

TEST REPORT

Reference No...... : WTX23X10227387W001
FCC ID..... : 2ARPV-PS2
Applicant..... : Kool Brands, LLC.
Address..... : 1450 Vassar Street Reno, Nevada 89502 United States
Manufacturer..... : Innex, Inc
Address..... : 2/F, Bld#10, TongFuYu Industrial park, Lezhujiao, Xixiang, Ban'an,
Shenzhen, China
Product Name..... : Wireless 2.4 GHz Controller
Model No...... : PS2
Standards..... : FCC Part 15.249
Date of Receipt sample..... : 2023-10-24
Date of Test..... : 2023-10-24 to 2023-11-24
Date of Issue..... : 2024-03-18
Test Report Form No...... : WTX_Part 15_249W
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

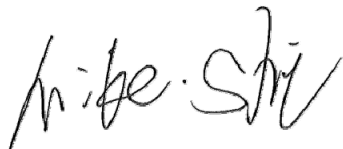
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Approved by:



Silin Chen

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Report version

Version No.	Date of issue	Description
Rev.00	2024-03-18	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Wireless 2.4 GHz Controller
Trade Name:	Retro-Bit
Model No.:	PS2
Adding Model(s):	/
Rated Voltage:	Charging Port: DC 5V Battery:DC3.7V
Battery Capacity	300mAh
Power Adapter Model:	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	2402MHz-2475MHz
Max. Field Strength:	91.77dBuV/m
Modulation:	GFSK
Quantity of Channels:	74
Channel Separation:	1MHz
Antenna Type:	PCB Antenna
Antenna Gain:	-6.17dBi
<i>Note: The Antenna Gain is provided by the customer and can affect the validity of results.</i>	

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.249: Operation within the bands 902-928MHz, 2400-2483.5MHz, 5725-5875MHz, and 24.0-24.25GHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Low Channel	2402MHz
TM2	Middle Channel	2438MHz
TM3	High Channel	2475MHz

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	50~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	1.20	Shielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	9-150kHz $\pm 3.74\text{dB}$
		0.15-30MHz $\pm 3.34\text{dB}$
Transmitter Spurious Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-26GHz $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041 A1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
WTXE1005 A1005	Spectrum Analyzer	Agilent	N9020A	US471401 02	2023-02-25	2024-02-24
WTXE1084 A1001	Spectrum Analyzer	Agilent	N9020A	MY543205 48	2023-02-25	2024-02-24
WTXE1004 A1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
☐ Chamber A: Below 1GHz						
WTXE1005 A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007 A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1007 A1001	Amplifier	HP	8447F	2805A034 75	2023-02-25	2024-02-24
WTXE1010 A1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1010 A1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☐ Chamber A: Above 1GHz						
WTXE1005 A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007 A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1065 A1001	Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
WTXE1010 A1005	Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
WTXE1010 A1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003 A1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
WTXE1004 A1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
☐ Chamber B:Below 1GHz						
WTXE1010 A1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08

WTXE1038 A1001	Amplifier	Agilent	8447D	2944A104 57	2023-02-25	2024-02-24
WTXE1001 A1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☒ Chamber C: Below 1GHz						
WTXE1093 A1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1010 A1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
WTXE1010 A1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1007 A1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
☒ Chamber C: Above 1GHz						
WTXE1093 A1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1103 A1005	Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
WTXE1103 A1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2023-02-25	2024-02-24
WTXE1010 A1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003 A1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐ Conducted Room 1#						
WTXE1001 A1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
WTXE1002 A1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
WTXE1003 A1001	AC LISN	Schwarz beck	NSLK8126	8126-279	2023-02-25	2024-02-24
☒ Conducted Room 2#						
WTXE1001 A1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
WTXE1003 A1003	LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 1#)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 2#)*	SKET	EMC-I	V2.0

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.207(a)	Conducted Emission	Compliant
§15.209(a)(f)	Radiated Spurious Emissions	Compliant
§15.249(a)	Field Strength of Emissions	Compliant
§15.249(d)	Out of Band Emission	Compliant
§15.215(c)	Emission Bandwidth	Compliant

N/A: Not applicable.

3. Antenna Requirements

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Test Result

This product has a PCB antenna, fulfill the requirement of this section.

4. Radiated Emissions

4.1 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of Harmonics (micro-volts/meter)
902-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

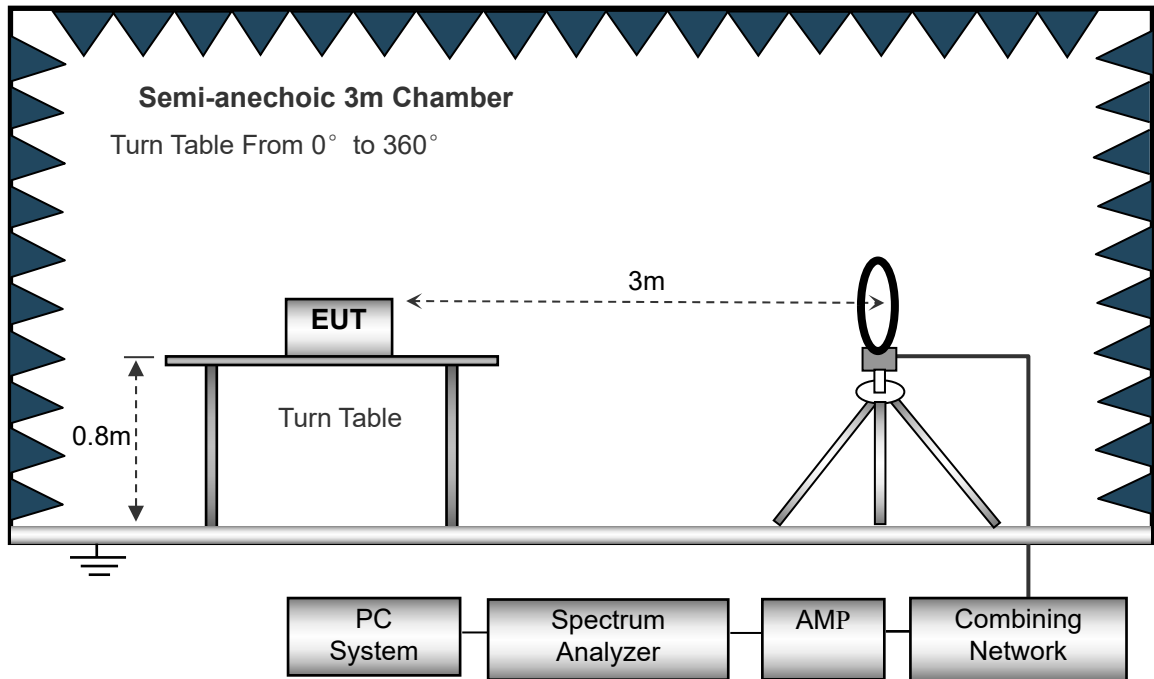
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

4.2 Test Procedure

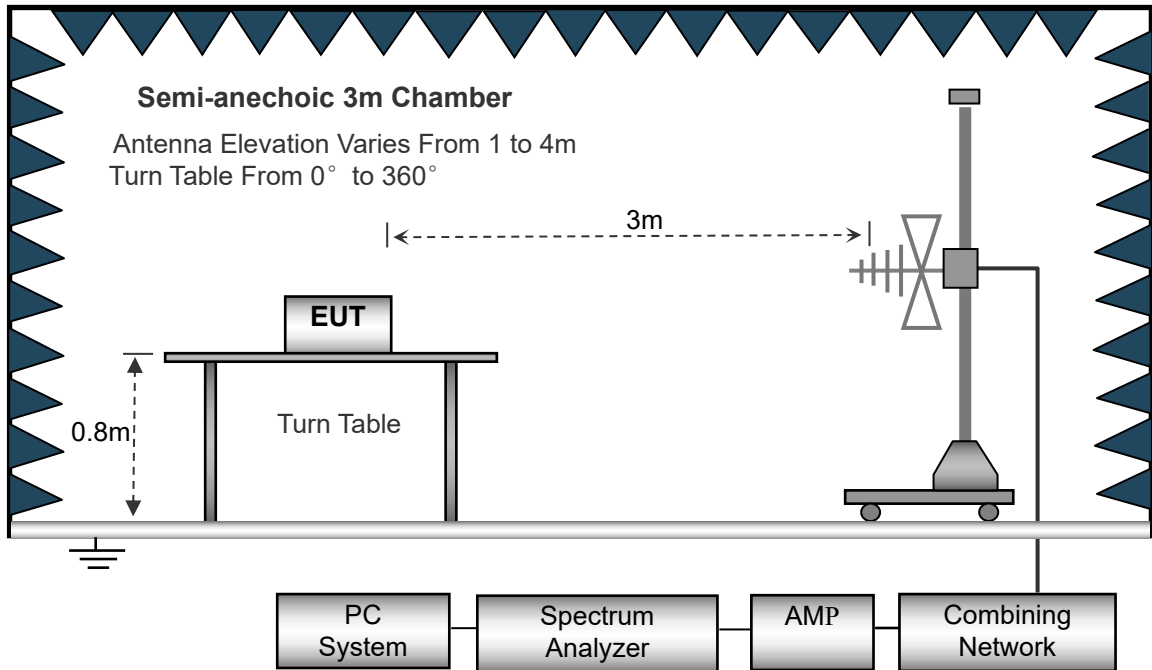
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.249(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

