



Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

1250 Peterson Dr., Wheeling, IL 60090

FCC Rules and Regulations / Intentional Radiators

Low Power Auxiliary Stations

Part 74, Subpart H, Sections 74.801 - 74.882

Part 74.861 (d) Other Than TV Broadcasting

THE FOLLOWING "**MEETS**" THE ABOVE TEST SPECIFICATION

Formal Name: PSM400 Wireless Personal Monitor
Kind of Equipment: Wireless Personal Monitor Transmitter
Test Configuration: Through shielded audio frequency cables (Tested at 120 vac, 60 Hz)
Model Number(s): P4T-X1
Model(s) Tested: P4T-X1
Serial Number(s): NA
Date of Tests: June 25, 26, 29, 2007
Test Conducted For: Shure Inc.
5800 Touhy Avenue
Niles, Illinois 60714

NOTICE: "This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government". Please see the "Additional Description of Equipment Under Test" page listed inside of this report.

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SIGNATURE PAGE

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William Stumpf
OATS Manager

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Shure Inc.



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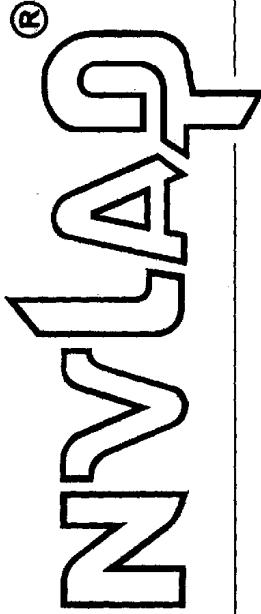
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United States Department of Commerce
 National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.
 Wheeling, IL

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
 listed on the Scope of Accreditation, for:*

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
 This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
 management system (refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005).*



2006-10-01 through 2007-09-30
 Effective dates

Dolly A. Bruce
 For the National Institute of Standards and Technology

NVLAP-01C (REV. 2006-09-13)



Company: Shure Inc.
Model Tested: P4T-X1
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1.0 SUMMARY OF TEST REPORT

It was found that the PSM400 Wireless Personal Monitor, Model Number(s) P4T-X1, "**meets**" the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Section 74.861 (d), for low power auxiliary stations.

2.0 INTRODUCTION

On June 25, 26, 29, 2007, a series of radio frequency interference measurements was performed on PSM400 Wireless Personal Monitor, Model Number(s) P4T-X1, Serial Number: NA. The tests were performed according to the procedures of the FCC as stated in Part 2 - Frequency Allocations and Radio Treaty Matters: General Rules and Regulations, Subpart J, Equipment Authorization Procedures of the Code of Federal Regulations 47. Tests were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO Guide 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI. All immunity tests were performed by personnel of D.L.S. Electronic Systems, Inc. at the following location(s):

Main Test Facility:
D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, Illinois 60090

3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency interference requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Section 74.861 (d), for low power auxiliary stations.



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4.0 TEST SET-UP

All tests were performed at D.L.S. Electronic Systems, Inc. and set up according to the American National Standards Institute, ANSI C63.4-2003, Section 7, (Figures 10a, 10b, 10c and 10d). The conducted tests if required were performed with the test item placed on a non-conductive table (table top equipment), located in the test room. Equipment normally operated on the floor was tested by placing it on the metal ground plane. The ground plane has an electrical isolation layer over its surface approximately 7mm thick. The power line supplied was connected to a dual line impedance stabilization network electrically bonded to the ground plane, located on the floor. The networks were constructed per the requirements of the American National Standards Institute, ANSI C63.4-2003, Section 4, (Figure 2).

All radiated emissions tests were performed with the test item placed on a 80 cm high rotating non-conductive table, located in the test room. Equipment normally operated on the floor was placed on a metal covered turntable, which is flush with the surrounding conducting ground plane. The ground plane has an electrical isolation layer over its surface approximately 7 mm thick. The EUT is separated from the turntable ground plane by a non-conductive layer. The equipment under test was set up according to ANSI C63.4-2003, Sections 6 and 8.



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5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the HP Spectrum Analyzer or ESI 26/ESI 40 Fixed Tuned Receiver. The data was taken using Peak, Quasi-Peak or the Average Detector Functions as required. This information was then used to determine the frequencies of maximum emissions. Above 1000 MHz, final data was taken using the Average Detector.

Below 1000 MHz, final data was taken using the HP Spectrum Analyzer and or ESI 26/ESI 40 fixed tuned receiver. These plots were made using the Peak or Quasi-Peak Detector functions, with manual measurements performed on the questionable frequencies using the Quasi-Peak or the Average Detector Function of the Analyzer or ESI 26/ESI 40 Receiver as required. Above 1000 MHz, final data was taken using the Average Detector on the ESI 26/ESI 40 Fixed Tuned Receiver.

The bandwidths shown below are specified by ANSI C63.4-2003, Section 4.2.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

A list of the equipment used can be found in Table 1. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.



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6.0 AMBIENT MEASUREMENTS

For emissions measurements, broadband antennas and an EMI Test Receiver with a panoramic spectrum display are used. First the frequency range is scanned and displayed on the test receiver display. Next the scanned frequency range is divided into smaller ranges, and then it is manually tuned through to determine the emissions from the EUT. A headset or loudspeaker is connected to the test receiver's AM/FM demodulated output as an aid in detecting ambient signals and finding frequencies of significant emission from the EUT. If there is any doubt as to the source of the emission, it is further investigated by rotating the EUT, or by disconnecting the power from the EUT.

The EUT is set up in its typical configuration and operated in its various modes. For tabletop systems, cables are manipulated within the range of likely configurations. For floor-standing equipment, the cables or are located in the same manner as the user would install them and no further manipulation is made. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions. For each mode of operation, the frequency spectrum is monitored. Variations in antenna height, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) are explored to produce the emission that has the highest amplitude relative to the limit. These methods are performed to the specifications in ANSI C63.4: 2003.



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7.0 CONDUCTED EMISSION MEASUREMENTS – Part 15.207

Conducted emissions were measured over the frequency range from 150 kHz to 30 MHz in accordance with the power line measurements as specified in FCC Part 15, Subpart C, Section 15.207 & ANSI C63.4-2003. Since the device is operated from the public utility lines, the 120 Vac, 60 Hz power leads, high (hot) and low (neutral) sides, were measured by connecting the measuring equipment to the appropriate meter terminal of the LISN. During the test, the cables were placed and items moved (when appropriate) to maximize emissions. All signals were then recorded. The allowed levels for Intentional Radiators which is designed to be connected to the public utility (AC) power line cannot exceed the following:

Frequency of Emissions (MHz)	Conducted Limits (dBuV)	
	Quasi Peak	Average
.15 to .5	66 to 56	56 to 46
.5 to 5	56	46
5 to 30	60	50

NOTE:

All test measurements were made at a screen room temperature of **74°F** at **52%** relative humidity.



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8.0 DESCRIPTION OF TEST SAMPLE: (See also Paragraph 9.0)

8.1 Description:

The PSM400 system, P4T Transmitter and P4R Receiver, is a frequency-agile, in-ear monitoring system for use in a wide variety of applications. Its many features help overcome the difficulties associated with stage monitoring.

The P4T Transmitter is another breakthrough design for in-ear monitoring. It allows the user to connect two line-level inputs directly into the transmitter. The P4T-X1 operates from 944 MHz to 952 MHz, using frequency modulation. It is powered by an external linear 120VAC to 15VDC power supply.

A Shure FP33 Microphone Mixer with its internal 1 kHz generator, will supply an audio signal to the two P4T input ports, 1/L and 2/R. The P4T LOOP OUT output ports will be connected to the Shure FP33 input ports, which provide proper loading. All audio cables are shielded.

8.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 220mm x Width: 137mm x Height: 44mm

8.3 LINE FILTER USED:

None

8.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

N/A

Clock Frequencies:

38 kHz and 4 MHz

8.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. Unpopulated PCB
2. Populated PCB

PN: 34A10587
PN: 90AC10586



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9.0 ADDITIONAL DESCRIPTION OF TEST SAMPLE:
(See also Paragraph 8.0)

1: There were no additional descriptions noted at the time of test.

I certify that the above, combined with paragraph 8.0, describes the equipment tested and that the equipment will be manufactured as stated.

