

	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 102507OWD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	  Certificate No. 2470.01
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

DECLARATION OF COMPLIANCE SAR RF EXPOSURE EVALUATION

Test Lab Information	Name CELLTECH LABS INC.
	Address 21-364 Lougheed Road, Kelowna B.C. V1X 7R8 Canada
Company Information	Name M/A-COM, INC.
	Address 221 Jefferson Ridge Parkway Lynchburg, VA 24501 United States
Standard(s) Applied	FCC 47 CFR §2.1093
	IC Health Canada Safety Code 6
Procedure(s) Applied	FCC OET Bulletin 65, Supplement C (Edition 01-01)
	IC RSS-102 Issue 2
Device Classification	FCC Licensed Non-Broadcast Transmitter Held to Face (Part 90)
	IC Land Mobile Radio Transceiver (RSS-119)
RF Exposure Category	Occupational / Controlled Environment
Application Type	Permissive Change - Addition of Alkaline Battery Pack (P/N: BT-013259-001)
	Original FCC Grant Date: May 21, 2003 Original IC Certification Date: July 9, 2003
Device Description	Portable UHF-L PTT Radio Transceiver
Device Model(s)	P7100 (UHF-L)
FCC IDENTIFIER	OWDTR-0016-E
IC IDENTIFIER	3636B-0016
Serial No. Tested	T1-L SAR02
Frequency Range(s)	378 - 430 MHz
Antenna Types Tested	Face-held - Helical Coil (P/N: KRE1011219/10)
	Body-worn - 1/4-Wave Whip (P/N: KRE1011223/10)
Battery Type(s) Tested	Alkaline - 1.5V, 2850mAh Duracell Procell (x6 AA)
Body-worn Accessories Tested	Metal Belt-Clip (P/N: CC23894)
Audio Accessories Tested	Speaker-Microphone Non-Antenna Version (P/N: KRY1011617/183)
Max. SAR Level(s) Evaluated	Face-held 1.75 W/kg averaged over 1g 50% Duty Cycle
	Body-worn 6.14 W/kg averaged over 1g 50% Duty Cycle
FCC/IC Spatial Peak SAR Limit(s)	Head/Body 8.0 W/kg averaged over 1g Occupational / Controlled Exposure

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada's Safety Code 6 for the Occupational / Controlled Exposure environment. The device was evaluated in accordance with the measurement standards and procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01) and Industry Canada RSS-102 Issue 2. All measurements were performed in accordance with the SAR system manufacturer recommendations.

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.

The results and statements contained in this report pertain only to the device(s) evaluated.

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Test Report Approved By



Sean Johnston

Celltech Labs Inc.



Applicant: M/A-COM, Inc.	FCC ID: OWDTR-0016-E	IC: 3636B-0016	Freq.: 378 - 430 MHz		
Model(s): P7100 (UHF-L)	DUT Type: Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack				
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	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

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1.0 INTRODUCTION

This measurement report demonstrates that the M/A-COM Model(s): P7100 UHF-L Portable PTT Radio Transceiver, with the Permissive Change(s) described in this report, continues to comply with the SAR (Specific Absorption Rate) RF exposure requirements specified in FCC 47 CFR §2.1093 (see reference [1]) and Health Canada's Safety Code 6 (see reference [2]) for the Occupational / Controlled Exposure environment. The measurement procedures described in FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]) and IC RSS-102 Issue 2 (see reference [4]) were employed. A description of the device, 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 SAR MEASUREMENT SYSTEM

Celltech Labs Inc. SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 measurement system is comprised of the measurement server, robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for brain and/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 DASY4 measurement server. The DAE4 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 DASY4 measurement server 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. The sensor systems are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.



DASY4 SAR Measurement System with Plexiglas validation phantom

DASY4 SAR Measurement System
with Plexiglas side planar phantom

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3.0 SAR MEASUREMENT SUMMARY

SAR EVALUATION RESULTS

Test Type	Freq.	Chan.	Test Mode	Antenna Type	Accessories		DUT Position to Planar Phantom	Cond. Power Before Test	Measured SAR 1g (W/kg)		SAR Drift During Test	Scaled SAR 1g (W/kg)								
					Body-worn	Spacing			100%	50%		100%	50%							
	MHz				Audio	Watts			100%	50%	dB	100%	50%							
Face-held	403.0000	Mid	CW	Helical Coil	na	2.5 cm	Front Side	4.28	3.48	1.74	-0.028	3.50	1.75							
Body-worn	403.0000	Mid	CW	1/4-wave Whip	Belt-Clip	1.1 cm	Back Side	4.28	12.2	6.10	-0.0310	12.3	6.14							
SAR SAFETY LIMIT(S)					BRAIN	BODY		SPATIAL PEAK		RF EXPOSURE CATEGORY										
FCC 47 CFR 2.1093	Health Canada Safety Code 6			8.0 W/kg		8.0 W/kg		averaged over 1 gram		Occupational / Controlled										
Test Date		October 25, 2007			October 26, 2007			Test Date		Oct. 25	Oct. 26	Unit								
Fluid Type		450 MHz Brain			450 MHz Body			Ambient Temperature		22.9	23.0	°C								
Dielectric Constant ϵ_r	IEEE Target		Meas.	Dev.	IEEE Target	Meas.	Dev.	Fluid Temperature		22.8	22.8	°C								
	43.5	±5%	43.8	+0.7%	56.7	±5%	58.1	+2.5%	Relative Humidity		31	32	%							
Conductivity σ (mho/m)	IEEE Target		Meas.	Dev.	IEEE Target	Meas.	Dev.	Atmospheric Pressure		100.4	100.4	kPa								
	0.87	±5%	0.87	0.0%	0.94	±5%	0.94	0.0%	ρ (Kg/m ³)		1000									
Note(s)	1.	The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.																		
	2.	The test configuration(s) utilized for this Permissive Change evaluation as reported above were determined based on the following previous measurement results: a. maximum face-held SAR level configuration - measured during previous Class II Permissive Change evaluations (please refer to Celltech Test Report Serial No.: 091704OWD-T559-S90U). b. maximum body-worn SAR level configuration - measured during the original certification evaluations (please refer to Celltech Test Report Serial No.: 040403-326OWD).																		
	3.	The power droops measured by the DASY4 system for the duration of the SAR evaluations were added to the measured SAR levels to report scaled SAR results as shown in the above test data table.																		
	4.	The area scan evaluation was performed with fully charged batteries. After the area scan evaluation was completed the batteries were replaced with fully charged batteries prior to the zoom scan evaluation. Battery Type(s) Evaluated: 1.5V, 2850mAh Duracell Procell Alkaline (x6 AA)																		
	5.	The fluid temperature was measured prior to and after the SAR evaluations to ensure the temperature remained within +/-2°C of the fluid temperature reported during the dielectric parameter measurements.																		
	6.	The dielectric parameters of the simulated tissue mixtures were measured prior to the SAR evaluations using a Dielectric Probe Kit and a Network Analyzer (see Appendix C).																		
	7.	The SAR evaluations were performed within 24 hours of the system performance check.																		

Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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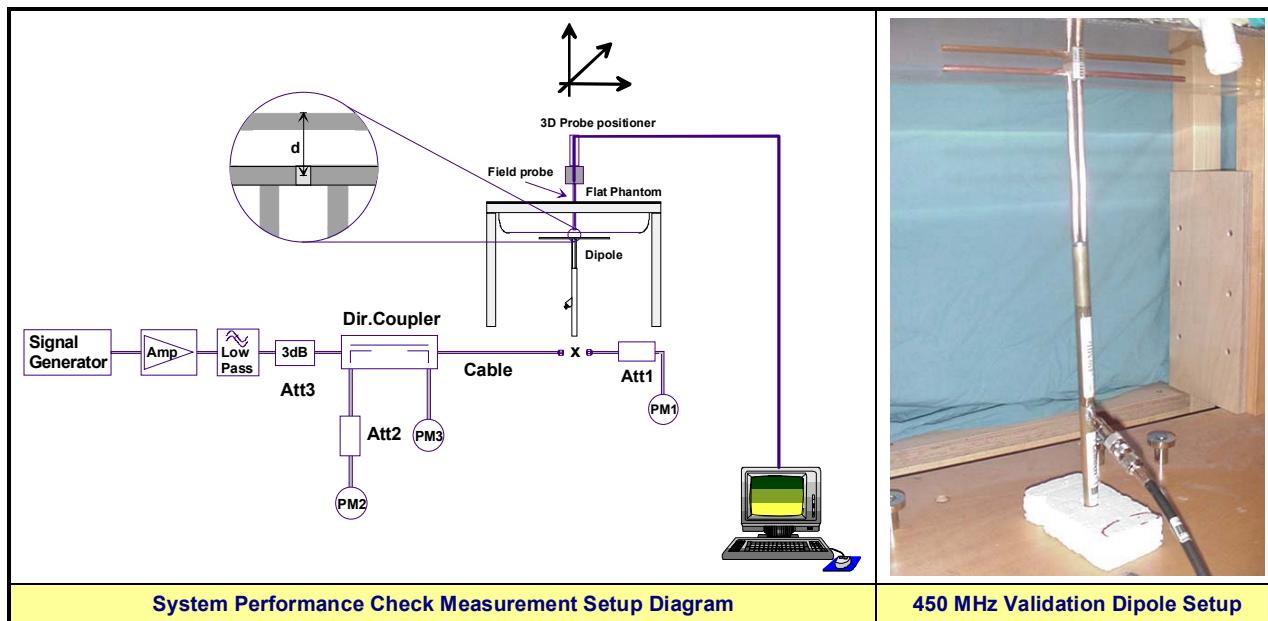
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6.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations a system check was performed using a Plexiglas planar phantom with a 450 MHz dipole (see Appendix B for system performance check test plot). The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer (see Appendix C for measured fluid dielectric parameters). A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of $\pm 10\%$ from the system validation target SAR value (see Appendix E for system validation procedures).

