

FCC & ISSED TEST REPORT

Product Name: HD Video Conferencing Device
Trade Mark: GRANDSTREAM
Model No. / HVIN: GVC3212
Add. Model No. / HVIN: N/A
Report Number: 200518001EMC-1
Test Standards: FCC 47 CFR Part 15 Subpart B
ICES-003 Issue 6
FCC ID: YZZGVC3212
IC: 11964A-GVC3212
Test Result: PASS
Date of Issue: July 6, 2020

Prepared for:

Grandstream Networks, Inc.
126 Brookline Ave., 3rd Floor Boston, MA 02215, USA

Prepared by:

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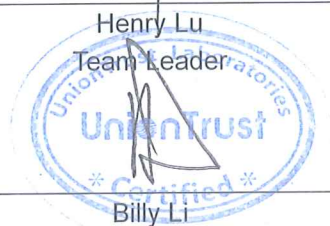
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Version

Version No.	Date	Description
V1.0	July 6, 2020	Original



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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Grandstream Networks, Inc.
Address of Applicant:	126 Brookline Ave., 3rd Floor Boston, MA 02215, USA
Manufacturer:	Grandstream Networks, Inc.
Address of Manufacturer:	126 Brookline Ave., 3rd Floor Boston, MA 02215, USA

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	HD Video Conferencing Device
Model No. / HVIN:	GVC3212
Add. Model No. / HVIN:	N/A
Trade Mark:	GRANDSTREAM
DUT Stage:	Production Unit
Rated Voltage:	☒ Adapter: Input: 110-240V~50/60Hz Output: 12V $\equiv$ 1.0A
	☐ Powered by USB port (5Vdc)
	☐ Vdc (x V Li-ion Rechargeable battery)
Classification of digital devices:	Class B
Highest Internal Frequency:	5.825 GHz
Sample Received Date:	May 18, 2020
Sample Tested Date:	June 2, 2020 to June 10, 2020

1.2.2 Description of Accessories

Adapter 1	
Model No.:	PEA-120100VA
Input:	100-240 V~50/60 Hz 0.3 A
Output:	12.0 V $\equiv$ 1.0 A
AC Cable:	N/A
DC Cable:	2.5 Meter, Unshielded without ferrite

Adapter 2	
Model No.:	F12US1200100A
Input:	100-240 V~50/60 Hz 0.5 A
Output:	12.0 V $\equiv$ 1.0 A
AC Cable:	N/A
DC Cable:	2.5 Meter, Unshielded without ferrite

Adapter 3	
Model No.:	RD1201000-C55-35MGD
Input:	100-240 V~50/60 Hz 0.6 A
Output:	12.0 V $\equiv$ 1.0 A
AC Cable:	N/A
DC Cable:	2.5 Meter, Unshielded without ferrite

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Cable(1)	
Description:	Ethernet Cable
Cable Type:	Unshielded without ferrite
Length:	1.5 Meter

Cable(2)	
Description:	HDMI Cable
Cable Type:	Shielded with two ferrite
Length:	1.5 Meter

1.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
USB Disk	Kingston	DTSE9H	N/A	UnionTrust
Mouse	RAPOO	N1050	N/A	UnionTrust
Display	KTC	U3202S	N/A	UnionTrust
Headphone	EDIFIER	K800	N/A	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
--	--	--	--	--

1.4 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

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1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

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ISED Wireless Device Testing Laboratories

CAB identifier: CN0032

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.9 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.2 dB
2	Conducted emission 150KHz-30MHz	±2.7 dB
3	Radiated emission 9KHz-30MHz	± 4.7 dB
4	Radiated emission 30MHz-1GHz	± 4.6 dB
5	Radiated emission 1GHz-18GHz	± 4.4 dB
6	Radiated emission 18GHz-26GHz	± 4.6 dB
7	Radiated emission 26GHz-40GHz	± 4.6 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart B Test Cases			
Test Item	Test Requirement	Test Method	Result
Conducted Emission	FCC 47 CFR Part 15.107 ICES-003 Issue 6 Section 6.1	ANSI C63.4-2014	PASS
Radiated Emission	FCC 47 CFR Part 15.109 ICES-003 Issue 6 Section 6.2	ANSI C63.4-2014	PASS



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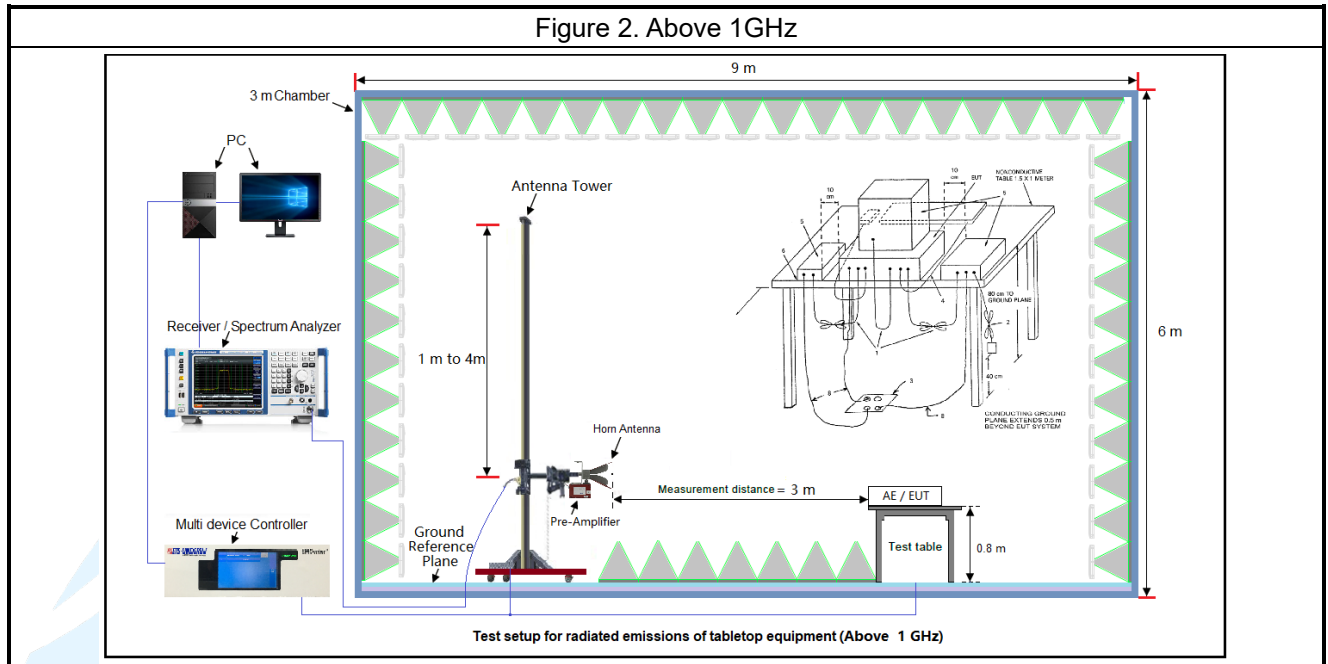
3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
☒	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	N/A	Dec. 03, 2018	Dec. 03, 2021
☒	Receiver	R&S	ESIB26	100114	Nov. 24, 2019	Nov. 23, 2020
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Nov. 16, 2019	Nov. 15, 2020
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	Nov. 16, 2019	Nov. 15, 2020
☒	Preamplifier	HP	8447F	2805A02960	Nov. 24, 2019	Nov. 23, 2020
☐	Broadband Antenna (Pre-amplifier)	ETS-LINDGREN	3142E-PA	00201891	Nov. 24, 2019	Nov. 23, 2020
☐	6dB Attenuator	Talent	RA6A5-N-18	18103002	Nov. 24, 2019	Nov. 23, 2020
☒	Horn Antenna	ETS-LINDGREN	3117	00164202	Nov. 16, 2019	Nov. 15, 2020
☒	Pre-amplifier	ETS-LINDGREN	118385	00201874	Jan. 10, 2020	Jan. 10, 2021
☐	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	May 30, 2020	May 29, 2021
☐	Horn Antenna	ETS-LINDGREN	3116C	00200180	Jun. 23, 2019	Jun. 23, 2020
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Nov. 16, 2019	Nov. 15, 2020
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

