

Japan - TEST REPORT

Report Number : **66.740.21.0112.01** Date of Issue: **2021-09-06**

Model : **8371135**

Product Type : **LED LAMP**

Applicant : **NITORI Co., Ltd.**

Address : **6-20, Kamiya 3-chome, Kita-ku, Tokyo, Japan, 1150043**

Manufacturer : **LEEDARSON LIGHTING CO., LTD.**

Address : **Xingtai Industrial Zone, Economic Development Zone,
Changtai Country, Zhangzhou City, Fujian Province,
P.R.China**

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

Total pages including
Appendices : **27**

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.

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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 (95% confidence levels, k=2).....	8
3	Measurements Result.....	9
3.1	Antenna Power.....	9
3.2	Tolerances for Antenna Power	10
3.3	Frequency Tolerance.....	11
3.4	Occupied Frequency Bandwidth.....	12
3.5	Spread Bandwidth.....	14
3.6	Process Gain & Transmission Rate	16
3.7	Transmitter Spurious Emissions (Conducted) (For transmitter).....	17
3.8	Secondary Radiated Emissions (Conducted) (For receiver).....	23
3.9	Interference prevention function	26
4	Photographs of Test Set-ups.....	27

1 General Information

1.1 Notes

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Prepared by
Project Engineer

2021-09-06

Date

Matt Zhang

Name

Matt Zhang

Signature

Approved by
Project Manager

2021-09-06

Date

Peter Jia

Name

Peter Jia

Signature

1.2 Testing Laboratory

Address of Test Laboratory:

Site 1 :

JianYan Testing Group Co.,Ltd.
No.760, Fengling Road, Tong'an District, Xiamen,
Fujian, China

Tel: +86-592-2273071

Fax: +86-592-2273700

1.3 Details of Applicant

Applicant: NITORI Co., Ltd.

Address: 6-20, Kamiya 3-chome, Kita-ku, Tokyo, Japan, 1150043

Product Description: LED LAMP

Manufacturers Model No.: 8371135

1.4 Application Details

Date of receipt of order: 2021-08-16

Date of receipt of test item: 2021-08-17

Date of test: 2021-09-03

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

N/A

2.2 Technical Data

Description	LED LAMP
Model	8371135
Operation frequency	Zigbee 2405MHz~2480MHz
Antenna type	Integral antenna
Antenna gain	-1.47dBi
Smart Antenna System	SISO, without Beamforming
Modulation	OQPSK
Rated Input	AC 100V_50/60Hz

2.3 Test conditions and test Connections

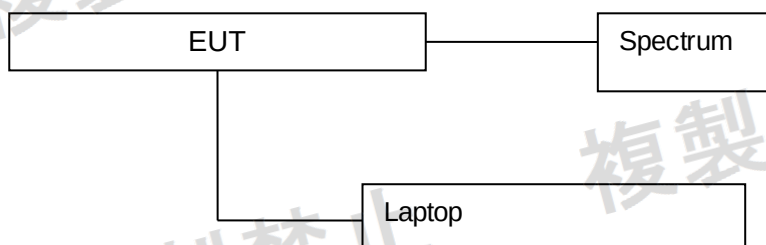
2.3.1 Test Conditions

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).

Note: 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. The details information as below.

External power supply	IC power supply	Deviation from normal	Deviation
90V	3.3V	---	---
100V	3.3V	0.00V	0.00%
110V	3.3V	0.00V	0.00%

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	Lenovo	T470	---	---

2.5 Lists of Test Instruments

Table 4. Lists of Test Instruments

Conducted method For EN 300 328 Test System:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Signal Generator	Agilent	N5181	MY49060122	2021-04-12	2022-04-11
Signal Generator	Agilent	N5182A	MY51004823	2021-04-12	2022-04-11
Wideband Radio Communication Tester	R&S	CMW500	145852	2021-04-12	2022-04-11
Spectrum Analyzer	R&S	FSV40-N	102175	2021-04-12	2022-04-11
Power Sensor	Keysight	U2021XA	MY54320007	2021-04-01	2022-03-31
Test Software	MWRFTTEST	MTS 8310	Version: 2.0.0.0		

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

Test Item	Uncertainty
Uncertainty for Conducted RF test	RF Power Conducted: 1.9dB Frequency test involved: 2.0×10^{-8} MHz
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3 Measurements Result

3.1 Antenna Power

3.1.1 Test condition

Test position:	Transmitting
Ambient temperature:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 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

Frequency (MHz)	Voltage (VDC)	Result Antenna Power (mW/MHz)	Limit Antenna Power (mW/MHz)	Result EIRP (dBm/MHz)	Limit EIRP (dBm/MHz)
2405	3.3	7.709	10.00	7.40	12.14
2445	3.3	8.072	10.00	7.60	12.14
2480	3.3	7.551	10.00	7.31	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:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 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 (VDC)	Declared Output Power (mW/MHz)	Result (mW/MHz)	Tolerances (%)	Limit (%)
2405	3.3	10	7.709	-22.91	+20%~-80%
2445	3.3	10	8.072	-19.28	+20%~-80%
2480	3.3	10	7.551	-24.49	+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:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 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 (VDC)	Result (MHz)	Tolerance (kHz)	Tolerance (ppm)	Limit (ppm)
2405	3.3	2404.991	9	3.742	± 50
2445	3.3	2444.990	10	4.090	± 50
2480	3.3	2479.989	11	4.435	± 50
Conclusion: PASS					

The equipment met the requirement of this clause.

