



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

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: PGX2-X1 Wireless Handheld Transmitter  
Frequency Range: 944 MHz – 952 MHz  
Kind of Equipment: Wireless Microphone Transmitter  
Test Configuration: Connected to a microphone cartridge. (Tested at 3 vdc)  
Model Number(s): PGX2-X1  
Model(s) Tested: PGX2-X1  
Serial Number(s): #103  
Emission Designator: 84.2KF3E  
Date of Tests: November 13, 16 & 20, 2007 and August 12 & 14, 2008  
Test Conducted For: Shure Inc.  
5800 W. Touhy Ave.  
Niles, IL 60714-4608

**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.

© Copyright 1983-2007 D.L.S. Electronic Systems, Inc

**COPYRIGHT NOTICE**

This report or any portion thereof, may not be reproduced or modified in any form without the expressed written consent of D.L.S. Electronic Systems, Inc.



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

SIGNATURE PAGE

Report By:

Arnom C. Rowe  
Test Engineer  
EMC-001375-NE

Reviewed By:

William Stumpf  
OATS Manager

Approved By:

Brian Mattson  
General Manager



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## TABLE OF CONTENTS

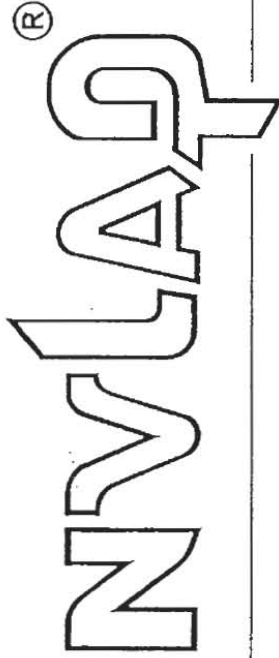
i.	Cover Page.....	1
ii.	Signature Page.....	2
iii.	Table of Contents.....	3
iv.	NVLAP Certificate of Accreditation.....	4
1.0	Summary of Test Report.....	5
2.0	Introduction.....	5
3.0	Object.....	5
4.0	Test Set-Up.....	6
5.0	Test Equipment.....	7
6.0	Ambient Measurements.....	8
7.0	AC Power Line Conducted Emission Measurements.....	8
8.0	Description of Test Sample.....	9
9.0	Additional Description of Test Sample.....	10
10.0	Photo Information and Test Set-Up.....	10
11.0	Radiated Photos Taken During Testing.....	11
11.0	AC Power Line Conducted Photos Taken During Testing.....	13
12.0	Results of Tests.....	13
13.0	Conclusion.....	13
	TABLE 1 – EQUIPMENT LIST.....	14
	Appendix A – Transmitter Emissions Tests.....	15
1.0	Test Set-Up.....	16
2.0	DC Voltages and Current into final Amplifying Stage.....	16
3.0	RF Power Output.....	16
3.0	Data taken of the RF Power Output.....	17
3.0	RF Output Power Photos Taken During Testing.....	20
4.0	Modulation Characteristics.....	21
4.0	Graph(s) taken of the Modulation Characteristics.....	22
5.0	Occupied Bandwidth.....	26
5.0	Data and Graph(s) taken of the 99% Occupied Bandwidth.....	27
6.0	Spurious Emissions At Antenna Terminals.....	30
7.0	Field Strength of Spurious Emission Measurements.....	31
7.0	Radiated Data and Graph(s) Taken During Testing for Fundamental Emissions.....	33
7.0	Radiated Data Taken During Testing for Spurious Emissions.....	35
8.0	Frequency Stability (Temperature).....	38
9.0	Frequency Stability (Voltage Variation).....	38
8.0 & 9.0	Low Channel Data Taken for Bandedge and Frequency Stability Variation.....	39
8.0 & 9.0	High Channel Data Taken for Bandedge and Frequency Stability Variation.....	50
10.0	Data Taken for Frequency Tolerance.....	61
11.0	Frequency Stability Photos Taken During Testing.....	63



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

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).*



2007-10-01 through 2008-09-30  
 Effective dates

*Dolly J. Buce*  
 For the National Institute of Standards and Technology



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## 1.0 SUMMARY OF TEST REPORT

It was found that the PGX2-X1 Wireless Handheld Transmitter, Model Number(s) PGX2-X1, **meets** the radio interference radiated emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Section 74.861 (d), for low power auxiliary stations. The AC Power Line conducted emissions test was not required because the PGX2-X1 Wireless Handheld Transmitter is powered from a D.C. power source. It does not have a line cord to plug into the A.C. power line.

## 2.0 INTRODUCTION

On November 13, 16 & 20, 2007 and August 12 & 14, 2008, a series of radio frequency interference measurements was performed on PGX2-X1 Wireless Handheld Transmitter, Model Number(s) PGX2-X1, Serial Number: #103. 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 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.

### **Main Test Facility:**

D.L.S. Electronic Systems, Inc.  
1250 Peterson Drive  
Wheeling, Illinois 60090

### **O.A.T.S. Test Facility:**

D.L.S. Electronic Systems, Inc.  
166 S. Carter Street  
Genoa City, Wisconsin 53128

## 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.



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

#### 4.0 TEST SET-UP

All tests were performed at D.L.S. Electronic Systems, Inc. and set up according to the FCC and TIA-603C regulations. 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.

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 TIA Standard, TIA-603-C:2004, Section 2.2.12.



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## 5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the 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 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.

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.



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## 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 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.

## 7.0 AC POWER LINE CONDUCTED EMISSION MEASUREMENTS – Part 15.207

**The PGX2-X1 Wireless Handheld Transmitter is powered from a D.C. power source and will not at any time be directly plugged into the public utility lines, therefore the conducted emissions test was not performed.**





Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## 8.0 DESCRIPTION OF TEST SAMPLE:

### 8.1 Description:

The Shure Model PGX2-X1 is a microprocessor controlled frequency agile UHF handheld transmitter operating over the frequency range of 944MHz to 952MHz. The transmitter will operate for a minimum of 8 hours using two AA alkaline batteries. The user interface includes a Power/Mute button and transmitter/receiver frequency synchronization. The PGX2-X1 has a plastic enclosure. It utilizes an internal antenna for optimum range and reliability.

### 8.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 254mm x Width: 51mm x Height: 51mm

### 8.3 LINE FILTER USED:

N/A

### 8.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

N/A

Clock Frequencies:

16 MHz, 0.32768 MHz

### 8.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. PC Board Assy.

PN: 190-10304



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

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

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

10.0 PHOTO INFORMATION AND TEST SET-UP

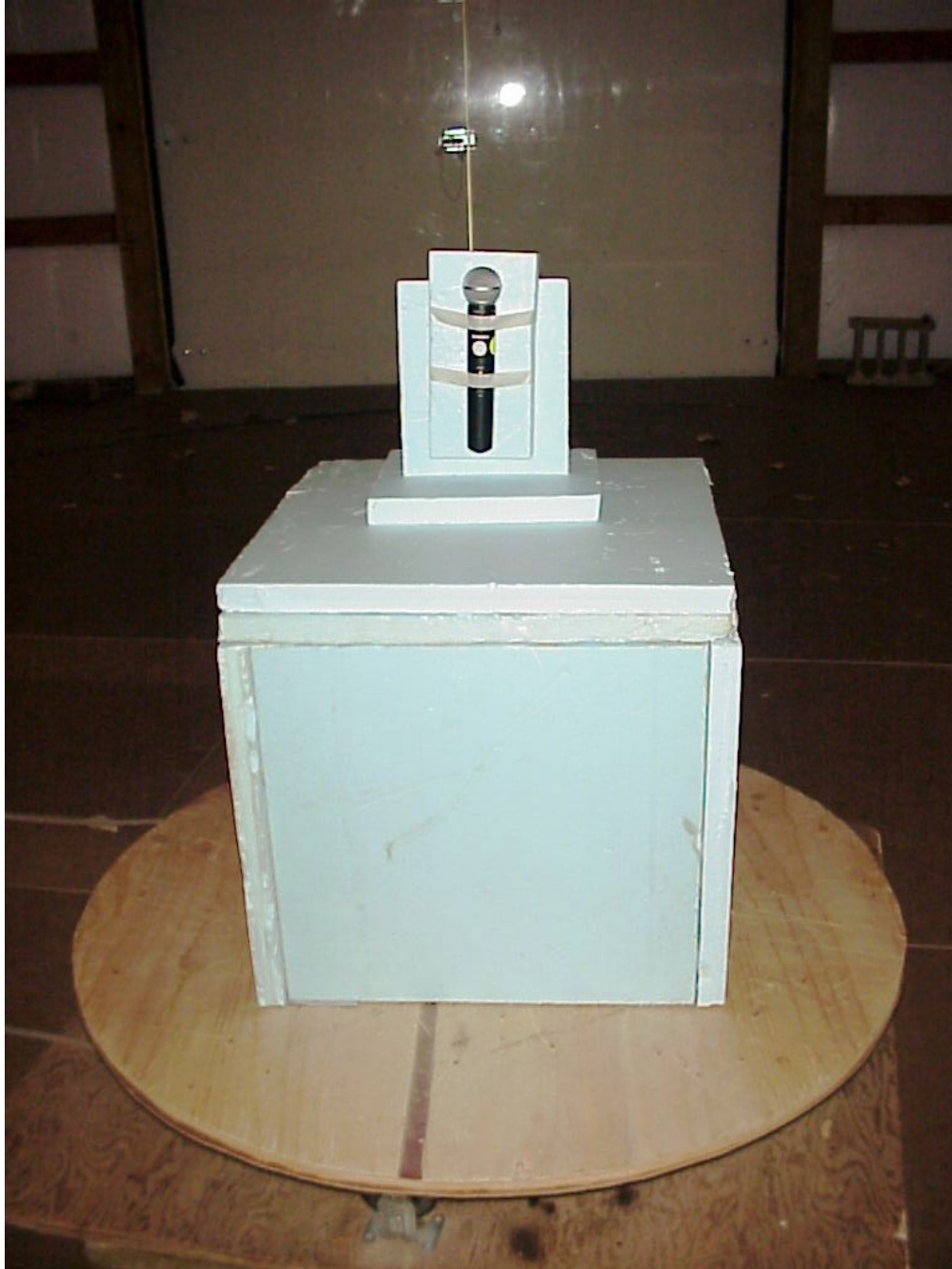
Item 0 PGX2-X1 Wireless Handheld Transmitter  
Model Number: PGX2-X1, Serial Number: #103



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

11.0 RADIATED PHOTOS TAKEN DURING TESTING





Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

### 11.0 RADIATED PHOTOS TAKEN DURING TESTING





Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

#### 11.0 AC POWER LINE CONDUCTED PHOTOS TAKEN DURING TESTING

The AC Power Line conducted emissions test was not required because the PGX2-X1 Wireless Handheld Transmitter is powered from a D.C. power source. It does not have a line cord to plug into the A.C. power line.

#### 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 PGX2-X1 Wireless Handheld Transmitter, Model Number(s) PGX2-X1 **meets** the radio interference radiated emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Section 74.861 (d), for low power auxiliary stations. The AC Power Line conducted emissions test was not required because the PGX2-X1 Wireless Handheld Transmitter is powered from a D.C. power source. It does not have a line cord to plug into the A.C. power line.



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	3/09
Preamplifier	Rohde & Schwarz	TS-PR10	032001/004	9 kHz – 1 GHz	1/09
Preamp	Ciao	CA118-4010	101	1 GHz-18 GHz	1/09
Signal Generator	Marconi	2022A	119026	10 kHz – 1 GHz	7/09
Oscilloscope	Yukogawa	DL1720	R047912	1 Hz – 500 MHz	10/09
Antenna	Electrometrics	3146	1205	200 MHz – 1 GHz	4/10
Dipole Antenna	Com-Power	AD-100	40140	400 MHz – 1 GHz	N/A
Horn Antenna	EMCO	3115	4451	1-18 GHz	5/09
Power Meter	Anritsu	ML2487A	6K00002069	100 kHz – 65 GHz	10/09
High Pass Filter	Mini-Circuits	NHP-600	10521	600 MHz	10/08
High Pass Filter	Q-Microwave	100460	001	1.1 GHz	5/09
Attenuator-20dB Fixed	Aeroflex Weinschel	75A-20-12	1071	DC – 40 GHz	7/09
Power Sensor	Anritsu	MA2490A	031563	50 MHz – 8 GHz	10/09

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



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

# APPENDIX A

## TEST PROCEDURE

### SUBPART H

#### LOW POWER AUXILIARY STATIONS OPERATING IN THE BANDS OTHER THAN THOSE ALLOCATED FOR TV BROADCASTING



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## 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 DC VOLTAGES AND CURRENTS APPLIED INTO FINAL AMPLIFYING STAGE – PART 2.1033(c-8)

5 Vdc @ 26.56 mA

### 3.0 RF-POWER OUTPUT – PART 2.1046 and EIA /TIA-603-C:2004, SECTION 2.2.17

As stated in PART 74.861 (d)(1), the RF output power should not exceed 1 watt(s). The RF output of the PGX2-X1 Wireless Handheld Transmitter was connected to a Spectrum Analyzer through suitable attenuation. All cables, connectors, and attenuators were calibrated prior to testing. The RF output power was measured using the following test method:

#### **Actual Measurements Taken:**

14.72 dBm Measured output of the transmitter

14.72 dBm equals 0.02965 watt(s)

#### **LIMIT:**

Manufacturer's rated output power = 14 dbm  $\pm$  2 dB

#### **MARGIN:**

1 - 0.02965 = 0.97035 watt(s)





1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

## APPENDIX A

# DATA TAKEN OF THE RF POWER OUTPUT MEASUREMENT

EIA /TIA-603-C:2004, SECTION 2.2.17

FCC Part 74.861 (d)(1) & PART 2.1046



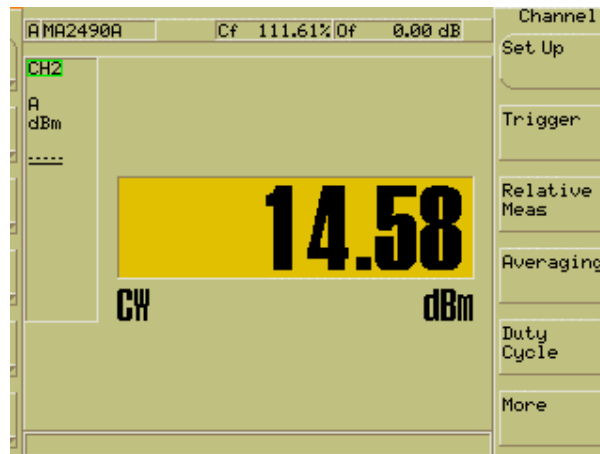
Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-16-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Peak Power Output - Conducted  
Rule part: FCC Part 74; FCC Part 2.1046  
Operator: Craig B  
Comment: Channel: 944.125 MHz

