



TEST REPORT

Reference No...... : WTX20X08053579W
FCC ID Number : FCC ID: 2AO3LB1347R24G
Applicant..... : MTMS (HK) LIMITED
Room 1306, Block B, Veristrong Industrial Centre,
Address..... : No. 34-36 Au Pui Wan Street, Fo Tan, New Territories,
Hong Kong
Product Description : 2.4 GHz Radio Control Vehicle - TX Portion
Product Name : Mini Car
Tested Model : B1347
Rule(s)/Standard(s)..... : Part 15.249 of the FCC Rules
Received Date of Sample(s) : Aug. 07, 2020
.....
Sample ID..... : WTX20X08053579W
Tested Date : Aug. 07, 2020 to Aug. 10, 2020
Issued Date..... : Aug. 10, 2020
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:**Waltek Testing Group (Shenzhen) Co., Ltd.**

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Report Version

Version No.	Date of Issue	Description
Rev.00	Aug. 10, 2020	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: MTMS (HK) LIMITED
Address of applicant: Room 1306, Block B, Veristrong Industrial Centre,
No. 34-36 Au Pui Wan Street, Fo Tan, New Territories,
Hong Kong

Manufacturer: MTMS (HK) LIMITED
Address of manufacturer: Room 1306, Block B, Veristrong Industrial Centre,
No. 34-36 Au Pui Wan Street, Fo Tan, New Territories,
Hong Kong

General Description of EUT	
Product Description:	2.4 GHz Radio Control Vehicle - TX Portion
Product Name:	Mini Car
Tested Brand Name/Trade Name:	/
Tested Model #/Item Number:	B1347
Adding Model #/Item Number(s):	B1350, B1351, B1352, B1354, B1355, B1118, B1322, B1166, B1236, B1314 [All Adding Brand Name(s)/Trade Name(s) and Model #/Item Number(s) is/are same electrically identical as Tested Brand Name/Trade Name and Tested Model #/Item Number]
Power Source:	DC 3.7V (1 unit of Built-in DC 3.7V 70mAh 0.26Wh Rechargeable Li-ion Battery)
Battery Capacity	70 mAh
Power Adapter Model:	/
<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 B1347, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	2420.00-2462.00 MHz
Max. Field Strength:	77.00 dBuV/m
Modulation:	GFSK
Lowest Internal Frequency:	16 MHz
Highest Internal Frequency:	2462 MHz
Antenna Type:	Fixed 30mm-long (1.0mm-diameter) black wire antenna
Antenna Gain:	0 dBi

1.2 Test Standards

The tests were performed according to following standards:

Part 15.249 of the FCC Rules: 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

Test laboratory

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

Address: 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, 518101, China

Federal Communications Commission (FCC) - Test Firm Registration Number: 125990

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

Innovation, Science and Economic Development Canada (ISED) - ISED#/Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada (ISED) for radio equipment testing with CAB identifier: CN0057 and ISED#/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:

Test Mode List		
Test Mode	Description	Remark
TM1	Lowest Channel	2420 MHz
TM2	Near Middle Channel	2441 MHz
TM3	Highest Channel	2462 MHz

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	$\pm 0.42\text{dB}$
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 $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2020-04-28	2021-04-27
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2020-04-28	2021-04-27
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2020-04-28	2021-04-27
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2020-04-28	2021-04-27
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2020-04-28	2021-04-27
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	Schwarz beck	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	2020-04-28	2021-04-27
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2020-04-28	2021-04-27
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2020-04-28	2021-04-27
SEMT-1168	Pre-amplifier (0.1-26.5GHz)	Direction Systems Inc.	PAP-0126	14141-12838	2020-04-28	2021-04-27
SEMT-1169	Pre-amplifier (26-40GHz)	Direction Systems Inc.	PAP-2640	14145-14153	2020-04-28	2021-04-27
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2020-04-28	2021-04-27
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2019-05-05	2021-05-04
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2020-04-28	2021-04-27
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2020-04-28	2021-04-27
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2020-04-28	2021-04-27
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 Emissions)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emissions)*	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
Part 15.203 of the FCC Rules	Antenna Requirement	Compliant
Part 15.205 of the FCC Rules	Restricted Band of Operation	Compliant
Part 15.207(a) of the FCC Rules	Conducted Emissions	N/A
Part 15.209(a)(f) of the FCC Rules	Radiated Spurious Emissions	Compliant
Part 15.249(a) of the FCC Rules	Field Strength of Emissions	Compliant
Part 15.249(d) of the FCC Rules	Out of Band Emission	Compliant
Part 15.215(c) of the FCC Rules	Emission Bandwidth	Compliant

N/A: Not Applicable

3. Antenna Requirements

3.1 Standard Applicable

According to Part 15.203 of the FCC Rules, 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 an Integral antenna, fulfill the requirement of this section.

4. Radiated Emissions

4.1 Standard Applicable

According to Part 15.249(a) of the FCC Rules, 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.

