Test Report

Applicant	:	PEAG, LLC dba JLab Audio
Address	:	5927 LANDAU CT, Carlsbad, CA 92008, United States
Product Name	:	Wireless Headset
Brand Mark	:	JLAB
Model	:	JBuddies Pop wireless
Report Number	:	BLA-RF-202507-A7901
Date of Receipt	:	July 23, 2025
Date of Test	:	July 23, 2025 to Aug. 22, 2025
Test standard	:	Item 19 of Article 2 Paragraph 1
Test Result	:	Pass

Compiled by: Hugh **Review by:** Xavier **Approved by:** Blue Zheng

Issued Date: Aug. 22, 2025

BlueAsia Technical Services (Shenzhen) Co., Ltd

Address: No.41, South of Beihuan Road, Shangwu Community, Shiyan Subdistrict,Bao'an District, Shenzhen, Guangdong, China

BlueAsia Technical Services (Shenzhen) Co., Ltd. BLA

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Revise Record

Version No.	Date	Description
01	Aug. 22, 2025	Original

1 General information

1.1 General information

Applicant	PEAG, LLC dba JLab Audio
Address	5927 LANDAU CT, Carlsbad, CA 92008, United States
Manufacturer	GuangDong Simpreal Intelligent Technology Co., Ltd
Address	Room 2408, JiaHong ZhenXing DaSha, DongGuan Avenue #13, DongCheng District, DongGuan City, GuangDong Province, P.R. China
Factory	GuangDong Simpreal Intelligent Technology Co., Ltd
Address	Room 2408, JiaHong ZhenXing DaSha, DongGuan Avenue #13, DongCheng District, DongGuan City, GuangDong Province, P.R. China

1.2 General description of EUT

Product name	Wireless Headset
Model no.	JBuddies Pop wireless
Series model	N/A
Test engineer sample no.	BLA-RF-202507-A7901
Operation Frequency:	2402MHz-2480MHz
Conducted rated power	F1D: 0.18mW/MHz G1D: 0.17mW/MHz
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Channel Spacing:	1MHz
Dwell time:	Per channel is less than 0.4s.
Number of Channels:	79
Antenna Type:	Chip antenna
Antenna Gain:	2.5dBi from 2402~2480MHz
Power supply or adapter information	DC3.8V by battery
Hardware Version	V4
Software Version	V10.14
Note: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.	

2 Test summary

Test	Test Requirement	Limit/Severity	Result
Antenna Requirement	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43,B-1 (1)&(2)	PASS
Test frequency	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, A-3	PASS
Frequency Error	Item 19 of Article 2 Paragraph 1	±50 PPM or less	PASS
Occupied Bandwidth	Item 19 of Article 2 Paragraph 1	83.5 MHz or less	PASS
Spread-spectrum Bandwidth	Item 19 of Article 2 Paragraph 1	N/A	N/A
Spread Factor	Item 19 of Article 2 Paragraph 1	N/A	N/A
Antenna Power	Item 19 of Article 2 Paragraph 1	Designated value: (1)FH, FH+DS , FH+OFDM 3mW/MHz (Used in the range of 2400~2483.5MHz) (2) OFDM , DS other than (1) : 10mW/MHz (3) Other than (1) & (2) 10mW Tolerance: +20%	PASS
Transmission Antenna Gain (EIRP Antenna Power)	Item 19 of Article 2 Paragraph 1		PASS
Transmission Radiation Angle Width (3dB beam-width)	Item 19 of Article 2 Paragraph 1		Note1
Spurious Emission of Tx	Item 19 of Article 2 Paragraph 1	(1) Below 2387 MHz : -26dBm/MHz (2) 2387 to 2400 MHz : -16dBm/MHz (3) 2483.5 through 2496.5 MHz : -16dBm/MHz (4) Over 2496.5 MHz : -26dBm/MHz	PASS
Dwell Time	Item 19 of Article 2 Paragraph 1	less than 0.4sec	PASS
Pseudorandom Frequency Hopping Sequence	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43	PASS
Interference prevention capability	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43	PASS
RF accessibility	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43	PASS
Spurious Emission of Rx	Item 19 of Article 2 Paragraph 1	(1) Below 1 GHz: -54dBm (2) 1GHz or higher: -47dBm	PASS

Remark:
EUT: In this whole report EUT means Equipment Under Test.
Tx:In this whole report Tx (or tx) means the product in transmitting status.
Rx: In this whole report Rx (or rx) means the product in receiving status.
RF:In this whole report RF means Radiated Frequency.
Note1: The max EIRP power is less than 6.91dBm/MHz, this test is not applicable.

3 Description of Support Units

The EUT has been tested stand-alone..

4 Auxiliary equipment

Device Type	Manufacturer	Model Name	Serial No.	Remark
USB TO TTL	N/A	V287	N/A	By laboratory

Note:
"--" mean no any auxiliary device during testing.

5 Laboratory information

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

Company name:	BlueAsia Technical Services (Shenzhen) Co.,Ltd.
Address:	No.41, South of Beihuan Road, Shangwu Community, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Registration No.:	L9788
Telephone:	+86-755-28682673
FAX:	+86-755-28682673

6 Test equipment

Equipment	Manufacturer	Model	Serial No.	Cal Date	Due Date	Calibration body	Classification
Communication test set test set	Anritsu	MT8852B	06262047872	2024/9/7	2025/9/6	GRGT	(c)
Spectrum Analyzer	Keysight	N9030A	MY52350152	2024/9/7	2025/9/6	GRGT	(c)
Signal Generator	Agilent	E4438C	MY45092582	2024/9/7	2025/9/6	GRGT	(c)
DC regulated power supply	ZHAOXIN	KXN-305D	BLA-EMC-027	2024/9/24	2025/9/23	GRGT	(c)
Power sensor	RPR3006W	DARE	14I00889SN042	2025/08/05	2026/08/04	GRGT	(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.

7 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 Paragraph 1)

Items	Technical standard
Assigned frequency or designated frequency	2400-2483.5MHz
Communication method	One-way communication, simplex, semi-duplex, or duplex operation of digital signal transmission including spread spectrum
Tolerance of frequency (×10^{-6})	±50PPM
Tolerance of occupied bandwidth	FH: 83.5MHz or less FH + DS: 83.5MHz or less FH + OFDM: 83.5MHz or less OFDM: 38MHz or less Others: 26MHz or less
Antenna power	Designated value (1) FH, FH+DS , FH+OFDM：3mW/MHz (used in the range of 2400~2483.5 MHz) (2) OFDM , DS other than (1)：10mW/MHz (3) Other than (1) & (2)：10mW Tolerance ：+20%
Antenna gain	1) 12.14 dBi or less in principle 2) In case of directional antenna (1) FH, FH+DS or FH+OFDM using 2400~2483.5 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	N/A
Spreading factor	N/A
Limit of secondary radiated emissions	(1) Below 1 GHz: 4nW (2) 1 GHz or higher: 20nW
Dwell Time	Calculated method: Dwell time= 0.4s *Spreading Rate *one brurst time* number of transmission (1s) Note: * Spreading rate = [Spread bandwidth (actual measurement value)] / [Transmission rate] Number of transmission (1s) of DH1/2DH1/3DH1=1600/(2*79) Number of transmission (1s) of DH3/2DH3/3DH3=1600/(4*79) Number of transmission (1s) of DH5/2DH5/3DH5=1600/(6*79)
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

Note: The Technical Standards described here do not cover all of the regulated items.

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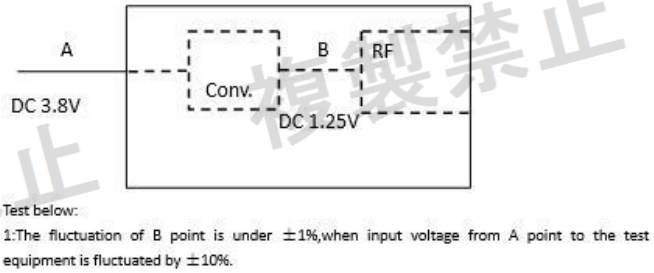
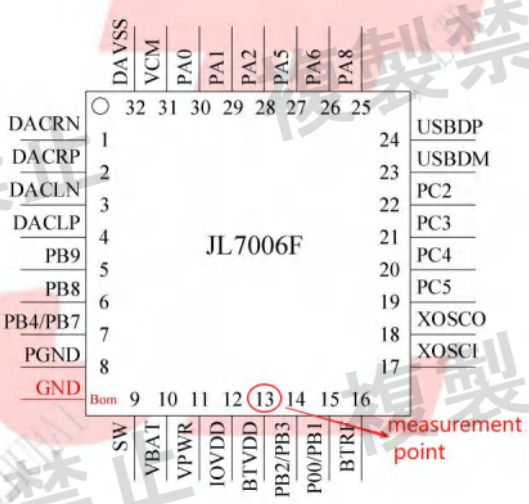
8 Transmitter Requirements

8.1 EUT test voltage and Frequency

EUT test voltage	
Power Supply:	DC 3.8V
Test voltage require:	The power supply is DC 3.8V by battery. The supply voltage of RF part is varied within +/-1% when DC 3.8V +/- 10%, so DC 3.8V is shown in the test report.
Power Supply view:	
	
Power Supply result:	The measurement result of the voltage fluctuation at RF circuit when DC 3.8V +/- 10%.

DC INPUT	RF circuit
3.42V	1.25V
3.8V	1.25V
4.18V	1.25V

Test condition	Ambient		
	Temperature(℃)	Humidity(%)	Voltage(V)
NTNV	24	48	DC 3.8
NTLV	N/A	N/A	N/A
NTHV	N/A	N/A	N/A

8.2 Test frequency

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.

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

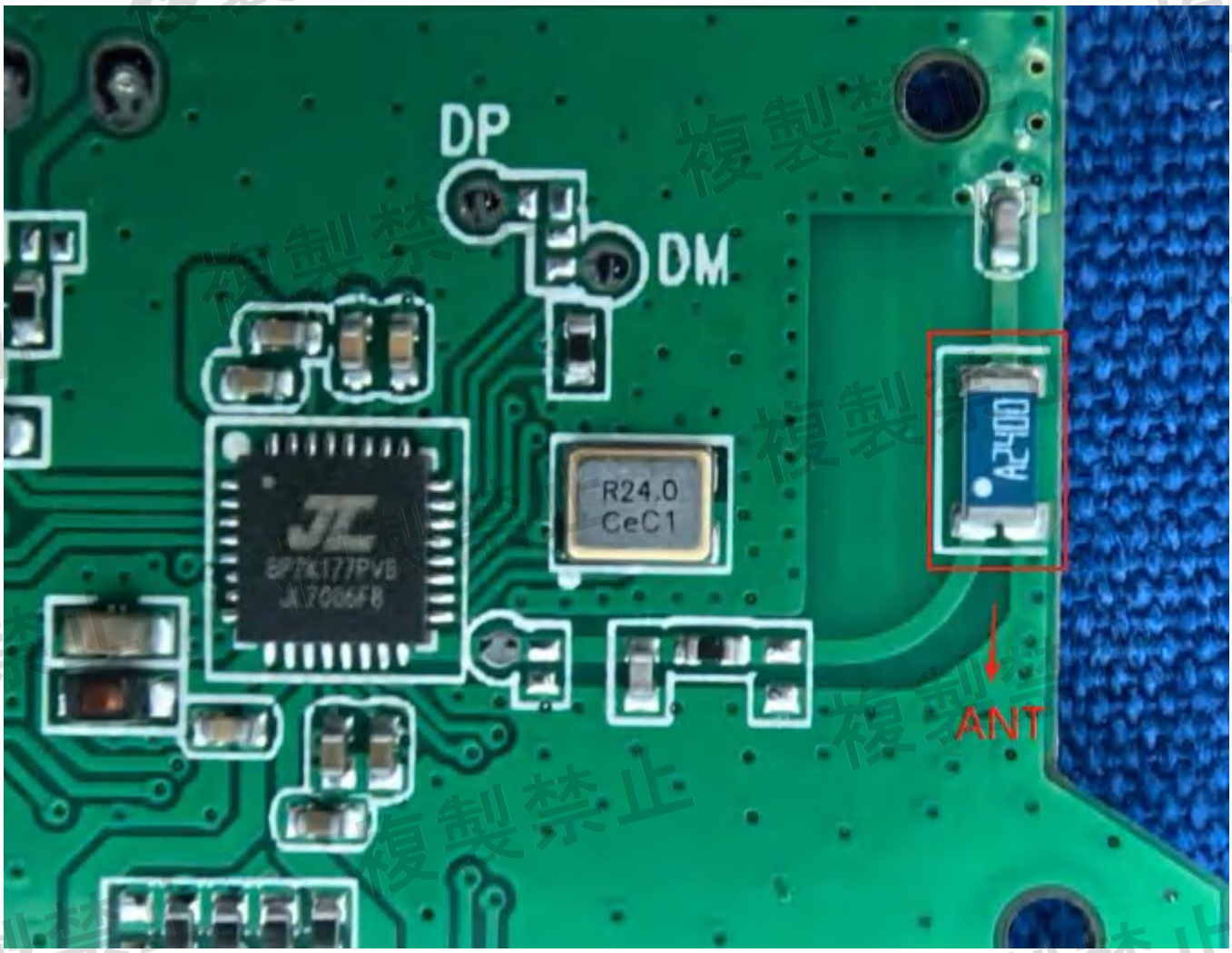
EUT channels and frequencies list:

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	N/A	N/A

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

8.3 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 antenna is Chip Antenna. The best case gain of the antenna is 2.5dBi from 2402~2480MHz.



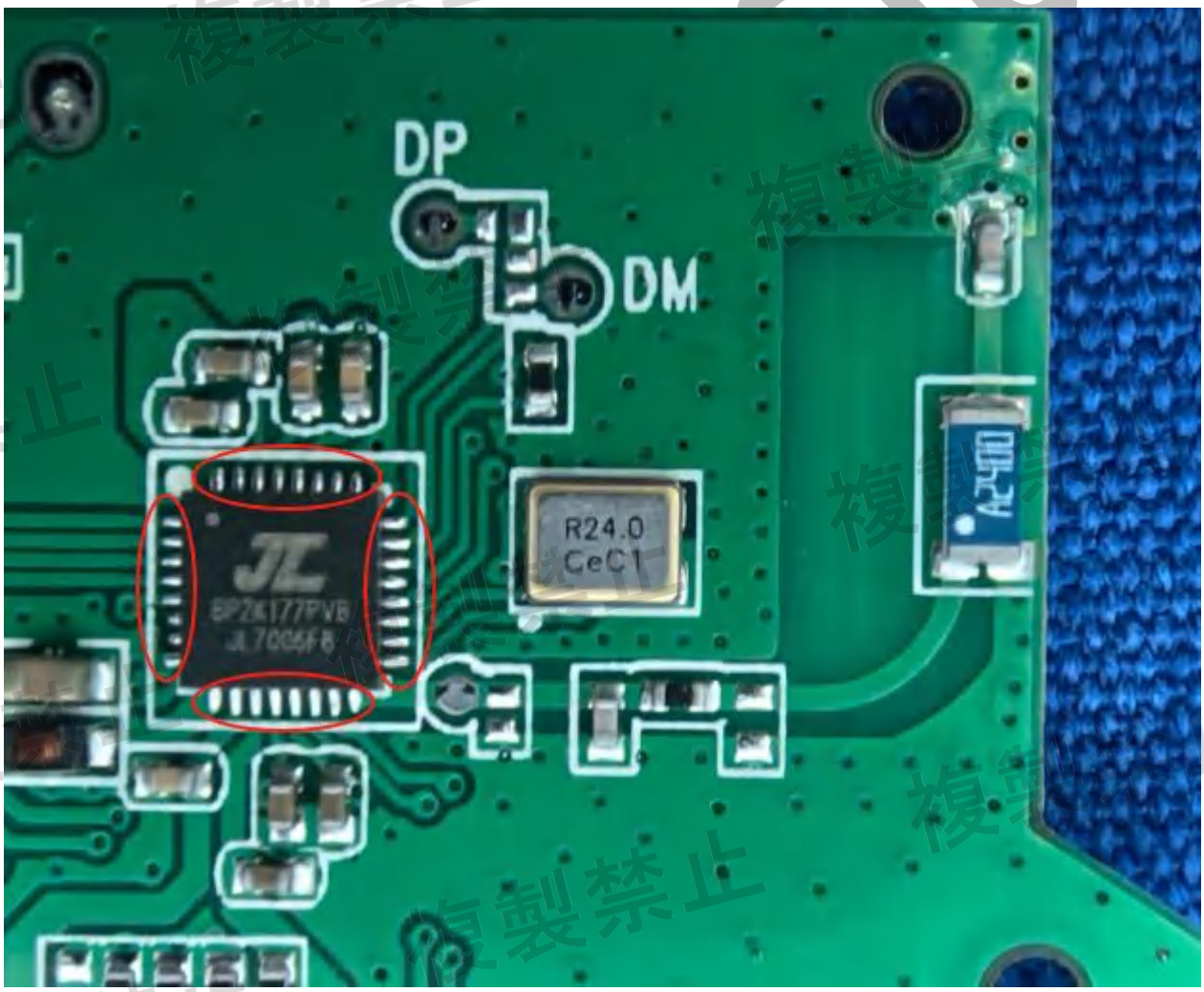
Result: An antenna connector is available; all relevant tests will be carried out conducted.

