



FCC Part 15C Measurement and Test Report

For

Acrox Technologies Co., Ltd.

4F., No.89, Minshan St., Neihu Dist., Taipei City 114, Taiwan, R.O.C

FCC ID: PRDKB41

FCC Rule(s):	<u>FCC Part 15.249</u>
Product Description:	<u>Wireless Keyboard</u>
Tested Model:	<u>AKR920</u>
Report No.:	<u>WTX20X04019953W</u>
Sample Receipt Date:	<u>Apr.17, 2020</u>
Tested Date:	<u>Apr.17, 2020 to Apr.23, 2020</u>
Issued Date:	<u>Apr.23, 2020</u>
Tested By:	<u>Mike Shi / Engineer</u>
Reviewed By:	<u>Lion Cai / RF Manager</u>
Approved & Authorized By:	<u>Silin Chen / Manager</u>
Prepared By:	

Mike Shi

Lion Cai

Silin Chen

Waltek Testing Group (Shenzhen) Co., Ltd.

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

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Waltek Testing Group (Shenzhen) Co., Ltd.



TABLE OF CONTENTS

1. GENERAL INFORMATION.....4
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....4
1.2 TEST STANDARDS.....5
1.3 TEST METHODOLOGY5
1.4 TEST FACILITY5
1.5 EUT SETUP AND TEST MODE.....6
1.6 MEASUREMENT UNCERTAINTY6
1.7 TEST EQUIPMENT LIST AND DETAILS7

2. SUMMARY OF TEST RESULTS9

3. ANTENNA REQUIREMENTS.....10
3.1 STANDARD APPLICABLE.....10
3.2 TEST RESULT.....10

4. RADIATED EMISSIONS.....11
4.1 STANDARD APPLICABLE.....11
4.2 TEST PROCEDURE.....11
4.3 CORRECTED AMPLITUDE & MARGIN CALCULATION.....13
4.4 SUMMARY OF TEST RESULTS/PLOTS13

5. OUT OF BAND EMISSIONS.....22
5.1 STANDARD APPLICABLE.....22
5.2 TEST PROCEDURE.....22
5.3 SUMMARY OF TEST RESULTS/PLOTS22

6. EMISSION BANDWIDTH.....27
6.1 STANDARD APPLICABLE.....27
6.2 TEST PROCEDURE.....27
6.3 SUMMARY OF TEST RESULTS/PLOTS27

7. CONDUCTED EMISSIONS29
7.1 TEST PROCEDURE.....29
7.2 BASIC TEST SETUP BLOCK DIAGRAM.....29
7.3 TEST RECEIVER SETUP29
7.4 SUMMARY OF TEST RESULTS/PLOTS29



Report version

Version No.	Date of issue	Description
Rev.00	Apr.23, 2020	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Acrox Technologies Co., Ltd.
Address of applicant: 4F., No.89, Minshan St., Neihu Dist., Taipei City 114, Taiwan, R.O.C

Manufacturer: TPV Electronics (Fujian) Co., Ltd.
Address of manufacturer: Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R.China

General Description of EUT	
Product Name:	Wireless Keyboard
Trade Name:	ACER
Model No.:	AKR920
Adding Model(s):	K6G
Rated Voltage:	DC1.5V*2
Battery Capacity	/
Power Adapter Model:	/
Software Version:	A3
Hardware Version:	V1.1
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model AKR920, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	2402MHz-2480MHz
Max. Field Strength:	86.27dBuV/m
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Antenna Type:	PCB Antenna
Antenna Gain:	1.5dBi

1.2 Test Standards

The tests were performed according to following standards:

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

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



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	2440MHz
TM3	High Channel	2480MHz

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
/	/	/	/

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

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	± 1.5%
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB



1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2019-04-30	2020-04-29
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2019-04-30	2020-04-29
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
SEMT-1042	Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2019-05-05	2021-05-04
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2019-04-30	2020-04-29
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2019-04-30	2020-04-29
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2019-05-05	2021-05-04
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2019-04-30	2020-04-29
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2019-04-30	2020-04-29
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2019-04-30	2020-04-29
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2020-03-17	2021-03-16
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2020-03-17	2021-03-16
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2020-03-17	2021-03-16
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2020-03-17	2021-03-16
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2020-03-17	2021-03-16
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2020-03-17	2021-03-16



Software List			
Description	Manufacturer	Model	Version
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

FCC Rules	Description of Test Item	Result
§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

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)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

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

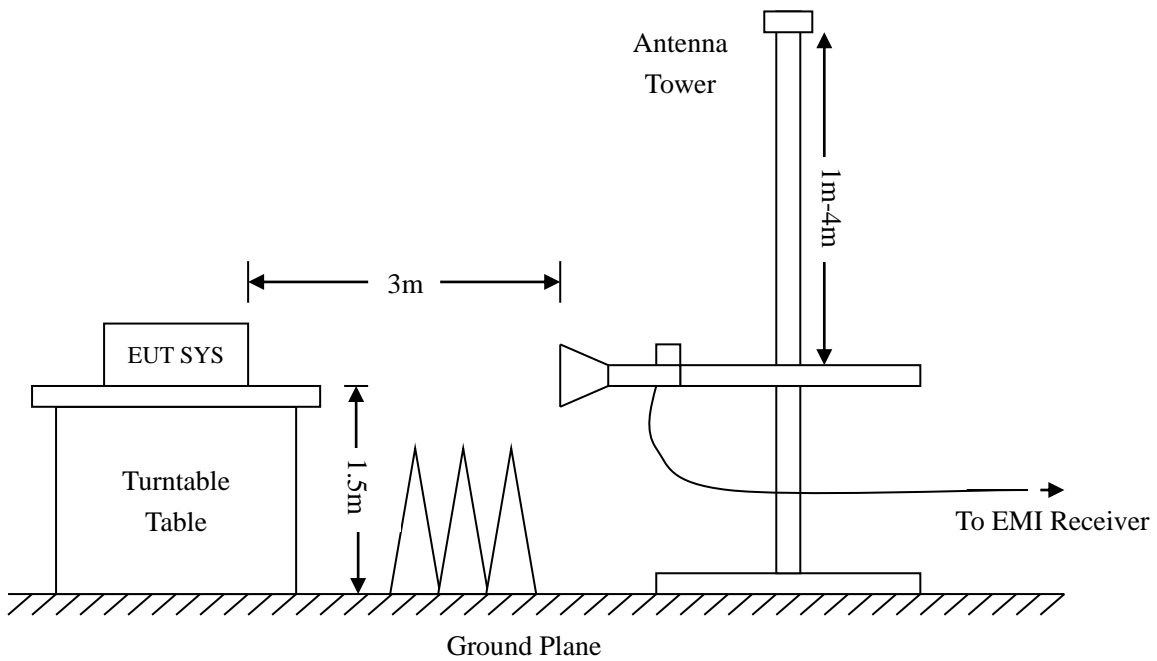
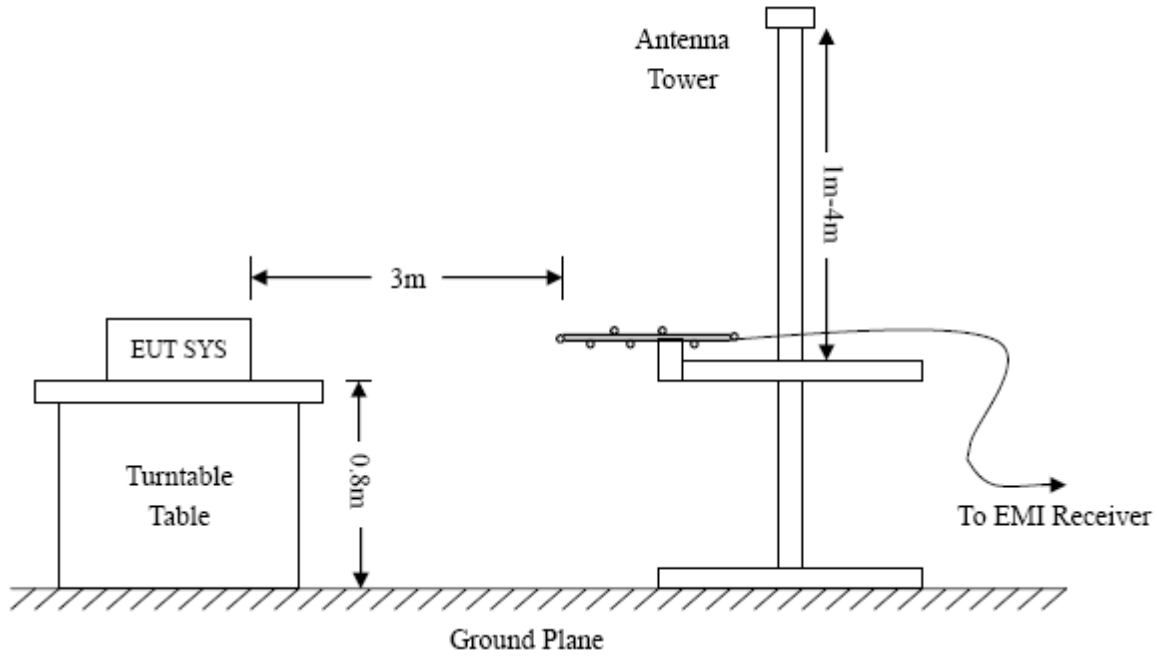
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

