TEST REPORT

Applicant:	Trane US, Inc.
Address of Applicant:	6200 Troup Highway, TYLER, Texas 75707, United States
Manufacturer/Factory:	Computime Electronics (Shenzhen) Company Limited
Address of Manufacturer/Factory:	Yuekenguangyu Industrial Park,Kangqiao Road 88#, Danzhutou Community, Nanwan Street office,Longgang District, Shenzhen, China.

Equipment Under Test (EUT)

Product Name:	COLOR WIFI Z-WAVE THERMOSTAT
Model No.:	TZON1050AC52ZC, AZON1050AC52ZC
Trade Mark:	TRANE
FCC ID:	XVRZON1054
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	October 08, 2022
Date of Test:	October 09, 2022-November 03, 2022
Date of report issued:	November 03, 2022
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Luo
Laboratory Manager

This 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.

2 Version

Version No.	Date	Description
00	*November 03, 2022*	*Original*

Prepared By: ***Date:*** *November 03, 2022*

Project Engineer

Check By: ***Date:*** *November 03, 2022*

Reviewer

3 Contents

Page

1 COVER PAGE 1

2 VERSION 2

3 CONTENTS 3

4 TEST SUMMARY 4

5 GENERAL INFORMATION 5

5.1 GENERAL DESCRIPTION OF EUT 5
5.2 TEST MODE 7
5.3 DESCRIPTION OF SUPPORT UNITS 7
5.4 DEVIATION FROM STANDARDS 7
5.5 ABNORMALITIES FROM STANDARD CONDITIONS 7
5.6 TEST FACILITY 7
5.7 TEST LOCATION 7
5.8 ADDITIONAL INSTRUCTIONS 7

6 TEST INSTRUMENTS LIST 8

7 TEST RESULTS AND MEASUREMENT DATA 10

7.1 ANTENNA REQUIREMENT 10
7.2 CONDUCTED EMISSIONS 11
7.3 CONDUCTED PEAK OUTPUT POWER 14
7.4 CHANNEL BANDWIDTH 15
7.5 POWER SPECTRAL DENSITY 16
7.6 SPURIOUS EMISSION IN NON-RESTRICTED & RESTRICTED BANDS 17
7.6.1 Conducted Emission Method 17
7.6.2 Radiated Emission Method 18

8 TEST SETUP PHOTO 33

9 EUT CONSTRUCTIONAL DETAILS 33

4 Test Summary

Test Item	Section	Result
Antenna requirement	FCC part 15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	FCC part 15.207	Pass
Conducted Peak Output Power	FCC part 15.247 (b)(3)	Pass
Channel Bandwidth & 99% OCB	FCC part 15.247 (a)(2)	Pass
Power Spectral Density	FCC part 15.247 (e)	Pass
Band Edge	FCC part 15.247(d)	Pass
Spurious Emission	FCC part 15.205/15.209	Pass

Remark: Test according to ANSI C63.10:2013 and RSS-Gen

Pass: The EUT complies with the essential requirements in the standard.

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz-30MHz	3.1dB	(1)
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

Product Name:	COLOR WIFI Z-WAVE THERMOSTAT
Model No.:	TZON1050AC52ZC, AZON1050AC52ZC
Test Model No.:	TZON1050AC52ZC
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The difference is model name for commercial purpose.	
Test sample(s) ID:	GTS202210000003-1
Sample(s) Status	Engineer sample
S/N:	N/A
Hardware Version:	V2.0
Software Version:	5.9.6.20220530
Operation Frequency:	802.11b/802.11g/802.11n(HT20): 2412MHz~2462MHz
Channel numbers:	802.11b/802.11g /802.11n(HT20): 11
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/802.11n(HT20): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	Integral Antenna
Antenna gain:	-1.71dBi(declare by applicant)
Power supply:	AC 24V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	**Frequency (MHz)**
	802.11b/802.11g/802.11n(HT20)
Lowest channel	2412MHz
Middle channel	2437MHz
Highest channel	2462MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11b	802.11g	802.11n(HT20)
Data rate	1Mbps	6Mbps	6.5Mbps

5.3 Description of Support Units

Manufacture	Description	Model	SN.
N/A	AC-AC adapter	N/A	N/A

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen 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 files.

● **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

5.8 Additional Instructions

Test Software	Special test command provided by manufacturer
Power level setup	Default

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July 02, 2020	July 01, 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 22, 2022	April 21, 2023
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 21, 2022	March 20, 2023
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June 12, 2022	June 11, 2023
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 23, 2022	June 22, 2023
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	April 22, 2022	April 21, 2023
9	Coaxial Cable	GTS	N/A	GTS211	April 22, 2022	April 21, 2023
10	Coaxial cable	GTS	N/A	GTS210	April 22, 2022	April 21, 2023
11	Coaxial Cable	GTS	N/A	GTS212	April 22, 2022	April 21, 2023
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	April 22, 2022	April 21, 2023
13	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 23, 2022	June 22, 2023
14	Band filter	Amindeon	82346	GTS219	June 23, 2022	June 22, 2023
15	Power Meter	Anritsu	ML2495A	GTS540	June 23, 2022	June 22, 2023
16	Power Sensor	Anritsu	MA2411B	GTS541	June 23, 2022	June 22, 2023
17	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 22, 2022	April 21, 2023
18	Splitter	Agilent	11636B	GTS237	June 23, 2022	June 22, 2023
19	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 30, 2021	Nov. 29, 2022
20	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 22, 2022	April 21, 2023
21	Breitband hornantenna	SCHWARZBECK	BBHA 9170	GTS579	Oct. 16, 2022	Oct. 15, 2023
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 16, 2022	Oct. 15, 2023
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 16, 2022	Oct. 15, 2023
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June 23, 2022	June 22, 2023
25	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 22, 2022	April 21, 2023

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May 14, 2022	May 13, 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 24, 2022	April 23, 2023
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 23, 2022	June 22, 2023
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	April 22, 2022	April 21, 2023
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	JINCHUANG	GSP-8A	GTS639	April 28, 2022	April 27, 2023
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	April 15, 2022	April 14, 2023
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	April 22, 2022	April 21, 2023
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	April 22, 2022	April 21, 2023

RF Conducted Test:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 22, 2022	April 21, 2023
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 22, 2022	April 21, 2023
3	Spectrum Analyzer	Agilent	E4440A	GTS536	April 22, 2022	April 21, 2023
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 22, 2022	April 21, 2023
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 22, 2022	April 21, 2023
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 22, 2022	April 21, 2023
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 22, 2022	April 21, 2023
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 22, 2022	April 21, 2023

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	April 25, 2022	April 24, 2023
2	Barometer	KUMAO	SF132	GTS647	July 26, 2022	July 25, 2023

7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. **15.247(c) (1)(i) requirement:** (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
EUT Antenna:	
The antenna is integral antenna, reference to the appendix II for details.	

