Test Report

Report No.	:	**MTi250311017-0113E2**
Date of issue	:	**2025-04-07**
Applicant	:	**Earfun Technology (HK) Limited**
Product	:	**ANC Wireless Earbuds**
Model(s)	:	**TW230**

Shenzhen Microtest Co., Ltd.

TEST REPORT

Report No.: MTi250311017-0113E2

Table of contents

1 General Description 4
1.1 Description of the EUT 4
1.2 Description of test modes 4
1.3 Environmental Conditions 6
1.4 Description of support units 6
1.5 Measurement uncertainty 6

2 Summary of Test Result 7
3 Test Facilities and accreditations 8
3.1 Test laboratory 8

4 List of test equipment 9
5 Evaluation Results (Evaluation) 10
5.1 Interference Prevention Function 10

6 Radio Spectrum Matter Test Results (RF) 11
6.1 Tolerance of Frequency 11
6.2 Occupied Bandwidth (99%) 12
6.3 Antenna Power and Tolerance 14
6.4 Spurious Emission Intensity 15
6.5 Secondary Radiated Emissions 18

Photographs of the test setup 20
Photographs of the EUT 21
Appendix A: Deviation of frequency 23
Appendix B: Deviation of antenna power 27
Appendix C: Occupied Bandwidth 28
Appendix D: Spurious Emission of TX 32
Appendix E: Spurious Emission of RX 45

TEST REPORT

Report No.: MTi250311017-0113E2

Test Result Certification	
Applicant	Earfun Technology (HK) Limited
Applicant Address	FLAT/RM A 9F, SILVERCORP INTERNATIONAL TOWER 707-713 NATHAN ROAD MONGKOK KL, HONG KONG
Manufacturer	Earfun Technology (HK) Limited
Manufacturer Address	FLAT/RM A 9F, SILVERCORP INTERNATIONAL TOWER 707-713 NATHAN ROAD MONGKOK KL, HONG KONG
Product description	
Product name	ANC Wireless Earbuds
Trademark	EarFun
Model name	TW230
Series Model(s)	N/A
Standards	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43
Testing Information	
Date of test	2025-03-25 to 2025-04-02
Test result	Pass

Prepared by:	James Qin	James Qin
Reviewed by:	David Lee	David. Lee
Approved by:	Lewis Lian	Lewis Lian

1 General Description

1.1 Description of the EUT

Product name:	ANC Wireless Earbuds
Model name:	TW230
Series Model(s):	N/A
Model difference:	N/A
Electrical rating:	Input: DC 5V/1A Battery: Earbuds: DC 3.85V 60mAh Charging case: DC 3.7V 520mAh
Accessories:	Cable: USB-A to USB-C cable (0.3m)*1
Hardware version:	H2000
Software version:	V0.3.1
Test sample(s) number:	MTi250311017-01-R004
RF specification	
Bluetooth version:	V5.4
Operating frequency range:	2402-2480MHz
Channel number:	40
Modulation type:	GFSK
Antenna(s) type:	FPC
Antenna(s) gain:	L: -1.34dBi, R: -1.63dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	TX-GFSK-1Mbps- Left earbuds
Mode2	TX-GFSK-1Mbps- Right earbuds
Mode3	RX- Left earbuds
Mode4	RX- Right earbuds

Left earbuds: ANT1, Right earbuds: ANT2

1.2.1 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468

4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Test Channel List
Operation Band: 1

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
2	2402	2440	2480

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Test Software: BT_Tool
For power setting, refer to below table.

Mode	2402MHz	2440MHz	2480MHz
1M	5	5	5

1.3 Environmental Conditions

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

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

Test Conditions		Power Supply (V)	Input Voltage to the circuit of RF unit (V)
NTNV (V_{normal})	/	3.85	3.33
NTHV ($V_{max.}$)	+10%	4.235	3.33
NTLV ($V_{min.}$)	-10%	3.465	3.33

Note: If the fluctuation of input voltage to the circuit of RF unit (except power supply) of test equipment is under ±1%, when input voltage from external power supply to the test equipment is fluctuated by ±10%: conduct the test with the rated voltage only

1.4 Description of support units

Support equipment list			
Description	Model	Serial No.	Manufacturer
Laptop	e485	/	Lenovo
Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

Parameter	Measurement uncertainty
Frequency tolerance	±10 ppm
Occupied channel bandwidth	±3 %
RF output power, conducted	±1 dB
Power Spectral Density, conducted	±1 dB
Unwanted Emissions, conducted	±1 dB
All emissions, radiated	±4.7 dB
Temperature	±1 °C
Supply voltages	±1 %
Time	±1 %

Note: the measurement uncertainty is calculated and correspond to a factor k-=2 (which provide confidence levels of.95.45%)

2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Tolerance of Frequency	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
2	Occupied Bandwidth (99%)	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
3	Antenna Power and Tolerance	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
4	Spurious Emission Intensity	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
5	Secondary Radiated Emissions	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
6	Carrier Sensing 1	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	N/A
7	Interference Prevention Function	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
8	Transmission Antenna Absolute Gain	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
9	Half Powe Beam Angie(Radiation angle of antenna)	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	N/A

Notes:

N/A means not applicable

Carrier Sensing 1: Application to transmitting devices which EIRP is less than [2.14dBi + antenna power limit] and the shortage of EIRP is compensated by the antenna power. Not applicable to this product.

Absolute gain of transmitter antenna: this requirement does not applicable to the EUT when its EIRP is under 12.14dBm.

Transmitter antenna beam width: this requirement does not applicable to the EUT when its EIRP is under 12.14dBm

3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Antenna Power and Tolerance Spurious Emission Intensity Secondary Radiated Emissions Tolerance of Frequency Occupied Bandwidth (99%)						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2025-03-18	2026-03-17
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2025-03-14	2026-03-13
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2025-03-14	2026-03-13
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2025-03-18	2026-03-17
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2025-03-18	2026-03-17
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2025-03-18	2026-03-17
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2025-03-18	2026-03-17
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2025-03-14	2026-03-13
9	DC Power Supply	Agilent	E3632A	MY40027695	2025-03-18	2026-03-17

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

5 Evaluation Results (Evaluation)

5.1 Interference Prevention Function

Test Requirement:	The EUT shall support one of the following functions: - Automatic identification transmission - Automatic identification reception
Test Method:	Notification No.88 of MIC, 2004
Procedure:	(1) For EUTs capable of automatically transmitting identification data a. Transmit identification data from EUT to Demodulator b. Confirm identification data is correctly received by Demodulator (2) For EUTs capable of automatically receiving identification data a. Transmit identification data from Link Partner to EUT b. Confirm communication link is established c. Link Partner shall respond by transmitting different identification data back to the EUT d. Confirm EUT stops transmitting, or confirm EUT recognizes that the two identification data are different

5.1.1 Conclusion:

The detected ID of the device is below: D7:9A:36:ED:72:27 Test result: The device meet the requirements PASS

6 Radio Spectrum Matter Test Results (RF)

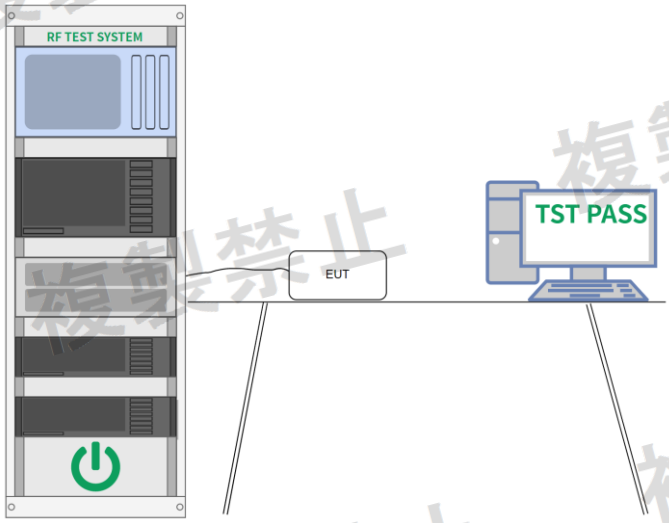
6.1 Tolerance of Frequency

Test Requirement:	Article 2-1, Item 19
Test Limit:	±50ppm or less.
Test Method:	Notification No.88 of MIC, 2004
Procedure:	Center frequency: Test frequency Span: span(1MHz). RBW: unmodulated 10KHz VBW: unmodulated 10KHz Sweep data points: 1001 or greater Sweep time: Auto Detector mode: Positive peak Indication mode: Max hold If the EUT cannot transmit in un-modulated mode then modulated mode measurements can be made, as follows: If the spectrum observed using the spectrum analyzer has a characteristic dip at the center, then the center frequency of the dip shall be regarded as the center frequency of the carrier.

6.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	55 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

6.1.2 Test Setup Diagram:



6.1.3 Test Data:

Please Refer to Appendix for Details.

6.2 Occupied Bandwidth (99%)

Test Requirement:	Article 2-1, Item 19
Test Limit:	For OFDM Modulation: The measured bandwidth at the low and high channels shall meet the following requirements: - The lowest frequency of the measured bandwidth shall not be less than 2400 MHz - The highest frequency of the measured bandwidth shall not be greater than 2483.5 MHz [Occupied Bandwidth] 40 MHz or less
Test Method:	Notification No.88 of MIC, 2004
Procedure:	

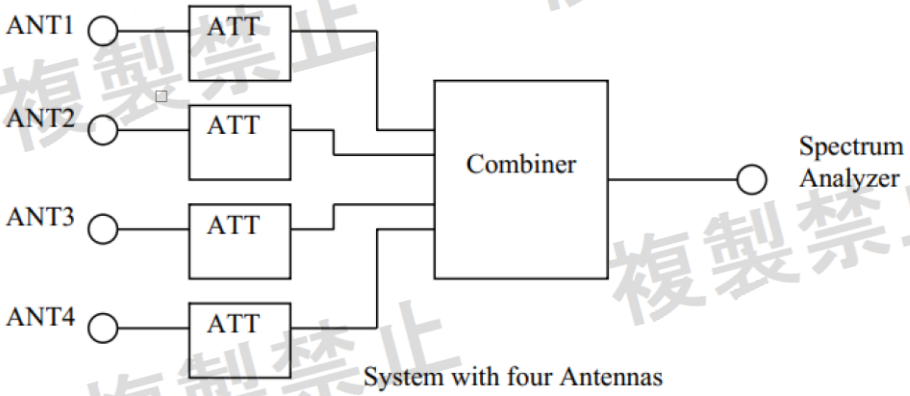
Center Frequency:	Test frequency
Span:	2 - 3.5 times the technical standard
RBW:	Within 3% of the technical standard
VBW:	Same as RBW
Sweep time:	Auto
Sweep data points:	1001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold
BW setting:	99%

(1) Measure the signal bandwidth using a spectrum analyzer

(2) For multiple antenna systems:

a) Each antenna shall be individually measured

b) If the measured occupied bandwidth for any antenna exceeds [(Occupied Bandwidth Limit) – 100kHz] then, in addition, the occupied bandwidth shall be measured with all antennas combined – see diagram below:

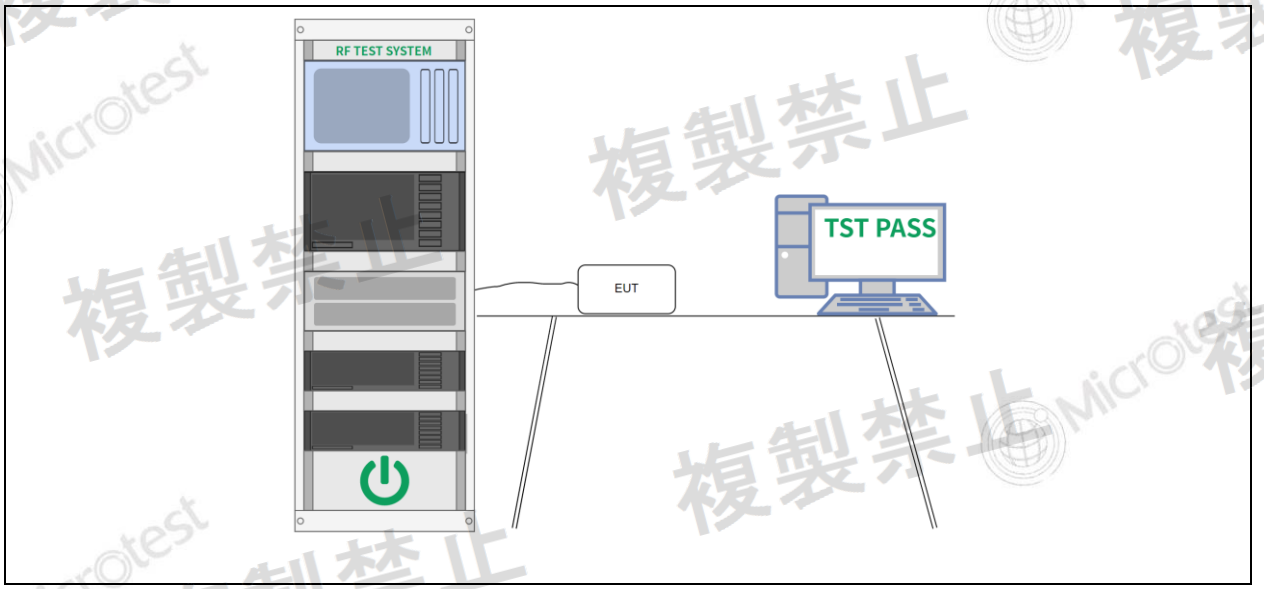


System with four Antennas

6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	42.2 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

