

TEST REPORT

Report No.: 8431EU010715W2

Applicant: Woan Technology (Shenzhen) Co., Ltd.

Address: Room 1101, Qiancheng Commercial Center, No. 5
Haicheng Road, Mabu Community, Xixiang Sub-district,
Bao'an District, Shenzhen, Guangdong, P.R.China,
518100

Product Name: SwitchBot Permanent Outdoor Lights

Model No.: W1702120 (refer to clause 2.4)

Trademark: SwitchBot

Test Standard(s): MIC Notice No.88 Appendix No.43
Ordinance of MPT No.37, 1981:
Article 2 paragraph 1 item (19)

Test Result: Pass

Date of Receipt: May 07, 2026

Test Date: May 07, 2026 – May 26, 2026

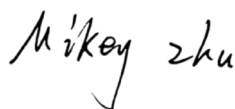
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ISSUED BY:

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2 General Information

2.1 Applicant Information

Applicant	Woan Technology (Shenzhen) Co., Ltd.
Address	Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100

2.2 Manufacturer Information

Manufacturer	Woan Technology (Shenzhen) Co., Ltd.
Address	Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100

2.3 Factory Information

Factory	Wo'an Technology (Shenzhen) Co., Ltd. Huizhou Branch
Address	Building 2, 2nd Floor, Baidi Zhigu Science and Technology Innovation Park, No.263 Chang'an Avenue, Shatian Town, Huiyang District, Huizhou City, Guangdong, China

2.4 General Description of E.U.T.

Product Name	SwitchBot Permanent Outdoor Lights
Model No. Under Test	W1702120
List Model No.	W1702121, W1702122, W1702123, W1702124, W1702125
Description of Model differentiation	All models are same with electrical parameters and internal circuit structure, but only differ in model name. (this information provided by the customer)
Rating(s)	Input: 24V $\equiv$ 2A (Adapter Input: 100-240V~, 50/60Hz, 1.2A Max; Output: 24.0V $\equiv$ 2.0A, 48.0W)
Adapter	Model No.: XY48SR-240200VQ-PP Input: 100-240V~, 50/60Hz, 1.2A Max Output: 24.0V $\equiv$ 2.0A, 48.0W Manufacturer: XING YUAN ELECTRONICS CO., LTD
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Test Sample No.	-1/2(Normal Sample), -2/2(Engineering Sample)
Hardware Version	V03
Software Version	V15
Remark	For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.5 Technical Information of E.U.T.

Network and Wireless Connectivity	Bluetooth Low Energy (BLE) WiFi 2.4G: 802.11b, 802.11g, 802.11n(HT20/40)
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The requirement for the following technical information of the EUT was tested in this report:

Technology	WiFi 2.4G
Operation Mode	☒ b ☒ g ☒ n(HT20) ☒ n(HT40)
	☐ ac(VHT20) ☐ ac(VHT40) ☐ ax(HEW20) ☐ ax(HEW40)
Operating Frequency	802.11b/g/n(HT20): 2412MHz to 2472MHz 802.11n(HT40): 2422MHz to 2462MHz
Number of Channels	802.11b/g/n(HT20): 13 Channels 802.11n(HT40): 9 Channels
Modulation Technology	DSSS, OFDM
Modulation Type	☒ 802.11b: DSSS (CCK, DQPSK, DBPSK) ☒ 802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM) ☒ 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) ☐ 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) ☐ 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Antenna Type	PCB Antenna
Antenna Gain(Peak)	2.53 dBi
Antenna Impedance	50Ω
Rated output Power	802.11b: 1.200 mW/MHz 802.11g: 1.200 mW/MHz 802.11n 20: 1.000 mW/MHz 802.11n 40: 1.000 mW/MHz
Remark	The above information are declared by the applicant, EU-LAB is not responsible for the information accuracy provided by the applicant.

All channels were listed on the following table:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
01	2412	05	2432	09	2452	13	2472
02	2417	06	2437	10	2457		
03	2422	07	2442	11	2462		
04	2427	08	2447	12	2467		

Modulation technology	Modulation Type	Transfer Rate (Mbps)(Single RF path)
DSSS (802.11b)	DBPSK	1
	DQPSK	2
	CCK	5.5/11
OFDM (802.11g)	BPSK	6/9
	QPSK	12/18
	16QAM	24/36
	64QAM	48/54
OFDM (802.11n-20 MHz)	BPSK	6.5/7.2
	QPSK	13/19.5/14.4/21.7
	16QAM	26/39/28.9/43.3
	64QAM	52/58.5/65/57.8/65/72.2
OFDM (802.11n-40 MHz)	BPSK	13.5/15
	QPSK	27/40.5/30/45
	16QAM	54/81/60/90
	64QAM	108/121.5/135/120/150

3 Test Summary

3.1 Test Standard

The tests were performed according to following standards:

No.	Identity	Document Title
1	MIC Notice No.88 Appendix No.43 Ordinance of MPT No.37, 1981: Article 2 paragraph 1 item (19)	Low power data communications system in the 2.4GHz band

Remark:

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission should be checked to ensure compliance has been maintained.

3.2 Test Verdict

No.	Description	Test Mode	Channel		Data Rate (Mbps)	Verdict	Remark
1	Frequency Tolerance	Modulation	1/13	3/11	/	Pass	--
2	Occupied Bandwidth	11b/11g/11n20/11n40	1/13	3/11	1/6/6.5/13.5/Mbps	Pass	--
3	Antenna Power / EIRP Antenna Power	11b/11g/11n20/11n40	1/13	3/11	1/6/6.5/13.5/Mbps	Pass	--
4	Spurious Emission Intensity	11b/11g/11n20/11n40	1/13	3/11	1/6/6.5/13.5/Mbps	Pass	--
5	Secondary Radiated Emission	11b/11g/11n20/11n40	1/13	3/11	1/6/6.5/13.5/Mbps	Pass	--
6	Spurious Emissions	11b/11g/11n20/11n40	1/13	3/11	1/6/6.5/13.5/Mbps	Pass	--
7	Interference Prevention Function	11b/11g/11n20/11n40	1/13	3/11	1/6/6.5/13.5/Mbps	Pass	--
8	Transmission Radiated Angle Width (3dB Beam Bandwidth)	11b/11g/11n20/11n40	1/13	3/11	1/6/6.5/13.5/Mbps	N/A	Note ²
9	Construction Protection Confirmation	11b/11g/11n20/11n40	1/13	3/11	1/6/6.5/13.5/Mbps	Compliance	--
10	Carrier Sense Function	11n40	--	3/11	13.5 Mbps	Compliance	--
11	Carrier Sense Function	--	--	--	--	N/A	Note ³

Note 1: The tests were performed according to the method of measurements prescribed in MIC Notice No.88 Appendix No.43.

Note 2: This test is not applicable for 802.11b/g/n20 EIRP is less than 12.14dBm/MHz and 802.11n40 EIRP is less than 9.14dBm/MHz.

Note 3: Not apply to this device, since EIRP does not require compensation through Antenna Power.

The test channel corresponding to the frequency list:

Mode	Channel	Channel Number	Frequency (MHz)
11b	HIGH/LOW(H/L)	13/1	2472/2412
11g	HIGH/LOW(H/L)	13/1	2472/2412
11n20	HIGH/LOW(H/L)	13/1	2472/2412
11n40	HIGH/LOW(H/L)	11/3	2422/2462

3.3 Test Laboratory

Test Laboratory	Shenzhen EU Testing Laboratory Limited
Address	101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China

4 Test Configuration

4.1 Test Environment

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	52%	
Atmospheric Pressure	103 kPa	
Temperature	NT (Normal Temperature)	+26°C
Working Voltage of the EUT	NV (Normal Voltage)	100VAC
	LV (Low Voltage)	90VAC
	HV (High Voltage)	110VDC

Power Supply Voltage Fluctuation Test

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input To EUT	100VAC	110VAC	90VAC
Output To RF Module	3.3VDC	3.3VDC	3.3VDC
Voltage Variation (%)	--	0.00%	0.00%

Note:

$\text{Voltage Variation (\%)} = (\text{Output high or Low Voltage} - \text{Output Normal Voltage}) / \text{Output Normal Voltage} * 100\%$
 For extreme voltage test, we have tested the relationship between the external power supply and RF IC power supply. Base on the test results, only the normal voltage was selected to perform all items.

4.2 Test Equipment

Radiated Emission and RF Test					
Equipment	Manufacturer	Model No	Serial No	Cal Date	Cal Due Date
EMI Test Receiver	ROHDE & SCHWARZ	ESPI	EE-006	2026/01/07	2027/01/06
Bilog Broadband Antenna	SCHWARZBECK	VULB 9163	EE-007	2026/01/13	2029/01/12
Double Ridged Horn Antenna	A-INFOMW	LB-10180-NF	EE-008	2026/01/11	2029/01/10
Pre-amplifier	Agilent	8447D	EE-009	2026/01/07	2027/01/06
Pre-amplifier	Agilent	8449B	EE-010	2026/01/07	2027/01/06
MXA Signal Analyzer	Agilent	N9020A	EE-011	2026/01/07	2027/01/06
MXG RF Vector Signal Generator	Agilent	N5182A	EE-012	2026/01/07	2027/01/06
Test Software	Farad	EZ-EMC	EE-015	N.C.R	N.C.R
MIMO Power Measurement Module	TSTPASS	TSPS 2023R	EE-016	2026/01/07	2027/01/06
RF Test Software	TSTPASS	TS32893 V2.0	EE-017	N.C.R	N.C.R
Wideband Radio Communication Tester	ROHDE & SCHWARZ	CMW500	EE-402	2026/02/13	2027/02/12
Loop Antenna	TESEQ	HLA6121	EE-403	2026/02/13	2027/02/12
MXG RF Analog Signal Generator	Agilent	N5181A	EE-406	2026/02/13	2027/02/12
Constant Temperature Humidity Chamber	Guangxin	GXP-401	ES-002	2025/07/29	2026/07/28
DC Power Source	QJE	QJ3020E	ES-037	2025/07/29	2026/07/28
Note ¹ : Calibration Company: Shenzhen Academy Of Metrology& Quality inspection.					
Note ² : Calibration method: Calibration conducted in foreign countries, which is equivalent to calibration conducted by the NICT or a designated calibration agency under Article 102-18-1 and Article 24-2, Paragraph 4 of the Radio Act.					

4.3 Description of Support Unit

No.	Title	Manufacturer	Model No.	Serial No.
1	Adapter	refer to clause 2.4	refer to clause 2.4	--

4.4 Measurement Uncertainty

Parameters	Uncertainty
Frequency Error / 99% Bandwidth	$(3.2 \times f \times 10^{-6})$ Hz
Antenna Power	1.82 dB
TX-RX Spurious Emissions	1.84 dB
Transmission Antenna Gain	5.36 dB
Temperature	0.82 °C
Humidity	4.1%
DC / AC Power Source	0.04%
Duty Cycle	0.05%
Noet: "f" is the nominal signal frequency in Hz.	

Note: This uncertainty represents as expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5 Test Items

5.1 Frequency Tolerance Test

5.1.1 Test Requirement

Item	Limits
Frequency Tolerance	$\leq \pm 50$ ppm

5.1.2 Test Setup Diagram



5.1.3 Test Procedure

Test Frequency= test channel
RBW=VBW=10KHz
Span=1MHz (for 802.11b/g/n20)
Sweep time=Auto
Detector mode=Positive peak
Indication mode=Max hold
EUT have transmitted unmodulated signal and fixed channelize. f is using the mark cursor to mark the peak frequency value, f_c is declaring of channel frequency. Then the frequency error formula is $(f-f_c)/f_c \times 10^6$ ppm and the limit is less than ± 50 ppm.

5.1.4 Test Deviation

There is no deviation with the original standard.

5.1.5 EUT Operation during Test

The EUT was programmed to be in continuous transmit, modulated waveform mode (computing).

5.1.6 Test Data

PASS.

Please refer to Annex D for details.

5.2 Occupied Bandwidth

5.2.1 Test Requirement

Item	Limits
Occupied Band Width	FHSS $\leq$ 83.5MHz; OFDM $\leq$ 40MHz, DSSS $\leq$ 26MHz; Others $\leq$ 26MHz

5.2.2 Test Setup Diagram



5.2.3 Test Procedure

- Set the spectrum analyzer as follows:
 Center frequency: Test frequency
 Span: Approximately 2 to 3.5 times nominal bandwidth
 Resolution bandwidth: Within 3% of the technical standard
 Video bandwidth: equivalent to resolvable bandwidth
 Sweep time: auto
 Sweep mode: Continuous sweep
 Detection: Positive peak
 Trace mode: Maximum hold
- After repeating sweeps until the display shows steady data, store the values at all data points into the computer array variables.
- Convert the dB values at all data points to antilogarithm on the power dimension.
- Obtain sum total of the power at all data points, and store it as "total power".

5.2.4 Test Deviation

There is no deviation with the original standard.

5.2.5 EUT Operation during Test

The EUT was programmed to be in continuous transmit, channel-selected mode.

5.2.6 Test Data

PASS.

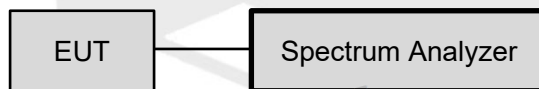
Please refer to Annex D for details.

5.3 Antenna Power / EIRP Antenna Power

5.3.1 Test Requirement

Item	Limits
Antenna Power Density	a) FH, FH+DS, or FH+OFDM form 2427 - 2470.75 MHz: ≤ 3 mW/MHz b) DS but other than a) from 2400~2483.5 MHz: ≤ 10 mW/MHz c) OFDM, but other than a): For OCB of 26MHz or less: ≤ 10 mW/MHz For OCB of over 26 MHz to 40 MHz: ≤ 5 mW/MHz d) Other than a), b) and c): ≤ 10 mW
Antenna Power Error	+20% (Base on manufacturer declare antenna power density)
EIRP Power	12.14 dBm/MHz

5.3.2 Test Setup Diagram



5.3.3 Test Procedure

[Setting 1] – Search for peak power frequency	
Center Frequency:	Test frequency
Span:	Approximately twice the occupied bandwidth
RBW:	$\geq$ OBW
VBW:	Approximately three times the RBW
Sweep time:	Auto
Sweep data points:	1001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold
[Setting 2] – Measurement of average antenna power other than for FHSS, DSSS, OFDM	
Frequency:	Frequency of peak power found using [Setting 1]
Span:	0 Hz
RBW:	Bandwidth sufficient to cover that occupied by the carrier
VBW:	Bandwidth sufficient to cover that occupied by the carrier
Detector mode:	Sample
Sweep:	Minimum time required to make an accurate measurement.
	For burst type (intermittent) transmission sweep time shall be greater than one burst interval
Sweep data points:	1001 or greater

5.3.4 Test Deviation

There is no deviation with the original standard.

5.3.5 EUT Operation during Test

The EUT was programmed to be in continuous transmit, channel-selected mode.

5.3.6 Test Data

PASS.

Please refer to Annex D for details.

5.4 Spurious Emissions Intensity Test

5.4.1 Test Requirement

Item	Limits
TX Spurious Emission	$\leq 2.5 \mu\text{W}/\text{MHz}$ ($30 \leq f \leq 1000 \text{ MHz}$),
	$\leq 2.5 \mu\text{W}/\text{MHz}$ ($1000 \text{ MHz} \leq f < 2387 \text{ MHz}$; $2496.5 \text{ MHz} < f$)
	$\leq 25 \mu\text{W}$ ($2387 \text{ MHz} \leq f < 2400 \text{ MHz}$) and ($2483.5 \text{ MHz} < f \leq 2496.5 \text{ MHz}$)

5.4.2 Test Setup Diagram



5.4.3 Test Procedure

Spectrum Parameter	Setting
Attenuation	Auto
RB	30-1000 MHz: 1 MHz/1 MHz
VB	Above 1GHz: 1 MHz/1 MHz
Detector	Peak
Trace	Max Hold
Sweep	Auto

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. Setting of SA is following as: RBW/VBW = 1MHz; / AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
3. Setting of SA is following as 30 MHz and stop frequency 1000 MHz Then to mark peak reading value + cable loss shall be less than 2.5 $\mu\text{W}/\text{MHz}$.
4. Setting of SA is following as 1000 MHz and stop frequency 2387 MHz Then to mark peak reading value + cable loss shall be less than 2.5 $\mu\text{W}/\text{MHz}$.
5. SA adjusted to start frequency 2387 MHz and stop frequency 2400 MHz. Then to mark peak reading value + cable loss shall be less than 25 $\mu\text{W}/\text{MHz}$.
6. SA adjusted to start frequency 2483.5 MHz and stop frequency 2496.5 MHz Then to mark peak reading value + cable loss shall be less than 25 $\mu\text{W}/\text{MHz}$.
7. SA adjusted to start frequency 2496.5 MHz and stop frequency 12500 MHz Then to mark peak reading value + cable loss shall be less than 2.5 $\mu\text{W}/\text{MHz}$.
8. If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

5.4.4 Test Deviation

There is no deviation with the original standard.

5.4.5 EUT Operation during Test

The EUT was programmed to be in continuous transmit, channel-selected mode.

5.4.6 Test Data

PASS.

Please refer to Annex D for details.

5.5 Secondary Radiated Emissions Test

5.5.1 Test Requirement

Item	Limits
RX Spurious Emission	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)

5.5.2 Test Setup Diagram



5.5.3 Test Procedure

Spectrum Parameter	Setting
Attenuation	Auto
RB	30-1000 MHz: 100KHz/100KHz
VB	Above 1GHz: 1 MHz/1 MHz
Detector	Peak
Trace	Max Hold
Sweep	Auto

1. EUT has the continuous reception mode and fixed only one channelize.
2. Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) / AT:10 dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
3. SA set RB: 100 kHz and VB: 100 kHz. Then adjust to start frequency 30 MHz and stop frequency 1000 MHz. Search to mark peak reading value + cable loss shall be less than 4 nW.
4. SA set RB: 1 MHz and VB: 1 MHz. Then adjust to start frequency 1000 MHz and stop frequency 12500 MHz. Search to mark peak reading value + cable loss shall be less than 20 nW.
5. If power level of lower emissions are more than 1/10 of limit (0.4nW for $f < 1\text{GHz}$, 2 nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

5.5.4 Test Deviation

There is no deviation with the original standard.

5.5.5 EUT Operation during Test

The EUT was programmed to be in continuous transmit, channel-selected mode.

5.5.6 Test Data

PASS.

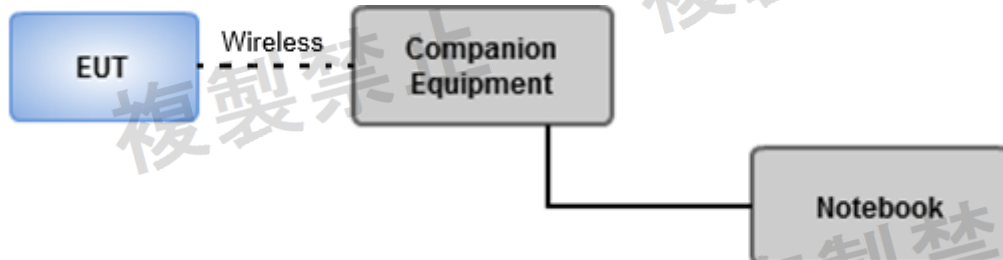
Please refer to Annex D for details.

