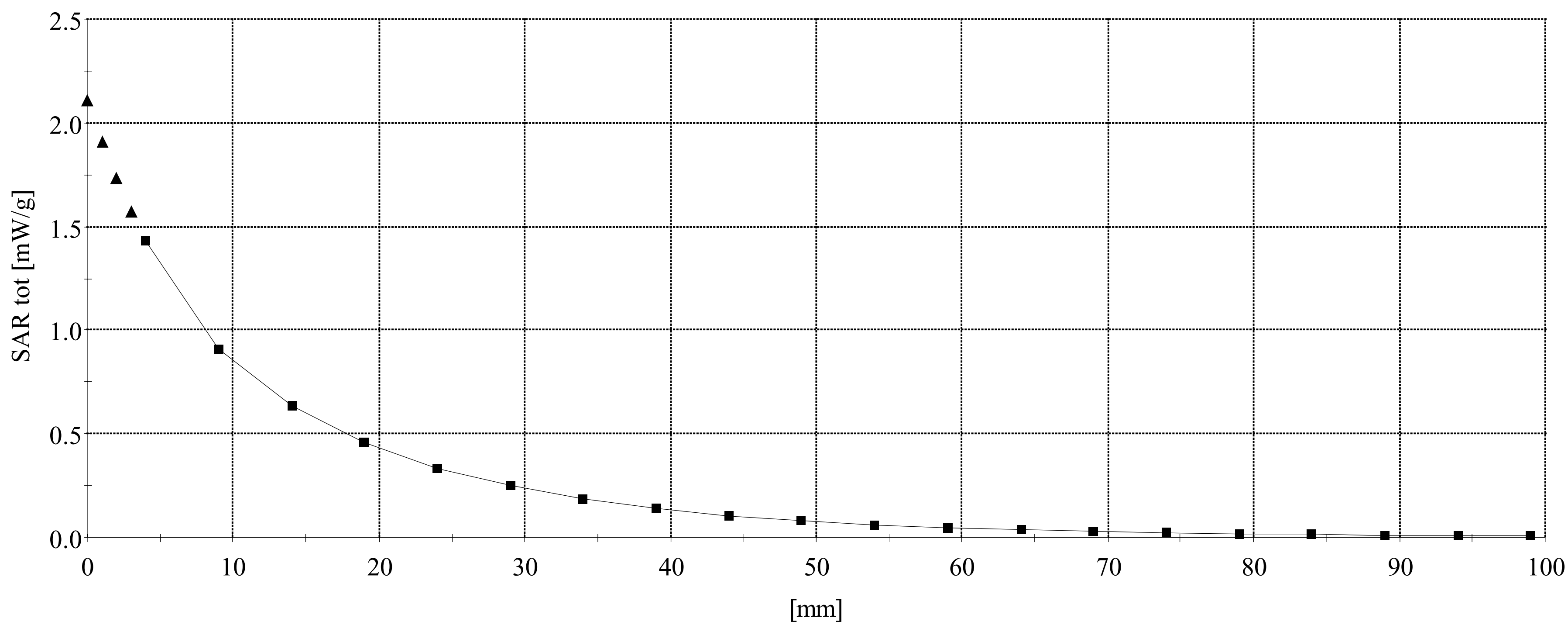


Dipole 450MHz

Large Planar Phantom
Probe: ET3DV6 - SN1387; ConvF(7.30,7.30,7.30); Crest factor: 1.0;
450 MHz Brain: $\sigma = 0.87$ mho/m $\varepsilon_r = 44.1$ $\rho = 1.00$ g/cm^3

Z-Axis Extrapolation at Peak SAR Location

Calibration Date: March 18, 2002
Antenna Input Power: 250 mW



APPENDIX E - PROBE CALIBRATION

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:	**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**	$\mu V/(V/m)^2$
NormY	**1.67**	$\mu V/(V/m)^2$
NormZ	**1.67**	$\mu V/(V/m)^2$

Diode Compression

DCP X	**97**	mV
DCP Y	**97**	mV
DCP Z	**97**	mV

Sensitivity in Tissue Simulating Liquid

Head 900 MHz ε_r **= 41.5 ± 5%** **σ = 0.97 ± 5% mho/m**
Head 835 MHz ε_r **= 41.5 ± 5%** **σ = 0.90 ± 5% mho/m**

ConvF X	**6.6**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.6**	± 9.5% (k=2)	Alpha	**0.40**
ConvF Z	**6.6**	± 9.5% (k=2)	Depth	**2.38**

Head 1800 MHz ε_r **= 40.0 ± 5%** **σ = 1.40 ± 5% mho/m**
Head 1900 MHz ε_r **= 40.0 ± 5%** **σ = 1.40 ± 5% mho/m**

ConvF X	**5.4**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.4**	± 9.5% (k=2)	Alpha	**0.57**
ConvF Z	**5.4**	± 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