8.4 Interference prevention function

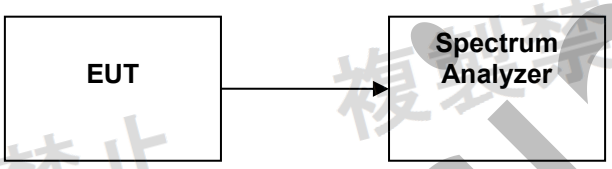
Measurement system diagram	When transmitting identification code
Condition of measuring instrument	Demodulator must be able to demodulate the transmitting signal emitted by test equipment and to indicate the identification code.
Condition of test equipment The mode of normal use.	--
Measuring operation procedure	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.
	d2:10:1a:24:50:86
	MAC Address: D2:10:1A:24:50:86
Test result	The unit does meet the requirements (Good).

8.5 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.
RF and Modulation parts are mounted on PCB with surface mount technology, and The product cannot be modified and once disassembled, it will not be usable. The number of IC pins is 32, and the interval of pins is less than 1.5mm.



8.6 Frequency Error

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 46%	Press.: 1010 mbar
Test Status:	Test the EUT in transmitting mode without modulation. Test in Channel lowest (2402MHz), middle (2441MHz) and highest (2480MHz), keep in continuously transmitting status.		
Test Configuration:			
			
Test Conditions:	Frequency Counter or Spectrum Analyzer is used for measurement.		
EUT conditions:	Modulation/Spread/Hopping off, CW Tx If EUT does not accept “Modulation OFF” mode in the measurement, you may use “Modulation ON” mode. In that case you can use the Max power Frequency as the measuring results.		
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 1MHz RBW 10KHz VBW 10KHz Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Technical standard:	Tolerance of frequency: $\pm 50\times 10^{-6}$		
Test result:	PASS		

Measurement Record: **Uncertainty: ± 10Hz**

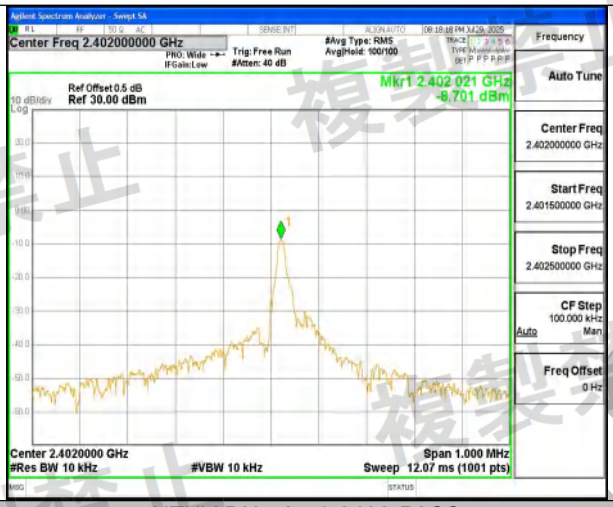
8.6.1 Test Result

TestCondition	TestMode	Channel	Result[ppm]	Limit[ppm]	Verdict
NTNV	CW	2402	8.74271	±50	PASS
		2441	9.01270	±50	PASS
		2480	8.87097	±50	PASS

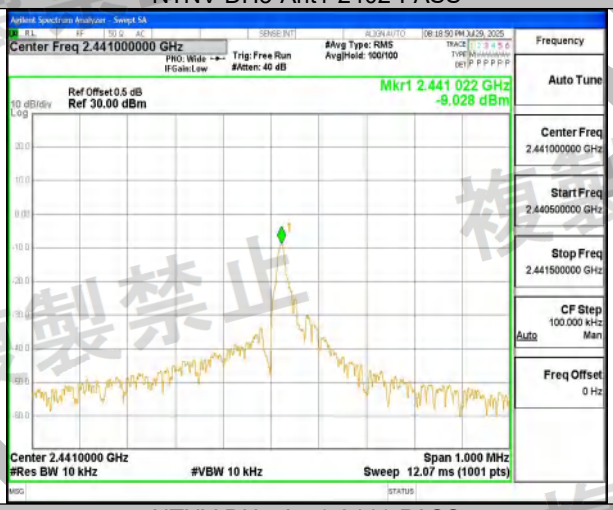
Note: The nominal frequency shall be confirmed by the applicant and test lab.

Result plot as follows:

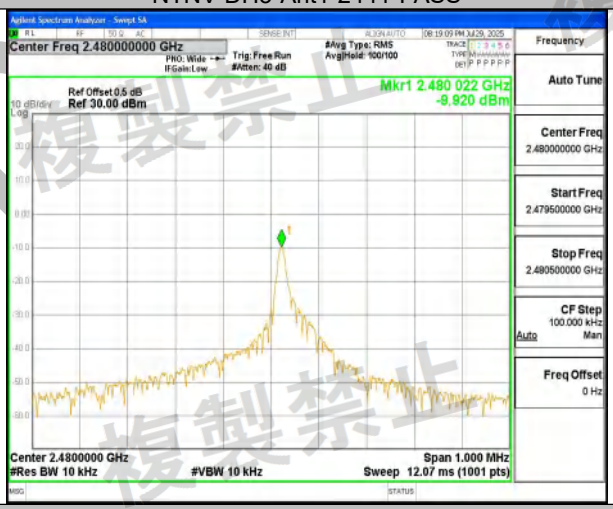
8.6.2 Test Graphs



NTNV-DH5-Ant1-2402-PASS

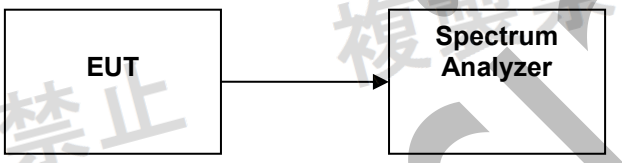


NTNV-DH5-Ant1-2441-PASS



NTNV-DH5-Ant1-2480-PASS

8.7 Occupied Bandwidth (99%)

Test Requirement:	Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
EUT Operation:	
Ambient:	Temp.: 24°C Humid.: 46% Press.: 1010 mbar
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 listedbelow.
Test Configuration:	
	
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding testsignal.
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 120MHz (FHSS), RBW 1MHz VBW 1MHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 99%
Technical standard:	FH : 83.5MHz
Test result:	PASS

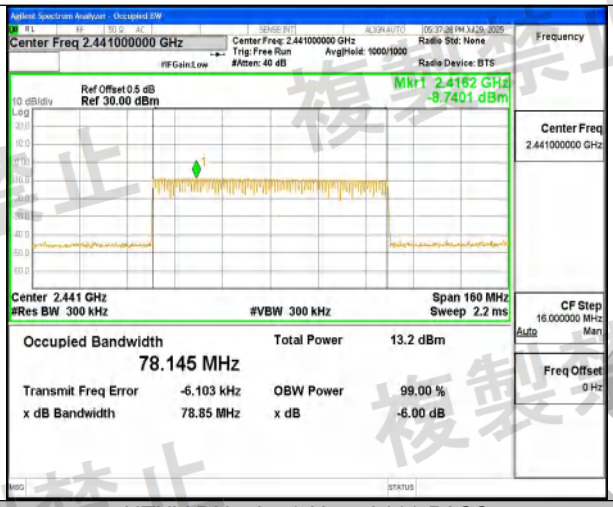
Measurement Record: Uncertainty: ± 10KHz

8.7.1 Test Result

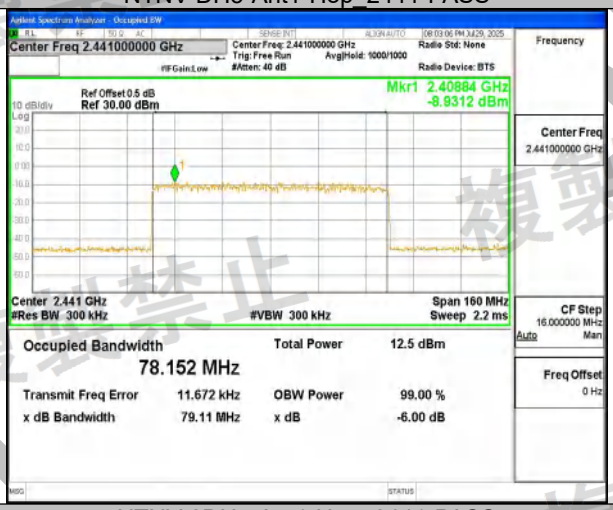
TestCondition	TestMode	Channel	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Hop	78.145	<=83.5	PASS
	2DH5	Hop	78.152	<=83.5	PASS
	3DH5	Hop	78.398	<=83.5	PASS

Result plot as follows:

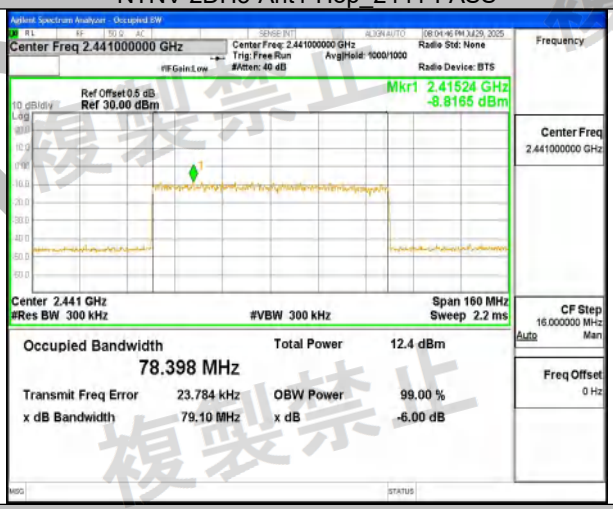
8.7.2 Test Graphs



NTNV-DH5-Ant1-Hop_2441-PASS

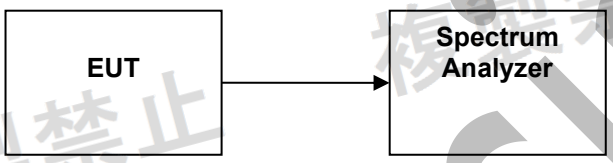


NTNV-2DH5-Ant1-Hop_2441-PASS



NTNV-3DH5-Ant1-Hop_2441-PASS

8.8 Spread spectrum Bandwidth (90%)

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 46%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode formal possible combinations between available modulations, data ratesand antenna ports (if EUT with antenna diversity architecture).Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:			
			
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding testsignal.		
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 120MHz (FHSS), RBW 1MHz VBW 1MHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 90% Spreading factor=90% Spread bandwidth/Transmission rate>=5 Transmission rate =1Mbps		
Technical standard:	N/A		
Test result:	N/A		

Measurement Record: **Uncertainty: ± 10KHz**

8.8.1 Test Result

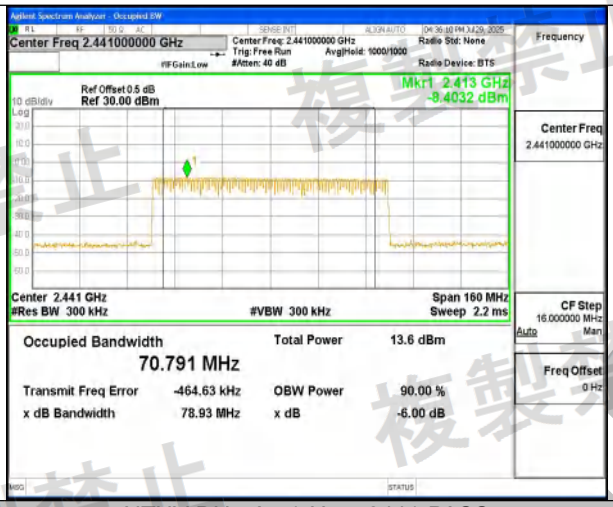
TestCondition	TestMode	Channel	Result [MHz]
NTNV	DH5	Hop	70.791
	2DH5	Hop	70.641
	3DH5	Hop	70.353

Note: Spread Factor = Spread Bandwidth/Symbol Rate

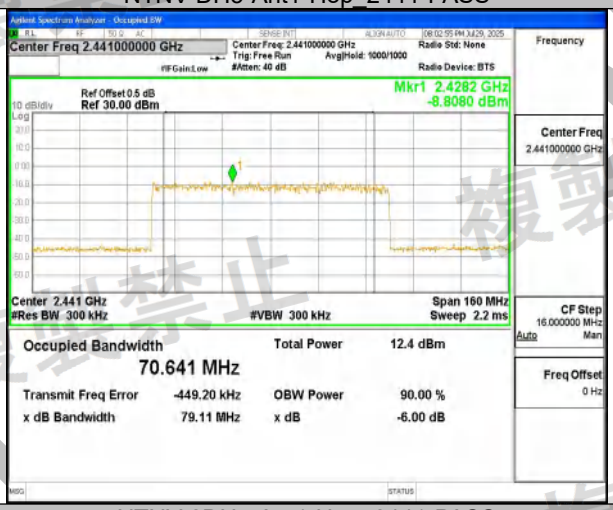
Symbol Rate=1 for DH5/2DH5/3DH5

Result plot as follows:

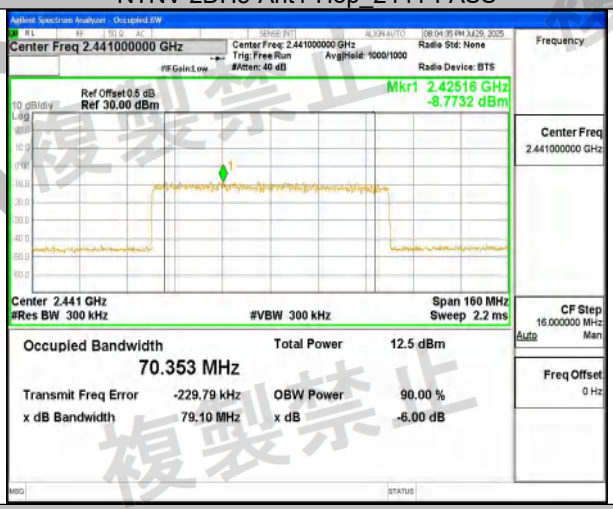
8.8.2 Test Graphs



NTNV-DH5-Ant1-Hop_2441-PASS

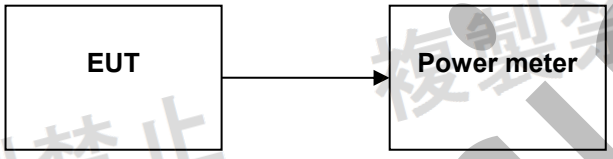


NTNV-2DH5-Ant1-Hop_2441-PASS



NTNV-3DH5-Ant1-Hop_2441-PASS

8.9 Antenna Power

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 46%	Press.: 1010 mbar
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:			
			
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding testsignal.		
Power meter conditions(FHSS):	Step1: First, measure the total power using a power meter. Step2: Antenna power(mW/MHz)=conducted power(mW)/Spread bandwidth(MHz).		
Technical standard:	Antenna Power (1) FH, FH+DS , FH+OFDM 3mW/MHz or less (used in the range of 2400~2483.5 MHz) (2) OFDM , DS other than (1) 10mW/MHz or less (3) Other than (1) & (2) 10mW or less Tolerance: ＋20%		
Test result:	PASS		

Measurement Record: Uncertainty: ± 10 kHz / ±1dB

8.9.1 Test Result

Test Mode	Antenna	Channel	Total conducted power (dBm)	Total conducted power (mW)	Spread bandwidth (MHz)	Antenna power (mW/MHz)	Limit (mw/MHz)	Verdict
DH5	Ant1	Hopping	10.94	12.417	70.791	0.17540	<=3	PASS
2DH5	Ant1	Hopping	10.67	11.668	70.641	0.16517	<=3	PASS
3DH5	Ant1	Hopping	10.55	11.350	70.353	0.16133	<=3	PASS

Remark:

Antenna power(mW/MHz)=conducted power(mW)/Spread bandwidth(MHz) .

