

TEST REPORT

Application No.: SHCR2507001821HS
Applicant: Hisense Home Appliances Group Co., Ltd. Qingdao Branch
Address of Applicant: Hisense R&D center, #399 Songling Road, Qingdao, Shandong, 266000, China
Manufacturer: Hisense Home Appliances Group Co., Ltd. Qingdao Branch
Address of Manufacturer: Hisense R&D center, #399 Songling Road, Qingdao, Shandong, 266000, China
Equipment Under Test (EUT):
EUT Name: Wi-Fi Module
Model No.: HLW3215-TG05, HL3215SG-lite, HLW3215-TG06
Remark: Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) : MIC Item 19 of Article 2 Paragraph 1
Test Method: MIC Notice No.88 Appendix No.43
Date of Receipt: 2025-07-10
Date of Test: 2025-07-11 to 2025-08-05
Date of Issue: 2025-08-07

Test Result:**Pass***

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

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Revision Record			
Version	Description	Date	Remark
00	Original	2025-08-07	/

Authorized for issue by:			
Tested By	Wade Zhang		
	Wade Zhang/Project Engineer		
Approved By	Parlam Zhan		
	Parlam Zhan/Reviewer		

2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	MIC Item 19 of Article 2 Paragraph 1	N/A	MIC Item 19 of Article 2 Paragraph 1	Pass
Interference prevention capability		MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
RF accessibility		N/A	MIC Item 19 of Article 2 Paragraph 1	Pass
Carrier sensing Capability		MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Frequency Error	MIC Item 19 of Article 2 Paragraph 1	MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Occupied Bandwidth(99%)		MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Spreading factor& Spread spectrum Bandwidth(90%)		MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Antenna Power		MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Spurious emission Intensity		MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Limit of secondary radiated emissions		MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model HLW3215-TG05 was tested since their differences were the model number and appearance.

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4 General Information

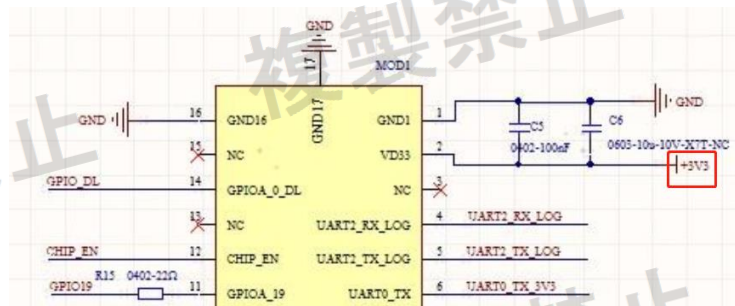
4.1 Details of E.U.T.

Power supply:	DC 5V
Test Voltage:	DC 5V
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2472MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK), 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel Spacing:	5MHz
Number of Channels:	802.11b/g/n(HT20): 13
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi (Provided by manufacturer)
Rated Power	11b: 1.6~3.4mW/MHz 11g: 0.23~0.33mW/MHz 11n(HT20): 0.27~0.39mW/MHz

4.2 Test Conditions

EUT Power by DC 5V

The RF unit is supplied DC 3.30V. The fluctuation of input voltage to the circuit of RF unit of test equipment is under $\pm 1\%$, when input voltage from DC 5V to the test equipment is fluctuated by $\pm 10\%$, So, all measurement has been conducted by only rated voltage.



The measurement result of the voltage fluctuation at RF circuit when DC 5V $\pm 10\%$.

DC Input	DC
DC 5V	3.30V
DC 5.5V	3.31V(+0.3%)
DC 4.5V	3.29V(-0.3%)

5 -35.0 °C

45-85 % RH

1000 -1010 mbar

Note:

VN: Normal Voltage

TN: Normal Temperature

TL: Low Extreme Test Temperature

TH: High Extreme Test Temperature

If the EUT can be set to 3 or more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L, M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	L460	/
Serial port adapter plate	/	Test Plate 3	/

4.4 Measurement Uncertainty & Decision Rule

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty cycle	0.4%
4	Occupied Bandwidth	3%
5	RF conducted power	0.6dB
6	RF power density	2.9dB
7	Conducted Spurious emissions	0.75dB
8	RF Radiated power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious emission test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
10	Temperature test	1°C
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).
3. Sample source: sent by customer.

4.6 Test Facility

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

- **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

- **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment	Manufacturer	Model No	Serial No.	Cal Date	Cal Due Date	Cal body	Certifier
Spectrum Analyzer	R&S	FSP-30	100324	2024-12-19	2025-12-18	JEPSI*	(c)
Spectrum Analyzer	Agilent	N9020A	MY49100060	2024-08-01	2025-07-31	JEPSI*	(c)
Spectrum Analyzer	Agilent	N9020A	MY49100060	2025-08-01	2026-07-31	JEPSI*	(c)
Spectrum Analyzer	Keysight	N9020B	MY58100087	2024-12-19	2025-12-18	JEPSI*	(c)
Signal Generator	R&S	SMR20	101113	2024-08-01	2025-07-31	JEPSI*	(c)
Signal Generator	R&S	SMR20	101113	2025-08-01	2026-07-31	JEPSI*	(c)
Signal Generator	Agilent	N5182A	MY50143776	2024-08-01	2025-07-31	JEPSI*	(c)
Signal Generator	Agilent	N5182A	MY50143776	2025-08-01	2026-07-31	JEPSI*	(c)
Communication Tester	R&S	CMW270	101162	2025-04-30	2026-04-29	LISAI*	(c)
Switcher+ Power Sensor	Tonscend / Keysight	JS0806 U2021XA*4	JS0806-2	2024-08-01	2025-07-31	JEPSI*	(c)
Switcher+ Power Sensor	Tonscend / Keysight	JS0806 U2021XA*4	JS0806-2	2025-08-01	2026-07-31	JEPSI*	(c)
EMI Test Receiver	R&S	ESU40	100109	2024-12-19	2025-12-18	JEPSI*	(c)
High-low Temp Cabinet	Suzhou Zhihe	TL-40	20090917	2024-11-08	2025-11-07	SGS SHCAL	(c)
AC Power Stabilizer	APC	KDF-31020T-V0-F0	F317060067	2024-12-19	2025-12-18	JEPSI*	(c)
DC Power Supply	HP	6010A	SHEM222-1	2024-12-19	2025-12-18	JEPSI*	(c)

Remark:

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

From JRL Article 24-2, paragraph 4, Item 2

Notice:

- 1) (C) is applicable for equipment calibration above.
- 2) Calibration duration for above equipments is 1 year.

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

6.1.2 Conclusion

Standard requirement:

Applicable for equipment with an antenna terminal, including testing terminals. If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.

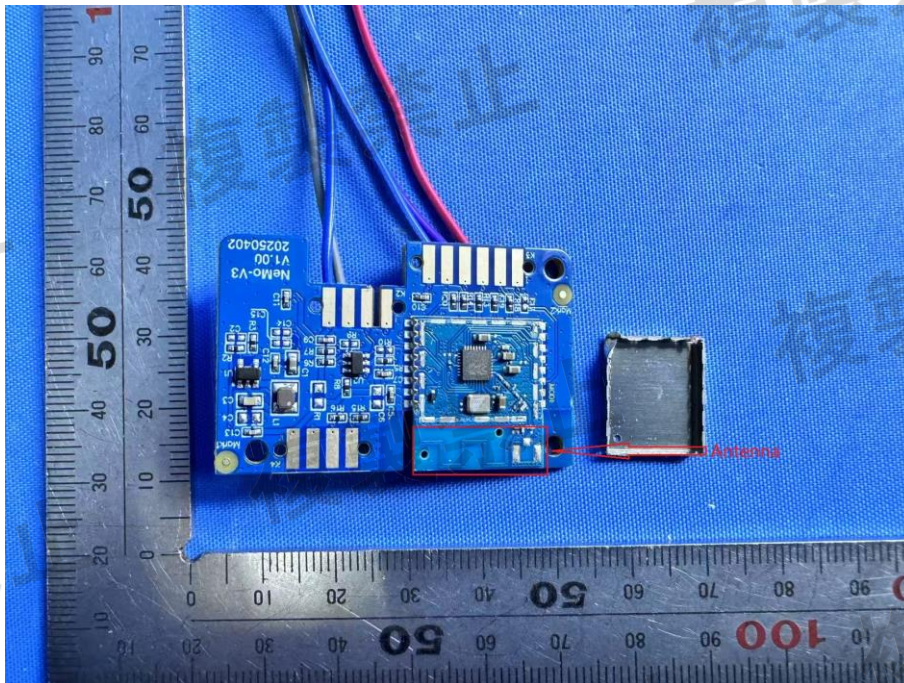
EUT Details:

The antenna is PCB antenna and no consideration of replacement.

The best case gain of the antenna is 0dBi.

Result:

An antenna connector is available, all relevant tests will be carried out conducted.



6.2 Interference prevention capability

6.2.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

Limit:

Article 2, Item (19) Notice 88 Appendix 43

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

6.2.2 Conclusion

Standard Requirement:

1) Measurement system diagram as shown above and test equipment keep transmitting identification code.

2) Condition of measuring instrument

(1) Demodulator must be able to demodulate the transmitting signal emitted by test equipment and to indicate the identification code.

3) Condition of test equipment The mode of normal use.

4) Measuring operation procedure

(1) When test equipment has the function to transmit identification code automatically:

A) Transmit the predetermined identification code from test equipment.

B) Confirm the transmitted identification code by demodulator.

EUT Details:

The unit does meet the requirements (Good).

Mac Address:

wlan0

c8:0a:35:72:d9:f2

6.3 RF accessibility

6.3.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

6.3.2 Conclusion

Standard Requirement:

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

Protective Structure:

☐	1.Sealed with special screws.
☐	2.Plastic chassis is being welded using ultrasonic waves.
☐	3.Chassis is glued using a special adhesive.
☐	4.Metal covers are spot-fused.
☐	5.Cover is specially interlocked
☒	6.RF and Modulation components are covered with shielding case and this shielding case is soldered.
☐	7.Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
☐	8.Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
☐	9.Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
☐	10.RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable parts on PCB or adjustable parts are not exposed.

EUT Details:



6.4 Carrier sensing Capability

6.4.1 Test Requirement:

MIC Item 19, of Article 2 Paragraph 1

Limit: Shall not transmit radio wave when receiving over 100mV/m

6.4.2 Conclusion

Test Procedure:

(1) Set the standard signal generator as follows:

Carrier frequency: Center frequency of receiving frequency band of test equipment

Modulation: No modulation (when the carrier sense function does not work by the the unmodulated subcarrier in center frequency, shift the frequency or modulate if needed.)

Output level: In the antenna input unit of a test equipment, field intensity is equivalent to the value which becomes 100mV/m.

(2) Set the spectrum analyzer as follows:

Center frequency: Center frequency of the bandwidth used.

Sweep frequency band: 50MHz

Resolution bandwidth: Approximately 1 MHz

Video bandwidth: Approximately same as the resolution bandwidth

Y-axis scale: 10dB/Div

Trigger condition: Free-run

Detective mode: Positive peak

(3) Measuring operation

(a) Test with test equipment only: Set the test equipment to the transmitting operation with the output of standard signal generator OFF, and confirm that it emits radio wave, using spectrum analyzer.

(b) Set the test equipment to the receiving mode.

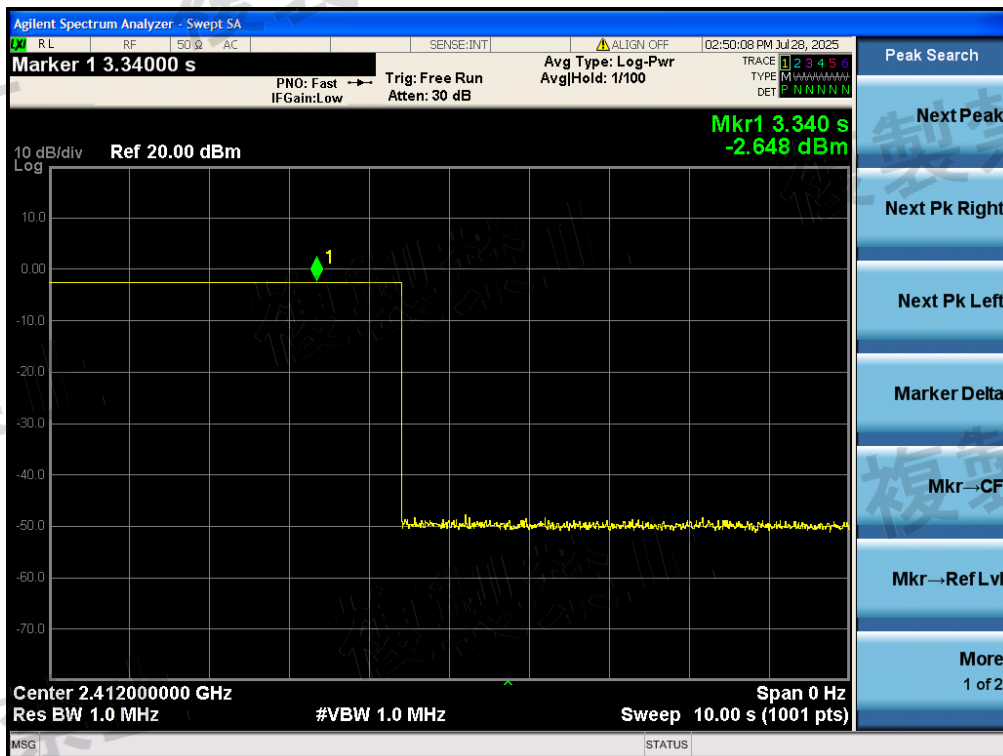
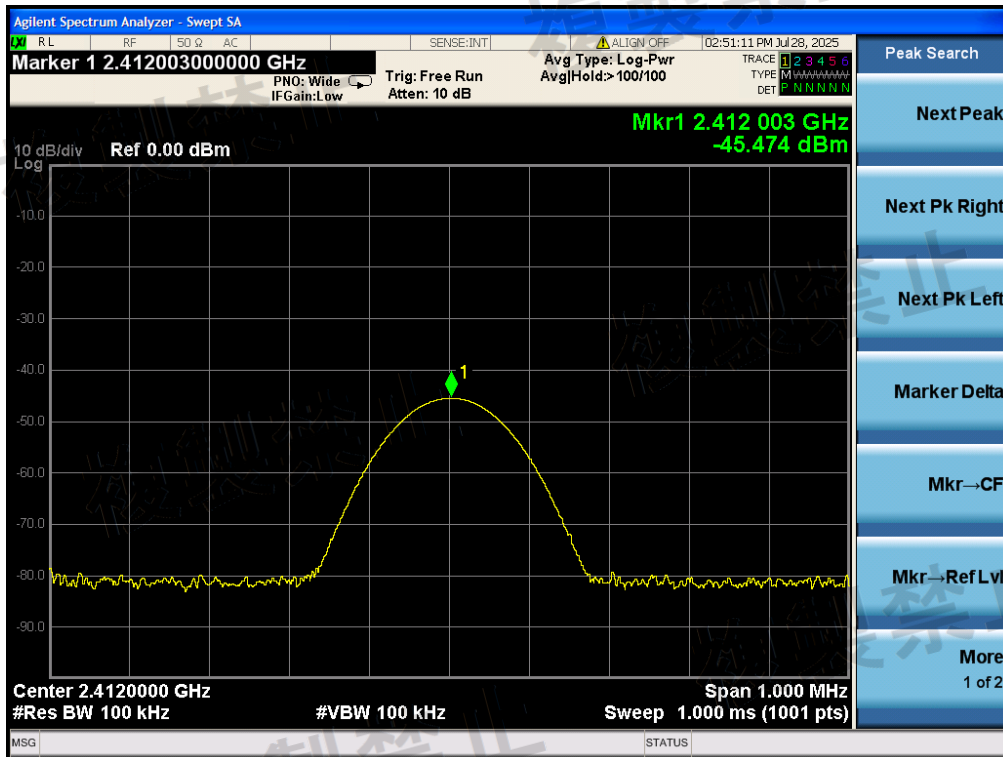
(c) Set the test equipment to the transmitting operation with the output of standard signal generator ON, and confirm that it does not emit radio wave, using spectrum analyzer.