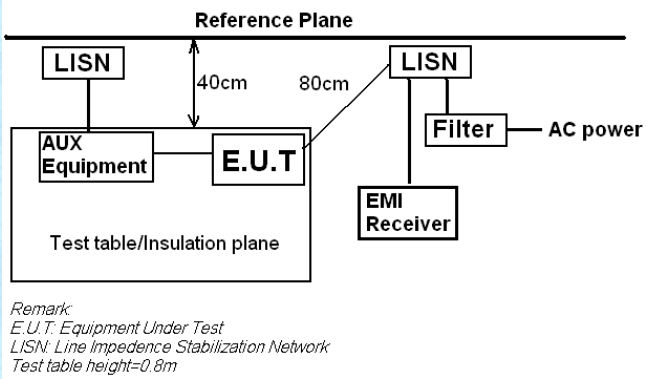
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test setup:



Test procedure:

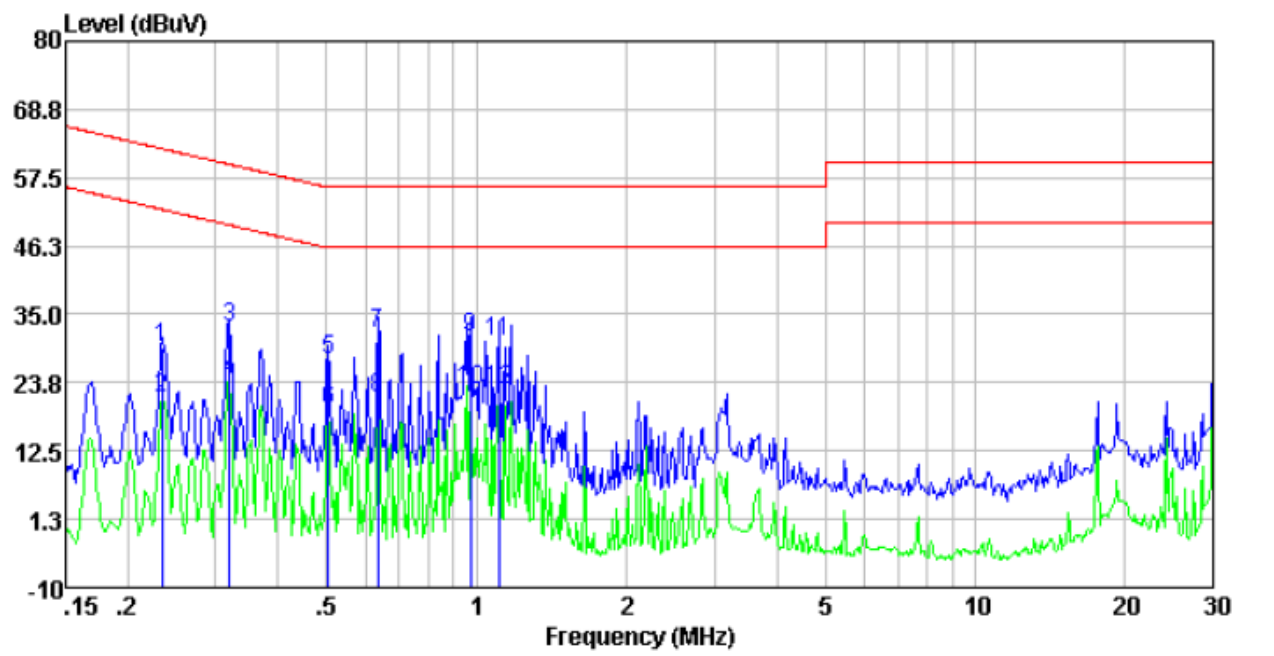
1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.

Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 24V					
Test results:	Pass					

Measurement Data:

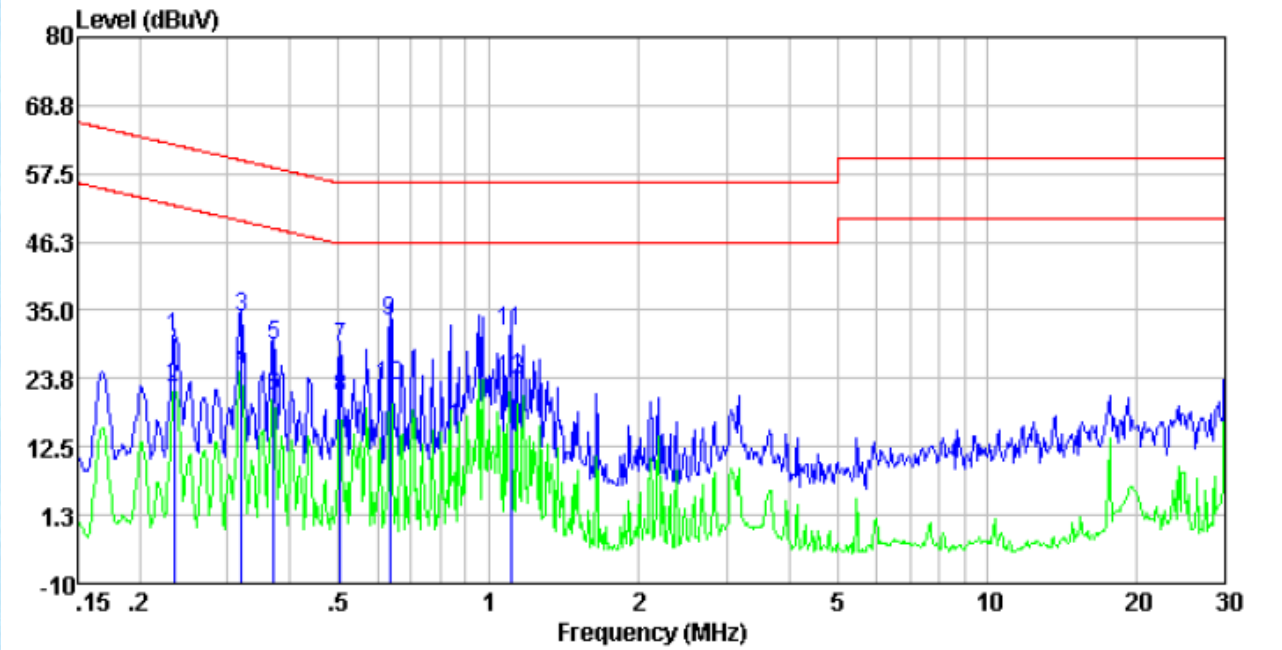
Pre-scan all test modes, found worst case at 802.11b 2462MHz, and so only show the test result of 802.11b 2462MHz

Line:



Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.23	19.54	10.02	0.01	29.57	62.30	-32.73	QP
0.23	11.23	10.02	0.01	21.26	52.30	-31.04	Average
0.32	22.86	9.98	0.01	32.85	59.71	-26.86	QP
0.32	14.08	9.98	0.01	24.07	49.71	-25.64	Average
0.50	17.59	9.96	0.01	27.56	56.00	-28.44	QP
0.50	9.17	9.96	0.01	19.14	46.00	-26.86	Average
0.63	21.98	9.96	0.02	31.96	56.00	-24.04	QP
0.63	11.18	9.96	0.02	21.16	46.00	-24.84	Average
0.97	21.32	9.96	0.03	31.31	56.00	-24.69	QP
0.97	12.70	9.96	0.03	22.69	46.00	-23.31	Average
1.11	20.61	9.94	0.03	30.58	56.00	-25.42	QP
1.11	12.45	9.94	0.03	22.42	46.00	-23.58	Average

Neutral:

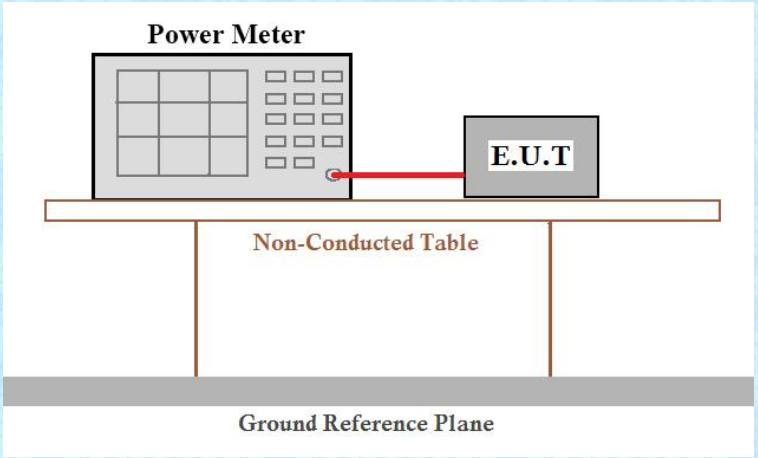


Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.23	20.52	10.03	0.01	30.56	62.30	-31.74	QP
0.23	12.28	10.03	0.01	22.32	52.30	-29.98	Average
0.32	23.92	9.97	0.01	33.90	59.71	-25.81	QP
0.32	15.24	9.97	0.01	25.22	49.71	-24.49	Average
0.37	19.16	9.96	0.01	29.13	58.47	-29.34	QP
0.37	10.76	9.96	0.01	20.73	48.47	-27.74	Average
0.50	18.85	9.96	0.01	28.82	56.00	-27.18	QP
0.50	10.51	9.96	0.01	20.48	46.00	-25.52	Average
0.63	23.20	9.96	0.02	33.18	56.00	-22.82	QP
0.63	12.40	9.96	0.02	22.38	46.00	-23.62	Average
1.11	21.58	9.95	0.03	31.56	56.00	-24.44	QP
1.11	13.68	9.95	0.03	23.66	46.00	-22.34	Average

