



JRL - TEST REPORT

Report Number : **64.710.23.06340.01** Date of Issue: 2024-06-25

Model : BL-WN151

Product Type : WIFI module

Applicant : Guangzhou Jetinno Intelligent Equipment Co.,LTD

Address : 4/F., Building A, No.2, Ruitai Road, Huangpu 510000 Guangzhou,
Guangdong PEOPLE'S REPUBLIC OF CHINA

Manufacturer : Guangzhou Jetinno Intelligent Equipment Co.,LTD

Address : 4/F., Building A, No.2, Ruitai Road, Huangpu 510000 Guangzhou,
Guangdong PEOPLE'S REPUBLIC OF CHINA

Test Result : ☒ **Positive** ☐ **Negative**



Total pages including
Appendices : 95

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1 General Information

1.1 Product information and other Remarks

The product is a 2.4GHz Wi-Fi module.

Remark: N/A.

Prepared By

2024-06-25

Chris Liang

Date

Name

Signature

Approved by

2024-06-25

Peter Jia

Date

Name

Signature



1.2 Testing Laboratory

■ -TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Address: Building 12&13, Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2, Nanshan District,
Shenzhen City, 518052, P. R. China

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1.3 Application Details

Applicant : Guangzhou Jetinno Intelligent Equipment Co.,LTD
Manufacturer : Guangzhou Jetinno Intelligent Equipment Co.,LTD
Address : 4/F., Building A, No.2, Ruitai Road, Huangpu 510000 Guangzhou,
Guangdong PEOPLE'S REPUBLIC OF CHINA

1.4 Application Details

Date of receipt of order: 2024-03-26

Date of receipt of test item: 2024-03-26

Date of test: 2024-03-26 to 2024-04-03

1.5 Test Item

Refer to table 1



1.6 Applied Standard

APPLIED PRODUCT STANDARD

Article 2 Paragraph 1 item 19: Ministry of Internal Affairs and Communications Notification Article 88 Appendix 43

1.7 Test Summary

Table 1. Summary of results

Essential parameter	Corresponding technical requirements: Article 88 Appendix 43	Result
Transmitter requirements	RF output power	PASS
	RF output power Tolerance	PASS
	Frequency Tolerance	PASS
	Occupied Bandwidth	PASS
	Spread Bandwidth	PASS
	Spreading Factor	PASS
	Interference prevention function	PASS
	Unwanted (Spurious) Emissions Strength	PASS
	Carrier sense	PASS
Receiver requirements	Secondary Radiated Emissions	PASS

NOTE 1 Measurement taken is within the measurement uncertainty of measurement system.

Remark: It is compliance to the appropriate section of the Ordinance Article 2 paragraph 1 Item 19.



2 Equipment Specification

2.1 General Description

2.2 Technical Data

Description	WIFI module
Model	BL-WN151
Brand Name	JETINNO
Rated Voltage	DC 3.3V
Operation frequency	2412MHz-2472MHz
Modulation	DSSS_802.11b; OFDM_802.11g; OFDM_802.11n_HT20; OFDM_802.11n_HT40
Antenna gain	1.33dBi
Antenna Type	Internal antenna

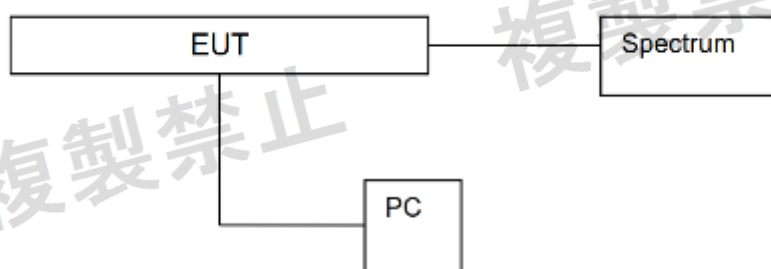
2.3 Test conditions and test Connections

2.3.1 Test Conditions

The EUT will be connected to test system to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

The EUT is supplied by an internal battery, the fluctuation of the input voltage to the radio circuit section is 1% or less when the input power supply to the EUT at $\pm 10\%$. All test items were performed at normal voltage.

2.3.2 Test Connections



Test Configuration

2.4 Auxiliary Equipment Used during Test

Table 3. Auxiliary Equipment Used during Test

NAME	MODEL	MANUFACTURER	S/N	CAL DATE	CAL INTERVAL (MONTH)
---	---	---	---	---	---

2.5 Lists of Test Instruments

Table 4. Lists of Test Instruments

Test Equipment	Manufacturer	Model No.	Series No.	Calibrated by	Cal. Method	Cal. Due date	Cal. Date
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	101031	CEPREI	C	2025-05-11	2024-05-12
RF test system	TDK	TS8997	---	CEPREI	C	2025-10-15	2024-10-16

- (a): Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1)
- (b): Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)
- (c): Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)
- (d): Calibration conducted by using measuring instruments and other equipment listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from (a) to (c)

2.6 Measurement Uncertainty (95% confidence levels, k=2)

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Conducted RF test with TS 8997	RF Power Conducted: 1.31dB Frequency test involved: 0.6×10^{-8} or 1%

3 Measurements Result

3.1 Antenna Power

3.1.1 Test condition

Date of testing:	Mar.26, 2024
Channel:	Low: 2412MHz; High: 2472MHz (for 802.11b; 802.11g; 802.11n_HT20)
	Low: 2422MHz; High: 2462MHz (for 802.11n_HT40)
Test position:	Transmitting
Ambient temperature:	24.1 °C
Relative humidity:	52 %
Atmosphere Pressure:	105.5 KPa

3.1.2 Limit

- The antenna power of a transmitting equipment (with a frequency band of 2,427 – 2,470.75 MHz, for spread spectrum systems using FH systems, hybrid systems of DS and FH, or hybrid systems of FH and OFDM) shall be such that the mean power within a bandwidth of 1 MHz is 3 mW or less in the case of modulation using a standard coding test signal with the same transmission rate as that of the modulation signal.
- The antenna power of a transmitting equipment using a spread spectrum system other than any of those in “a” and the OFDM system shall be such that the mean power within a bandwidth of 1 MHz is 10 mW or less in the case of modulation using a standard coding test signal with the same transmission rate as that of the modulation signal.

3.1.3 Test result

802.11b

Frequency (MHz)	Measured Power (mW/MHz)	Average Power (mW/MHz)	Limit (mW/MHz)
2412	10.423	10.423	10
2472	10.765	10.765	10

802.11g

Frequency (MHz)	Measured Power (mW/MHz)	Average Power (mW/MHz)	Limit (mW/MHz)
2412	3.006	2.994	10
2472	3.000	2.988	10



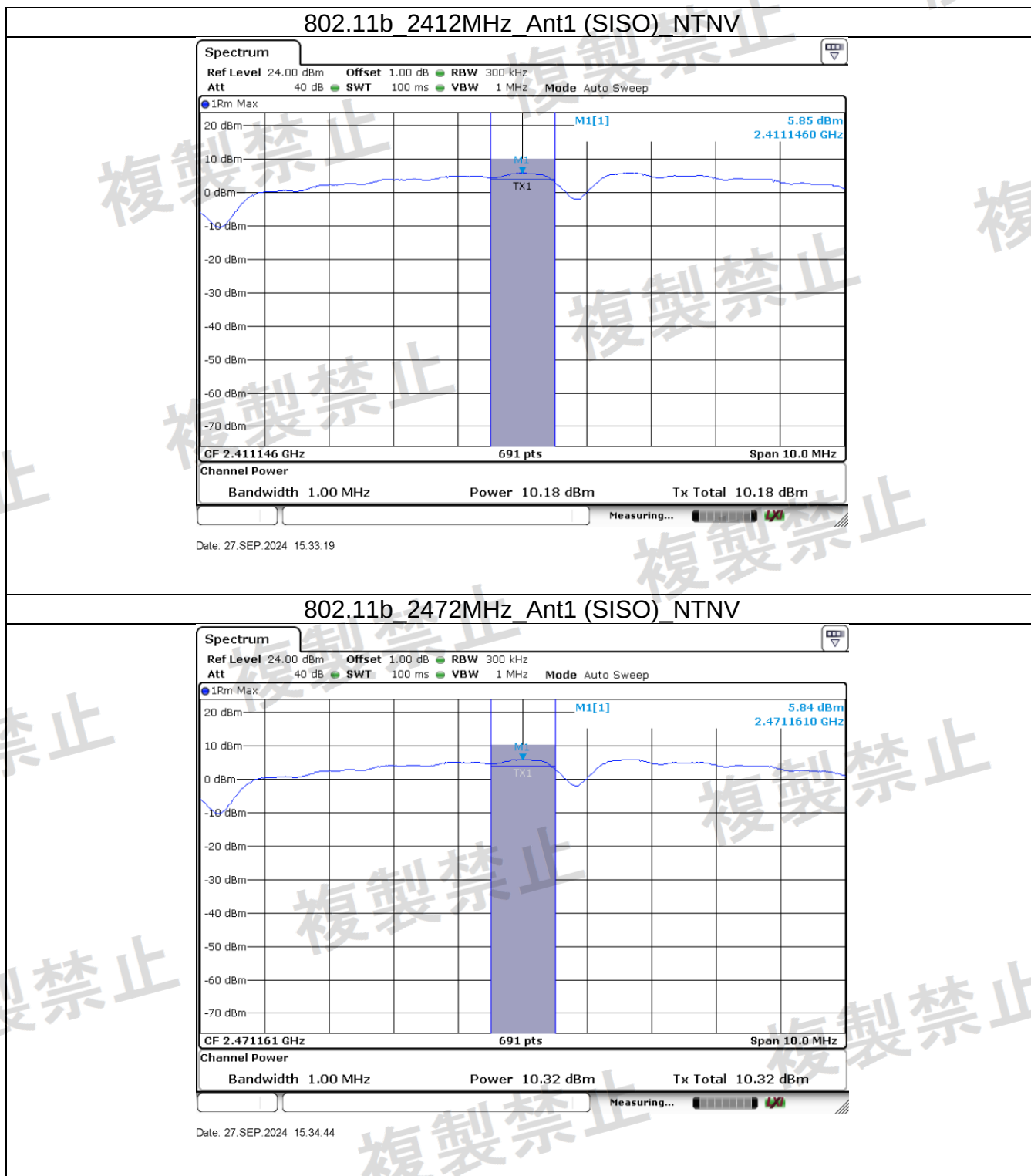
802.11n HT20

Frequency (MHz)	Measured Power (mW/MHz)	Average Power (mW/MHz)	Limit (mW/MHz)
2412	2.844	2.766	10
2472	2.786	2.710	10

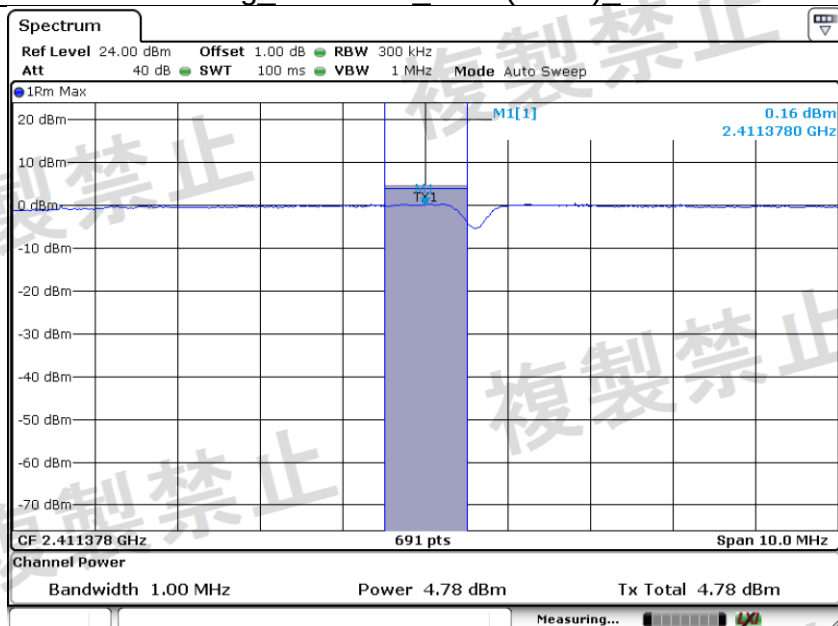
802.11n HT40

Frequency (MHz)	Measured Power (mW/MHz)	Average Power (mW/MHz)	Limit (mW/MHz)
2422	3.000	2.913	5
2462	2.773	2.692	5

3.1.4 Test Graphs

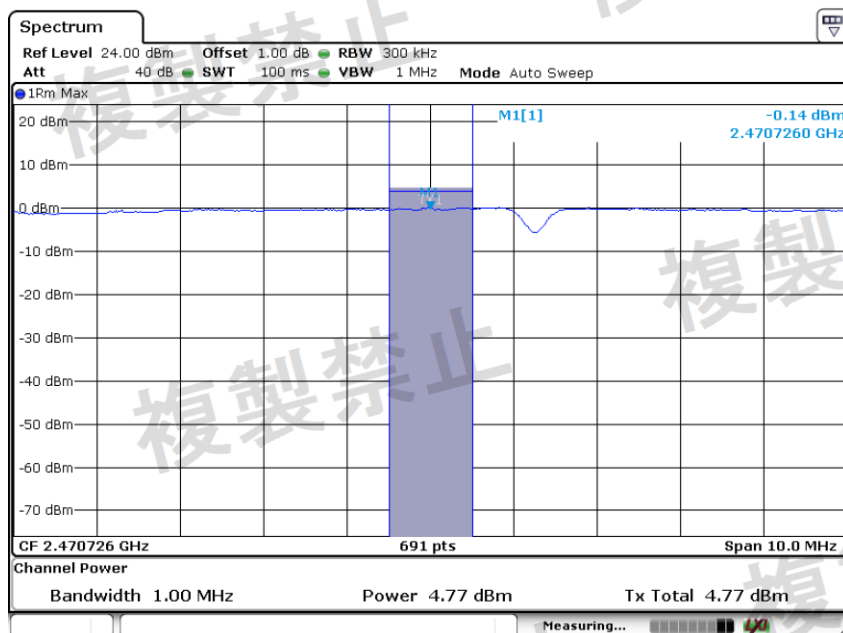


802.11g_2412MHz_Ant1 (SISO) NTN



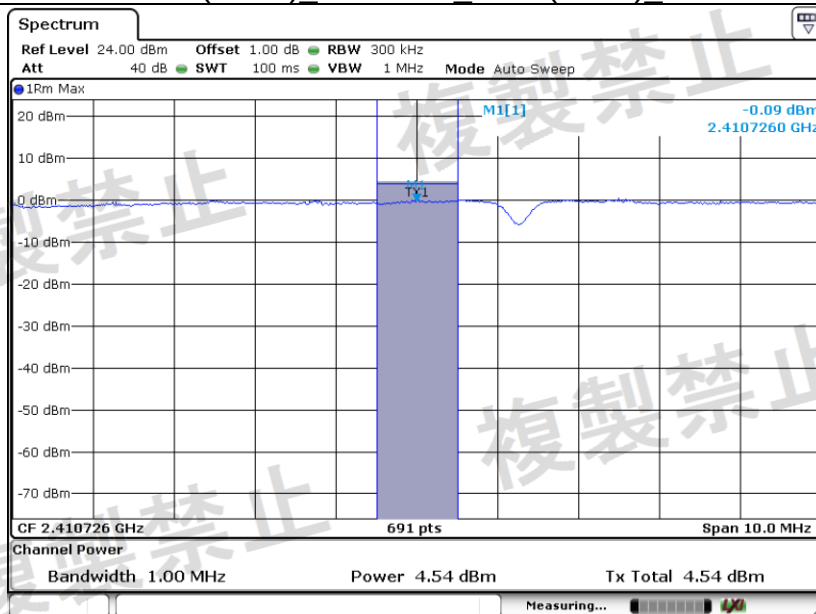
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802.11g_2472MHz_Ant1 (SISO) NTN



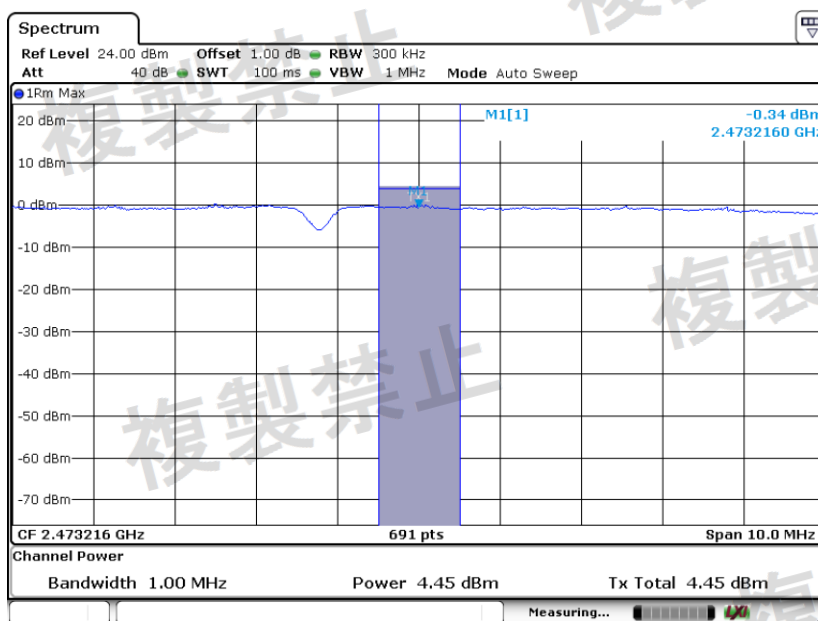
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802.11n(HT20) 2412MHz_Ant1 (SISO) NTVN



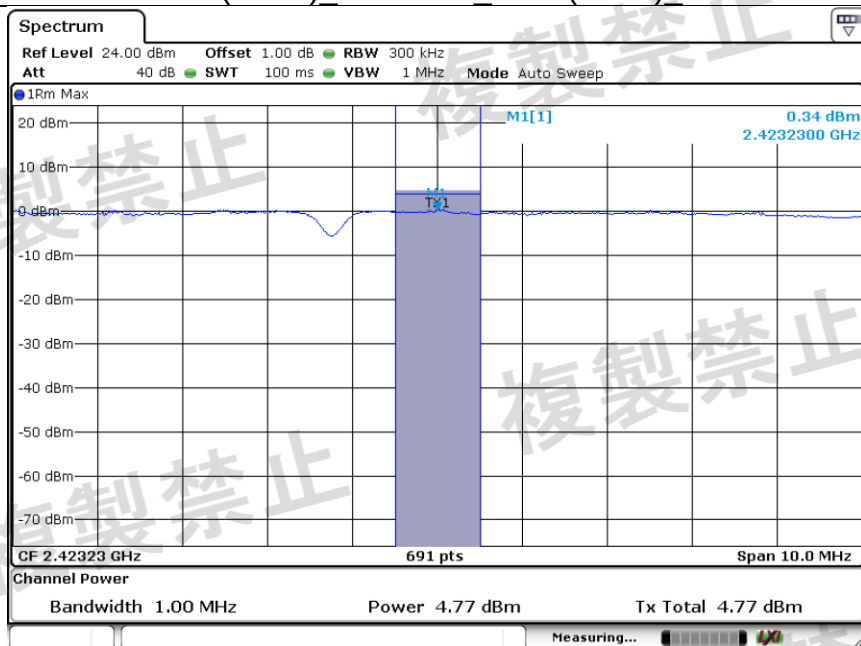
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802.11n(HT20) 2472MHz_Ant1 (SISO) NTVN



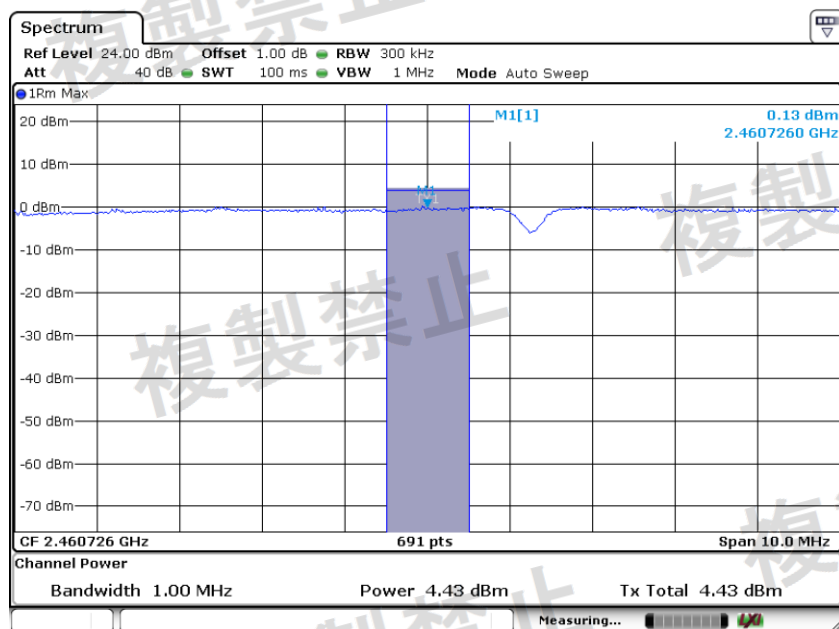
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802.11n(HT40) 2422MHz_Ant1 (SISO) NTVN



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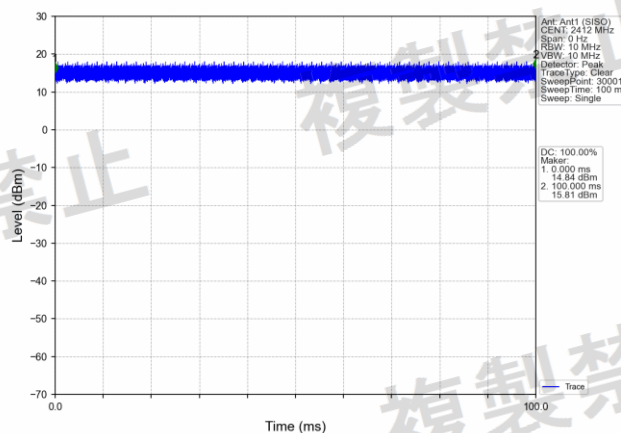
802.11n(HT40) 2462MHz_Ant1 (SISO) NTVN



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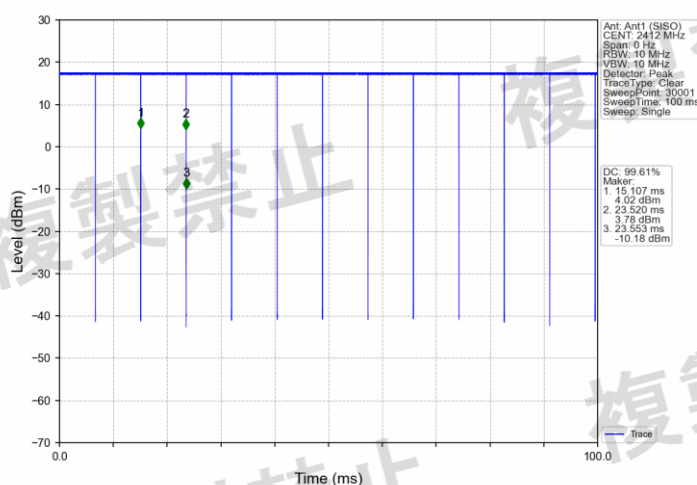
802.11b_2412MHz

Transmission time rate = Burst transmission time / Burst repetition period=100%



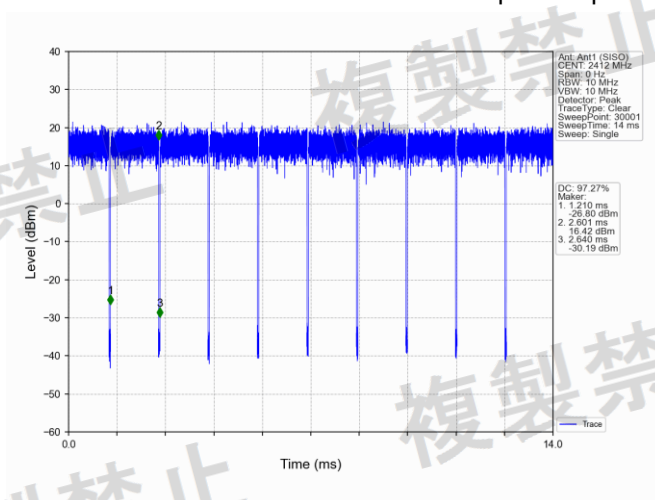
802.11g_2412MHz

Transmission time rate = Burst transmission time / Burst repetition period=99.61%



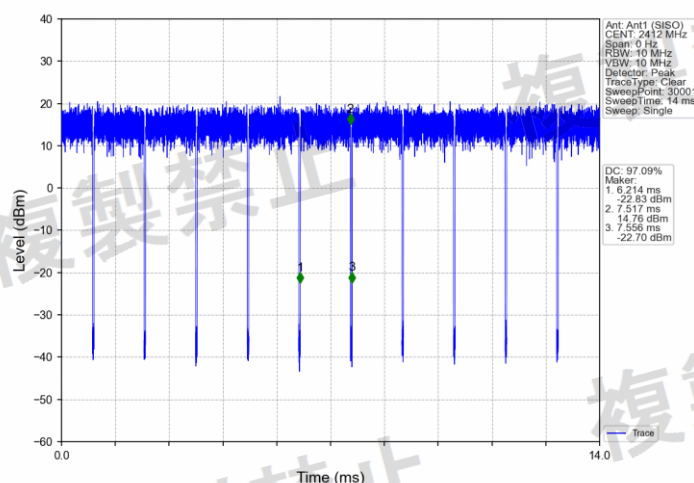
802.11n20_2412MHz

Transmission time rate = Burst transmission time / Burst repetition period=97.27%



802.11n40_2412MHz

Transmission time rate = Burst transmission time / Burst repetition period=97.09%



3.1.5 Result

The equipment met the requirement of this clause.



3.2 RF Output Power Tolerance

3.2.1 Test condition

Date of testing:	Mar.26, 2024
Channel:	Low: 2412MHz; High: 2472MHz (for 802.11b; 802.11g; 802.11n_HT20)
	Low: 2422MHz; High: 2462MHz (for 802.11n_HT40)
Test position:	Transmitting
Ambient temperature:	24.3 °C
Relative humidity:	55 %
Atmosphere Pressure:	105.1 KPa

3.2.2 Limit

Upper and lower limits of the tolerance for antenna power shall be 20% and 80%, respectively. Note that they represent the tolerance for the maximum rated antenna power and that no upper and lower limits of the tolerance are regulated in the case of antenna power reduction for communications reasons.

