

Japan - TEST REPORT

Report Number : **68.940.21.0068.01** Date of Issue: October 8, 2021

Model : **NL59**

Product Type : Nanoleaf Lines

Applicant : NANOGRID LIMITED

Address : Room 1301, 13/F, Excel Centre, 483A Castle Peak Road,
Lai Chi Kok, Kowloon, HONG KONG

Production Facility : SEVECO GLOBAL LTD.

Address : 2 Jianxiang St. Hanxishui Chashan Town, 523377 Dongguan,
Guangdong, PEOPLE'S REPUBLIC OF CHINA

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

Total pages including Appendices : 57

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production. For further details, please see testing and certification regulation, chapter A-3.4.

Table of Content

1	General Information	3
1.1	Notes	3
1.2	Testing Laboratory	4
1.3	Details of Applicant	4
1.4	Application Details	4
1.5	Test Item	4
1.6	Applied Standard	5
1.7	Test Summary	5
2	Equipment Specification	6
2.1	General Description	6
2.2	Technical Data	6
2.3	Test conditions and test Connections	7
2.4	Auxiliary Equipment Used during Test	8
2.5	Lists of Test Instruments	8
2.6	Measurement Uncertainty	9
3	Measurements Result	10
3.1	Antenna Power	10
3.2	Tolerances for Antenna Power	12
3.3	Frequency Tolerance	14
3.4	Occupied Frequency Bandwidth	15
3.5	Spread Bandwidth	21
3.6	Process Gain & Transmission Rate	27
3.7	Transmitter Spurious Emissions (Conducted) (For transmitter)	28
3.8	Secondary Radiated Emissions (Conducted) (For receiver)	46
3.9	Interference prevention function	56
4	Photographs of Test Set-ups	57



1 General Information

1.1 Notes

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production. For further details, please see testing and certification regulation, chapter A-3.4.

Prepared By
Project Engineer

2021-10-08
Date

Henry Chen
Name

Signature

Approved By
Project Manager

2021-10-08
Date

Dawi Xu
Name

Signature





1.2 Testing Laboratory

Site 1

Company name:

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2,
Nanshan District, Shenzhen City, 518052, P. R. China,

Telephone:

86 755 8828 6998

Fax:

86 755 8828 5299

1.3 Details of Applicant

Client:

NANOGRID LIMITED

Address:

Room 1301, 13/F, Excel Centre, 483A Castle Peak Road,
Lai Chi Kok, Kowloon, HONG KONG

Product Description:

Nanoleaf Lines

Submitted Model No.:

NL59

1.4 Application Details

Date of receipt of order:

July 19, 2021

Date of receipt of test item:

July 19, 2021

Date of test:

July 19, 2021 to July 26, 2021

1.5 Test Item

Refer to table 1

1.6 Applied Standard

APPLIED PRODUCT STANDARD

ARIB STD-T66 Version 3.7/2014-10

1.7 Test Summary

Table 1. Summary of results

Conformance requirement according to ARIB STD-T66 Version 3.7/2014-10		Result	Test Site
Essential parameter	Corresponding technical requirements		
Transmitter requirements	3.2 (2) Antenna Power	PASS	Site 1
	3.2 (3) Tolerances for Antenna Power	PASS	Site 1
	3.2 (4) Frequency Tolerance	PASS	Site 1
	3.2 (5) Transmission Rate	PASS	Site 1
	3.2 (7) Occupied Frequency Bandwidth	PASS	Site 1
	3.2 (8) Spread Bandwidth	PASS	Site 1
	3.2 (9) Process Gain	PASS	Site 1
	3.2 (10) Number of Carriers	PASS	N/A*
	3.2 (11) Dwell Time	PASS	N/A*
	3.2 (6) Spurious Emissions	PASS	Site 1
Receiver requirements	3.5 (1) Secondary Radiated Emissions	PASS	Site 1
	3.4 (1) Interference prevention function	PASS	Site 1

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

NOTE 2: "*" N/A is an abbreviation for Not Applicable.

2 Equipment Specification

2.1 General Description

EUT is a Nanoleaf Lines which support 2.4G proprietary protocol, Thread, NFC and 2.4GWiFi.

This report is for 2.4GWiFi only.

2.2 Technical Data

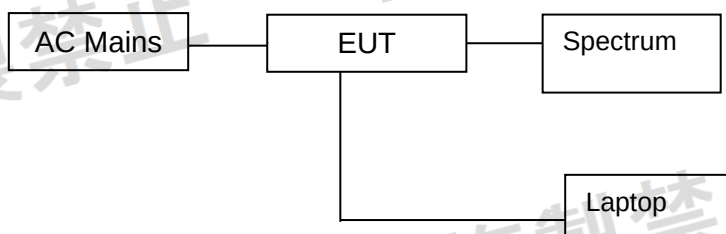
EUT Description	
Product Name	Nanoleaf Lines
Model Number	NL59
Ratings	100-240VAC; 50/60Hz; Other ratings see " Model list " for details.
TX & RX Frequency	2402-2480MHz for 2.4G proprietary protocol 2405-2480MHz for Thread 2412-2472MHz for WiFi
S/N	NIL
EUT Accessory	
Adapter:	Model: DSL-42WA-42 420100 I/P: 100-240V~; 50/60Hz; 1,0A O/P: 42,0Vdc; 1,0A; 42,0W;

2.3 Test conditions and test Connections

2.3.1 Test Conditions

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

2.3.2 Test Connections



Test Configuration

2.4 Auxiliary Equipment Used during Test

Table 3. Auxiliary Equipment Used during Test

Description	Manufacturer	Model no.	Serial no.	CAL. DUE DATE
Laptop	X220	Thinkpad	---	---

2.5 Lists of Test Instruments

Table 4. Lists of Test Instruments

TS8997 Test System

DESCRIPTION	MANUFACTURER	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVAL (YEAR)	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	68-4-48-14-001	108272	1	2022-6-3
Vector Signal Generator	Rohde & Schwarz	SMBV100A	68-4-48-18-001	262825	1	2022-6-3
Communication Synthetical Test Instrument	Rohde & Schwarz	CMW 270	68-4-48-18-003	101251	1	2022-6-3
Signal Analyzer	Rohde & Schwarz	FSV40	68-4-74-14-004	101030	1	2022-6-3
Vector Signal Generator	Rohde & Schwarz	SMU 200A	68-4-48-14-003	105324	1	2022-6-3
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	68-4-93-14-003	101226/100851	1	2022-6-3
Power Splitter	Weinschel	1580	68-4-85-14-001	SC319	1	2022-6-3
10dB Attenuator	Weinschel	4M-10	68-4-81-14-003	43152	1	2022-6-3
10dB Attenuator	R&S	DNF	68-4-81-14-004	DNF-001	1	2022-6-3
10dB Attenuator	R&S	DNF	68-4-81-14-005	DNF-002	1	2022-6-3
10dB Attenuator	R&S	DNF	68-4-81-14-006	DNF-003	1	2022-6-3
10dB Attenuator	R&S	DNF	68-4-81-14-007	DNF-004	1	2022-6-3
Test software	Rohde & Schwarz	EMC32	68-4-48-14-003-A10	Version 10.60.10	N/A	N/A
Test software	Tonscend	System for BT/WIFI	68-4-74-14-006-A13	Version 2.6.77.0518	N/A	N/A
Shielding Room	TDK	TS8997	68-4-90-19-003	----	1	2022-11-07

2.6 Measurement Uncertainty

For the test methods, according to the harmonized standard and conformance testing standard, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 and shall correspond to an expansion factor (coverage factor) $k = 1.96$ (which provides a confidence level of 95 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

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 ⁻⁷ or 1%

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.

3 Measurements Result

3.1 Antenna Power

3.1.1 Test condition

Test position:	Transmitting
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 KPa

3.1.2 Limit (ARIB STD-T66, Clause 3.2 (2)-a)

Modulation system	Frequency band used	Antenna power (max.)	EIRP (max.)	
			Omnidirectional case	Directional case
DS, OFDM	2,400 - 2,483.5 MHz	10 mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
FH, DS FH FH OFDM	2,400 - 2,483.5 MHz	3 mW/MHz	6.91 dBm/MHz	16.91 dBm/MHz
	Excluding 2,427 - 2,470.75 MHz	10 mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
Other than the above	2,400 - 2,483.5 MHz	10 mW	12.14 dBm	22.14 dBm

Note 1: The absolute gain of the transmitting antenna shall be 12.14dB or less. However, when the equivalent isotropic radiated power is equal to or less than the value obtained by applying an antenna power with the mean power of 10mW with its absolute gain being 12.14dB.

Note 2: The half-power beam width (angle between two points at which radiated power becomes 1/2) of the transmitting antenna's horizontal and vertical planes shall not exceed the value as determined by the following formula: $360 / A$ [degrees]. As the Antenna specification report, the value should be less than 90° , so the limit with beamforming of Max EIRP should be 18.14dBm.

3.1.3 Test result

11b

Frequency (MHz)	Voltage (VAC)	Result Antenna Power (mW/MHz)	Limit Antenna Power (mW/MHz)	Result EIRP (dBm/MHz)	Limit EIRP (dBm/MHz)
2412	230	3.369	10.00	7.42	12.14
	207	3.362	10.00	7.42	12.14
	253	3.362	10.00	7.42	12.14
2442	230	3.215	10.00	7.22	12.14
	207	3.211	10.00	7.22	12.14
	253	3.212	10.00	7.22	12.14
2472	230	3.608	10.00	7.72	12.14
	207	3.603	10.00	7.72	12.14
	253	3.604	10.00	7.72	12.14
Conclusion: PASS					

11g

Frequency (MHz)	Voltage (VAC)	Result Antenna Power (mW/MHz)	Limit Antenna Power (mW/MHz)	Result EIRP (dBm/MHz)	Limit EIRP (dBm/MHz)
2412	230	2.107	10.00	5.39	12.14
	207	2.104	10.00	5.38	12.14
	253	2.103	10.00	5.38	12.14
2442	230	2.077	10.00	5.32	12.14
	207	2.074	10.00	5.32	12.14
	253	2.074	10.00	5.32	12.14
2472	230	1.619	10.00	4.24	12.14
	207	1.617	10.00	4.24	12.14
	253	1.618	10.00	4.24	12.14
Conclusion: PASS					

11nHT20

Frequency (MHz)	Voltage (VAC)	Result Antenna Power (mW/MHz)	Limit Antenna Power (mW/MHz)	Result EIRP (dBm/MHz)	Limit EIRP (dBm/MHz)
2412	230	1.972	10.00	5.10	12.14
	207	1.971	10.00	5.10	12.14
	253	1.971	10.00	5.10	12.14
2442	230	2.025	10.00	5.21	12.14
	207	2.022	10.00	5.21	12.14
	253	2.023	10.00	5.21	12.14
2472	230	2.049	10.00	5.27	12.14
	207	2.047	10.00	5.26	12.14
	253	2.049	10.00	5.26	12.14
Conclusion: PASS					

11nHT40

Frequency (MHz)	Voltage (VAC)	Result Antenna Power (mW/MHz)	Limit Antenna Power (mW/MHz)	Result EIRP (dBm/MHz)	Limit EIRP (dBm/MHz)
2422	230	1.061	10.00	2.41	12.14
	207	1.060	10.00	2.40	12.14
	253	1.061	10.00	2.41	12.14
2442	230	1.106	10.00	2.59	12.14
	207	1.104	10.00	2.58	12.14
	253	1.104	10.00	2.58	12.14
2462	230	1.177	10.00	2.86	12.14
	207	1.175	10.00	2.85	12.14
	253	1.176	10.00	2.86	12.14
Conclusion: PASS					

3.1.4 Result

The equipment met the requirement of this clause.

3.2 Tolerances for Antenna Power

3.2.1 Test condition

Test position:	Transmitting
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 KPa

3.2.2 Limit (ARIB STD-T66, Clause 3.2 (3))

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

11b

Frequency (MHz)	Voltage (VAC)	Declared Output Power (mW/MHz)	Result (mW/MHz)	Tolerances (%)	Limit (%)
2412	230	5.5	3.369	-38.74	+20%~-80%
	207	5.5	3.364	-38.83	+20%~-80%
	253	5.5	3.365	-38.81	+20%~-80%
2442	230	5.5	3.215	-41.54	+20%~-80%
	207	5.5	3.213	-41.58	+20%~-80%
	253	5.5	3.213	-41.58	+20%~-80%
2472	230	5.5	3.608	-34.40	+20%~-80%
	207	5.5	3.607	-34.41	+20%~-80%
	253	5.5	3.606	-34.43	+20%~-80%
Conclusion: PASS					

11g

Frequency (MHz)	Voltage (VAC)	Declared Output Power (mW/MHz)	Result (mW/MHz)	Tolerances (%)	Limit (%)
2412	230	5.5	2.107	-61.69	+20%~-80%
	207	5.5	2.104	-61.74	+20%~-80%
	253	5.5	2.103	-61.76	+20%~-80%
2442	230	5.5	2.077	-62.23	+20%~-80%
	207	5.5	2.074	-62.29	+20%~-80%
	253	5.5	2.075	-62.27	+20%~-80%
2472	230	5.5	1.619	-70.56	+20%~-80%
	207	5.5	1.617	-70.60	+20%~-80%
	253	5.5	1.616	-70.61	+20%~-80%
Conclusion: PASS					

11nHT20

Frequency (MHz)	Voltage (VAC)	Declared Output Power (mW/MHz)	Result (mW/MHz)	Tolerances (%)	Limit (%)
2412	230	5.5	1.972	-64.14	+20%~-80%
	207	5.5	1.971	-64.16	+20%~-80%
	253	5.5	1.970	-64.18	+20%~-80%
2442	230	5.5	2.025	-63.18	+20%~-80%
	207	5.5	2.023	-63.21	+20%~-80%
	253	5.5	2.023	-63.21	+20%~-80%
2472	230	5.5	2.049	-62.74	+20%~-80%
	207	5.5	2.046	-62.80	+20%~-80%
	253	5.5	2.047	-62.78	+20%~-80%
Conclusion: PASS					

11nHT40

Frequency (MHz)	Voltage (VAC)	Declared Output Power (mW/MHz)	Result (mW/MHz)	Tolerances (%)	Limit (%)
2422	230	1.0	1.061	6.10	+20%~-80%
	207	1.0	1.060	6.00	+20%~-80%
	253	1.0	1.061	6.10	+20%~-80%
2442	230	1.0	1.106	10.60	+20%~-80%
	207	1.0	1.104	10.40	+20%~-80%
	253	1.0	1.104	10.40	+20%~-80%
2462	230	1.0	1.177	17.70	+20%~-80%
	207	1.0	1.175	17.50	+20%~-80%
	253	1.0	1.174	17.40	+20%~-80%
Conclusion: PASS					

Note: Deviation = (Output power – Declared Output Power) / Declared Output Power * 100%

3.2.4 Result

The equipment met the requirement of this clause.

3.3 Frequency Tolerance

3.3.1 Test condition

Test position:	Transmitting
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 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

Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Tolerance (kHz)	Tolerance (ppm)	Limit (ppm)
2412	230	2412.029	29	12.02322	± 50
	207	2412.029	29	12.02322	± 50
	253	2412.029	29	12.02322	± 50
2422	230	2422.029	29	11.97358	± 50
	207	2422.029	29	11.97358	± 50
	253	2422.029	29	11.97358	± 50
2442	230	2442.030	30	12.28501	± 50
	207	2442.030	30	12.28501	± 50
	253	2442.030	30	12.28501	± 50
2462	230	2462.030	30	12.18522	± 50
	207	2462.030	30	12.18522	± 50
	253	2462.030	30	12.18522	± 50
2472	230	2472.030	30	12.13592	± 50
	207	2472.030	30	12.13592	± 50
	253	2472.030	30	12.13592	± 50
Conclusion: PASS					

Result

The equipment met the requirement of this clause.

3.4 Occupied Frequency Bandwidth

3.4.1 Test condition

Test position:	Transmitting
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 KPa

3.4.2 Limit (ARIB STD-T66, Clause 3.2 (7))

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 system other than any of the above shall be 26 MHz or less.

