CERTIFICATE OF COMPLIANCE
SAR EVALUATION - SUPPLEMENT

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Applicant Information:
M/A-COM PRIVATE RADIO SYSTEMS, INC.
3315 Old Forest Road
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FCC Rule Part(s):	**2.1093; ET Docket 96-326**
FCC ID:	**OWDTR-0014-E**
Model(s):	**Jaguar 700P (Modified Unit)**
EUT Type(s):	**Portable FM PTT Radio Transceiver (RU101219V1)**
Modulation:	**FM**
Tx Frequency Range(s):	**806-821 MHz (Repeater Input mode)** **821-824 MHz (NPSPAC, Repeater Input mode)** **851-866 MHz (Talk-Around mode)** **866-869 MHz (NPSPAC, Talk-Around mode)**
Conducted Output Power:	**3.2 Watts**
Antenna Type(s):	**1: Elevated Feed Gain Antenna (KRE1011216/01)** **2: Flexible Gain Antenna (KRE1011506/01)** **3: Whip Antenna (KRE1011223/01)**
Battery Type(s):	**1. High Capacity NICAD Battery (BKB191210/3)** **2. Extra High Capacity NIMH Battery (BKB191210/4)**
Accessories:	**1. Speaker Microphone Antenna Version Plus (OT-V2-10120)** **2. Metal Belt-Clip (KRY1011647/1)** **3. Leather Belt-Loop (19B226627G2) & Swivel Socket (19B233243G3)** **4. T-Strap Belt-Loop (KRY1011656/1)**

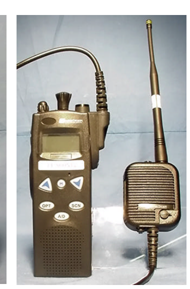
Celltech Research Inc. declares under its sole responsibility that this device was found to be in compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC OET Bulletin 65, Supplement C, Edition 01-01 (General Population/Uncontrolled Exposure), and was tested in accordance 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 that the M/A-COM PRS INC. Model: Jaguar 700P Portable FM PTT Radio Transceiver FCC ID: OWDTR-0014-E (modified unit) with three alternate antennas complies with the regulations and procedures specified in FCC Rule Part 2.1093, ET Docket 96-326 for mobile and portable devices (controlled exposure). 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
EUT Type	Portable FM PTT Radio Transceiver	**Tx Frequency Range**	806-821 MHz (Repeater Input mode) 821-824 MHz (NPSPAC, Repeater Input mode) 851-866 MHz (Talk-Around mode) 866-869 MHz (NPSPAC, Talk-Around mode)
FCC ID	OWDTR-0014-E	**Rated RF Conducted Power**	3.2 Watts
Model(s)	Jaguar 700P (Modified Unit)	**Antenna Type(s)**	1. Elevated Feed Gain (KRE1011216/01) 2. Flexible Gain (KRE1011506/01) 3. Whip (KRE1011223/01)
Serial No.	Pre-production	**Battery Type(s)**	1. 7.5 VDC Nickel Cadmium (BKB191210/3) 2. 7.5 VDC Nickel Metal Hydride (BKB191210/4)
Accessories Retested		1. Speaker Microphone Antenna Version Plus (OT-V2-10120) 2. Metal Belt-Clip (KRY1011647/1) 3. T-Strap Belt-Loop (KRY1011656/1)	

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, specific anthropomorphic mannequin (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 small planar phantom

4.0 SUMMARY OF SAR RETEST WITH MODIFIED EUT

Test Configuration		Battery Type	Antenna	SAR W/Kg (Modified Unit)		SAR W/Kg (Unmodified Unit)	
				Mid-Channel Low Band 815.000 MHz	Mid-Channel High Band 860.000 MHz	Mid-Channel Low Band 815.000 MHz	Mid-Channel High Band 860.000 MHz
1	FACE-HELD Radio	NiCAD	#1	2.45	1.37	3.37	1.99
2	FACE-HELD Radio	NiCAD	#2	1.71	1.19	2.58	2.06
3	FACE-HELD Radio	NiCAD	#3	2.23	1.09	3.02	1.88
4	FACE-HELD Speaker-Microphone	NiCAD	#1	5.46	3.67	5.82	4.58
5	BODY-WORN Radio with Belt-Clip	NiCAD	#1	11.0	7.21	12.8	9.23
6	BODY-WORN Radio with T-Strap	NiCAD	#1	11.1	6.92	10.3	9.21

Notes:

1. SAR levels reported are 100% duty cycle.
2. Antenna #1: Elevated Feed Gain (KRE1011216/01)
   Antenna #2: Flexible Gain (KRE1011506/01)
   Antenna #3: Whip (KRE1011223/01)
3. Belt-Clip separation distance: 1.1 cm
   T-Strap separation distance: 1.6 cm
4. The leather belt-loop provided the greatest separation distance of 3.3cm and therefore was not evaluated.
5. Antenna #1 was found to be the worst-case antenna, and therefore was evaluated for each test configuration.
6. SAR measurements for test configuration 1 were performed with both the NiMH and NiCAD battery options. The SAR results for the NiMH battery were substantially lower than the NiCAD battery, therefore SAR results for the NiCAD battery are reported.

5.0 MEASUREMENT RESULTS

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 Measurements - EUT with Antenna #1, #2, & #3

Freq. (MHz)	Chan.	Mode	Cond. Power Before (W)	Cond. Power After (W)	Battery Type	Antenna	Separ. Dist. (cm)	SAR (w/kg)	
								100% Duty Cycle	50% Duty Cycle
815.000	L. Mid	CW	3.27	3.20	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	2.5	2.45	1.23
860.520	H. Mid	CW	3.23	3.09	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	2.5	1.37	0.685
815.000	L. Mid	CW	3.29	3.18	NiCad	#2: Flexible Gain (KRE1011506/01)	2.5	1.71	0.855
860.520	H. Mid	CW	3.16	3.07	NiCad	#2: Flexible Gain (KRE1011506/01)	2.5	1.19	0.595
815.000	L. Mid	CW	3.24	3.16	NiCad	#3: Whip (KRE1011223/01)	2.5	2.23	1.12
860.520	H. Mid	CW	3.16	3.07	NiCad	#3: Whip (KRE1011223/01)	2.5	1.09	0.545
Mixture Type: Brain Dielectric Constant: 41.1 Conductivity: 0.90 (Measured)					**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Controlled Exposure / Occupational BRAIN: 8.0 W/kg (averaged over 1 gram)**				

Notes:

1. Test Date: January 18, 2002
2. The SAR values found were below the maximum limit of 8.0 w/kg (controlled exposure).
3. The highest face-held SAR value found was 2.45 w/kg (100% duty cycle, mid-channel low band, Antenna #1, NiCad battery).
4. The EUT was tested for face-held SAR with a 2.5 cm separation distance between the front of the EUT and the outer surface of the planar phantom.
5. Ambient TEMPERATURE: 22.2 °C
   Relative HUMIDITY: 35 %
   Atmospheric PRESSURE: 102.4 kPa
6. Fluid Temperature 23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

Face-Held SAR Measurements - Speaker Microphone Antenna Version Plus (OT-V2-10120) with Antenna #1: Elevated Feed Gain (KRE1011216/01)

Freq. (MHz)	Chan.	Mode	Cond. Power Before (W)	Cond. Power After (W)	Battery Type	Antenna	Separ. Dist. (cm)	SAR (w/kg)	
								100% Duty Cycle	50% Duty Cycle
815.000	L. Mid	CW	3.24	3.16	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	2.5	5.46	2.73
860.520	H. Mid	CW	3.19	3.05	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	2.5	3.67	1.84
Mixture Type: Brain Dielectric Constant: 41.1 Conductivity: 0.90 (Measured)					**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Controlled Exposure / Occupational BRAIN: 8.0 W/kg (averaged over 1 gram)**				

Notes:

1. Test Date: January 18, 2002
2. The SAR values found were below the maximum limit of 8.0 w/kg (controlled exposure).
3. The highest face-held SAR value found was 5.46 w/kg (100% duty cycle, low band).
4. The speaker-microphone with antenna was tested for face-held SAR with a 2.5 cm separation distance between the front of the device and the outer surface of the planar phantom.
5. Ambient TEMPERATURE: 22.2 °C
   Relative HUMIDITY: 35 %
   Atmospheric PRESSURE: 102.4 kPa
6. Fluid Temperature °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

Body-Worn SAR Measurements - EUT with Antenna #1: Elevated Feed Gain (KRE1011216/01)

With Metal Belt-Clip (KRY1011647/1)

Freq. (MHz)	Chan.	Mode	Cond. Power Before (W)	Cond. Power After (W)	Battery Type	Antenna	Belt-Clip Separ. Dist. (cm)	SAR (w/kg)	
								100% Duty Cycle	50% Duty Cycle
815.000	L. Mid	CW	3.24	3.11	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	1.1	11.0	5.5
860.520	H. Mid	CW	3.12	3.07	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	1.1	7.21	3.61
Mixture Type: Body Dielectric Constant: 54.5 Conductivity: 0.98 (Measured)					ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Controlled Exposure / Occupational BODY: 8.0 W/kg (averaged over 1 gram)				

Notes:

1. Test Date: January 19, 2002
2. The SAR values found were below the maximum limit of 8.0 w/kg (controlled exposure, 50% duty cycle).
3. The highest body-worn SAR value found was 5.50 w/kg (50% duty cycle, low band).
4. The EUT was tested for body-worn SAR with the attached metal belt-clip providing a 1.1 cm separation distance between the back of the EUT and the outer surface of the planar phantom.
5. Ambient TEMPERATURE: 22.0°C
   Relative HUMIDITY: 34 %
   Atmospheric PRESSURE: 102.1 kPa
6. Fluid Temperature 23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

Body-Worn SAR Measurements - EUT with Antenna #1: Elevated Feed Gain (KRE1011216/01)

With T-Strap (KRY1011656/1)

Freq. (MHz)	Chan.	Mode	Cond. Power Before (W)	Cond. Power After (W)	Battery Type	Antenna	T-Strap Separ. Dist. (cm)	SAR (w/kg)	
								100% Duty Cycle	50% Duty Cycle
806.000	L. Low	CW	3.29	3.19	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	1.6	11.5	5.75
815.000	L. Mid	CW	3.29	3.22	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	1.6	11.1	5.55
823.975	L. High	CW	3.26	3.19	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	1.6	10.6	5.3
850.970	H. Low	CW	3.12	3.04	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	1.6	8.78	4.39
860.520	H. Mid	CW	3.12	3.03	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	1.6	6.92	3.46
868.970	H. High	CW	3.11	3.01	NiCad	#1: Elevated Feed Gain (KRE1011216/01)	1.6	6.39	3.20
Mixture Type: Body Dielectric Constant: 54.5 Conductivity: 0.98 (Measured)					**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Controlled Exposure / Occupational BODY: 8.0 W/kg (averaged over 1 gram)**				

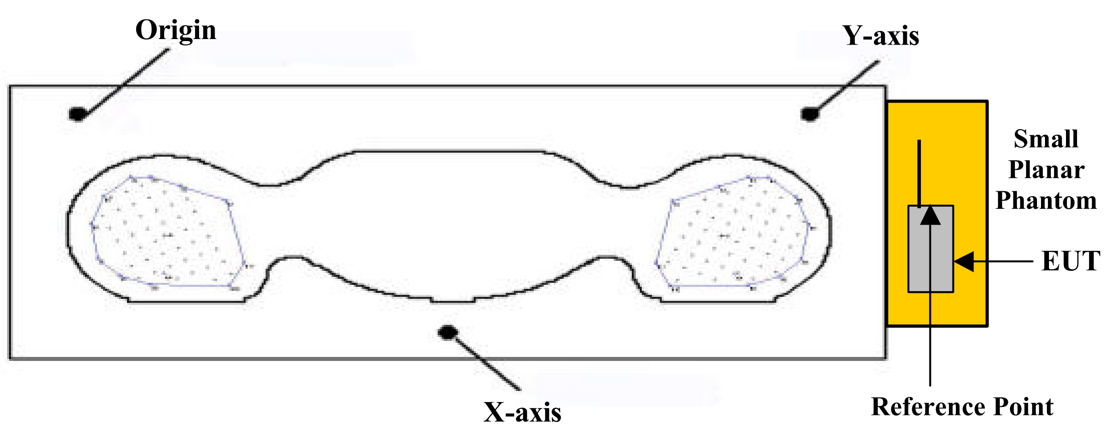
Notes:

1. Test Date: January 19, 2002
2. The SAR values found were below the maximum limit of 8.0 w/kg (controlled exposure, 50% duty cycle).
3. The highest body-worn SAR value found was 11.5 w/kg (50% duty cycle, low band).
4. The EUT was tested for body-worn SAR with the attached T-strap providing a 1.6 cm separation distance between the back of the EUT and the outer surface of the planar phantom.
5. Ambient TEMPERATURE: 22.0°C
   Relative HUMIDITY: 34 %
   Atmospheric PRESSURE: 102.1 kPa
6. Fluid Temperature 23.0 °C
7. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

6.0 DETAILS OF SAR EVALUATION

The M/A-COM PRS INC. Model: Jaguar 700P Portable FM PTT Radio Transceiver FCC ID: OWDTR-0014-E (modified unit) was found to be compliant for localized Specific Absorption Rate (Controlled Exposure) based on the following test provisions and conditions:

1. The EUT was tested in a face-held configuration with the front of the device placed parallel to the outer surface of the small planar phantom and with a 2.5 cm separation distance.
2. The speaker microphone with antenna were tested in a face-held configuration with the front of the device placed parallel to the outer surface of the small planar phantom and with a 2.5 cm separation distance.
3. The EUT was tested in a body-worn configuration with the back of the EUT placed parallel to the outer surface of the small planar phantom. The attached metal belt-clip was touching the outer surface of the small planar phantom and provided a 1.1 cm separation distance.
4. The EUT was tested in a body-worn configuration with the back of the EUT placed parallel to the outer surface of the small planar phantom. The attached T-strap was touching the outer surface of the small planar phantom, and provided a 1.6 cm separation distance.
5. The EUT was evaluated for SAR at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimize drift. The conducted power levels were checked before and after each test. If the conducted power level dropped more than 5% of the initial power level, then the EUT was retested. Any unusual anomalies over the course of the test also warranted a re-evaluation.
6. The conducted power was measured according to the procedures described in FCC Part 2.1046.
7. 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.
8. The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the device and its antenna.
9. The EUT was tested with a fully charged battery.



