FCC Test Report

Report No.:	2405T77560EB
Applicant:	Shenzhen Junge Yunchuang Technology Co., Ltd.
Address:	1204, Unit 3, Building C, Fu Gui Yuan, Fu Gui Road, Fu Hua Community, Xixiang Street, Baoan District, Shenzhen, China
Product Name:	Projector
Product Model:	V800P
Multiple Models:	F505, V700, J801, J802, J701, J702
Trade Mark:	N/A
FCC ID:	2A3FP-P15
Standards:	FCC CFR Title 47 Part 15C (§15.247)
Test Date:	2024-05-30 to 2024-07-09
Test Result:	Complied
Report Date:	2024-07-10

Reviewed by:	Abel chen	**Approved by:**	Jacob Gong
	Abel Chen Project Engineer		Jacob Kong Manager

Prepared by:

World Alliance Testing & 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

ilac-MRA

This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★"

Announcement

1. This test report shall not be reproduced except in full, without the written approval of World Alliance Testing & Certification (Shenzhen) Co., Ltd

2. The results in this report apply only to the sample tested.

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

4. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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	*2024-07-10*	*Original*

Contents

1 General Information

1.1 Client Information

Applicant:	Shenzhen Junge Yunchuang Technology Co., Ltd.
Address:	1204, Unit 3, Building C, Fu Gui Yuan, Fu Gui Road, Fu Hua Community, Xixiang Street, Baoan District, Shenzhen, China
Manufacturer:	Shenzhen Junge Yunchuang Technology Co., Ltd.
Address:	1204, Unit 3, Building C, Fu Gui Yuan, Fu Gui Road, Fu Hua Community, Xixiang Street, Baoan District, Shenzhen, China

1.2 Product Description of EUT

The EUT is Projector that contains Classic Bluetooth, 2.4GHz and 5GHz WLAN radios, this report covers the full testing of the 2.4GHz WLAN radio.

Sample Serial Number	2LUU-1 for CE test, 2LUU-3 for RE test, 2LUU-2 for RF conducted test (assigned by WATC)
Sample Received Date	2024-05-27
Sample Status	Good Condition
Frequency Range	2412MHz - 2472MHz(802.11b, g, n-HT20) 2422MHz - 2462MHz(802.11n-HT40)
Maximum Conducted Peak Output Power	11.75dBm
Modulation Technology	DSSS, OFDM
Antenna Gain#	ANT 1: 4.09dBi ANT 2: 4.18dBi
Spatial Streams#	MIMO (2TX, 2RX)
Power Supply	DC 35V from adapter
Adapter Information	Model: SOY-3500428-454 Input: AC100-240V, 50/60Hz, 2.5A Max Output: DC 35.0V/4.28A ,149.8W
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)

FCC Part 15, Subpart C, Equipment Class: DSS, FCC ID: 2A3FP-P15

FCC Part 15, Subpart E, Equipment Class: NII, FCC ID: 2A3FP-P15

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
Emissions, Conducted		1.75dB
Conducted Power		0.74dB
Frequency Error		150Hz
Bandwidth		0.34%
Power Spectral Density		0.74dB

Note: *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.*

1.6 Laboratory Location

World Alliance Testing & 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 C63.10-2013

2 Description of Measurement

2.1 Test Configuration

Operating channels:					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	6	2437	11	2462
2	2417	7	2442	12	2467
3	2422	8	2447	13	2472
4	2427	9	2452	/	/
5	2432	10	2457	/	/
According to ANSI C63.10-2013 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	7	2442	13	2472
802.11n-HT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
3	2422	7	2442	11	2462

Test Mode:				
Transmitting mode:	Keep the EUT in continuous transmitting with modulation			
Exercise software#:	SecureCRT			
Mode	**Worst-case Data rate**	**Power Level Setting#**		
		Low Channel	**Middle Channel**	**High Channel**
802.11b	1Mbps	1	1	1
802.11g	6Mbps	1	1	1
802.11n-HT20	6.5Mbps	1	1	1
802.11n-HT40	13.5Mbps	1	1	1
The exercise software and the maximum power setting that provided by manufacturer.				

Worst-Case Configuration:
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. According to manufacturer, the device support MIMO mode, all modes share the same power level setting under the same modulation. So the worst mode MIMO was selected to test

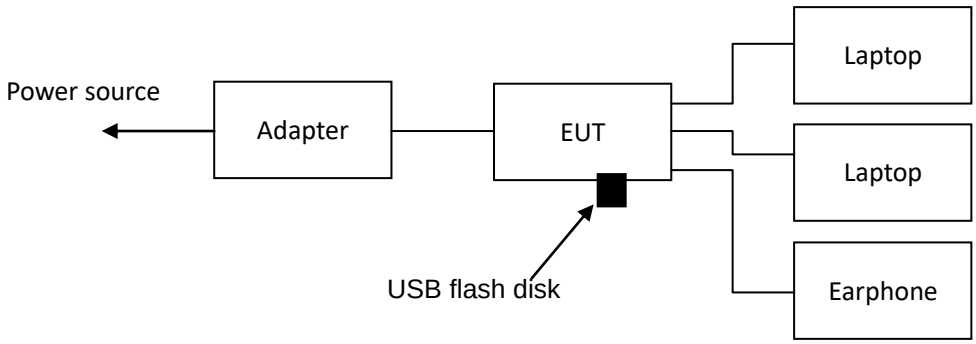
2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
aigo	USB flash disk	unknown	unknown
unknown	Earphone	unknown	unknown
DELL	Laptop*2	unknown	unknown

2.3 Interconnecting Cables

Manufacturer	Description	Length(m)	From	To
SOY	AC Power Cable	2.0	Power Source	Adapter
SOY	DC Power Cable	1.2	Adapter	EUT
Unknown	Shielding HDMI cable*2	1.5	EUT	Laptop

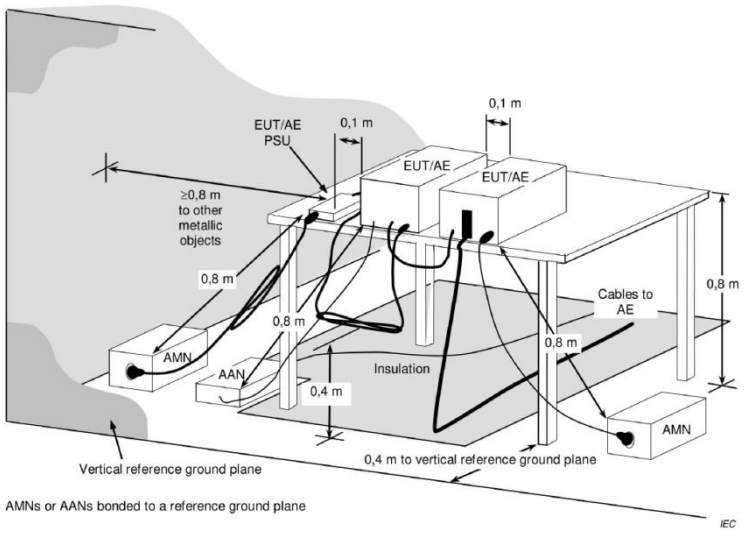
2.4 Block Diagram of Connection between EUT and AE



Note: for reference only, the actual connection setup used for testing please refer to the test photos.

2.5 Test Setup

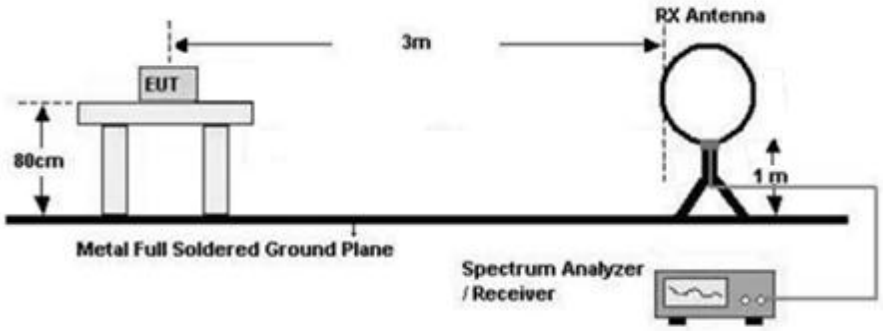
1) Conducted emission measurement:



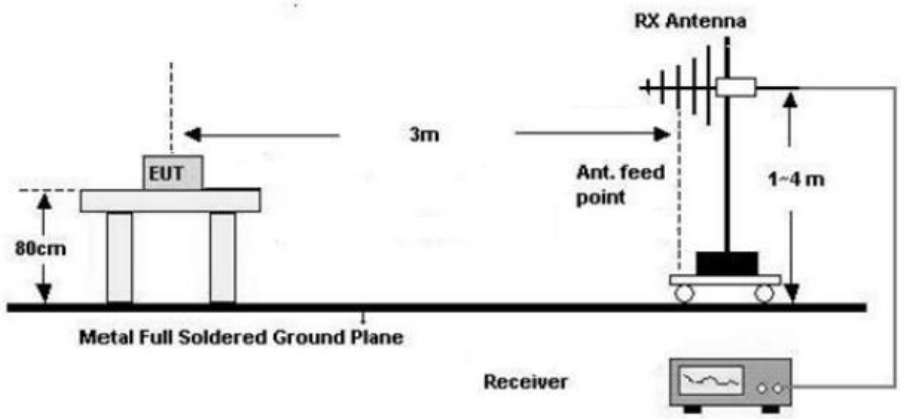
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

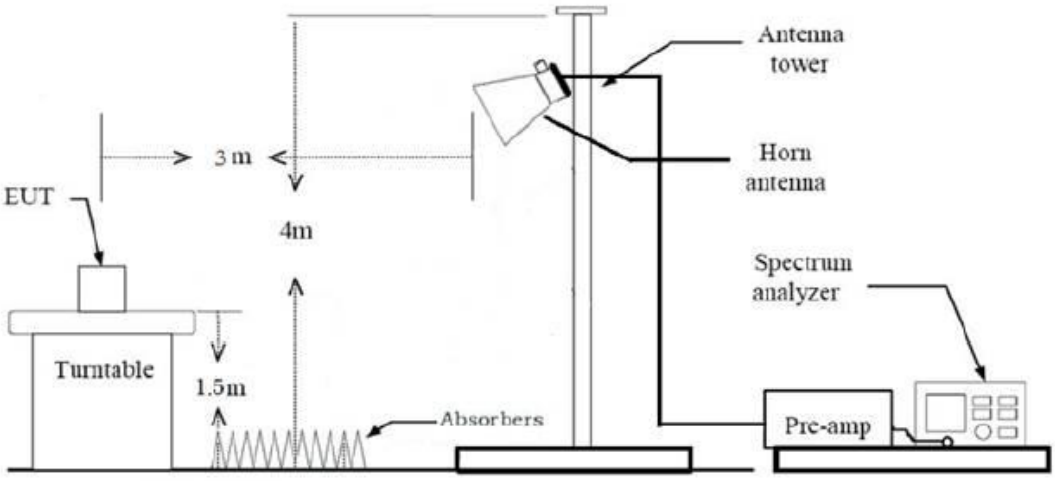
Below 30MHz (3m SAC)



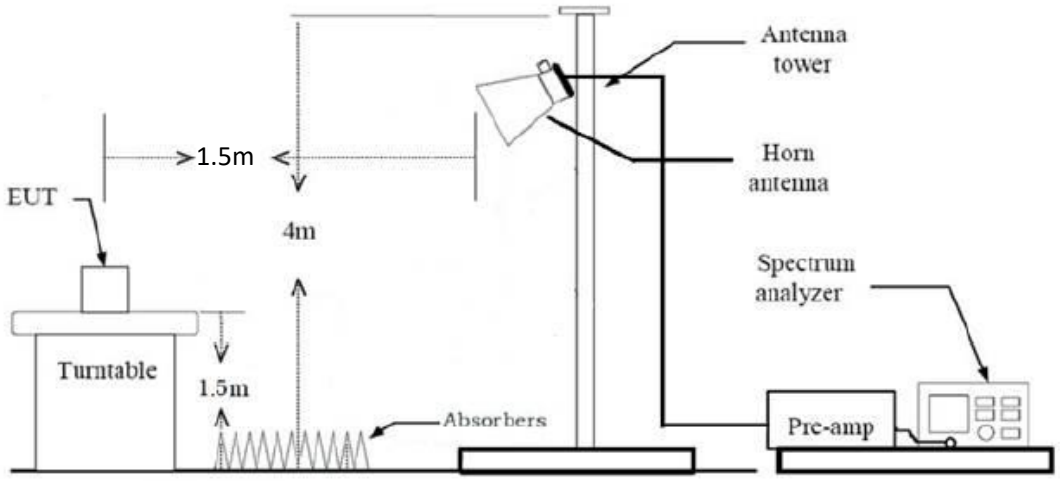
30MHz-1GHz (3m SAC)



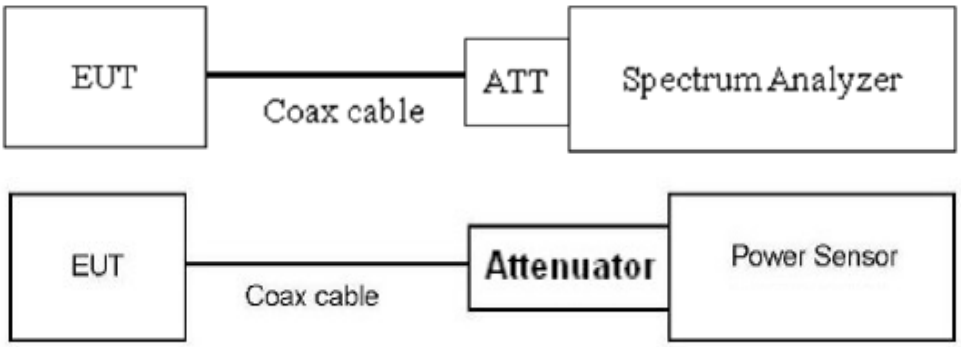
1GHz-18GHz(3m FAC)



Above 18GHz (3m FAC)



3) RF Conducted Test



2.6 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 7.0dB (including 6.0 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.

2.7 Measurement Method

Description of Test	Measurement Method
AC Line Conducted Emissions	ANSI C63.10-2013 Section 6.2
Maximum Conducted Output Power	ANSI C63.10-2013 Section 11.9.1.2 PKPM1 Peak power meter method or ANSI C63.10-2013 Section 11.9.2.3.2 Method AVGPM-G
Power Spectral Density	ANSI C63.10-2013 Section 11.10.2 Method PKPSD (peak PSD)
6 dB Emission Bandwidth	ANSI C63.10-2013 Section 11.8.1
99% Occupied Bandwidth	ANSI C63.10-2013 Section 6.9.3
100kHz Bandwidth of Frequency Band Edge	ANSI C63.10-2013 Section 6.10
Radiated emission	ANSI C63.10-2013 Section 11.11&11.12
Duty Cycle	ANSI C63.10-2013 Section 11.6

2.8 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
ROHDE& SCHWARZ	EMI TEST RECEIVER	ESR	101817	2023/7/3	2024/7/2
R&S	LISN	ENV216	101748	2023/8/1	2024/7/31
N/A	Coaxial Cable	NO.12	N/A	2023/7/3	2024/7/2
Farad	Test Software	EZ-EMC	Ver. EMEC-3A1	/	/
Radiated Emission Test(above 1GHz)					
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSV40-N	101608	2023/7/3	2024/7/2
COM-POWER	preamplifier	PAM-118A	18040152	2023/8/21	2024/8/20
COM-POWER	Amplifier	PAM-840A	461306	2023/8/8	2024/8/7
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
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	/	/
Radiated Emission Test(below 1GHz)					
R&S	EMI test receiver	ESR3	102758	2024/6/4	2025/6/3
SONOMA INSTRUMENT	Low frequency amplifier	310	186014	2024/6/4	2025/6/3
BACL	Loop Antenna	1313-1A	4010611	2024/2/7	2027/2/6
SCHWARZBECK	Log - periodic wideband antenna	VULB 9163	9163-872	2023/7/7	2026/7/6
N/A	Coaxial Cable	NO.14	N/A	2024/6/4	2025/6/3
N/A	Coaxial Cable	NO.16	N/A	2024/6/4	2025/6/3
Audix	Test Software	E3	191218 V9	/	/
RF Conducted Test					
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSU-26	200680/026	2023/7/12	2024/7/11
ANRITSU	USB Power Sensor	MA24418A	12620	2023/7/12	2024/7/11
narda	6dB attenuator	603-06-1	N/A	2023/7/26	2024/7/25