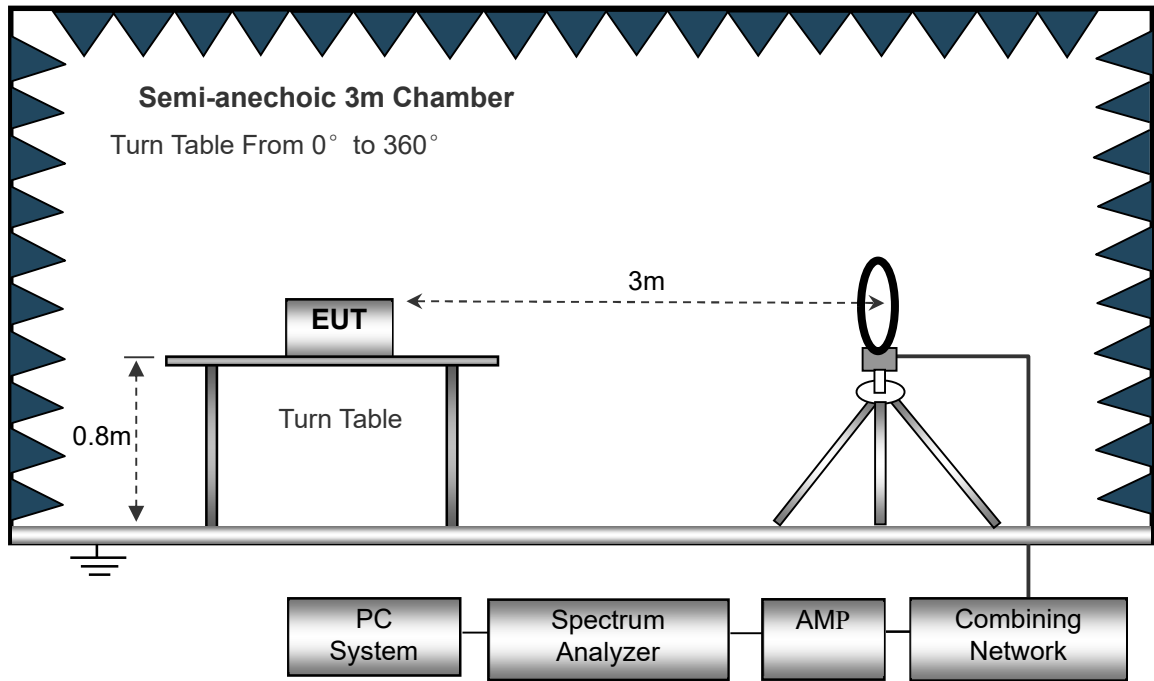
4.2 Test Procedure

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

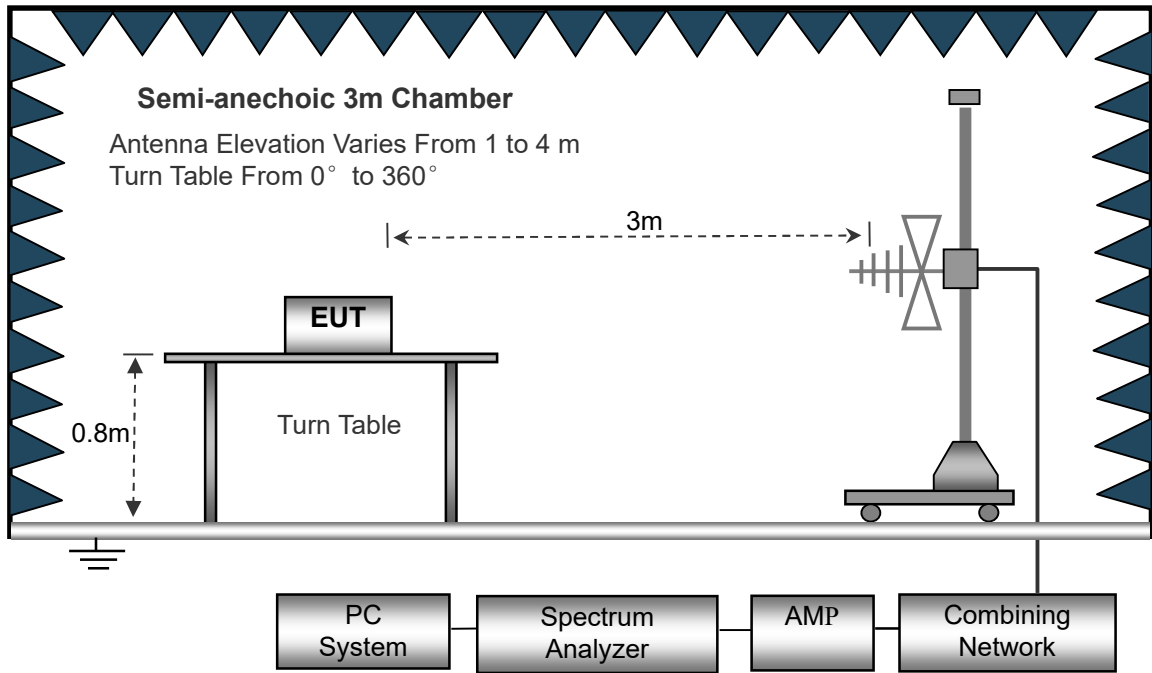
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

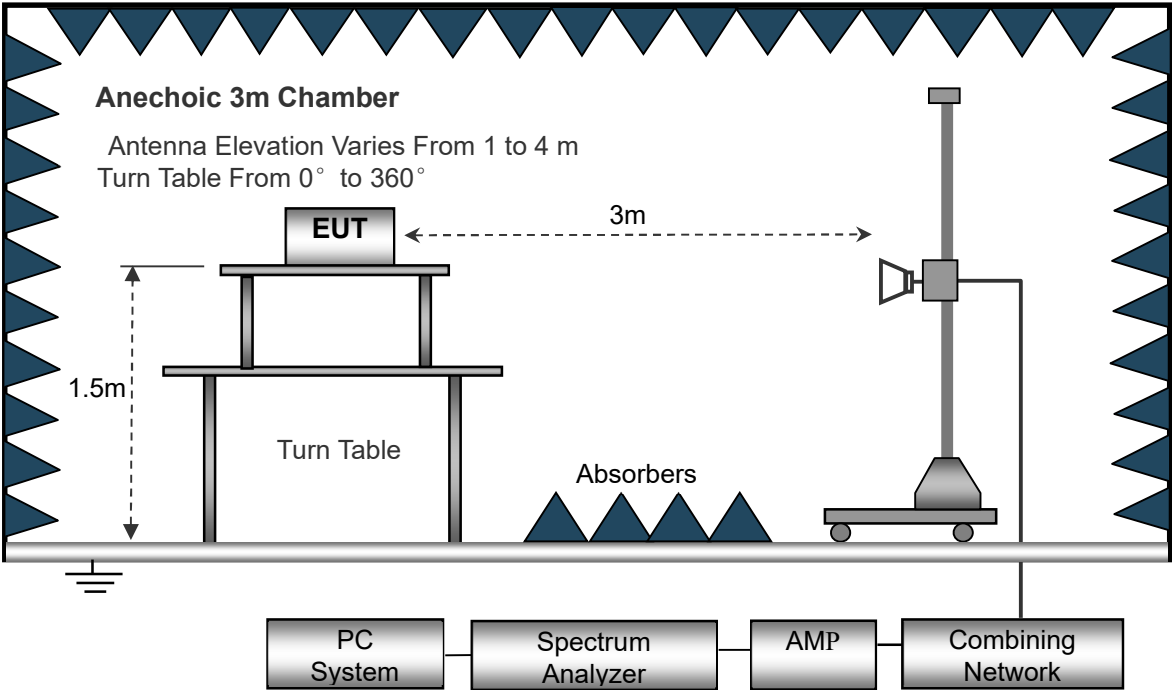
The test setup for emission measurement below 30 MHz.



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



The test setup for emission measurement above 1 GHz.



