Test Report

Report No.	:	MTi250904014-0111E1
Date of issue	:	2025-09-22
Applicant	:	Zhuhai Quin Technology Co., Ltd.
Product	:	Portable printer
Model(s)	:	M08F, M08 pro, T08F, T08FS, TP81, TP83, TP86, TP87, TP88, M08E

Issued by:

Shenzhen Microtest Co., Ltd.

TEST REPORT

Report No.: MTi250904014-0111E1

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 Spread Bandwidth (90%) 14
6.4 Spread Factor 16
6.5 Antenna Power and Tolerance 17
6.6 Spurious Emission Intensity 18
6.7 Secondary Radiated Emissions 21
6.8 Dwell Time 23

Photographs of the test setup 24
Photographs of the EUT 25
Appendix A: Deviation of frequency 27
Appendix B: Deviation of antenna power 30
Appendix C: Occupied Bandwidth 31
Appendix D: Spread Bandwidth 33
Appendix E: Spurious and unwanted emission intensity 35
Appendix F: Secondary radiated emissions 47
Appendix G: Hopping frequency holding time 54

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Test Result Certification	
Applicant	Zhuhai Quin Technology Co., Ltd.
Applicant Address	1ST FLOOR, BUILDING 1, NO.456 CHUANGYUAN ROAD, XIANGZHOU DISTRICT, ZHUHAI CITY
Manufacturer	Zhuhai Quin Technology Co., Ltd.
Manufacturer Address	1ST FLOOR, BUILDING 1, NO.456 CHUANGYUAN ROAD, XIANGZHOU DISTRICT, ZHUHAI CITY
Product description	
Product name	Portable printer
Trademark	N/A
Model name	M08F
Series Model(s)	M08 pro, T08F, T08FS, TP81, TP83, TP86, TP87, TP88, M08E
Standards	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43
Testing Information	
Date of test	2024-07-03 to 2024-07-05
Test result	Pass

Prepared by:	Maleah Deng	Maleah Deng
Reviewed by:	David Lee	David. Lee
Approved by:	Lewis Lian	Lewis Lian

Note: The report changes the information of the address of the applicant and manufacturer on the basis of MTi240619023-10E1. Test data is not affected, citing the original report (dated 2024-10-10).

1 General Description

1.1 Description of the EUT

Product name:	Portable printer
Model name:	M08F
Series Model(s):	M08 pro, T08F, T08FS, TP81, TP83, TP86, TP87, TP88, M08E
Model difference:	All the models are the same circuit and module, except the model name, colour, silk-screen and appearance.
Electrical rating:	Input: 5VDC 2A Battery: 11.1VDC 1200mAh
Accessories:	Cable: USB-A to Type-C cable 0.8m* 1 Type-C to Type-C cable 0.8m* 1 USB to Type-C adapter 0.15m *1
Hardware version:	Q063_A_V1.1_240411
Software version:	_1.0.0
Test sample(s) number:	MTi240619023-01S1001(RF Conducted test)
RF specification	
Bluetooth version:	V5.3
Operating frequency range:	2402-2480MHz
Channel number:	79
Modulation type:	GFSK, π/4-DQPSK
Antenna(s) type:	FPC
Antenna(s) gain:	2.33dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	TX-GFSK
Mode2	TX-π/4-DQPSK
Mode3	RX

1.2.1 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465

4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	-	-

Test Channel List
Operation Band: 1

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
1	2402	2441	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: FCC Assist 1.0.2.2
For power setting, refer to below table.

Mode	2402MHz	2441MHz	2480MHz
GFSK	10	10	10
π/4-DQPSK	10	10	10

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})	/	11.1	3.3
NTHV ($V_{max.}$)	+10%	12.21	3.3
NTLV ($V_{min.}$)	-10%	9.99	3.3

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

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

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	Spread Bandwidth (90%)	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
4	Spread Factor	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
5	Antenna Power and Tolerance	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
6	Spurious Emission Intensity	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
7	Secondary Radiated Emissions	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
8	Dwell Time	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
9	Interference Prevention Function	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass

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
Spread Bandwidth (90%) Spread Factor Antenna Power and Tolerance Spurious Emission Intensity Secondary Radiated Emissions Dwell Time Tolerance of Frequency Occupied Bandwidth (99%)						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2024-03-20	2025-03-19
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2024-03-21	2025-03-20
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-21	2025-03-20
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2024-03-21	2025-03-20
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2024-03-21	2025-03-20
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2024-03-21	2025-03-20
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2024-03-21	2025-03-20
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2024-03-20	2025-03-19
9	DC Power Supply	Agilent	E3632A	MY40027695	2024-03-21	2025-03-20

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: DF:0F:3D:58:D8:57 Test result: The device meet the requirements PASS

6 Radio Spectrum Matter Test Results (RF)

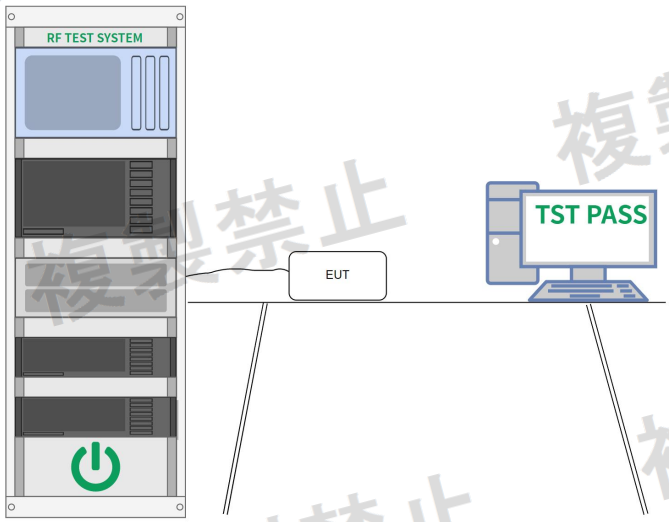
6.1 Tolerance of Frequency

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 :	21.5 °C	Humidity :	51.78 %	Atmospheric Pressure:	98 kPa
Pre test mode:	unmodulated carrier				
Final test mode:	unmodulated carrier				

6.1.2 Test Setup Diagram:



6.1.3 Test Data:

Please Refer to Appendix for Details.

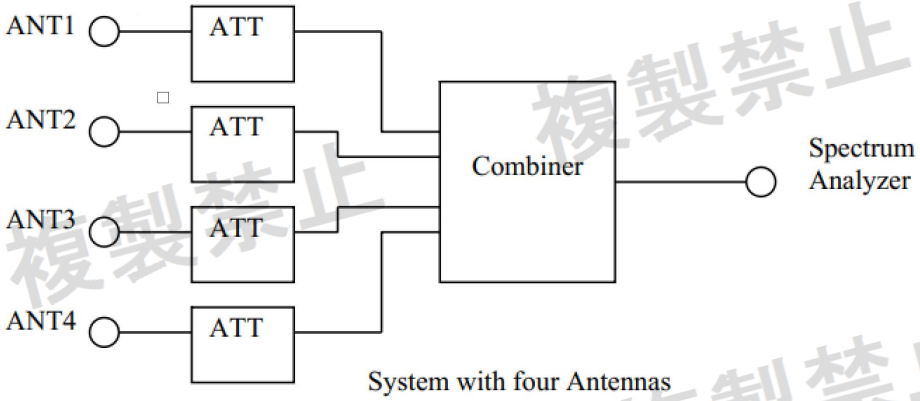
6.2 Occupied Bandwidth (99%)

Test Requirement:	Article 2-1, Item 19
Test Limit:	For FHSS or FHSS and other modulation Hybird: 83.5 MHz or less: 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] 83.5 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:

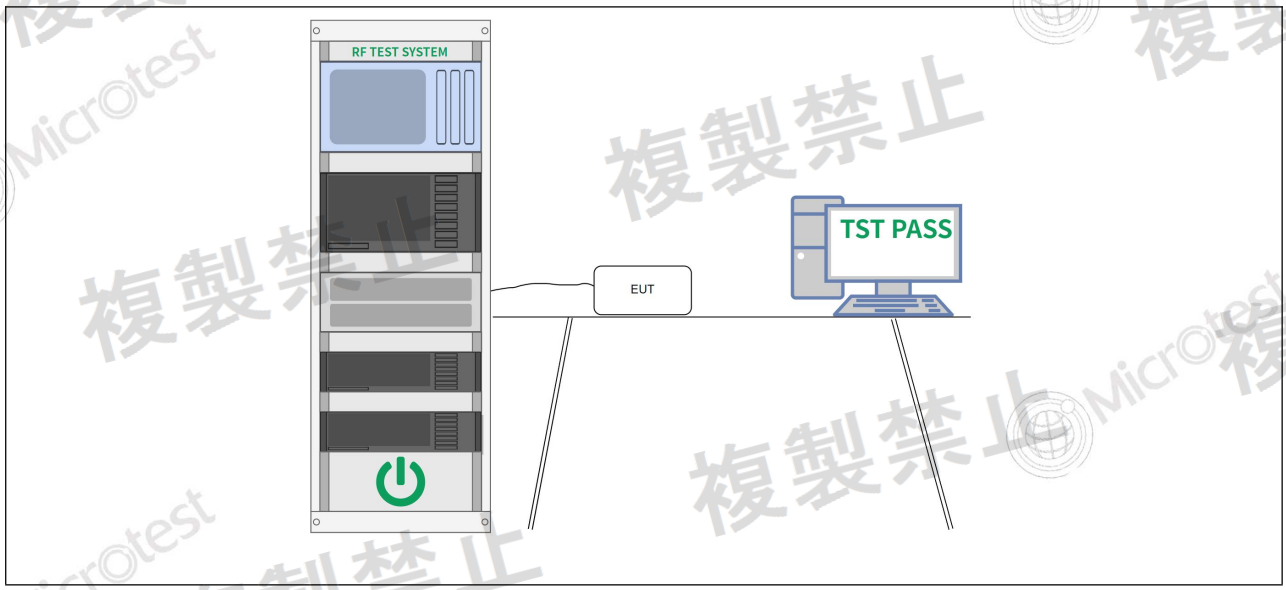


System with four Antennas

6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature :	21.5 °C	Humidity :	51.78 %	Atmospheric Pressure:	98 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

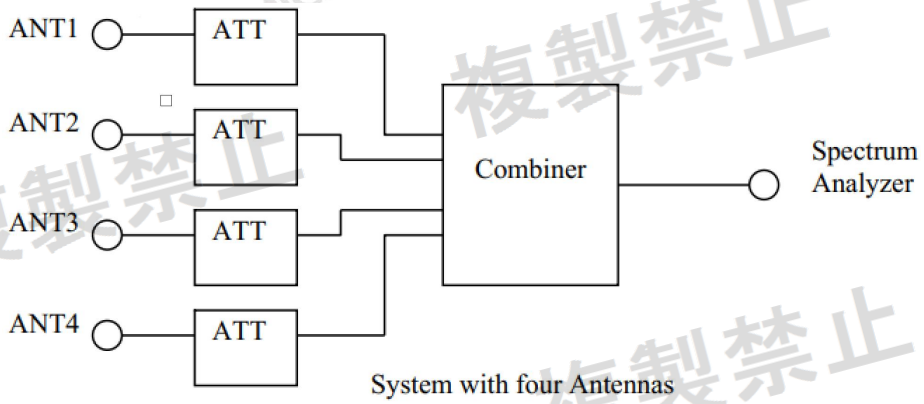
Please Refer to Appendix for Details.

6.3 Spread Bandwidth (90%)

Test Requirement:	Article 2-1, Item 19
Test Limit:	Only for report use.
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:	90%

(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:

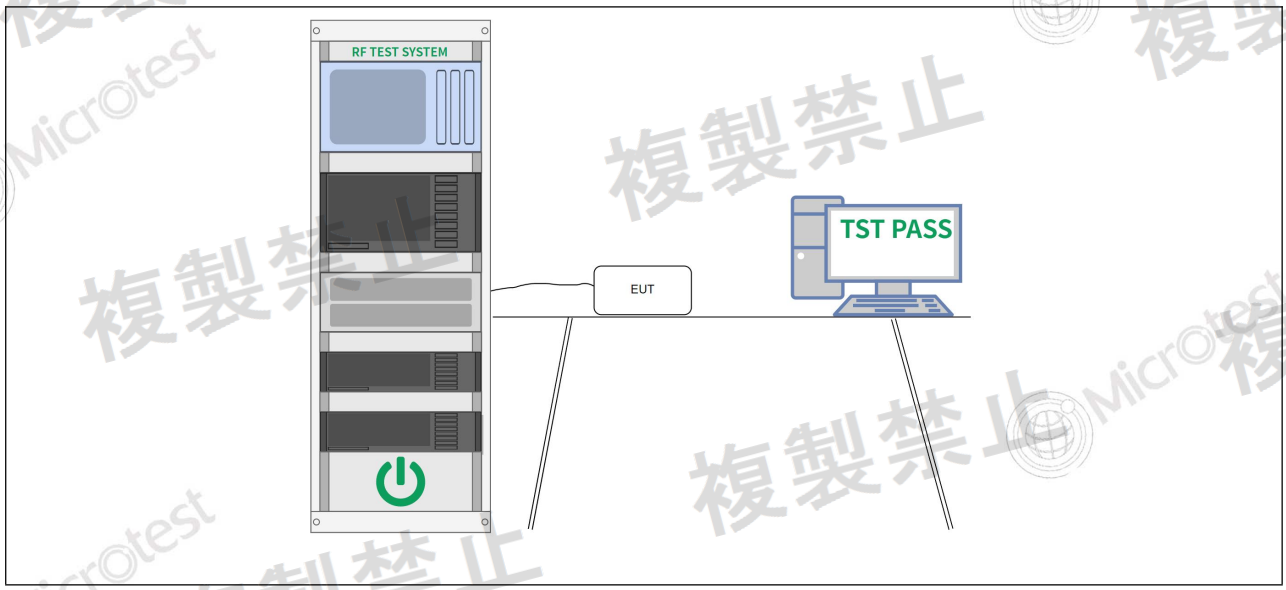


System with four Antennas

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature :	21.5 °C	Humidity :	51.78 %	Atmospheric Pressure:	98 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.