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 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



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

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

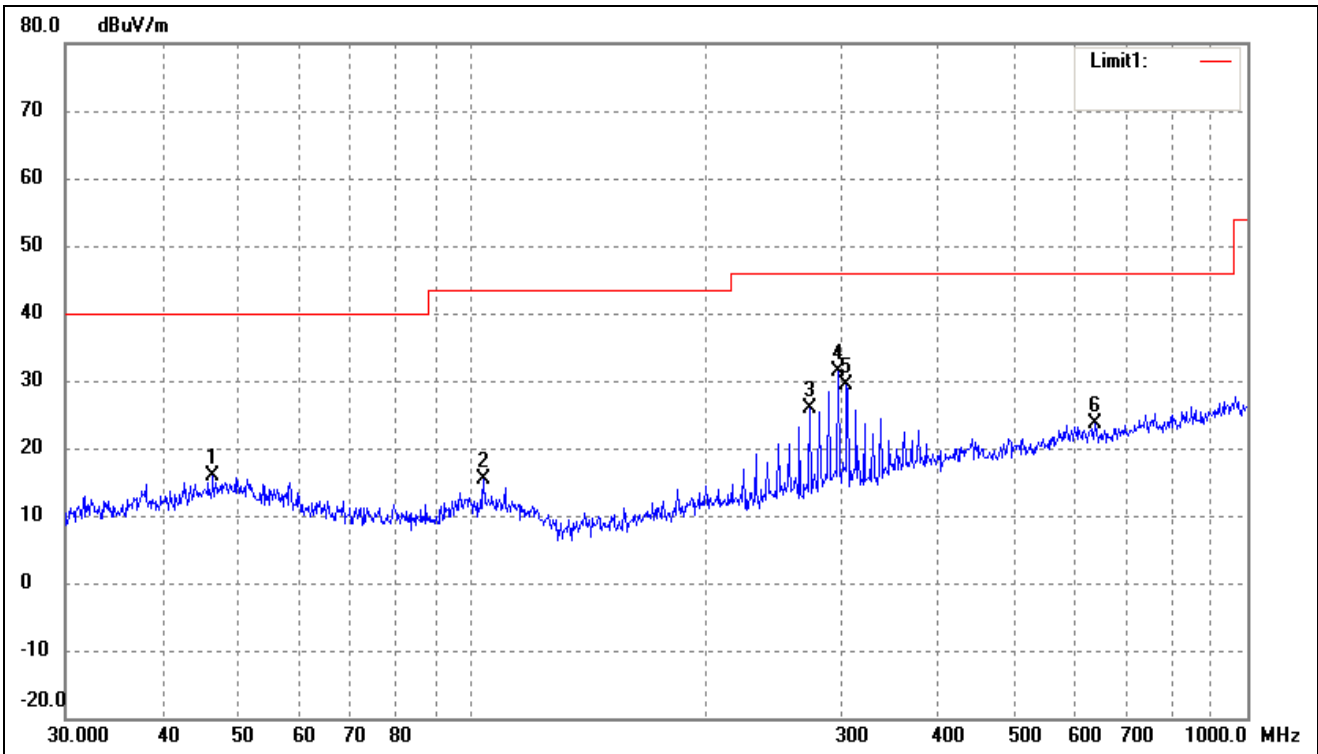
4.4 Summary of Test Results/Plots

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



➤ Spurious Emissions Below 1GHz

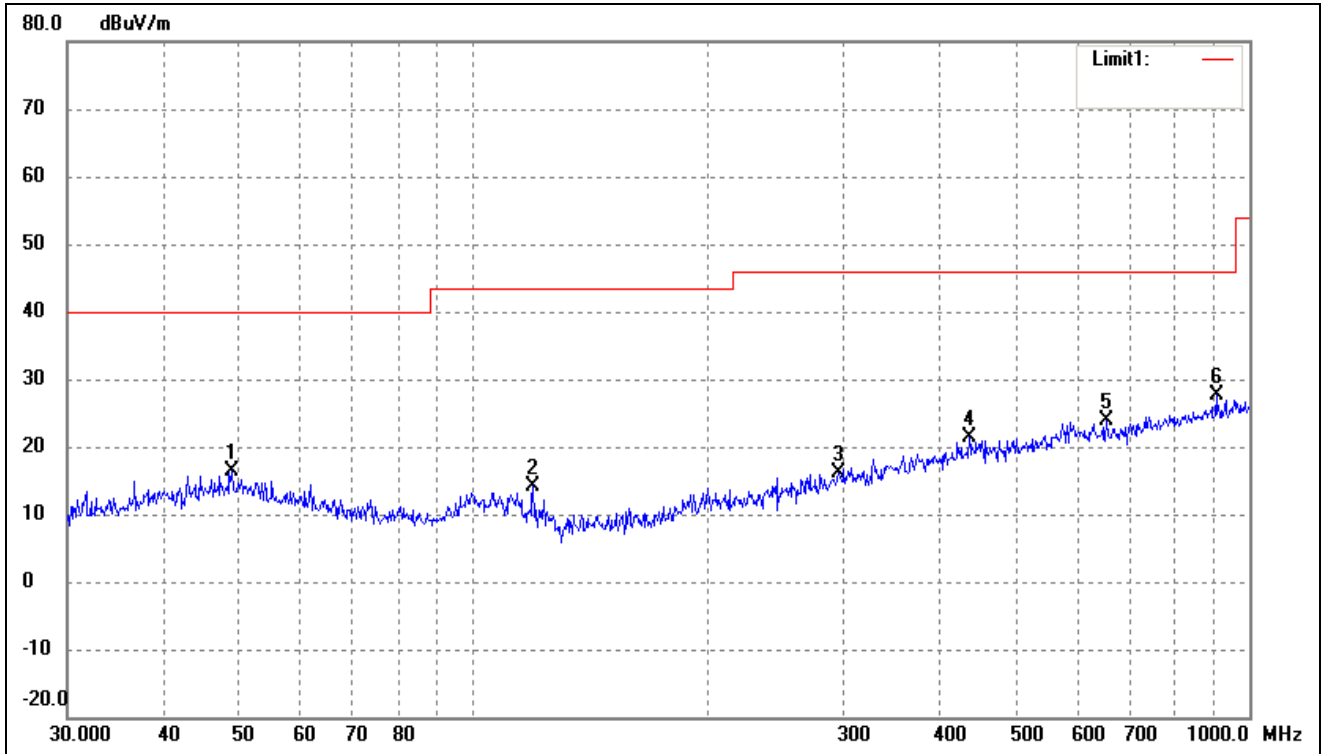
Test Channel	Low	Polarity:	Horizontal
--------------	-----	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.5030	27.03	-11.23	15.80	40.00	-24.20	-	-	peak
2	103.8055	28.44	-13.12	15.32	43.50	-28.18	-	-	peak