By: _____
Signature Title

For: _____
Company Date



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10.0 PHOTO INFORMATION AND TEST SET-UP

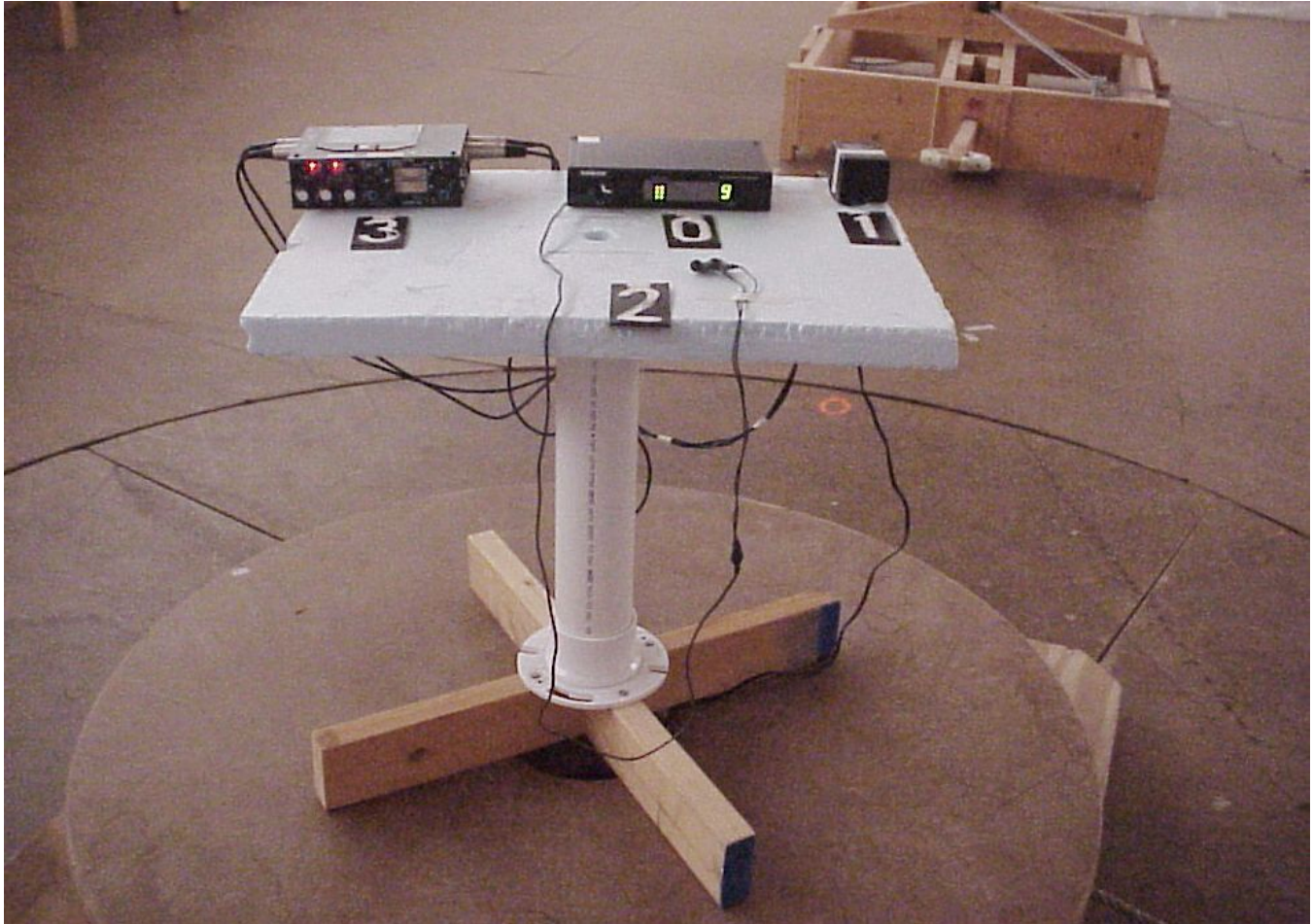
- Item 0 PSM400 Wireless Personal Monitor
Model Number: P4T-X1 Serial Number: NA
- Item 1 Shure Power Supply
Model Number: PS40
- Item 2 Shure Earphones
Model Number: E3
- Item 3 Shure Mixer
Model Number: FP33
- Item 4 50 Ohm termination
- Item 5 Two Shielded Input Cables with Metal Shells. 1.1m
- Item 6 Two Shielded Output Cables with Metal Shells. 1.1m



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11.0 RADIATED PHOTOS TAKEN DURING TESTING

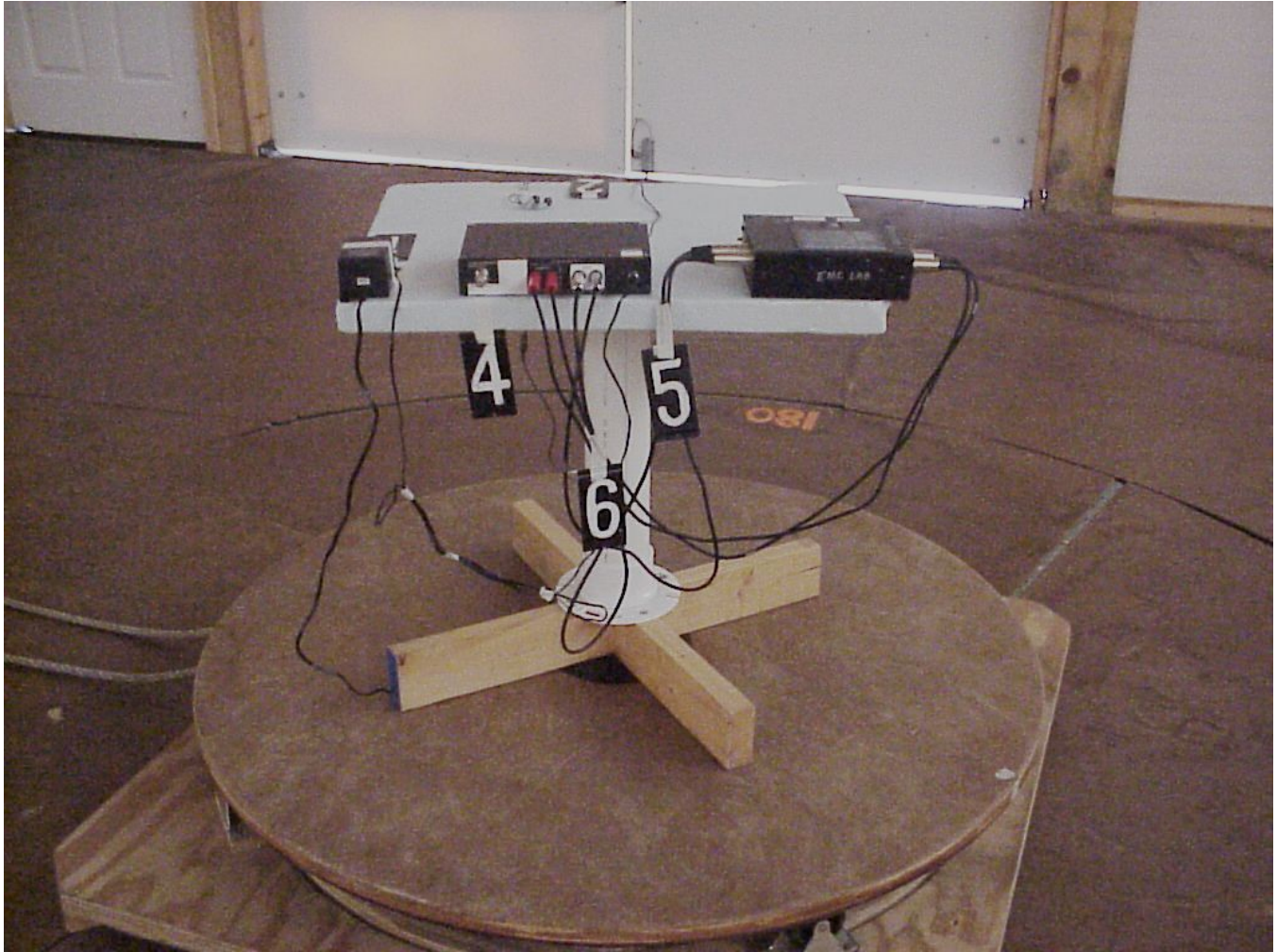




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11.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)





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11.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)



**RF CONDUCTED SPURIOUS EMISSIONS AT
THE ANTENNA TERMINALS**



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11.0 CONDUCTED PHOTOS TAKEN DURING TESTING





Company: Shure Inc.
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12.0 RESULTS OF TESTS

The radio interference emission charts can be seen on the pages at the end of this report. Data sheets indicating the test measurements taken during testing can also be found at the end of this report.