6.4.3 Result

The product shall not transmit radio wave when receiving over 100mV/m. The unit does meet the requirements

ENV	Mode	TX Type	Frequency (MHz)	Interference Signal Level (mV/m)	Verdict
	802.11n (HT20)	SISO	2412	100	Pass
	802.11n (HT20)	SISO	2472	100	Pass

6.4.4 Measurement Data



7 Radio Spectrum Matter Test Results

7.1 Frequency Error

Test Requirement: MIC Item 19 of Article 2 Paragraph 1
Test Method: MIC Notice No.88 Appendix No.43
Limit: Tolerance of frequency: $\pm 50\text{E-6}$

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

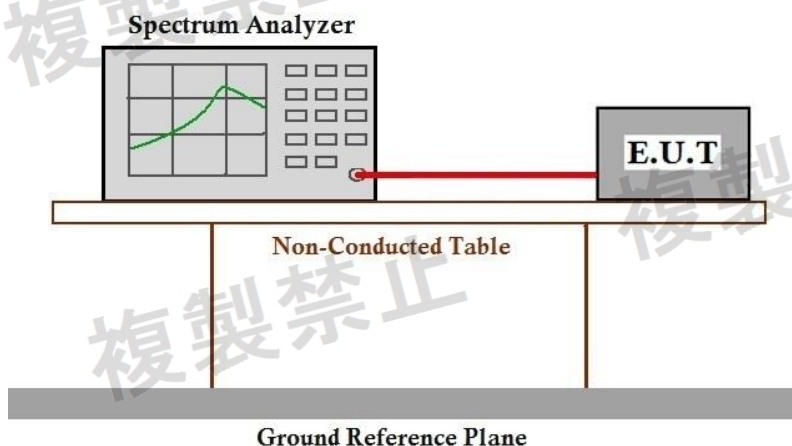
Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping OFF, CW Tx

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 1MHz

RBW 10 kHz (Modulation OFF),

VBW 10 kHz (Modulation OFF),

Sweep Time Auto

Detector mode Positive peak

Indication mode Max hold

Alternative method:

Frequency: Test Frequency

Span 2 times channel bandwidth

RBW 100 kHz (Modulation ON),

VBW 100 kHz (Modulation ON),

Sweep Time Auto

Detector mode Positive peak

Indication mode Max hold

Please Refer to Appendix for Details

7.2 Occupied Bandwidth(99%)

Test Requirement MIC Item 19 of Article 2 Paragraph 1

Test Method: MIC Notice No.88 Appendix No.43

Limit:

FH: 83.5MHz or less

FH + DS: 83.5MHz or less

FH + OFDM: 83.5MHz or less

OFDM: 40MHz or less

DS: 26MHz or less

Others: 26MHz or less

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

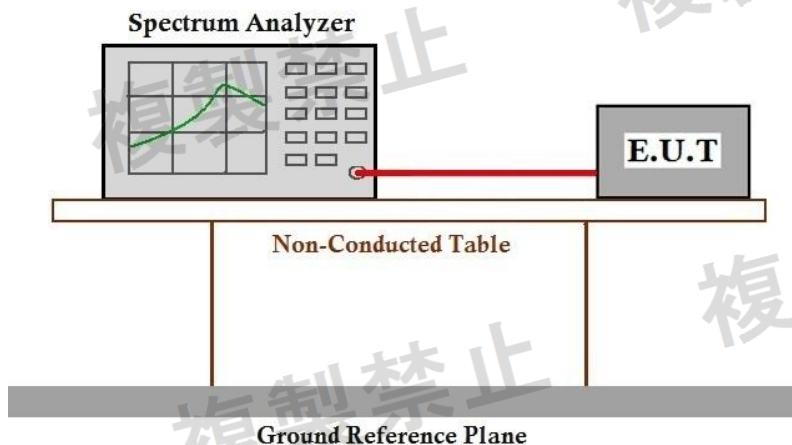
Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, Modulation Tx

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 83.5 MHz (FHSS); 40/60 MHz (OFDM; DSSS); 2-5 times OBW (Others)

RBW 1 MHz (FHSS); 300kHz (OFDM; DSSS); 3% OBW (Others)

VBW 1 MHz (FHSS); 300kHz (OFDM; DSSS); 3 times RBW (Others)

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

OBW 99%

Please Refer to Appendix for Details

7.3 Spread spectrum Bandwidth(90%)

Test Requirement MIC Item 19 of Article 2 Paragraph 1

Test Method: MIC Notice No.88 Appendix No.43

Limit:

DS, FH, FH+DS, FH+OFDM: 500kHz or more

For DS system;(Spreading bandwidth) / (Frequency corresponding to transmission rate) ≥ 5

7.3.1 E.U.T. Operation

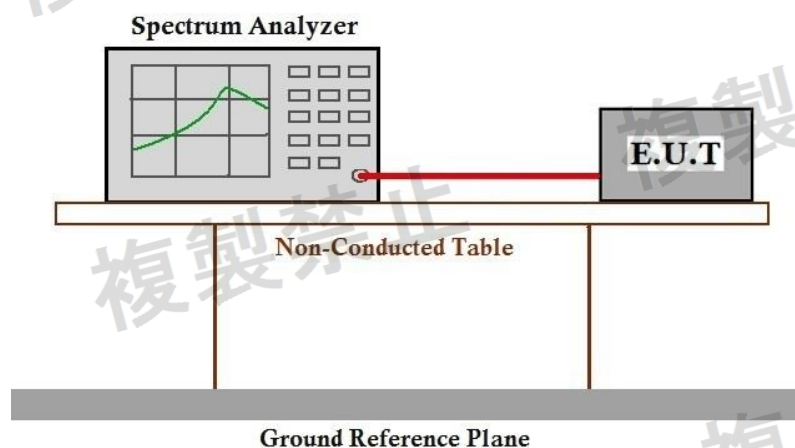
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, Modulation Tx

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 83.5 MHz (FHSS); 40/60 MHz (OFDM; DSSS)

RBW 1 MHz (FHSS); 300kHz (OFDM; DSSS)

VBW 1 MHz (FHSS); 300kHz (OFDM; DSSS)

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

OBW 90%

Please Refer to Appendix for Details

7.4 Antenna Power

Test Requirement MIC Item 19 of Article 2 Paragraph 1

Test Method: MIC Notice No.88 Appendix No.43

Limit:

Designated value

(1) FH, FH+DS, FH+OFDM: 3mW/MHz

(used in the range of 2427 - 2470.75 MHz)

(2) OFDM, DS other than (1) 10mW/MHz

(3) Other than (1) & (2) 10mW

(4) OFDM OBW 26 - 40MHz: 5mW/MHz

Tolerance: +20%, -80%

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

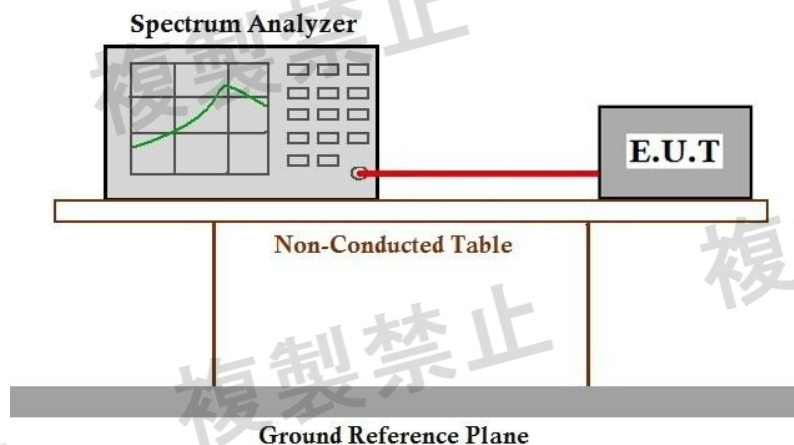
Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, Modulation Tx

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 25 MHz(FHSS); 40/60 MHz (OFDM; DSSS); Enough to capture the emission (Others)

RBW 1 MHz (FHSS; OFDM; DSSS); More than OBW (Others)

VBW 1 MHz (FHSS; OFDM; DSSS); More than RBW (Others)

Sweep Time Auto

detector mode RMS

Indication mode Max hold

Please Refer to Appendix for Details

7.5 Spurious emission Intensity

Test Requirement MIC Item 19 of Article 2 Paragraph 1

Test Method: MIC Notice No.88 Appendix No.43

Limit:

(1) Below 2387 MHz: 2.5 μ W/MHz

(2) 2387 to 2400 MHz: 25 μ W/MHz

(3) 2483.5 through 2496.5 MHz: 25 μ W/MHz

(4) Over 2496.5 MHz: 2.5 μ W/MHz

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

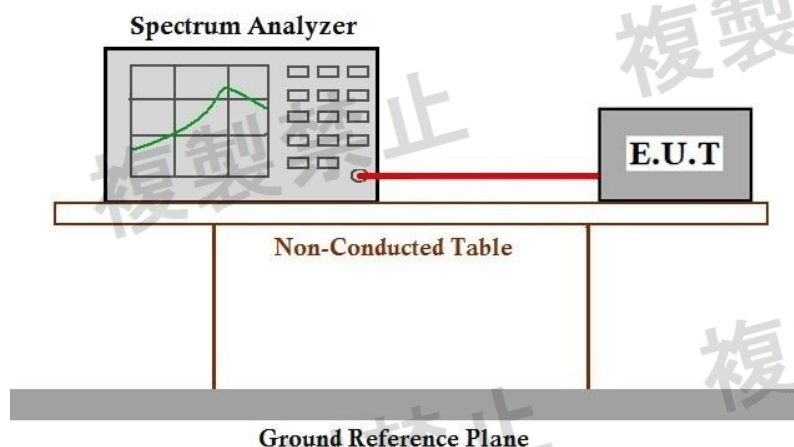
Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, , Modulation Tx

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Step 1

All spurious are measured from 30 MHz to 13 GHz by peak mode.

Step 2

IF the value measured by Step1 is 2 dB or less, measure in average mode.

Test setup for Step 1:

Frequency: 30 MHz - 2400 MHz , 2483.5 MHz -13 GHz

RBW 1 MHz

VBW 1 MHz

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

Test setup for Step 2:

Frequency: Spurious Frequency

RBW 1 MHz

VBW 1 MHz

Sweep Time Auto

detector mode Sample

Indication mode Max hold

Please Refer to Appendix for Details

7.6 Limit of secondary radiated emissions

Test Requirement MIC Item 19 of Article 2 Paragraph 1

Test Method: MIC Notice No.88 Appendix No.43

Limit:

(1) Below 1 GHz : 4 nW or less

(2) 1 GHz and over : 20 nW or less

7.6.1 E.U.T. Operation

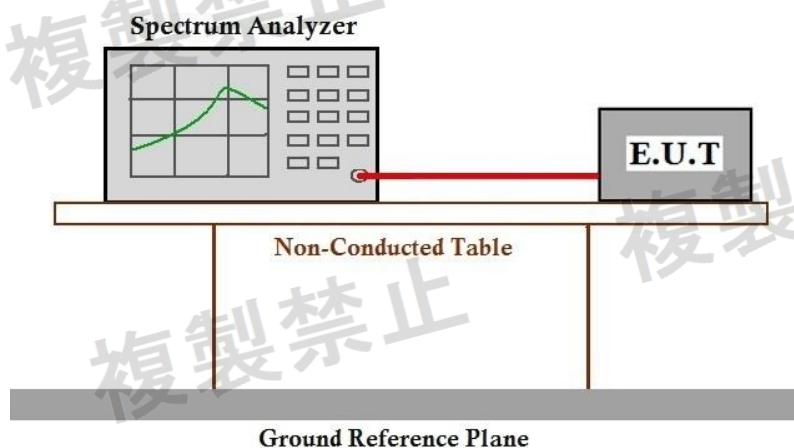
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	RX mode_Keep the EUT in receiving mode. Only the 20MHz channel plan was tested and recorded in the report.