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:

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

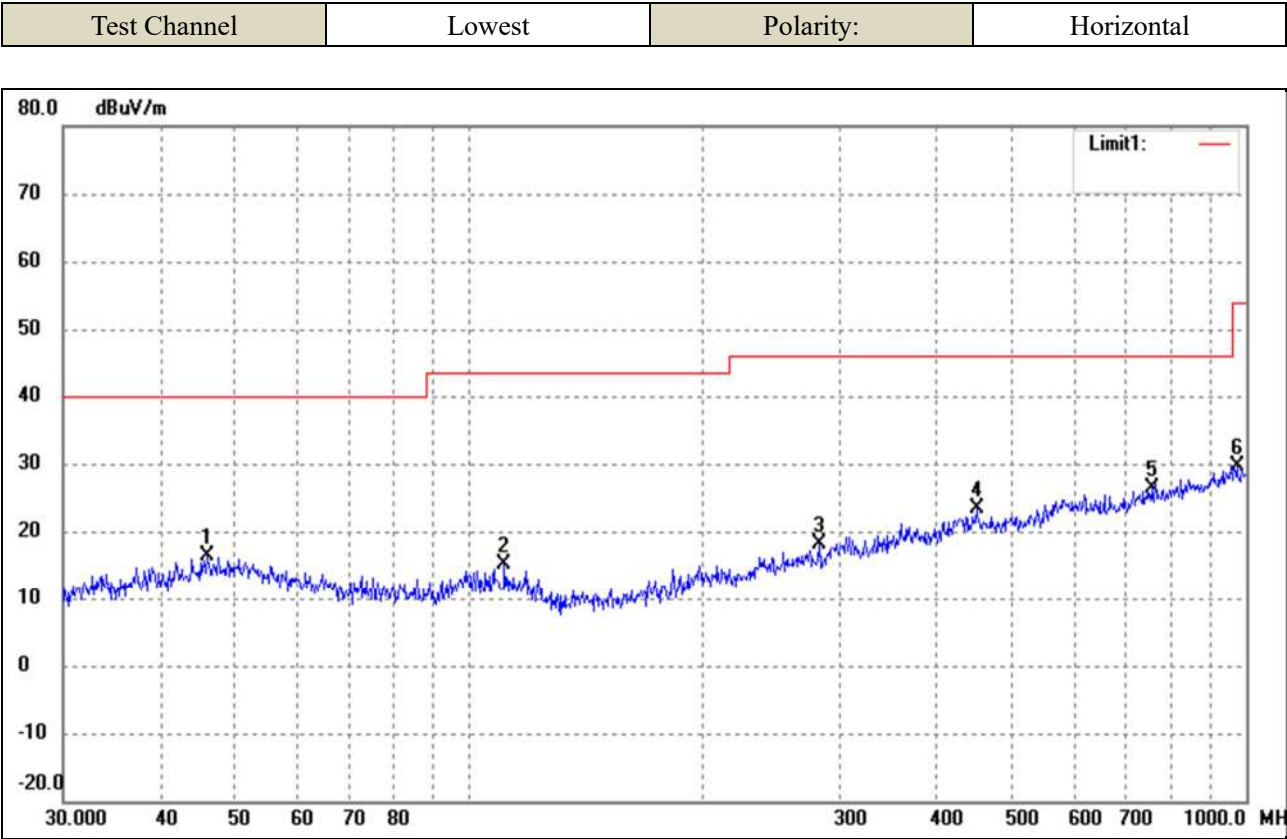
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

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

4.4 Summary of Test Results/Plots

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

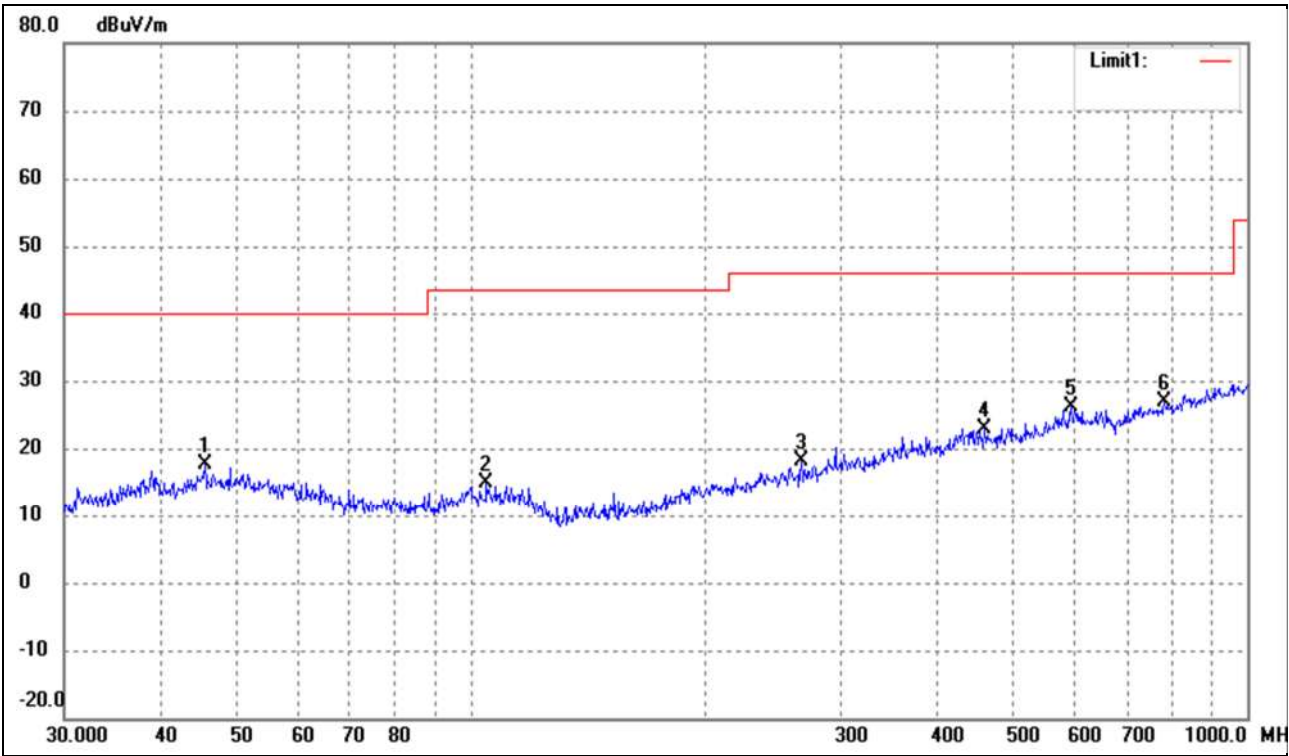
➤ Spurious Emissions Below 1GHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	46.0164	26.83	-10.49	16.34	40.00	-23.66	-	-	peak
2	110.9571	27.32	-12.25	15.07	43.50	-28.43	-	-	peak
3	281.9946	26.44	-8.29	18.15	46.00	-27.85	-	-	peak
4	449.5558	27.94	-4.58	23.36	46.00	-22.64	-	-	peak
5	755.3873	27.10	-0.81	26.29	46.00	-19.71	-	-	peak
6	972.3374	26.95	2.68	29.63	54.00	-24.37	-	-	peak

Remark: ‘-’ means the test at Degree and Height are not recorded by the test software and only show the worst case in the test report.

