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CNAS L5785

TEST REPORT

Application No.:	CQASZ20260601157E-02
Applicant:	Shenzhen DO Intelligent Technology Co., Ltd
Address of Applicant:	1st/2nd/east of 3rd/4th Floor of Building 1, 1st/14th/15th Floor of Building 6, Changyi Industrial Park, No. 1 of Lirong Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen, Guangdong, P.R. China (518110)
Manufacturer:	Shenzhen DO Intelligent Technology Co., Ltd
Address of Manufacturer:	1st/2nd/east of 3rd/4th Floor of Building 1, 1st/14th/15th Floor of Building 6, Changyi Industrial Park, No. 1 of Lirong Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen, Guangdong, P.R. China (518110)
Factory:	Shenzhen DO Intelligent Technology Co., Ltd
Address of Factory:	1st/2nd/east of 3rd/4th Floor of Building 1, 1st/14th/15th Floor of Building 6, Changyi Industrial Park, No. 1 of Lirong Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen, Guangdong, P.R. China (518110)

Equipment Under Test (EUT):

Product:	Smart Watch
Model No.:	GTX21, AR-03
Test Model No.:	GTX21
Brand Name:	IDO
Standards:	Item 19 of Article 2 Paragraph 1
Date of Receipt:	2026-06-01
Date of Test:	2026-06-01 to 2026-06-10
Date of Issue:	2026-07-20
Test Result:	**PASS***

*** In the configuration tested, the EUT complied with the standards specified above.**

Test Method: MIC Notice No.88 Appendix No.43

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

Tested By: Lewis Zhou

(Lewis Zhou)

Reviewed By: Timo Lei

(Timo Lei)

Approved By:

(Jack Ai)

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1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20260601157E-02	Rev.01	Initial report	2026-07-20

2 Test Summary

Test	Test Requirement	Result
Frequency Error	Item 19 of Article 2-1	PASS
Occupied Bandwidth	Item 19 of Article 2-1	PASS
Spread-spectrum Bandwidth	Item 19 of Article 2-1	PASS
Antenna Power	Item 19 of Article 2-1	PASS
Spurious Emission of Tx	Item 19 of Article 2-1	PASS
Dwell Time	Item 19 of Article 2-1	PASS
Interference prevention capability	Item 19 of Article 2-1	PASS
RF accessibility	Item 19 of Article 2-1	PASS
Spurious Emission of Rx	Item 19 of Article 2-1	PASS
Transmission Antenna Gain	Item 19 of Article 2-1	N/A
Transmission Radiation Angle Width	Item 19 of Article 2-1	N/A

Remark:

EUT: In this whole report EUT means Equipment Under Test.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radio Frequency.

Other: NV-Normal voltage, HV-High voltage, LV-Low voltage, NTNV-Normal temperature & normal voltage

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4 General Information

4.1 General Description of E.U.T.

Product Name:	Smart Watch
Model No:	GTX21, AR-03
Test Model No:	GTX21
Trade Mark:	IDO

4.2 Details of E.U.T.

Operating Frequency:	2402 MHz to 2480 MHz
Type of Modulation:	GFSK, (π/4)DQPSK, 8DPSK
Number of Channels:	79 Channels
Channel Separation:	1 MHz
Bluetooth Version:	5.3
Software version:	V1.00.15
Hardware version:	V1.0
Antenna Type:	FPC antenna
Antenna Gain:	-4.1dBi
Rated power:	1.64mW/MHz
Sample Type:	Portable product
Power Supply:	☒ For EUT operation: lithium battery, DC3.85V, 350mAh, 1.347Wh
	☐ For other: Charge by DC5.0V
Test Voltage:	☒ Normal voltage (EUT operation): DC3.85V
	☐ Low voltage (Normal voltage -10%):
	☐ High voltage (Normal voltage+10%):

4.3 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark
/	/	/	/

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.

4.7 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

No tests were sub-contracted.

4.8 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• ISED Registration No.: 22984-1

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

5 Equipment List

Test Equipment List						
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. date (yyyy-mm-dd)**	**Calibration body**	**Classification**
Humi/ Temp Indicator	ANPUHUA	HTC-1	212066	2026/9/1	CCIC (Shenzhen) Metrology & Testing Service Co.,Ltd	(c)
Spectrum Analyzer	Rohde & Schwarz	FSU26	200019	2026/9/1	CCIC (Shenzhen) Metrology & Testing Service Co.,Ltd	(c)
Multimeter	Fluke	15B	96710318	2026/9/1	CCIC (Shenzhen) Metrology & Testing Service Co.,Ltd	(c)
Signal generator	ANRITSU	MG3692B	074702	2026/9/1	CCIC (Shenzhen) Metrology & Testing Service Co.,Ltd	(c)
DC Power Supply	GW	GPC3030D	A671672	2026/9/1	CCIC (Shenzhen) Metrology & Testing Service Co.,Ltd	(c)

Remark:

(a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.

(b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act

No. 51 of 1992) .

(c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

(d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).

From JRL Article 24-2, paragraph 4, Item 2

Notice: Calibration duration for above equipments is 1 year.

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6 Test Results

6.1 Radio Technical Requirements Specification

Table 1: Radio Technical Requirements Specification for 2.4 GHz band wide-band low-power data communication system (Item 19 of Article 2-1)

Items	Technical standard
Assigned frequency or designated frequency	2402-2480MHz
Communication method	One-way communication, simplex, semi-duplex, or duplex operation of digital signal transmission including spread spectrum
Tolerance of frequency ($\times 10^{-6}$)	±50
Tolerance of occupied bandwidth	FH: 83.5MHz or less FH + DS: 83.5MHz or less FH + OFDM: 83.5MHz or less OFDM 40MHz System: 26~40MHz Others: 26MHz or less
Antenna power	Designated value (1) FH, FH+DS, FH+OFDM: 3mW/MHz (used in the range of 2402 - 2480MHz) (2) OFDM, DS other than (1) 10mW/MHz (3) Other than (1) & (2) 10mW (4) OFDM OBW 26 - 38MHz: 5mW/MHz Tolerance:+20%
Antenna gain	1) 0dBi or less in principle 2) In case of directional antenna (1) FH, FH+DS or FH+OFDM using 2402-2480 MHz EIRP≤ 16.91 dBm/MHz (2) OFDM or DS other than (1) EIRP≤ 22.14 dBm/MHz (3) Other than (1) and (2): 22.14 dBm or less (4) OFDM OBW 26 - 38MHz: 19.14dBm/MHz (5) Half-power angle of directional antenna (e) in case of the item 2):e ≤ 360/A (The A is 10 in maximum.)
Tolerance of spurious emission intensity	(1) Below 2387 MHz: 2.5μW/MHz (2) 2387 to 2400 MHz: 25μW/MHz (3) 2483.5 through 2496.5 MHz: 25μW/MHz (4) Over 2496.5 MHz: 2.5μW/MHz
Spreading bandwidth	DS,FH,FH+DS,FH+OFDM: 500kHz or more
Spreading rate of spectrum	For DS system;(Spreading bandwidth) / (Frequency corresponding to

	transmission rate) ≥ 5
Limit of secondary radiated emissions	(1) Below 1 GHz: 4nW (2) 1 GHz or higher: 20nW
Interference prevention function	Shall have the function of automatic transmission and reception of identification sign.
Structure	Shall be of the structure that the RF and modulator sections excluding antenna cannot easily be opened.
Note	DS: Direct spread FH: Frequency hopping OFDM: Orthogonal frequency division multiplexing

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6.2 E.U.T. Test Conditions

Power Supply: The fluctuation of input voltage to the circuit of RF unit of test equipment is under ±1%, when input voltage to the test equipment is fluctuated by ±10%, So, all measurement has been conducted by only rated voltage.

The measurement result of the voltage fluctuation at RF circuit		
	EUT Voltage for operation	RF Circuitry Voltage
High voltage	4.235V	3.3V
Normal voltage	3.85V	3.3V
Low voltage	3.465V	3.3V

Temperature: 5 -35.0 °C

Humidity: 45-85 % RH

Atmospheric Pressure: 1000 -1010 mbar

Test Frequencies: If the EUT can be set to 3 of more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L, M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.

EUT Channels and Frequencies List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

Test frequencies are the lowest channel: 0 channel (2402 MHz),
middle channel: 39 channel (2441 MHz) and highest channel: 78 channel (2480 MHz).

6.3 Test Environment

Operating Environment:	
Temperature:	25.5 °C
Humidity:	53 % RH
Atmospheric Pressure:	1009 mbar

6.4 Antenna Requirement

Standard requirement

Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.

EUT Antenna

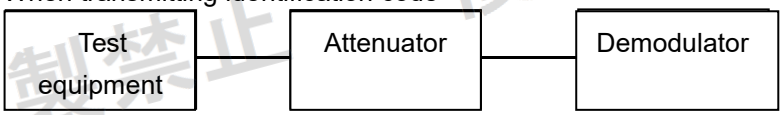
The EUT with FPC antenna, the max peak gain of the antenna is -4.1dBi.

Note: An antenna connector is available, all relevant tests will be carried out conducted.

6.5 Interference prevention function

1） Measurement system diagram

(1) When transmitting identification code



2) Condition of measuring instrument

(1) Demodulator must be able to demodulate the transmitting signal emitted by test equipment and to indicate the identification code.

3) Condition of test equipment The mode of normal use.

4) Measuring operation procedure

(1) When test equipment has the function to transmit identification code automatically:

A) Transmit the predetermined identification code from test equipment.

B) Confirm the transmitted identification code by demodulator.

5) Test result: Record the identification code and test result.

Test result: PASS

The identification code is 56:2C:6E:3D:B6:05

The unit does meet the requirements.

6.6 Frequency Error

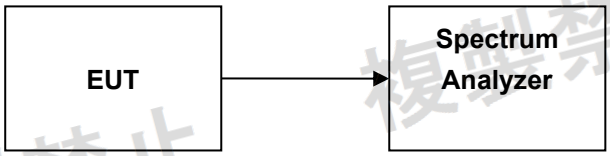
Test Requirement: Item 19 of Article 2-1

Tolerance of frequency: $\pm 50\times10^{-6}$

Test Method: MIC Notice No.88 Appendix No.43

Test Status: Test the EUT in transmitting mode without modulation.

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping OFF, CW Tx

3. Spectrum Analyzer conditions:

   Frequency: Test Frequency
   Span 1MHz
   RBW 10 kHz (Modulation OFF),
   VBW 10 kHz (Modulation OFF),
   Sweep Time Auto
   Detector mode Positive peak
   Indication mode Max hold

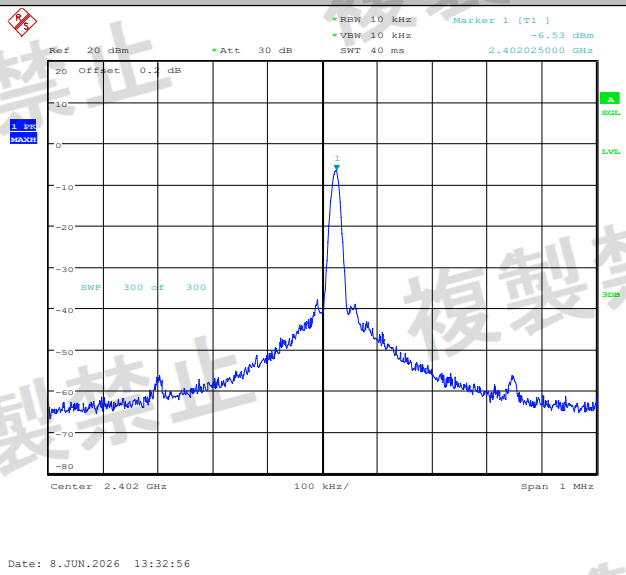
Test Result:

Test Mode	Antenna	Freq(MHz)	CenterFreq	Result[ppm]	Limit[ppm]	Verdict
DH5	Ant1	2402	2402.025	10.40799	±50	PASS
		2441	2441.024	9.83204	±50	PASS
		2480	2480.024	9.67742	±50	PASS
2DH5	Ant1	2402	2402.021	8.74271	±50	PASS
		2441	2441.022	9.01270	±50	PASS
		2480	2480.024	9.67742	±50	PASS
3DH5	Ant1	2402	2402.023	9.57535	±50	PASS
		2441	2441.023	9.42237	±50	PASS
		2480	2480.024	9.67742	±50	PASS

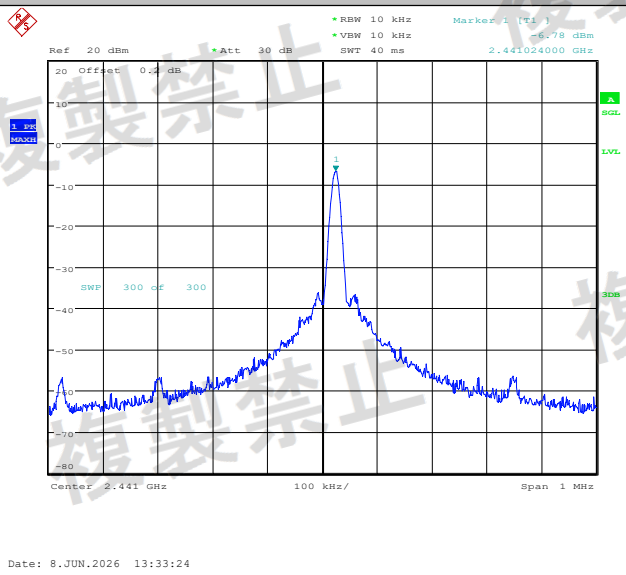
Note: The nominal frequency shall be confirmed by the applicant and test lab.

Result plot as follows:

