1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Incorporated
Model Tested: UR1M L3
Report Number: 13861

FCC Rules and Regulations / Intentional Radiators

Low Power Auxiliary Stations

Part 74, Subpart H, Sections 74.801 - 74.882

Part 74.861 (e) TV Broadcasting

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	Micro Bodypack Transmitter
Kind of Equipment:	Wireless Microphone Transmitter
Test Configuration:	Stand Alone (Tested at 3 vdc)
Model Number(s):	UR1M L3, UR1MLEMO3 L3
Model(s) Tested:	UR1M L3
Serial Number(s):	NA
Emission Designator:	89KF3E
Date of Tests:	August 22, 2007 and September 7, 17, 18, 26, 28 & 29, 2007
Test Conducted For:	Shure Incorporated 5800 West Touhy Avenue Niles, Illinois 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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SIGNATURE PAGE

Report By:

Arnom C. Rowe
Test Engineer
EMC-001375-NE

Reviewed By:

William Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager

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United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

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 Communique dated 18 June 2005).

DEPARTMENT OF COMMERCE ★ UNITED STATES OF AMERICA ★

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

Sally S. Bruce
For the National Institute of Standards and Technology

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

1250 Peterson Dr., Wheeling, IL 60090

1.0 SUMMARY OF TEST REPORT

It was found that the Micro Bodypack Transmitter, Model Number(s) UR1M L3, **meets** the radio interference radiated emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Section 74.861 (e), for low power auxiliary stations. The AC Power Line conducted emissions test was not required because the Micro Bodypack 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 August 22, 2007 and September 7, 17, 18, 26, 28 & 29, 2007, a series of radio frequency interference measurements was performed on Micro Bodypack Transmitter, Model Number(s) UR1M L3, Serial Number: NA. The tests were performed according to the procedures of the FCC as stated in Part 2 - Frequency Allocations and Radio Treaty Matters: General Rules and Regulations, Subpart J, Equipment Authorization Procedures of the Code of Federal Regulations 47. Tests were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO Guide 17025. NVLAP Certificate and Scope can be viewed at http://www.dlsemc.com/certificate. Our facilities are registered with the FCC (Registration #90531), Industry Canada (Registration #2060A-1, 2060A-2, & 2060A-3), and VCCI. All Emission 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 (e), 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 or are located in the same manner as the user would install them and no further manipulation is made. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions. For each mode of operation, the frequency spectrum is monitored. Variations in antenna height, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) are explored to produce the emission that has the highest amplitude relative to the limit. These methods are performed to the specifications in ANSI C63.4: 2003.

7.0 AC POWER LINE CONDUCTED EMISSION MEASUREMENTS – Part 15.207

The Micro Bodypack 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.

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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 865 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: 49 mm x 60mm Width: 17 mm

8.3 LINE FILTER USED:

NA

8.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

NA

Clock Frequencies:

0.025, 0.064, 1.2, 4, 32 MHz

8.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. Printed Circuit Board PN: 190-11427

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 Micro Bodypack Transmitter
Model Number: UR1M L3, Serial Number: NA

Item 1 Shure Microphone Cable

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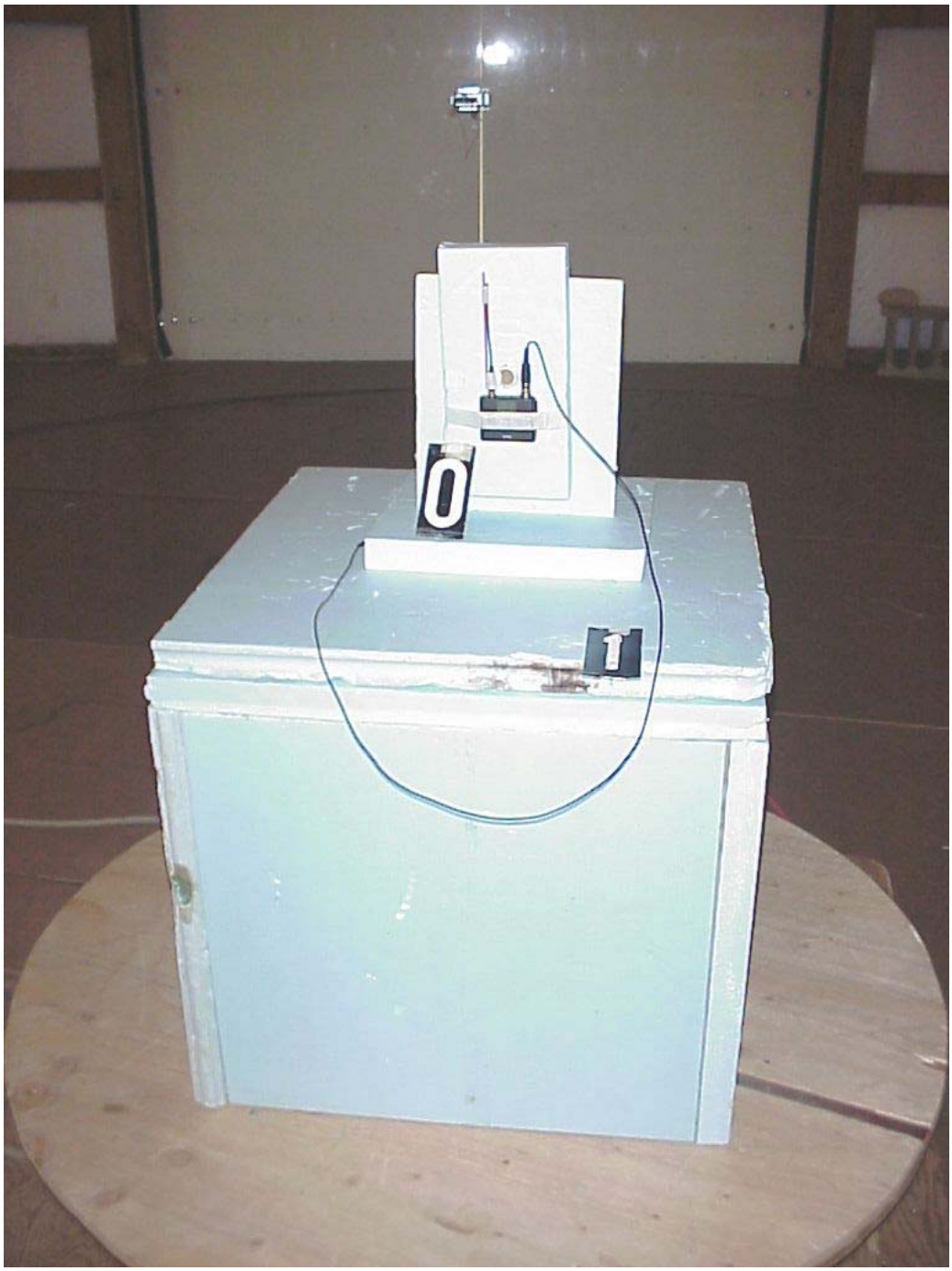
11.0 RADIATED PHOTOS TAKEN DURING TESTING



ORIENTATION Y-AXIS

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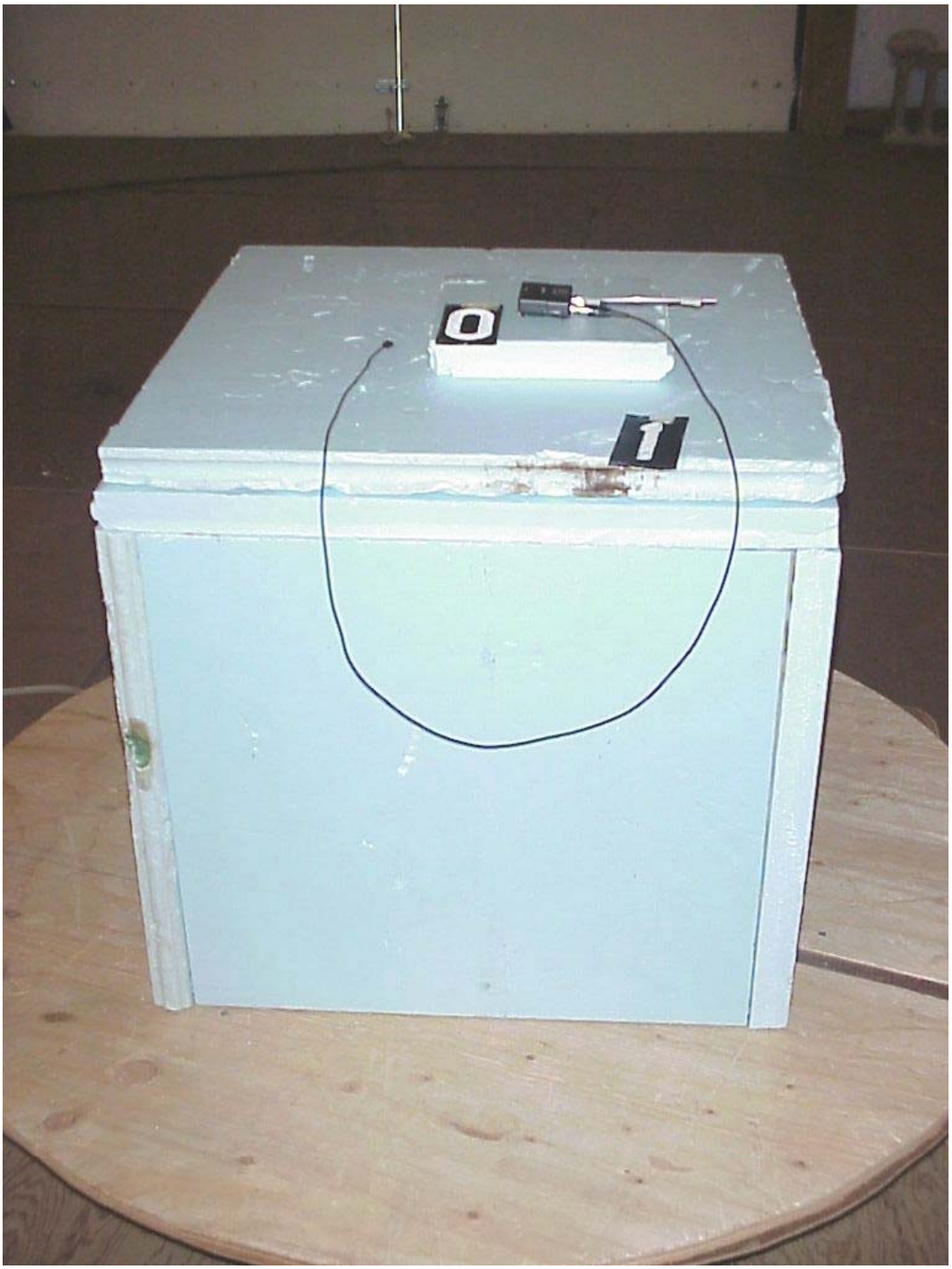
11.0 RADIATED PHOTOS TAKEN DURING TESTING

ORIENTATION X-AXIS

1250 Peterson Dr., Wheeling, IL 60090

11.0 RADIATED PHOTOS TAKEN DURING TESTING



ORIENTATION Z-AXIS

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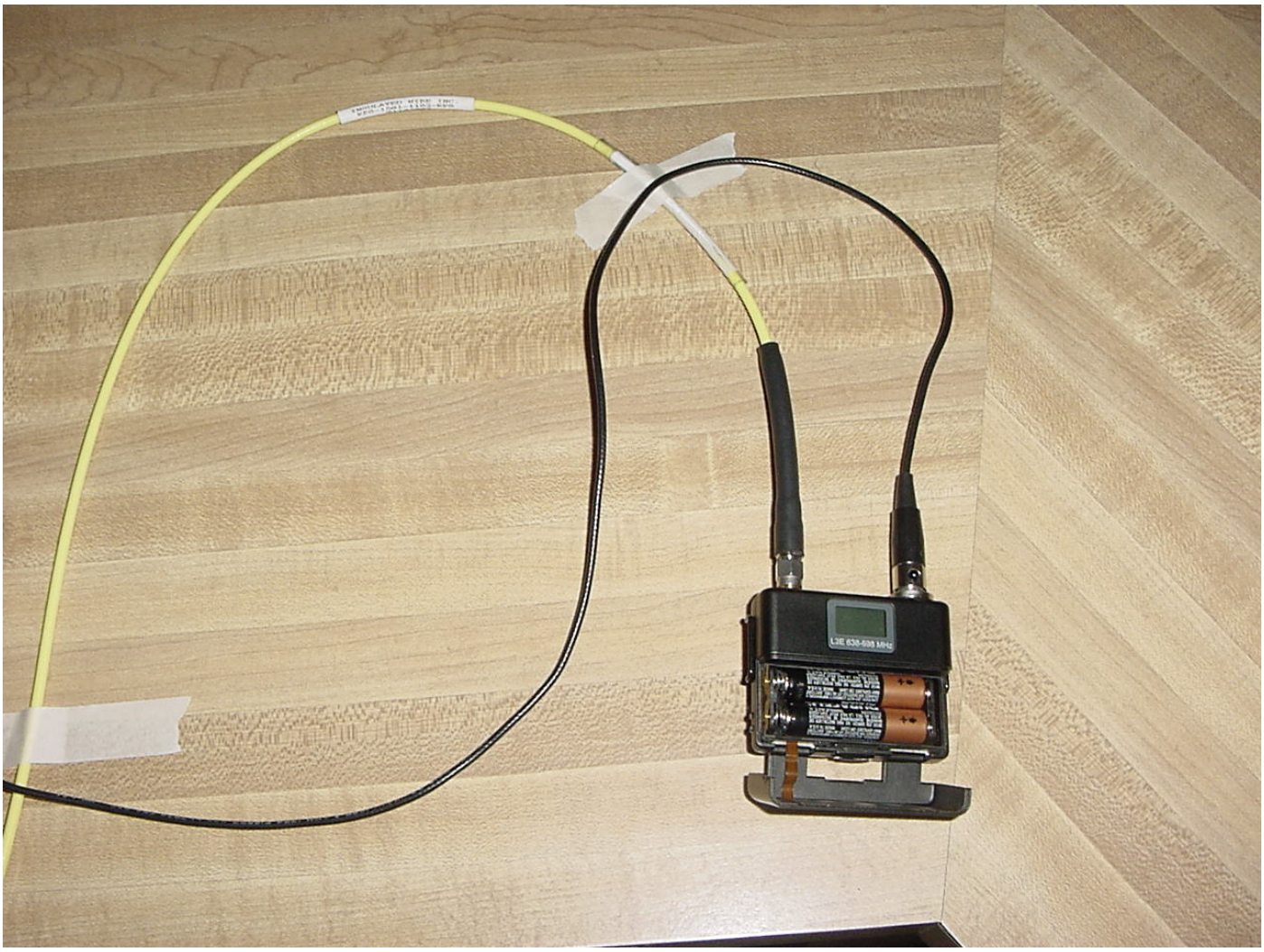
11.0 RF CONDUCTED PHOTO TAKEN DURING TESTING



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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 Micro Bodypack Transmitter, Model Number(s) UR1M L3 **meets** the radio interference radiated emission requirements of the FCC "Rules and Regulations", Part 74, Subpart H, Section 74.861 (e), for low power auxiliary stations.The AC Power Line conducted emissions test was not required because the Micro Bodypack Transmitter is powered from a D.C. power source. It does not have a line cord to plug into the A.C. power line.

TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	11/07
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	12/07
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	12/07
Antenna	EMCO	3104C	00054891	20 MHz – 200 MHz	2/08
Antenna	Electrometrics	LPA-25	1114	200 MHz – 1 GHz	3/08
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3/08
Antenna	Electrometrics	3146	1205	200 MHz – 1 GHz	3/08
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	2/08
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	3/08
Antenna	Rohde & Schwarz	HUF-Z1	829381001	20 MHz – 1 GHz	2/08
Antenna	Rohde & Schwarz	HUF-Z1	829381005	20 MHz – 1 GHz	8/08
Horn Antenna	EMCO	3116	2549	18 – 40GHz	5/08
Horn Antenna	ETS Lindgren	3116	00062917	18 – 40GHz	10/08

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

TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Horn Antenna	A.H. Systems	SAS-574	221	18 - 40GHz	4/08
Horn Antenna	A.H. Systems	SAS-574	222	18 - 40GHz	4/08
Horn Antenna	Com Power	AH 118	071127	1-18GHz	5/08
Horn Antenna	EMCO	3115	4451	1-18GHz	5/08
Horn Antenna	EMCO	3115	6204	1-18GHz	5/08
Horn Antenna	EMCO	3115	5731	1-18GHz	6/08
Attenuator - 10dB Fixed	JFW	50FH-101-50N	50FH-010-10	DC-2GHz	9/08
Attenuator- 10dB Fixed	Pasternack	PE7014-10		DC-18GHz	9/08
Attenuator- 10dB Fixed	JFW	50FH-010-10		DC-2GHz	9/08
Attenuator- 20dB Fixed	Aeroflex Weinschel	75A-20-12	1071	DC – 40GHz	7/08
Attenuator- 20dB Fixed	Pasternack	PE7019-20		DC-18GHz	9/08
Attenuator- 40dB Fixed	JFW	50FHA0-040-200		DC-18GHz	4/08
Audio Analyzer	HP	8903A	2336A03043	20Hz-100kHz	12/08

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

TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Attenuator-20dB fixed	MCE-WEIN	59955A-20		DC-40GHz	9/08
Filter- Band Reject Tunable	K&L	3TNF-500/1000-B/B		360MHz-1.25GHz	Cal when needed
Filter- Band Reject Tunable	K&L	3TNF-63/125-B/B		62MHz-200MHz	Cal when needed
Power Meter	Anritsu	ML2487A	6K00002069		10/08
Power Sensor	Anritsu	MA2411A	031563	300MHz-40GHz	10/08
Power Sensor	Anritsu	MA2490A		50MHz-8GHz	10/08
Power Sensor	Anritsu	MA2491A		50MHz-18GHz	10/08
Preamp	R&S	TS-PR40	032001/003	26GHz-40GHz	1/08
Preamp	Miteq	AMF-8B-180265-40-10P-H/S		18GHz-26GHz	9/08
Preamp	Miteq	MF-6D-010100-50 A	213976	10GHz-18GHz	5/08
Preamp	Miteq	AMF-6F-100200-50-10P	668382	10GHz-18GHz	1/08
Preamp	Miteq	AMF-6D-100200-50	313936	1GHz-10GHz	5/08
Preamp	Ciao	CA118-4010	----------	1GHz-18GHz	1/08

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

TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
50 Ohm Load-50W	Pasternack	PE6039	----------	DC-18GHz	Ref check
Modulation Analyzer	HP	8901B	2920A02096	150kHz-1.3GHz	11/08
Filter- High-Pass	Mini Circuits	NHP-600	438727	600MHz-7GHz	9/08
Filter- High-Pass	Mini Circuits	NHP-400	10433	400MHz-5GHz	9/08
Filter- High-Pass	Mini Circuits	NHP-900	----------	910MHz-8GHz	9/08
Filter- High-Pass	Q-Microwave	100460	----------	1.1GHz	5/08
Filter- High-Pass	Q-Microwave	100461	----------	2.9GHz	5/08
Filter- High-Pass	Q-Microwave	100462	----------	4.2GHz	5/08
Filter- High-Pass	Q-Microwave	100460	----------	1.1GHz	5/08
Filter- High-Pass	Q-Microwave	100461	----------	2.5GHz	5/08
Filter- High-Pass	Q-Microwave	100462	----------	4.6GHz	5/08
Filter- High-Pass	SOLAR	7930-10	921541	12kHz	3/08
Filter- High-Pass	SOLAR	7930-10	888809	11kHz	1/08

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

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TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Filter-Notch	K&L	4N45-2450/T100-0/0	----------	2.45GHz	5/08
Signal Generator	R&S	SMR-40	100092	1 – 40GHz	8/08
Filter- High-Pass	Planar	HP8G-7Q8-CD-SFF	PF1225/7728	f_c = 7.5GHz	7/08
Filter- High-Pass	Planar	HP8G-7Q8-CD-SFF	PF1226/7728	f_c = 7.5GHz	7/08
Filter- High-Pass	Planar	HP2G-1780-CD-SS	PF1227/7728	f_c = 1.5GHz	7/08
Filter- High-Pass	Planar	HP2G-1780-CD-SS	PF1228/7728	f_c = 1.5GHz	7/08
Filter- High-Pass	Planar	CL22600-9000-CD-SS	PF1230/7728	f_c = 16.2GHz	7/08
Filter- High-Pass	Planar	CL22600-9000-CD-SS	PF1229/7728	f_c = 16.2GHz	7/08
Signal Generator	Hewlet-Packard	HP8341B	2819A01017	10MHz – 20GHz	8/07
Directional Coupler	Mini-Circuits	ZDC-20-3	BF886600648	0.2 – 250MHz	New 8/07
Directional Coupler	Mini-Circuits	ZFDC-20-4-N	NF801600636	1 – 1000MHz	New 8/07
Bi-Directional Coupler	Mini-Circuits	ZX30-20-20BD-S+	SN350700724	500 – 2000MHz	New 8/07

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

APPENDIX A

TEST PROCEDURE

SUBPART H

LOW POWER AUXILIARY STATIONS OPERATING IN THE BANDS ALLOCATED FOR TV BROADCASTING

APPENDIX A

1.0 TEST SET-UP

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

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

As stated in PART 74.861 (e)(1)(ii), the RF output power should not exceed 0.25 watt(s). The RF output of the Micro Bodypack 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:

50 mW Power Setting:

17.10 dBm Measured output of the transmitter

17.10 dBm equals 0.05129 watt(s)

10 mW Power Setting:

10.47 dBm Measured output of the transmitter

10.47 dBm equals 0.01114watt(s)

LIMIT:

Manufacturer's rated output power = 10 mW or 50 mW

MARGIN:

50 mW Power Setting: 0.25 - 0.05129 = 0.198709 watt(s)

10 mW Power Setting: 0.25 - 0.01114 = 0.23886 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 (e)(1) & PART 2.1046

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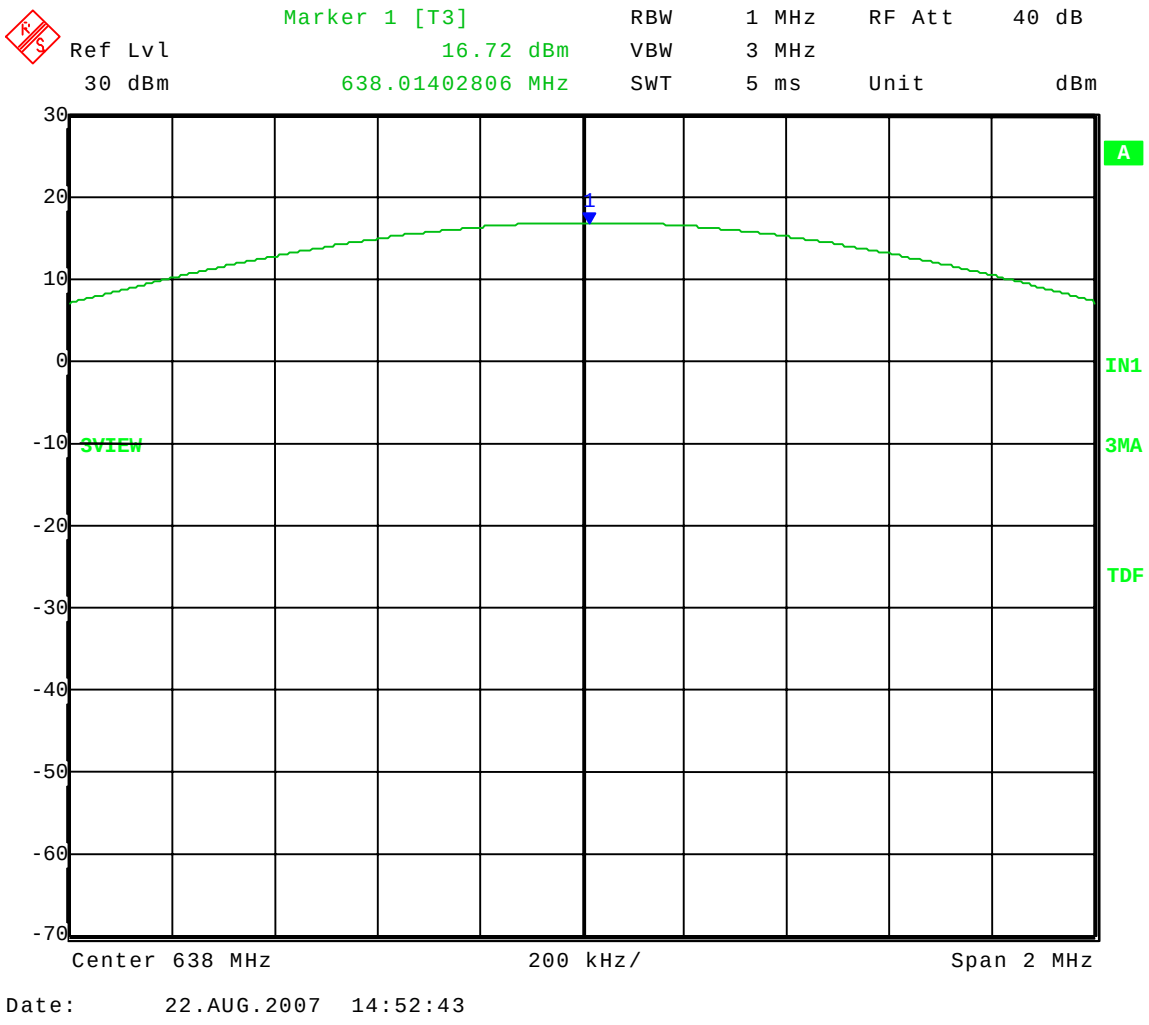
APPENDIX A

50 mW Power Setting on Transmitter

Test Date: 08-22-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Peak Power Output - Conducted
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Jason Lauer
Comment: Channel: 638 MHz

Peak Output Power = 16.72 dBm = 47.00 mW



1250 Peterson Dr., Wheeling, IL 60090

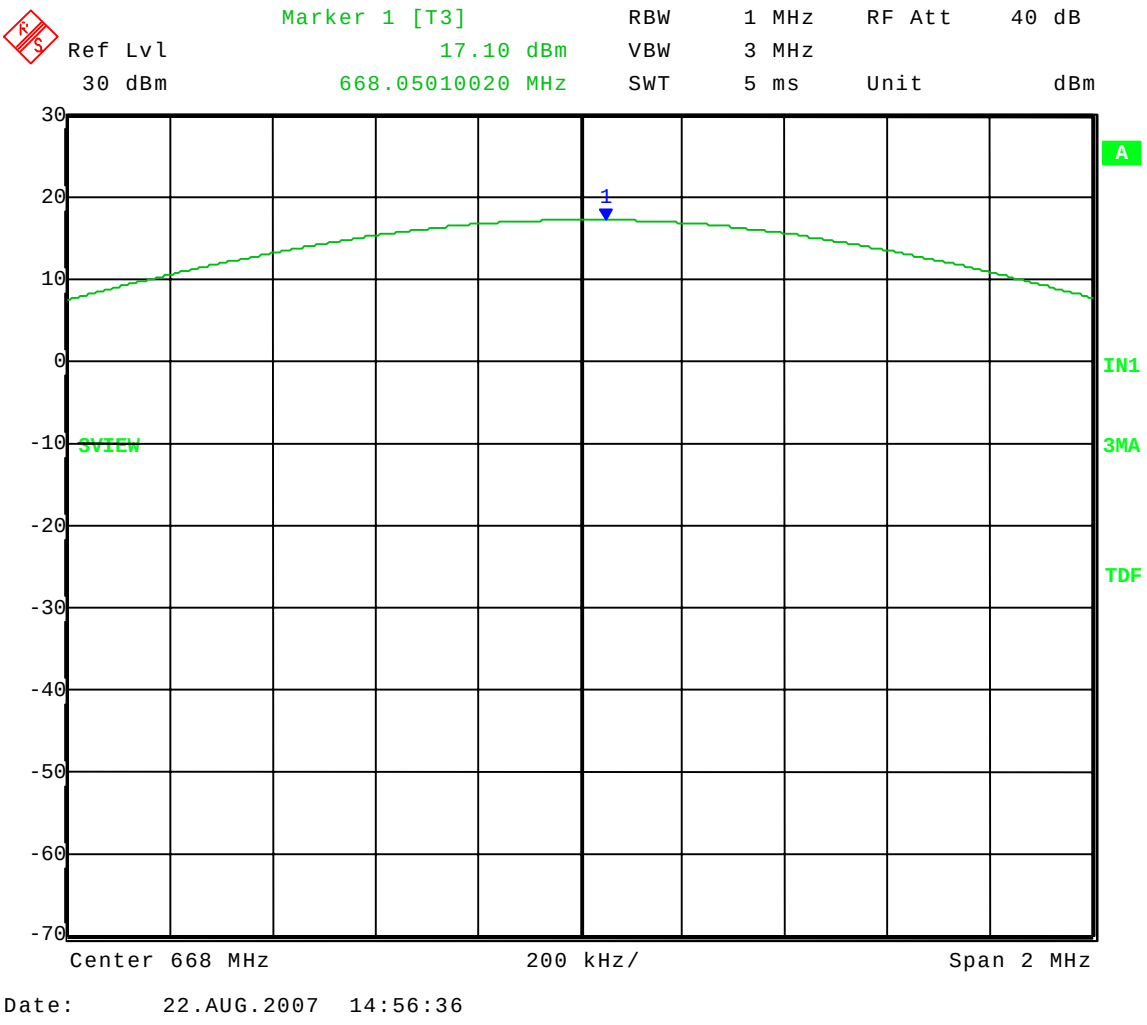
Company: Shure Incorporated
Model Tested: UR1M L3
Report Number: 13861

APPENDIX A

50 mW Power Setting on Transmitter

Test Date: 08-22-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Peak Power Output - Conducted
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Jason Lauer
Comment: Channel: 668 MHz