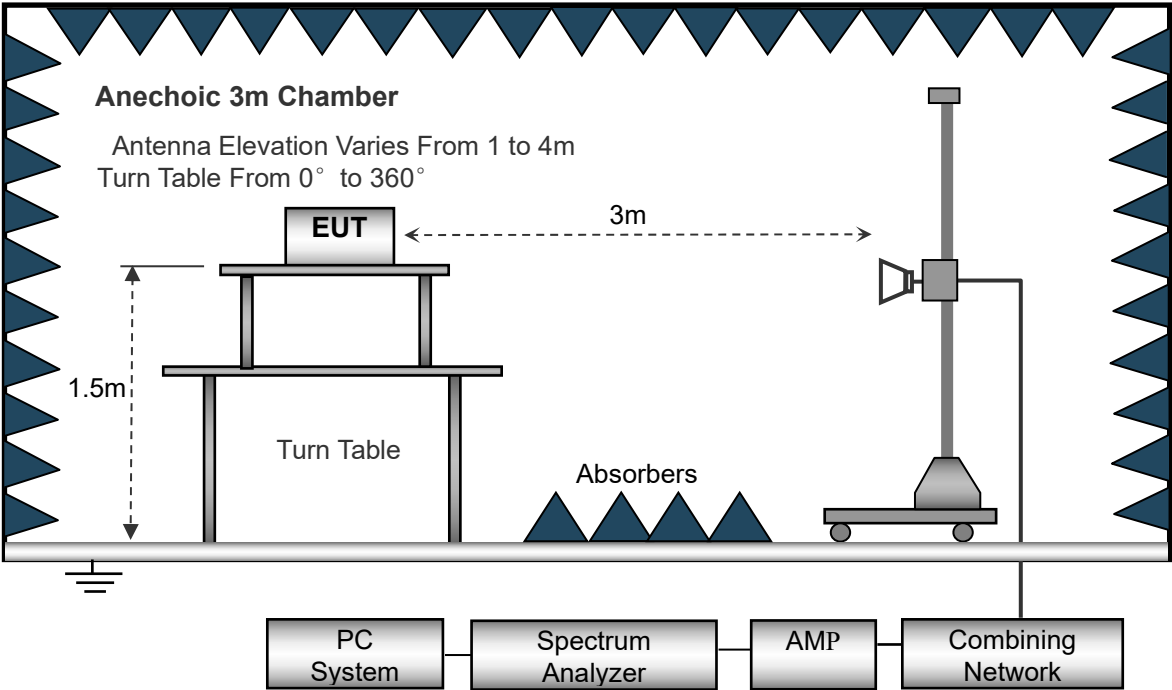
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1GHz.



Frequency :9kHz-30MHz
RBW=10KHz,
VBW =30KHz
Sweep time= Auto
Trace = max hold
Detector function = peak

Frequency :30MHz-1GHz
RBW=120KHz,
VBW=300KHz
Sweep time= Auto
Trace = max hold
Detector function = peak, QP

Frequency :Above 1GHz
RBW=1MHz,
VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto
Trace = max hold
Detector function = peak, AV

4.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

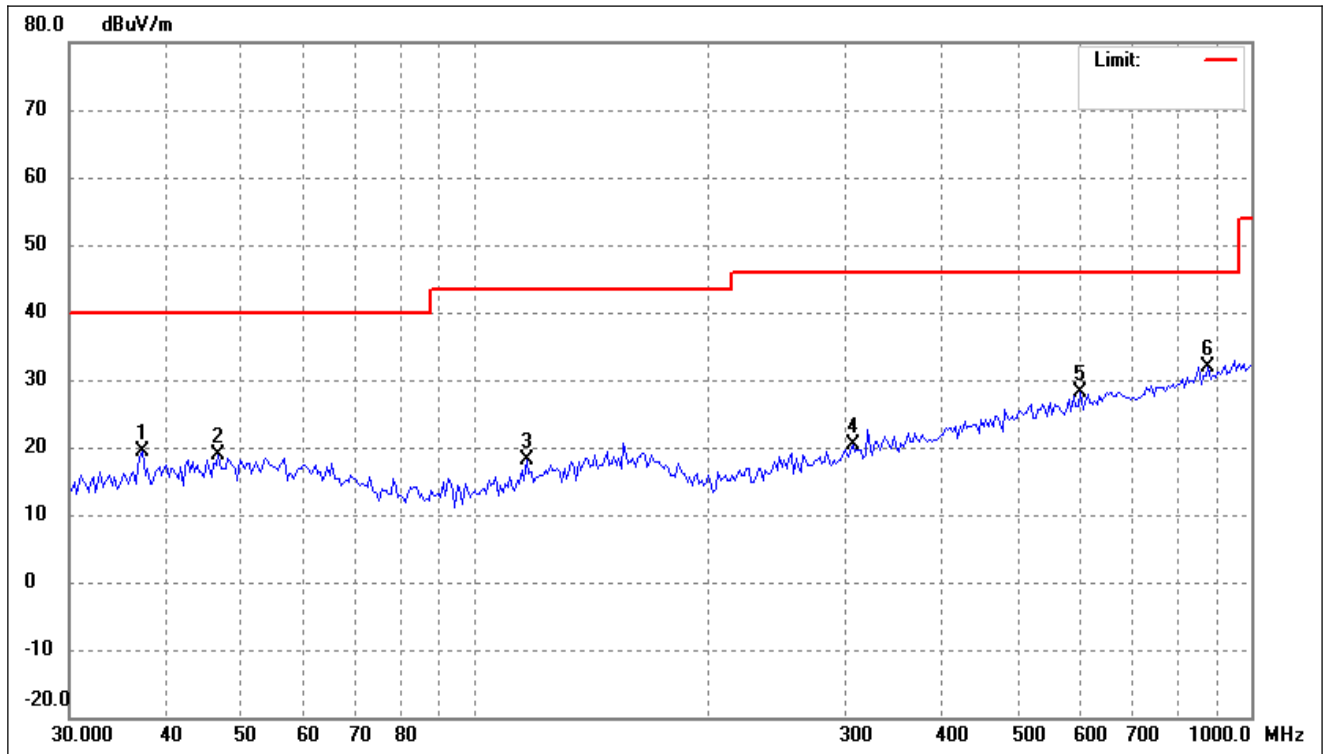
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15C Limit}$$

