



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

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: UR1H Bodypack Transmitter  
Kind of Equipment: Wireless Microphone Transmitter  
Test Configuration: Stand Alone, or with External Antenna, External Power Supply, and Mixer (Tested at 120 vac, 60 Hz)  
Model Number(s): UR1H X1  
Model(s) Tested: UR1H X1  
Serial Number(s): N/A  
Date of Tests: February 13, 14 & 15 and September 11, 2008  
Test Conducted For: Shure Incorporated  
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.

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Model Tested: UR1H X1  
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SIGNATURE PAGE

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EMC-001375-NE

Reviewed By:

William Stumpf  
OATS Manager

Approved By:

Brian Mattson  
General Manager



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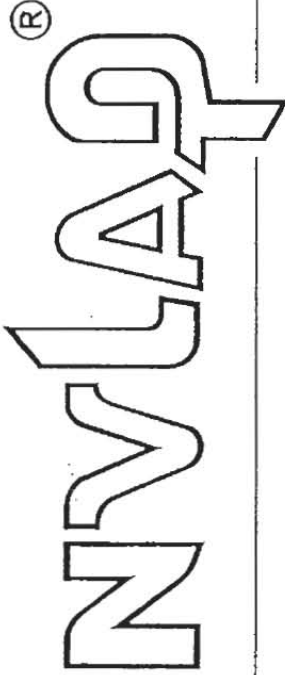


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United States Department of Commerce  
National Institute of Standards and Technology



# 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).

2007-10-01 through 2008-09-30

Effective dates



*Jolly S. Bruce*

For the National Institute of Standards and Technology

NVI AP-01C (REV. 2006-09-13)



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## 1.0 SUMMARY OF TEST REPORT

It was found that the UR1H Bodypack Transmitter, Model Number(s) UR1H 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 February 13, 14 & 15 and September 11, 2008, a series of radio frequency interference measurements was performed on UR1H Bodypack Transmitter, Model Number(s) UR1H X1, Serial Number: N/A. 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

### **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.



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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. 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.



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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.

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 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 AC POWER LINE 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:

### 8.1 Description:

The UHF-R Wireless Microphone System uses the latest wireless technology, delivers outstanding audio clarity, and is rugged and reliable. It operates over the frequency range of 518 to 952 MHz (in different frequency bands). The products are identical, with the exception of the frequency components needed for each range. The User Interface includes directional buttons, and an LCD that displays battery status, group/channel, and transmitter/receiver frequency synchronization. It is easy to set up and operate with advanced features for professional installations requiring multiple wireless microphone systems.

### 8.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 98 mm x 60mm Width: x 17 mm Height:

### 8.3 LINE FILTER USED:

N/A

### 8.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

N/A

Clock Frequencies:

0.025, 0.064, 0.750, 1.2, 4, 16, 32 MHz

### 8.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. Printed Circuit Board 1

PN: 190-11425 Rev.00

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

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



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## 10.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 UR1H Bodypack Transmitter

Model Number: UR1H X1, Serial Number: N/A

Item 1 Shure microphone cable.

Model Number: 93

Item 2 Shure AC Adapter

Model Number: PS22US, Serial Number: PS22US



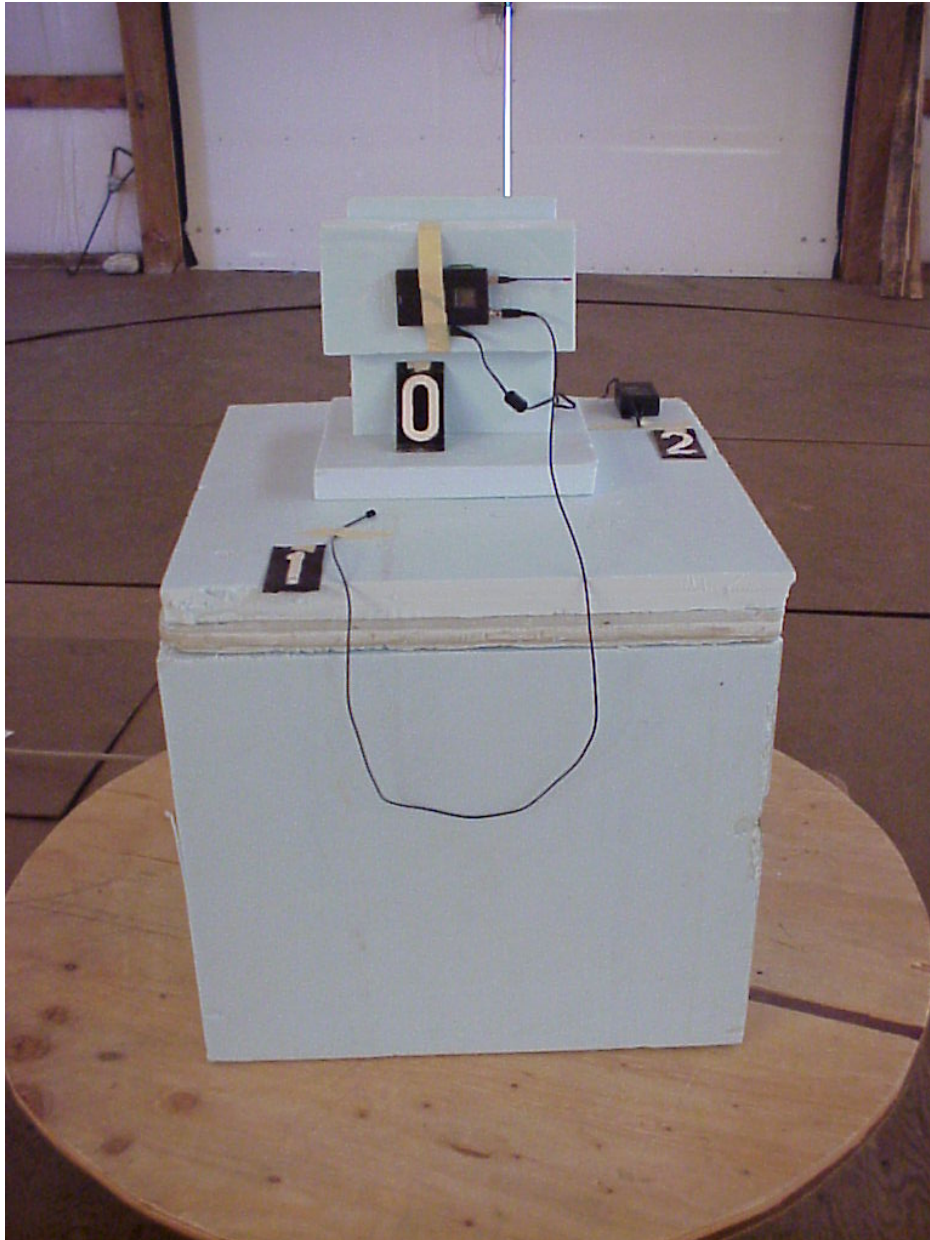
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11.0

DIATED PHOTOS TAKEN DURING TESTING

RA



RADIATED ERP X



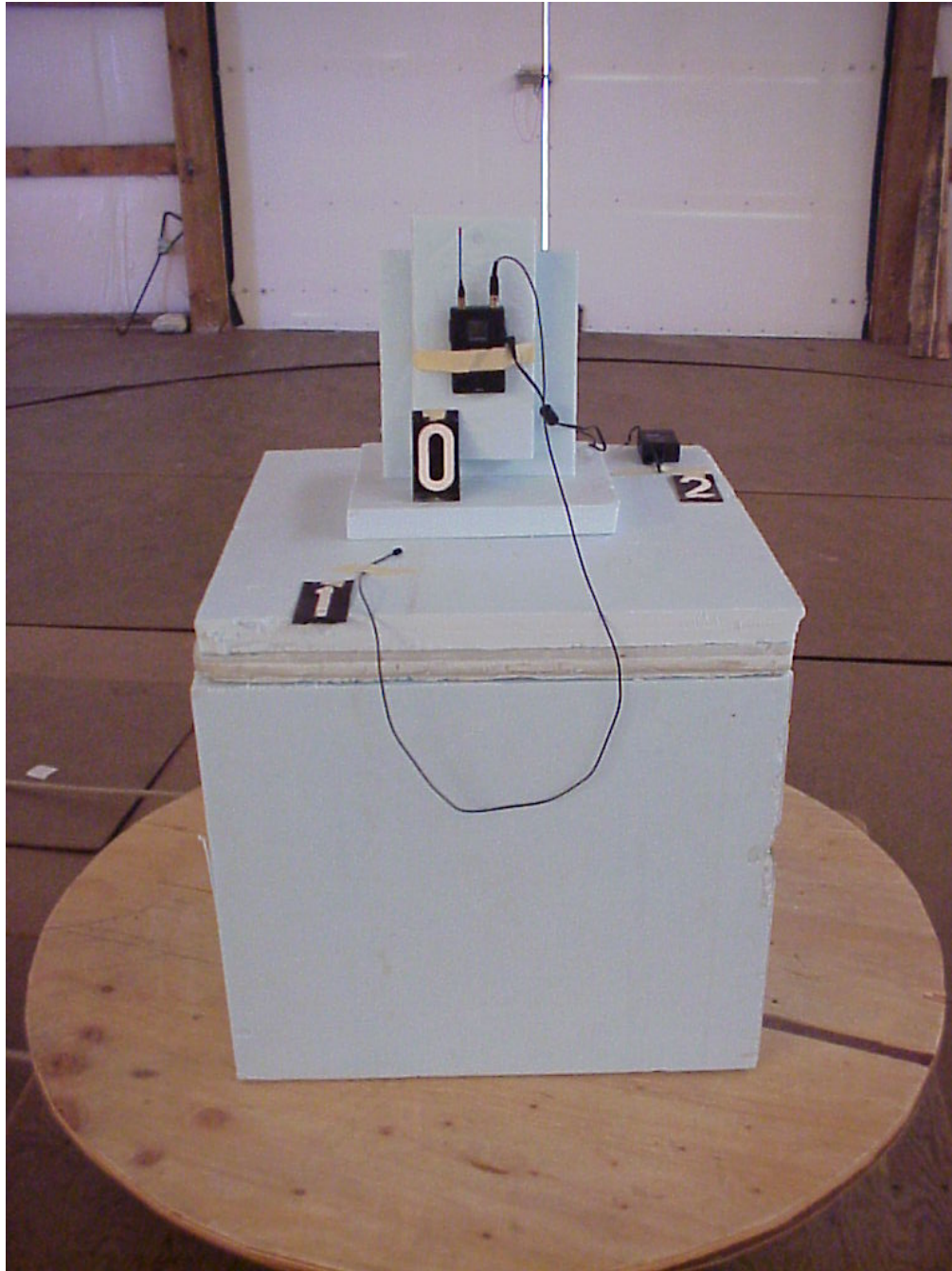
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11.0

RA

DIATED PHOTOS TAKEN DURING TESTING



RADIATED ERP Y





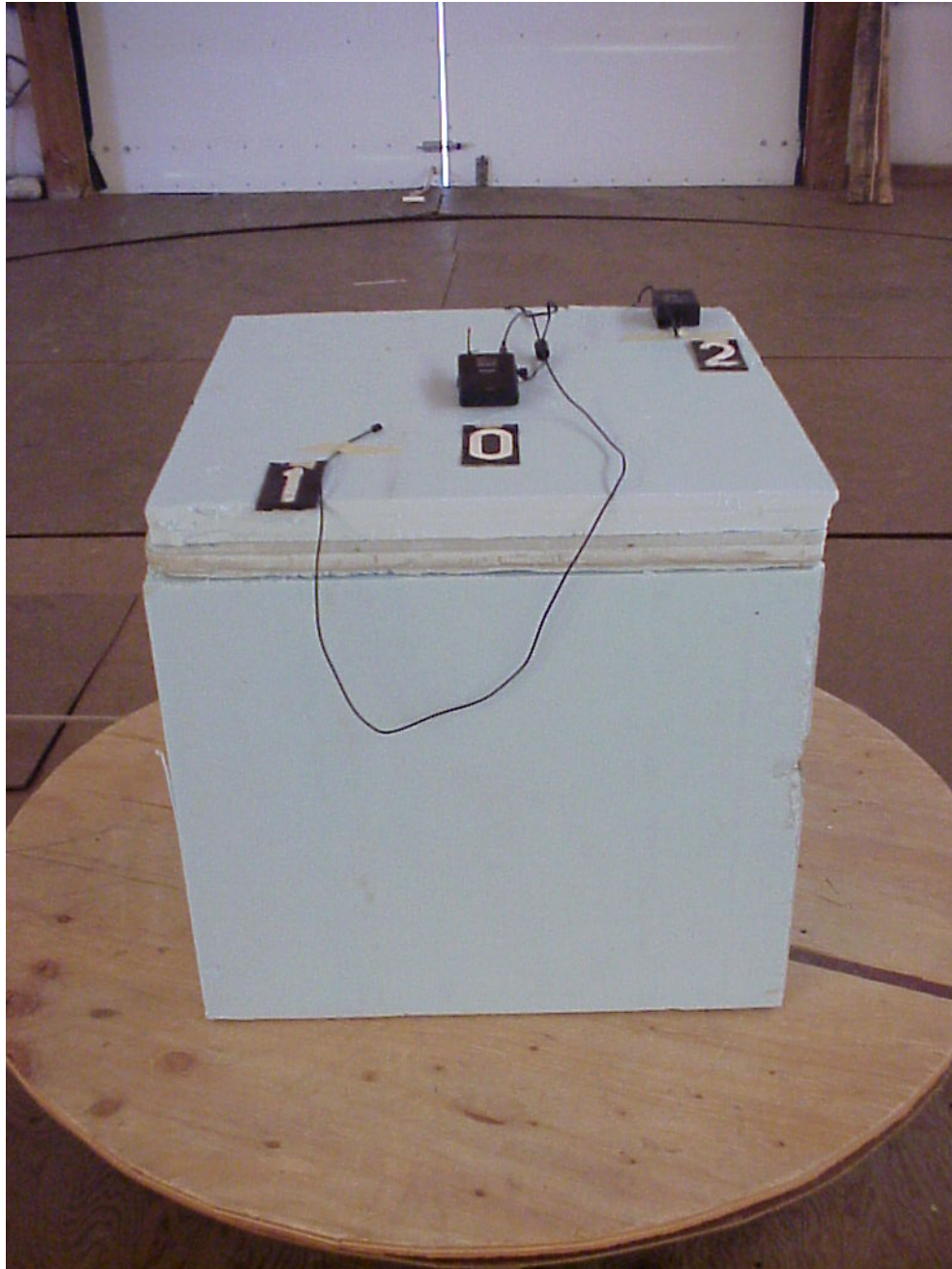
Company: Shure Incorporated  
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11.0

RA

DIATED PHOTOS TAKEN DURING TESTING



RADIATED ERP Z



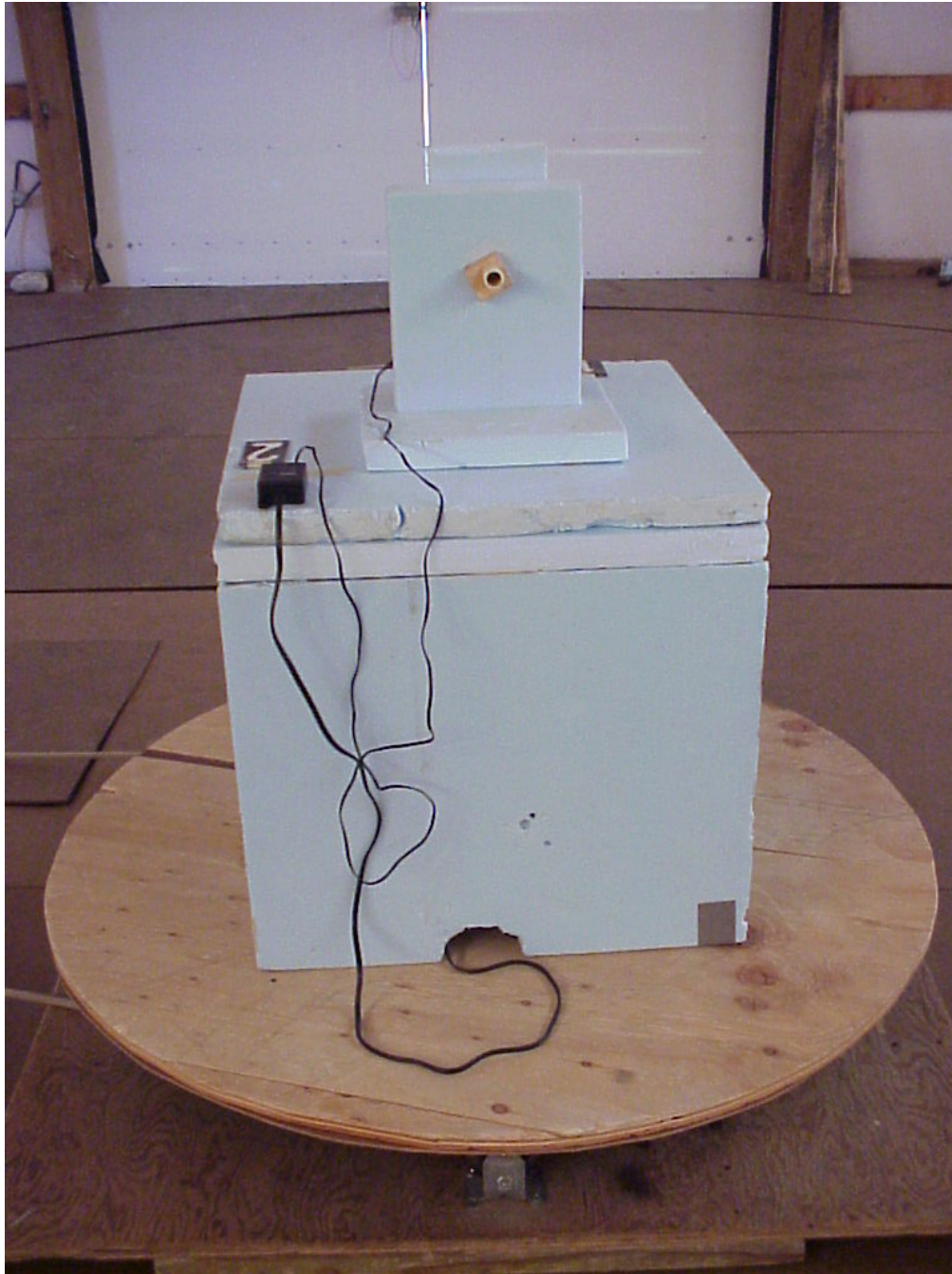
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11.0

RA

DIATED PHOTOS TAKEN DURING TESTING



RADIATED BACK





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## 11.0 RF CONDUCTED PHOTOS TAKEN DURING TESTING



RF CONDUCTED





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





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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 UR1H Bodypack Transmitter, Model Number(s) UR1H 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

<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Frequency Range</b>	<b>Cal Due Dates</b>
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	12/08
Preamplifier	Rohde & Schwarz	TS-PR10	032001/004	9 kHz – 1 GHz	1/09
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3/08
Antenna	EMCO	3146	1205	200 MHz – 1 GHz	3/08
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	1/09
Horn Antenna	EMCO	3115	4451	1-18GHz	5/08
Filter – High Pass	Q-Microwave	100460	002	1.1GHz	5/08

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



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TABLE 1 – EQUIPMENT LIST

<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Frequency Range</b>	<b>Cal Due Dates</b>
Receiver	Rhode & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	12/08
Attenuator 20 dB Fixed	Aeroflex Weinschel	75A-20-12	1071	DC – 40 GHz	7/08
Power Meter	Anritsu	ML2487A	6K00002069	100 kHz – 65 GHz	10/08
Power Sensor	Anritsu	MA2490A	031563	50 MHz – 8 GHz	10/08
RF Cable	Insulated Wire Inc.	KPS-1501-1182-KPS	01182007	30 MHz – 40 GHz	5/08
RF Cable	Manhattan / CDT	M4218	E96824-I	30 MHz – 1 GHz	3/08
Dipole Antenna	Com-Power	AD-100	40140	400 MHz – 1 GHz	7/09
Spectrum Analyzer	Hewlett-Packard	8591A	3009A00700	9 kHz – 1.8 GHz	9/08
Function Generator	Hewlett-Packard	3312A	1432A12543	1 Hz – 500 MHz	6/08
Signal Generator	Marconi	2022A	119026	10 kHz – 1 GHz	7/08
Signal Generator	Rhode & Schwarz	SMR-40	100092	1 GHz – 40 GHz	8/08
Modulation Analyzer	Hewlett-Packard	8901B	2920A02096	150 kHz – 1.3 GHz	7/09

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 OPERATING IN THE BANDS OTHER THAN THOSE ALLOCATED FOR TV BROADCASTING



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

5V (collector), 100 mA (Imax)

### 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 UR1H Bodypack Transmitter was connected to a Spectrum Analyzer or a Power Meter through suitable attenuation. All cables, connectors, and attenuators were calibrated prior to testing.

