



166 South Carter, Genoa City, WI 53128

Company: Shure Incorporated
Model Tested: PA421B
Report Number: 22304
Project Number: 8109

**Code of Federal Regulations 47 Part 74 – EXPERIMENTAL RADIO,
AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM
DISTRIBUTIONAL SERVICES**

Subpart H – Low Power Auxiliary Stations

Section 74.861(e)

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name: Antenna Combiner
Kind of Equipment: Wireless Microphone Accessory
Frequency Range: 470-865 MHz
Test Configuration: Tabletop
Model Number(s): PA421B
Model(s) Tested: PA421B
Serial Number(s): prototype sample
Date of Tests: May 24th to June 17th, 2016
Test Conducted For: Shure Incorporated
5800 W. Touhy Avenue
Niles, Illinois 60714-4608

NOTICE: “This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government”. Please see the "Description of Test Sample" page listed inside of this report.

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Company:
Model Tested:
Report Number:
Project Number:

Shure Incorporated
PA421B
22304
8109

166 South Carter, Genoa City, WI 53128

SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads "Paul Leo". The signature is written in a cursive style with a long, sweeping underline.

Paul Leo
Test Engineer

Reviewed By:

A handwritten signature in black ink that reads "Craig Brandt". The signature is written in a cursive style with a long, sweeping underline.

Craig Brandt
Senior Test Engineer

Approved By:

A handwritten signature in black ink that reads "William Stumpf". The signature is written in a cursive style with a long, sweeping underline.

William Stumpf
OATS Manager



Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
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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 & 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 January 2009).*

2015-09-25 through 2016-09-30
Effective Dates



[Signature]
For the National Voluntary Laboratory Accreditation Program

**ELECTROMAGNETIC
COMPATIBILITY &
TELECOMMUNICATIONS**

NVLAP LAB CODE 100276-0

Emissions

Designation

Off-site test location

Description

D.L.S. Electronics performs radiated emissions testing at an additional location, 166 South Carter Street, Genoa City, WI 53128.



Company: Shure Incorporated
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1.0 Summary of Test Report

It was determined that the Antenna Combiner, Model PA421B, complies with the requirements of CFR 47 Part 74 Subpart H Section 74.861(e) for low power auxiliary stations.

Subpart H Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
74.861(e)(1), 2.1046	Conducted Output Power	TIA-603D 2010 (2.2.1)	1	Yes
74.861(e)(5), 2.1049	99% Emission Bandwidth	FCC Part 2.1049	1	Yes
74.861(e)(6)(i)(ii), 2.1051	Emission Mask	TIA-603D 2010 (2.2.13)	1	Yes
74.861(e)(6)(iii), 2.1051	RF Conducted Spurious Emissions	TIA-603D 2010 (2.2.13)	1	Yes
74.861(e)(6)(iii), 2.1053	Radiated Spurious Emissions	TIA-603D 2010 (2.2.12)	2	Yes
Part 15 Subpart C Section 15.207	AC Line Conducted Emissions	ANSI C63.4-2014	3	Yes

Note 1: RF Conducted Measurement.
 Note 2: Radiated Emission Measurement.
 Note 3: AC Line Conducted Measurement.

2.0 Introduction

From May 24th to June 17th, 2016 the Antenna Combiner, Model PA421B, as provided from Shure Incorporated was tested to the requirements of CFR 47 Part 74 Subpart H Section 74.861(e). To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI.

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

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

FCC Registration #90531



Company: Shure Incorporated
 Model Tested: PA421B
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4.0 Description of Test Sample

Description:

Combines outputs of personal-monitor transmitters into a single antenna output.

Type of Equipment / Frequency Range:

Antenna Combiner / 470 - 865 MHz

Physical Dimensions of Equipment Under Test:

Length: 14.4 in. x Width: 15.8 in. x Height: 1.7 in.

Power Source:

120V, 240V / 60 Hz

Internal Frequencies:

70-100kHz, 225kHz

Transmit Frequencies Used For Test Purpose:

471.125 MHz, 541.875MHz, 626.125MHz, 697.875MHz

Type of Modulation(s) / Antenna Type:

FM / Shure UA860SWB passive wide band UHF omnidirectional antenna (470-1100 MHz) with 2.15 dBi gain

Description of Circuit Board(s) / Part Number:

Antenna Combiner PCB	95C31572
PA421 DC jack board	190A32637



Company: Shure Incorporated
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5.0 Test Equipment

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

5.0a D.L.S. Wisconsin - Test Equipment:

30 – 1000 MHz (OATS Site 2)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	6-25-15	6-25-16
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3-11-16	3-11-18
Antenna	Electro-Metrics	LPA-25	1205	200 MHz – 1 GHz	3-23-16	3-23-18
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A

Additional if 1-18 GHz (OATS Site 2)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Preamp	Miteq	AMF-7D-01001800-22-10P	17779900	1GHz-18GHz	1-22-16	1-22-17
Horn Antenna	EMCO	3115	6204	1-18GHz	8-25-15	8-25-17
High Pass Filter	Planer	HP2G-1780-CD-SS	PF1227/0728	1-20GHz	6-5-16	6-5-17
High Pass Filter	Q Microwave	100460	2	500MHz-18GHz	10-14-15	10-14-16
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A

Other

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Horn Antenna	EMCO	3115	9502-4451	1-18GHz	6-1-15	6-1-17
Di-Pole Antenna	Com-Power	AD-100	40139	30-1000MHz	N/A	N/A
20 dB attenuator	MCE/weinschel	5955A-20	0256	DC- 40 GHz	7-1-15	7-1-16
20 dB attenuator	Aeroflex/weinschel	75A-20-12	1071	DC – 40 GHz	7-1-15	7-1-16
Signal Generator	Rhode & Schwarz	SMT-03	DE23762	5kHz-3GHz	6-25-15	6-25-16
Signal Generator	Rhode & Schwarz	SMR40	100092	1-40 GHz	6-25-15	6-25-16
Function Generator	Hewlet Packard	3312A	2501A18150	0.1Hz-13MHz	N/A	N/A
Power Meter	Anritsu	ML2487A	6K00002069	100kHz-65GHz	6-25-15	6-25-16
Power Sensor	Anritsu	MA2490A	031563	50MHz-8GHz	6-25-15	6-25-16

AC Line Conducted (Screen Room)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Narda PMM	9010F	020WW4010 2	10Hz-50MHz	6-25-15	6-25-16
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	5-4-16	5-4-17
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	12-3-15	12-3-16
Limiter	Electro-Metrics	EM-7600	705	9 kHz – 30 MHz	12-3-15	12-3-16
Test Software	Narda PMM	PMM Emission Suite	Rel.2.17	N/A	N/A	N/A



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5.0b Shure Equipment:

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Audio Signal Generator	Leader	LAG-25	2237708	10Hz-1MHz	3-15-16	3-15-17
Audio Signal Generator	Leader	LAG-25	2237702	10Hz-1MHz	3-15-16	3-15-17

6.0 Test Arrangements

Radiated Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to TIA-603d 2010 or ANSI C63.4-2014, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up. See Appendix C for Measurement Uncertainty.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

Frequency Range	Bandwidth (-6 dB)
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

7.0 Test Conditions

Temperature and Humidity:

73°F at 45% RH - Conducted testing,
 66°F at 46% RH - Radiated testing

Supply Voltage:

120V, 240V / 60 Hz

8.0 Modifications Made To EUT For Compliance

None noted at time of test.



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9.0 Additional Descriptions & Notes

Continuous Transmit at maximum output power level.

The EUT was tested at Low, Mid., and High Channels, unmodulated, modulated at 2.5kHz 16dB> 50% modulation, and 15kHz at 85% modulation

Frequency stability testing was not performed. The EUT (combiner) is a pass-through device. The frequency determining circuits are part of the transmitter inputs and not part of the combiner.

The modulation characteristics test was not performed by D.L.S. Electronic Systems, Inc.

10.0 Results

Measurements were performed in accordance with TIA-603D 2010 and ANSI C63.4-2014. Graphical and tabular data can be found in Appendix B at the end of this report.

11.0 Conclusion

The Antenna Combiner, Model PA421B as provided from Shure Incorporated, tested from May 24th to June 17th, 2016 **meets** the requirements of CFR 47 Part 74 Subpart H Section 74.861(e).

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Appendix A – Test Setup Photos

Photo Information and Test Setup:

Item: EUT – Model PA421B

RF Conducted - 1



RF Conducted - 2



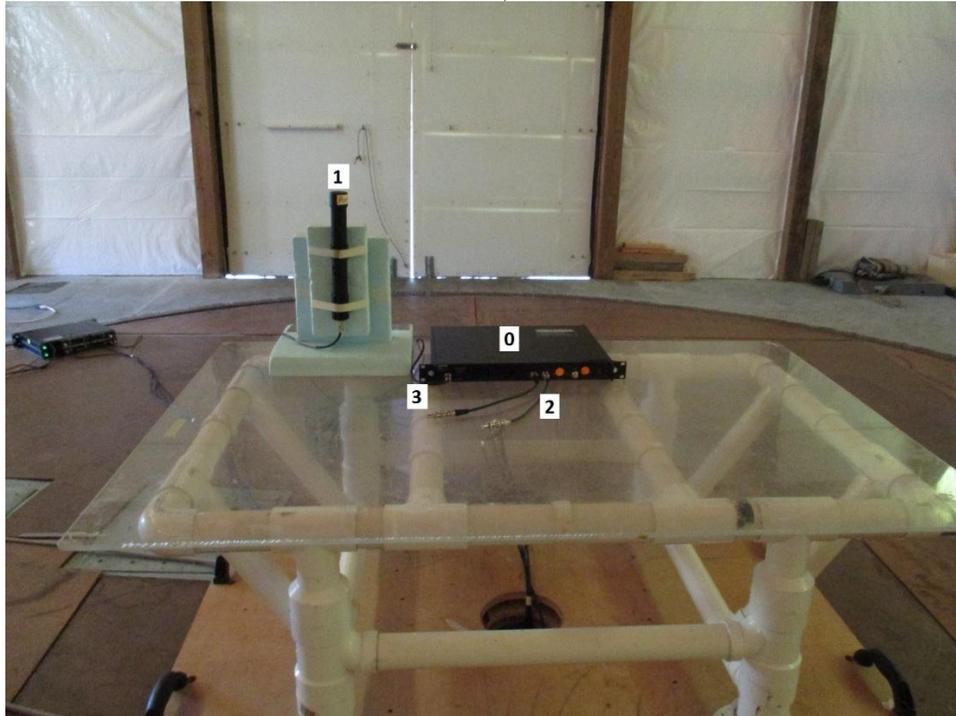
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Appendix A

Conducted Power



Radiated – Front, 30-1000 MHz



Appendix A

Radiated – Back, 30-1000 MHz



Radiated – Front, 1-7 GHz



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Appendix A

Radiated – Back, 1-7 GHz



AC Line Conducted - Front





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Appendix A

Company:	Shure Incorporated
Model Tested:	PA421B
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AC Line Conducted - Back





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Appendix B – Measurement Data

Company:	Shure Incorporated
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B1.0 Conducted Output Power

Rule Part: FCC Part 74.861(e) (1), Part 2.1046

Test Procedure: TIA-603D 2010 (2.2.1)

Limit: 250mW (23.979 dBm)

Results: Compliant

Sample Equation: $10^{(15.87\text{dBm}/10)} = 38.64\text{mW}$

Notes: This was an RF conducted measurement. The EUT was connected to the measuring equipment through the external antenna connector. Cable loss and attenuation was accounted for in the transducer factors set in the analyzer.
The EUT was set to transmit continuously at its maximum power level at the low, middle and high channels of the operating band.
The transmitter was modulated by a 2500Hz tone at an input level 16dB greater than that necessary to produce 50% modulation

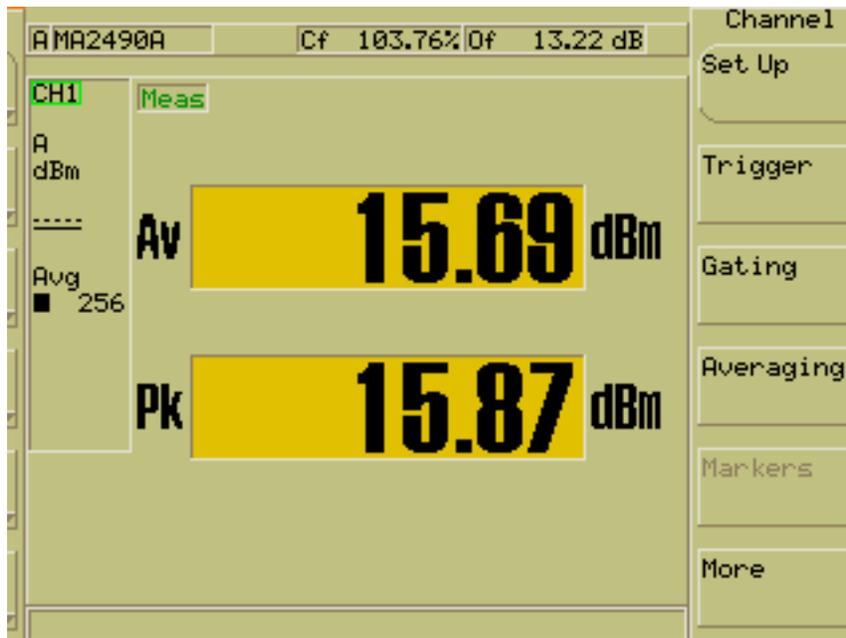


Company: Shure Incorporated
Model Tested: PA421B
Report Number: 22304
Project Number: 8109

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Test Date: 05-24-2016
Company: Shure, Inc.
EUT: PA421B 4-input Combiner
Test: Peak Power Output - Conducted (Modulated 2.5kHz 16db > 50%)
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Paul L
Comment: Channel: 471.125MHz

Peak Output Power = 15.87dBm = 38.64mW



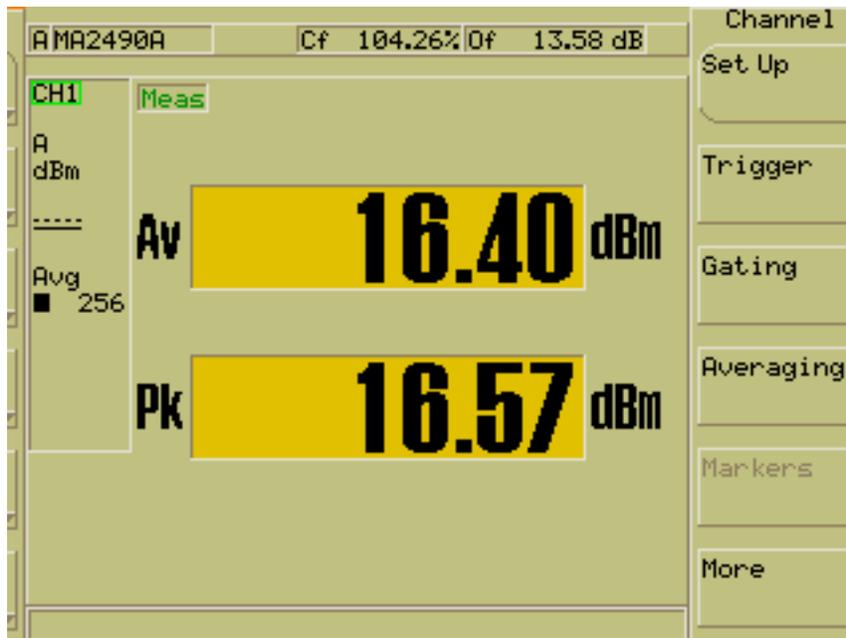


Company: Shure Incorporated
Model Tested: PA421B
Report Number: 22304
Project Number: 8109

166 South Carter, Genoa City, WI 53128

Test Date: 05-24-2016
Company: Shure, Inc.
EUT: PA421B 4-input Combiner
Test: Peak Power Output - Conducted (Modulated 2.5kHz 16db > 50%)
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Paul L
Comment: Channel: 541.875MHz

Peak Output Power = 16.57dBm = 45.39mW



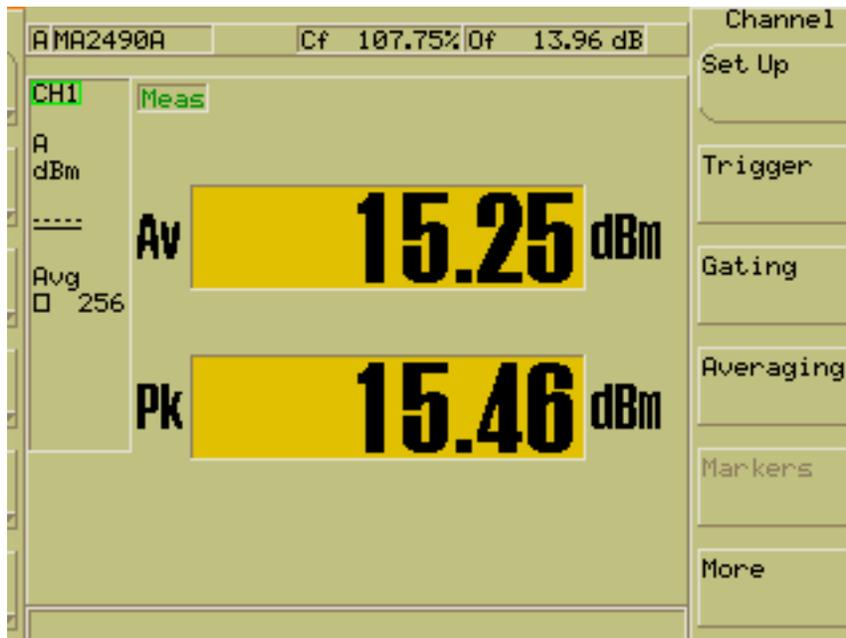


Company: Shure Incorporated
Model Tested: PA421B
Report Number: 22304
Project Number: 8109

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Test Date: 05-24-2016
Company: Shure, Inc.
EUT: PA421B 4-input Combiner
Test: Peak Power Output - Conducted (Modulated 2.5kHz 16db > 50%)
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Paul L
Comment: Channel: 697.875MHz

Peak Output Power = 15.46dBm = 35.16mW





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Company: Shure Incorporated
Model Tested: PA421B
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Appendix B

B2.0 99% Emission Bandwidth

Rule Parts: FCC Part 74.861(e)(5), FCC Part 2.1049

Test Procedure: FCC Part 2.1049

Limit: Must be less than 200 kHz.