Tolerance								
Test Condition	Test Mode	Antenna	Channel	Power (mW/MHz)	RatedPower (mW/MHz)	Result (%)	Limit (%)	Verdict
NTNV	DH5	Ant1	Hopping	0.17540	0.18	-2.56	+20	PASS
	2DH5	Ant1	Hopping	0.16517	0.17	-2.84	+20	PASS
	3DH5	Ant1	Hopping	0.16133	0.17	-5.10	+20	PASS

EIRP							
TestCondition	TestMode	Antenna	Channel	EIRP (mW/MHz)	EIRP (dBm/MHz)	Limit(dBm/MHz)	Verdict
NTNV	DH5	Ant1	Hopping	0.312	-5.06	<=6.91	PASS
	2DH5	Ant1	Hopping	0.294	-5.32	<=6.91	PASS
	3DH5	Ant1	Hopping	0.287	-5.42	<=6.91	PASS

Remark:

Conducted rated power:

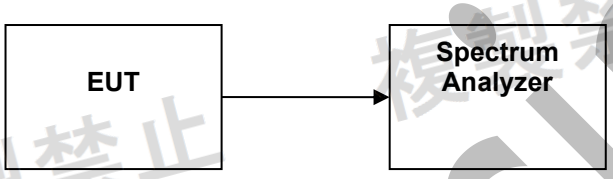
F1D: 0.18mW/MHz

G1D: 0.17mW/MHz

Tolerance (%) :[(test value- rate power)/rater power]*100

EIRP= antenna power in dBm/MHz+ gain in dBi

8.10 Spurious Emissions of Tx

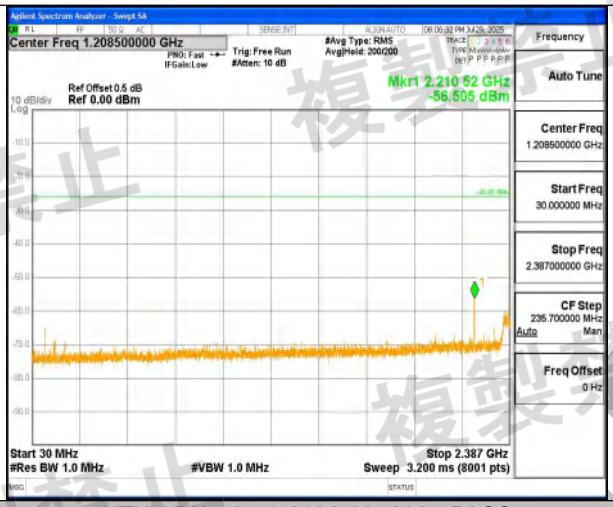
Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 46%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, 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:			
			
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding testsignal.		
Measurement Procedure:	Step1 All spurious are measured from 30MHz to 13GHz by peak mode.		
Spectrum Analyzer conditions(Step 1):	Frequency: 30MHz – 2400MHz , 2483.5MHz –13GHz RBW 1000kHz (30 – 1GHz) , 1000KHz (over 1GHz) VBW 1000kHz (30 – 1GHz) , 1000KHz (over 1GHz) Sweep Time Auto detector mode Positive peak Indication mode Max hold		
Spectrum Analyzer conditions(Step 2):	Frequency: Spurious Frequency Span 0Hz RBW 1MHz VBW 1MHz Sweep Time Auto Detector mode Sample Indication mode Max hold		
Technical standard:	(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 result:	PASS		

Measurement Record: Uncertainty: ±1dB

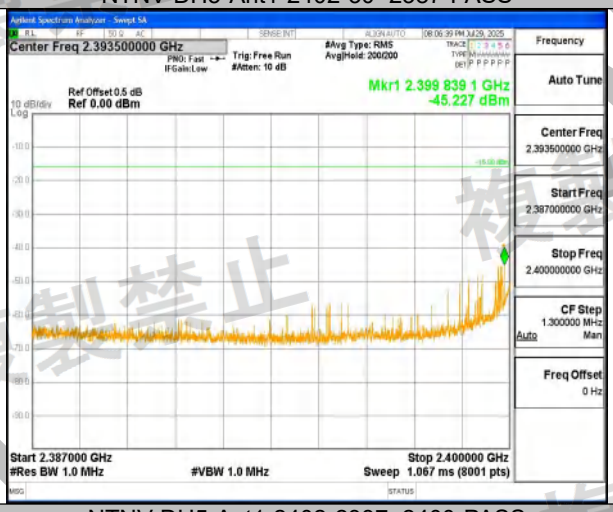
8.10.1 Test Result

Test Condition	Test Mode	Antenna	Frequency[MHz]	Freq.Range [MHz]	Freq. [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
NTNV	DH5	Ant1	2402	30~2387	2210.52	-56.51	≤-26	PASS
NTNV	DH5	Ant1	2402	2387~2400	2399.84	-45.23	≤-16	PASS
NTNV	DH5	Ant1	2402	2483.5~2496.5	2493.21	-68.22	≤-16	PASS
NTNV	DH5	Ant1	2402	2496.5~13000	4804.23	-46.33	≤-26	PASS
NTNV	DH5	Ant1	2441	30~2387	2249.12	-55.32	≤-26	PASS
NTNV	DH5	Ant1	2441	2387~2400	2399.72	-60.29	≤-16	PASS
NTNV	DH5	Ant1	2441	2483.5~2496.5	2488.77	-61.10	≤-16	PASS
NTNV	DH5	Ant1	2441	2496.5~13000	4882.49	-46.96	≤-26	PASS
NTNV	DH5	Ant1	2480	30~2387	2288.30	-53.34	≤-26	PASS
NTNV	DH5	Ant1	2480	2387~2400	2399.31	-68.21	≤-16	PASS
NTNV	DH5	Ant1	2480	2483.5~2496.5	2483.51	-52.54	≤-16	PASS
NTNV	DH5	Ant1	2480	2496.5~13000	4960.22	-48.62	≤-26	PASS
NTNV	2DH5	Ant1	2402	30~2387	2210.23	-57.14	≤-26	PASS
NTNV	2DH5	Ant1	2402	2387~2400	2399.55	-43.16	≤-16	PASS
NTNV	2DH5	Ant1	2402	2483.5~2496.5	2491.84	-67.49	≤-16	PASS
NTNV	2DH5	Ant1	2402	2496.5~13000	4804.23	-46.91	≤-26	PASS
NTNV	2DH5	Ant1	2441	30~2387	2249.12	-55.64	≤-26	PASS
NTNV	2DH5	Ant1	2441	2387~2400	2398.50	-60.08	≤-16	PASS
NTNV	2DH5	Ant1	2441	2483.5~2496.5	2489.10	-60.68	≤-16	PASS
NTNV	2DH5	Ant1	2441	2496.5~13000	4882.49	-47.04	≤-26	PASS
NTNV	2DH5	Ant1	2480	30~2387	2288.01	-54.47	≤-26	PASS
NTNV	2DH5	Ant1	2480	2387~2400	2394.22	-68.03	≤-16	PASS
NTNV	2DH5	Ant1	2480	2483.5~2496.5	2483.67	-50.99	≤-16	PASS
NTNV	2DH5	Ant1	2480	2496.5~13000	4960.22	-48.87	≤-26	PASS
NTNV	3DH5	Ant1	2402	30~2387	2210.52	-57.27	≤-26	PASS
NTNV	3DH5	Ant1	2402	2387~2400	2399.99	-42.93	≤-16	PASS
NTNV	3DH5	Ant1	2402	2483.5~2496.5	2489.24	-68.27	≤-16	PASS
NTNV	3DH5	Ant1	2402	2496.5~13000	4804.23	-46.50	≤-26	PASS
NTNV	3DH5	Ant1	2441	30~2387	2249.12	-56.37	≤-26	PASS
NTNV	3DH5	Ant1	2441	2387~2400	2399.35	-59.83	≤-16	PASS
NTNV	3DH5	Ant1	2441	2483.5~2496.5	2489.18	-60.92	≤-16	PASS
NTNV	3DH5	Ant1	2441	2496.5~13000	4881.96	-47.30	≤-26	PASS
NTNV	3DH5	Ant1	2480	30~2387	2288.01	-54.26	≤-26	PASS
NTNV	3DH5	Ant1	2480	2387~2400	2394.38	-68.06	≤-16	PASS
NTNV	3DH5	Ant1	2480	2483.5~2496.5	2483.63	-53.75	≤-16	PASS
NTNV	3DH5	Ant1	2480	2496.5~13000	4960.22	-49.01	≤-26	PASS