Notes:

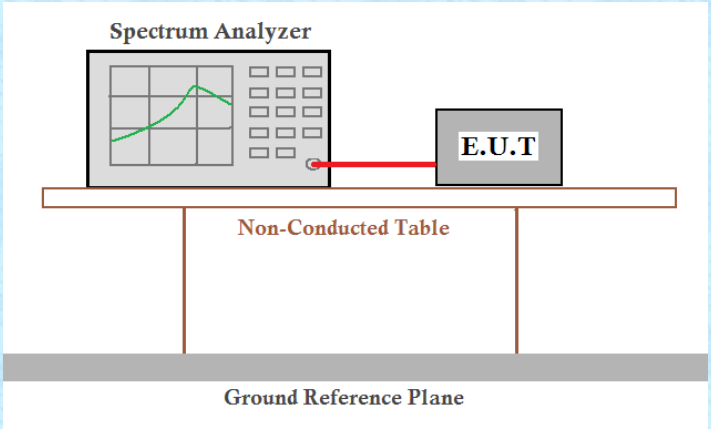
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

7.3 Conducted Peak Output Power

Test Requirement :	FCC Part15 C Section 15.247 (b)(3)
Test Method :	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

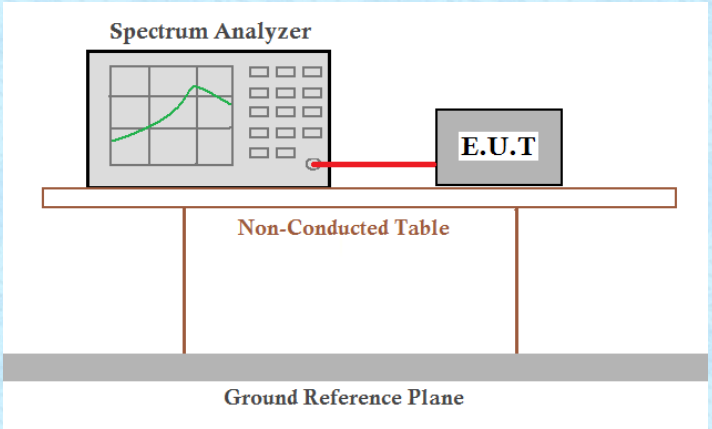
Measurement Data: The detailed test data see Appendix for WIFI 2.4G.

7.4 Channel Bandwidth

Test Requirement :	FCC Part15 C Section 15.247 (a)(2)
Test Method :	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	>500KHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix for WIFI 2.4G.

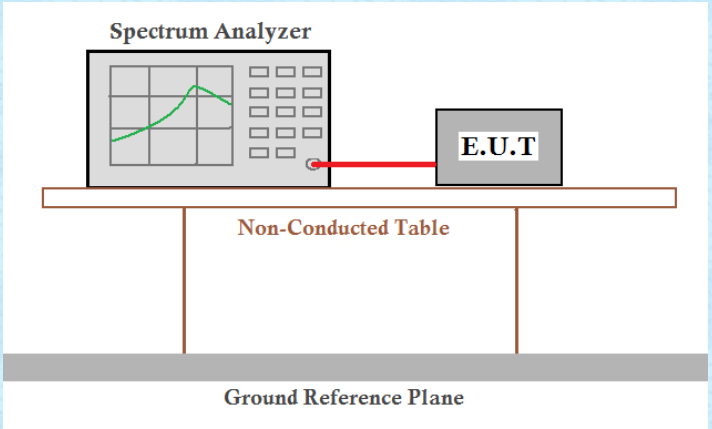
7.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	8dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix for WIFI 2.4G.

7.6 Spurious Emission in Non-restricted & restricted Bands

7.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix for WIFI 2.4G.

7.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 25GHz
Test site:	Measurement Distance: 3m

Receiver setup:

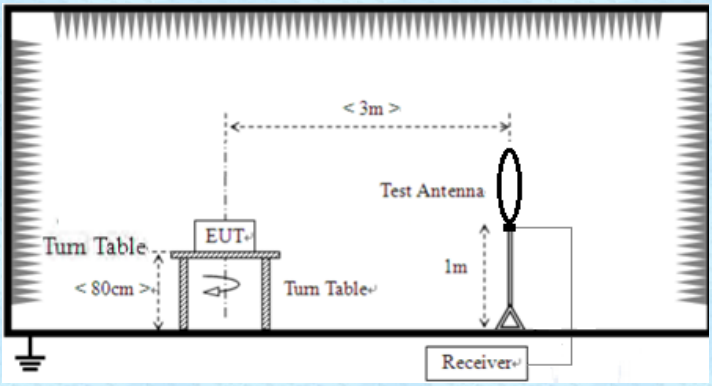
Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:

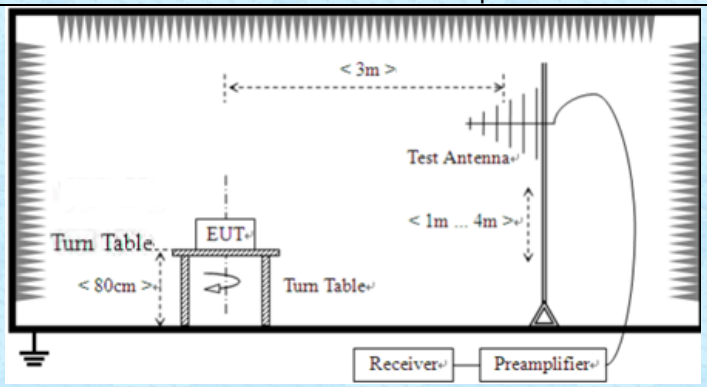
Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	PK/AV/QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	30m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

Test setup:

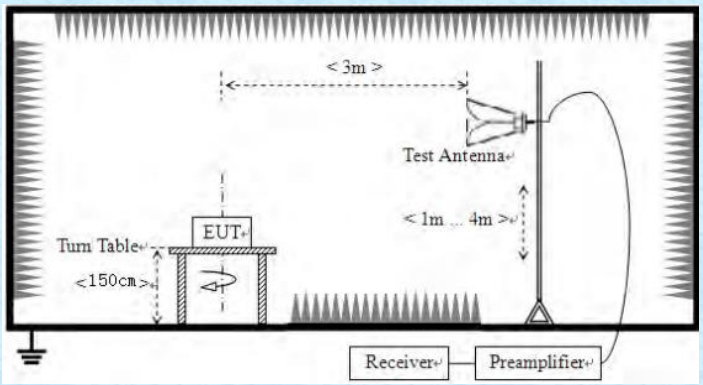
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz

<table>
<tr><td></td><td>


For radiated emissions above 1GHz



</td></tr>
<tr><td>Test Procedure:</td><td>
1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 6.0 for details</td></tr>
</table>

Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 24V					
Test results:	Pass					

Remarks:

1. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

Measurement data:

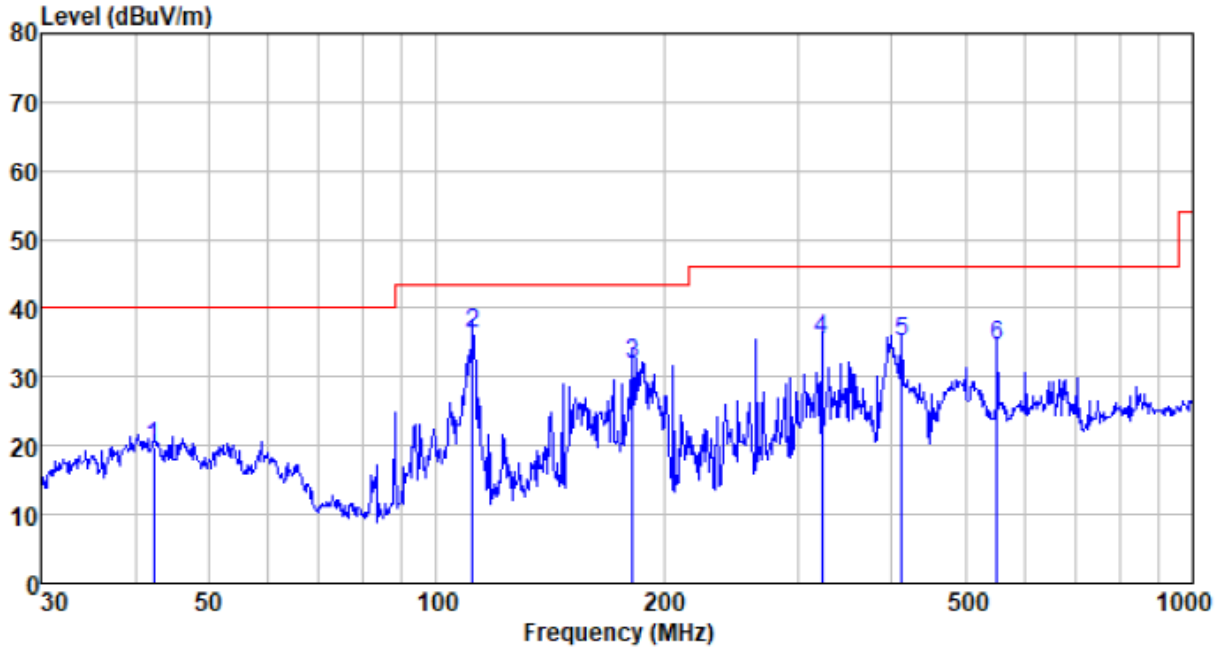
■ **9kHz~30MHz**

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

■ **Below 1GHz**

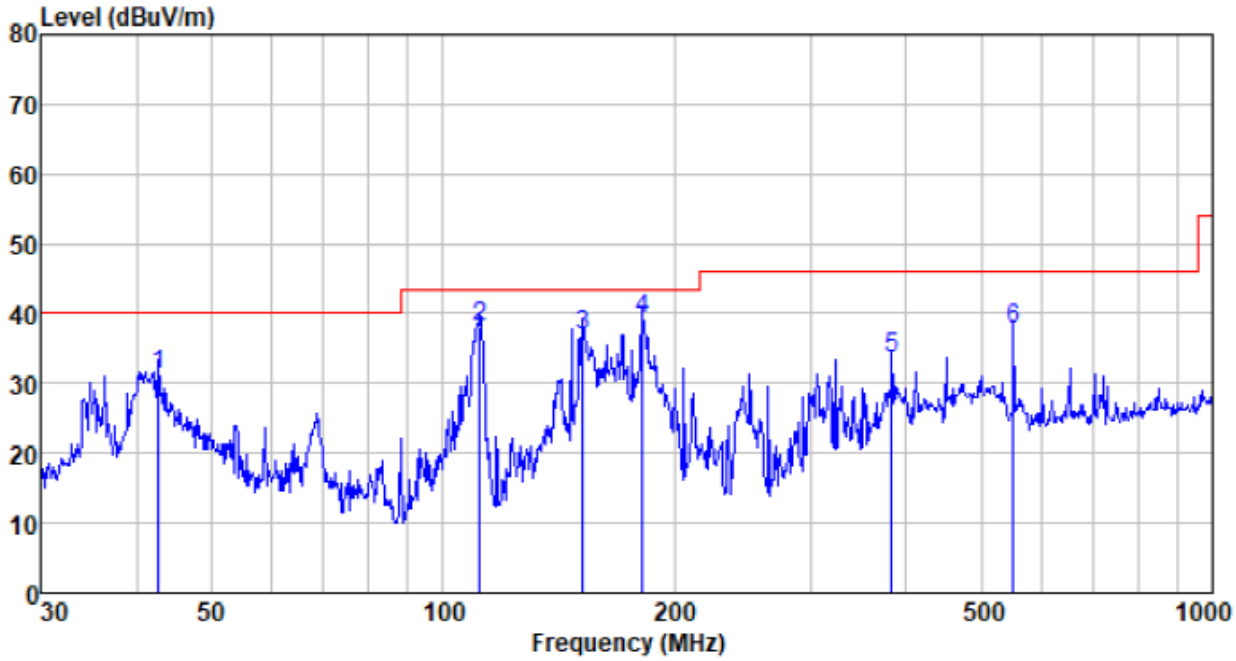
Pre-scan all test modes, found worst case at 802.11b 2462MHz, and so only show the test result of 802.11b 2462MHz

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
42.302	40.96	13.42	0.69	35.38	19.69	40.00	-20.31	QP
111.738	60.60	10.61	1.29	36.18	36.32	43.50	-7.18	QP
181.920	56.56	10.19	1.75	36.54	31.96	43.50	-11.54	QP
323.320	56.75	13.26	2.49	36.93	35.57	46.00	-10.43	QP
411.824	53.35	15.95	2.91	37.02	35.19	46.00	-10.81	QP
550.948	49.68	18.50	3.53	37.14	34.57	46.00	-11.43	QP

Vertical:

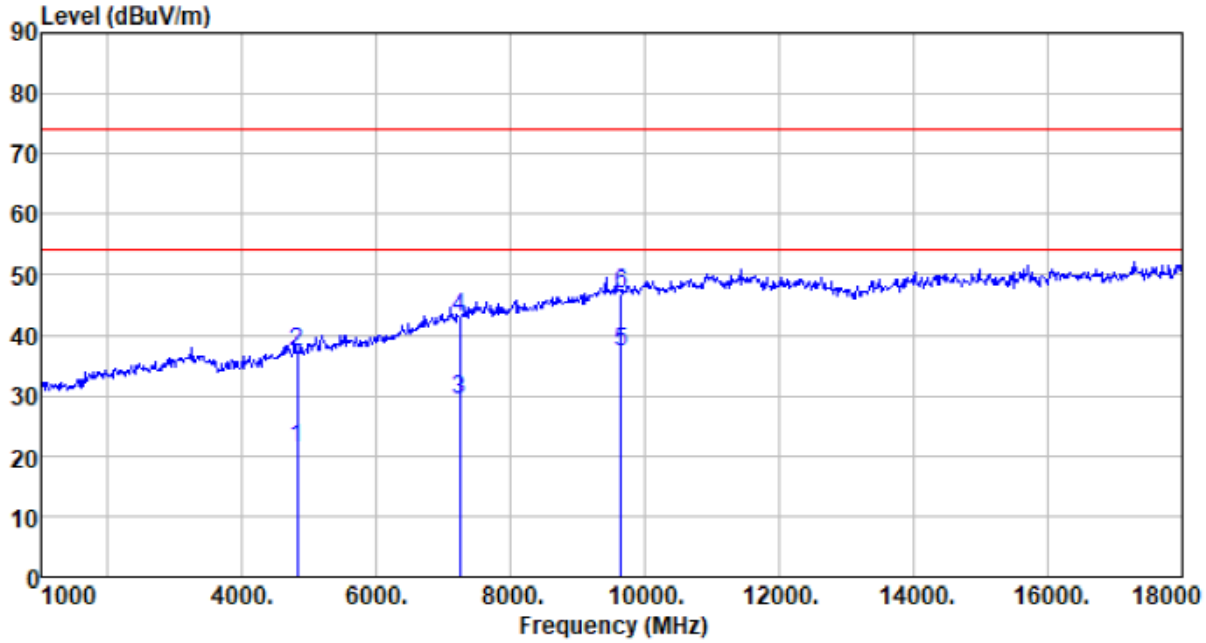


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
42.750	52.54	13.41	0.69	35.39	31.25	40.00	-8.75	QP
111.738	62.46	10.61	1.29	36.18	38.18	43.50	-5.32	QP
152.130	59.31	12.52	1.58	36.41	37.00	43.50	-6.50	QP
181.920	63.75	10.19	1.75	36.54	39.15	43.50	-4.35	QP
382.588	52.84	15.19	2.77	37.00	33.80	46.00	-12.20	QP
550.948	52.84	18.50	3.53	37.14	37.73	46.00	-8.27	QP

All modulations have been tested, Only show the worst case

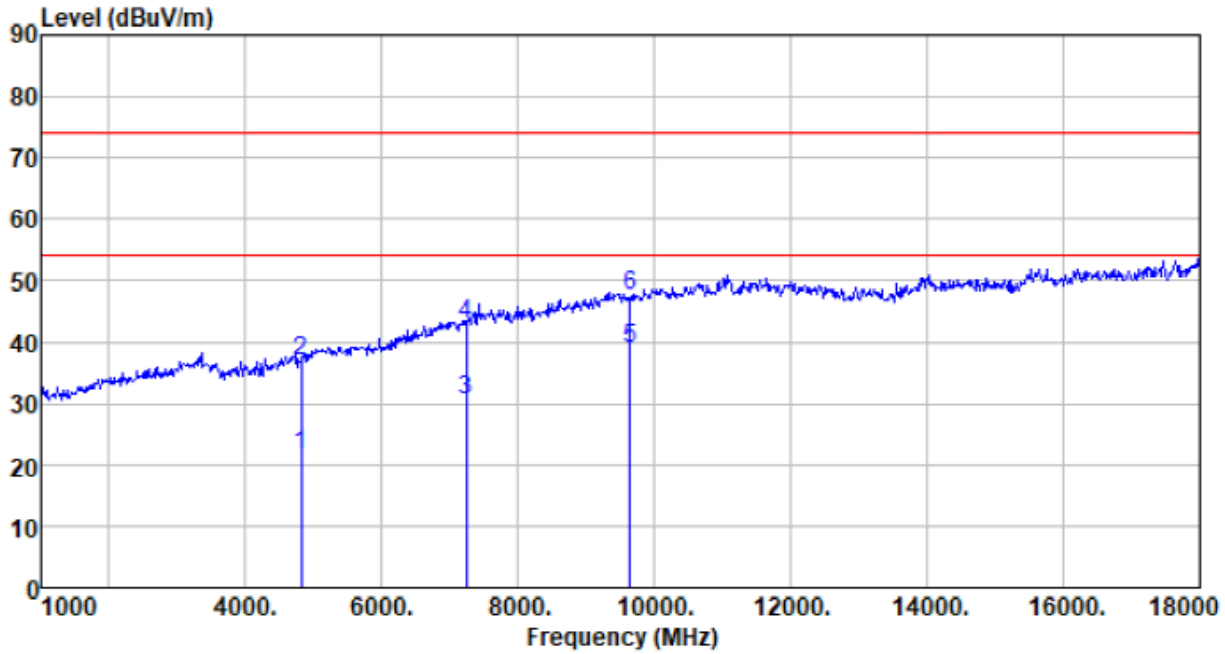
- **Unwanted Emissions in non-restricted Frequency Bands**
- **Above 1GHz**

Test mode:	802.11b	Test channel:	Lowest	Polarization:	Horizontal



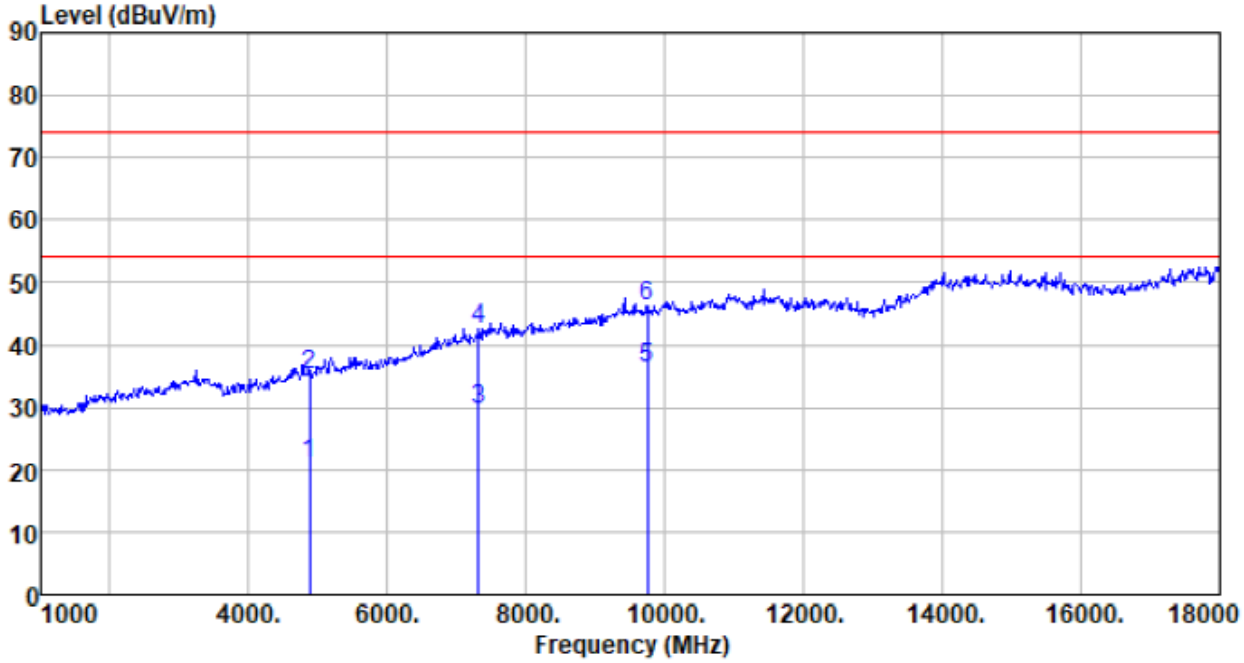
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	23.96	31.11	4.63	38.36	21.34	54.00	-32.66	Average
4824.000	39.79	31.11	4.63	38.36	37.17	74.00	-36.83	Peak
7236.000	25.63	35.97	6.52	38.97	29.15	54.00	-24.85	Average
7236.000	39.27	35.97	6.52	38.97	42.79	74.00	-31.21	Peak
9648.000	30.85	37.95	7.99	39.69	37.10	54.00	-16.90	Average
9648.000	40.64	37.95	7.99	39.69	46.89	74.00	-27.11	Peak

