TEST REPORT

Product Name : Wireless Home Speaker

Model Number : TAFA3, TAFA3/11 ,TAFA3/10, TAFA3/61, TAFA3/12, TAFA3/98

Prepared for	:	MMD Hong Kong Holding Limited
Address	:	Units 1208-11, 12th Floor, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong
Prepared by	:	EMTEK (DONGGUAN) CO., LTD.
Address	:	Room 111&112, Building 8, -1&2/F., Office Building2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China TEL: +86-0769-22807078 FAX: +86-0769-22807079

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Date of sample receipt	:	May 20, 2026
Date(s) of Tests	:	May 20, 2026 to June 11, 2026
Date of issue	:	June 11, 2026

TEST RESULT CERTIFICATION

Applicant	:	MMD Hong Kong Holding Limited
Address	:	Units 1208-11, 12th Floor, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong
Manufacturer	:	MMD Hong Kong Holding Limited
Address	:	Units 1208-11, 12th Floor, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong
Factory	:	ZhongShan City Li Tai Electronic Industrial Co., Ltd.
Address	:	3rd Industrial District, Wuguishan Town, ZhongShan City, GuangDong, China
EUT	:	Wireless Home Speaker
Model Name	:	TAFA3, TAFA3/11 ,TAFA3/10, TAFA3/61, TAFA3/12, TAFA3/98
Trademark	:	PHILIPS or

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 (DONGGUAN) 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 (DONGGUAN) 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 : May 20, 2026 to June 11, 2026

Prepared by : Warren Deng
Warren Deng /Editor

Reviewer : Jessica Zhang
Jessica Zhang /Supervisor

Approved & Authorized Signer : Sam Lv / Manager

Modified Information

Version	Report No.	Revision Date	Summary
V1.0	EDG2605200187E00104R	/	Original Report

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1 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product:	Wireless Home Speaker
Model Number:	TAFA3, TAFA3/11 ,TAFA3/10, TAFA3/61, TAFA3/12, TAFA3/98 (Note: Only the model of TAFA3/11 was tested, since the electrical circuit design, layout, components used and internal wiring are identical, only the color of appearance, model name and country code diferent.)
BT Version	BT V5.4
Data Rate	1Mbps, 2Mbps
Modulation:	GFSK
Operating Frequency Range(s):	2402-2480MHz
Number of Channels:	40 channels
Rated Antenna Power:	0.5 mW
Antenna Type :	FPC Antenna
Antenna Gain:	1.92 dBi
Power Supply:	100V-240V~50/60Hz
Hardware version:	V0.5
Software version:	V67
Temperature Range	0°C ~ +40°C

Note: *for more details, please refer to the user's manual of the EUT.*

2 SUMMARY OF TEST RESULT

MIC RULES	DESCRIPTION OF TEST	RESULT
Item 19	RF Output Power	Compliant
Item 19	Frequency Tolerance	Compliant
Item 19	Occupied Bandwidth /Spreading Bandwidth/Spread Factor	Compliant
Item 19	Holding time of hopping frequency	N/A
Item 19	Transmitter Spurious Emissions	Compliant
Item 19	Receiver Spurious Emissions	Compliant
Item 19	Interference Prevention Function	Compliant
Item 19	Carrier Sending Function	N/A

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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.

3.1.1 MEASUREMENT EQUIPMENT USEDRadio Frequency Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval	Calibration Method
Wireless Connectivity Tester	R&S	CMW270	102543	2026/4/23	1Year	c
Automatic Control Unit	Tonscend	JS0806-2	21I8060480	2026/4/23	1Year	c
Signal Analyzer	KEYSIGHT	N9010B	MY60242456	2026/4/23	1Year	c
Analog Signal Generator	KEYSIGHT	N5173B	MY61252625	2026/4/23	1Year	c
UP/DOWN-Converter	R&S	CMW-Z800A	100274	2026/4/23	1Year	c
Vector Signal Generator	KEYSIGHT	N5182B	MY61252674	2026/4/23	1Year	c
Frequency Extender	KEYSIGHT	N5182BX07	MY59362541	2026/4/23	1Year	c
Temperature&Humidity test chamber	ESPEC	EL-02KA	12107166	2026/4/23	1 Year	c
Attenuator	Huixunda technology co., ltd	SMA-JK 6G-10dB	N/A	2026/4/23	1 Year	c

Calibration agency : Guangzhou LiSai Metrology & Test Co., Ltd.

Address : Address: No.8.South Street ShiJi Institute Guangzhou.Guangdong.China

3.1.2 Calibration Method:

a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafterl referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1).
b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992).
c) Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

d) Calibration conducted by using measuring instruments and other equipment listed Table attached hereto, which shall have been given any of calibration, etc. listed above from a) to c).

For measurement cables(It is from the antenna end of EUT to the test port of test equipment.)

Equipment	Manufacturer	cable loss	Application frequency band	Measurement data of line loss comes from	Last Cal.	Cal. Interval
measurement cable	Provided by the applicant	0.5 dBm	2400-2500MHz	Manufacturers claim themselves.	N/A	N/A

3.2 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, and then record on this report.

Those data rates (BLE mode: 1Mbps, 2Mbps) were used for all tests.

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 Bluetooth DTS:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2440	…	…
1	2404	21	2442	38	2476
2	2406	22	2444	39	2478
…	…	…	…	40	2480
Note: fc=2402MHz+(k-1)×2MHz k=1 to 40					

Test Frequency and channel for Bluetooth DTS 1Mbps:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2440	40	2480

3.3 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
Notebook	Lenovo	E46L	11S168003748Z0LR06E0HG

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.*

4 FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at:

EMTEK (DONGGUAN) CO., LTD.
Room 111&112, Building 8, -1&2/F., Office Building2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China

4.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description		
EMC Lab.	:	**Accredited by CNAS** 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) **Accredited by FCC** Designation Number: CN1451 Test Firm Registration Number: 846861 **Accredited by A2LA** The Certificate Number is 4321.01. Accredited by Industry Canada The Conformity Assessment Body Identifier is CN0008
Name of Firm	:	EMTEK (DONGGUAN) CO., LTD.
Site Location	:	Room 111&112,Building 8,-1&2/F., Office Building2,Zone A,Zhongda Marine Biotechnology Research and Development Base, No.9,Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China

5 TEST SYSTEM UNCERTAINTY

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

Parameter	Uncertainty
Radio Frequency	±1ppm
Uncertainty for Output power test	±0.83dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Occupied Bandwidth Test	±1.0dB
Power density test	±1.85dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5℃
Humidity	±3%

Measurement Uncertainty for a level of Confidence of 95%

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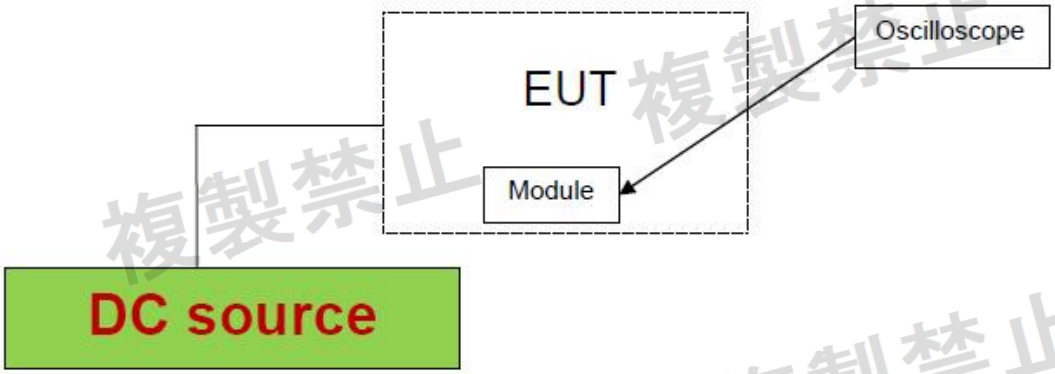
6 WIRELESS MODULE VOLTAGE TEST IN EXTREME CONDITIONS

6.1 Applicable Standard

When there is a fluctuation of +/-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 +/-1%, Measurement shall be tested with the rated voltage.

6.2 Test Configuration



Note: The sample is powered by the serial port board, which is connected to the computer. Refer to the test photos.Products are powered by a serial port board, which is connected to a computer., please see the test photos for details.

6.3 Test Results

Test Voltage	DC 2.7V	DC 3.0	DC 3.3V
Module Test voltage	3.0	3.0	3.0
Module Ratedvoltage	3.0	3.0	3.0
The Range of Module Voltage (%)	0	0	0

Note: In extreme conditions, EUT module power is confirmed below +/-1%.

7 TEST REQUIREMENTS

7.1 FREQUENCY TOLERANCE

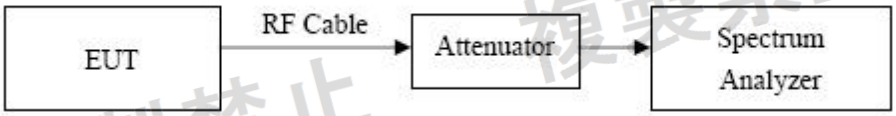
7.1.1 Applicable Standard

According to Item 19 of Article 2 Paragraph 1.

7.1.2 Conformance Limit

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

7.1.3 Test Setup Block Diagram



7.1.4 Test Procedure

If the fluctuation of input voltage to the circuit of the radio part (excl. power) in the test equipment is confirmed below +/-1%, Measurement shall be tested with the rated voltage.
When there is a fluctuation of +/-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 +/-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.

7.1.5 Environmental Conditions

Temperature:	25°C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

7.1.6 Test Results

TestCondition	TestMode	Antenna	Freq(MHz)	CenterFreq [MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	BLE_1M	Ant1	2402	2402	0	±50	PASS
NTNV	BLE_1M	Ant1	2440	2440	0	±50	PASS
NTNV	BLE_1M	Ant1	2480	2480	0	±50	PASS
NTNV	BLE_2M	Ant1	2402	2402	0	±50	PASS
NTNV	BLE_2M	Ant1	2440	2440	0	±50	PASS
NTNV	BLE_2M	Ant1	2480	2480	0	±50	PASS

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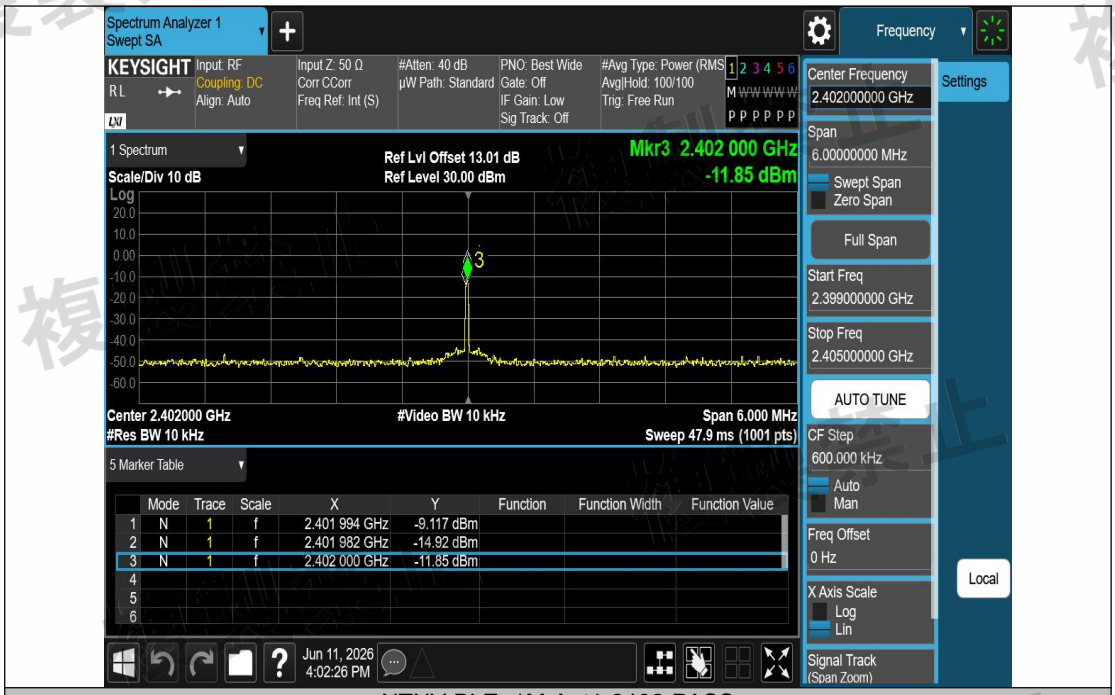
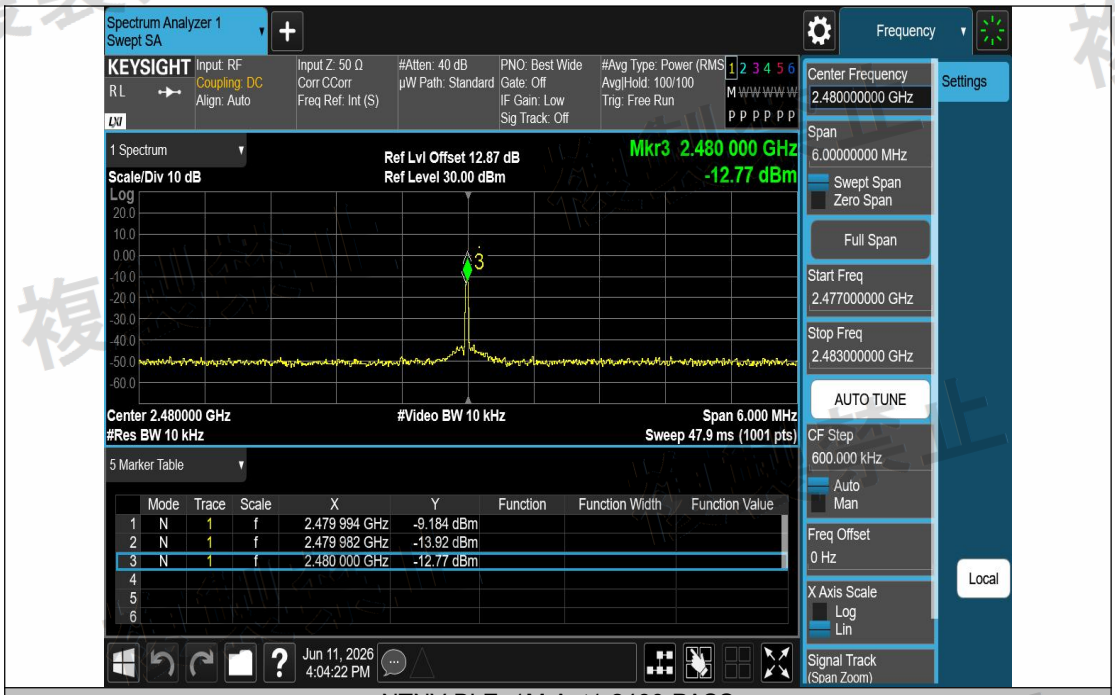