5.6 Interference Prevention Function

5.6.1 Test Requirement

Item	Limits
Identification	≥ 48 bits

5.6.2 Test Setup Diagram



5.6.3 Test Procedure

- In the case that the EUT has the function of automatically transmitting the identification code:
 - Transmit the predetermined identification codes from EUT.
 - Check the transmitted identification codes with the demodulator.
- In the case of receiving the identification code:
 - Transmit the predetermined identification codes from the counterpart.
 - Check if communication is normal.
 - Transmit the signals other than predetermined ID codes from the counterpart.
 - check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

5.6.4 Test Deviation

There is no deviation with the original standard.

5.6.5 EUT Operation during Test

The EUT was programmed to be in continuous transmit, channel-selected mode.

5.6.6 Test Data

PASS.

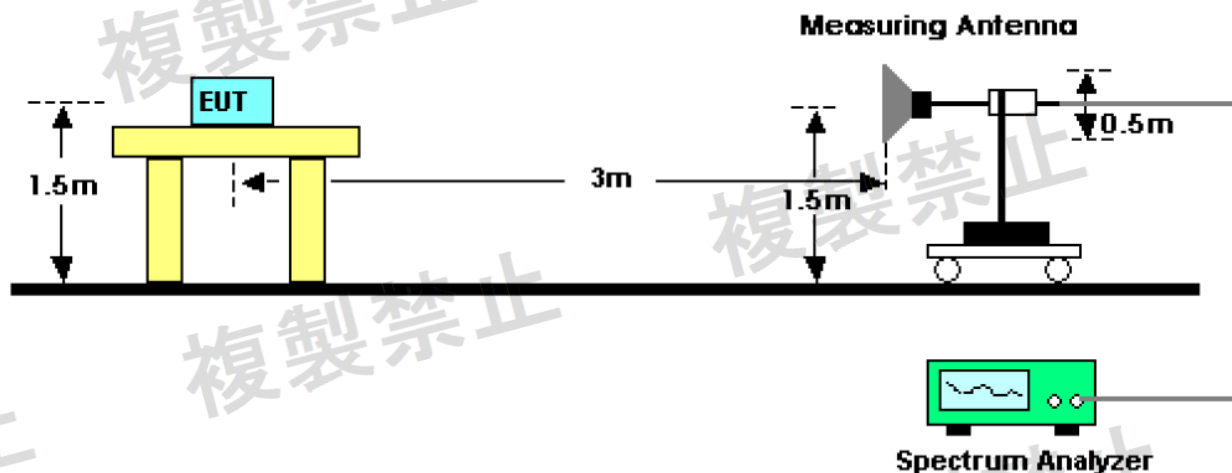
Mode	ID Code	Test Results
2.4G WiFi	E8:82:E3:19:1F:65	Pass

5.7 Transmission Radiation Angle Width (3dB Beamwidth) Measurement

5.7.1 Test Requirement

Item	Limits
3dB antenna beam width	$360/A$ (If $A < 1$; then $A = 1$) $A = \{ \text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM} \}$ or $A = \{ \text{EIRP Power [mW]} / 4.9 \text{ for FH} \}$
Note: This test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less.	

5.7.2 Test Setup Diagram



5.7.3 Test Procedure

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with RBW=1 MHz, VBW=1 KHz, Y scale=5 dB, Detector=Peak, Trace mode=Max Hold, and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as "E".
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$). $A = \{ \text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM} \}$ or $A = \{ \text{EIRP Power [mW]} / 4.9 \text{ for FH} \}$

5.7.4 Test Deviation

There is no deviation with the original standard.

5.7.5 EUT Operation during Test

The EUT was programmed to be in continuous transmit, channel-selected mode.

5.7.6 Test Data

Note: Because the 802.11b/g/n20 EIRP is less than 12.14dBm/MHz and 802.11n40 EIRP is less than 9.14dBm/MHz, this item is not applicable.

5.8 Carrier Sense Function

5.8.1 Test Requirement

Limits	Radio equipment using OFDM method shall provide a carrier sensing function when the occupied bandwidth of its transmitting device is over 26 MHz and 40 MHz or less.
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5.8.2 Test Setup Diagram



5.8.3 Test Procedure

- 1 Set the spectrum analyzer as follows:
Center frequency: Center of frequency of test channel
Frequency sweep width: 50MHz
RBW: Approximately 1MHz
VBW: Approximately same as RBW
Y-axis scale: 10dB / div
Detection mode: Positive peak
- 2 Turn off the output of the standard signal generator. Set the standard signal generator as follows:
Carrier frequency: Center of reception frequency band of EUT
Modulation: No modulation
Output level: Specified level at antenna input of EUT
- 3 Make a line connection between the EUT and the external test device and confirm using the spectrum analyzer that the EUT is transmitting a test frequency signal of OFDM method which occupied bandwidth is over 26 MHz.
- 4 EUT is set to a test frequency and a test spreading code and put to reception state first. when using an external test device, a communication link between the EUT and the external test device is established.
- 5 Turn on the output of the standard signal generator, set the EUT to transmission state and confirm using the spectrum analyzer that the EUT does not transmit radio wave of OFDM method which occupied bandwidth is over 26 MHz.

5.8.4 Test Deviation

There is no deviation with the original standard.

5.8.5 EUT Operation during Test

EUT is set to a test frequency and a test spreading code and put to reception state first.

5.8.6 Test Data

802.11n (40M)

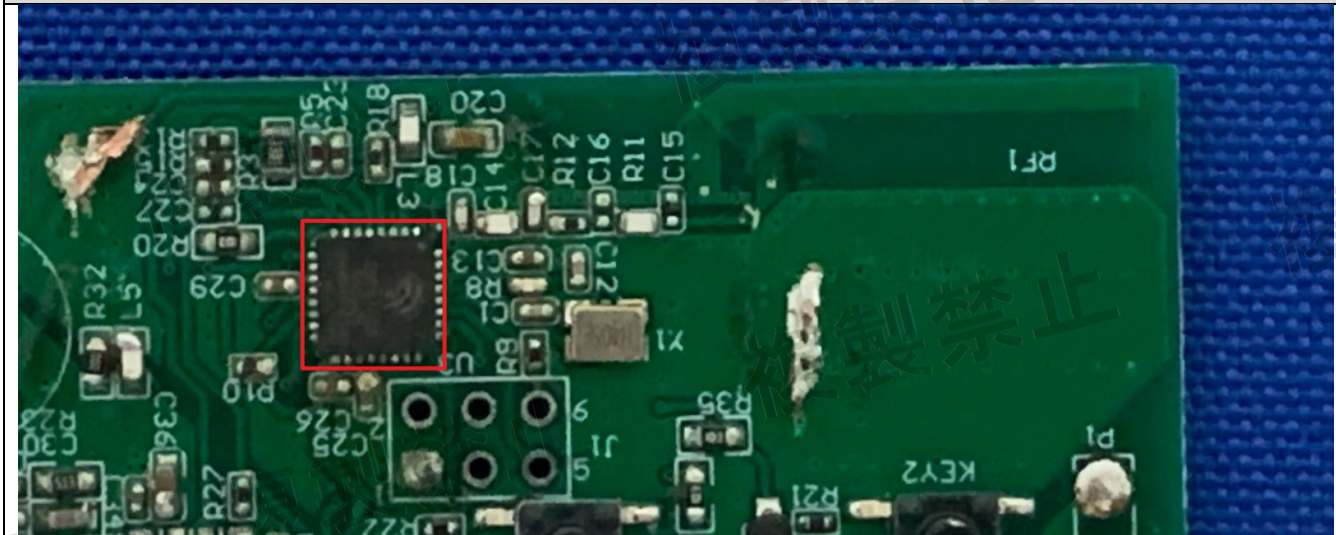
Test Voltage	Channel	Test Result	Verdict
LV	Low	GOOD	Pass
	Middle	GOOD	Pass
	High	GOOD	Pass
NV	Low	GOOD	Pass
	Middle	GOOD	Pass
	High	GOOD	Pass
HV	Low	GOOD	Pass
	Middle	GOOD	Pass
	High	GOOD	Pass

5.9 Construction Protection Confirmation Method

The RF and modulation portions are protected against illegal modification as following method:

Protected Method	Description
Structure protection	The terminal number is 33, terminal pitch is 1mm. it can't be easily opened and modified.

Reference Photo



ANNEX A TEST SETUP PHOTOS

Please refer to the document "8431EU010715W-AA.PDF"

ANNEX B EXTERNAL PHOTOS

Please refer to the document "8431EU010715W-AB.PDF"

ANNEX C INTERNAL PHOTOS

Please refer to the document "8431EU010715W-AC.PDF"

ANNEX D TEST DATA

1. Frequency Error

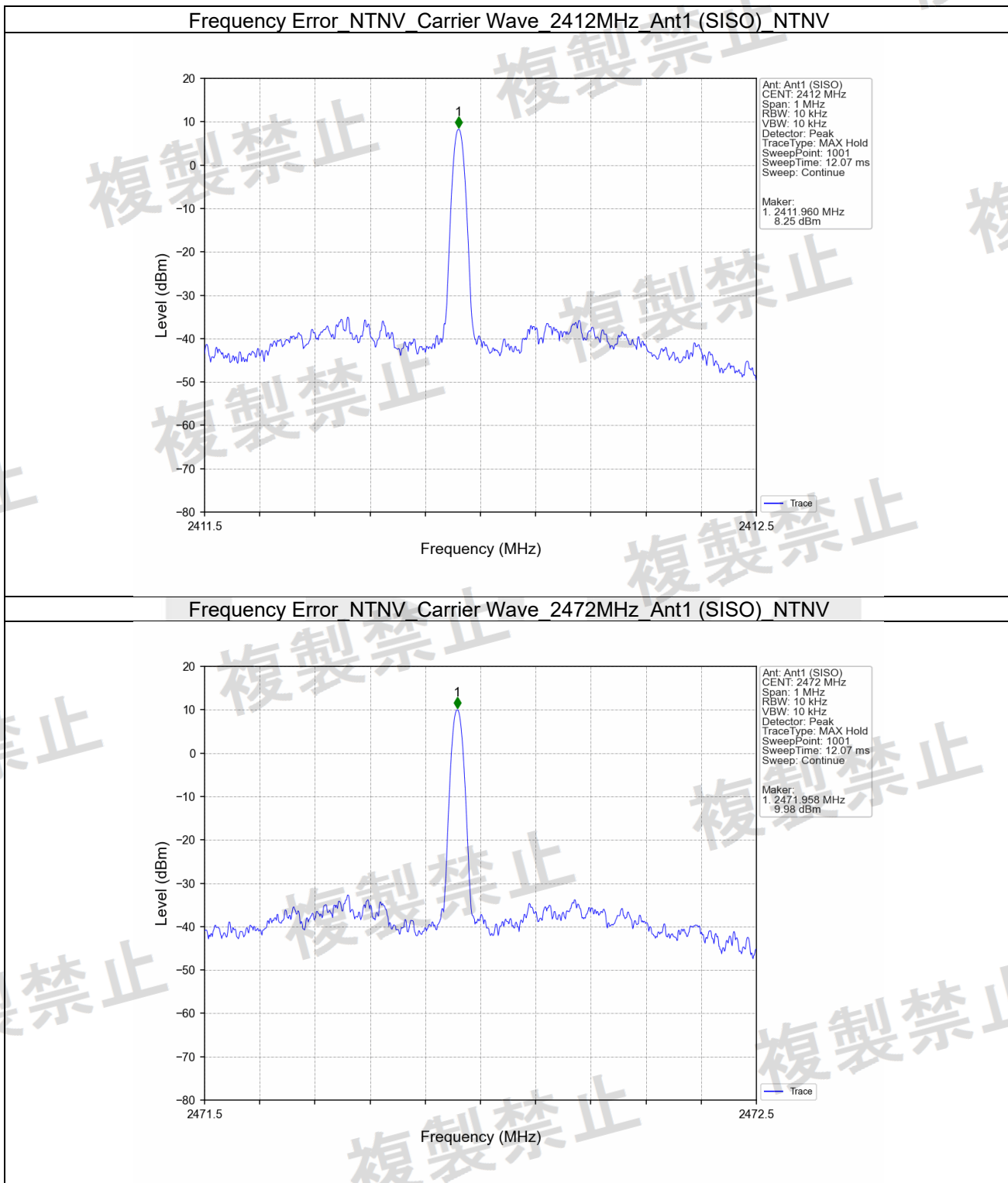
1.1 Test Result

1.1.1 Ant1

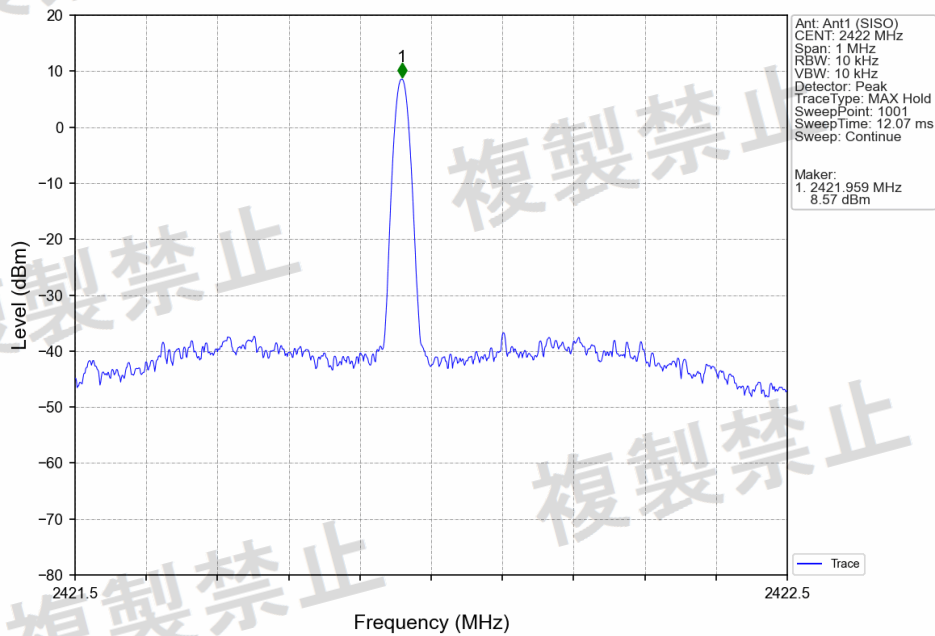
Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)		Verdict
					Result	Limit	
NTNV	Carrier Wave	SISO	2412	2411.960	-16.58	-50 to 50	Pass
			2472	2471.958	-16.99	-50 to 50	Pass
			2422	2421.959	-16.93	-50 to 50	Pass
			2462	2461.958	-17.06	-50 to 50	Pass