Test mode:	802.11b	Test channel:	Lowest	Polarization:	Vertical



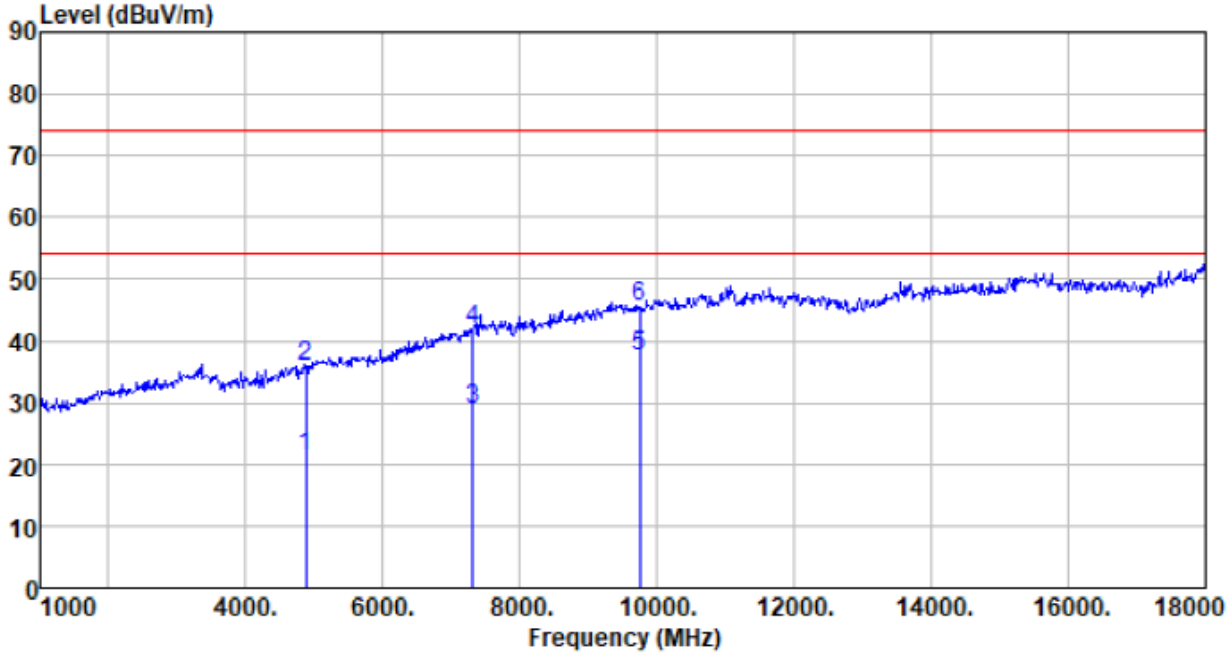
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	24.20	31.11	4.63	38.36	21.58	54.00	-32.42	Average
4824.000	39.61	31.11	4.63	38.36	36.99	74.00	-37.01	Peak
7236.000	27.14	35.97	6.52	38.97	30.66	54.00	-23.34	Average
7236.000	39.42	35.97	6.52	38.97	42.94	74.00	-31.06	Peak
9648.000	32.54	37.95	7.99	39.69	38.79	54.00	-15.21	Average
9648.000	41.35	37.95	7.99	39.69	47.60	74.00	-26.40	Peak

Test mode:	802.11b	Test channel:	Middle	Polarization:	Horizontal



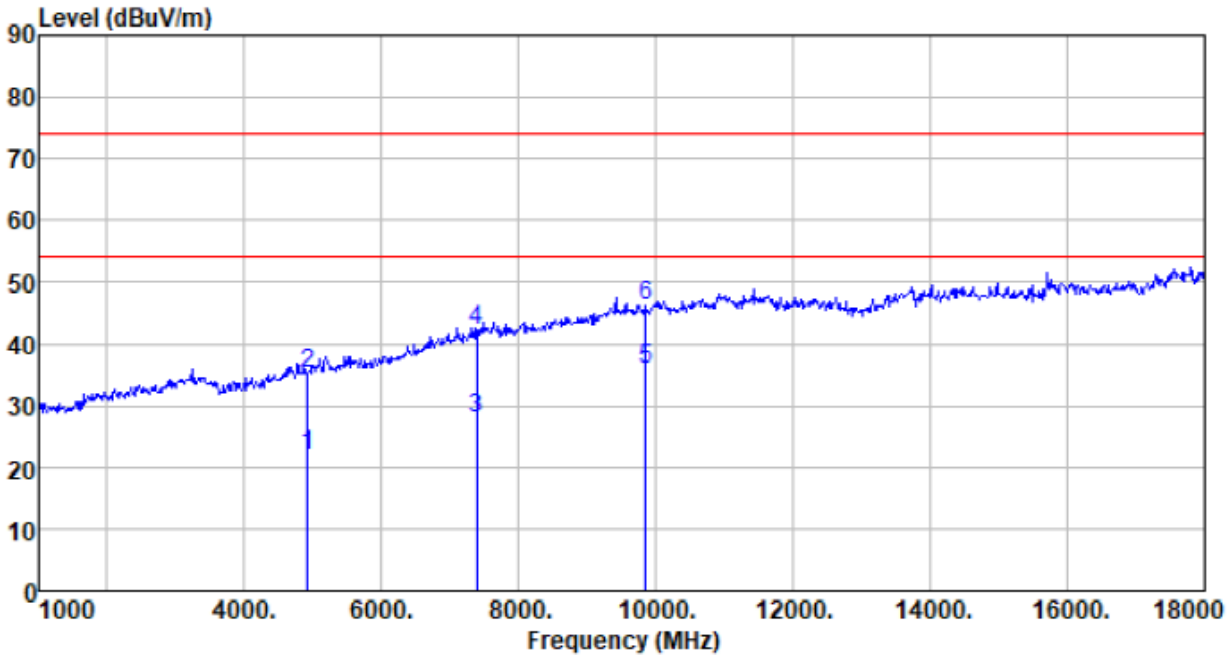
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	23.41	31.25	4.69	38.37	20.98	54.00	-33.02	Average
4874.000	37.71	31.25	4.69	38.37	35.28	74.00	-38.72	Peak
7311.000	25.86	36.12	6.61	38.99	29.60	54.00	-24.40	Average
7311.000	38.84	36.12	6.61	38.99	42.58	74.00	-31.42	Peak
9748.000	29.92	38.05	8.03	39.72	36.28	54.00	-17.72	Average
9748.000	39.88	38.05	8.03	39.72	46.24	74.00	-27.76	Peak

