

FCC & ISED TEST REPORT

Product Name: Enterprise Layer 2++ Managed Switch
Trade Mark: GRANDSTREAM
Model No.: GWN7801P Pro
Report Number: 25082019567EMC-1
Test Standards: FCC 47 CFR Part 15 Subpart B
ICES-003 Issue 7
FCC ID: YZZGWN7801PR
Test Result: PASS
Date of Issue: September 28, 2025

Prepared for:

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

Prepared by:

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September 28, 2025

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Version

Version No.	Date	Description
V1.0	September 28, 2025	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:	Enterprise Layer 2++ Managed Switch
Model No:	GWN7801P Pro
Trade Mark:	GRANDSTREAM
DUT Stage:	Production Unit
Rated Voltage:	100-240V~ 50/60Hz 2.5A
Classification of digital devices:	Class A
Highest Internal Frequency:	1000 MHz
Software Version:	N/A (Provided by the customer)
Hardware Version:	V1.1 (Provided by the customer)
Sample Received Date:	August 21, 2025
Sample Tested Date:	September 4, 2025 to September 7, 2025
Note: This product can configure with three different power modules: Build-in Power 1: BOF-150S54E; Build-in Power 2: UES150-540280SPA3-OP; Build-in Power 3: G1707-150W.	
Remark: The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.	

1.2.2 Description of Accessories

Cable	
Description:	AC Power Cable
Cable Type:	Unshielded without ferrite
Length:	1.2 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
Notebook	LENOVO	E450	PF-0EQBE3 15/11	UnionTrust
Mouse	DELL	MS111-T	CN-0KW2YH-71616-5AH-0 SV7	UnionTrust
AE (POE Load)	N/A	N/A	N/A	Applicant

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1~10	Ethernet Cable	RJ45	1.0 meter Unshielded without ferrite	UnionTrust
11	Ethernet Cable	RJ45	2.0 meter Unshielded without ferrite	UnionTrust

1.4 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China

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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 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 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

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 7 Section 3.2.1	ANSI C63.4-2014	PASS
Radiated Emission	FCC 47 CFR Part 15.109 ICES-003 Issue 7 Section 3.2.2	ANSI C63.4-2014	PASS

3. EQUIPMENT LIST

Radiated Emission Test - 3M Chamber						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	3m SAC	ETS-LINDGREN	3M	Euroshiedpn-CT 001270-1317	11-Nov-2023	10-Nov-2026
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	29-Oct-2024	28-Oct-2025
☒	6dB Attenuator	Talent	RA6A5-N- 18	18103001	29-Oct-2024	28-Oct-2025
☒	Preamplifier	HP	8447F	2805A02960	25-Oct-2024	24-Oct-2025
☒	Receiver	R&S	ESIB26	100114	25-Oct-2024	24-Oct-2025
☒	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	Cal. Due date
☒	Receiver	R&S	ESCI3	1166.5950.03	25-Oct-2024	24-Oct-2025
☒	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	25-Oct-2024	24-Oct-2025
☒	LISN	R&S	EVN216	3560.6550.12	26-Sep-2024	25-Sep-2025
☐	LISN	ETS-Lindgren	3816/2SH	00201088	25-Oct-2024	24-Oct-2025
☒	Test Software	EZ-EMC	EZ-CON	Software Version: EMC-CON 3A1.1		

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
NT/NV	+15 to +35	1: AC 120V/60Hz 2: AC 240V/50Hz	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment and Test Sample

Test Item	Temperature (°C)	Relative Humidity(%)	Pressure (Kpa)	Sample No.	Tested by
Conducted Emission	25.2	56.5	99.7	S202508206729-ZJA01/6	Fire Huo
Radiated Emission	22.6	55.6	99.9	S202508206729-ZJA03/6 S202508206729-ZJA05/6	Leo Li

4.2 TEST MODES

Test Item	EMI Test Modes
Radiated Emission	Test Mode 1: AC120V/60Hz(Build-in Power 1) + Ethernet Ports Loop transmission+ SFP port Transmission Test Mode 2: AC240V/50Hz(Build-in Power 1) + Ethernet Ports Loop transmission+ SFP port Transmission Test Mode 3: worse from TM1~TM2& Build-in Power 2 Test Mode 4: worse from TM1~TM2& Build-in Power 3
Conducted Emission	Test Mode 1: AC120V/60Hz(Build-in Power 1) + Ethernet Ports Loop transmission+ SFP port Transmission Test Mode 2: AC240V/50Hz(Build-in Power 1) + Ethernet Ports Loop transmission+ SFP port Transmission Test Mode 3: worse from TM1~TM2& Build-in Power 2 Test Mode 4: worse from TM1~TM2& Build-in Power 3

4.3 TEST SETUP

4.3.1 For Radiated Emissions test setup

Figure 1. 30MHz to 1GHz

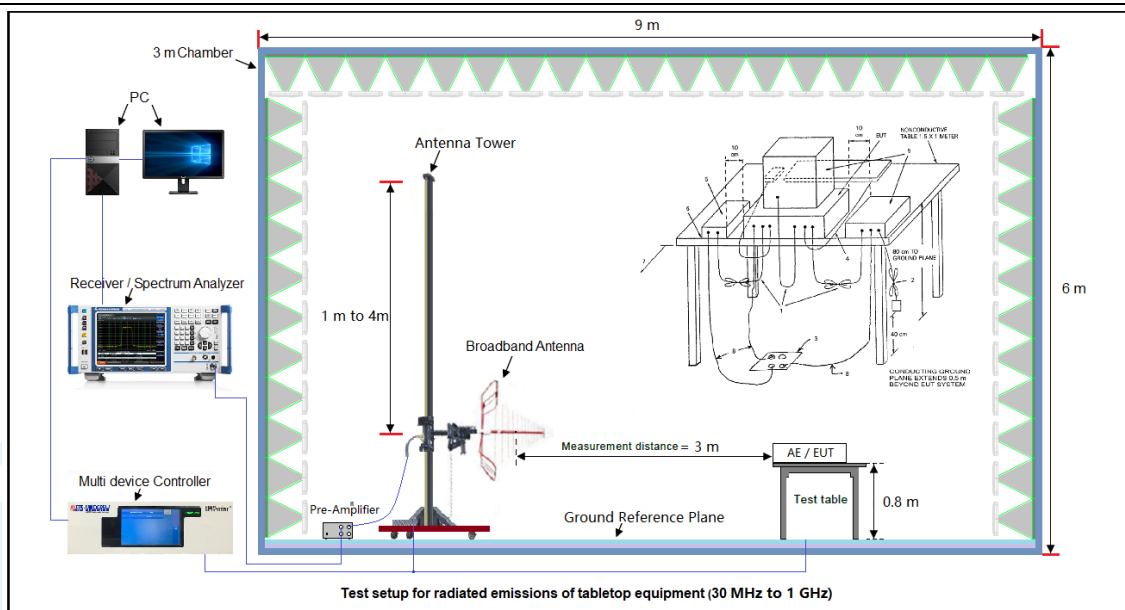
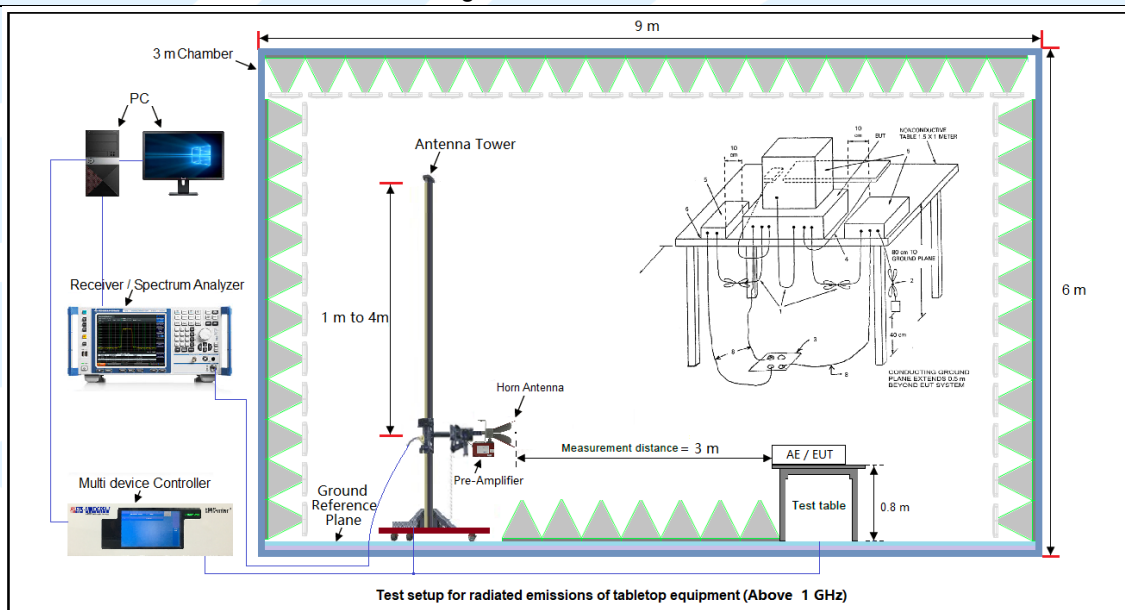


Figure 2. Above 1GHz



5. REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part15 Subpart B	Unintentional Radiators
2	ICES-003 Issue 7	Information Technology Equipment (Including Digital Apparatus)
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 7 Clause 3.2.2

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 A devices

FCC 47 CFR Part 15 Subpart B

Frequency (MHz)	limits at 3 m (dB μ V/m)		
	QP Detector	PK Detector	AV Detector
30-88	49.5	--	--
88-216	54.0	--	--
216-960	56.9	--	--
960 to 1000	60.0	--	--
Above 1000	--	80.0	60.0

ICES-003 Issue 7

Frequency (MHz)	limits at 3 m (dB μ V/m)		
	QP Detector	PK Detector	AV Detector
30 – 88	50.0	--	--
88 – 216	54.0	--	--

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216 – 230	56.9	--	--
230 – 960	57.0	--	--
960 – 1000	60.0	--	--
Above 1000	--	80	60

Remark:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB μ V/m) = 20 log Emission level (μ V/m).
3. 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.

