FCC Test Report

Report No.:	RWAY202300070E
Applicant:	Shenzhen Intellirocks Tech. Co., Ltd.
Address:	No.2901-2904, 3002, Block C, Section 1, Chuangzhi, Yuncheng Building, Liuxian Avenue,Xili Community, Xili Street, Nanshan District, Shenzhen, Guangdong, China
Product Name:	Govee RGBICWW Light Bars
Product Model:	H6056
Multiple Models:	N/A
Trade Mark:	Govee
FCC ID:	2AQA6-H6056A
Standards:	FCC CFR Title 47 Part 15C (§15.247)
Test Date:	2023/12/07-2024/01/29
Test Result:	Complied
Report Date:	2024-02-04

Reviewed by: Abel chen

Abel Chen
Project Engineer

Approved by: Jacob Gong

Jacob Kong
Manager

Prepared by:

World Alliance Testing and Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

NVLAP TESTING NVLAP LAB CODE 600335-0

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3. This sample tested is in compliance with the limits of the above regulation.

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5. The information marked "#" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

Revision History

Version No.	Issued Date	Description
00	*2024-02-04*	*Original*

Contents

1 General Information 4
1.1 Client Information 4
1.2 Product Description of EUT 4
1.3 Antenna information 4
1.4 Related Submittal(s)/Grant(s) 5
1.5 Measurement Uncertainty 5
1.6 Laboratory Location 5
1.7 Test Methodology 5
2 Description of Measurement 6
2.1 Test Configuration 6
2.2 Test Auxiliary Equipment 6
2.3 Test Setup 7
2.4 Test Procedure 9
2.5 Measurement Method 10
2.6 Measurement Equipment 11
3 Test Results 12
3.1 Test Summary 12
3.2 Limit 13
3.3 AC Line Conducted Emissions Test Data 14
3.4 Radiated emission Test Data 16
3.5 RF Conducted Test Data 24
3.5.1 6 dB Emission Bandwidth and 99% Occupied Bandwidth 24
3.5.2 Maximum Conducted Peak Output Power 24
3.5.3 Power Spectral Density 25
3.5.4 100 kHz Bandwidth of Frequency Band Edge 25
3.5.5 Duty Cycle 25
4 Test Setup Photo 34
5 E.U.T Photo 35

1 General Information

1.1 Client Information

Applicant:	Shenzhen Intellirocks Tech. Co., Ltd.
Address:	No.2901-2904, 3002, Block C, Section 1, Chuangzhi, Yuncheng Building, Liuxian Avenue,Xili Community, Xili Street, Nanshan District, Shenzhen, Guangdong, China
Manufacturer:	Shenzhen Intellirocks Tech. Co., Ltd.
Address:	No.2901-2904, 3002, Block C, Section 1, Chuangzhi, Yuncheng Building, Liuxian Avenue,Xili Community, Xili Street, Nanshan District, Shenzhen, Guangdong, China

1.2 Product Description of EUT

The EUT is Govee RGBICWW Light Bars that contains BLE and 2.4G WLAN radios, this report covers the full testing of the 2.4G WLAN radio.

Sample Serial Number	34-2 for CE&RE test, 34-1 for RF test conducted test (assigned by WATC)
Sample Received Date	2023/10/16
Sample Status	Good Condition
Frequency Range	2412MHz - 2462MHz(802.11b, g, n-HT20)
Maximum Conducted Peak Output Power	15.33dBm
Modulation Technology	DSSS, OFDM
Antenna Gain#	4.42dBi
Spatial Streams#	SISO (1TX, 1RX)
Power Supply	DC 12V from adapter
Operating temperature#	-10deg.C to +45 deg.C
Adapter Information	Model: YXTG18US-1201500 Input: AC 100-240V~0.8A Max 50/60Hz Output: DC 12.0V, 1.5A 18.0W
Modification	Sample No Modification by the test lab

1.3 Antenna information

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.

Device Antenna information:	

The Wi-Fi antenna is an internal antenna which cannot replace by end-user. Please see product internal photos for details.

1.4 Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s)

1.5 Measurement Uncertainty

Parameter		Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
AC Power Lines Conducted Emissions		±3.14dB
Emissions, Radiated	Below 30MHz	±2.78dB
	Below 1GHz	±4.84dB
	Above 1GHz	±5.44dB
Conducted Power		0.74dB
Frequency Error		150Hz
Bandwidth		0.34%
Power Spectral Density		0.74dB

Note 1: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Note 2: The Decision Rule is based on simple acceptance with ISO Guide 98-4:2012 Clause 8.2 (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

1.6 Laboratory Location

World Alliance Testing and Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

1.7 Test Methodology

FCC CFR 47 Part 2

FCC CFR 47 Part 15

KDB 558074 D01 DTS Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2020

2 Description of Measurement

2.1 Test Configuration

Operating channels:					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/
According to ANSI C63.10-2020 chapter 5.6.1 Table 11 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:					
802.11b, 802.11g, 802.11n-HT20					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	6	2437	11	2462

Test Mode:				
Transmitting mode:	Keep the EUT in continuous transmitting with modulation			
Exercise software#:	UI_mptool			
Mode	**Worst-case Data rate**	**Powel Level Setting#**		
		Low Channel	**Middle Channel**	**High Channel**
802.11b	1Mbps	64	64	64
802.11g	6Mbps	60	60	60
802.11n-HT20	6.5Mbps	58	58	58
The exercise software and the maximum power setting that provided by manufacturer.				

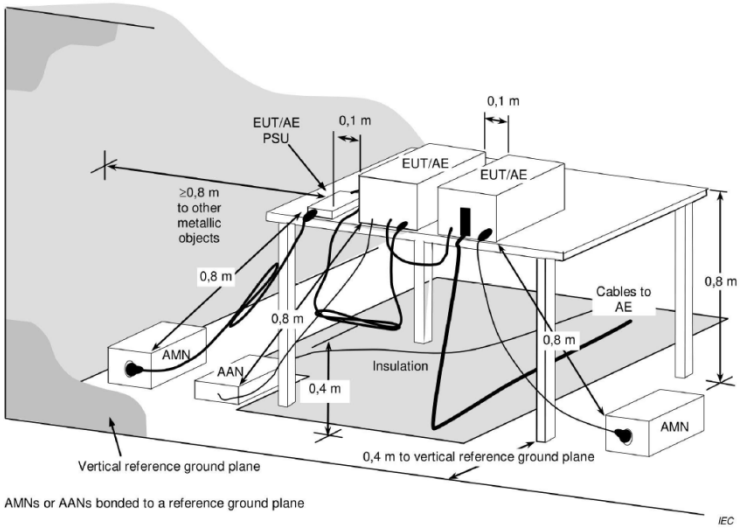
Worst-Case Configuration:
For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report For AC power line conducted emission and radiated emission 9kHz-1GHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.

2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

2.3 Test Setup

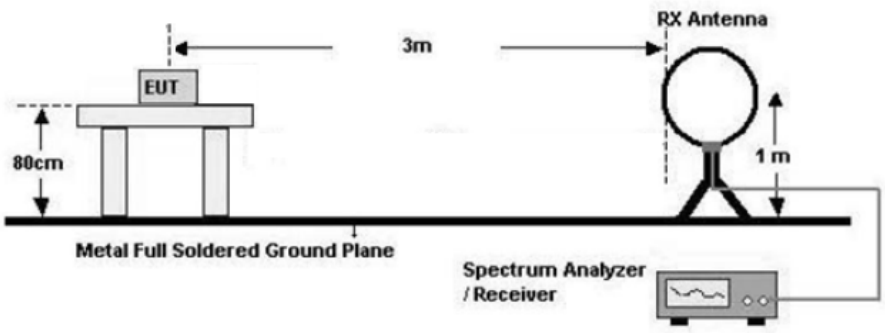
1) Conducted emission measurement:



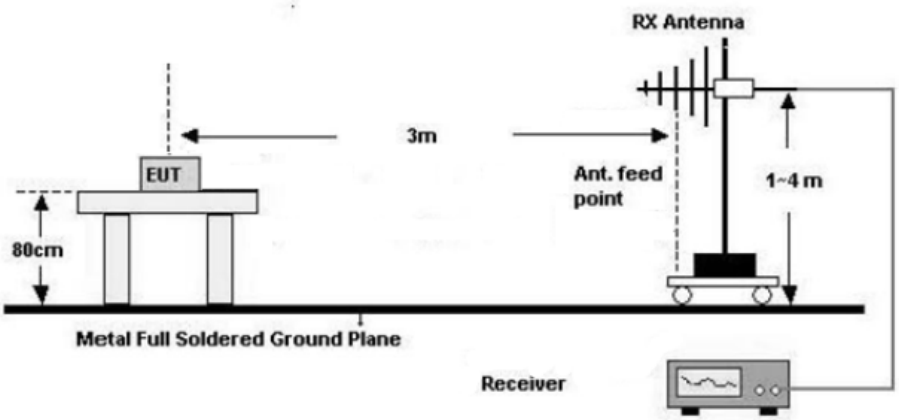
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