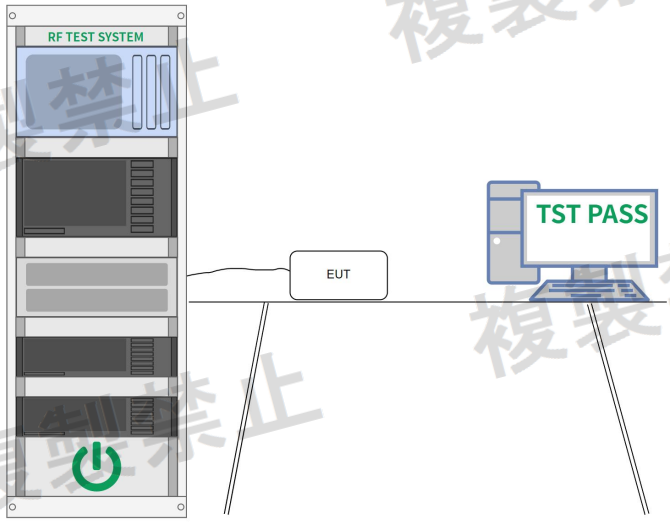
6.4 Spread Factor

Test Requirement:	Article 2-1, Item 19
Test Limit:	The spread factor should be more than 5.
Test Method:	The test method is the same as spread bandwidth.
Procedure:	The test procedure is the same as spread bandwidth.

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature :	21.5 °C	Humidity :	51.78 %	Atmospheric Pressure:	98 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

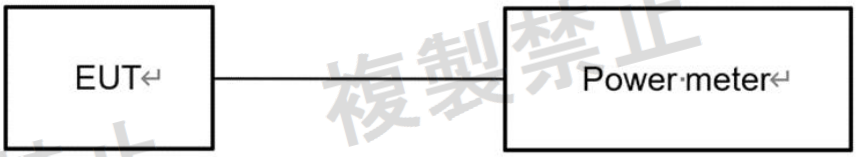
6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

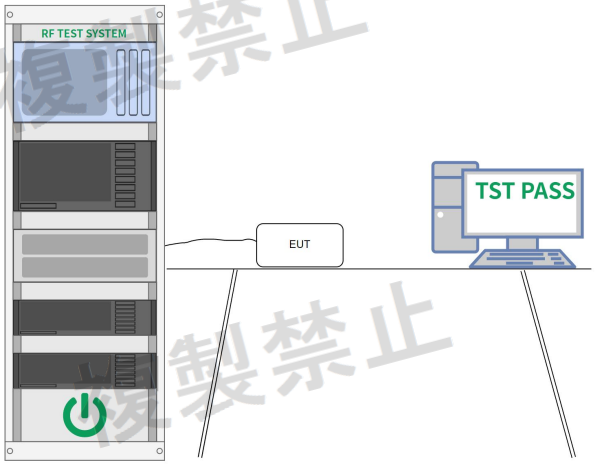
6.5 Antenna Power and Tolerance

Test Requirement:	Article 2-1, Item 19
Test Limit:	Antenna Power: 3 mW/MHz or less Tolerance: +20% or less EIRP: 6.91dBm/MHz
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.  (1) Calculate Antenna Power using the following formula: Antenna Power (W/MHz) = Average Burst Power (W) / Spread Bandwidth (MHz) [Note] Spread Bandwidth in the formula above is derived from the data collected in section 5 (Occupied Bandwidth (99%) and Spread Bandwidth (90%)) (2) If the EUT has multiple antennas then each antenna power output shall be measured individually – the sum of these individual measurements shall represent the power output value

6.5.1 E.U.T. Operation:

Operating Environment:					
Temperature :	21.5 °C	Humidity :	51.78 %	Atmospheric Pressure:	98 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

Please Refer to Appendix for Details.

6.6 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:	1 MHz
	VBW:	3 MHz
	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

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

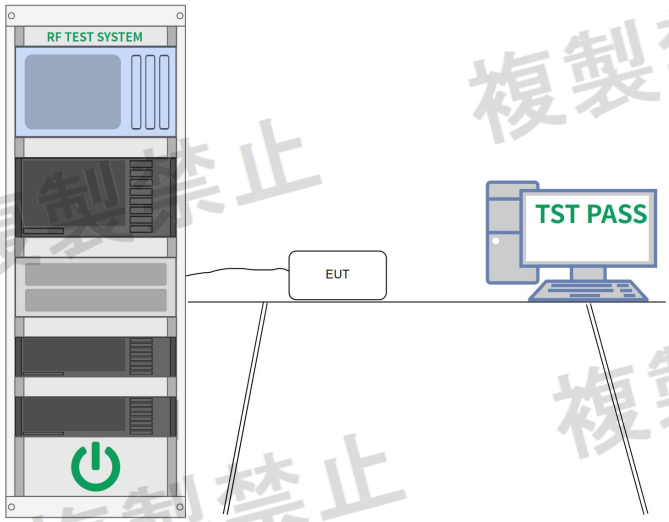
Ps: Sum (Watts)
Ei: Measured value at each point in the Span (Watts) Sw: Span (1MHz)
n: Number of measurement points in the Span
k: Correction factor for Equivalent Noise Bandwidth, specific to each

	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

6.6.1 E.U.T. Operation:

Operating Environment:					
Temperature :	21.5 °C	Humidity :	51.78 %	Atmospheric Pressure:	98 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

6.6.2 Test Setup Diagram:



6.6.3 Test Data:

Please Refer to Appendix for Details.

6.7 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

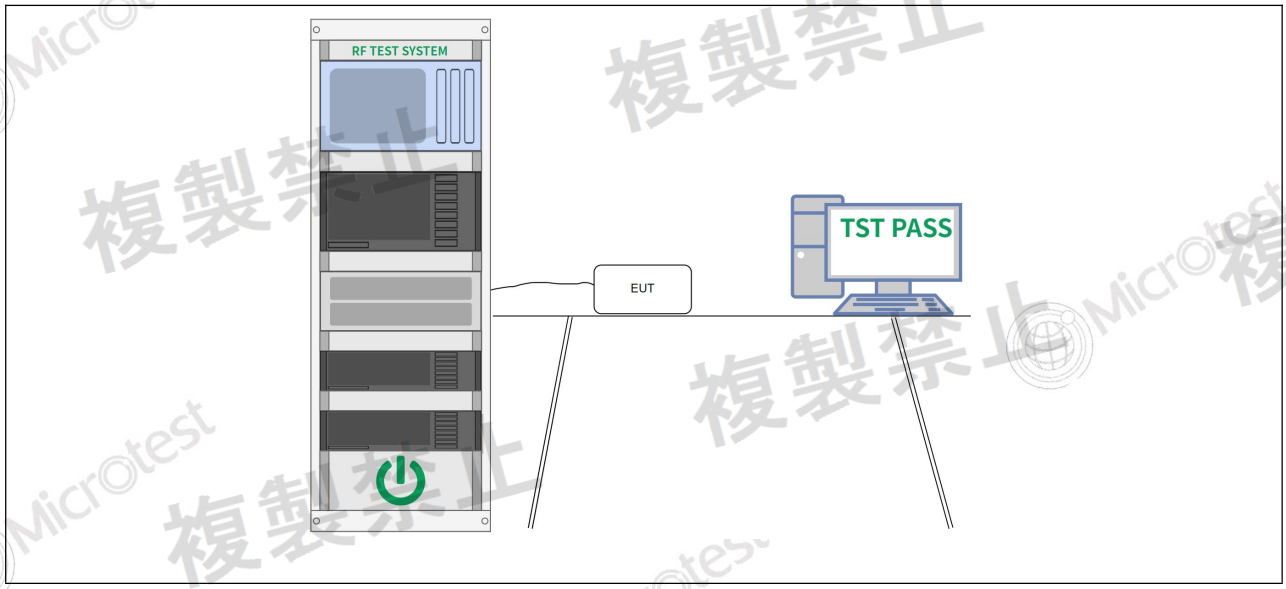
(1) Configure the spectrum analyzer to [Setting 1] and then search for spurious emissions in the range 30 MHz to 12.5GHz. If the sweep range does not cover the required measurement frequency range then the measurement range will need to be divided into sufficient sections of size [RBW x Sweep Data Points].
(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

6.7.1 E.U.T. Operation:

Operating Environment:					
Temperature :	21.5 °C	Humidity :	51.78 %	Atmospheric Pressure:	98 kPa

Pre test mode:	Mode3
Final test mode:	Mode3

6.7.2 Test Setup Diagram:



6.7.3 Test Data:

Please Refer to Appendix for Details.

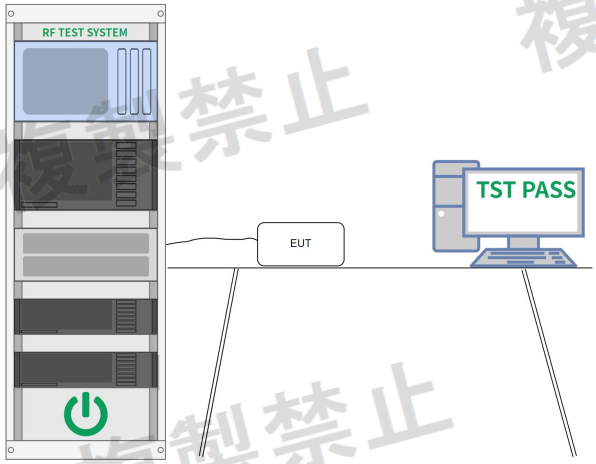
6.8 Dwell Time

Test Requirement:	Article 2-1, Item 19
Test Limit:	Transmit ON Time shall be less than 0.4 seconds Total Dwell Time shall be less than 0.4 seconds
Test Method:	Notification No.88 of MIC, 2004
Procedure:	[Setting 1] Frequency: Test frequency Span: 0 Hz RBW: 1 MHz VBW: 1 MHz Sweep data points: 1001 or greater Trigger: Video trigger Detection mode: Positive peak (1) Configure the spectrum analyzer to [Setting 1] (2) Measure the Burst Cycle and Transmit ON Time (3) Total Dwell Time shall be calculated by the following formula: Total Dwell Time = (0.4 x Spreading Rate x Transmit ON Time) / (Burst Cycle x Number of Hopping Channels) [Notes] a. Spreading Rate = Spread Bandwidth (measured value) / Transmission Rate b. Transmit ON Time and Burst Cycle are both measured in Seconds c. Numerical Coefficient (0.4) is a dimensionless number defined in the technical standard

6.8.1 E.U.T. Operation:

Operating Environment:					
Temperature :	21.5 °C	Humidity :	51.78 %	Atmospheric Pressure:	98 kPa
Pre test mode:	Mode1, Mode2				
Final test mode:	Mode1, Mode2				

6.8.2 Test Setup Diagram:



6.8.3 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

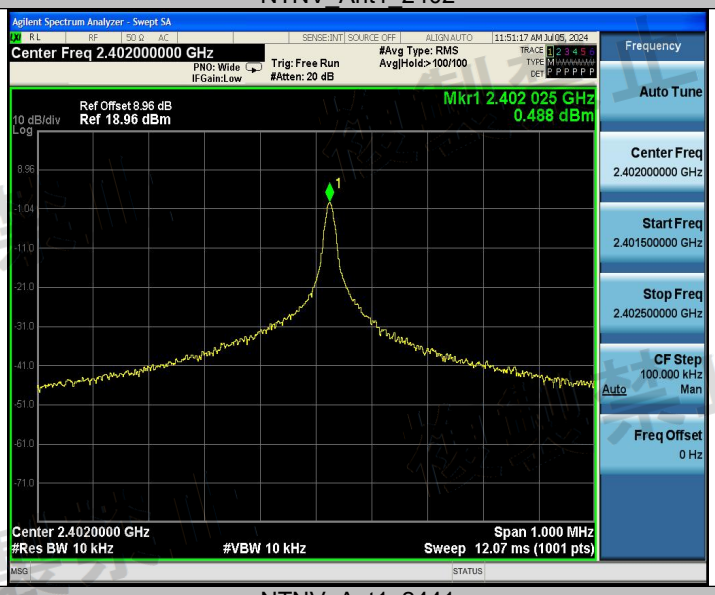
Test Result

Test Condition	Test Mode	Antenna	Freq. [MHz]	CenterFreq [MHz]	Result [ppm]	Limit [ppm]	Verdict
NTNV	/	Ant1	2402	2402.025	10.40799	±50	PASS
			2441	2441.025	10.24170	±50	PASS
			2480	2480.026	10.48387	±50	PASS

