CERTIFICATE OF COMPLIANCE
SAR EVALUATION

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Applicant Information:

CISCO SYSTEMS INC.
3875 Embassy Parkway, Suite 350
Akron, OH 44333
Attn: Jim Nicholson

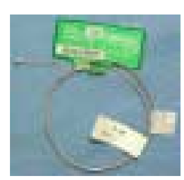
FCC ID:	**LDK102042**
Model(s):	**AIR-MPI352**
Equipment Type:	**2.4GHz Wireless LAN Mini-PCI Card**
Equipment Classification:	**Part 15 Spread Spectrum Transmitter (DSS)**
Modulation:	**Direct Sequence Spread Spectrum (DSSS)**
Tx Frequency Range:	**2412 - 2462 MHz**
Max. Output Power Tested:	**20.4 dBm (Conducted)**
Antenna Type(s):	**1. Murata Chip Antenna; 2. Dell Inverted F Antenna; 3. Toshiba Inverted F Antenna; 4. Dell Dipole Diversity Antenna**
FCC Rule Part(s):	**15.247, 2.1093; ET Docket 96.326**
IC Rule Part(s):	**RSS-210 Issue 4, RSS-102 Issue 1**

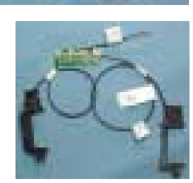
This wireless mobile and/or portable device has been shown to be compliant for localized Specific Absorption Rate (SAR) for uncontrolled environment/general exposure limits specified in ANSI/IEEE Std. C95.1-1992 and has been tested in accordance with the measurement procedures specified in ANSI/IEEE Std. C95.3-1999.

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.

Celltech Research Inc. certifies that no party to this application has been denied FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

Shawn McMillen
General Manager
Celltech Research Inc.



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1.0 INTRODUCTION

This measurement report shows compliance of the CISCO SYSTEMS INC. AIR-MPI352 2.4GHz Direct Sequence Spread Spectrum Wireless LAN Mini-PCI Card FCC ID: LDK102042 (with 4 alternate antennas) with FCC Part 2.1093, ET Docket 96-326 Rules and RSS-102 Issue 1 of Industry Canada for mobile and portable devices. The test procedures, as described in American National Standards Institute C95.1-1992 (1), FCC OET Bulletin 65-1997 were employed. A description of the product and 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)

EUT Type	Wireless LAN Mini-PCI Card	**FCC ID**	LDK102042
FCC Equipment Class	Part 15 Spread Spectrum Transmitter (DSS)	**Model No.(s)**	AIR-MPI352
FCC Rule Part	15.247, 2.1093; ET Docket 96.326	**Modulation**	Direct Sequence Spread Spectrum
IC Device Class	Low Power License-Exempt Radio Communication Device	**Tx Frequency Range (MHz)**	2412 - 2462
IC Rule Part	RSS-210 Issue 4 RSS-102 Issue 1	**Max. RF Output Power Tested**	20.4 dBm (Conducted)
Antenna Type(s)	1. Murata Chip 2. Dell Inverted F 3. Toshiba Inverted F 4. Dell Dipole Diversity	**Power Supply**	from host PC

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, and the generic twin phantom containing brain or muscle equivalent material. 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 electronics (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

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.

Body SAR Measurement Results

Freq. (MHz)	Chan.	Mode Tested	Conducted Power (dBm)	Antenna Type	Phantom Section	Separation Distance (cm)	SAR (w/kg)
2412	Low	CW	19.4	Murata Chip	Flat	0.0	0.245
2437	Mid	CW	20.4	Murata Chip	Flat	0.0	0.276
2462	High	CW	18.4	Murata Chip	Flat	0.0	0.281
2412	Low	CW	19.4	Dell Inverted F	Flat	0.0	0.183
2437	Mid	CW	20.4	Dell Inverted F	Flat	0.0	0.110
2462	High	CW	18.4	Dell Inverted F	Flat	0.0	0.0780
2412	Low	CW	19.4	Toshiba Inverted F	Flat	0.0	0.196
2437	Mid	CW	20.4	Toshiba Inverted F	Flat	0.0	0.155
2462	High	CW	18.4	Toshiba Inverted F	Flat	0.0	0.119
2412	Low	CW	19.4	Dell Dipole Diversity	Flat	0.0	0.0686
2437	Mid	CW	20.4	Dell Dipole Diversity	Flat	0.0	0.0886
2462	High	CW	18.4	Dell Dipole Diversity	Flat	0.0	0.0914
Mixture Type: Muscle **Dielectric Constant: 53.6** **Conductivity: 1.77**			**ANSI / IEEE C95.1 1992 - SAFETY LIMIT** **Spatial Peak Uncontrolled Exposure/General Population** **Body SAR: 1.6 W/kg (averaged over 1 gram)**				

Notes:

1. The SAR levels found were below the maximum limit of 1.6 w/kg.
2. The highest SAR level found was 0.281 w/kg (with Murata chip antenna).
3. The EUT was tested for body SAR with the antenna touching the outer surface of the planar phantom.

5.0 DETAILS OF SAR EVALUATION

The CISCO SYSTEMS INC. Model: AIR-MPI352 2.4GHz Direct Sequence Spread Spectrum Wireless LAN Mini-PCI Card FCC ID: LDK102042 (with 4 alternate antennas) was found to be compliant for localized Specific Absorption Rate (SAR) based on the following test provisions and conditions:

1. The EUT was installed in the PCI slot of the host mini-tower PC with the case cover off and placed below the phantom. The EUT was tested for body SAR with each antenna placed parallel to, and touching, the outer surface of the planar phantom.
2. SAR measurements were evaluated 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 for each channel were checked before and after each test.
3. The device was operated continuously in the transmit mode for the duration of the test.
4. The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the device and its antenna.
5. The EUT was tested in the host PC with AC power.

6.0 EVALUATION PROCEDURES

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

a. (i) The evaluation was performed in an 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 center frequency of the band at maximum power. The ear position that produced the highest SAR determined which side of the phantom would be used for the entire evaluation. FCC OET Bulletin 65 Supplement C dictated the positioning of the ear-held device relative to the phantom.

(ii) For face-held and body-worn devices, or devices which can be operated within 20cm of the body, the planar section of the phantom was used. The type of device being evaluated dictated the distance of the EUT to the outer surface of the planar phantom.

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. For frequencies below 500MHz a 4x4x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. For frequencies above 500MHz a 5x5x7 matrix was performed. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.

d. If the EUT had any appreciable drift over the course of the evaluation, then the EUT was re-evaluated. Any unusual anomalies over the course of the test also warranted a re-evaluation.

7.0 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.

8.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified in the planar region of the phantom. For devices operating below 1GHz, an 835MHz or 900MHz dipole was used, depending on the operating frequency of the EUT. For devices operating above 1GHz, an 1800MHz dipole was used. A forward power of 250mW was applied to the dipole and the system was verified to a tolerance of ±3%. The applicable verification(s) is/are as follows (see Appendix B for validation test plot):

Dipole Validation Kit	**Target SAR 1g (w/kg)**	**Measured SAR 1g (w/kg)**	
D1800V2	9.32	9.57 (05/10/01)	9.59 (05/11/01)

9.0 SIMULATED TISSUES

The 2400MHz muscle mixture consists of Glycol-monobutyl, water, and salt. The fluid was prepared in accordance with standardized procedures, and measured for dielectric parameters (permitivity and conductivity) of the tissue. Prior to the evaluation, a dipole validation was performed using 1800MHz brain mixture.

INGREDIENT	**MIXTURE (%)**
	2400MHz Muscle
Water	69.91
Glycol Monobutyl	29.96
Salt	0.13

2400MHz Muscle Mixture

INGREDIENT	**MIXTURE (%)**
	1800MHz Brain (Validation)
Water	45.0
Sugar	53.9
Salt	0.0
HEC	0.1
Bactericide	1.0

1800MHz Brain (Validation) Mixture

10.0 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 as follows:

Frequency	**Equivalent Tissue**	**Dielectric Constant ε_r**	**Conductivity σ (mho/m)**	**ρ (Kg/m^3)**
1800MHz (Validation)	Brain	41.2 ± 5%	1.68 ± 10%	1000
2400MHz	Muscle	53.6 ± 5%	1.77 ± 10%	1000

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)

Phantom

Phantom:	Generic Twin
Shell Material:	Fiberglass
Thickness:	2.0 ± 0.1 mm

12.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
EQUIPMENT	***SERIAL NO.***	***CALIBRATION DATE***
DASY3 System -Robot -ET3DV6 E-Field Probe -DAE -835MHz Validation Dipole -900MHz Validation Dipole -1800MHz Validation Dipole -Generic Twin Phantom V3.0	 599396-01 1387 383 411 054 247 N/A	 N/A Sept 1999 Sept 1999 Aug 1999 Aug 1999 Aug 1999 N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Oct 1999 Oct 1999 Oct 1999
E4408B Spectrum Analyzer	US39240170	Nov 1999
8594E Spectrum Analyzer	3543A02721	Mar 2000
8753E Network Analyzer	US38433013	Nov 1999
8648D Signal Generator	3847A00611	N/A
5S1G4 Amplifier Research Power Amplifier	26235	N/A

13.0 MEASUREMENT UNCERTAINTIES

Uncertainty Description	Error	Distribution	Weight	Standard Deviation	Offset
Probe Uncertainty					
Axial isotropy	±0.2 dB	U-Shaped	0.5	±2.4 %	
Spherical isotropy	±0.4 dB	U-Shaped	0.5	±4.8 %	
Isotropy from gradient	±0.5 dB	U-Shaped	0	±	
Spatial resolution	±0.5 %	Normal	1	±0.5 %	
Linearity error	±0.2 dB	Rectangle	1	±2.7 %	
Calibration error	±3.3 %	Normal	1	±3.3 %	
SAR Evaluation Uncertainty					
Data acquisition error	±1 %	Rectangle	1	±0.6 %	
ELF and RF disturbances	±0.25 %	Normal	1	±0.25 %	
Conductivity assessment	±10 %	Rectangle	1	±5.8 %	
Spatial Peak SAR Evaluation Uncertainty					
Extrapolated boundary effect	±3 %	Normal	1	±3 %	±5 %
Probe positioning error	±0.1 mm	Normal	1	±1 %	
Integrated and cube orientation	±3 %	Normal	1	±3 %	
Cube Shape inaccuracies	±2 %	Rectangle	1	±1.2 %	
Device positioning	±6 %	Normal	1	±6 %	
Combined Uncertainties				±11.7 %	±5 %

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, the estimated measurement uncertainties in SAR are less than 15-25 %.