Conducted Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
☒	Receiver	R&S	ESR7	1316.3003K07-101181-K3	Nov. 24, 2019	Nov. 23, 2020
☒	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	Nov. 24, 2019	Nov. 23, 2020
☒	LISN	R&S	ESH2-Z5	860014/024	Nov. 24, 2019	Nov. 23, 2020
☒	LISN	ETS-Lindgren	3816/2SH	00201088	Nov. 24, 2019	Nov. 23, 2020
☒	Test Software	Audix	e3	Software Version: 9.160323		

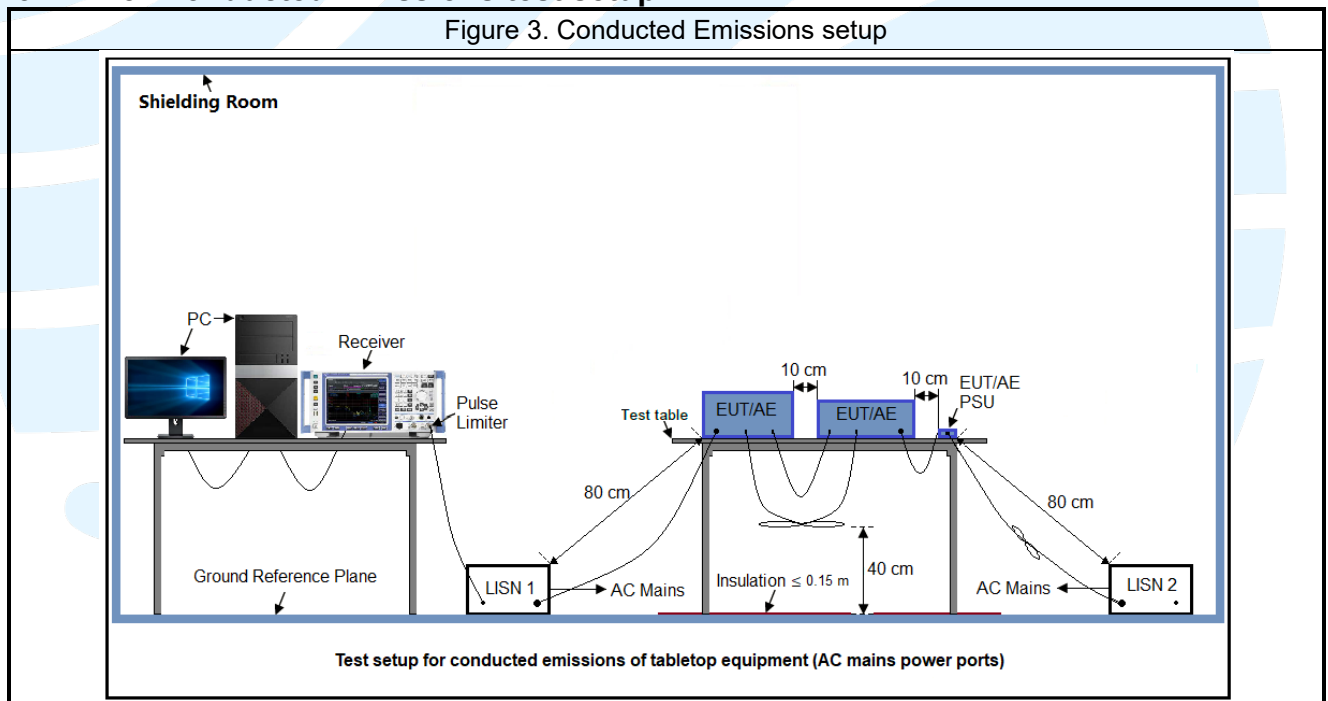
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Figure 2. Above 1GHz



4.3.2 For Conducted Emissions test setup

Figure 3. Conducted Emissions setup



4.4 SYSTEM TEST CONFIGURATION

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic (according to KDB 896810 D02 SDoC FAQ v01r01) of the highest fundamental frequency or to 40 GHz, whichever is lower.

5. REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part15 Subpart B	Unintentional Radiators
2	ICES-003 Issue 6	Information Technology Equipment (Including Digital Apparatus) — Limits and Methods of Measurement
3	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
4	KDB 174176 D01 Line Conducted FAQ v01r01	AC power-line conducted emission frequency asked questions
5	KDB 896810 D02 SDoC FAQ v01r02	Supplier's Declaration of Conformity frequency asked questions

6. EMC REQUIREMENTS SPECIFICATION

6.1 RADIATED EMISSION

Test Requirement: FCC 47 CFR Part 15.109
ICES-003 Issue 6 Clause 6.2

Test Method: ANSI C63.4-2014

Receiver Setup:

Frequency: (f) (MHz)	Detector type	Measurement receiver bandwidth	
		RBW	VBW
$30 \leq f \leq 1\,000$	Quasi Peak	120 kHz	300 kHz
$f \geq 1000$	Peak	1 MHz	3 MHz
	Average	1 MHz	3 MHz

Measured frequency range

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705-108	1000.
108-500	2000.
500-1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

Limits:

Limits for Class B devices

Frequency (MHz)	limits at 3m (dB μ V/m)		
	QP Detector	PK Detector	AV Detector
30-88	40.0	--	--
88-216	43.5	--	--
216-960	46.0	--	--
960 to 1000	54.0	--	--
Above 1000	--	74.0	54.0

Remark:

- The lower limit shall apply at the transition frequencies.
- Emission level (dB μ V/m) = 20 log Emission level (μ V/m).
- For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

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Test Setup: Refer to section 4.3.1 for details.

Test Procedures:

1. From 30 MHz to 1GHz test procedure as below:

- 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

2. Above 1GHz test procedure as below:

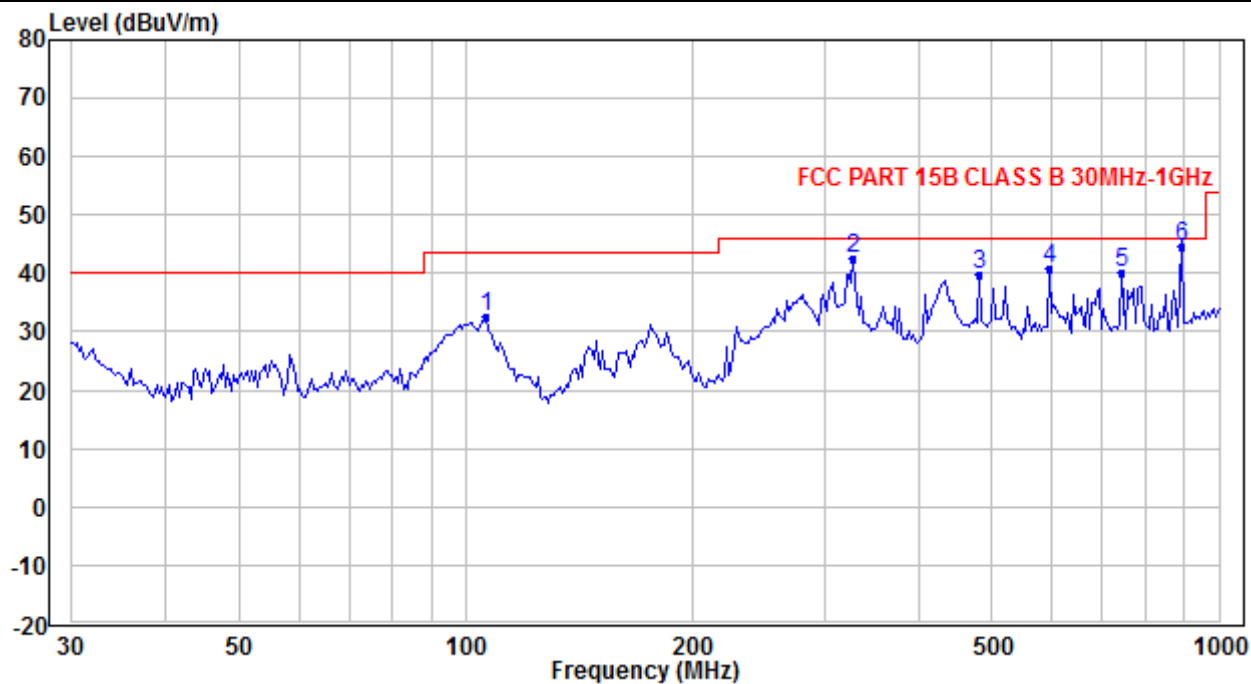
- 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