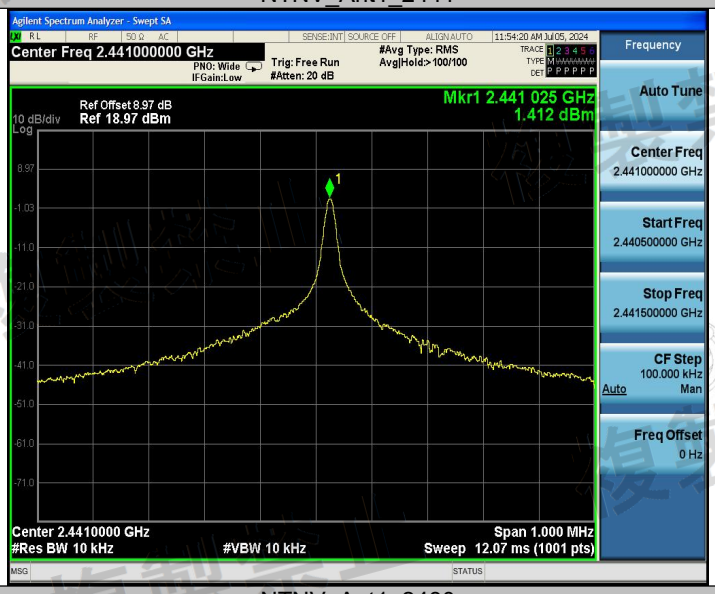
Note: Result [ppm] = (CenterFreq [MHz] – Freq. [MHz]) / Freq. [MHz] * 1000000

Test Graphs

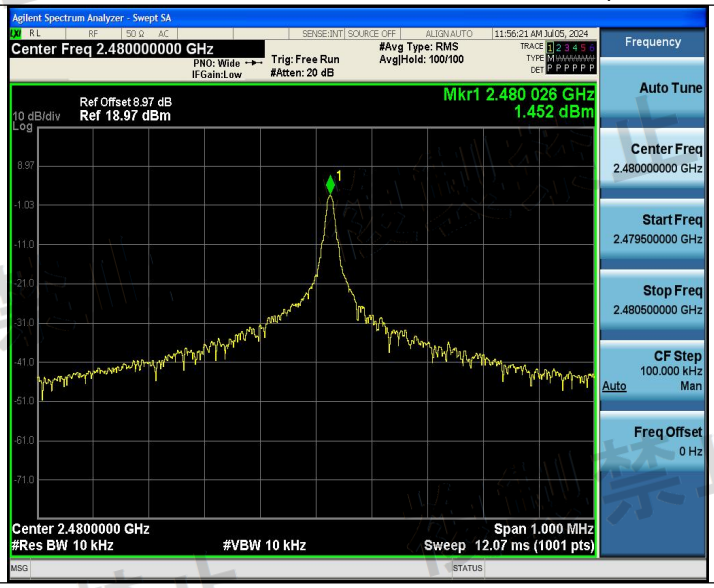
NTNV_Ant1_2402



NTNV_Ant1_2441



NTNV_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 100/100
11:56:21 AM Jul 05, 2024
Ref Offset 8.97 dB
10 dB/div
Ref 18.97 dBm
Log
Mkr1 2.480 026 GHz
1.452 dBm
Center 2.4800000 GHz
#Res BW 10 kHz
#VBW 10 kHz
Span 1.000 MHz
Sweep 12.07 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479500000 GHz
Stop Freq
2.480500000 GHz
CF Step
100.000 kHz
Auto
Man
Freq Offset
0 Hz

Appendix B: Deviation of antenna power

Test Result

Antenna Power									
Test Condition	Test Mode	Antenna	Freq. [MHz]	Result [dBm]	Result [mW]	Spread bandwidth [MHz]	Result [mW/MHz]	Limit [mW /MHz]	Verdict
NTNV	DH5	Ant1	Hop	2.12	1.6293	71.165	0.0229	≤3	PASS
	2DH5	Ant1	Hop	0.62	1.1535	71.717	0.0161	≤3	PASS

Notes:
Result [mW/MHz] = Result [mW] / Spread bandwidth [MHz]
The duty cycle factor has been in compensation during the testing.
Duty cycle of DH5: 76.06%,
Duty cycle of 2DH5: 76.53%

Tolerance								
Test Condition	Test Mode	Antenna	Freq [MHz]	Power [mW/MHz]	RatedPower [mW/MHz]	Result [%]	Limit [%]	Verdict
NTNV	DH5	Ant1	Hop	0.0229	0.1	-77.11%	≤20	PASS
	2DH5	Ant1	Hop	0.0161	0.1	-83.92%	≤20	PASS

Notes:
Result = (Power [mW] – RatedPower [mW]) / RatedPower [mW] * 100
The rated power is 0.1 mW/MHz for DH5 mode, which is declared by the manufacturer.
The rated power is 0.1 mW/MHz for 2DH5 mode, which is declared by the manufacturer.

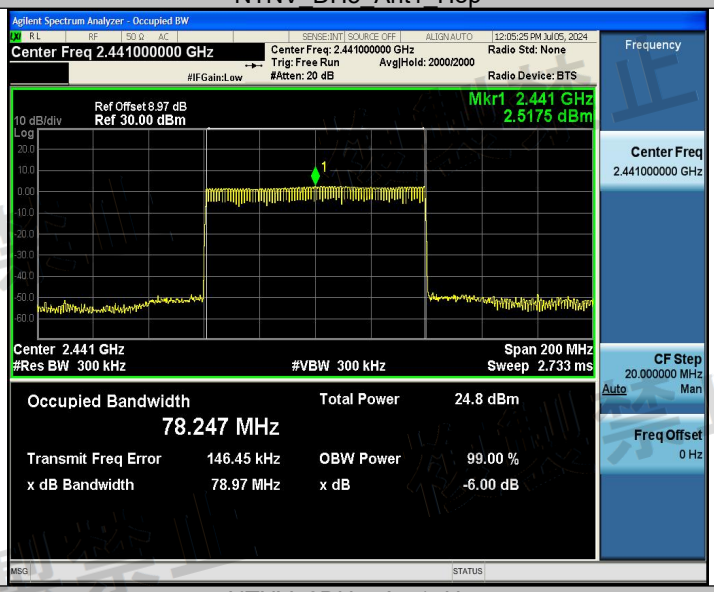
Test Condition	Test Mode	Antenna	Freq [MHz]	Spread bandwidth [MHz]	Power [dBm/ MHz]	EIRP [dBm/ MHz]	Limit [dBm/ MHz]	Verdict
NTNV	DH5	Ant1	Hop	71.165	-16.403	-14.073	≤6.91	PASS
	2DH5	Ant1	Hop	71.717	-17.936	-15.606	≤6.91	PASS

Notes:
The antenna gain is 2.33dBi.
EIRP= antenna gain +Power

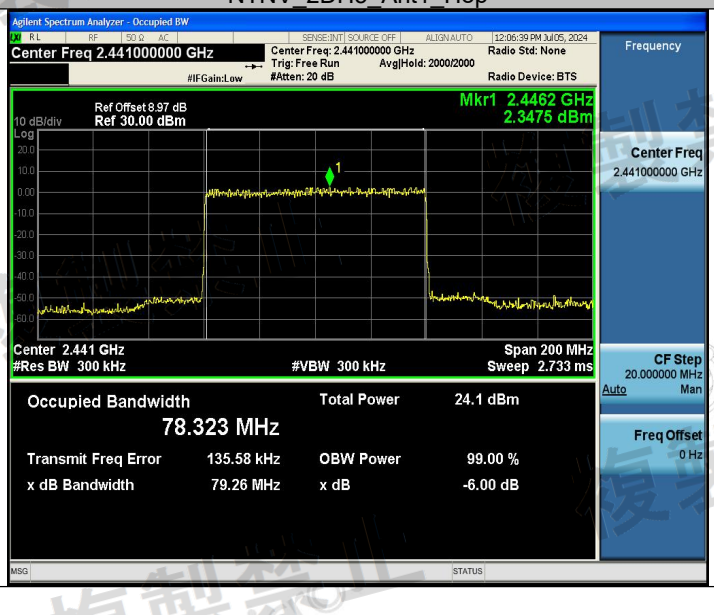
Appendix C: Occupied Bandwidth

Test Condition	Test Mode	Antenna	Freq. [MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	78.247	≤83.5	PASS
	2DH5	Ant1	Hop	78.323	≤83.5	PASS

NTNV_DH5_Ant1_Hop



NTNV_2DH5_Ant1_Hop



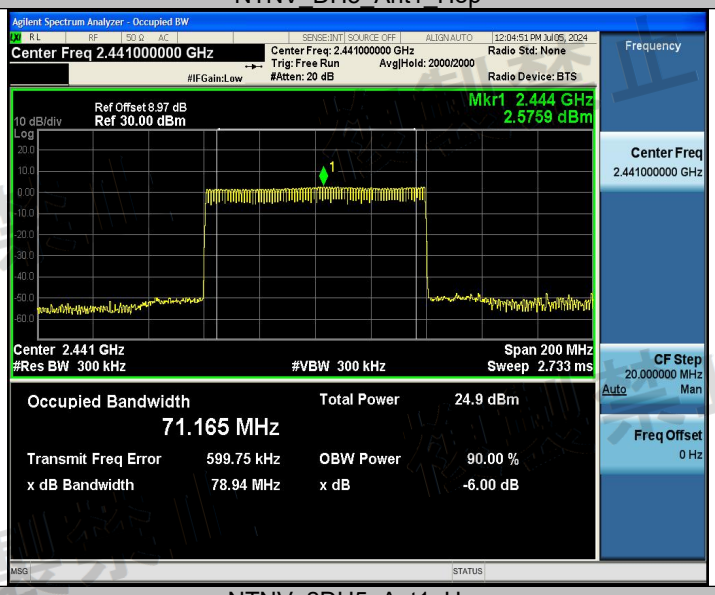
Appendix D: Spread Bandwidth

Test Result

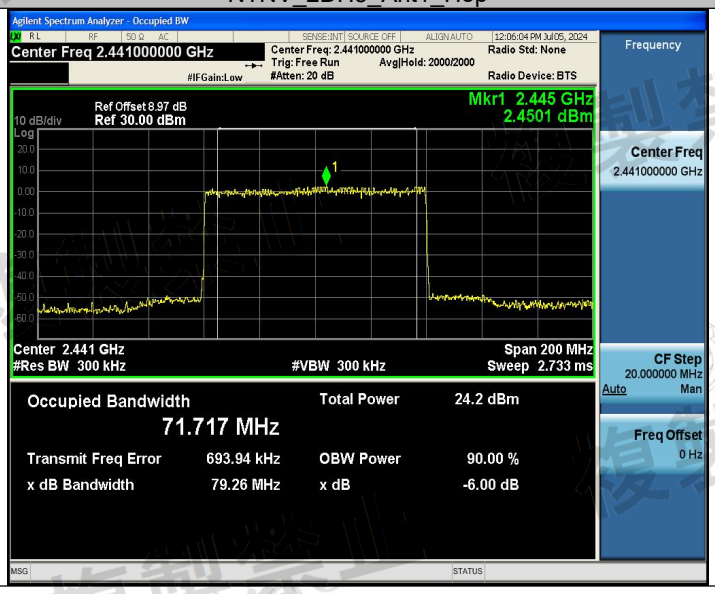
Test Condition	Test Mode	Antenna	Freq. [MHz]	Result [MHz]
NTNV	DH5	Ant1	Hop	71.165
	2DH5	Ant1	Hop	71.717

Test Graphs

NTNV_DH5_Ant1_Hop



NTNV_2DH5_Ant1_Hop



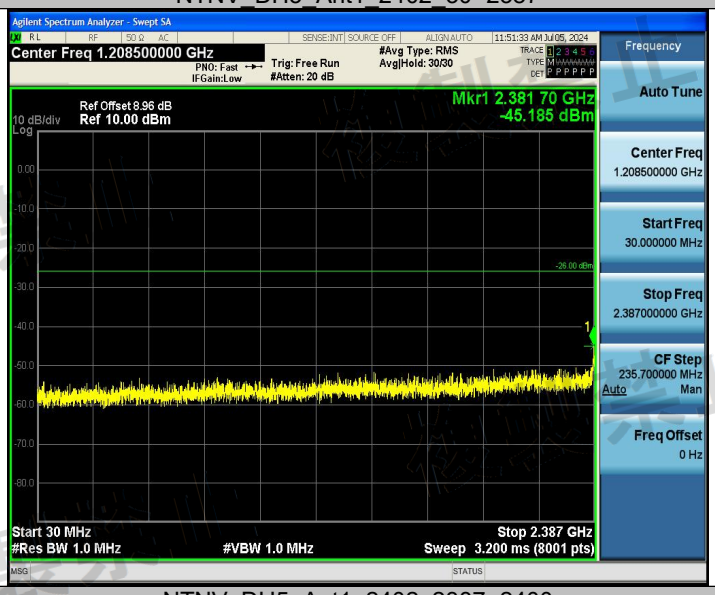
Appendix E: Spurious and unwanted emission intensity

