



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927

1250 PETERSON DRIVE, WHEELING, IL 60090-6454 • PHONE 847-537-6400 • FAX 847-537-6488 • www.dlsemc.com

EMISSIONS TEST REPORT

FCC Rules and Regulations
Unintentional Radiators - Class A Digital Devices
Part 15, Subpart B, Sections 15.107b, 15.109b
&
FCC Rules and Regulations
Intentional Radiators
Part 15, Subpart C, Section 15.207 & 15.247

SUMMARY OF TEST RESULTS CAN BE FOUND IN SECTION 1.0 OF THIS REPORT

Equipment Under Test: Portable Thermal Printer
Test Voltage: Tested at 120 and 240 Vac, 60 Hz; Battery Operated
Model Number: M211
Model Tested: M211
Serial Numbers: EM3 #103, EM3 #104
Dates of Test: November 1, 2 & 3 and December 16, 2021
Test Conducted for: Brady Worldwide, Inc
6555 W. Good Hope Road
Milwaukee, WI 53223
Date of Report: June 7, 2023
Revision Level: A

NOTICE: "This test report contains test data, equipment lists, photographs and/or other information regarding only the sample provided by the client for testing."

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Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927

SIGNATURE PAGE

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General Manager



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CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

DLS Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090

(and satellite sites as shown on the scope)

Fulfills the requirements of

ISO/IEC 17025:2017

In the field of

TESTING

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 23 April 2022
Certificate Number: AT-1859



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory
quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
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1.0 SUMMARY OF TEST RESULTS

The Portable Thermal Printer, Model M211 was subjected to requirements of FCC Rules and Regulations, Part 15, Subpart B & Subpart C, with the results as described in the below table.

Test Section	Result
Section 15.107 for AC Line Conducted Emissions	Meets
Section 15.207 AC Line Conducted Emissions	Meets
Section 15.109 for Radiated Emissions Below 1 GHz	Meets
Section 15.109 for Radiated Emissions Above 1 GHz	Meets
Section 15.209 Radiated Emissions in Restricted Bands Below 1 GHz	Meets
Section 15.209 Radiated Emissions in Restricted Bands Above 1 GHz	Meets

See the following test sections for a detailed explanation of the test results.

2.0 INTRODUCTION

On November 1, 2 & 3 and December 16, 2021, a series of radio frequency interference measurements were performed on the Portable Thermal Printer, Model M211, Serial Numbers EM3 #103, EM3 #104. All tests were performed in accordance with FCC, ANSI C63.4-2014 & ANSI C63.10-2013 procedures and requirements, where applicable.

3.0 TEST FACILITY

D.L.S. Electronic Systems, Inc. is a full-service EMC Testing Laboratory accredited to ISO 17025. Our test facilities are located at 1250 Peterson Drive, Wheeling, IL, and 166 South Carter Street, Genoa City, WI. Our ANAB Certificate and Scope of Accreditation can be viewed at DLSEMC.COM/Accreditations. Our facilities are recognized by the FCC, ISSED, and VCCI. All emissions tests were performed by personnel of D.L.S. Electronic Systems, Inc.

4.0 TEST EQUIPMENT

A list of the test equipment used, along with identification and calibration data, is included in the Table(s) at the end of this introduction section. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.



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5.0 DESCRIPTION OF TEST SAMPLE

5.1. DESCRIPTION

The test sample is a compact portable thermal transfer printer. It can be worn on a belt clip or used on a table top. It contains an internal automatic cutter. It provides 2 buttons and 3 LED indicators. Its main user interface is via an application on a Bluetooth connected smartphone. Printing media is provided by user replaceable cartridges.

5.2. PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 5.5 in x Width: 2.75 in x Height: 4 in

5.3. INTERNALLY GENERATED FREQUENCIES

Switching Power Supply Frequencies

1MHz, 750 kHz, 400 kHz

Digital Clock/Timing Frequencies

32 MHz MCU clock, 16 MHz internal clock, 32.768 kHz real time clock

6.0 MODIFICATIONS MADE TO EUT FOR EMC COMPLIANCE

No modifications to the EUT were required.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
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7.0 PHOTO INFORMATION AND TEST SET-UP

- | | |
|--------|---|
| Item 0 | EUT |
| Item 1 | Brady Worldwide power adapter, Model TP015AH-Z |
| Item 2 | Shielded Brady Worldwide USB cable, 1.8 meters long with metal USB-C shells |
| Item 3 | Unshielded AC power cable (not EUT), 1.5 meters long with plastic shells |
| Item 4 | USB Battery Bank, Model (no info given) |



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7.1 PHOTO ID TAKEN DURING TESTING

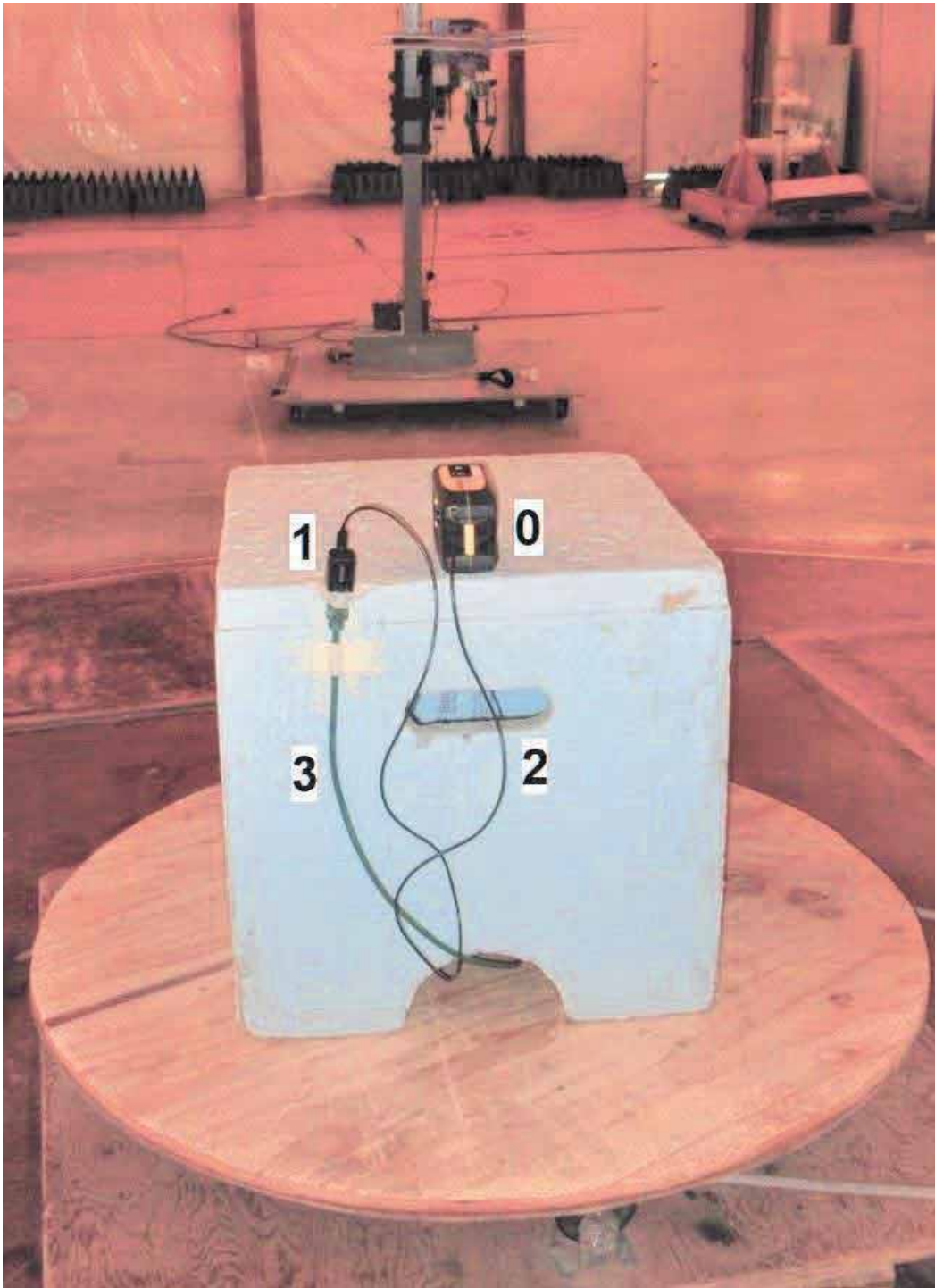


Photo ID (1 of 2)



Company: Brady Worldwide, Inc
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Report Number: 26666
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7.1 PHOTO ID TAKEN DURING TESTING



Photo ID (2 of 2)



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions

PART 15 SECTION 15.107 AC LINE CONDUCTED EMISSIONS



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions

1.0 TEST PROCEDURE AND SETUP

The Portable Thermal Printer was set up according to the general testing requirements of ANSI C63.4:2014 & ANSI C63.10-2013.

All test measurements were made with the following mode of operation:

Continuous printing and cutting mode.

2.0 TEST RESULTS

The Portable Thermal Printer Model Number: M211 **meets** the requirements of FCC Part 15, Subpart B & Subpart C, for Section 15.107 AC Line Conducted Emissions. Plots and tabular data can be viewed at the end of this section.

Summary: No non-compliant emissions were observed.

3.0 SAMPLE CALCULATIONS

Line Conducted emissions: Emissions measurements include all system transducers and are compared against the appropriate limit requirement. See sample calculation below.

$$\begin{array}{l} \text{Equations: } \frac{\text{Level(dB}\mu\text{V)}}{\text{Sample:}} = \frac{\text{Raw Level(dB}\mu\text{V)}}{30.14} + \frac{\text{System Loss(dB)}}{= 18.44} + \frac{\text{LISN Factor(dB)}}{+ 11.24} + 0.46 \end{array}$$

$$\frac{\text{Margin(dB)}}{15.86} = \frac{\text{Limit(dB}\mu\text{V)}}{= 46} - \frac{\text{Level(dB}\mu\text{V)}}{- 30.14}$$



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4.0 D.L.S. ELECTRONIC SYSTEMS, INC. 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.

	Power Line Conducted	Uncertainty ($\pm$ dB)
Contribution	Probability Distribution	150 kHz - 30 MHz
Combined Standard Uncertainty	Normal	1.05
Expanded Uncertainty	Normal (k=2)	2.10



Company: Brady Worldwide, Inc
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Test: Section 15.107 for AC Line Conducted Emissions

TABLE 1 / TEST INSTRUMENTATION

Description	Manufacturer	Model Number	Serial Number	Range	Cal On	Cal Due Dates
Beldin 9914; N-N; 15 Meter; Line Conducted	Beldin	9914	CBL-043	9kHz-30MHz	3/30/2021	3/30/2022
Filter, High pass	Solar Electronics	7930-120	090702	120k-30Mhz	10/4/2021	10/4/2022
Limiter, Transient, RF, w/ CBL-035	Electro-Metrics	EM-7600	705	9kHz - 100MHz	10/4/2021	10/4/2022
LISN, 20 Amp, 2-Line	Com-Power	LI-220A	192036	9 kHz to 30 MHz	8/18/2021	8/18/2022
Narda PMM EMI Receiver	Narda	9010F	020WW40102	10 Hz - 50 MHz	4/14/2021	4/14/2022
RG-223/U; BNC-BNC; 1.5 Meter; Lisen Hook-Up	Manhattan/CDT	RG223/U	CBL-045	9kHz-30MHz	3/30/2021	3/30/2022

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

TABLE 2 / TEST EQUIPMENT

Description	Manufacturer	Model Number	Serial Number	Range
Test Software	Narda	Emission Suite	V2.4.0	N/A

The test equipment above is verified with calibrated equipment.



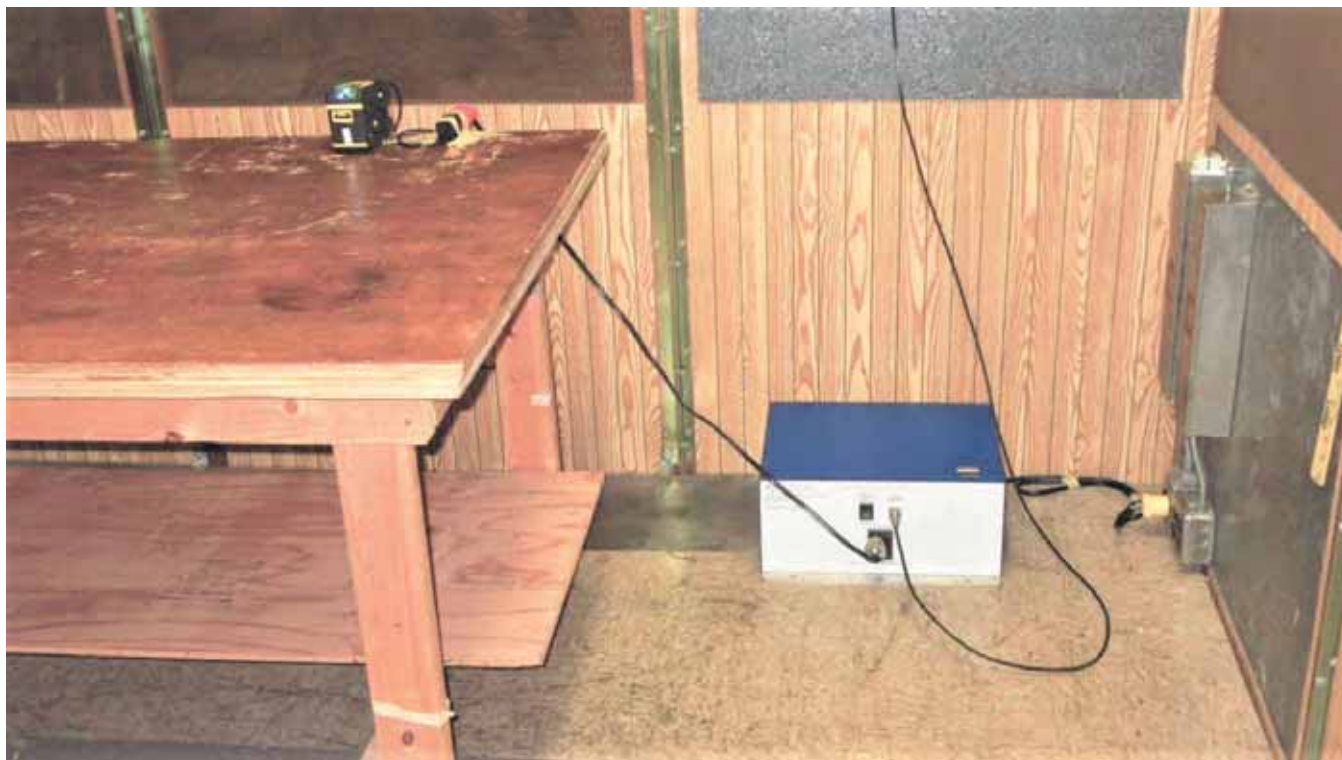
Company: Brady Worldwide, Inc
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PART 15 SECTION 15.107 AC LINE CONDUCTED EMISSIONS

TEST SETUP PHOTOS



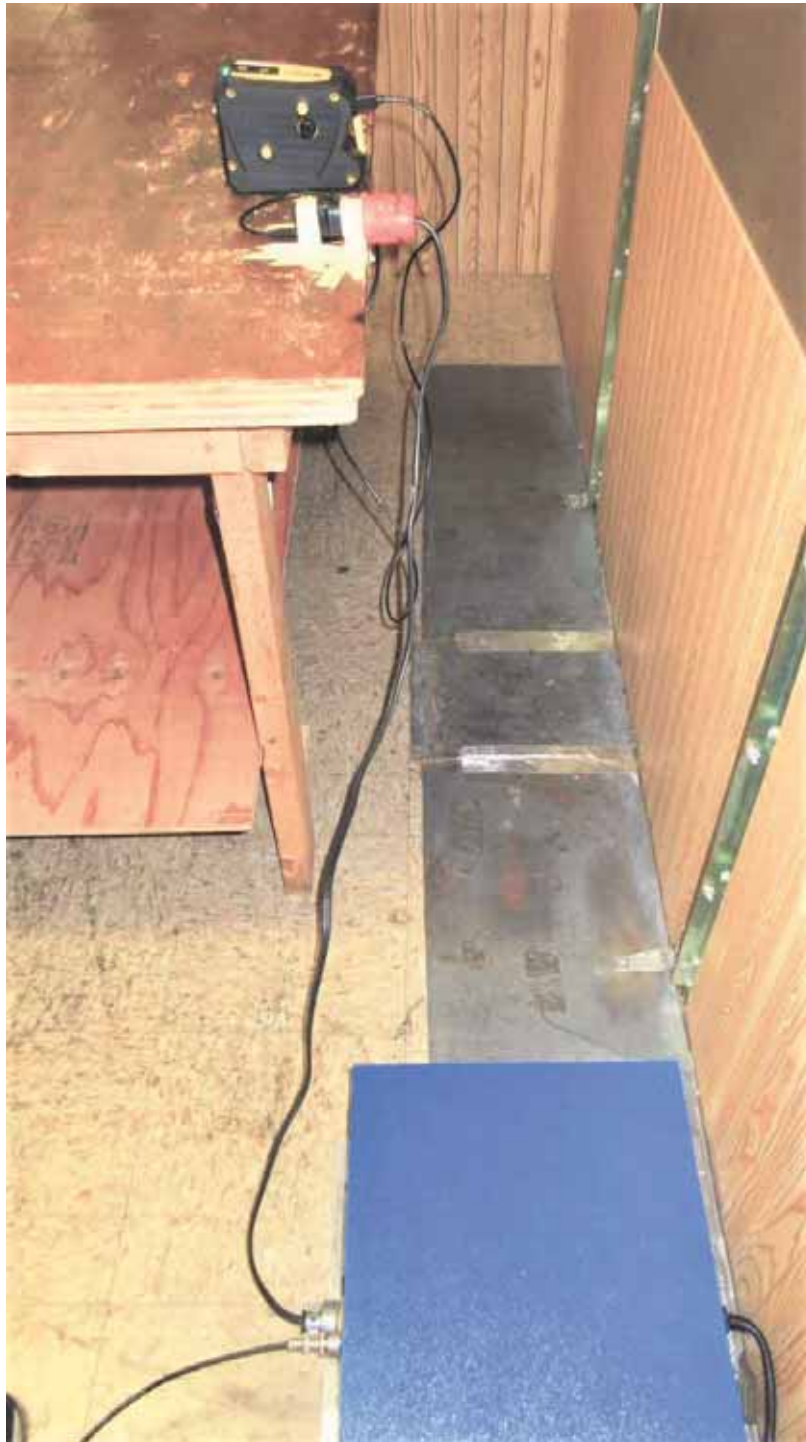
Company: Brady Worldwide, Inc
Model Tested: M211
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AC Line Conducted - Front



Company: Brady Worldwide, Inc
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AC Line Conducted - Back (1 of 2)



Company: Brady Worldwide, Inc
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AC Line Conducted - Back (2 of 2)



Company: Brady Worldwide, Inc
Model Tested: M211
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Test: Section 15.107 for AC Line Conducted Emissions

PART 15 SECTION 15.107 AC LINE CONDUCTED EMISSIONS

120 V, 60 HZ TEST DATA



Company: Brady Worldwide, Inc
Model Tested: M211
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Test: Section 15.107 for AC Line Conducted Emissions



PMM NARDA REPORT: 11927 Brady M211 120v Line 1_000

Report issuing date : 11-02-2021

Standard : FCC Part 15.107 Class A
Test Type : Voltage Mains Test
Test Site : DLS Genoa Screen Room
Temperature : 71 °F
Humidity : 29% R.H.
Test Specs : Line 1/ Quasi-Peak Detector
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 120 V 60 Hz
Comments : Continuous printing and cutting mode

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlaemc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W040102
Last Calibration : 04/14/2021

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.



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Model Tested: M211
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Test: Section 15.107 for AC Line Conducted Emissions





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions



11927 Brady M211 120v Line 1_000 02/11/2021 09:47:53
Ref. SW 2.40 (January 2021)
Ref. FW 2.02 21/04/21
Margin: 100 dB

Frequency [MHz]	QPeak [dBµV]	Limit Class A v.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor Cables 43.. [dB]	Factor LIM #507 .. [dB]	Factor HPF #592 [dB]
1 0.15204468	52.50	79.00	-26.50	0.08	0.03	9.70	2.20
2 0.15408936	52.68	79.00	-26.32	0.08	0.04	9.70	2.17
3 0.1704468	63.17	79.00	-15.83	0.06	0.06	9.66	1.98
4 0.23427868	53.71	79.00	-25.29	0.04	0.08	9.65	1.49
5 0.33811056	45.52	79.00	-33.48	0.03	0.06	9.65	1.18
6 0.42194244	41.84	79.00	-37.16	0.03	0.08	9.69	0.98
7 0.507819	38.43	73.00	-34.57	0.03	0.09	9.69	0.84
8 5.06202564	22.43	73.00	-50.57	0.04	0.41	9.68	0.16
9 8.68858368	25.03	73.00	-47.97	0.04	0.53	9.74	0.18
10 11.10335076	29.90	73.00	-43.10	0.04	0.60	9.76	0.20



Company: Brady Worldwide, Inc
Model Tested: M211
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PMM NARDA REPORT: 11927 Brady M211 120v Line 1_001

Report issuing date : 11-02-2021

Standard : FCC Part 15.107 Class A
Test Type : Voltage Mains Test
Test Site : DLS Genoa Screen Room
Temperature : 71 °F
Humidity : 29% R.H.
Test Specs : Line 1/ AVERAGE Detector
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 120 V 60 Hz
Comments : Continuous printing and cutting mode

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlaemc.com>

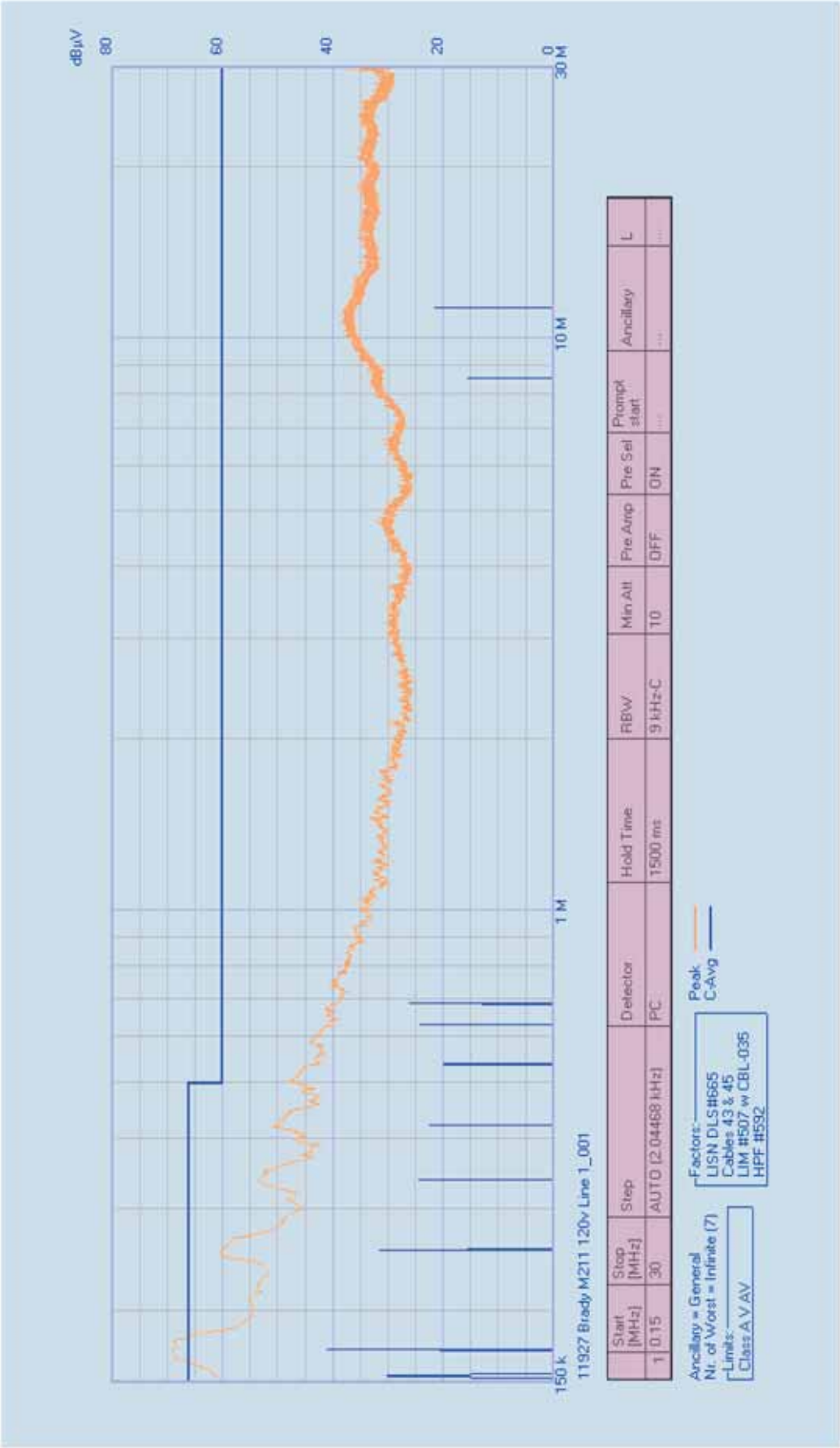
Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W040102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
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Test: Section 15.107 for AC Line Conducted Emissions





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions



11927 Brady M211 120v Line 1_001 02/11/2021 09:52:00
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

Frequency [MHz]	C-Avg [dBµV]	Limit Class A v... [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 .. [dB]	Factor HPF #592 [dB]
1 0.15204468	30.02	66.00	-35.98	0.08	0.03	9.70	2.20
2 0.15408936	30.26	66.00	-35.74	0.08	0.04	9.70	2.17
3 0.1704468	40.97	66.00	-25.03	0.06	0.06	9.66	1.98
4 0.23427868	31.42	66.00	-34.58	0.04	0.08	9.65	1.49
5 0.33811056	24.42	66.00	-41.58	0.03	0.06	9.65	1.18
6 0.42194244	22.37	66.00	-43.63	0.03	0.08	9.69	0.98
7 0.5384892	19.91	60.00	-40.09	0.03	0.10	9.69	0.79
8 0.6304998	24.04	60.00	-35.96	0.03	0.11	9.68	0.66
9 0.69570616	26.16	60.00	-33.84	0.03	0.12	9.67	0.59
10 8.51069652	15.47	60.00	-44.53	0.04	0.54	9.73	0.18
11 11.2526124	21.66	60.00	-38.34	0.04	0.61	9.76	0.20



Company: Brady Worldwide, Inc
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Test: Section 15.107 for AC Line Conducted Emissions



PMM NARDA REPORT: 11927 Brady M211 120v Line 2_000

Report issuing date : 11-02-2021

Standard	: FCC Part 15.107 Class A
Test Type	: Voltage Mains Test
Test Site	: DLS Genoa Screen Room
Temperature	: 71 °F
Humidity	: 29% R.H.
Test Specs	: Line 2/ Quasi-Peak Detector
Operator	: cbrandt
DLS Project #	: 11927
Result	: Pass

EUT

Manufacturer	: Brady Worldwide
Model	: M211
Product	: Portable Thermal Printer
Notes	: 120 V 60 Hz
Comments	: Continuous printing and cutting mode

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlaemc.com>

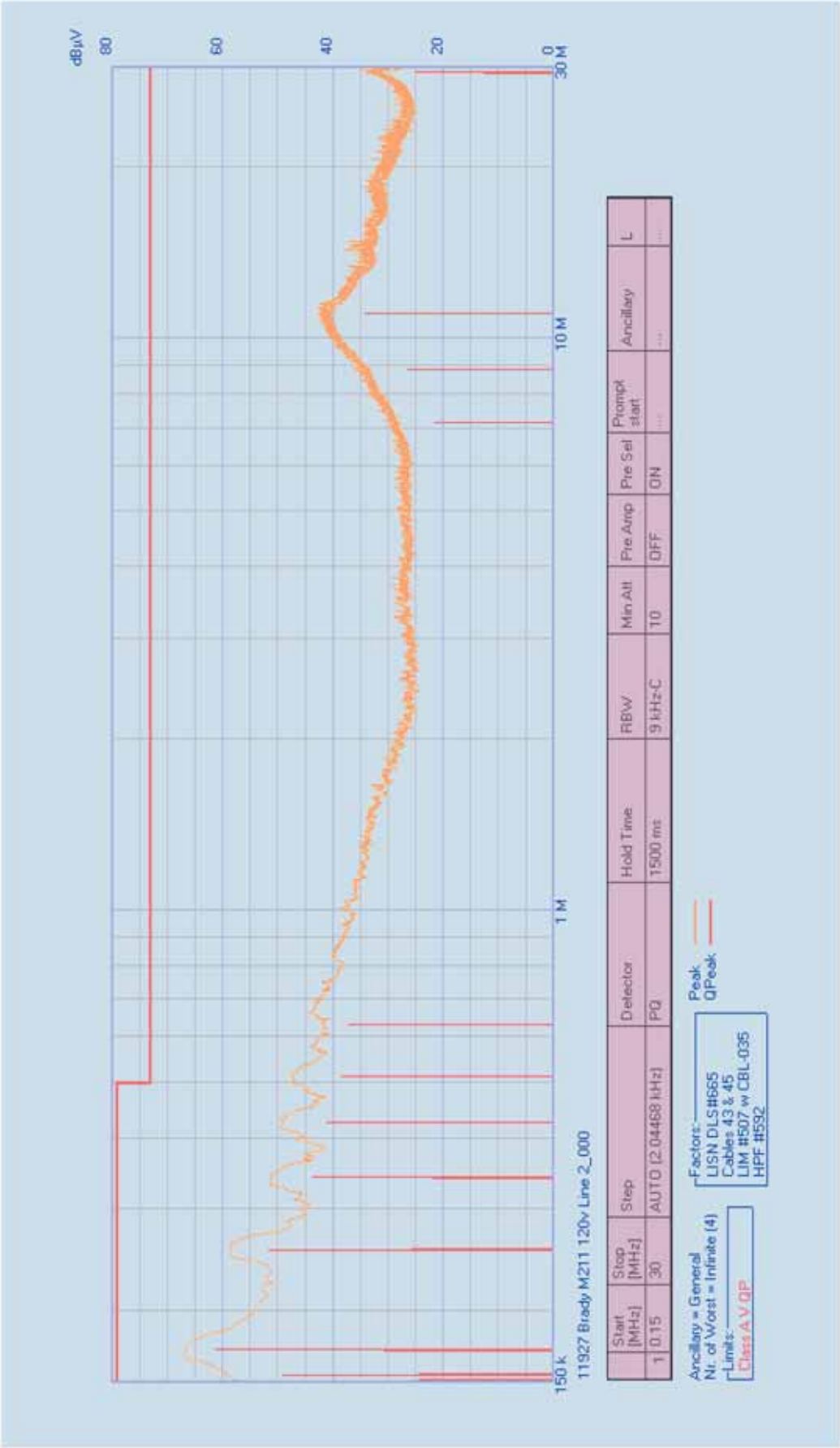
Receiver Details

Model	: PMM 9010F
Brand	: Narda
S/N	: 020WN40102
Last Calibration	: 04/14/2021

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.