Phantom Reference Point & EUT Positioning

7.0 EVALUATION PROCEDURES

The Specific Absorption Rate (SAR) evaluation was performed in the following manner:

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 at the low, middle, and high frequencies of the band at maximum power, and with the device antenna in both the extended and extracted positions as applicable. The positioning of the ear-held device relative to the phantom was performed in accordance with FCC OET Bulletin 65, Supplement C (Edition 01-01) using the SAM phantom.
(ii) For face-held and body-worn 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 using uniform grid spacing.
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 phantom used for the SAR evaluation and system validation was no less than 15.0cm.
e. The E-field probe conversion factors for 835MHz were determined as follows:

- In brain and body tissue between 750MHz and 1GHz, the conversion factor decreases approximately 1.3% per 100MHz frequency increase.
- In brain and body tissue between 1.6GHz and 2GHz, the conversion factor decreases approximately 1% per 100MHz frequency increase.

For body tissue around 900MHz (permittivity about 30% higher and conductivity about 15% higher than brain tissue):

- The conversion factor in body tissue is approximately 3% lower than for brain tissue for the same frequency.

Face-held SAR Test Setup
with small planar phantom

Body-worn SAR Test Setup
with small planar phantom

8.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified in a planar phantom with a 900MHz dipole. A forward power of 250 mW was applied to the dipole and system was verified to a tolerance of ±10%. The applicable verifications are as follows (see Appendix B for validation test plots):

Dipole Validation Kit	Target SAR 1g (w/kg)	Measured SAR 1g (w/kg)	Fluid Temperature	Ambient Temperature	Validation Date
D900V2	2.78	2.77	≈22.0 °C	22.2°C	Jan. 18, 2002
D900V2	2.78	2.79	≈22.0 °C	22.2°C	Jan. 19, 2002

9.0 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 listed below. See also Appendix E - Measured Liquid Dielectric Parameters.

TISSUE PARAMETERS - DIPOLE VALIDATION			
Equivalent Tissue	**Dielectric Constant e_r**	**Conductivity s (mho/m)**	**r (Kg/m^3)**
900MHz Brain - Target	41.5 ±5%	0.97 ±5%	1000
900MHz Brain Measured - 01/18/02	40.4	0.96	1000
900MHz Brain Measured - 01/19/02	41.4	0.97	1000

TISSUE PARAMETERS - EUT EVALUATION			
Equivalent Tissue	**Dielectric Constant e_r**	**Conductivity s (mho/m)**	**r (Kg/m^3)**
835MHz Head - Target	41.5 ±5%	0.90 ±5%	1000
835MHz Head Measured - 01/18/02	41.1	0.90	1000
835MHz Body - Target	55.2 ±5%	0.97 ±5%	1000
835MHz Body Measured – 01/19/02	54.5	0.98	1000

10.0 EQUIVALENT 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 MIXTURE FOR DIPOLE VALIDATION & EUT EVALUATION		
INGREDIENT	**900MHz Validation & 835MHz Evaluation Brain Mixture**	**835MHz Evaluation Body Mixture**
Water	40.71 %	53.70 %
Sugar	56.63 %	45.10 %
Salt	1.48 %	0.97 %
HEC	1.00 %	0.13%
Bactericide	0.18 %	0.10 %

11.0 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 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	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.

12.0 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.:	1590
Construction:	Triangular core fiber optic detection system
Frequency:	10 MHz to 6 GHz
Linearity:	±0.2 dB (30 MHz to 3 GHz)

Phantom Type(s)

Type 1:	SAM V4.0C
Shell Material:	Fiberglass
Thickness:	2.0 ±0.1 mm
Volume:	Approx. 20 liters
Type 2:	Small Planar Phantom
Shell Material:	Plexiglas
Bottom Thickness:	2.0 mm ±0.1mm
Dimensions:	Box: 36.5cm (L) x 22.5cm (W) x 20.3cm (H); Back Plane: 25.3cm (H)

13.0 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)

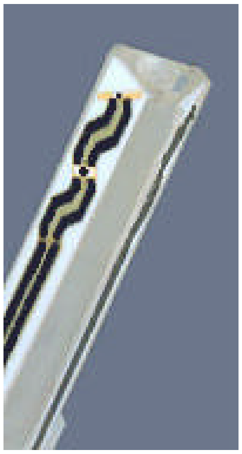
Directivity: ±0.2 dB in brain tissue (rotation around probe axis)
±0.4 dB in brain tissue (rotation normal to probe axis)

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

14.0 SAM PHANTOM V4.0C

The SAM phantom V4.0C is a fiberglass shell phantom with a 2.0 mm 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 SMALL PLANAR PHANTOM

The small planar phantom is constructed of Plexiglas material with a 2.0 mm shell thickness for face-held and body-worn SAR evaluations. The small planar phantom is mounted onto the outer left hand section of the DASY3 compact system.


Small Planar Phantom

16.0 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

17.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
EQUIPMENT	***SERIAL NO.***	***DATE CALIBRATED***
DASY3 System -Robot -ET3DV6 E-Field Probe -900MHz Validation Dipole -1800MHz Validation Dipole -SAM Phantom V4.0C	 599396-01 1590 054 247 N/A	 N/A Mar 2001 June 2001 June 2001 N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Oct 2001 Jan 2002 Feb 2001
E4408B Spectrum Analyzer	US39240170	Nov 2001
8594E Spectrum Analyzer	3543A02721	Mar 2001
8753E Network Analyzer	US38433013	Nov 2001
8648D Signal Generator	3847A00611	Aug 2001
5S1G4 Amplifier Research Power Amplifier	26235	N/A

18.0 MEASUREMENT UNCERTAINTIES

Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	c_i 1g	Standard Uncertainty ±% (1g)	v_i or v_{eff}
Measurement System						
Probe calibration	± 4.4	Normal	1	1	± 4.4	∞
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					± 13.6	
Extended Standard Uncertainty (k=2)					**± 27.1**	

19.0 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] IEEE Standards Coordinating Committee 34, DRAFT Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques: Draft 6.1, November 2000.

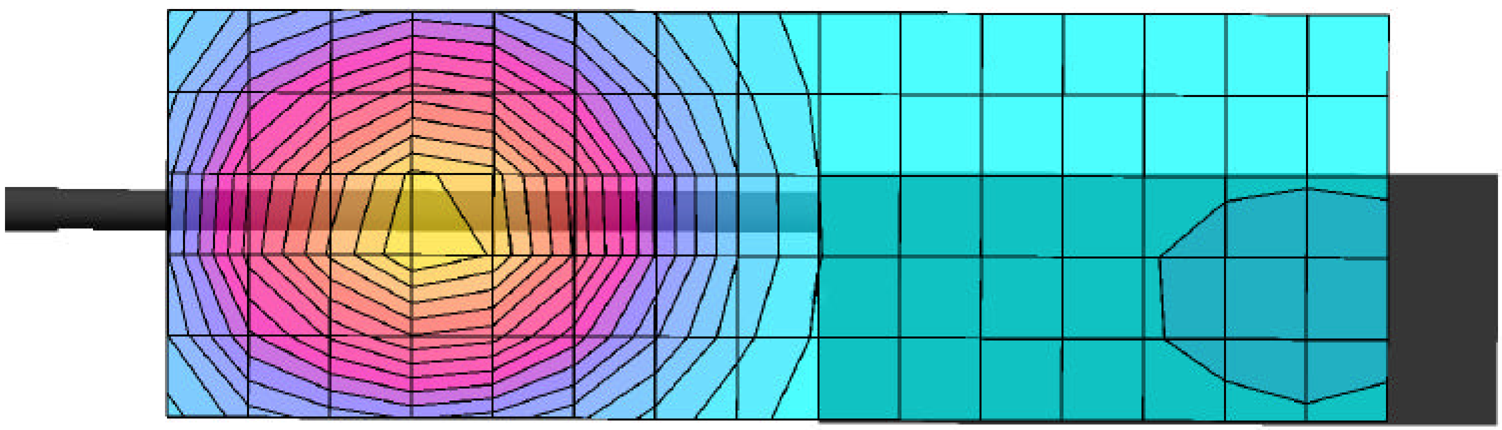
APPENDIX A - SAR MEASUREMENT DATA

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

This large area scan is intended to show the peak SAR location relative to the device

Face SAR - FULL AREA SCAN
Portable FM PTT Radio Transceiver
Antenna#1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 Mhz]
Conducted Power: 3.27 Watts
Date Tested: January 18, 2002



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.09 dB
SAR (1g): 2.45 mW/g, SAR (10g): 1.79 mW/g

Face SAR at 2.5 cm Separation Distance
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 MHz]
Conducted Power: 3.27 Watts
Date Tested: January 18, 2002

M/A-COM FCC ID: OWDTR-0014-E

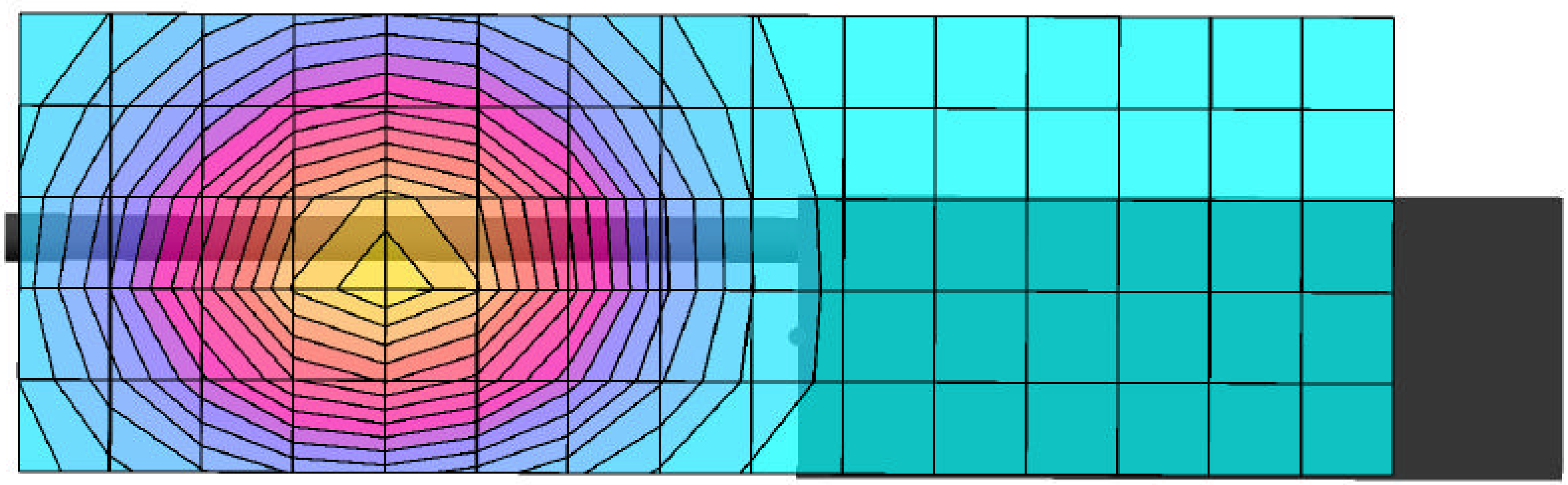
Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 1.37 mW/g, SAR (10g): 0.994 mW/g