3.4 Occupied Frequency Bandwidth

3.4.1 Test condition

Test position:	Transmitting
Ambient temperature:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 KPa

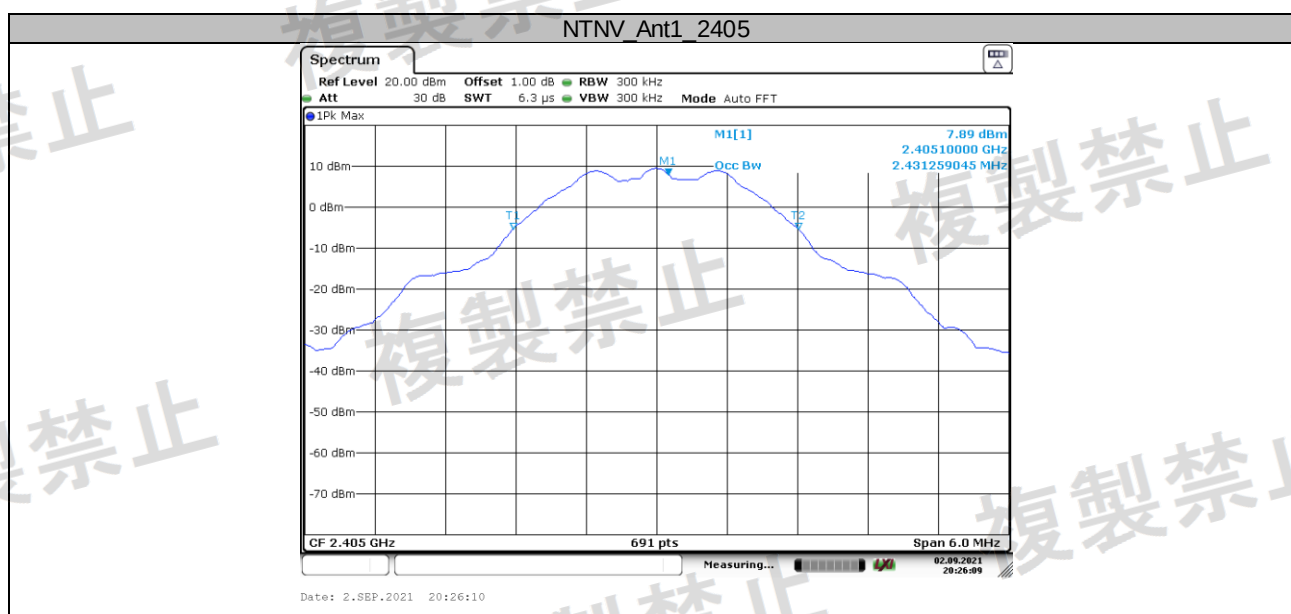
3.4.2 Limit (ARIB STD-T66, Clause 3.2 (7))

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.

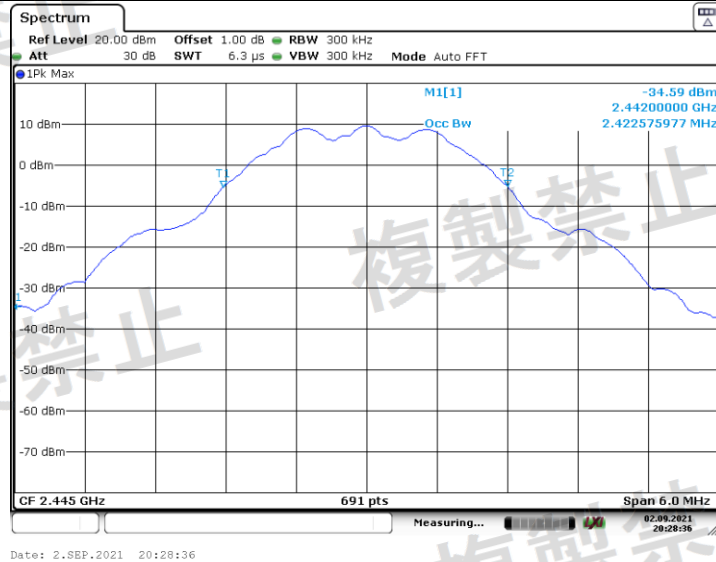
3.4.3 Test Result

11b

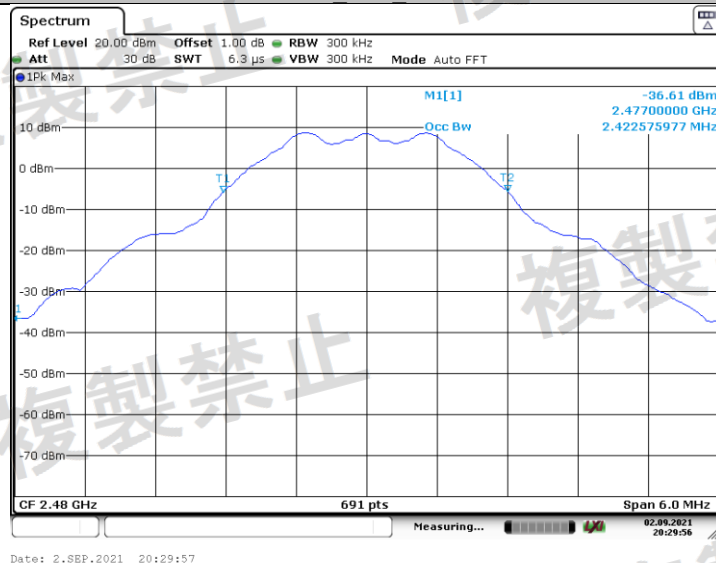
Test Frequency (MHz)	Voltage (VDC)	Result (MHz)	Limit (MHz)
2405	3.3	2.43	<26MHz
2445	3.3	2.42	<26MHz
2480	3.3	2.42	<26MHz



NTNV Ant1 2445



NTNV Ant1 2480



3.4.4 Result

The equipment met the requirement of this clause.