Test Result

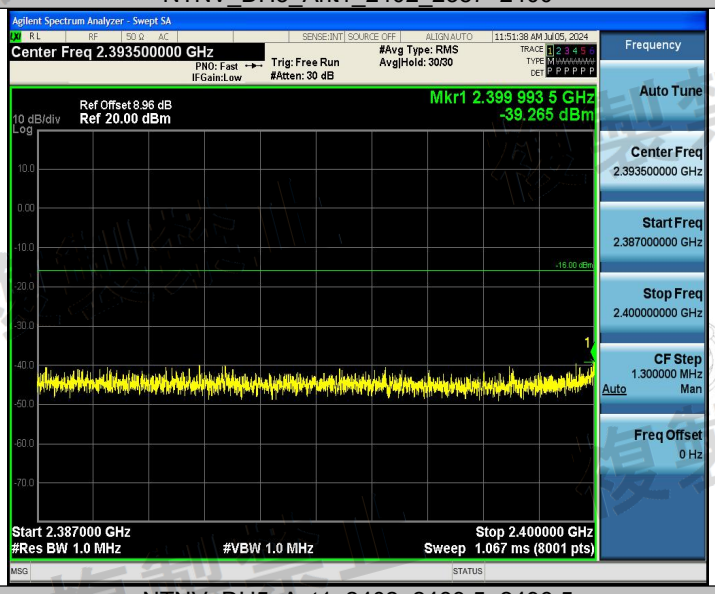
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	DH5	Ant1	2402	30~2387	-45.19	≤-26	0.03027	≤2.5	PASS
				2387~2400	-39.27	≤-16	0.11830	≤25	PASS
				2483.5~2496.5	-40.02	≤-16	0.09954	≤25	PASS
				2496.5~13000	-43.60	≤-26	0.04365	≤2.5	PASS
			2441	30~2387	-49.74	≤-26	0.01062	≤2.5	PASS
				2387~2400	-40.68	≤-16	0.08551	≤25	PASS
				2483.5~2496.5	-40.01	≤-16	0.09977	≤25	PASS
				2496.5~13000	-43.31	≤-26	0.04667	≤2.5	PASS
			2480	30~2387	-48.75	≤-26	0.01334	≤2.5	PASS
				2387~2400	-40.39	≤-16	0.09141	≤25	PASS
				2483.5~2496.5	-38.48	≤-16	0.14191	≤25	PASS
				2496.5~13000	-42.90	≤-26	0.05129	≤2.5	PASS
	2DH5	Ant1	2402	30~2387	-44.49	≤-26	0.03556	≤2.5	PASS
				2387~2400	-31.82	≤-16	0.65766	≤25	PASS
				2483.5~2496.5	-40.58	≤-16	0.08750	≤25	PASS
				2496.5~13000	-45.26	≤-26	0.02979	≤2.5	PASS
			2441	30~2387	-50.23	≤-26	0.00948	≤2.5	PASS
				2387~2400	-40.41	≤-16	0.09099	≤25	PASS
				2483.5~2496.5	-40.43	≤-16	0.09057	≤25	PASS
				2496.5~13000	-44.13	≤-26	0.03864	≤2.5	PASS
			2480	30~2387	-49.09	≤-26	0.01233	≤2.5	PASS
				2387~2400	-40.65	≤-16	0.08610	≤25	PASS
				2483.5~2496.5	-38.99	≤-16	0.12618	≤25	PASS
				2496.5~13000	-44.31	≤-26	0.03707	≤2.5	PASS