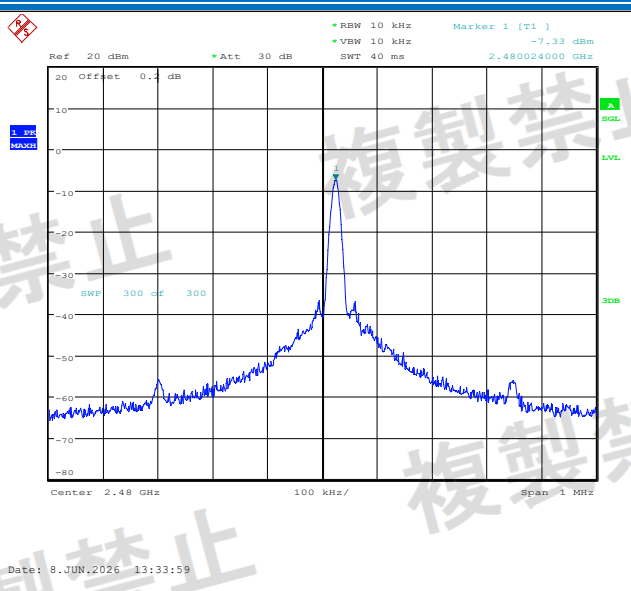
NTNV_DH5_Ant1_2402



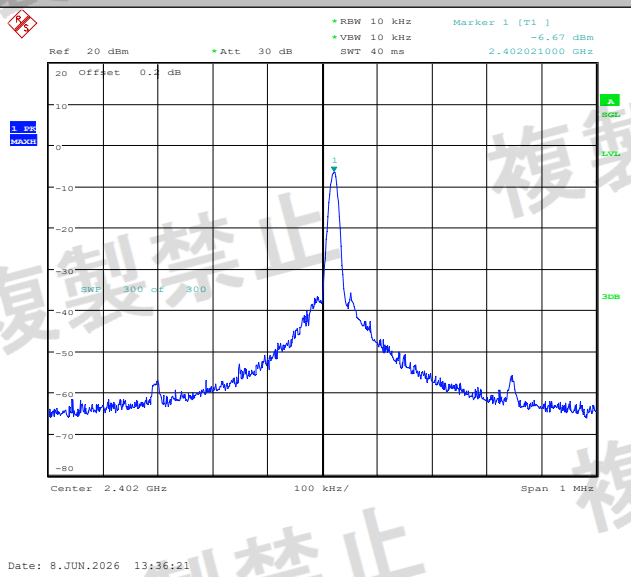
NTNV_DH5_Ant1_2441



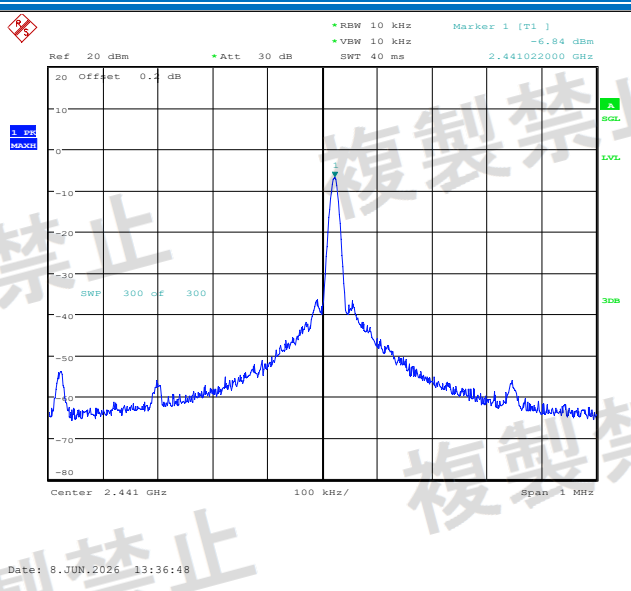
NTNV_DH5_Ant1_2480



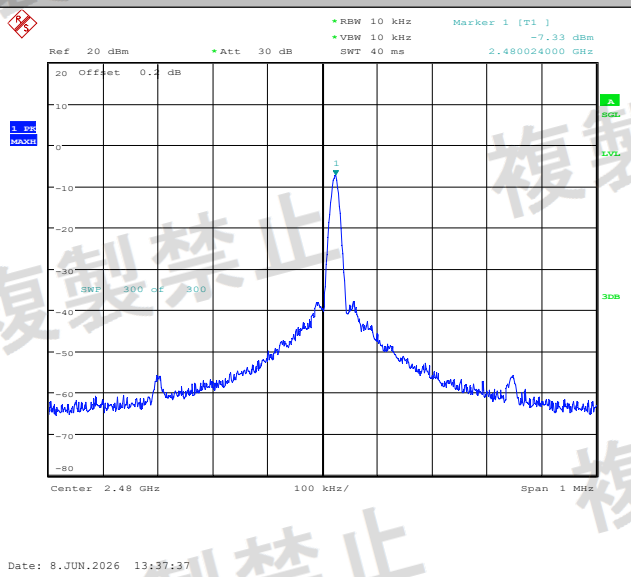
NTNV_2DH5_Ant1_2402



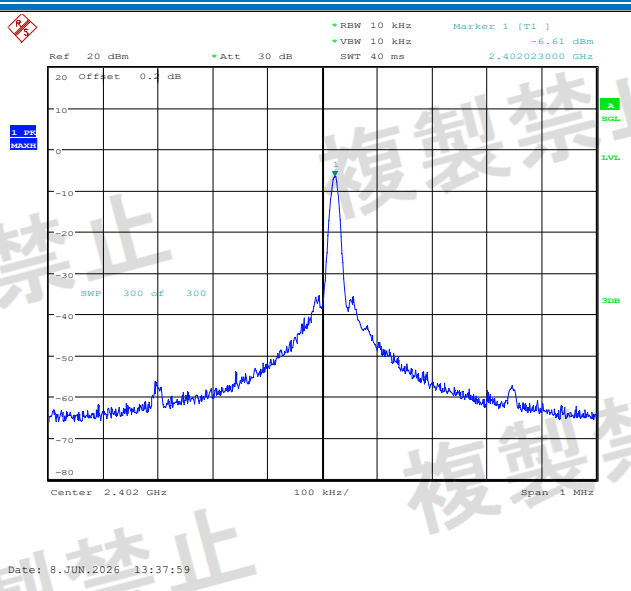
NTNV_2DH5_Ant1_2441



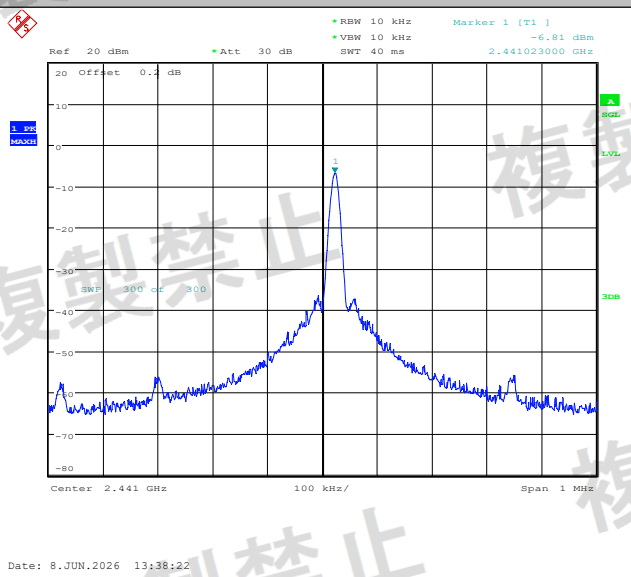
NTNV_2DH5_Ant1_2480



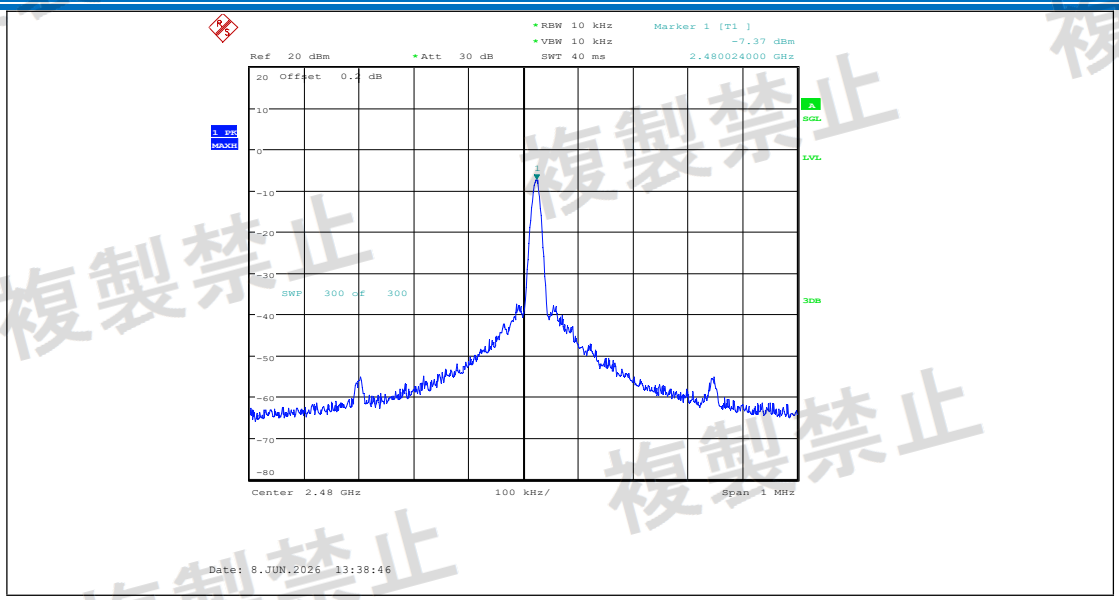
NTNV_3DH5_Ant1_2402



NTNV_3DH5_Ant1_2441



NTNV_3DH5_Ant1_2480


RBW 10 kHz
VBW 10 kHz
SWT 40 ms
Marker 1 [T1]
-7.37 dBm
2.480024000 GHz
Ref 20 dBm
Att 30 dB
Offset 0.2 dB
1 PK MAXH
A
SGL
LVL
3DB
SWP 300 of 300
Center 2.48 GHz
100 kHz/
Span 1 MHz
Date: 8.JUN.2026 13:38:46

6.7 Occupied Bandwidth (99%)

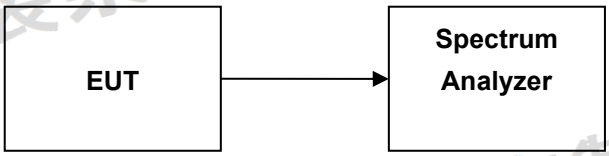
Test Requirement: Item 19 of Article 2-1

FH: 83.5MHz or less

Test Method: MIC Notice No.88 Appendix No.43

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping ON, Modulation Tx

   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

   Frequency: Test Frequency

   Span 167 MHz (FHSS),

   RBW 1 MHz

   VBW 1 MHz

   Sweep Time Auto

   detector mode Positive peak

   Indication mode Max hold

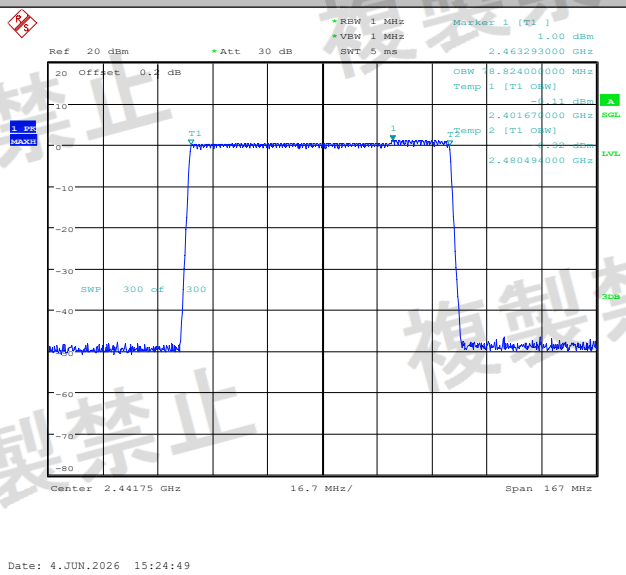
   OBW 99%

Test Result:

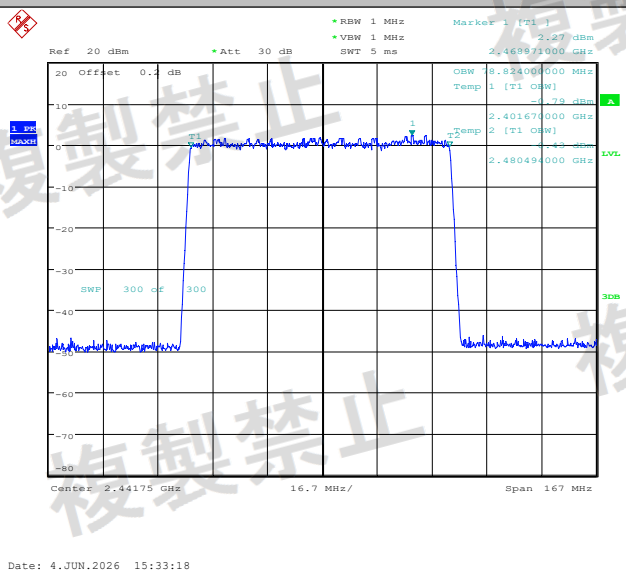
Test Condition	Test Mode	Freq(MHz)	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Hop	78.824	≤83.5	PASS
	2DH5	Hop	78.824	≤83.5	PASS
	3DH5	Hop	78.824	≤83.5	PASS

Result plot as follows:

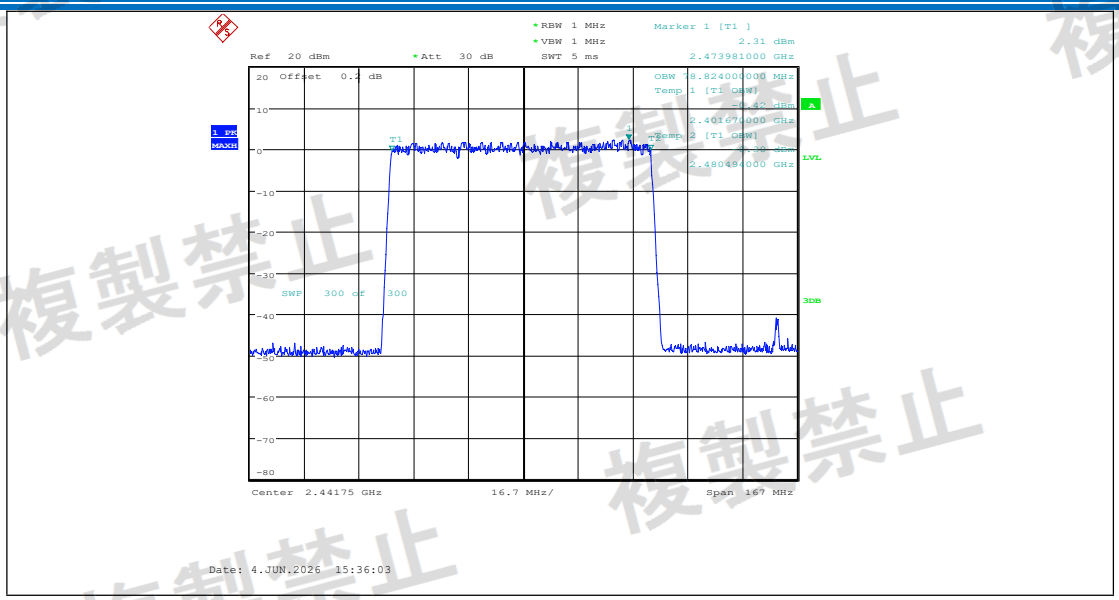
NTNV_DH5_Ant1_Hop



NTNV_2DH5_Ant1_Hop



NTNV_3DH5_Ant1_Hop



Test Result: The unit does meet the requirements.

6.8 Spread spectrum Bandwidth (90%)

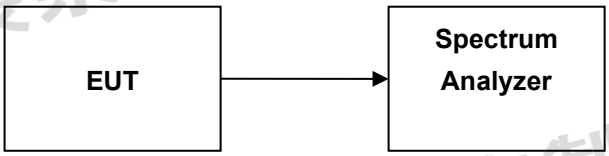
Test Requirement: Item 19 of Article 2-1

500 kHz or more

Test Method: MIC Notice No.88 Appendix No.43

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping ON, Modulation Tx

   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

   Frequency: Test Frequency
   Span 167MHz (FHSS),
   RBW 1 MHz
   VBW 1 MHz
   Sweep Time Auto
   detector mode Positive peak
   Indication mode Max hold

   OBW 90%

Test Result:

Test Condition	Test Mode	Freq(MHz)	Result [MHz]	Limit [MHz]	Spread Factor	Limit	Verdict
NTNV	DH5	Hop	71.643	≥0.5	71.643	>5	PASS
	2DH5	Hop	71.810	≥0.5	71.810	>5	PASS
	3DH5	Hop	71.810	≥0.5	71.810	>5	PASS

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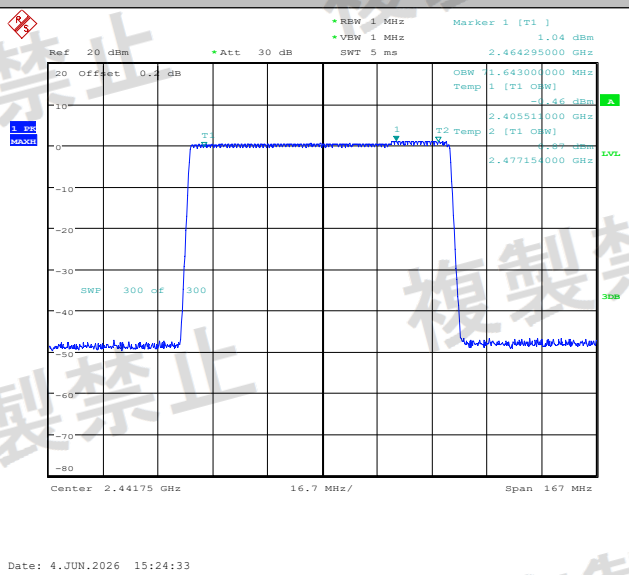
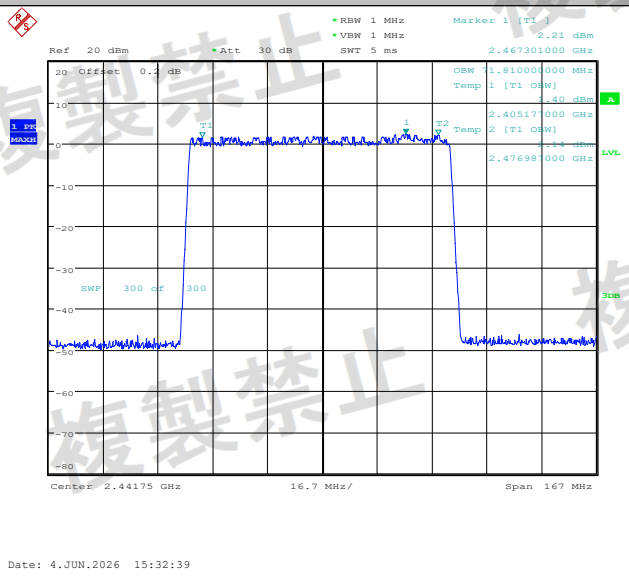
Result plot as follows:

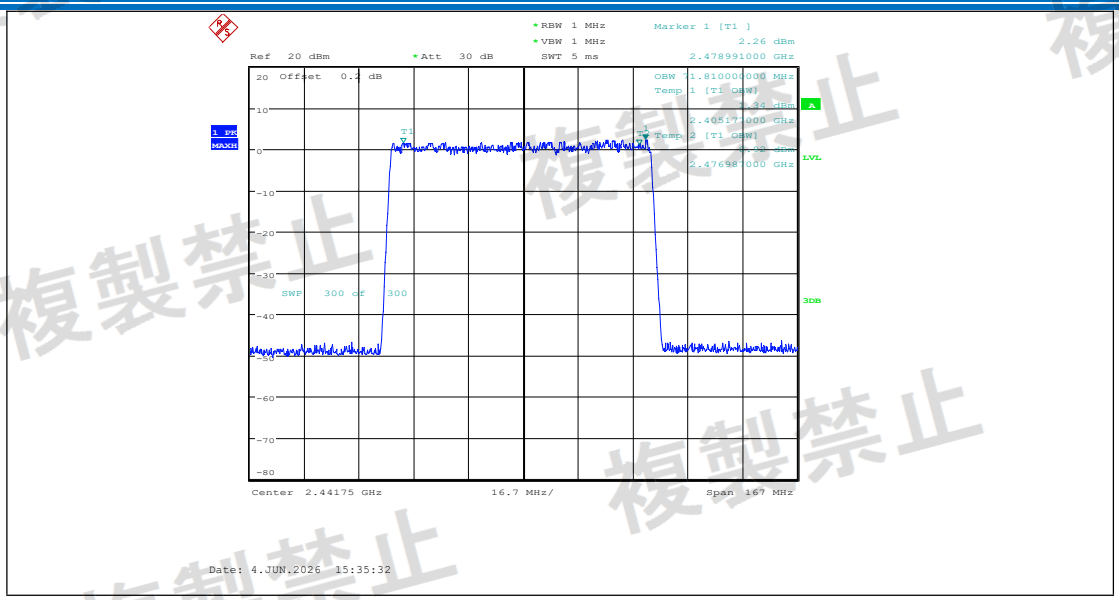
NTNV_DH5_Ant1_Hop



NTNV_2DH5_Ant1_Hop



NTNV_3DH5_Ant1_Hop



Test Result: The unit does meet the requirements.

