ACCREDITED
Certificate #4312.01

TEST REPORT

Product Name:	IP Phone
Trade Mark:	GRANDSTREAM
Model No.:	GRP2612W
HVIN:	GRP2612WV3
Report Number:	2401178955EMC-1
Test Standards:	FCC 47 CFR Part 15 Subpart B ICES-003 Issue 7
FCC ID:	YZZGRP2612WV3
Test Result:	PASS
Date of Issue:	May 28, 2024

Prepared for:

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

Prepared by:

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Approved by:	Billy Li Technical Director	Date:	May 28, 2024

UnionTrust Laboratories UnionTrust *Certified*

Version

Version No.	Date	Description
V1.0	May 28, 2024	Original

CONTENTS

1. GENERAL INFORMATION 4
   1.1 CLIENT INFORMATION 4
   1.2 EUT INFORMATION 4
      1.2.1 GENERAL DESCRIPTION OF EUT 4
      1.2.2 DESCRIPTION OF ACCESSORIES 4
   1.3 DESCRIPTION OF SUPPORT UNITS 5
   1.4 TEST LOCATION 5
   1.5 TEST FACILITY 6
   1.6 DEVIATION FROM STANDARDS 6
   1.7 ABNORMALITIES FROM STANDARD CONDITIONS 6
   1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER 6
   1.9 MEASUREMENT UNCERTAINTY 6
2. TEST SUMMARY 7
3. EQUIPMENT LIST 8
4. TEST CONFIGURATION 9
   4.1 ENVIRONMENTAL CONDITIONS FOR TESTING 9
      4.1.1 NORMAL OR EXTREME TEST CONDITIONS 9
      4.1.2 RECORD OF NORMAL ENVIRONMENT AND TEST SAMPLE 9
   4.2 TEST MODES 9
   4.3 TEST SETUP 10
      4.3.1 FOR RADIATED EMISSIONS TEST SETUP 10
      4.3.2 FOR CONDUCTED EMISSIONS TEST SETUP 11
   4.4 SYSTEM TEST CONFIGURATION 11
5. REFERENCE DOCUMENTS FOR TESTING 12
6. EMC REQUIREMENTS SPECIFICATION 12
   6.1 RADIATED EMISSION 12
   6.2 CONDUCTED EMISSION 18

APPENDIX 1 PHOTOS OF TEST SETUP 21
APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS 21

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:	IP Phone
Model No.:	GRP2612W
HVIN:	GRP2612WV3
Trade Mark:	GRANDSTREAM
DUT Stage:	Identical Prototype
Rated Voltage:	Powered by AC-DC Adapter Input: 110-240V~50/60Hz Output: 5.0 V ⎓ 0.6A
Classification of digital devices:	Class B
Highest Internal Frequency:	5825 MHz
Sample Received Date:	January 17, 2024
Sample Tested Date:	April 11, 2024 to April 21, 2024

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

Adapter (1)	
Model No.:	GQ06-050060-ZU
Input:	100-240V~50/60Hz 0.3 A Max
Output:	5.0V⎓0.6 A
DC Cable	1.8 Meter, Unshielded without ferrite

Adapter (2)	
Model No.:	DCT06W050060US-D0
Input:	100-240V~50/60Hz 0.2 A Max
Output:	5.0V⎓0.6A 3.0W
DC Cable	1.8 Meter, Unshielded without ferrite

Adapter (3)	
Model No.:	F06US0500060A
Input:	100-240V~50/60Hz 0.2 A Max
Output:	5.0V⎓0.6A
DC Cable	1.8 Meter, Unshielded without ferrite

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

Cable(2)	
Description:	Phone Cord
Cable Type:	Unshielded without ferrite
Length:	2.5 Meter

Others
1x Handset, 1x Phone Stand

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
Headset	YEY	VE120-MV	N/A	UnionTrust
Wireless Router	ASUA	RT-AC2200	2019AJ4850	UnionTrust
Notebook	Lenovo	B40-80	MP12NEQ6	UnionTrust
Mouse	DELL	MS111	CN-011D3V-738	UnionTrust
IP Phone	GRANDSTREAM	GRP2602W	N/A	Applicant

Support Cable

Cable No.	Description	Connector	Length(Meter)	Supplied by
1	Ethernet Cable	RJ45	2.0 Unshielded without ferrite	UnionTrust

