



Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

**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): PA821B
Model(s) Tested: PA821B
Serial Number(s): prototype sample
Date of Tests: May 20th 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
PA821B
22114
8112

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 large, looped "P" and a trailing "o".

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 large, looped "C" and a trailing "t".

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 large, looped "W" and a trailing "f".

William Stumpf
OATS Manager



Company: Shure Incorporated
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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

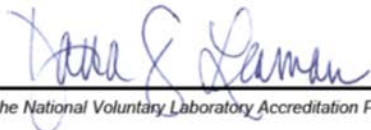
*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

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




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 PA821B, 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 (2.2.11)	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 20th to June 17th, 2016 the Antenna Combiner, Model PA821B, 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:	PA821B
Report Number:	22114
Project Number:	8112

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

Power Source:

100-240 Vac, 50-60 Hz

Internal Frequencies:

70-100 kHz, 225 kHz

Transmit Frequencies Used For Test Purpose:

471.125 MHz, 526.300 MHz, 697.875 MHz

475.000 MHz, 483.625 MHz, 489.975 MHz, 519.125 MHz, 541.875 MHz, 626.125 MHz

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	95A31572
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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
Preamplifier	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	Hewlett 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

Temperature Chamber

Description	Manufacturer	Model Number	Serial Number	Temperature Range	Cal Date	Cal Due Dates
Temperature Chamber	Tenney Engineering	BTC	SB10, 748-23	-70° C to +177° C	N/A	N/A
Digital Thermometer	Tenma	72-2060	723662	N/A	8-31-15	8-31-16

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 PA821B as provided from Shure Incorporated, tested from May 20th 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 PA821B

RF Conducted - 1



RF Conducted - 2

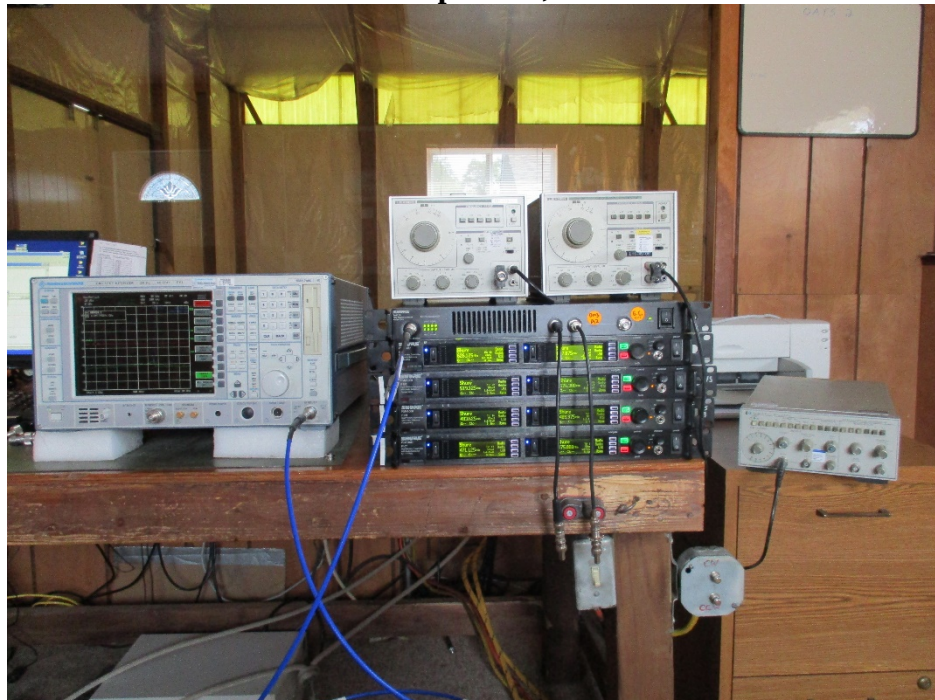


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Appendix A

Conducted Power

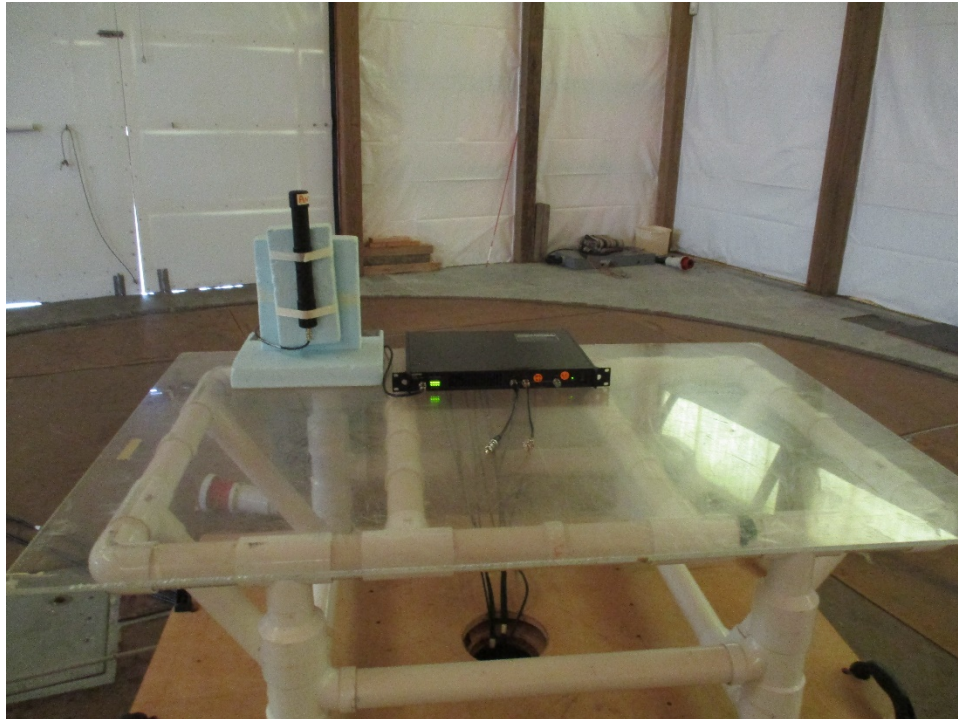


Conducted Spurious, 1-10 GHz



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Appendix A

Radiated – Front, 30-1000 MHz



Radiated – Back, 30-1000 MHz



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Appendix A

Radiated – Front, 1-7 GHz



Radiated – Back, 1-7 GHz

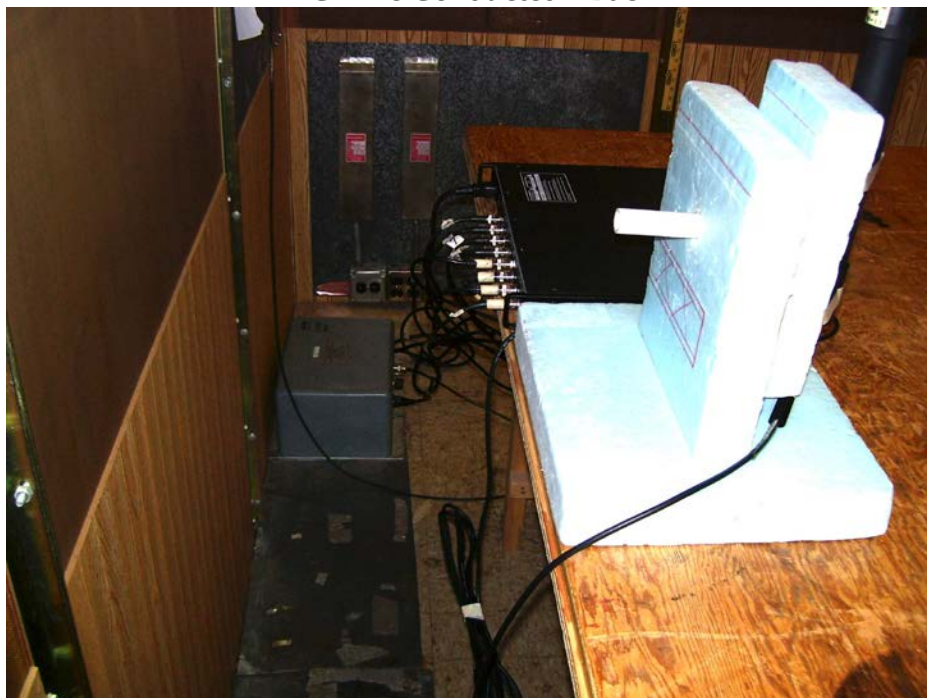


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Appendix A

AC Line Conducted - Front



AC Line Conducted - Back





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Appendix B – Measurement Data

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 offset factors set in the power meter.
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

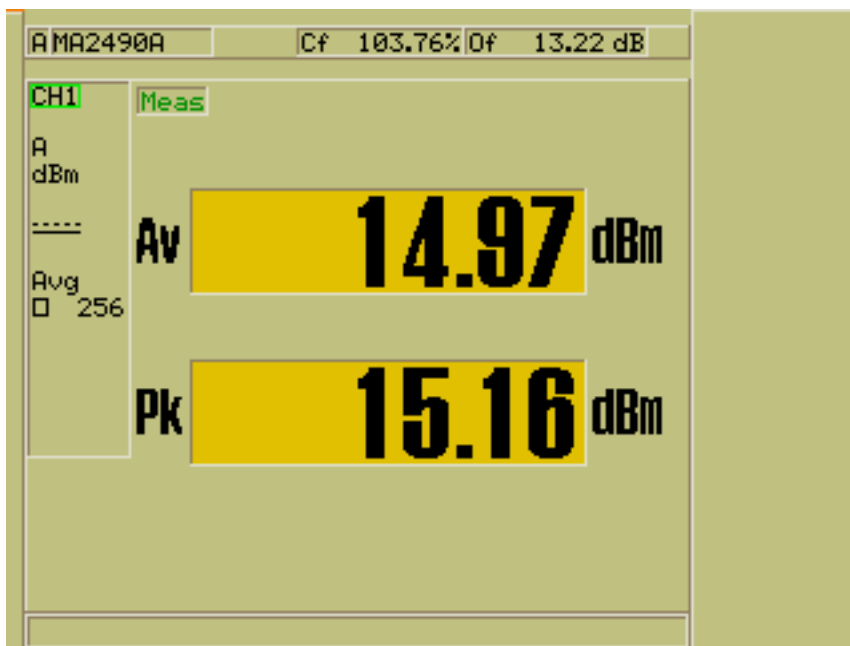


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
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Test Date: 05-20-2016
Company: Shure, Inc.
EUT: PA821B 8-input Combiner
Test: Peak Power Output - Conducted (Modulated 2.5kHz 16dB> 50%)
Rule part: FCC Part 74; FCC Part 2.1046
Operator: Paul L
Comment: Channel: 471.125MHz

Peak Output Power = 15.16dBm = 32.81mW



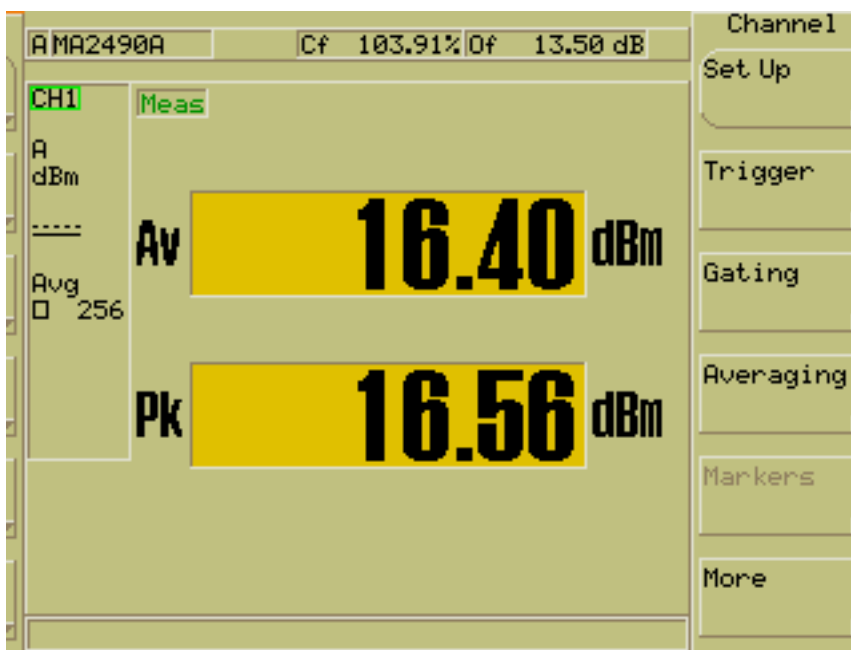


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-20-2016
Company: Shure, Inc.
EUT: PA821B 8-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: 526.300MHz

Peak Output Power = 16.56dBm = 45.29mW



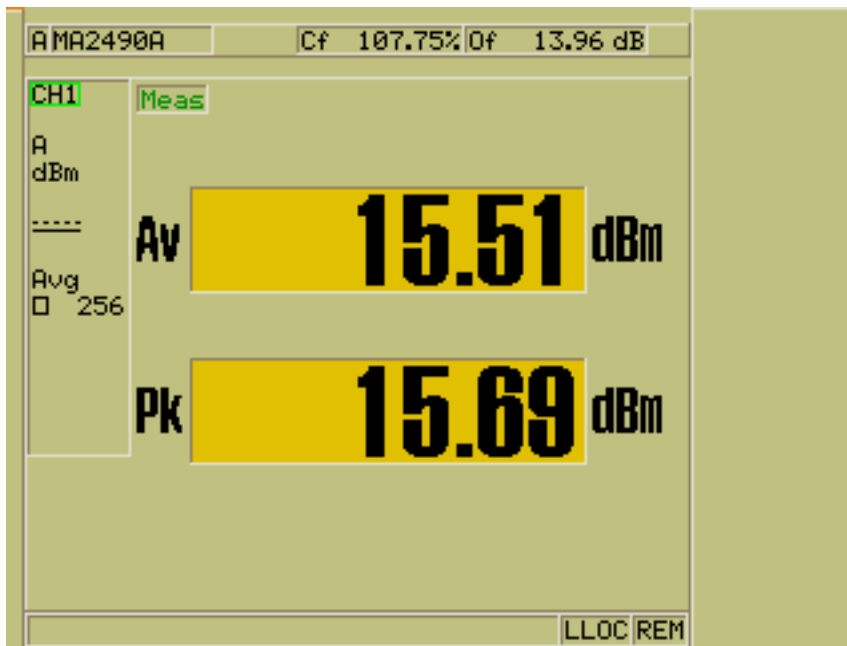


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-20-2016
Company: Shure, Inc.
EUT: PA821B 8-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 = 15.68dBm = 37.07mW





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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.

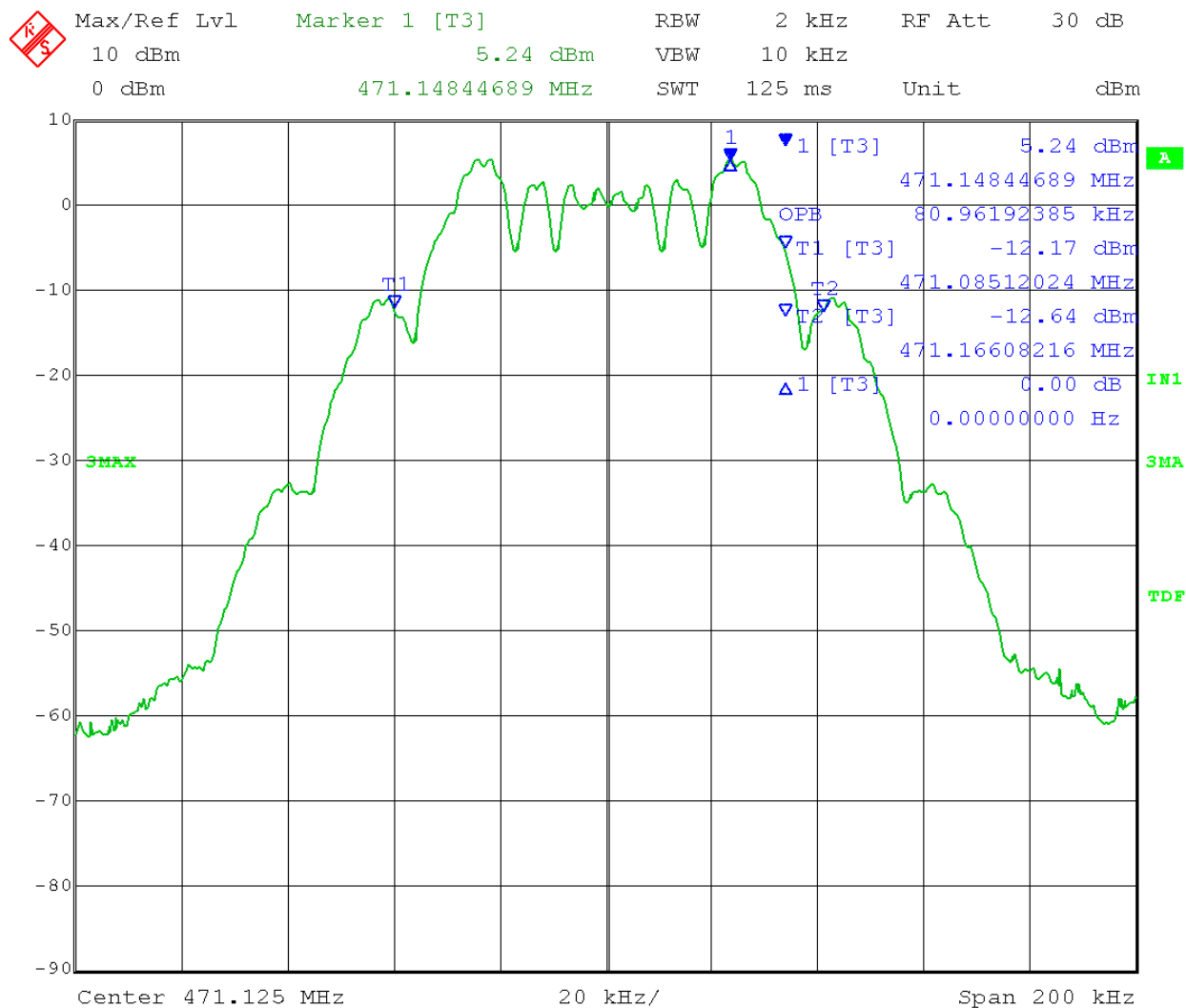


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth; 99% bandwidth
Rule part: FCC Part 74; FCC Part 2.1049
Operator: Paul L