SYSTEM PERFORMANCE CHECK EVALUATION

Test Date	Tissue Freq.	SAR 1g (W/kg)			Dielectric Constant ϵ_r			Conductivity σ (mho/m)			ρ (Kg/m ³)	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
		Brain	Sys. Val.	Meas.	Dev.	Sys. Val.	Meas.	Dev.	Sys. Val.	Meas.	Dev.					
		MHz	Target			Target			Target							
Oct 25	450	1.29 $\pm 10\%$	1.32	+2.4%	43.1 $\pm 5\%$	43.8	+1.7%	0.85 $\pm 5\%$	0.87	+2.4%	1000	22.9	22.8	≥ 15	31	100.4
Note(s)	1. The target SAR value is referenced from the System Validation procedure performed by Celltech Labs Inc. (see Appendix E). 2. The target dielectric parameters are referenced from the System Validation procedure performed by Celltech Labs Inc. (see Appendix E). 3. The fluid temperature was measured prior to and after the system performance check to ensure the temperature remained within $\pm 2^\circ\text{C}$ of the fluid temperature reported during the dielectric parameter measurements. 4. The SAR evaluations were performed within 24 hours of the system performance check.															



Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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7.0 SIMULATED EQUIVALENT TISSUES

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

SIMULATED TISSUE MIXTURES		
INGREDIENT	450 MHz Brain	450 MHz Body
	System Check & DUT Evaluation	DUT 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 %

8.0 SAR LIMITS

SAR RF EXPOSURE LIMITS (W/kg)			
FCC 47 CFR 2.1093	Health Canada Safety Code 6	(General Population / Uncontrolled Exposure)	(Occupational / Controlled Exposure)
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
The Spatial Average value of the SAR averaged over the whole body.			
The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.			
The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.			
Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.			
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.			

Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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January 08, 2008	Specific Absorption Rate	Occupational (Controlled)		Certificate No. 2470.01

15.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION						
Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	ci 1g	Uncertainty Value ±% (1g)	V _i or V _{eff}
Measurement System						
Probe calibration (450 MHz)	8.0	Normal	1	1	8.0	∞
Axial isotropy of the probe	4.7	Rectangular	1.732050808	0.7	1.9	∞
Spherical isotropy of the probe	9.6	Rectangular	1.732050808	0.7	3.9	∞
Spatial resolution	0	Rectangular	1.732050808	1	0.0	∞
Boundary effects	8.2	Rectangular	1.732050808	1	4.7	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0.8	Rectangular	1.732050808	1	0.5	∞
Integration time	2.6	Rectangular	1.732050808	1	1.5	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
Test Sample Related						
Device positioning	2.9	Normal	1	1	2.9	12
Device holder uncertainty	3.6	Normal	1	1	3.6	8
Power drift	5	Rectangular	1.732050808	1	2.9	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	0	Normal	1	0.64	0.0	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	2.5	Normal	1	0.6	1.5	∞
Combined Standard Uncertainty					12.85	
Expanded Uncertainty (k=2)					25.71	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])						

Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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MEASUREMENT UNCERTAINTIES (Cont.)

UNCERTAINTY BUDGET FOR SYSTEM VALIDATION						
Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	ci 1g	Uncertainty Value ±% (1g)	Vi or V _{eff}
Measurement System						
Probe calibration (450 MHz)	8	Normal	1	1	8.0	∞
Axial isotropy of the probe	4.7	Rectangular	1.732050808	1	2.7	∞
Spherical isotropy of the probe	0	Rectangular	1.732050808	1	0.0	∞
Spatial resolution	0	Rectangular	1.732050808	1	0.0	∞
Boundary effects	8.2	Rectangular	1.732050808	1	4.7	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0	Rectangular	1.732050808	1	0.0	∞
Integration time	0	Rectangular	1.732050808	1	0.0	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
Dipole						
Dipole Positioning	2	Normal	1.732050808	1	1.2	∞
Power & Power Drift	4.7	Normal	1.732050808	1	2.7	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	2.4	Normal	1	0.64	1.5	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	1.7	Normal	1	0.6	1.0	∞
Combined Standard Uncertainty					11.47	
Expanded Uncertainty (k=2)					22.94	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])						

Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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16.0 REFERENCES

- [1] Federal Communications Commission - "Radiofrequency radiation exposure evaluation: portable devices", Rule Part 47 CFR §2.1093: 1999.
- [2] Health Canada - "Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz", Safety Code 6: 1999.
- [3] 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.
- [4] Industry Canada - "Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)", Radio Standards Specification RSS-102 Issue 2: November 2005.
- [5] IEEE Standard 1528-2003 - "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques": December 2003.

Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
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	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

APPENDIX A - SAR MEASUREMENT DATA

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Date Tested: 10/25/2007

Face-Held SAR - P7100 (UHF-L) Radio - Helical Coil Antenna (P/N: KRE1011219/10) - 403 MHz

DUT: M/A-COM Model: P7100 (UHF-L); Type: Portable FM UHF-L PTT Radio Transceiver; Serial: T1-L SAR02

Ambient Temp: 22.9°C; Fluid Temp: 22.8°C; Barometric Pressure: 100.4 kPa; Humidity: 31%

Communication System: FM (CW)

Frequency: 403 MHz; Duty Cycle: 1:1

RF Output Power: 4.28 Watts (Conducted)

9V AA Alkaline Battery Pack (Battery Case P/N: BT-013259-001)

Medium: HSL450 Medium parameters used: $f = 403$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 43.8$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1387; ConvF(7, 7, 7); Calibrated: 16/03/2007
- Sensor-Surface: 4 mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 10/07/2007
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 403 MHz

Area Scan (8x25x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 3.41 mW/g

Face-Held SAR - 2.5 cm Spacing from Front of DUT to Planar Phantom - Mid Channel - 403 MHz

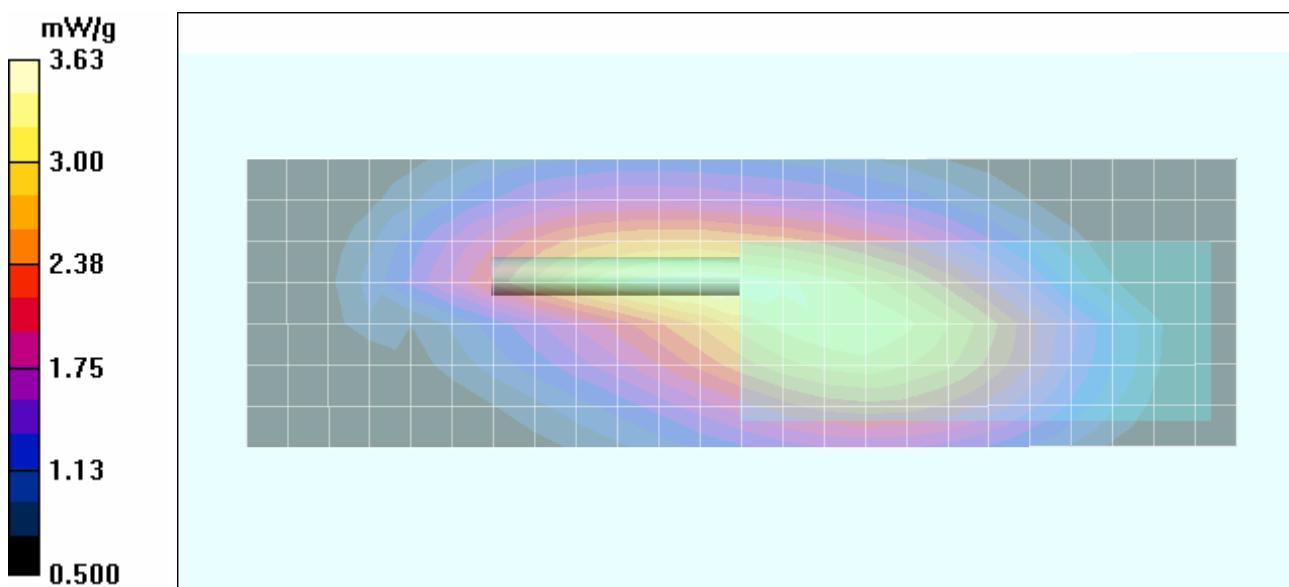
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 64.1 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 5.39 W/kg