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Model Tested: M211
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Test: Section 15.107 for AC Line Conducted Emissions



11927 Brady M211 120v Line 2_000 02/11/2021 10:05:59
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

	Frequency [MHz]	QPeak [dBµV]	Limit Class A v... [dBµV]	Delta [dB]	Factor	Factor	Factor	Factor
					L1SN DLS#... [dB]	Cables 43... [dB]	LIM #507 .. [dB]	HPF #592 [dB]
1	0.15	49.28	79.00	-29.72	0.08	0.03	9.71	2.23
2	0.15406936	49.99	79.00	-30.01	0.08	0.04	9.70	2.17
3	0.1704468	61.28	79.00	-17.72	0.06	0.06	9.66	1.98
4	0.23427868	51.69	79.00	-27.31	0.04	0.08	9.65	1.49
5	0.34015524	43.67	79.00	-35.33	0.03	0.06	9.65	1.17
6	0.4260318	41.09	79.00	-37.91	0.03	0.08	9.69	0.97
7	0.51190836	38.51	73.00	-34.49	0.03	0.09	9.69	0.83
8	0.6304998	37.11	73.00	-35.89	0.03	0.11	9.68	0.66
9	7.101912	21.62	73.00	-51.38	0.04	0.52	9.71	0.15
10	8.77037088	26.63	73.00	-46.37	0.04	0.53	9.74	0.18
11	10.99907208	34.03	73.00	-38.97	0.04	0.60	9.76	0.20
12	29.133339	25.11	73.00	-47.89	0.02	0.95	9.89	0.38



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PMM NARDA REPORT: 11927 Brady M211 120v Line 2_001

Report issuing date : 11-02-2021

Standard : FCC Part 15.107 Class A
Test Type : Voltage Mains Test
Test Site : DLS Genoa Screen Room
Temperature : 71 °F
Humidity : 29% R.H.
Test Specs : Line 2/ AVERAGE Detector
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 120 V 60 Hz
Comments : Continuous printing and cutting mode

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlaemc.com>

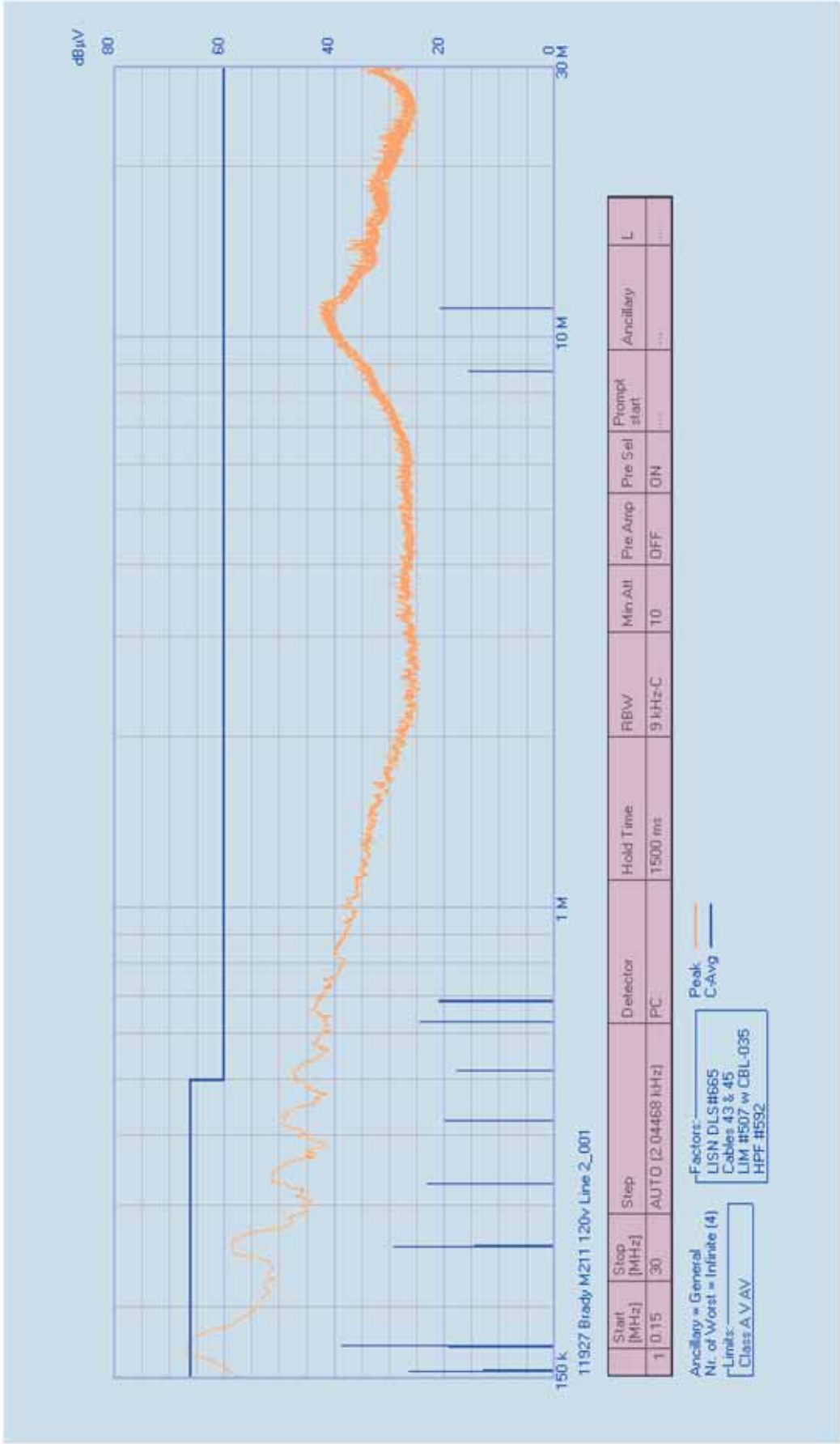
Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W040102
Last Calibration : 04/14/2021

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.



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Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions



11927 Brady M211 120v Line 2_001 02/11/2021 10:15:03
Ref. SW 2.40 (January 2021)
Ref. FW 2.02 21/04/21
Margin: 100 dB

	Frequency [MHz]	C-Avg [dBμV]	Limit Class A v... [dBμV]	Delta [dB]	Factor LISH DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 .. [dB]	Factor HPF #592 [dB]
1	0.15	27.21	66.00	-38.79	0.08	0.03	9.71	2.23
2	0.15406936	26.39	66.00	-39.61	0.08	0.04	9.70	2.17
3	0.1704468	38.72	66.00	-27.28	0.06	0.06	9.66	1.98
4	0.23427868	29.04	66.00	-36.96	0.04	0.08	9.65	1.49
5	0.32788716	23.13	66.00	-42.87	0.04	0.07	9.64	1.21
6	0.42398712	19.89	66.00	-46.11	0.03	0.08	9.69	0.97
7	0.5180424	17.75	60.00	-42.25	0.03	0.09	9.69	0.82
8	0.6304998	24.40	60.00	-35.60	0.03	0.11	9.68	0.66
9	0.68366148	20.94	60.00	-39.06	0.03	0.12	9.67	0.59
10	8.6967624	15.44	60.00	-44.56	0.04	0.53	9.74	0.18
11	11.2219422	20.73	60.00	-39.27	0.04	0.61	9.76	0.20



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions

PART 15 SECTION 15.107 AC LINE CONDUCTED EMISSIONS

240 V, 60 HZ TEST DATA



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions



PMM NARDA REPORT: 11927 Brady M211 240v Line 1_000

Report issuing date : 11-02-2021

Standard : FCC Part 15.107 Class A
Test Type : Voltage Mains Test
Test Site : DLS Genoa Screen Room
Temperature : 71 °F
Humidity : 28% R.H.
Test Specs : Line 1/ Quasi-Peak Detector vs. AVERAGE Limit
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 240 V 60 Hz
Comments : Continuous printing and cutting mode

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlaemc.com>

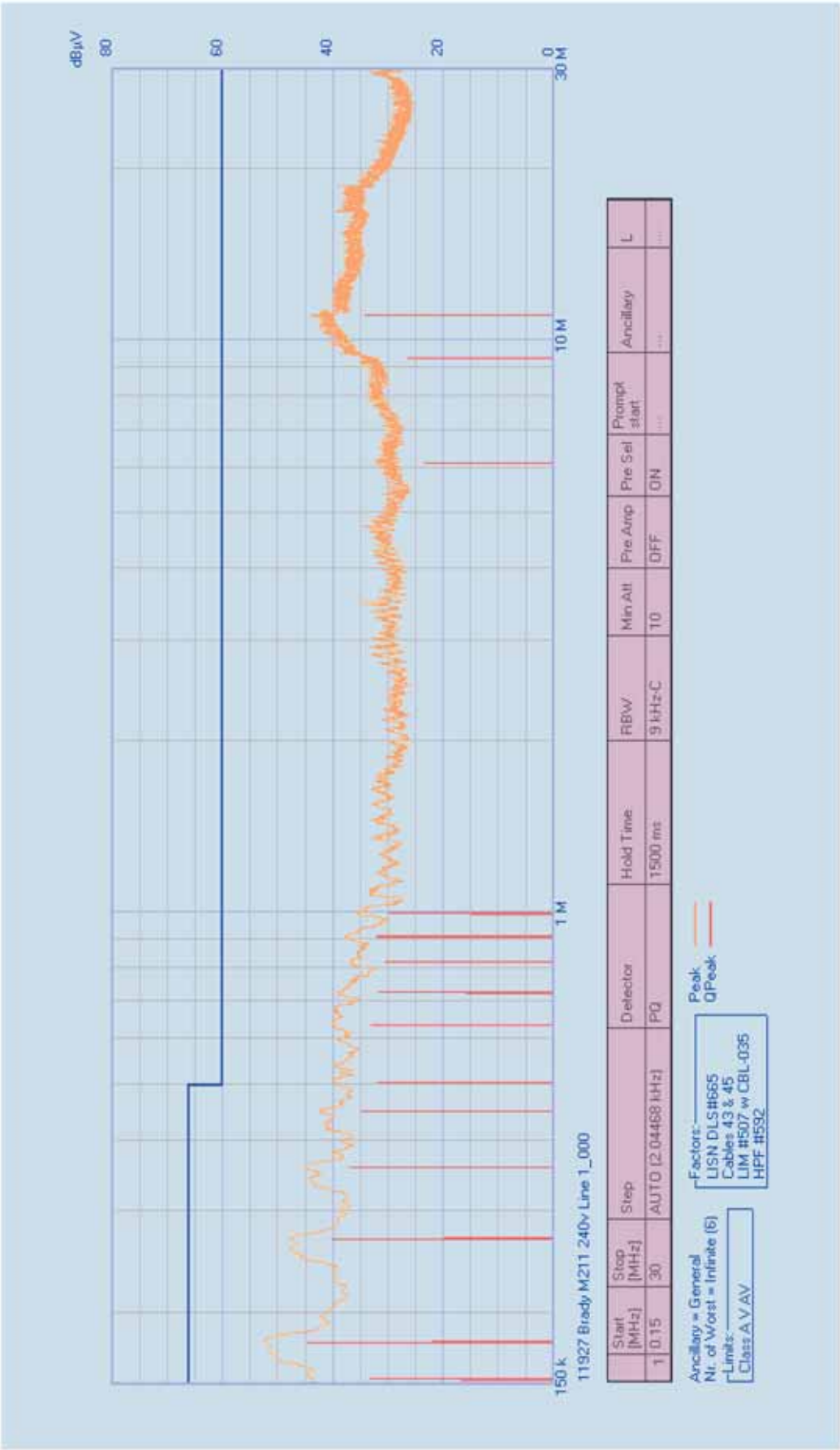
Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W040102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions



11927 Brady M211 240v Line 1_000 02/11/2021 10:27:47
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

Frequency [MHz]	QPeak [dBµV]	Limit Class A V... [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 .. [dB]	Factor HPF #592 [dB]
1 0.15204468	33.13	66.00	-32.87	0.08	0.03	9.70	2.20
2 0.17658084	44.43	66.00	-21.57	0.06	0.07	9.67	1.93
3 0.26859144	40.23	66.00	-25.77	0.04	0.09	9.65	1.42
4 0.33855736	36.93	66.00	-29.07	0.03	0.05	9.65	1.11
5 0.44852328	34.68	66.00	-31.32	0.03	0.09	9.70	0.94
6 0.50372964	31.88	60.00	-28.12	0.03	0.09	9.69	0.84
7 0.63254448	32.90	60.00	-27.10	0.03	0.11	9.68	0.65
8 0.7225104	31.61	60.00	-28.39	0.03	0.13	9.66	0.56
9 0.81656568	30.31	60.00	-29.69	0.03	0.15	9.65	0.51
10 0.90448692	31.98	60.00	-28.02	0.03	0.15	9.65	0.48
11 0.99240816	29.75	60.00	-30.25	0.03	0.15	9.65	0.45
12 6.07139328	23.33	60.00	-36.67	0.04	0.50	9.70	0.15
13 9.2386026	26.21	60.00	-33.79	0.04	0.54	9.74	0.18
14 11.037921	34.04	60.00	-25.96	0.04	0.60	9.76	0.20



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions



PMM NARDA REPORT: 11927 Brady M211 240v Line 2_000

Report issuing date : 11-02-2021

Standard : FCC Part 15.107 Class A
Test Type : Voltage Mains Test
Test Site : DLS Genoa Screen Room
Temperature : 71 °F
Humidity : 28% R.H.
Test Specs : Line 2f Quasi-Peak Detector vs. AVERAGE Limit
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 240 V 60 Hz
Comments : Continuous printing and cutting mode

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlaemc.com>

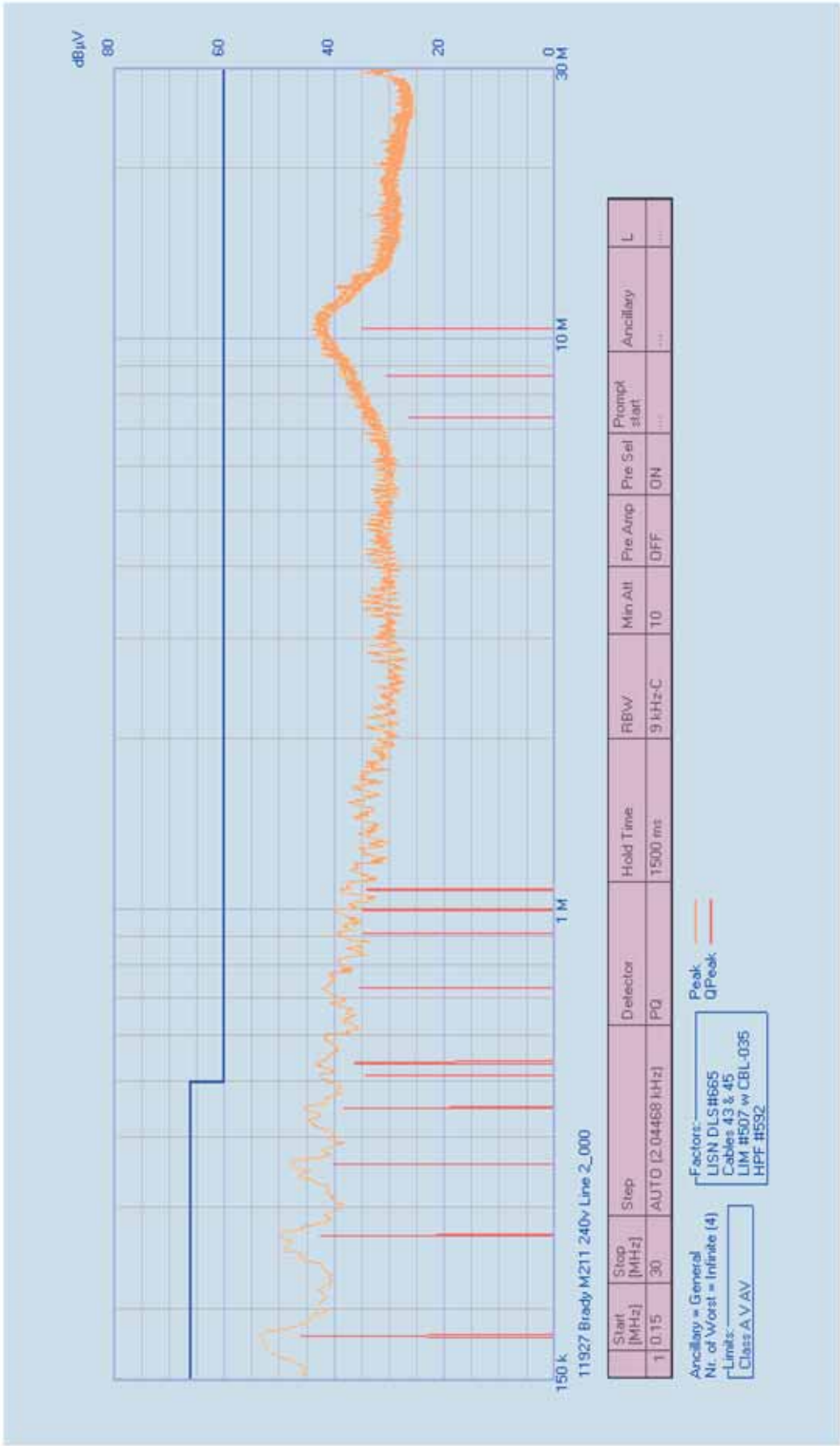
Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W040102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.107 for AC Line Conducted Emissions



11927 Brady M211 240v Line 2_000 02/11/2021 10:38:10
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

	Frequency [MHz]	QPeak [dBµV]	Limit Class A V... [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 .. [dB]	Factor HPF #592 [dB]
1	0.15	33.80	66.00	-32.20	0.08	0.03	9.71	2.23
2	0.17862552	45.99	66.00	-20.01	0.06	0.07	9.67	1.92
3	0.26859144	42.46	66.00	-23.54	0.04	0.09	9.65	1.42
4	0.35855736	40.16	66.00	-25.84	0.03	0.05	9.65	1.11
5	0.44852328	38.21	66.00	-27.79	0.03	0.09	9.70	0.94
6	0.51190836	34.31	60.00	-25.69	0.03	0.09	9.69	0.83
7	0.5384892	36.14	60.00	-23.86	0.03	0.10	9.69	0.79
8	0.73068912	35.46	60.00	-24.54	0.03	0.13	9.66	0.56
9	0.9065316	34.70	60.00	-25.30	0.03	0.15	9.65	0.48
10	0.99445284	34.95	60.00	-25.05	0.03	0.15	9.65	0.45
11	1.08237408	34.09	60.00	-25.91	0.03	0.15	9.66	0.41
12	7.24095024	26.60	60.00	-33.40	0.04	0.52	9.71	0.15
13	8.60270712	30.53	60.00	-29.47	0.04	0.54	9.73	0.18
14	10.41224892	35.03	60.00	-24.97	0.04	0.59	9.75	0.19



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

PART 15 SECTION 15.109 RADIATED EMISSIONS BELOW 1 GHz



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

1.0 TEST PROCEDURE AND SETUP

The Portable Thermal Printer was set up according to the general testing requirements of ANSI C63.4:2014 & ANSI C63.10-2013.

All test measurements were made with the following mode of operation:

Continuous printing and cutting mode.

2.0 TEST RESULTS

The Portable Thermal Printer Model Number: M211 **meets** the requirements of FCC Part 15, Subpart B & Subpart C for Section 15.109 Radiated Emissions Below 1 GHz. Plots and tabular data can be viewed at the end of this section.

Summary: No non-compliant emissions were observed.

3.0 SAMPLE CALCULATIONS

Radiated emissions: Emissions measurements include all system transducers and are compared against the appropriate limit requirement. See sample calculation below.

$$\begin{array}{l} \text{Equations:} \quad \frac{\text{Total Level(dB}\mu\text{V/m)}}{24.6} = \frac{\text{Level(dB}\mu\text{V)}}{= 35.51} + \frac{\text{System Loss(dB)}}{+ (-22.1)} + \frac{\text{Antenna Factor(dB/m)}}{+ 11.20} \\ \text{Sample:} \end{array}$$

$$\frac{\text{Margin(dB)}}{15.4} = \frac{\text{Limit(dB}\mu\text{V/m)}}{= 40} - \frac{\text{Total Level(dB}\mu\text{V/m)}}{- 24.6}$$



Company: Brady Worldwide, Inc
 Model Tested: M211
 Report Number: 26666
 Project Number: 11927
 Test: Section 15.109 for Radiated Emissions Below 1 GHz

4.0 D.L.S. ELECTRONIC SYSTEMS, INC. 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 Emission Uncertainty										
Contribution	Probability Distribution	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)
		3M	3M	3M	3M	3M	3M	10M	10M	10M
		30-100 MHz	100-700 MHz	700-1000 MHz	1- 4.5 GHz	4.5 – 7 GHz	7 – 18 GHz	30-100 MHz	100-700 MHz	700-1000 MHz
Combined Standard Uncertainty	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



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

TABLE 1 / TEST INSTRUMENTATION

Description	Manufacturer	Model Number	Serial Number	Range	Cal On	Cal Due Dates
Antenna, Biconical	EMCO	3104C	9701-4785	20MHz-200MHz	4/15/2020	4/15/2022
Antenna, Log Periodic	EMCO	3146	9702-4895	200MHz-1GHz	4/15/2020	4/15/2022
Beldin 9273; N-BNC; 2 Meter; Receiver Hook-Up	Beldin	9273	CBL-028	9 kHz-1000MHz	2/5/2021	2/5/2022
Beldin 9914; N-N; 3 Meter Test	Beldin	9914	CBL-005	9kHz-1000MHz	2/5/2021	2/5/2022
Preamplifier, RF, w/CBL-039	Rohde & Schwarz	TS-PR10	032001/004	9kHz - 1GHz	10/28/2021	10/28/2022
Receiver, RF, Tuned	Rohde & Schwarz	ESI 26	837491/010	20Hz – 26GHz	4/13/2021	4/13/2022
RG-223/U; N-BNC; 10Meter; Antenna Hook-Up	Coleman Cable	991079 / RG-223/U	CBL-051	9kHz-1GHz	2/5/2021	2/5/2022

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

TABLE 2 / TEST EQUIPMENT

Description	Manufacturer	Model Number	Serial Number	Range
Test Software	Rohde & Schwarz	ESK1	V1.7.1	N/A

The test equipment above is verified with calibrated equipment.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

FCC PART 15 SECTION 15.109 RADIATED EMISSIONS BELOW 1 GHZ

AC AND INTERNAL BATTERY POWERED PHOTOS



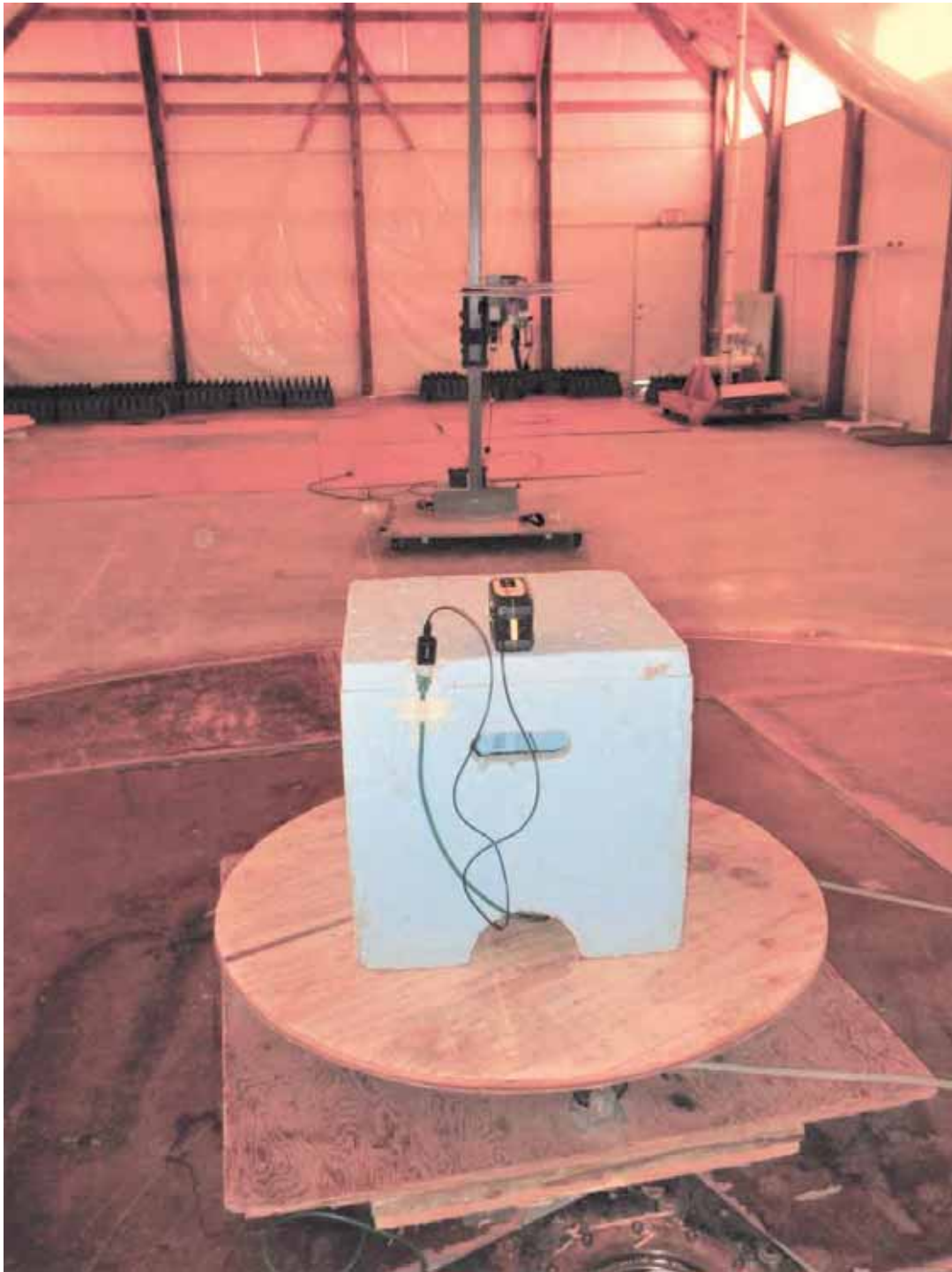
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - USB Powered - Front



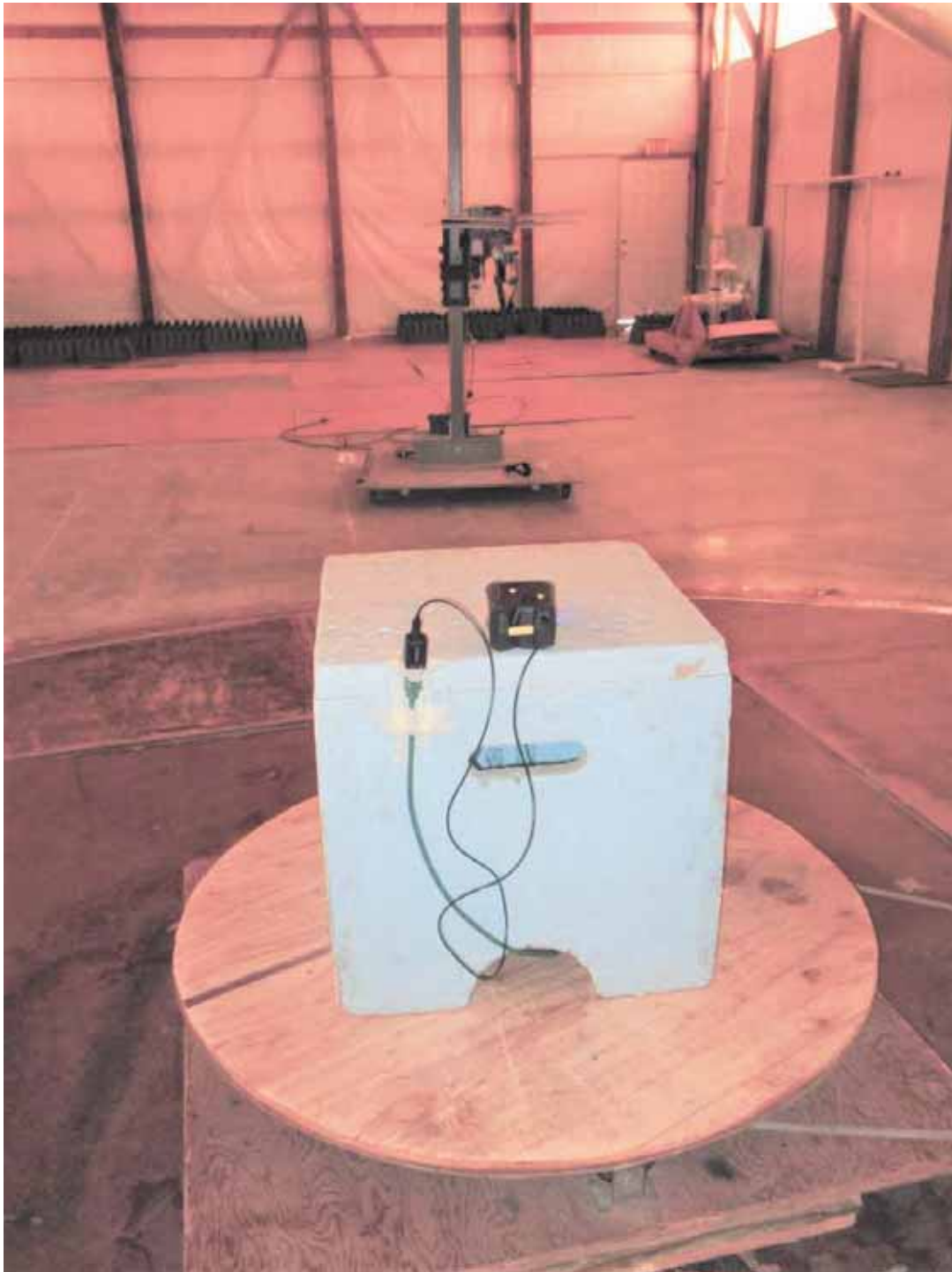
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - USB Powered - Back