According to ANSI/IEEE C95.3, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of ± 1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ± 2dB can be expected.

According to CENELEC, typical worst-case uncertainty of field measurements is ± 5 dB.
For well-defined modulation characteristics the uncertainty can be reduced to ± 3 dB.

14.0 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 10017, 1992;*

(2) Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, FCC, Washington, D.C. 20554, 1997;

(3) Thomas Schmid, Oliver Egger, and Neils Kuster, “Automated E-field scanning system for dosimetric assessments”, IEEE *Transaction on Microwave Theory and Techniques,* Vol. 44, pp. 105 – 113, January, 1996.

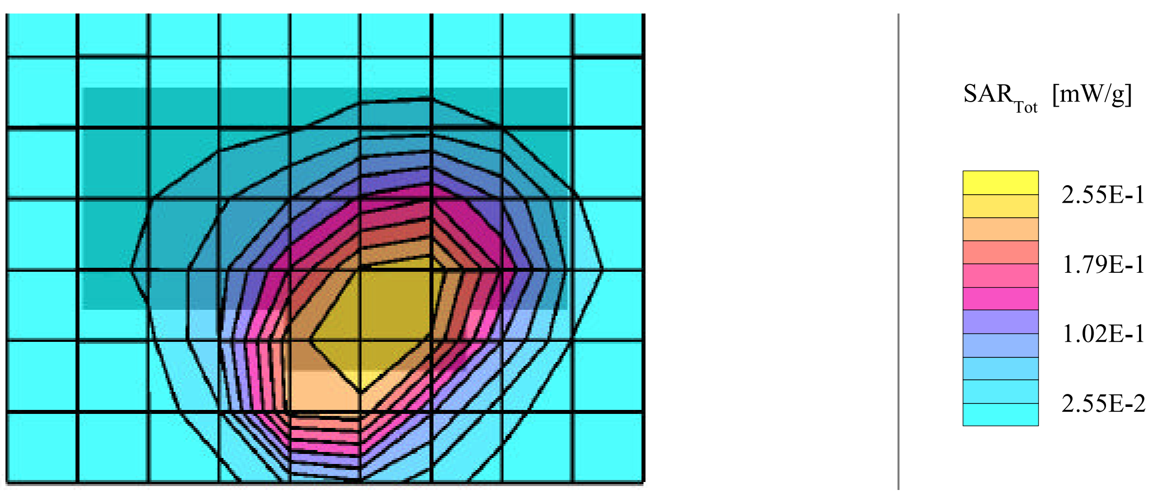
(4) Niels Kuster, Ralph Kastle, and Thomas Schmid, “Dosimetric evaluation of mobile communications equipment with know precision”, IEICE Transactions of Communications, vol. E80-B, no. 5, pp. 645 – 652, May 1997.

APPENDIX A - SAR MEASUREMENT DATA

Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.245 mW/g, SAR (10g): 0.105 mW/g

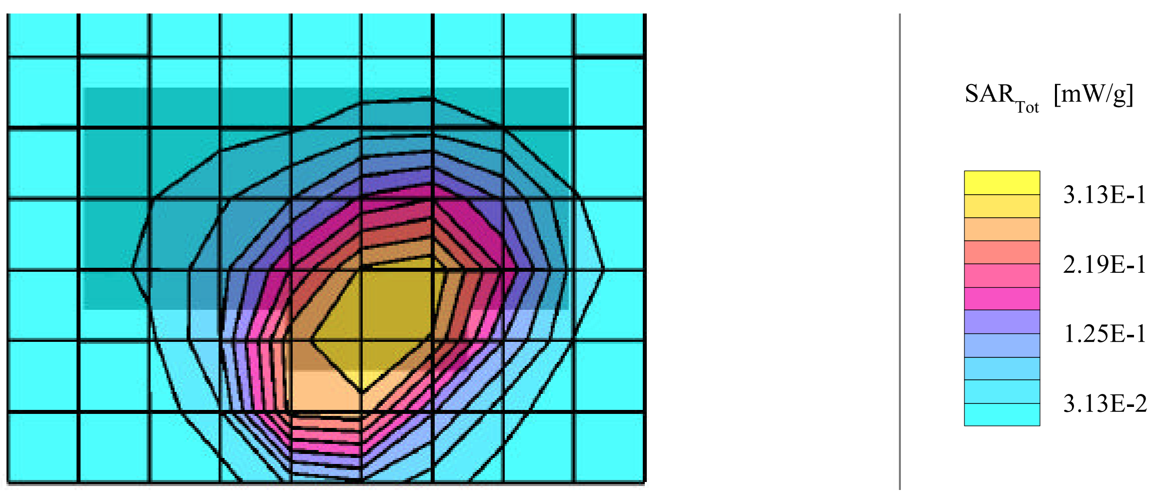
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Murata Chip Antenna
Unmodulated Carrier
Low Channel [2412 MHz]
Conducted Power: 19.4 dBm
Date Tested: May 10, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.276 mW/g, SAR (10g): 0.0992 mW/g

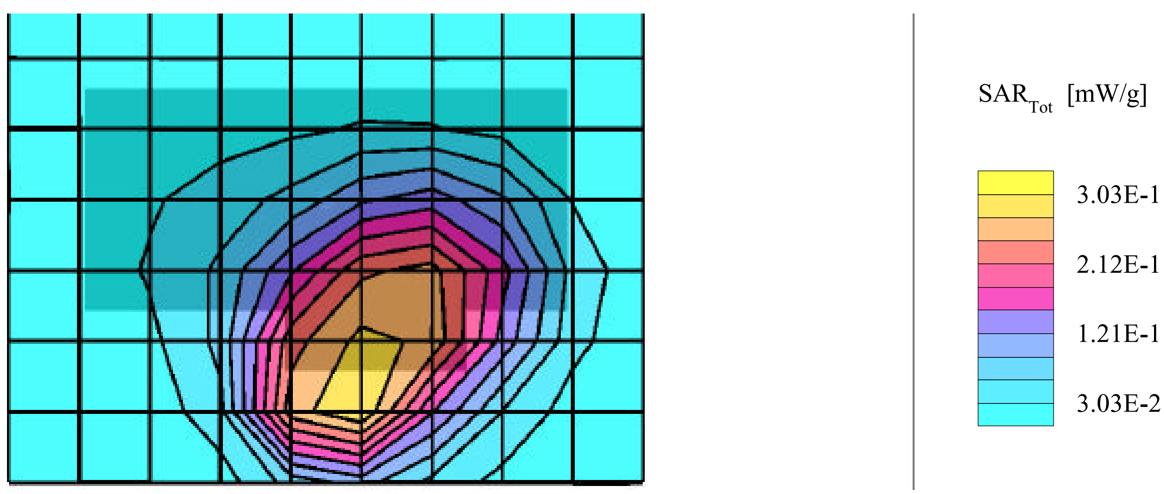
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Murata Chip Antenna
Unmodulated Carrier
Mid Channel [2437 MHz]
Conducted Power: 20.4 dBm
Date Tested: May 10, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm^3
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.281 mW/g, SAR (10g): 0.111 mW/g

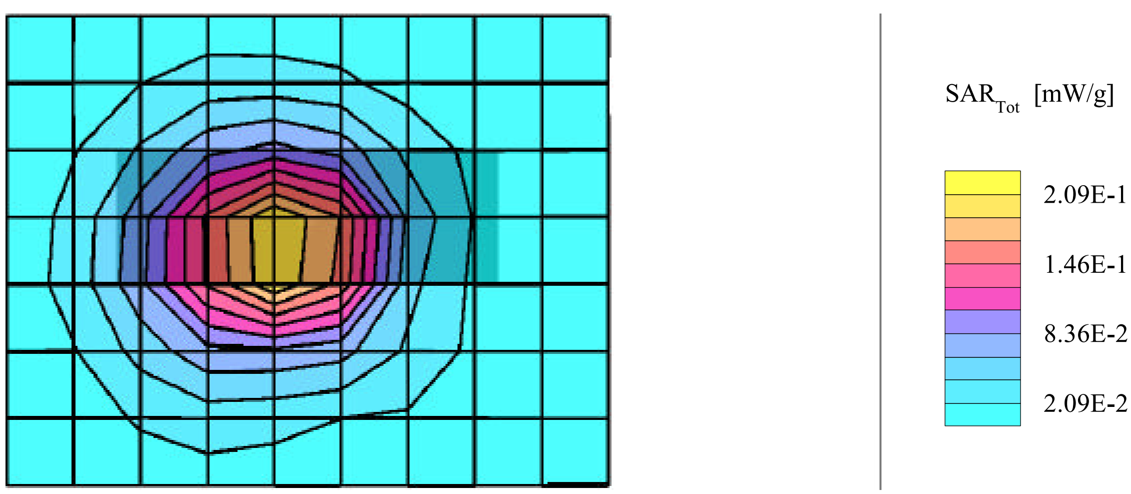
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Murata Chip Antenna
Unmodulated Carrier
High Channel [2462 MHz]
Conducted Power: 18.4 dBm
Date Tested: May 10, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.183 mW/g, SAR (10g): 0.0721 mW/g

