

TEST REPORT

Product Name : Projector
Model Number : A02M11

Prepared for : Shenzhen Neutop Optoelectronics Co., Ltd.
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Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2607210134W00102R	/	Original Report

TEST RESULT CERTIFICATION

Applicant Shenzhen Neutop Optoelectronics Co., Ltd.
Address 502, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen, Guangdong, China
Manufacturer Shenzhen Neutop Optoelectronics Co., Ltd.
Address 502, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen, Guangdong, China
EUT Projector
Model Name A02M11
Trademark Aurzen. **Aurzen**

Measurement Procedure Used:

APPLICABLE STANDARDS		
STANDARD	Test Procedure	TEST RESULT
Item 19 of Article 2 Paragraph 1	MIC public notice 88:2004, annex 43	PASS

The device described above is tested by EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) was measured according to the test methods of Ordinance Concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment in Annex 1, the Ministry of Internal Affairs and Communication notification in Annex "43" of Article 88, Paragraph 1 or the test method more than equivalent and the result is technically compliant with the ARIB STD T-66 requirements.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : July 21, 2026 to August 26, 2026

Prepared by : Yu Xiaolan

Yu Xiaolan/Editor

Reviewer : Xia Lili

Xia Lili/Supervisor

Approved & Authorized Signer : Wang Li

Wang Li/Manager

1 EUT TECHNICAL DESCRIPTION

Product Name:	Projector
Model Number:	A02M11
Test Sample S/N:	ENS2607210134W001-01
Software Version:	V1.0.11
Hardware Version:	OD.P.JBV1.MT9266
Bluetooth Version:	Bluetooth V5.2
Device Type:	Bluetooth-LE
Modulation:	GFSK
Frequency Range:	2402-2480MHz
Number of Channels:	40 Channels
Rated Antenna power:	10 mW
Antenna:	FPC Antenna
Antenna Gain:	2.64dBi (Note: The antenna information is provided by the customers, which will have a certain impact on the test results.)
Adapter:	Model:Z48AW350100JA00 INPUT:100-240V~50/60Hz 1.2A MAX 47.0W OUTPUT1:35.0V/1.0A OUTPUT2:12.0V/1.0A
Power supply:	DC 12V&35V from adapter
Test Voltage:	AC 100V/50Hz
Temperature Range:	0° C to 35° C
Date of Received:	July 21, 2026
Date of Test:	July 21, 2026 to August 26, 2026

2 SUMMARY OF TEST RESULT

Clause	Test Parameter	Verdict	Remark
Item 19 of Article 2 Paragraph 1	Antenna Power	Pass	
Item 19 of Article 2 Paragraph 1	Frequency Error	Pass	
Item 19 of Article 2 Paragraph 1	Occupied Bandwidth (99%)	Pass	
Item 19 of Article 2 Paragraph 1	Spreading Bandwidth (90%)&Spread Factor	Pass	
Item 19 of Article 2 Paragraph 1	Spurious Emissions of Tx	Pass	
Item 19 of Article 2 Paragraph 1	Spurious Emissions of Rx	Pass	
Item 19 of Article 2 Paragraph 1	Interference Prevention Function	Pass	
Item 19 of Article 2 Paragraph 1	RF accessibility	Pass	

3 TEST METHODOLOGY

3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
Item 19 of Article 2 Paragraph 1 of the TELEC rules for 2.4GHz band wide-band low-power data communication system. All measurements contained in this report were conducted with test method for radio equipment specified in MIC public notice 88:2004, annex 43 for certification. And measuring method for electric field intensity of radio station with remarkably weak radiowave transmitted.

3.2 MEASUREMENT EQUIPMENT USED

3.2.1 Radio Frequency Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Calibration Body	Calibration Method
Wideband Radio Communication Tester	R&S	CMW500	171168	2025/9/9	LISAI	(c)
Spectrum Analyzer	R&S	FSV3044	101289	2025/12/16		
Signal Analyzer	KEYSIGHT	N9010B	MY60240204	2025/12/16	LISAI	(c)
Analog Signal Generator	R&S	SMB100A	183237	2025/9/9	LISAI	(c)
Vector Signal Generator	R&S	SMM100A	101808	2025/9/9	LISAI	(c)
RF Control Unit(Power Meter)	Tonscend	JS0806-2	22C8060567	2025/9/9	LISAI	(c)
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2026/5/8	N/A	N/A

Remark:

- (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
 - (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).
 - (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
 - (d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).
- From JRL Article 24-2, paragraph 4, Item 2.

Notice: Calibration duration for above equipments is 1 year.

3.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

BLE data rates were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for BLE mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	19	2440	...	...
2	2404	20	2442	37	2476
4	2406	21	2444	38	2478
...	...	...	...	39	2480

Note: $f_c = 2402\text{MHz} + k \times 2\text{MHz}$ $k=0$ to 39

Test Frequency and channel for BLE mode:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	19	2440	39	2480

3.4 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. Unless otherwise denoted as EUT in [Remark] column, device(s) used in tested system is a support equipment accordance with the manufacturer's requirements and conditions for the intended use.

4 FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22."

4.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description EMC Lab.	: The Certificate Registration Number is L2291. The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)
3m Chamber #1	: Certificated by VCCI, Japan Registration No.: R-12777 Registration No.: G-20141
10m Chamber	: Certificated by VCCI, Japan Registration No.: R-14410
Shielding Room #1	: Certificated by VCCI, Japan Registration No.: C-13065 Registration No.: T-11318
Name of Firm	: EMTEK (SHENZHEN) CO., LTD.
Site Location	: Building 69, Majialong, Industry Zone, Nanshan District, Shenzhen, Guangdong, China

5 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Parameter	Measurement Uncertainty
RF Output Power	±1.0%
Power Spectral Density	±0.9%
Duty Cycle and Tx-Sequence and Tx-Gap	±1.3%
Medium Utilisation Factor	±1.5%
Occupied Channel Bandwidth	±2.3%
Transmitter Unwanted Emission in the Out-of Band	±1.2%
Transmitter Unwanted Emissions in the Spurious Domain	±2.7%
Receiver Spurious Emissions	±2.7%
Temperature	±3.2%
Humidity	±2.5%

Measurement Uncertainty for a level of Confidence of 95%.

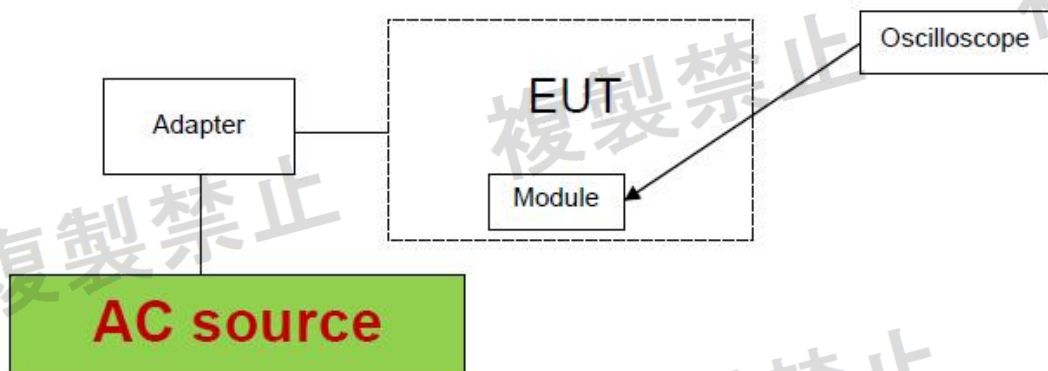
6 SETUP OF EQUIPMENT UNDER TEST

6.1 Applicable Standard

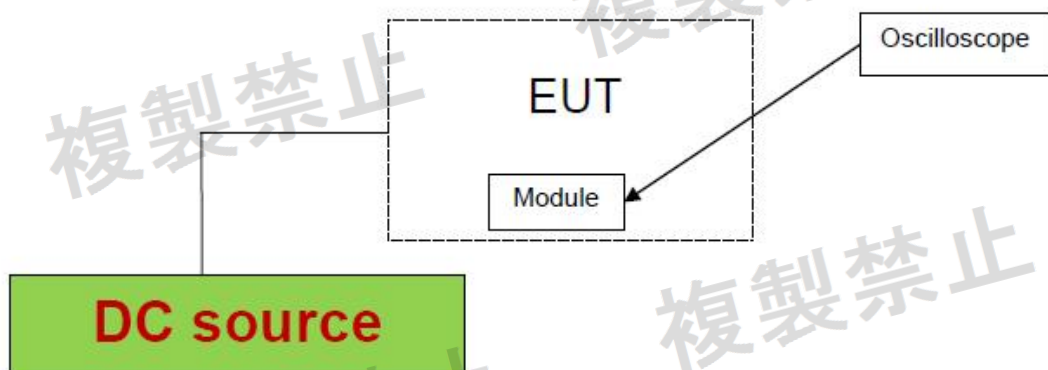
When there is a fluctuation of $\pm 10\%$ input voltage from external power to the test equipment. If the fluctuation of input voltage to the circuit of the radio part (excl. power) in the test equipment is confirmed below $\pm 1\%$, Measurement shall be tested with the rated voltage.

6.2 Test Configuration

Config A



Config B



6.3 Test Results

Temperature : 21.4℃
Humidity : 46%

Test By:
Atmospheric Pressure:

Zhu Guangjun
101KPa

Test Sample DC Input Voltage	10.8V	12V	13.2V
Input Voltage To The Circuit	3.31	3.29	3.29
Module Rated Voltage	3.30	3.30	3.30
The Deviation of Module Voltage (%)	0.3	0	0.3

Note: In extreme conditions, The test sample module power is confirmed below $\pm 1\%$.

7 TEST REQUIREMENTS

7.1 ANTENNA POWER

7.1.1 Applicable Standard

According to Item 19 of Article 2 Paragraph 1.

7.1.2 Conformance Limit

- ≤ 3 mW /MHz(FHSS from 2402-2480 MHz)
- ≤ 10 mW /MHz(DS OFDM (Occupied Bandwidth <26MHz) from 2400-2483.5 MHz)
- ≤ 5 mW/MHz (OFDM(26MHz<Occupied Bandwidth <38MHz) from 2400-2483.5 MHz)
- ≤ 10 mW (other from 2400-2483.5 MHz)

The Output Power Tolerance must be within 20%.

E.i.r.p:

- ≤ 6.91mW /MHz(FHSS from 2402-2480 MHz)
- ≤ 12.14 mW /MHz(DS OFDM (Occupied Bandwidth <26MHz) from 2400-2483.5 MHz)
- ≤ 9.14 mW/MHz (OFDM(26MHz<Occupied Bandwidth <38MHz) from 2400-2483.5 MHz)
- ≤ 12.14 mW (other from 2400-2483.5 MHz)

Note: E.I.R.P will not be applied to the transmission antenna which has a gain of 2.14dBi or less.

7.1.3 Test Setup Block Diagram



7.1.4 Test Procedure

Set the EUT on the test frequency and the consecutive TX mode or continuous (constant period, constant burst length) burst TX mode.

In case of spreading code used, set on the test spreading code, then the modulation is performed with standard coding test signal.

(1) Measure the equivalent noise bandwidth at the spectrum analyzer for resolution bandwidth of 1 MHz, then read the value correcting the resolution bandwidth on the 1 MHz equivalent bandwidth. In case of a spreading bandwidth lower than 1 MHz, however, perform the correction only for a higher value than "Spreading bandwidth (MHz) / Equivalent noise bandwidth (MHz)".

(2)The attenuation value of the attenuator shall be set to achieve the optimal operating input level at the spectrum analyzer.

(3)Spectrum analyzer for seeking the maximum antenna power is set as below.

Central Frequency	Test frequency
Sweeping Bandwidth	Approx. twice the Occupied Bandwidth
Resolution Bandwidth	1 MHz
Video Bandwidth	Approx. twice the resolution bandwidth (VBW=2MHz)
Y-Axis Scale	10 dB/Div
Sweep Time	Minimum time to assure the measurement accuracy (In case of burst wave, 1 burst per 1 sample)
Trigger Condition	Free run
Data points	More than 400 points

Sweep Mode	Consecutive sweep
Phase-Detection Mode	Positive peak
Display mode	Max-hold

(4) Spectrum analyzer for measuring the antenna power is set as below. In this case, calibrate the indication of the RF Power Meter on the output of the EUT with the RF Power Meter connected to the IF output of the spectrum analyzer.

Central Frequency	Frequency to achieve the maximum power (sought frequency)
Sweeping Bandwidth	0 Hz
Resolution Bandwidth	1 MHz
Video Bandwidth	Same level as the resolution bandwidth
Sweep Mode	Consecutive sweep
Phase-Detection Mode	Sample

Measurement Procedure

(1) No frequency hopping systems:

- Configure the settings of the spectrum analyzer to 2(3).
- After repeating sweeps (until no display changes are found), measure the maximum power frequency per MHz.
- Connect the high frequency power meter to the IF output of the spectrum analysers.
- Configure the settings of the spectrum analyzer to 2(4).
- Set the antenna power as follows:
 - Continuous waves: value indicated on the high frequency power meter, corrected according to 2(1).
 - Burst waves: value similarly corrected in the case of continuous waves and value calculated from the average power within bursts from rates of transmission times (i.e. correction on the duty-cycle, to find the average within the transmit burst)

7.1.5 Environmental Conditions

Temperature:	23.7°C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

7.1.6 Test Results

TestCondition	TestMode	Antenna	Freq(MHz)	Result(dBm)	Result(mW)	Limit(mW)	Verdict
NTNV	BLE_1M	Ant1	2402	7.36	5.4450	≤10	PASS
NTNV	BLE_1M	Ant1	2440	7.18	5.2240	≤10	PASS
NTNV	BLE_1M	Ant1	2480	7.81	6.0395	≤10	PASS
NTNV	BLE_2M	Ant1	2402	7.36	5.4450	≤10	PASS
NTNV	BLE_2M	Ant1	2440	7.20	5.2481	≤10	PASS
NTNV	BLE_2M	Ant1	2480	7.86	6.1094	≤10	PASS

TestCondition	TestMode	Antenna	Freq(MHz)	Result(dBm)	EIRP(dBm)	Limit(dBm)	Verdict
NTNV	BLE_1M	Ant1	2402	7.36	10.00	≤12.14	PASS
NTNV	BLE_1M	Ant1	2440	7.18	9.82	≤12.14	PASS
NTNV	BLE_1M	Ant1	2480	7.81	10.45	≤12.14	PASS
NTNV	BLE_2M	Ant1	2402	7.36	10.00	≤12.14	PASS
NTNV	BLE_2M	Ant1	2440	7.20	9.84	≤12.14	PASS
NTNV	BLE_2M	Ant1	2480	7.86	10.50	≤12.14	PASS

Test Condition	Test Mode	Antenna	Freq(MHz)	Power (mW)	RatedPower (mW)	Result (%)	Limit (%)	Verdict
NTNV	BLE_1M	Ant1	2402	5.4450	10	-45.55	≤+20	PASS
NTNV	BLE_1M	Ant1	2440	5.2240	10	-47.76	≤+20	PASS
NTNV	BLE_1M	Ant1	2480	6.0395	10	-39.61	≤+20	PASS
NTNV	BLE_2M	Ant1	2402	5.4450	10	-45.55	≤+20	PASS
NTNV	BLE_2M	Ant1	2440	5.2481	10	-47.52	≤+20	PASS
NTNV	BLE_2M	Ant1	2480	6.1094	10	-38.91	≤+20	PASS

7.2 FREQUENCY ERROR

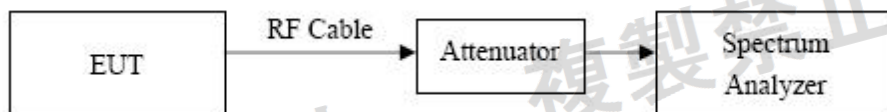
7.2.1 Applicable Standard

According to Item 19 of Article 2 Paragraph 1.

7.2.2 Conformance Limit

For the 2.4 GHz bands it shall be better than 50 ppm under the operational conditions.

7.2.3 Test Setup Block Diagram



7.2.4 Test Procedure

If the fluctuation of input voltage to the circuit of the radio part (excl. power) in the test equipment is confirmed below $\pm 1\%$, Measurement shall be tested with the rated voltage.

When there is a fluctuation of $\pm 10\%$ input voltage from external power to the test equipment. In case the test equipment is designed to function only within the specified fluctuation range of $\pm 10\%$ for the voltage source tests shall be conducted applying the rated voltage and a respective specified maximum/minimum value of fluctuation range.

Set the EUT on the test frequency and transmit.

Stop the modulation (stop the spreading), set on "continuous transmission of no-modulated radiation" in principle. If impossible, on "continuous burst transmission of no-modulated radiation", or a modulation mode to generate a specific frequency spectrum so that the frequency can be measured using a spectrum analyzer (example: a wave of the sub-carrier).

In case of no-modulation (consecutive or continuous burst), direct measurement is conducted with the frequency meter.

In case of burst wave, the measurement is conducted for a time period to achieve a sufficient accuracy. The mean value is employed as the measurement value.

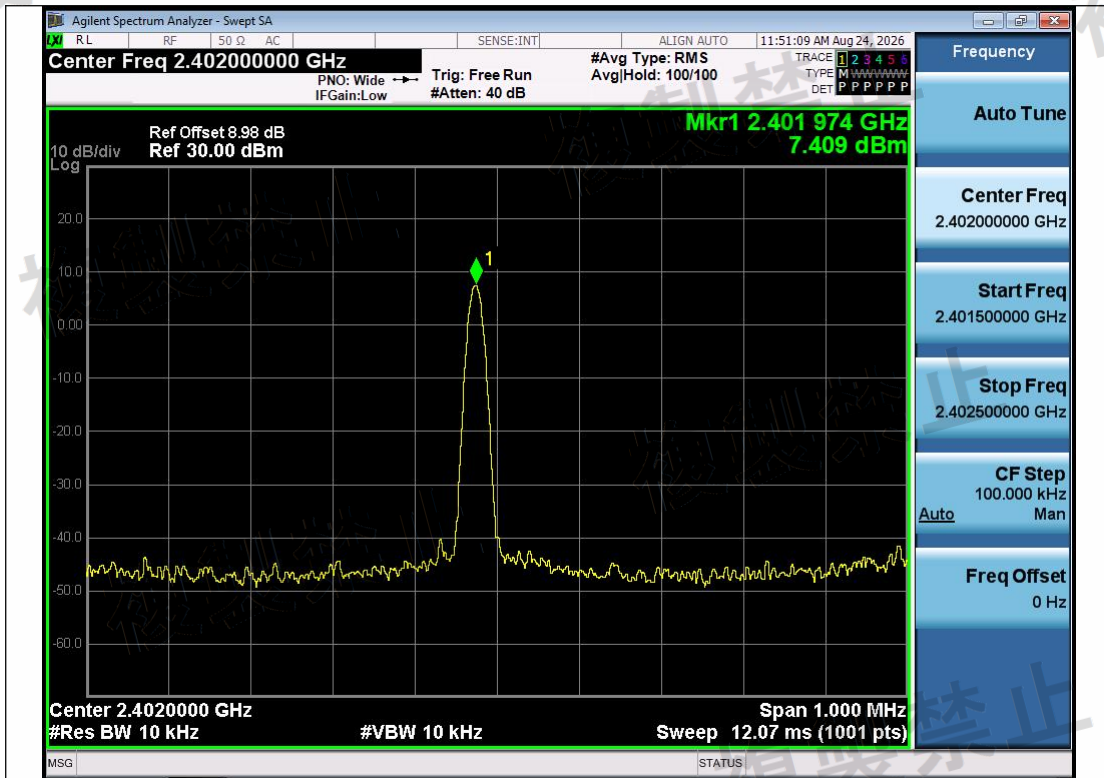
In case of a test mode generating specific frequency spectrum, the spectrum frequency is measured with the spectrum analyzer.

7.2.5 Environmental Conditions

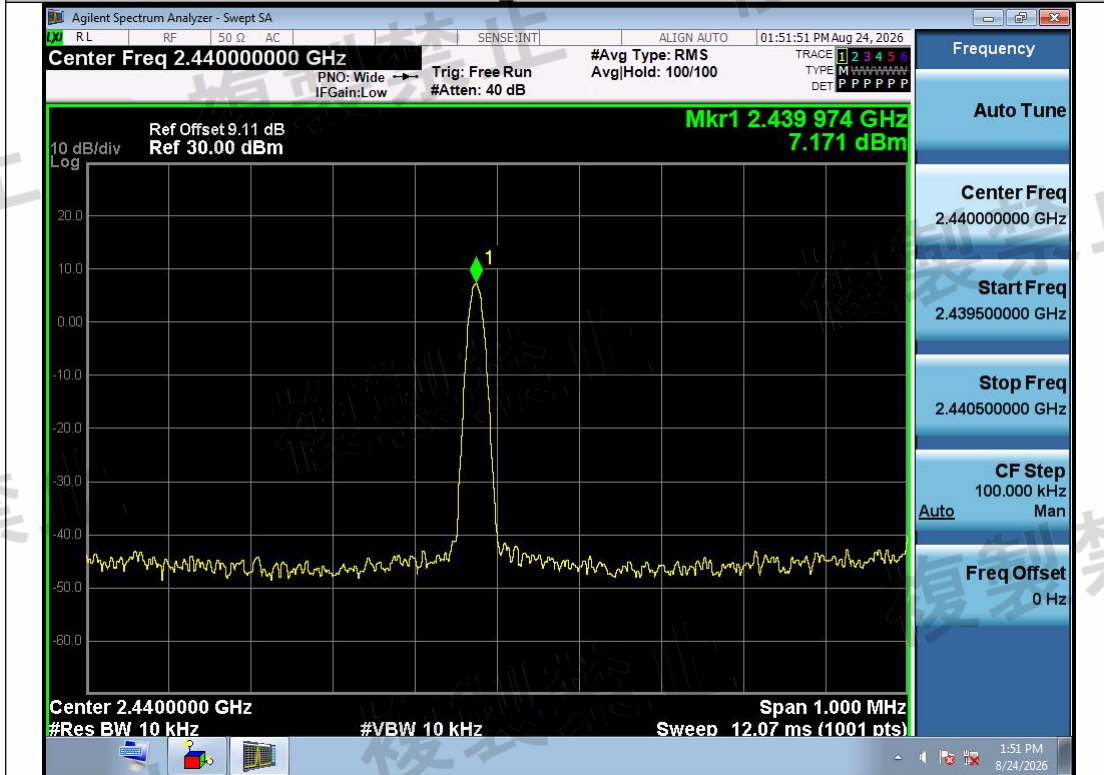
Temperature:	23.7°C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

7.2.6 Test Results

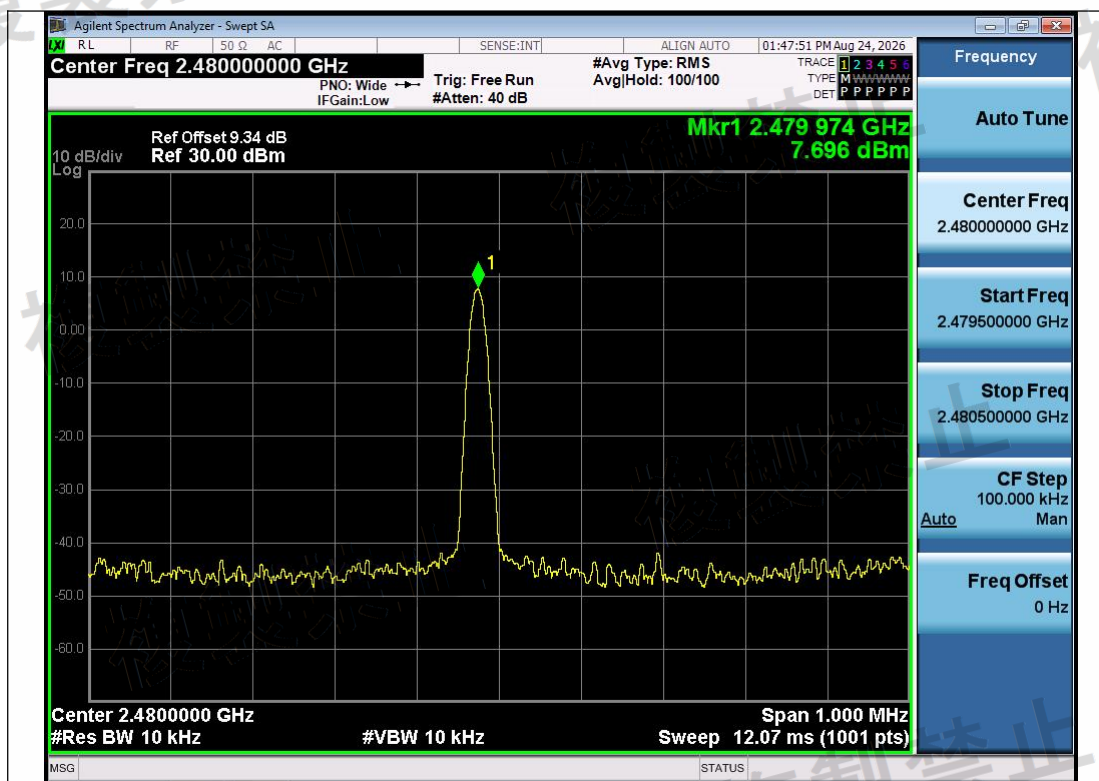
TestCondition	TestMode	Antenna	Freq(MHz)	CenterFreq [MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	BLE_1M	Ant1	2402	2401.974	-10.82431	±50	PASS
NTNV	BLE_1M	Ant1	2440	2439.974	-10.65574	±50	PASS
NTNV	BLE_1M	Ant1	2480	2479.974	-10.48387	±50	PASS
NTNV	BLE_2M	Ant1	2402	2401.974	-10.82431	±50	PASS
NTNV	BLE_2M	Ant1	2440	2439.974	-10.65574	±50	PASS
NTNV	BLE_2M	Ant1	2480	2479.974	-10.48387	±50	PASS