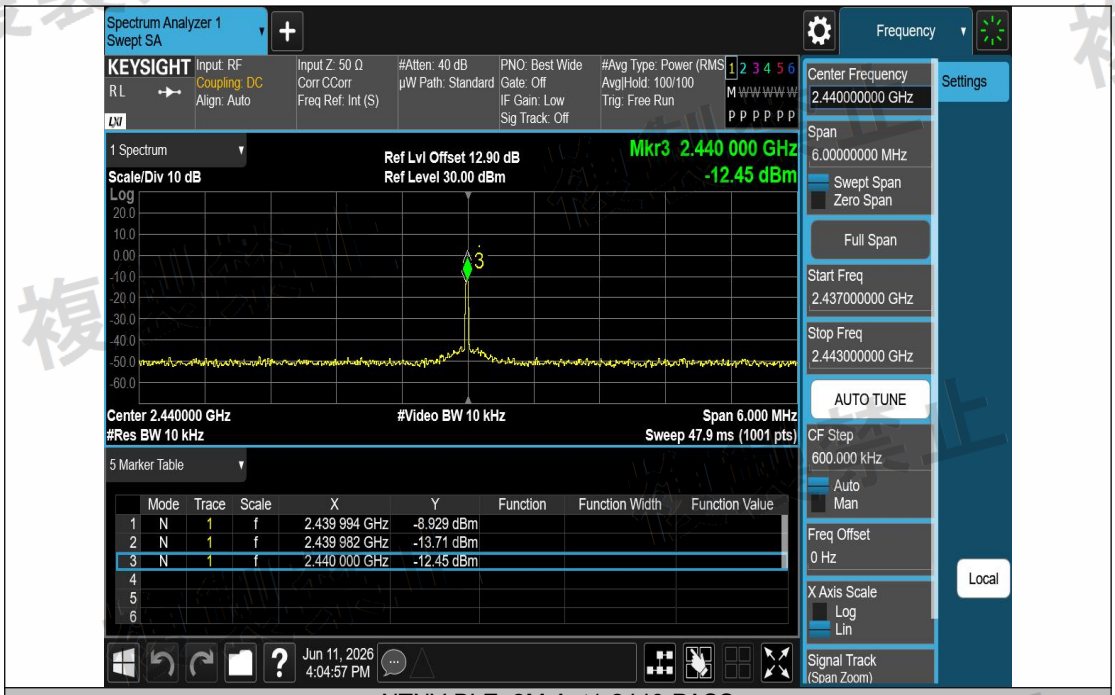
NTNV-BLE_1M-Ant1-2402-PASS

NTNV-BLE_1M-Ant1-2440-PASS

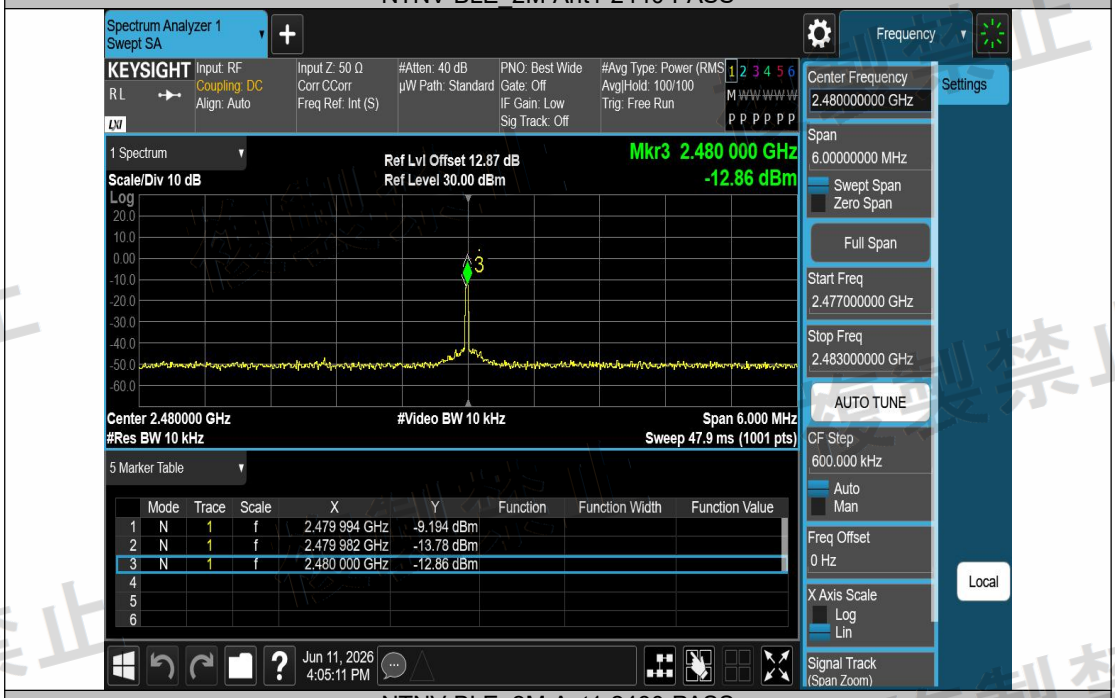


NTNV-BLE_1M-Ant1-2480-PASS

NTNV-BLE_2M-Ant1-2402-PASS



NTNV-BLE_2M-Ant1-2440-PASS



NTNV-BLE_2M-Ant1-2480-PASS

7.2 OCCUPIED BANDWIDTH & SPREADING BANDWIDTH

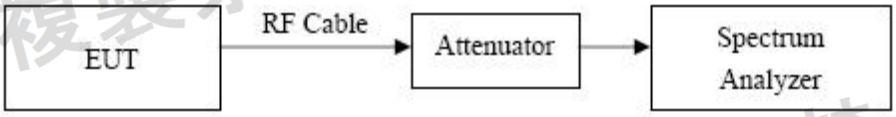
7.2.1 Applicable Standard

According to Item 19 of Article 2 Paragraph 1.

7.2.2 Conformance Limit

Permissible value for occupied bandwidth using the FH system, a hybrid systems combining DS and FH systems or hybrid system combining FH and OFDM systems shall be 83.5MHz 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.

7.2.3 Test Setup Block Diagram



7.2.4 Test Procedure

Spectrum analyzer is set as below

Central Frequency	Test frequency
Sweeping Bandwidth	2 to 3.5 times the allowable value
Resolution Bandwidth	Lower than 3 % of allowable value
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”

7.2.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

7.2.6 Test Results

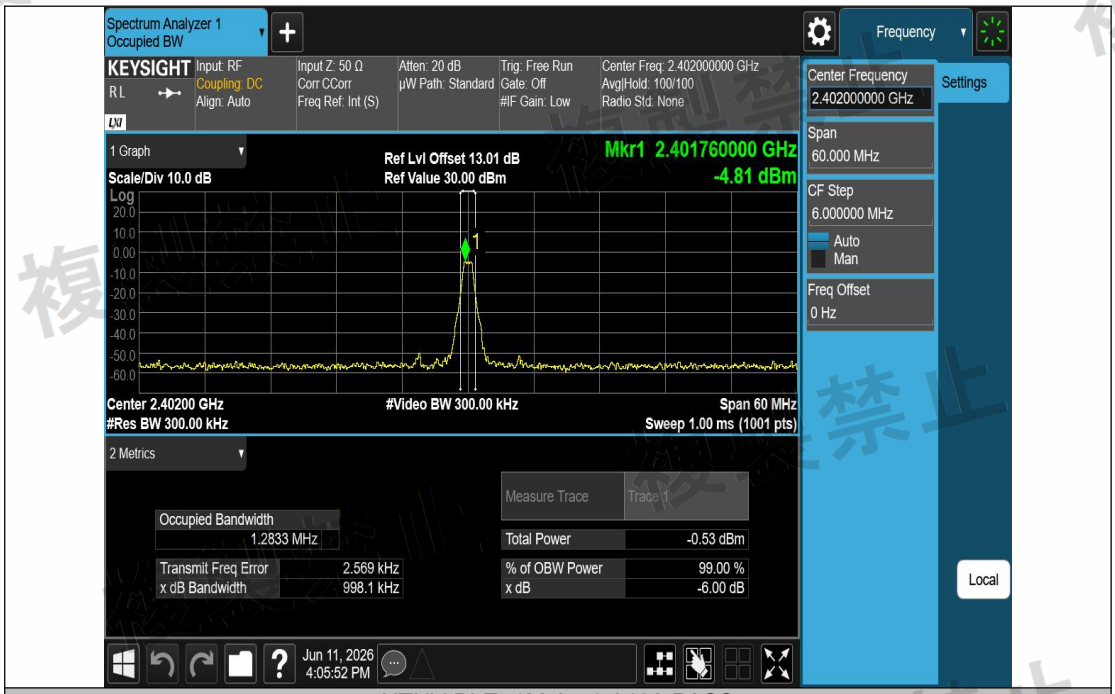
Occupied Bandwidth

TestCondition	TestMode	Antenna	Freq(MHz)	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	1.283	≤26	PASS
NTNV	BLE_1M	Ant1	2440	1.266	≤26	PASS
NTNV	BLE_1M	Ant1	2480	1.274	≤26	PASS
NTNV	BLE_2M	Ant1	2402	2.176	≤26	PASS
NTNV	BLE_2M	Ant1	2440	2.107	≤26	PASS
NTNV	BLE_2M	Ant1	2480	2.139	≤26	PASS

Spread Bandwidth

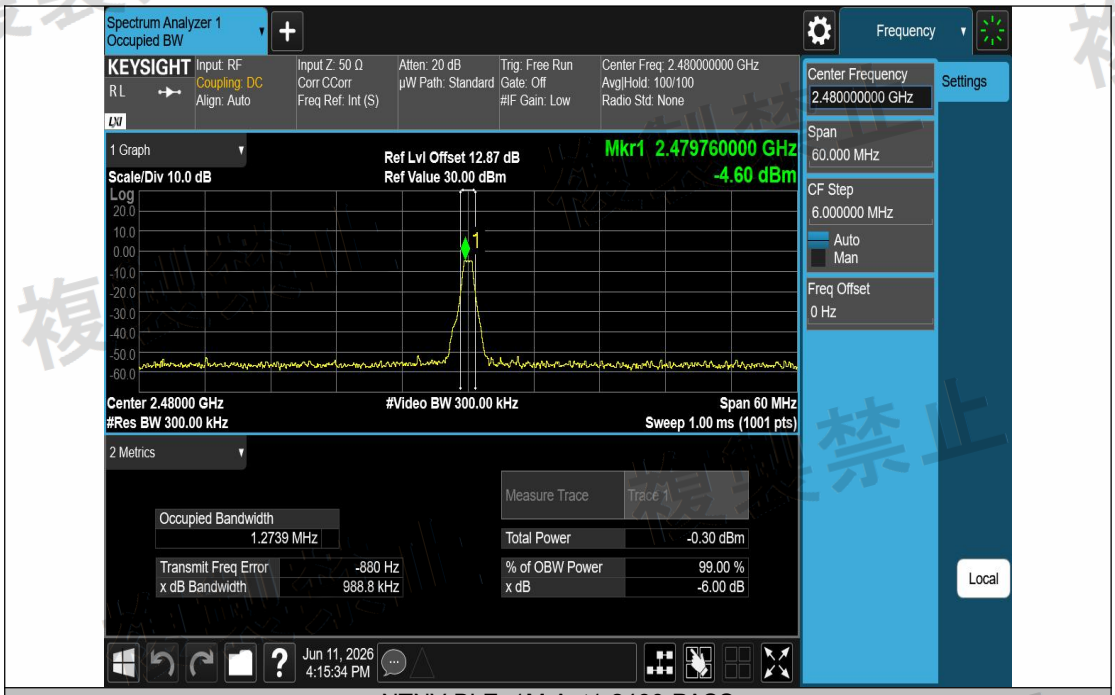
TestCondition	TestMode	Antenna	Freq(MHz)	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	0.967	≥0.5	PASS
NTNV	BLE_1M	Ant1	2440	0.957	≥0.5	PASS
NTNV	BLE_1M	Ant1	2480	0.963	≥0.5	PASS
NTNV	BLE_2M	Ant1	2402	1.489	≥0.5	PASS
NTNV	BLE_2M	Ant1	2440	1.458	≥0.5	PASS
NTNV	BLE_2M	Ant1	2480	1.489	≥0.5	PASS