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

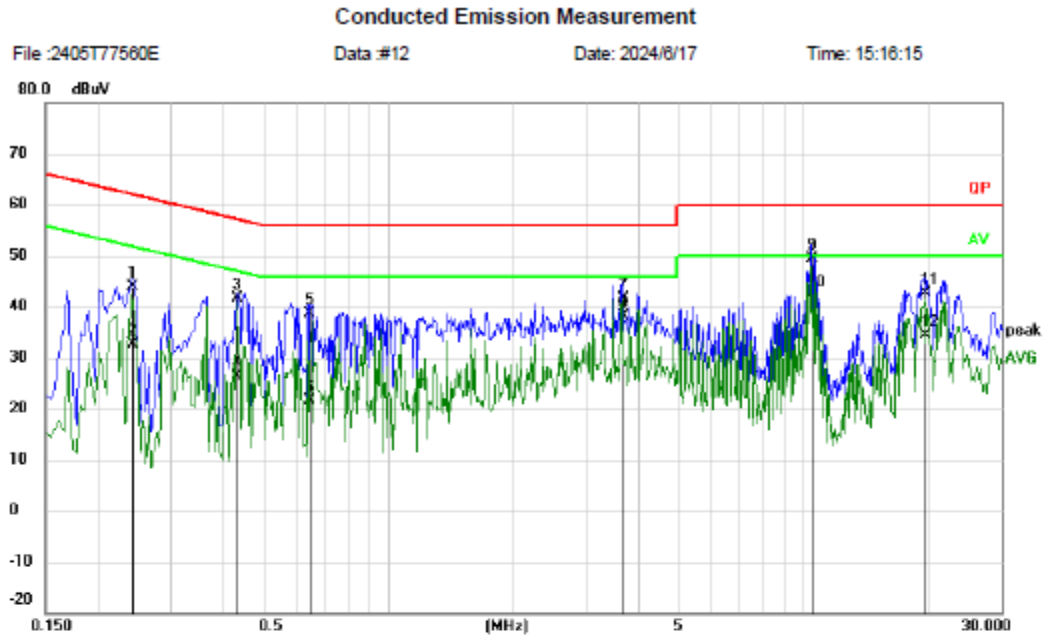
FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.247(b)(3)	Maximum Conducted Output Power	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
-	99% Occupied Bandwidth	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:	2024-06-17	Test By:	Lirou Li
Environment condition:	Temperature: 23.1°C; Relative Humidity:65%; ATM Pressure: 101.1kPa		



Limit: QP
Mode:transmitting
Note: 802.11g H Channel

Phase: L1
Power: AC 120V/60Hz

Temperature: 23.1 ℃
Humidity: 65 %
Air Pressure: 1011 hpa

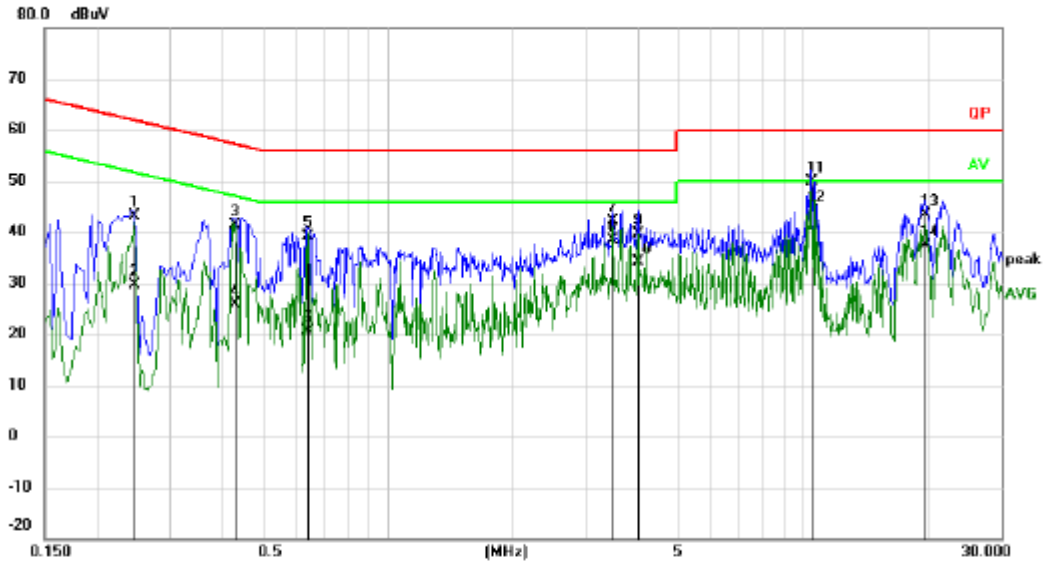
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2420	33.35	10.65	44.00	62.03	-18.03	QP	
2		0.2420	22.05	10.65	32.70	52.03	-19.33	AVG	
3		0.4340	30.78	10.80	41.58	57.18	-15.60	QP	
4		0.4340	15.69	10.80	26.49	47.18	-20.69	AVG	
5		0.6460	27.89	10.85	38.74	56.00	-17.26	QP	
6		0.6460	10.80	10.85	21.65	46.00	-24.35	AVG	
7		3.6620	30.50	11.01	41.51	56.00	-14.49	QP	
8	*	3.6620	27.22	11.01	38.23	46.00	-7.77	AVG	
9		10.4700	38.95	10.43	49.38	60.00	-10.62	QP	
10		10.4700	31.74	10.43	42.17	50.00	-7.83	AVG	
11		19.5380	32.13	10.54	42.67	60.00	-17.33	QP	
12		19.5380	23.75	10.54	34.29	50.00	-15.71	AVG	

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

Engineer Signature: Lirou

Conducted Emission Measurement

File :2405T77560E Data :#11 Date: 2024/6/17 Time: 15:14:11



Limit: QP
Mode:transmitting
Note: 802.11g H Channel

Phase: N
Power: AC 120V/60Hz

Temperature: 23.1 ℃
Humidity: 65 %
Air Pressure: 1011 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over Limit		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2460	32.56	10.47	43.03	61.89	-18.86	QP	
2		0.2460	19.18	10.47	29.65	51.89	-22.24	AVG	
3		0.4300	30.71	10.67	41.38	57.25	-15.87	QP	
4		0.4300	15.15	10.67	25.82	47.25	-21.43	AVG	
5		0.6419	28.46	10.61	39.07	56.00	-16.93	QP	
6		0.6419	9.98	10.61	20.59	46.00	-25.41	AVG	
7		3.4900	31.63	10.48	42.11	56.00	-13.89	QP	
8		3.4900	28.01	10.48	38.49	46.00	-7.51	AVG	
9		4.0140	29.15	10.41	39.56	56.00	-16.44	QP	
10		4.0140	23.65	10.41	34.06	46.00	-11.94	AVG	
11		10.4700	39.06	10.73	49.79	60.00	-10.21	QP	
12	*	10.4700	33.37	10.73	44.10	50.00	-5.90	AVG	
13		19.7139	32.70	10.65	43.35	60.00	-16.65	QP	
14		19.7139	26.70	10.65	37.35	50.00	-12.65	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

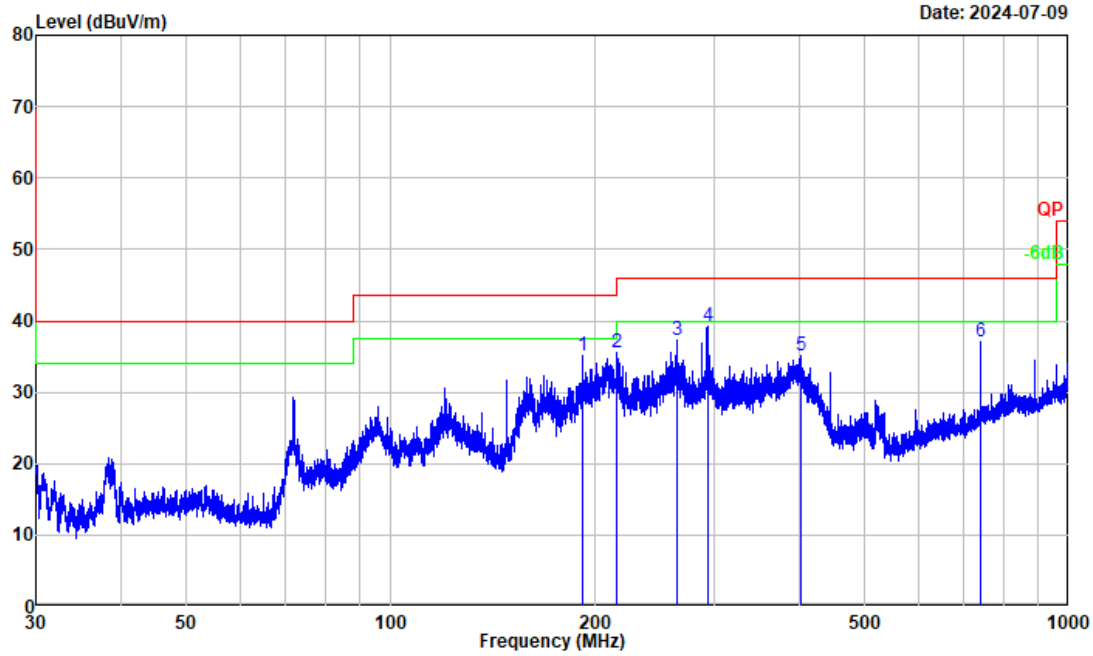
9 kHz-30MHz:

Test Date:	2024-07-09	**Test By:**	Luke Li
Environment condition:	Temperature: 22.8°C; Relative Humidity:64%; ATM Pressure: 100.1kPa		

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

30MHz-1GHz:

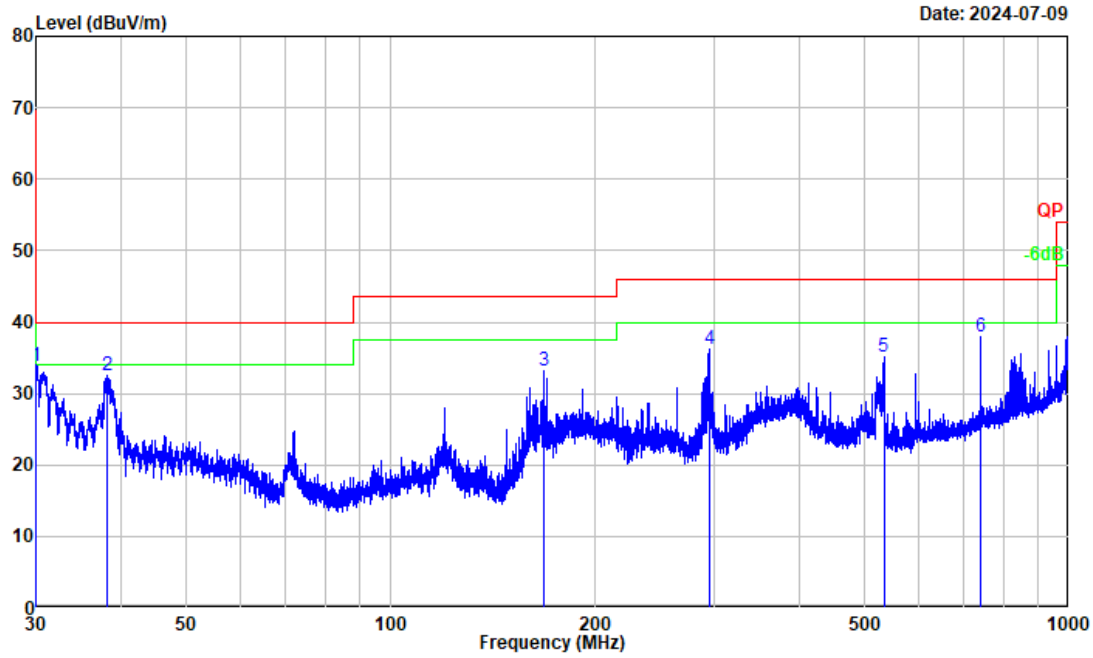
Test Date:	2024-07-09	Test By:	Luke Li
Environment condition:	Temperature: 22.8°C; Relative Humidity:64%; ATM Pressure: 100.1kPa		



Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/64%R.H./100.1kPa
Tested by : Luke Li
Polarization : horizontal
Remark : 802.11g high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	192.042	48.93	-13.81	35.12	43.50	-8.38	Peak
2	215.983	48.62	-13.04	35.58	43.50	-7.92	Peak
3	264.006	48.68	-11.29	37.39	46.00	-8.61	Peak
4	293.425	49.77	-10.58	39.19	46.00	-6.81	Peak
5	402.498	42.53	-7.33	35.20	46.00	-10.80	Peak
6	741.906	37.97	-0.80	37.17	46.00	-8.83	Peak

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



Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 22.8℃/64%R.H./100.1kPa
Tested by : Luke Li
Polarization : vertical
Remark : 802.11g high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	30.000	49.06	-15.17	33.89	40.00	-6.11	Peak
2	38.163	46.45	-13.95	32.50	40.00	-7.50	Peak
3	168.081	49.19	-15.98	33.21	43.50	-10.29	Peak
4	295.749	46.69	-10.53	36.16	46.00	-9.84	Peak
5	533.556	40.33	-5.18	35.15	46.00	-10.85	Peak
6	741.906	38.84	-0.80	38.04	46.00	-7.96	Peak

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

Remark:

Result = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Over Limit = Result – Limit

Above 1GHz:

Test Date:	2024-05-31	Test By:	Bard Huang
Environment condition:	Temperature: 23.1°C; Relative Humidity:63%; ATM Pressure: 99.9kPa		

Frequency (MHz)	Reading level (dBμV)	Polar	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
802.11b							
Low Channel							
2390.000	38.55	horizontal	7.18	45.73	54.00	-8.27	Average
2390.000	48.67	horizontal	7.18	55.85	74.00	-18.15	Peak
2390.000	37.61	vertical	7.18	44.79	54.00	-9.21	Average
2390.000	48.01	vertical	7.18	55.19	74.00	-18.81	Peak
4824.000	48.01	horizontal	-0.15	47.86	74.00	-26.14	Peak
4824.000	47.15	vertical	-0.15	47.00	74.00	-27.00	Peak
Middle Channel							
4884.000	48.85	horizontal	0.11	48.96	74.00	-25.04	Peak
4884.000	48.18	vertical	0.11	48.29	74.00	-25.71	Peak
High Channel							
2486.053	43.79	horizontal	7.26	51.05	54.00	-2.95	Average
2486.053	52.89	horizontal	7.26	60.15	74.00	-13.85	Peak
2485.513	39.38	vertical	7.26	46.64	54.00	-7.36	Average
2485.513	51.44	vertical	7.26	58.70	74.00	-15.30	Peak
4944.000	47.83	horizontal	0.26	48.09	74.00	-25.91	Peak
4944.000	47.73	vertical	0.26	47.99	74.00	-26.01	Peak
802.11g							
Low Channel							
2390.000	36.77	horizontal	7.18	43.95	54.00	-10.05	Average
2390.000	48.98	horizontal	7.18	56.16	74.00	-17.84	Peak
2390.000	36.64	vertical	7.18	43.82	54.00	-10.18	Average
2390.000	48.87	vertical	7.18	56.05	74.00	-17.95	Peak
4824.000	47.52	horizontal	-0.15	47.37	74.00	-26.63	Peak
4824.000	48.47	vertical	-0.15	48.32	74.00	-25.68	Peak
Middle Channel							
4884.000	48.33	horizontal	0.11	48.44	74.00	-25.56	Peak
4884.000	47.24	vertical	0.11	47.35	74.00	-26.65	Peak
High Channel							
2483.912	43.70	horizontal	7.25	50.95	54.00	-3.05	Average

2483.912	56.40	horizontal	7.25	63.65	74.00	-10.35	Peak
2484.092	40.27	vertical	7.25	47.52	54.00	-6.48	Average
2484.092	52.75	vertical	7.25	60.00	74.00	-14.00	Peak
4944.000	47.13	horizontal	0.26	47.39	74.00	-26.61	Peak
4944.000	47.78	vertical	0.26	48.04	74.00	-25.96	Peak
802.11n20							
Low Channel							
2390.000	38.50	horizontal	7.18	45.68	54.00	-8.32	Average
2390.000	48.96	horizontal	7.18	56.14	74.00	-17.86	Peak
2390.000	38.34	vertical	7.18	45.52	54.00	-8.48	Average
2390.000	48.96	vertical	7.18	56.14	74.00	-17.86	Peak
4824.000	48.52	horizontal	-0.15	48.37	74.00	-25.63	Peak
4824.000	48.53	vertical	-0.15	48.38	74.00	-25.62	Peak
Middle Channel							
4884.000	47.65	horizontal	0.11	47.76	74.00	-26.24	Peak
4884.000	47.49	vertical	0.11	47.60	74.00	-26.40	Peak
High Channel							
2483.512	44.74	horizontal	7.25	51.99	54.00	-2.01	Average
2483.512	54.78	horizontal	7.25	62.03	74.00	-11.97	Peak
2483.500	41.15	vertical	7.25	48.40	54.00	-5.60	Average
2483.500	51.75	vertical	7.25	59.00	74.00	-15.00	Peak
4944.000	47.24	horizontal	0.26	47.50	74.00	-26.50	Peak
4944.000	47.93	vertical	0.26	48.19	74.00	-25.81	Peak
802.11n40							
Low Channel							
2390.000	37.95	horizontal	7.18	45.13	54.00	-8.87	Average
2390.000	49.94	horizontal	7.18	57.12	74.00	-16.88	Peak
2390.000	37.20	vertical	7.18	44.38	54.00	-9.62	Average
2390.000	49.88	vertical	7.18	57.06	74.00	-16.94	Peak
4844.000	47.14	horizontal	-0.09	47.05	74.00	-26.95	Peak
4844.000	47.33	vertical	-0.09	47.24	74.00	-26.76	Peak
Middle Channel							
4884.000	47.50	horizontal	0.11	47.61	74.00	-26.39	Peak
4884.000	47.98	vertical	0.11	48.09	74.00	-25.91	Peak
High Channel							
2483.500	43.71	horizontal	7.25	50.96	54.00	-3.04	Average
2483.500	59.95	horizontal	7.25	67.20	74.00	-6.80	Peak
2483.500	40.59	vertical	7.25	47.84	54.00	-6.16	Average