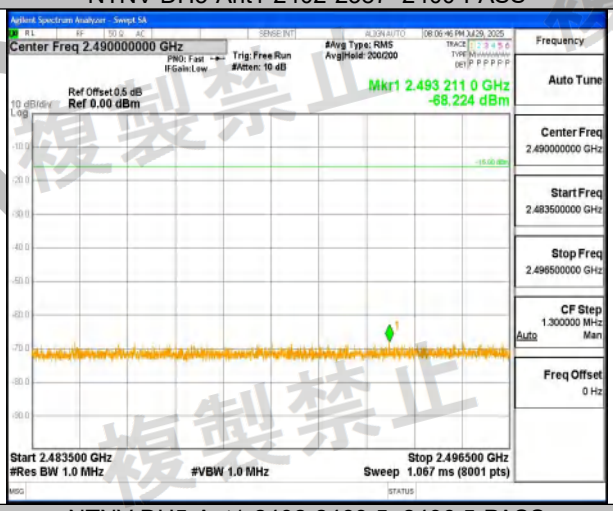
8.10.2 Test Graphs



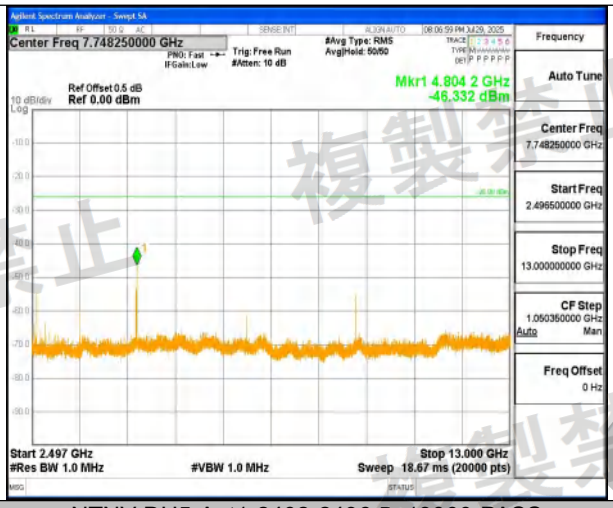
NTNV-DH5-Ant1-2402-30~2387-PASS



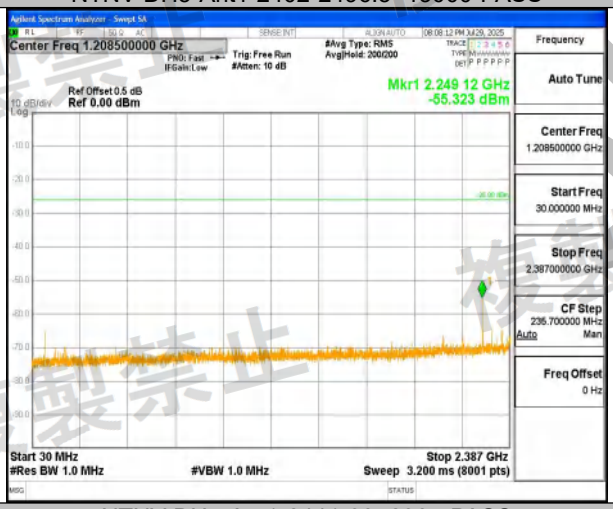
NTNV-DH5-Ant1-2402-2387~2400-PASS



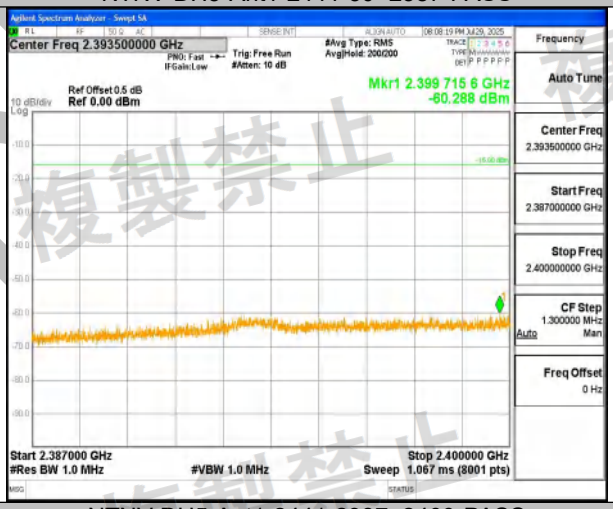
NTNV-DH5-Ant1-2402-2483.5~2496.5-PASS



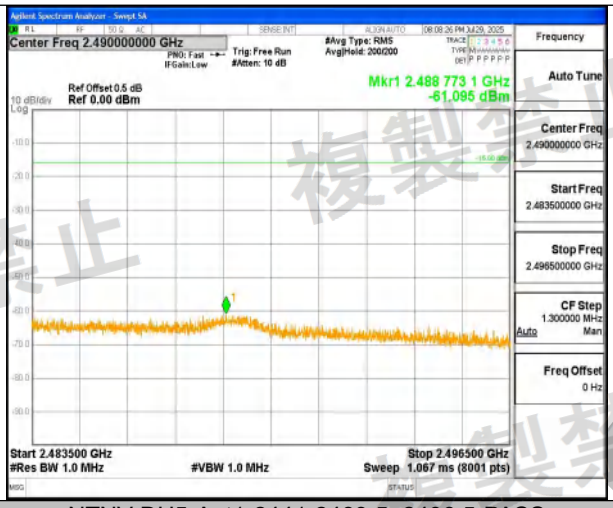
NTNV-DH5-Ant1-2402-2496.5~13000-PASS



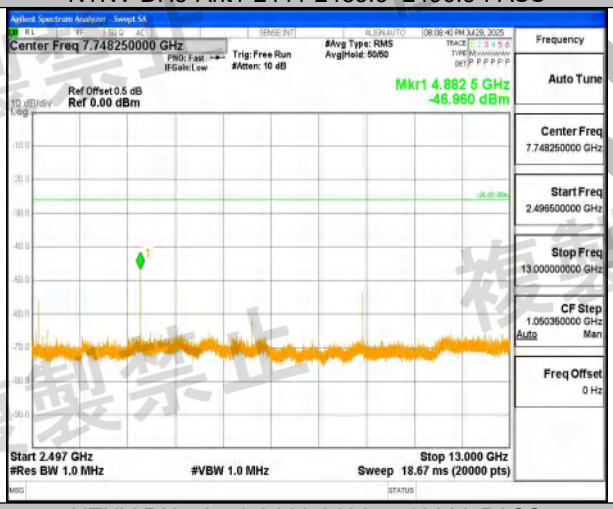
NTNV-DH5-Ant1-2441-30~2387-PASS



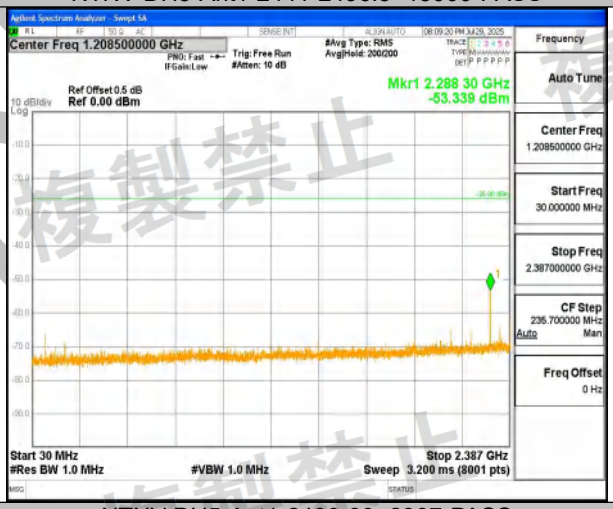
NTNV-DH5-Ant1-2441-2387~2400-PASS



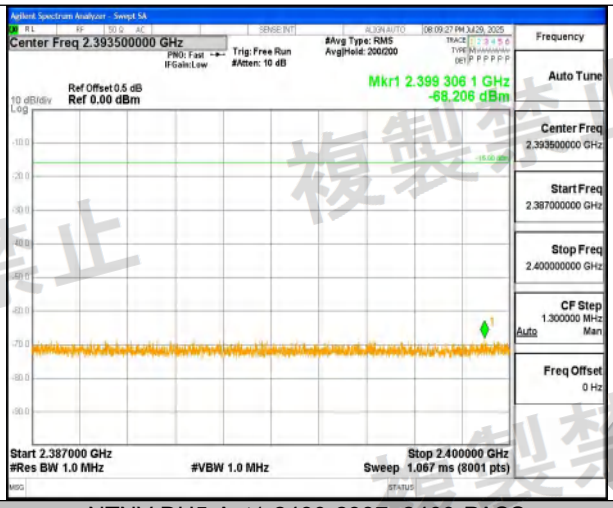
NTNV-DH5-Ant1-2441-2483.5~2496.5-PASS



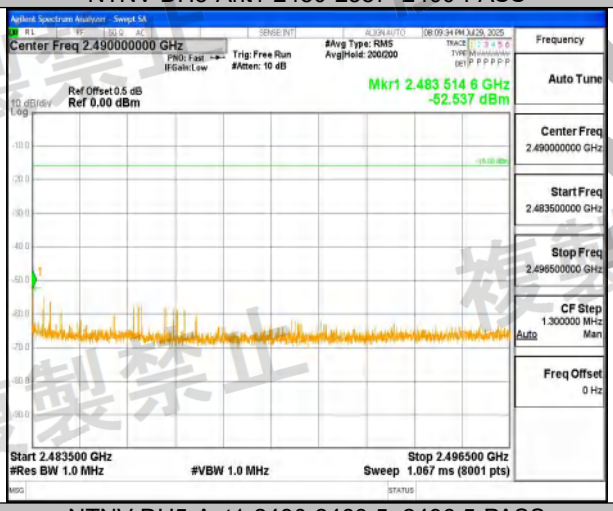
NTNV-DH5-Ant1-2441-2496.5~13000-PASS



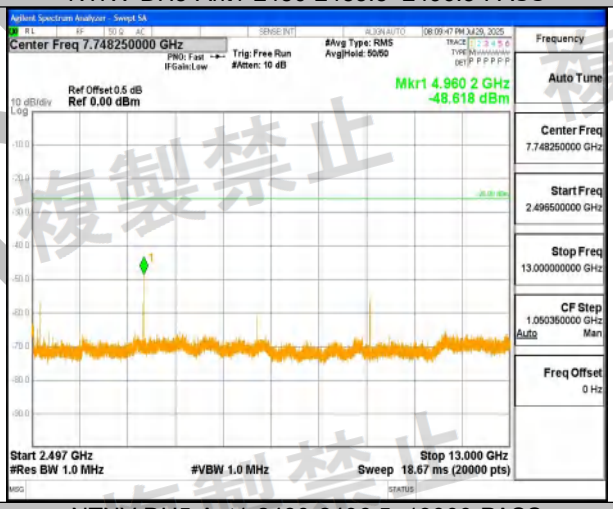
NTNV-DH5-Ant1-2480-30~2387-PASS



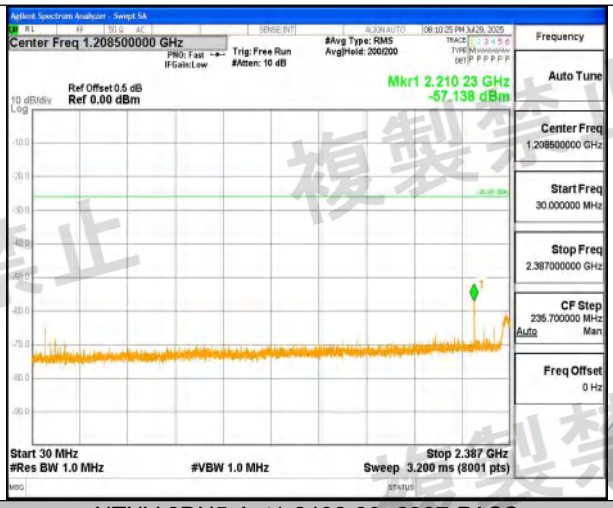
NTNV-DH5-Ant1-2480-2387~2400-PASS



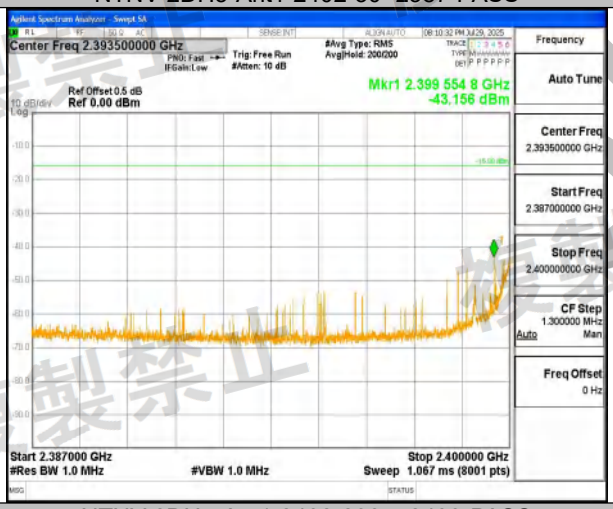
NTNV-DH5-Ant1-2480-2483.5~2496.5-PASS



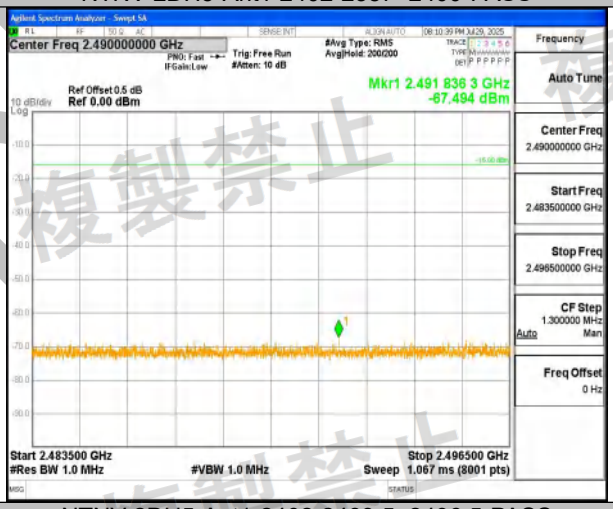
NTNV-DH5-Ant1-2480-2496.5~13000-PASS



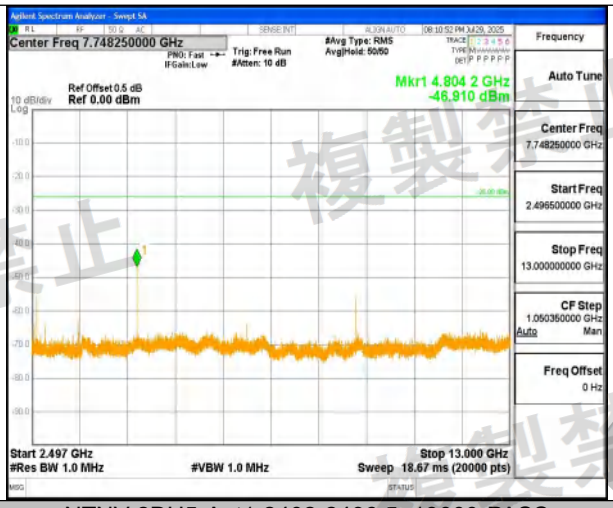
NTNV-2DH5-Ant1-2402-30~2387-PASS



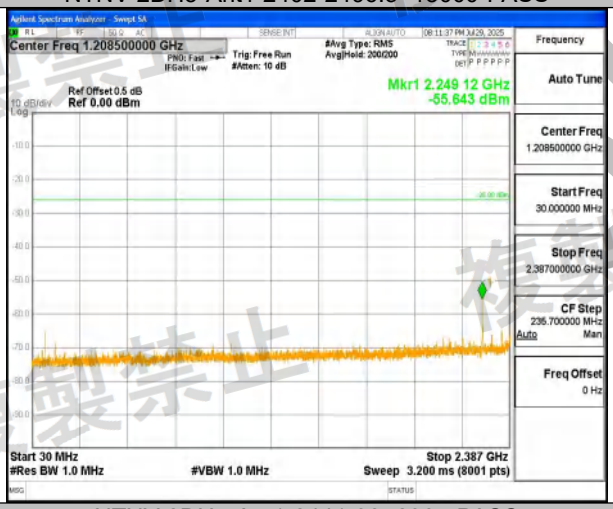
NTNV-2DH5-Ant1-2402-2387~2400-PASS



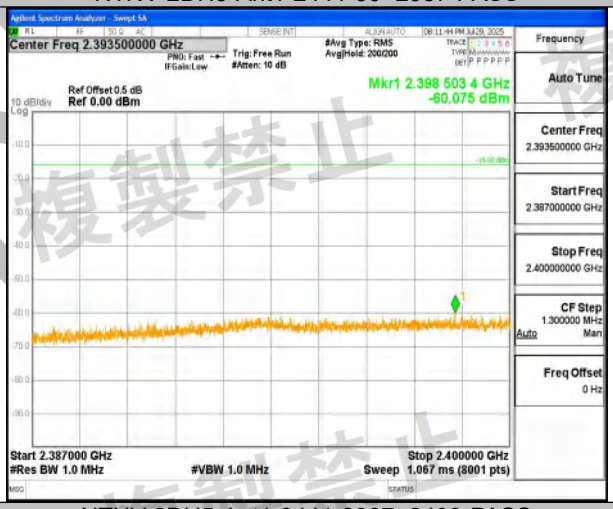
NTNV-2DH5-Ant1-2402-2483.5~2496.5-PASS



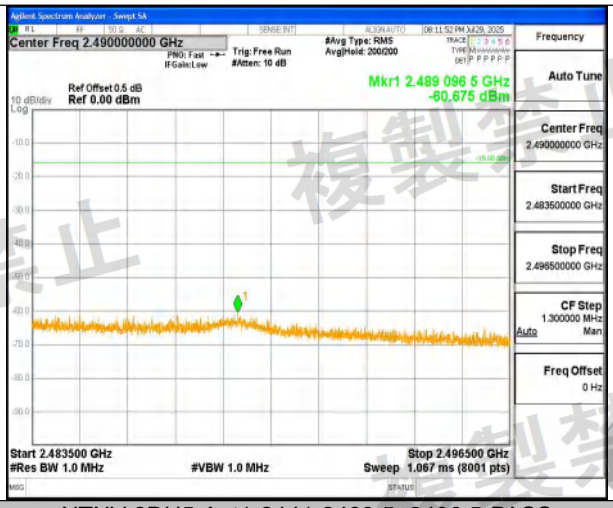
NTNV-2DH5-Ant1-2402-2496.5~13000-PASS



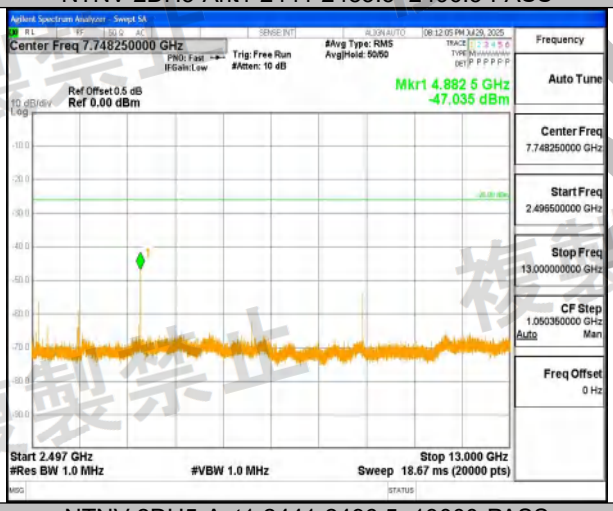
NTNV-2DH5-Ant1-2441-30~2387-PASS



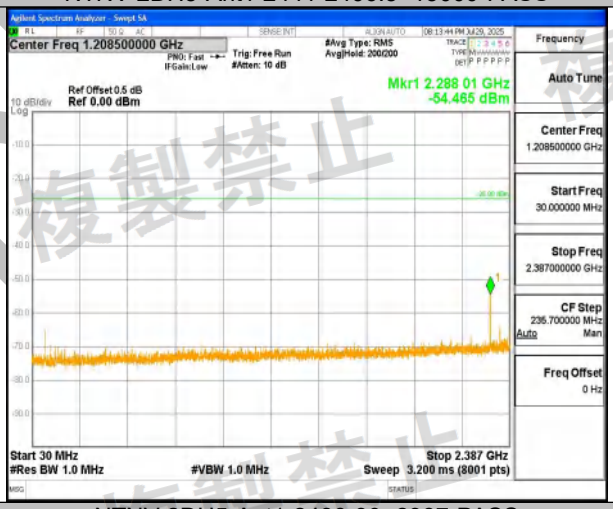
NTNV-2DH5-Ant1-2441-2387~2400-PASS