Occupied Bandwidth

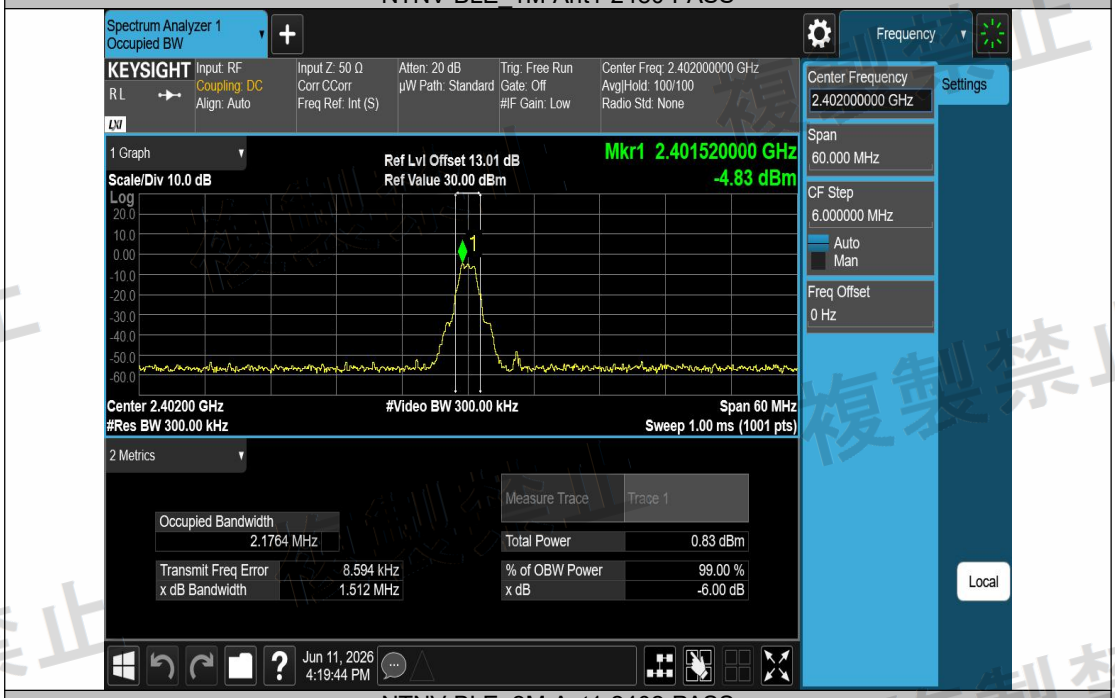


NTNV-BLE_1M-Ant1-2402-PASS

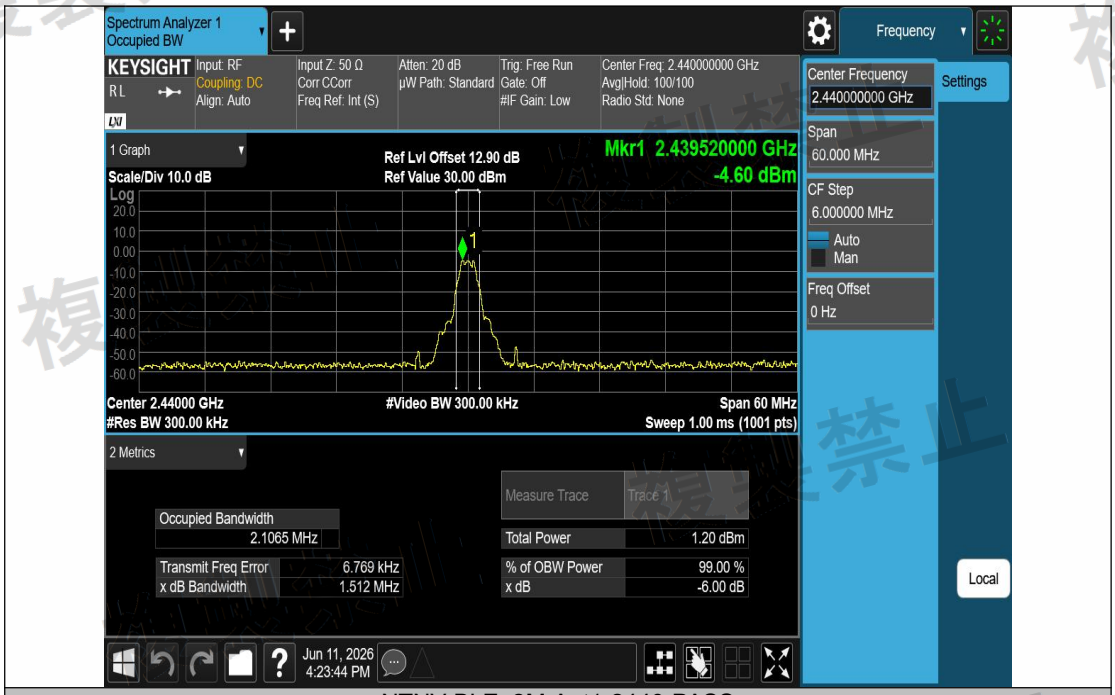
NTNV-BLE_1M-Ant1-2440-PASS



NTNV-BLE_1M-Ant1-2480-PASS



NTNV-BLE_2M-Ant1-2402-PASS



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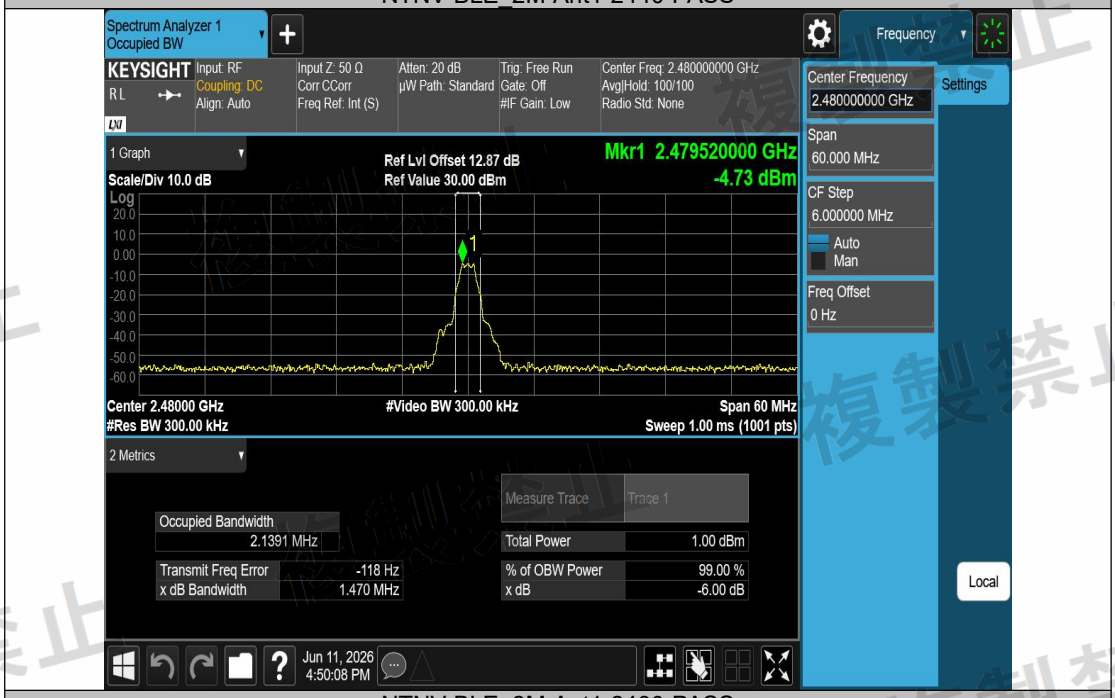
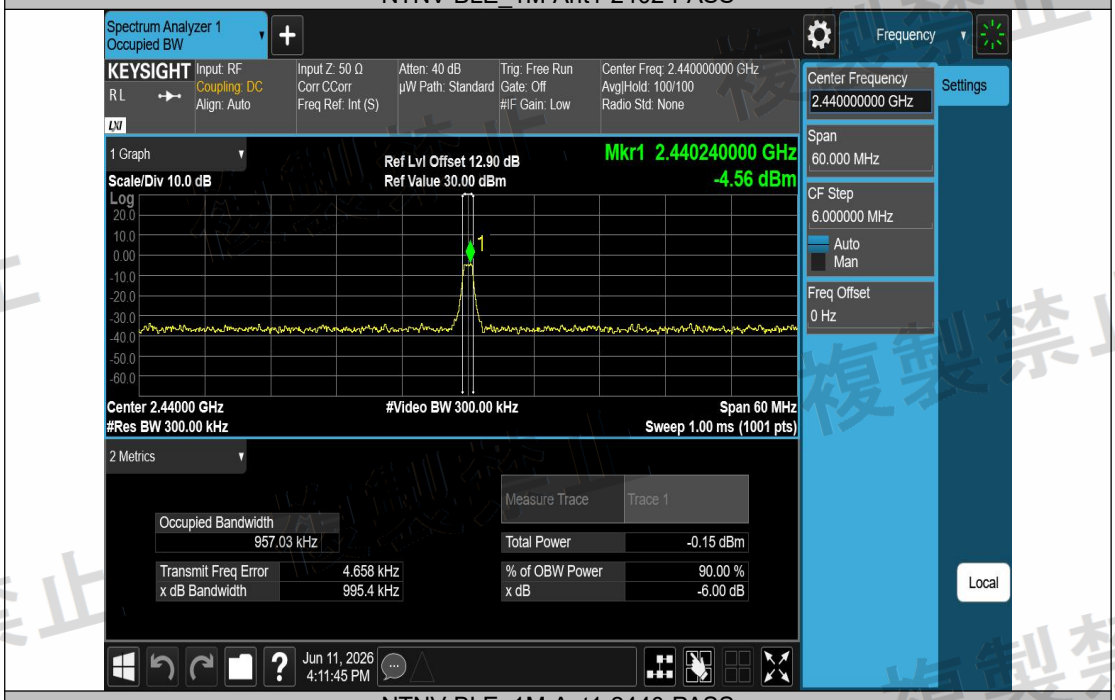


NTNV-BLE_2M-Ant1-2480-PASS

Spread Bandwidth

NTNV-BLE_1M-Ant1-2402-PASS



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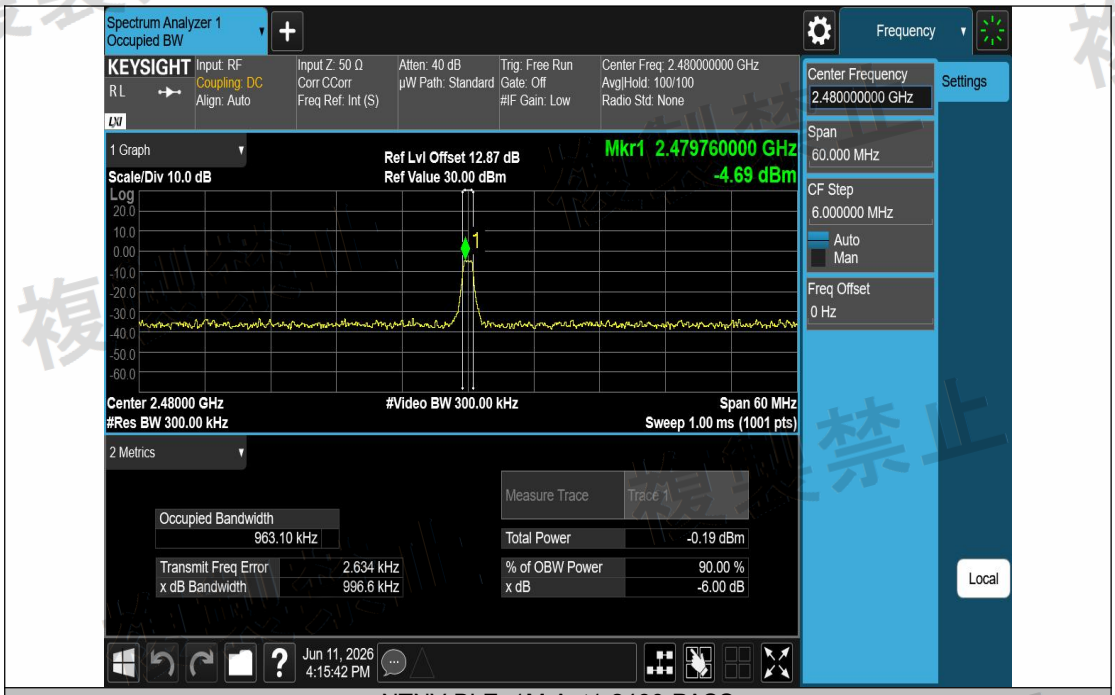

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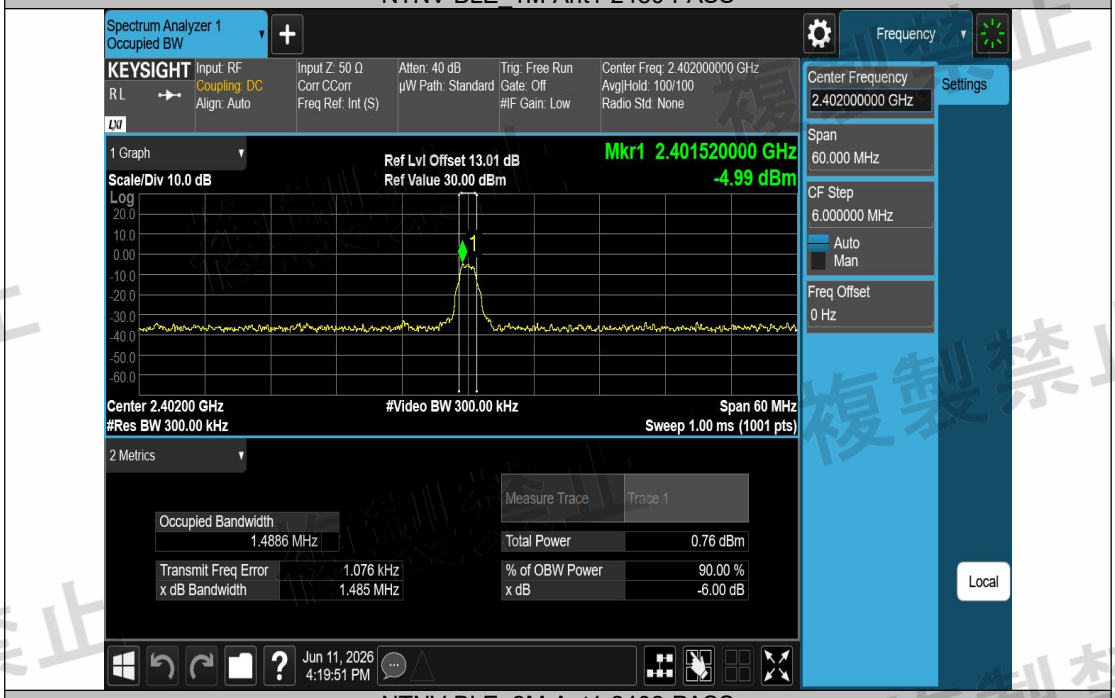

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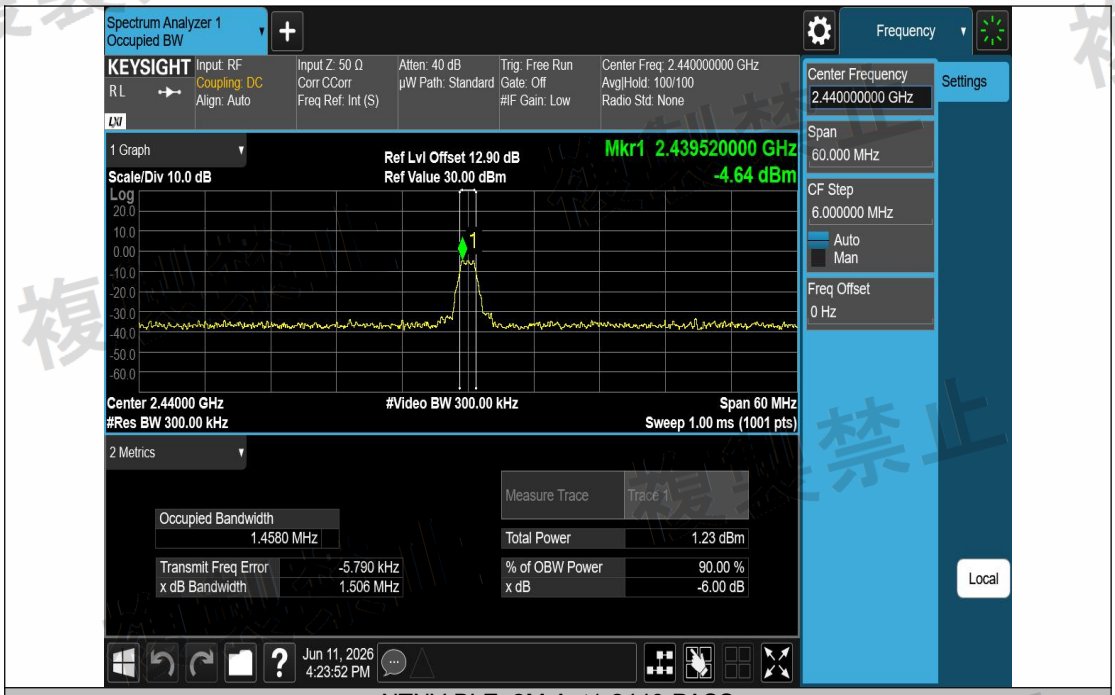
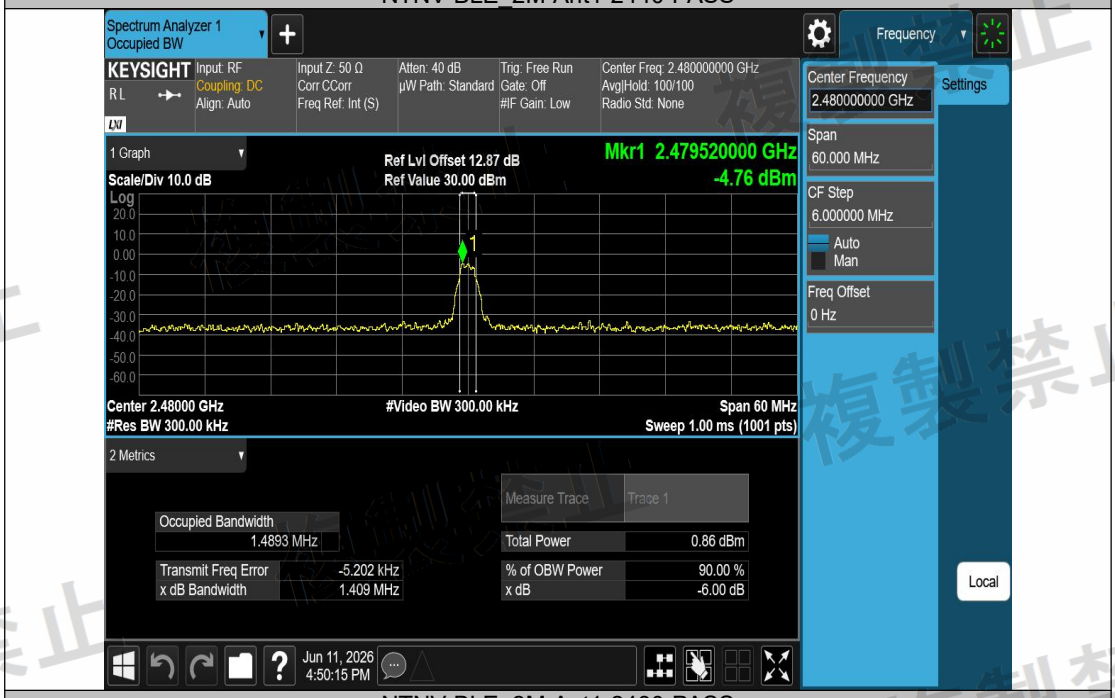


NTNV-BLE_2M-Ant1-2440-PASS



NTNV-BLE_2M-Ant1-2480-PASS

7.3 HOPPING FREQUENCY STAYING TIME (DWELL TIME)

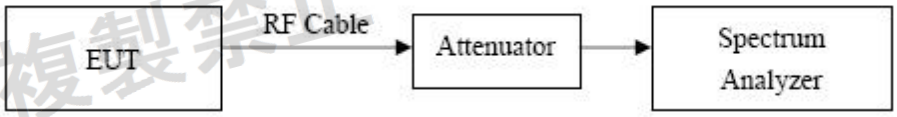
7.3.1 Applicable Standard

According to Item 19 of Article 2 Paragraph 1.

7.3.2 Conformance Limit

Frequency dwell time (time during which radio waves continue to be emitted at a specified frequency) of a transmitting equipment using the FH system shall be 0.4 seconds or less. When a simple system (except hybrid system) is used ,total frequency dwell time at an arbitrary frequency within the time period obtained by multiplying 0.4 seconds by the process gain shall be 0.4 seconds or less.