2483.500	55.31	vertical	7.25	62.56	74.00	-11.44	Peak
4924.000	48.29	horizontal	0.23	48.52	74.00	-25.48	Peak
4924.000	47.49	vertical	0.23	47.72	74.00	-26.28	Peak

Remark:
Corrected Amplitude= Reading level + corrected Factor
Corrected Factor = Antenna factor + Cable loss – Amplifier gain
Margin = Corrected Amplitude – Limit

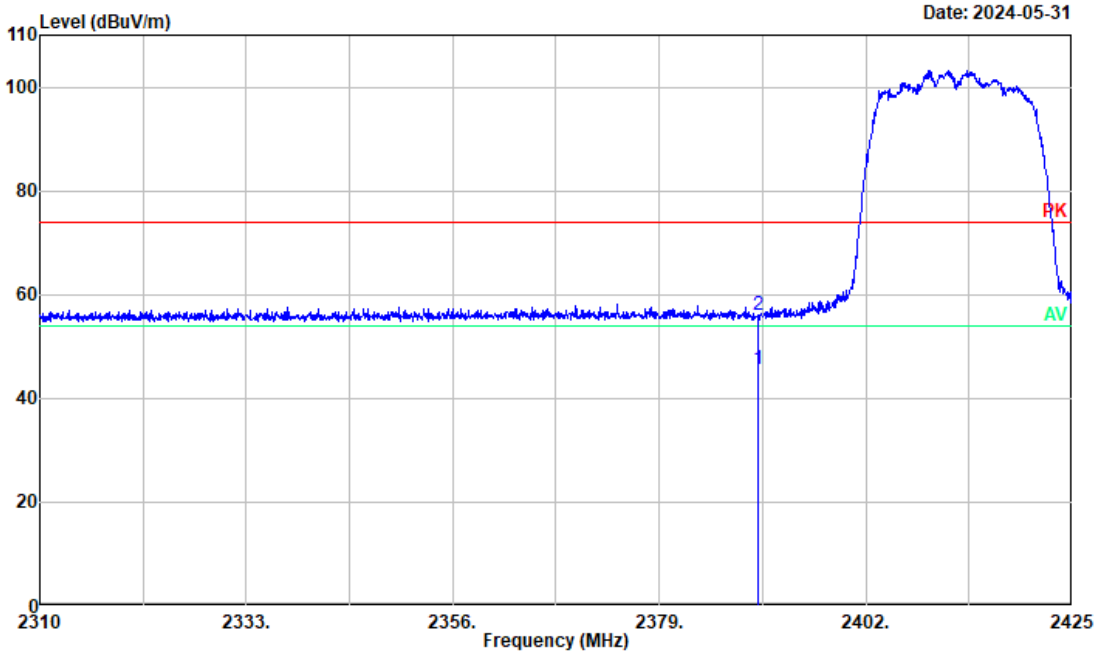
For the test result of Peak below the Peak limit more than 20dB, which can compliance with the average limit, just the Peak level was recorded.

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:	802.11n20	Channel:	2412MHz

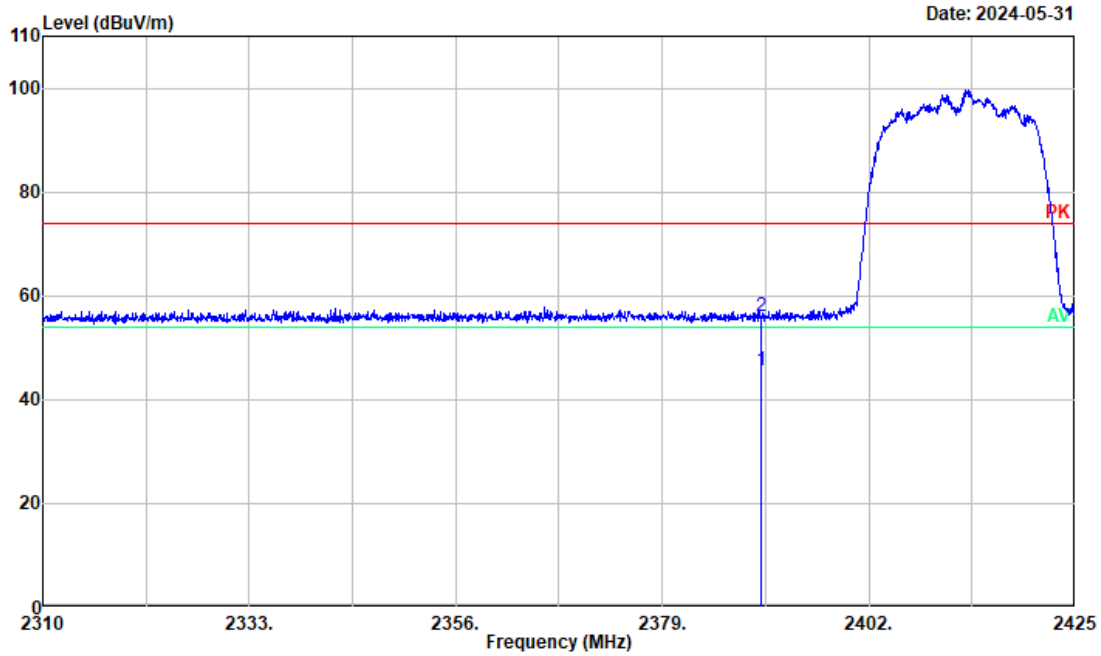


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n20 low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2390.000	38.50	7.18	45.68	54.00	-8.32	Average
2	2390.000	48.96	7.18	56.14	74.00	-17.86	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11n20	Channel:	2412MHz

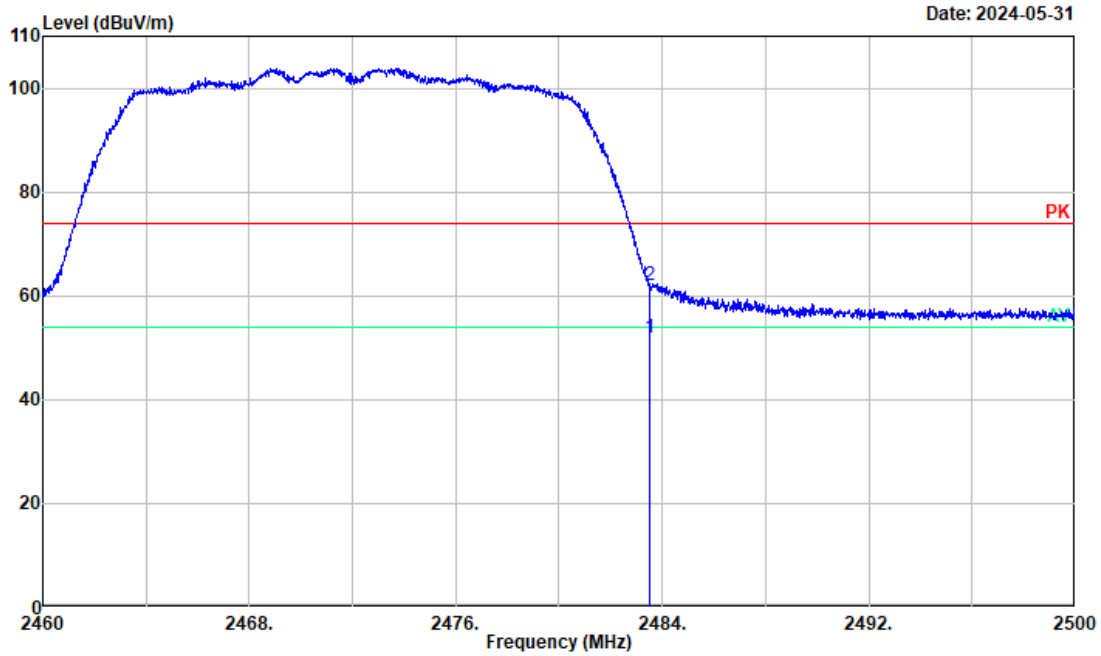


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n20 low channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2390.000	38.34	7.18	45.52	54.00	-8.48	Average
2	2390.000	48.96	7.18	56.14	74.00	-17.86	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11n20	Channel:	2472MHz

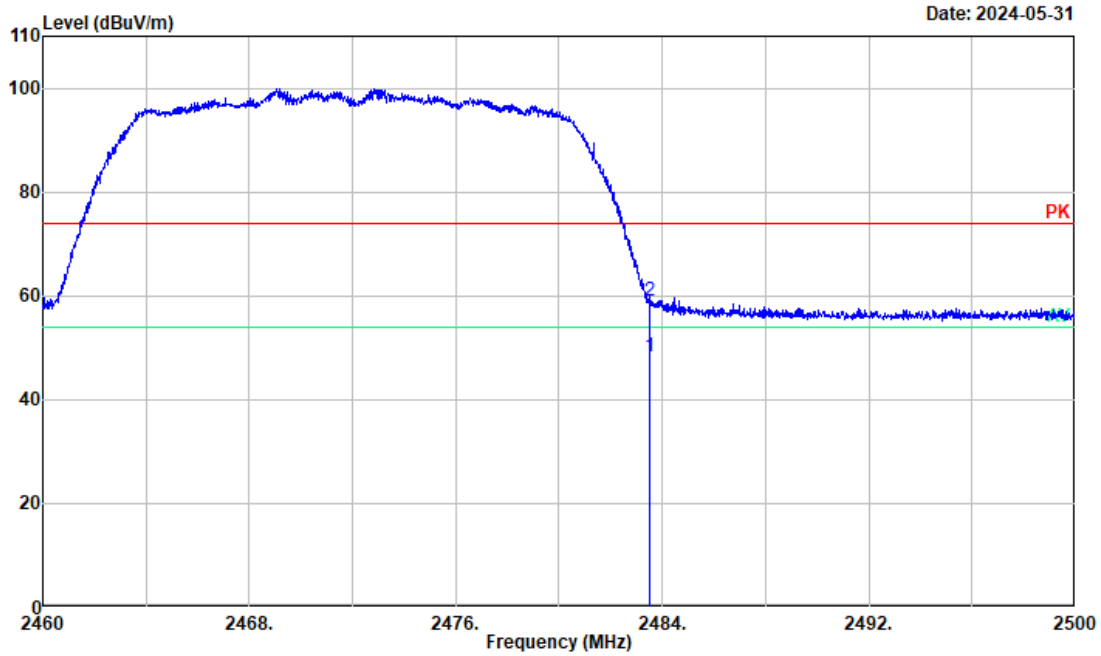


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11n20 high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2483.512	44.74	7.25	51.99	54.00	-2.01	Average
2	2483.512	54.78	7.25	62.03	74.00	-11.97	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11n20	Channel:	2472MHz

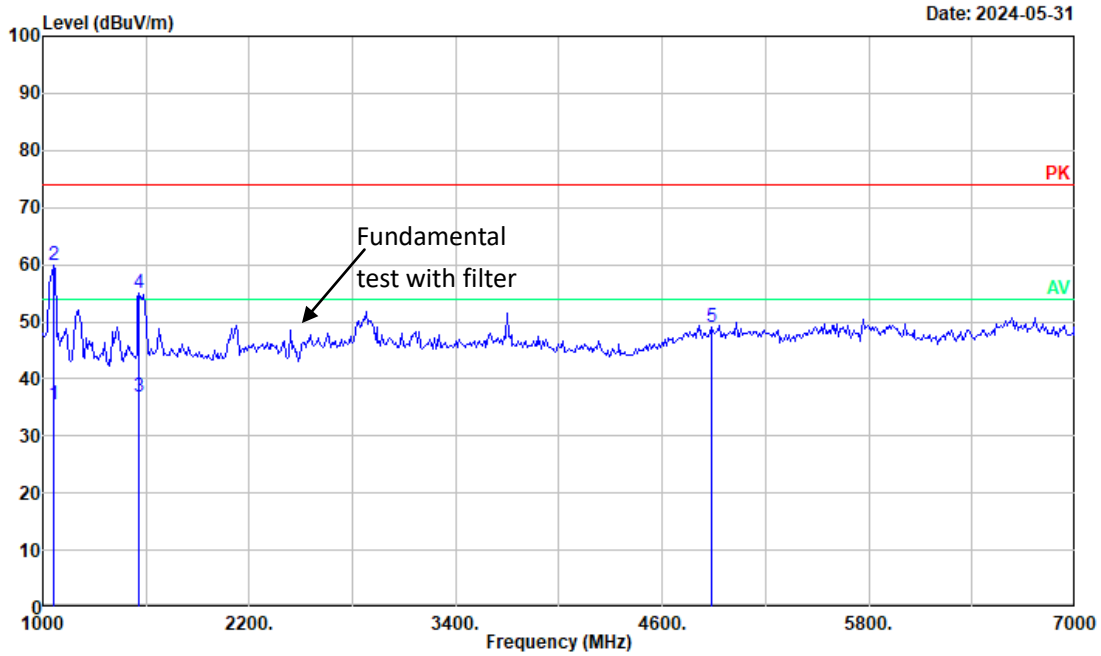


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11n20 high channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	2483.500	41.15	7.25	48.40	54.00	-5.60	Average
2	2483.500	51.75	7.25	59.00	74.00	-15.00	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11b	Channel:	2442MHz

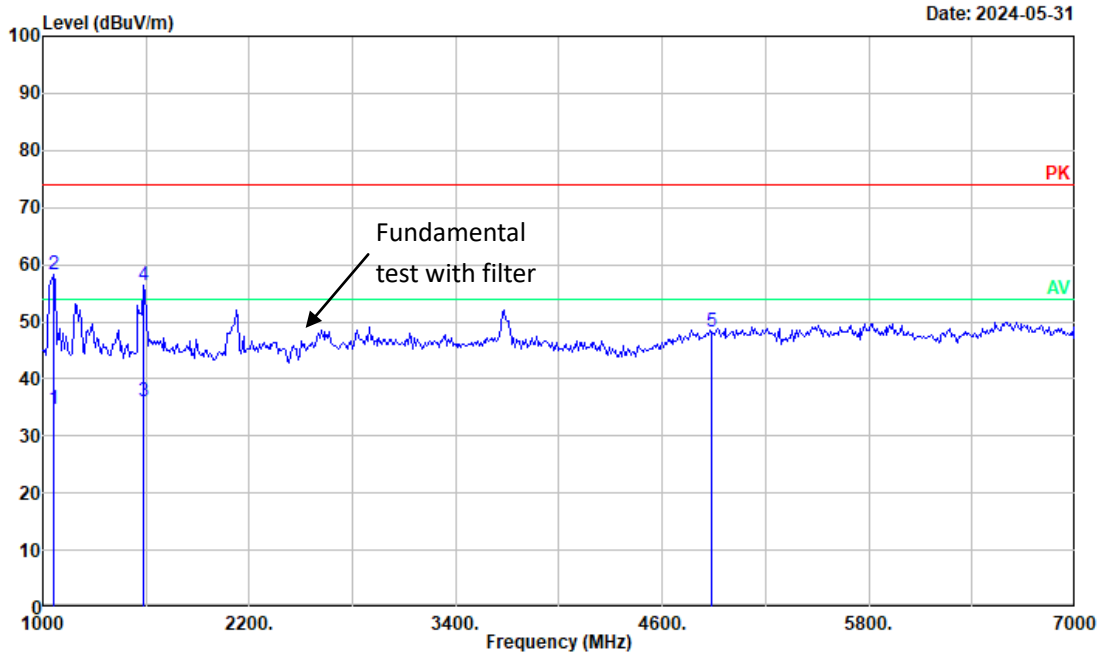


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11b middle channel

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	1059.530	41.87	-6.28	35.59	54.00	-18.41	Average
2	1059.530	66.11	-6.28	59.83	74.00	-14.17	Peak
3	1561.281	40.77	-3.97	36.80	54.00	-17.20	Average
4	1561.281	59.05	-3.97	55.08	74.00	-18.92	Peak
5	4884.000	48.85	0.11	48.96	74.00	-25.04	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11b	Channel:	2442MHz