3.2.3 Test result

802.11b

Frequency (MHz)	Voltage (VDC)	Declared Output Power (mW/MHz)	Output Power (mW/MHz)	Tolerances (%)	Limit
2412	3.3	10	10.423	4.23	+20% to -80%
2472	3.3	10	10.765	7.65	+20% to -80%
Conclusion: PASS					

802.11g

Frequency (MHz)	Voltage (VDC)	Declared Output Power (mW/MHz)	Output Power (mW/MHz)	Tolerances (%)	Limit
2412	3.3	5	2.994	-40.12	+20% to -80%
2472	3.3	5	2.988	-40.24	+20% to -80%
Conclusion: PASS					

802.11n_HT20

Frequency (MHz)	Voltage (VDC)	Declared Output Power (mW/MHz)	Output Power (mW/MHz)	Tolerances (%)	Limit
2412	3.3	5	2.766	-44.68	+20% to -80%
2472	3.3	5	2.710	-45.80	+20% to -80%
Conclusion: PASS					



802.11n HT40

Frequency (MHz)	Voltage (VDC)	Declared Output Power (mW/MHz)	Output Power (mW/MHz)	Tolerances (%)	Limit
2422	3.3	5	2.913	-41.74	+20% to -80%
2462	3.3	5	2.692	-46.16	+20% to -80%
Conclusion: PASS					

3.2.4 Result

The equipment met the requirement of this clause.



3.3 Frequency Tolerance

3.3.1 Test condition

Date of testing:	Mar.27, 2024
Channel:	Low: 2412MHz; Middle: 2442MHz; High: 2472MHz (for 802.11b; 802.11g; 802.11n_HT20; 802.11n_HT20)
Test position:	Transmitting
Ambient temperature:	24.5 °C
Relative humidity:	56 %
Atmosphere Pressure:	105.1 KPa

3.3.2 Limit (ARIB STD-T66, Clause 3.2 (4))

Tolerance of frequency: $\pm 50 \times 10^{-6}$.

3.3.3 Test Result

802.11b

Test Frequency (MHz)	Voltage (DC)	Result (MHz)	Tolerance (kHz)	Tolerance (ppm)	Limit (ppm)
2412	3.3	2412.040	-40	16.58	± 50
2442	3.3	2442.060	-60	24.57	± 50
2472	3.3	2472.080	-80	32.36	± 50
Conclusion: PASS					

802.11g

Test Frequency (MHz)	Voltage (DC)	Result (MHz)	Tolerance (kHz)	Tolerance (ppm)	Limit (ppm)
2412	3.3	2412.060	-60	24.88	± 50
2442	3.3	2442.060	-60	24.57	± 50
2472	3.3	2472.060	-60	24.27	± 50
Conclusion: PASS					

802.11n_HT20

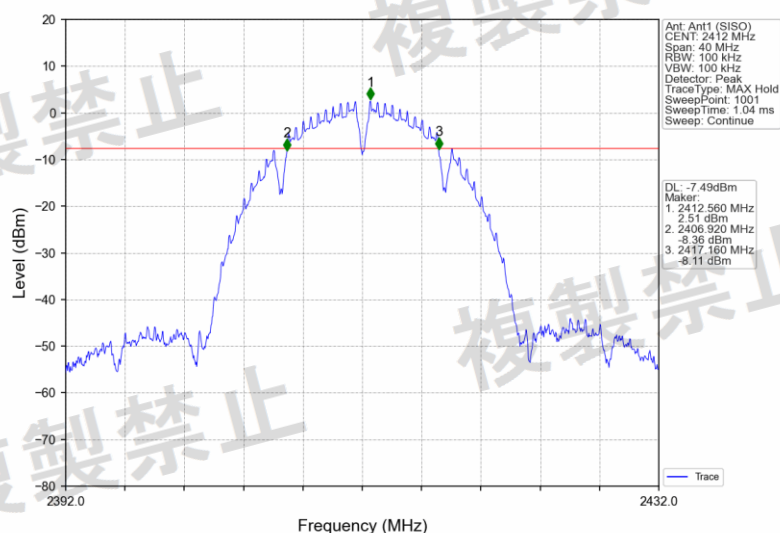
Test Frequency (MHz)	Voltage (DC)	Result (MHz)	Tolerance (kHz)	Tolerance (ppm)	Limit (ppm)
2412	3.3	2412.040	-40	16.58	± 50
2442	3.3	2442.060	-60	24.57	± 50
2472	3.3	2472.060	-60	24.27	± 50
Conclusion: PASS					

802.11n_HT40

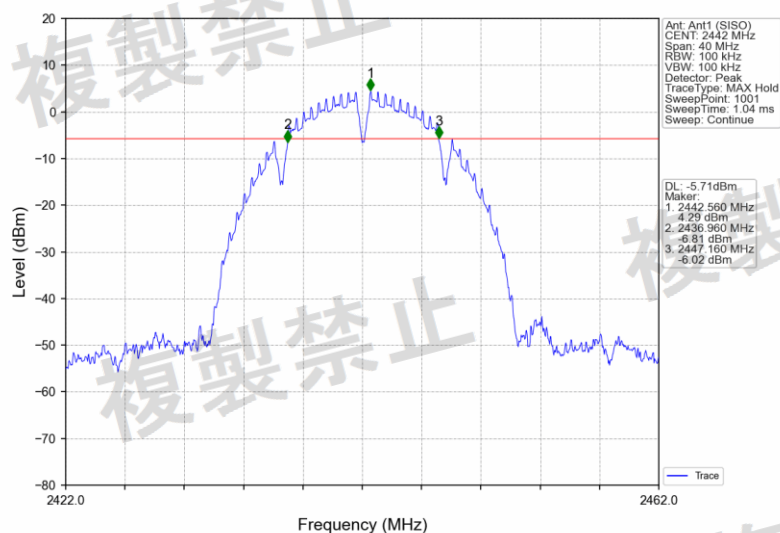
Test Frequency (MHz)	Voltage (DC)	Result (MHz)	Tolerance (kHz)	Tolerance (ppm)	Limit (ppm)
2422	3.3	2412.080	-80	33.03	± 50
2442	3.3	2442.080	-80	32.76	± 50
2462	3.3	2472.080	-80	32.49	± 50
Conclusion: PASS					

3.3.4 Test Graphs

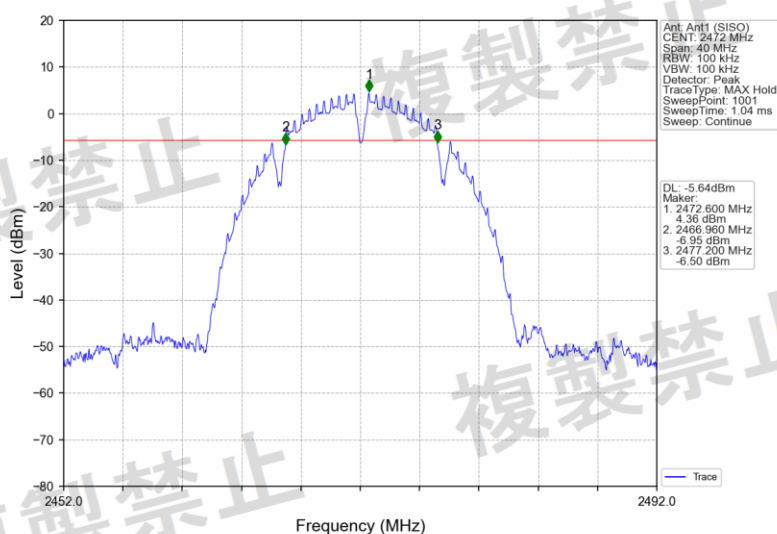
802.11b 2412MHz Ant1 (SISO) NTN



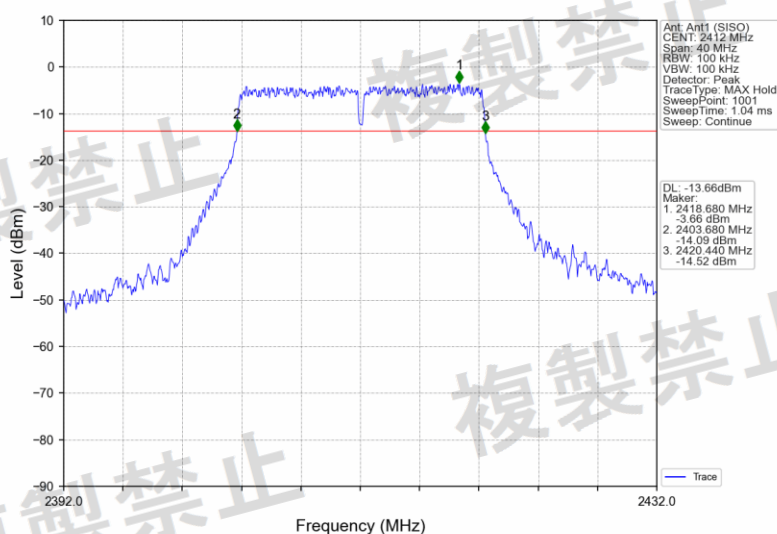
802.11b 2442MHz Ant1 (SISO) NTN



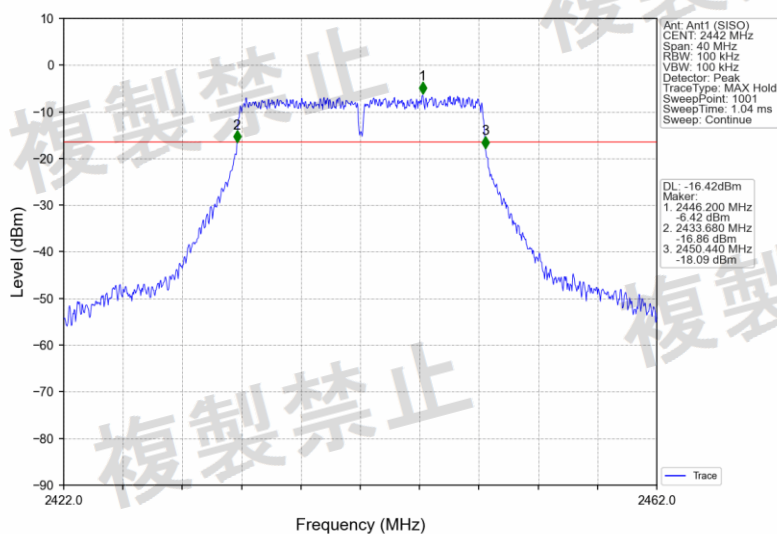
802.11b 2472MHz_Ant1 (SISO)_NTNV



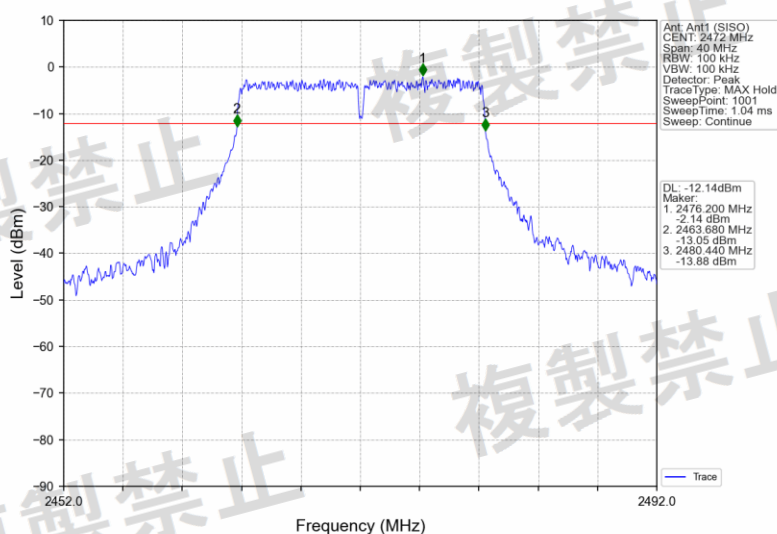
802.11g_2412MHz_Ant1 (SISO)_NTNV



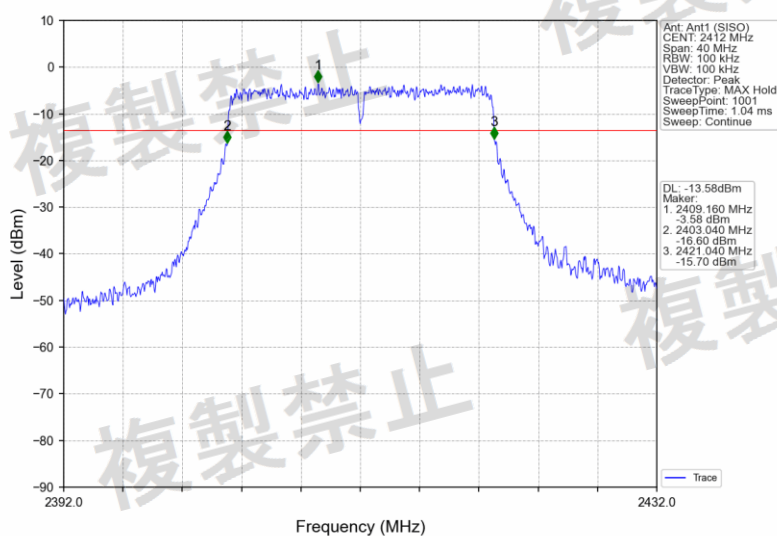
802.11g_2442MHz_Ant1 (SISO)_NTNV



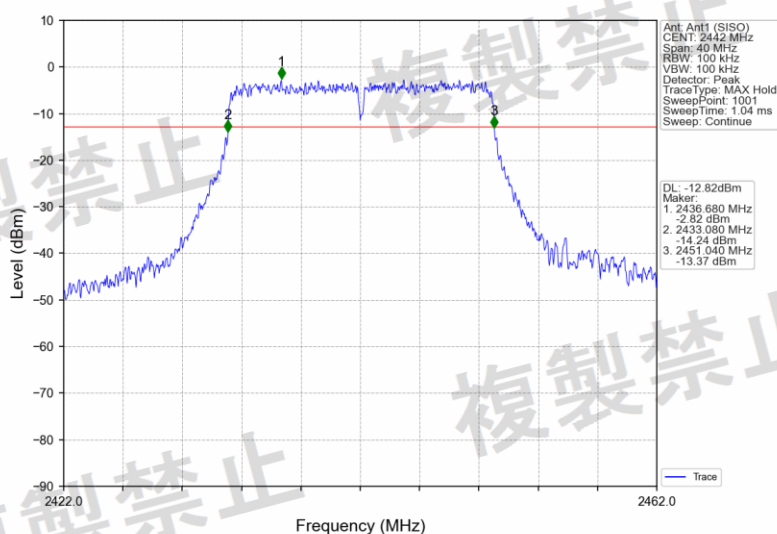
802.11g_2472MHz_Ant1 (SISO)_NTNV



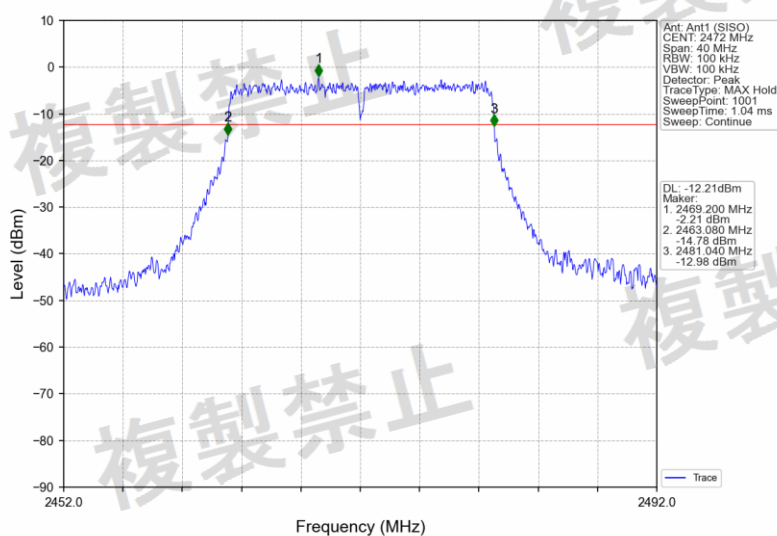
802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV



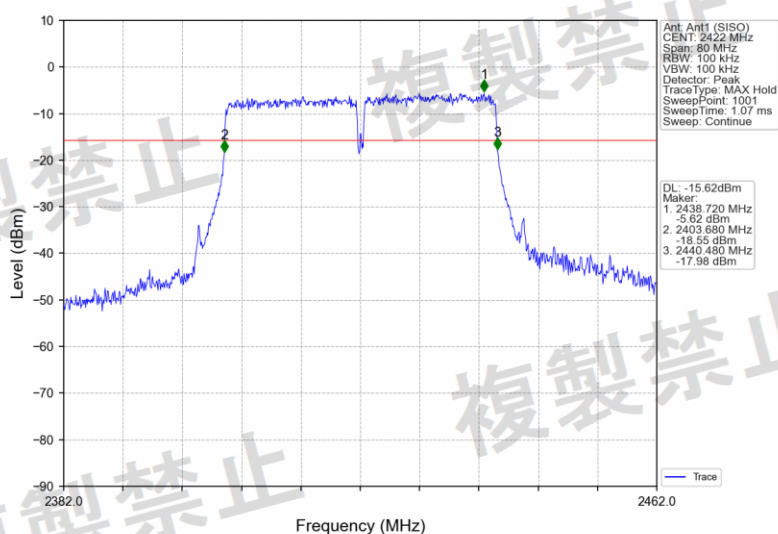
802.11n(HT20) 2442MHz_Ant1 (SISO)_NTNV



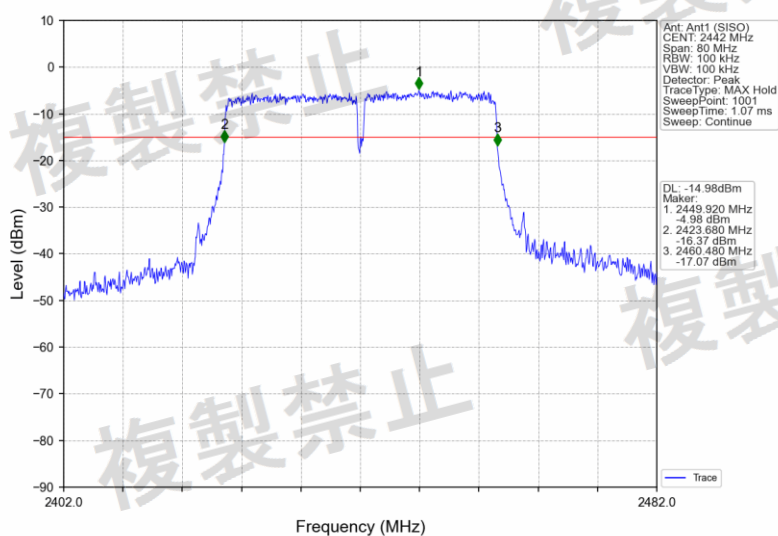
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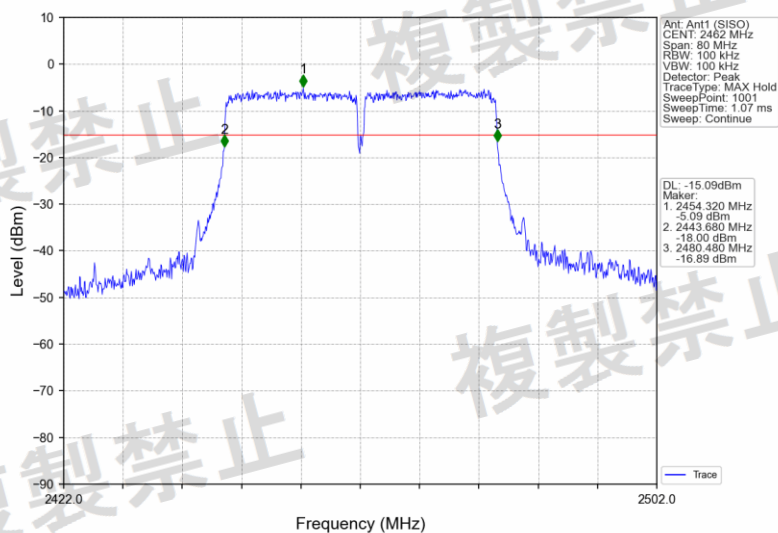
802.11n(HT40) 2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40) 2442MHz_Ant1 (SISO)_NTNV



802.11n(HT40) 2462MHz_Ant1 (SISO) NTVN



3.3.5 Result

The equipment met the requirement of this clause.

3.4 Occupied Bandwidth

3.4.1 Test condition

Date of testing:	Mar.27, 2024
Channel:	Low: 2412MHz; Middle: 2442MHz; High: 2472MHz (for 802.11b; 802.11g; 802.11n_HT20)
	Low: 2422MHz; Middle: 2442MHz; High: 2462MHz (for 802.11n_HT40)
Test position:	Transmitting
Ambient temperature:	23.5 °C
Relative humidity:	55 %
Atmosphere Pressure:	105.1 KPa

3.4.2 Limit

Permissible value for occupied bandwidth using the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems shall be 83.5 MHz or less, while necessary bandwidth (minimum occupied bandwidth sufficient to ensure information transmission of required quality at a required transmission rate for the system used under specified conditions for a given emission type) using a OFDM system is at most 40MHz; and for transmission devices using any other necessary frequency bandwidth is at most 26 MHz or less.

3.4.3 Test Result

802.11b

Test Frequency (MHz)	Voltage (DC/V)	Result (MHz)	Limit (MHz)
2412	3.3	13.564	<26MHz
2442	3.3	13.364	<26MHz
2472	3.3	13.307	<26MHz

802.11g

Test Frequency (MHz)	Voltage (DC/V)	Result (MHz)	Limit (MHz)
2412	3.3	16.805	<40MHz
2442	3.3	16.806	<40MHz
2472	3.3	16.815	<40MHz

802.11n_HT20

Test Frequency (MHz)	Voltage (DC/V)	Result (MHz)	Limit (MHz)
2412	3.3	17.861	<40MHz
2442	3.3	17.866	<40MHz
2472	3.3	17.861	<40MHz

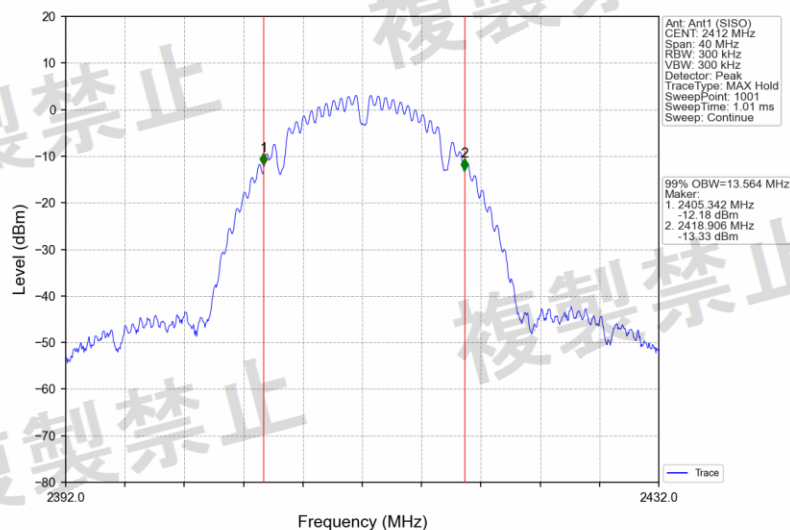


802.11n HT40

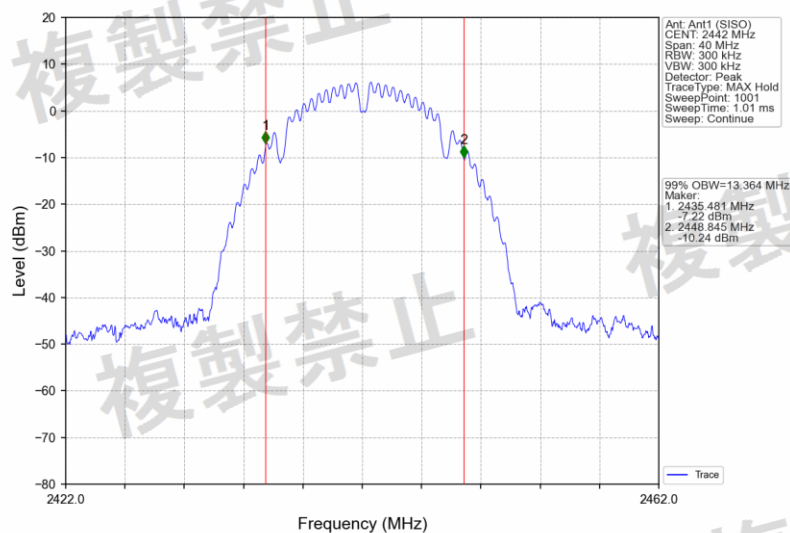
Test Frequency (MHz)	Voltage (DC/V)	Result (MHz)	Limit (MHz)
2422	3.3	36.184	<40MHz
2442	3.3	36.176	<40MHz
2462	3.3	36.216	<40MHz