7.3.3 Test Setup Block Diagram



7.3.4 Test Procedure

Set the EUT at the test frequency with test spreading code(Frequency Hopping), then modulation is performed with standard PN test signal
Spectrum analyzer is set as below

Central Frequency	Measurement hopping frequency
Sweep Frequency Bandwidth	0 MHz
Resolution Bandwidth	Approx. 1 MHz
Video Bandwidth	Same level as resolution bandwidth
Y-Axis Scale	10 dB/Div
Sweep Time	Hopping period
Sweep Mode	Single sweep
Trigger Condition	Video trigger
Phase-Detection Mode	Positive peak

Set the spectrum analyzer as in 2 above, wait for the hopping signal at the frequency to hop to.
Read the staying time from the trajectory on the screen at the frequency to hop in the hopping period by using marker, confirm the summation of the staying time to be less than 0.4 seconds.
In the same manner as (2), read the integral of the staying time at the frequency to hop in the hopping period.
Calculate the total of the frequency staying time at the frequency to hop to as described in the equation below.
Repeat the measurement for each frequency to hop.

7.3.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

7.3.6 Test Results

N/A

7.4 POWER TO ANTENNA (CONDUCTED)

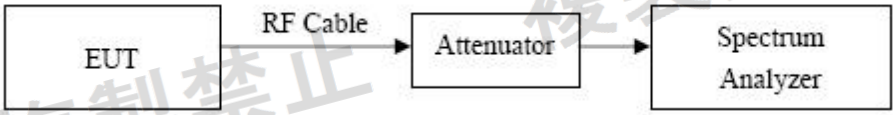
7.4.1 Applicable Standard

According to Item 19 of Article 2 Paragraph 1.

7.4.2 Conformance Limit

The maximum permit antenna power is 3mW/MHz for DSSS the maximum permit antenna power is 10mW, and the maximum permit tolerance is +20%

7.4.3 Test Setup Block Diagram



7.4.4 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	3 MHz
Video Bandwidth	Approx. twice the resolution bandwidth (VBW=6MHz)
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	3 MHz
Video Bandwidth	Same level as the resolution bandwidth
Sweep Mode	Consecutive sweep
Phase-Detection Mode	Sample

Measurement Procedure
Frequency hopping system or combined systems of direct spread and frequency hopping:
a. Connect the high frequency power meter to the output of the attenuator and measure the total power (without bandwidth limitation)
b. Divide the total power by the spread bandwidth to find the “average” power per MHz.
c. Confirm that frequency distribution of the hopping frequencies is homogeneous according to the supporting data. If frequency distribution of the frequencies is not homogeneous, consider other measurement or correction methods based on the supporting data.
d. Set the antenna power as follows:
- Continuous waves: value in b.
- Burst waves: value in b. 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)
.

7.4.5 Environmental Conditions

Temperature:	25°C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

7.4.6 Test Results

TestCondition	TestMode	Antenna	Freq(MHz)	Result(dBm)	Result(mW)	Limit(mW)	Verdict
NTNV	BLE_1M	Ant1	2402	-5.48	0.2831	≤10	PASS
NTNV	BLE_1M	Ant1	2440	-5.23	0.2999	≤10	PASS
NTNV	BLE_1M	Ant1	2480	-5.58	0.2767	≤10	PASS
NTNV	BLE_2M	Ant1	2402	-8.18	0.1521	≤10	PASS
NTNV	BLE_2M	Ant1	2440	-7.67	0.1710	≤10	PASS
NTNV	BLE_2M	Ant1	2480	-7.06	0.1968	≤10	PASS

Test Condition	Test Mode	Antenna	Freq(MHz)	Power (mW)	RatedPower (mW)	Result (%)	Limit (%)	Verdict
NTNV	BLE_1M	Ant1	2402	0.2831	0.5	-43.38	+20	PASS
NTNV	BLE_1M	Ant1	2440	0.2999	0.5	-40.02	+20	PASS
NTNV	BLE_1M	Ant1	2480	0.2767	0.5	-44.66	+20	PASS
NTNV	BLE_2M	Ant1	2402	0.1521	0.5	-69.58	+20	PASS
NTNV	BLE_2M	Ant1	2440	0.1710	0.5	-65.80	+20	PASS
NTNV	BLE_2M	Ant1	2480	0.1968	0.5	-60.64	+20	PASS

TestCondition	TestMode	Antenna	Freq(MHz)	Result(dBm)	EIRP(dBm)	Limit(dBm)	Verdict
NTNV	BLE_1M	Ant1	2402	-5.48	-3.56	≤12.14	PASS
NTNV	BLE_1M	Ant1	2440	-5.23	-3.31	≤12.14	PASS
NTNV	BLE_1M	Ant1	2480	-5.58	-3.66	≤12.14	PASS
NTNV	BLE_2M	Ant1	2402	-8.18	-6.26	≤12.14	PASS
NTNV	BLE_2M	Ant1	2440	-7.67	-5.75	≤12.14	PASS
NTNV	BLE_2M	Ant1	2480	-7.06	-5.14	≤12.14	PASS

Note: Tolerance = (Output Power – Rated Output Power) / Rated Output Power * 100%

7.5 SPURIOUS EMISSIONS INTENSITY

7.5.1 Applicable Standard

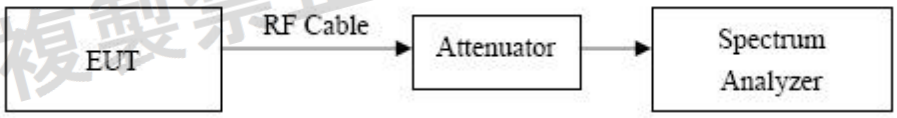
According to Item 19 of Article 2 Paragraph 1.

7.5.2 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. 2,387MHz ≤ f ≤ 2,400MHz and 2,483.5MHz < f ≤ 2,496.5MHz 25 μW(-16dB) or less
b. 2,387MHz > f and 2,496.5MHz < f 2.5 μW(-26dB) or less

7.5.3 Test Setup Block Diagram



7.5.4 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 uW 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 << 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

1. Respectively mark the maximum results in the above sweep bandwidth.

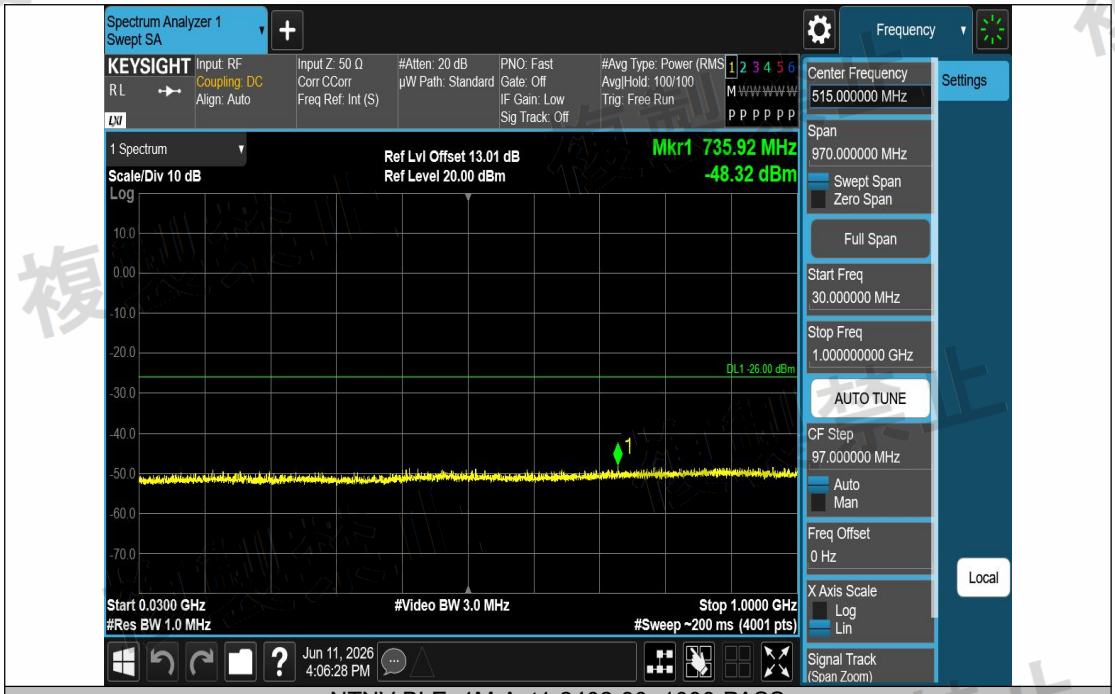
7.5.5 Environmental Conditions

Temperature:	25°C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

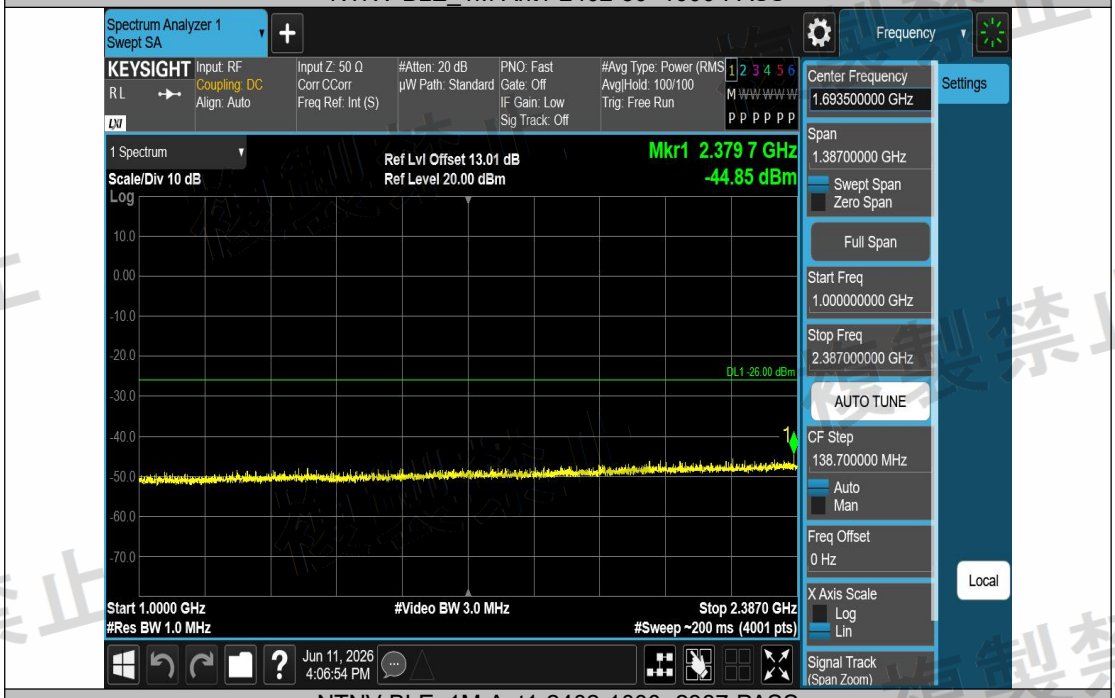
7.5.6 Test Results

TestCondition	TestMode	Antenna	Freq(MHz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Result [μW/MHz]	Limit [μW/MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	30~1000	735.92	-48.32	≤-26	0.01472	≤2.5	PASS
NTNV	BLE_1M	Ant1	2402	1000~2387	2379.72	-44.85	≤-26	0.03273	≤2.5	PASS
NTNV	BLE_1M	Ant1	2402	2387~2400	2399.95	-32.47	≤-16	0.56624	≤25	PASS
NTNV	BLE_1M	Ant1	2402	2483.5~2496.5	2487.38	-35.61	≤-16	0.27479	≤25	PASS
NTNV	BLE_1M	Ant1	2402	2496.5~3000	2716.96	-45.27	≤-26	0.02972	≤2.5	PASS
NTNV	BLE_1M	Ant1	2402	3000~13000	8050.50	-43.02	≤-26	0.04989	≤2.5	PASS
NTNV	BLE_1M	Ant1	2440	30~1000	862.26	-47.90	≤-26	0.01622	≤2.5	PASS
NTNV	BLE_1M	Ant1	2440	1000~2387	2364.81	-45.53	≤-26	0.02799	≤2.5	PASS
NTNV	BLE_1M	Ant1	2440	2387~2400	2391.30	-35.93	≤-16	0.25527	≤25	PASS
NTNV	BLE_1M	Ant1	2440	2483.5~2496.5	2487.32	-35.49	≤-16	0.28249	≤25	PASS
NTNV	BLE_1M	Ant1	2440	2496.5~3000	2851.90	-45.79	≤-26	0.02636	≤2.5	PASS
NTNV	BLE_1M	Ant1	2440	3000~13000	8856.00	-43.27	≤-26	0.04710	≤2.5	PASS
NTNV	BLE_1M	Ant1	2480	30~1000	954.65	-48.12	≤-26	0.01542	≤2.5	PASS
NTNV	BLE_1M	Ant1	2480	1000~2387	2337.41	-43.98	≤-26	0.03999	≤2.5	PASS
NTNV	BLE_1M	Ant1	2480	2387~2400	2393.05	-35.87	≤-16	0.25882	≤25	PASS
NTNV	BLE_1M	Ant1	2480	2483.5~2496.5	2489.93	-35.72	≤-16	0.26792	≤25	PASS
NTNV	BLE_1M	Ant1	2480	2496.5~3000	2662.55	-45.75	≤-26	0.02661	≤2.5	PASS
NTNV	BLE_1M	Ant1	2480	3000~13000	4902.00	-42.63	≤-26	0.05458	≤2.5	PASS
NTNV	BLE_2M	Ant1	2402	30~1000	910.52	-47.65	≤-26	0.01718	≤2.5	PASS
NTNV	BLE_2M	Ant1	2402	1000~2387	2331.17	-45.90	≤-26	0.02570	≤2.5	PASS
NTNV	BLE_2M	Ant1	2402	2387~2400	2399.99	-24.82	≤-16	3.29610	≤25	PASS
NTNV	BLE_2M	Ant1	2402	2483.5~2496.5	2492.44	-35.48	≤-16	0.28314	≤25	PASS
NTNV	BLE_2M	Ant1	2402	2496.5~3000	2662.73	-45.67	≤-26	0.02710	≤2.5	PASS
NTNV	BLE_2M	Ant1	2402	3000~13000	8452.50	-43.38	≤-26	0.04592	≤2.5	PASS
NTNV	BLE_2M	Ant1	2440	30~1000	925.07	-48.03	≤-26	0.01574	≤2.5	PASS
NTNV	BLE_2M	Ant1	2440	1000~2387	2272.92	-45.29	≤-26	0.02958	≤2.5	PASS
NTNV	BLE_2M	Ant1	2440	2387~2400	2393.92	-36.07	≤-16	0.24717	≤25	PASS
NTNV	BLE_2M	Ant1	2440	2483.5~2496.5	2487.23	-35.06	≤-16	0.31189	≤25	PASS
NTNV	BLE_2M	Ant1	2440	2496.5~3000	2623.73	-45.47	≤-26	0.02838	≤2.5	PASS
NTNV	BLE_2M	Ant1	2440	3000~13000	4021.50	-43.11	≤-26	0.04887	≤2.5	PASS
NTNV	BLE_2M	Ant1	2480	30~1000	905.43	-47.76	≤-26	0.01675	≤2.5	PASS

