

# TEST REPORT

**Reference No.**..... : WTX21X09099124W-1  
**FCC ID** ..... : 2AS5O-1008M  
**Applicant** ..... : China Etech Groups Ltd  
**Address** ..... : 16/F, Block C, 2nd Phase of Central Avenue, Haihong Industrial Area,  
Xixiang Road, Baoan District, Shenzhen,China  
**Product Name** ..... : Mouse comb  
**Test Model.** ..... : PCA2-1008-AST  
**Standards** ..... : FCC Part 15.249  
**Date of Receipt sample** .... : Sept. 16, 2021  
**Date of Test**..... : Sept. 16, 2021 to Sept. 29, 2021  
**Date of Issue** ..... : Sept. 29, 2021  
**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 compiler and approver.

**Prepared By:**

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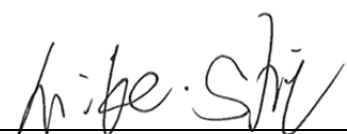
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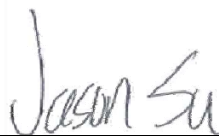
Tested by:

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Mike Shi / Project Engineer



Jason Su / RF Manager



Silin Chen / Manager

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**Report version**

Version No.	Date of issue	Description
Rev.00	Sept. 29, 2021	Original
/	/	/

## 1. GENERAL INFORMATION

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### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: China Etech Groups Ltd  
 Address of applicant: 16/F, Block C, 2nd Phase of Central Avenue, Haihong Industrial Area, Xixiang Road, Baoan District, Shenzhen, China

Manufacturer: China Etech Groups Ltd  
 Address of manufacturer: 16/F, Block C, 2nd Phase of Central Avenue, Haihong Industrial Area, Xixiang Road, Baoan District, Shenzhen, China

General Description of EUT	
Product Name:	Mouse comb
Trade Name:	/
Model No.:	PCA2-1008-AST
Adding Model(s):	/
Rated Voltage:	Battery:DC1.5V*2
Battery Capacity	/
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-2480MHz
Max. Field Strength:	88.00dBuV/m
Modulation:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	-4.62dBi

## 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.

### 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:

<b>Test Mode List</b>		
Test Mode	Description	Remark
TM1	Low Channel	2402MHz
TM2	Middle Channel	2440MHz
TM3	High Channel	2480MHz

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

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

<b>Special Cable List and Details</b>			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

<b>Auxiliary Equipment List and Details</b>			
Description	Manufacturer	Model	Serial Number
Computer	Lenovo	ThinkPad Edge E445	/

## 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**

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
SEMT-1075	Communication Tester	Rohde & Schwarz	CMW500	148650	2021-03-27	2022-03-26
SEMT-1063	GSM Tester	Rohde & Schwarz	CMU200	114403	2021-03-27	2022-03-26
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2021-03-27	2022-03-26
SEMT-1079	Spectrum Analyzer	Agilent	N9020A	US47140102	2021-03-27	2022-03-26
SEMT-1080	Signal Generator	Agilent	83752A	3610A01453	2021-03-27	2022-03-26
SEMT-1081	Vector Signal Generator	Agilent	N5182A	MY47070202	2021-03-27	2022-03-26
SEMT-1028	Power Divider	Weinschel	1506A	PM204	2021-03-27	2022-03-26
SEMT-1082	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2021-03-27	2022-03-26
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2021-03-27	2022-03-26
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2021-03-27	2022-03-26
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2021-04-12	2022-04-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2021-04-12	2022-04-11
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-19	2023-03-18
SEMT-1068	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-19	2023-03-18
SEMT-1042	Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2021-04-27	2023-04-26
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2021-04-27	2022-04-26
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2021-03-27	2022-03-26
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2021-03-27	2022-03-26
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2021-03-19	2023-03-18
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	/	/
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	/	/
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	/	/
SEMT-C004	Cable	Zheng DI	2M0RFC	/	/	/
SEMT-C005	Cable	Zheng DI	1M0RFC	/	/	/
SEMT-C006	Cable	Zheng DI	1M0RFC	/	/	/



<b>Software List</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Version</b>
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

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

## 2. SUMMARY OF TEST RESULTS

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<b>FCC Rules</b>	<b>Description of Test Item</b>	<b>Result</b>
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.207(a)	Conducted Emission	N/A
§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**

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#### **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

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### 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.

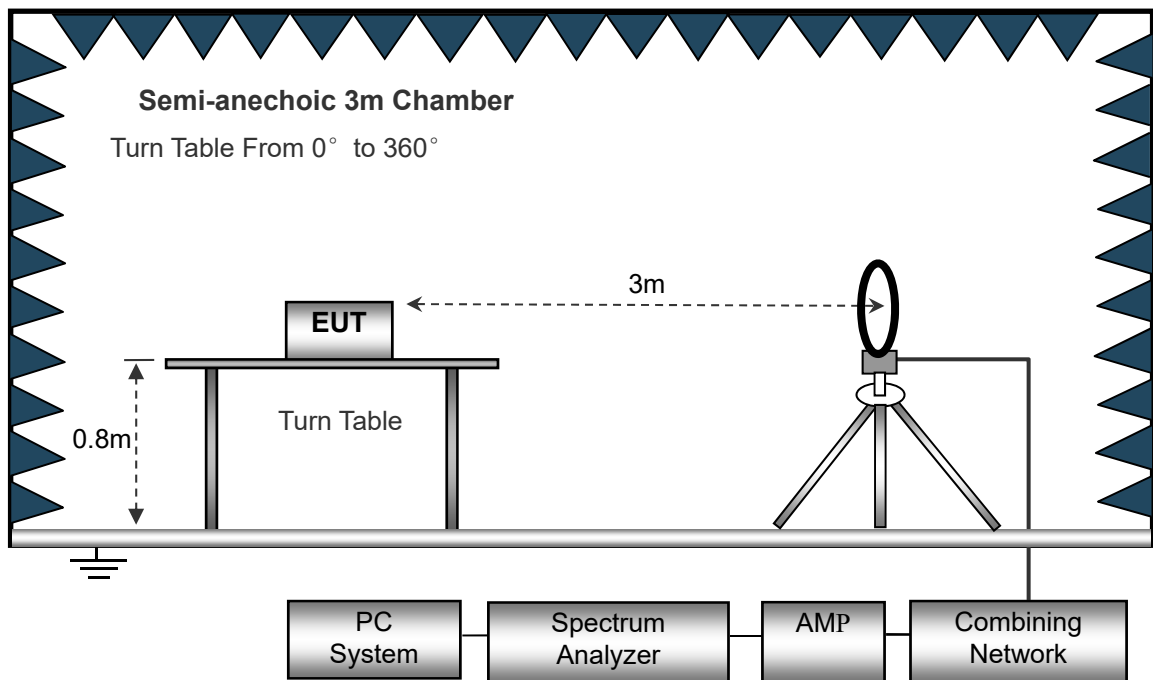
### 4.2 Test Procedure

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.