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

13.74 dBm Measured output of the transmitter

13.74 dBm equals 234.4 mW

#### **LIMIT:**

Manufacturer's rated output power = 250 mW

#### **MARGIN:**

$1 - .2344 = .7656$  watt(s)



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## 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





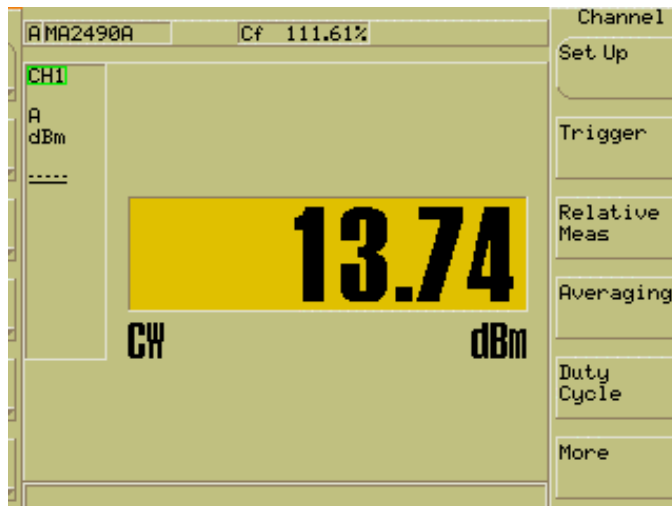
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### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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 = 13.74 dBm + 9.96 dB ext. attn. = 23.7 dBm = 234.4 mW





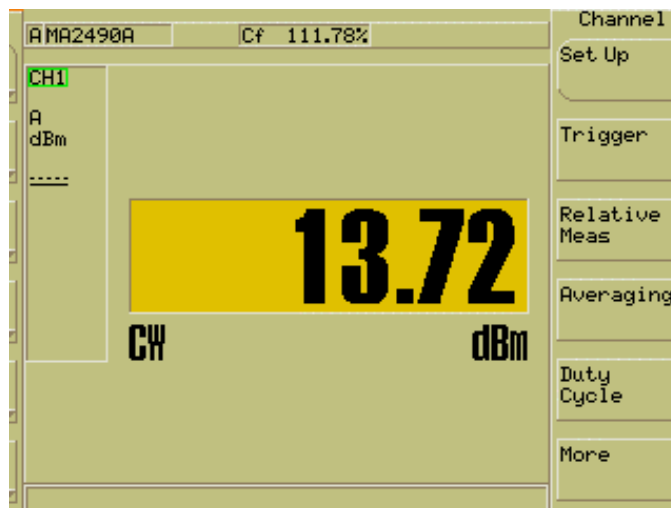
Company: Shure Incorporated  
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### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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 = 13.72 dBm + 9.96 dB ext. attn. = 23.68 dBm = 233.3 mW





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## APPENDIX A

### 4.0 RF POWER OUTPUT PHOTOS TAKEN DURING TESTING



CONDUCTED OUTPUT POWER



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## APPENDIX A

### 5.0 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 50 Hz to 15 kHz  $\pm$  3.0 dB 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.



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## 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

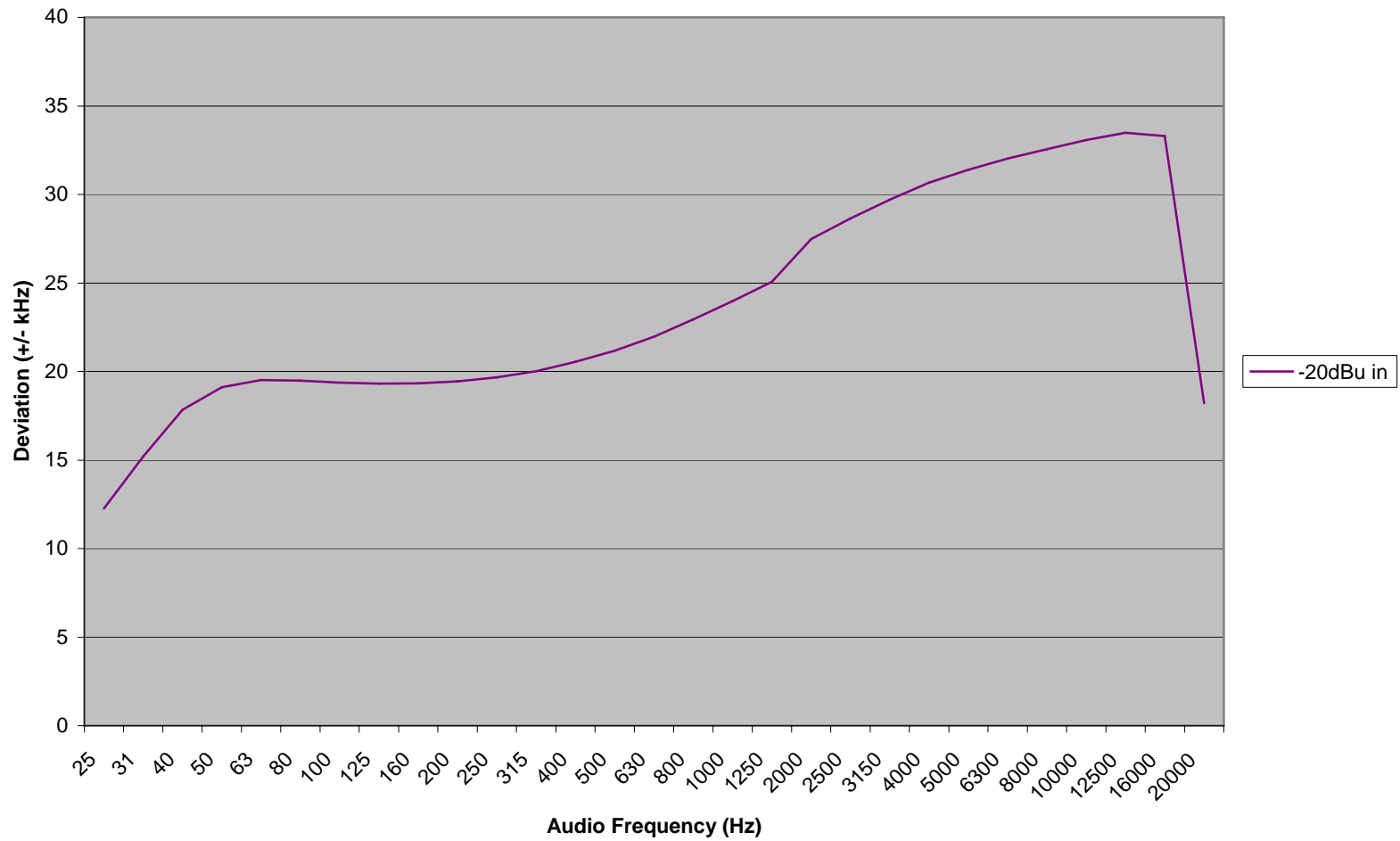


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## APPENDIX A

### Deviation vs. Frequency





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APPENDIX A

948MHz			
X1-1		X1-2	
Freq	Deviation	Deviation	Average
25	12.23	12.31	12.27
31	15.15	15.27	15.21
40	17.79	17.91	17.85
50	19.07	19.18	19.125
63	19.46	19.57	19.515
80	19.42	19.54	19.48
100	19.31	19.44	19.375
125	19.24	19.39	19.315
160	19.26	19.41	19.335
200	19.37	19.52	19.445
250	19.59	19.76	19.675
315	19.95	20.10	20.025
400	20.47	20.63	20.55
500	21.10	21.24	21.17
630	21.90	22.03	21.965
800	22.87	23.03	22.95
1000	23.89	24.05	23.97
1250	24.97	25.15	25.06
2000	27.37	27.59	27.48
2500	28.52	28.74	28.63
3150	29.58	29.84	29.71
4000	30.53	30.81	30.67
5000	31.25	31.56	31.405
6300	31.85	32.19	32.02
8000	32.37	32.76	32.565
10000	32.85	33.29	33.07
12500	33.25	33.72	33.485
16000	33.01	33.60	33.305
20000	24.19	12.23	18.21

-20dBu in

DATA BY FREQUENCY

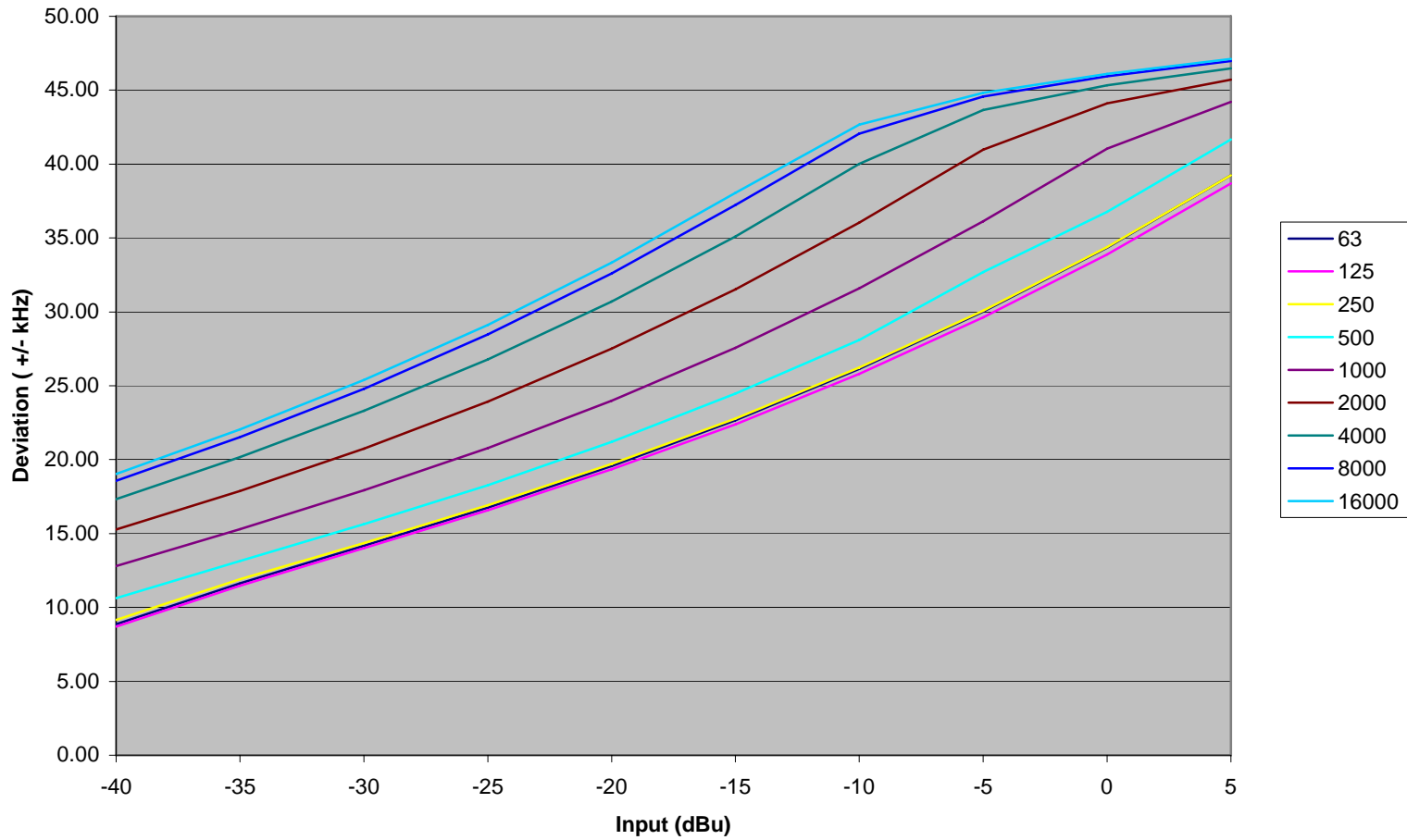


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## APPENDIX A

### Deviation vs. Input





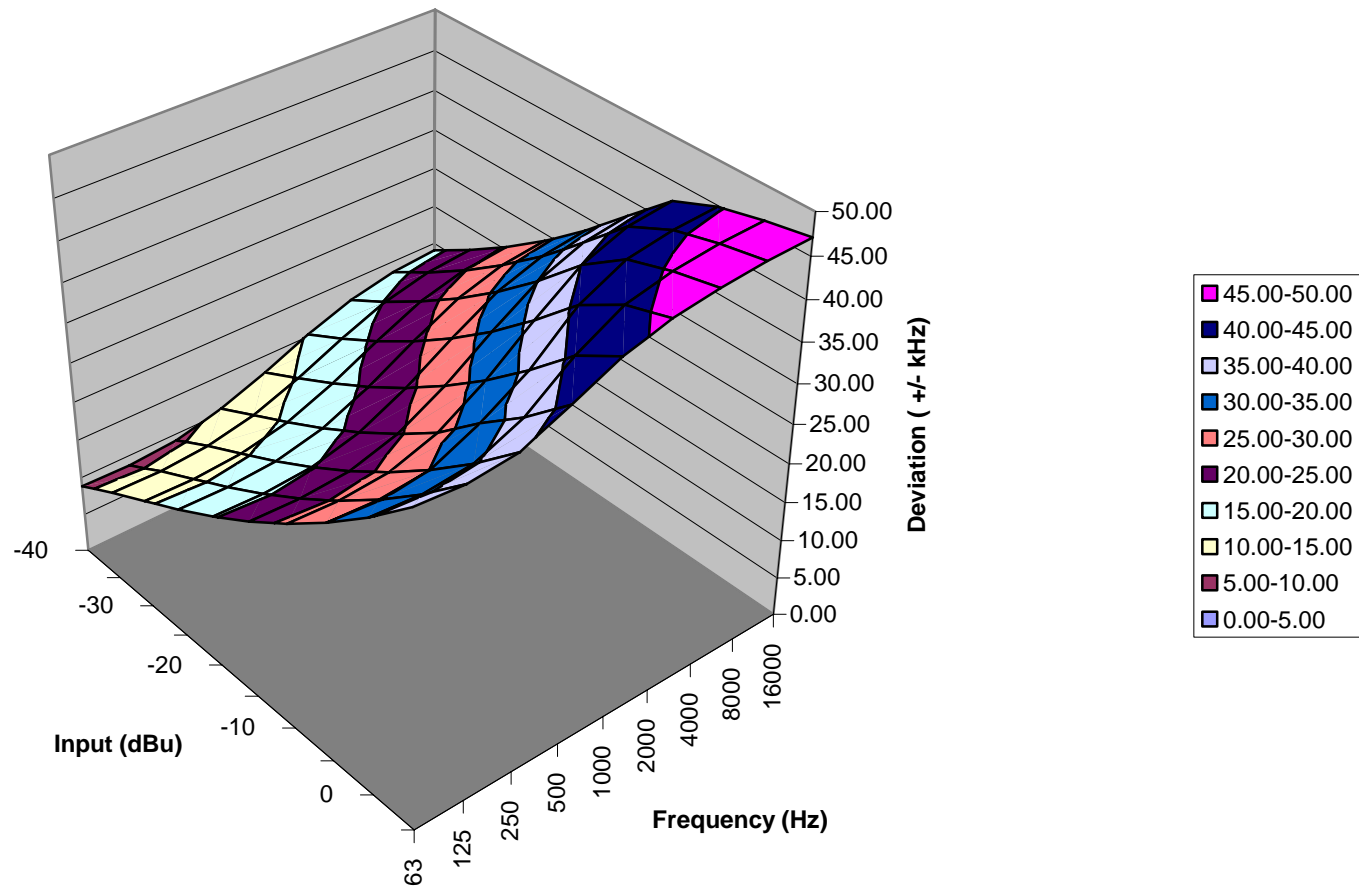


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### APPENDIX A

#### Deviation vs. Input





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APPENDIX A

X1-1	63	125	250	500	1000	2000	4000	8000	16000
-40	8.97	8.65	9.14	10.66	12.79	15.28	17.30	18.49	18.88
-35	11.71	11.43	11.93	13.16	15.29	17.85	20.10	21.43	21.88
-30	14.23	14.01	14.38	15.64	17.89	20.71	23.23	24.70	25.22
-25	16.78	16.57	16.93	18.26	20.77	23.89	26.70	28.37	28.92
-20	19.62	19.34	19.71	21.19	23.96	27.47	30.61	32.46	33.10
-15	22.73	22.41	22.74	24.44	27.53	31.47	35.00	37.07	37.79
-10	26.21	25.83	26.22	28.07	31.56	35.97	39.92	41.95	42.48
-5	30.10	29.63	30.05	33.16	36.08	40.92	43.66	44.55	44.75
0	34.45	33.91	34.37	36.74	41.03	44.18	45.36	45.94	46.06
5	39.37	38.71	39.20	41.67	44.29	45.79	46.53	46.99	47.08

X1-2	63	125	250	500	1000	2000	4000	8000	16000
-40	8.75	8.73	9.17	10.59	12.79	15.26	17.38	18.64	19.15
-35	11.54	11.49	11.86	13.13	15.28	17.90	20.22	21.61	22.20
-30	14.09	14.00	14.35	15.62	17.94	20.79	23.36	24.89	25.56
-25	16.72	16.56	16.92	18.30	20.81	23.98	26.85	28.58	29.33
-20	19.52	19.33	19.73	21.23	24.03	27.56	30.78	32.73	33.56
-15	22.61	22.38	22.80	24.49	27.61	31.57	35.19	37.37	38.32
-10	26.06	25.78	26.25	28.12	31.63	36.11	40.13	42.18	42.85
-5	29.94	29.60	30.10	32.21	36.15	41.03	43.66	44.59	44.92
0	34.23	33.86	34.41	36.81	41.06	44.07	45.30	45.95	46.16
5	39.10	38.66	39.29	41.65	44.14	45.65	46.42	46.97	47.15

DATA BY LEVEL



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### Averages

	63	125	250	500	1000	2000	4000	8000	16000
-40	8.86	8.69	9.16	10.63	12.79	15.27	17.34	18.57	19.02
-35	11.63	11.46	11.90	13.15	15.29	17.88	20.16	21.52	22.04
-30	14.16	14.01	14.37	15.63	17.92	20.75	23.30	24.80	25.39
-25	16.75	16.57	16.93	18.28	20.79	23.94	26.78	28.48	29.13
-20	19.57	19.34	19.72	21.21	24.00	27.52	30.70	32.60	33.33
-15	22.67	22.40	22.77	24.47	27.57	31.52	35.10	37.22	38.06
-10	26.14	25.81	26.24	28.10	31.60	36.04	40.03	42.07	42.67
-5	30.02	29.62	30.08	32.69	36.12	40.98	43.66	44.57	44.84
0	34.34	33.89	34.39	36.78	41.05	44.13	45.33	45.95	46.11
5	39.24	38.69	39.25	41.66	44.22	45.72	46.48	46.98	47.12

## DATA BY LEVEL



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 6.0 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

$$D = 47.5 \text{ kHz,}$$

$D$  = Peak Deviation

$$\mathbf{B_n = 2(15) + 2(47.5)(1) = 125 \text{ kHz}}$$



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Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