Peak Output Power = 14.58 dBm = 28.71 mW





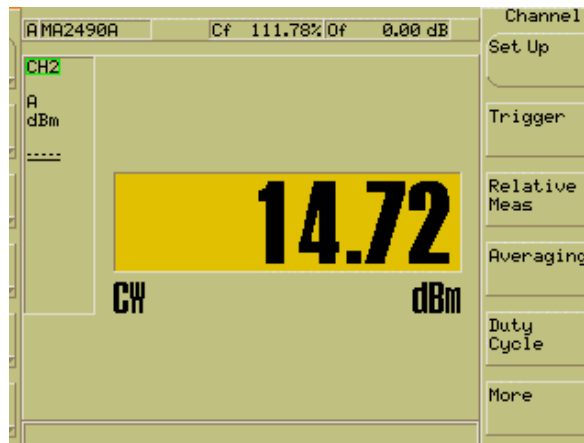
Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-16-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Peak Power Output - Conducted  
Rule part: FCC Part 74; FCC Part 2.1046  
Operator: Craig B  
Comment: Channel: 951.875 MHz

Peak Output Power = 14.72 dBm = 29.65 mW



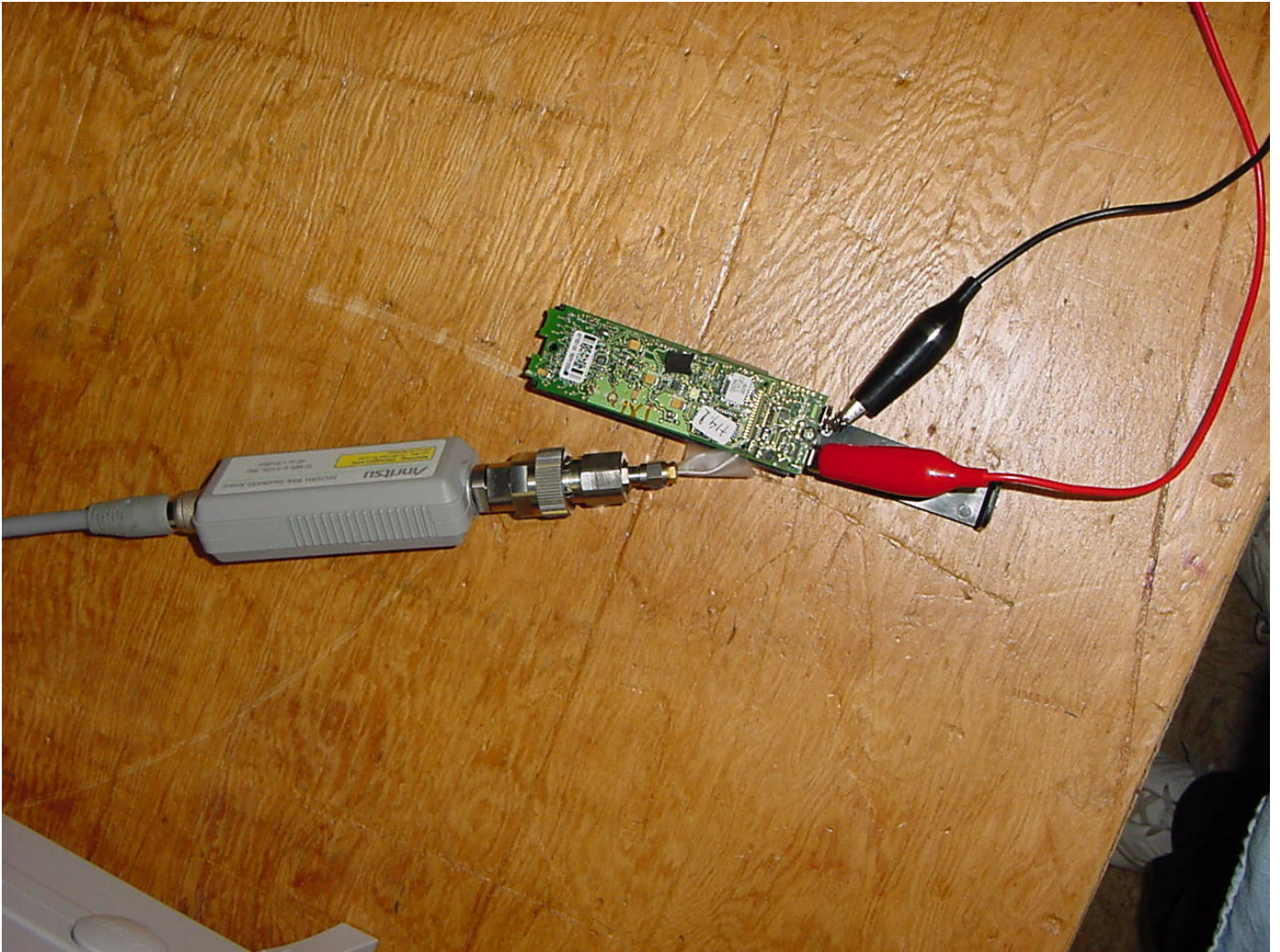


Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 3.0 RF POWER OUTPUT PHOTOS TAKEN DURING TESTING





Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 4.0 MODULATION CHARACTERISTICS – PART 2.1047 and EIA /TIA-603-C:2004, SECTION 2.2.3

#### a. Voice modulated communication equipment.

A curve showing the frequency response of the audio modulating circuit over a range of 45 Hz to 12 kHz Hz 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.



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

APPENDIX A

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

EIA /TIA-603-C:2004, SECTION 2.2.3

PART 2.1047

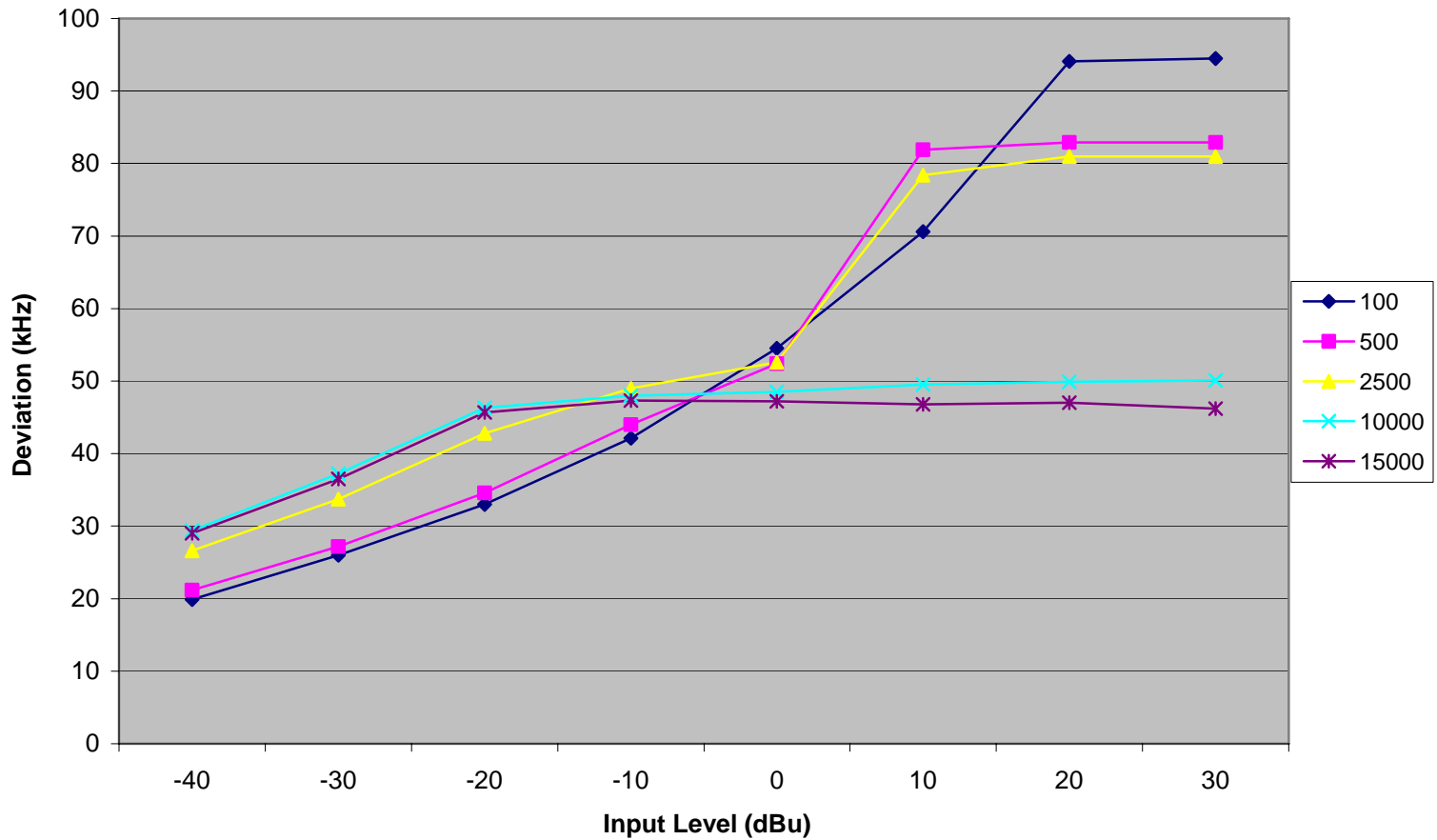


Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

#### PGX2 X1 Deviation vs. Input Level For Different Input Frequencies



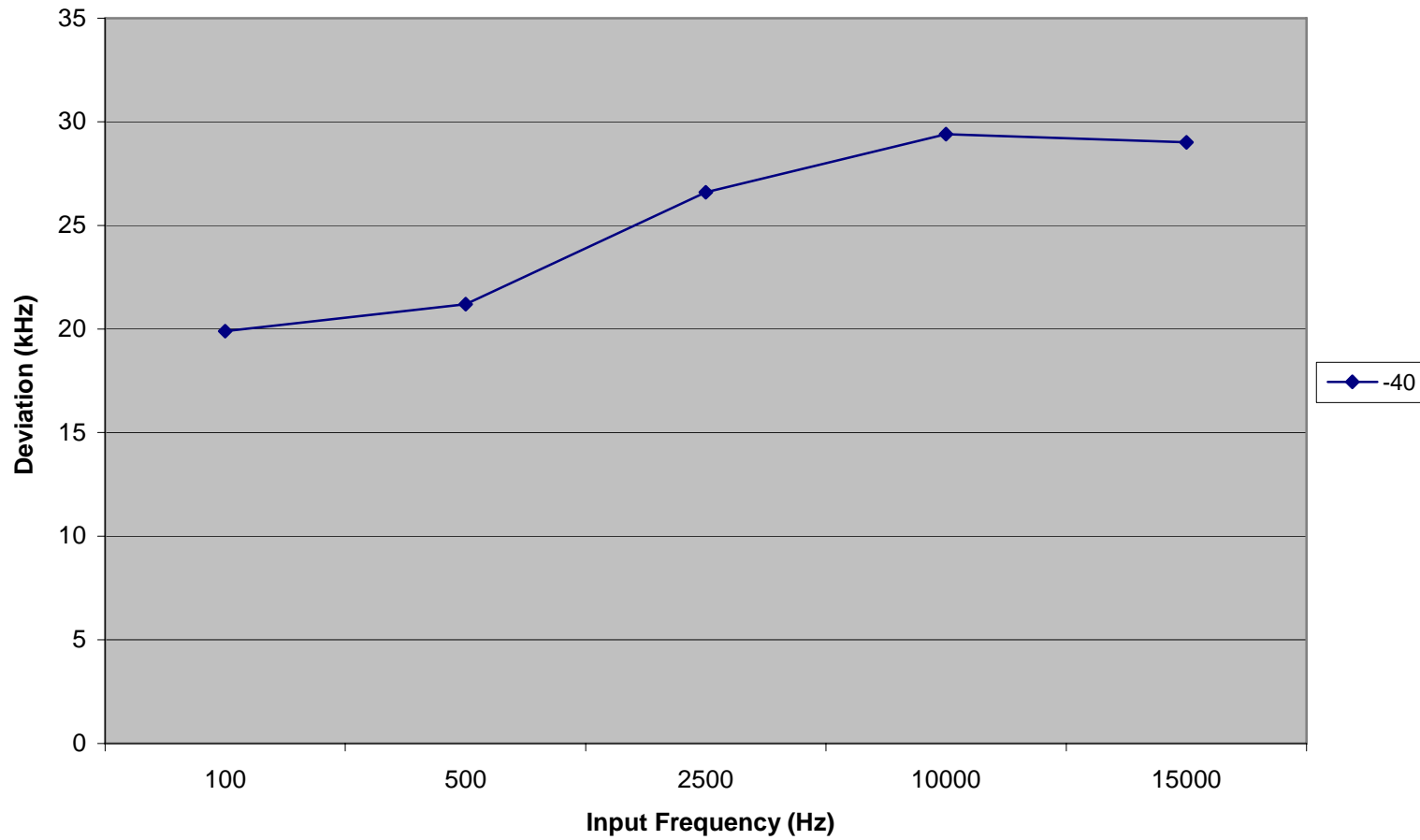


Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

**PGX2 X1 Deviation vs. Input Frequency -40dBu Input 0dB Gain setting**







Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

				PGX2 - X1			
		100	500	2500	10000	15000	(Hz)
	-40	19.9	21.2	26.6	29.4	29	
	-30	26	27.2	33.7	37.2	36.5	
(dBu)	-20	33	34.6	42.8	46.3	45.7	
	-10	42.1	44	49	48	47.3	
	0	54.5	52.4	52.6	48.5	47.2	
	10	70.6	81.9	78.4	49.5	46.8	
	20	94.1	82.9	81	49.9	47	
	30	94.5	82.9	81	50.1	46.2	



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 5.0 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  $\pm 75$  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

$$D = 48 \text{ kHz,}$$

$D$  = Peak Deviation

$$\mathbf{B_n = 2(15) + 2(48)(1) = 126 \text{ kHz}}$$

#### NOTE:

The modulation will not exceed 75 kHz as describes in the Operation Description.