1.2 Test Graph

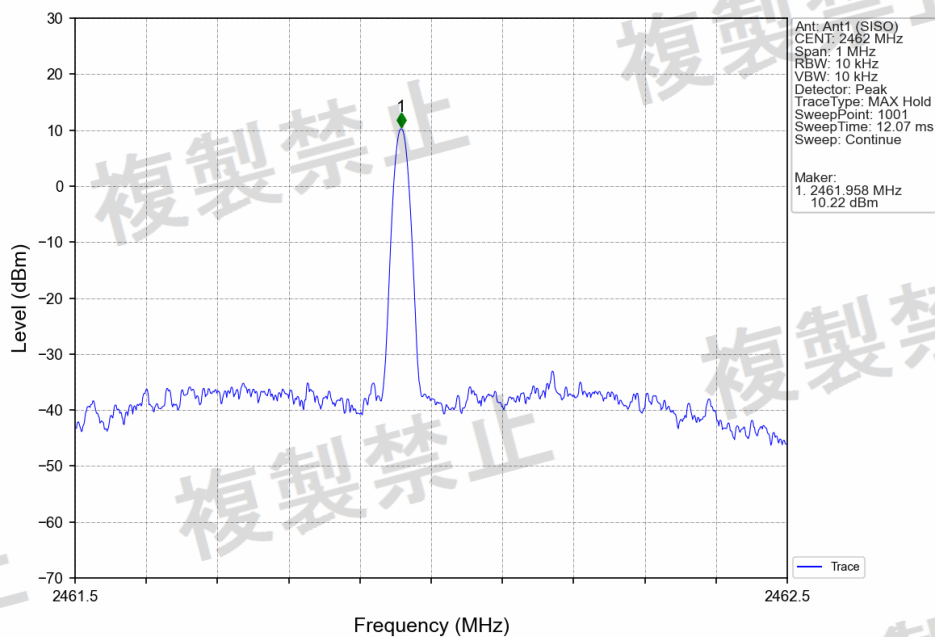
1.2.1 Ant1



Frequency Error_NTNV_Carrier Wave_2422MHz_Ant1 (SISO)_NTNV



Frequency Error_NTNV_Carrier Wave_2462MHz_Ant1 (SISO)_NTNV



2. Occupied Bandwidth

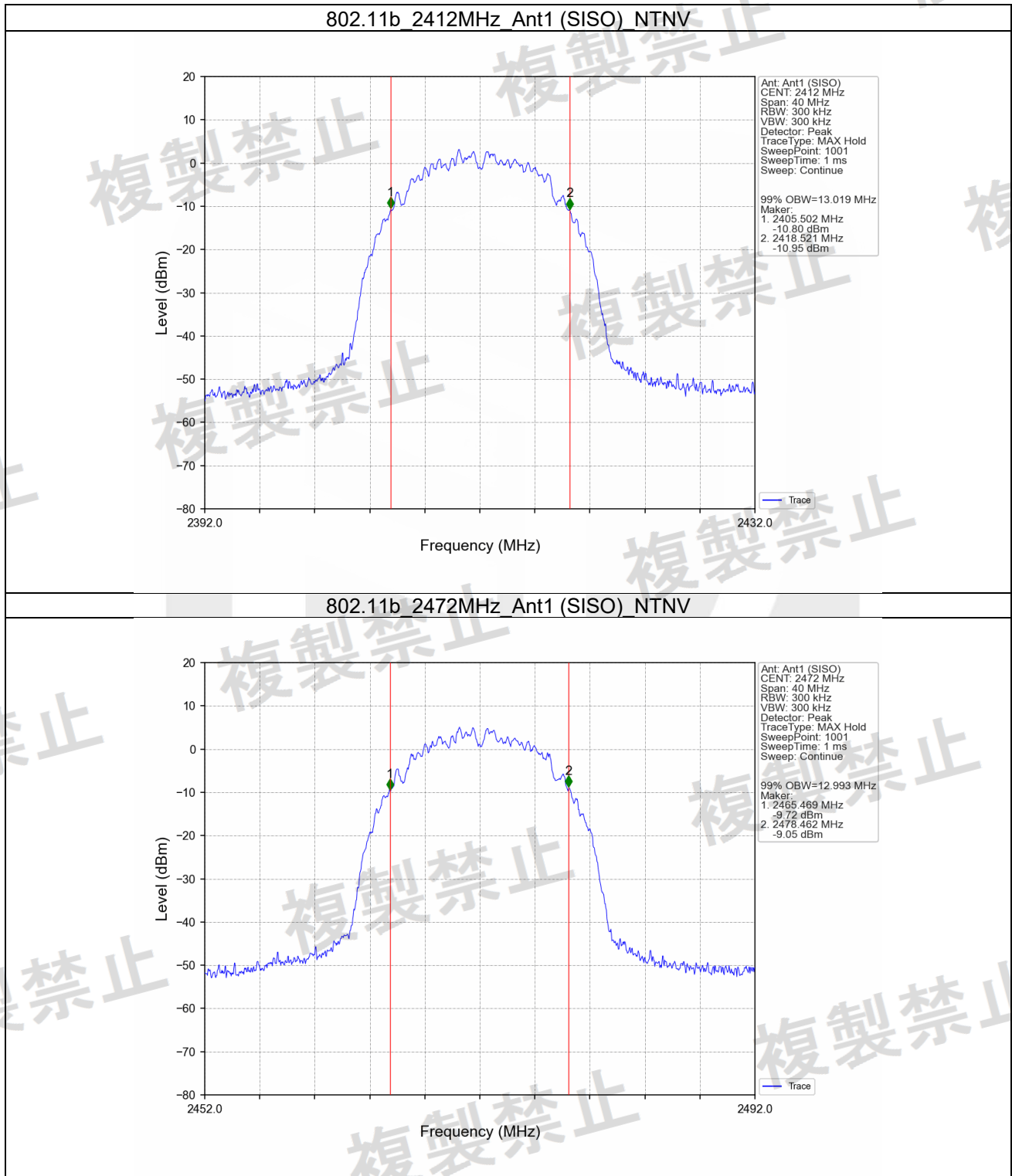
2.1 Test Result

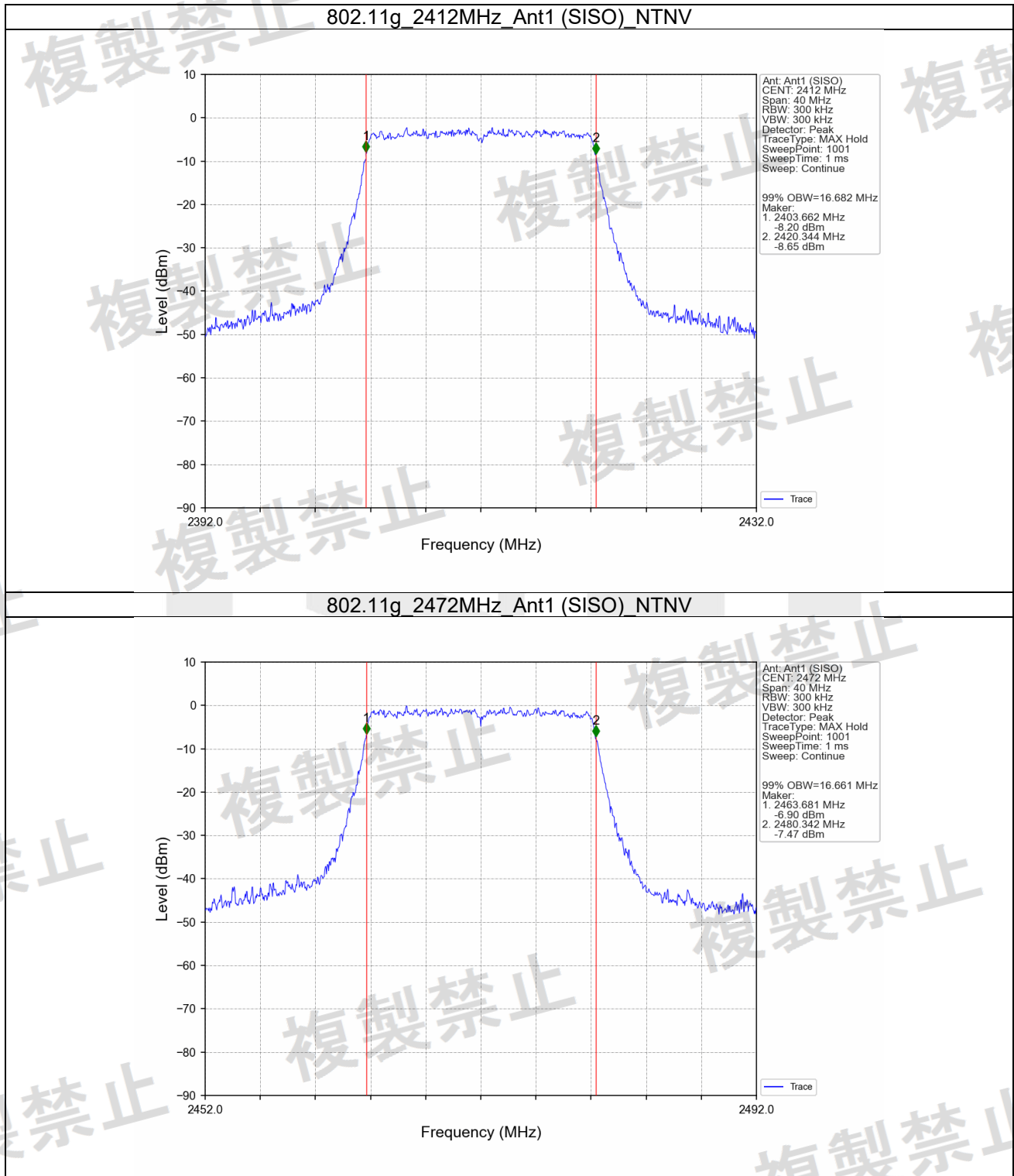
2.1.1 OBW

ENV	Mode	TX Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
				ANT1	Limit	
NTNV	802.11b	SISO	2412	13.019	≤ 26	Pass
			2472	12.993	≤ 26	Pass
	802.11g	SISO	2412	16.682	≤ 40	Pass
			2472	16.661	≤ 40	Pass
	802.11n (HT20)	SISO	2412	17.517	≤ 40	Pass
			2472	17.488	≤ 40	Pass
	802.11n (HT40)	SISO	2422	35.936	≤ 40	Pass
			2462	35.890	≤ 40	Pass

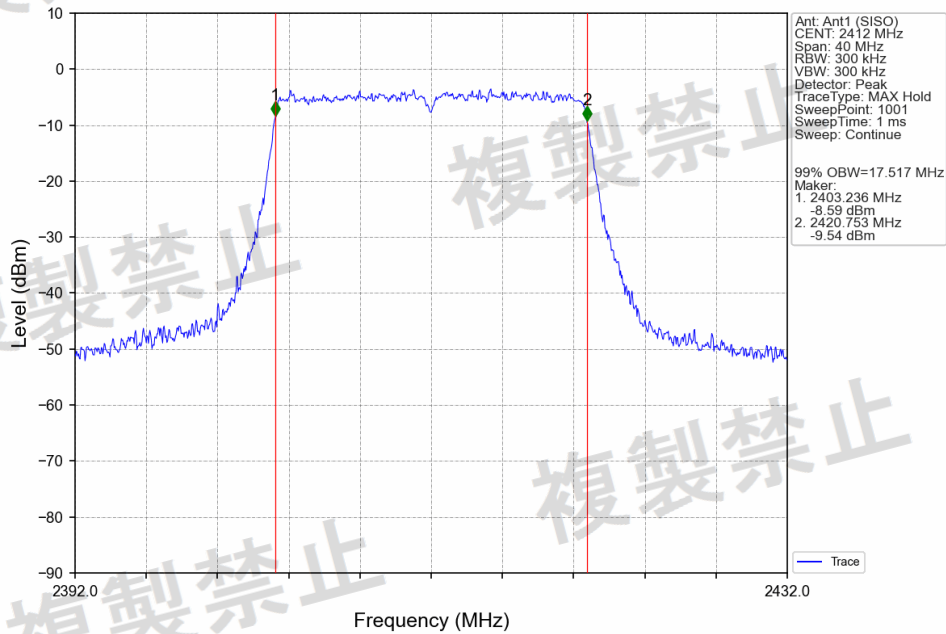
2.2 Test Graph

2.2.1 OBW

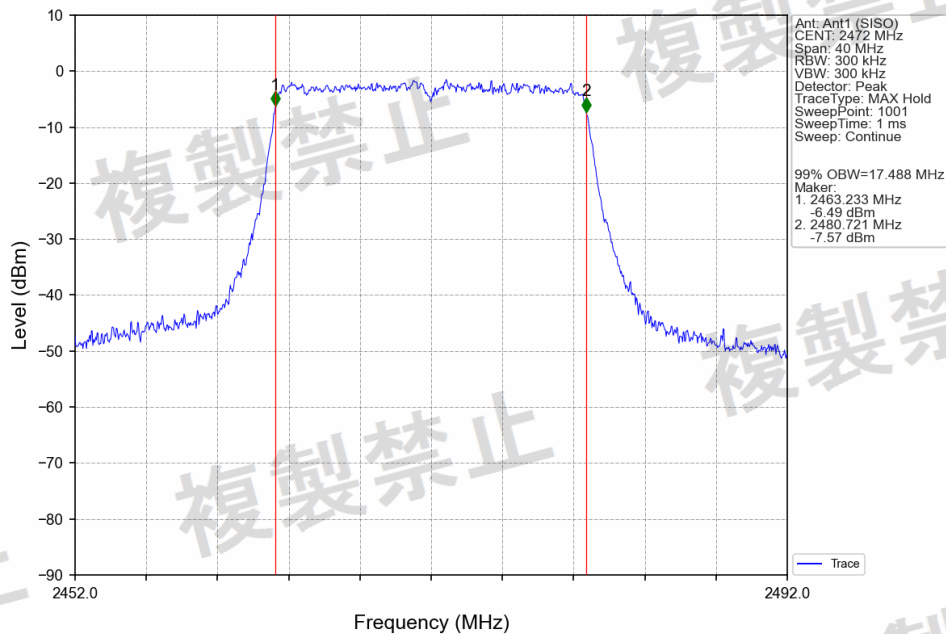




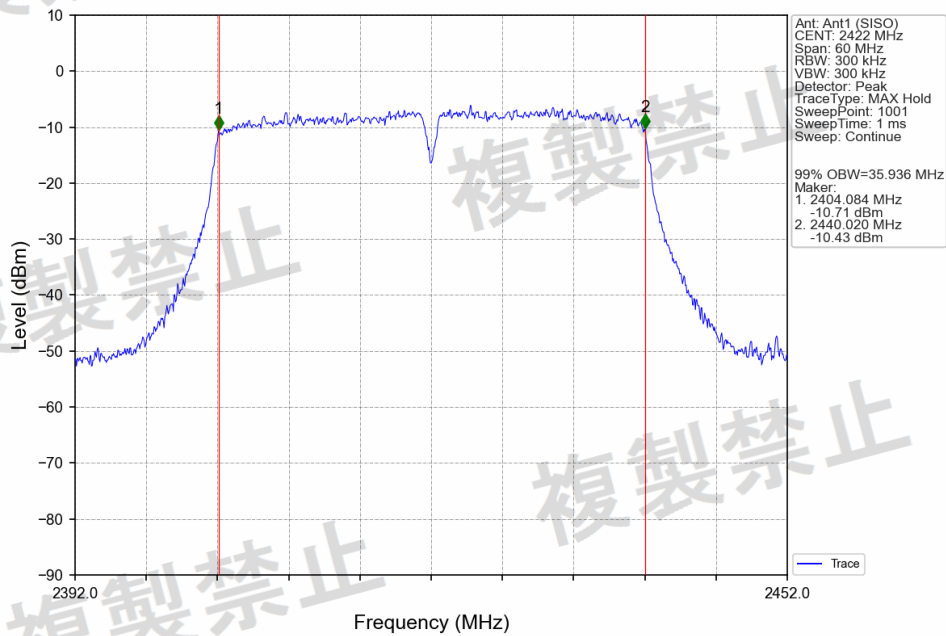
802.11n(HT20) 2412MHz_Ant1 (SISO)_NTNV



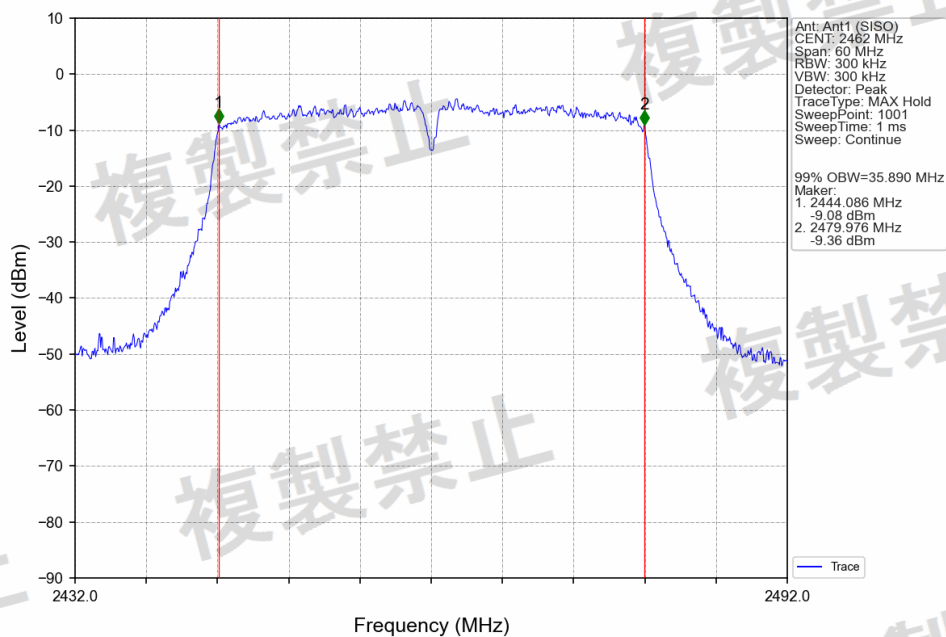
802.11n(HT20) 2472MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_2462MHz_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	0.689	≤ 10.00	1.200	-42.58	≤ 20	Pass
			2472	1	1.119	≤ 10.00	1.200	-6.75	≤ 20	Pass
	802.11g	SISO	2412	1	0.335	≤ 10.00	1.200	-72.08	≤ 20	Pass
			2472	1	0.503	≤ 10.00	1.200	-58.08	≤ 20	Pass
	802.11n (HT20)	SISO	2412	1	0.224	≤ 10.00	1.000	-77.60	≤ 20	Pass
			2472	1	0.390	≤ 10.00	1.000	-61.00	≤ 20	Pass
	802.11n (HT40)	SISO	2422	1	0.114	≤ 5.00	1.000	-88.60	≤ 20	Pass
			2462	1	0.171	≤ 5.00	1.000	-82.90	≤ 20	Pass

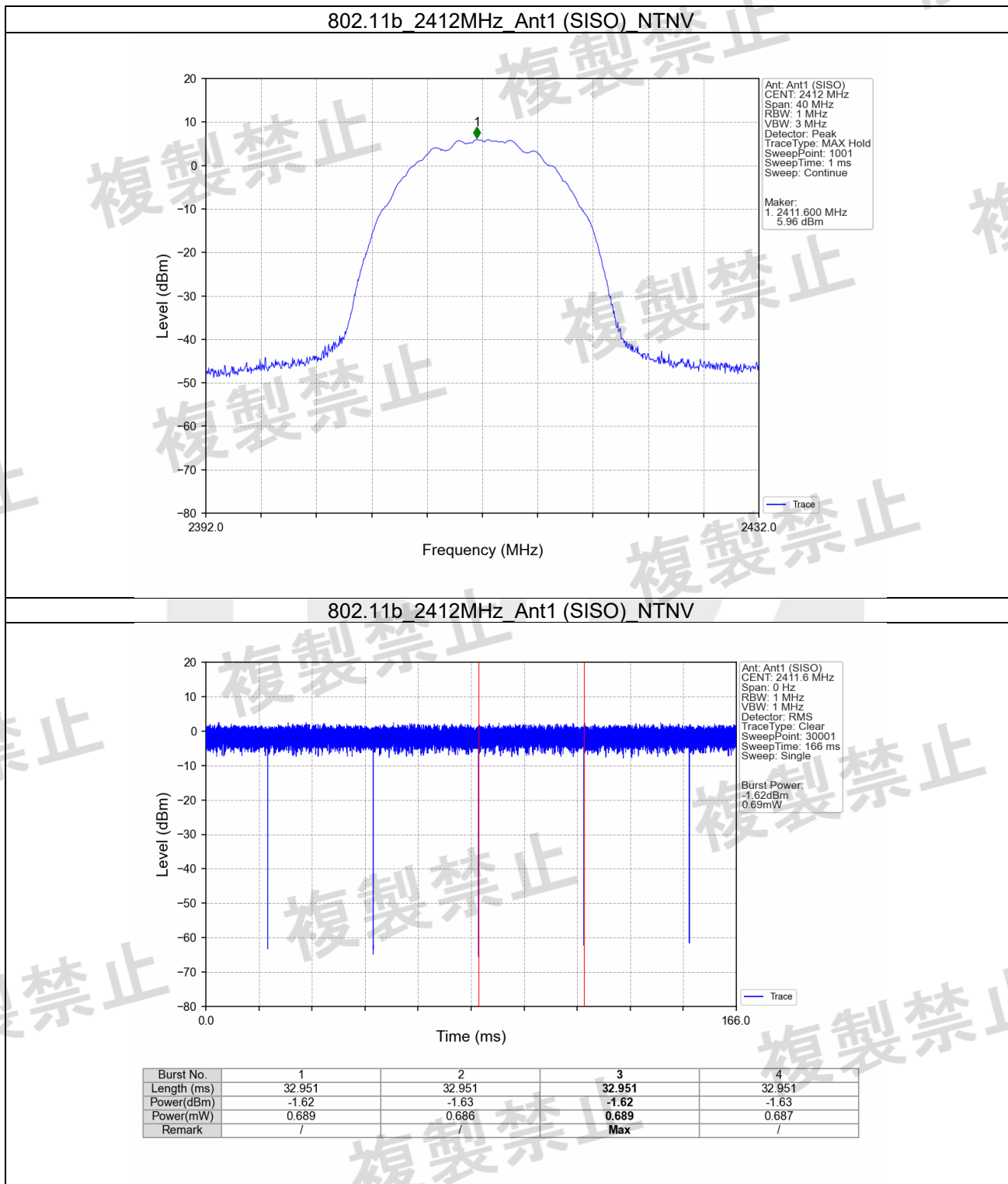
3.1.2 EIRP

ENV	Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	Gain (dBi)	Measured Power (dBm)	EIRP (dBm/MHz)		Verdict
									Result	Limit	
NTNV	802.11b	SISO	2412	/	/	1	2.53	-1.62	0.91	12.14	Pass
			2472	/	/	1	2.53	0.49	3.02	12.14	Pass
	802.11g	SISO	2412	/	/	1	2.53	-4.75	-2.22	12.14	Pass
			2472	/	/	1	2.53	-2.98	-0.45	12.14	Pass
	802.11n (HT20)	SISO	2412	/	/	1	2.53	-6.50	-3.97	12.14	Pass
			2472	/	/	1	2.53	-4.09	-1.56	12.14	Pass
	802.11n (HT20)	SISO	2422	/	/	1	2.53	-9.43	-6.90	9.14	Pass
			2462	/	/	1	2.53	-7.67	-5.14	9.14	Pass