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

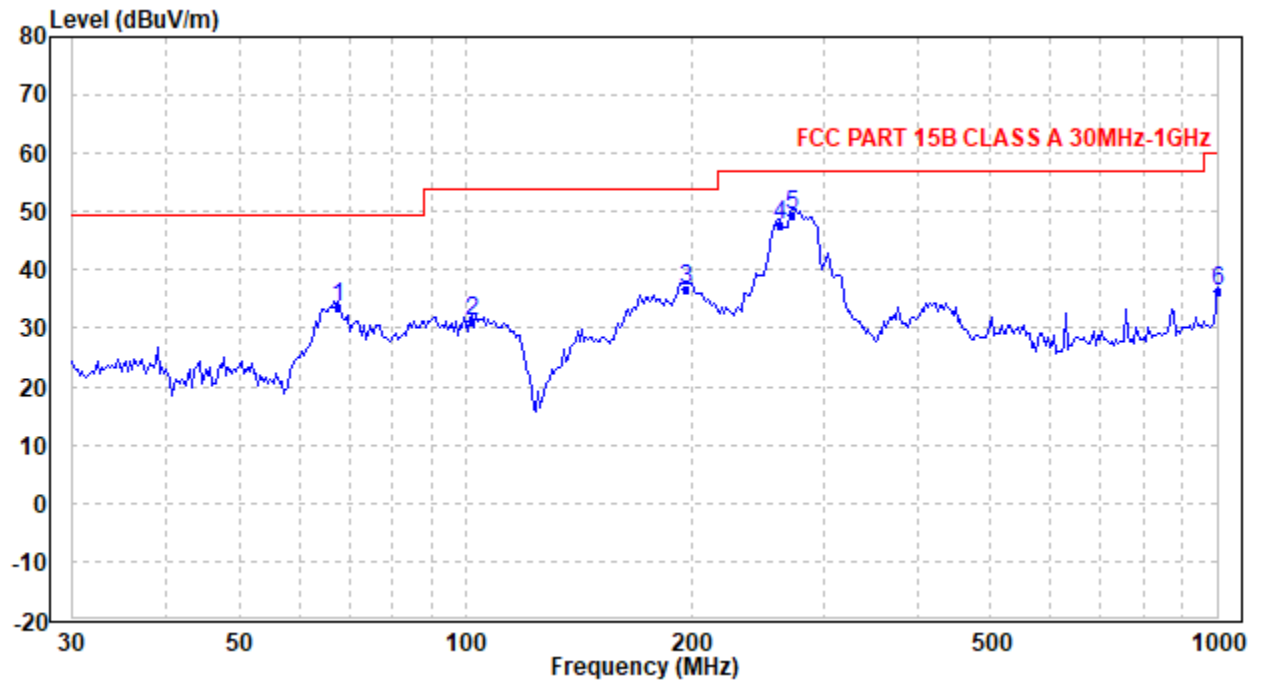
The measurement data as follows:

The measurement data for FCC 47 CFR Part 15 Subpart B as follows:

Below 1GHz (Quasi Peak):

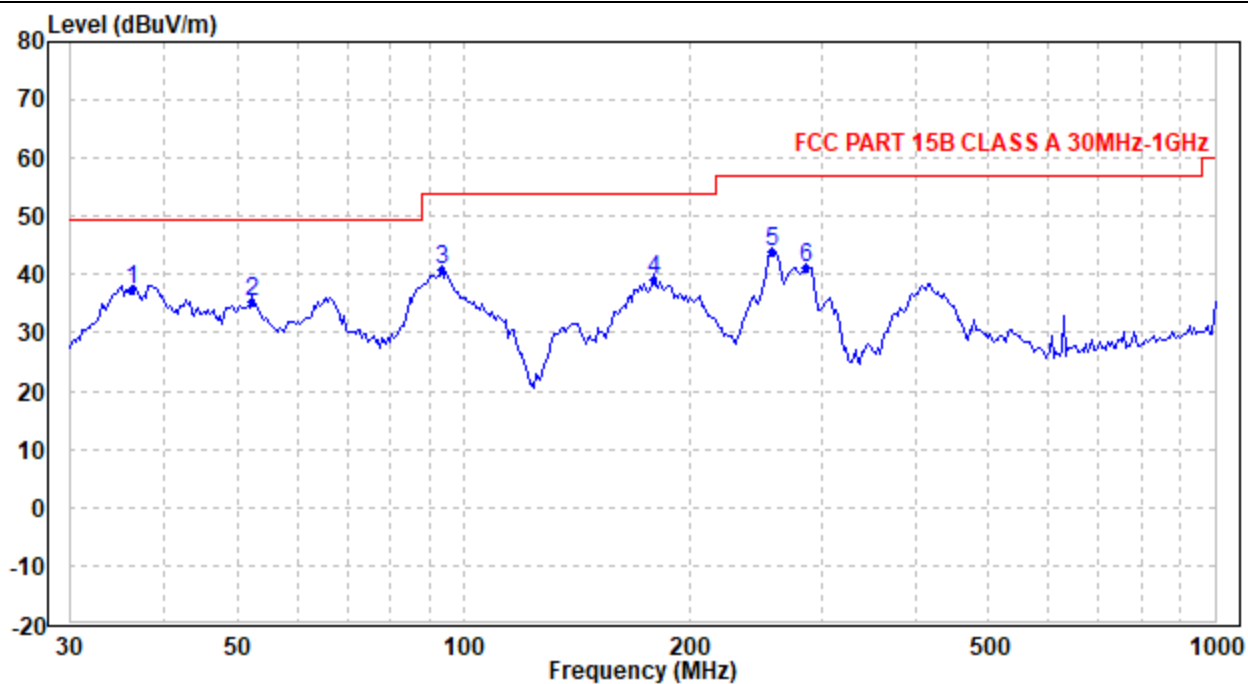
Test Mode 2

Horizontal



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	67.786	51.90	-18.16	33.74	49.50	-15.76	QP
2	101.893	47.11	-15.98	31.13	54.00	-22.87	QP
3	195.87	48.31	-11.46	36.85	54.00	-17.15	QP
4	261.273	57.92	-10.31	47.61	56.90	-9.29	QP
5	272.525	59.33	-9.84	49.49	56.90	-7.41	QP
6	1000	30.65	5.71	36.36	60.00	-23.64	QP

Vertical



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	36.268	44.48	-7.23	37.25	49.50	-12.25	QP
2	52.266	50.29	-15.03	35.26	49.50	-14.24	QP
3	93.653	57.08	-16.42	40.66	54.00	-13.34	QP
4	178.77	51.28	-12.08	39.20	54.00	-14.80	QP
5	257.627	54.23	-10.46	43.77	56.90	-13.13	QP
6	286.265	50.20	-9.19	41.01	56.90	-15.89	QP