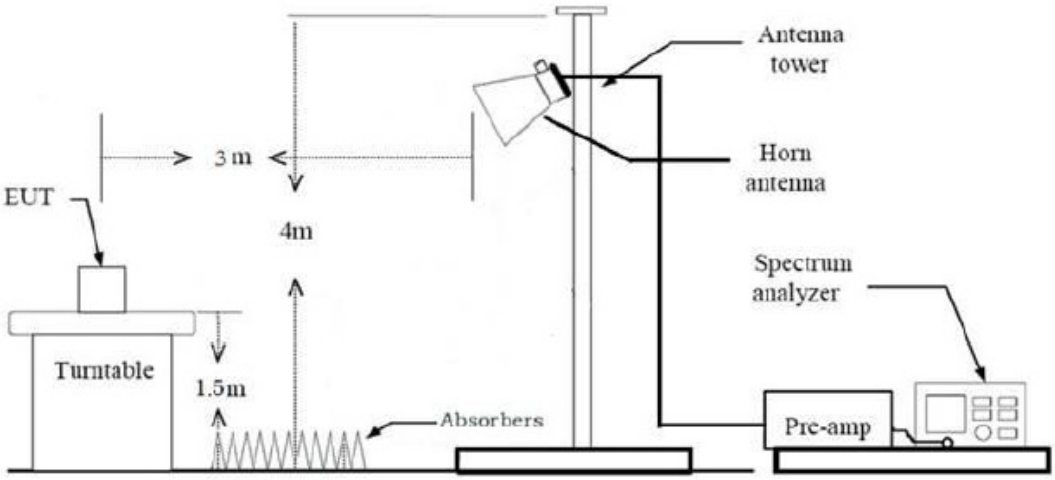
Below 30MHz (3m SAC)



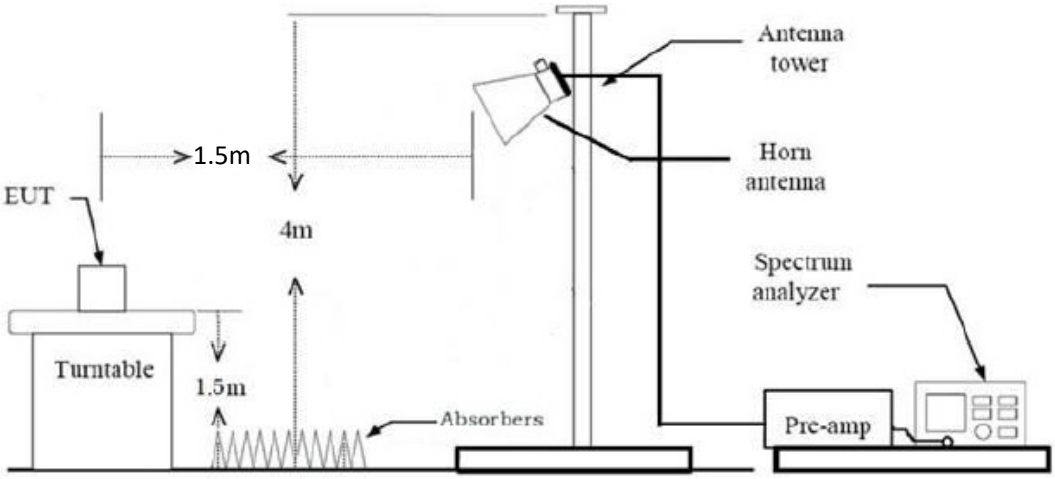
30MHz-1GHz (3m SAC)



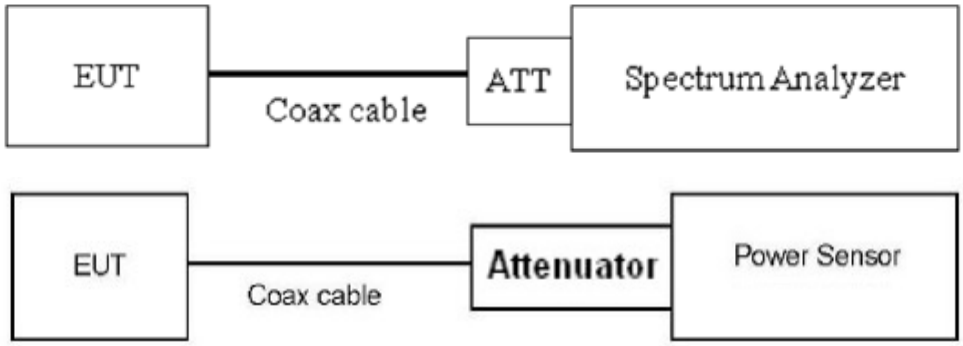
1GHz-18GHz(3m FAC)



Above 18GHz (3m FAC)



3) RF Conducted Test



2.4 Test Procedure

Conducted emission:

1. The E.U.T is placed on a non-conducting table 40cm from the vertical ground plane and 80cm above the horizontal ground plane (Please refer to the block diagram of the test setup and photographs).
2. 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 on conducted measurement.
3. Line conducted data is recorded for both Line and Neutral

Radiated Emission Procedure:

a) For below 30MHz

1. All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz- 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).
2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, gound-parallel)

b) For 30MHz-1GHz:

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

c) For above 1GHz:

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m (1-18GHz) and 1.5 m (above 18GHz).

2. EUT works in each mode of operation that needs to be tested，and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
4. Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

RF Conducted Test:

1. The antenna port of EUT was connected to the RF port of the test equipment (Power Meter or Spectrum analyzer) through Attenuator and RF cable.
2. The cable assembly insertion loss of 11dB (including 10 dB Attenuator and 1.0 dB cable) was entered as an offset in the power meter. Note: Actual cable loss was unavailable at the time of testing, therefore a loss of 1.0dB was assumed as worst case. This was later verified to be true by laboratory. (if the RF cable provided by client, the cable loss declared by client)
3. The EUT is keeping in continuous transmission mode and tested in all modulation modes.

2.5 Measurement Method

Description of Test	Measurement Method
AC Line Conducted Emissions	ANSI C63.10-2020 Section 6.2
Maximum Conducted Output Power	ANSI C63.10-2020 Section 11.9.1.2 PKPM1 Peak power meter method or ANSI C63.10-2020 Section 11.9.2.3.2 Method AVGPM-G
Power Spectral Density	ANSI C63.10-2020 Section 11.10.2 Method PKPSD (peak PSD)
6 dB Emission Bandwidth	ANSI C63.10-2020 Section 11.8.1
99% Occupied Bandwidth	ANSI C63.10-2020 Section 6.9.3
100kHz Bandwidth of Frequency Band Edge	ANSI C63.10-2020 Section 6.10
Radiated emission	ANSI C63.10-2020 Section 11.11&11.12
Duty Cycle	ANSI C63.10-2020 Section 11.6

2.6 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
ROHDE& SCHWARZ					
R&S	LISN	ENV216	101748	2023/8/1	2024/7/30
N/A	Coaxial Cable	NO.12	N/A	2023/7/3	2024/7/2
Farad	Test Software	EZ-EMC	Ver. EMEC-3A1	/	/
ROHDE& SCHWARZ	EMI TEST RECEIVER	ESR	101817	2023/7/3	2024/7/2
Radiated Emission Test					
R&S	EMI test receiver	ESR3	102758	2023/7/3	2024/7/2
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSV40-N	101608	2023/7/3	2024/7/2
SONOMA INSTRUMENT	Low frequency amplifier	310	186014	2023/7/12	2024/7/11
COM-POWER	preamplifier	PAM-118A	18040152	2023/8/21	2024/8/20
COM-POWER	Amplifier	PAM-840A	461306	2023/8/8	2024/8/7
ETS	Passive Loop Antenna	6512	29604	2023/7/7	2024/7/6
SCHWARZBECK	Log - periodic wideband antenna	VULB 9163	9163-872	2023/7/7	2024/7/6
Astro Antenna Ltd	Horn antenna	AHA-118S	3015	2023/7/6	2024/7/5
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2023/7/10	2024/7/9
Ducommun technologies	Horn Antenna	ARH-2823-02	1007726-03	2023/7/10	2024/7/9
Oulitong	Band Reject Filter	OBSF-2400-248 3.5-50N	OE02103119	2023/9/15	2024/9/14
N/A	Coaxial Cable	N/A	NO.9	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.10	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.11	2023/8/8	2024/8/7
Audix	Test Software	E3	191218 V9	/	/
RF Conducted Test					
R&S	Spectrum Analyzer	FSU26	200982	2023/12/18	2024/12/17
MARCONI	10dB Attenuator	1692595	2942	2023/10/25	2024/10/24

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

3 Test Results

3.1 Test Summary

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.247(b)(3)	Maximum Conducted Output Power	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
-	99% Occupied Bandwidth	Report only
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Compliance
§15.205, §15.209, §15.247(d)	Radiated emission	Compliance
-	Duty Cycle	Report only

3.2 Limit

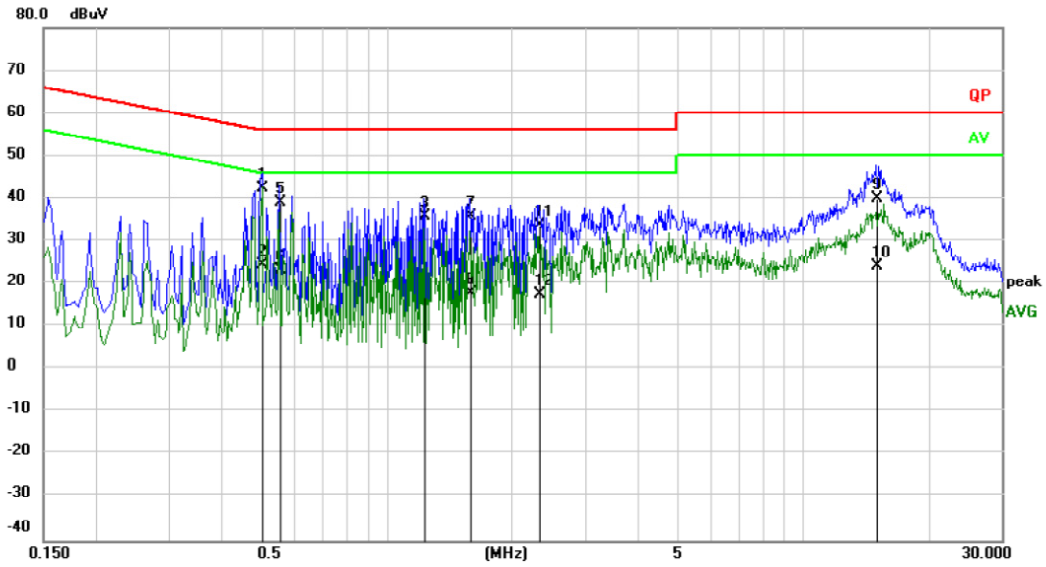
Test items	Limit
AC Line Conducted Emissions	See details §15.207 (a)
Conducted Output Power	For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.
6dB Emission Bandwidth	The minimum 6 dB bandwidth shall be at least 500 kHz.
Power Spectral Density	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
Spurious Emissions, 100kHz Bandwidth of Frequency Band Edge	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