APPENDIX A

DATA AND GRAPH(S) TAKEN OF THE  
99% OCCUPIED BANDWIDTH  
Part 74.861 (d)(3) & PART 2.1049



Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

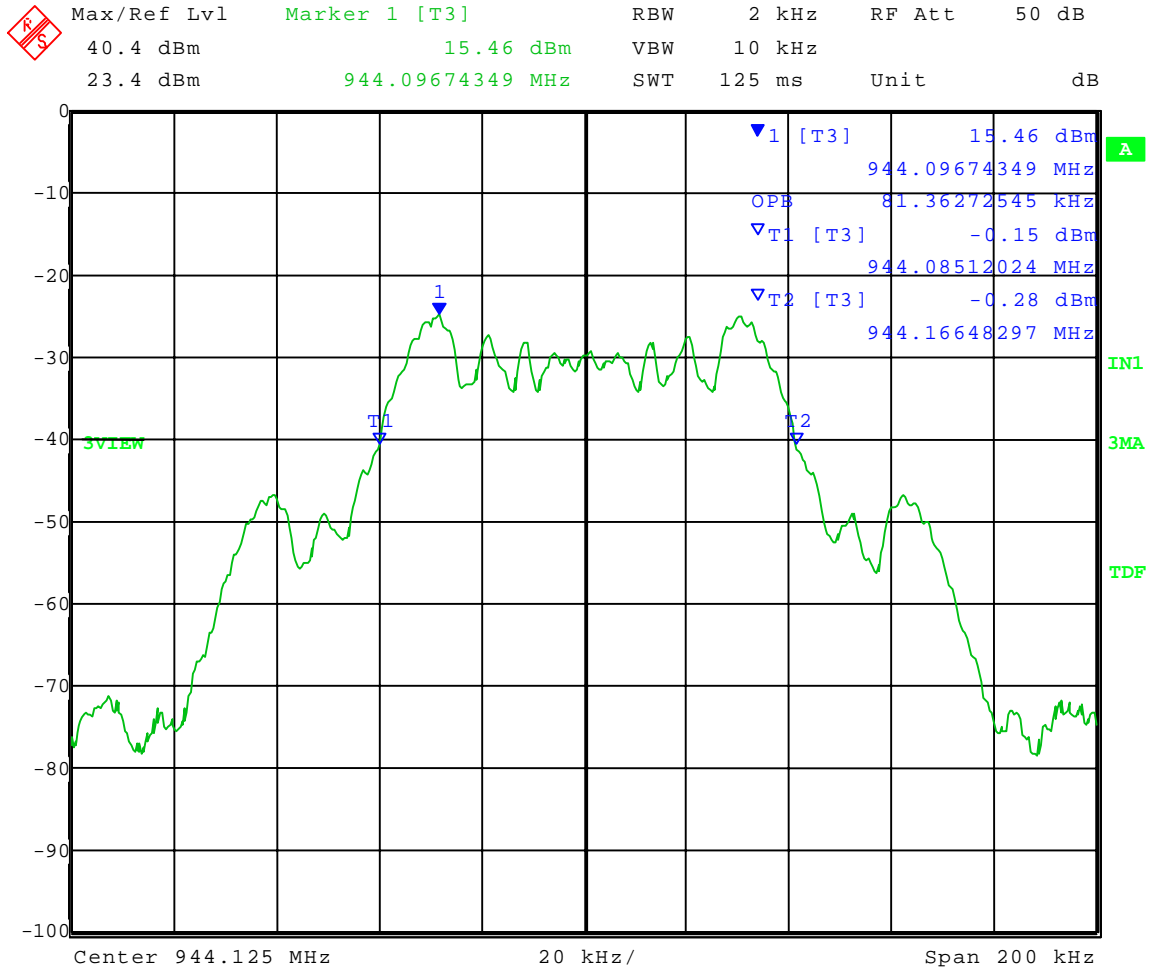
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 02-14-2008  
 Company: Shure, Inc.  
 EUT: UR1H-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 = 81.4 kHz



Date: 14.FEB.2008 12:31:57



Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

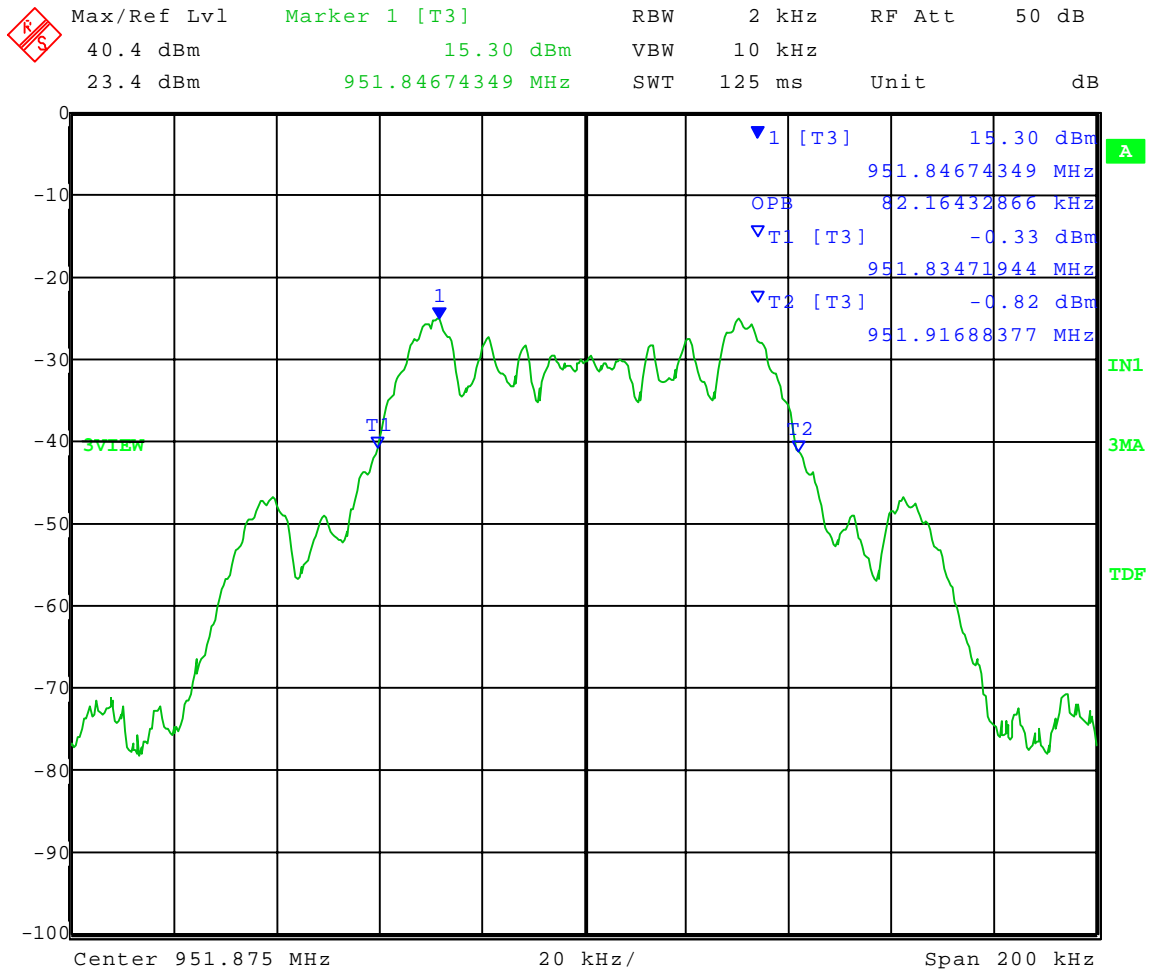
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 02-14-2008  
 Company: Shure, Inc.  
 EUT: UR1H-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 = 82.2 kHz



Date: 14.FEB.2008 12:33:53



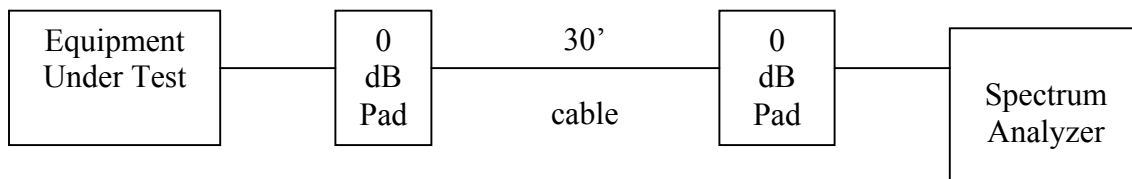
Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 7.0 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 UR1H Bodypack 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 UR1H Bodypack Transmitter uses the Semi Rigid "Whip" Antenna. See the following pages for the data and graphs of the actual measurements made:**





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Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

APPENDIX A

CONDUCTED EMISSION DATA & CHARTS  
TAKEN FOR  
SPURIOUS EMISSION MEASUREMENTS MADE  
AT THE ANTENNA TERMINALS  
EIA /TIA-603-C:2004, SECTION 2.2.13  
PART 2.1051











1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

## APPENDIX A

### 8.0 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 UR1H Bodypack Transmitter, 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 UR1H Bodypack 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.



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Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

APPENDIX A

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





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Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 02-13-2008  
 Temperature: 66 deg. F  
 Humidity: 24% R.H.

Output Power - ERP - Substitution Method

Model: UR1H-X1 w/whip antenna								
Channel: Low; 944.125 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	121.63	29.72	7.16	2.15	22.56	24	1.44	180.30

$EIRP = \text{Signal generator output} - \text{cable loss} + \text{antenna gain}$

$ERP_{(ref. to \frac{1}{2}\lambda \text{ dipole})} = \text{Signal generator output} - \text{cable loss} + \text{antenna gain} - 2.15$



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 02-13-2008  
 Temperature: 66 deg. F  
 Humidity: 24% R.H.

Output Power - ERP - Substitution Method

Model: <b>UR1H-X1 w/whip antenna</b>								
Channel: High; <b>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)
951.875 vertical	122.18	29.68	7.14	2.15	22.54	24	1.46	179.47

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 Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 11-11-2008  
 Temperature: 68 deg. F  
 Humidity: 30% R.H.

Output Power - ERP - Substitution Method

Model: <b>UR1H-X1</b> w/ dipole antenna								
Channel: Low: <b>944.125 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	121.51	29.58	7.16	2.15	22.42	NA	NA	174.58

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 Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 11-11-2008  
 Temperature: 68 deg. F  
 Humidity: 30% R.H.

Output Power - ERP - Substitution Method

Model: <b>UR1H-X1 w/ dipole antenna</b>								
Channel: High; <b>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)
951.875 vertical	124.28	31.73	7.14	2.15	24.59	NA	NA	287.74

EIRP = Signal generator output - cable loss + antenna gain

ERP<sub>(ref. to 1/2λ dipole)</sub> = Signal generator output - cable loss + antenna gain - 2.15



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Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

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 Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

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APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 02-13-2008  
 Temperature: 66 deg. F  
 Humidity: 24% R.H.

Radiated Spurious Emissions (e.r.p. substitution method) FCC Part 74; FCC Part 2.1053								
Model: UR1H-X1 Transmit Frequency: 944.125 MHz								
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	58.2	99.0	-40.8	-13	27.8	Horizontal	125	1.1
2.83238	59.9	101.0	-41.1	-13	28.1	Horizontal	320	1.1
3.77650	60.0	100.1	-40.1	-13	27.1	Horizontal	340	1.1
4.72063	61.9	98.6	-36.7	-13	23.7	Horizontal	340	1.0
5.66475	55.6	98.5	-43.0	-13	30.0	Horizontal	170	1.0
6.60888	59.9	98.1	-38.2	-13	25.2	Horizontal	270	1.1
1.88825	57.0	98.5	-41.5	-13	28.5	Vertical	315	1.5
2.83238	59.5	99.0	-39.5	-13	26.5	Vertical	0	1.0
3.77650	59.3	99.5	-40.2	-13	27.2	Vertical	20	1.1
4.72063	64.6	99.6	-35.0	-13	22.0	Vertical	150	1.0
5.66475	56.8	100.0	-43.2	-13	30.2	Vertical	190	1.0
6.60888	57.9	99.2	-41.4	-13	28.4	Vertical	165	1.1



Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

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APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.  
 Operator: Craig B  
 Date of test: 02-13-2008  
 Temperature: 66 deg. F  
 Humidity: 24% R.H.

Radiated Spurious Emissions (e.r.p. substitution method) FCC Part 74; FCC Part 2.1053								
Model: UR1H-X1 Transmit Frequency: 951.875 MHz								
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	59.9	99.7	-39.8	-13	26.8	Horizontal	45	1.1
2.85563	63.0	101.1	-38.1	-13	25.1	Horizontal	60	1.1
3.80750	57.9	99.7	-41.9	-13	28.9	Horizontal	0	1.1
4.75938	63.9	98.3	-34.4	-13	21.4	Horizontal	180	1.0
5.71125	56.7	98.9	-42.2	-13	29.2	Horizontal	70	1.0
6.66313	59.1	97.9	-38.8	-13	25.8	Horizontal	50	1.1
1.90375	56.8	100.1	-43.3	-13	30.3	Vertical	20	1.2
2.85563	60.4	99.3	-38.9	-13	25.9	Vertical	35	1.3
3.80750	57.7	99.0	-41.3	-13	28.3	Vertical	10	1.5
4.75938	64.2	99.3	-35.1	-13	22.1	Vertical	135	1.4
5.71125	54.6	100.3	-45.7	-13	32.7	Vertical	340	1.1
6.66313	59.2	99.1	-40.0	-13	27.0	Vertical	45	1.4





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Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

APPENDIX A

FREQUENCY TOLERANCE DATA TAKEN DURING  
TESTING

PART 2.1055



Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

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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)
UR1H-X1	944.125	944.125360	0.360	944.124928	-0.072	944.125647	0.647	944.125893	0.893	944.126754	1.754
UR1H-X1	951.875	951.875407	0.407	951.874880	-0.120	951.875551	0.551	951.875839	0.839	951.876754	1.754

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)
UR1H-X1	944.125	944.126253	1.253	944.125050	0.050	944.122144	-2.856	944.121643	-3.357	944.125839	0.839
UR1H-X1	951.875	951.876253	1.253	951.874750	-0.250	951.872846	-2.154	951.870942	-4.058	951.875887	0.887



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

## APPENDIX A

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

The frequency stability was measured from  $-30^{\circ}$  to  $+50^{\circ}$  centigrade at intervals of  $10^{\circ}$  centigrade throughout the range. Prior to each frequency measurement, the equipment was left alone for a sufficient period of time (approximately 30 minutes or more) to allow the components of the Wireless Boundary Microphone oscillator circuitry to stabilize.

See the following page for the data taken during testing.

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

The frequency stability of UR1H Bodypack Transmitter 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.



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Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

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 Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

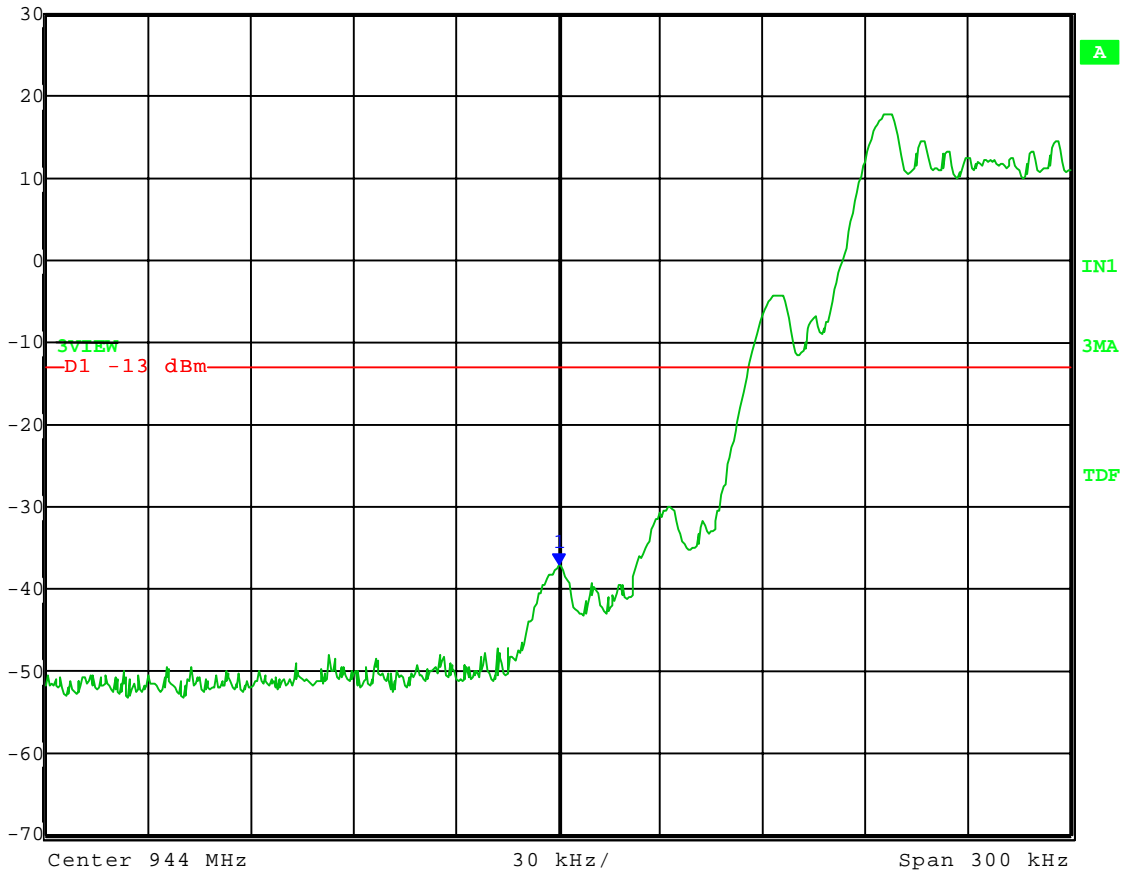
### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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 DC 20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.08 dBm	VBW	10 kHz		
	20 dBm	944.00030060 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 15:52:12



Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

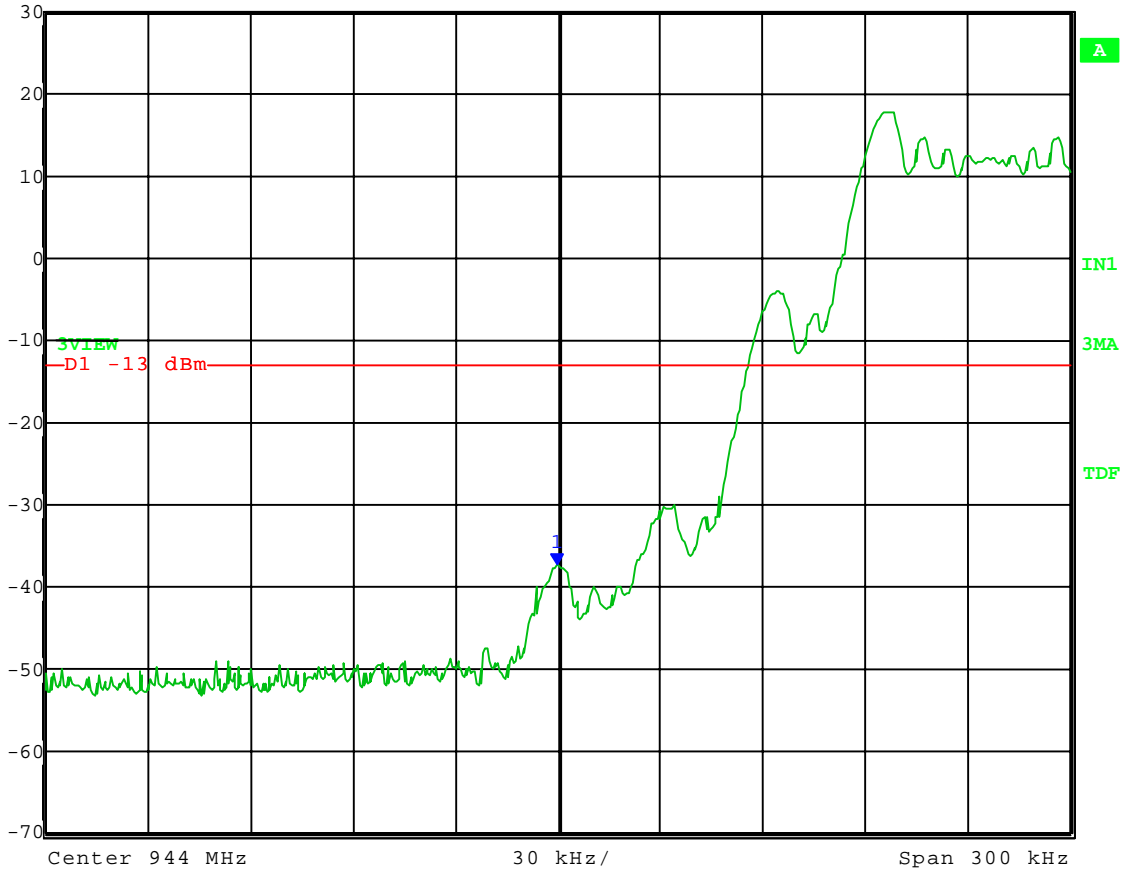
APPENDIX A

Test Date: 02-14-2008  
 Company: Shure, Inc.  
 EUT: UR1H-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 DC 20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.38 dBm	VBW	10 kHz		
	20 dBm	943.99969940 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 15:39:47



