TEST REPORT

Report No.	CISRR260826427
Project No.	CISR260826427
Applicant	Shenzhen JunWu Technology Co., LTD
Address	SOHO 603-1, International Art Exhibition Center, No. 8 Yizhan Fourth Road,Shapu Community, Songgang Street, Bao an District, Shenzhen, China
Manufacturer	Shenzhen JunWu Technology Co., LTD
Address	SOHO 603-1, International Art Exhibition Center, No. 8 Yizhan Fourth Road,Shapu Community, Songgang Street, Bao an District, Shenzhen, China
Product Name	Portable Bluetooth Speaker
Trade mark	DreamWave
Model/Type reference	BOLT
Listed Model(s)	BOLT、BOLT II、BOLT III、BOLT +、BOLT Pro 、BOLT Max、BOLT Plus、BOLT SE
Standard	Article 2, paragraph 1, item 19
Date of sample receipt	August 26, 2026
Test date	August 28, 2026 to September 1, 2026
Issue date	September 2, 2026
Test result	**Complied**

Lucas Huang

Reviewed by: Lucas Huang

Hans Hu

Approved by: Hans Hu

The test results relate only to the tested samples.

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1. REPORT VERSION

Version No.	Issue date	Description
00	September 2, 2026	Original

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2. TEST DESCRIPTION

No.	Test Item	Standard Requirement	Result
1	Tolerance of Frequency	Article 2, paragraph 1, item 19	Pass
2	Occupied Bandwidth (99%)	Article 2, paragraph 1, item 19	Pass
3	Spread Bandwidth (90%)	Article 2, paragraph 1, item 19	Pass
4	Spread Factor	Article 2, paragraph 1, item 19	Pass
5	Antenna Power and Tolerance	Article 2, paragraph 1, item 19	Pass
6	Spurious Emission Intensity	Article 2, paragraph 1, item 19	Pass
7	Secondary Radiated Emissions	Article 2, paragraph 1, item 19	Pass
8	Dwell Time	Article 2, paragraph 1, item 19	Pass
9	Interference Prevention Function	Article 2, paragraph 1, item 19	Pass
10	RF Accessibility	Article 49-20, paragraph 1(a)	Pass

Note:

– The measurement uncertainty is not included in the test result.

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3. SUMMARY

3.1. Product Description

Main unit information:	
Product Name:	Portable Bluetooth Speaker
Trade mark:	DreamWave
Model No.:	BOLT
Listed Model(s):	BOLT、BOLT II、BOLT III、BOLT +、BOLT Pro 、BOLT Max、BOLT Plus、BOLT SE
Model difference:	Due to different sales regions, the model names vary; however, the internal structure, circuit principles, and all key components related to electromagnetic compatibility (EMC) performance are completely identical. The differences do not affect the product's safety or EMC performance.
Power supply:	DC 5V by USB-C port or DC 3.7V by Internal battery
Hardware version:	-
Software version:	-
Accessory unit information:	
Battery information:	3.7V, 2500mAh

3.2. Radio Specification Description

Modulation type:	GFSK, Pi/4-DQPSK,8DPSK
Operation frequency:	2402-2480MHz
Channel number:	79
Channel separation:	1MHz
Rated power:	0.04mW/MHz
Antenna type:	PCB antenna
Antenna gain:	3.38dBi

Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467

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

3.3. Modification of EUT

No modifications are made to the EUT during all test items.

3.4. Deviation from standards

None

3.5. Testing Site

Laboratory Name	Shenzhen Bangce Testing Technology Co., Ltd.
Laboratory Location	101, building 10, Yunli Intelligent Park, Shutianpu community, Matian Street, Guangming District, Shenzhen，Guangdong, China
Contact information	Tel: 86-755-2319 6848, email: service@cis-cn.net Website: http://www.cis-cn.net/

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4. TEST CONFIGURATION

4.1. Test frequency list

Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
2402	2441	2480

4.2. Descriptions of test mode

No	Test mode	Description
Mode1	TX mode	Keep EUT in transmitting mode
Mode2	RX mode	Keep EUT in receiving mode

4.3. Environmental conditions

Type	Requirement
Temperature:	15~35°C
Relative Humidity:	25~75%
Air Pressure:	860~1060mbar

4.4. Test Voltage

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		
Test condition	EUT Voltage for operation	RF Circuitry Voltage
Normal Voltage	3.3V	3V
High Voltage (+10% of Normal Voltage)	3.63V	3V
Low Voltage (-10% of Normal Voltage)	2.97V	2.97V

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4.5. Equipment Used during the Test

Secondary Radiated Emissions
Dwell Time
Tolerance of Frequency
Occupied Bandwidth (99%)
Spread Bandwidth (90%)
Spread Factor
Antenna Power and Tolerance
Spurious Emission Intensity

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	Spectrum analyzer	ROHDE&SCHWARZ	FSV-40N	CIS-EE076	2026-01-06	2027-01-05
2	Notch Filter Assembly	WCS	SMU-1003	CIS-EE093	2026-01-06	2027-01-05
3	Vector Signal Generator	Agilent	N5182A	CIS-RE012	2026-01-06	2027-01-05
4	Analog Signal Generator	Agilent	N5181A	CIS-RE013	2026-01-06	2027-01-05
5	Test software	WCS	WCN-Regulatory	CIS-EE103	/	/

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5. TEST RESULTS

5.1. Evaluation Results (Evaluation)

5.1.1. Interference Prevention Function

Test Requirement:	The EUT shall support one of the following functions: - Automatic identification transmission - Automatic identification reception
Test Method:	Notification No.88 of MIC, Appendix No.43
Procedure:	(1) For EUTs capable of automatically transmitting identification data a. Transmit identification data from EUT to Demodulator b. Confirm identification data is correctly received by Demodulator (2) For EUTs capable of automatically receiving identification data a. Transmit identification data from Link Partner to EUT b. Confirm communication link is established c. Link Partner shall respond by transmitting different identification data back to the EUT d. Confirm EUT stops transmitting, or confirm EUT recognizes that the two identification data are different

5.1.1.1. Test Result

Pass

5.1.1.2. Conclusion:

The detected ID of the device is below:

8C:C8:32:46:99:B3

Test result: The device meet the requirements
PASS

5.1.2. RF Accessibility

Test Requirement:	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.

5.1.2.1. Test Result

Pass

5.1.2.2. Conclusion:

Tamper proof declaration:

□ Sealed with special screws.
□ Plastic chassis is being welded using ultrasonic waves.
□ Chassis is glued using a special adhesive
□ Metal covers are spot-fused.
□ Cover is specially interlocked.
□ RF and modulation components are covered with shielding case and this shielding case is soldered.
□ Shiled case is welded at RF and modulation parts, and ID-ROM is welded using the BGA method.
□ Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
□ Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
☑ 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.

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5.2. Radio Spectrum Matter Test Results (RF)

5.2.1. Tolerance of Frequency

Test Requirement:	Article 2, paragraph 1, item 19
Test Limit:	±50ppm or less.
Test Method:	Notification No.88 of MIC, Appendix No.43
Procedure:	

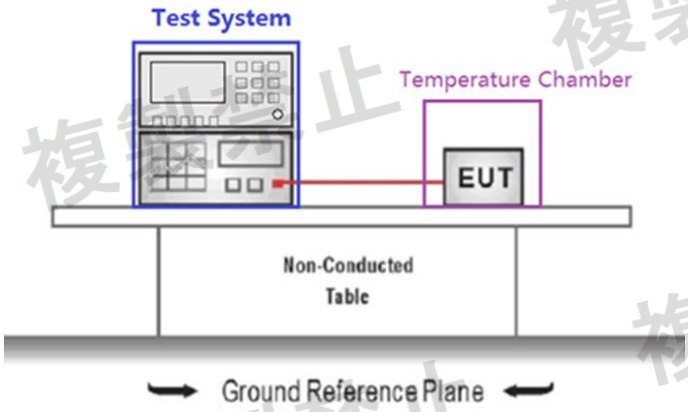
Center frequency:	Test frequency
Span:	1MHz
RBW:	10 kHz
VBW:	10 kHz
Sweep data points:	1001 or greater
Sweep time:	Auto
Detector mode:	Positive peak
Indication mode:	Max hold

If the EUT cannot transmit in un-modulated mode then modulated mode measurements can be made, as follows: If the spectrum observed using the spectrum analyzer has a characteristic dip at the center, then the center frequency of the dip shall be regarded as the center frequency of the carrier.

5.2.1.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.3 °C	Humidity:	55.4 %	Atmospheric Pressure:	102.9 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

5.2.1.2. Test Setup Diagram



5.2.1.3. Test Result

Pass

5.2.1.4. Test Data

Please Refer to Appendix for Details.

5.2.2. Occupied Bandwidth (99%)

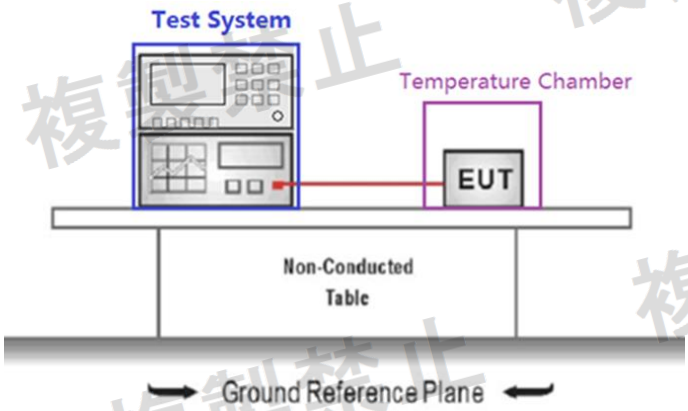
Test Requirement:	Article 2, paragraph 1, item 19
Test Limit:	For FHSS or FHSS and other modulation Hybird: 83.5 MHz or less: The measured bandwidth at the low and high channels shall meet the following requirements: - The lowest frequency of the measured bandwidth shall not be less than 2400 MHz - The highest frequency of the measured bandwidth shall not be greater than 2483.5 MHz [Occupied Bandwidth] 83.5 MHz or less
Test Method:	Notification No.88 of MIC, Appendix No.43
Procedure:	

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

5.2.2.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.2 °C	Humidity:	55.2 %	Atmospheric Pressure:	102.9 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

5.2.2.2. Test Setup Diagram



5.2.2.3. Test Result

Pass

5.2.2.4. Test Data

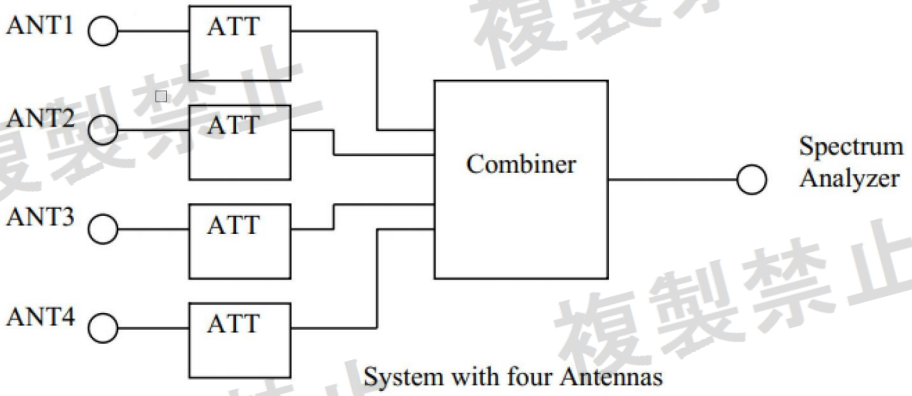
Please Refer to Appendix for Details.

5.2.3. Spread Bandwidth (90%)

Test Requirement:	Article 2, paragraph 1, item 19
Test Limit:	Only for report use.
Test Method:	Notification No.88 of MIC, Appendix No.43
Procedure:	

Center Frequency:	Test frequency
Span:	2 - 3.5 times the technical standard
RBW:	Within 3% of the technical standard
VBW:	Same as RBW
Sweep time:	Auto
Sweep data points:	1001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold
BW setting:	90%

(1) Measure the signal bandwidth using a spectrum analyzer
(2) For multiple antenna systems:
a) Each antenna shall be individually measured
b) If the measured occupied bandwidth for any antenna exceeds [(Occupied Bandwidth Limit) – 100kHz] then, in addition, the occupied bandwidth shall be measured with all antennas combined – see diagram below:

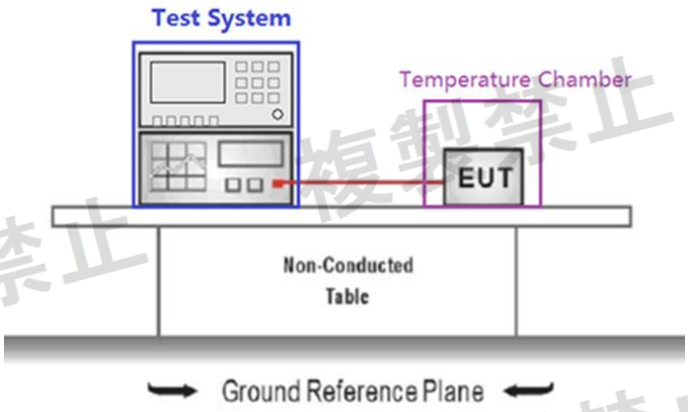


System with four Antennas

5.2.3.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.4 °C	Humidity:	56.9 %	Atmospheric Pressure:	102.9 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

5.2.3.2. Test Setup Diagram



5.2.3.3. Test Result

Pass

5.2.3.4. Test Data

Please Refer to Appendix for Details.

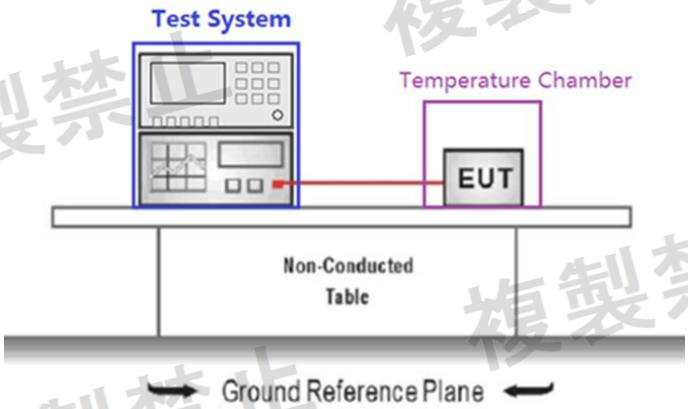
5.2.4. Spread Factor

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

5.2.4.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.7 °C	Humidity:	56.2 %	Atmospheric Pressure:	102.9 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

5.2.4.2. Test Setup Diagram



5.2.4.3. Test Result

Pass

5.2.4.4. Test Data

Please Refer to Appendix for Details.

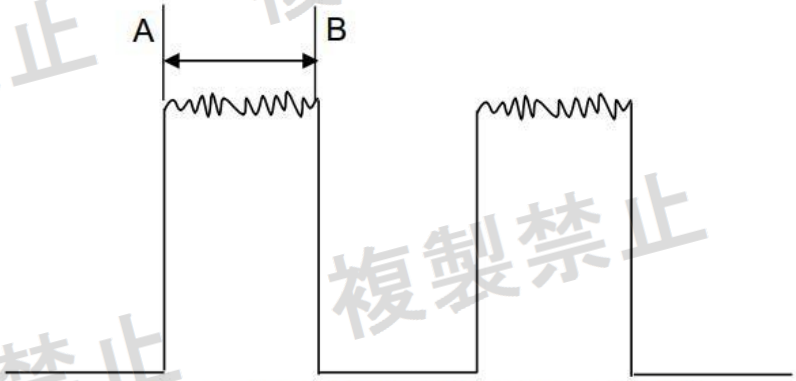
5.2.5. Antenna Power and Tolerance

Test Requirement:	Article 2, paragraph 1, item 19
Test Limit:	Antenna Power: 3 mW/MHz or less Tolerance: +20% or less EIRP: 16.91dBm/MHz
Test Method:	Notification No.88 of MIC, Appendix No.43
Procedure:	

[Setting 1] – Search for peak power frequency	
Center Frequency:	Test frequency
Span:	Approximately twice the occupied bandwidth
RBW:	1MHz
VBW:	Approximately three times the RBW
Sweep time:	Auto
Sweep data points:	1001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold
[Setting 2] – Measurement of average antenna power for FHSS, DSSS, OFDM	
Frequency:	Frequency of peak power found using [Setting 1]
Span:	0 Hz
RBW:	3 MHz (FHSS-Channel Spacing ≤ 1MHz) 1MHz (DSSS, OFDM, FHSS-Channel Spacing > 1MHz)
Detector mode:	Sample
Sweep:	Minimum time required to make an accurate measurement.
	For burst type (intermittent) transmission sweep time shall be greater than one burst interval
Sweep data points:	1001 or greater
[Setting 3] – Measurement of average antenna power other than for FHSS, DSSS, OFDM	
Frequency:	Frequency of peak power found using [Setting 1]
Span:	0 Hz
RBW:	Bandwidth sufficient to cover that occupied by the carrier
VBW:	Bandwidth sufficient to cover that occupied by the carrier
Detector mode:	Sample
Sweep:	Minimum time required to make an accurate measurement.
	For burst type (intermittent) transmission sweep time shall be greater than one burst interval
Sweep data points:	1001 or greater

- A hopping transmission separation of 1MHz or less with a constant transmission

interval
- The transmission probability is equal for all hopping frequencies Procedure:
(1) After configuring the spectrum analyzer to [Setting 1], find the frequency of maximum transmitted power
(2) After configuring the spectrum analyzer to [Setting 2], measure the Average Burst Power of the frequency found in (1)
Note: Measure the period A-B in the figure below:



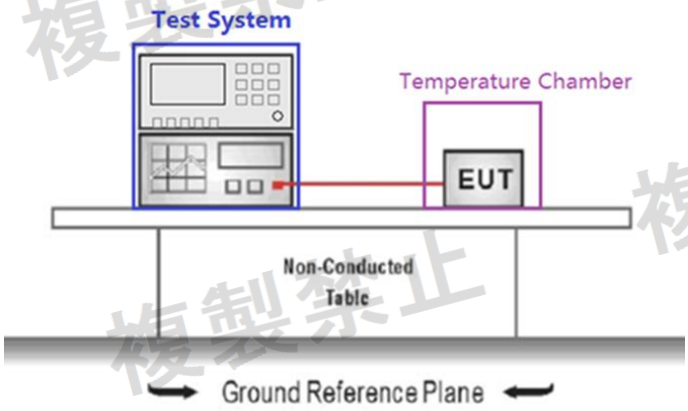
Measurement of Average Burst Power (A to B)

(3) Calculate Antenna Power using the following formula:
Antenna Power (W/MHz) = Average Burst Power (W) / Spread Bandwidth (MHz)
[Note]
Spread Bandwidth in the formula above is derived from the data collected in section 5 (Occupied Bandwidth (99%) and Spread Bandwidth (90%))
(4) If the EUT has multiple antennas then each antenna power output shall be measured individually – the sum of these individual measurements shall represent the power output value

5.2.5.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.3 °C	Humidity:	55.9 %	Atmospheric Pressure:	102.9 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

5.2.5.2. Test Setup Diagram



5.2.5.3. Test Result

Pass

5.2.5.4. Test Data

Please Refer to Appendix for Details.