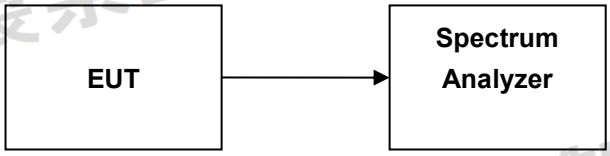
6.9 Antenna Power

Test Requirement: Item 19 of Article 2-1
2400-2427MHz, 2470.75-2483.5MHz: 10mW/MHz or less
2427-2470.75MHz: 3mW/MHz or less

Test Method: MIC Notice No.88 Appendix No.43

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping ON, Modulation Tx

   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

   Center Frequency: Test Frequency
   Span: 2 times of occupied bandwidth
   RBW: 1 MHz
   VBW: 3 MHz
   Sweep Time: Auto
   detector mode: Positive peak
   Indication mode: Max hold

4. Spectrum Analyzer conditions(Measure of Antenna Power):

   Center Frequency: Frequency of Peak Power (Search Frequency by 3)

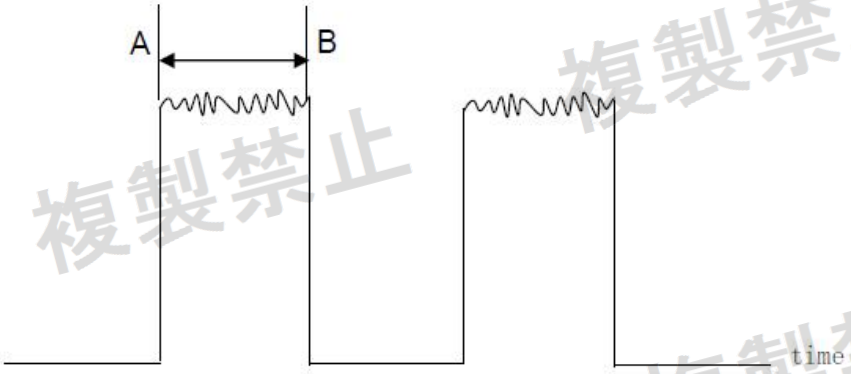
   Span: 0Hz

   RBW: 1 MHz

   VBW: 1 MHz

   Sweep Time: Auto

   detector mode: Positive peak



Test Result:

Antenna Power							
Test Condition	Test Mode	Antenna	Channel	Result(dBm/MHz)	Result(mW/MHz)	Limit(mW/MHz)	Verdict
NTNV	DH5	Ant1	2441	2.03	1.60	≤3	PASS
	2DH5	Ant1	2441	2.1	1.62	≤3	PASS
	3DH5	Ant1	2441	2.15	1.64	≤3	PASS

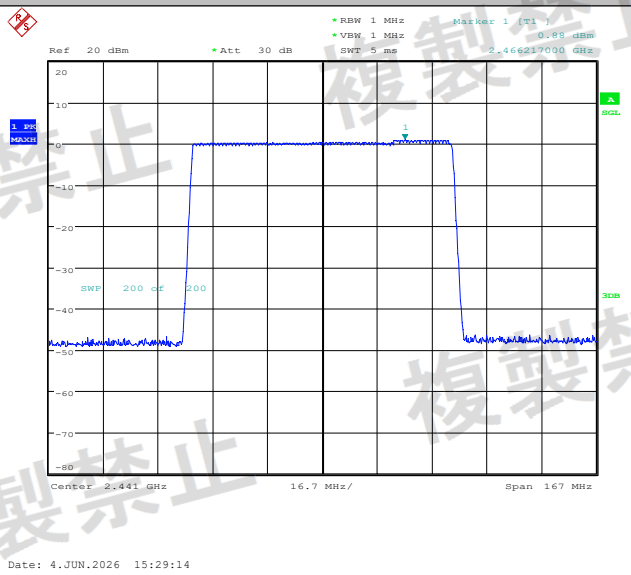
Tolerance								
Test Condition	Test Mode	Antenna	Channel	Power (mW/MHz)	RatedPower (mW/MHz)	Result (%)	Limit (%)	Verdict
NTNV	DH5	Ant1	2441	1.60	1.64	-2.44	+20	PASS
	2DH5	Ant1	2441	1.62	1.64	-1.22	+20	PASS
	3DH5	Ant1	2441	1.64	1.64	0.00	+20	PASS

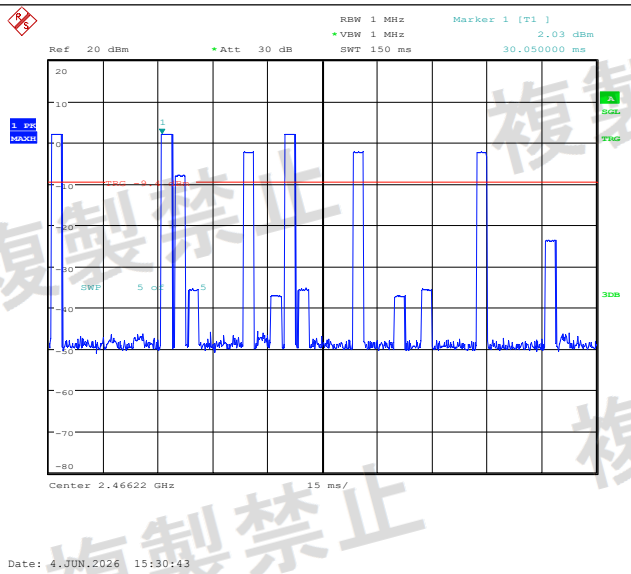
EIRP							
Test Condition	Test Mode	Antenna	Channel	Result(dBm/MHz)	EIRP (dBm/MHz)	Limit (dBm/MHz)	Verdict
NTNV	DH5	Ant1	2441	2.03	-2.07	≤6.91	PASS
	2DH5	Ant1	2441	2.1	-2	≤6.91	PASS
	3DH5	Ant1	2441	2.03	-2.07	≤6.91	PASS

Remark:

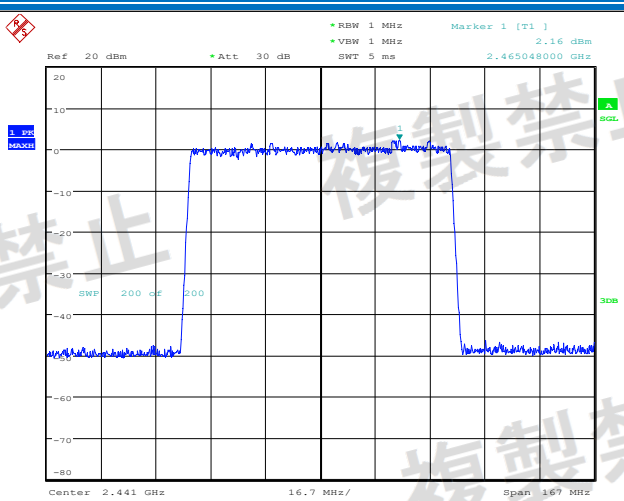
EIRP= Antenna power + Antenna Gain

NTNV_DH5_Ant1_2441

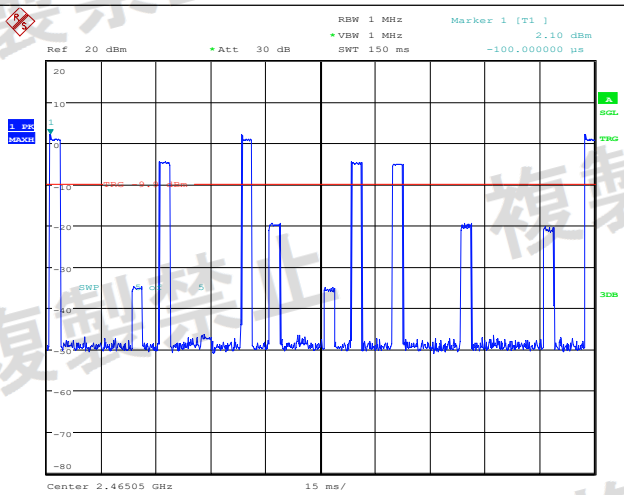




NTNV_2DH5_Ant1_2441

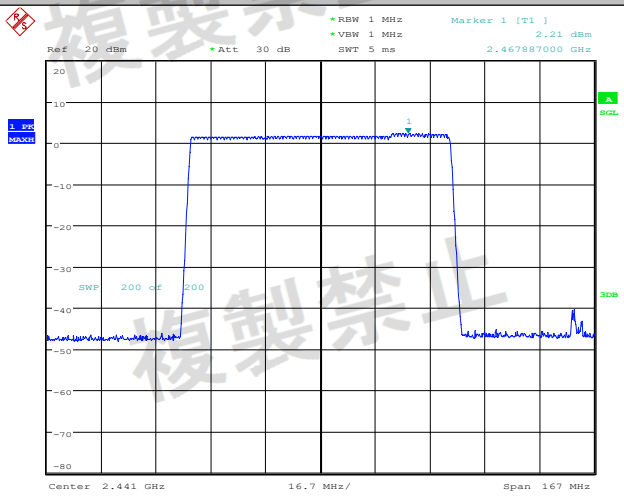


Date: 4.JUN.2026 15:34:08

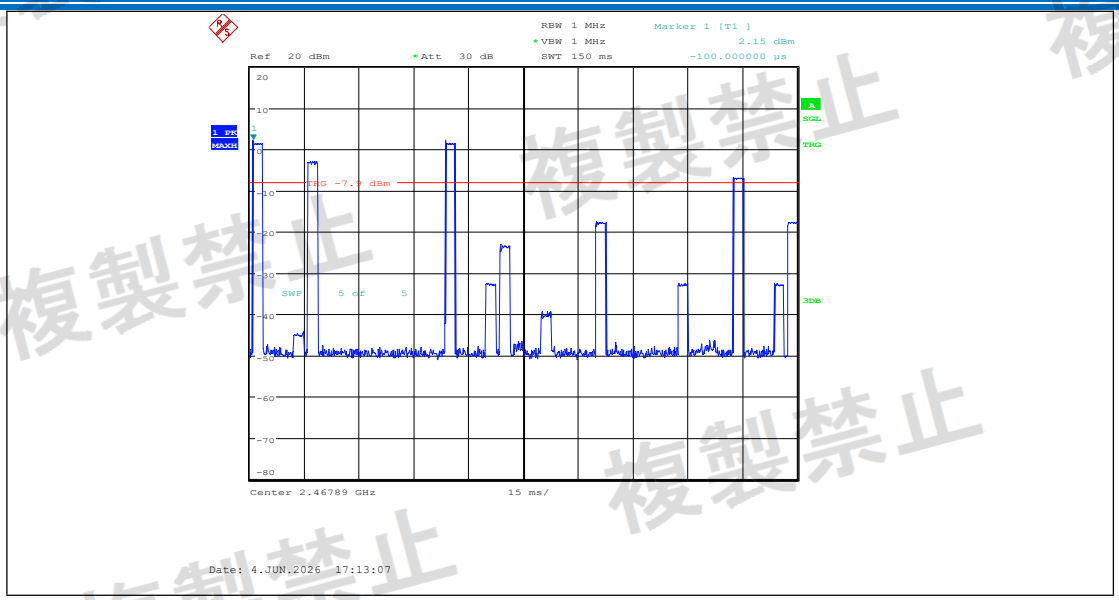


Date: 4.JUN.2026 15:34:42

NTNV_3DH5_Ant1_2441



Date: 4.JUN.2026 17:12:26


RBW 1 MHz
VBW 1 MHz
SWT 150 ms
Marker 1 [T1]
2.15 dBm
-100.000000 µs
Ref 20 dBm
Att 30 dB
1 PK
MAXH
A
SGL
TRG
TRG -7.0 dBm
SWP 5 of 5
3DB
Center 2.46789 GHz
15 ms/
Date: 4.JUN.2026 17:13:07

6.10 Spurious Emissions of Tx

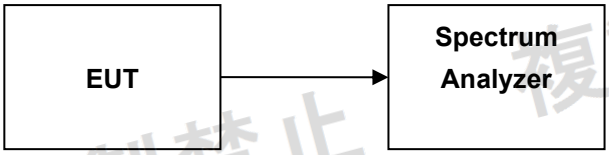
Test Requirement: Item 19 of Article 2-1

Test Method: MIC Notice No.88 Appendix No.43

(1) Below 2387 MHz: 2.5μW/MHz(-26dBm/MHz)
(2) 2387 to 2400 MHz: 25μW/MHz(-16dBm/MHz)
(3) 2483.5 through 2496.5 MHz: 25μW/MHz(-16dBm/MHz)
(4) Over 2496.5 MHz: 2.5μW/MHz(-26dBm/MHz)

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Test Conditions:
   Spectrum Analyzer is used for measurement.
2. EUT conditions:
   Modulation/Spread/Hopping ON, , Modulation Tx
   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
3. Spectrum Analyzer conditions:
   Step 1
   All spurious are measured from 30 MHz to 13 GHz by peak mode.
   Step 2
   IF the value measured by Step1 is 2 dB or less, measure in average mode.
   Test setup for Step 1:
   Frequency: 30 MHz – 1000 MHz
   RBW 100 KHz
   VBW 100 KHz
   Sweep Time Auto
   detector mode Positive peak
   Indication mode Max hold

   Frequency: 1000 MHz – 2400 MHz , 2483.5 MHz –13 GHz
   RBW 1 MHz
   VBW 1 MHz
   Sweep Time Auto
   detector mode Positive peak
   Indication mode Max hold

Test setup for Step 2:
Frequency: Spurious Frequency
RBW 1 MHz
VBW 1 MHz
Sweep Time Auto
detector mode Sample
Indication mode Max hold

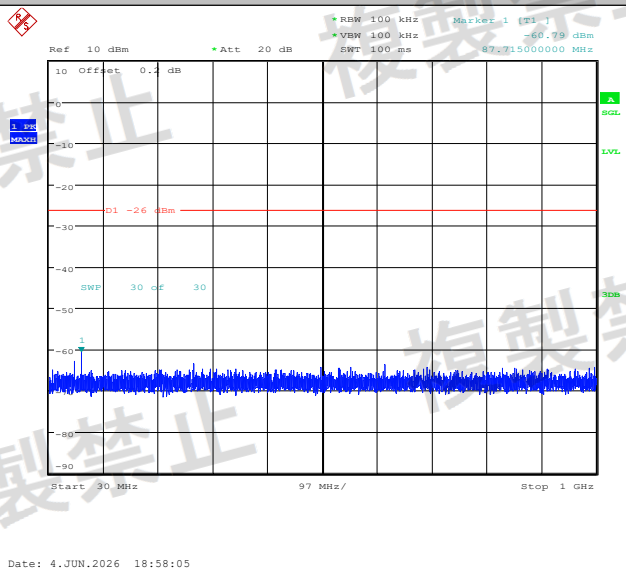
6.10.1 Test Result

Test Mode	Freq (MHz)	Freq.Range [MHz]	Freq [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Result [μW/MHz]	Limit [μW/MHz]	Verdict
DH5	2402	30~1000	87.72	-60.79	≤-26	0.00083	≤2.5	PASS
		1000~2387	2156.06	-47.95	≤-26	0.01603	≤2.5	PASS
		2387~2400	2400.00	-23.44	≤-16	4.52898	≤25	PASS
		2483.5~2496.5	2493.74	-46.27	≤-16	0.02360	≤25	PASS
		2496.5~13000	4804.12	-36.39	≤-26	0.22961	≤2.5	PASS
	2441	30~1000	126.64	-61.61	≤-26	0.00069	≤2.5	PASS
		1000~2387	2267.02	-46.99	≤-26	0.02000	≤2.5	PASS
		2387~2400	2394.10	-46.68	≤-16	0.02148	≤25	PASS
		2483.5~2496.5	2487.83	-46.06	≤-16	0.02477	≤25	PASS
		2496.5~13000	4881.84	-36.33	≤-26	0.23281	≤2.5	PASS
	2480	30~1000	165.68	-59.78	≤-26	0.00105	≤2.5	PASS
		1000~2387	2290.08	-47.12	≤-26	0.01941	≤2.5	PASS
		2387~2400	2388.35	-46.78	≤-16	0.02099	≤25	PASS
		2483.5~2496.5	2483.50	-40.91	≤-16	0.08110	≤25	PASS
		2496.5~13000	4960.10	-36.13	≤-26	0.24378	≤2.5	PASS
2DH5	2402	30~1000	87.59	-63.37	≤-26	0.00046	≤2.5	PASS
		1000~2387	2321.46	-47.79	≤-26	0.01663	≤2.5	PASS
		2387~2400	2399.99	-23.27	≤-16	4.70977	≤25	PASS
		2483.5~2496.5	2484.34	-46.53	≤-16	0.02223	≤25	PASS
		2496.5~13000	4804.12	-37.76	≤-26	0.16749	≤2.5	PASS
	2441	30~1000	126.64	-62.06	≤-26	0.00062	≤2.5	PASS
		1000~2387	2349.20	-47.52	≤-26	0.01770	≤2.5	PASS
		2387~2400	2398.40	-47.20	≤-16	0.01905	≤25	PASS
		2483.5~2496.5	2488.45	-46.32	≤-16	0.02333	≤25	PASS
		2496.5~13000	4881.32	-38.79	≤-26	0.13213	≤2.5	PASS
	2480	30~1000	846.86	-63.87	≤-26	0.00041	≤2.5	PASS
		1000~2387	2356.31	-47.65	≤-26	0.01718	≤2.5	PASS
		2387~2400	2399.95	-46.63	≤-16	0.02173	≤25	PASS
		2483.5~2496.5	2483.50	-42.23	≤-16	0.05984	≤25	PASS
		2496.5~13000	4959.57	-38.60	≤-26	0.13804	≤2.5	PASS
3DH5	2402	30~1000	87.59	-62.98	≤-26	0.00050	≤2.5	PASS
		1000~2387	2300.31	-47.62	≤-26	0.01730	≤2.5	PASS
		2387~2400	2400.00	-22.19	≤-16	6.03949	≤25	PASS
		2483.5~2496.5	2494.12	-46.12	≤-16	0.02443	≤25	PASS
		2496.5~13000	4804.12	-37.91	≤-26	0.16181	≤2.5	PASS
	2441	30~1000	891.00	-63.66	≤-26	0.00043	≤2.5	PASS
		1000~2387	2303.95	-47.53	≤-26	0.01766	≤2.5	PASS

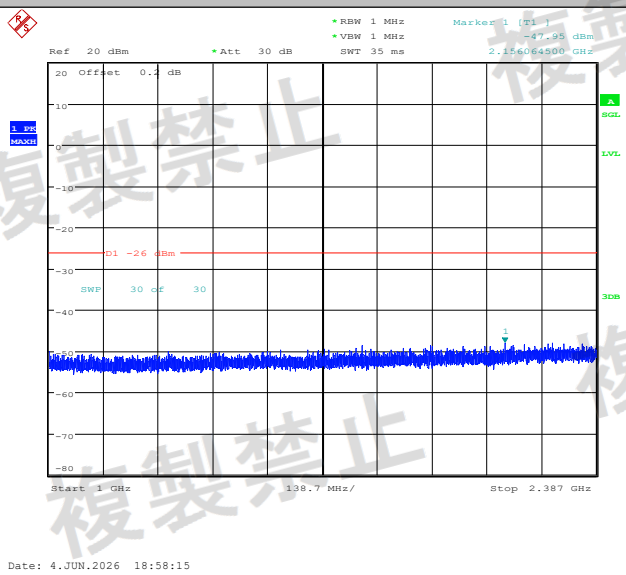
		2387~2400	2392.17	-46.57	≤-16	0.02203	≤25	PASS
		2483.5~2496.5	2495.95	-45.66	≤-16	0.02716	≤25	PASS
		2496.5~13000	4881.32	-40.30	≤-26	0.09333	≤2.5	PASS
	2480	30~1000	165.92	-63.16	≤-26	0.00048	≤2.5	PASS
		1000~2387	2180.68	-47.90	≤-26	0.01622	≤2.5	PASS
		2387~2400	2395.08	-47.26	≤-16	0.01879	≤25	PASS
		2483.5~2496.5	2483.50	-41.35	≤-16	0.07328	≤25	PASS
		2496.5~13000	4959.57	-38.03	≤-26	0.15740	≤2.5	PASS