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

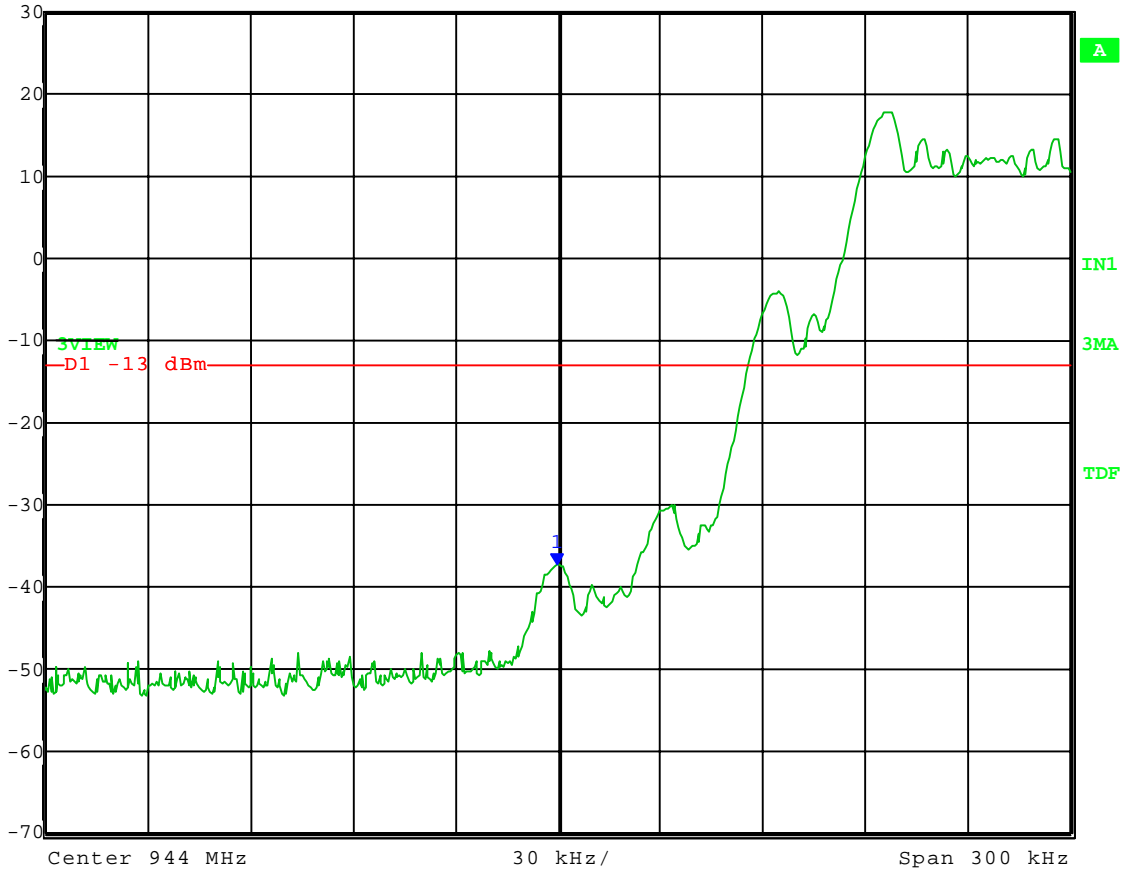
### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 102 V AC 20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.37 dBm	VBW	10 kHz		
	20 dBm	943.99969940 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 16:02:21





Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

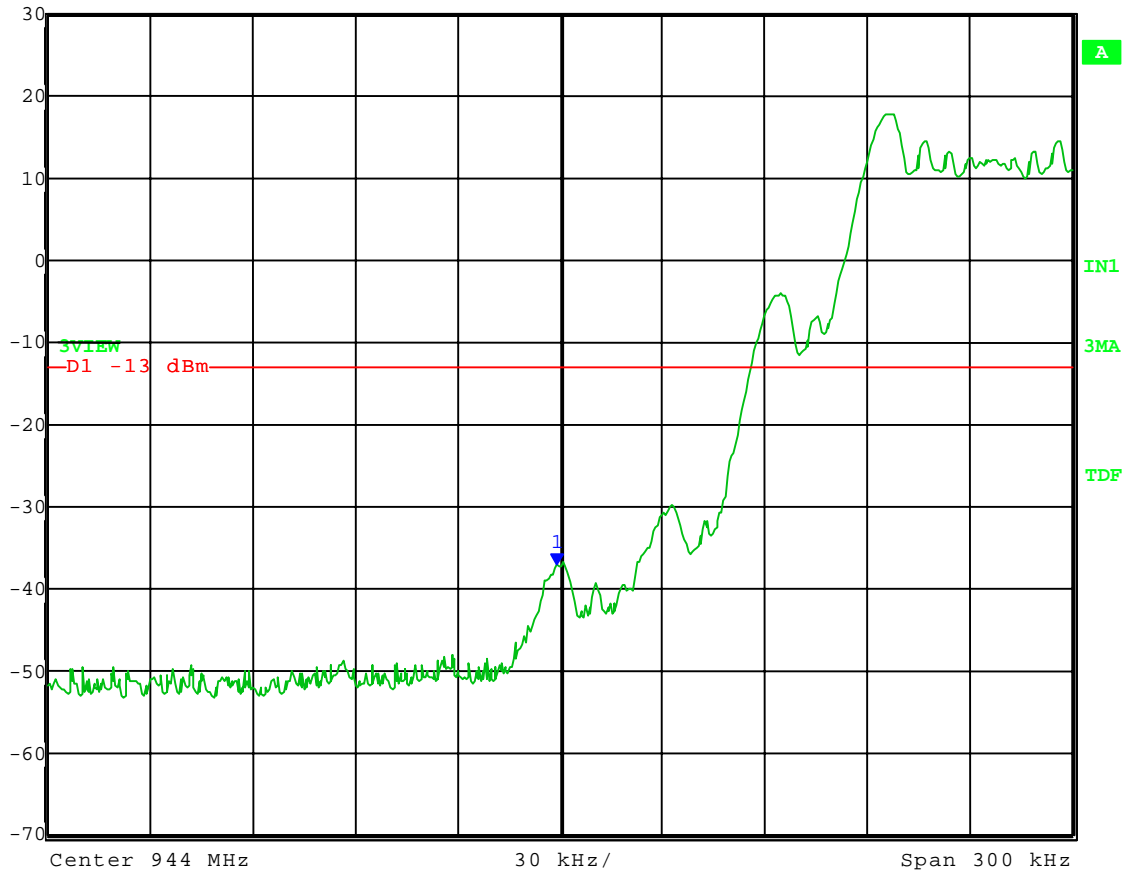
### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 120 V AC 20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.10 dBm	VBW	10 kHz		
	20 dBm	943.99909820 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 15:55:39



Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

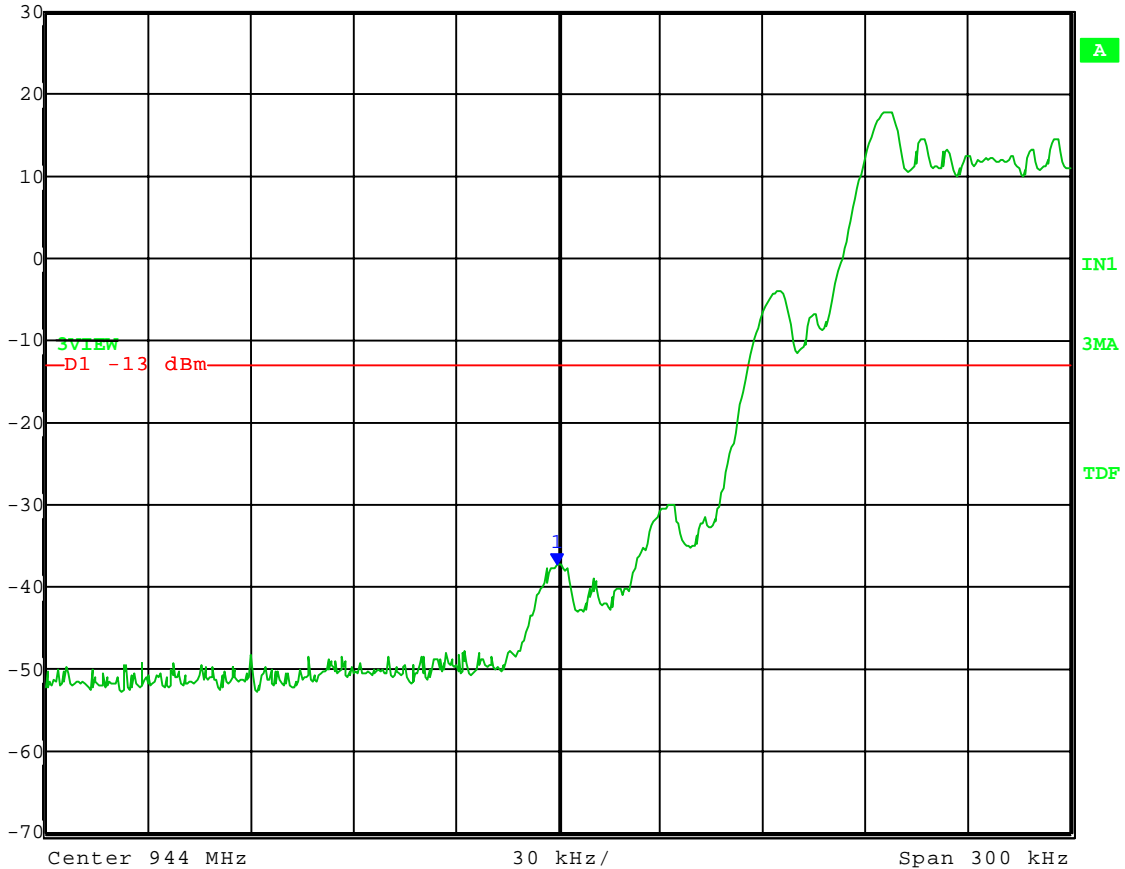
APPENDIX A

Test Date: 02-14-2008  
 Company: Shure, Inc.  
 EUT: UR1H-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: 138 V AC 20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.49 dBm	VBW	10 kHz		
	20 dBm	943.99969940 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 16:05:22



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

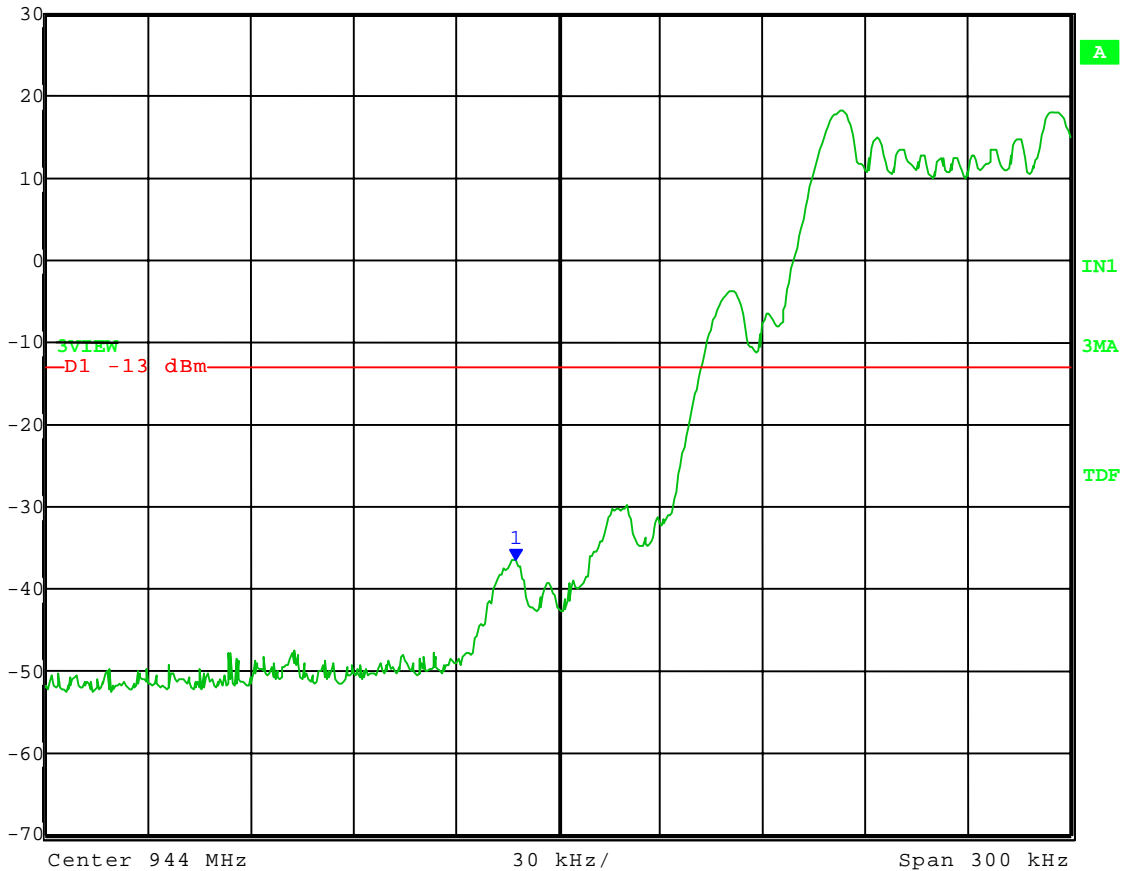
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: -30° C

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

R/S	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.72 dBm	VBW	10 kHz		
	20 dBm	943.98767535 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 17:06:37



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

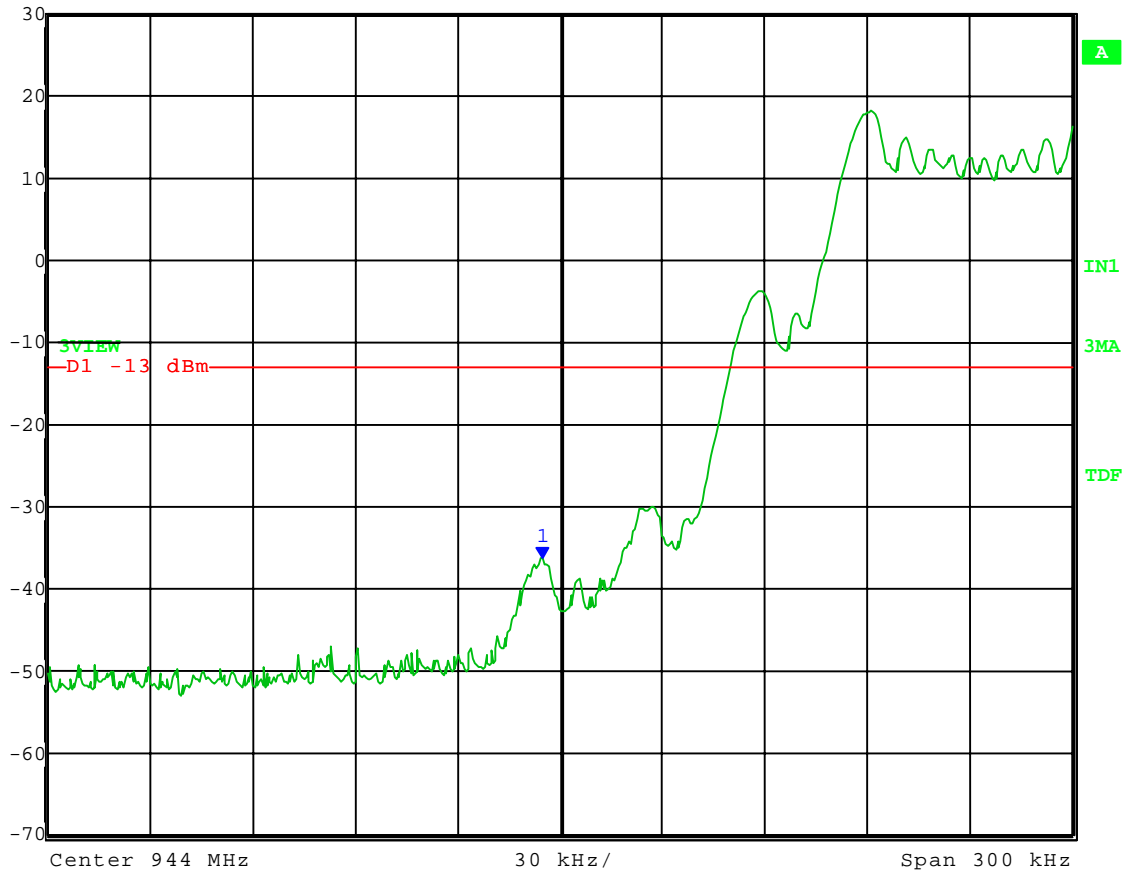
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: -20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.31 dBm	VBW	10 kHz		
	20 dBm	943.99488978 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 16:34:37



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

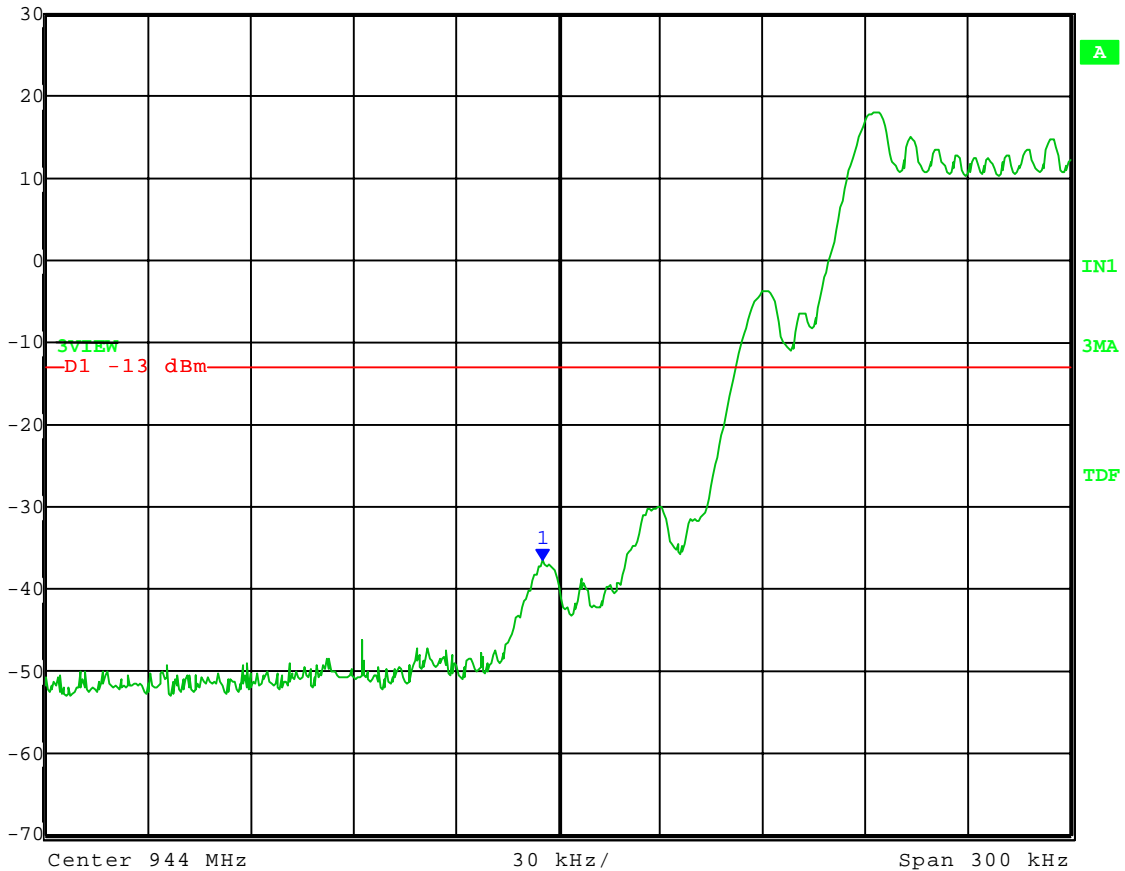
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: **-10° C**