3.5 Spread Bandwidth

3.5.1 Test condition

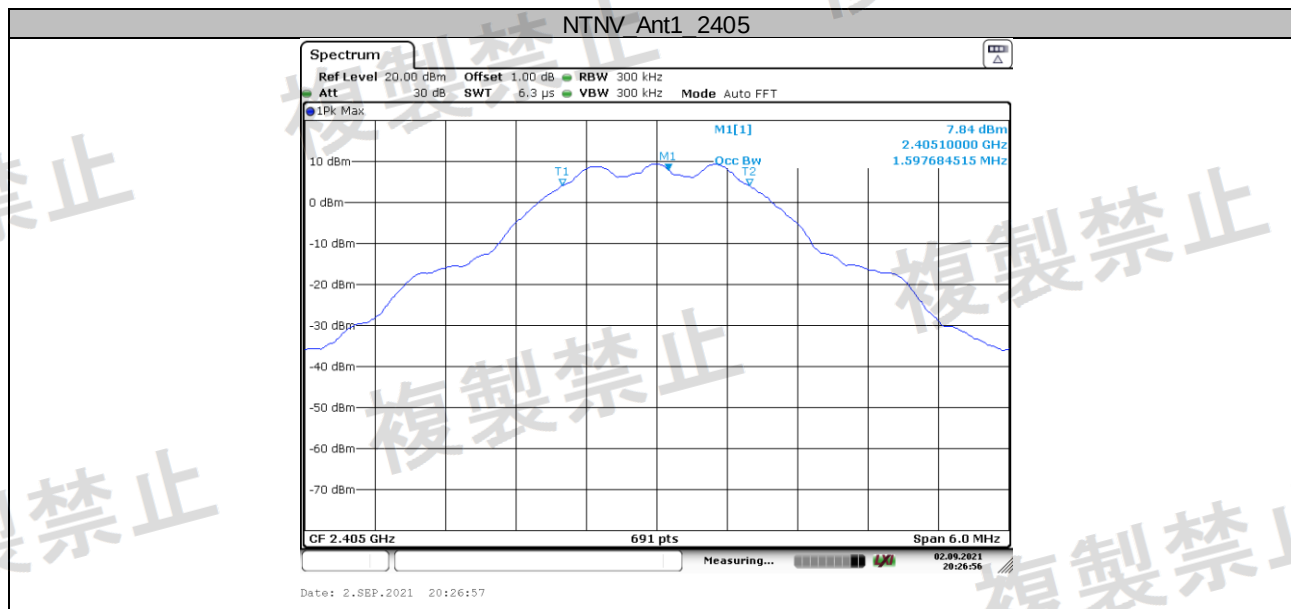
Test position:	Transmitting
Ambient temperature:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 KPa

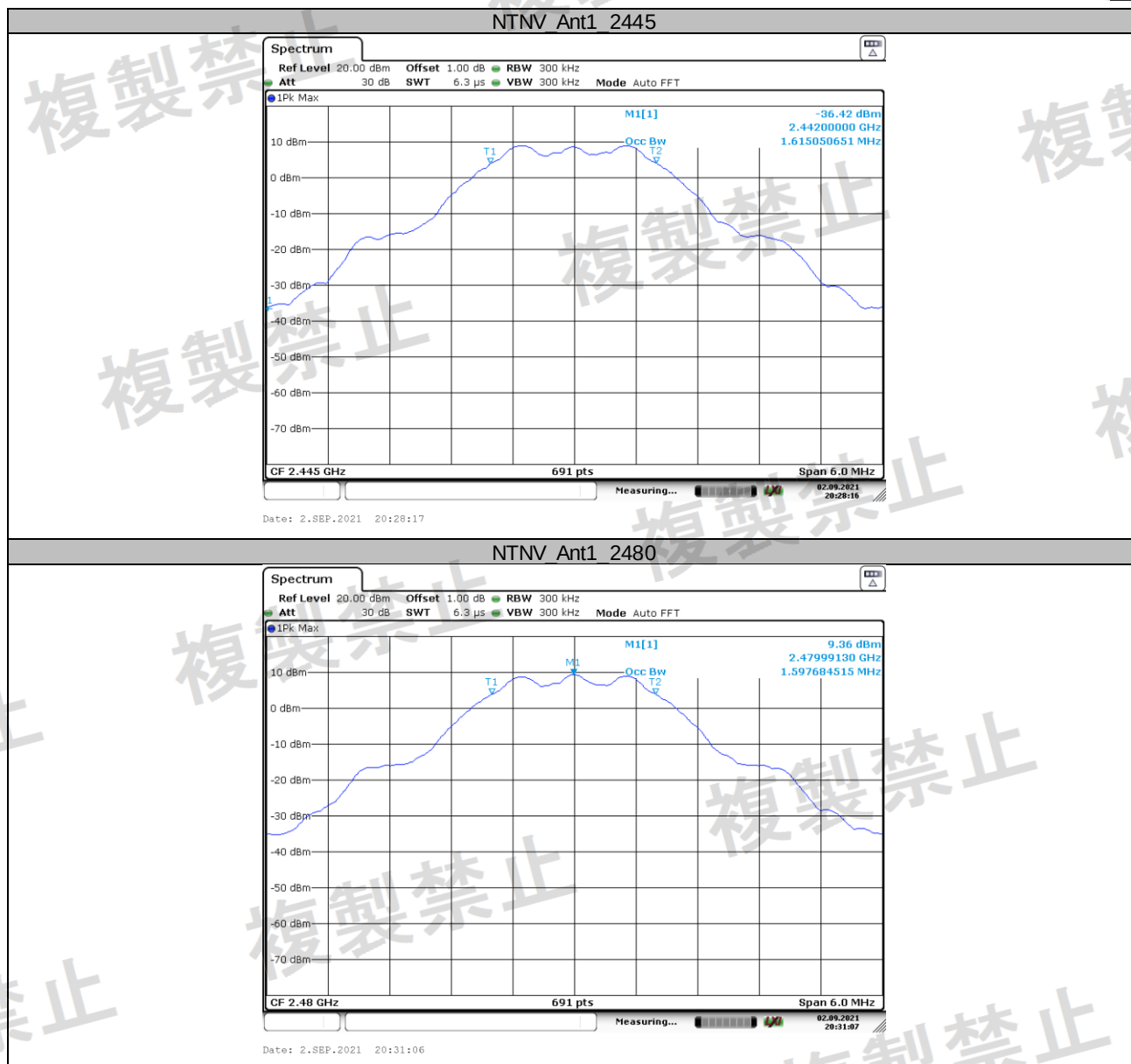
3.5.2 Limit (ARIB STD-T66, Clause 3.2 (8))

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

Test Frequency (MHz)	Voltage (VDC)	Result (MHz)	Limit (kHz)
2405	3.3	1.597	>500
2445	3.3	1.615	>500
2480	3.3	1.597	>500





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:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 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

Channel	Voltage (DC)	Spread Bandwidth (MHz)	Symbol rate (Mbps)	Result	Limit
2405	3.3	1.597	0.0625	25.55	≥5
2445	3.3	1.615	0.0625	25.84	≥5
2480	3.3	1.597	0.0625	25.55	≥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:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 KPa