Test Graphs

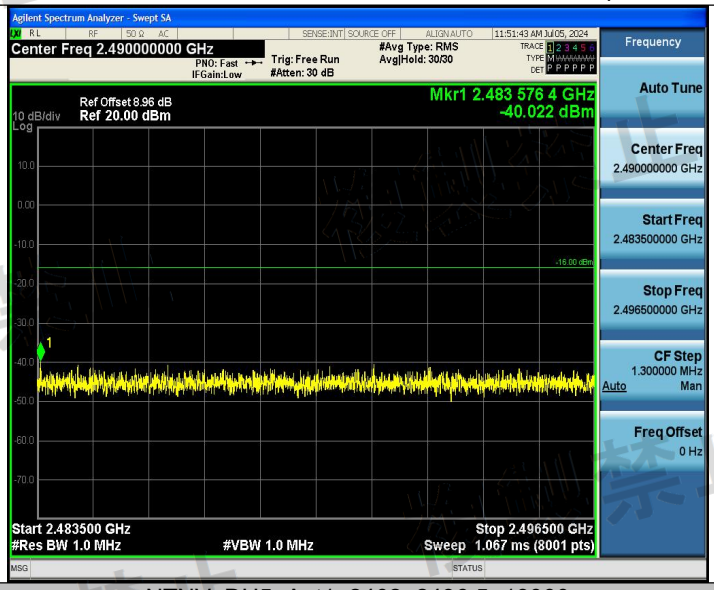
NTNV_DH5_Ant1_2402_30~2387



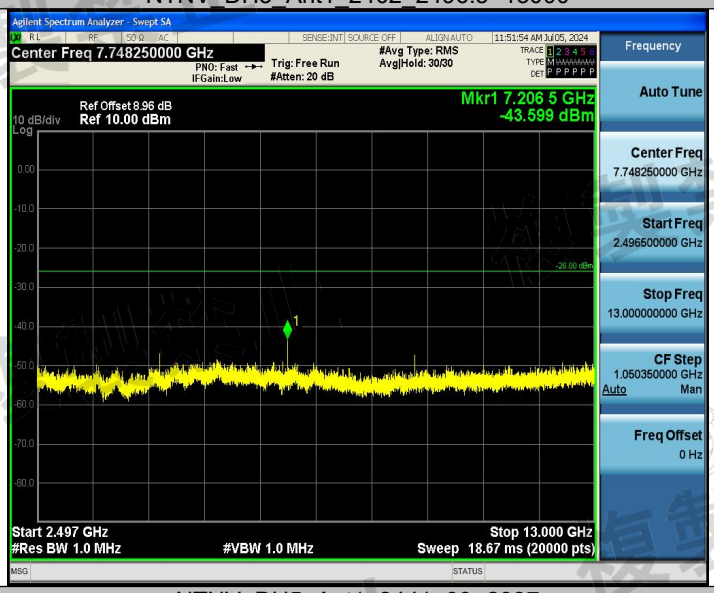
NTNV_DH5_Ant1_2402_2387~2400



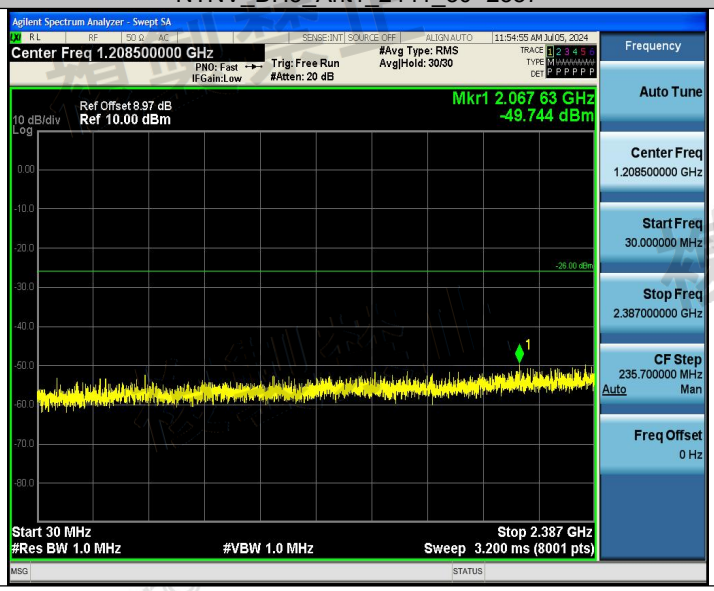
NTNV_DH5_Ant1_2402_2483.5~2496.5



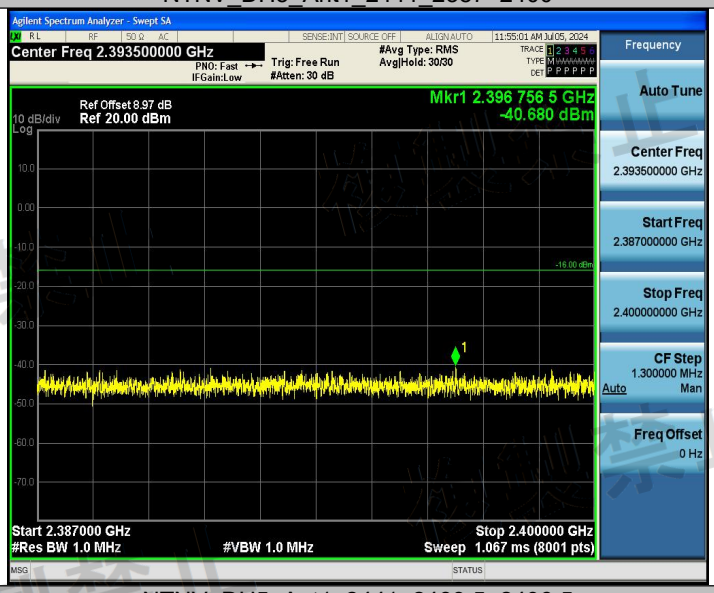
NTNV_DH5_Ant1_2402_2496.5~13000



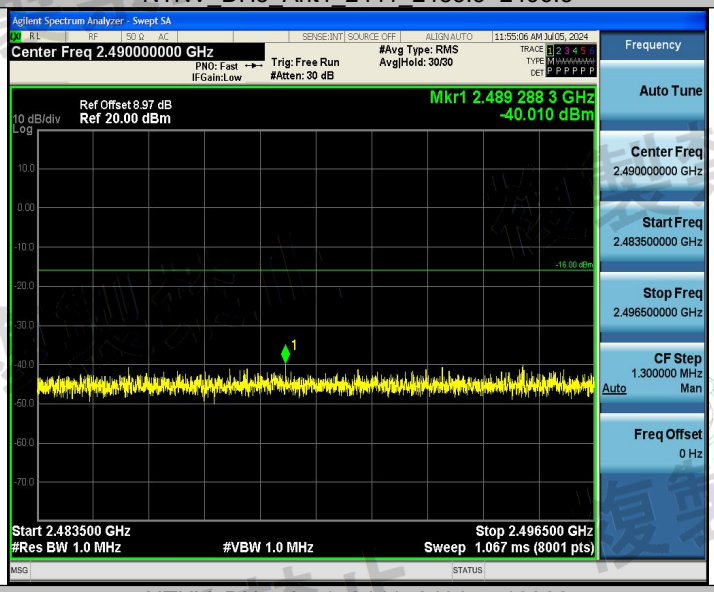
NTNV_DH5_Ant1_2441_30~2387



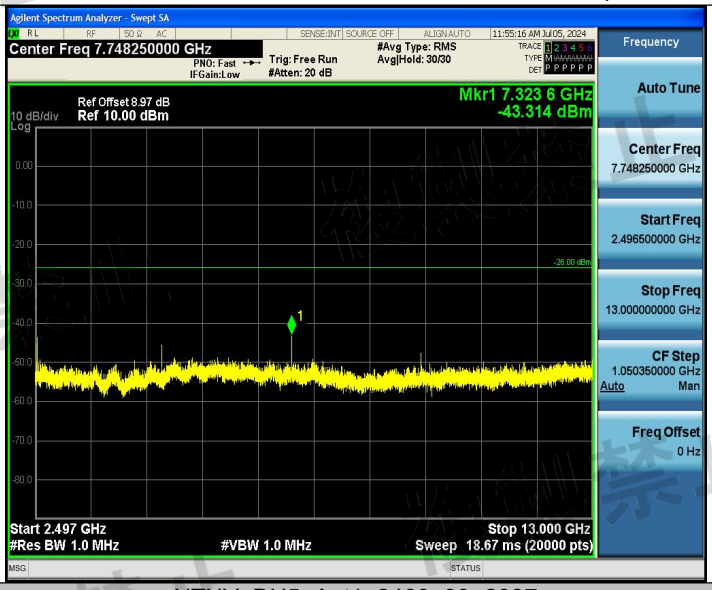
NTNV_DH5_Ant1_2441_2387~2400



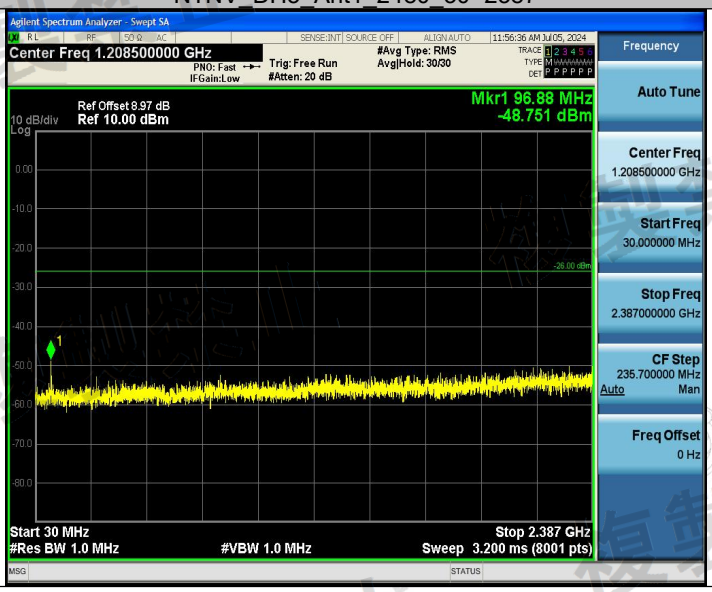
NTNV_DH5_Ant1_2441_2483.5~2496.5



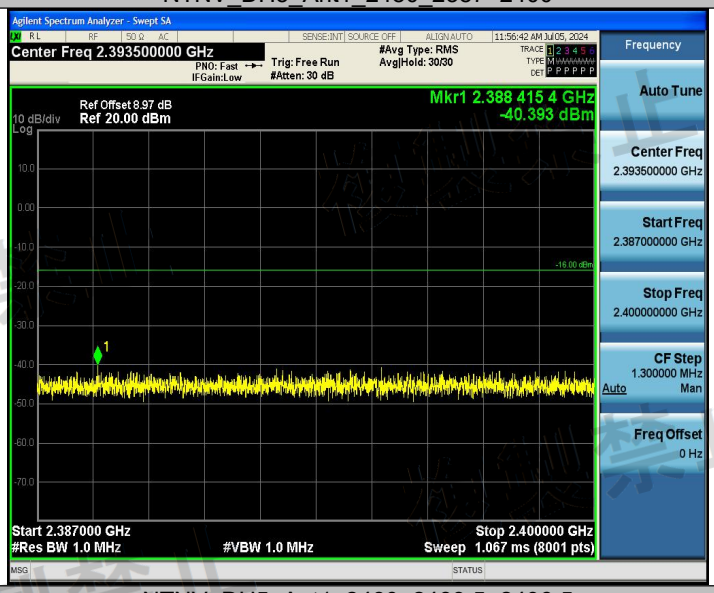
NTNV_DH5_Ant1_2441_2496.5~13000



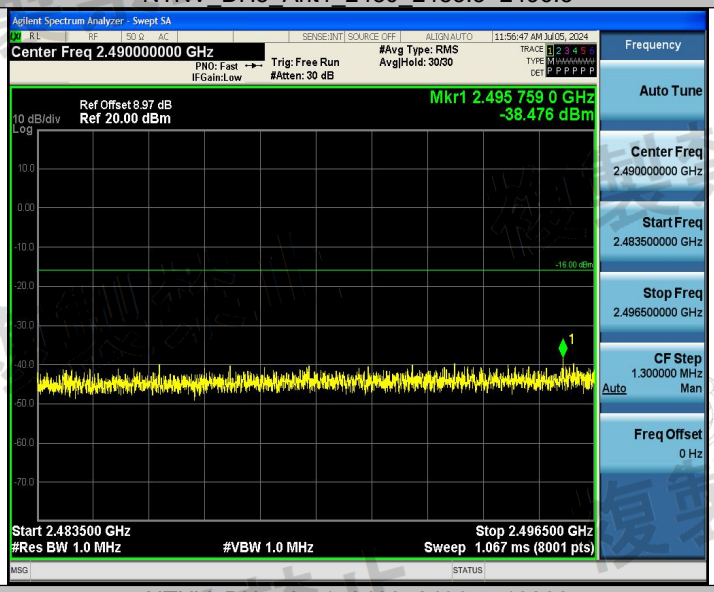
NTNV_DH5_Ant1_2480_30~2387



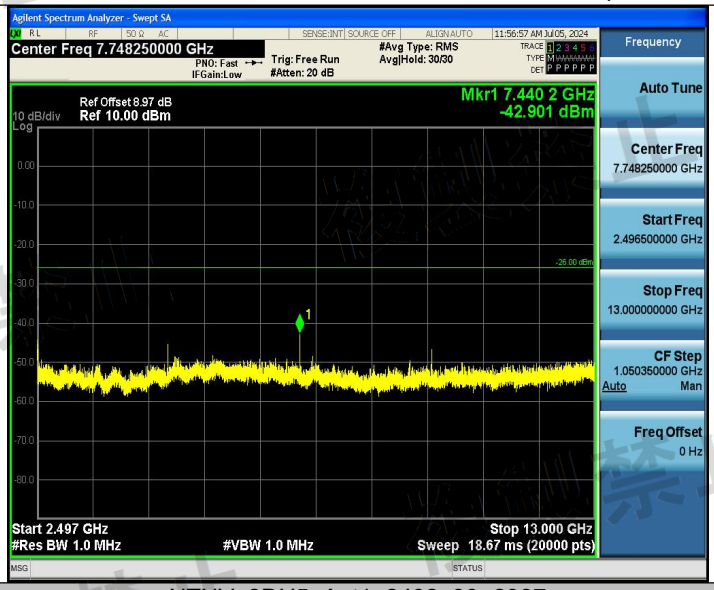
NTNV_DH5_Ant1_2480_2387~2400



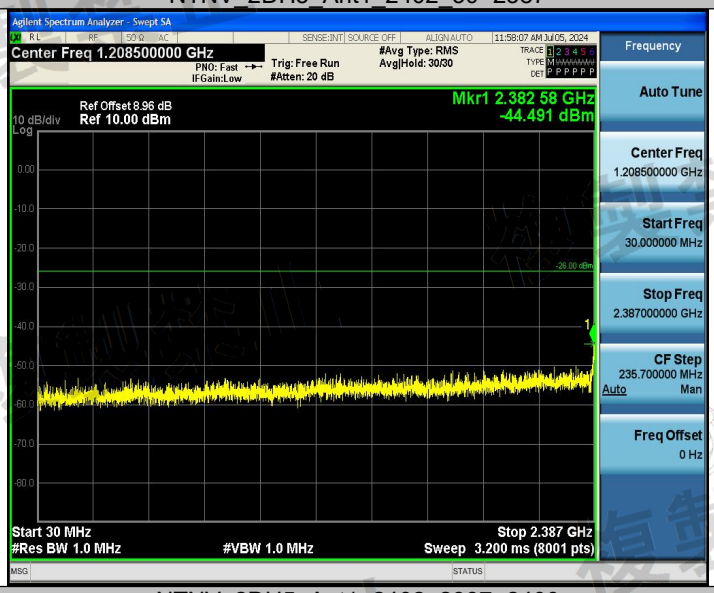
NTNV_DH5_Ant1_2480_2483.5~2496.5



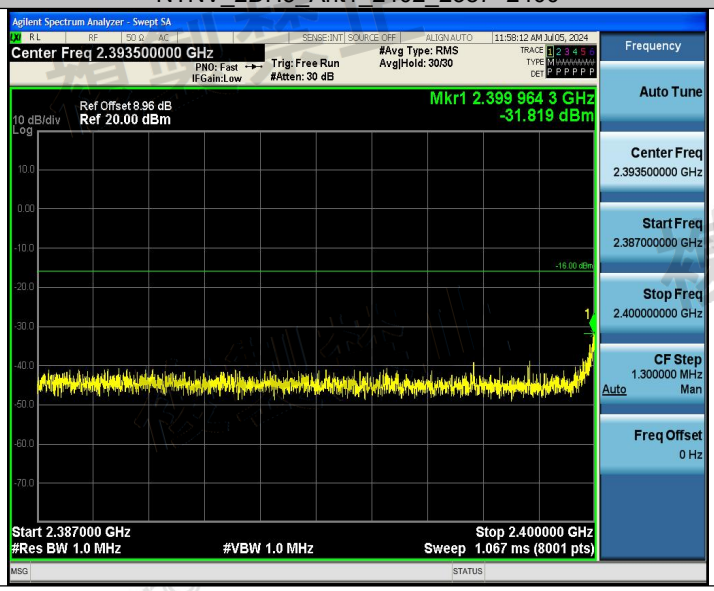
NTNV_DH5_Ant1_2480_2496.5~13000