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.57 dBm	VBW	10 kHz		
	20 dBm	943.99549098 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 16:02:32



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

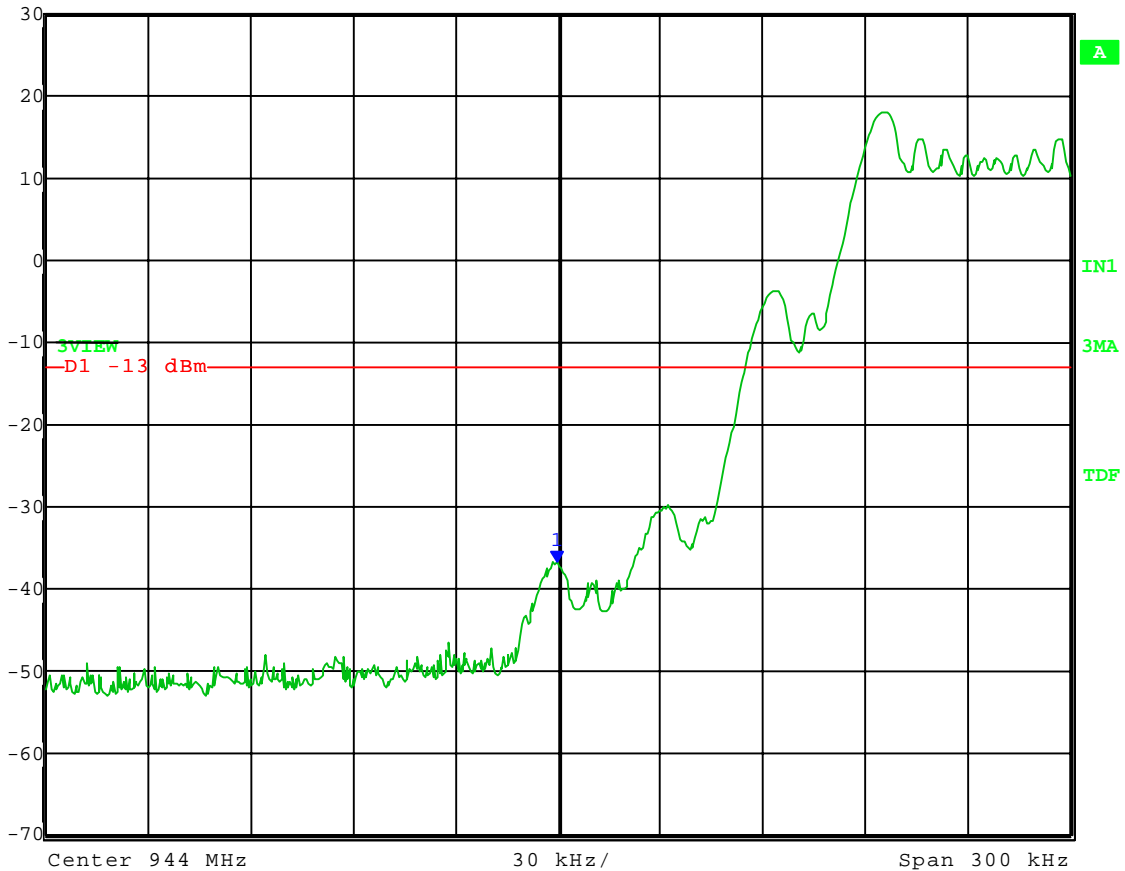
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 0° C

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

R/S	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.93 dBm	VBW	10 kHz		
	20 dBm	943.99969940 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 15:26:32



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

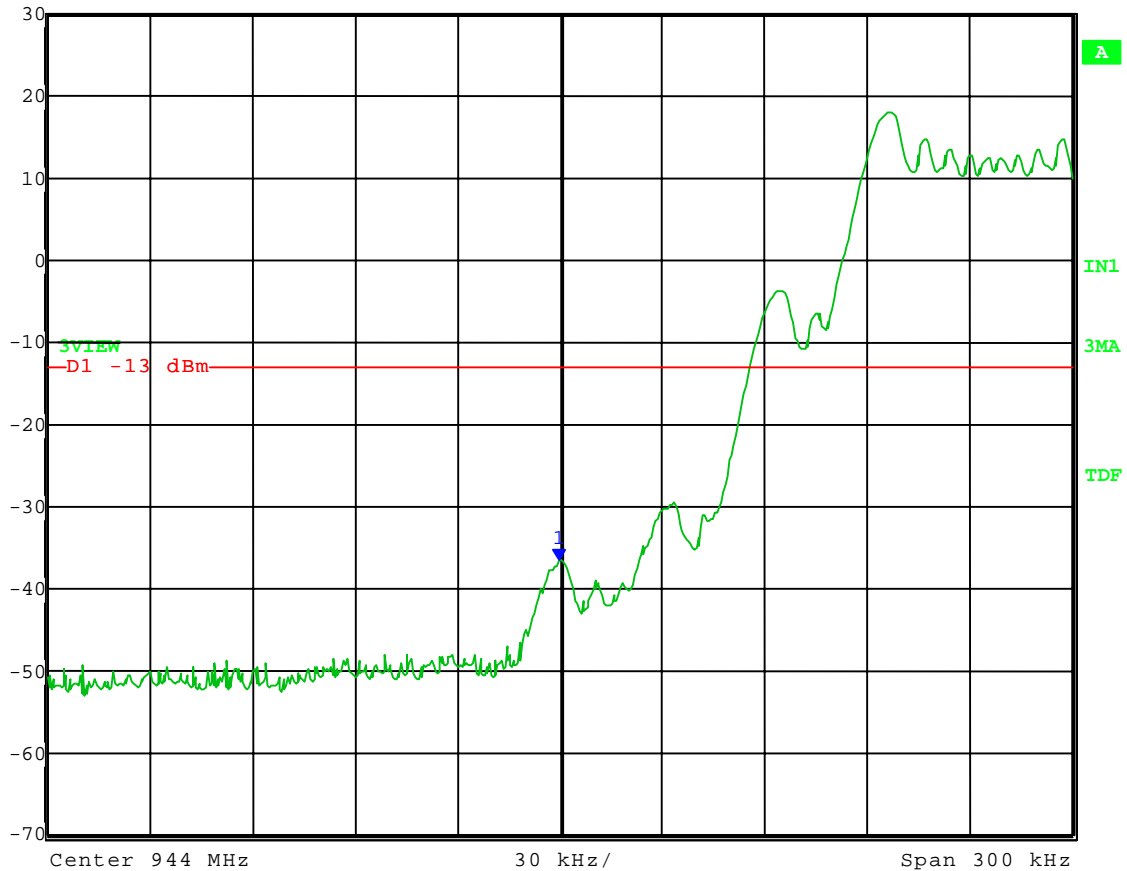
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 10° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.60 dBm	VBW	10 kHz		
	20 dBm	943.99969940 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 14:49:34





Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

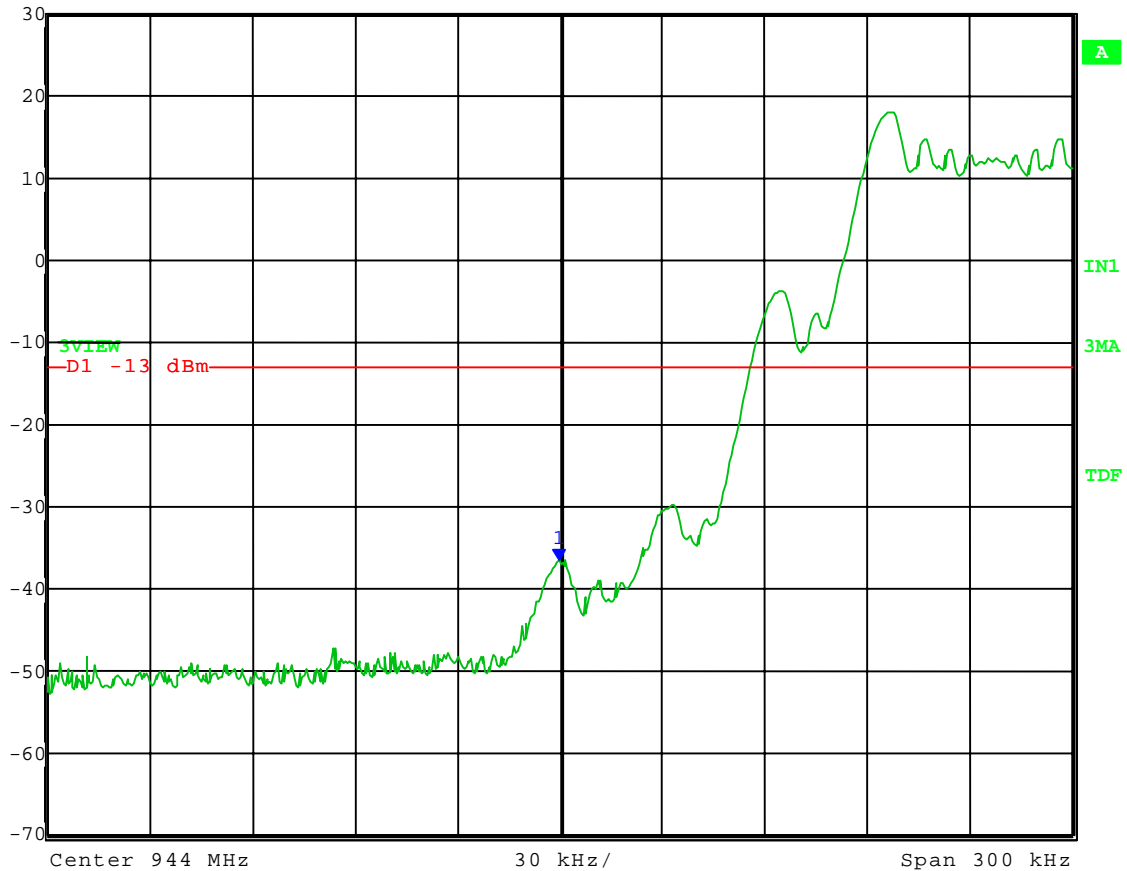
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 20° C

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

R/S	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.67 dBm	VBW	10 kHz		
	20 dBm	943.99969940 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 12:47:49



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

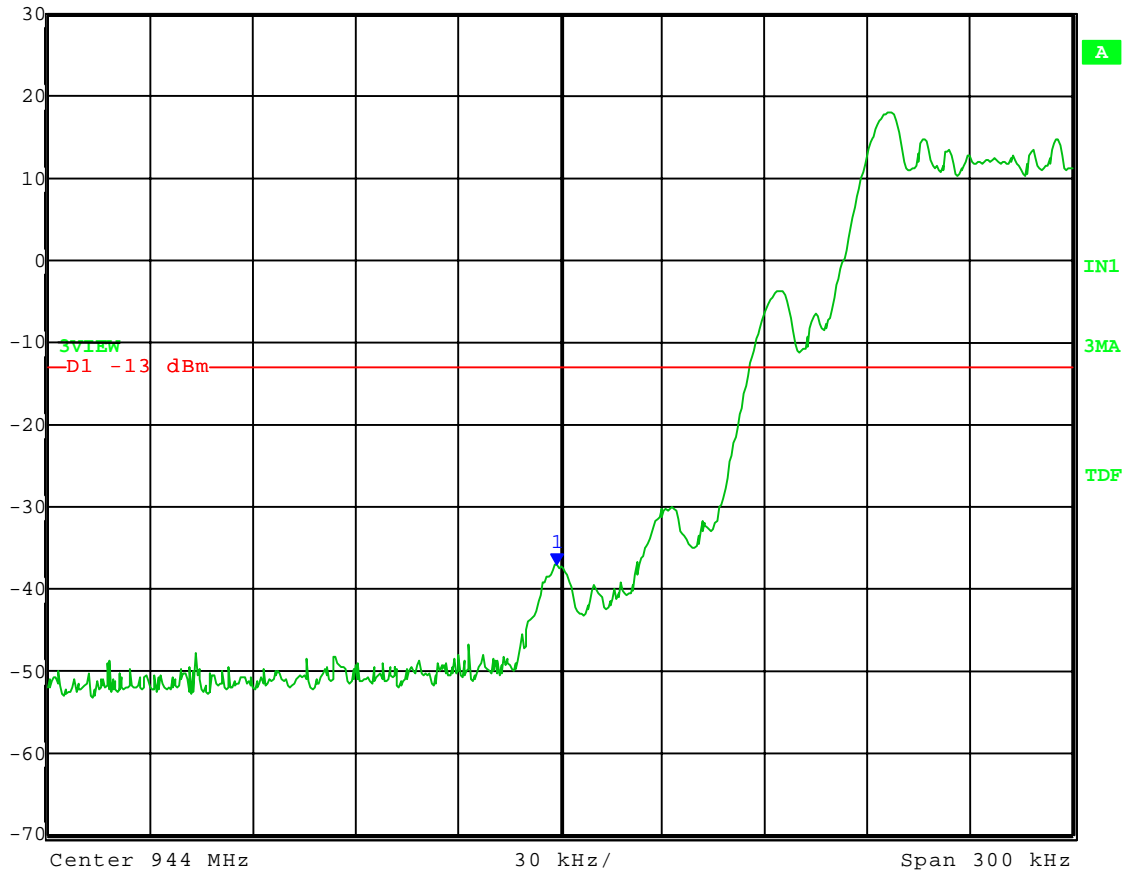
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 30° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.21 dBm	VBW	10 kHz		
	20 dBm	943.99909820 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 13:20:49



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

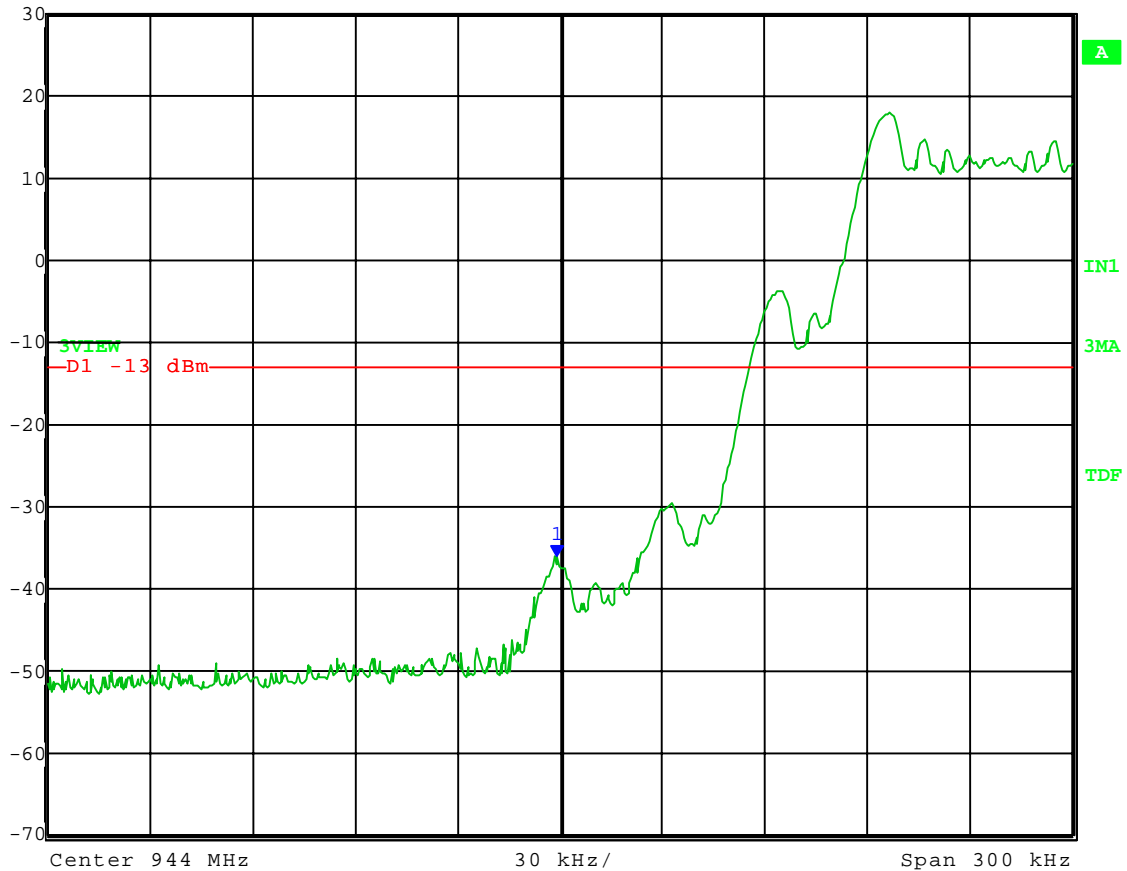
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 40° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.17 dBm	VBW	10 kHz		
	20 dBm	943.99909820 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 13:40:38



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

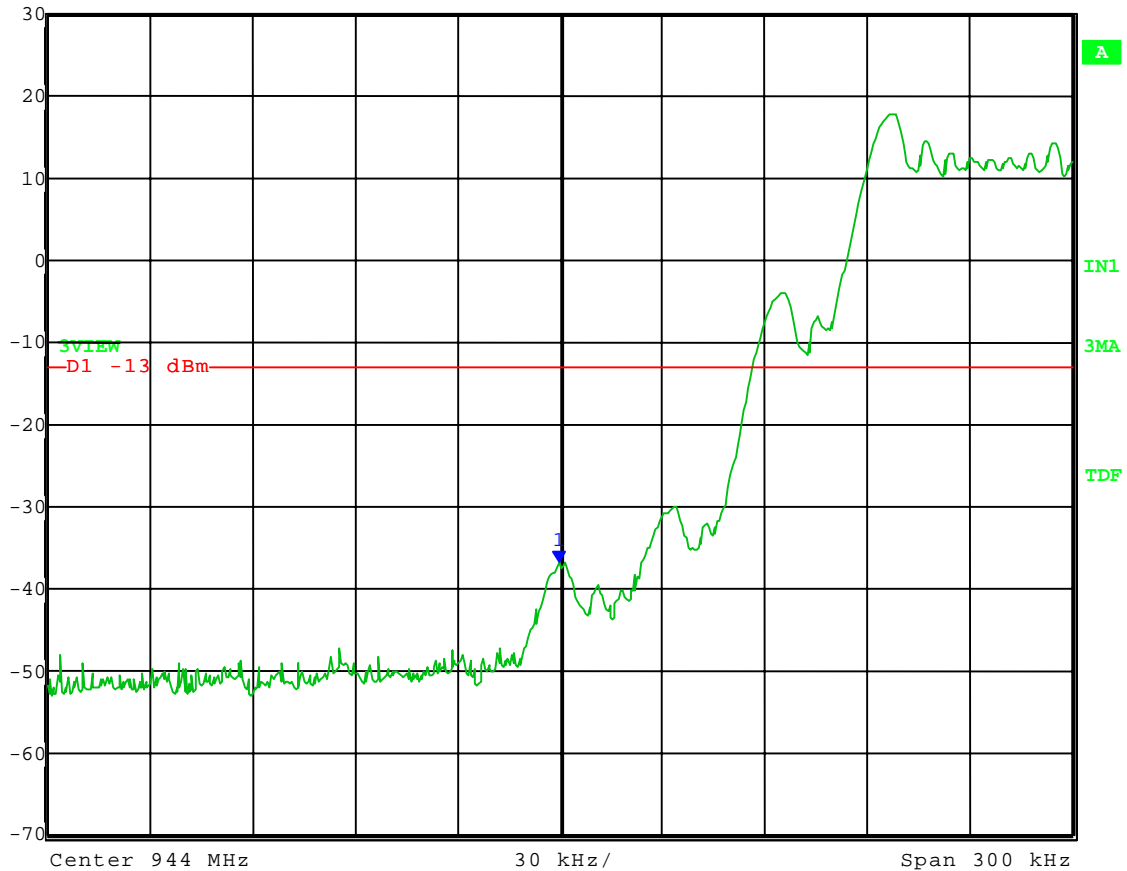
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 50° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.85 dBm	VBW	10 kHz		
	20 dBm	943.99969940 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 14:09:07