3.3 AC Line Conducted Emissions Test Data

Test Date:	2024-1-24	Test By:	Lirou Li
Environment condition:	Temperature: 21.4°C; Relative Humidity:30%; ATM Pressure: 101.0kPa		

Conducted Emission Measurement

File :RWAY202300070 Data :#3 Date: 2024/1/24 Time: 13:48:47



Limit: QP
Mode:transmitting
Note: 2.4G-WIFI

Phase: L1
Power: AC 120V/60Hz

Temperature: 21.4
Humidity: 30 %
Air Pressure: 1010 hpa

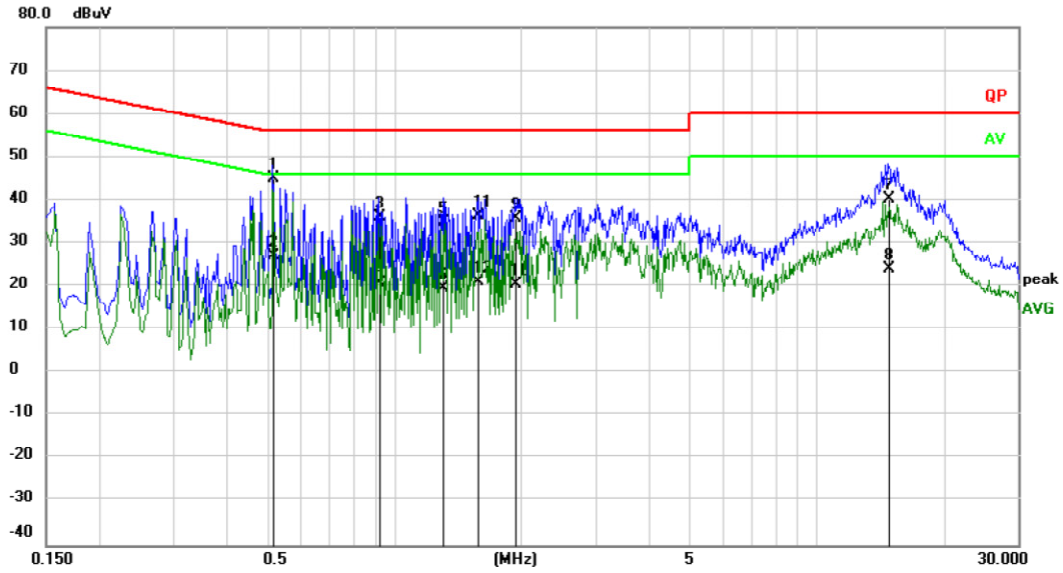
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.5020	31.55	10.81	42.36	56.00	-13.64	QP	
2		0.5020	13.65	10.81	24.46	46.00	-21.54	AVG	
3		1.2340	24.86	10.93	35.79	56.00	-20.21	QP	
4		1.2340	6.82	10.93	17.75	46.00	-28.25	AVG	
5		0.5540	28.12	10.83	38.95	56.00	-17.05	QP	
6		0.5540	12.30	10.83	23.13	46.00	-22.87	AVG	
7		1.5900	25.04	10.73	35.77	56.00	-20.23	QP	
8		1.5900	7.12	10.73	17.85	46.00	-28.15	AVG	
9		15.0020	29.46	10.59	40.05	60.00	-19.95	QP	
10		15.0020	13.47	10.59	24.06	50.00	-25.94	AVG	
11		2.3300	23.01	10.59	33.60	56.00	-22.40	QP	
12		2.3300	6.97	10.59	17.56	46.00	-28.44	AVG	

*:Maximum data x:Over limit !:over margin

Engineer Signature: Lirou

Conducted Emission Measurement

File :RWAY202300070 Data :#4 Date: 2024/1/24 Time: 14:00:36



Limit: QP Phase: N Temperature: 21.4

Mode:transmitting Power: AC 120V/60Hz Humidity: 30 %

Note: 2.4G-WIFI Air Pressure: 1010 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.5180	34.38	10.70	45.08	56.00	-10.92	QP	
2		0.5180	16.44	10.70	27.14	46.00	-18.86	AVG	
3		0.9220	25.50	10.63	36.13	56.00	-19.87	QP	
4		0.9220	10.01	10.63	20.64	46.00	-25.36	AVG	
5		1.3060	24.32	10.67	34.99	56.00	-21.01	QP	
6		1.3060	8.75	10.67	19.42	46.00	-26.58	AVG	
7		14.7980	29.48	10.88	40.36	60.00	-19.64	QP	
8		14.7980	13.13	10.88	24.01	50.00	-25.99	AVG	
9		1.9300	24.91	10.69	35.60	56.00	-20.40	QP	
10		1.9300	9.75	10.69	20.44	46.00	-25.56	AVG	
11		1.5820	25.75	10.68	36.43	56.00	-19.57	QP	
12		1.5820	10.40	10.68	21.08	46.00	-24.92	AVG	

*:Maximum data x:Over limit !:over margin Engineer Signature: Lirou

Remark:

Measurement (dBuV)= Reading Level (dBuV) + Correct Factor(dB)

Correct Factor (dB)= LISN Voltage Division Factor (dB)+ Cable loss(dB)

Over = Measurement – Limit

3.4 Radiated emission Test Data

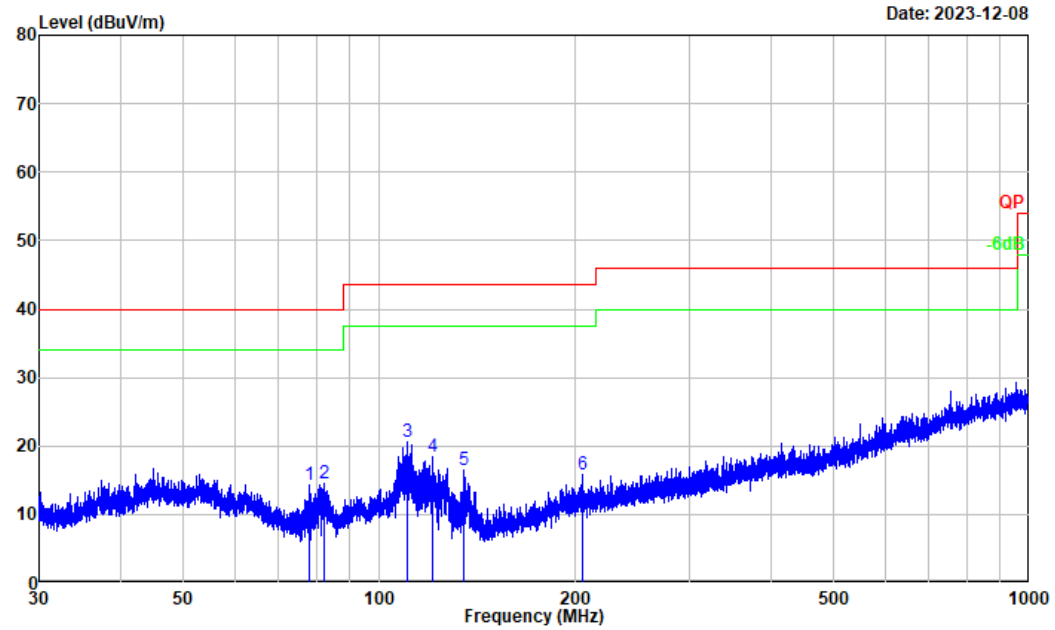
9 kHz-30MHz:

Test Date:	2023-12-08	**Test By:**	Bard Huang
Environment condition:	Temperature: 24°C; Relative Humidity:47%; ATM Pressure: 101kPa		

For radiated emissions below 30MHz, there were no emissions found within 20dB of limit.