Results: Compliant

Sample Equation: None

Notes: The EUT was set to transmit at its maximum power. The EUT was tested at Low, Mid, and High Channels modulated at 2500 Hz 16dB > 50% modulation & 15kHz @ 85% modulation.

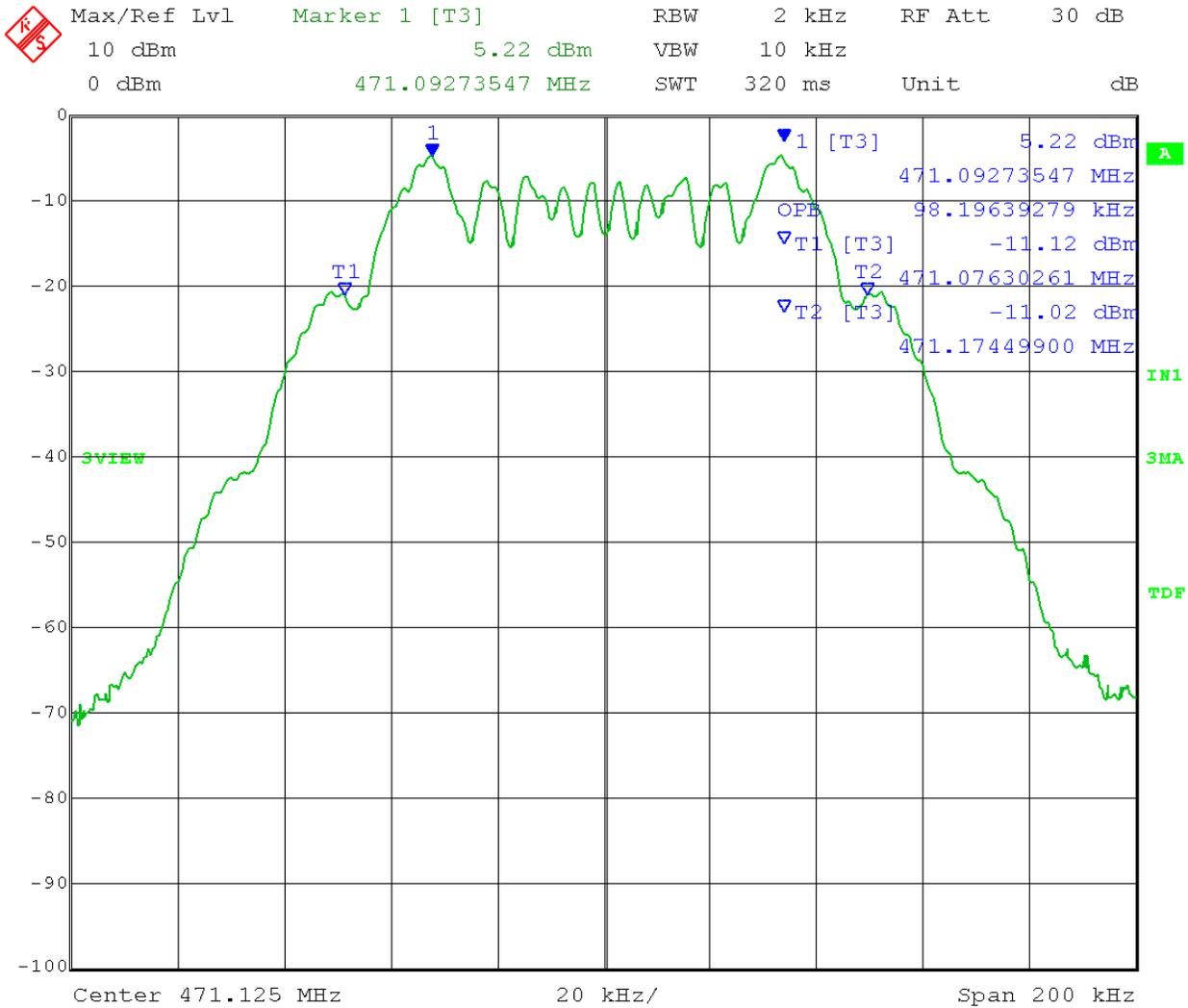


Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth; 99% bandwidth
 Rule part: FCC Part 74; FCC Part 2.1049
 Operator: Paul L

Frequency: 471.125 MHz
 Audio Input: Modulated 2.5kHz, 16db > 50%)
 99% power bandwidth = 98.196 kHz



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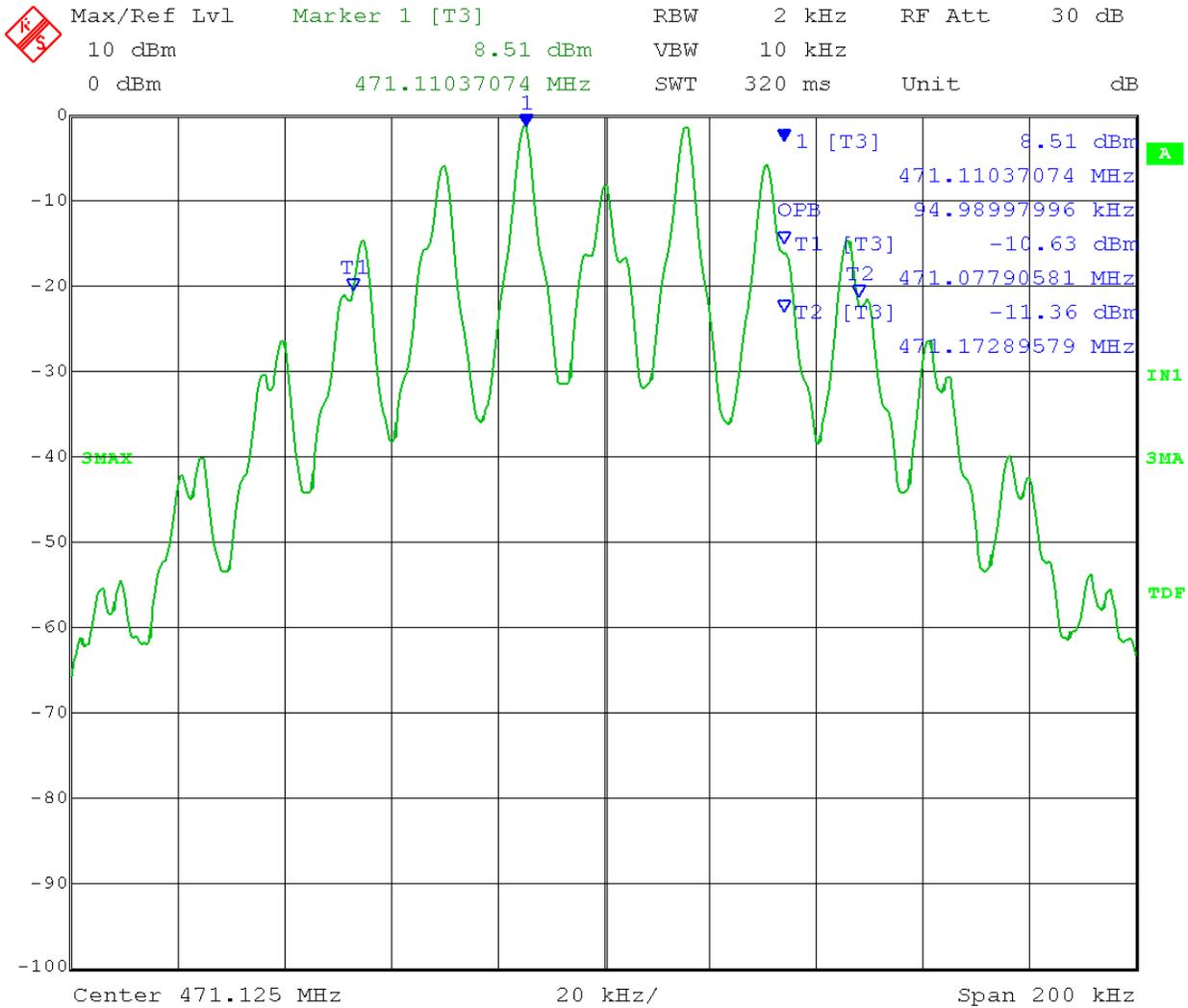


Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth; 99% bandwidth
 Rule part: FCC Part 74; FCC Part 2.1049
 Operator: Paul L

Frequency: 471.125 MHz
 Audio Input: Modulated 15kHz 85% Modulation
 99% power bandwidth = 94.98kHz



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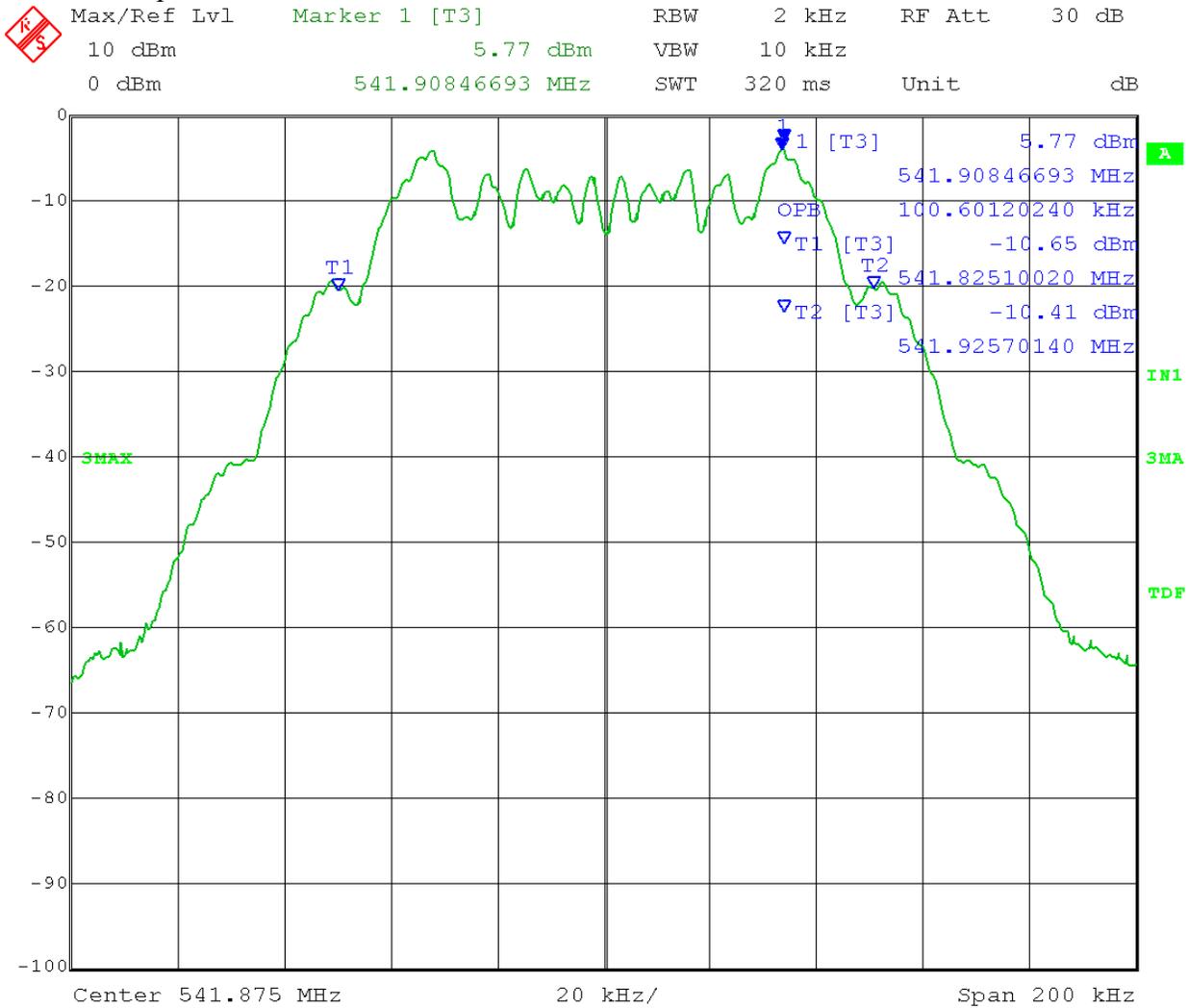


Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth; 99% bandwidth
 Rule part: FCC Part 74; FCC Part 2.1049
 Operator: Paul L

Frequency: 541.875 MHz
 Audio Input: Modulated 2.5kHz, 16db > 50%)
 99% power bandwidth = 100.60kHz