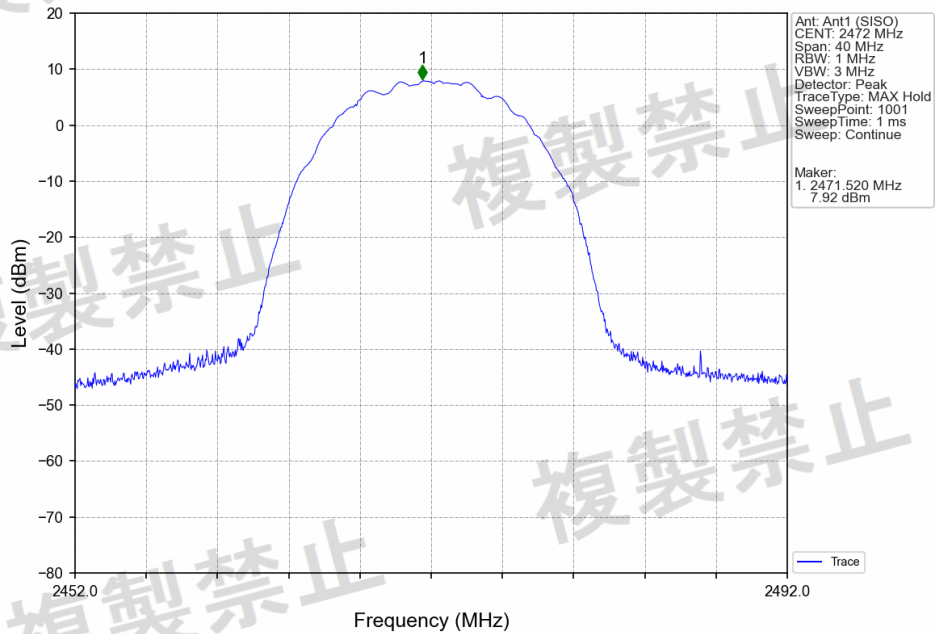
Note: E.I.R.P = Measured Power + Antenna Gain

3.2 Test Graph

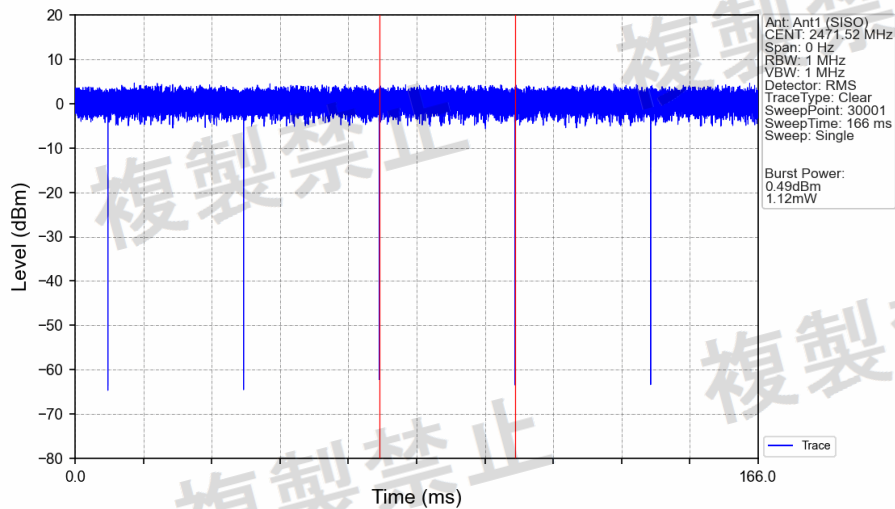
3.2.1 Power



802.11b 2472MHz_Ant1 (SISO)_NTNV

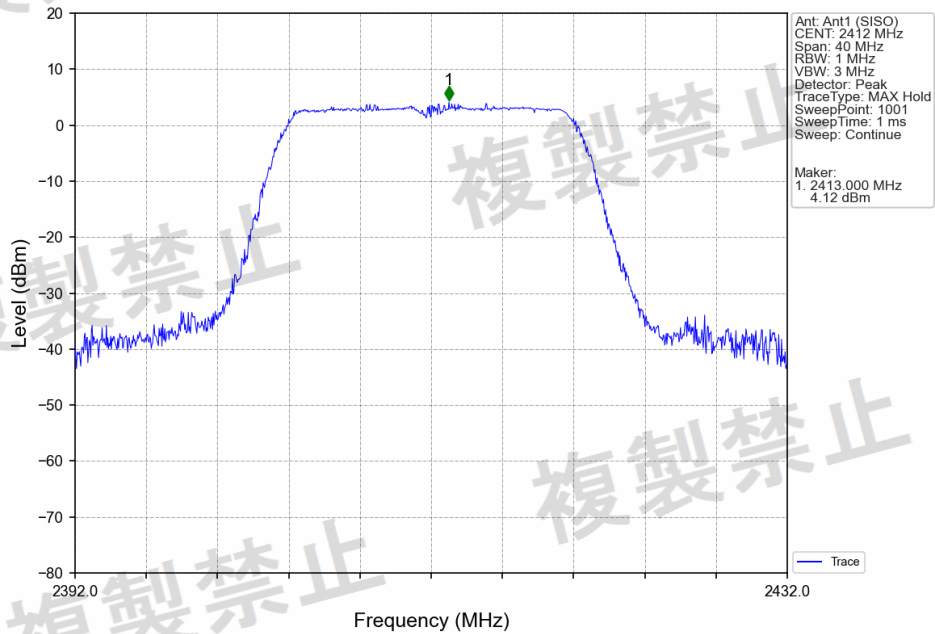


802.11b 2472MHz_Ant1 (SISO)_NTNV

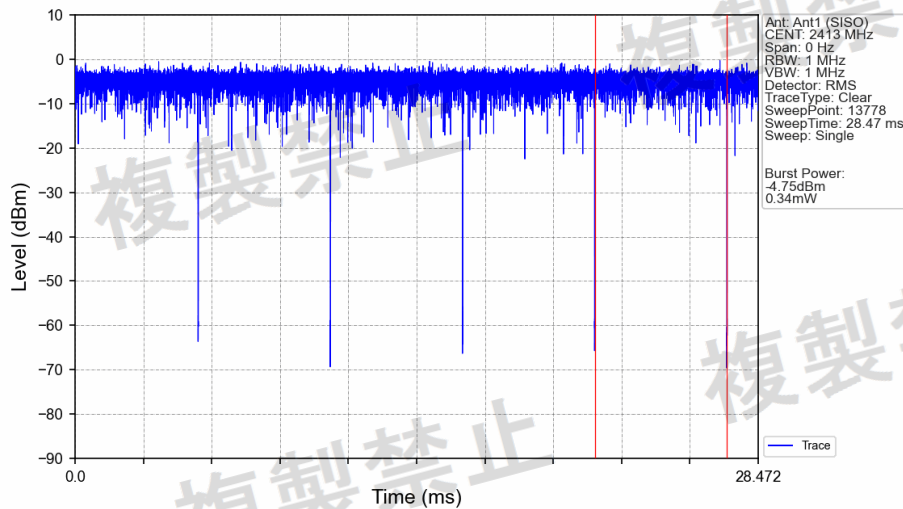


Burst No.	1	2	3	4
Length (ms)	32.951	32.951	32.951	32.951
Power(dBm)	0.49	0.47	0.49	0.47
Power(mW)	1.119	1.115	1.119	1.115
Remark	/	/	Max	/

802.11g_2412MHz_Ant1 (SISO)_NTNV

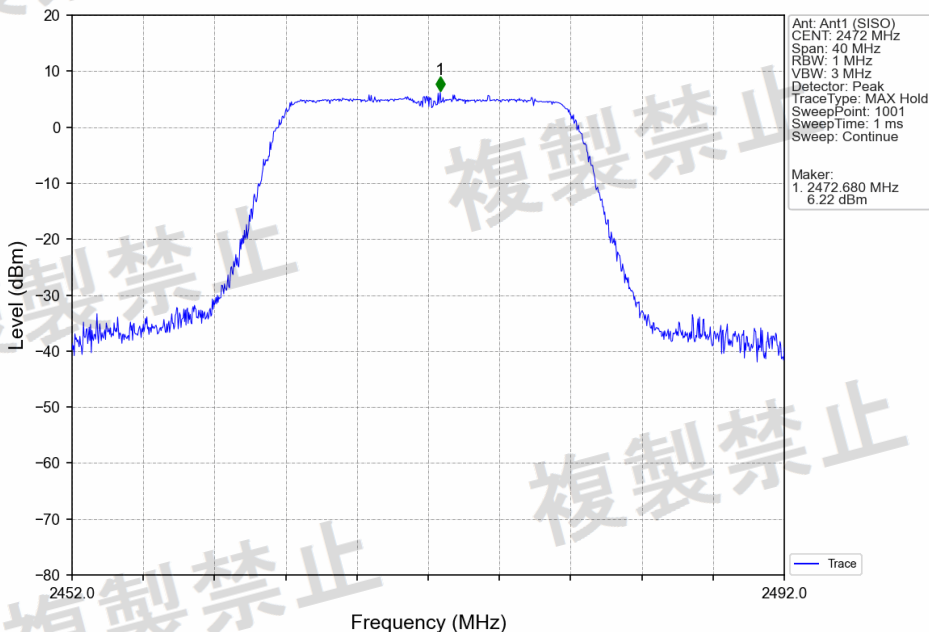


802.11g_2412MHz_Ant1 (SISO)_NTNV

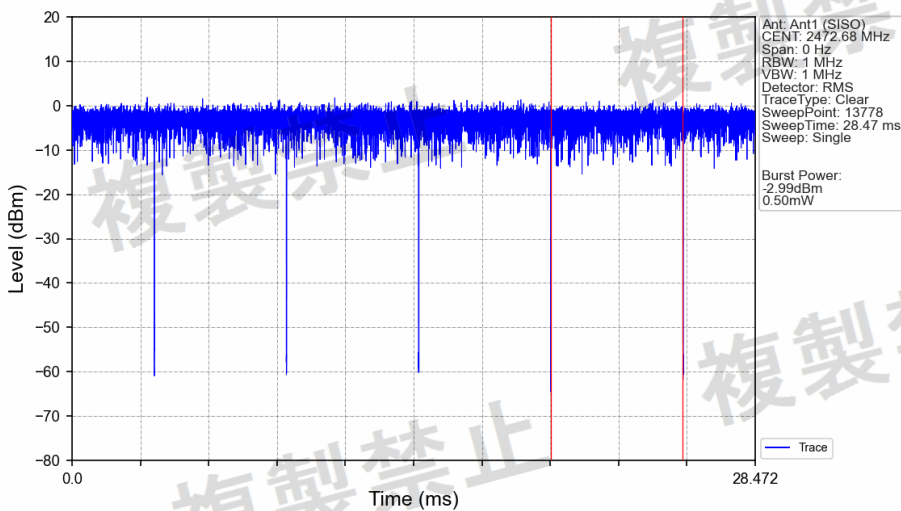


Burst No.	1	2	3	4
Length (ms)	5.485	5.485	5.485	5.485
Power(dBm)	-4.76	-4.76	-4.75	-4.75
Power(mW)	0.334	0.334	0.335	0.335
Remark	/	/	/	Max

802.11g_2472MHz_Ant1 (SISO)_NTNV

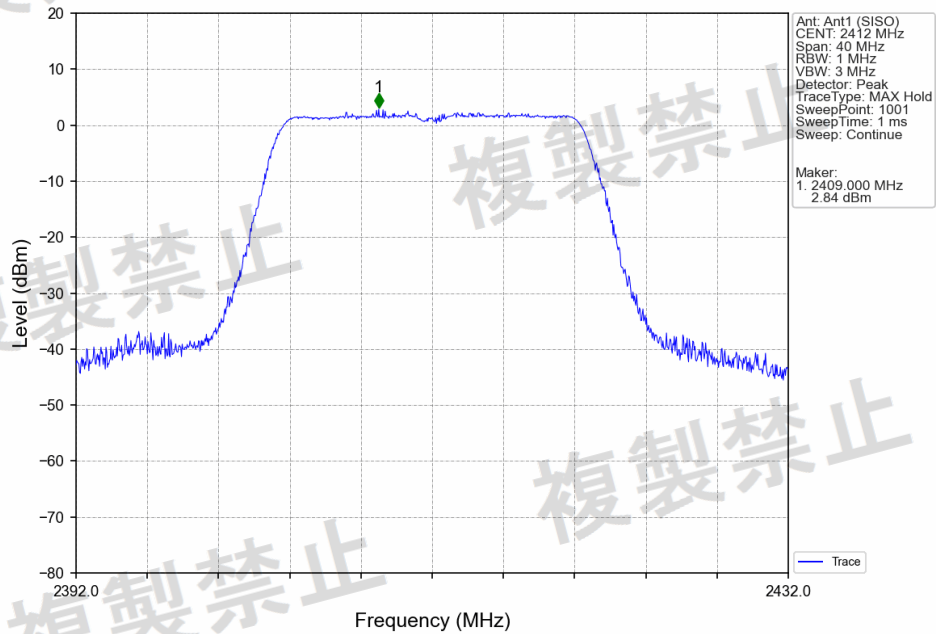


802.11g_2472MHz_Ant1 (SISO)_NTNV

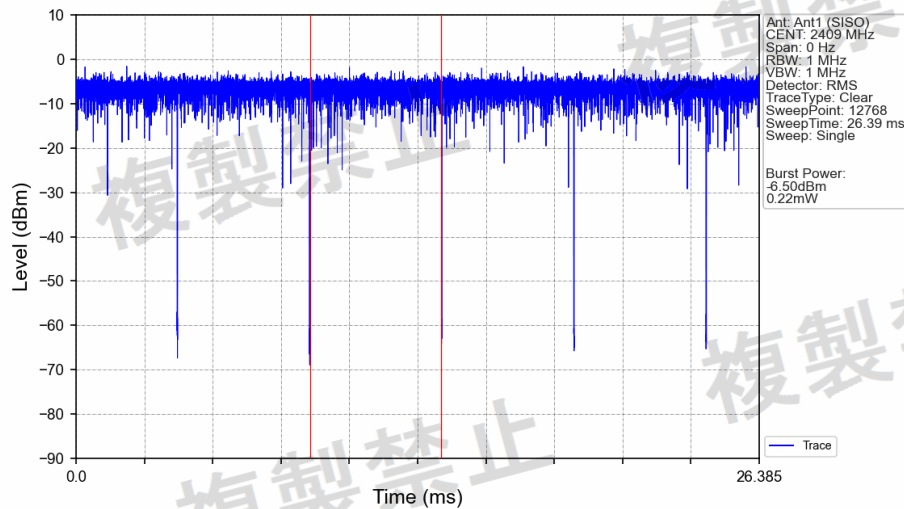


Burst No.	1	2	3	4
Length (ms)	5.485	5.485	5.485	5.485
Power(dBm)	-2.99	-2.99	-2.99	-2.99
Power(mW)	0.502	0.502	0.502	0.503
Remark	/	/	/	Max

802.11n(HT20) 2412MHz_Ant1 (SISO)_NTNV

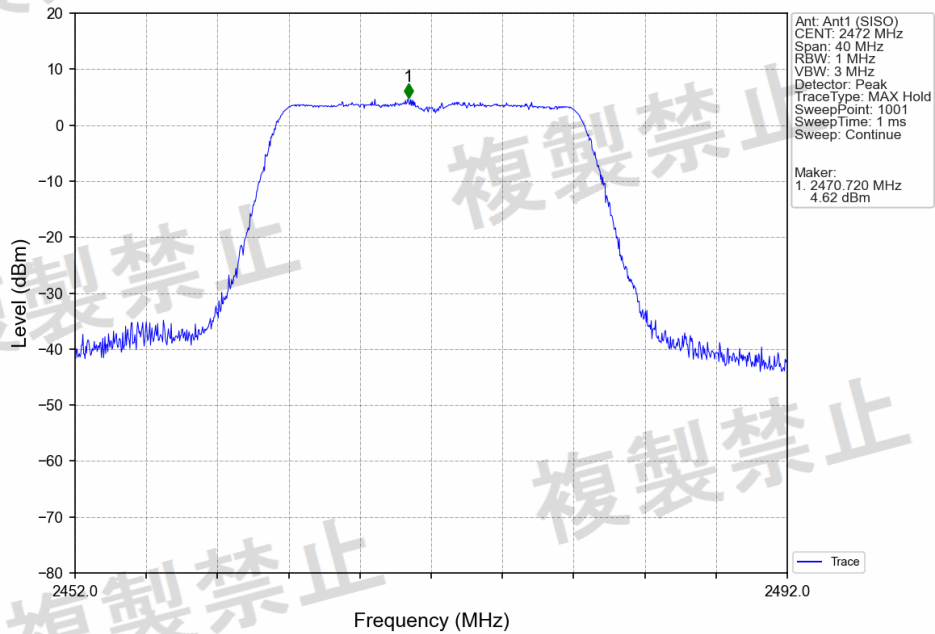


802.11n(HT20) 2412MHz_Ant1 (SISO)_NTNV

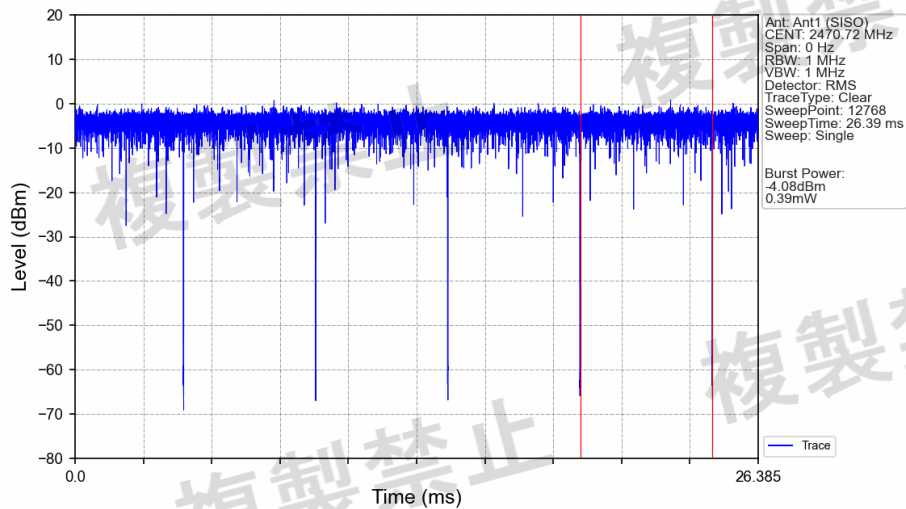


Burst No.	1	2	3	4
Length (ms)	5.082	5.080	5.082	5.082
Power(dBm)	-6.51	-6.50	-6.50	-6.51
Power(mW)	0.224	0.224	0.224	0.223
Remark	/	Max	/	/