Frequency: 471.125 MHz
Audio Input: Modulated 2.5kHz, 16dB> 50%)
99% power bandwidth = 80.96 kHz



Date: 21.MAY.2016 09:58:06

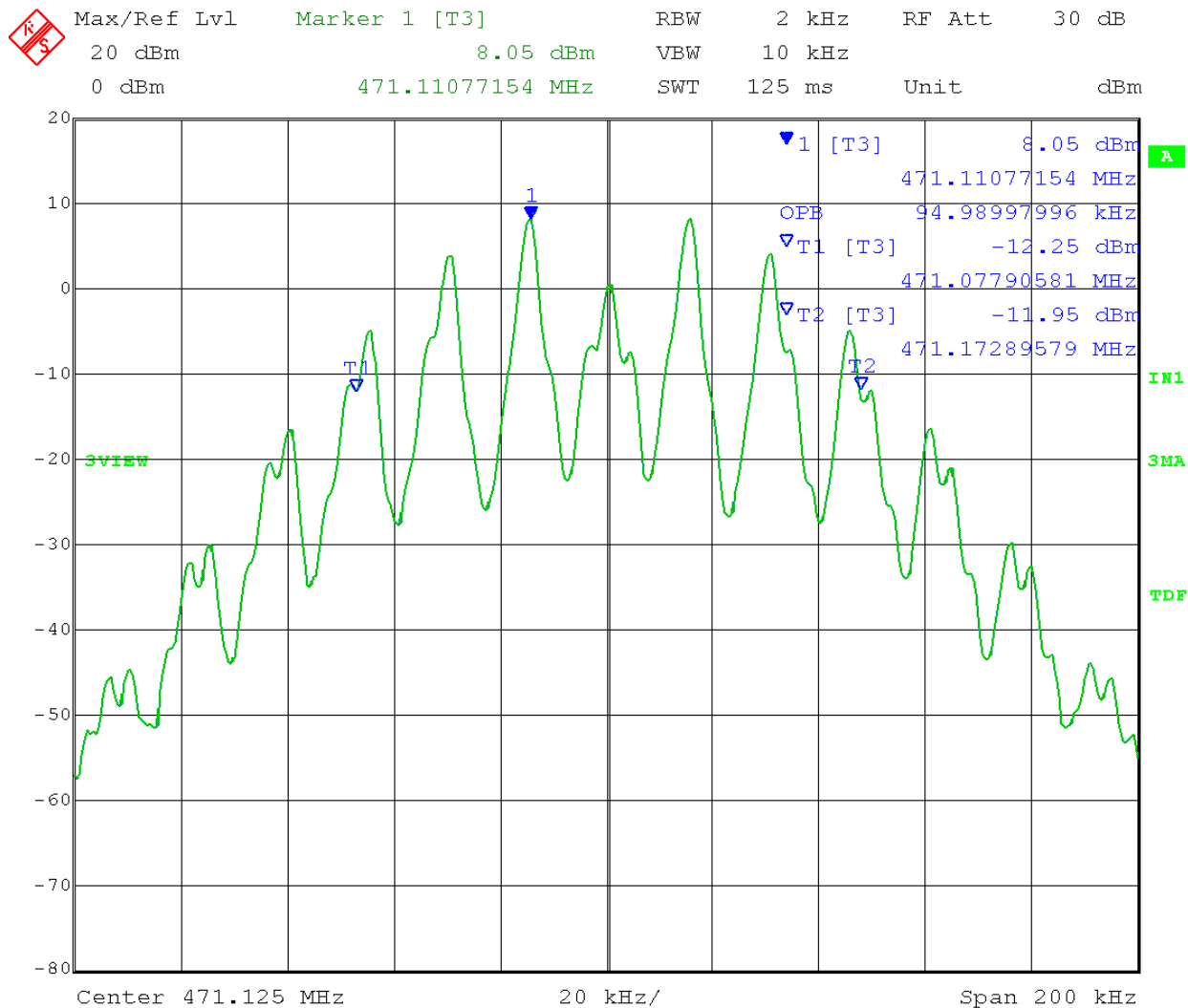


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B 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 = 94.99 kHz



Date: 21.MAY.2016 10:59:06

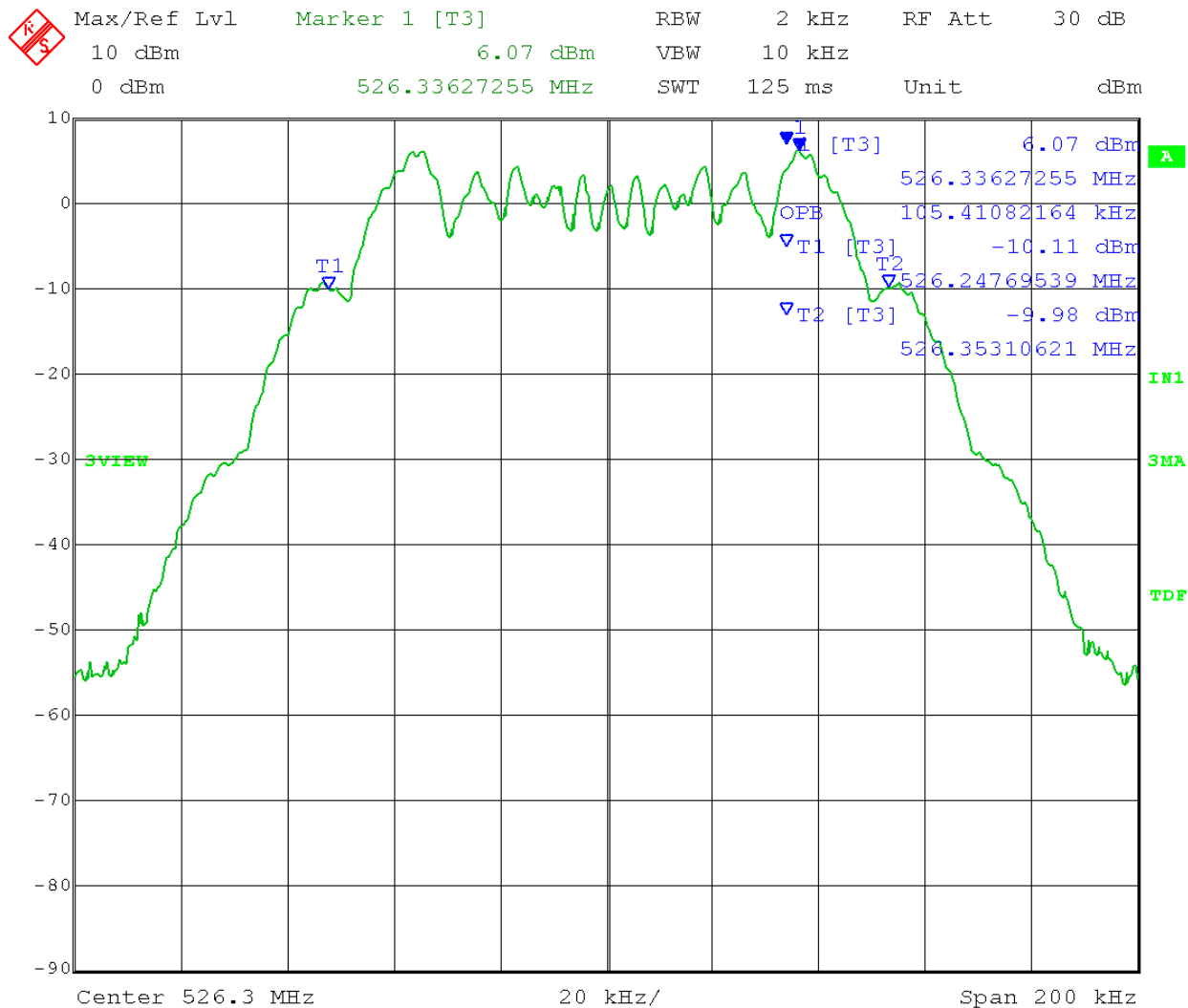


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth; 99% bandwidth
Rule part: FCC Part 74; FCC Part 2.1049
Operator: Paul L

Frequency: 526.300 MHz
Audio Input: Modulated 2.5kHz, 16dB> 50%)
99% power bandwidth = 105.41kHz



Date: 21.MAY.2016 11:38:31

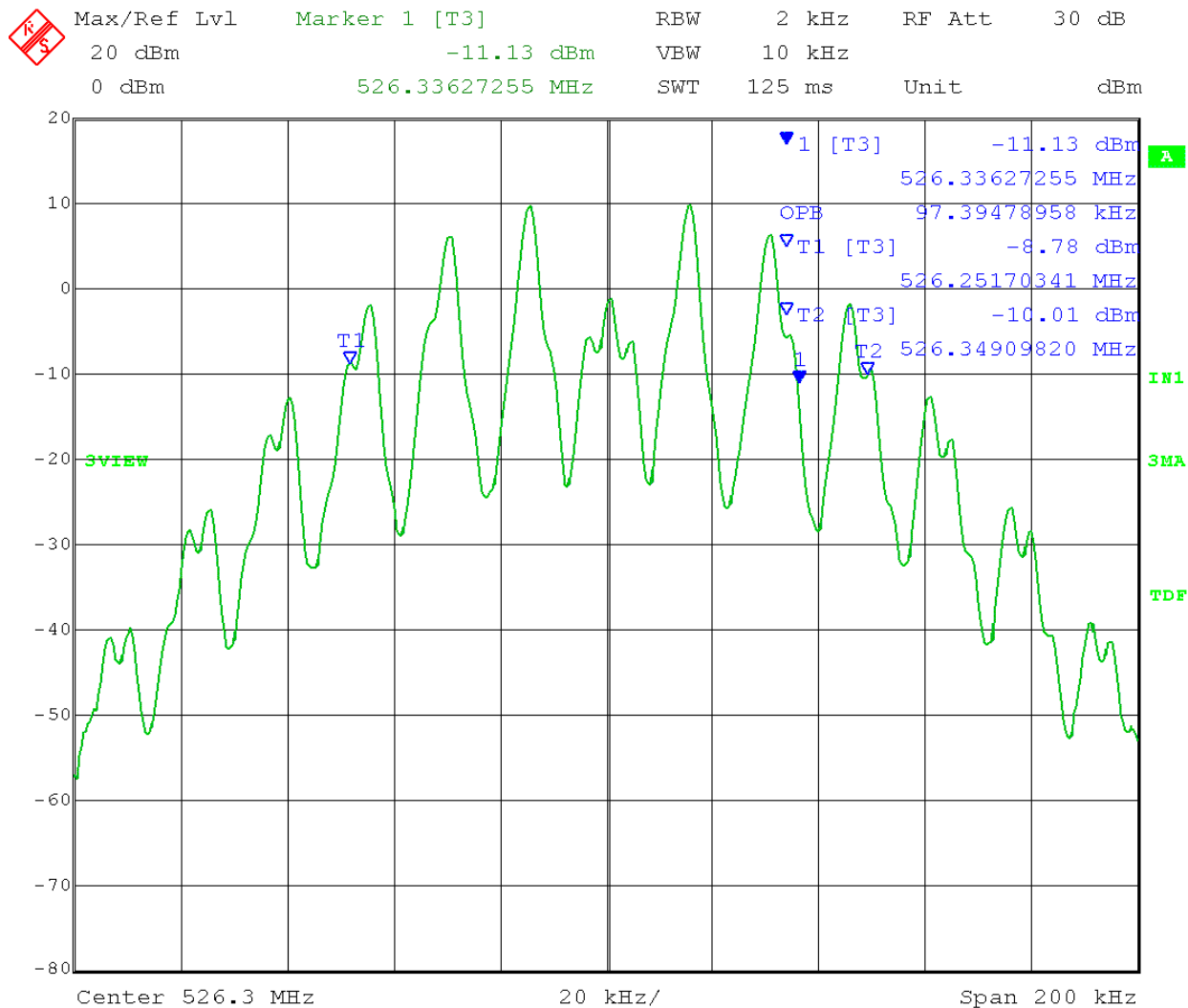


Company: Shure Incorporated
Model Tested: PA821B
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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth; 99% bandwidth
Rule part: FCC Part 74; FCC Part 2.1049
Operator: Paul L

Frequency: 526.300 MHz
Audio Input: Modulated 15kHz 85% Modulation
99% power bandwidth = 97.39kHz



Date: 21.MAY.2016 11:43:30

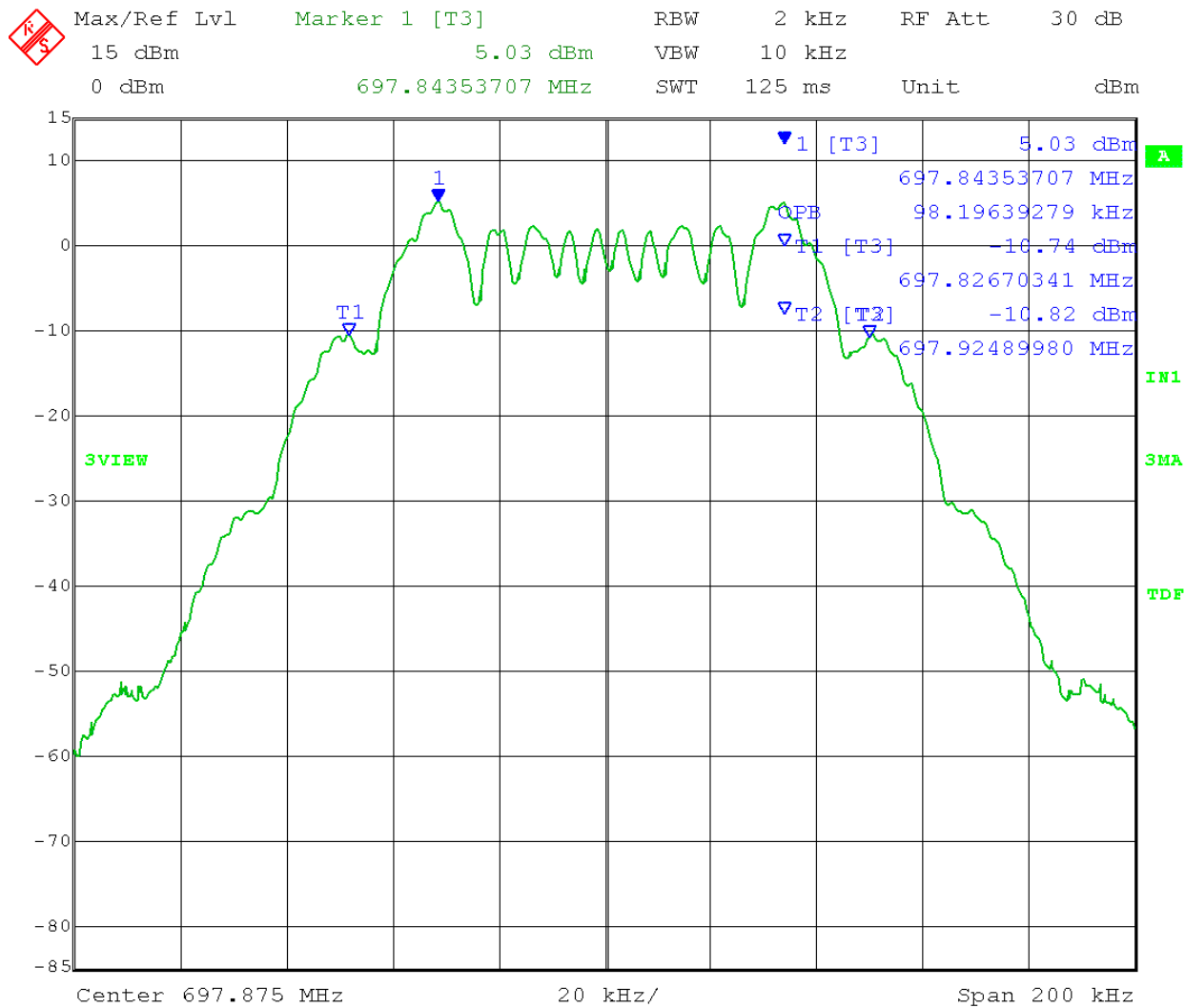


Company: Shure Incorporated
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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth; 99% bandwidth
Rule part: FCC Part 74; FCC Part 2.1049
Operator: Paul L