Below 1GHz(Quasi Peak):
Test Mode 2 (Worst mode for Adapter 1)
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	106.281	44.86	-12.28	32.58	43.50	-10.92	QP
2	327.155	47.86	-5.32	42.54	46.00	-3.46	QP
3	481.511	41.86	-2.08	39.78	46.00	-6.22	QP
4	594.514	40.25	0.48	40.73	46.00	-5.27	QP
5	744.427	37.84	2.42	40.26	46.00	-5.74	QP
6	893.656	40.23	4.46	44.69	46.00	-1.31	QP

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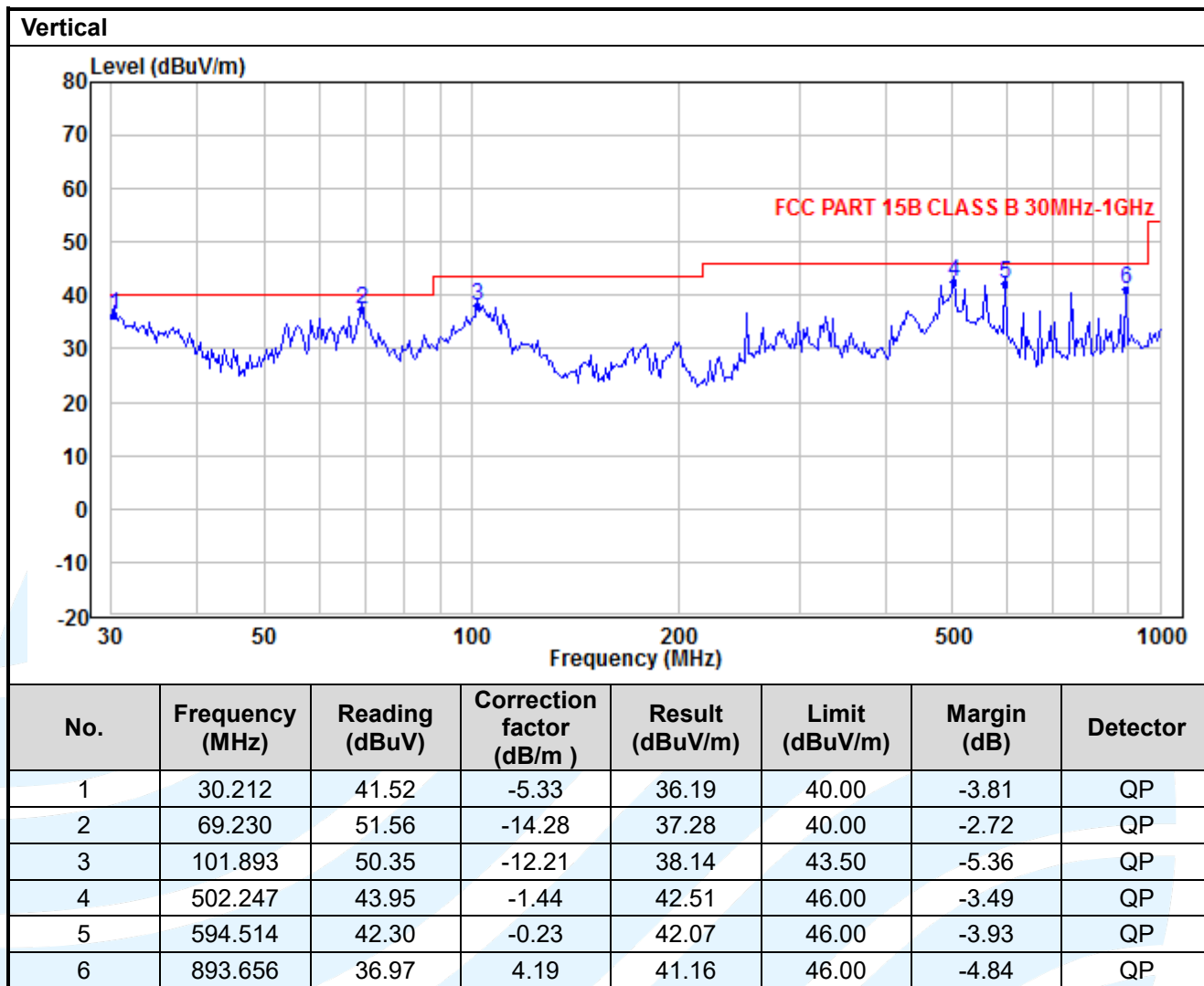
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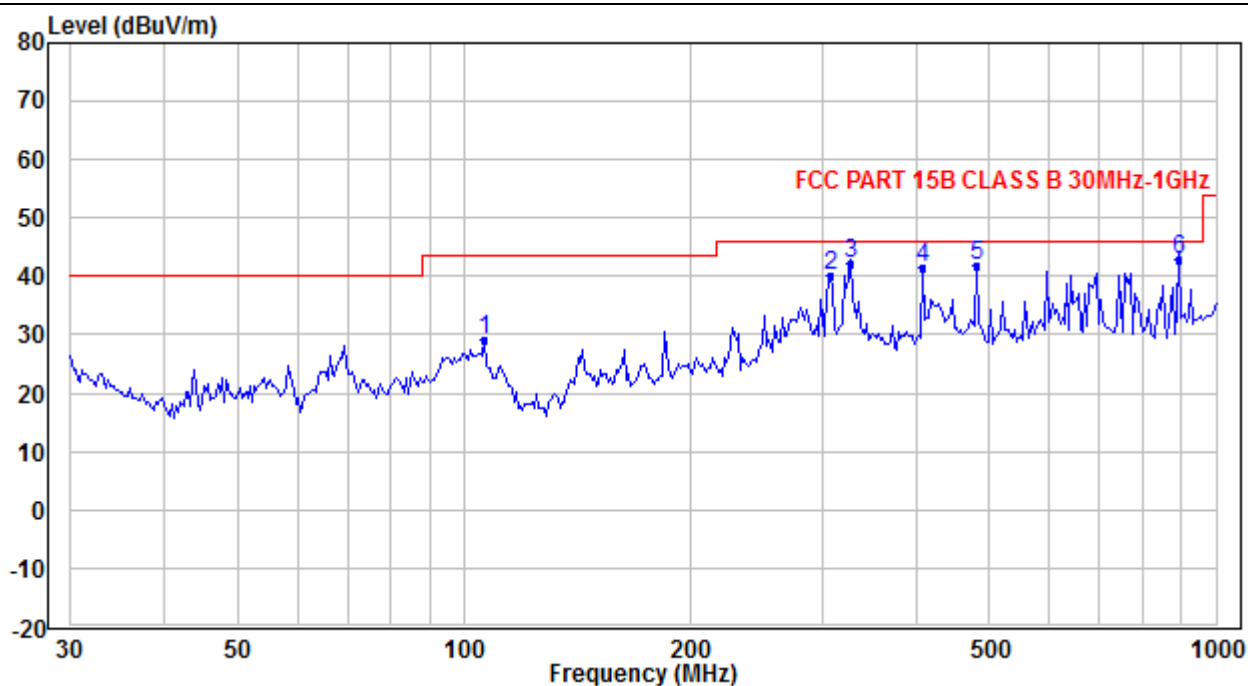
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Test Mode 3 (Worst mode for Adapter 2)
Horizontal