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

## APPENDIX A

# DATA AND GRAPH(S) TAKEN OF THE

## 99% OCCUPIED BANDWIDTH

### Part 74.861 (d)(3) & PART 2.1049



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

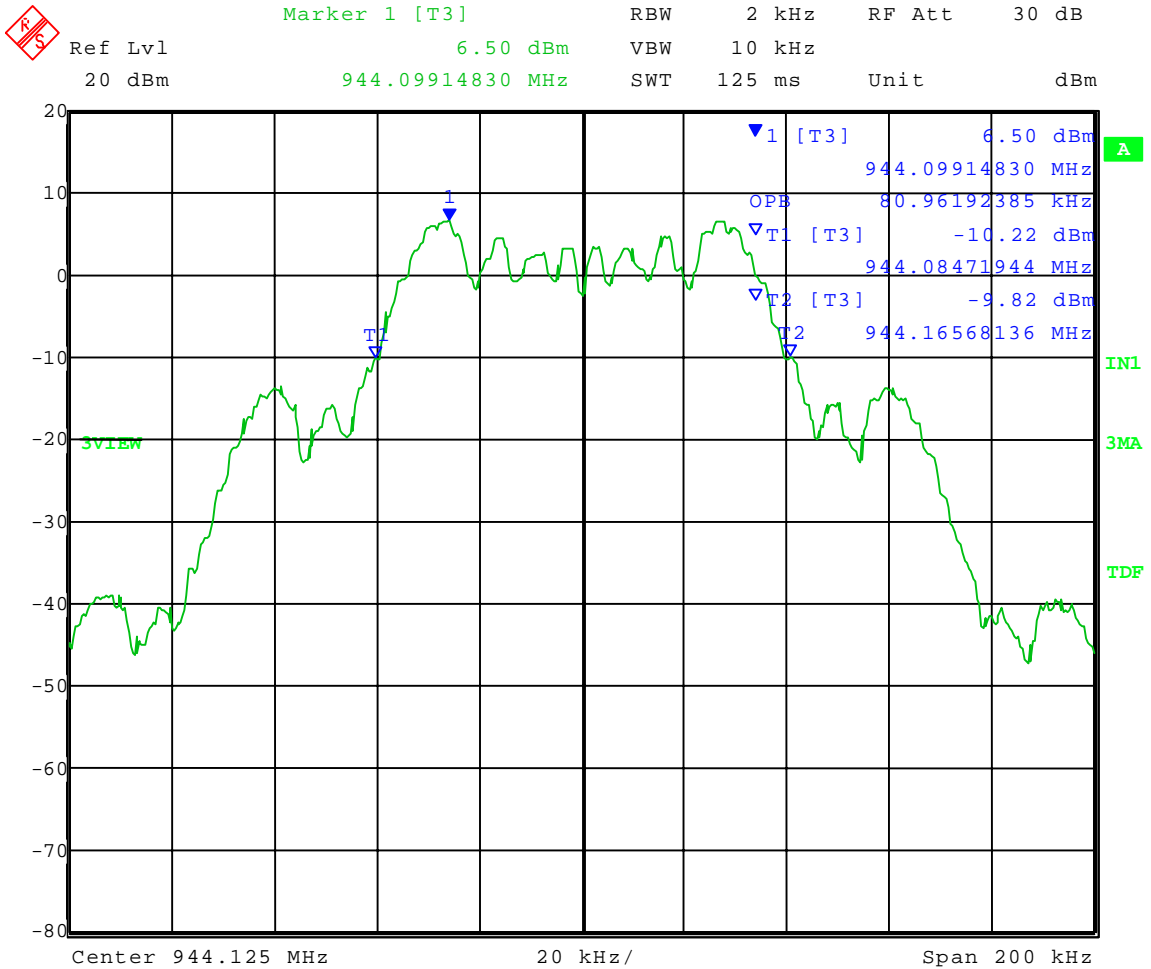
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-20-2007  
 Company: Shure, Inc.  
 EUT: PGX2-X1  
 Test: Occupied Bandwidth; 99% bandwidth  
 Rule part: FCC Part 74; FCC Part 2.1049  
 Operator: Craig B

Frequency: 944.125 MHz

99% power bandwidth = 80.96 kHz



Date: 20.NOV.2007 10:04:40



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

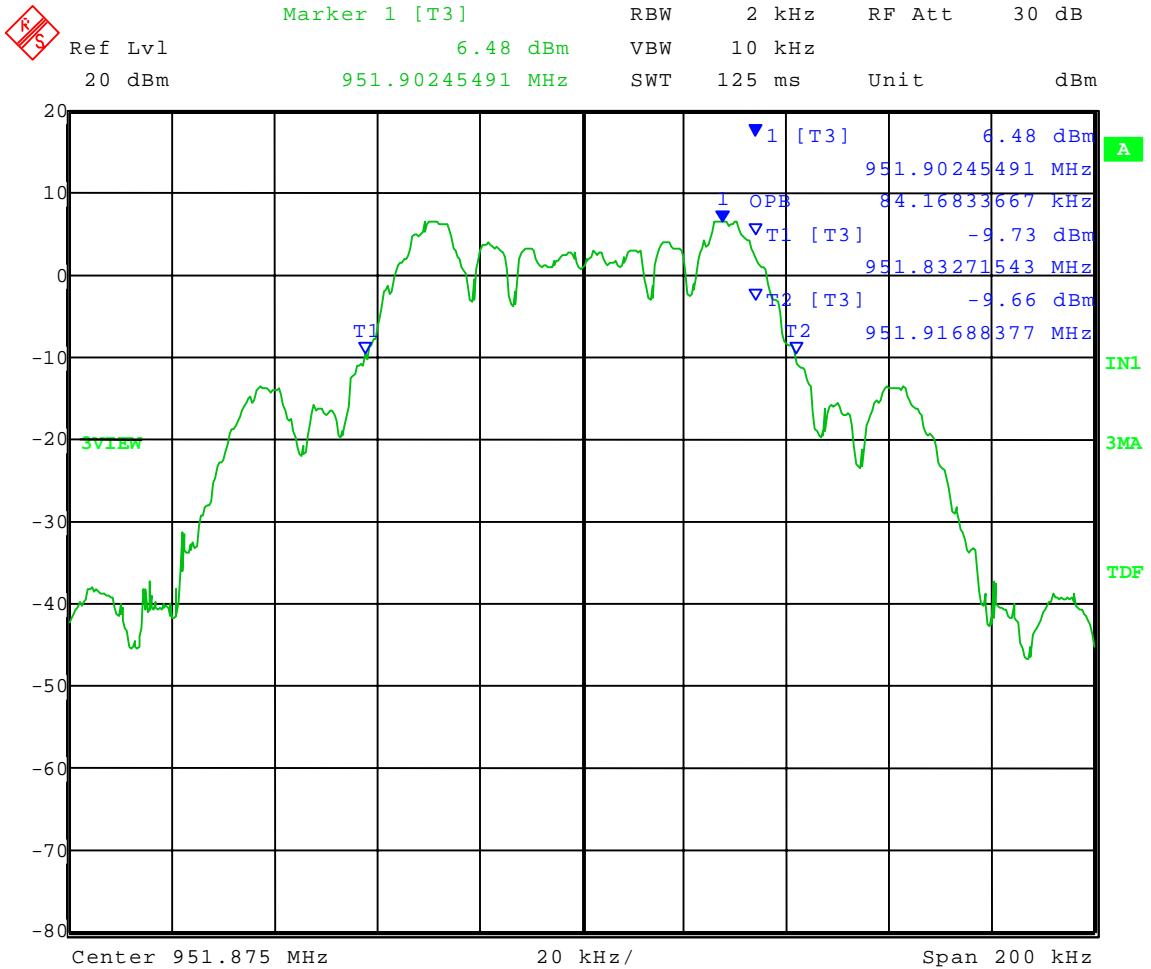
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-20-2007  
 Company: Shure, Inc.  
 EUT: PGX2-X1  
 Test: Occupied Bandwidth; 99% bandwidth  
 Rule part: FCC Part 74; FCC Part 2.1049  
 Operator: Craig B

Frequency: 951.875 MHz

99% power bandwidth = 84.17 kHz



Date: 20.NOV.2007 10:06:59



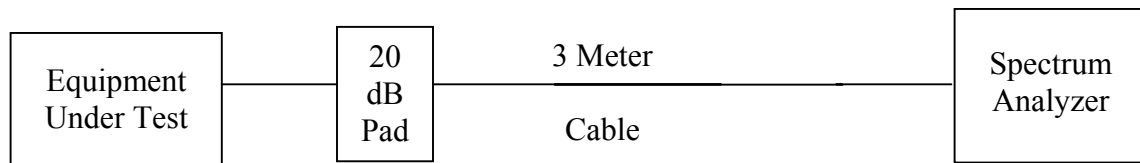
Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 6.0 SPURIOUS EMISSIONS AT ANTENNA TERMINALS – PART 2.1051 and EIA /TIA-603-C:2004, SECTION 2.2.13

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. Measurements were made up to the 10<sup>th</sup> 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 PGX2-X1 Wireless Handheld Transmitter 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:

**The PGX2-X1 Wireless Handheld Transmitter uses the Internal Power Supply Batteries Configured as ¼ Wave Antenna (non-removeable).. See the following pages for the data and graphs of the actual measurements made:**



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 7.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS – PART 2.1053 and EIA /TIA-603-C:2004, SECTION 2.2.12

Radiated measurements were performed scanning the frequency range from 30 MHz to at least the 10<sup>th</sup> harmonic of the fundamental frequency.

For the PGX2-X1 Wireless Handheld Transmitter, the highest fundamental frequency is 704 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 PGX2-X1 Wireless Handheld Transmitter are found under Part 74, Section 74.861, Paragraph d-3 for Low Power Auxiliary Stations. This paragraph states that 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.



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 7.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS (CON'T) – PART 2.1053

On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth, the mean power of emissions shall be attenuated below the mean output power of the transmitter at least  $43 + 10 \log_{10}$  (mean output power in watts) dB.

To determine the **LIMIT** for Spurious Emissions the following method was used:

$$\text{Measured output power} = 14.72 \text{ dBm} = 0.02965 \text{ Watts}$$

**The emissions must be reduced by:**

$$43 + 10 \log_{10} (0.02965 \text{ Watts}) = 27.72 \text{ dB}$$

Therefore, the **LIMIT** at three/ten meters equals:

$$\text{Limit} = 14.72 \text{ dBm} - 27.72 \text{ dB} = -13 \text{ dBm}$$

$$14.72 \text{ dBm} = 29.65 \text{ mW}$$





1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

APPENDIX A

**RADIATED EMISSION DATA & CHARTS TAKEN**  
**FOR FUNDAMENTAL EMISSIONS**  
**USING THE SUBSTITUTION METHOD**  
**EIA /TIA-603-C:2004, SECTION 2.2.12**



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 11-13-2007  
 Temperature: 70 deg. F  
 Humidity: 33% R.H.  
 Part 74.861(d)  
 Rated Power = 32 mW = 15.05 dBm

Spurious Emissions - ERP - Substitution Method

Model: <b>PGX2-X1</b>								
Channels: <b>944.125 MHz, and 951.875 MHz</b>								
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	105.62	18.76	7.10	2.15	11.7	30.0	18.3	14.66
944.125 horizontal	110.16	22.58	7.10	2.15	15.5	30.0	14.5	35.32
951.875 vertical	104.37	18.13	7.14	2.15	11.0	30.0	19.0	12.56
951.875 horizontal	108.67	21.74	7.14	2.15	14.6	30.0	15.4	28.84

EIRP = Signal generator output - cable loss + antenna gain

ERP<sub>(ref. to ½λ dipole)</sub> = Signal generator output - cable loss + antenna gain - 2.15



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

APPENDIX A

**RADIATED EMISSION DATA**  
**TAKEN FOR**  
**SPURIOUS EMISSION MEASUREMENTS**  
**USING THE SUBSTITUTION METHOD**  
**EIA /TIA-603-C:2004, SECTION 2.2.12**  
**PART 2.1053**



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 11-13-2007  
 Temperature: 70 deg. F.  
 Humidity: 33% R.H.

Radiated Spurious Emissions (e.r.p. substitution method) FCC Part 74; FCC Part 2.1053								
Model: <b>PGX2-X1</b> Transmit Frequency: <b>944.125 MHz</b>								
Frequency GHz	Field Strength Level dBuV/m	Factor to Convert to dBm	Power ERP dBm	Limit dBm	Margin dB	Receive Antenna Polarization	EUT Antenna Orientation	Receive Antenna Height (m)
1.88825	78.6	99.0	-20.4	-13	7.4	Horizontal	135	1.1
2.83238	73.5	101.0	-27.5	-13	14.5	Horizontal	225	1.0
3.77650	78.6	100.1	-21.5	-13	8.5	Horizontal	250	1.3
4.72063	71.0	98.6	-27.6	-13	14.6	Horizontal	135	1.0
5.66475	75.1	98.5	-23.4	-13	10.4	Horizontal	100	1.1
6.60888	60.0	98.1	-38.1	-13	25.1	Horizontal	160	1.3
7.55300	62.6	98.7	-36.1	-13	23.1	Horizontal	135	1.1
8.49713	71.0	99.2	-28.2	-13	15.2	Horizontal	180	1.4
9.44125	69.4	98.3	-28.9	-13	15.9	Horizontal	210	1.4
1.88825	73.3	98.5	-25.2	-13	12.2	Vertical	200	1.0
2.83238	73.0	99.0	-26.0	-13	13.0	Vertical	180	1.3
3.77650	82.2	99.5	-17.3	-13	4.3	Vertical	180	1.2
4.72063	69.1	99.6	-30.5	-13	17.5	Vertical	170	1.0
5.66475	74.4	100.0	-25.6	-13	12.6	Vertical	170	1.2
6.60888	63.4	99.2	-35.8	-13	22.8	Vertical	225	1.4
7.55300	60.1	100.3	-40.2	-13	27.2	Vertical	140	1.3
8.49713	67.9	101.5	-33.6	-13	20.6	Vertical	180	1.1
9.44125	70.8	100.3	-29.5	-13	16.5	Vertical	200	1.3



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 11-13-2007  
 Temperature: 70 deg. F.  
 Humidity: 33% R.H.

Radiated Spurious Emissions (e.r.p. substitution method) FCC Part 74; FCC Part 2.1053								
Model: <b>PGX2-X1</b> Transmit Frequency: <b>951.875 MHz</b>								
Frequency GHz	Field Strength Level dBuV/m	Factor to Convert to dBm	Power ERP dBm	Limit dBm	Margin dB	Receive Antenna Polarization	EUT Antenna Orientation	Receive Antenna Height (m)
1.90375	78.9	99.7	-20.8	-13	7.8	Horizontal	130	1.1
2.85563	72.2	101.1	-28.9	-13	15.9	Horizontal	180	1.1
3.80750	79.5	99.7	-20.2	-13	7.2	Horizontal	80	1.1
4.75938	73.3	98.3	-25.0	-13	12.0	Horizontal	135	1.0
5.71125	73.3	98.9	-25.6	-13	12.6	Horizontal	120	1.0
6.66313	58.9	97.9	-39.0	-13	26.0	Horizontal	170	1.1
7.61500	63.0	98.9	-35.9	-13	22.9	Horizontal	100	1.1
8.56688	70.2	99.1	-28.9	-13	15.9	Horizontal	180	1.2
9.51875	70.1	98.0	-27.9	-13	14.9	Horizontal	170	1.5
1.90375	73.4	100.1	-26.7	-13	13.7	Vertical	170	1.0
2.85563	72.1	99.3	-27.2	-13	14.2	Vertical	180	1.2
3.80750	80.7	99.0	-18.3	-13	5.3	Vertical	180	1.0
4.75938	74.0	99.3	-25.3	-13	12.3	Vertical	180	1.0
5.71125	74.8	100.3	-25.5	-13	12.5	Vertical	170	1.1
6.66313	57.8	99.1	-41.3	-13	28.3	Vertical	270	1.0
7.61500	60.3	100.4	-40.1	-13	27.1	Vertical	180	1.1
8.56688	70.5	101.3	-30.8	-13	17.8	Vertical	175	1.4
9.51875	68.9	100.4	-31.5	-13	18.5	Vertical	200	1.2



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 8.0 FREQUENCY STABILITY (TEMPERATURE)– PART 2.1055(a1)

The band-edge compliance / frequency stability was measured from -30° to +50° centigrade at intervals of 10° centigrade throughout the range. With power to the transmitter removed, the equipment was left alone for a sufficient period of time (approximately 30 minutes or more) to allow the temperature inside the transmitter to stabilize. Power was then applied to the unit. Prior to each frequency measurement, the unit was operated for a period of time sufficient to stabilize all of the components of the oscillator circuit.

See the following page for the data taken during testing.

### 9.0 FREQUENCY STABILITY (VOLTAGE VARIATION)– PART 2.1055(d2)

The frequency stability of Wireless Boundary Microphone was measured by reducing the primary supply voltage to the battery end point specified by the manufacturer.

See the following page for the data taken during testing.