Frequency: 697.875MHz
Audio Input: Modulated 2.5kHz, 16dB> 50%)
99% power bandwidth = 98.196kHz



Date: 23.MAY.2016 10:22:14

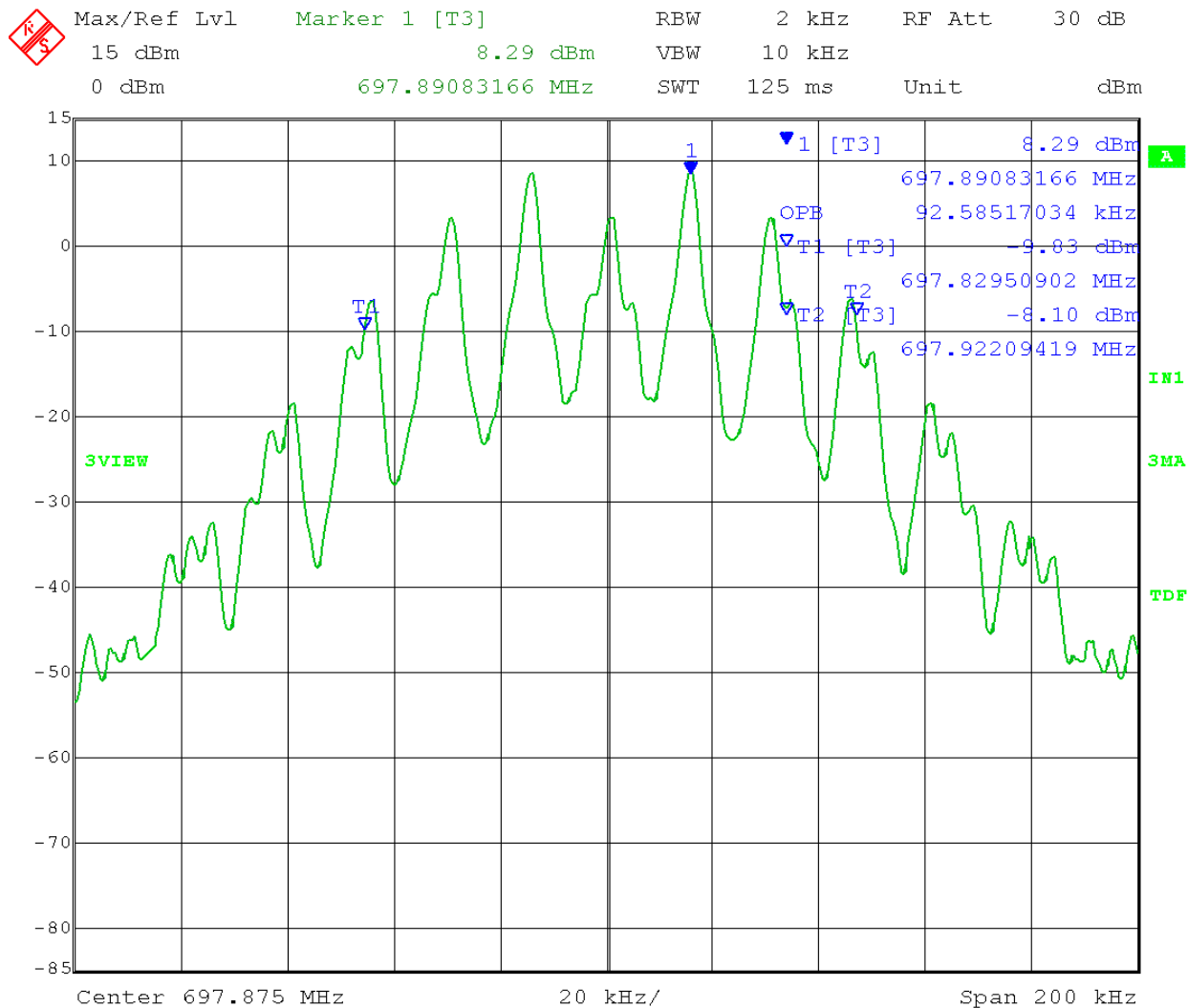


Company: Shure Incorporated
Model Tested: PA821B
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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth; 99% bandwidth
Rule part: FCC Part 74; FCC Part 2.1049
Operator: Paul L

Frequency: 697.875MHz
Audio Input: Modulated 15kHz 85% Modulation
99% power bandwidth = 92.585kHz



Date: 23.MAY.2016 10:30:49



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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 (2.2.11)

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.

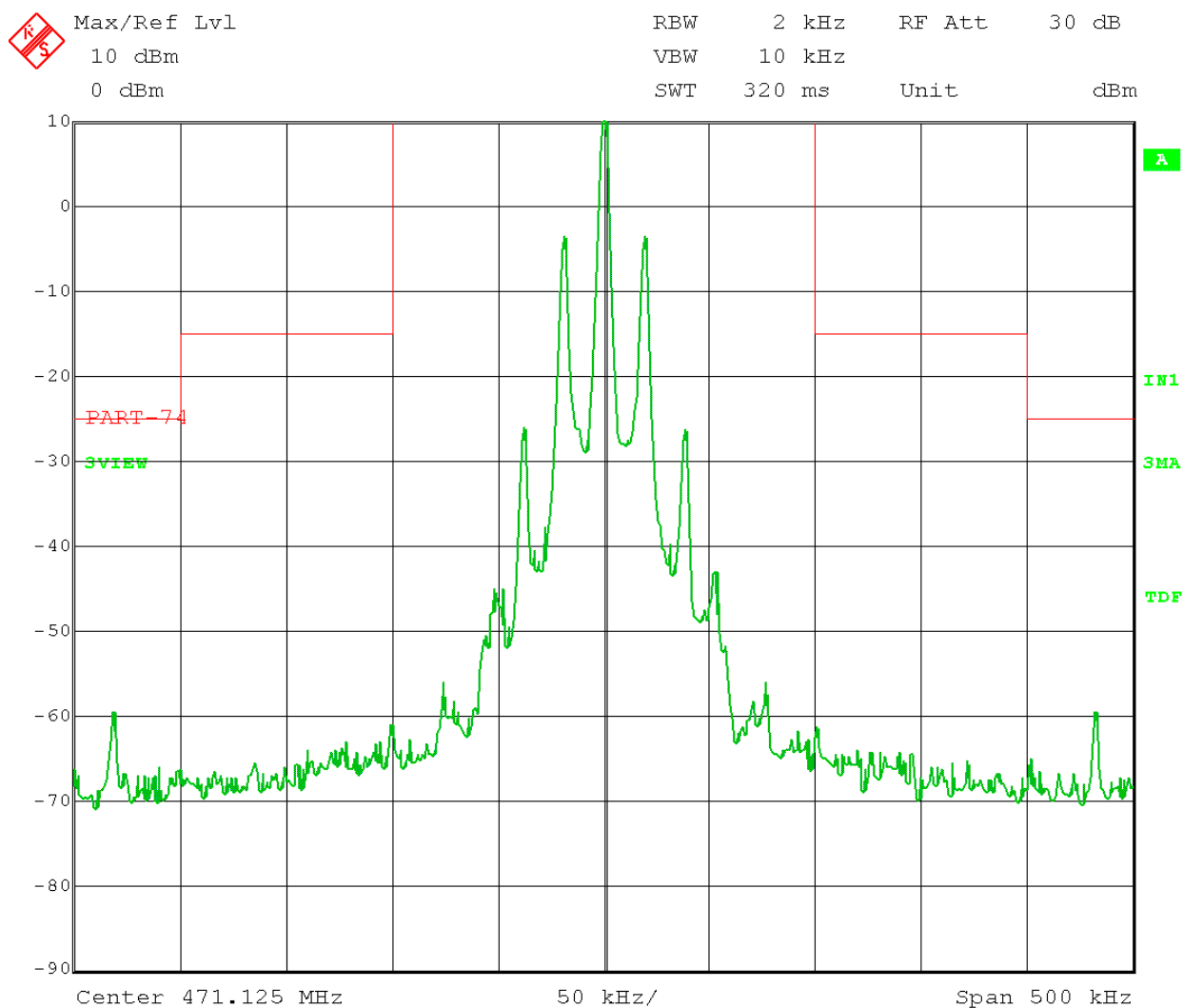


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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L

Frequency: 471.125 MHz
Audio Input: Unmodulated



Date: 21.MAY.2016 10:42:46

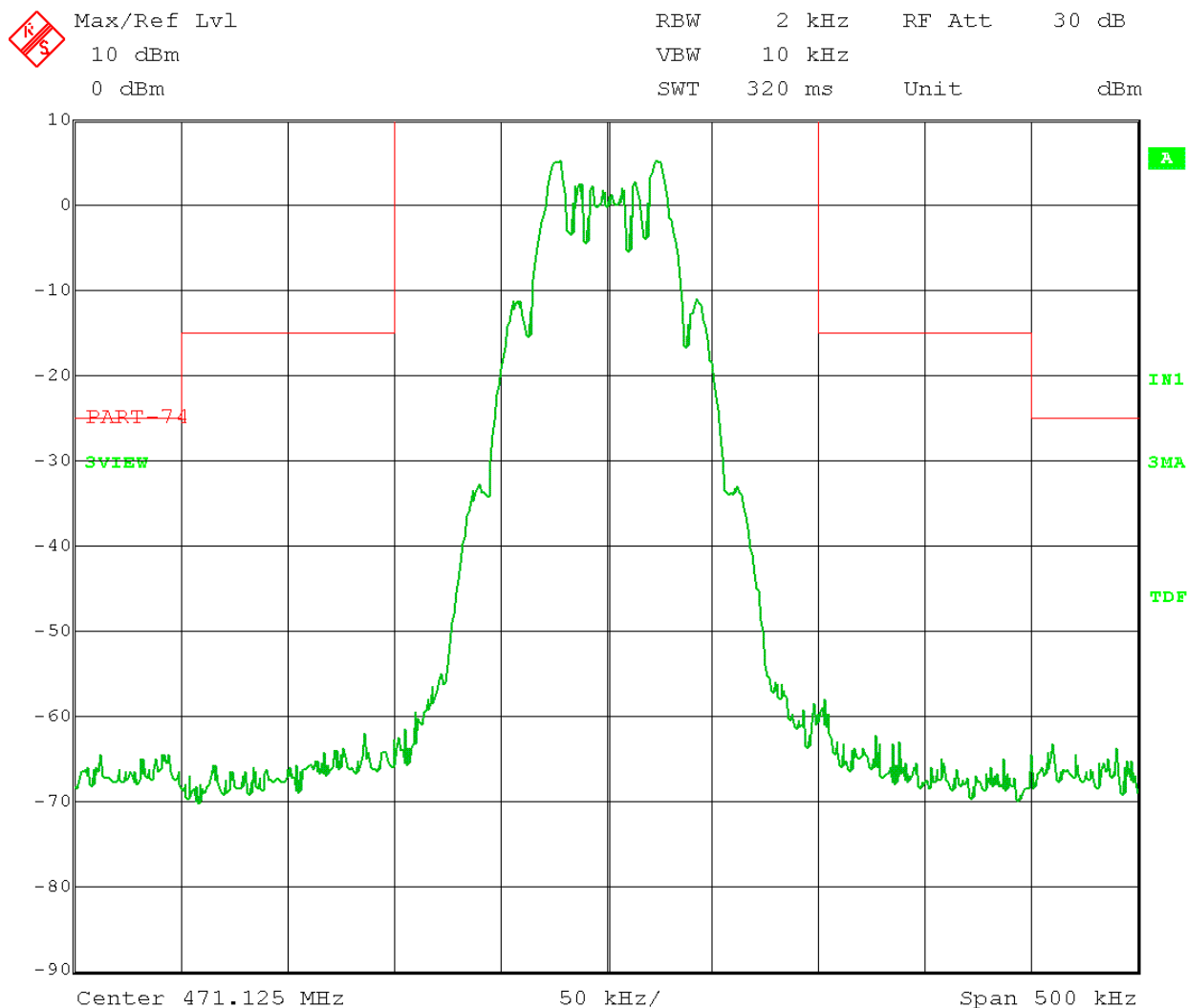


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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L

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



Date: 21.MAY.2016 10:36:56

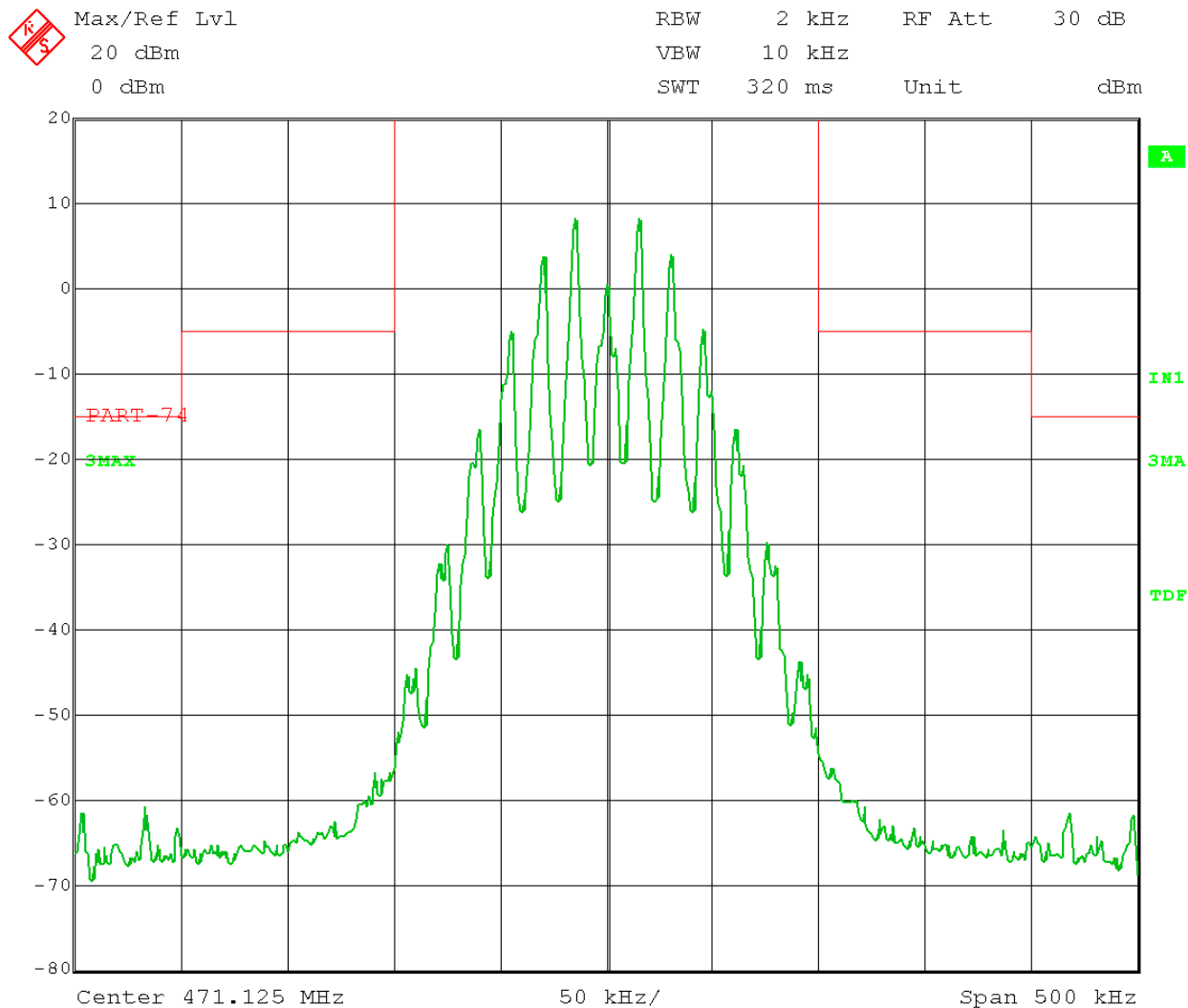


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Project Number: 8112

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Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B 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