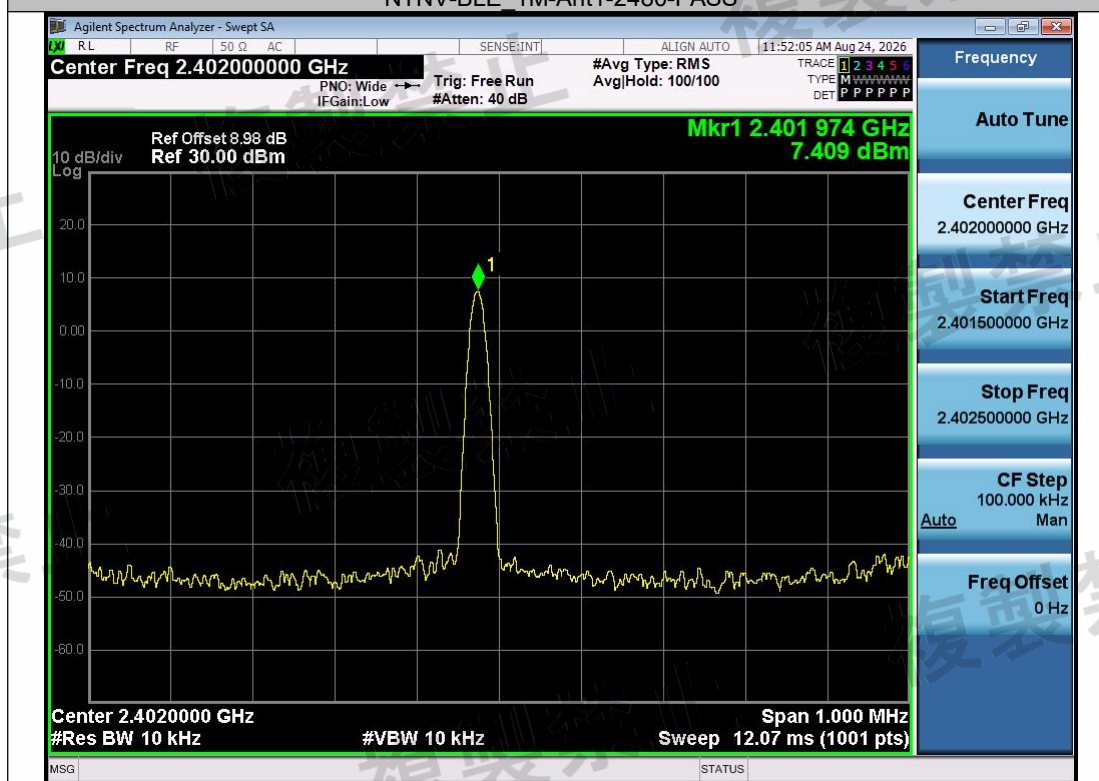
NTNV-BLE_1M-Ant1-2402-PASS



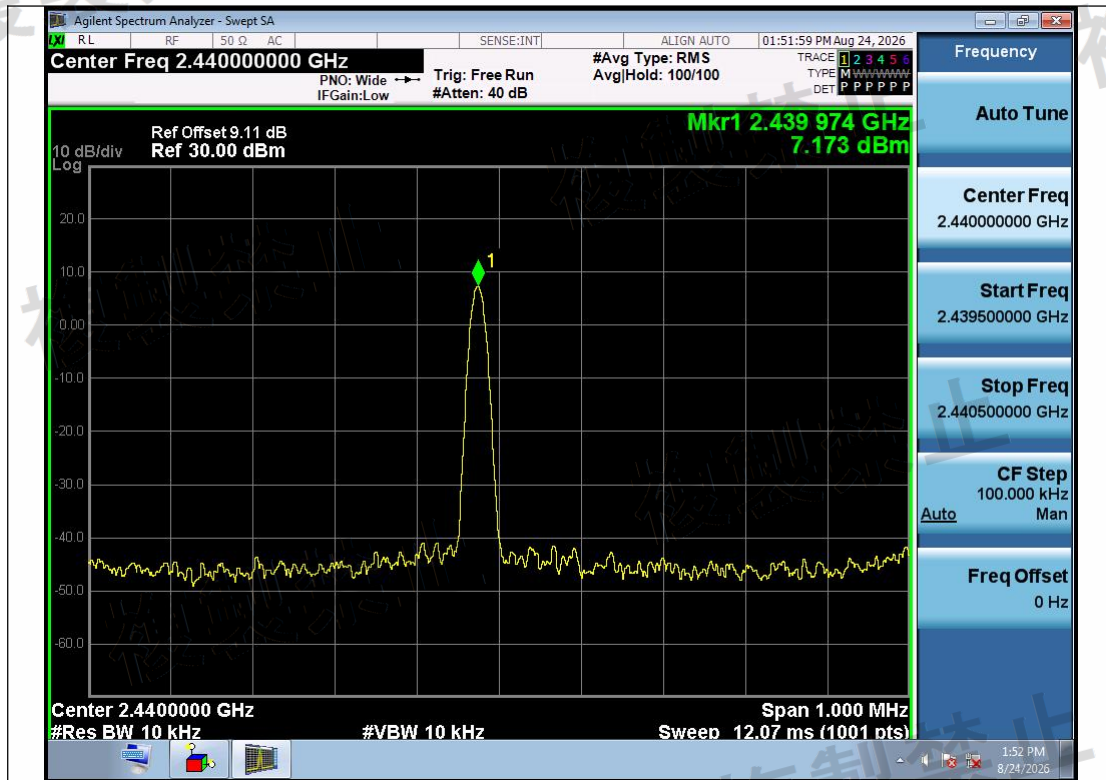
NTNV-BLE_1M-Ant1-2440-PASS



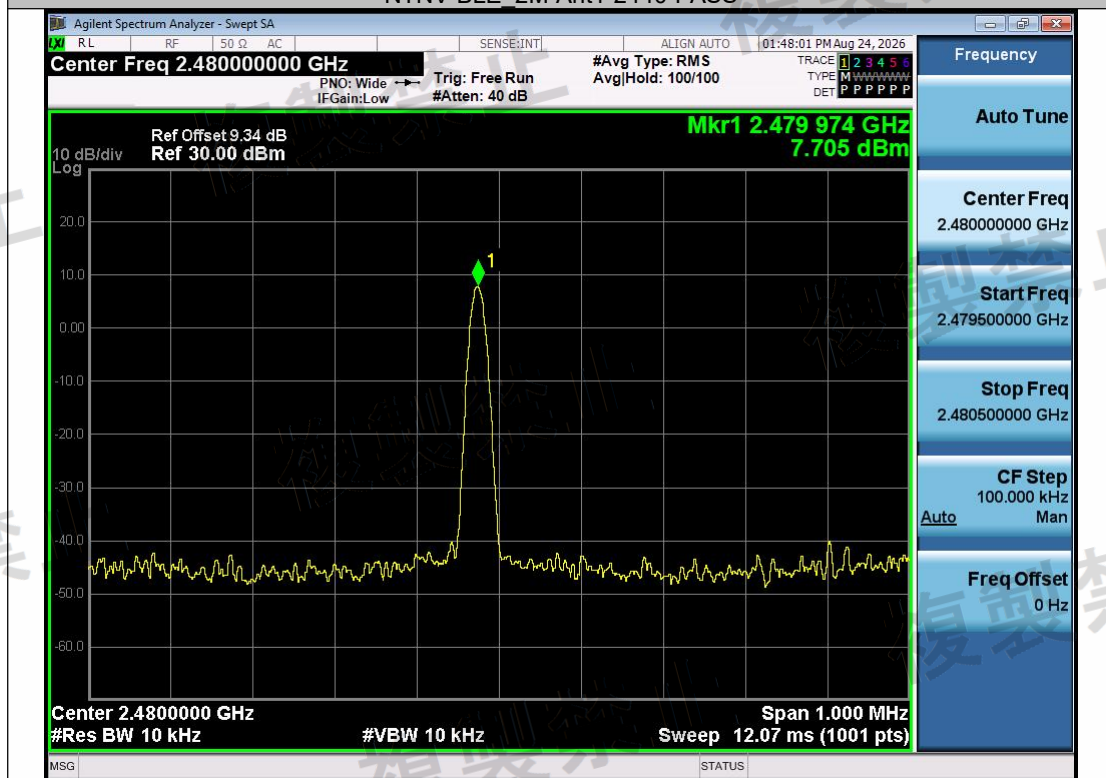
NTNV-BLE 1M-Ant1-2480-PASS



NTNV-BLE 2M-Ant1-2402-PASS



NTNV-BLE_2M-Ant1-2440-PASS



NTNV-BLE_2M-Ant1-2480-PASS

7.3 OCCUPIED BANDWIDTH (99%)

7.3.1 Applicable Standard

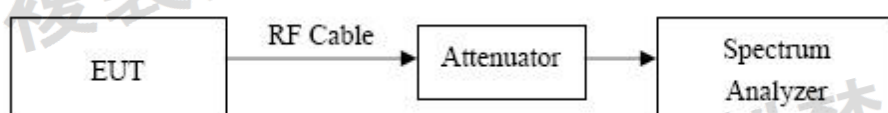
According to Item 19 of Article 2 Paragraph 1

7.3.2 Conformance Limit

Permissible value for occupied bandwidth for DSSS & OFDM equipment (Carrier frequencies from 2,400MHz to 2,483.5MHz or from 2,471MHz to 2,497MHz, for all equipment except for 40 MHz channel separation) shall be 26MHz or less.

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 500kHz or more.

7.3.3 Test Setup Block Diagram



7.3.4 Test Procedure

Spectrum analyzer is set as below

Central Frequency	Test frequency
Sweeping Bandwidth	2 to 3.5 times the allowable value (SPAN=4MHz)
Resolution Bandwidth	Lower than 3 % of allowable value (RBW=10kHz)
Video Bandwidth	Same level as Resolution Bandwidth
Y-Axis Scale	10 dB/Div
Input Level	Carrier level is sufficiently higher than spectrum analyzer noise
Sweep Time	Minimum time to assure the measurement accuracy (In case of burst wave, 1 burst per 1 sample)
Sampling points	More than 400 points
Sweep Mode	Consecutive sweep
Phase-Detection Mode	Positive peak
Trigger Condition	Max-hold

The measured value of the spectrum analyzer is processed by the computer internally or externally
Conditions of EUT

Set the test frequency and the modulation is performed with the standard coded test signal. In case of OFDM with burst wave, the modulation is conducted to minimize the rate of the time that the number of sub-carrier is less (short preamble).

After a repetition of sweep so that no variation is found, values of all the data points are loaded into the array variable on the computer.

For all the data, the dB values are converted to antilogarithm of power dimension.

Power summation of all the data is estimated and stored as "total power value".

Starting with the data of the minimum frequency, the power is summed sequentially, and the limiting data point where the value achieves 0.5% of the total power is sensed. The limiting point is converted to

frequency, stored as “lower limit”.

Starting with the data of the maximum frequency, the power is summed sequentially, and the limiting data point where the value achieves 0.5% of the total power is sensed. The limiting point is converted to frequency, stored as “upper limit”

7.3.5 Environmental Conditions

Temperature:	23.7℃
Relative Humidity:	50%
ATM Pressure:	1011 mbar

7.3.6 Test Results

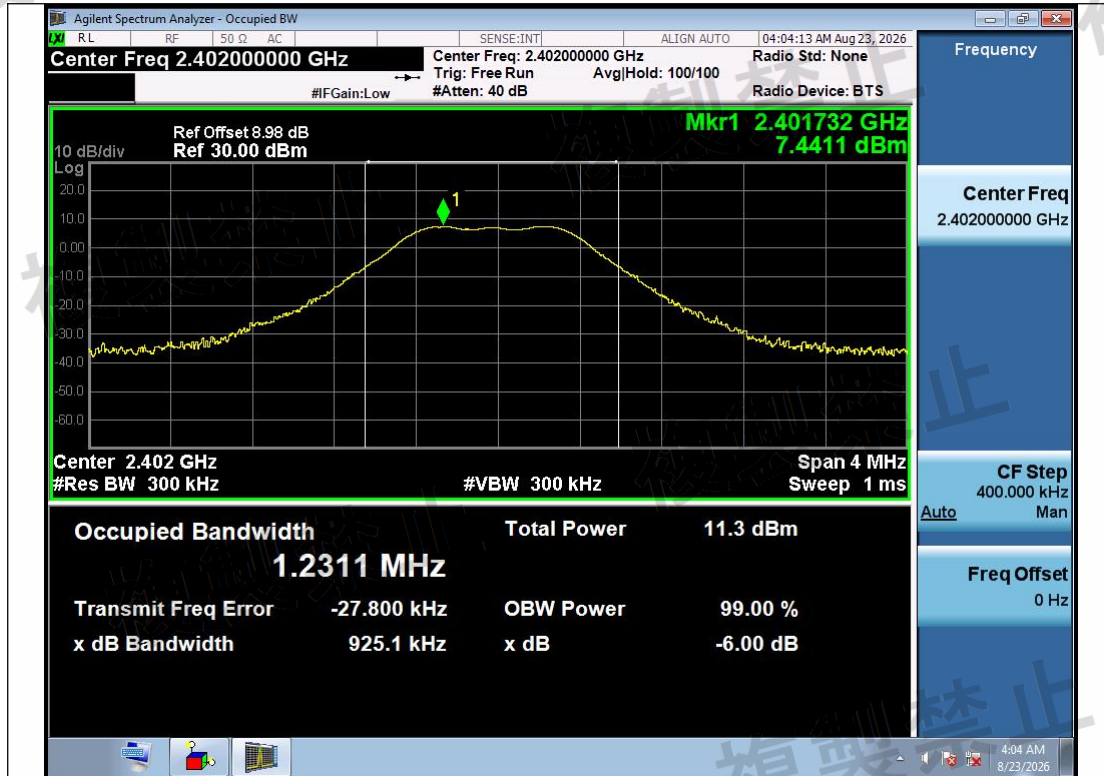
99% Emission bandwidth

TestCondition	TestMode	Antenna	Freq(MHz)	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	1.231	≤26	PASS
NTNV	BLE_1M	Ant1	2440	1.233	≤26	PASS
NTNV	BLE_1M	Ant1	2480	1.232	≤26	PASS
NTNV	BLE_2M	Ant1	2402	2.115	≤26	PASS
NTNV	BLE_2M	Ant1	2440	2.146	≤26	PASS
NTNV	BLE_2M	Ant1	2480	2.134	≤26	PASS

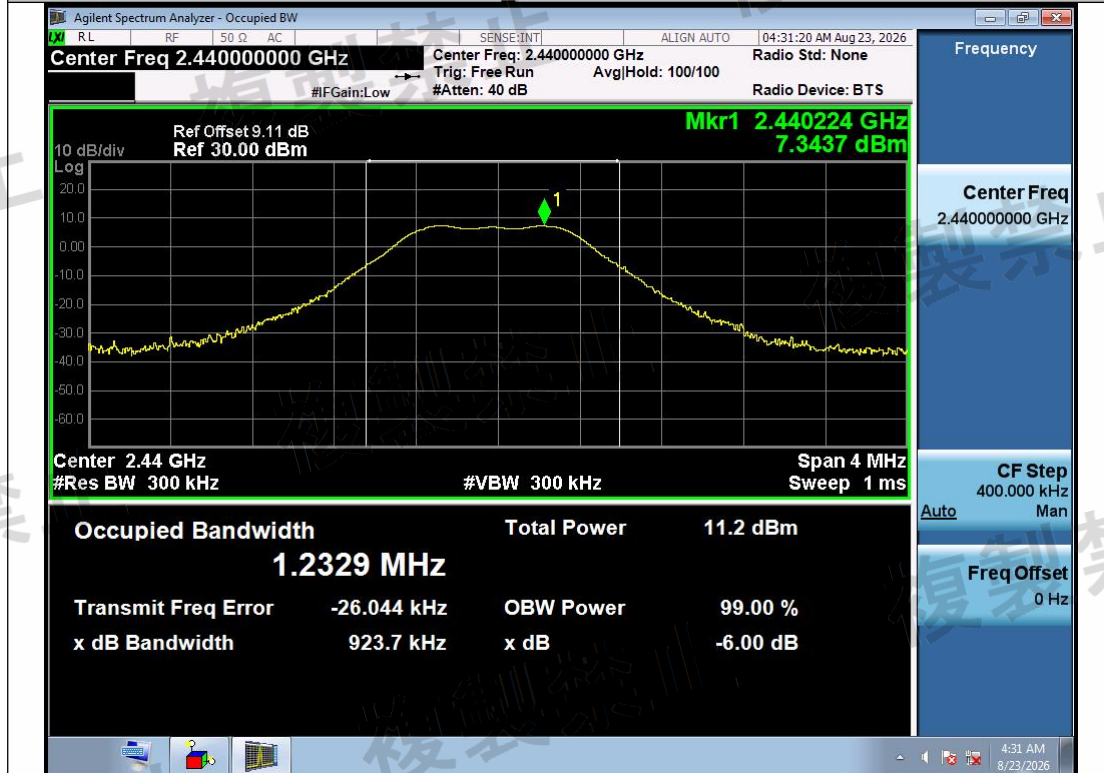
90% Emission bandwidth

TestCondition	TestMode	Antenna	Freq(MHz)	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	0.824	≥0.5	PASS
NTNV	BLE_1M	Ant1	2440	0.823	≥0.5	PASS
NTNV	BLE_1M	Ant1	2480	0.823	≥0.5	PASS
NTNV	BLE_2M	Ant1	2402	1.372	≥0.5	PASS
NTNV	BLE_2M	Ant1	2440	1.383	≥0.5	PASS
NTNV	BLE_2M	Ant1	2480	1.378	≥0.5	PASS