4.4 Summary of Test Results/Plots

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

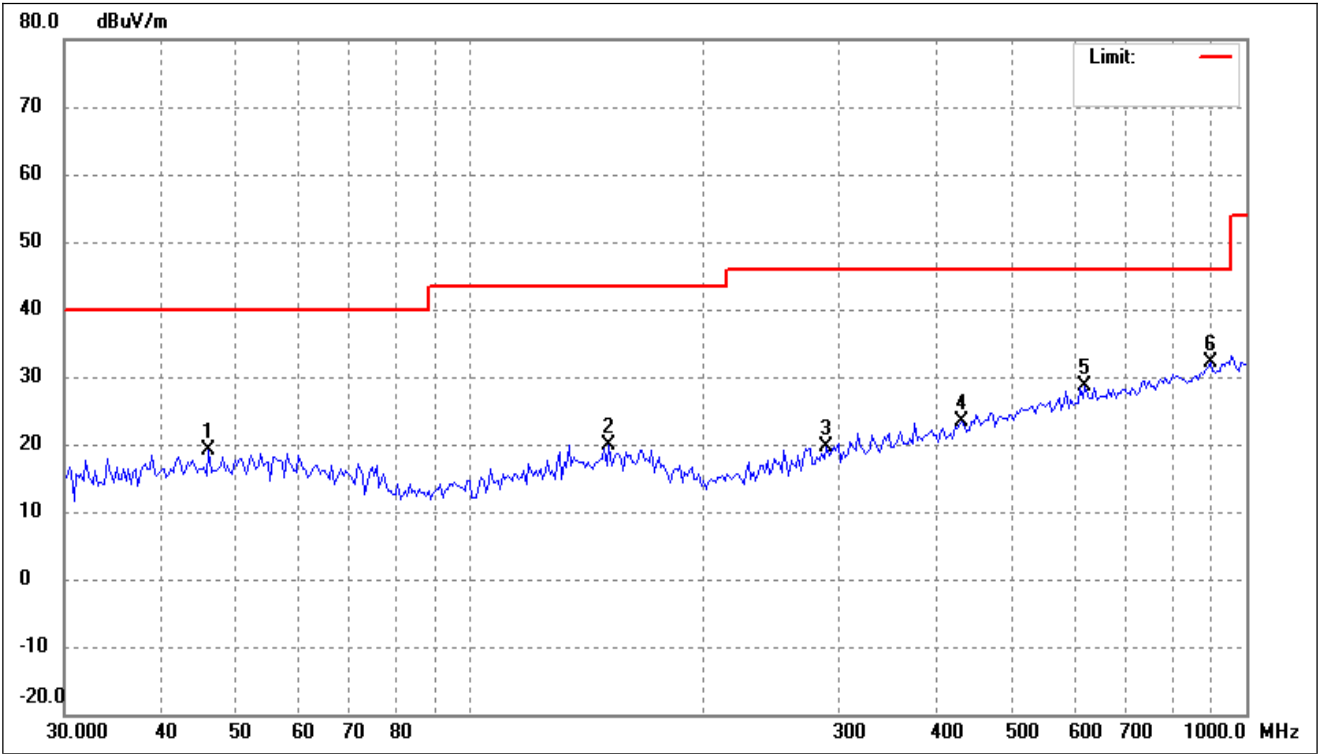
➤ Spurious Emissions Below 1GHz

Test Channel	Low	Polarity:	Horizontal
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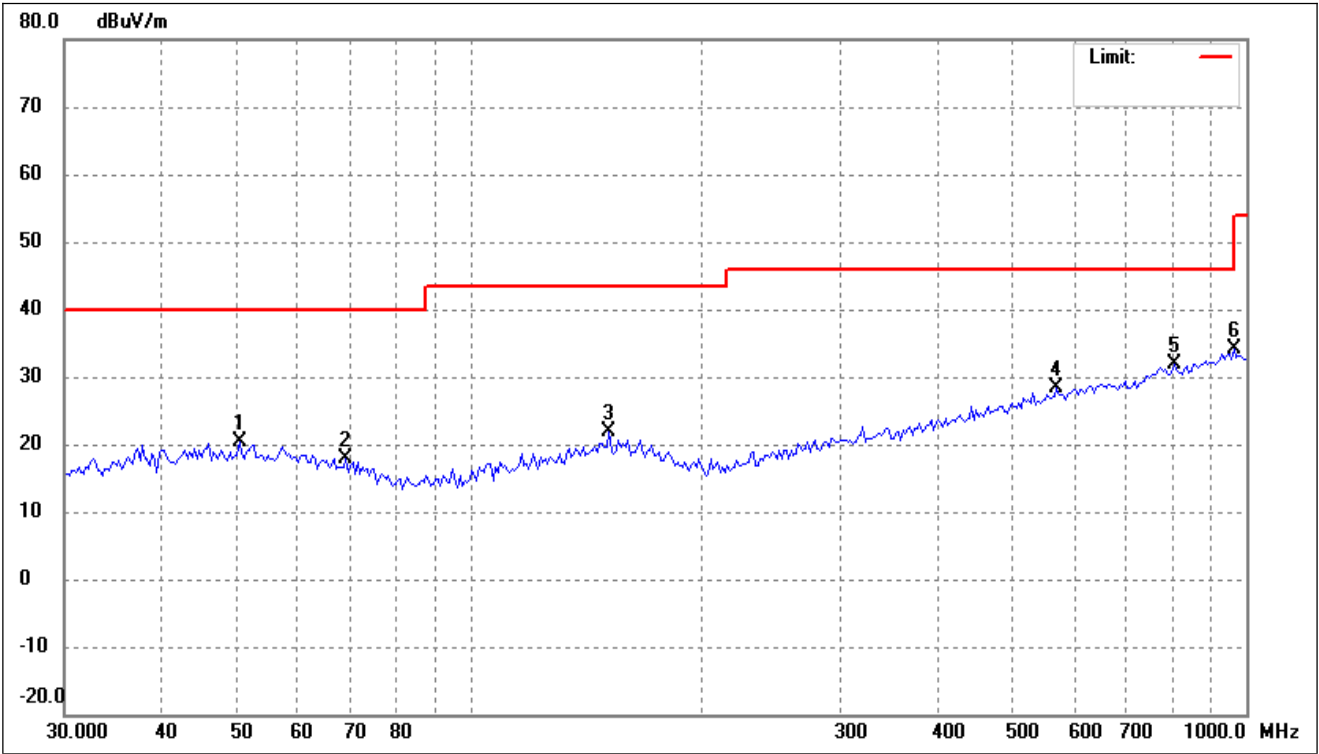
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	37.3017	28.34	-9.06	19.28	40.00	-20.72	-	-	peak
2	46.7077	27.16	-8.34	18.82	40.00	-21.18	-	-	peak
3	116.4476	28.91	-10.90	18.01	43.50	-25.49	-	-	peak
4	307.1053	28.40	-8.06	20.34	46.00	-25.66	-	-	peak
5	602.9287	29.79	-1.71	28.08	46.00	-17.92	-	-	peak
6	881.1838	30.95	1.02	31.97	46.00	-14.03	-	-	peak

Test Channel	Low	Polarity:	Vertical
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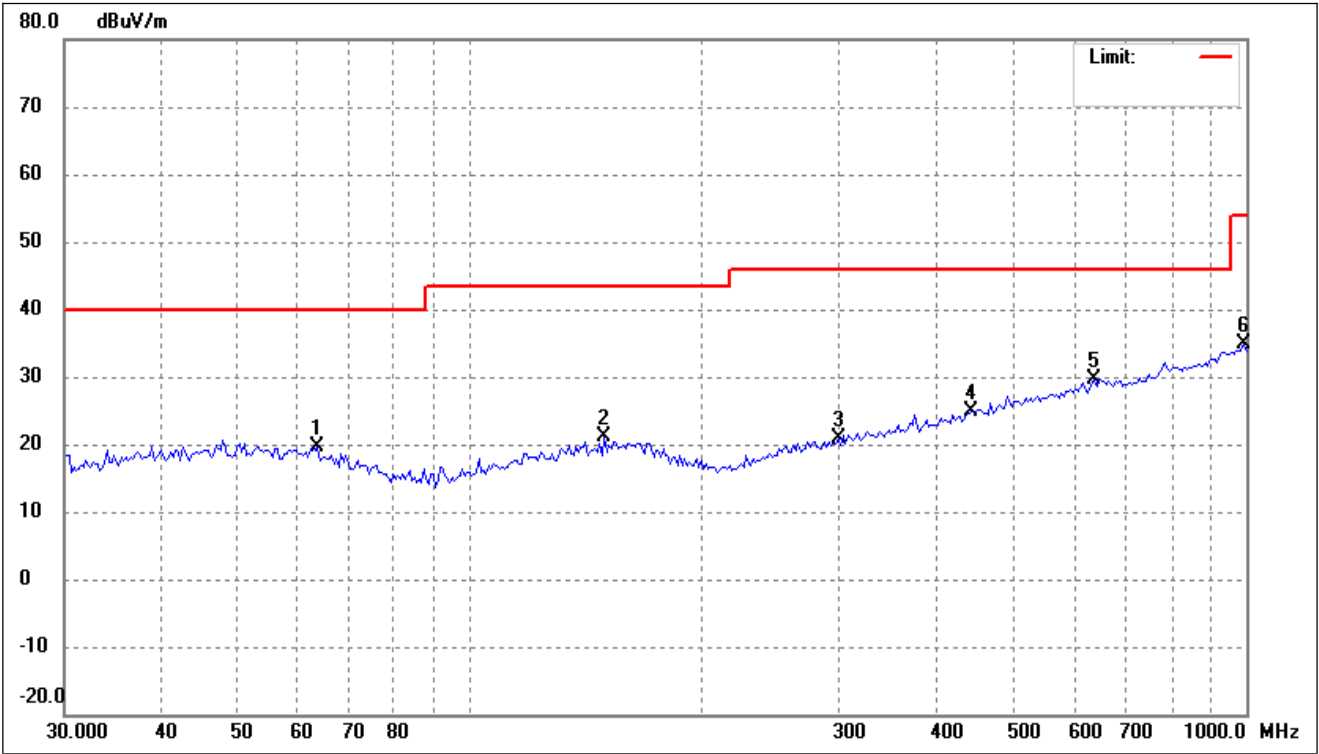
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.0558	27.51	-8.38	19.13	40.00	-20.87	-	-	peak
2	151.0252	28.40	-8.61	19.79	43.50	-23.71	-	-	peak
3	288.2840	28.40	-8.66	19.74	46.00	-26.26	-	-	peak
4	430.3053	28.51	-5.14	23.37	46.00	-22.63	-	-	peak
5	620.1167	29.98	-1.46	28.52	46.00	-17.48	-	-	peak
6	899.9577	30.96	1.19	32.15	46.00	-13.85	-	-	peak