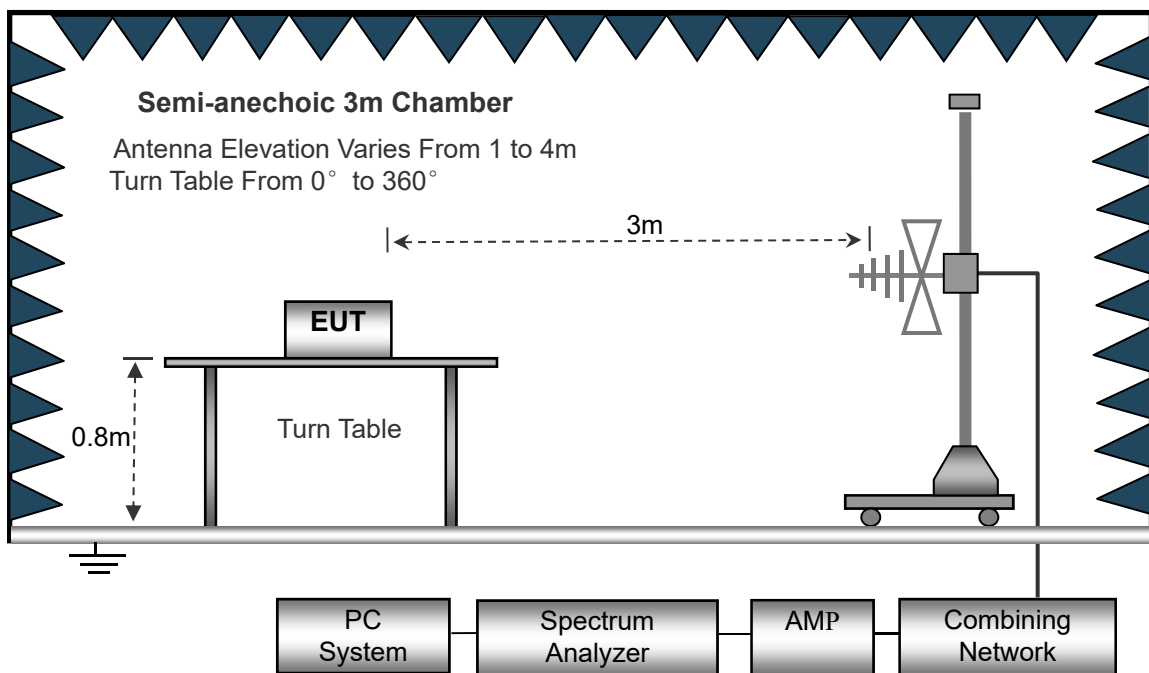
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

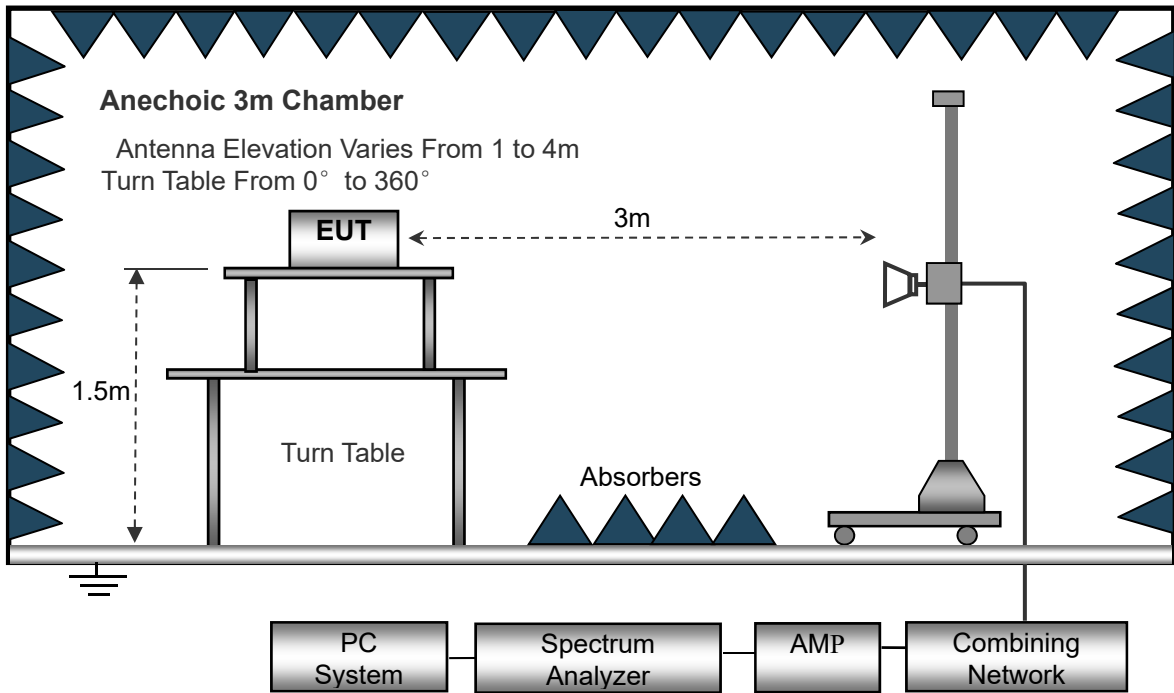
The test setup for emission measurement below 30MHz.



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 $\mu$ V means the emission is 6dB $\mu$ V below the maximum limit. The equation for margin calculation is as follows:

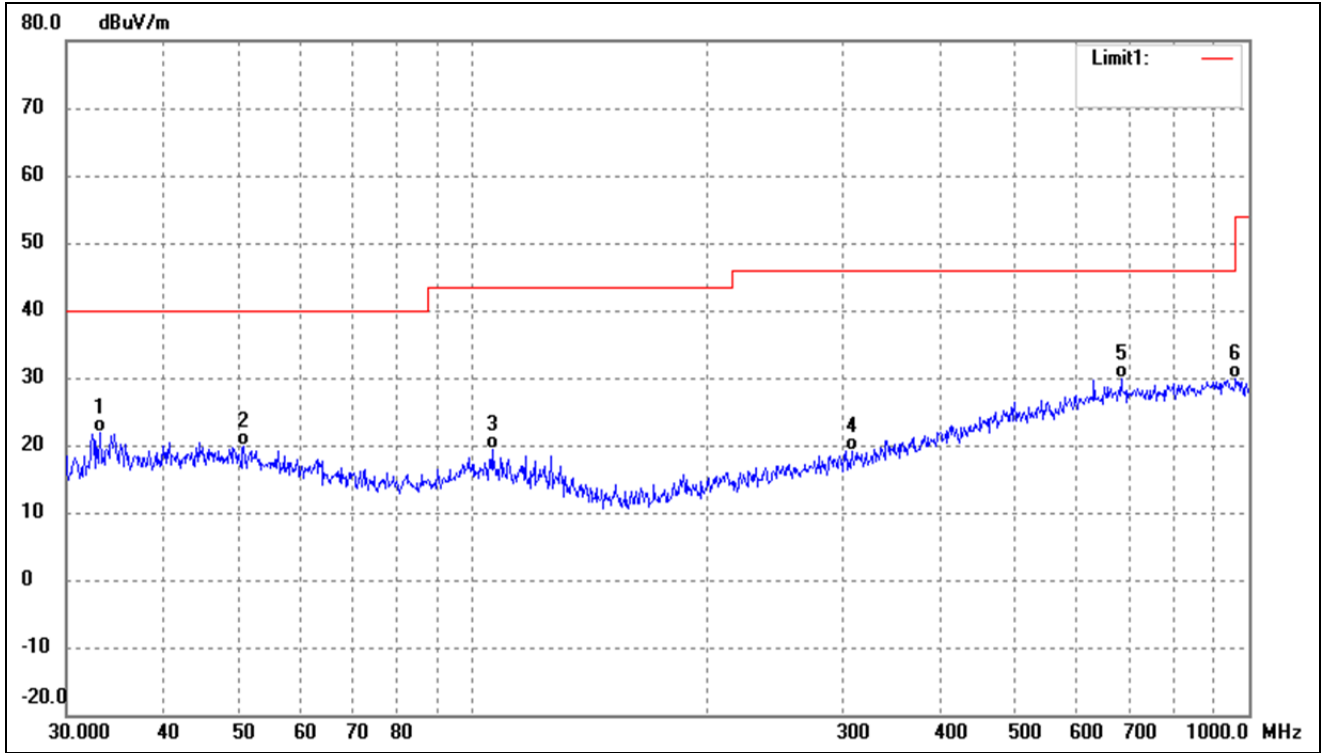
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15C Limit}$$