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5.2.6. Spurious Emission Intensity

Test Requirement:	Article 2, paragraph 1, item 19
Test Limit:	(1) Below 2387 MHz: 2.5 μW (-26 dBm)/MHz or less (2) 2387 to 2400 MHz: 25.0 μW (-16 dBm)/MHz or less (3) 2483.5 to 2496.5 MHz: 25.0 μW (-16 dBm)/MHz or less (4) Over 2496.5 MHz: 2.5 μW (-26 dBm)/MHz or less
Test Method:	Notification No.88 of MIC, Appendix No.43
Procedure:	

[Setting 1]	
Frequency range:	(see Note 1)
RBW:	1 MHz
VBW:	1 MHz
Sweep time:	Minimum time required to make an accurate measurement
Sweep Data Points:	1001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold (see Note 2)
Note 1:	Measurement range shall be 30 MHz to 12.5 GHz, except for the following cases: -FHSS, FHSS+DSSS, FHSS+OFDM:2374 MHz to 2509.5 MHz -Other than FHSS, FHSS+DSSS, FHSS+OFDM: 2400 MHz to 2483.5 MHz
Note 2:	Sweep shall be repeated until the max hold waveform is stable.
[Setting 2]	
Center frequency:	Frequency of spurious emission found using [Setting 1]
Span:	0 Hz
RBW:	1 MHz
VBW:	1 MHz
Sweep time:	Minimum time required to make an accurate measurement. For burst type (intermittent) spurious emissions, sweep time shall be greater than one burst interval
Sweep Data Points:	1001 or greater
Detector mode:	Sample
[Setting 3]	
Frequency range:	2374 MHz to 2400 MHz 2483.5 MHz to 2509.5 MHz
RBW:	30 kHz
VBW:	30 kHz
Sweep time:	Minimum time required to make an accurate measurement.
Sweep data points:	1001 or greater

Detector mode:	Positive peak
Indication mode:	Max hold

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

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

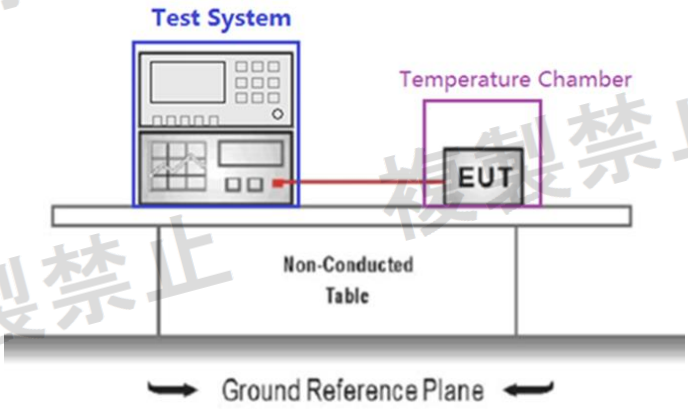
Ps: Sum (Watts)
Ei: Measured value at each point in the Span (Watts) Sw: Span (1MHz)
n: Number of measurement points in the Span
k: Correction factor for Equivalent Noise Bandwidth, specific to each spectrum analyzer, check the instrument user guide
RBW: Resolution Bandwidth (MHz).
(10) If the EUT has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

	emissions with all the antennas electrically combined

5.2.6.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.4 °C	Humidity:	56.5 %	Atmospheric Pressure:	102.9 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

5.2.6.2. Test Setup Diagram



5.2.6.3. Test Result

Pass

5.2.6.4. Test Data

Please Refer to Appendix for Details.

5.2.7. Secondary Radiated Emissions

Test Requirement:	Article 2, paragraph 1, item 19
Test Limit:	(1) Below 1 GHz: 4 nW (-54dBm) or less (2) Above 1 GHz: 20 nW (-47dBm) or less
Test Method:	Notification No.88 of MIC, Appendix No.43
Procedure:	

[Setting 1]	
Frequency range:	30 MHz ~ 12.5 GHz
RBW:	Below 1 GHz:100 kHz
	Above 1 GHz:1 MHz
VBW:	Below 1 GHz:100 kHz
	Above 1 GHz:1 MHz
Sweep time:	Auto
Sweep data points:	1001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold
[Setting 2]	
Center Frequency:	Frequency of spurious emission found using [Setting 1]
Span:	0 Hz
RBW:	Below 1 GHz:100 kHz
	Above 1 GHz:1 MHz
VBW:	Below 1 GHz:100 kHz
	Above 1 GHz:1 MHz
Sweep time:	Auto
Sweep data points:	1001 or greater
Detector mode:	Sample

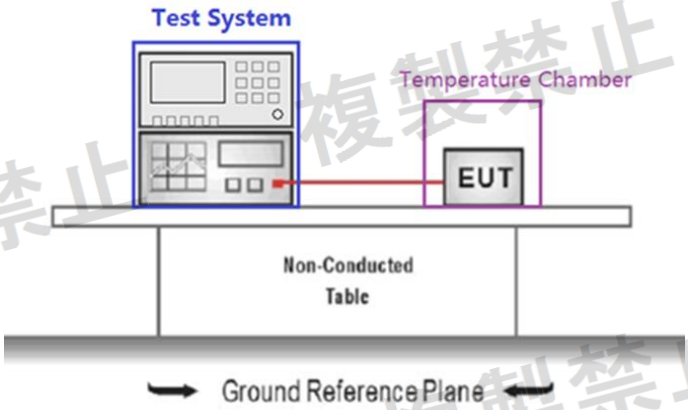
(1) Configure the spectrum analyzer to [Setting 1] and then search for spurious emissions in the range 30 MHz to 12.5GHz. If the sweep range does not cover the required measurement frequency range then the measurement range will need to be divided into sufficient sections of size [RBW x Sweep Data Points].
(2) If spurious emissions are found with an amplitude greater than [Limit - 10dB] then perform further detailed measurements as described in (3)
(3) Configure the spectrum analyzer using [Setting 2] and measure the average signal amplitude.
If the spurious emission is burst type (intermittent), then the average value shall not include signal OFF time Multiple Antenna Systems
If the EUT has multiple antennas then emissions from each antenna shall be measured individually, as described below
(4) For each antenna repeat steps (1) through (3). Convert all spurious level measurements from dB to absolute value
(5) Combine (sum) the absolute values of the spurious measurements at each frequency for each antenna (to create a single composite spectrum of spurious emissions)
(6) Ensure that the composite spectrum does not exceed the Limit

5.2.7.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.8 °C	Humidity:	56.7 %	Atmospheric Pressure:	102.9 kPa
Pre test mode:	Mode2				

Final test mode:	Mode2

5.2.7.2. Test Setup Diagram



5.2.7.3. Test Result

Pass

5.2.7.4. Test Data

Please Refer to Appendix for Details.

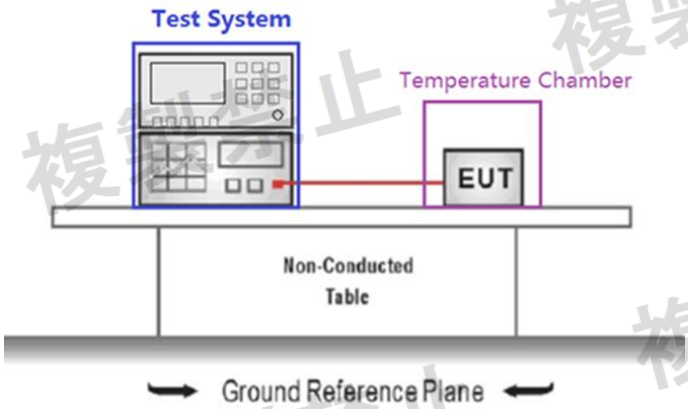
5.2.8. Dwell Time

Test Requirement:	Article 2, paragraph 1, item 19
Test Limit:	Transmit ON Time shall be less than 0.4 seconds Total Dwell Time shall be less than 0.4 seconds
Test Method:	Notification No.88 of MIC, Appendix No.43
Procedure:	[Setting 1] Frequency: Test frequency Span: 0 Hz RBW: 1 MHz VBW: 1 MHz Sweep data points: 1001 or greater Trigger: Video trigger Detection mode: Positive peak (1) Configure the spectrum analyzer to [Setting 1] (2) Measure the Burst Cycle and Transmit ON Time (3) Total Dwell Time shall be calculated by the following formula: Total Dwell Time = (0.4 x Spreading Rate x Transmit ON Time) / (Burst Cycle x Number of Hopping Channels) [Notes] a. Spreading Rate = Spread Bandwidth (measured value) / Transmission Rate b. Transmit ON Time and Burst Cycle are both measured in Seconds c. Numerical Coefficient (0.4) is a dimensionless number defined in the technical standard

5.2.8.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.6 °C	Humidity:	56.1 %	Atmospheric Pressure:	102.9 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

5.2.8.2. Test Setup Diagram



5.2.8.3. Test Result

Pass

5.2.8.4. Test Data

Please Refer to Appendix for Details.

6. APPENDIX REPORT

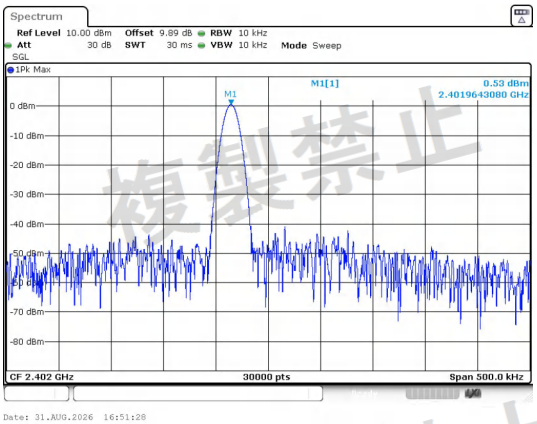
6.1. Frequency Tolerance

Test Result

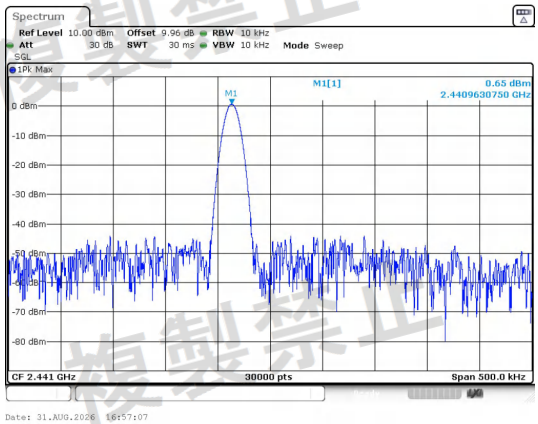
Condition	Mode	Ch.	Center Frequency (MHz)	Measured Value (MHz)	Result (ppm)	Limit (ppm)	Verdict
NT/NV	GFSK	0	2402	2401.9643080	-14.86	± 50	PASS
NT/NV	GFSK	39	2441	2440.9630750	-15.13	± 50	PASS
NT/NV	GFSK	78	2480	2479.9628750	-14.97	± 50	PASS

Test Graphs

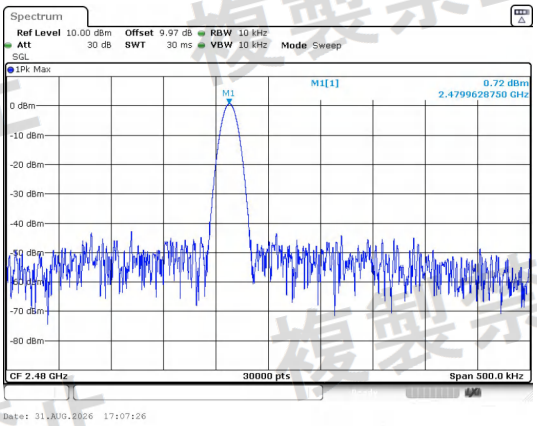
NT/NV



NT/NV_DH5_Channel 0



NT/NV_DH5_Channel 39



NT/NV_DH5_Channel 78

6.2. Antenna Power

Test Result

Normal Mode

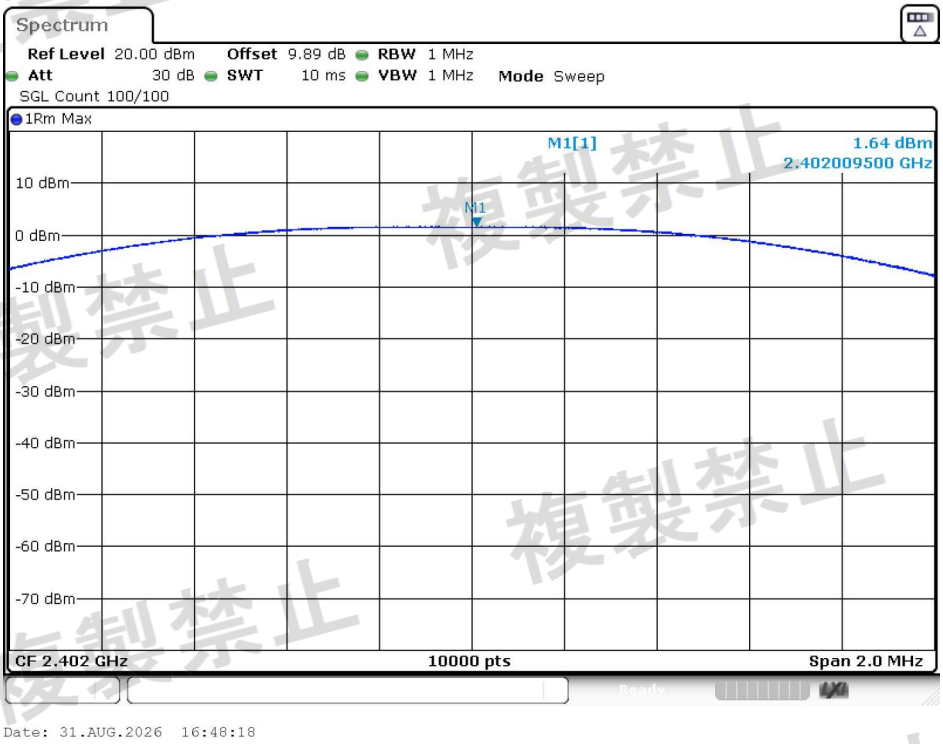
Condition	Modulation	Frequency (MHz)	Antenna power (dBm)	Antenna power density (mW/MHz)	Limit (mW/MHz)	Verdict
NT/NV	GFSK_DH5	2402	1.64	0.021	3	PASS
		2441	0.45	0.015	3	PASS
		2480	0.16	0.015	3	PASS
	π/4DQPSK_2-DH5	2402	1.68	0.021	3	PASS
		2441	0.49	0.016	3	PASS
		2480	-0.88	0.011	3	PASS
	8DPSK_3-DH5	2402	-0.83	0.012	3	PASS
		2441	0.51	0.016	3	PASS
		2480	-1.81	0.009	3	PASS