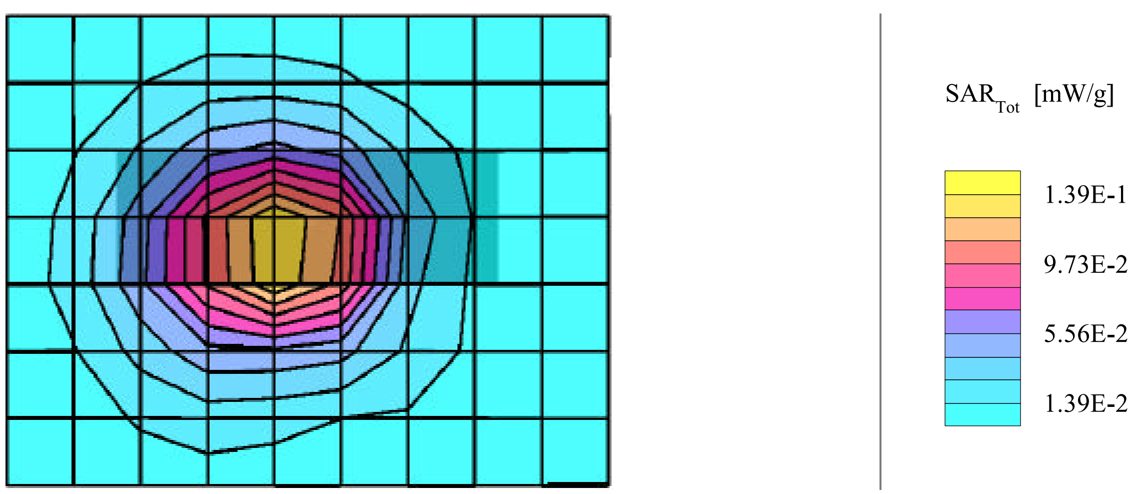
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Dell Inverted F Antenna
CW Mode
Low Channel [2412 MHz]
Conducted Power: 19.4 dBm
Date Tested: May 10, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: $\sigma = 1.77$ mho/m $\varepsilon_r = 53.6$ $\rho = 1.00$ g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.110 mW/g, SAR (10g): 0.0434 mW/g

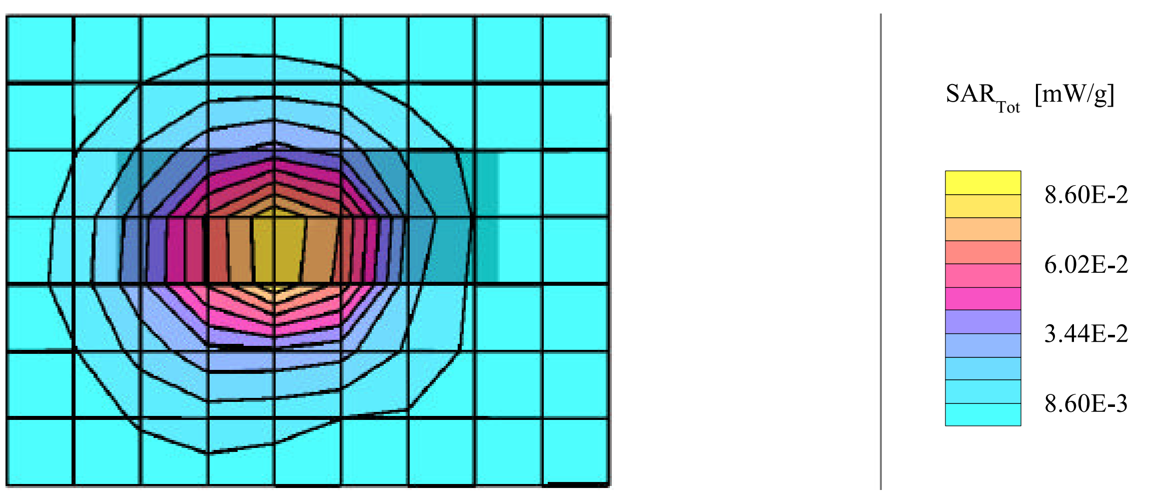
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Dell Inverted F Antenna
CW Mode
Mid Channel [2437 MHz]
Conducted Power: 20.4 dBm
Date Tested: May 10, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: $\sigma = 1.77$ mho/m $\varepsilon_r = 53.6$ $\rho = 1.00$ g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.0780 mW/g, SAR (10g): 0.0301 mW/g

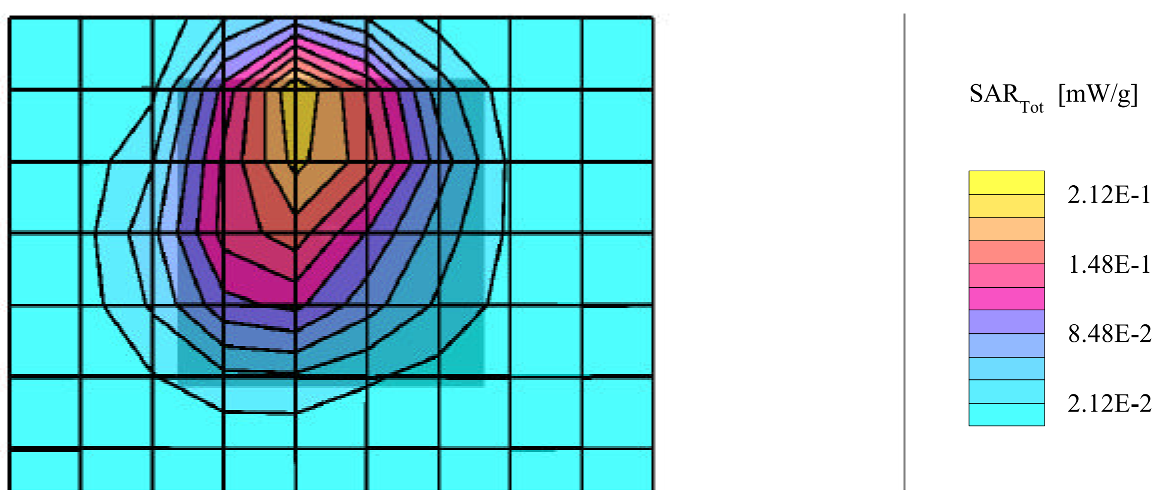
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Dell Inverted F Antenna
CW Mode
High Channel [2462 MHz]
Conducted Power: 18.4 dBm
Date Tested: May 10, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.196 mW/g, SAR (10g): 0.0723 mW/g

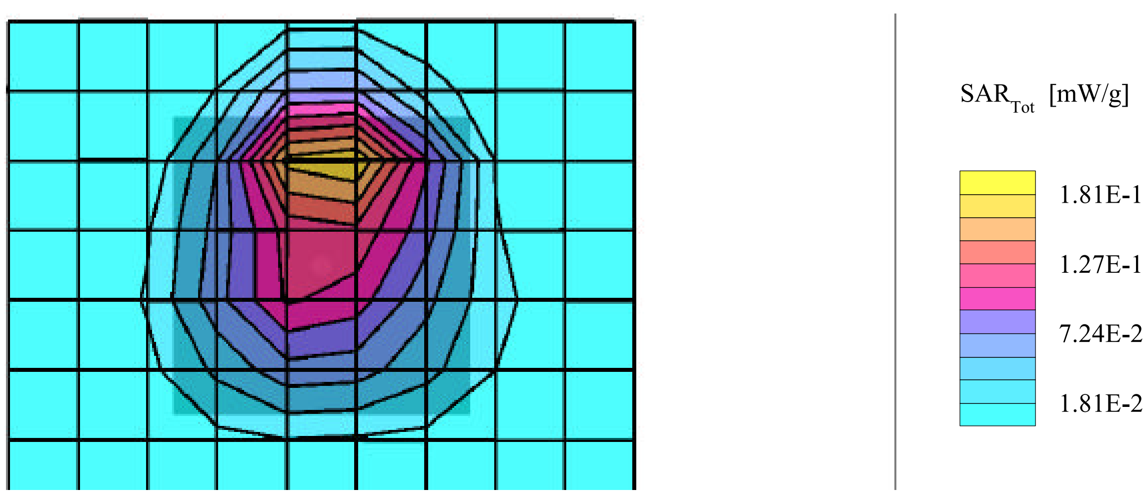
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Toshiba Inverted F Antenna
CW Mode
Low Channel [2412 MHz]
Conducted Power: 19.4 dBm
Date Tested: May 11, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.155 mW/g, SAR (10g): 0.0560 mW/g

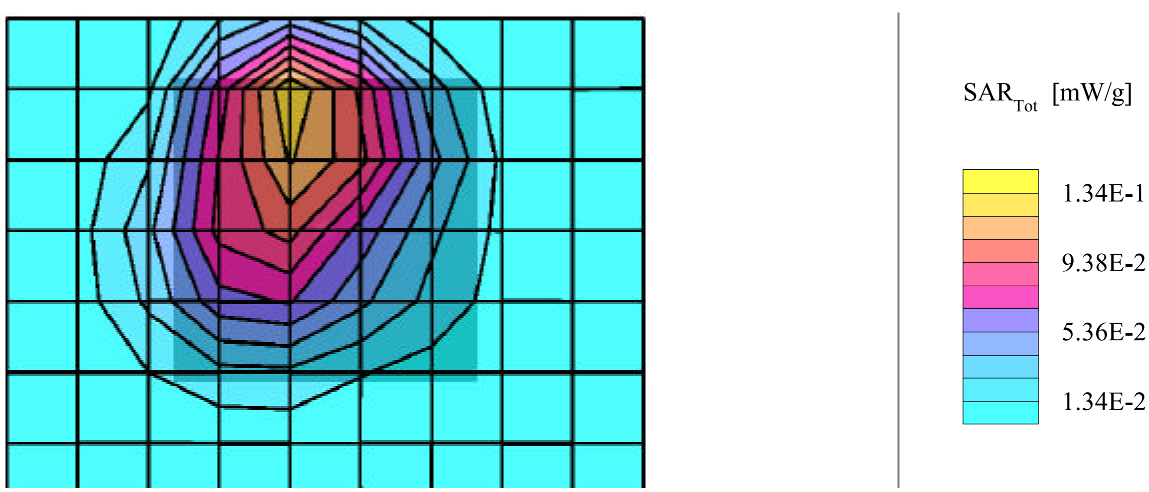
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Toshiba Inverted F Antenna
CW Mode
Mid Channel [2437 MHz]
Conducted Power: 20.4 dBm
Date Tested: May 11, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.119 mW/g, SAR (10g): 0.0436 mW/g