SAR(1 g) = 3.48 mW/g; SAR(10 g) = 2.45 mW/g

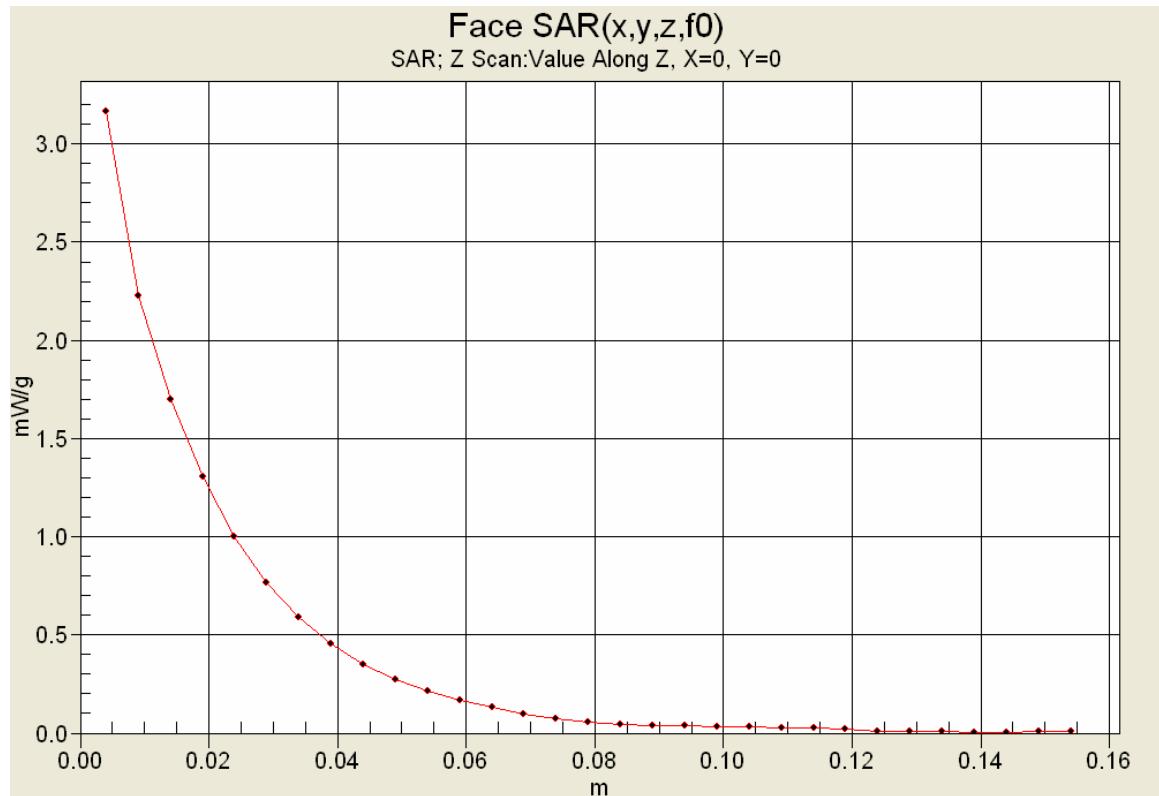
Maximum value of SAR (measured) = 3.63 mW/g



Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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 Celltech <small>Testing and Engineering Services Ltd.</small>	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 1025070WD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	 MRC MRA  ACCREDITED
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Z-Axis Scan



	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 102507OWD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	  Certificate No. 2470.01
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 10/26/2007

Body-Worn SAR - P7100 (UHF-L) Radio - 1/4-Wave Whip Antenna (P/N: KRE1011223/10) - 403 MHz

DUT: M/A-COM Model: P7100 (UHF-L); Type: Portable FM UHF-L PTT Radio Transceiver; Serial: T1-L SAR02

Body-Worn Accessory: Metal Belt-Clip (P/N: CC23894)

Audio Accessory: Speaker-Microphone (P/N: KRY1011617/183)

Ambient Temp: 23.0°C; Fluid Temp: 22.8°C; Barometric Pressure: 100.4 kPa; Humidity: 32%

Communication System: FM (CW)

Frequency: 403 MHz; Duty Cycle: 1:1

RF Output Power: 4.28 Watts (Conducted)

9V AA Alkaline Battery Pack (Battery Case P/N: BT-013259-001)

Medium: M450 Medium parameters used: $f = 403$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 58.1$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1387; ConvF(6.9, 6.9, 6.9); Calibrated: 16/03/2007
- Sensor-Surface: 4 mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 10/07/2007
- Phantom: Side Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body-Worn SAR - 1.1 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 403 MHz

Area Scan (8x26x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 12.2 mW/g

Body-Worn SAR - 1.1 cm Belt-Clip Spacing from Back of DUT to Planar Phantom - Mid Channel - 403 MHz

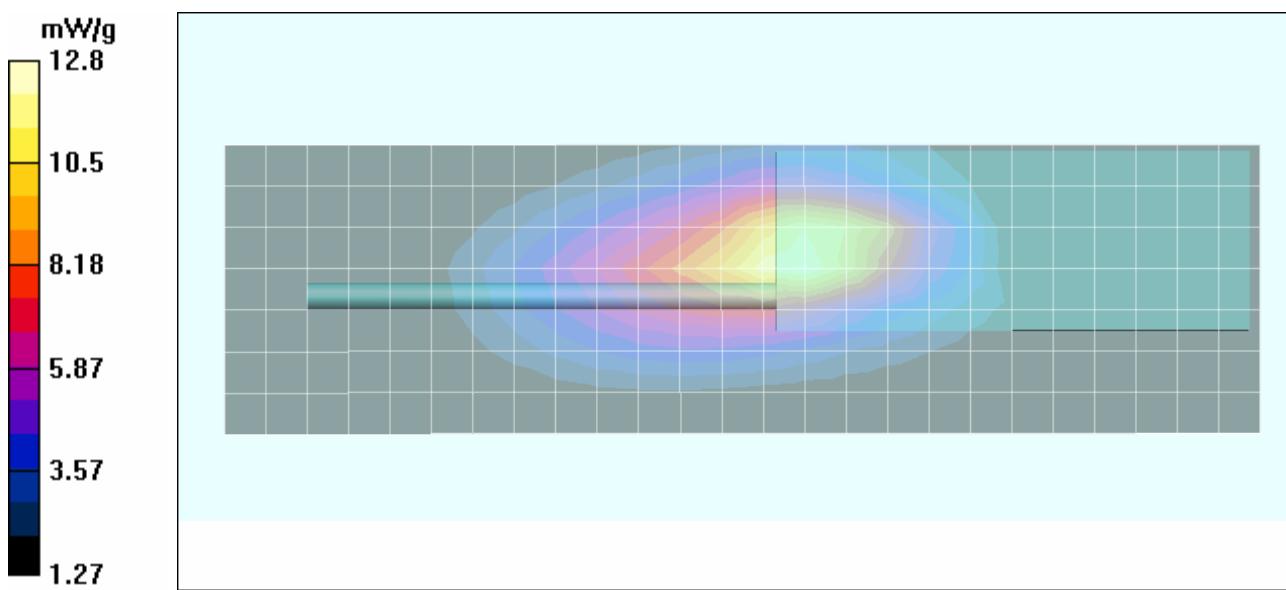
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 113.1 V/m; Power Drift = -0.0310 dB

Peak SAR (extrapolated) = 22.2 W/kg

SAR(1 g) = 12.2 mW/g; SAR(10 g) = 8.2 mW/g

Maximum value of SAR (measured) = 12.8 mW/g



Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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 Celltech <small>Testing and Engineering Services Ltd.</small>	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 1025070WD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	 MRC MRA  ACCREDITED
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 102507OWD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	  Certificate No. 2470.01
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 10/25/2007

System Performance Check - 450 MHz Dipole - HSL

DUT: Dipole 450 MHz; Asset: 00024; Serial: 136; Validation: 07/30/2007

Ambient Temp: 22.9°C; Fluid Temp: 22.8°C; Barometric Pressure: 100.4 kPa; Humidity: 31%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used: $f = 450$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 43.8$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1387; ConvF(7, 7, 7); Calibrated: 16/03/2007
- Sensor-Surface: 4 mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 10/07/2007
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