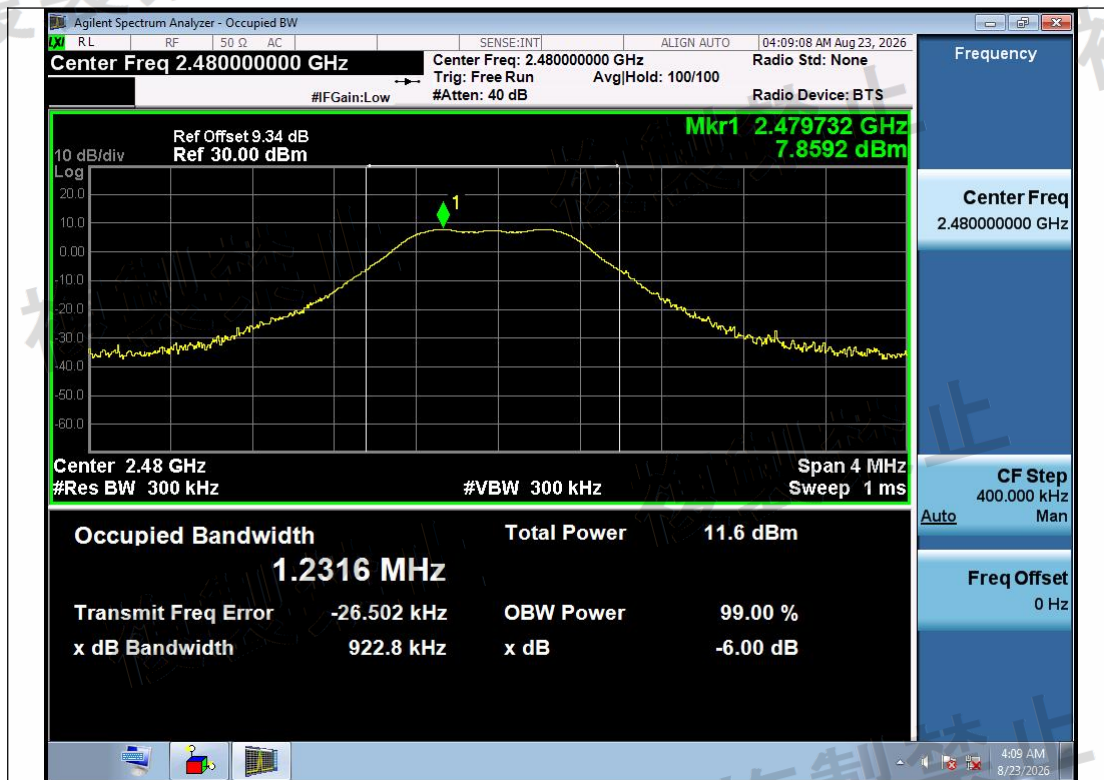
99% Emission bandwidth



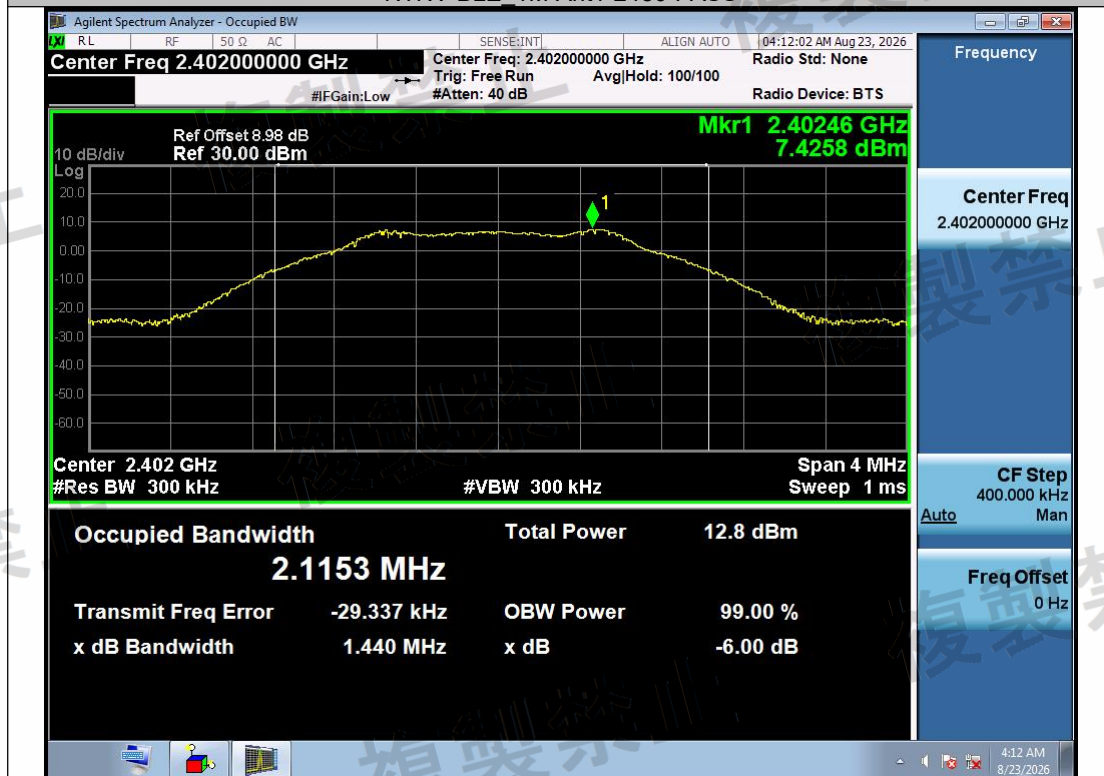
NTNV-BLE_1M-Ant1-2402-PASS



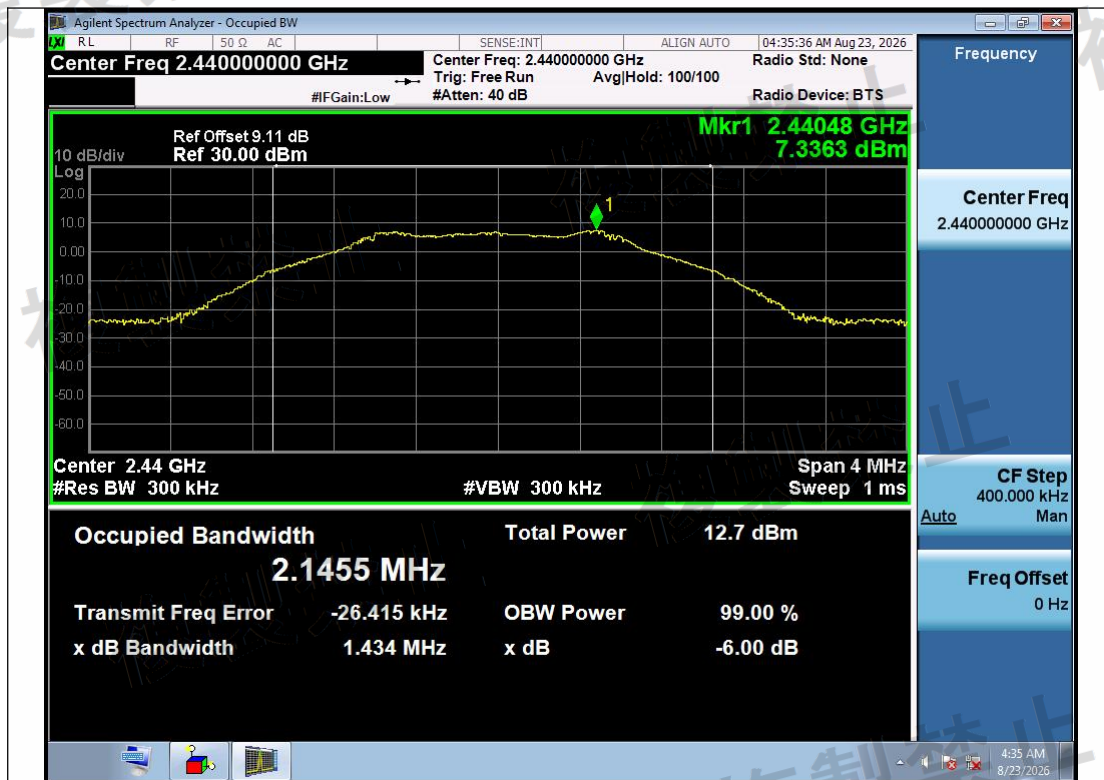
NTNV-BLE_1M-Ant1-2440-PASS



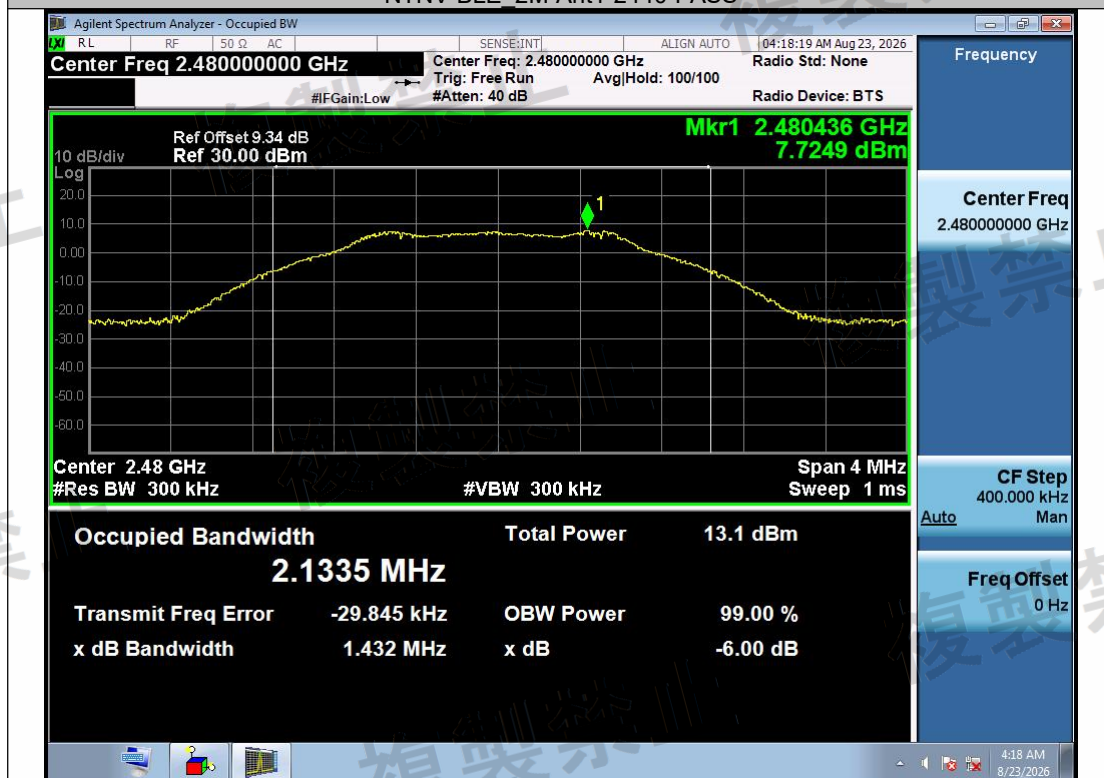
NTNV-BLE 1M-Ant1-2480-PASS



NTNV-BLE 2M-Ant1-2402-PASS

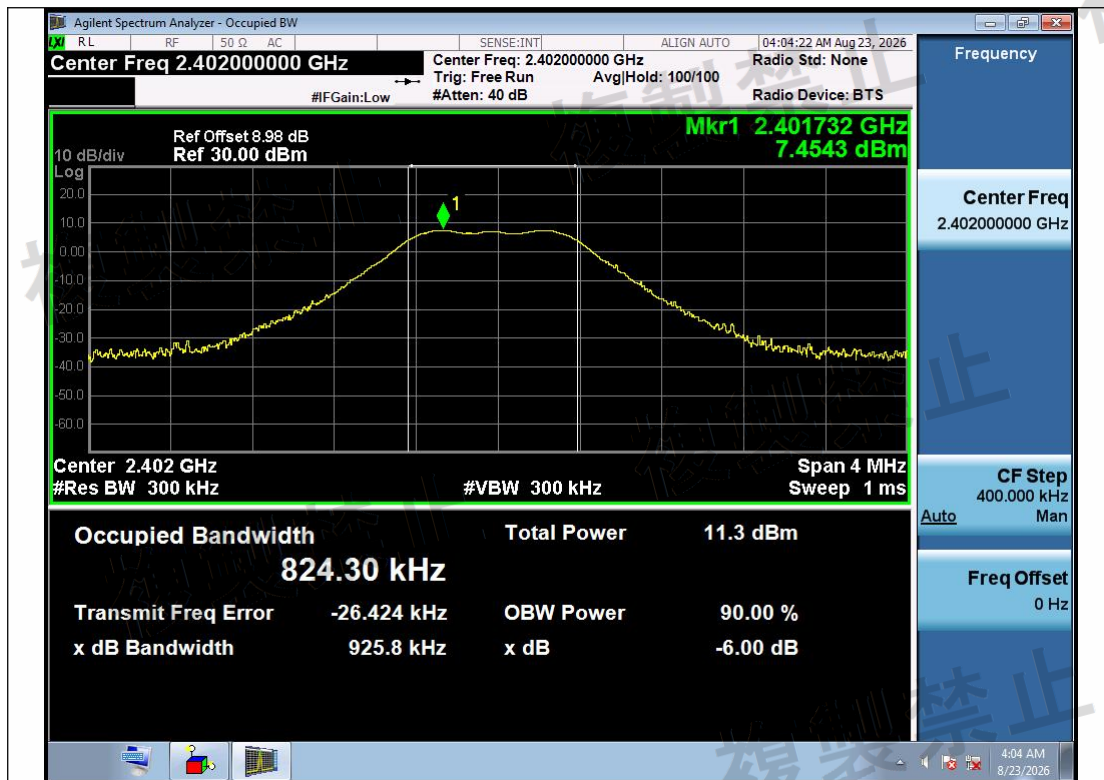


NTNV-BLE_2M-Ant1-2440-PASS

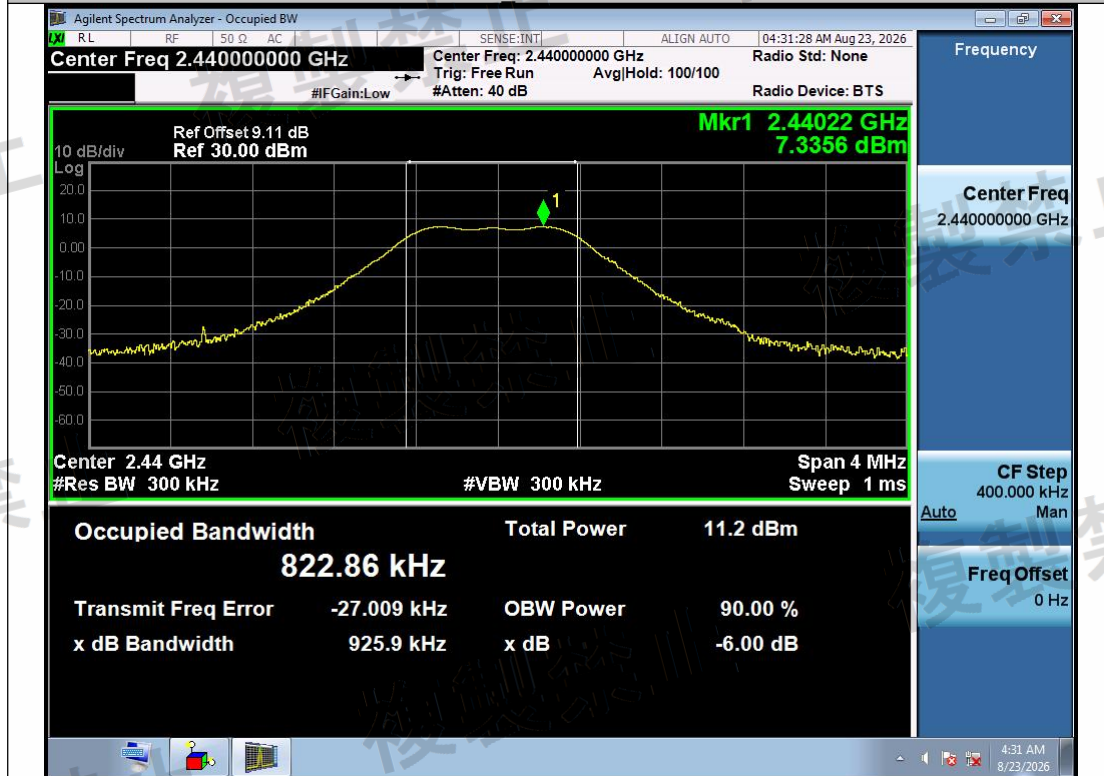


NTNV-BLE_2M-Ant1-2480-PASS

Spread Bandwidth



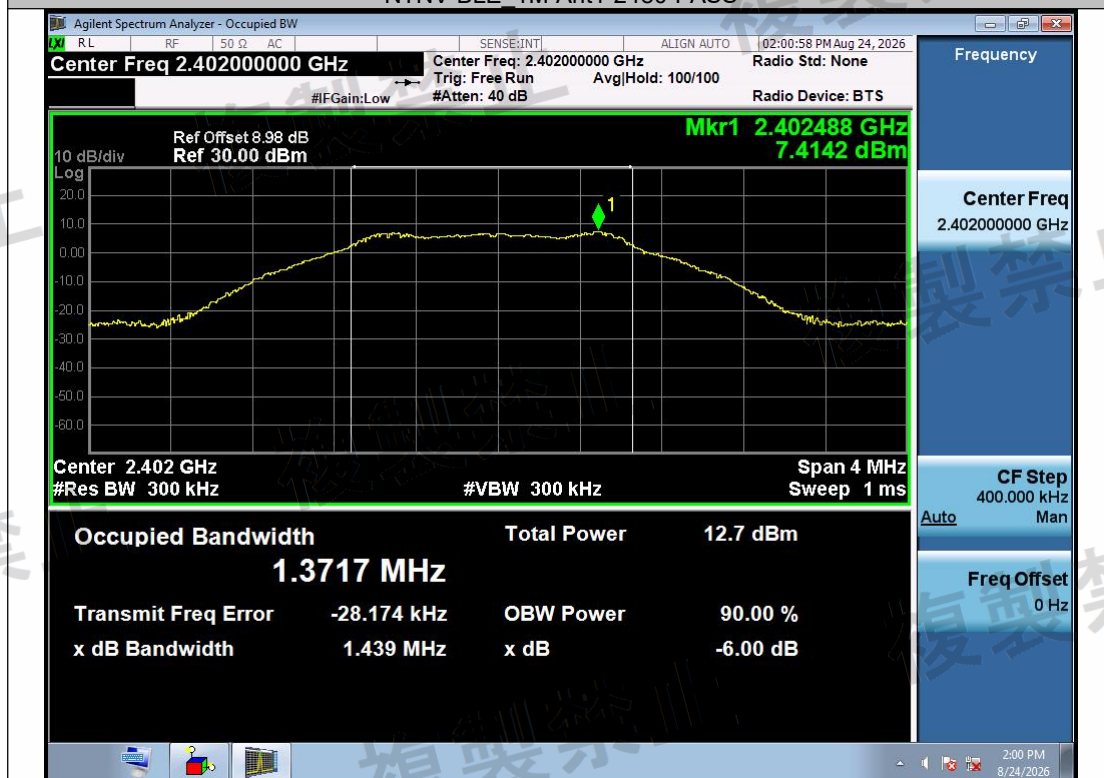
NTNV-BLE 1M-Ant1-2402-PASS



NTNV-BLE 1M-Ant1-2440-PASS



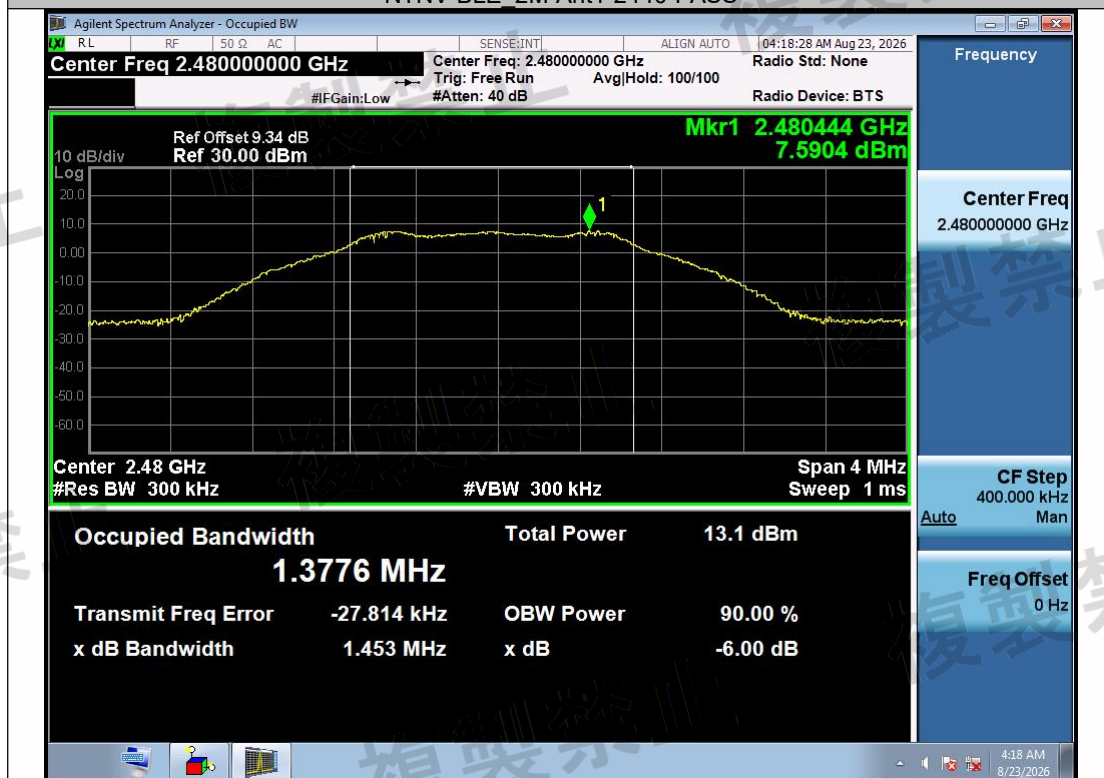
NTNV-BLE 1M-Ant1-2480-PASS



NTNV-BLE 2M-Ant1-2402-PASS



NTNV-BLE_2M-Ant1-2440-PASS



NTNV-BLE_2M-Ant1-2480-PASS

7.4 SPURIOUS EMISSIONS OF TX

7.4.1 Applicable Standard

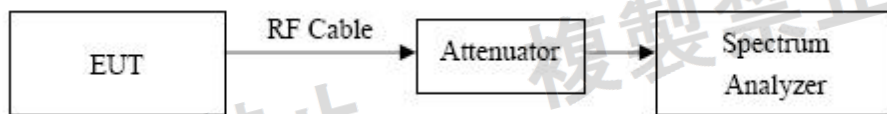
According to Item 19 of Article 2 Paragraph 1.

7.4.2 Conformance Limit

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

- | | |
|---|------------------------------------|
| 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 (-16dBm) or less |
| b. $2,387\text{MHz} > f$ and $2,496.5\text{MHz} < f$ | 2.5 μW (-26dBm) or less |

7.4.3 Test Setup Block Diagram



7.4.4 Test Procedure

(1) Spectrum analyzer for seeking the spurious emission is set as below

Sweeping Bandwidth	For seeking the spurious emission, from frequency lowest possible to the 5 times the carrier frequency
Resolution Bandwidth	1 MHz
Video Bandwidth	Approx. As same as Resolution bandwidth
Y-Axis Scale	10 dB/Div
Input Level	Value of maximum dynamic range
Sweep Time	Minimum time to assure the measurement accuracy (Note 1)
Sweep Mode	Single sweep
Phase-Detection Mode	Positive peak

(2) The settings of the spectrum analyzer while conducting spurious amplitude measurements are as follows:

- Central Frequency: Acquired spurious frequencies in (1)
- Sweep Frequency 0 Hz
- Resolution Bandwidth 1 MHz
- Video Bandwidth same as Resolution Bandwidth
- Note: take into account that the requirement limits the power in a bandwidth of 1 MHz.
- If the measurement is carried out with a bandwidth of 100 kHz (for frequencies below 1 GHz), the limit shall be reduced with 10 dB.
- For example 2.5 μW in 1 MHz = -26 dBm limit, becomes -36 dBm for 100 kHz bandwidth.
- Y-Axis Scale 10 dB/Div
- Input Level: choose input level within the linear range of the SA mixer (so that no additional spurious are generated by the mixer)
- Sweep Time: Minimum amount of time to ensure measurement accuracy. However, in the case of burst waves, time exceeds duration of 1 burst.
- Data Points Over 400 points
- Sweep Mode: Single sweep

- Detection Mode Sample (BIN-Width $\ll$ RBW, so that all spurious emissions are captured) [BIN-width is the frequency difference between 2 adjacent sample points on the display]

(3) Set EUT as occupied bandwidth is measure. That is, Set the EUT on the test frequency and the continuous TX mode or continuous (constant period, constant burst length) burst TX mode. In case of spreading code used, set on the test spreading code, then the modulation is performed with standard coding test signal.

The spectrum analyzer is set as 2 (1). Seek the spurious emission If the amplitude of the sought spurious emission satisfies the specified value (in case of 2 (2) Note 1, the specified value is -3dB), the measurement

of 2 (2) is not performed, then the estimated value is employed as the measured value.

In case the sought spurious emission amplitude exceeds the specified value, seek the spurious frequency by narrowing the sweeping band sequentially as 100 MHz, 10 MHz, 1 MHz for the purpose of higher accuracy of the spectrum analyzer. Set the spectrum analyzer as 2 (2). Estimate the mean value of the spurious amplitude, then employ it as the measured value (In case DSSS as well as OFDM with burst wave, the mean inside of the burst).

Sweep Bandwidth: 30MHz~2387MHz, 2483.5MHz~2496.5MHz, 2496.5MHz~12500MHz

Respectively mark the maximum results in the above sweep bandwidth.

7.4.5 Environmental Conditions

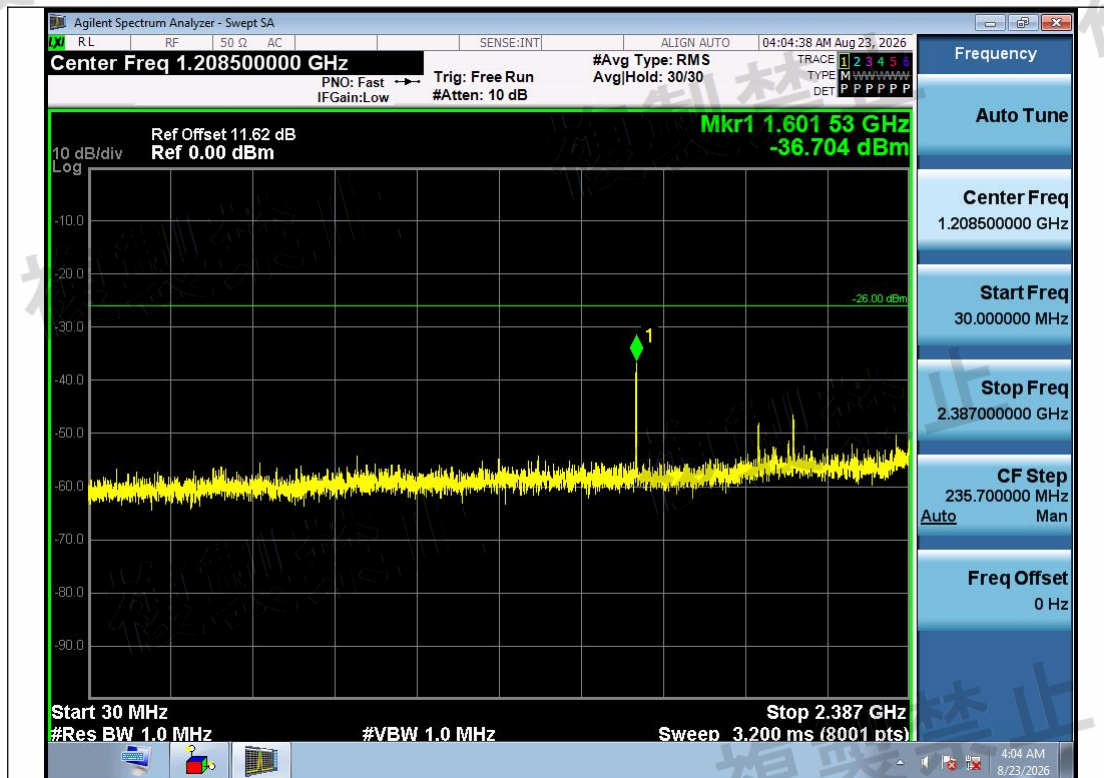
Temperature:	23.7℃
Relative Humidity:	50%
ATM Pressure:	1011 mbar