Date: 24.MAY.2016 13:29:24



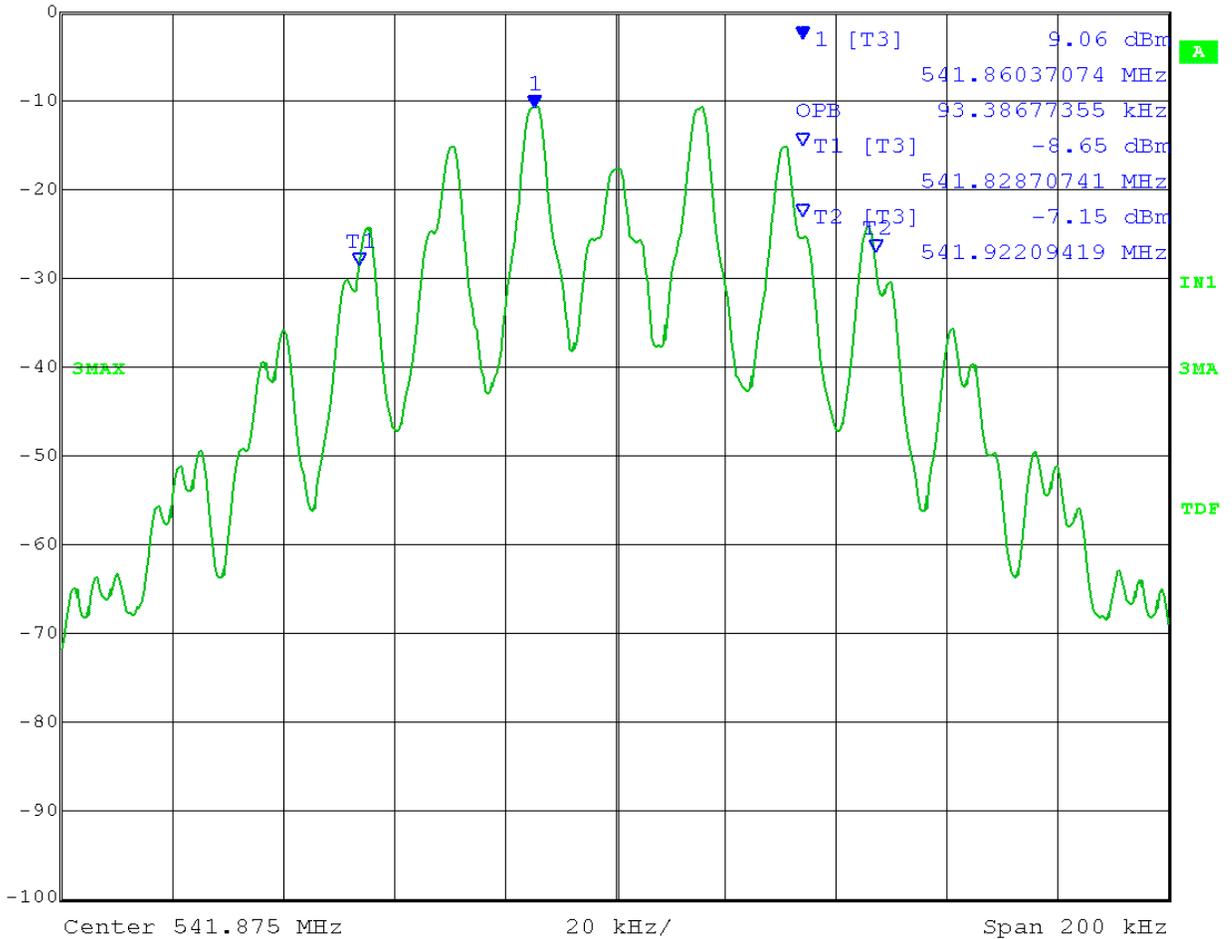
Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth; 99% bandwidth
 Rule part: FCC Part 74; FCC Part 2.1049
 Operator: Paul L

Frequency: 541.875MHz
 Audio Input: Modulated 15kHz 85% Modulation
 99% power bandwidth = 93.387kHz

	Max/Ref Lvl	Marker 1 [T3]	RBW	2 kHz	RF Att	30 dB
	20 dBm	9.06 dBm	VBW	10 kHz		
	0 dBm	541.86037074 MHz	SWT	320 ms	Unit	dB



Date: 24.MAY.2016 13:14:12



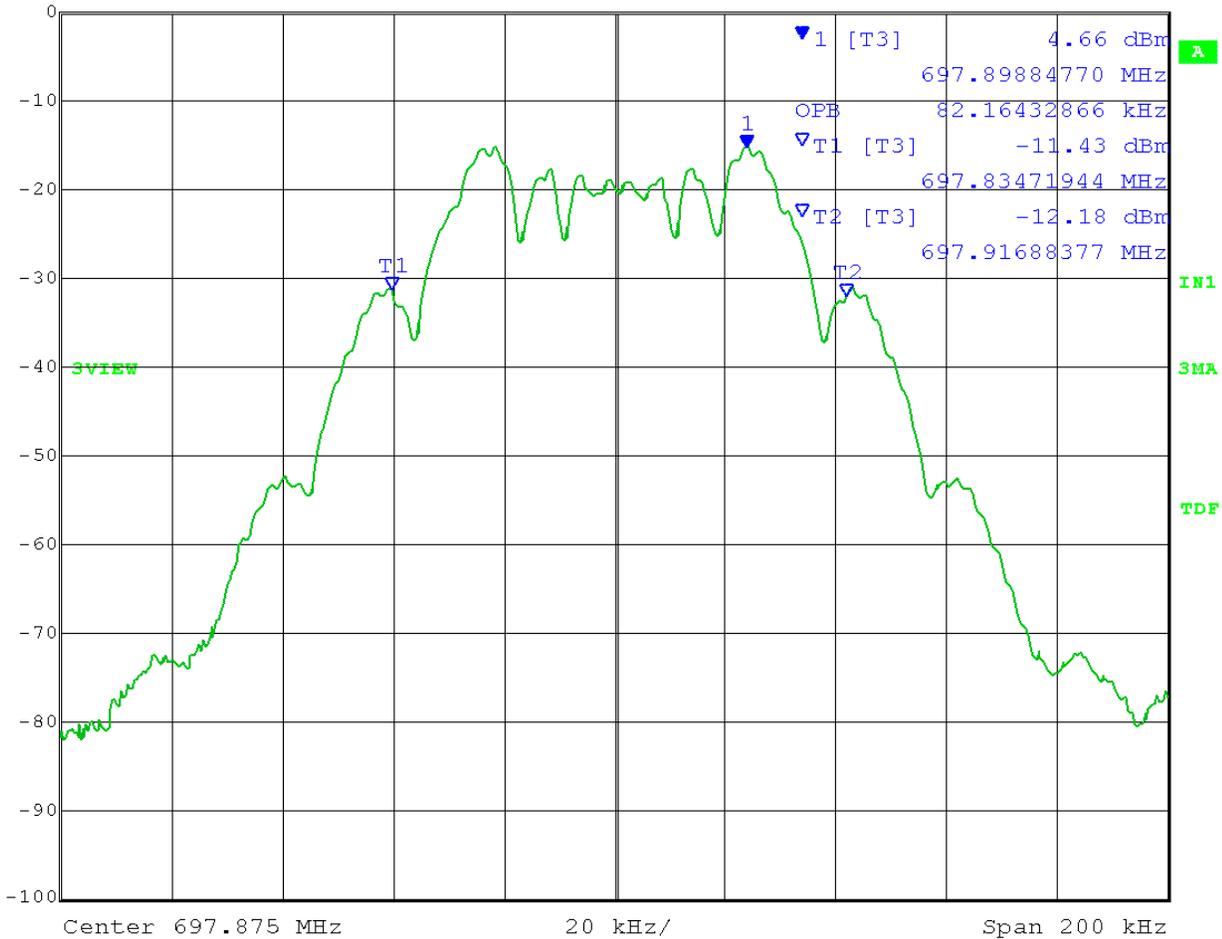
Company: Shure Incorporated
 Model Tested: PA421B
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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth; 99% bandwidth
 Rule part: FCC Part 74; FCC Part 2.1049
 Operator: Paul L

Frequency: 697.875MHz
 Audio Input: Modulated 2.5kHz, 16db > 50%)
 99% power bandwidth = 82.164kHz

Max/Ref Lvl Marker 1 [T3] RBW 2 kHz RF Att 30 dB
 20 dBm 4.66 dBm VBW 10 kHz
 0 dBm 697.89884770 MHz SWT 125 ms Unit dB



Date: 24.MAY.2016 11:47:15



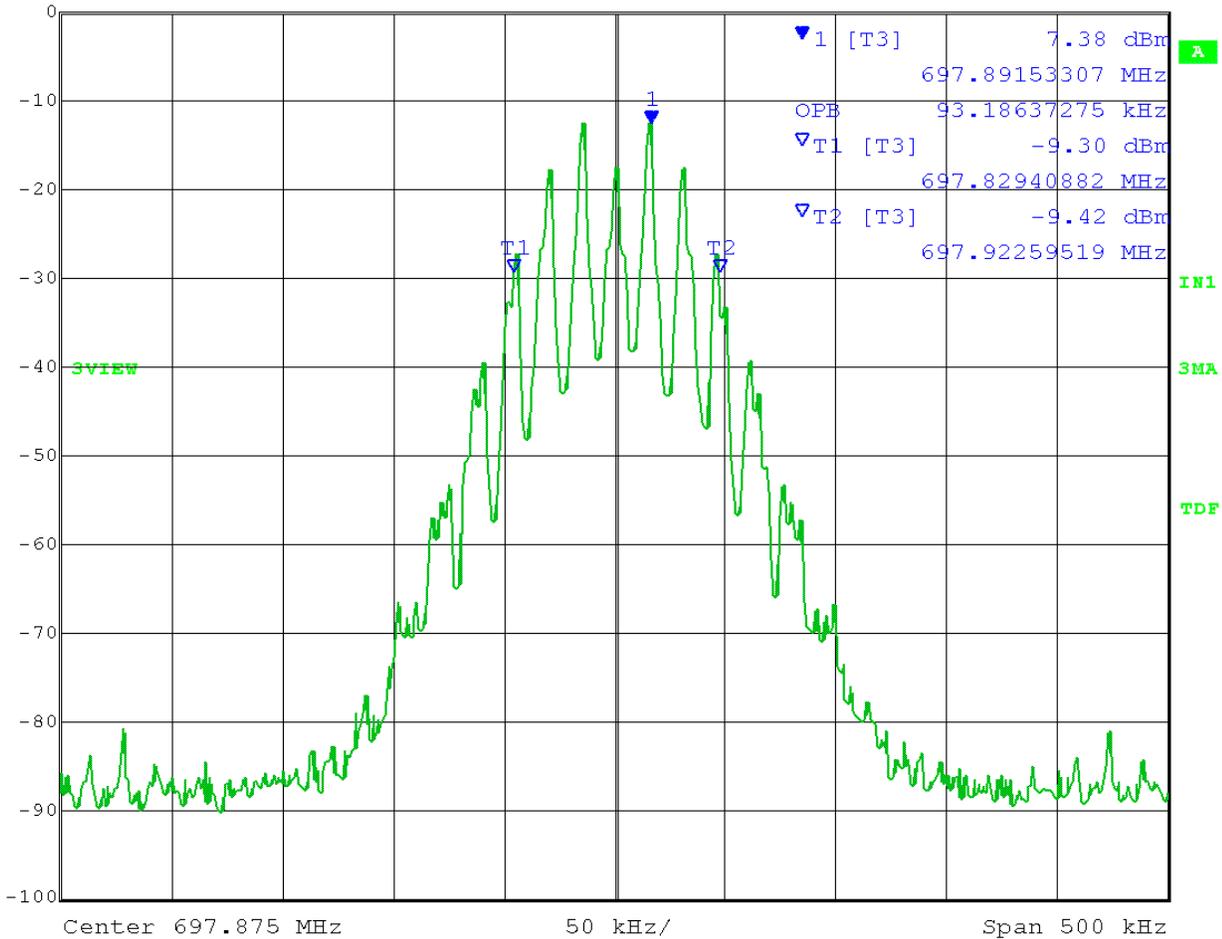
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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth; 99% bandwidth
 Rule part: FCC Part 74; FCC Part 2.1049
 Operator: Paul L

Frequency: 697.875MHz
 Audio Input: Modulated 15kHz 85% Modulation
 99% power bandwidth = 93.1865kHz

Max/Ref Lvl 20 dBm
 Marker 1 [T3] 7.38 dBm
 RBW 2 kHz
 RF Att 30 dB
 0 dBm 697.89153307 MHz
 VBW 10 kHz
 SWT 320 ms
 Unit dB



Date: 24.MAY.2016 12:50:29



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Company: Shure Incorporated
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Appendix B

B3.0 Emission Mask

Rule Part: FCC Part 74.861 (e)(6)(i)(ii), FCC Part 2.1051

Test Procedure: TIA-603D 2010 (2.2.13)

Limit: The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

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;

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

Results: Compliant

Notes: The EUT was set to transmit at its maximum power.
The EUT was tested at Low, Mid., and High Channels, unmodulated, modulated at 2.5kHz 16dB > 50% modulation, and 15kHz at 85% modulation.



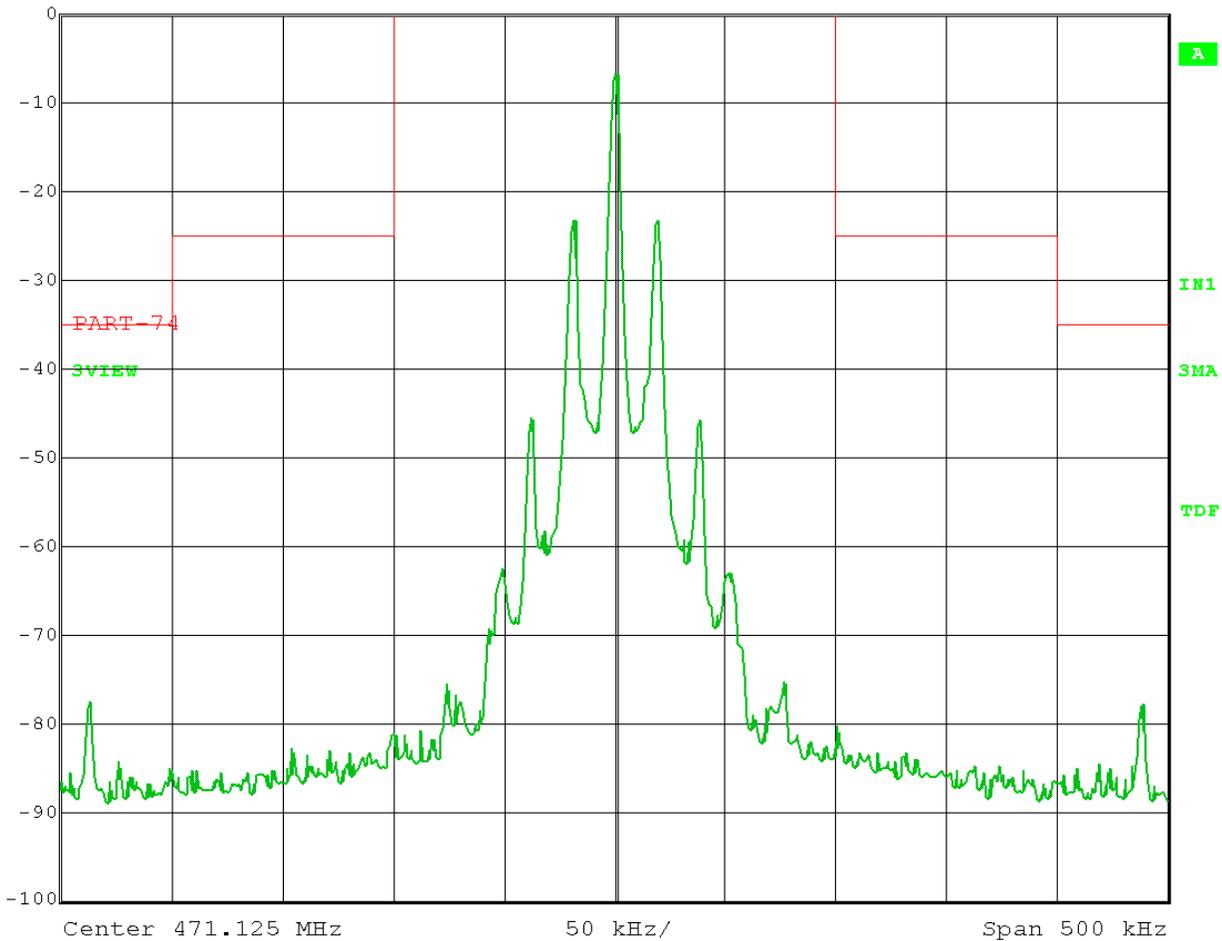
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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 471.125 MHz
 Audio Input: Unmodulated

	Max/Ref Lvl	RBW	2 kHz	RF Att	30 dB
	20 dBm	VBW	10 kHz		
	0 dBm	SWT	320 ms	Unit	dB