450 MHz Dipole - System Performance Check/Area Scan (6x11x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.29 mW/g

450 MHz Dipole - System Performance Check/Zoom Scan (5x5x7)/Cube 0:

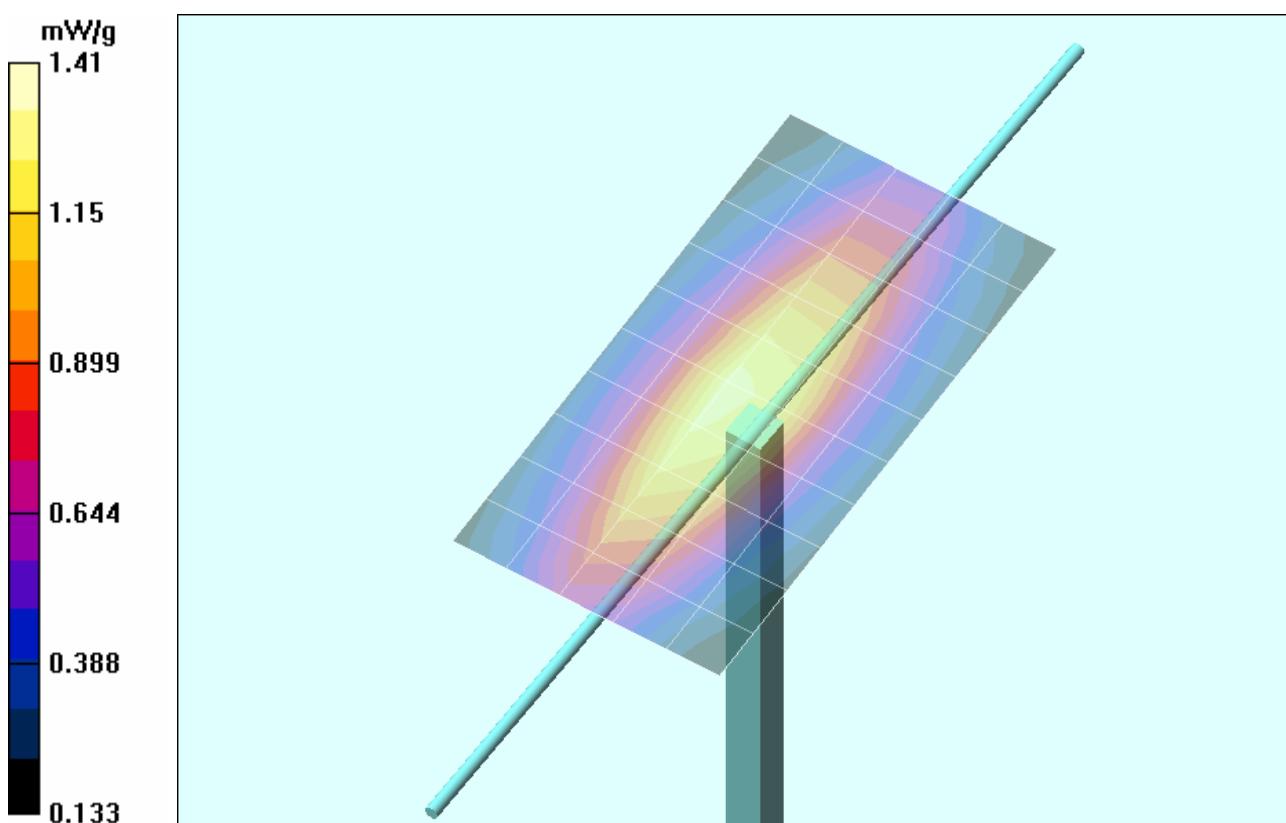
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 39.9 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 2.32 W/kg

SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.847 mW/g

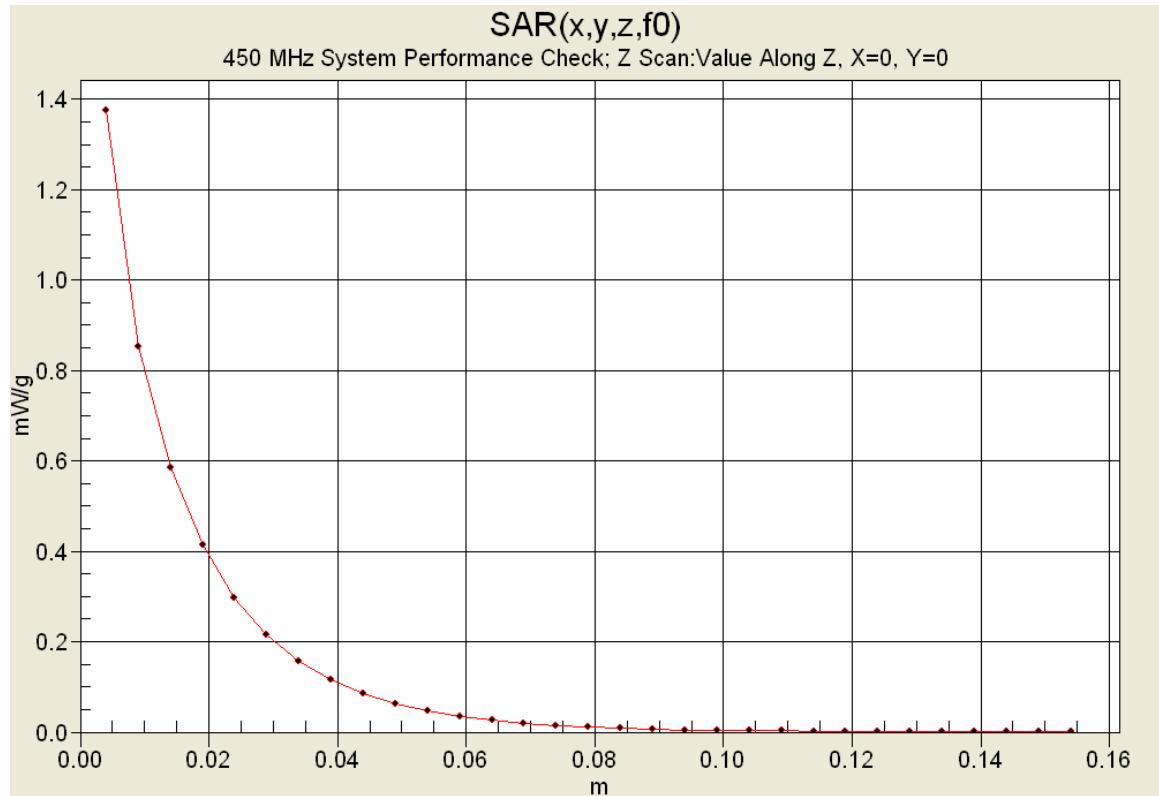
Maximum value of SAR (measured) = 1.41 mW/g



Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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 Celltech <small>Testing and Engineering Services Ltd.</small>	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 1025070WD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	 MRC MRA  ACCREDITED
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Z-Axis Scan



Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					

 Celltech <small>Testing and Engineering Services Ltd.</small>	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 1025070WD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	 MRC MRA  ACCREDITED
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

 Celltech Testing and Engineering Services Ltd	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 102507OWD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	 NAC-MRA ACCREDITED Certificate No. 2470.01
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

450 MHz DUT Evaluation (Body)

Celltech Labs Inc.

Test Result for UIM Dielectric Parameter

Fri 26/Oct/2007

Frequency (GHz)

FCC_eH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma

FCC_eB FCC Limits for Body Epsilon

FCC_sB FCC Limits for Body Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

Freq	FCC_eB	FCC_sB	Test_e	Test_s
0.3000	58.20	0.92	60.52	0.84
0.3100	58.10	0.92	59.81	0.84
0.3200	58.00	0.92	59.98	0.85
0.3300	57.90	0.92	59.63	0.85
0.3400	57.80	0.93	59.51	0.86
0.3500	57.70	0.93	59.58	0.87
0.3600	57.60	0.93	59.51	0.87
0.3700	57.50	0.93	59.24	0.88
0.3800	57.40	0.93	58.83	0.89
0.3900	57.30	0.93	59.22	0.90
0.4000	57.20	0.93	58.85	0.90
0.4100	57.10	0.93	58.78	0.91
0.4200	57.00	0.94	58.68	0.92
0.4300	56.90	0.94	58.55	0.93
0.4400	56.80	0.94	58.34	0.93
0.4500	56.70	0.94	58.13	0.94
0.4600	56.66	0.94	58.20	0.94
0.4700	56.62	0.94	58.12	0.96
0.4800	56.58	0.94	57.97	0.96
0.4900	56.54	0.94	57.97	0.97
0.5000	56.51	0.94	57.84	0.98

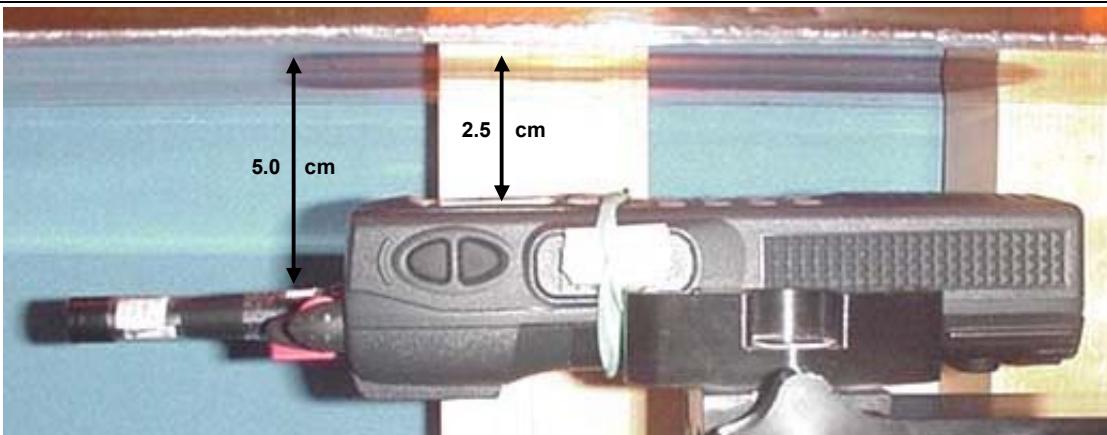
Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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 Celltech <small>Testing and Engineering Services Ltd.</small>	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 1025070WD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	 MRC MRA  ACCREDITED
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

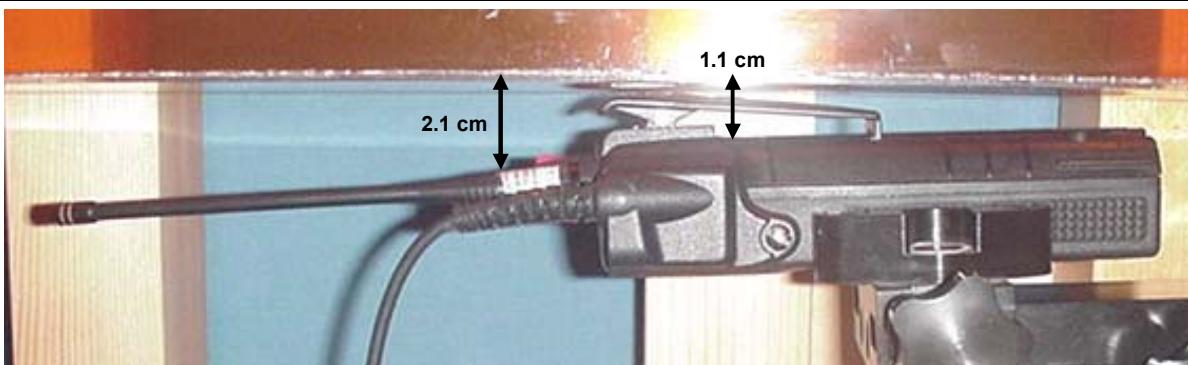
APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS

 Celltech <small>Testing and Engineering Services Ltd.</small>	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 102507OWD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	  Certificate No. 2470.01
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

SAR TEST SETUP PHOTOGRAPHS



DUT with Helical Coil Antenna (P/N: KRE1011219/10) - 2.5 cm Spacing from Front of DUT to Planar Phantom



DUT with 1/4-Wave Whip Antenna (P/N: KRE1011223/10) - 1.1 cm Belt-Clip Spacing from Back of DUT to Planar Phantom

 Celltech <small>Testing and Engineering Services Ltd</small>	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 102507OWD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)



DUT PHOTOGRAPHS



Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 102507OWD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	  Certificate No. 2470.01
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

DUT PHOTOGRAPHS



Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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 Testing and Engineering Services Ltd.	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 102507OWD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	 NAC-MRA
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Certificate No. 2470.01

DUT PHOTOGRAPHS

 Alkaline Battery Pack	 Duracell Procell AA Alkaline Batteries (x6)
--	---

 Alkaline Battery Case (P/N: BT-013259-001)

Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					
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 Celltech <small>Testing and Engineering Services Ltd.</small>	<u>Date(s) of Evaluation</u> October 25-26, 2007	<u>Test Report Serial No.</u> 1025070WD-T868a-S90U	<u>Test Report Revision No.</u> Revision 1.0	 MRC MRA  ACCREDITED
	<u>Test Report Issue Date</u> January 08, 2008	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

APPENDIX E - SYSTEM VALIDATION

Applicant:	M/A-COM, Inc.	FCC ID:	OWDTR-0016-E	IC:	3636B-0016	Freq.:	378 - 430 MHz	
Model(s):	P7100 (UHF-L)	DUT Type:	Portable UHF-L PTT Radio Transceiver with Alkaline Battery Pack					

 Celltech Testing and Engineering Services Ltd.	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
Evaluation Type:	System Validation	Validation Dipole:	450 MHz	Fluid Type: Brain

450 MHz SYSTEM VALIDATION

Type:

450 MHz Validation Dipole

Asset Number:

00024

Serial Number:

136

Place of Validation:

Celltech Labs Inc.

Date of Validation:

July 30, 2007

Celltech Labs Inc. certifies that the 450 MHz System Validation was performed on the date indicated above.

Validated by:

Cheri Frangiadakis

Approved by:

Sean Johnston

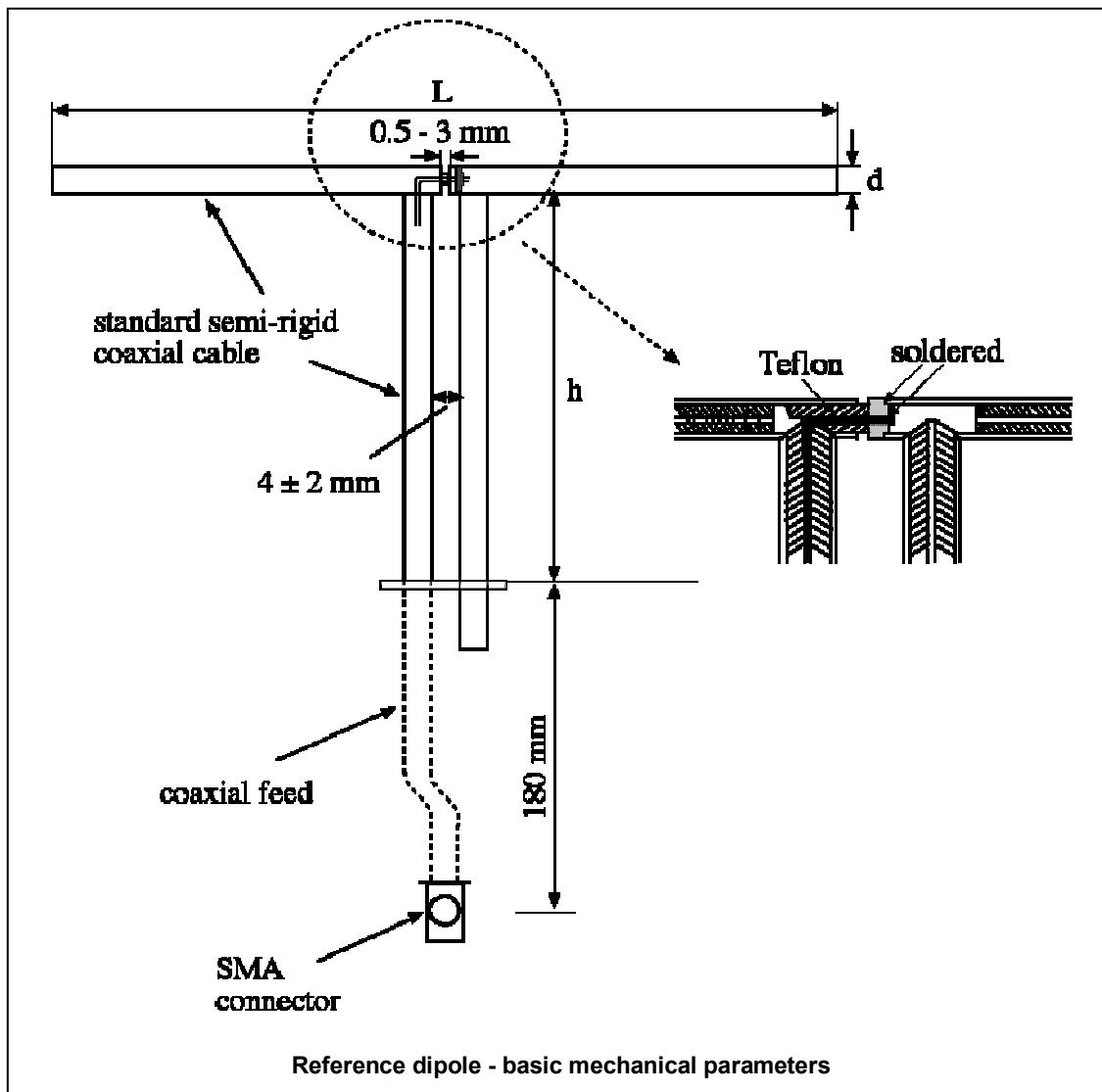
 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

1. Dipole Construction & Electrical Characteristics

The validation dipole was constructed in accordance with the requirements specified in IEEE Standard 1528-2003 and International Standard IEC 62209-1:2005. The electrical properties were measured using an HP 8753ET 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:

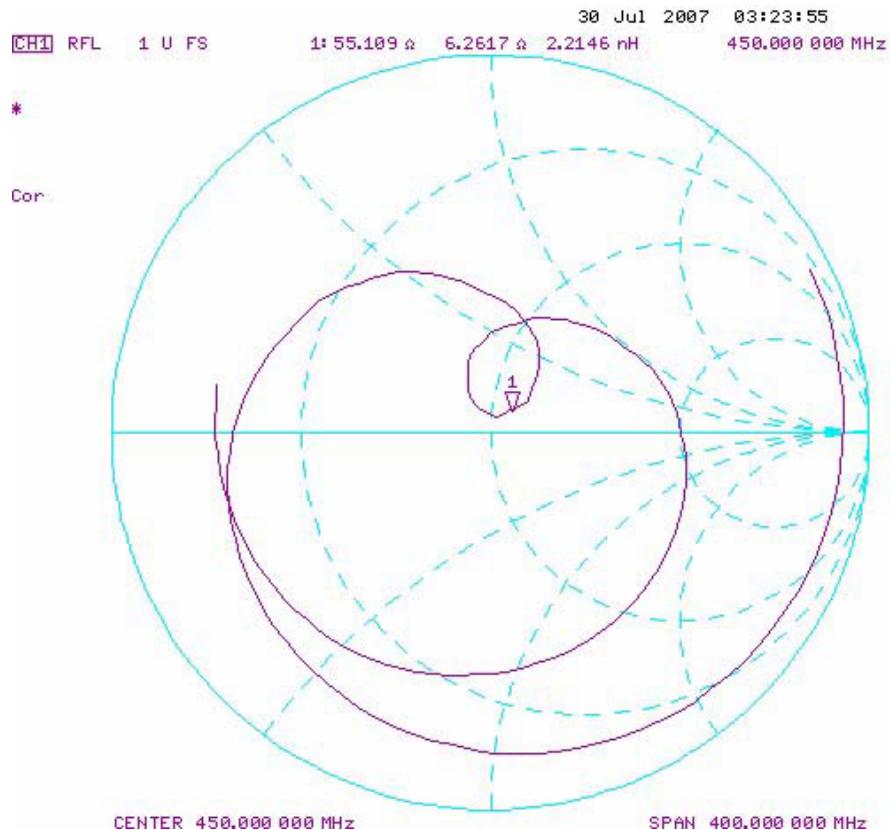
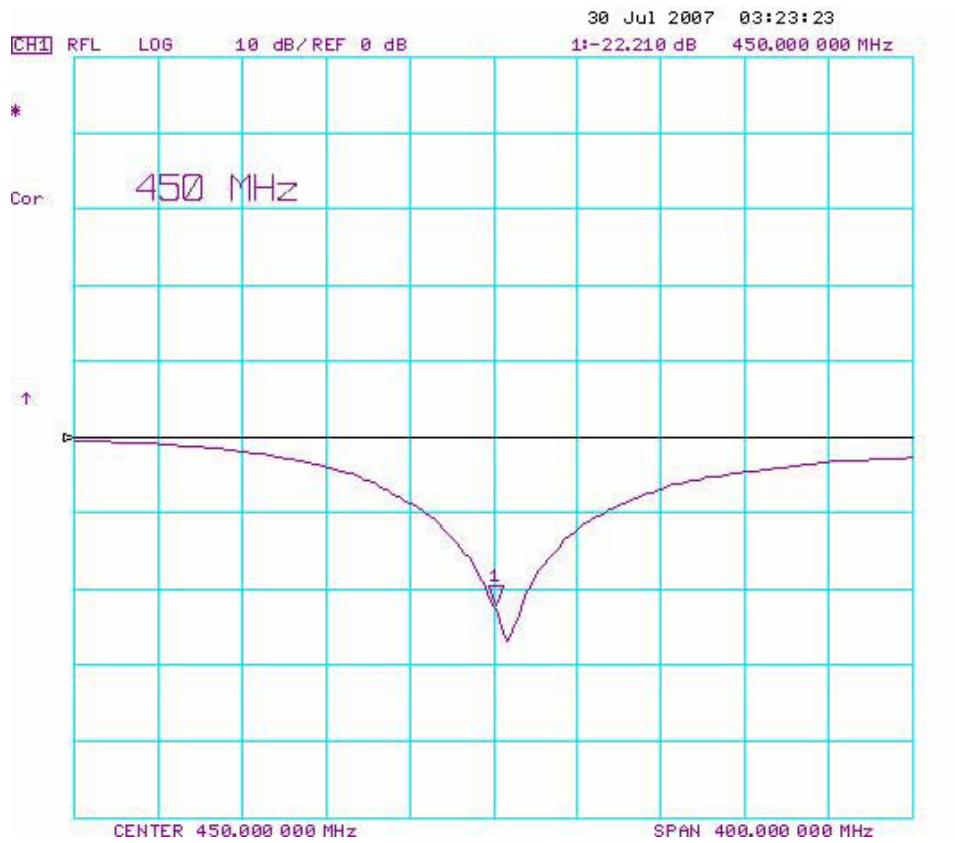
Feed point impedance at 450 MHz $\text{Re}\{Z\} = 55.109\Omega$
 $\text{Im}\{Z\} = 6.2617\Omega$

Return Loss at 450 MHz -22.210dB



 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
	Fluid Type:	Brain		

2. Validation Dipole VSWR Data



 <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
	Fluid Type:	Brain		

3. Validation Dipole Dimensions

Frequency (MHz)	L (mm)	h (mm)	d (mm)
300	396.0	250.0	6.0
450	270.0	167.0	6.0
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	51.5	30.4	3.6
3000	41.5	25.0	3.6

4. Validation Phantom

The validation phantom (planar) was constructed using relatively low-loss tangent Plexiglas material.

The inner dimensions of the validation phantom are as follows:

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

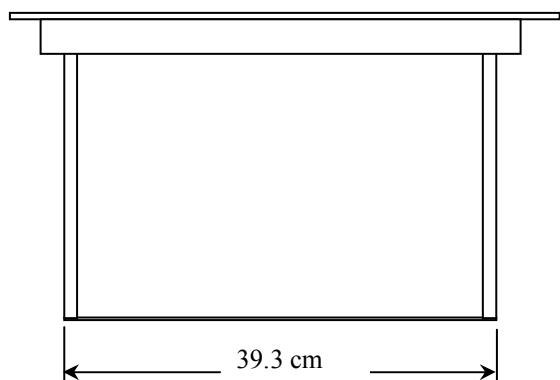
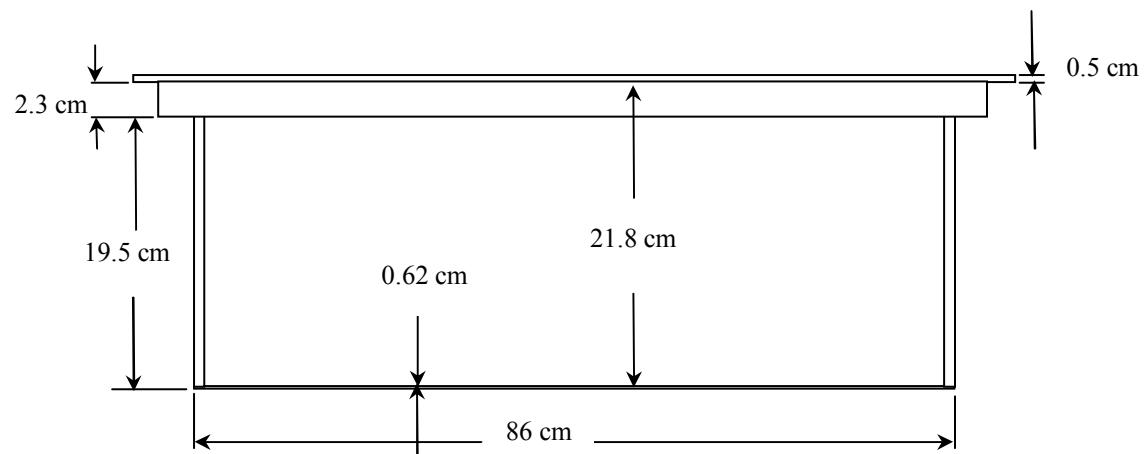
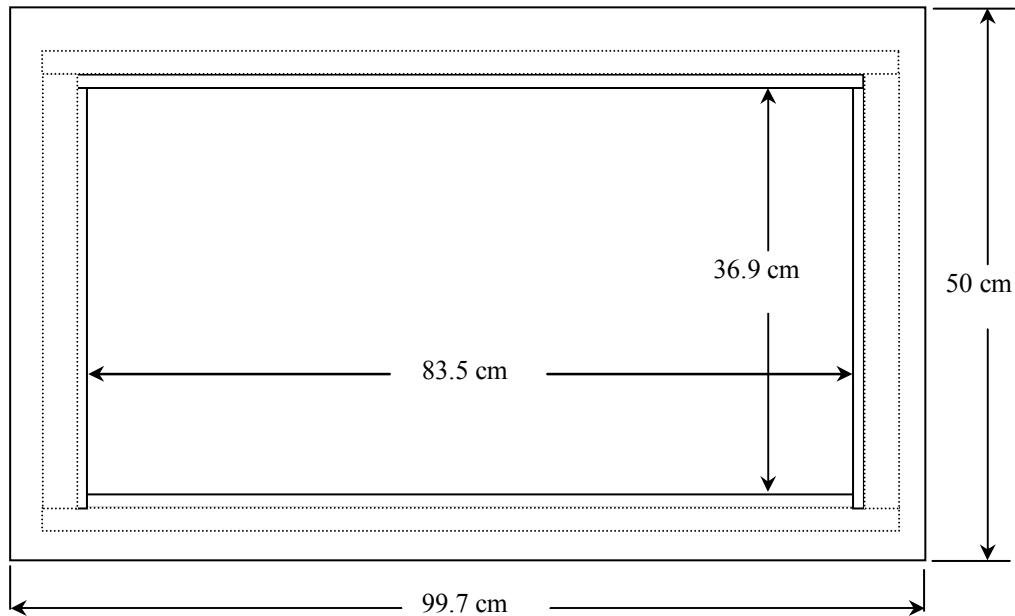
The bottom section of the validation phantom is constructed of 6.2 ± 0.1 mm Plexiglas.