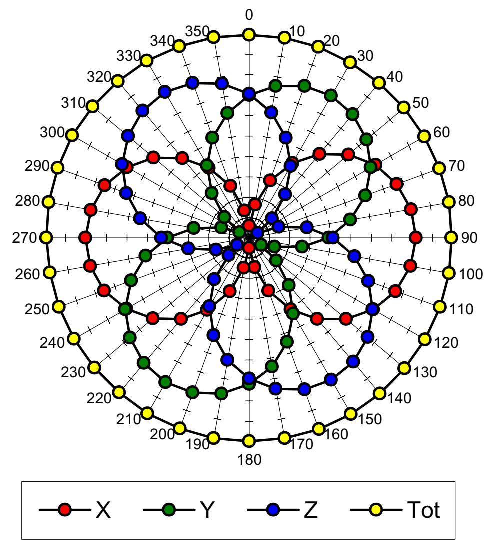
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	11.5	7.3
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

Sensor Offset

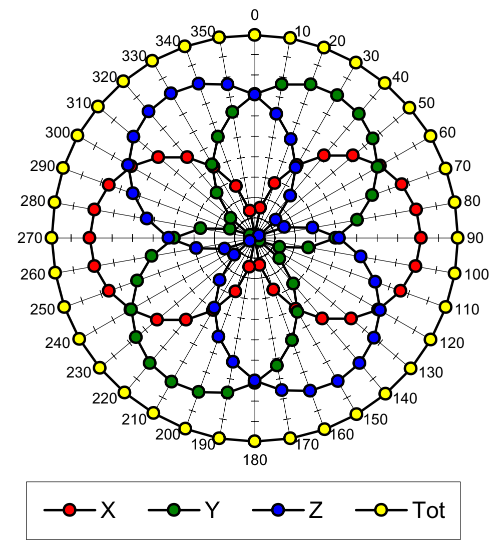
Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.3 ± 0.2**	mm