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Step 1

All spurious are measured from 30 MHz to 13 GHz by peak mode.

Step 2

IF the value measured by Step1 is 2 dB or less, measure in average mode.

Test setup for Step 1:

Frequency: 30 MHz - 2400 MHz , 2483.5 MHz -13 GHz

RBW 100 kHz (30 - 1GHz) , 1 MHz (over 1GHz)

VBW 100 kHz (30 - 1GHz) , 1 MHz (over 1GHz)

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

Test setup for Step 2:

Frequency: Spurious Frequency

Span 0 Hz

RBW 100 kHz (30 - 1GHz) , 1 MHz (over 1GHz)

VBW 100 kHz (30 - 1GHz) , 1 MHz (over 1GHz)

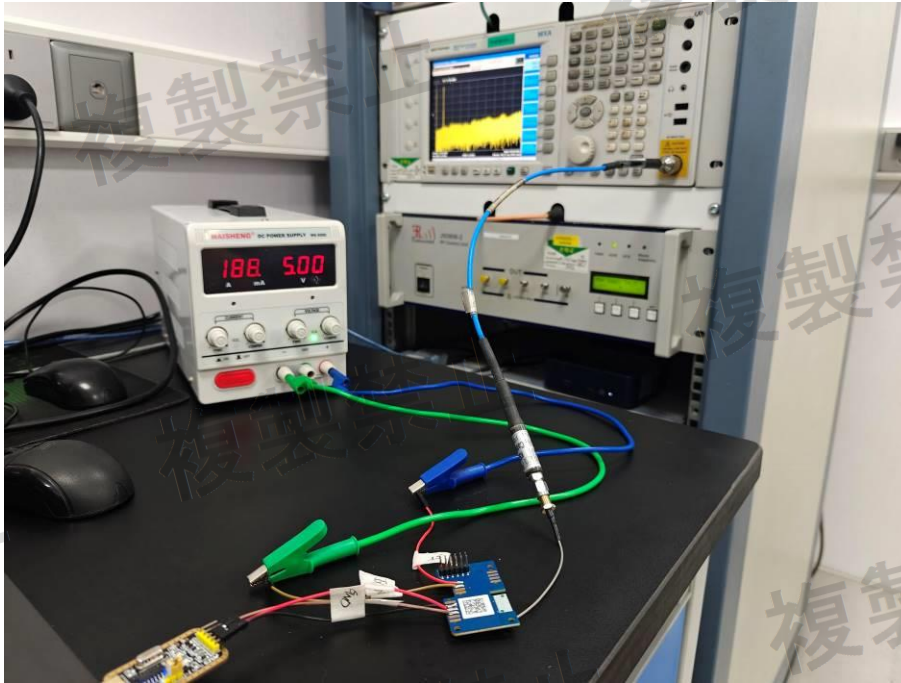
Sweep Time Auto

detector mode Sample

Indication mode Max hold

Please Refer to Appendix for Details

8 Test Setup Photo



9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for SHCR2507001821HS

10 Appendix

1. Frequency Error

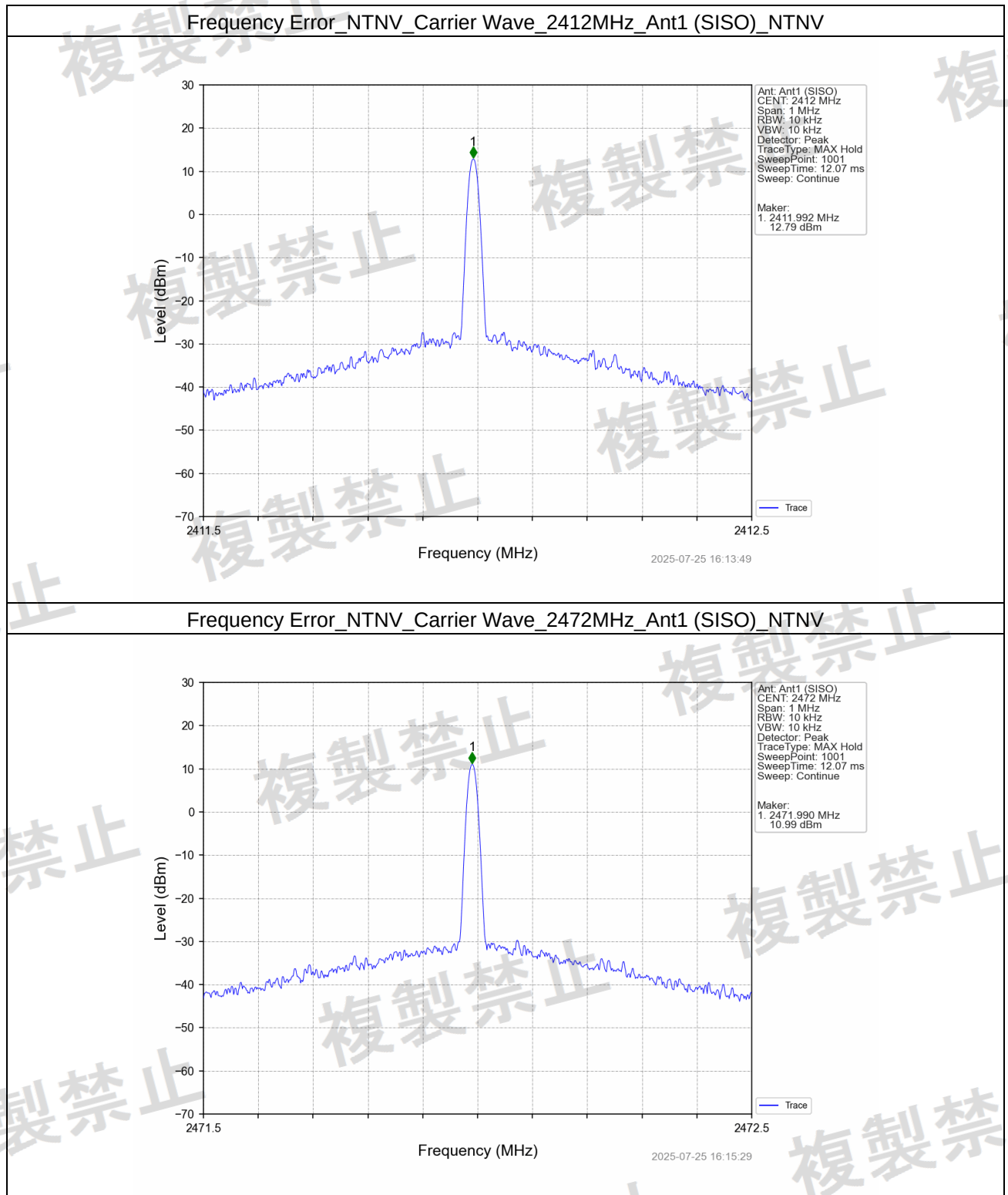
1.1 Test Result

1.1.1 Ant1

Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)		Verdict
					Result	Limit	
NTNV	Carrier Wave	SISO	2412	2411.992	-3.32	-50 to 50	Pass
			2472	2471.990	-4.05	-50 to 50	Pass

1.2 Test Graph

1.2.1 Ant1



2. Occupied Bandwidth

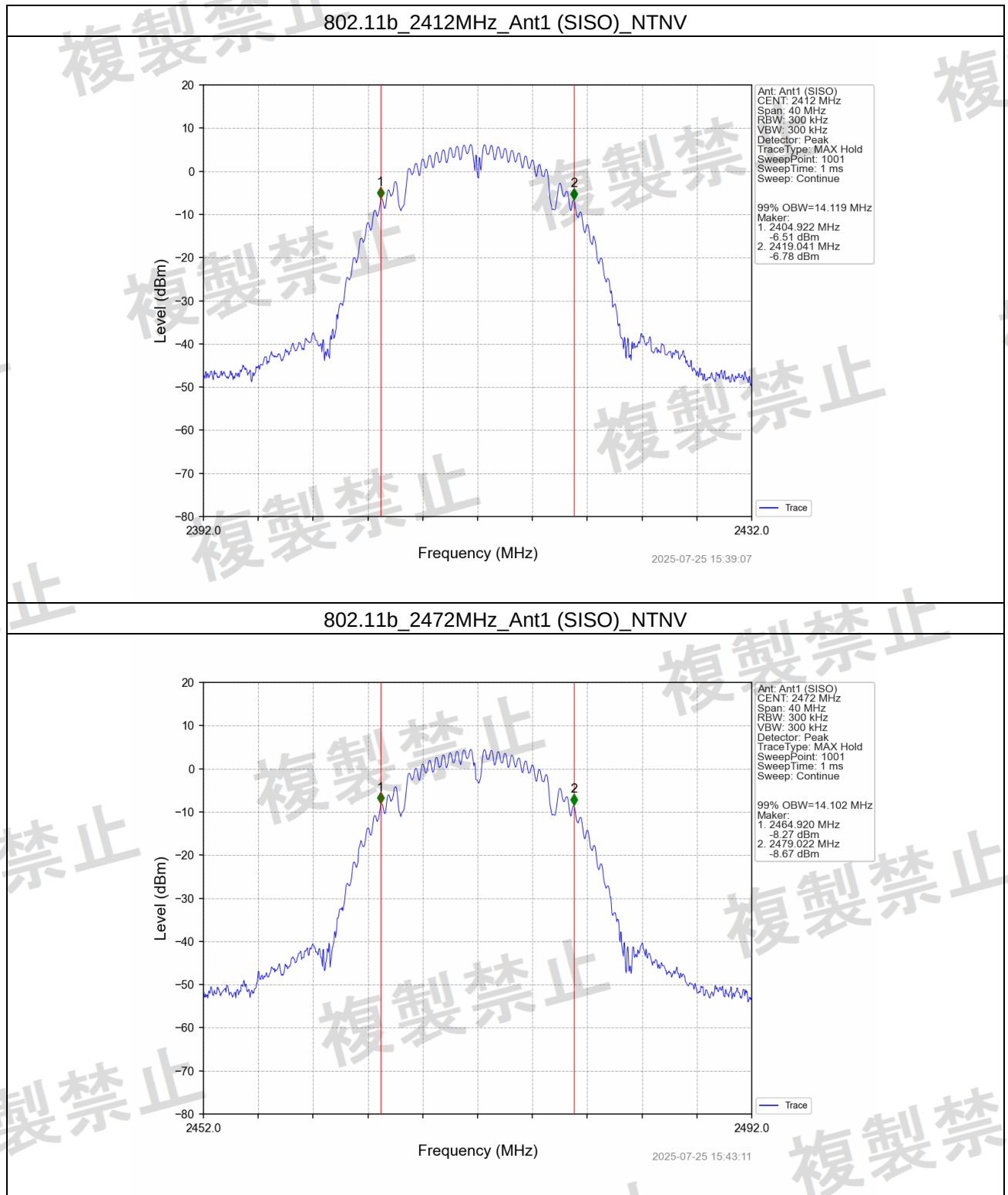
2.1 Test Result

2.1.1 OBW

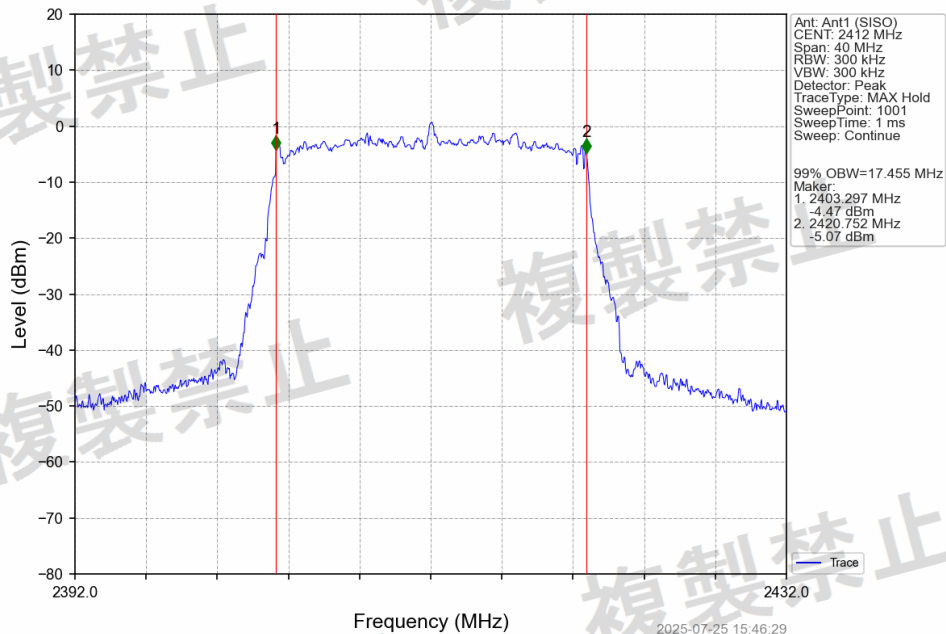
ENV	Mode	TX Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
				ANT1	Limit	
NTNV	802.11b	SISO	2412	14.119	≤ 26	Pass
			2472	14.102	≤ 26	Pass
	802.11g	SISO	2412	17.455	≤ 26	Pass
			2472	17.483	≤ 26	Pass
	802.11n (HT20)	SISO	2412	18.382	≤ 26	Pass
			2472	18.407	≤ 26	Pass