3	273.2341	36.34	-10.58	25.76	46.00	-20.24	-	-	peak
4	297.2241	40.68	-9.38	31.30	46.00	-14.70	-	-	peak
5	304.6100	38.71	-9.26	29.45	46.00	-16.55	-	-	peak
6	636.1340	27.84	-4.17	23.67	46.00	-22.33	-	-	peak



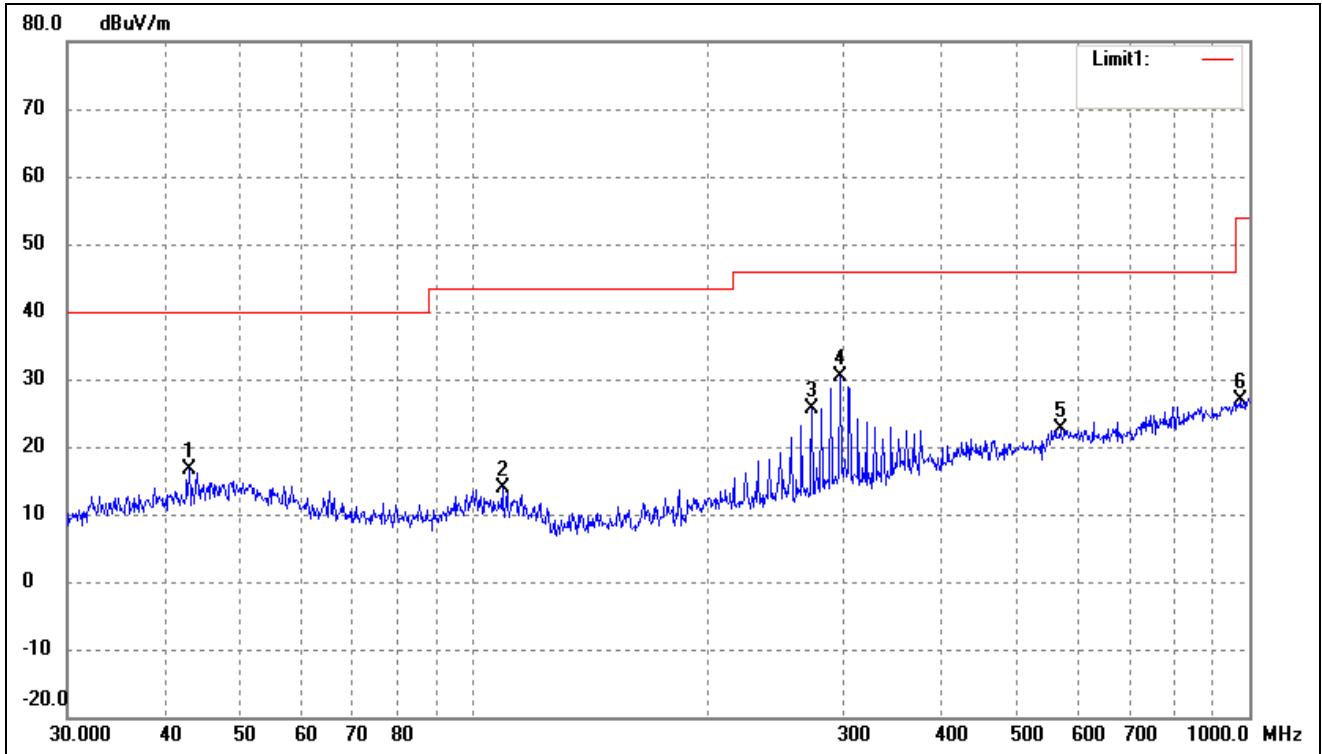
Test Channel	Low	Polarity:	Vertical
--------------	-----	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	48.8429	27.57	-11.07	16.50	40.00	-23.50	-	-	peak
2	119.4361	28.22	-14.08	14.14	43.50	-29.36	-	-	peak
3	295.1469	25.63	-9.48	16.15	46.00	-29.85	-	-	peak
4	435.5898	27.70	-6.20	21.50	46.00	-24.50	-	-	peak
5	654.2318	28.00	-4.23	23.77	46.00	-22.23	-	-	peak
6	906.4824	28.15	-0.47	27.68	46.00	-18.32	-	-	peak