13.0 CONCLUSION

It was found that the PSM400 Wireless Personal Monitor, Model Number(s) P4T-X1 "**meets**" the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Section 74.861 (d), for low power auxiliary stations.



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TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	11/07
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	12/07
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	12/07
Antenna	EMCO	3104C	00054891	20 MHz – 200 MHz	2/08
Antenna	Electrometrics	LPA-25	1114	200 MHz – 1 GHz	3/08
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3/08
Antenna	Electrometrics	3146	1205	200 MHz – 1 GHz	3/08
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	2/08
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	3/08
Antenna	EMCO	3115	2479	1 GHz – 18 GHz	5/08
Antenna	EMCO	3115	99035731	1 GHz – 18 GHz	6/08
Antenna	Rohde & Schwarz	HUF-Z1	829381001	20 MHz – 1 GHz	2/08
Antenna	Rohde & Schwarz	HUF-Z1	829381005	20 MHz – 1 GHz	8/07

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.



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TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
LISN	Solar	8012-50-R-24-BNC	8305116	10 MHz – 30 MHz	8/07
LISN	Solar	8012-50-R-24-BNC	814548	10 MHz – 30 MHz	8/07
LISN	Solar	9252-50-R-24-BNC	961019	10 MHz – 30 MHz	12/07
LISN	Solar	9252-50-R-24-BNC	971612	10 MHz – 30 MHz	10/07
LISN	Solar	9252-50-R-24-BNC	92710620	10 MHz – 30 MHz	7/07

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.



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APPENDIX A

TEST PROCEDURE

SUBPART H

LOW POWER AUXILIARY STATIONS



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APPENDIX A

1.0 TEST SET-UP

All radiated emission tests were performed at D.L.S. Electronic Systems, Inc. The radiated tests were made with the test item placed on a non-conductive turntable located in the Test Room with the receive antenna placed three or one meter(s) from the device under test.

2.0 RF-POWER OUTPUT – PART 2.1046

As stated in PART 74.861 (d-1), the RF output power should not exceed 1 watt. The RF output power was measured with the transmitter unmodulated. The RF output power was measured using the substitution method because there is no antenna port for a direct connection. The RF output power was measured using the following test method:

Actual Measurements Taken:

16.56 dBm Measured output of the transmitter
16.56 dBm equals 0.0453 watts

LIMIT:

Manufacturer's rated output power = 15 dBm \pm 2 dB = 20 mW min to 50 mW max

MARGIN:

1 - 0.0453 = .9547 watts



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APPENDIX A

GRAPH(S) TAKEN OF THE RF POWER

OUTPUT MEASUREMENT

PART 2.1046



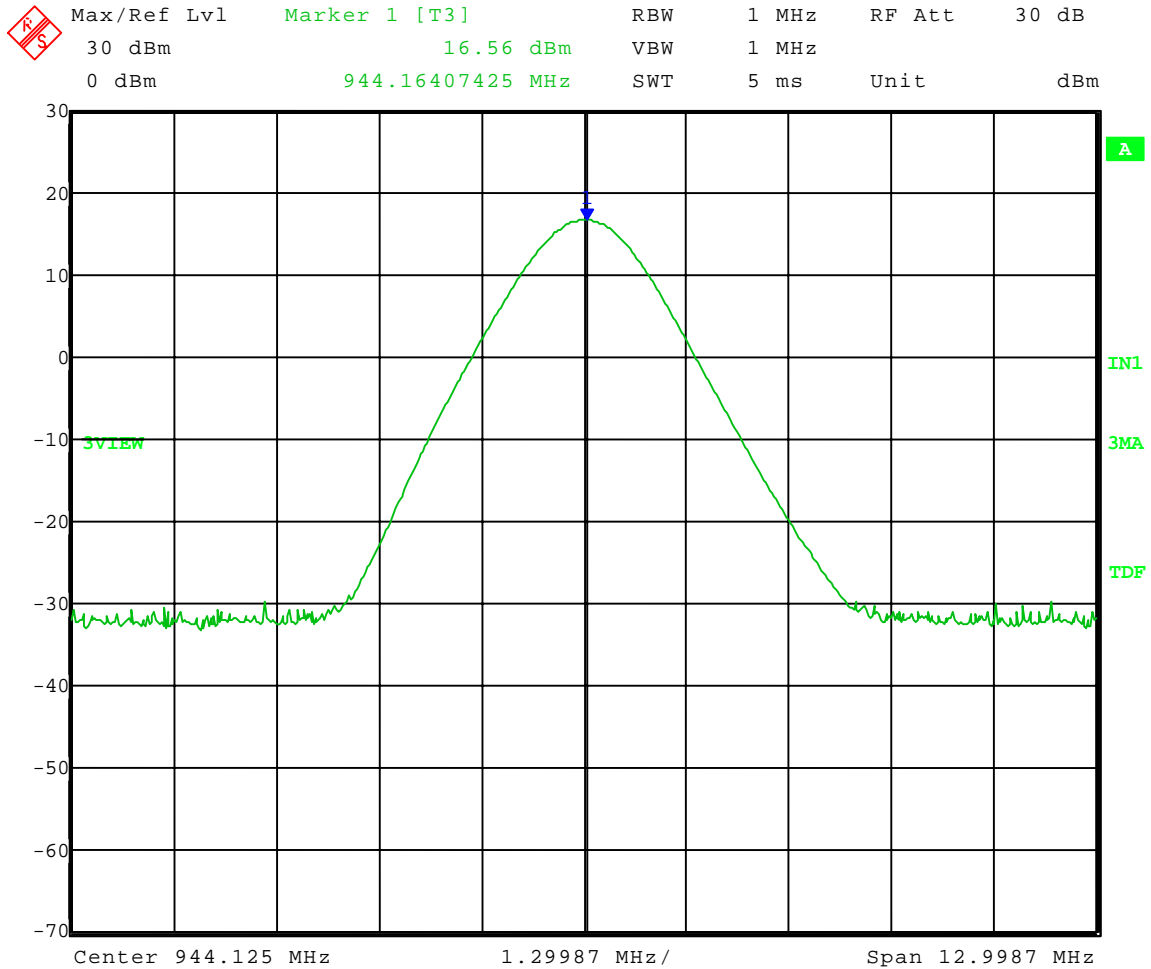
Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

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APPENDIX A

Test Date: 06-26-2007
Company: Shure, Inc.
EUT: P4T
Test: **Peak Power Output** - Conducted
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Craig B
Comment: Channel A: **944.125 MHz**