Date: 21.MAY.2016 10:56:43

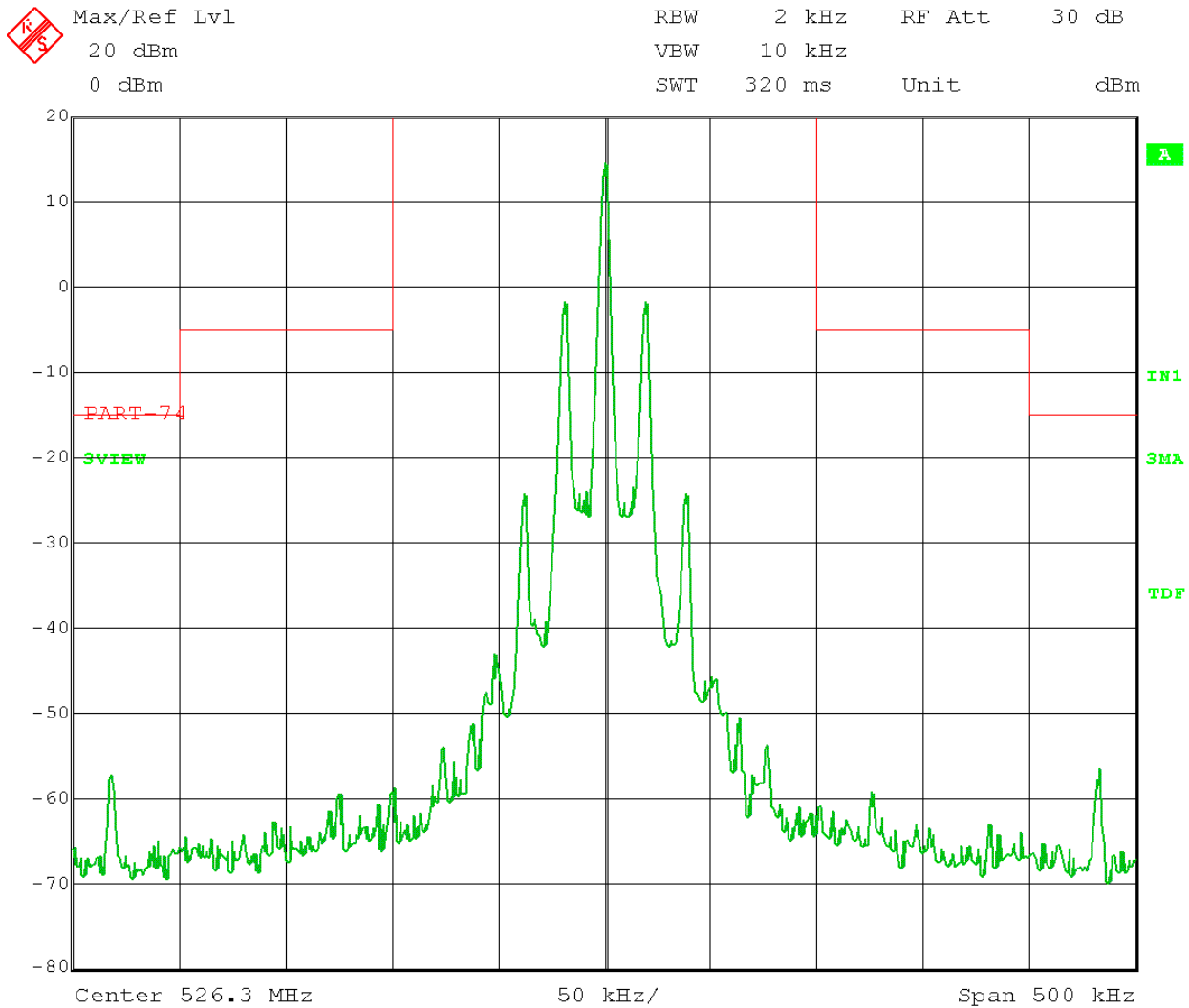


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L

Frequency: 526.300 MHz
Audio Input: Unmodulated



Date: 21.MAY.2016 11:29:59

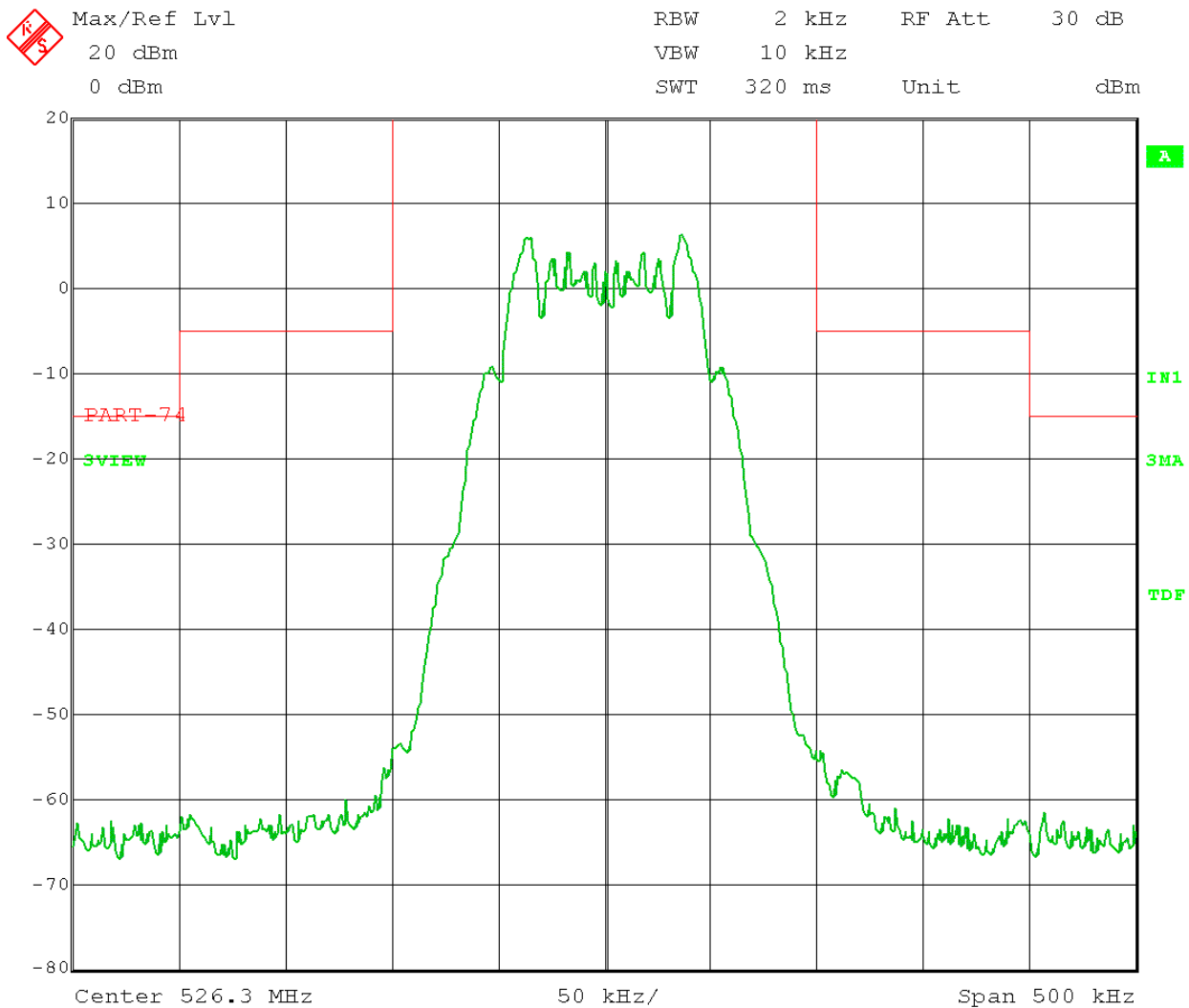


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L

Frequency: 526.300 MHz
Audio Input: Modulated 2.5kHz, 16dB> 50%)



Date: 21.MAY.2016 11:32:10

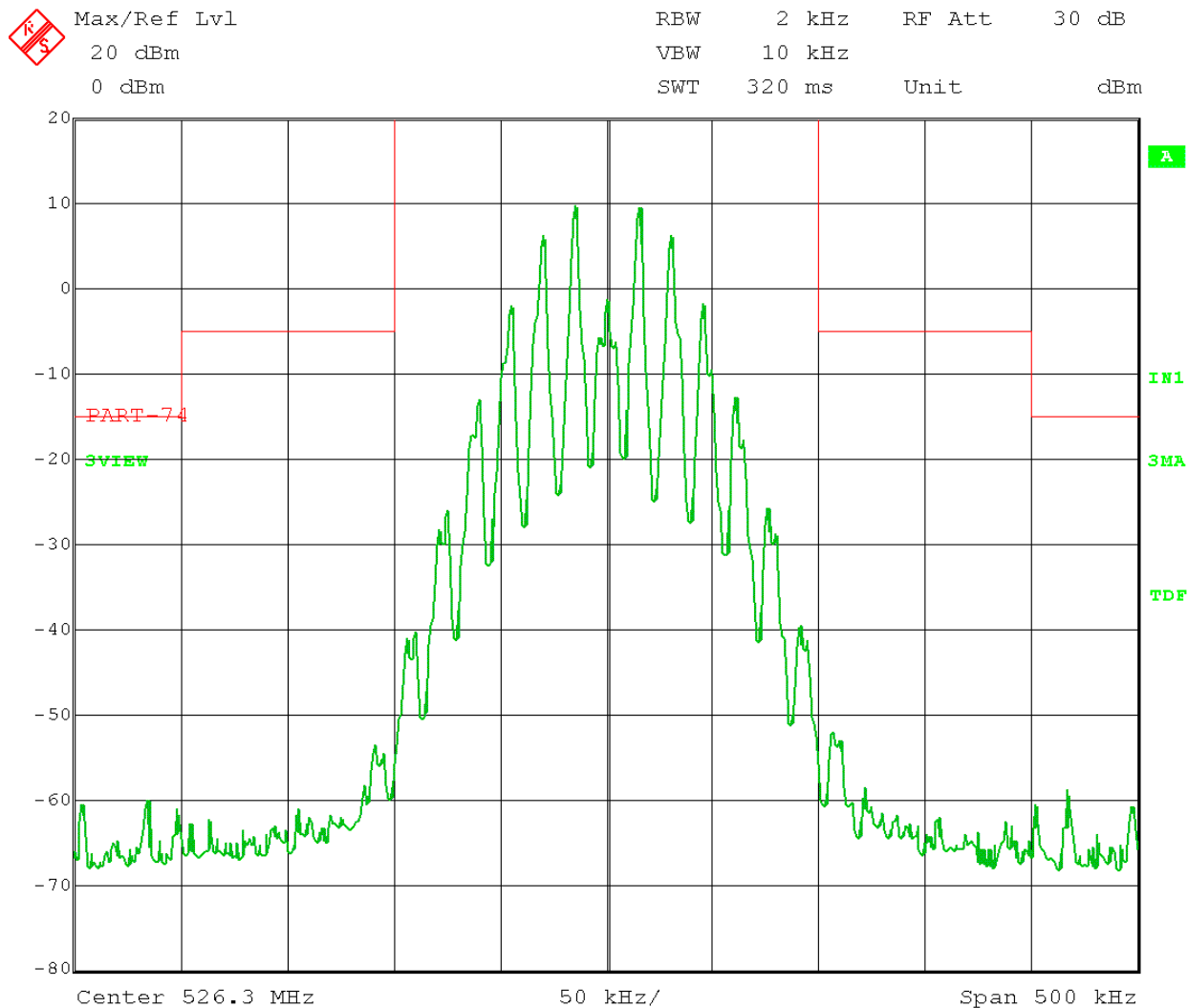


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L

Frequency: 526.300 MHz
Audio Input: Modulated 15kHz, 85% Modulated



Date: 21.MAY.2016 11:46:39

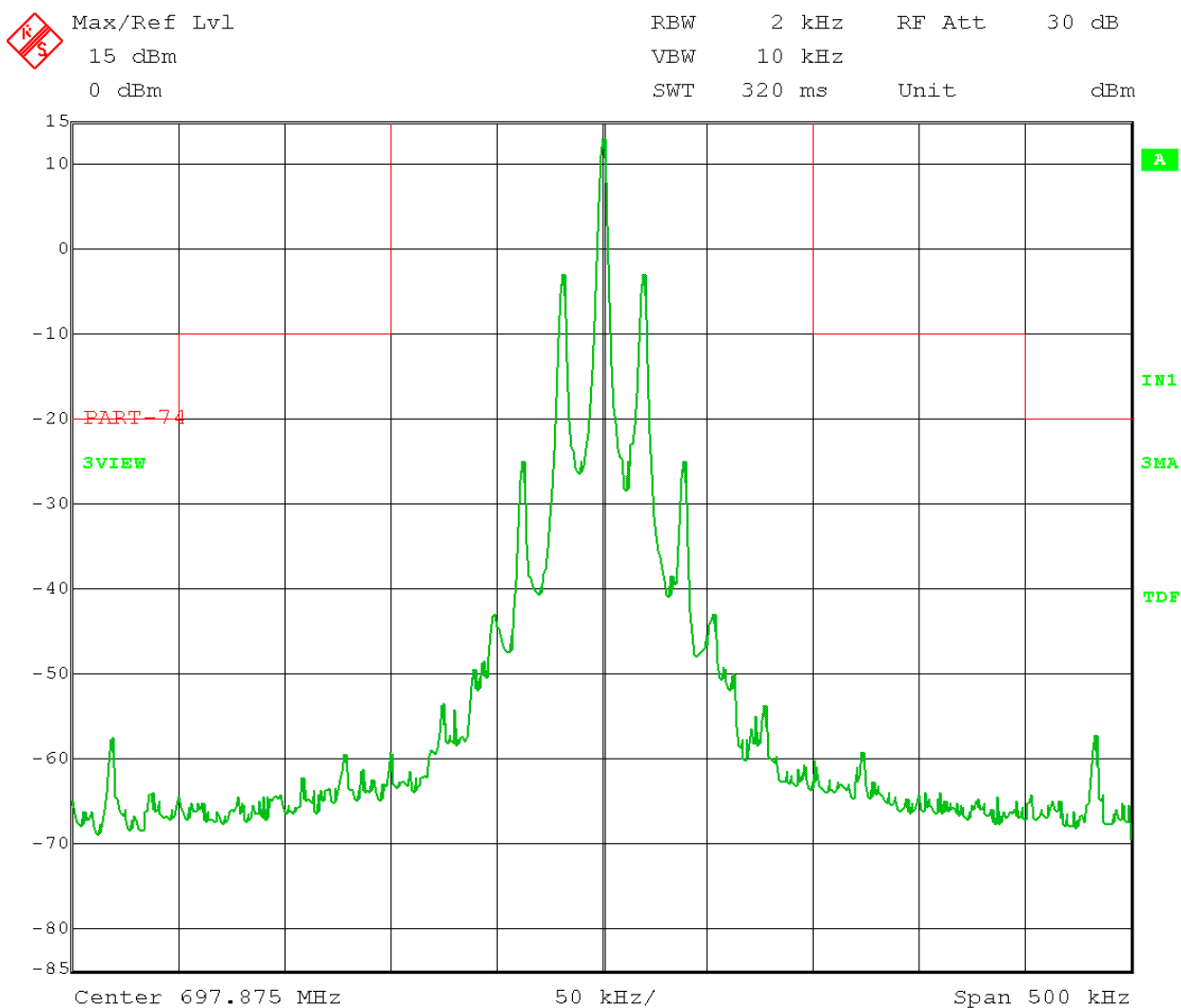


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Occupied Bandwidth
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L

Frequency: 697.875MHz
Audio Input: Unmodulated



Date: 23.MAY.2016 10:07:47

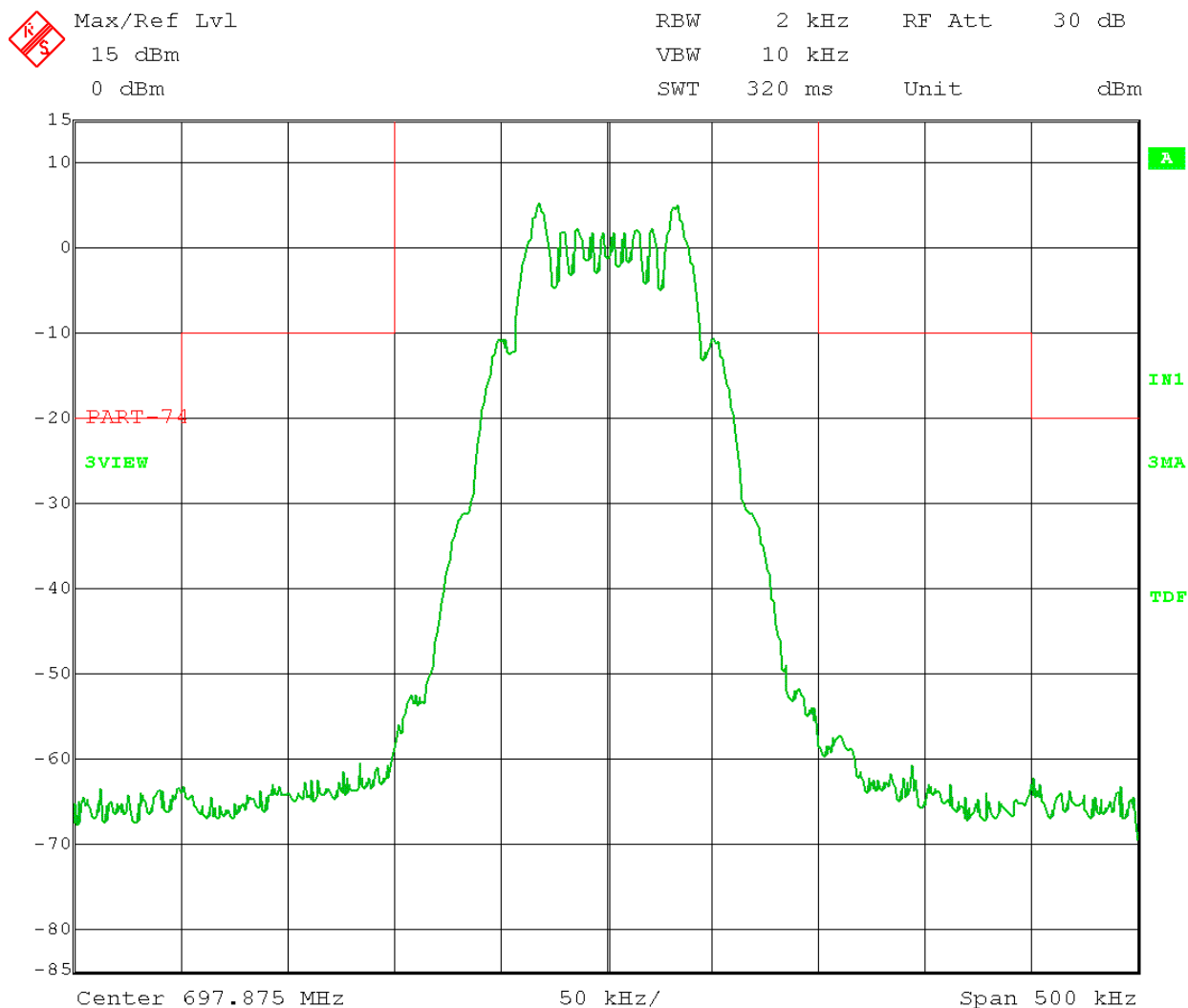


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B 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: 23.MAY.2016 10:20:35