Face SAR at 2.5 cm Separation Distance
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
High Band Mid Channel [860.520 MHz]
Conducted Power: 3.23 Watts
Date Tested: January 18, 2001

M/A-COM FCC ID: OWDTR-0014-E
Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

This large area scan is intended to show the peak SAR location relative to the device

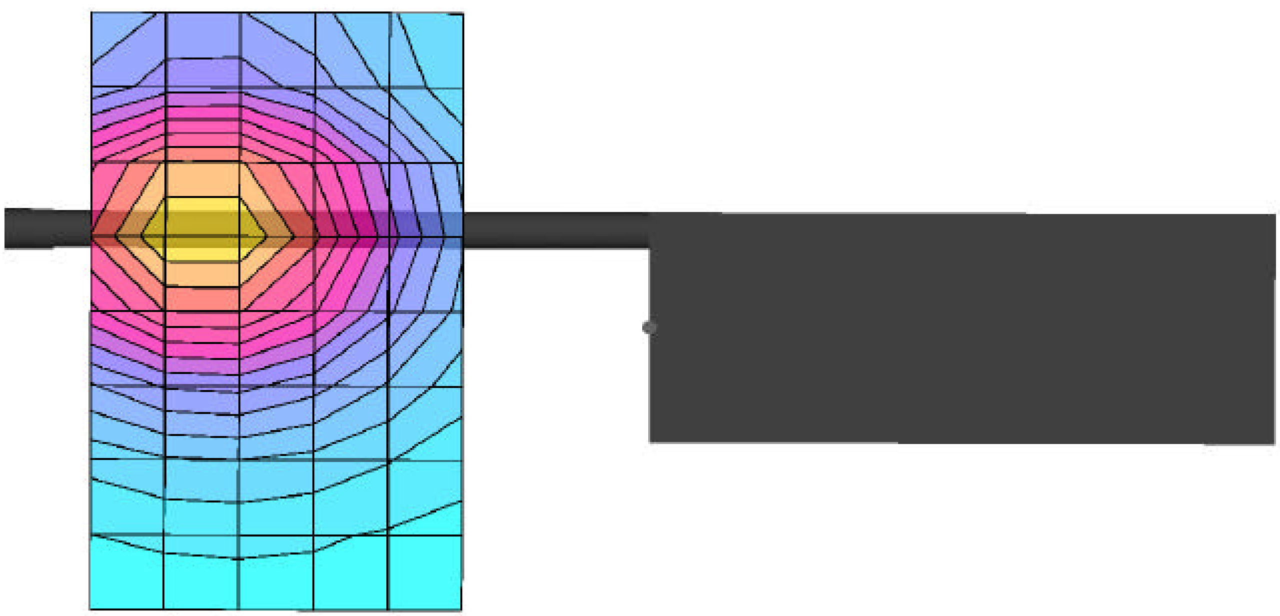
Face SAR - FULL AREA SCAN
Portable FM PTT Radio Transceiver
Antenna #2: Flexible Gain (KRE1011506/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 Mhz]
Conducted Power: 3.29 Watts
Date Tested: January 18, 2002

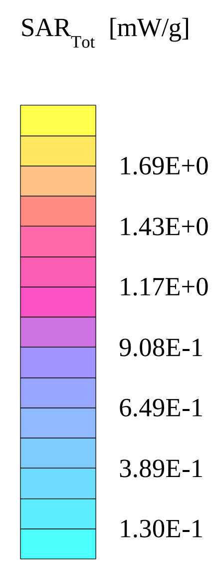


M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.13 dB
SAR (1g): 1.71 mW/g, SAR (10g): 1.26 mW/g

Face SAR at 2.5cm Separation Distance
Antenna #2: Flexible Gain (KRE1011506/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 MHz]
Conducted Power: 3.29 Watts
Date Tested: January 18, 2002





M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.09 dB
SAR (1g): 1.19 mW/g, SAR (10g): 0.846 mW/g

Face SAR at 2.5 cm Separation Distance
Antenna #2: Flexible Gain (KRE1011506/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
High Band Mid Channel [860.520 MHz]
Conducted Power: 3.16 Watts
Date Tested: January 18, 2002

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)

Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0

835 MHz Brain: $\sigma = 0.90$ mho/m $\varepsilon_r = 41.1$ $\rho = 1.00$ g/cm^3

Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

This large area scan is intended to show the peak SAR location relative to the device

Face SAR at 2.5 cm Separation Distance - FULL AREA SCAN

Portable FM PTT Radio Transceiver

Antenna #3: Whip (KRE1011223/01)

Nickel Cadmium Battery (BKB191210/3)

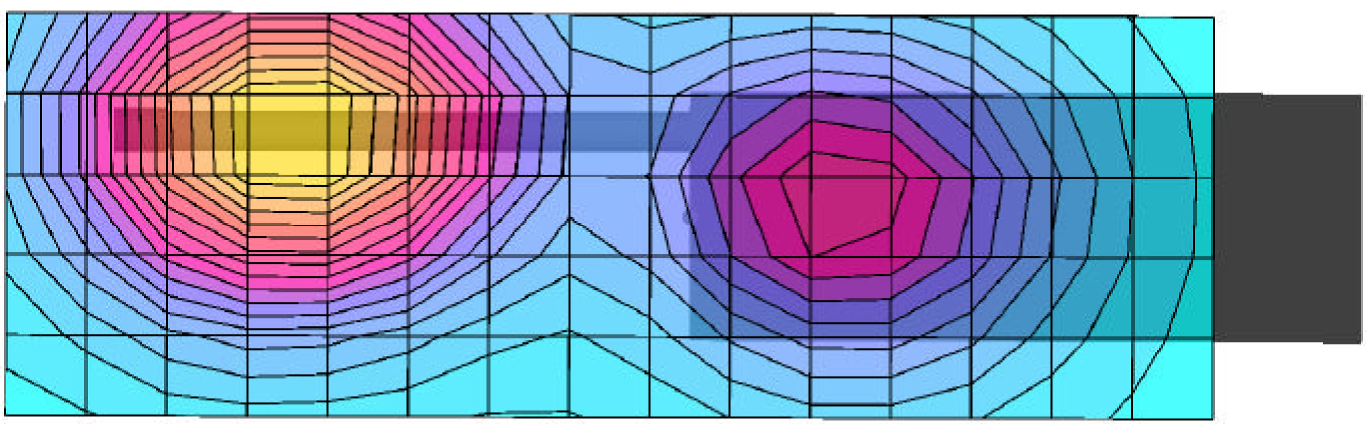
M/A-Com Model: Jaguar 700P

Continuous Wave Mode

Low Band Mid Channel [815.000 Mhz]

Conducted Power: 3.24 Watts

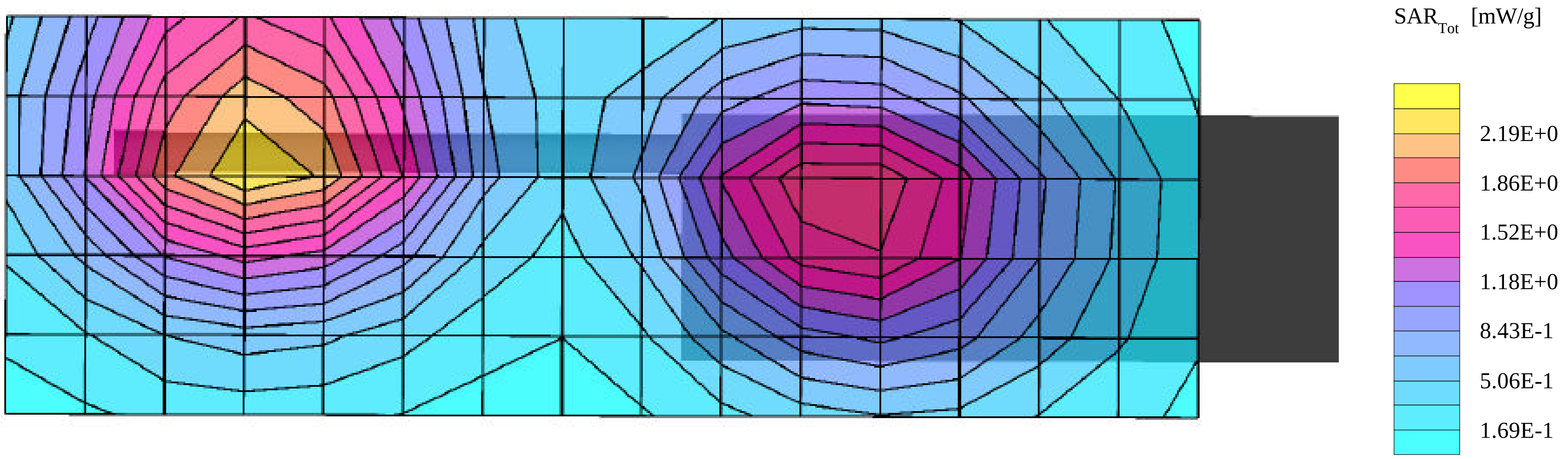
Date Tested: January 18, 2002



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7 Powerdrift: -0.19 dB
SAR (1g): 2.23 mW/g, SAR (10g): 1.59 mW/g

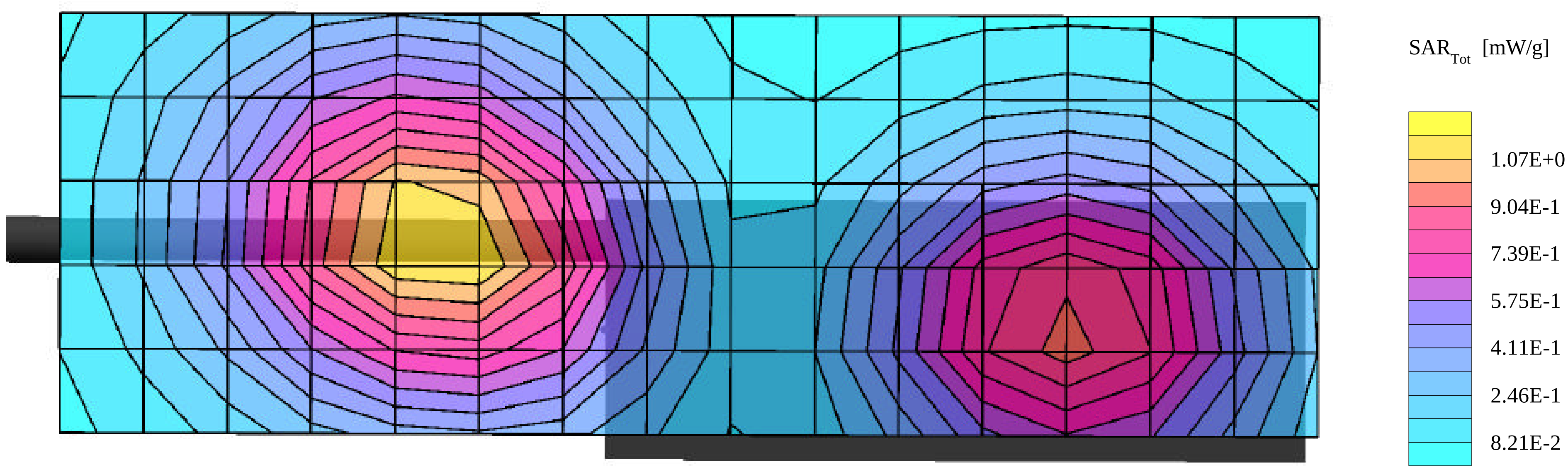
Face SAR at 2.5 cm Separation Distance
Portable FM PTT Radio Transceiver
Antenna #3: Whip (KRE1011223/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 MHz]
Conducted Power: 3.24 Watts
Date Tested: January 18, 2002



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: $\sigma = 0.90$ mho/m $\varepsilon_r = 41.1$ $\rho = 1.00$ g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.10 dB
SAR (1g): 1.09 mW/g, SAR (10g): 0.777 mW/g