Date: 24.MAY.2016 13:48:05

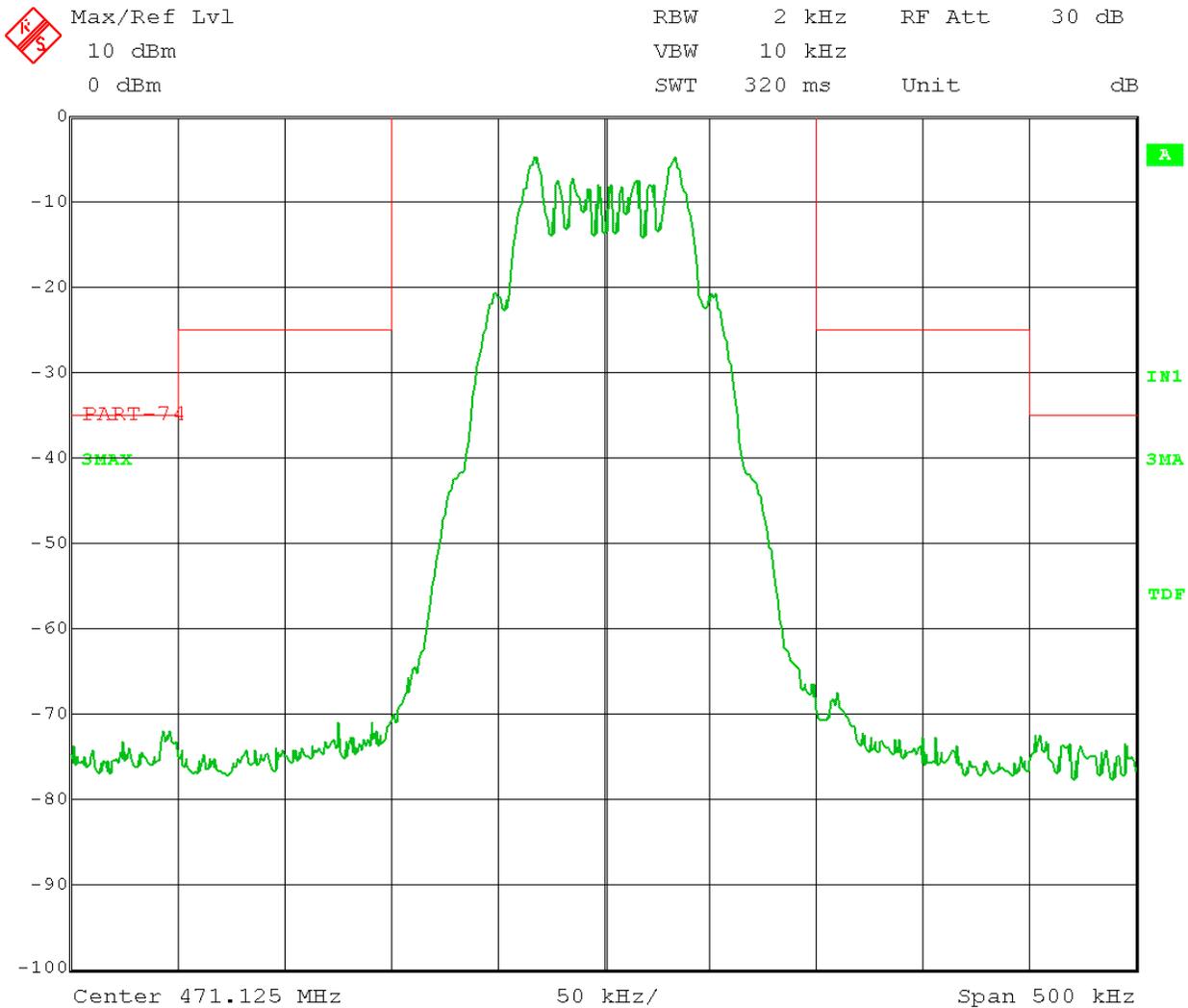


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 Project Number: 8109

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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 471.125 MHz
 Audio Input: Modulated 2.5kHz, 16db > 50%



Date: 24.MAY.2016 13:53:44



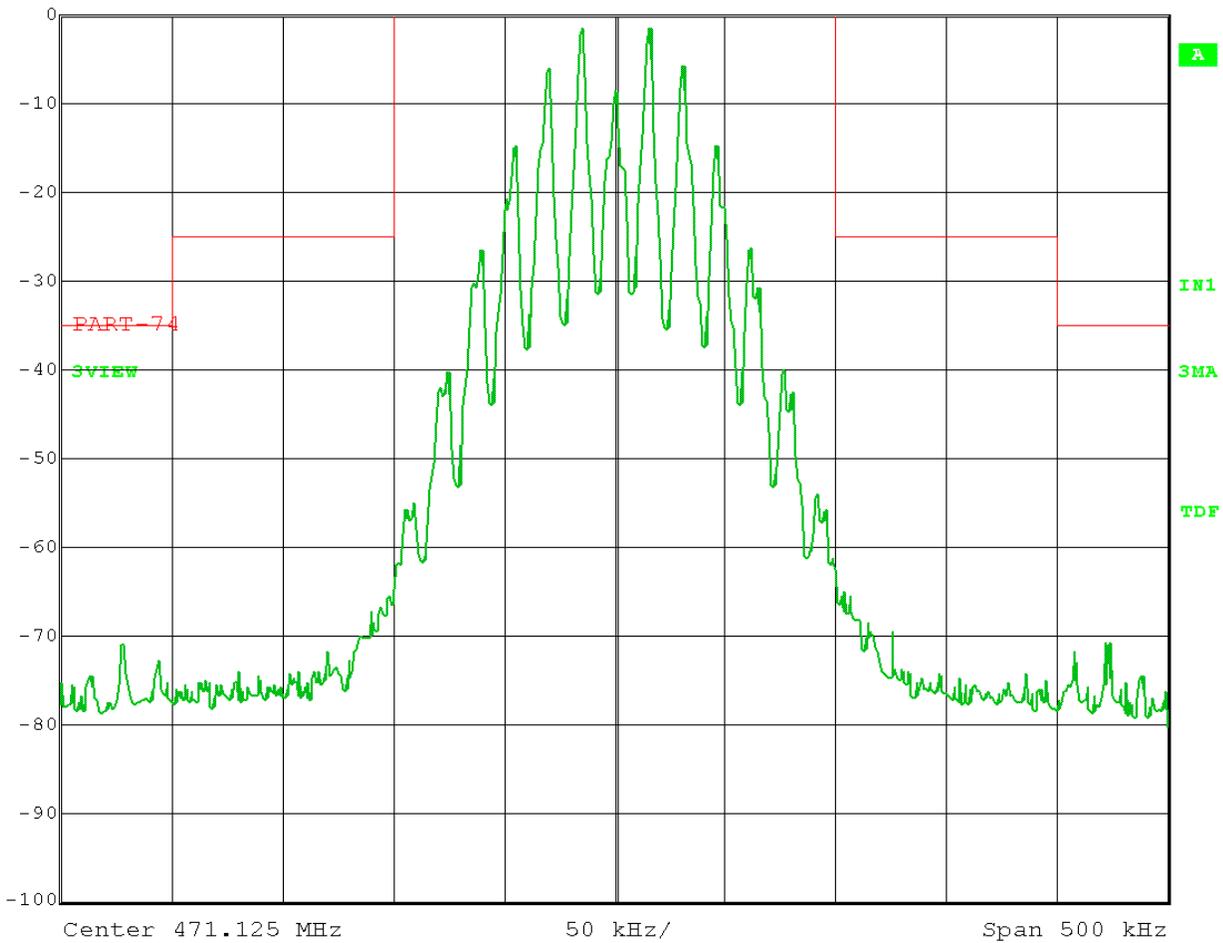
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Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 471.125 MHz
 Audio Input: Modulated 15kHz, 85% Modulated

	Max/Ref Lvl	RBW	2 kHz	RF Att	30 dB
	10 dBm	VBW	10 kHz		
	0 dBm	SWT	320 ms	Unit	dB



Date: 24.MAY.2016 14:09:04



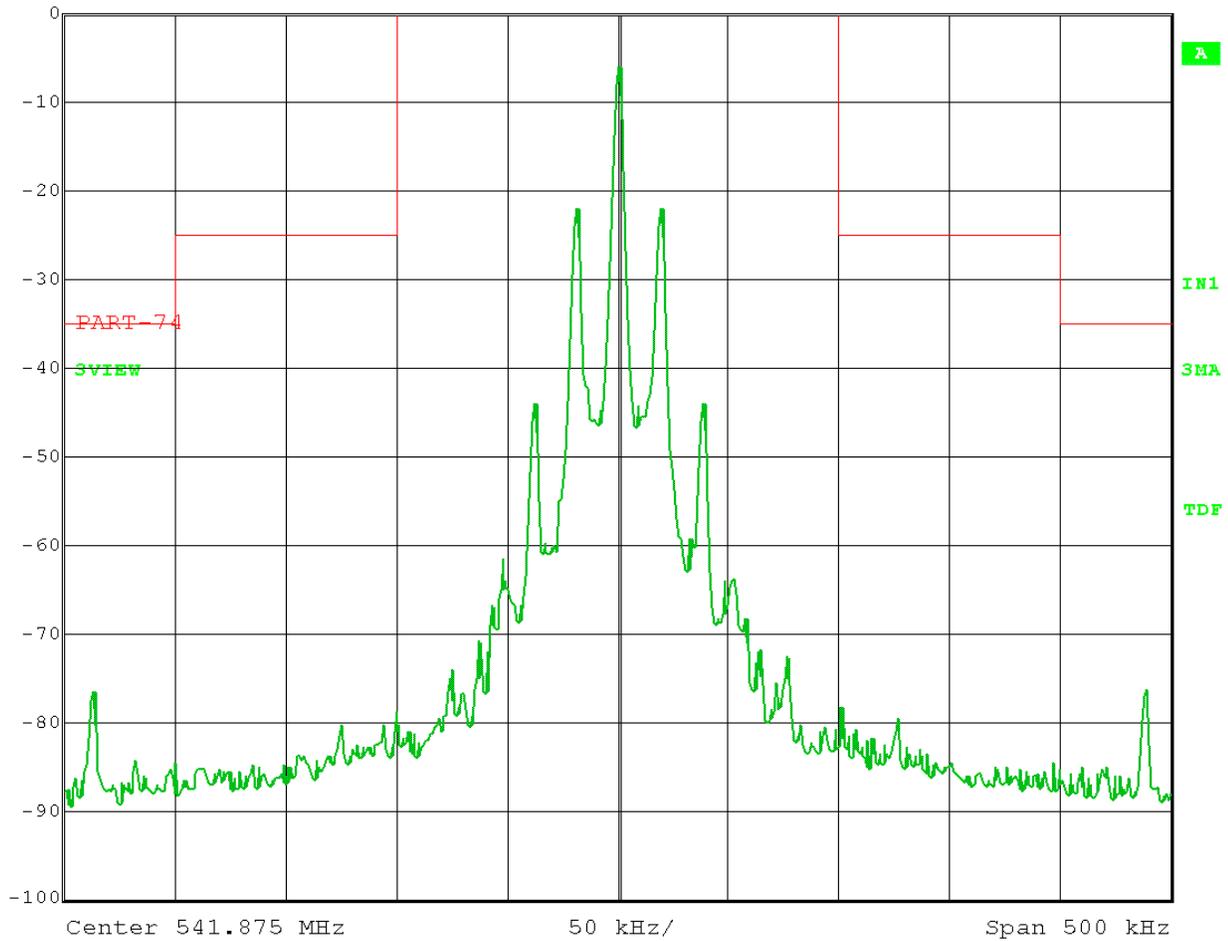
Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

166 South Carter, Genoa City, WI 53128

Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 541.875MHz
 Audio Input: Unmodulated

	Max/Ref Lvl	RBW	2 kHz	RF Att	30 dB
	20 dBm	VBW	10 kHz		
	0 dBm	SWT	320 ms	Unit	dB



Date: 24.MAY.2016 13:06:18

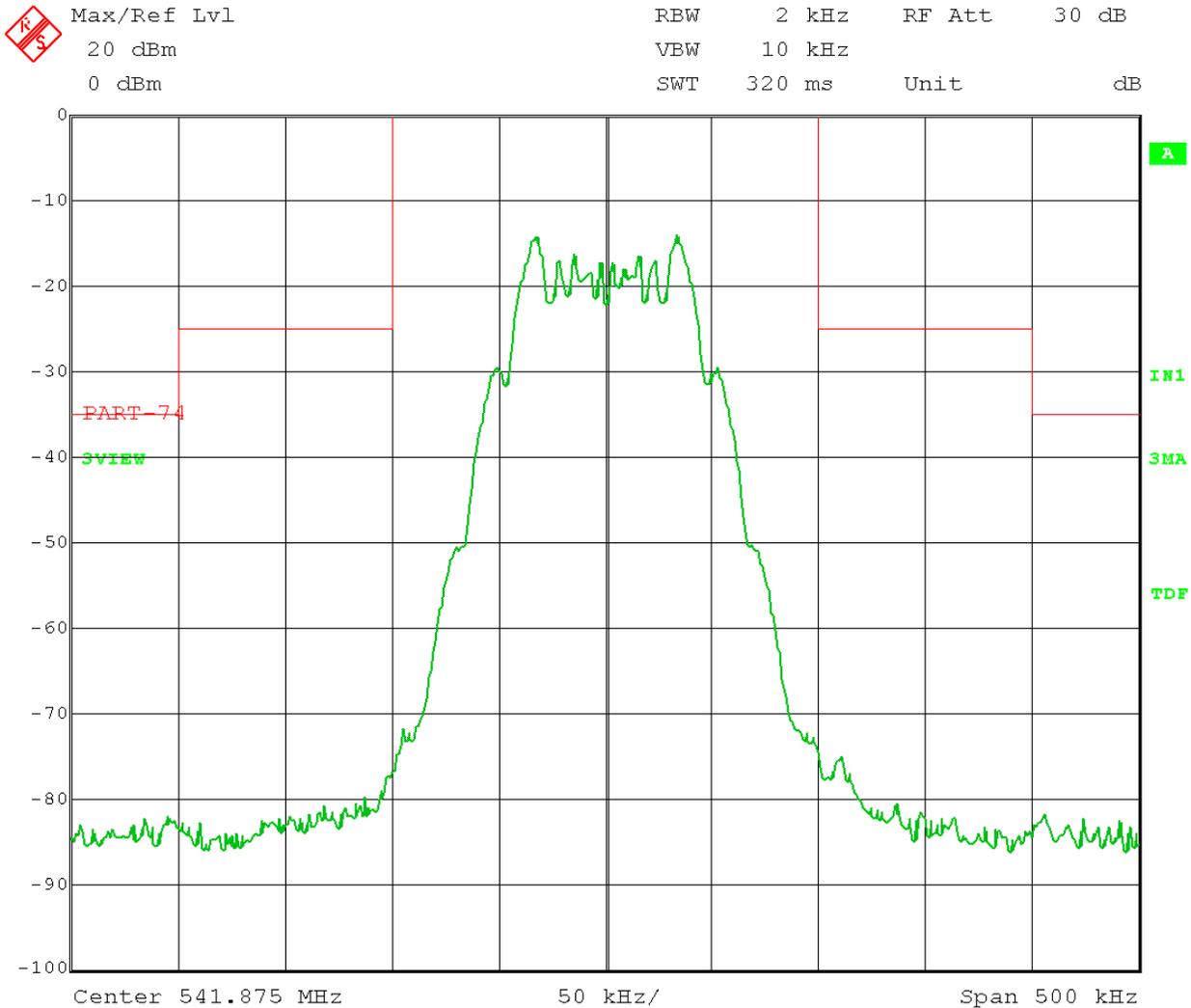


Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

166 South Carter, Genoa City, WI 53128

Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 541.875MHz
 Audio Input: Modulated 2.5kHz, 16db > 50%