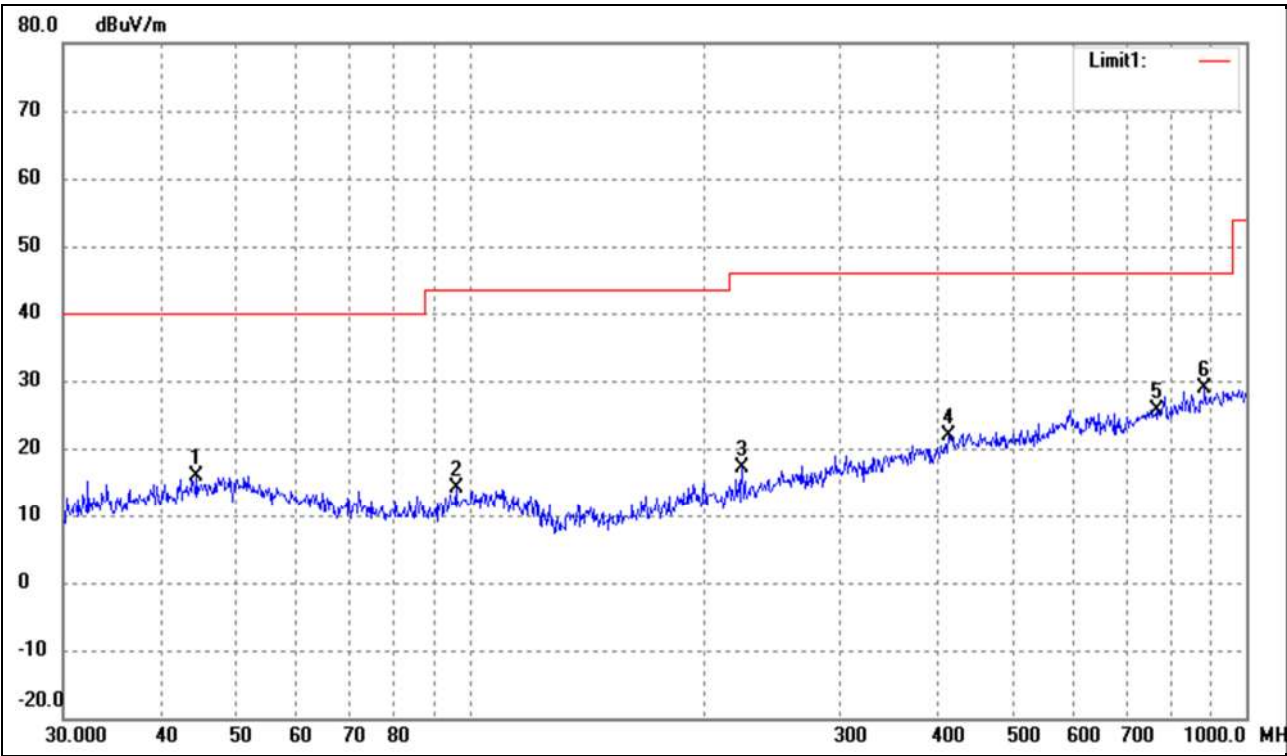
Test Channel	Lowest	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	45.5348	28.26	-10.53	17.73	40.00	-22.27	-	-	peak
2	104.9033	27.04	-12.27	14.77	43.50	-28.73	-	-	peak
3	266.6089	27.02	-8.91	18.11	46.00	-27.89	-	-	peak
4	459.1144	27.80	-4.81	22.99	46.00	-23.01	-	-	peak
5	593.0497	28.53	-2.35	26.18	46.00	-19.82	-	-	peak
6	782.3453	27.35	-0.55	26.80	46.00	-19.20	-	-	peak

Remark: ‘-’ means the test at Degree and Height are not recorded by the test software and only show the worst case in the test report.

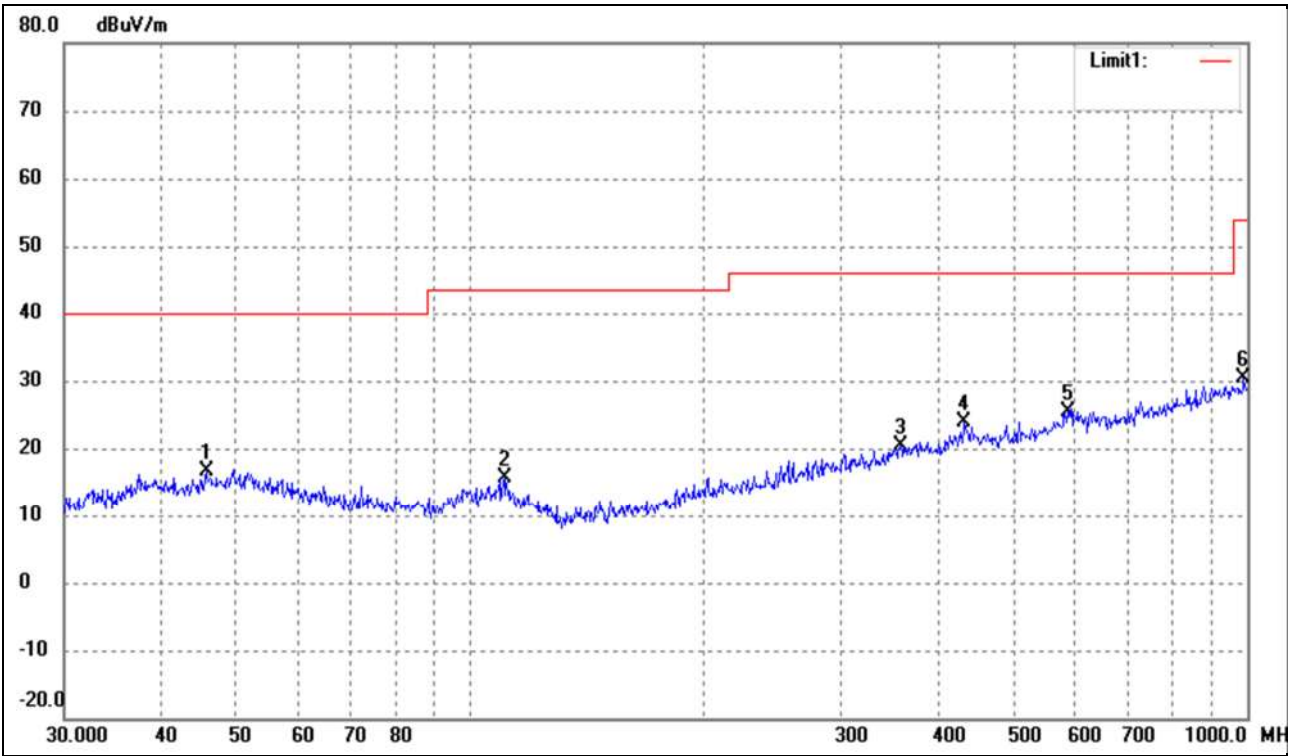
Test Channel	Near Middle	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	44.5868	26.65	-10.66	15.99	40.00	-24.01	-	-	peak
2	96.0986	27.27	-13.17	14.10	43.50	-29.40	-	-	peak
3	224.5193	27.90	-10.77	17.13	46.00	-28.87	-	-	peak
4	413.2706	26.93	-4.99	21.94	46.00	-24.06	-	-	peak
5	768.7482	26.34	-0.67	25.67	46.00	-20.33	-	-	peak
6	884.5029	27.66	1.26	28.92	46.00	-17.08	-	-	peak