1.4 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

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 Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date**	**Cal. Due date**
☑	3m SAC	ETS-LINDGREN	3m	Euroshiedpn-CT001270-1317	11-Nov-2023	10-Nov-2026
☑	Receiver	R&S	ESIB26	100114	27-Oct-2023	26-Oct-2024
☑	Broadband Antenna	ETS-LINDGREN	3142E	00201566	30-Oct-2023	29-Oct-2024
☑	6dB Attenuator	Talent	RA6A5-N-18	18103001	30-Oct-2023	29-Oct-2024
☑	Preamplifier	HP	8447F	2805A02960	31-Oct-2023	30-Oct-2024
☑	Double-Ridged Waveguide Horn Antenna	ETS-LINDGREN	3117-PA	00201541	16-Apr-2023	15-Apr-2024
					01-Apr-2024	31-Mar-2025
☑	Pre-amplifier	ETS-Lindgren	00118385	00201874	31-Oct-2023	30-Oct-2024
☑	Double-Ridged Waveguide Horn Antenna	ETS-LINDGREN	3116C-PA	00202652	30-Oct-2023	29-Oct-2024
☑	Pre-amplifier	ETS-Lindgren	00118384	00202652	30-Oct-2023	29-Oct-2024
☑	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	ESR7	101181	27-Oct-2023	26-Oct-2024
☑	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	27-Oct-2023	26-Oct-2024
☑	LISN	R&S	ESH2-Z5	860014/024	27-Oct-2023	26-Oct-2024
☑	LISN	ETS-Lindgren	3816/2SH	00201088	27-Oct-2023	26-Oct-2024
☑	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 (%)
NV/NT	+15 to +35	5.0 V ⎓ 1.0 A supplied by adapter or Powered by 3.8V Battery	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	21.6	55.8	100.2	S202401172633-ZJA02/4	Linson Xie
Radiated Emission	24.8	59.4	99.5		Yana Zeng