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

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 Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

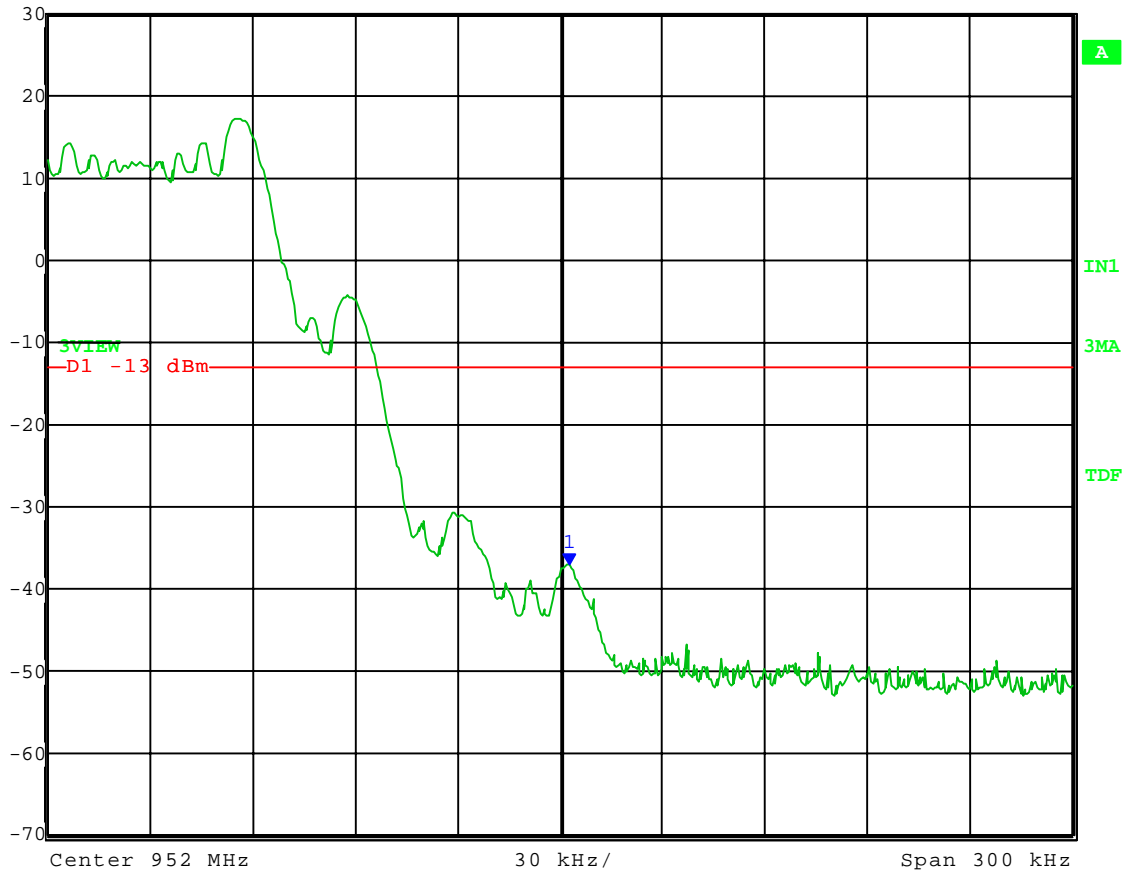
### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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 DC 20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.05 dBm	VBW	10 kHz		
	20 dBm	952.00270541 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 15:44:55



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

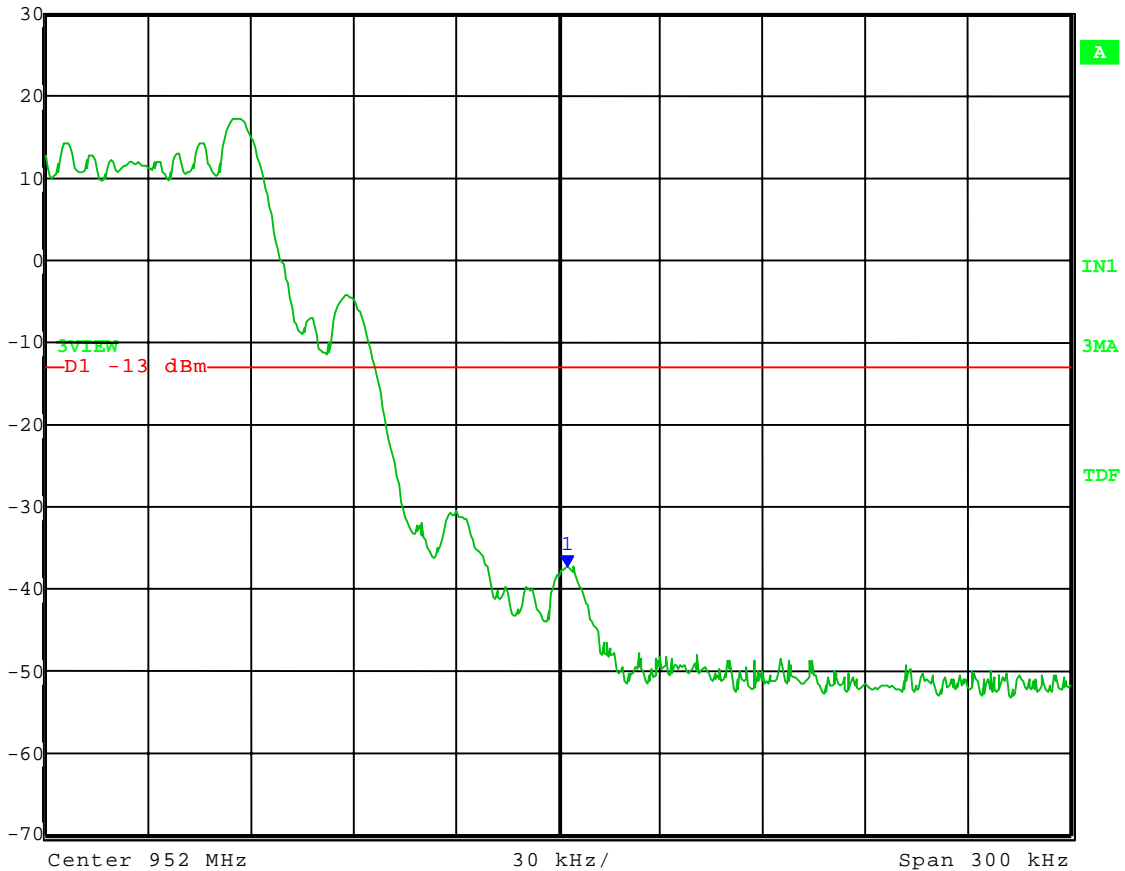
### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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 DC 20° C

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

R/S	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.39 dBm	VBW	10 kHz		
	20 dBm	952.00270541 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 15:42:14



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 102 V AC 20° C

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

R/S	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.61 dBm	VBW	10 kHz		
	20 dBm	952.00150301 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 16:00:21





Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

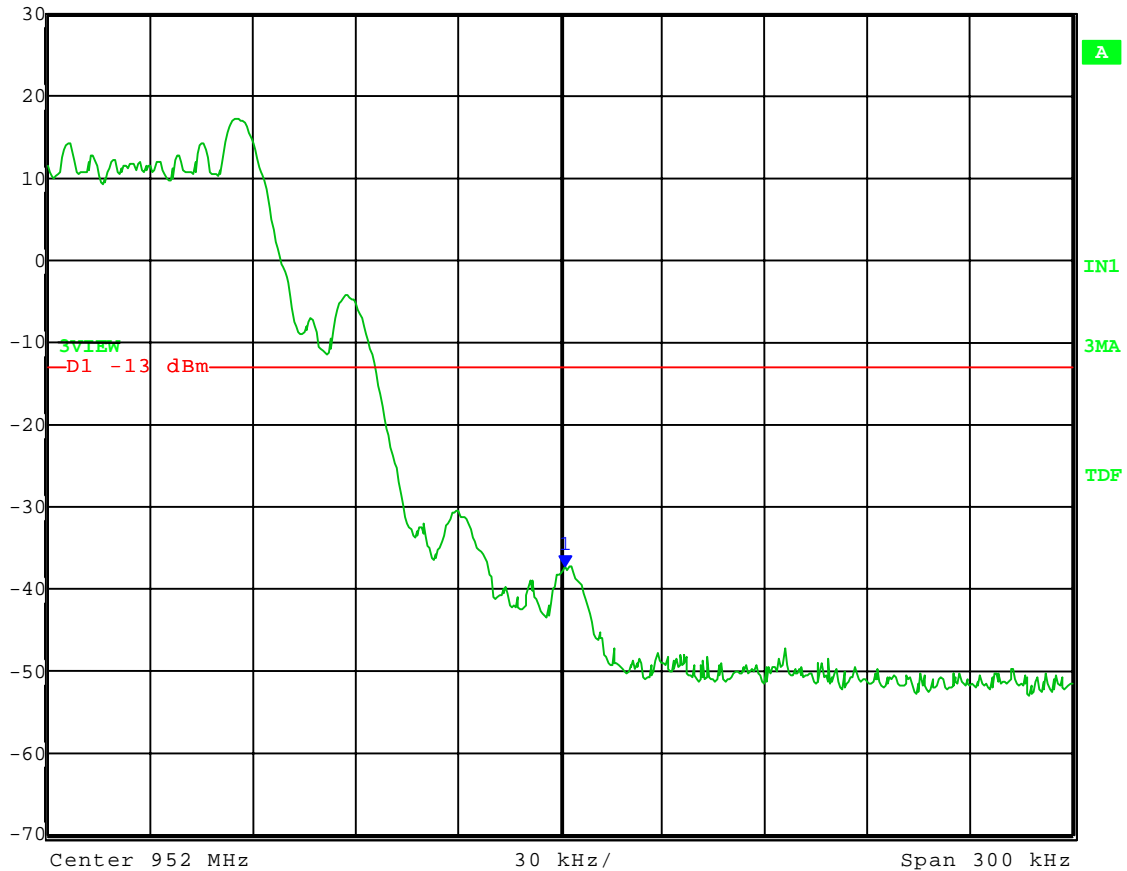
### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 120 V AC 20° C

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

R/S	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.25 dBm	VBW	10 kHz		
	20 dBm	952.00150301 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 15:57:39



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

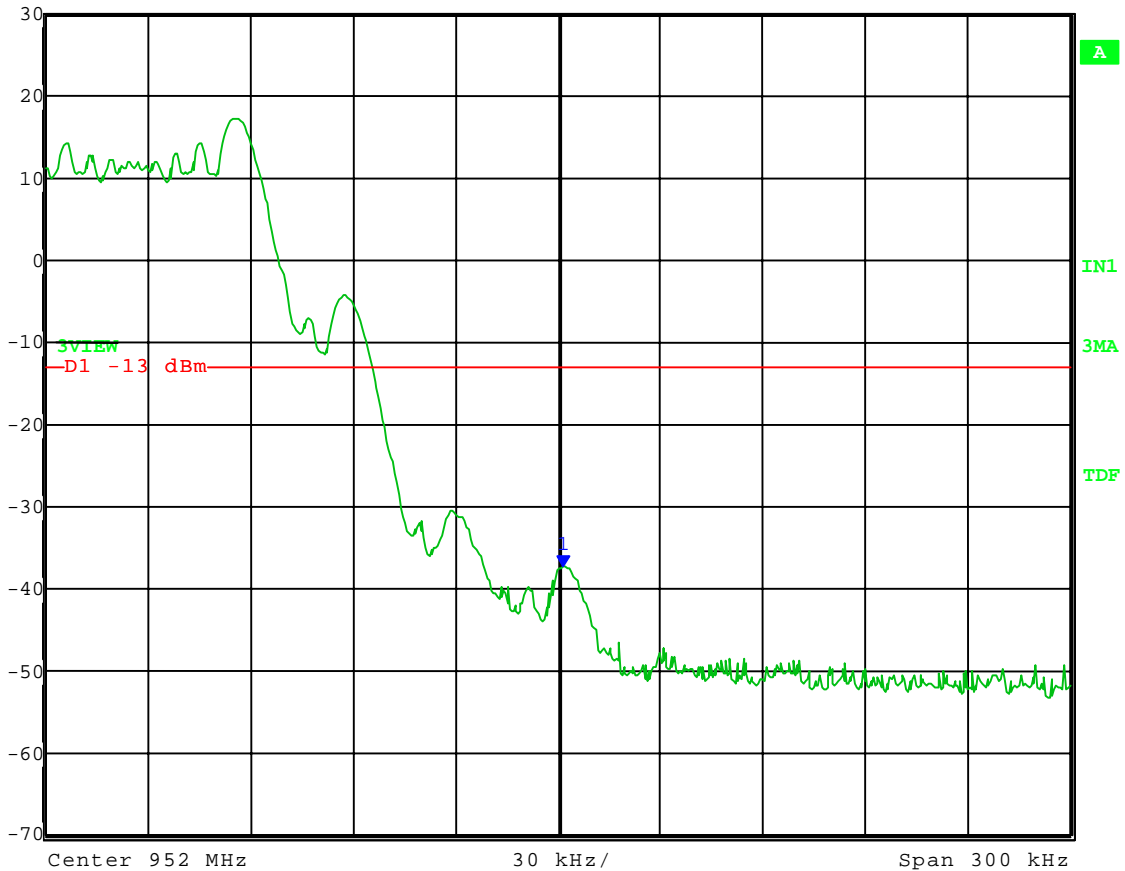
### APPENDIX A

Test Date: 02-14-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 138 V AC 20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.36 dBm	VBW	10 kHz		
	20 dBm	952.00150301 MHz	SWT	84 ms	Unit	dBm



Date: 14.FEB.2008 16:07:32



Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

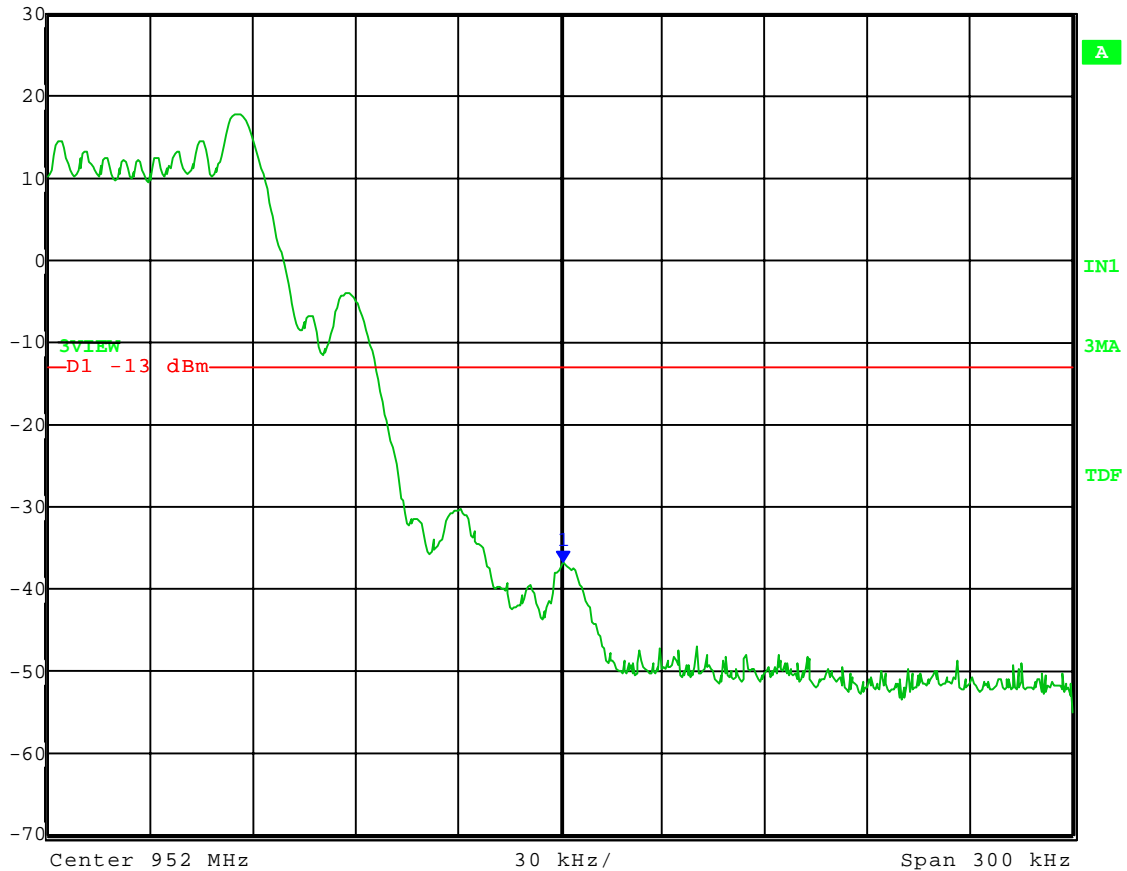
APPENDIX A

Test Date: 02-15-2008  
 Company: Shure, Inc.  
 EUT: UR1H-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: -10° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-36.92 dBm	VBW	10 kHz		
	20 dBm	952.00090180 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 16:04:35



Company: Shure Incorporated  
 Model Tested: UR1H X1  
 Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