2.2 Test Graph

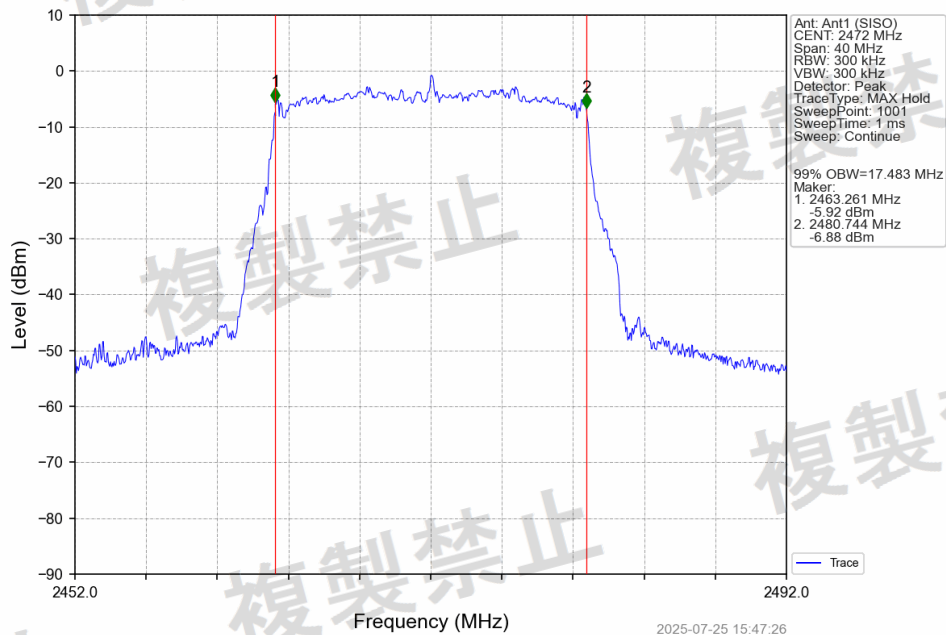
2.2.1 OBW



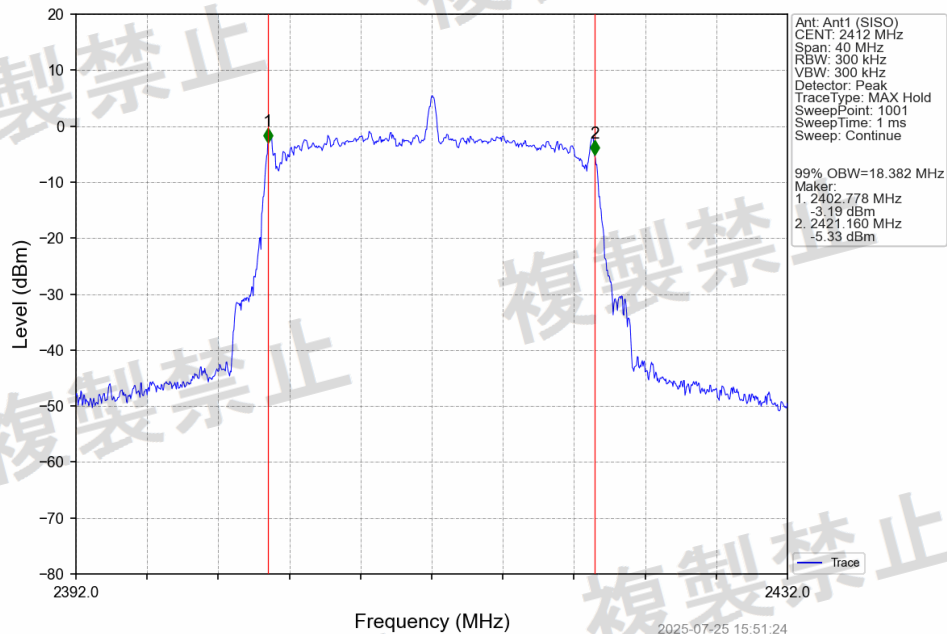
802.11g_2412MHz_Ant1 (SISO)_NTNV



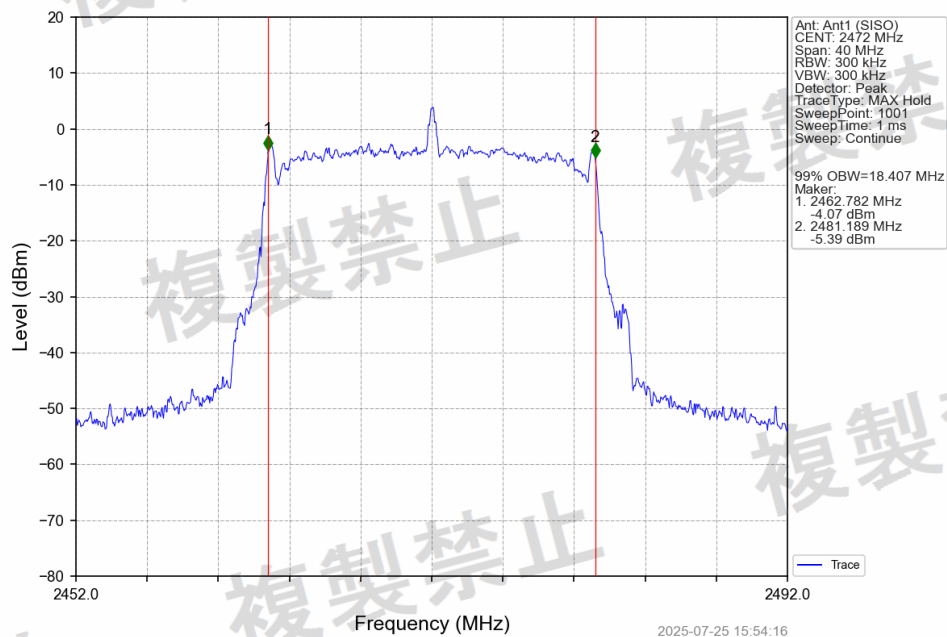
802.11g_2472MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



3. Antenna Power

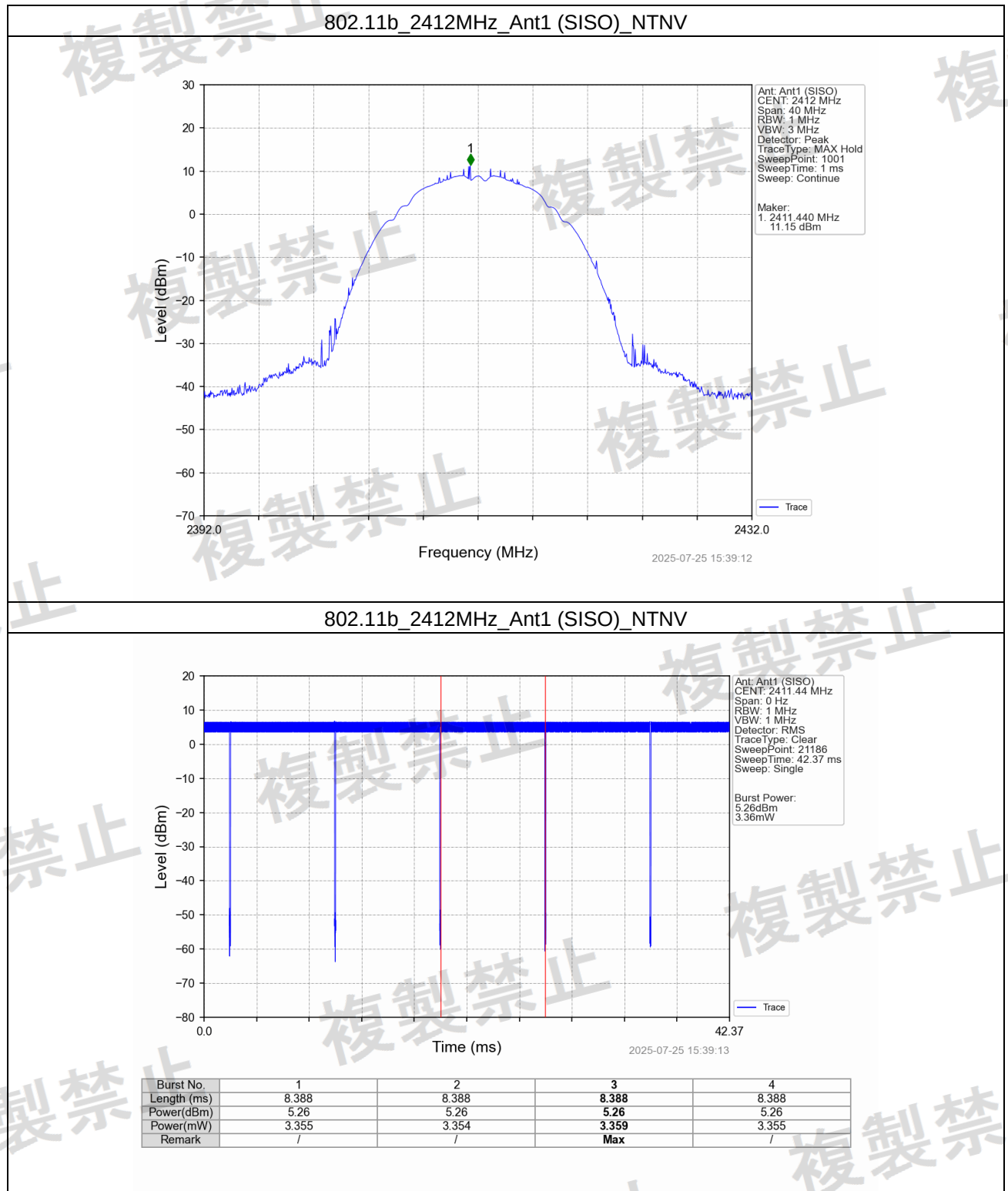
3.1 Test Result

3.1.1 Power

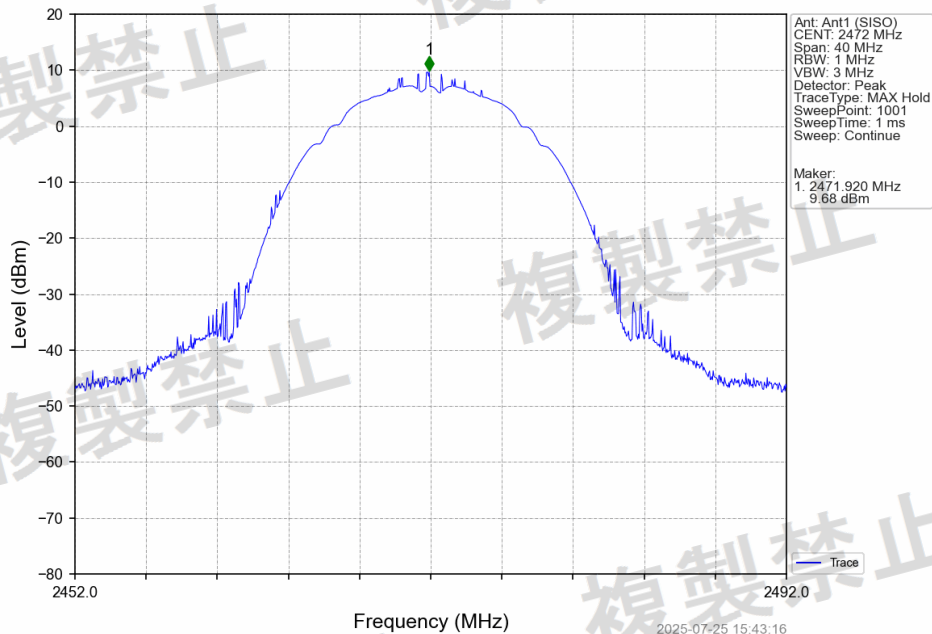
ENV	Mode	TX Type	Frequency (MHz)	ANT	Antenna Power (mW/MHz)		Nominal Power (mW/MHz)	Tolerance (%)		Verdict
					Measured	Limit		Measured	Limit	
NTNV	802.11b	SISO	2412	1	3.359	≤ 10.00	3.400	-1.21	≤ 20	Pass
			2472	1	1.646	≤ 10.00	1.600	2.87	≤ 20	Pass
	802.11g	SISO	2412	1	0.335	≤ 10.00	0.330	1.52	≤ 20	Pass
			2472	1	0.233	≤ 10.00	0.230	1.30	≤ 20	Pass
	802.11n (HT20)	SISO	2412	1	0.388	≤ 10.00	0.390	-0.51	≤ 20	Pass
			2472	1	0.269	≤ 10.00	0.270	-0.37	≤ 20	Pass