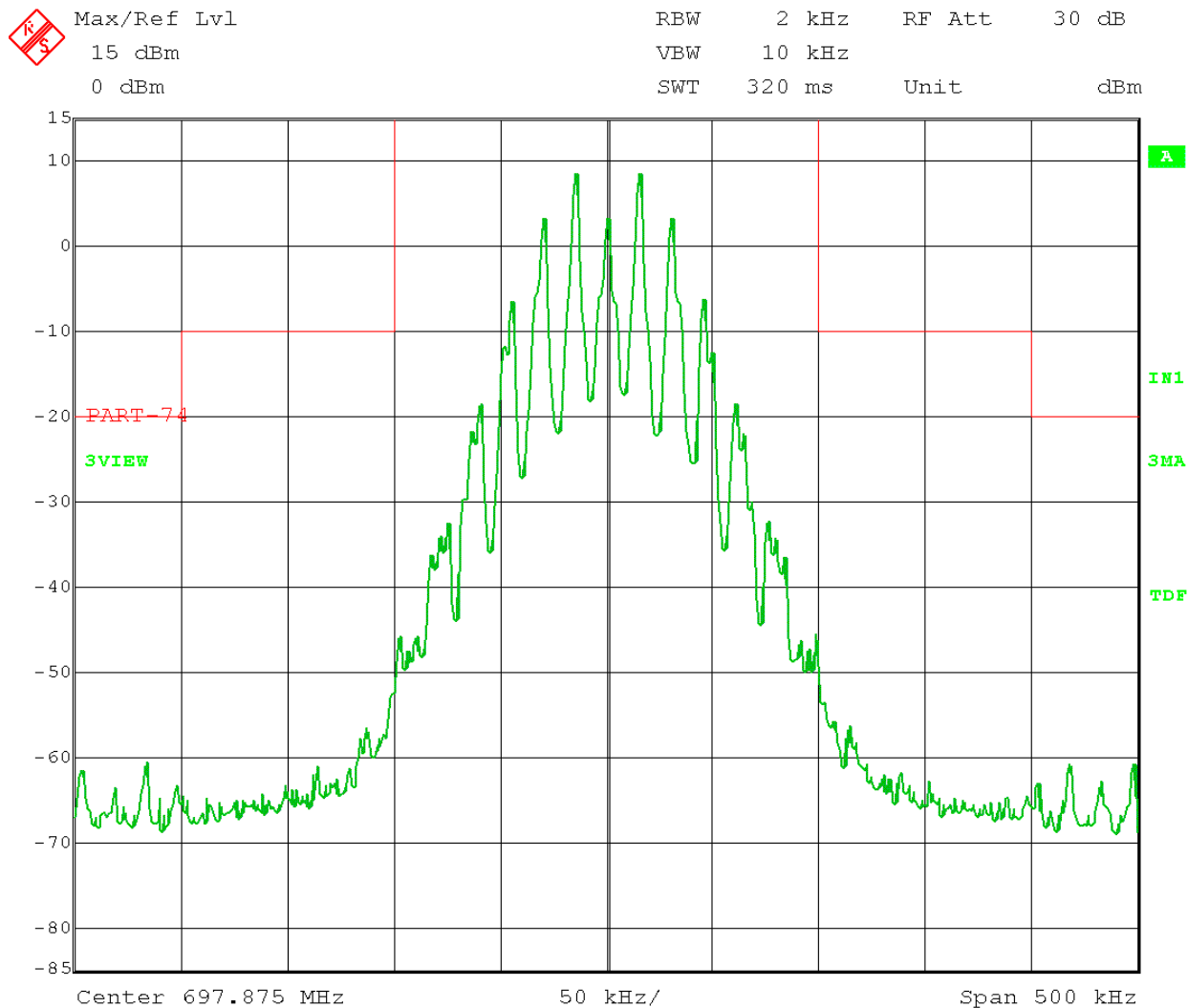


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-21-2016
Company: Shure, Inc.
EUT: PA821B 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



Date: 23.MAY.2016 10:34:05



Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

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.

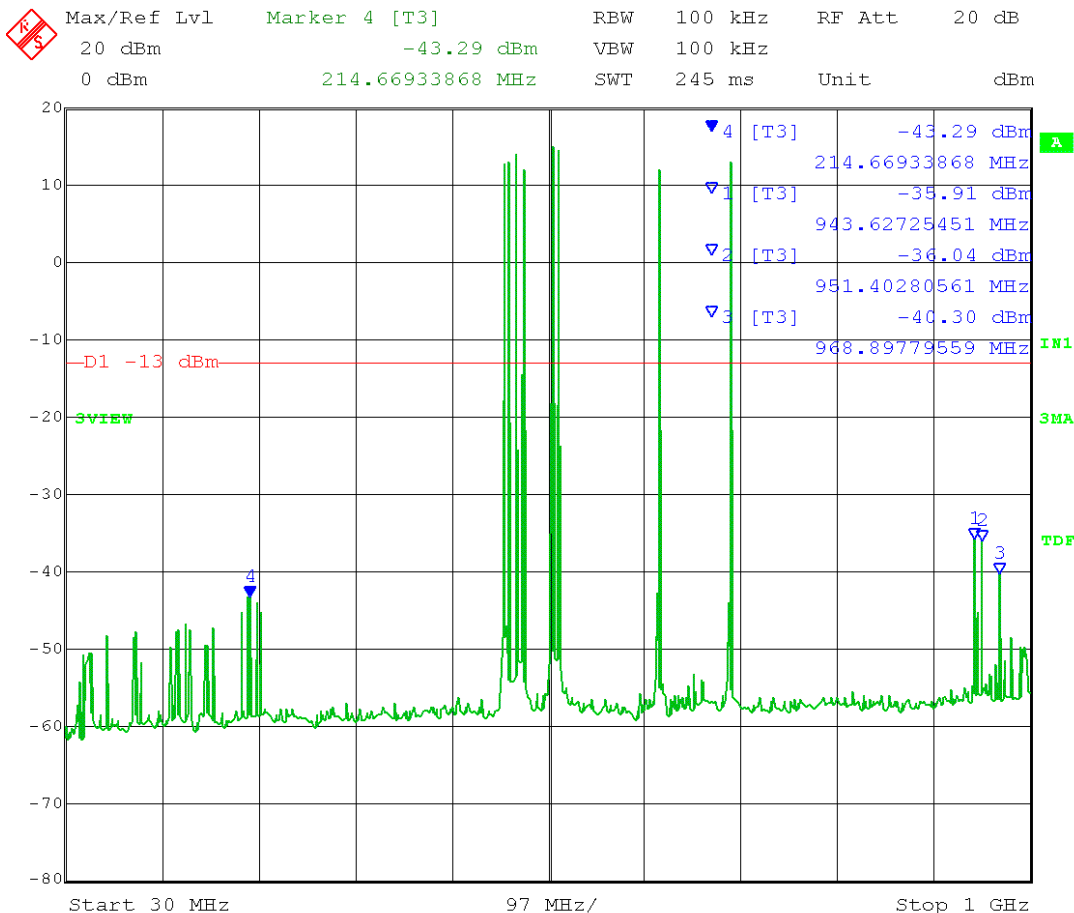
The EUT was tested in two configurations: 1) A transmitted signal passed through all available channels unmodulated. 2) A transmitted signal passed through all channels with three channels modulated at 2.5kHz 16dB >50% modulation.



Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-23-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Spurious Emissions - Conducted
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L
Comment: Inputs: 471.125 MHz
475.00 MHz
483.625 MHz
489.975 MHz
519.125MHz
526.300MHz
626.125MHz
697.875MHz
Frequency Range: 30 to 1000 MHz
Limit = -13 dBm



Date: 23.MAY.2016 11:25:14



Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

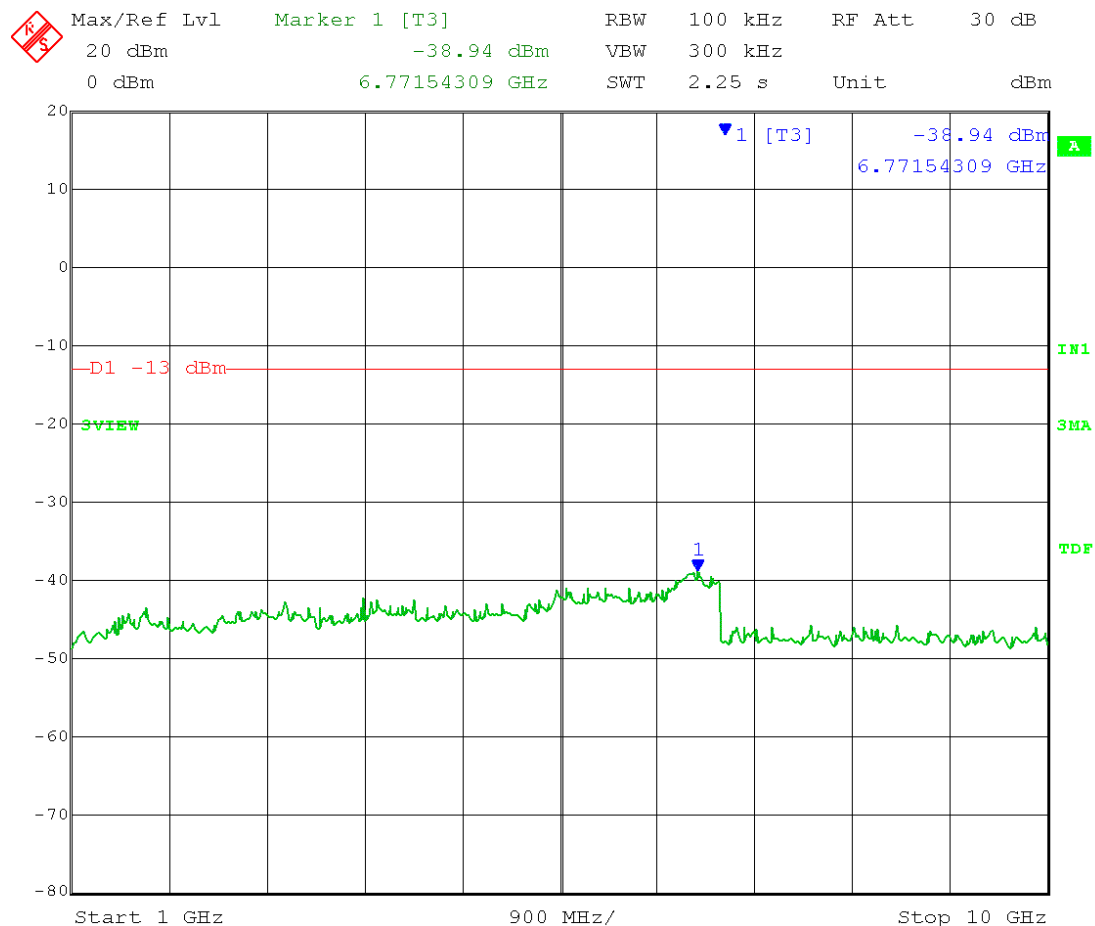
166 South Carter, Genoa City, WI 53128

Test Date: 05-23-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Spurious Emissions - Conducted
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L
Comment: Inputs: 471.125 MHz

475.00 MHz
483.625 MHz
489.975 MHz
519.125MHz
526.300MHz
626.125MHz
697.875MHz

Frequency Range: 1-10GHz

Limit = -13 dBm



Date: 23.MAY.2016 15:22:55

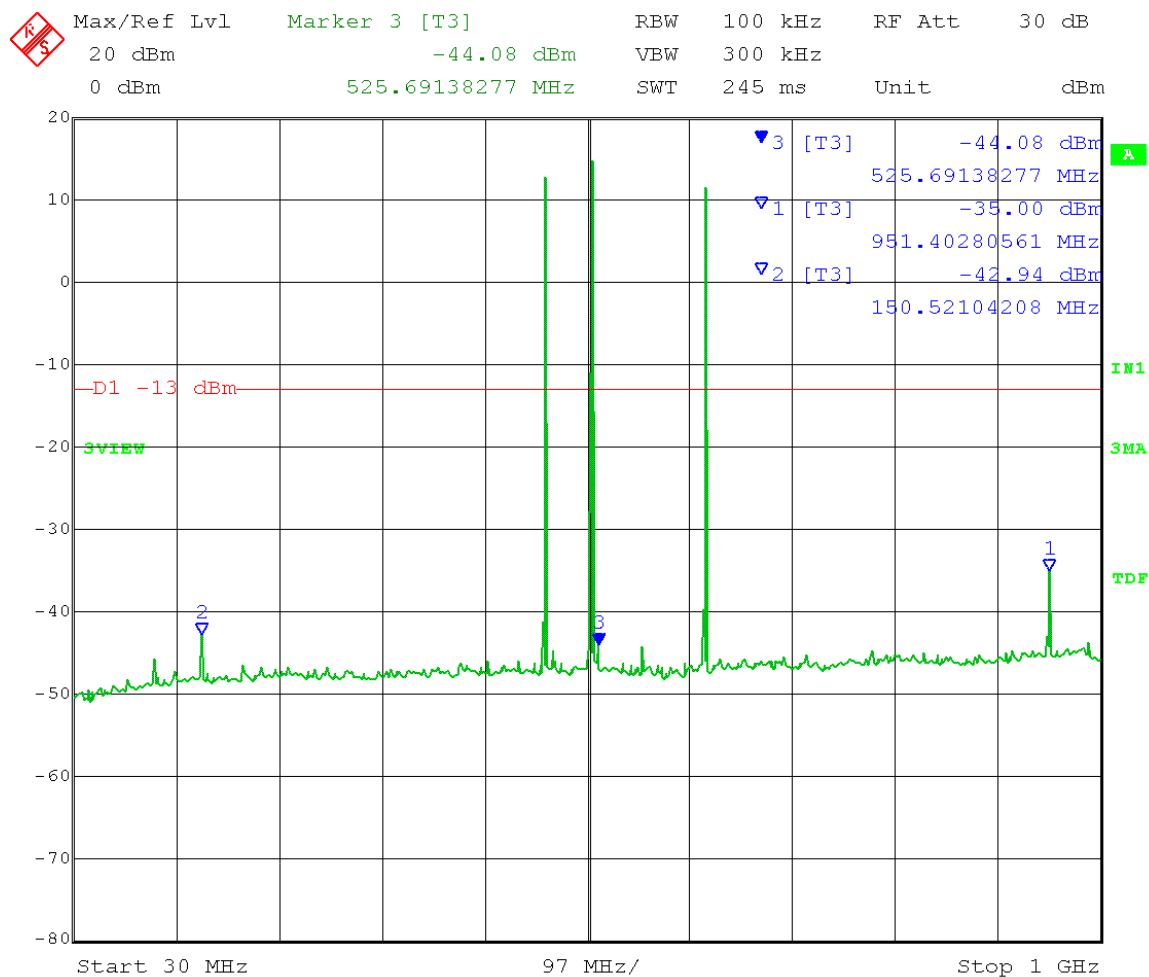


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-23-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Intermodulation – 3 signal test. (2.5kHz 16dB >50% modulation)
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L
Comment: Modulated Inputs: 475.0 MHz
519.125MHz
626.125 MHz