Peak Output Power = 16.56 dBm = 45.3 mW



Date: 26.JUN.2007 09:55:48



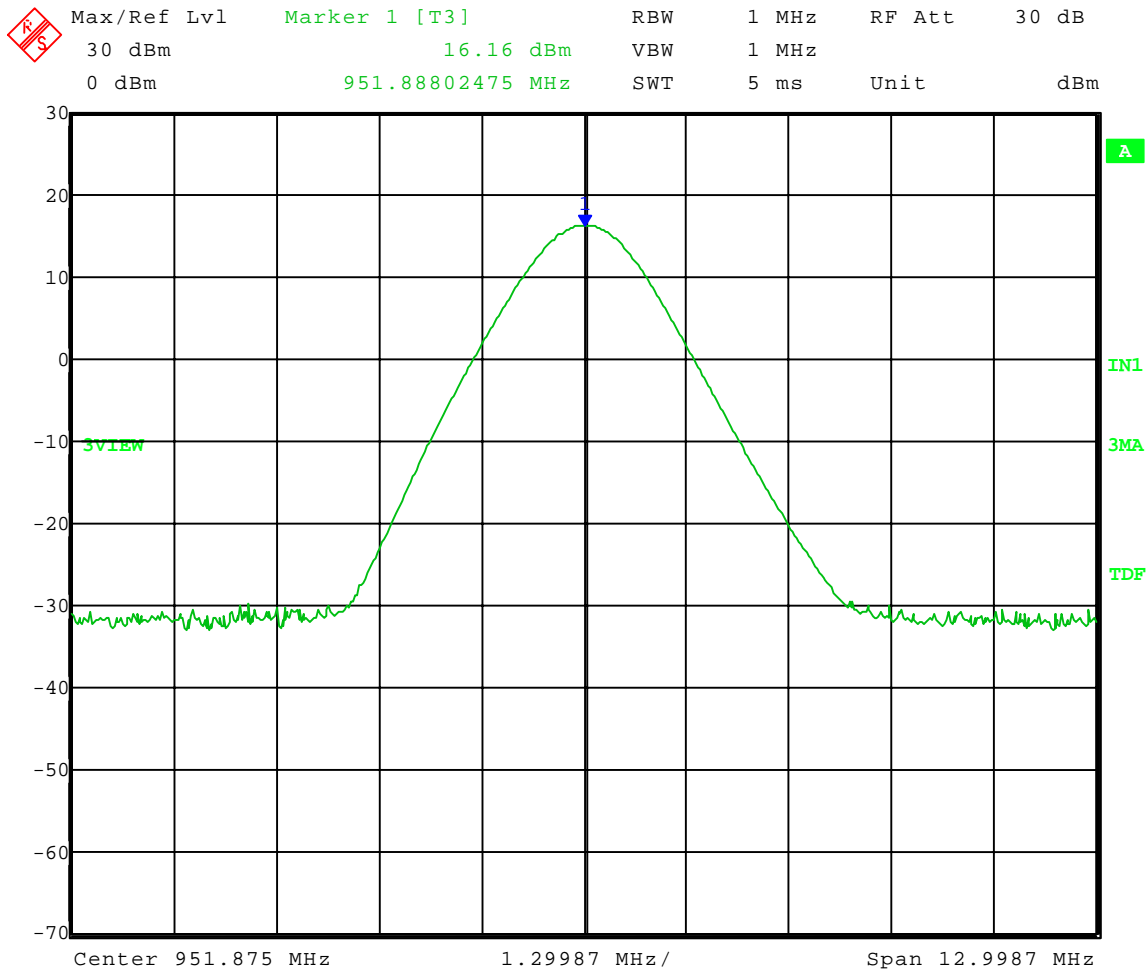
Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

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APPENDIX A

Test Date: 06-26-2007
Company: Shure, Inc.
EUT: P4T
Test: **Peak Power Output** - Conducted
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Craig B
Comment: Channel 9: **951.875 MHz**

Peak Output Power = 16.16 dBm = 41.3 mW



Date: 26.JUN.2007 09:53:31



Company: Shure Inc.
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APPENDIX A

3.0 MODULATION CHARACTERISTICS – PART 2.1047

- a. Voice modulated communication equipment.

A curve showing the frequency response of the audio modulating circuit over a range of 50 Hz - 12 kHz is submitted with this report.

- b. Equipment which employs modulation limiting

A family of curves showing the percentage of modulation versus the modulation input voltage with sufficient information showing the modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.



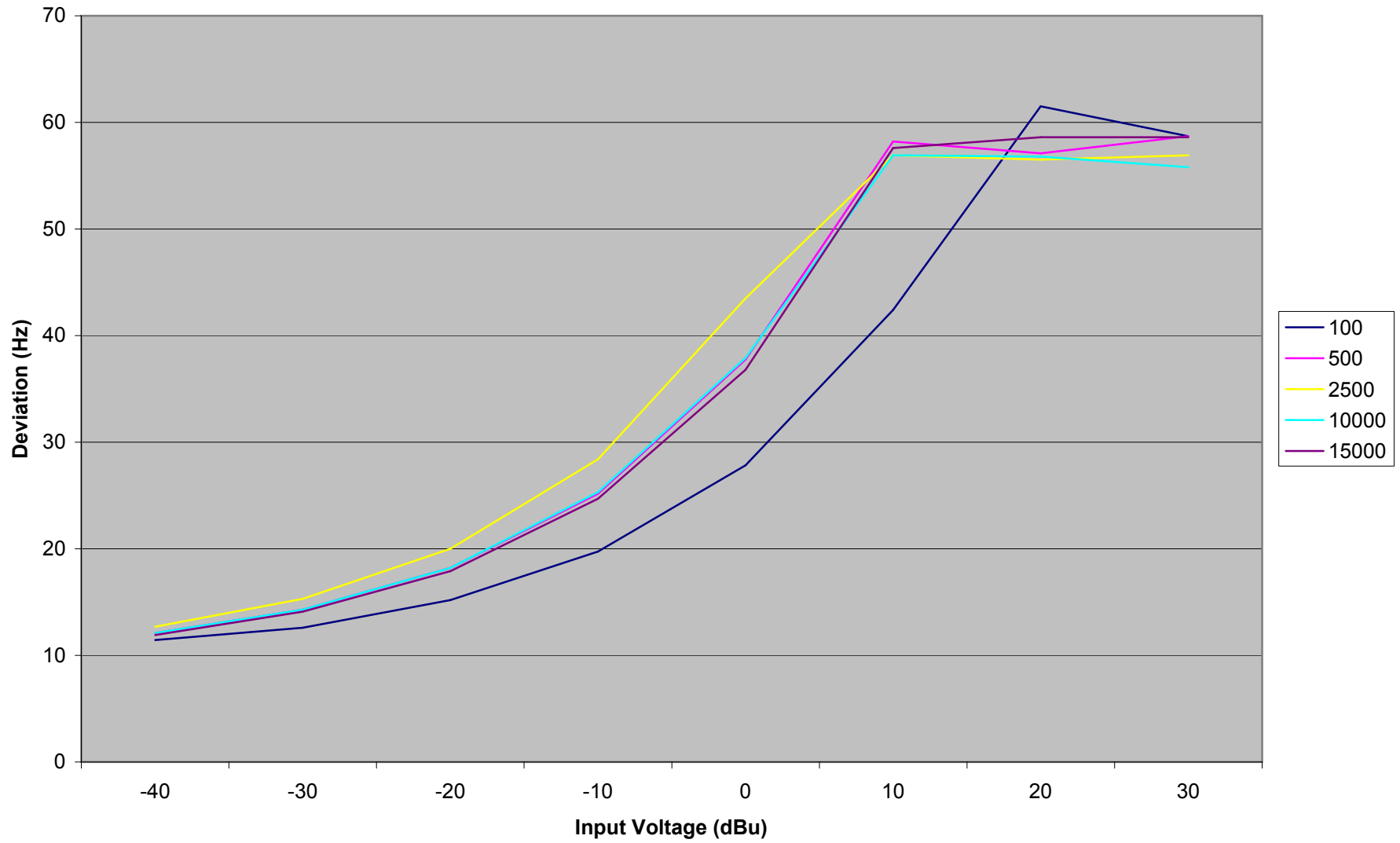
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Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