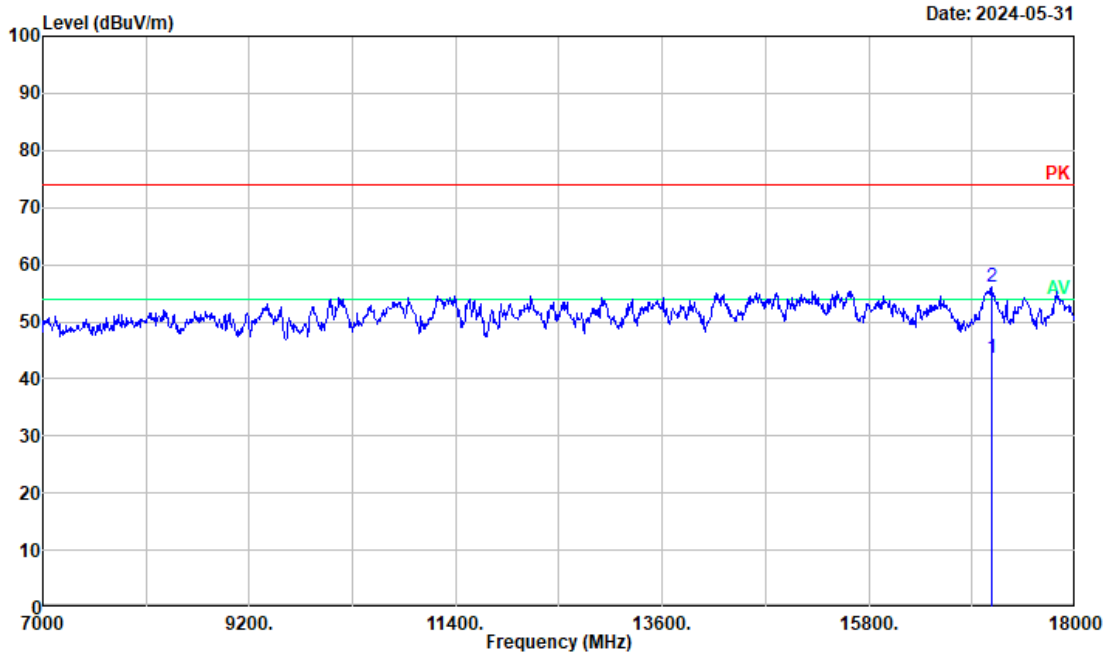


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11b middle channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	1059.530	41.01	-6.28	34.73	54.00	-19.27	Average
2	1059.530	64.54	-6.28	58.26	74.00	-15.74	Peak
3	1586.793	39.86	-3.79	36.07	54.00	-17.93	Average
4	1586.793	60.27	-3.79	56.48	74.00	-17.52	Peak
5	4884.000	48.18	0.11	48.29	74.00	-25.71	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11b	Channel:	2442MHz

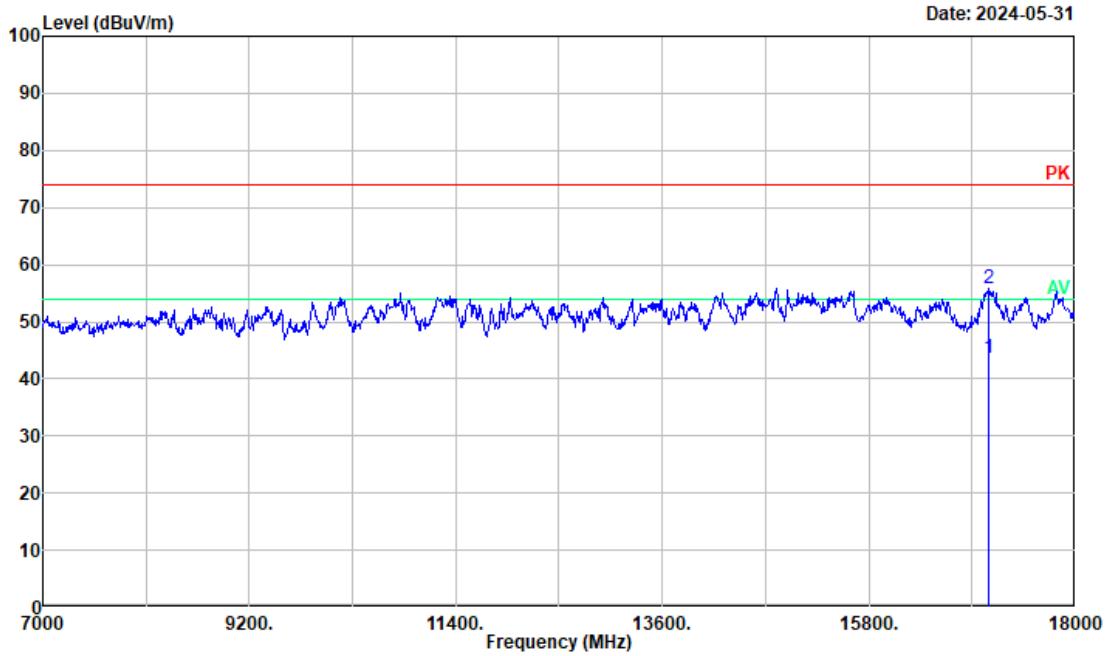


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11b middle channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	17115.560	36.07	7.53	43.60	54.00	-10.40	Average
2	17115.560	48.49	7.53	56.02	74.00	-17.98	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11b	Channel:	2442MHz

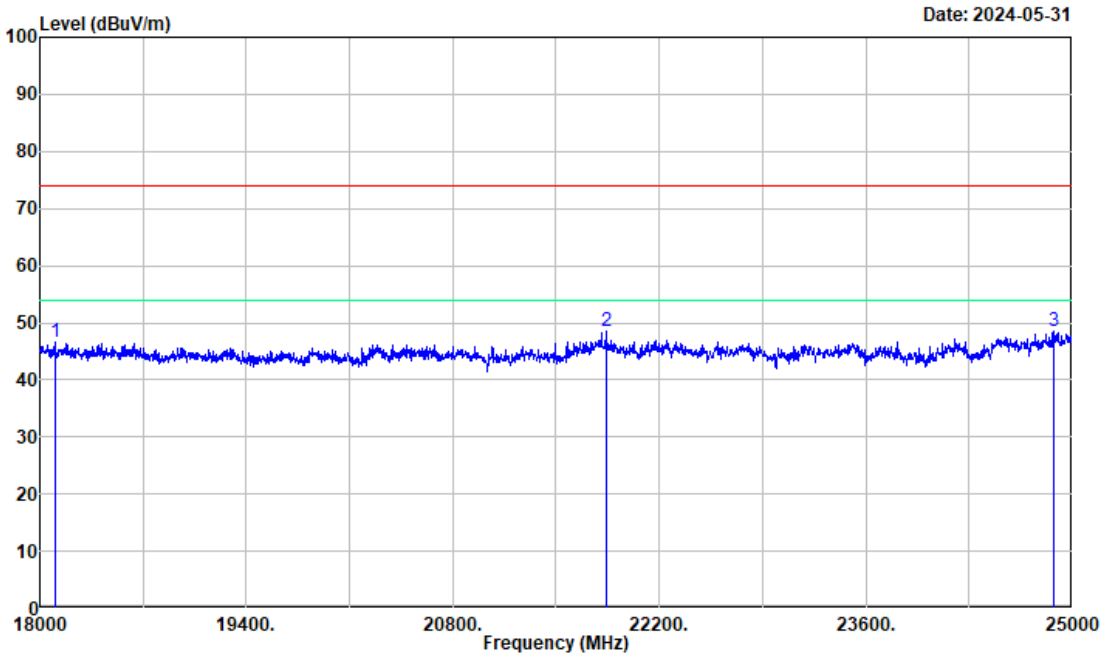


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11b middle channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	17081.540	36.32	7.41	43.73	54.00	-10.27	Average
2	17081.540	48.44	7.41	55.85	74.00	-18.15	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit

Mode:	802.11b	Channel:	2442MHz

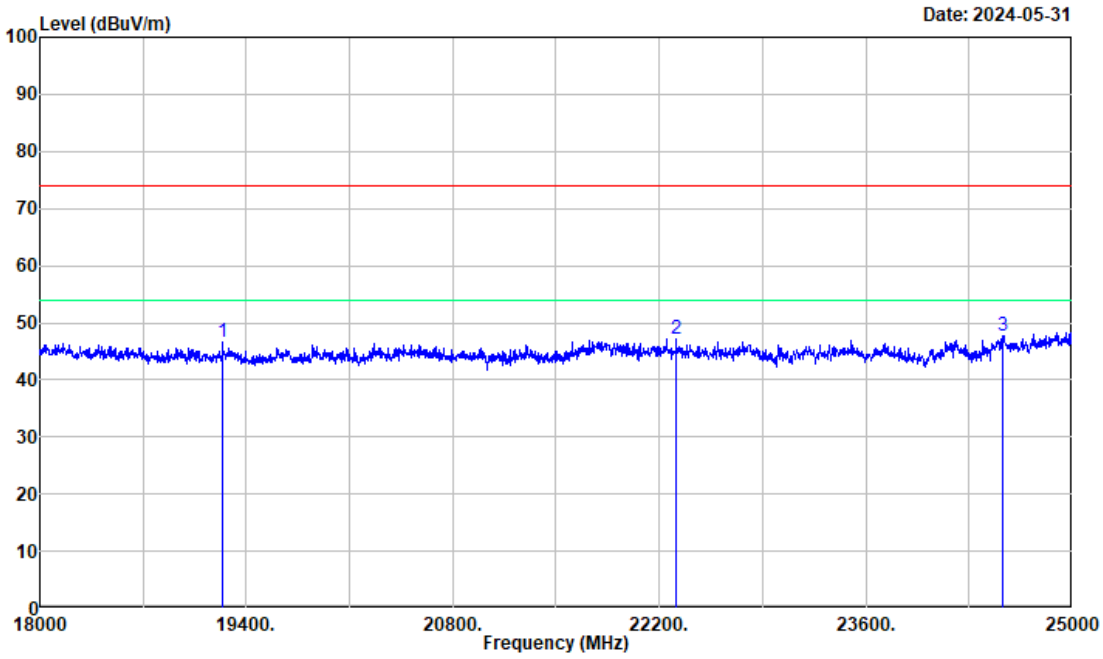


Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : 802.11b middle channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	18101.550	52.13	-5.57	46.56	74.00	-27.44	Peak
2	21837.920	55.36	-6.93	48.43	74.00	-25.57	Peak
3	24877.440	52.07	-3.62	48.45	74.00	-25.55	Peak

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

Mode:	802.11b	Channel:	2442MHz



Project No. : 2405T77560E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 23.1℃/63%R.H./99.9kPa
Tested by : Bard Huang
Polarization : vertical
Remark : 802.11b middle channel

--No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)	Detector
1	19239.620	53.68	-7.04	46.64	74.00	-27.36	Peak
2	22314.160	54.28	-7.02	47.26	74.00	-26.74	Peak
3	24523.760	53.26	-5.63	47.63	74.00	-26.37	Peak

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

3.5 RF Conducted Test Data

Test Date:	2024-06-03~2024-06-06	Test By:	Ryan Zhang
Environment condition:	Temperature: 23.3~23.8°C; Relative Humidity:60~66%; ATM Pressure: 99.9~100.8kPa		

3.5.1 6dB Emission Bandwidth and 99% Occupied Bandwidth

Test Mode	Antenna	Channel [MHz]	6dB BW [MHz]	99% OBW[MHz]	6dB BW Limit[MHz]	Verdict
11B	Ant1	2412	8.590	13.280	0.5	pass
		2442	8.577	13.440	0.5	pass
		2472	8.590	13.295	0.5	pass
11G	Ant1	2412	15.152	16.745	0.5	pass
		2442	15.192	16.710	0.5	pass
		2472	15.194	16.725	0.5	pass
11N20	Ant1	2412	16.879	17.655	0.5	pass
		2442	16.883	17.650	0.5	pass
		2472	16.791	17.630	0.5	pass
11N40	Ant1	2422	35.513	36.080	0.5	pass
		2442	35.282	36.080	0.5	pass
		2462	35.615	36.070	0.5	pass

Note: test only performed on antenna 1.

3.5.2 Maximum Conducted Peak Output Power

Test Mode	Antenna	Channel [MHz]	Result [dBm]	Limit [dBm]	Verdict
11B MIMO	Ant1	2412	6.66	30	Pass
		2442	6.93	30	Pass
		2472	6.62	30	Pass
	Ant2	2412	6.17	30	Pass
		2442	6.58	30	Pass
		2472	6.34	30	Pass
	Total	2412	9.43	30	Pass
		2442	9.77	30	Pass
		2472	9.49	30	Pass
11G MIMO	Ant1	2412	8.87	30	Pass
		2442	8.88	30	Pass
		2472	8.97	30	Pass
	Ant2	2412	8.30	30	Pass
		2442	8.46	30	Pass
		2472	8.50	30	Pass
	Total	2412	11.60	30	Pass
		2442	11.69	30	Pass
		2472	11.75	30	Pass
11N20 MIMO	Ant1	2412	8.42	30	Pass
		2442	8.54	30	Pass
		2472	8.52	30	Pass
	Ant2	2412	7.51	30	Pass
		2442	7.86	30	Pass
		2472	8.00	30	Pass
	Total	2412	11.00	30	Pass
		2442	11.22	30	Pass
		2472	11.28	30	Pass
11N40 MIMO	Ant1	2422	8.02	30	Pass
		2437	8.10	30	Pass
		2462	7.90	30	Pass
	Ant2	2422	7.47	30	Pass
		2437	7.29	30	Pass
		2462	7.41	30	Pass
	Total	2422	10.76	30	Pass
		2437	10.72	30	Pass
		2462	10.67	30	Pass

Note:

The device use CDD for MIMO mode, according to KDB 662911 D01 Multiple Transmitter Output v02r01,

Directional gain = G_{ANT} + Array Gain

for power measurements on IEEE 802.11 devices: *Array Gain = 0 dB* (i.e., no array gain) for $N_{ANT} \leq 4$

$G_{ANT\,1}$*=4.09dBi,* $G_{ANT\,2}$*=4.18dBi, use the higher gain for calculate.*

Directional gain=4.18+0=4.18dBi<6dBi

3.5.3 Power Spectral Density

Test Mode	Antenna	Channel [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B MIMO	Ant1	2412	-9.63	8	Pass
		2442	-13.26	8	Pass
		2472	-20.95	8	Pass
	Ant2	2412	-9.63	8	Pass
		2442	-9.28	8	Pass
		2472	-11.16	8	Pass
	Total	2412	-6.62	6.81	Pass
		2442	-7.82	6.81	Pass
		2472	-10.73	6.81	Pass
11G MIMO	Ant1	2412	-25.73	8	Pass
		2442	-26.04	8	Pass
		2472	-26.54	8	Pass
	Ant2	2412	-26.50	8	Pass
		2442	-25.90	8	Pass
		2472	-25.56	8	Pass
	Total	2412	-23.09	6.81	Pass
		2442	-22.96	6.81	Pass
		2472	-23.01	6.81	Pass
11N20 MIMO	Ant1	2412	-26.51	8	Pass
		2442	-25.24	8	Pass
		2472	-24.75	8	Pass
	Ant2	2412	-25.91	8	Pass
		2442	-25.88	8	Pass
		2472	-24.76	8	Pass
	Total	2412	-23.19	6.81	Pass
		2442	-22.54	6.81	Pass
		2472	-21.74	6.81	Pass
11N40 MIMO	Ant1	2422	-27.66	8	Pass
		2437	-27.91	8	Pass
		2462	-27.64	8	Pass
	Ant2	2422	-28.73	8	Pass
		2437	-27.51	8	Pass
		2462	-27.99	8	Pass
	Total	2422	-25.15	6.81	Pass
		2437	-24.70	6.81	Pass
		2462	-24.80	6.81	Pass

Note:

The device use CDD for MIMO mode, according to KDB 662911 D01 Multiple Transmitter Output v02r01,

Directional gain = G_{ANT} + Array Gain

for power spectral density (PSD) measurements: $Array\ Gain = 10\ log(N_{ANT}/N_{SS})\ dB$

$G_{ANT\,1}$=4.09dBi, $G_{ANT\,2}$=4.18dBi, use the higher gain for calculate.