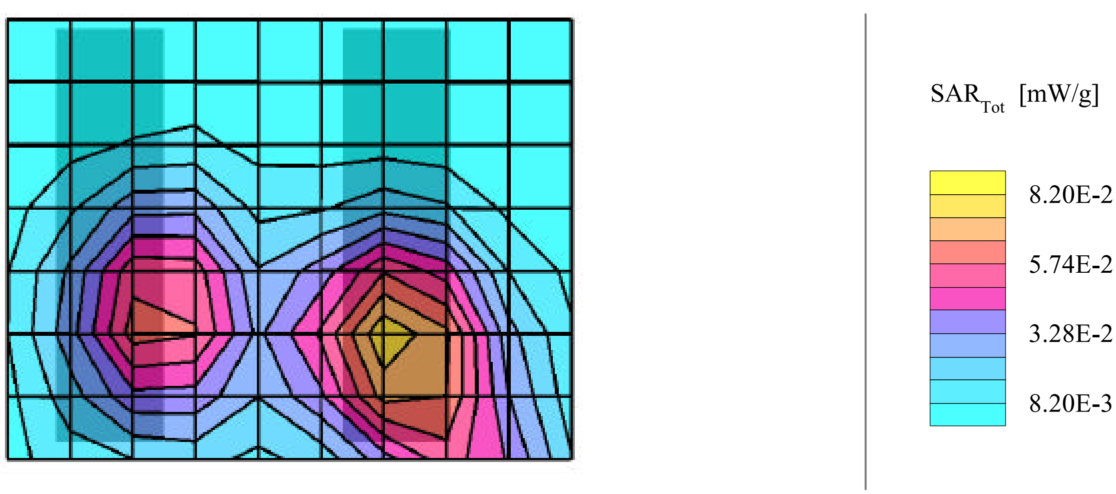
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
with Toshiba Inverted F Antenna
CW Mode
High Channel [2462 MHz]
Conducted Power: 18.4 dBm
Date Tested: May 11, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,180°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.0686 mW/g, SAR (10g): 0.0289 mW/g

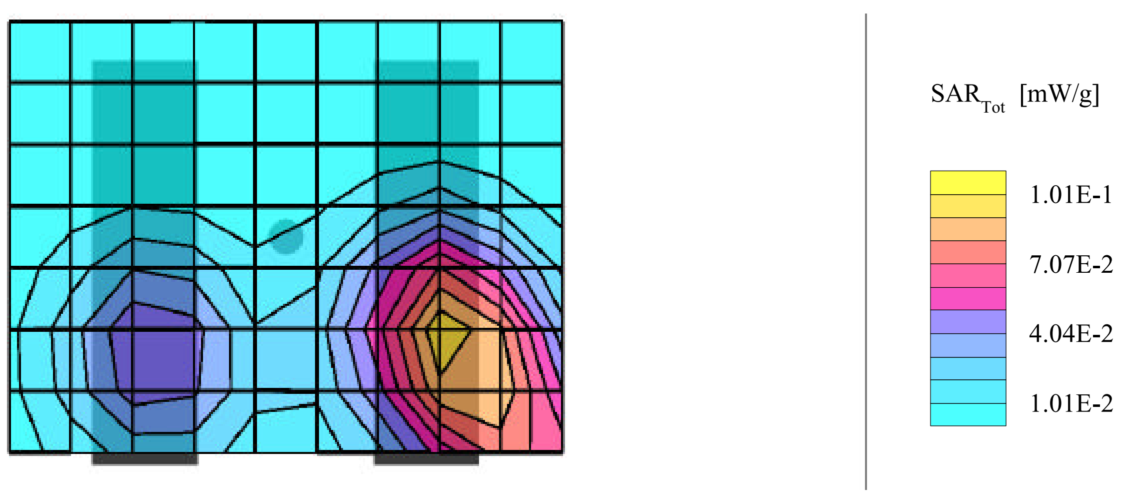
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
Dell Dipole Diversity Antenna
CW Mode
Low Channel [2412 MHz]
Conducted Power: 19.4 dBm
Date Tested: May 11, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,180°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.0886 mW/g, SAR (10g): 0.0376 mW/g

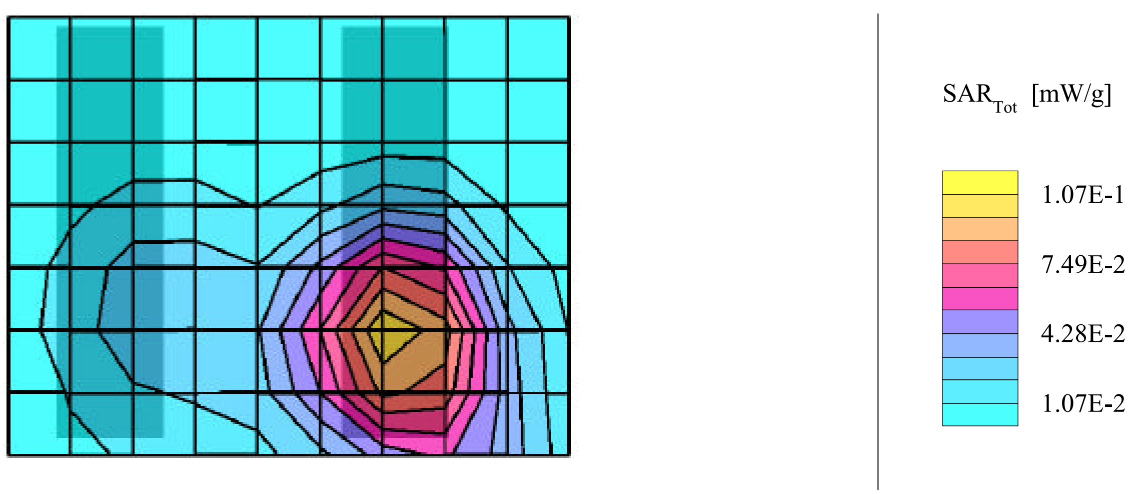
Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
Dell Dipole Diversity Antenna
CW Mode
Mid Channel [2437 MHz]
Conducted Power: 20.4 dBm
Date Tested: May 11, 2001



Cisco Systems Inc. FCC ID: LDK102042

Generic Twin Phantom; Flat Section; Position: (90°,180°)
Probe: ET3DV6 - SN1387; ConvF(4.94,4.94,4.94); Crest factor: 1.0
2400MHz Muscle: σ = 1.77 mho/m ε_r = 53.6 ρ = 1.00 g/cm³
Coarse: Dx = 7.0, Dy = 7.0, Dz = 10.0;
Cube 5x5x7
SAR (1g): 0.0914 mW/g, SAR (10g): 0.0374 mW/g

Body SAR at 0.0cm Separation
Cisco Model: AIR-MPI352
Wireless LAN Mini-PCI Card
Dell Dipole Diversity Antenna
CW Mode
High Channel [2462 MHz]
Conducted Power: 18.4 dBm
Date Tested: May 11, 2001

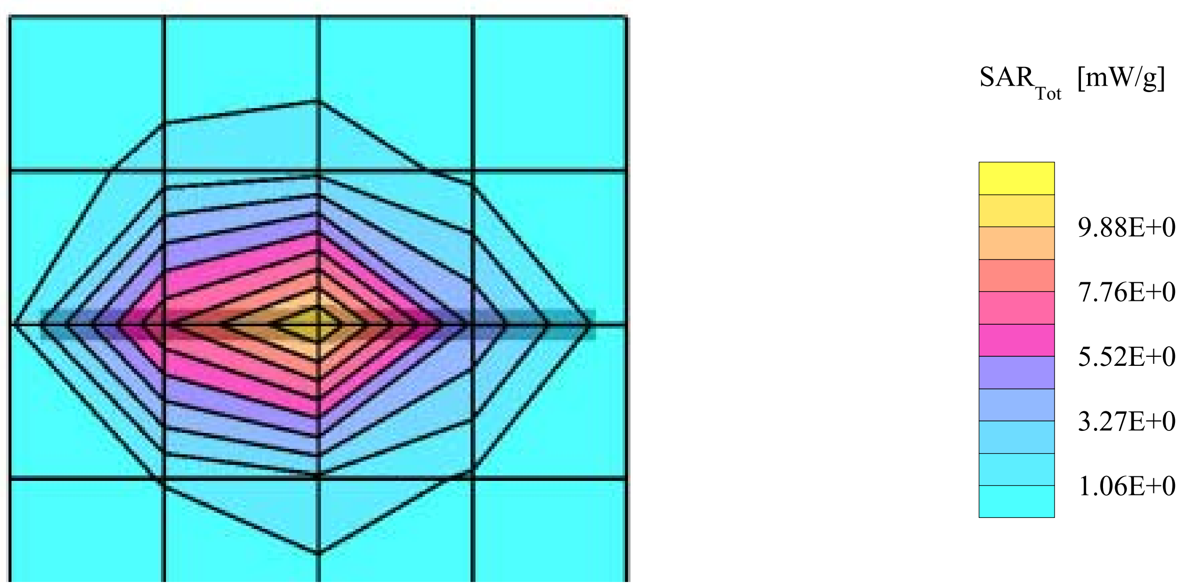


APPENDIX B - DIPOLE VALIDATION

Dipole 1800 MHz

Generic Twin Phantom; Flat Section; Position: (90°,90°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
1800MHz Brain: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 9.57 mW/g, SAR (10g): 4.80 mW/g