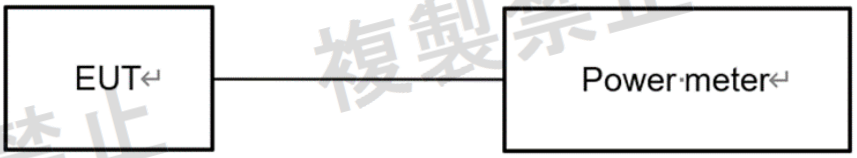
6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

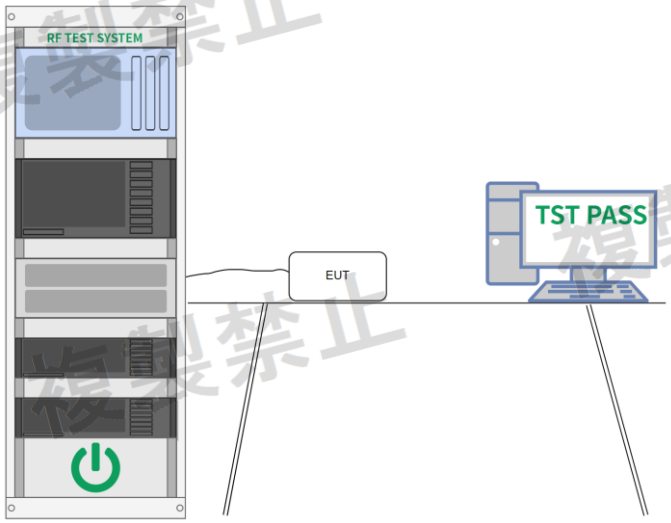
6.3 Antenna Power and Tolerance

Test Requirement:	Article 2-1, Item 19
Test Limit:	Antenna Power: 10 mW or less Tolerance: +20% or less EIRP: 12.14dBm
Test Method:	Notification No.88 of MIC, 2004
Procedure:	Connect high frequency power meter to the RF output of the EUT with a suitable attenuator and measure the total electric power. 

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	42.2 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

6.4 Spurious Emission Intensity

Test Requirement:	Article 2-1, Item 19	
Test Limit:	(1) Below 2387 MHz: 2.5 μW (-26 dBm)/MHz or less (2) 2387 to 2400 MHz: 25.0 μW (-16 dBm)/MHz or less (3) 2483.5 to 2496.5 MHz: 25.0 μW (-16 dBm)/MHz or less (4) Over 2496.5 MHz: 2.5 μW (-26 dBm)/MHz or less	
Test Method:	Notification No.88 of MIC, 2004	
Procedure:	[Setting 1]	
	Frequency range:	(see Note 1)
	RBW:	1 MHz
	VBW:	1 MHz
	Sweep time:	Minimum time required to make an accurate measurement
	Sweep Data Points:	1001 or greater
	Detector mode:	Positive peak
	Indication mode:	Max hold (see Note 2)
	Note 1:	Measurement range shall be 30 MHz to 12.5 GHz, except for the following cases: -FHSS, FHSS+DSSS, FHSS+OFDM:2374 MHz to 2509.5 MHz -Other than FHSS, FHSS+DSSS, FHSS+OFDM: 2400 MHz to 2483.5 MHz
	Note 2:	Sweep shall be repeated until the max hold waveform is stable.
	[Setting 2]	
	Center frequency:	Frequency of spurious emission found using [Setting 1]
	Span:	0 Hz
	RBW:	1 MHz
	VBW:	1 MHz
	Sweep time:	Minimum time required to make an accurate measurement. For burst type (intermittent) spurious emissions, sweep time shall be greater than one burst interval
	Sweep Data Points:	1001 or greater
	Detector mode:	Sample
	[Setting 3]	
	Frequency range:	2374 MHz to 2400 MHz 2483.5 MHz to 2509.5 MHz
	RBW:	30 kHz
	VBW:	30 kHz
	Sweep time:	Minimum time required to make an accurate measurement.
	Sweep data	1001 or greater

points:	
Detector mode:	Positive peak
Indication mode:	Max hold

(1) After configuring the spectrum analyzer to [Setting 1], search for spurious emissions from 30 MHz to 12.5 GHz. If the sweep range does not cover the required measurement frequency range then the measurement range will need to be divided into sufficient sections of size [RBW x Sweep Data Points]. If spurious emissions greater than [Limit - 3dB] are found, then more detailed measurements are required, go to step (2)
(2) Configure the spectrum analyzer using [Setting 2] and measure the average signal amplitude.
If the spurious emission is burst type (intermittent), then the average value shall not include signal OFF time.
If spurious emissions ranging from 30 MHz to 2374 MHz and from 2509.5MHz to 12.5GHz are over the limit, then the test result is Fail.
If spurious emissions ranging from 2374 MHz to 2400 MHz and from 2483.5 MHz to 2509.5 MHz are over the limit, then further detailed measurements are required, go to step (3)
(3) In the following cases, measure the spurious emissions using [Setting 3]
- Case1: FHSS, FHSS+DSSS, FHSS+OFDM
- Case2: Other than FHSS, FHSS+DSSS, FHSS+OFDM, and the spurious emissions in step (2) are over the limit
(4) Calculate the spurious emission value (Calculated Value) using following the formula below:
Calculated Value = (Measured Value using (3) + 15.2dB)
Note: 15.2dB adjustment is derived from the Conversion Factor of RBW
Conversion Factor of RBW = 10 x Log (Reference Bandwidth / RBW of measurement) = 15.2 [dB] Where: Reference Bandwidth = 1 MHz
RBW of measurement = 30 kHz
(5) If the calculated value using (4) is over the Limit (section 6.7), go to (6)
(6) Configure the spectrum analyzer to [Setting 3] then make the following changes: Frequency: Frequency of spurious emission
Span: 1 MHz
(7) After sweep, send the span data set to the PC
(8) Convert measured data from dBm to Watts
(9) Sum all the data using the formula below. If the sum is within the limit, the test result is Pass, otherwise, Fail

$$P_s = \left(\sum_{i=1}^{n} E_i\right) \times \frac{S_w}{RBW \times k \times n}$$

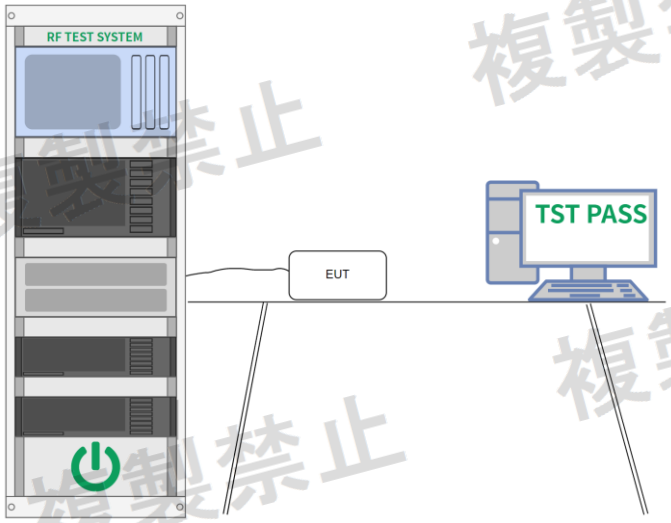
Ps: Sum (Watts)
Ei: Measured value at each point in the Span (Watts) Sw: Span (1MHz)

	n: Number of measurement points in the Span k: Correction factor for Equivalent Noise Bandwidth, specific to each spectrum analyzer, check the instrument user guide RBW: Resolution Bandwidth (MHz). (10) If the EUT has multiple antennas, measure the spurious emission form each individual antenna using steps (1) through (9) (11) Convert the individual antenna spurious level measurements (step (10)) from dB to absolute values (12) Combine (sum) the absolute values of the spurious measurements at each frequency for each antenna (to create a single composite spectrum of spurious emissions) (13) Ensure that the composite spectrum does not exceed the Limit defined in 6.7 (Technical Standard) (14) Configuring the spectrum analyzer using [Setting 3] and measure the spurious emissions with all the antennas electrically combined

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	24 °C	Humidity:	42.2 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

6.5 Secondary Radiated Emissions

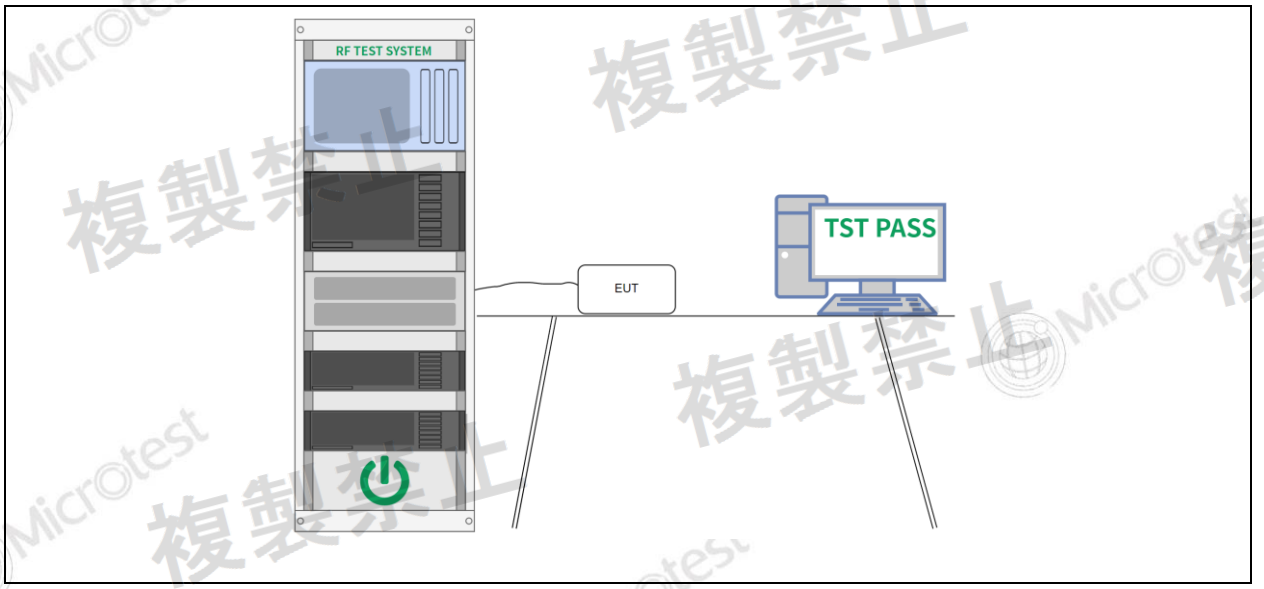
Test Requirement:	Article 2-1, Item 19
Test Limit:	(1) Below 1 GHz: 4 nW (-54dBm) or less (2) Above 1 GHz: 20 nW (-47dBm) or less
Test Method:	Notification No.88 of MIC, 2004
Procedure:	[Setting 1] Frequency range: 30 MHz ~ 12.5 GHz RBW: Below 1 GHz:100 kHz Above 1 GHz:1 MHz VBW: Below 1 GHz:100 kHz Above 1 GHz:1 MHz Sweep time: Auto Sweep data points: 1001 or greater Detector mode: Positive peak Indication mode: Max hold [Setting 2] Center Frequency: Frequency of spurious emission found using [Setting 1] Span: 0 Hz RBW: Below 1 GHz:100 kHz Above 1 GHz:1 MHz VBW: Below 1 GHz:100 kHz Above 1 GHz:1 MHz Sweep time: Auto Sweep data points: 1001 or greater Detector mode: Sample (1) Configure the spectrum analyzer to [Setting 1] and then search for spurious emissions in the range 30 MHz to 12.5GHz. If the sweep range does not cover the required measurement frequency range then the measurement range will need to be divided into sufficient sections of size [RBW x Sweep Data Points]. (2) If spurious emissions are found with an amplitude greater than [Limit - 10dB] then perform further detailed measurements as described in (3) (3) Configure the spectrum analyzer using [Setting 2] and measure the average signal amplitude. If the spurious emission is burst type (intermittent), then the average value shall not include signal OFF time Multiple Antenna Systems If the EUT has multiple antennas then emissions from each antenna shall be measured individually, as described below (4) For each antenna repeat steps (1) through (3). Convert all spurious level measurements from dB to absolute value (5) Combine (sum) the absolute values of the spurious measurements at each frequency for each antenna (to create a single composite spectrum of spurious emissions) (6) Ensure that the composite spectrum does not exceed the Limit

6.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	42.2 %	Atmospheric Pressure:	100 kPa

Pre test mode:	Mode3, Mode4
Final test mode:	Mode3, Mode4

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

Please Refer to Appendix for Details.