Peak Output Power = 17.10 dBm = 51.29 mW



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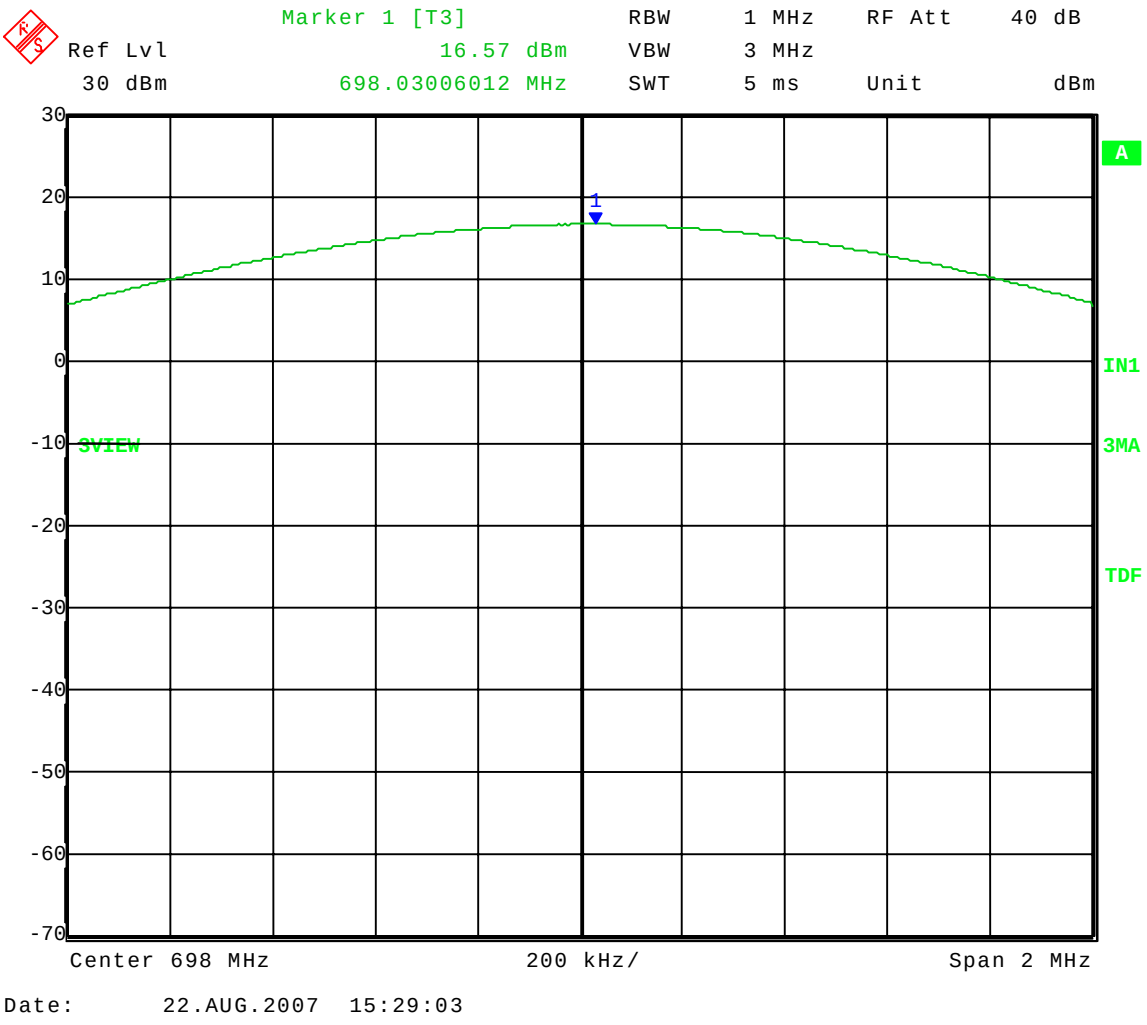
APPENDIX A

50 mW Power Setting on Transmitter

Test Date: 08-22-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Peak Power Output - Conducted
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Jason Lauer
Comment: Channel: 698 MHz

Peak Output Power = 16.57 dBm = 45.39 mW



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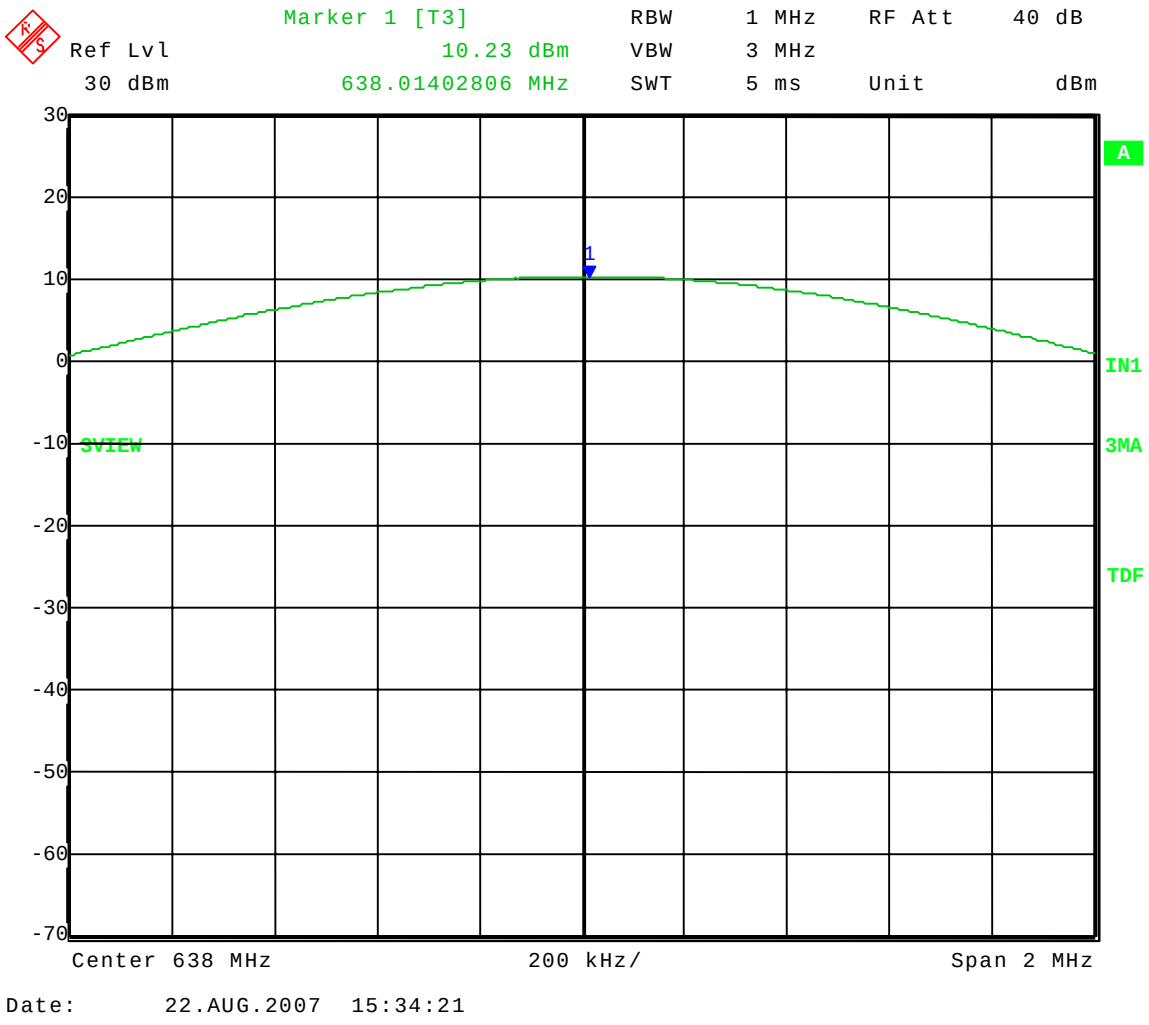
APPENDIX A

10 mW Power Setting on Transmitter

Test Date: 08-22-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Peak Power Output - Conducted
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Jason Lauer
Comment: Channel: 638 MHz

Peak Output Power = 10.23 dBm = 10.54 mW



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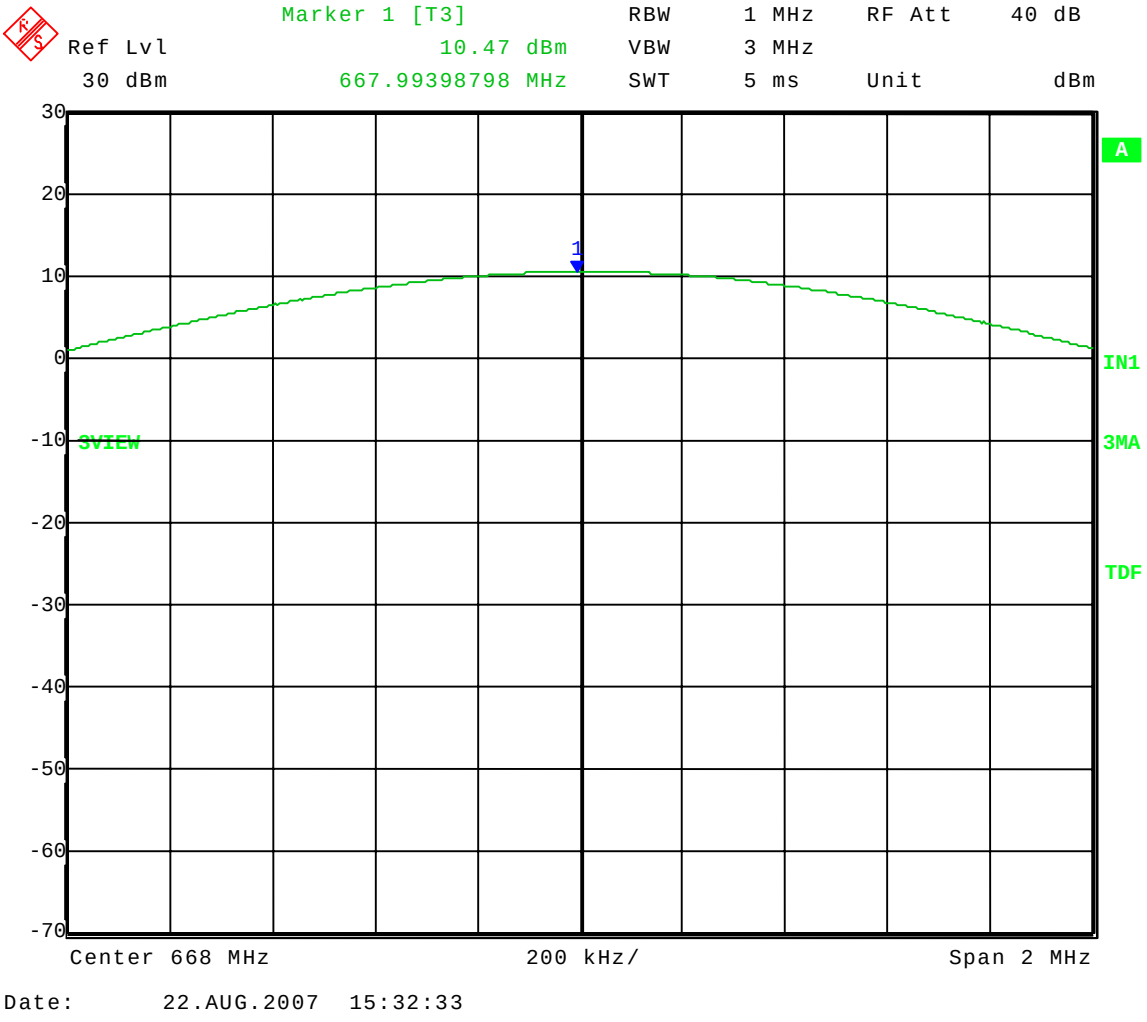
APPENDIX A

10 mW Power Setting on Transmitter

Test Date: 08-22-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Peak Power Output - Conducted
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Jason Lauer
Comment: Channel: 668 MHz

Peak Output Power = 10.47 dBm = 11.14 mW



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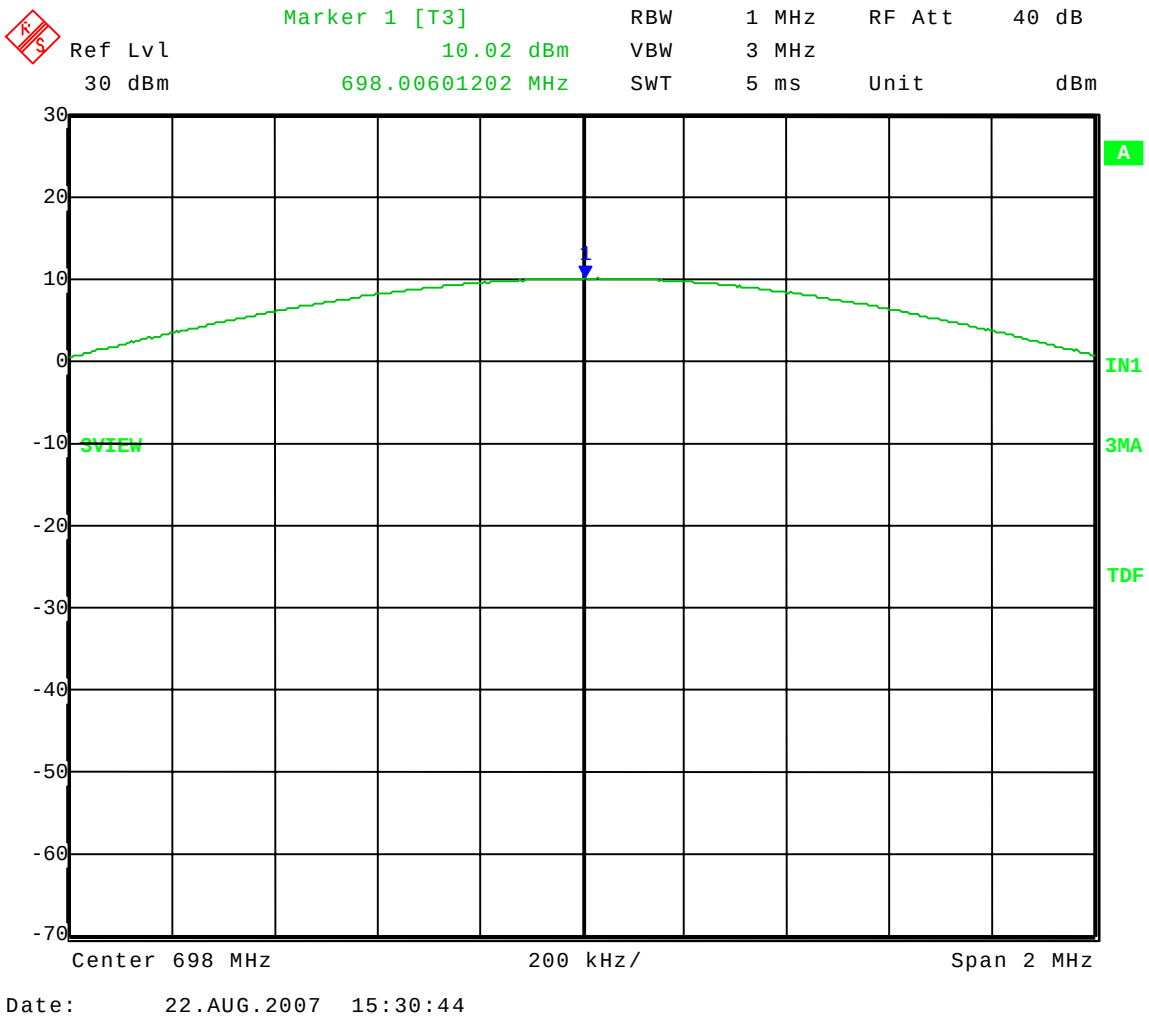
APPENDIX A

10 mW Power Setting on Transmitter

Test Date: 08-22-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Peak Power Output - Conducted
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Jason Lauer
Comment: Channel: 698 MHz

Peak Output Power = 10.02 dBm = 10.05 mW



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APPENDIX A

3.0 RF POWER OUTPUT PHOTOS TAKEN DURING TESTING

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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 50 Hz to 15 kHz -3.0 to 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.