Receiving Pattern (ϕ , θ = 0°

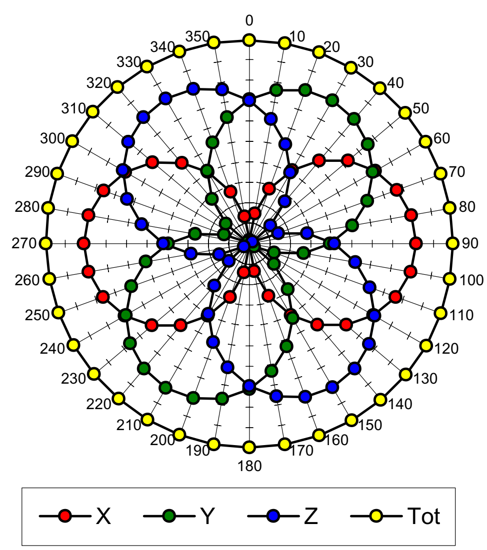
f = 30 MHz, TEM cell ifi110



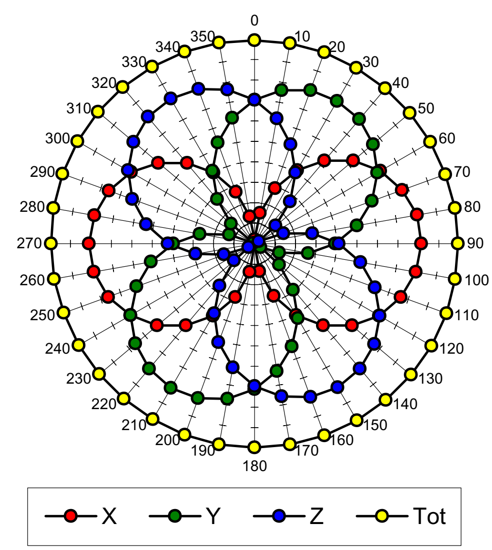
f = 100 MHz, TEM cell ifi110

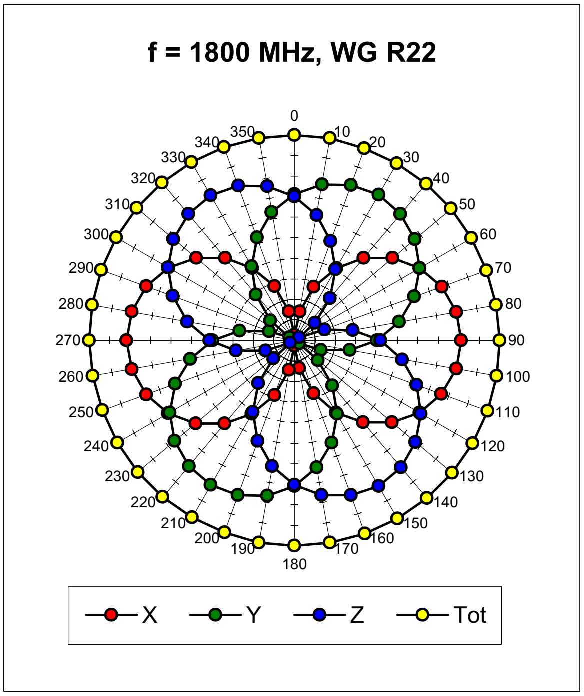


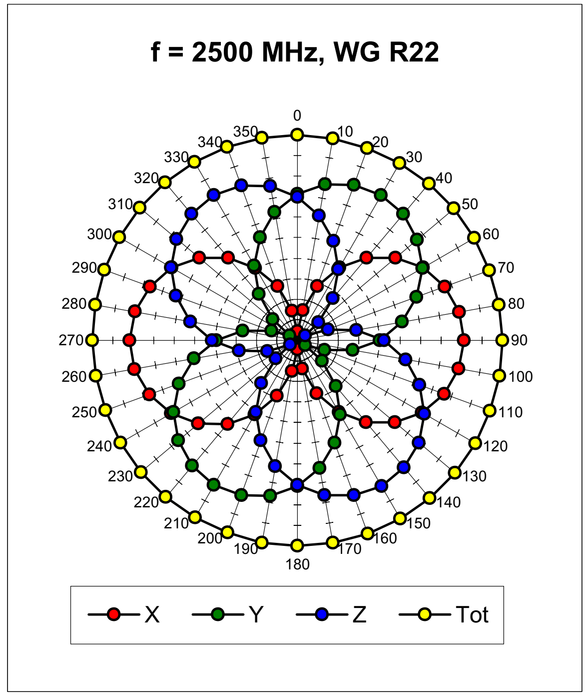