Test mode:	802.11b	Test channel:	Middle	Polarization:	Vertical



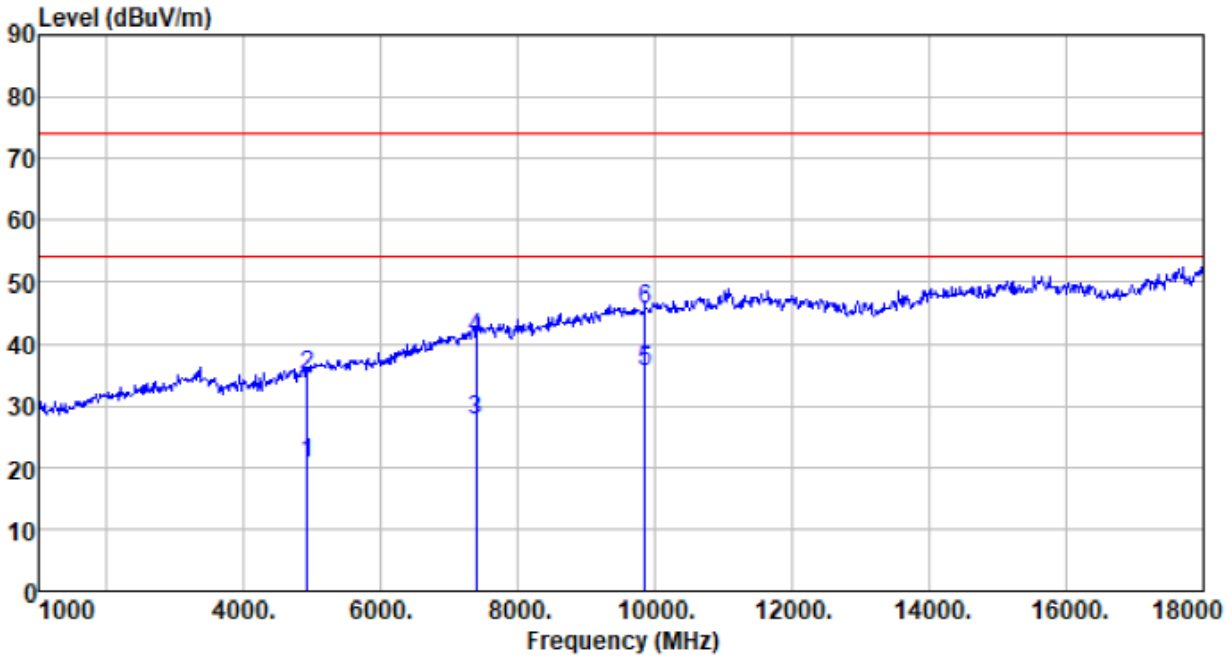
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	23.81	31.25	4.69	38.37	21.38	54.00	-32.62	Average
4874.000	38.27	31.25	4.69	38.37	35.84	74.00	-38.16	Peak
7311.000	25.25	36.12	6.61	38.99	28.99	54.00	-25.01	Average
7311.000	38.12	36.12	6.61	38.99	41.86	74.00	-32.14	Peak
9748.000	31.11	38.05	8.03	39.72	37.47	54.00	-16.53	Average
9748.000	39.09	38.05	8.03	39.72	45.45	74.00	-28.55	Peak

Test mode:	802.11b	Test channel:	Highest	Polarization:	Horizontal



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	24.27	31.39	4.75	38.38	22.03	54.00	-31.97	Average
4924.000	37.48	31.39	4.75	38.38	35.24	74.00	-38.76	Peak
7386.000	24.01	36.27	6.71	39.02	27.97	54.00	-26.03	Average
7386.000	38.27	36.27	6.71	39.02	42.23	74.00	-31.77	Peak
9848.000	29.57	38.15	8.06	39.75	36.03	54.00	-17.97	Average
9848.000	39.76	38.15	8.06	39.75	46.22	74.00	-27.78	Peak

Test mode:	802.11b	Test channel:	Highest	Polarization:	Vertical



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	22.77	31.39	4.75	38.38	20.53	54.00	-33.47	Average
4924.000	37.27	31.39	4.75	38.38	35.03	74.00	-38.97	Peak
7386.000	23.62	36.27	6.71	39.02	27.58	54.00	-26.42	Average
7386.000	37.00	36.27	6.71	39.02	40.96	74.00	-33.04	Peak
9848.000	29.21	38.15	8.06	39.75	35.67	54.00	-18.33	Average
9848.000	38.95	38.15	8.06	39.75	45.41	74.00	-28.59	Peak

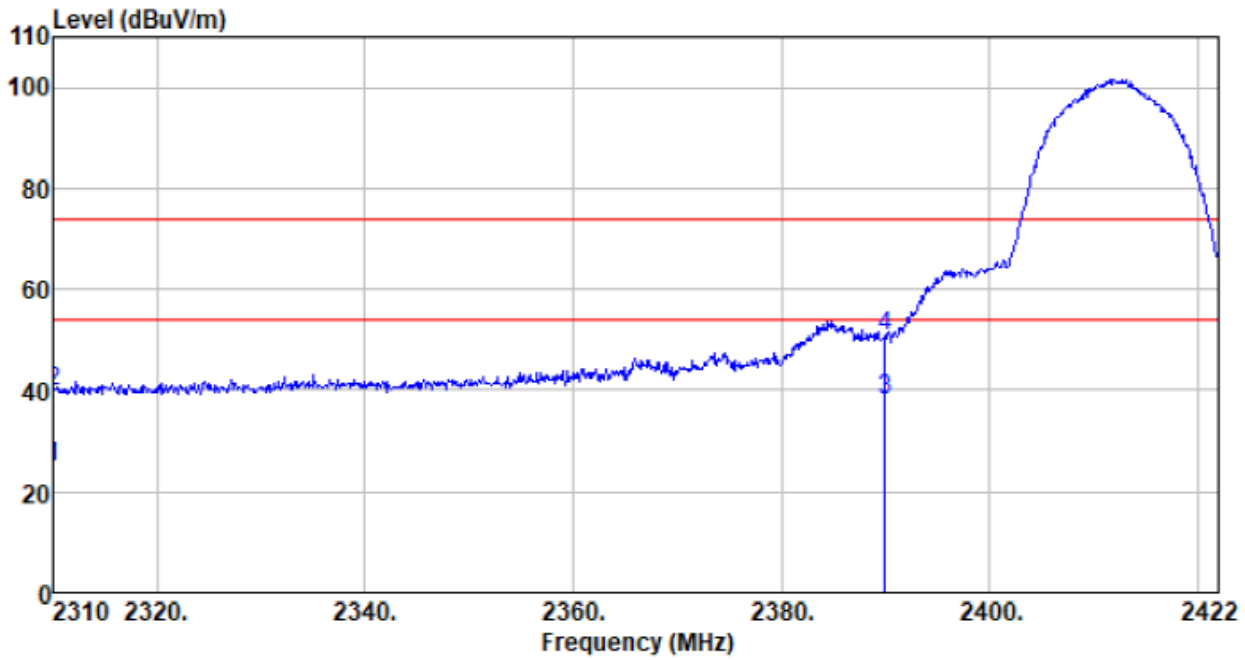
Notes:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

All modulations have been tested, Only show the worst case

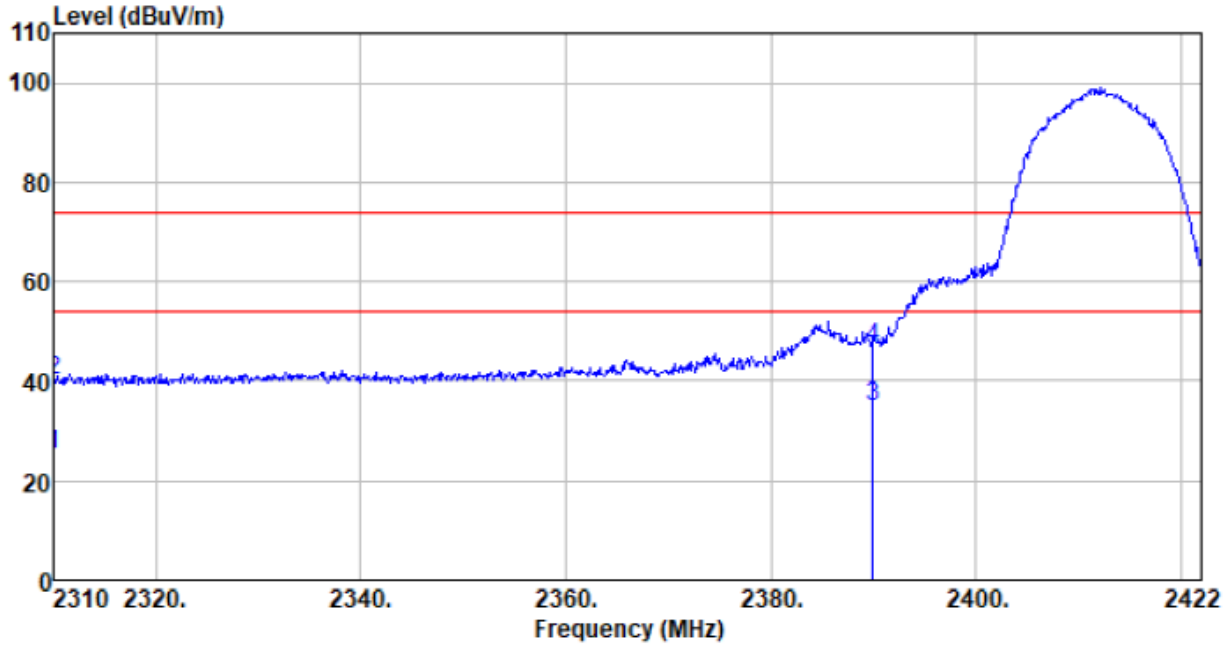
■ **Unwanted Emissions in restricted Frequency Bands**