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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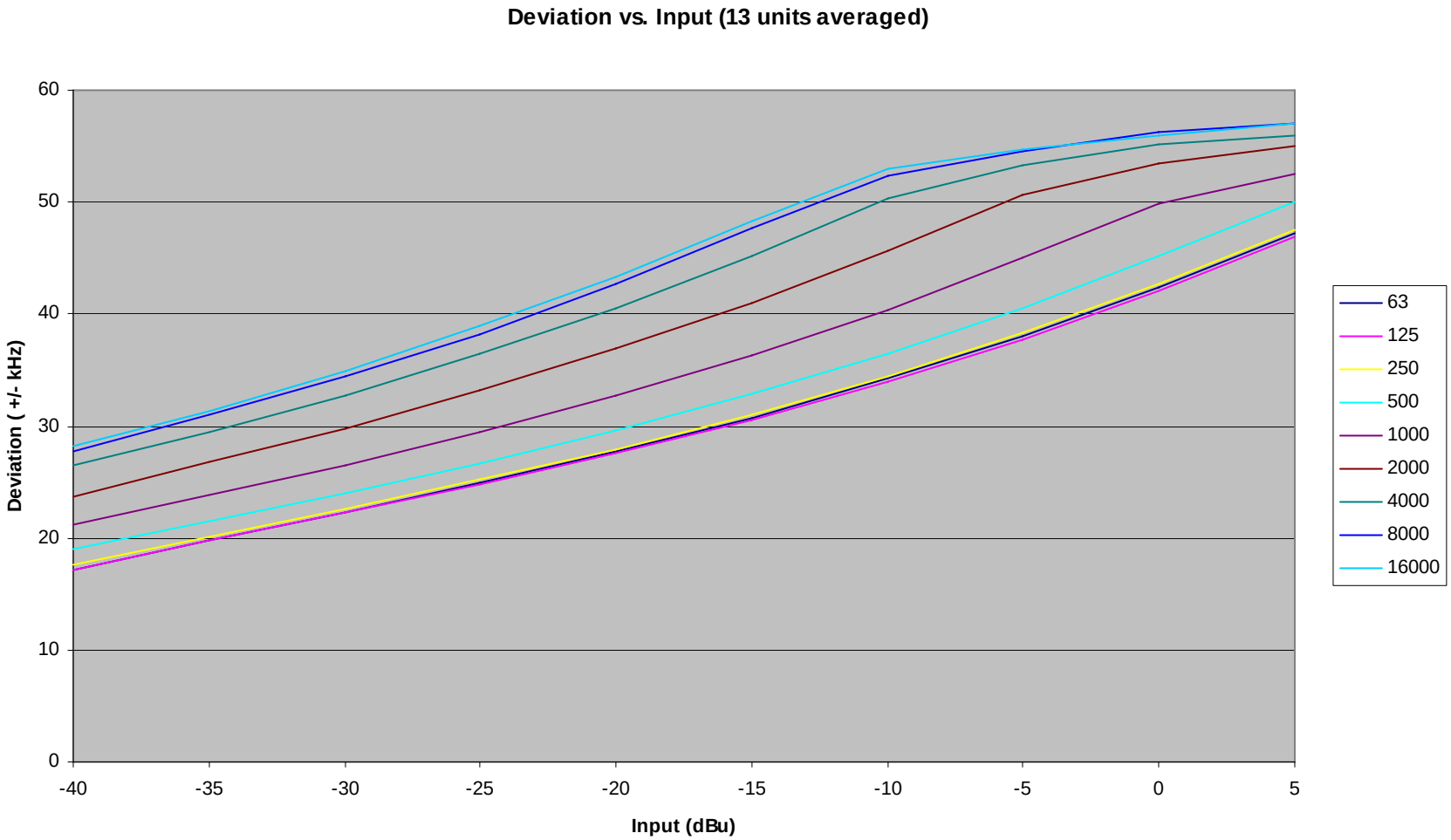
APPENDIX A



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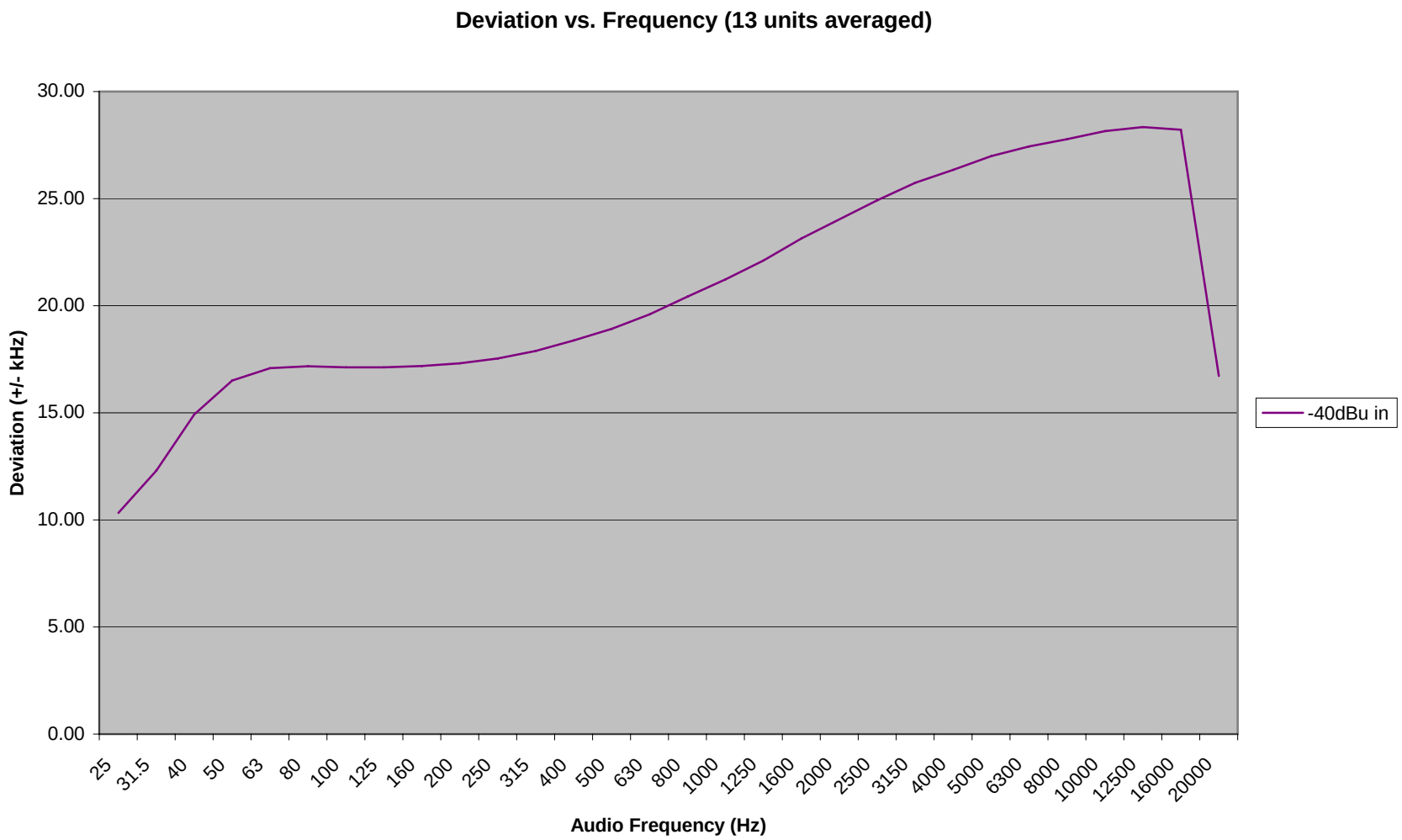
Company: Shure Incorporated
Model Tested: UR1M L3
Report Number: 13861

APPENDIX A



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Company: Shure Incorporated
Model Tested: UR1M L3
Report Number: 13861

APPENDIX A

dBu in

L3E (7789)	63	125	250	500	1000	2000	4000	8000	16000
-40	17.30	17.30	17.80	19.10	21.50	21.30	26.50	28.40	28.90
-35	20.00	19.90	20.30	21.60	24.00	27.20	29.90	31.60	32.20
-30	22.50	22.40	22.80	24.10	26.70	30.20	33.10	35.10	35.80
-25	25.10	25.00	25.30	26.80	29.70	33.50	36.80	39.10	39.90
-20	27.90	27.80	28.10	29.80	32.90	37.30	41.20	43.50	44.40
-15	31.00	30.80	31.30	33.10	36.60	41.40	45.90	48.50	49.60
-10	34.50	34.20	34.70	36.70	40.70	46.20	51.10	53.20	53.80
-5	38.40	38.00	38.60	40.80	45.30	51.30	54.30	55.60	55.90
0	42.60	42.30	42.90	45.50	50.30	54.00	55.80	57.00	57.30
5	47.60	47.10	47.80	50.30	53.00	55.70	56.30	58.00	58.20

Settings: 0dB Gain and 0dB Sensitivity

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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 ±75 kHz is permitted when frequency modulation is used. The operating bandwidth shall not exceed 200 kHz.

Carson's Rule:

Section 2.202 (g)

Bn = 2M+2DK, K=1	Bn = Bandwidth
M = 15 kHz,	M = Maximum Modulating Frequency
D = 45 kHz,	D = Peak Deviation

Bn = 2(15) + 2(45)(1) = 120 kHz

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APPENDIX A

DATA AND GRAPH(S) TAKEN OF THE

99% OCCUPIED BANDWIDTH

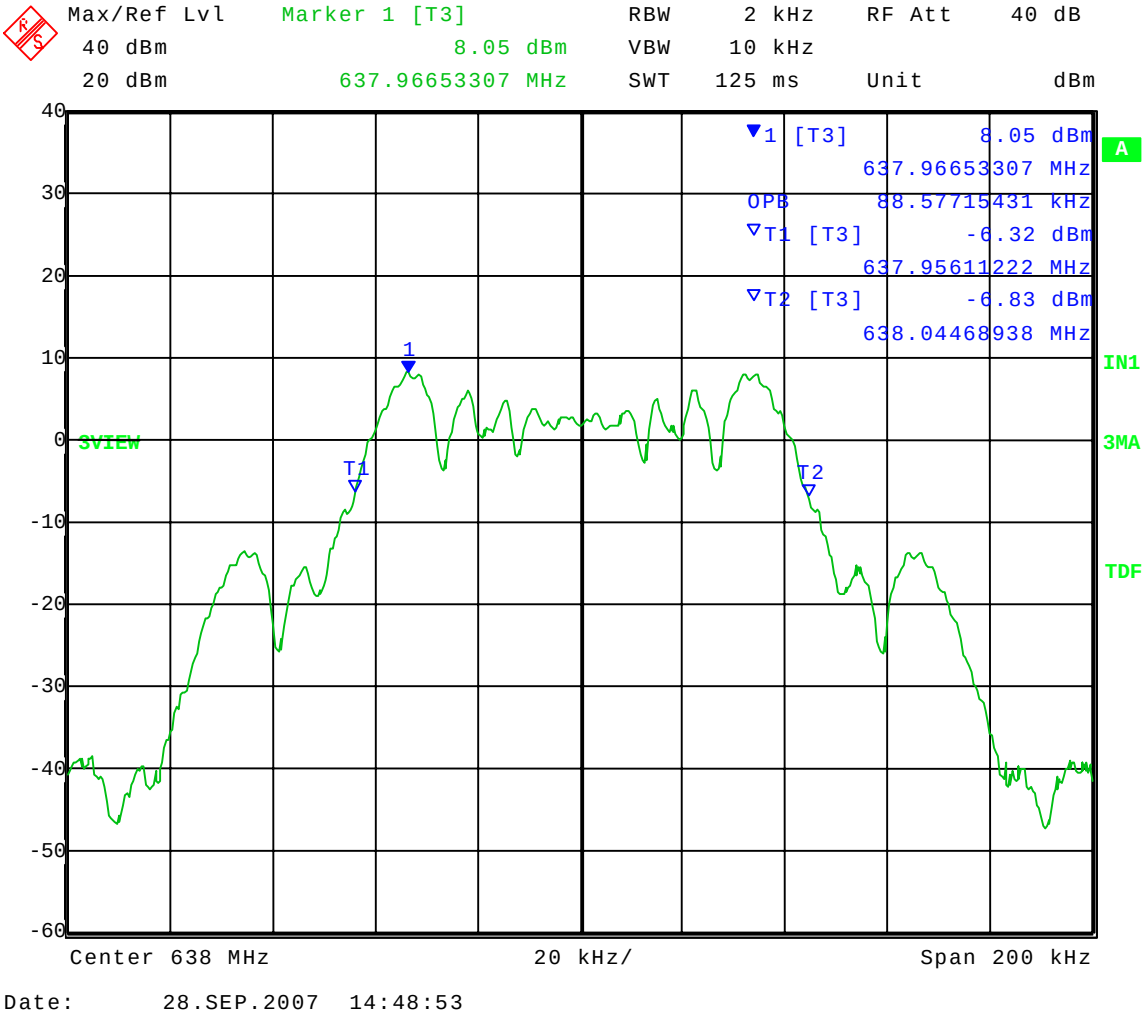
Part 74.861 (e)(5) & PART 2.1049

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth; 99% bandwidth
Rule part: FCC Part 74; FCC Part 2.1049
Operator: Craig B
Frequency: 638 MHz

99% power bandwidth = 88.58 kHz

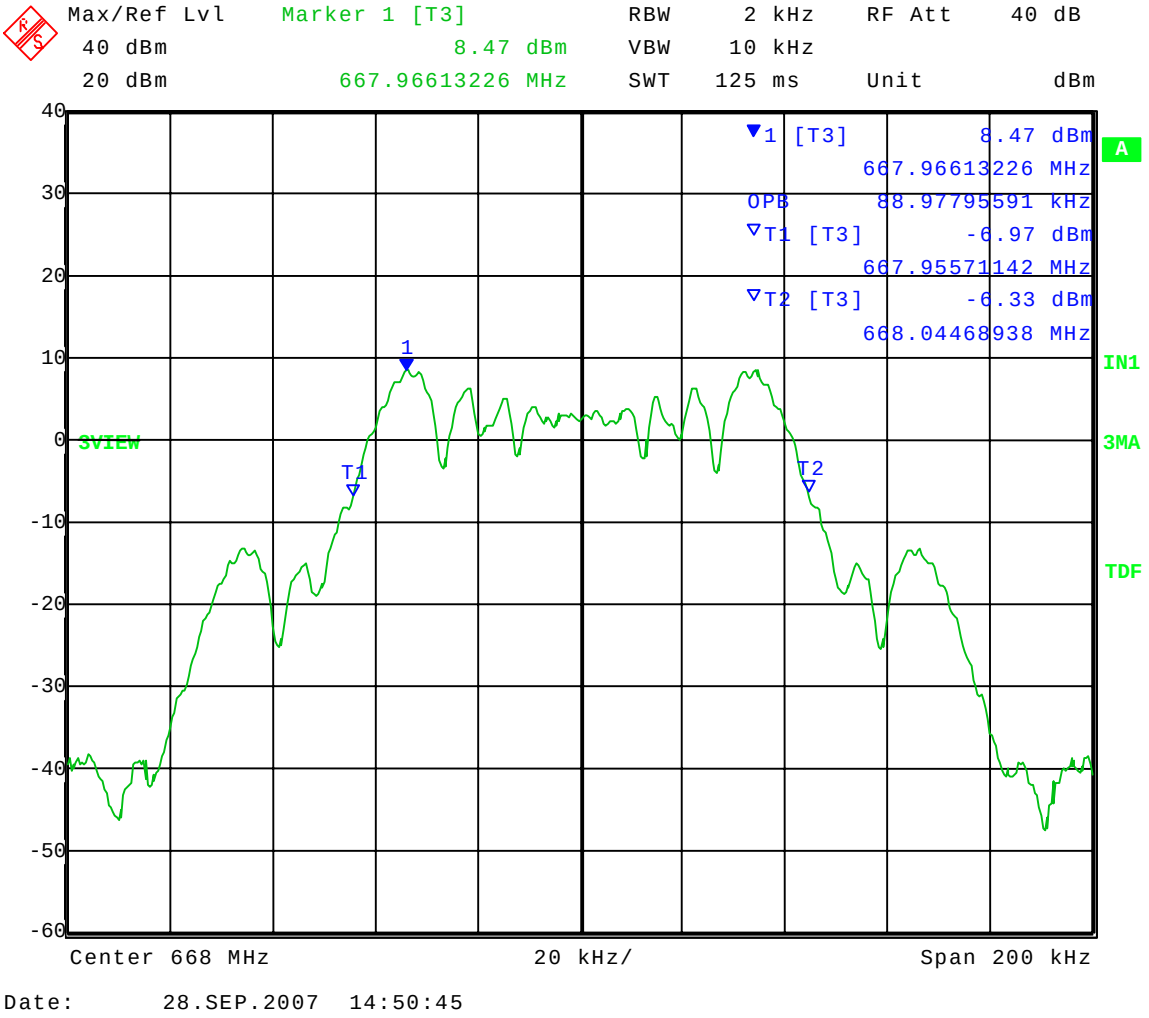


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth; 99% bandwidth
Rule part: FCC Part 74; FCC Part 2.1049
Operator: Craig B
Frequency: 668 MHz