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

APPENDIX A

DATA AND CHARTS TAKEN FOR BANDEDGE  
AND FREQUENCY STABILITY WHEN  
VARYING THE TEMPERATURE  
AND  
PRIMARY SUPPLY VOLTAGE VARIATION  
PART 2.1055a(1) & PART 2.1055d(d2)  
LOW CHANNEL



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

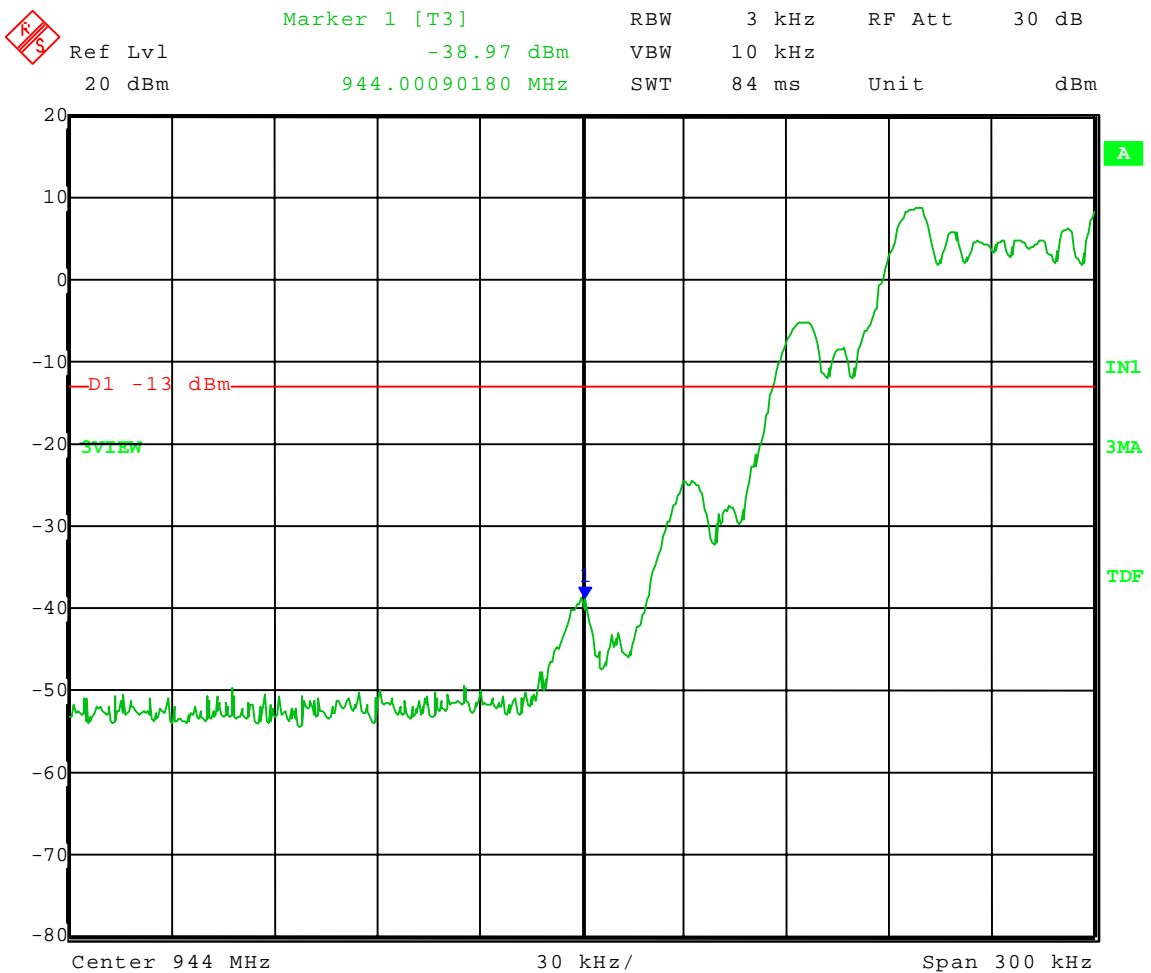
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 2.1 V 20° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 10:15:12





Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

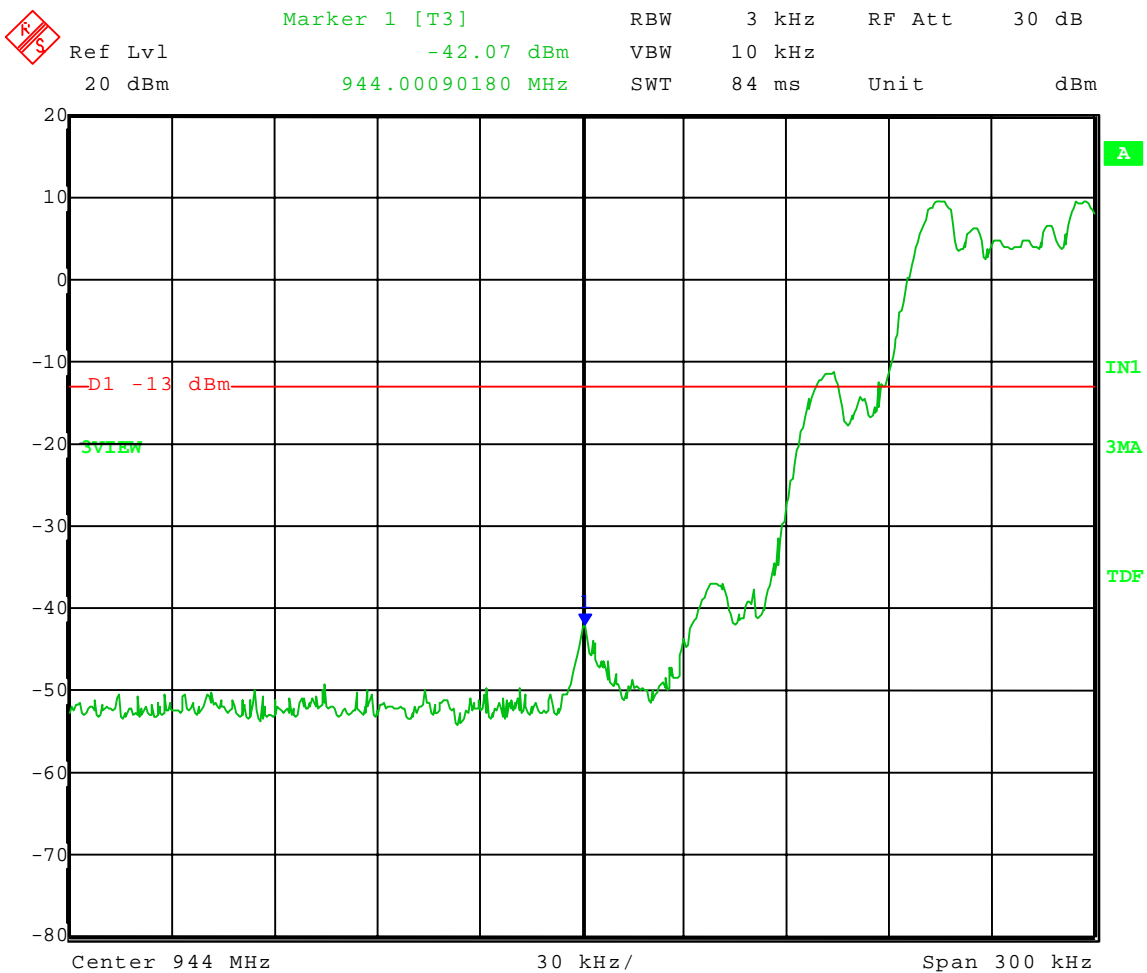
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V -30° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 16:23:15



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

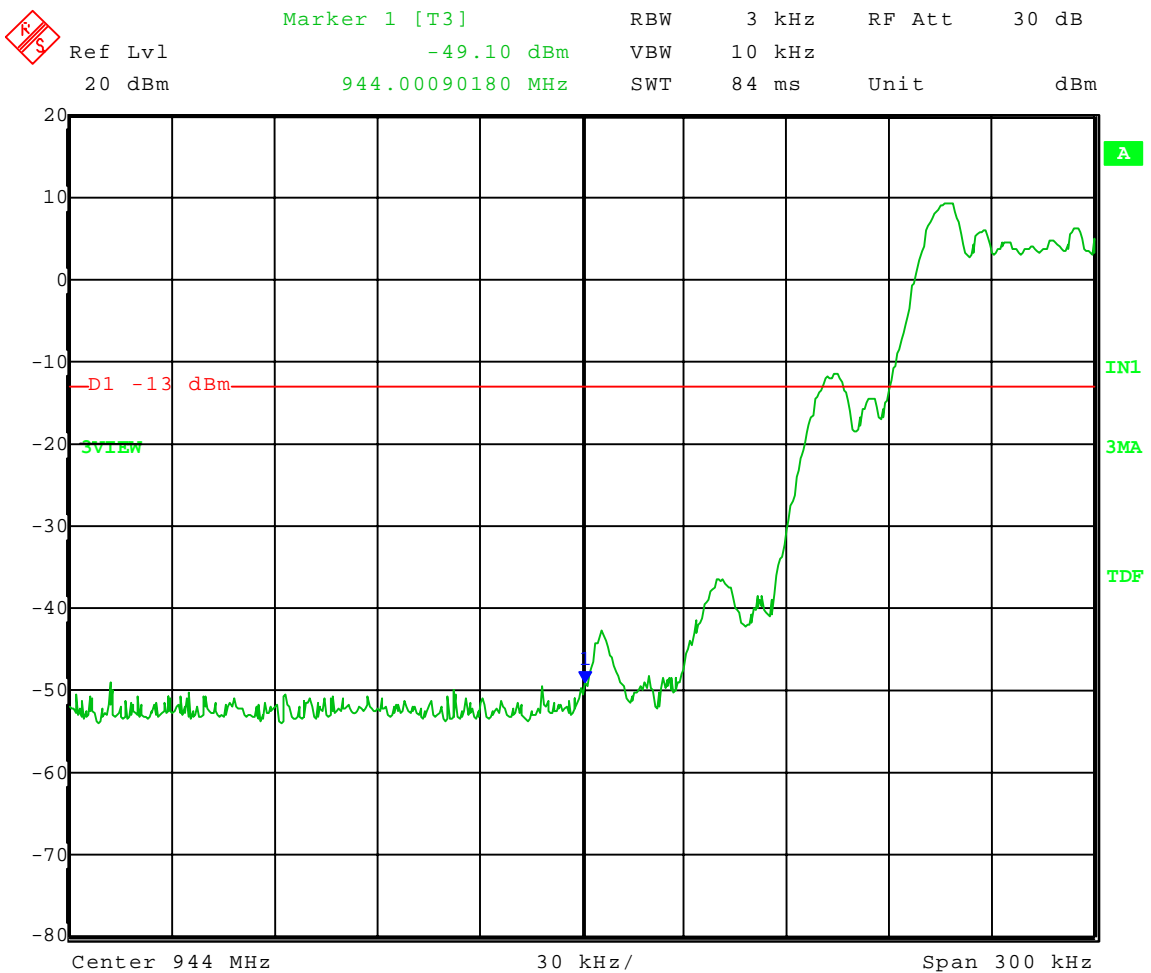
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V -20° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 15:40:44



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

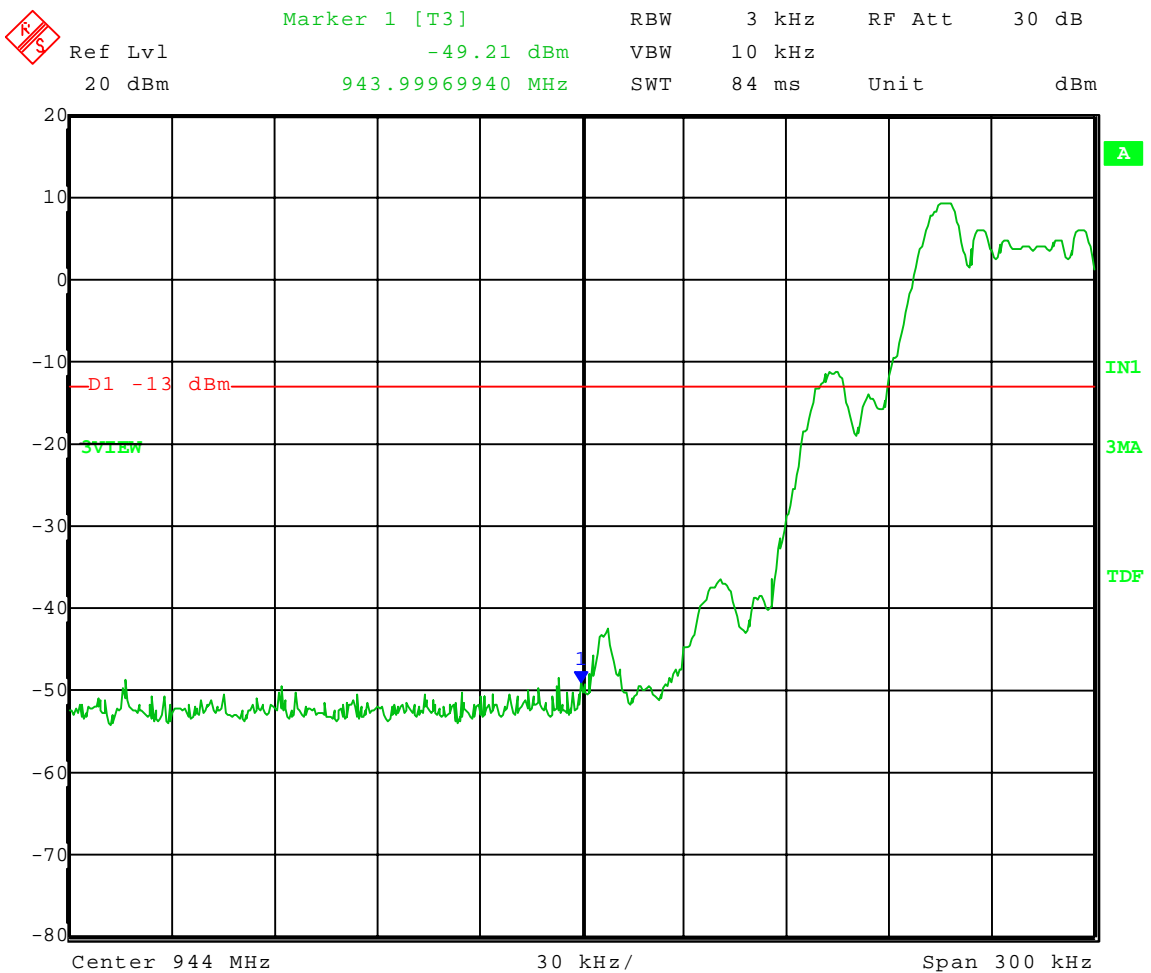
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V -10° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 14:55:10