30MHz-1GHz:

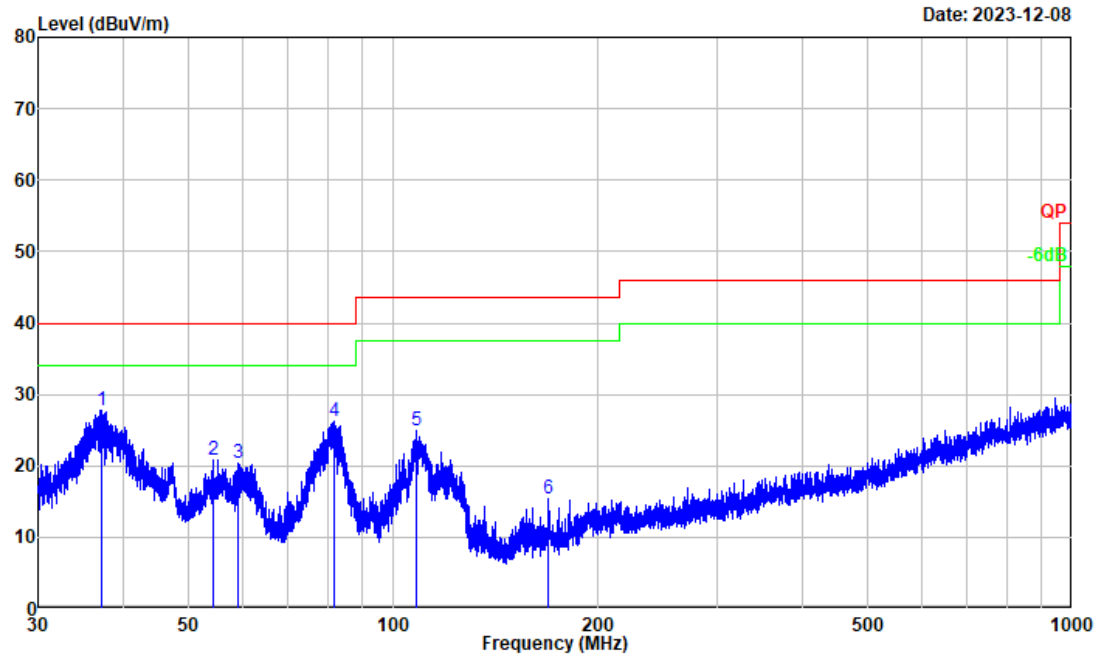
Test Date:	2023-12-08	Test By:	Bard Huang
Environment condition:	Temperature: 24°C; Relative Humidity:47%; ATM Pressure: 101kPa		



Project No. : RWAZ202300070
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24℃/47%R.H./101kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 2.4G

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	78.207	32.57	-18.19	14.38	40.00	-25.62	Peak
2	82.395	32.24	-17.69	14.55	40.00	-25.45	Peak
3	110.714	35.02	-14.36	20.66	43.50	-22.84	Peak
4	120.646	34.45	-15.98	18.47	43.50	-25.03	Peak
5	134.736	34.00	-17.46	16.54	43.50	-26.96	Peak
6	205.585	29.63	-13.82	15.81	43.50	-27.69	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain



Project No. : RWAZ202300070
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24℃/47%R.H./101kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 2.4G

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	37.220	41.65	-13.96	27.69	40.00	-12.31	Peak
2	54.213	33.39	-12.54	20.85	40.00	-19.15	Peak
3	58.999	33.91	-13.56	20.35	40.00	-19.65	Peak
4	81.819	43.99	-17.81	26.18	40.00	-13.82	Peak
5	108.409	39.04	-14.07	24.97	43.50	-18.53	Peak
6	169.525	31.81	-16.35	15.46	43.50	-28.04	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

Remark:

Level = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Over Limit = Level – Limit

Above 1GHz:

Test Date:	2023-12-07	Test By:	Bard Huang
Environment condition:	Temperature:24°C; Relative Humidity:44%; ATM Pressure: 101.1kPa		

Frequency (MHz)	Reading level (dBμV)	Polar	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
802.11b							
Low Channel							
2390	50.66	horizontal	8.25	58.91	74	-15.09	Peak
2390	39.6	horizontal	8.25	47.85	54	-6.15	Average
2390	48.78	vertical	8.25	57.03	74	-16.97	Peak
2390	37.72	vertical	8.25	45.97	54	-8.03	Average
4824	53.69	horizontal	0.26	53.95	74	-20.05	Peak
4824	49.24	horizontal	0.26	49.5	54	-4.5	Average
4824	52.81	vertical	0.26	53.07	74	-20.93	Peak
4824	48.36	vertical	0.26	48.62	54	-5.38	Average
Middle Channel							
4874	53.29	horizontal	0.41	53.7	74	-20.3	Peak
4874	48.84	horizontal	0.41	49.25	54	-4.75	Average
4874	52.41	vertical	0.41	52.82	74	-21.18	Peak
4874	47.96	vertical	0.41	48.37	54	-5.63	Average
High Channel							
2483.5	50.25	horizontal	8.25	58.5	74	-15.5	Peak
2483.5	39.14	horizontal	8.25	47.39	54	-6.61	Average
2483.5	48.37	vertical	8.25	56.62	74	-17.38	Peak
2483.5	37.26	vertical	8.25	45.51	54	-8.49	Average
4924	50.14	horizontal	0.69	50.83	74	-23.17	Peak
4924	45.73	horizontal	0.69	46.42	54	-7.58	Average
4924	49.26	vertical	0.69	49.95	74	-24.05	Peak
4924	44.85	vertical	0.69	45.54	54	-8.46	Average
802.11g							
Low Channel							
2390	55.37	horizontal	8.25	63.62	74	-10.38	Peak
2390	37.48	horizontal	8.25	45.73	54	-8.27	Average
2390	54.49	vertical	8.25	62.74	74	-11.26	Peak
2390	37.6	vertical	8.25	45.85	54	-8.15	Average
4824	47.89	horizontal	0.26	48.15	74	-25.85	Peak

4824	37.05	horizontal	0.26	37.31	54	-16.69	Average
4824	47.01	vertical	0.26	47.27	74	-26.73	Peak
4824	37.17	vertical	0.26	37.43	54	-16.57	Average
Middle Channel							
4874	47.09	horizontal	0.41	47.5	74	-26.5	Peak
4874	36.25	horizontal	0.41	36.66	54	-17.34	Average
4874	46.21	vertical	0.41	46.62	74	-27.38	Peak
4874	36.37	vertical	0.41	36.78	54	-17.22	Average
High Channel							
2483.5	58.6	horizontal	8.25	66.85	74	-7.15	Peak
2483.5	42.1	horizontal	8.25	50.35	54	-3.65	Average
2483.5	57.72	vertical	8.25	65.97	74	-8.03	Peak
2483.5	41.22	vertical	8.25	49.47	54	-4.53	Average
4924	48.07	horizontal	0.69	48.76	74	-25.24	Peak
4924	36.91	horizontal	0.69	37.6	54	-16.4	Average
4924	47.19	vertical	0.69	47.88	74	-26.12	Peak
4924	37.03	vertical	0.69	37.72	54	-16.28	Average
802.11n20							
Low Channel							
2390	50.11	horizontal	8.25	58.36	74	-15.64	Peak
2390	37.2	horizontal	8.25	45.45	54	-8.55	Average
2390	49.23	vertical	8.25	57.48	74	-16.52	Peak
2390	37.32	vertical	8.25	45.57	54	-8.43	Average
4824	48.9	horizontal	0.26	49.16	74	-24.84	Peak
4824	37.34	horizontal	0.26	37.6	54	-16.4	Average
4824	49.02	vertical	0.26	49.28	74	-24.72	Peak
4824	37.46	vertical	0.26	37.72	54	-16.28	Average
Middle Channel							
4874	49.5	horizontal	0.41	49.91	74	-24.09	Peak
4874	35.94	horizontal	0.41	36.35	54	-17.65	Average
4874	48.62	vertical	0.41	49.03	74	-24.97	Peak
4874	36.06	vertical	0.41	36.47	54	-17.53	Average
High Channel							
2483.5	62.38	horizontal	8.25	70.63	74	-3.37	Peak
2483.5	42.27	horizontal	8.25	50.52	54	-3.48	Average
2483.5	61.5	vertical	8.25	69.75	74	-4.25	Peak
2483.5	41.39	vertical	8.25	49.64	54	-4.36	Average
4924	46.95	horizontal	0.69	47.64	74	-26.36	Peak

4924	36.69	horizontal	0.69	37.38	54	-16.62	Average
4924	46.07	vertical	0.69	46.76	74	-27.24	Peak
4924	36.81	vertical	0.69	37.5	54	-16.5	Average

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

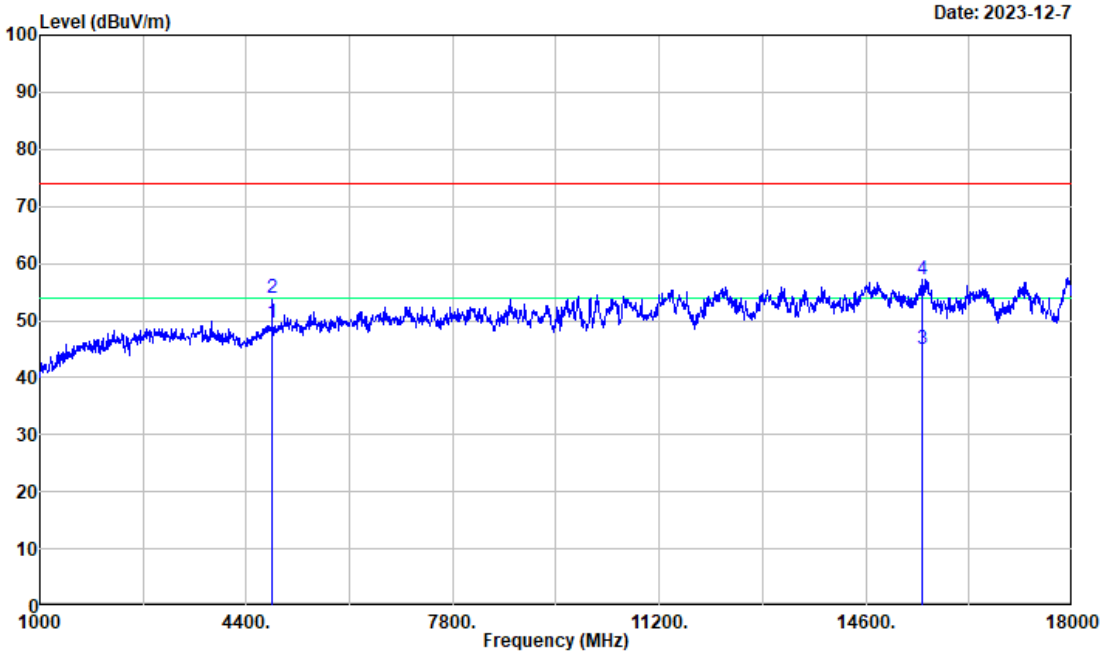
Margin = Corrected Amplitude – Limit

The emission levels of other frequencies that were lower than the limit 20dB not show in test report.