### 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

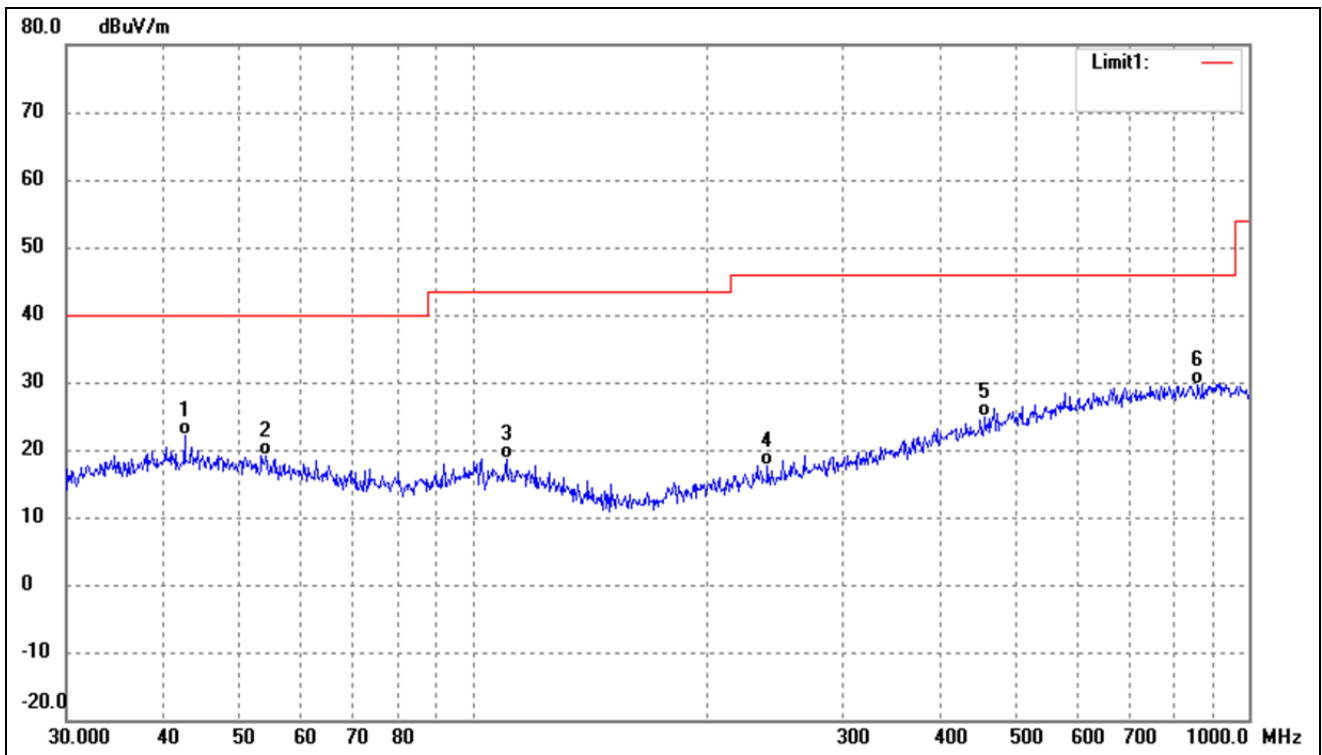
Test Channel	Low	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	33.2112	30.44	-8.67	21.77	40.00	-18.23	-	-	QP
2	50.7637	26.98	-7.07	19.91	40.00	-20.09	-	-	QP
3	106.0126	28.10	-8.82	19.28	43.50	-24.22	-	-	QP
4	307.8313	25.82	-6.71	19.11	46.00	-26.89	-	-	QP
5	684.7454	28.64	1.27	29.91	46.00	-16.09	-	-	QP
6	962.1623	27.40	2.54	29.94	54.00	-24.06	-	-	QP