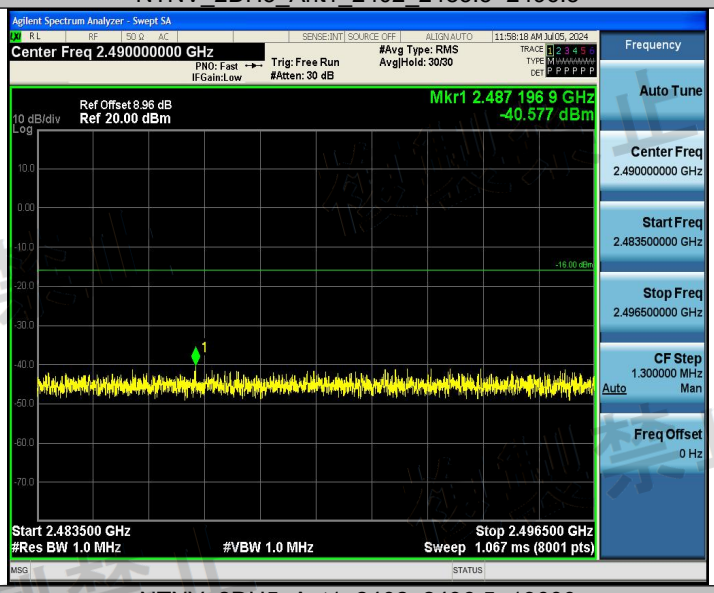
NTNV_2DH5_Ant1_2402_30~2387



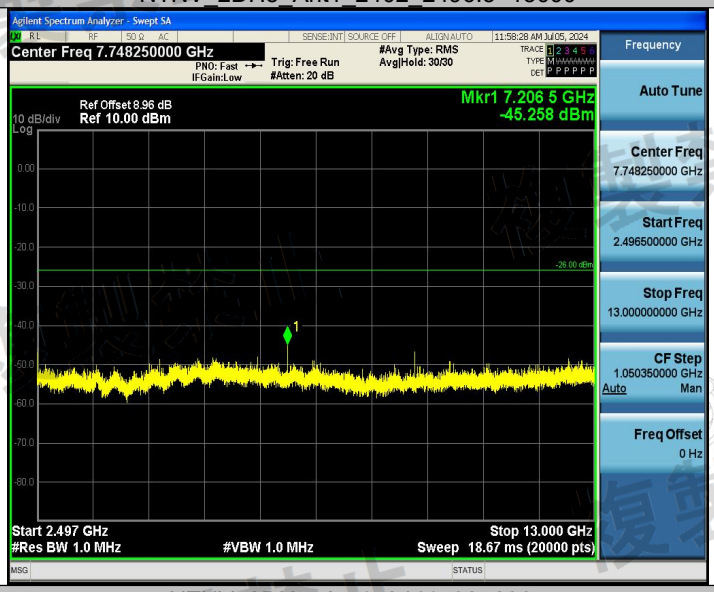
NTNV_2DH5_Ant1_2402_2387~2400



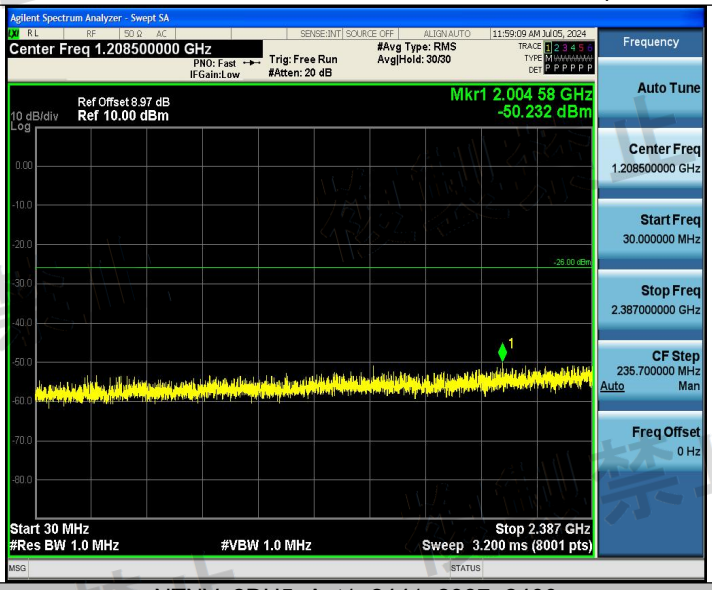
NTNV_2DH5_Ant1_2402_2483.5~2496.5



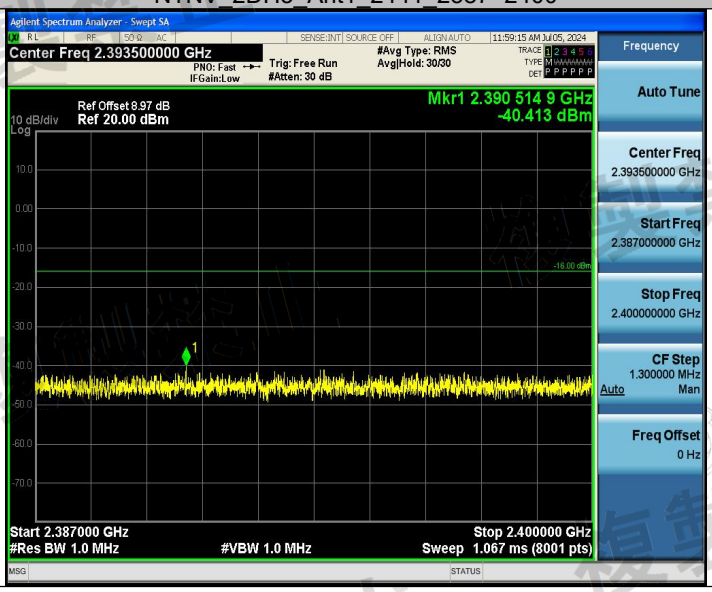
NTNV_2DH5_Ant1_2402_2496.5~13000



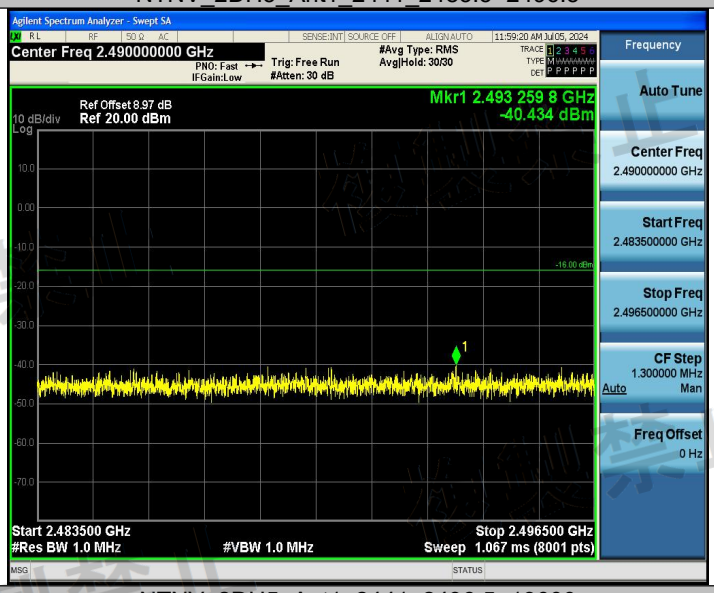
NTNV_2DH5_Ant1_2441_30~2387



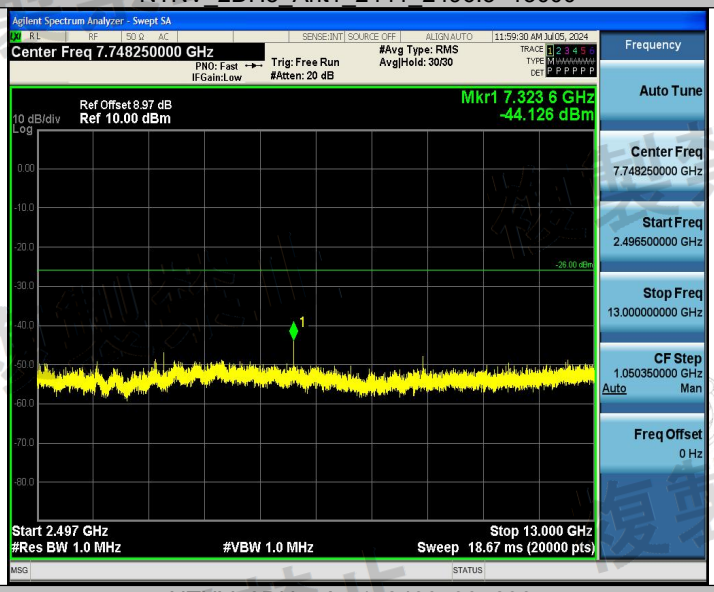
NTNV_2DH5_Ant1_2441_2387~2400



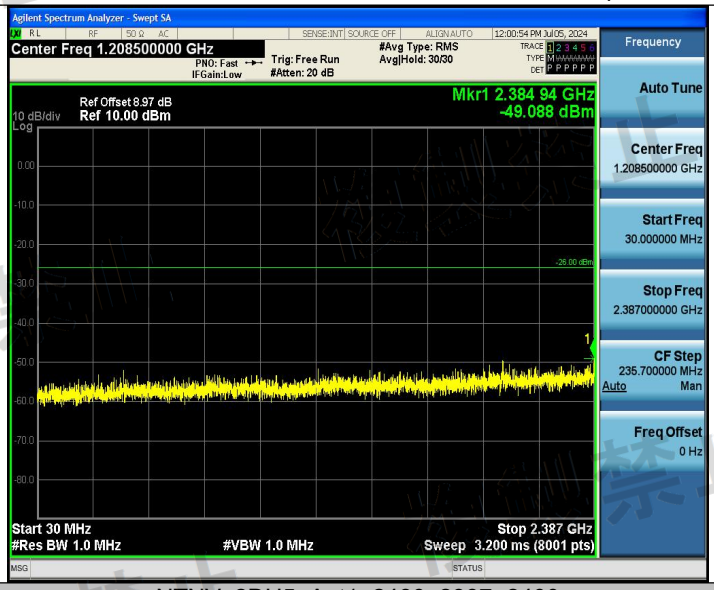
NTNV_2DH5_Ant1_2441_2483.5~2496.5



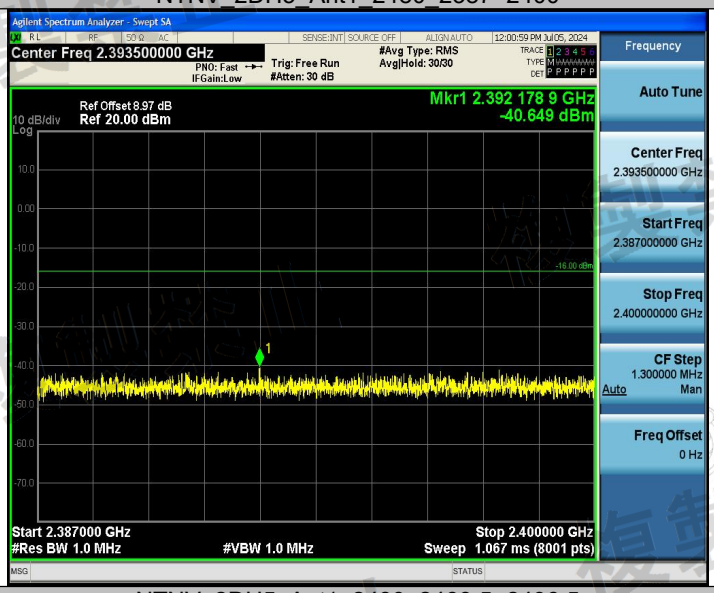
NTNV_2DH5_Ant1_2441_2496.5~13000



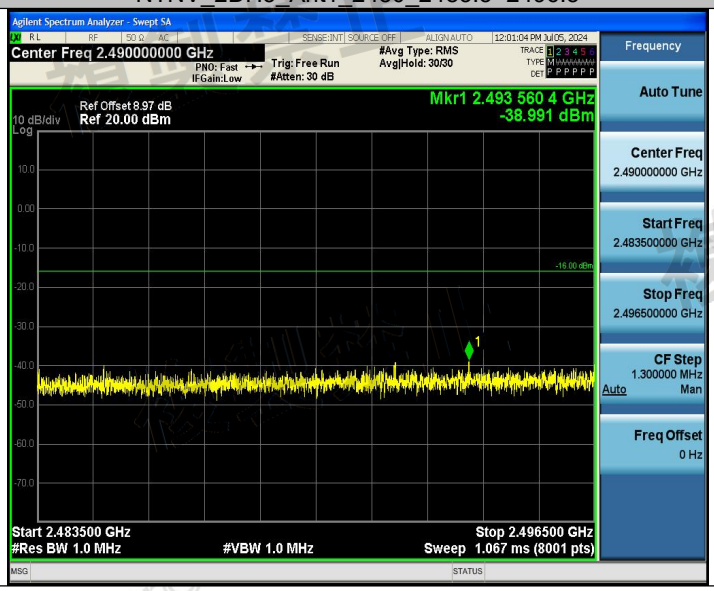
NTNV_2DH5_Ant1_2480_30~2387



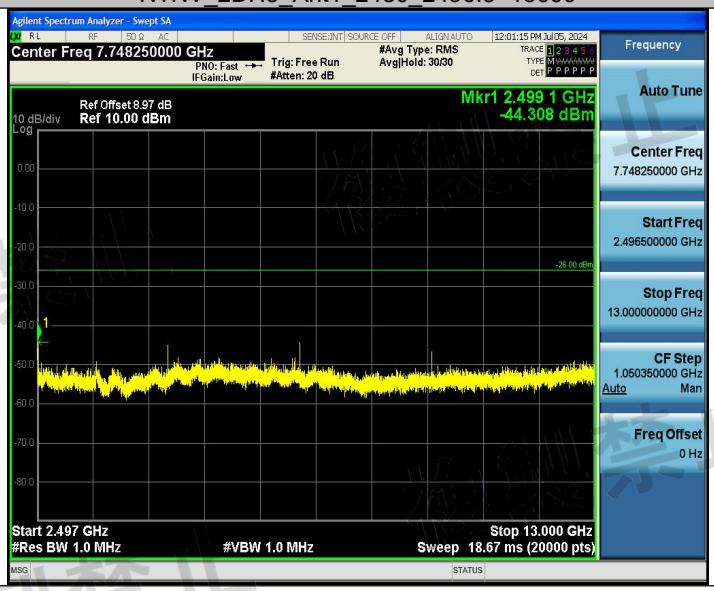
NTNV_2DH5_Ant1_2480_2387~2400



NTNV_2DH5_Ant1_2480_2483.5~2496.5



NTNV_2DH5_Ant1_2480_2496.5~13000



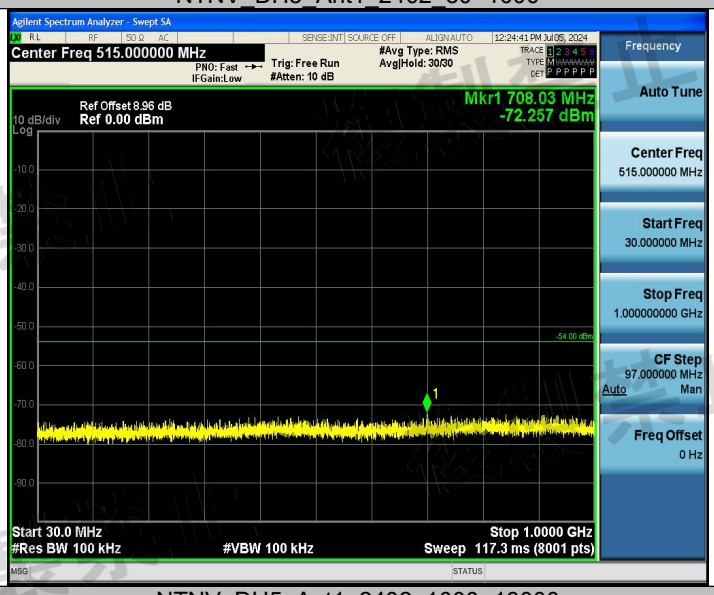
Appendix F: Secondary radiated emissions