Condition	Modulation	Frequency (MHz)	Tolerance (%)	Tolerance Limit (%)	Rated power (mW/MHz)	Verdict
NT/NV	GFSK_DH5	2402	-48.63	+20	0.04	PASS
		2441	-61.32	+20		PASS
		2480	-63.49	+20		PASS
	π/4DQPSK_2-DH5	2402	-48.15	+20		PASS
		2441	-60.96	+20		PASS
		2480	-71.27	+20		PASS
	8DPSK_3-DH5	2402	-70.91	+20		PASS
		2441	-60.78	+20		PASS
		2480	-76.81	+20		PASS

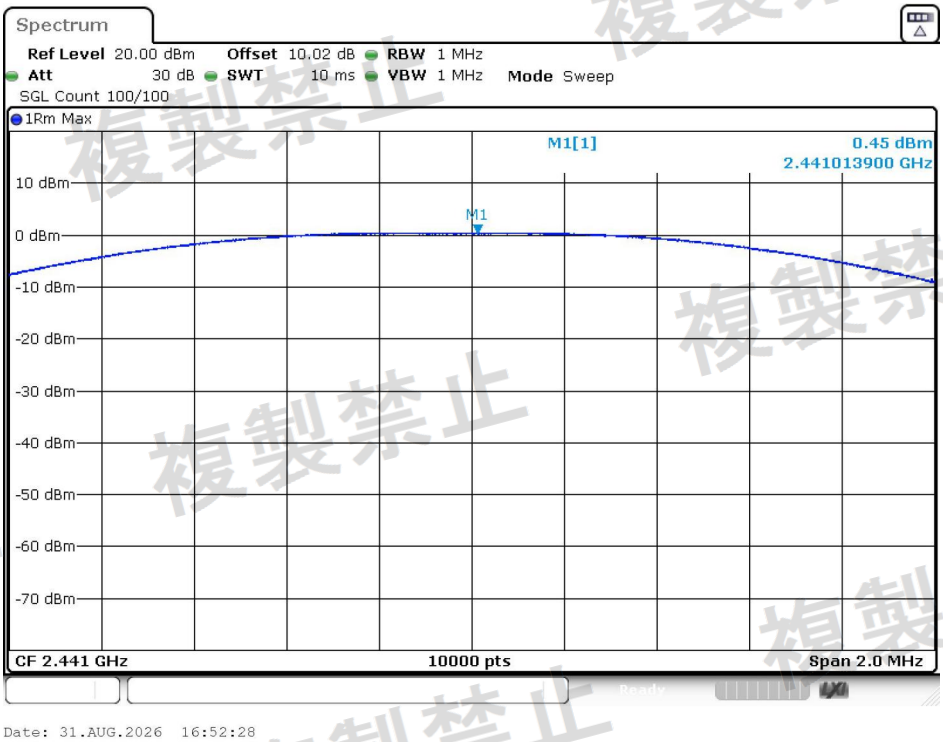
Condition	Mode	Frequency (MHz)	Gain(dBi)	EIRP(mW/MHz)	Limit (mW/MHz)	Verdict
NT/NV	GFSK_DH5	2402	3.38	0.046	4.91	PASS
	GFSK_DH5	2441	3.38	0.033	4.91	PASS
	GFSK_DH5	2480	3.38	0.033	4.91	PASS
	π/4DQPSK_2-DH5	2402	3.38	0.046	4.91	PASS
	π/4DQPSK_2-DH5	2441	3.38	0.035	4.91	PASS
	π/4DQPSK_2-DH5	2480	3.38	0.024	4.91	PASS
	8DPSK_3-DH5	2402	3.38	0.026	4.91	PASS
	8DPSK_3-DH5	2441	3.38	0.035	4.91	PASS
	8DPSK_3-DH5	2480	3.38	0.020	4.91	PASS

Test Graphs

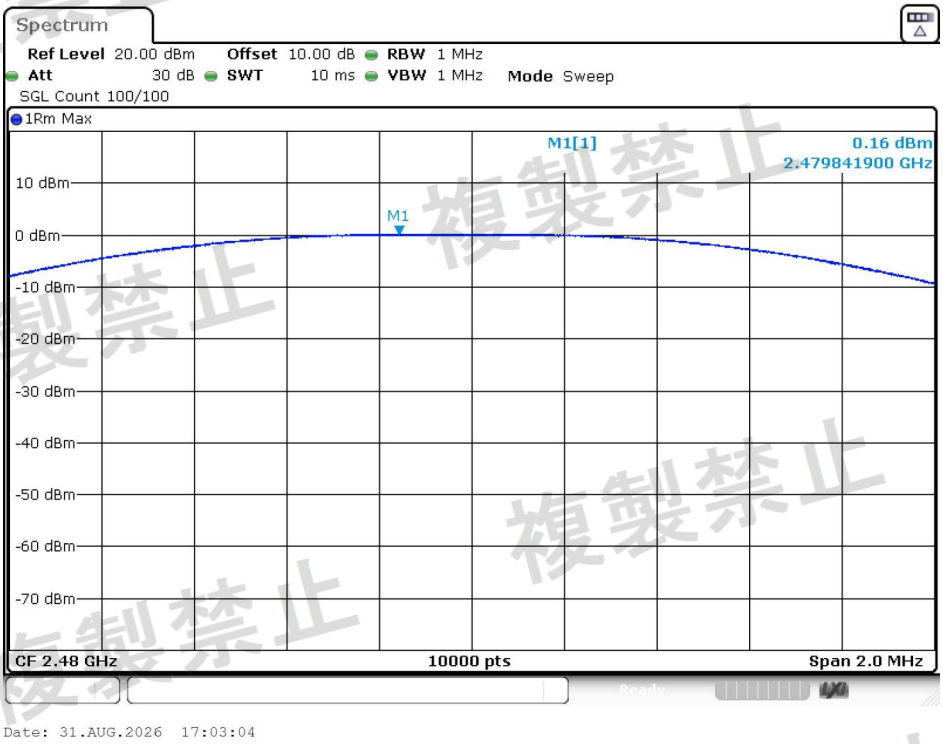
Normal Mode



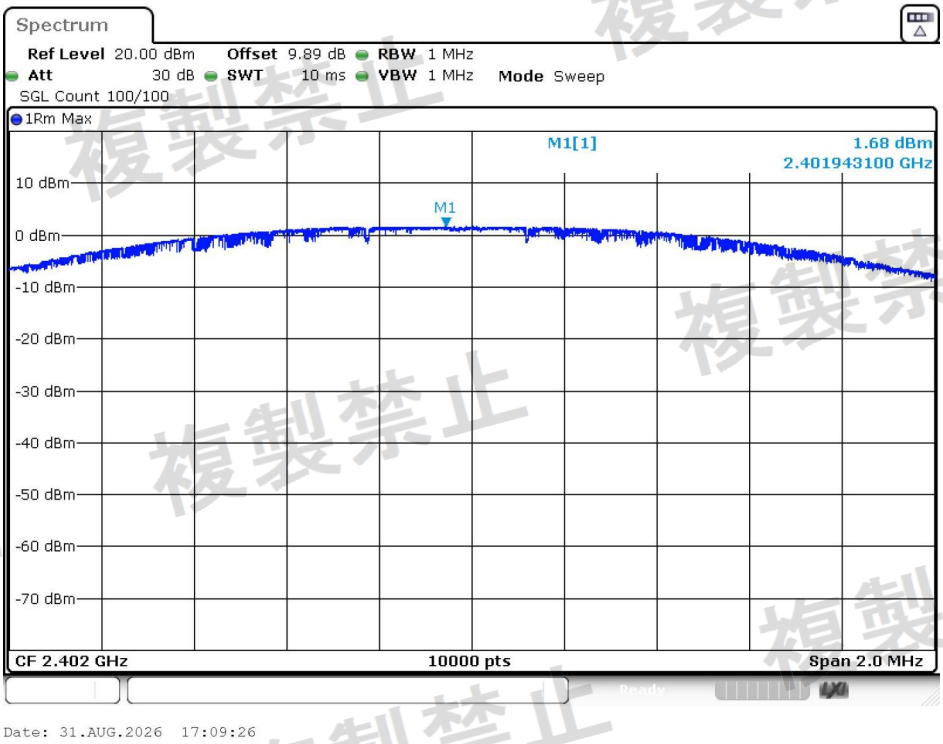
The maximum PD
NT/NV_GFSK_Channel 0



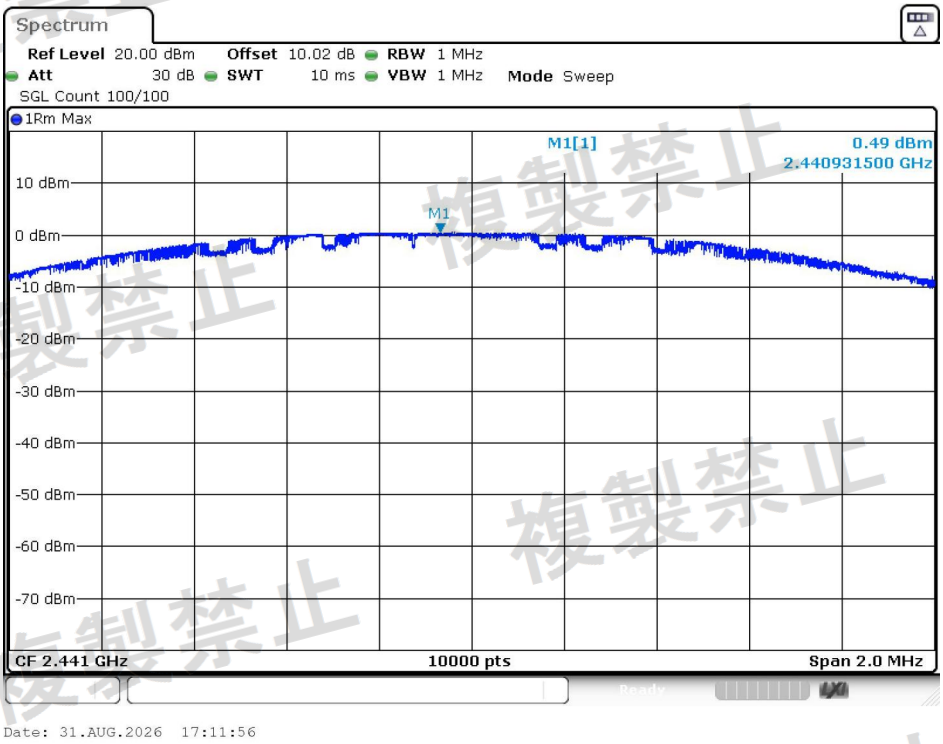
The maximum PD
NT/NV_GFSK_Channel 39



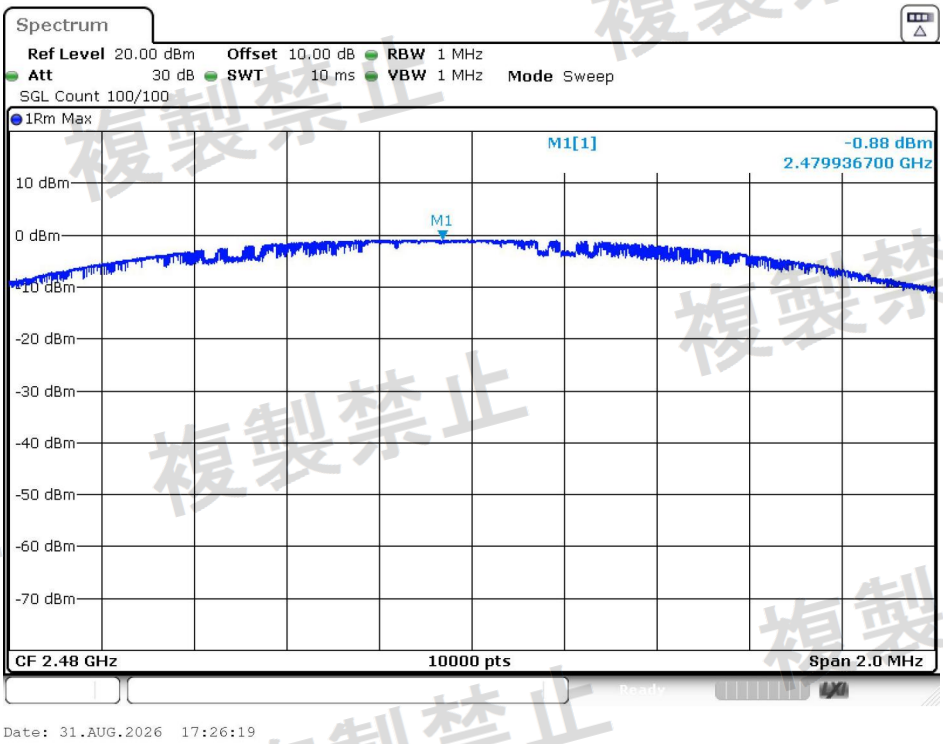
The maximum PD
NT/NV_GFSK_Channel 78



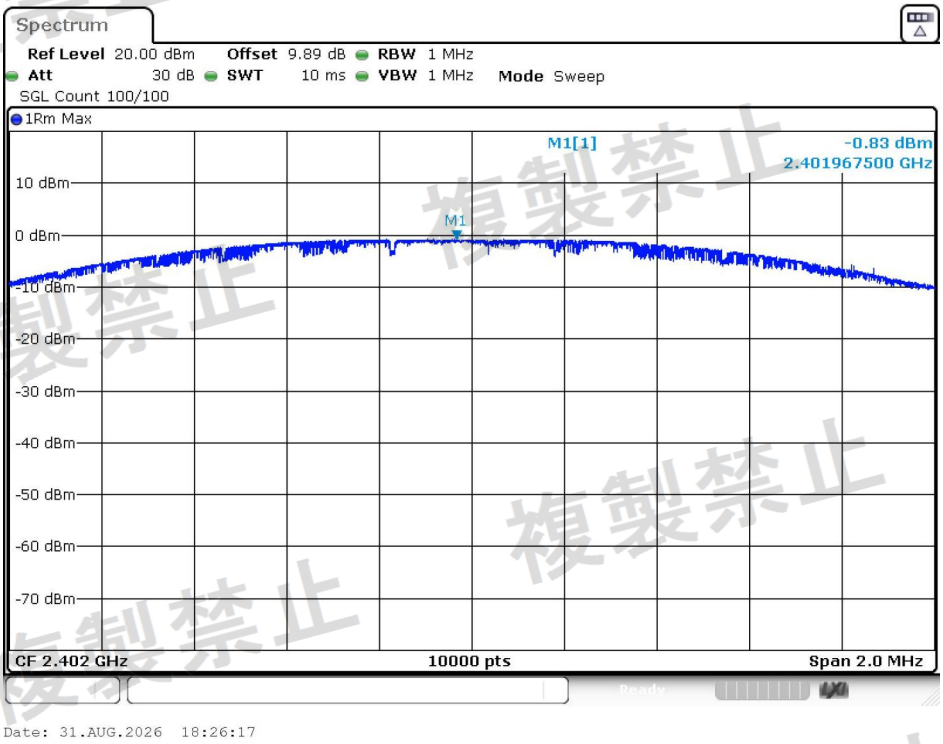
The maximum PD
NT/NV_π/4DQPSK_Channel 0



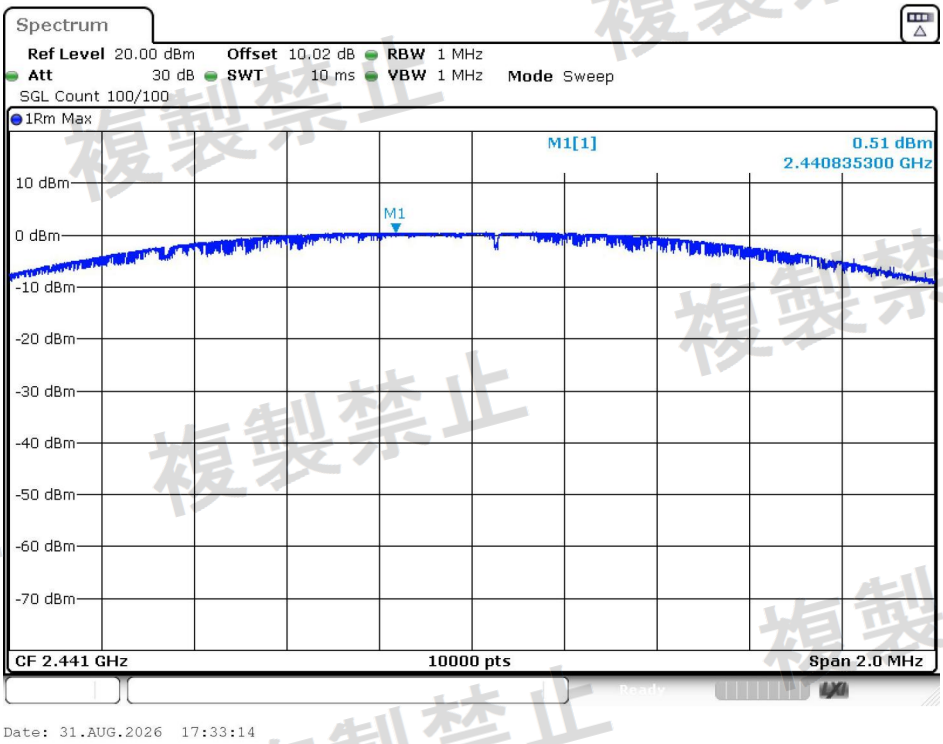
The maximum PD
NT/NV_π/4DQPSK_Channel 39