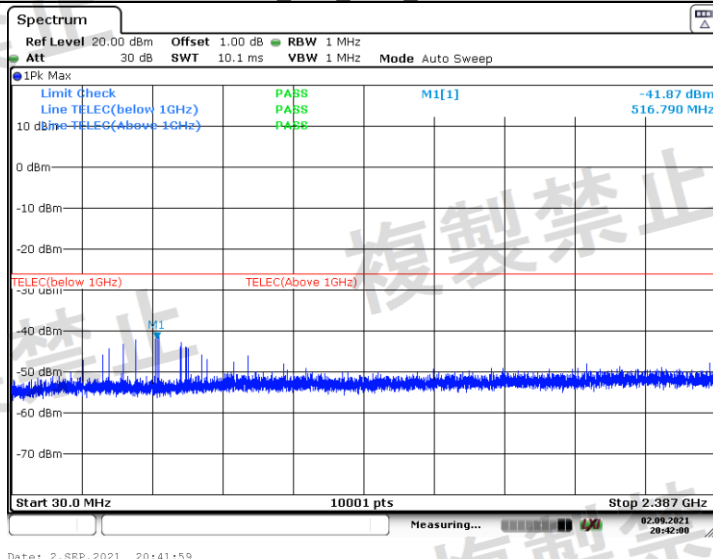
3.7.2 Limit (ARIB STD-T66, Clause 3.2 (6))

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

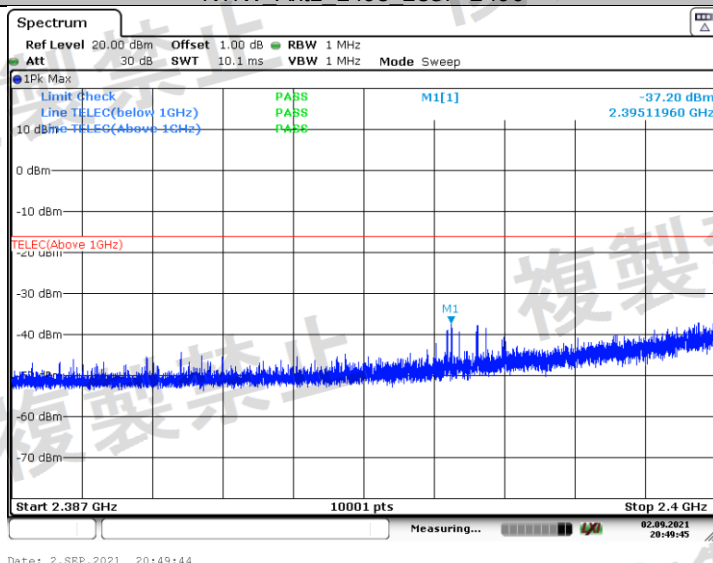
3.7.3 Test Result

TestCondition	Channel (MHz)	Freq.Range (MHz)	Result (dBm)	Limit (dBm)	Verdict
NTNV	2405	30~2387	-41.87	<=-26	PASS
		2387~2400	-37.20	<=-16	PASS
		2483.5~2496.5	-47.40	<=-16	PASS
		2496.5~12750	-43.67	<=-26	PASS
	2445	30~2387	-41.35	<=-26	PASS
		2387~2400	-45.80	<=-16	PASS
		2483.5~2496.5	-46.49	<=-16	PASS
		2496.5~12750	-43.46	<=-26	PASS
	2480	30~2387	-41.44	<=-26	PASS
		2387~2400	-48.58	<=-16	PASS
		2483.5~2496.5	-32.84	<=-16	PASS
		2496.5~12750	-43.98	<=-26	PASS