99% power bandwidth = 88.98 kHz

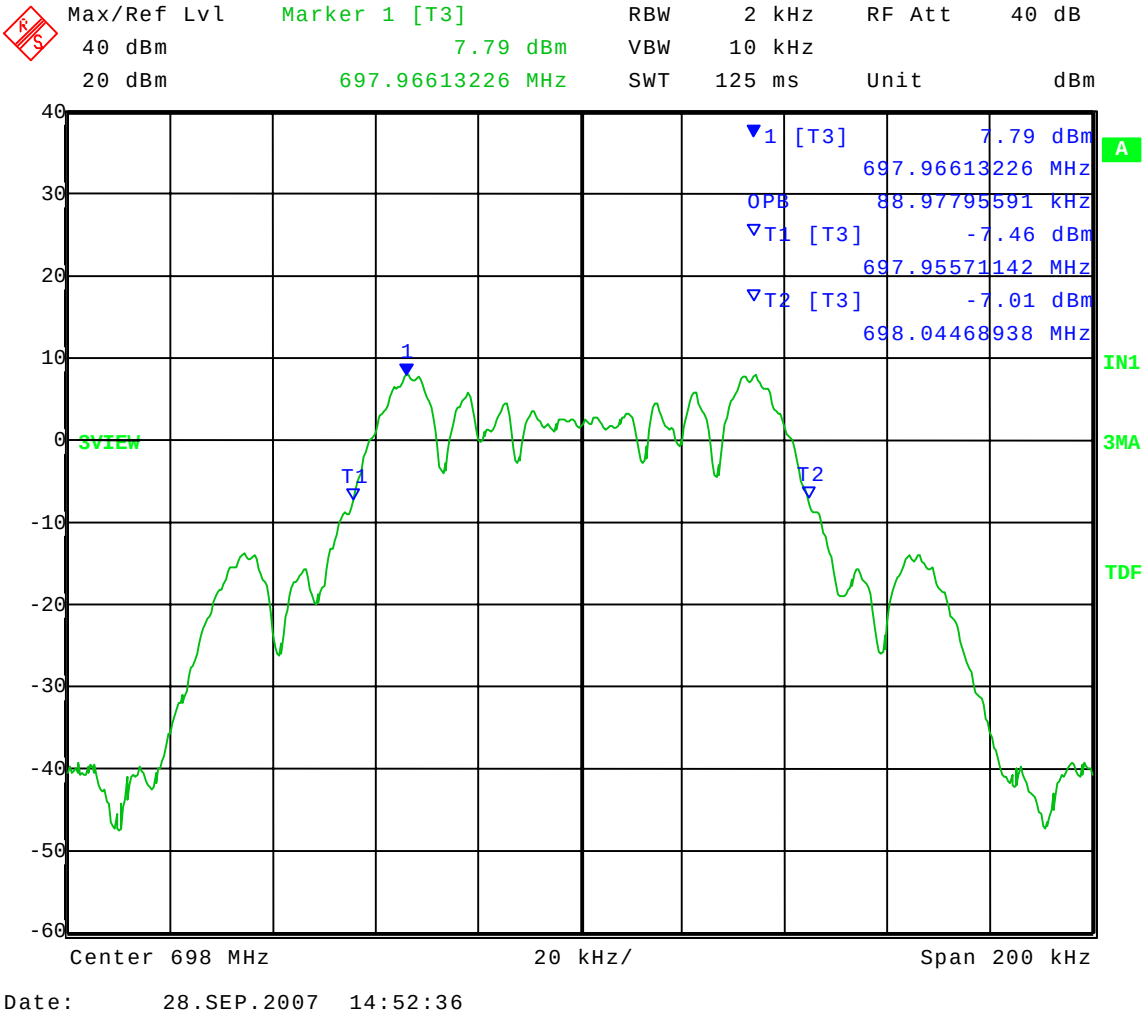


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth; 99% bandwidth
Rule part: FCC Part 74; FCC Part 2.1049
Operator: Craig B
Frequency: 698 MHz

99% power bandwidth = 88.98 kHz



APPENDIX A

DATA AND GRAPH(S) TAKEN OF THE

EMISSION MASK

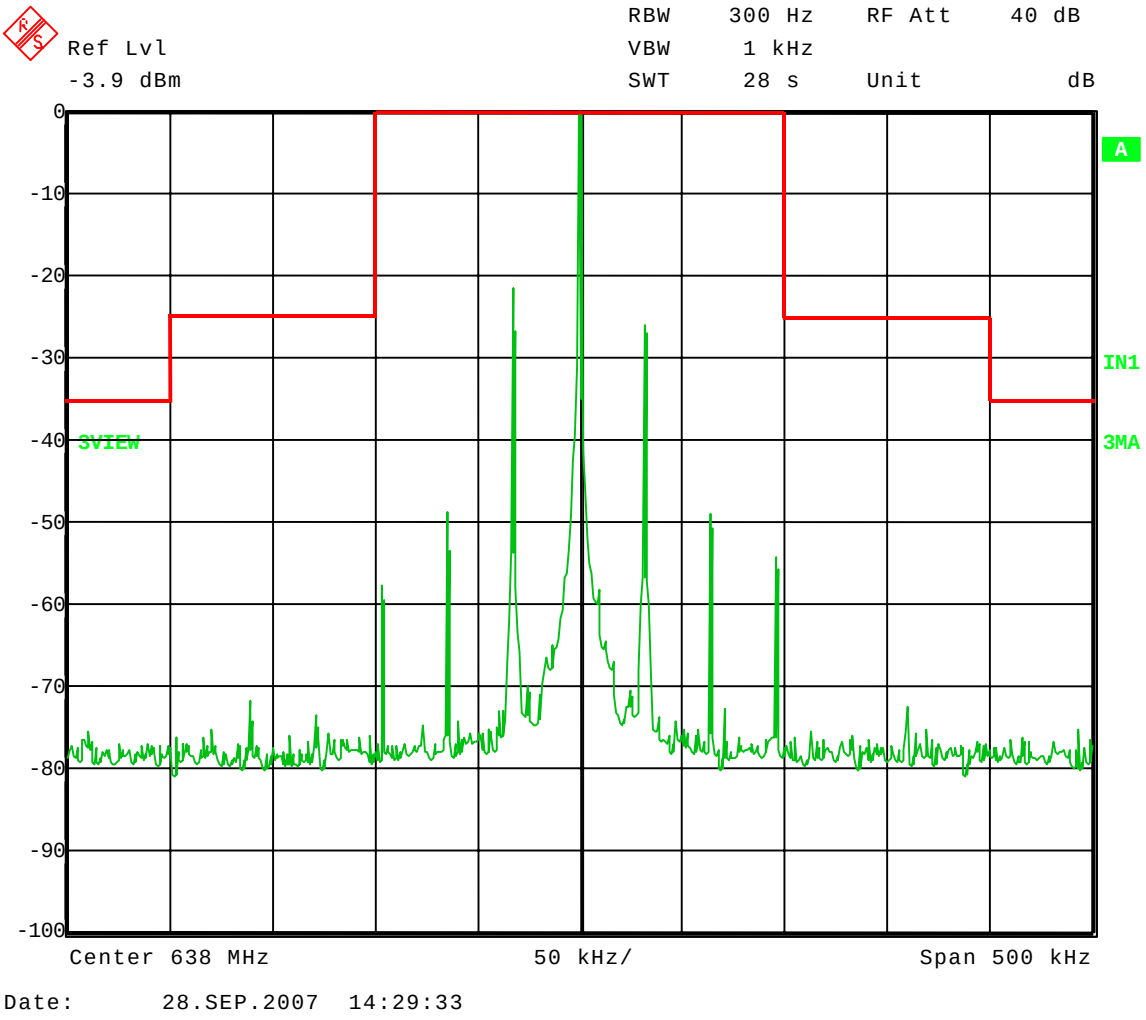
Part 74.861(d)(3) (e)(6) & PART 2.1049

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth
Operator: Craig B

Nominal Frequency: 638 MHz
Reference, Unmodulated



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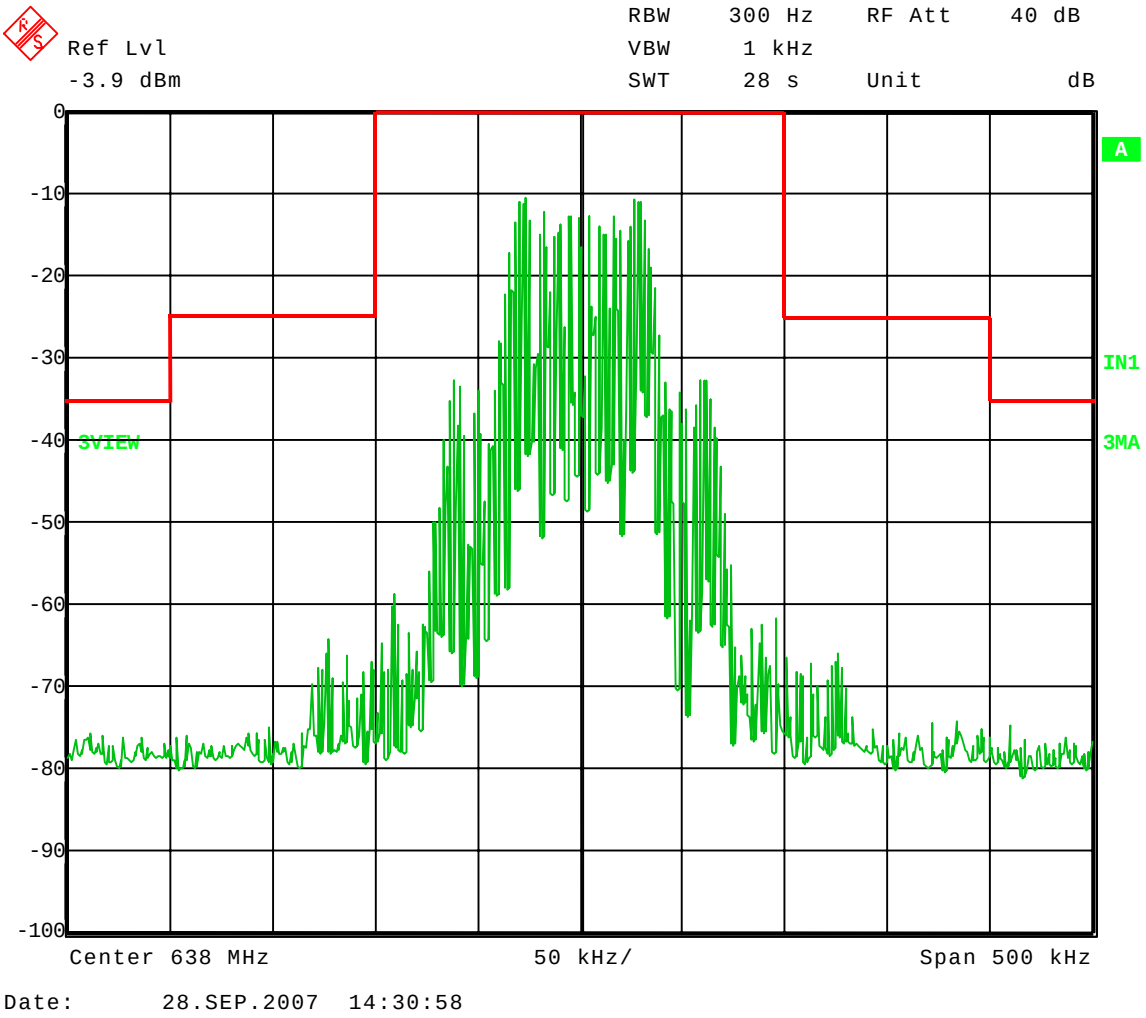
APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth
Operator: Craig B

Nominal Frequency: 638 MHz
2500 Hz 16 dB > 50% modulated



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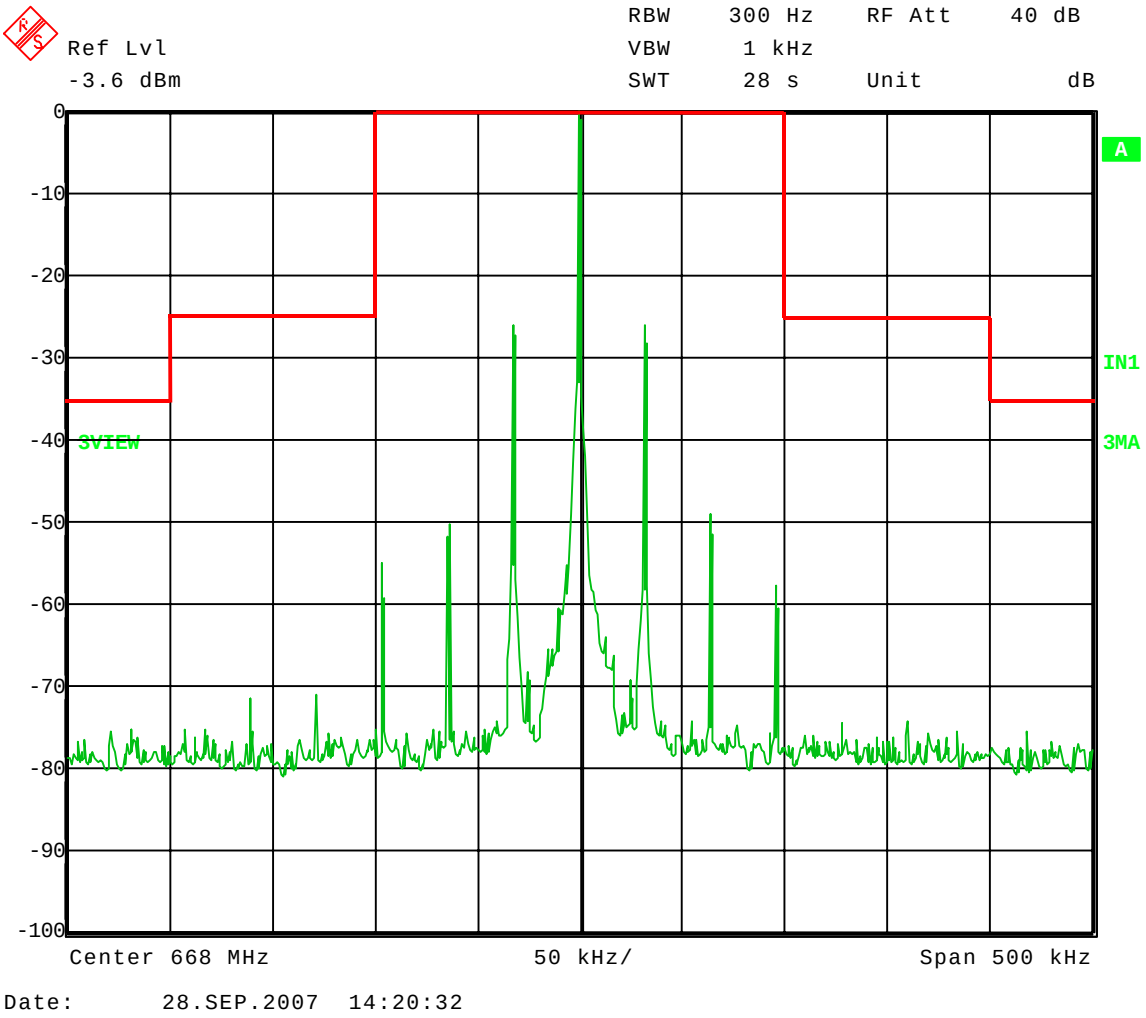
APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth
Operator: Craig B