3.4.4 Test Graphs

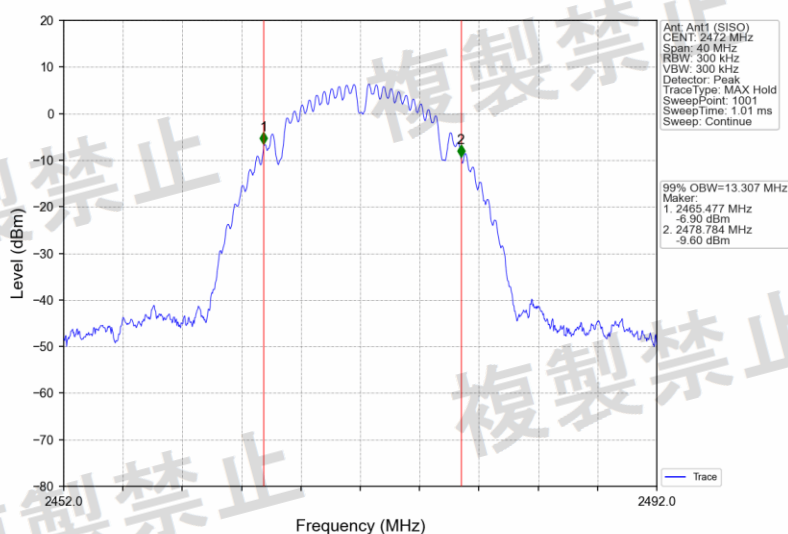
802.11b_2412MHz_Ant1 (SISO) NTN



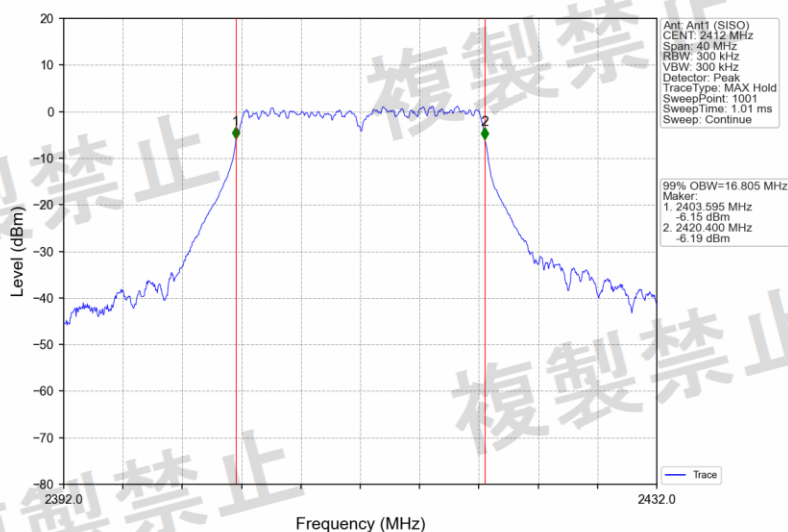
802.11b_2442MHz_Ant1 (SISO) NTN



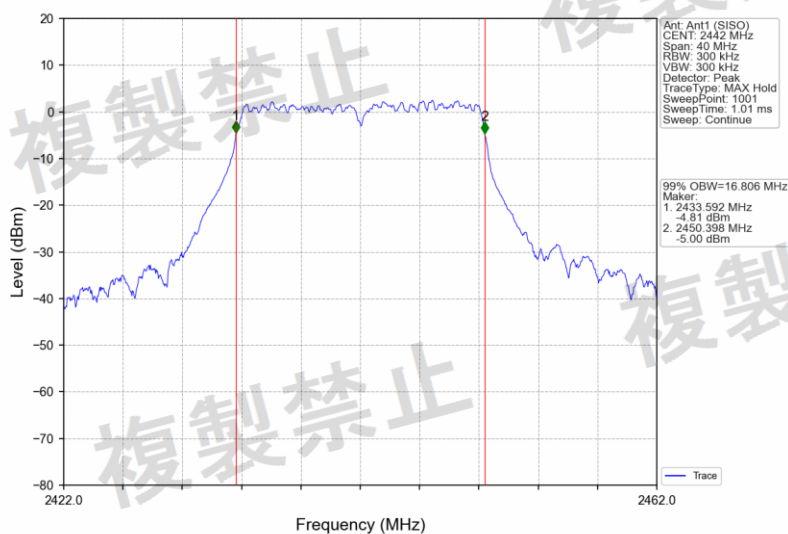
802.11b_2472MHz_Ant1 (SISO)_NTNV



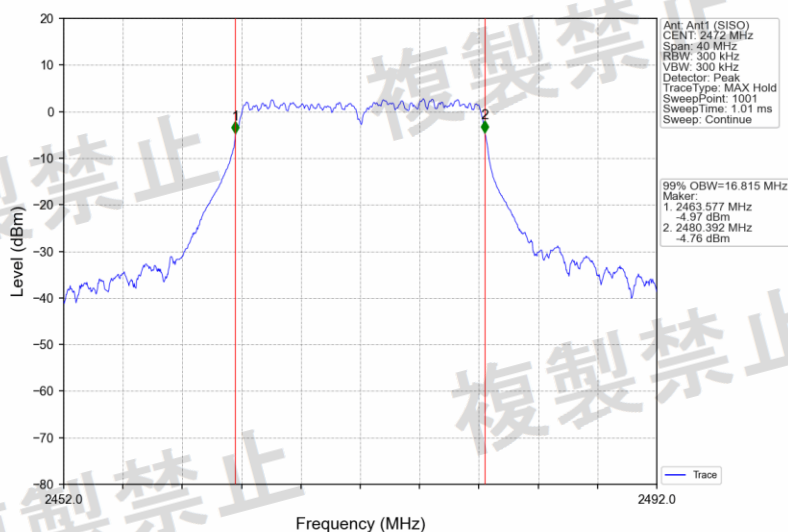
802.11g_2412MHz_Ant1 (SISO)_NTNV



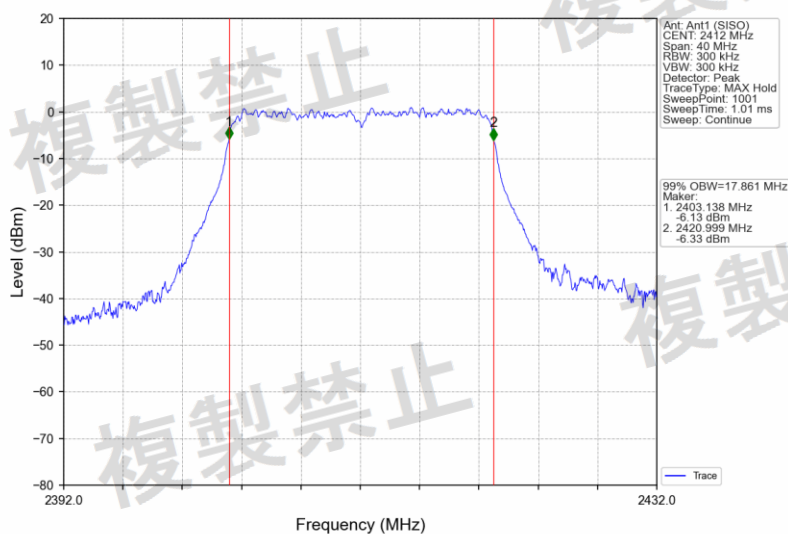
802.11g_2442MHz_Ant1 (SISO)_NTNV



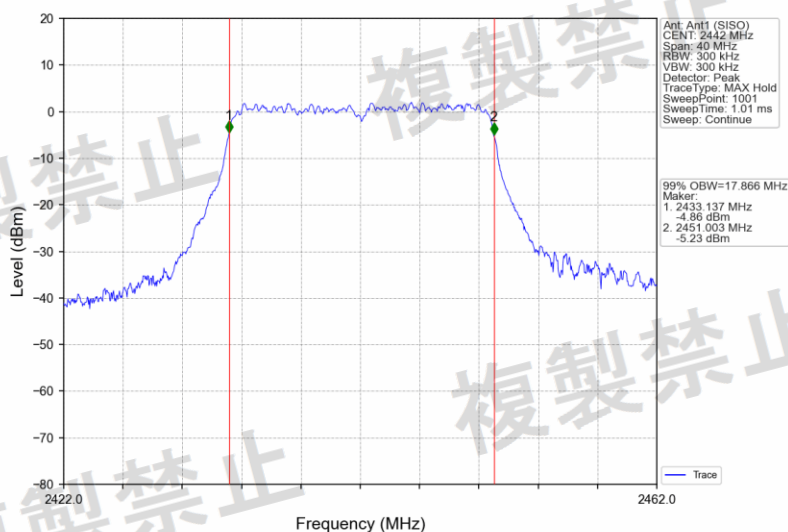
802.11g_2472MHz_Ant1 (SISO)_NTNV



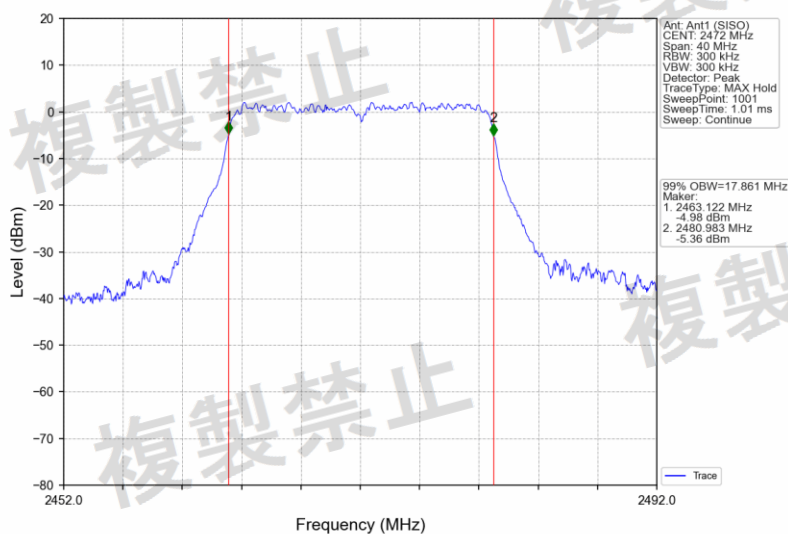
802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV



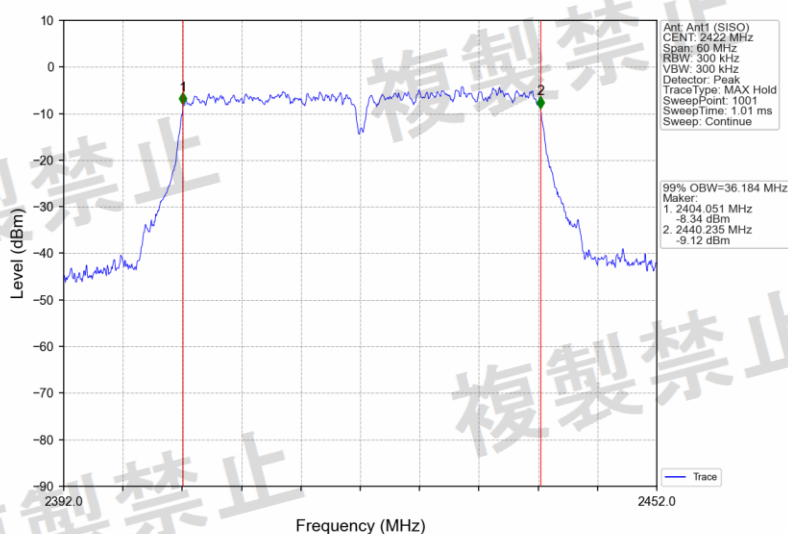
802.11n(HT20) 2442MHz_Ant1 (SISO)_NTNV



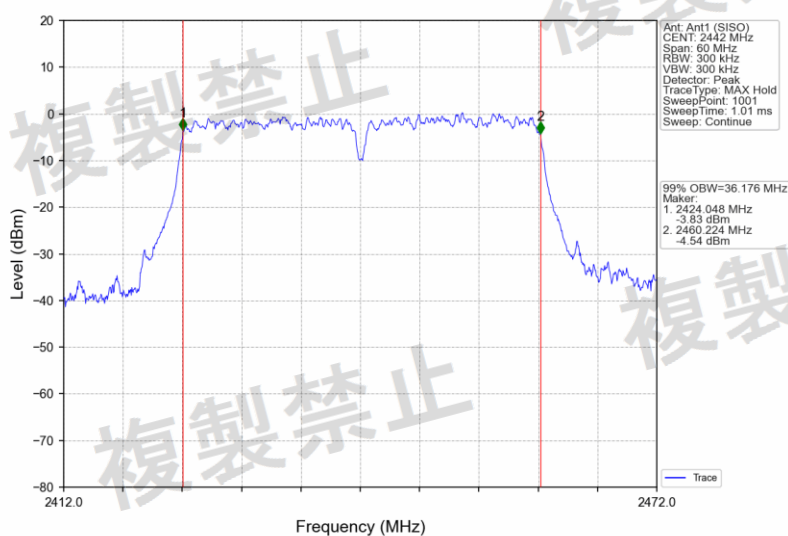
802.11n(HT20) 2472MHz_Ant1 (SISO)_NTNV



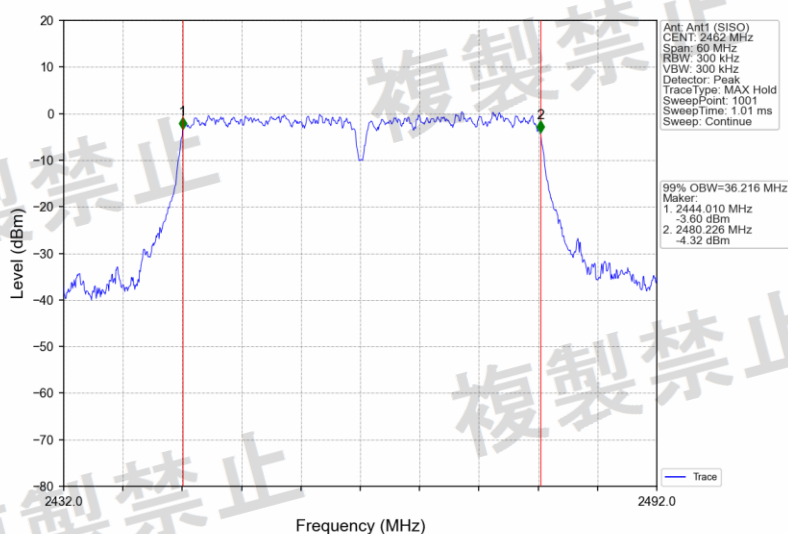
802.11n(HT40) 2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40) 2442MHz_Ant1 (SISO)_NTNV



802.11n(HT40) 2462MHz Ant1 (SISO) NTVN



3.4.5 Result

The equipment met the requirement of this clause.



3.5 Spread Bandwidth

3.5.1 Test condition

Date of testing:	Mar.27, 2024
Channel:	Low: 2412MHz; Middle: 2442MHz; High: 2472MHz (for 802.11b; 802.11g; 802.11n_HT20)
	Low: 2422MHz; Middle: 2442MHz; High: 2462MHz (for 802.11n_HT40)
Test position:	Transmitting
Ambient temperature:	23.5 °C
Relative humidity:	55 %
Atmosphere Pressure:	105.1 KPa

3.5.2 Limit

In spread spectrum systems, spread bandwidth (which refers to a frequency bandwidth with an upper limit and lower limit such that each of the mean powers radiated above the upper frequency limit and below the lower frequency limit is equal to 5 % of the total mean power radiated; this also applies hereafter) shall be 500 kHz or more.

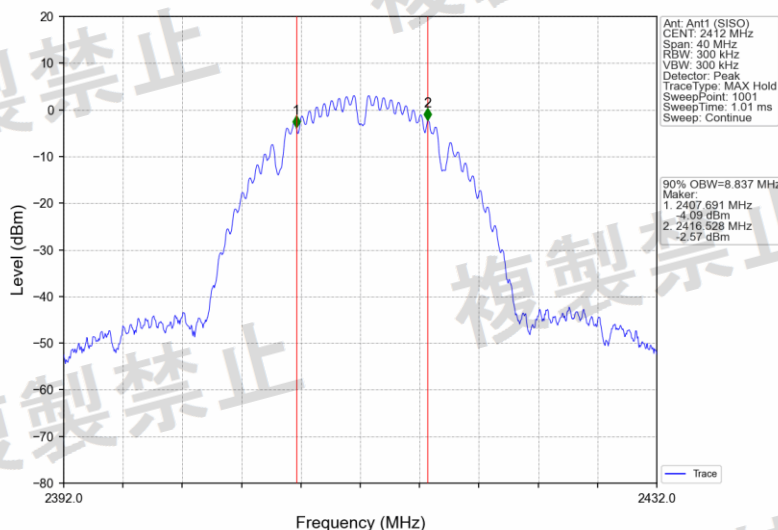
3.5.3 Test Result

802.11b

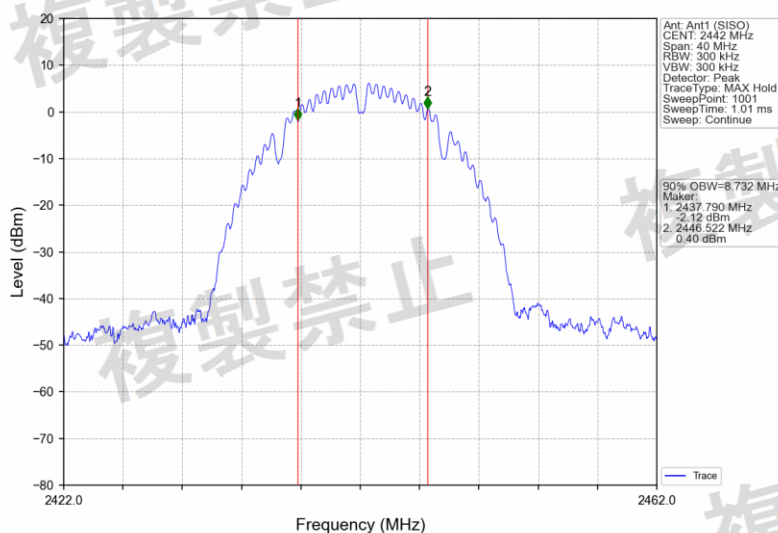
Test Frequency (MHz)	Voltage (DC/V)	Result (MHz)	Limit (KHz)
2412	3.3	8.837	> 500
2442	3.3	8.732	> 500
2472	3.3	8.731	> 500

3.5.4 Test Graphs

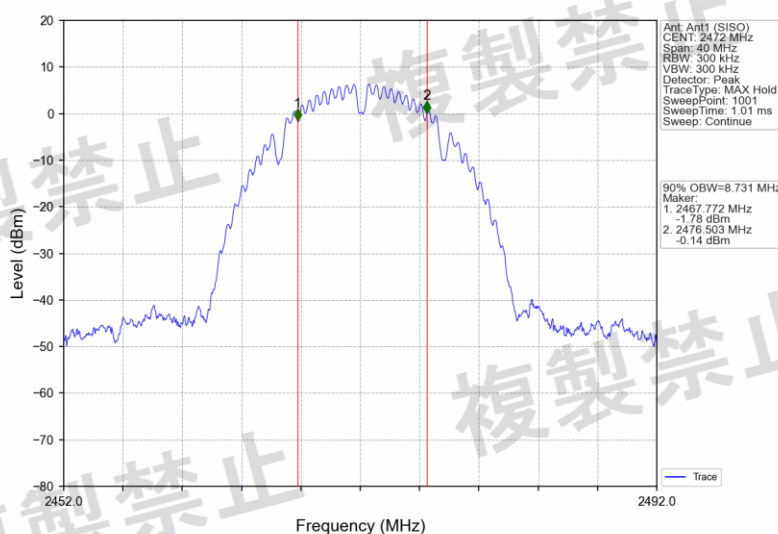
802.11b 2412MHz Ant1 (SISO) NTN



802.11b 2442MHz Ant1 (SISO) NTN



802.11b 2472MHz_Ant1 (SISO)_NTNV



3.5.5 Result

The equipment met the requirement of this clause.

3.6 Unwanted (Spurious) Emission Strength

3.6.1 Test condition

Date of testing:	Mar.27, 2024
Channel:	Low: 2412MHz; Middle: 2442MHz; High: 2472MHz (for 802.11b; 802.11g; 802.11n_HT20)
	Low: 2422MHz; Middle: 2442MHz; High: 2462MHz (for 802.11n_HT40)
Test position:	Transmitting
Ambient temperature:	24.5 °C
Relative humidity:	56 %
Atmosphere Pressure:	105.1 KPa

3.6.2 Limit

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:

$30 \leq f$ (MHz) < 2387MHz [2.5uW/MHz or below]

2387MHz $\leq f$ < 2400MHz [25uW/MHz or below]

2483.5MHz < f $\leq$ 2496.5MHz [25uW/MHz or below]

2496.5MHz < f $\leq$ 125000MHz [2.5uW/MHz or below]

3.6.3 Test Result

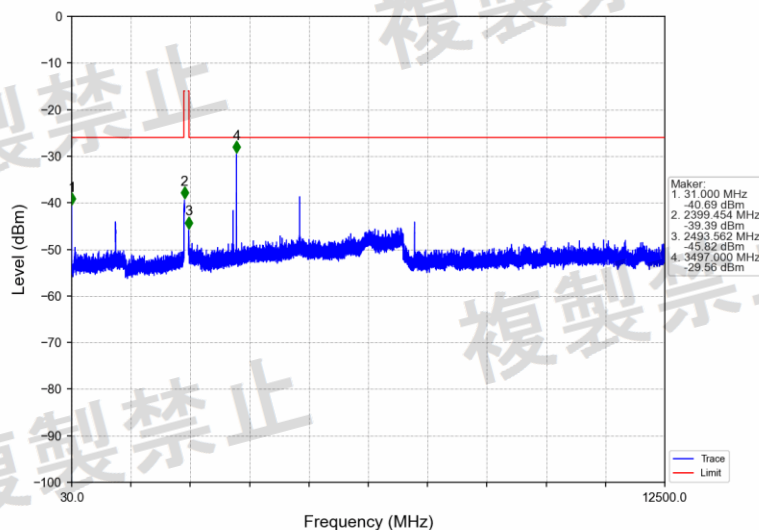
NTNV										
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker			Limit (uW/MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (uW/MHz)	AV Power (uW/MHz)		
802.11b	SISO	2412	1	30	2387	31	0.085	/	2.500	Pass
				2387	2400	2399.454	0.115	/	25.000	Pass
				2483.5	2496.5	2493.562	0.026	/	25.000	Pass
				2496.5	12500	3497	1.107	/	2.500	Pass
		2442	1	30	2387	585.950	0.098	/	2.500	Pass
				2387	2400	2398.778	0.039	/	25.000	Pass
				2483.5	2496.5	2485.853	0.044	/	25.000	Pass
				2496.5	12500	4884	0.258	/	2.500	Pass
		2472	1	30	2387	30	0.080	/	2.500	Pass
				2387	2400	2394.163	0.039	/	25.000	Pass
				2483.5	2496.5	2484.124	0.243	/	25.000	Pass
				2496.5	12500	7415.5	0.219	/	2.500	Pass
802.11g	SISO	2412	1	30	2387	2384.0	0.022	/	2.500	Pass
				2387	2400	2397.803	2.965	/	25.000	Pass
				2483.5	2496.5	2484.943	0.002	/	25.000	Pass
				2496.5	12500	4817.500	0.062	/	2.500	Pass
		2442	1	30	2387	30	0.074	/	2.500	Pass



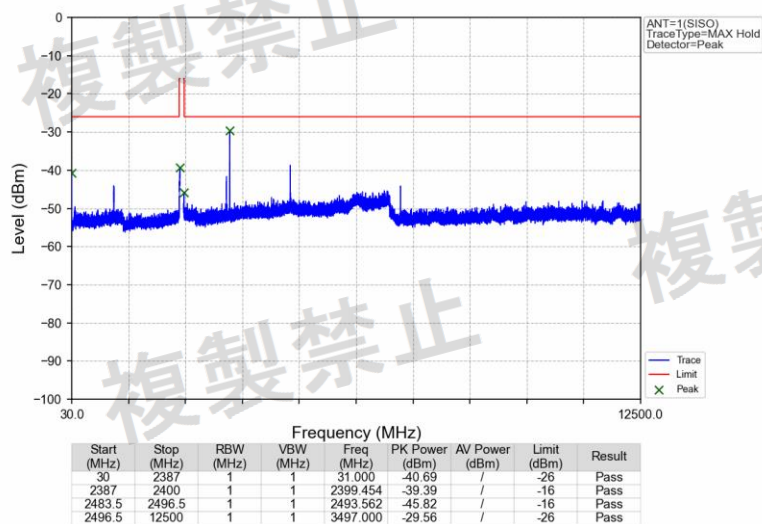
				2387	2400	2397.998	0.044	/	25.000	Pass
				2483.5	2496.5	2485.788	0.062	/	25.000	Pass
				2496.5	12500	3497.5	0.154	/	2.500	Pass
		2472	1	30	2387	2374.000	0.008	/	2.500	Pass
				2387	2400	2399.857	0.015	/	25.000	Pass
				2483.5	2496.5	2483.513	2.128	/	25.000	Pass
				2496.5	12500	2501.000	0.039	/	2.500	Pass
802.11n (HT20)	SISO	2412	1	30	2387	30.5	0.087	/	2.500	Pass
				2387	2400	2399.987	5.623	/	25.000	Pass
				2483.5	2496.5	2490.52	0.069	/	25.000	Pass
				2496.5	12500	4823	0.091	/	2.500	Pass
		2442	1	30	2387	955	0.090	/	2.500	Pass
				2387	2400	2394.735	0.039	/	25.000	Pass
				2483.5	2496.5	2488.297	0.073	/	25.000	Pass
				2496.5	12500	4882.5	0.102	/	2.500	Pass
		2472	1	30	2387	2386.500	0.007	/	2.500	Pass
				2387	2400	2399.974	0.015	/	25.000	Pass
				2483.5	2496.5	2483.552	2.109	/	25.000	Pass
				2496.5	12500	2498.500	0.039	/	2.500	Pass
802.11n (HT40)	SISO	2422	1	30	2387	30	0.009	/	2.500	Pass
				2387	2400	2399.116	0.296	/	25.000	Pass
				2483.5	2496.5	2483.903	0.003	/	25.000	Pass
				2496.5	12500	4846.000	0.061	/	2.500	Pass
		2442	1	30	2387	30.5	0.074	/	2.500	Pass
				2387	2400	2398.999	0.282	/	25.000	Pass
				2483.5	2496.5	2483.643	0.973	/	25.000	Pass
				2496.5	12500	12011.5	0.107	/	2.500	Pass
		2462	1	30	2387	30	0.087	/	2.500	Pass
				2387	2400	2399.974	0.069	/	25.000	Pass
				2483.5	2496.5	2484.176	7.112	/	25.000	Pass
				2496.5	12500	2497	0.796	/	2.500	Pass