Photographs of the test setup

Refer to Appendix - Test Setup Photos

Photographs of the EUT

Refer to Appendix - EUT Photos

Appendix

Appendix A: Deviation of frequency

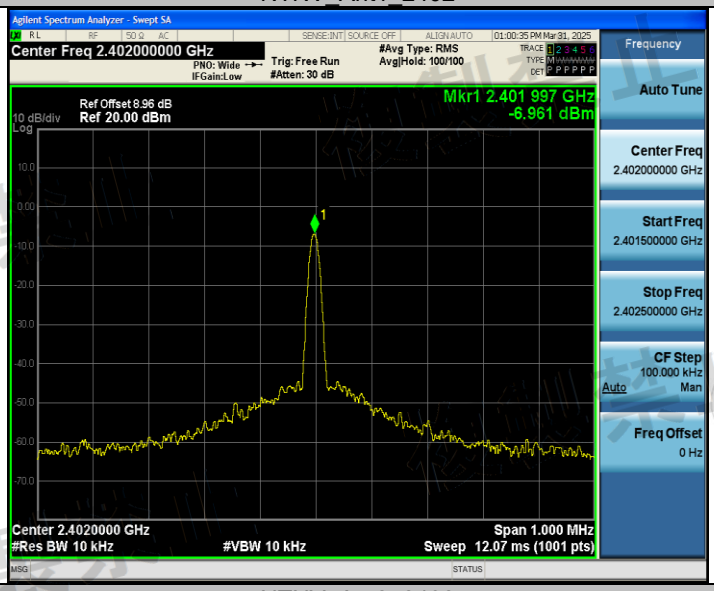
Test Result

Test Condition	Test Mode	Antenna	Freq. [MHz]	CenterFreq [MHz]	Result [ppm]	Limit [ppm]	Verdict
NTNV	/	Ant1	2402	2401.997	-1.24896	±50	PASS
		Ant2	2402	2401.996	-1.66528	±50	PASS
		Ant1	2440	2439.997	-1.22951	±50	PASS
		Ant2	2440	2439.996	-1.63934	±50	PASS
		Ant1	2480	2479.997	-1.20968	±50	PASS
		Ant2	2480	2479.996	-1.61290	±50	PASS

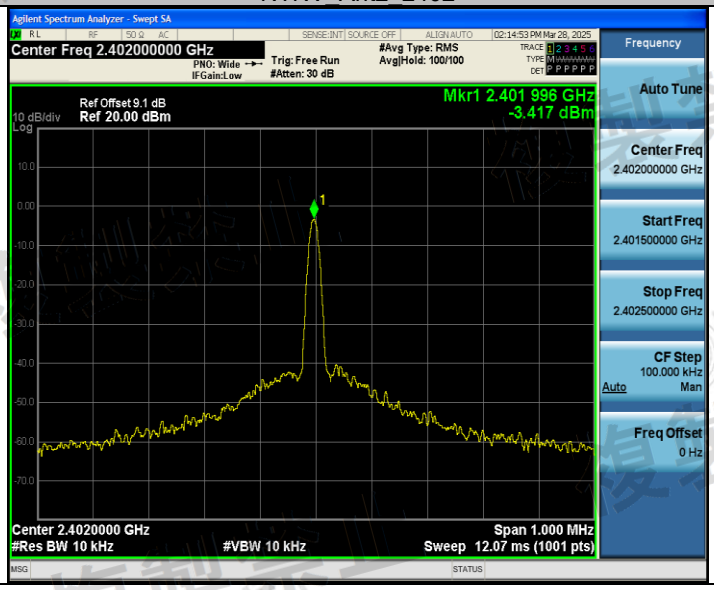
Note: Result [ppm] = (CenterFreq [MHz] – Freq. [MHz]) / Freq. [MHz] * 1000000

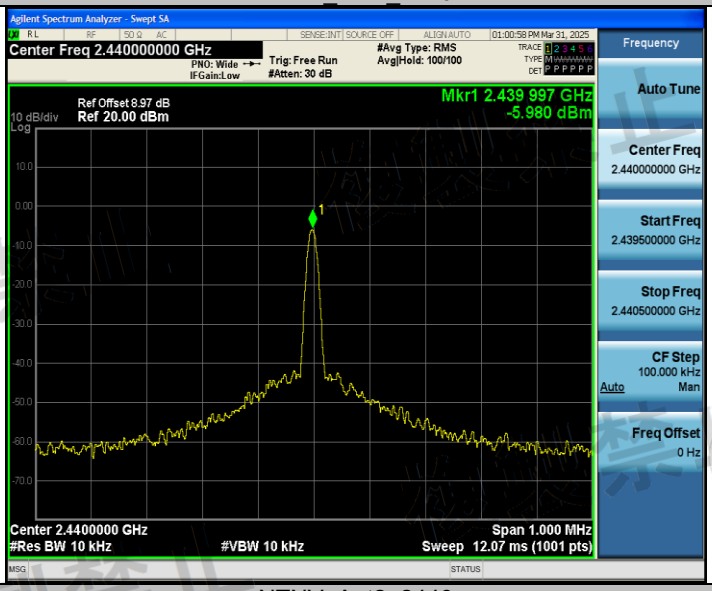
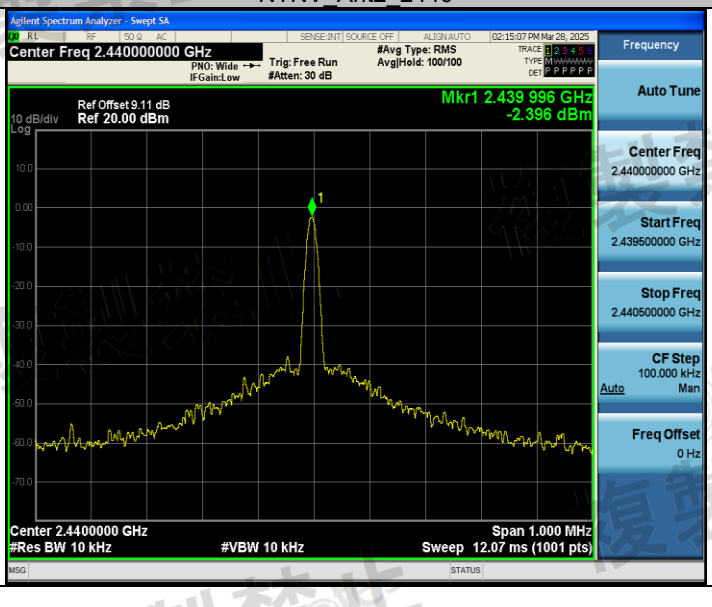
Test Graphs

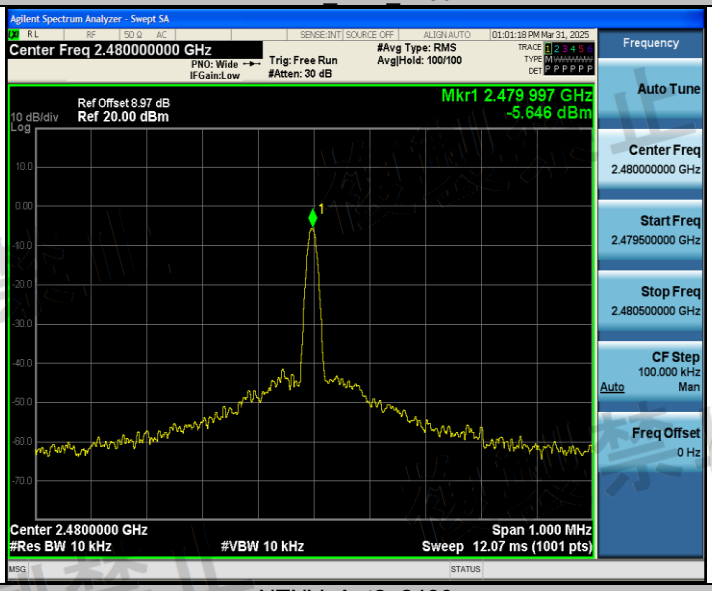
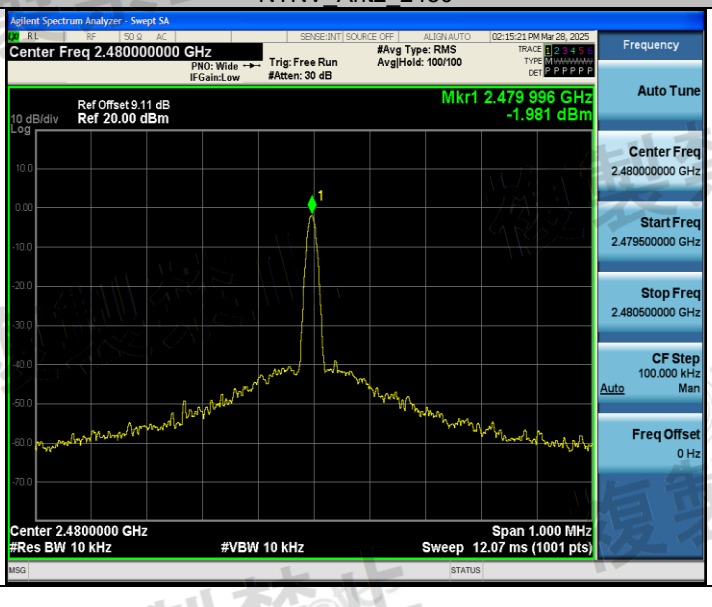
NTNV_Ant1_2402



NTNV_Ant2_2402



NTNV_Ant1_2440

NTNV_Ant2_2440


NTNV_Ant1_2480

NTNV_Ant2_2480


Appendix B: Deviation of antenna power

Test Result

Antenna Power							
Test Condition	Test Mode	Antenna	Freq. [MHz]	Result [dBm]	Result [mW]	Limit [mW]	Verdict
NTNV	BLE_1M	Ant1	2402	-0.58	0.8750	≤10	PASS
		Ant2	2402	-0.81	0.8299	≤10	PASS
		Ant1	2440	0.05	1.0116	≤10	PASS
		Ant2	2440	-0.47	0.8974	≤10	PASS
		Ant1	2480	-0.88	0.8166	≤10	PASS
		Ant2	2480	-1.45	0.7161	≤10	PASS

Note:
The EUT is set to be in continuously transmitting mode.

Tolerance								
Test Condition	Test Mode	Antenna	Freq. [MHz]	Power [mW]	RatedPower [mW]	Result [%]	Limit [%]	Verdict
NTNV	BLE_1M	Ant1	2402	0.8750	2	-56.25	≤20	PASS
		Ant2	2402	0.8299	2	-58.51	≤20	PASS
		Ant1	2440	1.0116	2	-49.42	≤20	PASS
		Ant2	2440	0.8974	2	-55.13	≤20	PASS
		Ant1	2480	0.8166	2	-59.17	≤20	PASS
		Ant2	2480	0.7161	2	-64.20	≤20	PASS

Notes:
Result = (Power [mW] – RatedPower [mW]) / RatedPower [mW] * 100
The rated power is 2 mW for BLE_1M, which is declared by the manufacturer.
The rated power is 2 mW for BLE_2M, which is declared by the manufacturer.