Test Result

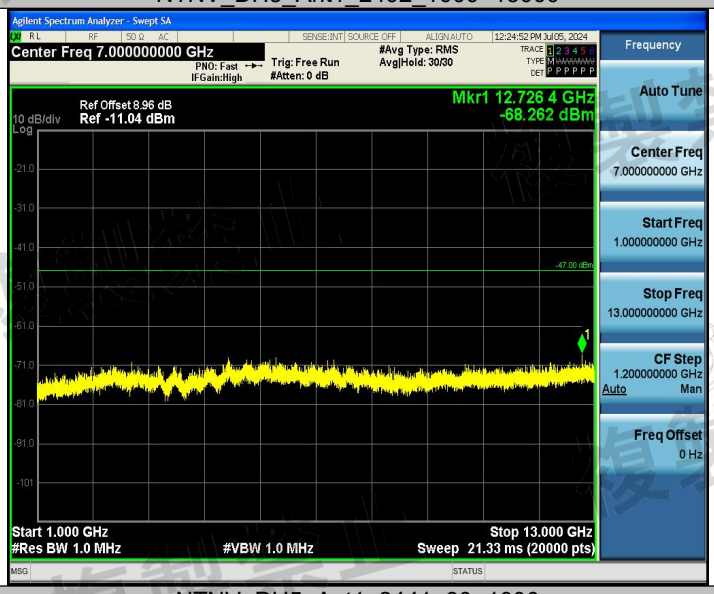
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	DH5	Ant1	2402	30~1000	-72.26	≤-54	0.05943	≤4	PASS
				1000~13000	-68.26	≤-47	0.14928	≤20	PASS
			2441	30~1000	-71.76	≤-54	0.06668	≤4	PASS
				1000~13000	-68.96	≤-47	0.12706	≤20	PASS
			2480	30~1000	-71.91	≤-54	0.06442	≤4	PASS
				1000~13000	-68.84	≤-47	0.13062	≤20	PASS
	2DH5	Ant1	2402	30~1000	-71.59	≤-54	0.06934	≤4	PASS
				1000~13000	-68	≤-47	0.15849	≤20	PASS
			2441	30~1000	-71.82	≤-54	0.06577	≤4	PASS
				1000~13000	-68.69	≤-47	0.13521	≤20	PASS
			2480	30~1000	-72.61	≤-54	0.05483	≤4	PASS
				1000~13000	-68.75	≤-47	0.13335	≤20	PASS

Test Graphs

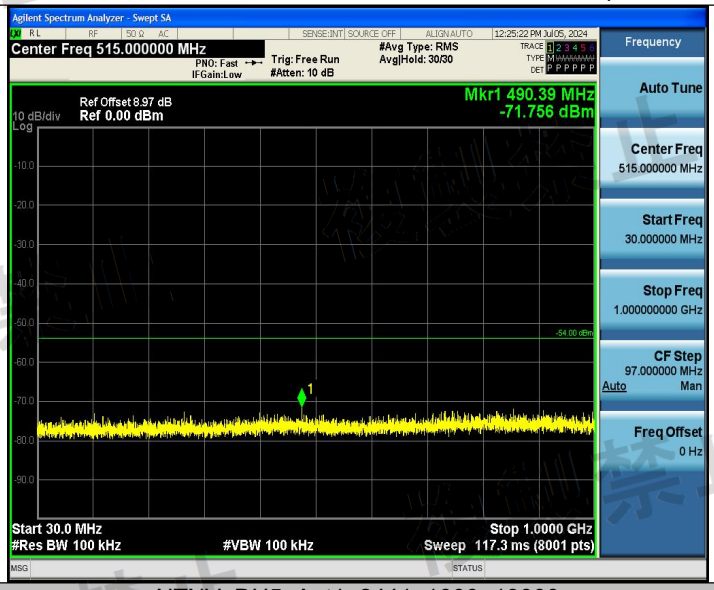
NTNV_DH5_Ant1_2402_30~1000



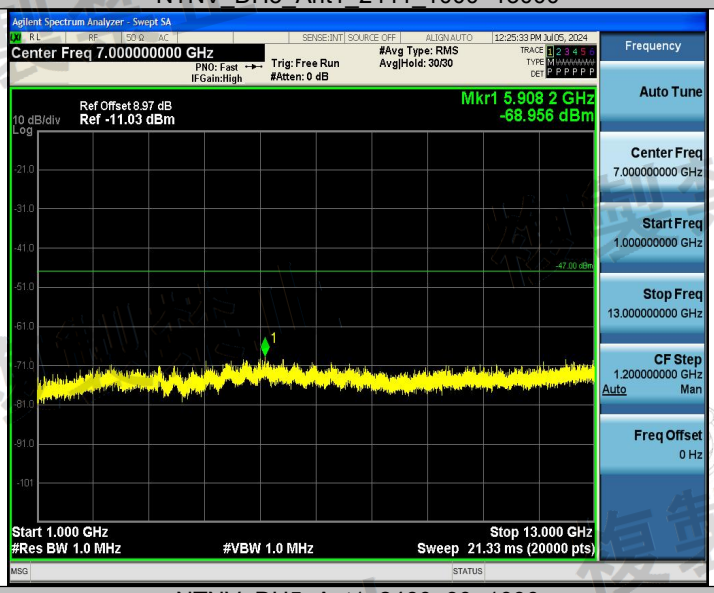
NTNV_DH5_Ant1_2402_1000~13000



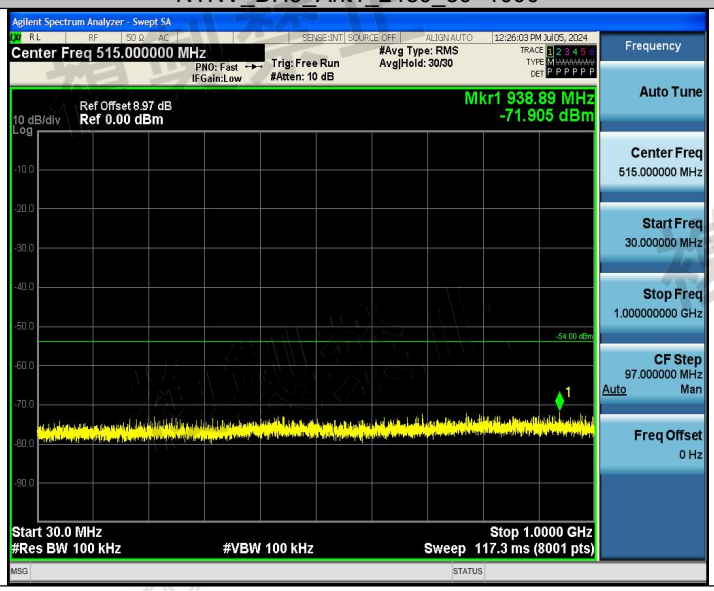
NTNV_DH5_Ant1_2441_30~1000



NTNV_DH5_Ant1_2441_1000~13000



NTNV_DH5_Ant1_2480_30~1000



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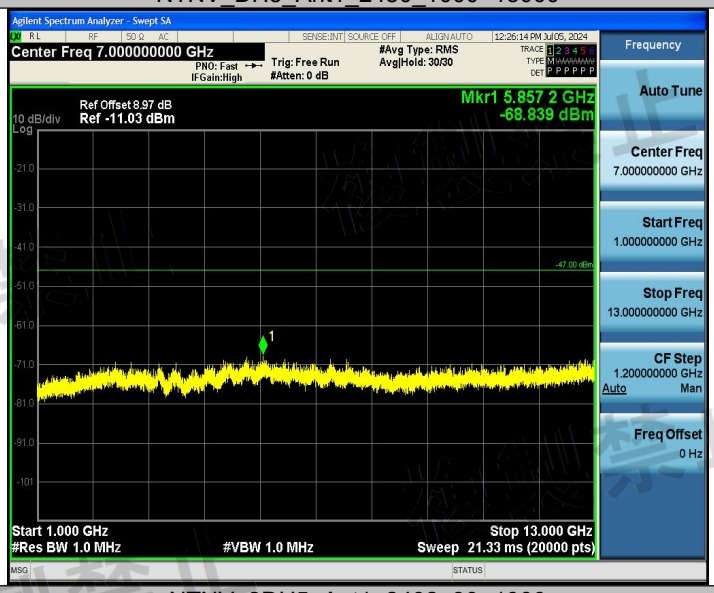

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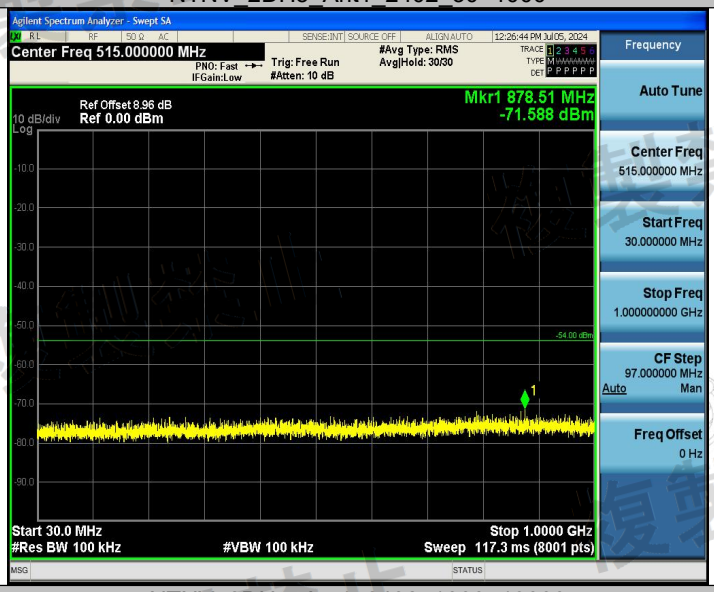
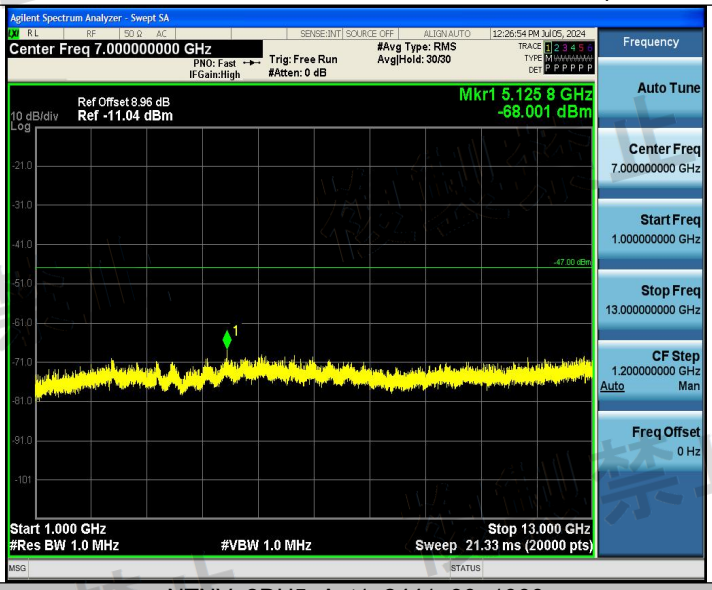
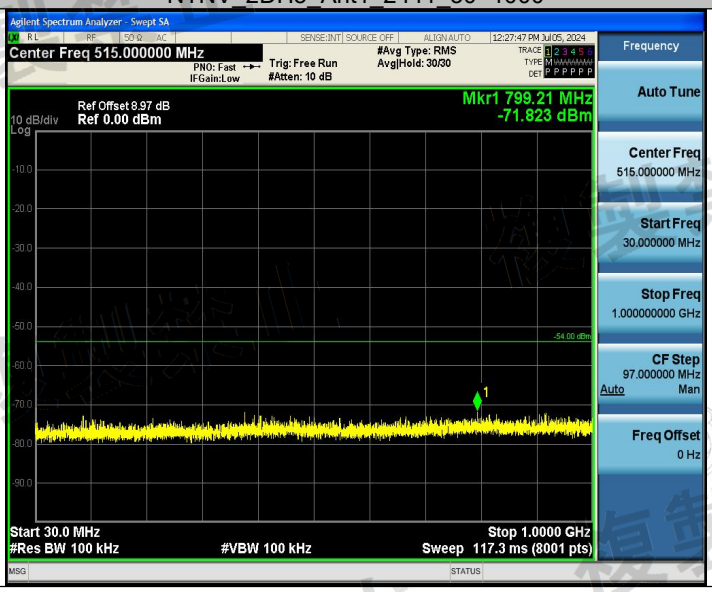