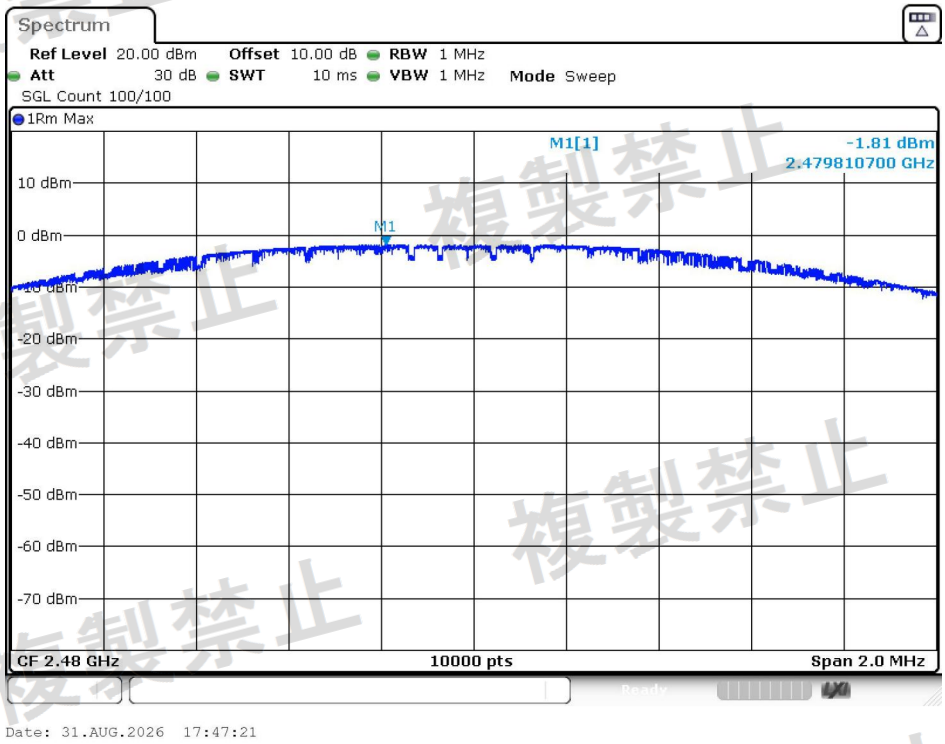
The maximum PD
NT/NV_π/4DQPSK_Channel 78



The maximum PD
NT/NV_8DPSK_Channel 0



The maximum PD
NT/NV_8DPSK_Channel 39



The maximum PD
NT/NV_8DPSK_Channel 78

6.3. Occupied Bandwidth (99% BW)

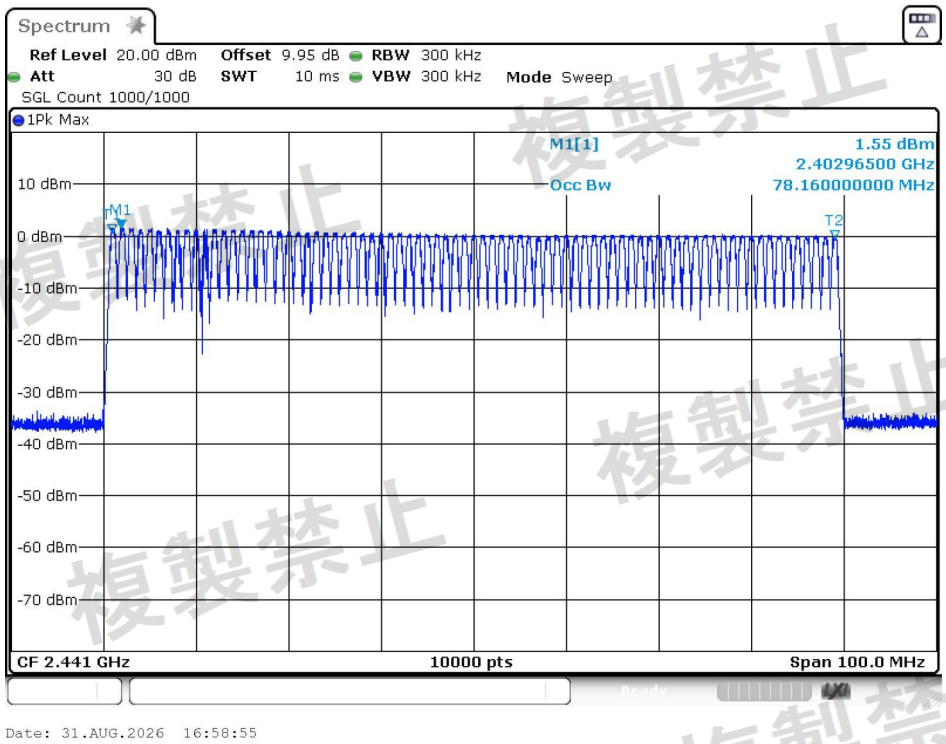
Test Result

Normal Mode

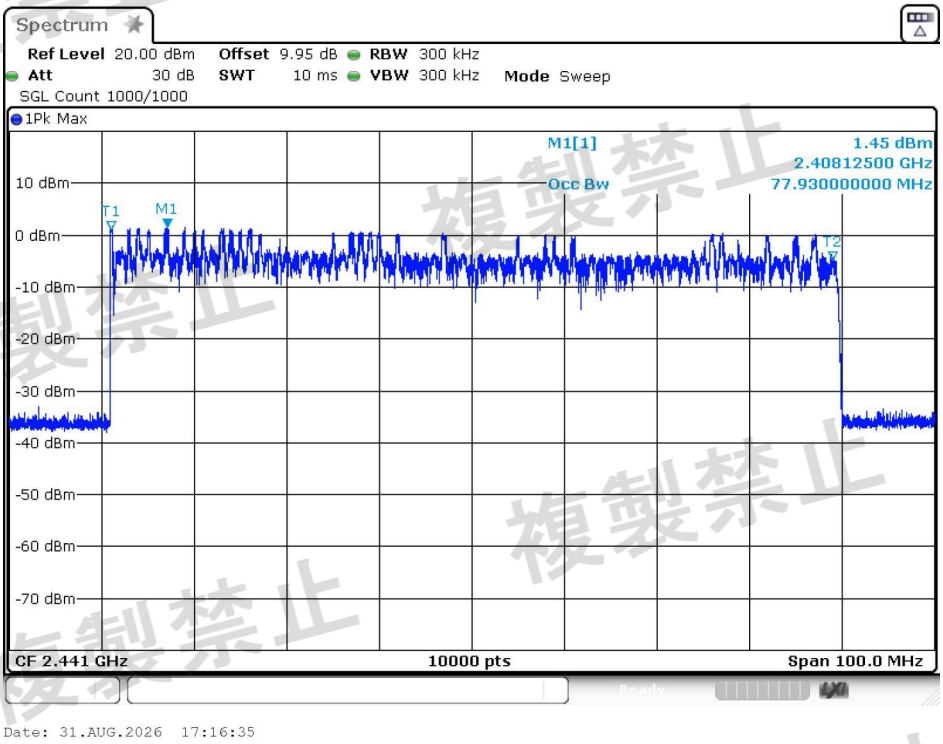
Condition	Modulation	99% BW (MHz)	Limit (MHz)	Verdict
NT/NV	GFSK_DH5	78.16	83.5	PASS
	π/4DQPSK_2-DH5	77.93		PASS
	8DPSK_3-DH5	78.41		PASS

Test Graphs

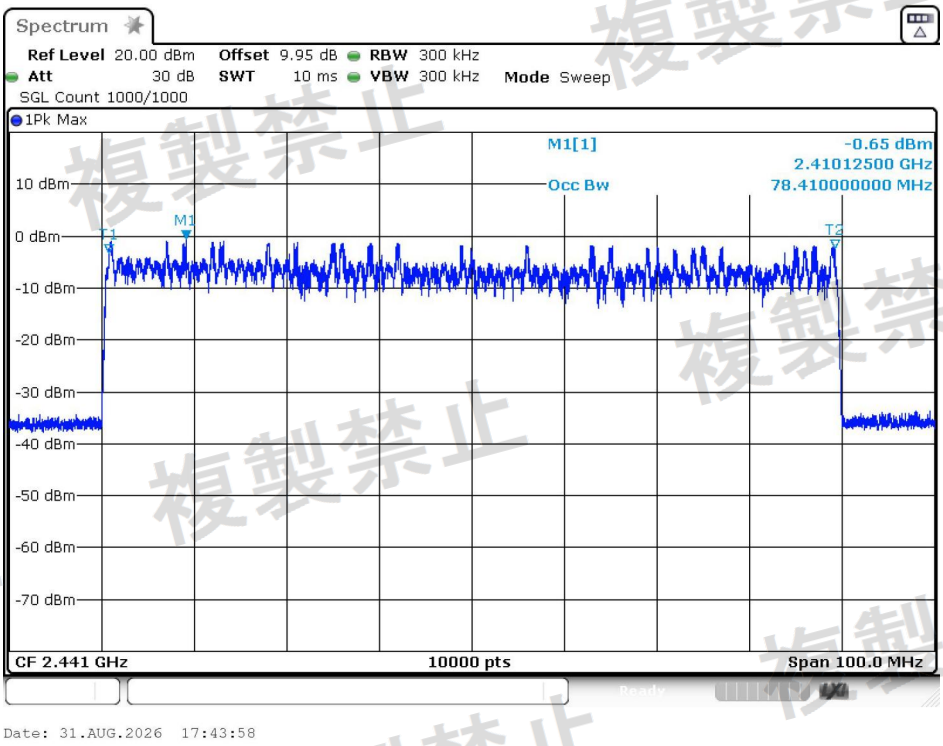
Normal Mode



NT/NV_GFSK_DH5



NT/NV_π/4DQPSK_2-DH5



NT/NV_8DPSK_3-DH5

6.4. Spreading Bandwidth (90% BW)

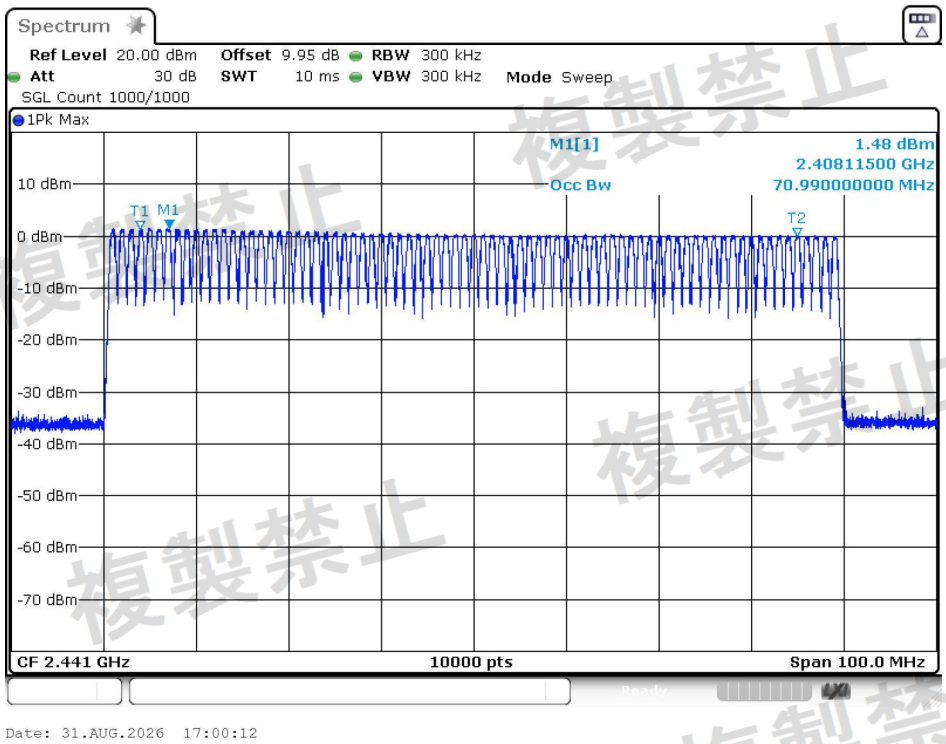
Test Result

Normal Mode

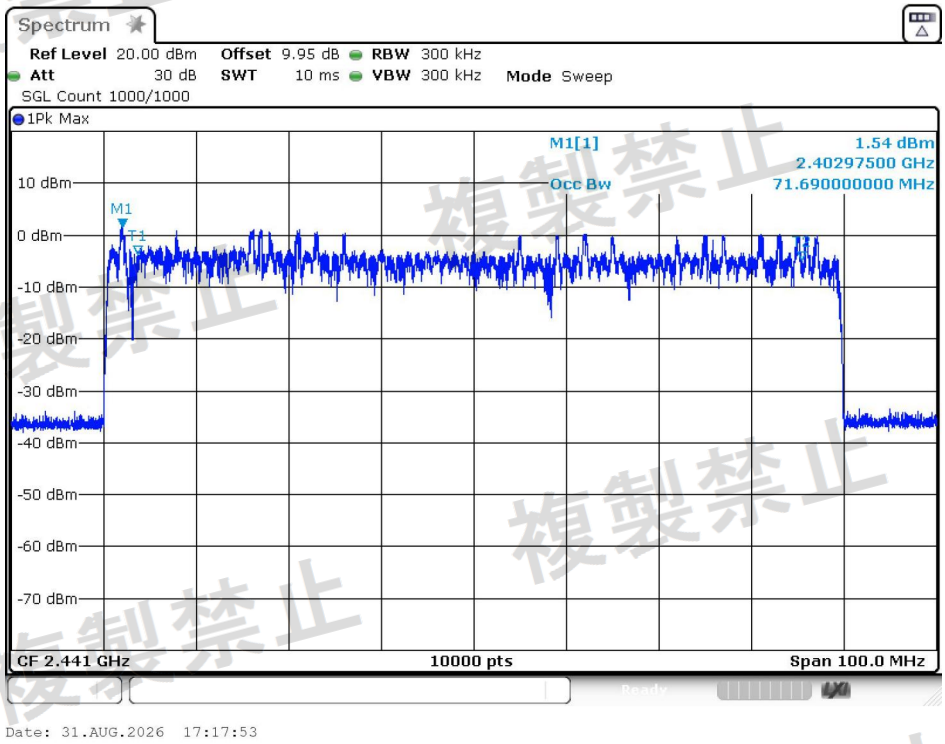
Condition	Mode	90% SBW (MHz)	Spreading factor	Verdict
NT/NV	GFSK_DH5	70.990	70.990	PASS
NT/NV	π/4DQPSK_2-DH5	71.690	35.845	PASS
NT/NV	8DPSK_3-DH5	71.050	23.683	PASS