5. Test Equipment List

TEST EQUIPMENT	ASSET NO.	SERIAL NO.	DATE OF CAL.	CAL. DUE DATE
SPEAG DASY4 Measurement Server	00158	1078	N/A	N/A
SPEAG Robot	00046	599396-01	N/A	N/A
SPEAG DAE4	00019	353	10Jul07	10Jul08
SPEAG ET3DV6 E-Field Probe	00016	1387	16Mar07	16Mar08
450 MHz Validation Dipole	00024	136	30Jul07	30Jul08
Plexiglas Validation Planar Phantom	00157	137	N/A	N/A
HP 85070C Dielectric Probe Kit	00033	US39240170	N/A	N/A
Gigatronics 8652A Power Meter	00007	1835272	26Mar07	26Mar08
Gigatronics 80701A Power Sensor	00014	1833699	22Jan07	22Jan08
Gigatronics 80701A Power Sensor	00109	1834366	26Mar07	26Mar08
HP 8753ET Network Analyzer	00134	US39170292	20Apr07	20Apr08
HP 8648D Signal Generator	00005	3847A00611	NCR	NCR
Amplifier Research 5S1G4 Power Amplifier	00106	26235	NCR	NCR

 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

6. Dimensions of Plexiglas Planar Phantom



Celltech Testing and Engineering Services Ltd.	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

7. 450 MHz System Validation Setup



 Celltech Testing and Engineering Services Ltd.	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

8. 450 MHz Validation Dipole Setup

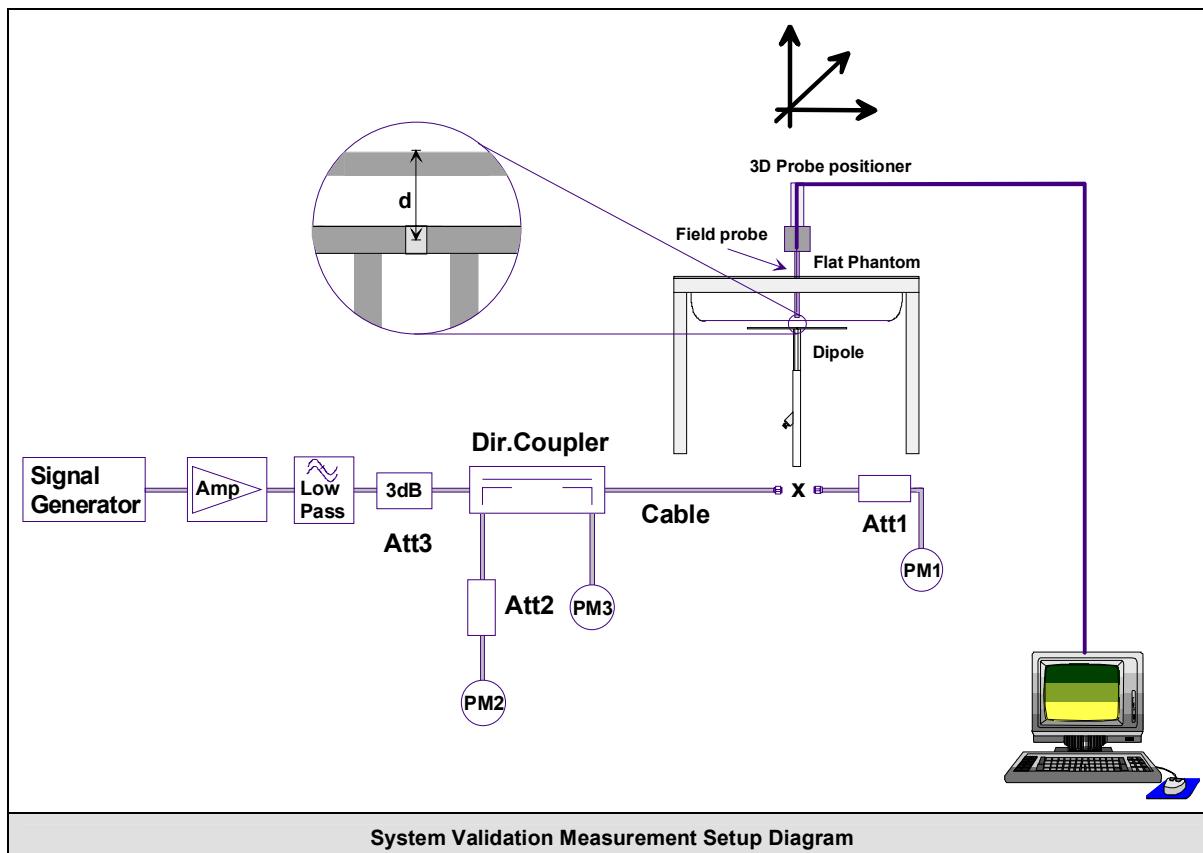


 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
			Fluid Type:	Brain

9. SAR Measurement

Measurements were made using a dosimetric E-field probe ET3DV6 (S/N: 1387, Conversion Factor 7.0). 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 procedures described below.

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.



 Testing and Engineering Services Ltd.	Date of Evaluation:	July 30, 2007		Document Serial No.:	SV450B-073007-R1.2	
	Evaluation Type:	System Validation		Validation Dipole:	450 MHz	Fluid Type:

10. Measurement Conditions

The validation phantom was filled with 450 MHz Brain tissue simulant.

Relative Permittivity: 43.1 (-0.9% deviation from target)
 Conductivity: 0.85 mho/m (-2.3% deviation from target)
 Fluid Temperature: 23.1°C (Start of Test) / 23.3°C (End of Test)
 Fluid Depth: ≥ 15.0 cm

Environmental Conditions:

Ambient Temperature: 24.5°C
 Barometric Pressure: 101.1 kPa
 Humidity: 31%

The 450 MHz Brain tissue simulant consisted of the following ingredients:

Ingredient	Percentage by weight	
Water	38.56%	
Sugar	56.32%	
Salt	3.95%	
HEC	0.98%	
Dowicil 75	0.19%	
IEEE Target Dielectric Parameters:	$\epsilon_r = 43.5 (+/- 5\%)$	$\sigma = 0.87 \text{ S/m} (+/- 5\%)$

11. System Validation SAR Results

SAR @ 0.25W Input averaged over 1g (W/kg)			SAR @ 1W Input averaged over 1g (W/kg)																																																								
IEEE/IEC Target	Measured	Deviation	IEEE/IEC Target	Measured	Deviation																																																						
1.23	+/- 10%	1.29	+4.9%	4.9	+/- 10%																																																						
SAR @ 0.25W Input averaged over 10g (W/kg)			SAR @ 1W Input averaged over 10g (W/kg)																																																								
IEEE/IEC Target	Measured	Deviation	IEEE/IEC Target	Measured	Deviation																																																						
0.825	+/- 10%	0.832	+0.8%	3.3	+/- 10%																																																						
<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>1 g SAR</th> <th>10 g SAR</th> <th>Local SAR at surface (above feed-point)</th> <th>Local SAR at surface (y = 2 cm offset from feed-point)^a</th> </tr> </thead> <tbody> <tr> <td>300</td><td>3.0</td><td>2.0</td><td>4.4</td><td>2.1</td></tr> <tr> <td>450</td><td>4.9</td><td>3.3</td><td>7.2</td><td>3.2</td></tr> <tr> <td>835</td><td>9.5</td><td>6.2</td><td>4.1</td><td>4.9</td></tr> <tr> <td>900</td><td>10.8</td><td>6.9</td><td>16.4</td><td>5.4</td></tr> <tr> <td>1450</td><td>29.0</td><td>16.0</td><td>50.2</td><td>6.5</td></tr> <tr> <td>1800</td><td>38.1</td><td>19.8</td><td>69.5</td><td>6.8</td></tr> <tr> <td>1900</td><td>39.7</td><td>20.5</td><td>72.1</td><td>6.6</td></tr> <tr> <td>2000</td><td>41.1</td><td>21.1</td><td>74.6</td><td>6.5</td></tr> <tr> <td>2450</td><td>52.4</td><td>24.0</td><td>104.2</td><td>7.7</td></tr> <tr> <td>3000</td><td>63.8</td><td>25.7</td><td>140.2</td><td>9.5</td></tr> </tbody> </table>					Frequency (MHz)	1 g SAR	10 g SAR	Local SAR at surface (above feed-point)	Local SAR at surface (y = 2 cm offset from feed-point) ^a	300	3.0	2.0	4.4	2.1	450	4.9	3.3	7.2	3.2	835	9.5	6.2	4.1	4.9	900	10.8	6.9	16.4	5.4	1450	29.0	16.0	50.2	6.5	1800	38.1	19.8	69.5	6.8	1900	39.7	20.5	72.1	6.6	2000	41.1	21.1	74.6	6.5	2450	52.4	24.0	104.2	7.7	3000	63.8	25.7	140.2	9.5
Frequency (MHz)	1 g SAR	10 g SAR	Local SAR at surface (above feed-point)	Local SAR at surface (y = 2 cm offset from feed-point) ^a																																																							
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Numerical reference SAR values for reference dipole and flat phantom normalized to 1 W (IEEE 1528-2003; IEC 62209-1:2005)																																																											

 Celltech <small>Testing and Engineering Services Ltd.</small>	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
	Fluid Type:	Brain		

System Validation - 450 MHz Dipole - July 30, 2007 - HSL

DUT: Dipole 450 MHz; Asset: 00024; Serial: 136; Validation: 07/30/2007

Ambient Temp: 24.5°C; Fluid Temp: 23.1°C; Barometric Pressure: 101.1 kPa; Humidity: 31%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used: $f = 450$ MHz; $\sigma = 0.85$ mho/m; $\epsilon_r = 43.1$; $\rho = 1000$ kg/m³

- Probe: ET3DV6 - SN1387; ConvF(7, 7, 7); Calibrated: 16/03/2007
- Sensor-Surface: 4 mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 10/07/2007
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