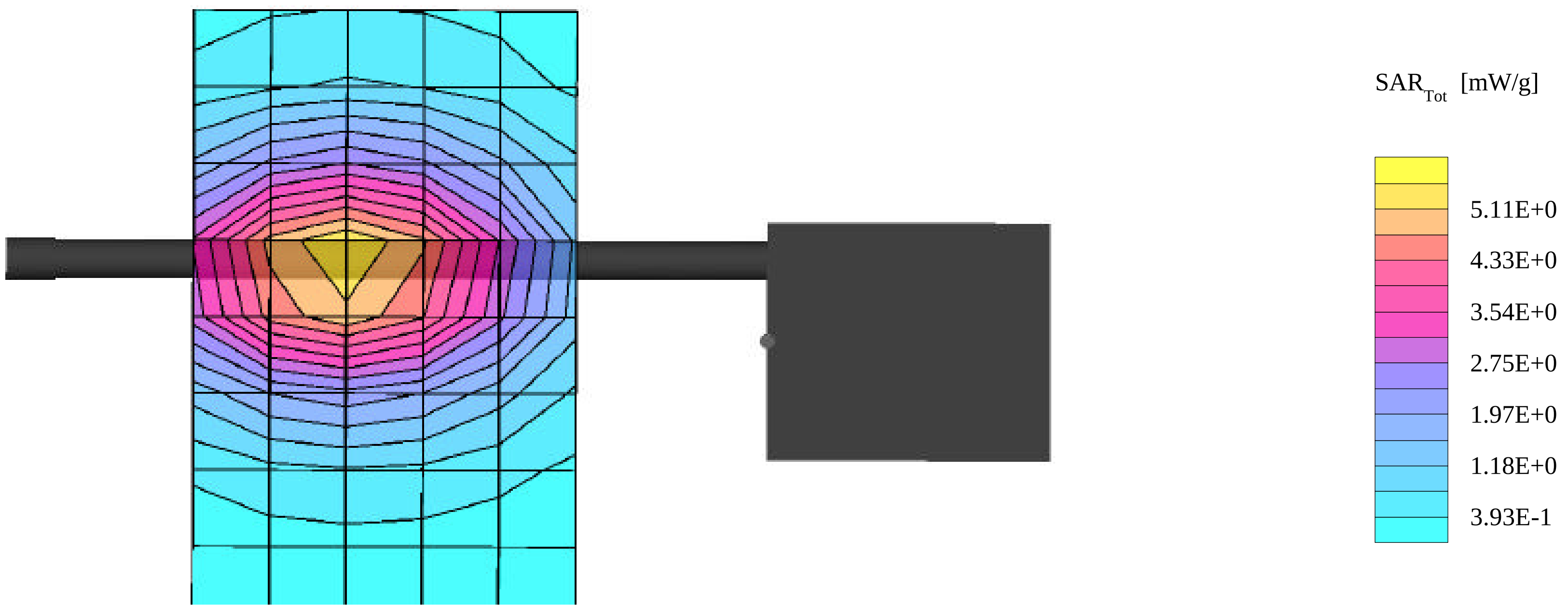
Face SAR at 2.5 cm Separation Distance
Portable FM PTT Radio Transceiver
Antenna #3: Whip (KRE1011223/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
High Band Mid Channel [860.520MHz]
Conducted Power: 3.16 Watts
Date Tested: January 18, 2002



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.10 dB
SAR (1g): 5.46 mW/g, SAR (10g): 3.82 mW/g

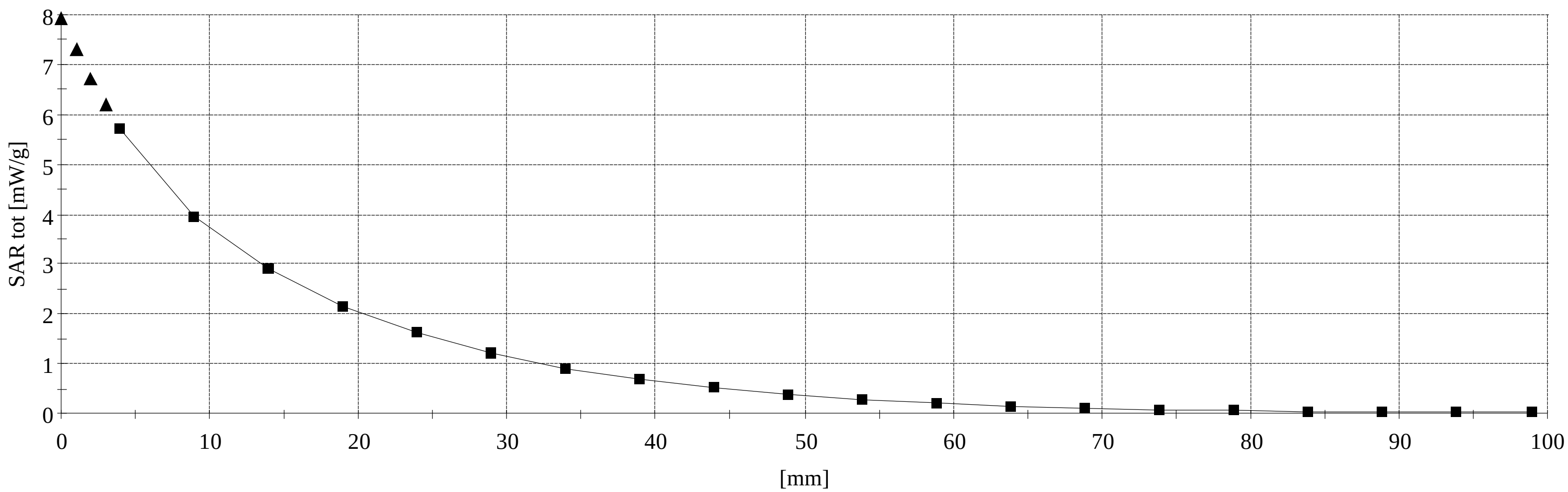
Face SAR at 2.5 cm Separation Distance
Portable FM PTT Radio Transceiver
Speaker Mic Antenna Version Plus (OT-V2-10120)
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 MHz]
Conducted Power: 3.24 Watts
Date Tested: January 18, 2001



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Section; Position:
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm³
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0

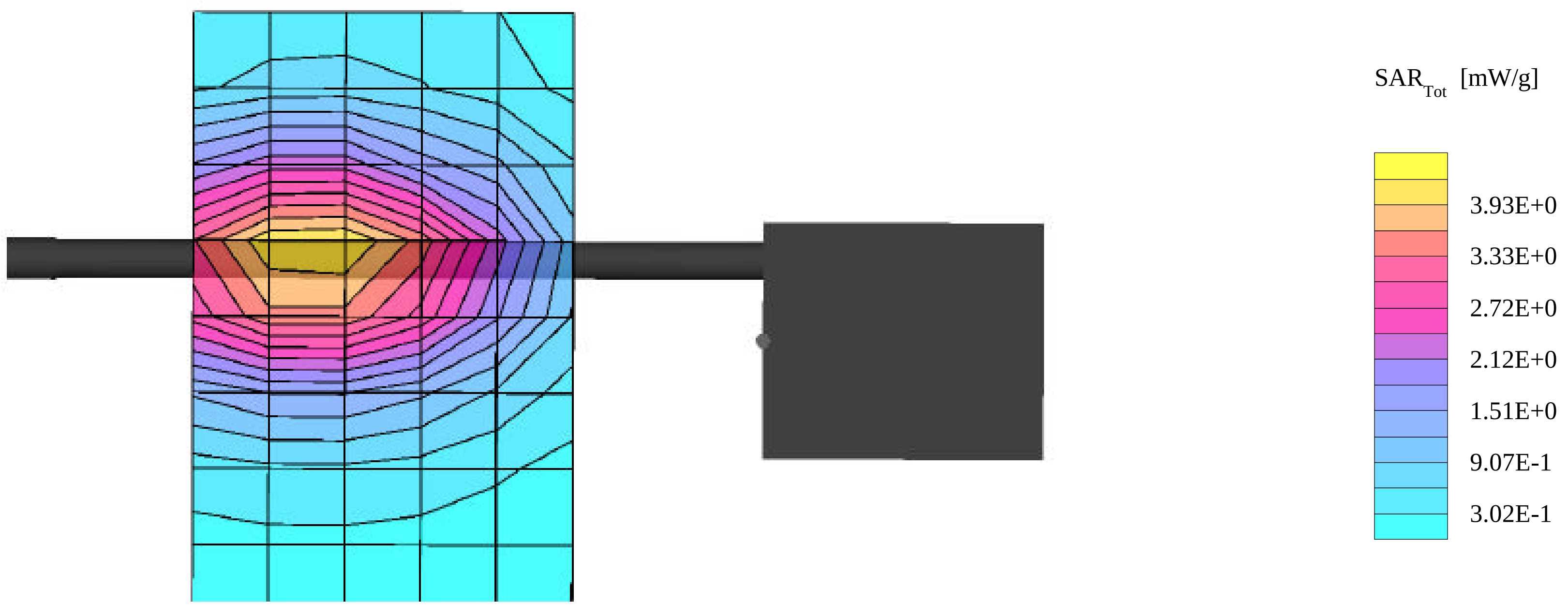
Face SAR at 2.5 cm Separation Distance
Portable FM PTT Radio Transceiver
Speaker Mic Antenna Version Plus (OT-V2-10120)
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 MHz]
Conducted Power: 3.24 Watts
Date Tested: January 18, 2001



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Brain: σ = 0.90 mho/m ε_r = 41.1 ρ = 1.00 g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 3.67 mW/g, SAR (10g): 2.57 mW/g

Face SAR at 2.5 cm Separation Distance
Portable FM PTT Radio Transceiver
Speaker Mic Antenna Version Plus (OT-V2-10120)
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
High Band Mid Channel [860.520 MHz]
Conducted Power: 3.19 Watts
Date Tested: January 18, 2001



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)

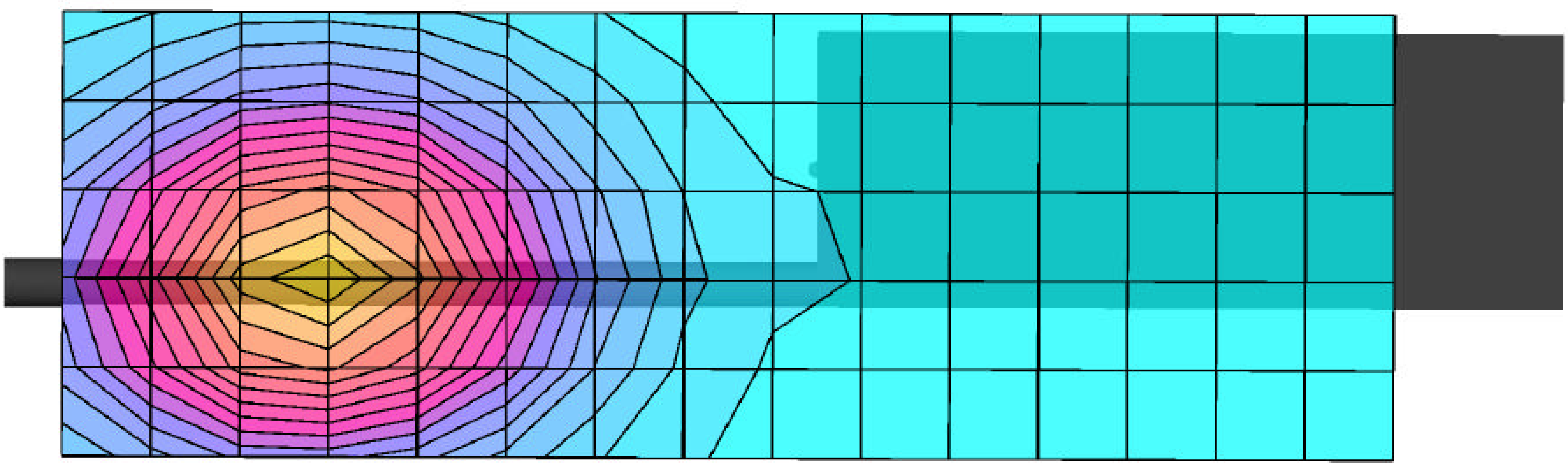
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0

835 MHz Muscle: σ = 0.98 mho/m ε_r = 54.5 ρ = 1.00 g/cm^3

Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

This large area scan is intended to show the peak SAR location relative to the device

Body-Worn SAR - 1.1cm Metal Belt-Clip - FULL AREA SCAN
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Lower Band Mid Channel [815.000 Mhz]
Conducted Power: 3.24 Watts
Date Tested: January 19, 2002



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: σ = 0.98 mho/m ε_r = 54.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift:-0.13 dB
SAR (1g): 11.0 mW/g, SAR (10g): 7.71 mW/g

Body-Worn SAR with 1.1cm Metal Belt-Clip
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 MHz]
Conducted Power: 3.24 Watts
Date Tested: January 19, 2002

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: σ = 0.98 mho/m ε_r = 54.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.17 dB
SAR (1g): 7.21 mW/g, SAR (10g): 5.00 mW/g