3.2 Test Graph

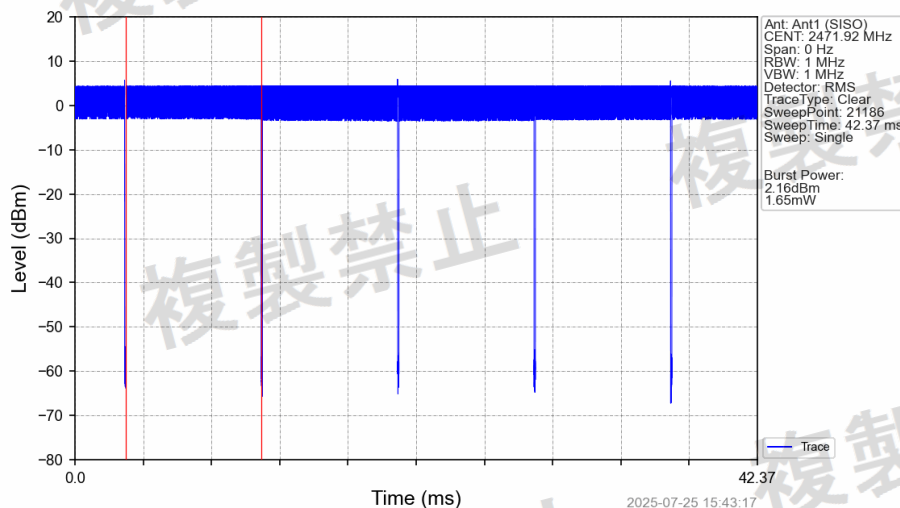
3.2.1 Power



802.11b_2472MHz_Ant1 (SISO)_NTNV

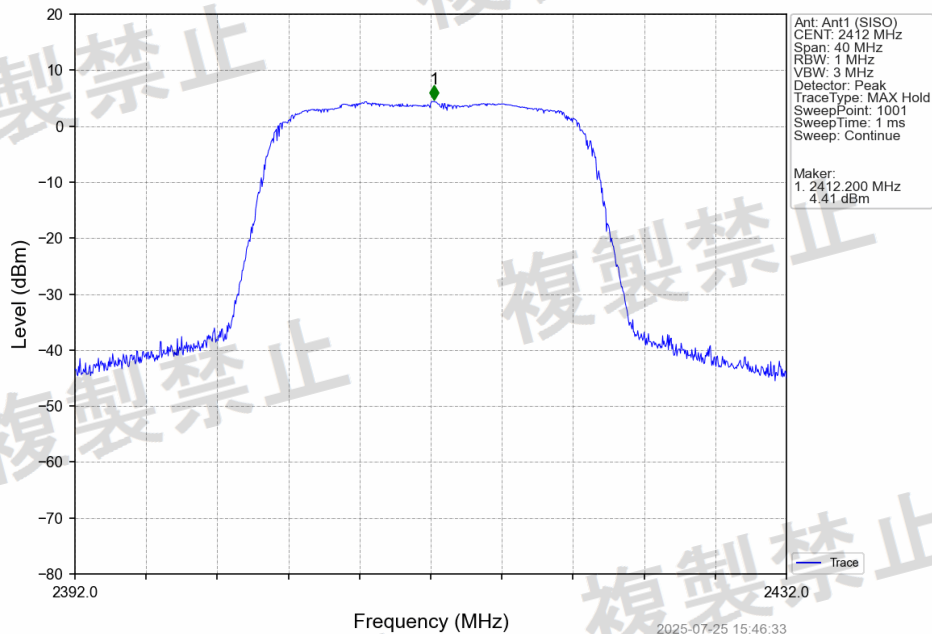


802.11b_2472MHz_Ant1 (SISO)_NTNV

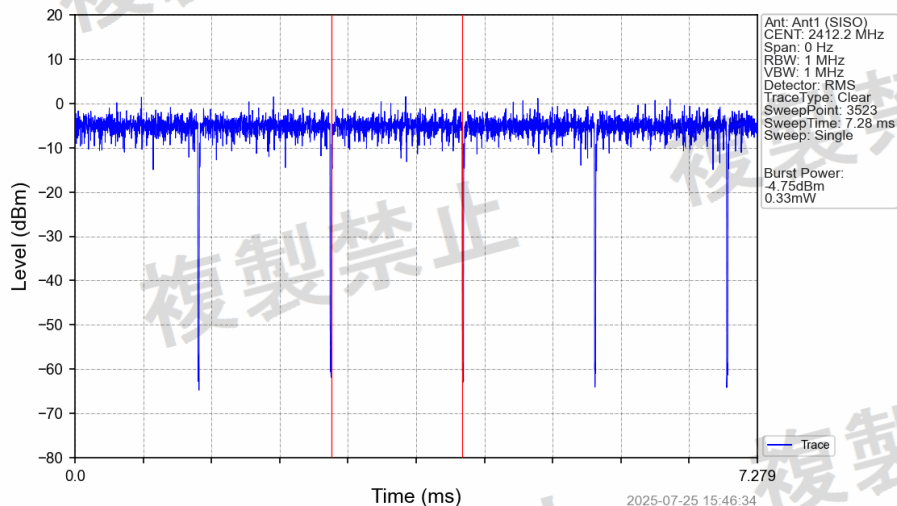


Burst No.	1	2	3	4
Length (ms)	8.388	8.388	8.388	8.388
Power(dBm)	2.16	2.16	2.16	2.16
Power(mW)	1.646	1.644	1.644	1.644
Remark	Max	/	/	/

802.11g_2412MHz_Ant1 (SISO)_NTNV

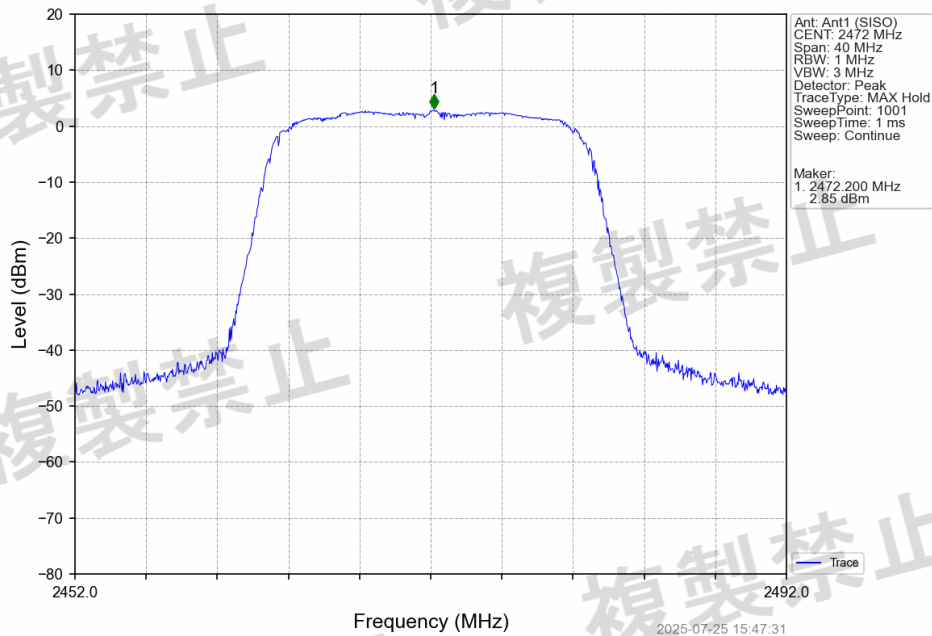


802.11g_2412MHz_Ant1 (SISO)_NTNV

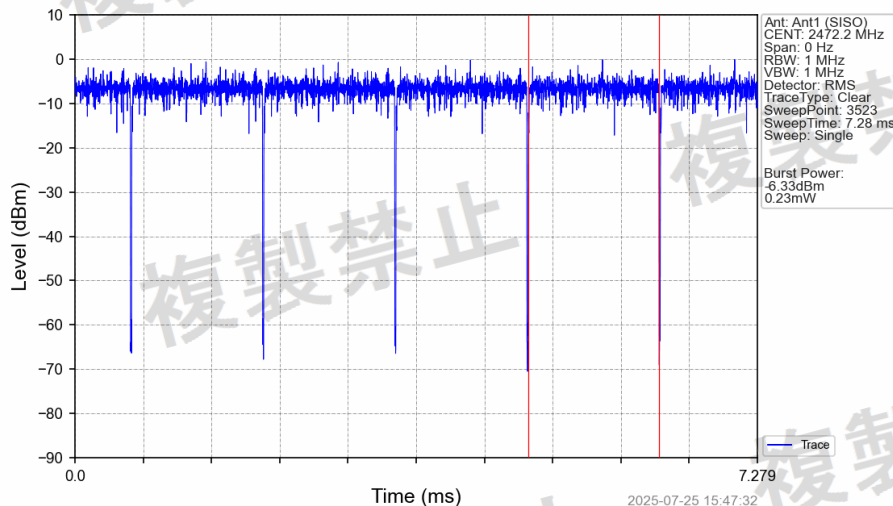


Burst No.	1	2	3	4
Length (ms)	1.395	1.395	1.395	1.395
Power(dBm)	4.76	4.75	4.77	4.76
Power(mW)	0.334	0.335	0.333	0.334
Remark	/	Max	/	/

802.11g_2472MHz_Ant1 (SISO)_NTNV

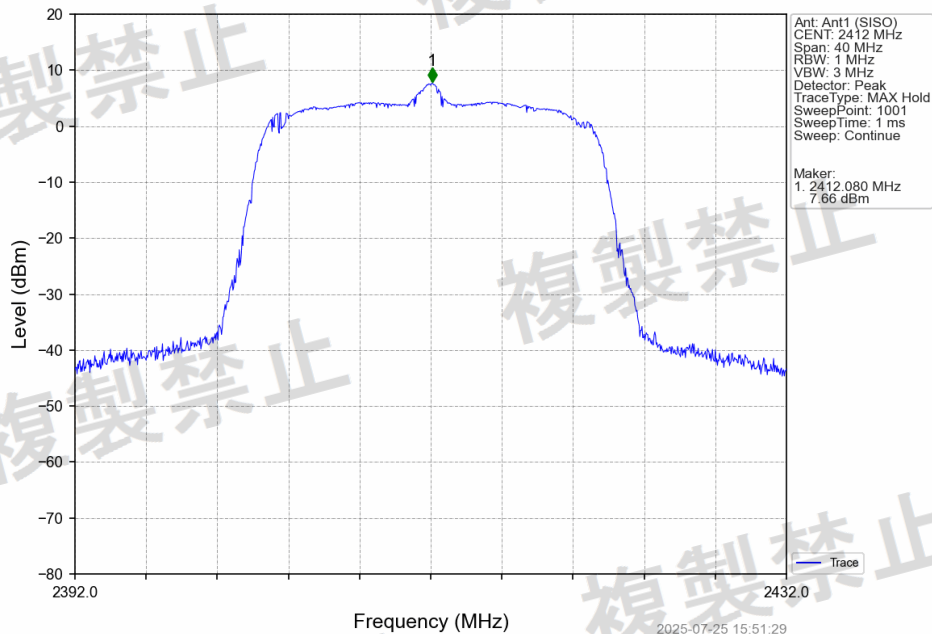


802.11g_2472MHz_Ant1 (SISO)_NTNV

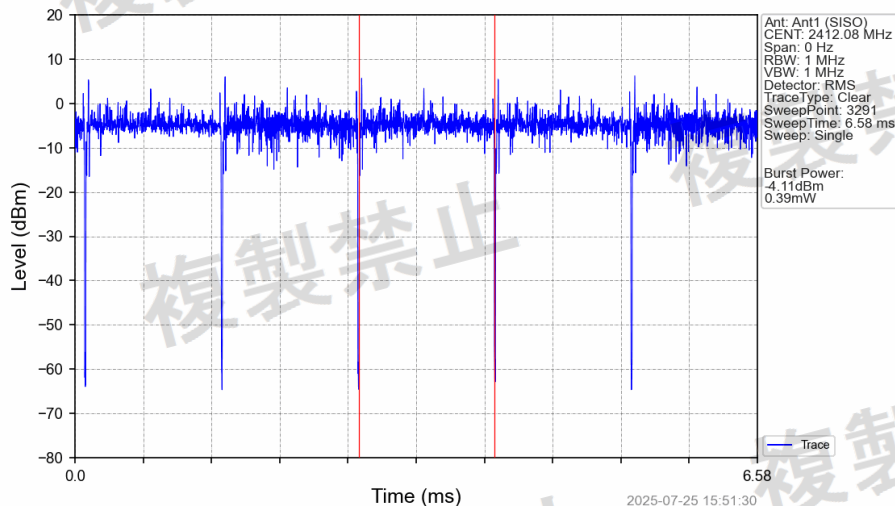


Burst No.	1	2	3	4
Length (ms)	1.395	1.395	1.395	1.395
Power(dBm)	-6.35	-6.34	-6.35	-6.33
Power(mW)	0.232	0.232	0.232	0.233
Remark	/	/	/	Max

802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

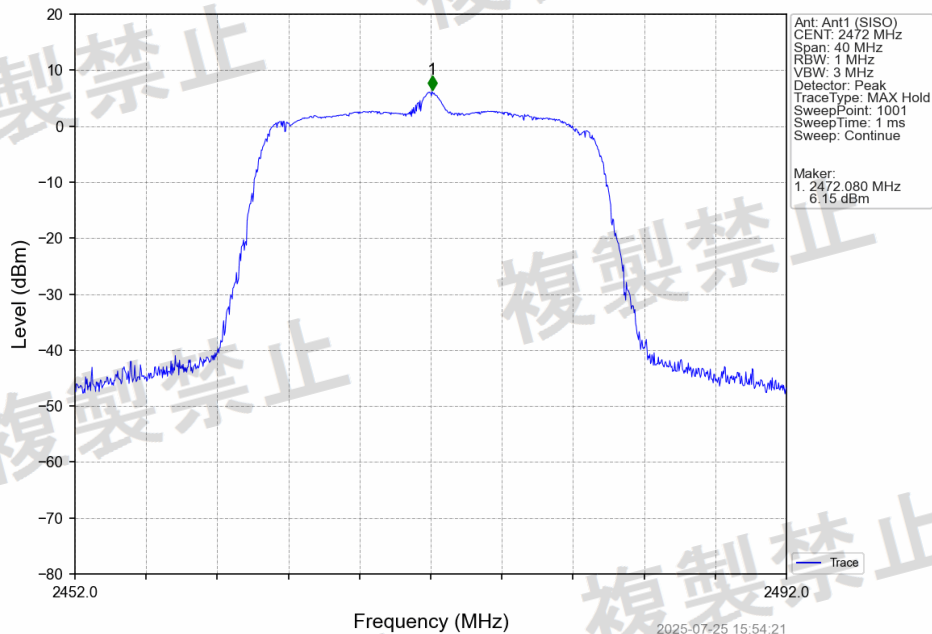


802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

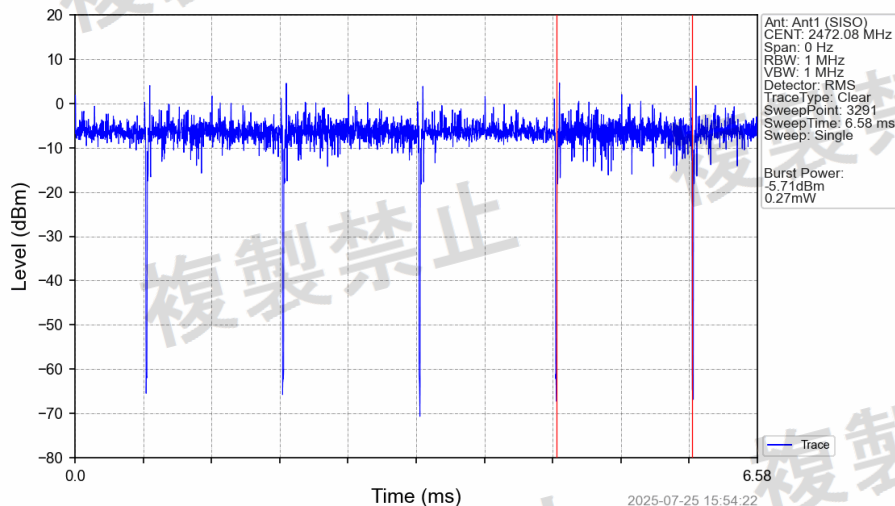


Burst No.	1	2	3	4
Length (ms)	1.304	1.304	1.302	1.304
Power(dBm)	-4.12	-4.12	-4.11	-4.12
Power(mW)	0.387	0.388	0.388	0.387
Remark	/	/	Max	/