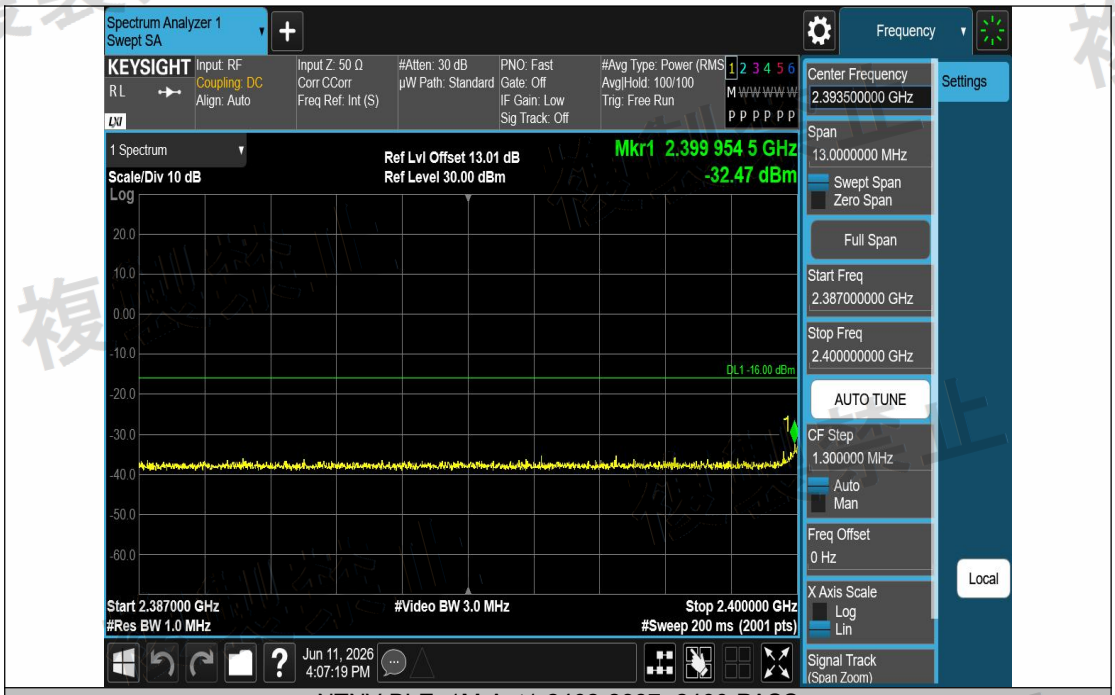
NTNV	BLE_2M	Ant1	2480	1000~2387	2318.00	-45.84	≤-26	0.02606	≤2.5	PASS
NTNV	BLE_2M	Ant1	2480	2387~2400	2399.80	-36.09	≤-16	0.24604	≤25	PASS
NTNV	BLE_2M	Ant1	2480	2483.5~2496.5	2490.73	-35.21	≤-16	0.30130	≤25	PASS
NTNV	BLE_2M	Ant1	2480	2496.5~3000	2733.02	-45.41	≤-26	0.02877	≤2.5	PASS
NTNV	BLE_2M	Ant1	2480	3000~13000	4041.00	-42.92	≤-26	0.05105	≤2.5	PASS



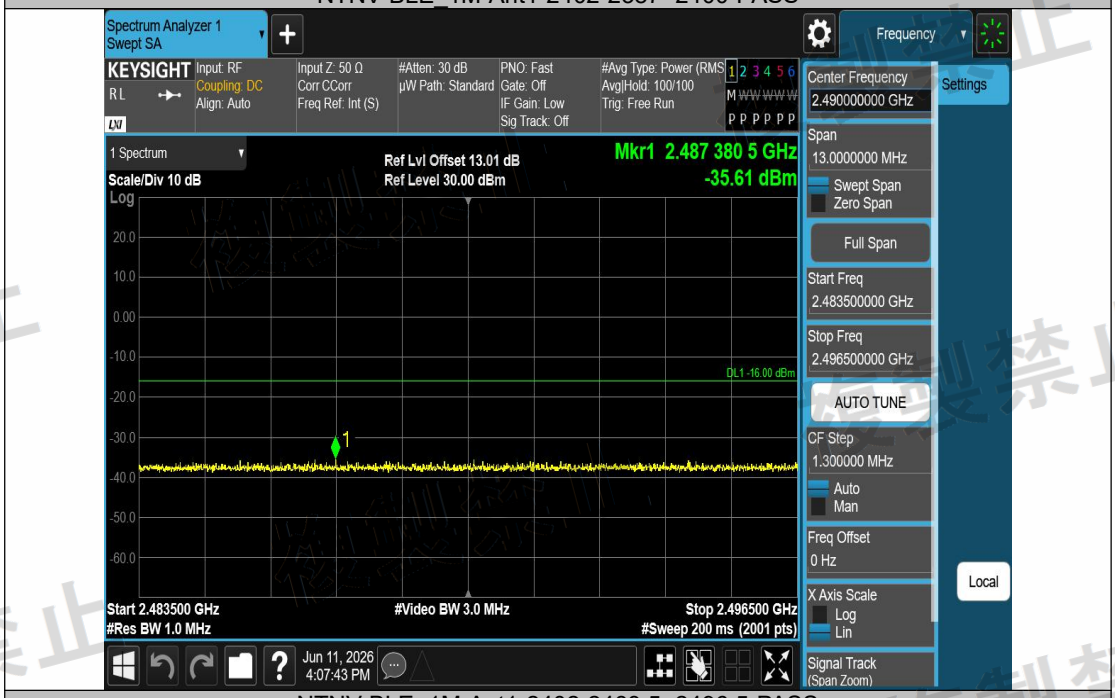
NTNV-BLE_1M-Ant1-2402-30~1000-PASS



NTNV-BLE_1M-Ant1-2402-1000~2387-PASS



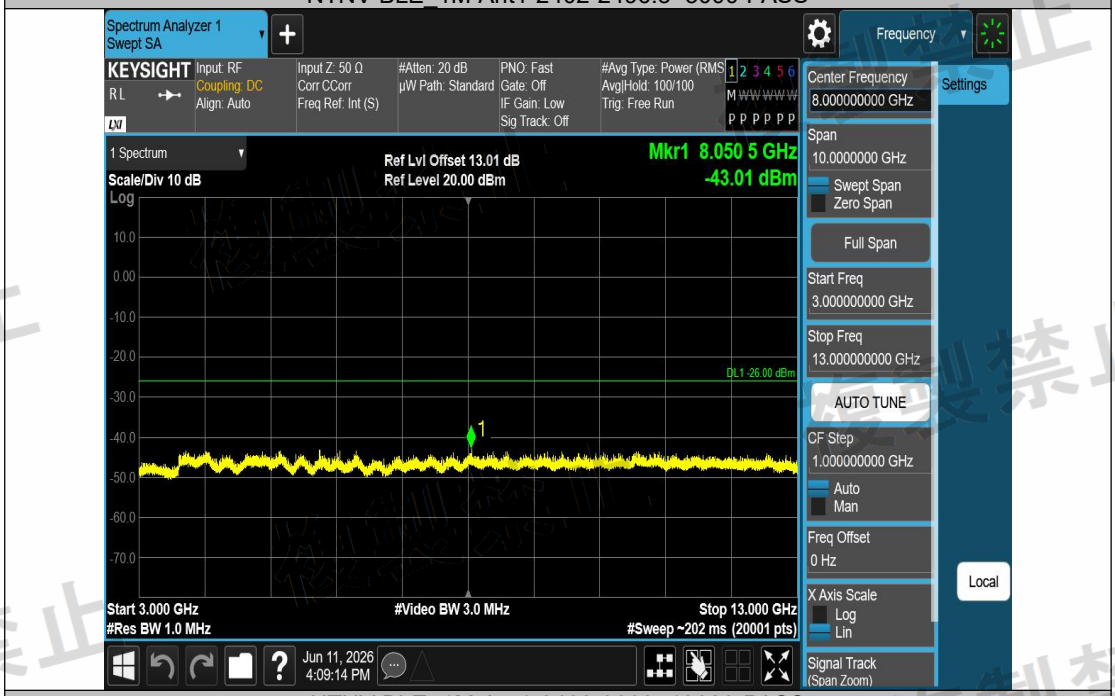
NTNV-BLE_1M-Ant1-2402-2387~2400-PASS



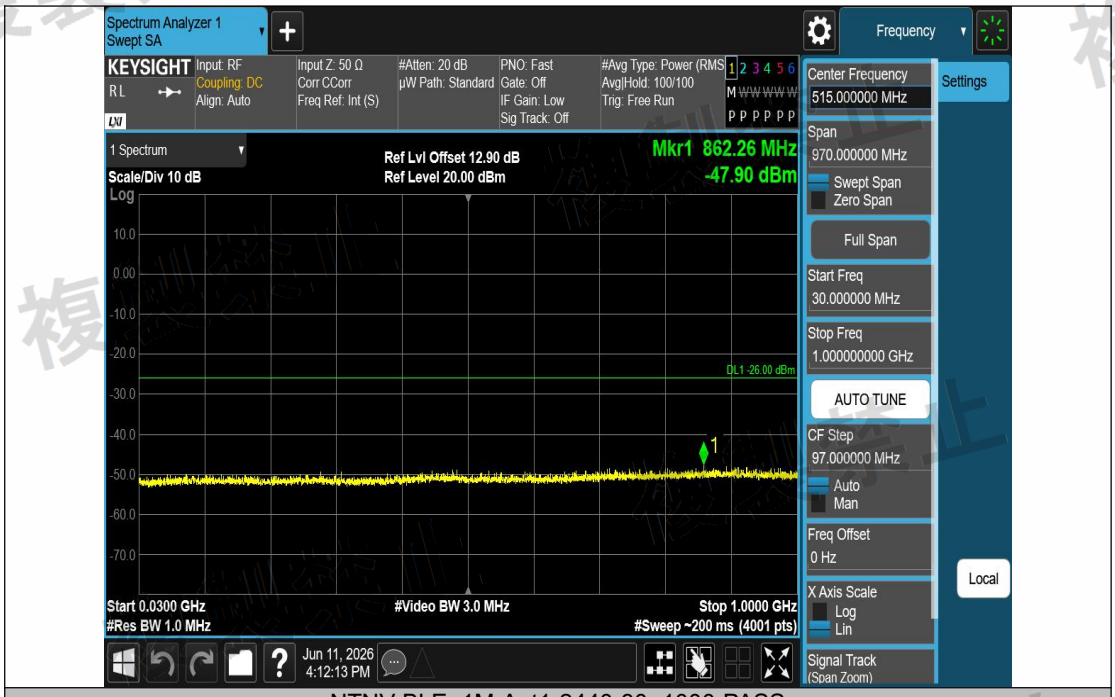
NTNV-BLE_1M-Ant1-2402-2483.5~2496.5-PASS