Test Graphs

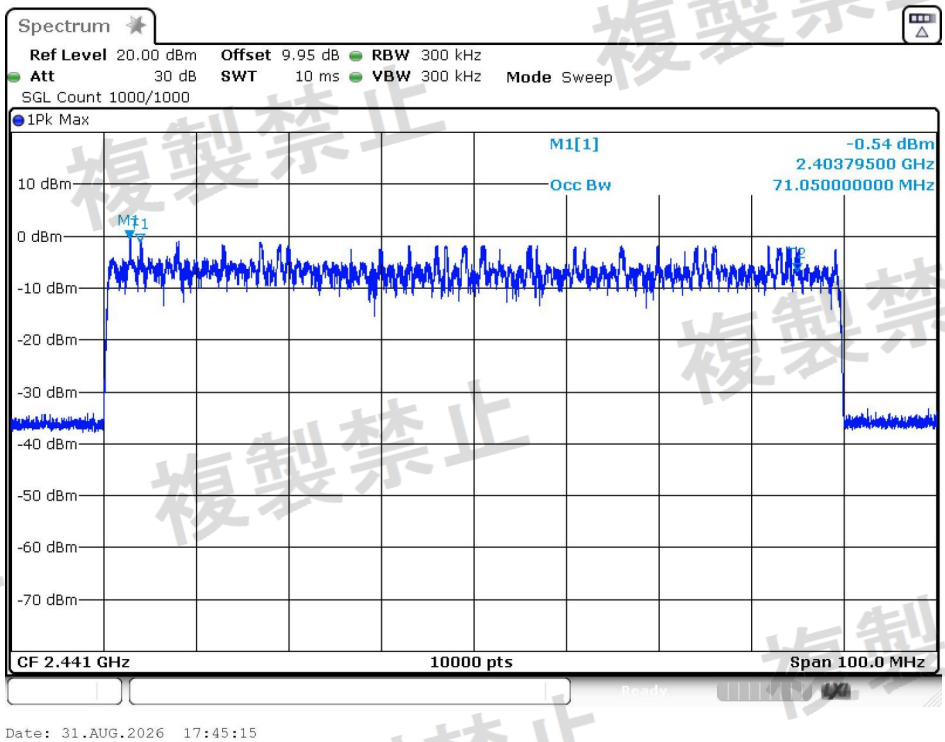
Normal Mode



NT/NV_GFSK_DH5



NT/NV_π/4DQPSK_2-DH5



NT/NV_8DPSK_3-DH5

6.5. Dwell Time

Test Result

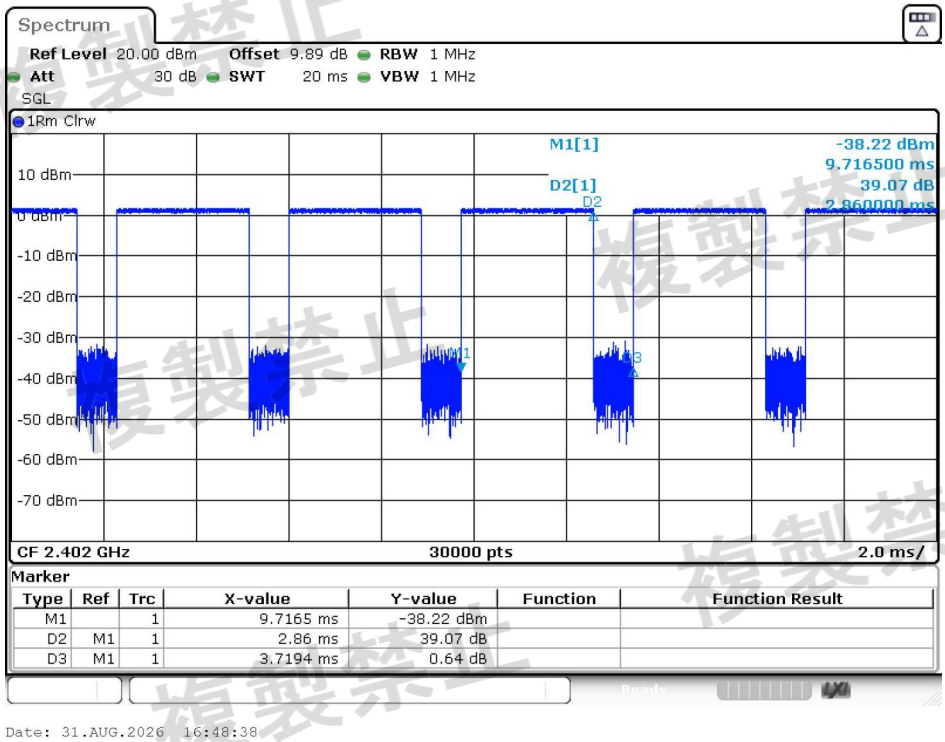
Normal Mode

Condition	Modulation	Packet	Spreading Rate	(Spreading Rate / 79) * 0.4	Burst Ratio	Dwell Time (ms)	Limit (ms)	Verdict
NT/NV	GFSK	DH5	70.99	0.3594	0.769	276	400	PASS
	π/4DQPSK	2-DH5	71.69	0.363	0.772	280	400	PASS
	8DPSK	3-DH5	71.05	0.3597	0.772	277	400	PASS

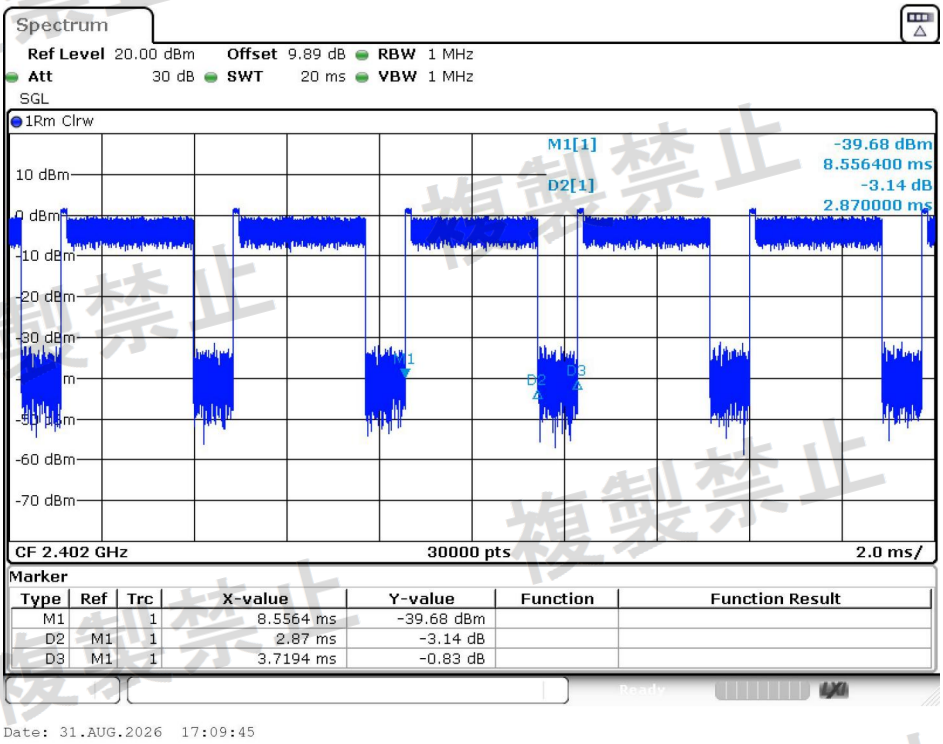
Note:
1) Spreading Rate = Spreading factor;
2) Normal mode Dwell time = (Spreading rate/79) x Burst Ratio x 0.4 seconds.
3) Burst Ratio = Duty Cycle = On Time / Period.

Test Graphs

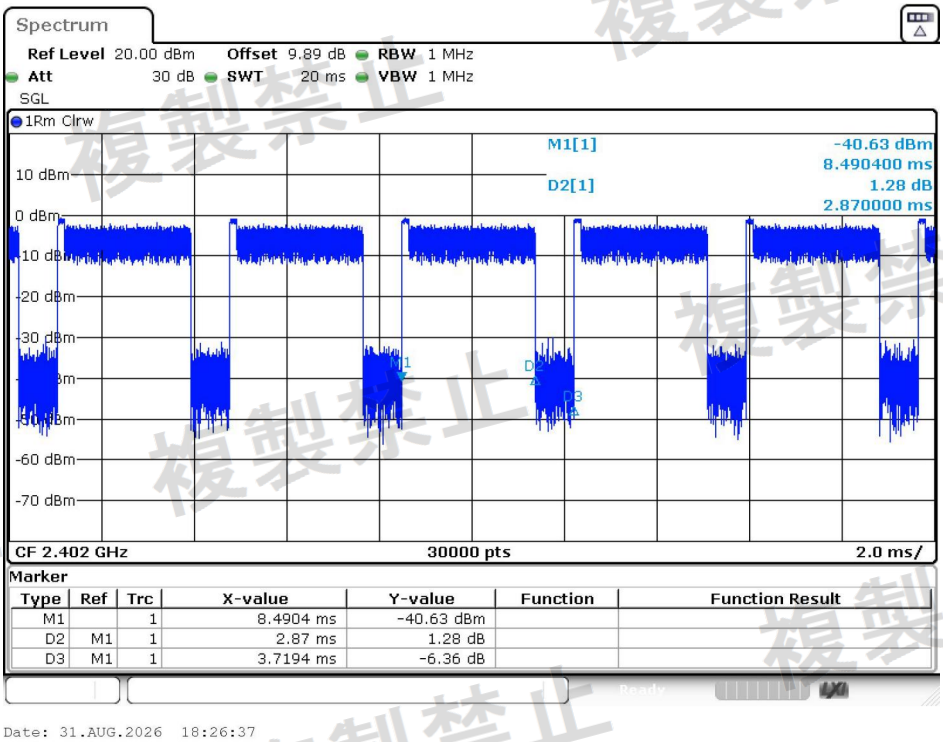
Normal Mode



Dwell Time
NT/NV_GFSK_DH5



Dwell Time
NT/NV_π/4DQPSK_2-DH5



Dwell Time
NT/NV_8DPSK_3-DH5

6.6. Spurious Emissions

Test Result

GFSK_DH5

Condition	Channel	Frequency Range (MHz)	Peak (MHz)	Measured Value (dBm/MHz)	Measured Value (uW/MHz)	Limit (uW/MHz)	Verdict
NT/NV	Lowest Channel	30 to 1000	120.040	-38.800	0.132	≤0.25	PASS
		1000 to 2387	2267.475	-39.200	0.12	≤2.5	PASS
		2387 to 2400	2399.989	-34.470	0.357	≤25	PASS
		2483.5 to 2496.5	2488.674	-37.770	0.167	≤25	PASS
		2496.5 to 12500	4803.560	-41.480	0.071	≤2.5	PASS
	Middle Channel	30 to 1000	119.992	-37.100	0.195	≤0.25	PASS
		1000 to 2387	1366.757	-39.310	0.117	≤2.5	PASS
		2387 to 2400	2399.289	-38.170	0.152	≤25	PASS
		2483.5 to 2496.5	2494.472	-38.280	0.149	≤25	PASS
		2496.5 to 12500	4803.560	-42.600	0.055	≤2.5	PASS
	Highest Channel	30 to 1000	119.992	-37.920	0.161	≤0.25	PASS
		1000 to 2387	2199.998	-39.700	0.107	≤2.5	PASS
		2387 to 2400	2396.512	-38.300	0.148	≤25	PASS
		2483.5 to 2496.5	2487.123	-37.840	0.164	≤25	PASS
		2496.5 to 12500	12251.160	-43.210	0.048	≤2.5	PASS

π/4DQPSK_2-DH5

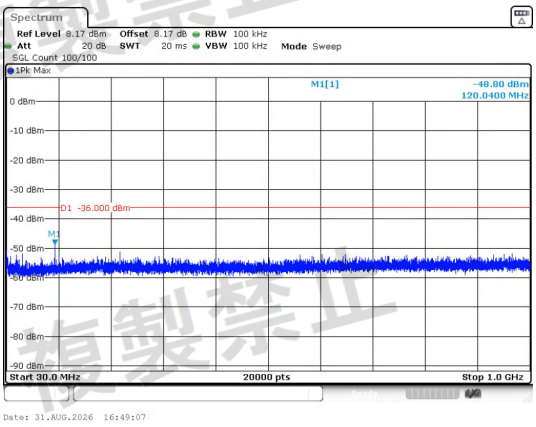
Condition	Channel	Frequency Range (MHz)	Peak (MHz)	Measured Value (dBm/MHz)	Measured Value (uW/MHz)	Limit (uW/MHz)	Verdict
NT/NV	Lowest Channel	30 to 1000	119.992	-38.910	0.129	≤0.25	PASS
		1000 to 2387	1349.836	-39.520	0.112	≤2.5	PASS
		2387 to 2400	2399.991	-29.780	1.052	≤25	PASS
		2483.5 to 2496.5	2494.438	-37.540	0.176	≤25	PASS
		2496.5 to 12500	4804.060	-39.980	0.1	≤2.5	PASS
	Middle Channel	30 to 1000	120.040	-37.800	0.166	≤0.25	PASS
		1000 to 2387	2218.792	-39.930	0.102	≤2.5	PASS
		2387 to	2391.060	-38.380	0.145	≤25	PASS

		2400					
		2483.5 to 2496.5	2488.056	-38.560	0.139	≤25	PASS
		2496.5 to 12500	5839.420	-42.950	0.051	≤2.5	PASS
	Highest Channel	30 to 1000	119.992	-39.230	0.119	≤0.25	PASS
		1000 to 2387	2202.564	-40.150	0.097	≤2.5	PASS
		2387 to 2400	2391.036	-39.400	0.115	≤25	PASS
		2483.5 to 2496.5	2485.450	-39.400	0.115	≤25	PASS
		2496.5 to 12500	6951.310	-44.020	0.04	≤2.5	PASS

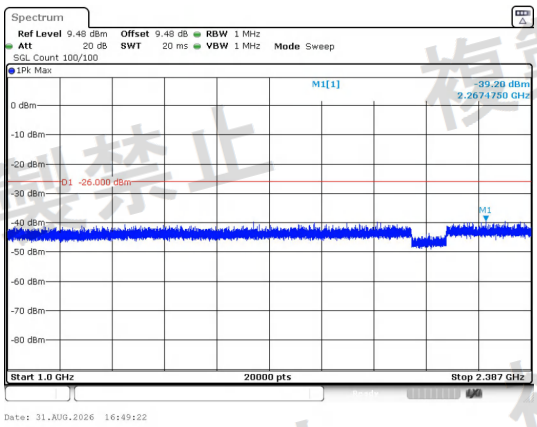
8DPSK_3-DH5

Condition	Channel	Frequency Range (MHz)	Peak (MHz)	Measured Value (dBm/MHz)	Measured Value (uW/MHz)	Limit (uW/MHz)	Verdict
NT/NV	Lowest Channel	30 to 1000	119.992	-37.940	0.161	≤0.25	PASS
		1000 to 2387	2325.729	-38.810	0.132	≤2.5	PASS
		2387 to 2400	2399.997	-32.730	0.533	≤25	PASS
		2483.5 to 2496.5	2495.902	-37.680	0.171	≤25	PASS
		2496.5 to 12500	11209.300	-42.560	0.055	≤2.5	PASS
	Middle Channel	30 to 1000	119.992	-37.570	0.175	≤0.25	PASS
		1000 to 2387	1867.187	-39.420	0.114	≤2.5	PASS
		2387 to 2400	2393.461	-38.930	0.128	≤25	PASS
		2483.5 to 2496.5	2484.007	-37.710	0.169	≤25	PASS
		2496.5 to 12500	6991.320	-43.750	0.042	≤2.5	PASS
	Highest Channel	30 to 1000	120.040	-38.180	0.152	≤0.25	PASS
		1000 to 2387	2277.462	-39.290	0.118	≤2.5	PASS
		2387 to 2400	2399.450	-38.940	0.128	≤25	PASS
		2483.5 to 2496.5	2494.331	-38.060	0.156	≤25	PASS
		2496.5 to 12500	5911.440	-42.970	0.05	≤2.5	PASS

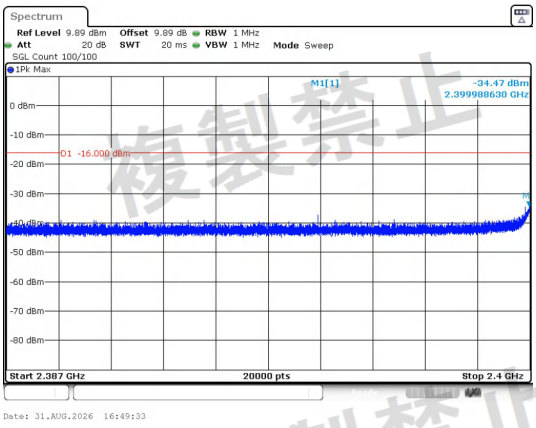
Test Graphs



30 to 1000MHz
NT/NV_GFSK_DH5_Channel 0



1000 to 2387MHz
NT/NV_GFSK_DH5_Channel 0



2387 to 2400MHz
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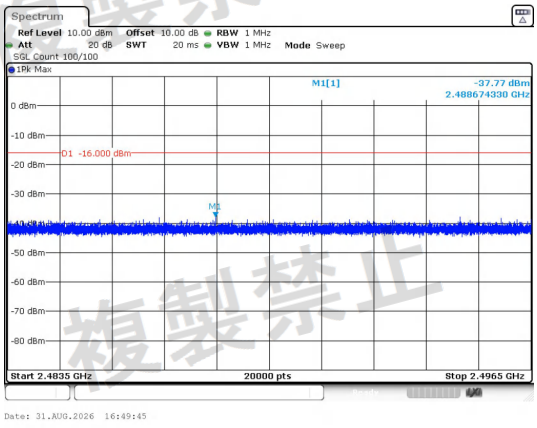
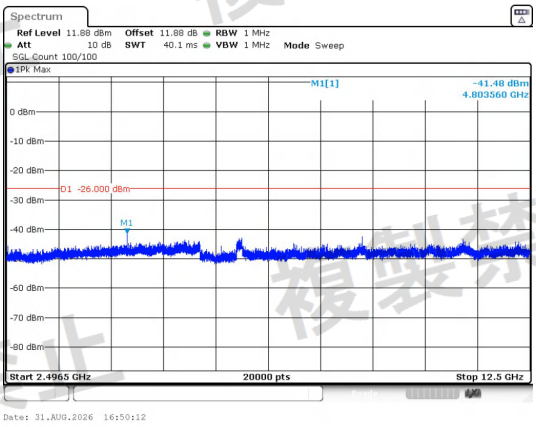
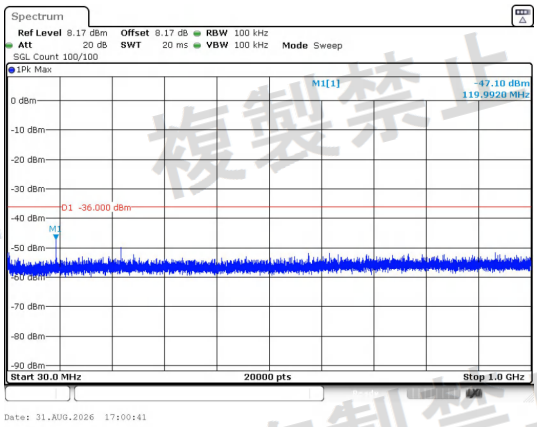