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

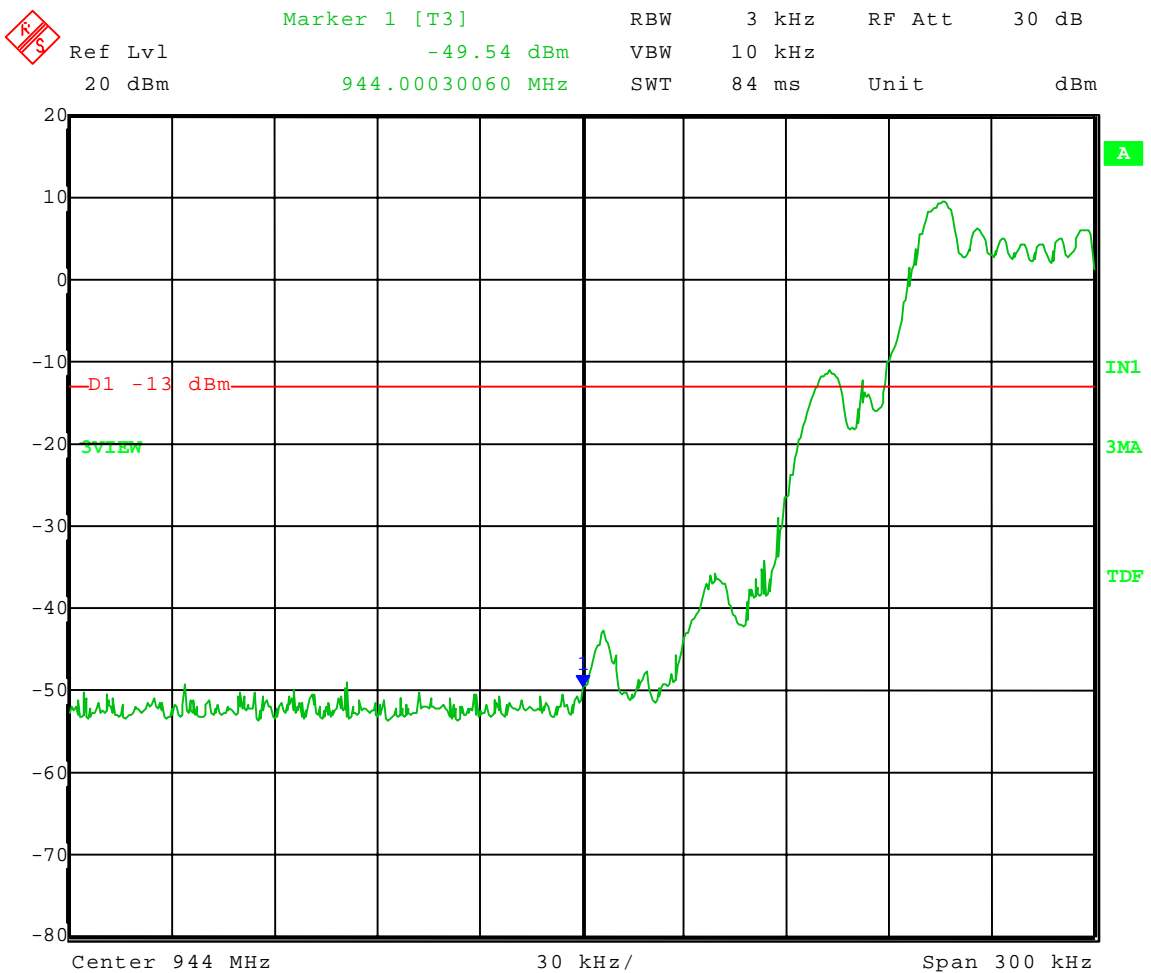
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V 0° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 14:13:02



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

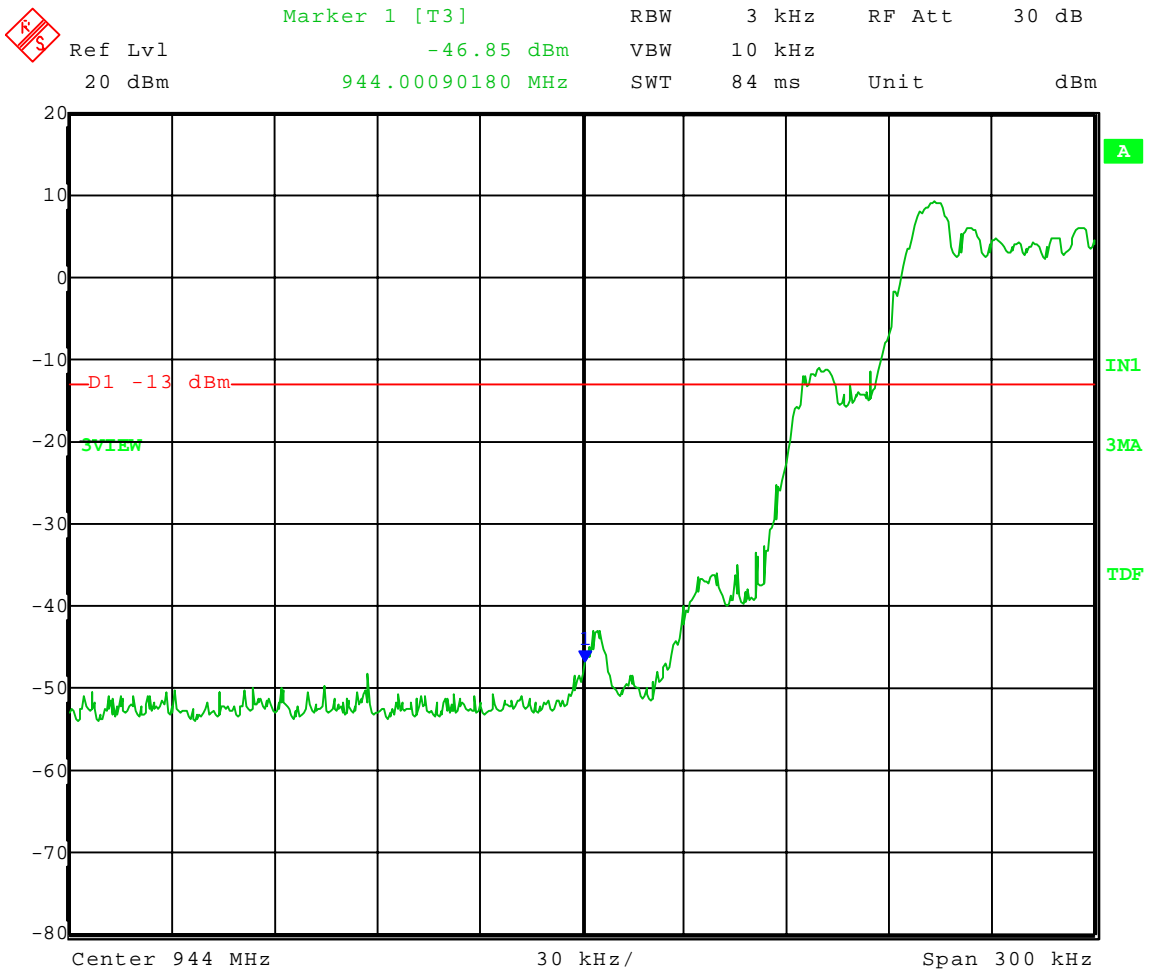
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V 10° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 13:33:29



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

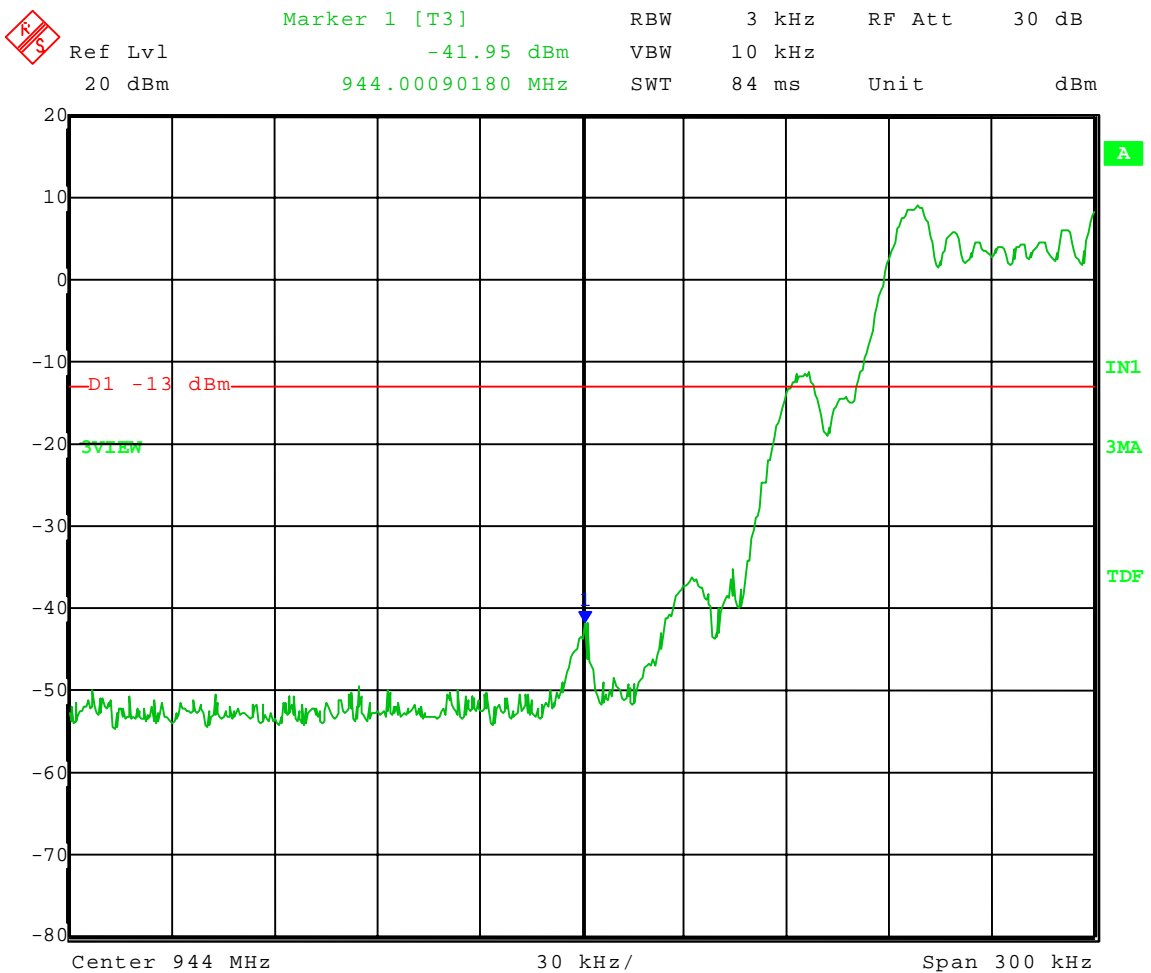
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V 20° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 10:17:24



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

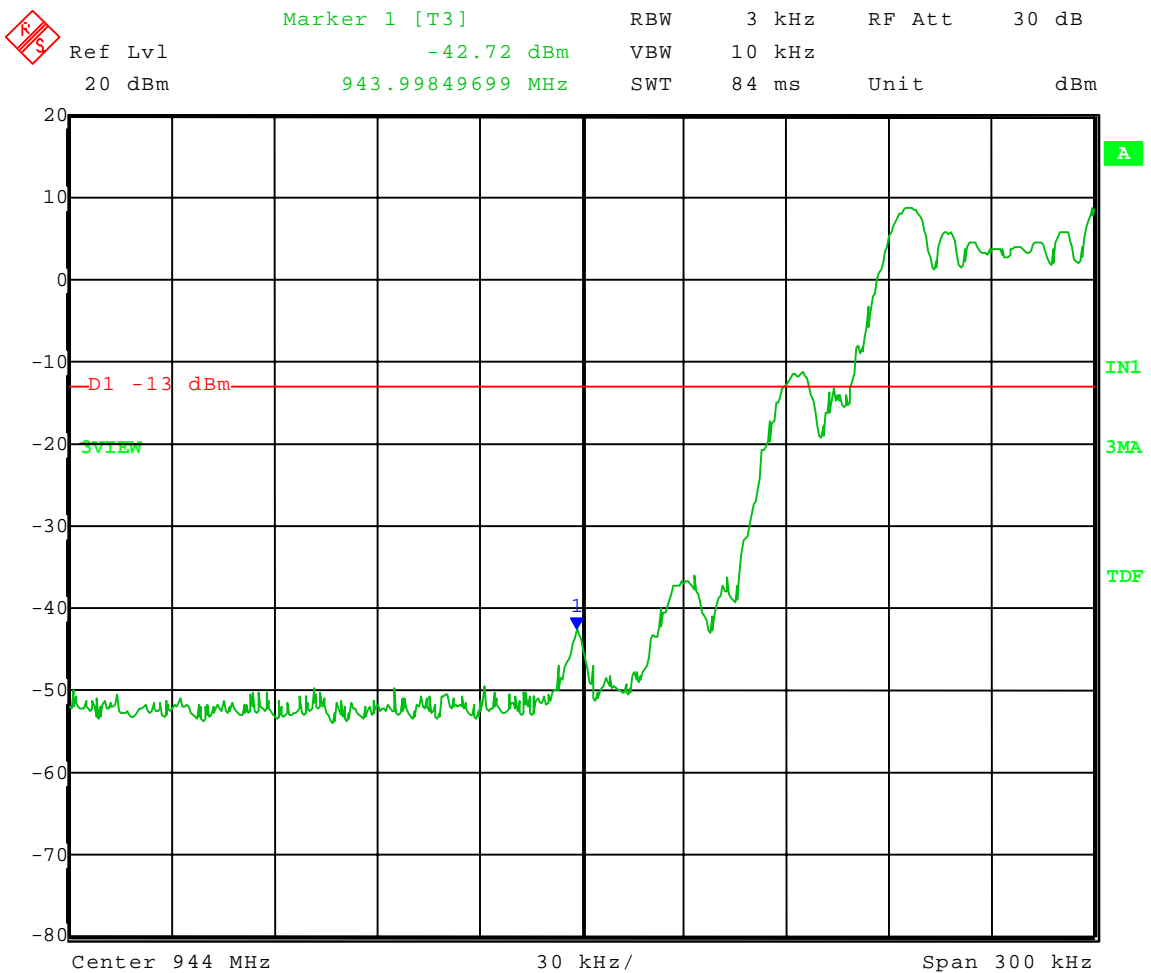
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V 30° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 11:01:34