複製禁止

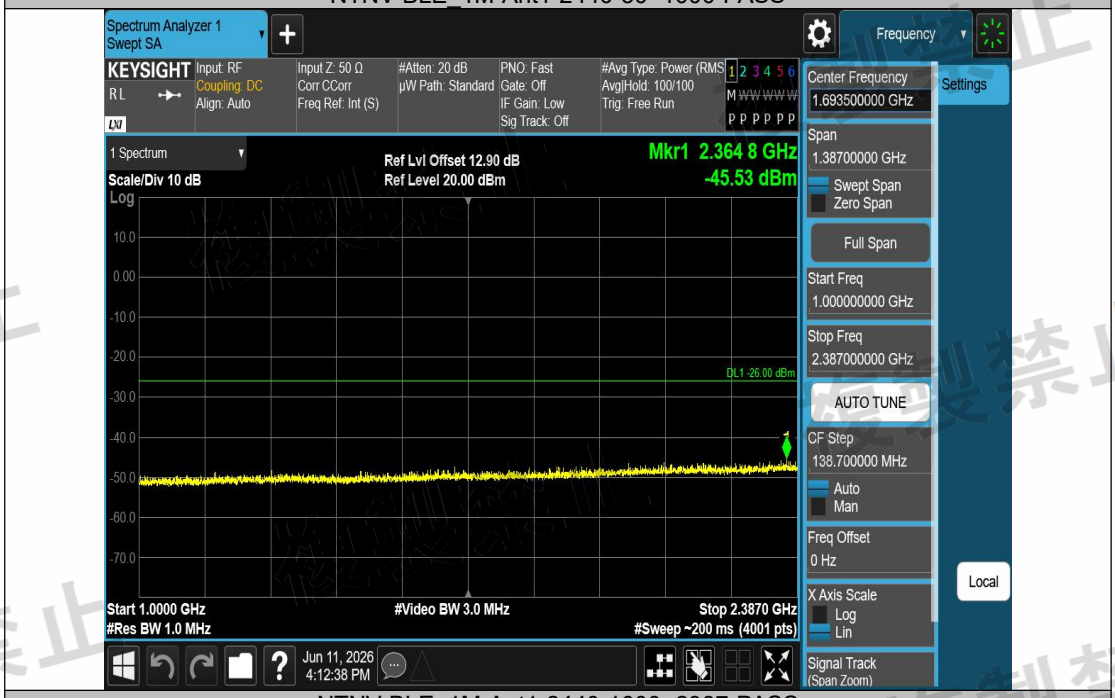
NTNV-BLE_1M-Ant1-2402-2496.5~3000-PASS



NTNV-BLE_1M-Ant1-2402-3000~13000-PASS

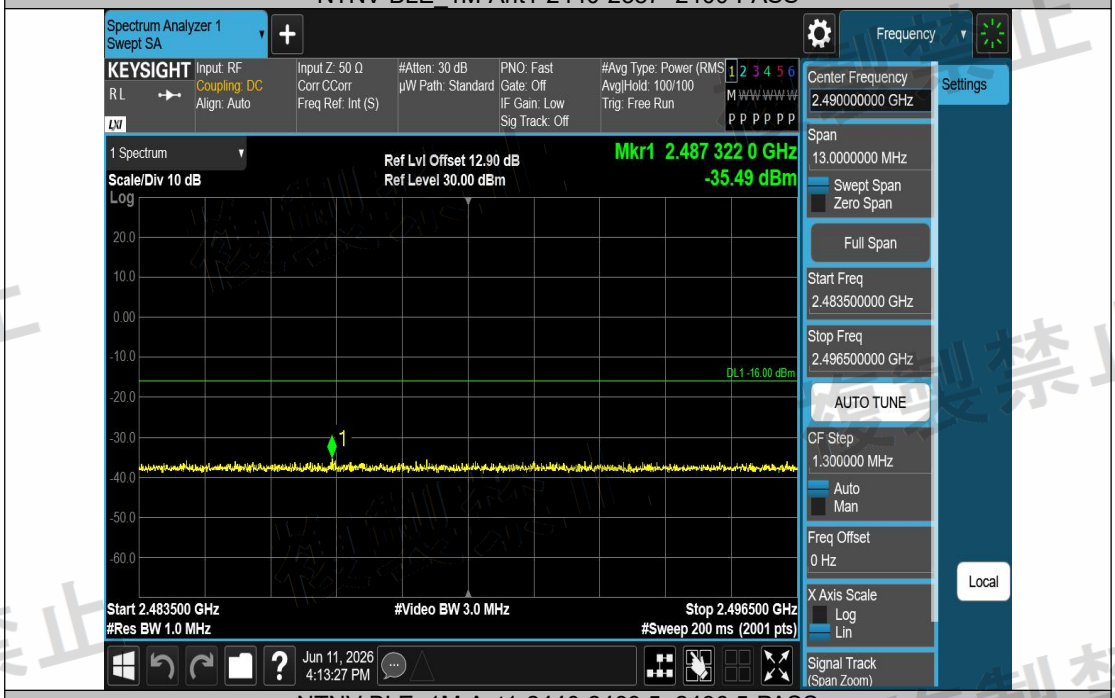


NTNV-BLE_1M-Ant1-2440-30~1000-PASS



NTNV-BLE_1M-Ant1-2440-1000~2387-PASS

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



NTNV-BLE_1M-Ant1-2440-2483.5~2496.5-PASS

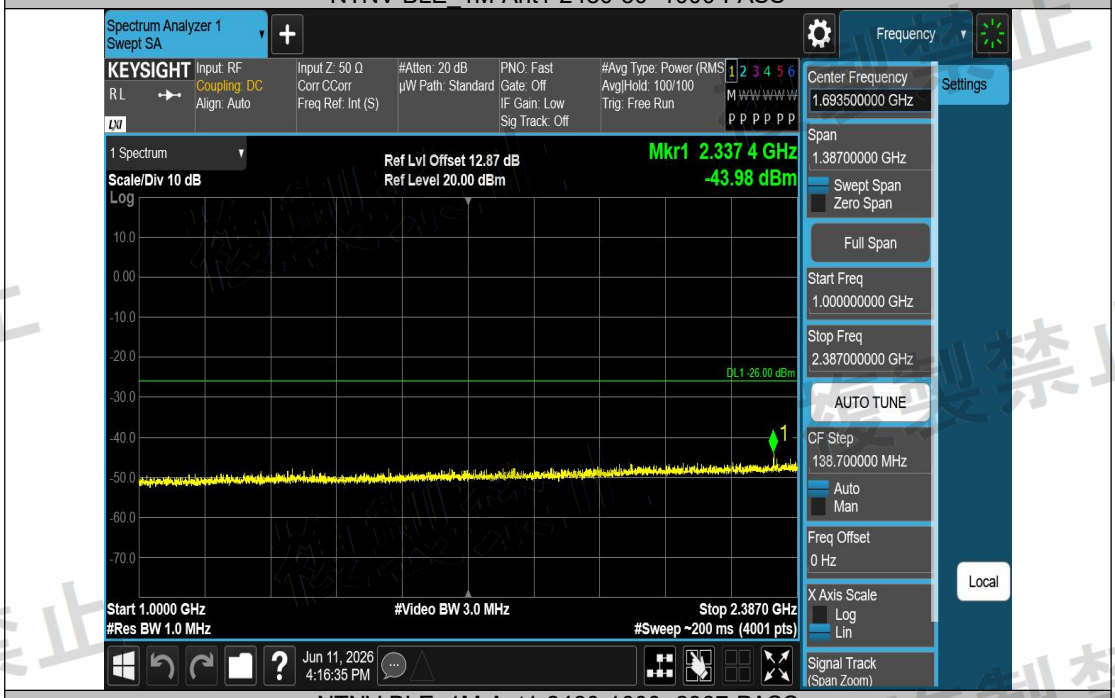
複製禁止

NTNV-BLE_1M-Ant1-2440-2496.5~3000-PASS

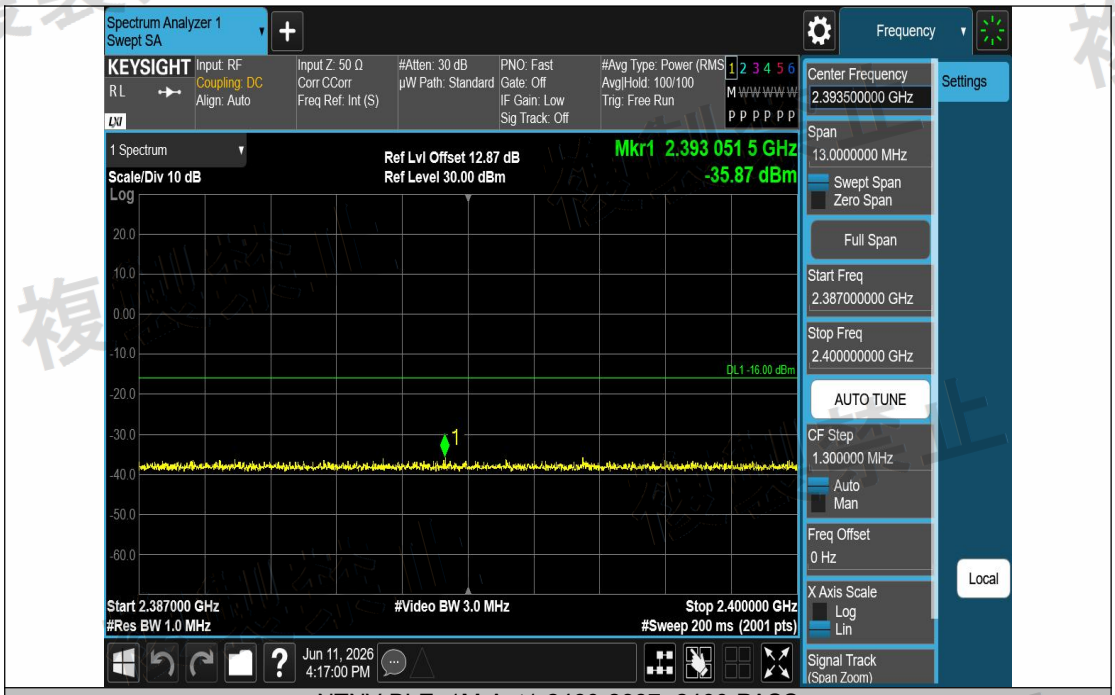
NTNV-BLE_1M-Ant1-2440-3000~13000-PASS

複製禁止

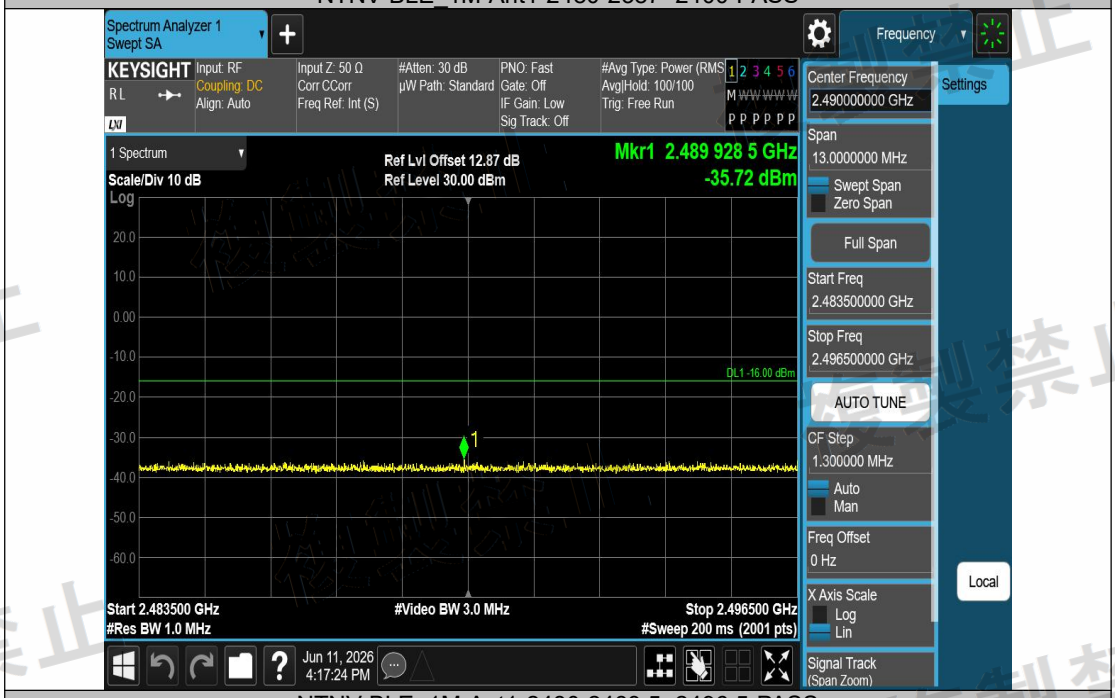
NTNV-BLE_1M-Ant1-2480-30~1000-PASS



NTNV-BLE_1M-Ant1-2480-1000~2387-PASS



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

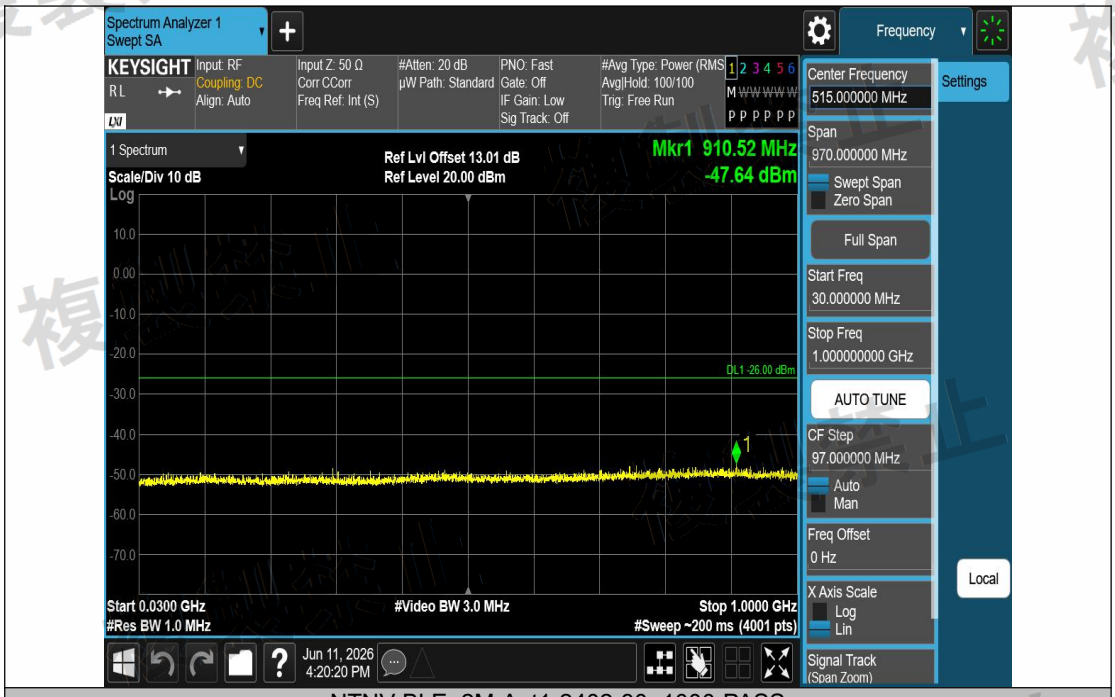


NTNV-BLE_1M-Ant1-2480-2483.5~2496.5-PASS

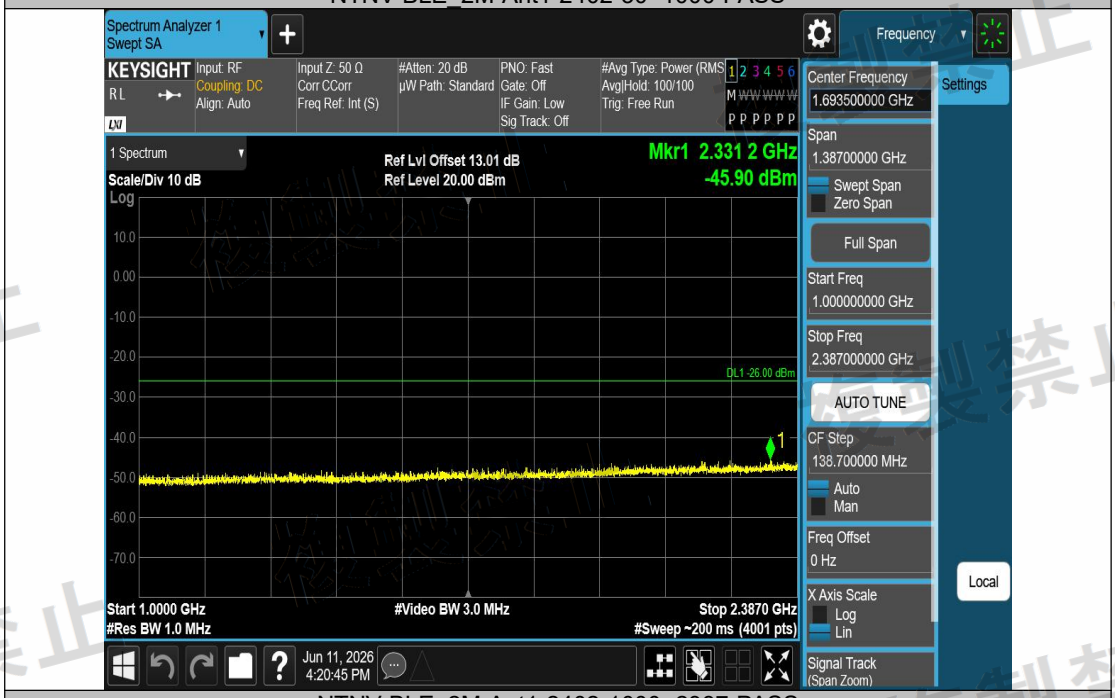
複製禁止

NTNV-BLE_1M-Ant1-2480-2496.5~3000-PASS

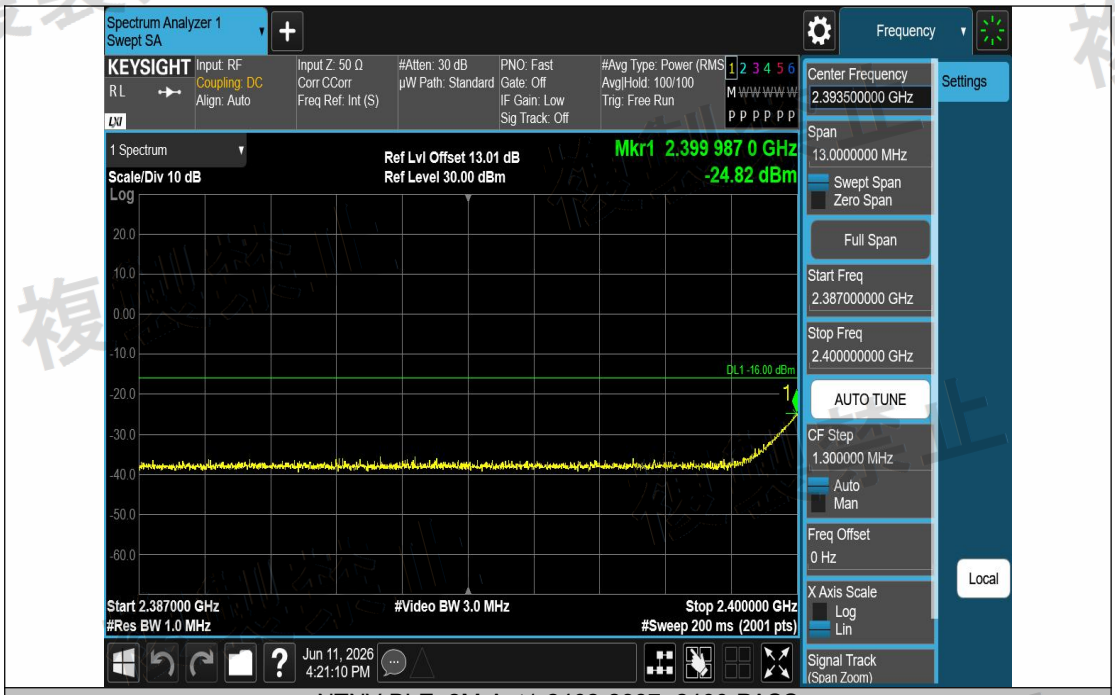
NTNV-BLE_1M-Ant1-2480-3000~13000-PASS



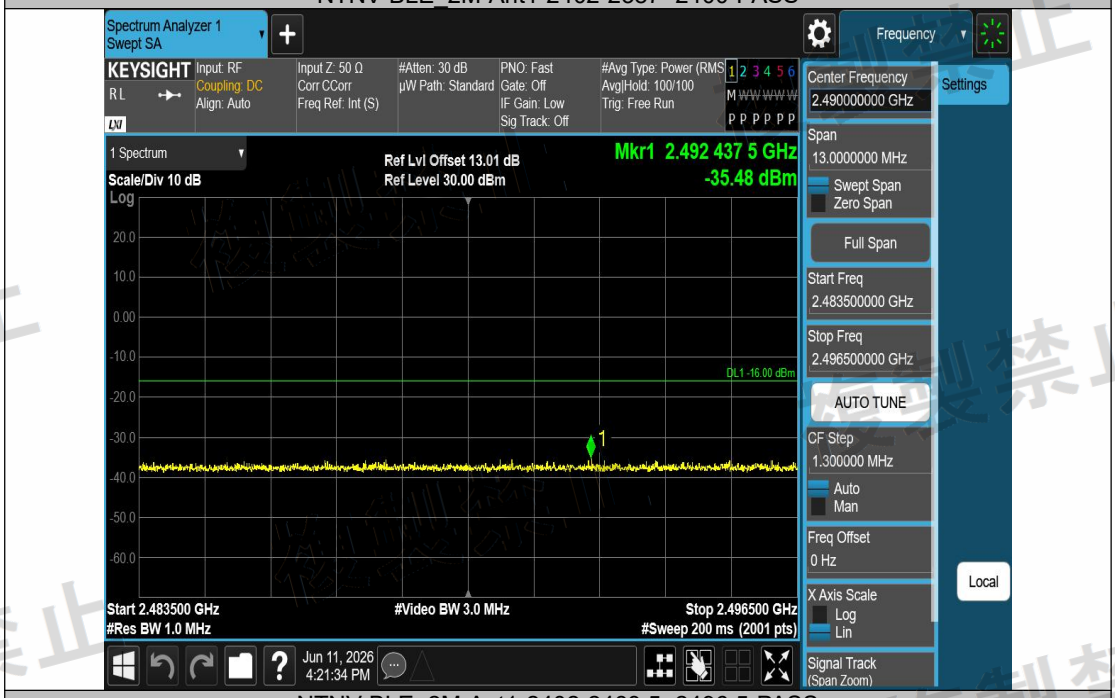
NTNV-BLE_2M-Ant1-2402-30~1000-PASS



NTNV-BLE_2M-Ant1-2402-1000~2387-PASS



NTNV-BLE_2M-Ant1-2402-2387~2400-PASS

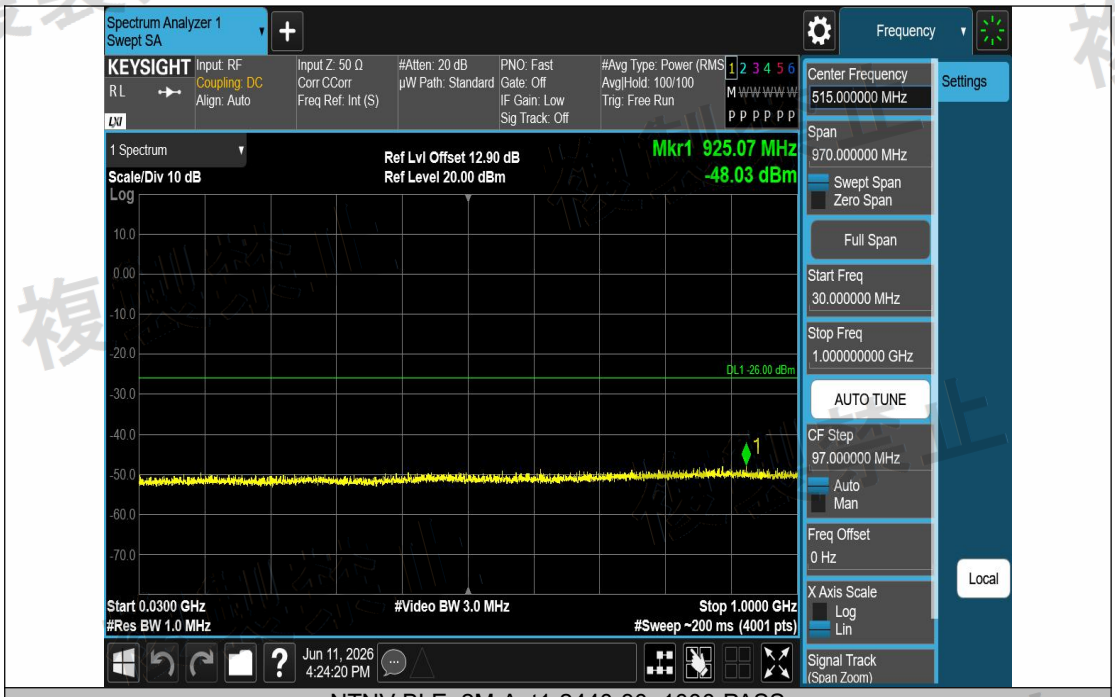


NTNV-BLE_2M-Ant1-2402-2483.5~2496.5-PASS

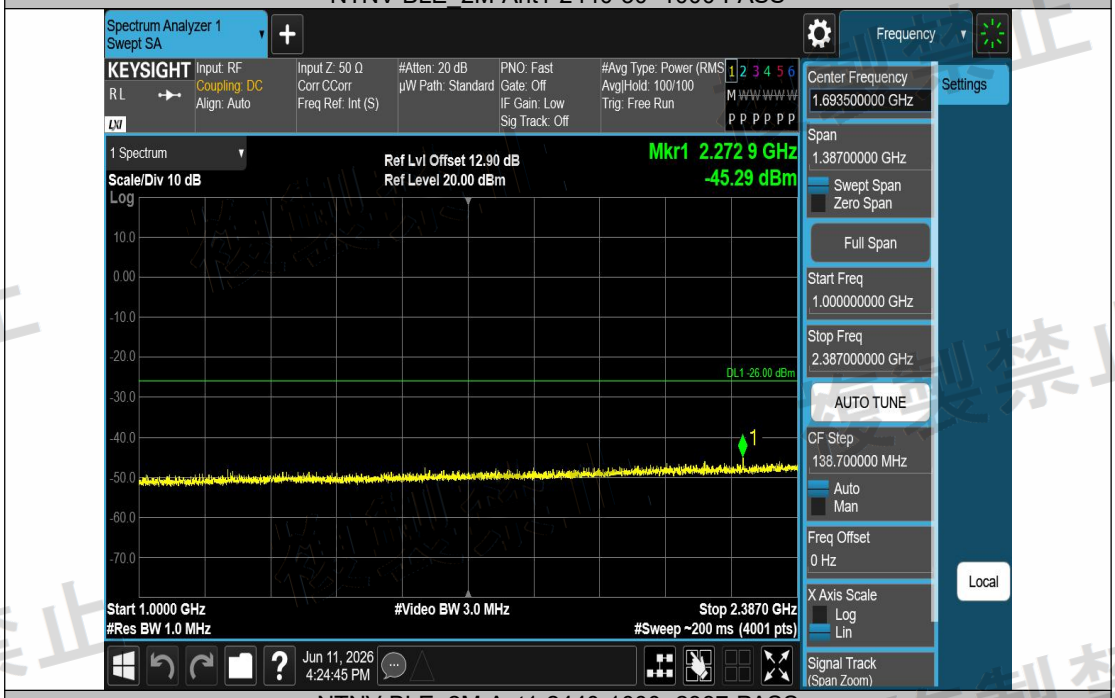
複製禁止

NTNV-BLE_2M-Ant1-2402-2496.5~3000-PASS

NTNV-BLE_2M-Ant1-2402-3000~13000-PASS



NTNV-BLE_2M-Ant1-2440-30~1000-PASS



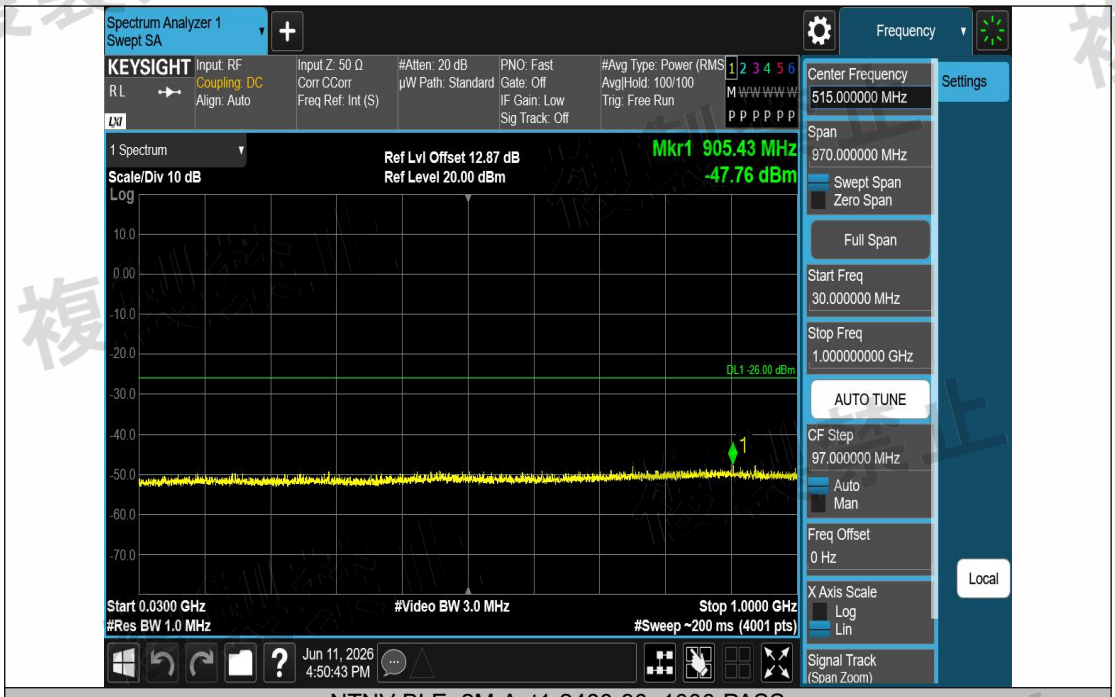
NTNV-BLE_2M-Ant1-2440-1000~2387-PASS

NTNV-BLE_2M-Ant1-2440-2387~2400-PASS

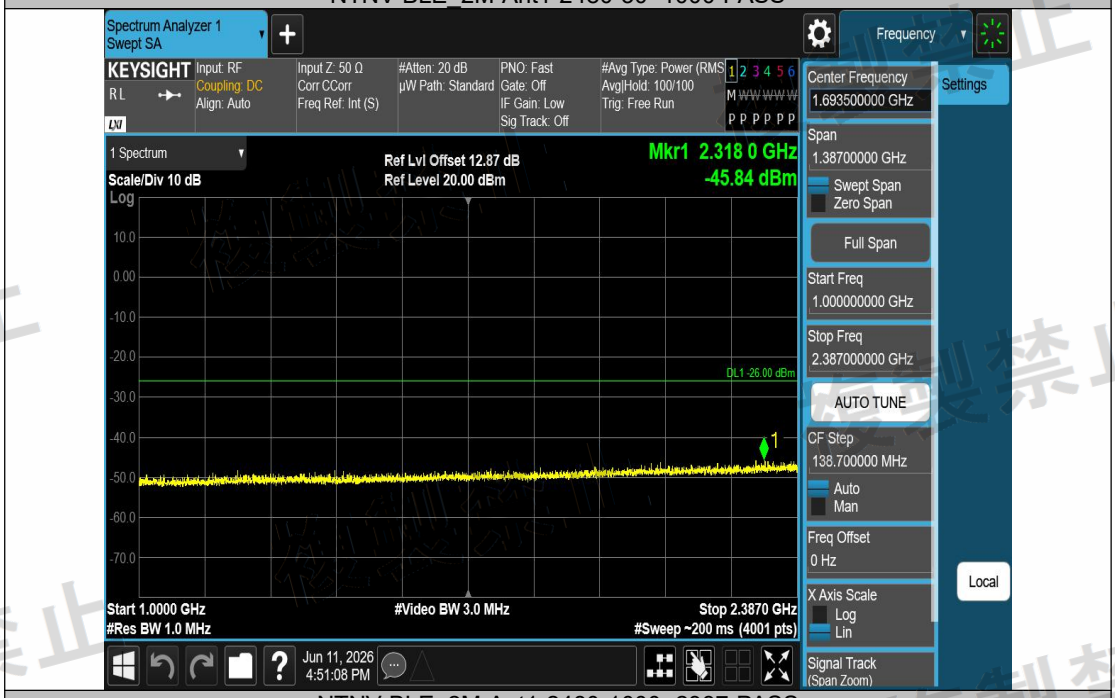
NTNV-BLE_2M-Ant1-2440-2483.5~2496.5-PASS

NTNV-BLE_2M-Ant1-2440-2496.5~3000-PASS

NTNV-BLE_2M-Ant1-2440-3000~13000-PASS



NTNV-BLE_2M-Ant1-2480-30~1000-PASS



NTNV-BLE_2M-Ant1-2480-1000~2387-PASS