EIRP							
Test Condition	Test Mode	Antenna	Freq. [MHz]	Result [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
NTNV	BLE_1M	Ant1	2402	-0.58	-1.92	≤12.14	PASS
		Ant2	2402	-0.81	-2.44	≤12.14	PASS
		Ant1	2440	0.05	-1.29	≤12.14	PASS
		Ant2	2440	-0.47	-2.10	≤12.14	PASS
		Ant1	2480	-0.88	-2.22	≤12.14	PASS
		Ant2	2480	-1.45	-3.08	≤12.14	PASS

Notes:
The antenna gain is Ant1 -1.34 Ant2 -1.63 dBi. ANT1: L, ANT2: R
EIRP= Result [dBm]+ antenna gain

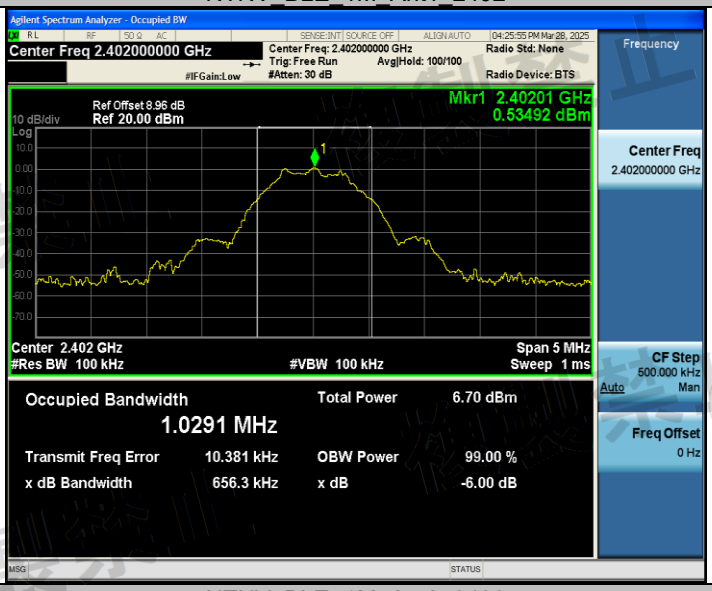
Appendix C: Occupied Bandwidth

Test Result

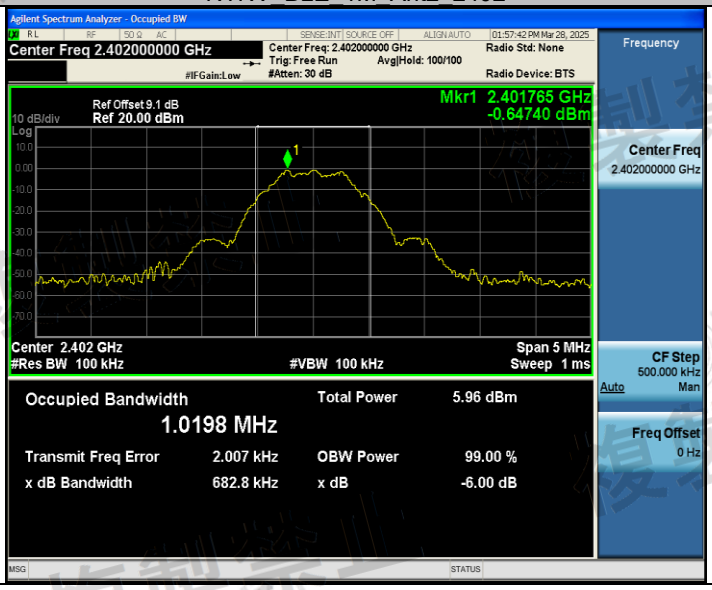
Test Condition	Test Mode	Antenna	Freq. [MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	1.029	≤26	PASS
		Ant2	2402	1.020	≤26	PASS
		Ant1	2440	1.016	≤26	PASS
		Ant2	2440	1.032	≤26	PASS
		Ant1	2480	1.028	≤26	PASS
		Ant2	2480	1.041	≤26	PASS

Test Graphs

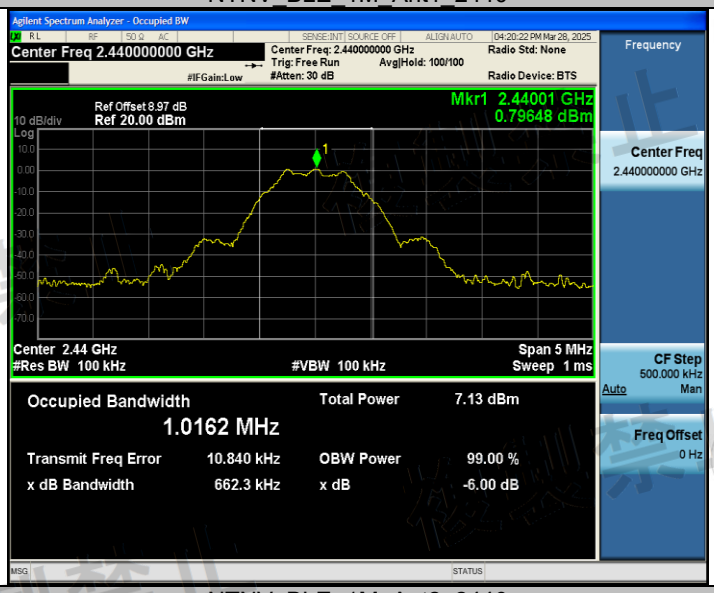
NTNV_BLE_1M_Ant1_2402



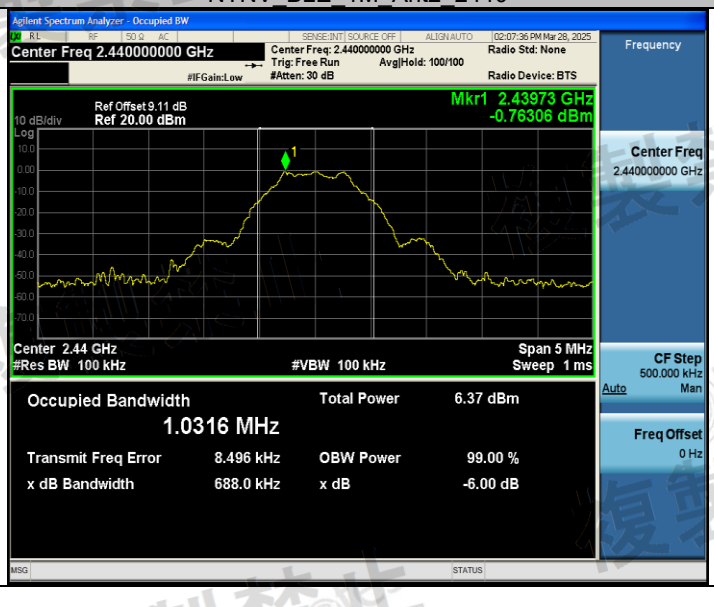
NTNV_BLE_1M_Ant2_2402



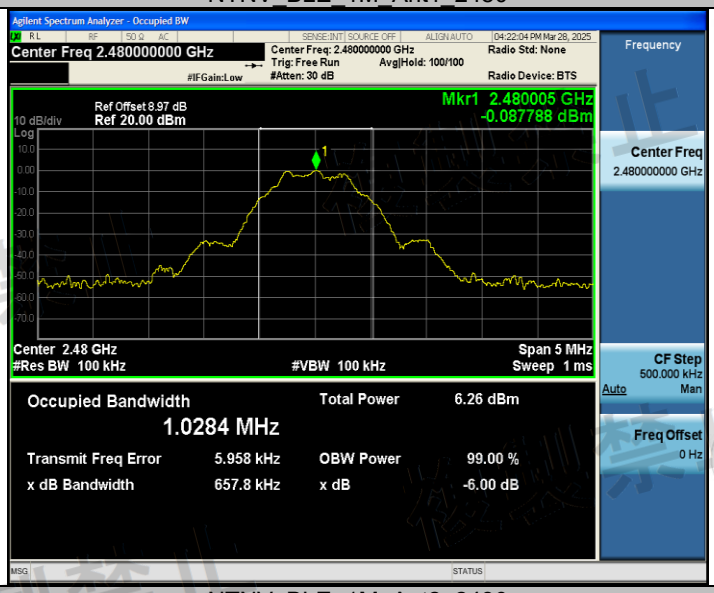
NTNV_BLE_1M_Ant1_2440



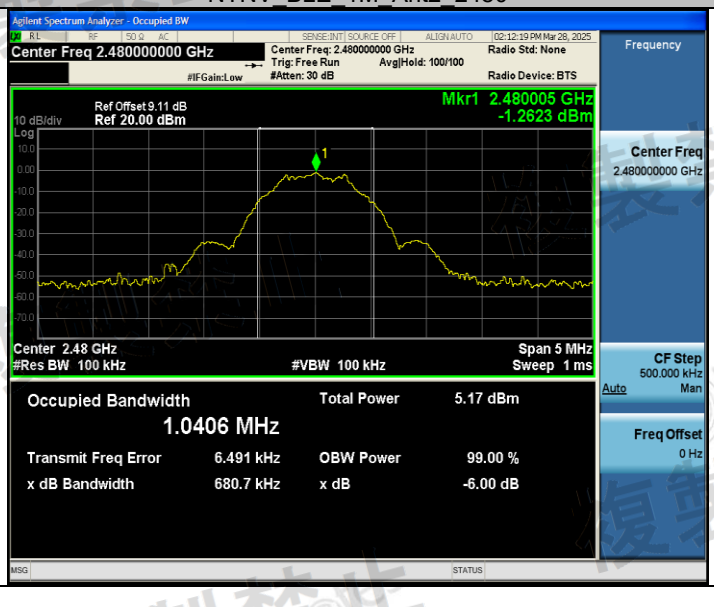
NTNV_BLE_1M_Ant2_2440



NTNV_BLE_1M_Ant1_2480



NTNV_BLE_1M_Ant2_2480



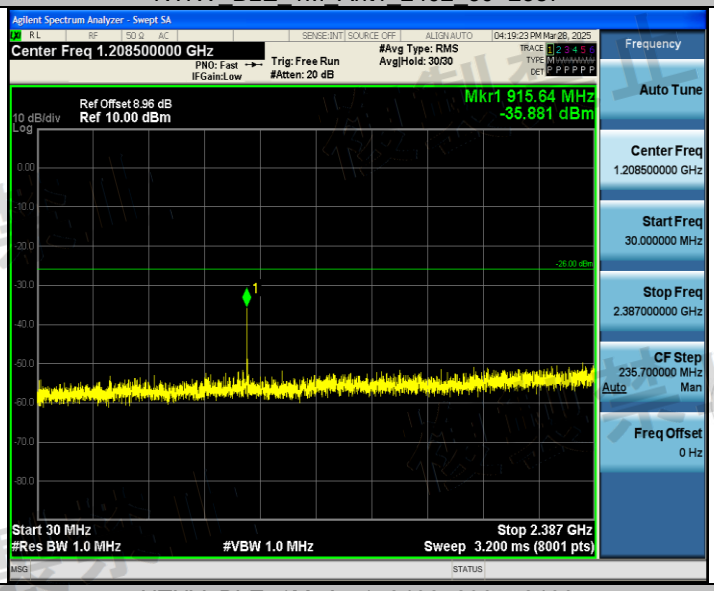
Appendix D: Spurious Emission of TX

Test Result

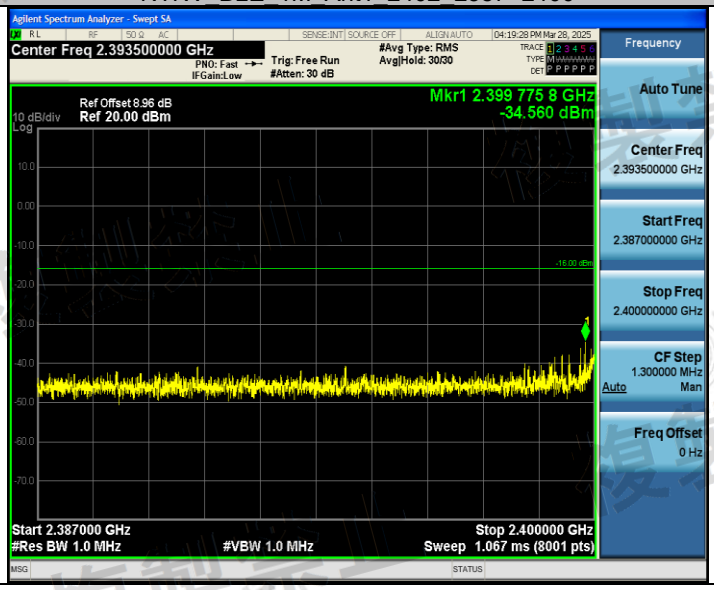
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	BLE_1M	Ant1	2402	30~2387	-35.88	≤-26	0.25823	≤2.5	PASS
				2387~2400	-34.56	≤-16	0.34995	≤25	PASS
				2483.5~2496.5	-41.02	≤-16	0.07907	≤25	PASS
				2496.5~13000	-38.04	≤-26	0.15704	≤2.5	PASS
		Ant2	2402	30~2387	-49.39	≤-26	0.01151	≤2.5	PASS
				2387~2400	-34.49	≤-16	0.35563	≤25	PASS
				2483.5~2496.5	-40.07	≤-16	0.09840	≤25	PASS
				2496.5~13000	-35.67	≤-26	0.27102	≤2.5	PASS
		Ant1	2440	30~2387	-39.30	≤-26	0.11749	≤2.5	PASS
				2387~2400	-41.58	≤-16	0.06950	≤25	PASS
				2483.5~2496.5	-40.47	≤-16	0.08974	≤25	PASS
				2496.5~13000	-40.06	≤-26	0.09863	≤2.5	PASS
		Ant2	2440	30~2387	-49.39	≤-26	0.01151	≤2.5	PASS
				2387~2400	-40.85	≤-16	0.08222	≤25	PASS
				2483.5~2496.5	-40.93	≤-16	0.08072	≤25	PASS
				2496.5~13000	-36.45	≤-26	0.22646	≤2.5	PASS
		Ant1	2480	30~2387	-50.27	≤-26	0.00940	≤2.5	PASS
				2387~2400	-40.31	≤-16	0.09311	≤25	PASS
				2483.5~2496.5	-40.79	≤-16	0.08337	≤25	PASS
				2496.5~13000	-40.83	≤-26	0.08260	≤2.5	PASS
		Ant2	2480	30~2387	-45.32	≤-26	0.02938	≤2.5	PASS
				2387~2400	-41.57	≤-16	0.06966	≤25	PASS
				2483.5~2496.5	-40.82	≤-16	0.08279	≤25	PASS
				2496.5~13000	-36.33	≤-26	0.23281	≤2.5	PASS