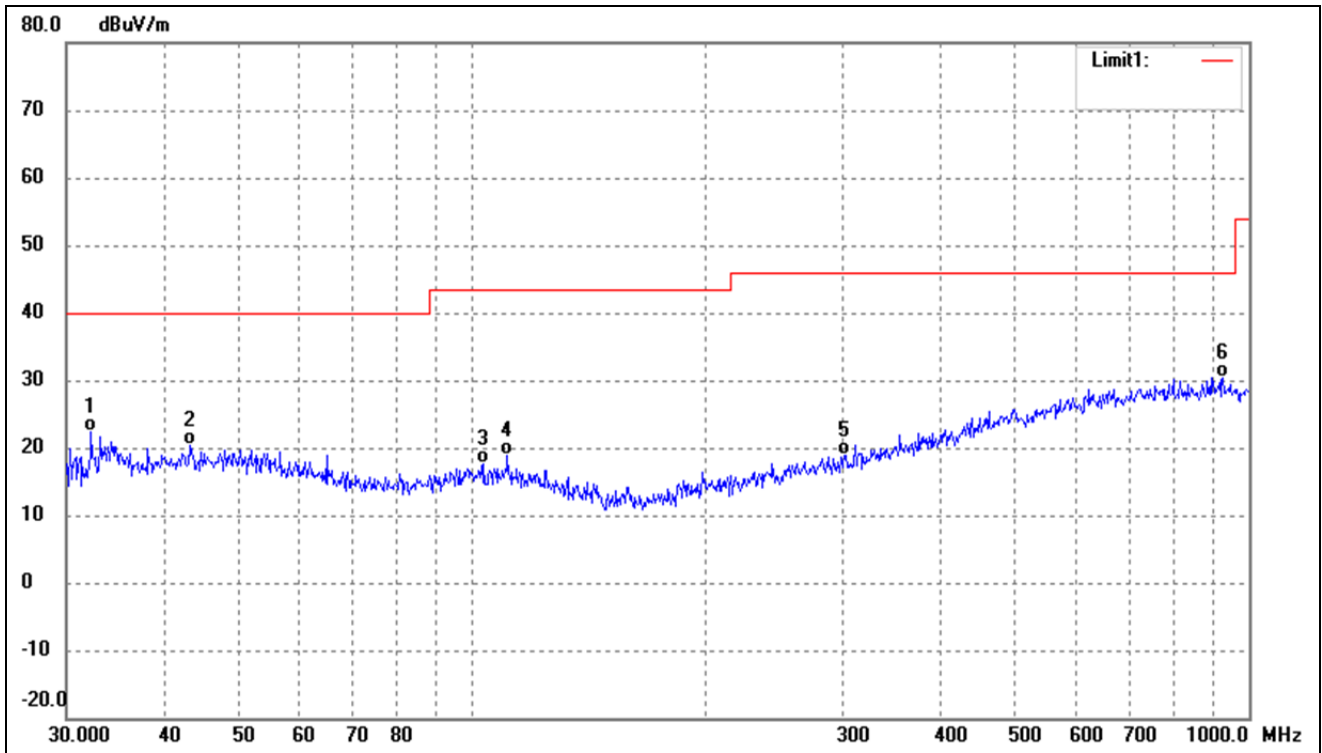


Test Channel	Low	Polarity:	Vertical
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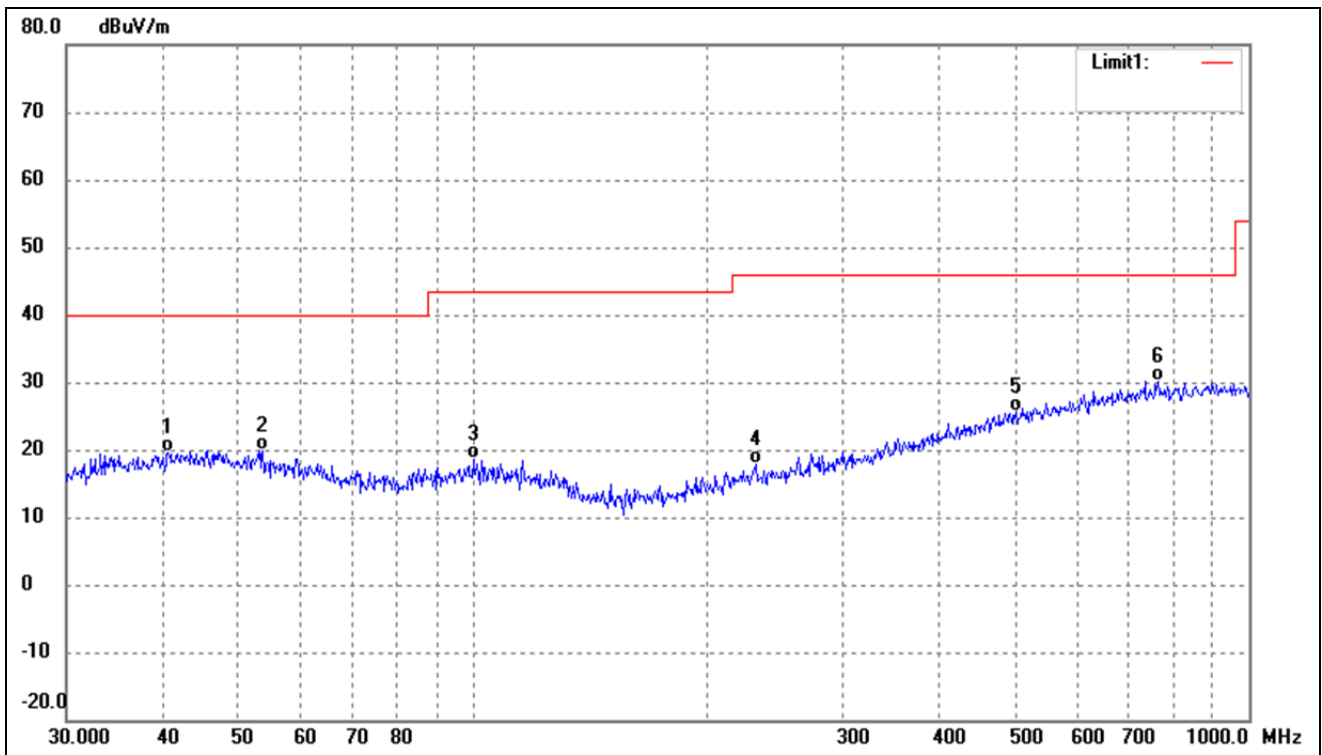
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	42.6000	29.03	-6.99	22.04	40.00	-17.96	-	-	QP
2	54.2610	26.78	-7.59	19.19	40.00	-20.81	-	-	QP
3	110.5687	27.56	-8.91	18.65	43.50	-24.85	-	-	QP
4	239.9874	26.27	-8.59	17.68	46.00	-28.32	-	-	QP
5	457.5073	27.28	-2.37	24.91	46.00	-21.09	-	-	QP
6	860.0352	27.19	2.45	29.64	46.00	-16.36	-	-	QP

Test Channel	Middle	Polarity:	Horizontal
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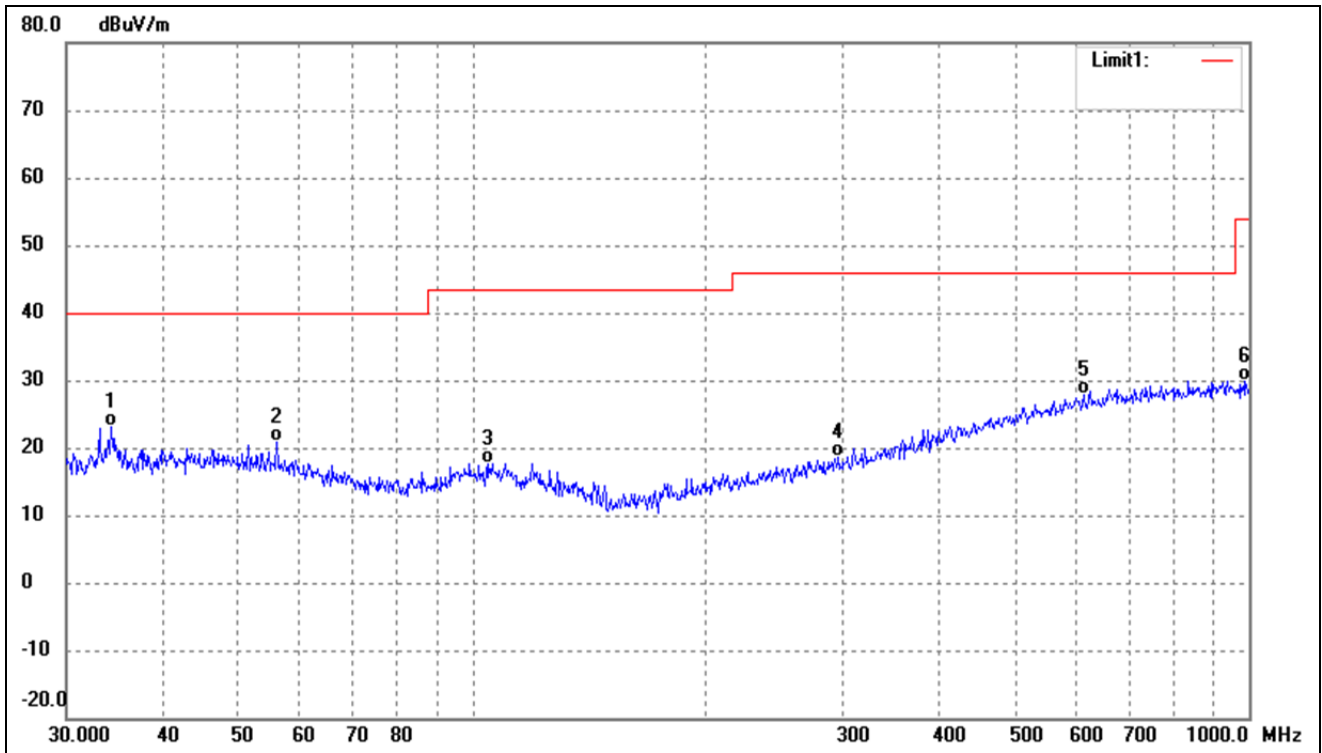
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	32.2925	31.31	-8.89	22.42	40.00	-17.58	-	-	QP
2	43.2017	27.32	-7.00	20.32	40.00	-19.68	-	-	QP
3	103.4421	26.34	-8.78	17.56	43.50	-25.94	-	-	QP
4	110.9571	27.89	-8.94	18.95	43.50	-24.55	-	-	QP
5	301.4224	25.73	-6.91	18.82	46.00	-27.18	-	-	QP
6	925.7563	27.82	2.66	30.48	46.00	-15.52	-	-	QP