7.4.6 Test Results

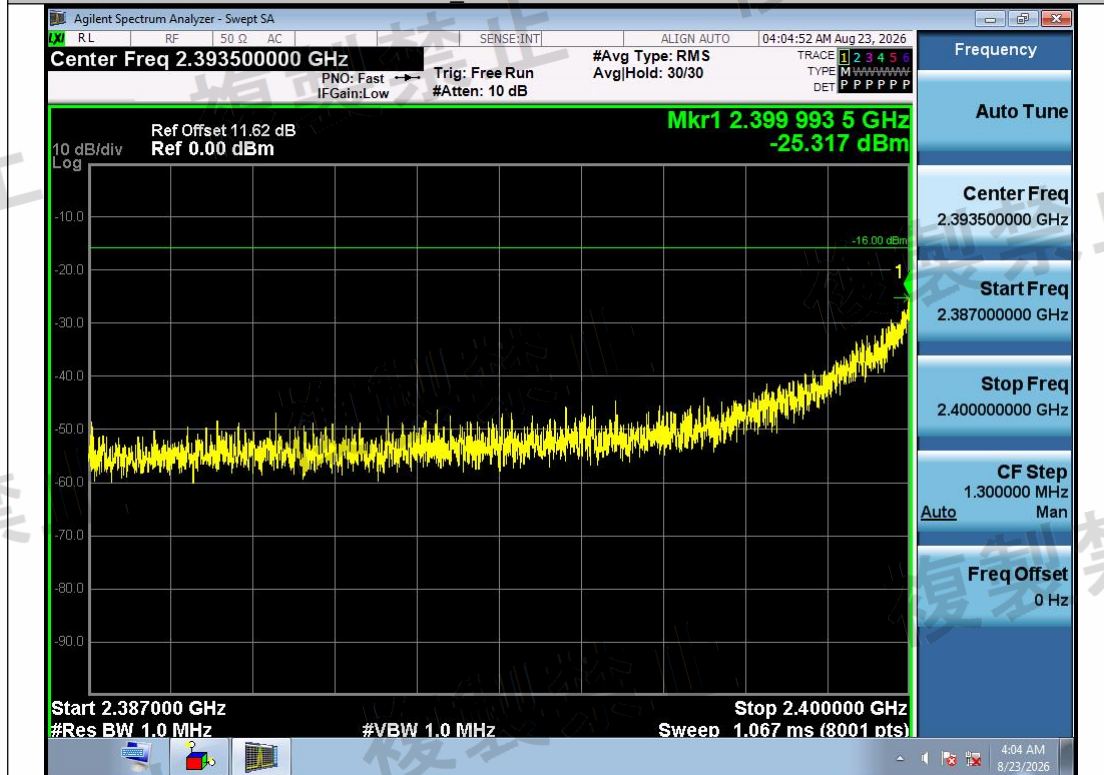
TestCondition	TestMode	Antenna	Freq(MHz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	BLE_1M	Ant1	2402	30~2387	1601.53	-36.70	≤-26	0.39264	≤2.5	PASS
NTNV	BLE_1M	Ant1	2402	2387~2400	2399.99	-25.32	≤-16	5.39511	≤25	PASS
NTNV	BLE_1M	Ant1	2402	2483.5~2496.5	2495.49	-53.76	≤-16	0.00773	≤25	PASS
NTNV	BLE_1M	Ant1	2402	2496.5~13000	7207.03	-32.21	≤-26	1.10408	≤2.5	PASS
NTNV	BLE_1M	Ant1	2440	30~2387	1626.87	-36.10	≤-26	0.45082	≤2.5	PASS
NTNV	BLE_1M	Ant1	2440	2387~2400	2399.94	-51.99	≤-16	0.01161	≤25	PASS
NTNV	BLE_1M	Ant1	2440	2483.5~2496.5	2486.86	-52.43	≤-16	0.01050	≤25	PASS
NTNV	BLE_1M	Ant1	2440	2496.5~13000	7319.42	-30.80	≤-26	1.52757	≤2.5	See table below
NTNV	BLE_1M	Ant1	2480	30~2387	1653.38	-35.93	≤-26	0.46881	≤2.5	PASS
NTNV	BLE_1M	Ant1	2480	2387~2400	2399.42	-54.03	≤-16	0.00726	≤25	PASS
NTNV	BLE_1M	Ant1	2480	2483.5~2496.5	2483.54	-40.50	≤-16	0.16368	≤25	PASS
NTNV	BLE_1M	Ant1	2480	2496.5~13000	7440.74	-31.68	≤-26	1.24738	≤2.5	PASS
NTNV	BLE_2M	Ant1	2402	30~2387	1601.24	-36.91	≤-26	0.37411	≤2.5	PASS
NTNV	BLE_2M	Ant1	2402	2387~2400	2399.99	-13.02	≤-16	91.62205	≤25	See table below
NTNV	BLE_2M	Ant1	2402	2483.5~2496.5	2484.74	-54.56	≤-16	0.00643	≤25	PASS
NTNV	BLE_2M	Ant1	2402	2496.5~13000	7204.93	-32.06	≤-26	1.14288	≤2.5	PASS
NTNV	BLE_2M	Ant1	2440	30~2387	1626.57	-36.08	≤-26	0.45290	≤2.5	PASS
NTNV	BLE_2M	Ant1	2440	2387~2400	2391.68	-52.77	≤-16	0.00971	≤25	PASS
NTNV	BLE_2M	Ant1	2440	2483.5~2496.5	2486.86	-51.95	≤-16	0.01172	≤25	PASS
NTNV	BLE_2M	Ant1	2440	2496.5~13000	7318.9	-31.25	≤-26	1.37721	≤2.5	See table below
NTNV	BLE_2M	Ant1	2480	30~2387	1653.38	-35.80	≤-26	0.48306	≤2.5	PASS
NTNV	BLE_2M	Ant1	2480	2387~2400	2399.46	-54.71	≤-16	0.00621	≤25	PASS
NTNV	BLE_2M	Ant1	2480	2483.5~2496.5	2483.53	-38.79	≤-16	0.24266	≤25	PASS
NTNV	BLE_2M	Ant1	2480	2496.5~13000	7441.27	-31.47	≤-26	1.30918	≤2.5	See table below

Step2

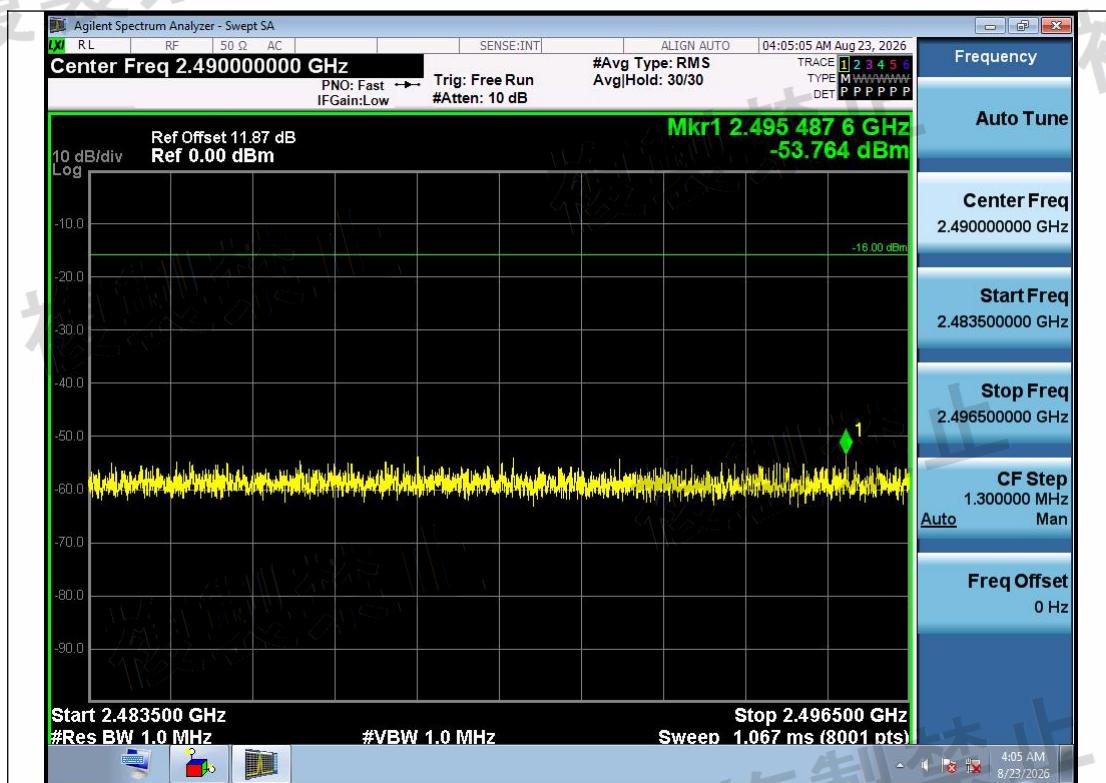
TestCondition	TestMode	Antenna	Freq(MHz)	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	BLE_1M	Ant1	2440	7319.42	-38.52	≤-26	0.14060	≤2.5	PASS
NTNV	BLE_2M	Ant1	2402	2399.99	-16.43	≤-16	22.75097	≤25	PASS
NTNV	BLE_2M	Ant1	2440	7318.90	-40.03	≤-26	0.09931	≤2.5	PASS
NTNV	BLE_2M	Ant1	2480	7441.27	-40.55	≤-26	0.08810	≤2.5	PASS



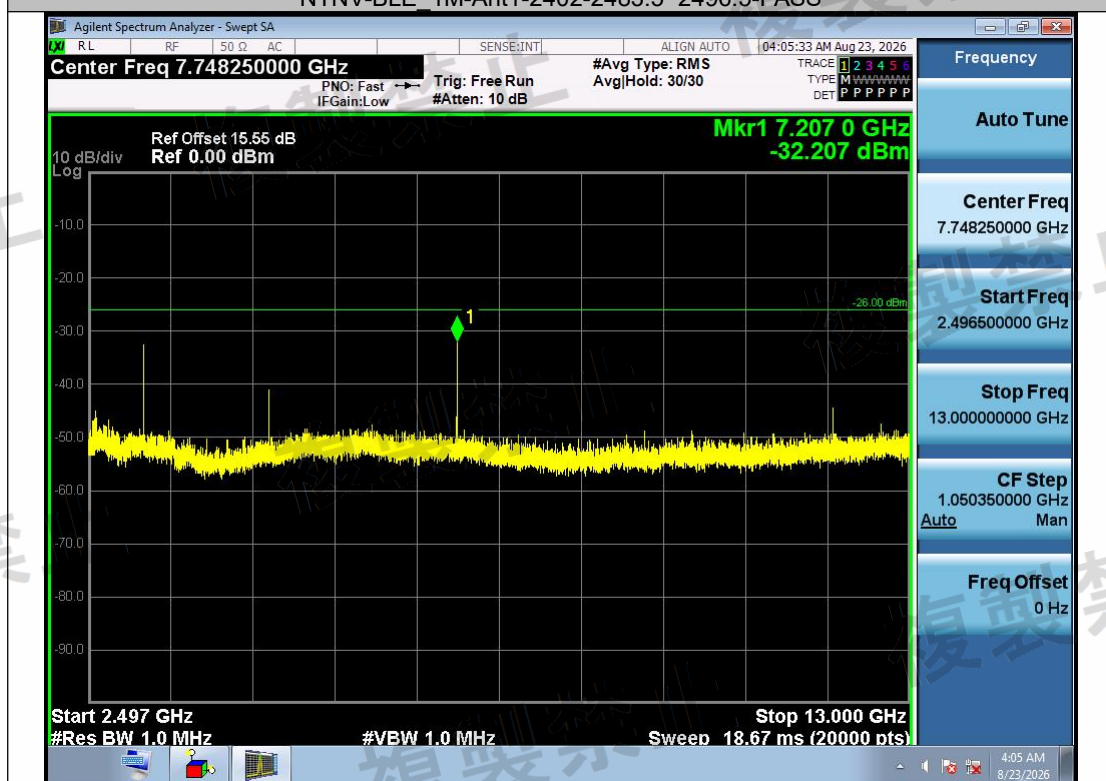
NTNV-BLE 1M-Ant1-2402-30~2387-PASS



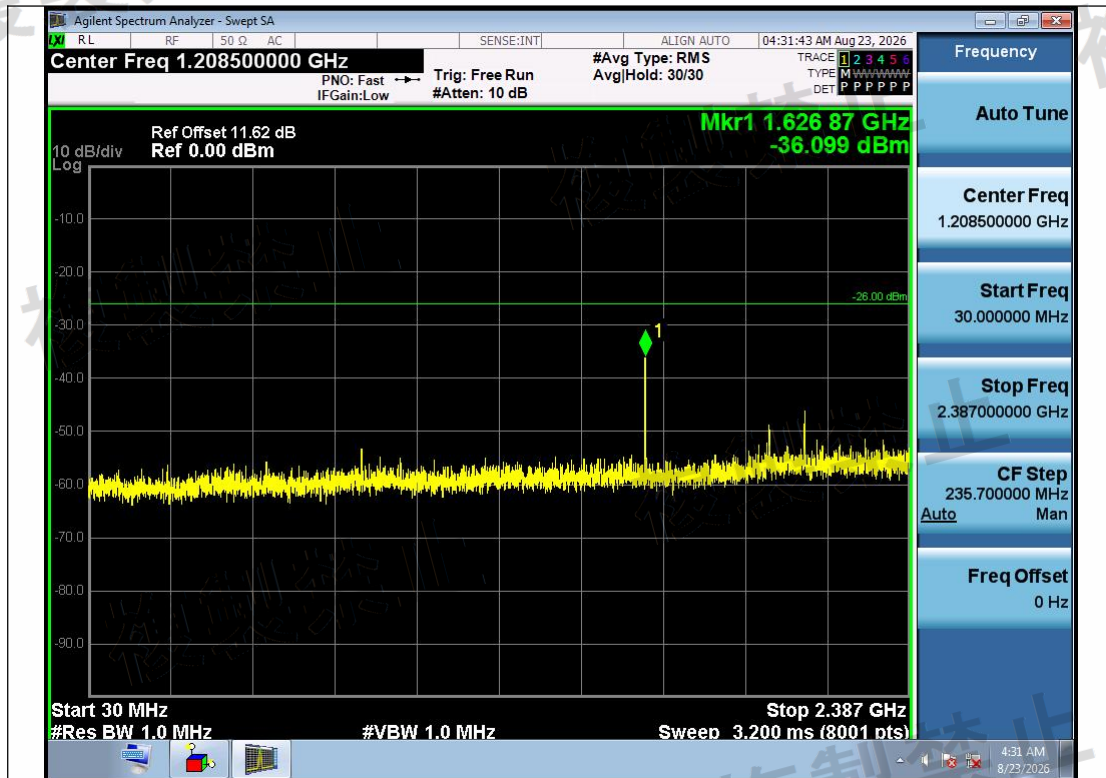
NTNV-BLE 1M-Ant1-2402-2387~2400-PASS



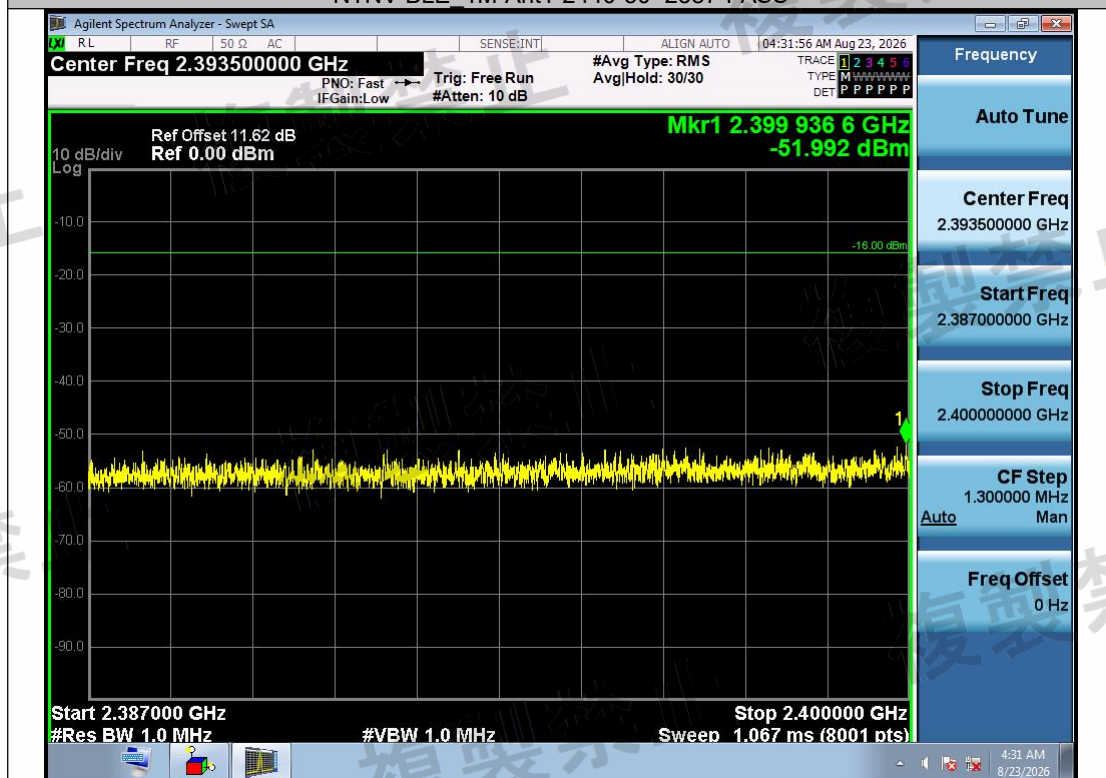
NTNV-BLE_1M-Ant1-2402-2483.5~2496.5-PASS



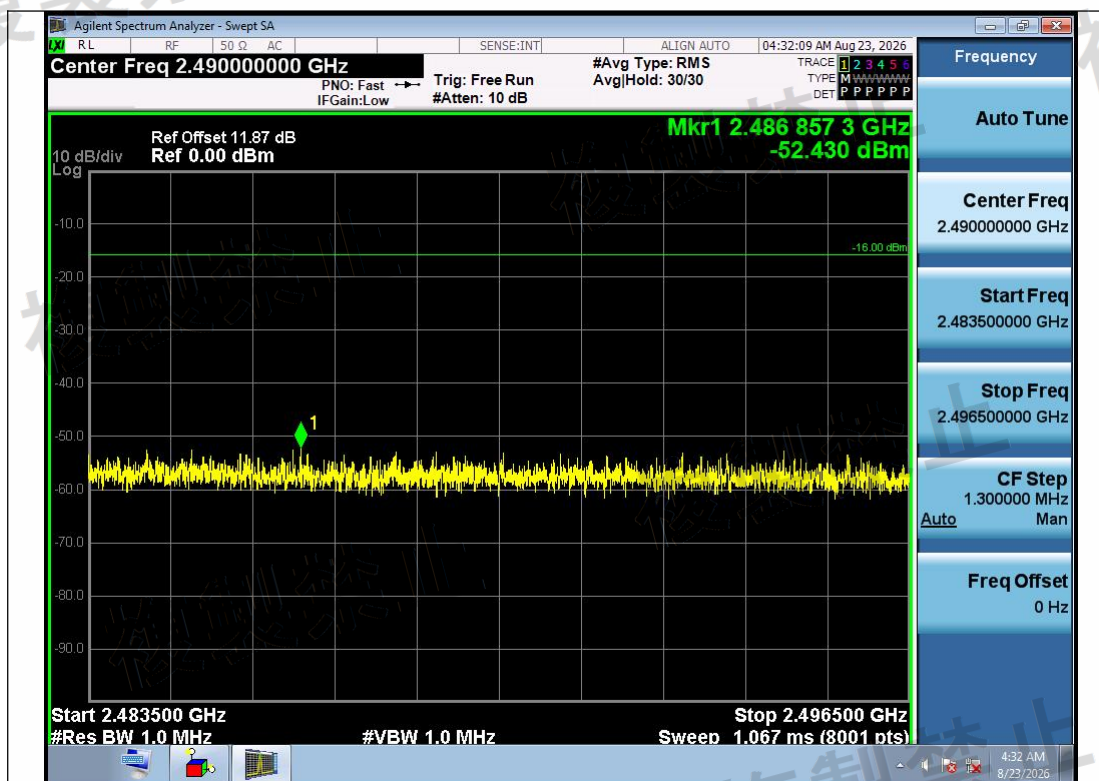
NTNV-BLE_1M-Ant1-2402-2496.5~13000-PASS



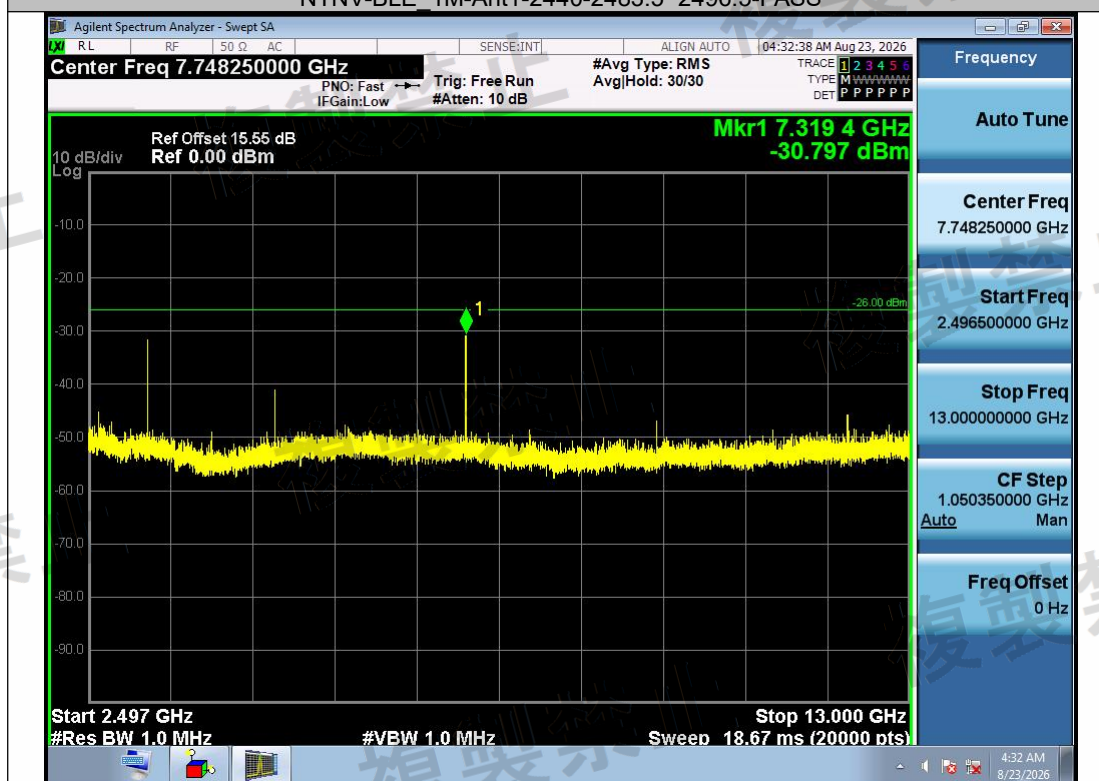
NTNV-BLE_1M-Ant1-2440-30~2387-PASS



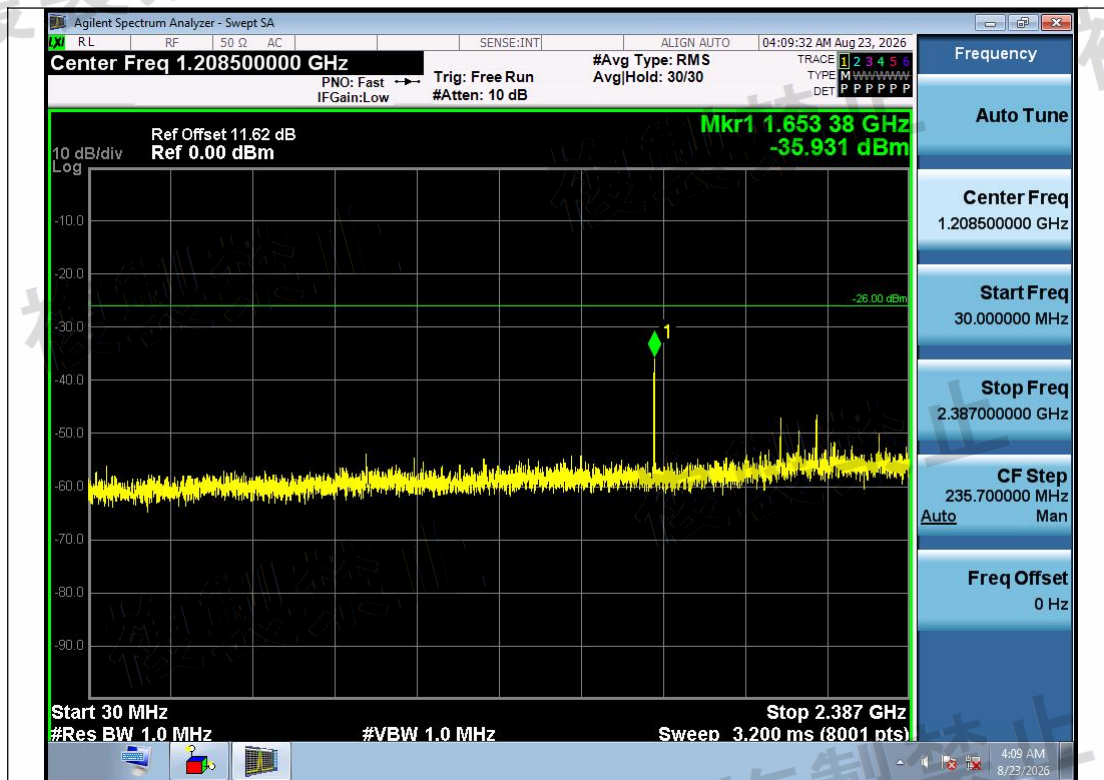
NTNV-BLE_1M-Ant1-2440-2387~2400-PASS



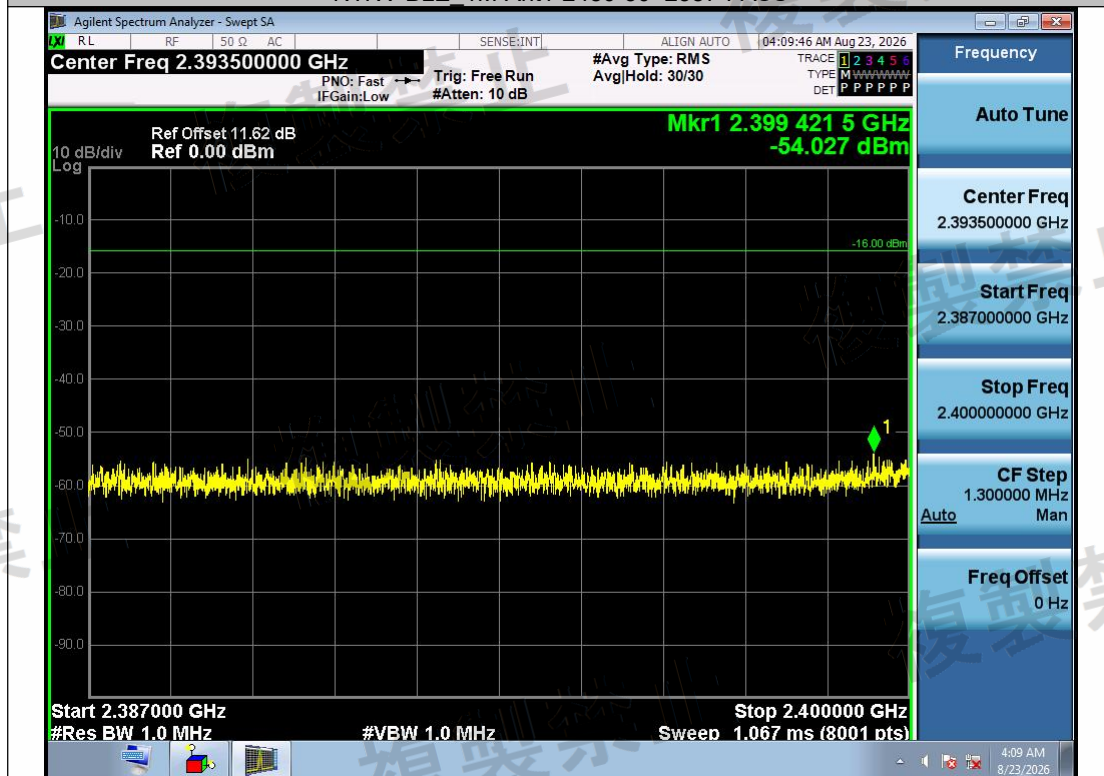
NTNV-BLE 1M-Ant1-2440-2483.5~2496.5-PASS