6.10.2 Test Graphs

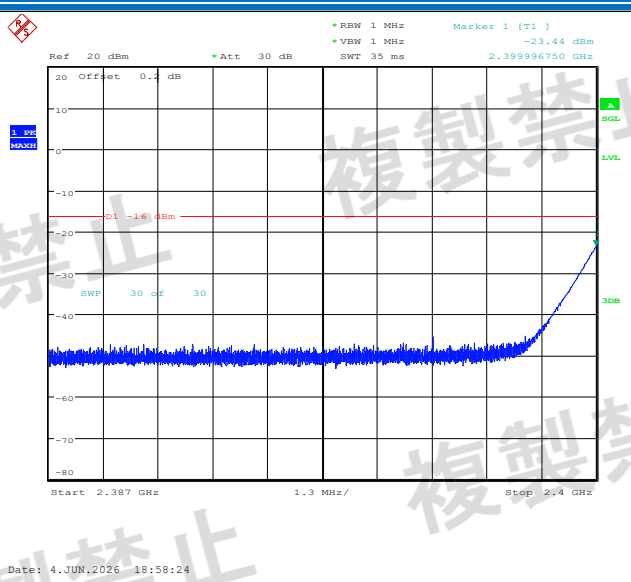
NTNV_DH5_Ant1_2402_30~1000



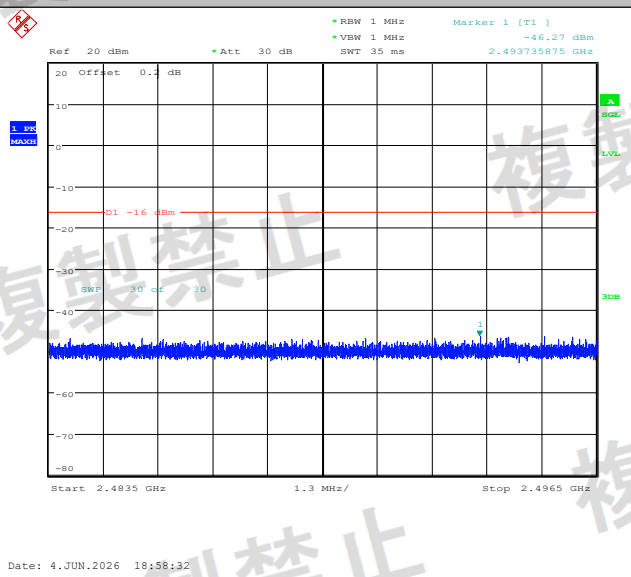
NTNV_DH5_Ant1_2402_1000~2387



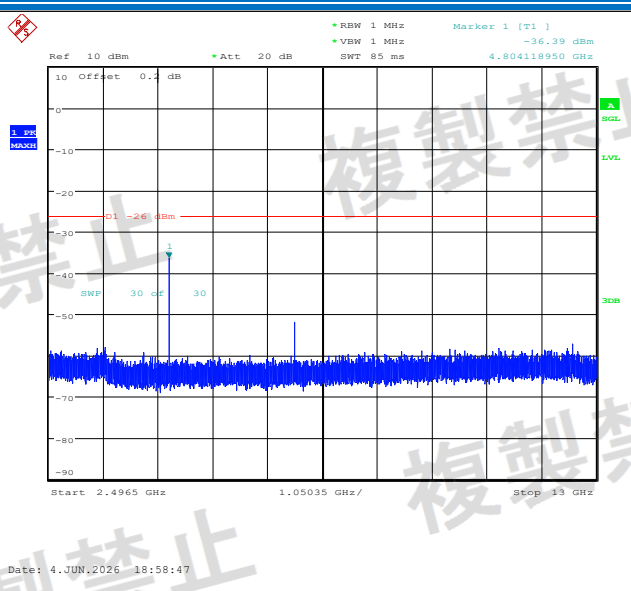
NTNV_DH5_Ant1_2402_2387~2400



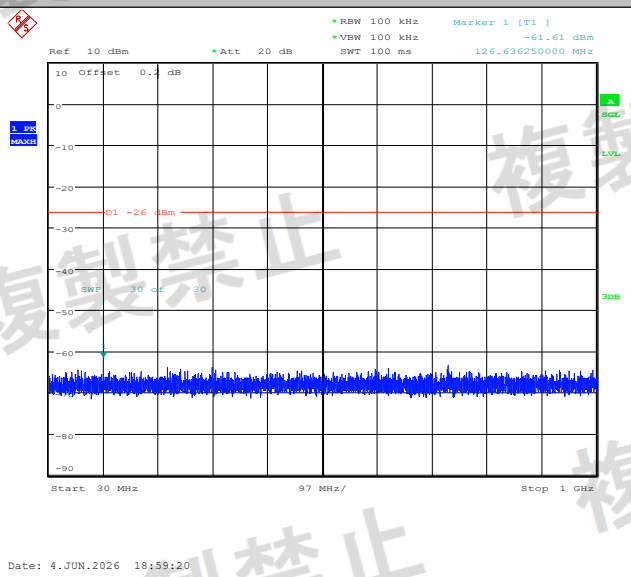
NTNV_DH5_Ant1_2402_2483.5~2496.5



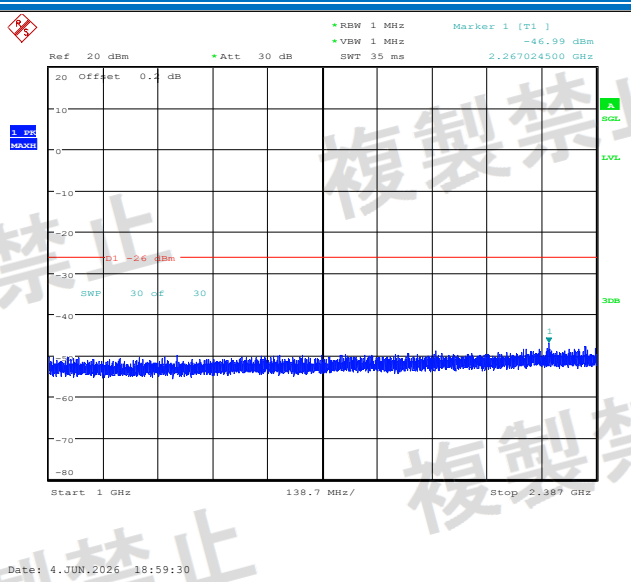
NTNV_DH5_Ant1_2402_2496.5~13000



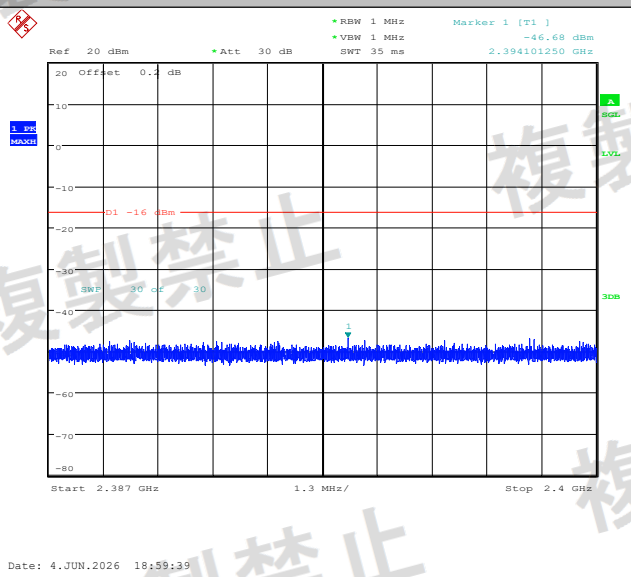
NTNV_DH5_Ant1_2441_30~1000



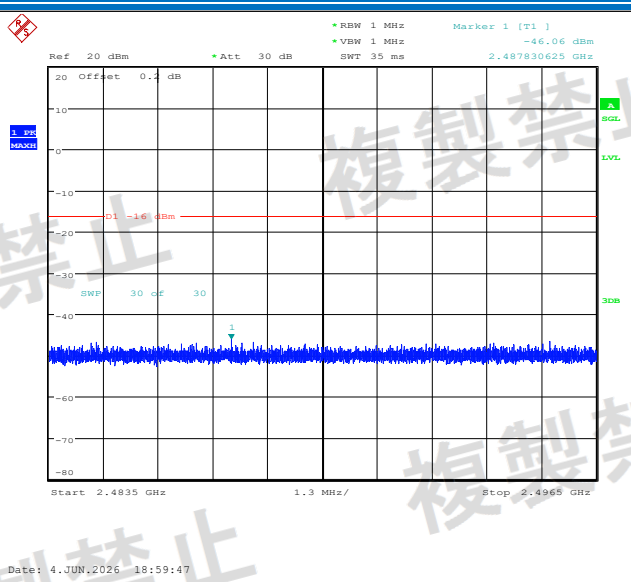
NTNV_DH5_Ant1_2441_1000~2387



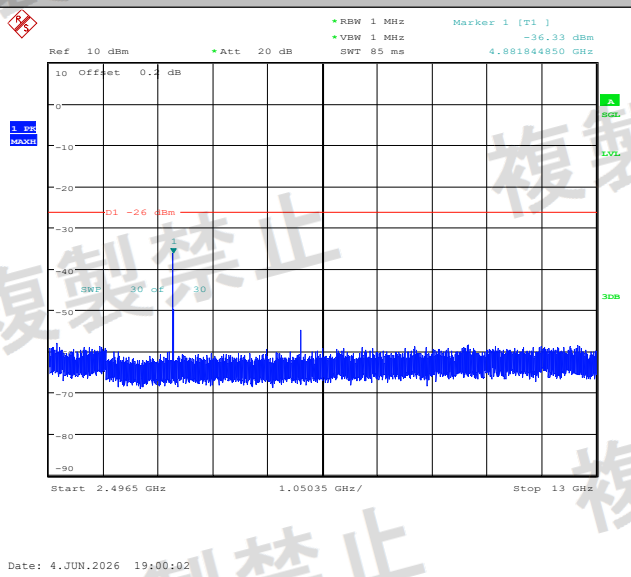
NTNV_DH5_Ant1_2441_2387~2400



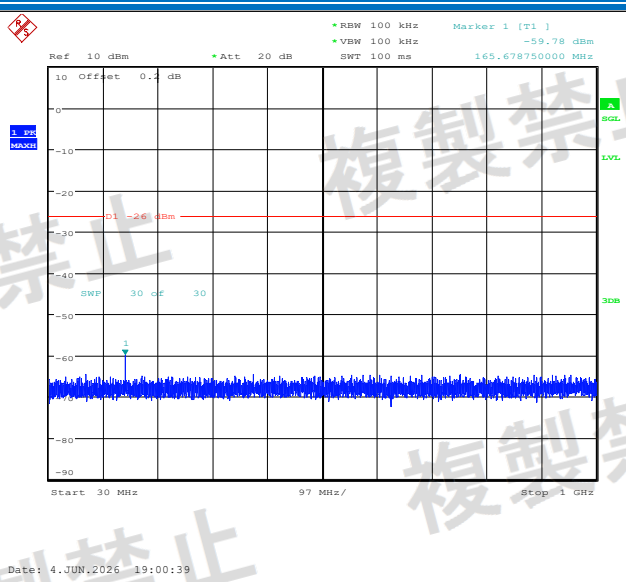
NTNV_DH5_Ant1_2441_2483.5~2496.5



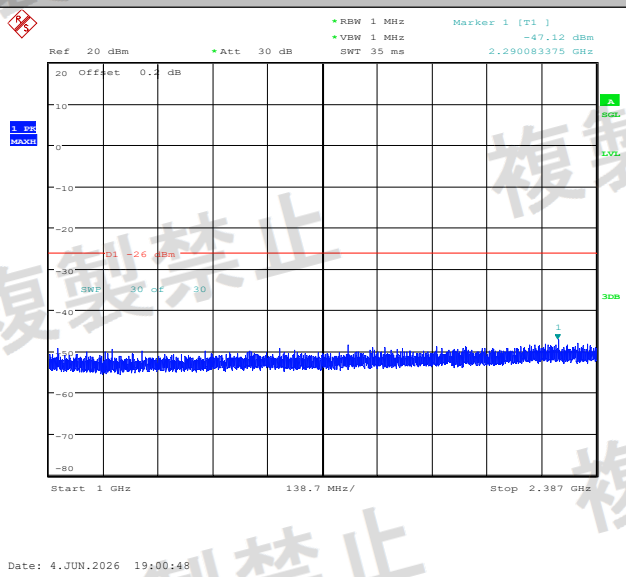
NTNV_DH5_Ant1_2441_2496.5~13000



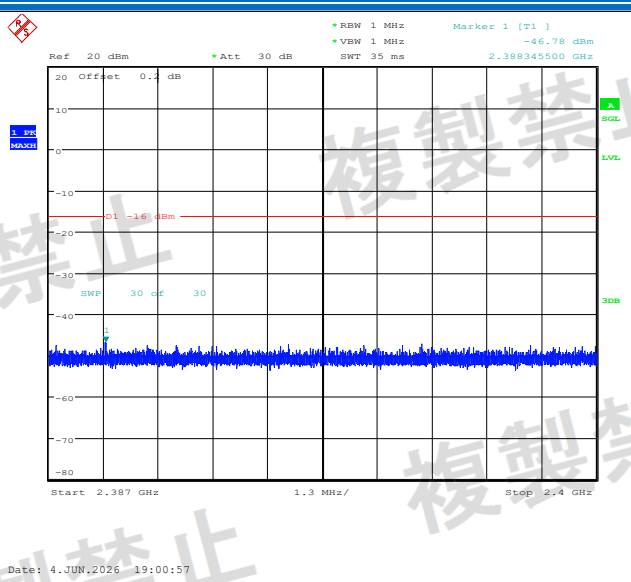
NTNV_DH5_Ant1_2480_30~1000



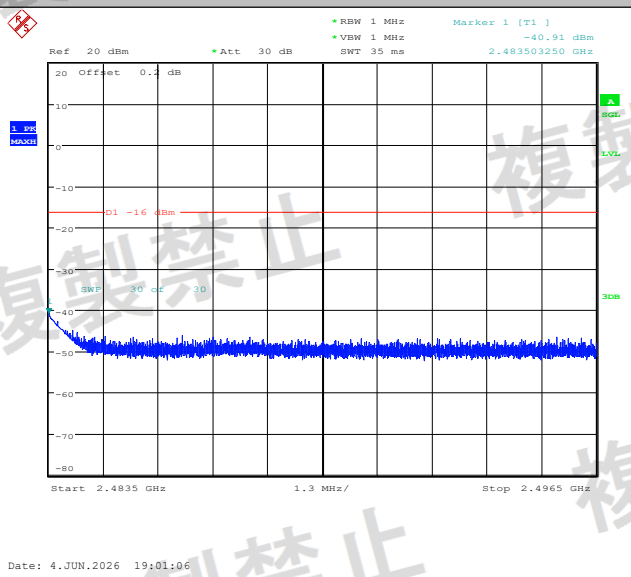
NTNV_DH5_Ant1_2480_1000~2387



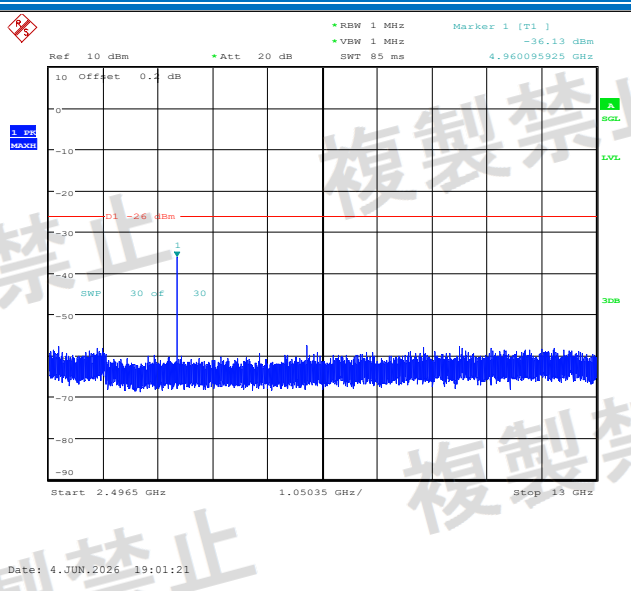
NTNV_DH5_Ant1_2480_2387~2400



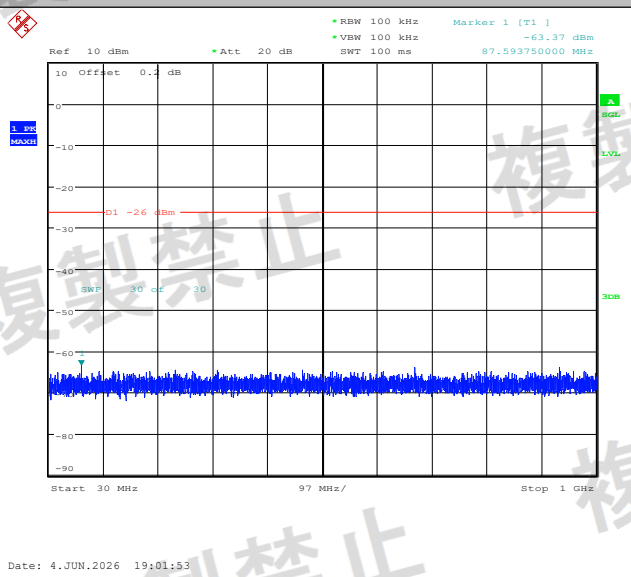
NTNV_DH5_Ant1_2480_2483.5~2496.5



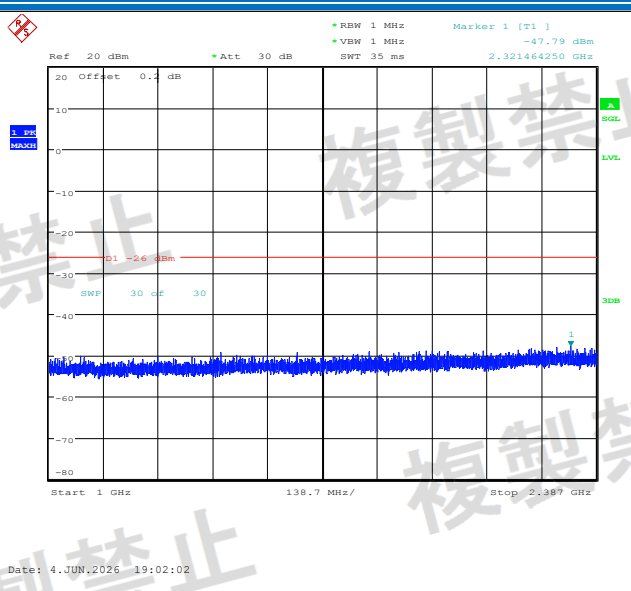
NTNV_DH5_Ant1_2480_2496.5~13000