Remark: ‘-’ means the test at Degree and Height are not recorded by the test software and only show the worst case in the test report.

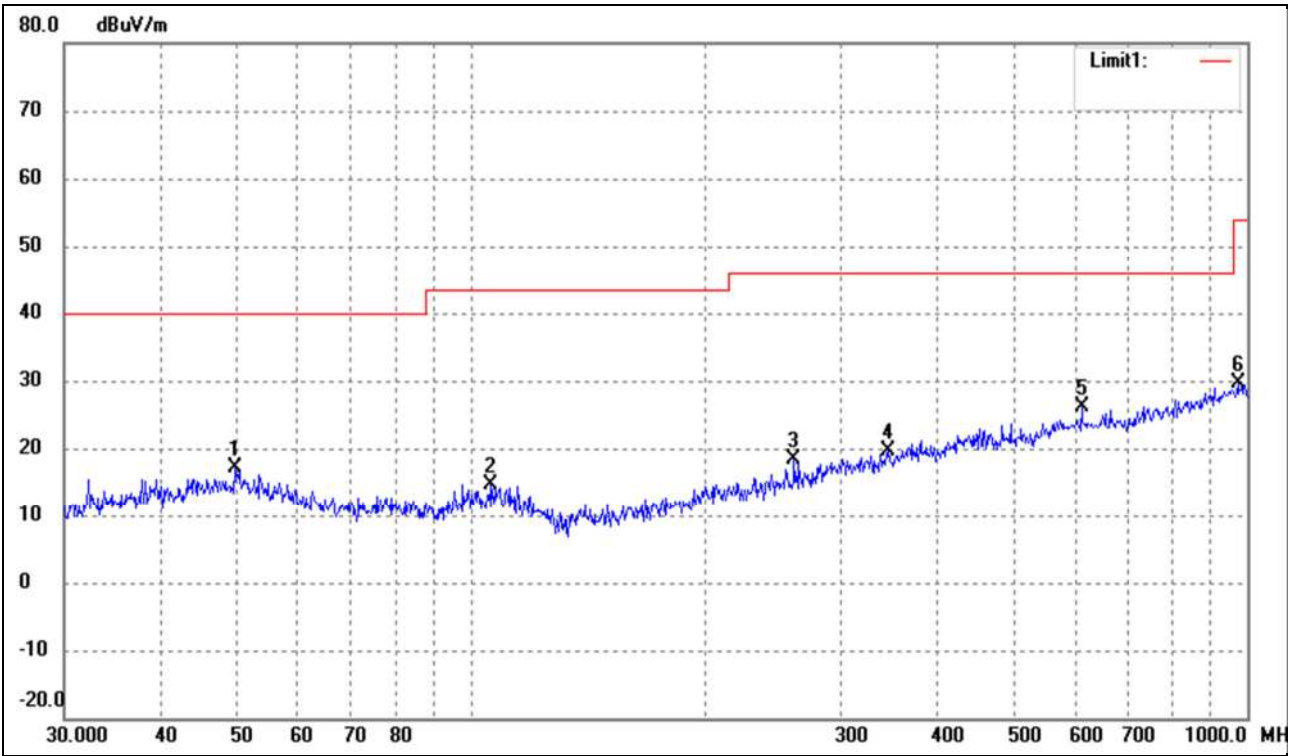
Test Channel	Near Middle	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	45.6948	27.20	-10.51	16.69	40.00	-23.31	-	-	peak
2	110.5687	27.73	-12.21	15.52	43.50	-27.98	-	-	peak
3	357.9287	26.34	-6.00	20.34	46.00	-25.66	-	-	peak
4	432.5457	28.30	-4.39	23.91	46.00	-22.09	-	-	peak
5	586.8437	27.84	-2.43	25.41	46.00	-20.59	-	-	peak
6	989.5355	27.40	2.94	30.34	54.00	-23.66	-	-	peak

Remark: ‘-’ means the test at Degree and Height are not recorded by the test software and only show the worst case in the test report.