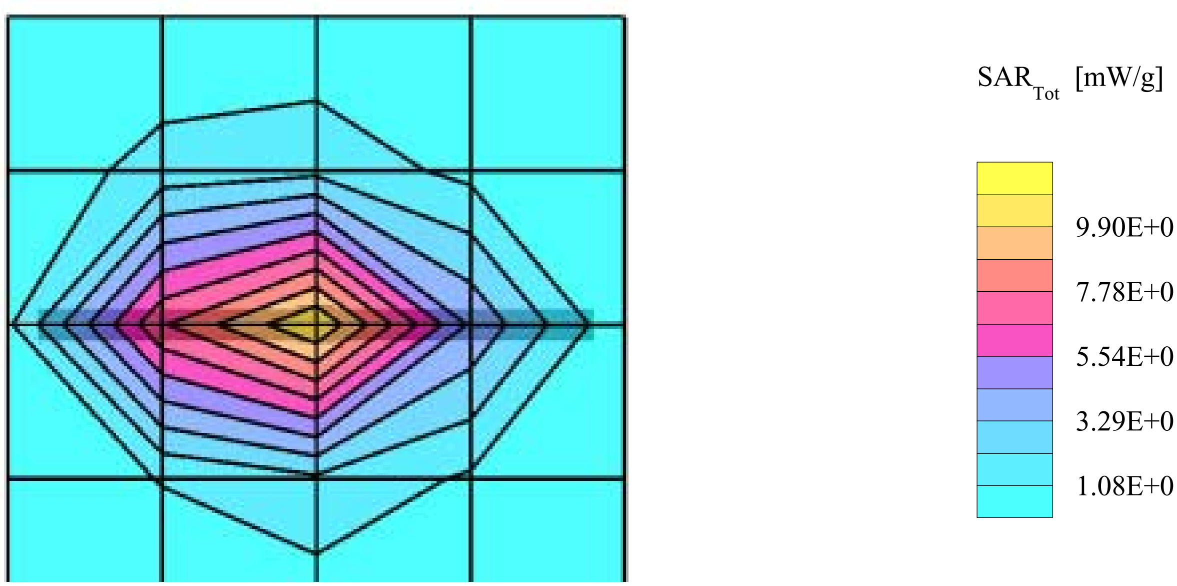
Date Tested: May 10, 2001



Dipole 1800 MHz

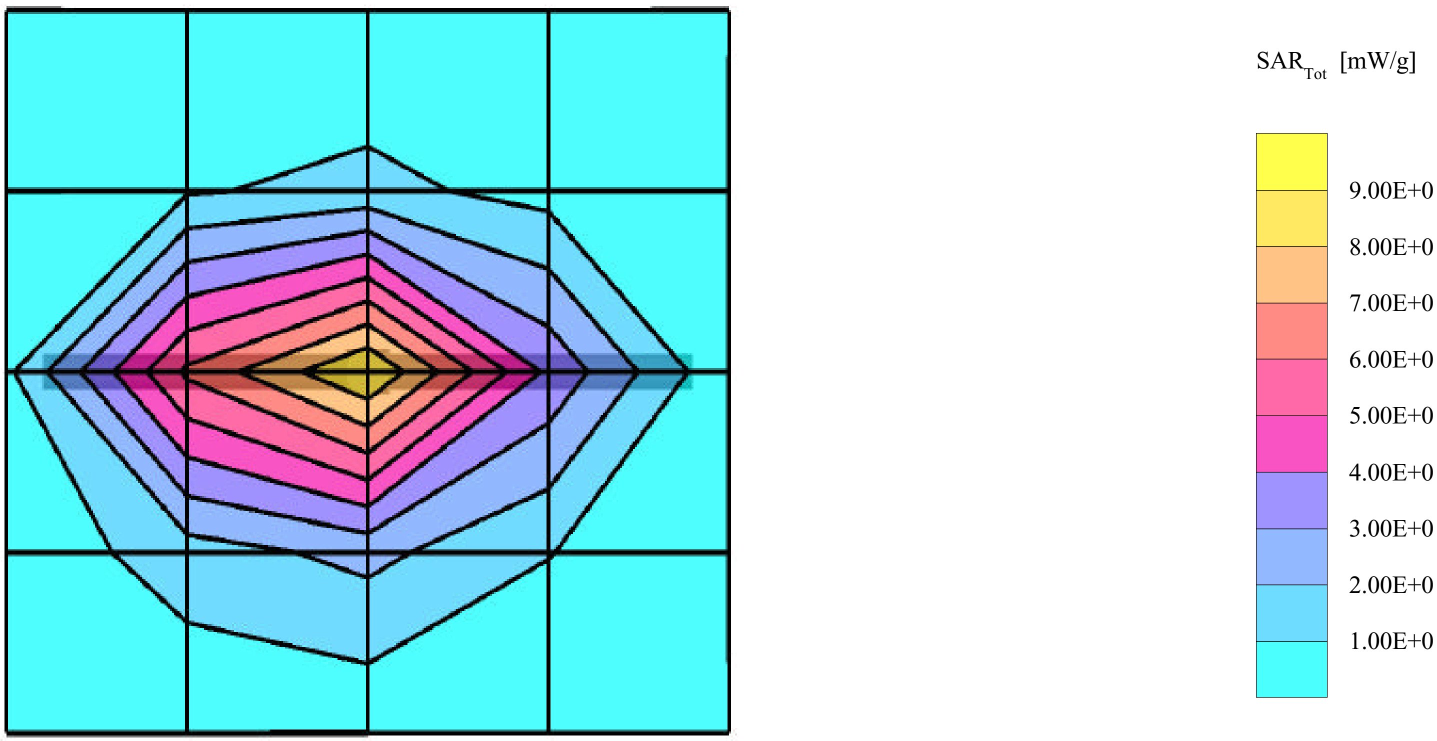
Generic Twin Phantom; Flat Section; Position: (90°,90°);
Probe: ET3DV6 - SN1387; ConvF(5.50,5.50,5.50); Crest factor: 1.0;
1800MHz Brain: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 9.59 mW/g, SAR (10g): 4.81 mW/g

Date Tested: May 11, 2001



Validation Dipole D1800V2 SN:247, d = 10mm

Frequency: 1800 MHz; Antenna Input Power: 250 [mW]
Generic Twin Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
Probe: ET3DV5 - SN1342/DAE3; ConvF(4.84,4.84,4.84); Brain 1800 MHz: σ = 1.68 mho/m ε_r = 41.2 ρ = 1.00 g/cm³
Cubes (2): Peak: 17.6 mW/g ± 0.02 dB, SAR (1g): 9.32 mW/g ± 0.04 dB, SAR (10g): 4.76 mW/g ± 0.06 dB, (Worst-case extrapolation)
Penetration depth: 7.5 (7.4, 8.0) [mm]
Powerdrift: -0.00 dB



APPENDIX C - PROBE CALIBRATION

Schmid & Partner
Engineering AG

Staffelstrasse 8, 8045 Zurich, Switzerland, Telefon +41 1 280 08 60, Fax +41 1 280 08 64

Probe ET3DV6

SN:1387

Manufactured: September 21, 1999
Last calibration: September 22, 1999

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1387

Sensitivity in Free Space

NormX	**1.55**	$\mu V/(V/m)^2$
NormY	**1.65**	$\mu V/(V/m)^2$
NormZ	**1.64**	$\mu V/(V/m)^2$

Diode Compression

DCP X	**98**	mV
DCP Y	**98**	mV
DCP Z	**98**	mV

Sensitivity in Tissue Simulating Liquid

Brain 450 MHz ε_r = 48 ± 5% σ = 0.50 ± 10% mho/m

ConvF X	**6.76**	extrapolated	Boundary effect:	
ConvF Y	**6.76**	extrapolated	Alpha	**0.30**
ConvF Z	**6.76**	extrapolated	Depth	**2.52**

Brain 900 MHz ε_r = 42.5 ± 5% σ = 0.86 ± 10% mho/m

ConvF X	**6.34**	± 7% (k=2)	Boundary effect:	
ConvF Y	**6.34**	± 7% (k=2)	Alpha	**0.47**
ConvF Z	**6.34**	± 7% (k=2)	Depth	**2.25**

Brain 1500 MHz ε_r = 41 ± 5% σ = 1.32 ± 10% mho/m

ConvF X	**5.78**	interpolated	Boundary effect:	
ConvF Y	**5.78**	interpolated	Alpha	**0.69**
ConvF Z	**5.78**	interpolated	Depth	**1.88**

Brain 1800 MHz ε_r = 41 ± 5% σ = 1.69 ± 10% mho/m

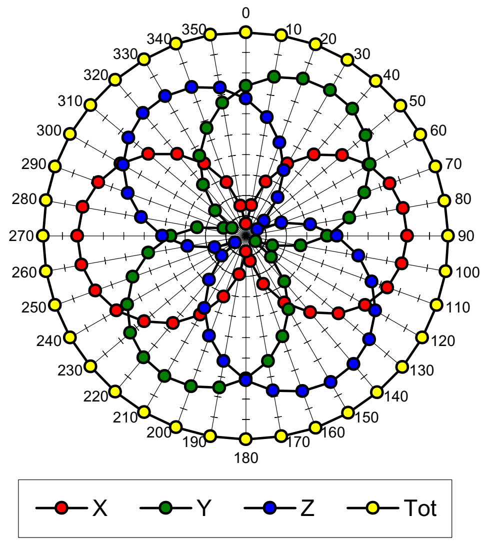
ConvF X	**5.50**	± 7% (k=2)	Boundary effect:	
ConvF Y	**5.50**	± 7% (k=2)	Alpha	**0.81**
ConvF Z	**5.50**	± 7% (k=2)	Depth	**1.70**

Sensor Offset

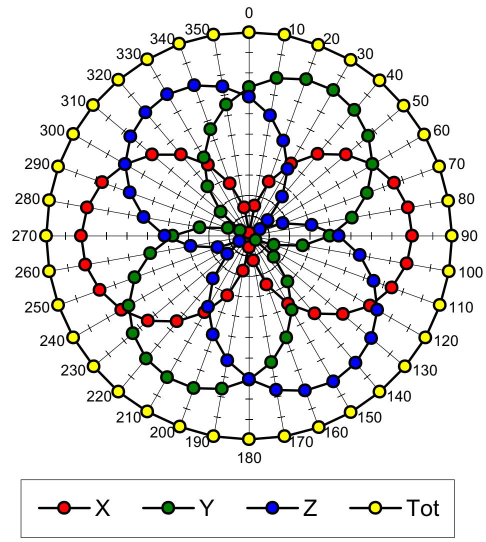
Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.6 ± 0.2**	mm

Receiving Pattern (ϕ, θ = 0°)