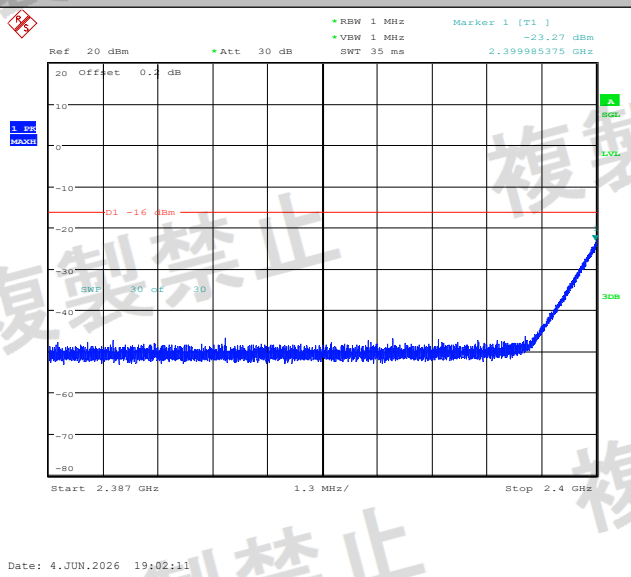
NTNV_2DH5_Ant1_2402_30~1000



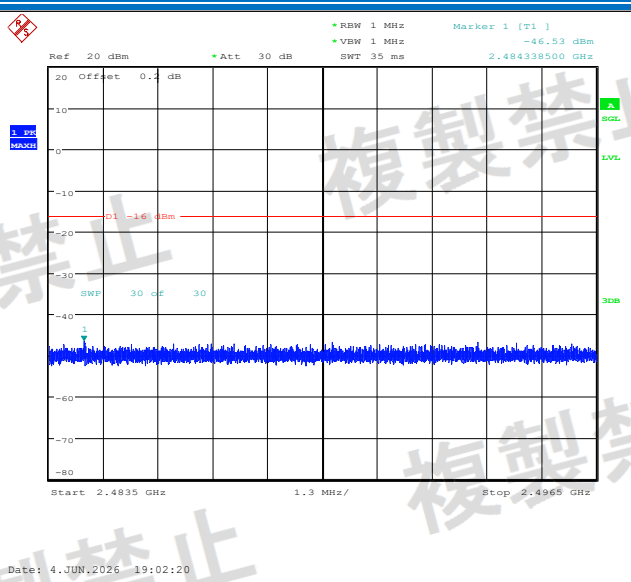
NTNV_2DH5_Ant1_2402_1000~2387



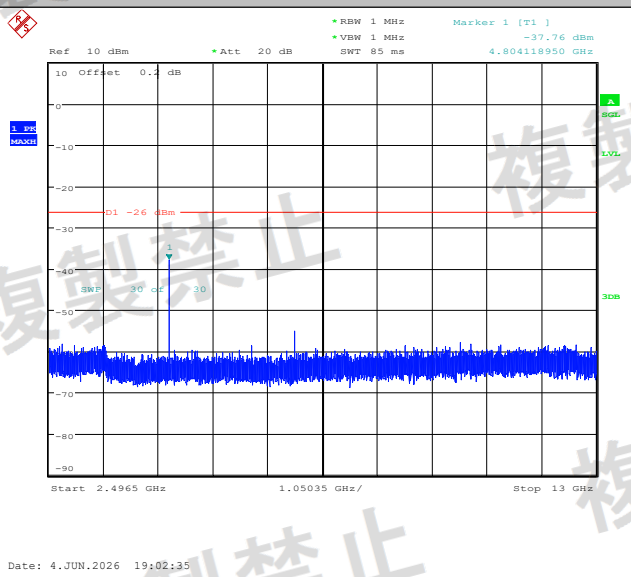
NTNV_2DH5_Ant1_2402_2387~2400



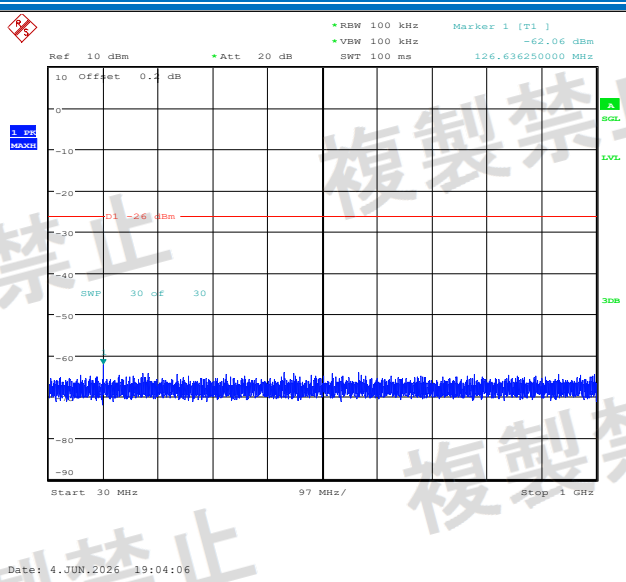
NTNV_2DH5_Ant1_2402_2483.5~2496.5



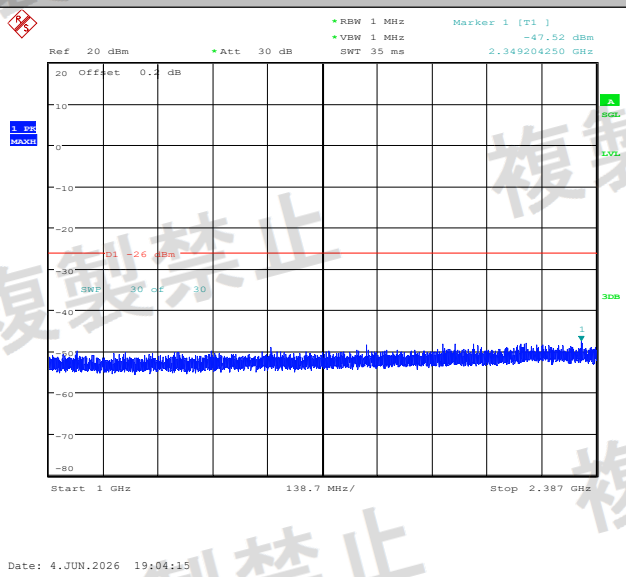
NTNV_2DH5_Ant1_2402_2496.5~13000



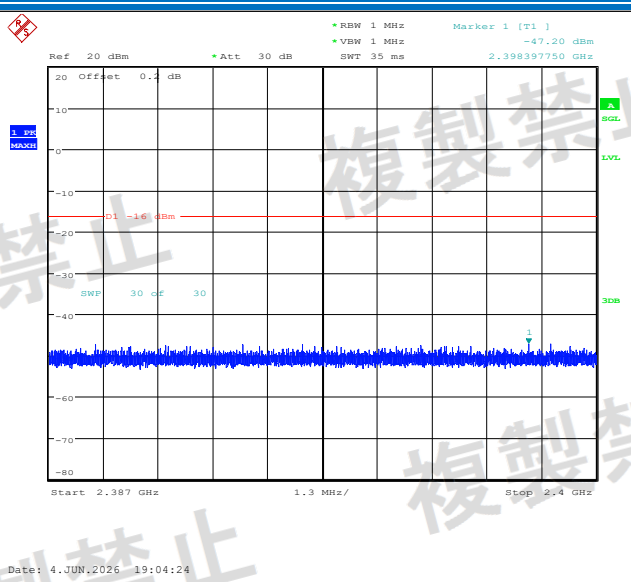
NTNV_2DH5_Ant1_2441_30~1000



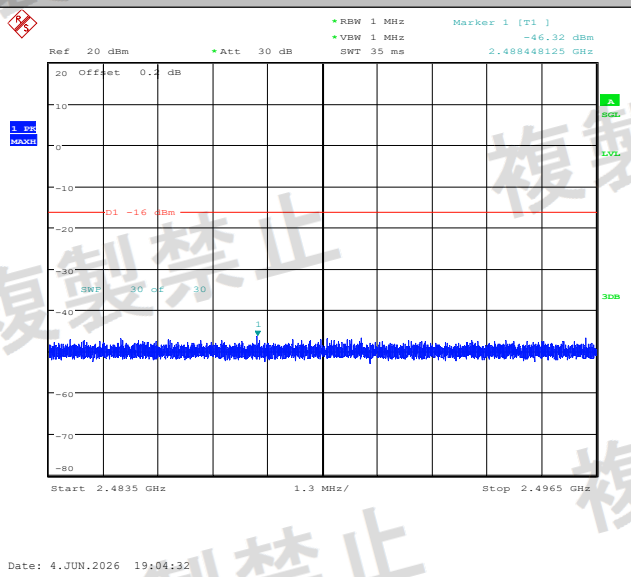
NTNV_2DH5_Ant1_2441_1000~2387



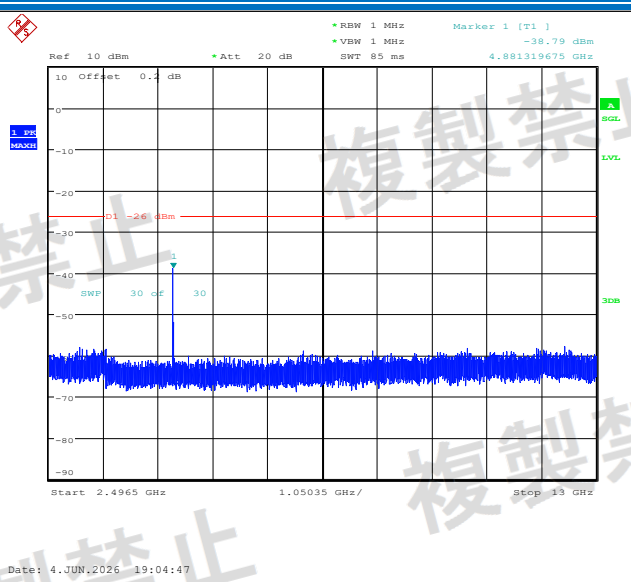
NTNV_2DH5_Ant1_2441_2387~2400



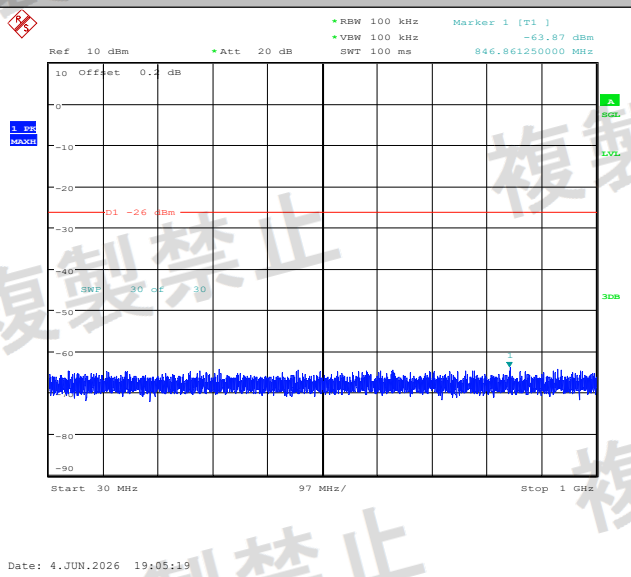
NTNV_2DH5_Ant1_2441_2483.5~2496.5



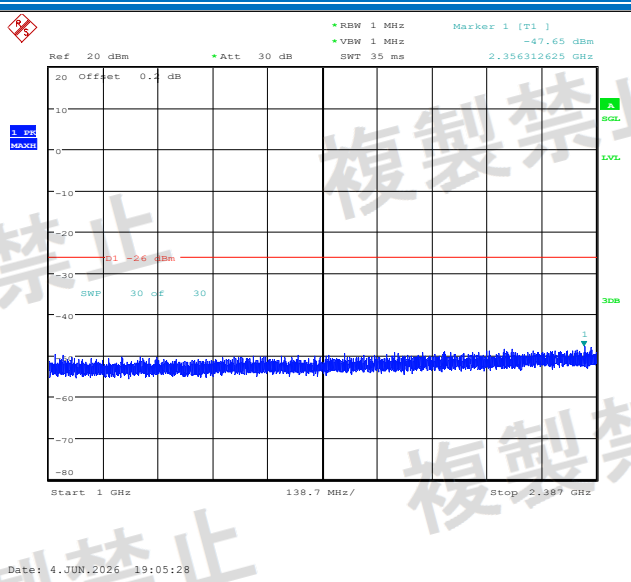
NTNV_2DH5_Ant1_2441_2496.5~13000



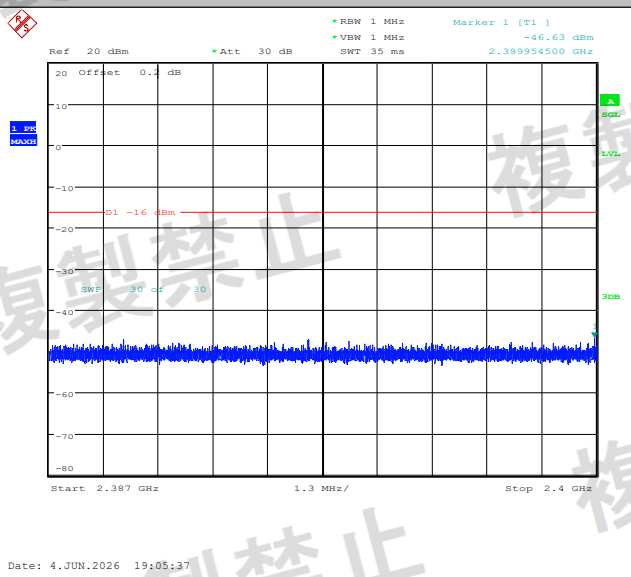
NTNV_2DH5_Ant1_2480_30~1000



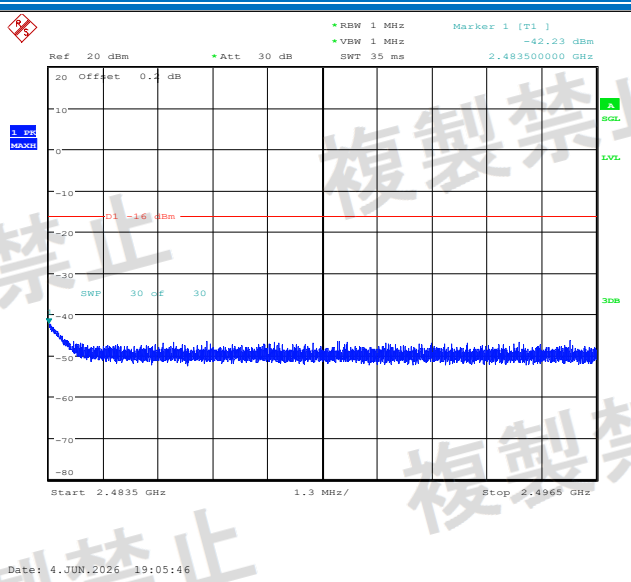
NTNV_2DH5_Ant1_2480_1000~2387



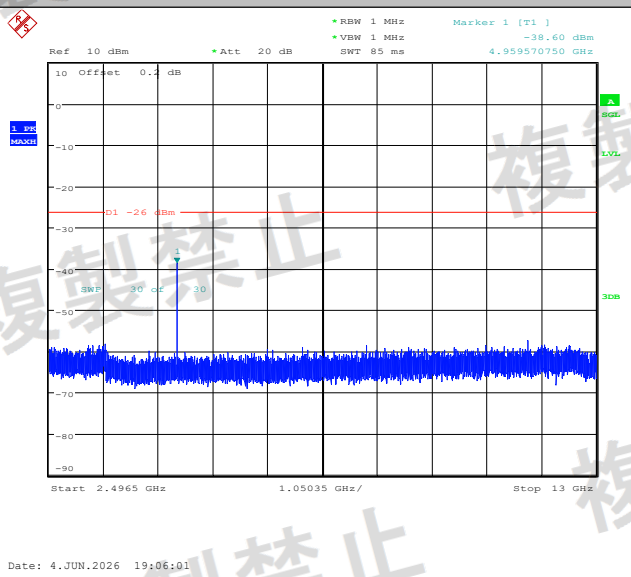
NTNV_2DH5_Ant1_2480_2387~2400



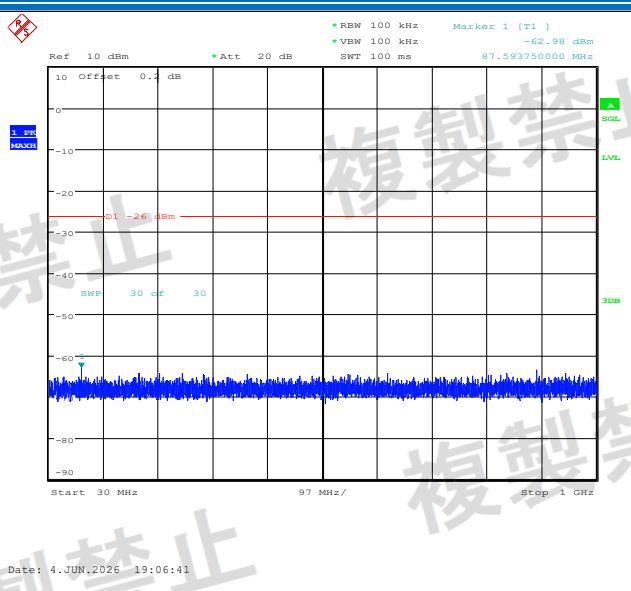
NTNV_2DH5_Ant1_2480_2483.5~2496.5



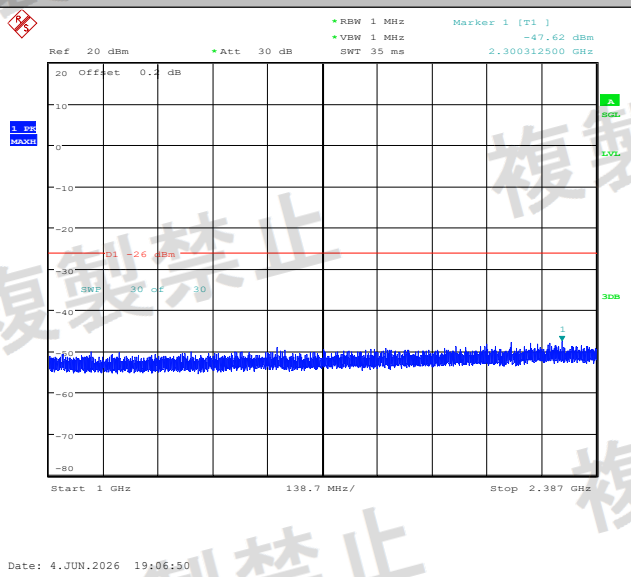