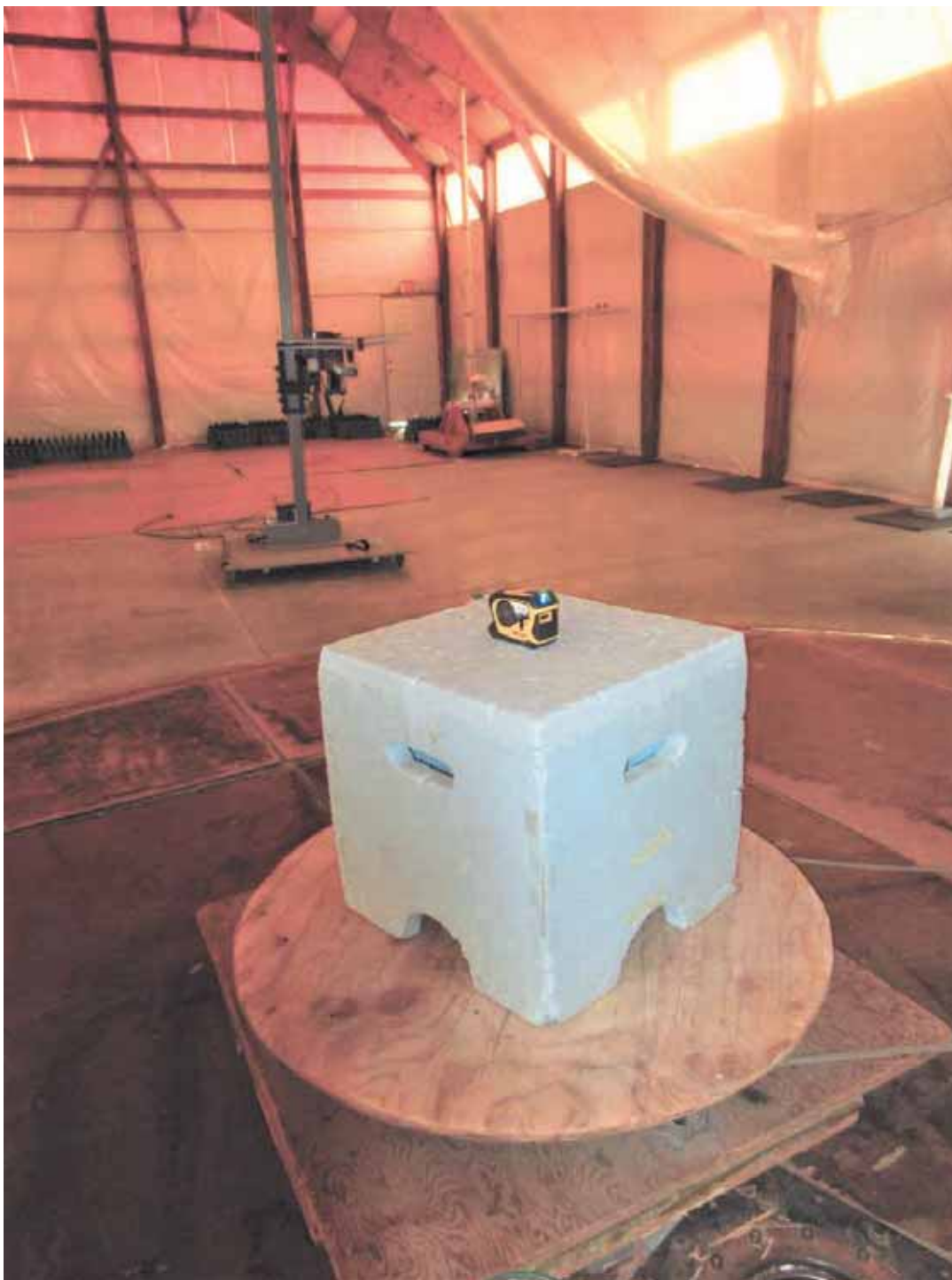
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - USB Powered - Back



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - Battery Powered



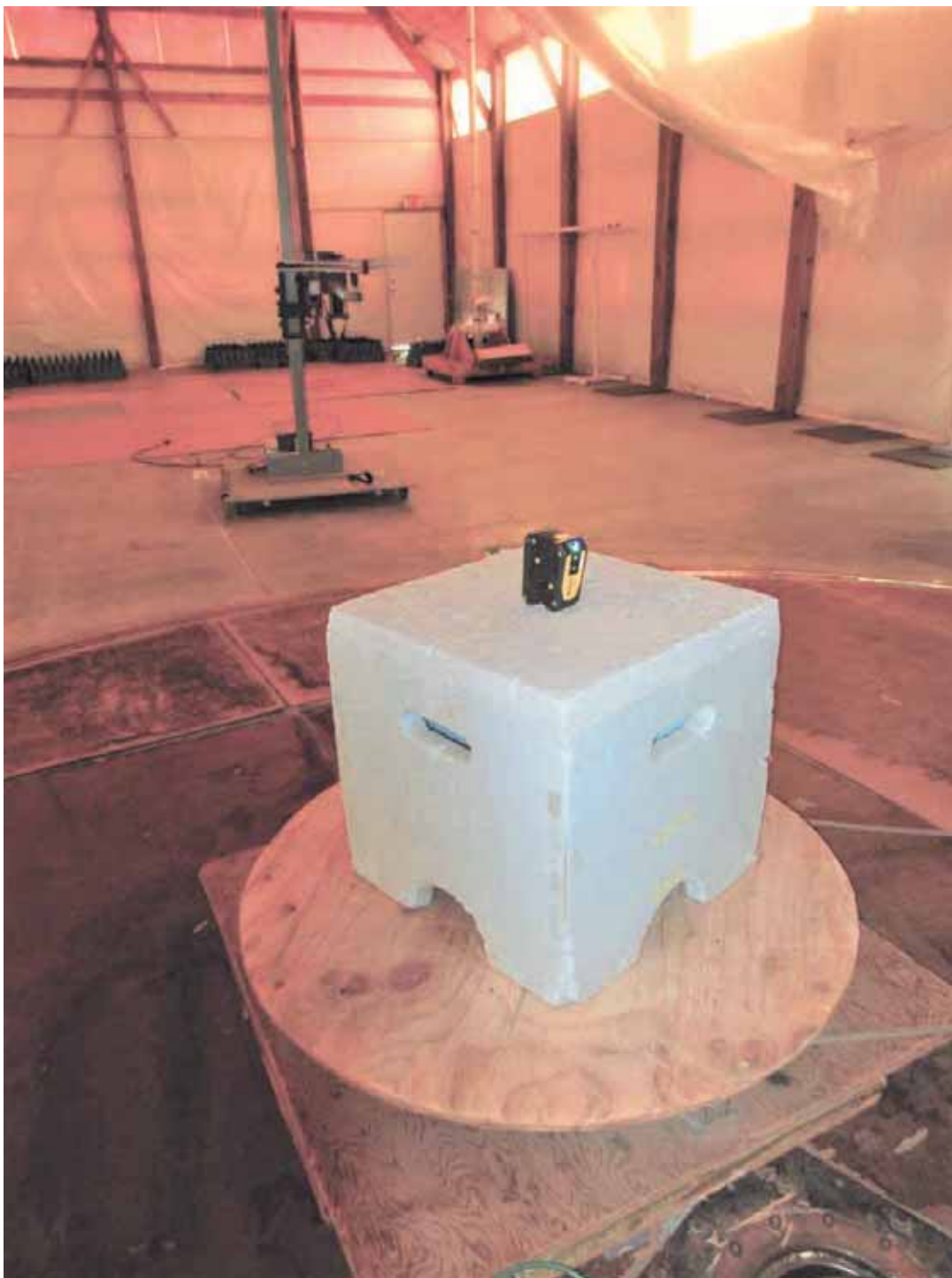
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - Battery Powered



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - Battery Powered



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

FCC PART 15 SECTION 15.109 RADIATED EMISSIONS BELOW 1 GHZ

USB BATTERY BANK POWERED PHOTOS



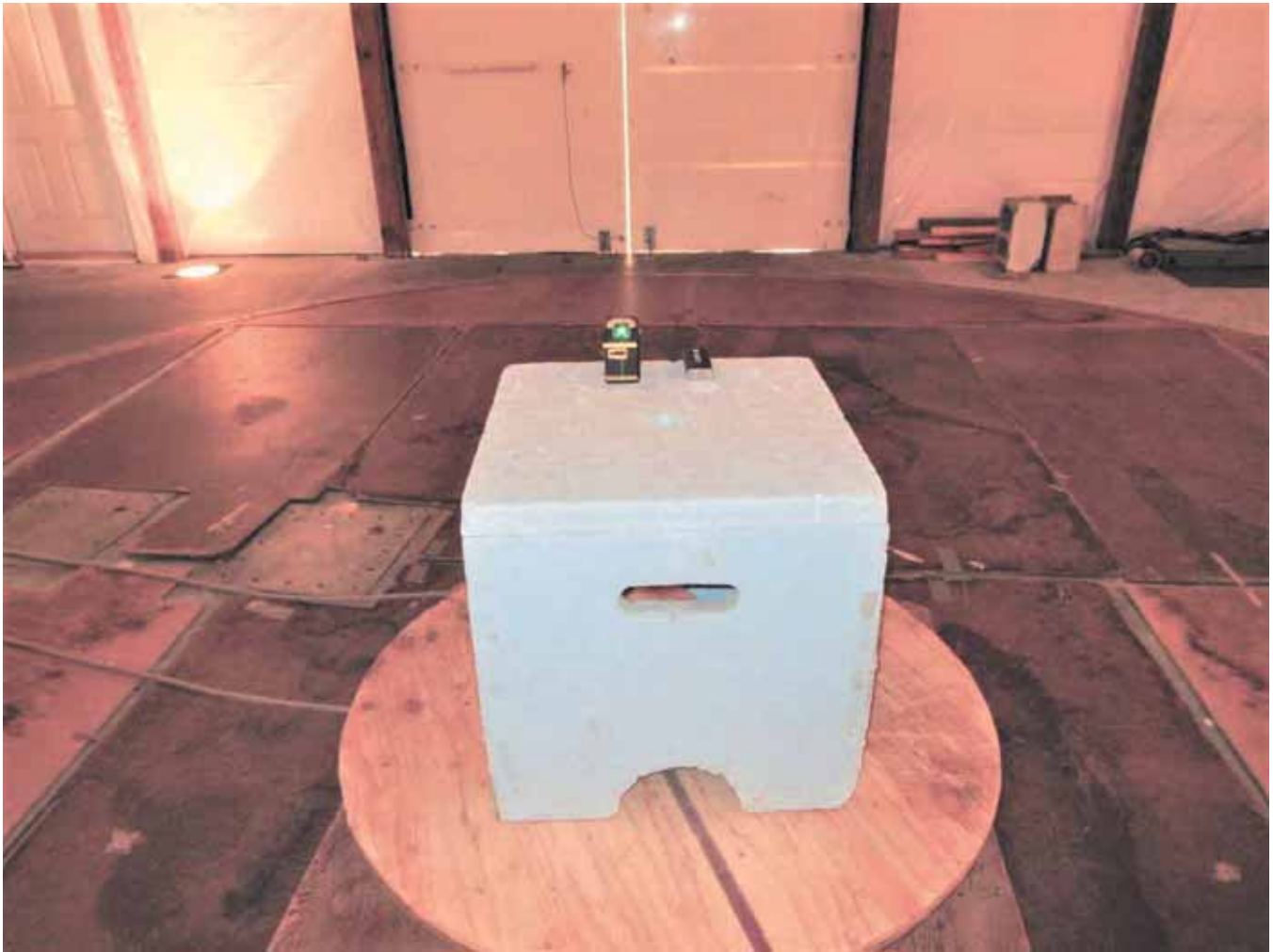
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - USB Battery Bank Powered - Back



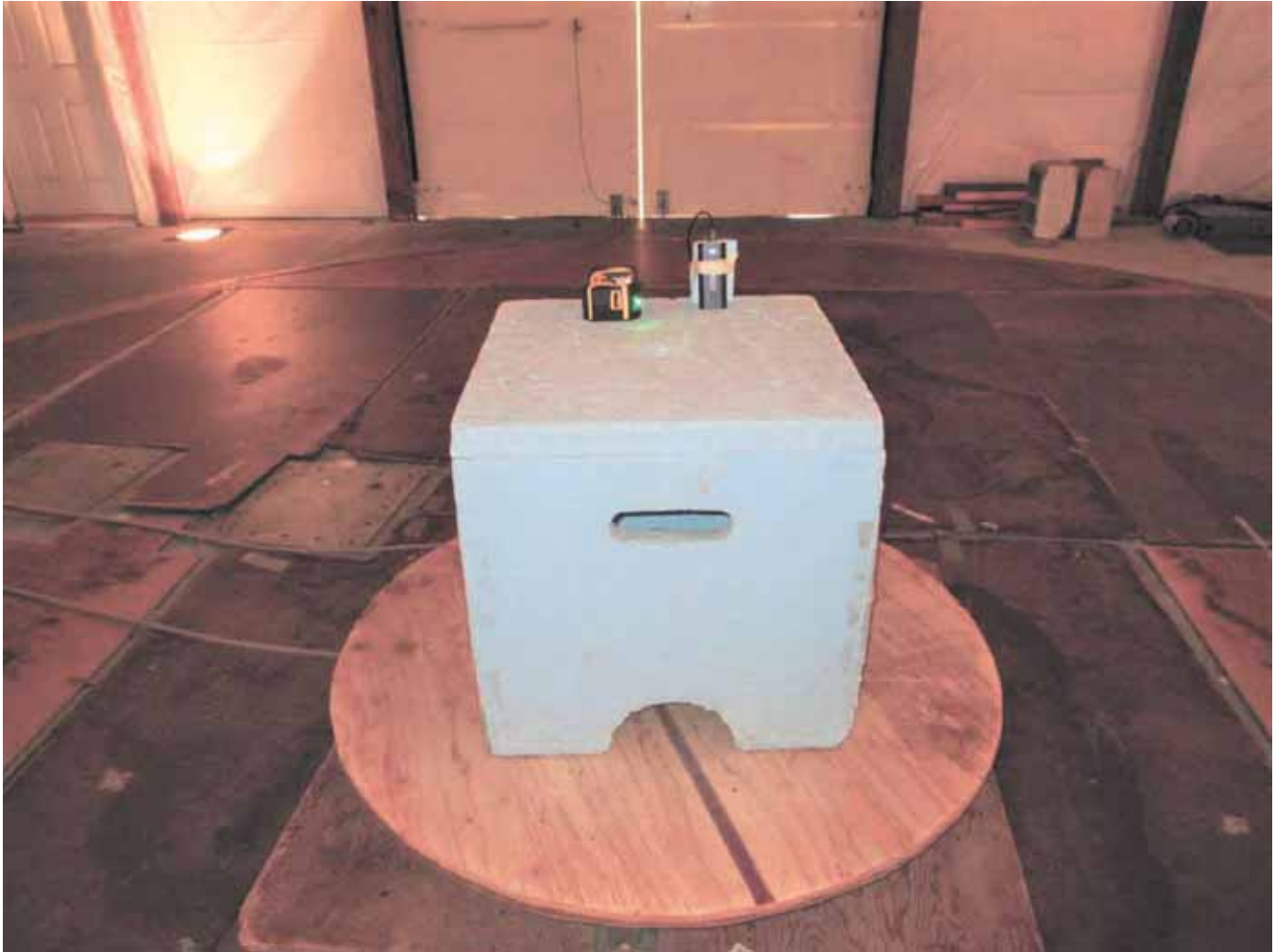
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - USB Battery Bank Powered - Front



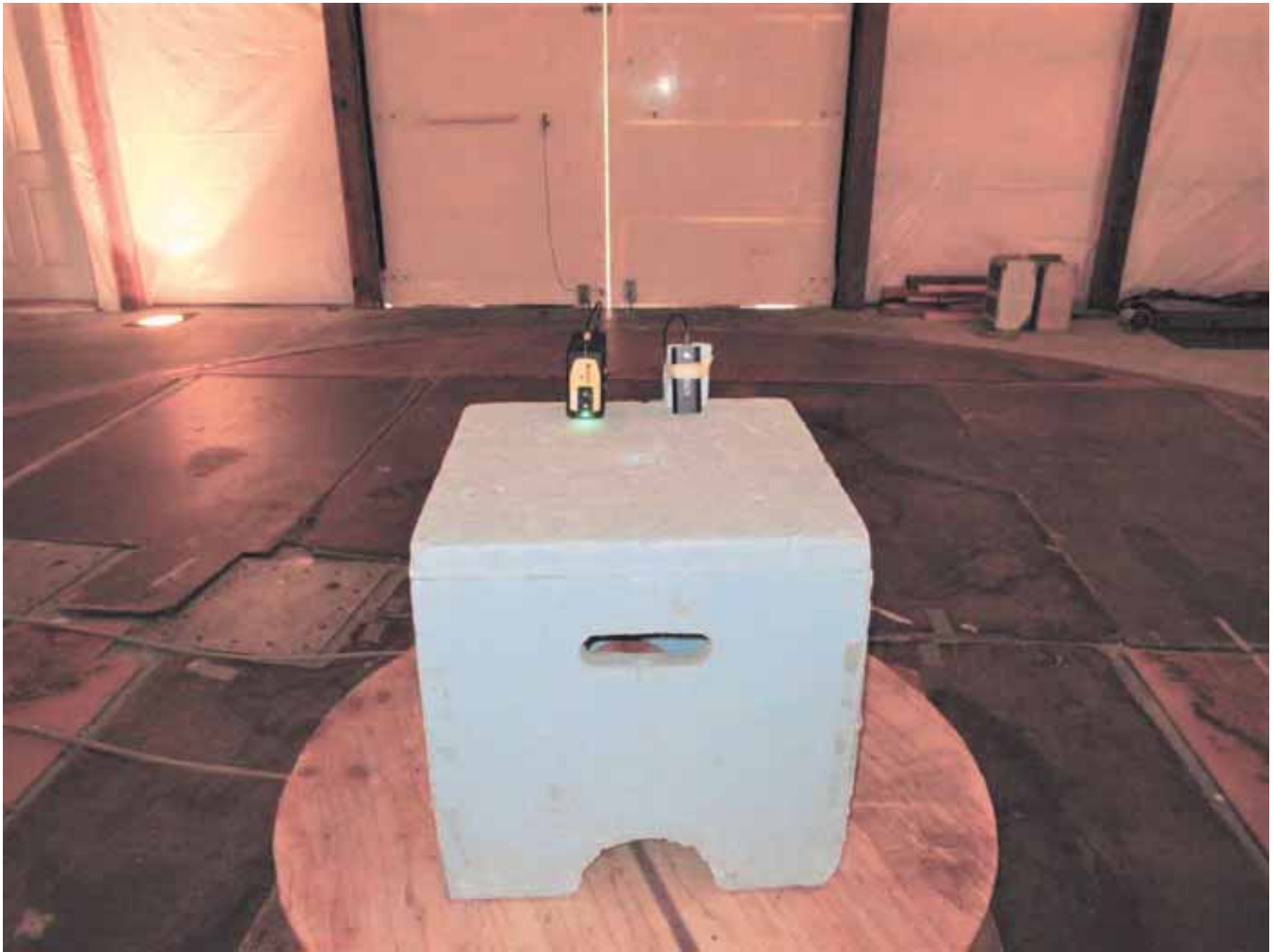
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - USB Battery Bank Powered - Front



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz



Radiated Below 1 GHz - USB Battery Bank Powered - Front



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

FCC PART 15 SECTION 15.109 RADIATED EMISSIONS BELOW 1 GHZ

AC AND INTERNAL BATTERY POWERED TEST DATA



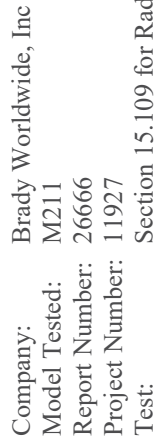
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

FCC Part 15.109 Class A @ 3 meters
Electric Field Strength

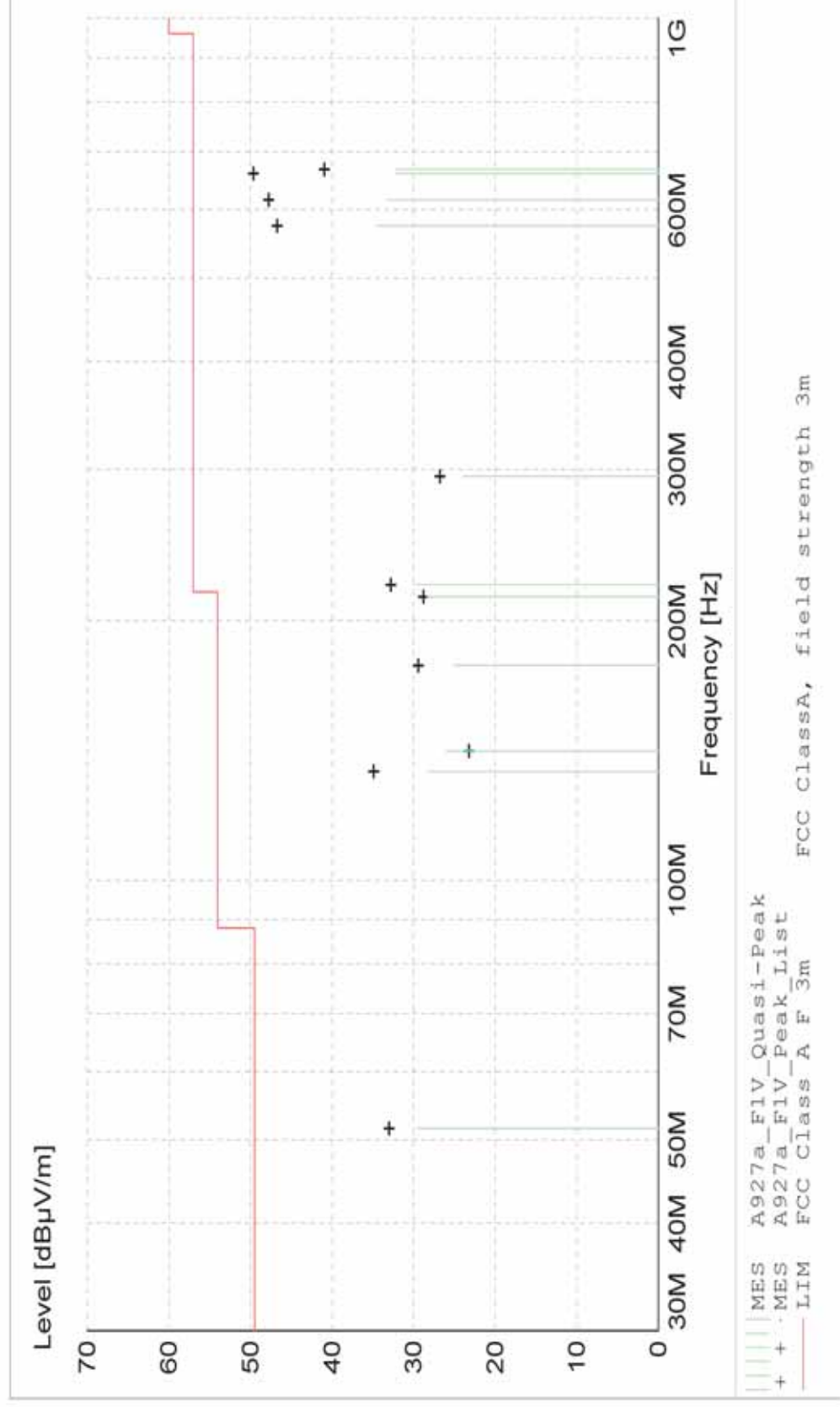
EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 65 deg. F; 29% R.H.
Test Site: DLS OF Site 2
Operator: cbrandt #11927
Test Specification: 120 V & 240 V 60 Hz; and internal Battery powered
Comment: Continuous print and cut mode
Date: 11-03-2021

TEXT: "Vert 3 meters"

Short Description:	Test Set-up								
Test Set-up:	EUT Measured at 3 Meters with VERTICAL Antenna Polarization								
Equations:	$\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$ $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$								
Graph Markers:	<table><tr><td>+</td><td>Frequency marker (Level of marker not related to final level)</td></tr><tr><td> </td><td>Final maximized level using Quasi-Peak detector</td></tr><tr><td>X</td><td>Final maximized level using Average detector</td></tr><tr><td>#</td><td>Final maximized level using Peak detector</td></tr></table>	+	Frequency marker (Level of marker not related to final level)		Final maximized level using Quasi-Peak detector	X	Final maximized level using Average detector	#	Final maximized level using Peak detector
+	Frequency marker (Level of marker not related to final level)								
	Final maximized level using Quasi-Peak detector								
X	Final maximized level using Average detector								
#	Final maximized level using Peak detector								



Section 15.109 for Radiated Emissions Below 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

MEASUREMENT RESULT: "A927a_F1V_Final"

11/3/2021	11:53AM	Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
		51.510000	42.23	11.15	-23.8	29.6	49.5	19.9	1.00	180	QUASI-PEAK	broadband
		574.780000	35.34	18.54	-19.4	34.5	57.0	22.5	1.60	270	QUASI-PEAK	broadband
		615.970000	33.12	19.06	-19.0	33.2	57.0	23.8	1.00	300	QUASI-PEAK	broadband
		660.910000	30.70	20.32	-18.8	32.2	57.0	24.8	1.00	340	QUASI-PEAK	broadband
		668.140000	30.16	20.64	-18.7	32.1	57.0	24.9	1.00	315	QUASI-PEAK	broadband
		213.220000	39.42	10.93	-22.0	28.4	54.0	25.7	1.00	170	QUASI-PEAK	broadband
		133.710000	38.49	12.43	-22.7	28.2	54.0	25.8	1.00	220	QUASI-PEAK	broadband
		220.240000	41.07	10.71	-21.9	29.9	57.0	27.1	1.00	135	QUASI-PEAK	broadband
		141.240000	36.55	12.08	-22.6	26.0	54.0	28.0	1.00	180	QUASI-PEAK	None
		177.500000	31.32	15.95	-22.2	25.0	54.0	29.0	1.00	0	QUASI-PEAK	broadband
		294.260000	31.63	13.58	-21.3	23.9	57.0	33.1	1.00	180	QUASI-PEAK	broadband



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

FCC Part 15.109 Class A @ 3 meters

Electric Field Strength

EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 65 deg. F; 29% R.H.
Test Site: DLS OF Site 2
Operator: cbrandt #11927
Test Specification: 120 V & 240 V 60 Hz; and internal Battery powered
Comment: Continuous print and cut mode
Date: 11-03-2021

TEXT: "Horz 3 meters"