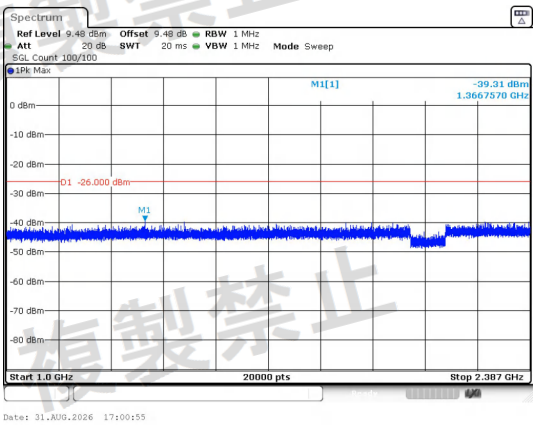
2483.5 to 2496.5MHz
NT/NV_GFSK_DH5_Channel 0



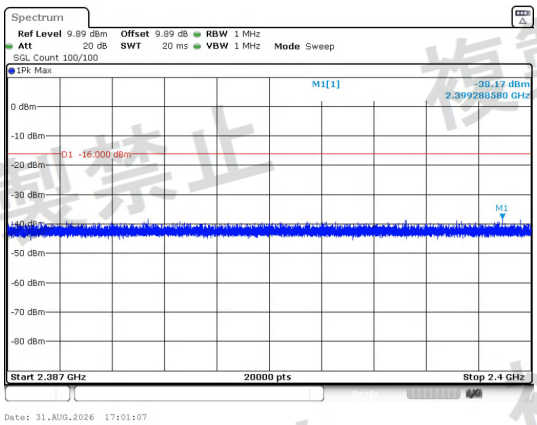
2496.5 to 12500MHz
NT/NV_GFSK_DH5_Channel 0



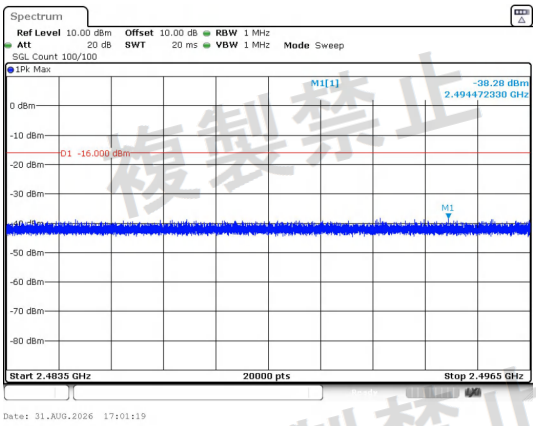
30 to 1000MHz
NT/NV_GFSK_DH5_Channel 39



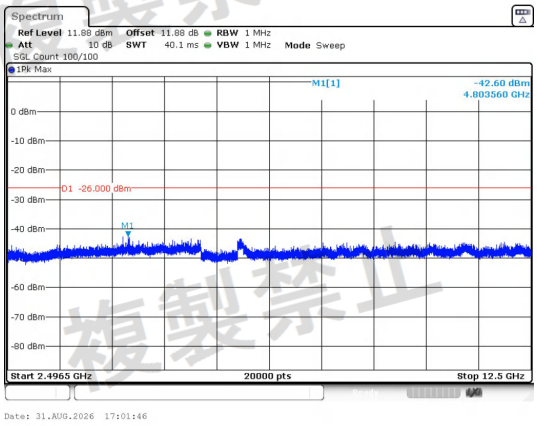
1000 to 2387MHz
NT/NV_GFSK_DH5_Channel 39



2387 to 2400MHz
NT/NV_GFSK_DH5_Channel 39



2483.5 to 2496.5MHz
NT/NV_GFSK_DH5_Channel 39



2496.5 to 12500MHz
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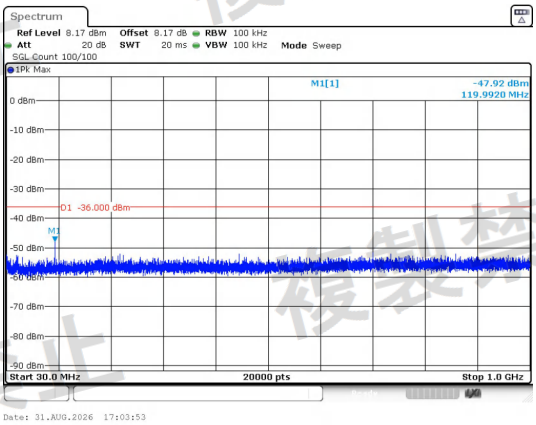
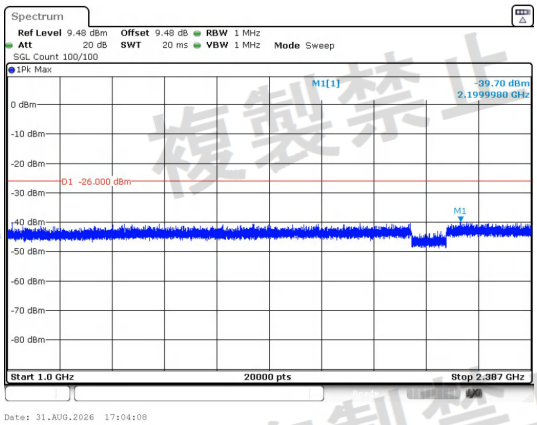
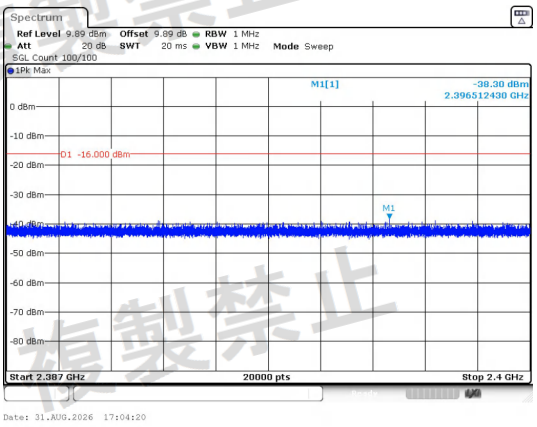


30 to 1000MHz
NT/NV_GFSK_DH5_Channel 78

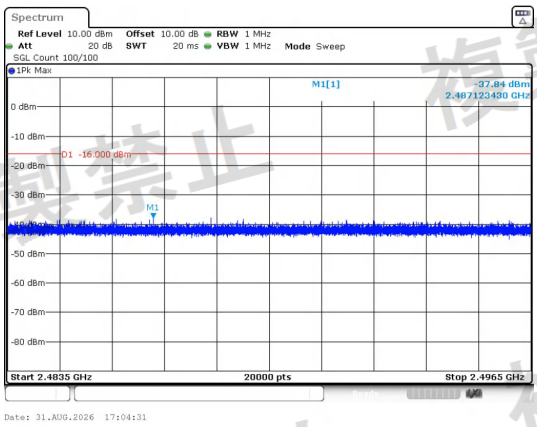


1000 to 2387MHz
NT/NV_GFSK_DH5_Channel 78

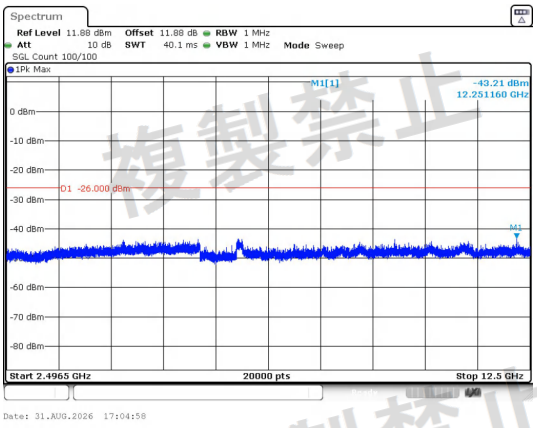
複製禁止



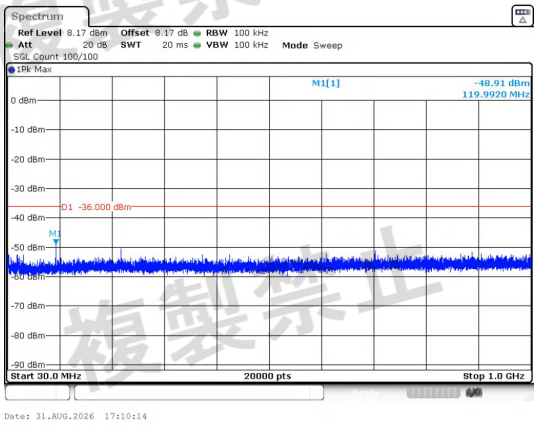
2387 to 2400MHz
NT/NV_GFSK_DH5_Channel 78



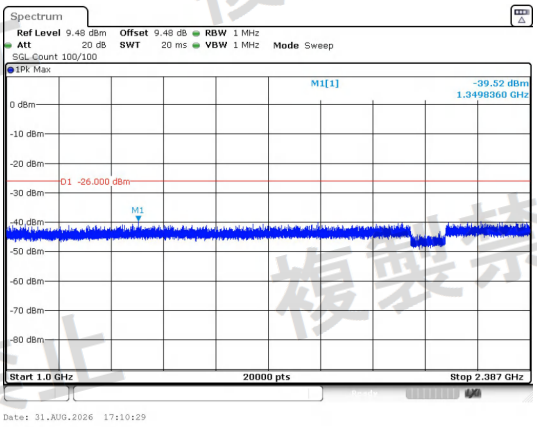
2483.5 to 2496.5MHz
NT/NV_GFSK_DH5_Channel 78



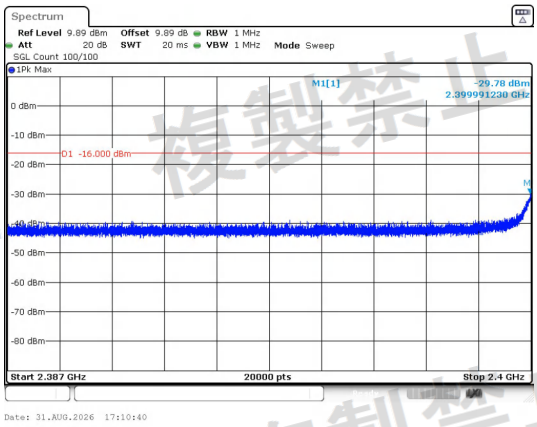
2496.5 to 12500MHz
NT/NV_GFSK_DH5_Channel 78



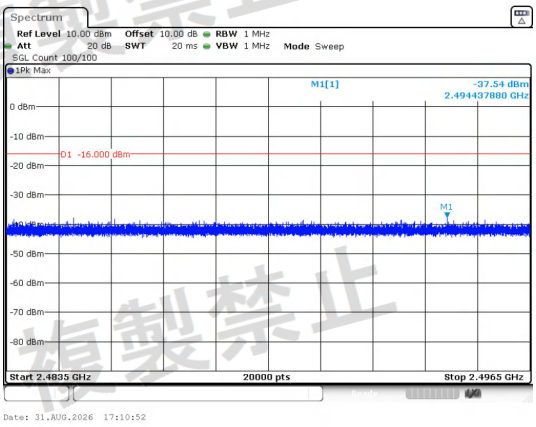
30 to 1000MHz
NT/NV_π/4DQPSK_2-DH5_Channel 0



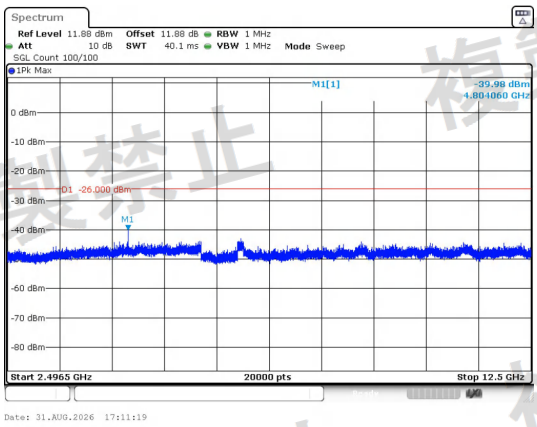
1000 to 2387MHz
NT/NV_π/4DQPSK_2-DH5_Channel 0



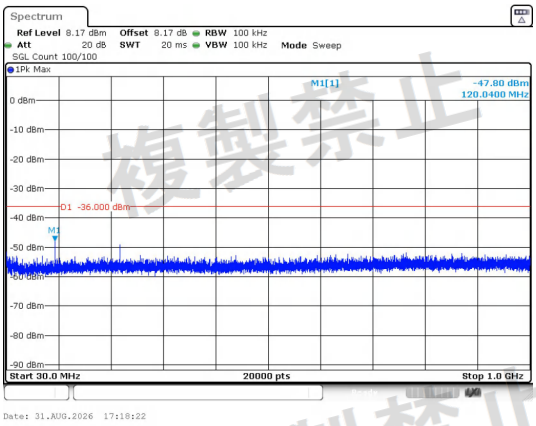
2387 to 2400MHz
NT/NV_π/4DQPSK_2-DH5_Channel 0



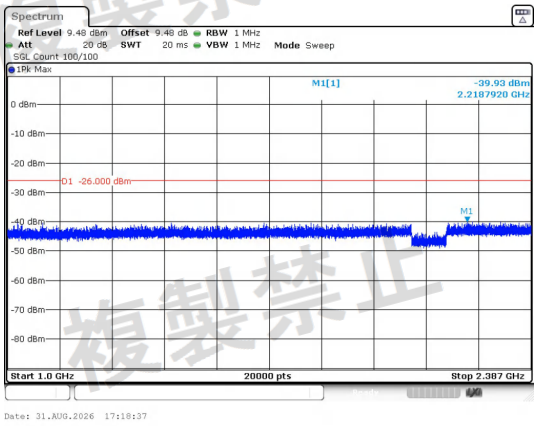
2483.5 to 2496.5MHz
NT/NV_π/4DQPSK_2-DH5_Channel 0



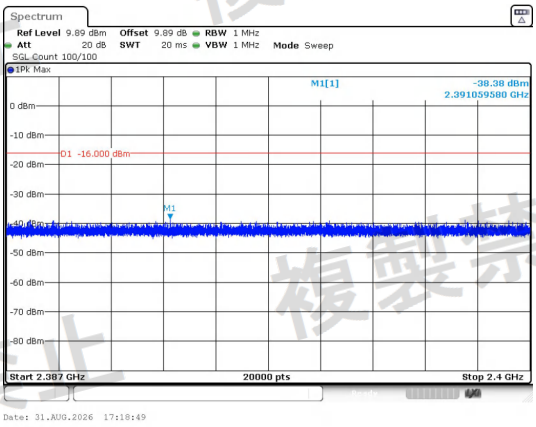
2496.5 to 12500MHz
NT/NV_π/4DQPSK_2-DH5_Channel 0



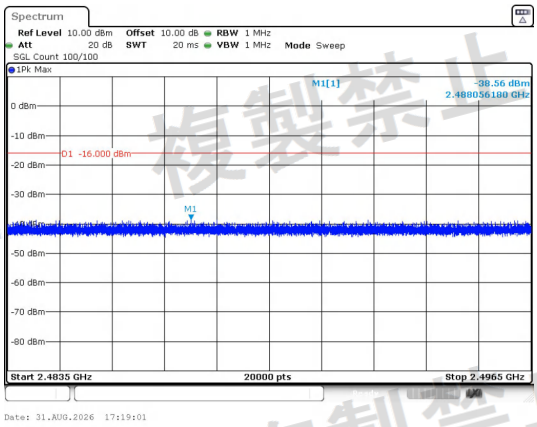
30 to 1000MHz
NT/NV_π/4DQPSK_2-DH5_Channel 39



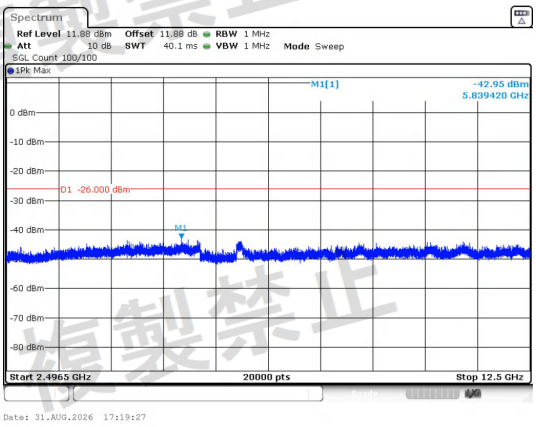
1000 to 2387MHz
NT/NV_π/4DQPSK_2-DH5_Channel 39