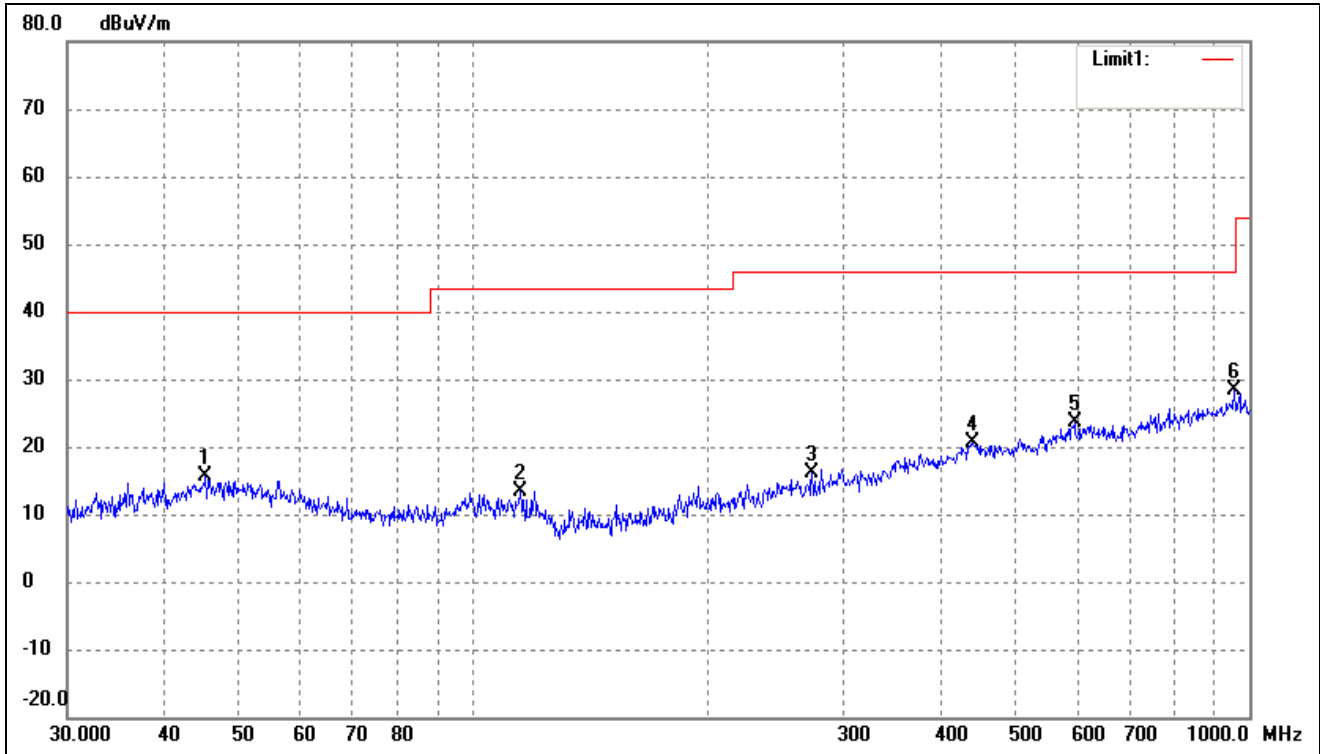
Test Channel	Middle	Polarity:	Horizontal
--------------	--------	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	43.0505	28.34	-11.80	16.54	40.00	-23.46	-	-	peak
2	109.0286	26.86	-13.03	13.83	43.50	-29.67	-	-	peak
3	273.2341	36.13	-10.58	25.55	46.00	-20.45	-	-	peak
4	297.2241	39.85	-9.38	30.47	46.00	-15.53	-	-	peak
5	570.6100	27.08	-4.49	22.59	46.00	-23.41	-	-	peak
6	975.7529	26.67	0.31	26.98	54.00	-27.02	-	-	peak



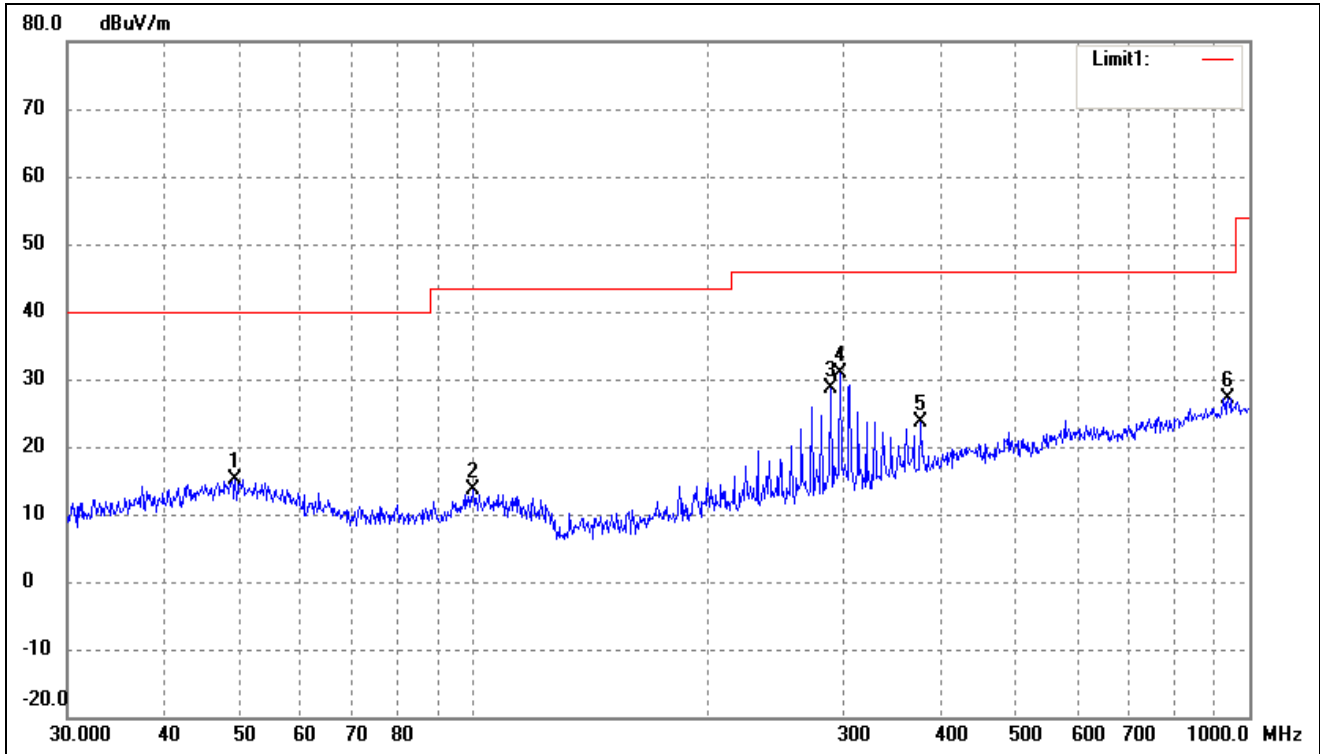
Test Channel	Middle	Polarity:	Vertical
--------------	--------	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.2166	26.95	-11.33	15.62	40.00	-24.38	-	-	peak
2	114.9169	26.94	-13.58	13.36	43.50	-30.14	-	-	peak
3	273.2341	26.60	-10.58	16.02	46.00	-29.98	-	-	peak
4	440.1963	26.76	-6.20	20.56	46.00	-25.44	-	-	peak
5	595.1329	27.71	-4.06	23.65	46.00	-22.35	-	-	peak
6	955.4381	28.17	0.13	28.30	46.00	-17.70	-	-	peak