NTNV_2DH5_Ant1_2480_2496.5~13000



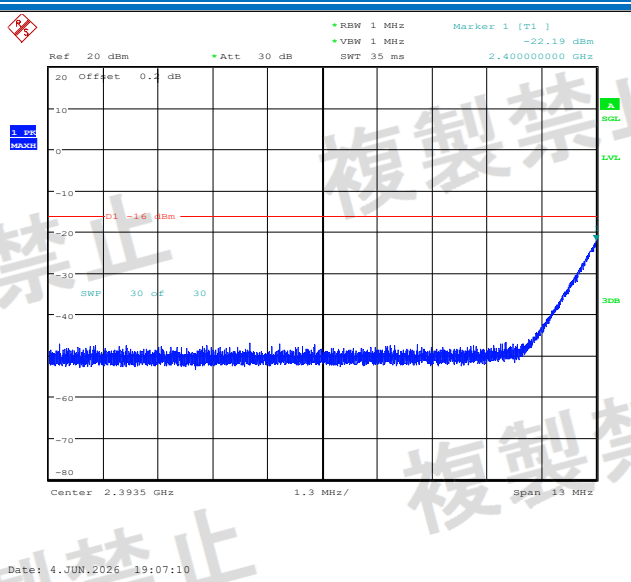
NTNV_3DH5_Ant1_2402_30~1000



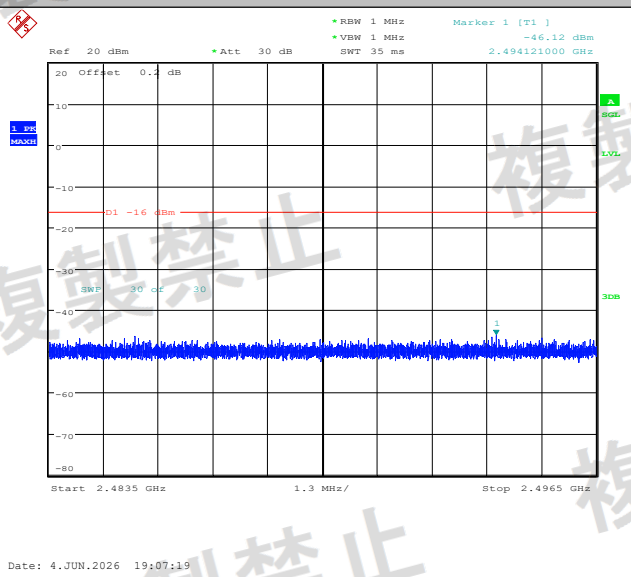
NTNV_3DH5_Ant1_2402_1000~2387



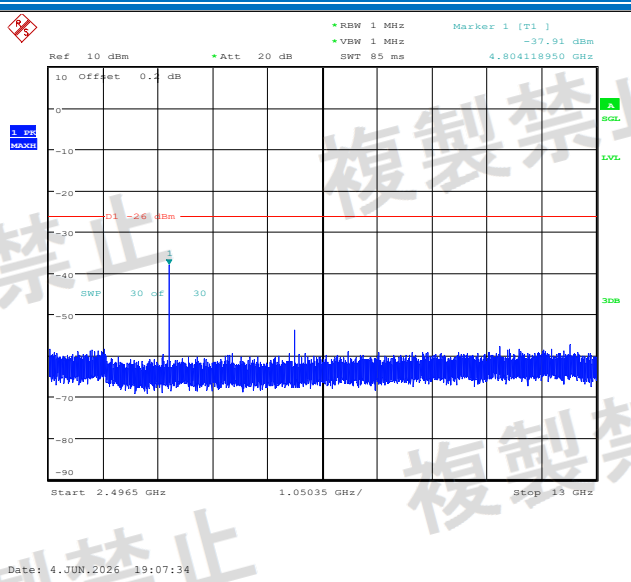
NTNV_3DH5_Ant1_2402_2387~2400



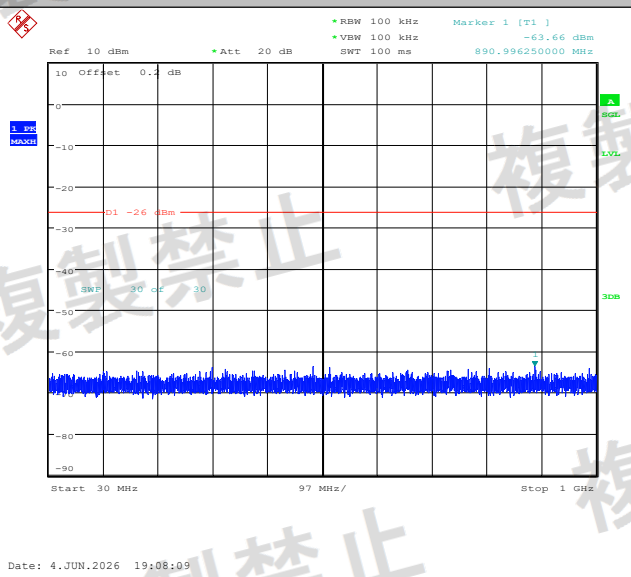
NTNV_3DH5_Ant1_2402_2483.5~2496.5



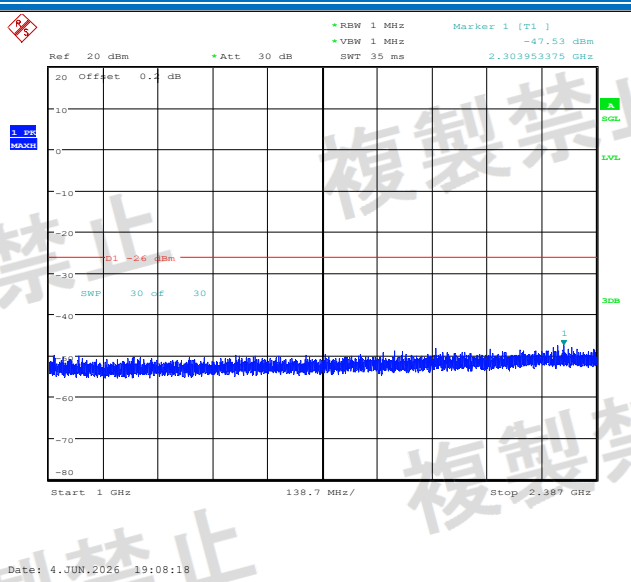
NTNV_3DH5_Ant1_2402_2496.5~13000



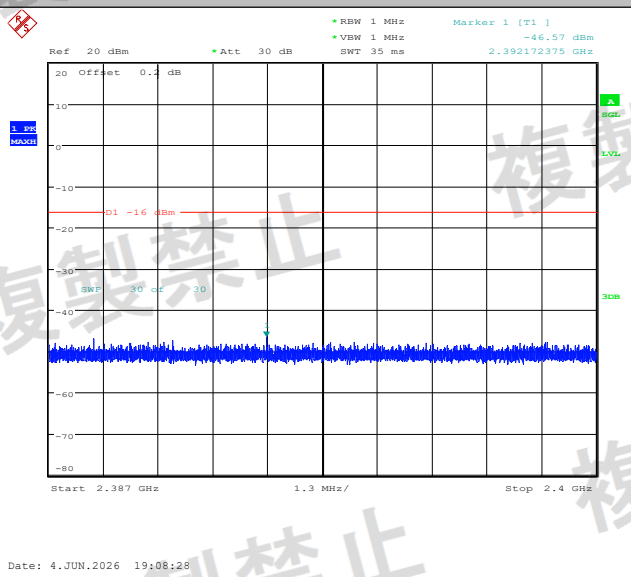
NTNV_3DH5_Ant1_2441_30~1000



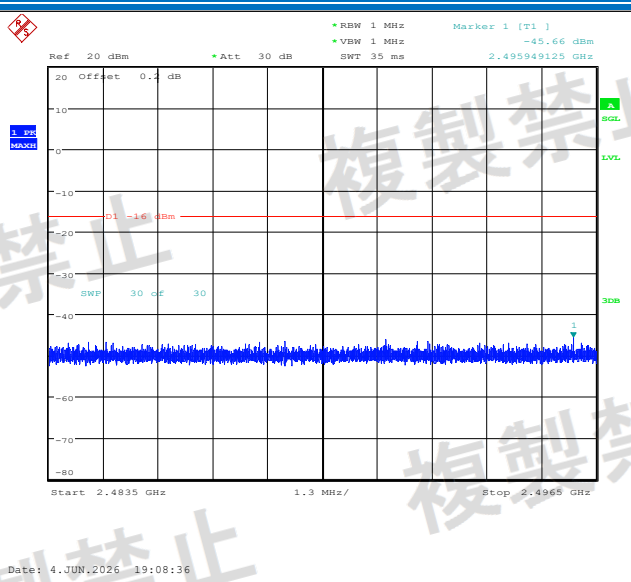
NTNV_3DH5_Ant1_2441_1000~2387



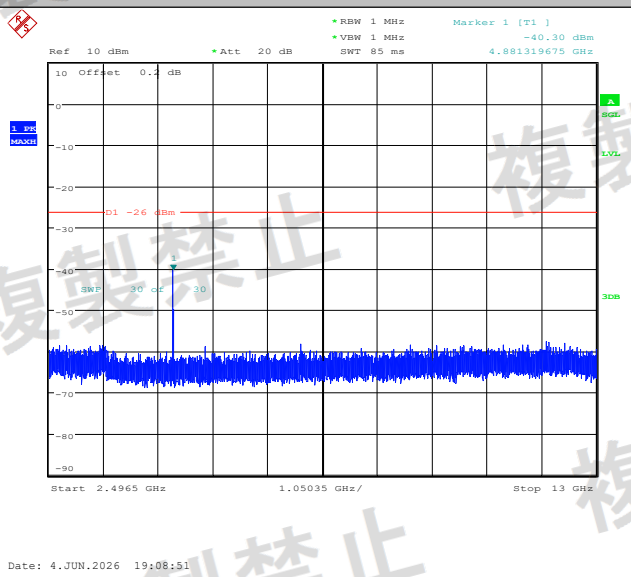
NTNV_3DH5_Ant1_2441_2387~2400



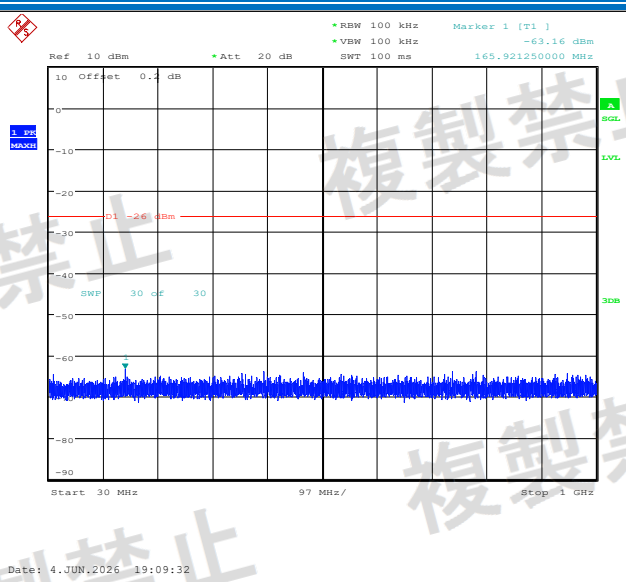
NTNV_3DH5_Ant1_2441_2483.5~2496.5



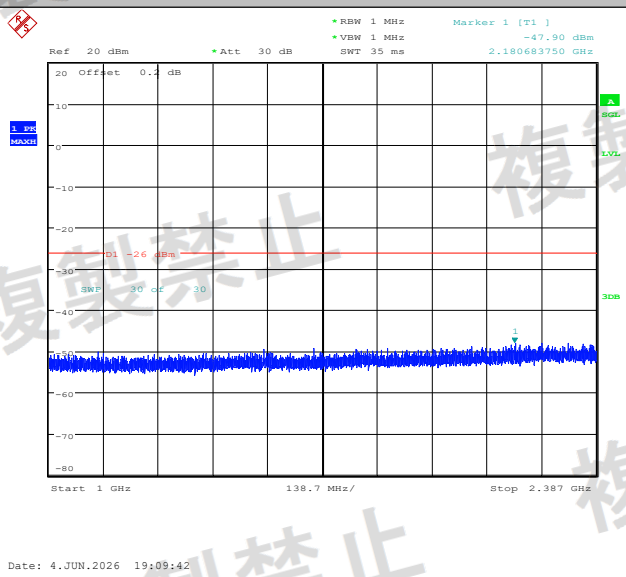
NTNV_3DH5_Ant1_2441_2496.5~13000



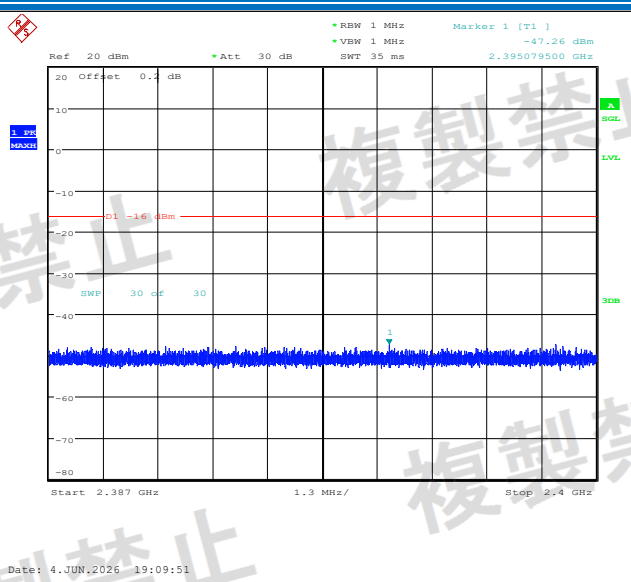
NTNV_3DH5_Ant1_2480_30~1000



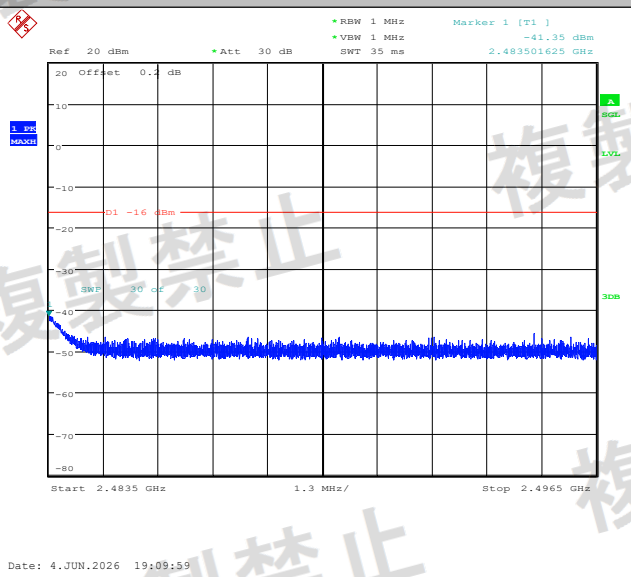
NTNV_3DH5_Ant1_2480_1000~2387



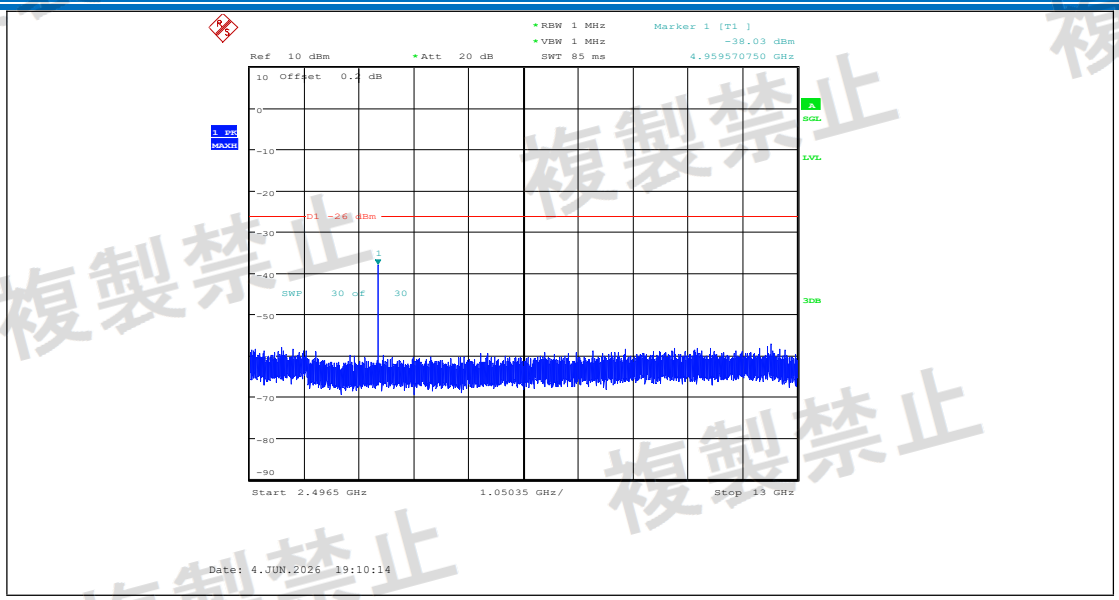
NTNV_3DH5_Ant1_2480_2387~2400



NTNV_3DH5_Ant1_2480_2483.5~2496.5



NTNV_3DH5_Ant1_2480_2496.5~13000



Test Result: The unit does meet the requirements.