NTNV-BLE_2M-Ant1-2480-2387~2400-PASS

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

複製禁止

NTNV-BLE_2M-Ant1-2480-2496.5~3000-PASS

NTNV-BLE_2M-Ant1-2480-3000~13000-PASS

7.6 COLLATERAL EMISSIONS OF RECEIVER

7.6.1 Applicable Standard

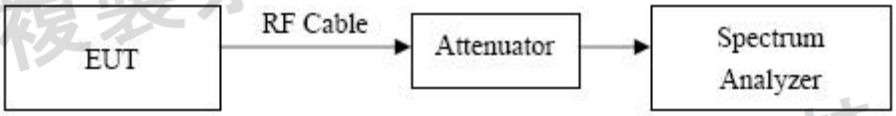
According to Item 19 of Article 2 Paragraph 1.

7.6.2 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

7.6.3 Test Setup Block Diagram



7.6.4 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 In case of frequency higher than 1 MHz
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 In case of frequency higher than 1 MHz
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).

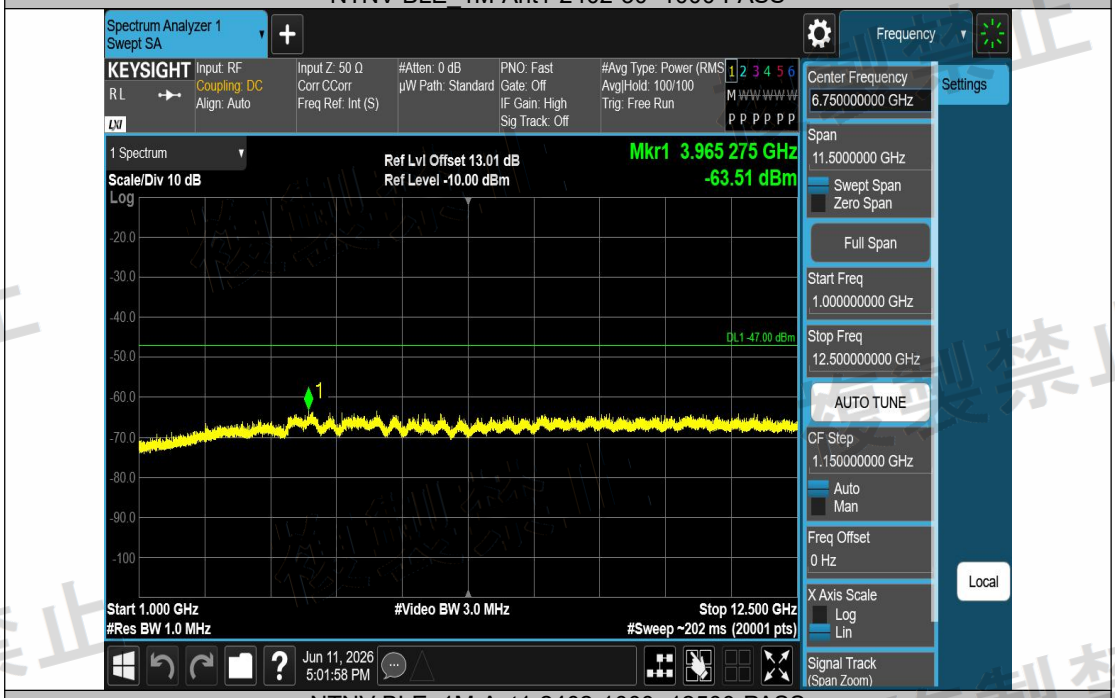
7.6.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

7.6.6 Test Results

TestCondition	TestMode	Antenna	Freq(MHz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	BLE_1M	Ant1	2402	30~1000	908.82	-79.62	≤-54	0.01091	≤4	PASS
NTNV	BLE_1M	Ant1	2402	1000~12500	3965.28	-63.51	≤-47	0.44566	≤20	PASS
NTNV	BLE_1M	Ant1	2440	30~1000	917.07	-79.17	≤-54	0.01211	≤4	PASS
NTNV	BLE_1M	Ant1	2440	1000~12500	2550.78	-62.83	≤-47	0.52119	≤20	PASS
NTNV	BLE_1M	Ant1	2480	30~1000	885.06	-79.26	≤-54	0.01186	≤4	PASS
NTNV	BLE_1M	Ant1	2480	1000~12500	4023.35	-63.10	≤-47	0.48978	≤20	PASS
NTNV	BLE_2M	Ant1	2402	30~1000	780.30	-79.63	≤-54	0.01089	≤4	PASS
NTNV	BLE_2M	Ant1	2402	1000~12500	3985.98	-62.86	≤-47	0.51761	≤20	PASS
NTNV	BLE_2M	Ant1	2440	30~1000	892.33	-79.45	≤-54	0.01135	≤4	PASS
NTNV	BLE_2M	Ant1	2440	1000~12500	4043.48	-63.61	≤-47	0.43551	≤20	PASS
NTNV	BLE_2M	Ant1	2480	30~1000	887.48	-79.36	≤-54	0.01159	≤4	PASS
NTNV	BLE_2M	Ant1	2480	1000~12500	4353.98	-63.43	≤-47	0.45394	≤20	PASS