Nominal Frequency: 668 MHz
Reference, Unmodulated



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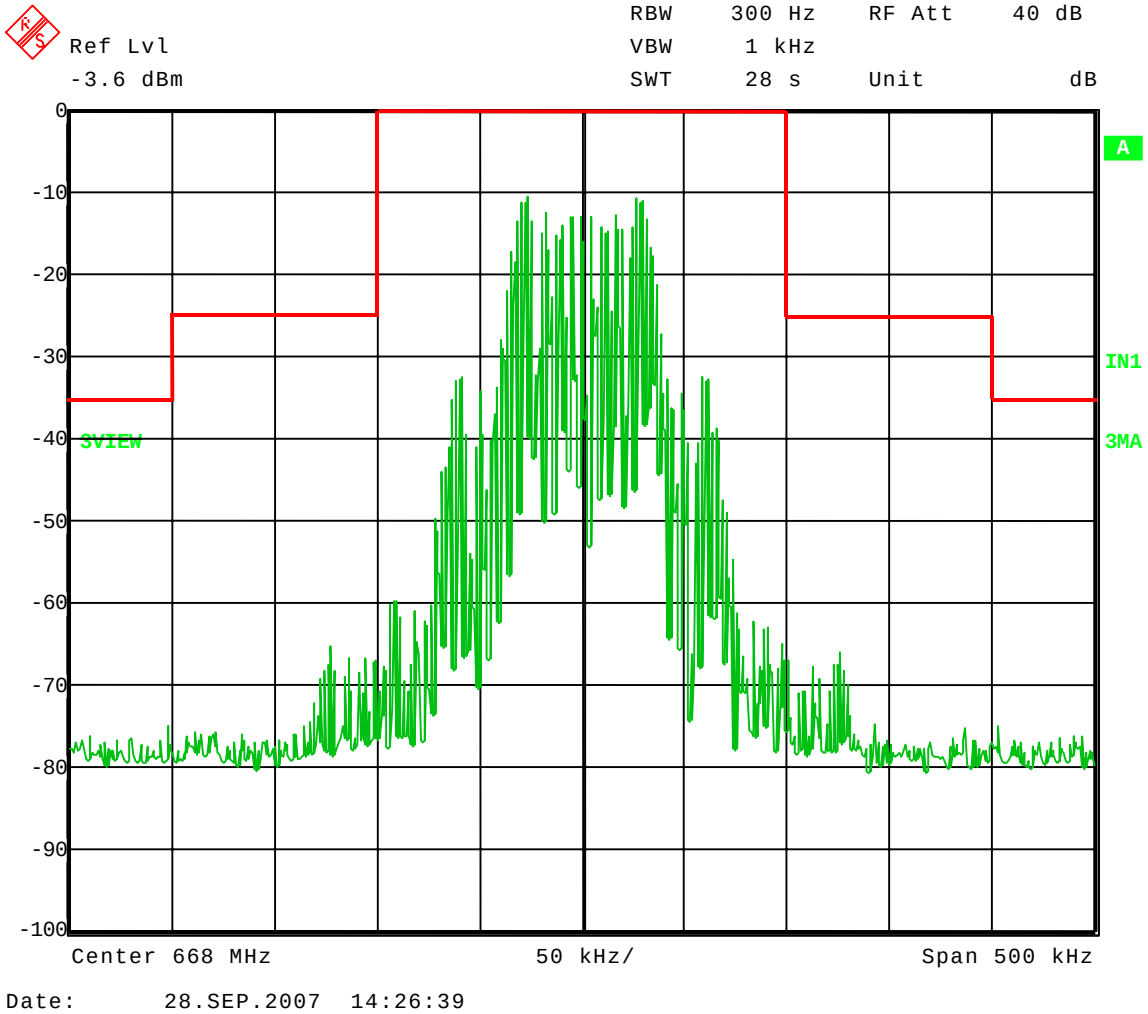
APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth
Operator: Craig B

Nominal Frequency: 668 MHz
2500 Hz 16 dB > 50% modulated



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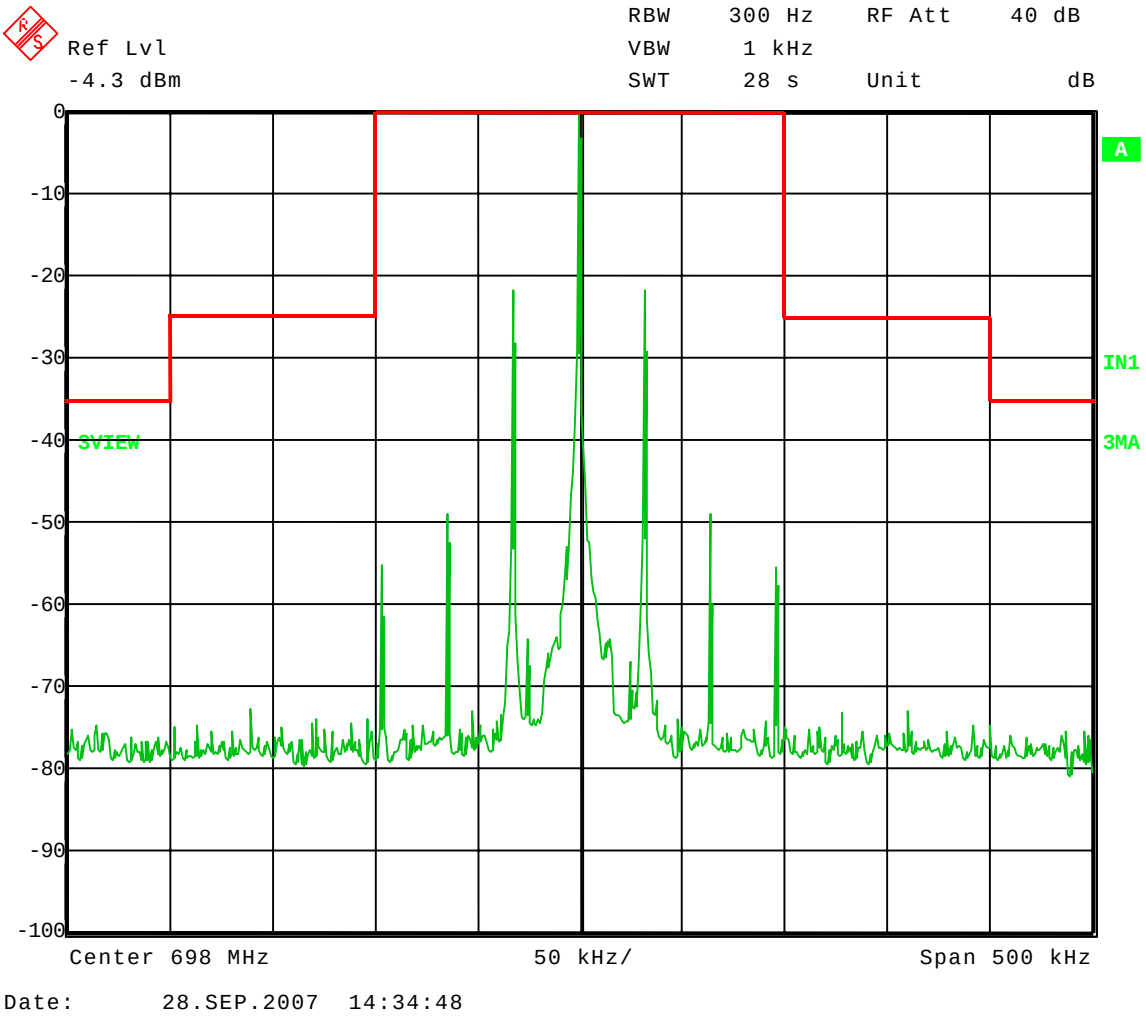
APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth
Operator: Craig B

Nominal Frequency: 698 MHz
Reference, Unmodulated



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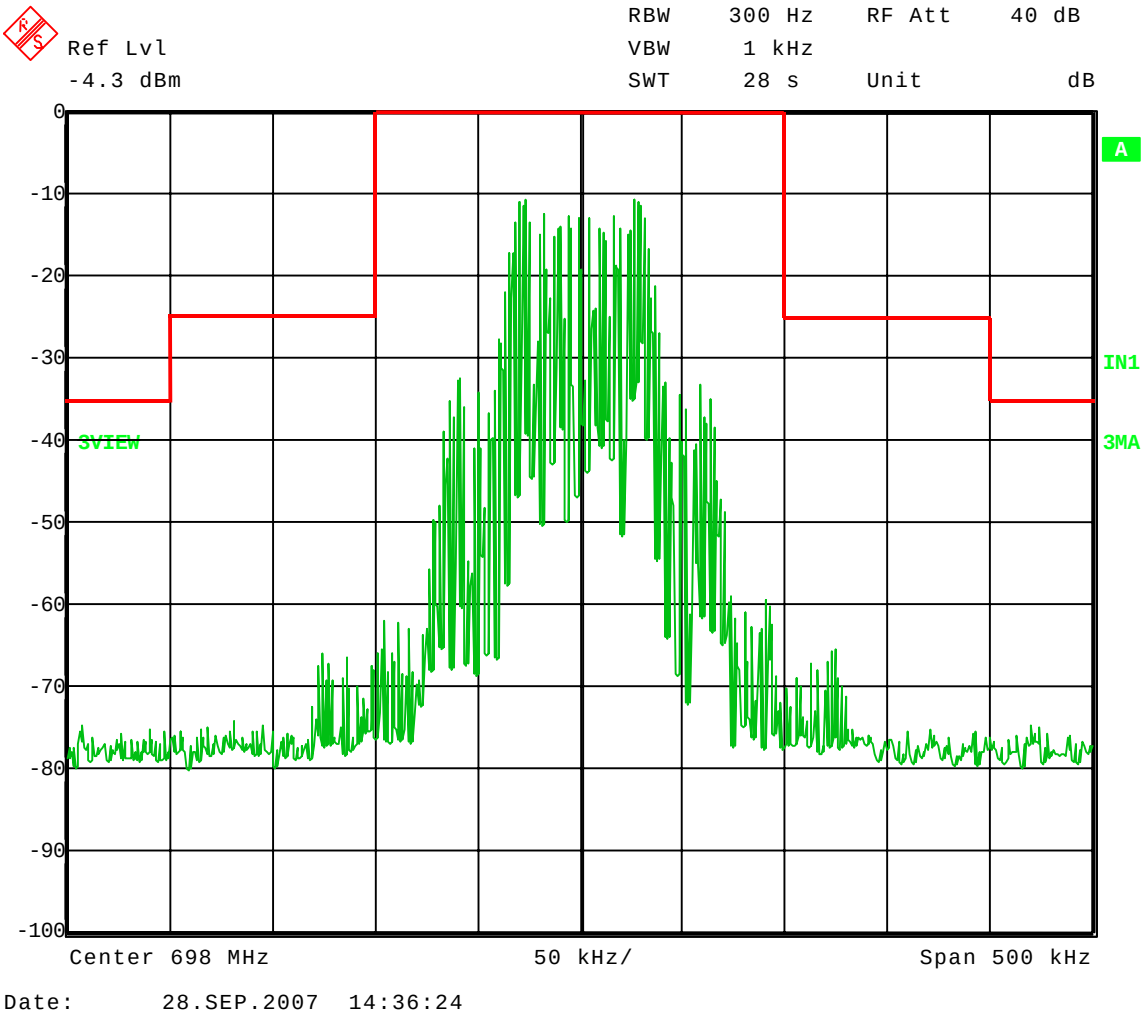
APPENDIX A

Test Date: 09-28-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Occupied Bandwidth
Operator: Craig B

Nominal Frequency: 698 MHz
2500 Hz 16 dB > 50% modulated



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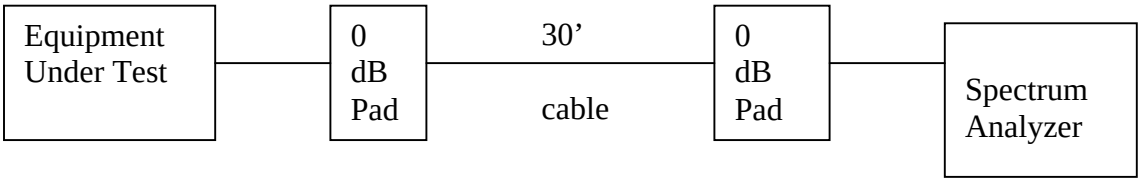
APPENDIX A

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 10th harmonic of the fundamental. The following setup was used showing placement of the attenuators:



The allowed emissions for transmitters operating in the 638 MHz - 698 MHz bands for Micro Bodypack Transmitter equipment are found under Part 74, Section 74.861, Paragraph e-6 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) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.

(2) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(3) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10Log10 (mean output power in watts) dB.