For emissions in 18GHz-25GHz range, all emissions were investigated and in the noise floor level.

Test plot for example as below:

Mode:	802.11b	Channel:	2412MHz

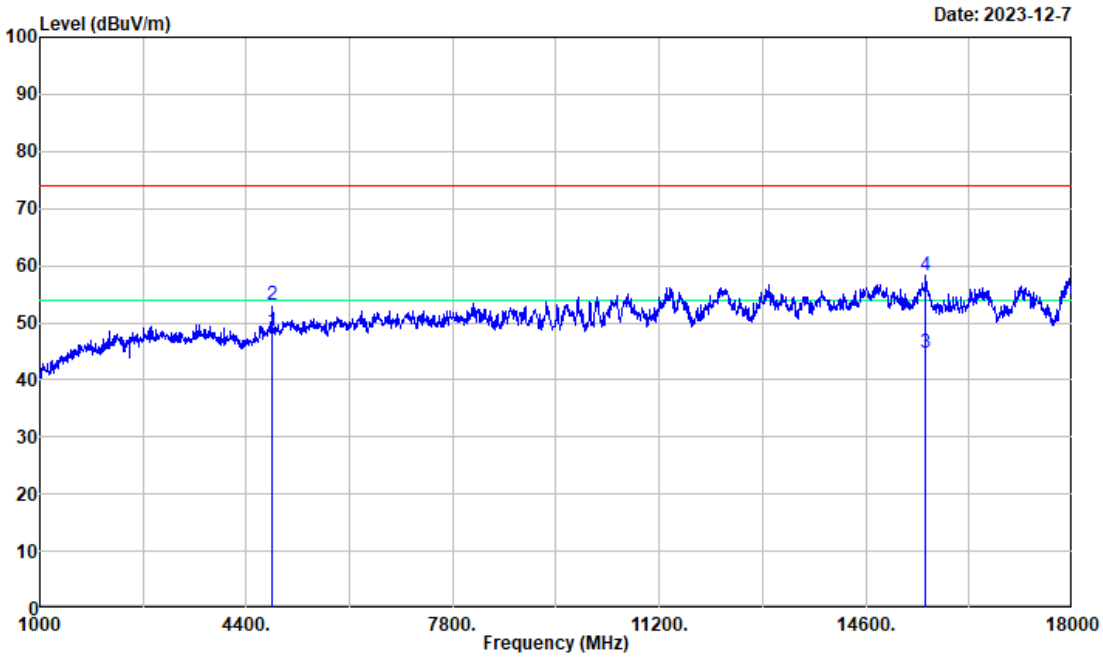


Project No. : RWAY20230070
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.0℃/44%R.H./101.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11b Low Channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	4824.000	49.24	0.26	49.50	54.00	-4.50	Average
2	4824.000	53.69	0.26	53.95	74.00	-20.05	Peak
3	15533.770	36.80	8.11	44.91	54.00	-9.09	Average
4	15533.770	49.12	8.11	57.23	74.00	-16.77	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

Mode:	802.11b	Channel:	2412MHz



Project No. : RWAY20230070
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.0℃/44%R.H./101.1kPa
Tested by : Bard Huang
Polarization : Vertical
Remark : 802.11b Low Channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	4824.000	48.36	0.26	48.62	54.00	-5.38	Average
2	4824.000	52.81	0.26	53.07	74.00	-20.93	Peak
3	15584.790	36.63	8.10	44.73	54.00	-9.27	Average
4	15584.790	50.16	8.10	58.26	74.00	-15.74	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

3.5 RF Conducted Test Data

Test Date:	2024/1/29	Test By:	Ryan Zhang
Environment condition:	Temperature: 25°C; Relative Humidity:45%; ATM Pressure: 101kPa		

3.5.1 6 dB Emission Bandwidth and 99% Occupied Bandwidth

Test Mode	Channel	6dB BW [MHz]	99% OBW[MHz]	6dB BW Limit[MHz]	Verdict
11B	2412	9.15	14.16	0.5	pass
	2437	9.15	14.16	0.5	pass
	2462	9.15	14.16	0.5	pass
11G	2412	16.65	17.08	0.5	pass
	2437	16.62	17.08	0.5	pass
	2462	16.62	17.08	0.5	pass
11N20	2412	17.85	18.12	0.5	pass
	2437	17.85	18.16	0.5	pass
	2462	17.82	18.12	0.5	pass

3.5.2 Maximum Conducted Peak Output Power

Test Mode	Channel [MHz]	Result [dBm]	Limit [dBm]	Verdict
11B	2412	14.82	30	Pass
	2437	14.95	30	Pass
	2462	15.15	30	Pass
11G	2412	14.89	30	Pass
	2437	15.10	30	Pass
	2462	15.33	30	Pass
11N20	2412	14.53	30	Pass
	2437	14.78	30	Pass
	2462	14.93	30	Pass

3.5.3 Power Spectral Density

Test Mode	Channel [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	2412	-18.59	8	Pass
	2437	-18.37	8	Pass
	2462	-18.18	8	Pass
11G	2412	-21.82	8	Pass
	2437	-21.74	8	Pass
	2462	-21.54	8	Pass
11N20	2412	-22.31	8	Pass
	2437	-22.18	8	Pass
	2462	-21.90	8	Pass

3.5.4 100 kHz Bandwidth of Frequency Band Edge

Test Mode	Channel	Result	Limit	Verdict
11B	2412	Refer test plot	Refer test plot	Pass
	2462	Refer test plot	Refer test plot	Pass
11G	2412	Refer test plot	Refer test plot	Pass
	2462	Refer test plot	Refer test plot	Pass
11N20	2412	Refer test plot	Refer test plot	Pass
	2462	Refer test plot	Refer test plot	Pass

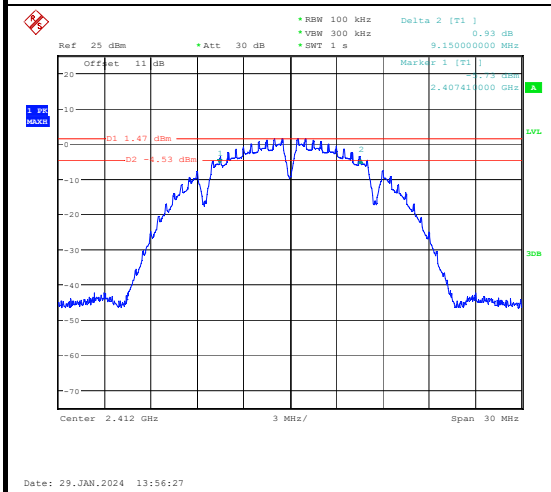
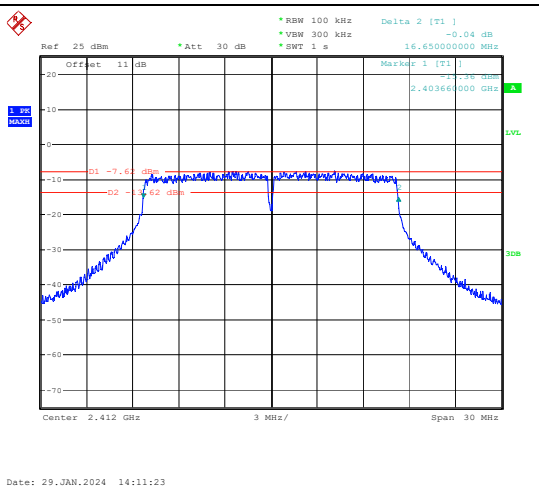
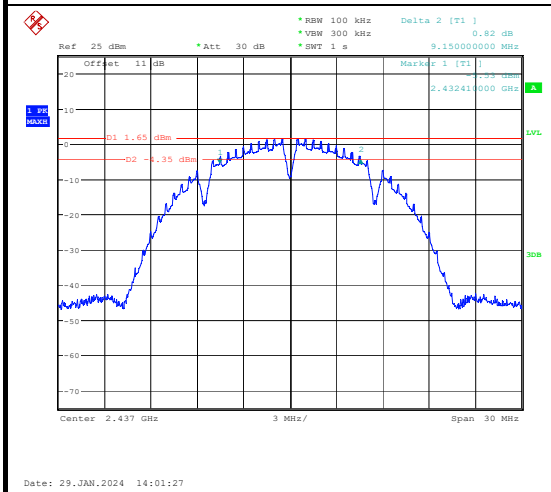
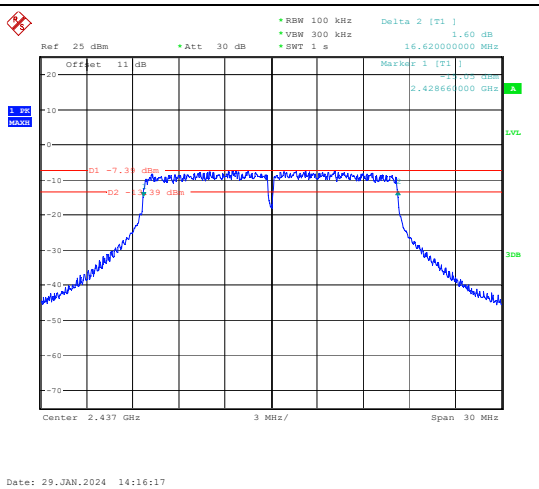
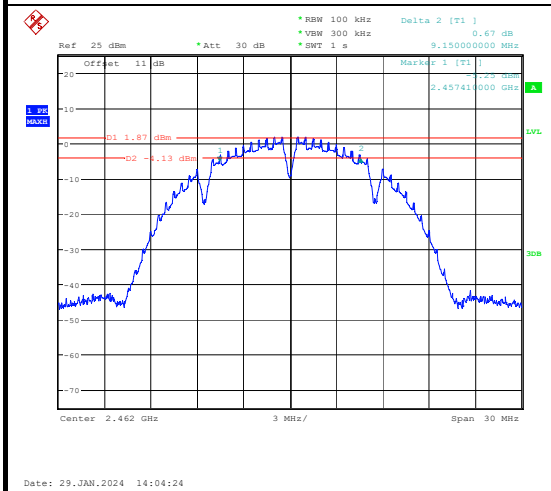
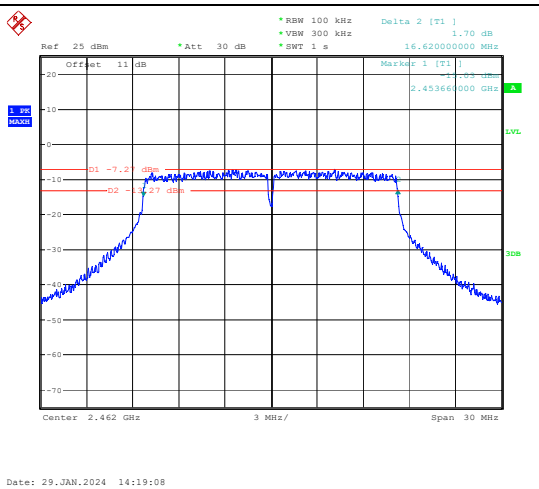
3.5.5 Duty Cycle