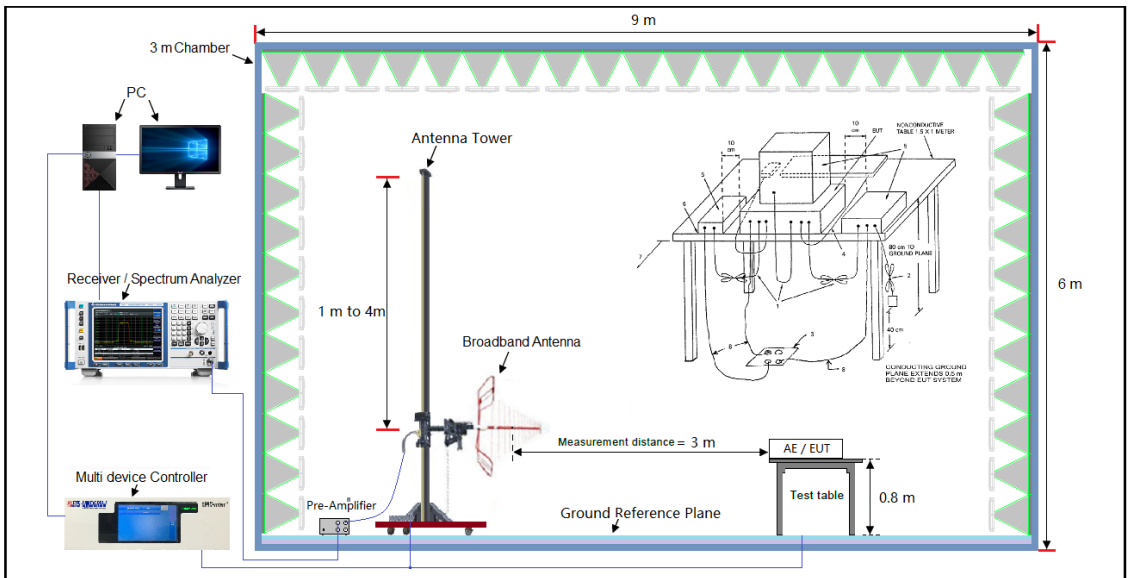
4.2 TEST MODES

Test Item	EMI Test Modes
Radiated Emission	**Test Mode 1: 230V~50Hz (Adaptor 1) + WLAN Link + RJ45(PC Port) + RJ45(LAN Port)+ Hands Free** Test Mode 2: 230V~50Hz (Adaptor 1) + WLAN Link + RJ45(PC Port) + RJ45(LAN Port) + Ringing Test Mode 3: 230V~50Hz (Adaptor 1) + WLAN Link + RJ45(PC Port) + RJ45(LAN Port) + Handset **Test Mode 4: 230V~50Hz (Adaptor 1) + WLAN Link + RJ45(PC Port) + RJ45(Internet Port) + Headset** Test Mode 5: 110V~60Hz (Adaptor1) + Worst from mode 1~4 Test Mode 6: Worst from mode 1~5 (Adaptor 2) Test Mode 7: Worst from mode 1~5 (Adaptor 3)
Conducted Emission	Test Mode 1: 230V~50Hz (Adaptor 1) + WLAN Link + RJ45(PC Port) + RJ45(LAN Port) + Hands Free Test Mode 2: 230V~50Hz (Adaptor 1) + WLAN Link + RJ45(PC Port) + RJ45(LAN Port) + Ringing Test Mode 3: 230V~50Hz (Adaptor 1) + WLAN Link + RJ45(PC Port) + RJ45(LAN Port) + Handset Test Mode 4: 230V~50Hz (Adaptor 1) + WLAN Link + RJ45(PC Port) + RJ45(LAN Port) + Headset Test Mode 5: 110V~60Hz (Adaptor1) + Worst from mode 1~4 Test Mode 6: Worst from mode 1~5 (Adaptor 2) **Test Mode 7: Worst from mode 1~5 (Adaptor 3)**
Remark: The above test modes in boldface were the worst cases, only the test data of these modes were reported.	

4.3 TEST SETUP

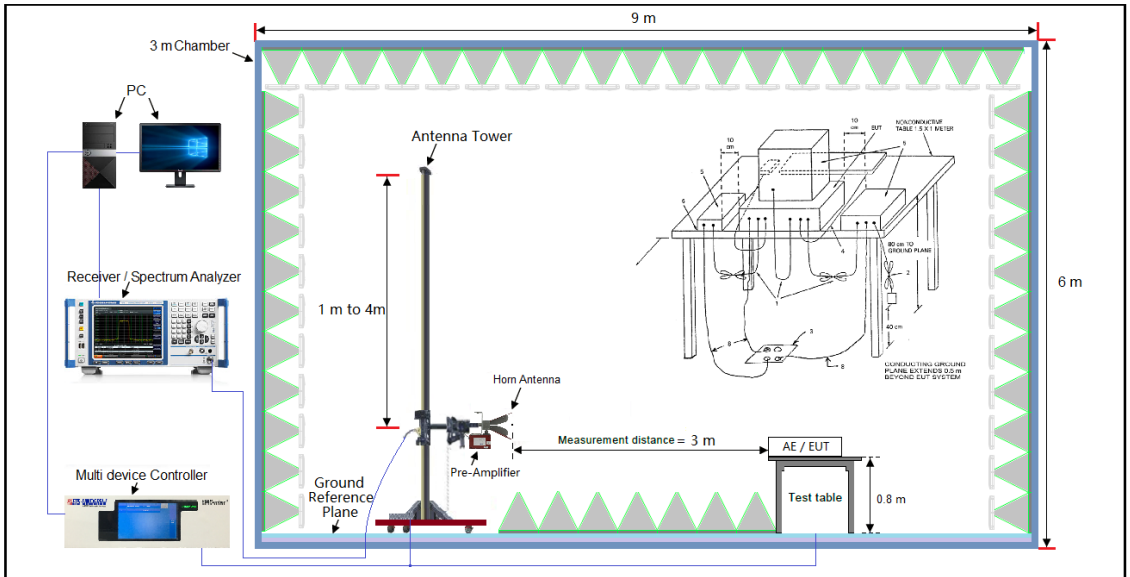
4.3.1 For Radiated Emissions test setup

Figure 1. 30MHz to 1GHz



Test setup for radiated emissions of tabletop equipment (30 MHz to 1 GHz)