NTNV-BLE_1M-Ant1-2402-30~1000-PASS

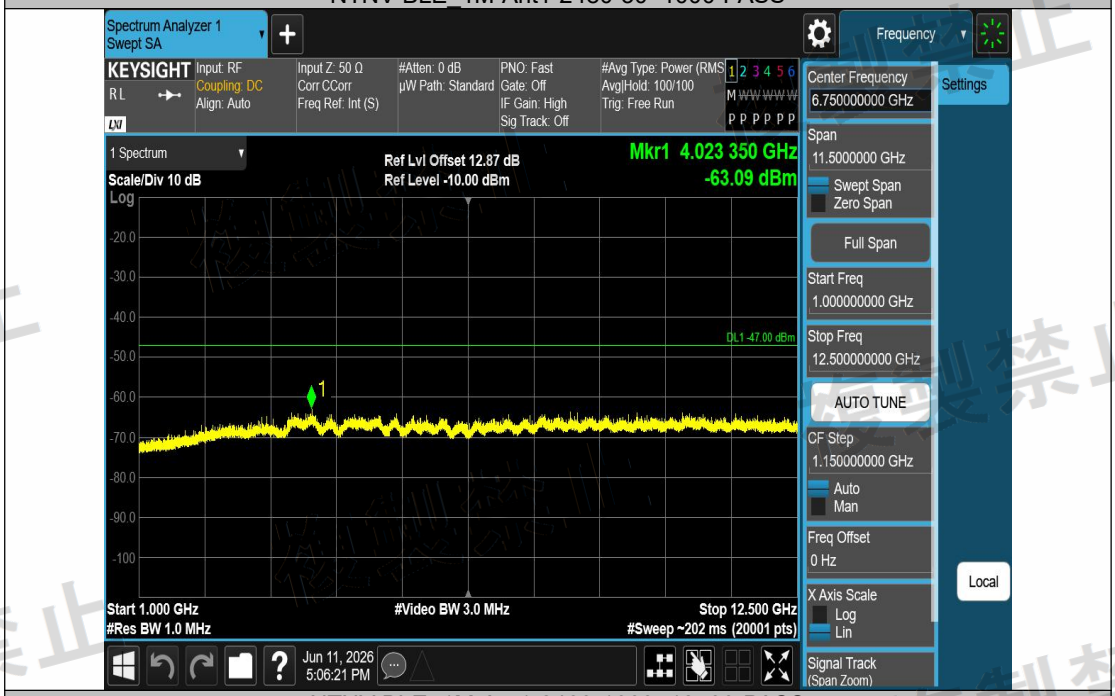


NTNV-BLE_1M-Ant1-2402-1000~12500-PASS

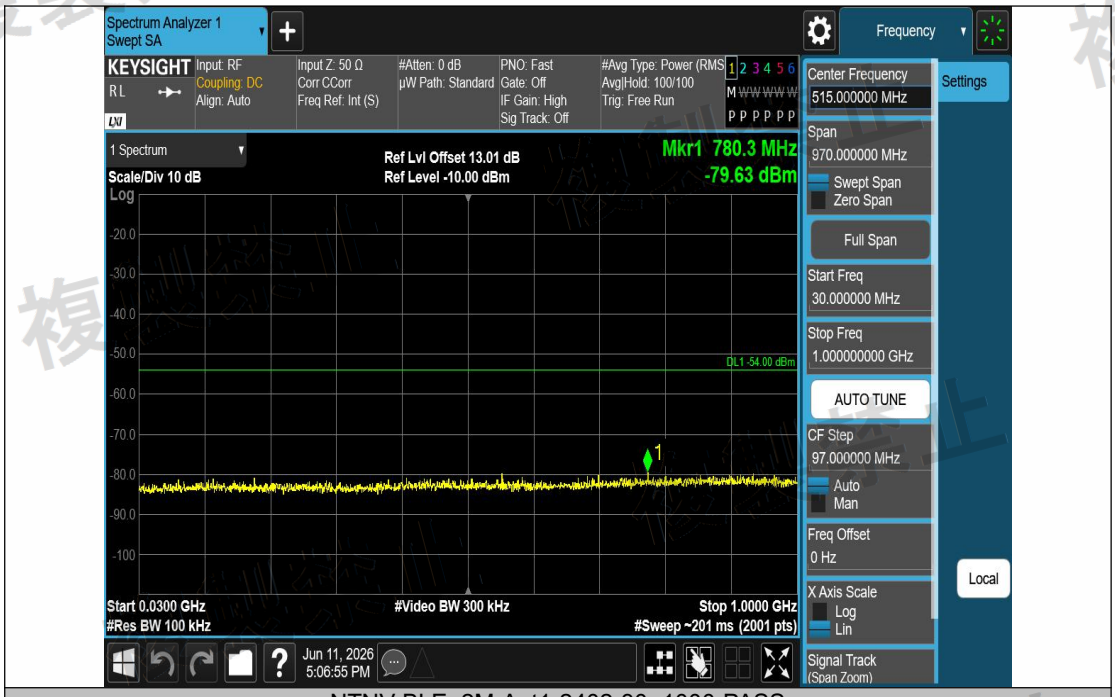
NTNV-BLE_1M-Ant1-2440-30~1000-PASS

NTNV-BLE_1M-Ant1-2440-1000~12500-PASS

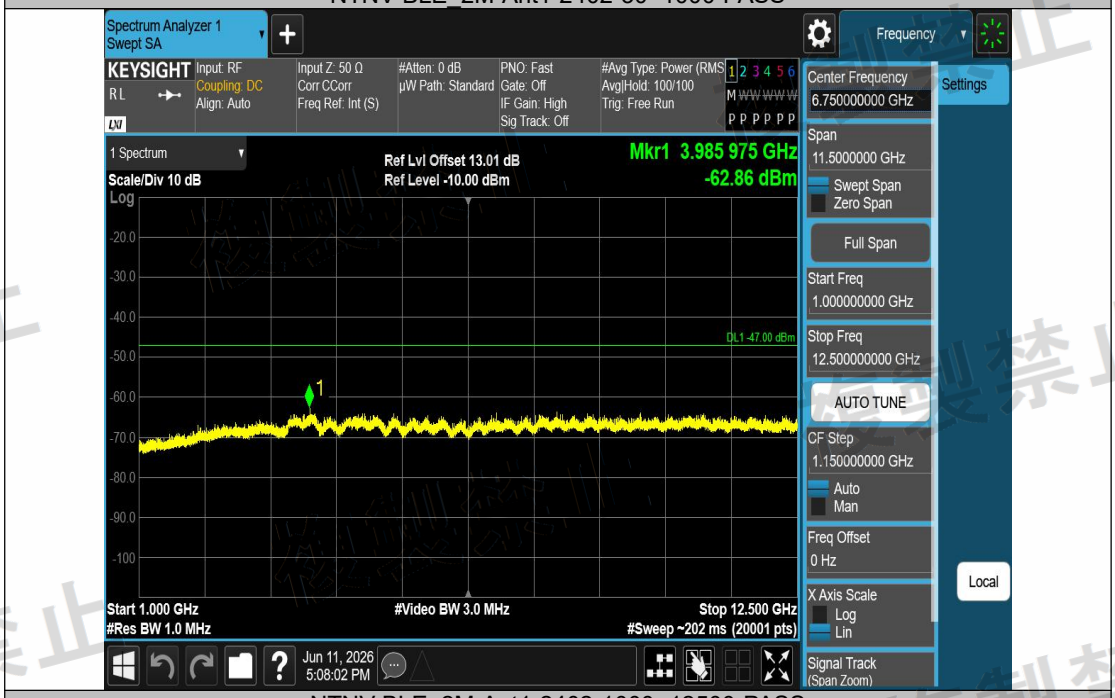
NTNV-BLE_1M-Ant1-2480-30~1000-PASS



NTNV-BLE_1M-Ant1-2480-1000~12500-PASS

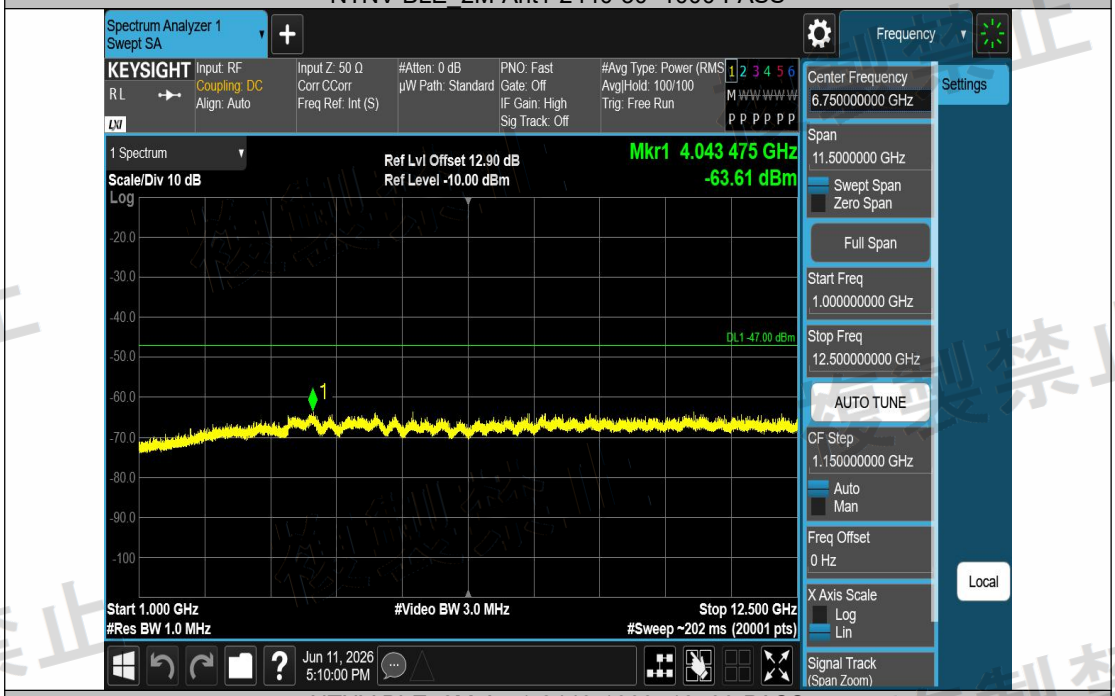


NTNV-BLE_2M-Ant1-2402-30~1000-PASS



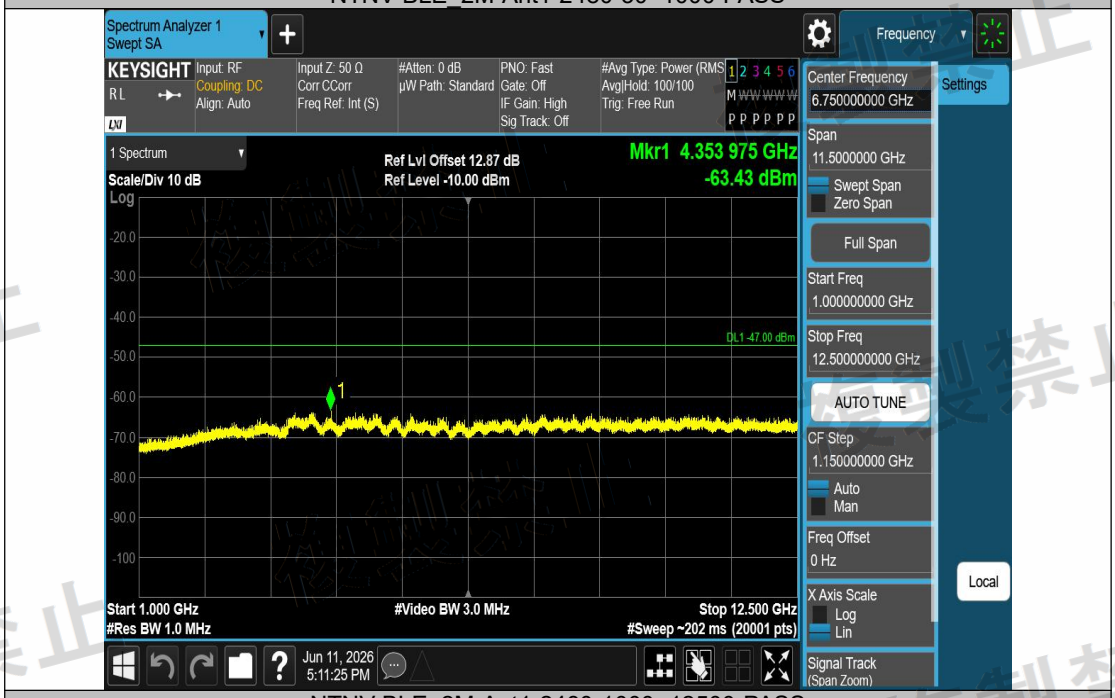
NTNV-BLE_2M-Ant1-2402-1000~12500-PASS

NTNV-BLE_2M-Ant1-2440-30~1000-PASS



NTNV-BLE_2M-Ant1-2440-1000~12500-PASS

NTNV-BLE_2M-Ant1-2480-30~1000-PASS



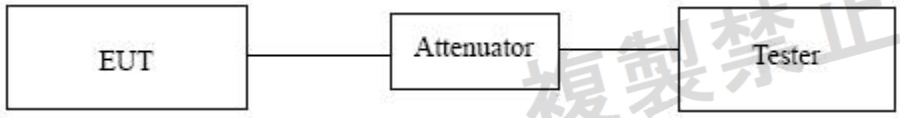
NTNV-BLE_2M-Ant1-2480-1000~12500-PASS

7.7 INTERFACE PREVENTION FUNCTION

7.7.1 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.

7.7.2 Test Setup Block Diagram



7.7.3 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.

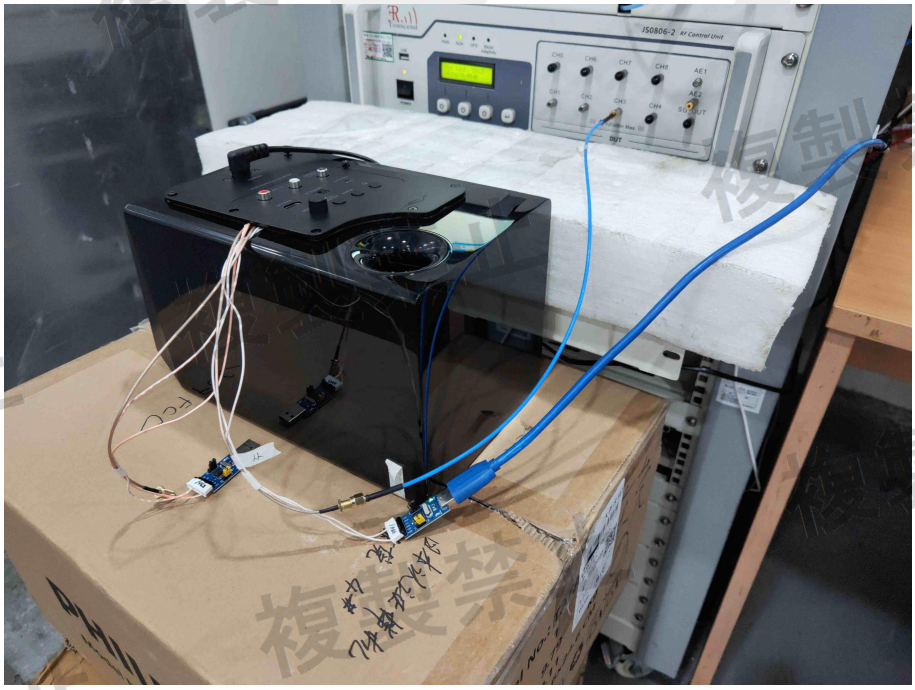
The identification function shall be recorded.

7.7.4 Summary of Test Results/Plots

All the modes were tested and recorded,the results of the test item are good.

Test Item	Test Result
Transmitting Function of Identification Code	>48 bits
Receiving Function of Identification Code	>48 bits
Mark Address	F8:61:4E:29:5A:BB
Test Results	Pass

8 APPENDIX PHOTOGRAPHS OF TEST SETUP



--- End of Report ---