Test Graphs

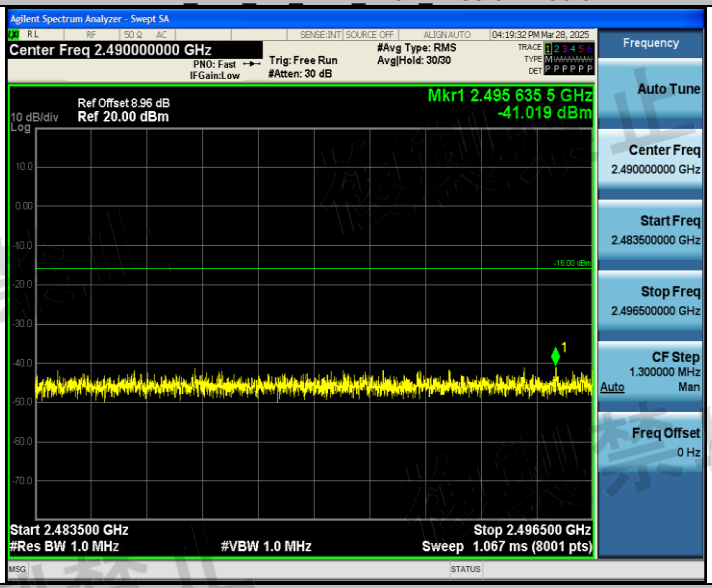
NTNV_BLE_1M_Ant1_2402_30~2387



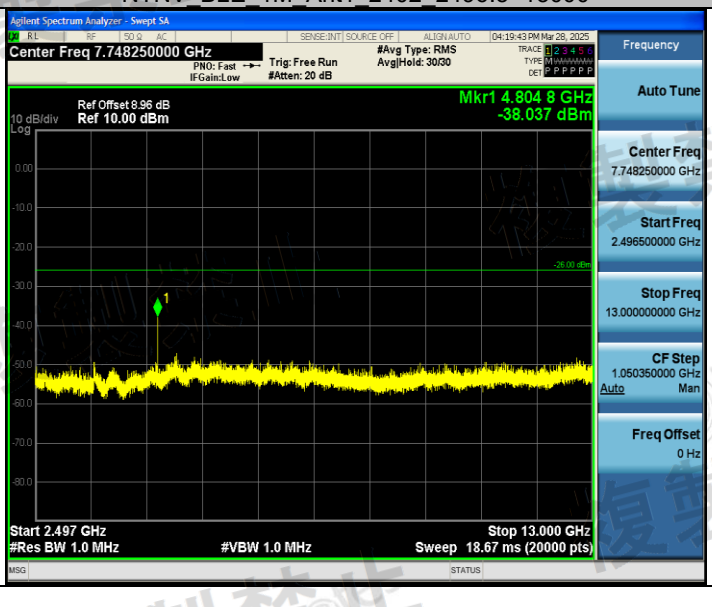
NTNV_BLE_1M_Ant1_2402_2387~2400



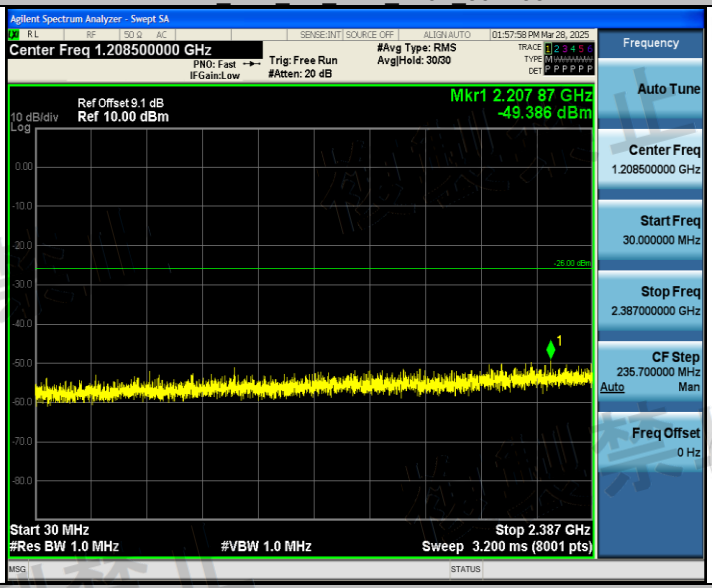
NTNV_BLE_1M_Ant1_2402_2483.5~2496.5



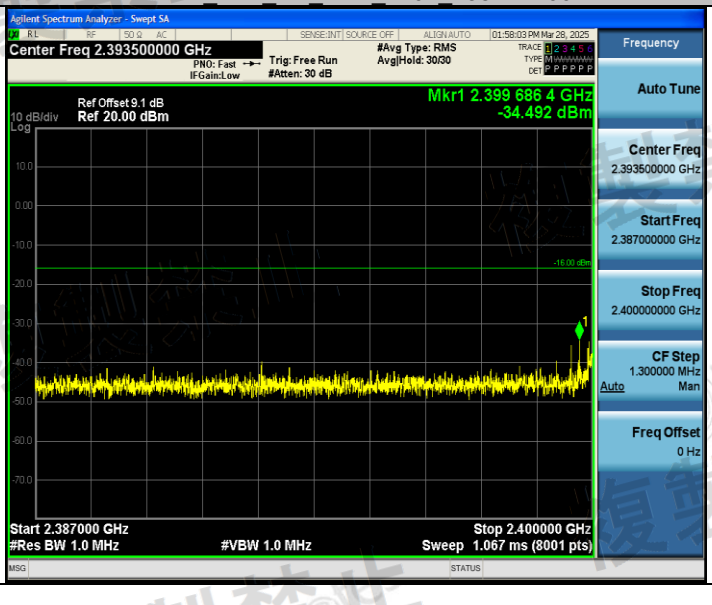
NTNV_BLE_1M_Ant1_2402_2496.5~13000



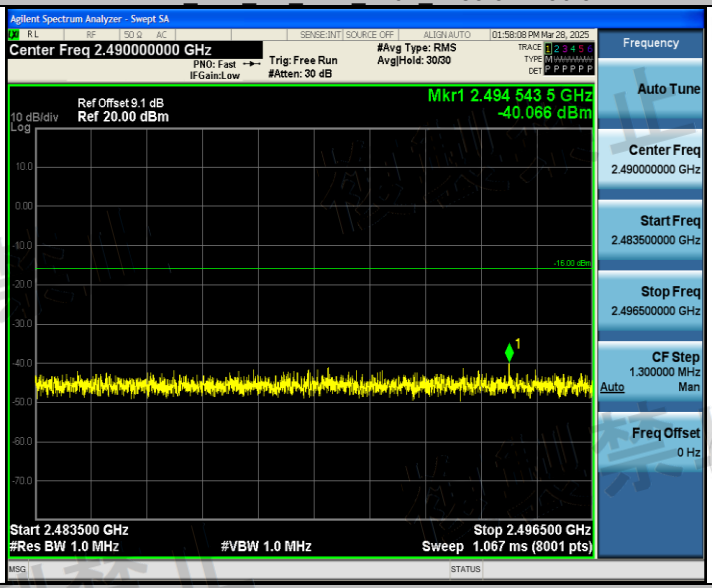
NTNV_BLE_1M_Ant2_2402_30~2387



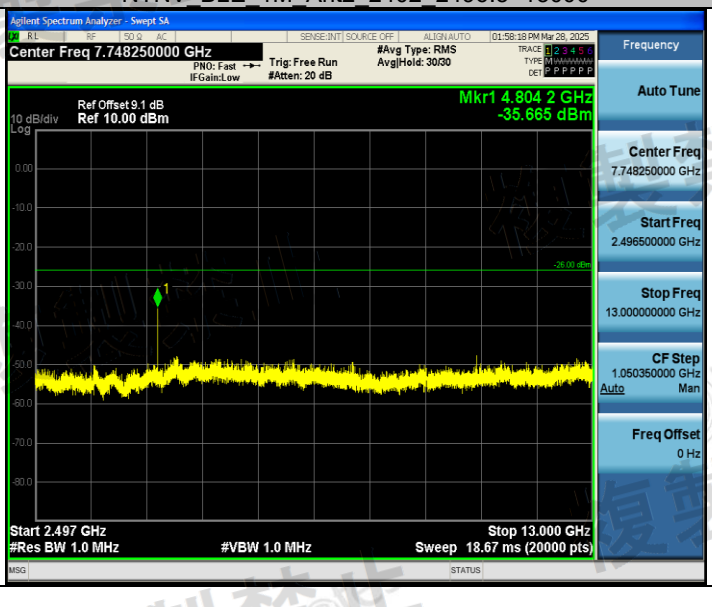
NTNV_BLE_1M_Ant2_2402_2387~2400



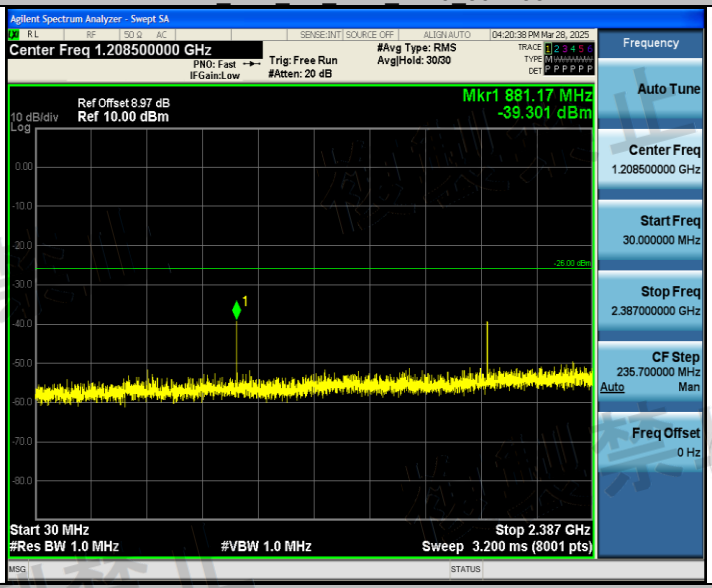
NTNV_BLE_1M_Ant2_2402_2483.5~2496.5



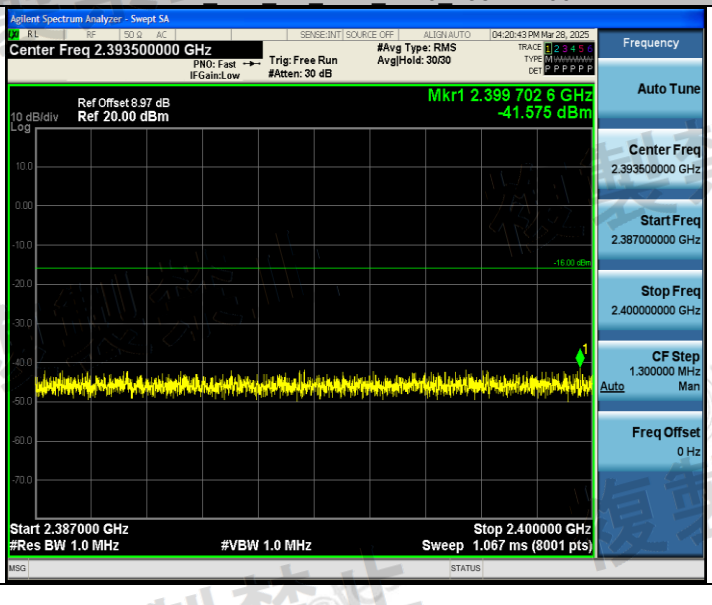
NTNV_BLE_1M_Ant2_2402_2496.5~13000