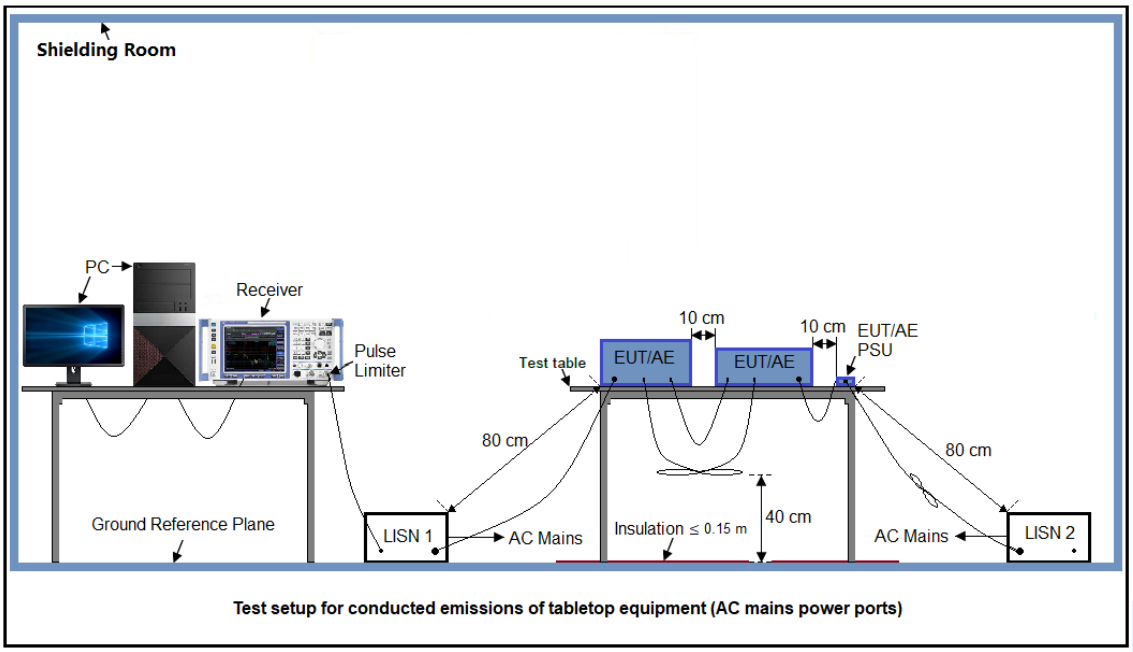
Figure 2. Above 1GHz



Test setup for radiated emissions of tabletop equipment (Above 1 GHz)

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 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 ≤ f ≤ 1 000	Quasi Peak	120 kHz	300 kHz
f ≥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

FCC 47 CFR Part 15 Subpart B

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

ICES-003 Issue 7

Frequency (MHz)	limits at 3m (dBμV/m)		
	QP Detector	PK Detector	AV Detector
30 – 88	40.0	--	--
88 – 216	43.5	--	--
216 – 230	46.0		

230 – 960	47.0	--	--
960 – 1000	54.0	--	--
Above 1000	--	74.0	54.0

Remark:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (μV/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.

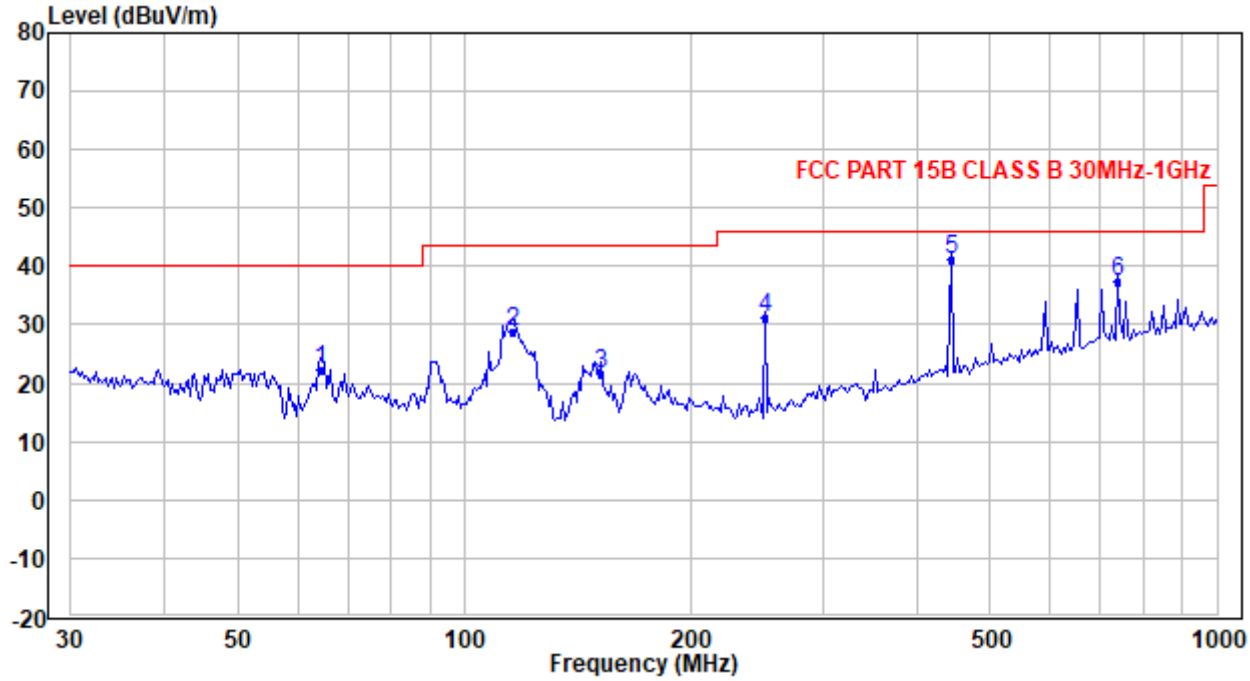
Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