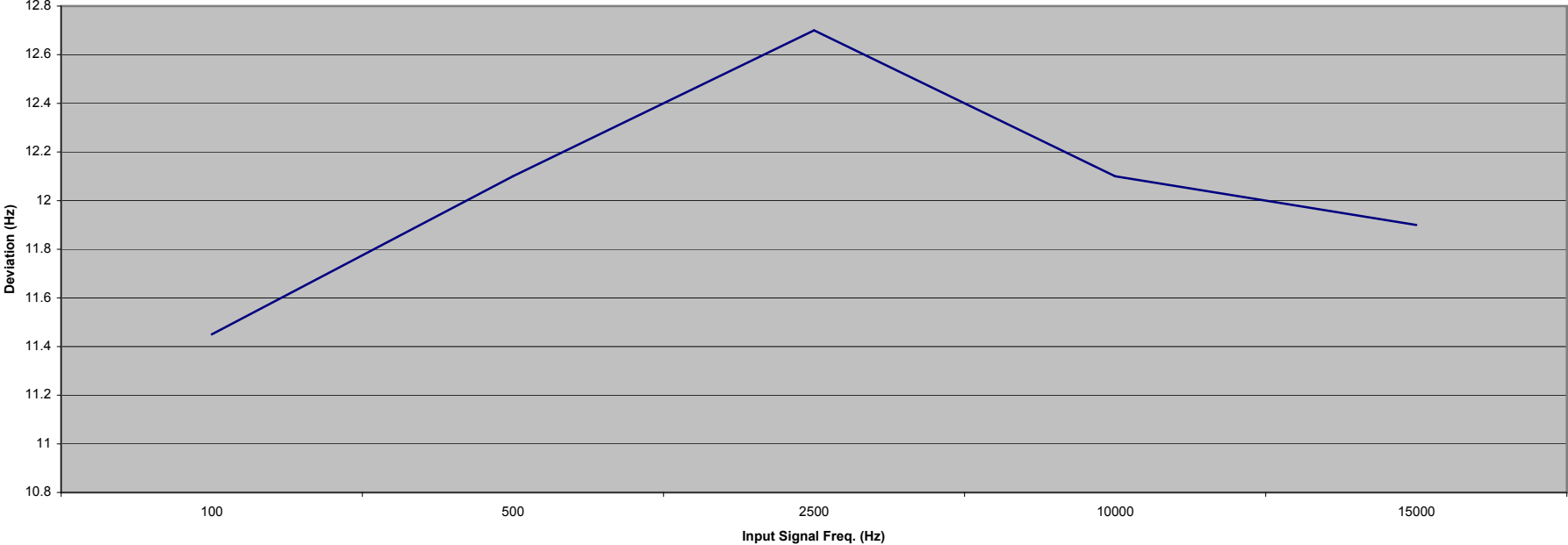
APPENDIX A

GRAPH(S) TAKEN SHOWING THE FREQUENCY
RESPONSE OF THE
AUDIO MODULATING CIRCUIT
PART 2.1047

P4T Deviation Vs. Input Voltage



P4T Deviation Vs. Frequency w/ -40 dBu Input



P4T #45 Raw Data							
		100	500	2500	10000	15000	(Hz)
	-40	11.45	12.1	12.7	12.1	11.9	
	-30	12.6	14.3	15.3	14.3	14.1	
	-20	15.18	18.2	20	18.2	17.9	
(dBu)	-10	19.73	25.17	28.4	25.3	24.7	
	0	27.84	37.75	43.5	37.9	36.8	
	10	42.4	58.2	56.9	56.9	57.6	
	20	61.5	57.1	56.5	56.8	58.6	
	30	58.7	58.7	56.9	55.8	58.6	



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APPENDIX A

4.0 OCCUPIED BANDWIDTH - PART 2.1049

The occupied bandwidth is that between the lower and upper limits of the signal where the mean power is 99.0% of the total mean power and measured under the following conditions:

For low power auxiliary stations operating in the bands other than those allocated for TV broadcasting, the occupied bandwidth shall not be greater than that necessary for satisfactory transmission and emissions appearing on any discrete frequency outside the authorize band shall be attenuated $43+10 \log_{10}$ (mean output power, in watts) dB below the mean output power of the transmitting unit (device under test).

For low power auxiliary stations operating in the bands allocated for TV broadcasting, any form of modulation may be used. A maximum of ± 75 kHz is permitted when frequency modulation is used. The operating bandwidth shall not exceed 200 kHz.

Carson's Rule:

Section 2.202 (g)

$$B_n = 2M + 2DK, \quad K=1$$

B_n = Bandwidth

$$M = 15 \text{ kHz,}$$

M = Maximum Modulating Frequency

$$D = 45 \text{ kHz,}$$

D = Peak Deviation

$$B_n = 2(15) + 2(45)(1) = 120 \text{ kHz}$$



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APPENDIX A

GRAPH(S) TAKEN OF THE OCCUPIED BANDWIDTH

PART 2.1049



Company: Shure Inc.
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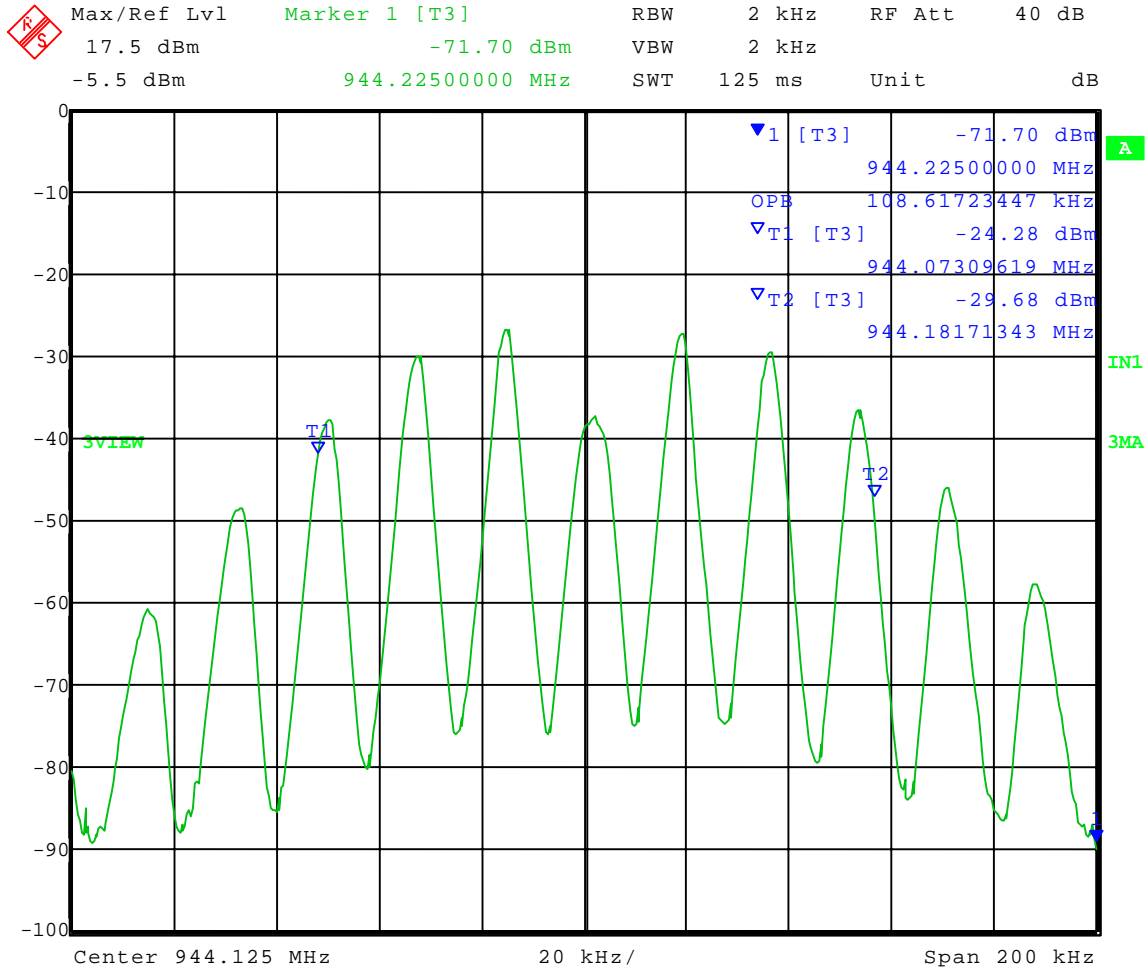
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 06-25-2007
 Company: Shure, Inc.
 EUT: P4T
 Test: **Occupied Bandwidth; 99% bandwidth**
 Rule part: FCC Part 74; FCC Part 2.1049
 Operator: Craig B