Date: 24.MAY.2016 13:22:33

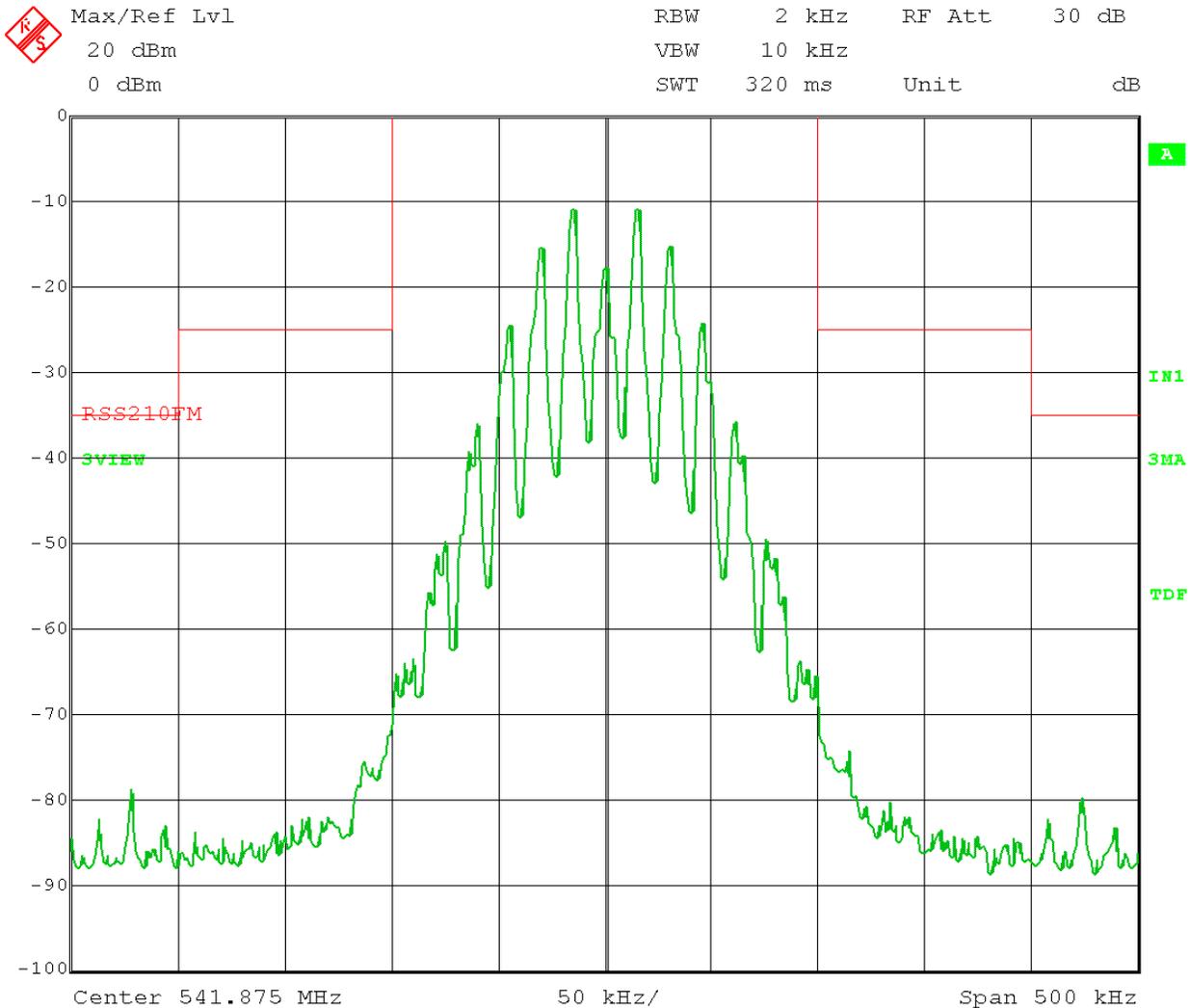


Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

166 South Carter, Genoa City, WI 53128

Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 541.875MHz
 Audio Input: Modulated 15khz, 85% Modulated



Date: 24.MAY.2016 13:10:52



Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

166 South Carter, Genoa City, WI 53128

Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 697.875MHz
 Audio Input: Unmodulated

	Max/Ref Lvl	RBW	2 kHz	RF Att	30 dB
	20 dBm	VBW	10 kHz		
	0 dBm	SWT	320 ms	Unit	dB



Date: 24.MAY.2016 12:01:36

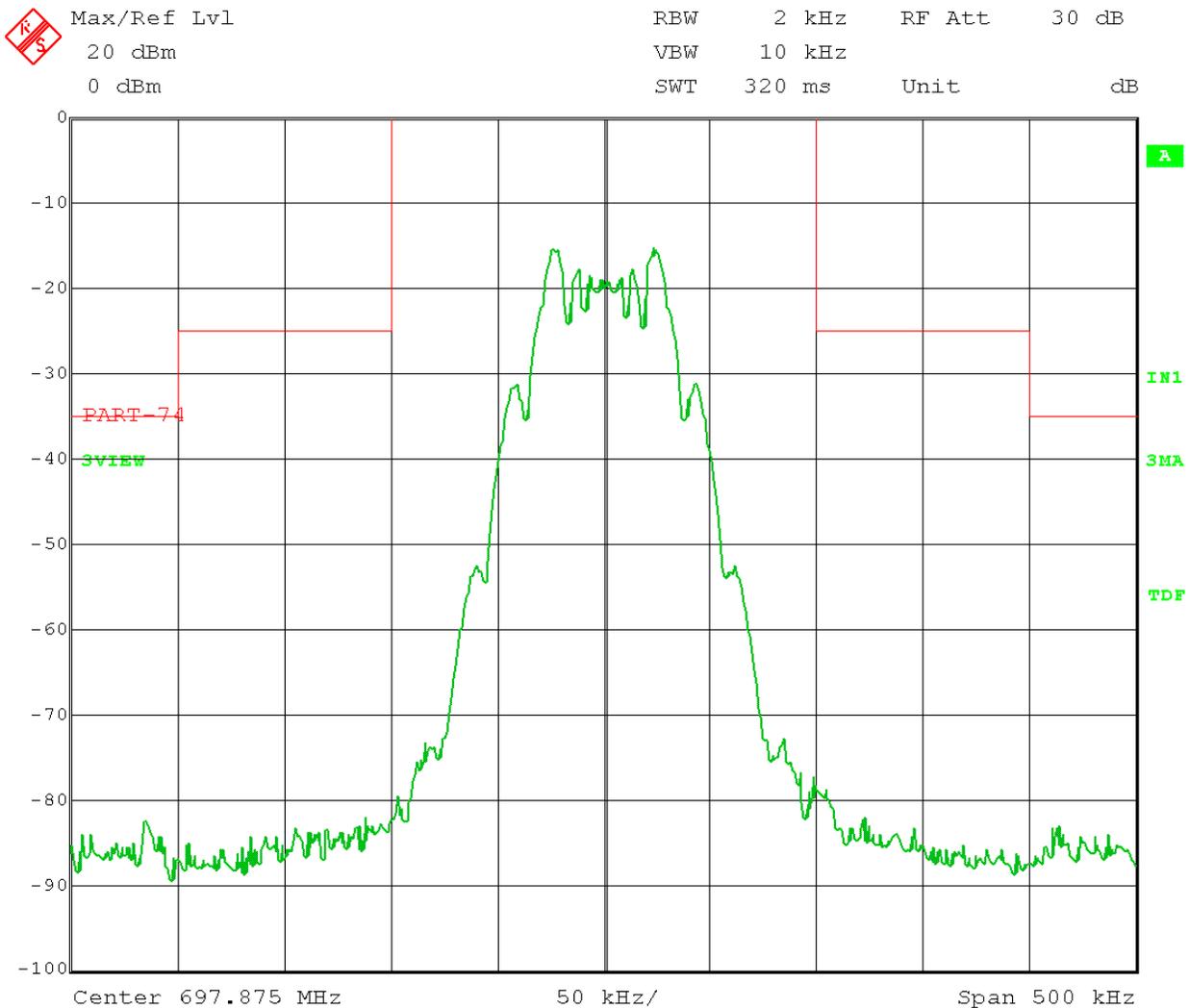


Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

166 South Carter, Genoa City, WI 53128

Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 697.875MHz
 Audio Input: Modulated 2.5kHz, 16db > 50%)



Date: 24.MAY.2016 11:55:46



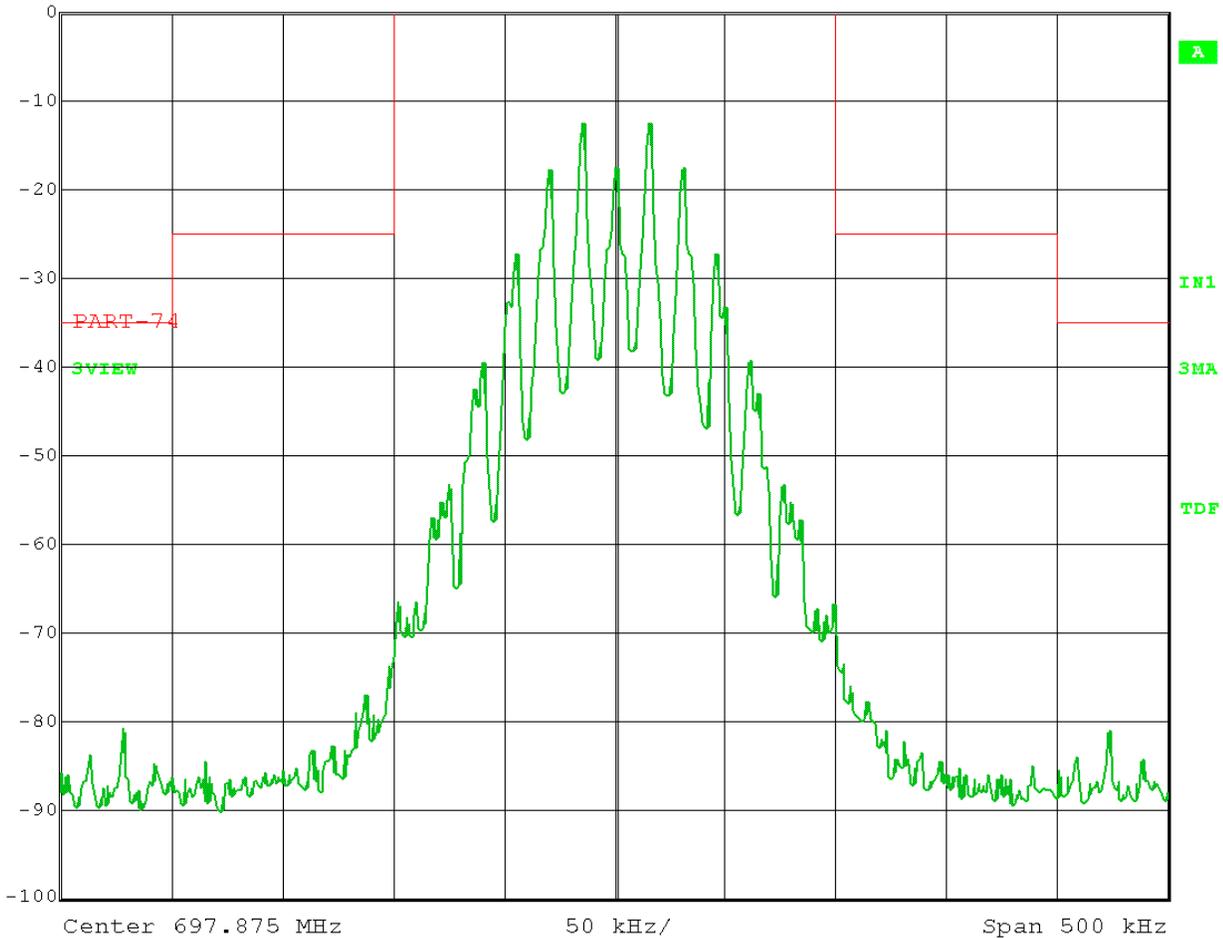
Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

166 South Carter, Genoa City, WI 53128

Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Occupied Bandwidth
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L

Frequency: 697.875MHz
 Audio Input: Modulated 15khz, 85% Modulated

	Max/Ref Lvl	RBW	2 kHz	RF Att	30 dB
	20 dBm	VBW	10 kHz		
	0 dBm	SWT	320 ms	Unit	dB



Date: 24.MAY.2016 12:51:45



166 South Carter, Genoa City, WI 53128

Company: Shure Incorporated
Model Tested: PA421B
Report Number: 22304
Project Number: 8109

Appendix B

B4.0 RF Conducted Spurious Emissions

Rule Part: FCC Part 74.861 (e)(6)(iii), FCC Part 2.1051

Test Procedure: TIA-603D 2010 (2.2.13)

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

Results: Compliant

Sample Equation: $43 + 10\log(.04989W) = 29.98$
 $10\log(49.89mW) = 16.98dBm$
 $16.98 - 29.98 = -13dBm$

Notes: The EUT was set to transmit at its maximum power. A peak detector was used for this test.

The EUT was tested in two configurations: 1) A transmitted signal passed through all available channels unmodulated. 2) A transmitted signal passed through all channels with three channels modulated at 2.5kHz 16dB >50% modulation.



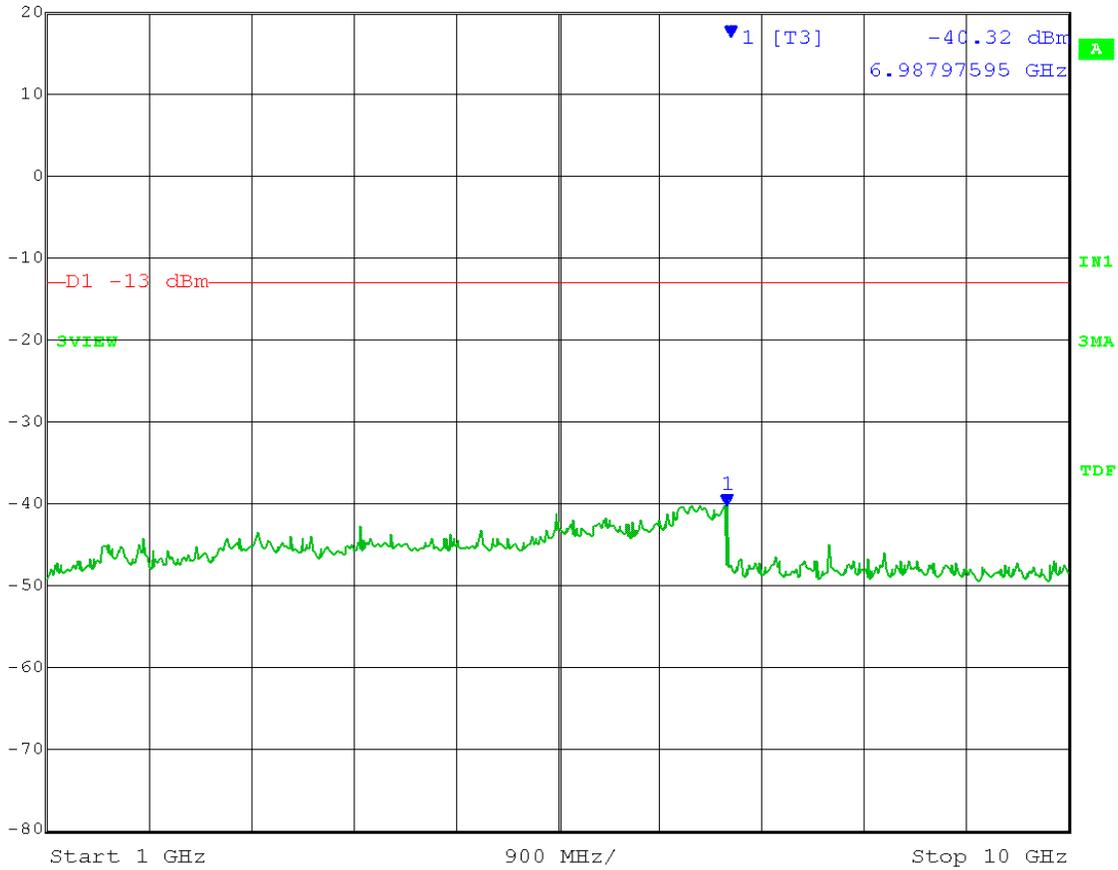
Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

166 South Carter, Genoa City, WI 53128

Test Date: 05-24-2016
 Company: Shure, Inc.
 EUT: PA421B Antenna Combiner
 Test: Spurious Emissions - Conducted
 Rule part: FCC Part 74; FCC Part 2.1051
 Operator: Paul L
 Comment: Inputs: 471.125 MHz
 541.875MHz
 626.125MHz
 697.875MHz

Frequency Range: 1-10GHz
 Limit = -13 dBm

	Max/Ref Lvl	Marker 1 [T3]	RBW	100 kHz	RF Att	30 dB
	20 dBm	-40.32 dBm	VBW	100 kHz		
	0 dBm	6.98797595 GHz	SWT	2.25 s	Unit	dBm



Date: 24.MAY.2016 15:32:04



166 South Carter, Genoa City, WI 53128

Company: Shure Incorporated
Model Tested: PA421B
Report Number: 22304
Project Number: 8109

Appendix B

B5.0 Radiated Spurious Emissions

Rule Part: FCC Part 74.861(e)(6)(iii), Part 2.1053

Test Procedure: TIA-603D 2010 (2.2.12)

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

Results: Compliant

Sample Equation: $43 + 10\log(.04989W) = 29.98$
 $10\log(49.89mW) = 16.98dBm$
 $16.98 - 29.98 = -13dBm$

Notes: The measurement bandwidth on the receiver was set 120 kHz from 30 to 1000 MHz, and 1 MHz from 1 to 7GHz. The detector was set to Quasi-Peak below 1 GHz and Peak above 1 GHz. The test distance was 3 meters.