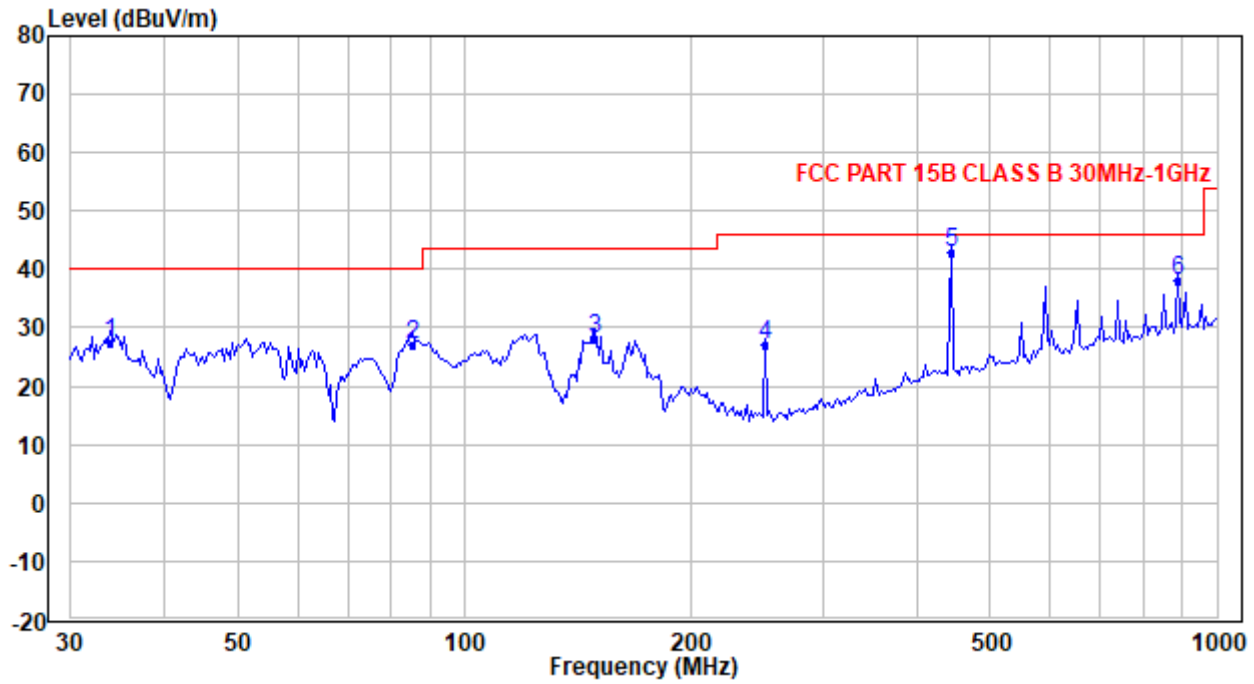
The worst measurement data for FCC 47 CFR Part 15 Subpart B as follows:

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



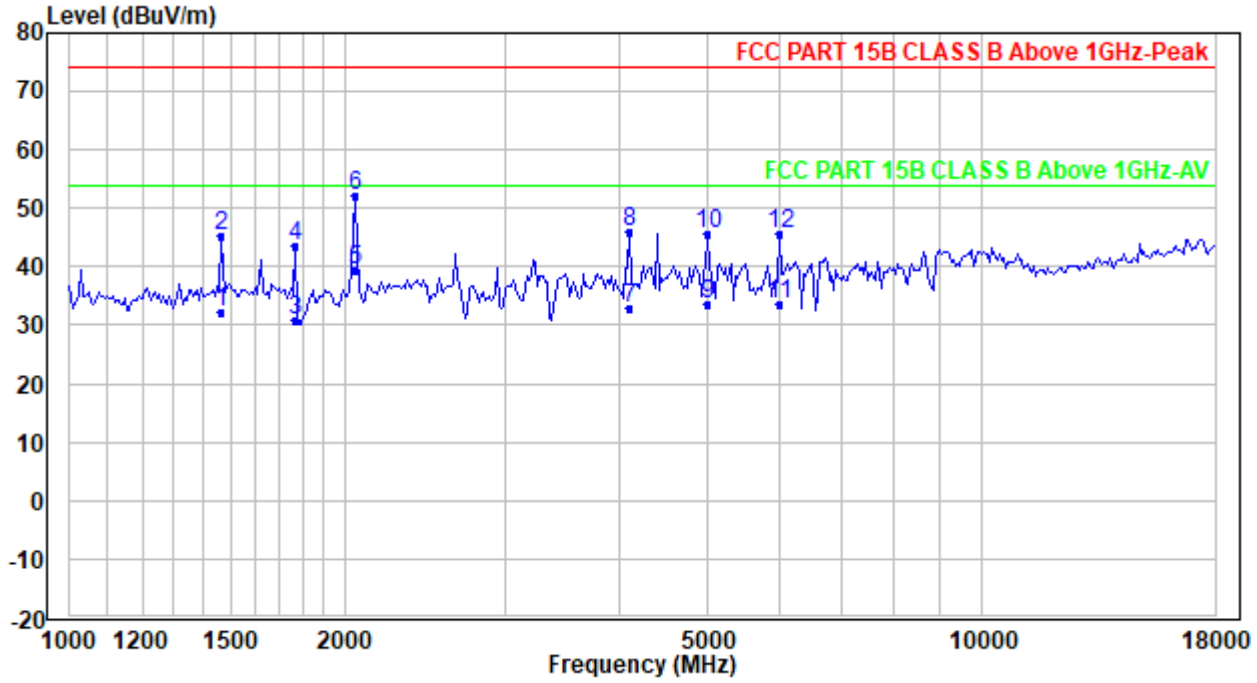
No.	Frequency (MHz)	Reading (dBµV)	Correction factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	64.532	39.81	-17.50	22.31	40.00	-17.69	QP
2	115.632	44.20	-15.45	28.75	43.50	-14.75	QP
3	152.090	36.15	-14.42	21.73	43.50	-21.77	QP
4	250.486	41.70	-10.61	31.09	46.00	-14.91	QP
5	442.572	45.10	-3.99	41.11	46.00	-4.89	QP
6	739.214	35.50	1.99	37.49	46.00	-8.51	QP