802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



Burst No.	1	2	3	4
Length (ms)	1.304	1.302	1.304	1.304
Power(dBm)	-5.73	-5.71	-5.75	-5.71
Power(mW)	0.267	0.268	0.266	0.269
Remark	/	/	/	Max

4. Spurious Emission Intensity

4.1 Test Result

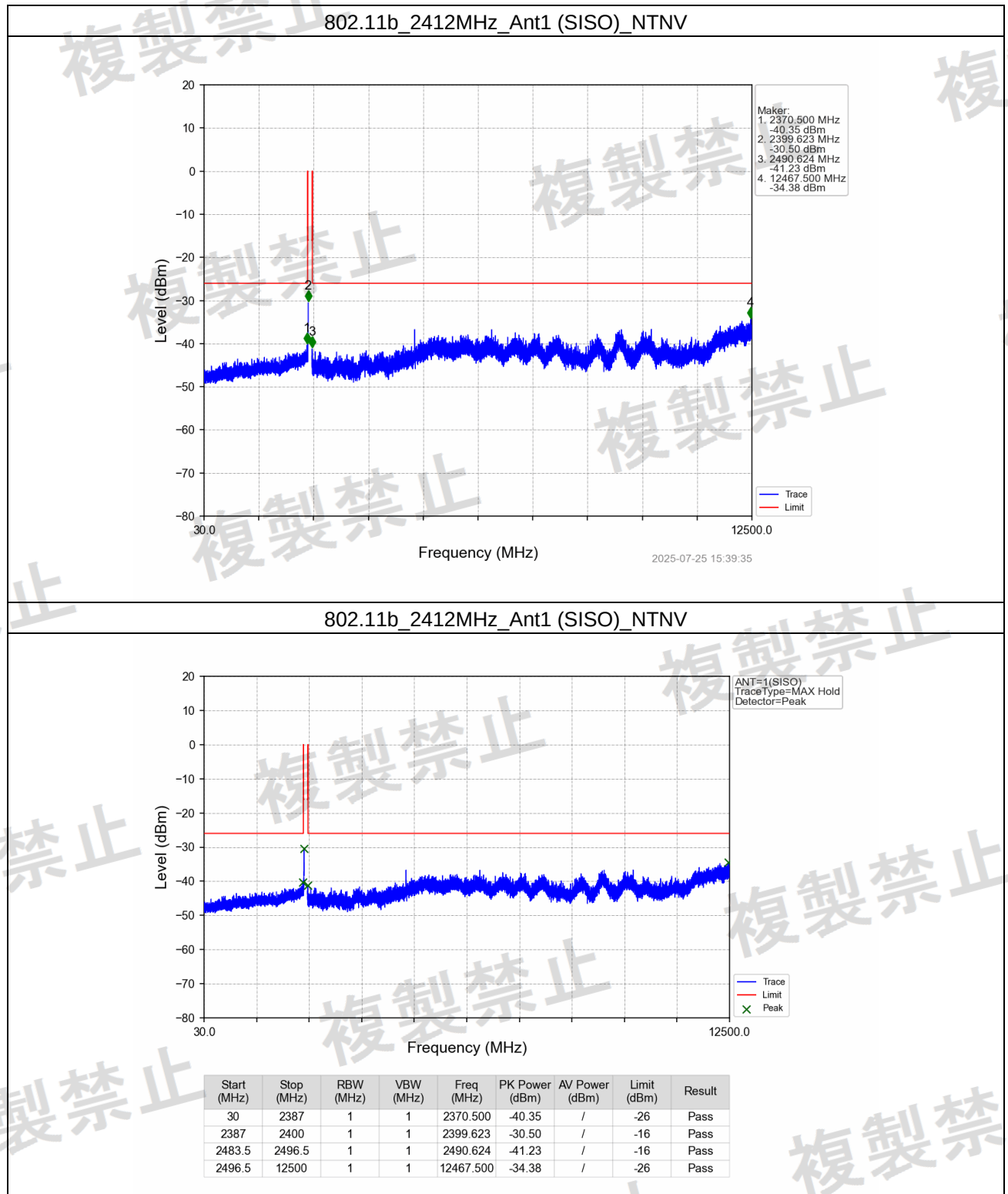
4.1.1 TxSe_NTNV

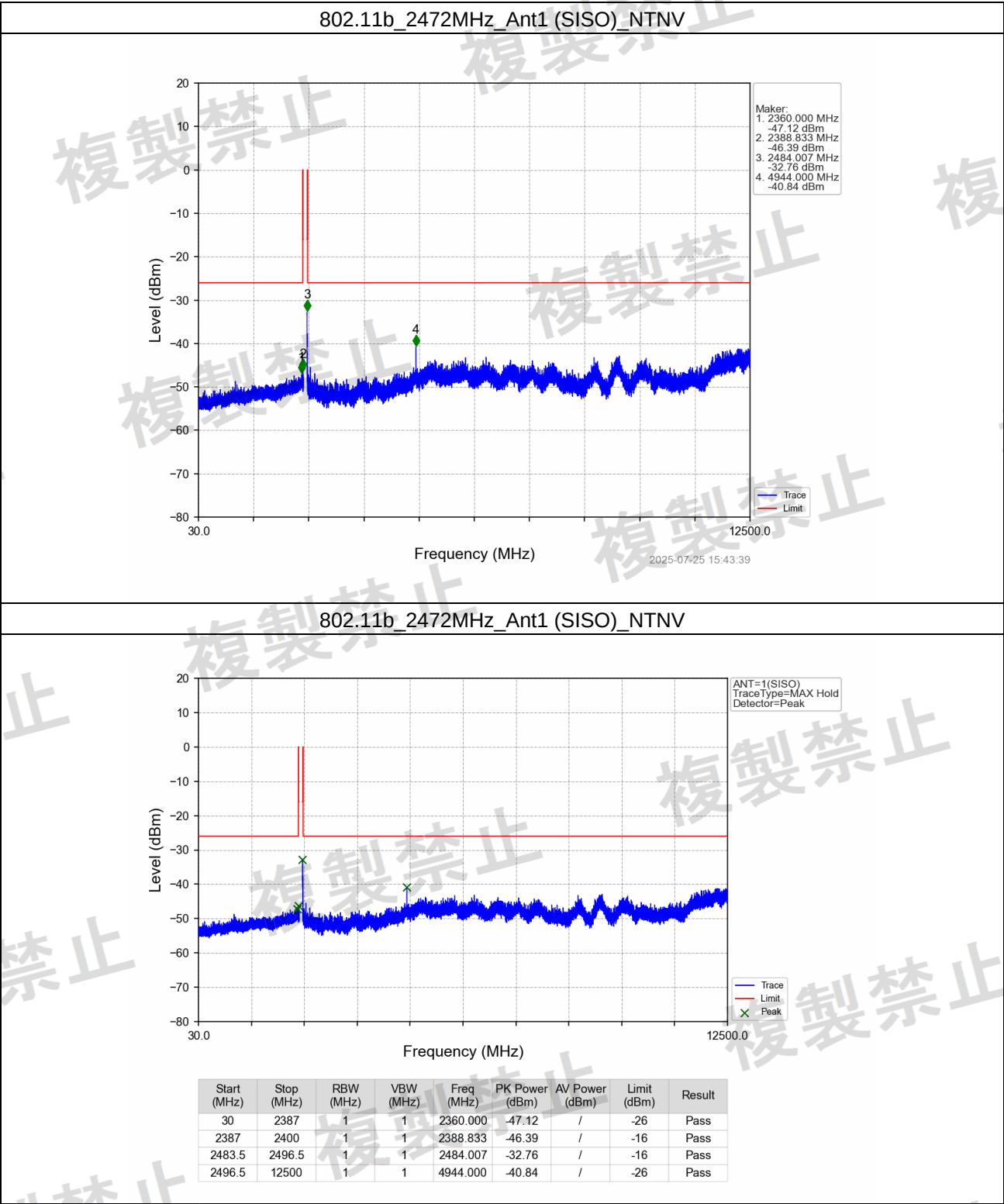
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
802.11b	SISO	2412	1	30	2387	2370.5	-40.35	0.092	/	/	2.5	Pass
				2387	2400	2399.623	-30.50	0.891	/	/	25	Pass
				2483.5	2496.5	2490.624	-41.23	0.075	/	/	25	Pass
				2496.5	12500	12467.5	-34.38	0.365	/	/	2.5	Pass
		2472	1	30	2387	2360	-47.12	0.019	/	/	2.5	Pass
				2387	2400	2388.833	-46.39	0.023	/	/	25	Pass
				2483.5	2496.5	2484.007	-32.76	0.530	/	/	25	Pass
				2496.5	12500	4944	-40.84	0.082	/	/	2.5	Pass
802.11g	SISO	2412	1	30	2387	2386.5	-45.47	0.028	/	/	2.5	Pass
				2387	2400	2399.883	-36.67	0.215	/	/	25	Pass
				2483.5	2496.5	2483.929	-46.76	0.021	/	/	25	Pass
				2496.5	12500	12083.5	-40.54	0.088	/	/	2.5	Pass
		2472	1	30	2387	1948	-47.87	0.016	/	/	2.5	Pass
				2387	2400	2391.472	-49.29	0.012	/	/	25	Pass
				2483.5	2496.5	2483.591	-38.70	0.135	/	/	25	Pass
				2496.5	12500	2560.5	-42.84	0.052	/	/	2.5	Pass
802.11n (HT20)	SISO	2412	1	30	2387	2377.5	-45.36	0.029	/	/	2.5	Pass
				2387	2400	2399.974	-37.00	0.200	/	/	25	Pass
				2483.5	2496.5	2491.144	-46.32	0.023	/	/	25	Pass
				2496.5	12500	12236.5	-40.59	0.087	/	/	2.5	Pass
		2472	1	30	2387	2370	-49.38	0.012	/	/	2.5	Pass
				2387	2400	2399.974	-49.78	0.011	/	/	25	Pass
				2483.5	2496.5	2483.513	-33.63	0.434	/	/	25	Pass
				2496.5	12500	12449.5	-44.38	0.036	/	/	2.5	Pass

Note: The measurement just show the test results, expressed in dBm units, which has the same meaning as uW/MHz.