Test Channel	Middle	Polarity:	Horizontal
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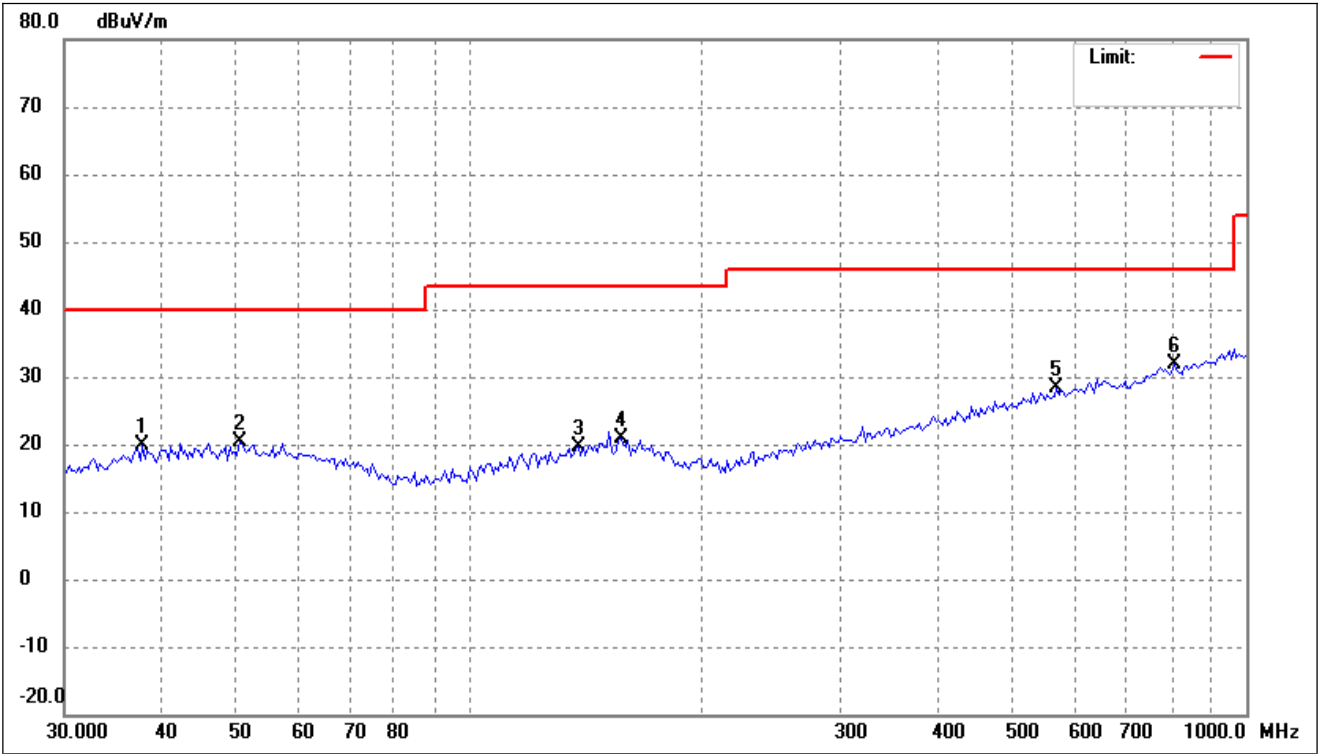
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	50.4614	28.59	-8.14	20.45	40.00	-19.55	-	-	peak
2	69.2297	28.51	-10.63	17.88	40.00	-22.12	-	-	peak
3	151.0252	30.43	-8.61	21.82	43.50	-21.68	-	-	peak
4	569.9688	30.70	-2.36	28.34	46.00	-17.66	-	-	peak
5	809.9238	31.55	0.39	31.94	46.00	-14.06	-	-	peak
6	965.4742	31.74	2.27	34.01	54.00	-19.99	-	-	peak

Test Channel	Middle	Polarity:	Vertical
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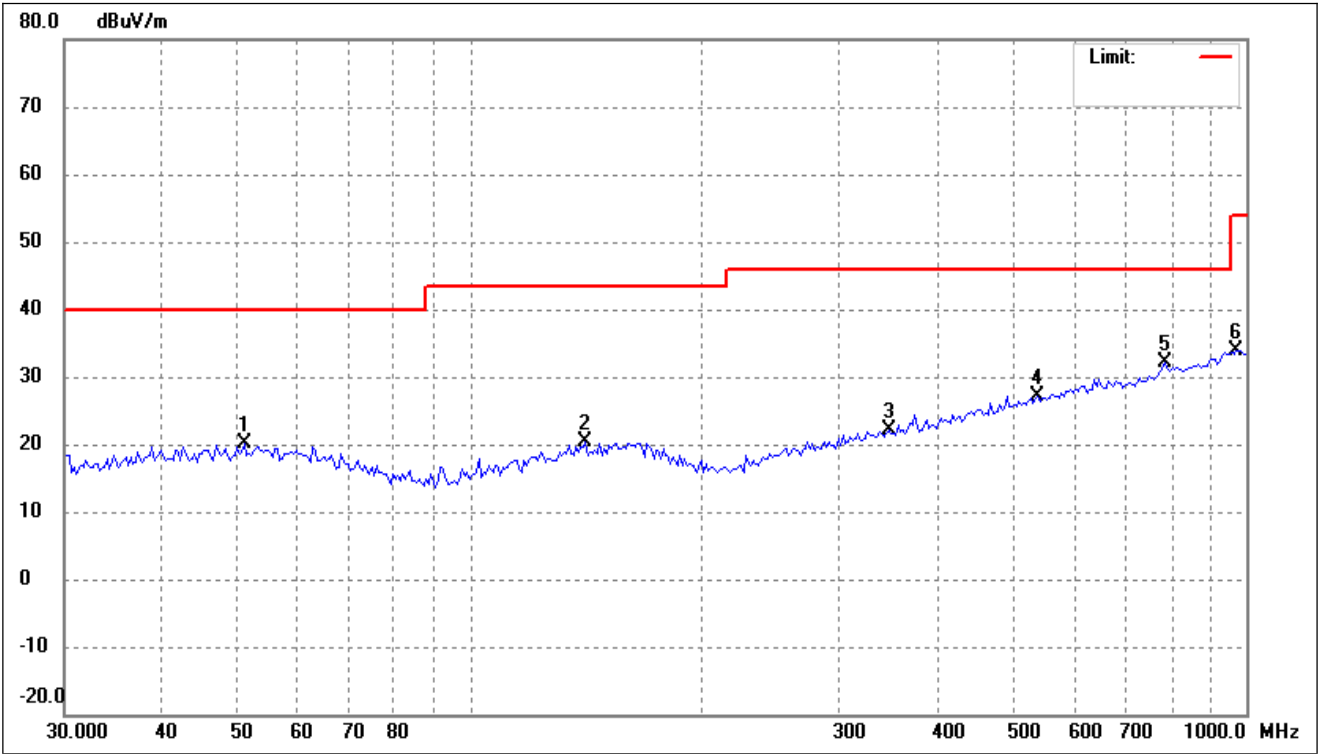
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	63.6312	29.27	-9.59	19.68	40.00	-20.32	-	-	peak
2	148.9175	29.76	-8.68	21.08	43.50	-22.42	-	-	peak
3	298.5932	29.16	-8.31	20.85	46.00	-25.15	-	-	peak
4	442.5722	29.74	-4.79	24.95	46.00	-21.05	-	-	peak
5	637.7947	31.08	-1.36	29.72	46.00	-16.28	-	-	peak
6	992.9975	32.59	2.30	34.89	54.00	-19.11	-	-	peak