3.6.4 Test Graphs

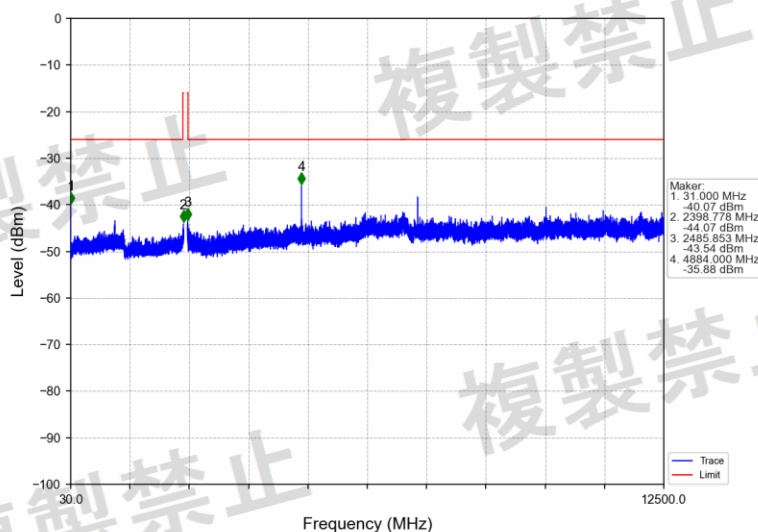
802.11b_2412MHz_Ant1 (SISO) NTN



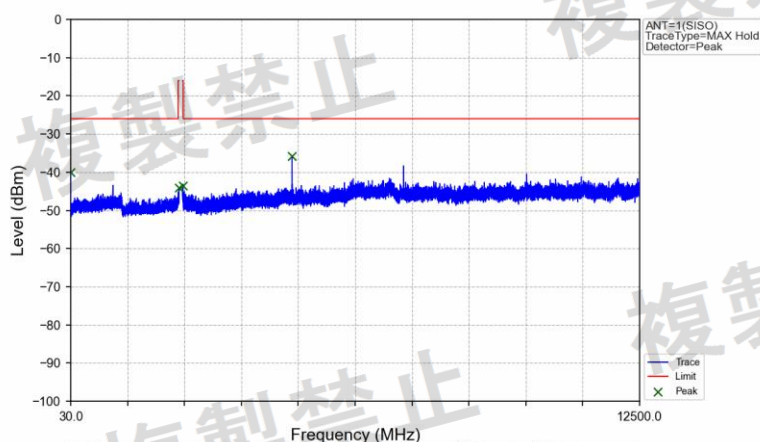
802.11b_2412MHz_Ant1 (SISO) NTN



802.11b_2442MHz_Ant1 (SISO)_NTNV

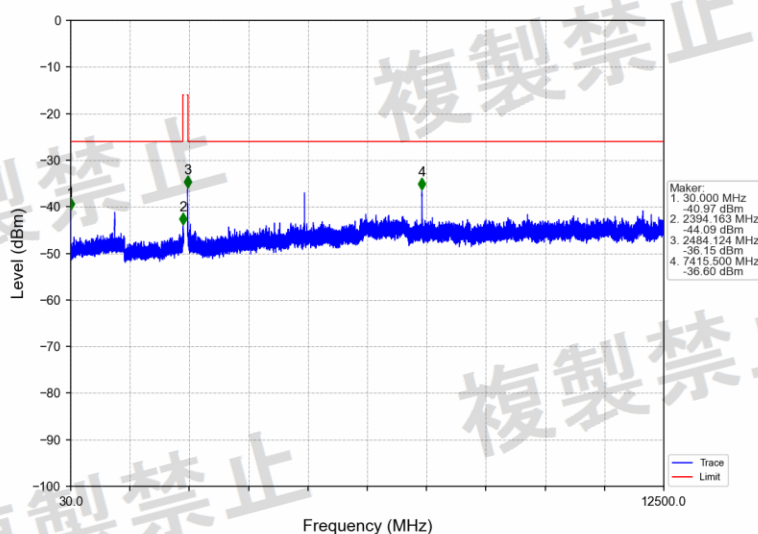


802.11b_2442MHz_Ant1 (SISO)_NTNV

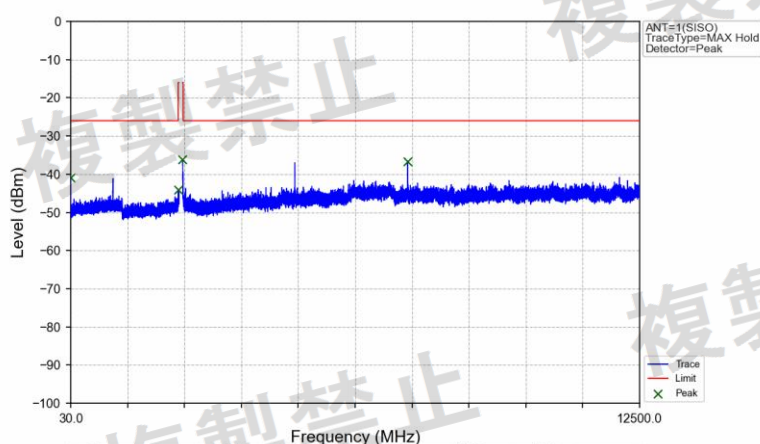


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	31.000	-40.07	/	-26	Pass
2387	2400	1	1	2398.778	-44.07	/	-16	Pass
2483.5	2496.5	1	1	2485.853	-43.54	/	-16	Pass
2496.5	12500	1	1	4884.000	-35.88	/	-26	Pass

802.11b_2472MHz_Ant1 (SISO)_NTNV

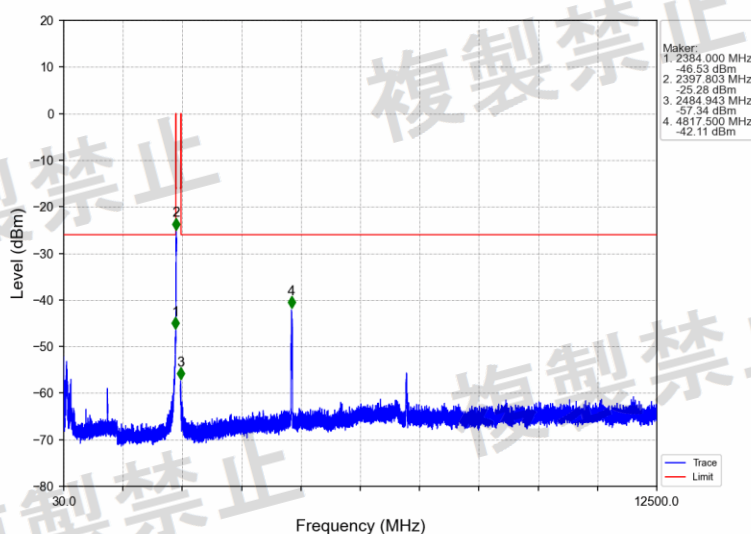


802.11b_2472MHz_Ant1 (SISO)_NTNV

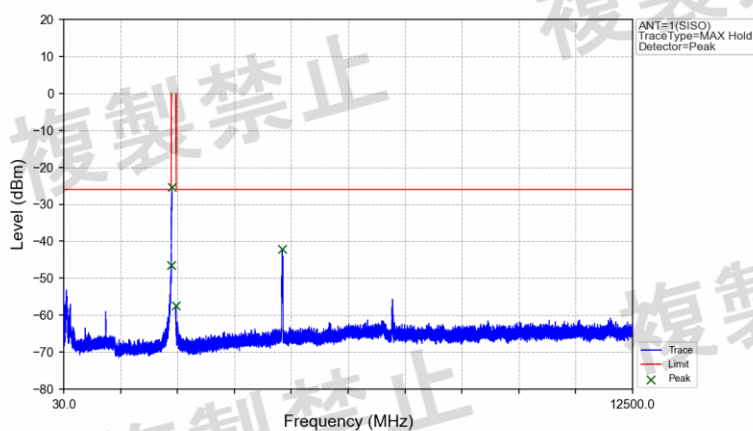


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	30.000	-40.97	/	-26	Pass
2387	2400	1	1	2394.163	-44.09	/	-16	Pass
2483.5	2496.5	1	1	2484.124	-36.15	/	-16	Pass
2496.5	12500	1	1	7415.500	-36.60	/	-26	Pass

802.11g_2412MHz_Ant1 (SISO)_NTNV

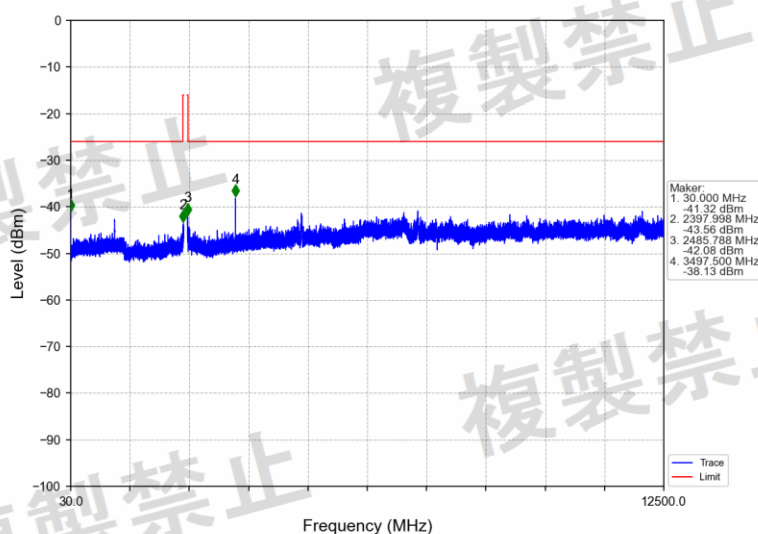


802.11g_2412MHz_Ant1 (SISO)_NTNV

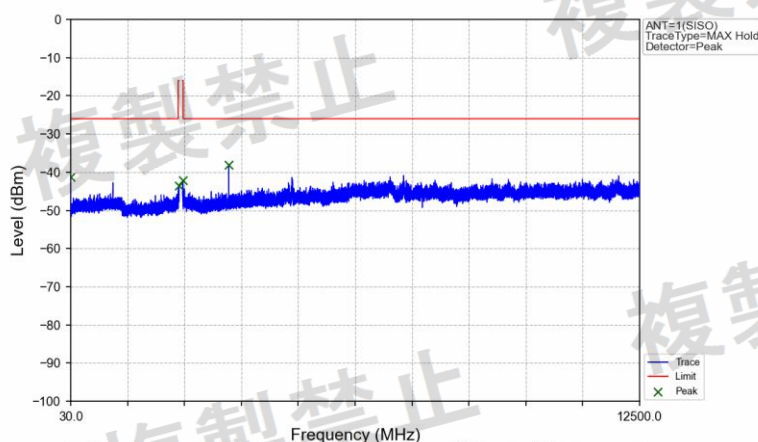


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2384.000	-46.53	/	-26	Pass
2387	2400	1	1	2397.803	-25.28	/	-16	Pass
2483.5	2496.5	1	1	2484.943	-57.34	/	-16	Pass
2496.5	12500	1	1	4817.500	-42.11	/	-26	Pass

802.11g_2442MHz_Ant1 (SISO)_NTNV

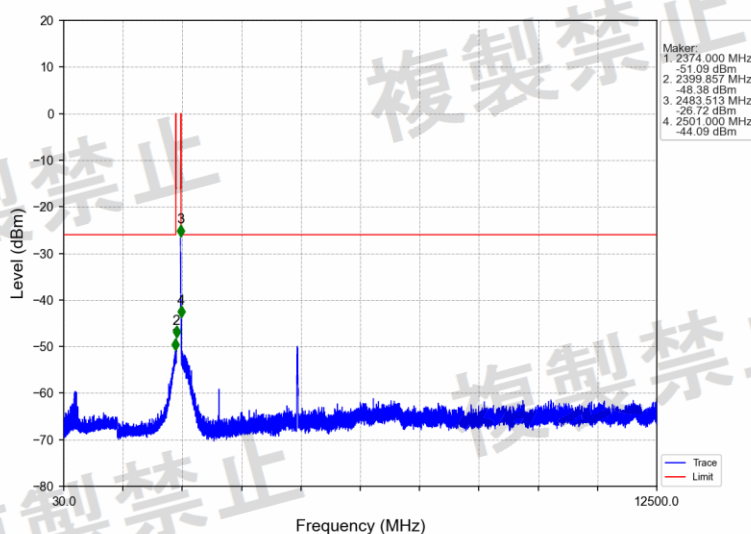


802.11g_2442MHz_Ant1 (SISO)_NTNV

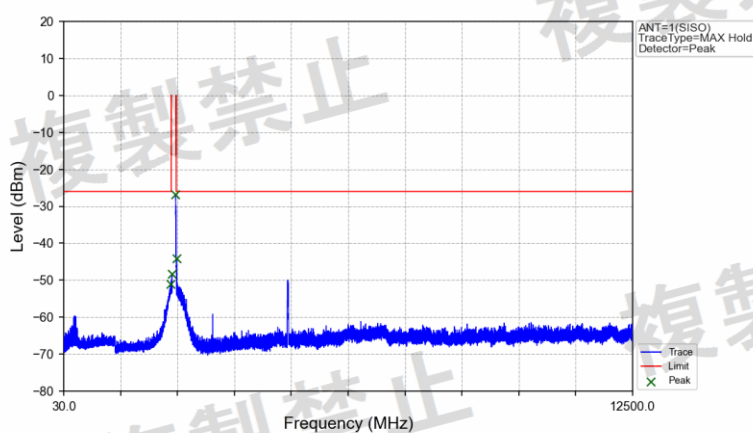


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	30.000	-41.32	/	-26	Pass
2387	2400	1	1	2397.998	-43.56	/	-16	Pass
2483.5	2496.5	1	1	2485.788	-42.08	/	-16	Pass
2496.5	12500	1	1	3497.500	-38.13	/	-26	Pass

802.11g_2472MHz_Ant1 (SISO)_NTNV

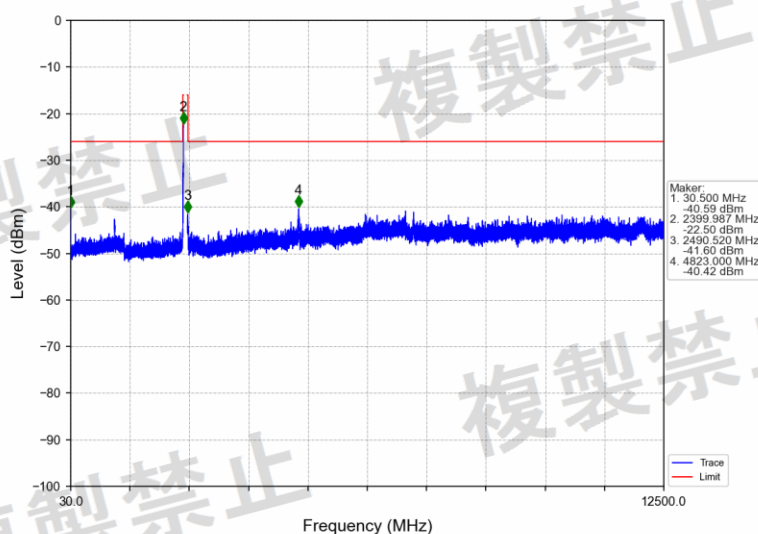


802.11g_2472MHz_Ant1 (SISO)_NTNV

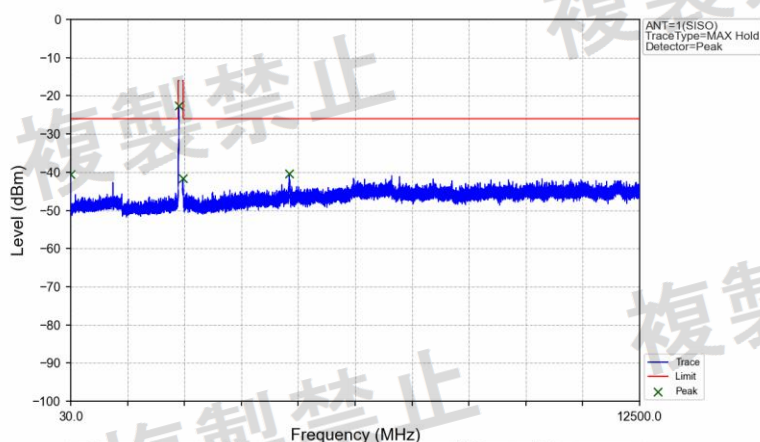


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2374.000	-51.09	/	-26	Pass
2387	2400	1	1	2399.857	-48.38	/	-16	Pass
2483.5	2496.5	1	1	2483.513	-26.72	/	-16	Pass
2496.5	12500	1	1	2501.000	-44.09	/	-26	Pass

802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

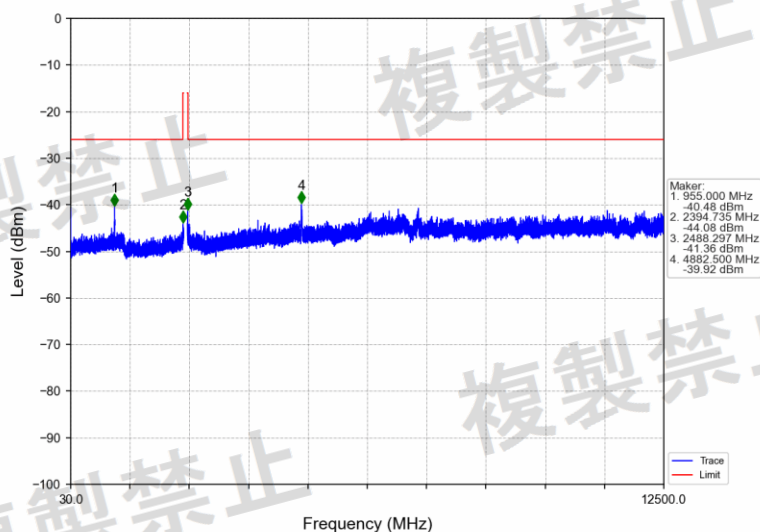


802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

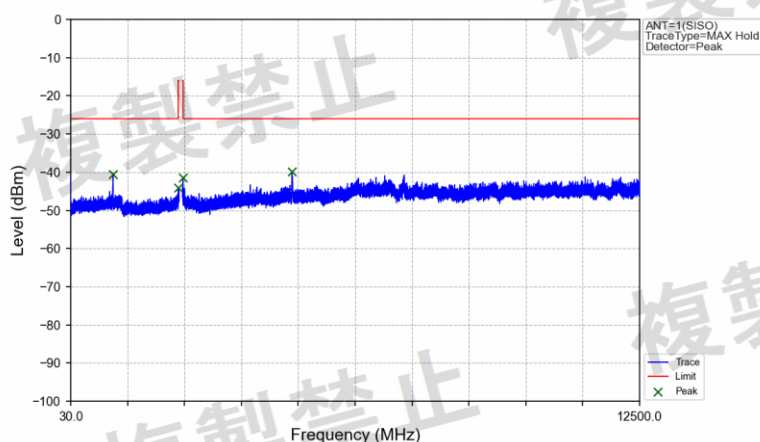


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	30.500	-40.59	/	-26	Pass
2387	2400	1	1	2399.987	-22.50	/	-16	Pass
2483.5	2496.5	1	1	2490.520	-41.60	/	-16	Pass
2496.5	12500	1	1	4823.000	-40.42	/	-26	Pass

802.11n(HT20)_2442MHz_Ant1 (SISO)_NTNV

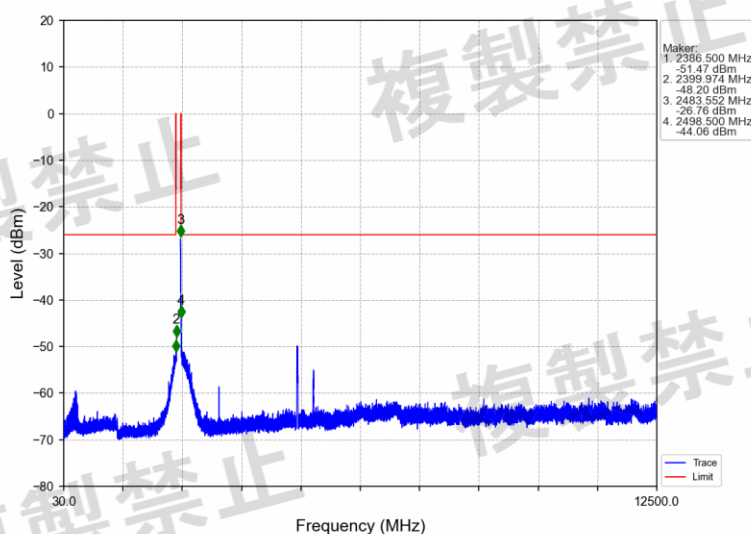


802.11n(HT20)_2442MHz_Ant1 (SISO)_NTNV

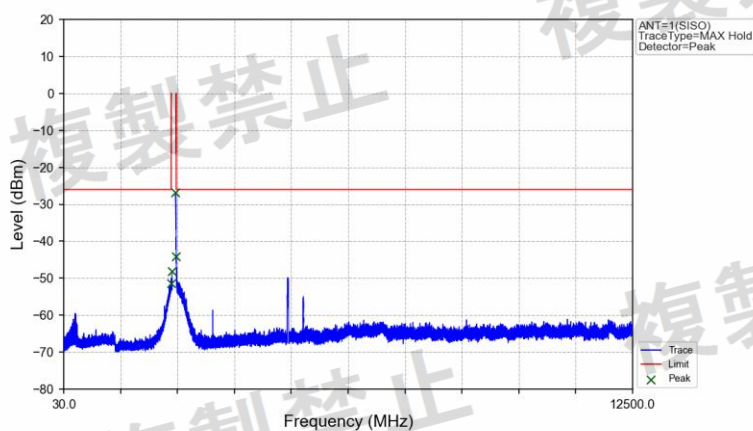


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	955.000	-40.48	/	-26	Pass
2387	2400	1	1	2394.735	-44.08	/	-16	Pass
2483.5	2496.5	1	1	2488.297	-41.36	/	-16	Pass
2496.5	12500	1	1	4882.500	-39.92	/	-26	Pass

802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV

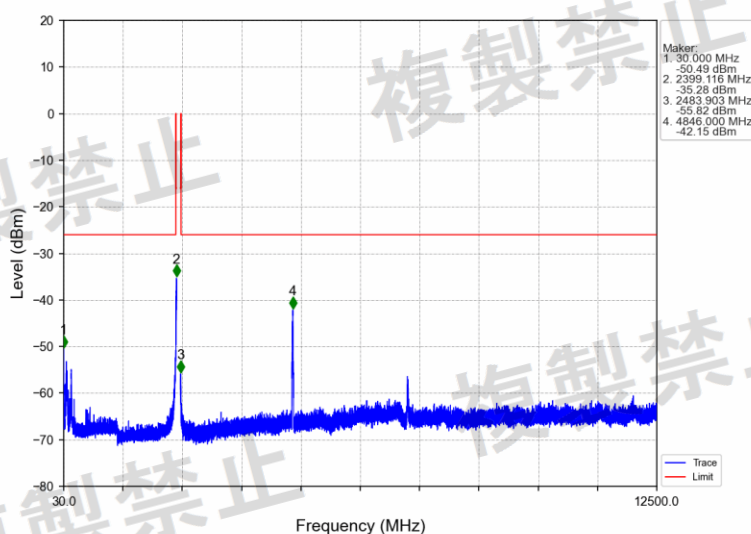


802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV

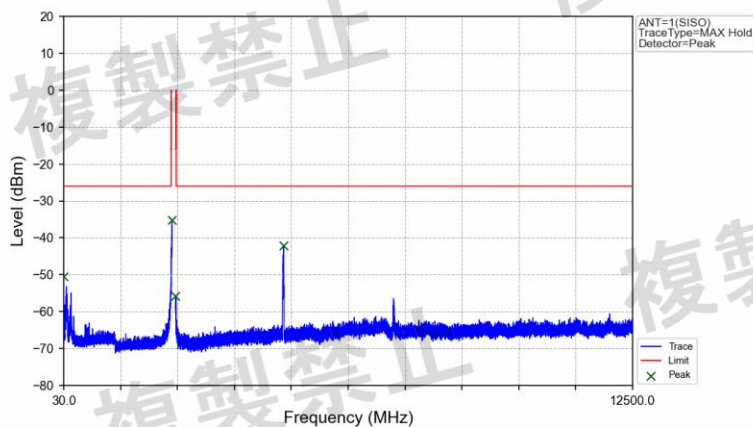


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2386.500	-51.47	/	-26	Pass
2387	2400	1	1	2399.974	-48.20	/	-16	Pass
2483.5	2496.5	1	1	2483.552	-26.76	/	-16	Pass
2496.5	12500	1	1	2498.500	-44.06	/	-26	Pass

802.11n(HT40) 2422MHz_Ant1 (SISO)_NTNV

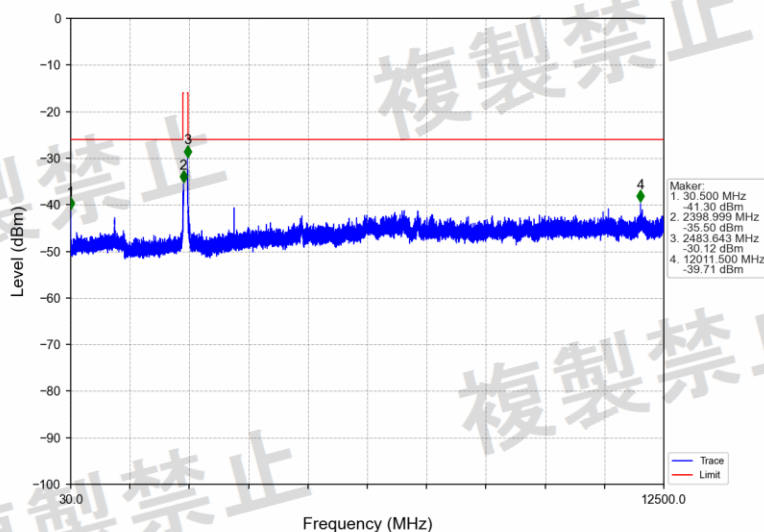


802.11n(HT40) 2422MHz_Ant1 (SISO)_NTNV

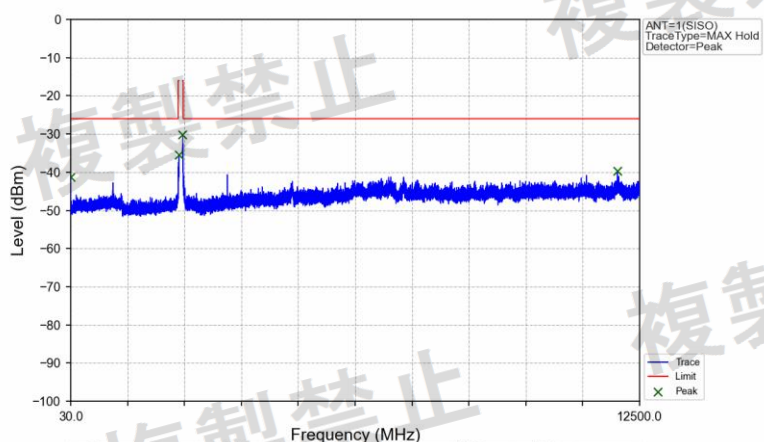


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	30.000	-50.49	/	-26	Pass
2387	2400	1	1	2399.116	-35.28	/	-16	Pass
2483.5	2496.5	1	1	2483.903	-55.82	/	-16	Pass
2496.5	12500	1	1	4846.000	-42.15	/	-26	Pass

802.11n(HT40) 2442MHz_Ant1 (SISO)_NTNV

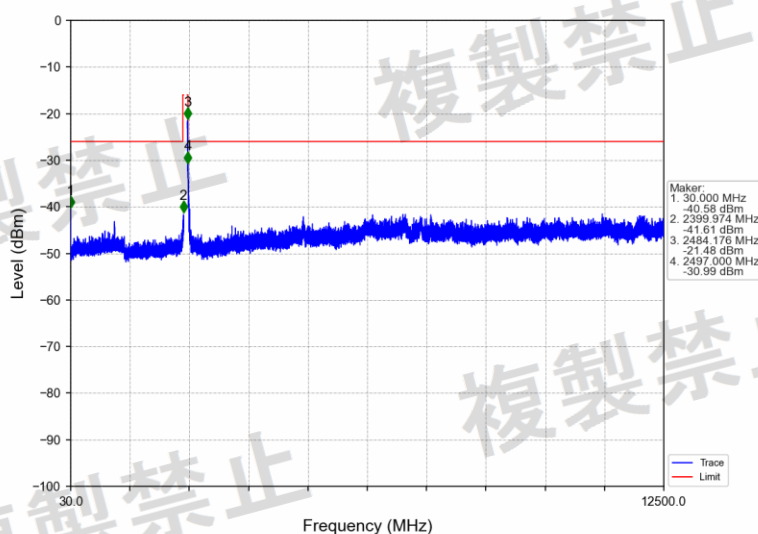


802.11n(HT40) 2442MHz_Ant1 (SISO)_NTNV

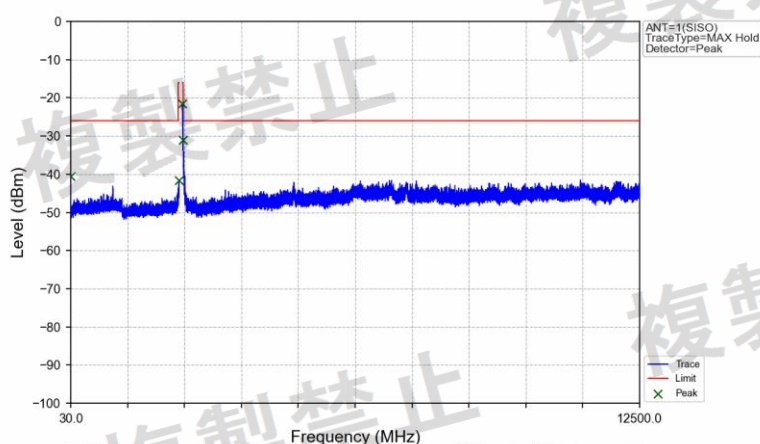


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	30.500	-41.30	/	-26	Pass
2387	2400	1	1	2398.999	-35.50	/	-16	Pass
2483.5	2496.5	1	1	2483.643	-30.12	/	-16	Pass
2496.5	12500	1	1	12011.500	-39.71	/	-26	Pass

802.11n(HT40) 2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40) 2462MHz_Ant1 (SISO)_NTNV



Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	30.000	-40.58	/	-26	Pass
2387	2400	1	1	2399.974	-41.61	/	-16	Pass
2483.5	2496.5	1	1	2484.176	-21.48	/	-16	Pass
2496.5	12500	1	1	2497.000	-30.99	/	-26	Pass

3.6.5 Result

The equipment met the requirement of this clause.