802.11n(HT20) 2472MHz_Ant1 (SISO)_NTNV

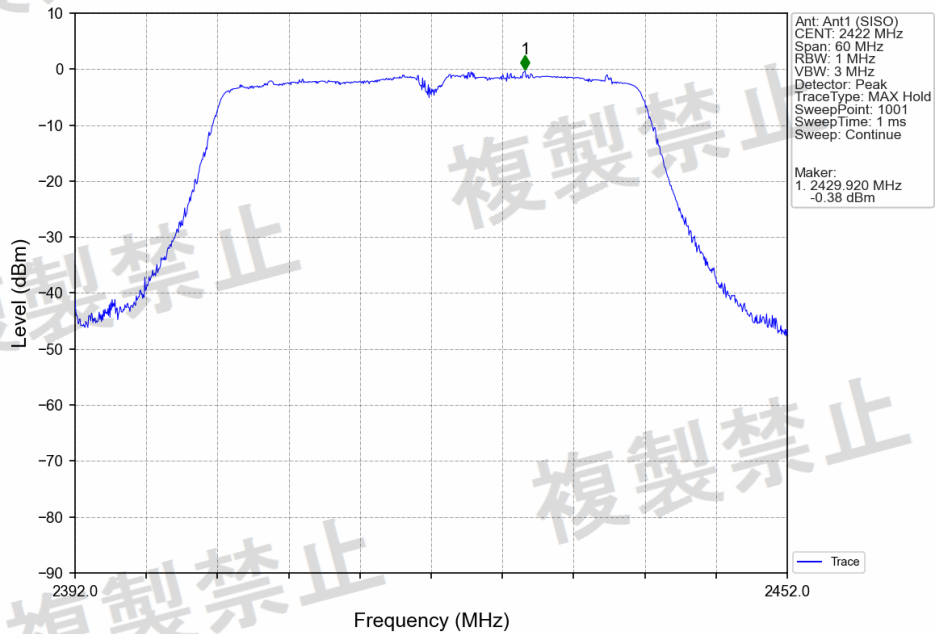


802.11n(HT20) 2472MHz_Ant1 (SISO)_NTNV

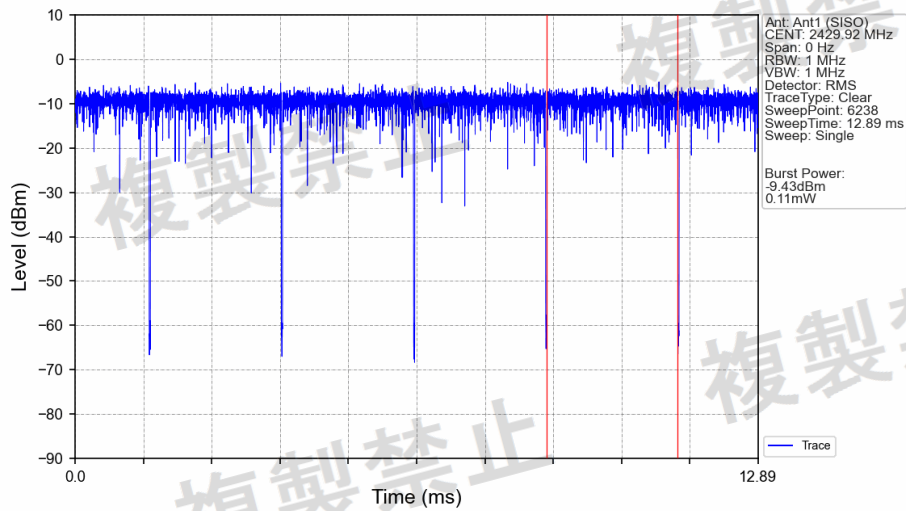


Burst No.	1	2	3	4
Length (ms)	5.080	5.082	5.082	5.080
Power(dBm)	-4.09	-4.09	-4.09	-4.08
Power(mW)	0.390	0.390	0.390	0.390
Remark	/	/	/	Max

802.11n(HT40)_2422MHz_Ant1 (SISO)_NTNV

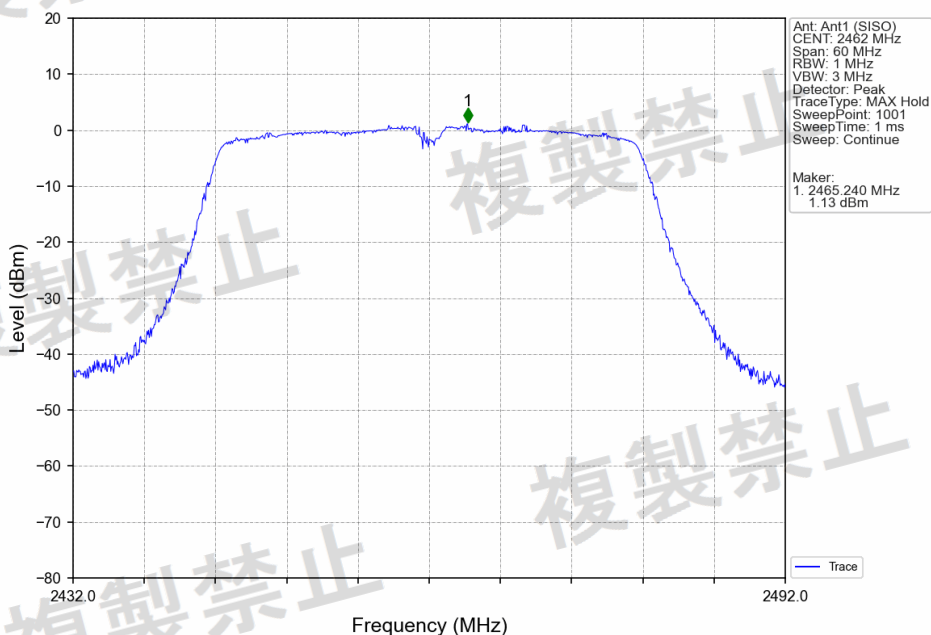


802.11n(HT40)_2422MHz_Ant1 (SISO)_NTNV

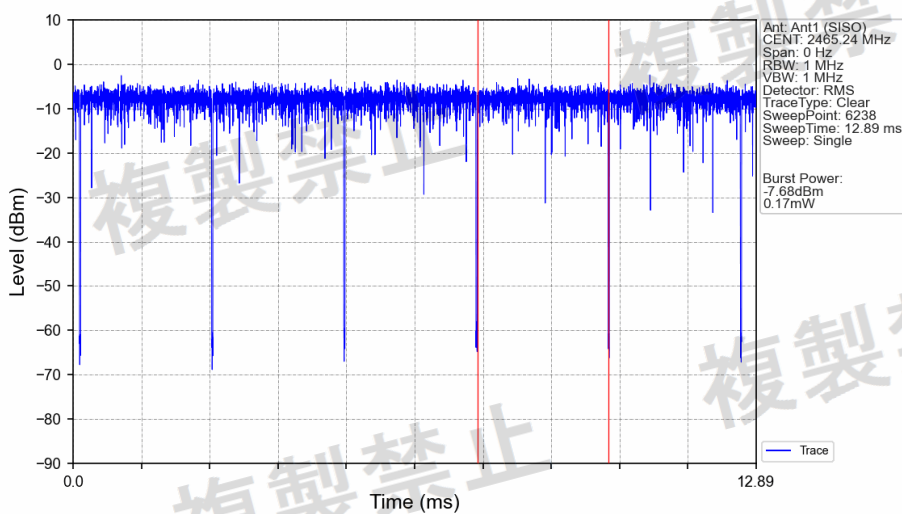


Burst No.	1	2	3	4
Length (ms)	2.470	2.470	2.468	2.468
Power(dBm)	-9.43	-9.43	-9.43	-9.43
Power(mW)	0.114	0.114	0.114	0.114
Remark	/	/	/	Max

802.11n(HT40)_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_2462MHz_Ant1 (SISO)_NTNV



Burst No.	1	2	3	4	5
Length (ms)	2.470	2.468	2.470	2.470	2.470
Power(dBm)	-7.68	-7.68	-7.68	-7.68	-7.68
Power(mW)	0.171	0.171	0.171	0.171	0.171
Remark	/	/	/	Max	/

4. Spurious Emission Intensity

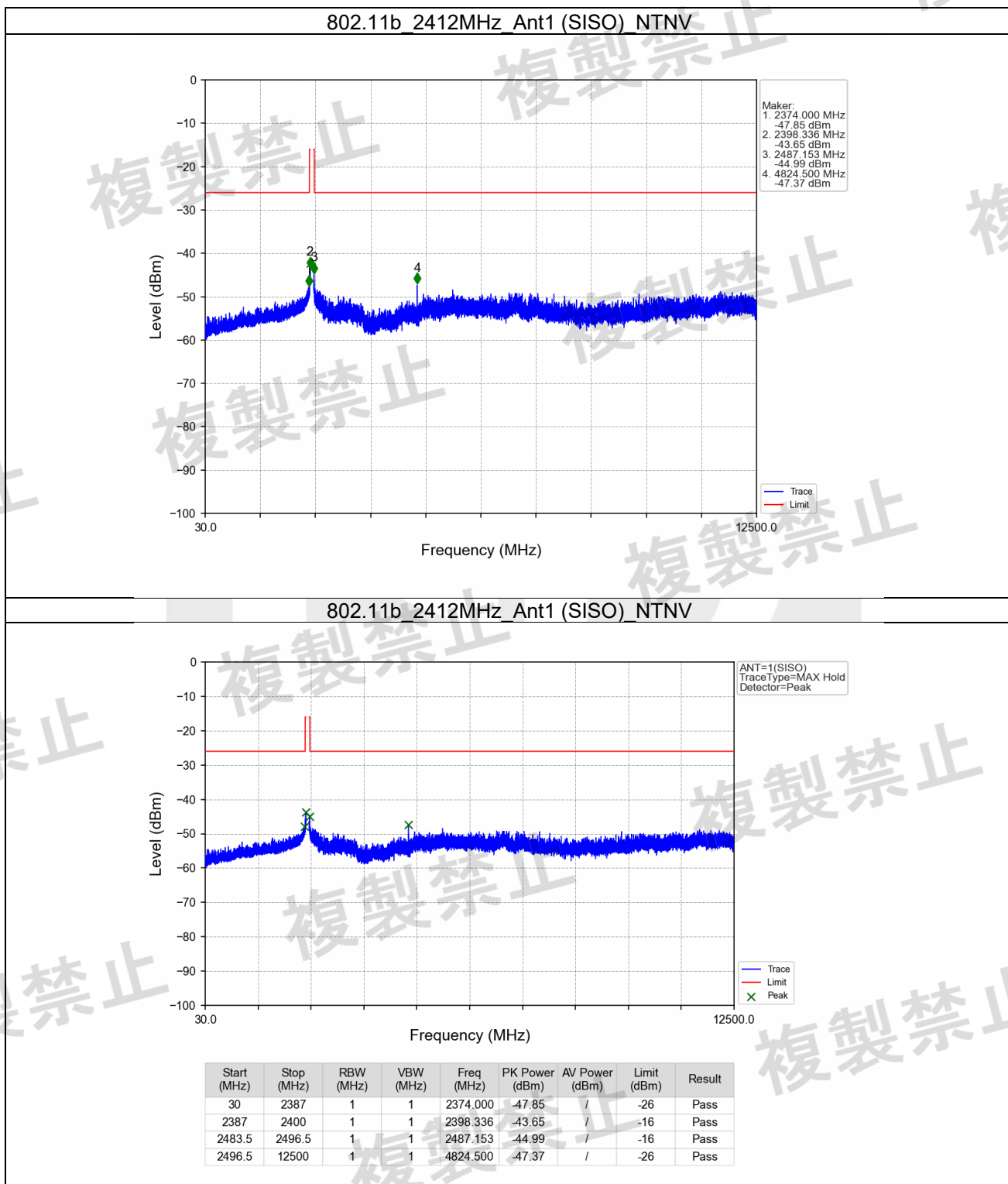
4.1 Test Result

4.1.1 TxSe_NTNV

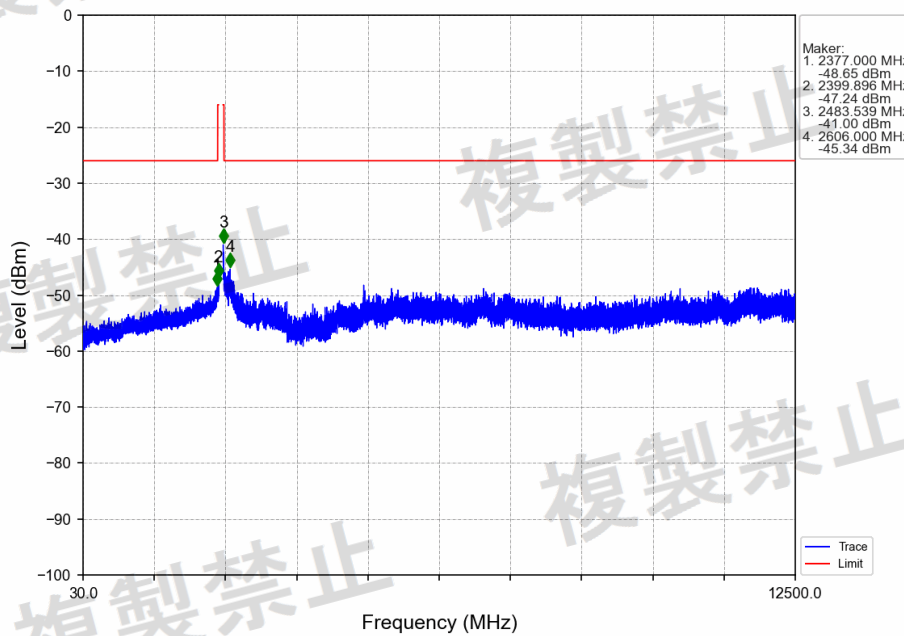
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
802.11b	SISO	2412	1	30	2387	2374	-47.85	0.016	/	/	2.5	Pass
				2387	2400	2398.336	-43.65	0.043	/	/	25	Pass
				2483.5	2496.5	2487.153	-44.99	0.032	/	/	25	Pass
				2496.5	12500	4824.5	-47.37	0.018	/	/	2.5	Pass
		2472	1	30	2387	2377	-48.65	0.014	/	/	2.5	Pass
				2387	2400	2399.896	-47.24	0.019	/	/	25	Pass
				2483.5	2496.5	2483.539	-41.00	0.079	/	/	25	Pass
				2496.5	12500	2606	-45.34	0.029	/	/	2.5	Pass
802.11g	SISO	2412	1	30	2387	2381	-47.09	0.020	/	/	2.5	Pass
				2387	2400	2399.87	-33.12	0.488	/	/	25	Pass
				2483.5	2496.5	2492.171	-45.37	0.029	/	/	25	Pass
				2496.5	12500	2500	-46.61	0.022	/	/	2.5	Pass
		2472	1	30	2387	2379.5	-45.24	0.030	/	/	2.5	Pass
				2387	2400	2394.202	-44.59	0.035	/	/	25	Pass
				2483.5	2496.5	2483.552	-29.90	1.023	/	/	25	Pass
				2496.5	12500	5543	-43.98	0.040	/	/	2.5	Pass
802.11n (HT20)	SISO	2412	1	30	2387	2382.5	-47.54	0.018	/	/	2.5	Pass
				2387	2400	2399.909	-34.90	0.324	/	/	25	Pass
				2483.5	2496.5	2487.27	-44.92	0.032	/	/	25	Pass
				2496.5	12500	2504.5	-46.87	0.021	/	/	2.5	Pass
		2472	1	30	2387	2379	-48.06	0.016	/	/	2.5	Pass
				2387	2400	2394.982	-47.30	0.019	/	/	25	Pass
				2483.5	2496.5	2483.526	-30.73	0.845	/	/	25	Pass
				2496.5	12500	2497	-45.70	0.027	/	/	2.5	Pass
802.11n (HT40)	SISO	2422	1	30	2387	2385.5	-46.95	0.020	/	/	2.5	Pass
				2387	2400	2399.987	-32.17	0.607	/	/	25	Pass
				2483.5	2496.5	2494.459	-46.77	0.021	/	/	25	Pass
				2496.5	12500	12198	-46.96	0.020	/	/	2.5	Pass
		2462	1	30	2387	2325.5	-49.23	0.012	/	/	2.5	Pass
				2387	2400	2392.265	-48.10	0.015	/	/	25	Pass
				2483.5	2496.5	2483.552	-27.48	1.786	/	/	25	Pass
				2496.5	12500	2516.5	-46.45	0.023	/	/	2.5	Pass