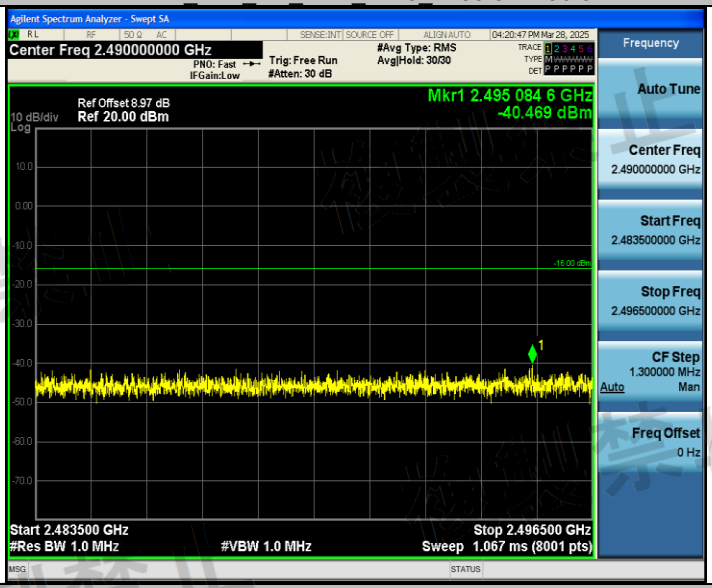
NTNV_BLE_1M_Ant1_2440_30~2387



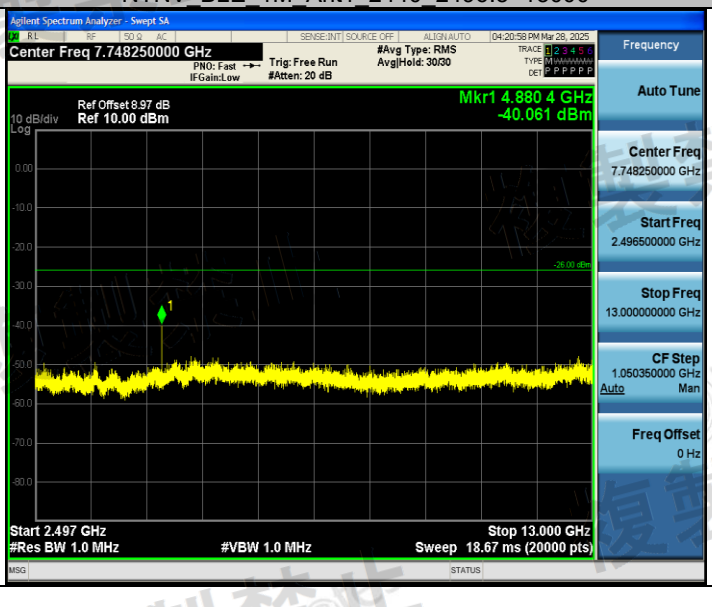
NTNV_BLE_1M_Ant1_2440_2387~2400



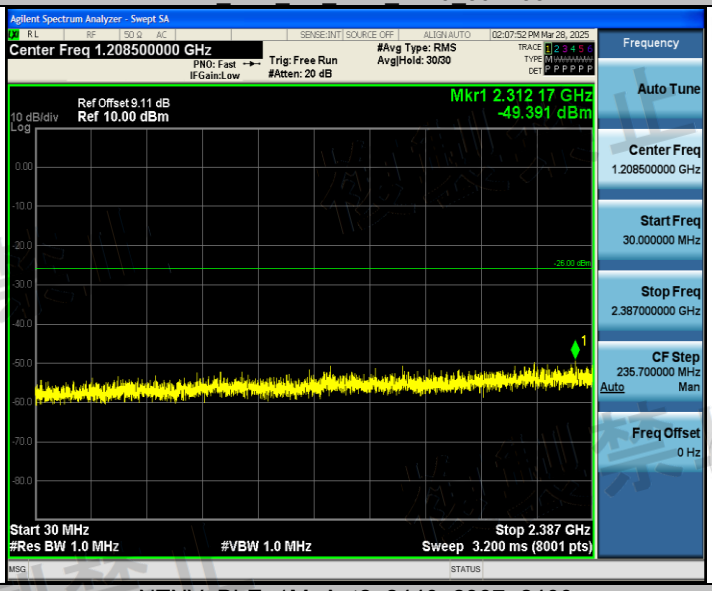
NTNV_BLE_1M_Ant1_2440_2483.5~2496.5



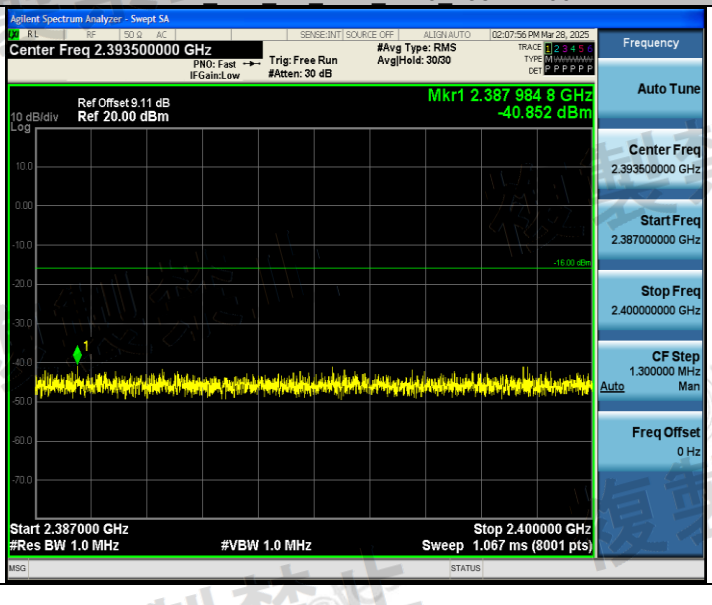
NTNV_BLE_1M_Ant1_2440_2496.5~13000

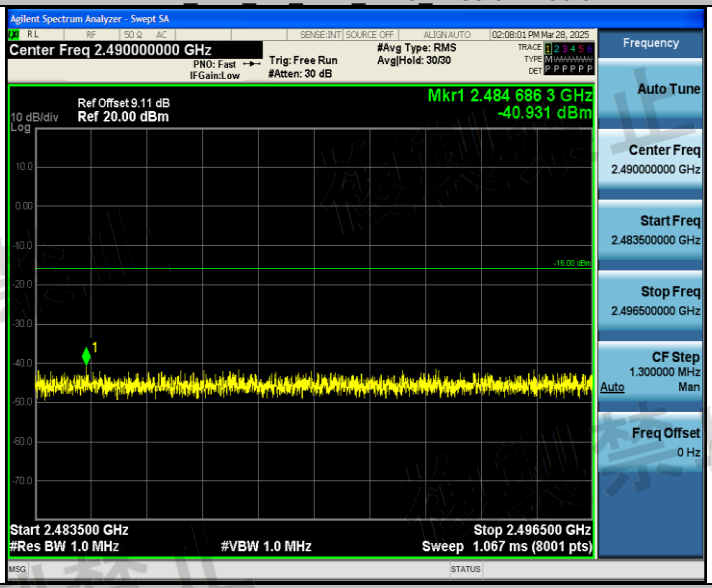
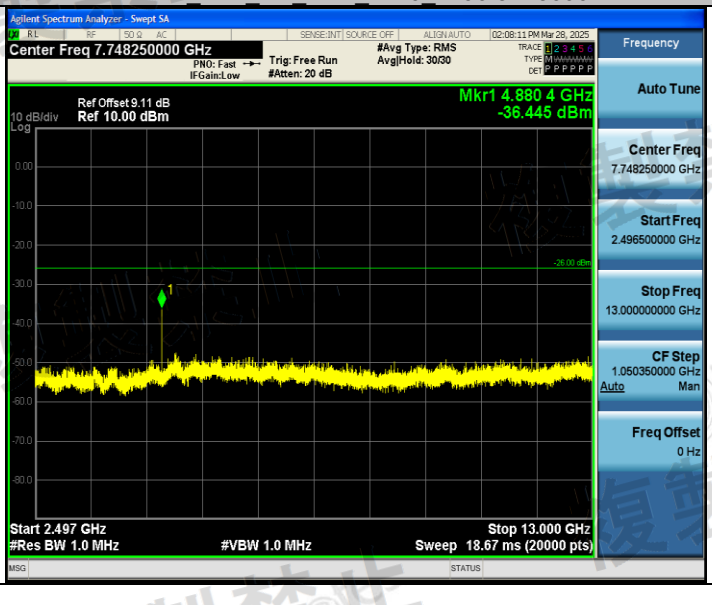


NTNV_BLE_1M_Ant2_2440_30~2387

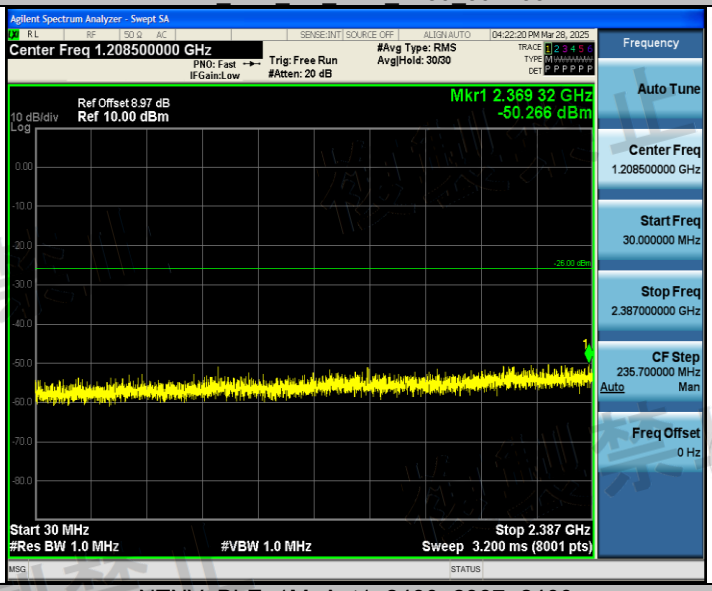


NTNV_BLE_1M_Ant2_2440_2387~2400

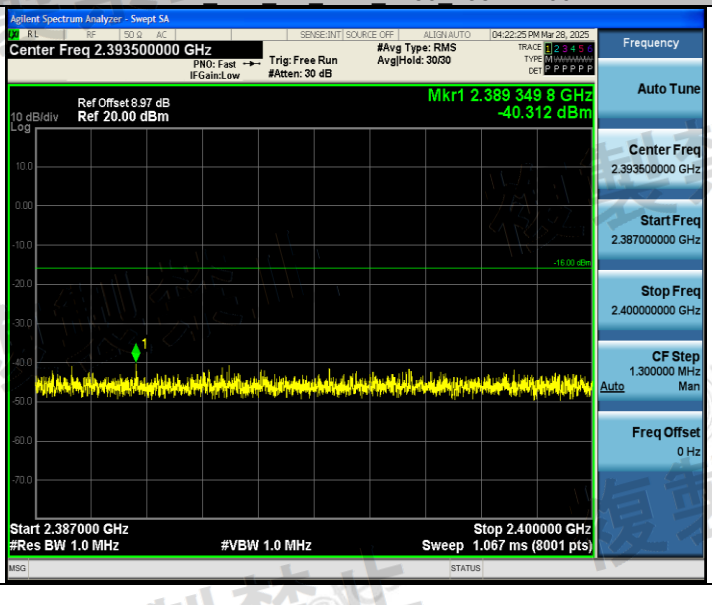


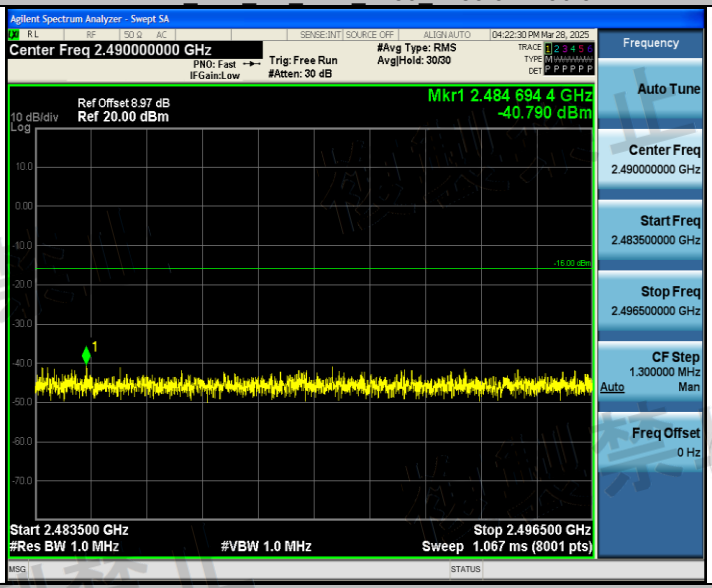
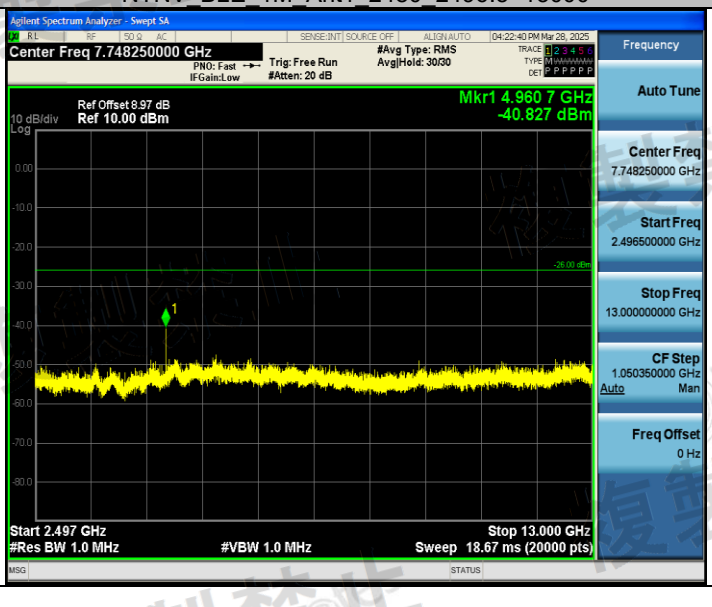
NTNV_BLE_1M_Ant2_2440_2483.5~2496.5