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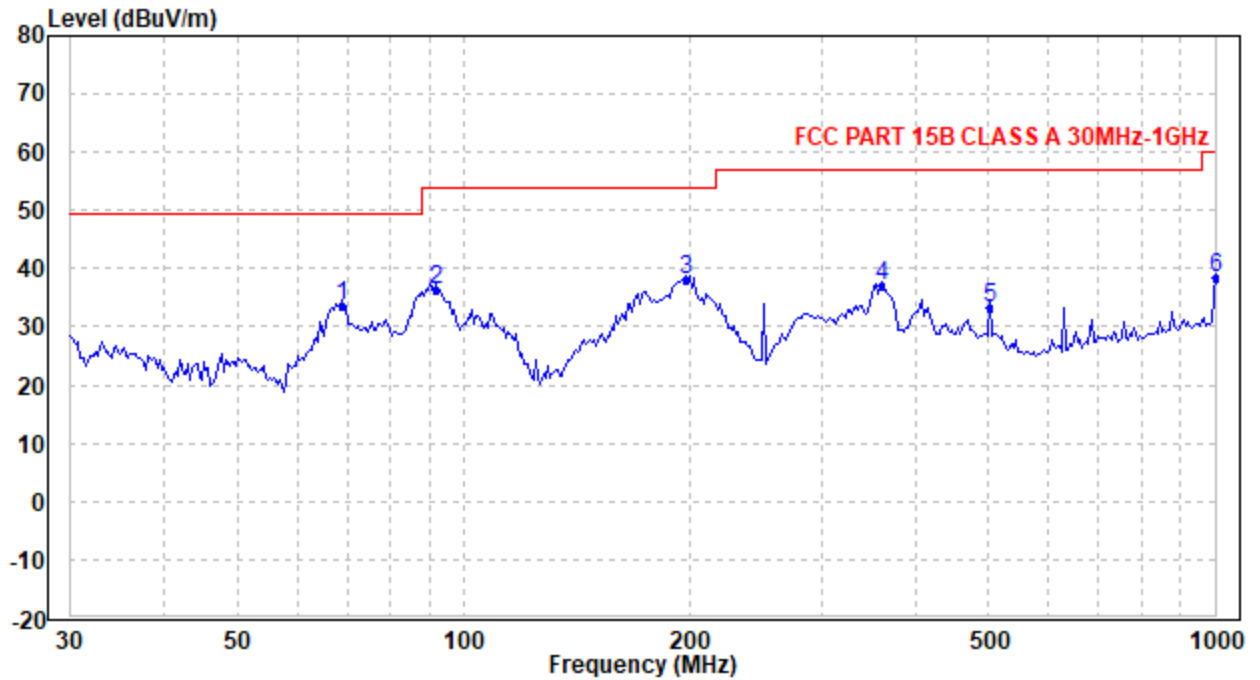
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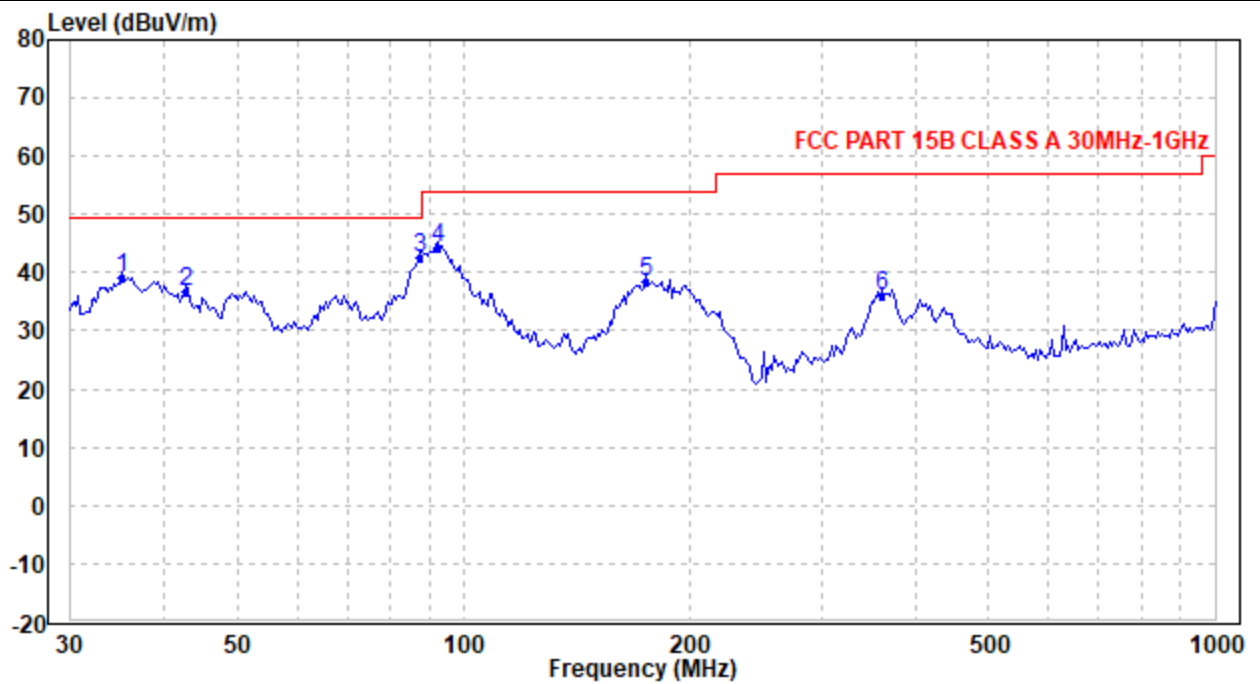
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Below 1GHz (Quasi Peak):
Test Mode 3
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	68.745	51.66	-17.97	33.69	49.50	-15.81	QP
2	91.7	52.94	-16.42	36.52	54.00	-17.48	QP
3	197.251	49.32	-11.41	37.91	54.00	-16.09	QP
4	360.977	42.86	-5.96	36.90	56.90	-20.00	QP
5	502.247	35.66	-2.26	33.40	56.90	-23.50	QP
6	1000	32.63	5.71	38.34	60.00	-21.66	QP

Vertical



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	35.016	46.03	-6.99	39.04	49.50	-10.46	QP
2	42.63	47.23	-10.43	36.80	49.50	-12.70	QP
3	87.298	59.26	-16.80	42.46	49.50	-7.04	QP
4	92.346	60.65	-16.42	44.23	54.00	-9.77	QP
5	175.04	50.12	-11.57	38.55	54.00	-15.45	QP
6	360.977	41.96	-5.96	36.00	56.90	-20.90	QP

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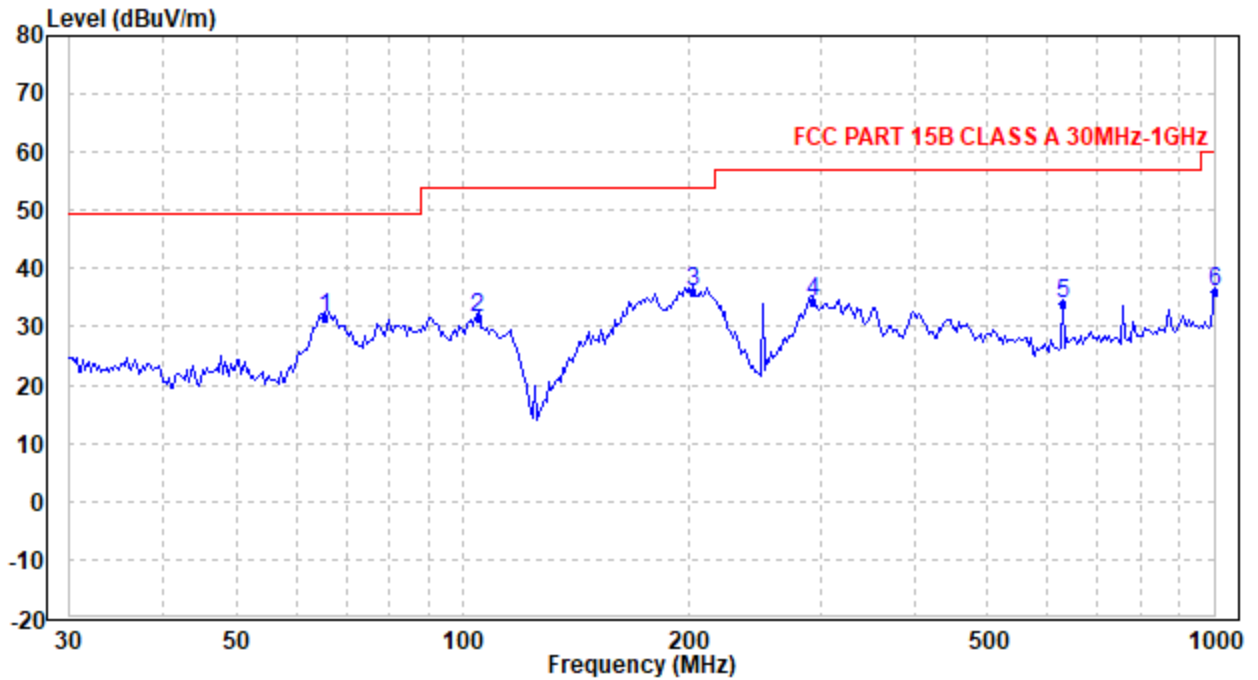
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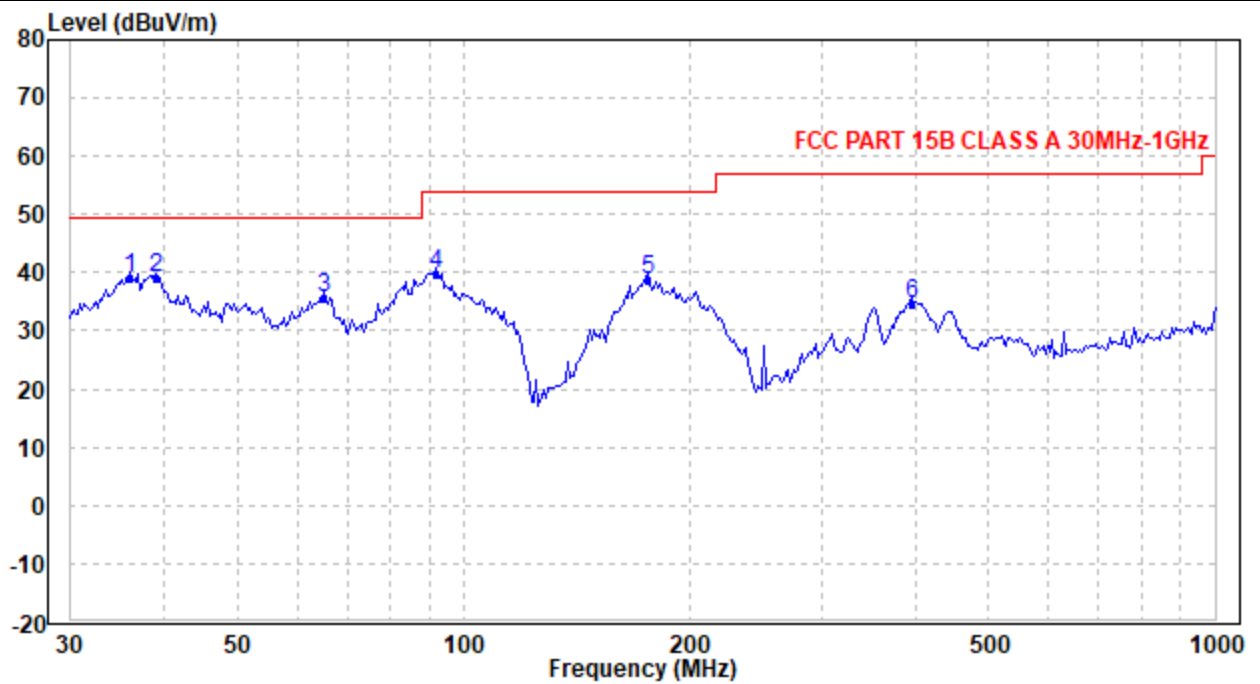
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Below 1GHz (Quasi Peak):
Test Mode 4
Horizontal