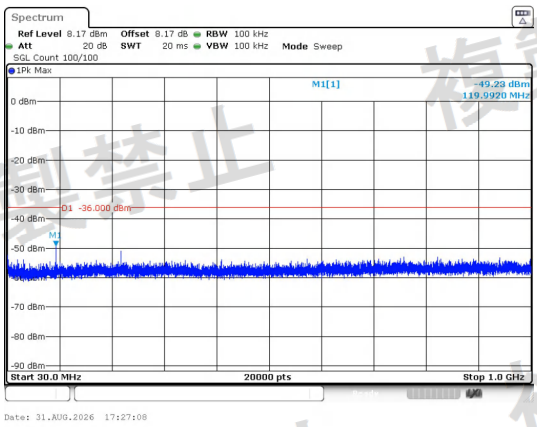
2387 to 2400MHz
NT/NV_π/4DQPSK_2-DH5_Channel 39



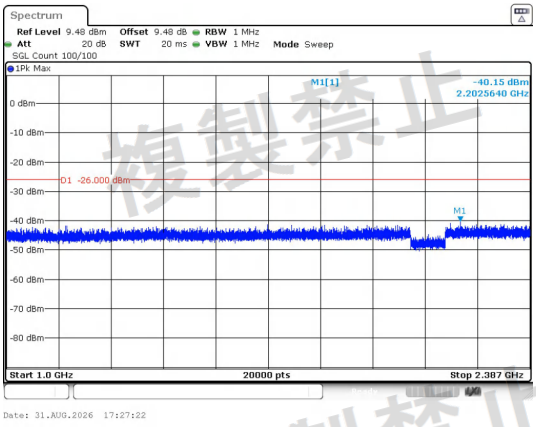
2483.5 to 2496.5MHz
NT/NV_π/4DQPSK_2-DH5_Channel 39



2496.5 to 12500MHz
NT/NV_π/4DQPSK_2-DH5_Channel 39



30 to 1000MHz
NT/NV_π/4DQPSK_2-DH5_Channel 78



1000 to 2387MHz
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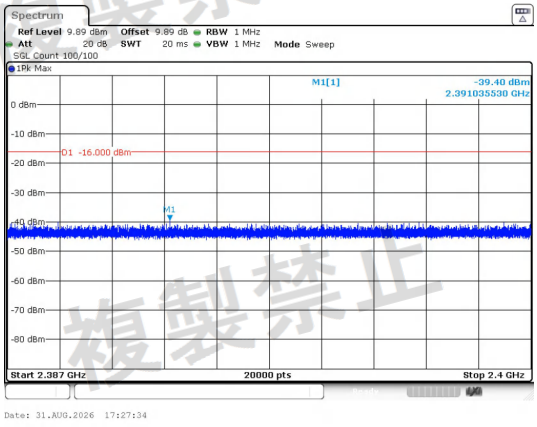
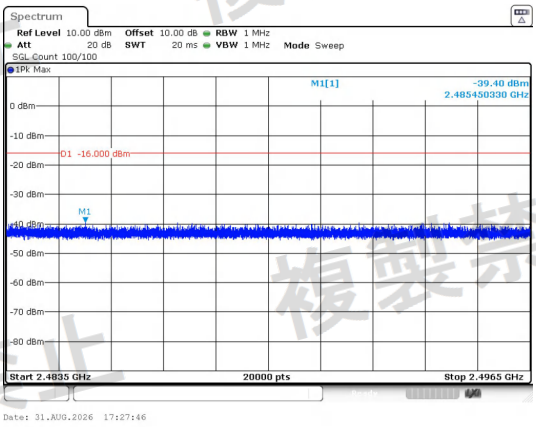


2387 to 2400MHz
NT/NV_π/4DQPSK_2-DH5_Channel 78



2483.5 to 2496.5MHz
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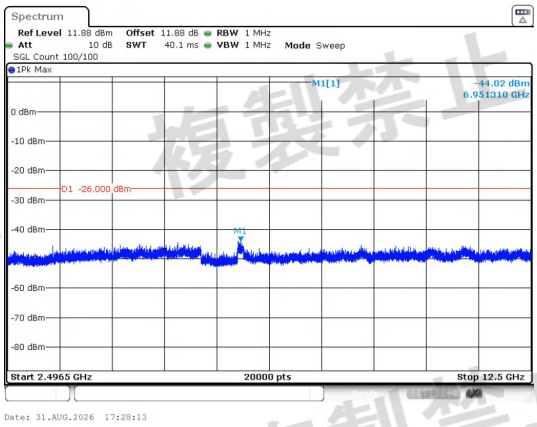
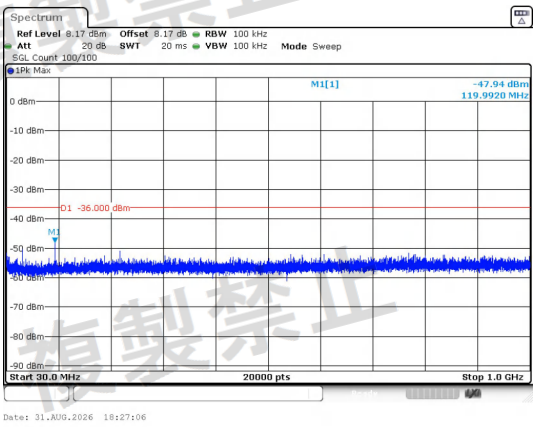
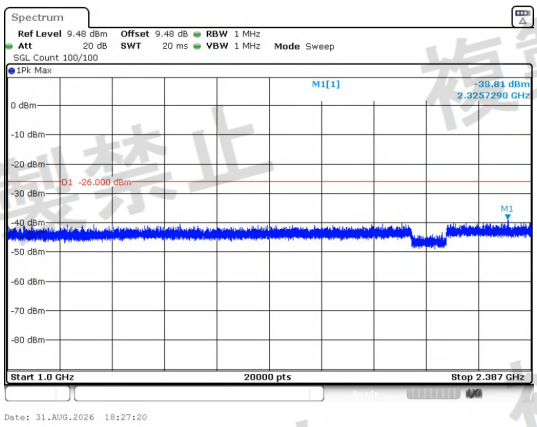


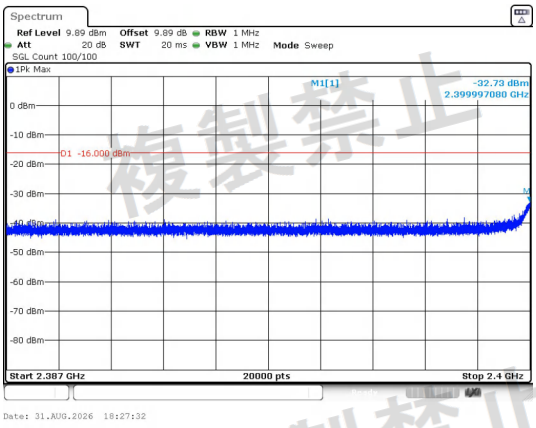
2496.5 to 12500MHz
NT/NV_π/4DQPSK_2-DH5_Channel 78



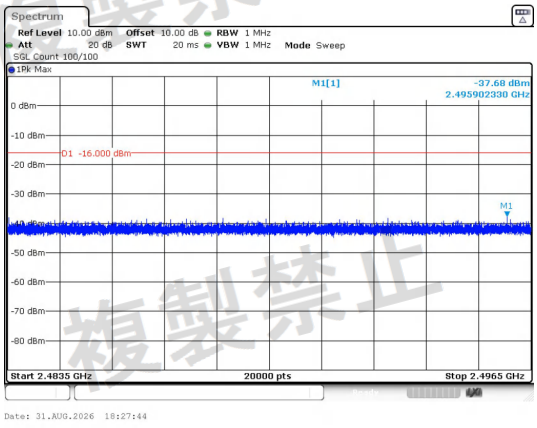
30 to 1000MHz
NT/NV_8DPSK_3-DH5_Channel 0



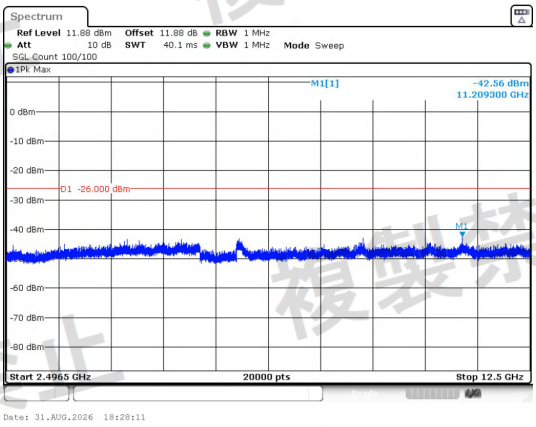
1000 to 2387MHz
NT/NV_8DPSK_3-DH5_Channel 0



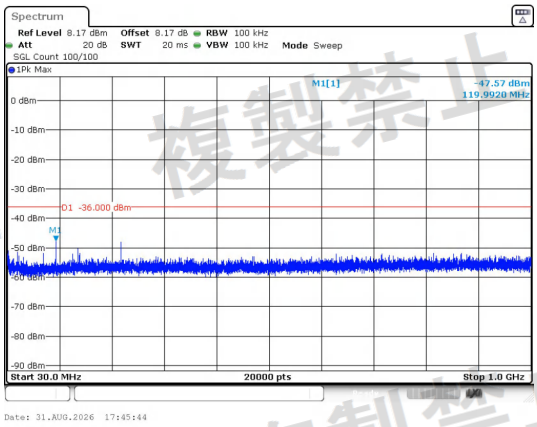
2387 to 2400MHz
NT/NV_8DPSK_3-DH5_Channel 0



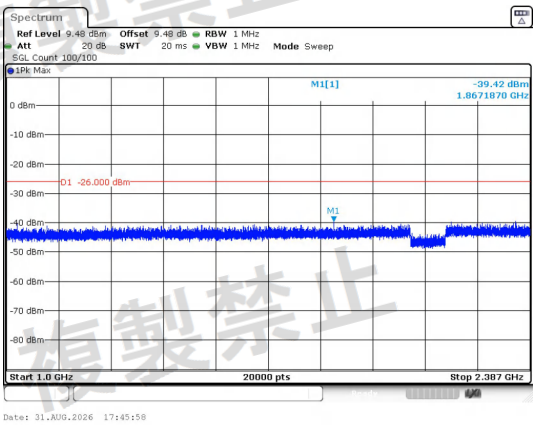
2483.5 to 2496.5MHz
NT/NV_8DPSK_3-DH5_Channel 0



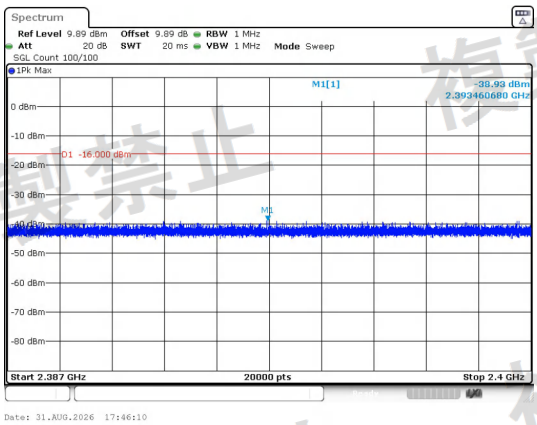
2496.5 to 12500MHz
NT/NV_8DPSK_3-DH5_Channel 0



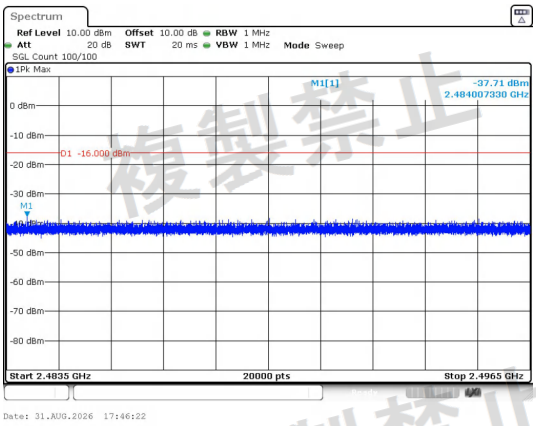
30 to 1000MHz
NT/NV_8DPSK_3-DH5_Channel 39



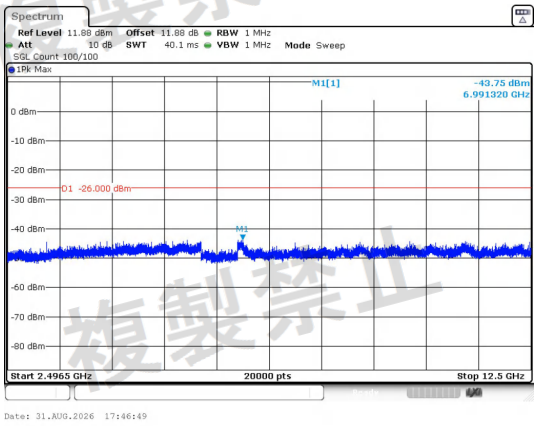
1000 to 2387MHz
NT/NV_8DPSK_3-DH5_Channel 39



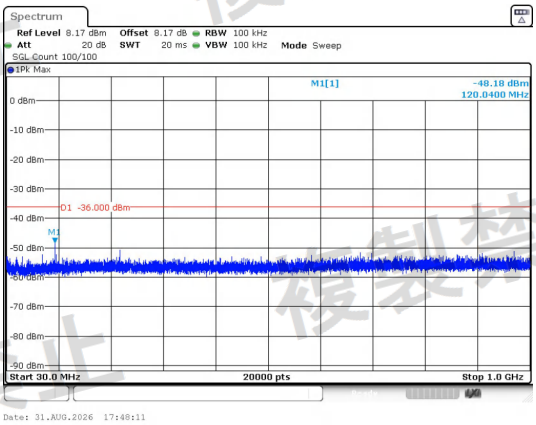
2387 to 2400MHz
NT/NV_8DPSK_3-DH5_Channel 39



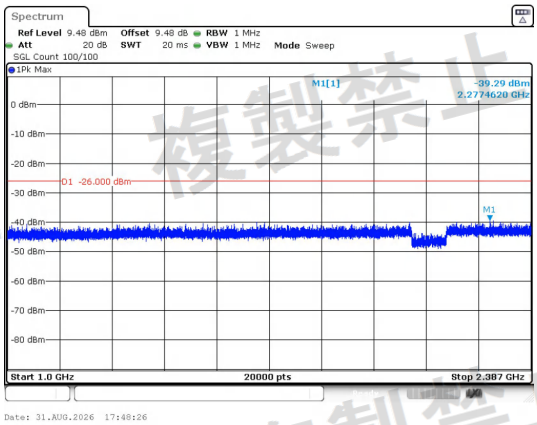
2483.5 to 2496.5MHz
NT/NV_8DPSK_3-DH5_Channel 39



2496.5 to 12500MHz
NT/NV_8DPSK_3-DH5_Channel 39

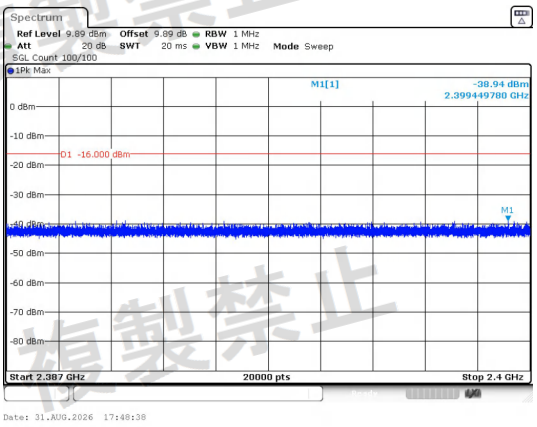


30 to 1000MHz
NT/NV_8DPSK_3-DH5_Channel 78

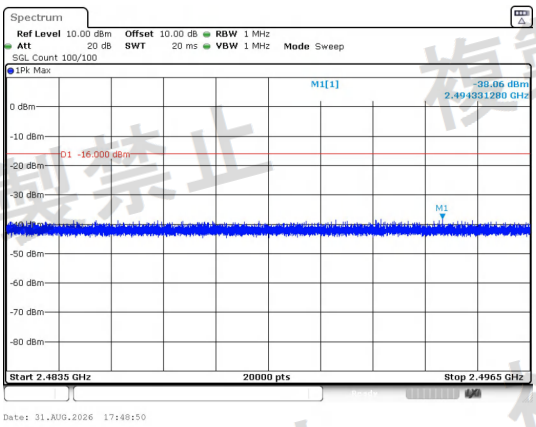


1000 to 2387MHz
NT/NV_8DPSK_3-DH5_Channel 78

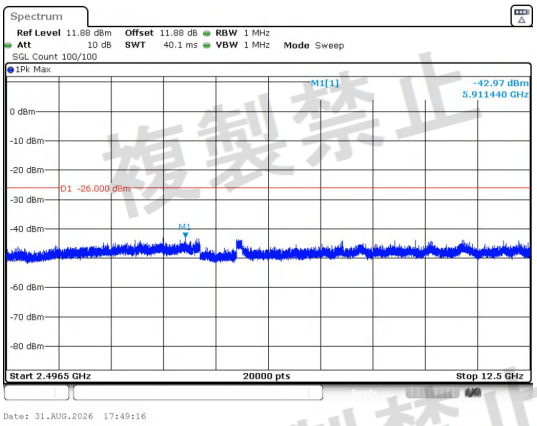
複製禁止



2387 to 2400MHz
NT/NV_8DPSK_3-DH5_Channel 78



2483.5 to 2496.5MHz
NT/NV_8DPSK_3-DH5_Channel 78



2496.5 to 12500MHz
NT/NV_8DPSK_3-DH5_Channel 78

6.7. Spurious Emissions of Receiver

Test Result

Normal mode_GFSK_DH5

Condition	Channel	Frequency Range (MHz)	Peak (MHz)	Measured Value (dBm)	Limit		Verdict
					dBm	nW	
NT/NV	0	30 to 1000	30.625	-56.680	-54	≤4	PASS
		1000 to 12500	2473.342	-48.190	-47	≤20	PASS
	39	30 to 1000	30.625	-56.940	-54	≤4	PASS
		1000 to 12500	2473.725	-54.130	-47	≤20	PASS
	78	30 to 1000	30.025	-58.270	-54	≤4	PASS
		1000 to 12500	2473.725	-51.660	-47	≤20	PASS