Test Channel	Middle	Polarity:	Vertical
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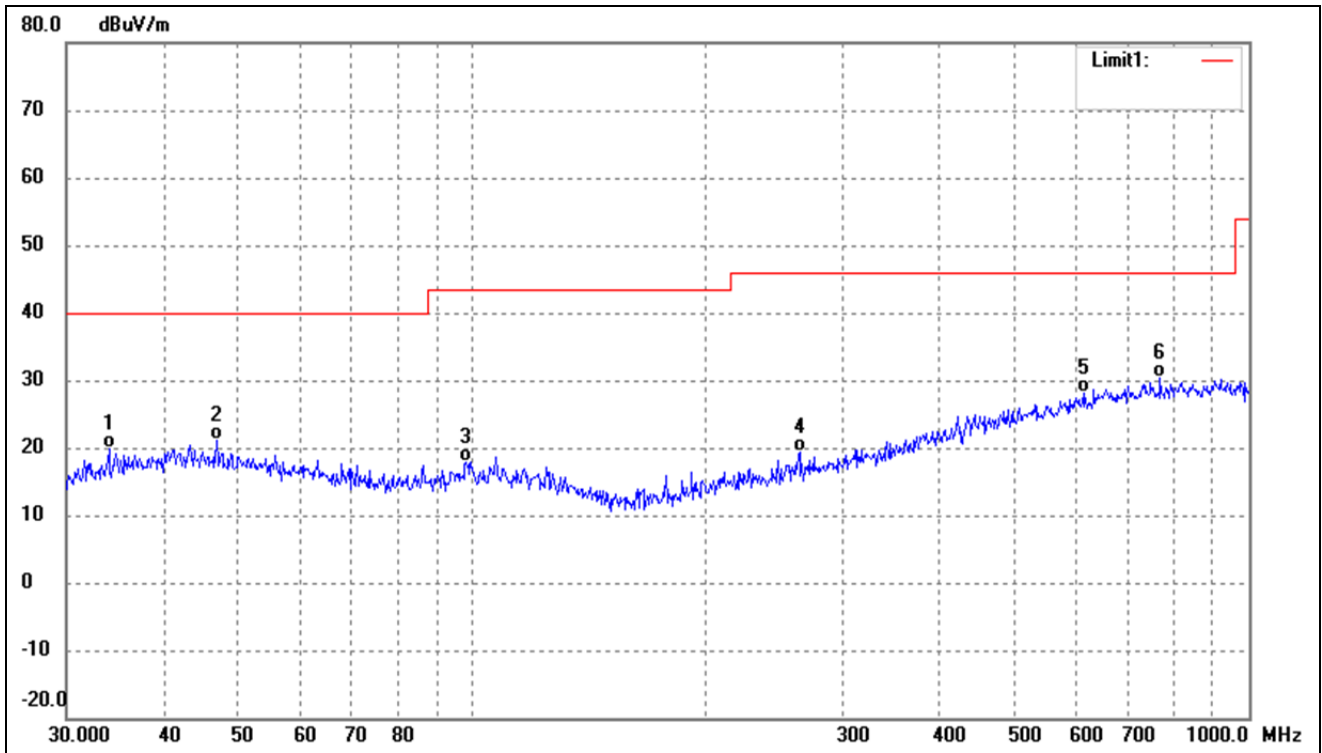
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	40.5591	26.67	-7.00	19.67	40.00	-20.33	-	-	QP
2	53.6932	27.40	-7.49	19.91	40.00	-20.09	-	-	QP
3	100.2286	27.28	-8.73	18.55	43.50	-24.95	-	-	QP
4	231.7179	26.80	-8.83	17.97	46.00	-28.03	-	-	QP
5	501.1790	26.91	-1.28	25.63	46.00	-20.37	-	-	QP
6	763.3757	28.38	1.85	30.23	46.00	-15.77	-	-	QP

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	34.2760	31.61	-8.40	23.21	40.00	-16.79	-	-	QP
2	56.0007	28.63	-7.84	20.79	40.00	-19.21	-	-	QP
3	104.5361	26.49	-8.79	17.70	43.50	-25.80	-	-	QP
4	296.1836	25.80	-7.06	18.74	46.00	-27.26	-	-	QP
5	612.0642	27.49	0.50	27.99	46.00	-18.01	-	-	QP
6	986.0717	27.42	2.46	29.88	54.00	-24.12	-	-	QP

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	34.0365	28.29	-8.46	19.83	40.00	-20.17	-	-	QP
2	46.8303	28.17	-6.96	21.21	40.00	-18.79	-	-	QP
3	98.1419	26.88	-9.07	17.81	43.50	-25.69	-	-	QP
4	263.8190	27.23	-7.94	19.29	46.00	-26.71	-	-	QP
5	612.0642	27.58	0.50	28.08	46.00	-17.92	-	-	QP
6	768.7482	28.51	1.89	30.40	46.00	-15.60	-	-	QP