Vertical



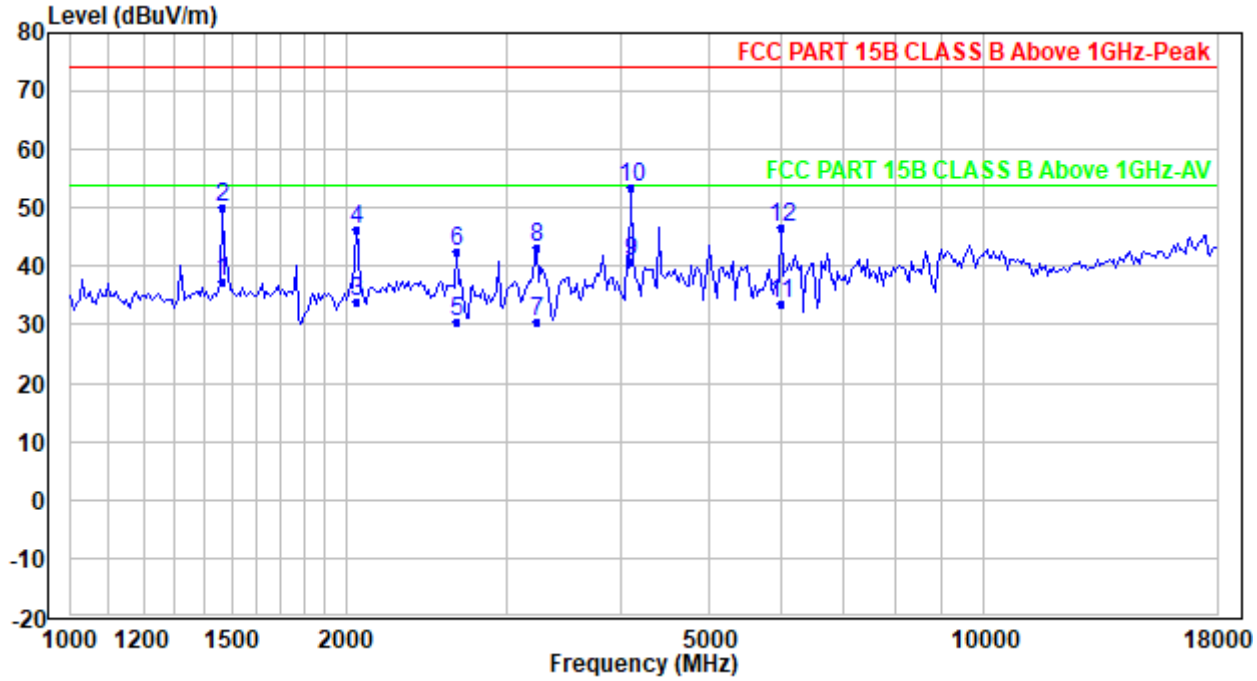
No.	Frequency (MHz)	Reading (dBµV)	Correction factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	33.807	34.10	-6.54	27.56	40.00	-12.44	QP
2	85.477	44.18	-16.99	27.19	40.00	-12.81	QP
3	148.917	42.49	-14.52	27.97	43.50	-15.53	QP
4	250.486	37.69	-10.61	27.08	46.00	-18.92	QP
5	442.572	46.89	-3.99	42.90	46.00	-3.10	QP
6	887.398	33.38	4.58	37.96	46.00	-8.04	QP