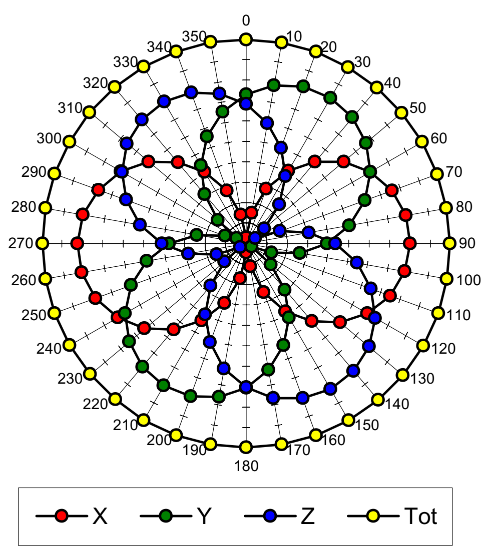
f = 30 MHz, TEM cell ifi110



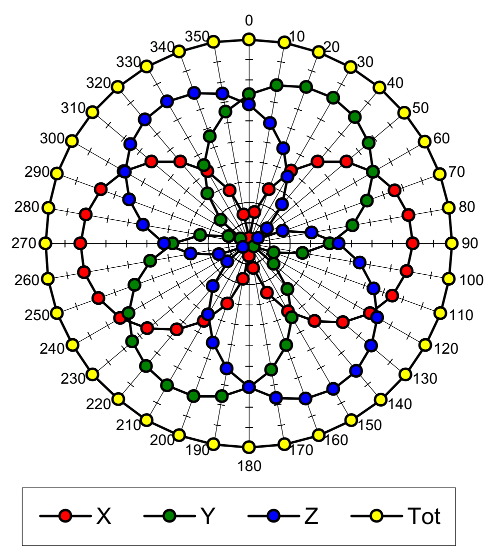
f = 100 MHz, TEM cell ifi110

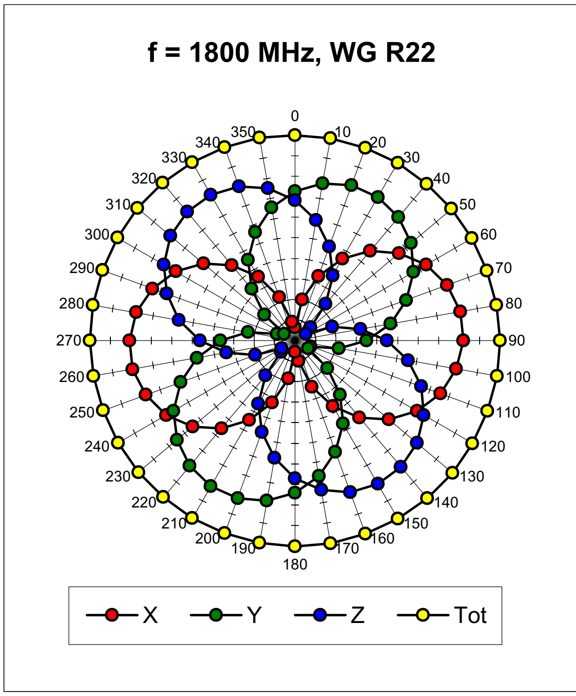


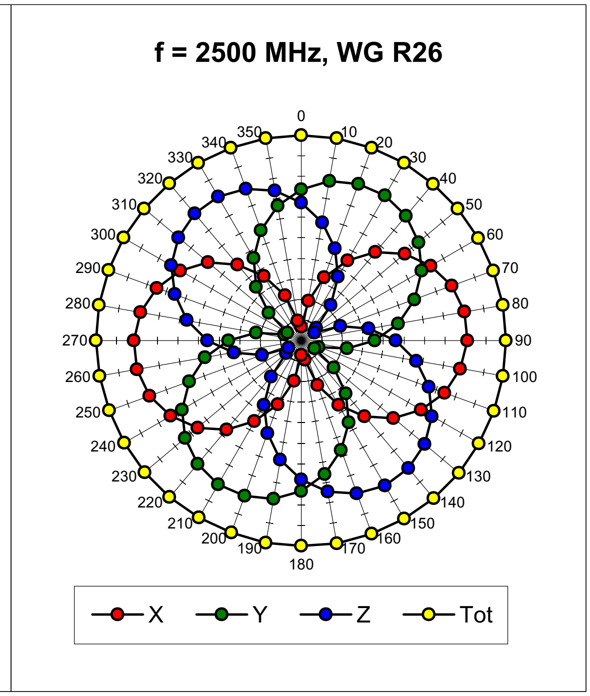
f = 300 MHz, TEM cell ifi110



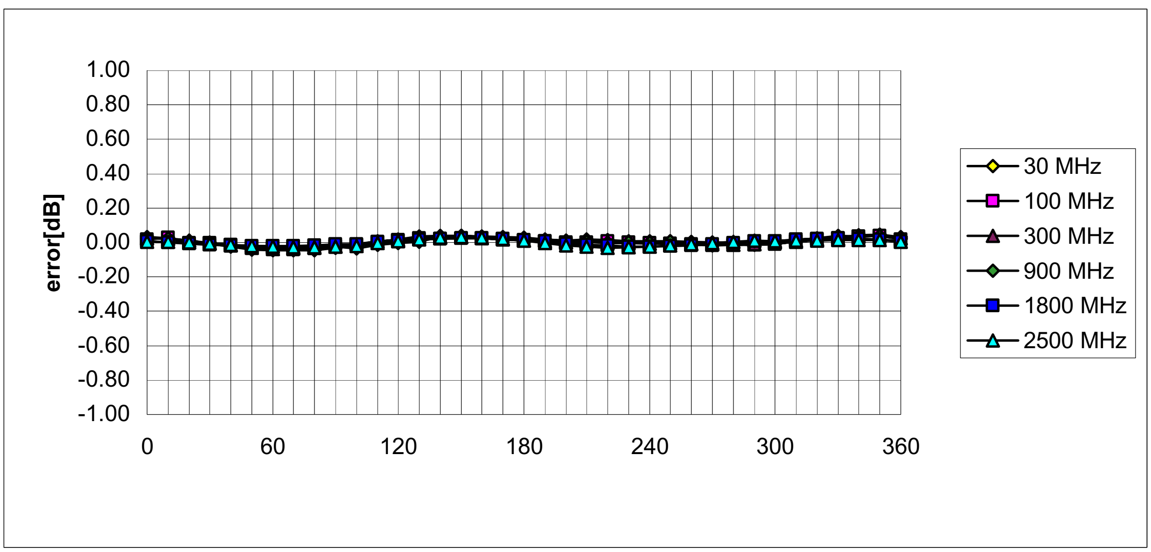
f = 900 MHz, TEM cell ifi110





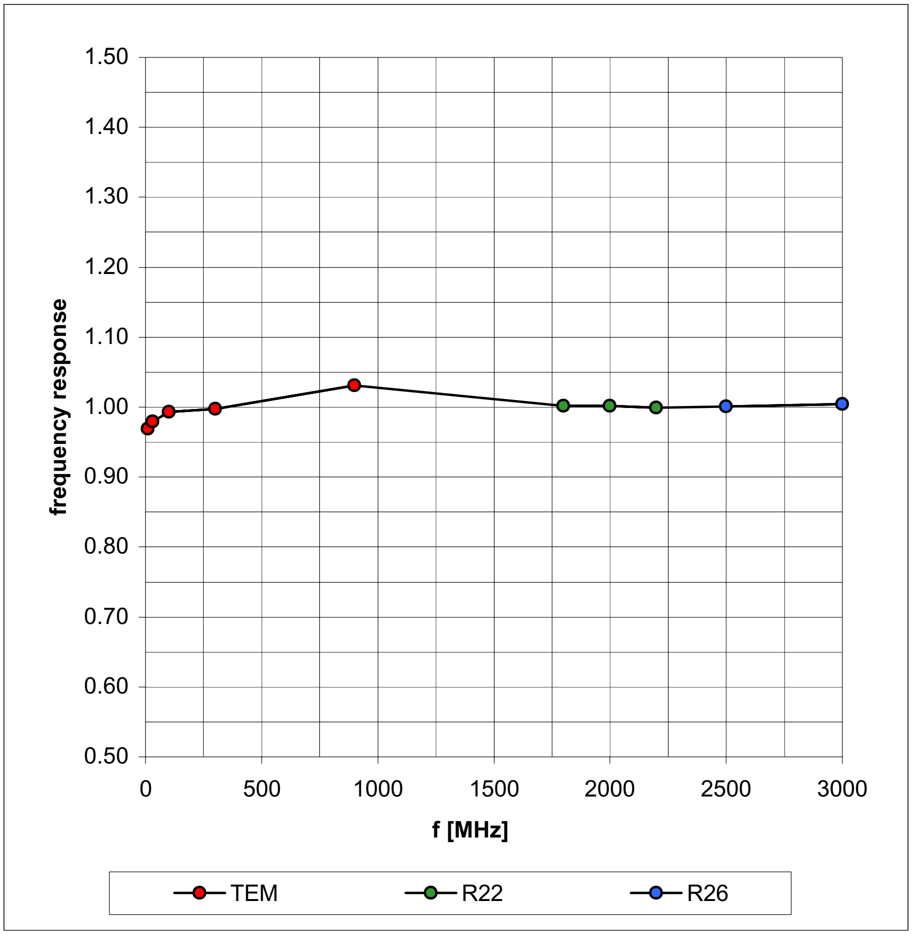


Isotropy Error (ϕ), θ = 0°



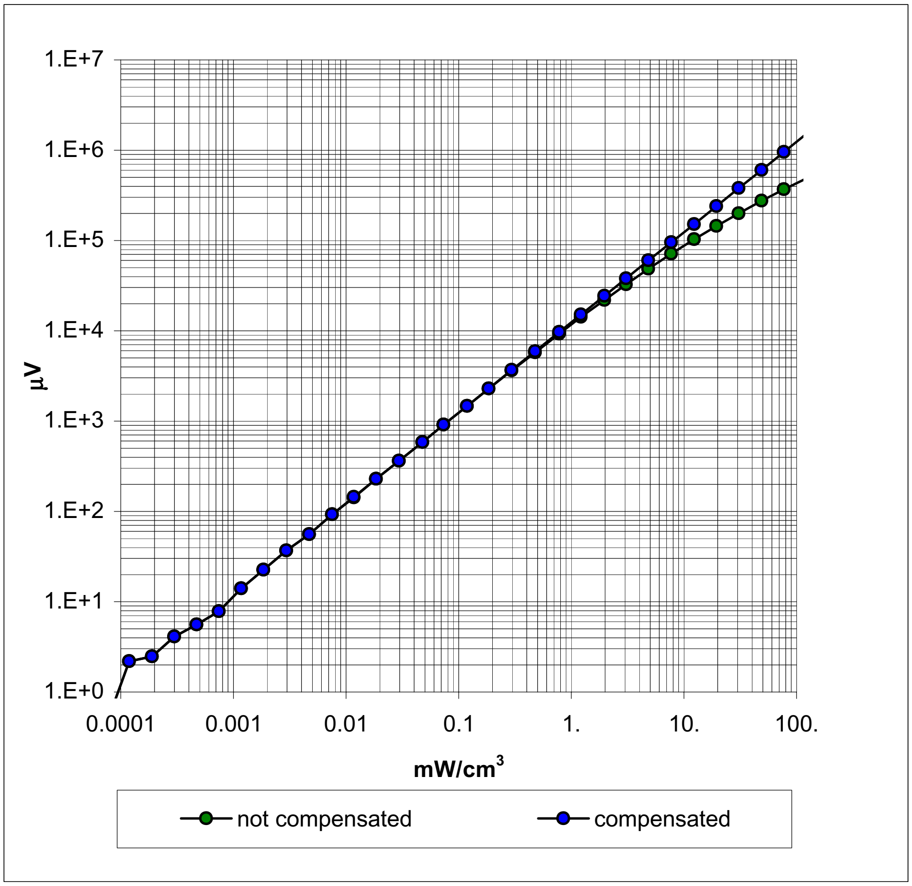
Frequency Response of E-Field

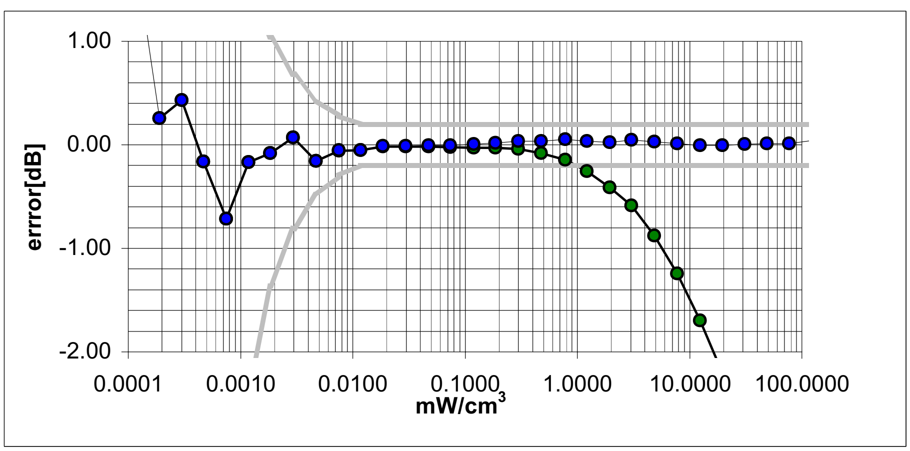