No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	106.281	41.25	-12.28	28.97	43.50	-14.53	QP
2	307.105	45.94	-5.91	40.03	46.00	-5.97	QP
3	327.155	47.36	-5.32	42.04	46.00	-3.96	QP
4	406.782	44.23	-2.78	41.45	46.00	-4.55	QP
5	481.511	43.99	-2.08	41.91	46.00	-4.09	QP
6	893.656	38.49	4.46	42.95	46.00	-3.05	QP

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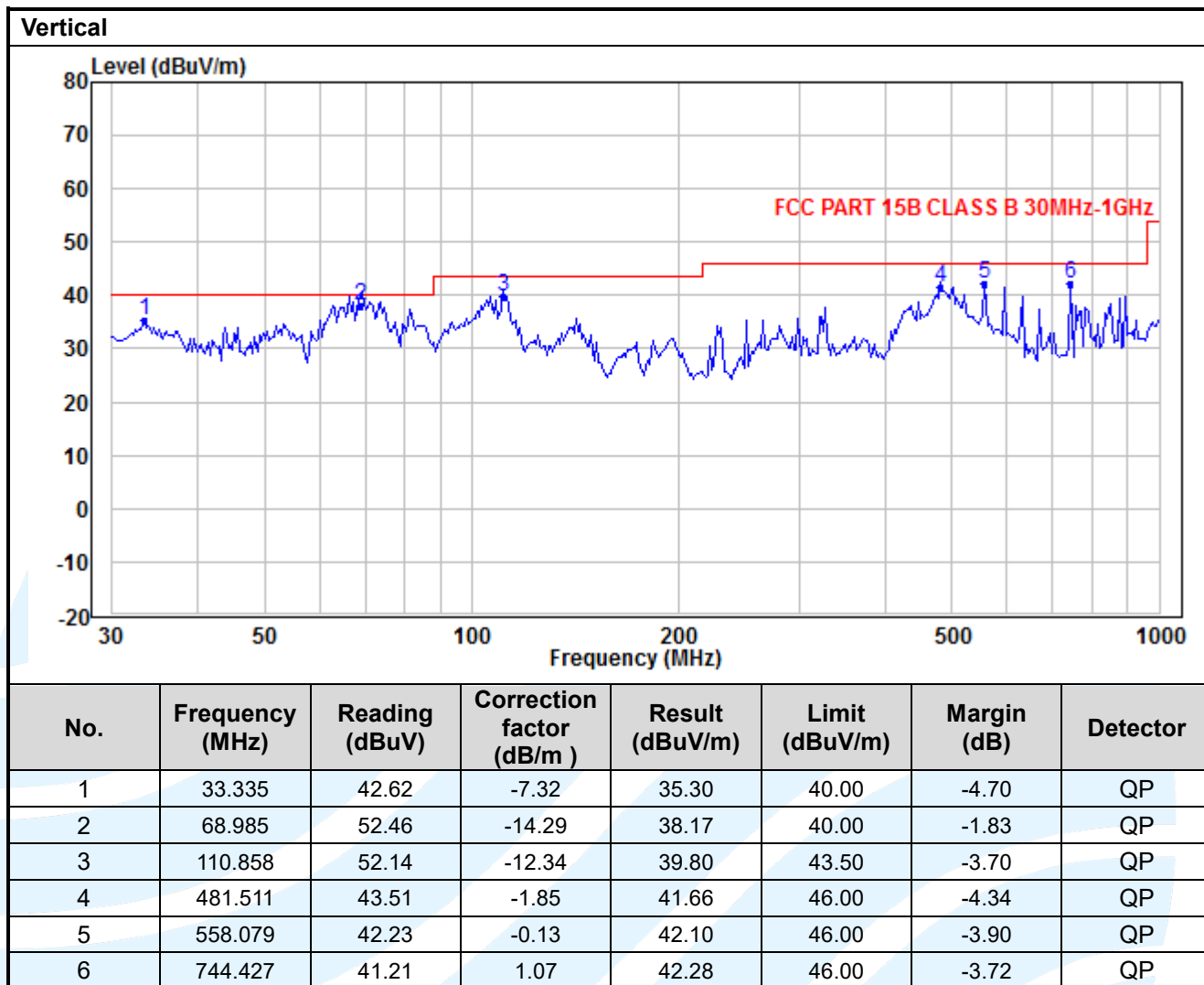
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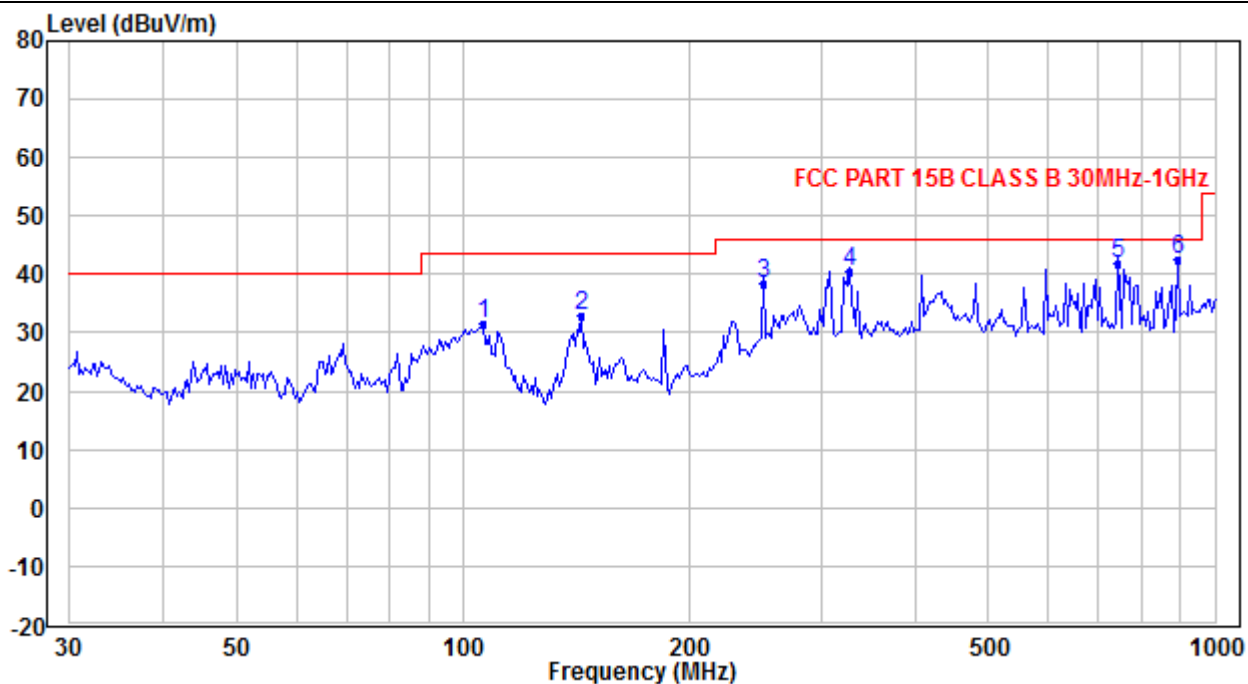
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Test Mode 4 (Worst mode for Adapter 3)
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	106.281	43.67	-12.28	31.39	43.50	-12.11	QP
2	143.776	44.74	-11.82	32.92	43.50	-10.58	QP
3	250.486	45.76	-7.37	38.39	46.00	-7.61	QP
4	327.155	45.64	-5.32	40.32	46.00	-5.68	QP
5	744.427	39.46	2.42	41.88	46.00	-4.12	QP
6	893.656	38.07	4.46	42.53	46.00	-3.47	QP