f = 300 MHz, TEM cell ifi110



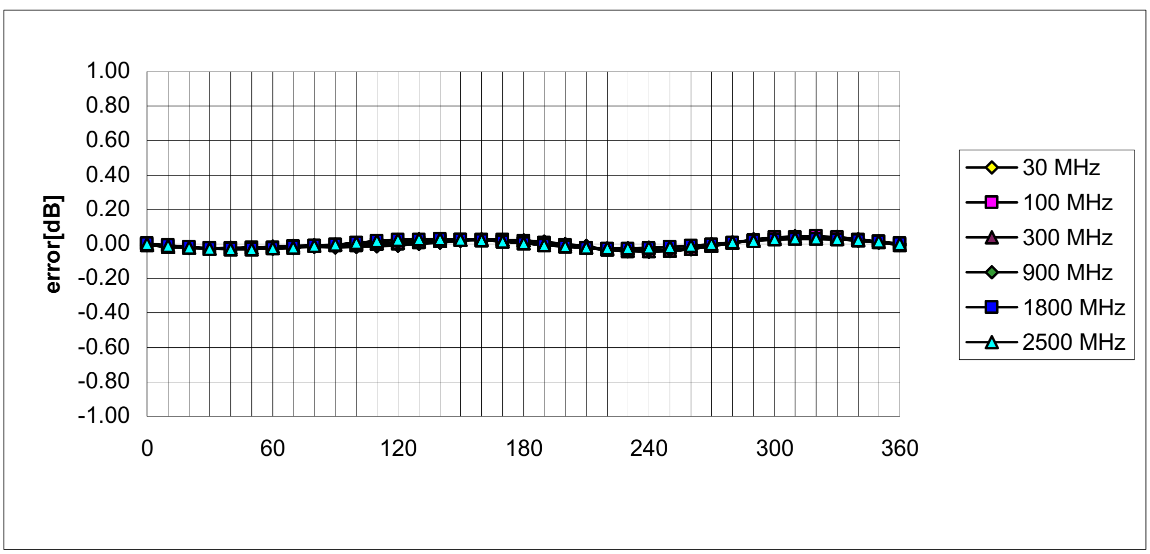
f = 900 MHz, TEM cell ifi110





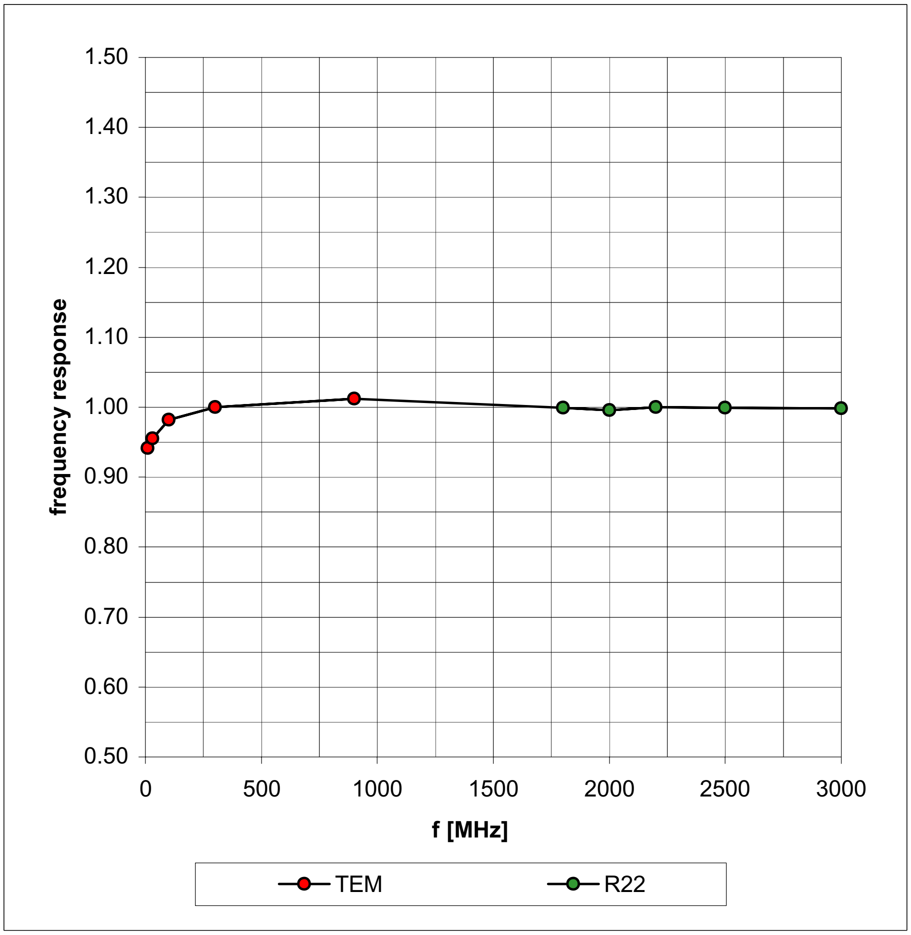


Isotropy Error (ϕ), θ = 0°



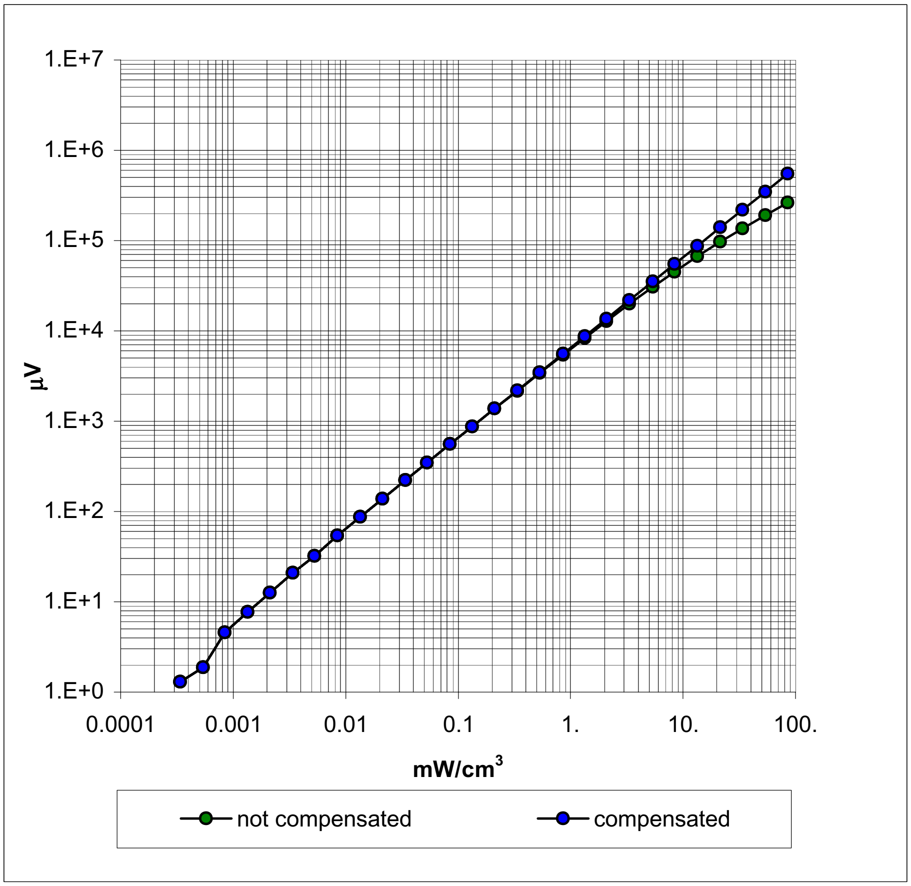