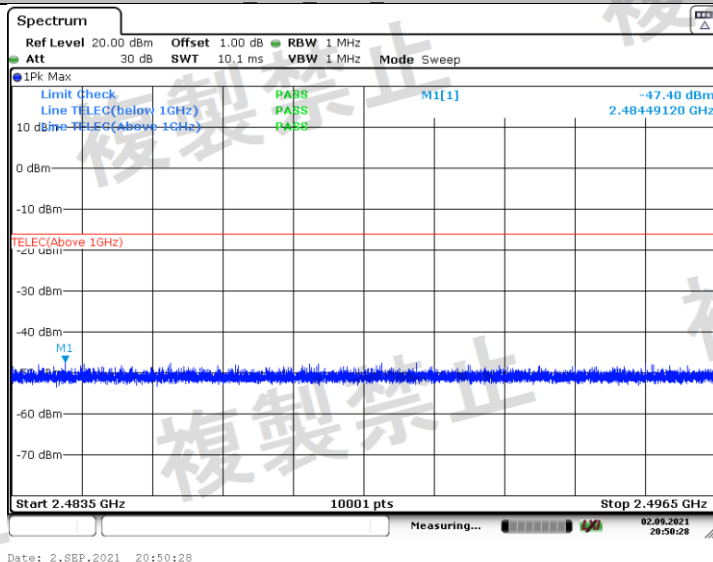
NTNV Ant1 2405 30~2387



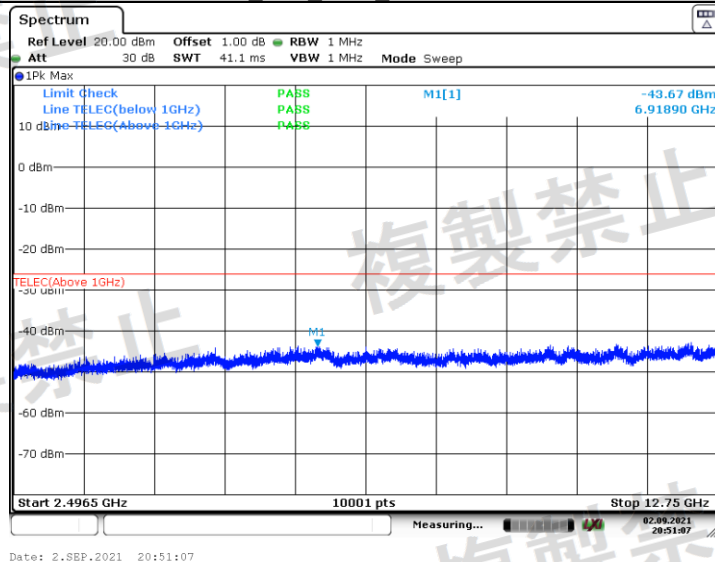
NTNV Ant1 2405 2387~2400



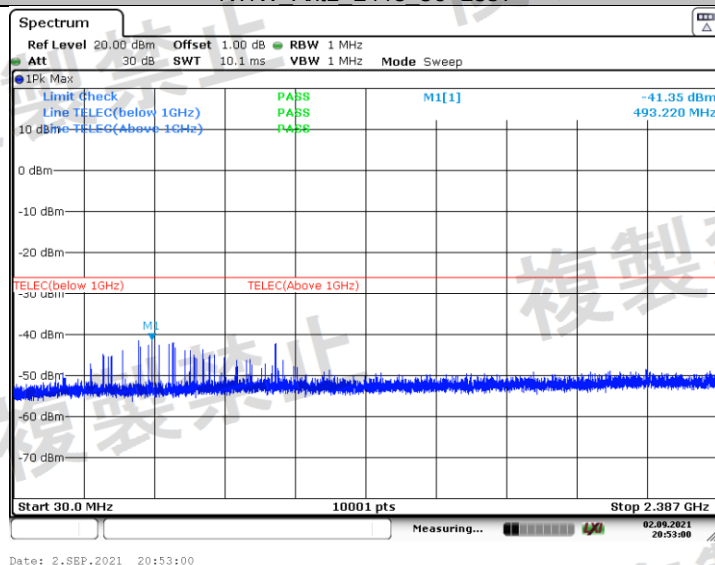
NTNV Ant1 2405 2483.5~2496.5



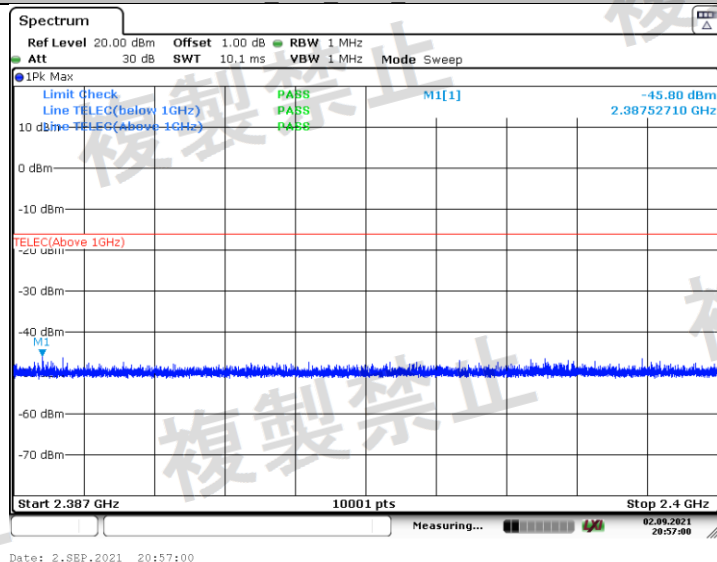
NTNV Ant1 2405 2496.5~12750



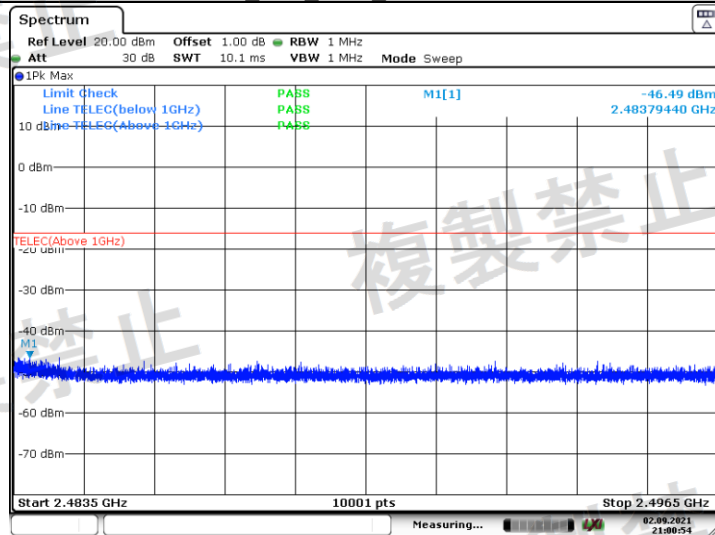
NTNV Ant1 2445 30~2387



NTNV Ant1 2445 2387~2400

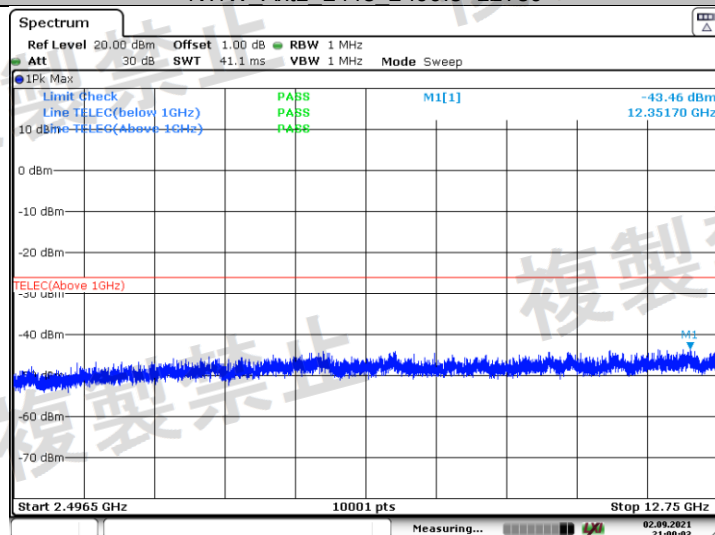