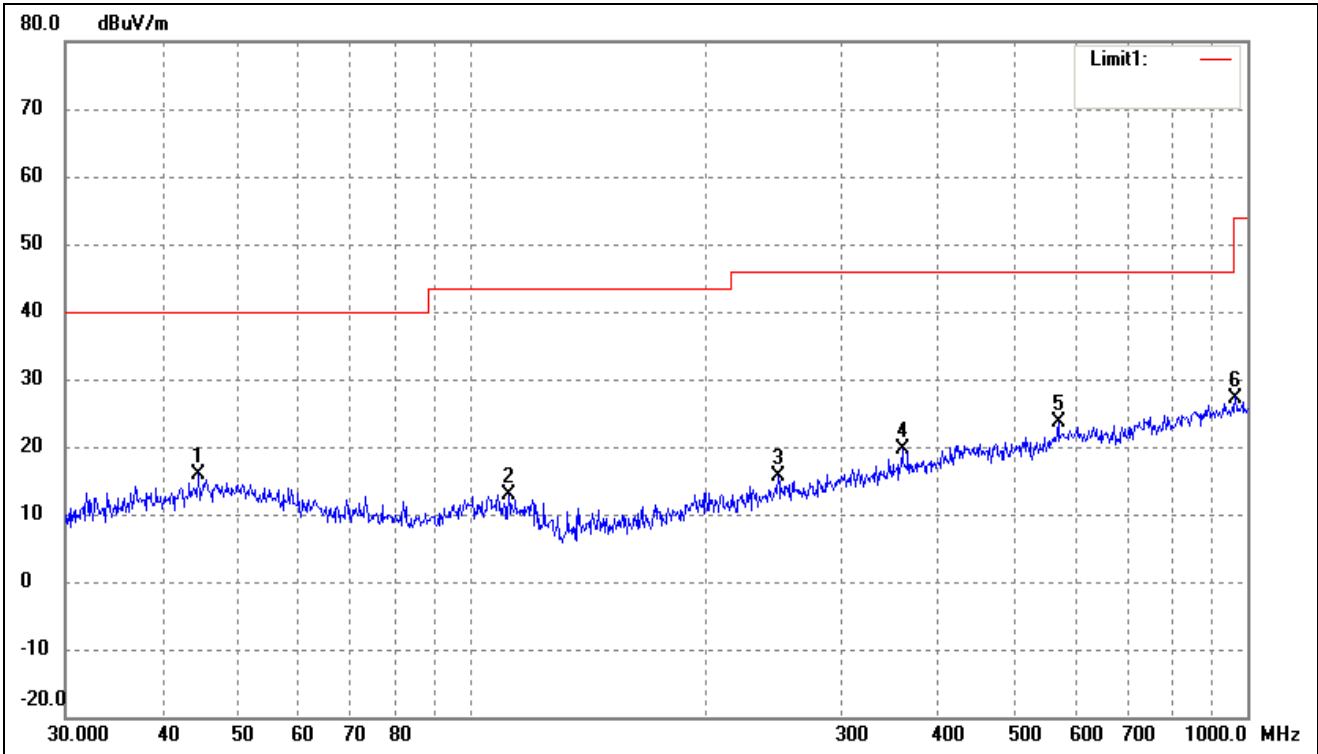
Test Channel	High	Polarity:	Horizontal
--------------	------	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.3594	26.23	-11.04	15.19	40.00	-24.81	-	-	peak
2	99.8777	26.85	-13.21	13.64	43.50	-29.86	-	-	peak
3	289.0021	38.33	-9.81	28.52	46.00	-17.48	-	-	peak
4	297.2241	40.20	-9.38	30.82	46.00	-15.18	-	-	peak
5	377.2591	31.25	-7.57	23.68	46.00	-22.32	-	-	peak
6	938.8326	27.12	-0.03	27.09	46.00	-18.91	-	-	peak



Test Channel	High	Polarity:	Vertical
--------------	------	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	44.5868	27.19	-11.43	15.76	40.00	-24.24	-	-	peak
2	111.7380	26.09	-13.21	12.88	43.50	-30.62	-	-	peak
3	248.5519	26.67	-11.06	15.61	46.00	-30.39	-	-	peak
4	359.1860	27.64	-7.89	19.75	46.00	-26.25	-	-	peak
5	570.6100	28.17	-4.49	23.68	46.00	-22.32	-	-	peak
6	965.5421	27.03	0.22	27.25	54.00	-26.75	-	-	peak

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



Spurious Emissions Above 1GHz

Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2402MHz							
2402	93.91	-9.47	84.44	114	-29.56	H	PK
2402	93.12	-9.47	83.65	94	-10.35	H	AV
4804	64.52	-5.87	58.65	74	-15.35	H	PK
4804	46.72	-5.87	40.85	54	-13.15	H	AV
7206	50.06	-0.54	49.52	74	-24.48	H	PK
7206	42.12	-0.54	41.58	54	-12.42	H	AV
2402	86.74	-9.47	77.27	114	-36.73	V	PK
2402	84.25	-9.47	74.78	94	-19.22	V	AV
4804	64.1	-5.87	58.23	74	-15.77	V	PK
4804	44.69	-5.87	38.82	54	-15.18	V	AV
7206	48.17	-0.54	47.63	74	-26.37	V	PK
7206	39.5	-0.54	38.96	54	-15.04	V	AV
Middle Channel-2440MHz							
2440	94.87	-9.39	85.48	114	-28.52	H	PK
2440	94.02	-9.39	84.63	94	-9.37	H	AV
4880	65.45	-5.43	60.02	74	-13.98	H	PK
4880	46.55	-5.43	41.12	54	-12.88	H	AV
7320	50.74	-0.61	50.13	74	-23.87	H	PK
7320	40.07	-0.61	39.46	54	-14.54	H	AV
2440	85.19	-9.39	75.8	114	-38.2	V	PK
2440	85.11	-9.39	75.72	94	-18.28	V	AV
4880	62.87	-5.43	57.44	74	-16.56	V	PK
4880	43.52	-5.43	38.09	54	-15.91	V	AV
7320	45.44	-0.61	44.83	74	-29.17	V	PK
7320	40.4	-0.61	39.79	54	-14.21	V	AV



Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
High Channel-2480MHz							
2480	92.88	-9.32	83.56	114	-30.44	H	PK
2480	92.08	-9.32	82.76	94	-11.24	H	AV
4960	63.87	-5.52	58.35	74	-15.65	H	PK
4960	45.67	-5.52	40.15	54	-13.85	H	AV
7440	53.48	-0.68	52.80	74	-21.20	H	PK
7440	39.78	-0.68	39.10	54	-14.90	H	AV
2480	87.95	-9.32	78.63	114	-35.37	V	PK
2480	86.29	-9.32	76.97	94	-17.03	V	AV
4960	61.14	-5.52	55.62	74	-18.38	V	PK
4960	43.09	-5.52	37.57	54	-16.43	V	AV
7440	49.42	-0.68	48.74	74	-25.26	V	PK
7440	40.61	-0.68	39.93	54	-14.07	V	AV

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 50 dB 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	<54 dBuV	Pass
	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
Highest	2483.50	<54 dBuV	Pass
	2500.00	<54 dBuV	Pass