Short Description: Test Set-up

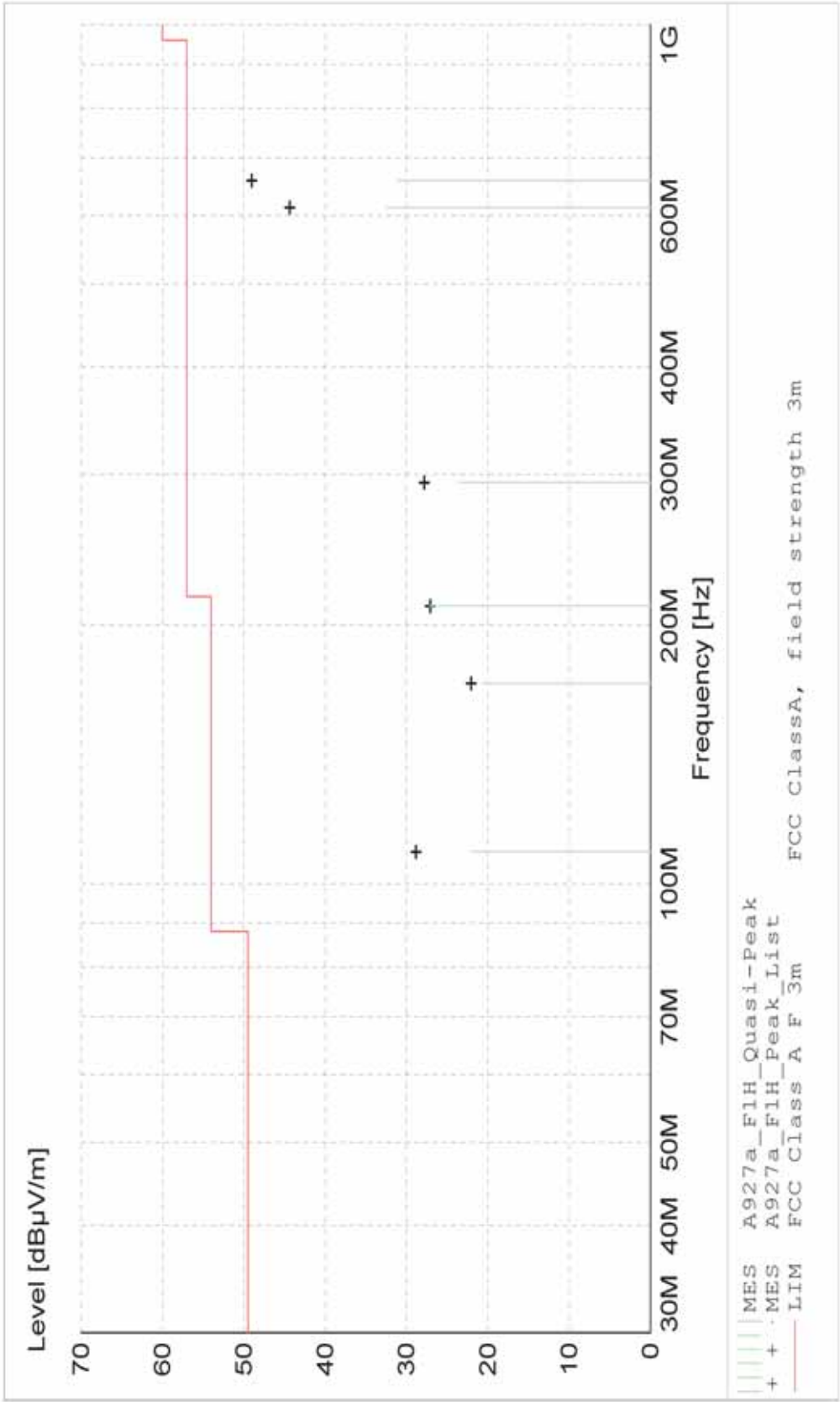
Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Equations: $\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$
 $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

MEASUREMENT RESULT: "A927a_F1H_Final"

11/3/2021 11:06AM	Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
	613.230000	32.45	19.01	-19.0	32.5	57.0	24.6	1.43	225	QUASI-PEAK	broadband
	658.980000	29.78	20.19	-18.8	31.2	57.0	25.9	1.30	250	QUASI-PEAK	broadband
	210.770000	38.13	11.03	-22.0	27.1	54.0	26.9	1.45	290	QUASI-PEAK	None
	108.940000	32.62	12.29	-22.9	22.0	54.0	32.0	2.44	270	QUASI-PEAK	broadband
	171.200000	27.97	15.02	-22.3	20.7	54.0	33.3	1.93	270	QUASI-PEAK	None
	293.310000	31.44	13.53	-21.4	23.6	57.0	33.4	1.39	270	QUASI-PEAK	broadband



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

PART 15 SECTION 15.109 RADIATED EMISSIONS BELOW 1 GHZ

USB BATTERY BANK POWERED TEST DATA



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

FCC Part 15.109 Class A @ 3 meters
Electric Field Strength

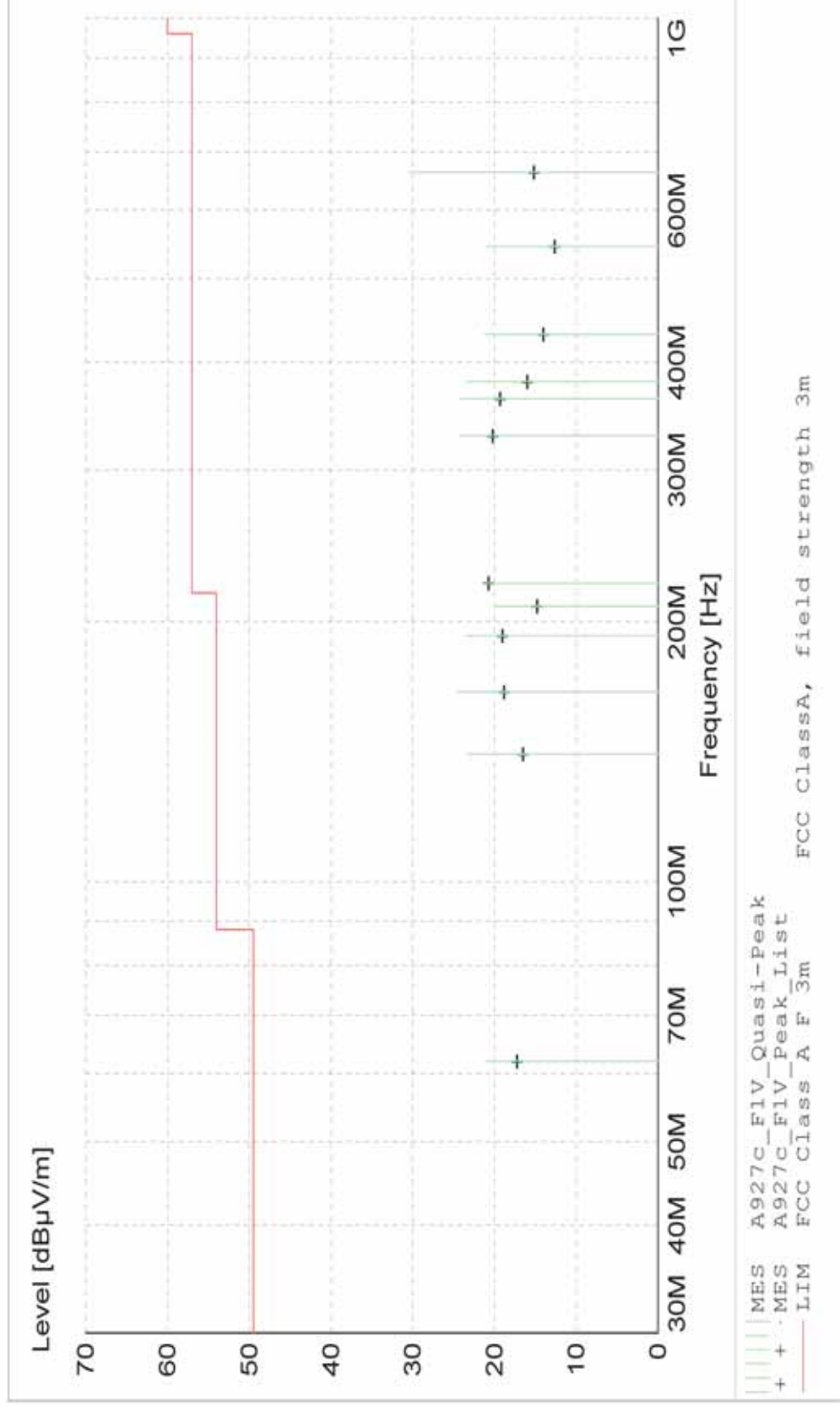
EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 64 deg. F; 34% R.H.
Test Site: DLS OF Site 2
Operator: cbrandt #11927
Test Specification: 5 Volts DC powered via external battery pack & USB-C cable
Comment: Continuous print and cut mode
Date: 12-16-2021

TEXT: "Vert 3 meters"

Short Description:	Test Set-up								
Test Set-up:	EUT Measured at 3 Meters with VERTICAL Antenna Polarization								
Equations:	$\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$ $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$								
Graph Markers:	<table><tbody><tr><td>+</td><td>Frequency marker (Level of marker not related to final level)</td></tr><tr><td> </td><td>Final maximized level using Quasi-Peak detector</td></tr><tr><td>X</td><td>Final maximized level using Average detector</td></tr><tr><td>#</td><td>Final maximized level using Peak detector</td></tr></tbody></table>	+	Frequency marker (Level of marker not related to final level)		Final maximized level using Quasi-Peak detector	X	Final maximized level using Average detector	#	Final maximized level using Peak detector
+	Frequency marker (Level of marker not related to final level)								
	Final maximized level using Quasi-Peak detector								
X	Final maximized level using Average detector								
#	Final maximized level using Peak detector								



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

MEASUREMENT RESULT: "A927c_Flv_Final"

12/16/2021 11:50AM	Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
	MHz	dBμV	Factor	Loss	Level	dBμV/m	dB	Ant.	Angle	Detector	
			dBμV/m	dB	dBμV/m			m	deg		
	663.340000	28.65	20.44	-18.7	30.4	57.0	26.7	1.17	75	QUASI-PEAK	broadband
	61.900000	35.31	9.42	-23.6	21.1	49.5	28.4	1.00	200	QUASI-PEAK	broadband
	165.820000	32.63	14.18	-22.3	24.5	54.0	29.5	1.00	245	QUASI-PEAK	broadband
	192.700000	28.52	17.10	-22.1	23.5	54.0	30.5	1.00	260	QUASI-PEAK	broadband
	140.480000	33.81	12.10	-22.7	23.3	54.0	30.8	1.00	180	QUASI-PEAK	broadband
	328.460000	31.05	14.23	-21.0	24.3	57.0	32.7	1.82	270	QUASI-PEAK	broadband
	362.640000	30.59	14.38	-20.8	24.2	57.0	32.9	1.40	270	QUASI-PEAK	broadband
	379.530000	29.23	14.79	-20.7	23.4	57.0	33.6	1.58	225	QUASI-PEAK	broadband
	208.460000	30.86	11.12	-22.0	20.0	54.0	34.0	1.00	90	QUASI-PEAK	broadband
	221.670000	32.67	10.67	-21.9	21.4	57.0	35.6	1.00	135	QUASI-PEAK	broadband
	430.520000	29.73	15.85	-20.4	21.2	57.0	35.8	1.31	225	QUASI-PEAK	broadband
	544.220000	22.51	17.99	-19.6	20.9	57.0	36.1	1.78	90	QUASI-PEAK	broadband



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

FCC Part 15.109 Class A @ 3 meters
Electric Field Strength

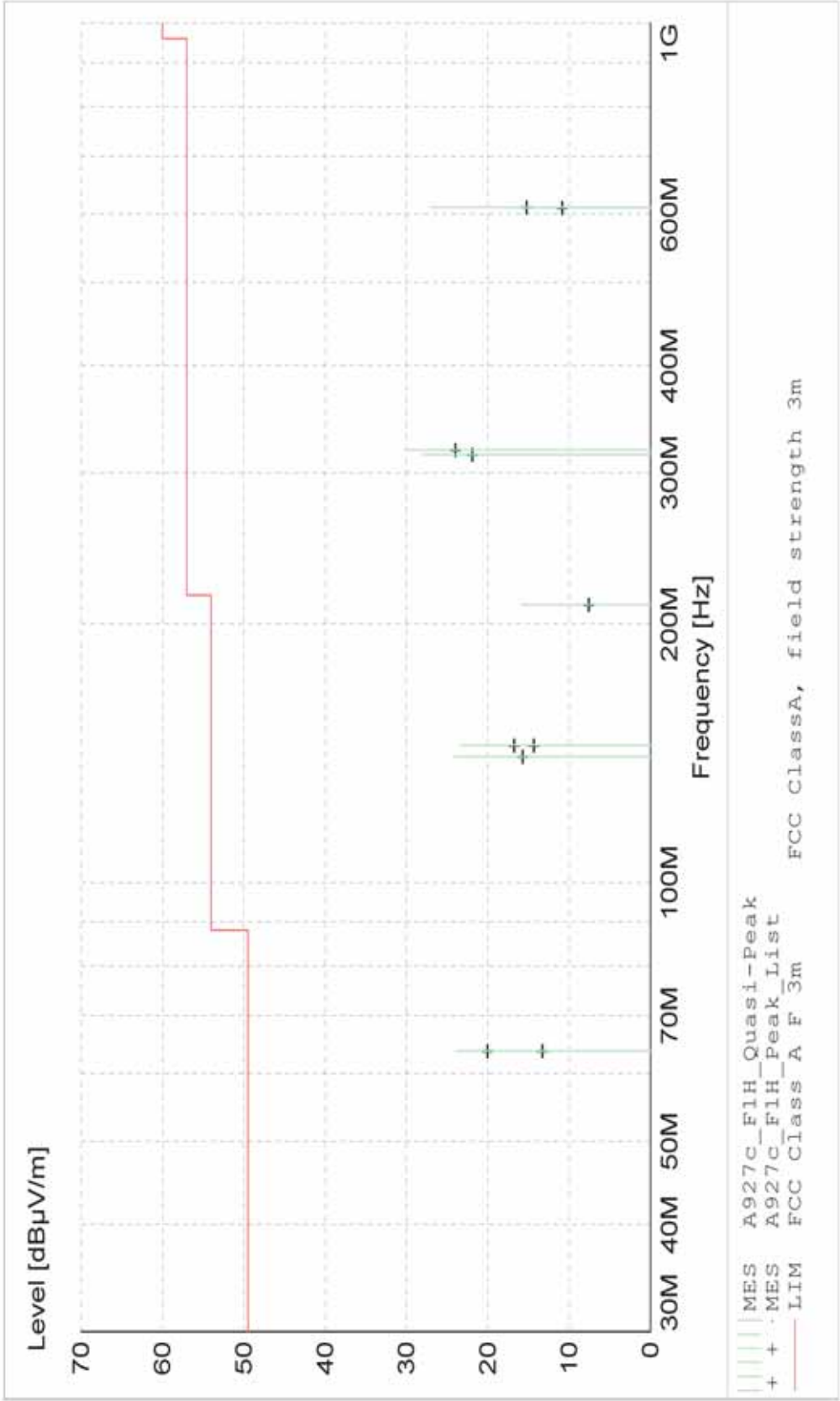
EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 64 deg. F; 34% R.H.
Test Site: DLS OF Site 2
Operator: cbrandt #11927
Test Specification: 5 Volts DC powered via external battery pack & USB-C cable
Comment: Continuous print and cut mode
Date: 12-16-2021

TEXT: "Horz 3 meters"

Short Description:	Test Set-up								
Test Set-up:	EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization								
Equations:	$\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$ $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$								
Graph Markers:	<table><tbody><tr><td>+</td><td>Frequency marker (Level of marker not related to final level)</td></tr><tr><td> </td><td>Final maximized level using Quasi-Peak detector</td></tr><tr><td>X</td><td>Final maximized level using Average detector</td></tr><tr><td>#</td><td>Final maximized level using Peak detector</td></tr></tbody></table>	+	Frequency marker (Level of marker not related to final level)		Final maximized level using Quasi-Peak detector	X	Final maximized level using Average detector	#	Final maximized level using Peak detector
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	Final maximized level using Quasi-Peak detector								
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#	Final maximized level using Peak detector								



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Below 1 GHz

MEASUREMENT RESULT: "A927c_F1H_Final"

12/16/2021 11:49AM	Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
	63.660000	38.43	9.00	-23.6	23.8	49.5	25.7	3.18	180	QUASI-PEAK	broadband
	318.750000	36.61	14.65	-21.1	30.2	57.0	26.8	1.56	135	QUASI-PEAK	broadband
	314.770000	34.17	15.13	-21.1	28.2	57.0	28.8	1.94	160	QUASI-PEAK	broadband
	610.900000	27.19	18.98	-19.0	27.1	57.0	29.9	1.28	225	QUASI-PEAK	broadband
	140.090000	34.71	12.10	-22.7	24.1	54.0	29.9	2.29	225	QUASI-PEAK	broadband
	144.390000	33.94	12.00	-22.6	23.4	54.0	30.7	2.27	225	QUASI-PEAK	broadband
	144.460000	30.93	12.00	-22.6	20.3	54.0	33.7	2.37	190	QUASI-PEAK	broadband
	210.580000	26.80	11.04	-22.0	15.8	54.0	38.2	1.52	135	QUASI-PEAK	broadband
	609.970000	16.75	18.96	-19.0	16.7	57.0	40.3	1.28	225	QUASI-PEAK	broadband



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC PART 15 SECTION 15.109 RADIATED EMISSIONS ABOVE 1 GHz



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

1.0 TEST PROCEDURE AND SETUP

The Portable Thermal Printer was set up according to the general testing requirements of ANSI C63.4:2014 & ANSI C63.10-2013 C.

All test measurements were made with the following mode of operation:

Continuous printing and cutting mode.

2.0 TEST RESULTS

The Portable Thermal Printer Model Number: M211 **meets** the requirements of FCC Part 15, Subpart B & Subpart for Section 15.109 Radiated Emissions above 1 GHz. Plots and tabular data can be viewed at the end of this section.

Summary: No non-compliant emissions were observed.

3.0 SAMPLE CALCULATIONS

Radiated emissions: Emissions measurements include all system transducers and are compared against the appropriate limit requirement. See sample calculation below.

$$\begin{array}{lcl} \text{Equations:} & \frac{\text{Total Level(dB}\mu\text{V/m)}}{24.6} = & \frac{\text{Level(dB}\mu\text{V)}}{= 35.51} + \frac{\text{System Loss(dB)}}{+ (-22.1)} + \frac{\text{Antenna Factor(dB/m)}}{+ 11.20} \\ \text{Sample:} & & \end{array}$$

$$\begin{array}{lcl} \frac{\text{Margin(dB)}}{15.4} = & \frac{\text{Limit(dB}\mu\text{V/m)}}{= 40} - & \frac{\text{Total Level(dB}\mu\text{V/m)}}{- 24.6} \end{array}$$



Company: Brady Worldwide, Inc
 Model Tested: M211
 Report Number: 26666
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 Test: Section 15.109 for Radiated Emissions Above 1 GHz

4.0 D.L.S. ELECTRONIC SYSTEMS, INC. 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 Emission Uncertainty										
Contribution	Probability Distribution	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)
		3M	3M	3M	3M	3M	3M	10M	10M	10M
		30-100 MHz	100-700 MHz	700-1000 MHz	1- 4.5 GHz	4.5 – 7 GHz	7 – 18 GHz	30-100 MHz	100-700 MHz	700-1000 MHz
Combined Standard Uncertainty	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



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

TABLE 1 / TEST INSTRUMENTATION

Description	Manufacturer	Model Number	Serial Number	Range	Cal On	Cal Due Dates
Antenna, Horn	EMCO	3115	9502-4451	1GHz-18GHz	10/7/2021	10/7/2023
N->N, 10m, High Frequency	Micro-Coax	UFB311A	CBL-100	30Mhz-18GHz	4/27/2021	4/27/2022
Preamplifier, RF	Miteq	AMF-7D-01001800-22-10P	1809602	1-18Ghz	4/27/2021	4/27/2022
Receiver, RF, Tuned	Rohde & Schwarz	ESI 40	837808/006	20Hz – 40 GHz	4/14/2021	4/14/2022

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

TABLE 2 / TEST EQUIPMENT

Description	Manufacturer	Model Number	Serial Number	Range
Test Software	Rohde & Schwarz	ESK1	V1.7.1	N/A

The test equipment above is verified with calibrated equipment.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC PART 15 SECTION 15.109 RADIATED EMISSIONS ABOVE 1 GHZ

AC AND INTERNAL BATTERY POWERED PHOTOS



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - Front



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - Back



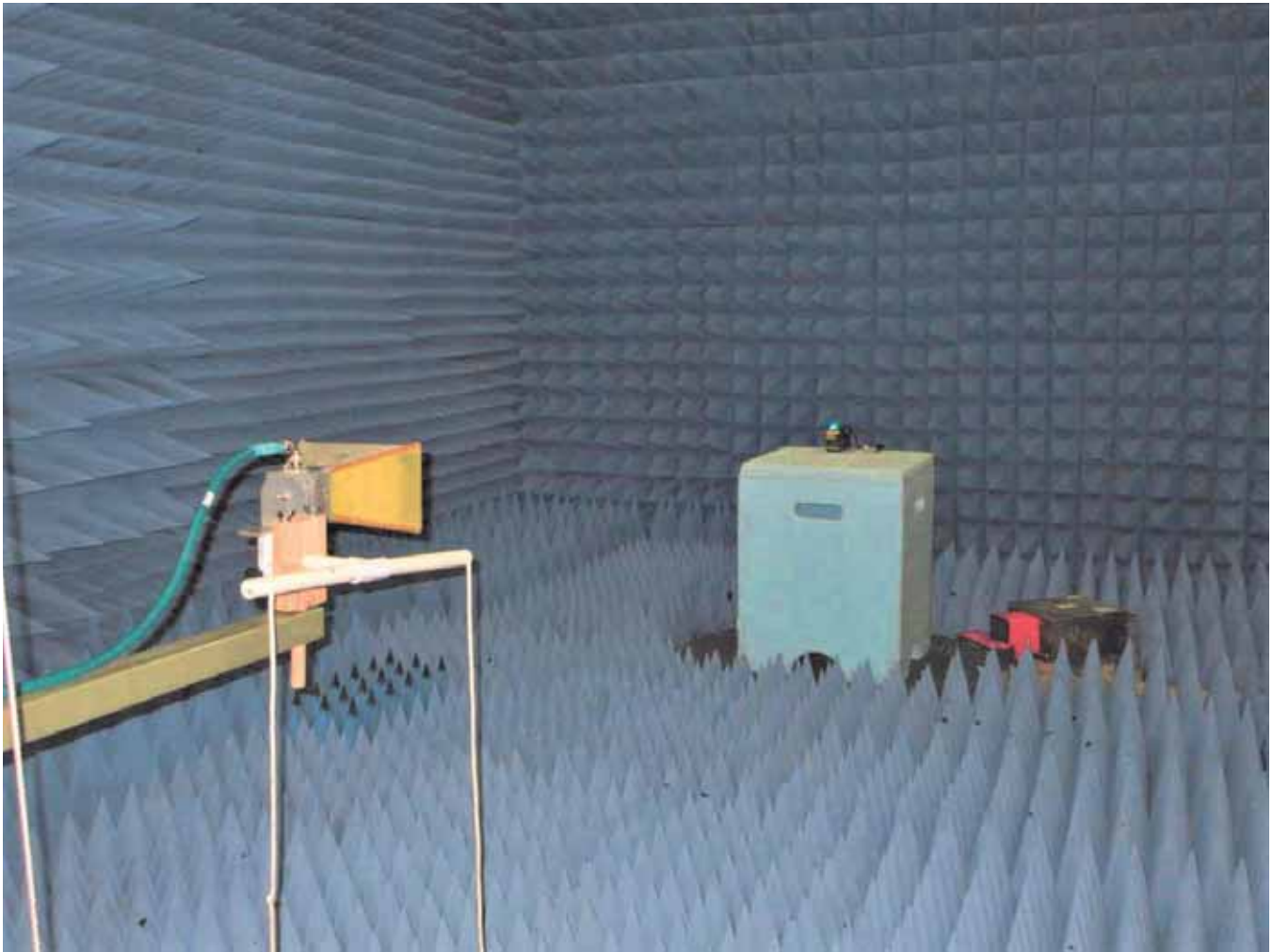
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC PART 15 SECTION 15.109 RADIATED EMISSIONS ABOVE 1 GHZ

USB BATTERY BANK POWERED PHOTOS



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - USB Battery Bank Powered



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - USB Battery Bank Powered - Back



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - USB Battery Bank Powered - Front



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - USB Battery Bank Powered - Front



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - USB Battery Bank Powered - Front



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - USB Battery Bank Powered - Front



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz



Radiated Above 1 GHz - USB Battery Bank Powered - Front



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC PART 15 SECTION 15.109 RADIATED EMISSIONS ABOVE 1 GHZ

AC AND INTERNAL BATTERY POWERED TEST DATA



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC Part 15.109 Class A
Electric Field Strength

EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 71 deg F; 33% R.H.
Test Site: DLS O.F. G1
Operator: cbrandt #11927
Test Specification: 120 V & 240 V 60 Hz; and internal Battery powered
Comment: Continuous printing and cutting mode
Date: 11-01-2021

TEXT: "Vert 3 meters"

Short Description: Test Set-up

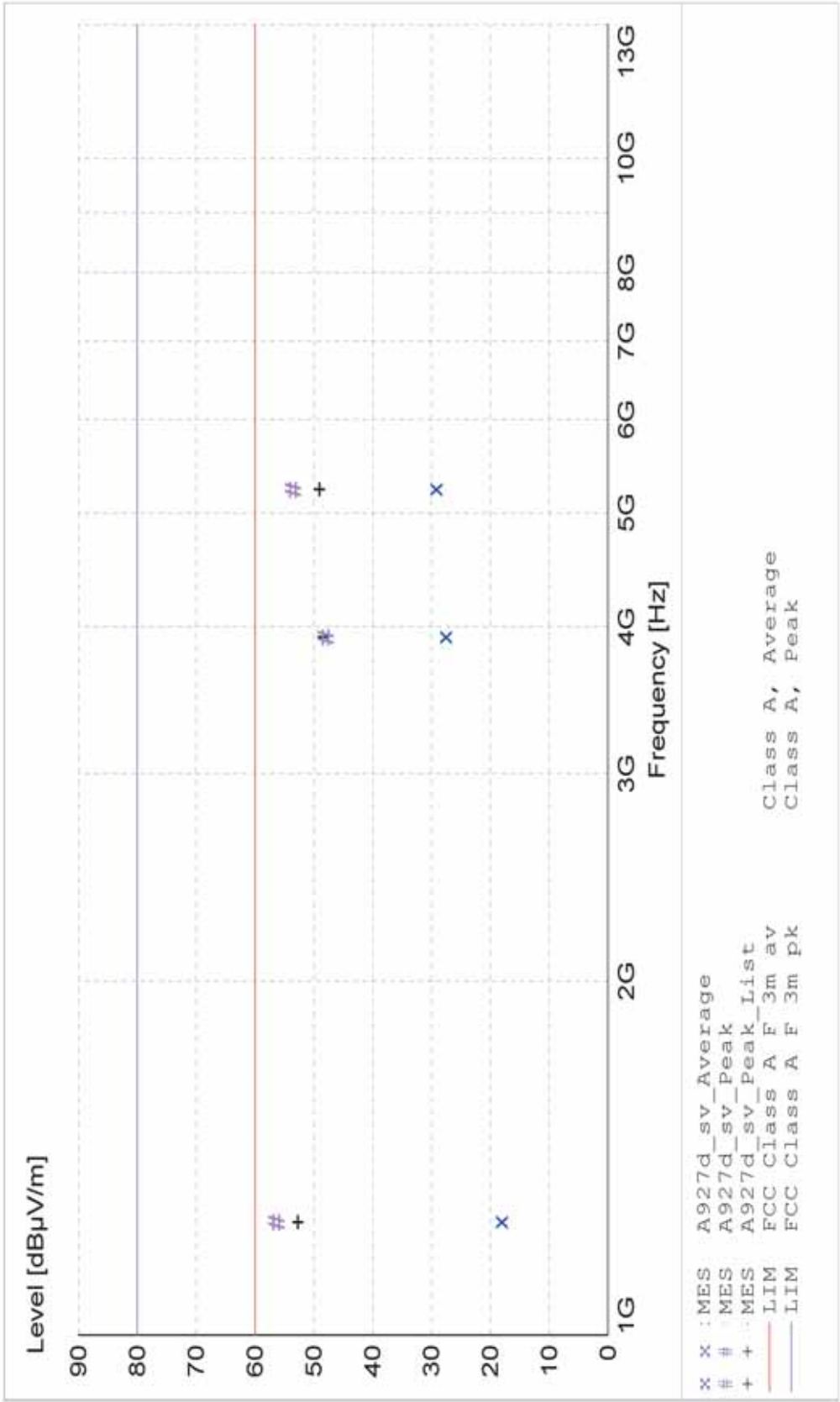
Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: $\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$
24.6 = 35.51 + (-22.1) + 11.20
 $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector
- Background Scan Peak Detector (Optional)
- Background Scan Average Detector (Optional)



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

MEASUREMENT RESULT: "A927d_sv_Final"

11/1/2021 3:38PM	Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
	1246.800000	88.63	24.99	-57.3	56.3	80.0	23.7	1.32	220	MAX PEAK	None
	5231.200000	74.09	33.81	-54.4	53.5	80.0	26.5	1.20	210	MAX PEAK	None
	5231.200000	50.06	33.81	-54.4	29.5	60.0	30.6	1.20	210	AVERAGE	None
	3916.800000	71.60	32.75	-56.4	47.9	80.0	32.1	1.00	270	MAX PEAK	None
	3916.800000	51.51	32.75	-56.4	27.8	60.0	32.2	1.00	270	AVERAGE	None
	1246.800000	50.62	24.99	-57.3	18.3	60.0	41.7	1.32	220	AVERAGE	None



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC Part 15.109 Class A
Electric Field Strength

EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 71 deg F; 33% R.H.
Test Site: DLS O.F. G1
Operator: cbrandt #11927
Test Specification: 120 V & 240 V 60 Hz; and internal Battery powered
Comment: Continuous printing and cutting mode
Date: 11-01-2021

TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

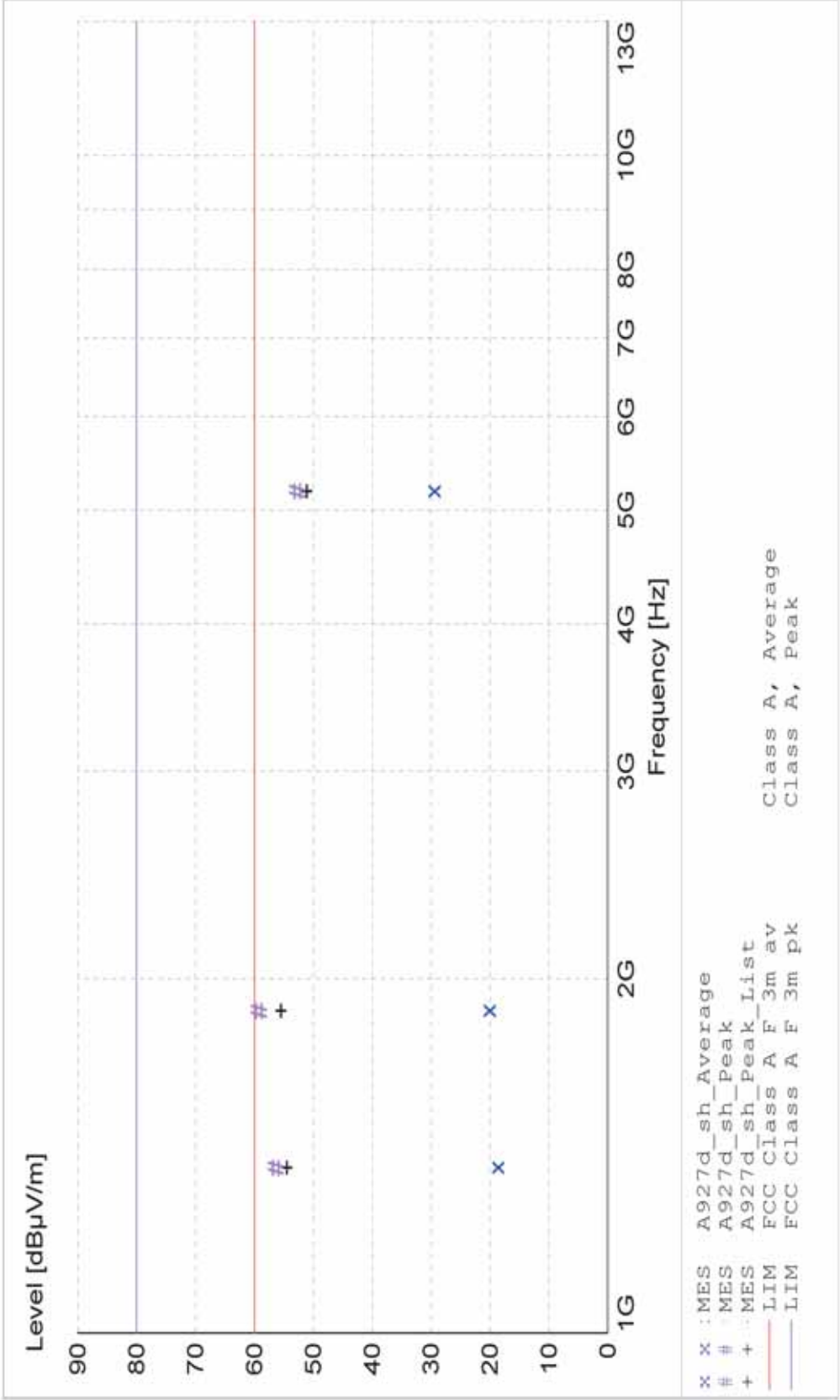
Sample Equations: $\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$
24.6 = 35.51 + (-22.1) + 11.20

Margin (dB) = Limit (dB μ V/m) - Total Level (dB μ V/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector
- Background Scan Peak Detector (Optional)
- Background Scan Average Detector (Optional)



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

MEASUREMENT RESULT: "A927d_sh_Final"

11/1/2021 4:01PM	Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
	1876.900000	88.55	27.04	-56.4	59.2	80.0	20.8	1.27	0	MAX PEAK	None
	1381.300000	88.12	25.24	-57.1	56.3	80.0	23.7	1.20	30	MAX PEAK	None
	5183.800000	73.42	33.72	-54.5	52.6	80.0	27.4	1.00	270	MAX PEAK	None
	5183.800000	50.25	33.72	-54.5	29.7	60.0	30.3	1.00	270	AVERAGE	None
	1876.900000	49.75	27.04	-56.4	20.4	60.0	39.6	1.27	0	AVERAGE	None
	1381.300000	50.76	25.24	-57.1	18.9	60.0	41.1	1.20	30	AVERAGE	None



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC PART 15 SECTION 15.109 RADIATED EMISSIONS ABOVE 1 GHZ

USB BATTERY BANK POWERED TEST DATA



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC Part 15.109 Class A
Electric Field Strength

EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 68 deg F; 39% R.H.
Test Site: DLS OF Site G1
Operator: cbrandt #11927
Test Specification: 5 Volts DC powered via external battery pack & USB-C cable
Comment: Continuous print and cut mode
Date: 12-16-2021

TEXT: "Vert 3 meters"

Short Description: Test Set-up

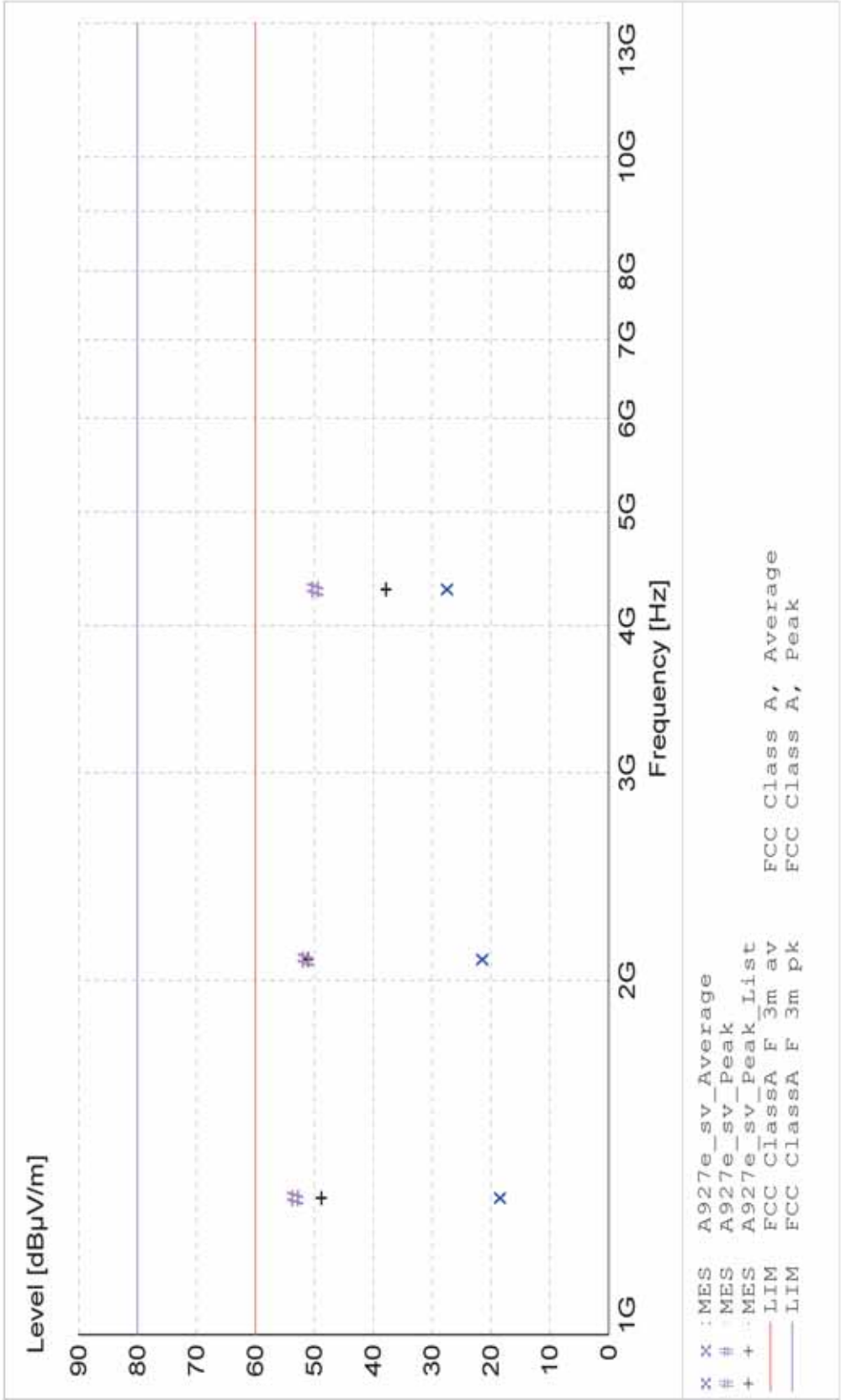
Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: $\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$
24.6 = 35.51 + (-22.1) + 11.20
 $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector
- Background Scan Peak Detector (Optional)
- Background Scan Average Detector (Optional)



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

MEASUREMENT RESULT: "A927e_sv_Final"

12/16/2021 2:18PM	Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
	1306.000000	85.43	24.97	-57.2	53.2	80.0	26.8	1.00	235	MAX PEAK	None
	2082.000000	80.23	27.48	-56.3	51.4	80.0	28.6	1.05	306	MAX PEAK	None
	4293.600000	74.04	32.05	-56.3	49.8	80.0	30.2	1.00	0	MAX PEAK	None
	4293.600000	52.01	32.05	-56.3	27.7	60.0	32.3	1.00	0	AVERAGE	None
	2082.000000	50.63	27.48	-56.3	21.8	60.0	38.2	1.05	306	AVERAGE	None
	1306.000000	51.00	24.97	-57.2	18.8	60.0	41.2	1.00	235	AVERAGE	None



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

FCC Part 15.109 Class A
Electric Field Strength

EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 68 deg F; 39% R.H.
Test Site: DLS OF Site G1
Operator: cbrandt #11927
Test Specification: 5 Volts DC powered via external battery pack & USB-C cable
Comment: Continuous print and cut mode
Date: 12-16-2021

TEXT: "Horz 3 meters"

Short Description: Test Set-up

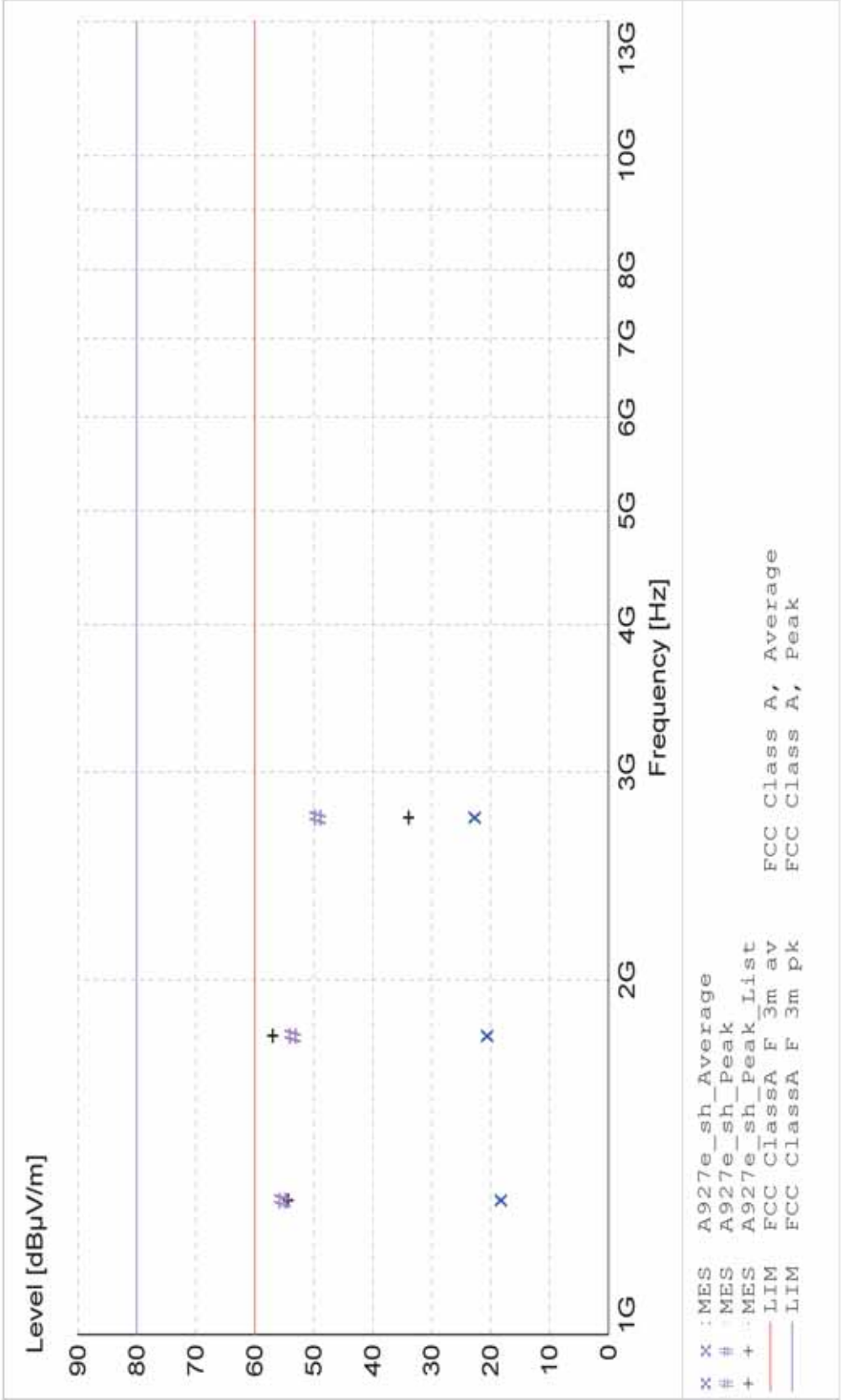
Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector
- Background Scan Peak Detector (Optional)
- Background Scan Average Detector (Optional)



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.109 for Radiated Emissions Above 1 GHz

MEASUREMENT RESULT: "A927e_sh_Final"

12/16/2021 1:36PM	Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
	1299.400000	87.48	24.95	-57.2	55.2	80.0	24.8	1.16	180	MAX PEAK	None
	1791.700000	83.40	26.56	-56.5	53.5	80.0	26.5	1.14	256	MAX PEAK	None
	2744.000000	76.78	28.81	-56.3	49.3	80.0	30.7	1.17	220	MAX PEAK	None
	2744.000000	50.50	28.81	-56.3	23.0	60.0	37.0	1.17	220	AVERAGE	None
	1791.700000	50.81	26.56	-56.5	20.9	60.0	39.1	1.14	256	AVERAGE	None
	1299.400000	50.80	24.95	-57.2	18.6	60.0	41.4	1.16	180	AVERAGE	None



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

FCC PART 15 SECTION 15.209

RADIATED EMISSIONS IN RESTRICTED BANDS BELOW 1 GHz



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

1.0 TEST PROCEDURE AND SETUP

The Portable Thermal Printer was set up according to the general testing requirements of ANSI C63.4:2014 & ANSI C63.10-2013.

All test measurements were made with the following mode of operation:

Continuous transmit (100% duty cycle) at 2440 MHz with power setting 0 and 2 Mbps data rate. This was the channel, modulation type & data rate shown to be worst-case in the radios' modular certification test reports.

2.0 TEST RESULTS

The Portable Thermal Printer Model Number: M211 **meets** the requirements of FCC Part 15, Subpart B & Subpart C, Section 15.209 Radiated Emissions in Restricted Bands below 1 GHz. Plots and tabular data can be viewed at the end of this section.

Summary: No non-compliant emissions were observed.

3.0 SAMPLE CALCULATIONS

Radiated emissions: Emissions measurements include all system transducers and are compared against the appropriate limit requirement. See sample calculation below.

$$\begin{array}{lcl} \text{Equations:} & \text{Total Level(dB}\mu\text{V/m)} = & \text{Level(dB}\mu\text{V)} + \text{System Loss(dB)} + \text{Antenna Factor(dB/m)} \\ \text{Sample:} & 24.6 & = 35.51 + (-22.1) + 11.20 \end{array}$$

$$\begin{array}{lcl} \text{Margin(dB)} = & \text{Limit(dB}\mu\text{V/m)} - & \text{Total Level(dB}\mu\text{V/m)} \\ 15.4 & = 40 & - 24.6 \end{array}$$



Company: Brady Worldwide, Inc
 Model Tested: M211
 Report Number: 26666
 Project Number: 11927
 Test: Section 15.209 Radiated Emissions in Restricted Bands
 Below 1 GHz

4.0 D.L.S. ELECTRONIC SYSTEMS, INC. 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 Emission Uncertainty										
Contribution	Probability Distribution	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)
		3M	3M	3M	3M	3M	3M	10M	10M	10M
		30-100 MHz	100-700 MHz	700-1000 MHz	1- 4.5 GHz	4.5 – 7 GHz	7 – 18 GHz	30-100 MHz	100-700 MHz	700-1000 MHz
Combined Standard Uncertainty	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



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

TABLE 1 / TEST INSTRUMENTATION

Description	Manufacturer	Model Number	Serial Number	Range	Cal On	Cal Due Dates
Antenna, Biconical	EMCO	3104C	9701-4785	20MHz-200MHz	4/15/2020	4/15/2022
Antenna, Log Periodic	EMCO	3146	9702-4895	200MHz-1GHz	4/15/2020	4/15/2022
Beldin 9273; N-BNC; 2 Meter; Receiver Hook-Up	Beldin	9273	CBL-028	9 kHz-1000MHz	2/5/2021	2/5/2022
Beldin 9914; N-N; 3 Meter Test	Beldin	9914	CBL-005	9kHz-1000MHz	2/5/2021	2/5/2022
Preamplifier, RF, w/CBL-039	Rohde & Schwarz	TS-PR10	032001/004	9kHz - 1GHz	10/28/2021	10/28/2022
Receiver, RF, Tuned	Rohde & Schwarz	ESI 26	837491/010	20Hz – 26GHz	4/13/2021	4/13/2022
RG-223/U; N-BNC; 10Meter; Antenna Hook-Up	Coleman Cable	991079 / RG-223/U	CBL-051	9kHz-1GHz	2/5/2021	2/5/2022

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

TABLE 2 / TEST EQUIPMENT

Description	Manufacturer	Model Number	Serial Number	Range
Test Software	Rohde & Schwarz	ESK1	V1.7.1	N/A

The test equipment above is verified with calibrated equipment.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

PART 15 SECTION 15.209

RADIATED EMISSIONS IN RESTRICTED BANDS BELOW 1 GHZ

TEST SETUP PHOTOS



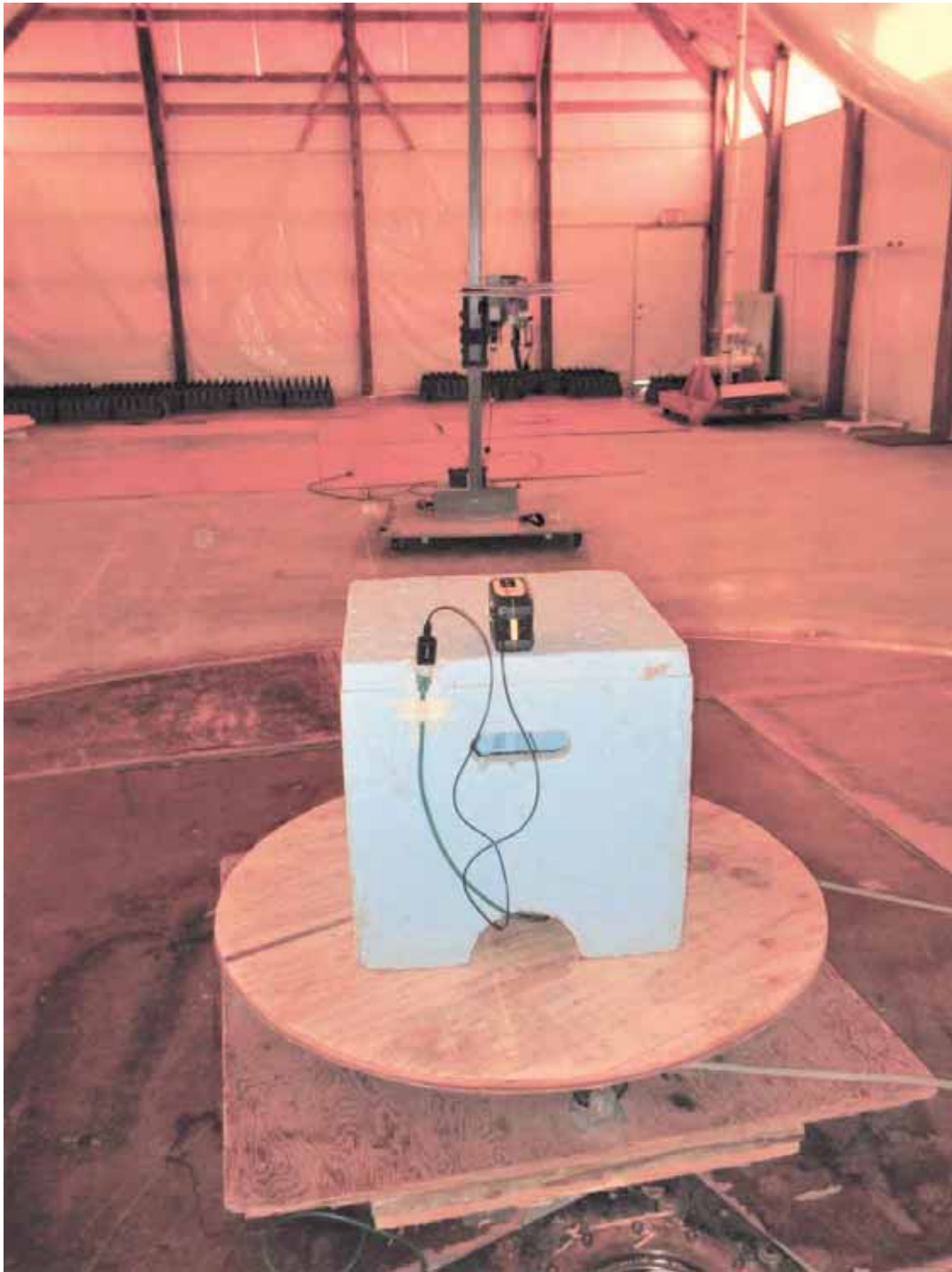
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz



Radiated Below 1 GHz - USB Powered - Front



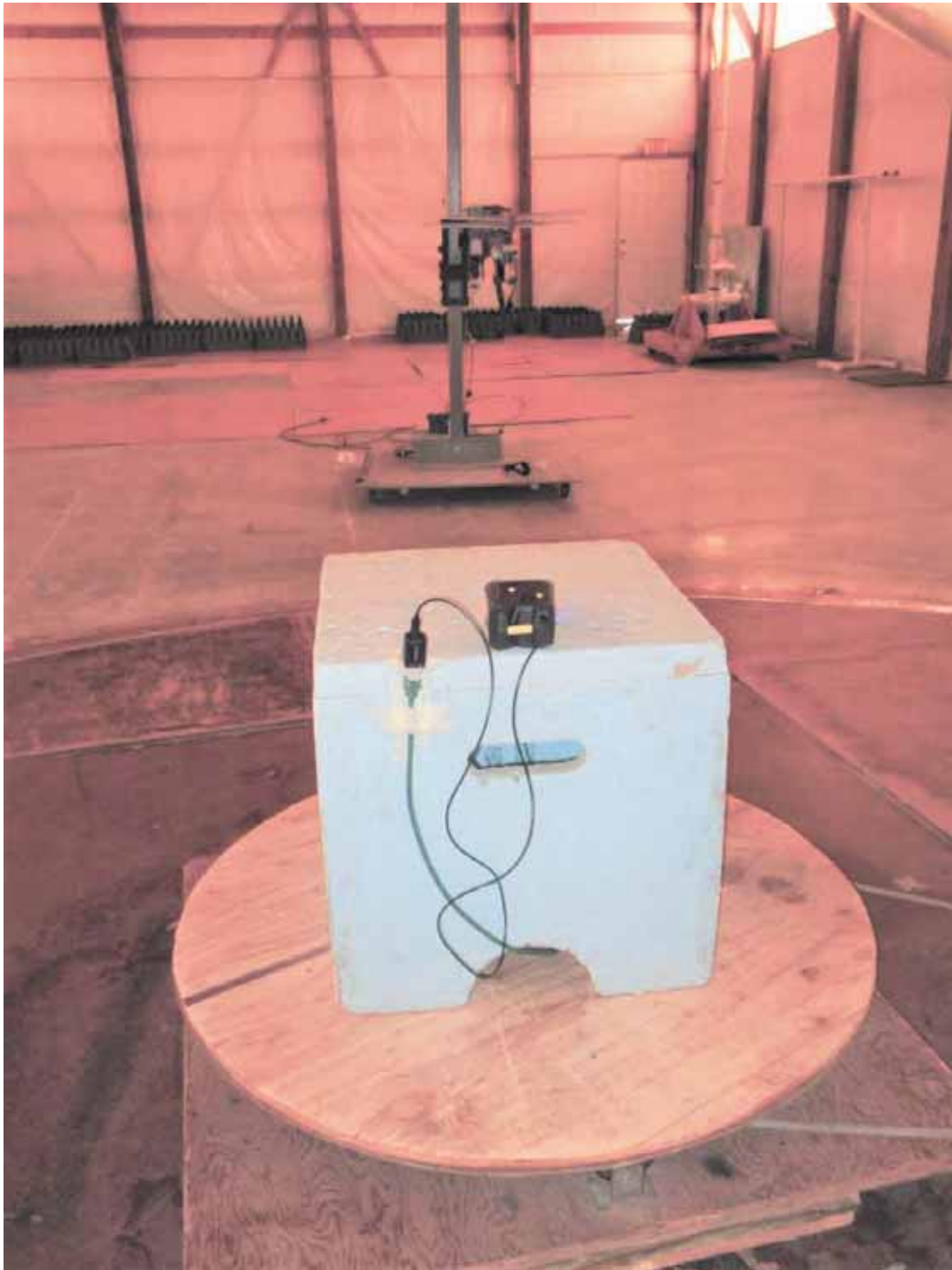
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz



Radiated Below 1 GHz - USB Powered - Back



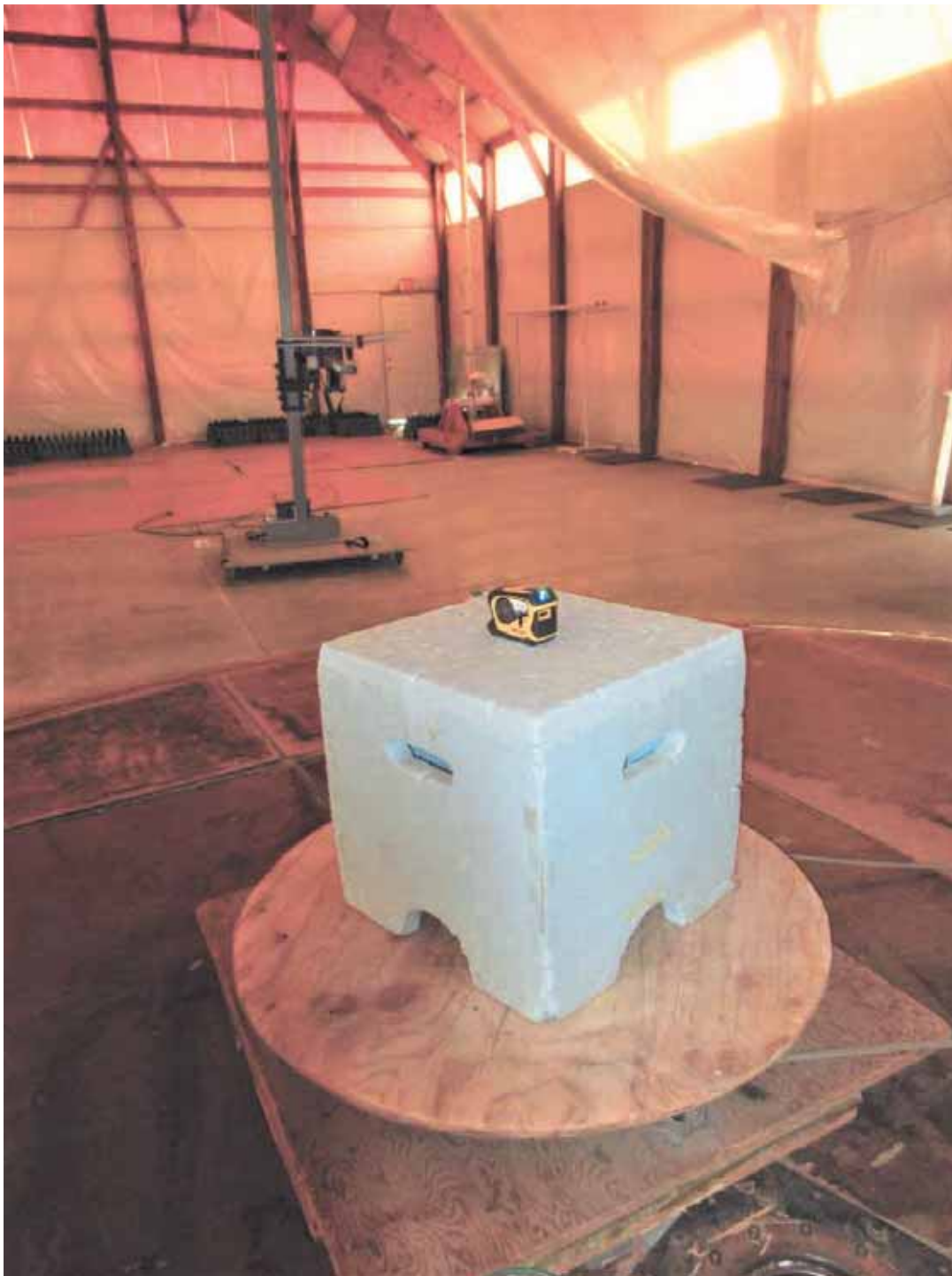
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz



Radiated Below 1 GHz - USB Powered - Back



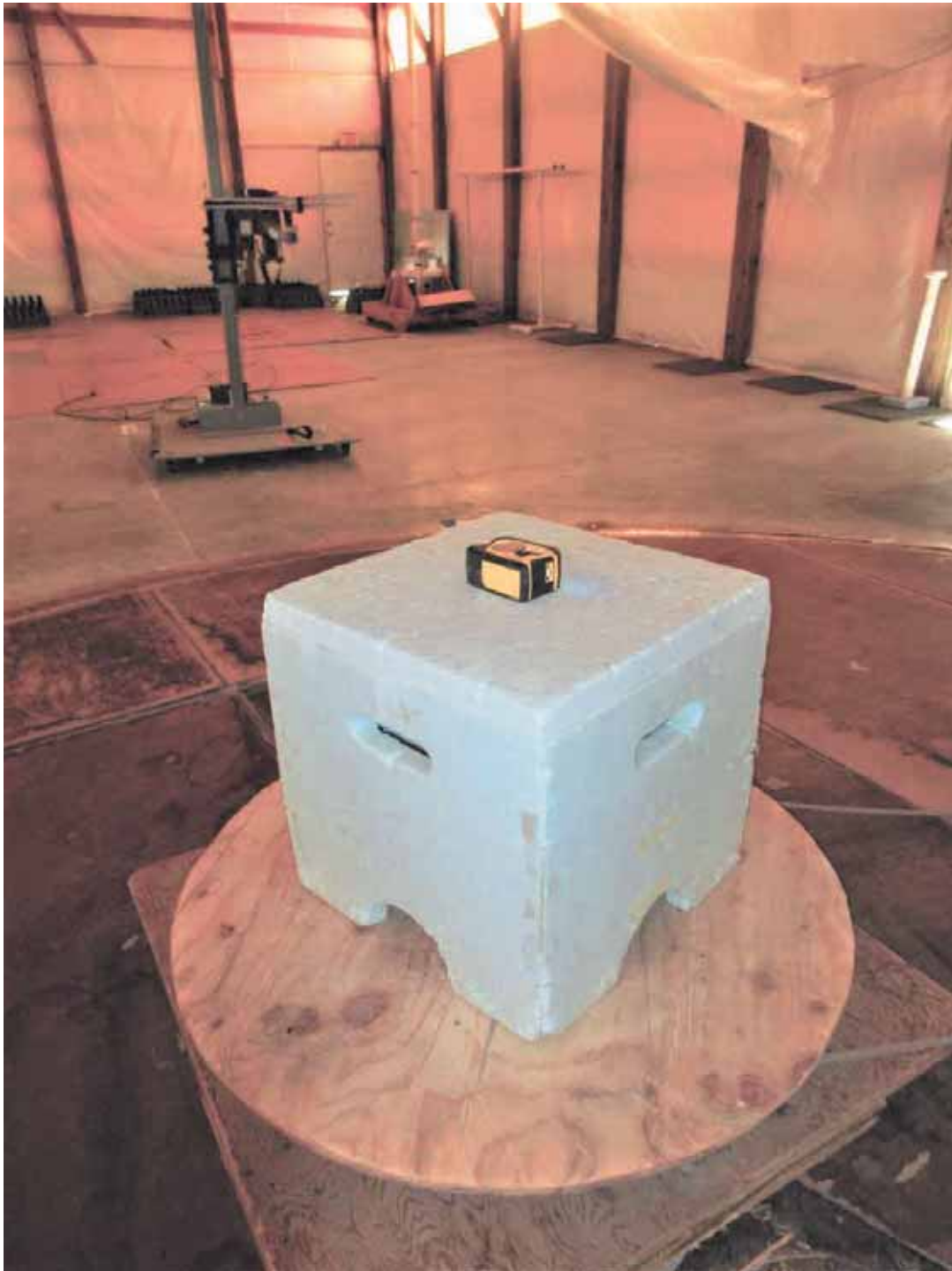
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz



Radiated Below 1 GHz - Battery Powered



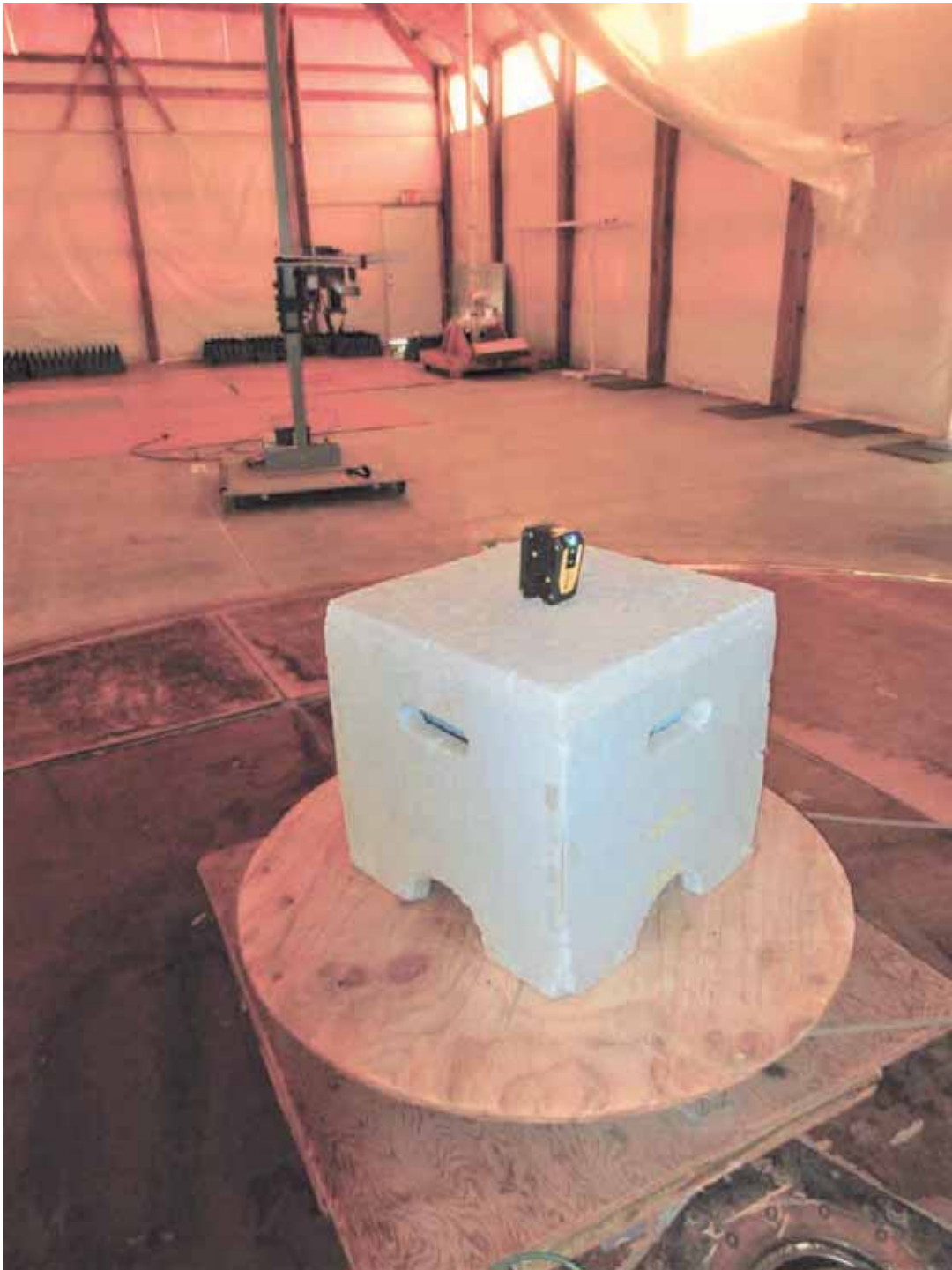
Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz



Radiated Below 1 GHz - Battery Powered



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz



Radiated Below 1 GHz - Battery Powered



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

FCC PART 15 SECTION 15.209

RADIATED EMISSIONS IN RESTRICTED BANDS BELOW 1 GHZ

TEST DATA



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

FCC Part 15.247/15.205/15.209 Restricted Bands
Electric Field Strength

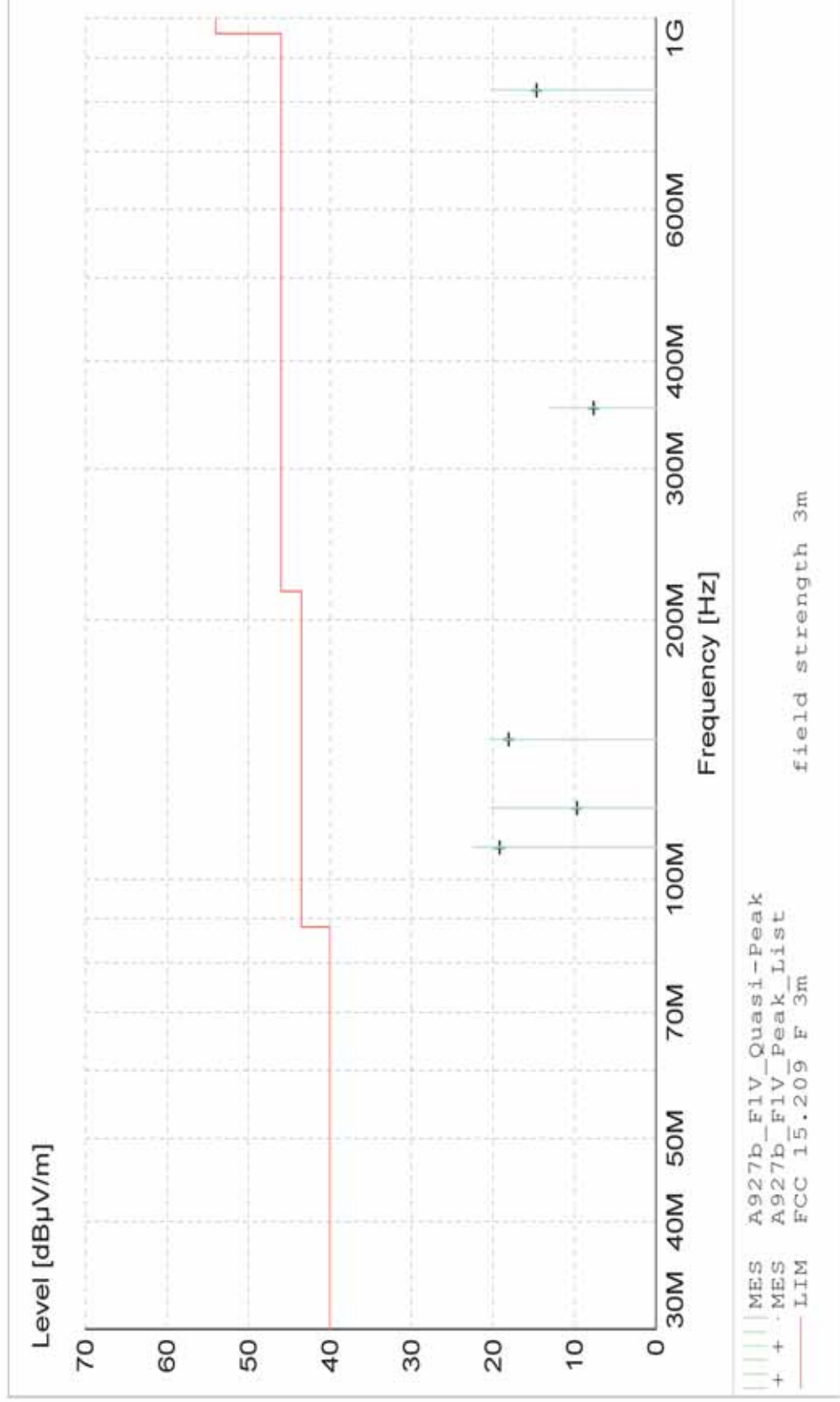
EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 65 deg. F; 29% R.H.
Test Site: DLS OF Site 2
Operator: cbrandt #11927
Test Specification: 120 V & 240 V 60 Hz; and internal Battery powered
Comment: Continuous transmit 2440 MHz (100% duty cycle)
Date: 11-03-2021

TEXT: "Vert 3 meters"

Short Description:	Test Set-up
Test Set-up:	EUT Measured at 3 Meters with VERTICAL Antenna Polarization
Equations:	Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)
	Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)
Graph Markers:	+ Frequency marker (Level of marker not related to final level)
	Final maximized level using Quasi-Peak detector
	X Final maximized level using Average detector
	# Final maximized level using Peak detector



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

MEASUREMENT RESULT: "A927b_F1V_Final"

Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
108.920000	33.04	12.29	-22.9	22.4	43.5	21.1	1.00	240	QUASI-PEAK	None
145.310000	31.04	12.00	-22.6	20.5	43.5	23.0	1.00	180	QUASI-PEAK	None
121.000000	30.22	12.90	-22.8	20.3	43.5	23.2	1.00	270	QUASI-PEAK	None
825.480000	16.10	21.76	-17.6	20.3	46.0	25.7	1.00	0	QUASI-PEAK	noise floor
352.940000	19.75	14.36	-20.9	13.2	46.0	32.8	1.00	0	QUASI-PEAK	noise floor



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

FCC Part 15.247/15.205/15.209 Restricted Bands
Electric Field Strength

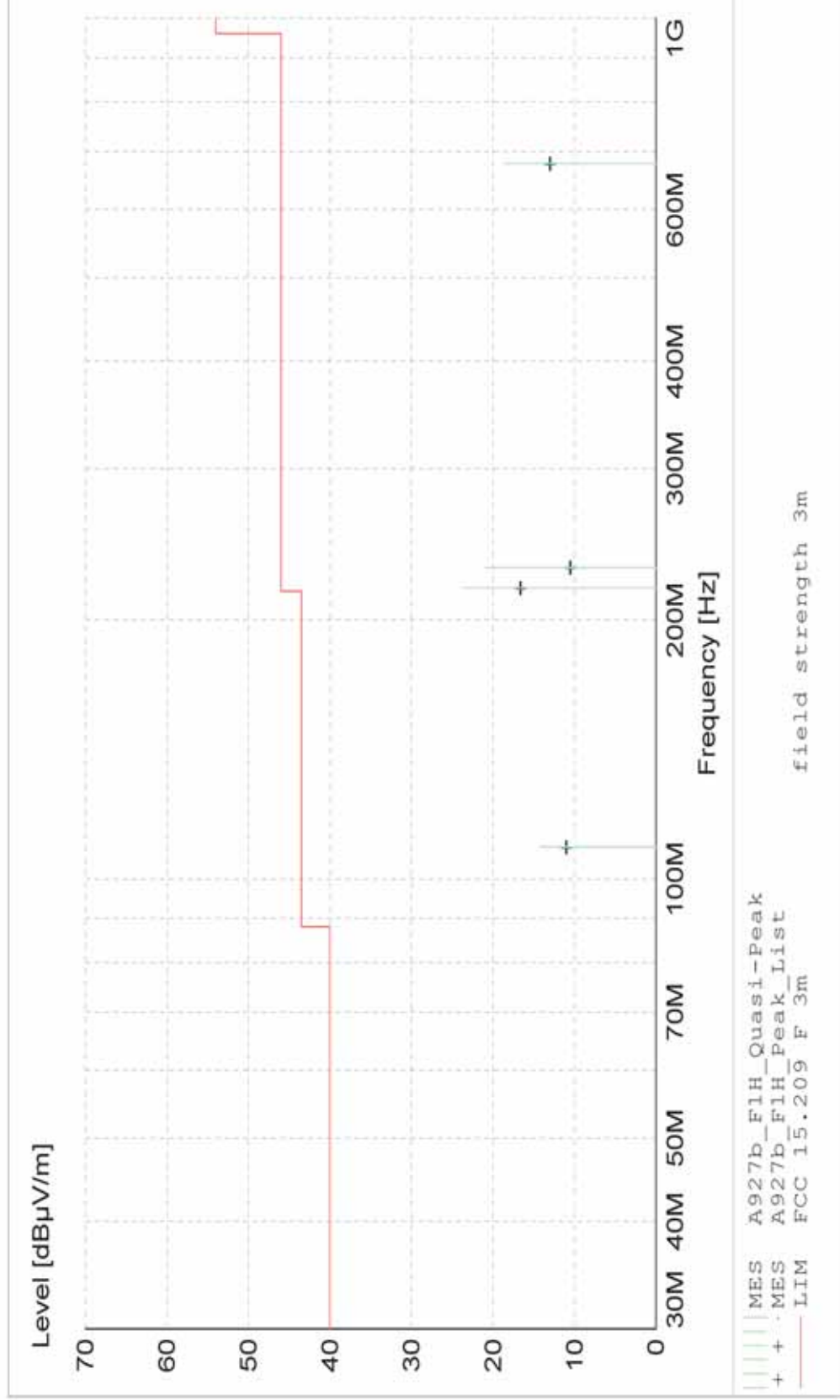
EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 65 deg. F; 29% R.H.
Test Site: DLS OF Site 2
Operator: cbrandt #11927
Test Specification: 120 V & 240 V 60 Hz; and internal Battery powered
Comment: Continuous transmit 2440 MHz (100% duty cycle)
Date: 11-03-2021

TEXT: "Horz 3 meters"

Short Description:	Test Set-up								
Test Set-up:	EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization								
Equations:	$\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$ $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$								
Graph Markers:	<table><tr><td>+</td><td>Frequency marker (Level of marker not related to final level)</td></tr><tr><td> </td><td>Final maximized level using Quasi-Peak detector</td></tr><tr><td>X</td><td>Final maximized level using Average detector</td></tr><tr><td>#</td><td>Final maximized level using Peak detector</td></tr></table>	+	Frequency marker (Level of marker not related to final level)		Final maximized level using Quasi-Peak detector	X	Final maximized level using Average detector	#	Final maximized level using Peak detector
+	Frequency marker (Level of marker not related to final level)								
	Final maximized level using Quasi-Peak detector								
X	Final maximized level using Average detector								
#	Final maximized level using Peak detector								



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Below 1 GHz

MEASUREMENT RESULT: "A927b_F1H_Final"

Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
217.840000	34.83	10.78	-21.9	23.7	46.0	22.3	1.37	255	QUASI-PEAK	None
229.980000	32.10	10.72	-21.8	21.0	46.0	25.0	1.48	270	QUASI-PEAK	None
678.040000	16.37	20.91	-18.6	18.7	46.0	27.3	1.30	135	QUASI-PEAK	noise floor
108.920000	24.82	12.29	-22.9	14.2	43.5	29.3	2.83	240	QUASI-PEAK	None



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

PART 15 SECTION 15.209

RADIATED EMISSIONS IN RESTRICTED BANDS ABOVE 1 GHz



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

1.0 TEST PROCEDURE AND SETUP

The Portable Thermal Printer was set up according to the general testing requirements of ANSI C63.4:2014 & ANSI C63.10-2013.

All test measurements were made with the following mode of operation:

Continuous transmit (100% duty cycle) at 2402 MHz and 2480 MHz with power setting 0 and 2 Mbps data rate. This was the channel, modulation type & data rate shown to be worst-case in the radios' modular certification test reports.

2.0 TEST RESULTS

The Portable Thermal Printer Model Number: M211 **meets** the requirements of FCC Part 15, Subpart B & Subpart C for Section 15.209 Radiated Emissions in Restricted Bands above 1 GHz. Plots and tabular data can be viewed at the end of this section.

Summary: No non-compliant emissions were observed.

3.0 SAMPLE CALCULATIONS

Radiated emissions: Emissions measurements include all system transducers and are compared against the appropriate limit requirement. See sample calculation below.

$$\begin{array}{lcl} \text{Equations:} & \text{Total Level(dB}\mu\text{V/m)} = & \text{Level(dB}\mu\text{V)} + \text{System Loss(dB)} + \text{Antenna Factor(dB/m)} \\ \text{Sample:} & 24.6 & = 35.51 + (-22.1) + 11.20 \end{array}$$

$$\begin{array}{lcl} \text{Margin(dB)} = & \text{Limit(dB}\mu\text{V/m)} - & \text{Total Level(dB}\mu\text{V/m)} \\ 15.4 & = 40 & - 24.6 \end{array}$$



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

4.0 D.L.S. ELECTRONIC SYSTEMS, INC. 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 Emission Uncertainty										
		(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)
Contribution	Probability Distribution	3M	3M	3M	3M	3M	3M	10M	10M	10M
		30-100 MHz	100-700 MHz	700-1000 MHz	1- 4.5 GHz	4.5 – 7 GHz	7 – 18 GHz	30-100 MHz	100-700 MHz	700-1000 MHz
Combined Standard Uncertainty	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



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

TABLE 1 / TEST INSTRUMENTATION

Description	Manufacturer	Model Number	Serial Number	Range	Cal On	Cal Due Dates
Antenna, Horn	EMCO	3115	9502-4451	1GHz-18GHz	10/7/2021	10/7/2023
Filter, High Pass	Q Microwave	100462	2	4.2GHz-18GHz	7/5/2021	7/5/2022
N->N, 10m, High Frequency	Micro-Coax	UFB311A	CBL-100	30MHz-18GHz	4/27/2021	4/27/2022
Preamplifier, RF	Miteq	AMF-7D-01001800-22-10P	1809602	1-18Ghz	4/27/2021	4/27/2022
Receiver, RF, Tuned	Rohde & Schwarz	ESI 40	837808/006	20Hz – 40 GHz	4/14/2021	4/14/2022

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

TABLE 2 / TEST EQUIPMENT

Description	Manufacturer	Model Number	Serial Number	Range
Test Software	Rohde & Schwarz	ESK1	V1.7.1	N/A

The test equipment above is verified with calibrated equipment.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

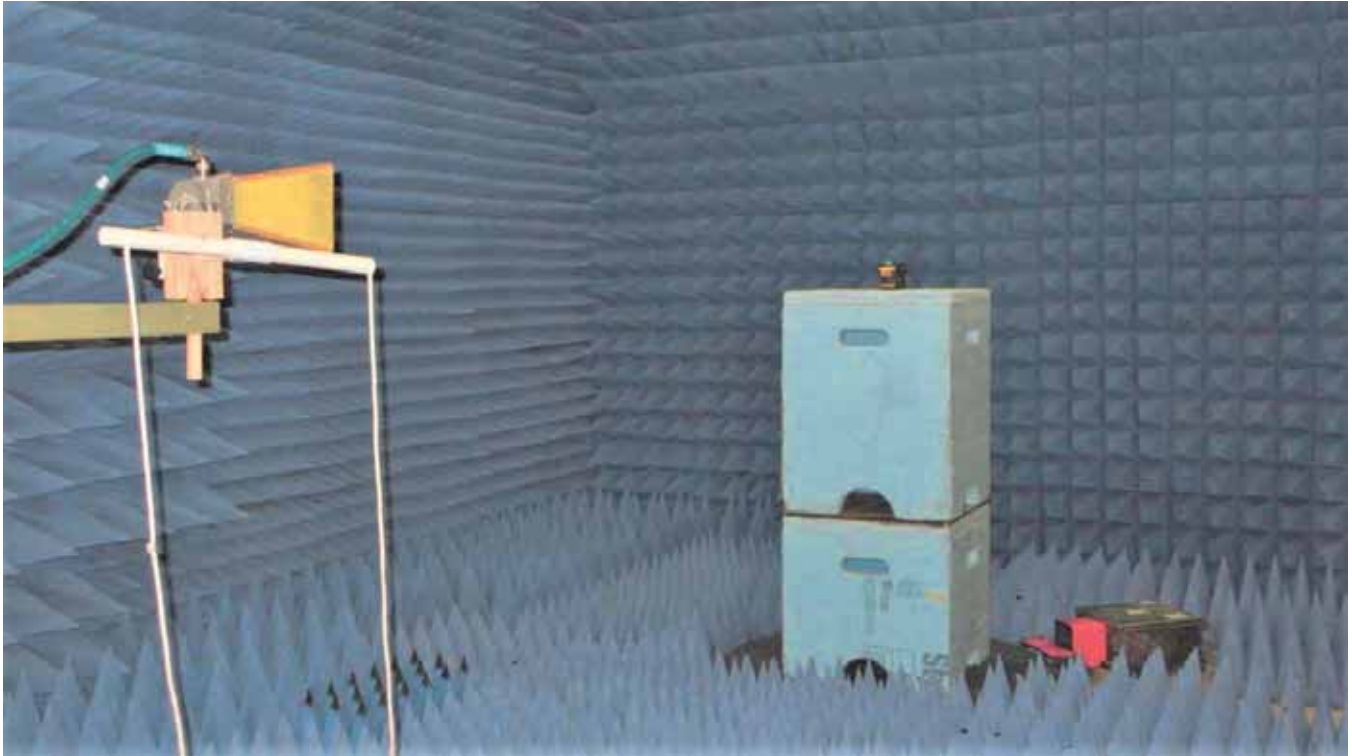
FCC PART 15 SECTION 15.209

RADIATED EMISSIONS IN RESTRICTED BANDS ABOVE 1 GHZ

TEST SETUP PHOTOS



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz



Radiated Above 1 GHz



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz



Radiated Above 1 GHz - USB Powered - Front



Radiated Above 1 GHz - USB Powered - Back



Radiated Above 1 GHz - USB Powered - Back



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz



Radiated Above 1 GHz - Battery Powered



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz



Radiated Above 1 GHz - Battery Powered



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz



Radiated Above 1 GHz - Battery Powered



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

FCC PART 15 SECTION 15.209

RADIATED EMISSIONS IN RESTRICTED BANDS ABOVE 1 GHZ

HARMONICS AND SPURIOUS EMISSIONS TEST DATA



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

FCC Part 15.247/15.205/15.209 Restricted Bands

Electric Field Strength

EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 72 deg F; 34% R.H.
Test Site: DLS O.F. G1
Operator: cbrandt #11927
Test Specification: Radiated Emissions from Transmitter
Comment: 2402 and 2480 MHz; modulated; 100% duty cycle
Date: 11-01-2021

TEXT: "Vert 3 meters"

Short Description: Test Set-up

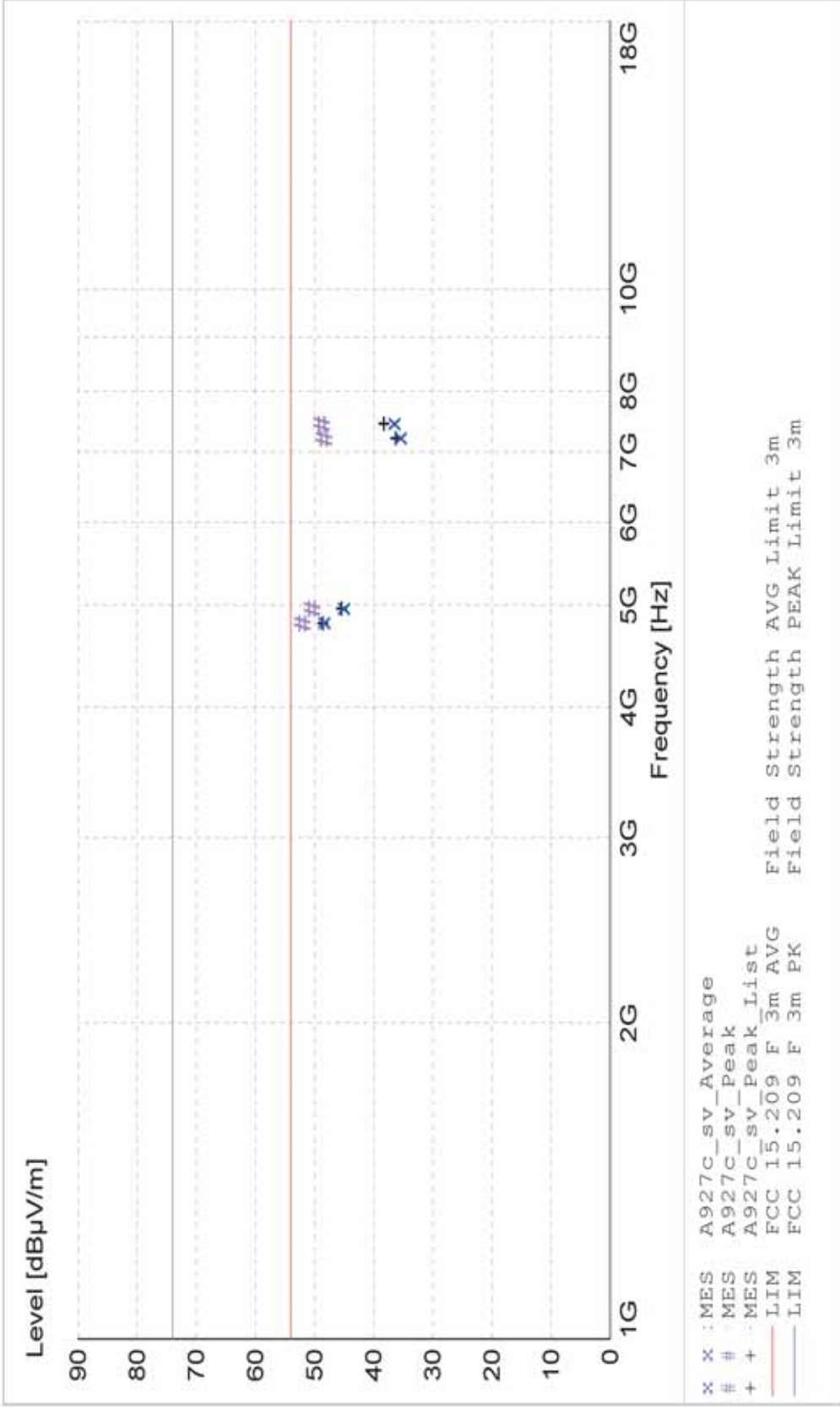
Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: $\text{Total Level (dB}\mu\text{V/m)} = \text{Level (dB}\mu\text{V)} + \text{System Loss (dB)} + \text{Antenna Factor (dB}\mu\text{V/m)}$
24.6 = 35.51 + (-22.1) + 11.20
 $\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector
- Background Scan Peak Detector (Optional)
- Background Scan Average Detector (Optional)



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

MEASUREMENT RESULT: "A927c_sv_Final"

11/1/2021	11:51AM	Frequency MHz	Level dBµV	Antenna Factor dBµV/m	System Loss dB	Total Level dBµV/m	Limit dBµV/m	Margin dB	Height Ant. m	Eut Angle deg	Final Detector	Comment
		4803.980000	69.49	32.95	-53.8	48.7	54.0	5.3	1.57	87	AVERAGE	Low ch
		4959.980000	65.68	33.07	-53.4	45.3	54.0	8.7	1.26	221	AVERAGE	High ch
		7439.970000	52.50	36.54	-52.3	36.8	54.0	17.2	1.92	101	AVERAGE	High ch
		7205.971732	51.95	35.82	-52.0	35.7	54.0	18.3	1.29	234	AVERAGE	Low ch
		4803.980000	72.85	32.95	-53.8	52.0	74.0	22.0	1.57	87	MAX PEAK	Low ch
		4959.980000	70.71	33.07	-53.4	50.4	74.0	23.6	1.26	221	MAX PEAK	High ch
		7439.970000	64.45	36.54	-52.3	48.7	74.0	25.3	1.92	101	MAX PEAK	High ch
		7205.971732	64.58	35.82	-52.0	48.4	74.0	25.6	1.29	234	MAX PEAK	Low ch