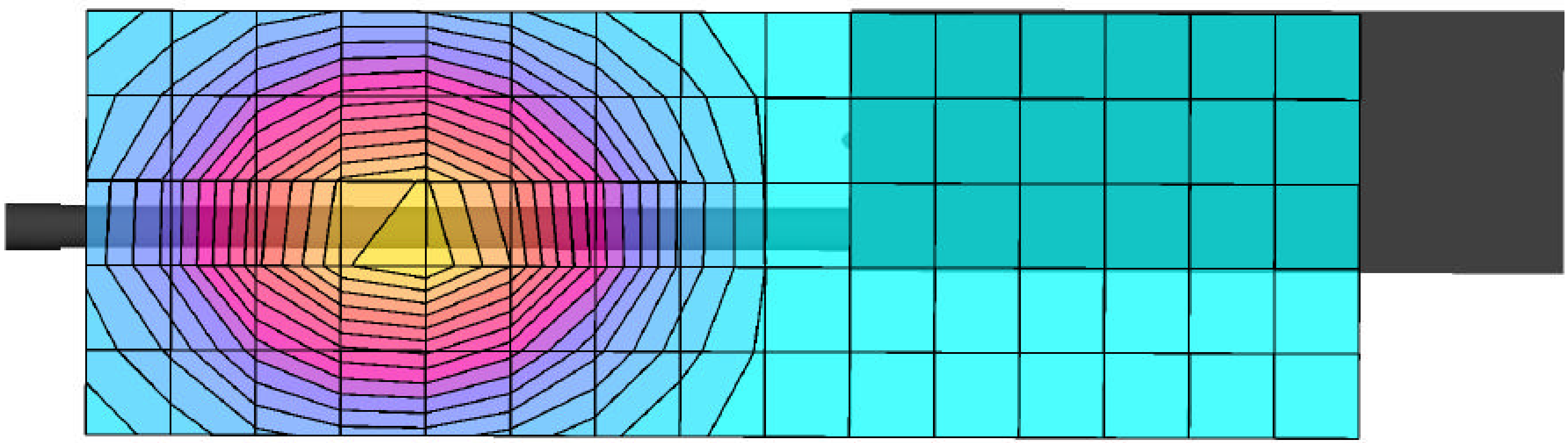
Body-Worn SAR with 1.1cm Metal Belt-Clip
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
High Band Mid Channel (862.520MHz]
Conducted Power: 3.12 Watts
Date Tested: January 19, 2002

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.91,6.91,6.91); Crest factor: 1.0
835 MHz Muscle: $\sigma = 0.98$ mho/m $\varepsilon_r = 54.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

This large area scan is intended to show the peak SAR location relative to the device

Body-Worn SAR - 1.6 cm Nylon T-Strap - FULL AREA SCAN
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Low Channel [806.000 MHz]
Conducted Power: 3.29 Watts
Date Tested: January 19, 2002



M/A-COM FCC ID: OWDTR-0014-E

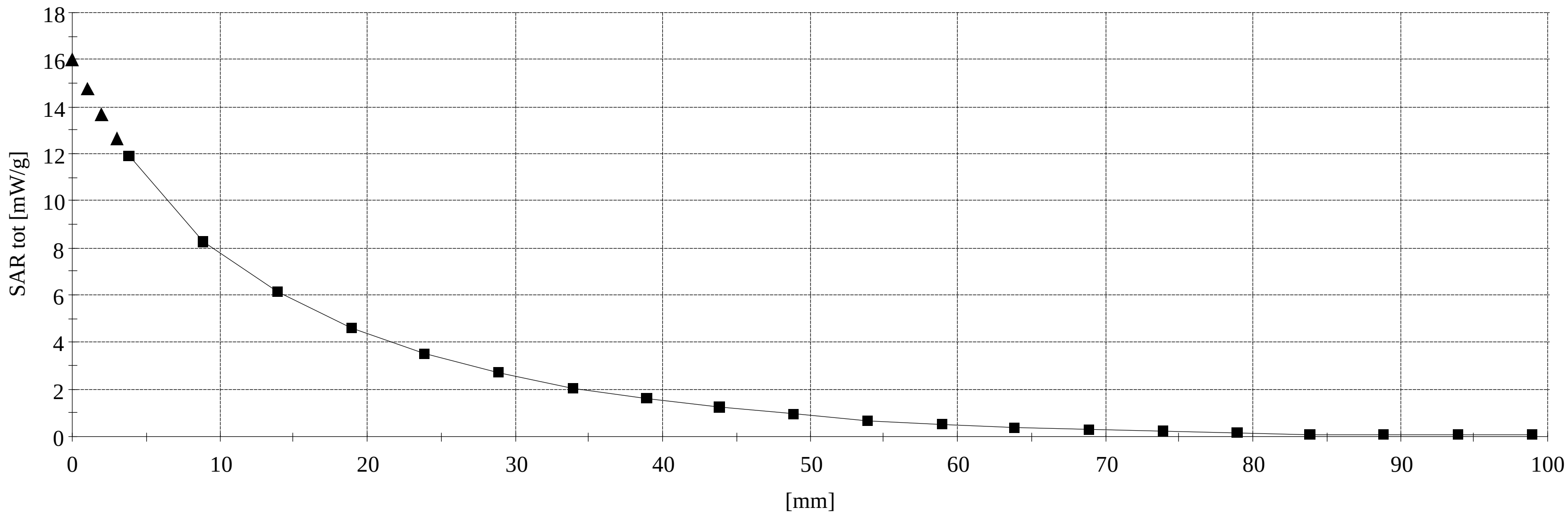
Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: σ = 0.98 mho/m ε_r = 54.5 ρ = 1.00 g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.11 dB
SAR (1g): 11.5 mW/g, SAR (10g): 8.01 mW/g

Body-Worn SAR with 1.6 cm Nylon T-Strap
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Low Channel [806.000 MHz]
Conducted Power: 3.29 Watts
Date Tested: January 19, 2002

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Section; Position:
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: $\sigma = 0.98$ mho/m $\varepsilon_r = 54.5$ $\rho = 1.00$ g/cm³
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0

Body-Worn SAR with 1.6 cm Nylon T-Strap
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Low Channel [806.000 MHz]
Conducted Power: 3.29 Watts
Date Tested: January 19, 2002



M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: σ = 0.98 mho/m ε_r = 54.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.06 dB
SAR (1g): 11.1 mW/g, SAR (10g): 7.77 mW/g

Body-Worn SAR with 1.6 cm Nylon T-Strap
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band Mid Channel [815.000 MHz]
Conducted Power: 3.29 Watts
Date Tested: January 19, 2002

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: $\sigma = 0.98$ mho/m $\varepsilon_r = 54.5$ $\rho = 1.00$ g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.05 dB
SAR (1g): 10.6 mW/g, SAR (10g): 7.45 mW/g

Body-Worn SAR with 1.6 cm Nylon T-Strap
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
Low Band High Channel [823.975 MHz]
Conducted Power: 3.26 Watts
Date Tested: January 19, 2002

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: σ = 0.98 mho/m ε_r = 54.5 ρ = 1.00 g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.08 dB
SAR (1g): 8.78 mW/g, SAR (10g): 6.10 mW/g

Body-Worn SAR with 1.6 cm Nylon T-Strap
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
High Band Low Channel (850.970 MHz]
Conducted Power: 3.12 Watts
Date Tested: January 19, 2002

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: σ = 0.98 mho/m ε_r = 54.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift:-0.10 dB
SAR (1g): 6.92 mW/g, SAR (10g): 4.81 mW/g

Body-Worn SAR with 1.6 cm Nylon T-Strap
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
High Band Mid Channel (860.520 MHz]
Conducted Power: 3.12 Watts
Date Tested: January 19, 2002

M/A-COM FCC ID: OWDTR-0014-E

Small Planar Phantom; Planar Section; Position: (270°,0°)
Probe: ET3DV6 - SN1590; ConvF(6.70,6.70,6.70); Crest factor: 1.0
835 MHz Muscle: σ = 0.98 mho/m ε_r = 54.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.08 dB
SAR (1g): 6.39 mW/g, SAR (10g): 4.43 mW/g

Body-Worn SAR with 1.6 cm Nylon T-Strap
Portable FM PTT Radio Transceiver
Antenna #1: Elevated Feed Gain (KRE1011216/01)
Nickel Cadmium Battery (BKB191210/3)
M/A-Com Model: Jaguar 700P
Continuous Wave Mode
High Band High Channel (868.970 MHz]
Conducted Power: 3.11 Watts
Date Tested: January 19, 2002

APPENDIX B - DIPOLE VALIDATION

Dipole 900 MHz

Small Planar Phantom; Planar Section

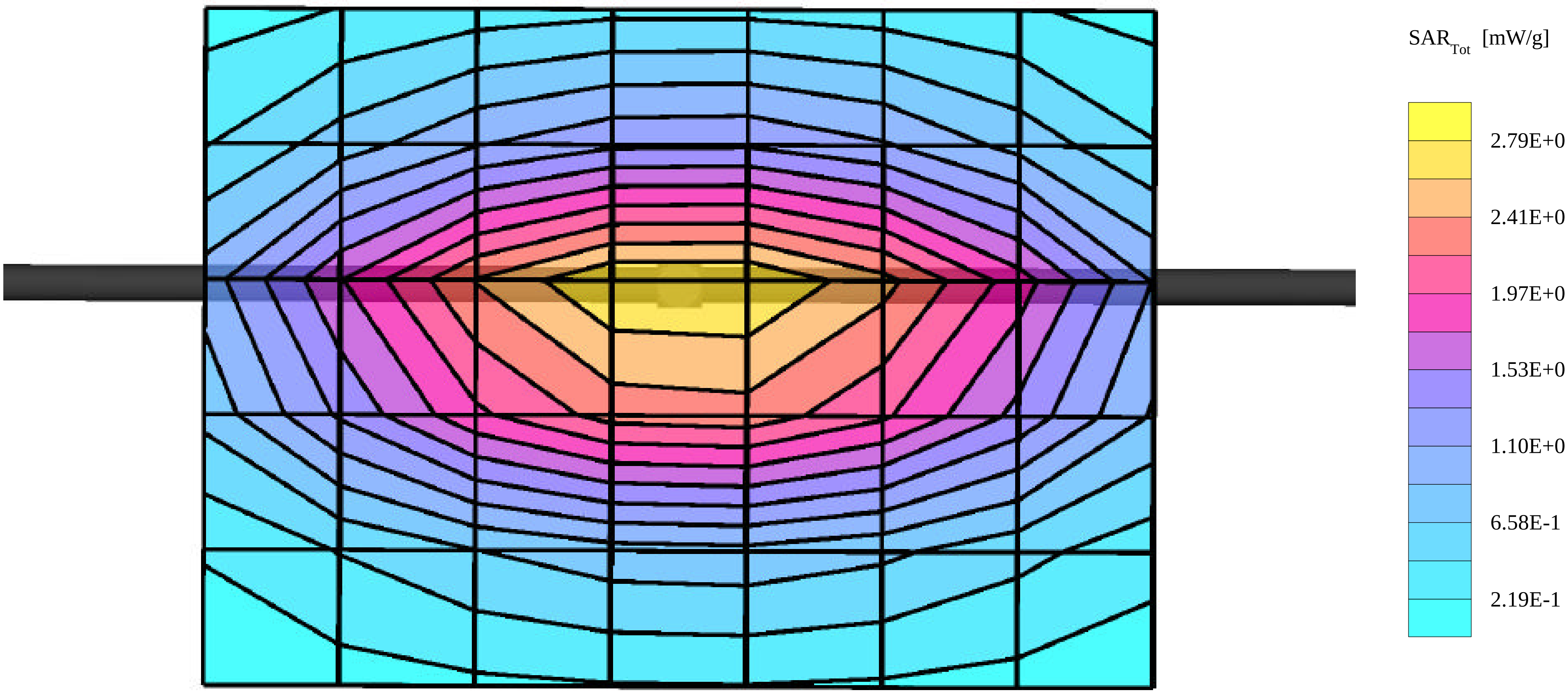
Probe: ET3DV6 - SN1590; ConvF(6.83,6.83,6.83); Crest factor: 1.0; 900 MHz Brain: σ = 0.96 mho/m ε_r = 40.4 ρ = 1.00 g/cm³

Cube 5x5x7: Peak: 4.51 mW/g, SAR (1g): 2.77 mW/g, SAR (10g): 1.71 mW/g, (Worst-case extrapolation)

Penetration depth: 11.4 (10.3, 12.8) [mm]