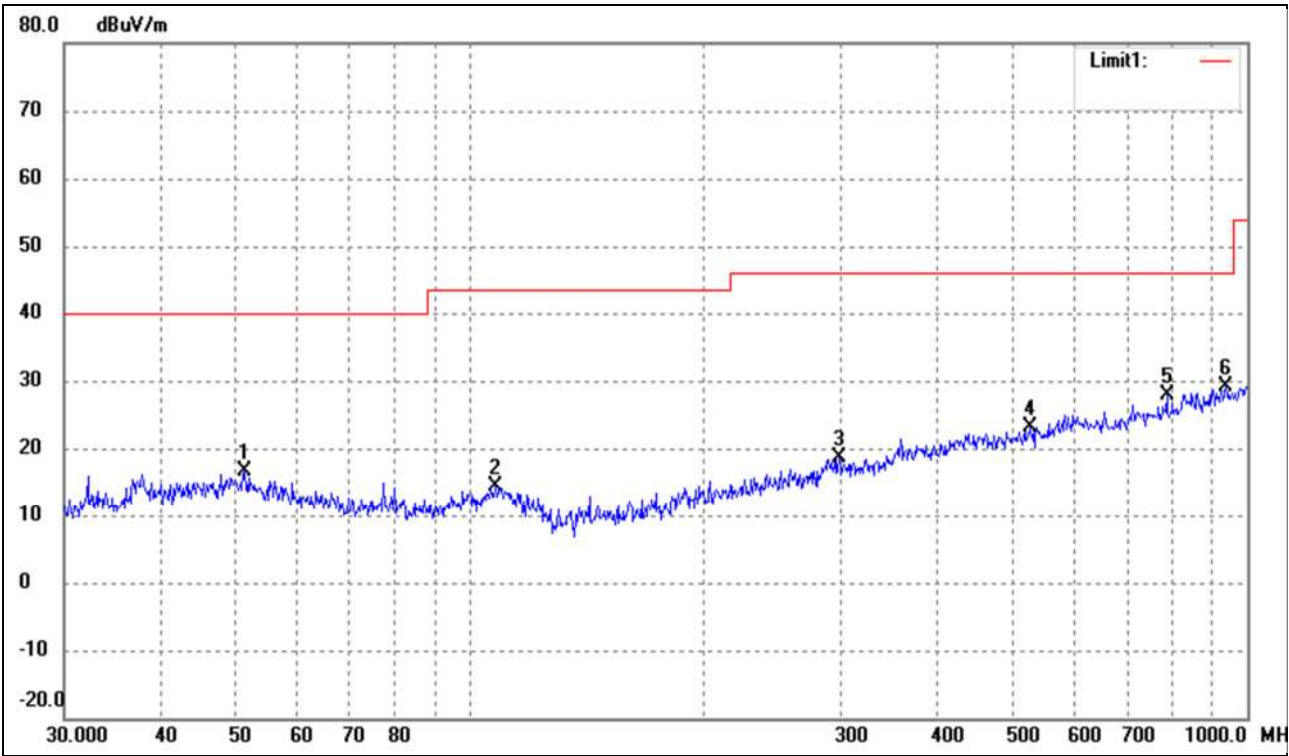
Test Channel	Highest	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7068	27.30	-10.21	17.09	40.00	-22.91	-	-	peak
2	106.3850	26.88	-12.24	14.64	43.50	-28.86	-	-	peak
3	261.0583	27.29	-9.03	18.26	46.00	-27.74	-	-	peak
4	345.5952	26.11	-6.37	19.74	46.00	-26.26	-	-	peak
5	612.0642	28.38	-2.33	26.05	46.00	-19.95	-	-	peak
6	972.3374	26.91	2.68	29.59	54.00	-24.41	-	-	peak

Remark: ‘-’ means the test at Degree and Height are not recorded by the test software and only show the worst case in the test report.

Test Channel	Highest	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	51.1209	26.95	-10.43	16.52	40.00	-23.48	-	-	peak
2	107.8877	26.62	-12.20	14.42	43.50	-29.08	-	-	peak
3	298.2681	25.85	-7.34	18.51	46.00	-27.49	-	-	peak
4	524.5541	27.48	-4.43	23.05	46.00	-22.95	-	-	peak
5	787.8513	28.48	-0.51	27.97	46.00	-18.03	-	-	peak
6	938.8326	26.96	2.25	29.21	46.00	-16.79	-	-	peak

Remark: ‘-’ means the test at Degree and Height are not recorded by the test software and only show the worst case in the test report.

Spurious Emissions Above 1 GHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Lowest Channel-2420MHz							
2420	82.34	-9.44	72.90	114	-41.10	H	PK
2420	75.51	-9.44	66.07	94	-27.93	H	AV
4840	58.97	-4.50	54.47	74	-19.53	H	PK
4840	41.16	-4.50	36.66	54	-17.34	H	AV
7260	50.17	-2.18	47.99	74	-26.01	H	PK
7260	32.41	-2.18	30.23	54	-23.77	H	AV
2420	74.13	-9.44	64.69	114	-49.31	V	PK
2420	68.51	-9.44	59.07	94	-34.93	V	AV
4840	59.75	-4.50	55.25	74	-18.75	V	PK
4840	44.45	-4.50	39.95	54	-14.05	V	AV
7260	52.64	-2.18	50.46	74	-23.54	V	PK
7260	36.11	-2.18	33.93	54	-20.07	V	AV
Near Middle Channel-2441MHz							
2441	83.55	-9.40	74.15	114	-39.85	H	PK
2441	77.13	-9.40	67.73	94	-26.27	H	AV
4882	52.09	-4.47	47.62	74	-26.38	H	PK
4882	33.44	-4.47	28.97	54	-25.03	H	AV
7323	51.63	-2.16	49.47	74	-24.53	H	PK
7323	31.90	-2.16	29.74	54	-24.26	H	AV
2441	78.98	-9.40	69.58	114	-44.42	V	PK
2441	68.83	-9.40	59.43	94	-34.57	V	AV
4882	54.19	-4.47	49.72	74	-24.28	V	PK
4882	37.76	-4.47	33.29	54	-20.71	V	AV
7323	52.02	-2.16	49.86	74	-24.14	V	PK
7323	36.29	-2.16	34.13	54	-19.87	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Highest Channel-2462MHz							
2462	86.36	-9.36	77.00	114	-37.00	H	PK
2462	77.84	-9.36	68.48	94	-25.52	H	AV
4924	52.37	-4.44	47.93	74	-26.07	H	PK
4924	35.98	-4.44	31.54	54	-22.46	H	AV
7386	51.30	-2.15	49.15	74	-24.85	H	PK
7386	33.35	-2.15	31.20	54	-22.80	H	AV
2462	77.91	-9.36	68.55	114	-45.45	V	PK
2462	71.21	-9.36	61.85	94	-32.15	V	AV
4924	52.06	-4.44	47.62	74	-26.38	V	PK
4924	38.55	-4.44	34.11	54	-19.89	V	AV
7386	51.92	-2.15	49.77	74	-24.23	V	PK
7386	37.49	-2.15	35.34	54	-18.66	V	AV

Note: Testing is carried out with frequency rang 9 kHz to the tenth harmonics, which above 5th Harmonics are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20 dB below the limit from 9 kHz to 30 MHz.