3.4.3 Test Result

11b

Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Limit (MHz)
2412	230	14.306	<26MHz
2442	230	14.306	<26MHz
2472	230	14.306	<26MHz

11g

Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Limit (MHz)
2412	230	16.344	<26MHz
2442	230	16.344	<26MHz
2472	230	16.384	<26MHz

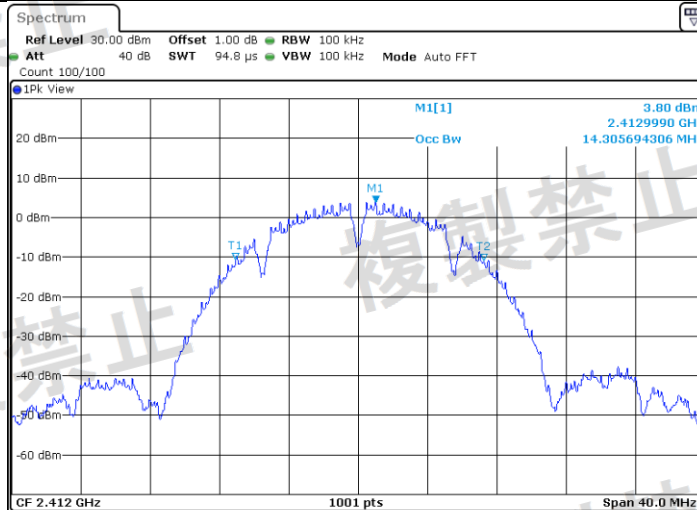
11nHT20

Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Limit (MHz)
2412	230	17.502	<26MHz
2442	230	17.502	<26MHz
2472	230	17.502	<26MHz

11nHT40

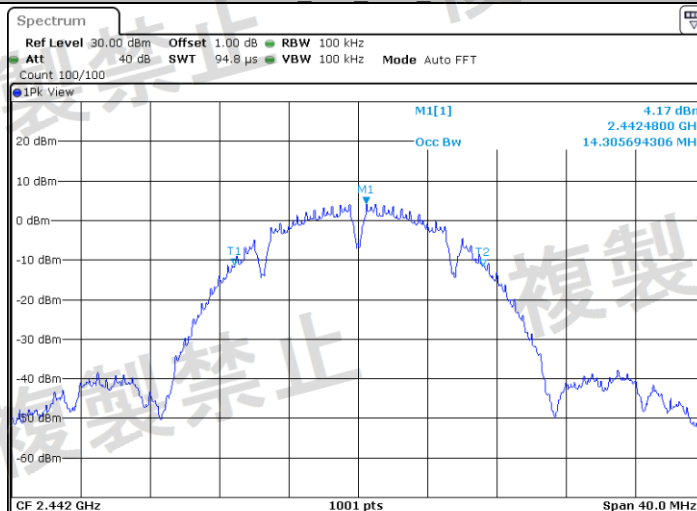
Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Limit (MHz)
2422	230	35.644	<38MHz
2442	230	35.724	<38MHz
2462	230	35.724	<38MHz

NTNV_11B_Ant1_2412



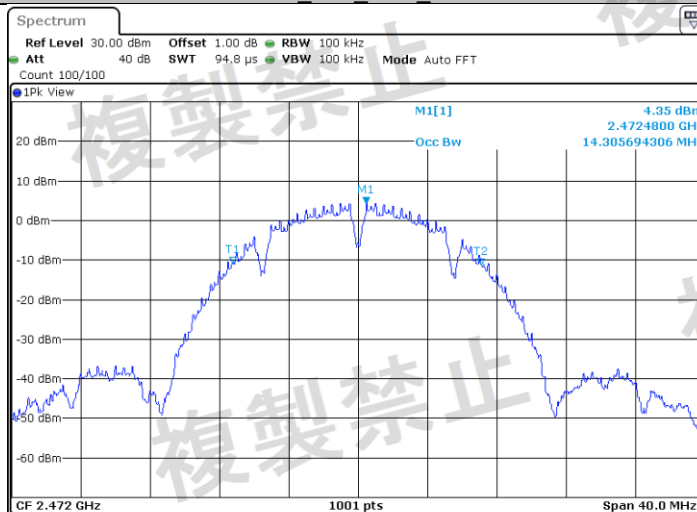
Date: 20 JUL 2021 10:43:46

NTNV_11B_Ant1_2442



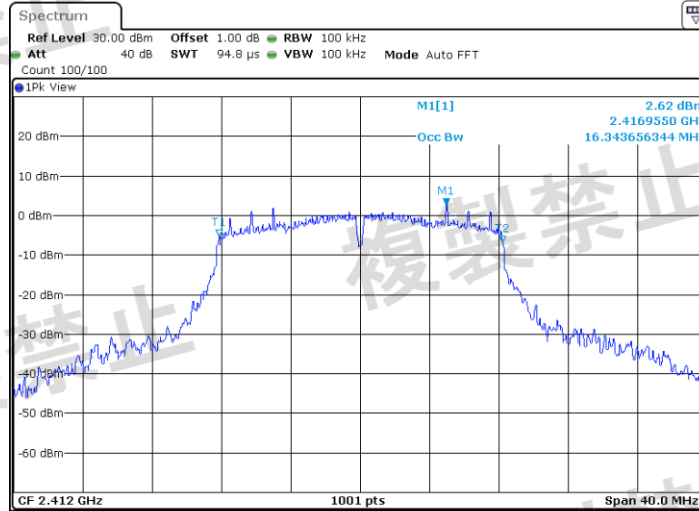
Date: 19 JUL 2021 20:19:29

NTNV_11B_Ant1_2472



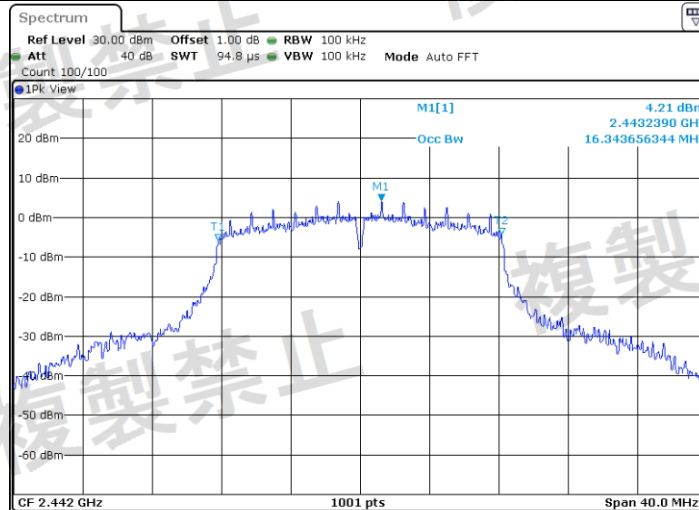
Date: 19 JUL 2021 20:23:46

NTNV_11G_Ant1_2412



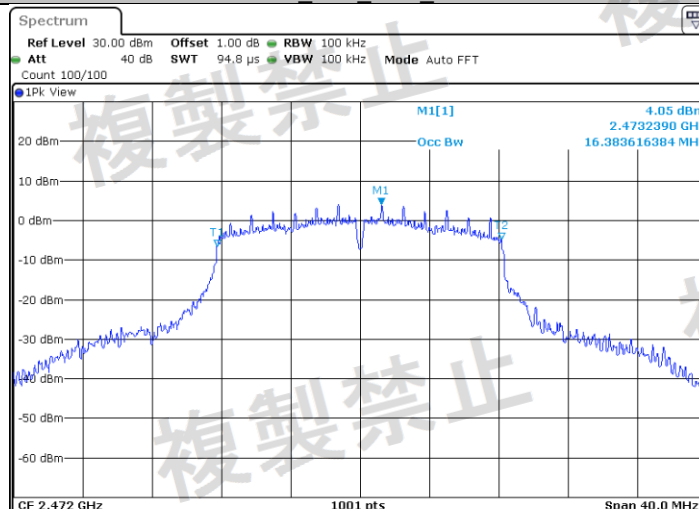
Date: 19 JUL 2021 20:27:05

NTNV_11G_Ant1_2442



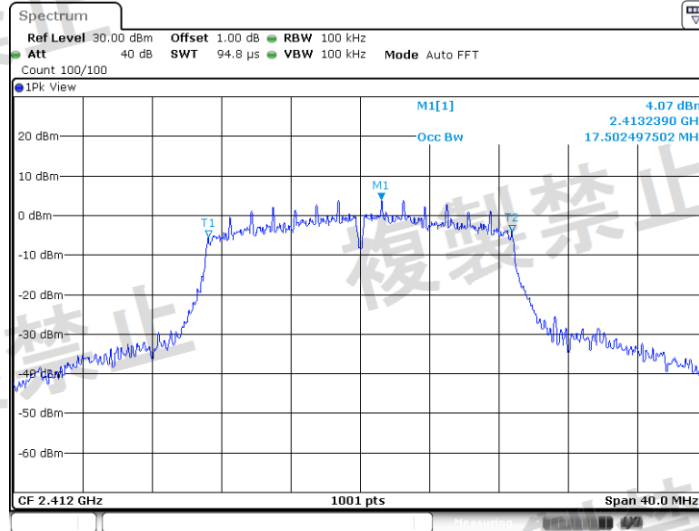
Date: 19 JUL 2021 20:28:41

NTNV_11G_Ant1_2472



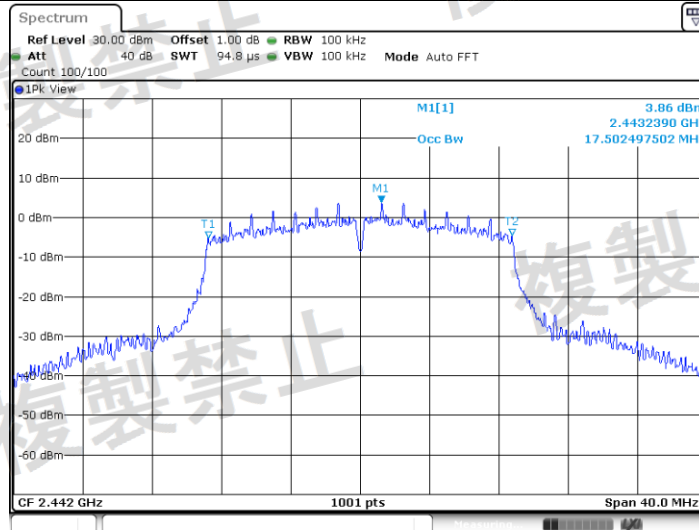
Date: 19 JUL 2021 20:37:23

NTNV 11N20SISO Ant1 2412



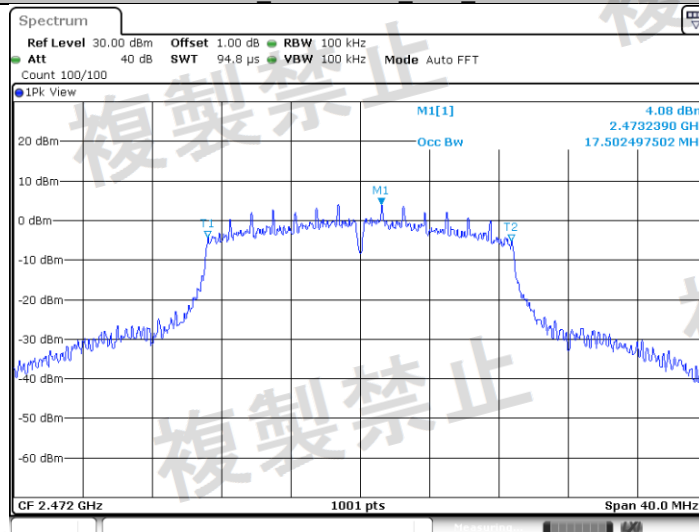
Date: 19 JUL 2021 20:39:14

NTNV 11N20SISO Ant1 2442



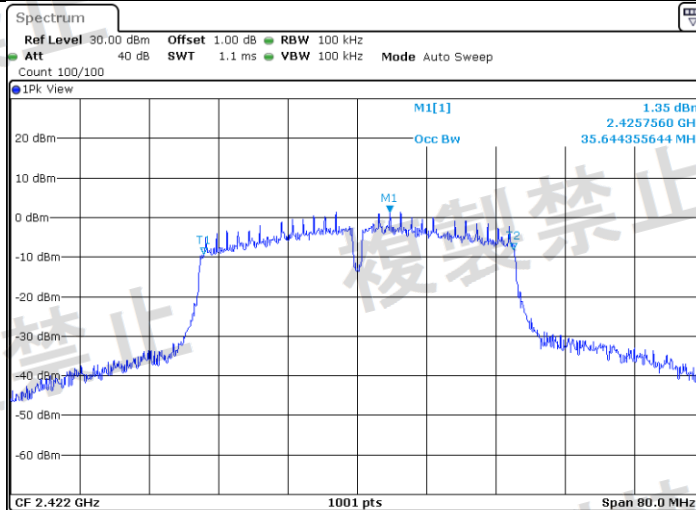
Date: 20 JUL 2021 11:14:15

NTNV 11N20SISO Ant1 2472



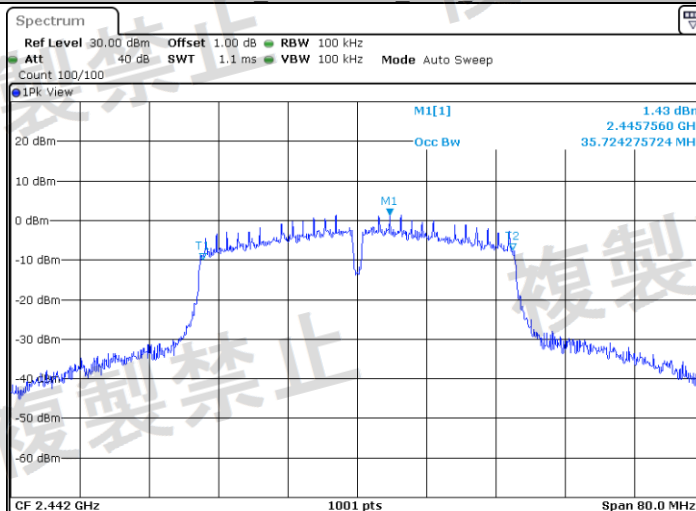
Date: 20 JUL 2021 11:16:05

NTNV 11N40SISO Ant1 2422



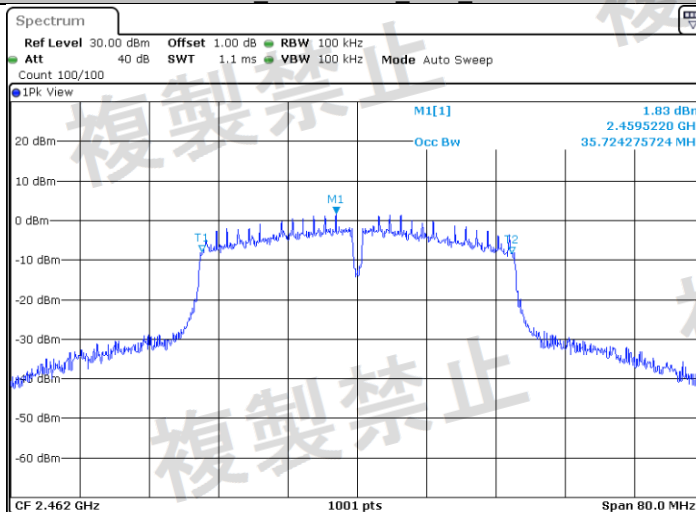
Date: 20 JUL 2021 11:18:07

NTNV 11N40SISO Ant1 2442



Date: 20 JUL 2021 11:21:14

NTNV 11N40SISO Ant1 2462



Date: 20 JUL 2021 11:24:05

3.4.4 Result

The equipment met the requirement of this clause.

3.5 Spread Bandwidth

3.5.1 Test condition

Test position:	Transmitting
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 KPa

3.5.2 Limit (ARIB STD-T66, Clause 3.2 (8))

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

11b

Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Limit (kHz)
2412	230	9.231	>500
2442	230	9.231	>500
2472	230	9.231	>500

11g

Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Limit (kHz)
2412	230	13.626	>500
2442	230	13.946	>500
2472	230	13.866	>500

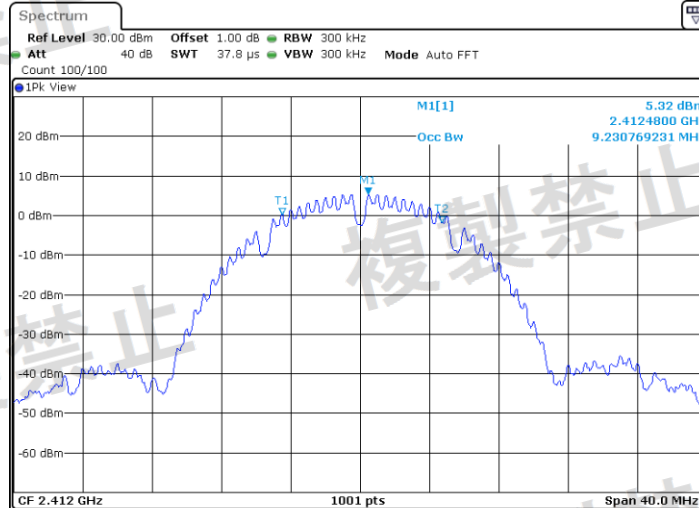
11nHT20

Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Limit (kHz)
2412	230	14.745	>500
2442	230	14.785	>500
2472	230	14.745	>500

11nHT40

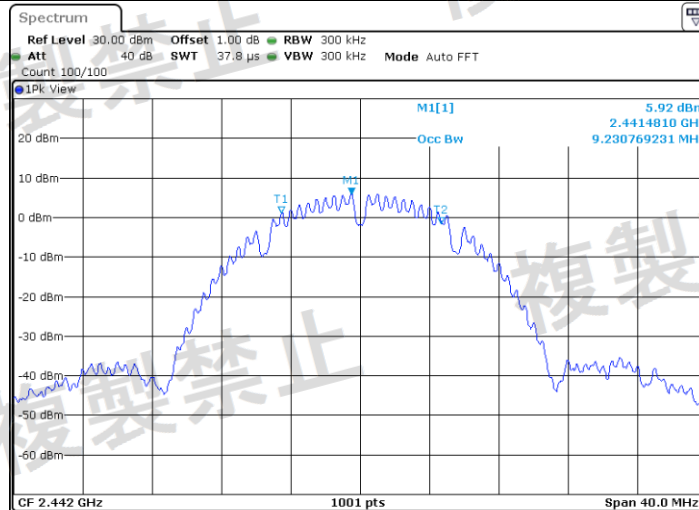
Test Frequency (MHz)	Voltage (VAC)	Result (MHz)	Limit (kHz)
2422	230	29.81	>500
2442	230	29.81	>500
2462	230	29.81	>500