Powerdrift: 0.01 dB

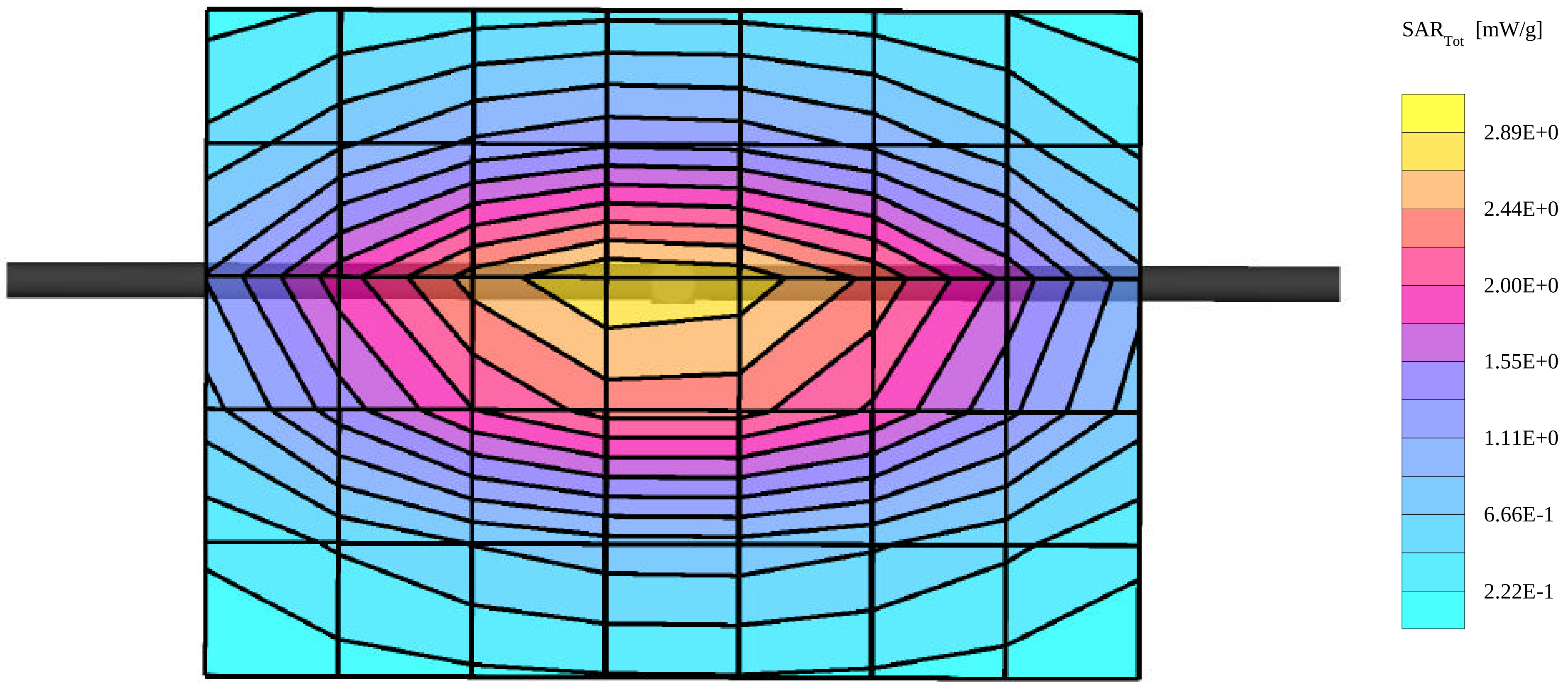
Date Tested: January 18, 2002



Dipole 900 MHz

Small Planar Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(6.83,6.83,6.83); Crest factor: 1.0; 900 MHz Brain: σ = 0.97 mho/m ε_r = 41.4 ρ = 1.00 g/cm^3
Cube 5x5x7: Peak: 4.51 mW/g, SAR (1g): 2.79 mW/g, SAR (10g): 1.76 mW/g, (Worst-case extrapolation)
Penetration depth: 11.4 (10.3, 12.8) [mm]
Powerdrift: -0.02 dB

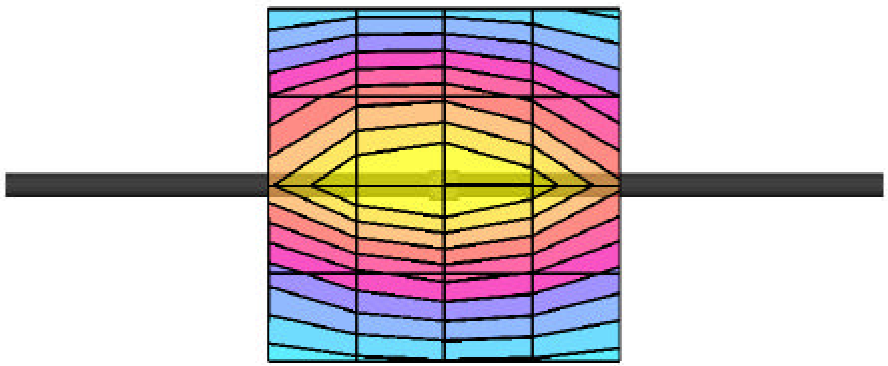
Date Tested: January 19, 2002

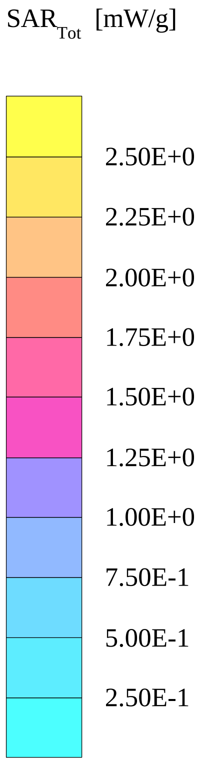


APPENDIX C - DIPOLE CALIBRATION

Validation Dipole D900V2 SN:054, d = 15 mm

Frequency: 900 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(6.27,6.27,6.27); Crest factor: 1.0; IEEE1528 900 MHz: σ = 0.97 mho/m ε_r = 42.4 ρ = 1.00 g/cm³
Cubes (2): Peak: 4.47 mW/g ± 0.05 dB, SAR (1g): 2.78 mW/g ± 0.04 dB, SAR (10g): 1.76 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 11.5 (10.3, 13.2) [mm]
Powerdrift: -0.00 dB





APPENDIX D - PROBE CALIBRATION

Probe ET3DV6

SN:1590

Manufactured:	March 19, 2001
Calibrated:	March 26, 2001

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1590

Sensitivity in Free Space

NormX	**1.77**	$\mu V/(V/m)^2$
NormY	**1.91**	$\mu V/(V/m)^2$
NormZ	**1.67**	$\mu V/(V/m)^2$

Diode Compression

DCP X	**100**	mV
DCP Y	**100**	mV
DCP Z	**100**	mV

Sensitivity in Tissue Simulating Liquid

Head **450 MHz** e_r **= 43.5 ± 5%** s **= 0.87 ± 10% mho/m**

ConvF X	**7.36**	extrapolated	Boundary effect:	
ConvF Y	**7.36**	extrapolated	Alpha	**0.29**
ConvF Z	**7.36**	extrapolated	Depth	**2.72**

Head **900 MHz** e_r **= 42 ± 5%** s **= 0.97 ± 10% mho/m**

ConvF X	**6.83**	± 7% (k=2)	Boundary effect:	
ConvF Y	**6.83**	± 7% (k=2)	Alpha	**0.37**
ConvF Z	**6.83**	± 7% (k=2)	Depth	**2.48**

Head **1500 MHz** e_r **= 40.4 ± 5%** s **= 1.23 ± 10% mho/m**

ConvF X	**6.13**	interpolated	Boundary effect:	
ConvF Y	**6.13**	interpolated	Alpha	**0.47**
ConvF Z	**6.13**	interpolated	Depth	**2.17**

Head **1800 MHz** e_r **= 40 ± 5%** s **= 1.40 ± 10% mho/m**

ConvF X	**5.78**	± 7% (k=2)	Boundary effect:	
ConvF Y	**5.78**	± 7% (k=2)	Alpha	**0.53**
ConvF Z	**5.78**	± 7% (k=2)	Depth	**2.01**

Sensor Offset

Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.2 ± 0.2**	mm

DASY3 - Parameters of Probe: ET3DV6 SN: 1590

Body **450 MHz** e_r **= 56.7 ± 5%** σ **= 0.94 ± 10% mho/m**

ConvF X	**7.23**	extrapolated
ConvF Y	**7.23**	extrapolated
ConvF Z	**7.23**	extrapolated

Body **900 MHz** e_r **= 55.0 ± 5%** σ **= 1.05 ± 10% mho/m**

ConvF X	**6.61**	± 7% (k=2)
ConvF Y	**6.61**	± 7% (k=2)
ConvF Z	**6.61**	± 7% (k=2)

Body **1500 MHz** e_r **= 54.0 ± 5%** σ **= 1.30 ± 10% mho/m**

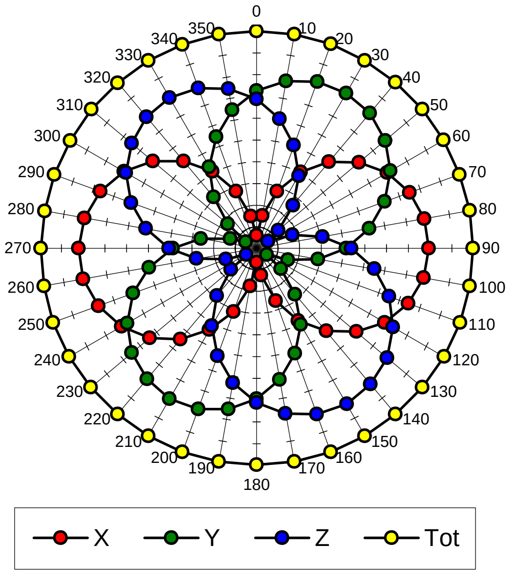
ConvF X	**5.78**	interpolated
ConvF Y	**5.78**	interpolated
ConvF Z	**5.78**	interpolated

Body **1800 MHz** e_r **= 53.3 ± 5%** σ **= 1.52 ± 10% mho/m**

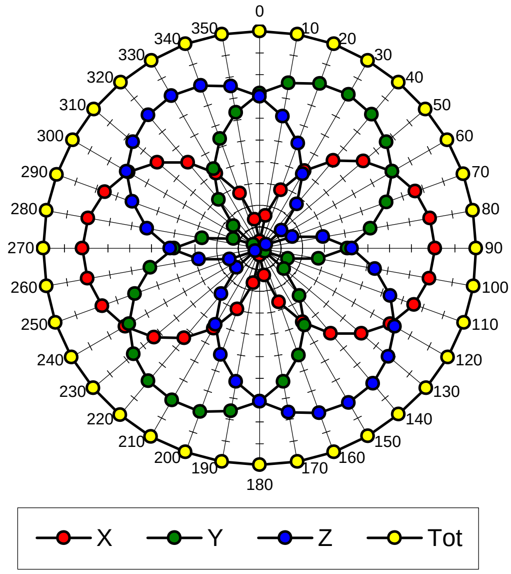
ConvF X	**5.36**	± 7% (k=2)
ConvF Y	**5.36**	± 7% (k=2)
ConvF Z	**5.36**	± 7% (k=2)