NOTE:

The Micro Bodypack Transmitter uses the Exceltec Electronics Model# 95F9236 (Whip Antenna). See the following pages for the data and graphs of the actual measurements made:

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

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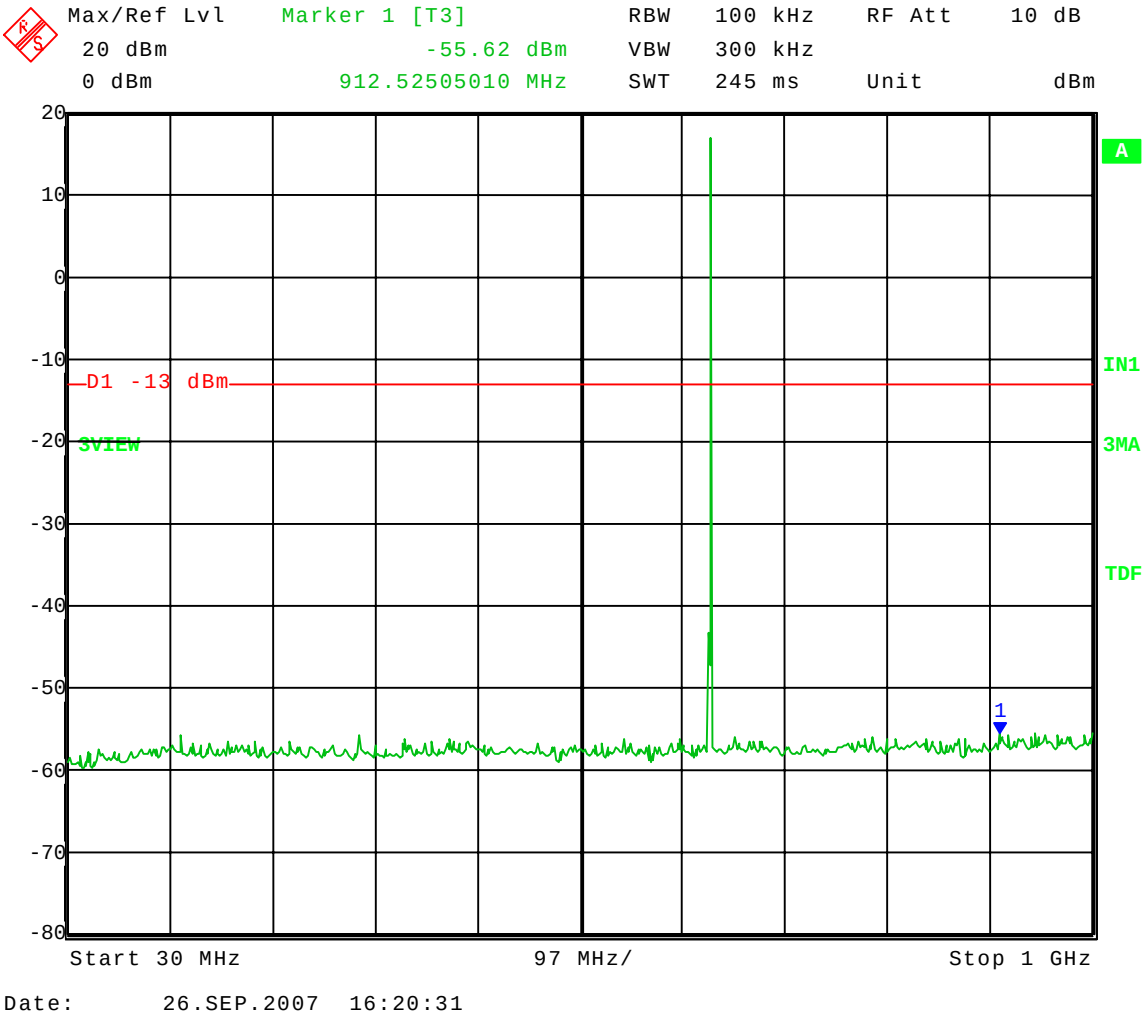
APPENDIX A

Test Date: 09-26-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Spurious Emissions - Conducted
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Craig B
Comment: Channel: 638 MHz
Power set to 50 mW
Frequency Range: 30 to 1000 MHz
Limit = -13 dBm



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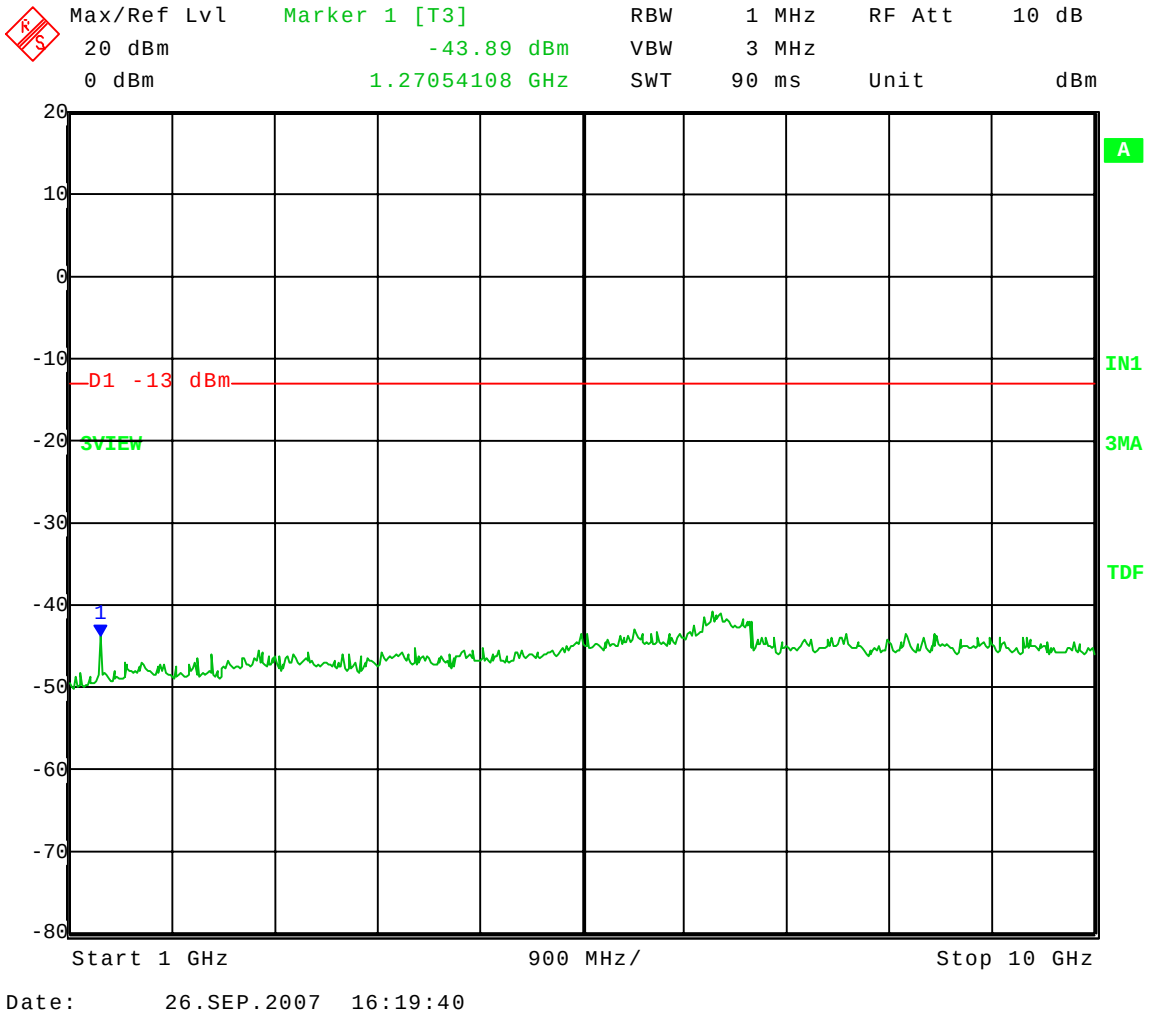
APPENDIX A

Test Date: 09-26-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Spurious Emissions - Conducted
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Craig B
Comment: Channel: 638 MHz
Power set to 50 mW
Frequency Range: 1 to 10 GHz
Limit = -13 dBm



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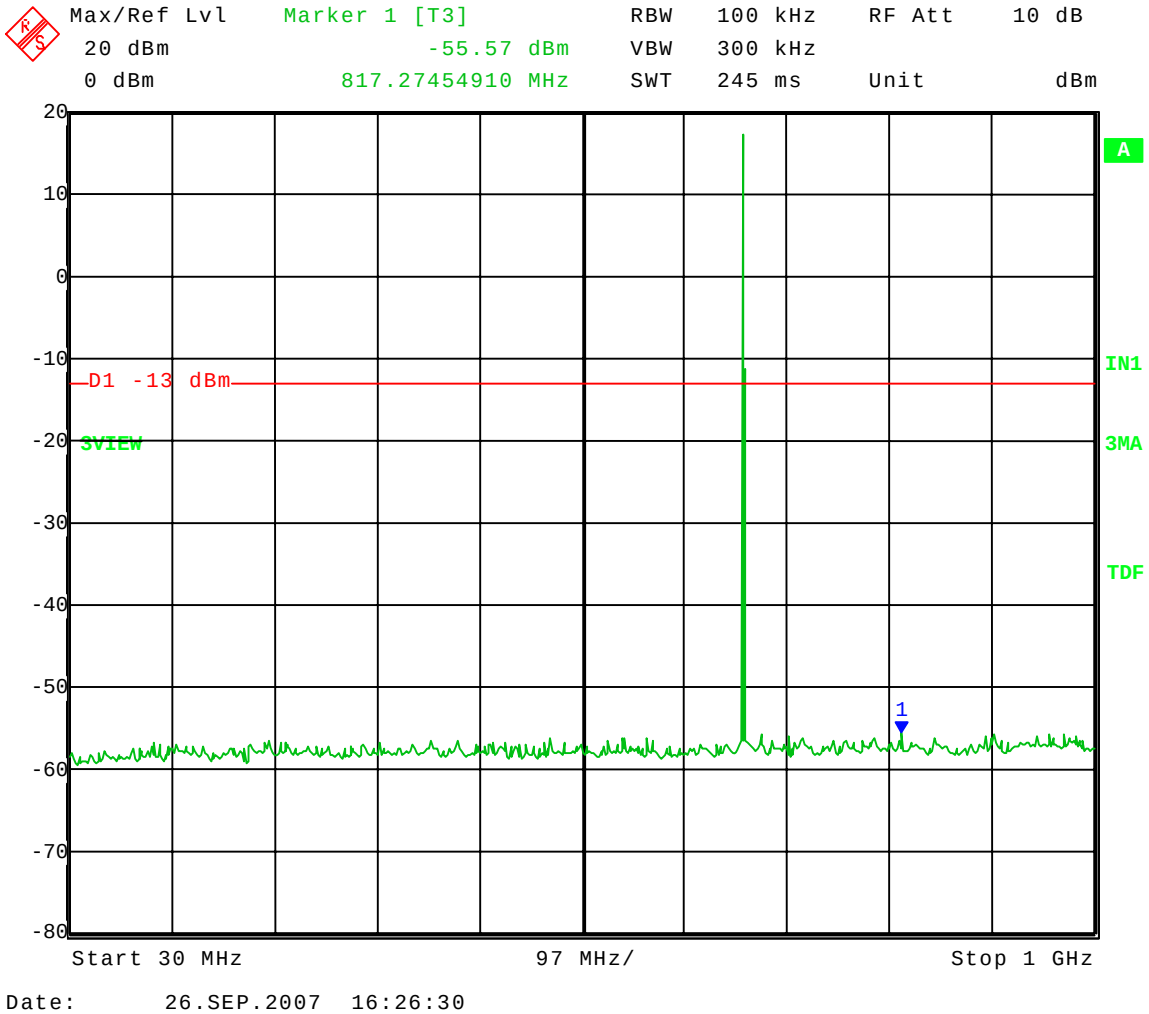
APPENDIX A

Test Date: 09-26-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Spurious Emissions - Conducted
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Craig B
Comment: Channel: 668 MHz
Power set to 50 mW
Frequency Range: 30 to 1000 MHz
Limit = -13 dBm



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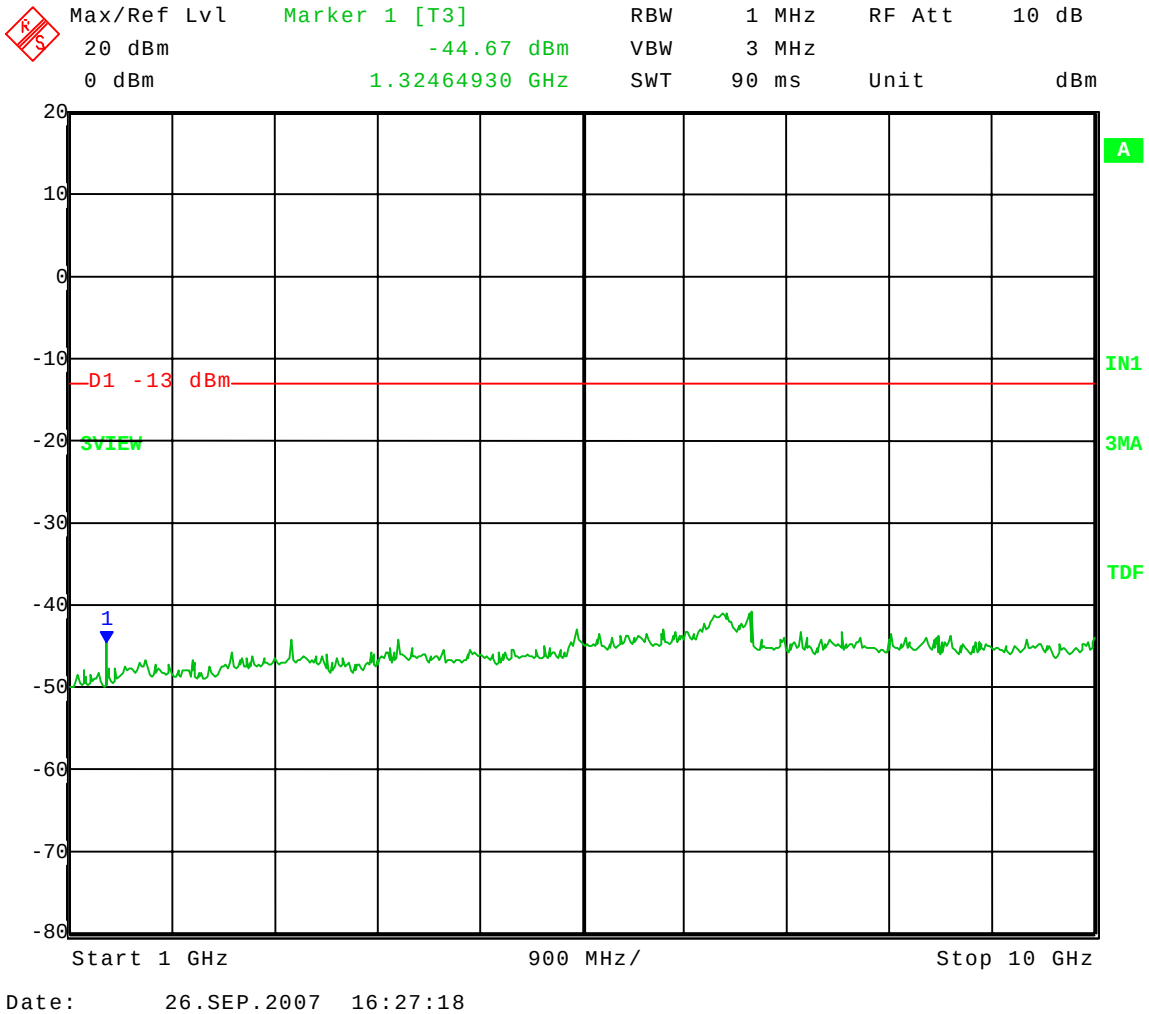
APPENDIX A

Test Date: 09-26-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Spurious Emissions - Conducted
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Craig B
Comment: Channel: 668 MHz
Power set to 50 mW
Frequency Range: 1 to 10 GHz
Limit = -13 dBm