Frequency: **944.125 MHz**

99% power bandwidth = 108.62 kHz



Date: 25.JUN.2007 15:06:12



Company: Shure Inc.
 Model Tested: P4T-X1
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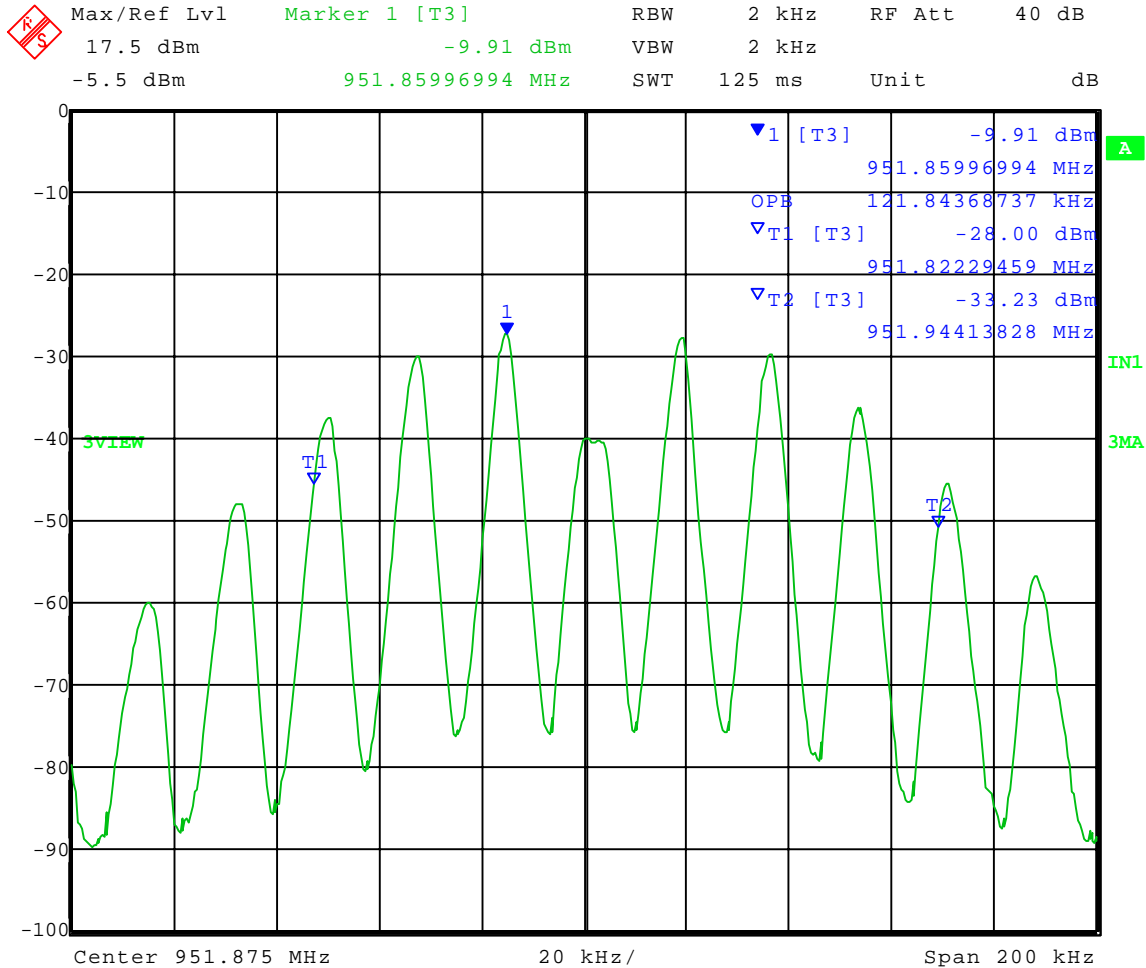
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 06-25-2007
 Company: Shure, Inc.
 EUT: P4T
 Test: **Occupied Bandwidth; 99% bandwidth**
 Rule part: FCC Part 74; FCC Part 2.1049
 Operator: Craig B

Frequency: **951.875 MHz**

99% power bandwidth = 121.84 kHz



Date: 25.JUN.2007 15:03:34



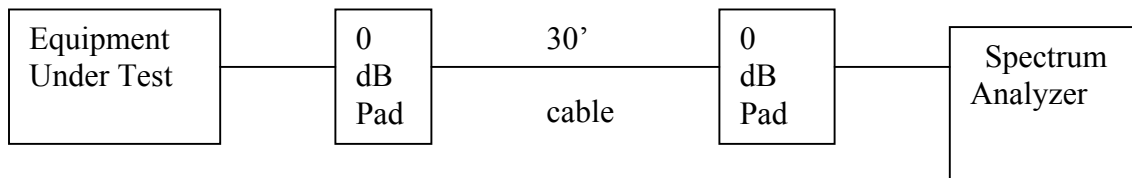
Company: Shure Inc.
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APPENDIX A

5.0 SPURIOUS EMISSIONS AT ANTENNA TERMINALS – PART 2.1051

Spurious conducted emissions were measured at the antenna terminals using an artificial load. Plots were made showing the amplitude of each harmonic emission with the equipment operated as specified in 2.989. As shown by the radiated charts there was no reason to believe that there were any spurious emissions other than the harmonics that were than individually investigated when doing the conducted test at the antenna terminals. Measurements were made up to the 10th harmonic of the fundamental. The following setup was used showing placement of the attenuators:



The allowed emissions for transmitters operating in the 944 MHz - 952 MHz bands for PSM400 Wireless Personal Monitor equipment are found under Part 74, Section 74.861, Paragraph d-3 for Low Power Auxiliary Stations. This paragraph states the mean power of the emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (1) any discrete frequency outside the authorized band shall be attenuated, at least, $43+10\text{Log}^{10}$ (mean output power, in watts) dB below the mean output power of the transmitting unit.

NOTE: See the following pages for the data and graphs of the actual measurements made:



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APPENDIX A

CONDUCTED EMISSION DATA AND GRAPHS
TAKEN FOR SPURIOUS EMISSION
MEASUREMENTS MADE AT THE
ANTENNA TERMINALS

PART 2.1051

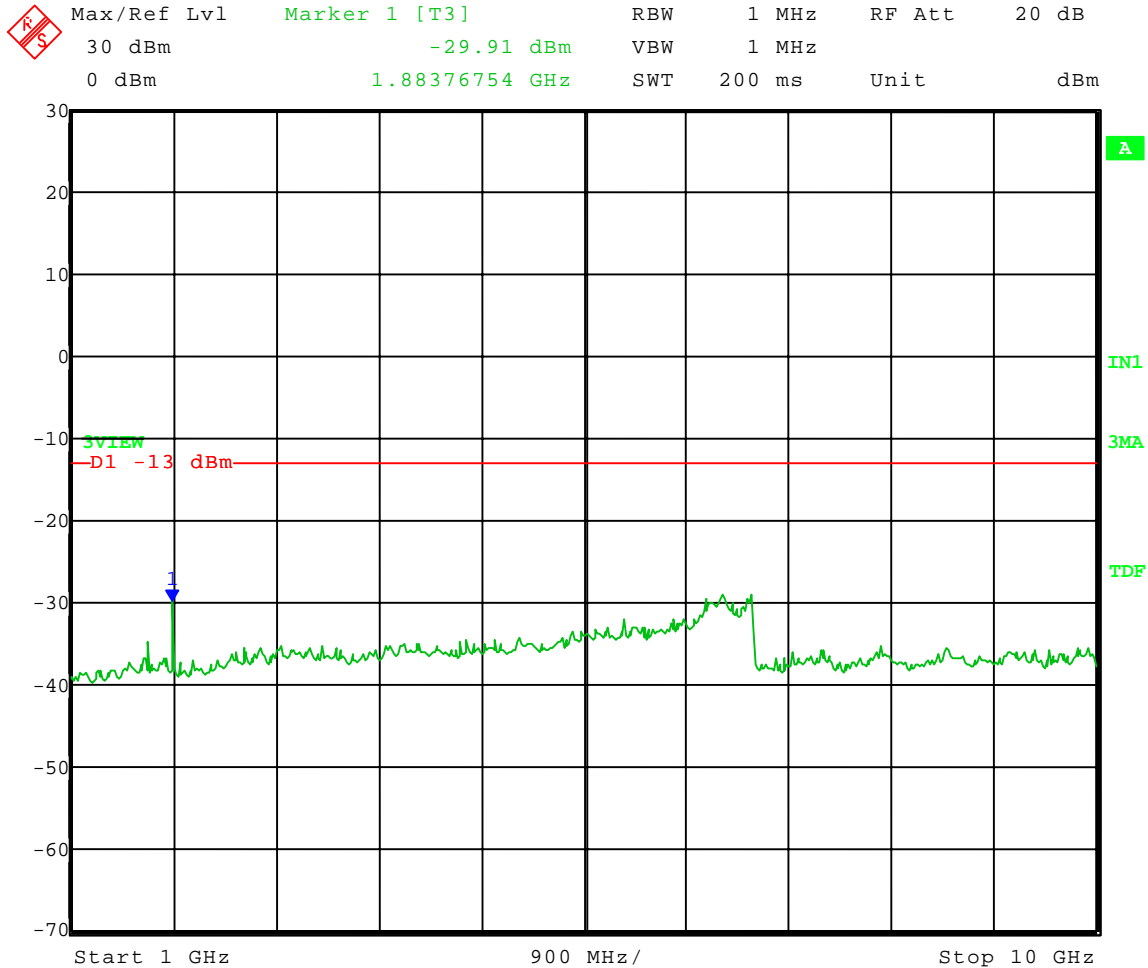


Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 06-25-2007
Company: Shure, Inc.
EUT: P4T
Test: **Spurious Emissions - Conducted**
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Craig B
Comment: Channel: **944.125 MHz**
Frequency Range: **1 to 10 GHz**
Limit = -13 dBm