Frequency Response of E-Field

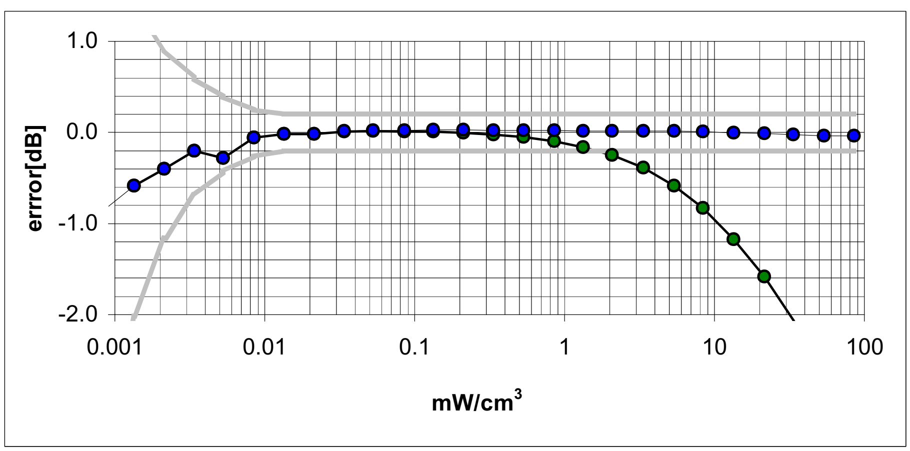
(TEM-Cell:ifi110, Waveguide R22)



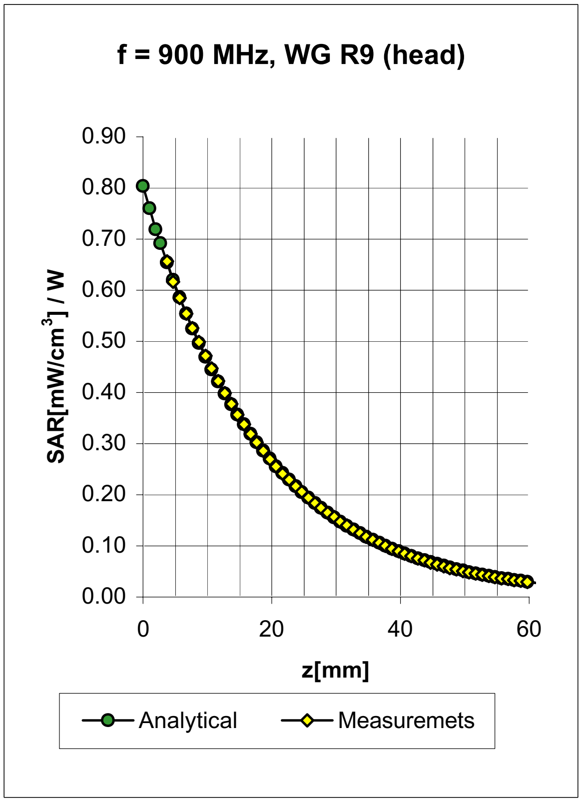
Dynamic Range f(SAR_{brain})

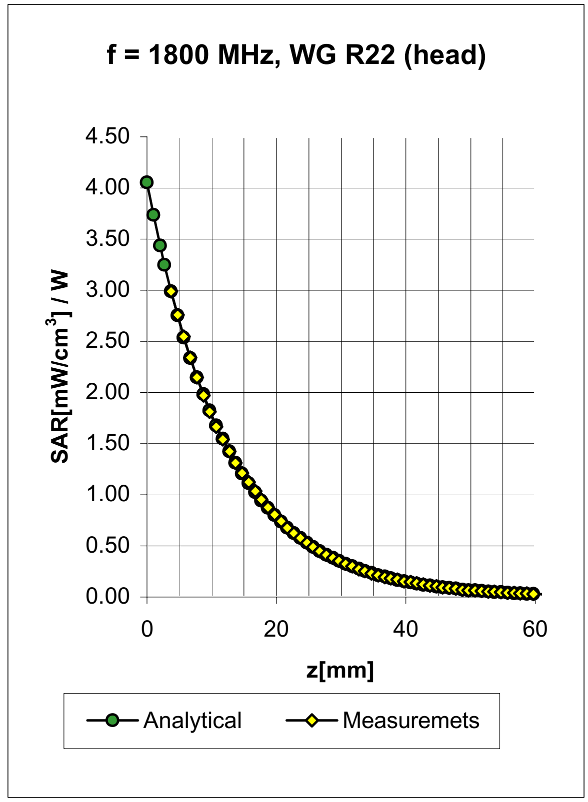
(Waveguide R22)