4.2 Test Graph

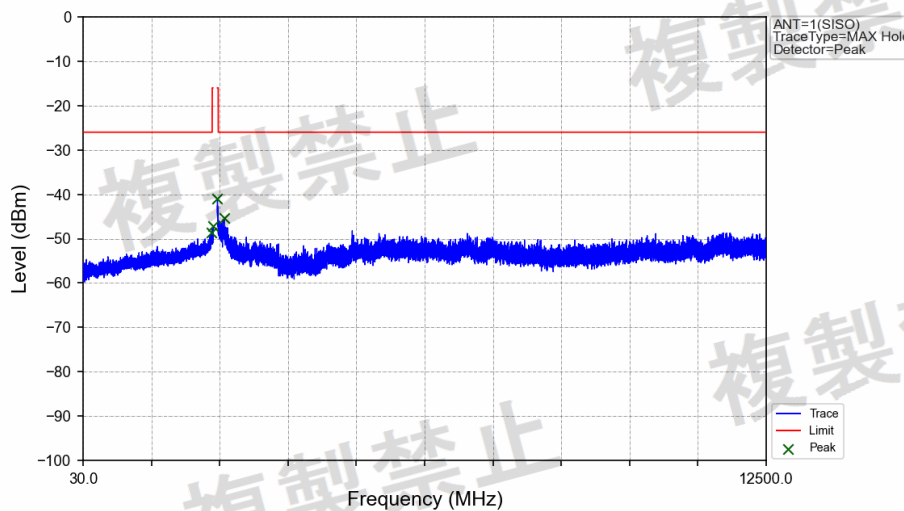
4.2.1 TxSe_NTNV



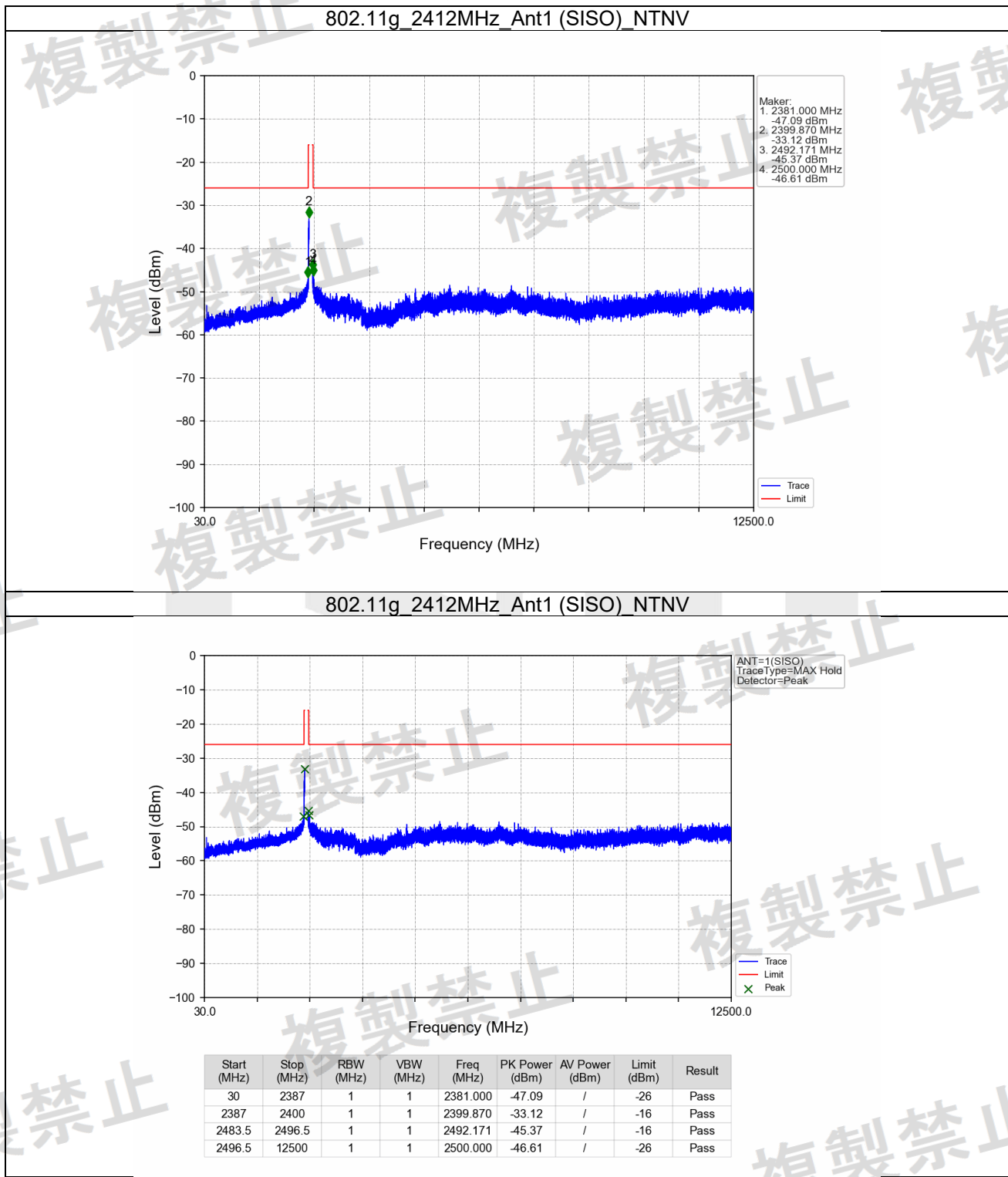
802.11b 2472MHz_Ant1 (SISO)_NTNV



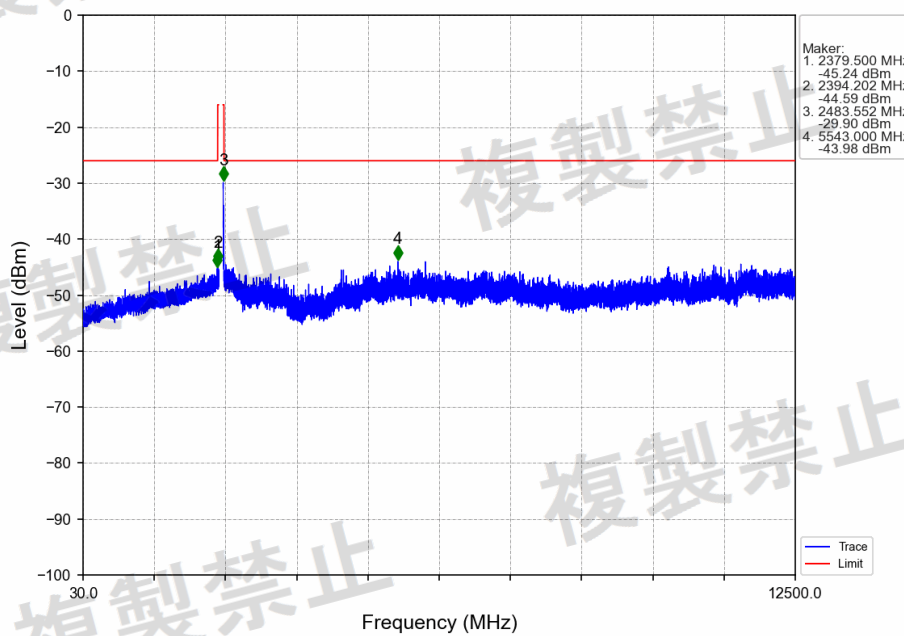
802.11b 2472MHz_Ant1 (SISO)_NTNV



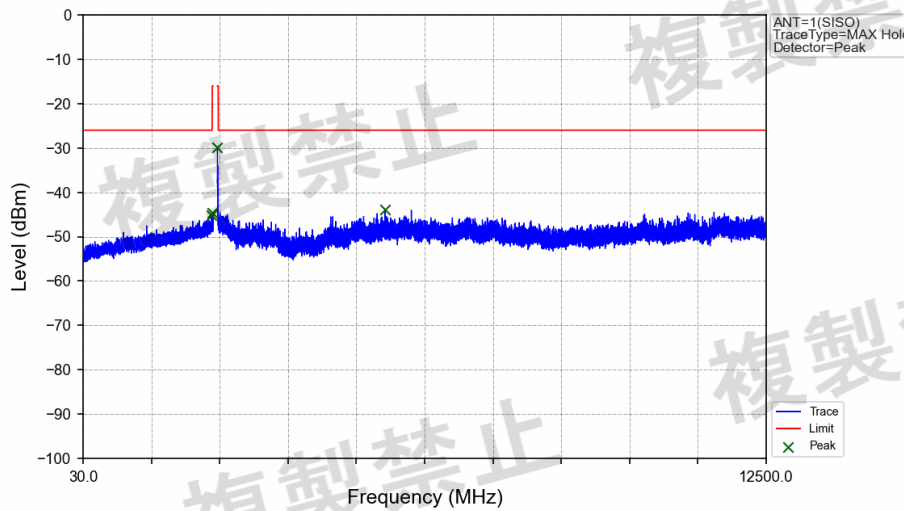
Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2377.000	-48.65	/	-26	Pass
2387	2400	1	1	2399.896	-47.24	/	-16	Pass
2483.5	2496.5	1	1	2483.539	-41.00	/	-16	Pass
2496.5	12500	1	1	2606.000	-45.34	/	-26	Pass



802.11g_2472MHz_Ant1 (SISO)_NTNV

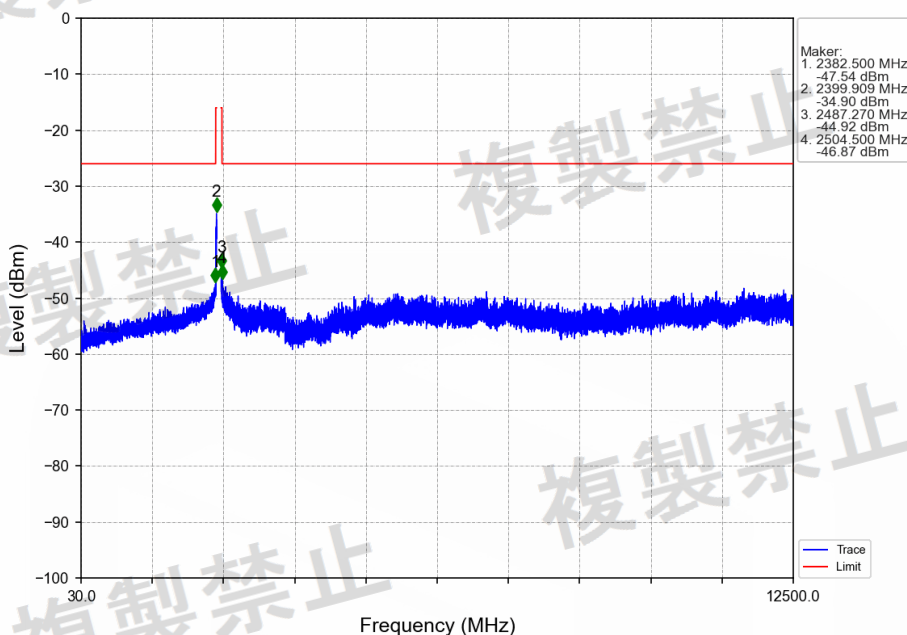


802.11g_2472MHz_Ant1 (SISO)_NTNV

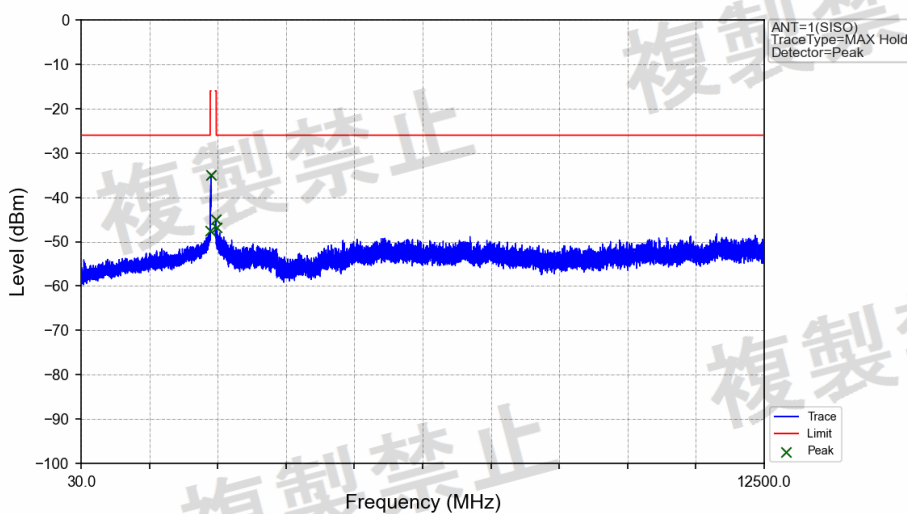


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2379.500	-45.24	/	-26	Pass
2387	2400	1	1	2394.202	-44.59	/	-16	Pass
2483.5	2496.5	1	1	2483.552	-29.90	/	-16	Pass
2496.5	12500	1	1	5543.000	-43.98	/	-26	Pass

802.11n(HT20) 2412MHz_Ant1 (SISO)_NTNV

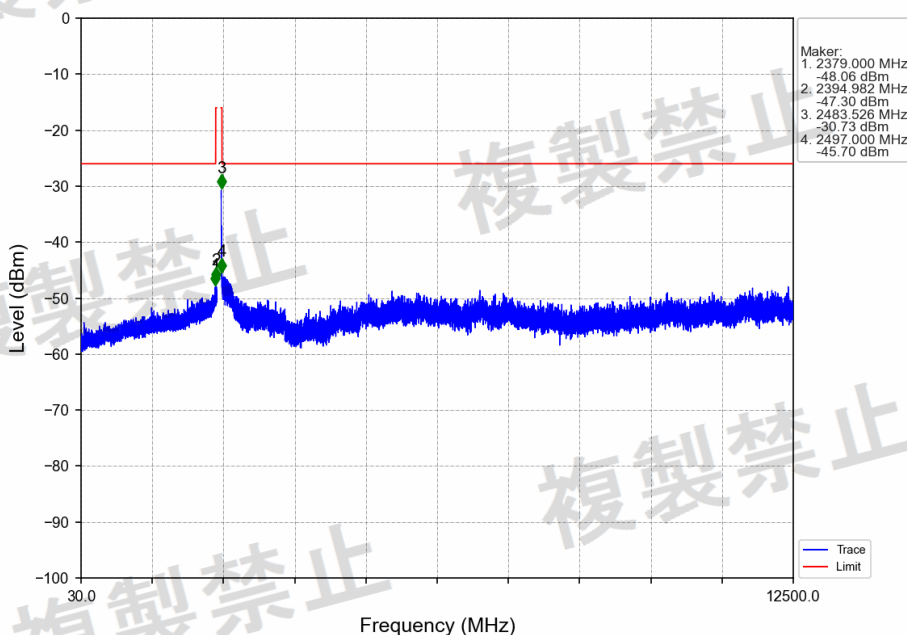


802.11n(HT20) 2412MHz_Ant1 (SISO)_NTNV

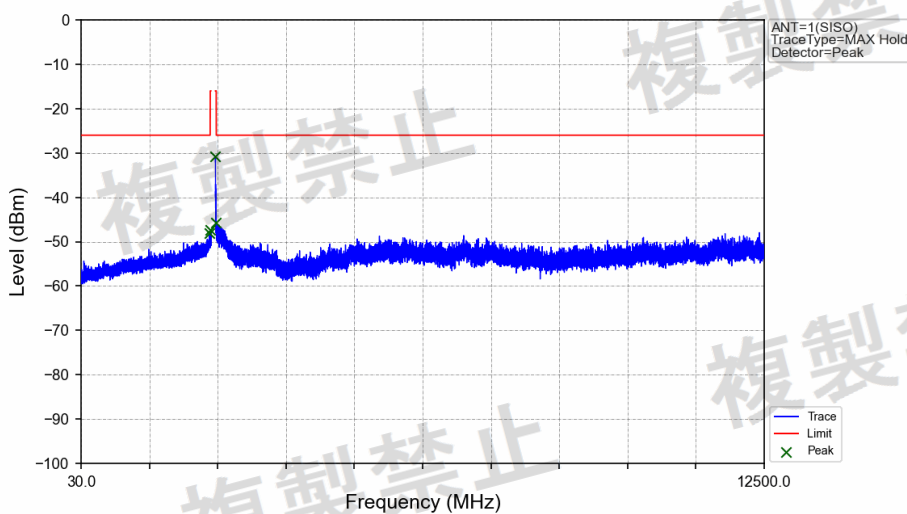


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2382.500	-47.54	/	-26	Pass
2387	2400	1	1	2399.909	-34.90	/	-16	Pass
2483.5	2496.5	1	1	2487.270	-44.92	/	-16	Pass
2496.5	12500	1	1	2504.500	-46.87	/	-26	Pass

802.11n(HT20) 2472MHz_Ant1 (SISO)_NTNV

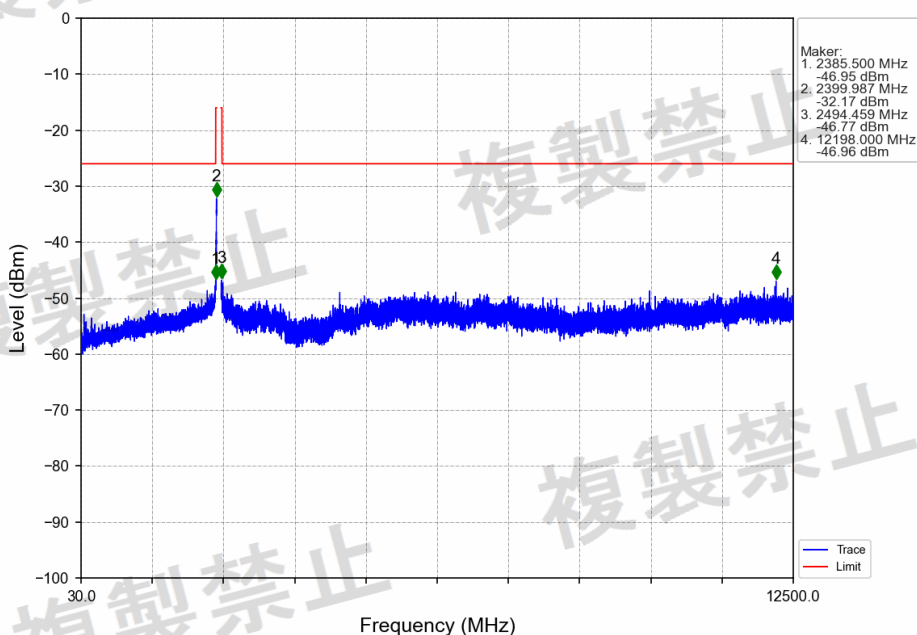


802.11n(HT20) 2472MHz_Ant1 (SISO)_NTNV

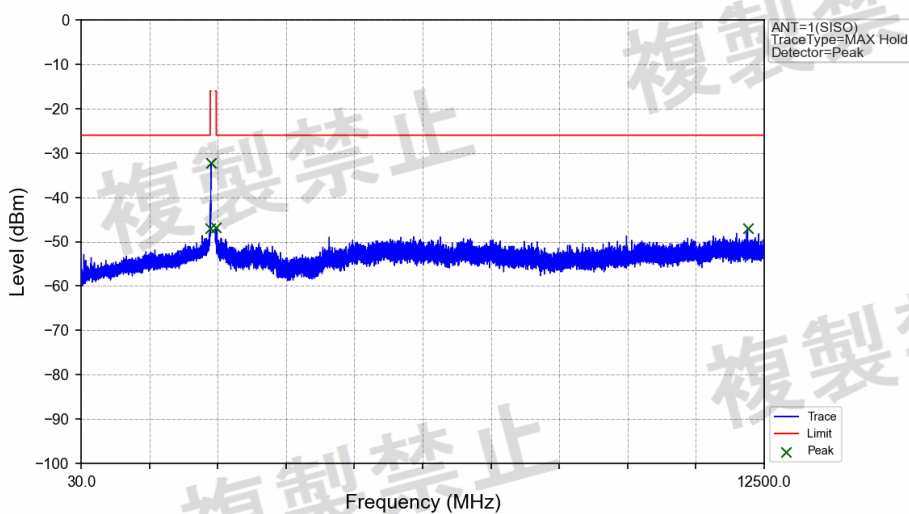


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2379.000	-48.06	/	-26	Pass
2387	2400	1	1	2394.982	-47.30	/	-16	Pass
2483.5	2496.5	1	1	2483.526	-30.73	/	-16	Pass
2496.5	12500	1	1	2497.000	-45.70	/	-26	Pass

802.11n(HT40) 2422MHz_Ant1 (SISO)_NTNV

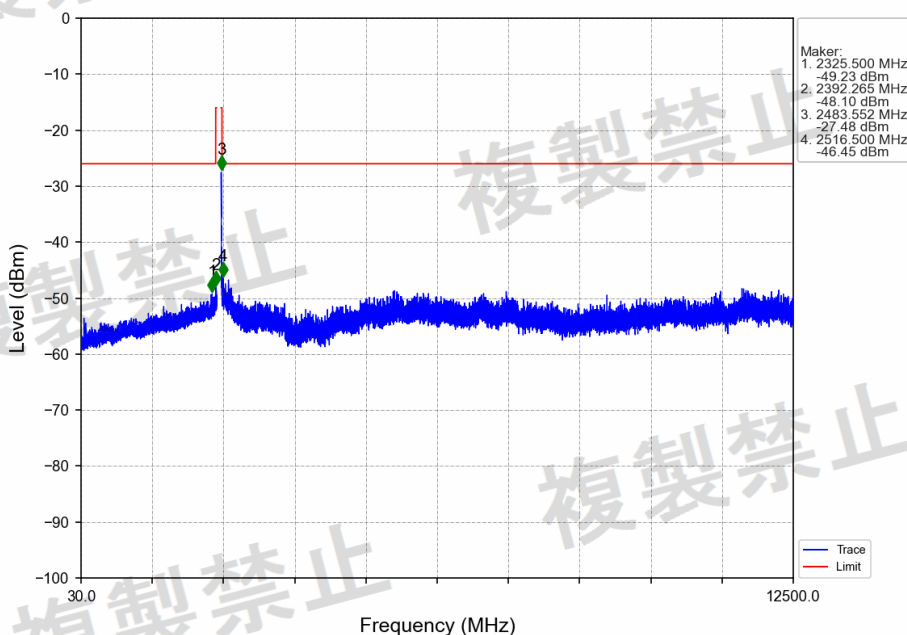


802.11n(HT40) 2422MHz_Ant1 (SISO)_NTNV

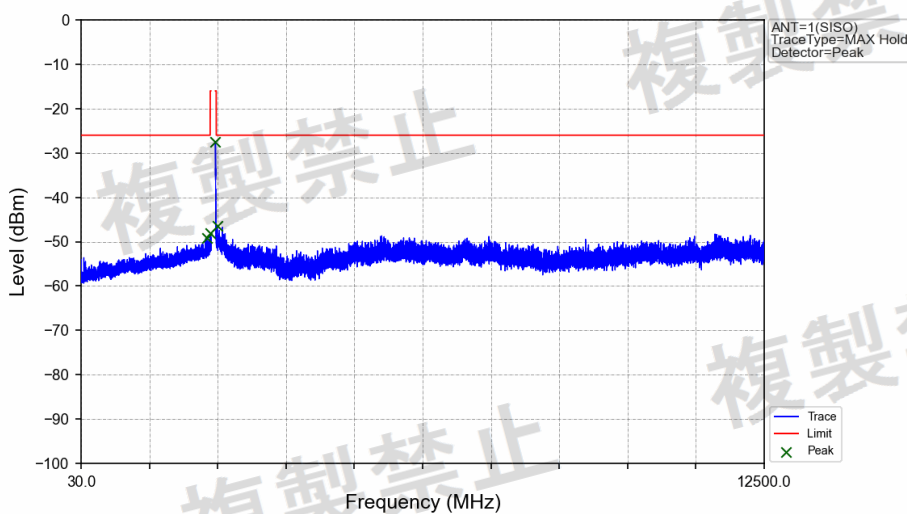


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2385.500	-46.95	/	-26	Pass
2387	2400	1	1	2399.987	-32.17	/	-16	Pass
2483.5	2496.5	1	1	2494.459	-46.77	/	-16	Pass
2496.5	12500	1	1	12198.000	-46.96	/	-26	Pass