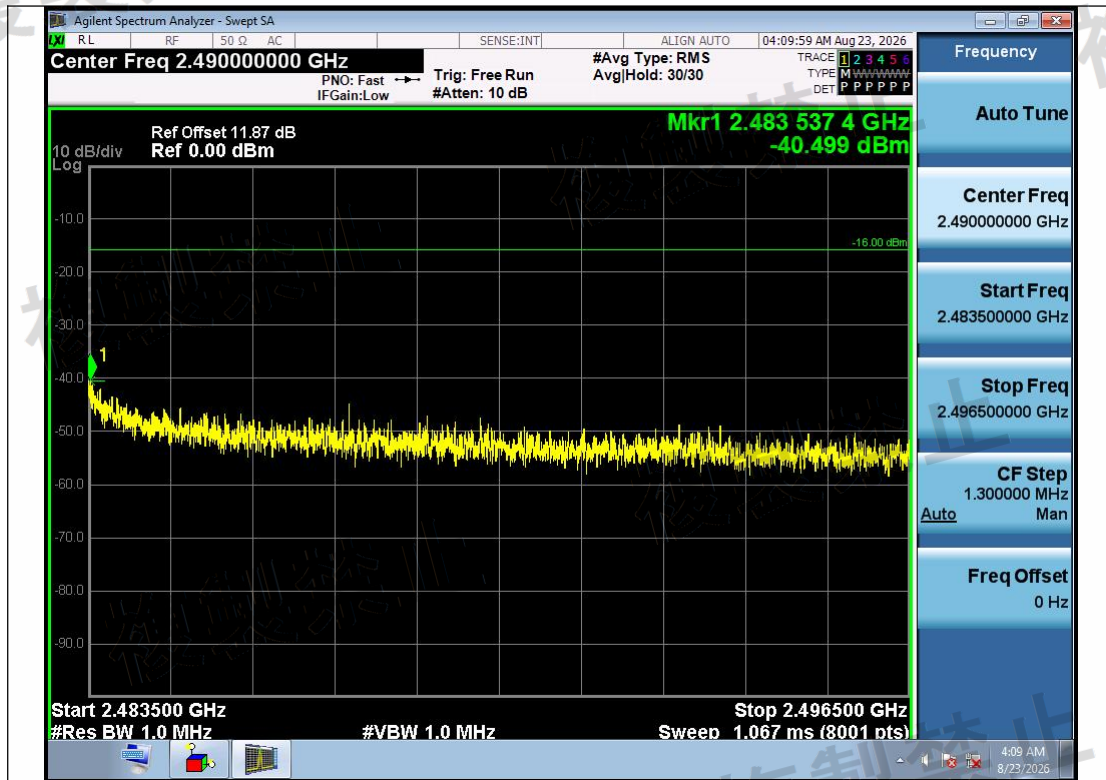
NTNV-BLE 1M-Ant1-2440-2496.5~13000-See table below



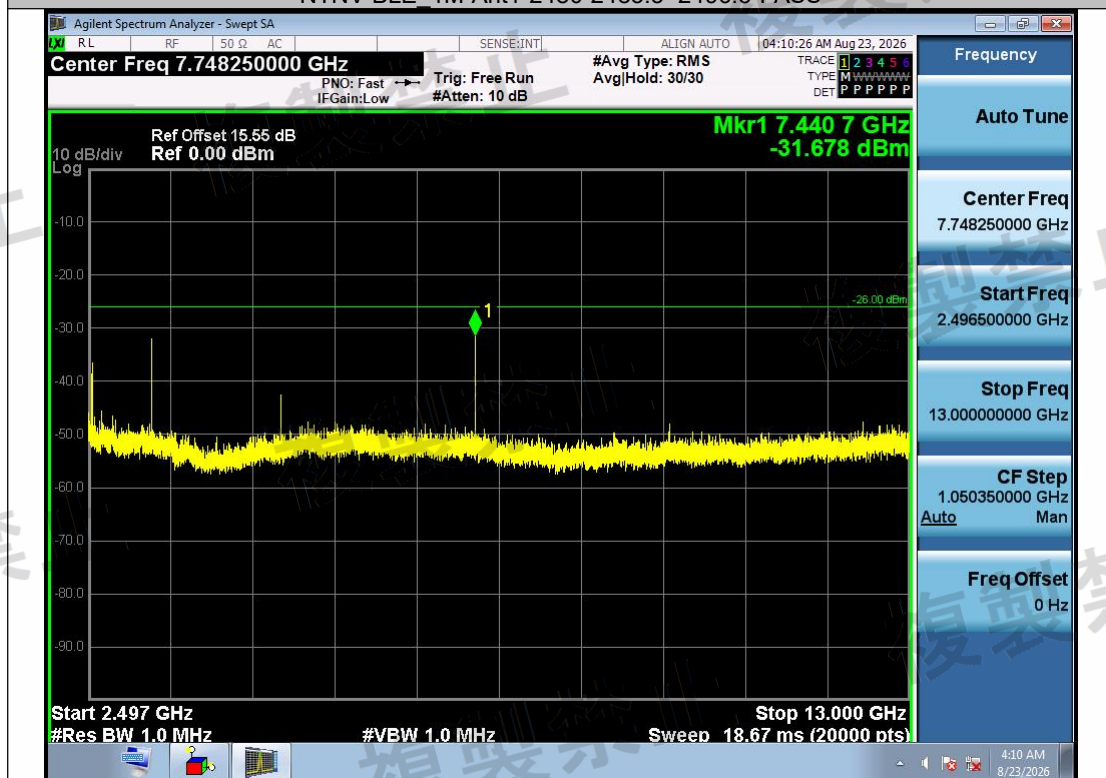
NTNV-BLE_1M-Ant1-2480-30~2387-PASS



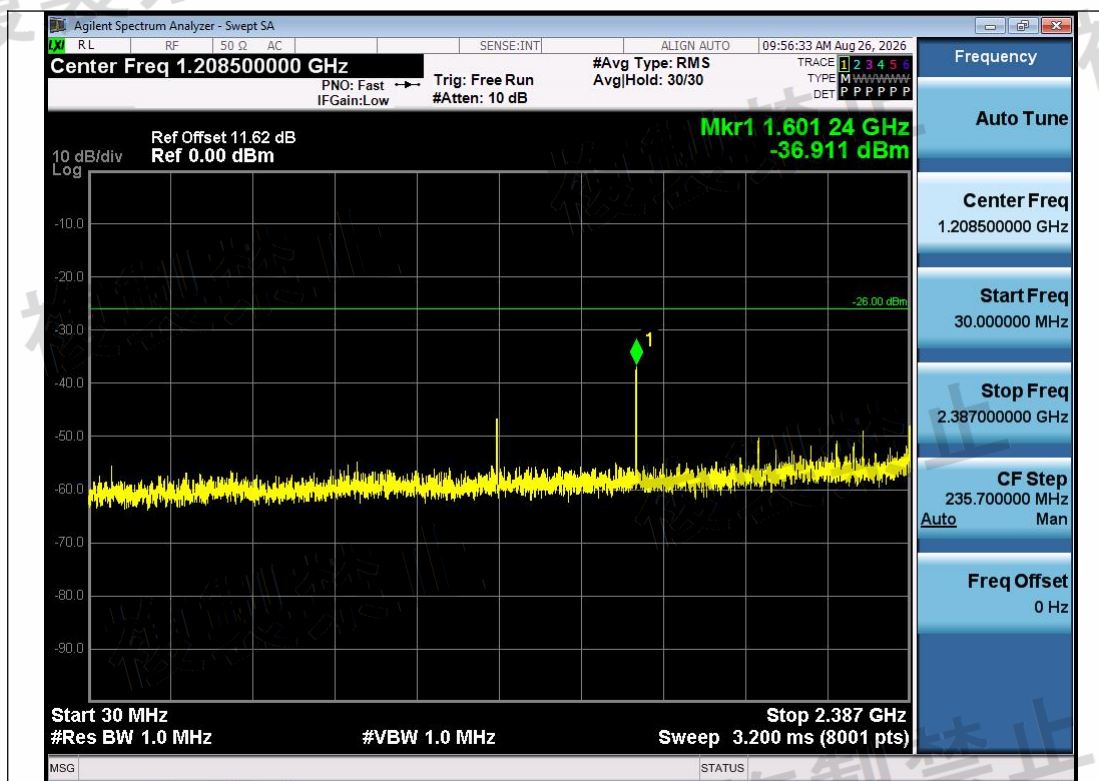
NTNV-BLE_1M-Ant1-2480-2387~2400-PASS



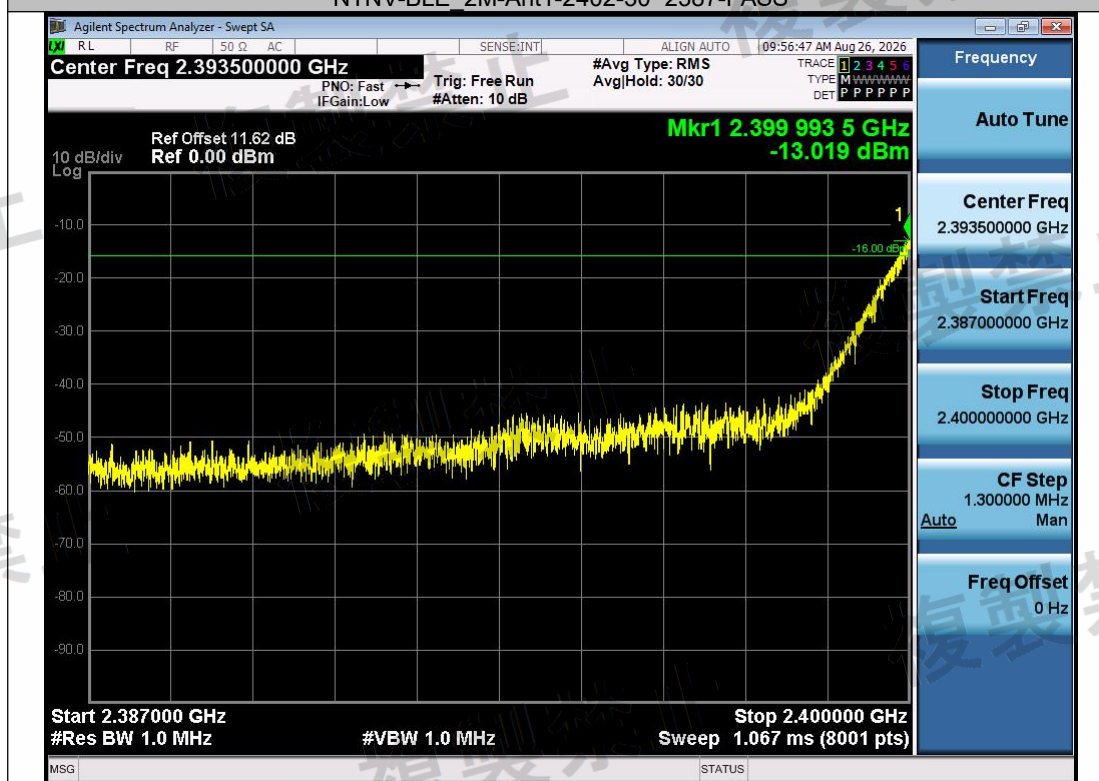
NTNV-BLE_1M-Ant1-2480-2483.5~2496.5-PASS



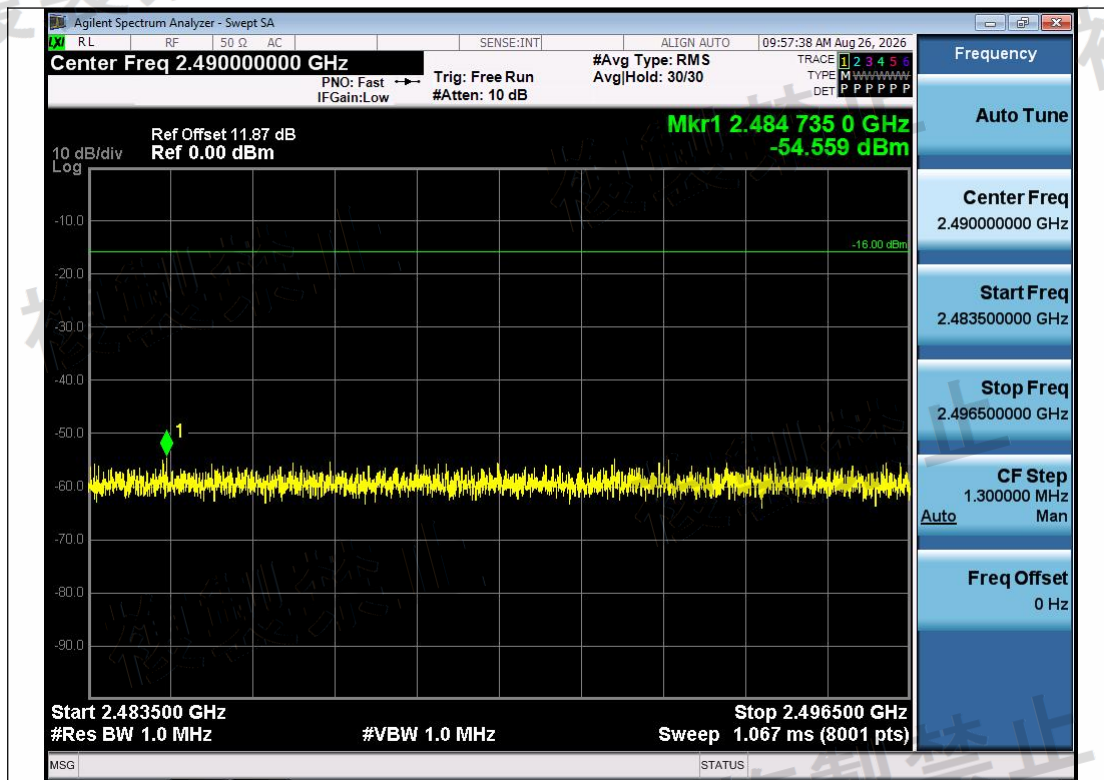
NTNV-BLE_1M-Ant1-2480-2496.5~13000-PASS



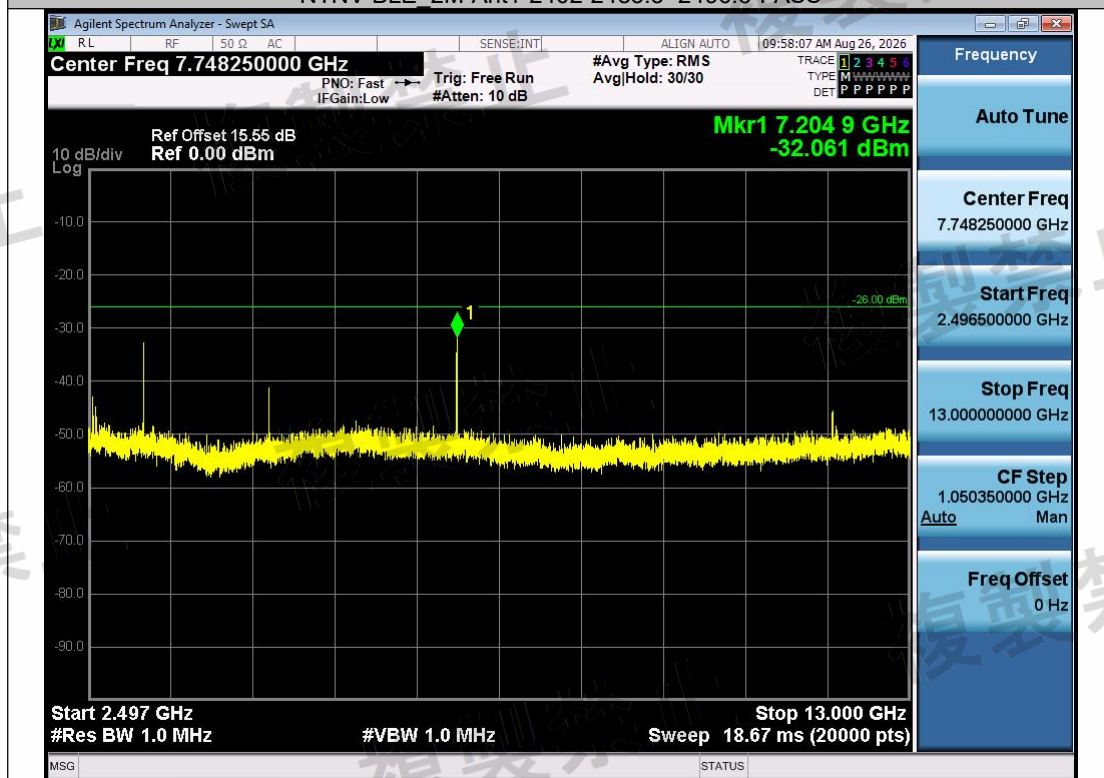
NTNV-BLE 2M-Ant1-2402-30~2387-PASS



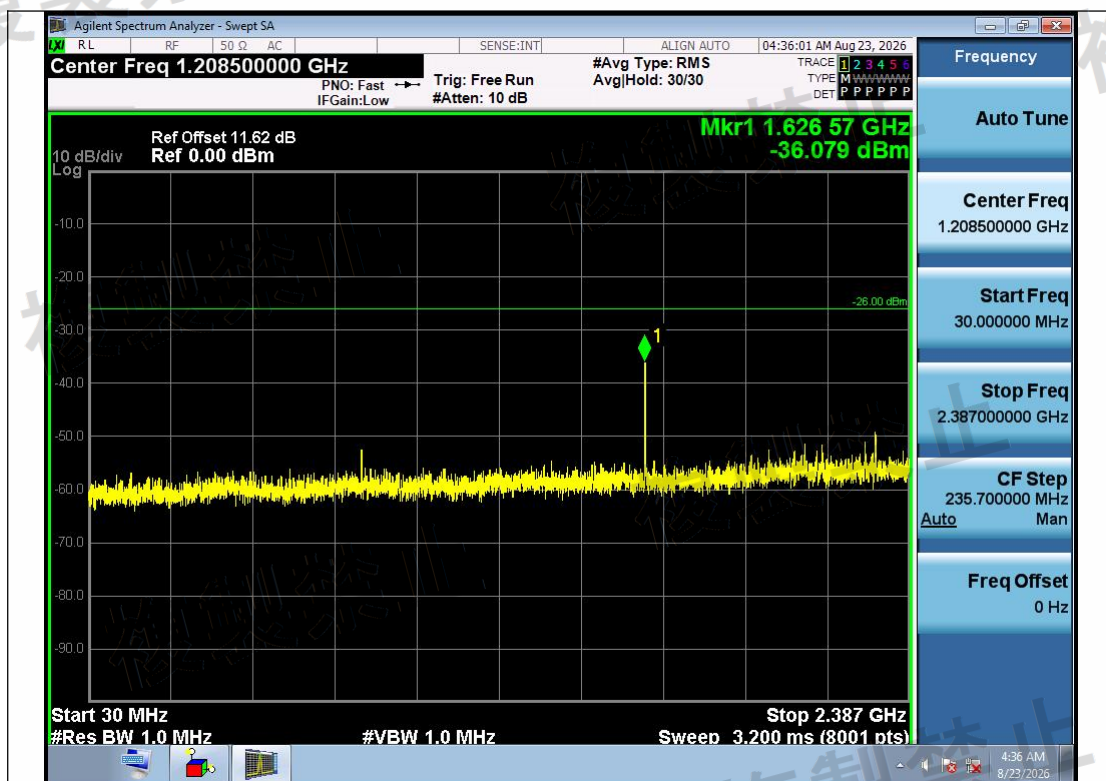
NTNV-BLE 2M-Ant1-2402-2387~2400-See table below



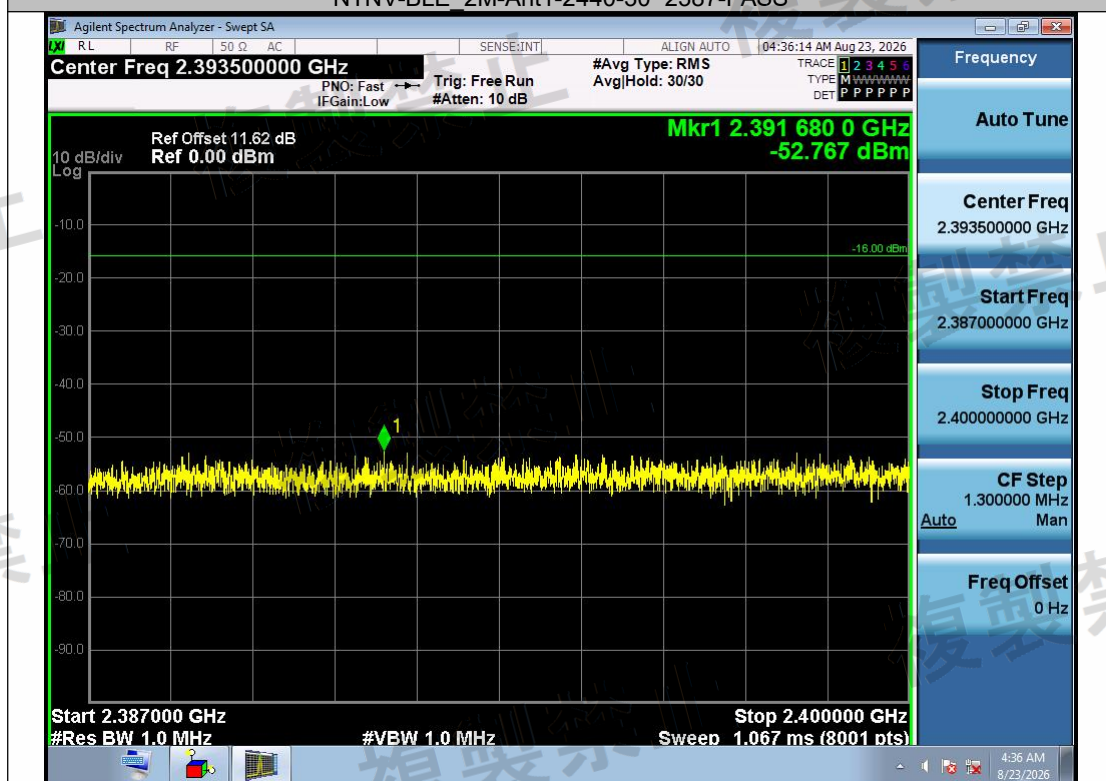
NTNV-BLE 2M-Ant1-2402-2483.5~2496.5-PASS