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

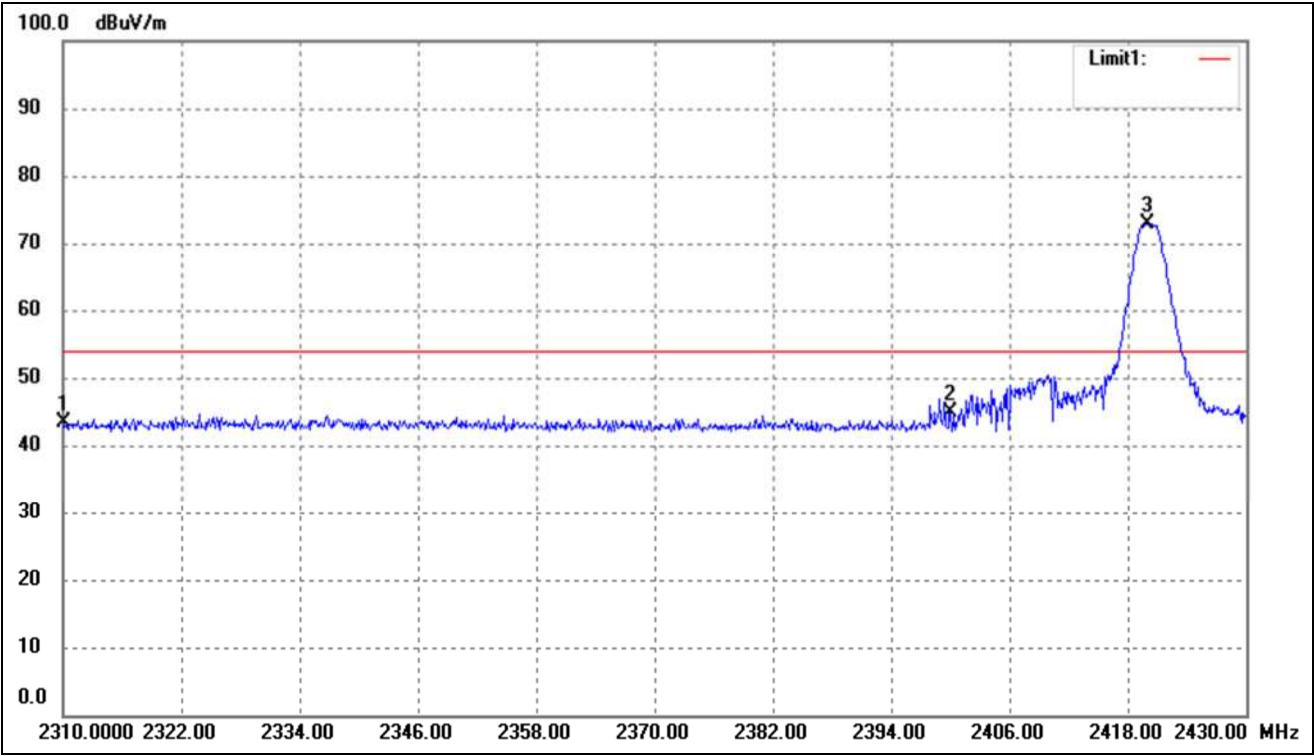
The edge emissions are below the Limits of the FCC Rules Part 15.209 or complies with the requirements of the FCC Rules Part 15.249.

Please refer to the test plots as below.

➤ Band edge

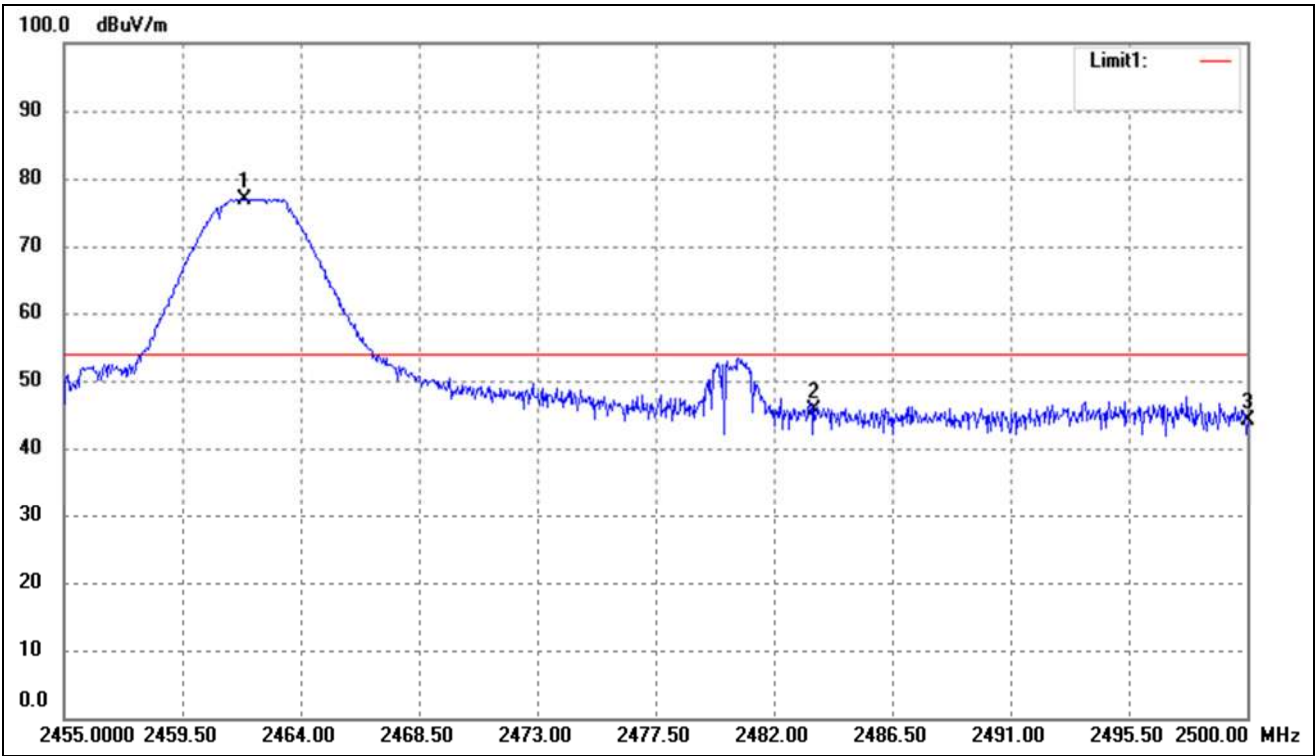
RBW: 100 kHz VBW: 300 kHz

Test Channel	Lowest (worst case)	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	53.11	-9.66	43.45	74.00	-30.55	Peak Detector
2	2400.000	54.44	-9.48	44.96	74.00	-29.04	Peak Detector
3	2420.040	82.34	-9.44	72.90	/	/	Peak Detector

Test Channel	Highest (worst case)	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	2461.885	86.36	-9.36	77.00	/	/	Peak Detector
2	2483.500	54.89	-9.31	45.58	74.00	-28.42	Peak Detector
3	2500.000	53.34	-9.28	44.06	74.00	-29.94	Peak Detector

Note: Average measurement was not performed if peak level is lower than average limit (54 dBuV/m) for above 1 GHz.