NTNV_BLE_1M_Ant2_2440_2496.5~13000


NTNV_BLE_1M_Ant1_2480_30~2387

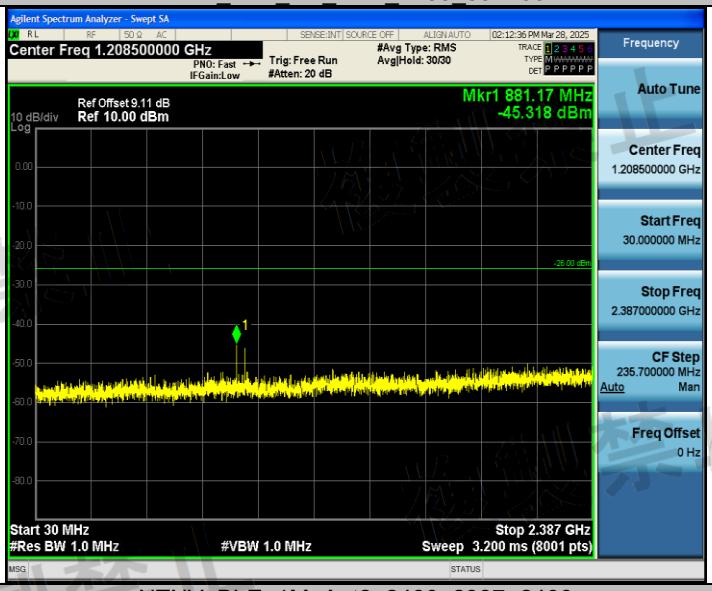


NTNV_BLE_1M_Ant1_2480_2387~2400

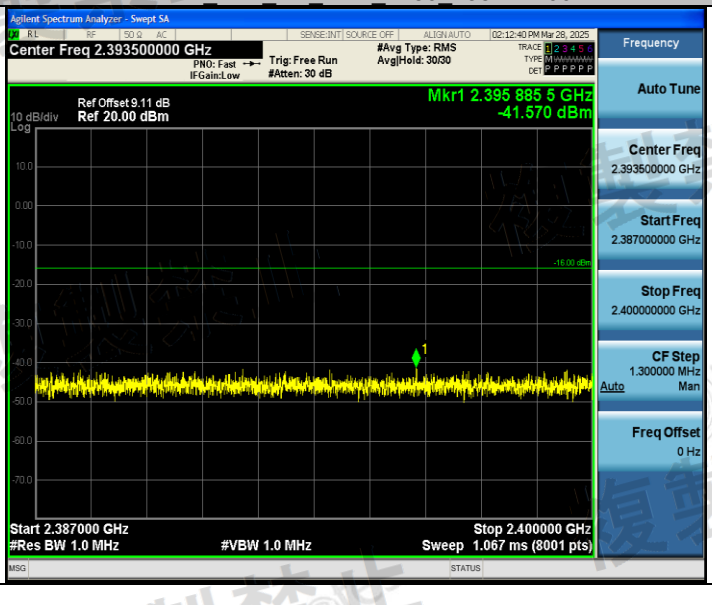


NTNV_BLE_1M_Ant1_2480_2483.5~2496.5

NTNV_BLE_1M_Ant1_2480_2496.5~13000


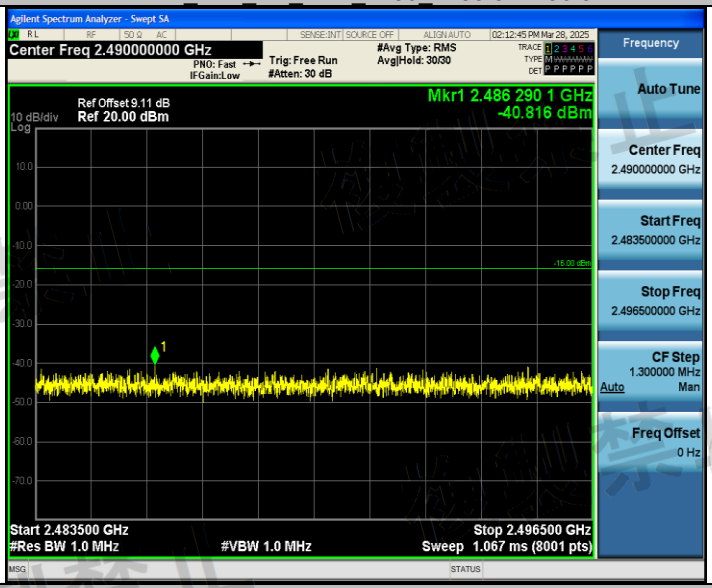
NTNV_BLE_1M_Ant2_2480_30~2387



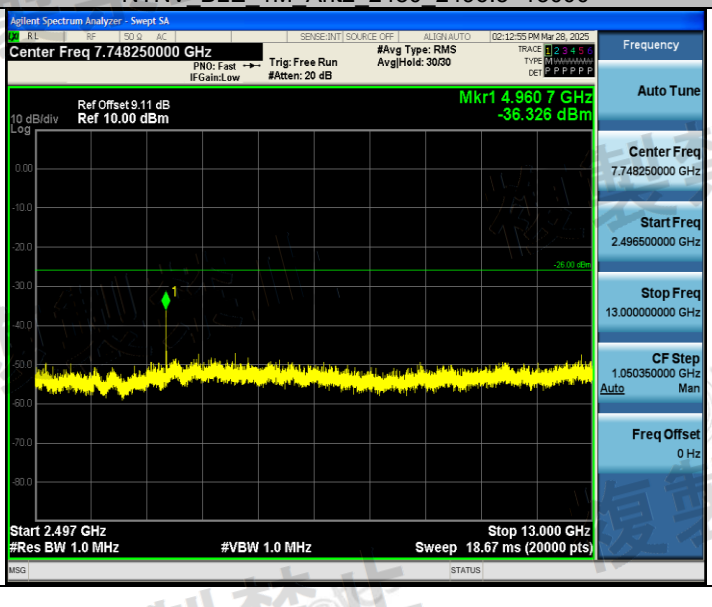
NTNV_BLE_1M_Ant2_2480_2387~2400



NTNV_BLE_1M_Ant2_2480_2483.5~2496.5



NTNV_BLE_1M_Ant2_2480_2496.5~13000



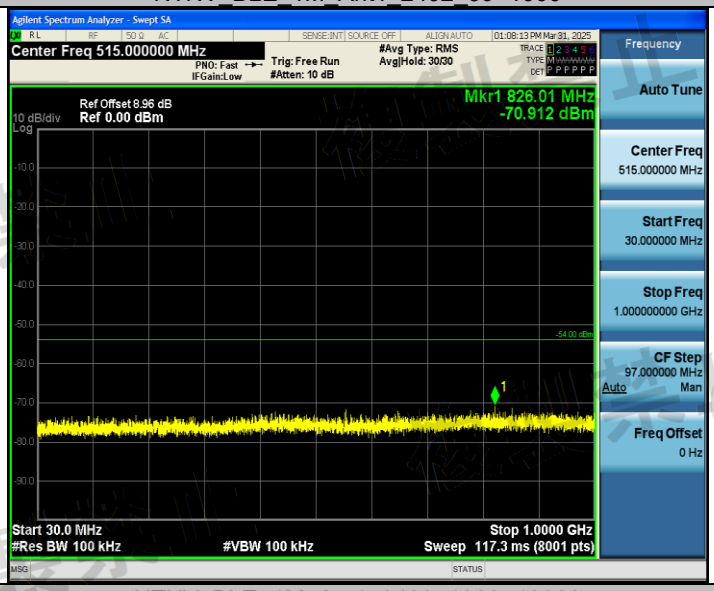
Appendix E: Spurious Emission of RX

Test Result

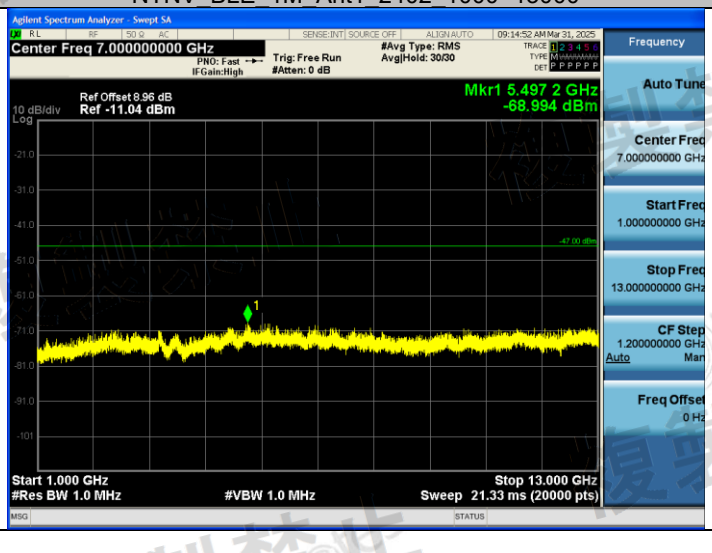
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	BLE_1M	Ant1	2402	30~1000	-70.91	≤-54	0.08110	≤4	PASS
				1000~13000	-68.99	≤-47	0.12618	≤20	See table below
		Ant2	2402	30~1000	-71.36	≤-54	0.07311	≤4	PASS
				1000~13000	-68.04	≤-47	0.15704	≤20	PASS
		Ant1	2440	30~1000	-71.27	≤-54	0.07464	≤4	PASS
				1000~13000	-60.31	≤-47	0.93111	≤20	PASS
		Ant2	2440	30~1000	-70.28	≤-54	0.09376	≤4	PASS
				1000~13000	-65.58	≤-47	0.27669	≤20	PASS
		Ant1	2480	30~1000	-71.71	≤-54	0.06745	≤4	PASS
				1000~13000	-62.87	≤-47	0.51642	≤20	PASS
		Ant2	2480	30~1000	-70.32	≤-54	0.09290	≤4	PASS
				1000~13000	-67.79	≤-47	0.16634	≤20	PASS

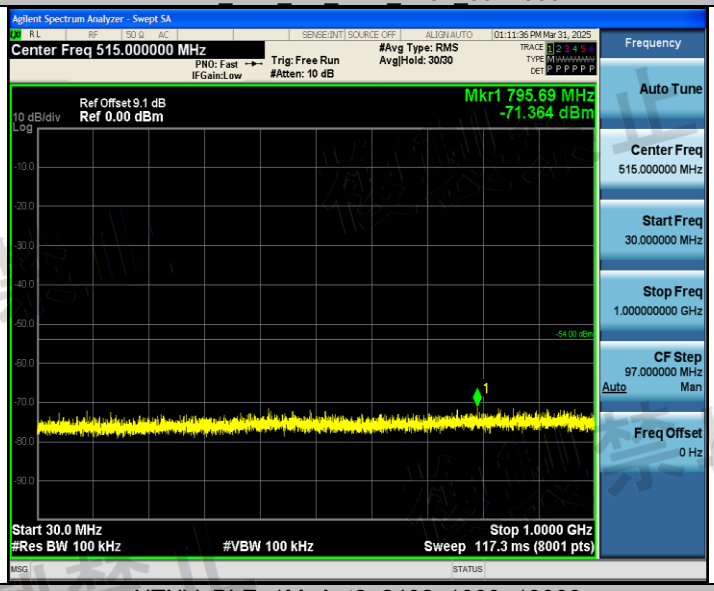
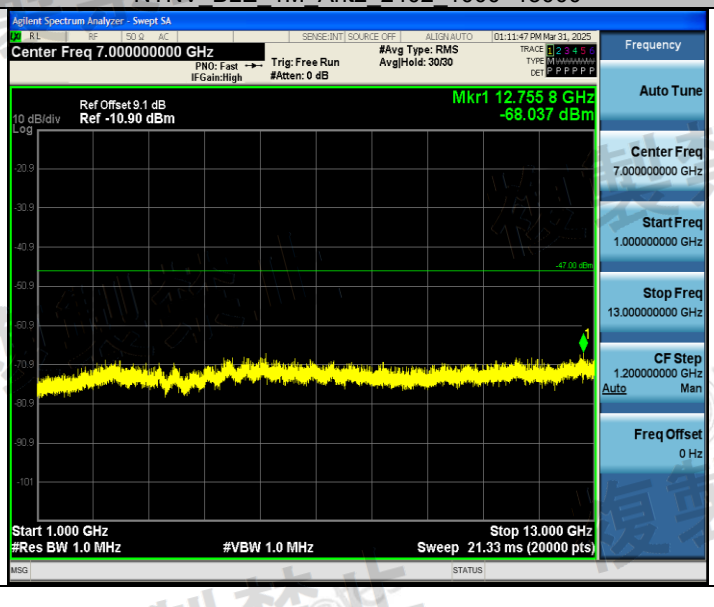
Test Graphs