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	98.69	-10.69	88.00	114	-26.00	H	PK
2402	96.50	-10.69	85.81	94	-8.19	H	AV
4804	58.95	-6.13	52.82	74	-21.18	H	PK
4804	55.41	-6.13	49.28	54	-4.72	H	AV
7206	50.89	-1.64	49.25	74	-24.75	H	PK
7206	40.47	-1.64	38.83	54	-15.17	H	AV
2402	89.56	-10.69	78.87	114	-35.13	V	PK
2402	86.12	-10.69	75.43	94	-18.57	V	AV
4804	54.12	-6.13	47.99	74	-26.01	V	PK
4804	50.17	-6.13	44.04	54	-9.96	V	AV
7206	44.59	-1.64	42.95	74	-31.05	V	PK
7206	36.00	-1.64	34.36	54	-19.64	V	AV
Middle Channel-2440MHz							
2440	98.01	-10.63	87.38	114	-26.62	H	PK
2440	95.74	-10.63	85.11	94	-8.89	H	AV
4880	57.49	-5.93	51.56	74	-22.44	H	PK
4880	55.84	-5.93	49.91	54	-4.09	H	AV
7320	50.78	-1.58	49.20	74	-24.80	H	PK
7320	40.17	-1.58	38.59	54	-15.41	H	AV
2440	89.12	-10.63	78.49	114	-35.51	V	PK
2440	85.07	-10.63	74.44	94	-19.56	V	AV
4880	53.65	-5.93	47.72	74	-26.28	V	PK
4880	50.40	-5.93	44.47	54	-9.53	V	AV
7320	43.17	-1.58	41.59	74	-32.41	V	PK
7320	34.68	-1.58	33.10	54	-20.90	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
High Channel-2480MHz							
2480	96.79	-10.58	86.21	114	-27.79	H	PK
2480	94.56	-10.58	83.98	94	-10.02	H	AV
4960	59.63	-5.71	53.92	74	-20.08	H	PK
4960	56.82	-5.71	51.11	54	-2.89	H	AV
7440	52.01	-1.52	50.49	74	-23.51	H	PK
7440	41.46	-1.52	39.94	54	-14.06	H	AV
2480	89.22	-10.58	78.64	114	-35.36	V	PK
2480	86.68	-10.58	76.10	94	-17.90	V	AV
4960	53.15	-5.71	47.44	74	-26.56	V	PK
4960	50.13	-5.71	44.42	54	-9.58	V	AV
7440	45.41	-1.52	43.89	74	-30.11	V	PK
7440	34.91	-1.52	33.39	54	-20.61	V	AV

*Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5<sup>th</sup> 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

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### 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

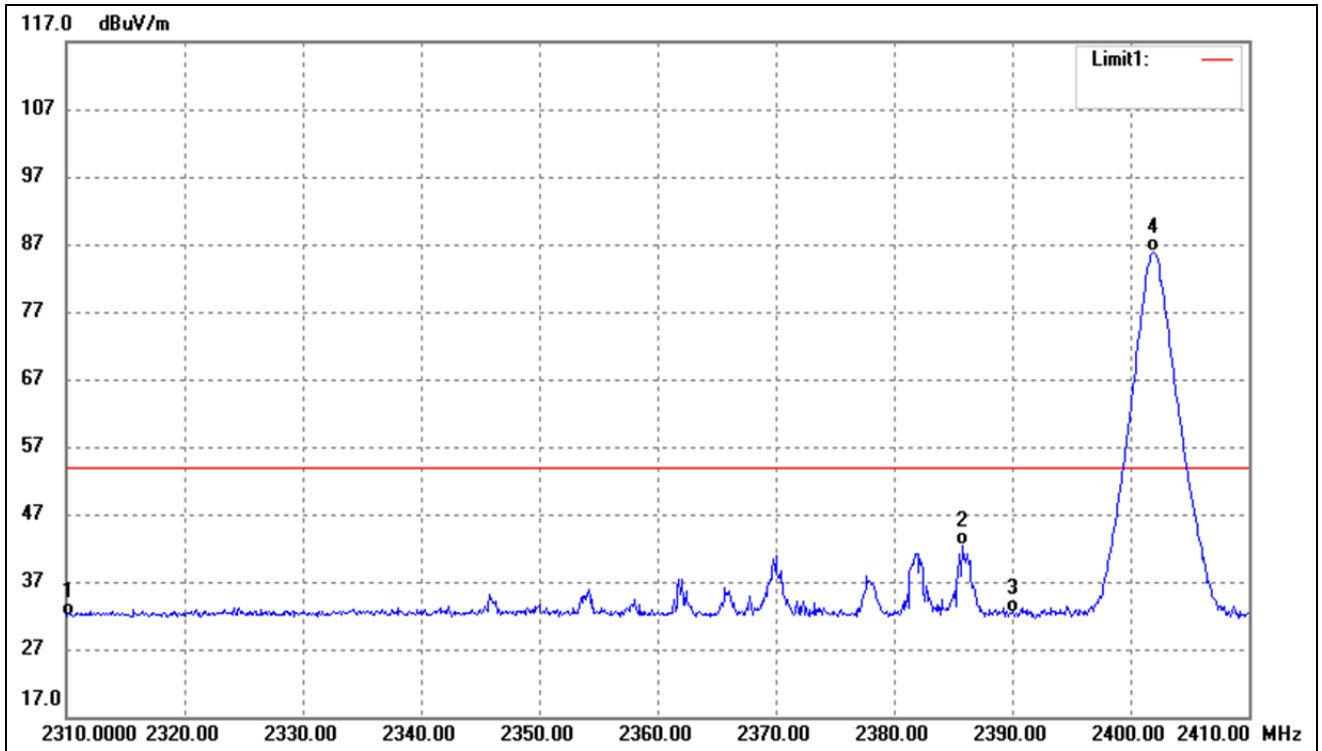
The edge emissions are below the FCC 15.209 Limits or complies with the 15.249 requirements.

Please refer to the test plots as below.