No.	Frequency (MHz)	Reading (dB μ V)	Correction factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	65.445	49.61	-17.97	31.64	49.50	-17.86	QP
2	104.798	47.21	-15.67	31.54	54.00	-22.46	QP
3	202.875	47.23	-11.26	35.97	54.00	-18.03	QP
4	292.364	43.23	-9.04	34.19	56.90	-22.71	QP
5	628.894	34.42	-0.61	33.81	56.90	-23.09	QP
6	1000	30.37	5.71	36.08	60.00	-23.92	QP

Vertical



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	36.014	46.34	-7.15	39.19	49.50	-10.31	QP
2	38.908	47.26	-8.32	38.94	49.50	-10.56	QP
3	64.987	53.74	-17.93	35.81	49.50	-13.69	QP
4	91.7	56.31	-16.42	39.89	54.00	-14.11	QP
5	176.275	50.60	-11.79	38.81	54.00	-15.19	QP
6	395.507	38.84	-4.31	34.53	56.90	-22.37	QP

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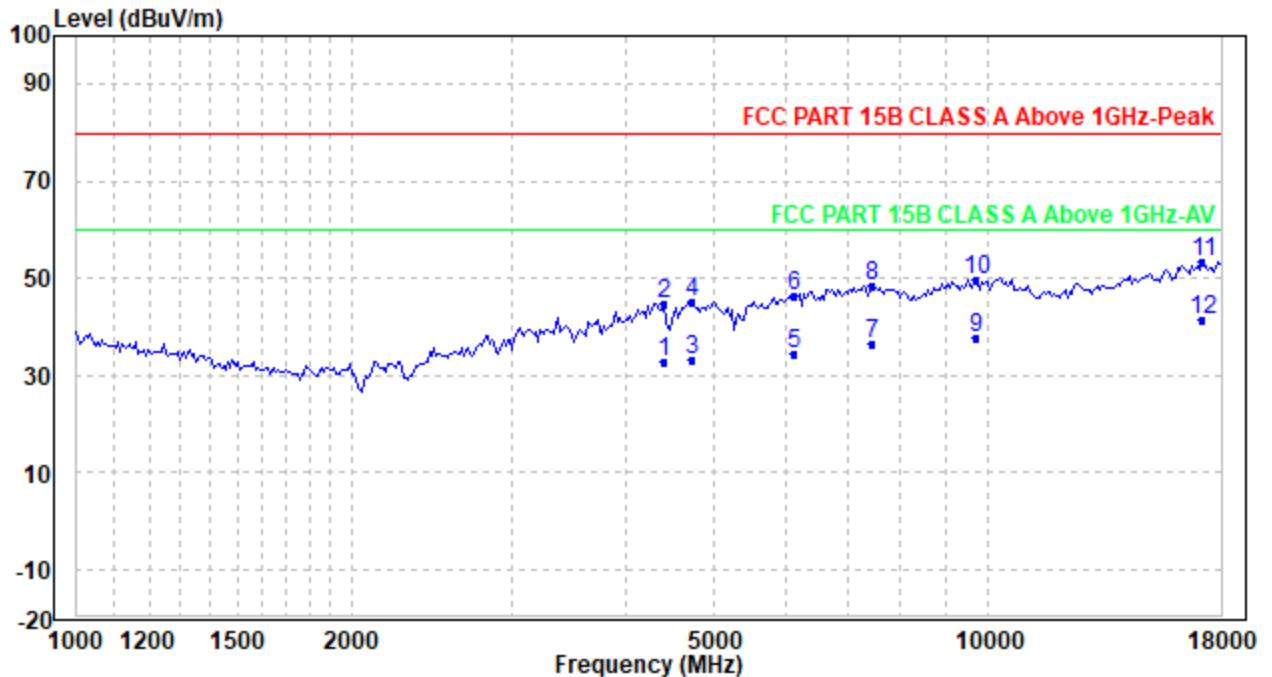
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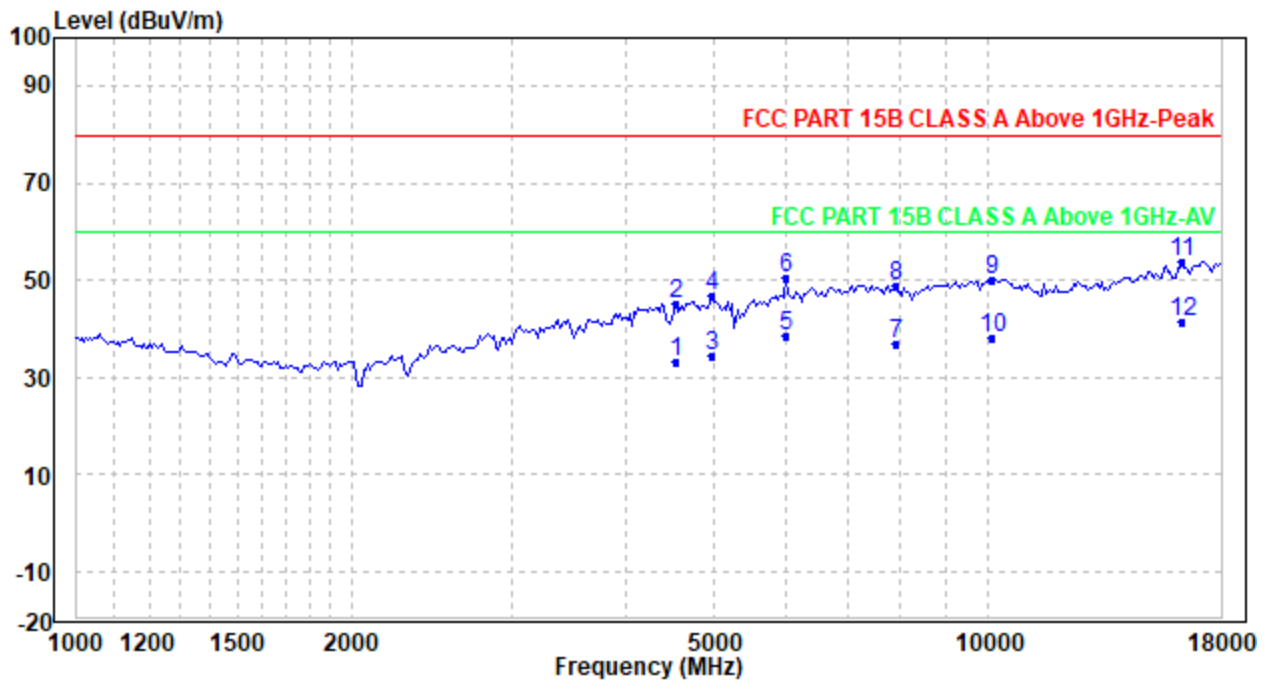
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Above 1GHz (Quasi Peak):
Test Mode 2
Horizontal