Above 1GHz(Peak & Average)
Test Mode 1
Horizontal



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1465.642	43.76	-11.46	32.30	54.00	-21.70	Average
2	1465.642	56.63	-11.46	45.17	74.00	-28.83	Peak
3	1764.113	41.28	-10.52	30.76	54.00	-23.24	Average
4	1764.113	53.99	-10.52	43.47	74.00	-30.53	Peak
5	2050.838	49.15	-9.69	39.46	54.00	-14.54	Average
6	2050.838	62.00	-9.69	52.31	74.00	-21.69	Peak
7	4109.610	34.71	-1.64	33.07	54.00	-20.93	Average
8	4109.610	47.68	-1.64	46.04	74.00	-27.96	Peak
9	5004.148	34.09	-0.63	33.46	54.00	-20.54	Average
10	5004.148	46.26	-0.63	45.63	74.00	-28.37	Peak
11	5988.431	32.90	0.66	33.56	54.00	-20.44	Average
12	5988.431	44.92	0.66	45.58	74.00	-28.42	Peak

Vertical



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1465.642	48.84	-11.46	37.38	54.00	-16.62	Average
2	1465.642	61.63	-11.46	50.17	74.00	-23.83	Peak
3	2050.838	43.50	-9.69	33.81	54.00	-20.19	Average
4	2050.838	56.06	-9.69	46.37	74.00	-27.63	Peak
5	2646.164	37.20	-6.70	30.50	54.00	-23.50	Average
6	2646.164	49.21	-6.70	42.51	74.00	-31.49	Peak
7	3240.873	35.54	-4.89	30.65	54.00	-23.35	Average
8	3240.873	47.99	-4.89	43.10	74.00	-30.90	Peak
9	4109.610	42.55	-1.64	40.91	54.00	-13.09	Average
10	4109.610	55.21	-1.64	53.57	74.00	-20.43	Peak
11	5988.431	33.05	0.66	33.71	54.00	-20.29	Average
12	5988.431	46.00	0.66	46.66	74.00	-27.34	Peak

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. For Radiated Emission above 18GHz, there was not any unwanted emission detected.
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.

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 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:

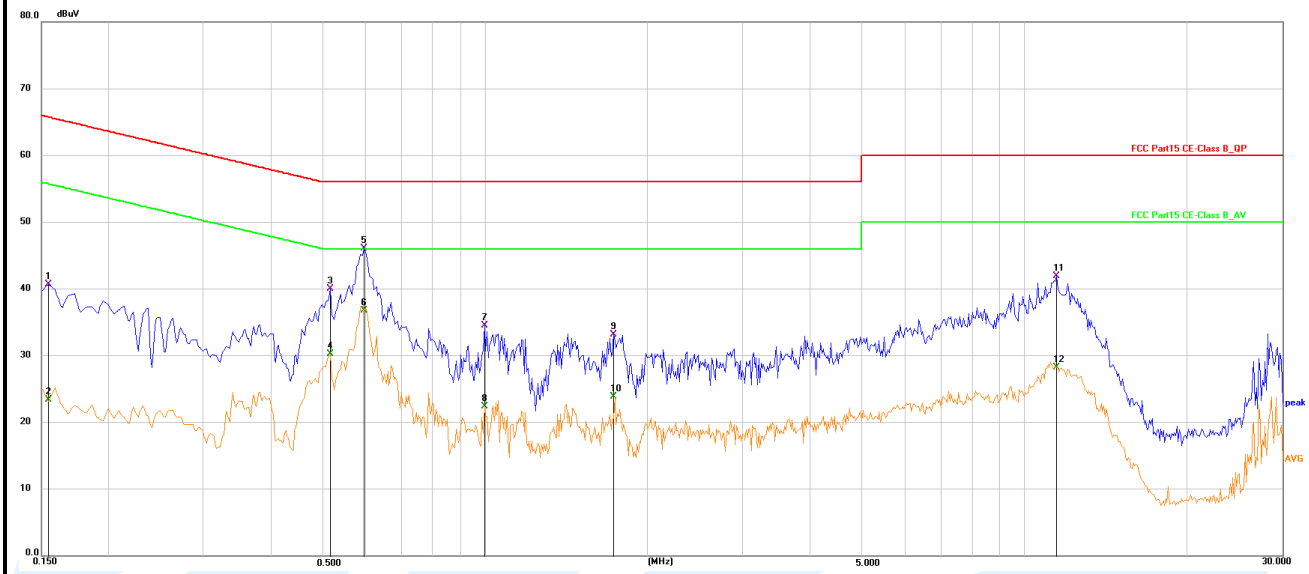
1) The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
2) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak 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