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	2325.500	-49.23	/	-26	Pass
2387	2400	1	1	2392.265	-48.10	/	-16	Pass
2483.5	2496.5	1	1	2483.552	-27.48	/	-16	Pass
2496.5	12500	1	1	2516.500	-46.45	/	-26	Pass

5. Secondary Radiated Emission

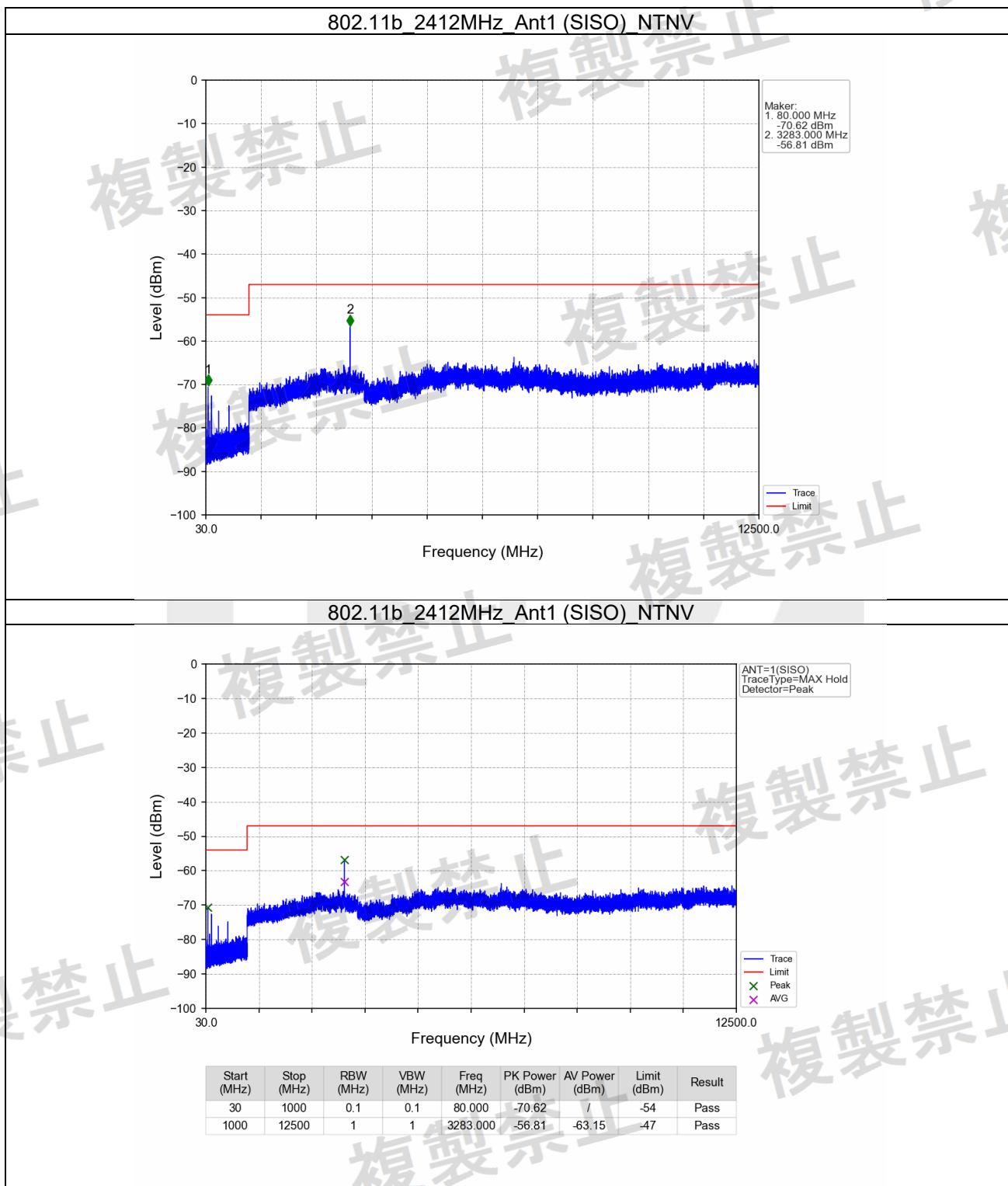
5.1 Test Result

5.1.1 RxSe_NTNV

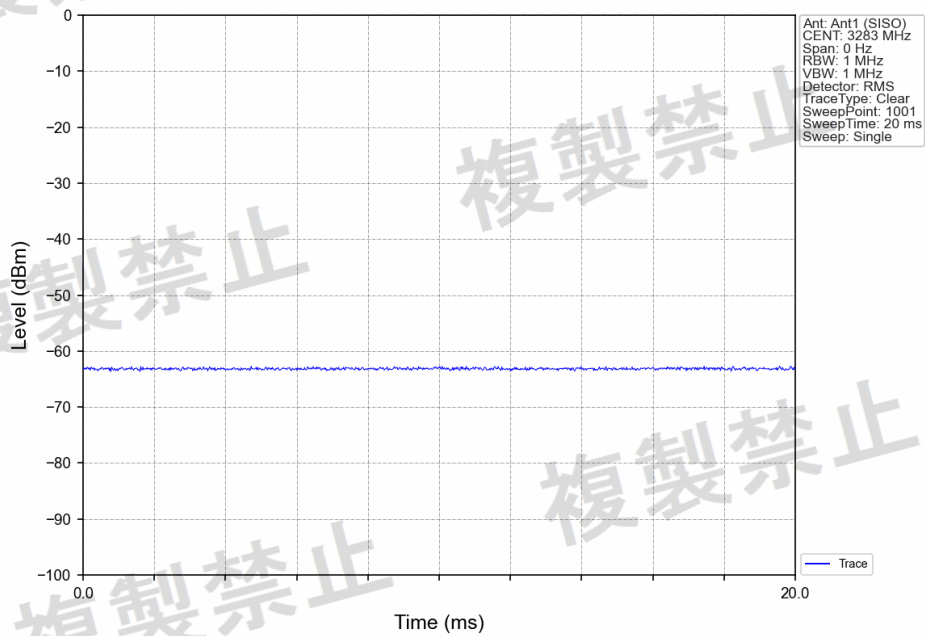
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
802.11b	SISO	2412	1	30	1000	80	-70.62	0.087	/	/	4	Pass
				1000	12500	3283	-56.81	2.084	-63.15	0.484	20	Pass
		2472	1	30	1000	80	-70.12	0.097	/	/	4	Pass
				1000	12500	3283.5	-56.86	2.061	-70.59	0.087	20	Pass
802.11g	SISO	2412	1	30	1000	80.05	-70.79	0.083	/	/	4	Pass
				1000	12500	3283.5	-56.95	2.018	-70.60	0.087	20	Pass
		2472	1	30	1000	80	-70.87	0.082	/	/	4	Pass
				1000	12500	3283.5	-57.50	1.778	/	/	20	Pass
802.11n (HT20)	SISO	2412	1	30	1000	80	-70.93	0.081	/	/	4	Pass
				1000	12500	3283	-57.28	1.871	/	/	20	Pass
		2472	1	30	1000	80	-70.72	0.085	/	/	4	Pass
				1000	12500	3283	-57.40	1.820	/	/	20	Pass
802.11n (HT40)	SISO	2422	1	30	1000	80	-70.75	0.084	/	/	4	Pass
				1000	12500	3283.5	-57.37	1.832	/	/	20	Pass
		2462	1	30	1000	80	-70.98	0.080	/	/	4	Pass
				1000	12500	3283.5	-57.11	1.945	/	/	20	Pass

5.2 Test Graph

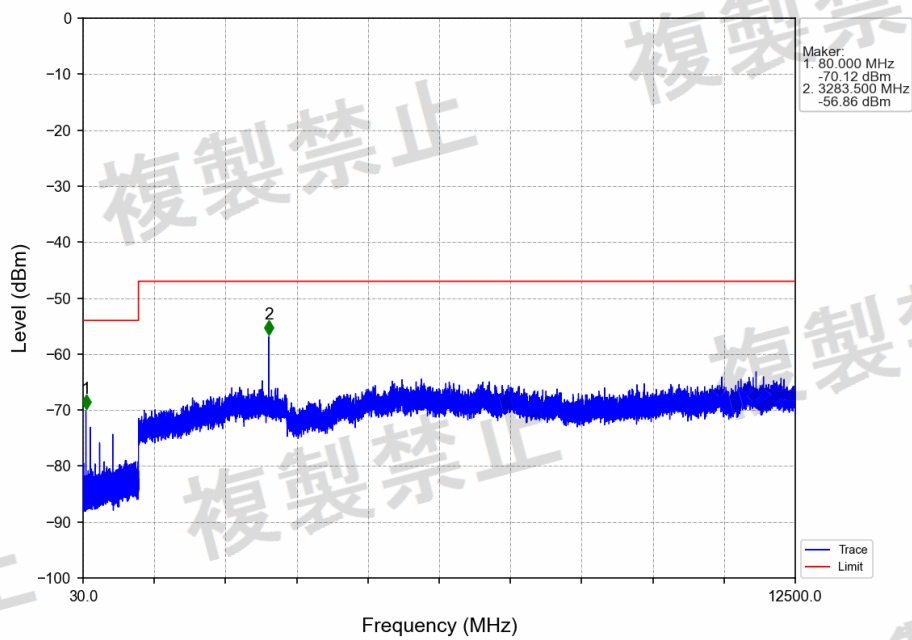
5.2.1 RxSe_NTNV



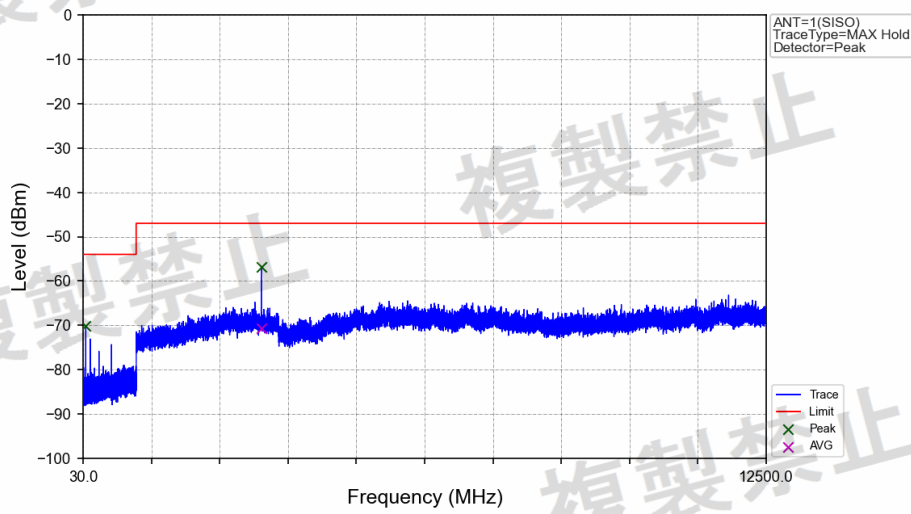
802.11b_2412MHz_Ant1 (SISO)_NTNV



802.11b_2472MHz_Ant1 (SISO)_NTNV

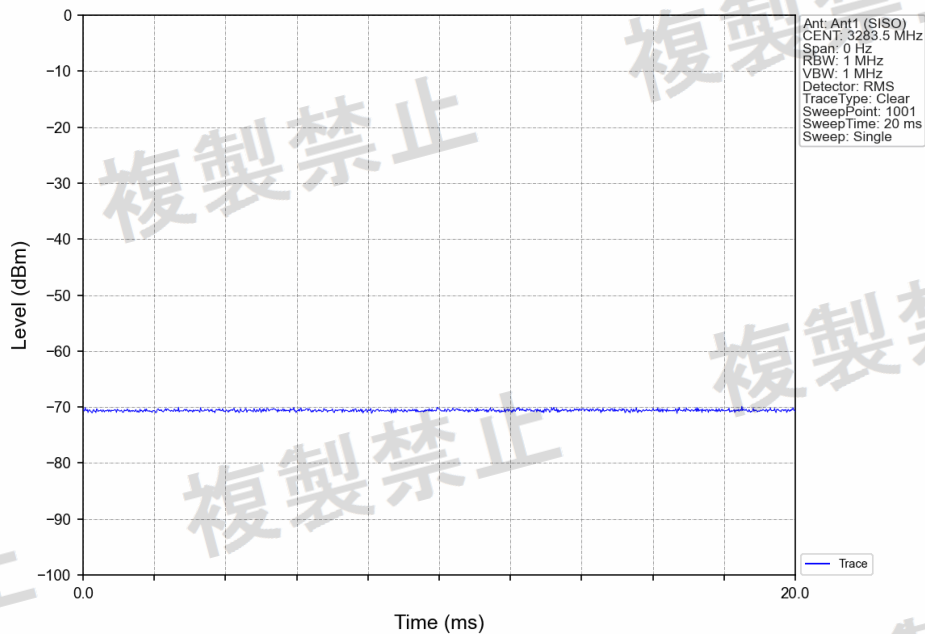


802.11b 2472MHz_Ant1 (SISO)_NTNV

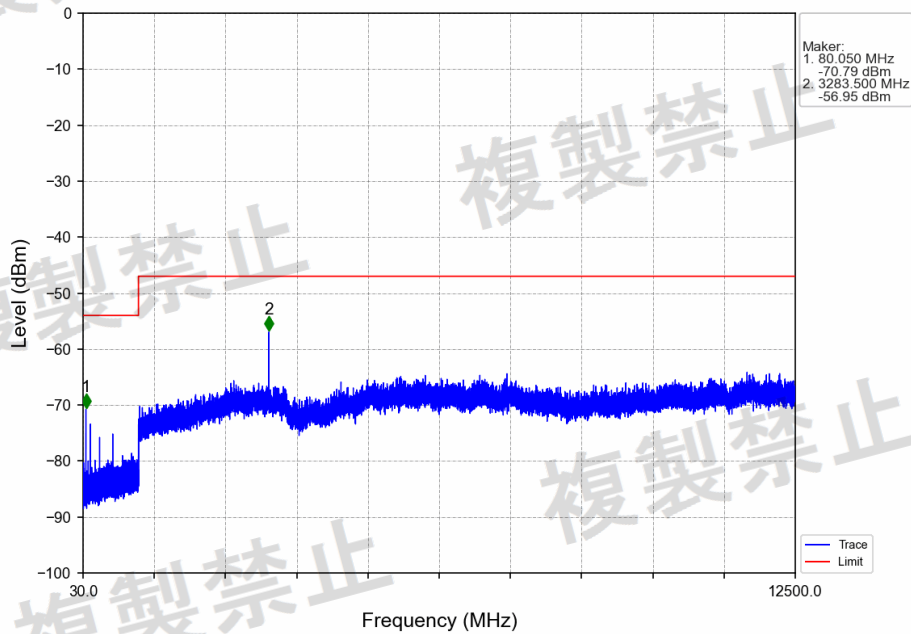


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	80.000	-70.12	/	-54	Pass
1000	12500	1	1	3283.500	-56.86	-70.59	-47	Pass

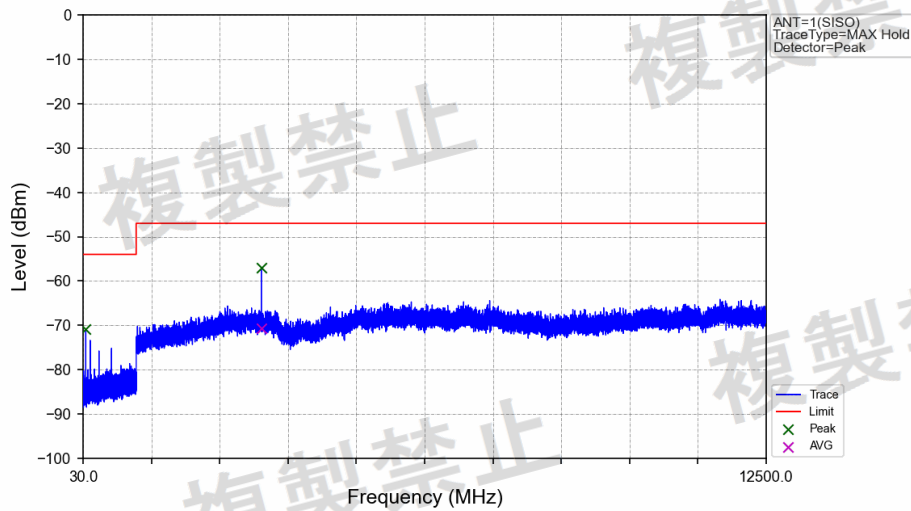
802.11b 2472MHz_Ant1 (SISO)_NTNV



802.11g_2412MHz_Ant1 (SISO)_NTNV

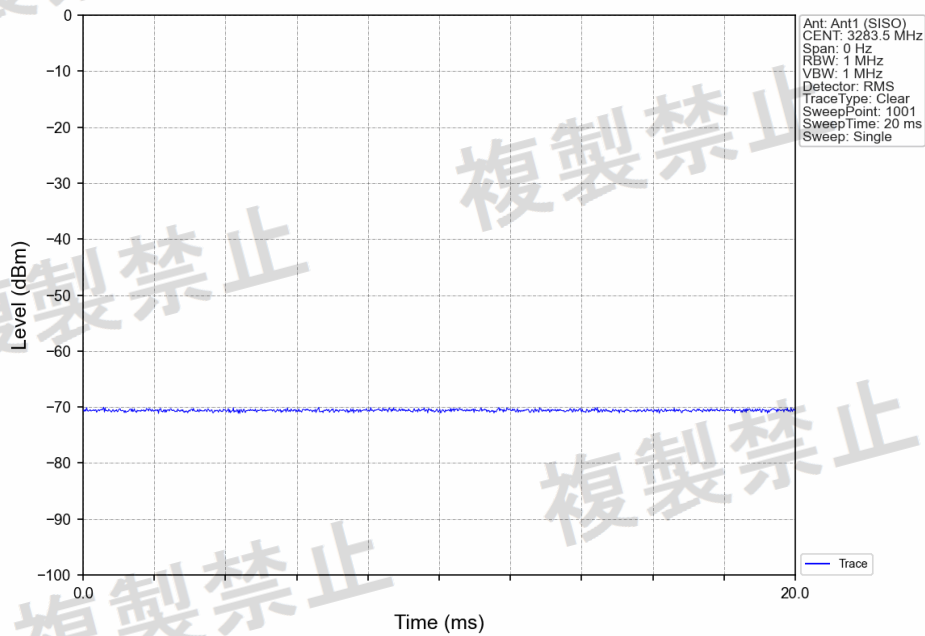


802.11g_2412MHz_Ant1 (SISO)_NTNV

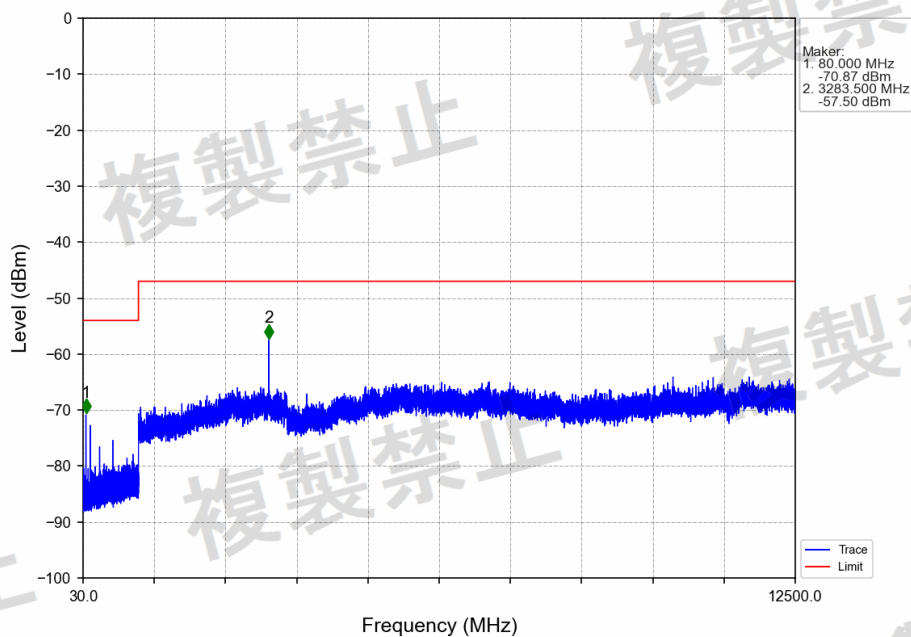


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	80.050	-70.79	/	-54	Pass
1000	12500	1	1	3283.500	-56.95	-70.60	-47	Pass