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	4405.422	35.00	-2.32	32.68	60.00	-27.32	Average
2	4405.422	47.00	-2.32	44.68	80.00	-35.32	Peak
3	4722.526	35.32	-2.11	33.21	60.00	-26.79	Average
4	4722.526	47.32	-2.11	45.21	80.00	-34.79	Peak
5	6128.798	34.05	0.55	34.60	60.00	-25.40	Average
6	6128.798	46.05	0.55	46.60	80.00	-33.40	Peak
7	7462.854	35.16	1.33	36.49	60.00	-23.51	Average
8	7462.854	47.16	1.33	48.49	80.00	-31.51	Peak
9	9685.139	34.50	3.16	37.66	60.00	-22.34	Average
10	9685.139	46.50	3.16	49.66	80.00	-30.34	Peak
11	17184.94	44.44	8.92	53.36	80.00	-26.64	Peak
12	17184.94	32.44	8.92	41.36	60.00	-18.64	Average

Vertical



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	4534.875	35.52	-2.18	33.34	60.00	-26.66	Average
2	4534.875	47.52	-2.18	45.34	80.00	-34.66	Peak
3	4975.247	36.64	-2.01	34.63	60.00	-25.37	Average
4	4975.247	48.64	-2.01	46.63	80.00	-33.37	Peak
5	5988.431	38.38	0.29	38.67	60.00	-21.33	Average
6	5988.431	50.38	0.29	50.67	80.00	-29.33	Peak
7	7907.891	35.84	1.22	37.06	60.00	-22.94	Average
8	7907.891	47.84	1.22	49.06	80.00	-30.94	Peak
9	10085.91	46.91	3.34	50.25	80.00	-29.75	Peak
10	10085.91	34.91	3.34	38.25	60.00	-21.75	Average
11	16312.02	45.93	7.68	53.61	80.00	-26.39	Peak
12	16312.02	33.93	7.68	41.61	60.00	-18.39	Average

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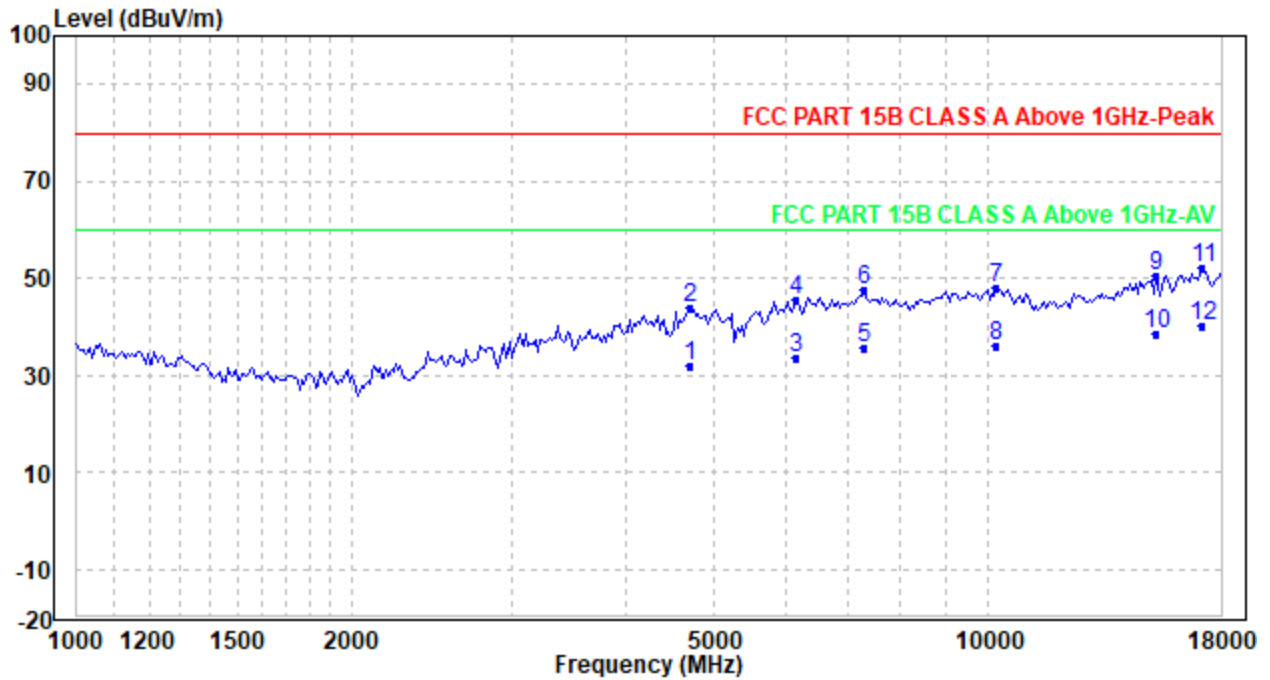
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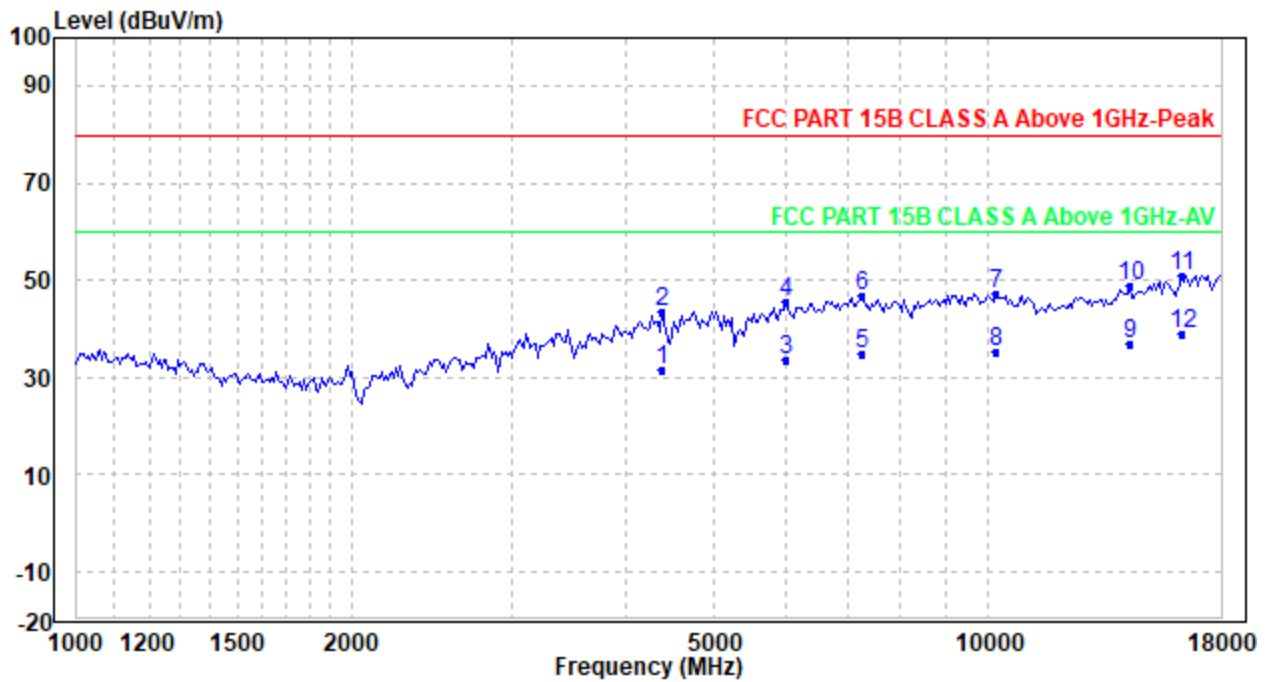
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Above 1GHz (Quasi Peak):
Test Mode 3
Horizontal



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	4695.251	33.96	-2.12	31.84	60.00	-28.16	Average
2	4695.251	45.96	-2.12	43.84	80.00	-36.16	Peak
3	6164.401	33.02	0.62	33.64	60.00	-26.36	Average
4	6164.401	45.02	0.62	45.64	80.00	-34.36	Peak
5	7291.932	34.43	1.30	35.73	60.00	-24.27	Average
6	7291.932	46.43	1.30	47.73	80.00	-32.27	Peak
7	10203.43	44.87	3.37	48.24	80.00	-31.76	Peak
8	10203.43	32.87	3.37	36.24	60.00	-23.76	Average
9	15305.11	42.94	7.73	50.67	80.00	-29.33	Peak
10	15305.11	30.94	7.73	38.67	60.00	-21.33	Average
11	17184.94	43.22	8.92	52.14	80.00	-27.86	Peak
12	17184.94	31.22	8.92	40.14	60.00	-19.86	Average

Vertical



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	4379.978	34.00	-2.36	31.64	60.00	-28.36	Average
2	4379.978	46.00	-2.36	43.64	80.00	-36.36	Peak
3	5988.431	33.36	0.29	33.65	60.00	-26.35	Average
4	5988.431	45.36	0.29	45.65	80.00	-34.35	Peak
5	7249.817	33.66	1.30	34.96	60.00	-25.04	Average
6	7249.817	45.66	1.30	46.96	80.00	-33.04	Peak
7	10203.43	43.86	3.37	47.23	80.00	-32.77	Peak
8	10203.43	31.86	3.37	35.23	60.00	-24.77	Average
9	14277.41	29.36	7.54	36.90	60.00	-23.10	Average
10	14277.41	41.36	7.54	48.90	80.00	-31.10	Peak
11	16312.02	43.34	7.68	51.02	80.00	-28.98	Peak
12	16312.02	31.34	7.68	39.02	60.00	-20.98	Average