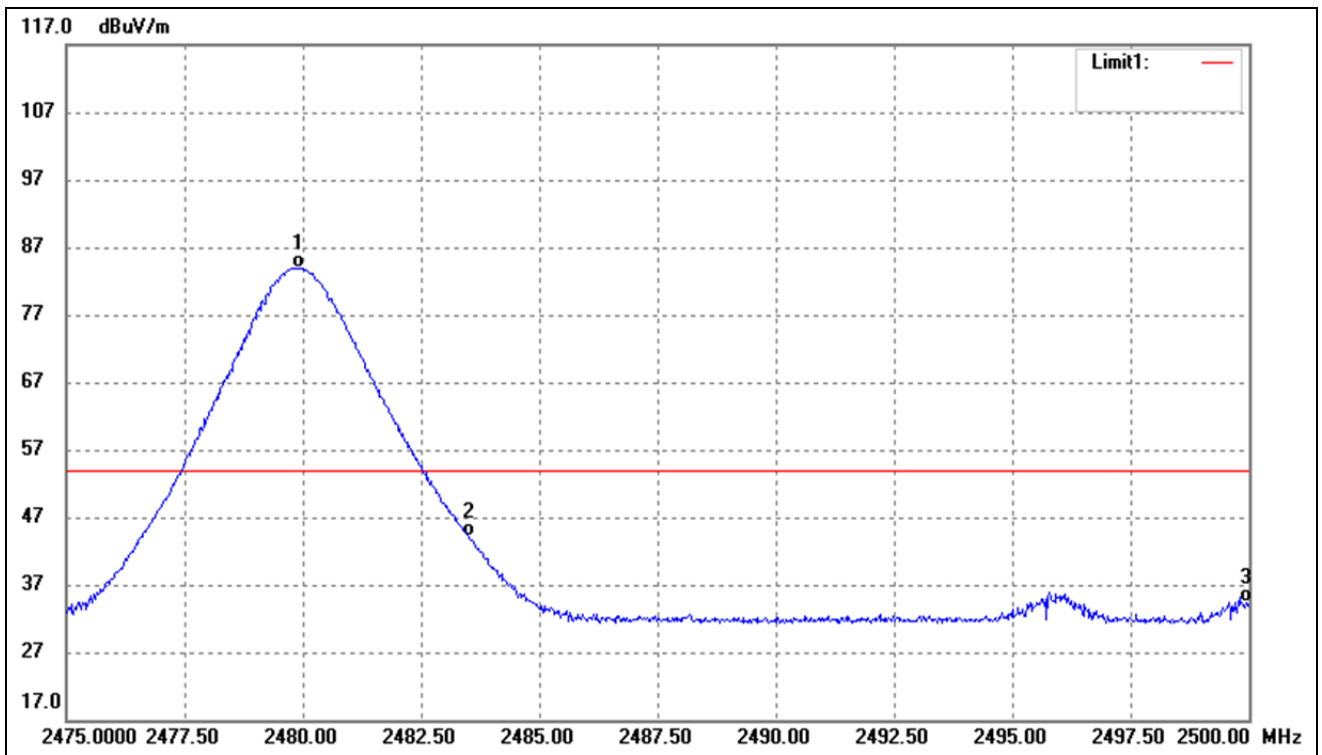
RBW 1MHz VBW 3MHz

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	42.67	-10.82	31.85	54.00	-22.15	Ave Detector
	2310.000	53.87	-10.82	43.05	74.00	-30.95	Peak Detector
2	2385.800	53.19	-10.71	42.48	54.00	-11.52	Ave Detector
	/	/	/	/	/	/	Peak Detector
3	2390.000	43.05	-10.70	32.35	54.00	-21.65	Ave Detector
	2390.000	64.85	-10.70	54.15	74.00	-19.85	Peak Detector
4	2401.900	96.50	-10.69	85.81	/	/	Ave Detector
	2402.000	98.69	-10.69	88.00	/	/	Peak Detector

Test Channel	High	Polarity:	Horizontal (worst case)
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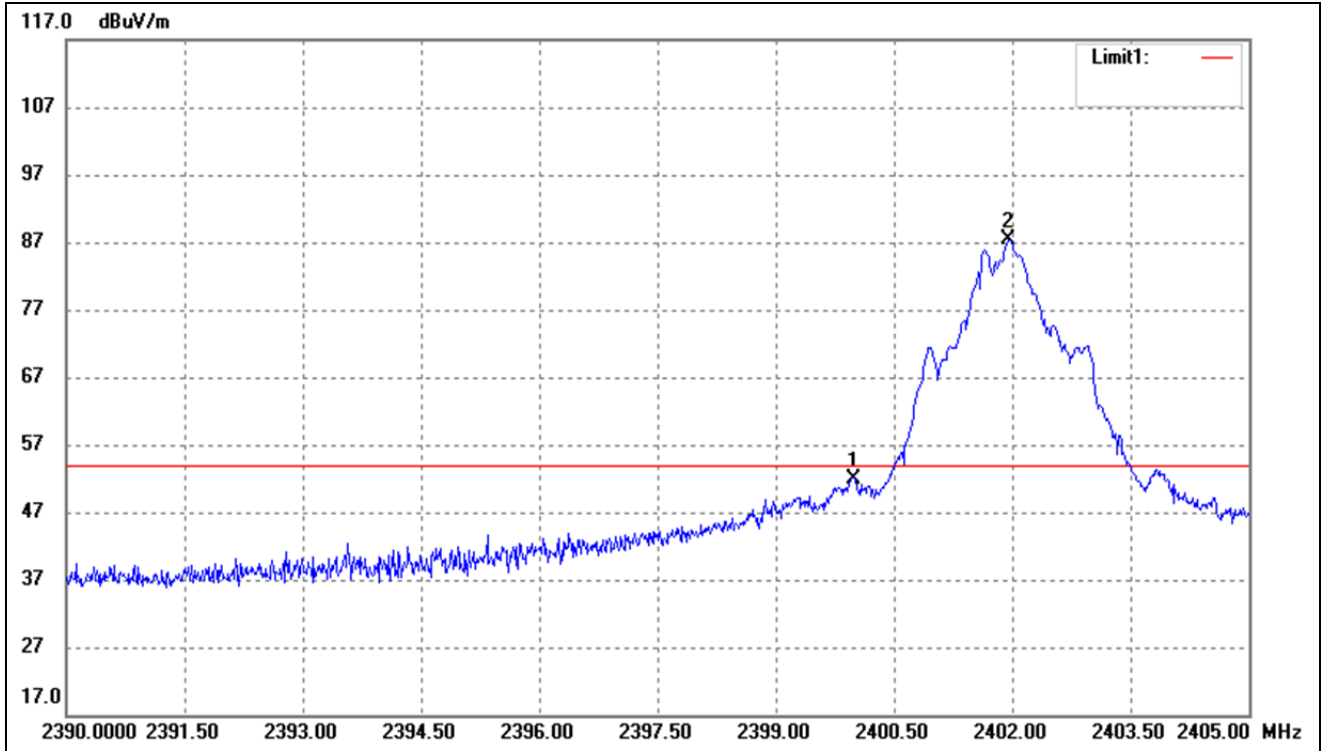


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.900	94.56	-10.58	83.98	/	/	Ave Detector
	2479.925	96.79	-10.58	86.21	/	/	Peak Detector
2	2483.500	54.78	-10.58	44.20	54.00	-9.80	Ave Detector
	2483.500	73.67	-10.58	63.09	74.00	-10.91	Peak Detector
3	2500.000	44.89	-10.55	34.34	54.00	-19.66	Ave Detector
	2500.000	58.55	-10.55	48.00	74.00	-26.00	Peak Detector