Conversion Factor Assessment

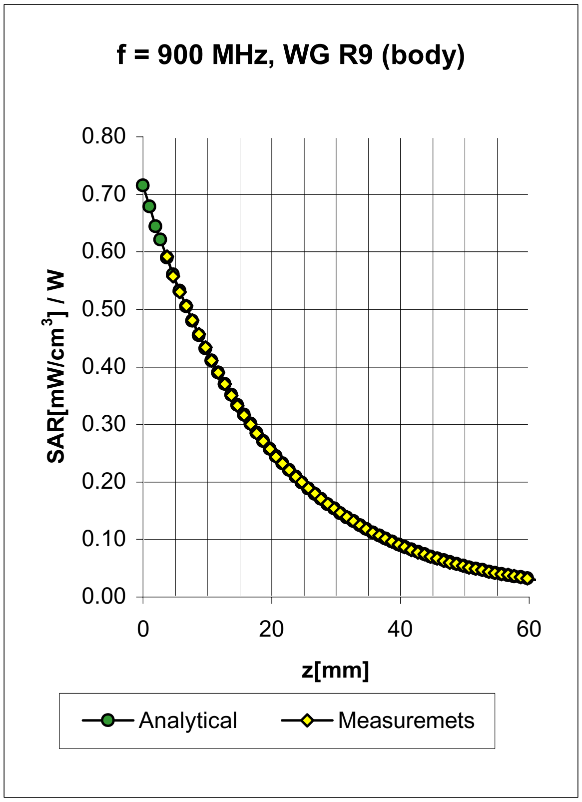


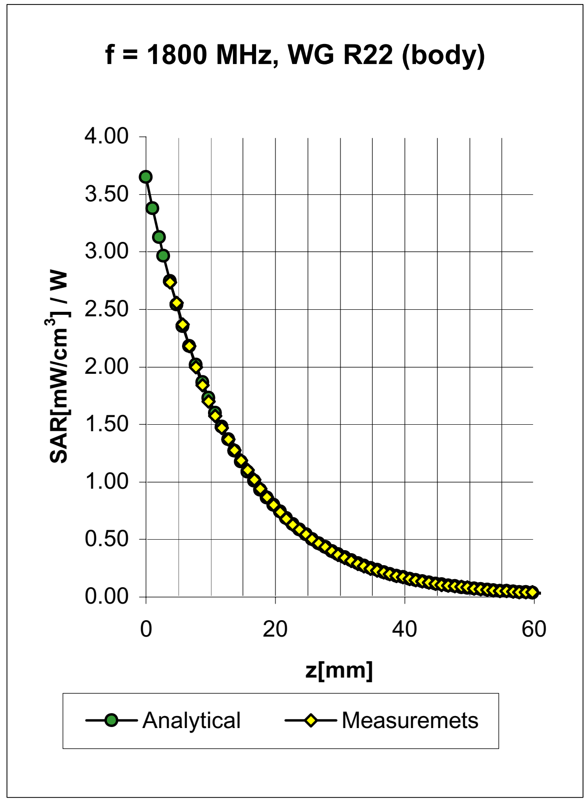


Head	**900 MHz**		ε_r = **41.5 ± 5%**	σ = **0.97 ± 5% mho/m**	
Head	**835 MHz**		ε_r = **41.5 ± 5%**	σ = **0.90 ± 5% mho/m**	
	ConvF X	**6.6**	± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**6.6**	± 9.5% (k=2)	Alpha	**0.40**
	ConvF Z	**6.6**	± 9.5% (k=2)	Depth	**2.38**

Head	**1800 MHz**		ε_r = **40.0 ± 5%**	σ = **1.40 ± 5% mho/m**	
Head	**1900 MHz**		ε_r = **40.0 ± 5%**	σ = **1.40 ± 5% mho/m**	
	ConvF X	**5.4**	± 9.5% (k=2)	Boundary effect:	
	ConvF Y	**5.4**	± 9.5% (k=2)	Alpha	**0.57**
	ConvF Z	**5.4**	± 9.5% (k=2)	Depth	**2.18**