NTNV_11B_Ant1_2412



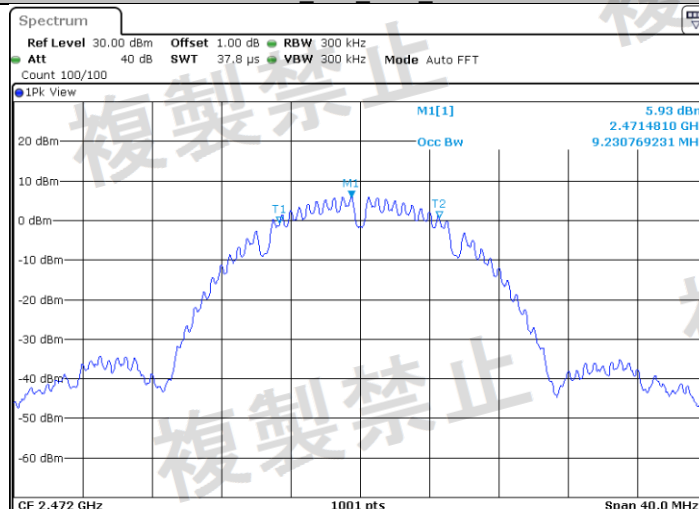
Date: 20 JUL 2021 10:43:58

NTNV_11B_Ant1_2442



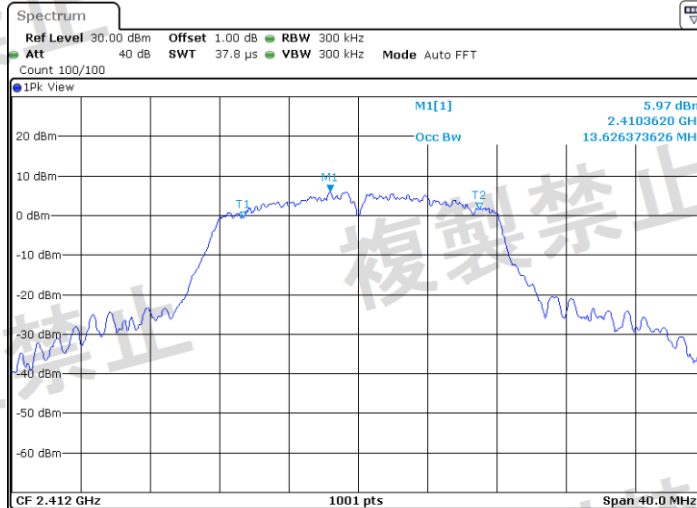
Date: 19 JUL 2021 20:19:41

NTNV_11B_Ant1_2472



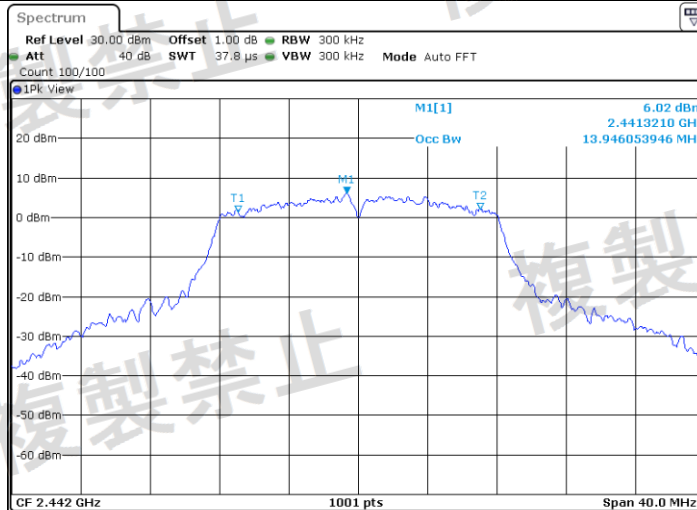
Date: 19 JUL 2021 20:23:58

NTNV_11G_Ant1_2412



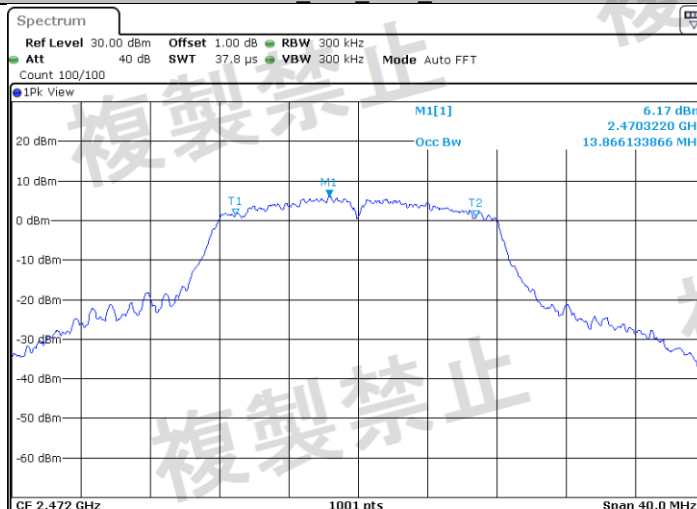
Date: 19 JUL 2021 20:27:16

NTNV_11G_Ant1_2442



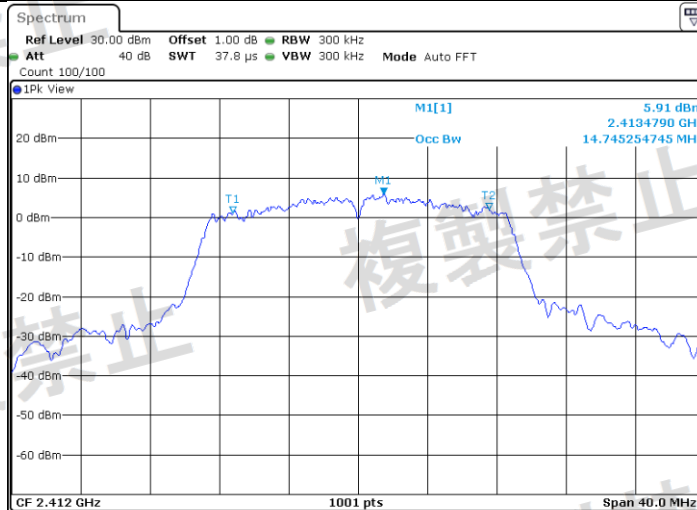
Date: 19 JUL 2021 20:28:52

NTNV_11G_Ant1_2472



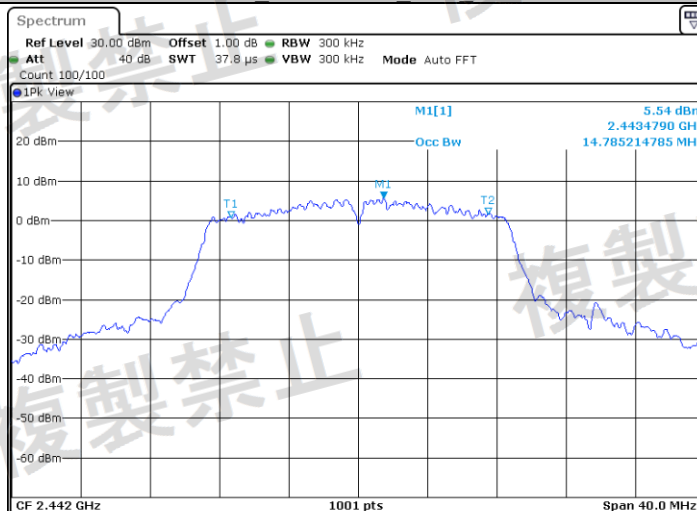
Date: 19 JUL 2021 20:37:34

NTNV 11N20SISO Ant1 2412



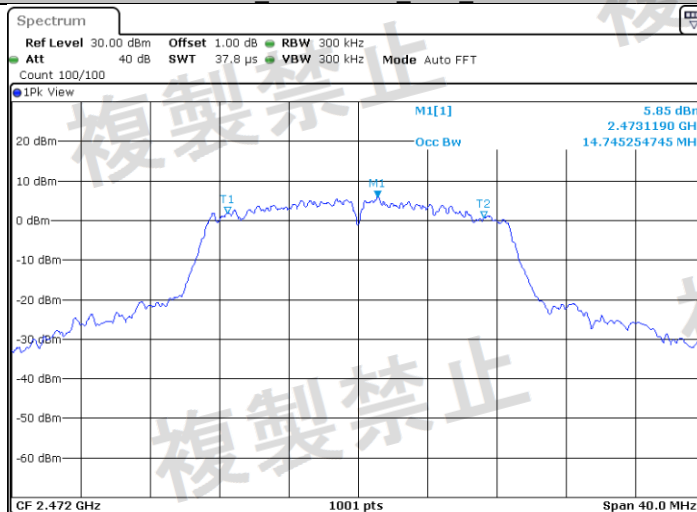
Date: 19 JUL 2021 20:39:26

NTNV 11N20SISO Ant1 2442



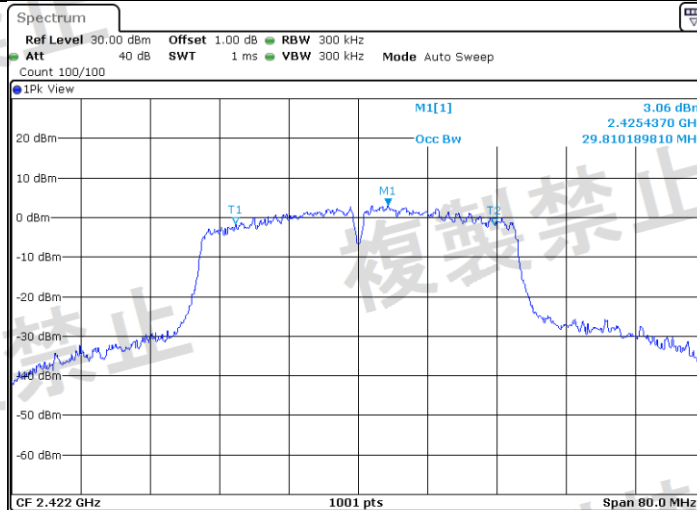
Date: 20 JUL 2021 11:14:27

NTNV 11N20SISO Ant1 2472



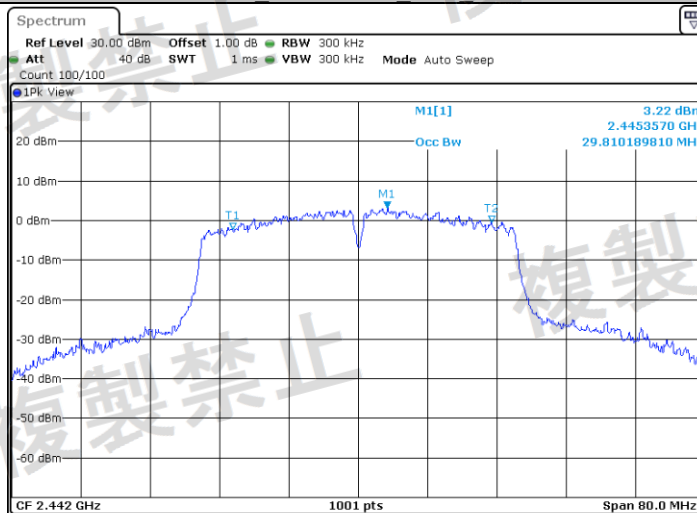
Date: 20 JUL 2021 11:16:17

NTNV 11N40SISO Ant1_2422



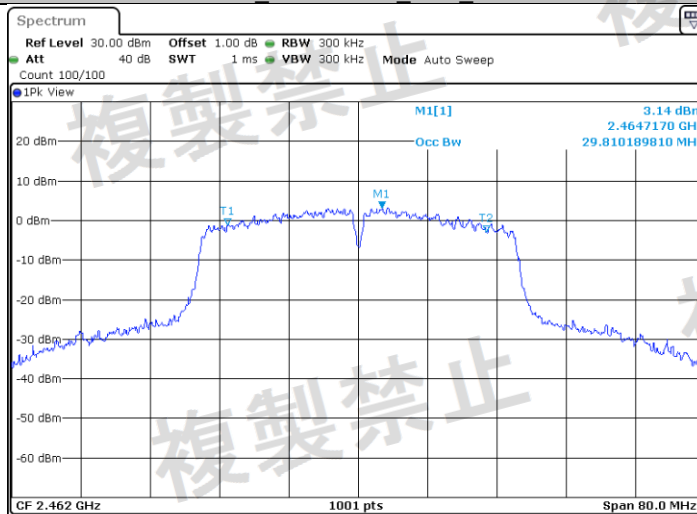
Date: 20 JUL 2021 11:18:18

NTNV 11N40SISO Ant1_2442



Date: 20 JUL 2021 11:21:26

NTNV 11N40SISO Ant1_2462



Date: 20 JUL 2021 11:24:16

3.5.4 Result

The equipment met the requirement of this clause

3.6 Process Gain & Transmission Rate

3.6.1 Test condition

Test position:	Transmitting
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 KPa

3.6.2 Limit (ARIB STD-T66, Clause 3.2 (9))

Process gain (value obtained by dividing the spread bandwidth by a frequency equal to the transmission rate of the modulation signal; this also applies hereafter) in the spread spectrum system shall be 5 or more.

3.6.3 Test Result

Modulation	Channel	Voltage (AC)	Spread Bandwidth (MHz)	Symbol rate (Mbps)	Result	Limit
11b	2412	230	9.231	1.375	6.71	≥5
	2442	230	9.231	1.375	6.71	≥5
	2472	230	9.231	1.375	6.71	≥5
11g	2412	230	13.626	1.5	9.08	≥5
	2442	230	13.946	1.5	9.29	≥5
	2472	230	13.866	1.5	9.24	≥5
11nHT20	2412	230	14.745	1.5	9.83	≥5
	2442	230	14.785	1.5	9.85	≥5
	2472	230	14.745	1.5	9.83	≥5
11nHT40	2422	230	29.81	3	9.93	≥5
	2442	230	29.81	3	9.93	≥5
	2462	230	29.81	3	9.93	≥5

The equipment met the requirement of this clause.

3.7 Transmitter Spurious Emissions (Conducted) (For transmitter)

3.7.1 Test condition

Test position:	Transmitting
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 KPa

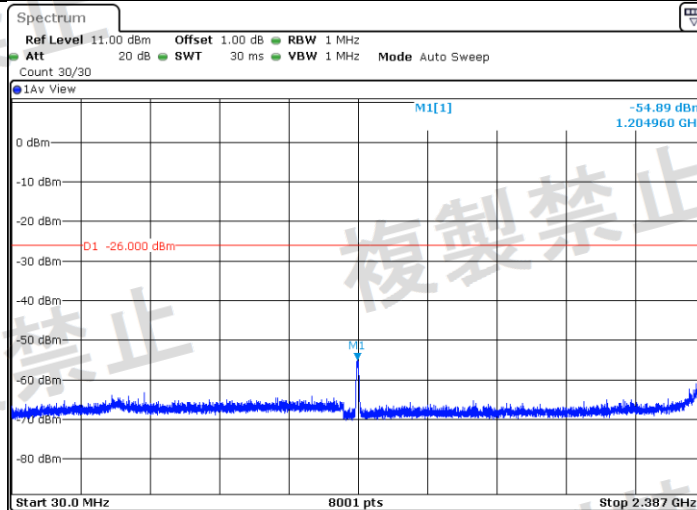
3.7.2 Limit (ARIB STD-T66, Clause 3.2 (6))

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: a. $2,387\text{MHz} \leq f \leq 2,400\text{MHz}$ and $2,483.5\text{MHz} < f \leq 2,496.5\text{MHz}$ 25 μW or less b. $2,387\text{MHz} > f$ and $2,496.5\text{MHz} < f$ 2.5 μW or less

3.7.3 Test Result

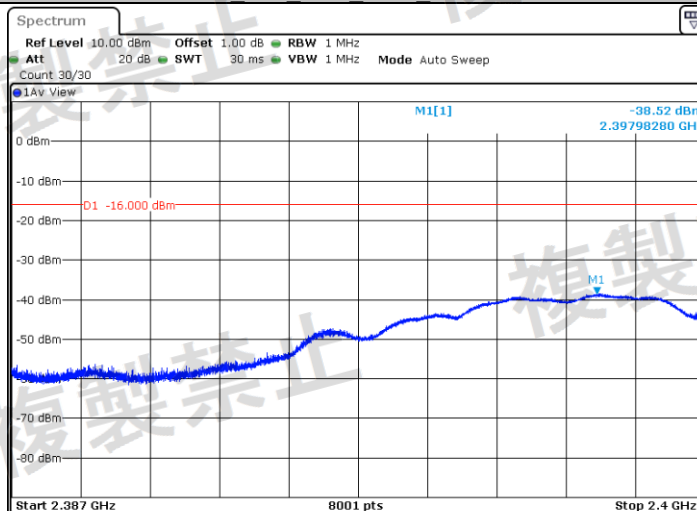
TestCondition	TestMode	Antenna	Channel	Freq.Range	Result	Limit	Verdict
NTNV	11B	Ant1	2412	30~2387	-54.89	<=-26	PASS
				2387~2400	-38.52	<=-16	PASS
				2483.5~2496.5	-56.43	<=-16	PASS
				2496.5~13000	-46.9	<=-26	PASS
			2442	30~2387	-58.06	<=-26	PASS
				2387~2400	-55.9	<=-16	PASS
				2483.5~2496.5	-54.85	<=-16	PASS
				2496.5~13000	-46.98	<=-26	PASS
			2472	30~2387	-58.28	<=-26	PASS
				2387~2400	-57.5	<=-16	PASS
				2483.5~2496.5	-35.91	<=-16	PASS
				2496.5~13000	-47.52	<=-26	PASS
	11G	Ant1	2412	30~2387	-48.95	<=-26	PASS
				2387~2400	-23.58	<=-16	PASS
				2483.5~2496.5	-46.49	<=-16	PASS
				2496.5~13000	-48.74	<=-26	PASS
			2442	30~2387	-52.15	<=-26	PASS
				2387~2400	-48.37	<=-16	PASS
				2483.5~2496.5	-43.79	<=-16	PASS
				2496.5~13000	-48.39	<=-26	PASS
			2472	30~2387	-54.82	<=-26	PASS
				2387~2400	-50.09	<=-16	PASS
				2483.5~2496.5	-21.5	<=-16	PASS
				2496.5~13000	-46.25	<=-26	PASS
	11N20SISO	Ant1	2412	30~2387	-48.33	<=-26	PASS
				2387~2400	-26.1	<=-16	PASS
				2483.5~2496.5	-46.98	<=-16	PASS
				2496.5~13000	-47.96	<=-26	PASS
			2442	30~2387	-53.14	<=-26	PASS
				2387~2400	-46.87	<=-16	PASS
				2483.5~2496.5	-45.49	<=-16	PASS
				2496.5~13000	-49.82	<=-26	PASS
			2472	30~2387	-54.51	<=-26	PASS
				2387~2400	-50.4	<=-16	PASS
				2483.5~2496.5	-21.95	<=-16	PASS
				2496.5~13000	-47.2	<=-26	PASS
	11N40SISO	Ant1	2422	30~2387	-37.92	<=-26	PASS
				2387~2400	-28.32	<=-16	PASS
				2483.5~2496.5	-45.75	<=-16	PASS
				2496.5~13000	-47.77	<=-26	PASS
			2442	30~2387	-51.55	<=-26	PASS
				2387~2400	-41.17	<=-16	PASS
				2483.5~2496.5	-37.02	<=-16	PASS
				2496.5~13000	-48.85	<=-26	PASS
			2462	30~2387	-53.52	<=-26	PASS
				2387~2400	-48.41	<=-16	PASS
				2483.5~2496.5	-24.5	<=-16	PASS
				2496.5~13000	-30.3	<=-26	PASS