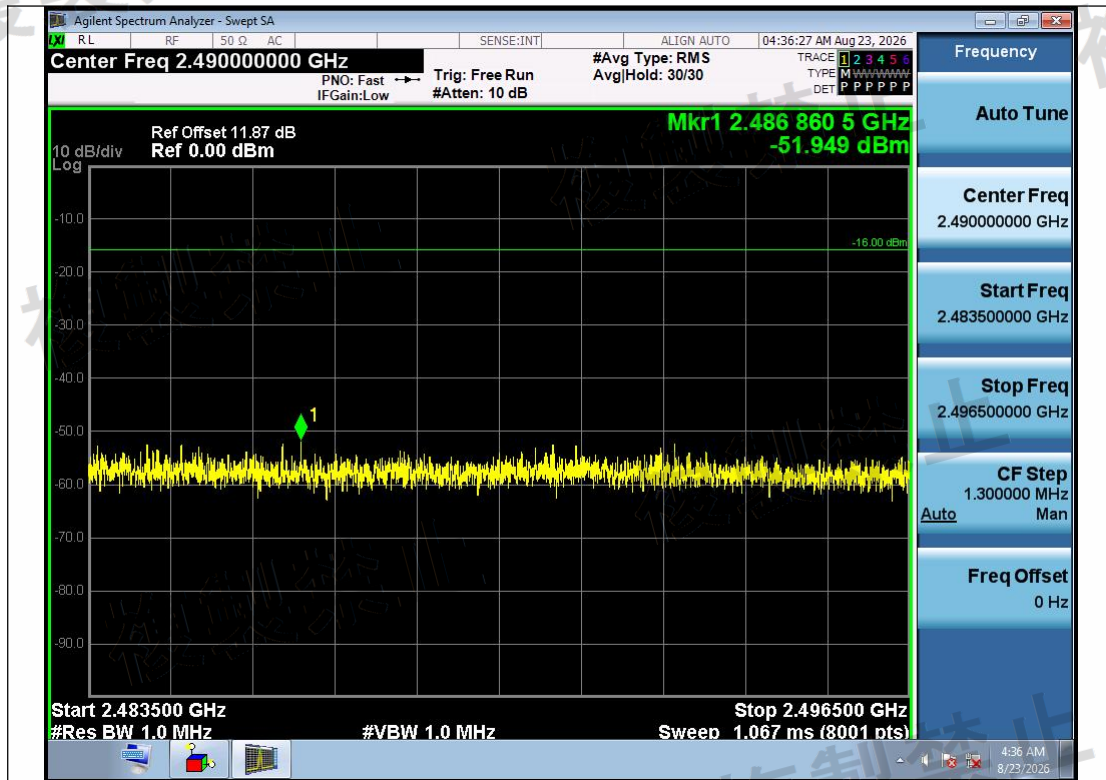
NTNV-BLE 2M-Ant1-2402-2496.5~13000-PASS



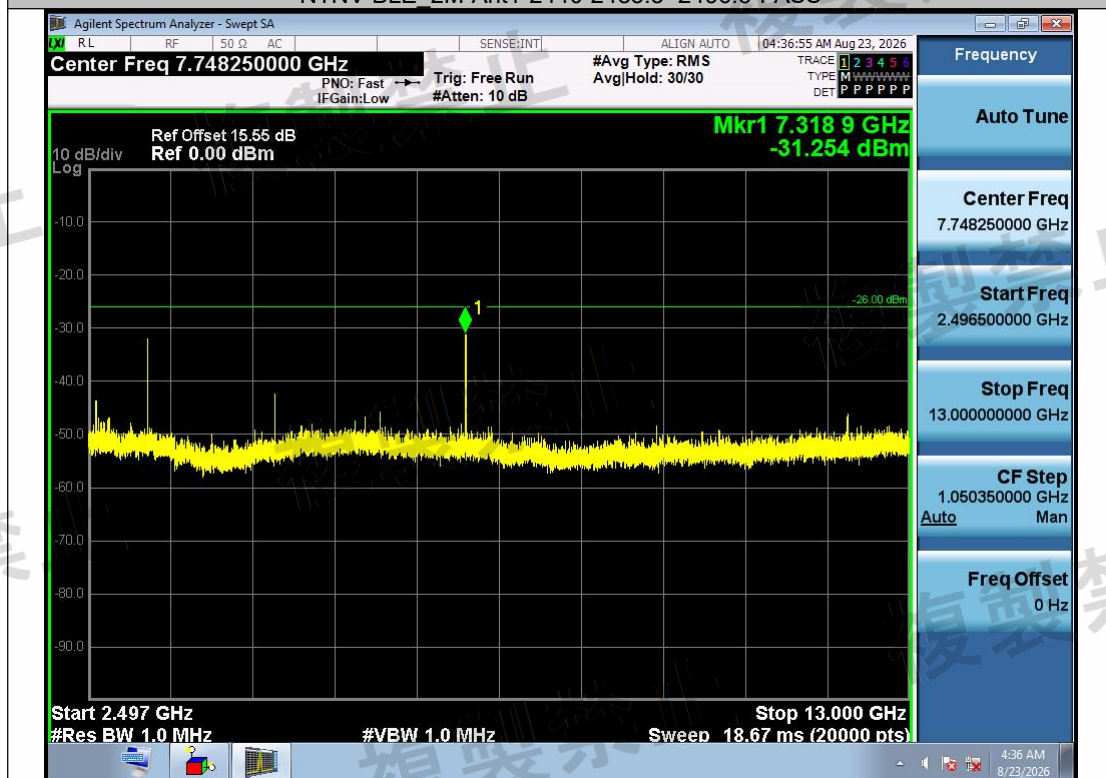
NTNV-BLE 2M-Ant1-2440-30~2387-PASS



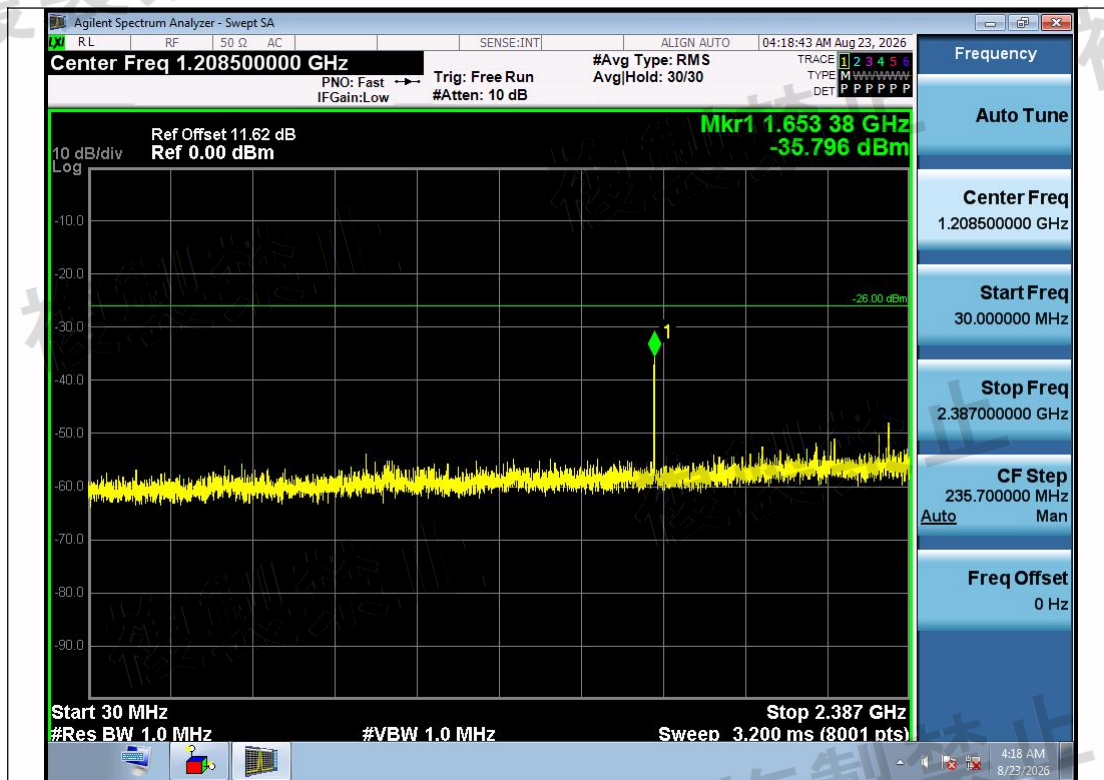
NTNV-BLE 2M-Ant1-2440-2387~2400-PASS



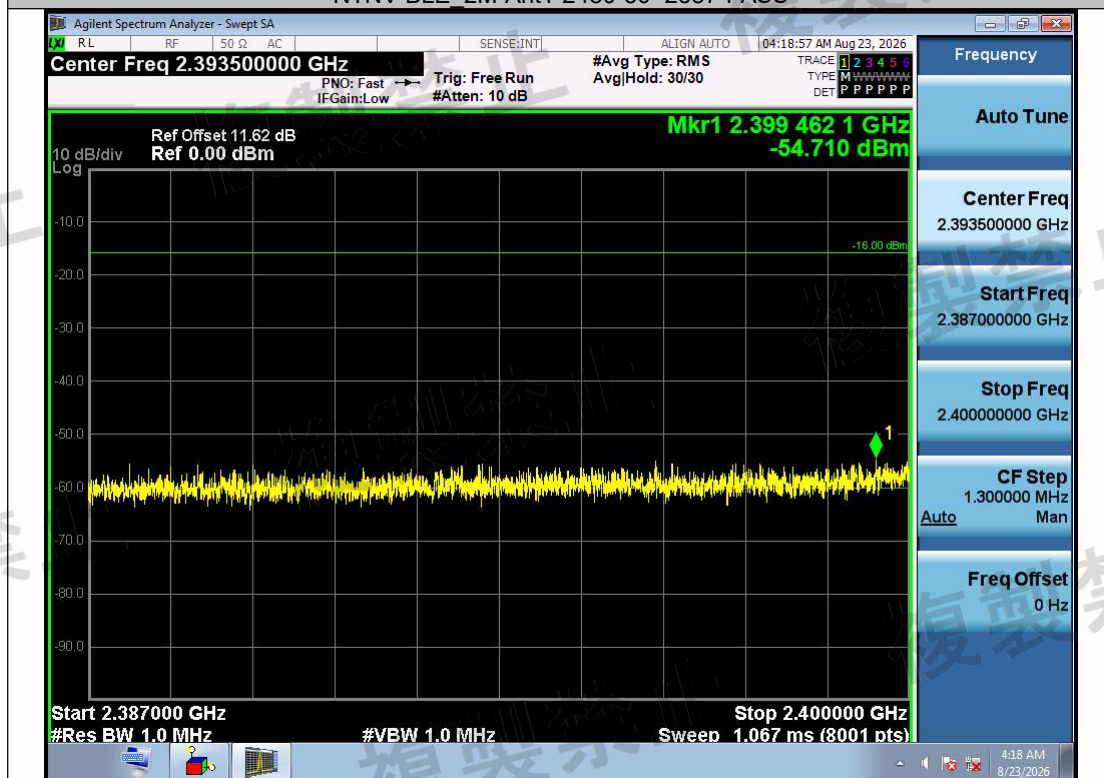
NTNV-BLE_2M-Ant1-2440-2483.5~2496.5-PASS



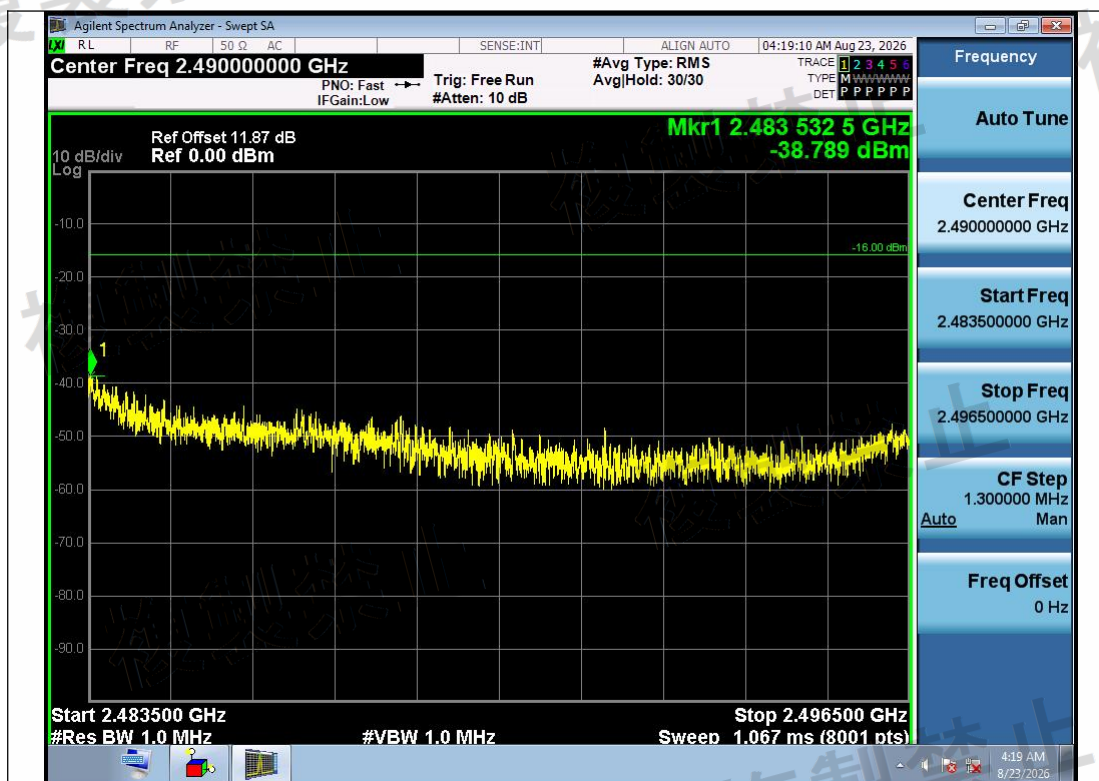
NTNV-BLE_2M-Ant1-2440-2496.5~13000-See table below



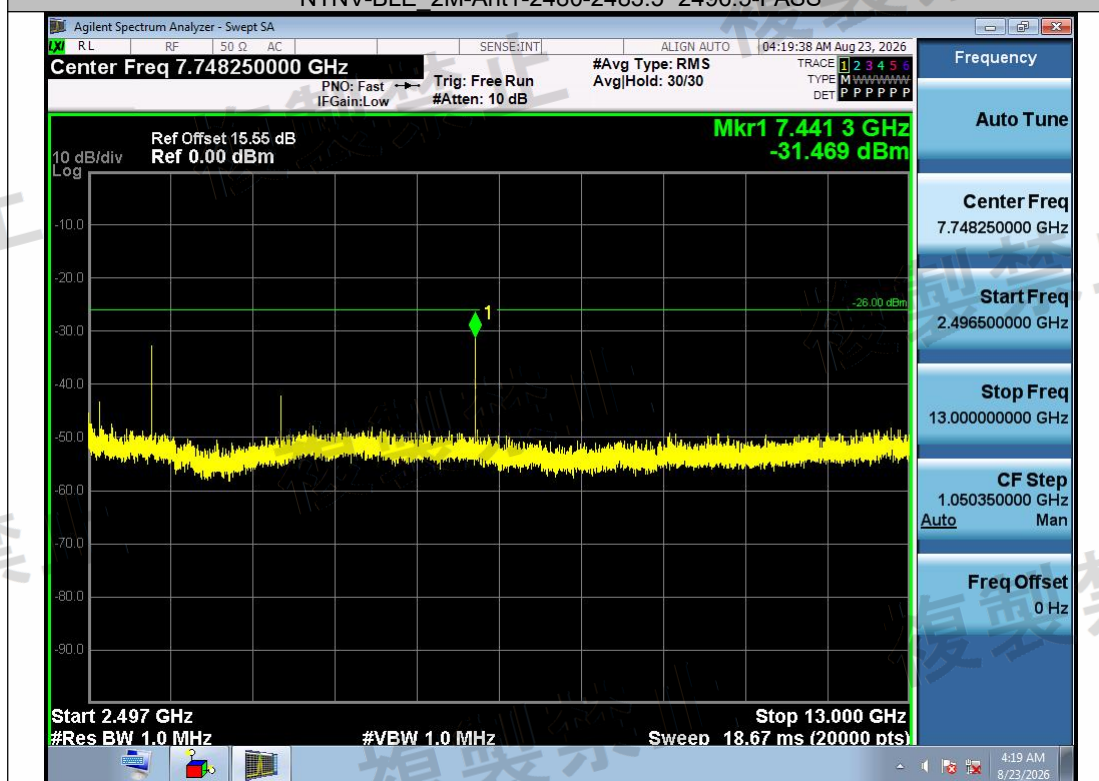
NTNV-BLE 2M-Ant1-2480-30~2387-PASS



NTNV-BLE 2M-Ant1-2480-2387~2400-PASS

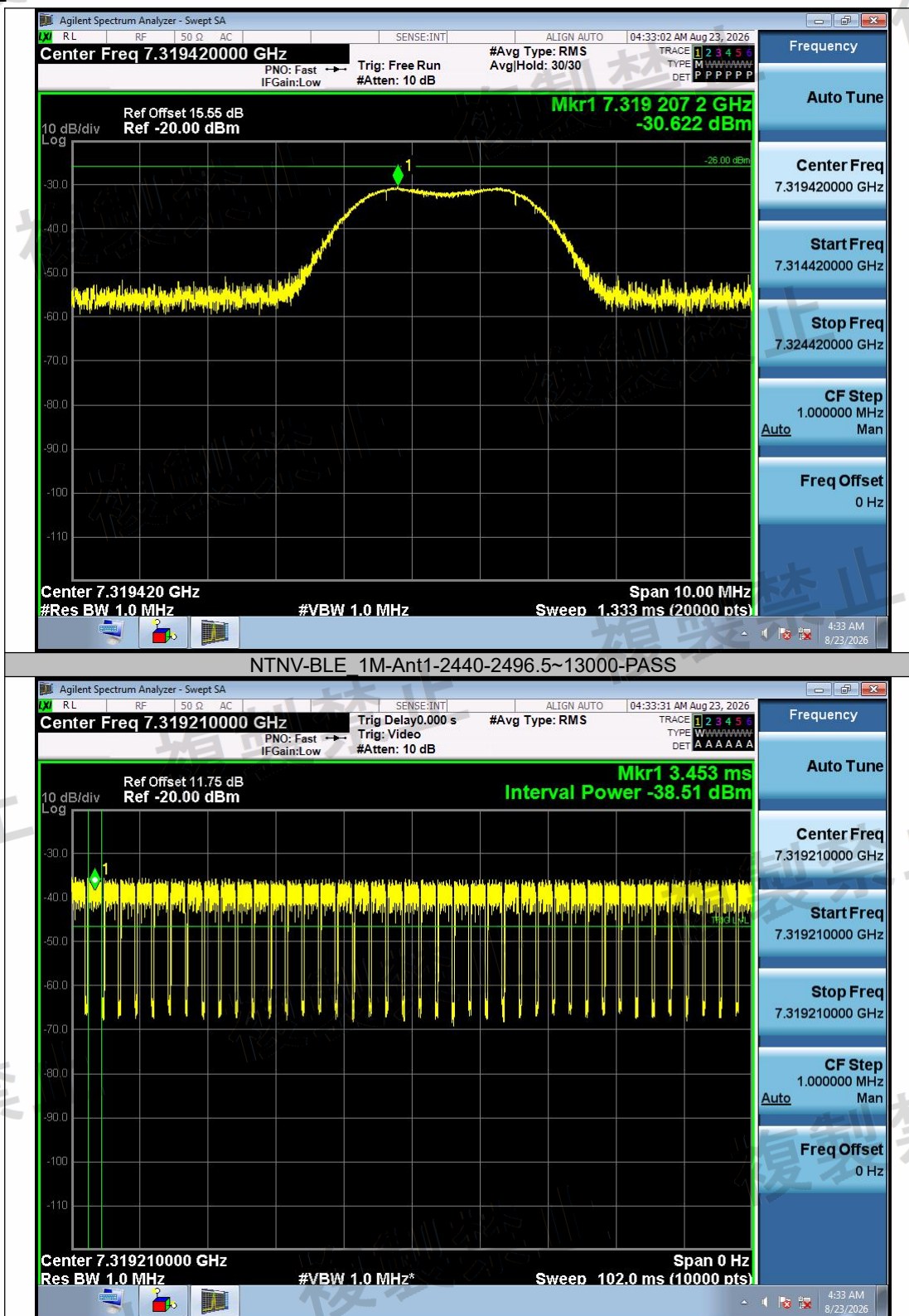


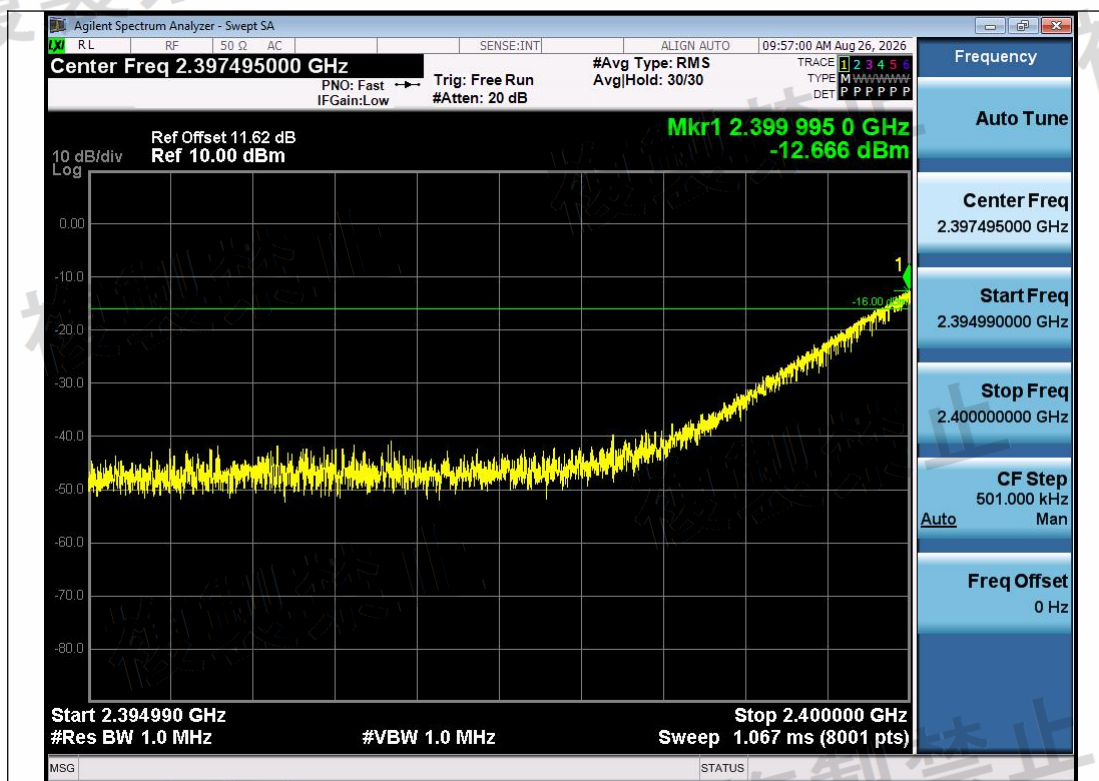
NTNV-BLE_2M-Ant1-2480-2483.5~2496.5-PASS



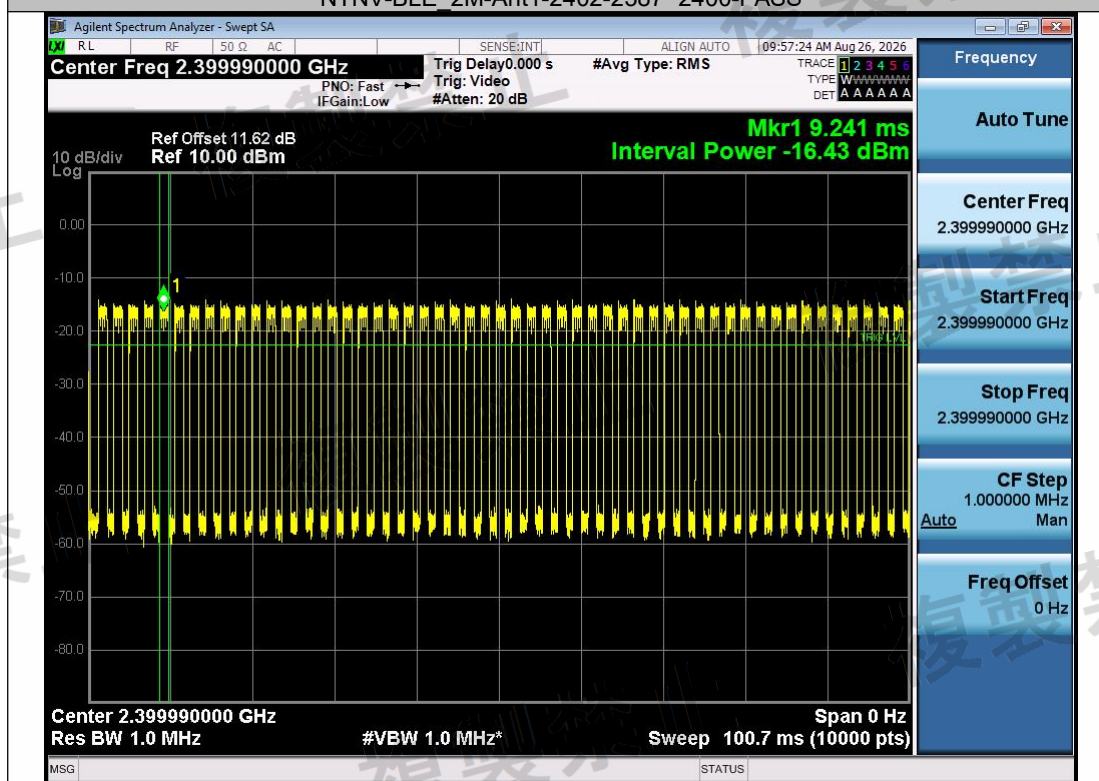
NTNV-BLE_2M-Ant1-2480-2496.5~13000-See table below