Receiving Pattern (f) , q = 0°

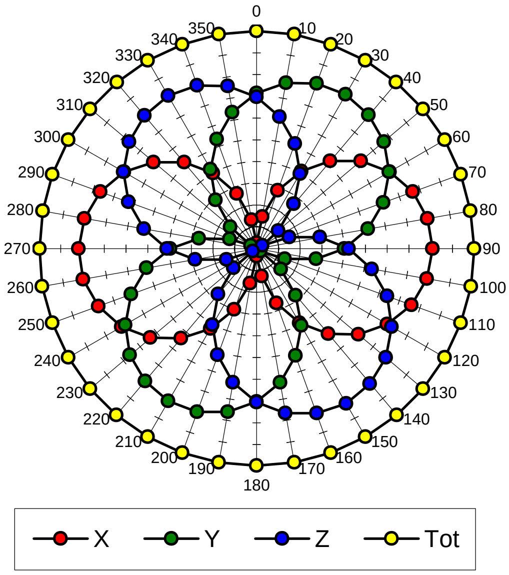
f = 30 MHz, TEM cell ifi110



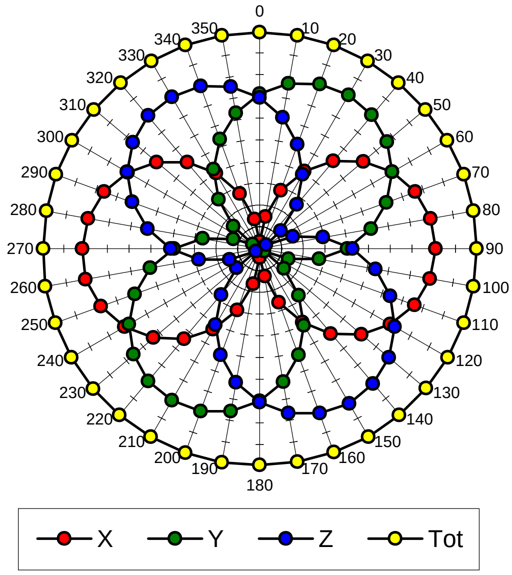
f = 100 MHz, TEM cell ifi110

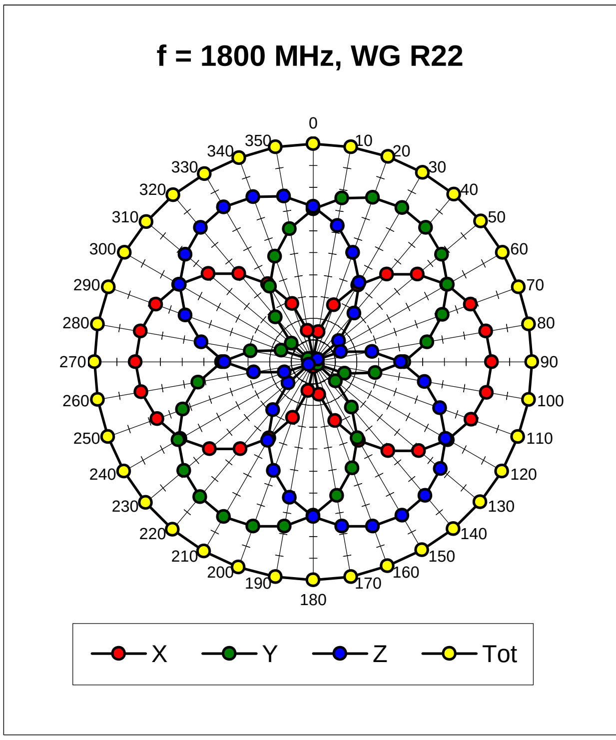


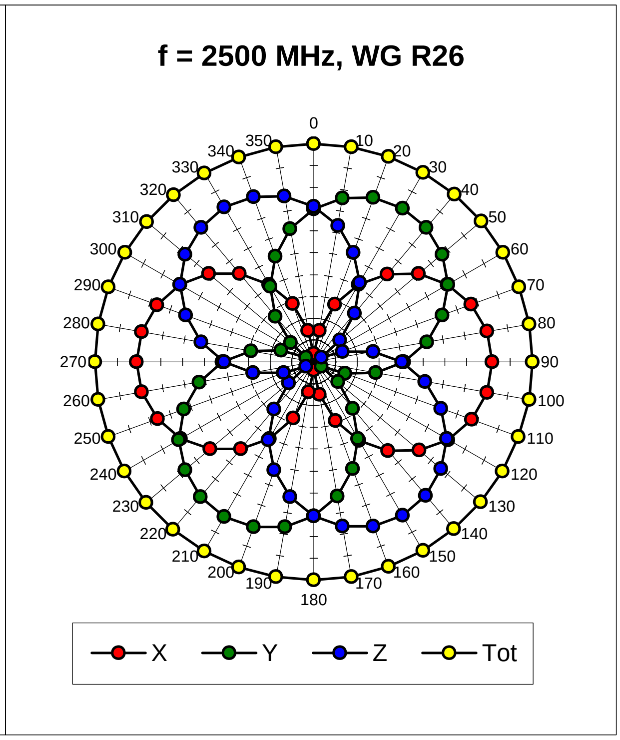
f = 300 MHz, TEM cell ifi110



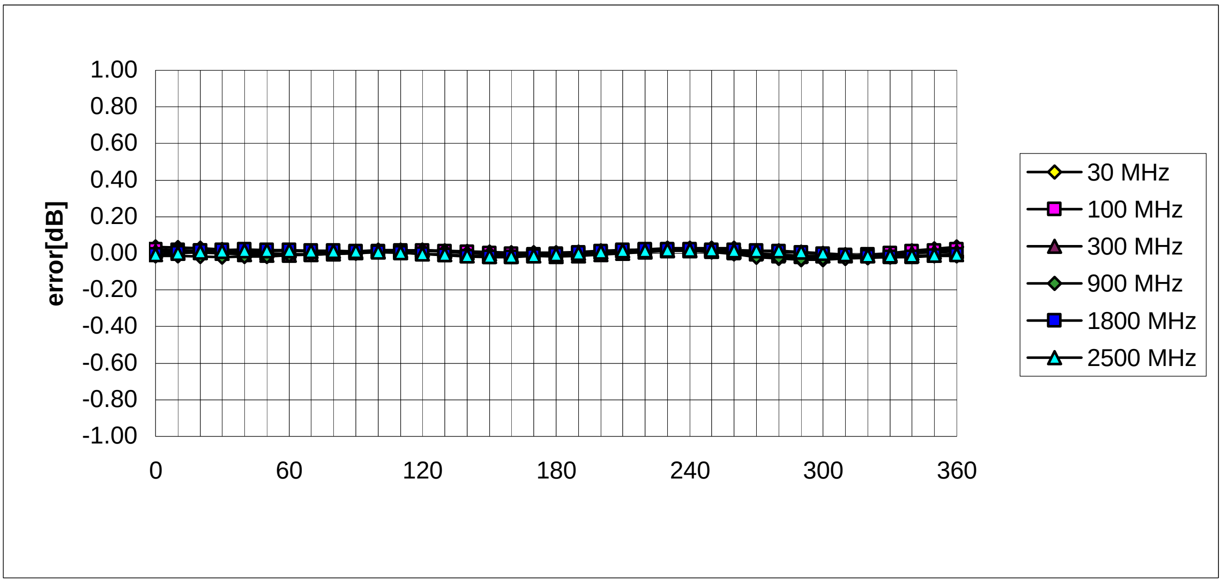
f = 900 MHz, TEM cell ifi110





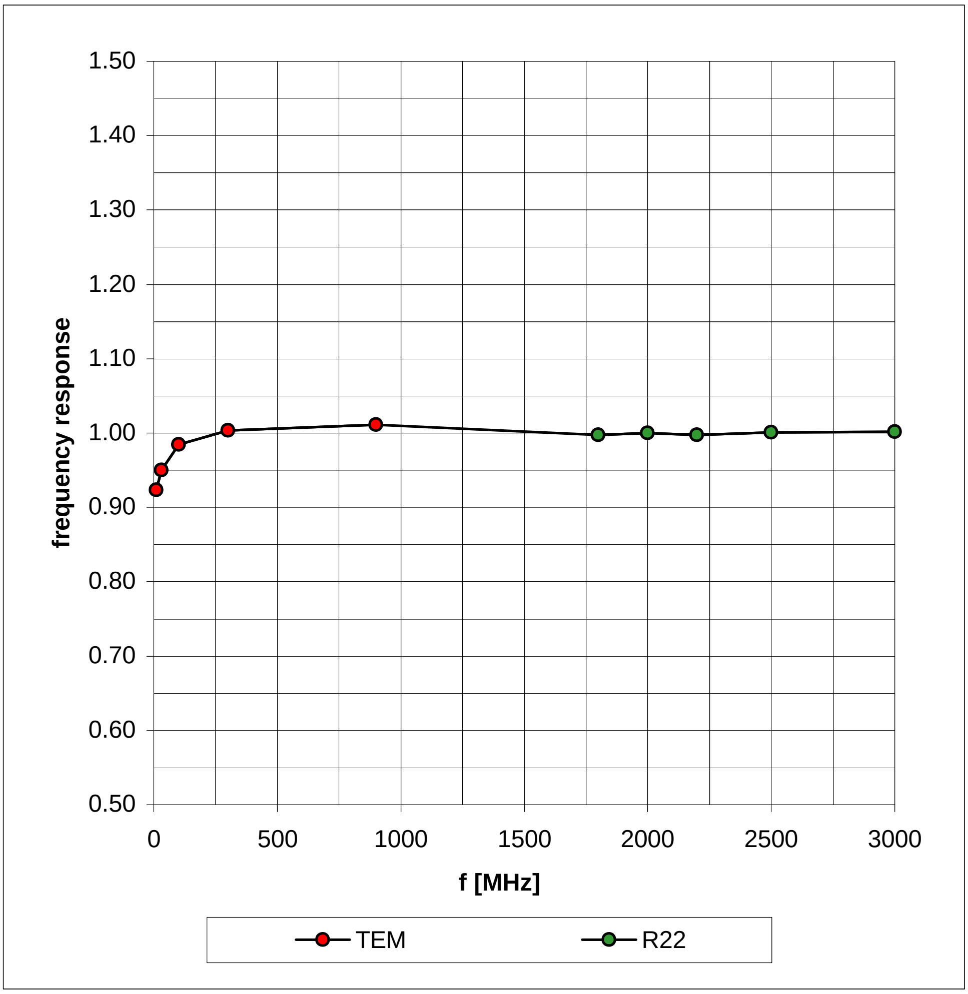


Isotropy Error (f), q = 0°



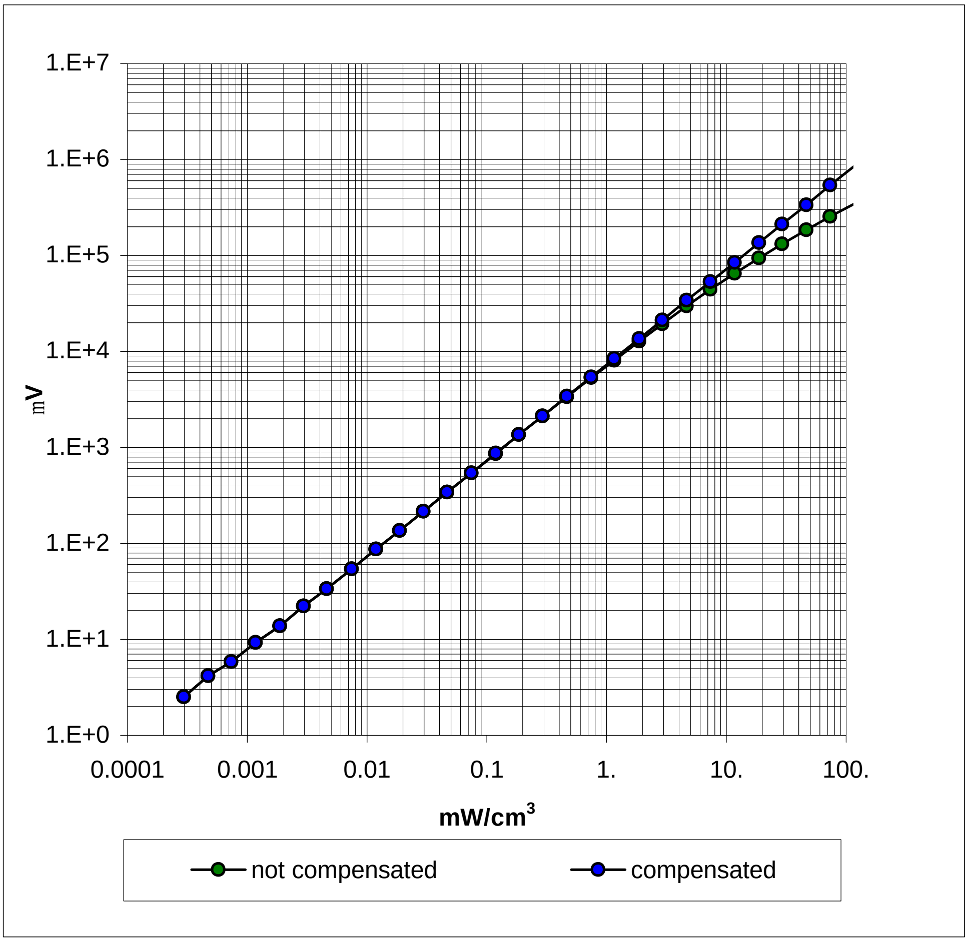
Frequency Response of E-Field

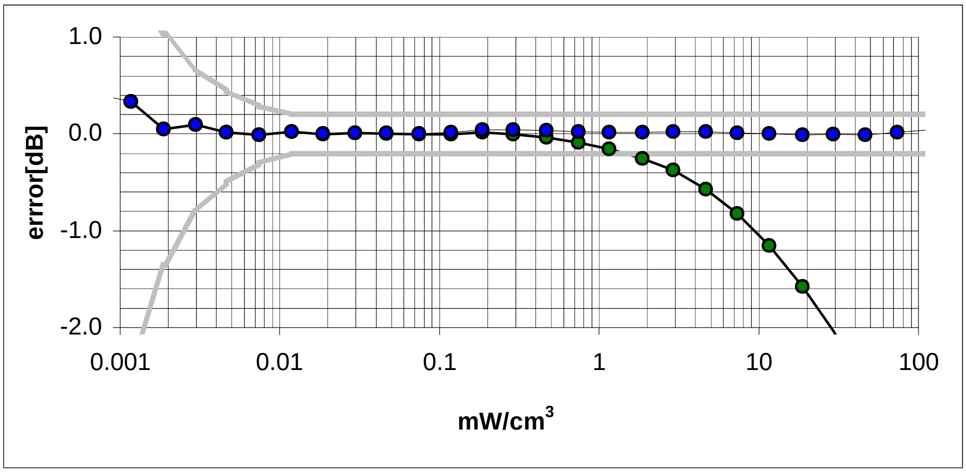
(TEM-Cell:ifi110, Waveguide R22)