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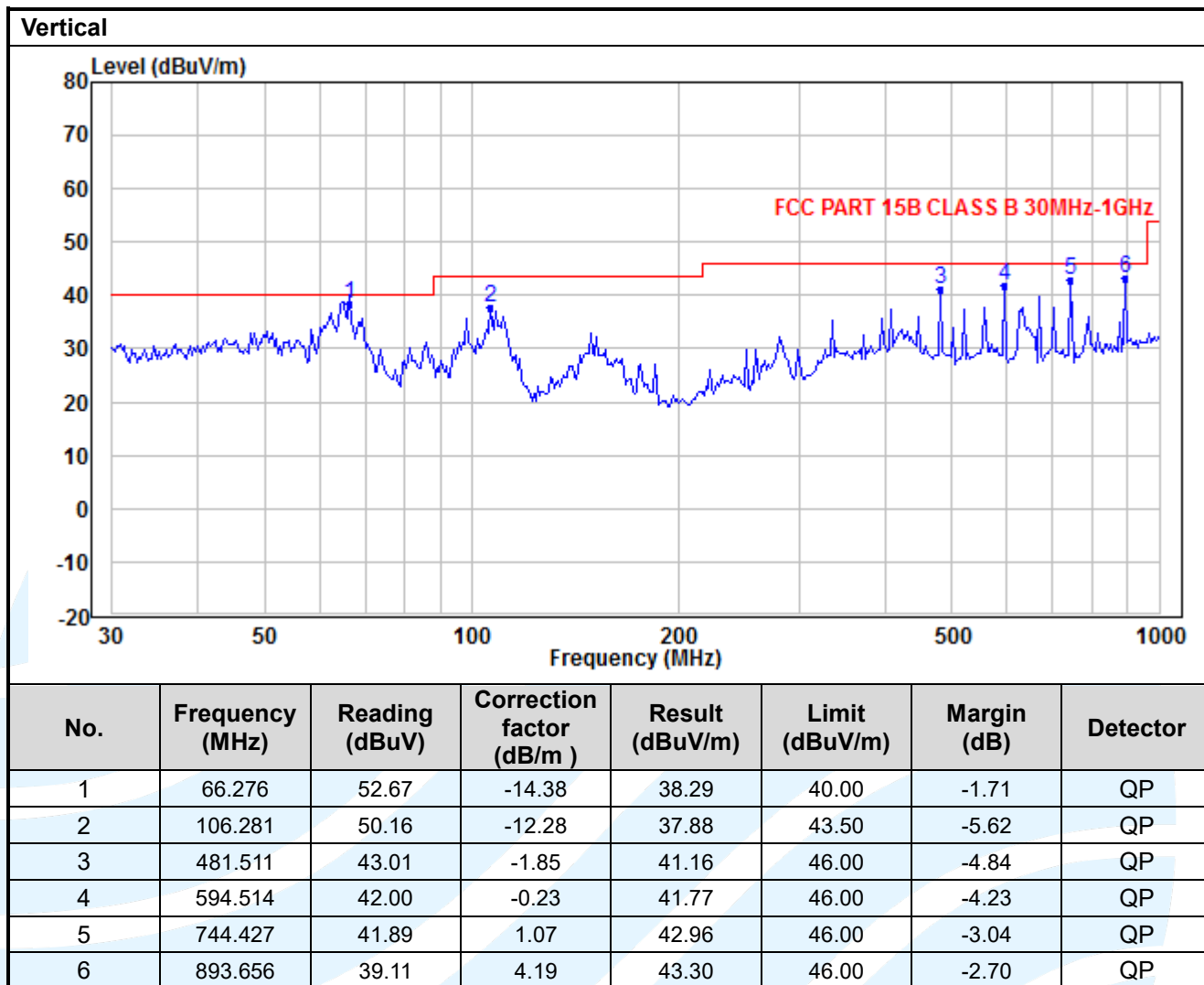
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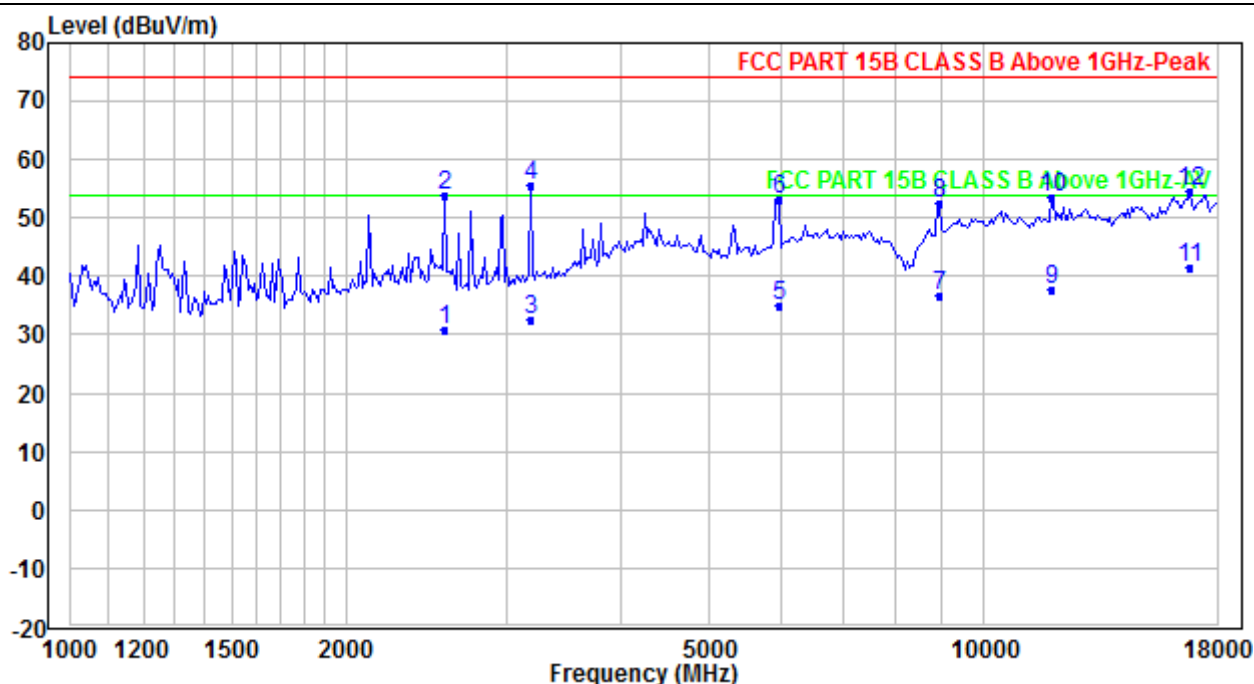
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Above 1GHz (Peak & Average)
Test Mode 3 (Worst mode for all Adapter)
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2570.626	31.11	-0.32	30.79	54.00	-23.21	Average
2	2570.626	54.11	-0.32	53.79	74.00	-20.21	Peak
3	3185.042	31.26	1.19	32.45	54.00	-21.55	Average
4	3185.042	54.26	1.19	55.45	74.00	-18.55	Peak
5	5953.844	28.69	6.35	35.04	54.00	-18.96	Average
6	5953.844	46.69	6.35	53.04	74.00	-20.96	Peak
7	8930.747	28.46	8.13	36.59	54.00	-17.41	Average
8	8930.747	44.46	8.13	52.59	74.00	-21.41	Peak
9	11861.810	27.87	9.78	37.65	54.00	-16.35	Average
10	11861.810	43.87	9.78	53.65	74.00	-20.35	Peak
11	16791.350	28.31	13.14	41.45	54.00	-12.55	Average
12	16791.350	41.31	13.14	54.45	74.00	-19.55	Peak