(TEM-Cell:ifi110, Waveguide R22, R26)



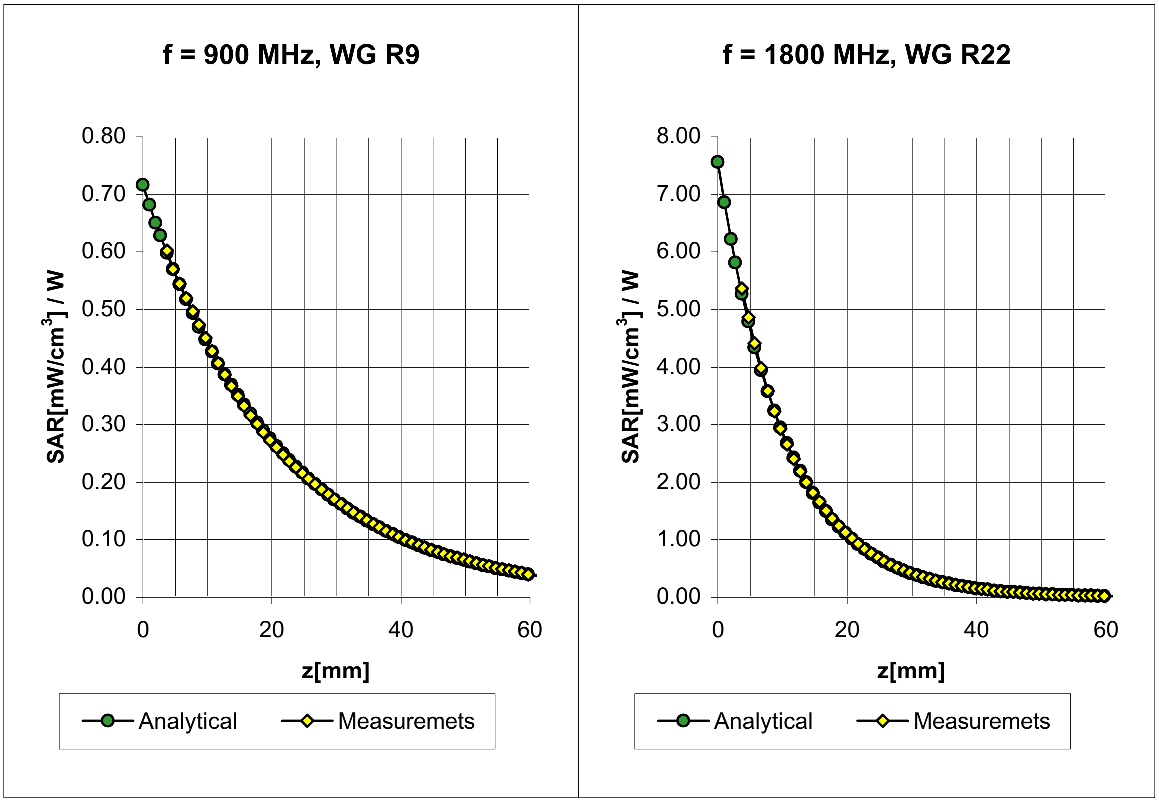
Dynamic Range f(SAR_{brain})

(TEM-Cell:ifi110)



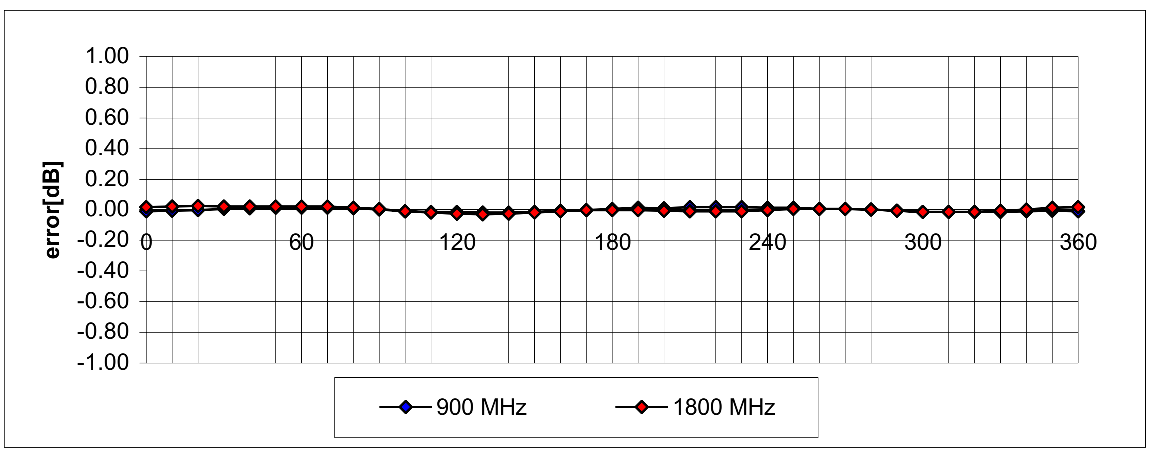


Conversion Factor Assessment



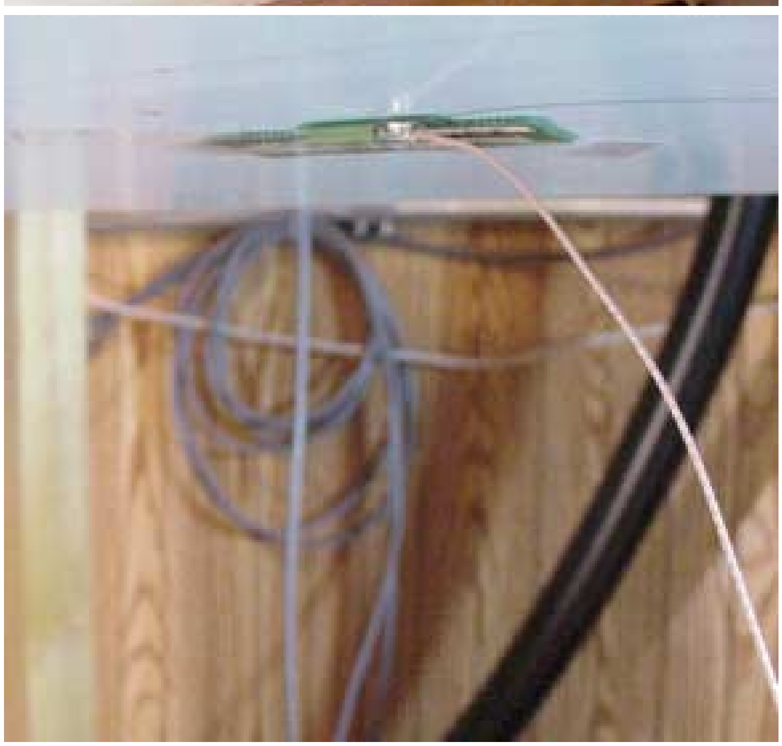
Receiving Pattern (ϕ)

(in brain tissue, z = 5 mm)



APPENDIX D - SAR TEST SETUP PHOTOGRAPHS

SAR TEST SETUP PHOTOGRAPHS
Antenna #1 - Murata Chip
0.0cm Separation Distance



SAR TEST SETUP PHOTOGRAPHS
Antenna #2 - Dell Inverted F
0.0 cm Separation Distance