Directional gain=4.18+$10log(2)$=7.19dBi>6dBi, so the limit should reduce 1.19dB

3.5.4 100 kHz Bandwidth of Frequency Band Edge

Test Mode	Antenna	Channel [MHz]	Result	Limit	Verdict
11B MIMO	Ant1	2412	Refer test plot	Refer test plot	Pass
		2472	Refer test plot	Refer test plot	Pass
	Ant2	2412	Refer test plot	Refer test plot	Pass
		2472	Refer test plot	Refer test plot	Pass
11G MIMO	Ant1	2412	Refer test plot	Refer test plot	Pass
		2472	Refer test plot	Refer test plot	Pass
	Ant2	2412	Refer test plot	Refer test plot	Pass
		2472	Refer test plot	Refer test plot	Pass
11N20 MIMO	Ant1	2412	Refer test plot	Refer test plot	Pass
		2472	Refer test plot	Refer test plot	Pass
	Ant2	2412	Refer test plot	Refer test plot	Pass
		2472	Refer test plot	Refer test plot	Pass
11N40 MIMO	Ant1	2422	Refer test plot	Refer test plot	Pass
		2462	Refer test plot	Refer test plot	Pass
	Ant2	2422	Refer test plot	Refer test plot	Pass
		2462	Refer test plot	Refer test plot	Pass

3.5.5 Duty Cycle

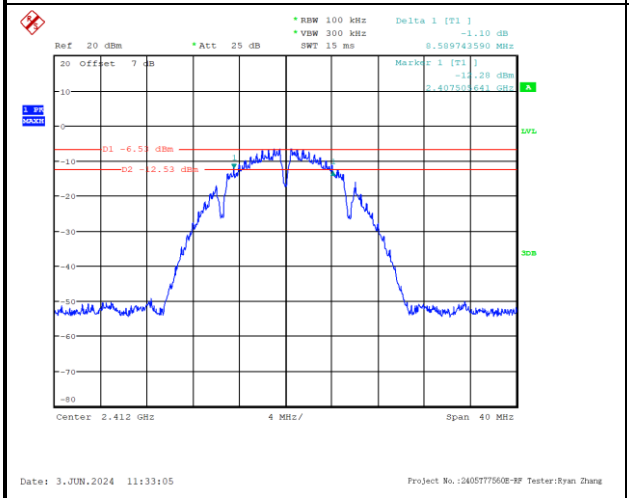
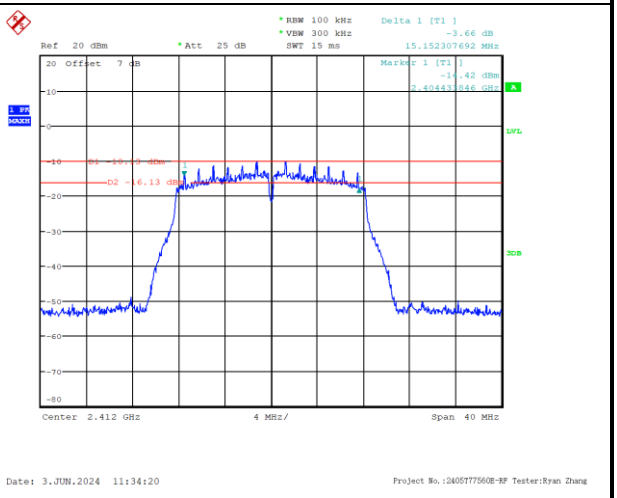
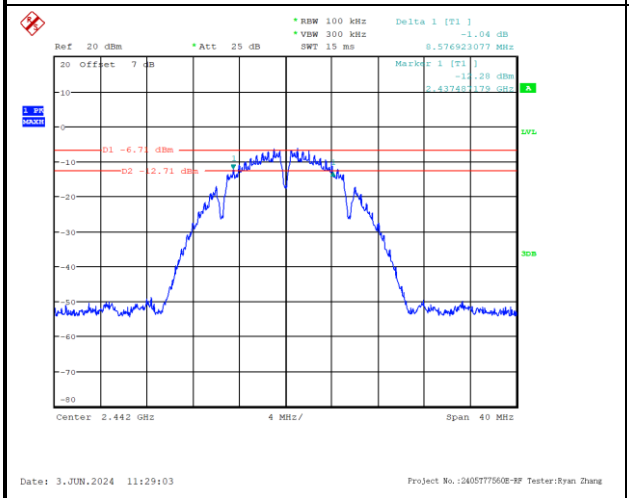
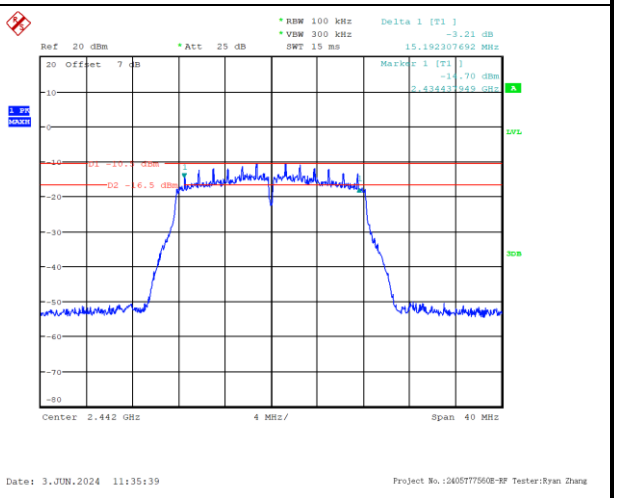
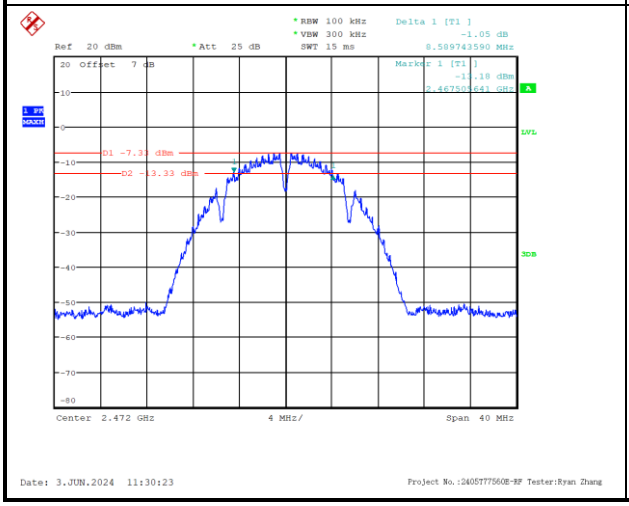
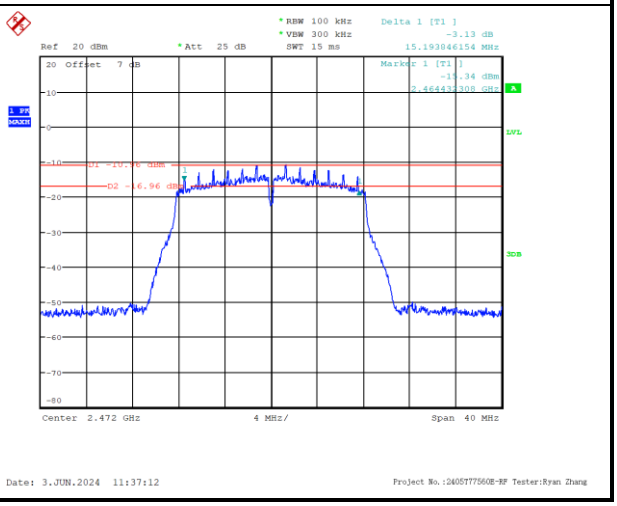
Test Mode	Antenna	Channel [MHz]	Ton (ms)	Ton+off (ms)	Duty Cycle [%]	1/T [kHz]	VBW setting* [Hz]
11B	Ant1	2442	8.337	8.427	98.93	/	10
11G	Ant1	2442	1.376	1.437	95.76	0.727	1000
11N20	Ant1	2442	0.160	0.208	76.92	6.250	10000
11N40	Ant1	2442	0.099	0.144	68.75	10.101	20000

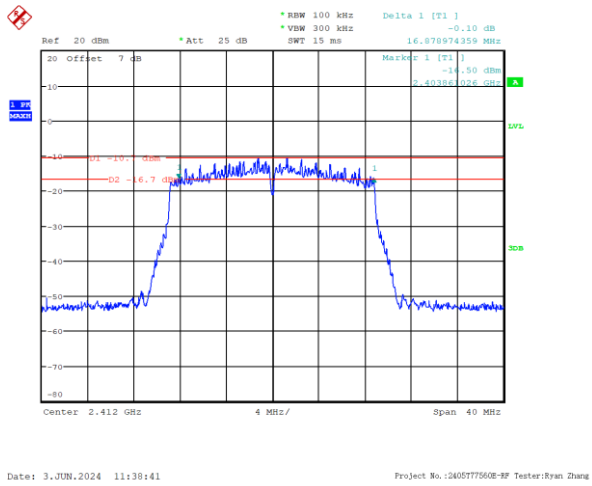
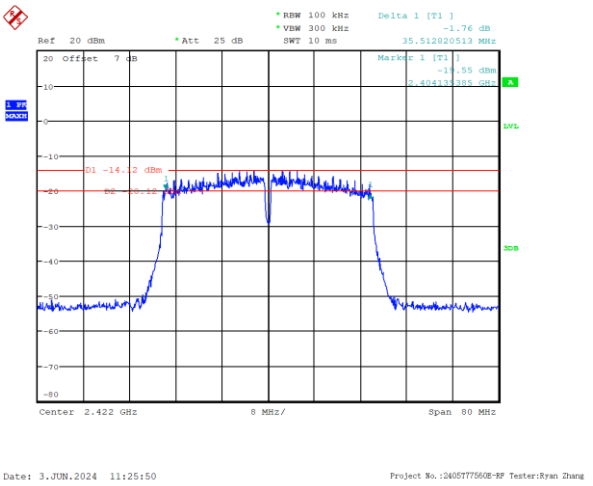
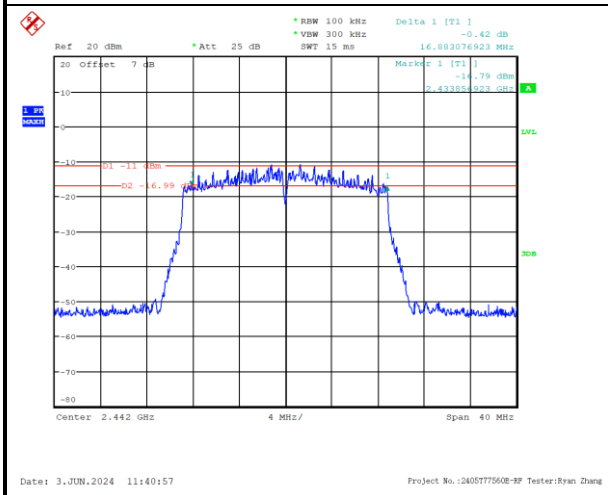
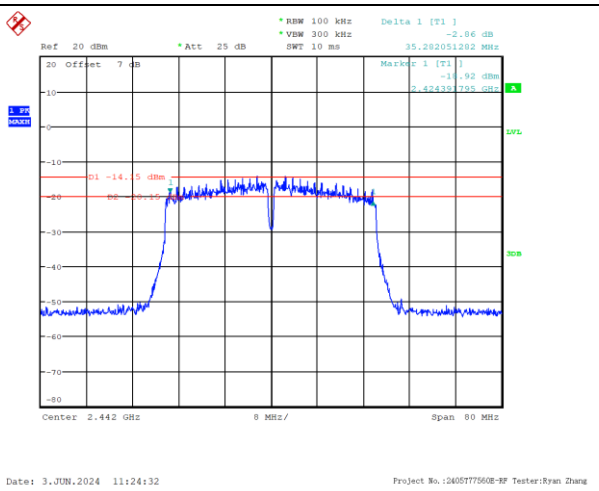
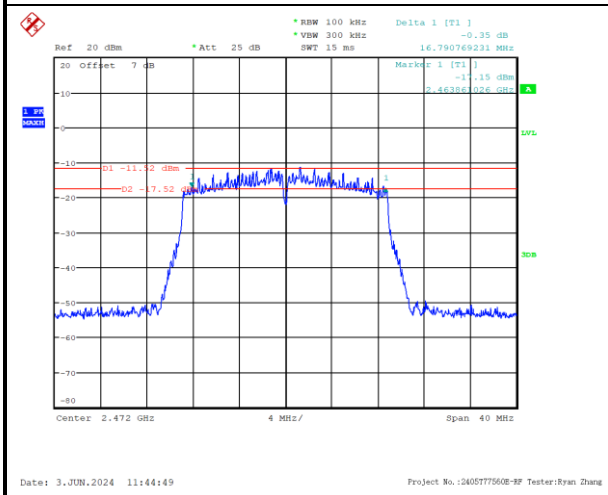
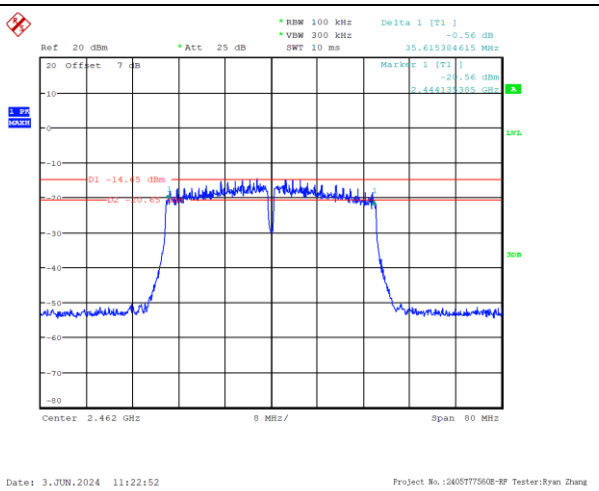
Note: test only performed on antenna 1.

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

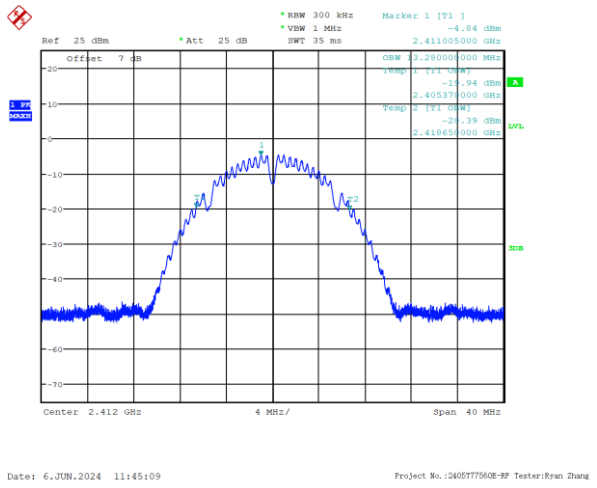
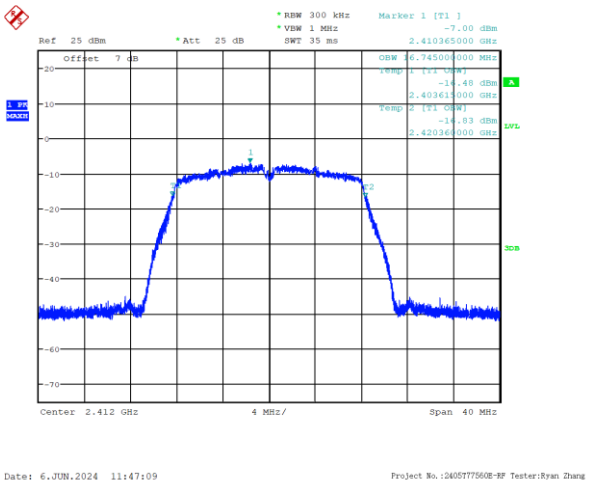
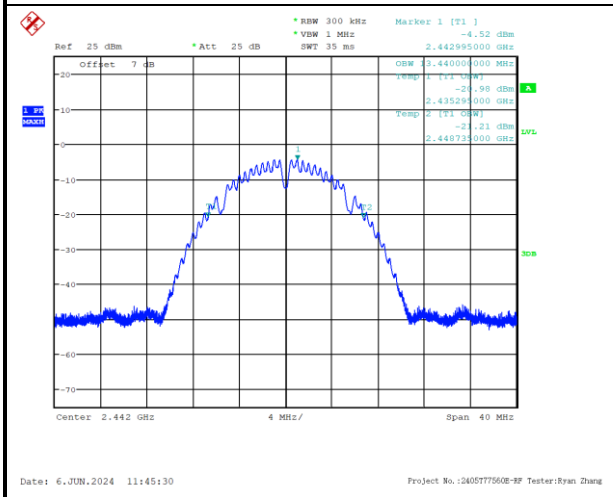
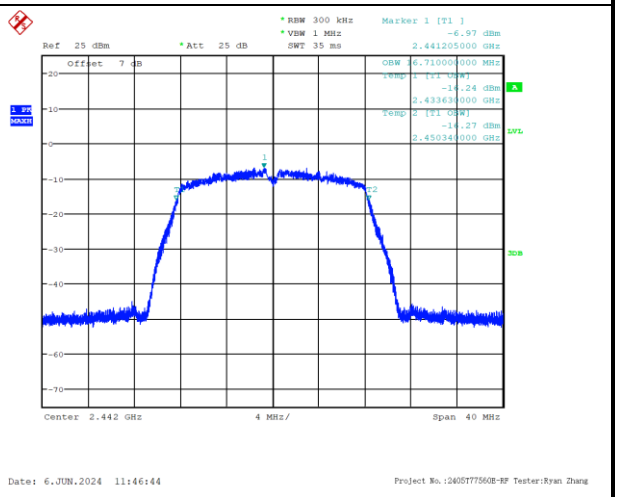
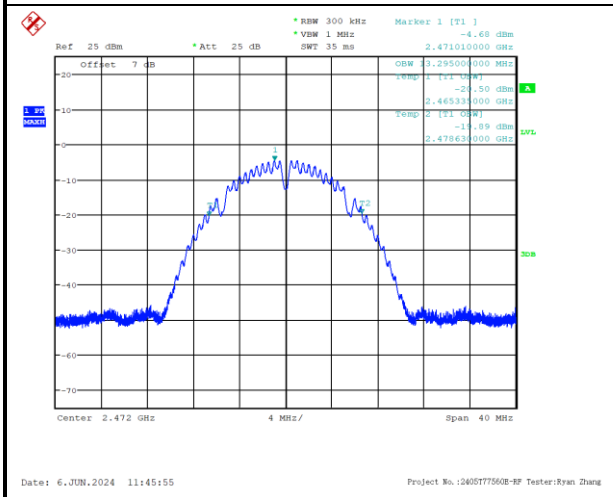
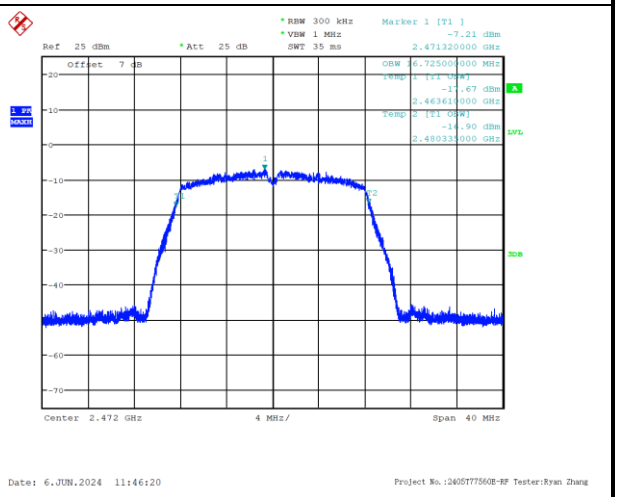
Test Plots:

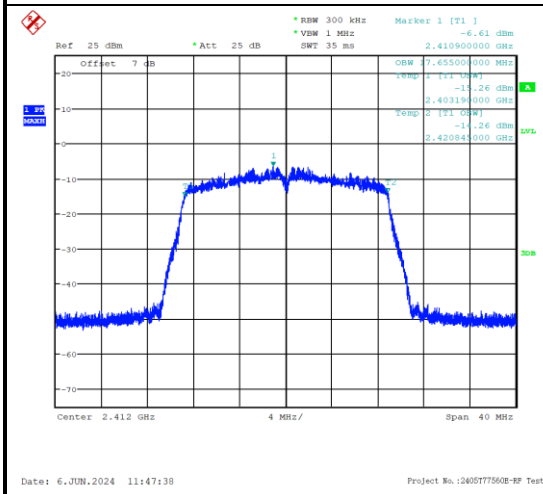
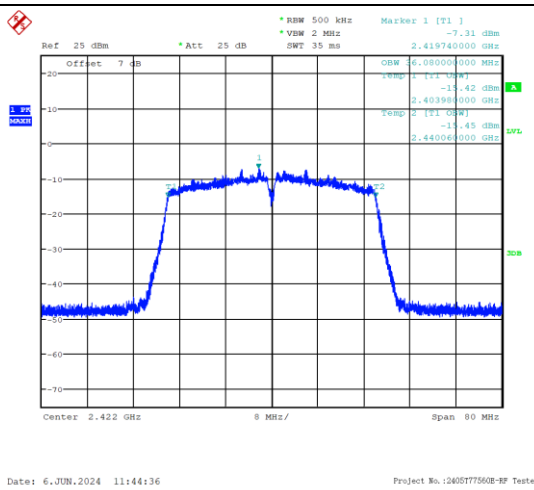
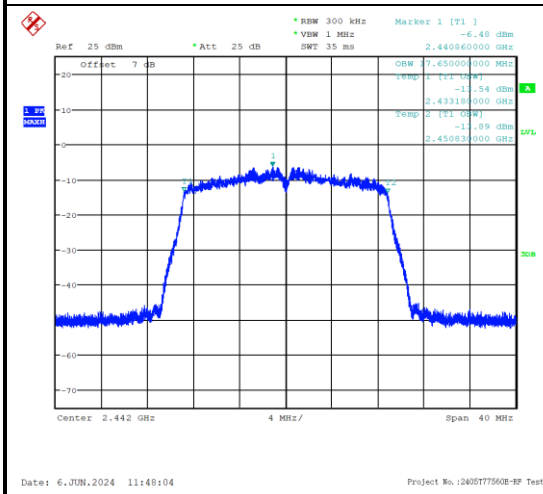
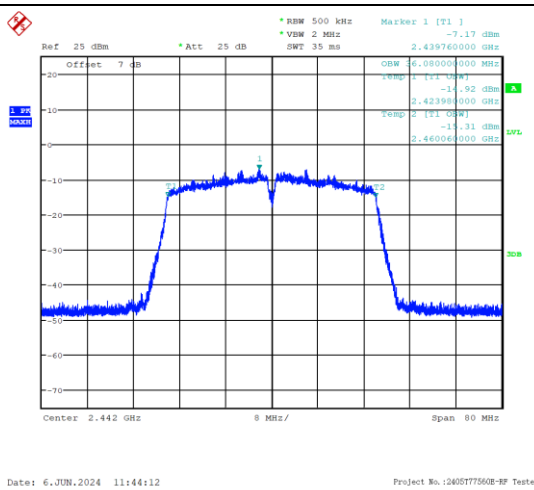
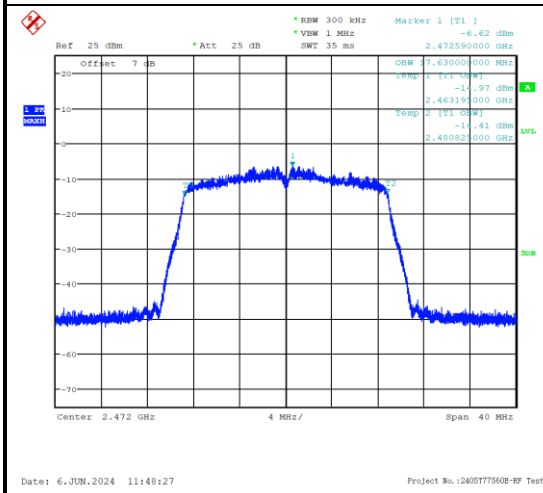
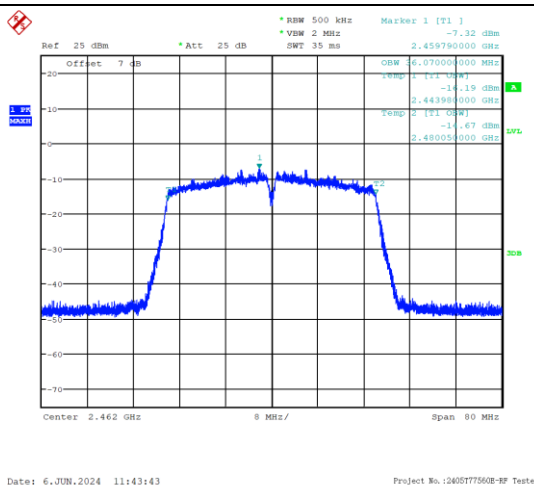
6 dB Emission Bandwidth:

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

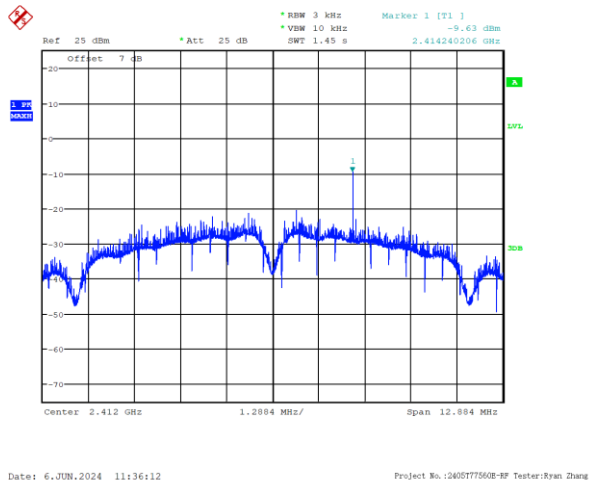
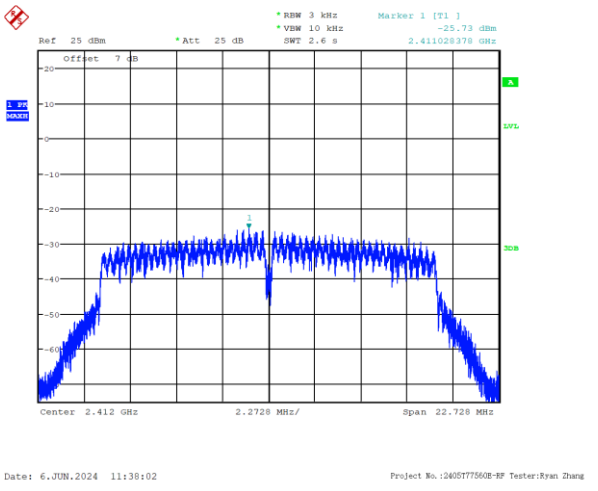
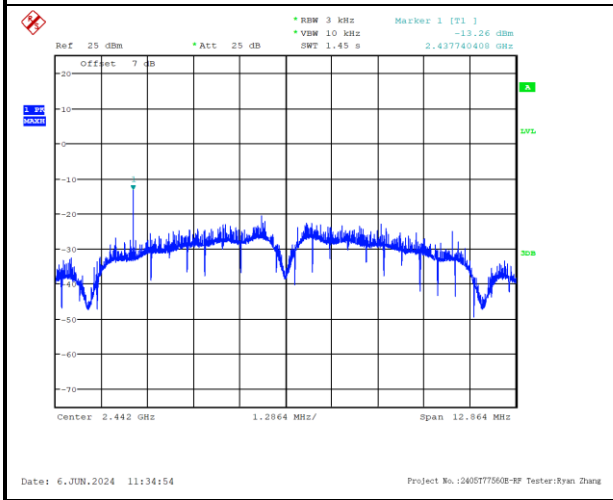
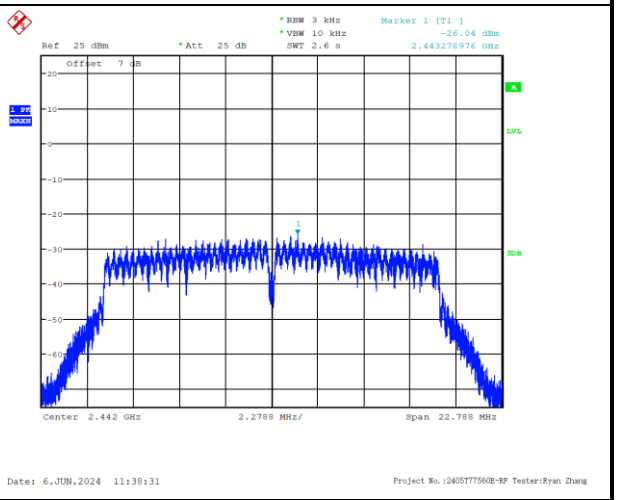
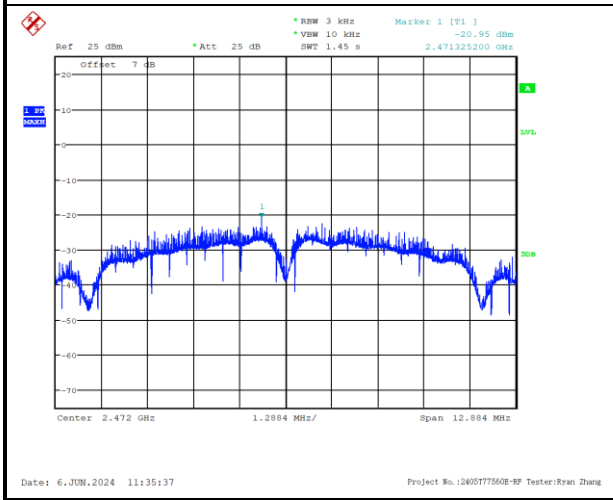
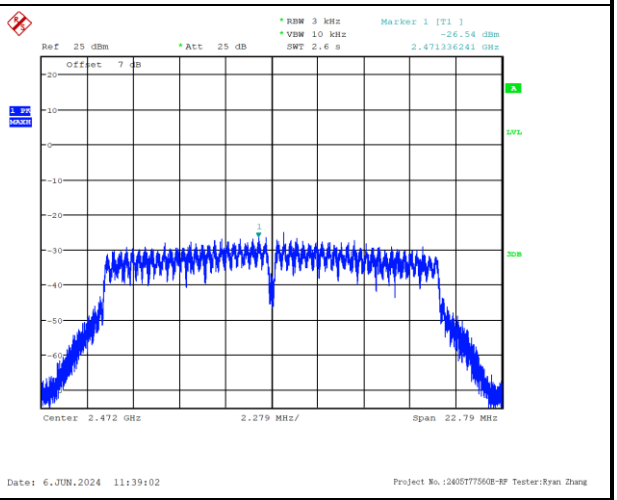
802.11n20	802.11n40
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

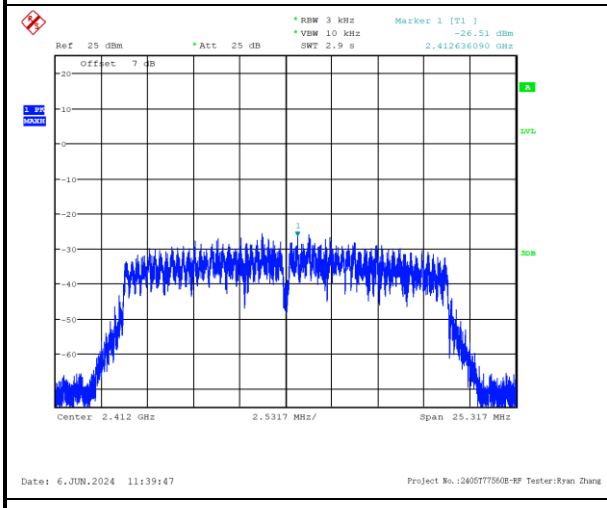
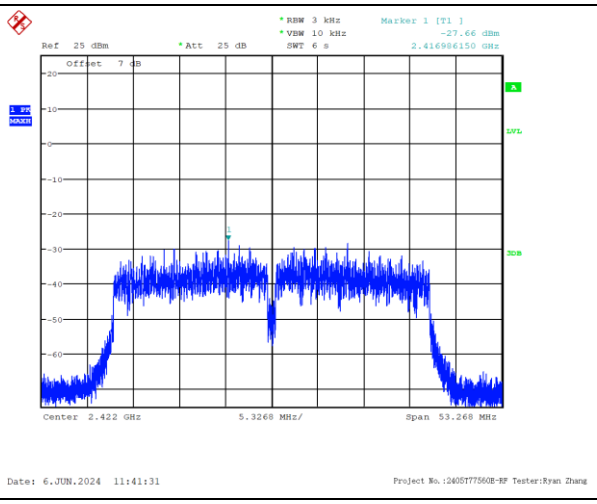
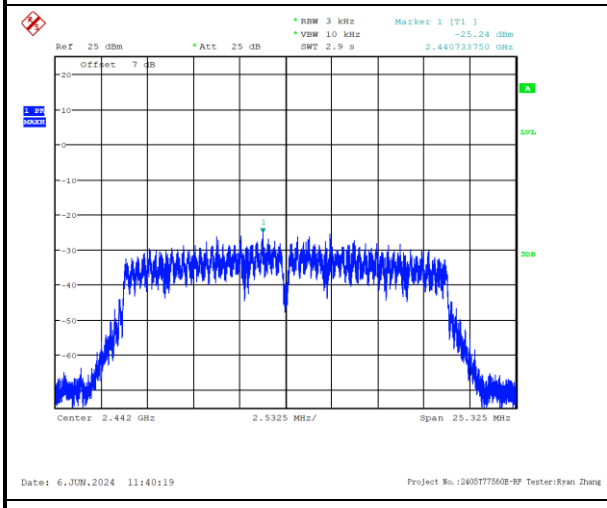
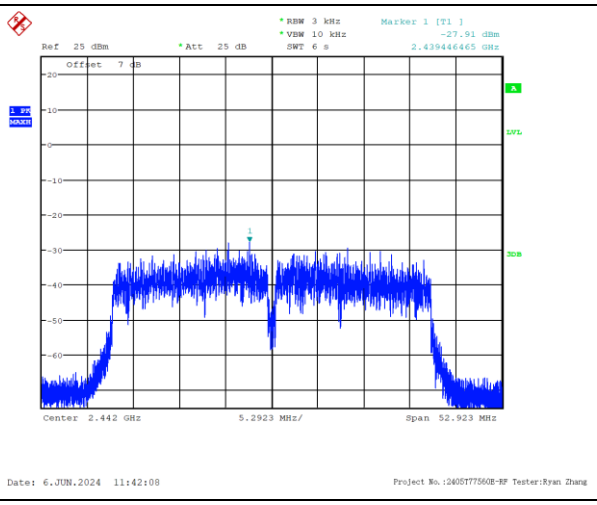
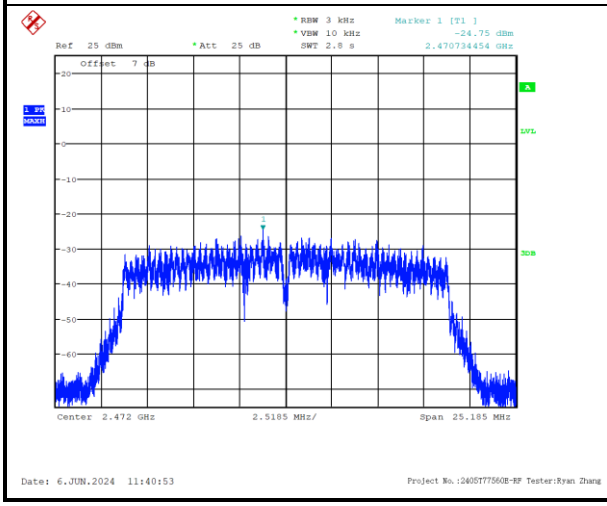
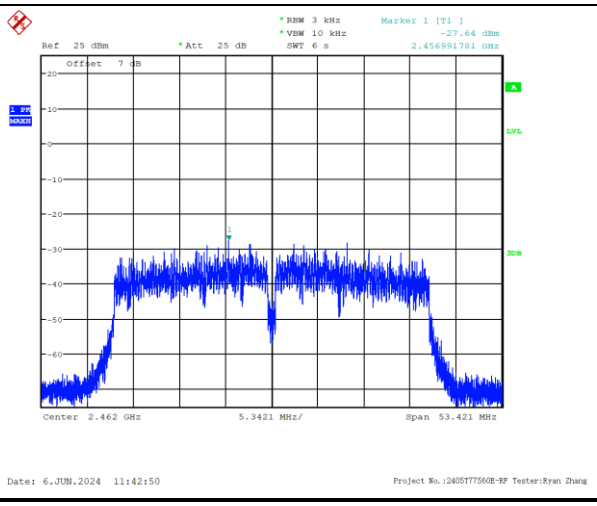
99% Occupied Bandwidth:

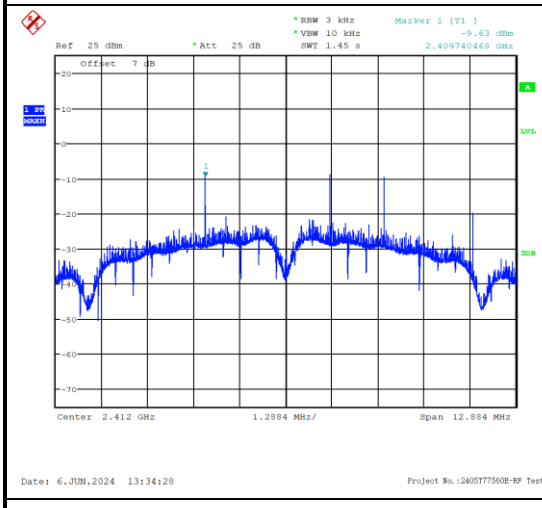
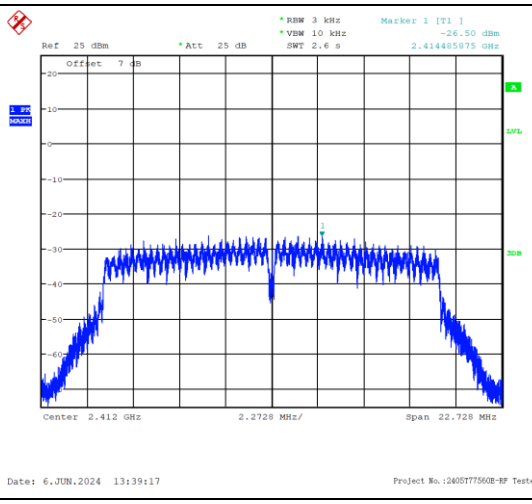
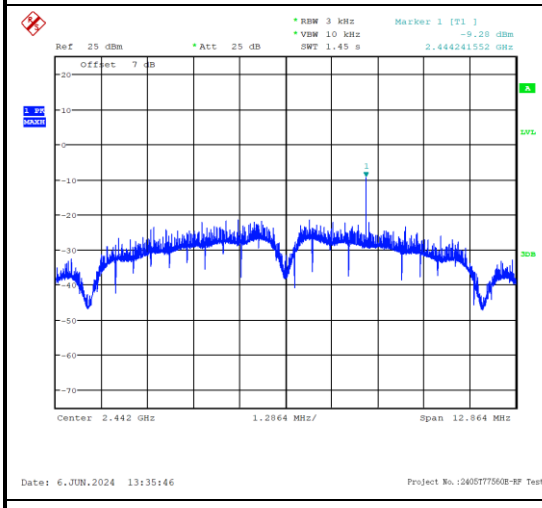
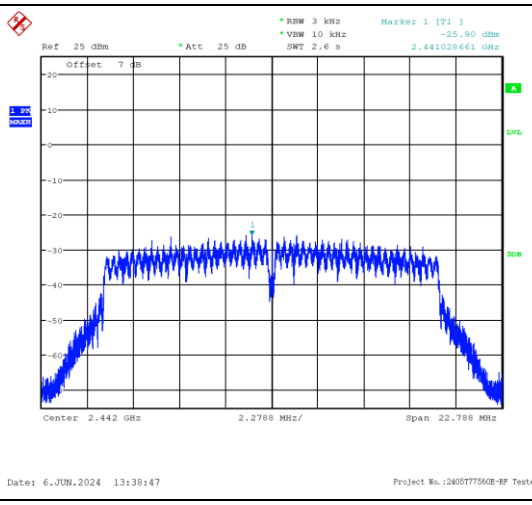
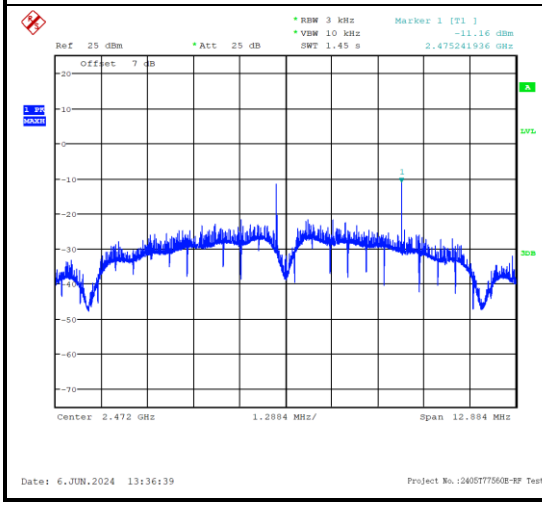
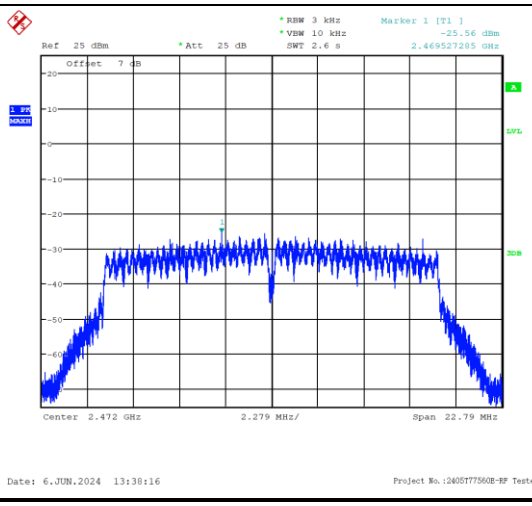
802.11b	802.11g
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

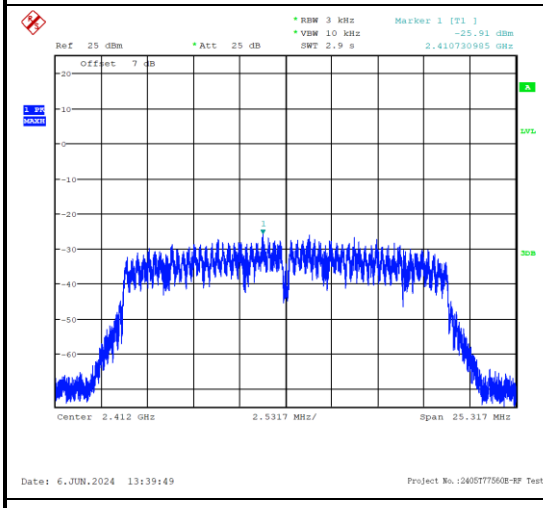
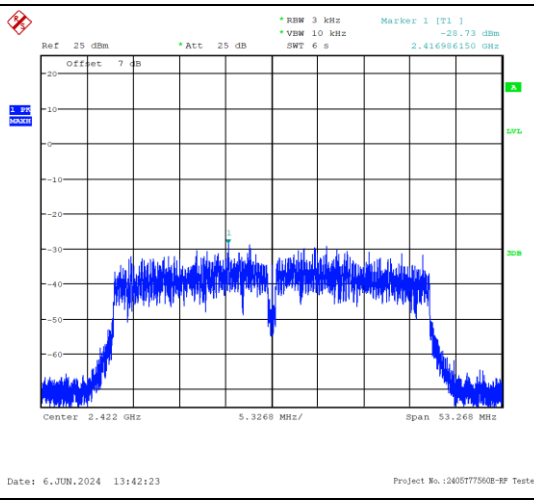
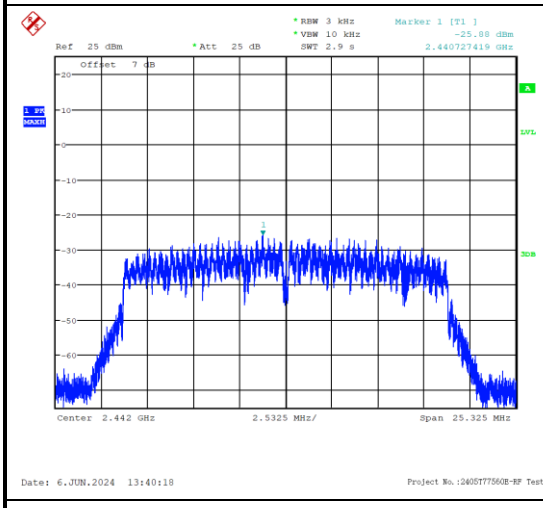
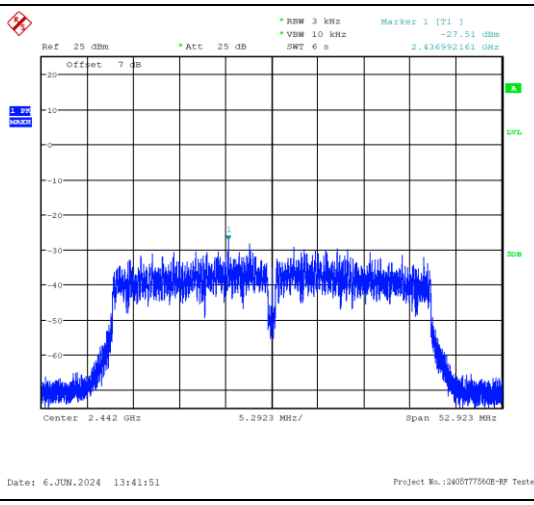
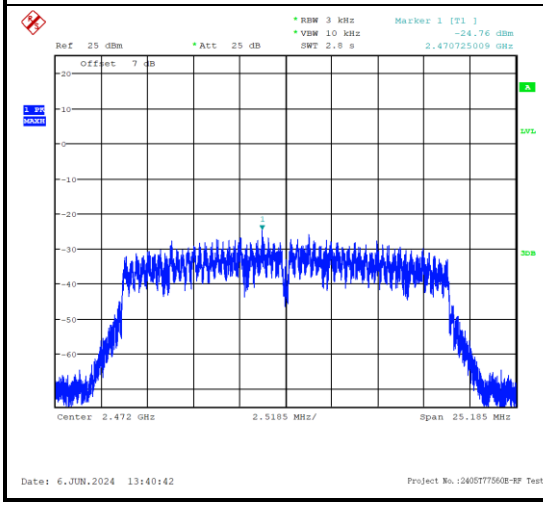
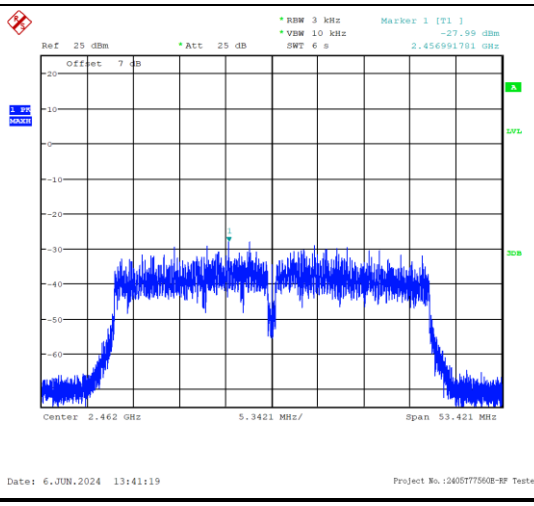
802.11n20	802.11n40
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

Power Spectral Density:

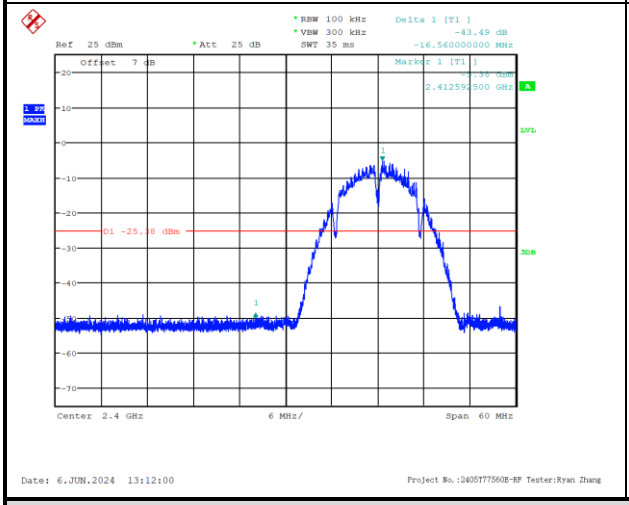
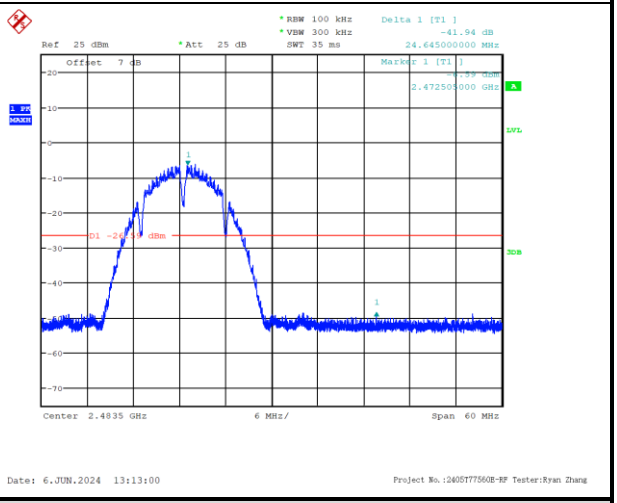
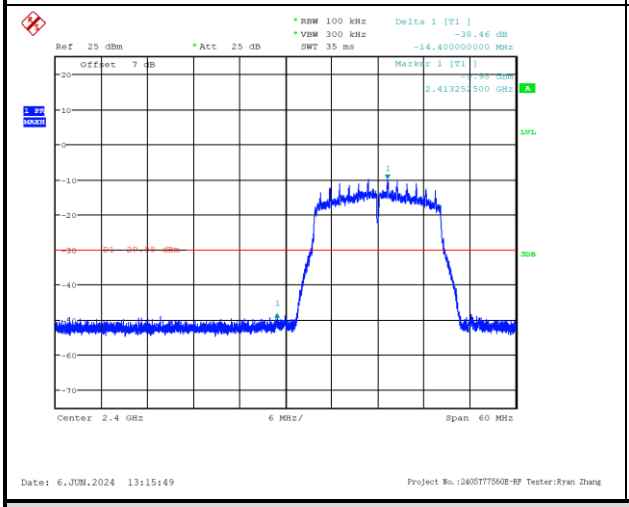
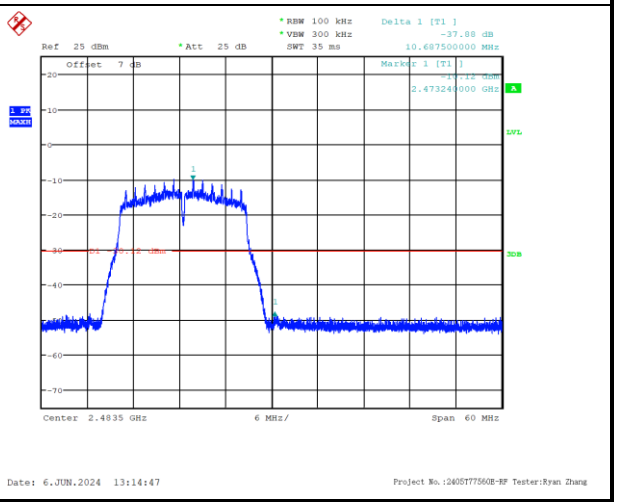
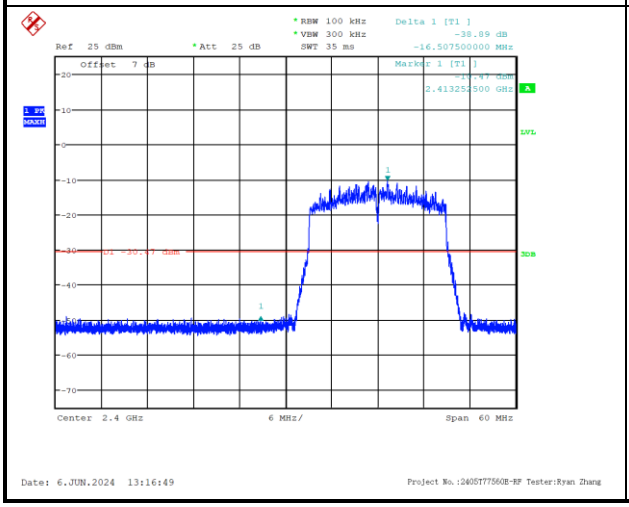
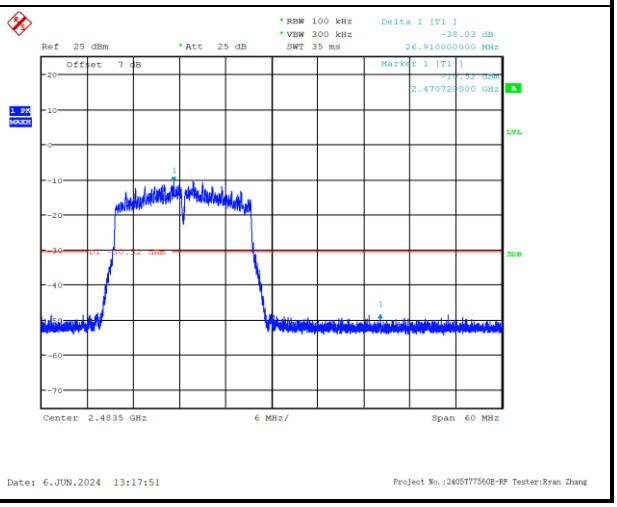
802.11b ANT1	802.11g ANT1
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