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

FCC Part 15.247/15.205/15.209 Restricted Bands

Electric Field Strength

EUT: M211
Manufacturer: Brady Worldwide
Operating Condition: 72 deg F; 34% R.H.
Test Site: DLS O.F. G1
Operator: cbrandt #11927
Test Specification: Emissions in the restricted bands
Comment: 2402 and 2480 MHz; modulated; 100% duty cycle
Date: 11-01-2021

TEXT: "Horz 3 meters"

Short Description: Test Set-up

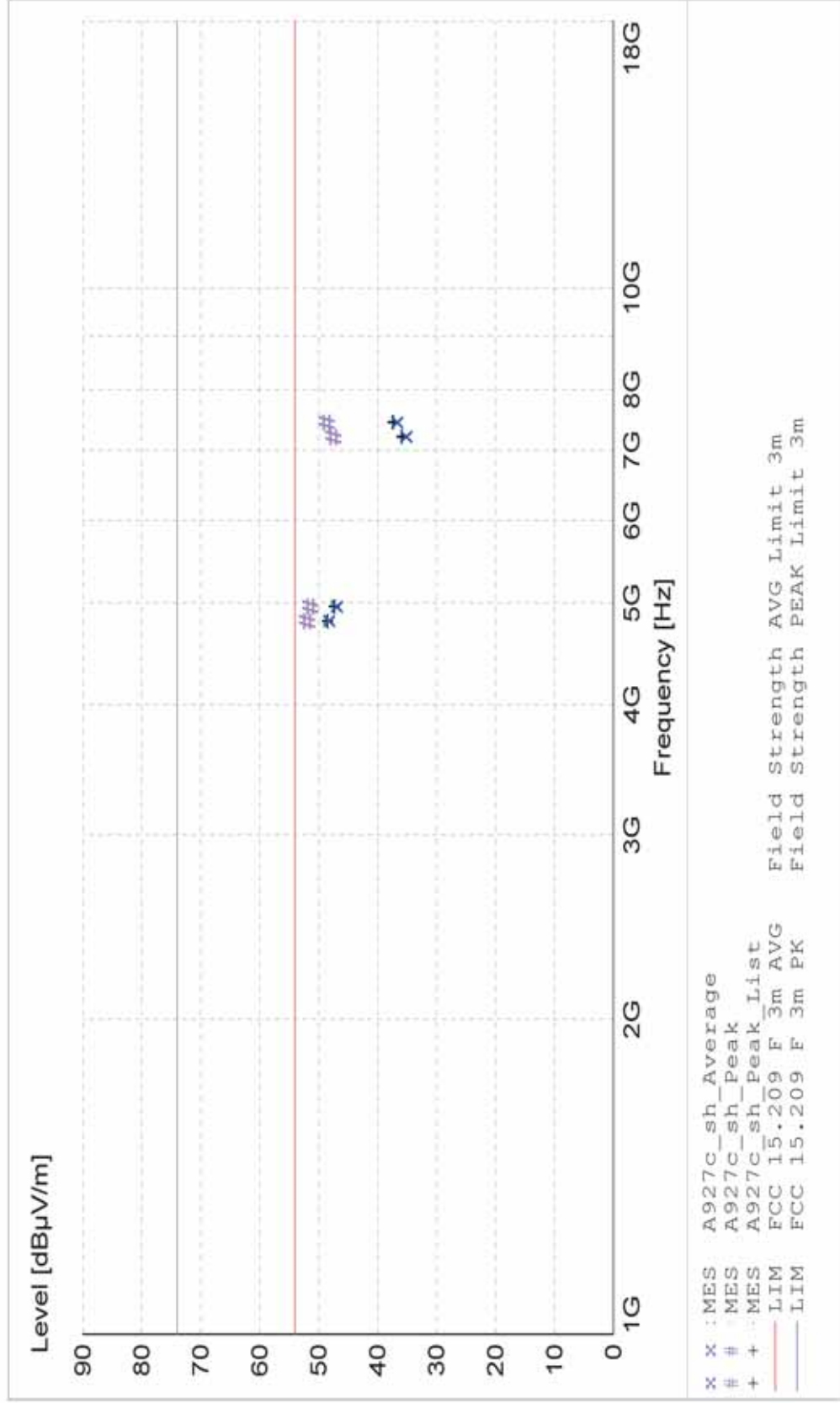
Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector
- Background Scan Peak Detector (Optional)
- Background Scan Average Detector (Optional)



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

MEASUREMENT RESULT: "A927c_sh_Final"

Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
11/1/2021 1:15PM										
4803.985000	69.38	32.95	-53.8	48.5	54.0	5.5	1.76	86	AVERAGE	Low ch
4959.980000	67.57	33.07	-53.4	47.2	54.0	6.8	1.74	283	AVERAGE	High ch
7439.970000	52.71	36.54	-52.3	37.0	54.0	17.0	1.36	25	AVERAGE	High ch
7205.990000	51.64	35.83	-52.0	35.4	54.0	18.6	1.08	84	AVERAGE	Low ch
4803.985000	72.73	32.95	-53.8	51.9	74.0	22.1	1.76	86	MAX PEAK	Low ch
4959.980000	71.72	33.07	-53.4	51.4	74.0	22.6	1.74	283	MAX PEAK	High ch
7439.970000	64.32	36.54	-52.3	48.6	74.0	25.4	1.36	25	MAX PEAK	High ch
7205.990000	63.65	35.83	-52.0	47.4	74.0	26.6	1.08	84	MAX PEAK	Low ch



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Since no emissions were detected from the

M211 w/precertified BLE Transceiver

above the 3rd harmonic (7440 MHz)

with the transceiver in continuous

transmit mode on the Low and High

channels,

No testing was performed in the

frequency range 18 to 25 GHz

11-01-2021



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

PART 15 SECTION 15.209

RADIATED EMISSIONS IN RESTRICTED BANDS ABOVE 1 GHZ

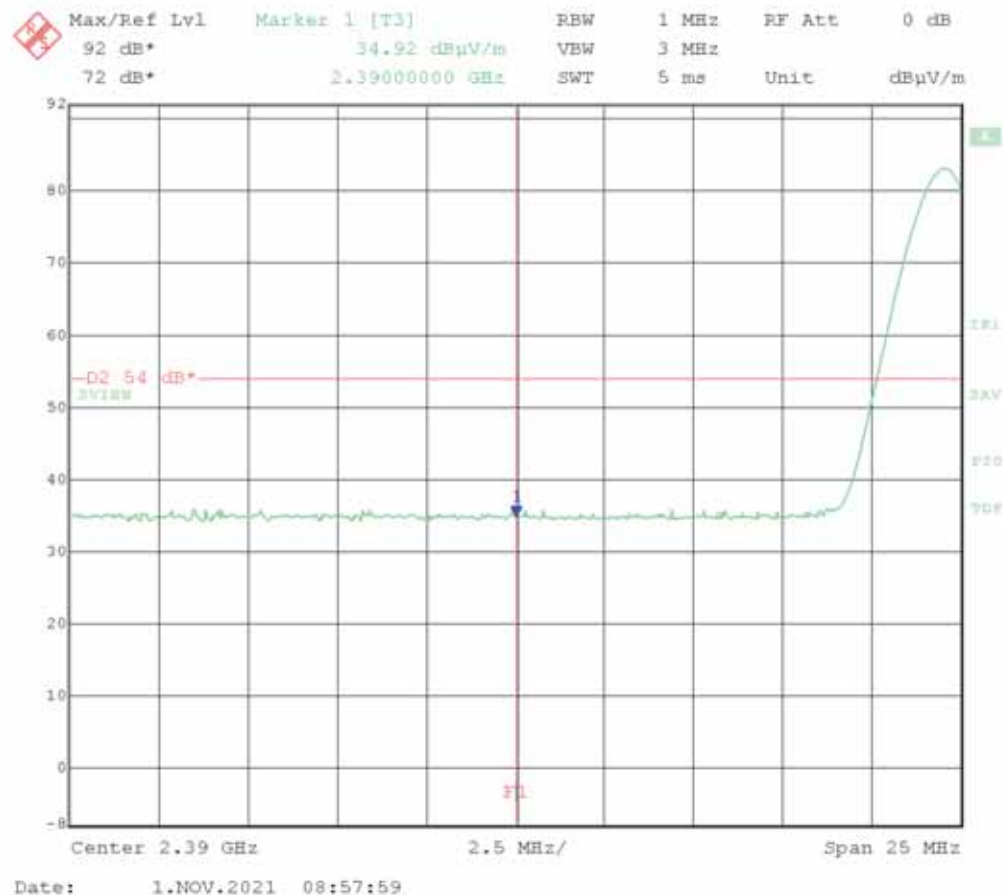
RESTRICTED BAND-EDGE TEST DATA



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Test Date: 11-01-2021
Company: Brady Worldwide
EUT: M211
Test: Lower Restricted Band-Edge - Radiated
Operator: cbrandt
Comment: Low Channel: 2402 MHz Internal battery powered (found to be worst-case)
Lower Restricted Band-Edge frequency: 2.390 GHz
Transmit at 100% duty cycle (verified)
Test Distance: 3 meters
Detector: Linear Average with max-hold

VERTICAL: Average level at restricted band edge = 34.92 dB μ V/m
AVERAGE: Limit: 54 dB μ V/m at 3meters

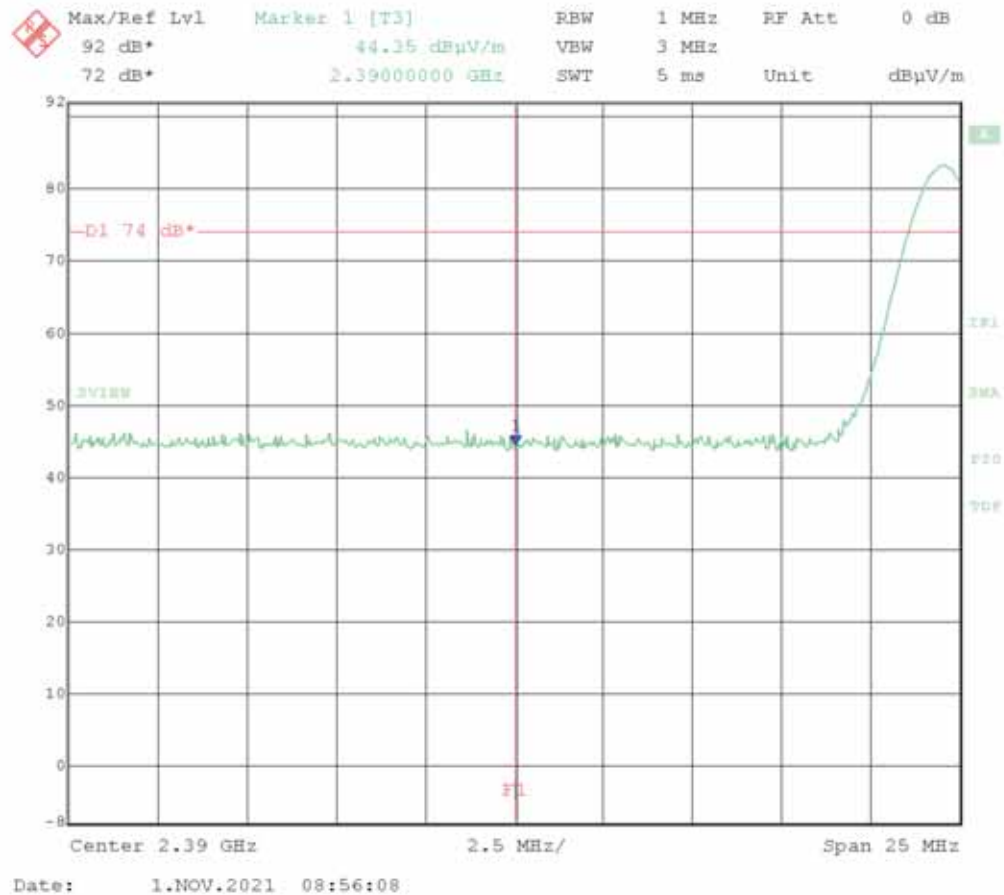




Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Test Date: 11-01-2021
Company: Brady Worldwide
EUT: M211
Test: Lower Restricted Band-Edge - Radiated
Operator: cbrandt
Comment: Low Channel: 2402 MHz Internal battery powered (found to be worst-case)
Lower Restricted Band-Edge frequency: 2.390 GHz
Transmit at 100% duty cycle (verified)
Test Distance: 3 meters
Detector: Peak with max-hold

VERTICAL: Peak level at restricted band edge = 44.35 dB μ V/m
PEAK: Limit: 74 dB μ V/m at 3meters

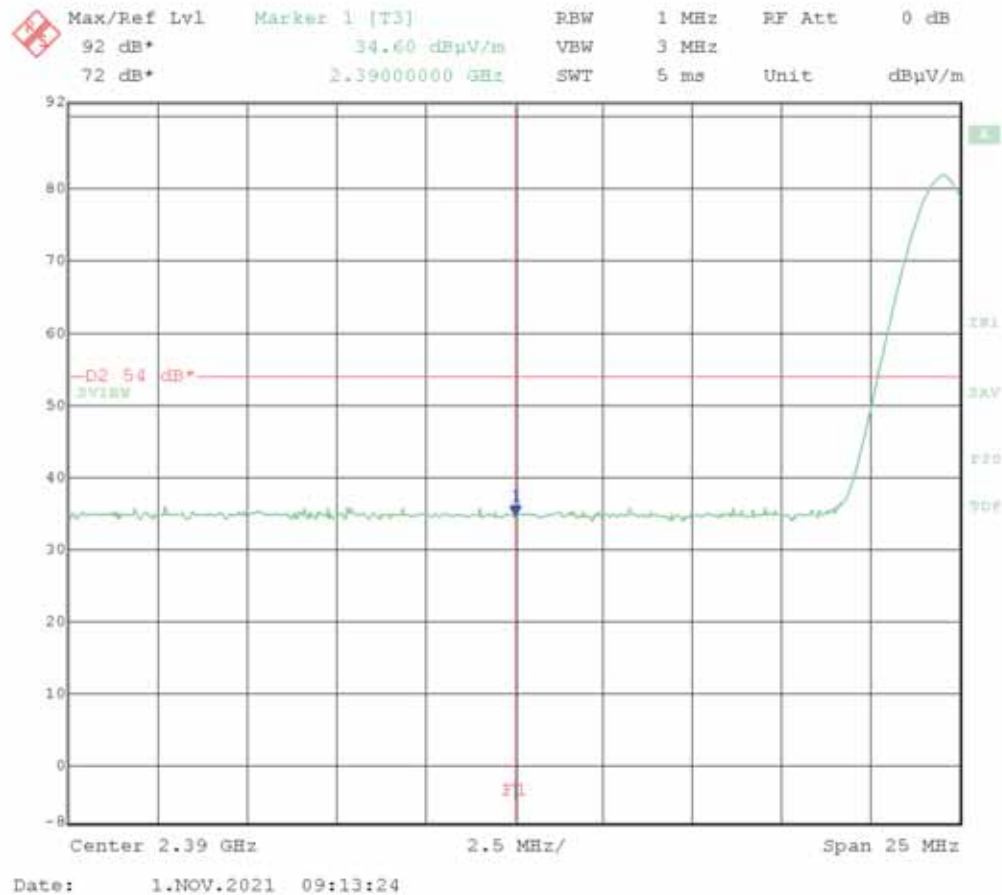




Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Test Date: 11-01-2021
Company: Brady Worldwide
EUT: M211
Test: Lower Restricted Band-Edge - Radiated
Operator: cbrandt
Comment: Low Channel: 2402 MHz Internal battery powered (found to be worst-case)
Lower Restricted Band-Edge frequency: 2.390 GHz
Transmit at 100% duty cycle (verified)
Test Distance: 3 meters
Detector: Linear Average with max-hold

HORIZONTAL: Average level at restricted band edge = 34.60 dB μ V/m
AVERAGE: Limit: 54 dB μ V/m at 3meters

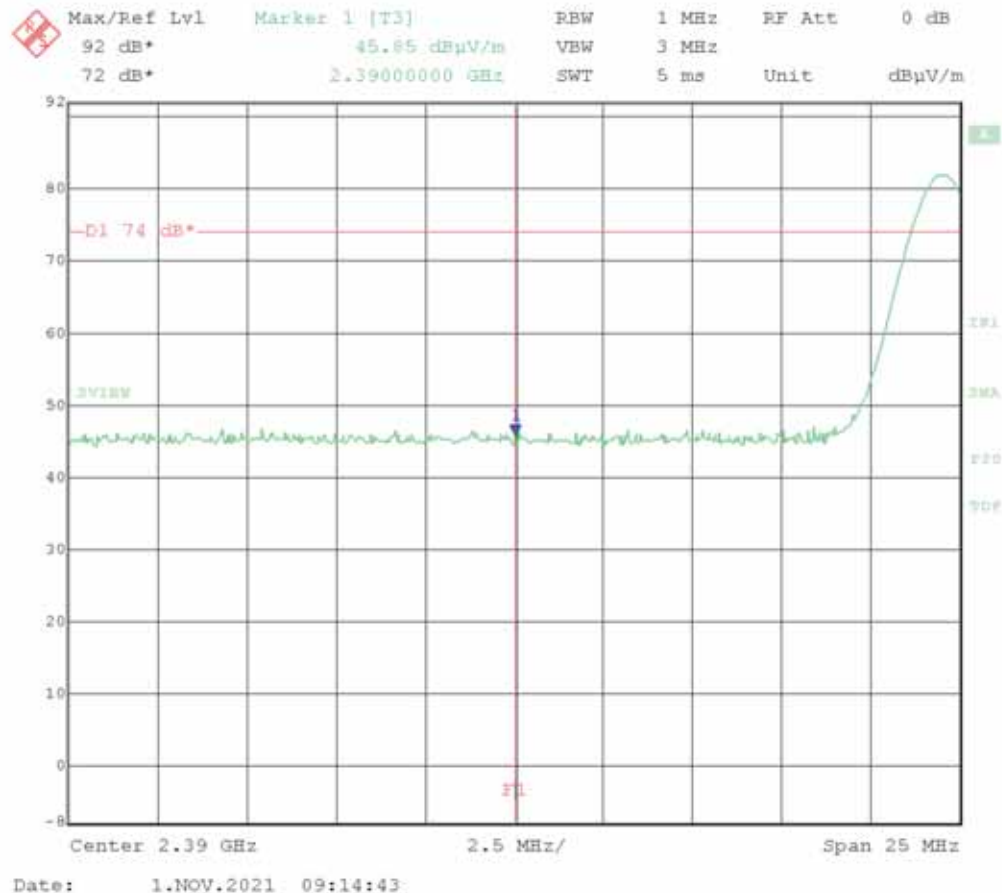




Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Test Date: 11-01-2021
Company: Brady Worldwide
EUT: M211
Test: Lower Restricted Band-Edge - Radiated
Operator: cbrandt
Comment: Low Channel: 2402 MHz Internal battery powered (found to be worst-case)
Lower Restricted Band-Edge frequency: 2.390 GHz
Transmit at 100% duty cycle (verified)
Test Distance: 3 meters
Detector: Peak with max-hold

HORIZONTAL: Peak level at restricted band edge = 45.85 dB μ V/m
PEAK: Limit: 74 dB μ V/m at 3meters

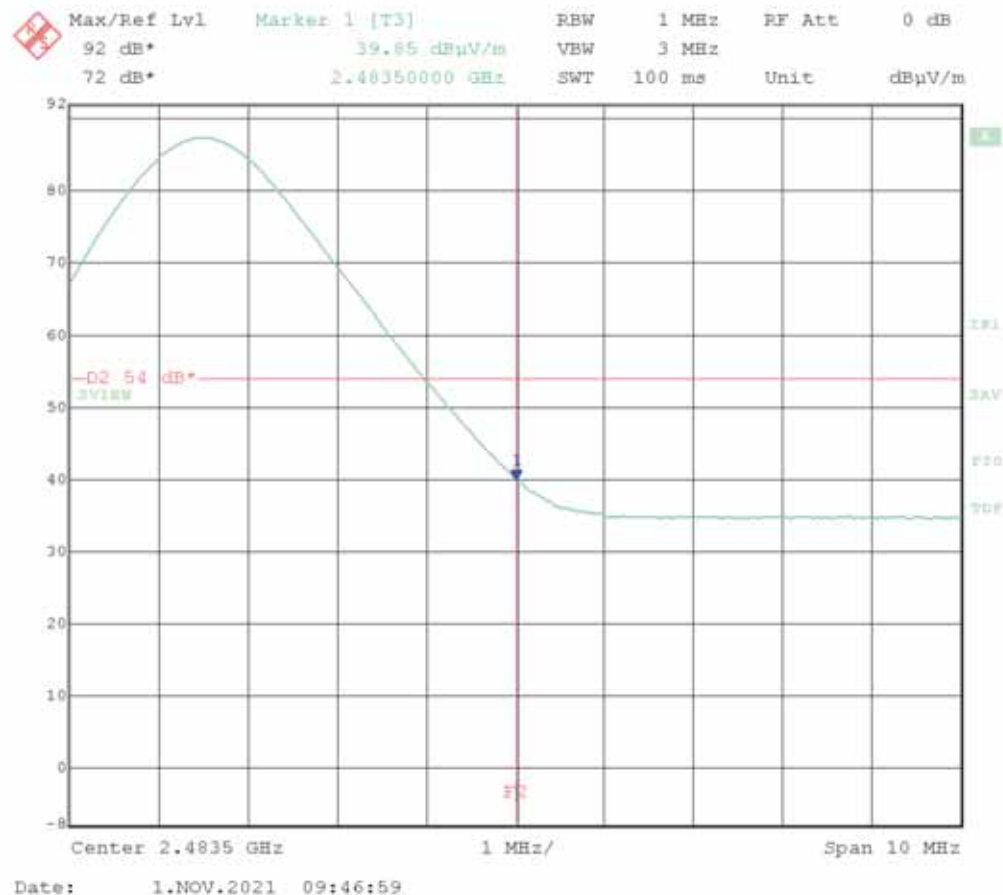




Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Test Date: 11-01-2021
Company: Brady Worldwide
EUT: M211
Test: Upper Restricted Band-Edge - Radiated
Operator: cbrandt
Comment: High Channel: 2480 MHz Internal battery powered (found to be worst-case)
Upper Restricted Band-Edge frequency: 2.4835 GHz
Transmit at 100% duty cycle (verified)
Test Distance: 3 meters
Detector: Linear Average with max-hold

VERTICAL: Average level at restricted band edge = 39.85 dB μ V/m
AVERAGE: Limit: 54 dB μ V/m at 3meters

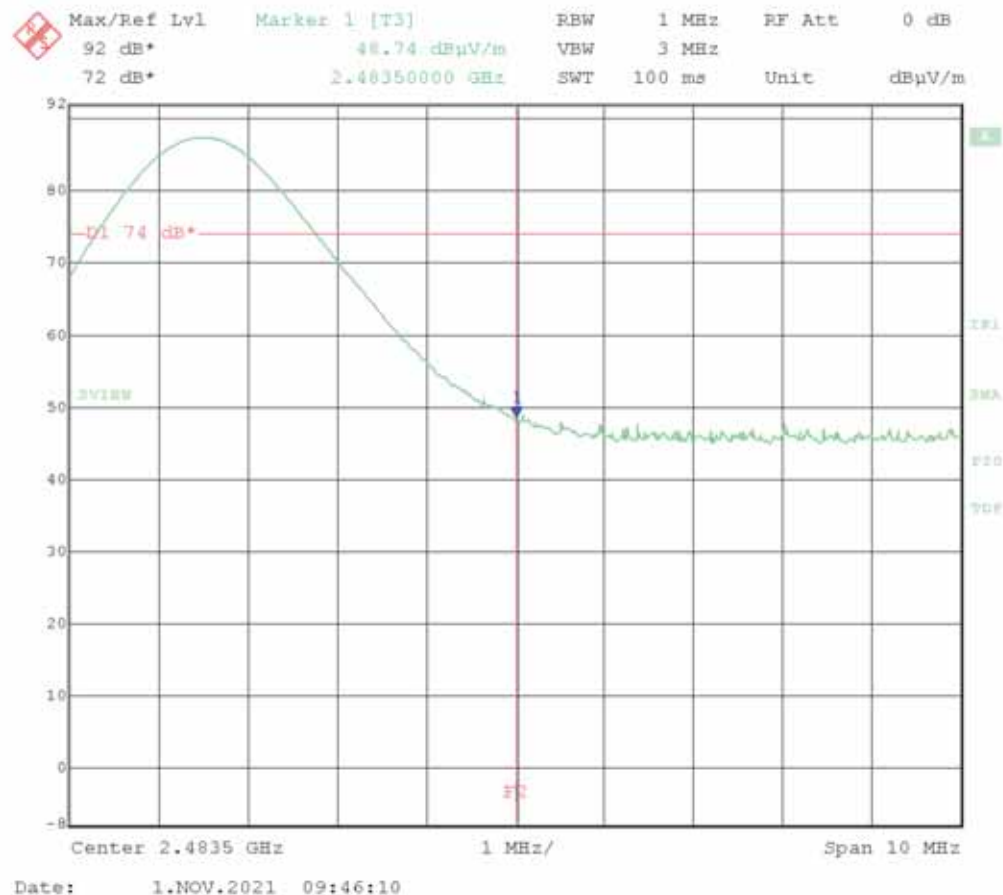




Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Test Date: 11-01-2021
Company: Brady Worldwide
EUT: M211
Test: Upper Restricted Band-Edge - Radiated
Operator: cbrandt
Comment: High Channel: 2480 MHz Internal battery powered (found to be worst-case)
Upper Restricted Band-Edge frequency: 2.4835 GHz
Transmit at 100% duty cycle (verified)
Test Distance: 3 meters
Detector: Peak with max-hold

VERTICAL: Peak level at restricted band edge = 48.74 dB μ V/m
PEAK: Limit: 74 dB μ V/m at 3meters

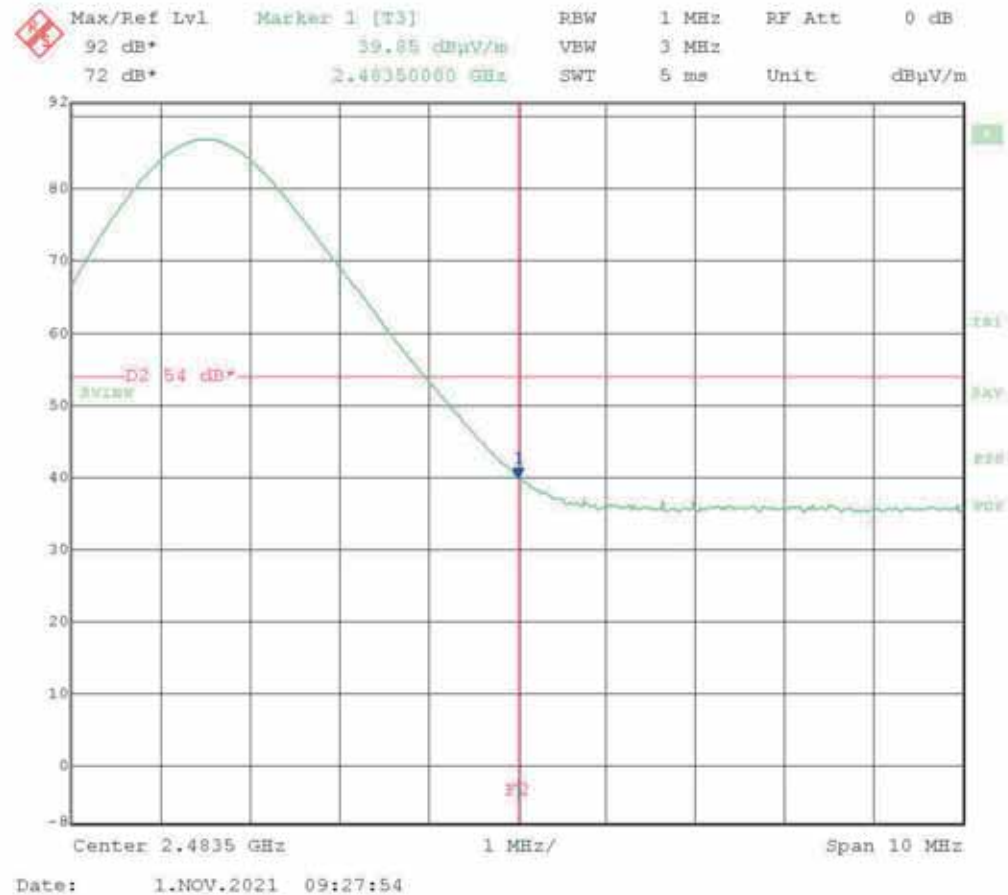




Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Test Date: 11-01-2021
Company: Brady Worldwide
EUT: M211
Test: Upper Restricted Band-Edge - Radiated
Operator: cbrandt
Comment: High Channel: 2480 MHz Internal battery powered (found to be worst-case)
Upper Restricted Band-Edge frequency: 2.4835 GHz
Transmit at 100% duty cycle (verified)
Test Distance: 3 meters
Detector: Linear Average with max-hold

HORIZONTAL: Average level at restricted band edge = 39.85 dB μ V/m
AVERAGE: Limit: 54 dB μ V/m at 3meters