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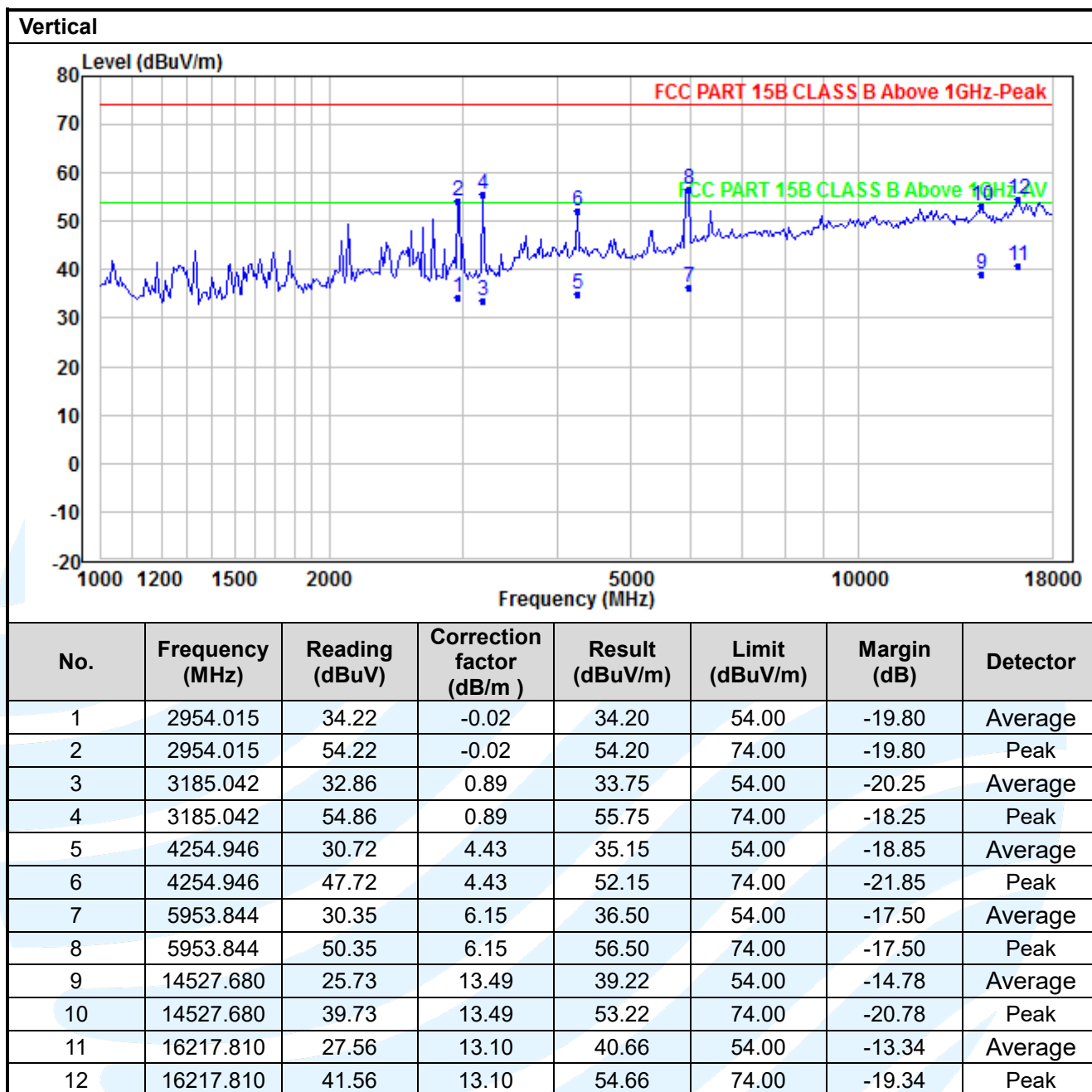
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Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit
4. All possible modes of operation were investigated, and testing at two nominal voltages of 240V/50Hz and 120V/60Hz, only the worst case emissions reported.
5. For Radiated Emission above 18GHz, there was not any unwanted emission detected.

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6.2 CONDUCTED EMISSION

Test Requirement: FCC 47 CFR Part 15.107
ICES-003 Issue 6 Section 6.1

Test Method: ANSI C63.4-2014

Limits:

Limits for Class B devices

Frequency range (MHz)	Limits (dB(μV))	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Remark:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

Test Setup: Refer to section 4.3.2 for details.

Test Procedures:

- 1) The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- 2) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- 3) For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

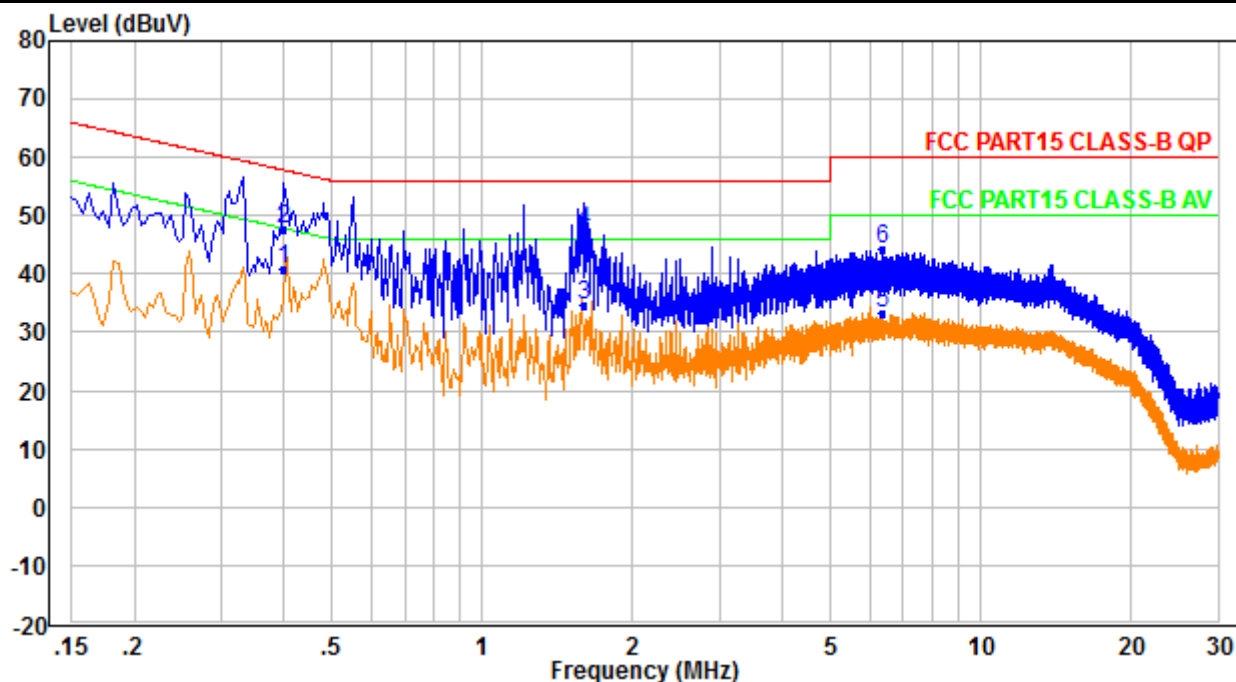
Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