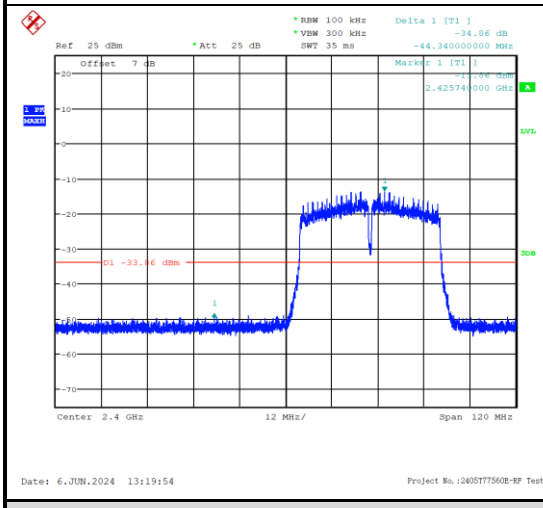
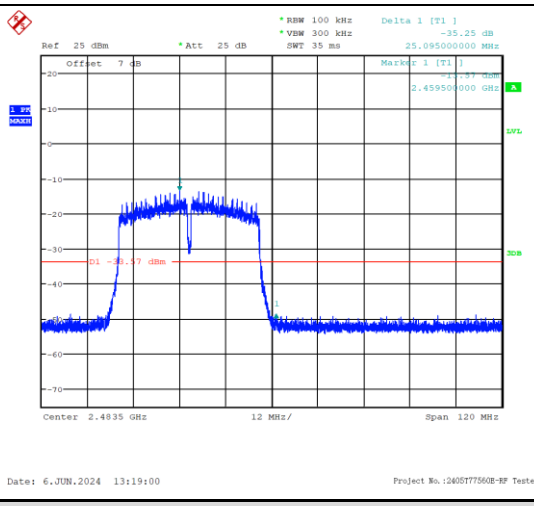
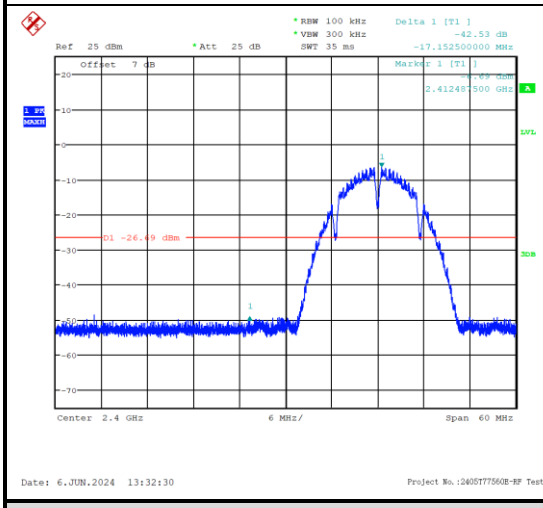
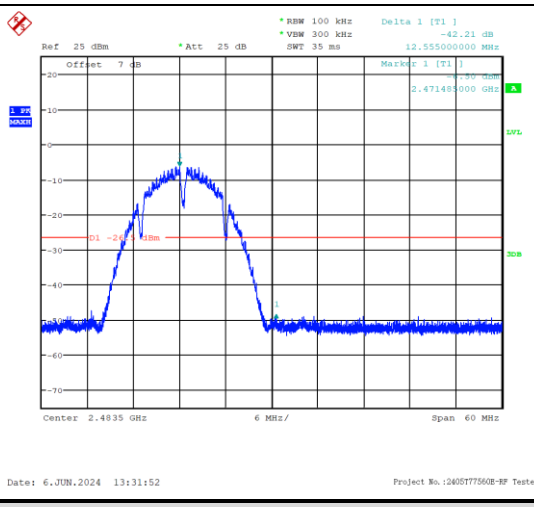
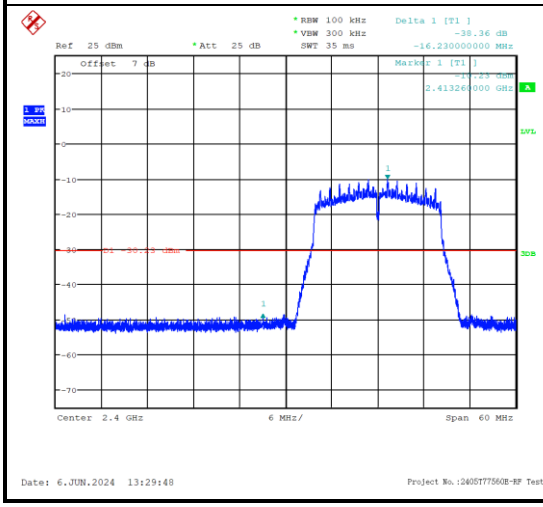
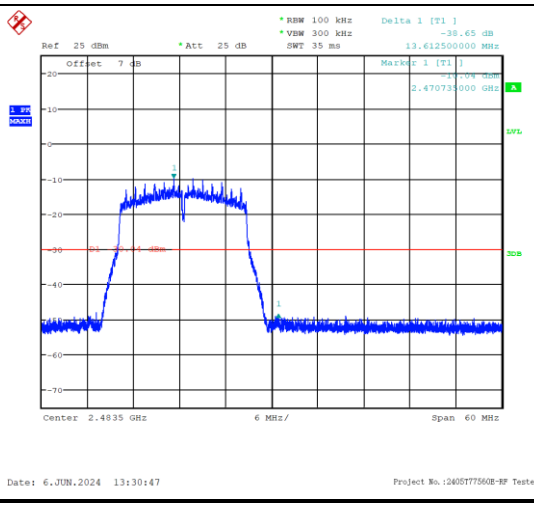
802.11n20 ANT1	802.11n40 ANT1
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

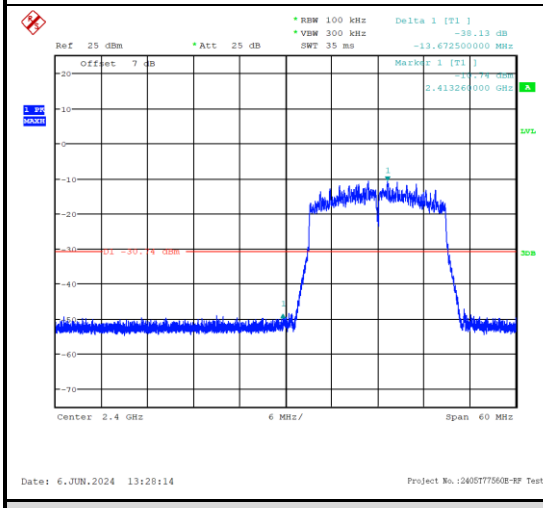
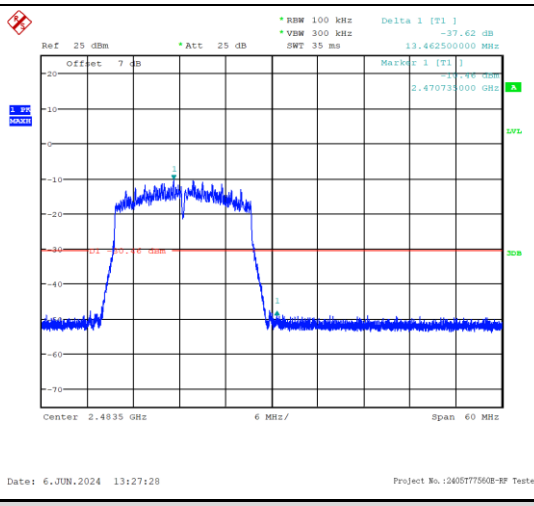
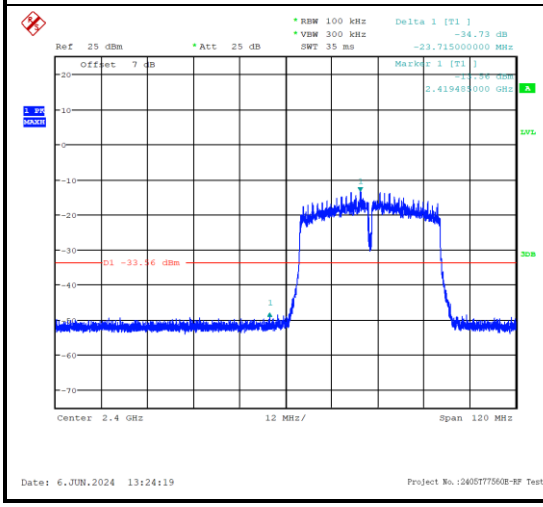
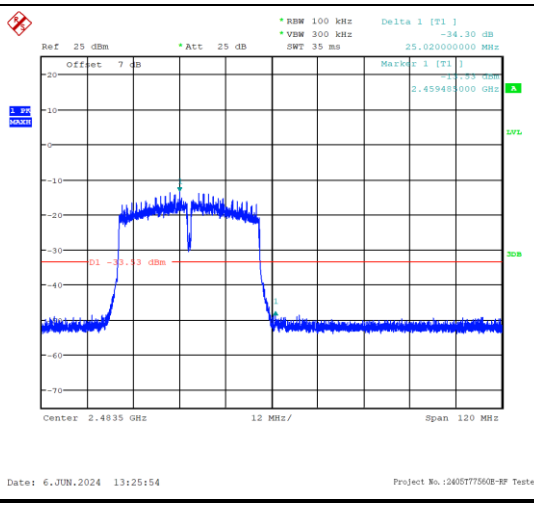
802.11b ANT2	802.11g ANT2
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

802.11n20 ANT2	802.11n40 ANT2
Lowest channel	Lowest channel
	
Middle channel	Middle channel
	
High channel	High channel
	

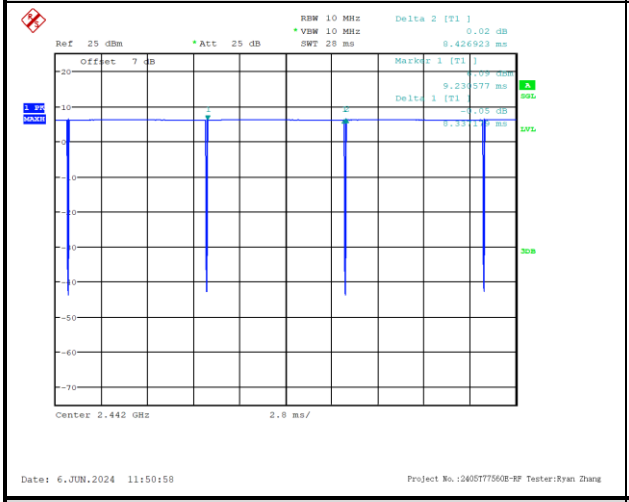
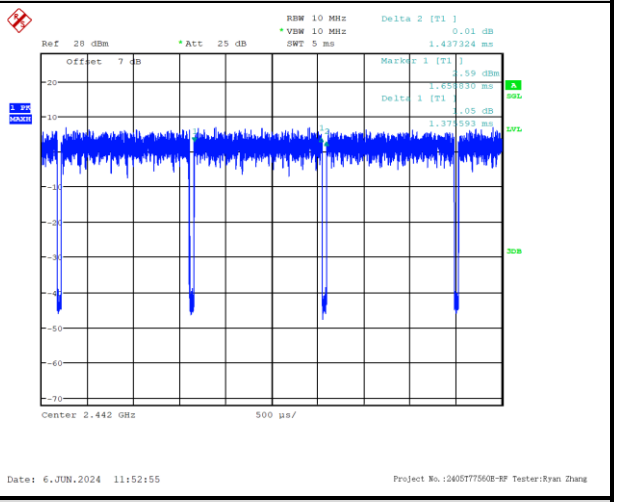
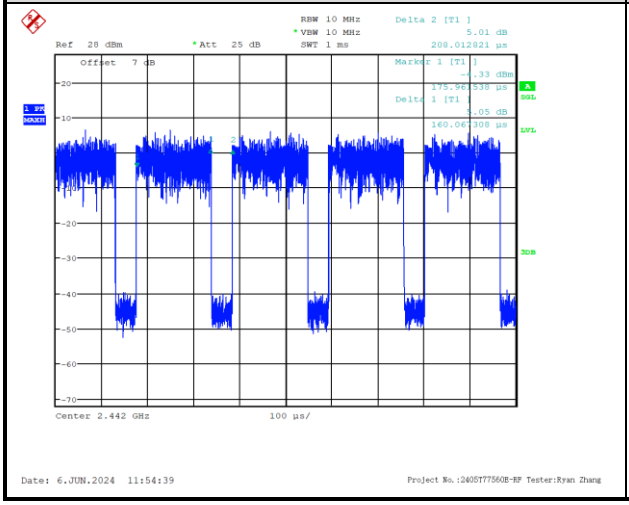
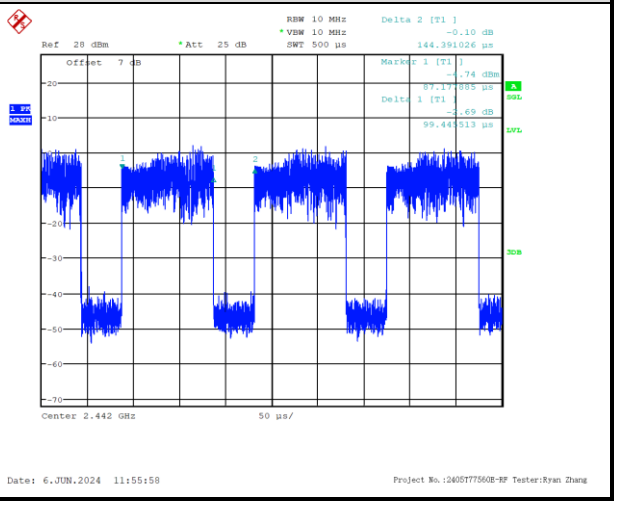
100kHz Bandwidth of Frequency Band Edge:

802.11b ANT1	
Lowest channel	High channel
	
802.11g ANT1	
Lowest channel	High channel
	
802.11n20 ANT1	
Lowest channel	High channel
	

802.11n40 ANT1	
Lowest channel	High channel
	
802.11b ANT2	
Lowest channel	High channel
	
802.11g ANT2	
Lowest channel	High channel
	

802.11n20 ANT2	
Lowest channel	High channel
	
802.11n40 ANT2	
Lowest channel	High channel
	

Duty Cycle:

802.11b	802.11g
	
802.11n20	**802.11n40**
	

4 Test Setup Photo

Please refer to the attachment 2405T77560E Test Setup photo.

5 E.U.T Photo

Please refer to the attachment 2405T77560E External photo and 2405T77560E Internal photo.

---End of Report---