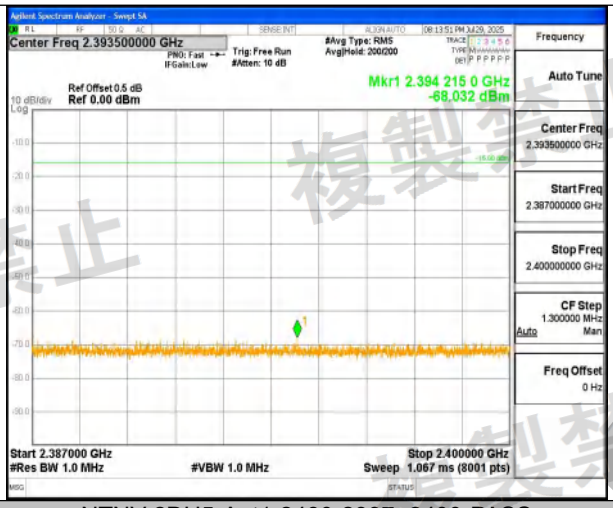
NTNV-2DH5-Ant1-2441-2483.5~2496.5-PASS



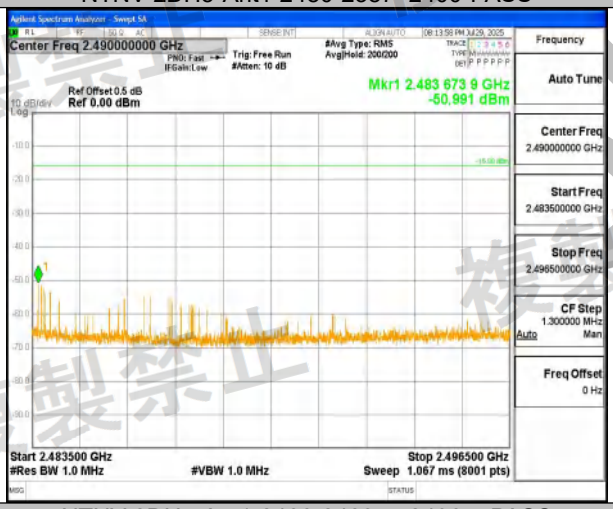
NTNV-2DH5-Ant1-2441-2496.5~13000-PASS



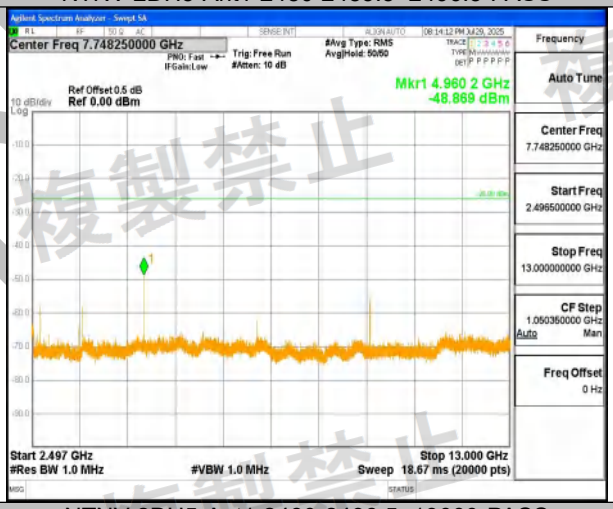
NTNV-2DH5-Ant1-2480-30~2387-PASS



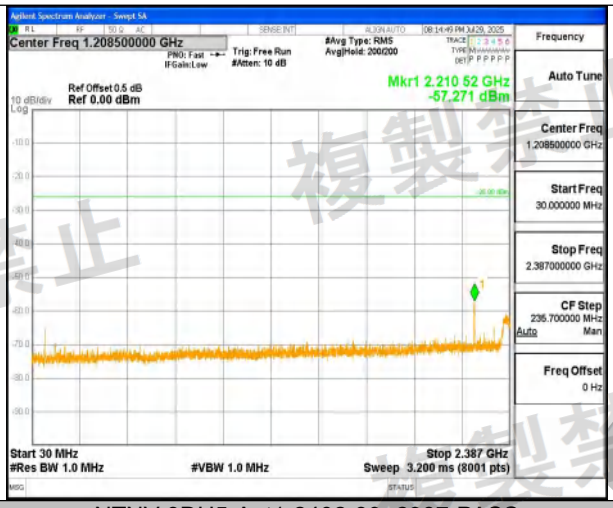
NTNV-2DH5-Ant1-2480-2387~2400-PASS



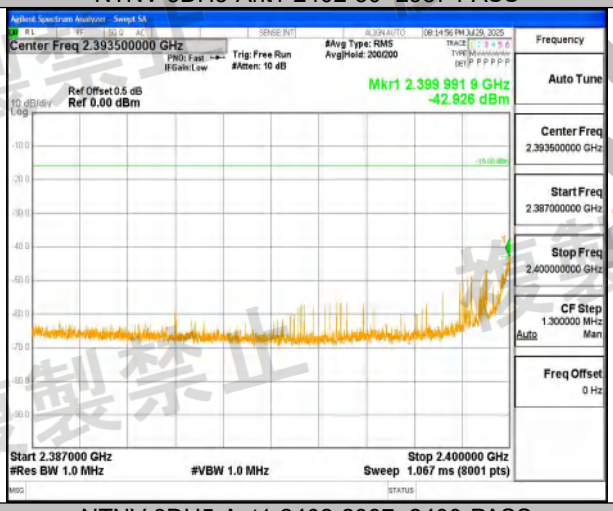
NTNV-2DH5-Ant1-2480-2483.5~2496.5-PASS



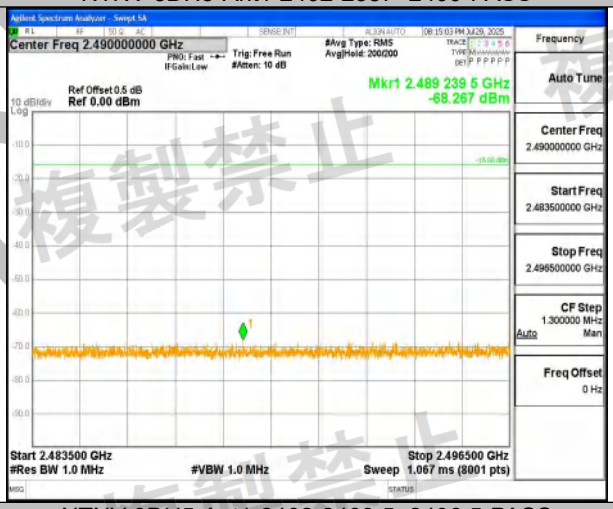
NTNV-2DH5-Ant1-2480-2496.5~13000-PASS



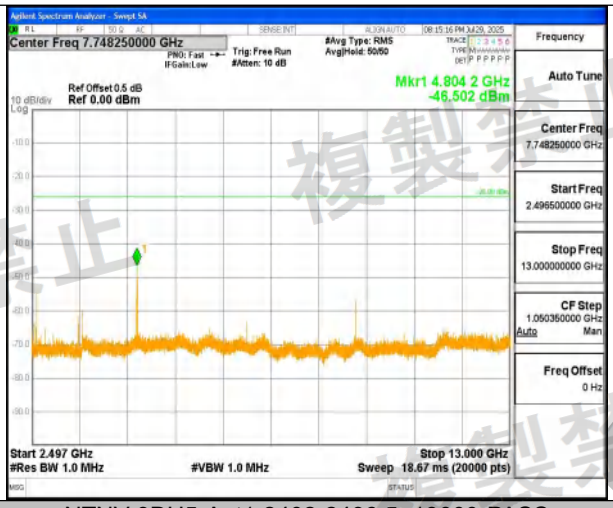
NTNV-3DH5-Ant1-2402-30~2387-PASS



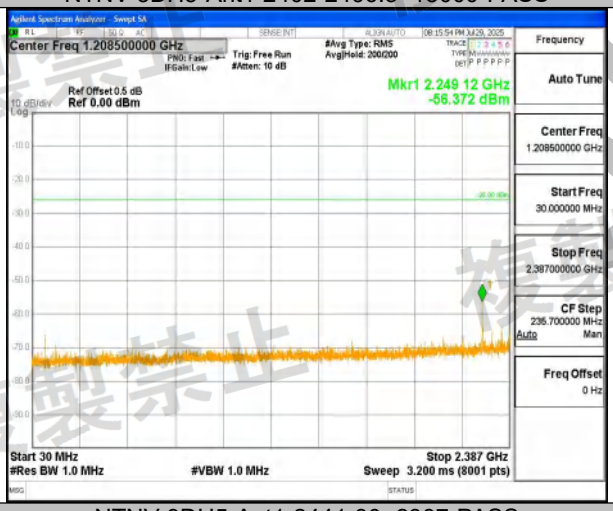
NTNV-3DH5-Ant1-2402-2387~2400-PASS



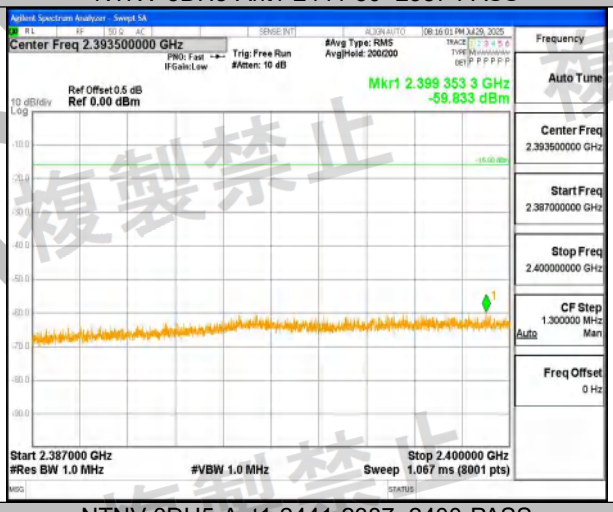
NTNV-3DH5-Ant1-2402-2483.5~2496.5-PASS



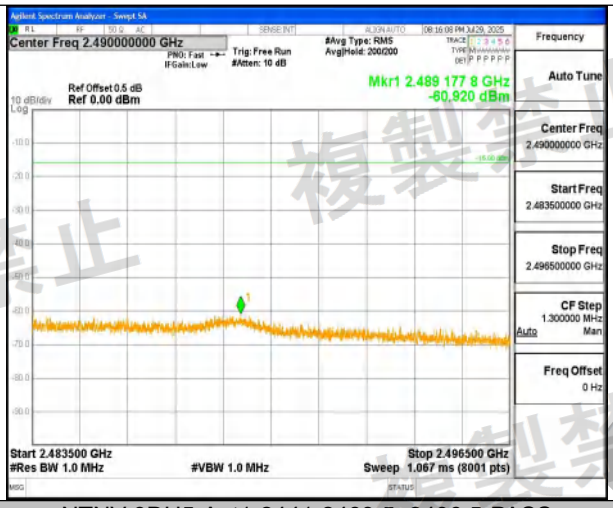
NTNV-3DH5-Ant1-2402-2496.5~13000-PASS



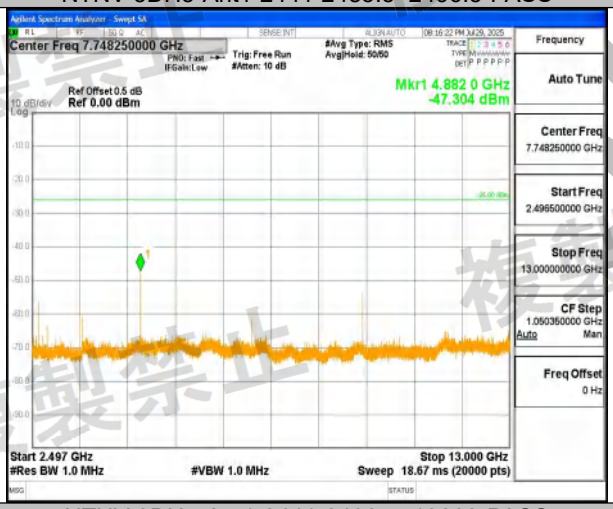
NTNV-3DH5-Ant1-2441-30~2387-PASS



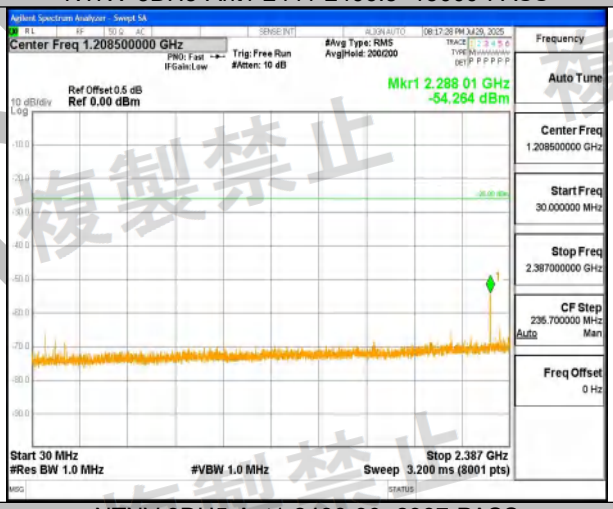
NTNV-3DH5-Ant1-2441-2387~2400-PASS



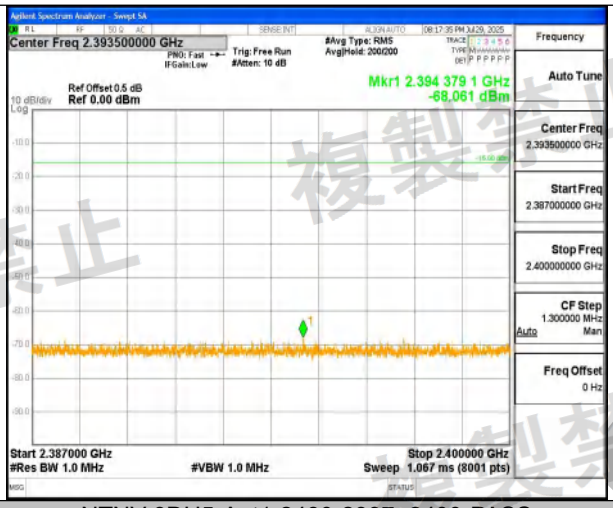
NTNV-3DH5-Ant1-2441-2483.5~2496.5-PASS



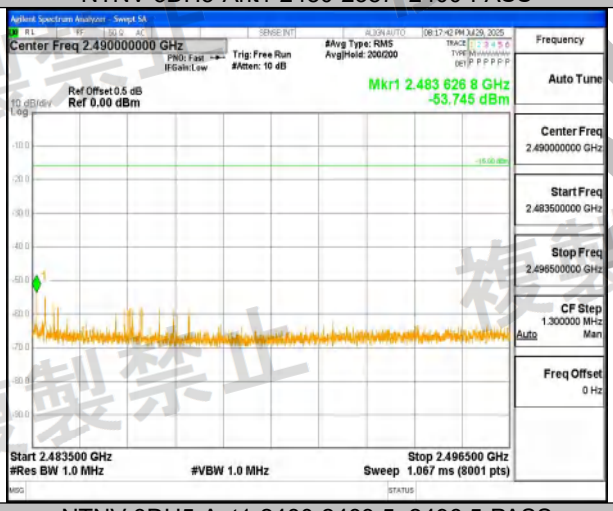
NTNV-3DH5-Ant1-2441-2496.5~13000-PASS



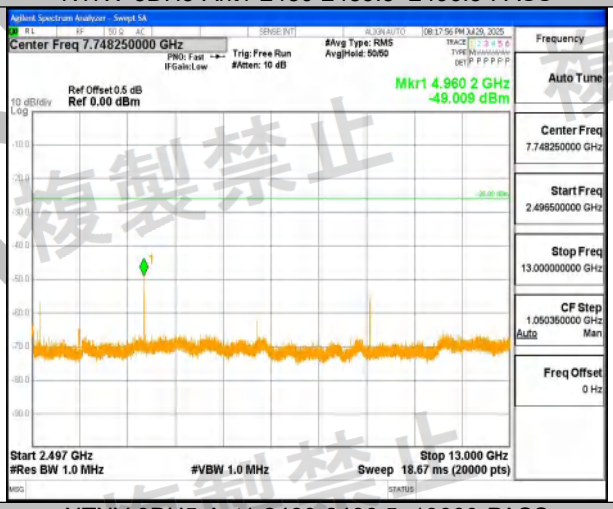
NTNV-3DH5-Ant1-2480-30~2387-PASS



NTNV-3DH5-Ant1-2480-2387~2400-PASS

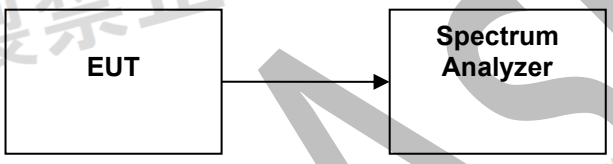


NTNV-3DH5-Ant1-2480-2483.5~2496.5-PASS



NTNV-3DH5-Ant1-2480-2496.5~13000-PASS

8.11 Dwell Time

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 46%	Press.: 1010 mbar
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:			
			