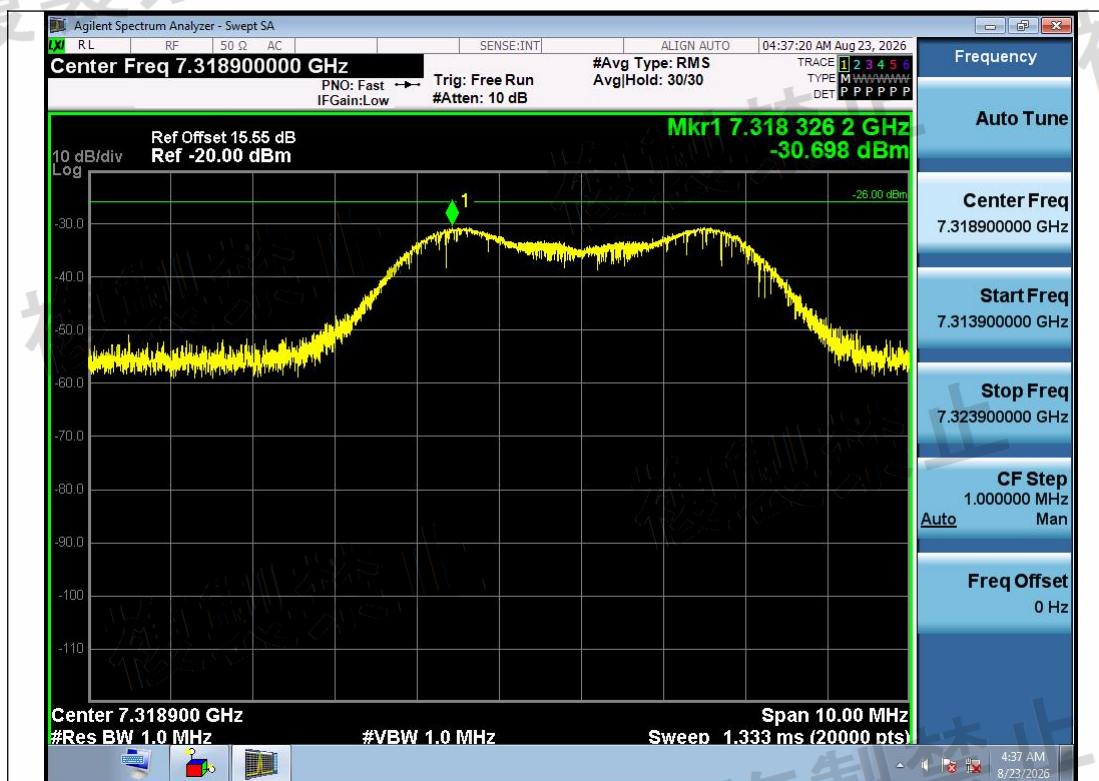
Step2



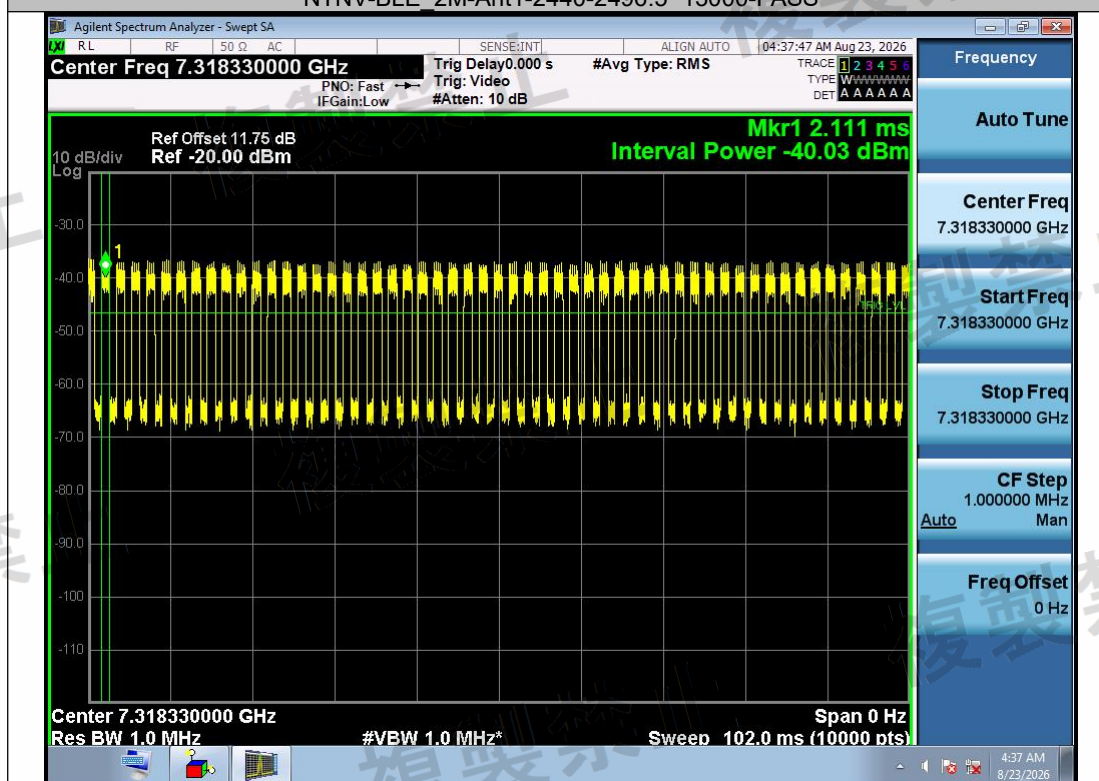


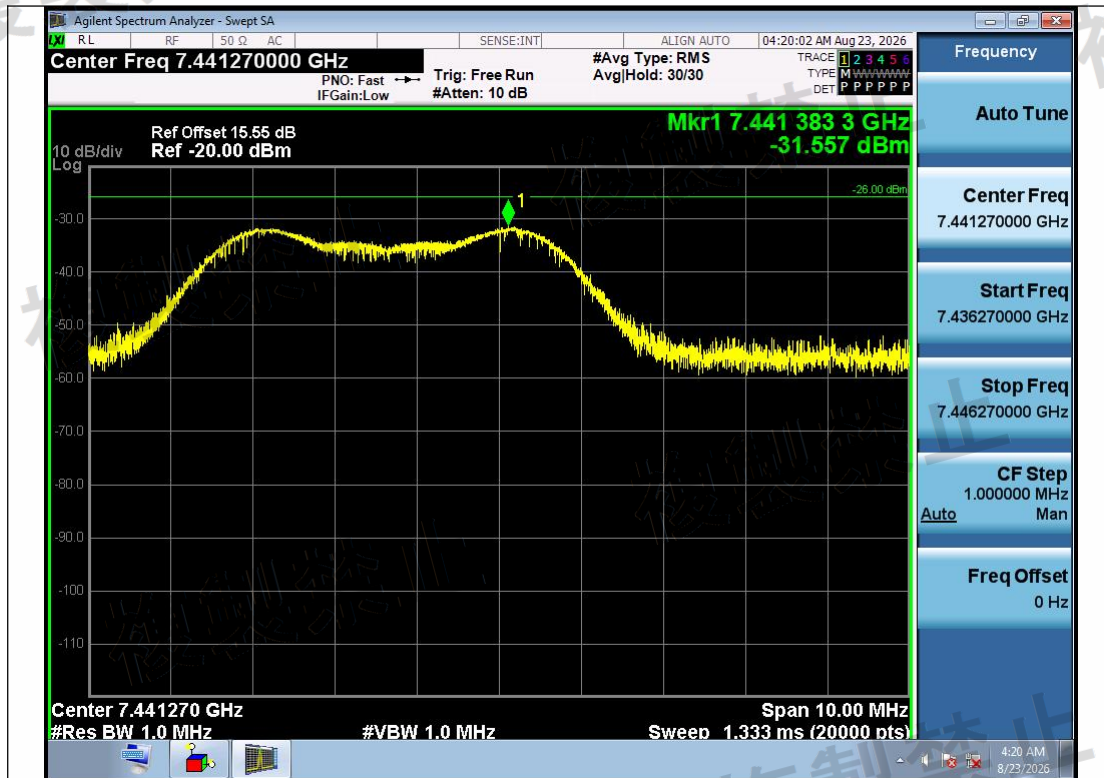
NTNV-BLE 2M-Ant1-2402-2387~2400-PASS



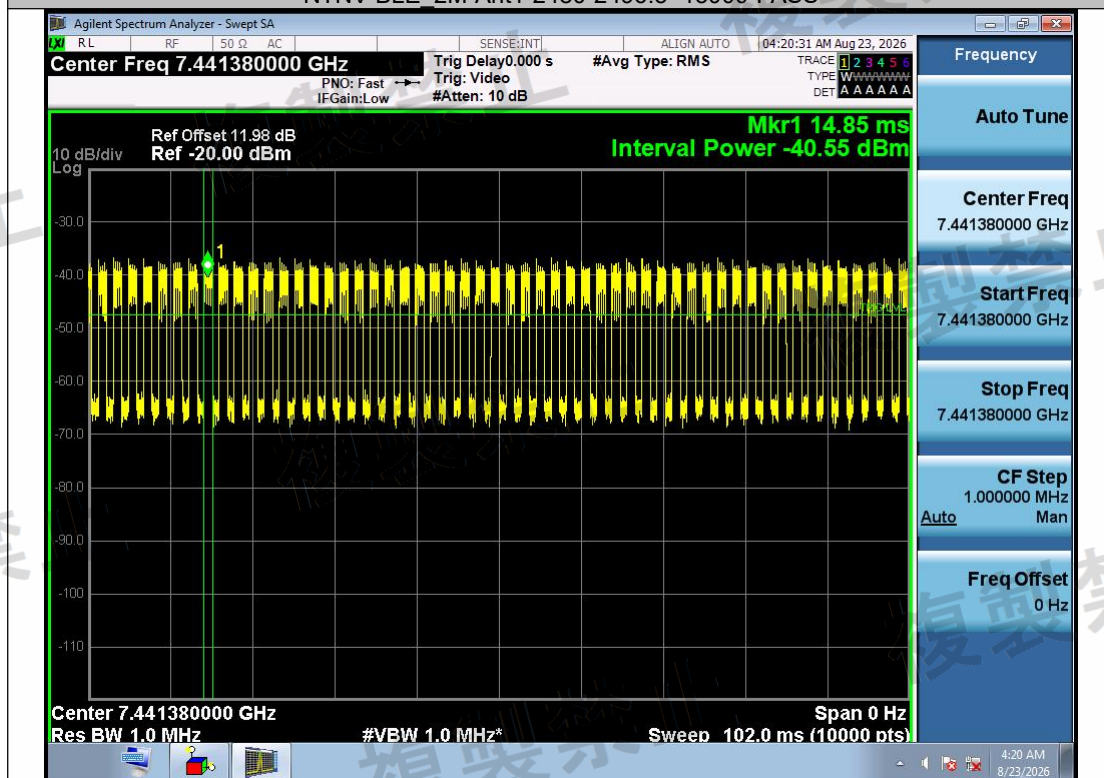


NTNV-BLE 2M-Ant1-2440-2496.5~13000-PASS





NTNV-BLE 2M-Ant1-2480-2496.5~13000-PASS



7.5 SPURIOUS EMISSIONS OF RX

7.5.1 Applicable Standard

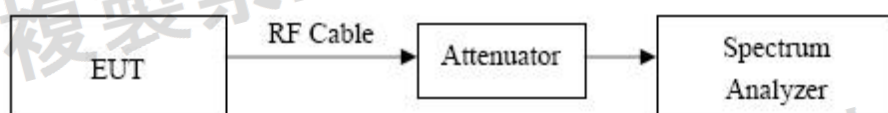
According to Item 19 of Article 2 Paragraph 1

7.5.2 Conformance Limit

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4 nW (-54dBm) or less at a frequency below 1 GHz and 20 nW(-47dBm) or less at a frequency of 1 GHz or higher as measured using the circuit.

- | | |
|----------------------|-----------------------|
| a. 30 MHz - 1000 MHz | 4 nW (-54dBm) or less |
| b. 1GHz – 12.5 GHz | 20 nW(-47dBm) or less |

7.5.3 Test Setup Block Diagram



7.5.4 Test Procedure

Set the EUT so that the test frequency is can be measured receipt consecutively all the time.

- (1) Set the attenuation value of the dummy load lowest as possible, due to low level of the measured object.
- (2) Set Spectrum analyzer for seeking the collateral emission is set as below.

Sweeping Bandwidth	30MHz to 5 times of carrier frequency
Resolution Bandwidth	in case of frequency lower than 1 GHz, 100 kHz RBW In case of frequency higher than 1 GHz, 1MHz RBW
Video Bandwidth	Same level as the resolution bandwidth
Sweep Time	Minimum time to assure the measurement accuracy
Y-Axis Scale	10 dB/Div
Sweep Mode	Single sweep
Phase-Detection Mode	Positive peak

- (3) Spectrum analyzer for measuring the collateral emission is set as below.

Central Frequency	Collateral emission frequency
Sweeping Bandwidth	0 Hz
Resolution Bandwidth	in case of frequency lower than 1 GHz, 100 kHz RBW In case of frequency higher than 1 GHz, 1MHz RBW
Video Bandwidth	Same level as the resolution bandwidth
Sweep Mode	Single sweep
Detection Mode	Sample

Set the spectrum analyzer as (2), seek the maximum amplitude of the collateral emission.

In case of sought result lower than 1/10 limit value, employ the sought value as the measured value.

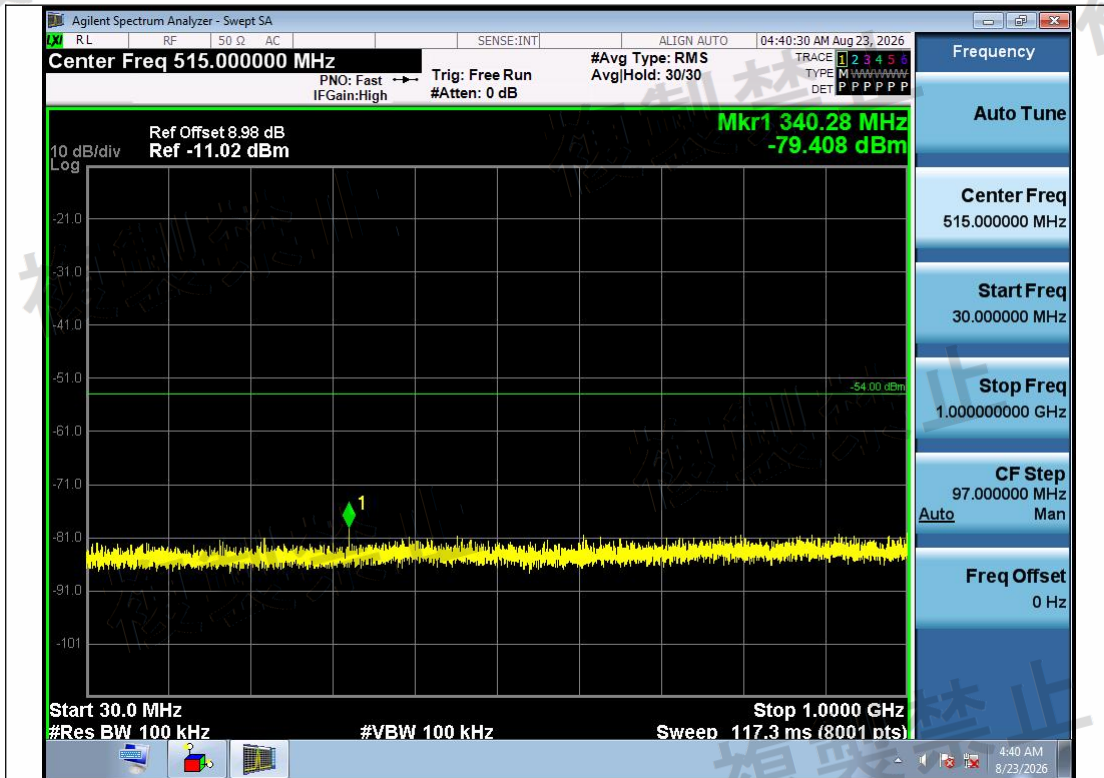
In case the sought value exceeds 1/10 limit value, seek the collateral emission frequency by narrowing the sweeping band sequentially to 1/10 for the purpose of higher accuracy of the spectrum analyzer. Set the spectrum analyzer as (3).

7.5.5 Environmental Conditions

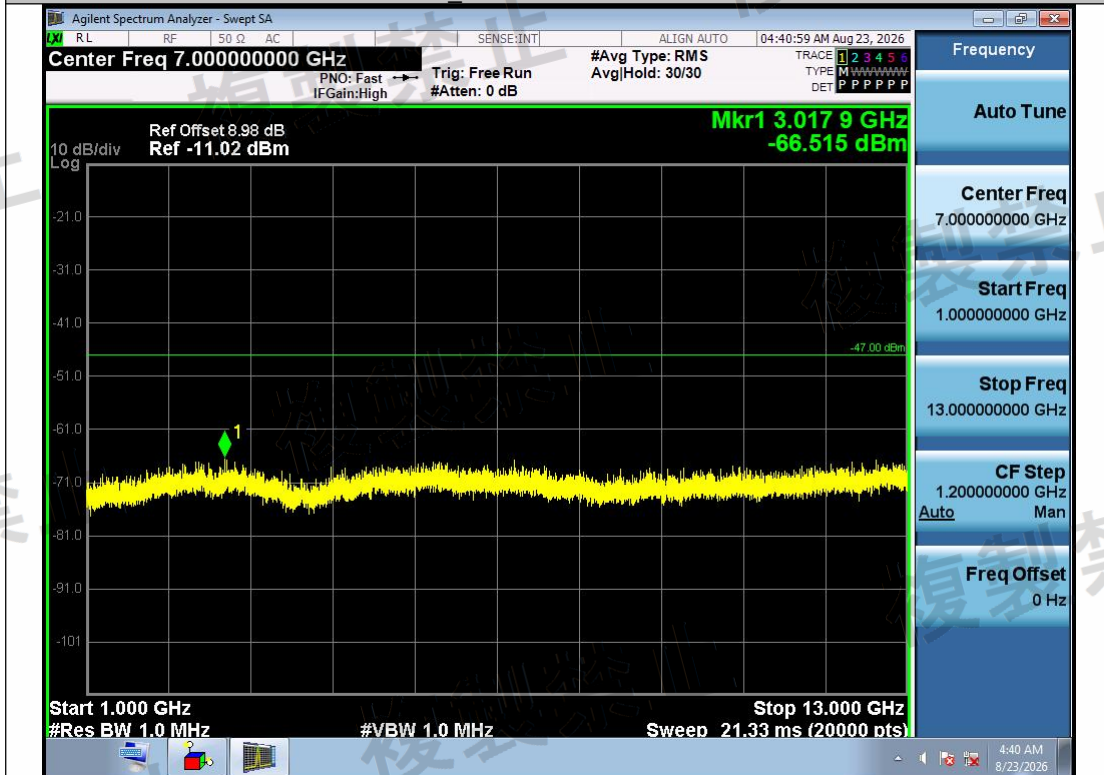
Temperature:	23.7℃
Relative Humidity:	50%
ATM Pressure:	1011 mbar

7.5.6 Test Results

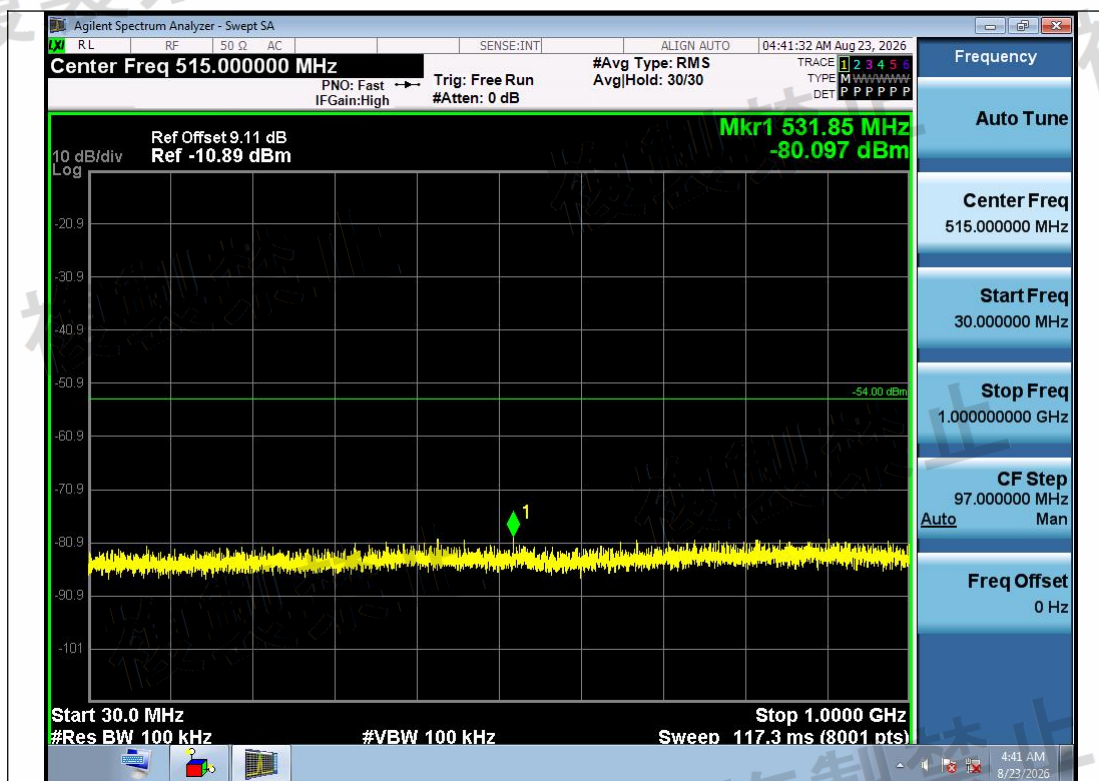
TestCondition	TestMode	Antenna	Freq(M Hz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	BLE_1M	Ant1	2402	30~1000	340.28	-79.41	≤-54	0.01146	≤4	PASS
NTNV	BLE_1M	Ant1	2402	1000~13000	3017.90	-66.52	≤-47	0.22284	≤20	PASS
NTNV	BLE_1M	Ant1	2440	30~1000	531.85	-80.10	≤-54	0.00977	≤4	PASS
NTNV	BLE_1M	Ant1	2440	1000~13000	2438.27	-66.23	≤-47	0.23823	≤20	PASS
NTNV	BLE_1M	Ant1	2480	30~1000	862.87	-79.09	≤-54	0.01233	≤4	PASS
NTNV	BLE_1M	Ant1	2480	1000~13000	2411.27	-65.49	≤-47	0.28249	≤20	PASS
NTNV	BLE_2M	Ant1	2402	30~1000	885.06	-79.54	≤-54	0.01112	≤4	PASS
NTNV	BLE_2M	Ant1	2402	1000~13000	12737.19	-66.79	≤-47	0.20941	≤20	PASS
NTNV	BLE_2M	Ant1	2440	30~1000	856.20	-79.27	≤-54	0.01183	≤4	PASS
NTNV	BLE_2M	Ant1	2440	1000~13000	2699.88	-66.75	≤-47	0.21135	≤20	PASS
NTNV	BLE_2M	Ant1	2480	30~1000	872.69	-79.32	≤-54	0.01169	≤4	PASS
NTNV	BLE_2M	Ant1	2480	1000~13000	6276.06	-65.86	≤-47	0.25942	≤20	PASS