6.11 Dwell Time

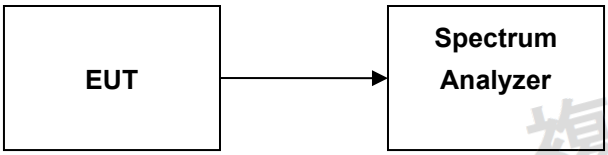
Test Requirement: Item 19 of Article 2-1

less than 0.4sec

Test Method: MIC Notice No.88 Appendix No.43

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Modulation/Spread/Hopping ON, Hopping frequency is fixed, Bluetooth equipment is setting DH5 mode

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping ON, Hopping frequency is fixed, Bluetooth equipment is setting DH5 mode
   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

   Frequency: Test Frequency (fixed hopping frequency)
   Span 0 Hz
   RBW 1 MHz
   VBW 1 MHz
   Sweep Time EUT condition
   Trigger Video Trigger
   Measures the Transmission time of 1 burst (sec)
   Measures the Burst cycle (sec)

4. Calculation procedure :

   Dwell time = (0.4(s) x [spreading rate] x [Transmission time of 1 burst(s)]) / ([burst cycle(s)] x [No. of hopping channel])
   Note:
   * Spreading rate = [Spread bandwidth (actual measurement value)] / [Transmission rate]

Test Result:

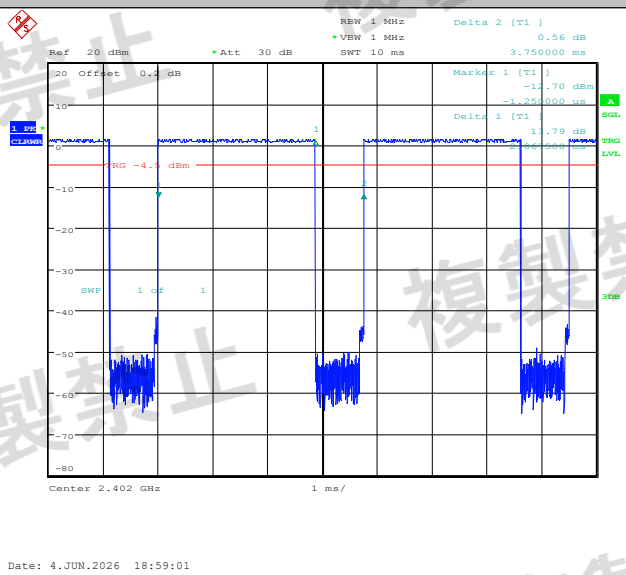
Test Condition	TestMode	Antenna	Channel	BurstWidth [ms]	Period [ms]	Result [s]	Limit [s]	Verdict
NTNV	DH5	Ant1	2402	2.87	3.75	0.28	<0.4	PASS
			2441	2.87	3.75	0.28	<0.4	PASS
			2480	2.87	3.75	0.28	<0.4	PASS
	2DH5	Ant1	2402	2.88	3.75	0.14	<0.4	PASS
			2441	2.88	3.75	0.14	<0.4	PASS
			2480	2.88	3.75	0.14	<0.4	PASS
	3DH5	Ant1	2402	2.88	3.75	0.09	<0.4	PASS
			2441	2.88	3.75	0.09	<0.4	PASS
			2480	2.88	3.75	0.09	<0.4	PASS

Remark: Calculated method: Dwell time = (0.4(s) x [spreading rate] x [Transmission time of 1 burst(s)])/ ([burst cycle(s)] x [No. of hopping channel])

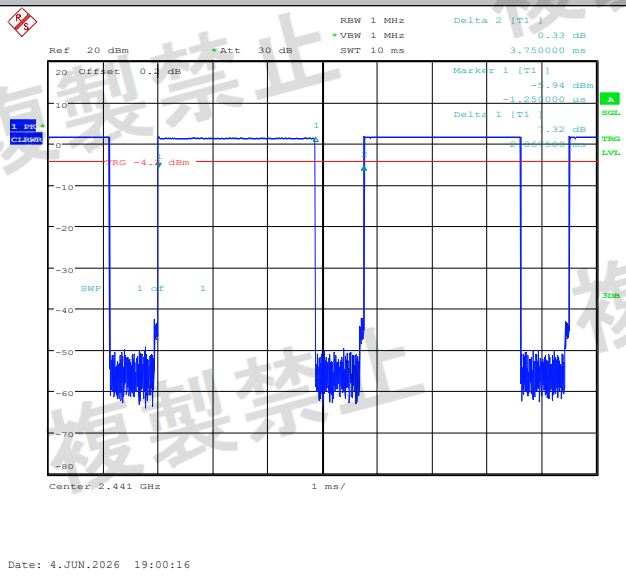
Note: Spreading rate = [Spread bandwidth (actual measurement value)]/[Transmission rate]

Result plot as follows:

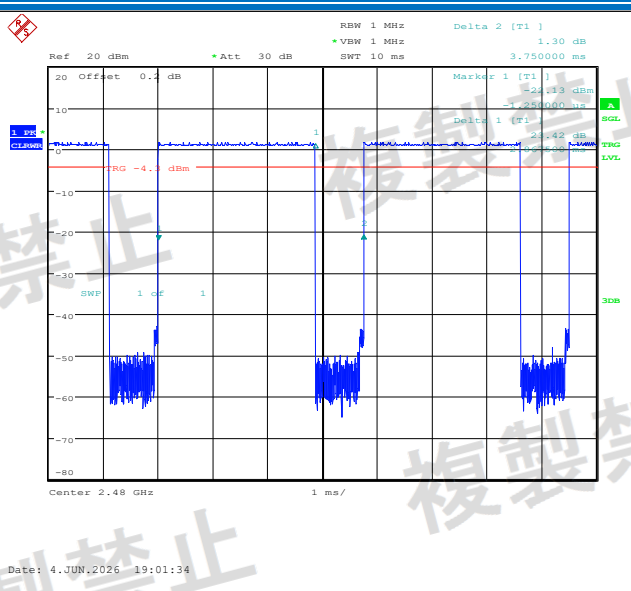
NTNV_DH5_Ant1_2402



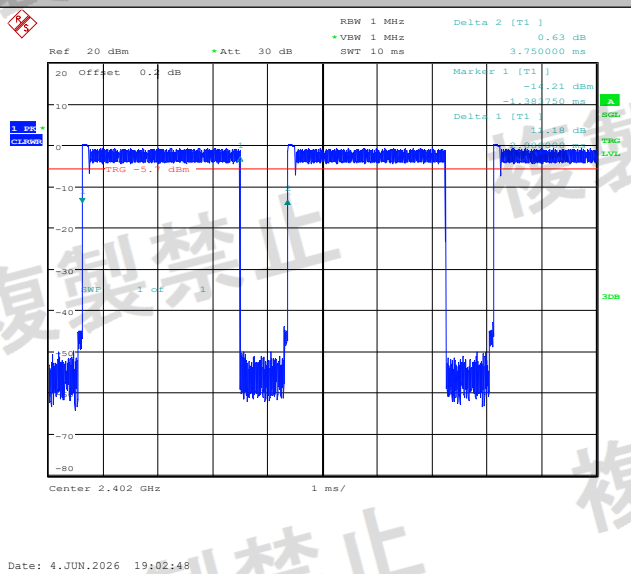
NTNV_DH5_Ant1_2441



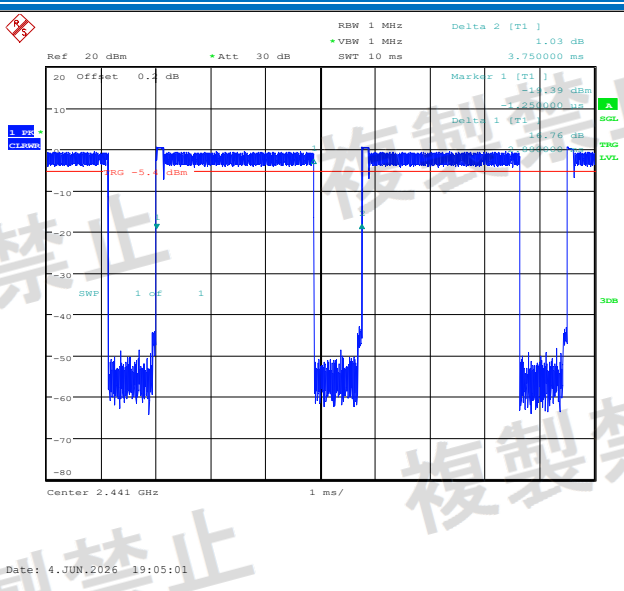
NTNV_DH5_Ant1_2480



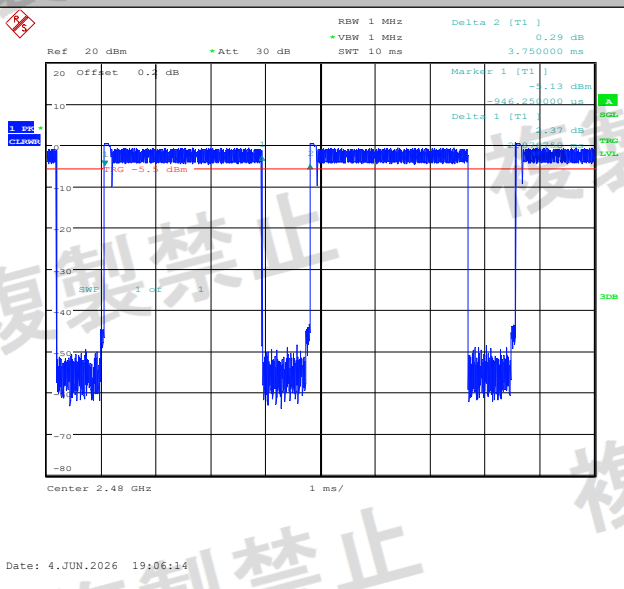
NTNV_2DH5_Ant1_2402



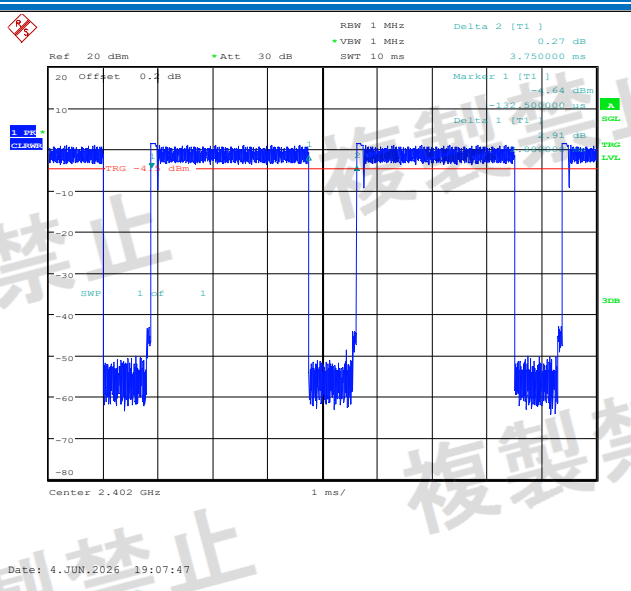
NTNV_2DH5_Ant1_2441



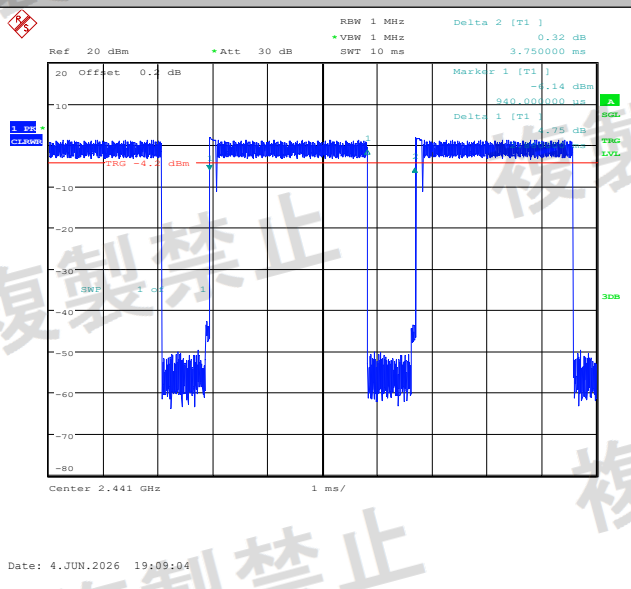
NTNV_2DH5_Ant1_2480



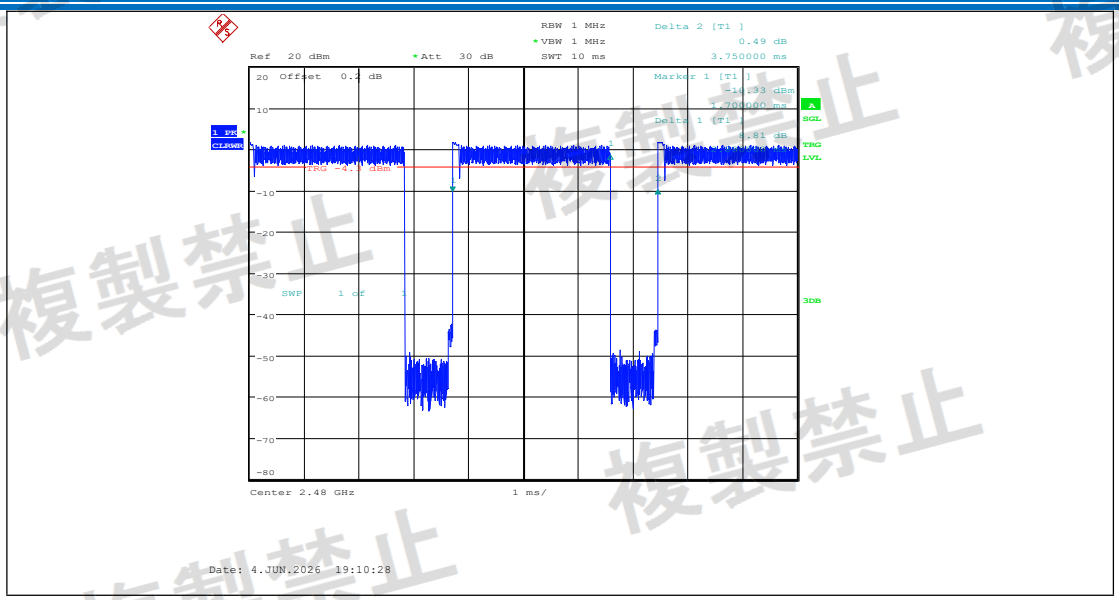
NTNV_3DH5_Ant1_2402



NTNV_3DH5_Ant1_2441



NTNV_3DH5_Ant1_2480



Test Result: The unit does meet the requirements.

6.12 RF accessibility

Standard requirement

Article 49-20, paragraph 1 (a)

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

Tamper proof Declaration:

☐ 1. Sealed with special screws.

☐ 2. Plastic chassis is being welded using ultrasonic waves.

☐ 3. Chassis is glued using a special adhesive.

☐ 4. Metal covers are spot-fused.

☐ 5. Cover is specially interlocked.

☐ 6. RF and Modulation components are covered with shielding case and this shielding case is soldered.

☒ 7. Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.

☐ 8. Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.

☐ 9. Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.

☐ 10. RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable parts on PCB or adjustable parts are not exposed.

The method used to meet the "cannot be opened easily" is to use a shielding cover to seal it.

Any attempt to modify the RF chip will invalidate the normal operation of the device.

6.13 Spurious Emissions of Rx

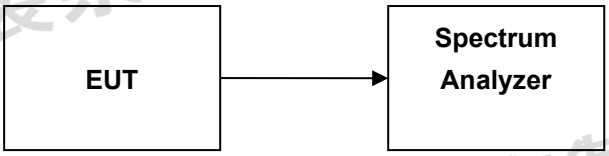
Test Requirement: Item 19 of Article 2-1

Test Method: MIC Notice No.88 Appendix No.43

(1) Below 1 GHz : 4 nW(-54dBm) or less
(2) 1 GHz and over : 20 nW(-47dBm) or less

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

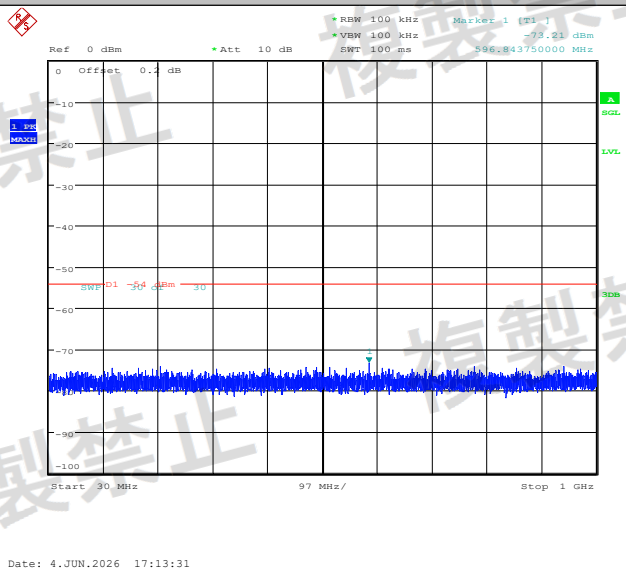
1. Test Conditions:
   Spectrum Analyzer is used for measurement.
2. EUT conditions:
   Modulation/Spread/Hopping ON
   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
3. Spectrum Analyzer conditions:
   Step 1
   All spurious are measured from 30 MHz to 13 GHz by peak mode.
   Step 2
   IF the value measured by Step1 is 2 dB or less, measure in average mode.
   Test setup for Step 1:
   Frequency: 30 MHz – 2400 MHz , 2483.5 MHz –13 GHz
   RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)
   VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)
   Sweep Time Auto
   detector mode Positive peak
   Indication mode Max hold
   Test setup for Step 2:
   Frequency: Spurious Frequency
   Span 0 Hz
   RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)
   VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)
   Sweep Time Auto
   detector mode Sample
   Indication mode Max hold

Test Result:

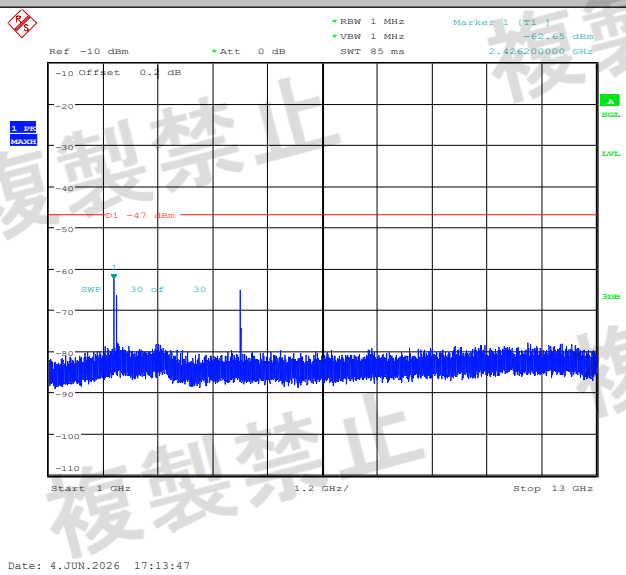
Test Mode	Freq (MHz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
DH5	2402	30~1000	596.84	-73.21	≤-54	0.04775	≤4	PASS
		1000~13000	2426.20	-62.65	≤-47	0.54325	≤20	PASS
	2441	30~1000	813.15	-73.70	≤-54	0.04266	≤4	PASS
		1000~13000	2426.20	-73.92	≤-47	0.04055	≤20	PASS
	2480	30~1000	329.97	-74.18	≤-54	0.03819	≤4	PASS
		1000~13000	2608.00	-67.27	≤-47	0.18750	≤20	PASS
2DH5	2402	30~1000	224.61	-74.31	≤-54	0.03707	≤4	PASS
		1000~13000	2425.60	-61.27	≤-47	0.74645	≤20	PASS
	2441	30~1000	511.97	-73.92	≤-54	0.04055	≤4	PASS
		1000~13000	12837.40	-78.01	≤-47	0.01581	≤20	PASS
	2480	30~1000	913.55	-73.79	≤-54	0.04178	≤4	PASS
		1000~13000	12083.20	-77.60	≤-47	0.01738	≤20	PASS
3DH5	2402	30~1000	994.06	-74.23	≤-54	0.03776	≤4	PASS
		1000~13000	5197.00	-65.99	≤-47	0.25177	≤20	PASS
	2441	30~1000	617.70	-73.98	≤-54	0.03999	≤4	PASS
		1000~13000	3569.80	-57.01	≤-47	1.99067	≤20	PASS
	2480	30~1000	482.51	-72.10	≤-54	0.06166	≤4	PASS
		1000~13000	1924.60	-61.96	≤-47	0.63680	≤20	PASS