Frequency Range: 30 to 1000 MHz
Limit = -13 dBm



Date: 23.MAY.2016 14:39:26

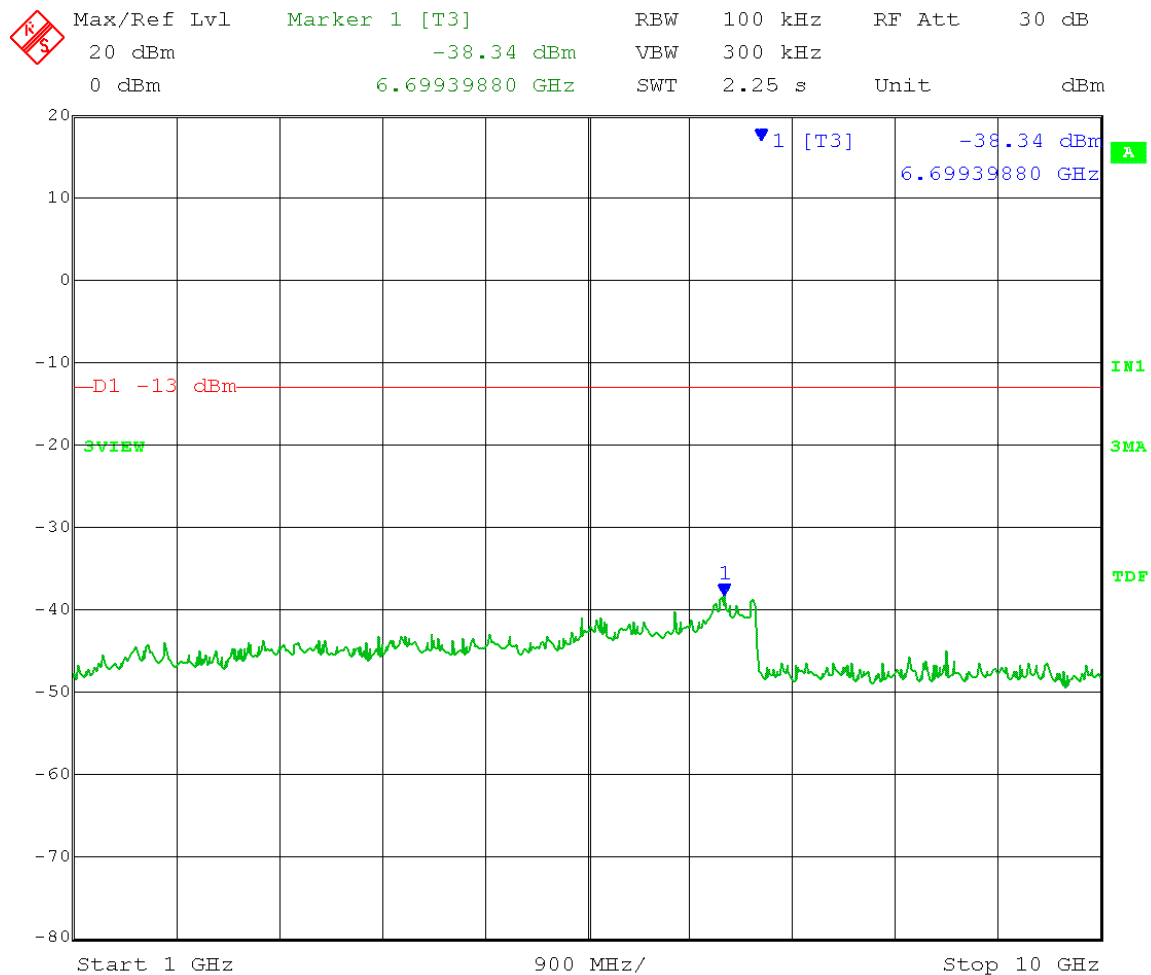


Company: Shure Incorporated
Model Tested: PA821B
Report Number: 22114
Project Number: 8112

166 South Carter, Genoa City, WI 53128

Test Date: 05-23-2016
Company: Shure, Inc.
EUT: PA821B Antenna Combiner
Test: Intermodulation – 3 signal test. (2.5kHz 16dB >50% modulation)
Rule part: FCC Part 74; FCC Part 2.1051
Operator: Paul L
Comment: Modulated Inputs: 475.0 MHz
519.125MHz
626.125 MHz

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



Date: 23.MAY.2016 15:14:47



Company:	Shure Incorporated
Model Tested:	PA821B
Report Number:	22114
Project Number:	8112

166 South Carter, Genoa City, WI 53128

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: PA821B
 Report Number: 22114
 Project Number: 8112

166 South Carter, Genoa City, WI 53128

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

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

Model: PA821B Transmit Frequency (MHz): 471.125, 483.625, 489.975, 519.125, 526.30, 541.875, 626.125, 697.875								
	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	43.2	-53.2	2.0	2.2	-55.2	-13.0	42.2	0.00301
84.24 horizontal	37.1	-61.2	2.0	2.2	-63.2	-13.0	50.2	0.00048
226.76 vertical	45.2	-47.3	3.6	2.2	-50.9	-13.0	37.9	0.00820
226.76 horizontal	45.9	-52.5	3.6	2.2	-56.1	-13.0	43.1	0.00248
942.26 vertical	62.3	-30.2	8.0	2.2	-38.2	-13.0	25.2	0.15171
942.26 horizontal	62.0	-30.3	8.0	2.2	-38.3	-13.0	25.3	0.14825
967.28 vertical	55.9	-38.8	8.0	2.2	-46.8	-13.0	33.8	0.02109
967.28 horizontal	56.2	-37.3	8.0	2.2	-45.3	-13.0	32.3	0.02979
979.94 vertical	55.8	-38.0	7.7	2.2	-45.7	-13.0	32.7	0.02673
979.94 horizontal	56.3	-37.4	7.7	2.2	-45.1	-13.0	32.1	0.03069
1052.8 horizontal	51.7	-55.4	1.9	6.7	-52.7	-13.0	39.7	0.00535
1252.4 vertical	34.3	-68.9	2.0	7.1	-65.9	-13.0	52.9	0.00026
1578.8 vertical	35.7	-66.9	2.3	8.8	-62.5	-13.0	49.5	0.00056
1578.8 horizontal	38.1	-64.3	2.3	8.7	-60.0	-13.0	47.0	0.00100
2105.2 vertical	37.5	-64.3	2.7	9.2	-60.0	-13.0	47.0	0.00101

EIRP = Signal generator output - cable loss + antenna gain

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



Company:	Shure Incorporated
Model Tested:	PA821B
Report Number:	22114
Project Number:	8112

166 South Carter, Genoa City, WI 53128

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 Class B
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 # : 8112
Result : Pass

EUT

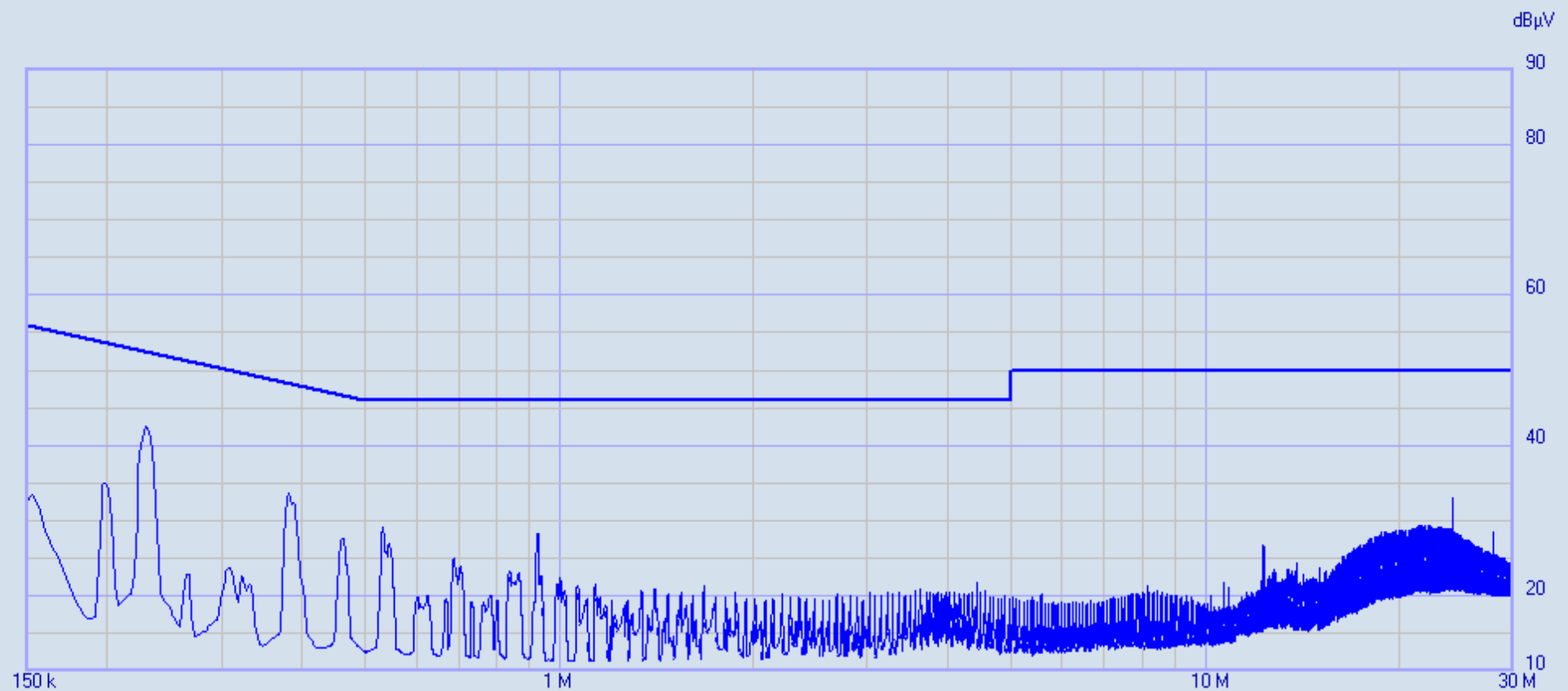
Manufacturer : Shure, Inc.
Model : PA821B 8-input Antenna Combiner
Notes : 120V 60 Hz

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.



8112 Shure Inc PA821B 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

8112 Shure Inc PA821B 120V 60Hz L1 17/06/2016 12:41:03
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 18 dB

	Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.22362	36.67	52.68	-16.01	1.02	9.82	1.54	0.09
2	0.225665	40.13	52.61	-12.48	1.01	9.82	1.53	0.10
3	0.22771	41.71	52.53	-10.82	1.00	9.81	1.51	0.11
4	0.229755	42.60	52.46	-9.86	0.99	9.81	1.50	0.12
5	0.2318	41.79	52.38	-10.59	0.97	9.82	1.49	0.12
6	0.233845	39.49	52.31	-12.82	0.96	9.83	1.49	0.11
7	0.23589	36.50	52.24	-15.74	0.95	9.84	1.48	0.11
8	0.376995	30.73	48.35	-17.62	0.58	9.97	1.15	0.09
9	0.37904	32.69	48.30	-15.61	0.57	9.97	1.15	0.09
10	0.381085	33.63	48.26	-14.63	0.57	9.97	1.14	0.09
11	0.38313	33.06	48.21	-15.15	0.57	9.97	1.14	0.09
12	0.385175	32.11	48.17	-16.06	0.57	9.97	1.14	0.09
13	0.38722	32.32	48.12	-15.80	0.56	9.97	1.13	0.10
14	0.389265	32.18	48.08	-15.90	0.56	9.97	1.13	0.10
15	0.39131	31.05	48.04	-16.99	0.56	9.97	1.13	0.10
16	0.532415	29.03	46.00	-16.97	0.45	9.96	0.88	0.14
17	0.53446	29.04	46.00	-16.96	0.45	9.96	0.88	0.14
18	0.92301	28.13	46.00	-17.87	0.34	9.96	0.57	0.18
19	0.925055	28.18	46.00	-17.82	0.34	9.96	0.57	0.18
20	24.000835	32.92	50.00	-17.08	0.37	10.15	0.46	0.89
21	24.00288	32.94	50.00	-17.06	0.37	10.15	0.46	0.89



Report issuing date : 6-17-2016

Standard : FCC Part 15.207 Class B
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 # : 8112
Result : Pass

EUT

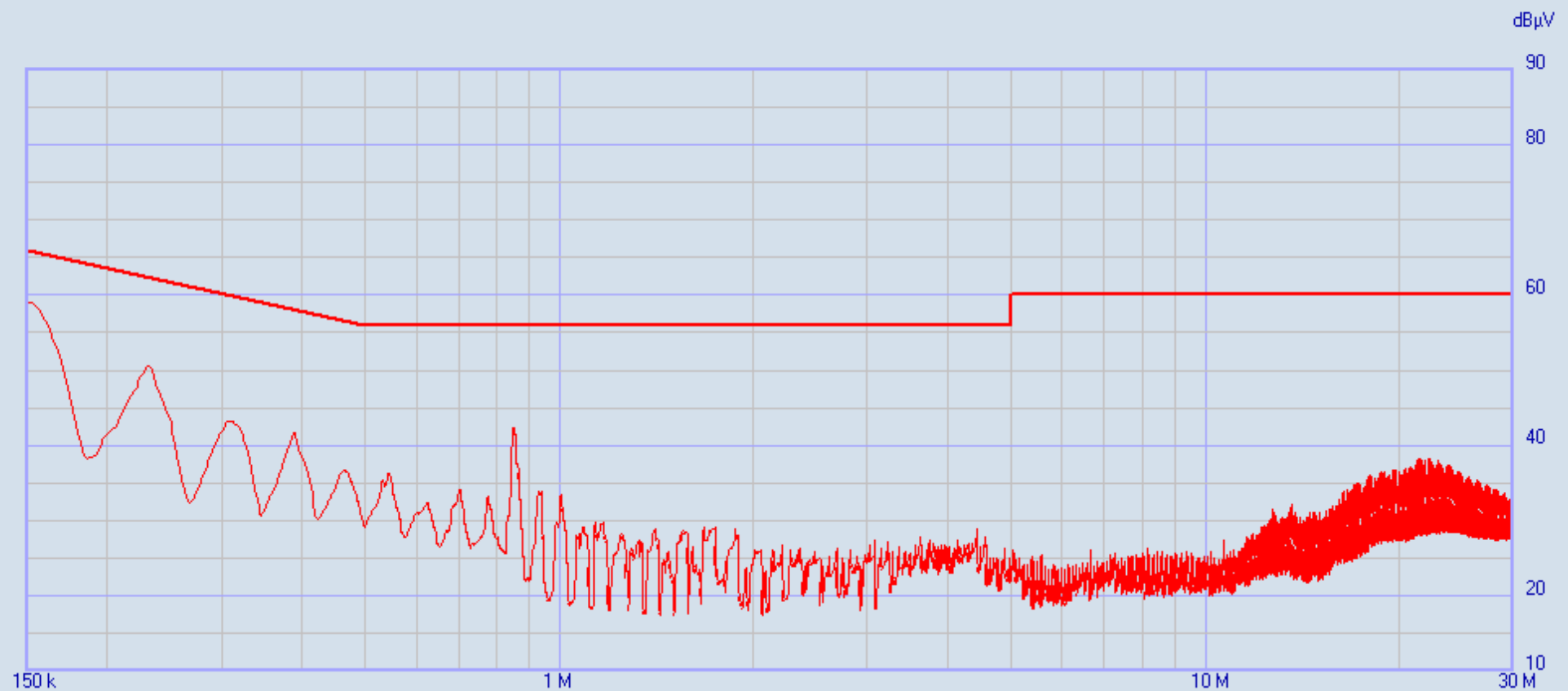
Manufacturer : Shure, Inc.
Model : PA821B 8-input Antenna Combiner
Notes : 120V 60 Hz

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.