NTNV_11B_Ant1_2412_30~2387



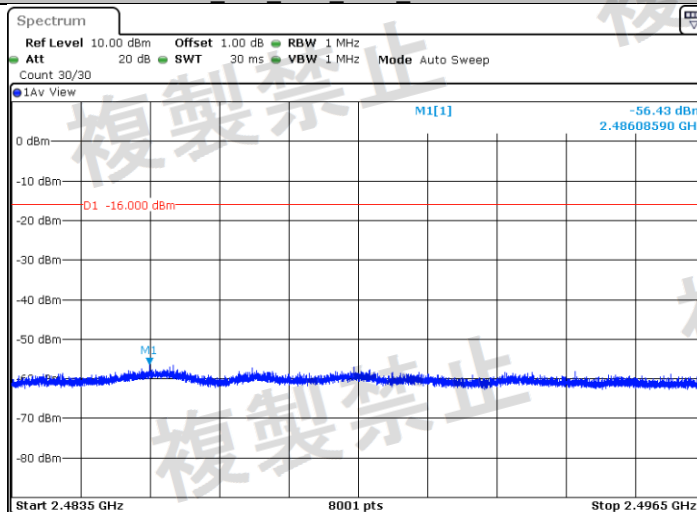
Date: 20 JUL 2021 10:44:09

NTNV_11B_Ant1_2412_2387~2400



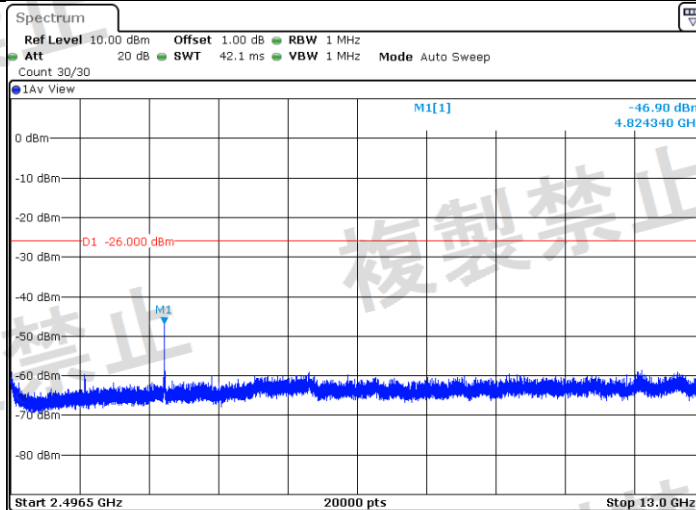
Date: 20 JUL 2021 10:44:18

NTNV_11B_Ant1_2412_2483.5~2496.5



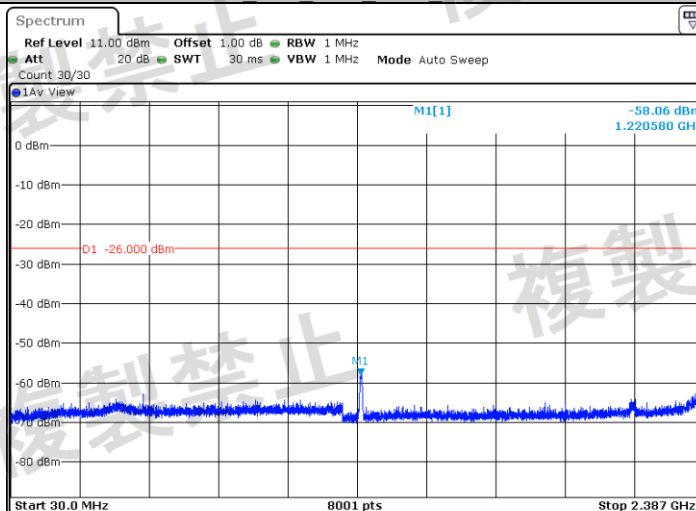
Date: 20 JUL 2021 10:44:30

NTNV_11B_Ant1_2412_2496.5~13000



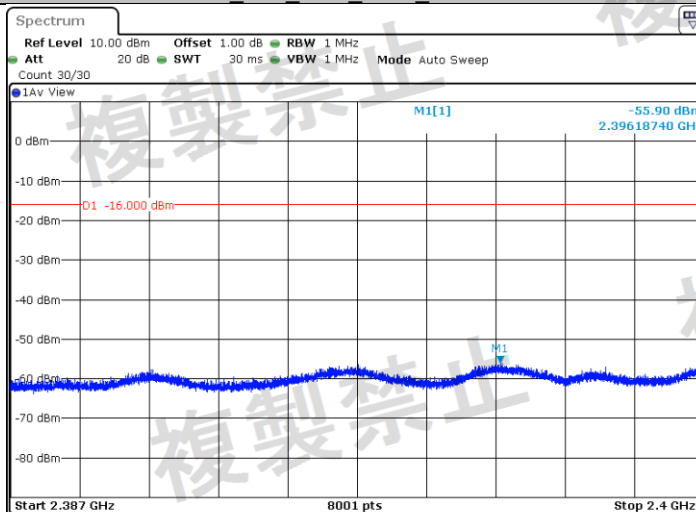
Date: 20 JUL 2021 10:44:40

NTNV_11B_Ant1_2442_30~2387



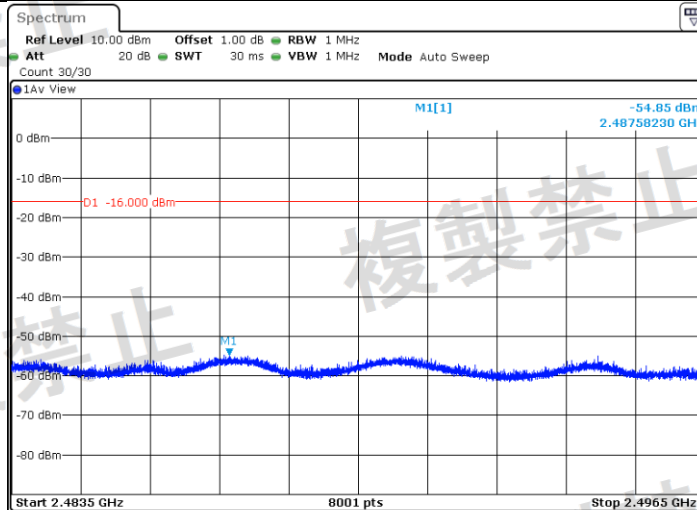
Date: 19 JUL 2021 20:19:52

NTNV_11B_Ant1_2442_2387~2400



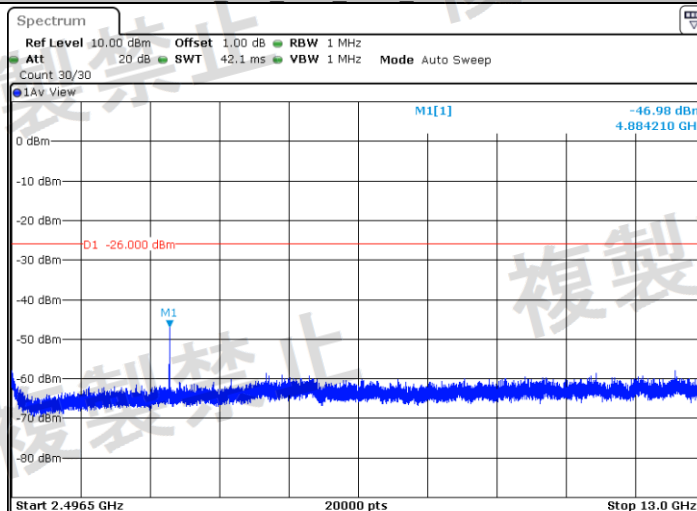
Date: 19 JUL 2021 20:20:01

NTNV_11B_Ant1_2442_2483.5~2496.5



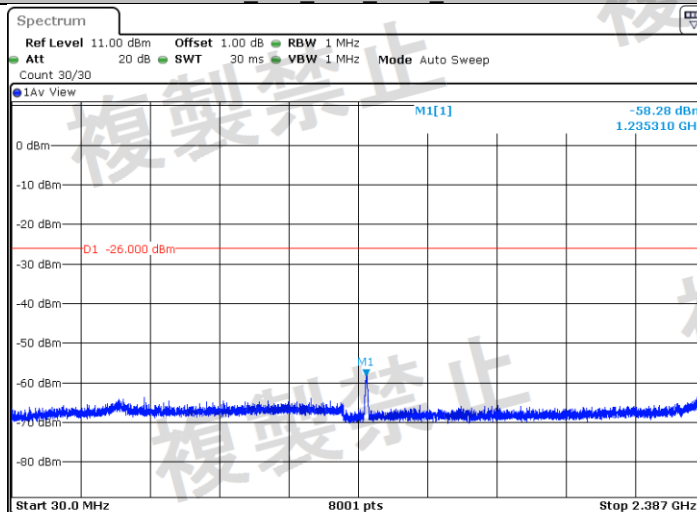
Date: 19 JUL 2021 20:20:12

NTNV_11B_Ant1_2442_2496.5~13000



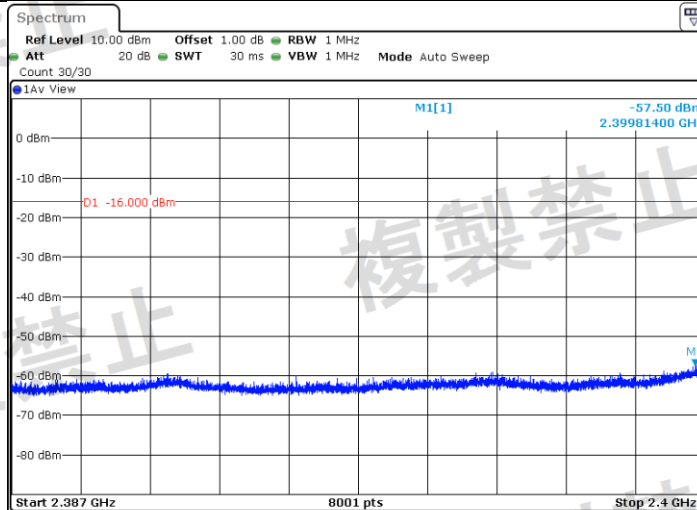
Date: 19 JUL 2021 20:20:23

NTNV_11B_Ant1_2472_30~2387



Date: 19 JUL 2021 20:24:09

NTNV_11B_Ant1_2472_2387~2400



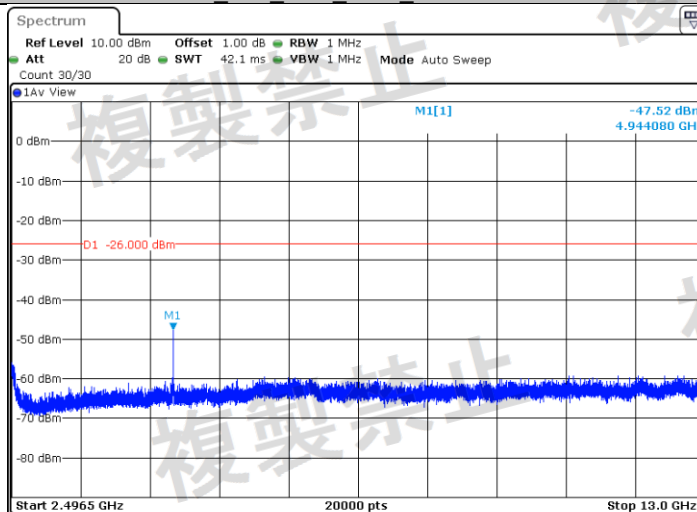
Date: 19 JUL 2021 20:24:18

NTNV_11B_Ant1_2472_2483.5~2496.5



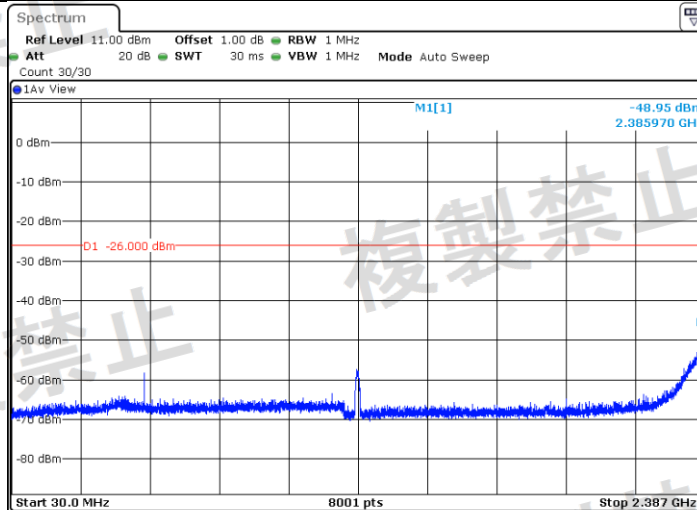
Date: 19 JUL 2021 20:24:29

NTNV_11B_Ant1_2472_2496.5~13000



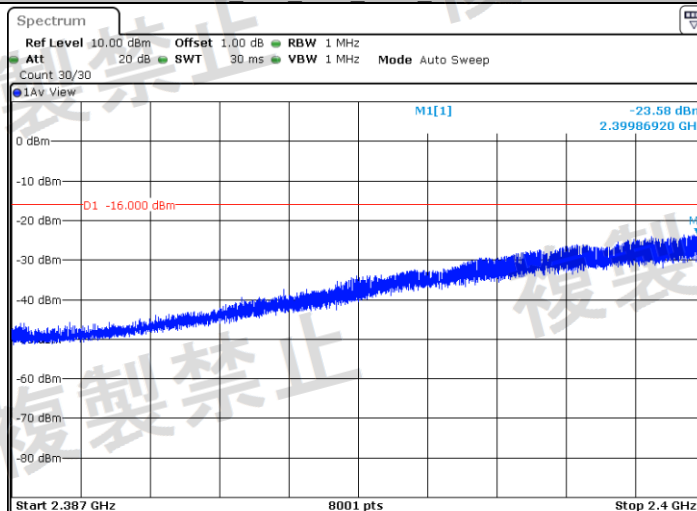
Date: 19 JUL 2021 20:24:40

NTNV 11G Ant1 2412 30~2387



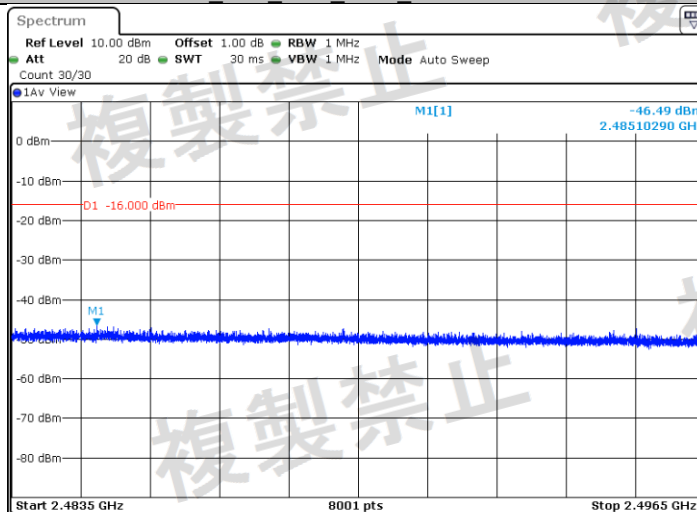
Date: 19 JUL 2021 20:27:27

NTNV 11G Ant1 2412 2387~2400



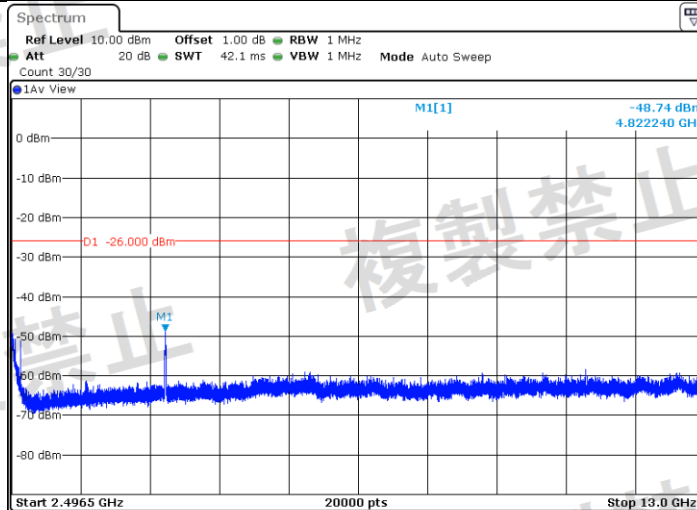
Date: 19 JUL 2021 20:27:37

NTNV 11G Ant1 2412 2483.5~2496.5



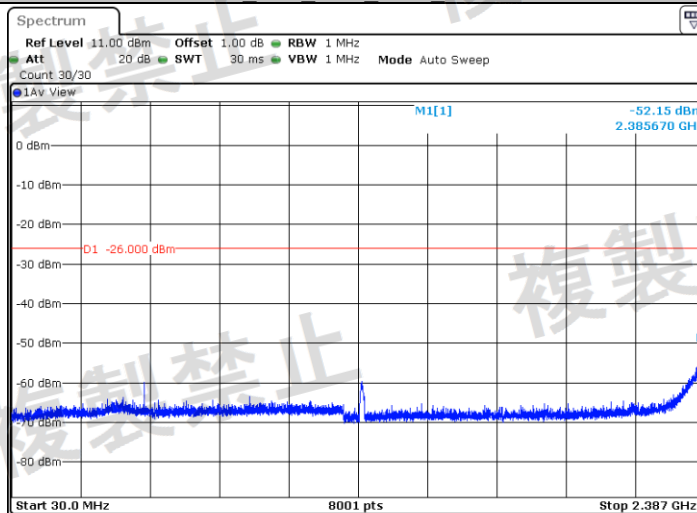
Date: 19 JUL 2021 20:27:48

NTNV_11G_Ant1_2412_2496.5~13000



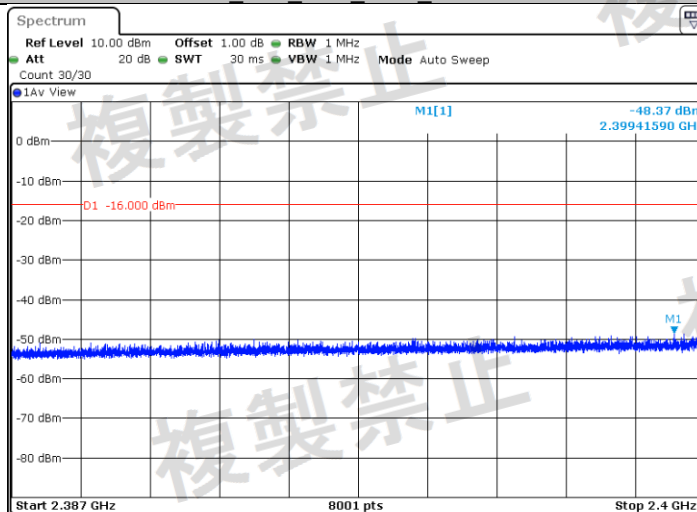
Date: 19 JUL 2021 20:27:58

NTNV_11G_Ant1_2442_30~2387



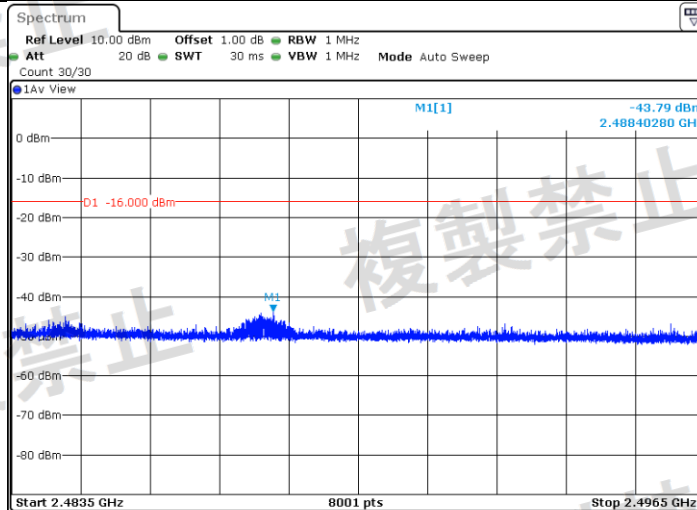
Date: 19 JUL 2021 20:29:03

NTNV_11G_Ant1_2442_2387~2400



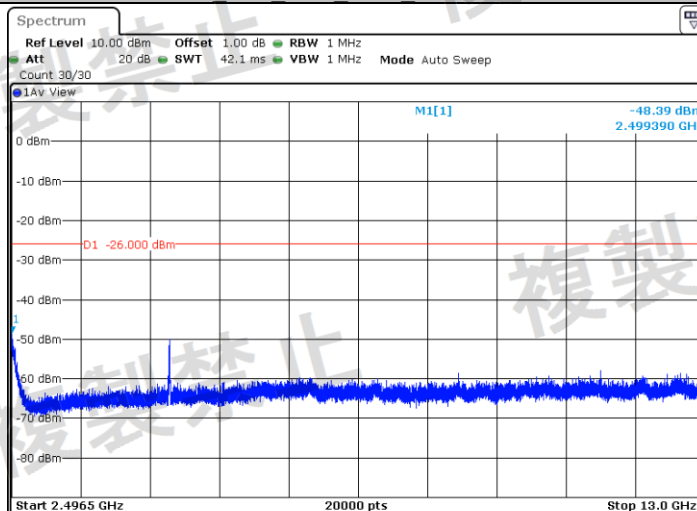
Date: 19 JUL 2021 20:29:13

NTNV 11G Ant1 2442 2483.5~2496.5



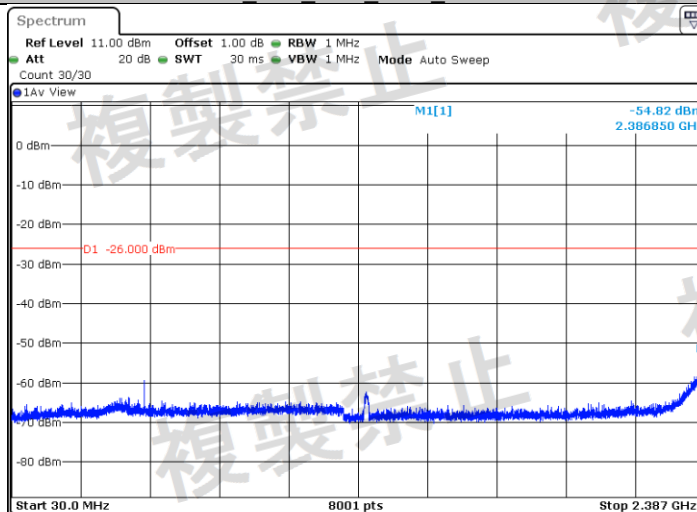
Date: 19 JUL 2021 20:29:24

NTNV 11G Ant1 2442 2496.5~13000



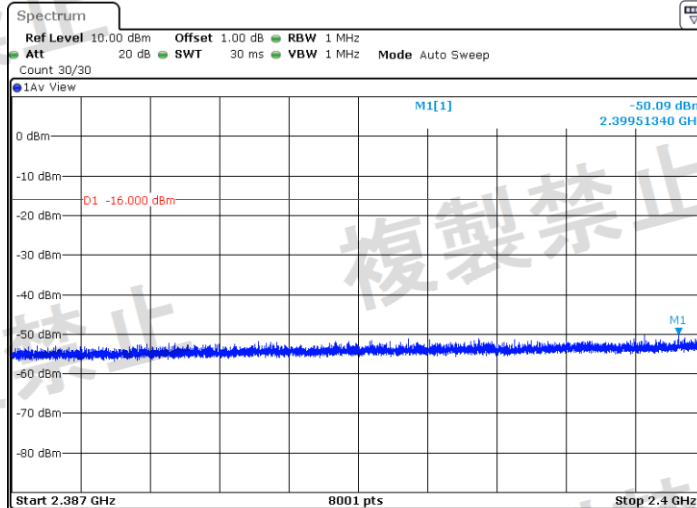
Date: 19 JUL 2021 20:29:34

NTNV 11G Ant1 2472 30~2387



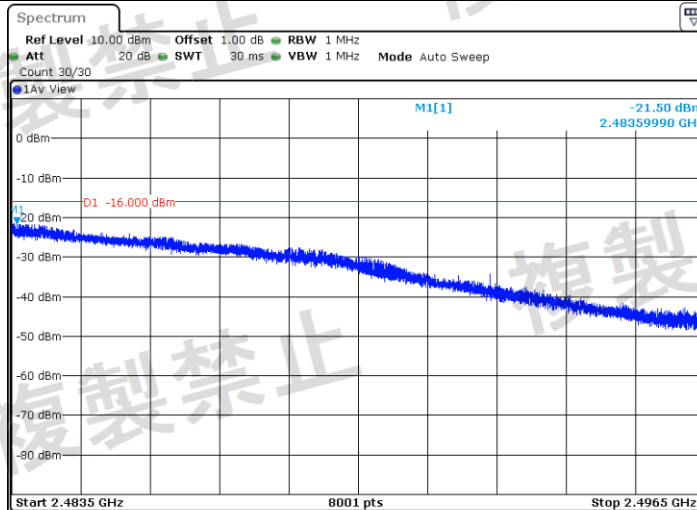
Date: 19 JUL 2021 20:37:45