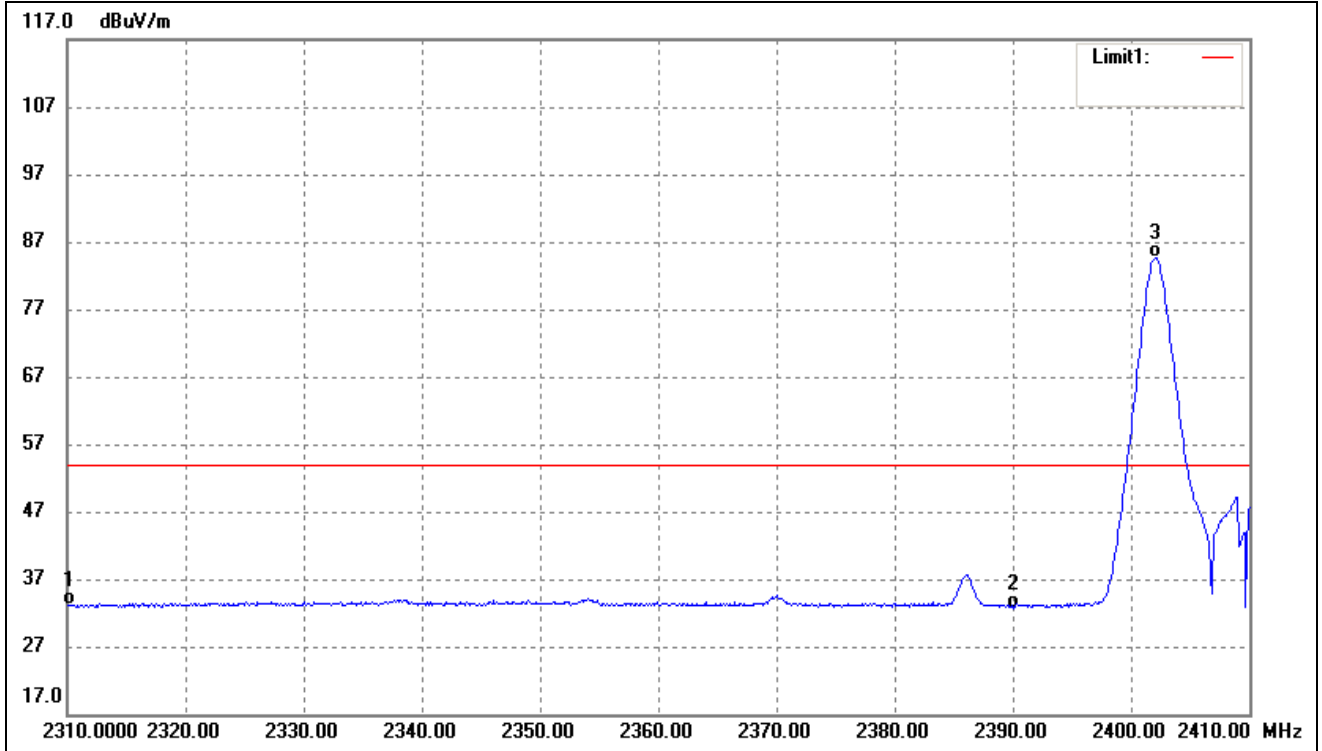
The edge emissions are below the FCC 15.209 Limits or complies with the 15.249 requirements.

Please refer to the test plots as below.



➤ Restricted Band

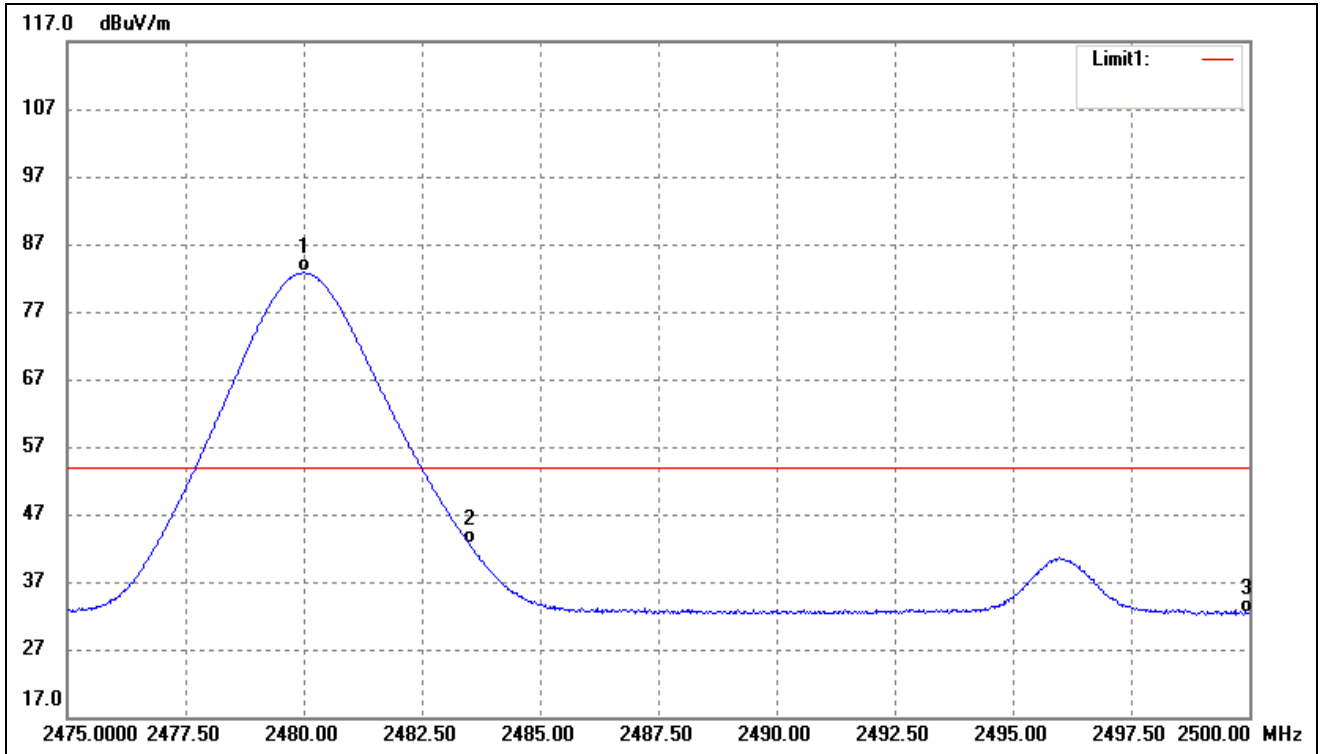
Test Channel	Low	Polarity:	Horizontal (worst case)
--------------	-----	-----------	-------------------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	42.82	-9.66	33.16	54.00	-20.84	Ave Detector
	2310.000	53.88	-9.66	44.22	74.00	-29.78	Peak Detector
2	2390.000	42.24	-9.50	32.74	54.00	-21.26	Ave Detector
	2390.000	53.09	-9.50	43.59	74.00	-30.41	Peak Detector
3	2402.100	94.17	-9.47	84.70	/	/	Ave Detector
	2402.300	94.90	-9.47	85.43	/	/	Peak Detector



Test Channel	High	Polarity:	Horizontal (worst case)
--------------	------	-----------	-------------------------