NTNV Ant1 2445 2483.5~2496.5



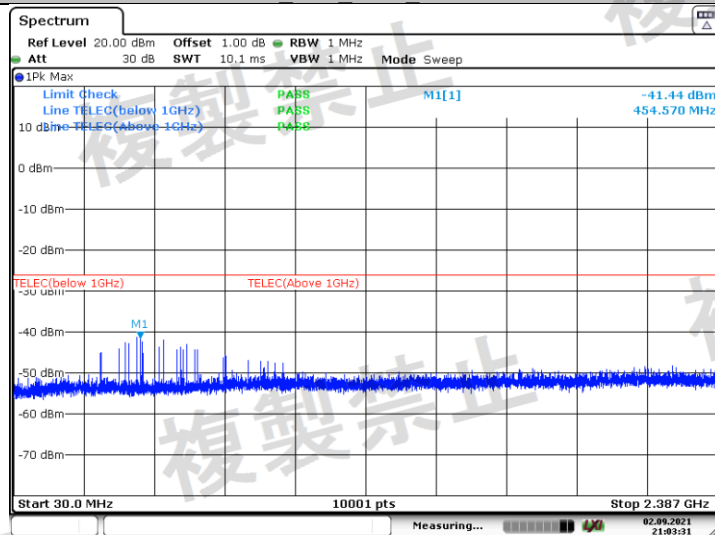
Date: 2.SEP.2021 21:00:54

NTNV Ant1 2445 2496.5~12750



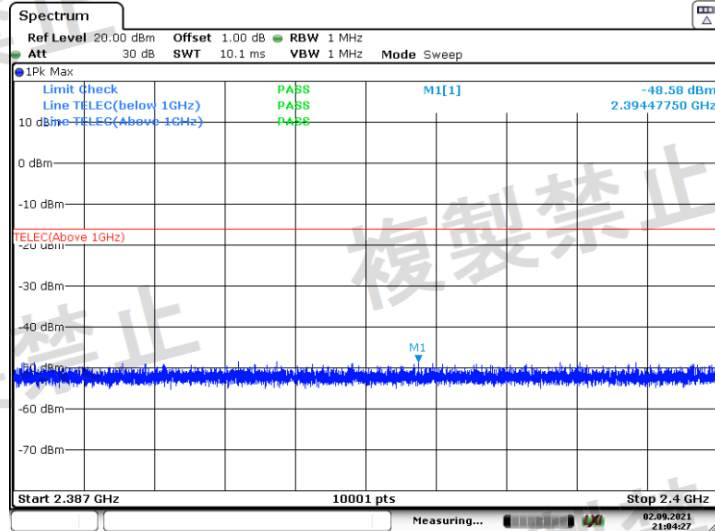
Date: 2.SEP.2021 21:00:03

NTNV Ant1 2480 30~2387



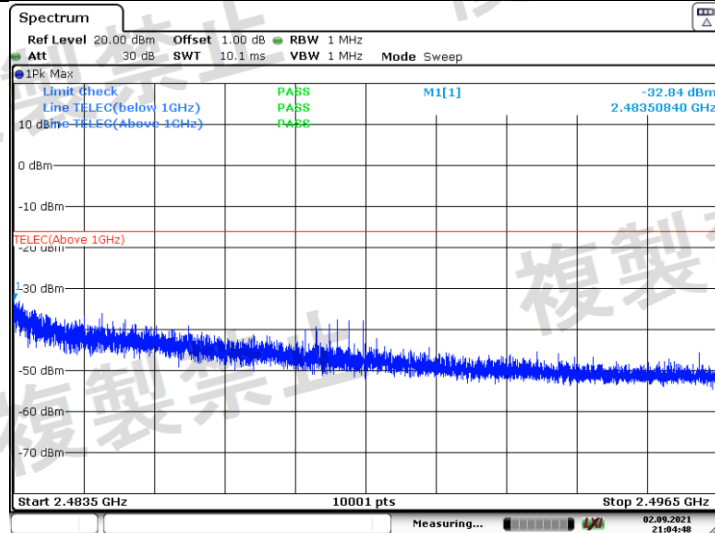
Date: 2.SEP.2021 21:03:30

NTNV Ant1 2480 2387~2400



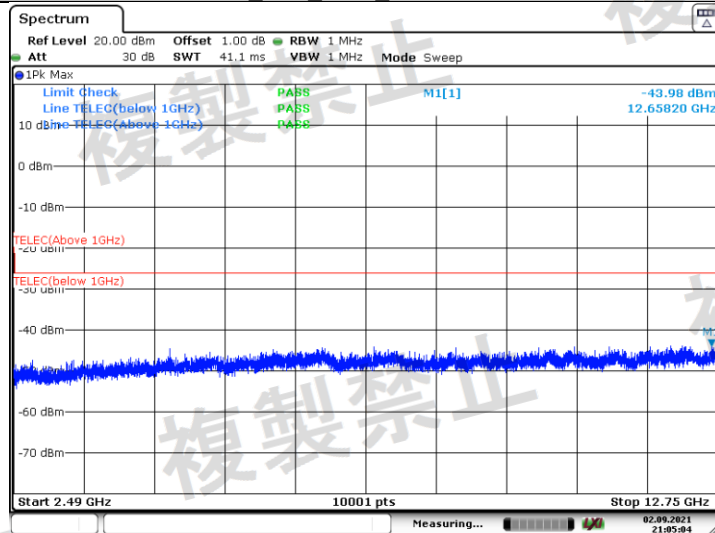
Date: 2.SEP.2021 21:04:28