Test Channel	High	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	37.8297	28.85	-8.94	19.91	40.00	-20.09	-	-	peak
2	50.4614	28.59	-8.14	20.45	40.00	-19.55	-	-	peak
3	137.8400	29.18	-9.52	19.66	43.50	-23.84	-	-	peak
4	156.4259	29.56	-8.60	20.96	43.50	-22.54	-	-	peak
5	569.9688	30.70	-2.36	28.34	46.00	-17.66	-	-	peak
6	809.9238	31.55	0.39	31.94	46.00	-14.06	-	-	peak

Test Channel	High	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	51.1756	28.46	-8.22	20.24	40.00	-19.76	-	-	peak
2	140.7767	29.67	-9.37	20.30	43.50	-23.20	-	-	peak
3	346.0740	29.19	-7.18	22.01	46.00	-23.99	-	-	peak
4	538.8107	30.28	-3.15	27.13	46.00	-18.87	-	-	peak
5	787.4749	31.90	0.19	32.09	46.00	-13.91	-	-	peak
6	972.2827	31.66	2.27	33.93	54.00	-20.07	-	-	peak

Remark: '-' Means the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

Spurious Emissions Above 1GHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2402MHz							
2402	110.62	-18.85	91.77	114	-22.23	H	PK
2402	110.44	-18.85	91.59	94	-2.41	H	AV
4804	64.16	-12.71	51.45	74	-22.55	H	PK
4804	61.45	-12.71	48.74	54	-5.26	H	AV
7206	61.04	-6.21	54.83	74	-19.17	H	PK
7206	56.68	-6.21	50.47	54	-3.53	H	AV
2402	104.56	-18.85	85.71	114	-28.29	V	PK
2402	103.32	-18.85	84.47	94	-9.53	V	AV
4804	59.95	-12.71	47.24	74	-26.76	V	PK
4804	55.11	-12.71	42.40	54	-11.60	V	AV
7206	55.46	-6.21	49.25	74	-24.75	V	PK
7206	53.66	-6.21	47.45	54	-6.55	V	AV
Middle Channel-2438MHz							
2438	108.52	-18.77	89.75	114	-24.25	H	PK
2438	107.99	-18.77	89.22	94	-4.78	H	AV
4876	62.69	-12.58	50.11	74	-23.89	H	PK
4876	60.02	-12.58	47.44	54	-6.56	H	AV
7314	62.79	-6.49	56.30	74	-17.70	H	PK
7314	58.38	-6.49	51.89	54	-2.11	H	AV
2438	104.50	-18.77	85.73	114	-28.27	V	PK
2438	102.49	-18.77	83.72	94	-10.28	V	AV
4876	61.42	-12.58	48.84	74	-25.16	V	PK
4876	55.07	-12.58	42.49	54	-11.51	V	AV
7314	57.99	-6.49	51.50	74	-22.50	V	PK
7314	53.30	-6.49	46.81	54	-7.19	V	AV
High Channel-2475MHz							
2475	107.74	-18.7	89.04	114	-24.96	H	PK
2475	107.55	-18.69	88.86	94	-5.14	H	AV
4950	60.94	-12.46	48.48	74	-25.52	H	PK
4950	60.40	-12.46	47.94	54	-6.06	H	AV
7425	59.86	-6.78	53.08	74	-20.92	H	PK
7425	57.82	-6.78	51.04	54	-2.96	H	AV
2475	104.94	-18.69	86.25	114	-27.75	V	PK
2475	103.09	-18.69	84.40	94	-9.60	V	AV
4950	57.66	-12.46	45.20	74	-28.80	V	PK
4950	54.30	-12.46	41.84	54	-12.16	V	AV
7425	56.96	-6.78	50.18	74	-23.82	V	PK

Reference No.: WTX23X10227387W001

7425	54.29	-6.78	47.51	54	-6.49	V	AV
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Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The measurements greater than 20dB below the limit from 9kHz to 30MHz..

5. Out of Band Emissions

5.1 Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

5.2 Test Procedure

As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2483.5MHz, than mark the higher-level emission for comparing with the FCC rules.

5.3 Summary of Test Results/Plots

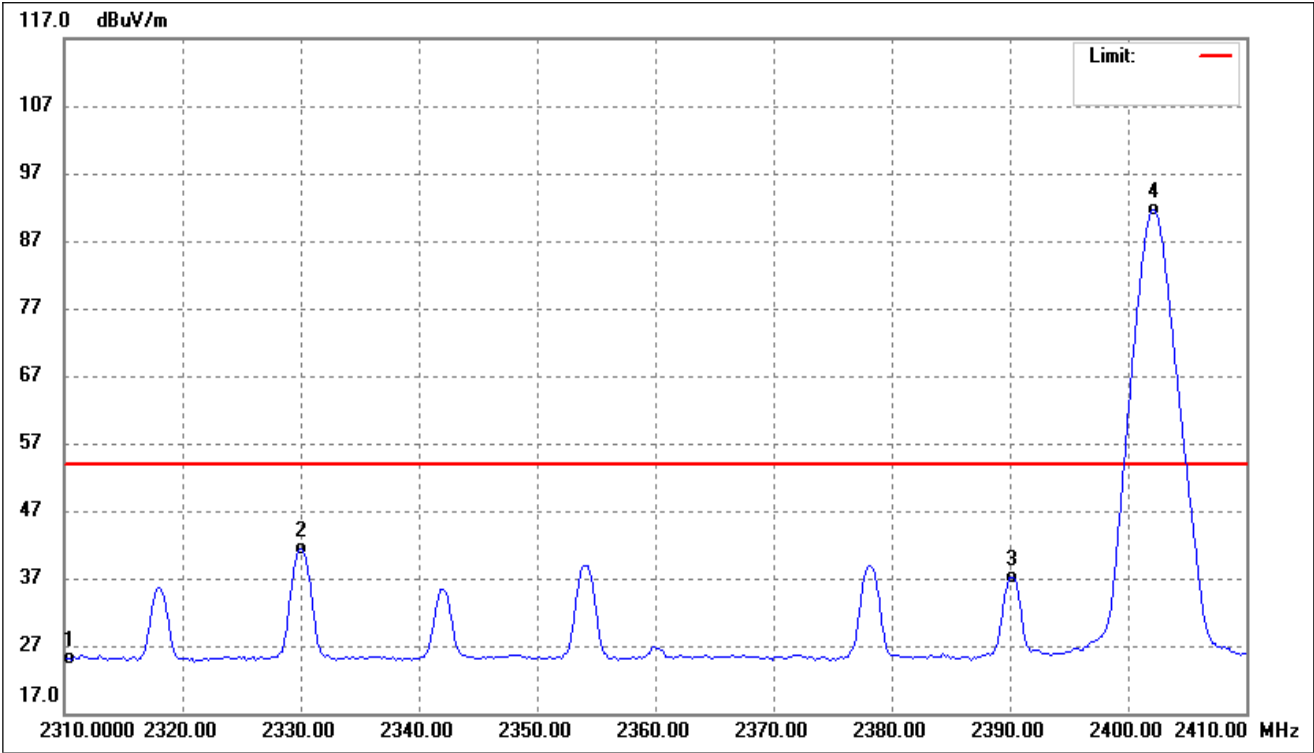
Test mode	Frequency	Limit	Result
	MHz	dBuV / dBc	
Lowest	2310.00	<54dBuV	Pass
	2390.00	<54dBuV	Pass
	2400.00	<54dBuV	Pass
Highest	2483.50	<54dBuV	Pass
	2500.00	<54dBuV	Pass

The edge emissions are below the FCC 15.209 Limits or complies with the 15.249 requirements.