450 MHz Dipole - System Validation/Area Scan (6x11x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.35 mW/g

450 MHz Dipole - System Validation/Zoom Scan (5x5x7)/Cube 0:

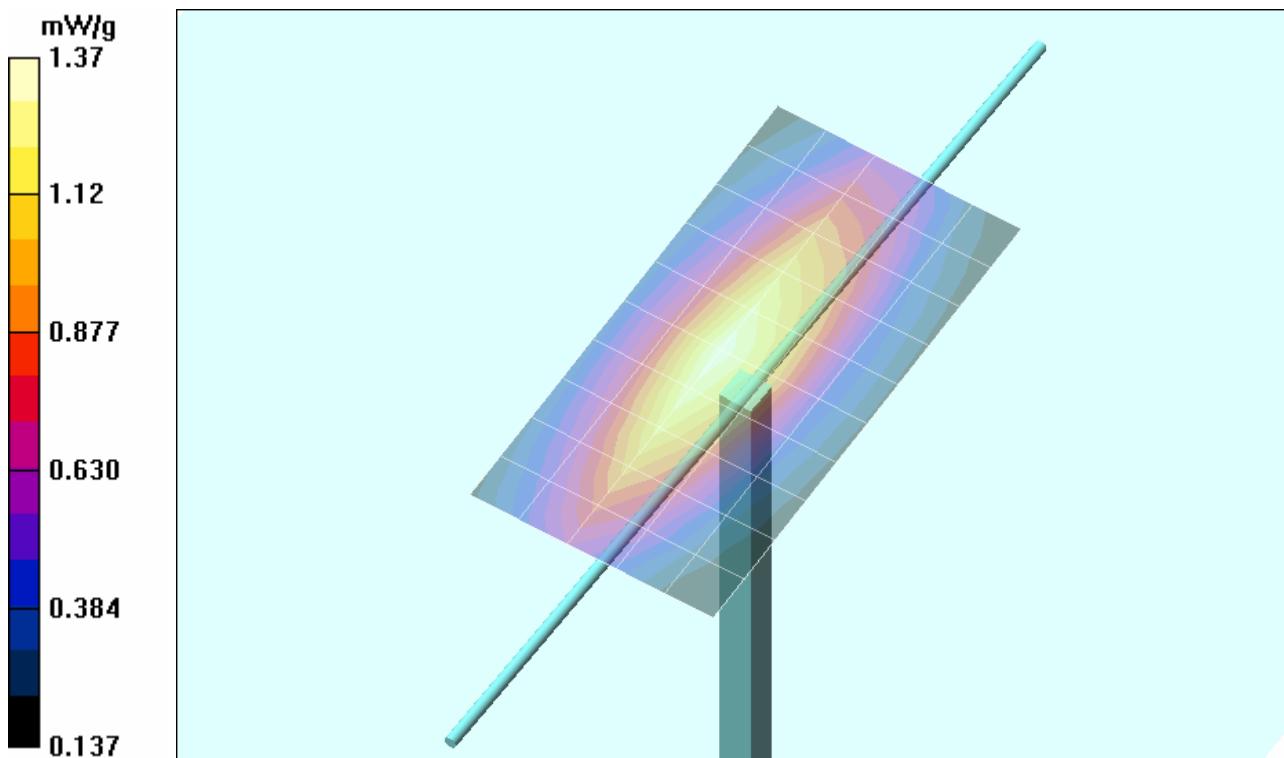
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 39.3 V/m; Power Drift = 0.042 dB

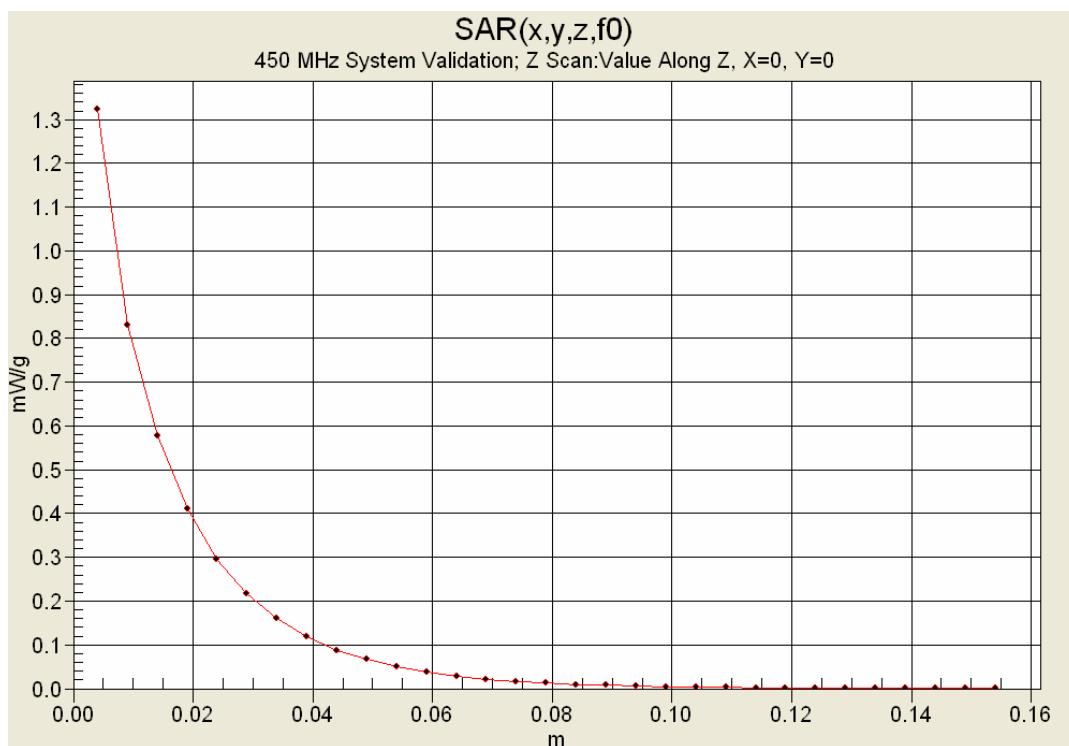
Peak SAR (extrapolated) = 2.24 W/kg

SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.832 mW/g

Maximum value of SAR (measured) = 1.37 mW/g



 Celltech Testing and Engineering Services LLC	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
	Fluid Type:	Brain		



12. Measured Fluid Dielectric Parameters

System Validation - 450 MHz (Brain)

Celltech Labs Inc.

Test Result for UIM Dielectric Parameter

Mon 30/Jul/2007

Frequency (GHz)

FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon

FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma

Test_e Epsilon of UIM

Test_s Sigma of UIM

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.3500	44.70	0.87	45.67	0.76
0.3600	44.58	0.87	45.22	0.77
0.3700	44.46	0.87	45.13	0.78
0.3800	44.34	0.87	44.88	0.79
0.3900	44.22	0.87	44.58	0.80
0.4000	44.10	0.87	44.42	0.81
0.4100	43.98	0.87	44.21	0.82
0.4200	43.86	0.87	43.93	0.82
0.4300	43.74	0.87	43.66	0.83
0.4400	43.62	0.87	43.15	0.84
0.4500	43.50	0.87	43.09	0.85
0.4600	43.45	0.87	42.96	0.86
0.4700	43.40	0.87	42.63	0.87
0.4800	43.34	0.87	42.72	0.87
0.4900	43.29	0.87	42.45	0.89
0.5000	43.24	0.87	42.18	0.90
0.5100	43.19	0.87	42.03	0.90
0.5200	43.14	0.88	41.77	0.91
0.5300	43.08	0.88	41.78	0.92
0.5400	43.03	0.88	41.42	0.93
0.5500	42.98	0.88	41.19	0.93

 Testing and Engineering Services LLC	Date of Evaluation:	July 30, 2007	Document Serial No.:	SV450B-073007-R1.2
	Evaluation Type:	System Validation	Validation Dipole:	450 MHz
	Fluid Type:	Brain		

13. Measurement Uncertainties

UNCERTAINTY BUDGET FOR SYSTEM VALIDATION						
Error Description	Uncertainty Value $\pm\%$	Probability Distribution	Divisor	c_i 1g	Uncertainty Value $\pm\%$ (1g)	V_i or V_{eff}
Measurement System						
Probe calibration (450 MHz)	8	Normal	1	1	8.0	∞
Axial isotropy of the probe	4.7	Rectangular	1.732050808	1	2.7	∞
Spherical isotropy of the probe	0	Rectangular	1.732050808	1	0.0	∞
Spatial resolution	0	Rectangular	1.732050808	1	0.0	∞
Boundary effects	8.2	Rectangular	1.732050808	1	4.7	∞
Probe linearity	4.7	Rectangular	1.732050808	1	2.7	∞
Detection limit	1	Rectangular	1.732050808	1	0.6	∞
Readout electronics	0.3	Normal	1	1	0.3	∞
Response time	0	Rectangular	1.732050808	1	0.0	∞
Integration time	0	Rectangular	1.732050808	1	0.0	∞
RF ambient conditions	3	Rectangular	1.732050808	1	1.7	∞
Mech. constraints of robot	0.4	Rectangular	1.732050808	1	0.2	∞
Probe positioning	2.9	Rectangular	1.732050808	1	1.7	∞
Extrapolation & integration	1	Rectangular	1.732050808	1	0.6	∞
Dipole						
Dipole Positioning	2	Normal	1.732050808	1	1.2	∞
Power & Power Drift	4.7	Normal	1.732050808	1	2.7	∞
Phantom and Setup						
Phantom uncertainty	4	Rectangular	1.732050808	1	2.3	∞
Liquid conductivity (target)	5	Rectangular	1.732050808	0.64	1.8	∞
Liquid conductivity (measured)	2.3	Normal	1	0.64	1.5	∞
Liquid permittivity (target)	5	Rectangular	1.732050808	0.6	1.7	∞
Liquid permittivity (measured)	1	Normal	1	0.6	0.6	∞
Combined Standard Uncertainty						
Expanded Uncertainty (k=2)						
Measurement Uncertainty Table in accordance with IEEE 1528-2003 and IEC 62209-1:2005						