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 testsignal.		
SpectrumAnalyzerconditions:	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)		
Calculation procedure :	Dwell time= 0.4s x Spreading Rate x one brurst time x Number of transmission (1s) Note: Spreading rate = [Spread bandwidth (actual measurement value)] / [Transmission rate] Number of transmission (1s) of DH1/2DH1/3DH1=1600/(2x79) Number of transmission (1s) of DH3/2DH3/3DH3=1600/(4x79) Number of transmission (1s) of DH5/2DH5/3DH5=1600/(6x79)		
Technical standard:	Less than 0.4 sec		
Test result:	PASS		

8.11.1 Test Result

Test Condition	Test Mode	Antenna	Frequency [MHz]	BurstWidth [ms]	Result[s]	Limit [s]	Verdict
NTNV	DH5	Ant1	Hop_2441	2.89	0.308	≤0.4	PASS
NTNV	2DH5	Ant1	Hop_2441	2.89	0.308	≤0.4	PASS
NTNV	3DH5	Ant1	Hop_2441	2.89	0.308	≤0.4	PASS

Remark: Calculated method: Dwell time=0.4s x Spreading Rate x One brurst time x number of transmission (1s)

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

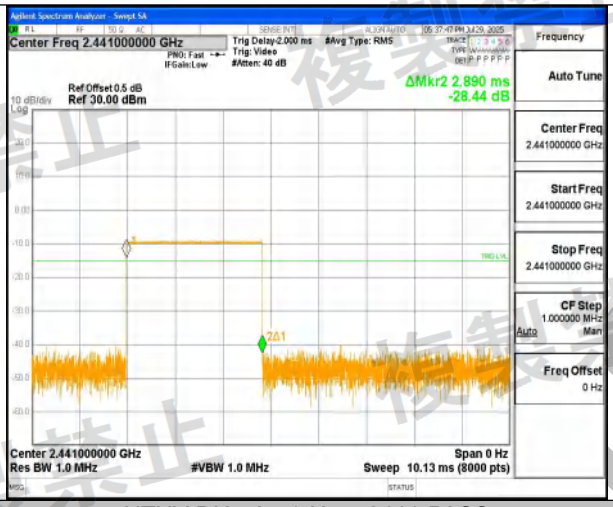
Transmission rate is 1.0 Mbps.

One brurst time [s]= Mark2/1000, Mark2 selected in Test Graphs

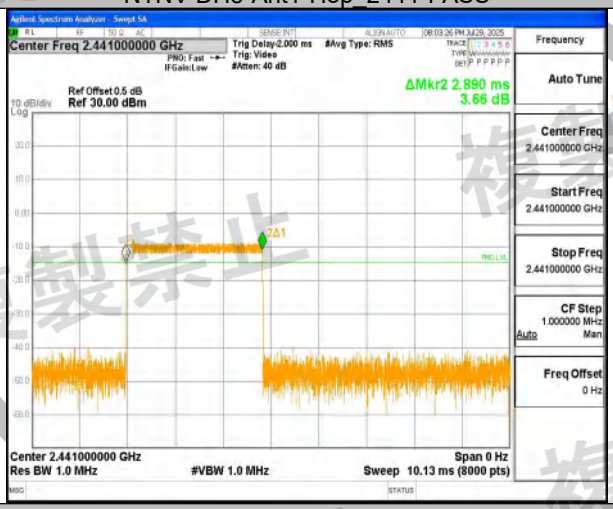
Number of transmission (1s) of DH5/2DH5/3DH5=1600/(6 x 79)

No. of hopping channel=79

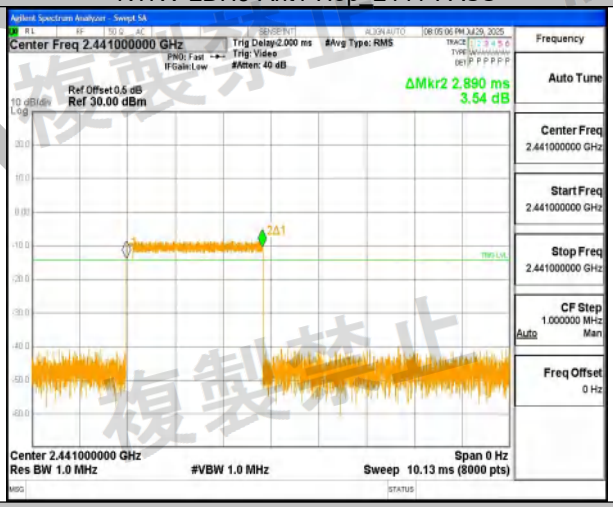
8.11.2 Test Graphs



NTNV-DH5-Ant1-Hop_2441-PASS



NTNV-2DH5-Ant1-Hop_2441-PASS



NTNV-3DH5-Ant1-Hop_2441-PASS

8.12 Pseudorandom Frequency Hopping Sequence

Standard requirement

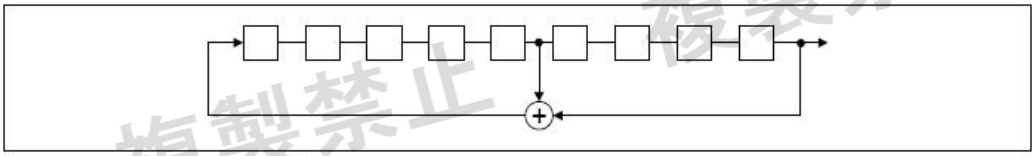
Article 2, Item (19) Notice 88 Appendix 43, 44, 45 requirement:

The EUT shall have the capability to transmit or to receive the MAC identification automatically, so that sender and receiver shall exclude other equipment.

EUT Pseudorandom Frequency Hopping Sequence

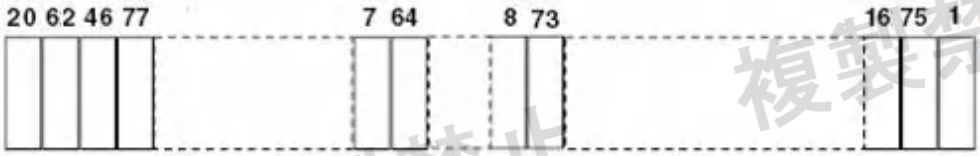
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. and the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: 2^9 -1 = 511 bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example ofPseudorandom Frequency Hopping Sequence as follow:

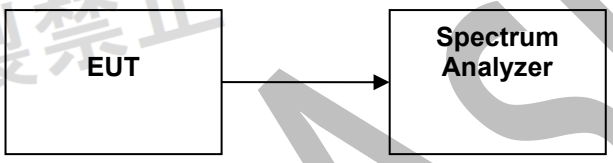


Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

9 Receiver Requirements

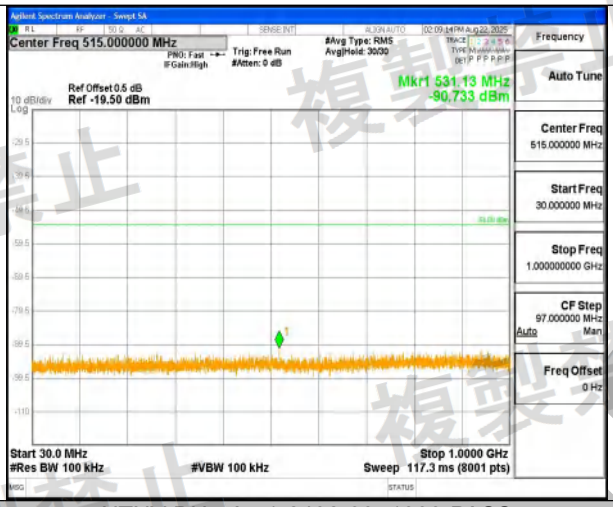
9.1 Spurious Emissions of Rx

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 46%	Press.: 1010 mbar
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:			
			
EUT conditions:	Rx		
Measurement Procedure:	Step1 All spurious are measured from 30MHz to 13 GHz by peak mode.		
Spectrum Analyzer conditions(Step 1):	Frequency: 30MHz – 2400MHz , 2483.5MHz –13GHz 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		
Spectrum Analyzer Conditions(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		
Technical standard:	(1) Below 1 GHz : 4 nW ;-54dBm (2) 1 GHz and over : 20 nW ;-47dBm		
Test result:	PASS		

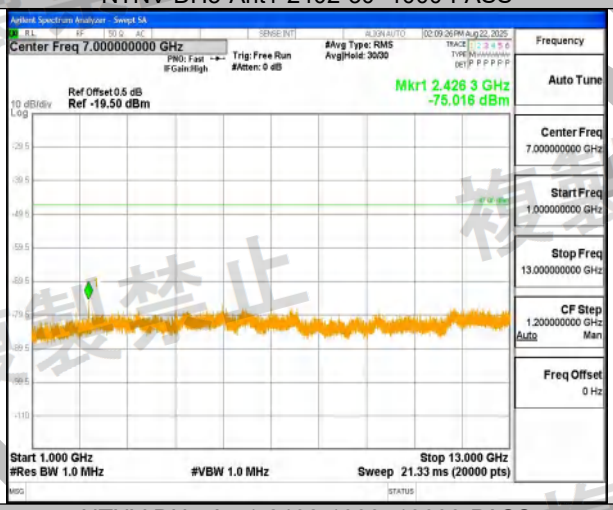
9.1.1 Test Result

Test Condition	Test Mode	Antenna	Frequency[MHz]	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
NTNV	DH5	Ant1	2402	30~1000	531.13	-90.73	≤-54	PASS
NTNV	DH5	Ant1	2402	1000~13000	2426.27	-75.02	≤-47	PASS
NTNV	DH5	Ant1	2441	30~1000	772.41	-90.87	≤-54	PASS
NTNV	DH5	Ant1	2441	1000~13000	11671.53	-76.24	≤-47	PASS
NTNV	DH5	Ant1	2480	30~1000	871.60	-90.29	≤-54	PASS
NTNV	DH5	Ant1	2480	1000~13000	12045.35	-76.69	≤-47	PASS
NTNV	2DH5	Ant1	2402	30~1000	947.14	-91.04	≤-54	PASS
NTNV	2DH5	Ant1	2402	1000~13000	2435.87	-66.06	≤-47	PASS
NTNV	2DH5	Ant1	2441	30~1000	868.69	-91.51	≤-54	PASS
NTNV	2DH5	Ant1	2441	1000~13000	12366.37	-76.54	≤-47	PASS
NTNV	2DH5	Ant1	2480	30~1000	797.03	-90.99	≤-54	PASS
NTNV	2DH5	Ant1	2480	1000~13000	5307.02	-76.30	≤-47	PASS
NTNV	3DH5	Ant1	2402	30~1000	472.81	-90.75	≤-54	PASS
NTNV	3DH5	Ant1	2402	1000~13000	3509.33	-72.13	≤-47	PASS
NTNV	3DH5	Ant1	2441	30~1000	787.09	-91.19	≤-54	PASS
NTNV	3DH5	Ant1	2441	1000~13000	2426.27	-65.01	≤-47	PASS
NTNV	3DH5	Ant1	2480	30~1000	885.06	-91.22	≤-54	PASS
NTNV	3DH5	Ant1	2480	1000~13000	12237.36	-76.71	≤-47	PASS