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

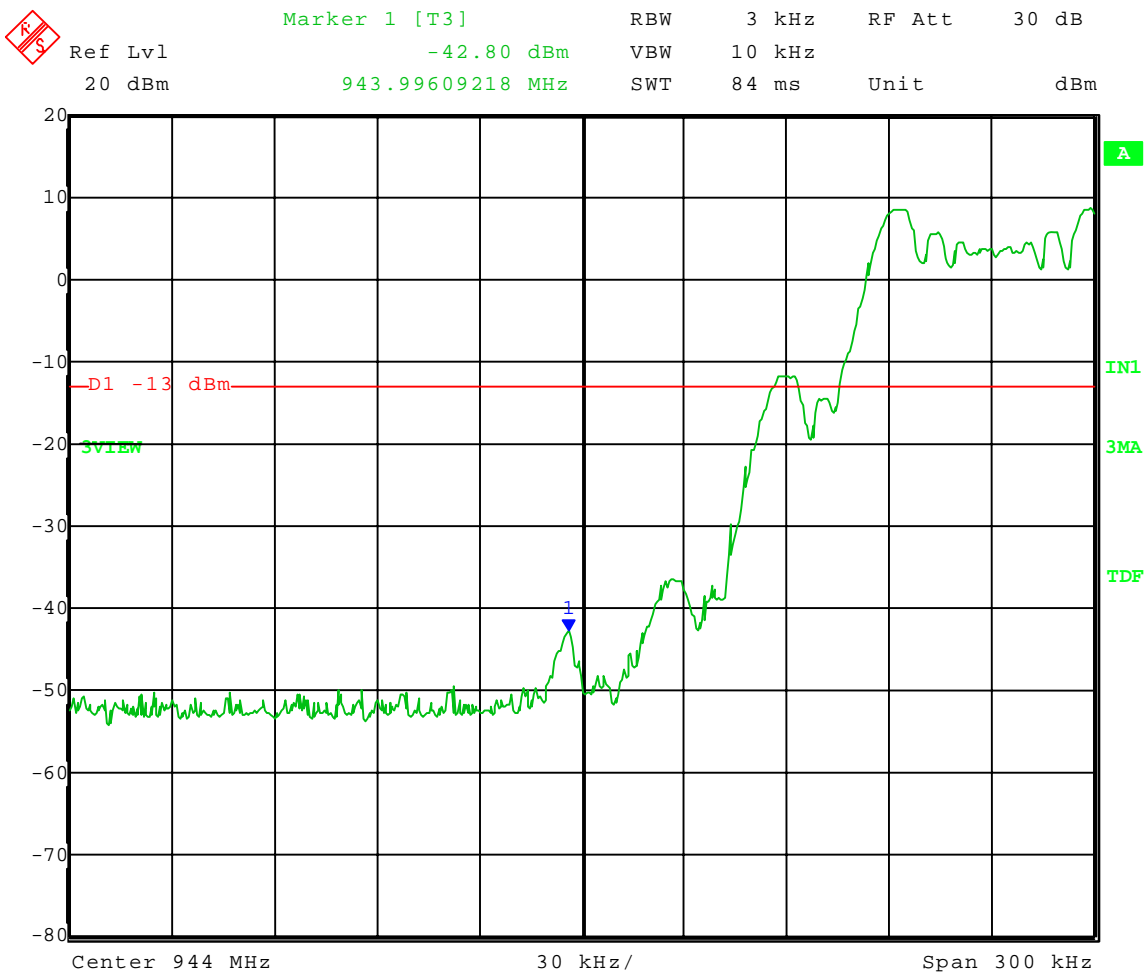
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V 40° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 11:36:27





Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

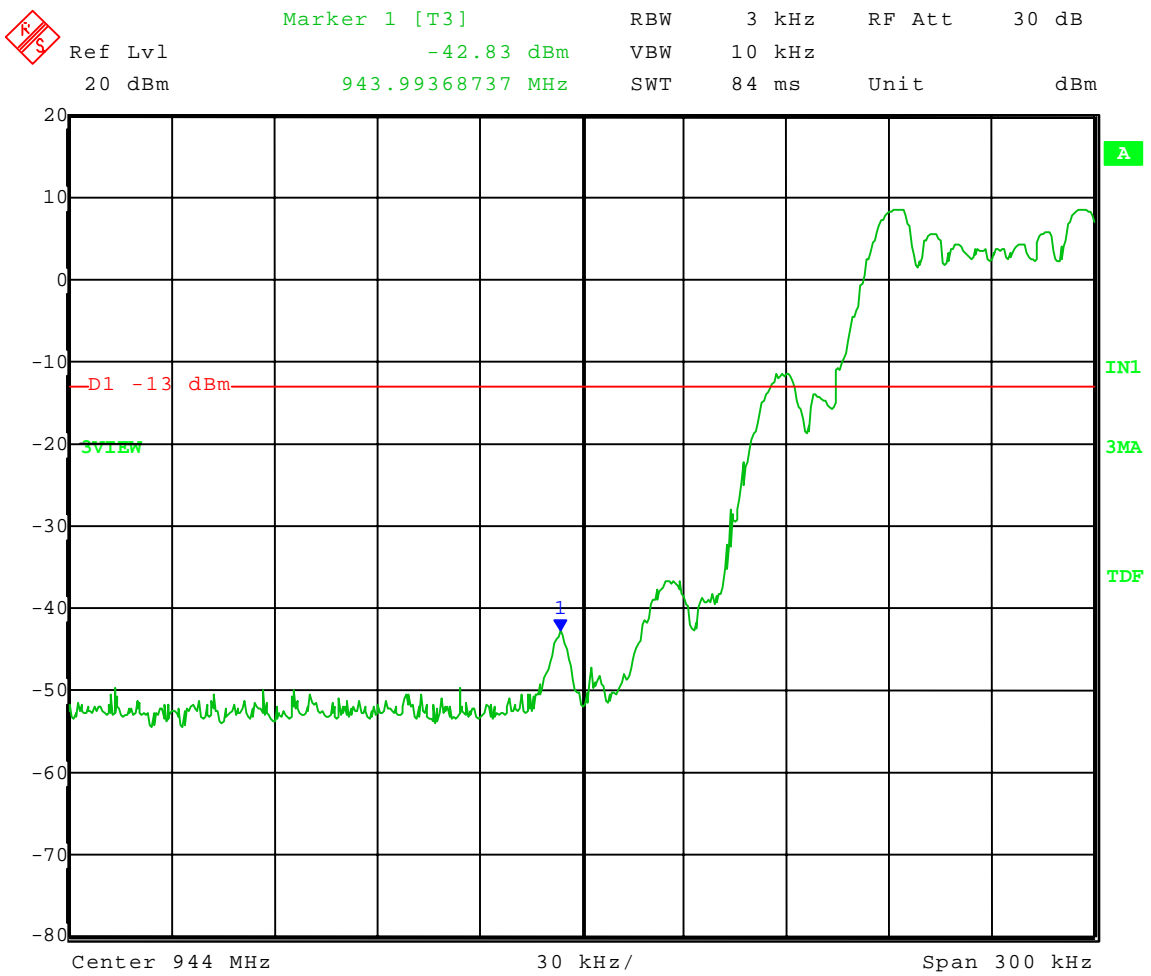
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 944.125 MHz

Operating conditions: 3.0 V 50° C

Band-Edge Frequency = 944 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 12:20:33



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

APPENDIX A

DATA AND CHARTS TAKEN FOR BANDEDGE  
AND FREQUENCY STABILITY WHEN  
VARYING THE TEMPERATURE  
AND  
PRIMARY SUPPLY VOLTAGE VARIATION  
PART 2.1055a(1) & PART 2.1055d(d2)  
HIGH CHANNEL



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

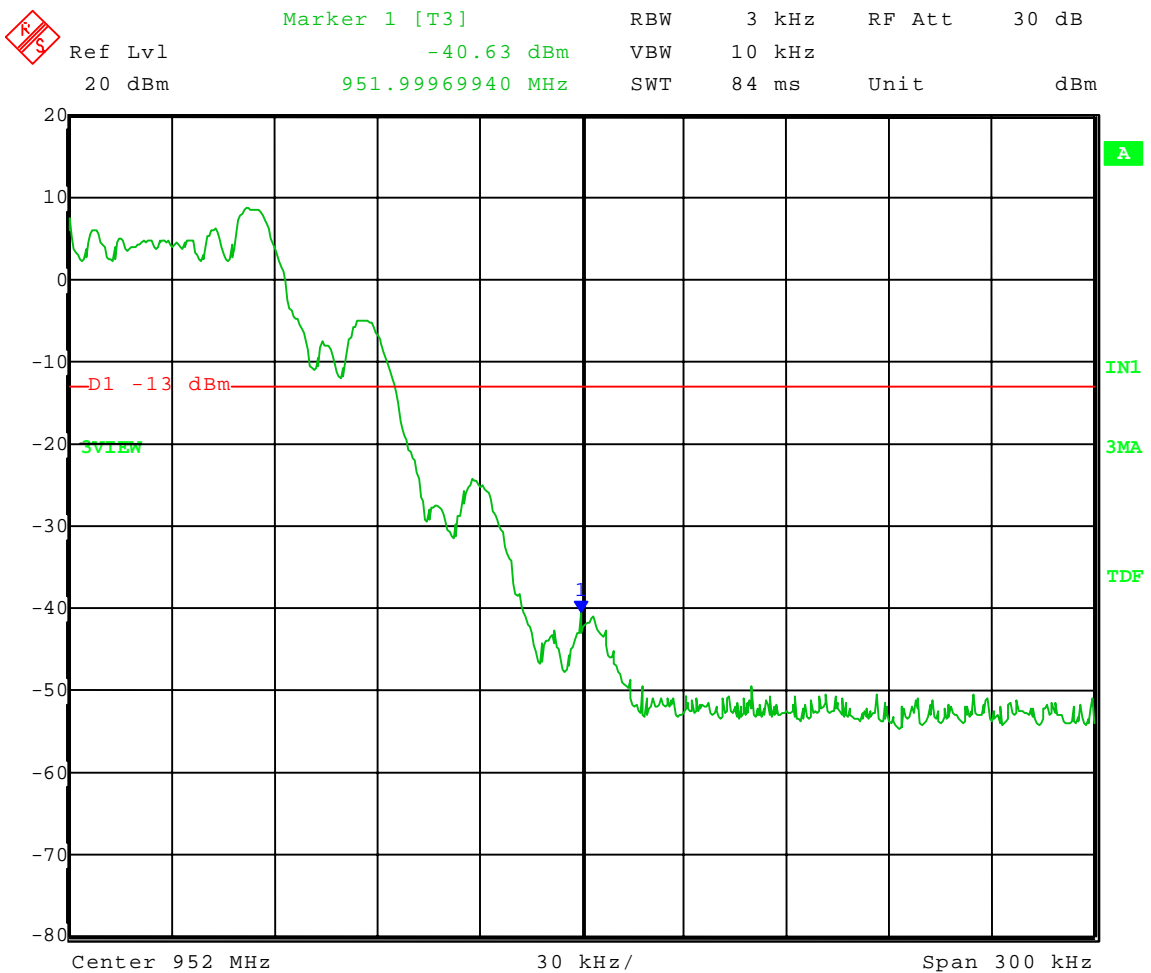
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-20-2007  
 Company: Shure, Inc.  
 EUT: PGX2-X1  
 Test: Band-Edge Compliance - Conducted  
 Rule part: FCC Part 74.861(d); FCC Part 2.1051  
 Operator: Craig B  
 Comment: Channel; 951.875 MHz

Operating conditions: 2.1 V 20° C

Band-Edge Frequency = 952 MHz  
 Band-Edge limit = -13 dBm



Date: 20.NOV.2007 10:13:16



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

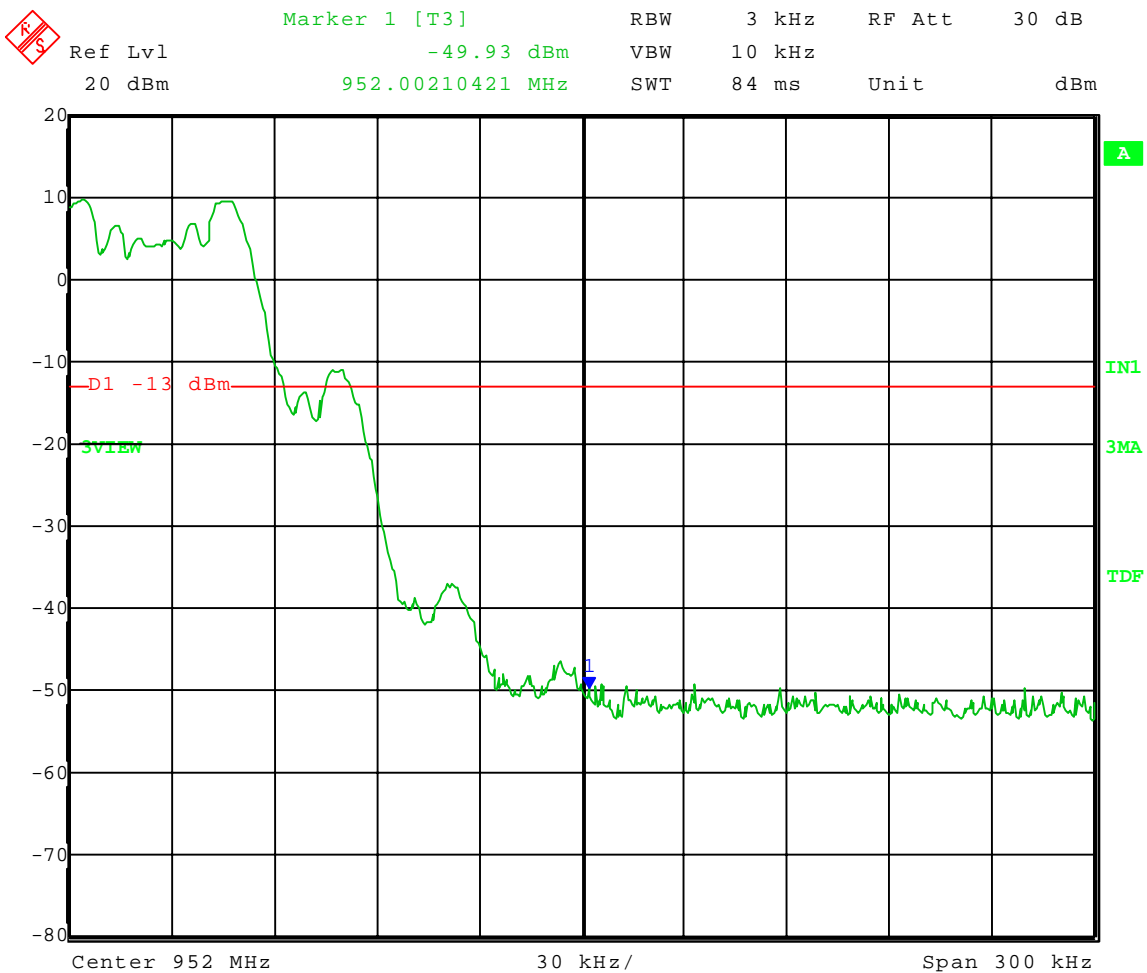
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V -30° C

Band-Edge Frequency = 952 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 16:20:55