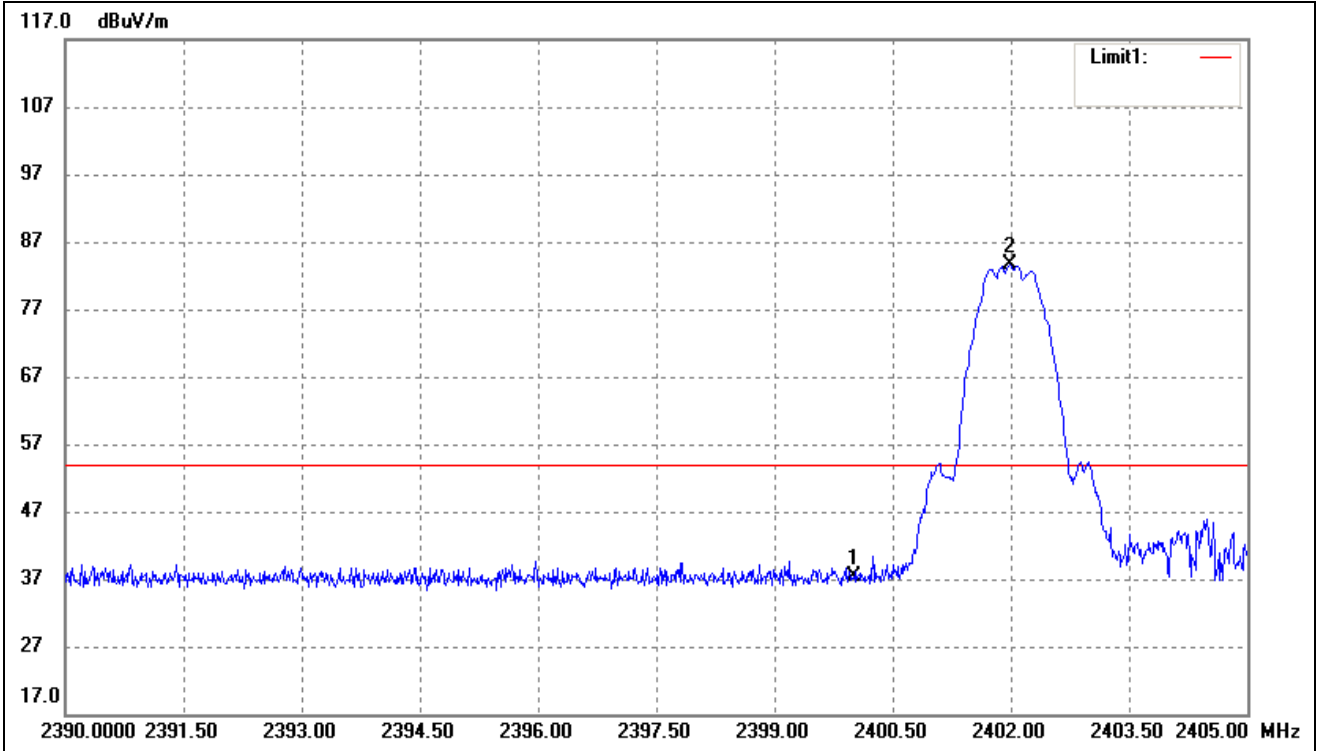
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.000	92.08	-9.32	82.76	/	/	Ave Detector
	2480.275	92.88	-9.32	83.56	/	/	Peak Detector
2	2483.500	51.99	-9.31	42.68	54.00	-11.32	Ave Detector
	2483.500	57.98	-9.31	48.67	74.00	-25.33	Peak Detector
3	2500.000	41.67	-9.28	32.39	54.00	-21.61	Ave Detector
	2500.000	53.05	-9.28	43.77	74.00	-30.23	Peak Detector



➤ Band edge

RBW:100kHz VBW:300kHz

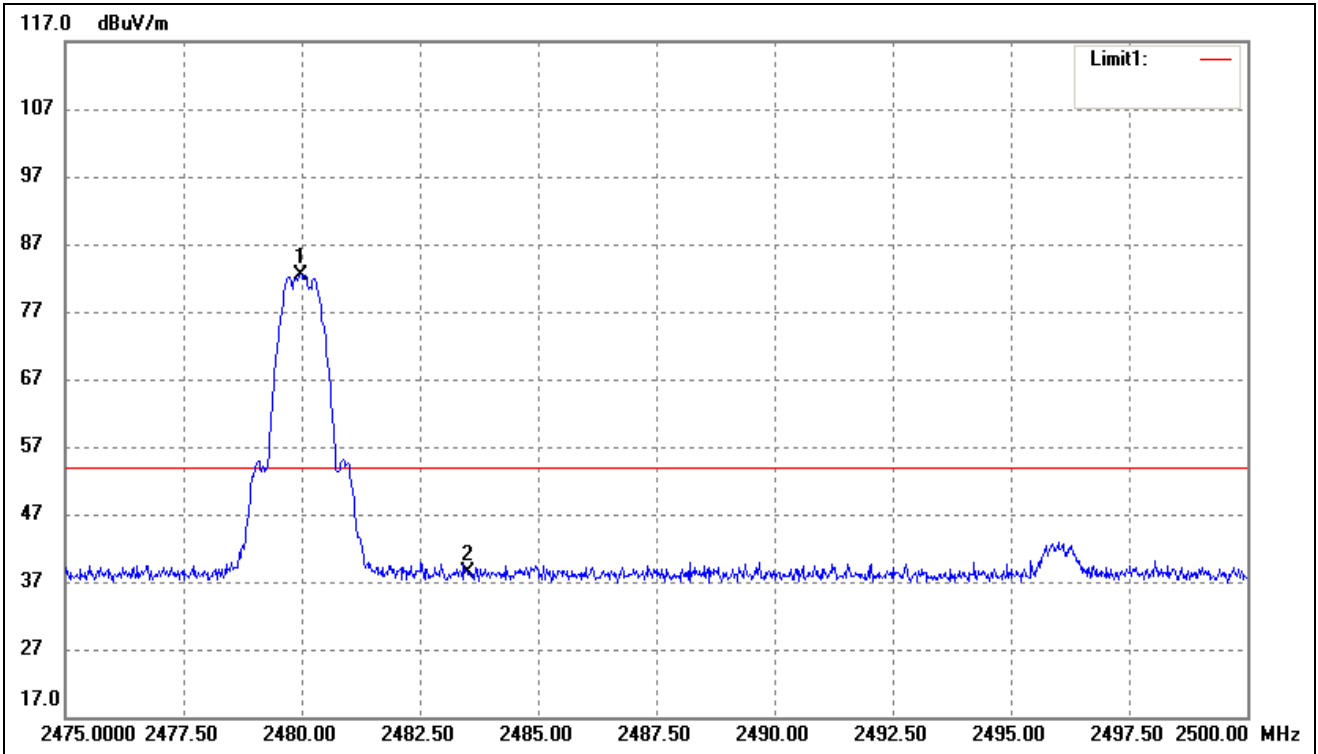
Test Channel	Low	Polarity:	Horizontal (worst case)
--------------	-----	-----------	-------------------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2400.000	46.78	-9.48	37.30	54.00	-16.70	Peak Detector
2	2401.985	93.07	-9.47	83.60	/	/	Peak Detector