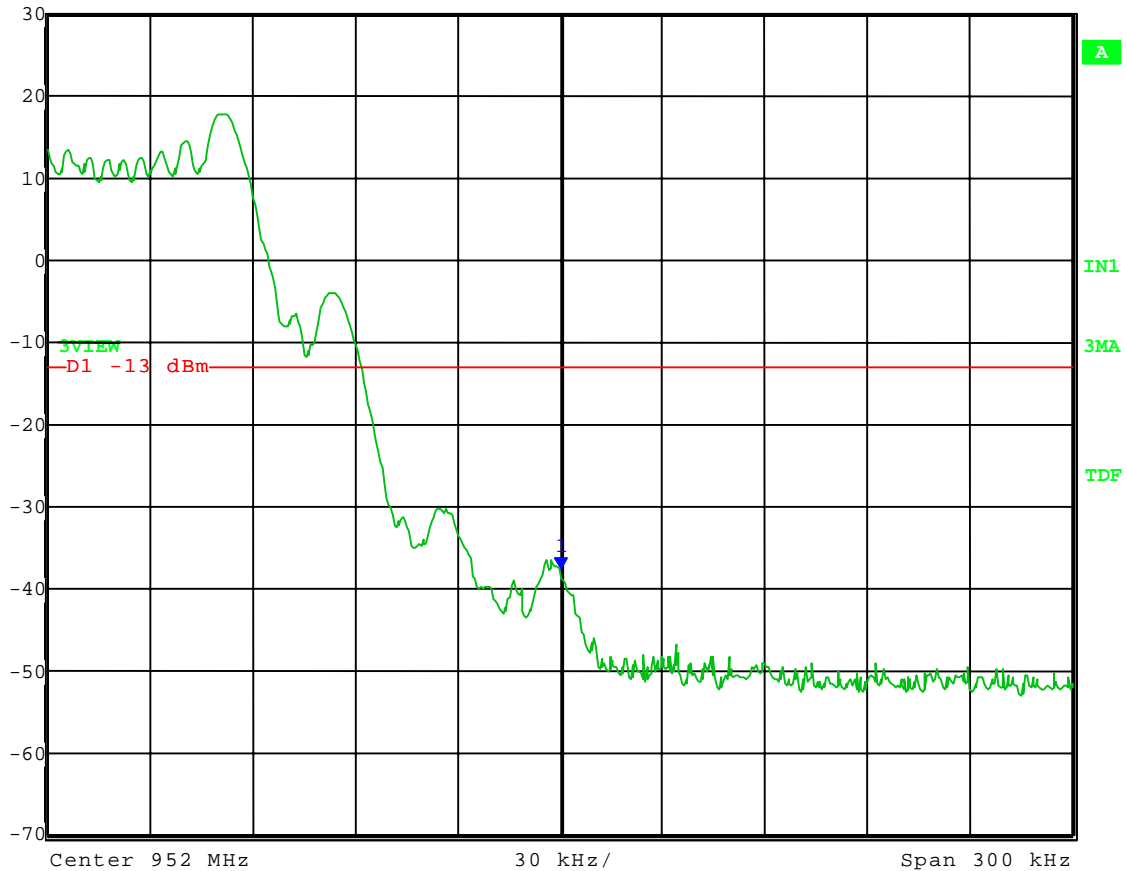
APPENDIX A

Test Date: 02-15-2008  
 Company: Shure, Inc.  
 EUT: UR1H-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: -20° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.57 dBm	VBW	10 kHz		
	20 dBm	952.00030060 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 16:32:43



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

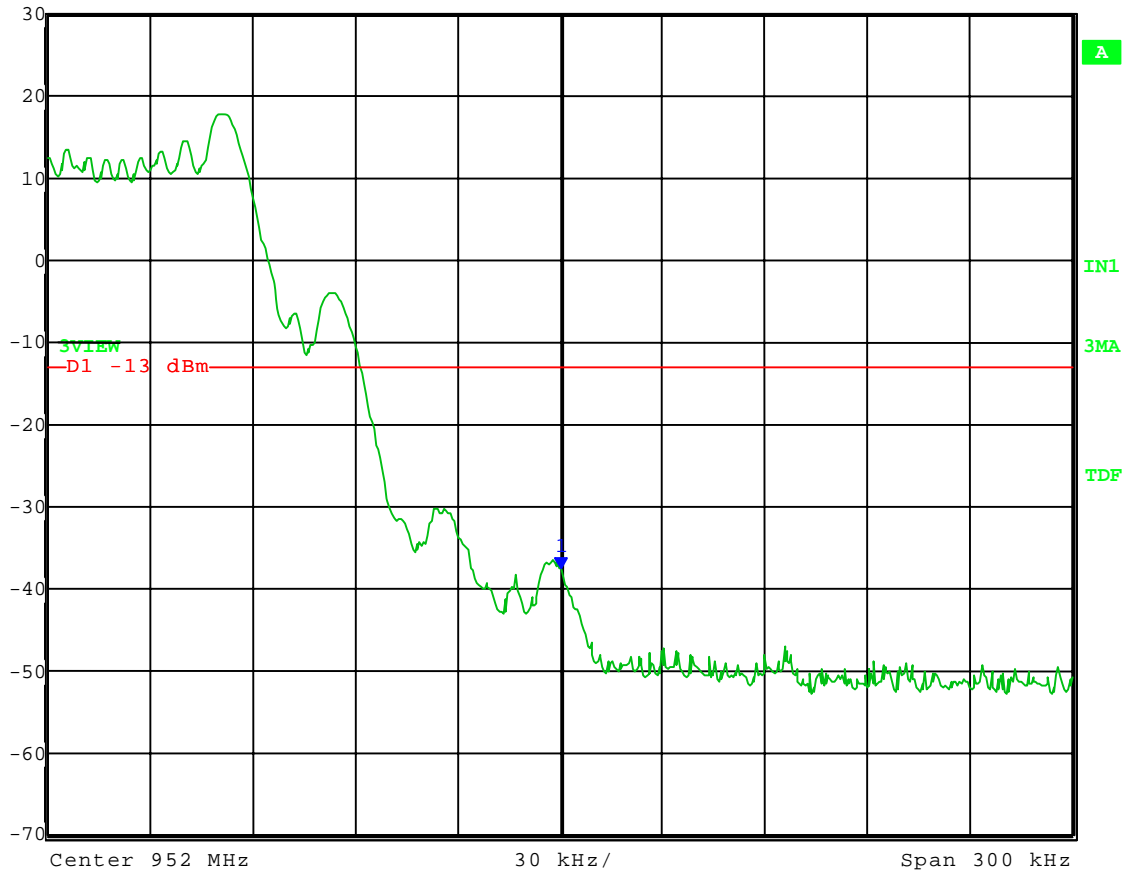
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: -30° C

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

R/S	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.59 dBm	VBW	10 kHz		
	20 dBm	952.00030060 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 17:09:53



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

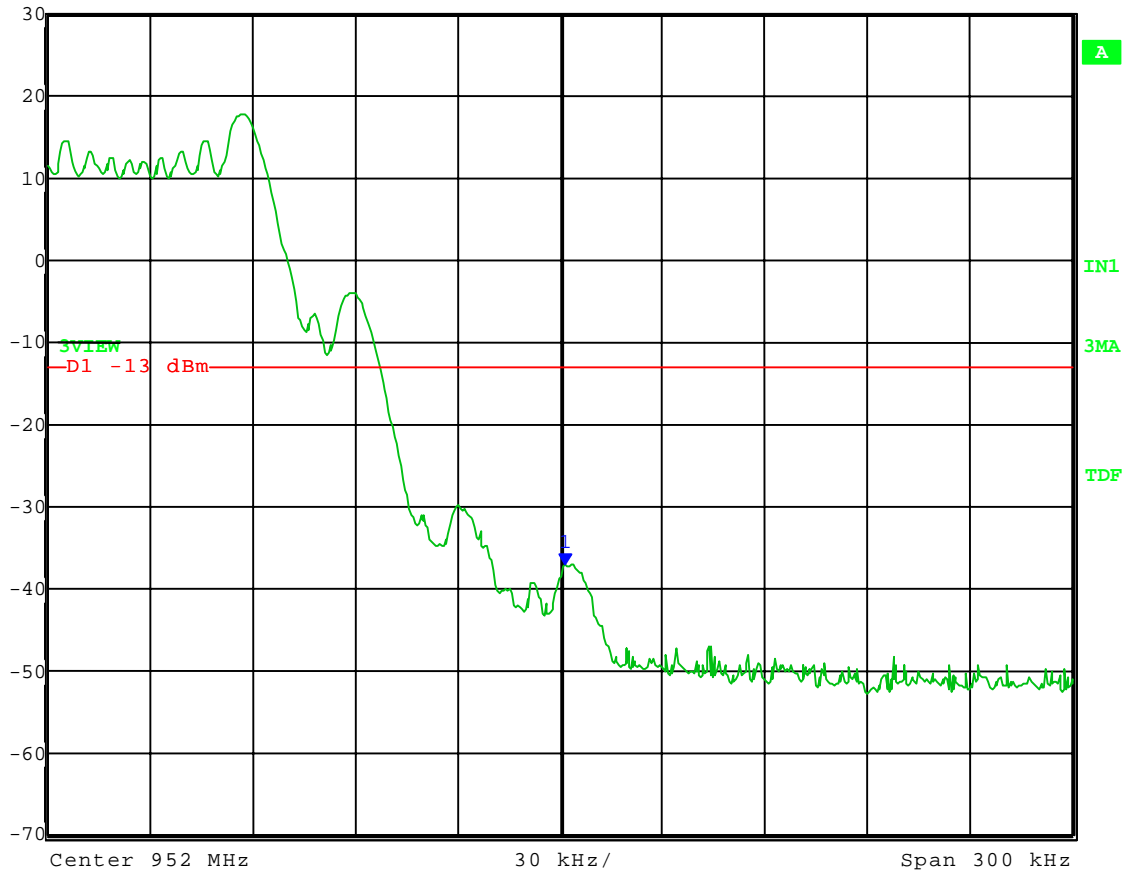
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 0° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.12 dBm	VBW	10 kHz		
	20 dBm	952.00150301 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 15:24:48



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

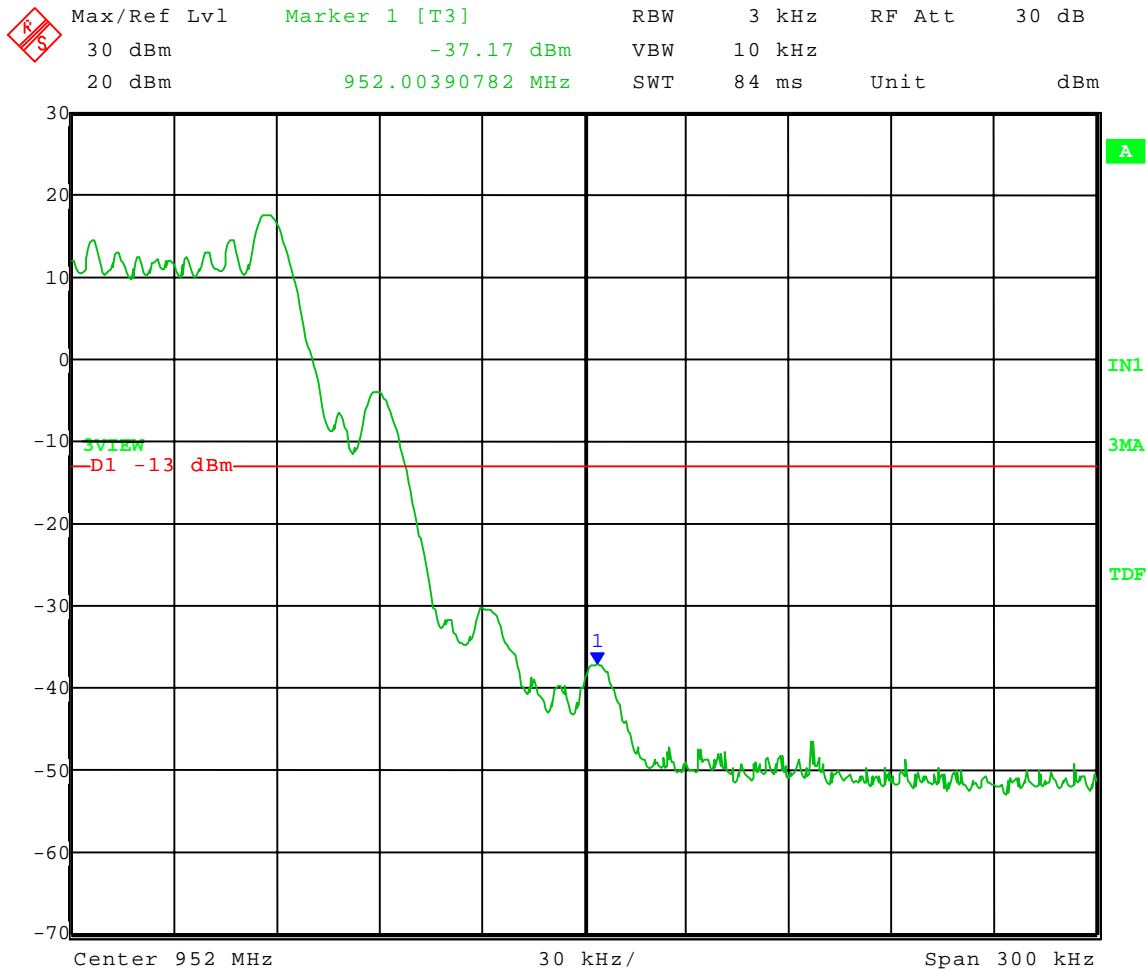
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 10° C

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



Date: 15.FEB.2008 14:52:00



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

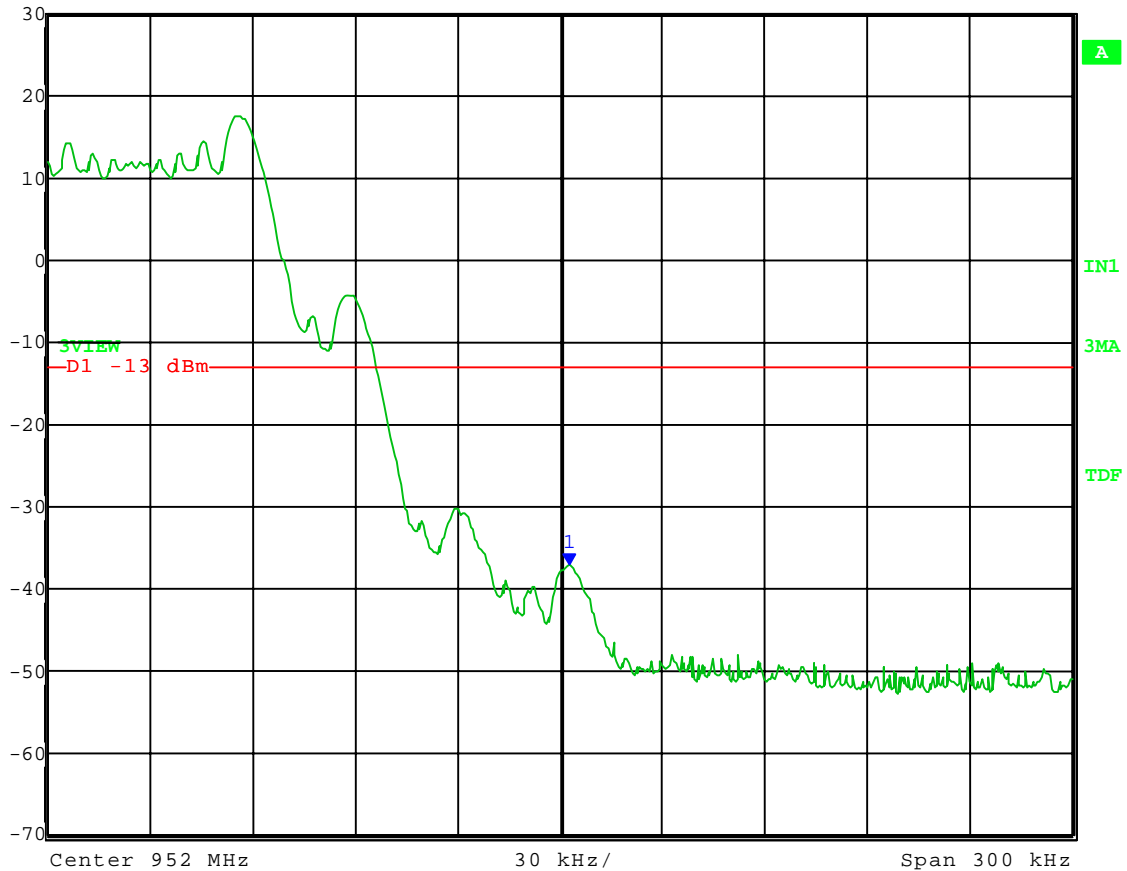
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 20° C

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

R/S	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.19 dBm	VBW	10 kHz		
	20 dBm	952.00270541 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 12:49:49





Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

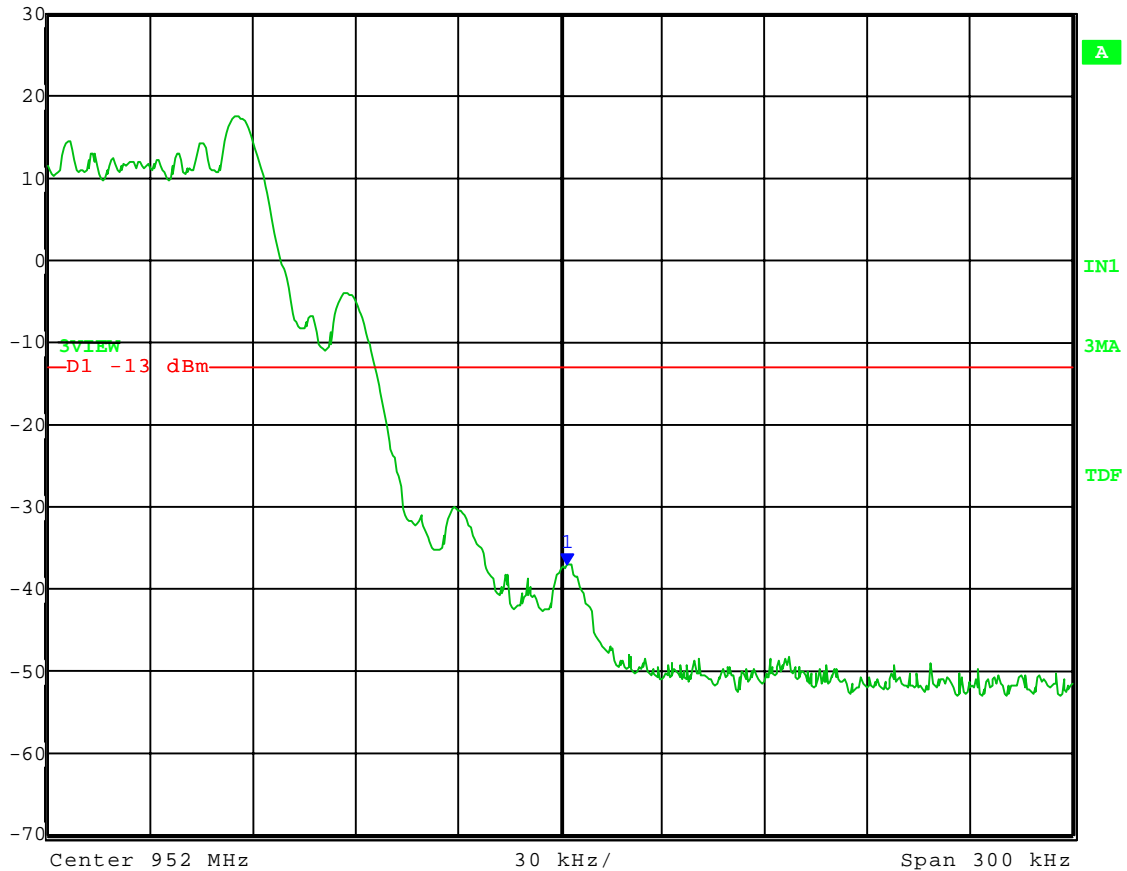
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 30° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.09 dBm	VBW	10 kHz		
	20 dBm	952.00210421 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 13:19:00