3.7 Secondary Emitted Radio Wave Strength

3.7.1 Test condition

Date of testing:	Mar.28, 2024
Channel:	Low: 2412MHz; Middle: 2442MHz; High: 2472MHz (for 802.11b; 802.11g; 802.11n_HT20)
	Low: 2422MHz; Middle: 2442MHz; High: 2462MHz (for 802.11n_HT40)
Test position:	Transmitting
Ambient temperature:	24.5 °C
Relative humidity:	56 %
Atmosphere Pressure:	105.1 KPa

3.7.2 Limit

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, detail as below:

$30 \leq f < 1000\text{MHz}$ [4nW or below]

$1000\text{MHz} \leq f < 10000\text{MHz}$ [20nW or below]

$10000\text{MHz} < f \leq 12500\text{MHz}$ [20nW or below]

3.7.3 Test Result

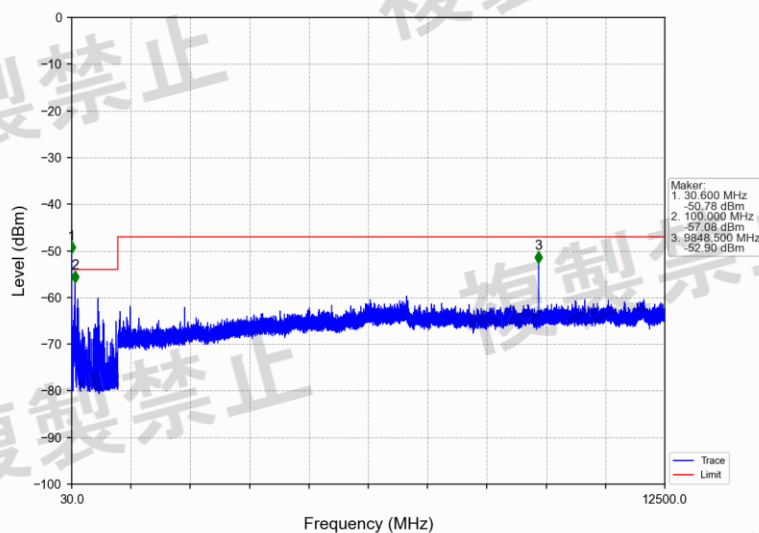
NTNV										
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker			Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (nW)	AV Power (nW)		
802.11b	SISO	2412	1	30	1000	30.6	8.356	2.203	4	Pass
				1000	12500	9848.5	5.129	1.854	20	Pass
		2442	1	30	1000	585.950	1.879	1.202	4	Pass
				1000	12500	9848.5	4.519	/	20	Pass
		2472	1	30	1000	31.4	8.810	2.084	4	Pass
				1000	12500	9848.5	4.909	/	20	Pass
802.11g	SISO	2412	1	30	1000	30.9	11.885	1.334	4	Pass
				1000	12500	9848.5	4.416	/	20	Pass
		2442	1	30	1000	31.45	8.954	2.228	4	Pass
				1000	12500	9848.5	4.385	/	20	Pass
		2472	1	30	1000	30.6	11.298	3.027	4	Pass
				1000	12500	9848.5	5.093	1.910	20	Pass
802.11n (HT20)	SISO	2412	1	30	1000	30.25	8.650	2.075	4	Pass
				1000	12500	9848.5	4.426	/	20	Pass
		2442	1	30	1000	30.85	9.078	1.009	4	Pass
				1000	12500	9848.5	4.667	/	20	Pass
		2472	1	30	1000	30.6	9.863	1.148	4	Pass
				1000	12500	9848.5	5.140	1.892	20	Pass



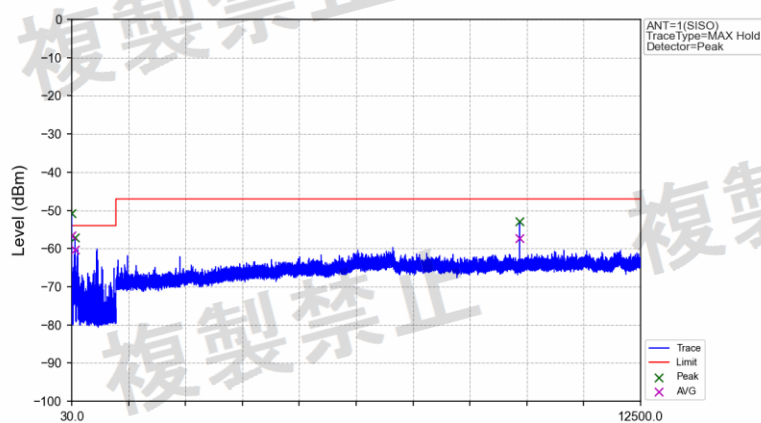
802.11n (HT40)	SISO	2422	1	30	1000	30.8	8.492	1.059	4	Pass
				1000	12500	9848.5	4.385	/	20	Pass
		2442	1	30	1000	30.6	8.851	1.995	4	Pass
				1000	12500	9848	4.742	/	20	Pass
		2462	1	30	1000	31.55	11.749	2.228	4	Pass
				1000	12500	9848	4.710	/	20	Pass

3.7.4 Test Graphs

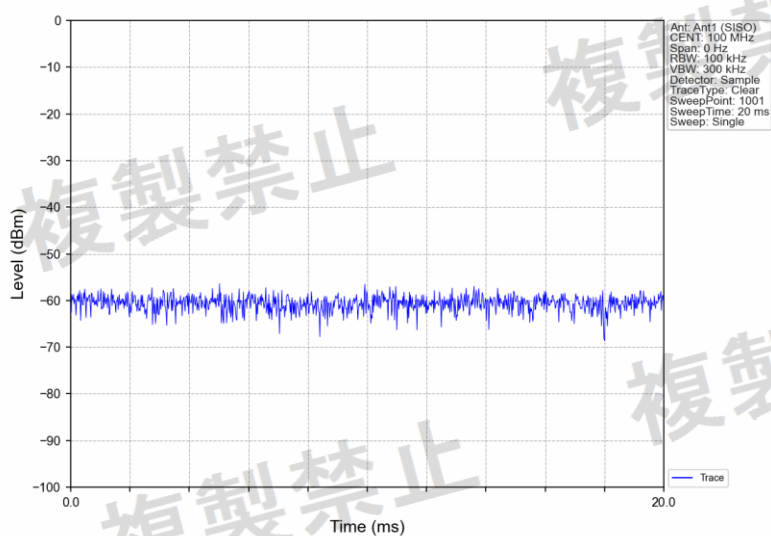
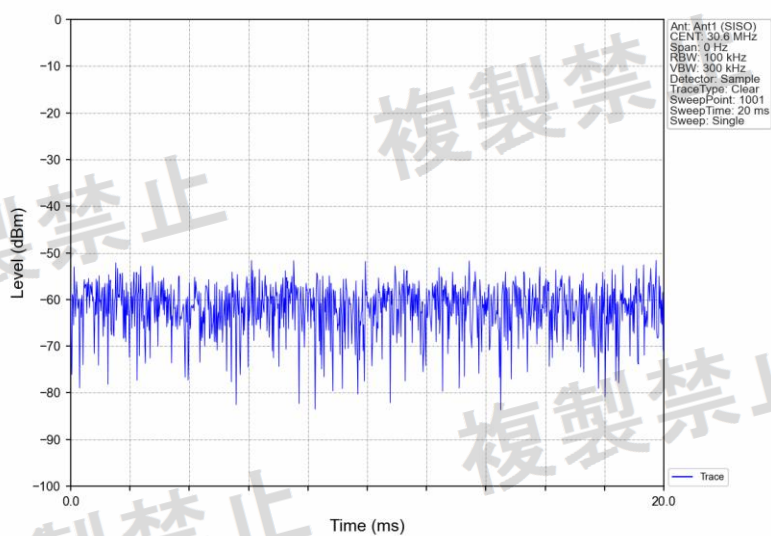
802.11b_2412MHz_Ant1 (SISO)_NTNV

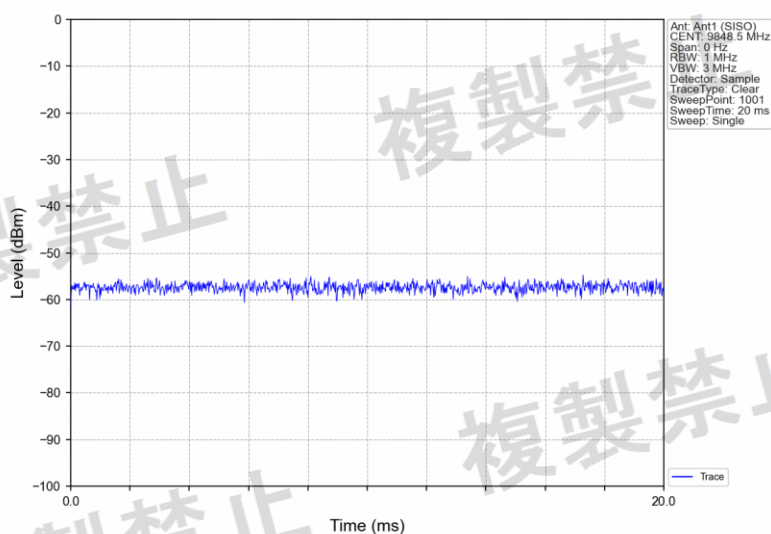


802.11b_2412MHz_Ant1 (SISO)_NTNV

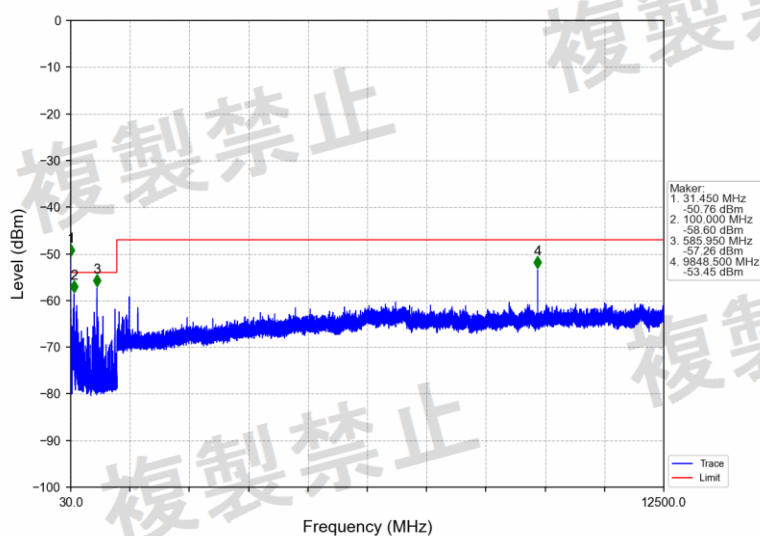


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	30.600	-50.78	-56.57	-54	Pass
30	1000	0.1	0.1	100.000	-57.08	-60.37	-54	Pass
1000	12500	1	1	9848.500	-52.90	-57.32	-47	Pass

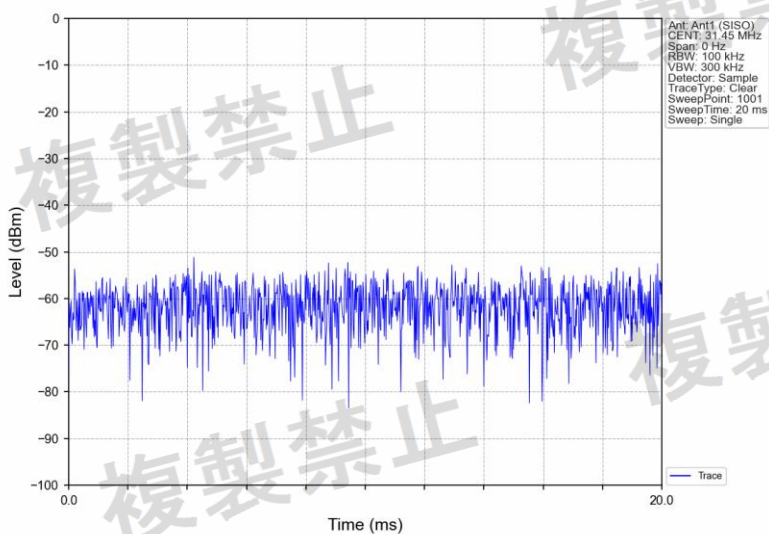
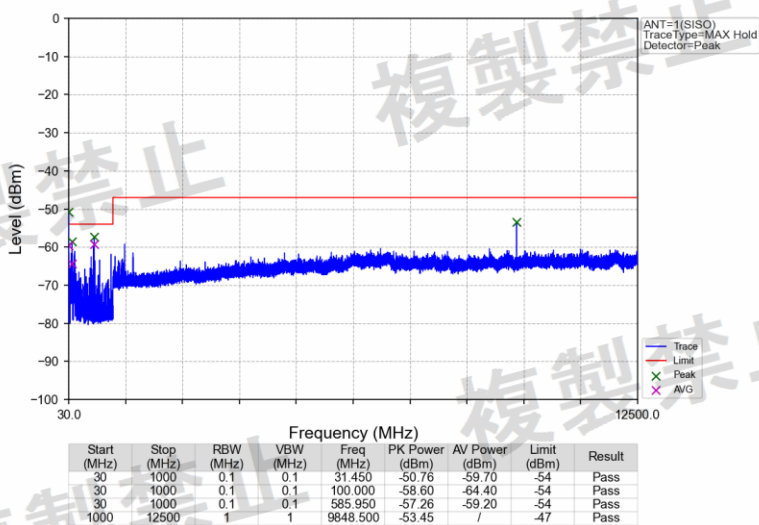


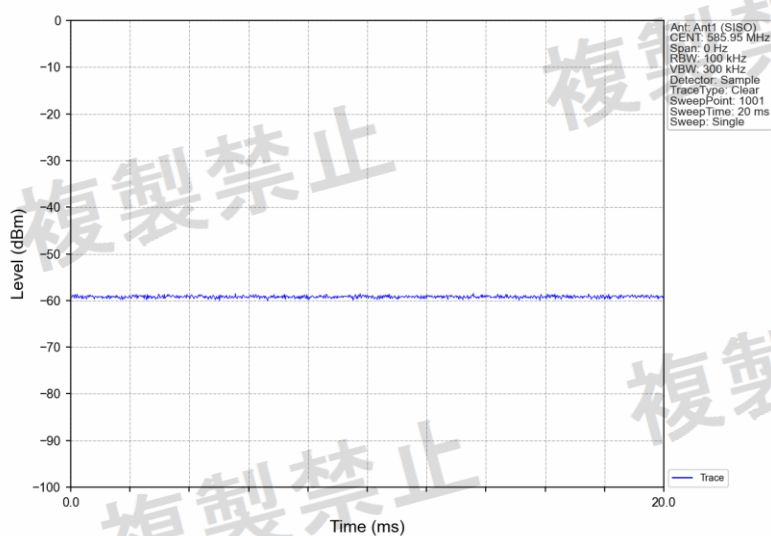
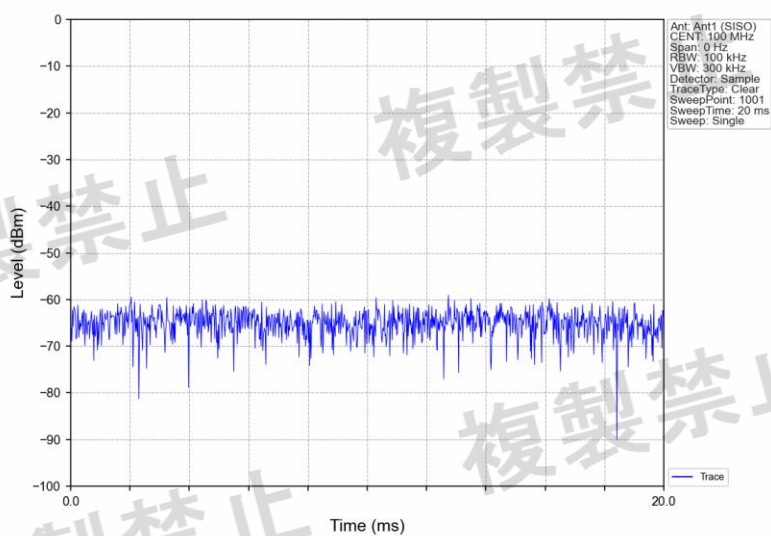


802.11b_2442MHz_Ant1 (SISO)_NTNV

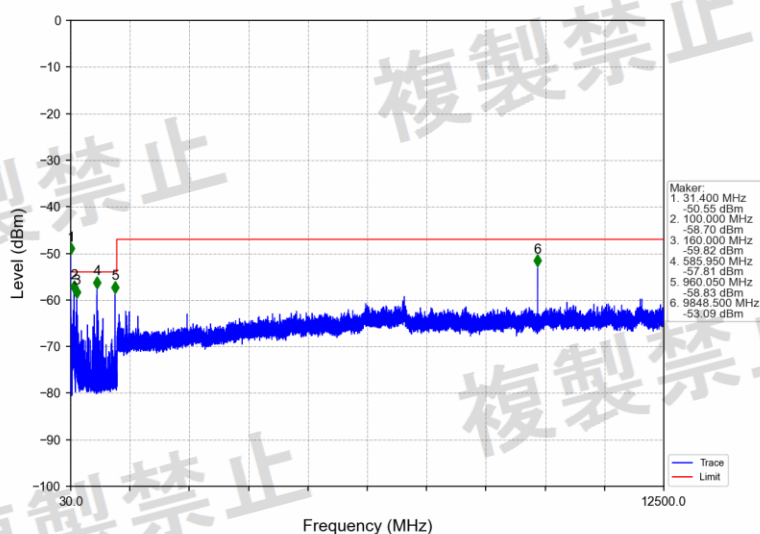


802.11b_2442MHz_Ant1 (SISO)_NTNV

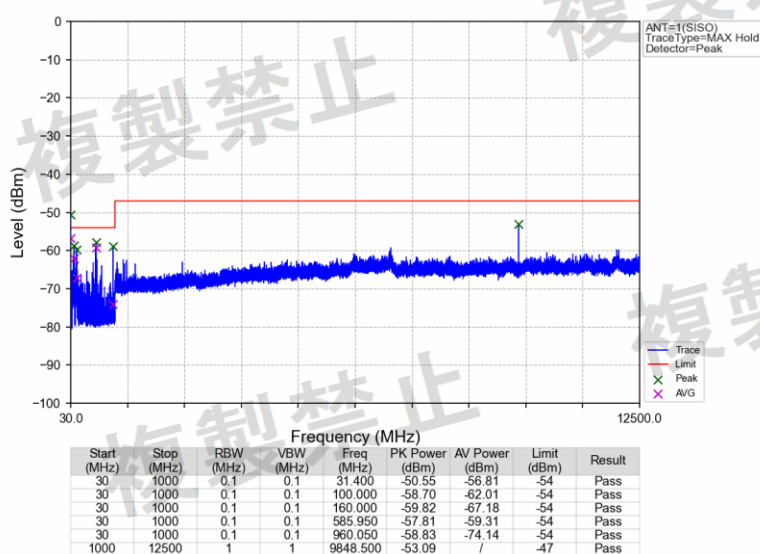


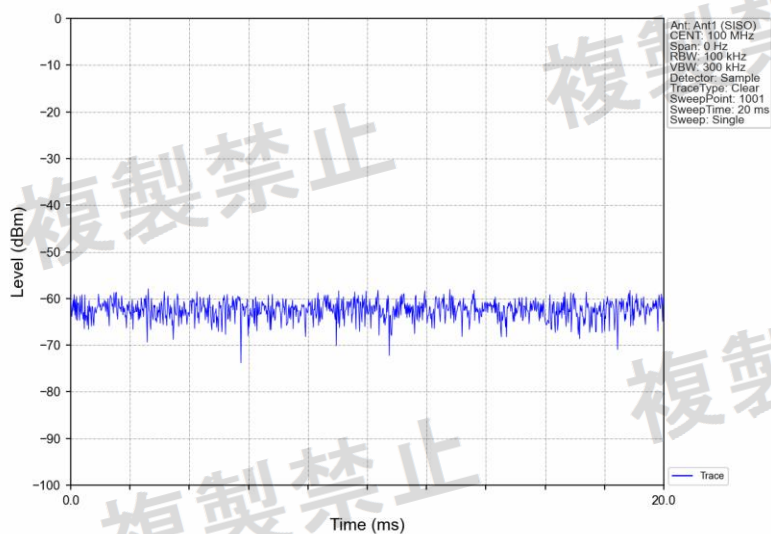
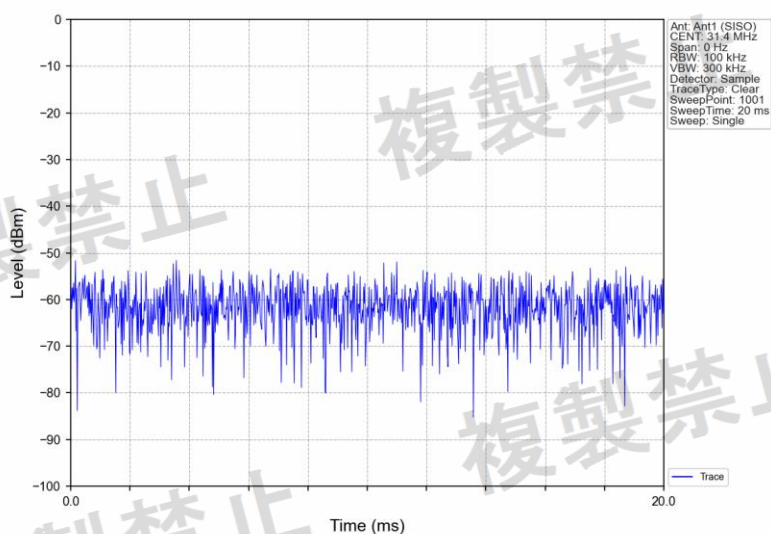


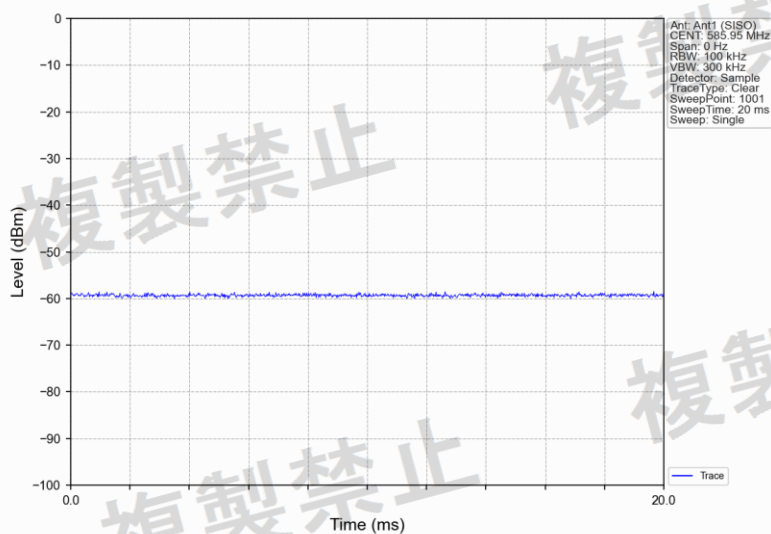
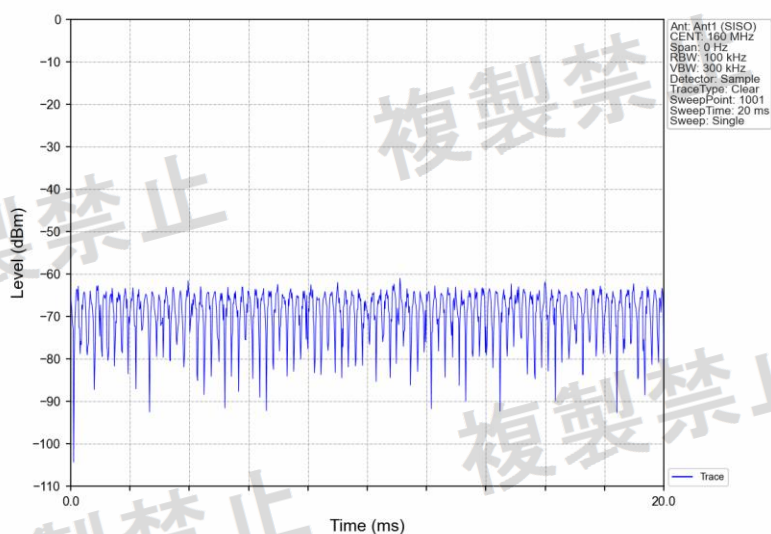
802.11b_2472MHz_Ant1 (SISO)_NTNV