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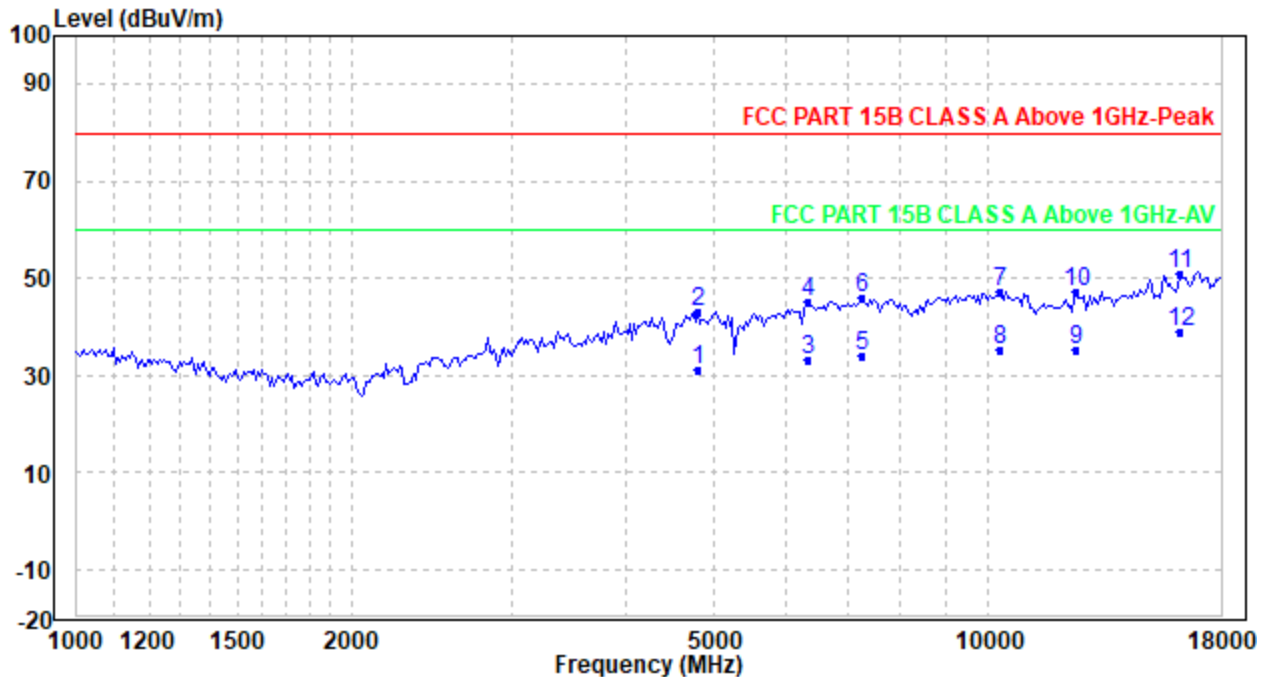
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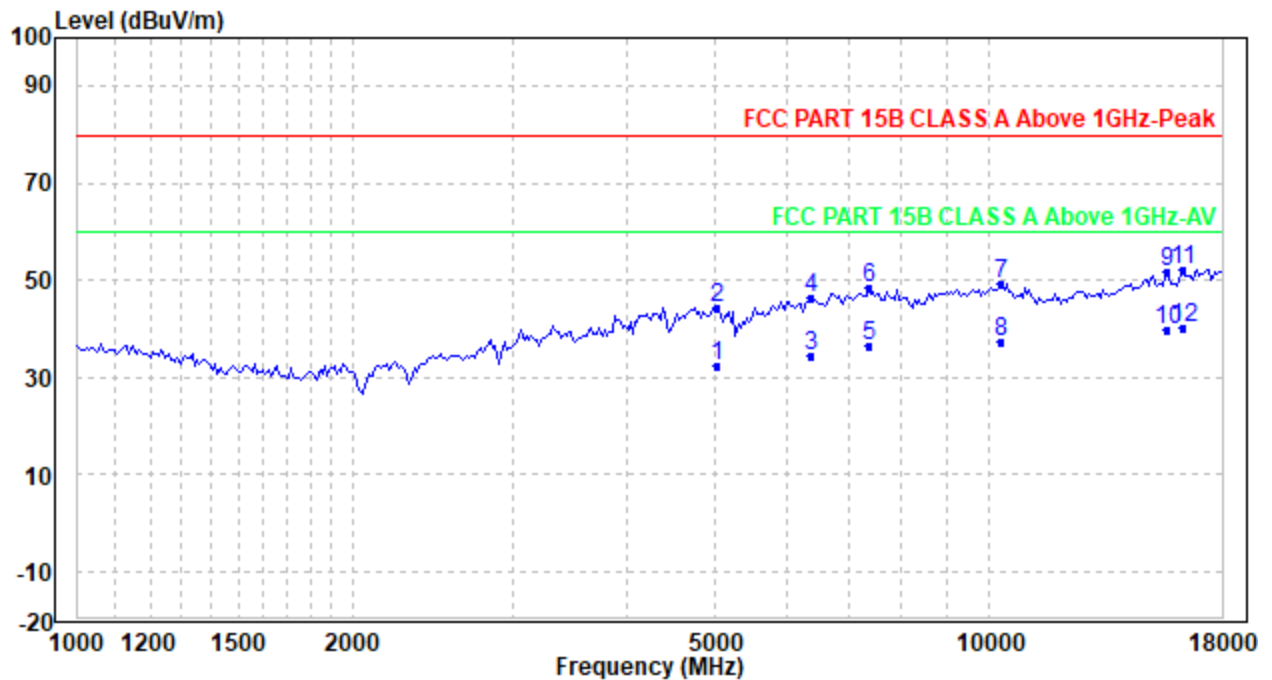
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Above 1GHz (Quasi Peak):
Test Mode 4
Horizontal



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	4805.307	33.17	-2.08	31.09	60.00	-28.91	Average
2	4805.307	45.17	-2.08	43.09	80.00	-36.91	Peak
3	6345.543	32.26	0.95	33.21	60.00	-26.79	Average
4	6345.543	44.26	0.95	45.21	80.00	-34.79	Peak
5	7249.817	32.88	1.30	34.18	60.00	-25.82	Average
6	7249.817	44.88	1.30	46.18	80.00	-33.82	Peak
7	10322.32	43.86	3.37	47.23	80.00	-32.77	Peak
8	10322.32	31.86	3.37	35.23	60.00	-24.77	Average
9	12496.58	31.57	3.85	35.42	60.00	-24.58	Average
10	12496.58	43.57	3.85	47.42	80.00	-32.58	Peak
11	16217.81	43.56	7.51	51.07	80.00	-28.93	Peak
12	16217.81	31.56	7.51	39.07	60.00	-20.93	Average

Vertical



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	5033.218	34.26	-1.93	32.33	60.00	-27.67	Average
2	5033.218	46.26	-1.93	44.33	80.00	-35.67	Peak
3	6382.405	33.53	1.03	34.56	60.00	-25.44	Average
4	6382.405	45.53	1.03	46.56	80.00	-33.44	Peak
5	7376.898	34.99	1.31	36.30	60.00	-23.70	Average
6	7376.898	46.99	1.31	48.30	80.00	-31.70	Peak
7	10322.32	45.79	3.37	49.16	80.00	-30.84	Peak
8	10322.32	33.79	3.37	37.16	60.00	-22.84	Average
9	15663.86	44.22	7.44	51.66	80.00	-28.34	Peak
10	15663.86	32.22	7.44	39.66	60.00	-20.34	Average
11	16312.02	44.42	7.68	52.10	80.00	-27.90	Peak
12	16312.02	32.42	7.68	40.10	60.00	-19.90	Average

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. The limit of ICES-003 in the 230MHz to 960MHz band is higher than that of FCC Part 15B, so the radiation emission test data conform to the limit of ICES-003.