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

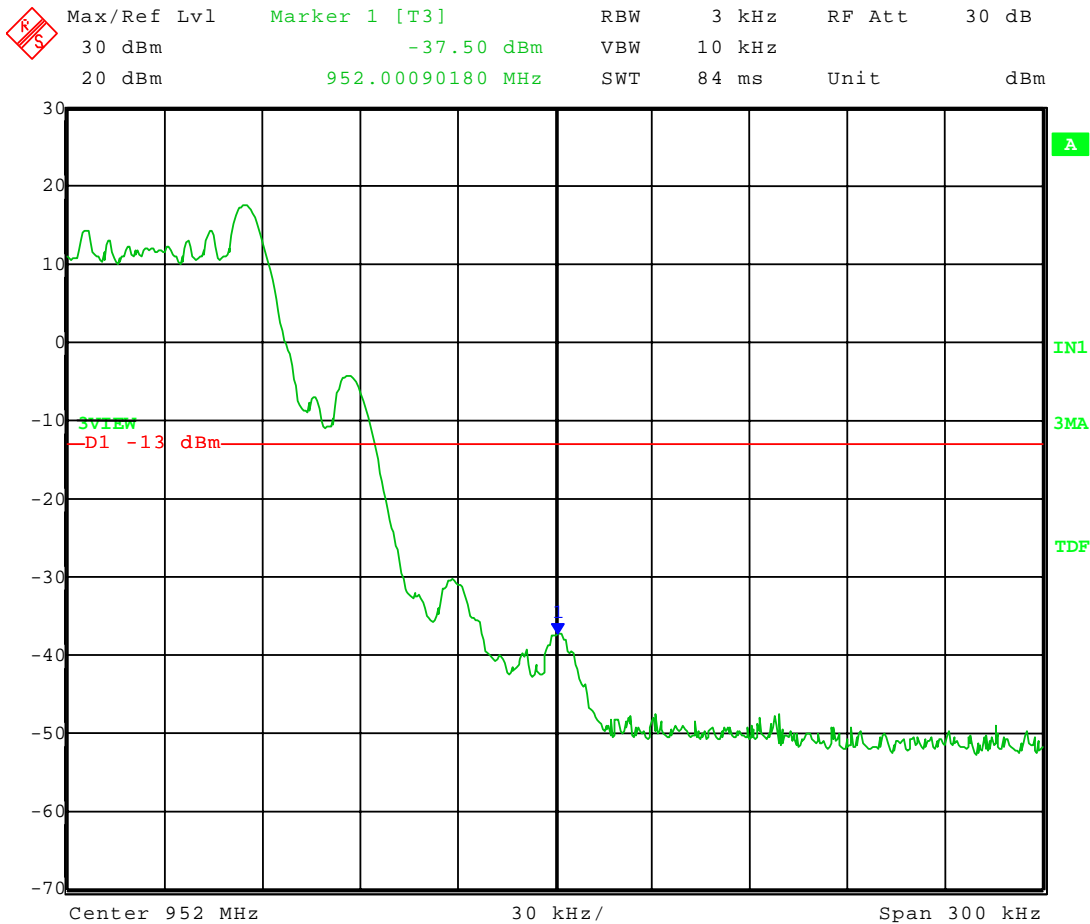
1250 Peterson Dr., Wheeling, IL 60090

### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 40° C

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



Date: 15.FEB.2008 13:42:26



Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

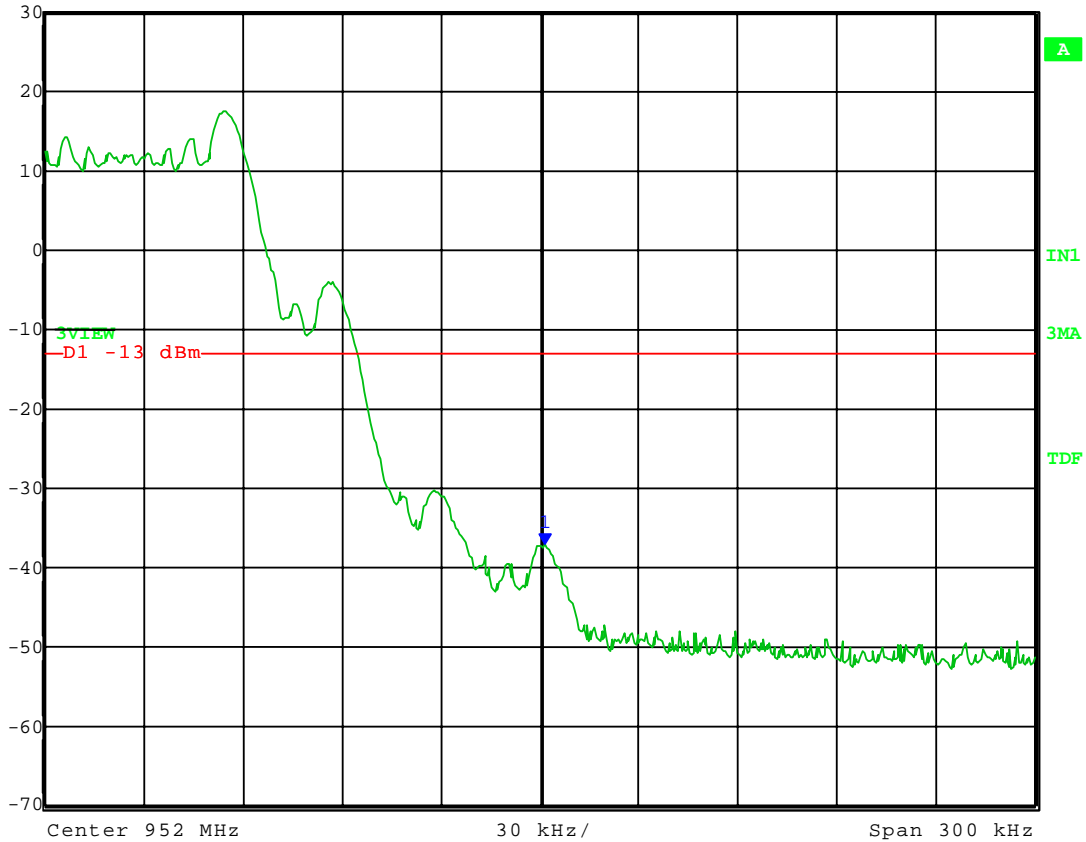
### APPENDIX A

Test Date: 02-15-2008  
Company: Shure, Inc.  
EUT: UR1H-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: 50° C

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

	Max/Ref Lvl	Marker 1 [T3]	RBW	3 kHz	RF Att	30 dB
	30 dBm	-37.14 dBm	VBW	10 kHz		
	20 dBm	952.00150301 MHz	SWT	84 ms	Unit	dBm



Date: 15.FEB.2008 14:06:53

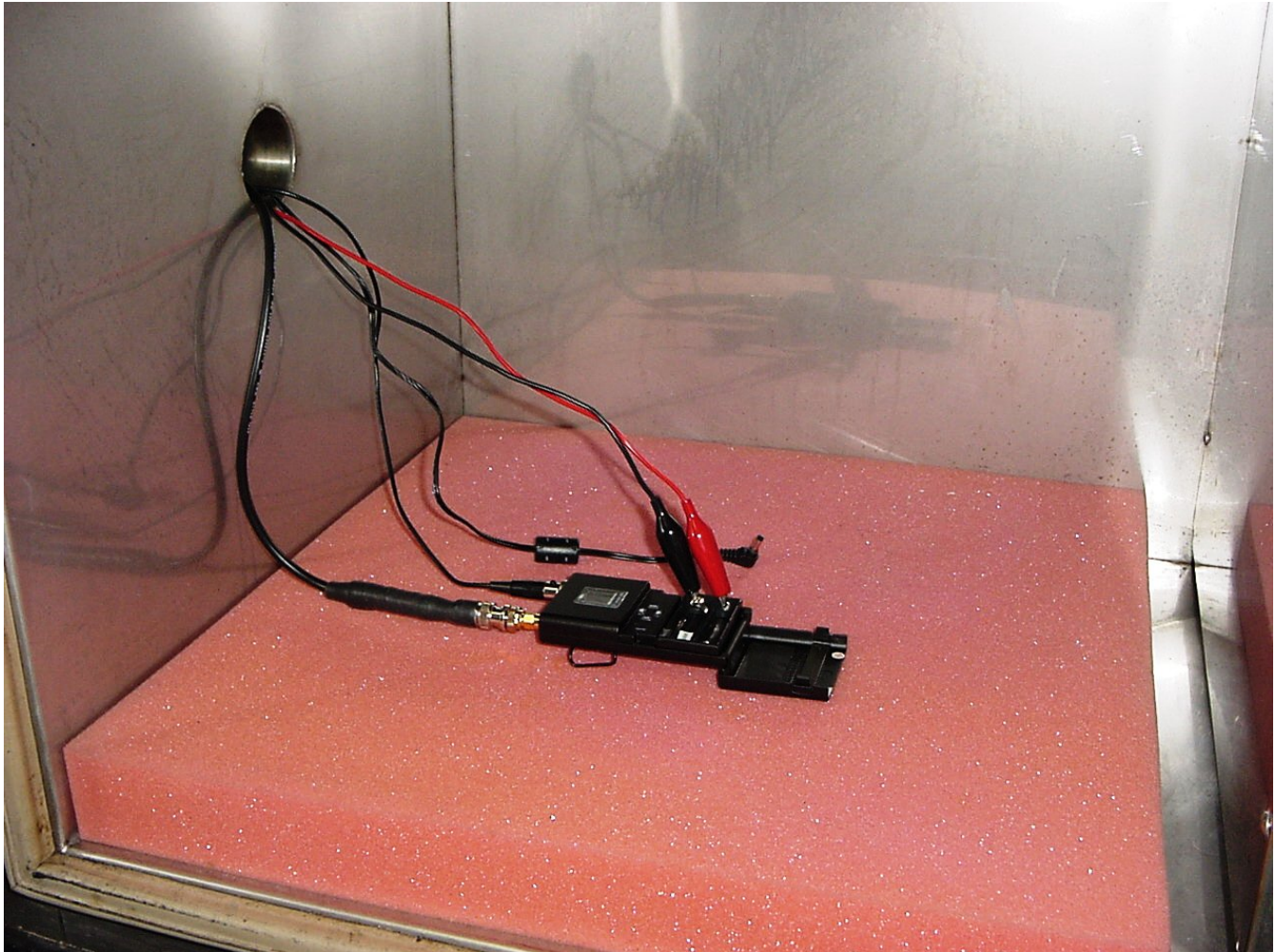


Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 11.0 FREQUENCY STABILITY PHOTOS TAKEN DURING TESTING



## BAND-EDGE AND FREQ STABILITY



1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Incorporated  
Model Tested: UR1H X1  
Report Number: 13943

## APPENDIX B

AC LINE POWER LINE CONDUCTED DATA

AND

CHARTS TAKEN DURING TESTING

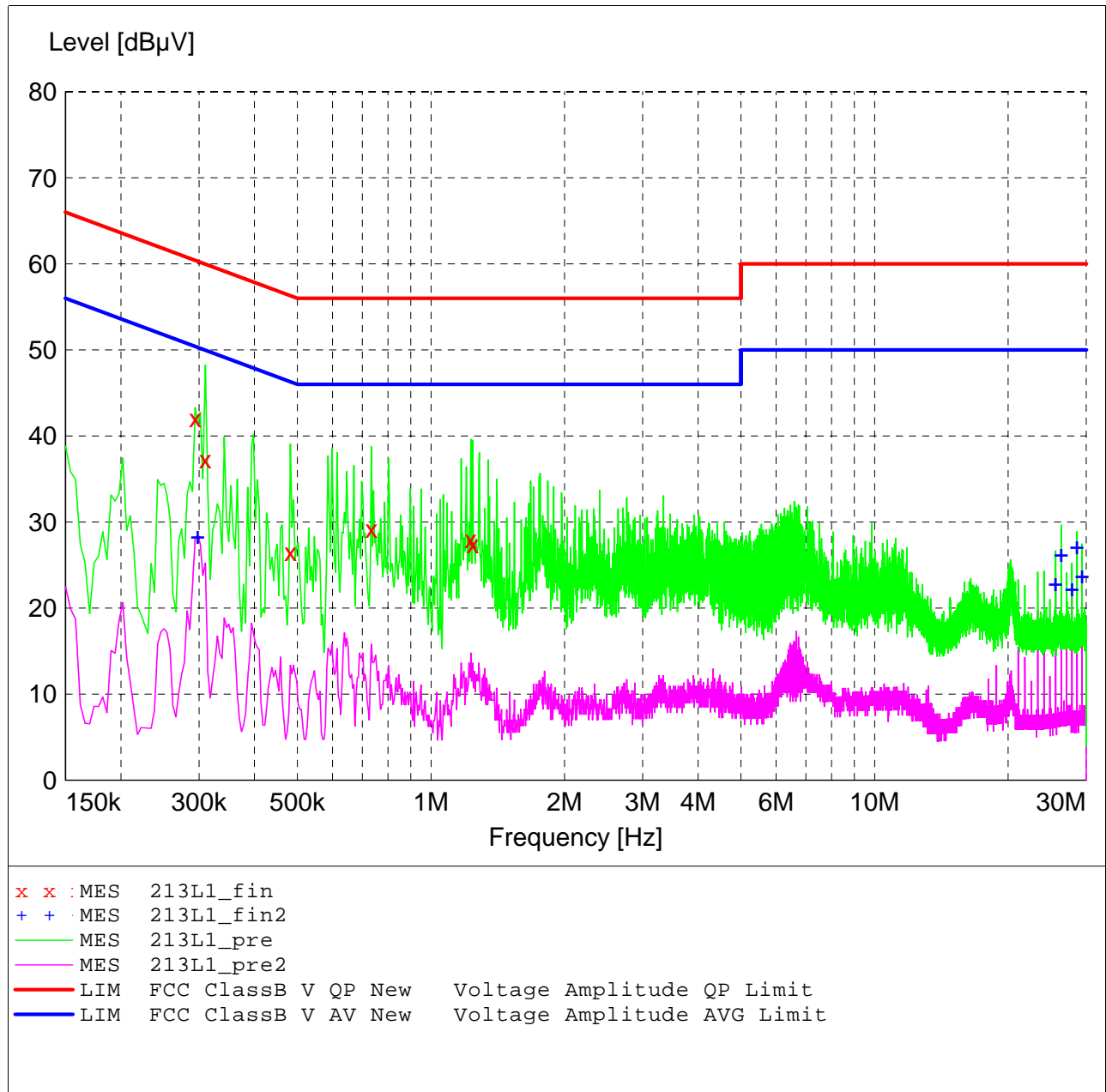
**FCC Part 15 Class B**

**Voltage Mains Test**

EUT: UR1H-X1  
 Manufacturer: Shure, Inc.  
 Operating Condition: 68 deg. F, 22% R.H.  
 Test Site: DLS O.F. Site 1 (Screenroom)  
 Operator: Craig B  
 Test Specification: 120 V 60 Hz  
 Comment: Line 1  
 Date: 02-13-2008

**SCAN TABLE: "Line Cond Scrn RmFin"**

Short Description:		Line Conducted Emissions					Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128	
CISPR AV							



**MEASUREMENT RESULT: "213L1\_fin"**

2/13/2008 2:55PM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.294000	42.00	10.6	60	18.4	QP	---	---
0.310000	37.20	10.5	60	22.8	QP	---	---
0.482000	26.50	10.3	56	29.8	QP	---	---
0.734000	29.20	10.3	56	26.8	QP	---	---
1.230000	28.00	10.2	56	28.0	QP	---	---
1.242000	27.40	10.2	56	28.6	QP	---	---

**MEASUREMENT RESULT: "213L1\_fin2"**

2/13/2008 2:55PM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.298000	28.40	10.6	50	21.9	CAV	---	---
25.594000	22.90	11.7	50	27.1	CAV	---	---
26.346000	26.30	11.8	50	23.7	CAV	---	---
27.850000	22.30	12.0	50	27.7	CAV	---	---
28.602000	27.20	12.0	50	22.8	CAV	---	---
29.358000	23.80	12.0	50	26.2	CAV	---	---

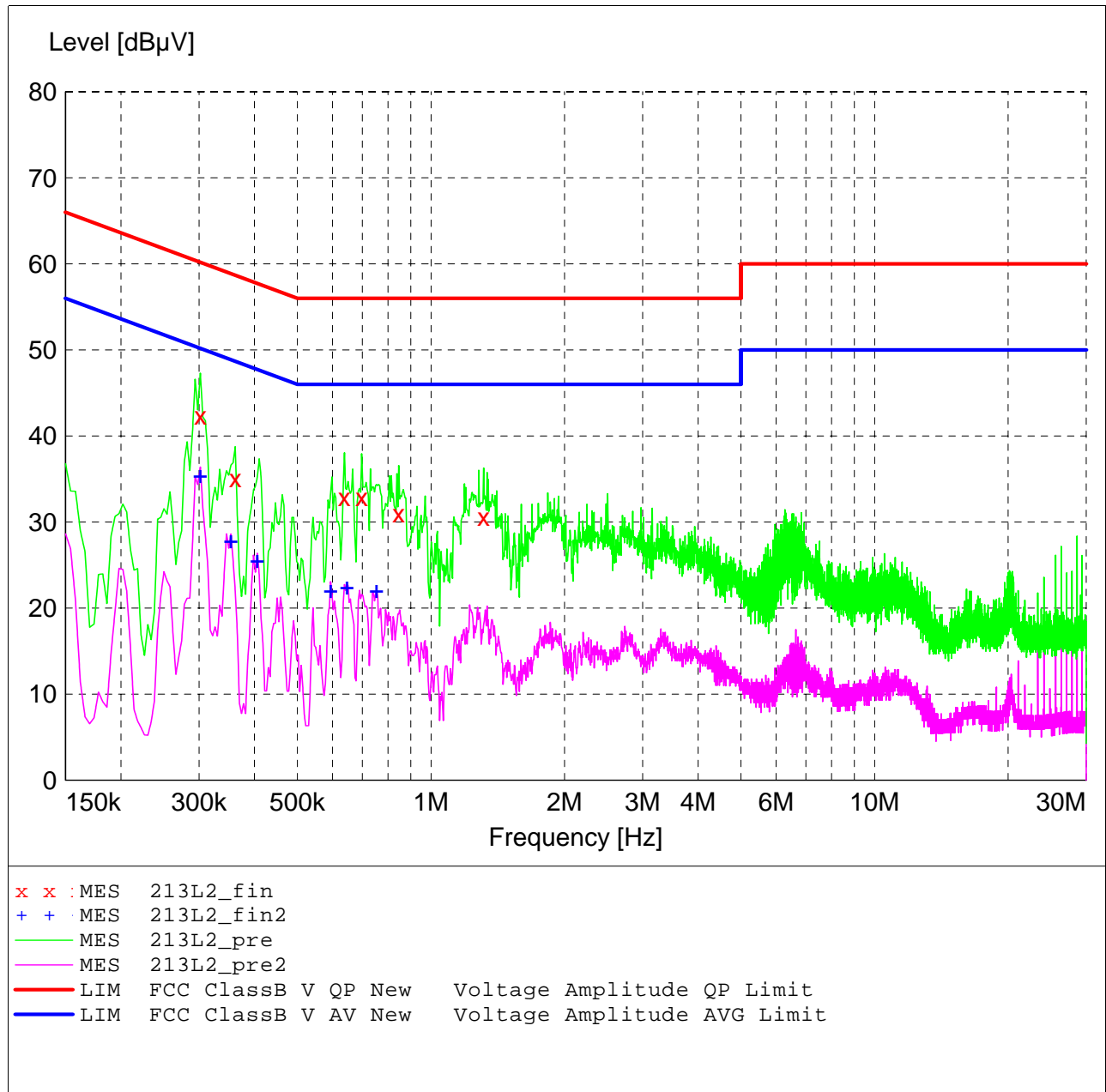
**FCC Part 15 Class B**

**Voltage Mains Test**

EUT: UR1H-X1  
 Manufacturer: Shure, Inc.  
 Operating Condition: 68 deg. F, 22% R.H.  
 Test Site: DLS O.F. Site 1 (Screenroom)  
 Operator: Craig B  
 Test Specification: 120 V 60 Hz  
 Comment: Line 2  
 Date: 02-13-2008

**SCAN TABLE: "Line Cond Scrn RmFin"**

Short Description:		Line Conducted Emissions					Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128	
CISPR AV							





**MEASUREMENT RESULT: "213L2\_fin"**

2/13/2008 3:00PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.302000	42.30	10.6	60	17.9	QP	---	---
0.362000	35.10	10.4	59	23.6	QP	---	---
0.638000	32.90	10.2	56	23.1	QP	---	---
0.698000	32.90	10.3	56	23.1	QP	---	---
0.846000	31.00	10.2	56	25.0	QP	---	---
1.314000	30.60	10.2	56	25.4	QP	---	---

**MEASUREMENT RESULT: "213L2\_fin2"**

2/13/2008 3:00PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.302000	35.50	10.6	50	14.7	CAV	---	---
0.354000	27.90	10.4	49	21.0	CAV	---	---
0.406000	25.60	10.4	48	22.1	CAV	---	---
0.594000	22.10	10.3	46	23.9	CAV	---	---
0.646000	22.50	10.2	46	23.5	CAV	---	---
0.754000	22.10	10.3	46	23.9	CAV	---	---