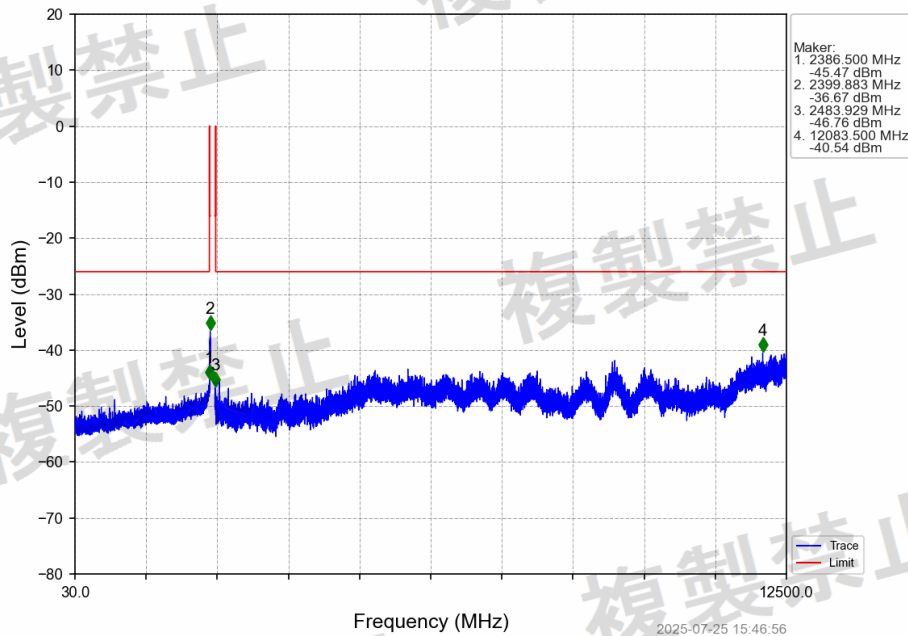
4.2 Test Graph

4.2.1 TxSe_NTNV

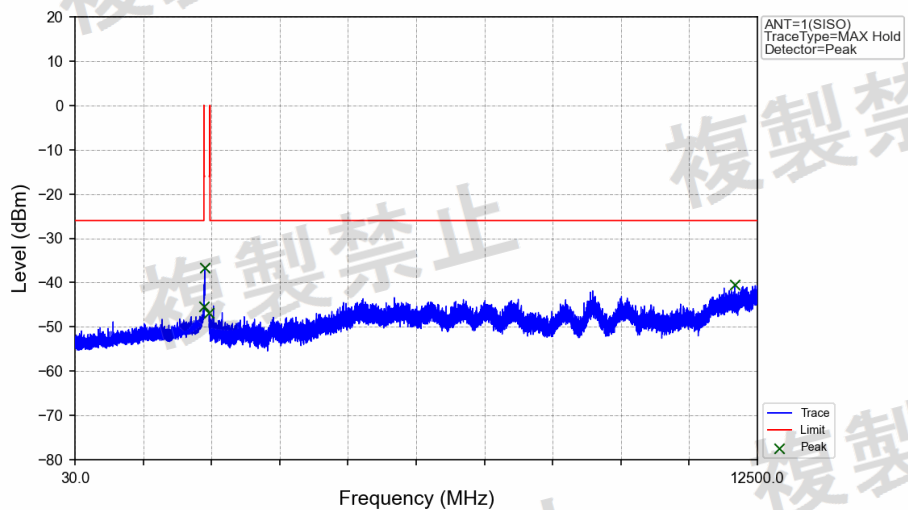




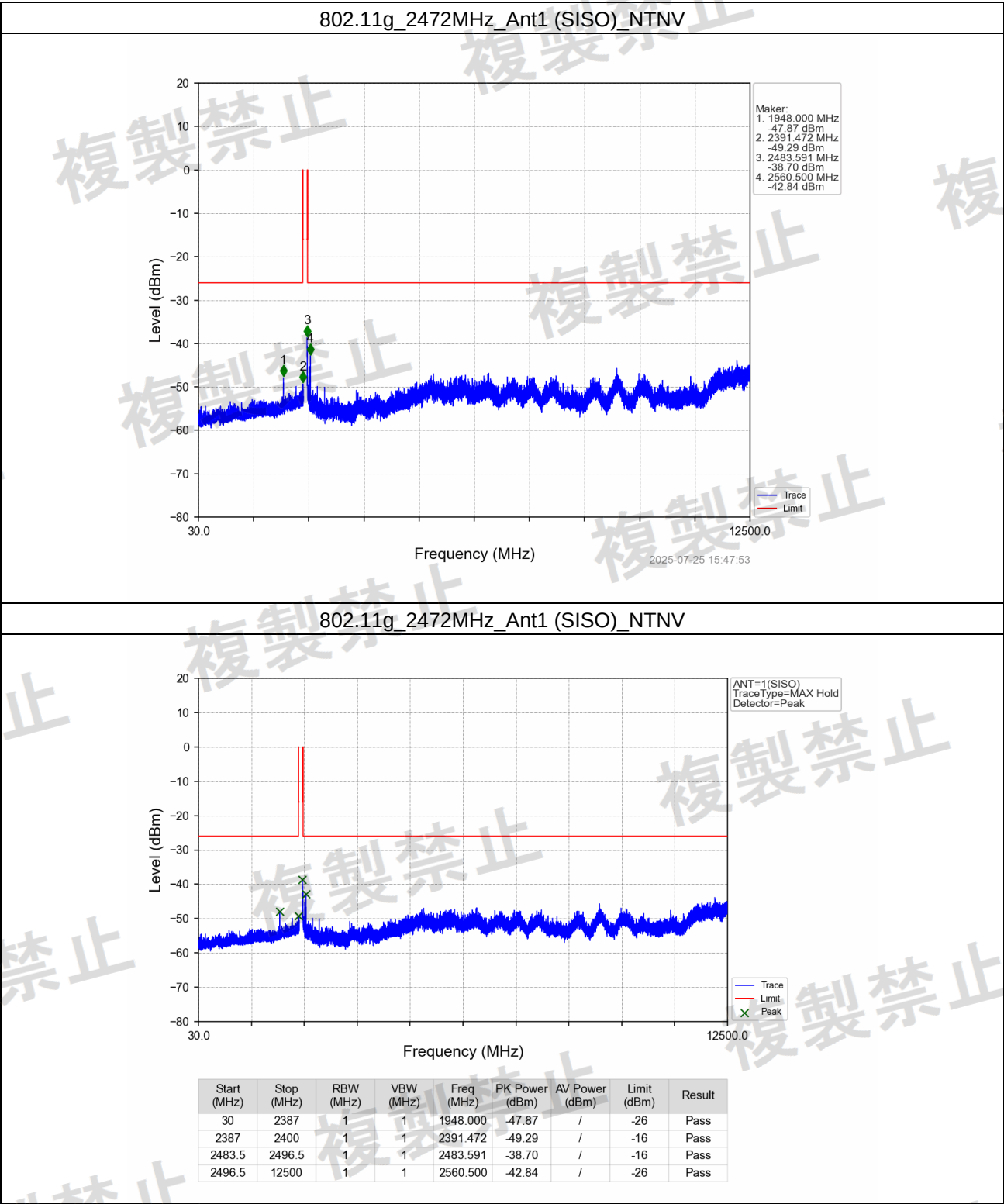
802.11g_2412MHz_Ant1 (SISO)_NTNV



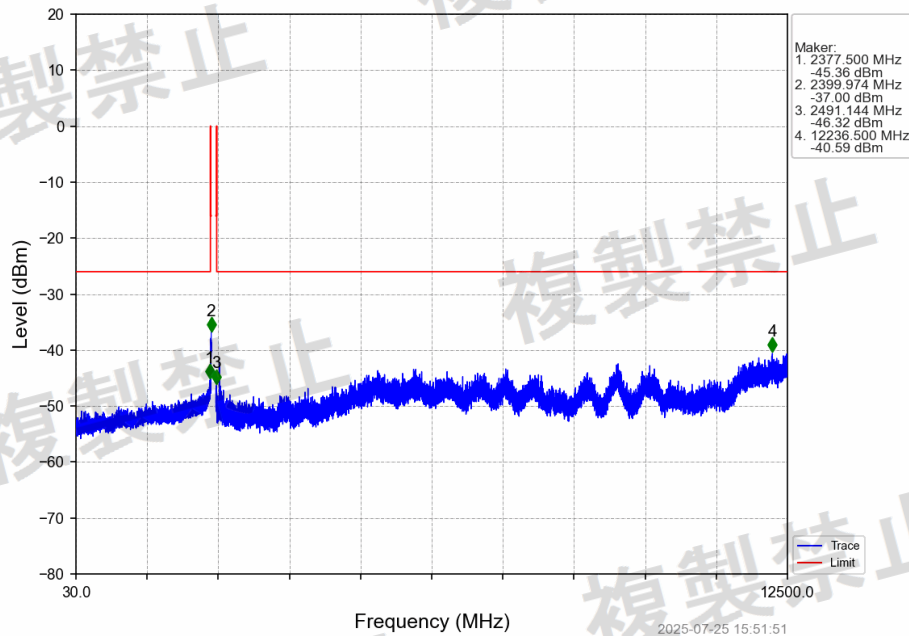
802.11g_2412MHz_Ant1 (SISO)_NTNV



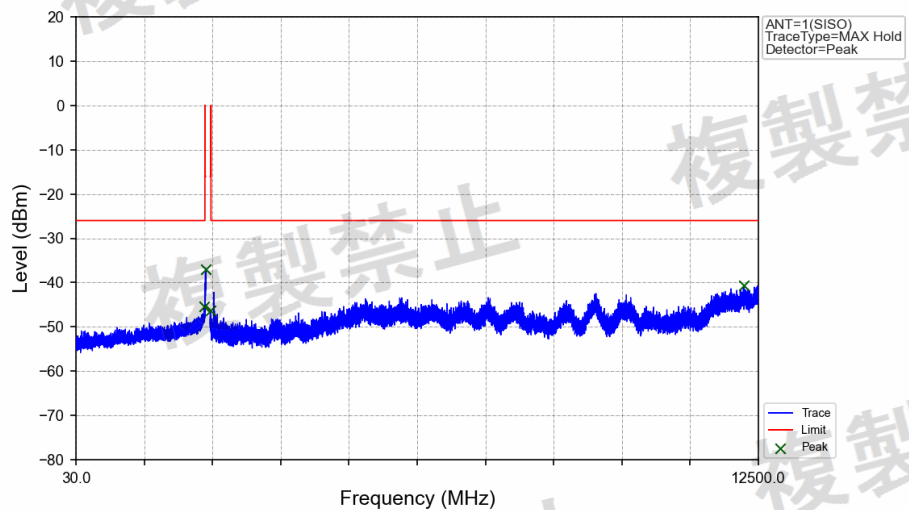
Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2386.500	-45.47	/	-26	Pass
2387	2400	1	1	2399.883	-36.67	/	-16	Pass
2483.5	2496.5	1	1	2483.929	-46.76	/	-16	Pass
2496.5	12500	1	1	12083.500	-40.54	/	-26	Pass



802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

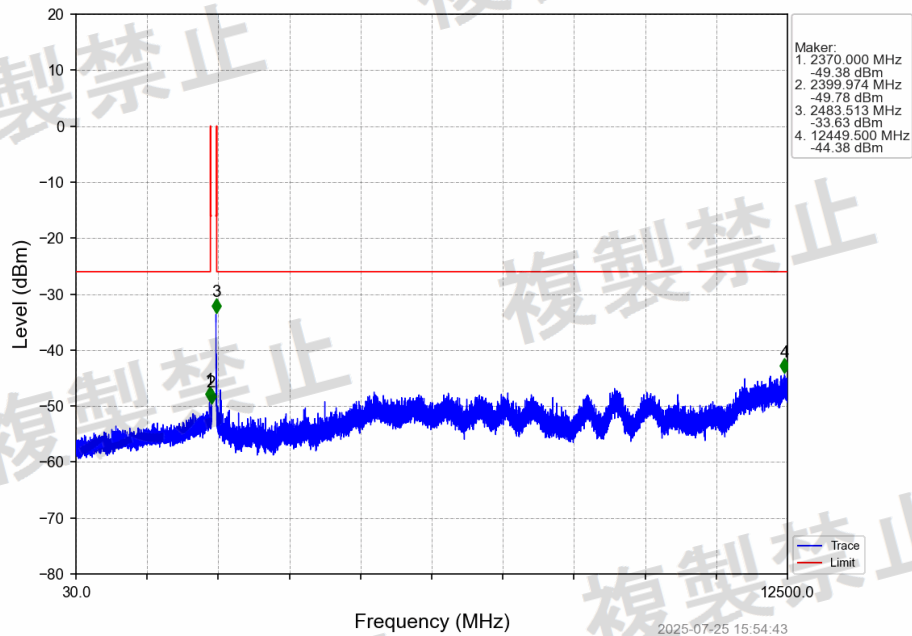


802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

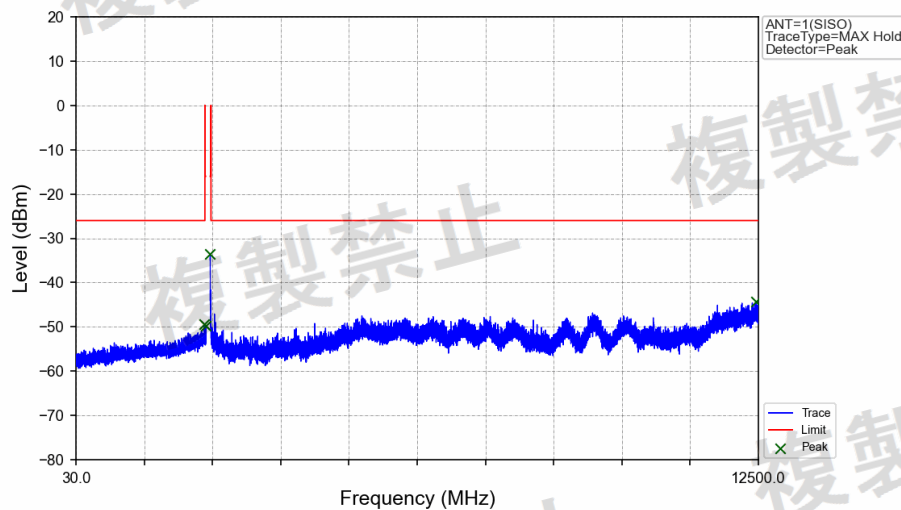


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2377.500	-45.36	/	-26	Pass
2387	2400	1	1	2399.974	-37.00	/	-16	Pass
2483.5	2496.5	1	1	2491.144	-46.32	/	-16	Pass
2496.5	12500	1	1	12236.500	-40.59	/	-26	Pass

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	2370.000	-49.38	/	-26	Pass
2387	2400	1	1	2399.974	-49.78	/	-16	Pass
2483.5	2496.5	1	1	2483.513	-33.63	/	-16	Pass
2496.5	12500	1	1	12449.500	-44.38	/	-26	Pass