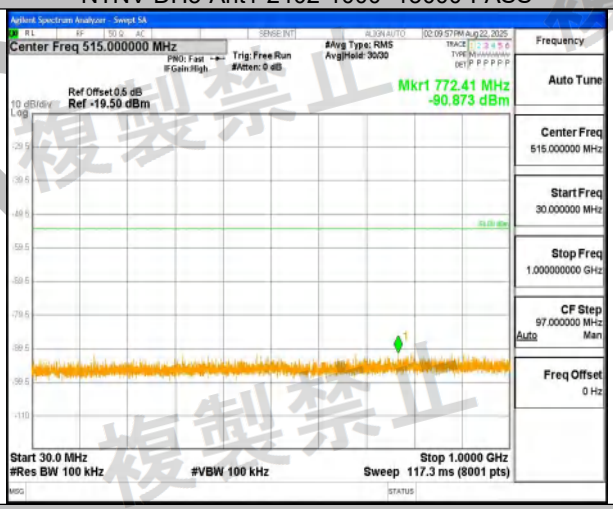
9.1.2 Test Graphs



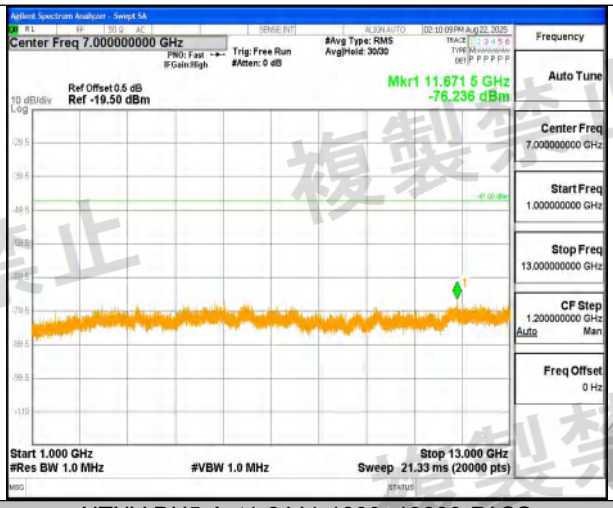
NTNV-DH5-Ant1-2402-30~1000-PASS



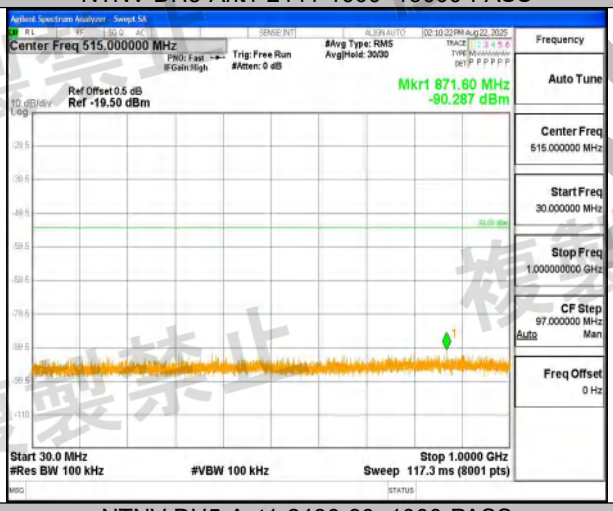
NTNV-DH5-Ant1-2402-1000~13000-PASS



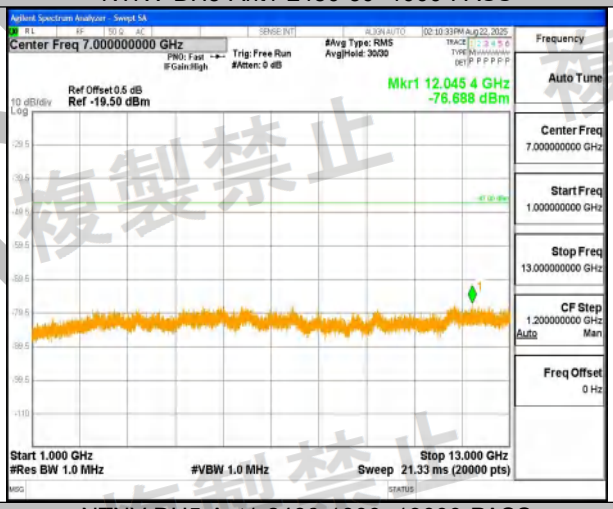
NTNV-DH5-Ant1-2441-30~1000-PASS



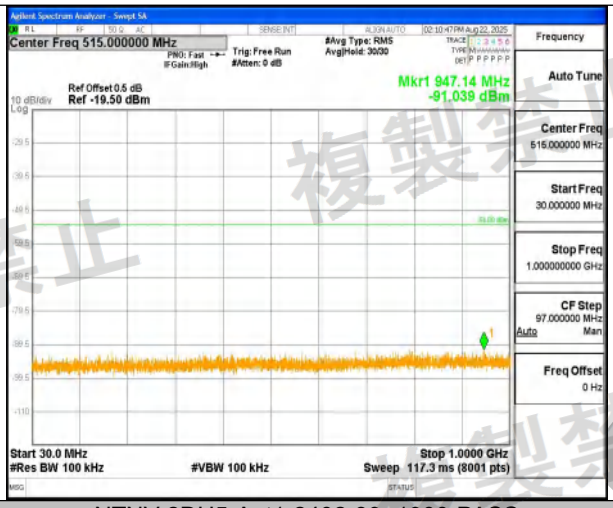
NTNV-DH5-Ant1-2441-1000~13000-PASS



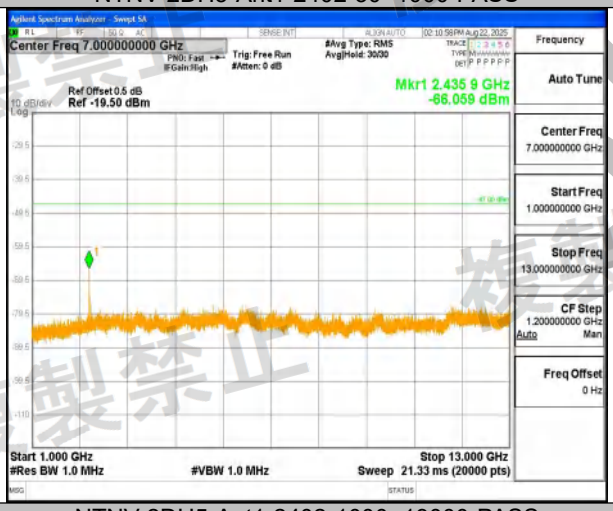
NTNV-DH5-Ant1-2480-30~1000-PASS



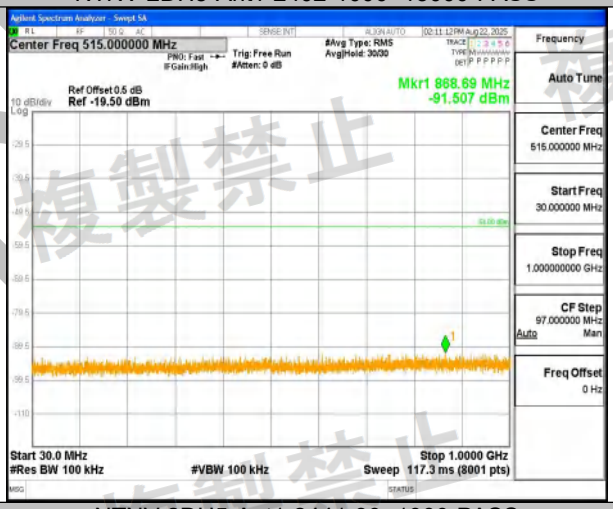
NTNV-DH5-Ant1-2480-1000~13000-PASS



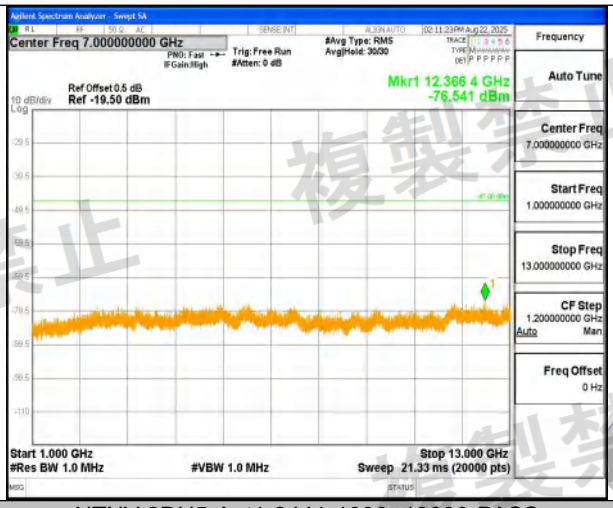
NTNV-2DH5-Ant1-2402-30~1000-PASS



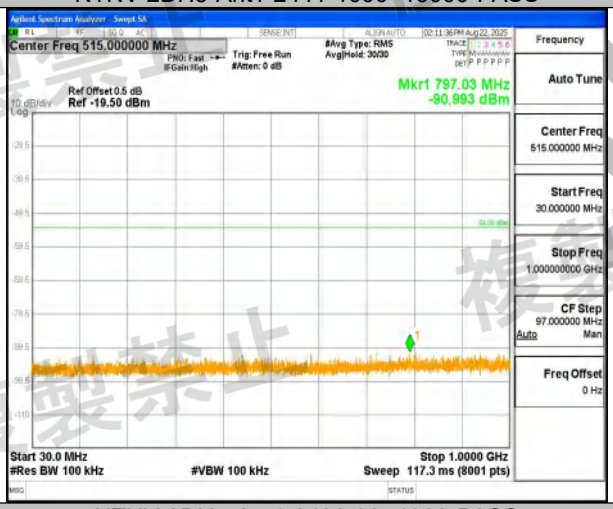
NTNV-2DH5-Ant1-2402-1000~13000-PASS



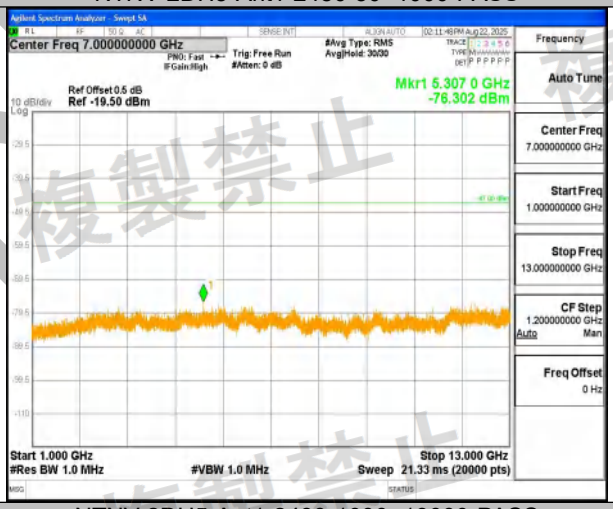
NTNV-2DH5-Ant1-2441-30~1000-PASS



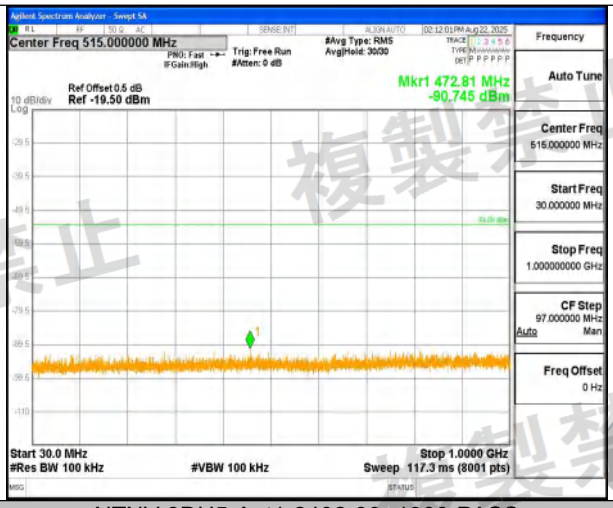
NTNV-2DH5-Ant1-2441-1000~13000-PASS



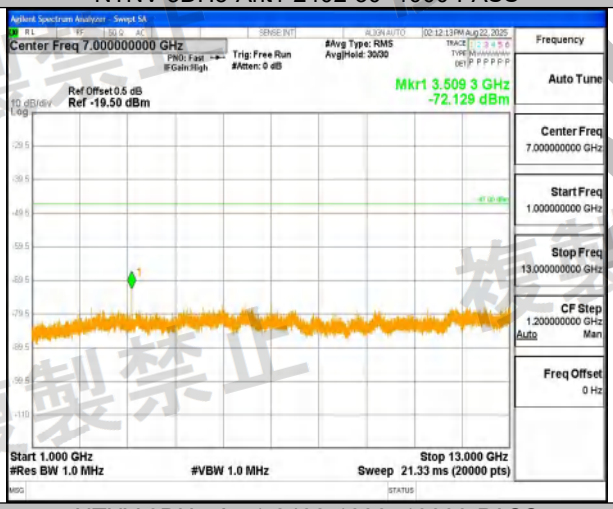
NTNV-2DH5-Ant1-2480-30~1000-PASS