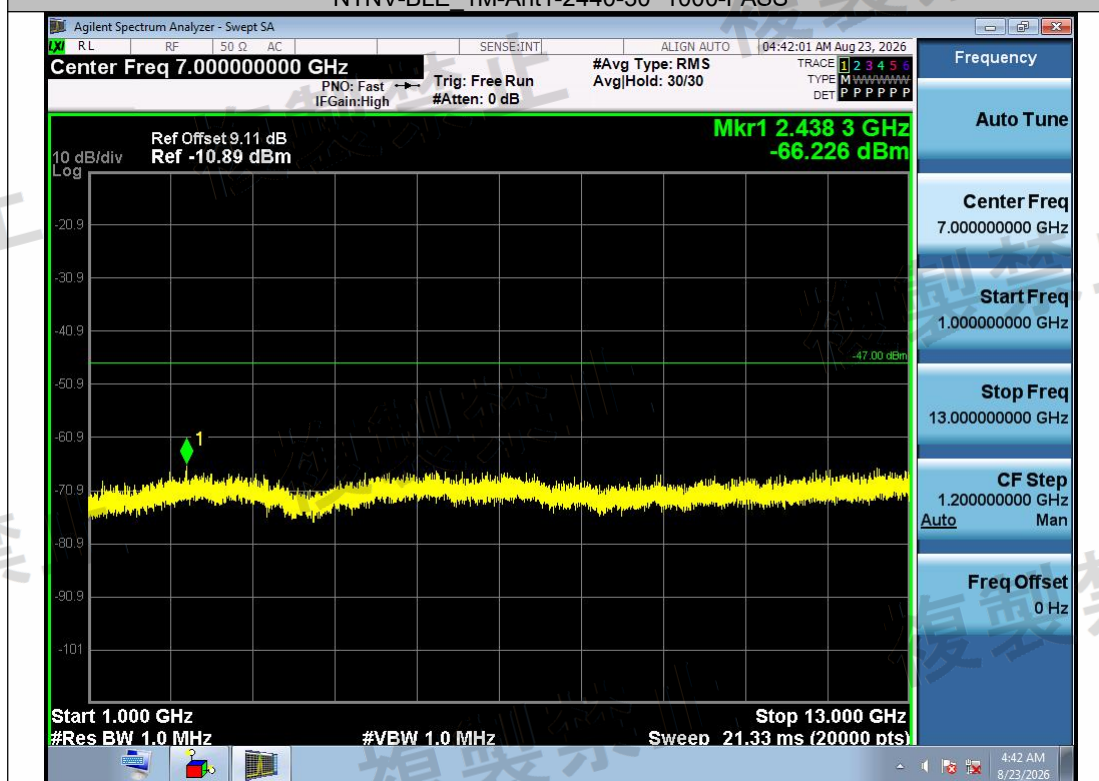
NTNV-BLE 1M-Ant1-2402-30~1000-PASS



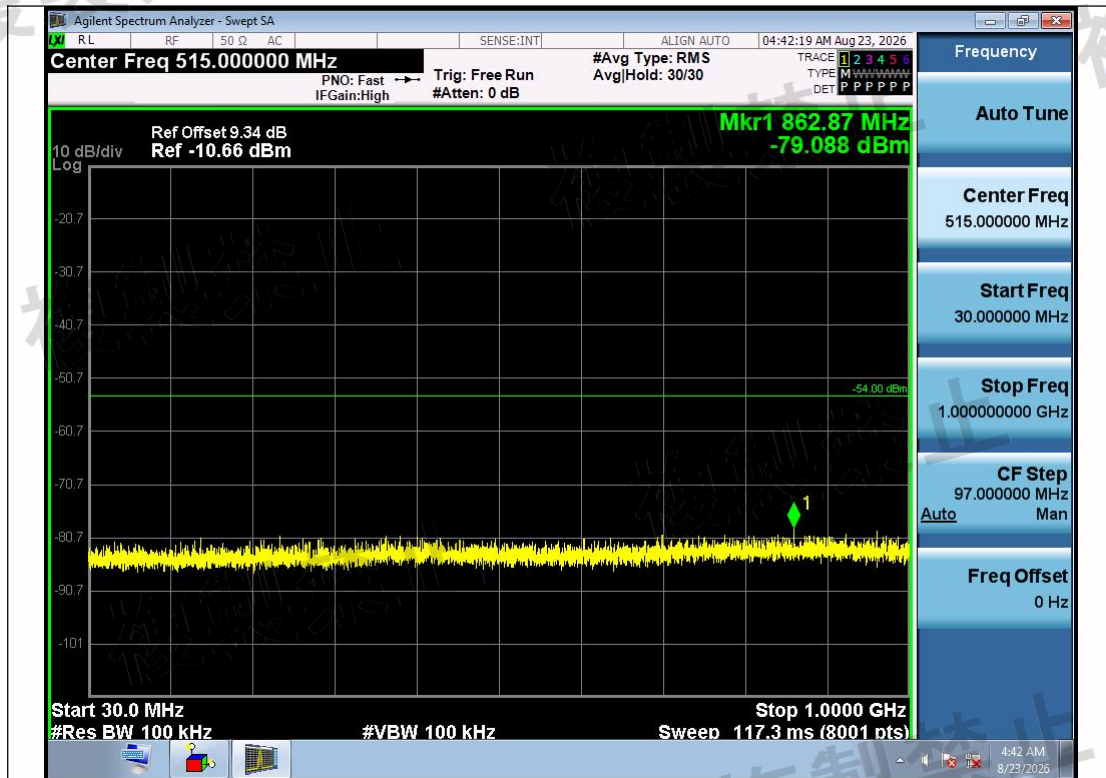
NTNV-BLE 1M-Ant1-2402-1000~13000-PASS



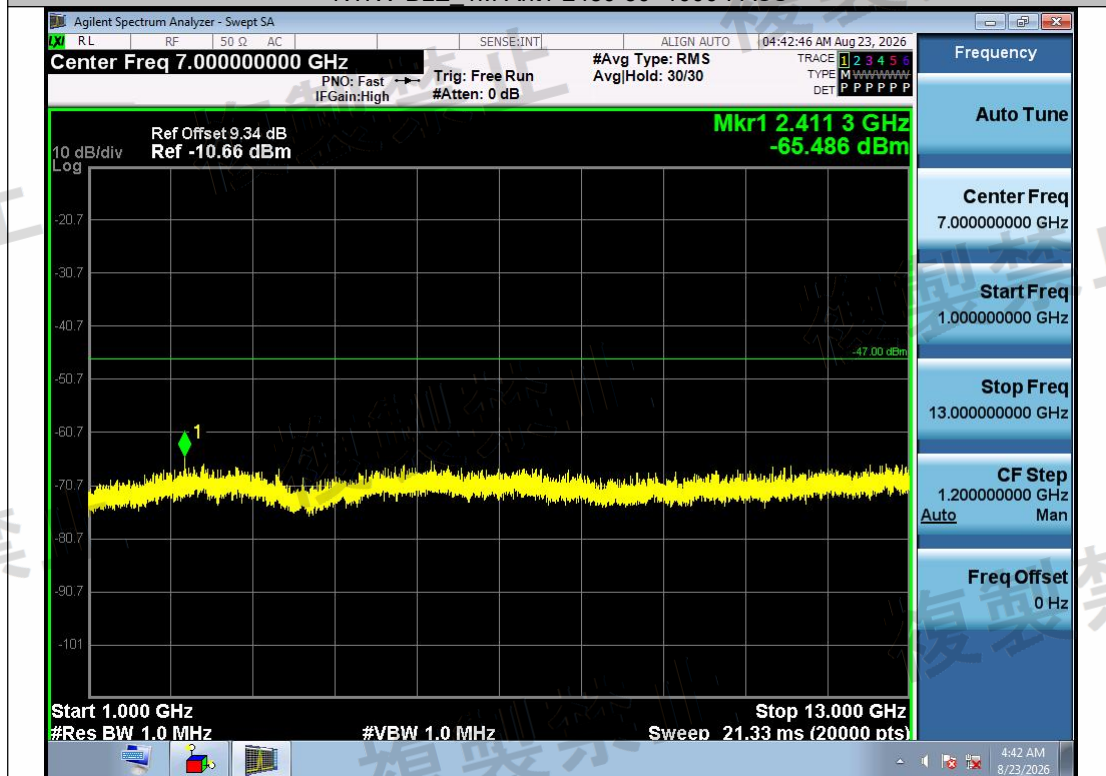
NTNV-BLE 1M-Ant1-2440-30~1000-PASS



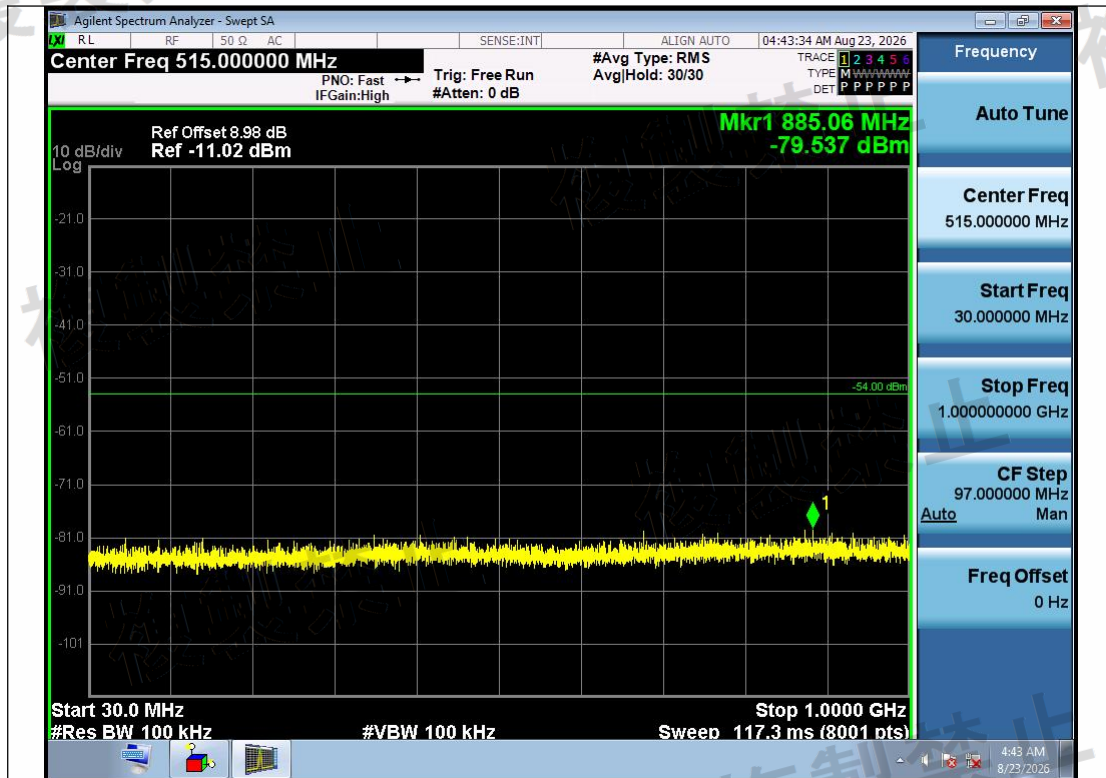
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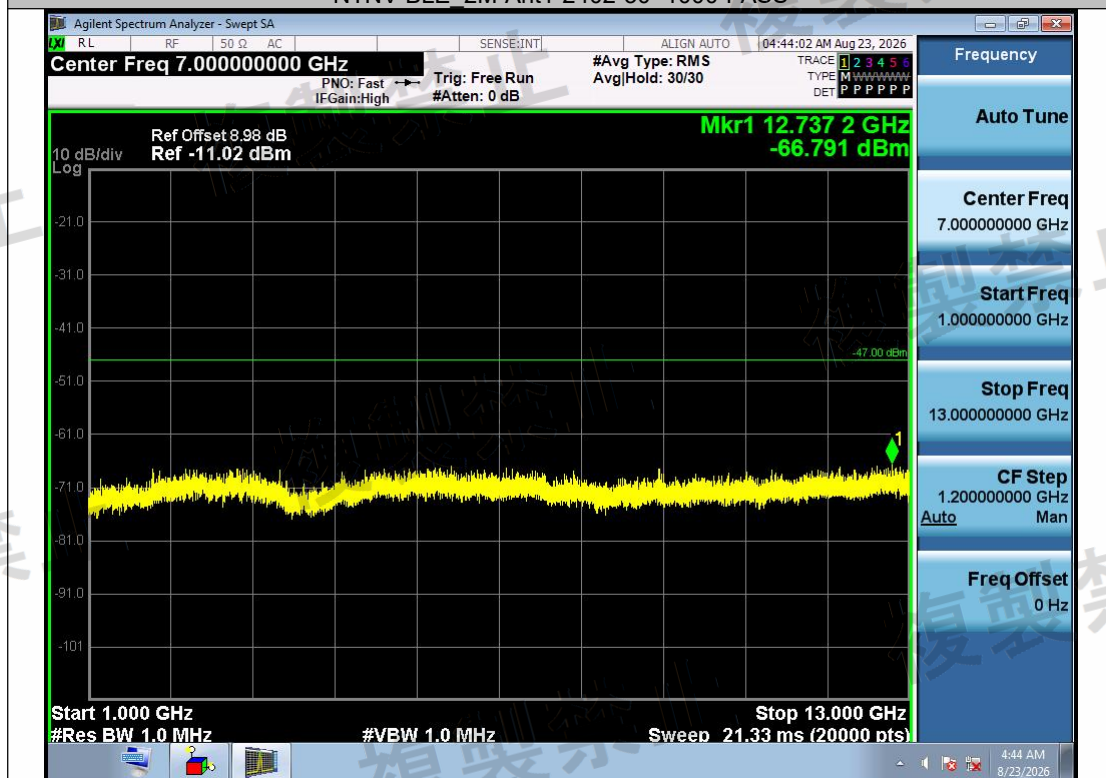
NTNV-BLE 1M-Ant1-2480-30~1000-PASS



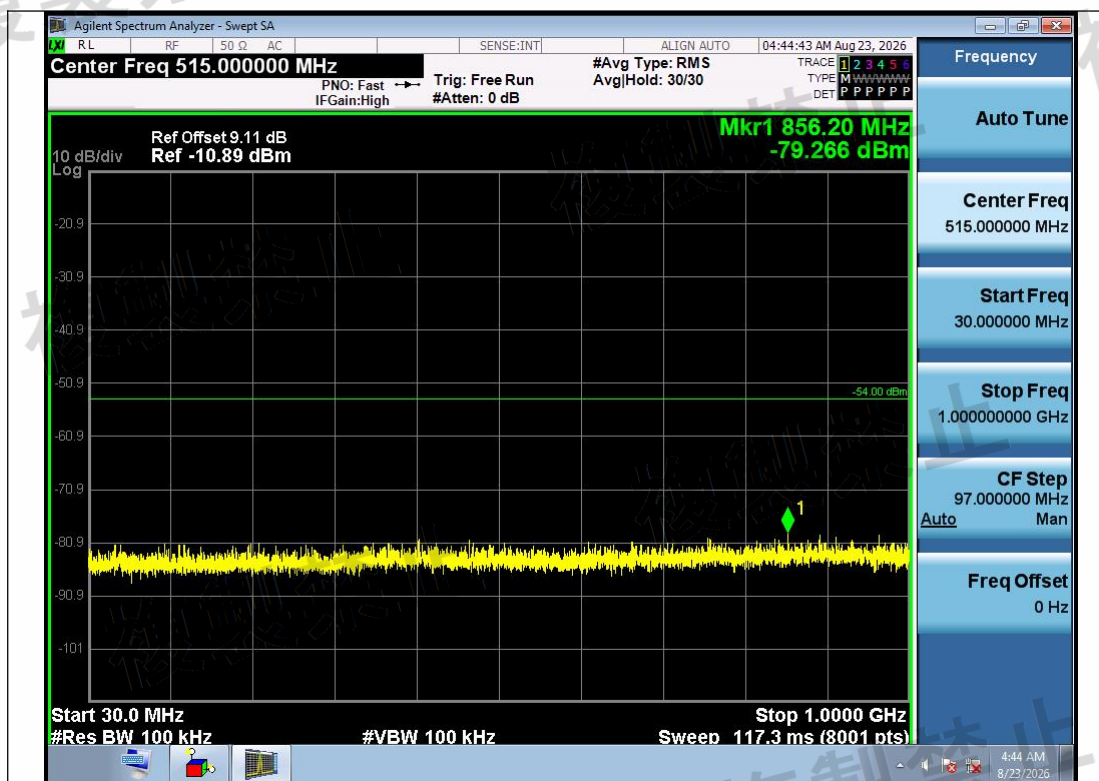
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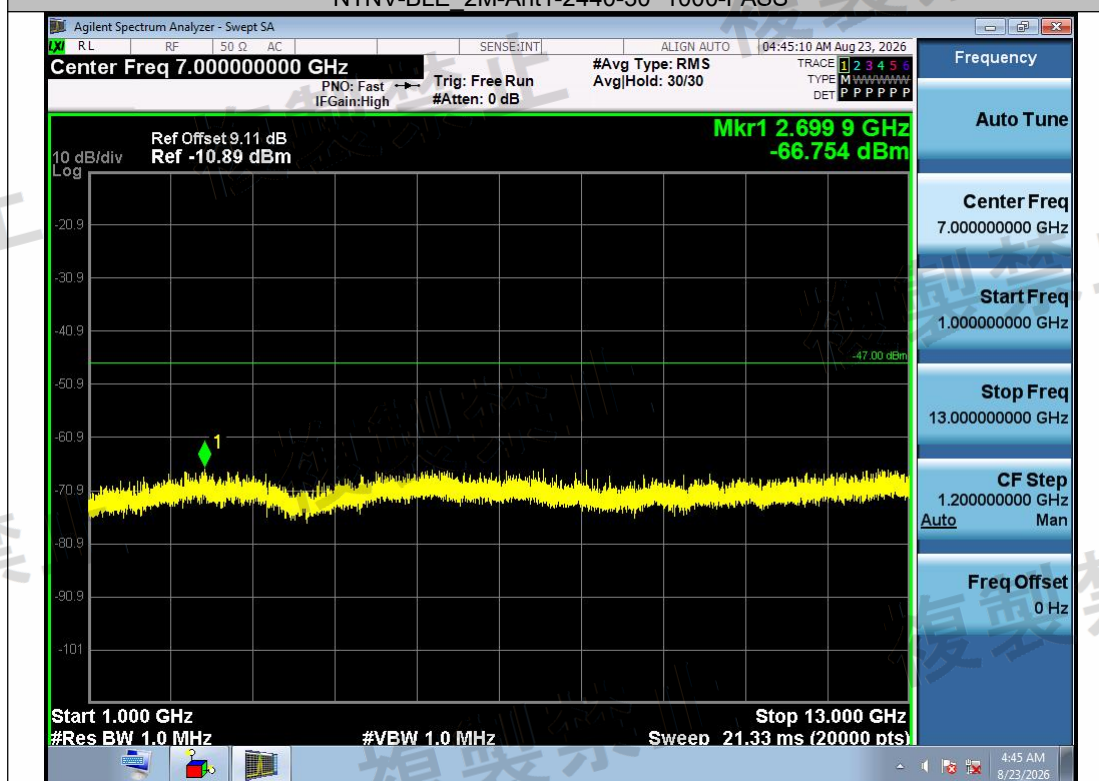
NTNV-BLE_2M-Ant1-2402-30~1000-PASS



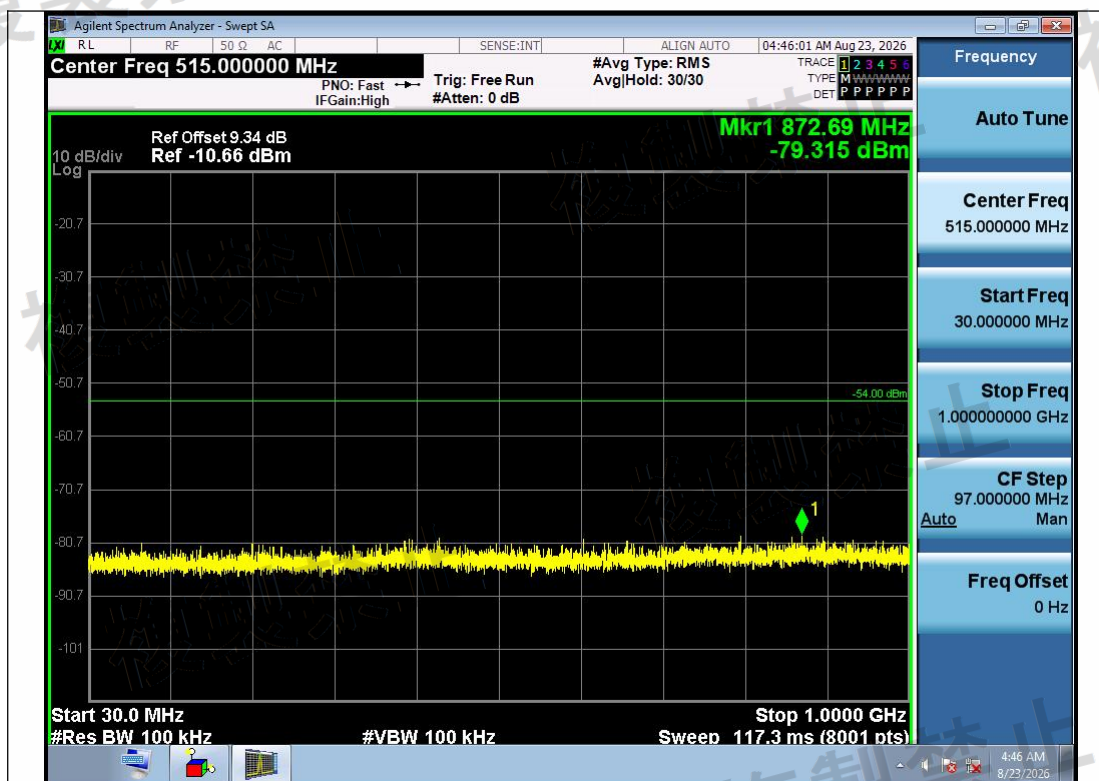
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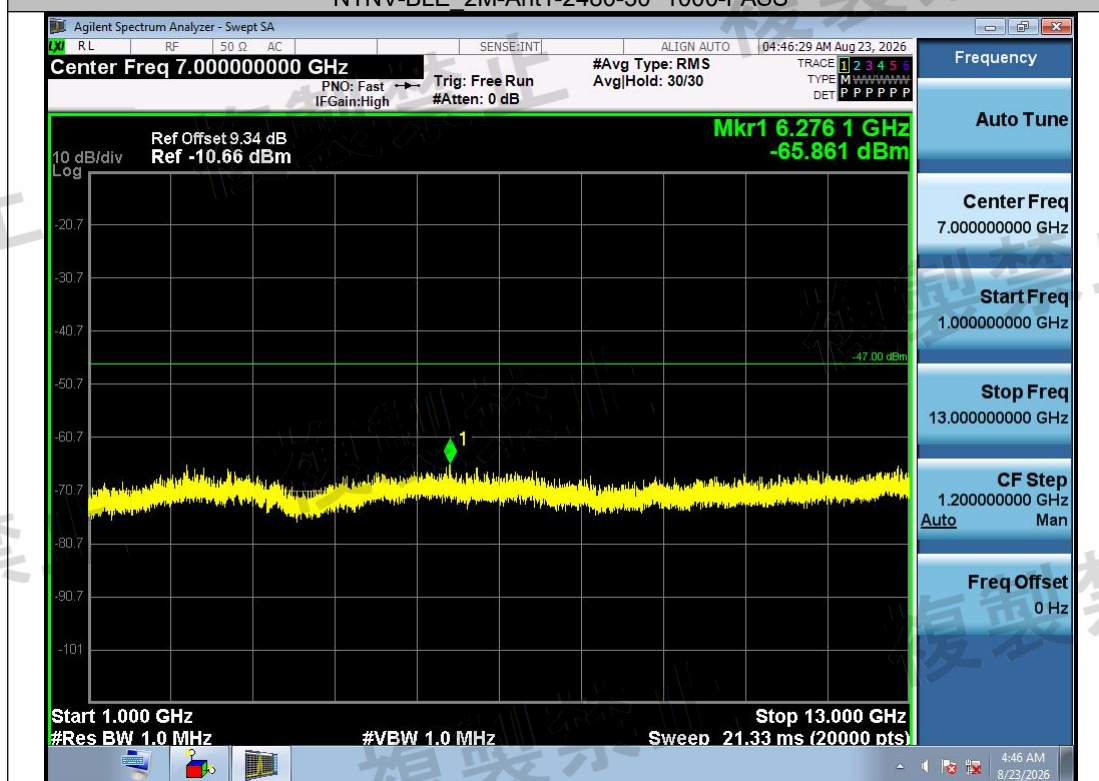
NTNV-BLE 2M-Ant1-2440-30~1000-PASS



NTNV-BLE 2M-Ant1-2440-1000~13000-PASS



NTNV-BLE 2M-Ant1-2480-30~1000-PASS



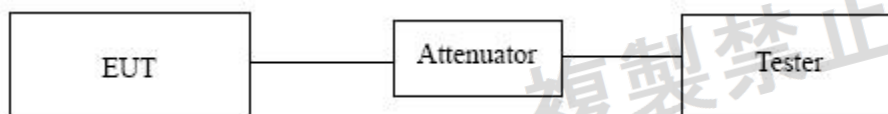
NTNV-BLE_2M-Ant1-2480-1000~13000-PASS

7.6 INTERFERENCE PREVENTION FUNCTION

7.6.1 Standard Applicable

According to Item 19 of Article 2 Paragraph 1. The device shall have the function of automatic transmission or reception of identification code.

7.6.2 Test Setup Block Diagram



7.6.3 Test Procedure

1. Set the EUT in the usual operation condition
2. The radio equipment with automatic transmitting function of identification code
 - A. Transmit the assigned identification code from the radio equipment.
 - B. Confirm the identification code received by the demodulator.
3. The radio equipment with automatic receiving function of identification code
 - A. Transmit the assigned identification code from the opposite equipment.
 - B. Confirm that the usual communication is available.
 - C. Transmit the identification code distinct from the assigned one from the opposite equipment.
 - D. Confirm that the radio equipment is stopped or an indication is displayed as the identification code is different.

The identification function shall be recorded.

7.6.4 Test Results

PASS

Test Item	Test Result
Transmitting Function of Identification Code	>48 bits
Receiving Function of Identification Code	>48 bits

7.7 RF ACCESSIBILITY

Standard requirement

Article 49-20, paragraph 1 (a)

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

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

Test result: Pass

8 APPENDIX PHOTOGRAPHS OF TEST SETUP



--- End of Report ---

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