Date: 25.JUN.2007 15:38:27



Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 06-25-2007
Company: Shure, Inc.
EUT: P4T
Test: **Spurious Emissions - Conducted**
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Craig B
Comment: Channel: **951.875 MHz**
Frequency Range: **1 to 10 GHz**
Limit = -13 dBm



Date: 25.JUN.2007 15:40:20



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

APPENDIX A

6.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS – PART 2.1053

Radiated measurements were performed at a 1 or 3 meter test distance automatically scanning the frequency range from 200 MHz to 10000 MHz, depending upon the fundamental frequency.

For the PSM400 Wireless Personal Monitor, the highest fundamental frequency is 952 MHz so the scans were made up to 10000 MHz, to cover the tenth harmonic.

All signals in the frequency range of 30 MHz to 200 MHz were measured with a Biconical Antenna and from 200 MHz to 1000 MHz a Log Periodic Antenna was used as the pickup devices. From 1000 MHz to 10000 MHz, a Double Ridge Horn Antenna was used. The cables and equipment were placed and moved within the range of positions likely to find their maximum emissions. Tests were made in both the horizontal and vertical planes of polarization.

The allowed emissions for transmitters operating in the 944 MHz - 952 MHz bands for PSM400 Wireless Personal Monitor are found under Part 74, Section 74.861, Paragraph d-3 for Low Power Auxiliary Stations. This paragraph states the mean power of the emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (1) any discrete frequency outside the authorized band shall be attenuated, at least, $43+10\text{Log}^{10}$ (mean output power, in watts) dB below the mean output power of the transmitting unit.



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

APPENDIX A

RADIATED EMISSION DATA TAKEN
FOR FUNDAMENTAL EMISSIONS
USING THE SUBSTITUTION METHOD



Company: Shure Inc.
 Model Tested: P4T-X1
 Report Number: 13409

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.
 Operator: Craig B
 Date of test: 06-26-2007
 Temperature: 72 deg. F
 Humidity: 59% R.H.

Rated Power = 50 mW = 17 dBm

Fundamental Emissions - ERP - Substitution Method

Model: P4T								
Channels: 944.125 MHz, and 951.875 MHz								
Frequency and Polarization (MHz)	Max. Field Strength of EUT @ 3 meters (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [ERP] (dBm)	Limit (dBm)	Margin (dB)	Strength of emission [ERP] (mW)
944.125 vertical	113.1	26.4	11.0	2.15	15.4	24.0	8.6	34.83
944.125 horizontal	115.5	28.6	11.0	2.15	17.6	24.0	6.4	57.81
951.875 vertical	113.1	27.3	11.3	2.15	16.0	24.0	8.0	39.81
951.875 horizontal	115.8	28.5	11.3	2.15	17.2	24.0	6.8	52.48

EIRP = Signal generator output - cable loss + antenna gain

ERP_(ref. to ½λ dipole) = Signal generator output - cable loss + antenna gain - 2.15



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

APPENDIX A

RADIATED EMISSION DATA TAKEN
FOR SPURIOUS EMISSIONS
USING THE SUBSTITUTION METHOD
ANSI/TIA/EIA-603-1992 SECTION 2.2.12



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

APPENDIX A

RADIATED EMISSION DATA AND GRAPH(S)

TAKEN FOR

SPURIOUS EMISSION MEASUREMENTS

PART 2.1053

FCC Part 15 Class B

Electric Field Strength

EUT: P4T (944 to 952 MHz)
Manufacturer: Shure, Inc.
Operating Condition: 72 deg. F; 59% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification:
Comment: Low and High channels
Date: 06-26-2007

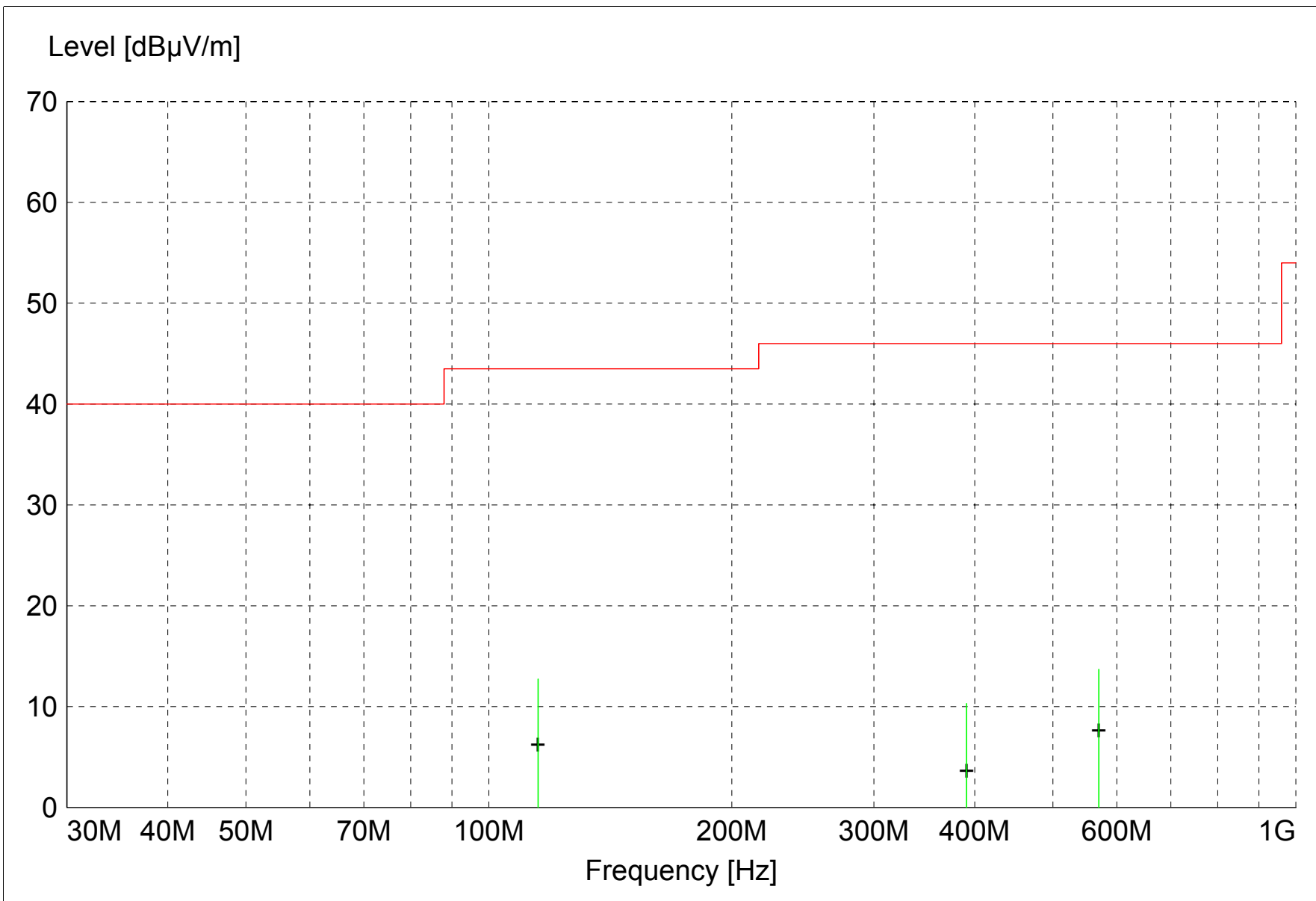
TEXT: "Site 3 MidV 3M"