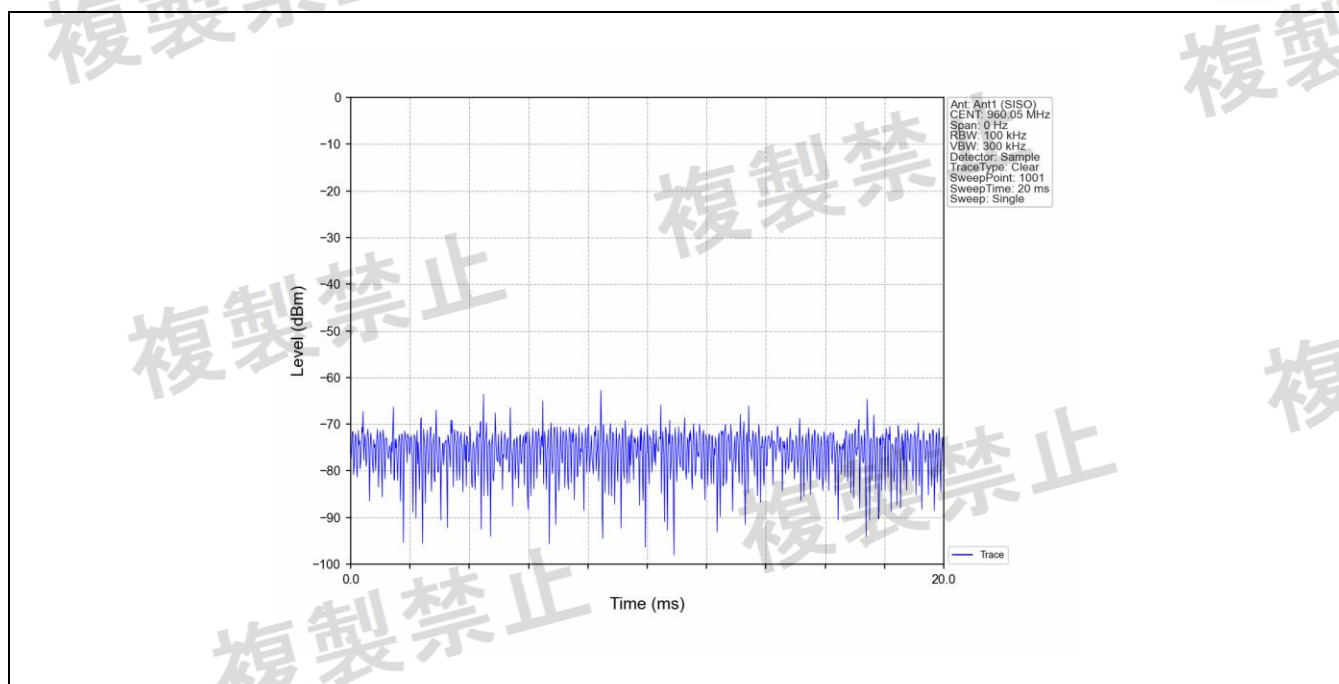


802.11b_2472MHz_Ant1 (SISO)_NTNV

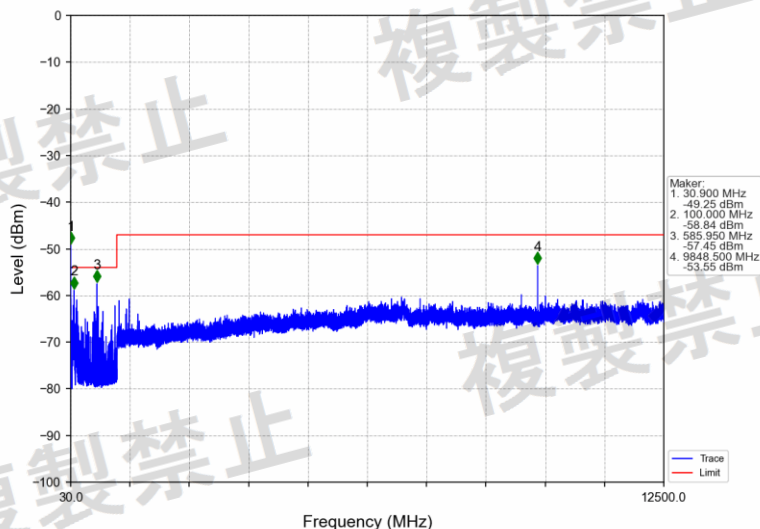




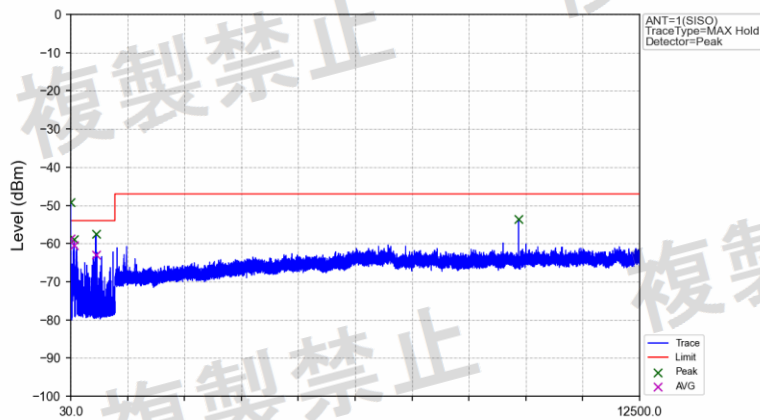




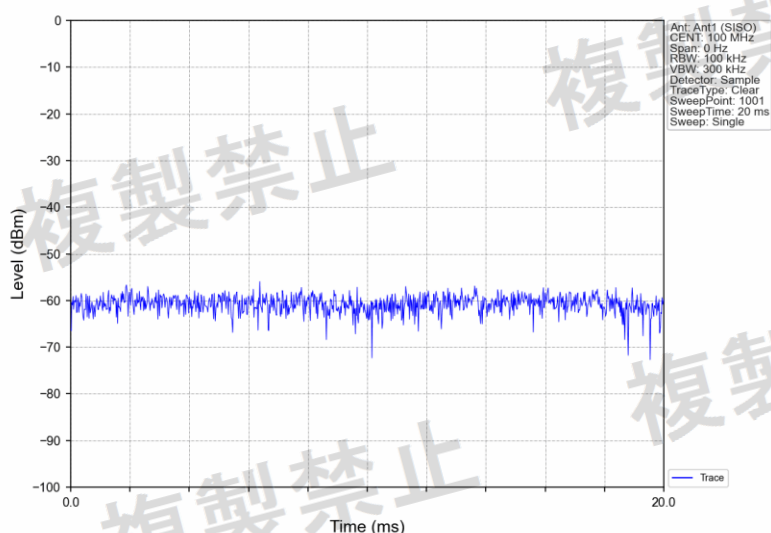
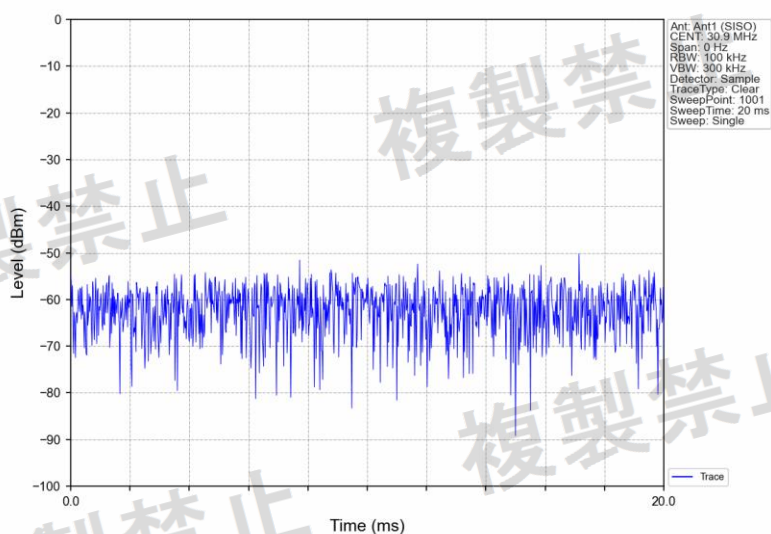
802.11g 2412MHz Ant1 (SISO) NTN

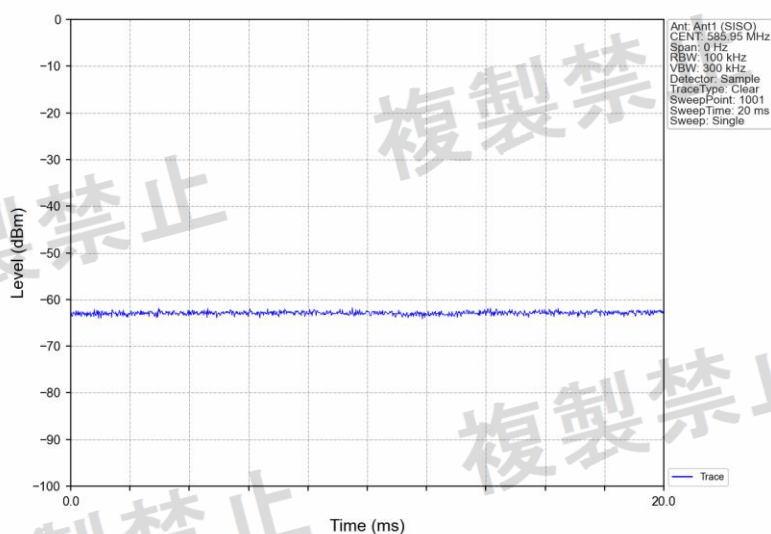


802.11g 2412MHz Ant1 (SISO) NTN

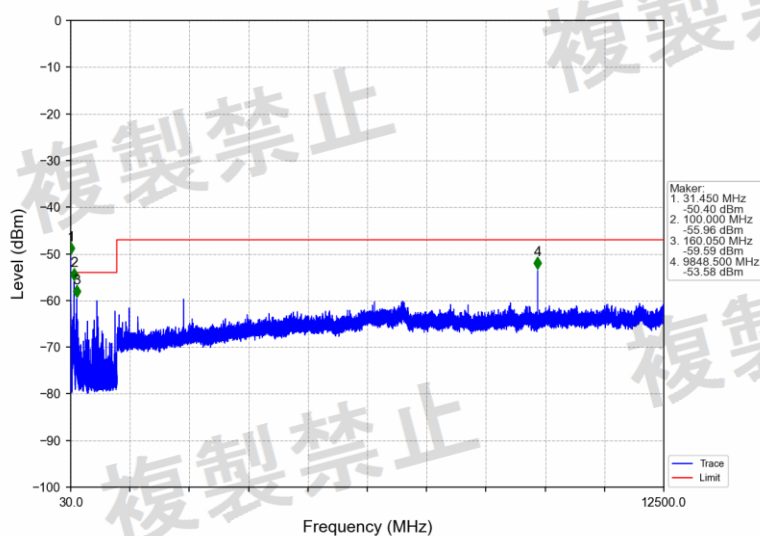


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	30.900	-49.25	-58.75	-54	Pass
30	1000	0.1	0.1	100.000	-58.84	-60.44	-54	Pass
30	1000	0.1	0.1	585.950	-57.45	-62.89	-54	Pass
1000	12500	1	1	9848.500	-53.55	/	-47	Pass

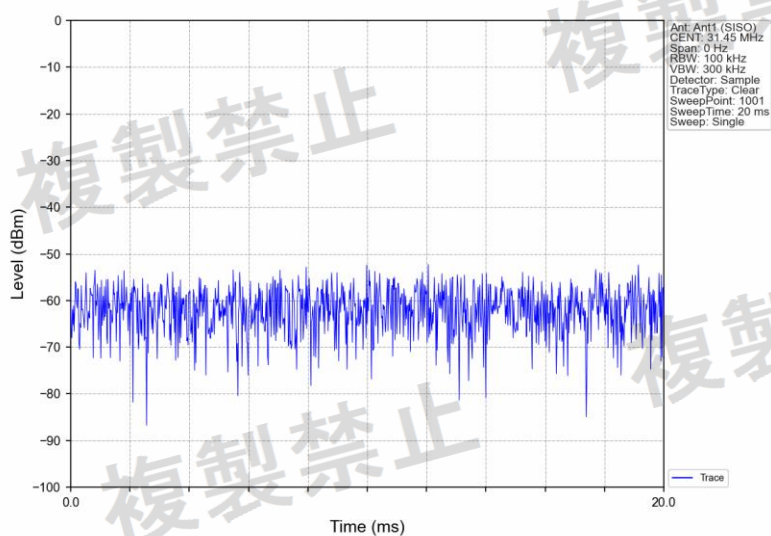
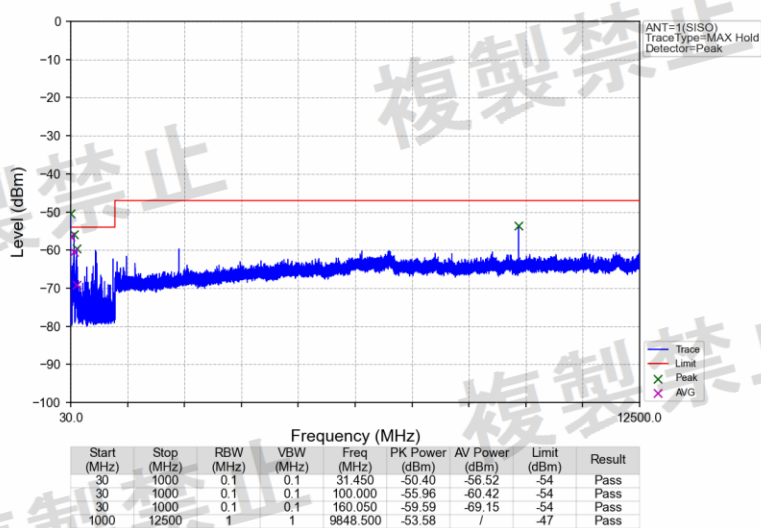


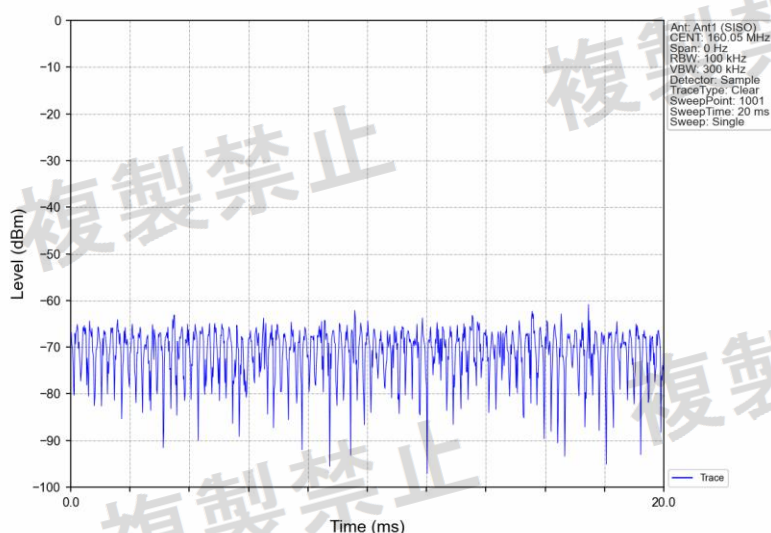
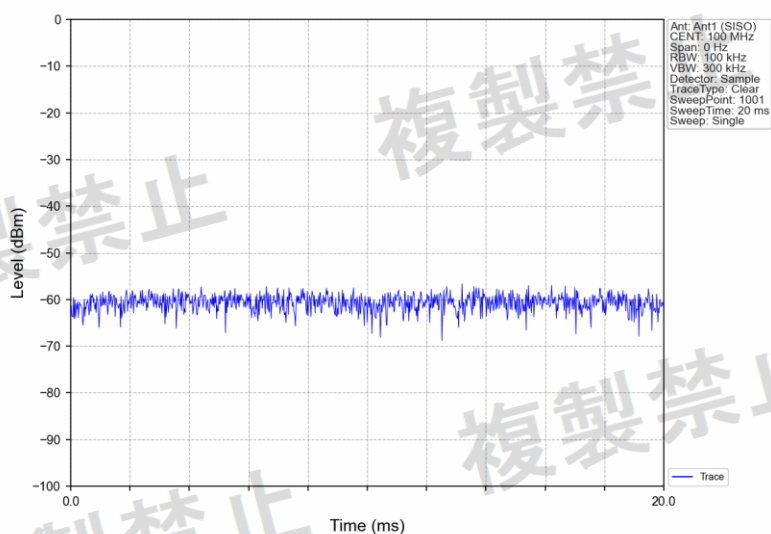


802.11g_2442MHz_Ant1 (SISO)_NTNV

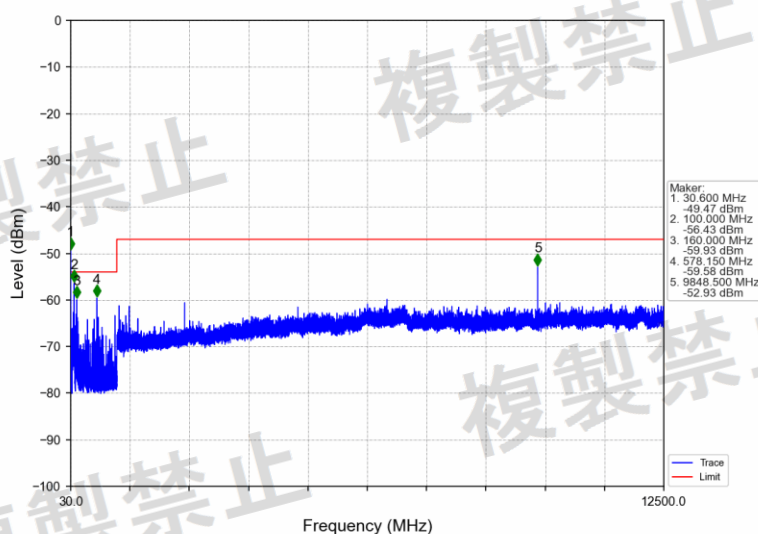


802.11g_2442MHz_Ant1 (SISO)_NTNV

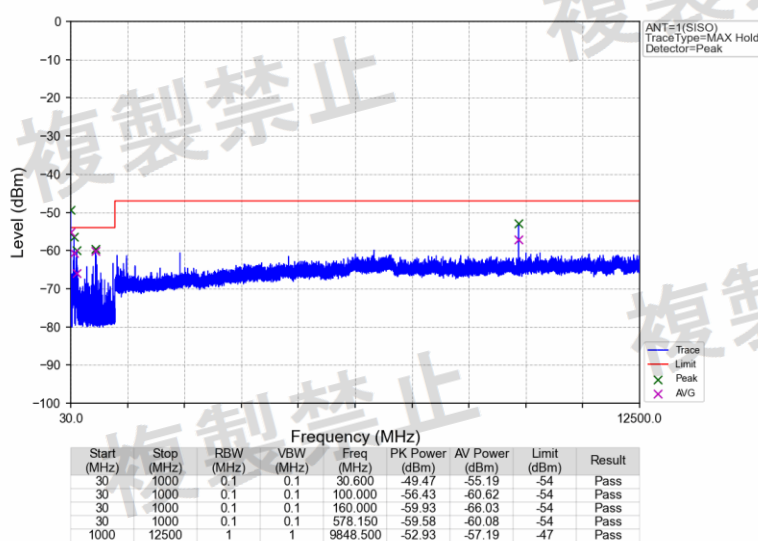


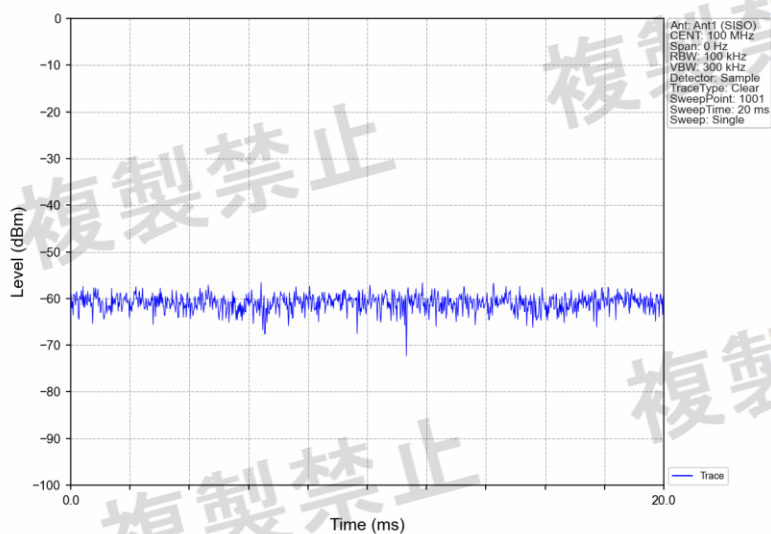
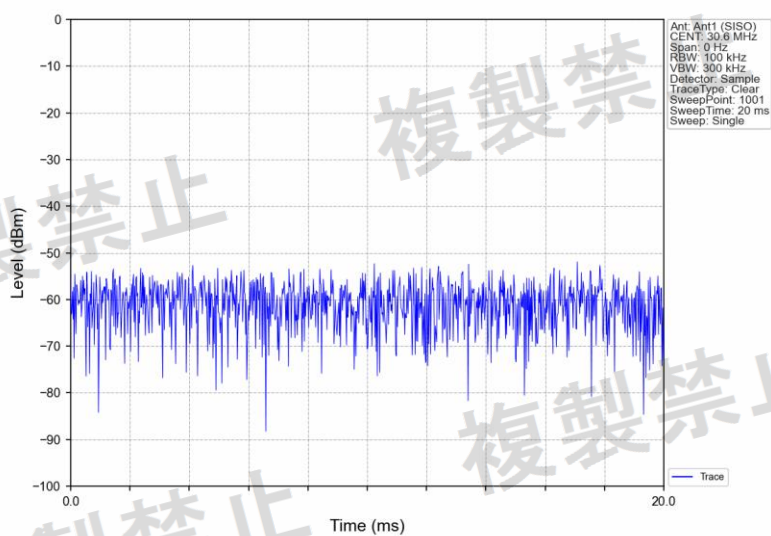


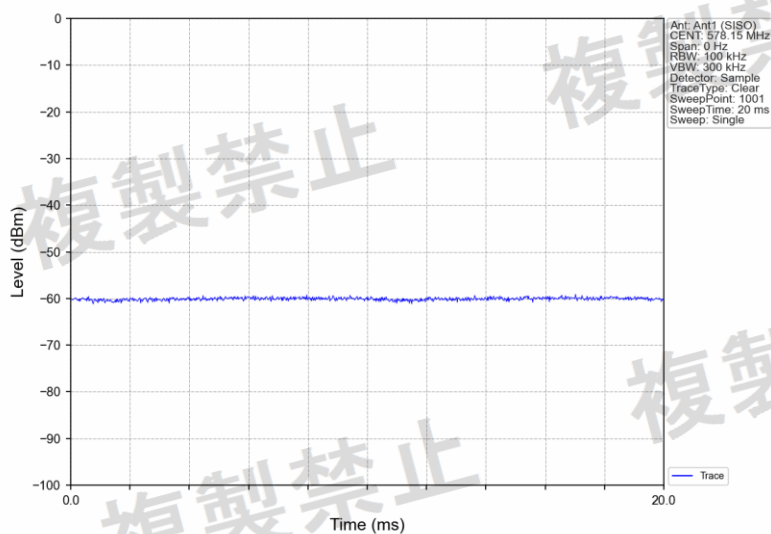
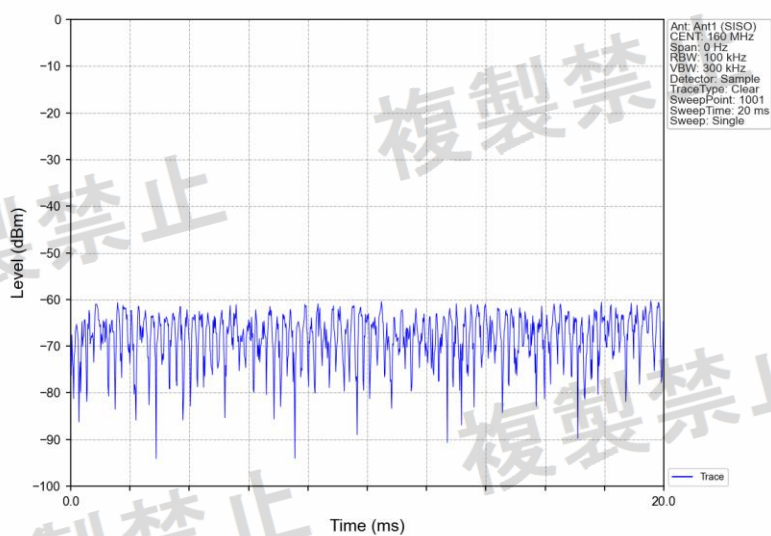
802.11g_2472MHz_Ant1 (SISO)_NTNV

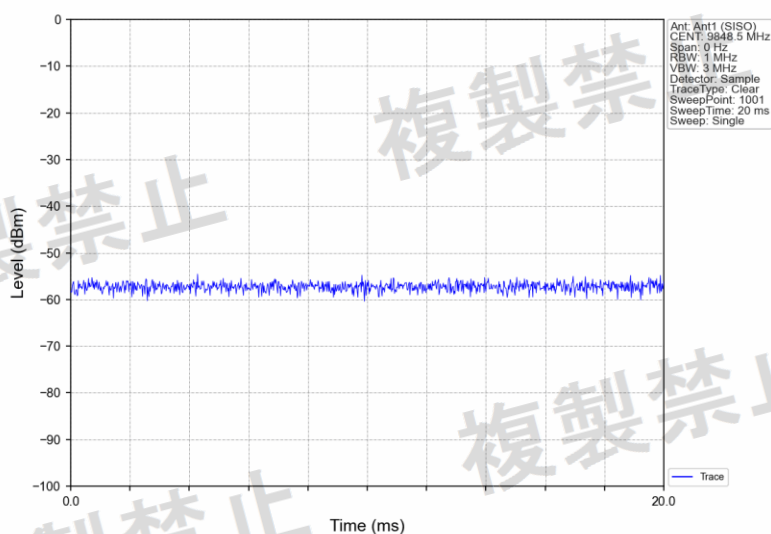


802.11g_2472MHz_Ant1 (SISO)_NTNV

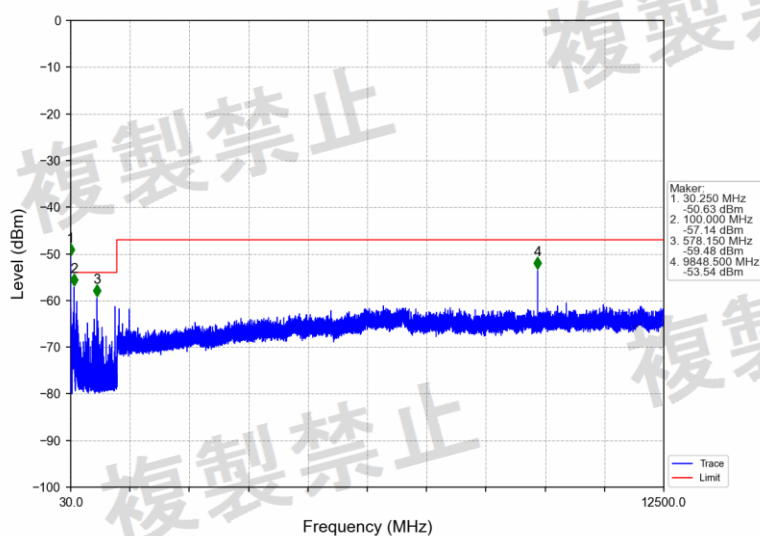




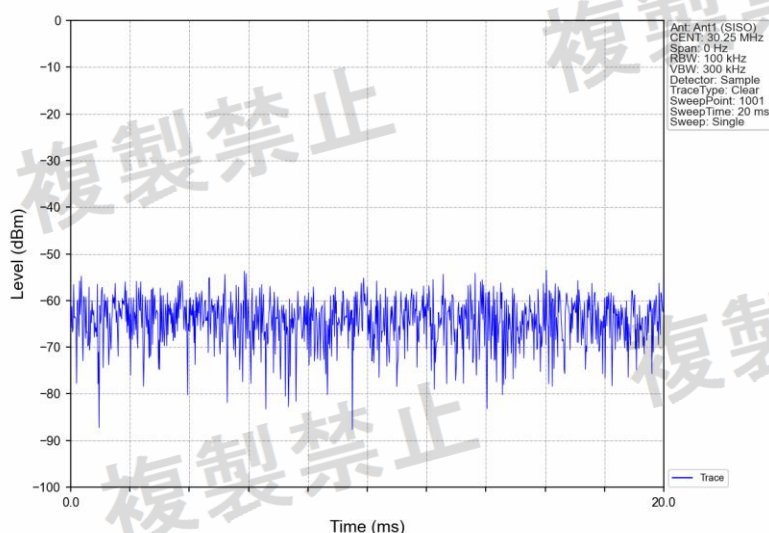
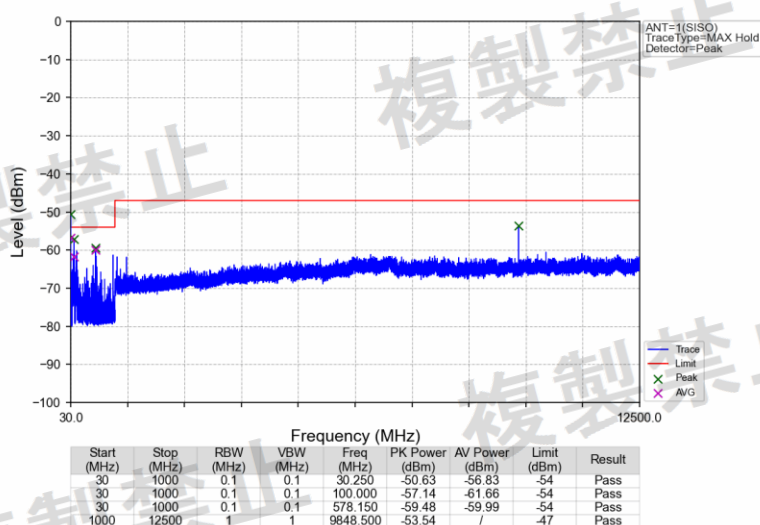