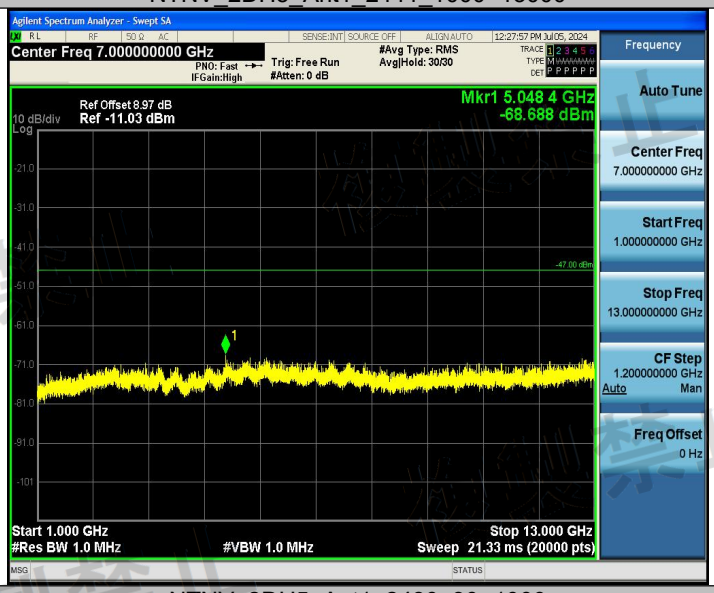
NTNV_2DH5_Ant1_2402_1000~13000



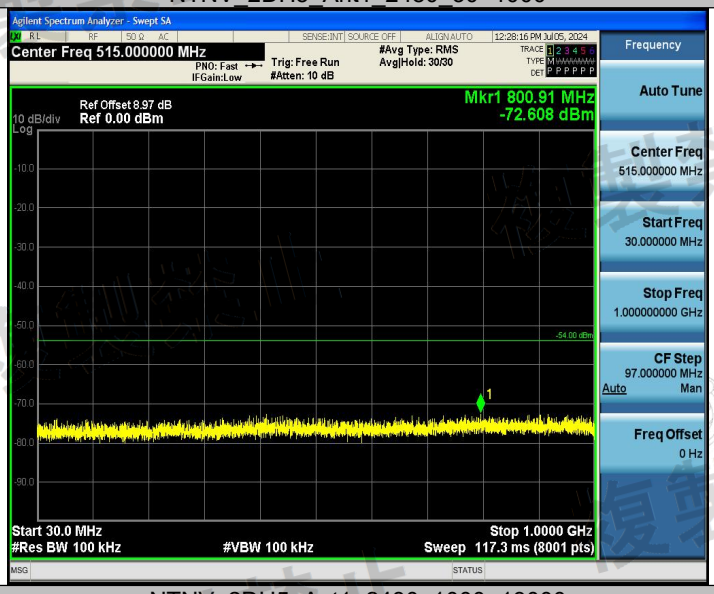
NTNV_2DH5_Ant1_2441_30~1000



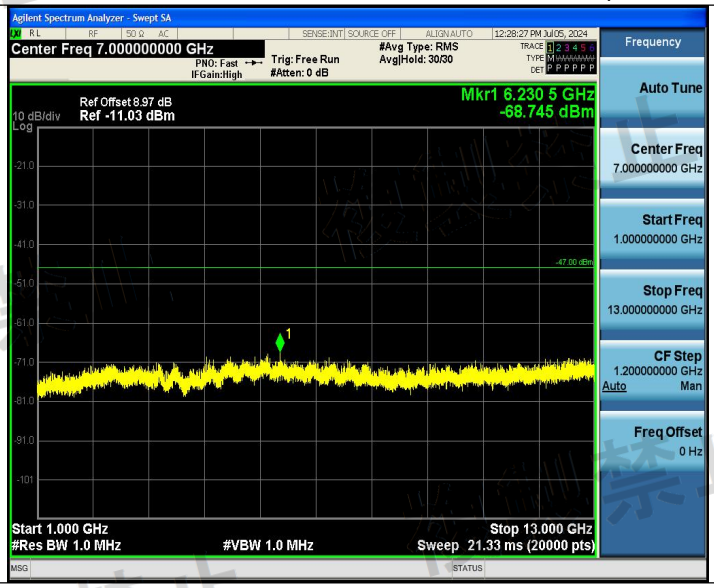
NTNV_2DH5_Ant1_2441_1000~13000



NTNV_2DH5_Ant1_2480_30~1000



NTNV_2DH5_Ant1_2480_1000~13000


Agilent Spectrum Analyzer - Swept SA
Center Freq 7.000000000 GHz
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
#Avg Type: RMS
Avg|Hold: 30/30
12:28:27 PM Jul 05, 2024
Ref Offset 8.97 dB
10 dB/div
Ref -11.03 dBm
Log
Mkr1 6.230 5 GHz
-68.745 dBm
-47.00 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz
Stop 13.000 GHz
Sweep 21.33 ms (20000 pts)
Frequency
Auto Tune
Center Freq
7.000000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
13.000000000 GHz
CF Step
1.200000000 GHz
Auto
Man
Freq Offset
0 Hz

Appendix G: Hopping frequency holding time

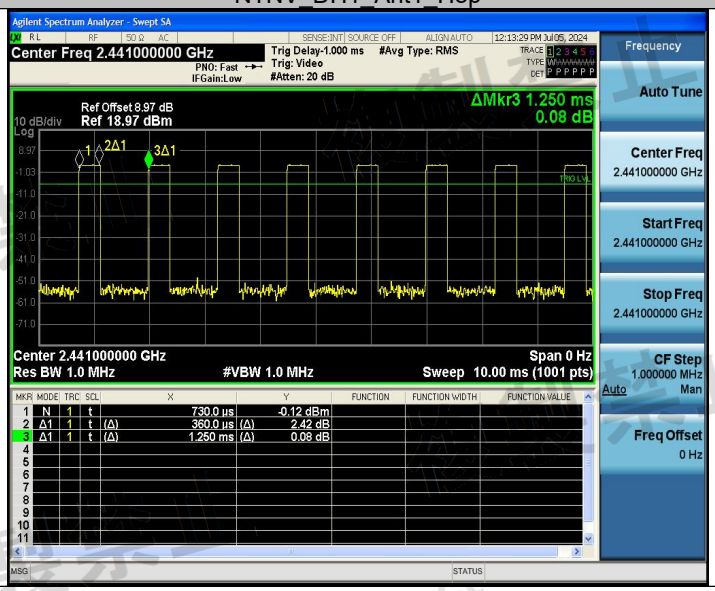
Test Result

Test Condition	Test Mode	Antenna	Freq. [MHz]	T_ON [ms]	Period [ms]	Result [s]	Limit [s]	Verdict
NTNV	DH1	Ant1	2441	0.36	1.25	0.104	≤0.4	PASS
	DH3	Ant1	2441	1.61	2.50	0.232	≤0.4	PASS
	DH5	Ant1	2441	2.86	3.76	0.274	≤0.4	PASS
	2DH1	Ant1	2441	0.37	1.25	0.036	≤0.4	PASS
	2DH3	Ant1	2441	1.62	2.5	0.471	≤0.4	PASS
	2DH5	Ant1	2441	2.87	3.75	0.417	≤0.4	PASS

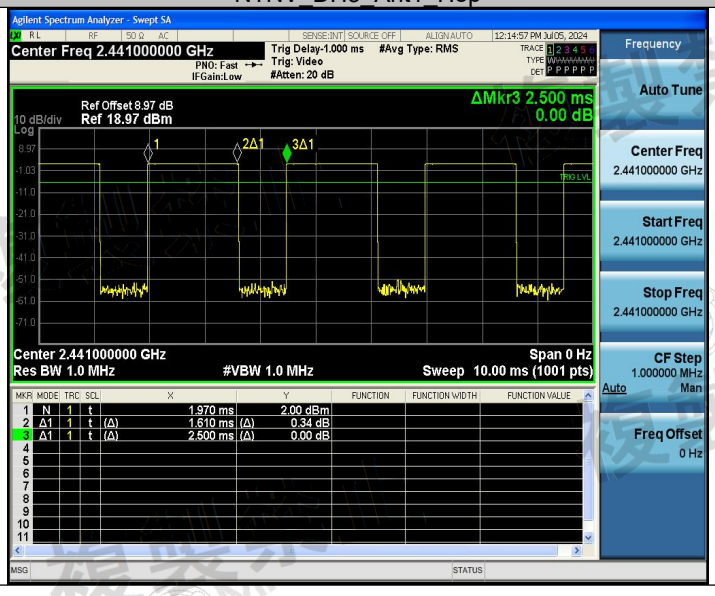
Note: Result [ms] = 0.4 [s] * Spread ratio * T_ON [ms] / Period [ms] / Number of hopping [79]

Test Graphs

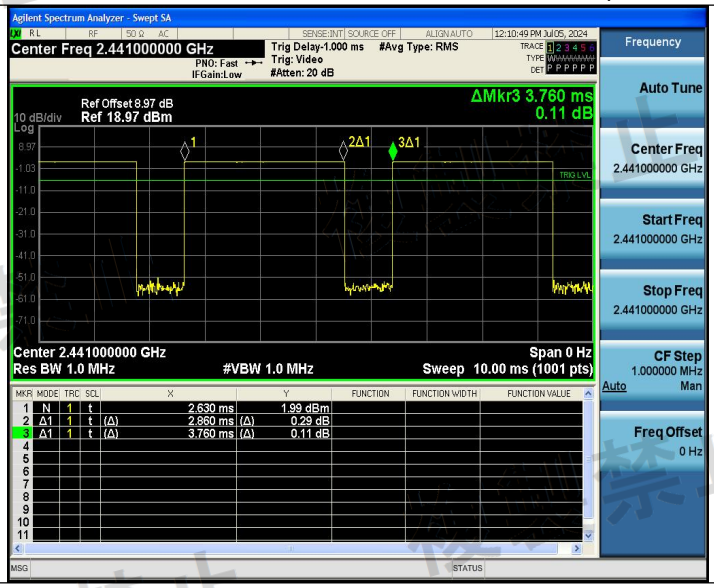
NTNV_DH1_Ant1_Hop



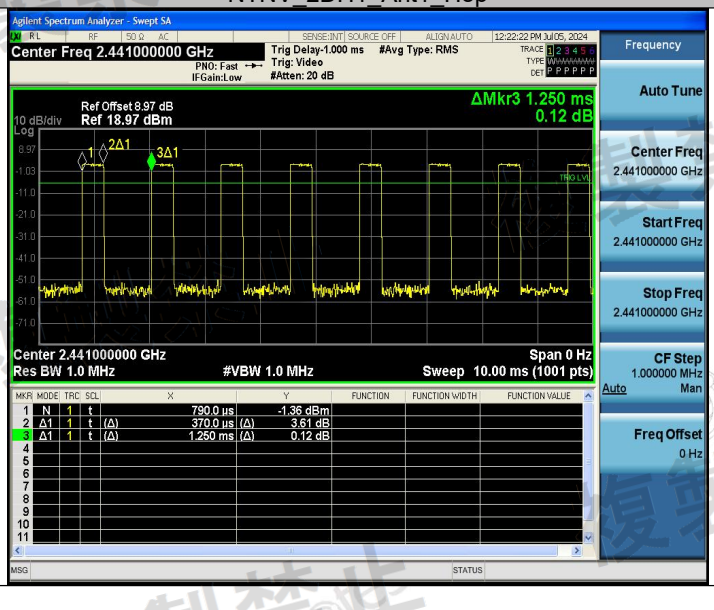
NTNV_DH3_Ant1_Hop



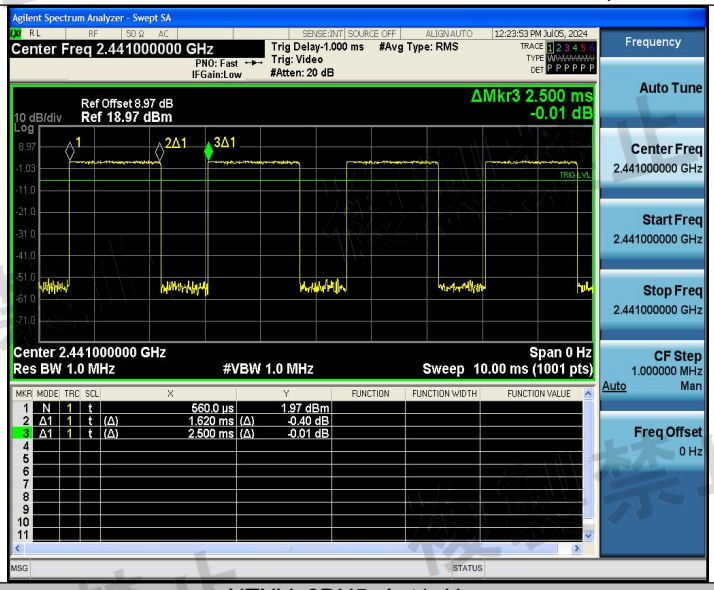
NTNV_DH5_Ant1_Hop



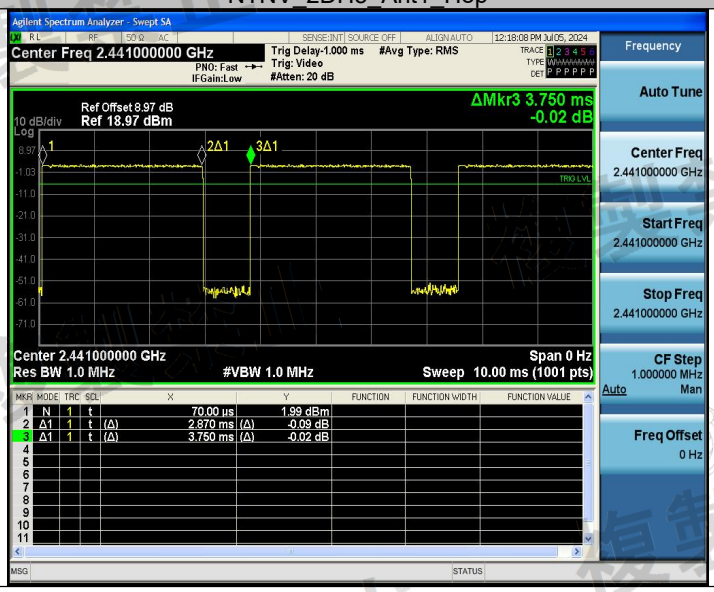
NTNV_2DH1_Ant1_Hop



NTNV_2DH3_Ant1_Hop



NTNV_2DH5_Ant1_Hop



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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.
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4. This report is invalid if transferred, altered or tampered with in any form without authorization.
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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 ******