NTNV Ant1 2480 2483.5~2496.5



Date: 2.SEP.2021 21:04:48

NTNV Ant1 2480 2496.5~12750



Date: 2.SEP.2021 21:05:04

3.8 Secondary Radiated Emissions (Conducted) (For receiver)

3.8.1 Test condition

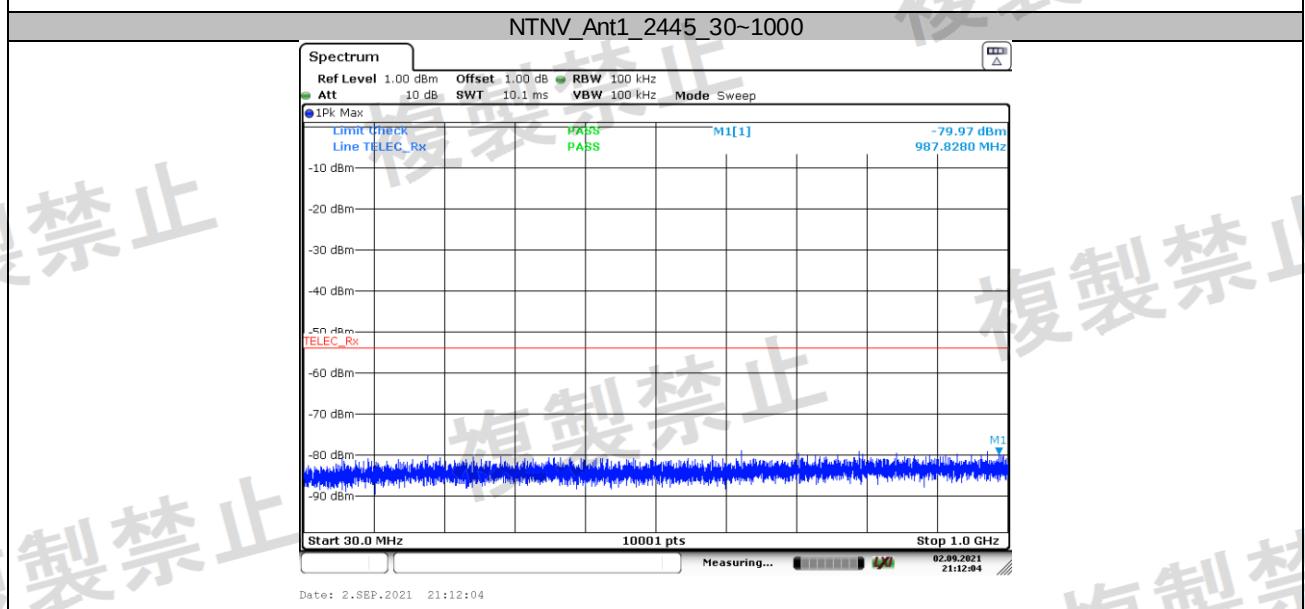
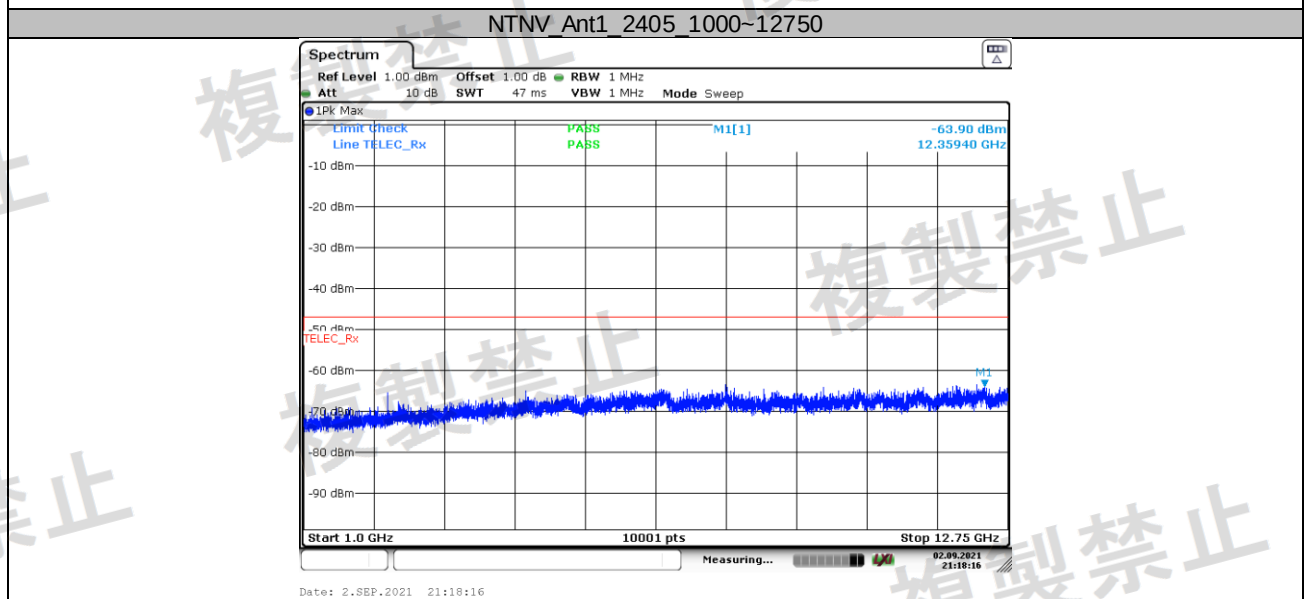
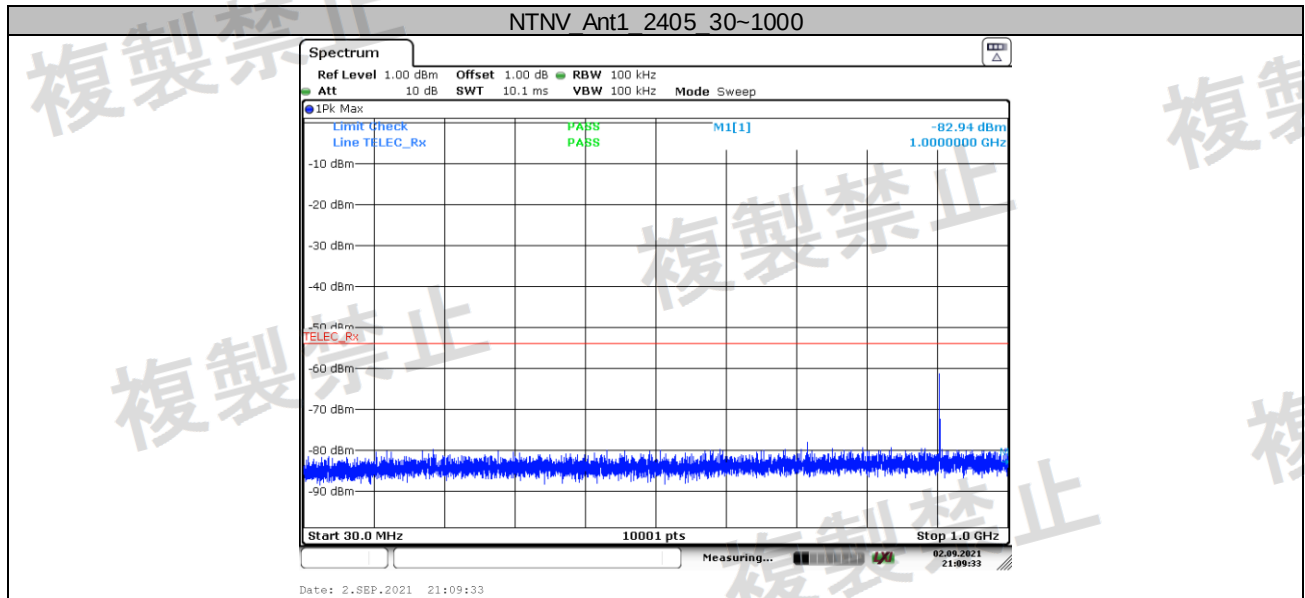
Test position:	Receiving
Ambient temperature:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 KPa