Company: Shure Incorporated
 Model Tested: PA421B
 Report Number: 22304
 Project Number: 8109

166 South Carter, Genoa City, WI 53128

Company: Shure, Inc		
Operator: Paul L		
Date of test: 06-07-2016		
Temperature: 66 deg. F		
Humidity: 46% R.H.		
Test: FCC Pt.74.861, FCC PT.2.1053		

Transmitter Radiated Spurious Emissions (e.r.p. substitution method) 30 MHz to 7.0 GHz OPERATING

Model: **PA421B** Transmit Frequency: 471.125MHz, 541.875MHz, 626.125MHz, 697.875MHz

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] (uW)
84.24 vertical	53.9	-41.9	2.02	2.15	-43.92	-13	30.92	0.04055
84.24 horizontal	49.9	-47	2.02	2.15	-49.02	-13	36.02	0.01253
226.76 vertical	41.1	-52.5	3.56	2.15	-56.06	-13	43.06	0.00248
226.76 horizontal	43.7	-55.1	3.56	2.15	-58.66	-13	45.66	0.00136
942.26 vertical	55.2	-40.3	7.99	2.15	-48.29	-13	35.29	0.01483
942.26 horizontal	56.7	-37.4	7.99	2.15	-45.39	-13	32.39	0.02891
1084.0 horizontal	41	-65.5	1.88	6.8	-62.73	-13	49.73	0.00053
1878.4 horizontal	35.6	-66.4	2.54	8.58	-62.51	-13	49.51	0.00056
2504.4 vertical	40.2	-62.5	2.97	9.65	-57.97	-13	44.97	0.00160
2791.6 vertical	39.3	-63.7	3.15	10.38	-58.62	-13	45.62	0.00137
2791.6 horizontal	37.8	-64.6	3.15	10.38	-59.52	-13	46.52	0.00112
3130.8 vertical	41.7	-59.8	3.36	9.55	-55.76	-13	42.76	0.00265
3130.8 horizontal	39.2	-62.4	3.36	9.53	-58.38	-13	45.38	0.00145

EIRP = Signal generator output - cable loss + antenna gain

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



166 South Carter, Genoa City, WI 53128

Company:	Shure Incorporated
Model Tested:	PA421B
Report Number:	22304
Project Number:	8109

Appendix B

B6.0 AC Line Conducted Emissions

Rule Part: FCC Part 15.207

Test Procedure: ANSI C63.4-2014

Limit: 15.207 Class B

Results: Compliant

Notes: This was an AC Mains Conducted emissions measurement.
The EUT was powered with an input of 120 and 240 VAC 60 Hz.



Report issuing date : 6-17-2016

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 73 °F
Humidity : 45 %
Test Specs : Line 1, Av
Operator : Paul L
DLS Project # : 8109
Result : Pass

EUT

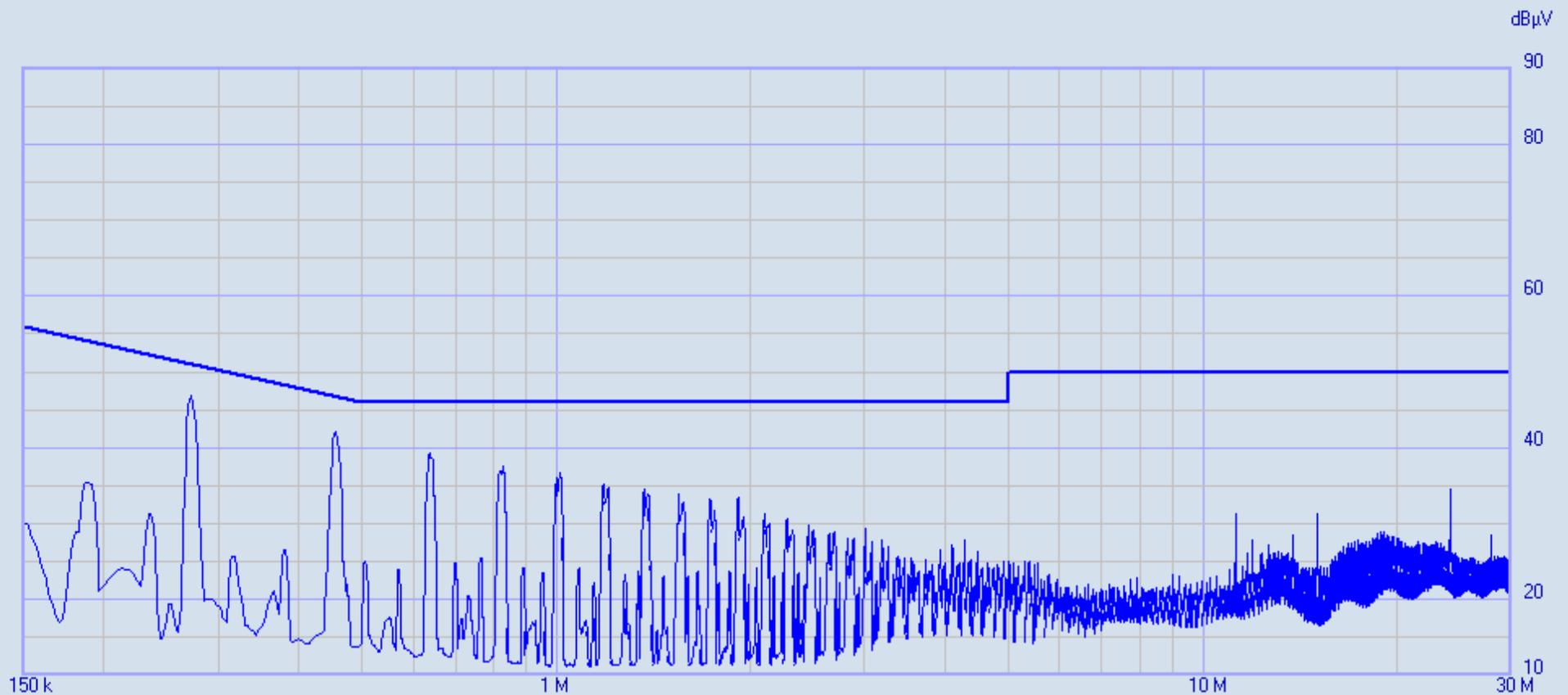
Manufacturer : Shure, Inc.
Model : PA421B 4-input Antenna Combiner
Notes : 120V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



8109 Shure Inc PA421B 120V 60Hz L1

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1500 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
Class B V AV

Factors:

LISN DLS#128
E-M L705
DLS #592
Cables 43 & 45

C-Avg

8109 Shure Inc PA421B 120V 60Hz L1 17/06/2016 10:05:22
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 9 dB

Frequency [MHz]	C-Avg [dBµV]	Limit Class B V.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor E-M L705 [dB]	Factor DLS #592 [dB]	Factor Cables 43.. [dB]	
1	0.26861	42.83	51.16	-8.33	0.81	9.96	1.44	0.07
2	0.270655	45.58	51.10	-5.52	0.80	9.96	1.43	0.07
3	0.2727	46.89	51.04	-4.15	0.80	9.97	1.43	0.07
4	0.274745	45.83	50.97	-5.14	0.79	9.97	1.42	0.07
5	0.27679	42.92	50.91	-7.99	0.78	9.97	1.42	0.07
6	0.450615	38.90	46.86	-7.96	0.50	9.95	1.00	0.12
7	0.45266	40.73	46.83	-6.10	0.50	9.95	0.99	0.12
8	0.454705	41.82	46.79	-4.97	0.49	9.95	0.99	0.12
9	0.45675	42.01	46.75	-4.74	0.49	9.95	0.99	0.12
10	0.458795	41.21	46.71	-5.50	0.49	9.95	0.98	0.12
11	0.46084	39.53	46.68	-7.15	0.49	9.95	0.98	0.12
12	0.63262	37.97	46.00	-8.03	0.40	9.96	0.75	0.15
13	0.634665	38.99	46.00	-7.01	0.40	9.96	0.75	0.15
14	0.63671	39.22	46.00	-6.78	0.40	9.96	0.75	0.15
15	0.638755	38.69	46.00	-7.31	0.40	9.96	0.74	0.15
16	0.6408	38.32	46.00	-7.68	0.40	9.96	0.74	0.15
17	0.642845	38.51	46.00	-7.49	0.40	9.96	0.74	0.15
18	0.64489	38.11	46.00	-7.89	0.40	9.96	0.74	0.15
19	0.826895	37.36	46.00	-8.64	0.35	9.96	0.60	0.17
20	0.82894	37.64	46.00	-8.36	0.35	9.96	0.60	0.17



Report issuing date : 6-17-2016

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 73 °F
Humidity : 45 %
Test Specs : Line 1, QP
Operator : Paul L
DLS Project # : 8109
Result : Pass

EUT

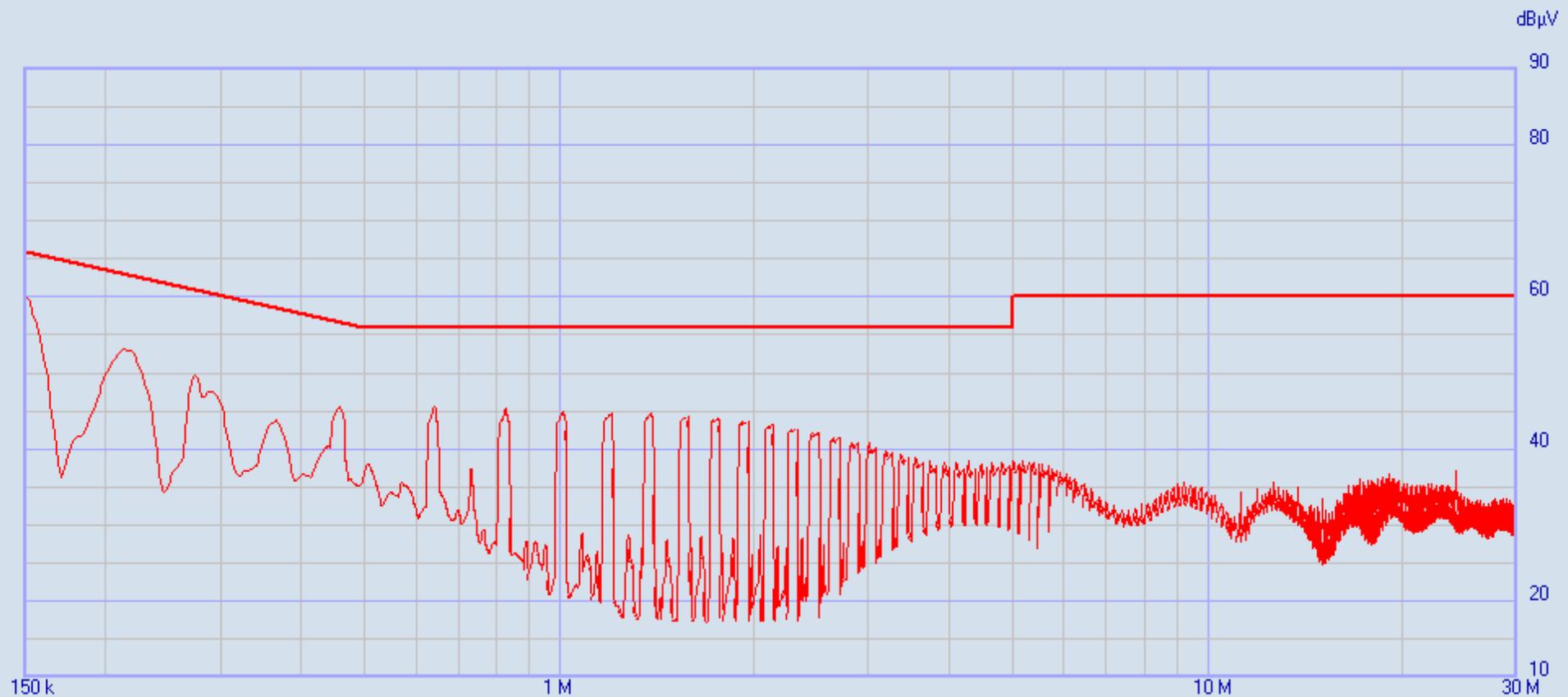
Manufacturer : Shure, Inc.
Model : PA421B 4-input Antenna Combiner
Notes : 120V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



8109 Shure Inc PA421B 120V 60Hz L1

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1500 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V QP

Factors:
LISN DLS#128
 E-M L705
 DLS #592
 Cables 43 & 45

QPeak —

8109 Shure Inc PA421B 120V 60Hz L1 17/06/2016 10:05:22
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 11 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBµV]	FCC Class..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBµV]		[dB]	[dB]	[dB]	[dB]
1	0.15	60.13	66.00	-5.87	1.74	9.87	2.16	0.17
2	0.152045	59.36	65.89	-6.53	1.70	9.86	2.13	0.16
3	0.15409	57.98	65.78	-7.80	1.67	9.86	2.09	0.15
4	0.156135	56.31	65.67	-9.36	1.64	9.86	2.06	0.14
5	0.209305	52.58	63.23	-10.65	1.10	9.84	1.64	0.04
6	0.21135	52.89	63.15	-10.26	1.09	9.83	1.62	0.05
7	0.213395	53.05	63.07	-10.02	1.08	9.83	1.61	0.05
8	0.21544	53.04	62.99	-9.95	1.07	9.83	1.59	0.06
9	0.217485	52.90	62.91	-10.01	1.05	9.83	1.58	0.07
10	0.21953	52.62	62.84	-10.22	1.04	9.82	1.57	0.08
11	0.221575	52.17	62.76	-10.59	1.03	9.82	1.55	0.08
12	0.638755	45.23	56.00	-10.77	0.40	9.96	0.74	0.15
13	0.6408	45.48	56.00	-10.52	0.40	9.96	0.74	0.15
14	0.642845	45.36	56.00	-10.64	0.40	9.96	0.74	0.15
15	0.822805	45.03	56.00	-10.97	0.35	9.96	0.61	0.17
16	0.82485	45.34	56.00	-10.66	0.35	9.96	0.60	0.17
17	0.826895	45.39	56.00	-10.61	0.35	9.96	0.60	0.17
18	0.82894	45.22	56.00	-10.78	0.35	9.96	0.60	0.17



Report issuing date : 6-17-2016

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 73 °F
Humidity : 45 %
Test Specs : Line 2, Av
Operator : Paul L
DLS Project # : 8109
Result : Pass