5. Secondary Radiated Emission

5.1 Test Result

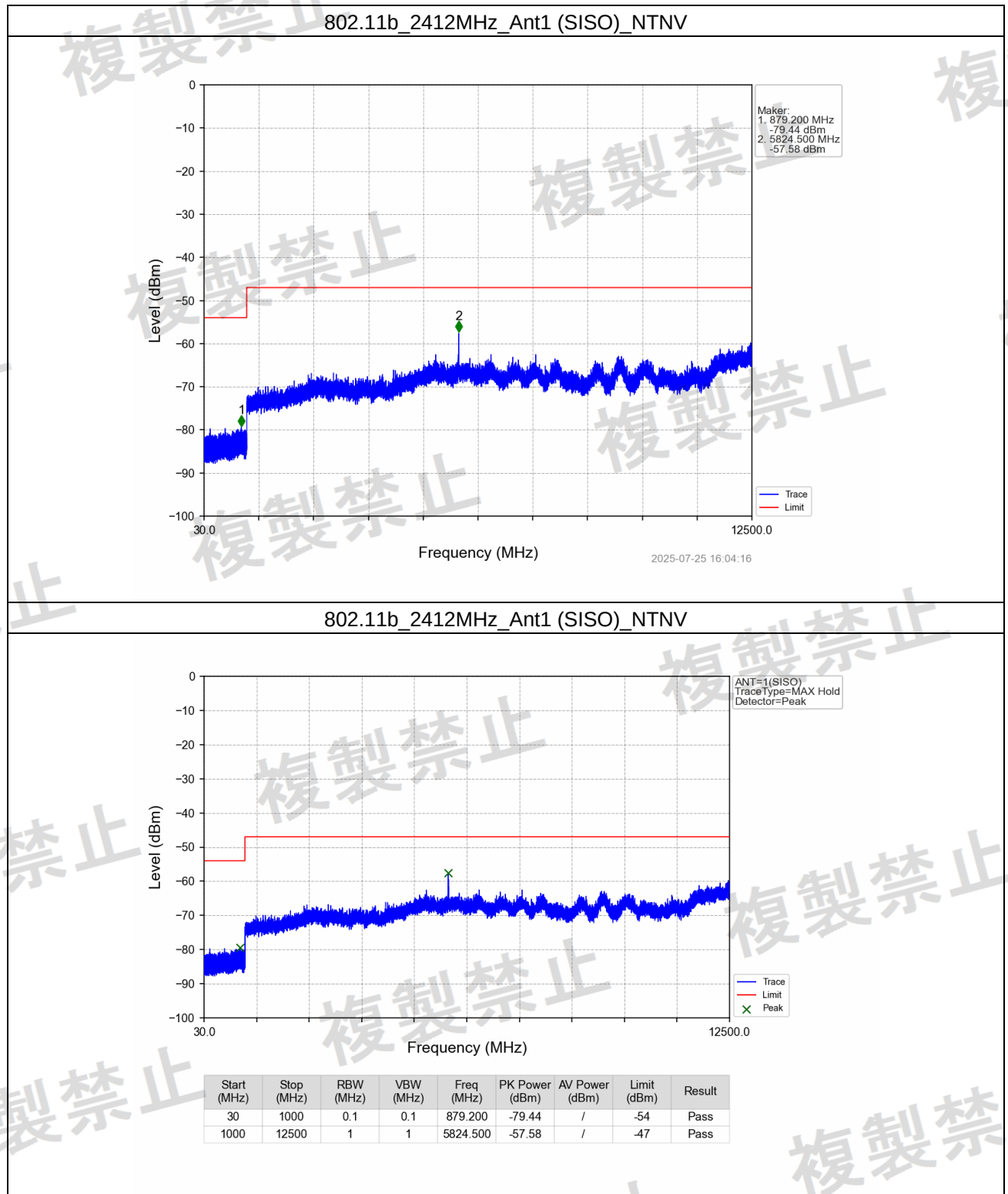
5.1.1 RxSe_NTNV

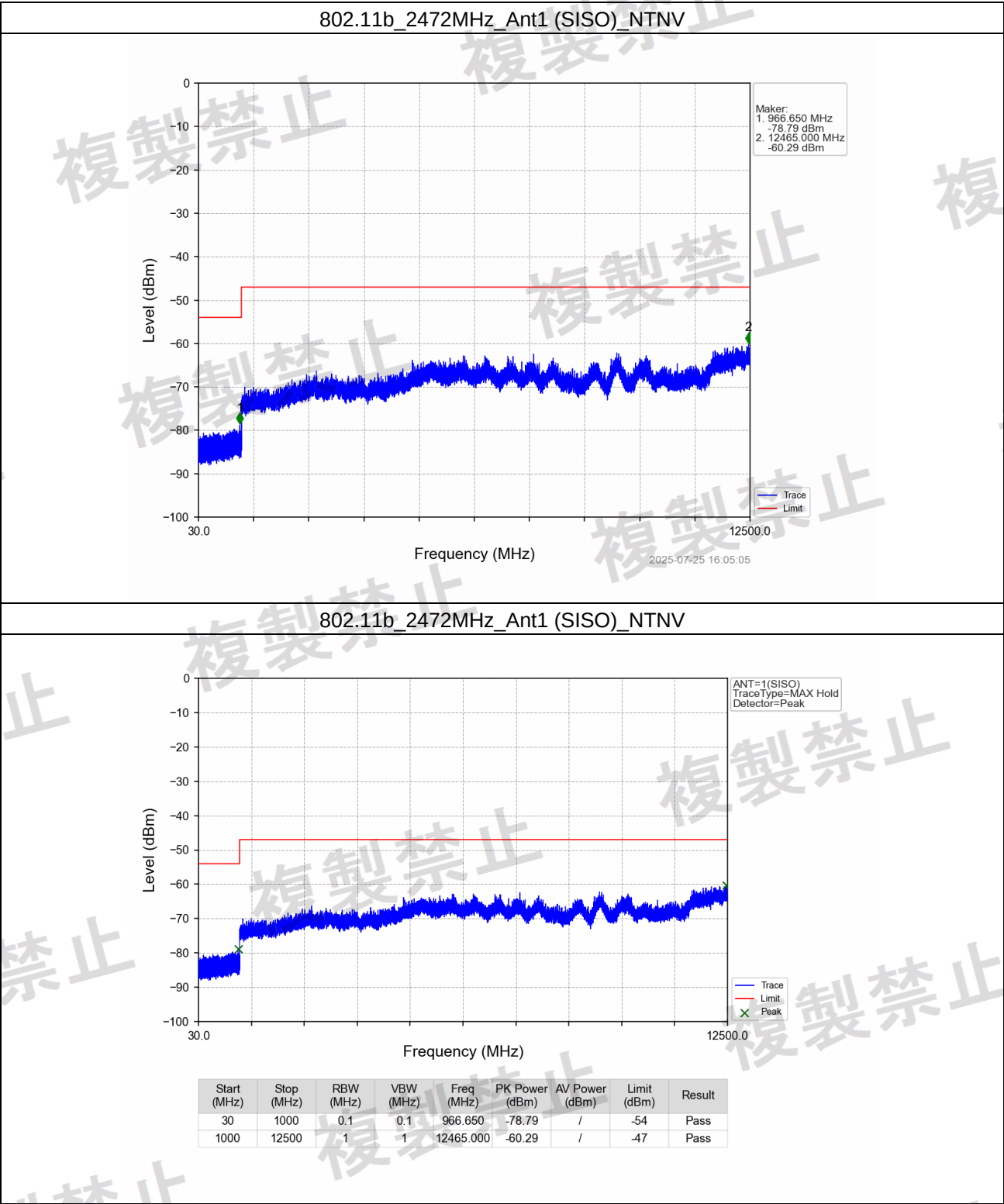
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
802.11b	SISO	2412	1	30	1000	879.2	-79.44	0.011	/	/	4	Pass
				1000	12500	5824.5	-57.58	1.746	/	/	20	Pass
		2472	1	30	1000	966.65	-78.79	0.013	/	/	4	Pass
				1000	12500	12465	-60.29	0.935	/	/	20	Pass
802.11g	SISO	2412	1	30	1000	706.9	-78.93	0.013	/	/	4	Pass
				1000	12500	12426	-60.42	0.908	/	/	20	Pass
		2472	1	30	1000	913.55	-78.86	0.013	/	/	4	Pass
				1000	12500	12457.5	-59.92	1.019	/	/	20	Pass
802.11n (HT20)	SISO	2412	1	30	1000	814.65	-79.20	0.012	/	/	4	Pass
				1000	12500	12440	-60.52	0.887	/	/	20	Pass
		2472	1	30	1000	908.05	-78.41	0.014	/	/	4	Pass
				1000	12500	12438	-60.22	0.951	/	/	20	Pass

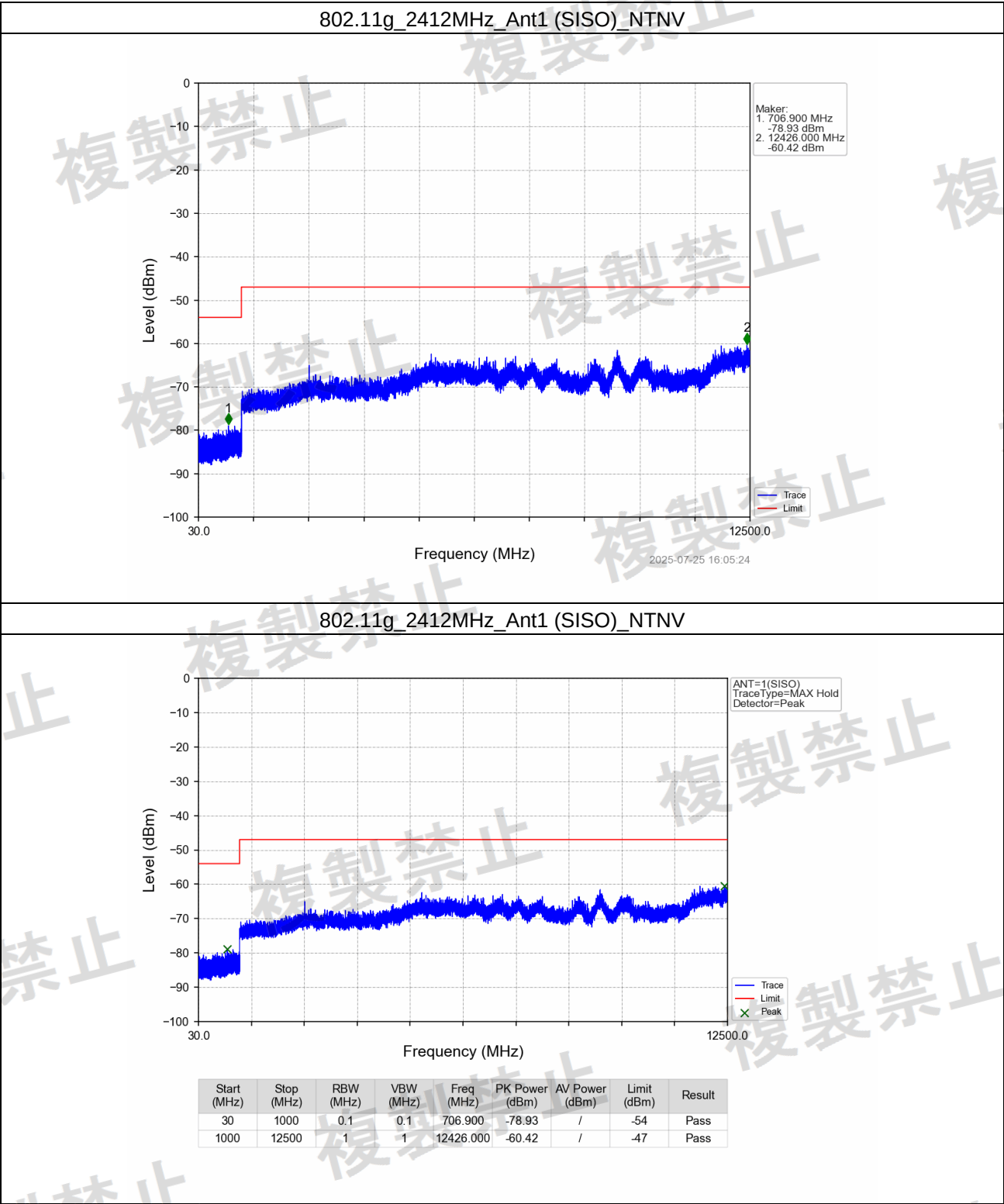
Note: The measurement just show the test results, expressed in dBm units, which has the same meaning as nW.

5.2 Test Graph

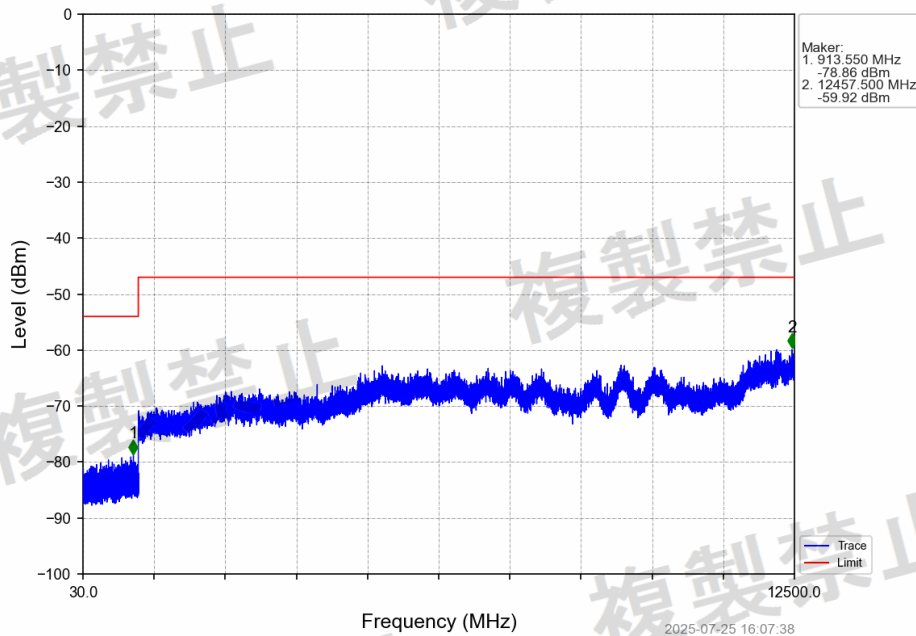
5.2.1 RxSe_NTNV



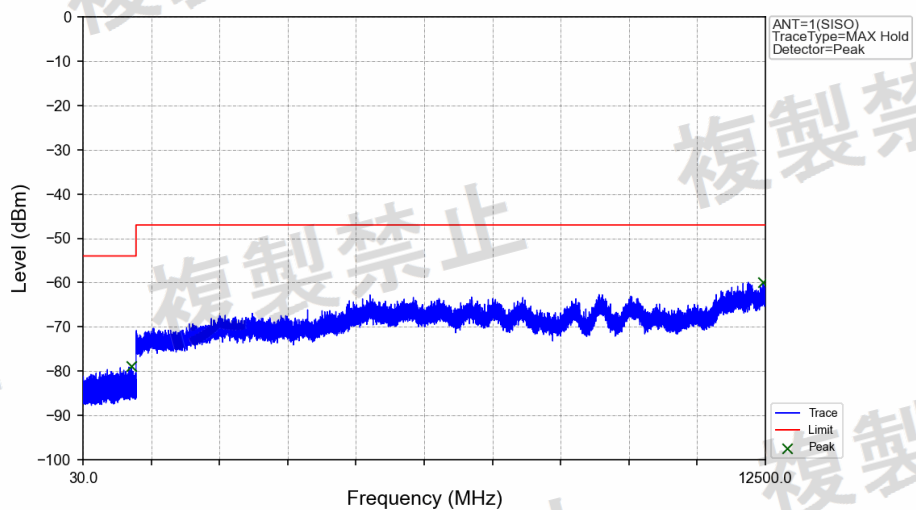




802.11g_2472MHz_Ant1 (SISO)_NTNV



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	1000	0.1	0.1	913.550	-78.86	/	-54	Pass
1000	12500	1	1	12457.500	-59.92	/	-47	Pass