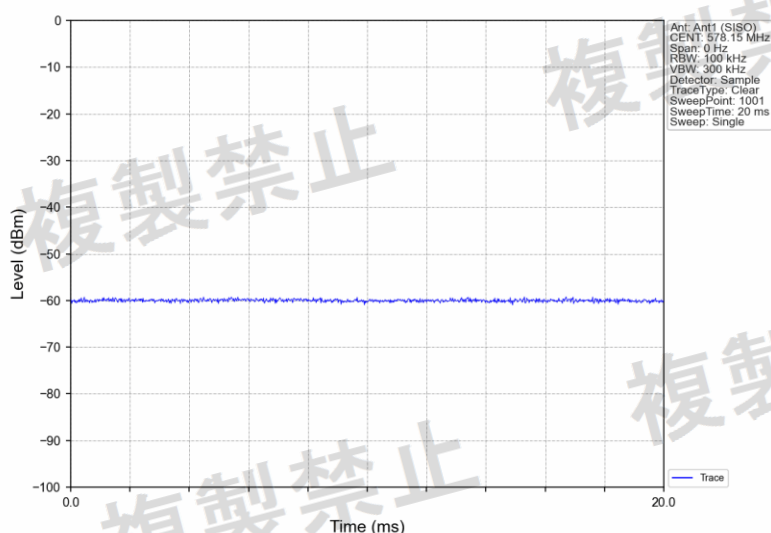
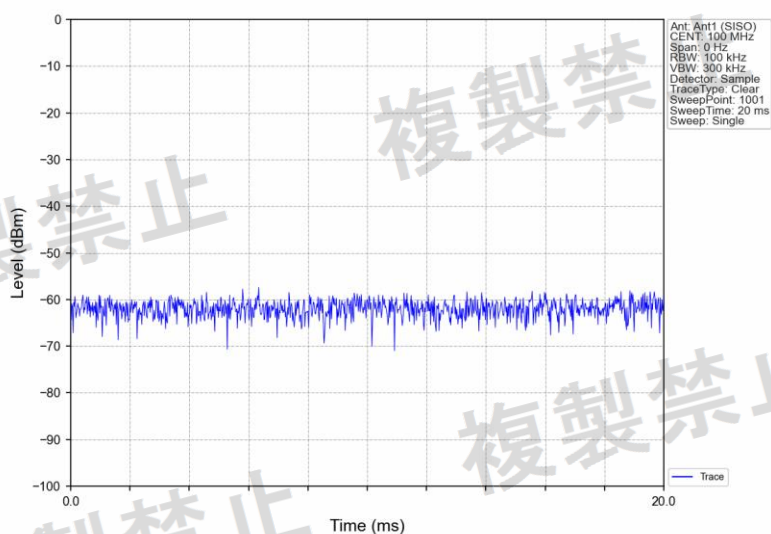


802.11n(HT20) 2412MHz_Ant1 (SISO) NTVN

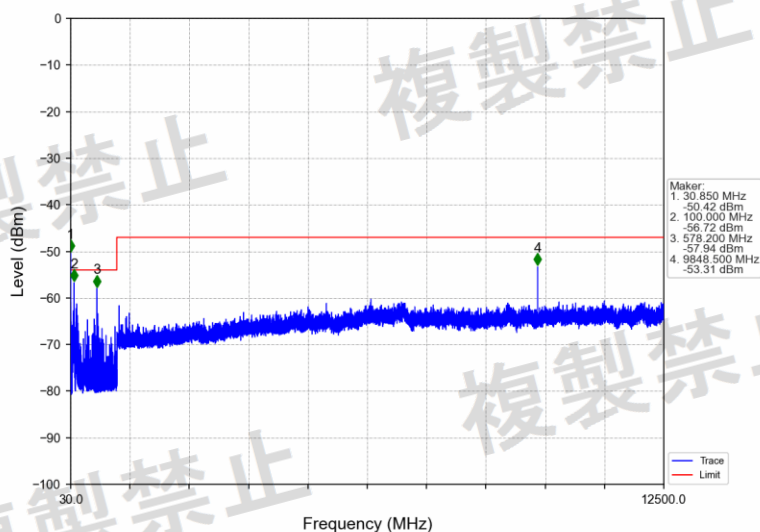


802.11n(HT20) 2412MHz Ant1 (SISO) NTVN

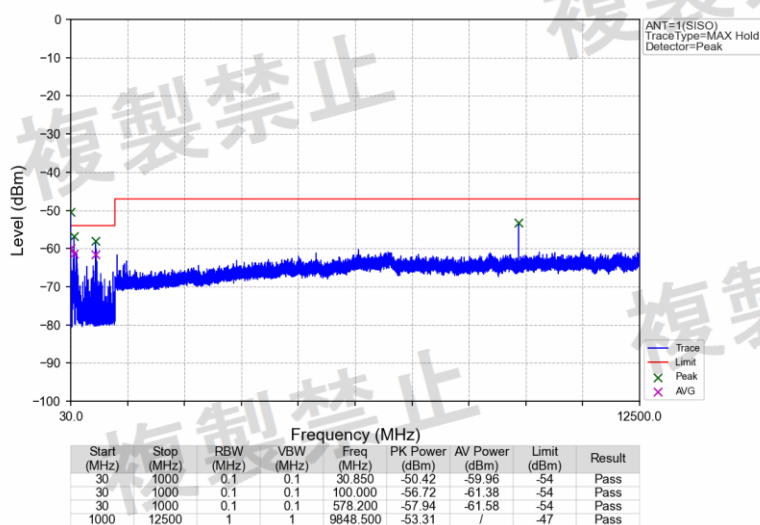


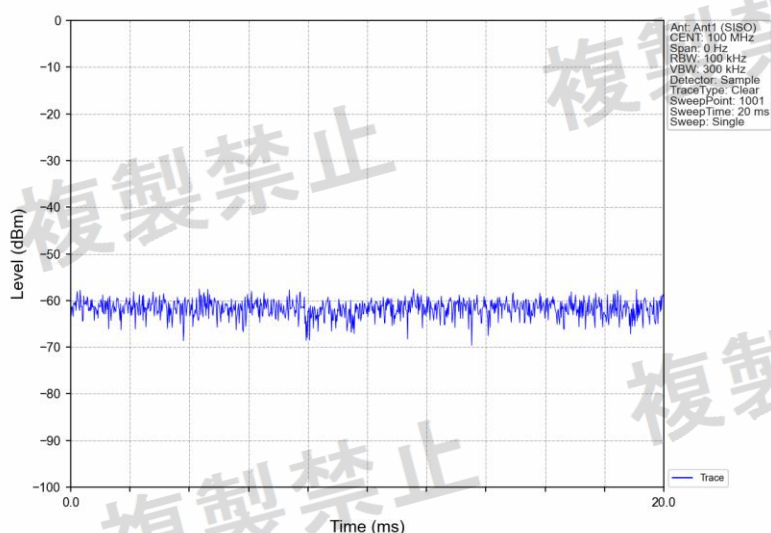
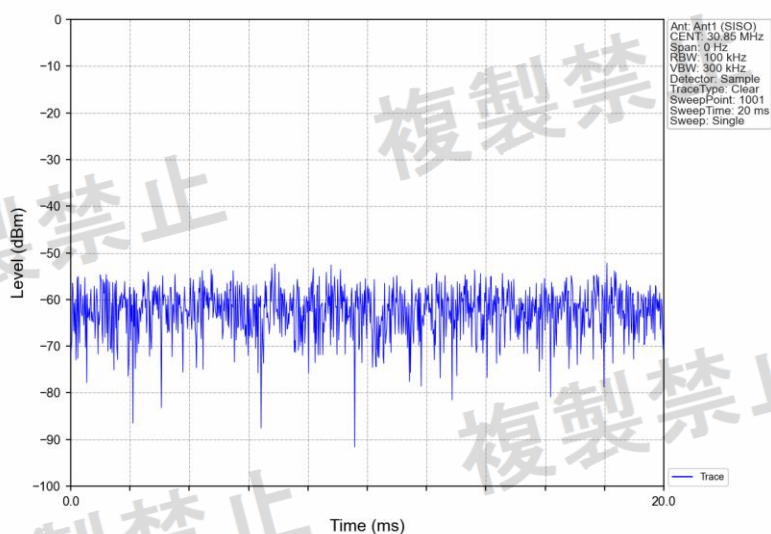


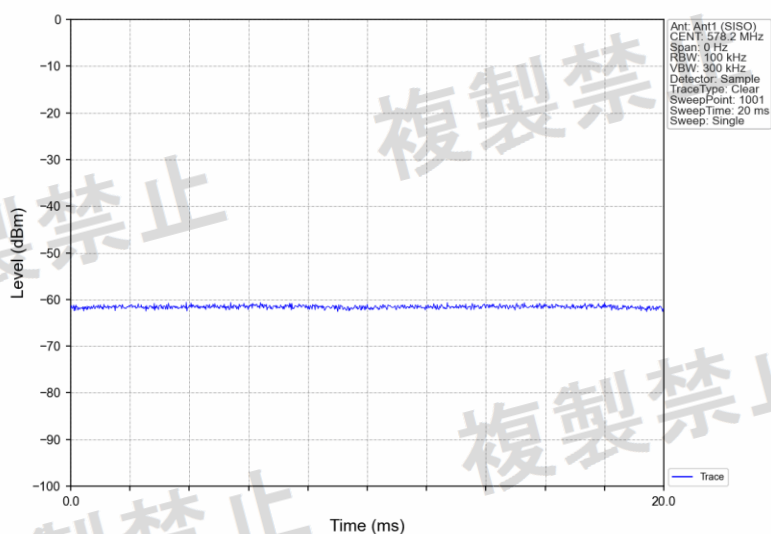
802.11n(HT20)_2442MHz_Ant1 (SISO)_NTNV



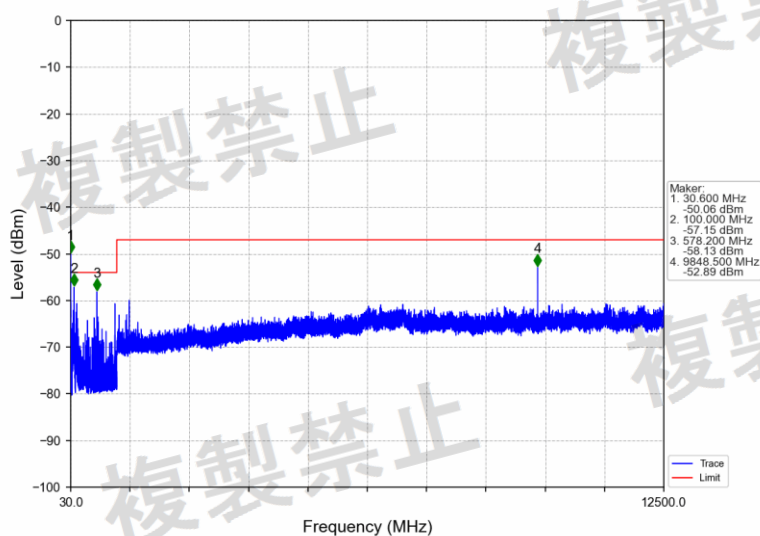
802.11n(HT20)_2442MHz_Ant1 (SISO)_NTNV



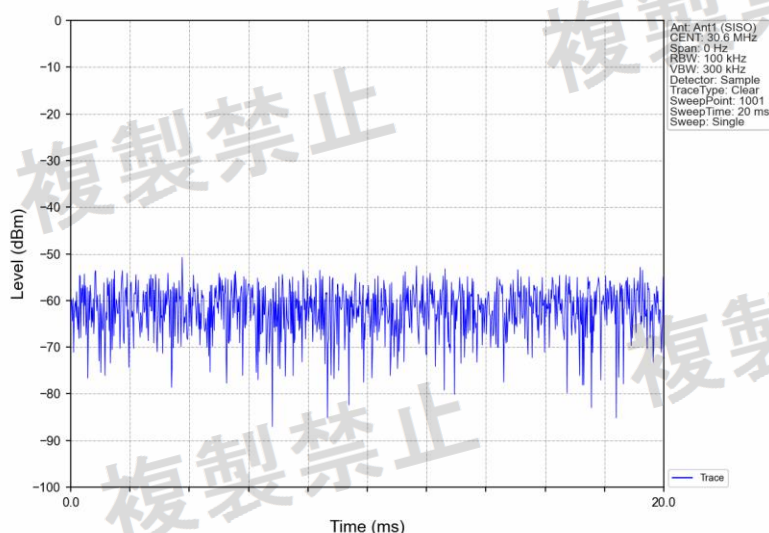
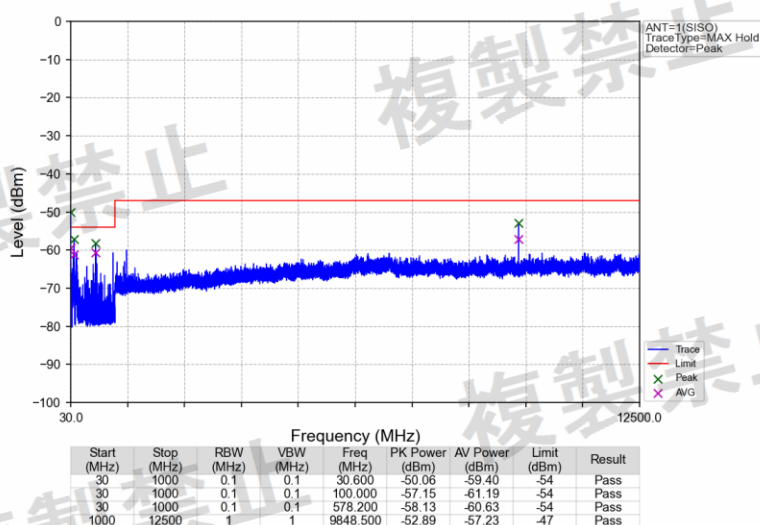


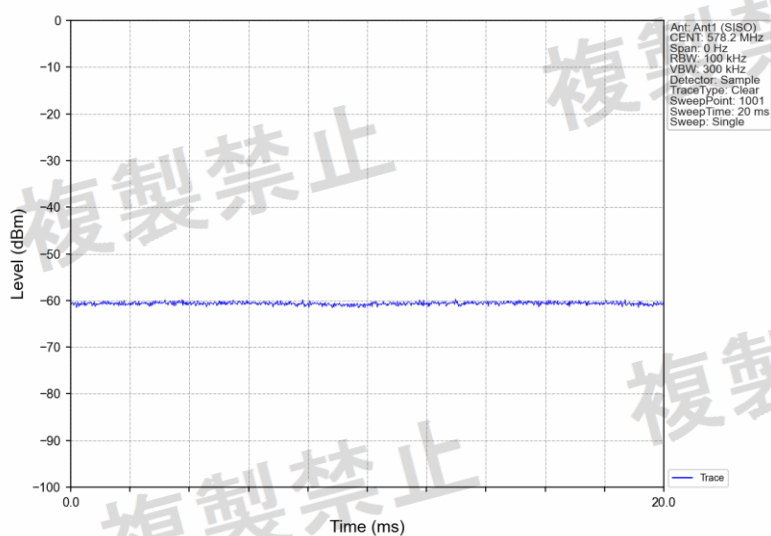
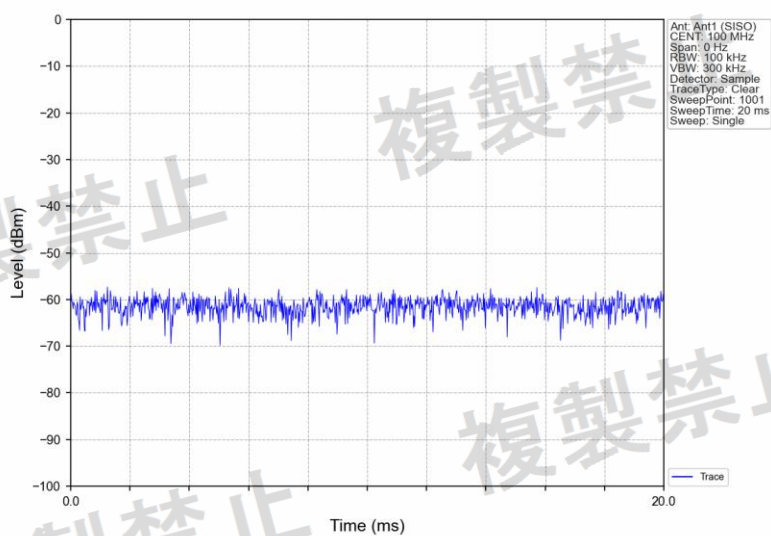


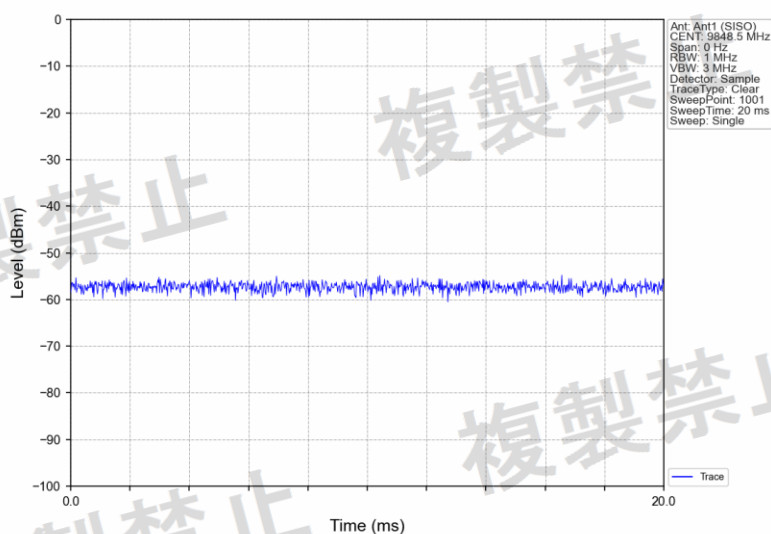
802.11n(HT20) 2472MHz Ant1 (SISO) NTVN



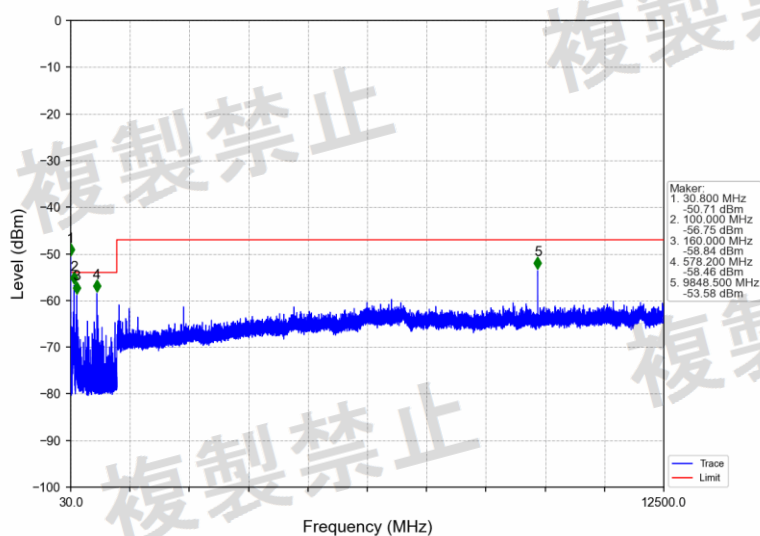
802.11n(HT20) 2472MHz_Ant1 (SISO)_NTNV



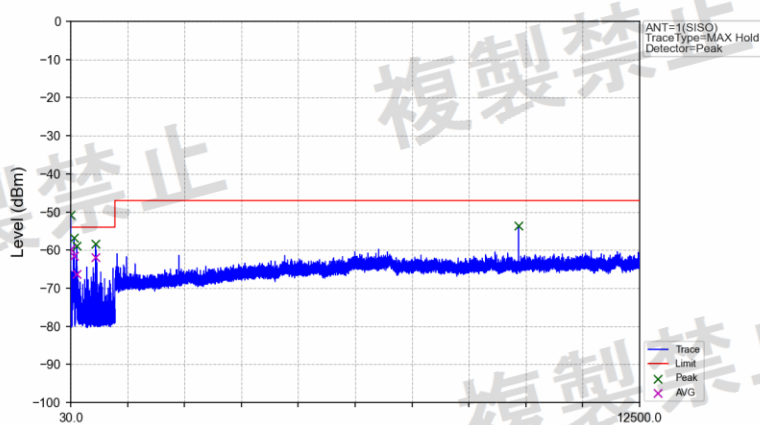




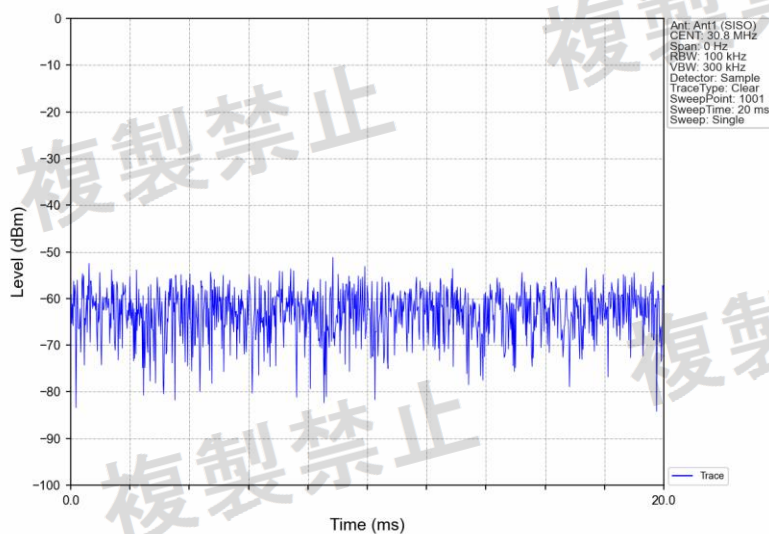
802.11n(HT40) 2422MHz_Ant1 (SISO) NTVN

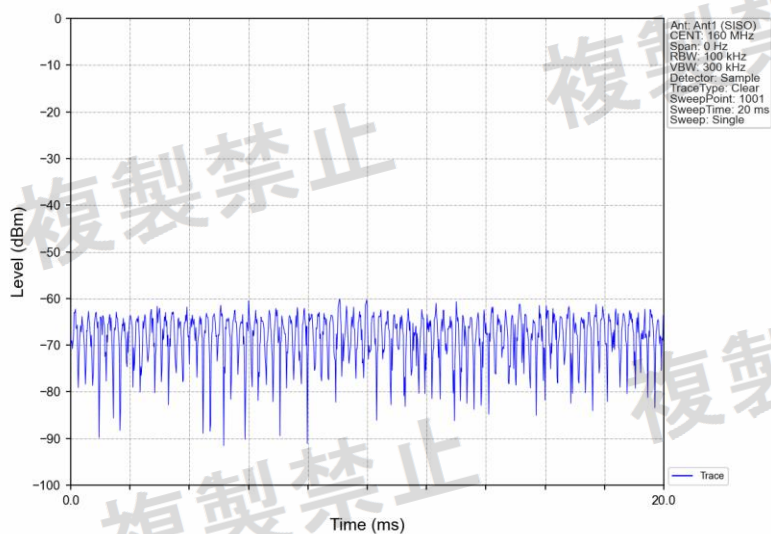
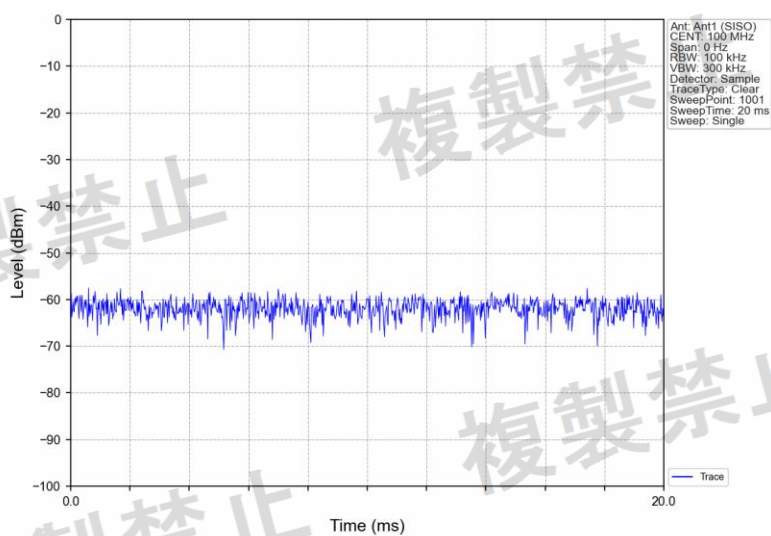