Please refer to the test plots as below.

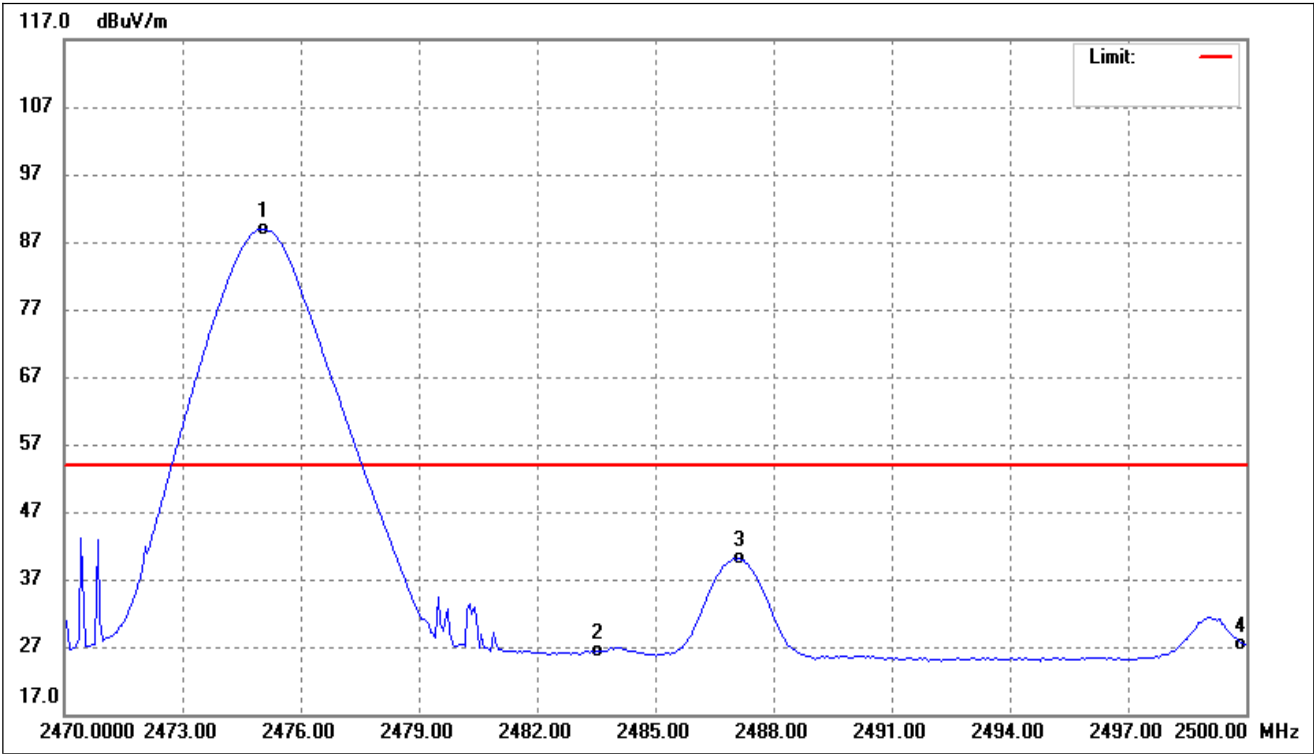
RBW: 1MHz; VBW: 3MHz

Test Channel	Low	Polarity:	Horizontal (worst case)
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	44.21	-19.02	25.19	54.00	-28.81	Ave Detector
	2310.000	63.43	-19.02	44.41	74.00	-29.59	Peak Detector
2	2330.040	60.24	-18.98	41.26	54.00	-12.74	Ave Detector
	2390.000	75.84	-18.87	56.97	74.00	-17.03	Peak Detector
3	2390.000	56.10	-18.87	37.23	54.00	-16.77	Ave Detector
4	2402.184	110.44	-18.85	91.59	/	/	Ave Detector
	2400.982	110.62	-18.85	91.77	/	/	Peak Detector

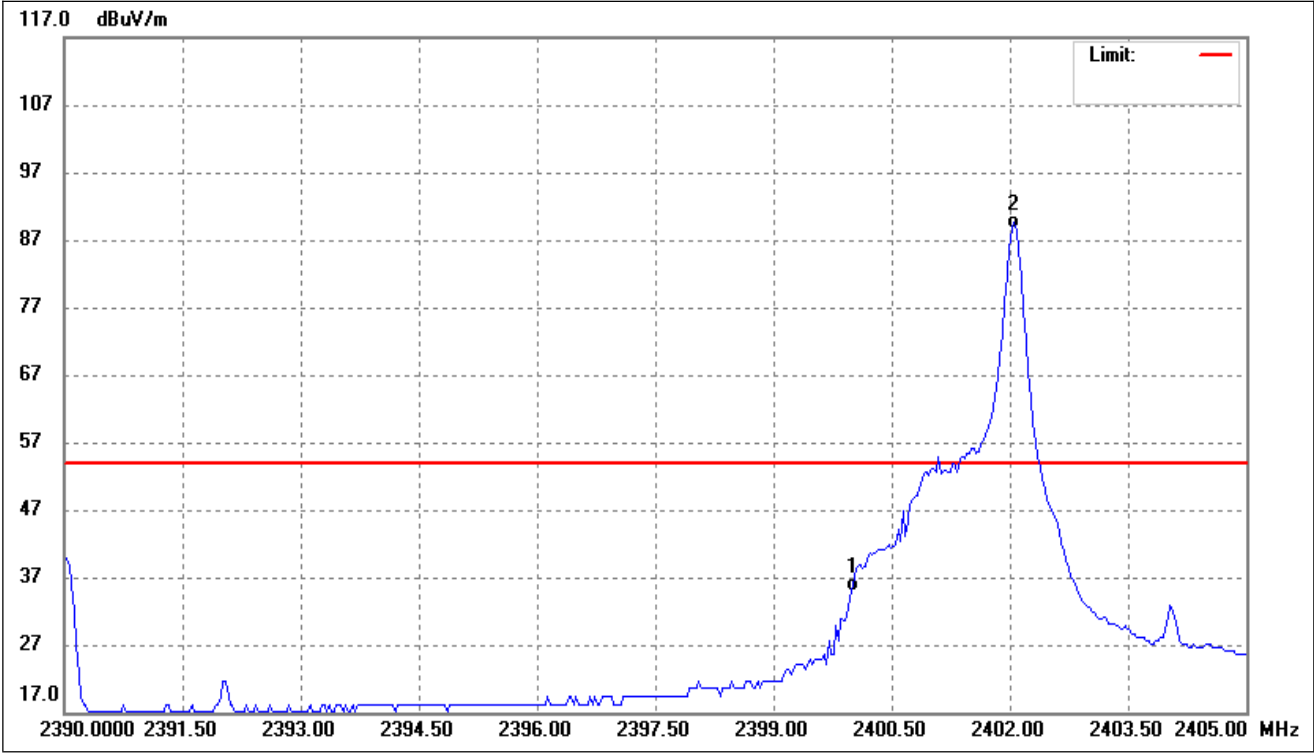
Test Channel	High	Polarity:	Horizontal (worst case)
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2475.050	107.55	-18.69	88.86	/	/	Ave Detector
	2474.990	107.74	-18.70	89.04	/	/	Peak Detector
2	2483.500	45.03	-18.68	26.35	54.00	-27.65	Ave Detector
	2483.500	72.04	-18.68	53.36	74.00	-20.64	Peak Detector
3	2487.134	58.77	-18.67	40.10	54.00	-13.90	Ave Detector
4	2500.000	45.99	-18.65	27.34	54.00	-26.66	Ave Detector
	2500.000	61.78	-18.65	43.13	74.00	-30.87	Peak Detector