NTNV_11G_Ant1_2472_2387~2400



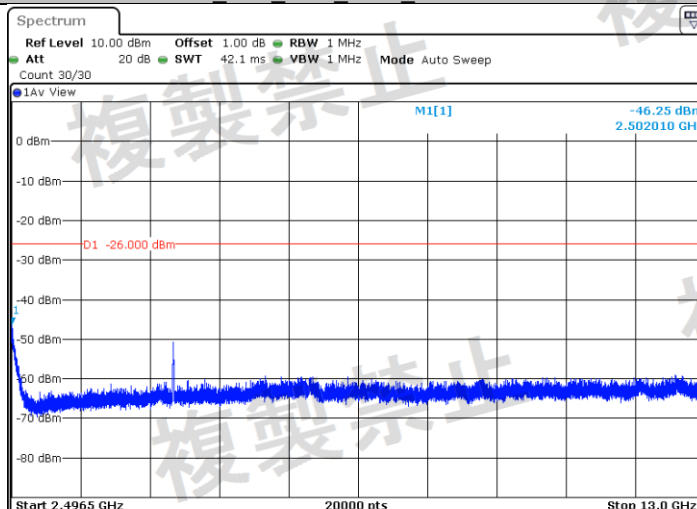
Date: 19 JUL 2021 20:37:55

NTNV_11G_Ant1_2472_2483.5~2496.5



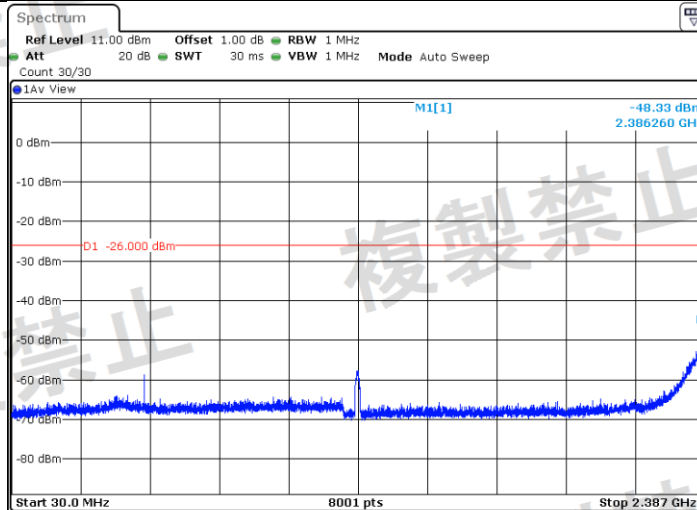
Date: 19 JUL 2021 20:38:06

NTNV_11G_Ant1_2472_2496.5~13000



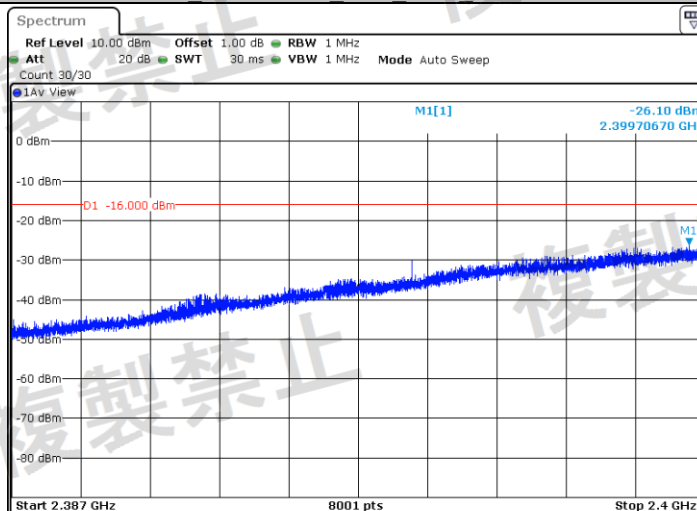
Date: 19 JUL 2021 20:38:16

NTNV_11N20SISO_Ant1_2412_30~2387



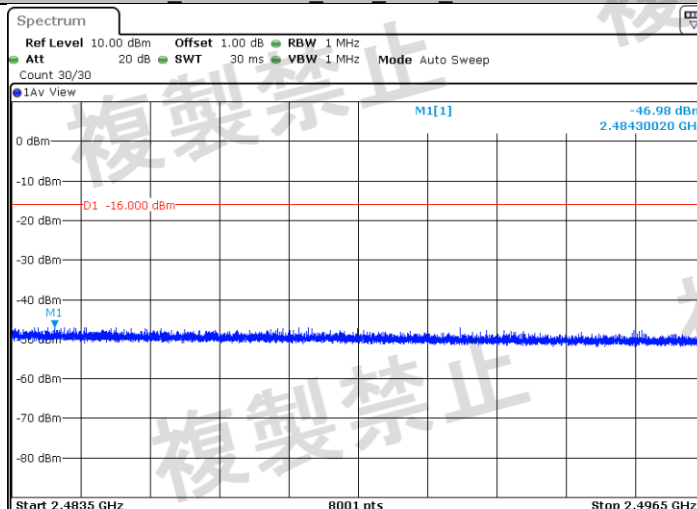
Date: 19 JUL 2021 20:39:37

NTNV_11N20SISO_Ant1_2412_2387~2400



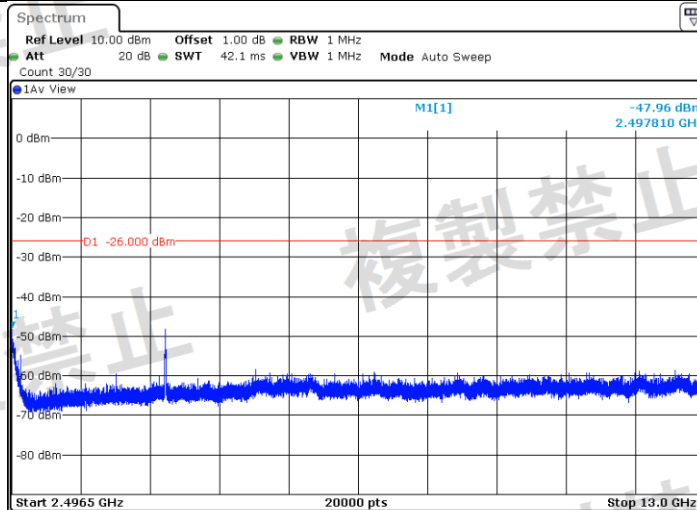
Date: 19 JUL 2021 20:39:46

NTNV_11N20SISO_Ant1_2412_2483.5~2496.5



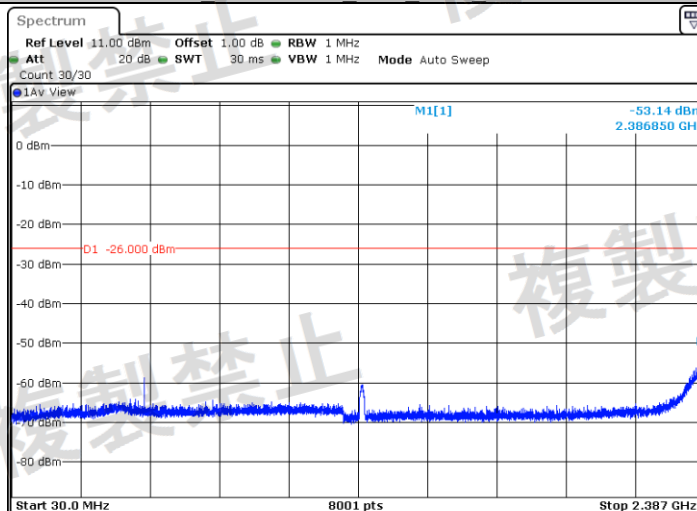
Date: 19 JUL 2021 20:39:57

NTNV 11N20SISO Ant1 2412 2496.5~13000



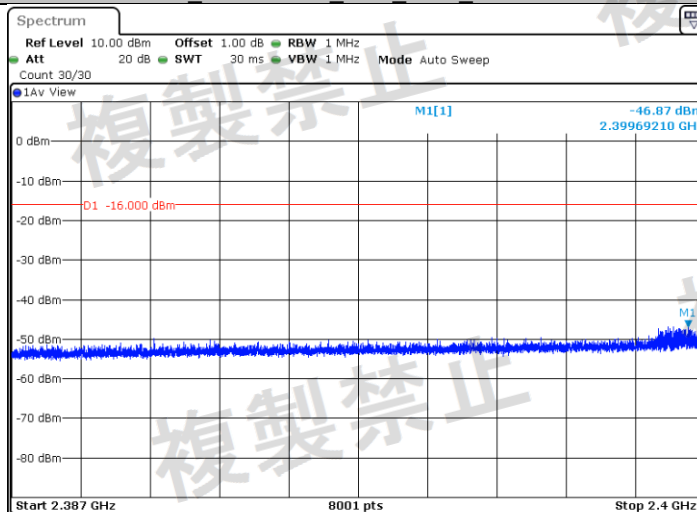
Date: 19 JUL 2021 20:40:07

NTNV 11N20SISO Ant1 2442 30~2387



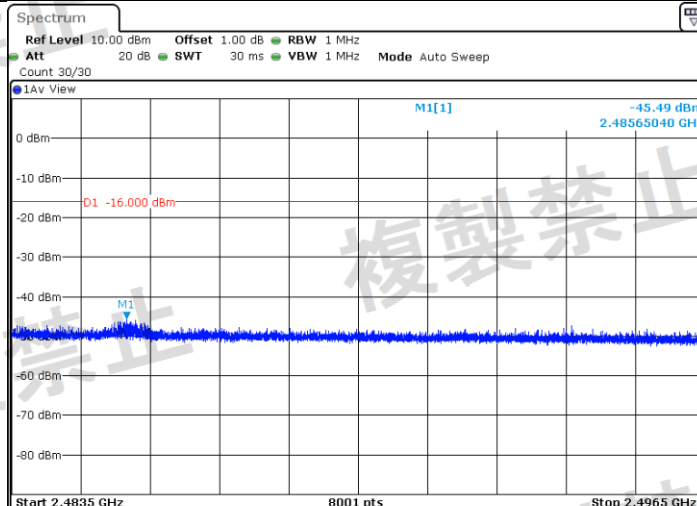
Date: 20 JUL 2021 11:14:37

NTNV 11N20SISO Ant1 2442 2387~2400



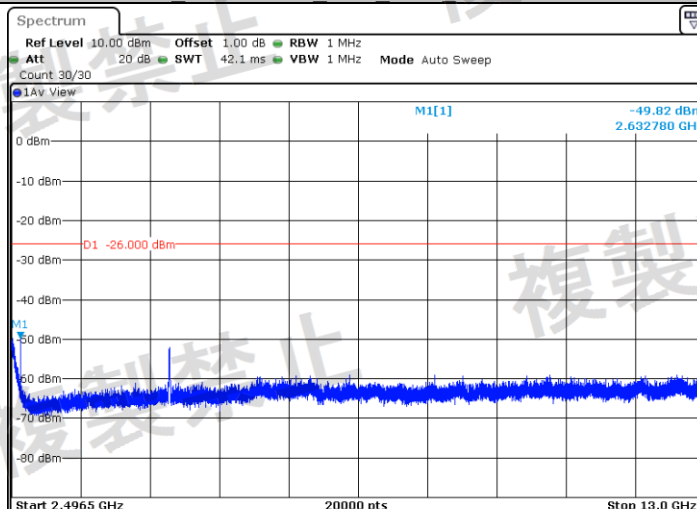
Date: 20 JUL 2021 11:14:47

NTNV_11N20SISO_Ant1_2442_2483.5~2496.5



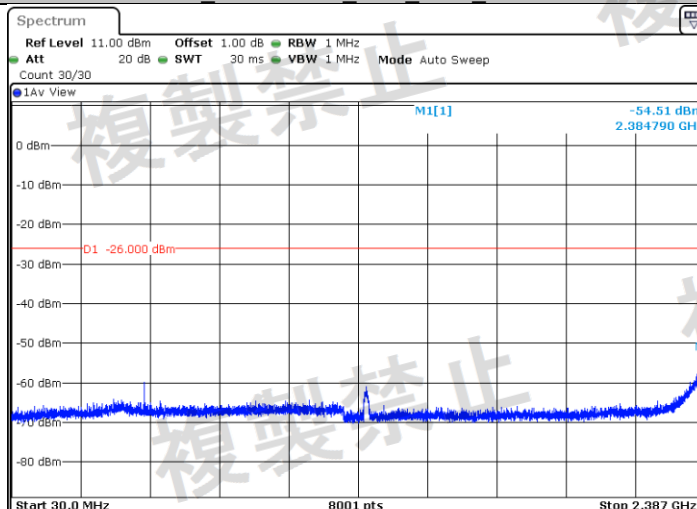
Date: 20 JUL 2021 11:14:58

NTNV_11N20SISO_Ant1_2442_2496.5~13000



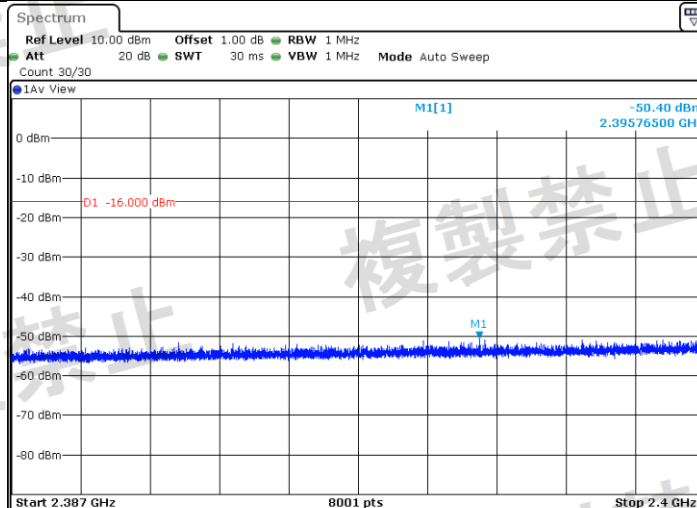
Date: 20 JUL 2021 11:15:08

NTNV_11N20SISO_Ant1_2472_30~2387



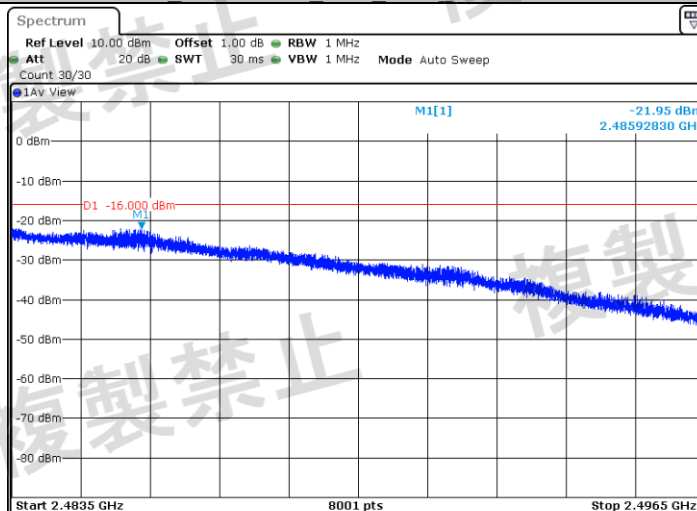
Date: 20 JUL 2021 11:16:27

NTNV 11N20SISO Ant1 2472 2387~2400



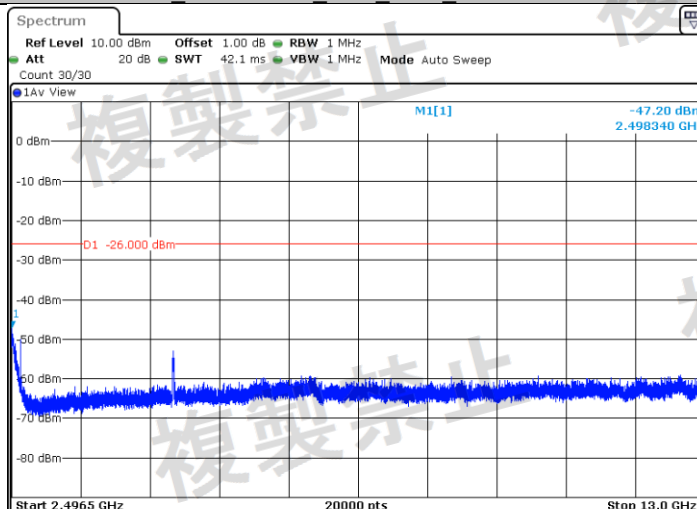
Date: 20 JUL 2021 11:16:37

NTNV 11N20SISO Ant1 2472 2483.5~2496.5



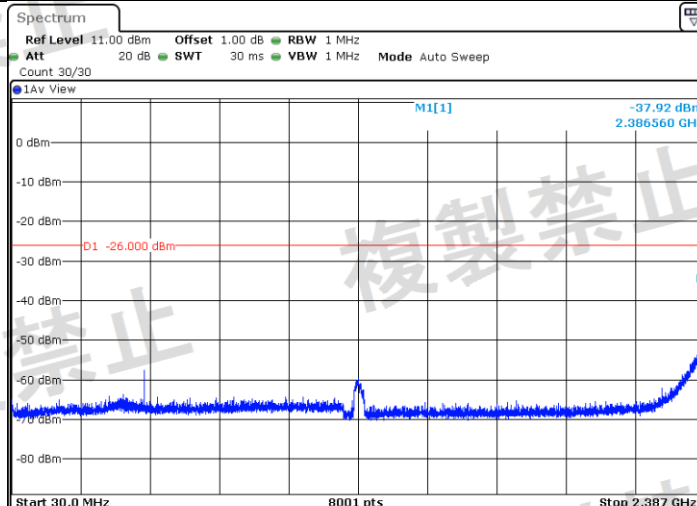
Date: 20 JUL 2021 11:16:48

NTNV 11N20SISO Ant1 2472 2496.5~13000



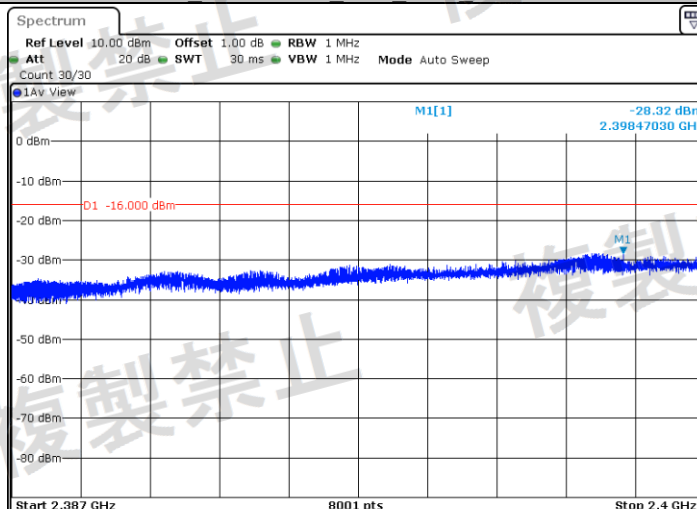
Date: 20 JUL 2021 11:16:58

NTNV_11N40SISO_Ant1_2422_30~2387



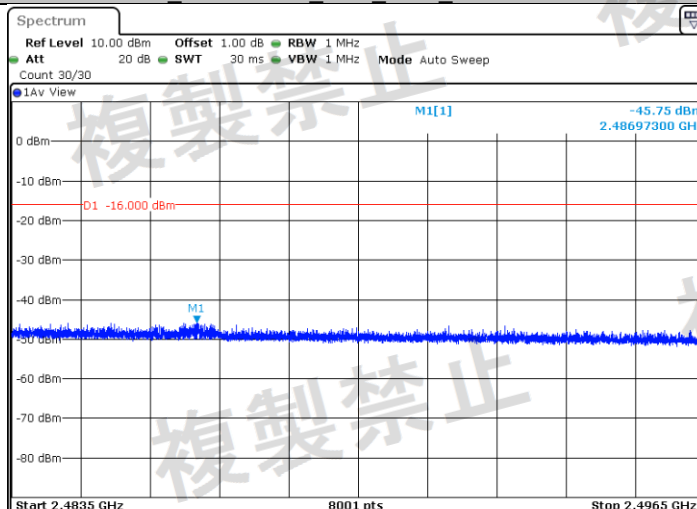
Date: 20 JUL 2021 11:18:29

NTNV_11N40SISO_Ant1_2422_2387~2400



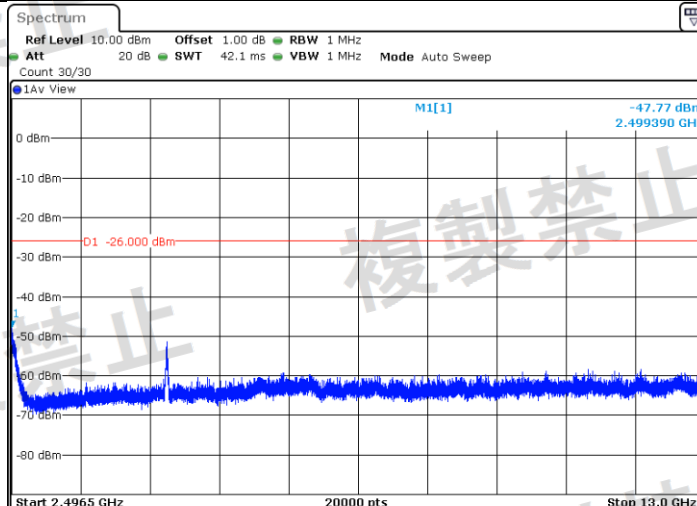
Date: 20 JUL 2021 11:18:38

NTNV_11N40SISO_Ant1_2422_2483.5~2496.5



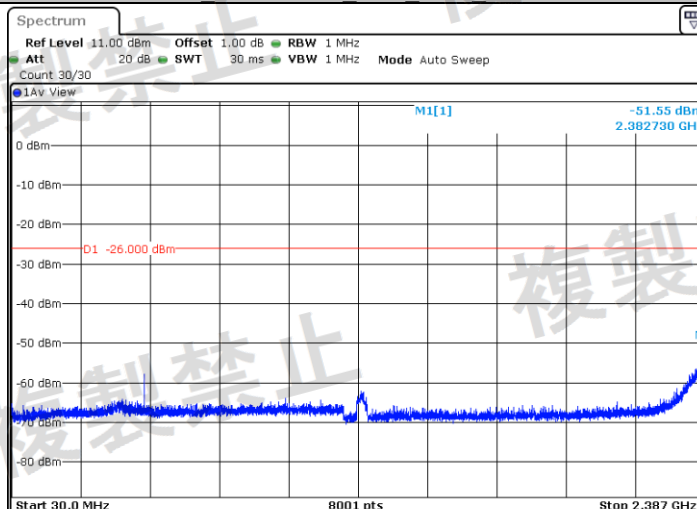
Date: 20 JUL 2021 11:18:50

NTNV 11N40SISO Ant1 2422 2496.5~13000



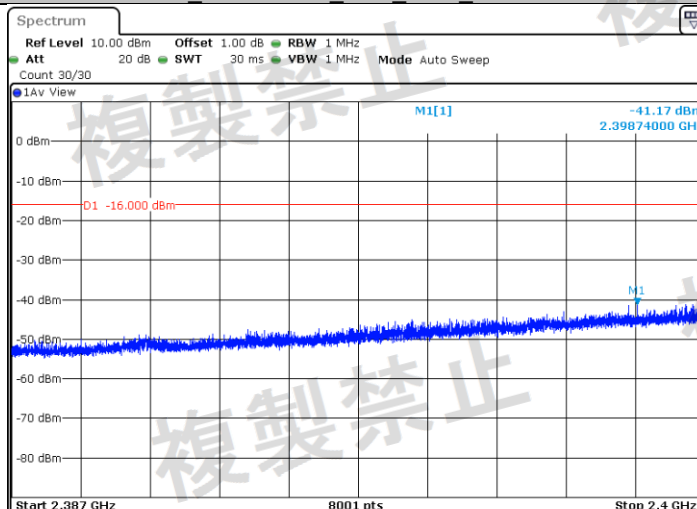
Date: 20 JUL 2021 11:19:00

NTNV 11N40SISO Ant1 2442 30~2387