Conversion Factor Assessment



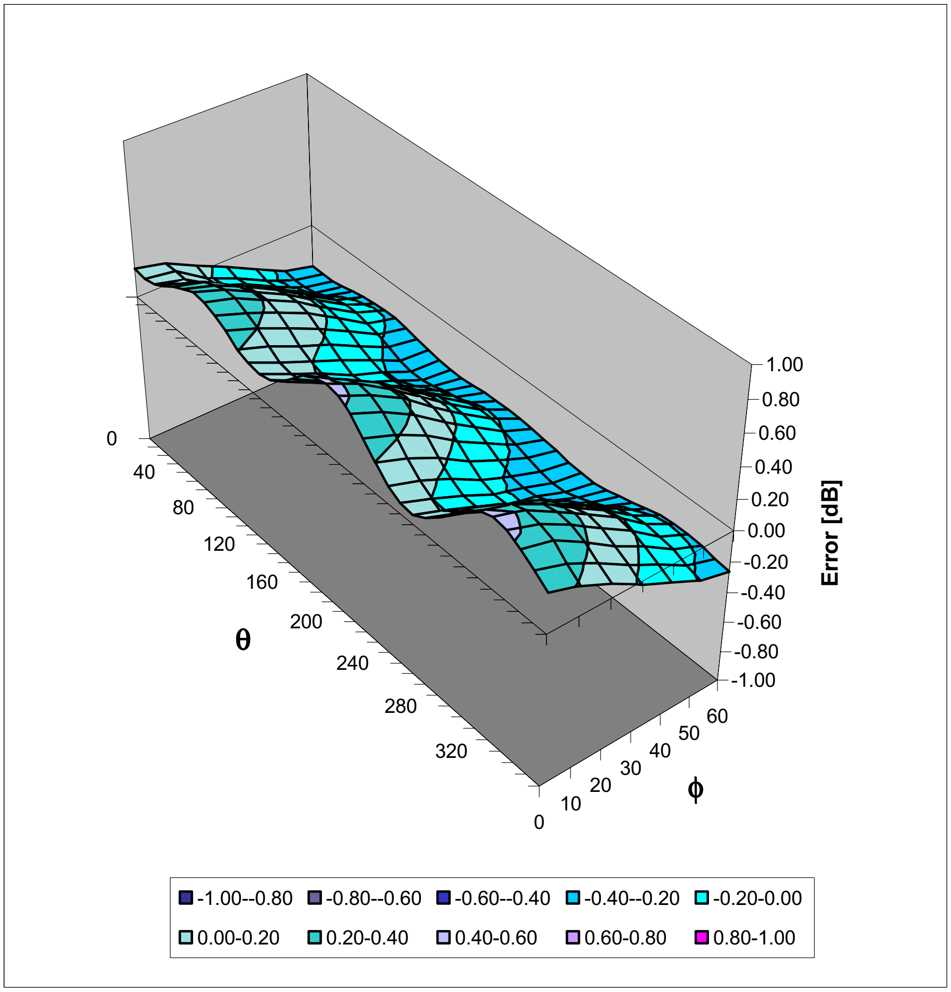


Body		**900 MHz**		**ε_r = 55.0 ± 5%**	**σ = 1.05 ± 5% mho/m**	
Body		**835 MHz**		**ε_r = 55.2 ± 5%**	**σ = 0.97 ± 5% mho/m**	
	ConvF X	**6.3**	± 9.5% (k=2)		Boundary effect:	
	ConvF Y	**6.3**	± 9.5% (k=2)		Alpha	**0.42**
	ConvF Z	**6.3**	± 9.5% (k=2)		Depth	**2.44**

Body		**1800 MHz**		**ε_r = 53.3 ± 5%**	**σ = 1.52 ± 5% mho/m**	
Body		**1900 MHz**		**ε_r = 53.3 ± 5%**	**σ = 1.52 ± 5% mho/m**	
	ConvF X	**5.0**	± 9.5% (k=2)		Boundary effect:	
	ConvF Y	**5.0**	± 9.5% (k=2)		Alpha	**0.76**
	ConvF Z	**5.0**	± 9.5% (k=2)		Depth	**2.01**

Deviation from Isotropy in HSL

Error (θϕ), f = 900 MHz



Schmid & Partner
Engineering AG

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

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 (± standard deviation)

150 MHz	ConvF	**9.2 ± 8%**	**ε_r = 52.3** **σ = 0.76 mho/m** (head tissue)
300 MHz	ConvF	**8.0 ± 8%**	**ε_r = 45.3** **σ = 0.87 mho/m** (head tissue)
150 MHz	ConvF	**8.8 ± 8%**	**ε_r = 61.9** **σ = 0.80 mho/m** (body tissue)
450 MHz	ConvF	**7.7 ± 8%**	**ε_r = 56.7** **σ = 0.94 mho/m** (body tissue)

APPENDIX F - MEASURED LIQUID DIELECTRIC PARAMETERS

Measured Liquid Dielectric Parameters

450MHz System Validation & EUT Evaluation (Brain)

March 21, 2002

Frequency	e'	e"
400.000000 MHz	45.6781	37.5911
402.500000 MHz	45.6656	37.3595
405.000000 MHz	45.5465	37.2498
407.500000 MHz	45.3910	37.0234
410.000000 MHz	45.3867	36.8390
412.500000 MHz	45.3226	36.6656
415.000000 MHz	45.1663	36.5485
417.500000 MHz	45.1715	36.2882
420.000000 MHz	45.1415	36.1961
422.500000 MHz	45.0524	35.9746
425.000000 MHz	44.9926	35.8107
427.500000 MHz	44.9343	35.5894
430.000000 MHz	44.8642	35.4802
432.500000 MHz	44.7847	35.3055
435.000000 MHz	44.7826	35.1887
437.500000 MHz	44.6758	35.0798
440.000000 MHz	44.6510	34.9977
442.500000 MHz	44.6008	34.8729
445.000000 MHz	44.5059	34.8229
447.500000 MHz	44.4296	34.7046
450.000000 MHz	44.4001	34.5803
452.500000 MHz	44.3385	34.5464
455.000000 MHz	44.2768	34.4480
457.500000 MHz	44.2187	34.3687
460.000000 MHz	44.2242	34.2799
462.500000 MHz	44.1582	34.2586
465.000000 MHz	44.0948	34.1916
467.500000 MHz	44.0468	34.1592
470.000000 MHz	44.0127	34.0978
472.500000 MHz	43.9311	34.0719
475.000000 MHz	43.8418	33.9941
477.500000 MHz	43.7449	33.9718
480.000000 MHz	43.6894	33.8723
482.500000 MHz	43.5773	33.8538
485.000000 MHz	43.4780	33.7985