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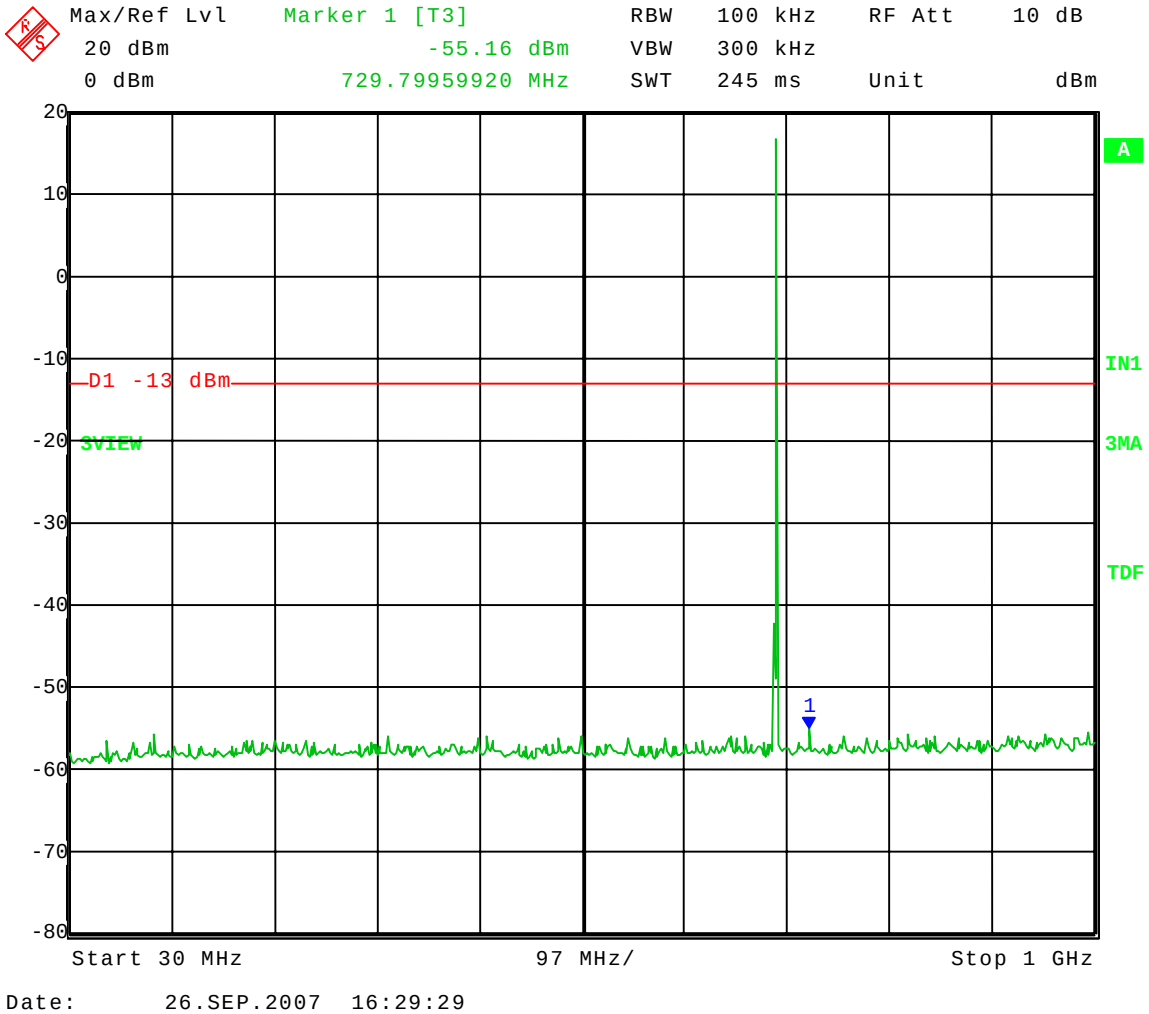
APPENDIX A

Test Date: 09-26-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Spurious Emissions - Conducted
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Craig B
Comment: Channel: 698 MHz
Power set to 50 mW
Frequency Range: 30 to 1000 MHz
Limit = -13 dBm



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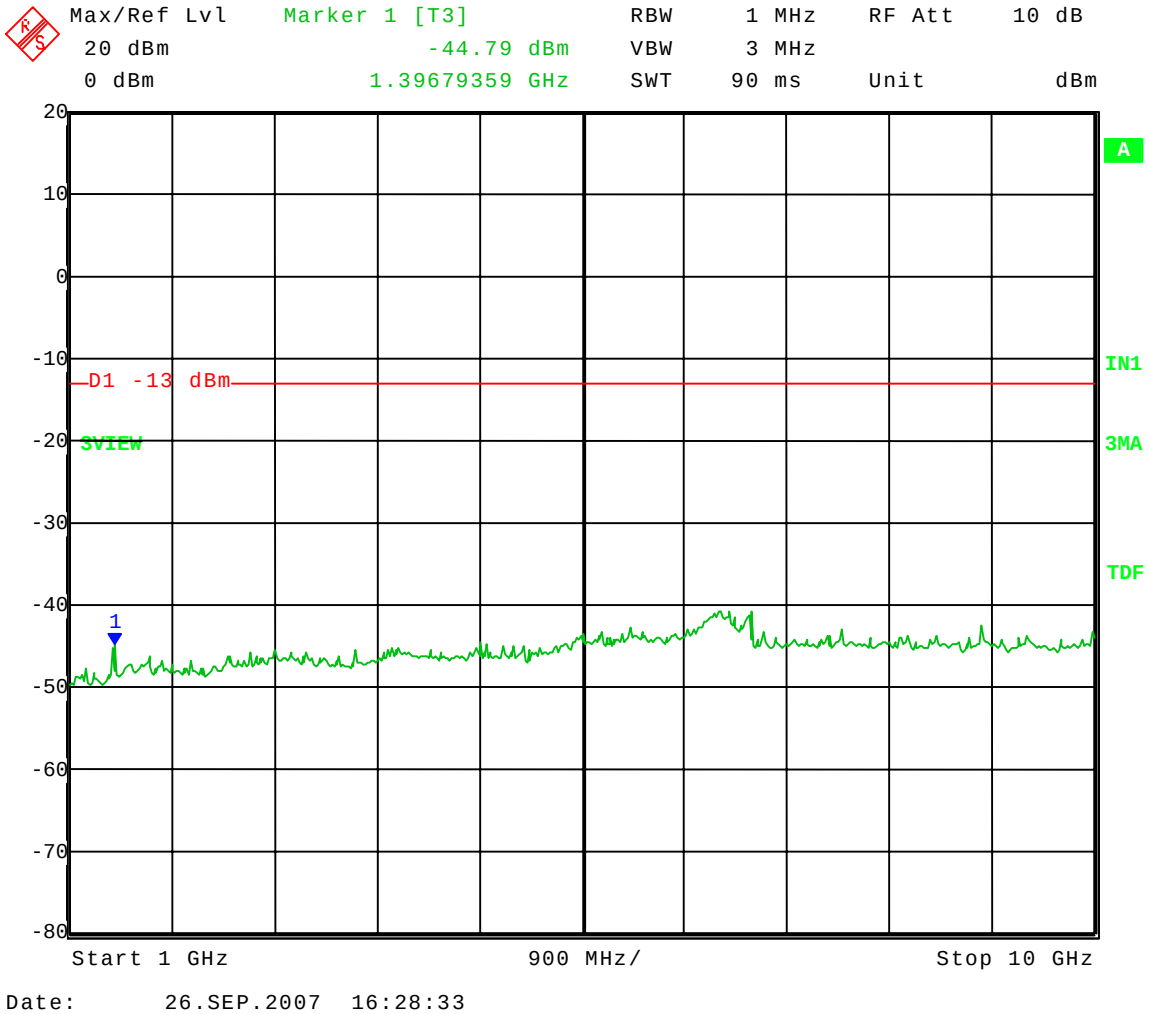
APPENDIX A

Test Date: 09-26-2007
Company: Shure, Inc.
EUT: UR1M-L3
Test: Spurious Emissions - Conducted
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Craig B
Comment: Channel: 698 MHz
Power set to 50 mW
Frequency Range: 1 to 10 GHz
Limit = -13 dBm



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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 200 MHz to at least the 10^{th} harmonic of the fundamental frequency.

For the Micro Bodypack Transmitter, the highest fundamental frequency is 698 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 638 MHz - 698 MHz bands for Micro Bodypack Transmitter are found under Part 74, Section 74.861, Paragraph e-6 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) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.

(2) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(3) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10Log10 (mean output power in watts) dB.

APPENDIX A

RADIATED EMISSION DATA & CHARTS

TAKEN FOR

FUNDAMENTAL EMISSIONS

USING THE SUBSTITUTION METHOD

EIA /TIA-603-C:2004, SECTION 2.2.12

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

50 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F
Humidity: 71% R.H.

Output Power - ERP - Substitution Method

Model: **UR1M-L3 Power set to 50 mW = 17 dBm**

Channel: Low; **638.000 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)
638.000 vertical	115.74	26.6	9.06	2.15	17.54	24	6.46	56.75
638.000 horizontal	119.86	26.8	9.06	2.15	17.74	24	6.26	59.43

EIRP = Signal generator output - cable loss + antenna gain

$ERP_{(ref.\ to\ ½\lambda\ dipole)}$ = Signal generator output - cable loss + antenna gain - 2.15

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

50 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F
Humidity: 71% R.H.

Output Power - ERP - Substitution Method

Model: **UR1M-L3 Power set to 50 mW = 17 dBm**

Channel: Mid; **668.000 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)
668.000 vertical	117.45	27.9	9.29	2.15	18.61	24	5.39	72.61
668.000 horizontal	118.95	26.4	9.29	2.15	17.11	24	6.89	51.40

EIRP = Signal generator output - cable loss + antenna gain

$ERP_{(ref.\ to\ ½\lambda\ dipole)}$ = Signal generator output - cable loss + antenna gain - 2.15

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

50 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F
Humidity: 71% R.H.

Output Power - ERP - Substitution Method

Model: **UR1M-L3 Power set to 50 mW = 17 dBm**

Channel: High; **698.000 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)
698.000 vertical	116.68	26.7	9.53	2.15	17.17	24	6.83	52.12
698.000 horizontal	117.55	26.3	9.53	2.15	16.77	24	7.23	47.53

EIRP = Signal generator output - cable loss + antenna gain

$ERP_{(ref.\ to\ ½\lambda\ dipole)}$ = Signal generator output - cable loss + antenna gain - 2.15

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APPENDIX A

10 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F
Humidity: 71% R.H.

Output Power - ERP - Substitution Method

Model: **UR1M-L3 Power set to 10 mW = 10 dBm**

Channel: Low; **638.000 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)
638.000 vertical	109.73	20.5	9.06	2.15	11.44	24	12.56	13.93
638.000 horizontal	113.11	20.0	9.06	2.15	10.94	24	13.06	12.42

EIRP = Signal generator output - cable loss + antenna gain

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

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APPENDIX A

10 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F
Humidity: 71% R.H.

Output Power - ERP - Substitution Method

Model: **UR1M-L3 Power set to 10 mW = 10 dBm**

Channel: Mid; **668.000 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)
668.000 vertical	111.05	21.4	9.29	2.15	12.11	24	11.89	16.26
668.000 horizontal	112.76	20.2	9.29	2.15	10.91	24	13.09	12.33

EIRP = Signal generator output - cable loss + antenna gain

$ERP_{(ref.\ to\ ½\lambda\ dipole)}$ = Signal generator output - cable loss + antenna gain - 2.15

1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Incorporated
Model Tested: UR1M L3
Report Number: 13861

APPENDIX A

10 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F
Humidity: 71% R.H.

Output Power - ERP - Substitution Method

Model: **UR1M-L3 Power set to 10 mW = 10 dBm**

Channel: High; **698.000 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)
698.000 vertical	110.24	20.2	9.53	2.15	10.67	24	13.33	11.67
698.000 horizontal	110.47	19.2	9.53	2.15	9.67	24	14.33	9.27

EIRP = Signal generator output - cable loss + antenna gain

$ERP_{(ref.\ to\ ½\lambda\ dipole)}$ = Signal generator output - cable loss + antenna gain - 2.15

APPENDIX A

RADIATED EMISSION DATA AND GRAPH(S)

TAKEN FOR

SPURIOUS EMISSION MEASUREMENTS

USING THE SUBSTITUTION METHOD

EIA /TIA-603-C:2004, SECTION 2.2.12

PART 2.1053

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

50 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F.
Humidity: 67% R.H.

Radiated Spurious Emissions (e.r.p. substitution method) FCC Part 74; FCC Part 2.1053								
Model: **UR1M-L3** Transmit Frequency: **638.000 MHz** Power set to 50 mW								
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)
1.276	45.9	100.6	-54.7	-13	41.7	Horizontal	315	1.0
2.552	51.1	101.3	-50.2	-13	37.2	Horizontal	340	1.4
3.828	48.7	100.6	-51.9	-13	38.9	Horizontal	180	1.3
4.466	51.1	99.3	-48.2	-13	35.2	Horizontal	0	1.0
1.276	45.9	99.6	-53.7	-13	40.7	Vertical	180	1.1
2.552	47.3	99.5	-52.2	-13	39.2	Vertical	315	1.2
3.828	49.7	100.0	-50.3	-13	37.3	Vertical	30	1.4
4.466	50.1	100.1	-50.0	-13	37.0	Vertical	30	2.0

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

50 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F.
Humidity: 67% R.H.

Radiated Spurious Emissions (e.r.p. substitution method) FCC Part 74; FCC Part 2.1053								
Model: **UR1M-L3** Transmit Frequency: **668.000 MHz** Power set to 50 mW								
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)
1.336	43.7	100.0	-56.3	-13	43.3	Horizontal	45	1.4
2.672	49.7	101.1	-51.4	-13	38.4	Horizontal	350	1.2
4.008	50.9	101.0	-50.1	-13	37.1	Horizontal	180	1.0
4.676	53.0	99.9	-46.9	-13	33.9	Horizontal	80	1.1
1.336	45.2	100.2	-55.0	-13	42.0	Vertical	320	1.0
2.672	49.1	99.7	-50.6	-13	37.6	Vertical	290	1.3
4.008	49.6	101.0	-51.4	-13	38.4	Vertical	180	1.4
4.676	53.0	100.7	-47.7	-13	34.7	Vertical	40	1.2

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Company: Shure Incorporated
Model Tested: UR1M L3
Report Number: 13861

APPENDIX A

50 mW Power Setting on Transmitter

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Craig B
Date of test: 09-07-2007
Temperature: 73 deg. F.
Humidity: 67% R.H.

Radiated Spurious Emissions (e.r.p. substitution method) FCC Part 74; FCC Part 2.1053									
Model: **UR1M-L3** Transmit Frequency: **698.000 MHz** Power set to 50 mW									
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)
1.396	46.0	100.3	-54.3	-13	41.3	Horizontal		0	1.3
4.188	52.5	100.2	-47.7	-13	34.7	Horizontal		315	1.1
4.886	52.8	99.4	-46.6	-13	33.6	Horizontal		330	1.1
1.396	45.5	101.1	-55.6	-13	42.6	Vertical		315	1.0
2.792	47.5	100.3	-52.8	-13	39.8	Vertical		300	1.0
4.188	51.5	100.0	-48.5	-13	35.5	Vertical		20	1.0
4.886	54.0	100.1	-46.1	-13	33.1	Vertical		0	1.1

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APPENDIX A

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

The frequency stability was measured from -30° to +50° centigrade at intervals of 10° 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.

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.

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APPENDIX A

DATA TAKEN FOR FREQUENCY

STABILITY WHEN VARYING THE TEMPERATURE

AND

PRIMARY SUPPLY VOLTAGE VARIATION

PART 2.1055a(1) & PART 2.1055d(d2)

1250 Peterson Dr., Wheeling, IL 60090

Company: Shure Incorporated
Model Tested: UR1M L3
Report Number: 13861

APPENDIX A

DLS Electronic Systems, Inc.

Company: Shure, Inc.
Operator: Jason Lauer / Craig B.
Date of test: 09-17-2007 to 09-18-2007 / 09-29-2007

Limit = 31.9 kHz (0.005% of 638 MHz)

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)
UR1M-L3	638.000	637.998928	**-1.072**	637.999197	**-0.803**	637.999696	**-0.304**	638.000394	**0.394**	638.000912	**0.912**
UR1M-L3	668.000	667.998667	**-1.333**	667.999077	**-0.923**	667.999714	**-0.286**	668.000334	**0.334**	668.000952	**0.952**
UR1M-L3	698.000	697.998487	**-1.513**	697.998969	**-1.031**	697.999805	**-0.195**	698.000328	**0.328**	698.001012	**1.012**

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)	1.5 Volts	Error (kHz)
UR1M-L3	638.000	638.000932	**0.932**	638.000150	**0.150**	637.998873	**-1.127**	637.996889	**-3.111**	638.000015	**0.015**
UR1M-L3	668.000	668.000972	**0.972**	668.000371	**0.371**	667.998602	**-1.398**	667.996769	**-3.231**	668.000075	**0.075**
UR1M-L3	698.000	698.000952	**0.952**	698.000471	**0.471**	697.998061	**-1.939**	697.997099	**-2.901**	698.000195	**0.195**

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APPENDIX A

10.0 FREQUENCY STABILITY PHOTOS TAKEN DURING TESTING