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

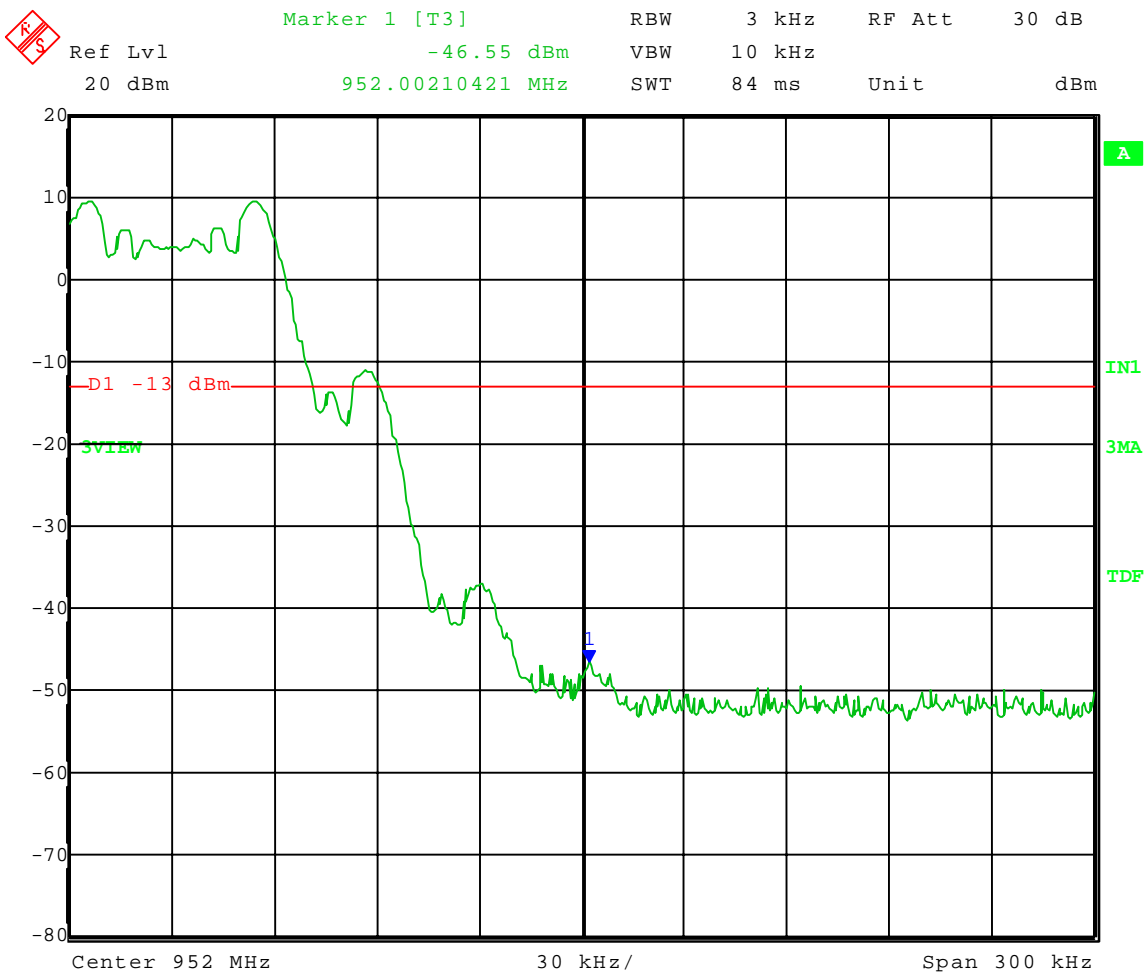
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-20-2007  
 Company: Shure, Inc.  
 EUT: PGX2-X1  
 Test: Band-Edge Compliance - Conducted  
 Rule part: FCC Part 74.861(d); FCC Part 2.1051  
 Operator: Craig B  
 Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V -20° C

Band-Edge Frequency = 952 MHz  
 Band-Edge limit = -13 dBm



Date: 20.NOV.2007 15:42:38



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

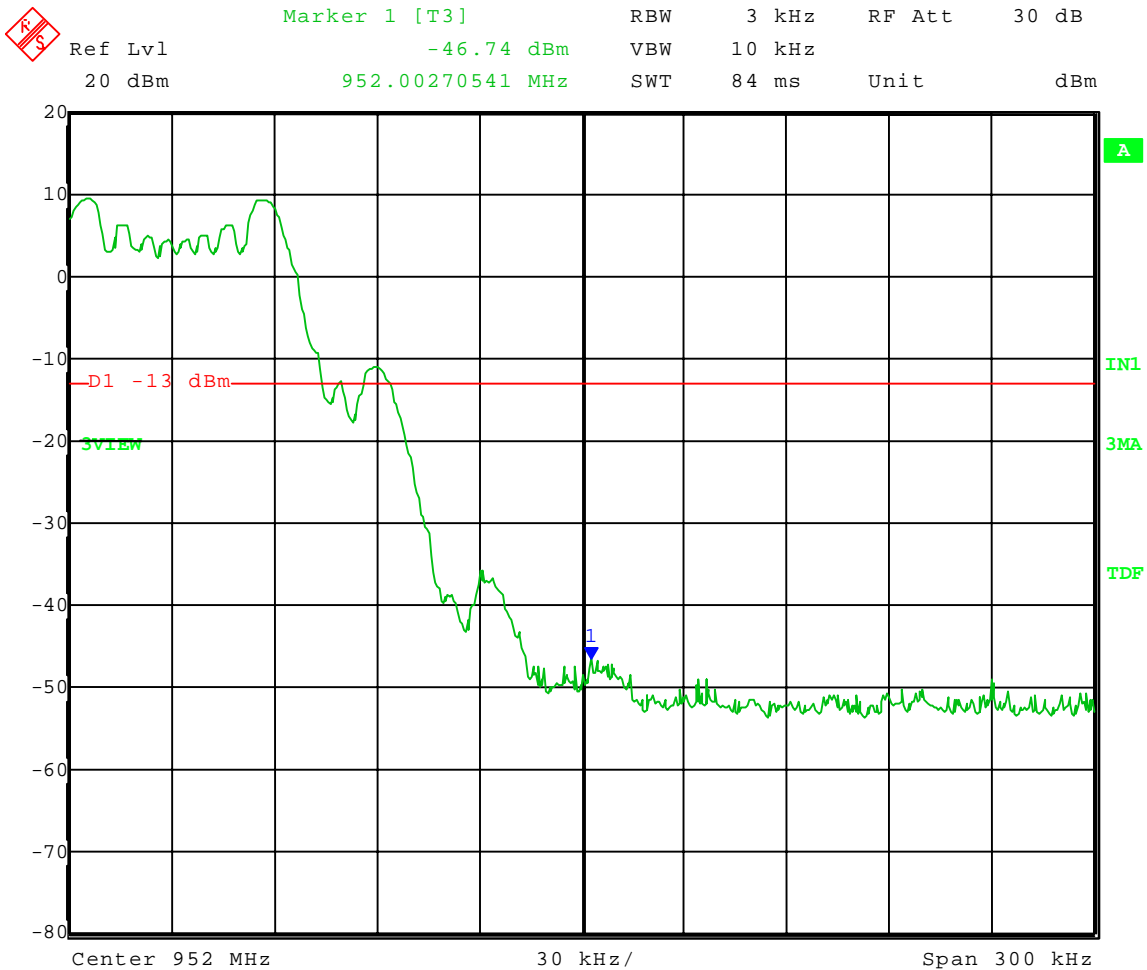
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V -10° C

Band-Edge Frequency = 952 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 14:53:12



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

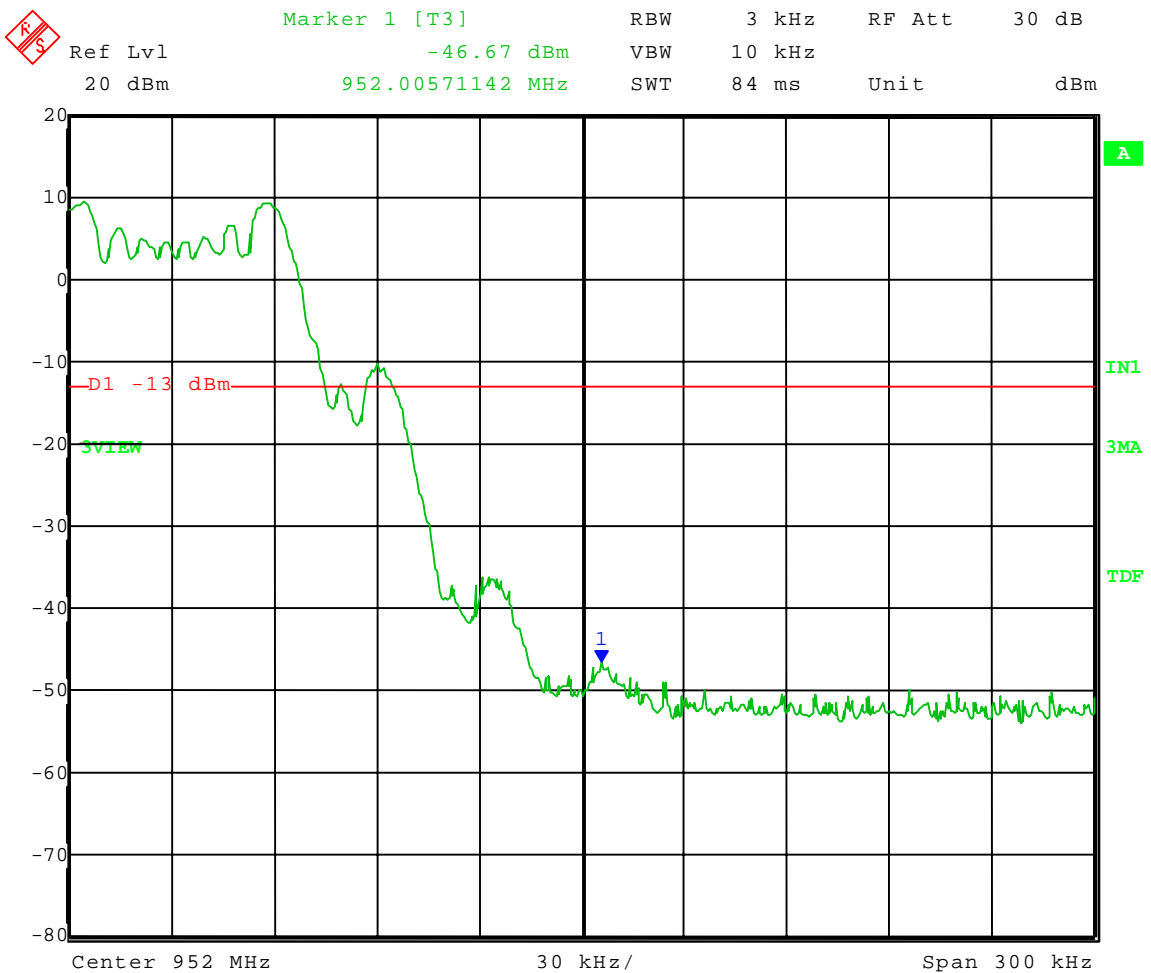
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-20-2007  
 Company: Shure, Inc.  
 EUT: PGX2-X1  
 Test: Band-Edge Compliance - Conducted  
 Rule part: FCC Part 74.861(d), FCC Part 2.1051  
 Operator: Craig B  
 Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V 0° C

Band-Edge Frequency = 952 MHz  
 Band-Edge limit = -13 dBm



Date: 20.NOV.2007 14:14:57



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

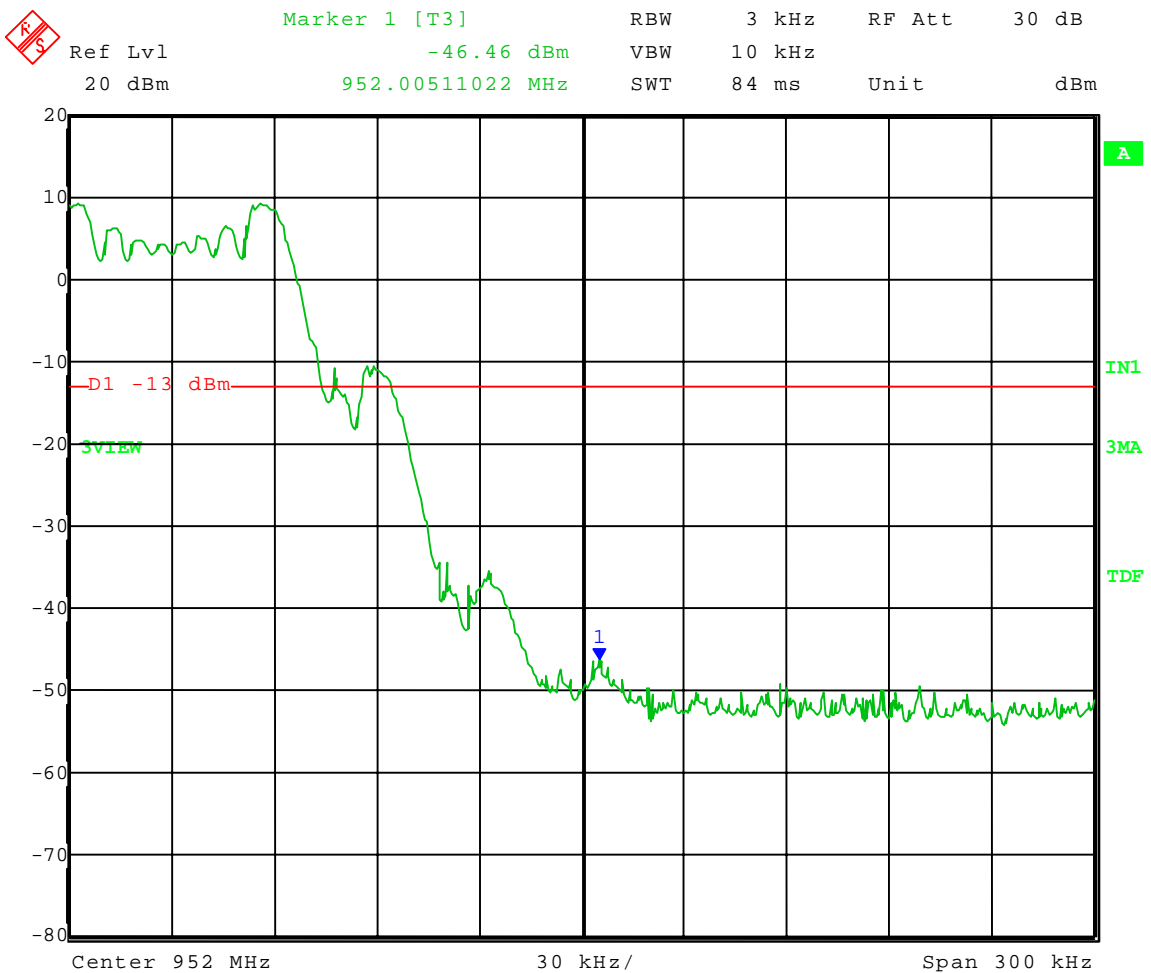
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-20-2007  
 Company: Shure, Inc.  
 EUT: PGX2-X1  
 Test: Band-Edge Compliance - Conducted  
 Rule part: FCC Part 74.861(d); FCC Part 2.1051  
 Operator: Craig B  
 Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V 10° C