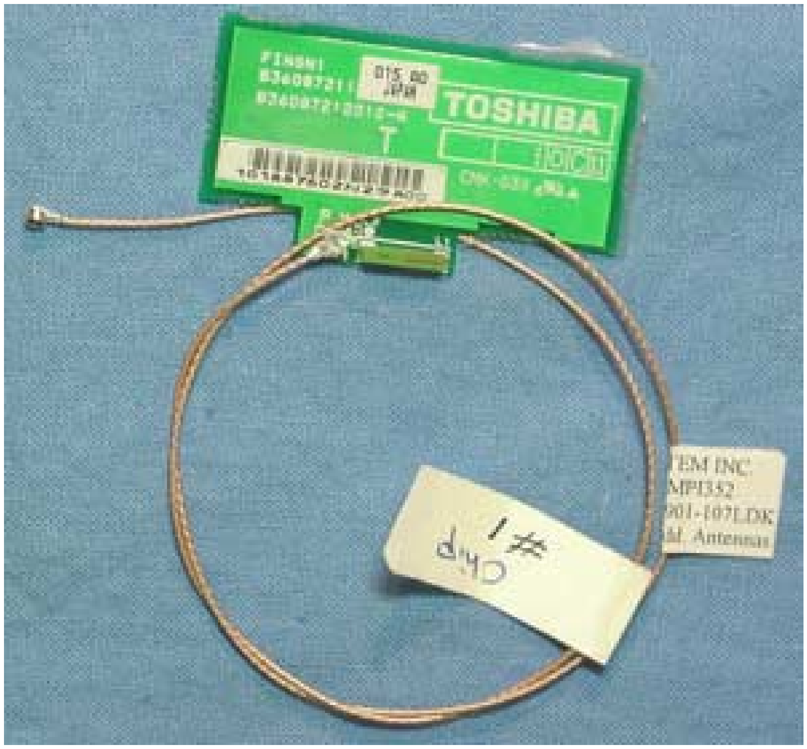
SAR TEST SETUP PHOTOGRAPHS
Antenna #3 - Toshiba Inverted F
0.0 cm Separation Distance

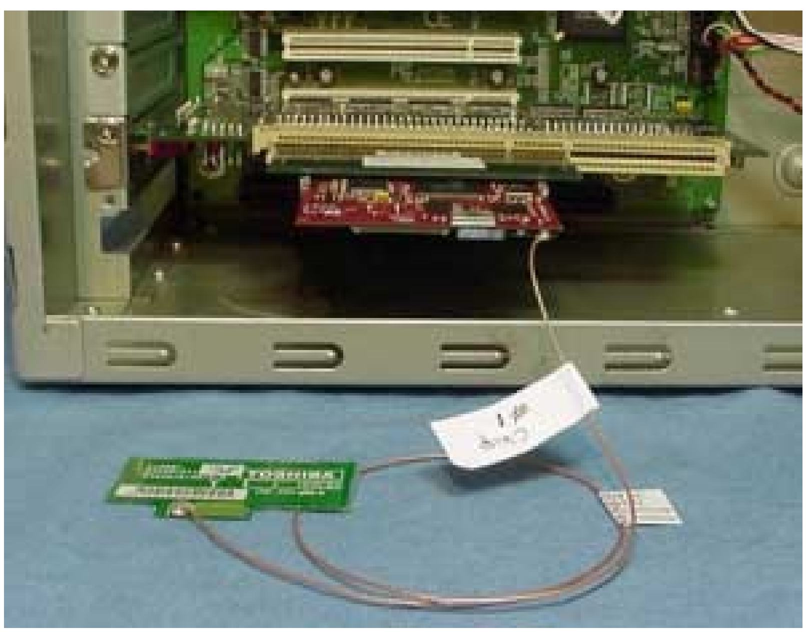
SAR TEST SETUP PHOTOGRAPHS
Antenna #4 - Dell Dipole Diversity
0.0 cm Separation Distance

APPENDIX E - EUT PHOTOGRAPHS

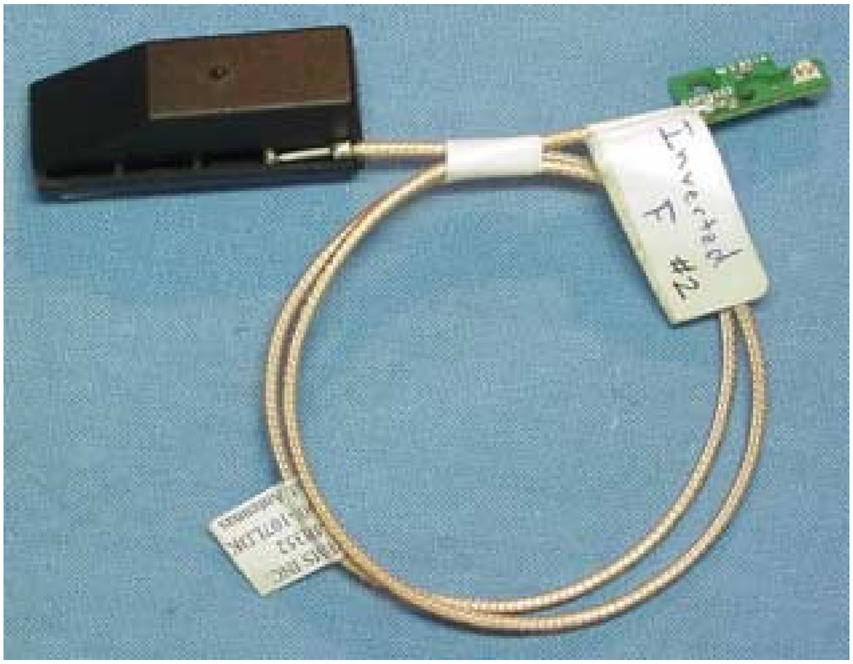
EUT PHOTOGRAPHS
Wireless LAN Mini-PCI Card

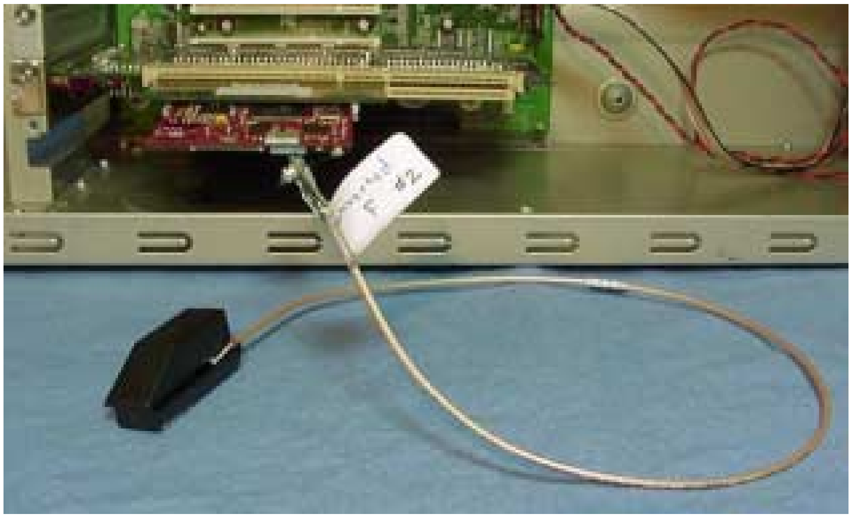
EUT PHOTOGRAPHS
Murata Chip Antenna



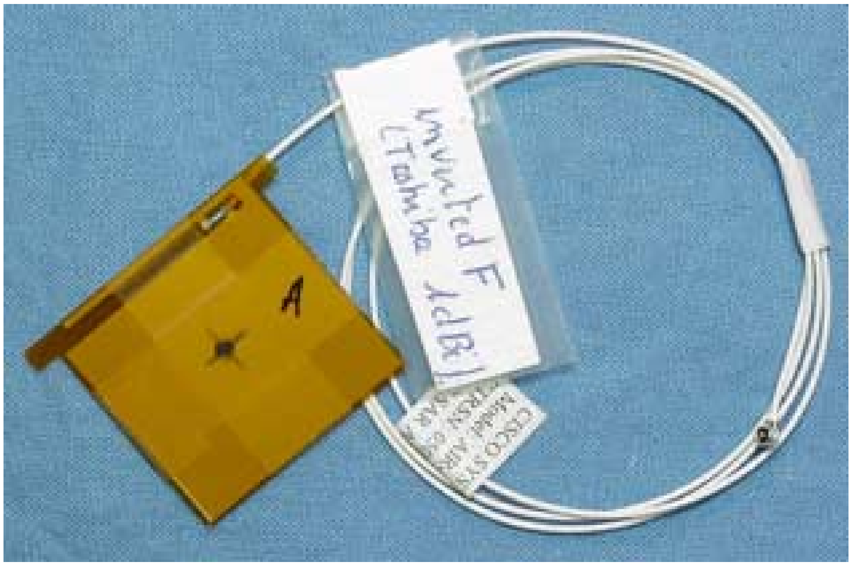


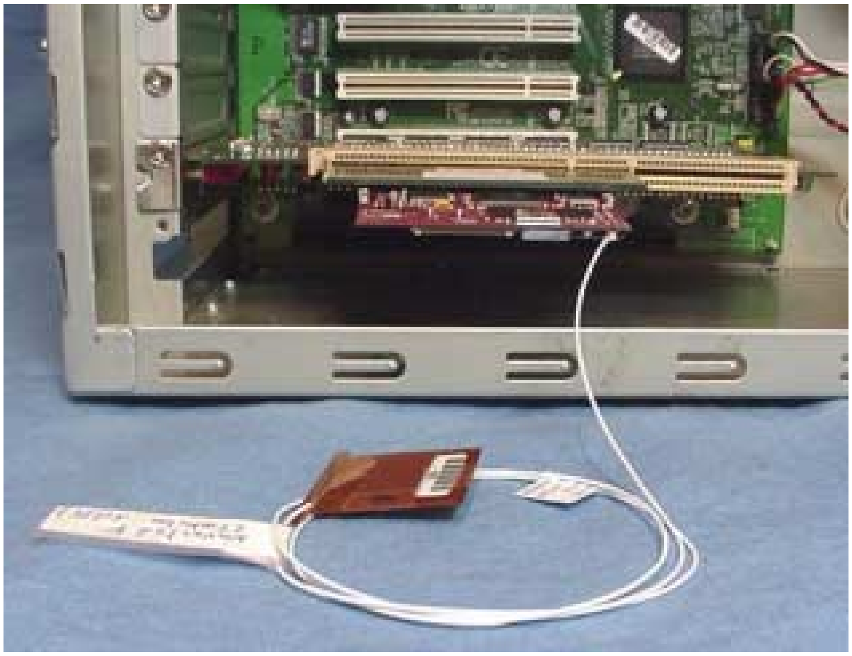
EUT PHOTOGRAPHS
Dell Inverted F Antenna





EUT PHOTOGRAPHS
Toshiba Inverted F Antenna





EUT PHOTOGRAPHS
Dell Dipole Diversity Antenna