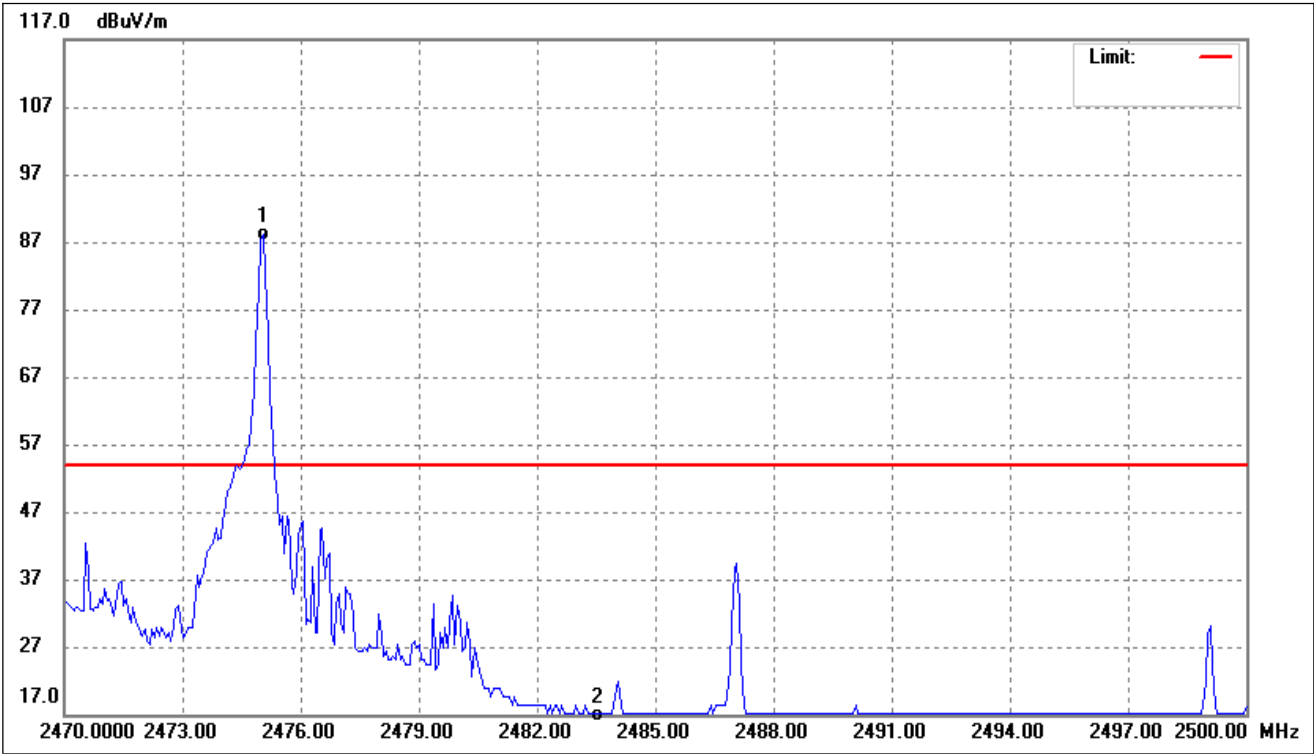
Band edge
RBW: 100kHz; VBW: 300kHz

Test Channel	Low	Polarity:	Horizontal(worst case)
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2400.000	54.69	-18.85	35.84	54.00	-18.16	Ave Detector
	2400.000	90.51	-18.85	71.66	74.00	-2.34	Peak Detector
2	2402.054	108.36	-18.85	89.51	/	/	Ave Detector
	2402.054	108.60	-18.85	89.75	/	/	Peak Detector

Test Channel	High	Polarity:	Horizontal(worst case)
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2475.050	106.92	-18.69	88.23	/	/	Ave Detector
	2475.050	107.79	-18.69	89.10	/	/	Peak Detector
2	2483.500	35.41	-18.68	16.73	54.00	-37.27	Ave Detector
	2483.500	53.93	-18.68	35.25	74.00	-38.75	Peak Detector

6. Emission Bandwidth

6.1 Standard Applicable

According to 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

6.2 Test Procedure

According to the ANSI 63.10-2013, the emission bandwidth test method as follows.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Set span = 1MHz, centered on a transmitting channel

RBW $\geq$ 1% 20dB Bandwidth, VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

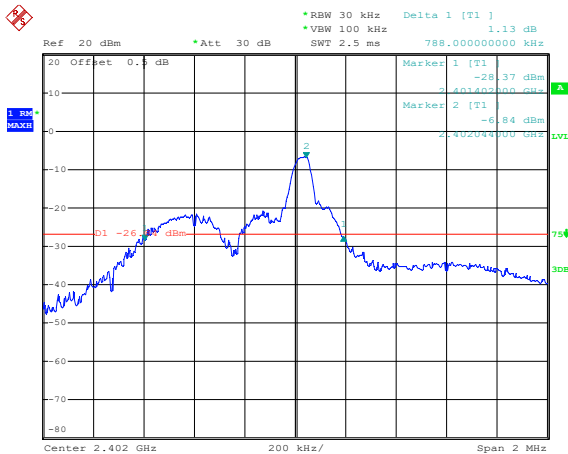
All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

6.3 Summary of Test Results/Plots

Test Channel	20dB Bandwidth(MHz)
Low Channel	0.788
Middle Channel	1.856
High Channel	1.876

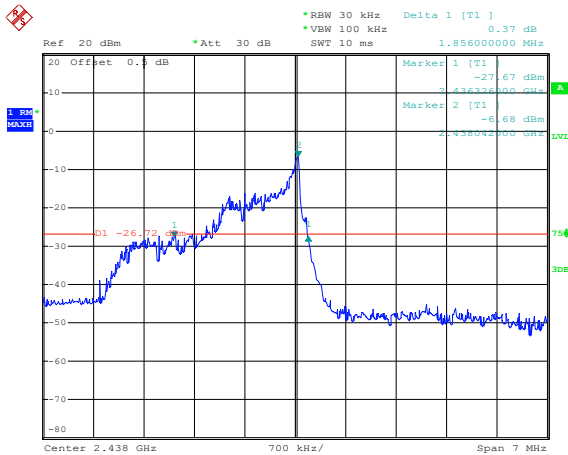
Please refer to the following test plots:

Low Channel



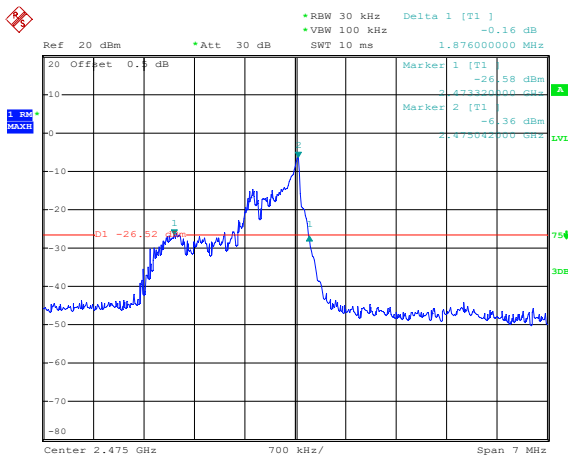
Date: 20.NOV.2023 07:58:18

Middle Channel



Date: 20.NOV.2023 08:02:58

High Channel



Date: 20.NOV.2023 08:07:14

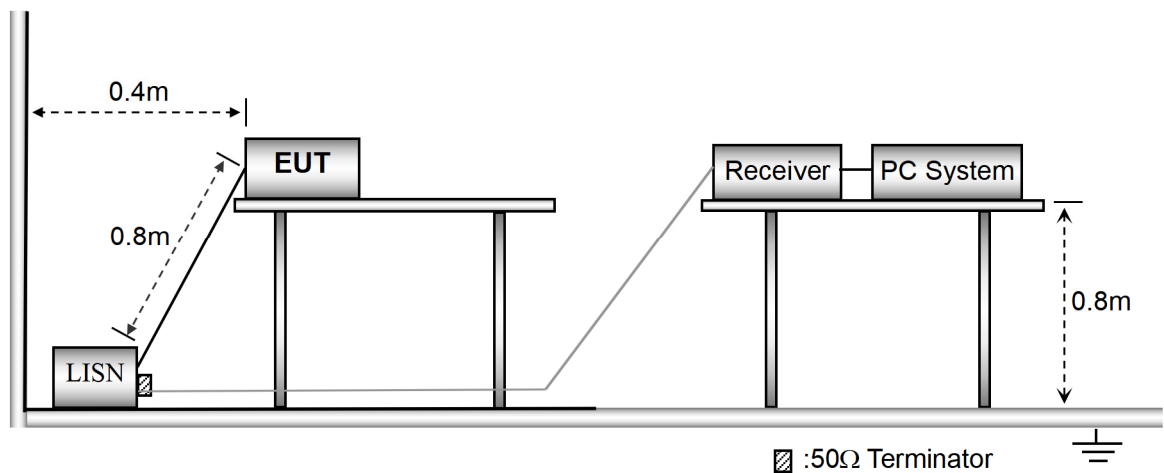
7. Conducted Emissions

7.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

7.2 Basic Test Setup Block Diagram



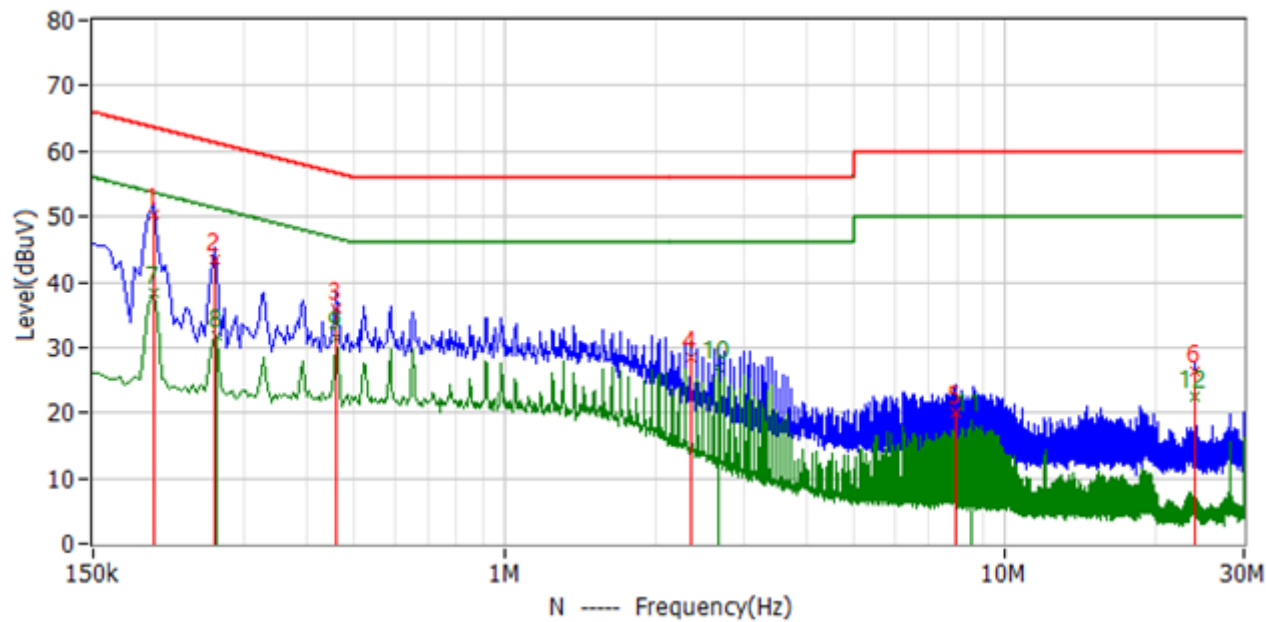
7.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency.....	150kHz
Stop Frequency.....	30MHz
Sweep Speed.....	Auto
IF Bandwidth.....	10kHz
Quasi-Peak Adapter Bandwidth.....	9kHz
Quasi-Peak Adapter Mode.....	Normal

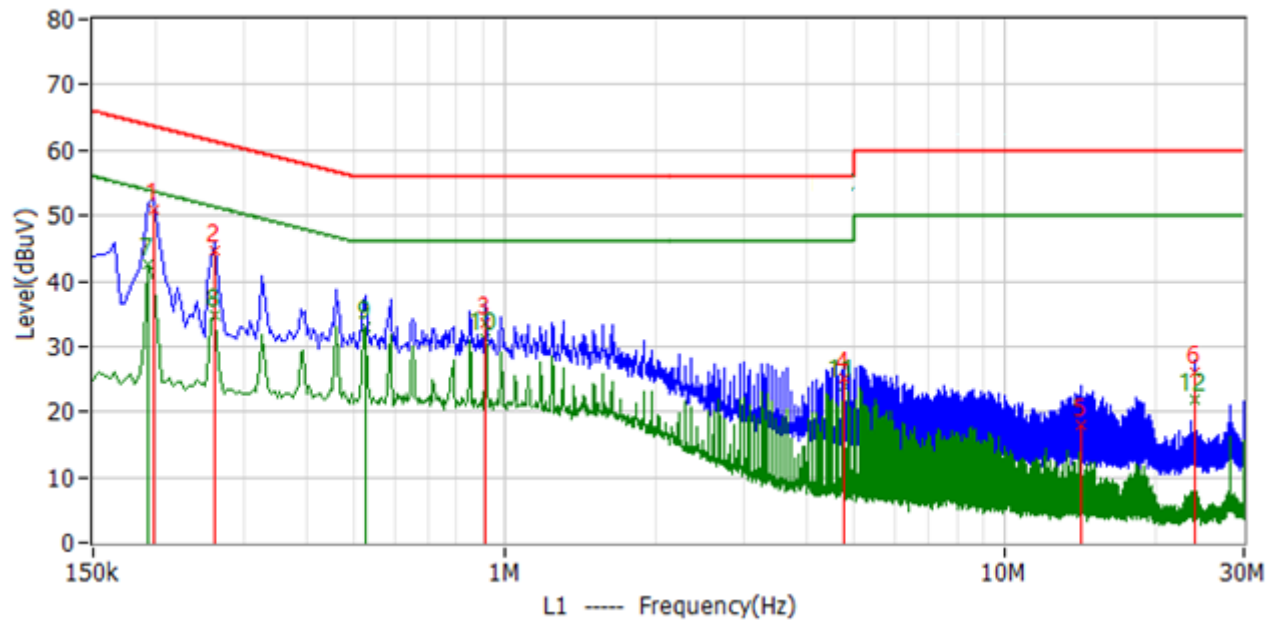
7.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	198.000kHz	29.6	20.6	50.2	63.7	-13.4	QP
2	262.000kHz	23.2	20.3	43.5	61.4	-17.8	QP
3	458.000kHz	15.1	20.8	35.9	56.7	-20.8	QP
4	2.354MHz	7.6	20.9	28.5	56.0	-27.5	QP
5	7.982MHz	-0.6	20.7	20.1	60.0	-39.9	QP
6	24.002MHz	6.2	20.1	26.3	60.0	-33.7	QP
7*	198.000kHz	17.8	20.6	38.4	53.7	-15.3	AV
8*	266.000kHz	11.5	20.3	31.8	51.2	-19.5	AV
9*	458.000kHz	10.8	20.8	31.6	46.7	-15.2	AV
10*	2.682MHz	6.1	20.9	27.0	46.0	-19.0	AV
11*	8.570MHz	-2.0	20.8	18.8	50.0	-31.2	AV
12*	24.002MHz	2.3	20.1	22.4	50.0	-27.6	AV

Test Mode	Communication	AC120V 60Hz	Polarity:	Line
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	198.000kHz	30.4	20.6	51.0	63.7	-12.7	QP
2	262.000kHz	24.2	20.3	44.5	61.4	-16.9	QP
3	914.000kHz	12.7	20.8	33.5	56.0	-22.5	QP
4	4.774MHz	4.3	20.9	25.2	56.0	-30.8	QP
5	14.126MHz	-2.7	20.7	18.0	60.0	-42.0	QP
6	24.002MHz	6.0	20.1	26.1	60.0	-33.9	QP
7*	194.000kHz	21.8	20.7	42.5	53.9	-11.3	AV
8*	262.000kHz	14.4	20.3	34.7	51.4	-16.7	AV
9*	526.000kHz	12.4	20.7	33.1	46.0	-12.9	AV
10*	914.000kHz	10.5	20.8	31.3	46.0	-14.7	AV
11*	4.774MHz	3.0	20.9	23.9	46.0	-22.1	AV
12*	24.002MHz	1.9	20.1	22.0	50.0	-28.0	AV

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

***** END OF REPORT *****