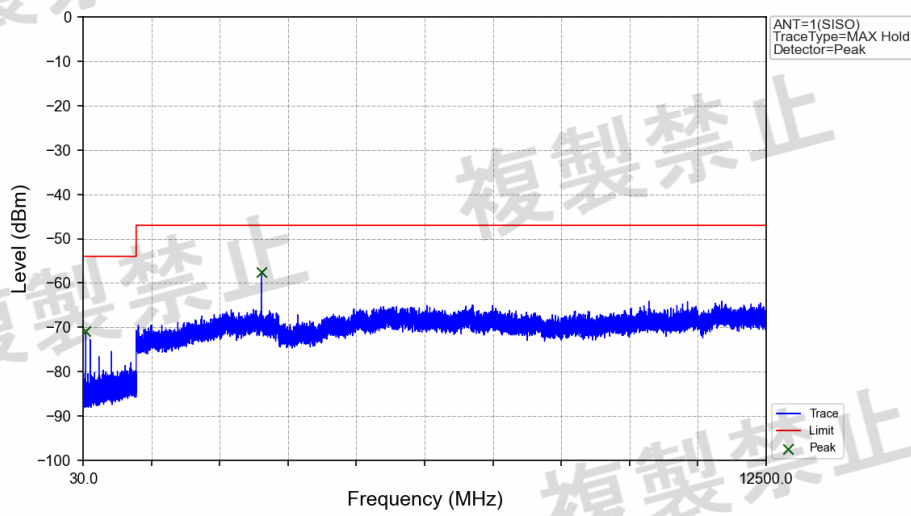
802.11g_2412MHz_Ant1 (SISO)_NTNV



802.11g_2472MHz_Ant1 (SISO)_NTNV

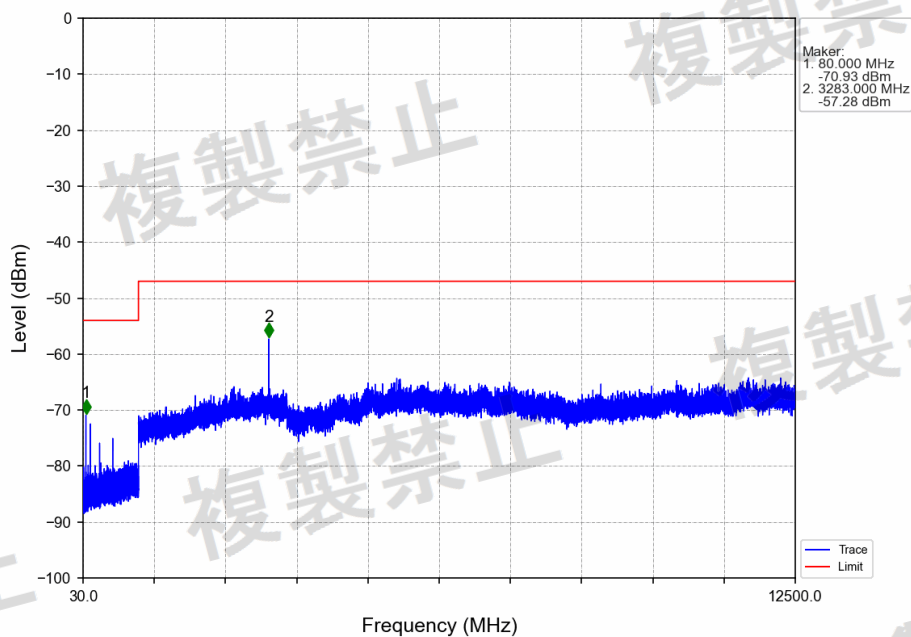


802.11g_2472MHz_Ant1 (SISO)_NTNV

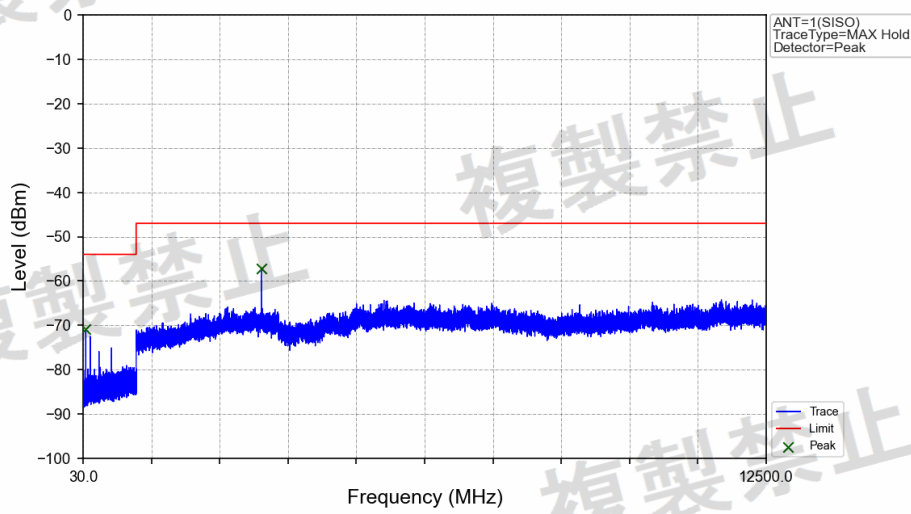


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	80.000	-70.87	/	-54	Pass
1000	12500	1	1	3283.500	-57.50	/	-47	Pass

802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

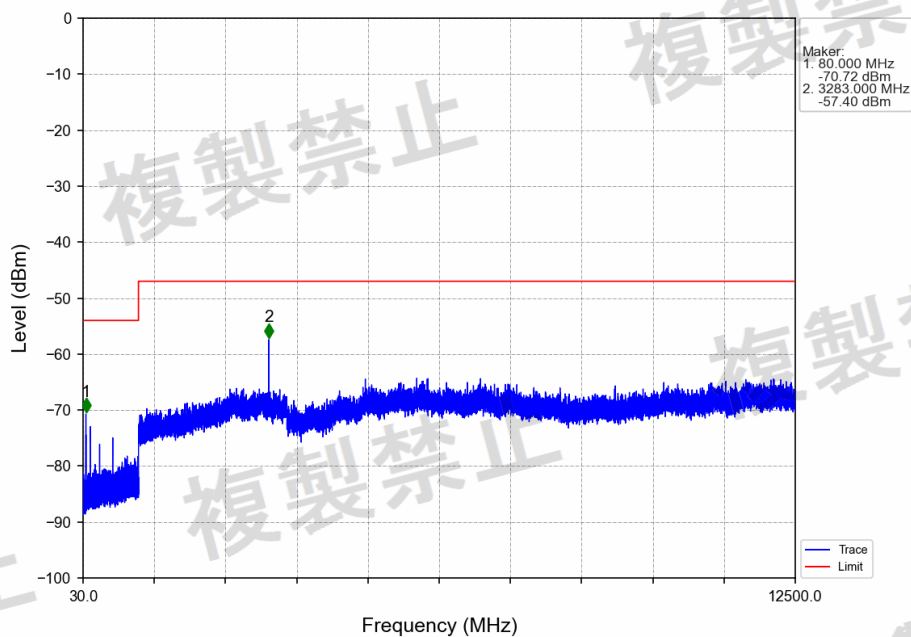


802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

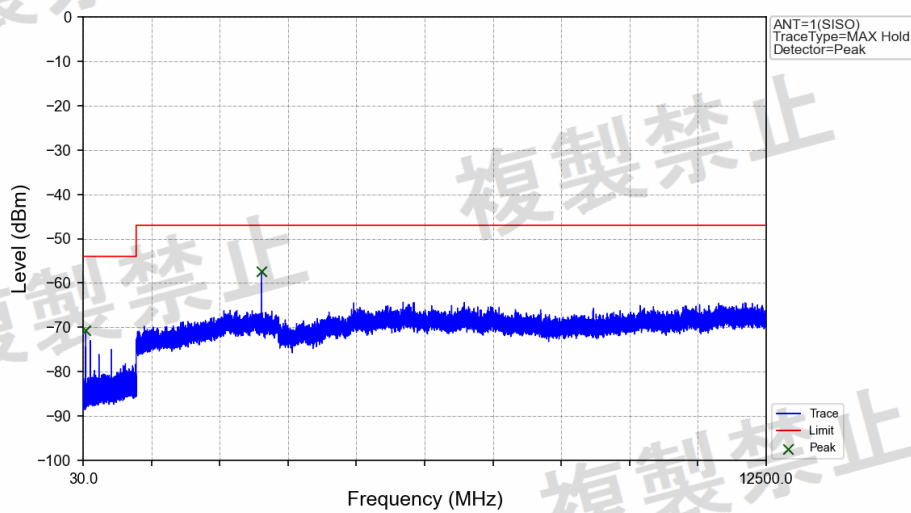


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	80.000	-70.93	/	-54	Pass
1000	12500	1	1	3283.000	-57.28	/	-47	Pass

802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV

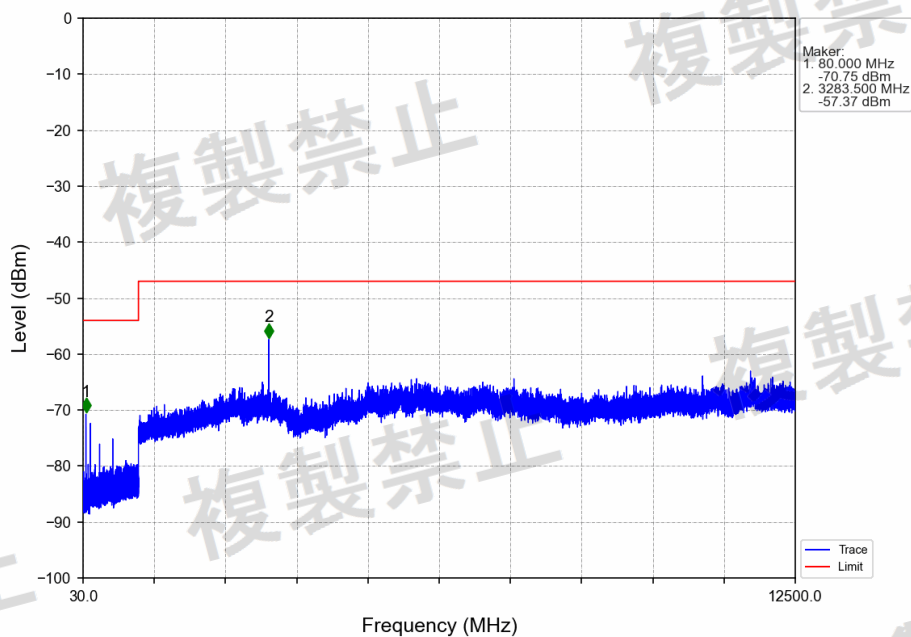


802.11n(HT20) 2472MHz_Ant1 (SISO)_NTNV

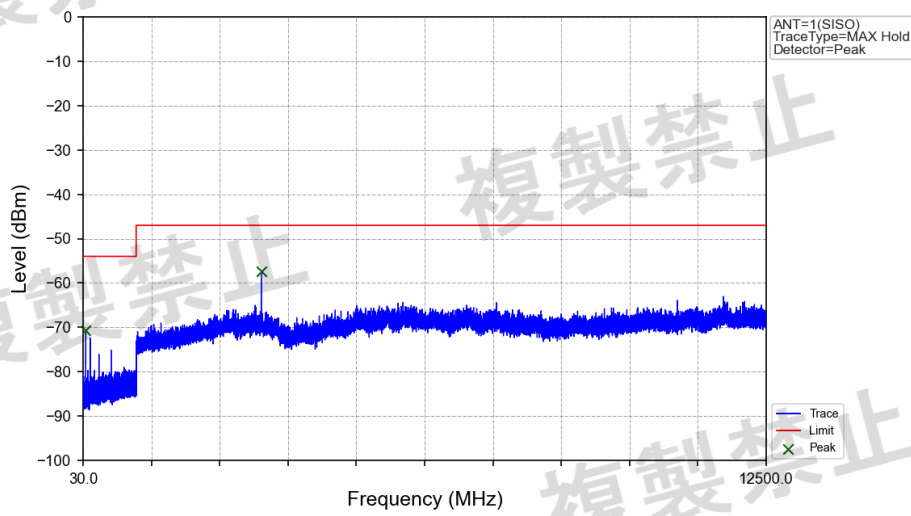


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	80.000	-70.72	/	-54	Pass
1000	12500	1	1	3283.000	-57.40	/	-47	Pass

802.11n(HT40) 2422MHz_Ant1 (SISO)_NTNV

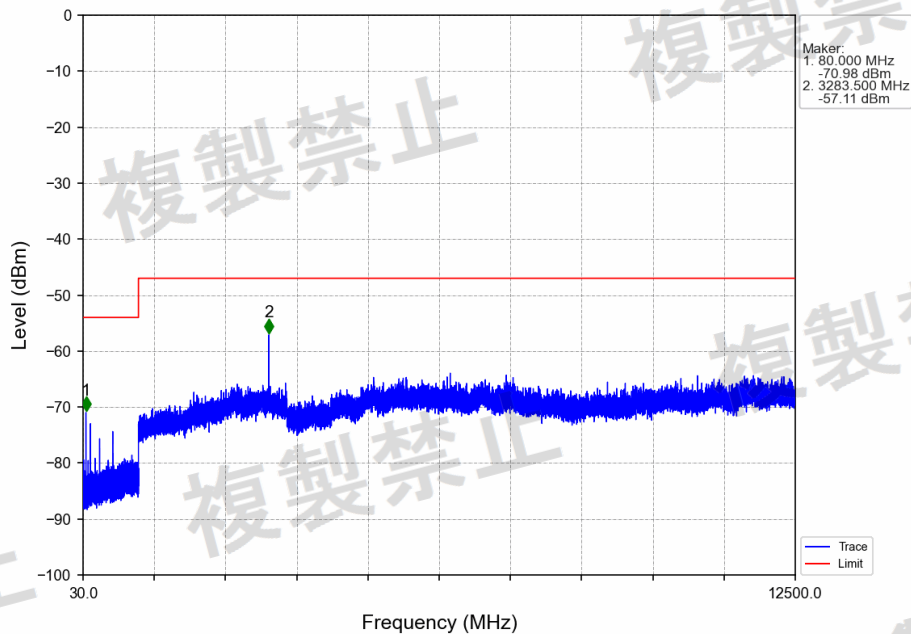


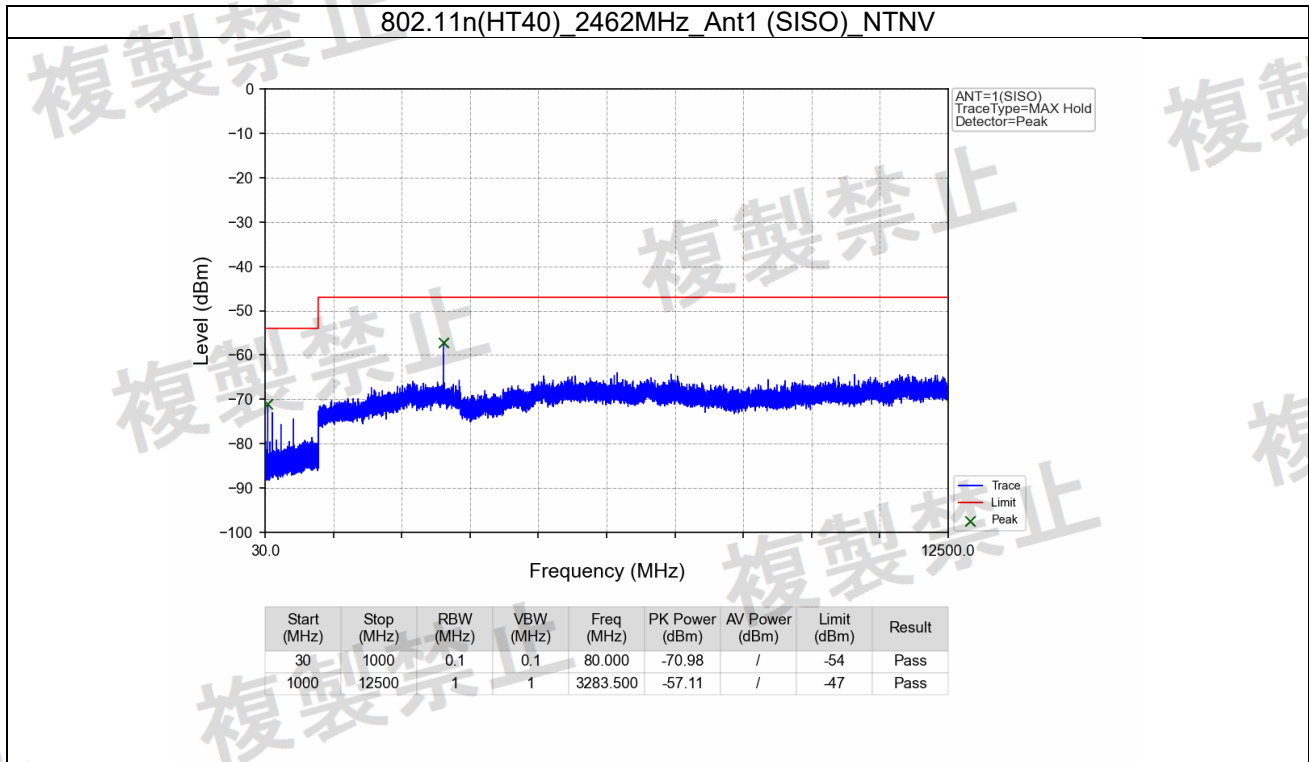
802.11n(HT40)_2422MHz_Ant1 (SISO)_NTNV



Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	80.000	-70.75	/	-54	Pass
1000	12500	1	1	3283.500	-57.37	/	-47	Pass

802.11n(HT40)_2462MHz_Ant1 (SISO)_NTNV





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