EUT

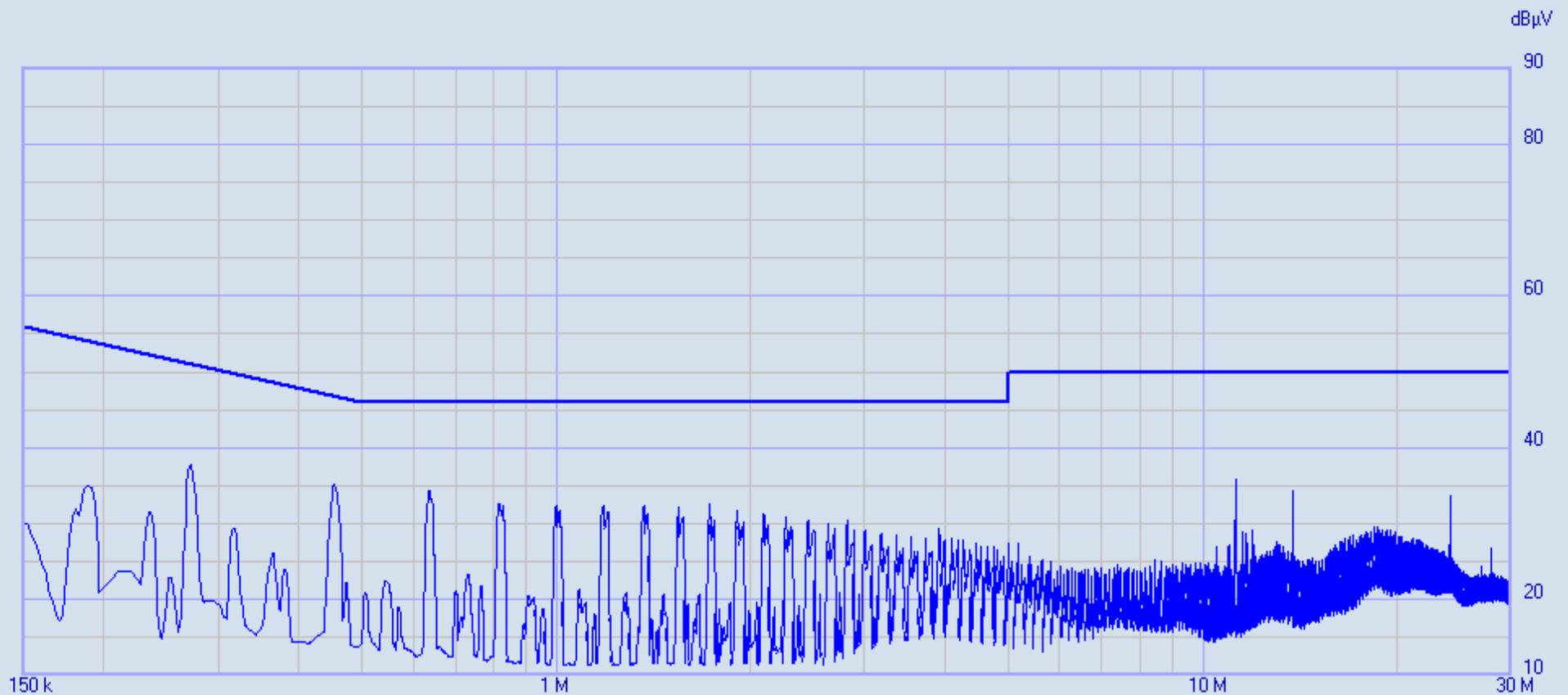
Manufacturer : Shure, Inc.
Model : PA421B 4-input Antenna Combiner
Notes : 120V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



8109 Shure Inc PA421B 120V 60Hz L2

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1500 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V AV

Factors:

LISN DLS#128
E-M L705
DLS #592
Cables 43 & 45

C-Avg ———

8109 Shure Inc PA421B 120V 60Hz L2 17/06/2016 10:15:45
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 14 dB

	Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBµV]	FCC Class..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBµV]		[dB]	[dB]	[dB]	[dB]
1	0.270655	37.15	51.10	-13.95	0.80	9.96	1.43	0.07
2	0.2727	37.84	51.04	-13.20	0.80	9.97	1.43	0.07
3	0.450615	33.57	46.86	-13.29	0.50	9.95	1.00	0.12
4	0.45266	34.78	46.83	-12.05	0.50	9.95	0.99	0.12
5	0.454705	35.24	46.79	-11.55	0.49	9.95	0.99	0.12
6	0.45675	34.80	46.75	-11.95	0.49	9.95	0.99	0.12
7	0.458795	33.53	46.71	-13.18	0.49	9.95	0.98	0.12
8	0.63262	33.49	46.00	-12.51	0.40	9.96	0.75	0.15
9	0.634665	34.19	46.00	-11.81	0.40	9.96	0.75	0.15
10	0.63671	33.86	46.00	-12.14	0.40	9.96	0.75	0.15
11	0.638755	33.21	46.00	-12.79	0.40	9.96	0.74	0.15
12	0.6408	32.83	46.00	-13.17	0.40	9.96	0.74	0.15
13	0.642845	32.43	46.00	-13.57	0.40	9.96	0.74	0.15
14	0.814625	32.61	46.00	-13.39	0.35	9.96	0.61	0.17
15	0.81667	32.46	46.00	-13.54	0.35	9.96	0.61	0.17
16	0.826895	32.41	46.00	-13.59	0.35	9.96	0.60	0.17
17	0.82894	32.05	46.00	-13.95	0.35	9.96	0.60	0.17
18	0.994585	32.01	46.00	-13.99	0.33	9.96	0.53	0.19
19	0.99663	32.40	46.00	-13.60	0.33	9.96	0.53	0.20
20	1.17659	32.25	46.00	-13.75	0.32	9.99	0.48	0.29
21	1.178635	32.23	46.00	-13.77	0.32	9.99	0.48	0.29
22	1.358595	32.28	46.00	-13.72	0.31	9.99	0.45	0.31
23	1.5406	32.03	46.00	-13.97	0.30	10.00	0.43	0.30
24	1.718515	32.06	46.00	-13.94	0.30	9.99	0.41	0.31
25	1.72056	32.57	46.00	-13.43	0.30	9.99	0.41	0.31
26	1.722605	32.14	46.00	-13.86	0.30	9.99	0.41	0.31



Report issuing date : 6-17-2016

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 73 °F
Humidity : 45 %
Test Specs : Line 2, QP
Operator : Paul L
DLS Project # : 8109
Result : Pass

EUT

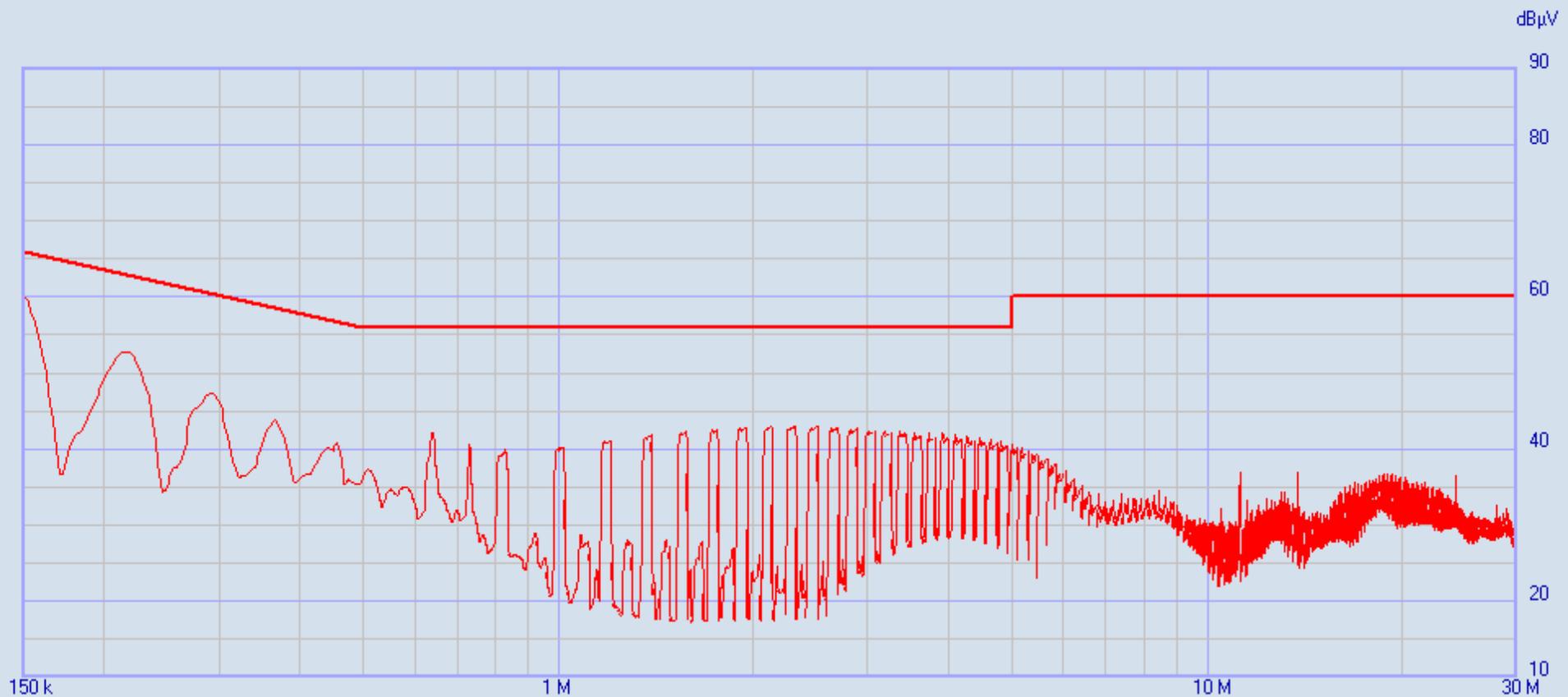
Manufacturer : Shure, Inc.
Model : PA421B 4-input Antenna Combiner
Notes : 120V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



8109 Shure Inc PA421B 120V 60Hz L2

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1500 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V QP

Factors:
 LISN DLS#128
 E-M L705
 DLS #592
 Cables 43 & 45

QPeak —

8109 Shure Inc PA421B 120V 60Hz L2 17/06/2016 10:15:45
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 11 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	FCC Class..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.15	60.09	66.00	-5.91	1.74	9.87	2.16	0.17
2	0.152045	59.40	65.89	-6.49	1.70	9.86	2.13	0.16
3	0.15409	58.12	65.78	-7.66	1.67	9.86	2.09	0.15
4	0.156135	56.57	65.67	-9.10	1.64	9.86	2.06	0.14
5	0.15818	54.79	65.56	-10.77	1.61	9.85	2.03	0.13
6	0.21135	52.44	63.15	-10.71	1.09	9.83	1.62	0.05
7	0.213395	52.66	63.07	-10.41	1.08	9.83	1.61	0.05
8	0.21544	52.74	62.99	-10.25	1.07	9.83	1.59	0.06
9	0.217485	52.69	62.91	-10.22	1.05	9.83	1.58	0.07
10	0.21953	52.50	62.84	-10.34	1.04	9.82	1.57	0.08
11	0.221575	52.14	62.76	-10.62	1.03	9.82	1.55	0.08



Report issuing date : 6-17-2016

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 73 °F
Humidity : 45 %
Test Specs : Line 1, Av
Operator : Paul L
DLS Project # : 8109
Result : Pass

EUT

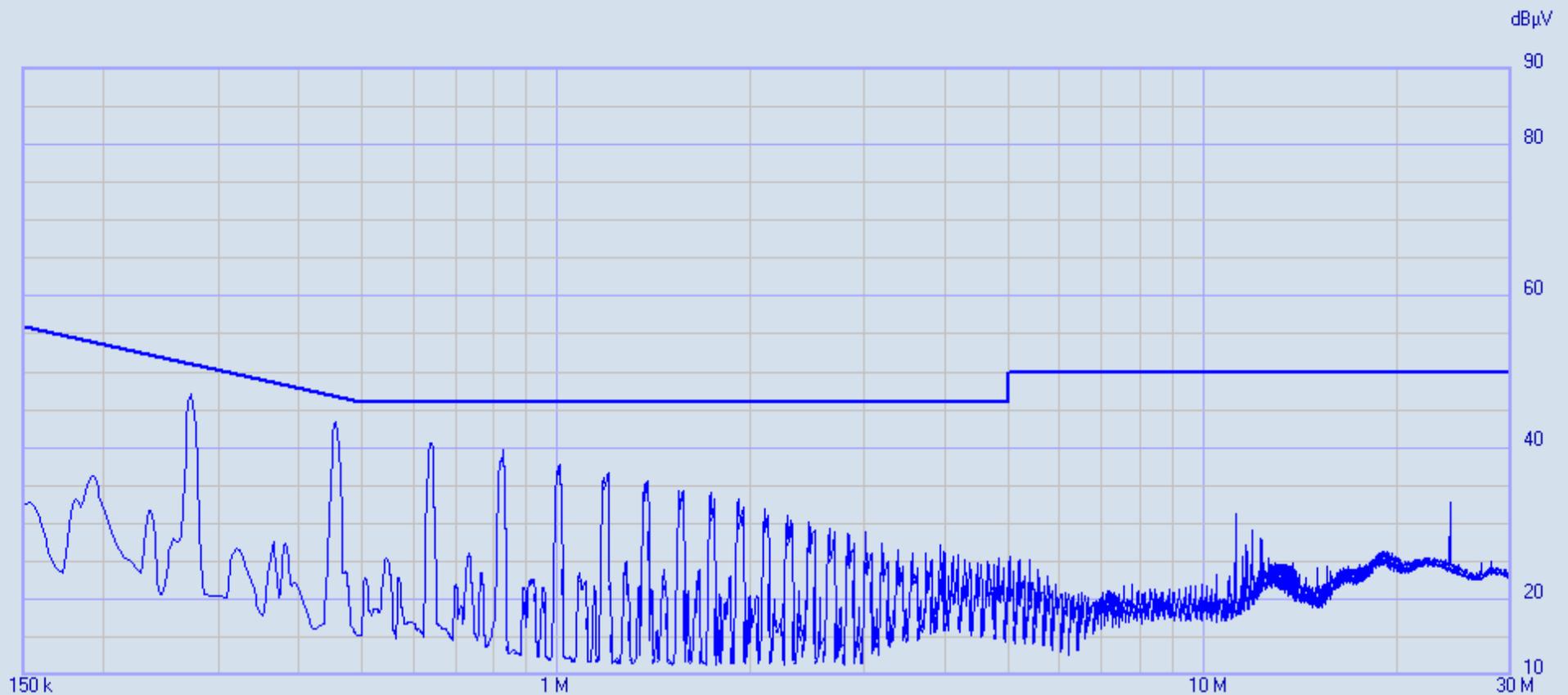
Manufacturer : Shure, Inc.
Model : PA421B 4-input Antenna Combiner
Notes : 240V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



8109 Shure Inc PA421B 240V 60Hz L1

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1500 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V AV

Factors:
LISN DLS#128
E-M L705
DLS #592
Cables 43 & 45

C-Avg —

8109 Shure Inc PA421B 240V 60Hz L1 17/06/2016 10:24:37
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 8 dB

	Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBµV]	FCC Class..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBµV]		[dB]	[dB]	[dB]	[dB]
1	0.26861	43.41	51.16	-7.75	0.81	9.96	1.44	0.07
2	0.270655	46.07	51.10	-5.03	0.80	9.96	1.43	0.07
3	0.2727	47.00	51.04	-4.04	0.80	9.97	1.43	0.07
4	0.274745	45.85	50.97	-5.12	0.79	9.97	1.42	0.07
5	0.450615	38.99	46.86	-7.87	0.50	9.95	1.00	0.12
6	0.45266	41.45	46.83	-5.38	0.50	9.95	0.99	0.12
7	0.454705	43.11	46.79	-3.68	0.49	9.95	0.99	0.12
8	0.45675	43.40	46.75	-3.35	0.49	9.95	0.99	0.12
9	0.458795	42.08	46.71	-4.63	0.49	9.95	0.98	0.12
10	0.46084	39.72	46.68	-6.96	0.49	9.95	0.98	0.12
11	0.634665	39.34	46.00	-6.66	0.40	9.96	0.75	0.15
12	0.63671	40.31	46.00	-5.69	0.40	9.96	0.75	0.15
13	0.638755	40.53	46.00	-5.47	0.40	9.96	0.74	0.15
14	0.6408	40.43	46.00	-5.57	0.40	9.96	0.74	0.15
15	0.642845	40.10	46.00	-5.90	0.40	9.96	0.74	0.15
16	0.64489	38.76	46.00	-7.24	0.40	9.96	0.74	0.15
17	0.818715	38.24	46.00	-7.76	0.35	9.96	0.61	0.17
18	0.82076	38.29	46.00	-7.71	0.35	9.96	0.61	0.17
19	0.822805	38.34	46.00	-7.66	0.35	9.96	0.61	0.17
20	0.82485	39.00	46.00	-7.00	0.35	9.96	0.60	0.17
21	0.826895	39.65	46.00	-6.35	0.35	9.96	0.60	0.17
22	0.82894	39.26	46.00	-6.74	0.35	9.96	0.60	0.17



Report issuing date : 6-17-2016

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 73 °F
Humidity : 45 %
Test Specs : Line 1, QP
Operator : Paul L
DLS Project # : 8109
Result : Pass