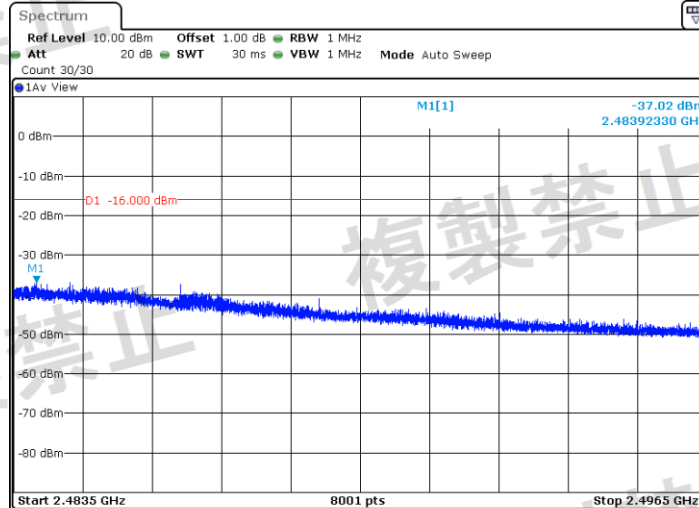
Date: 20 JUL 2021 11:21:37

NTNV 11N40SISO Ant1 2442 2387~2400



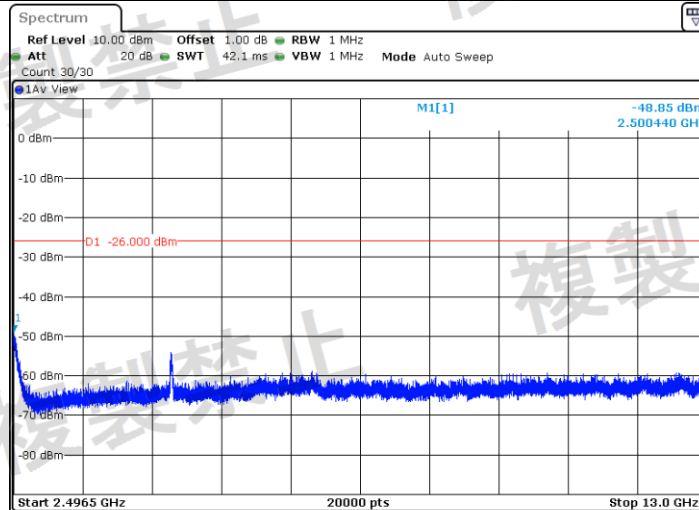
Date: 20 JUL 2021 11:21:46

NTNV_11N40SISO_Ant1_2442_2483.5~2496.5



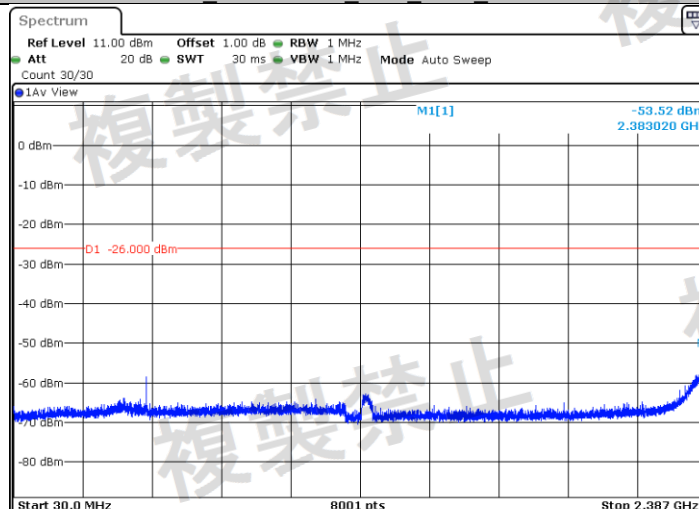
Date: 20 JUL 2021 11:21:58

NTNV_11N40SISO_Ant1_2442_2496.5~13000



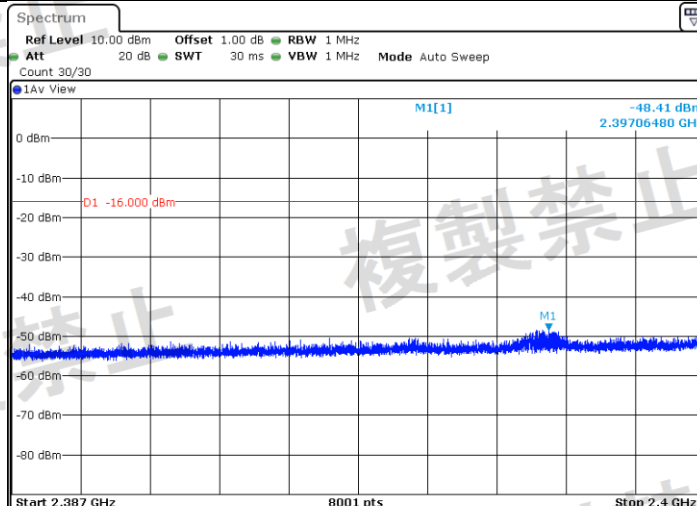
Date: 20 JUL 2021 11:22:08

NTNV_11N40SISO_Ant1_2462_30~2387



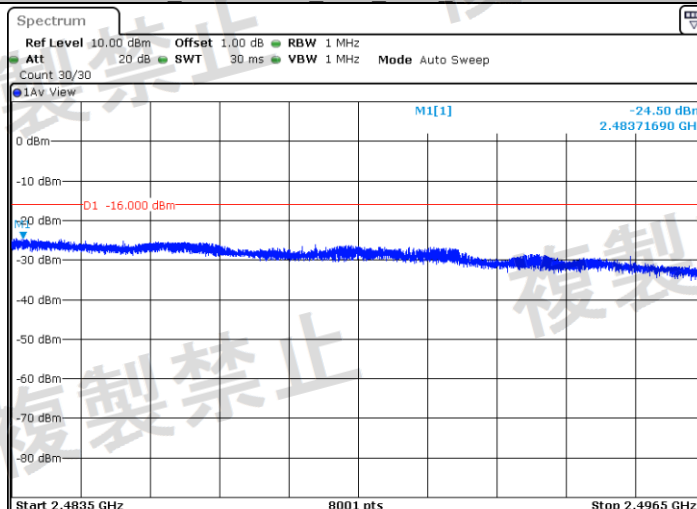
Date: 20 JUL 2021 11:24:27

NTNV 11N40SISO Ant1 2462 2387~2400



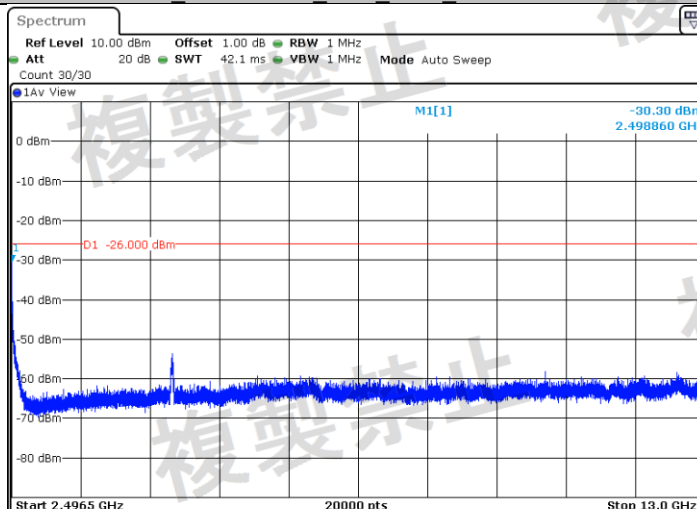
Date: 20 JUL 2021 11:24:37

NTNV 11N40SISO Ant1 2462 2483.5~2496.5



Date: 20 JUL 2021 11:24:48

NTNV 11N40SISO Ant1 2462 2496.5~13000



Date: 20 JUL 2021 11:24:58

3.8 Secondary Radiated Emissions (Conducted) (For receiver)

3.8.1 Test condition

Test position:	Receiving
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 KPa

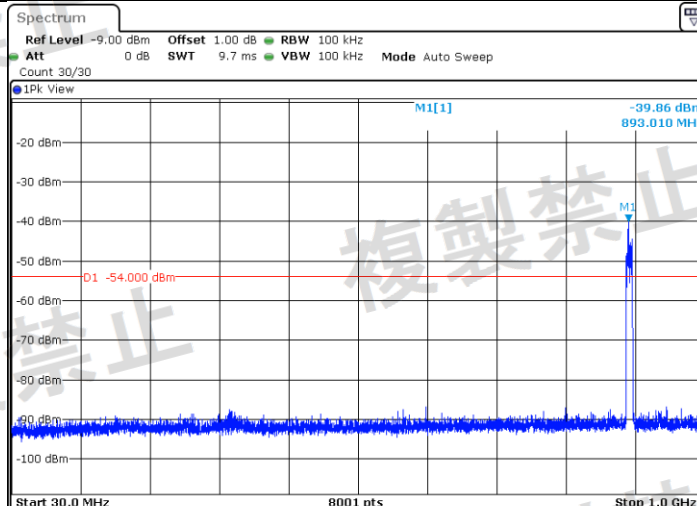
3.8.2 Limit (ARIB STD-T66, Clause 3.5 (1))

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, 4 nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit.

3.8.3 Test Result

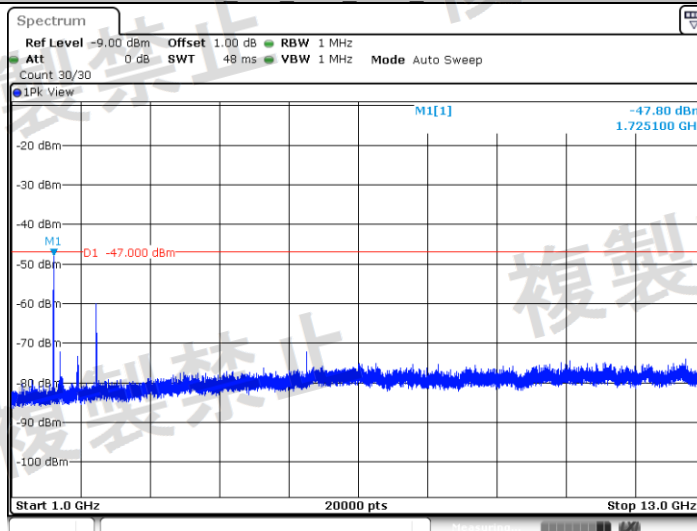
TestCondition	TestMode	Antenna	Channel	Freq.Range	Result	Limit	Verdict
NTNV	11B	Ant1	2412	30~1000	-39.86	<=-54	FAIL
				1000~13000	-47.8	<=-47	PASS
			2442	30~1000	-84.99	<=-54	PASS
				1000~13000	-62.21	<=-47	PASS
			2472	30~1000	-86.12	<=-54	PASS
				1000~13000	-72.37	<=-47	PASS
	11G	Ant1	2412	30~1000	-86.94	<=-54	PASS
				1000~13000	-72.23	<=-47	PASS
			2442	30~1000	-84.82	<=-54	PASS
				1000~13000	-71.98	<=-47	PASS
			2472	30~1000	-85.49	<=-54	PASS
				1000~13000	-71.73	<=-47	PASS
	11N20SISO	Ant1	2412	30~1000	-86.17	<=-54	PASS
				1000~13000	-72.08	<=-47	PASS
			2442	30~1000	-86.67	<=-54	PASS
				1000~13000	-73.02	<=-47	PASS
			2472	30~1000	-85.7	<=-54	PASS
				1000~13000	-71.86	<=-47	PASS
	11N40SISO	Ant1	2422	30~1000	-86.9	<=-54	PASS
				1000~13000	-54.62	<=-47	PASS
			2442	30~1000	-87.66	<=-54	PASS
				1000~13000	-72.31	<=-47	PASS
			2462	30~1000	-86.38	<=-54	PASS
				1000~13000	-63.36	<=-47	PASS