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6.2 CONDUCTED EMISSION

Test Requirement: FCC 47 CFR Part 15.107
ICES-003 Issue 7 Section 3.2.1

Test Method: ANSI C63.4-2014

Limits:

Limits for Class A devices

Frequency range (MHz)	Limits (dB(μV))	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60

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:

Quasi Peak and Average:

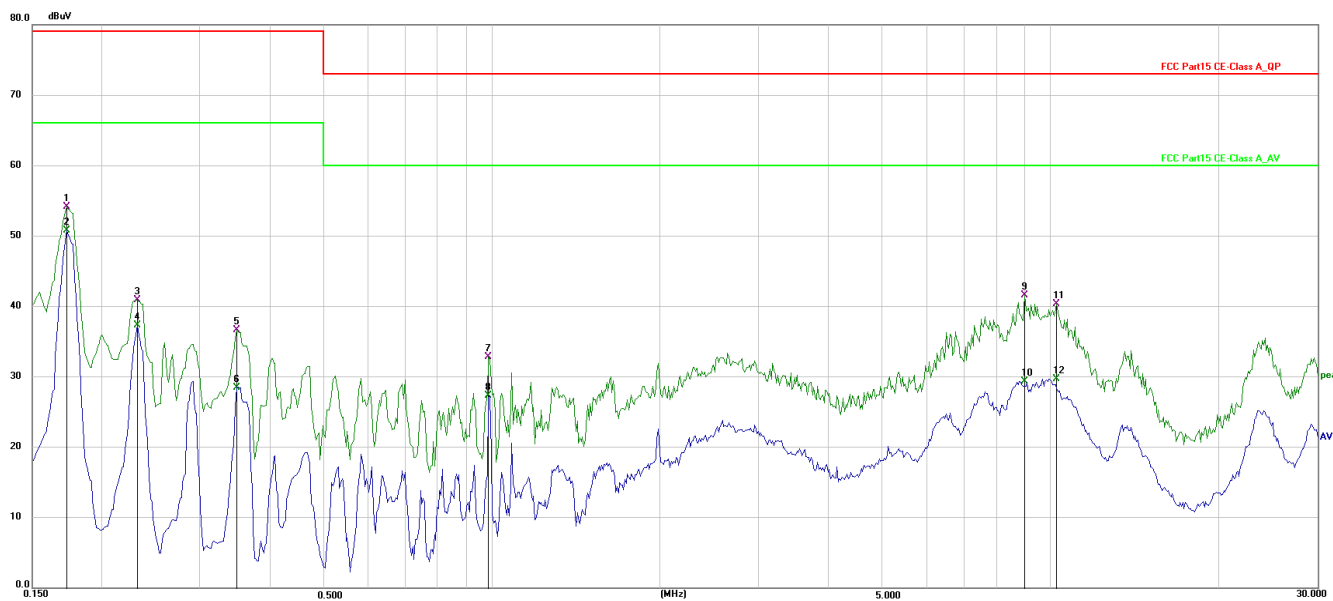
Test Mode 1

Live Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1724	53.98	0.13	54.11	79.00	-24.89	QP
2	0.1724	50.49	0.13	50.62	66.00	-15.38	AVG
3	0.2310	40.96	0.14	41.10	79.00	-37.90	QP
4	0.2310	37.14	0.14	37.28	66.00	-28.72	AVG
5	0.3480	35.86	0.14	36.00	79.00	-43.00	QP
6	0.3480	28.58	0.14	28.72	66.00	-37.28	AVG
7	0.9915	31.86	0.12	31.98	73.00	-41.02	QP
8	0.9915	26.52	0.12	26.64	60.00	-33.36	AVG
9	8.9924	39.92	0.36	40.28	73.00	-32.72	QP
10	8.9924	28.95	0.36	29.31	60.00	-30.69	AVG
11	9.9960	40.26	0.41	40.67	73.00	-32.33	QP
12	9.9960	29.35	0.41	29.76	60.00	-30.24	AVG

Neutral Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1724	53.99	0.16	54.15	79.00	-24.85	QP
2	0.1724	50.63	0.16	50.79	66.00	-15.21	AVG
3	0.2310	40.74	0.17	40.91	79.00	-38.09	QP
4	0.2310	37.09	0.17	37.26	66.00	-28.74	AVG
5	0.3480	36.47	0.16	36.63	79.00	-42.37	QP
6	0.3480	28.32	0.16	28.48	66.00	-37.52	AVG
7	0.9870	32.65	0.13	32.78	73.00	-40.22	QP
8	0.9870	27.14	0.13	27.27	60.00	-32.73	AVG
9	8.9970	41.17	0.39	41.56	73.00	-31.44	QP
10	8.9970	28.94	0.39	29.33	60.00	-30.67	AVG
11	10.2434	39.84	0.45	40.29	73.00	-32.71	QP
12	10.2434	29.25	0.45	29.70	60.00	-30.30	AVG

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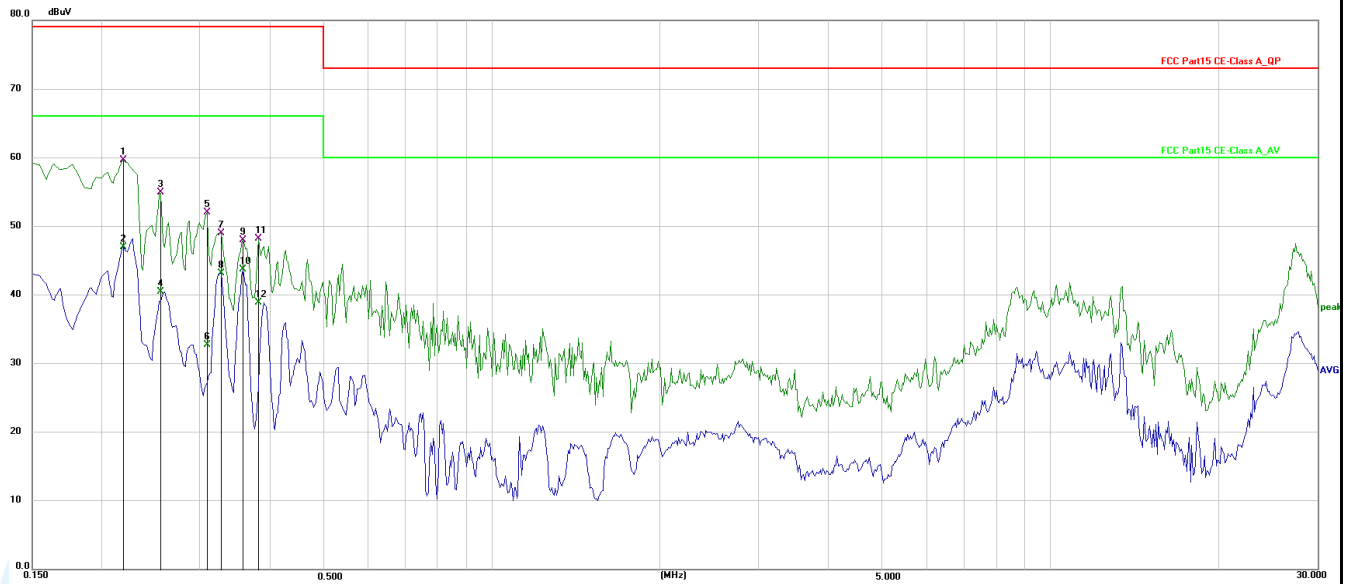
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Quasi Peak and Average: Test Mode 3

Live Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.2174	59.45	0.13	59.58	79.00	-19.42	QP
2	0.2174	46.85	0.13	46.98	66.00	-19.02	AVG
3	0.2535	54.73	0.14	54.87	79.00	-24.13	QP
4	0.2535	40.27	0.14	40.41	66.00	-25.59	AVG
5	0.3074	51.82	0.15	51.97	79.00	-27.03	QP
6	0.3074	32.57	0.15	32.72	66.00	-33.28	AVG
7	0.3255	48.88	0.14	49.02	79.00	-29.98	QP
8	0.3255	42.98	0.14	43.12	66.00	-22.88	AVG
9	0.3570	47.86	0.14	48.00	79.00	-31.00	QP
10	0.3570	43.56	0.14	43.70	66.00	-22.30	AVG
11	0.3795	48.11	0.13	48.24	79.00	-30.76	QP
12	0.3795	38.74	0.13	38.87	66.00	-27.13	AVG