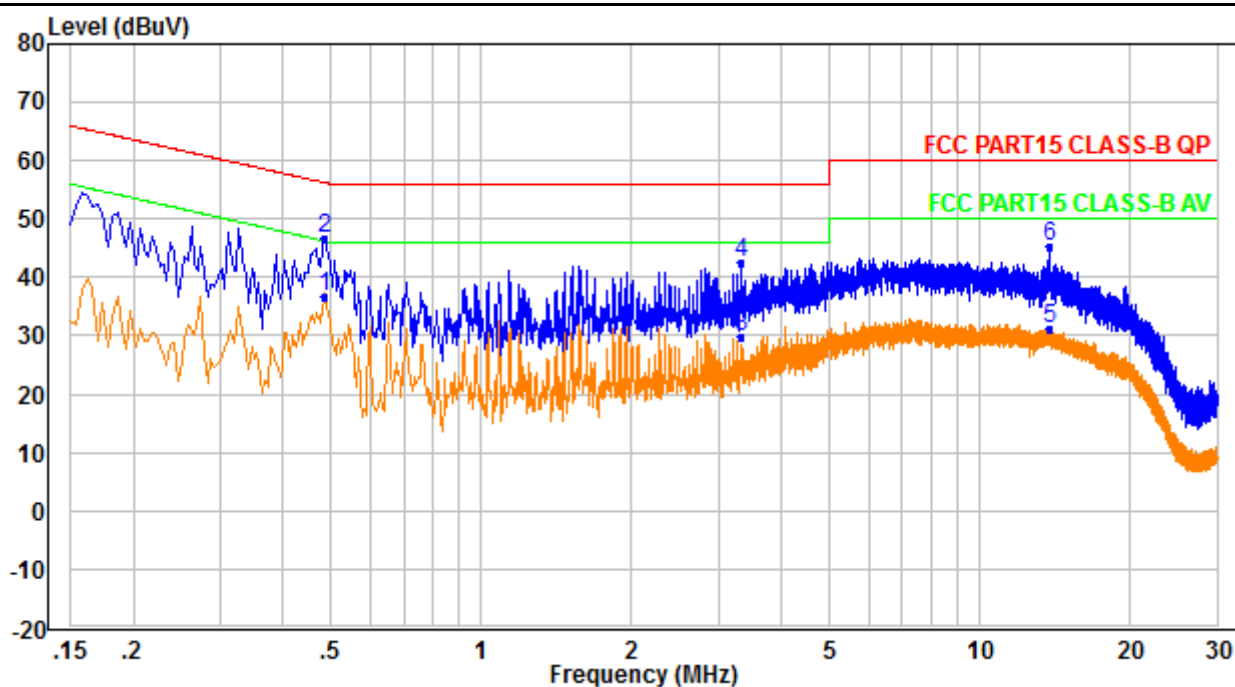
Test Mode 1 (Worst mode for Adapter 1)

Live Line



No.	Frequency (MHz)	Reading (dBUV)	Correction factor (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)	Detector
1	0.398	31.60	9.28	40.88	47.90	-7.02	Average
2	0.398	38.50	9.28	47.78	57.90	-10.12	QP
3	1.594	25.00	9.61	34.61	46.00	-11.39	Average
4	1.594	37.70	9.61	47.31	56.00	-8.69	QP
5	6.354	23.53	9.65	33.18	50.00	-16.82	Average
6	6.354	34.53	9.65	44.18	60.00	-15.82	QP

Neutral Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.486	27.33	9.42	36.75	46.24	-9.49	Average
2	0.486	37.39	9.42	46.81	56.24	-9.43	QP
3	3.318	20.03	9.66	29.69	46.00	-16.31	Average
4	3.318	33.03	9.66	42.69	56.00	-13.31	QP
5	13.829	21.12	9.99	31.11	50.00	-18.89	Average
6	13.829	35.44	9.99	45.43	60.00	-14.57	QP

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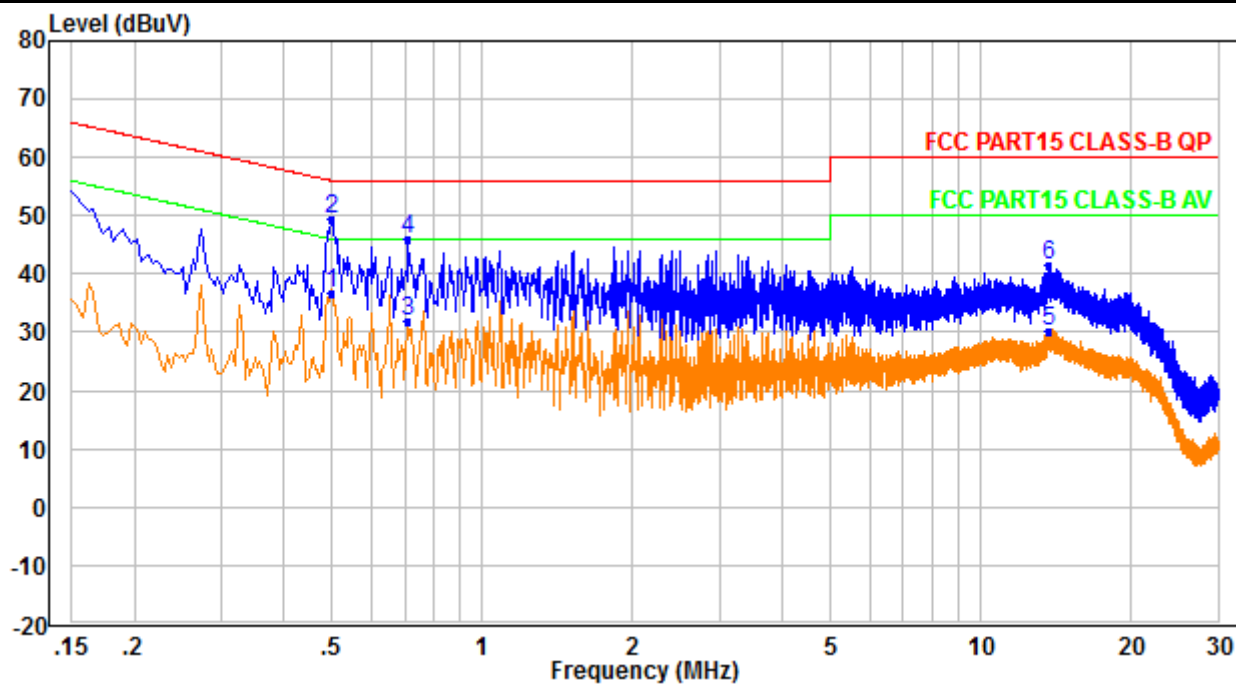
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E-mail: info@uttlab.com

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Test Mode 3 (Worst mode for Adapter 2)
Live Line


No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.498	27.32	9.41	36.73	46.03	-9.30	Average
2	0.498	39.95	9.41	49.36	56.03	-6.67	QP
3	0.710	22.31	9.50	31.81	46.00	-14.19	Average
4	0.710	36.35	9.50	45.85	56.00	-10.15	QP
5	13.749	20.13	9.98	30.11	50.00	-19.89	Average
6	13.749	31.39	9.98	41.37	60.00	-18.63	QP

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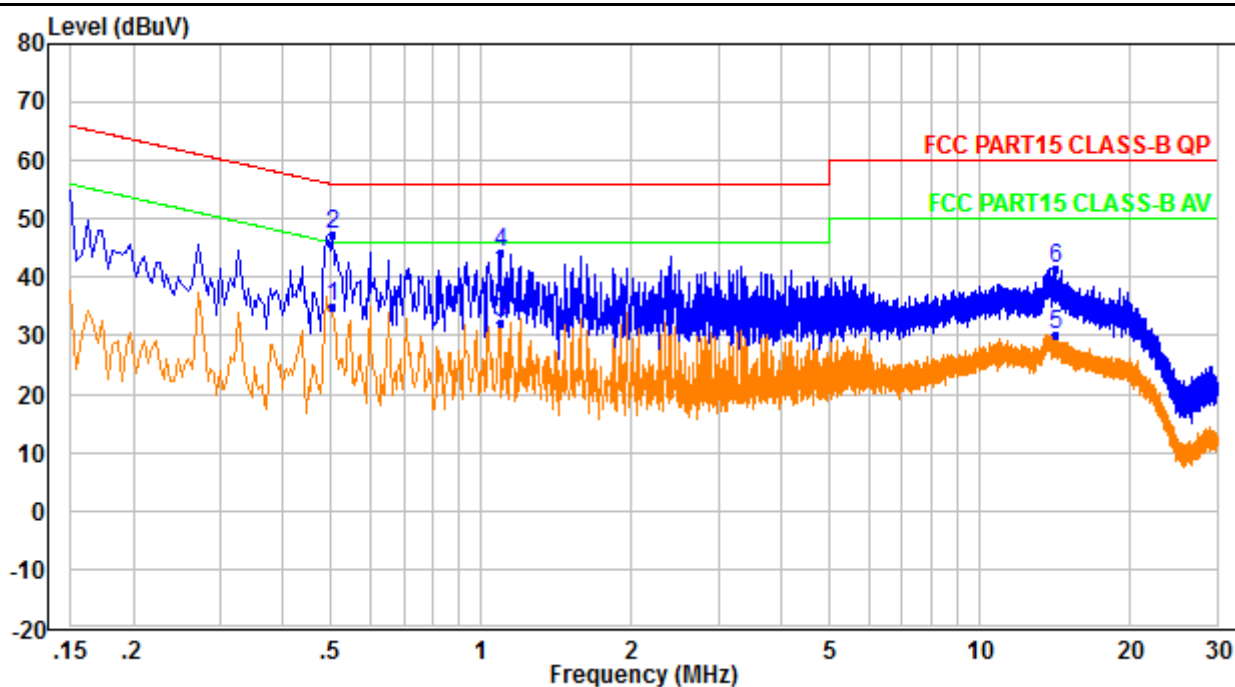
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Neutral Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.502	25.42	9.44	34.86	46.00	-11.14	Average
2	0.502	37.94	9.44	47.38	56.00	-8.62	QP
3	1.090	22.54	9.52	32.06	46.00	-13.94	Average
4	1.090	34.58	9.52	44.10	56.00	-11.90	QP
5	14.257	20.29	10.00	30.29	50.00	-19.71	Average
6	14.257	31.53	10.00	41.53	60.00	-18.47	QP