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

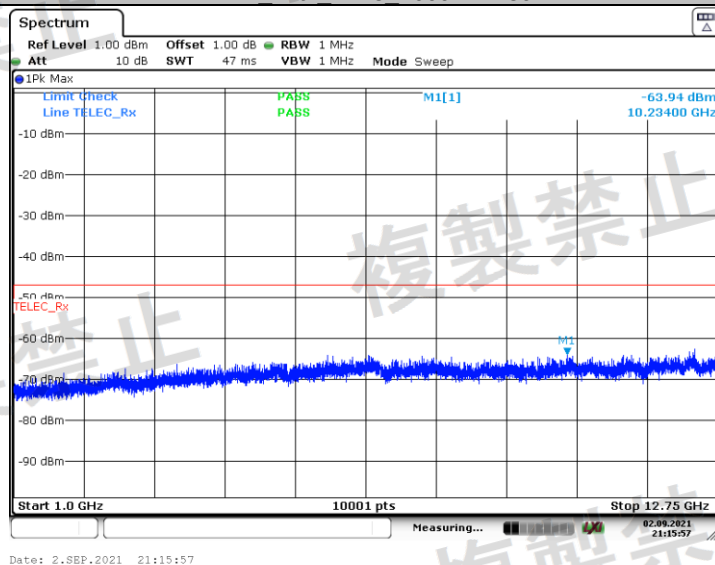
The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4 nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit.

3.8.3 Test Result

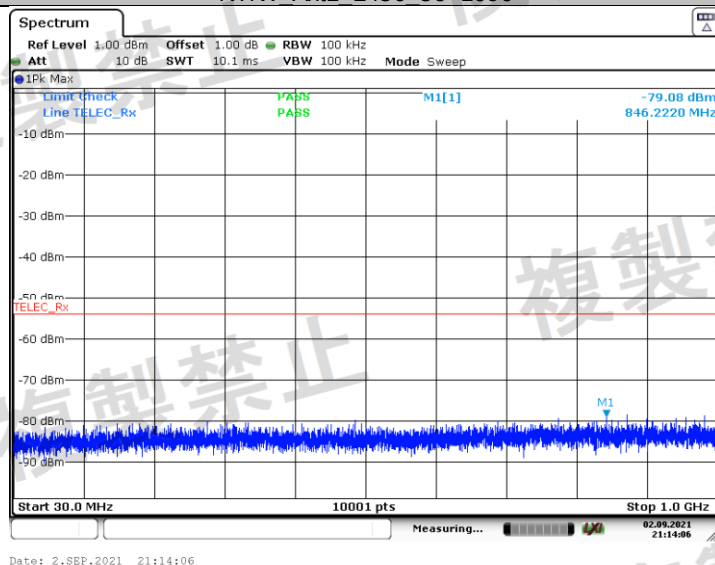
TestCondition	Channel (MHz)	Freq.Range (MHz)	Result (dBm)	Limit (dBm)	Verdict
NTNV	2405	30~1000		<=-54	PASS
		1000~12750		<=-47	PASS
	2445	30~1000		<=-54	PASS
		1000~12750		<=-47	PASS
	2480	30~1000		<=-54	PASS
		1000~12750		<=-47	PASS



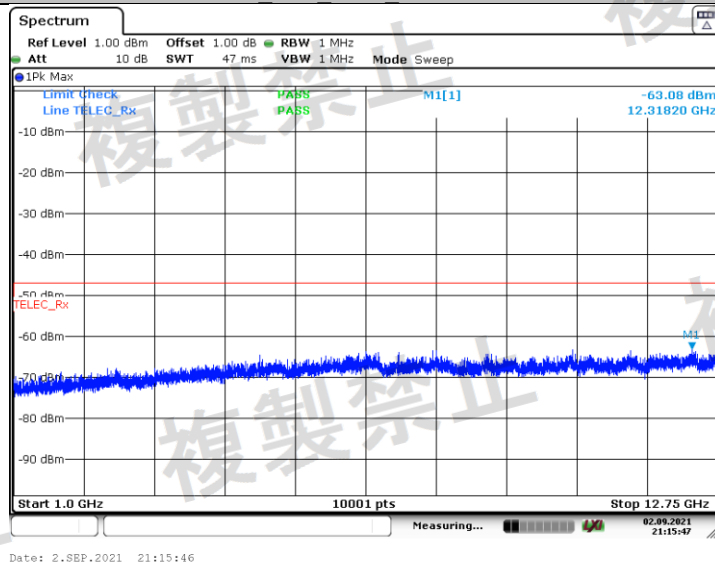
NTNV Ant1 2445 1000~12750



NTNV Ant1 2480 30~1000



NTNV Ant1 2480 1000~12750



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:	22.6 °C
Relative humidity:	53 %
Atmosphere Pressure:	101.2 KPa

3.9.2 Limit

Item	Limits
Identification Code	≥48 bits

Measured Result:

Test Conditions	Operation Frequency		
	2405 MHz	2445 MHz	2480 MHz
Normal Voltage (3.3V DC)	48	48	48

3.9.3 Result

The equipment met the requirement of this clause.

4 Photographs of Test Set-ups



THE END