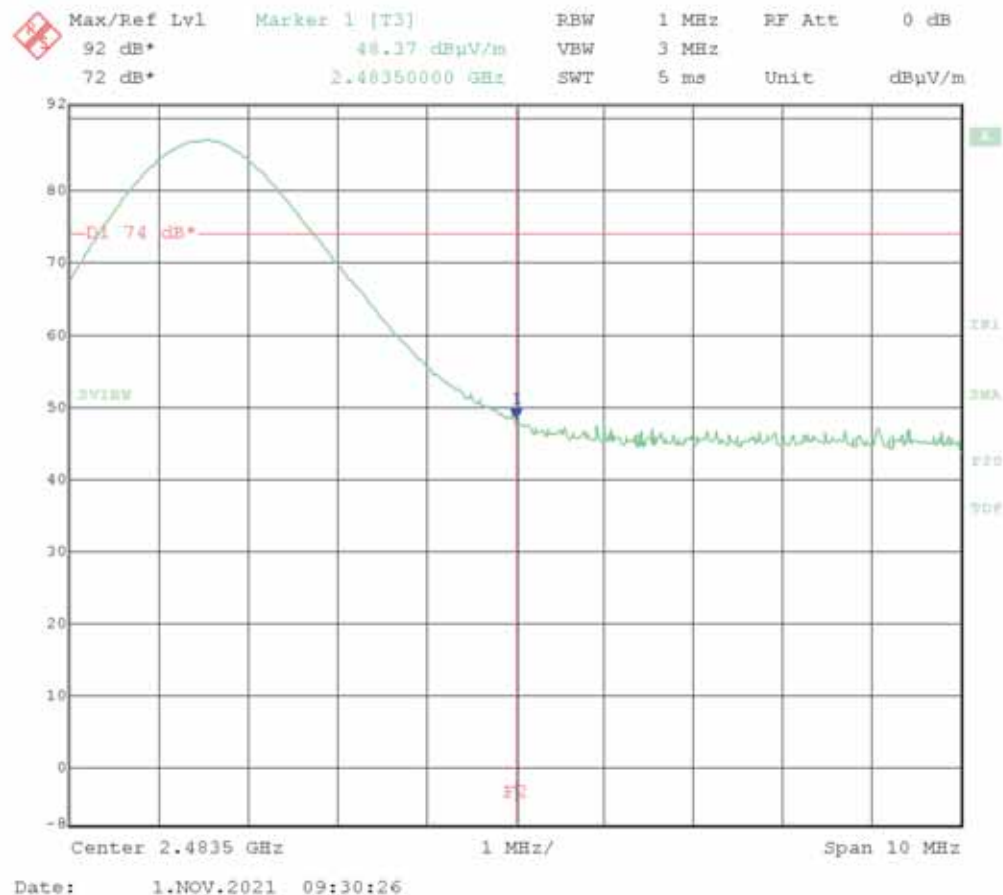




Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Test: Section 15.209 Radiated Emissions in Restricted Bands
Above 1 GHz

Test Date: 11-01-2021
Company: Brady Worldwide
EUT: M211
Test: Upper Restricted Band-Edge - Radiated
Operator: cbrandt
Comment: High Channel: 2480 MHz Internal battery powered (found to be worst-case)
Upper Restricted Band-Edge frequency: 2.4835 GHz
Transmit at 100% duty cycle (verified)
Test Distance: 3 meters
Detector: Peak with max-hold

HORIZONTAL: Peak level at restricted band edge = 48.37 dB μ V/m
PEAK: Limit: 74 dB μ V/m at 3meters





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data

APPENDIX A

FCC PART 15.207 AC LINE CONDUCTED EMISSIONS TEST DATA

Test Configuration: Continuous transmit (100% duty cycle) at 2440 MHz with power setting 0 and 2 Mbps data rate This was the channel, modulation type & data rate shown to be worst-case in the radios' modular certification test reports.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



PMM NARDA REPORT: 11927 Brady M211 120v Line 1_001

Report issuing date : 11-02-2021

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS OATS Screen Room
Temperature : 71 °F
Humidity : 29 %
Test Specs : Line 1: [X] Quasi-Peak Detector [X] Average Detector
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 120 V 60 Hz
Comments : BLE transmit at 2440 MHz, 1Mbps (worst case in module certification test report)

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsamc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W40102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



11927 Brady M211 120v Line 1_001 02/11/2021 09:52:00

Rel. SW 2.40 (January 2021)

Rel. FW 2.02 21/04/21

Margin: 100 dB

Frequency [MHz]	C-Avg [dBµV]	Limit FCC 15.207 [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 ... [dB]	Factor HPF #592 [dB]
1 0.15204468	30.02	55.89	-25.87	0.08	0.03	9.70	2.20
2 0.15408936	30.26	55.78	-25.52	0.08	0.04	9.70	2.17
3 0.1704468	40.97	54.94	-13.97	0.06	0.06	9.66	1.98
4 0.25427868	31.42	51.62	-20.20	0.04	0.08	9.65	1.49
5 0.33811056	24.42	49.25	-24.83	0.03	0.06	9.65	1.18
6 0.42194244	22.37	47.41	-25.04	0.03	0.08	9.69	0.98
7 0.5384892	19.91	46.00	-26.09	0.03	0.10	9.69	0.79
8 0.6304998	24.04	46.00	-21.96	0.03	0.11	9.68	0.66
9 0.68570616	26.16	46.00	-19.84	0.03	0.12	9.67	0.59
10 8.51069652	15.47	50.00	-34.53	0.04	0.54	9.73	0.18
11 11.2526124	21.66	50.00	-28.34	0.04	0.61	9.76	0.20



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



PMM NARDA REPORT: 11927 Brady M211 120v Line 1_000

Report issuing date : 11-02-2021

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS OATS Screen Room
Temperature : 71 °F
Humidity : 29 %
Test Specs :
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes :
Comments : BLE transmit at 2440 MHz, 1Mbps (worst case in module certification test report)

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsamc.com>

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W40102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



11927 Brady M211 120v Line 1_000 02/11/2021 09:47:53
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

Frequency [MHz]	QPeak [dBµV]	Limit FCC 15.207 [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 ... [dB]	Factor HPF #592 [dB]
1 0.15204468	52.50	65.89	-13.39	---	---	---	---
2 0.15408936	52.68	65.78	-13.10	0.08	0.04	9.70	2.17
3 0.1704468	63.17	64.94	-1.77	0.06	0.06	9.56	1.98
4 0.25427868	53.71	61.62	-7.91	0.04	0.08	9.65	1.49
5 0.33811056	45.52	59.25	-13.73	0.03	0.06	9.65	1.18
6 0.4219424	41.84	57.41	-15.57	0.03	0.08	9.69	0.98
7 0.507819	38.43	56.00	-17.57	0.03	0.09	9.69	0.84
8 5.00202564	25.43	60.00	-34.57	0.04	0.41	9.68	0.16
9 8.68858368	25.03	60.00	-34.97	0.04	0.53	9.74	0.18
10 11.10335076	29.90	60.00	-30.10	0.04	0.60	9.76	0.20



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



PMM NARDA REPORT: 11927 Brady M211 120v Line 2_001

Report issuing date : 11-02-2021

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS OATS Screen Room
Temperature : 71 °F
Humidity : 29 %
Test Specs : Line 2: [X] Quasi-Peak Detector [X] Average Detector
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 120 V 60 Hz
Comments : BLE transmit at 2440 MHz, 1Mbps (worst case in module certification test report)

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsamc.com>

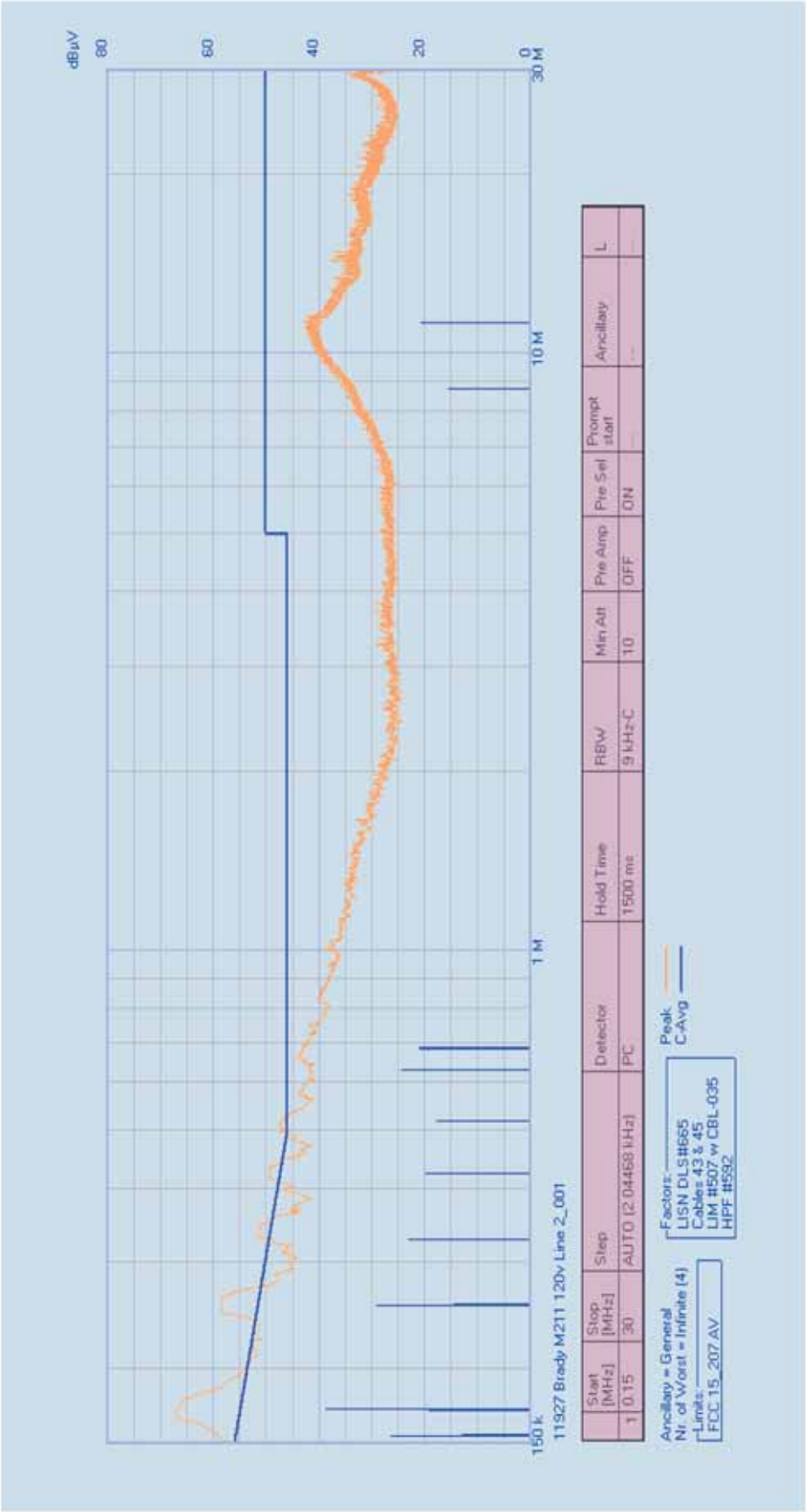
Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W40102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



11927 Brady M211 120v Line 2_001 02/11/2021 10:15:03
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

Frequency [MHz]	C-Avg [dBµV]	Limit FCC 15.207 [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 ... [dB]	Factor HPF #592 [dB]
1 0.15	27.21	56.00	-28.79	0.08	0.03	9.71	2.23
2 0.15408936	26.39	55.78	-29.39	0.08	0.04	9.70	2.17
3 0.1704468	38.72	54.94	-16.22	0.06	0.06	9.66	1.98
4 0.25427868	25.04	51.62	-26.58	0.04	0.08	9.65	1.49
5 0.32788716	23.13	49.50	-26.37	0.04	0.07	9.64	1.21
6 0.42398712	19.89	47.37	-27.48	0.03	0.08	9.69	0.97
7 0.5180424	17.75	46.00	-28.25	0.03	0.09	9.69	0.82
8 0.6304998	24.40	46.00	-21.60	0.03	0.11	9.68	0.66
9 0.68366148	20.94	46.00	-25.06	0.03	0.12	9.67	0.59
10 8.6967624	15.44	50.00	-34.56	0.04	0.53	9.74	0.18
11 11.2219422	20.73	50.00	-29.27	0.04	0.61	9.76	0.20



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



PMM NARDA REPORT: 11927 Brady M211 120v Line 2_000

Report issuing date : 11-02-2021

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS OATS Screen Room
Temperature : 71 °F
Humidity : 29 %
Test Specs : Line 2: [X]Quasi-Peak Detector [] Average Detector
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT -----
Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 120 V 60 Hz
Comments : BLE transmit at 2440 MHz, 1Mbps (worst case in module certification test report)

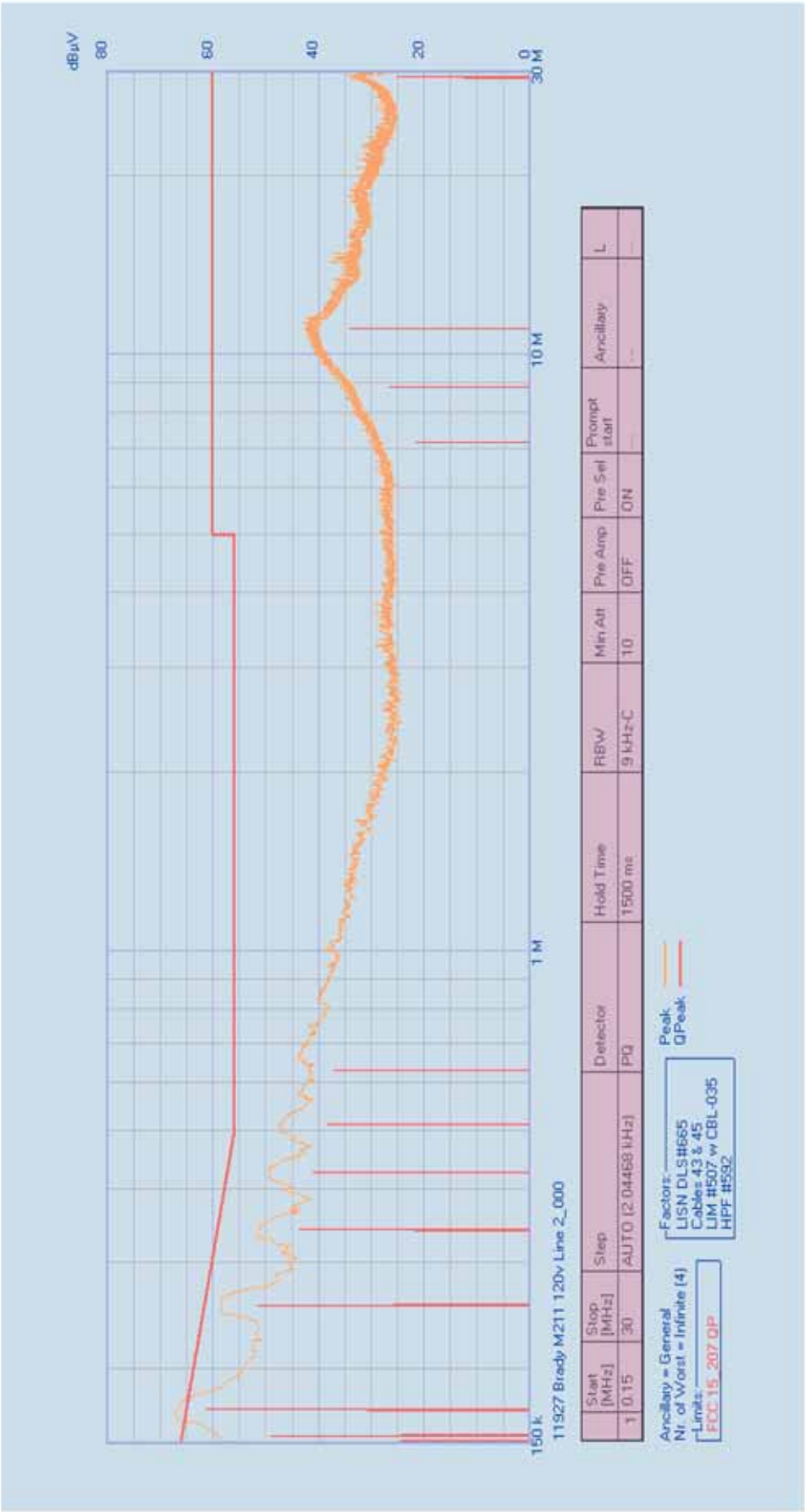
Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsamc.com>

Receiver Details -----
Model : PMM 9010F
Brand : Narda
S/N : 020W40102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



11927 Brady M211 120v Line 2_000 02/11/2021 10:05:59
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

	Frequency [MHz]	QPeak [dBµV]	Limit FCC 15.207 [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 ... [dB]	Factor HPF #592 [dB]
1	0.15	49.28	66.00	-16.72	0.08	0.03	9.71	2.23
2	0.15408936	48.99	65.78	-16.79	0.08	0.04	9.70	2.17
3	0.1704468	61.28	64.94	-3.66	0.06	0.06	9.66	1.98
4	0.25427868	51.69	61.62	-9.93	0.04	0.08	9.65	1.49
5	0.34015524	43.67	59.20	-15.53	0.03	0.06	9.65	1.17
6	0.4260318	41.09	57.33	-16.24	0.03	0.08	9.69	0.97
7	0.51190836	38.51	56.00	-17.49	0.03	0.09	9.69	0.83
8	0.6304998	37.11	56.00	-18.89	0.03	0.11	9.68	0.66
9	7.101912	21.62	60.00	-38.38	0.04	0.52	9.71	0.15
10	8.77037088	26.63	60.00	-33.37	0.04	0.53	9.74	0.18
11	10.99907208	34.03	60.00	-25.97	0.04	0.60	9.76	0.20
12	25.133339	25.11	60.00	-34.89	0.02	0.95	9.89	0.38



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



PMM NARDA REPORT: 11927 Brady M211 240v Line 1_000

Report issuing date : 11-02-2021

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS OATS Screen Room
Temperature : 71 °F
Humidity : 29 %
Test Specs :
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes :
Comments : BLE transmit at 2440 MHz, 1Mbps (worst case in module certification test report)

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsamc.com>

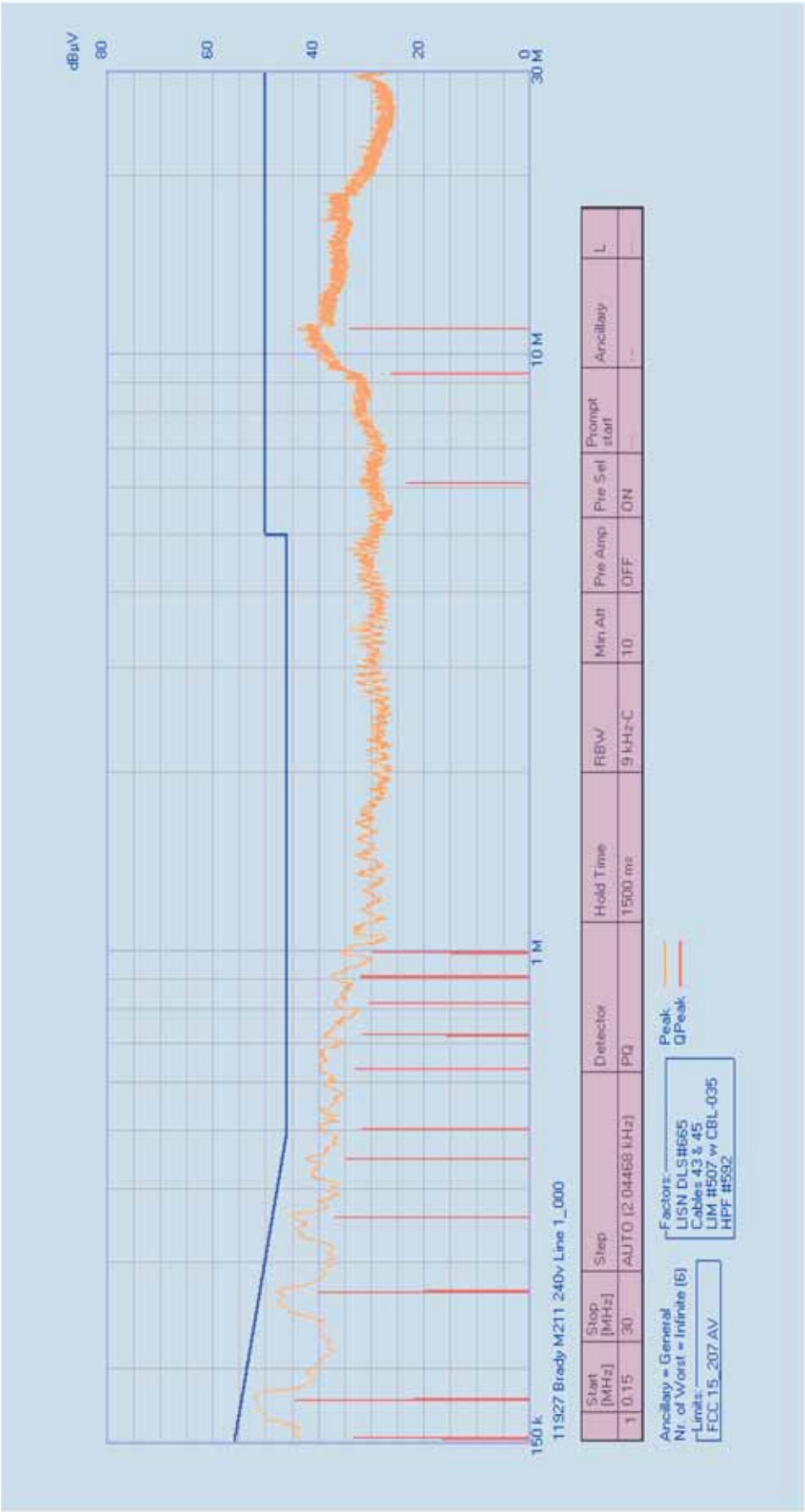
Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W40102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



11927 Brady M211 340v Line 1_000 02/11/2021 10:27:47
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

Frequency [MHz]	QPeak [dBµV]	Limit FCC 15.20... [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 [dB]	Factor HPF #592 [dB]
1 0.15204468	33.13	55.89	-22.76	0.08	0.03	9.70	2.20
2 0.17656094	44.43	54.64	-10.21	0.06	0.07	9.67	1.93
3 0.26859144	40.23	51.16	-10.93	0.04	0.09	9.65	1.42
4 0.35855736	36.93	48.76	-11.83	0.03	0.05	9.65	1.11
5 0.44852728	34.68	46.90	-12.22	0.03	0.09	9.70	0.94
6 0.50372964	31.88	46.00	-14.12	0.03	0.09	9.69	0.84
7 0.63254448	32.90	46.00	-13.10	0.03	0.11	9.68	0.65
8 0.7225104	31.61	46.00	-14.39	0.03	0.13	9.66	0.56
9 0.81656568	30.31	46.00	-15.69	0.03	0.15	9.65	0.51
10 0.90448692	31.98	46.00	-14.02	0.03	0.15	9.65	0.48
11 0.99240816	29.75	46.00	-16.25	0.03	0.15	9.65	0.45
12 6.07139328	23.33	50.00	-26.67	0.04	0.50	9.70	0.15
13 9.2386026	26.21	50.00	-23.79	0.04	0.54	9.74	0.18
14 11.037921	34.04	50.00	-15.96	0.04	0.60	9.76	0.20



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



PMM NARDA REPORT: 11927 Brady M211 240v Line 2_000

Report issuing date : 11-02-2021

Standard : FCC Part 15.207
Test Type : Voltage Mains Test
Test Site : DLS OATS Screen Room
Temperature : 71 °F
Humidity : 29 %
Test Specs : Line 2: [X]Quasi-Peak Detector [] Average Detector
Operator : cbrandt
DLS Project # : 11927
Result : Pass

EUT

Manufacturer : Brady Worldwide
Model : M211
Product : Portable Thermal Printer
Notes : 240 V 60 Hz
Comments : BLE transmit at 2440 MHz, 1Mbps (worst case in module certification test report)

Testing Company : DLS Electronic Systems
Tel./Fax : 262-279-0210
Web site : <http://www.dlsenc.com>

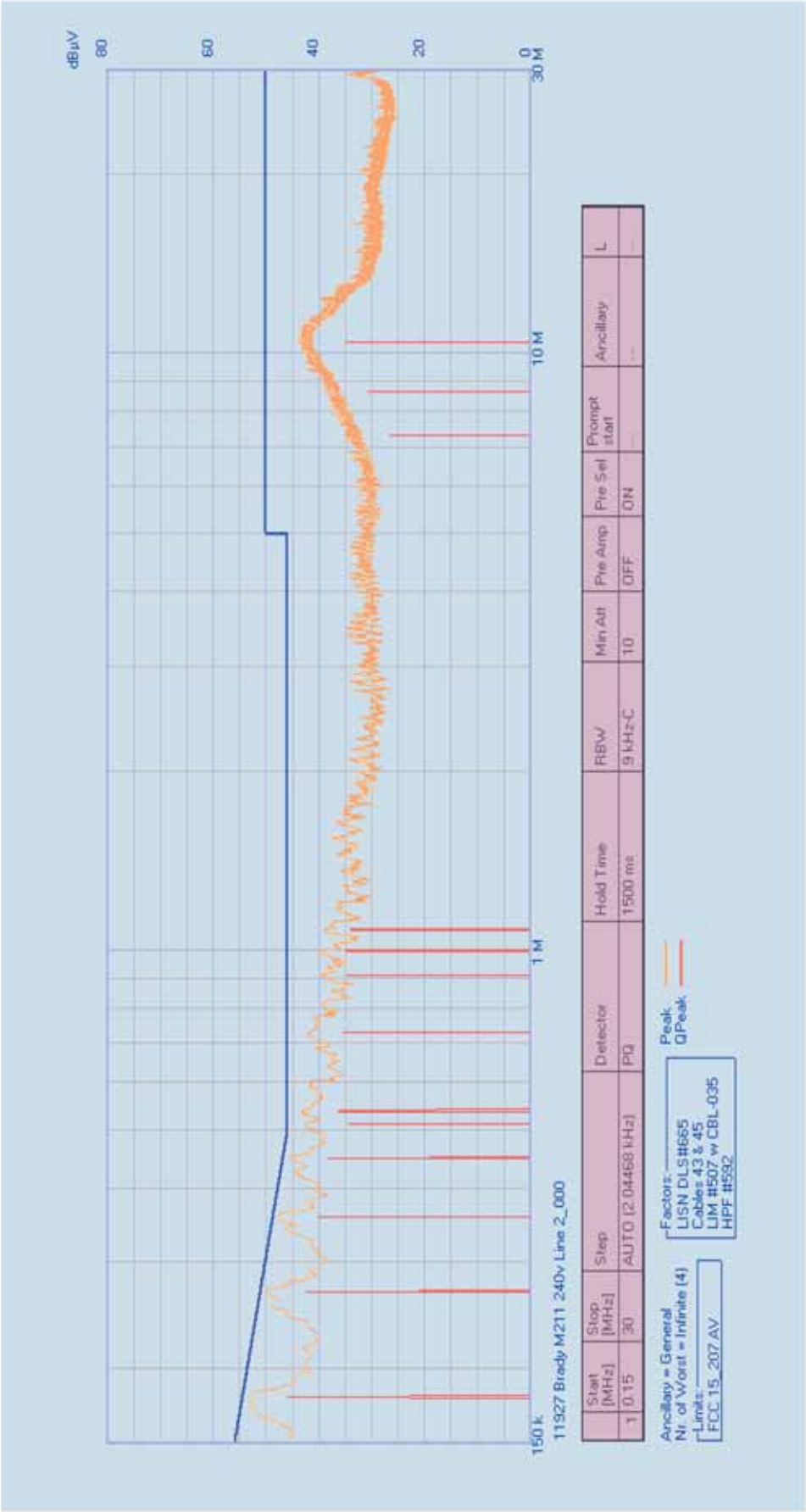
Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020W40102
Last Calibration : 04/14/2021

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.



Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data





Company: Brady Worldwide, Inc
Model Tested: M211
Report Number: 26666
Project Number: 11927
Appendix A: FCC Part 15.207 AC Line Conducted Emissions Test Data



11927 Brady M211 340v Line_2_000 02/11/2021 10:38:10
Rel. SW 2.40 (January 2021)
Rel. FW 2.02 21/04/21
Margin: 100 dB

Frequency [MHz]	QPeak [dBµV]	Limit FCC 15.20... [dBµV]	Delta [dB]	Factor LISN DLS#... [dB]	Factor Cables 43... [dB]	Factor LIM #507 [dB]	Factor HPF #592 [dB]
1 0.15	33.80	56.00	-22.20	0.08	0.03	9.71	2.23
2 0.17862552	45.99	54.55	-8.56	0.06	0.07	9.67	1.92
3 0.26859144	42.46	51.16	-8.70	0.04	0.09	9.65	1.42
4 0.33855736	40.16	48.76	-8.60	0.03	0.05	9.65	1.11
5 0.44852728	38.21	46.90	-8.69	0.03	0.09	9.70	0.94
6 0.51190836	34.31	46.00	-11.69	0.03	0.09	9.69	0.83
7 0.5304892	36.14	46.00	-9.86	0.03	0.10	9.69	0.79
8 0.73068912	35.46	46.00	-10.54	0.03	0.13	9.66	0.56
9 0.9065316	34.70	46.00	-11.30	0.03	0.15	9.65	0.48
10 0.9945284	34.95	46.00	-11.05	0.03	0.15	9.65	0.45
11 1.08237408	34.09	46.00	-11.91	0.03	0.15	9.66	0.41
12 7.24095024	26.60	50.00	-23.40	0.04	0.52	9.71	0.15
13 8.60270712	30.53	50.00	-19.47	0.04	0.54	9.73	0.18
14 10.41224892	35.03	50.00	-14.97	0.04	0.59	9.75	0.19