8112 Shure Inc PA821B 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 QP

Factors:

LISN DLS#128

E-M L705

DLS #592

Cables 43 & 45

QPeak —

8112 Shure Inc PA821B 120V 60Hz L1 17/06/2016 12:41:03
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 12 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.15	59.06	66.00	-6.94	1.74	9.87	2.16	0.17
2	0.152045	59.12	65.89	-6.77	1.70	9.86	2.13	0.16
3	0.15409	58.70	65.78	-7.08	1.67	9.86	2.09	0.15
4	0.156135	58.13	65.67	-7.54	1.64	9.86	2.06	0.14
5	0.15818	57.43	65.56	-8.13	1.61	9.85	2.03	0.13
6	0.160225	56.58	65.45	-8.87	1.58	9.85	2.00	0.12
7	0.16227	55.62	65.35	-9.73	1.56	9.84	1.97	0.11
8	0.164315	54.48	65.24	-10.76	1.53	9.84	1.94	0.10
9	0.16636	53.23	65.14	-11.91	1.50	9.83	1.91	0.09
10	0.2318	50.48	62.38	-11.90	0.97	9.82	1.49	0.12



Report issuing date : 6-17-2016

Standard : FCC Part 15.207 Class B
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 # : 8112
Result : Pass

EUT

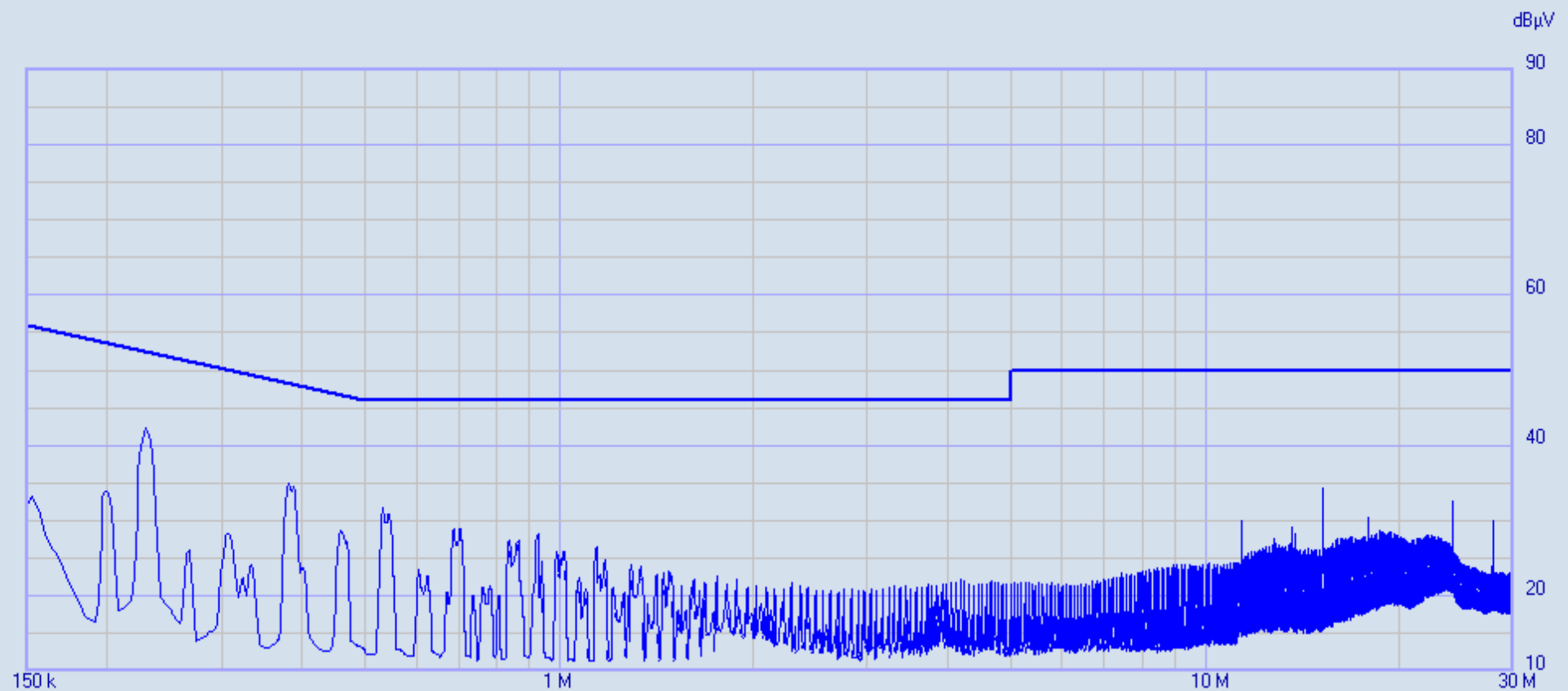
Manufacturer : Shure, Inc.
Model : PA821B 8-input Antenna Combiner
Notes : 120V 60 Hz

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.



8112 Shure Inc PA821B 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:
Class B V AV

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

C-Avg —

8112 Shure Inc PA821B 120V 60Hz L2 17/06/2016 13:11:06
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 16 dB

Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor	
[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..	
		[dBμV]		[dB]	[dB]	[dB]	[dB]	
1	0.225665	39.97	52.61	-12.64	1.01	9.82	1.53	0.10
2	0.22771	41.50	52.53	-11.03	1.00	9.81	1.51	0.11
3	0.229755	42.30	52.46	-10.16	0.99	9.81	1.50	0.12
4	0.2318	41.39	52.38	-10.99	0.97	9.82	1.49	0.12
5	0.233845	39.04	52.31	-13.27	0.96	9.83	1.49	0.11
6	0.37904	34.00	48.30	-14.30	0.57	9.97	1.15	0.09
7	0.381085	34.92	48.26	-13.34	0.57	9.97	1.14	0.09
8	0.38313	34.35	48.21	-13.86	0.57	9.97	1.14	0.09
9	0.385175	33.94	48.17	-14.23	0.57	9.97	1.14	0.09
10	0.38722	34.42	48.12	-13.70	0.56	9.97	1.13	0.10
11	0.389265	33.97	48.08	-14.11	0.56	9.97	1.13	0.10
12	0.39131	32.52	48.04	-15.52	0.56	9.97	1.13	0.10
13	0.53037	30.12	46.00	-15.88	0.45	9.96	0.88	0.14
14	0.532415	31.57	46.00	-14.43	0.45	9.96	0.88	0.14
15	0.53446	31.46	46.00	-14.54	0.45	9.96	0.88	0.14
16	0.536505	30.41	46.00	-15.59	0.45	9.96	0.87	0.14
17	0.544685	30.73	46.00	-15.27	0.44	9.96	0.86	0.14
18	0.54673	30.61	46.00	-15.39	0.44	9.96	0.86	0.14
19	15.13985	34.20	50.00	-15.80	0.32	10.13	0.37	0.70
20	15.141895	34.06	50.00	-15.94	0.32	10.13	0.37	0.70



Report issuing date : 6-17-2016

Standard : FCC Part 15.207 Class B
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 # : 8112
Result : Pass

EUT

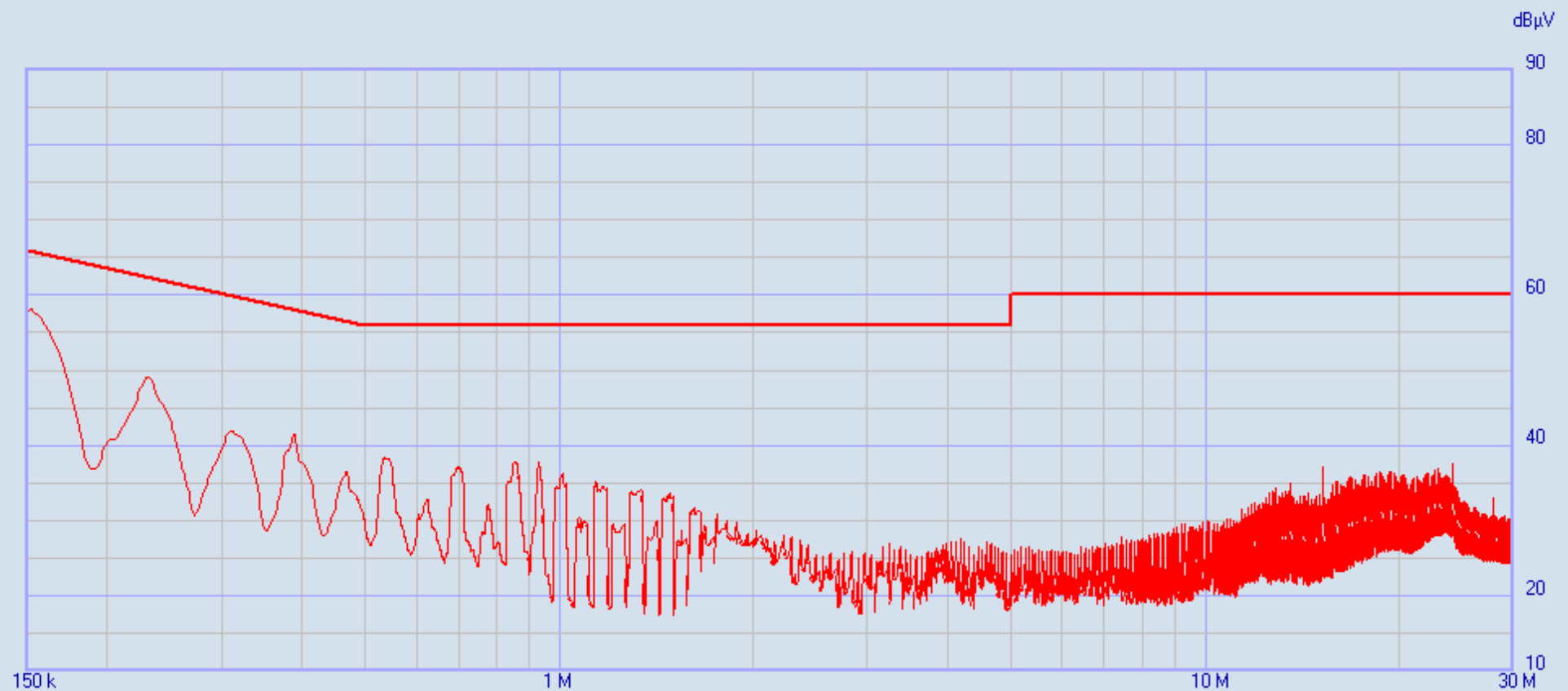
Manufacturer : Shure, Inc.
Model : PA821B 8-input Antenna Combiner
Notes : 120V 60 Hz

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.



8112 Shure Inc PA821B 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:

Class B V QP

Factors:

LISN DLS#128

E-M L705

DLS #592

Cables 43 & 45

QPeak —

8112 Shure Inc PA821B 120V 60Hz L2 17/06/2016 13:11:06
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 14 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.15	57.95	66.00	-8.05	1.74	9.87	2.16	0.17
2	0.152045	58.14	65.89	-7.75	1.70	9.86	2.13	0.16
3	0.15409	57.82	65.78	-7.96	1.67	9.86	2.09	0.15
4	0.156135	57.36	65.67	-8.31	1.64	9.86	2.06	0.14
5	0.15818	56.76	65.56	-8.80	1.61	9.85	2.03	0.13
6	0.160225	56.05	65.45	-9.40	1.58	9.85	2.00	0.12
7	0.16227	55.21	65.35	-10.14	1.56	9.84	1.97	0.11
8	0.164315	54.25	65.24	-10.99	1.53	9.84	1.94	0.10
9	0.16636	53.19	65.14	-11.95	1.50	9.83	1.91	0.09
10	0.168405	52.00	65.04	-13.04	1.48	9.83	1.89	0.09
11	0.229755	49.01	62.46	-13.45	0.99	9.81	1.50	0.12
12	0.2318	49.05	62.38	-13.33	0.97	9.82	1.49	0.12
13	0.233845	48.64	62.31	-13.67	0.96	9.83	1.49	0.11



Report issuing date : 6-17-2016

Standard : FCC Part 15.207 Class B
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 # : 8112
Result : Pass

EUT

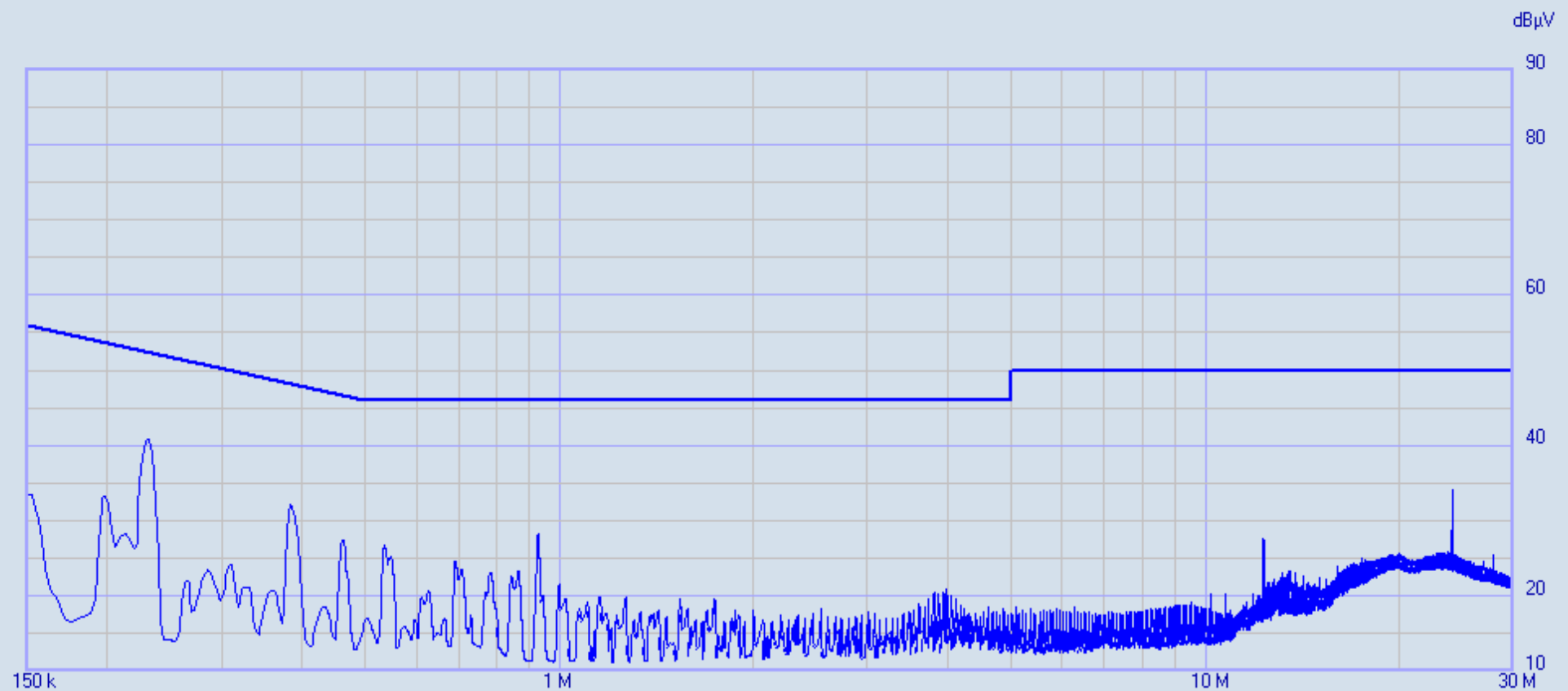
Manufacturer : Shure, Inc.
Model : PA821B 8-input Antenna Combiner
Notes : 240V 60 Hz

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.



8112 Shure Inc PA821B 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:
Class B V AV

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

C-Avg —

8112 Shure Inc PA821B 240V 60Hz L1 17/06/2016 12:21:25
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 18 dB

	Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBµV]	Class B V..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBµV]		[dB]	[dB]	[dB]	[dB]
1	0.225665	37.17	52.61	-15.44	1.01	9.82	1.53	0.10
2	0.22771	39.47	52.53	-13.06	1.00	9.81	1.51	0.11
3	0.229755	40.56	52.46	-11.90	0.99	9.81	1.50	0.12
4	0.2318	40.89	52.38	-11.49	0.97	9.82	1.49	0.12
5	0.233845	39.03	52.31	-13.28	0.96	9.83	1.49	0.11
6	0.23589	35.88	52.24	-16.36	0.95	9.84	1.48	0.11
7	0.381085	30.77	48.26	-17.49	0.57	9.97	1.14	0.09
8	0.38313	32.06	48.21	-16.15	0.57	9.97	1.14	0.09
9	0.385175	32.00	48.17	-16.17	0.57	9.97	1.14	0.09
10	0.38722	31.02	48.12	-17.10	0.56	9.97	1.13	0.10
11	0.389265	30.68	48.08	-17.40	0.56	9.97	1.13	0.10
12	0.39131	30.04	48.04	-18.00	0.56	9.97	1.13	0.10
13	0.925055	28.20	46.00	-17.80	0.34	9.96	0.57	0.18
14	23.99879	32.79	50.00	-17.21	0.37	10.15	0.46	0.89
15	24.000835	34.08	50.00	-15.92	0.37	10.15	0.46	0.89
16	24.00288	34.09	50.00	-15.91	0.37	10.15	0.46	0.89
17	24.004925	32.78	50.00	-17.22	0.37	10.15	0.46	0.89



Report issuing date : 6-17-2016

Standard : FCC Part 15.207 Class B
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 # : 8112
Result : Pass

EUT

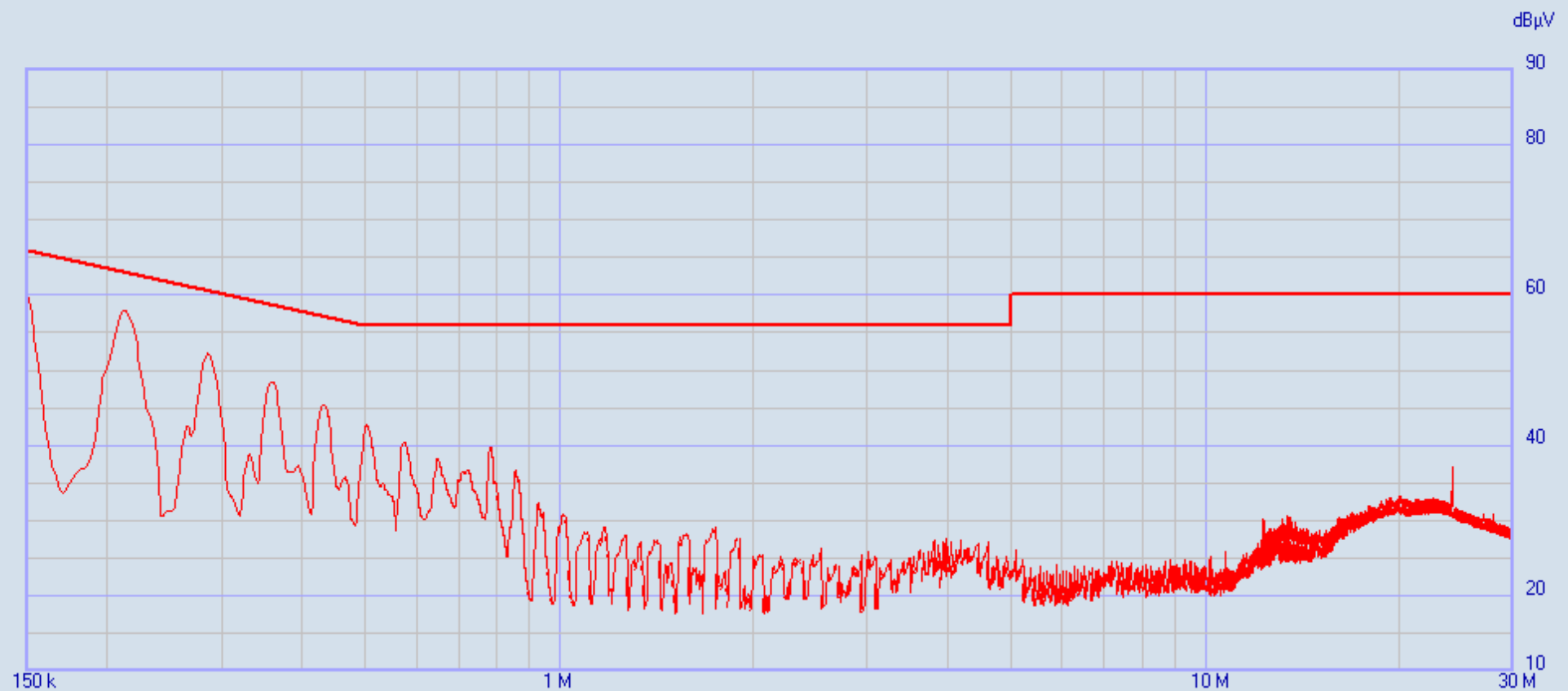
Manufacturer : Shure, Inc.
Model : PA821B 8-input Antenna Combiner
Notes : 240V 60 Hz

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.