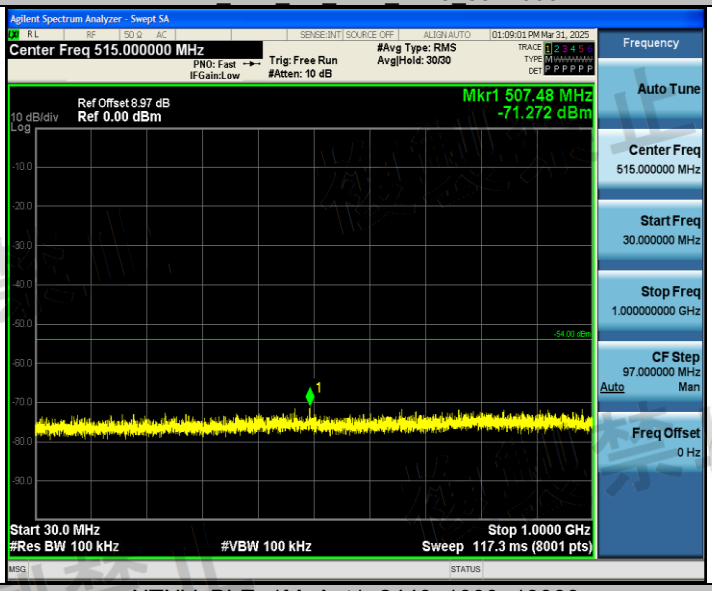
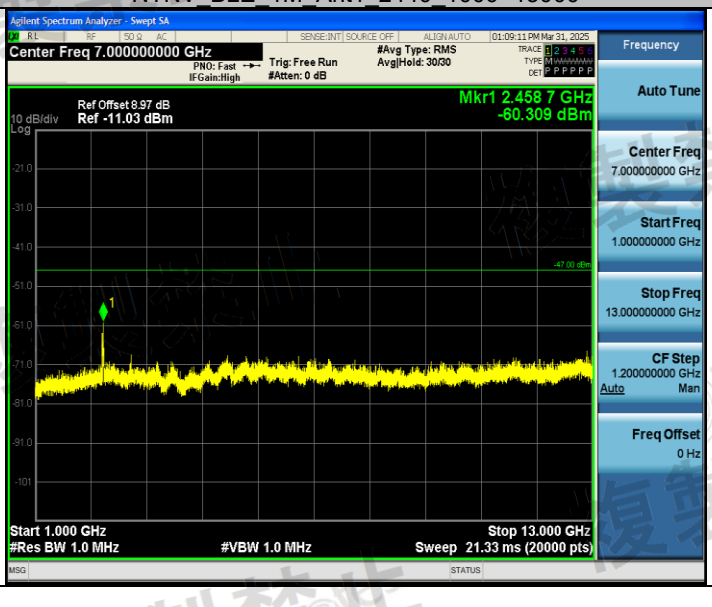
NTNV_BLE_1M_Ant1_2402_30~1000

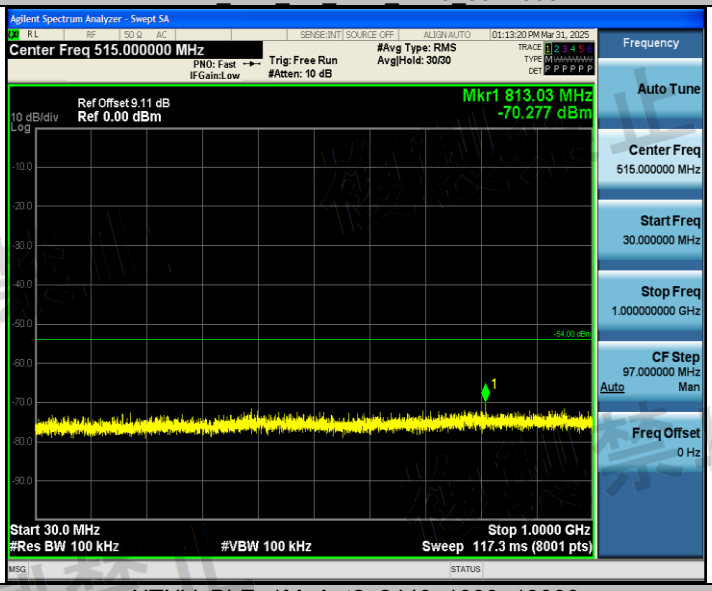
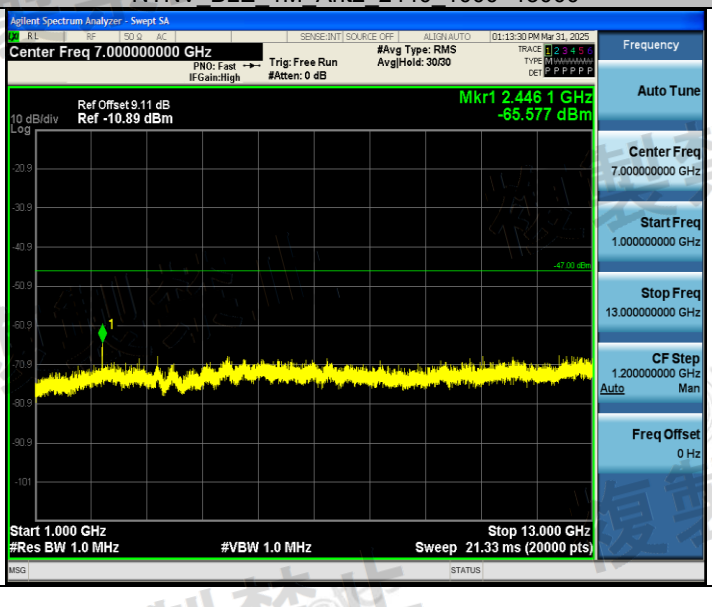


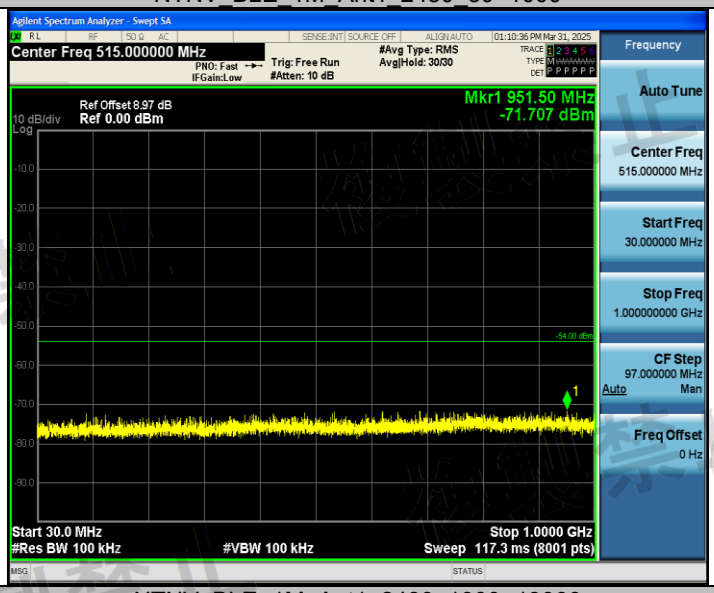
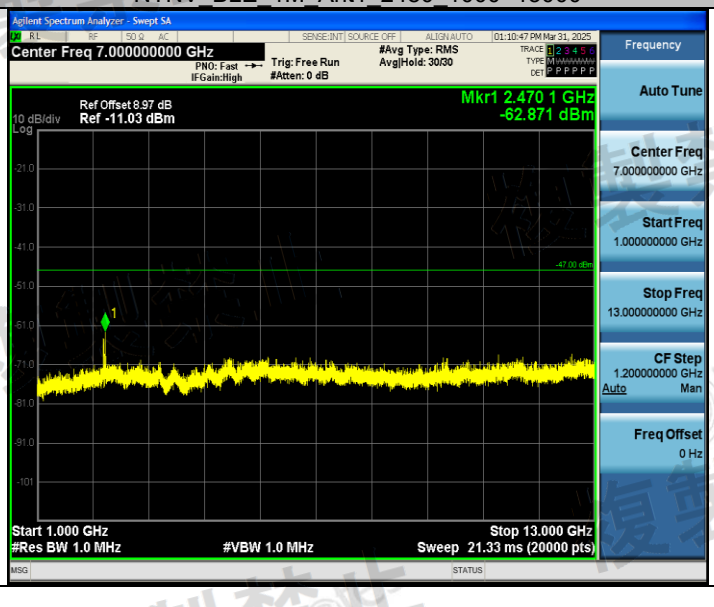
NTNV_BLE_1M_Ant1_2402_1000~13000



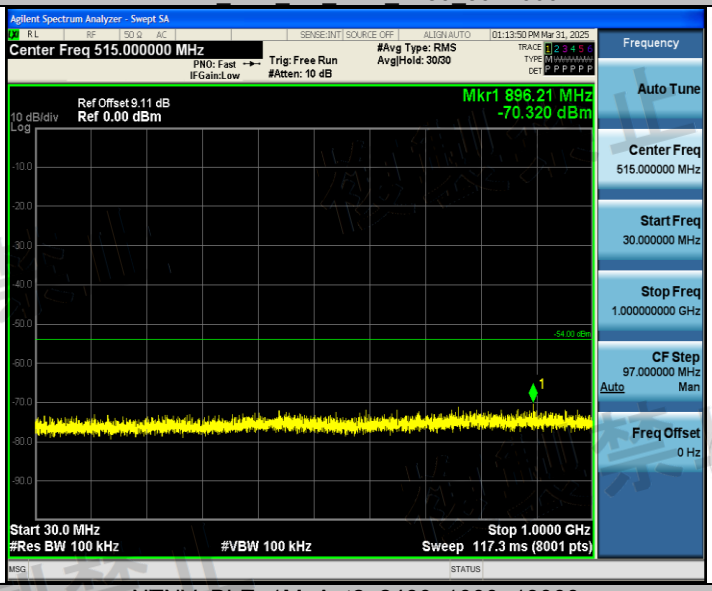
NTNV_BLE_1M_Ant2_2402_30~1000

NTNV_BLE_1M_Ant2_2402_1000~13000


NTNV_BLE_1M_Ant1_2440_30~1000

NTNV_BLE_1M_Ant1_2440_1000~13000


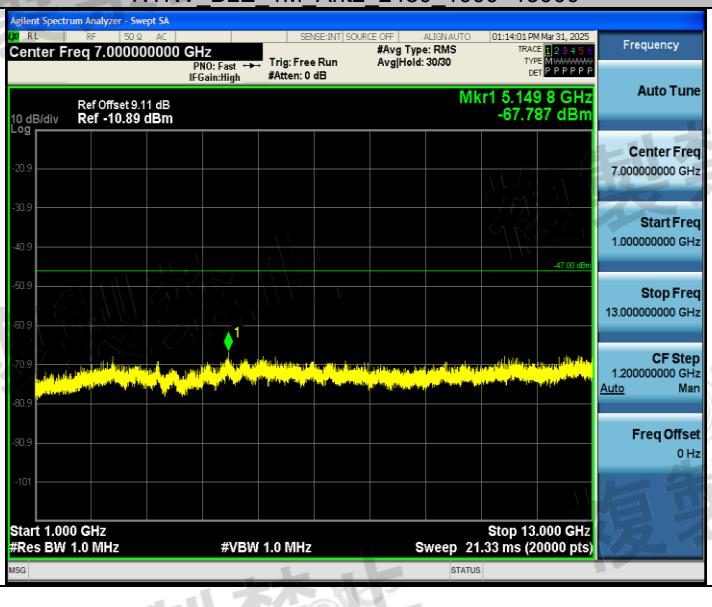
NTNV_BLE_1M_Ant2_2440_30~1000

NTNV_BLE_1M_Ant2_2440_1000~13000


NTNV_BLE_1M_Ant1_2480_30~1000

NTNV_BLE_1M_Ant1_2480_1000~13000


NTNV_BLE_1M_Ant2_2480_30~1000



NTNV_BLE_1M_Ant2_2480_1000~13000



Statement

1. This report is invalid without the seal and signature of the laboratory.

2. The test results of this report are only responsible for the samples submitted.Client shall be responsible for representativeness of the sample and authenticity of the material.
3. The report shall not be partially reproduced without the written consent of the Laboratory.
4. This report is invalid if transferred, altered or tampered with in any form without authorization.
5. The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
6. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

****** END OF REPORT ******