Dynamic Range f(SAR_{brain})

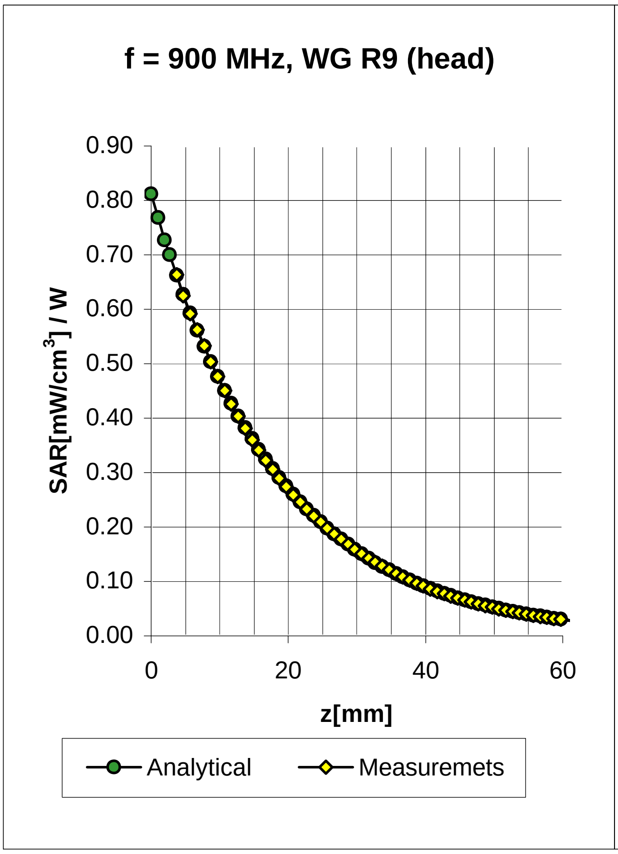
(TEM-Cell:ifi110)

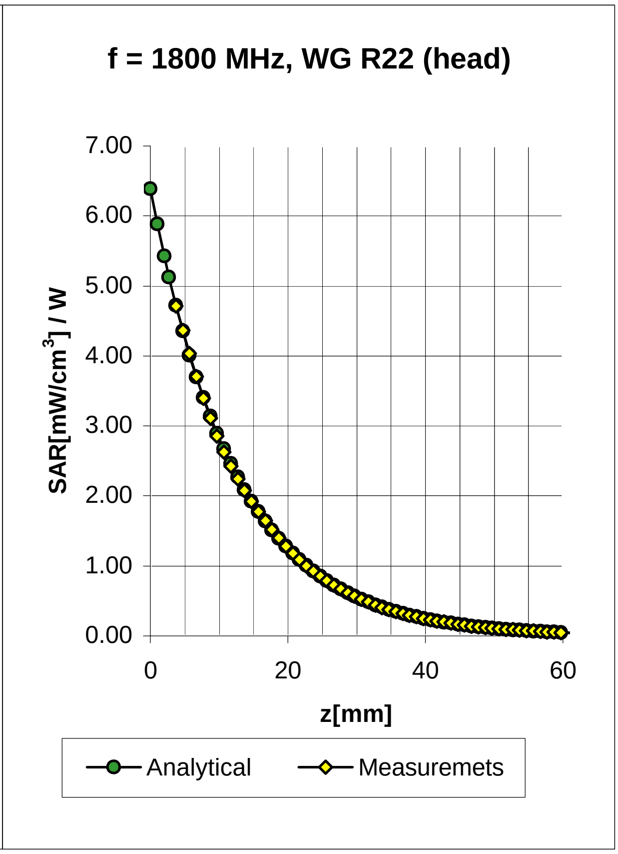




ET3DV6 SN:1590

Conversion Factor Assessment

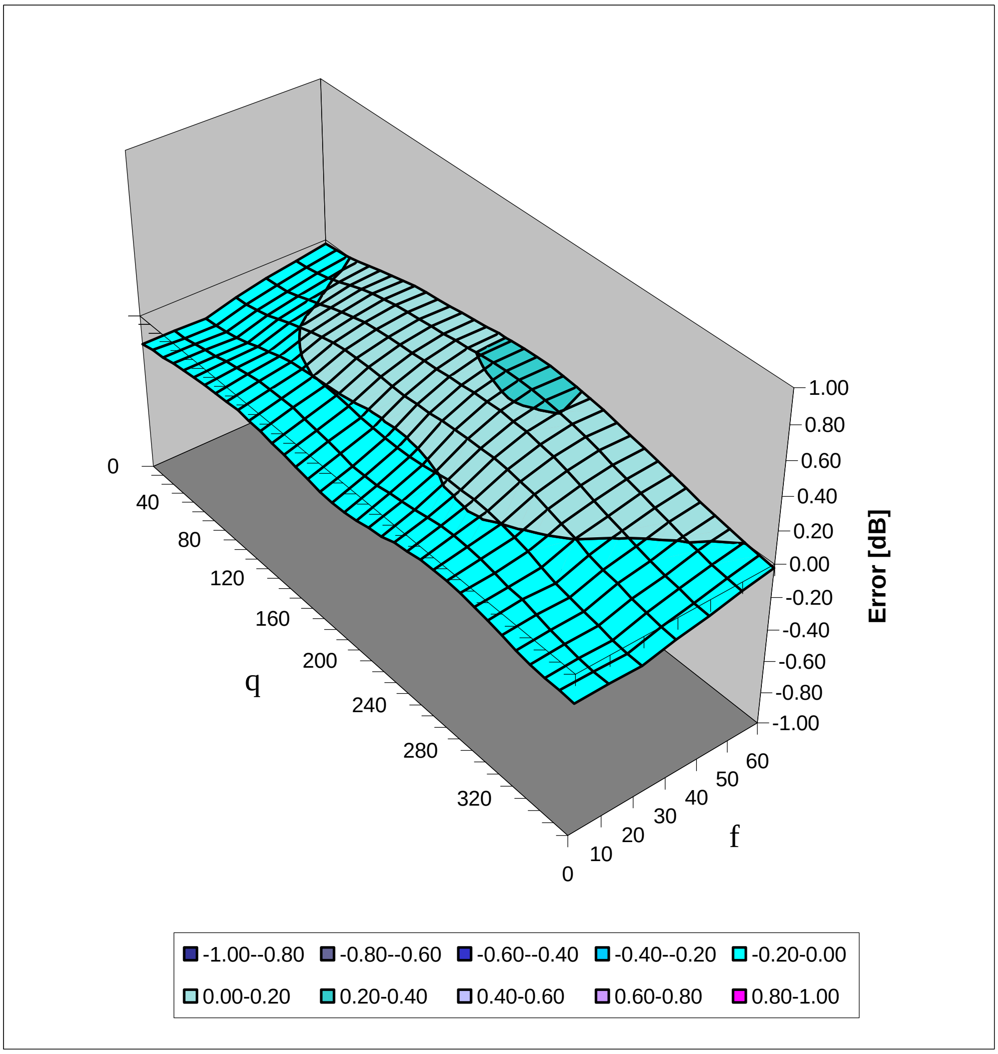




ET3DV6 SN:1590

Deviation from Isotropy in HSL

Error (q,f), f = 900 MHz



APPENDIX E - MEASURED LIQUID DIELECTRIC PARAMETERS

900 MHz Validation & 835 MHz Evaluation

Measured Liquid Dielectric Parameters (Head)

January 18, 2002

Frequency	e'	e''
800.000000 MHz	41.5792	19.5510
805.000000 MHz	41.4870	19.5255
810.000000 MHz	41.4458	19.5246
815.000000 MHz	41.3733	19.5039
820.000000 MHz	41.3262	19.4973
825.000000 MHz	41.2365	19.4801
830.000000 MHz	41.1726	19.4691
835.000000 MHz	41.0831	19.4579
840.000000 MHz	41.0752	19.3936
845.000000 MHz	40.9605	19.3776
850.000000 MHz	40.8830	19.3215
855.000000 MHz	40.8349	19.2999
860.000000 MHz	40.7838	19.2678
865.000000 MHz	40.7187	19.2397
870.000000 MHz	40.6638	19.2105
875.000000 MHz	40.6112	19.2002
880.000000 MHz	40.5594	19.1899
885.000000 MHz	40.4980	19.2127
890.000000 MHz	40.4637	19.1876
895.000000 MHz	40.4286	19.1234
900.000000 MHz	40.3636	19.1081
905.000000 MHz	40.3159	19.0979
910.000000 MHz	40.2851	19.0927
915.000000 MHz	40.2052	19.0679
920.000000 MHz	40.1419	19.0630
925.000000 MHz	40.1049	19.0457
930.000000 MHz	40.0380	19.0231
935.000000 MHz	39.9624	19.0323
940.000000 MHz	39.9000	19.0185
945.000000 MHz	39.8498	19.0109
950.000000 MHz	39.7917	19.0059
955.000000 MHz	39.7119	18.9889
960.000000 MHz	39.6657	18.9714
965.000000 MHz	39.6058	18.9678
970.000000 MHz	39.5680	18.9575

900 MHz Validation

Measured Liquid Dielectric Parameters (Head)

January 19, 2002

Frequency	e'	e''
800.000000 MHz	42.4780	19.8347
805.000000 MHz	42.4295	19.8253
810.000000 MHz	42.3836	19.7829
815.000000 MHz	42.3199	19.7514
820.000000 MHz	42.2735	19.7208
825.000000 MHz	42.1912	19.7014
830.000000 MHz	42.1459	19.6772
835.000000 MHz	42.1357	19.6381
840.000000 MHz	42.0056	19.6246
845.000000 MHz	41.9819	19.6183
850.000000 MHz	41.9506	19.5931
855.000000 MHz	41.9265	19.5801
860.000000 MHz	41.8634	19.5672
865.000000 MHz	41.8067	19.5633
870.000000 MHz	41.7444	19.5715
875.000000 MHz	41.6654	19.5542
880.000000 MHz	41.6276	19.5353
885.000000 MHz	41.5644	19.5245
890.000000 MHz	41.5134	19.5097
895.000000 MHz	41.5090	19.4987
900.000000 MHz	41.4201	19.4790
905.000000 MHz	41.3664	19.4613
910.000000 MHz	41.3131	19.4585
915.000000 MHz	41.2628	19.4305
920.000000 MHz	41.1905	19.4242
925.000000 MHz	41.1486	19.4186
930.000000 MHz	41.0922	19.3789
935.000000 MHz	41.0162	19.3361
940.000000 MHz	40.9459	19.3401
945.000000 MHz	40.8827	19.3326
950.000000 MHz	40.8203	19.3251
955.000000 MHz	40.7620	19.2977
960.000000 MHz	40.7075	19.2647
965.000000 MHz	40.6388	19.2742
970.000000 MHz	40.5937	19.2811

835 MHz Evaluation

Measured Liquid Dielectric Parameters (Body)

January 19, 2002

Frequency	e'	e''
800.000000 MHz	54.8636	21.3040
805.000000 MHz	54.8378	21.3078
810.000000 MHz	54.7607	21.2450
815.000000 MHz	54.7246	21.2301
820.000000 MHz	54.6661	21.2122
825.000000 MHz	54.6028	21.1630
830.000000 MHz	54.5385	21.1535
835.000000 MHz	54.4786	21.0929
840.000000 MHz	54.4679	21.1028
845.000000 MHz	54.3978	21.0688
850.000000 MHz	54.3230	21.0480
855.000000 MHz	54.2874	21.0128
860.000000 MHz	54.2373	20.9942
865.000000 MHz	54.1788	20.9791
870.000000 MHz	54.1285	20.9826
875.000000 MHz	54.1071	20.9749
880.000000 MHz	54.0623	20.9869
885.000000 MHz	54.0058	20.9929
890.000000 MHz	53.9777	20.9878
895.000000 MHz	53.9554	20.9280
900.000000 MHz	53.8937	20.8997
905.000000 MHz	53.8321	20.8823
910.000000 MHz	53.7706	20.8755
915.000000 MHz	53.7324	20.8596
920.000000 MHz	53.6765	20.8356
925.000000 MHz	53.6453	20.8326
930.000000 MHz	53.6079	20.8119
935.000000 MHz	53.5466	20.7806
940.000000 MHz	53.5005	20.7841
945.000000 MHz	53.4446	20.7614
950.000000 MHz	53.3745	20.7752
955.000000 MHz	53.3291	20.7487
960.000000 MHz	53.2732	20.7069
965.000000 MHz	53.2189	20.7147
970.000000 MHz	53.1902	20.7218