Measured Liquid Dielectric Parameters
450MHz EUT Evaluation (Body)
March 21, 2002

Frequency	e'	e''
400.000000 MHz	59.1976	39.7806
402.500000 MHz	59.1728	39.5532
405.000000 MHz	59.0903	39.4658
407.500000 MHz	58.9742	39.1973
410.000000 MHz	59.0072	39.0494
412.500000 MHz	58.9162	38.9060
415.000000 MHz	58.8585	38.7167
417.500000 MHz	58.8725	38.5771
420.000000 MHz	58.7845	38.4384
422.500000 MHz	58.7447	38.2310
425.000000 MHz	58.7209	38.1034
427.500000 MHz	58.6763	37.9211
430.000000 MHz	58.6305	37.7808
432.500000 MHz	58.5739	37.6343
435.000000 MHz	58.5903	37.5042
437.500000 MHz	58.5010	37.3870
440.000000 MHz	58.4902	37.3138
442.500000 MHz	58.4586	37.1385
445.000000 MHz	58.3872	37.0506
447.500000 MHz	58.3372	36.9689
450.000000 MHz	58.2910	36.8107
452.500000 MHz	58.3141	36.7539
455.000000 MHz	58.2459	36.6693
457.500000 MHz	58.2311	36.5649
460.000000 MHz	58.2212	36.3946
462.500000 MHz	58.2185	36.3459
465.000000 MHz	58.1392	36.2861
467.500000 MHz	58.1027	36.1623
470.000000 MHz	58.1058	36.0494
472.500000 MHz	58.0565	35.9489
475.000000 MHz	57.9981	35.8880
477.500000 MHz	57.9426	35.7543
480.000000 MHz	57.8993	35.6736
482.500000 MHz	57.7841	35.5916
485.000000 MHz	57.8032	35.4628

APPENDIX G - SAM PHANTOM CERTIFICATE OF CONFORMITY

Schmid & Partner Engineering AG

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

Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 BA
Series No	TP-1002 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

Tests

The series production process used allows the limitation to test of first articles.
Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series units (called samples).

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

[1] CENELEC EN 50361
[2] IEEE P1528-200x draft 6.5
[3] IEC PT 62209 draft 0.9
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

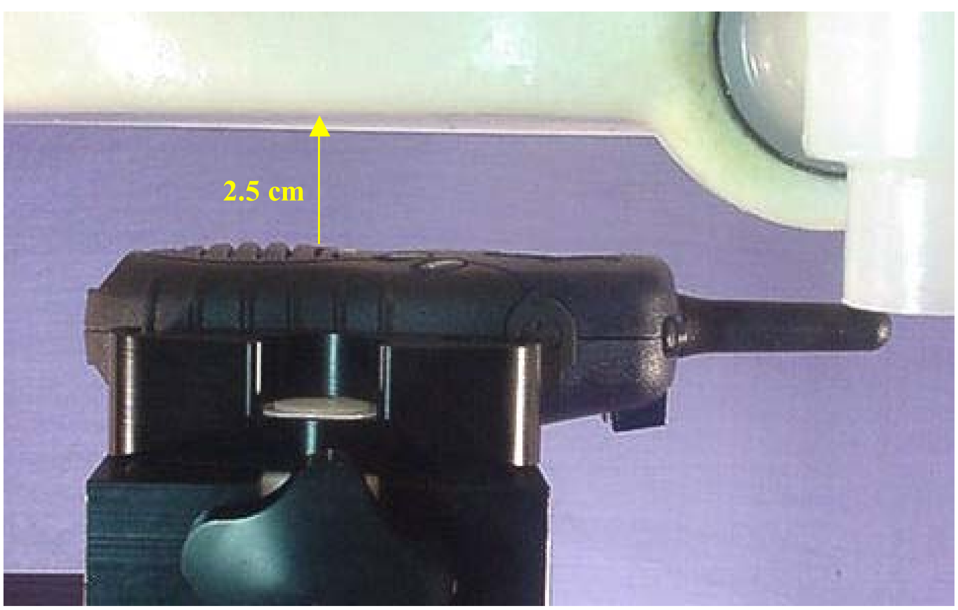
Date 18.11.2001

Signature / Stamp

Schmid & Partner Engineering AG
Zeughausstrasse 43, CH-8004 Zurich
Tel. +41 1 245 97 00, Fax +41 1 245 97 79

APPENDIX H - SAR TEST SETUP PHOTOGRAPHS

FACE-HELD SAR TEST SETUP PHOTOGRAPHS
2.5cm Separation Distance



BODY-WORN SAR TEST SETUP PHOTOGRAPHS
0.7cm Belt-Clip Separation Distance