EUT

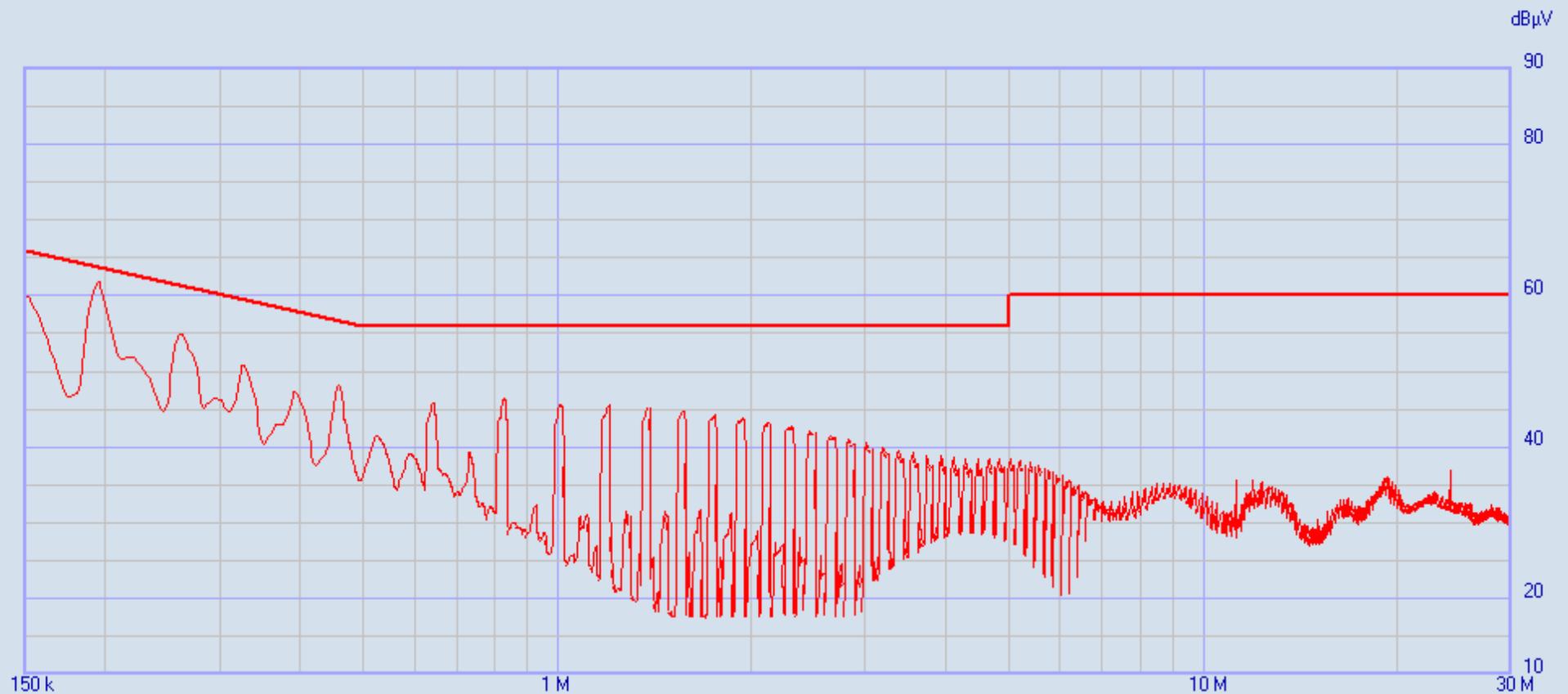
Manufacturer : Shure, Inc.
Model : PA421B 4-input Antenna Combiner
Notes : 240V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



8109 Shure Inc PA421B 240V 60Hz L1

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1500 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V QP

Factors:
 LISN DLS#128
 E-M L705
 DLS #592
 Cables 43 & 45

QPeak —

8109 Shure Inc PA421B 240V 60Hz L1 17/06/2016 10:24:37
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 8 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBµV]	FCC Class..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBµV]		[dB]	[dB]	[dB]	[dB]
1	0.15	60.12	66.00	-5.88	1.74	9.87	2.16	0.17
2	0.152045	59.74	65.89	-6.15	1.70	9.86	2.13	0.16
3	0.15409	58.86	65.78	-6.92	1.67	9.86	2.09	0.15
4	0.156135	57.87	65.67	-7.80	1.64	9.86	2.06	0.14
5	0.188855	58.21	64.09	-5.88	1.26	9.80	1.75	0.03
6	0.1909	60.45	64.00	-3.55	1.24	9.80	1.74	0.03
7	0.192945	61.54	63.91	-2.37	1.22	9.81	1.73	0.03
8	0.19499	61.77	63.82	-2.05	1.21	9.81	1.72	0.03
9	0.197035	61.08	63.73	-2.65	1.19	9.82	1.71	0.03
10	0.19908	59.81	63.65	-3.84	1.18	9.82	1.70	0.03
11	0.201125	58.19	63.56	-5.37	1.16	9.83	1.68	0.03
12	0.20317	56.40	63.48	-7.08	1.15	9.83	1.67	0.03
13	0.258385	54.55	61.48	-6.93	0.85	9.96	1.46	0.06
14	0.26043	54.99	61.42	-6.43	0.84	9.96	1.45	0.06
15	0.262475	54.80	61.35	-6.55	0.84	9.96	1.45	0.06
16	0.26452	54.19	61.29	-7.10	0.83	9.96	1.45	0.06
17	0.266565	53.51	61.22	-7.71	0.82	9.96	1.44	0.07



Report issuing date : 6-17-2016

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 73 °F
Humidity : 45 %
Test Specs : Line 2, Av
Operator : Paul L
DLS Project # : 8109
Result : Pass

EUT

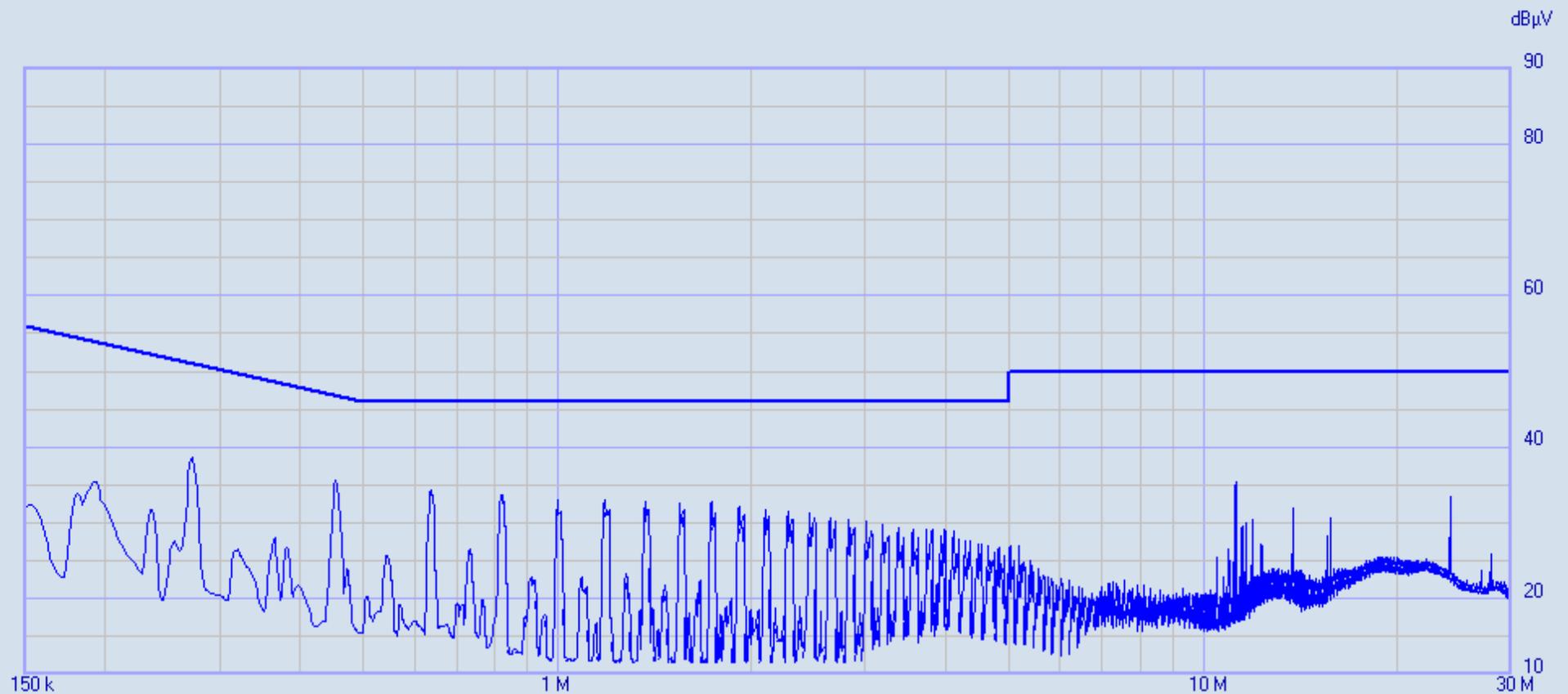
Manufacturer : Shure, Inc.
Model : PA421B 4-input Antenna Combiner
Notes : 240V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



8109 Shure Inc PA421B 240V 60Hz L2

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1500 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V AV

Factors:
LISN DLS#128
E-M L705
DLS #592
Cables 43 & 45

C-Avg —

8109 Shure Inc PA421B 240V 60Hz L2 17/06/2016 10:29:57
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 13 dB

	Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	FCC Class..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.2727	38.62	51.04	-12.42	0.80	9.97	1.43	0.07
2	0.45266	34.72	46.83	-12.11	0.50	9.95	0.99	0.12
3	0.454705	35.56	46.79	-11.23	0.49	9.95	0.99	0.12
4	0.45675	34.94	46.75	-11.81	0.49	9.95	0.99	0.12
5	0.634665	33.84	46.00	-12.16	0.40	9.96	0.75	0.15
6	0.63671	34.29	46.00	-11.71	0.40	9.96	0.75	0.15
7	0.638755	33.66	46.00	-12.34	0.40	9.96	0.74	0.15
8	0.81667	33.28	46.00	-12.72	0.35	9.96	0.61	0.17
9	0.818715	33.55	46.00	-12.45	0.35	9.96	0.61	0.17
10	0.82076	33.14	46.00	-12.86	0.35	9.96	0.61	0.17



Report issuing date : 6-17-2016

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 73 °F
Humidity : 45 %
Test Specs : Line 2, QP
Operator : Paul L
DLS Project # : 8109
Result : Pass

EUT

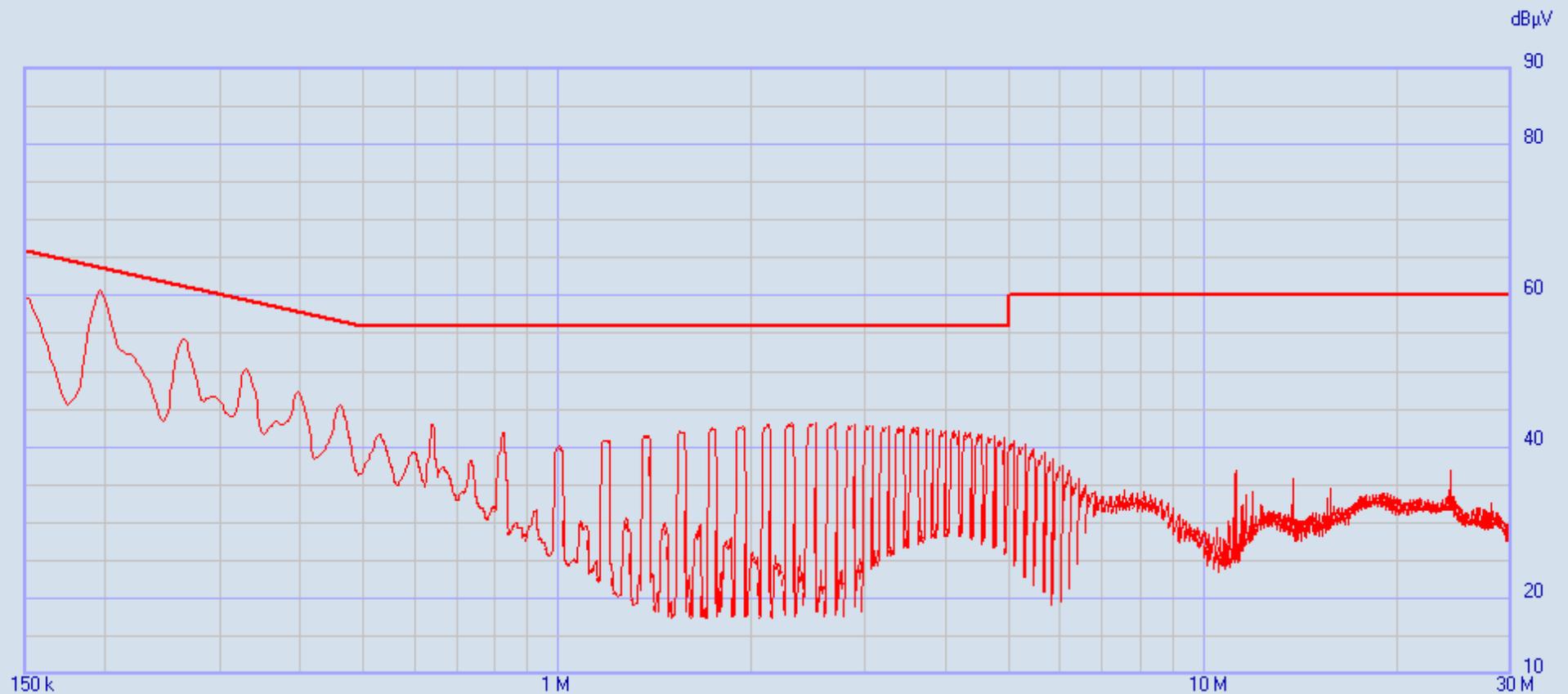
Manufacturer : Shure, Inc.
Model : PA421B 4-input Antenna Combiner
Notes : 240V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : <http://www.dlsemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



8109 Shure Inc PA421B 240V 60Hz L2

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1500 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V QP

Factors:
 LISN DLS#128
 E-M L705
 DLS #592
 Cables 43 & 45

QPeak —

8109 Shure Inc PA421B 240V 60Hz L2 17/06/2016 10:29:57
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 8 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBµV]	FCC Class..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBµV]		[dB]	[dB]	[dB]	[dB]
1	0.15	59.89	66.00	-6.11	1.74	9.87	2.16	0.17
2	0.152045	59.38	65.89	-6.51	1.70	9.86	2.13	0.16
3	0.15409	58.42	65.78	-7.36	1.67	9.86	2.09	0.15
4	0.1909	58.41	64.00	-5.59	1.24	9.80	1.74	0.03
5	0.192945	59.95	63.91	-3.96	1.22	9.81	1.73	0.03
6	0.19499	60.76	63.82	-3.06	1.21	9.81	1.72	0.03
7	0.197035	60.80	63.73	-2.93	1.19	9.82	1.71	0.03
8	0.19908	60.08	63.65	-3.57	1.18	9.82	1.70	0.03
9	0.201125	58.79	63.56	-4.77	1.16	9.83	1.68	0.03
10	0.20317	57.20	63.48	-6.28	1.15	9.83	1.67	0.03
11	0.205215	55.50	63.40	-7.90	1.13	9.84	1.66	0.03
12	0.26043	53.62	61.42	-7.80	0.84	9.96	1.45	0.06
13	0.262475	54.23	61.35	-7.12	0.84	9.96	1.45	0.06
14	0.26452	54.26	61.29	-7.03	0.83	9.96	1.45	0.06
15	0.266565	53.79	61.22	-7.43	0.82	9.96	1.44	0.07



Company: Shure Incorporated
Model Tested: PA421B
Report Number: 22304
Project Number: 8109

166 South Carter, Genoa City, WI 53128

Appendix C – Measurement Uncertainty

Compliance with the limits in this standard are based on the results of the compliance measurement. Our calculated measurement uncertainty including the measurement instrumentation, associated connections between the various instruments in the measurement chain, and other contributions, are provided in this section of the test report.

Parameter	Expanded Uncertainty (K=2)
Emission Bandwidth, Conducted	+/-1.14%
RF Output Power, Conducted	+/-1.36dB
Power Spectral Density, Conducted	+/-1.26dB
All Emissions, Radiated	+/-5.69dB
Duty Cycle	+/-0.05%



166 South Carter, Genoa City, WI 53128

Company: Shure Incorporated
Model Tested: PA421B
Report Number: 22304
Project Number: 8109

END OF REPORT

Revision #	Date	Comments	By
1.0	11-3-2016	Initial Release	PL