Test mode:	802.11b	Test channel:	Lowest	Polarization:	Horizontal



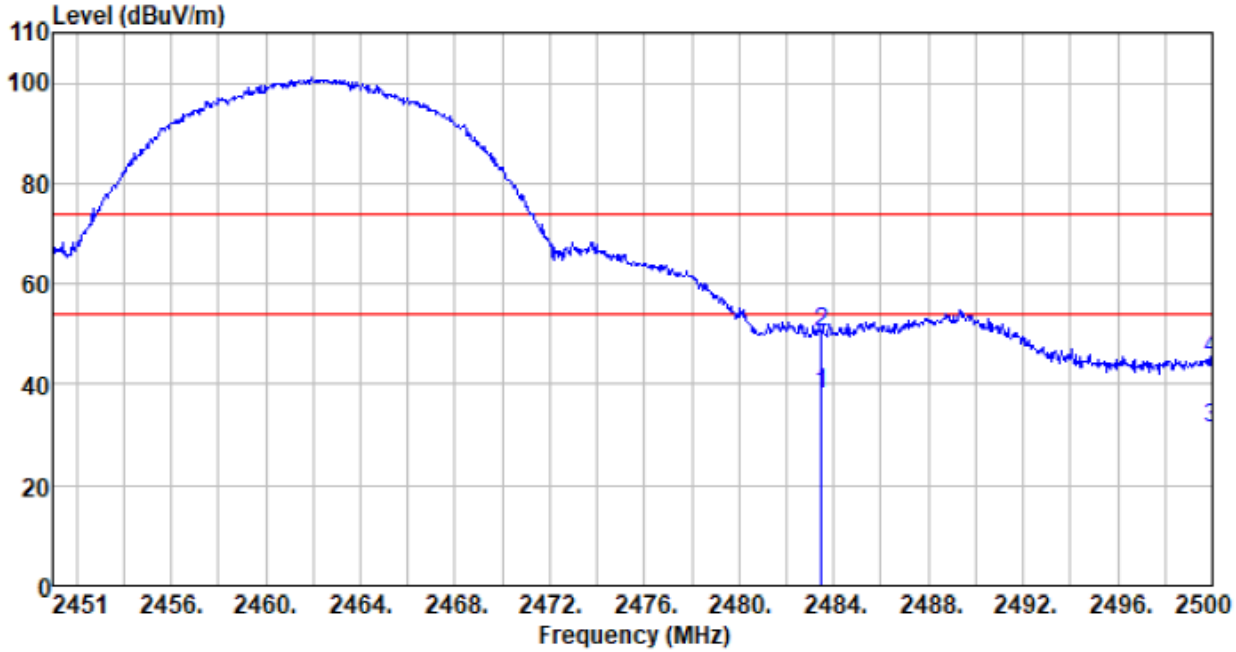
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	33.21	27.17	2.81	38.52	24.67	54.00	-29.33	Average
2310.000	48.19	27.17	2.81	38.52	39.65	74.00	-34.35	Peak
2390.000	46.66	27.27	2.91	38.56	38.28	54.00	-15.72	Average
2390.000	58.92	27.27	2.91	38.56	50.54	74.00	-23.46	Peak

Test mode:	802.11b	Test channel:	Lowest	Polarization:	Vertical



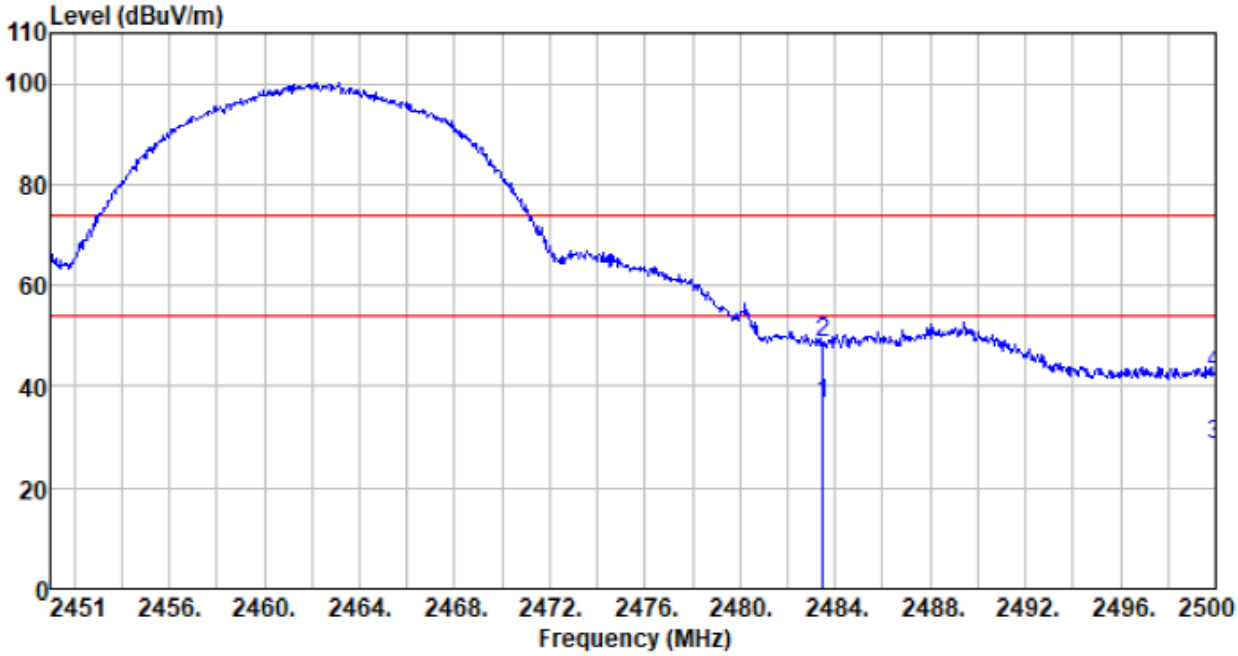
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	33.69	27.17	2.81	38.52	25.15	54.00	-28.85	Average
2310.000	48.72	27.17	2.81	38.52	40.18	74.00	-33.82	Peak
2390.000	43.24	27.27	2.91	38.56	34.86	54.00	-19.14	Average
2390.000	55.13	27.27	2.91	38.56	46.75	74.00	-27.25	Peak

Test mode:	802.11b	Test channel:	Highest	Polarization:	Horizontal



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2483.500	46.38	27.38	2.99	38.59	38.16	54.00	-15.84	Average
2483.500	58.59	27.38	2.99	38.59	50.37	74.00	-23.63	Peak
2500.000	39.27	27.40	3.01	38.60	31.08	54.00	-22.92	Average
2500.000	53.11	27.40	3.01	38.60	44.92	74.00	-29.08	Peak

Test mode:	802.11b	Test channel:	Highest	Polarization:	Vertical



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2483.500	44.73	27.38	2.99	38.59	36.51	54.00	-17.49	Average
2483.500	56.83	27.38	2.99	38.59	48.61	74.00	-25.39	Peak
2500.000	36.61	27.40	3.01	38.60	28.42	54.00	-25.58	Average
2500.000	50.93	27.40	3.01	38.60	42.74	74.00	-31.26	Peak

Remarks:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

------End------