Short Description: Test Set-up Vert30-1000MHz
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/005

Antennas ---
Biconical -- EMCO 3104C SN: 9701-4785
Log Periodic -- EMCO 3146 SN: 9702-4895

Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/005

TEST SET-UP: EUT Measured at 3 Meters with VERTICAL Antenna Polarization



||||| MES A6262_F1V_Quasi-Peak
 + + + MES A6262_F1V_Peak_List
 — LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "A6262_F1V_Final"

6/26/2007 1:10PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dB μ V	Factor	Loss	Level	dB μ V/m	dB	Ant.	Angle	Detector	
		dB μ V/m	dB	dB μ V/m	dB μ V/m		m	deg		
115.080000	23.99	12.20	-23.4	12.7	43.5	30.8	1.00	0	QUASI-PEAK	Noise Floor
569.900000	15.80	18.41	-20.5	13.7	46.0	32.3	1.00	0	QUASI-PEAK	Noise Floor
390.740000	16.52	15.04	-21.3	10.3	46.0	35.7	1.00	0	QUASI-PEAK	Noise Floor

FCC Part 15 Class B

Electric Field Strength

EUT: P4T (944 to 952 MHz)
Manufacturer: Shure, Inc.
Operating Condition: 72 deg. F; 59% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification:
Comment: Low and High channels
Date: 06-26-2007

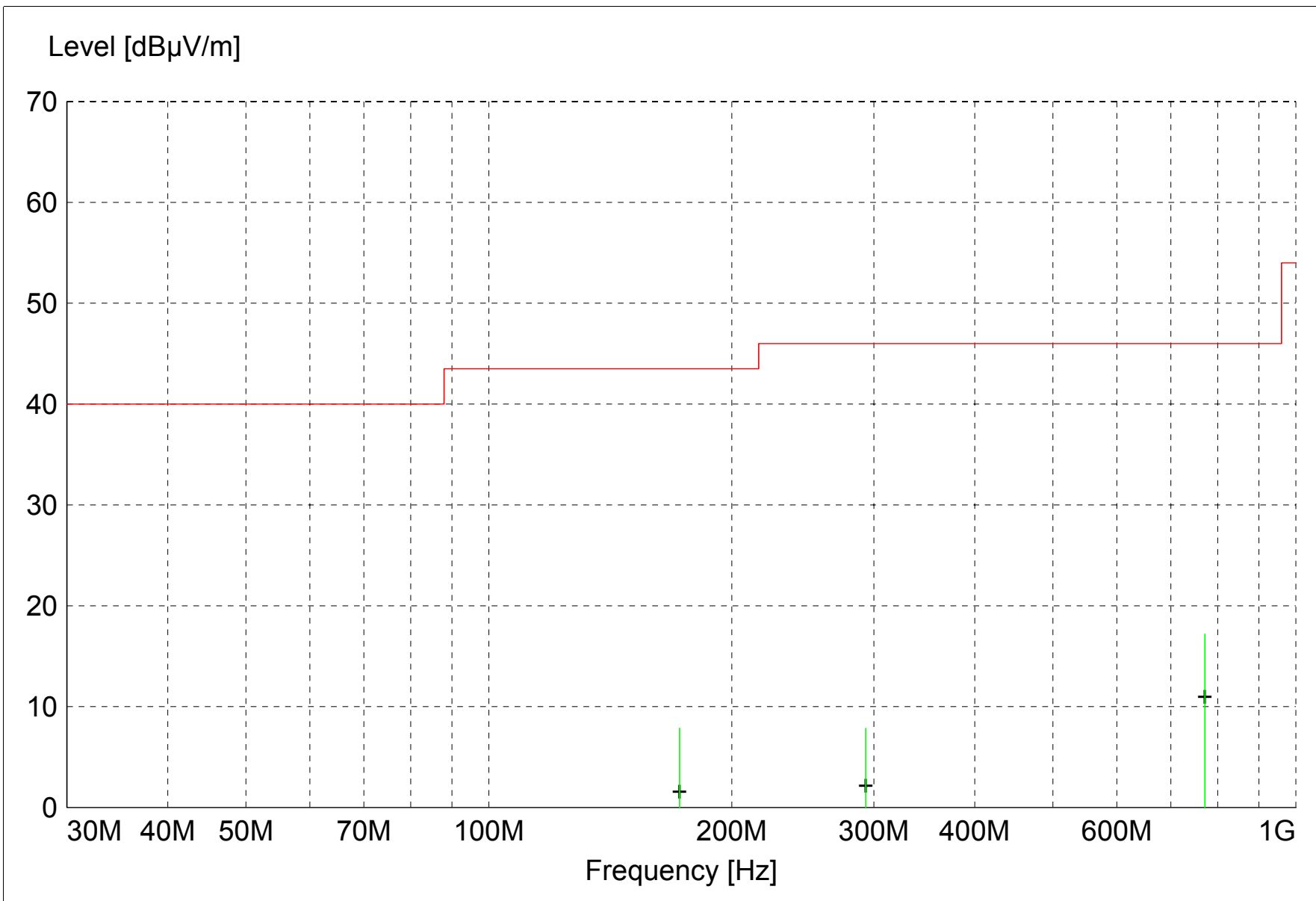
TEXT: "Site 3 MidH 3M"

Short Description: Test Set-up Horz30-1000MHz
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/005

Antennas ---
Biconical -- EMCO 3104C SN: 9701-4785
Log Periodic -- EMCO 3146 SN: 9702-4895

Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/005

TEST SET-UP: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization



||||| MES A6262_F1H_Quasi-Peak
 + + MES A6262_F1H_Peak_List
 — LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "A6262_F1H_Final"

6/26/2007 1:12PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dB μ V	Factor	Loss	Level	dB μ V/m	dB	Ant.	Angle	Detector	
		dB μ V/m	dB	dB μ V/m			m	deg		
771.620000	15.89	20.75	-19.5	17.2	46.0	28.8	2.50	0	QUASI-PEAK	Noise Floor
172.320000	16.28	14.57	-23.0	7.9	43.5	35.6	2.50	0	QUASI-PEAK	Noise Floor
293.120000	16.19	13.35	-21.7	7.9	46.0	38.1	2.50	0	QUASI-PEAK	Noise Floor



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

APPENDIX A

FREQUENCY STABILITY DATA
TAKEN DURING TESTING

PART 2.1053



Company: Shure Inc.
 Model Tested: P4T-X1
 Report Number: 13409

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Shure, Inc.
 Operator: Craig B
 Date of test: 06-29-2007

Limit = 47.2 kHz (0.005% of 944 MHz)

Frequency Stability FCC Part 2.1055

Model	Nominal Frequency (MHz)	Measured Frequency									
		+50 deg. C	Error (kHz)	+40 deg. C	Error (kHz)	+30 deg. C	Error (kHz)	+20 deg. C	Error (kHz)	+10 deg. C	Error (kHz)
P4T	944.125	944.133742	8.742	944.129434	4.434	944.125726	0.726	944.124073	-0.927	944.123071	-1.929
P4T	951.875	951.883542	8.542	951.879935	4.935	951.875025	0.025	951.874574	-0.426	951.873021	-1.979

Frequency Stability FCC Part 2.1055

Model	Nominal Frequency (MHz)	Measured Frequency							
		0 deg. C	Error (kHz)	-10 deg. C	Error (kHz)	-20 deg. C	Error (kHz)	-30 deg. C	Error (kHz)
P4T	944.125	944.118211	-6.789	944.112325	-12.675	944.105411	-19.589	944.096443	-28.557
P4T	951.875	951.867310	-7.690	951.861423	-13.577	951.854108	-20.892	951.845040	-29.960

Frequency Stability FCC Part 2.1055

Model	Nominal Frequency (MHz)	Measured Frequency					
		102 Volts	Error (kHz)	120 Volts	Error (kHz)	138 Volts	Error (kHz)
P4T	944.125	944.122971	-2.029	944.124073	-0.927	944.124324	-0.676
P4T	951.875	951.873973	-1.027	951.874574	-0.426	951.874624	-0.376



Company: Shure Inc.
Model Tested: P4T-X1
Report Number: 13409

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

8.0 FREQUENCY STABILITY (TEMPERATURE) PHOTOS TAKEN DURING TESTING