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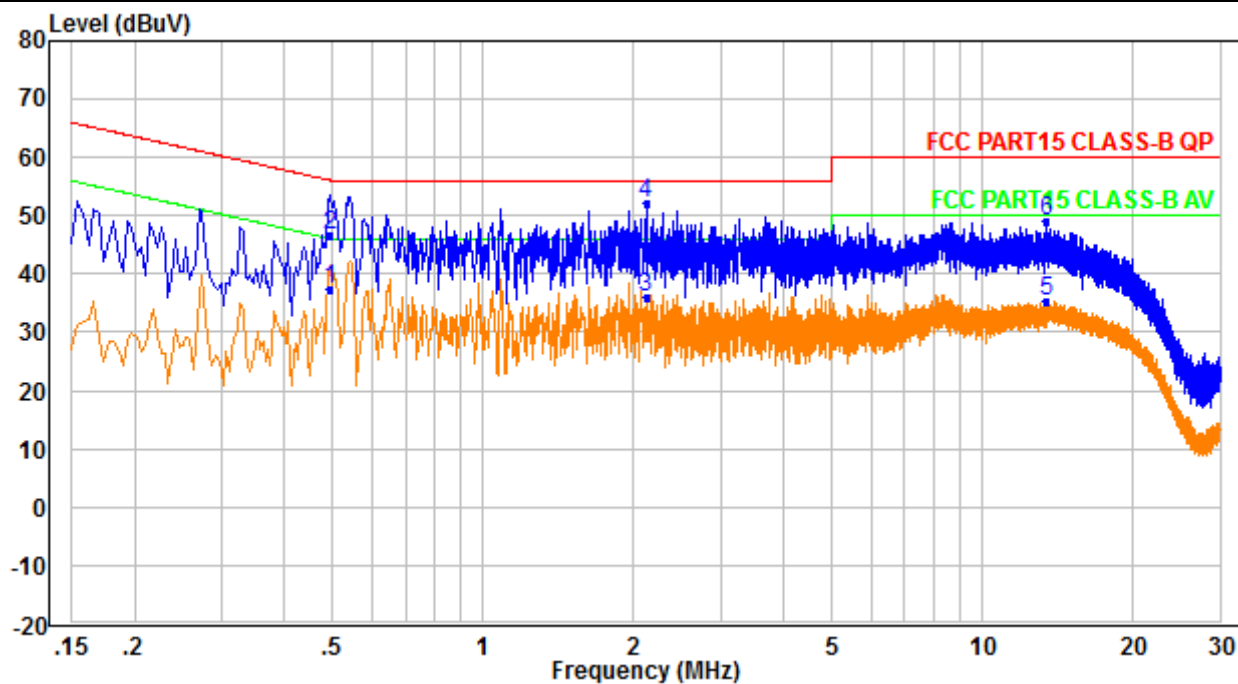
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Test Mode 4 (Worst mode for Adapter 3)
Live Line

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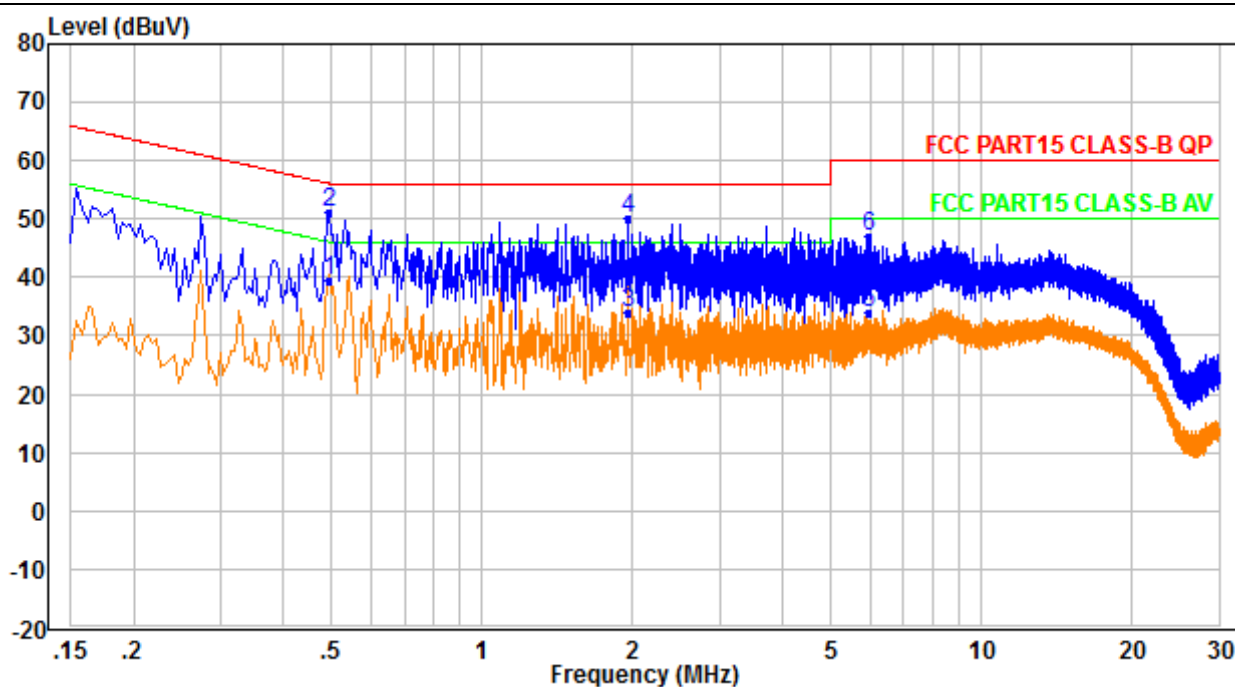
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Neutral Line



No.	Frequency (MHz)	Reading (dBUV)	Correction factor (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)	Detector
1	0.494	30.05	9.43	39.48	46.10	-6.62	Average
2	0.494	41.80	9.43	51.23	56.10	-4.87	QP
3	1.958	24.40	9.65	34.05	46.00	-11.95	Average
4	1.958	40.54	9.65	50.19	56.00	-5.81	QP
5	5.982	24.22	9.64	33.86	50.00	-16.14	Average
6	5.982	37.23	9.64	46.87	60.00	-13.13	QP

Remark:

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit
4. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.
5. All possible modes of operation were investigated, and testing at two nominal voltages of 240V/50Hz and 120V/60Hz, only the worst case emissions reported.

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APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

***** End of Report *****

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