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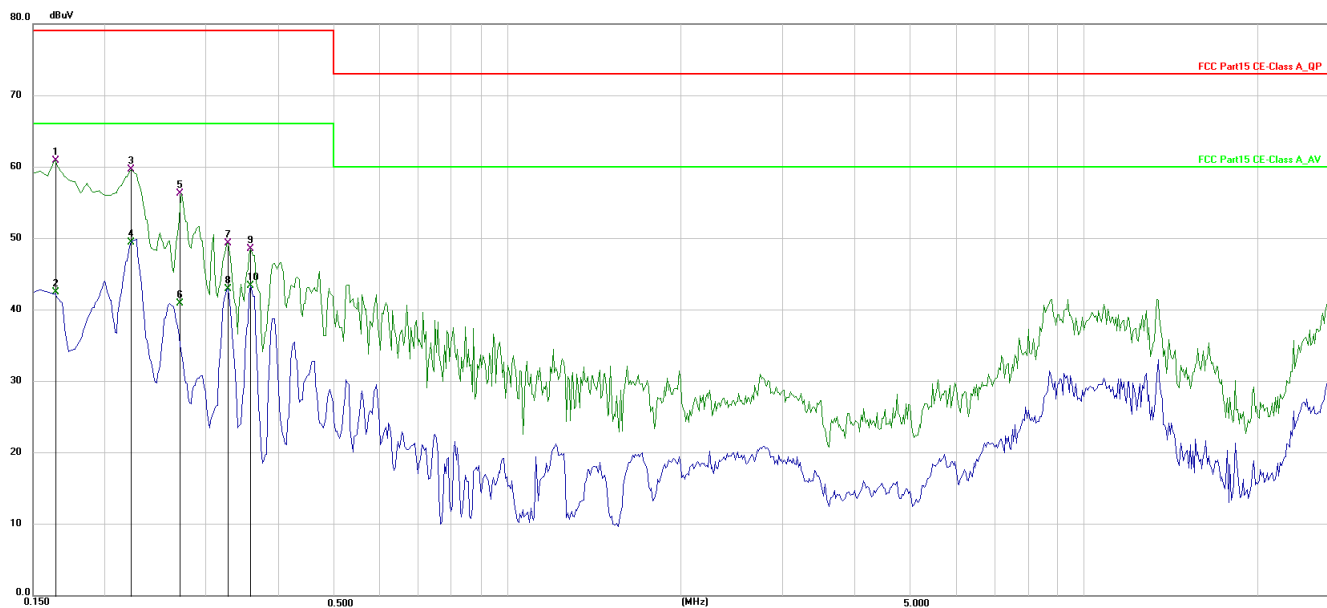
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Neutral Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1635	60.71	0.16	60.87	79.00	-18.13	QP
2	0.1635	42.28	0.16	42.44	66.00	-23.56	AVG
3	0.2220	59.44	0.17	59.61	79.00	-19.39	QP
4	0.2220	49.21	0.17	49.38	66.00	-16.62	AVG
5	0.2714	56.08	0.16	56.24	79.00	-22.76	QP
6	0.2714	40.74	0.16	40.90	66.00	-25.10	AVG
7	0.3255	49.19	0.16	49.35	79.00	-29.65	QP
8	0.3255	42.76	0.16	42.92	66.00	-23.08	AVG
9	0.3570	48.43	0.15	48.58	79.00	-30.42	QP
10	0.3570	43.23	0.15	43.38	66.00	-22.62	AVG
11	27.7260	46.54	1.21	47.75	73.00	-25.25	QP
12	27.7260	34.03	1.21	35.24	60.00	-24.76	AVG

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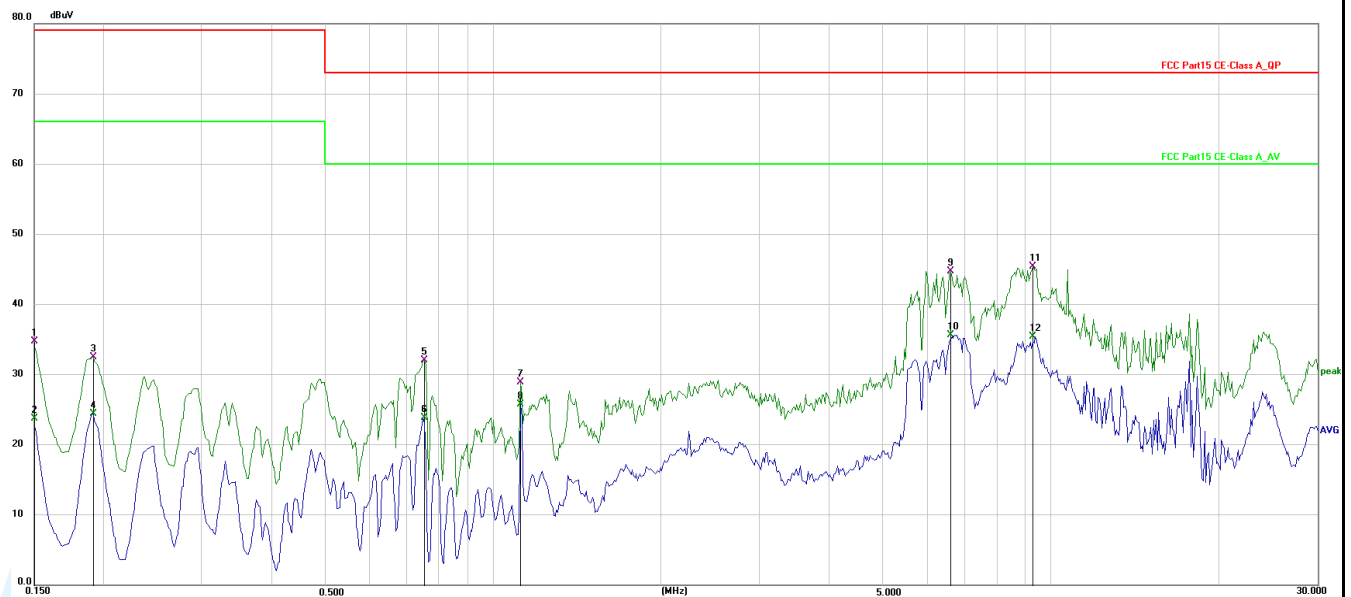
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**Quasi Peak and Average:
Test Mode 4****Live Line**

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1500	34.61	0.13	34.74	79.00	-44.26	QP
2	0.1500	23.64	0.13	23.77	66.00	-42.23	AVG
3	0.1905	32.35	0.13	32.48	79.00	-46.52	QP
4	0.1905	24.31	0.13	24.44	66.00	-41.56	AVG
5	0.7530	31.93	0.11	32.04	73.00	-40.96	QP
6	0.7530	23.72	0.11	23.83	60.00	-36.17	AVG
7	1.1220	28.81	0.12	28.93	73.00	-44.07	QP
8	1.1220	25.59	0.12	25.71	60.00	-34.29	AVG
9	6.6254	44.48	0.25	44.73	73.00	-28.27	QP
10	6.6254	35.42	0.25	35.67	60.00	-24.33	AVG
11	9.2850	44.98	0.38	45.36	73.00	-27.64	QP
12	9.2850	35.07	0.38	35.45	60.00	-24.55	AVG

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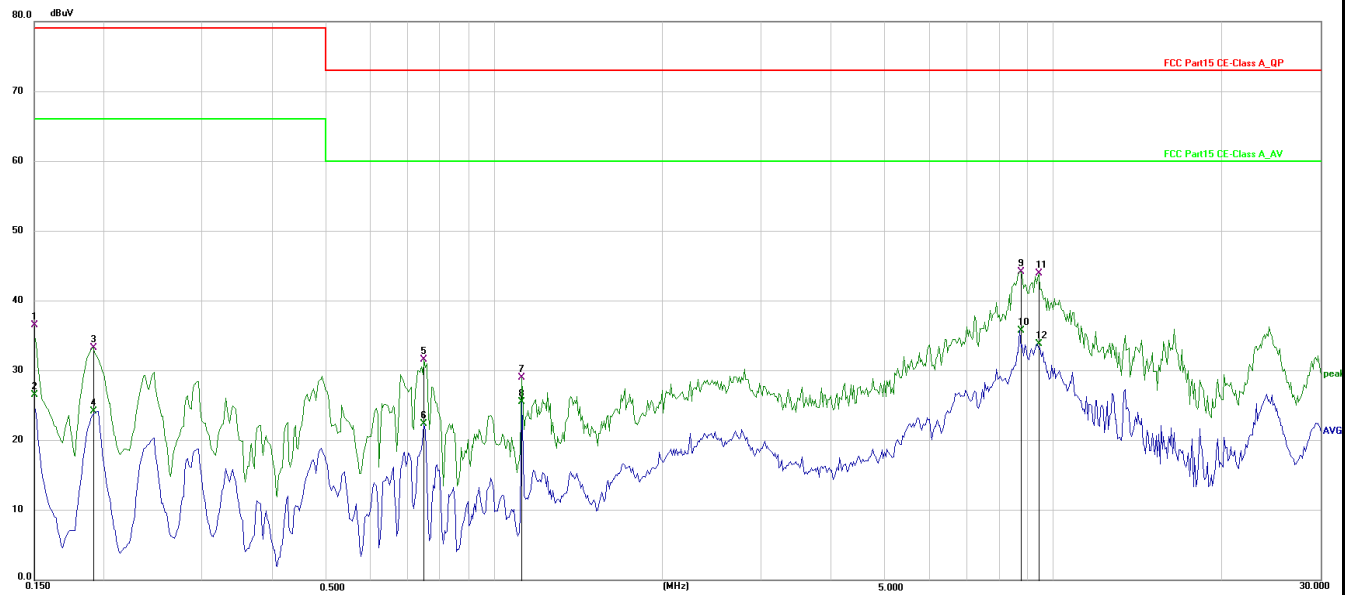
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Neutral Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1500	36.37	0.15	36.52	79.00	-42.48	QP
2	0.1500	26.35	0.15	26.50	66.00	-39.50	AVG
3	0.1905	33.12	0.16	33.28	79.00	-45.72	QP
4	0.1905	24.02	0.16	24.18	66.00	-41.82	AVG
5	0.7485	31.49	0.12	31.61	73.00	-41.39	QP
6	0.7485	22.29	0.12	22.41	60.00	-37.59	AVG
7	1.1220	28.91	0.13	29.04	73.00	-43.96	QP
8	1.1220	25.37	0.13	25.50	60.00	-34.50	AVG
9	8.7494	43.78	0.37	44.15	73.00	-28.85	QP
10	8.7494	35.37	0.37	35.74	60.00	-24.26	AVG
11	9.4154	43.51	0.41	43.92	73.00	-29.08	QP
12	9.4154	33.39	0.41	33.80	60.00	-26.20	AVG

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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