Test Channel	High	Polarity:	Horizontal (worst case)
--------------	------	-----------	-------------------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.975	91.82	-9.32	82.50	/	/	Peak Detector
2	2483.500	47.68	-9.31	38.37	54.00	-15.63	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 20 dB 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

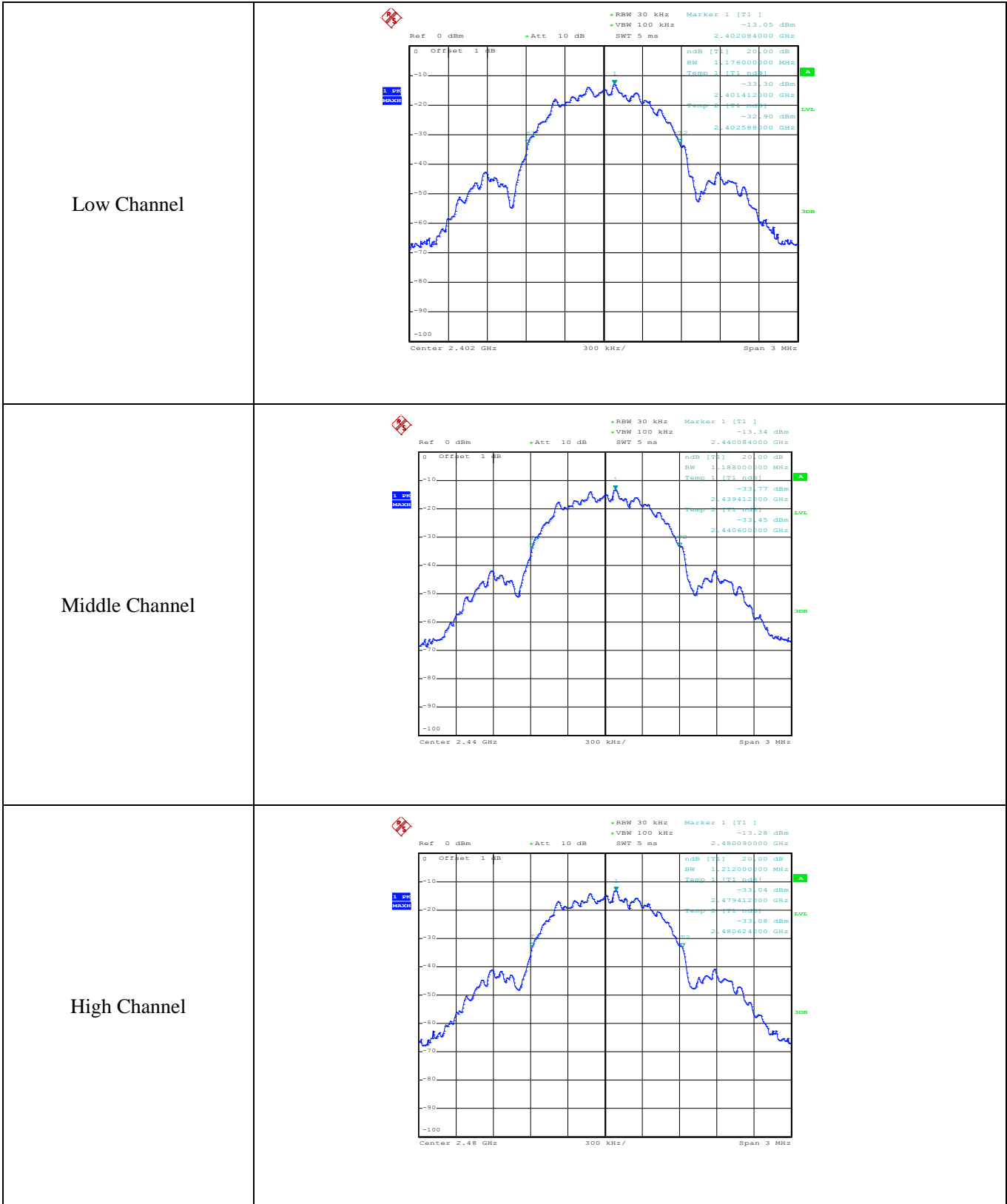
Trace = max hold

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	1.18
Middle Channel	1.19
High Channel	1.21

Please refer to the following test plots



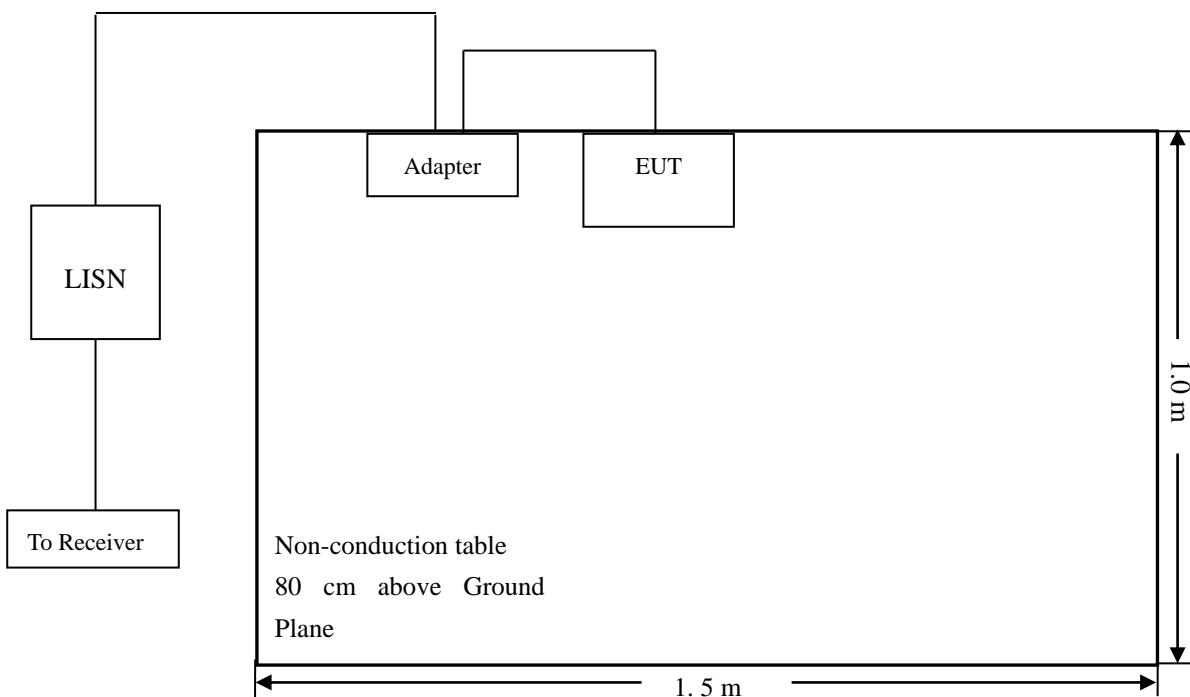
7. Conducted Emissions

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 40 cm long in the middle. The spacing between the peripherals was 10 cm.

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

7.4 Summary of Test Results/Plots

Not applicable. The EUT is powered by two DC batteries (AAA batteries), so AC power line conducted test is not applicable.

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