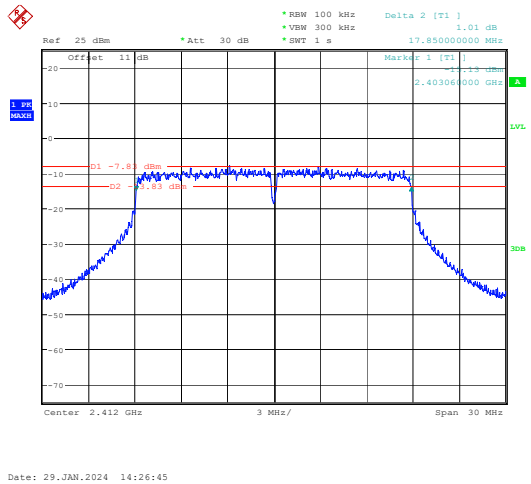
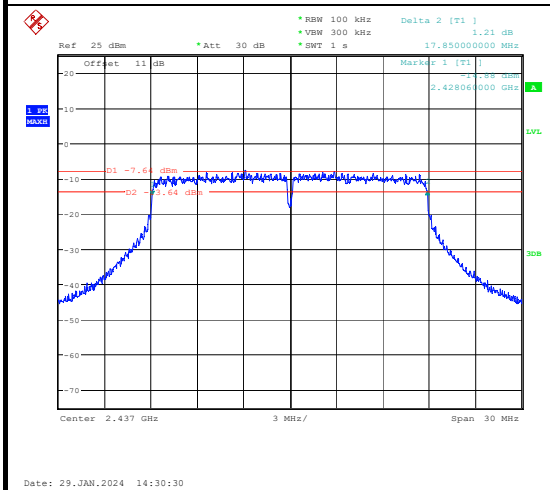
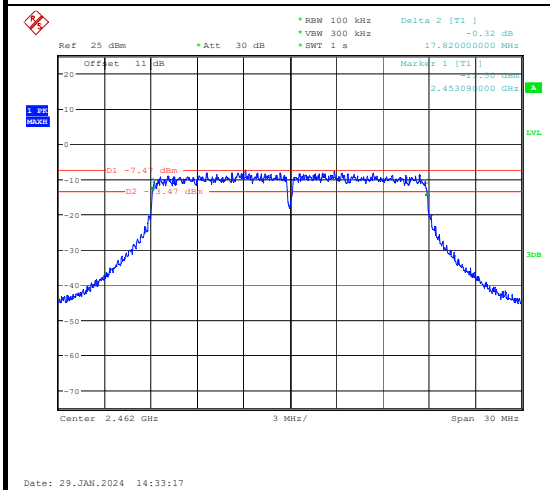
Test Mode	**Channel**	**Ton (ms)**	**Ton+off (ms)**	**Duty Cycle [%]**	**1/T**	**VBW setting* [Hz]**
11B	2437	100	100	100	/	10
11G	2437	100	100	100	/	10
11N20	2437	100	100	100	/	10

Note*: Radiated emission test with average value, the Spectrum analyzer VBW setting information.

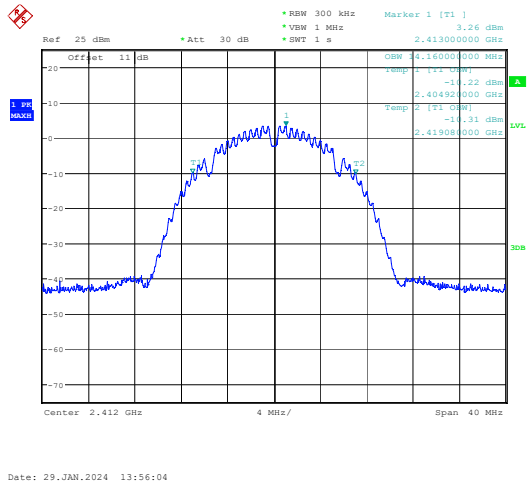
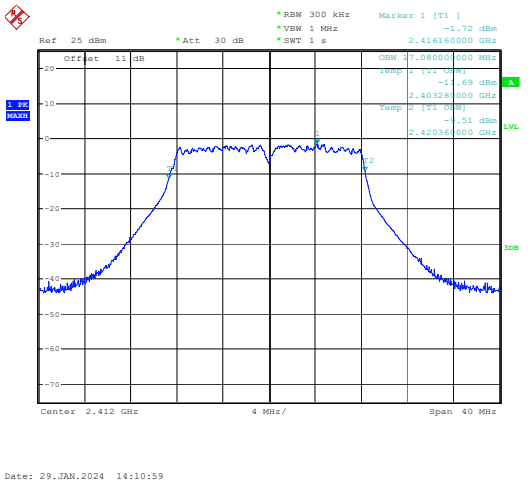
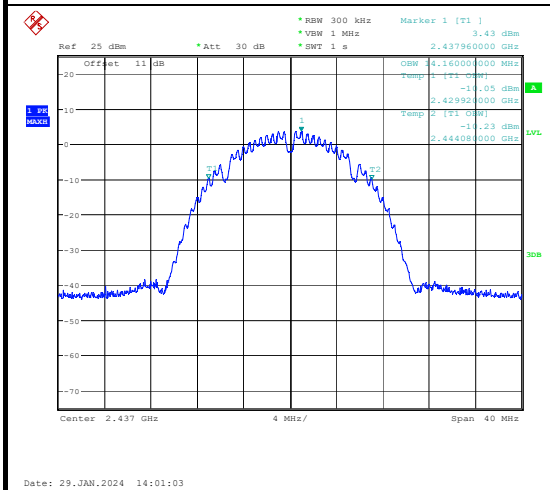
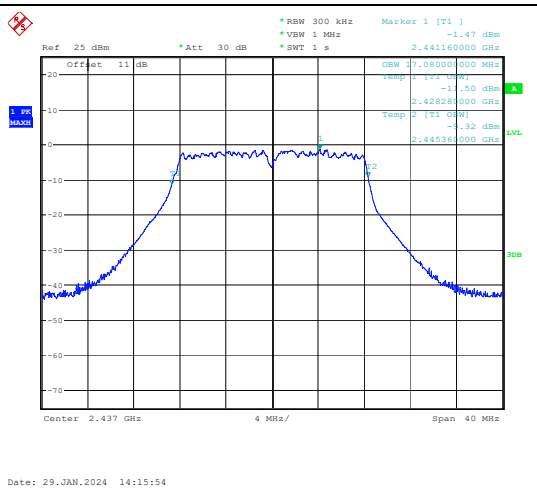
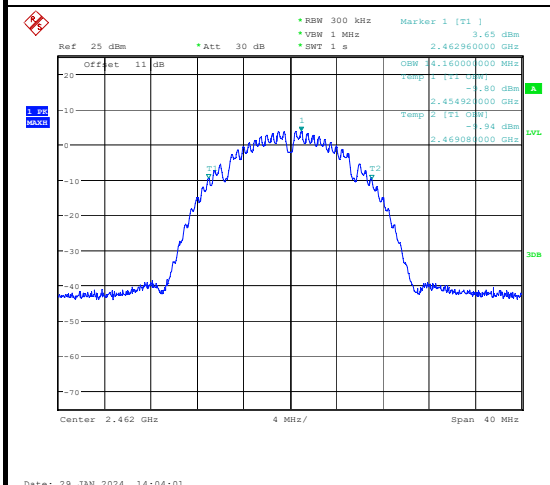
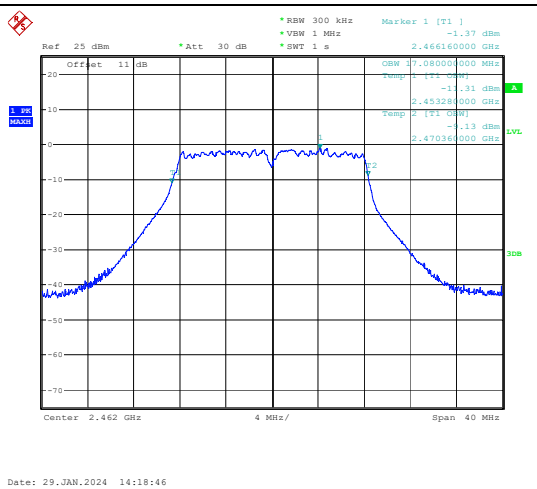
Test Plots:

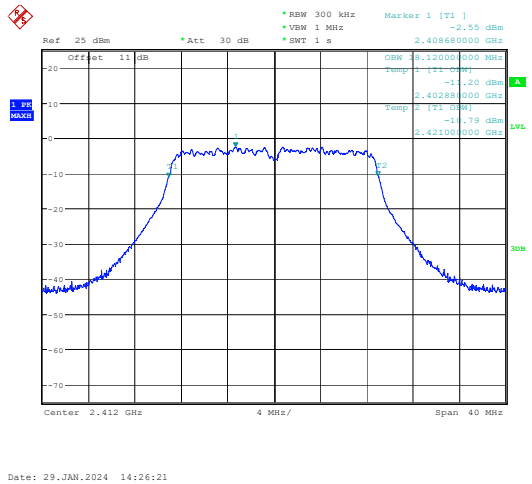
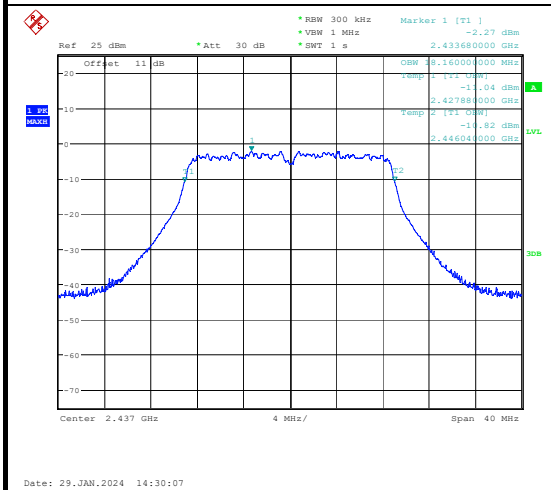
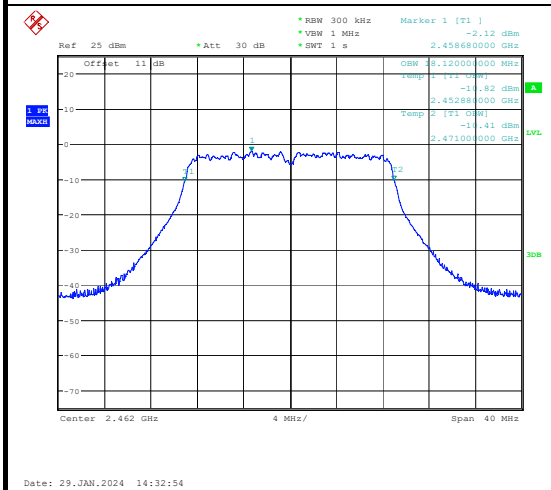
6 dB Emission Bandwidth:

802.11b	802.11g
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

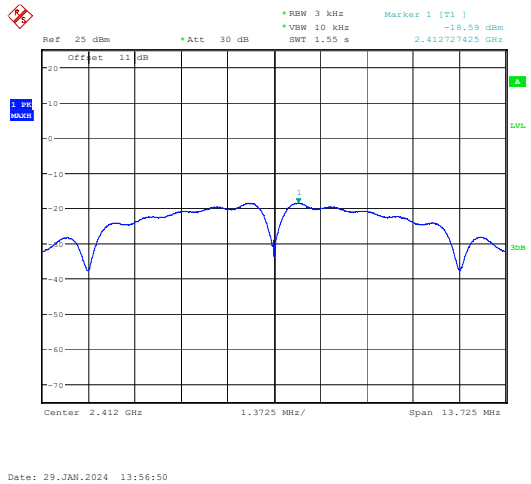
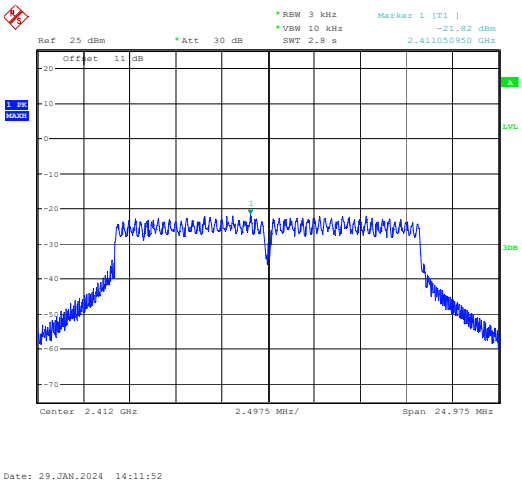
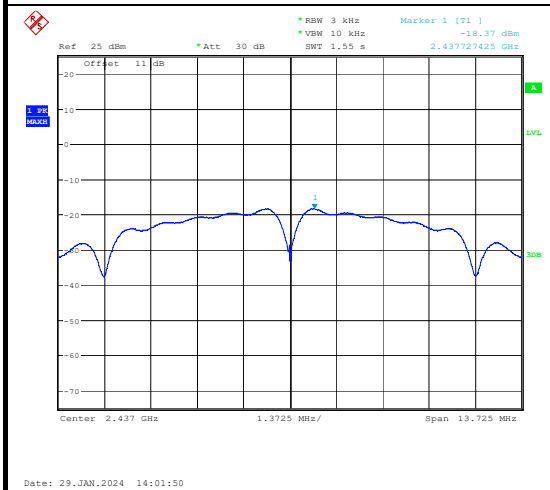
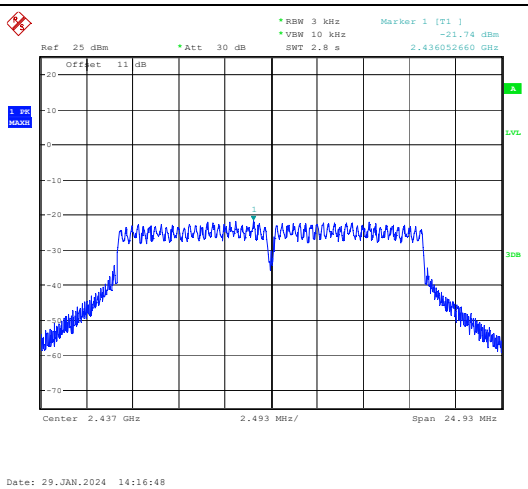
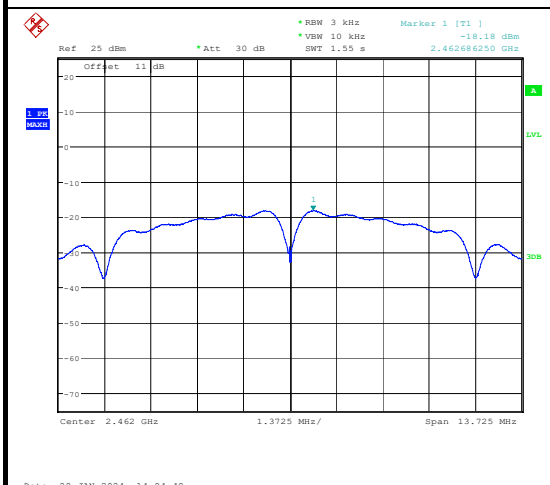
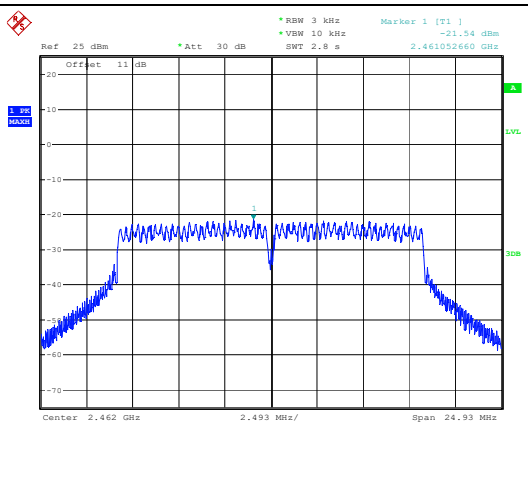
802.11n20	/
Lowest channel	/
	/
Middle channel	/
	/
High channel	/
	/

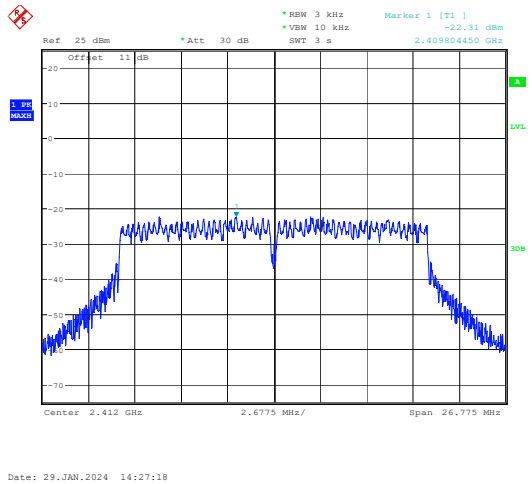
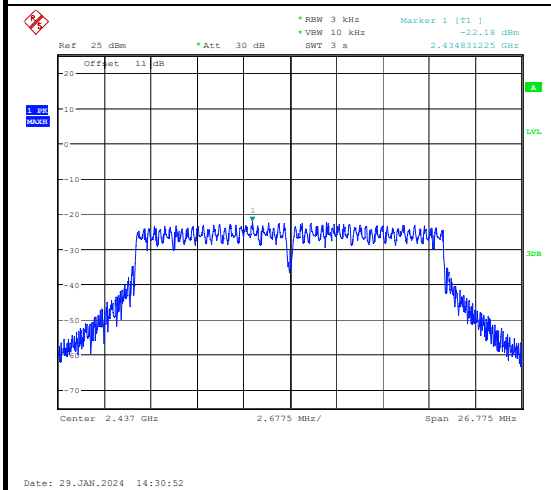
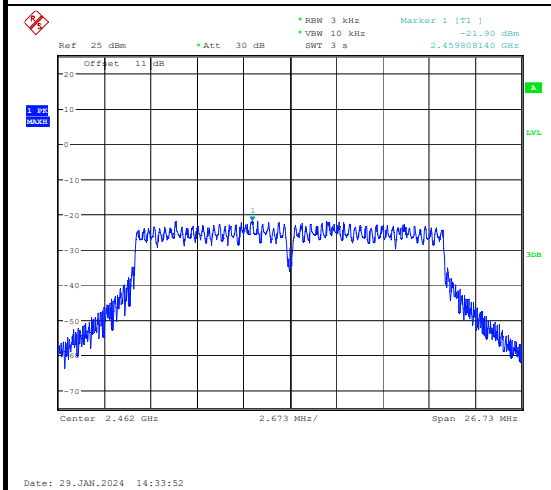
99% Occupied Bandwidth:

802.11b	802.11g
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

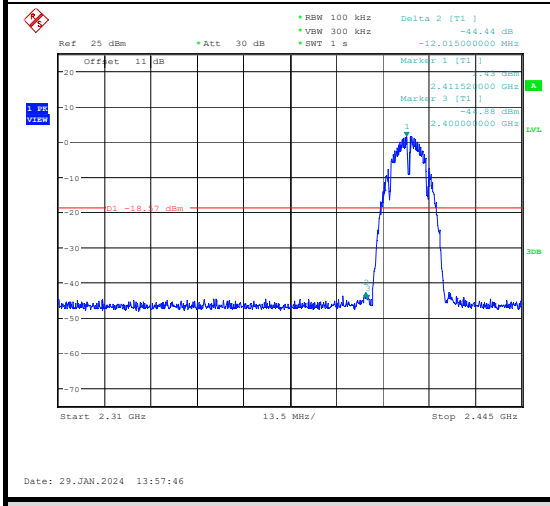
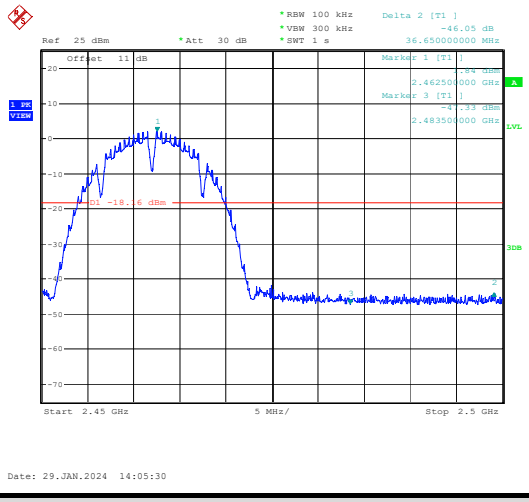
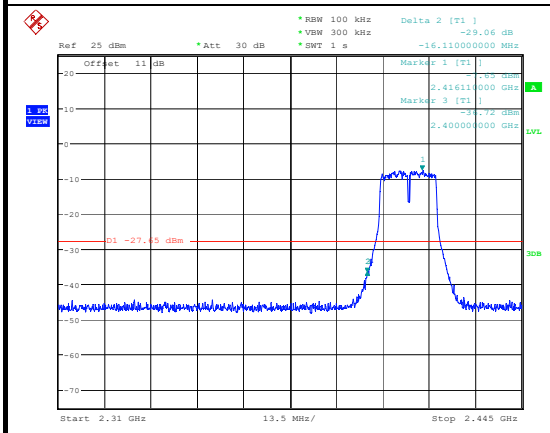
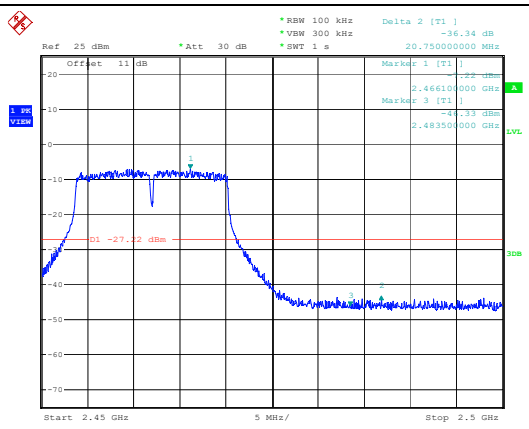
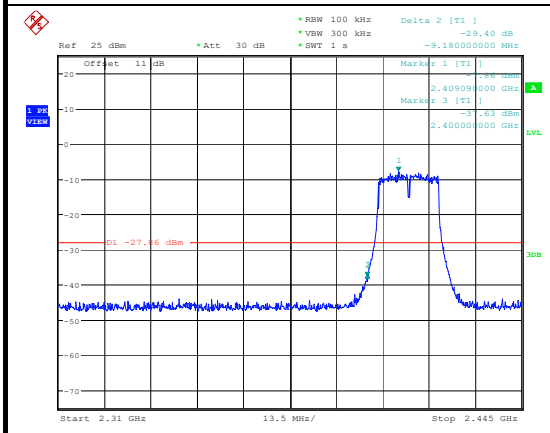
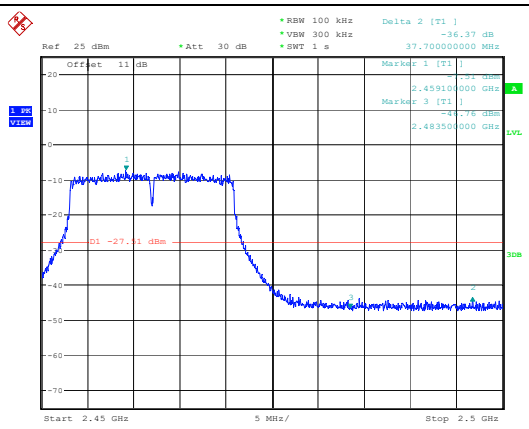
802.11n20	/
Lowest channel	/
	/
Middle channel	/
	/
High channel	/
	/

Power Spectral Density:

802.11b	802.11g
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

802.11n20	/
Lowest channel	/
	/
Middle channel	/
	/
High channel	/
	/

100kHz Bandwidth of Frequency Band Edge:

802.11b	
Lowest channel	High channel
	
Date: 29.JAN.2024 13:57:46	Date: 29.JAN.2024 14:05:30
802.11g	
Lowest channel	High channel
	
Date: 29.JAN.2024 14:13:31	Date: 29.JAN.2024 14:20:29
802.11n20	
Lowest channel	High channel
	
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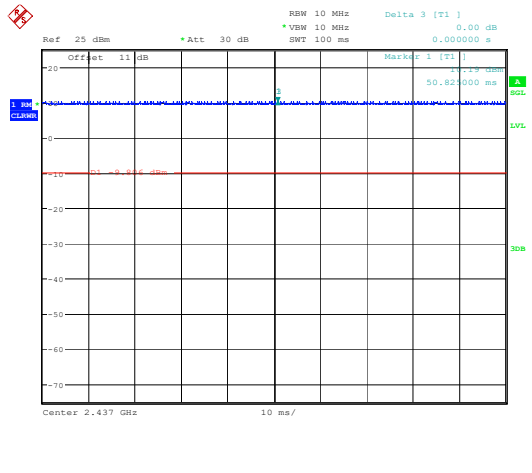
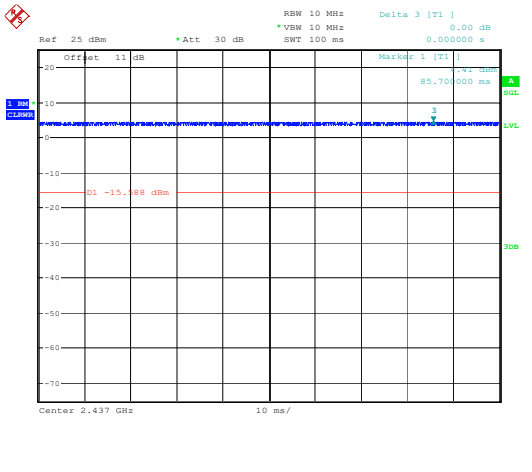
Duty Cycle:

802.11b	802.11g
	
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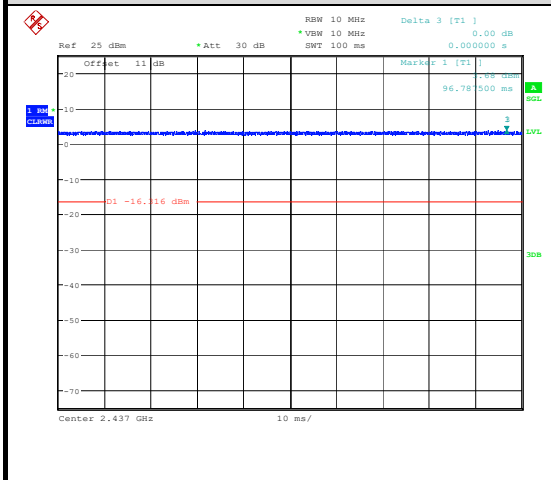	/

4 Test Setup Photo

Please refer to the attachment RWAY202300070 Test Setup photo.

5 E.U.T Photo

Please refer to the attachment RWAY202300070 External photo and RWAY202300070 Internal photo.

---End of Report---