6.13.1 Test Graphs

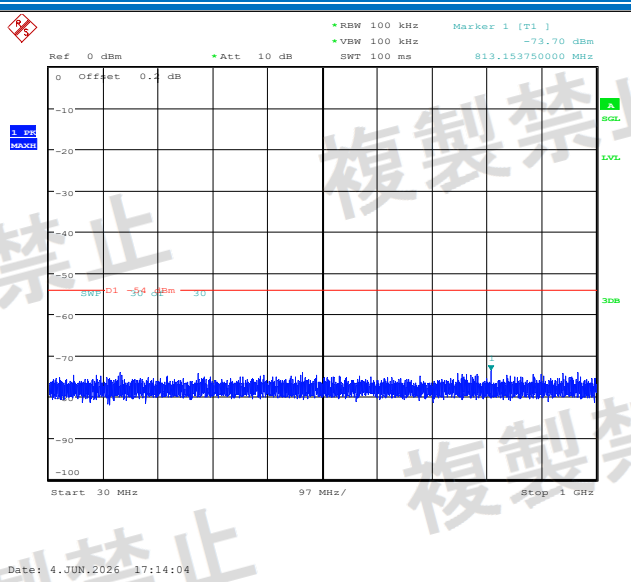
NTNV_DH5_Ant1_2402_30~1000



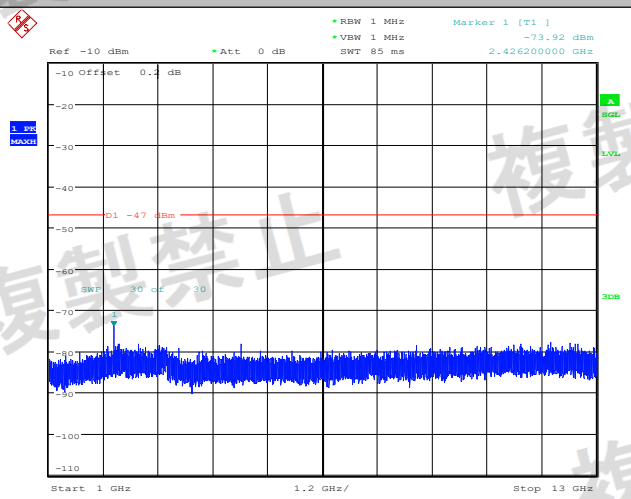
NTNV_DH5_Ant1_2402_1000~13000



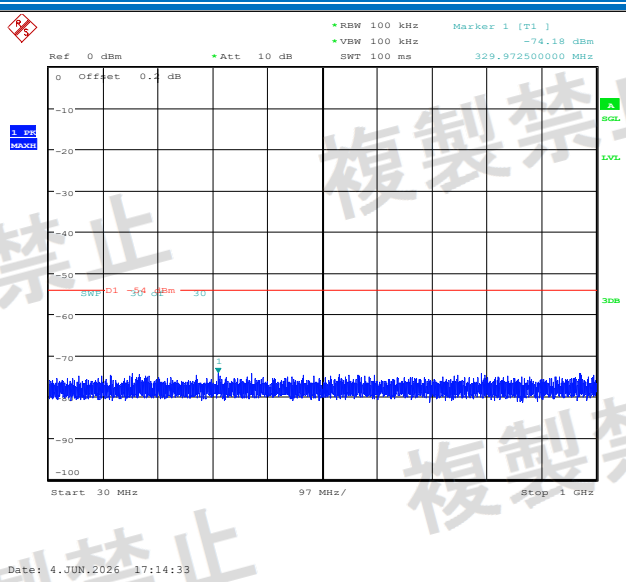
NTNV_DH5_Ant1_2441_30~1000



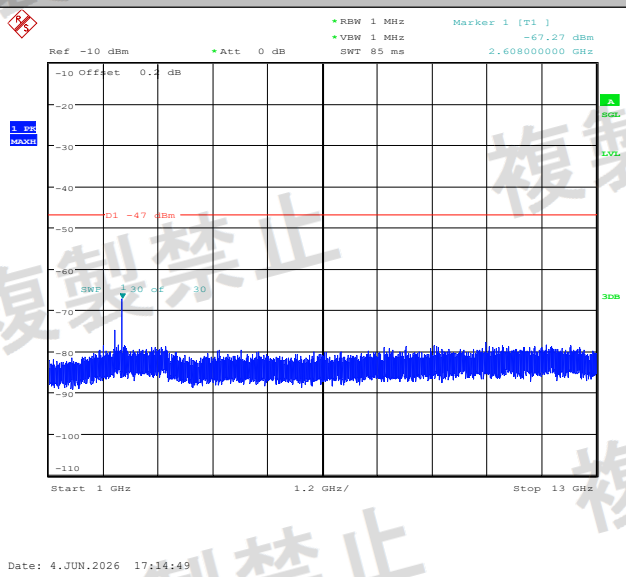
NTNV_DH5_Ant1_2441_1000~13000



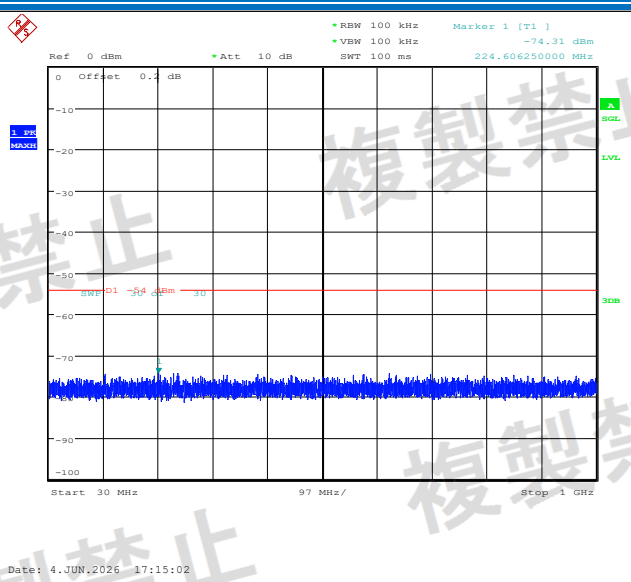
NTNV_DH5_Ant1_2480_30~1000



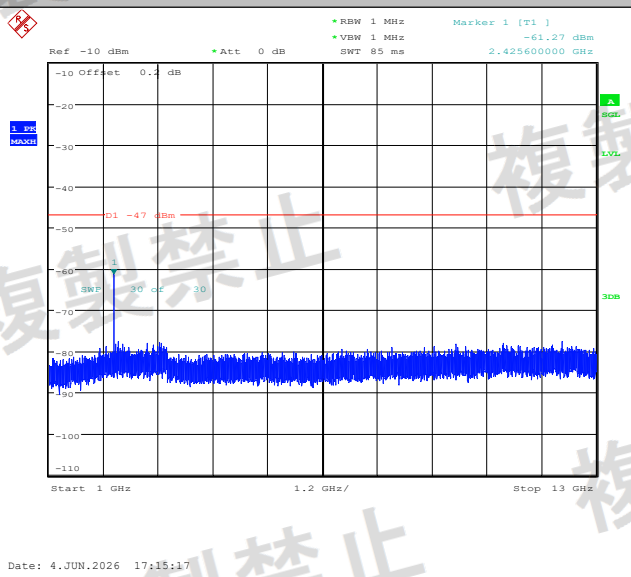
NTNV_DH5_Ant1_2480_1000~13000



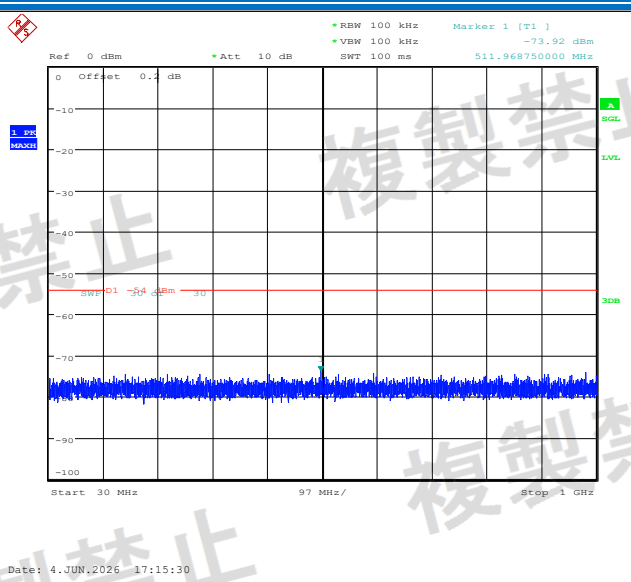
NTNV_2DH5_Ant1_2402_30~1000



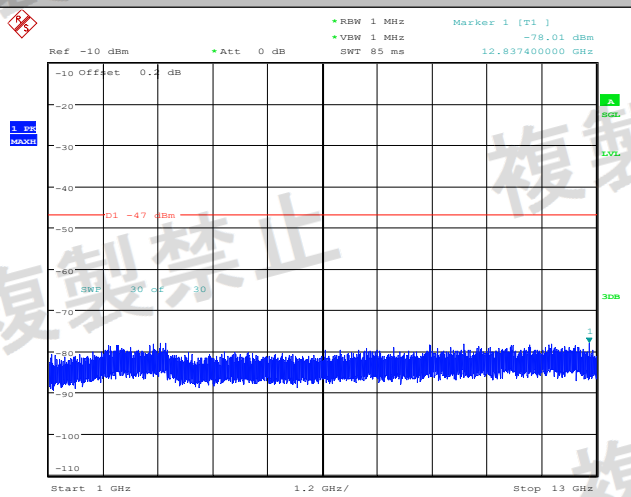
NTNV_2DH5_Ant1_2402_1000~13000



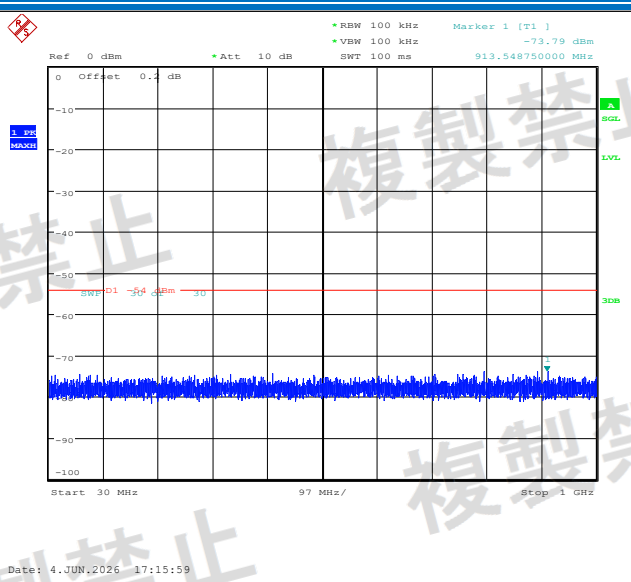
NTNV_2DH5_Ant1_2441_30~1000



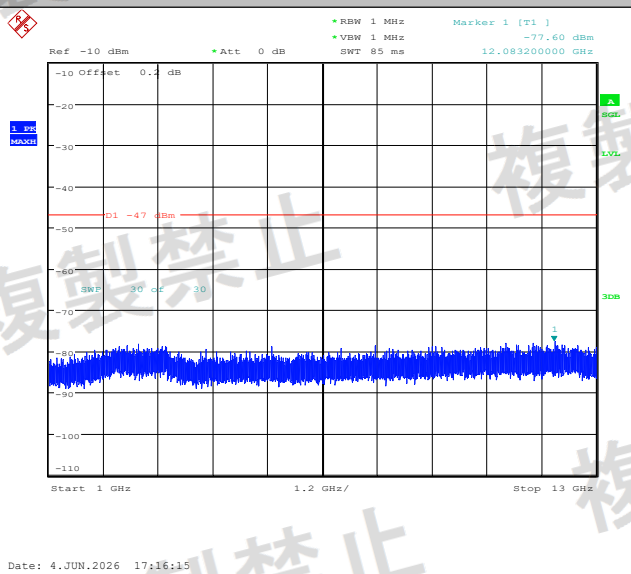
NTNV_2DH5_Ant1_2441_1000~13000



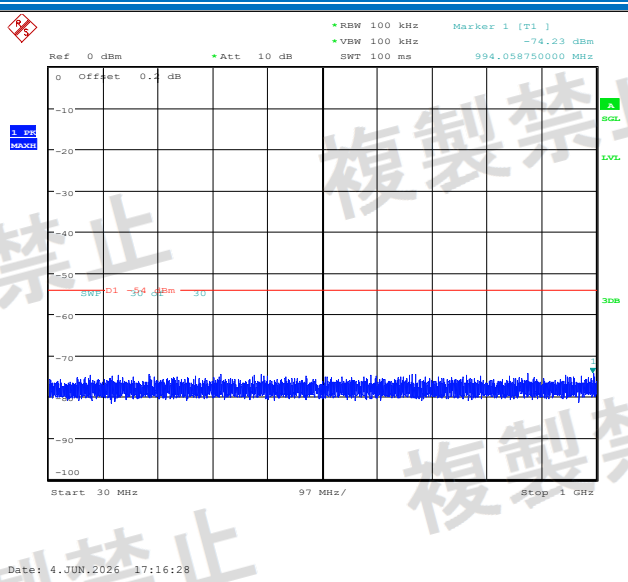
NTNV_2DH5_Ant1_2480_30~1000



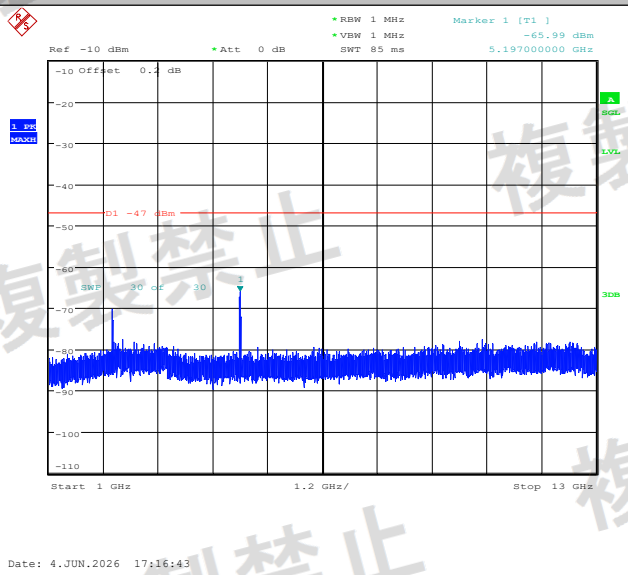
NTNV_2DH5_Ant1_2480_1000~13000



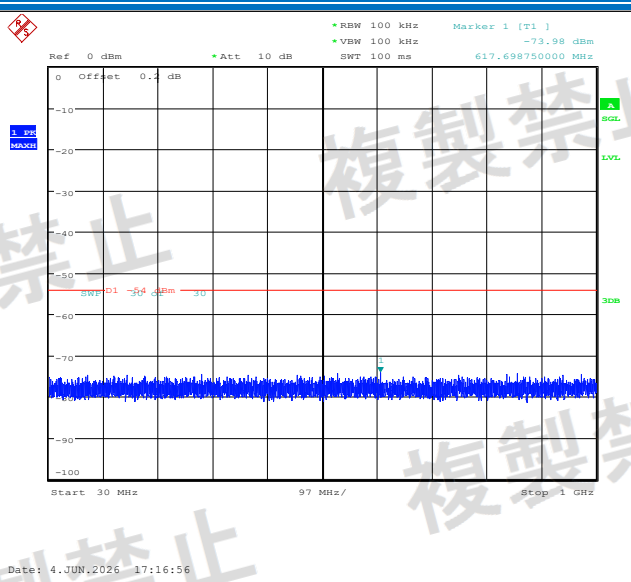
NTNV_3DH5_Ant1_2402_30~1000



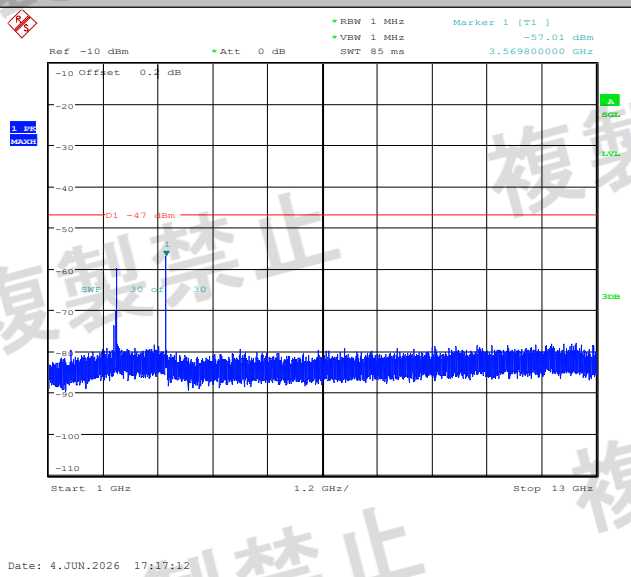
NTNV_3DH5_Ant1_2402_1000~13000



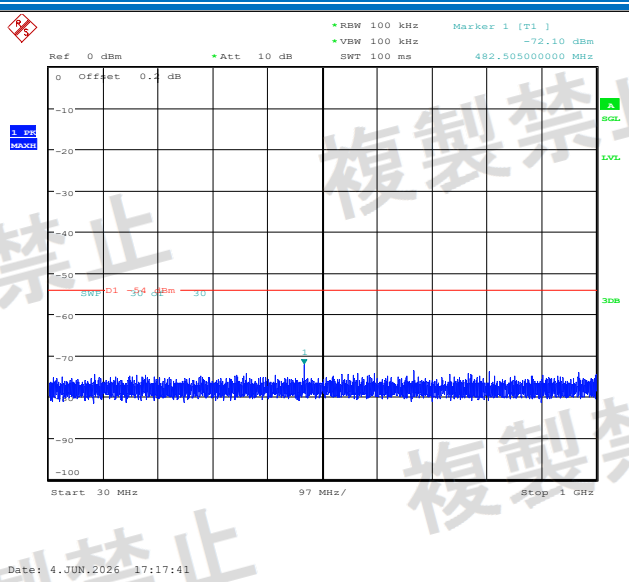
NTNV_3DH5_Ant1_2441_30~1000



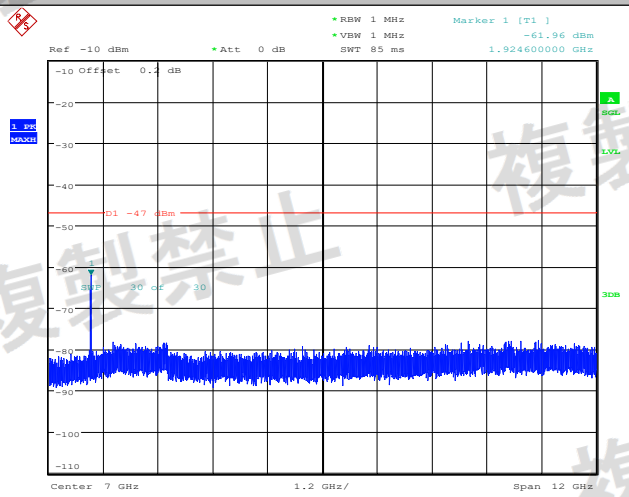
NTNV_3DH5_Ant1_2441_1000~13000



NTNV_3DH5_Ant1_2480_30~1000



NTNV_3DH5_Ant1_2480_1000~13000



7 Photographs

7.1 Test Setup

Detailed information is given in Appendix A

8 Photographs - EUT Constructional Details

Detailed information is given in Appendix B and Appendix C

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

複製禁止