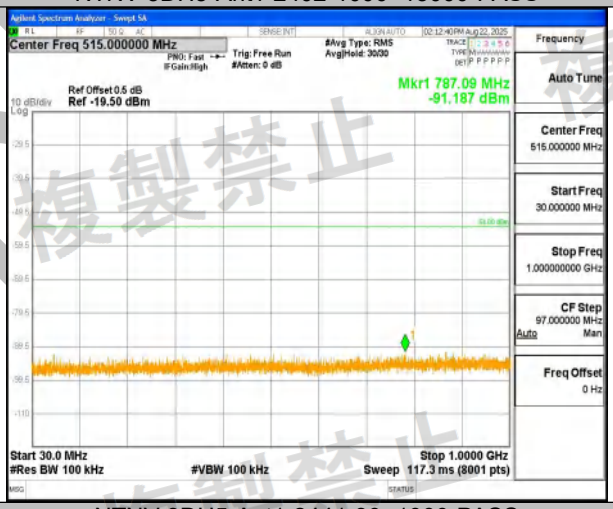
NTNV-2DH5-Ant1-2480-1000~13000-PASS



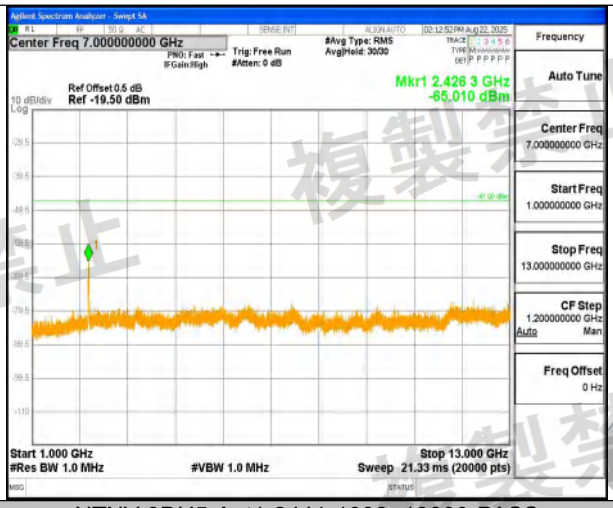
NTNV-3DH5-Ant1-2402-30~1000-PASS



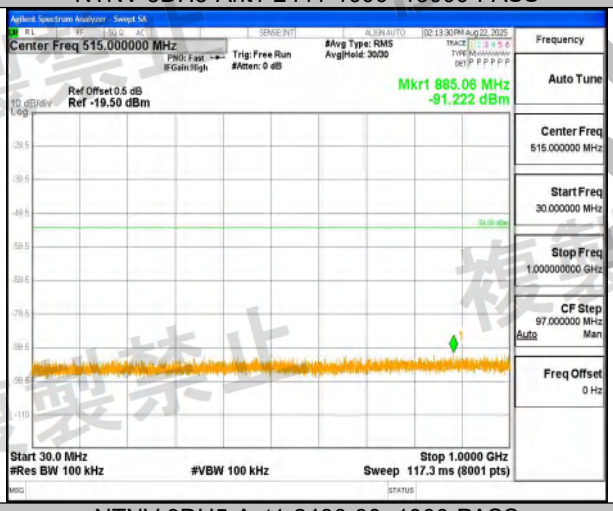
NTNV-3DH5-Ant1-2402-1000~13000-PASS



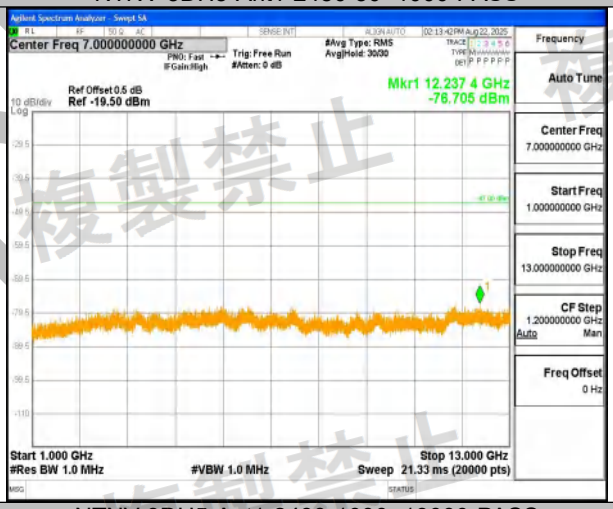
NTNV-3DH5-Ant1-2441-30~1000-PASS



NTNV-3DH5-Ant1-2441-1000~13000-PASS



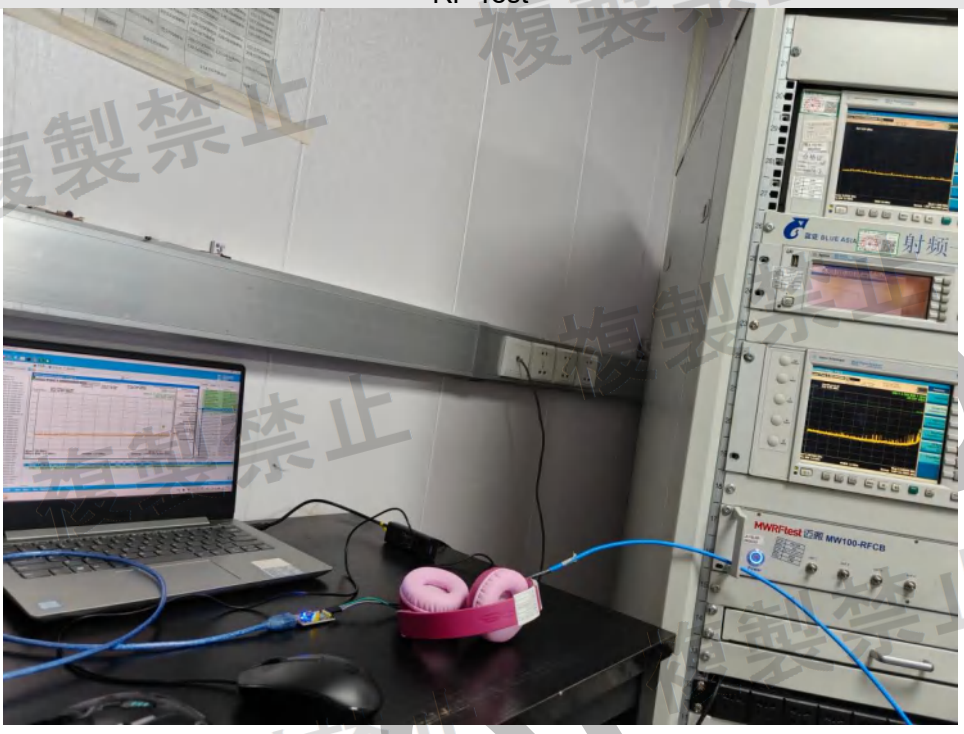
NTNV-3DH5-Ant1-2480-30~1000-PASS



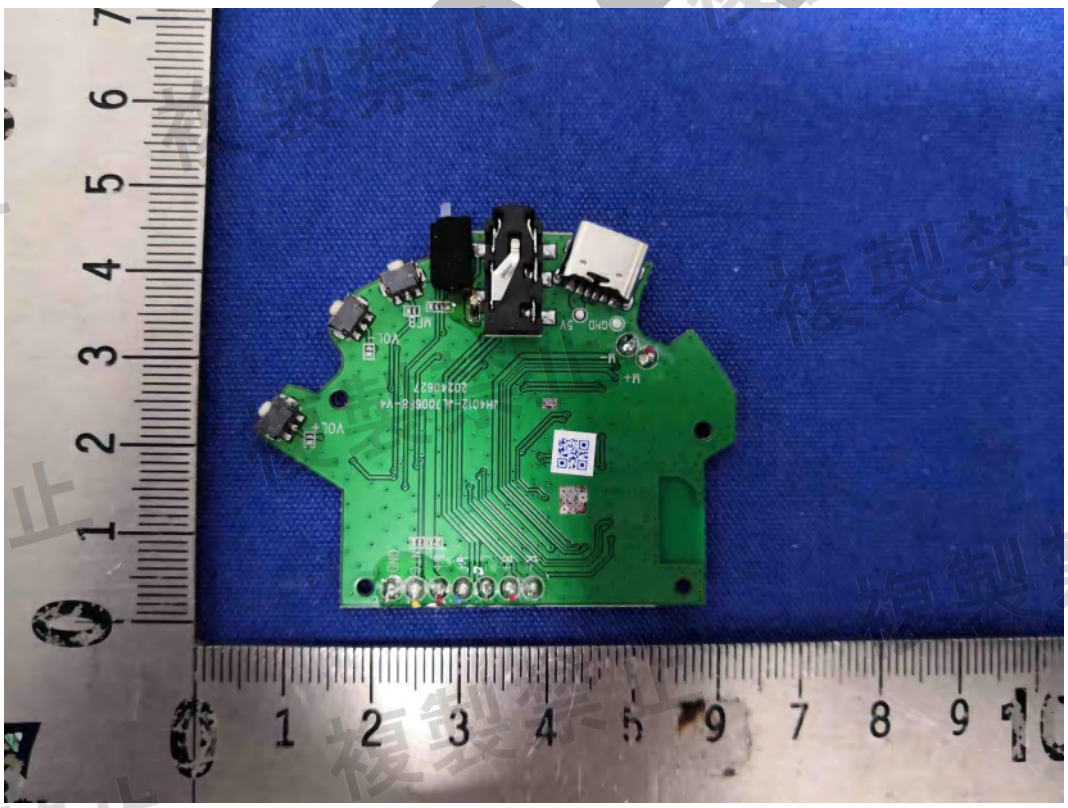
NTNV-3DH5-Ant1-2480-1000~13000-PASS

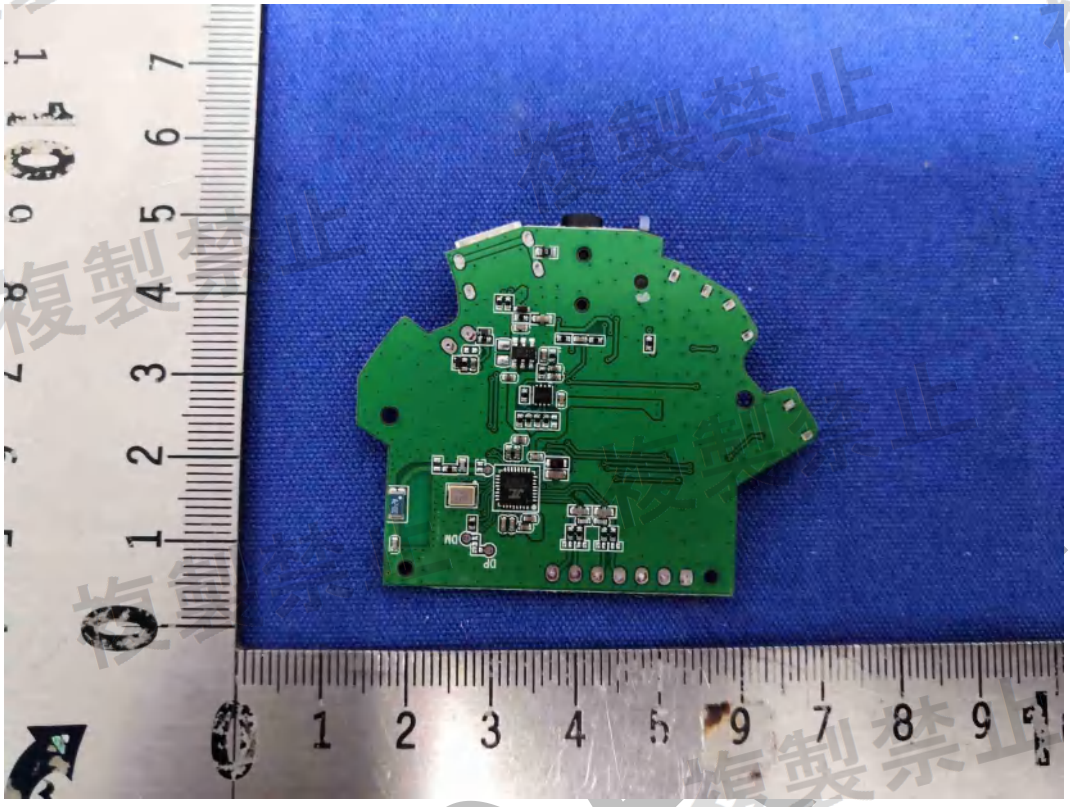
Appendix A: photographs of test setup

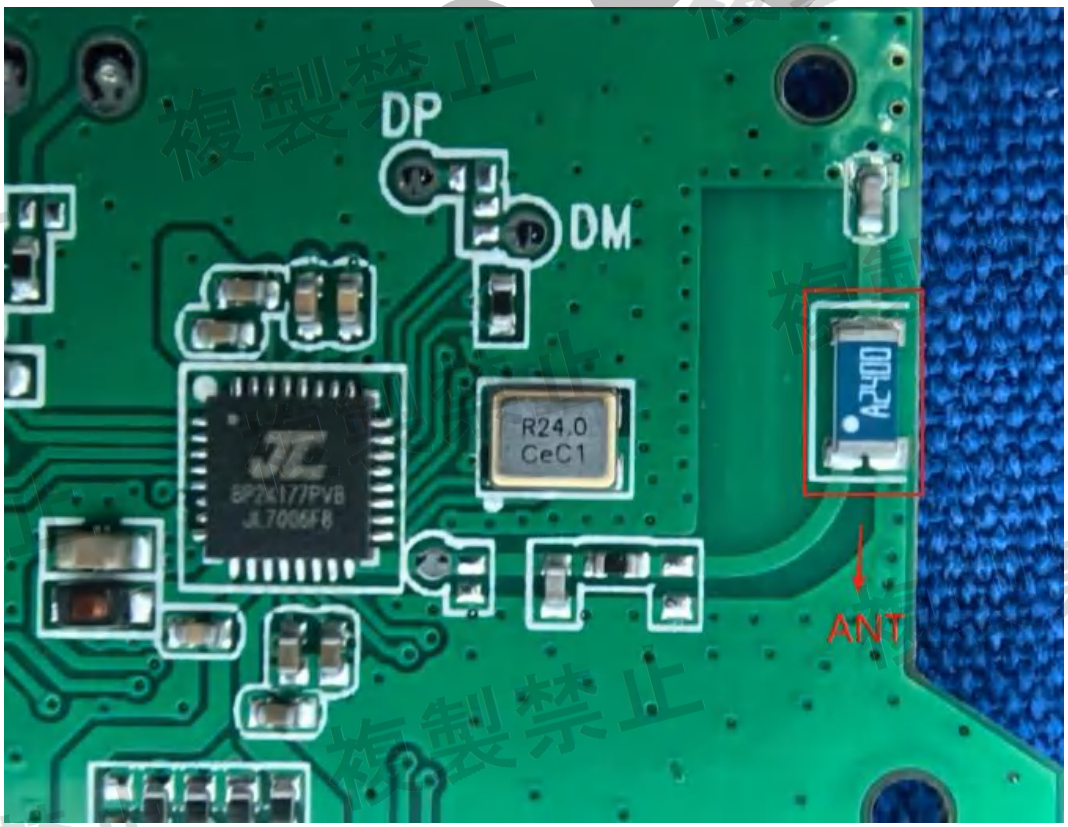
RF Test



Appendix B: photographs of EUT



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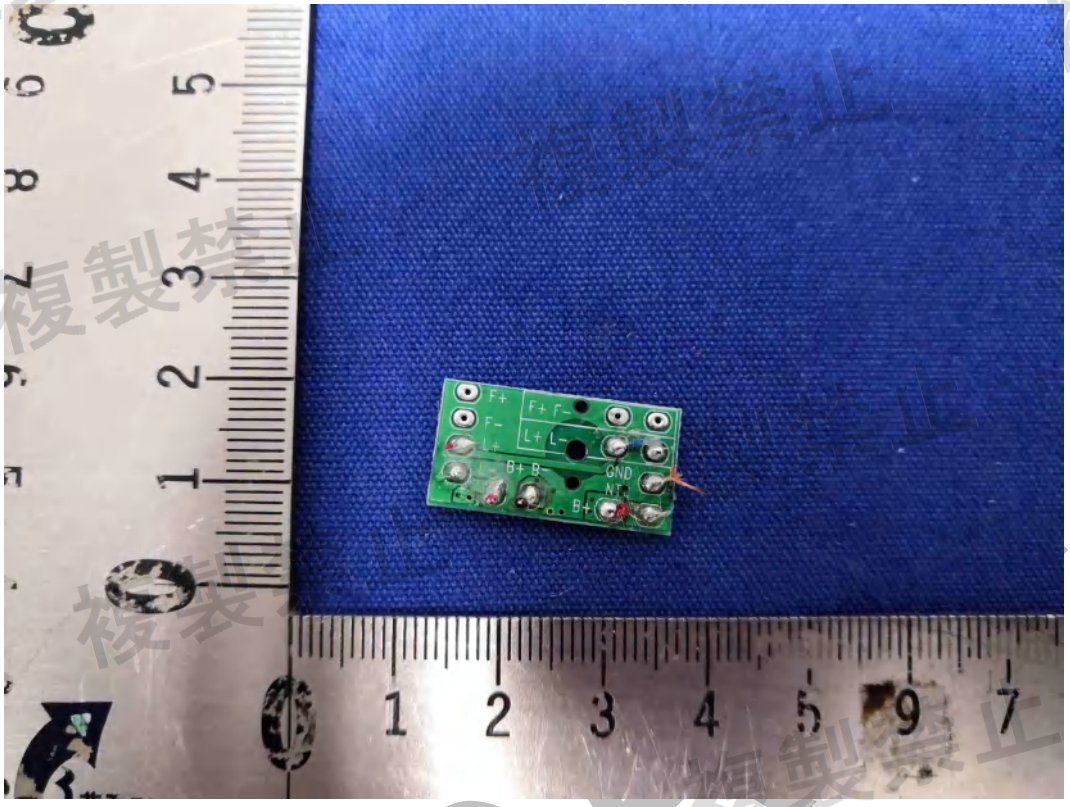
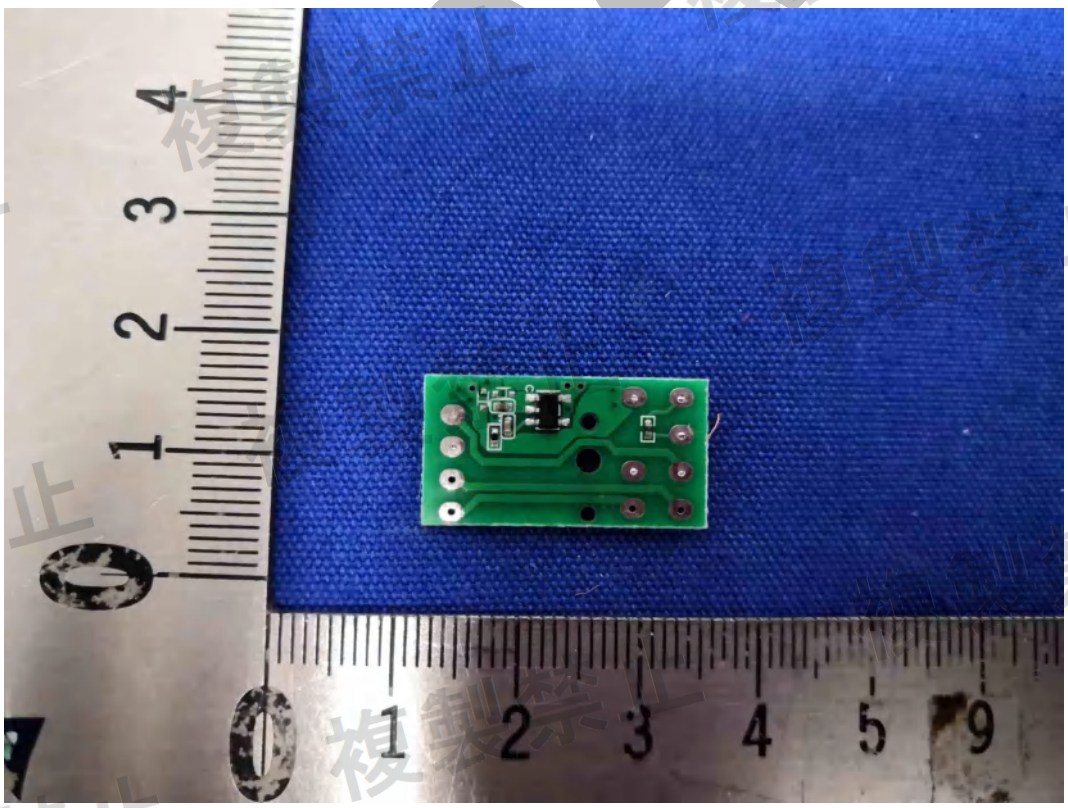
DM
R24.0
CeC1
ANT


F+
F-
L+
L-
B+
B-
GND
NT
B+



----END OF REPORT----

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