6. Emission Bandwidth

6.1 Standard Applicable

According to Part 15.215(c) of the FCC Rules, 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% 20 dB Bandwidth, VBW $\geq$ RBW

Sweep = Auto

Detector function = Peak

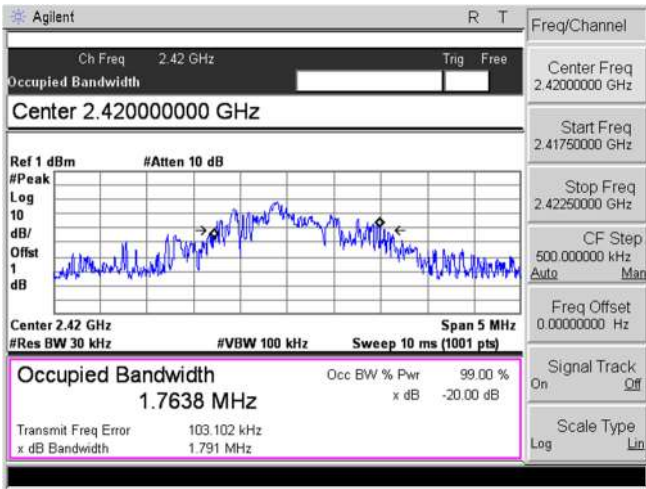
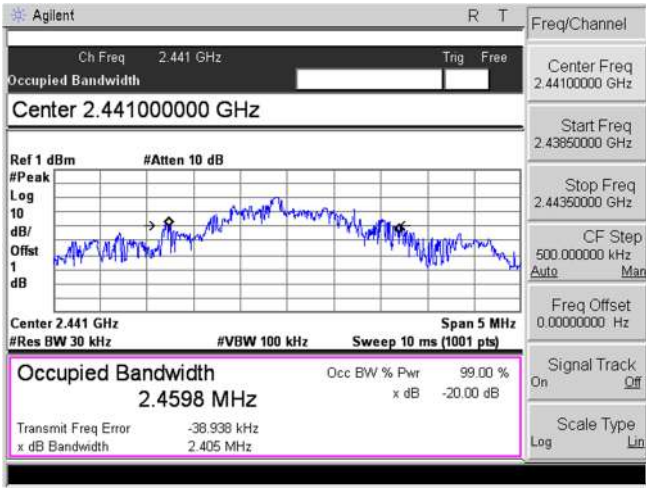
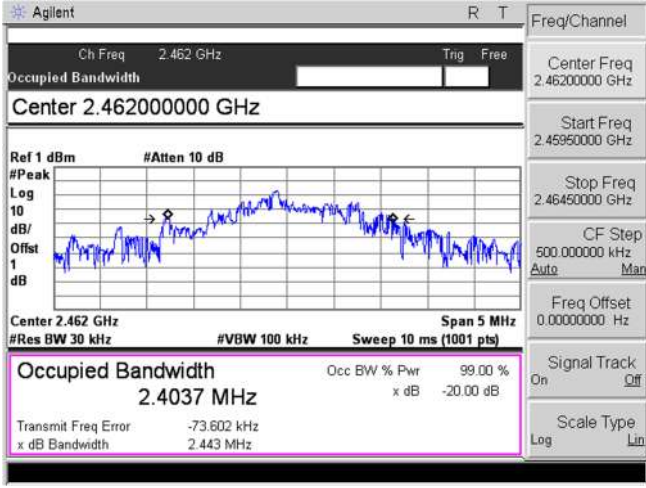
Trace = Max hold

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 20 dB down and 99% bandwidth of the emission.

6.3 Summary of Test Results/Plots

Test Channel	20 dB Bandwidth (MHz)
Lowest Channel	1.791
Near Middle Channel	2.405
Highest Channel	2.443

Please refer to the following test plots

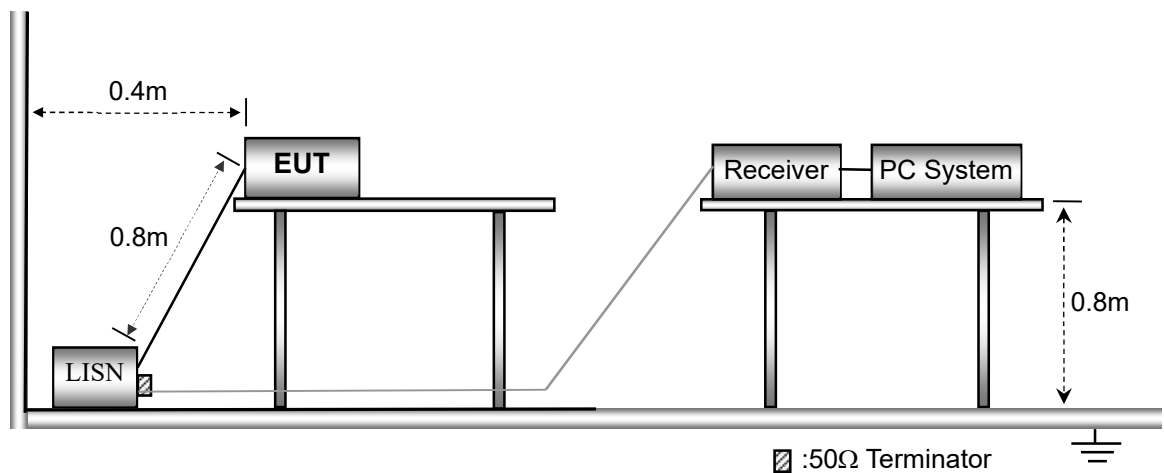
Lowest Channel	
Near Middle Channel	
Highest Channel	

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 Rules 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

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