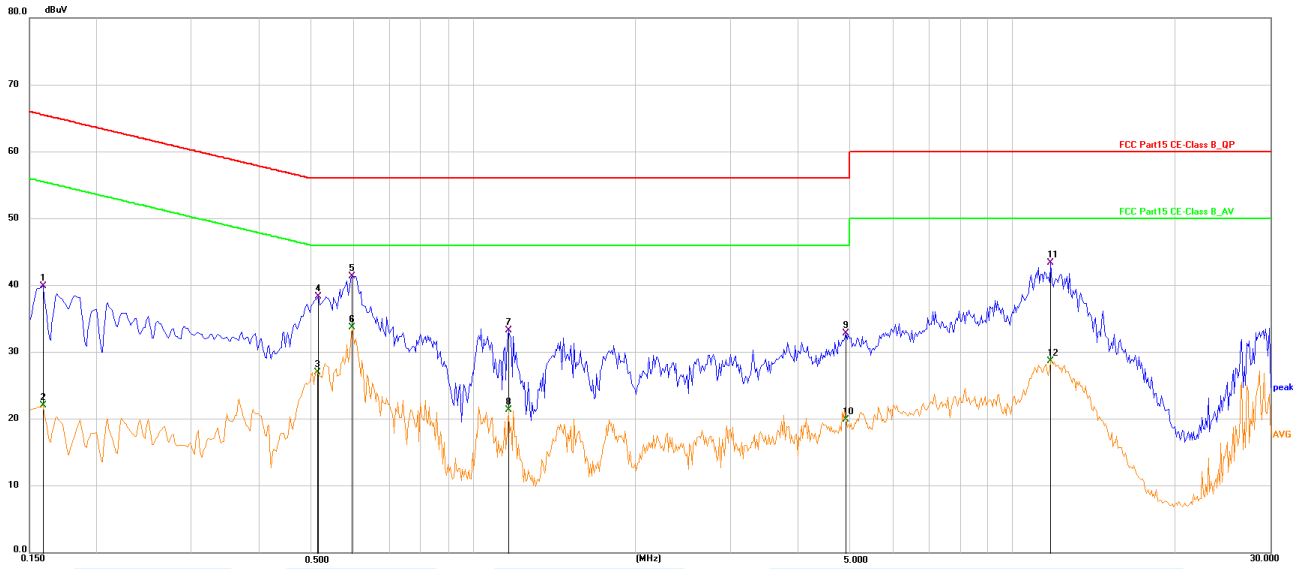
The worst measurement data as follows:
Quasi Peak and Average:
Test Mode 7

Live Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1544	30.52	10.20	40.72	65.76	-25.04	QP
2	0.1544	13.21	10.20	23.41	55.76	-32.35	AVG
3	0.5144	29.85	10.19	40.04	56.00	-15.96	QP
4	0.5144	20.10	10.19	30.29	46.00	-15.71	AVG
5	0.5955	35.82	10.20	46.02	56.00	-9.98	QP
6	0.5955	26.56	10.20	36.76	46.00	-9.24	AVG
7	0.9960	24.11	10.35	34.46	56.00	-21.54	QP
8	0.9960	12.01	10.35	22.36	46.00	-23.64	AVG
9	1.7295	22.95	10.26	33.21	56.00	-22.79	QP
10	1.7295	13.54	10.26	23.80	46.00	-22.20	AVG
11	11.4720	31.43	10.49	41.92	60.00	-18.08	QP
12	11.4720	17.69	10.49	28.18	50.00	-21.82	AVG

Neutral Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1590	29.64	10.20	39.84	65.52	-25.68	QP
2	0.1590	11.81	10.20	22.01	55.52	-33.51	AVG
3	0.5128	16.79	10.19	26.98	46.00	-19.02	AVG
4	0.5144	28.12	10.19	38.31	56.00	-17.69	QP
5	0.5955	31.17	10.20	41.37	56.00	-14.63	QP
6	0.5955	23.47	10.20	33.67	46.00	-12.33	AVG
7	1.1625	22.98	10.33	33.31	56.00	-22.69	QP
8	1.1625	11.08	10.33	21.41	46.00	-24.59	AVG
9	4.9110	22.60	10.23	32.83	56.00	-23.17	QP
10	4.9110	9.72	10.23	19.95	46.00	-26.05	AVG
11	11.7510	32.92	10.49	43.41	60.00	-16.59	QP
12	11.7510	18.21	10.49	28.70	50.00	-21.30	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.

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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