NTNV_11B_Ant1_2412_30~1000



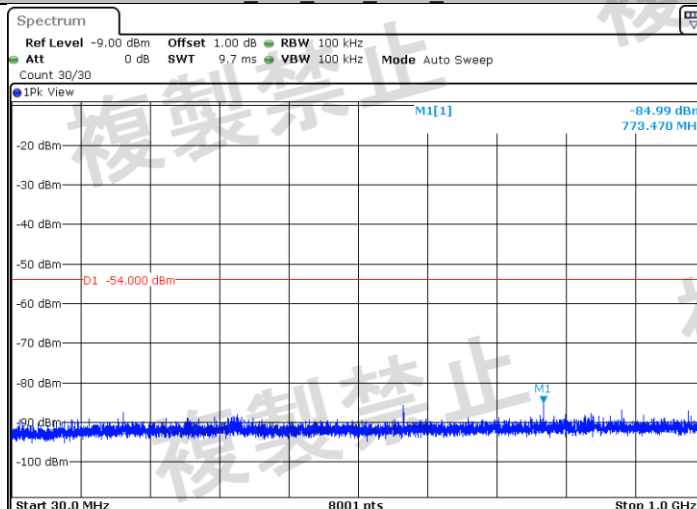
Date: 20 JUL 2021 11:51:13

NTNV_11B_Ant1_2412_1000~13000



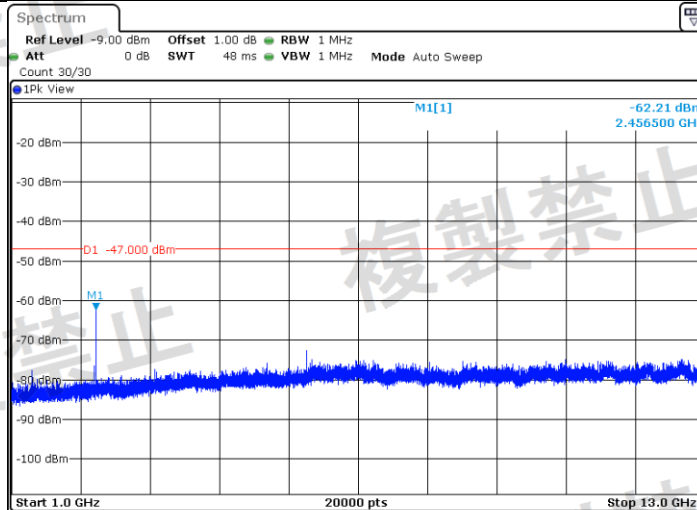
Date: 20 JUL 2021 11:51:23

NTNV_11B_Ant1_2442_30~1000



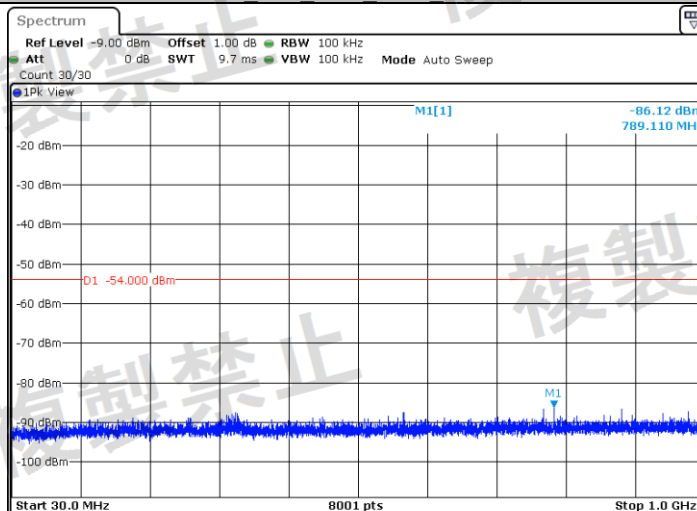
Date: 20 JUL 2021 11:51:49

NTNV 11B Ant1 2442 1000~13000



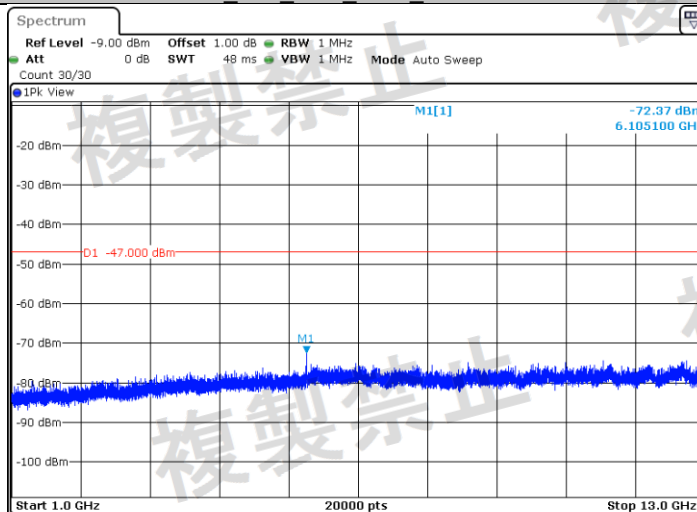
Date: 20 JUL 2021 11:51:59

NTNV 11B Ant1 2472 30~1000



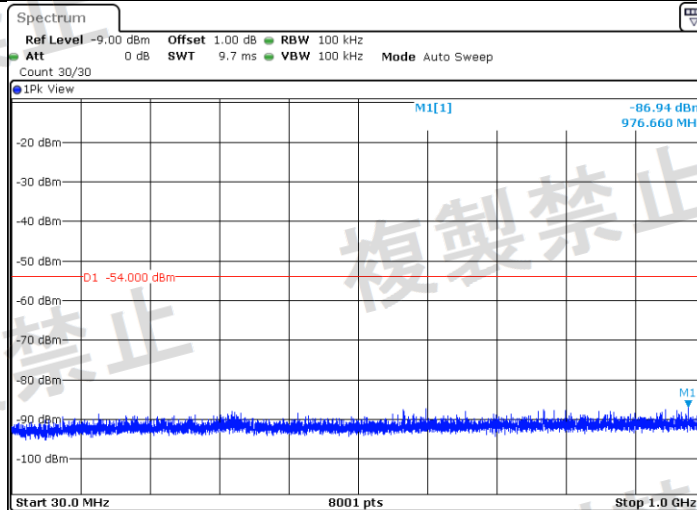
Date: 20 JUL 2021 11:52:12

NTNV 11B Ant1 2472 1000~13000



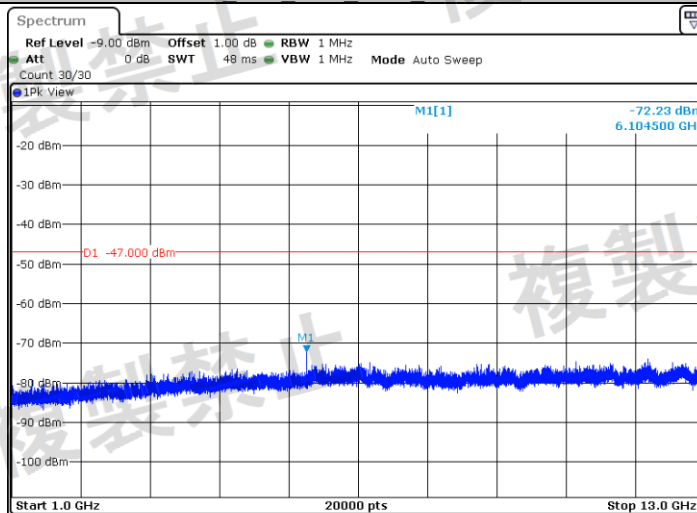
Date: 20 JUL 2021 11:52:23

NTNV_11G_Ant1_2412_30~1000



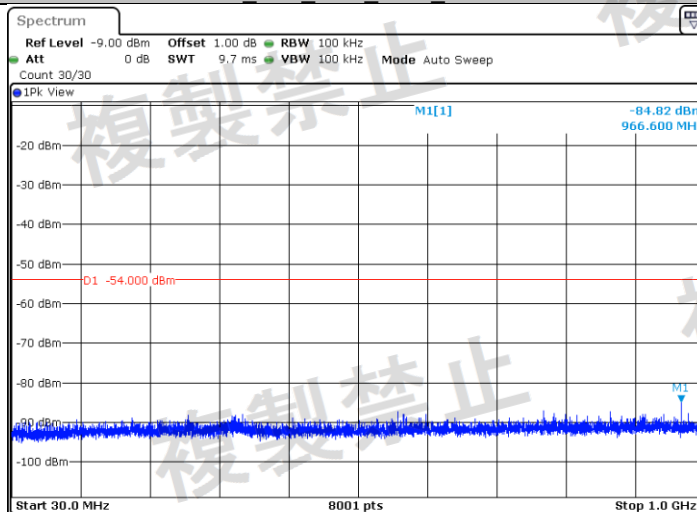
Date: 20 JUL 2021 11:52:35

NTNV_11G_Ant1_2412_1000~13000



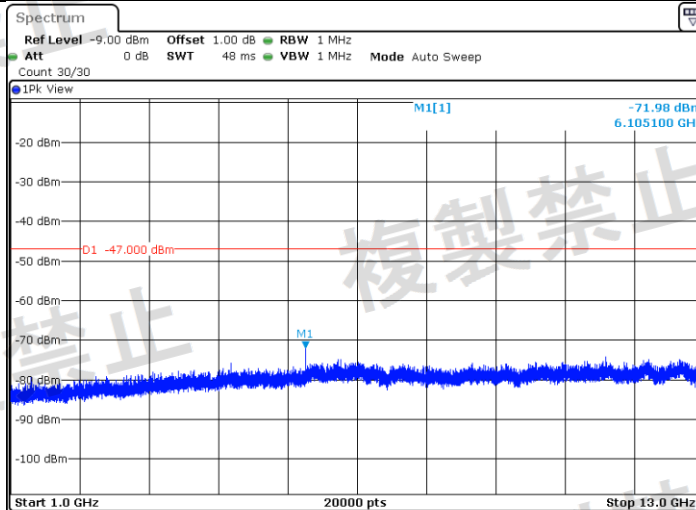
Date: 20 JUL 2021 11:52:45

NTNV_11G_Ant1_2442_30~1000



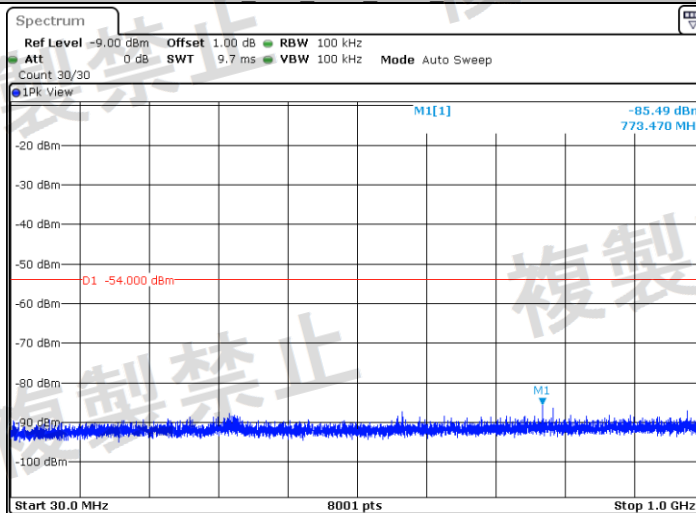
Date: 20 JUL 2021 11:52:59

NTNV 11G Ant1 2442 1000~13000



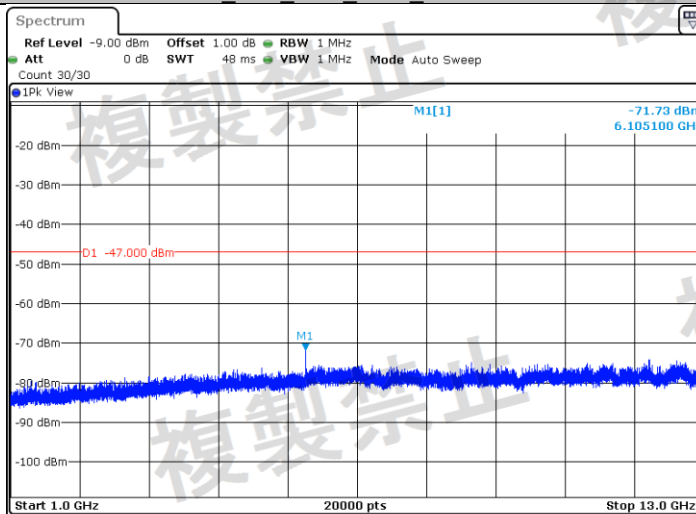
Date: 20 JUL 2021 11:53:09

NTNV 11G Ant1 2472 30~1000



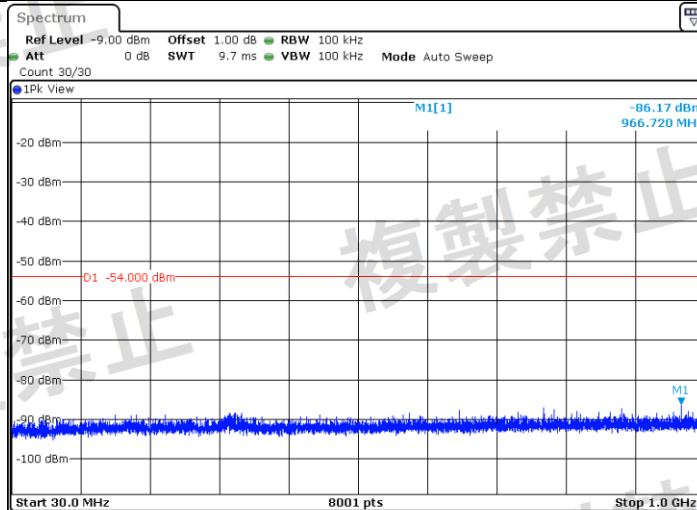
Date: 20 JUL 2021 11:53:21

NTNV 11G Ant1 2472 1000~13000



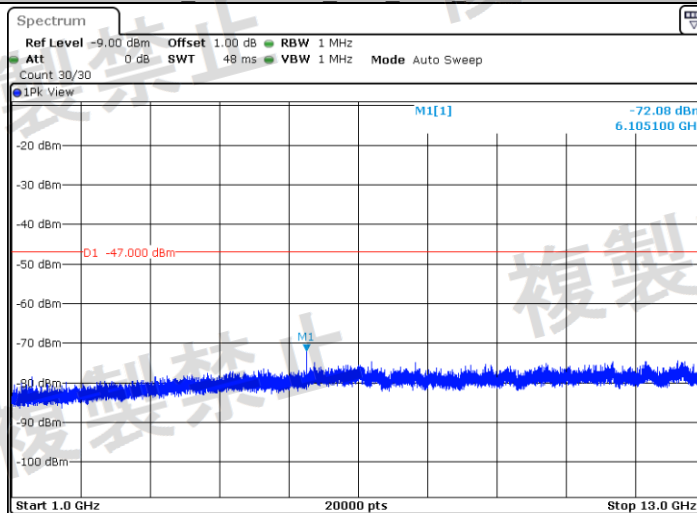
Date: 20 JUL 2021 11:53:32

NTNV_11N20SISO_Ant1_2412_30~1000



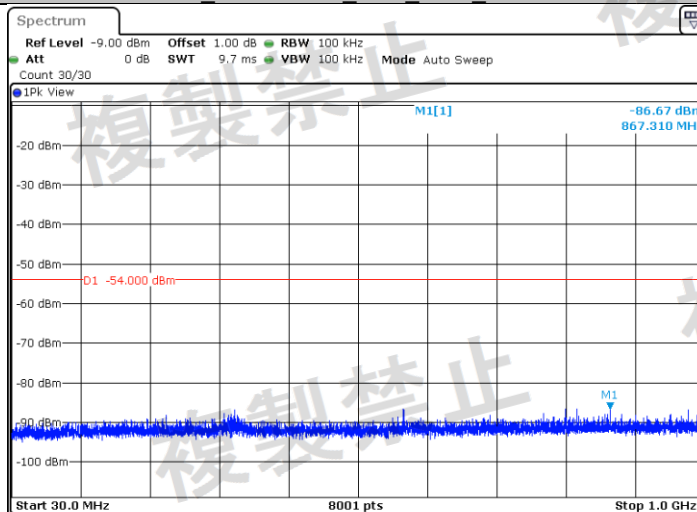
Date: 20 JUL 2021 11:54:22

NTNV_11N20SISO_Ant1_2412_1000~13000



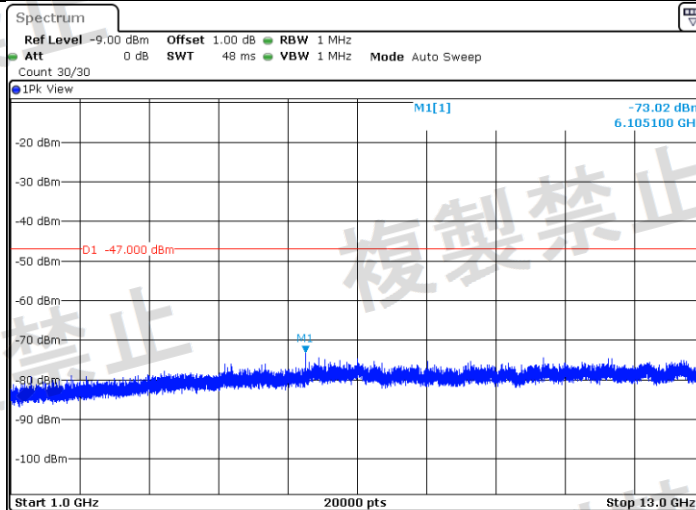
Date: 20 JUL 2021 11:54:32

NTNV_11N20SISO_Ant1_2442_30~1000