Band edge

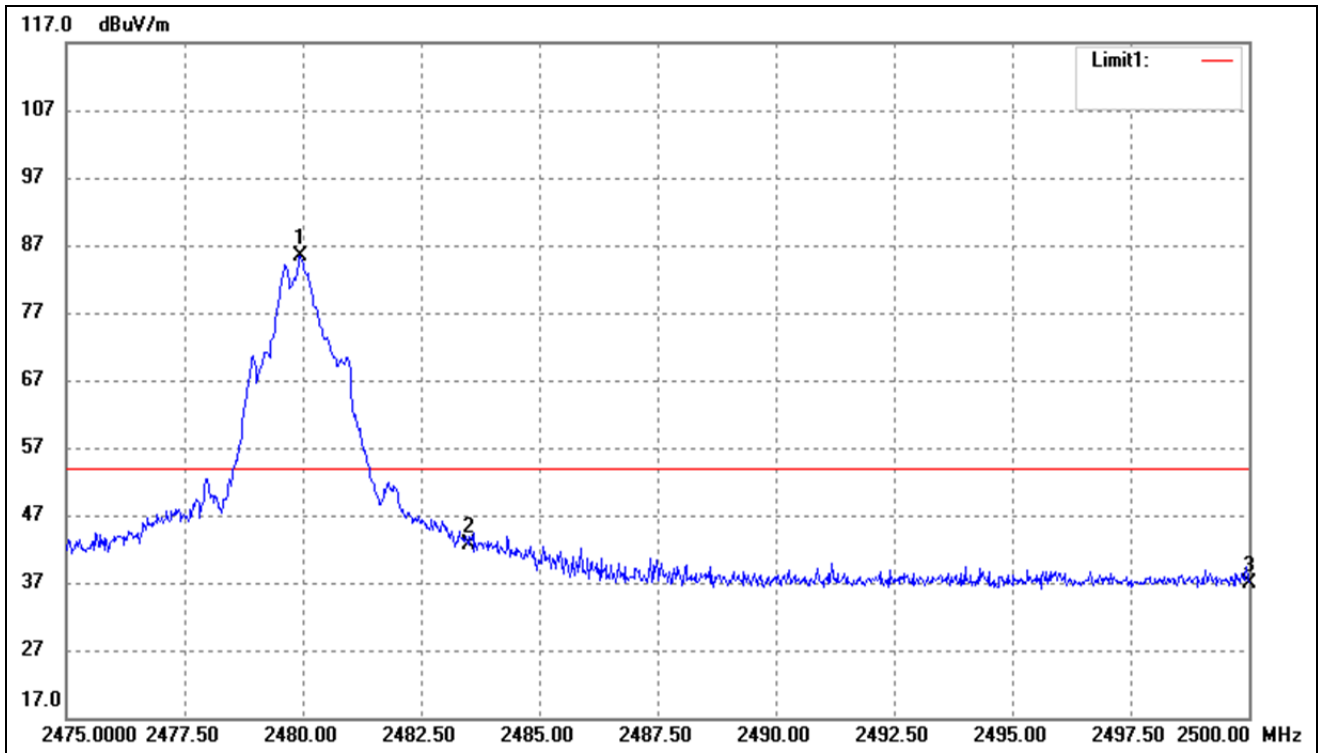
RBW 100kHz VBW 300kHz

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	62.51	-10.69	51.82	54.00	-2.18	Peak Detector
2	2401.955	98.07	-10.69	87.38	/	/	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	2479.950	96.04	-10.58	85.46	/	/	Peak Detector
2	2483.500	53.09	-10.58	42.51	54.00	-11.49	Peak Detector

## 6. Emission Bandwidth

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### 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

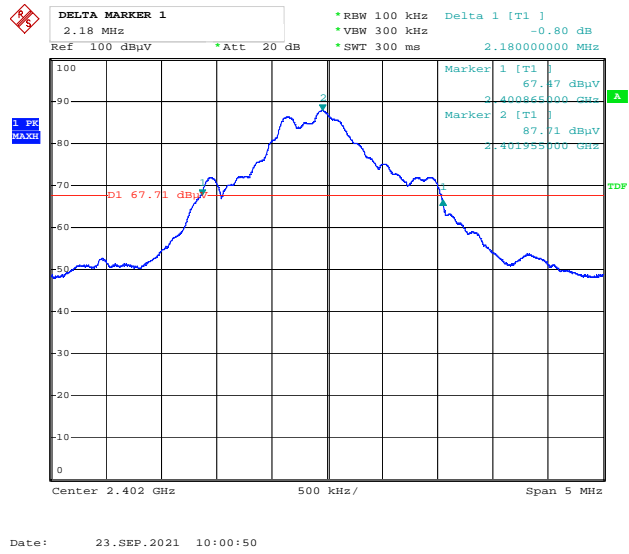
All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

### 6.3 Summary of Test Results/Plots

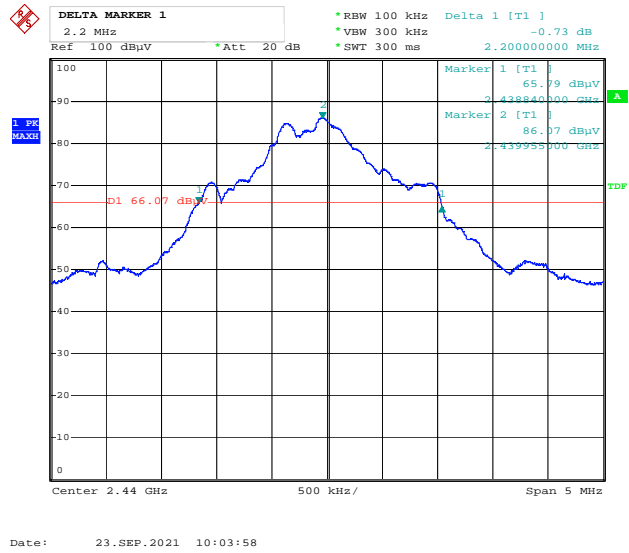
Test Channel	20dB Bandwidth(kHz)
Low Channel	2.18
Middle Channel	2.20
High Channel	2.21

*Please refer to the following test plots:*

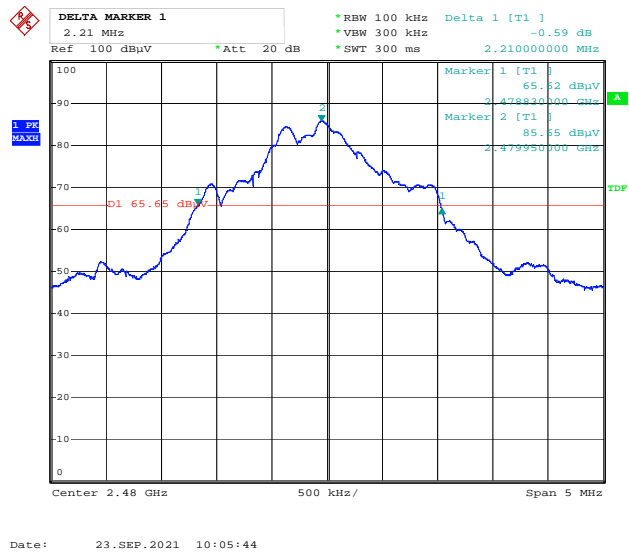
Low Channel



Middle Channel



High Channel



## 7. Conducted Emissions

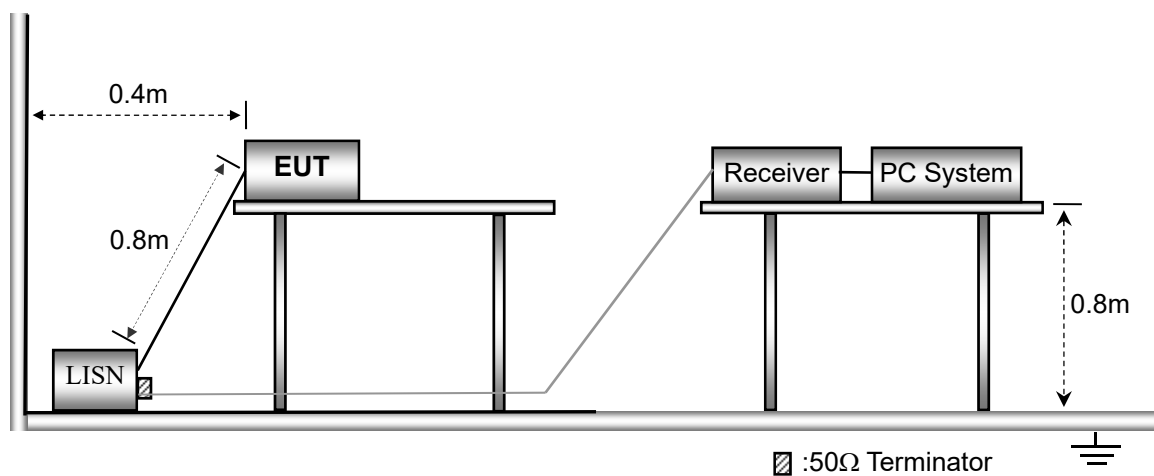
### 7.1 Test Procedure

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

Not applicable

## **APPENDIX PHOTOGRAPHS**

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**Please refer to “ANNEX”**

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