Band-Edge Frequency = 952 MHz  
 Band-Edge limit = -13 dBm



Date: 20.NOV.2007 13:31:25





Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

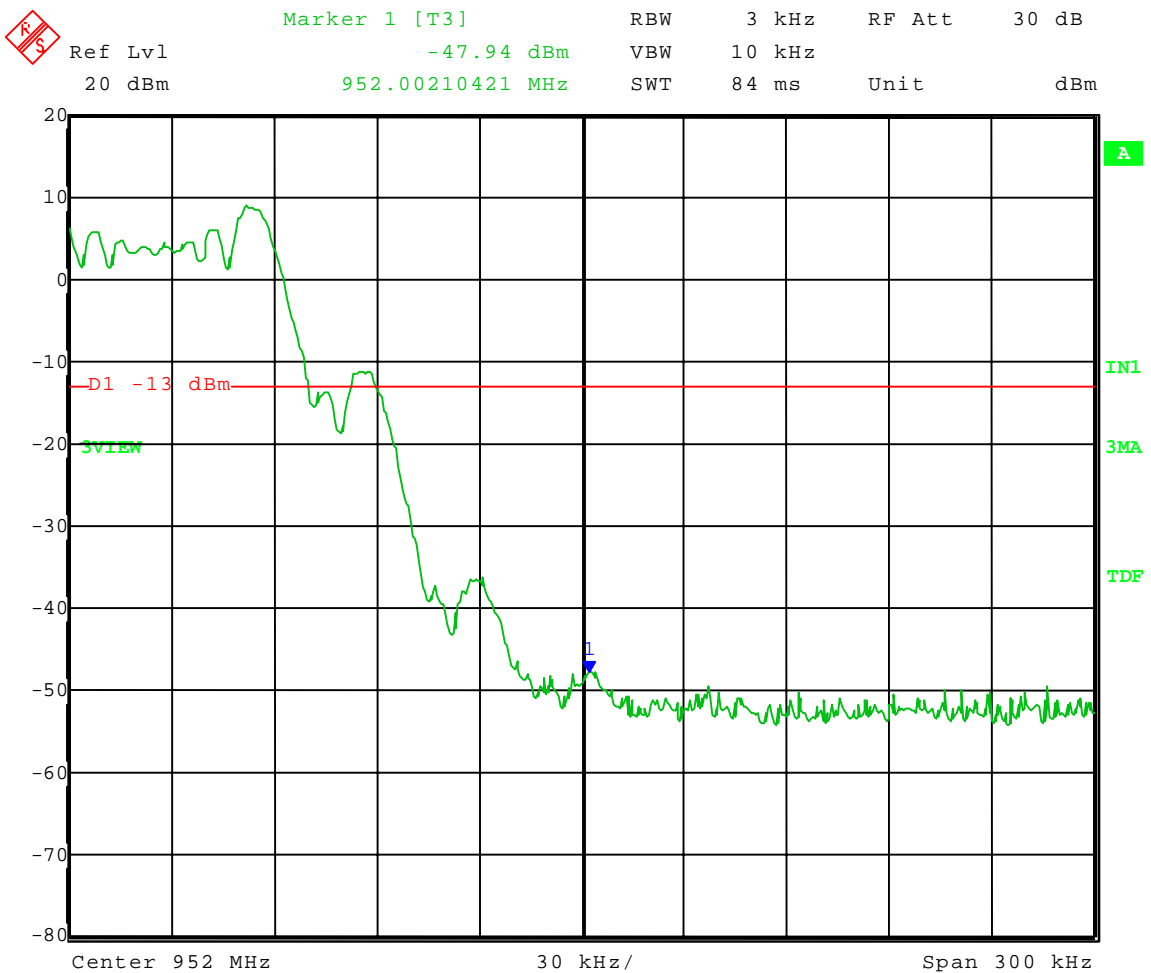
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V 20° C

Band-Edge Frequency = 952 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 10:09:20



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

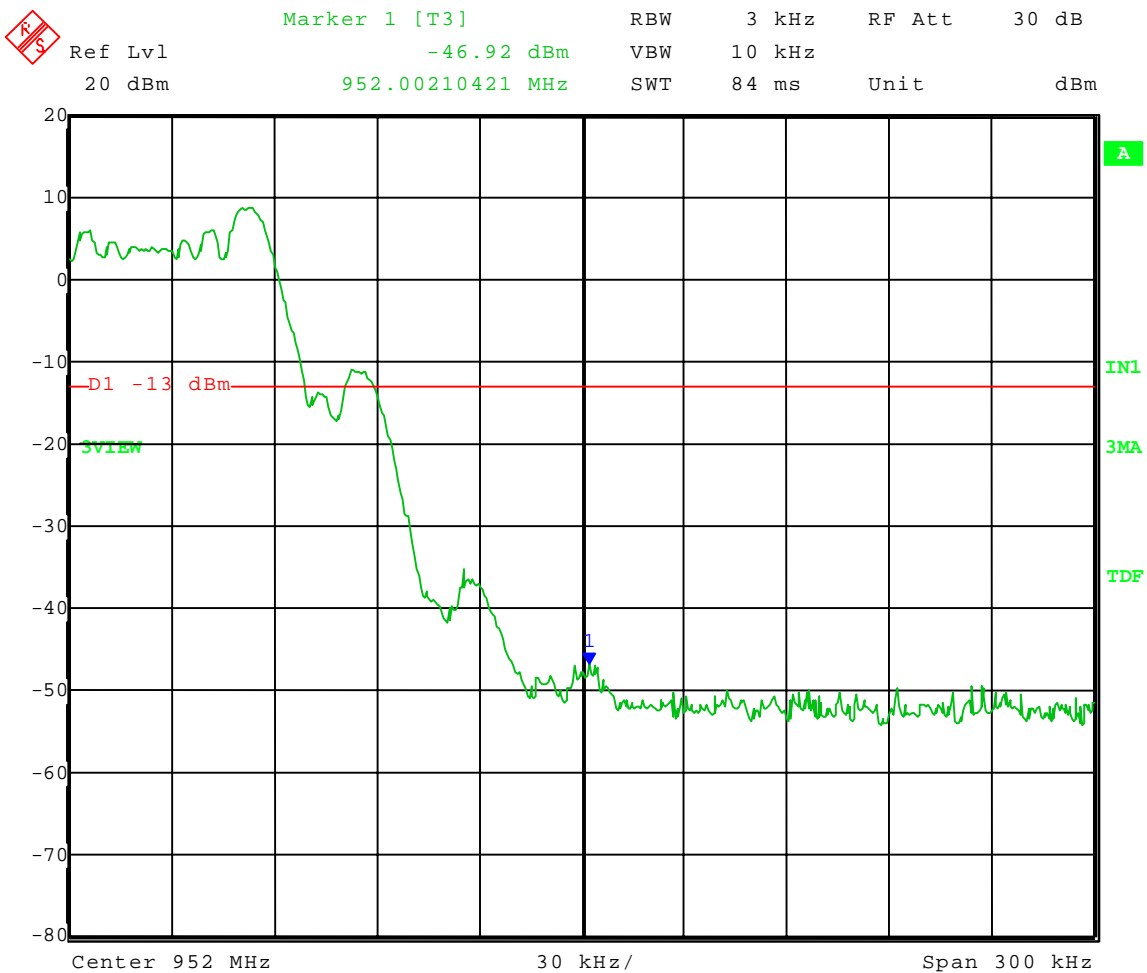
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-20-2007  
 Company: Shure, Inc.  
 EUT: PGX2-X1  
 Test: Band-Edge Compliance - Conducted  
 Rule part: FCC Part 74.861(d); FCC Part 2.1051  
 Operator: Craig B  
 Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V 30° C

Band-Edge Frequency = 952 MHz  
 Band-Edge limit = -13 dBm



Date: 20.NOV.2007 11:03:21



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

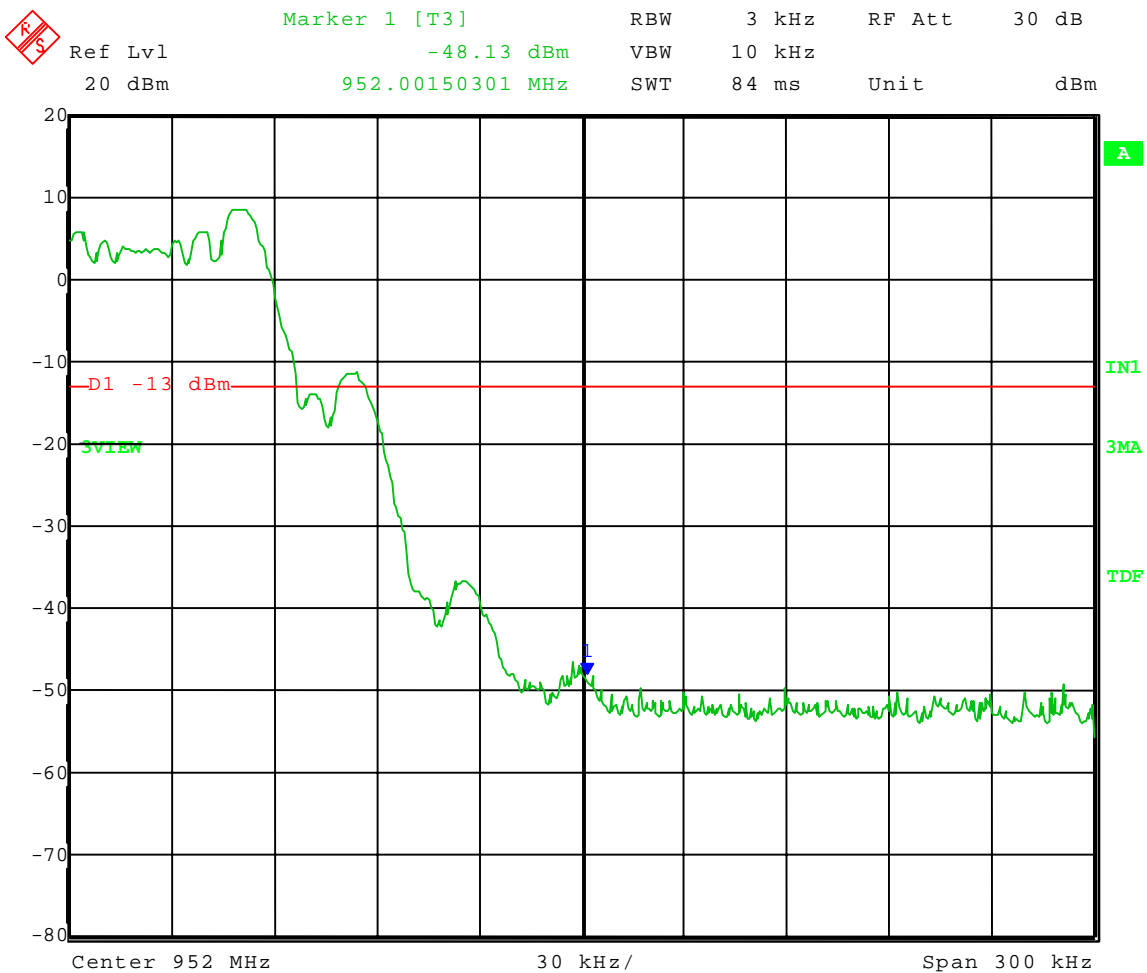
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V 40° C

Band-Edge Frequency = 952 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 11:34:30



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

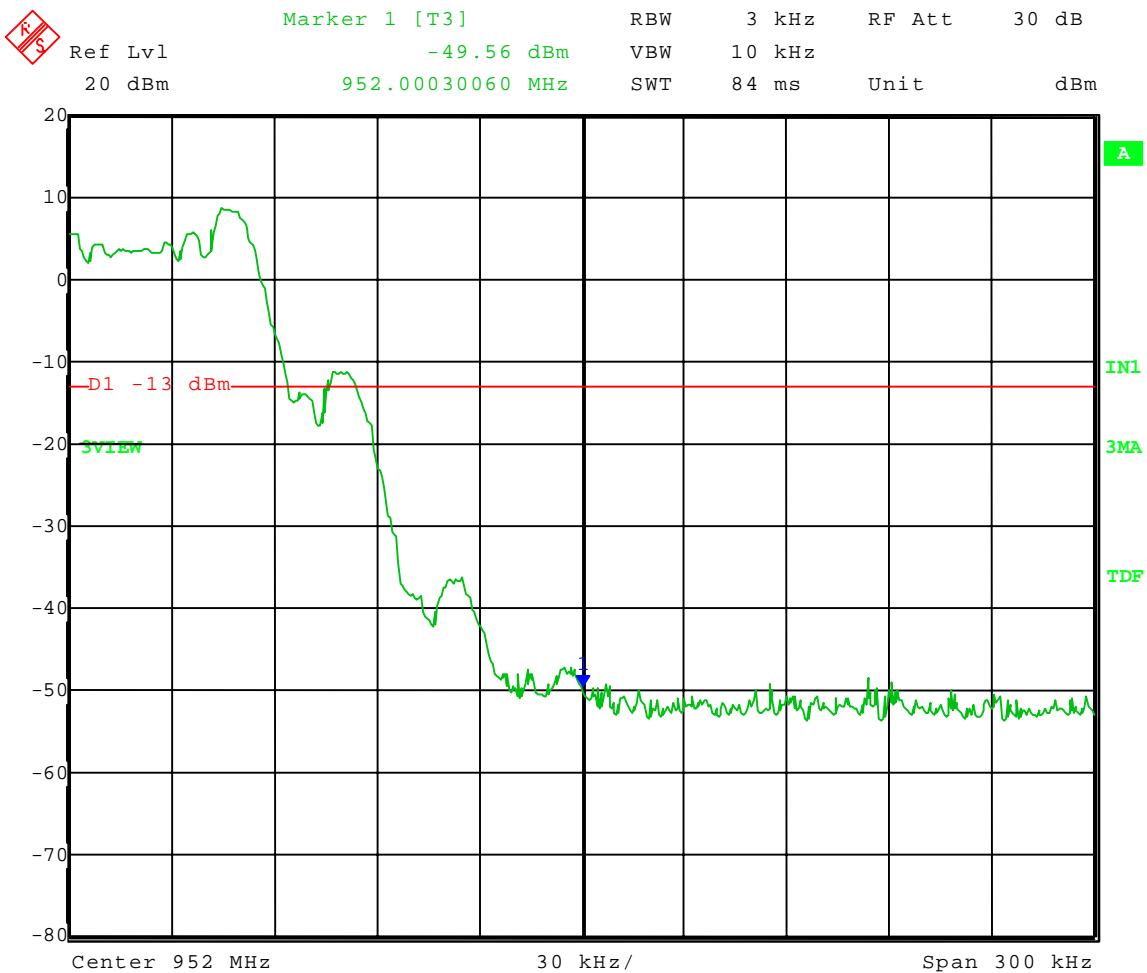
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 11-20-2007  
Company: Shure, Inc.  
EUT: PGX2-X1  
Test: Band-Edge Compliance - Conducted  
Rule part: FCC Part 74.861(d); FCC Part 2.1051  
Operator: Craig B  
Comment: Channel; 951.875 MHz

Operating conditions: 3.0 V 50° C

Band-Edge Frequency = 952 MHz  
Band-Edge limit = -13 dBm



Date: 20.NOV.2007 12:22:53



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

APPENDIX A

DATA TAKEN FOR FREQUENCY  
TOLERANCE WHEN VARYING THE  
TEMPERATURE AND PRIMARY SUPPLY VOLTAGE  
  
PART 2.1055



Company: Shure Inc.  
 Model Tested: PGX2-X1  
 Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 08-12-2008 and 08-14-2008

Limit = +/-9.4 kHz (+/- 10 ppm as stated by Shure, Inc.)

Frequency Stability FCC Part 74; 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)
PGX2-X1	944.125	944.120805	-4.195	944.121333	-3.667	944.123298	-1.702	944.123634	-1.366	944.126653	1.653
PGX2-X1	951.875	951.870758	-4.242	951.871477	-3.523	951.872819	-2.181	951.874113	-0.887	951.876854	1.854

Frequency Stability FCC Part 74; 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)	2.1 Volts	Error (kHz)
PGX2-X1	944.125	944.127655	2.655	944.127655	2.655	944.126253	1.253	944.123647	-1.353	944.122771	-2.229
PGX2-X1	951.875	951.877555	2.555	951.877455	2.455	951.876453	1.453	951.872946	-2.054	951.873730	-1.270



Company: Shure Inc.  
Model Tested: PGX2-X1  
Report Number: 13854

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 11.0 FREQUENCY STABILITY PHOTOS TAKEN DURING TESTING