8112 Shure Inc PA821B 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:

Class B V QP

Factors:

LISN DLS#128

E-M L705

DLS #592

Cables 43 & 45

QPeak —

8112 Shure Inc PA821B 240V 60Hz L1 17/06/2016 12:21:25
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 10 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.15	60.20	66.00	-5.80	1.74	9.87	2.16	0.17
2	0.152045	57.68	65.89	-8.21	1.70	9.86	2.13	0.16
3	0.205215	54.64	63.40	-8.76	1.13	9.84	1.66	0.03
4	0.20726	56.29	63.31	-7.02	1.12	9.84	1.65	0.03
5	0.209305	57.34	63.23	-5.89	1.10	9.84	1.64	0.04
6	0.21135	57.88	63.15	-5.27	1.09	9.83	1.62	0.05
7	0.213395	57.91	63.07	-5.16	1.08	9.83	1.61	0.05
8	0.21544	57.48	62.99	-5.51	1.07	9.83	1.59	0.06
9	0.217485	56.56	62.91	-6.35	1.05	9.83	1.58	0.07
10	0.21953	55.24	62.84	-7.60	1.04	9.82	1.57	0.08
11	0.221575	53.53	62.76	-9.23	1.03	9.82	1.55	0.08
12	0.282925	51.73	60.73	-9.00	0.77	9.97	1.41	0.08
13	0.28497	52.19	60.67	-8.48	0.76	9.97	1.40	0.08
14	0.287015	52.22	60.61	-8.39	0.75	9.97	1.40	0.08
15	0.28906	51.82	60.55	-8.73	0.75	9.97	1.39	0.08
16	0.291105	50.98	60.49	-9.51	0.74	9.97	1.38	0.08



Report issuing date : 6-17-2016

Standard : FCC Part 15.207 Class B
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 # : 8112
Result : Pass

EUT

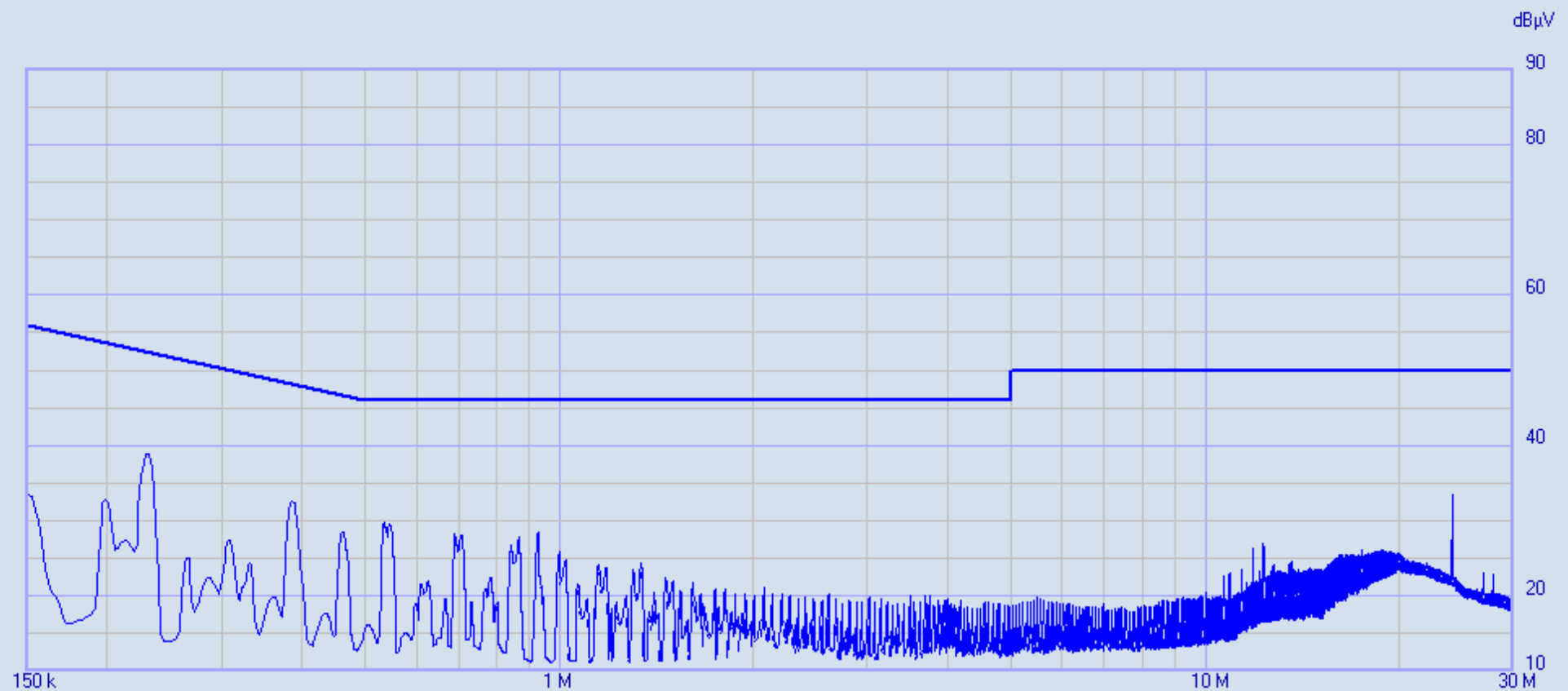
Manufacturer : Shure, Inc.
Model : PA821B 8-input Antenna Combiner
Notes : 240V 60 Hz

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.



8112 Shure Inc PA821B 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:
Class B V AV

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

C-Avg —

8112 Shure Inc PA821B 240V 60Hz L2 17/06/2016 12:29:26
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 18 dB

	Frequency	C-Avg	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.225665	35.90	52.61	-16.71	1.01	9.82	1.53	0.10
2	0.22771	37.81	52.53	-14.72	1.00	9.81	1.51	0.11
3	0.229755	38.79	52.46	-13.67	0.99	9.81	1.50	0.12
4	0.2318	38.87	52.38	-13.51	0.97	9.82	1.49	0.12
5	0.233845	36.86	52.31	-15.45	0.96	9.83	1.49	0.11
6	0.381085	31.13	48.26	-17.13	0.57	9.97	1.14	0.09
7	0.38313	32.38	48.21	-15.83	0.57	9.97	1.14	0.09
8	0.385175	32.50	48.17	-15.67	0.57	9.97	1.14	0.09
9	0.38722	32.34	48.12	-15.78	0.56	9.97	1.13	0.10
10	0.389265	32.37	48.08	-15.71	0.56	9.97	1.13	0.10
11	0.39131	31.39	48.04	-16.65	0.56	9.97	1.13	0.10
12	0.53446	29.38	46.00	-16.62	0.45	9.96	0.88	0.14
13	0.536505	29.70	46.00	-16.30	0.45	9.96	0.87	0.14
14	0.53855	28.97	46.00	-17.03	0.44	9.96	0.87	0.14
15	0.540595	28.01	46.00	-17.99	0.44	9.96	0.87	0.14
16	0.544685	28.62	46.00	-17.38	0.44	9.96	0.86	0.14
17	0.54673	29.48	46.00	-16.52	0.44	9.96	0.86	0.14
18	0.548775	29.20	46.00	-16.80	0.44	9.96	0.86	0.14
19	0.68988	28.28	46.00	-17.72	0.38	9.96	0.71	0.15
20	0.92301	28.37	46.00	-17.63	0.34	9.96	0.57	0.18
21	0.925055	28.28	46.00	-17.72	0.34	9.96	0.57	0.18
22	23.99879	32.02	50.00	-17.98	0.37	10.15	0.46	0.89
23	24.000835	33.34	50.00	-16.66	0.37	10.15	0.46	0.89
24	24.00288	33.34	50.00	-16.66	0.37	10.15	0.46	0.89
25	24.004925	32.00	50.00	-18.00	0.37	10.15	0.46	0.89



Report issuing date : 6-17-2016

Standard : FCC Part 15.207 Class B
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 # : 8112
Result : Pass

EUT

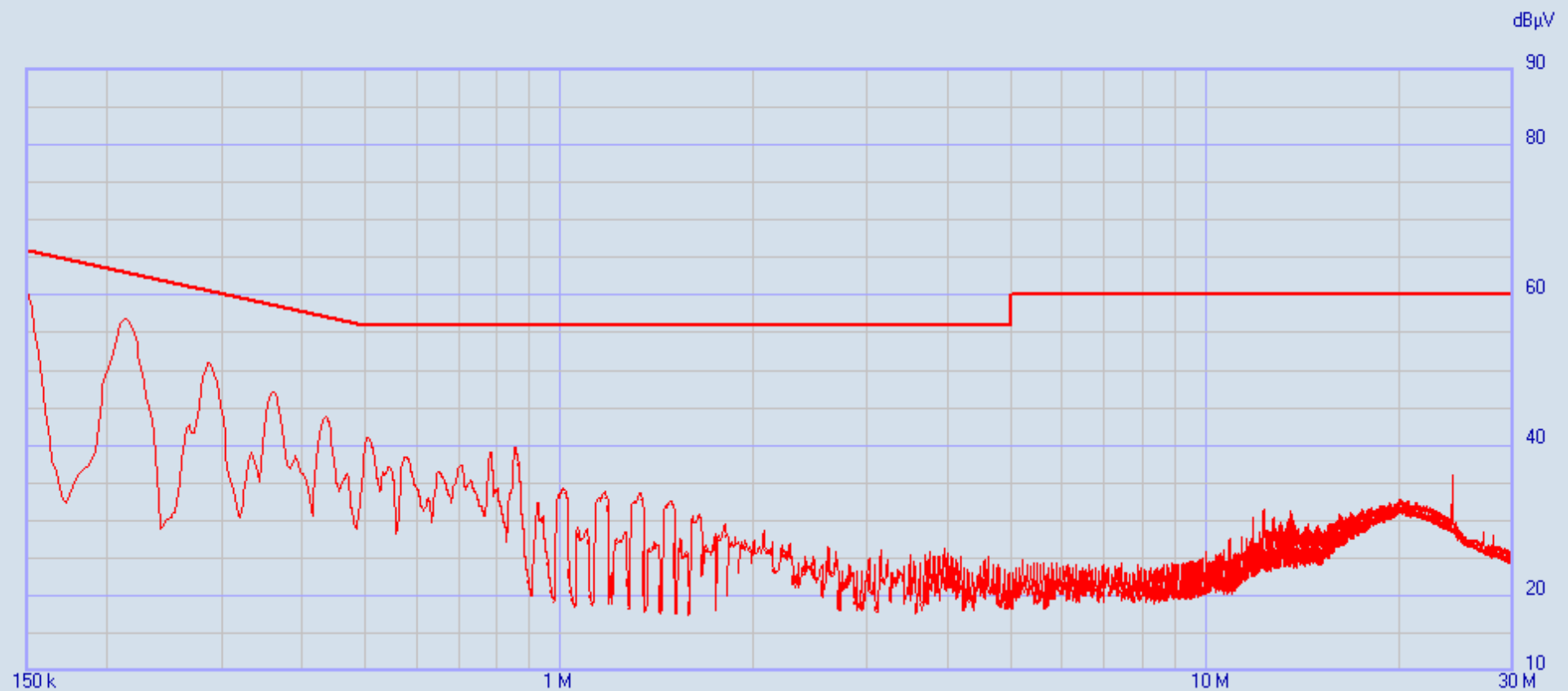
Manufacturer : Shure, Inc.
Model : PA821B 8-input Antenna Combiner
Notes : 240V 60 Hz

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.



8112 Shure Inc PA821B 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:

Class B V QP

Factors:

LISN DLS#128

E-M L705

DLS #592

Cables 43 & 45

QPeak —

8112 Shure Inc PA821B 240V 60Hz L2 17/06/2016 12:29:26
 Rel. SW 2.22 (August 2015)
 Rel. FW 1.54 20/04/16
 Margin: 10 dB

	Frequency	QPeak	Limit	Delta	Factor	Factor	Factor	Factor
	[MHz]	[dBμV]	Class B V..	[dB]	LISN DLS#..	E-M L705	DLS #592	Cables 43..
			[dBμV]		[dB]	[dB]	[dB]	[dB]
1	0.15	60.57	66.00	-5.43	1.74	9.87	2.16	0.17
2	0.152045	58.45	65.89	-7.44	1.70	9.86	2.13	0.16
3	0.20726	54.88	63.31	-8.43	1.12	9.84	1.65	0.03
4	0.209305	56.09	63.23	-7.14	1.10	9.84	1.64	0.04
5	0.21135	56.73	63.15	-6.42	1.09	9.83	1.62	0.05
6	0.213395	56.90	63.07	-6.17	1.08	9.83	1.61	0.05
7	0.21544	56.65	62.99	-6.34	1.07	9.83	1.59	0.06
8	0.217485	55.98	62.91	-6.93	1.05	9.83	1.58	0.07
9	0.21953	54.96	62.84	-7.88	1.04	9.82	1.57	0.08
10	0.221575	53.66	62.76	-9.10	1.03	9.82	1.55	0.08
11	0.28497	50.74	60.67	-9.93	0.76	9.97	1.40	0.08
12	0.287015	50.96	60.61	-9.65	0.75	9.97	1.40	0.08
13	0.28906	50.82	60.55	-9.73	0.75	9.97	1.39	0.08



Company: Shure Incorporated
 Model Tested: PA821B
 Report Number: 22114
 Project Number: 8112

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.

Radiated Emissions from 30 MHz to 18 GHz

		Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)
		3M	3M	3M	3M	3M	3M	10M	10M	10M
Contribution	Probability Distribution	30- 100MHz.	100- 700MHz	700- 1000MHz.	1- 4.5Ghz	4.5 - 7Ghz	7 - 18Ghz	30- 100MHz.	100- 700MHz.	700- 1000MHz.
Combined Standard Un certainty	Normal	1.70	1.62	1.66	2.13	2.48	2.85	1.64	1.58	1.66
Expanded Uncertainty	Normal (k=2)	3.40	3.23	3.33	4.26	4.95	5.69	3.29	3.16	3.31

Radiated Emission Substitution from 1 GHz to 18 GHz

		Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)
		3M	3M	3M
Contribution	Probability Distribution	1- 4.5Ghz	4.5 - 7Ghz	7 - 18Ghz
Combined Standard Un certainty	Normal	1.59	1.90	2.90
Expanded Uncertainty	Normal (k=2)	3.19	3.80	4.17

RF Conducted Emissions from 1 GHz to 18 GHz

		Uncertainty (+/- dB)	Uncertainty (+/- dB)	Uncertainty (+/- dB)
Contribution	Probability Distribution	1- 4.5Ghz	4.5 - 7Ghz	7 - 18Ghz
Combined Standard Un certainty	Normal	1.31	1.59	1.65
Expanded Uncertainty	Normal (k=2)	2.61	3.19	3.31



166 South Carter, Genoa City, WI 53128

Company:	Shure Incorporated
Model Tested:	PA821B
Report Number:	22114
Project Number:	8112

END OF REPORT

Revision #	Date	Comments	By
1.0	8-8-2016	Initial Release	JS
1.1	9-30-2016	Added product information from DLS Part A form	CB