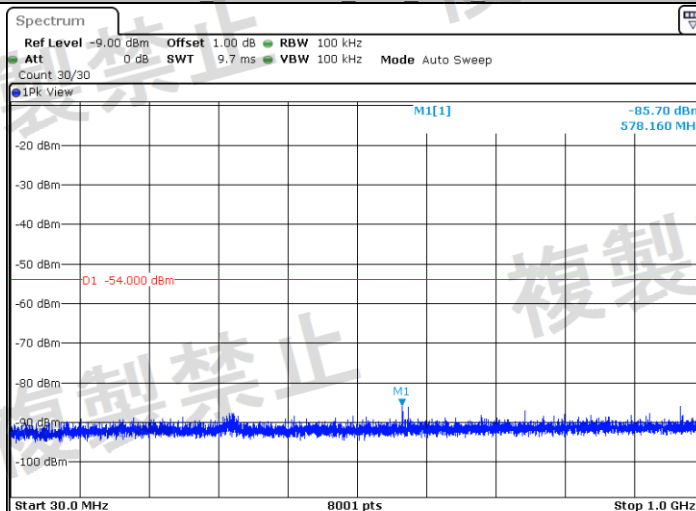
Date: 20 JUL 2021 11:54:52

NTNV_11N20SISO_Ant1_2442_1000~13000



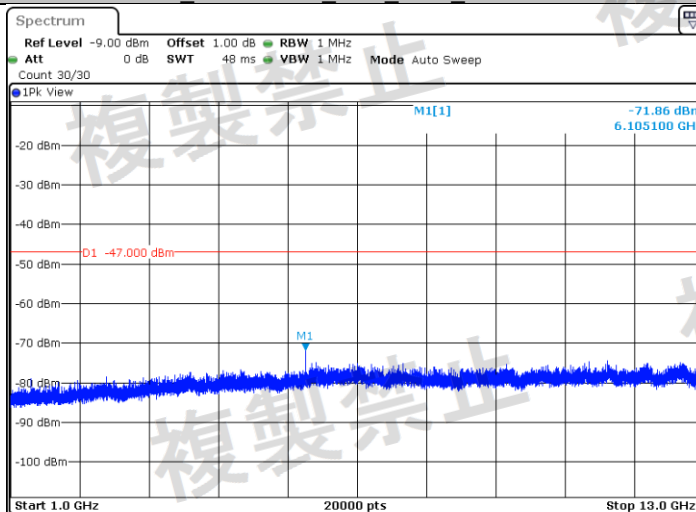
Date: 20 JUL 2021 11:55:02

NTNV_11N20SISO_Ant1_2472_30~1000



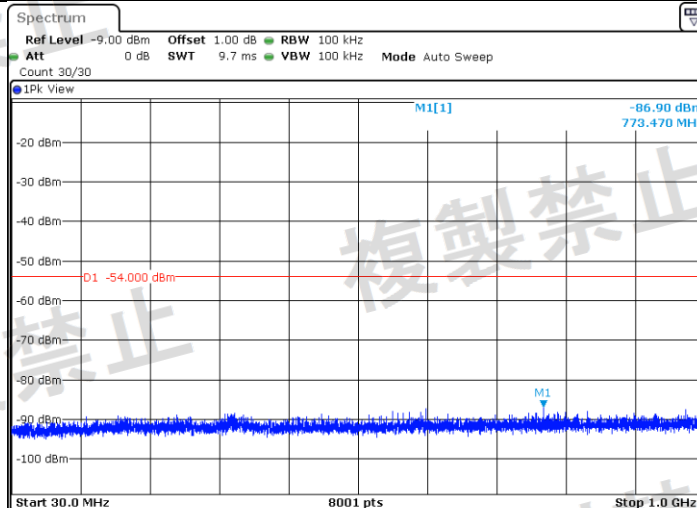
Date: 20 JUL 2021 11:56:27

NTNV_11N20SISO_Ant1_2472_1000~13000



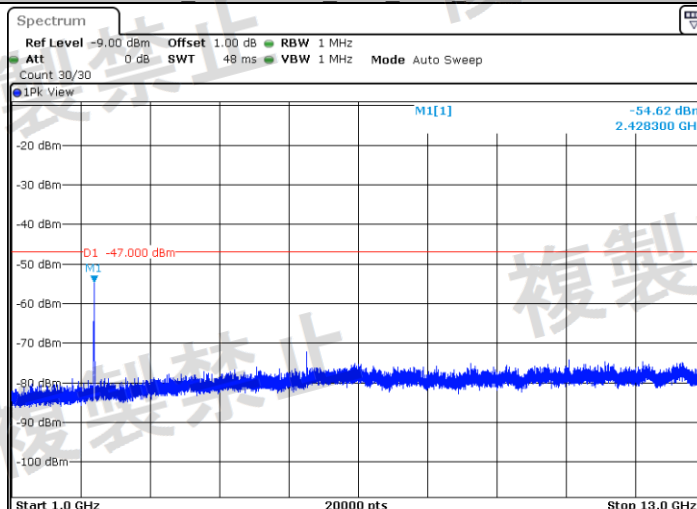
Date: 20 JUL 2021 11:56:38

NTNV_11N40SISO_Ant1_2422_30~1000



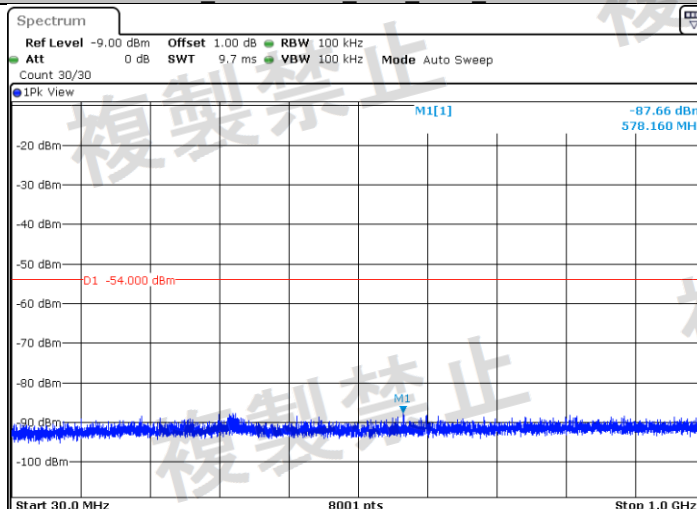
Date: 20 JUL 2021 12:21:58

NTNV_11N40SISO_Ant1_2422_1000~13000



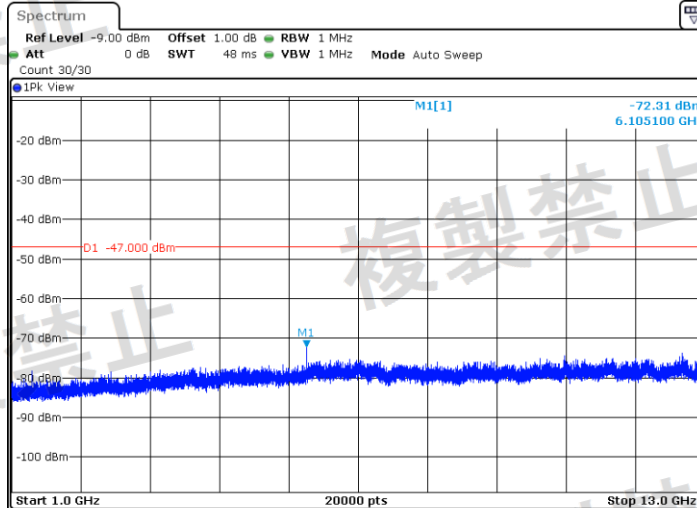
Date: 20 JUL 2021 12:22:08

NTNV_11N40SISO_Ant1_2442_30~1000



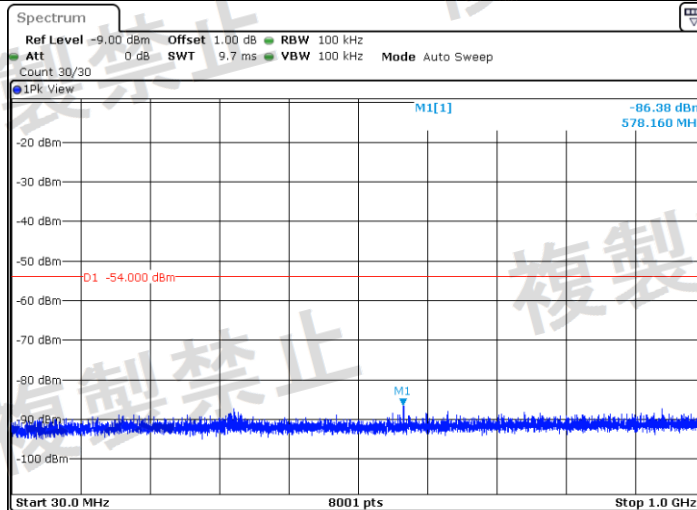
Date: 20 JUL 2021 12:23:50

NTNV_11N40SISO_Ant1_2442_1000~13000



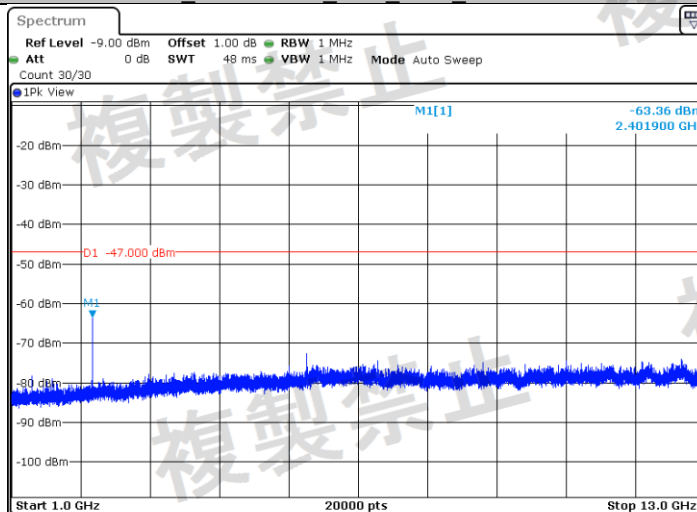
Date: 20 JUL 2021 12:24:01

NTNV_11N40SISO_Ant1_2462_30~1000



Date: 20 JUL 2021 12:24:15

NTNV_11N40SISO_Ant1_2462_1000~13000



Date: 20 JUL 2021 12:24:25

3.8.4 Result

The equipment met the requirement of this clause.

3.9 Interference prevention function

3.9.1 Test condition

Test position:	Transmitting
Ambient temperature:	23.1 °C
Relative humidity:	55.9 %
Atmosphere Pressure:	100.9 KPa

3.9.2 Limit

Item	Limits
Identification Code	≥48 bits

Measured Result:

Test Conditions	Operation Frequency				
	2412 MHz	2422 MHz	2442 MHz	2462 MHz	2472 MHz
Normal Voltage (230V AC)	48	48	48	48	48

3.9.3 Result

The equipment met the requirement of this clause.

4 Photographs of Test Set-ups



THE END