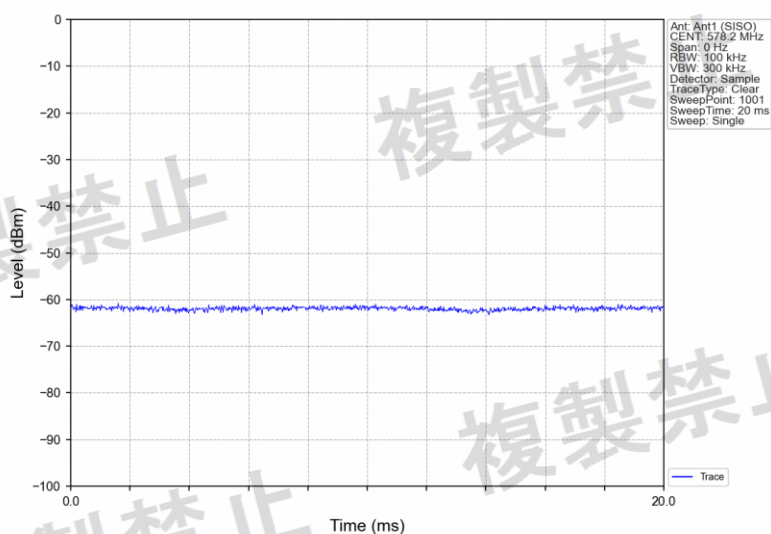
802.11n(HT40) 2422MHz Ant1 (SISO) NTVN



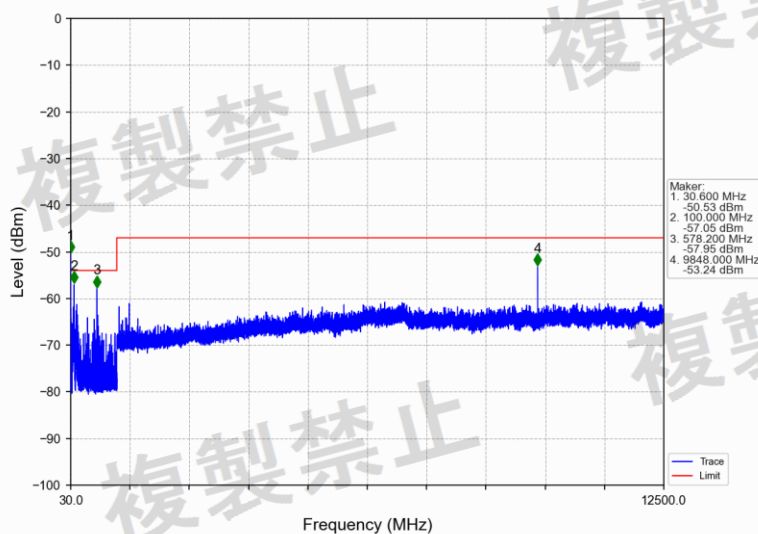
Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	30.800	-50.71	-59.75	-54	Pass
30	1000	0.1	0.1	100.000	-56.75	-61.58	-54	Pass
30	1000	0.1	0.1	160.000	-58.84	-66.35	-54	Pass
30	1000	0.1	0.1	578.200	-58.46	-61.95	-54	Pass
1000	12500	1	1	9848.500	-53.58	/	-47	Pass



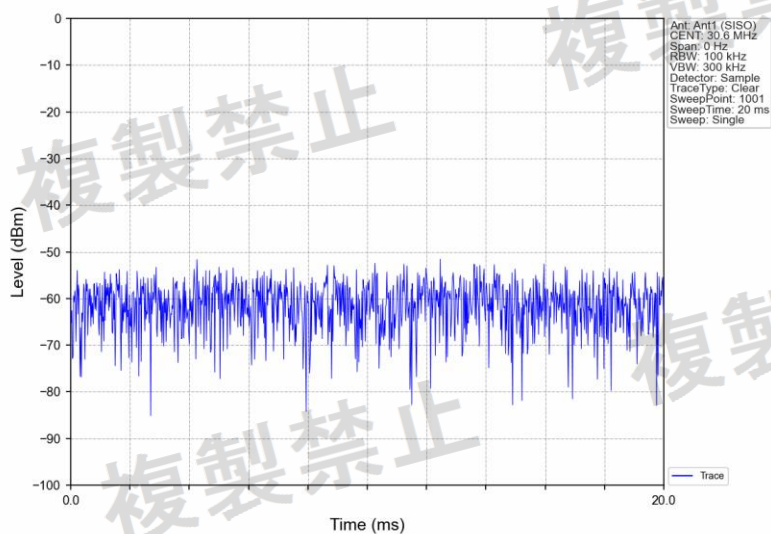
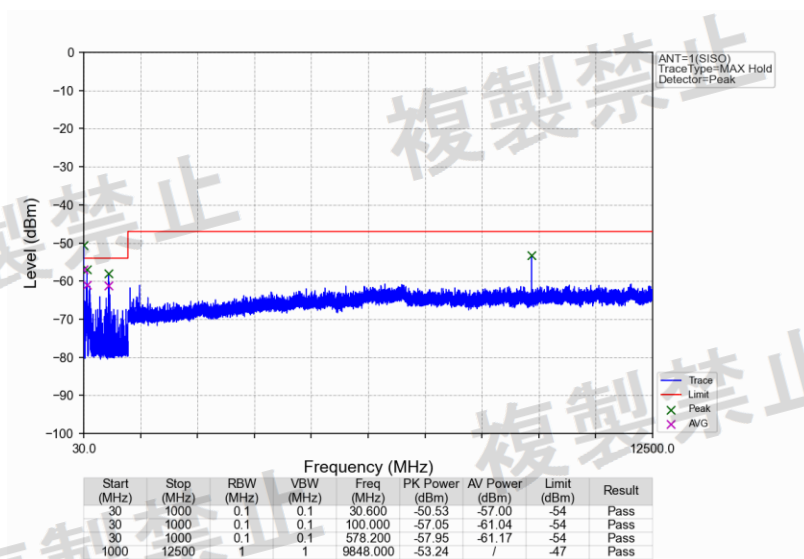


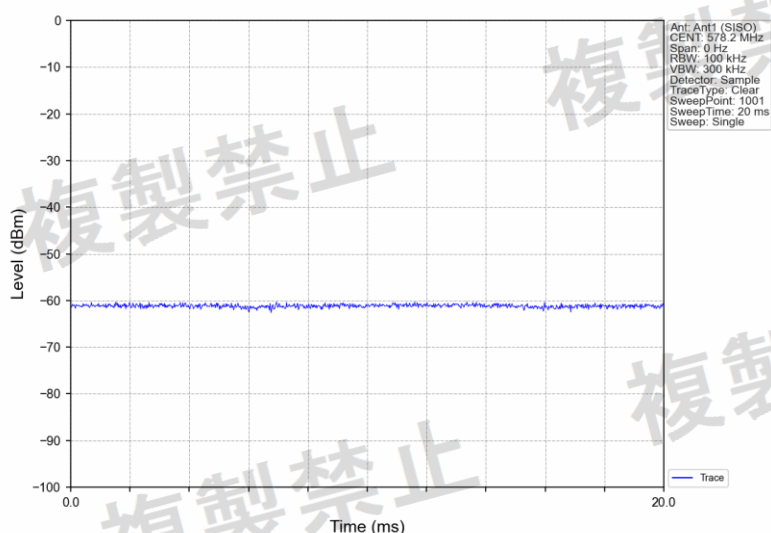
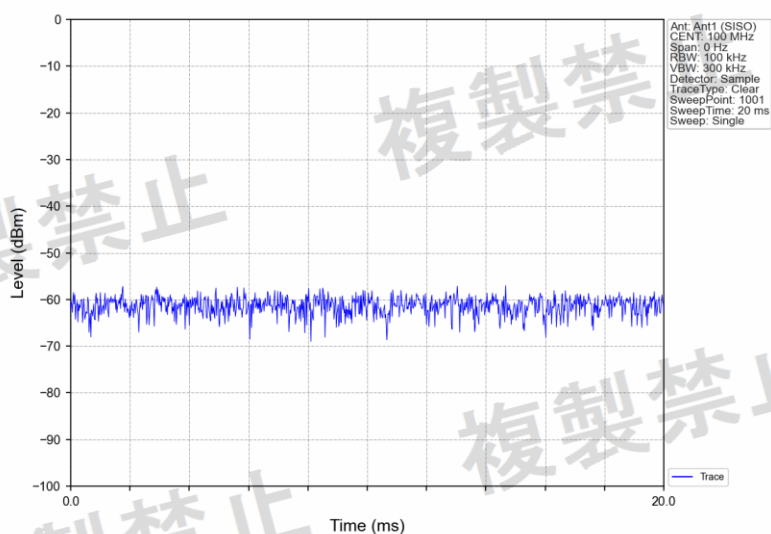


802.11n(HT40) 2442MHz Ant1 (SISO) NTVN

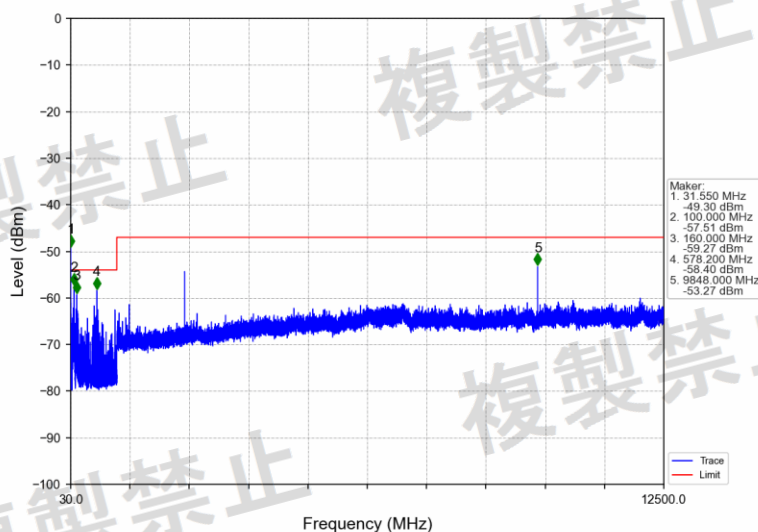


802.11n(HT40) 2442MHz_Ant1 (SISO)_NTNV

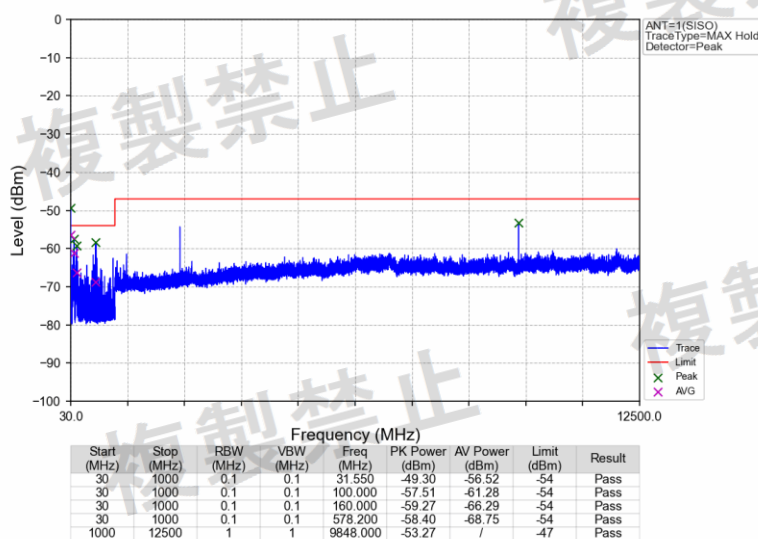


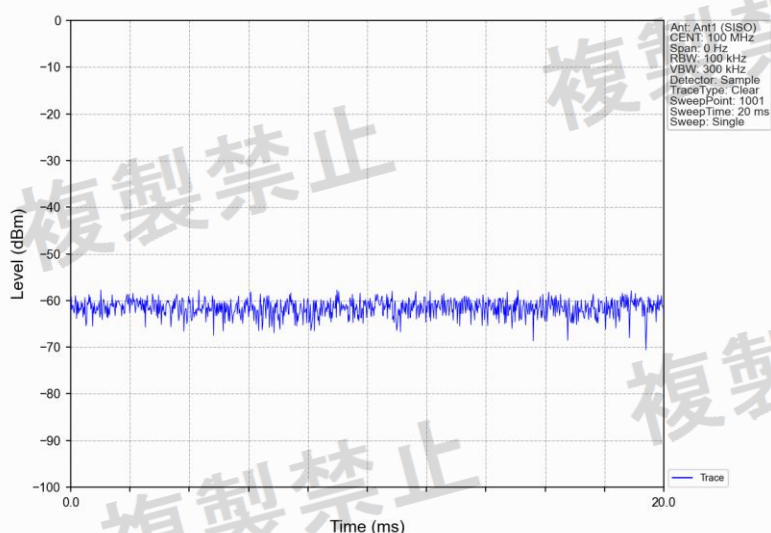
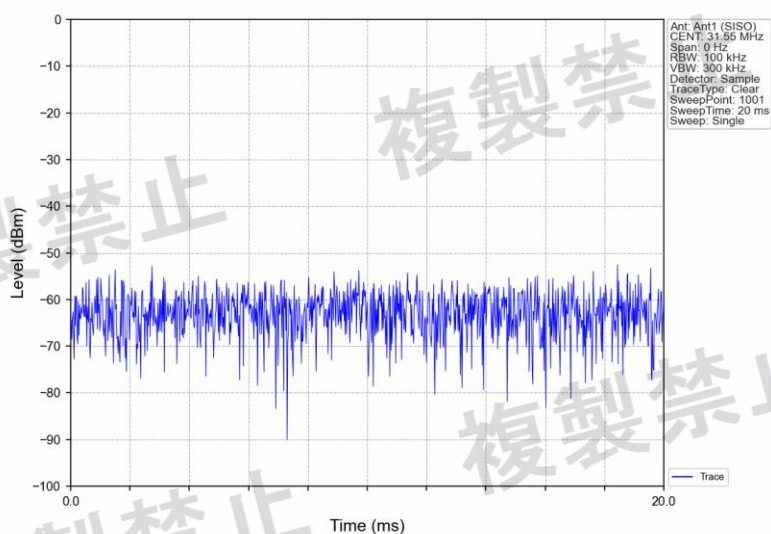


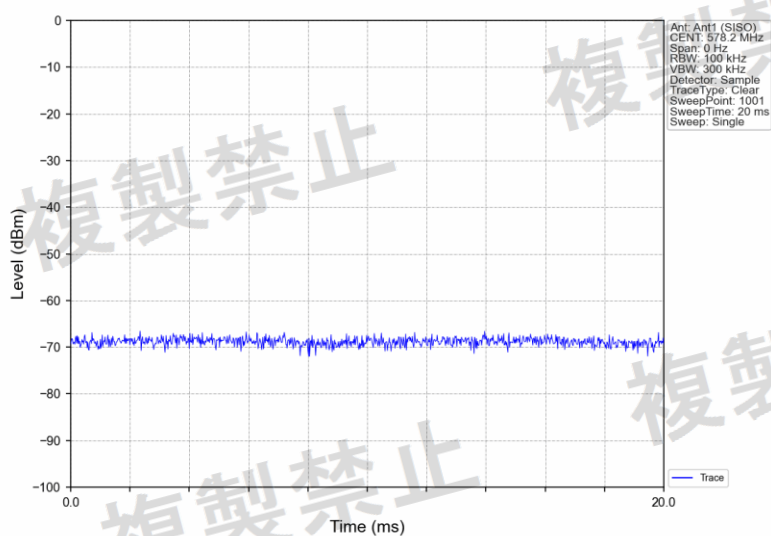
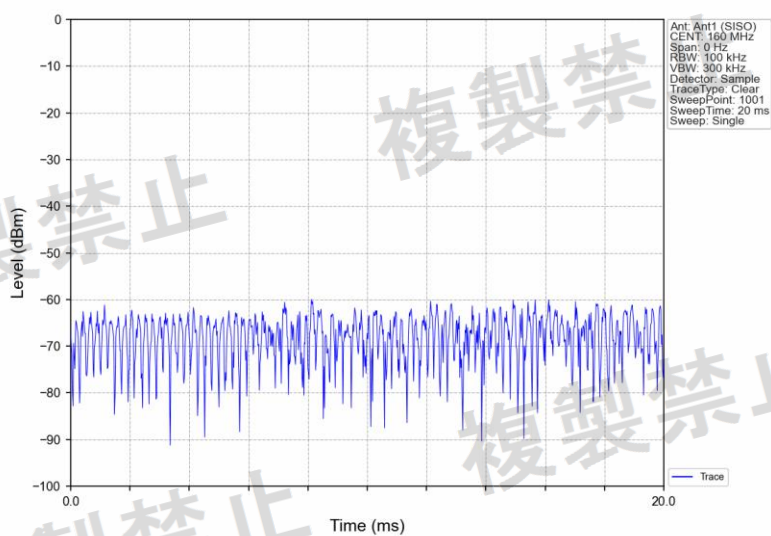
802.11n(HT40)_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_2462MHz_Ant1 (SISO)_NTNV







3.7.5 Result

The equipment met the requirement of this clause.



3.8 Spreading Factor

3.8.1 Test condition

Date of testing:	Mar.27, 2024
Channel:	Low: 2412MHz; Middle: 2442MHz; High: 2472MHz (for 802.11b)
Test position:	Transmitting
Ambient temperature:	24.1 °C
Relative humidity:	55 %
Atmosphere Pressure:	105.1 KPa

3.8.2 Limit

Item	Limits
Spread Factor	≥5

Measured Result:

3.8.3 Test Result

Test Condition	Test Mode	Channel	Spread bandwidth/modulation rate	Result	Limit	Verdict
NTNV	b	2412	8.84/1.375	6.43	5	PASS
NTNV	b	2442	8.73/1.375	6.35	5	PASS
NTNV	b	2472	8.73/1.375	6.35	5	PASS

3.8.4 Result

The equipment met the requirement of this clause.



3.9 Interference prevention function

3.9.1 Test condition

Date of testing:	Apr.1, 2024
Test position:	Connecting with host
Ambient temperature:	24.2 °C
Relative humidity:	56 %
Atmosphere Pressure:	105.1 KPa

3.9.2 Limit

Item	Limits
Identification Code	≥48 bits

Measured Result:

Complies. EUT displayed a valid identification. In real life applications, the EUT is programmed to connect with specific host only.

3.9.3 Result

The equipment met the requirement of this clause.

3.10 Carrier sense

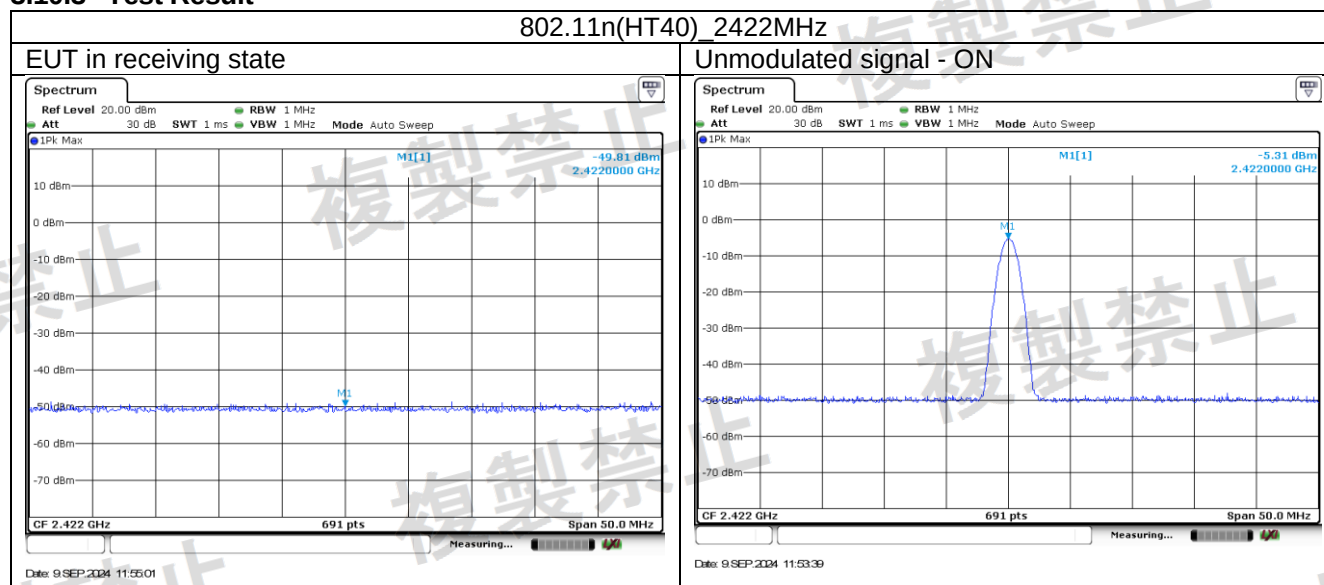
3.10.1 Test condition

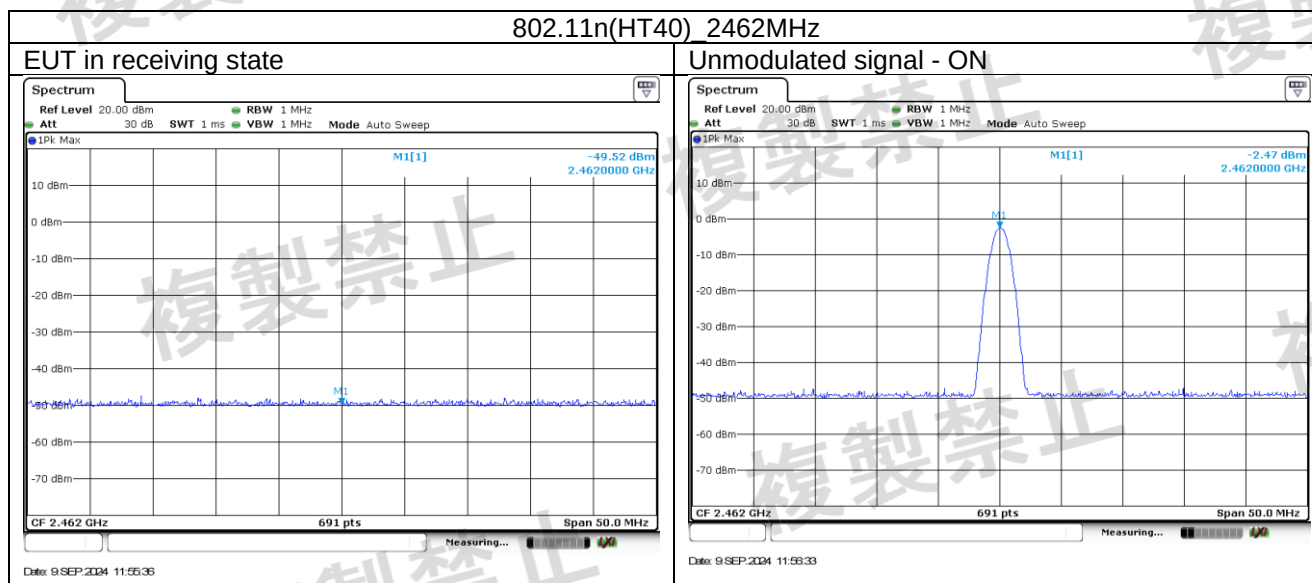
Date of testing:	Apr.1, 2024
Channel:	Low: 2422MHz; High: 2462MHz (for 802.11n_HT40)
Test position:	Transmitting
Ambient temperature:	24.2 °C
Relative humidity:	56 %
Atmosphere Pressure:	105.1 KPa

3.10.2 Limit

Limited to the OFDM system (orthogonal frequency division multiplexing) in radio equipment for second generation low power data transmission system radio stations, carrier sense is employed when transmitting, capable of transmitting only after confirming that other radio stations are not using the same occupied bandwidth.

3.10.3 Test Result





3.10.4 Test Result

The equipment met the requirement of this clause.

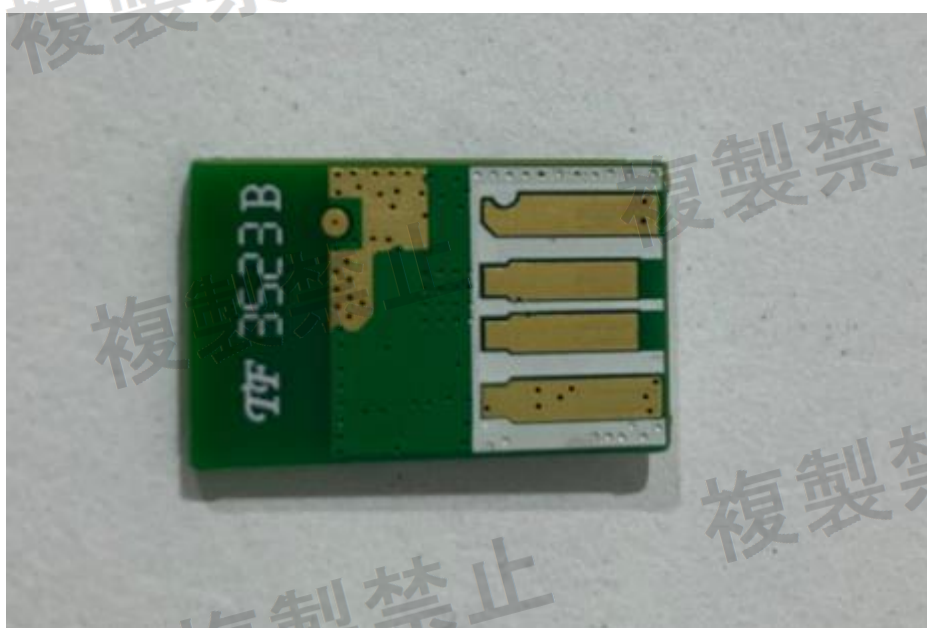
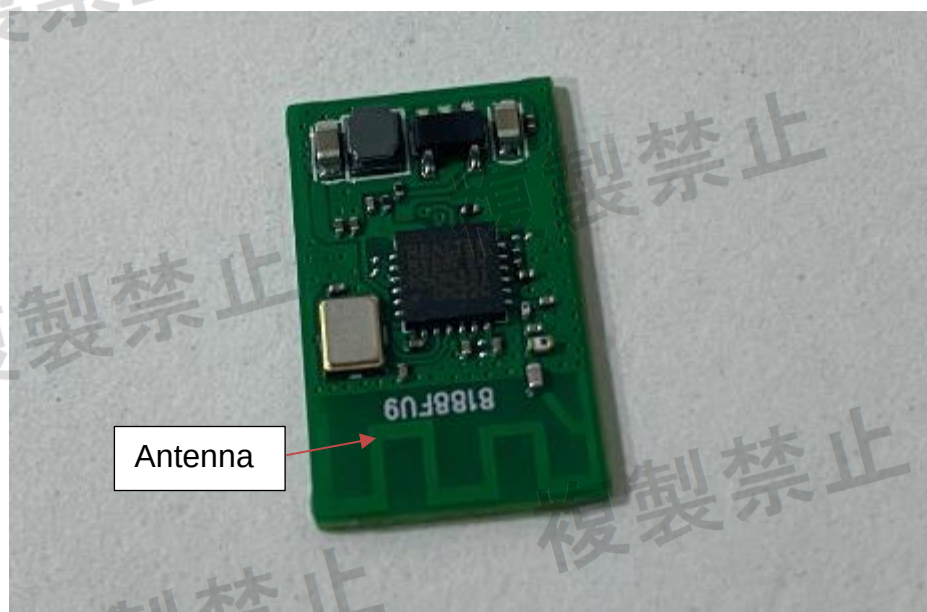
4 Photographs of Test Set-ups



5 Photographs of EUT

WIFI module





---END---