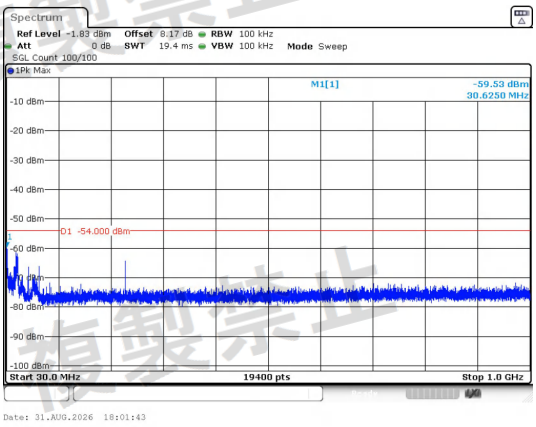
Normal mode_π/4DQPSK_2-DH5

Condition	Channel	Frequency Range (MHz)	Peak (MHz)	Measured Value (dBm)	Limit		Verdict
					dBm	nW	
NT/NV	0	30 to 1000	30.625	-56.770	-54	≤4	PASS
		1000 to 12500	2474.108	-49.430	-47	≤20	PASS
	39	30 to 1000	30.625	-57.000	-54	≤4	PASS
		1000 to 12500	2472.958	-52.030	-47	≤20	PASS
	78	30 to 1000	30.625	-56.480	-54	≤4	PASS
		1000 to 12500	2471.808	-49.410	-47	≤20	PASS

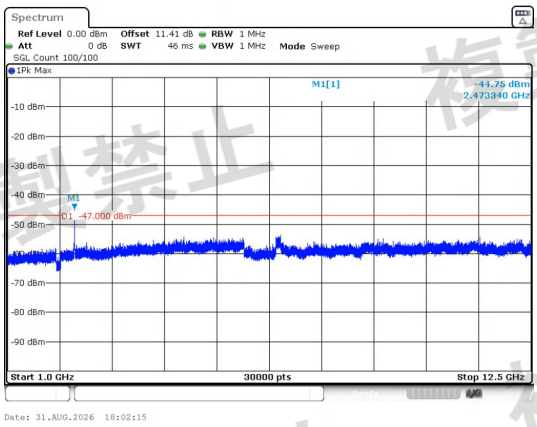
Normal mode_8DPSK_3-DH5

Condition	Channel	Frequency Range (MHz)	Peak (MHz)	Measured Value (dBm)	Limit		Verdict
					dBm	nW	
NT/NV	0	30 to 1000	30.575	-57.370	-54	≤4	PASS
		1000 to 12500	2471.808	-51.690	-47	≤20	PASS
	39	30 to 1000	30.025	-57.670	-54	≤4	PASS
		1000 to 12500	2473.725	-51.880	-47	≤20	PASS
	78	30 to 1000	30.025	-58.050	-54	≤4	PASS
		1000 to 12500	2471.425	-51.350	-47	≤20	PASS

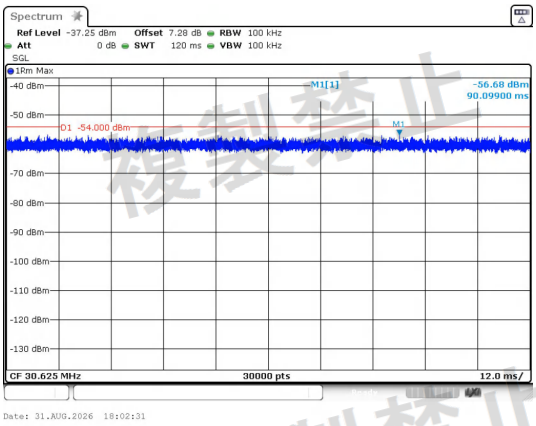
Test Graphs



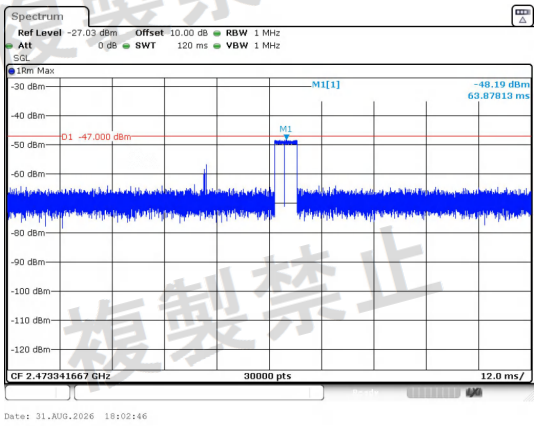
30MHz - 1000MHz
NT/NV_GFSK_DH5_Channel 0



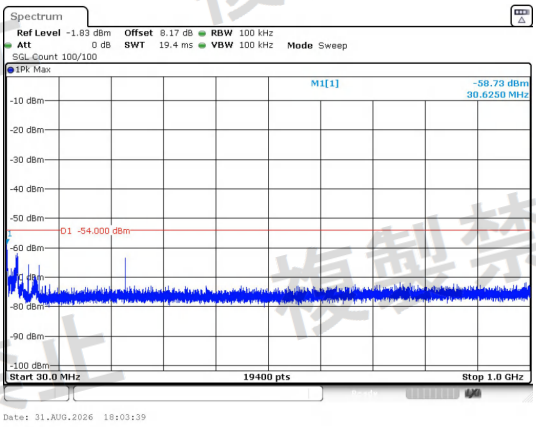
> 1GHz
NT/NV_GFSK_DH5_Channel 0



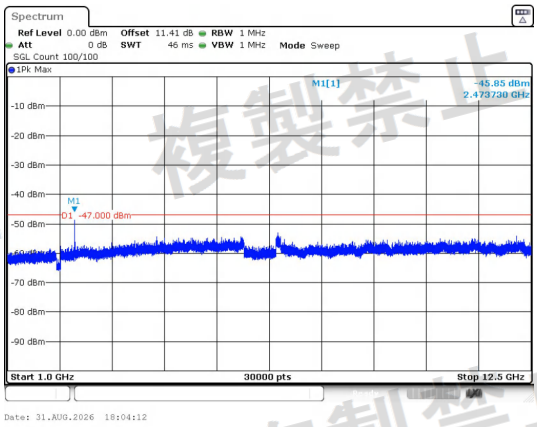
Unwant Emission Frequency: 30.62MHz
NT/NV_GFSK_DH5_Channel 0



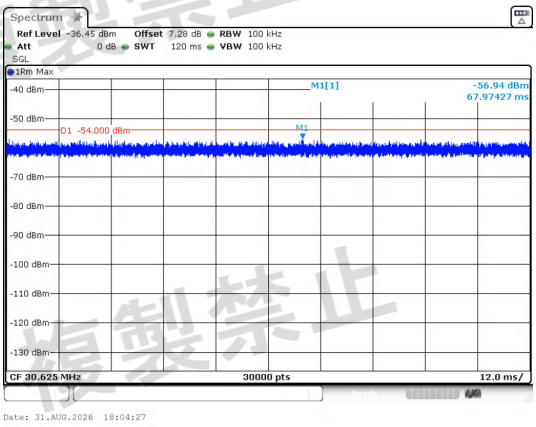
Unwant Emission Frequency: 2473.34MHz
NT/NV_GFSK_DH5_Channel 0



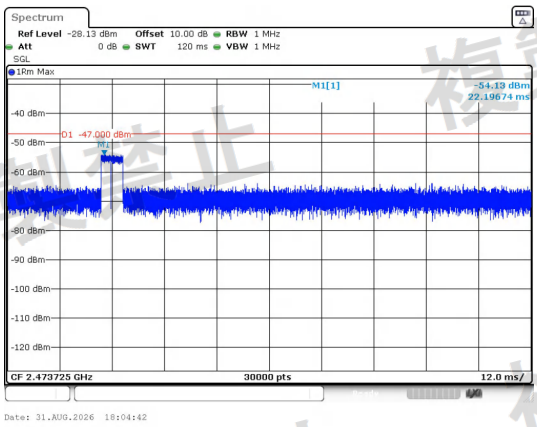
30MHz - 1000MHz
NT/NV_GFSK_DH5_Channel 39



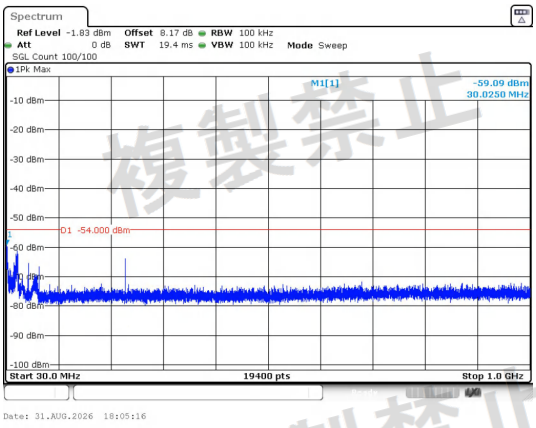
> 1GHz
NT/NV_GFSK_DH5_Channel 39



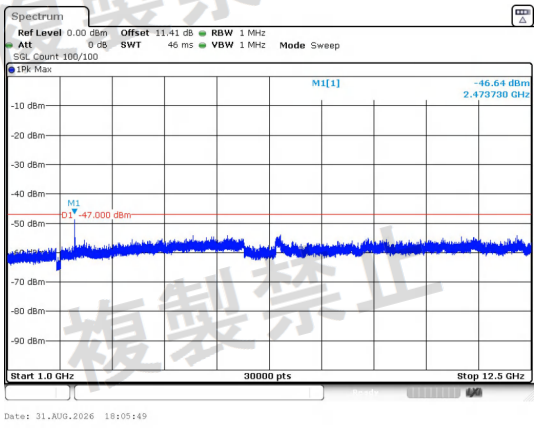
Unwant Emission Frequency: 30.62MHz
NT/NV_GFSK_DH5_Channel 39



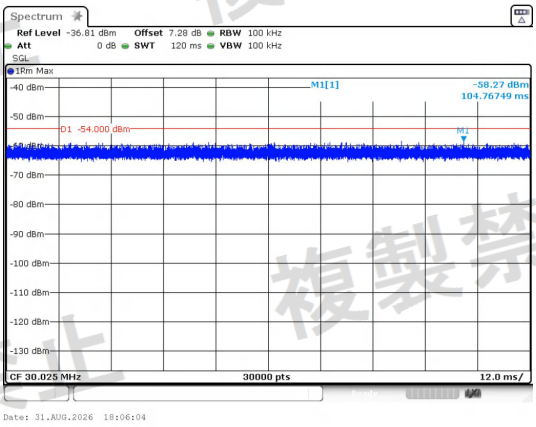
Unwant Emission Frequency: 2473.72MHz
NT/NV_GFSK_DH5_Channel 39



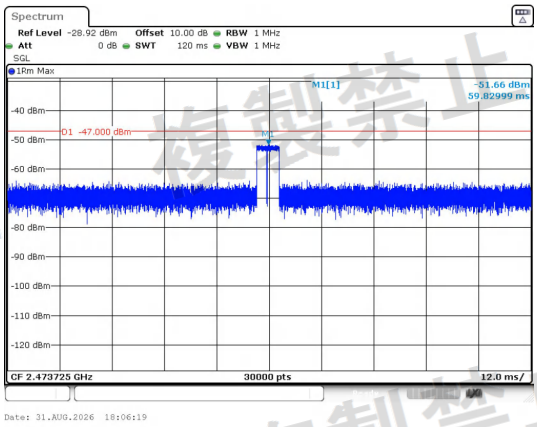
30MHz - 1000MHz
NT/NV_GFSK_DH5_Channel 78



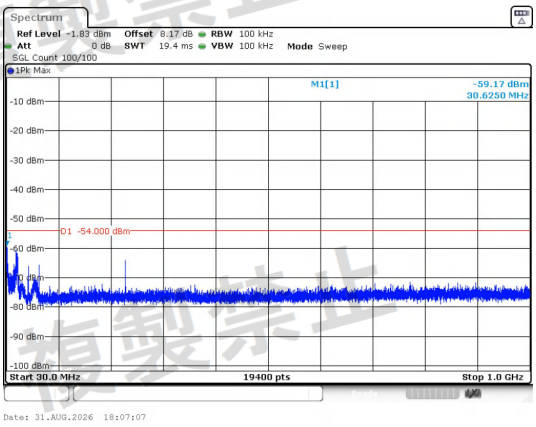
> 1GHz
NT/NV_GFSK_DH5_Channel 78



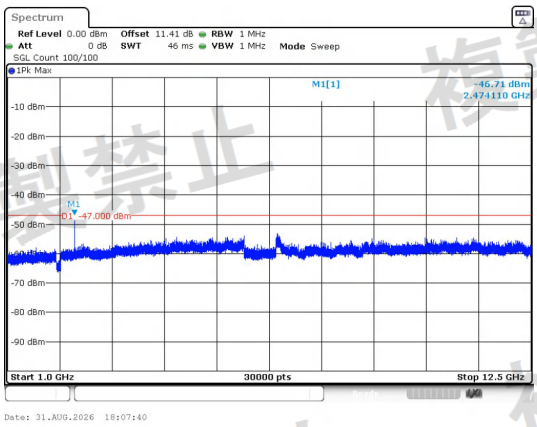
Unwant Emission Frequency: 30.02MHz
NT/NV_GFSK_DH5_Channel 78



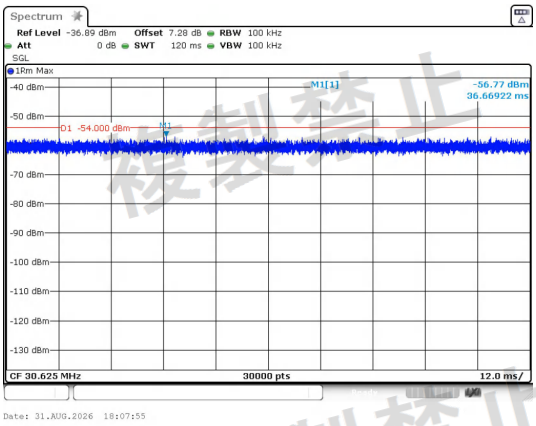
Unwant Emission Frequency: 2473.72MHz
NT/NV_GFSK_DH5_Channel 78



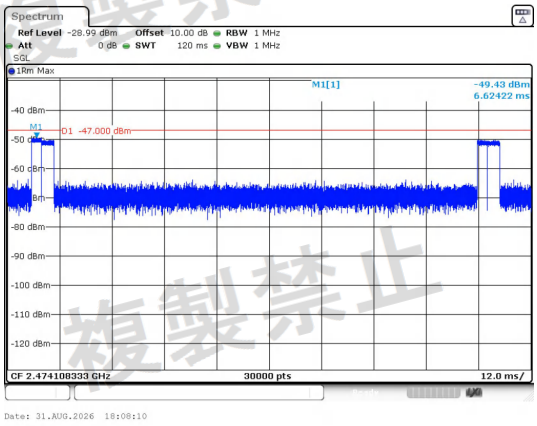
30MHz - 1000MHz
NT/NV_π/4DQPSK_2-DH5_Channel 0



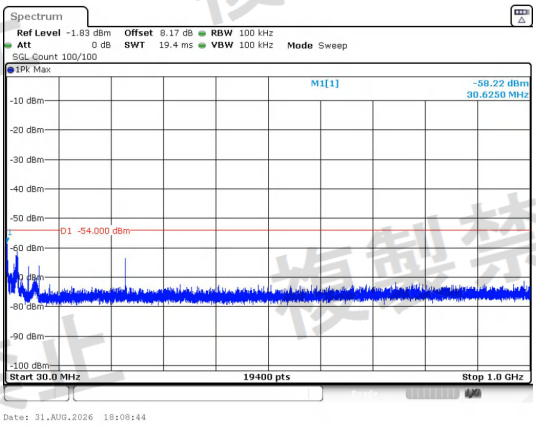
> 1GHz
NT/NV_π/4DQPSK_2-DH5_Channel 0



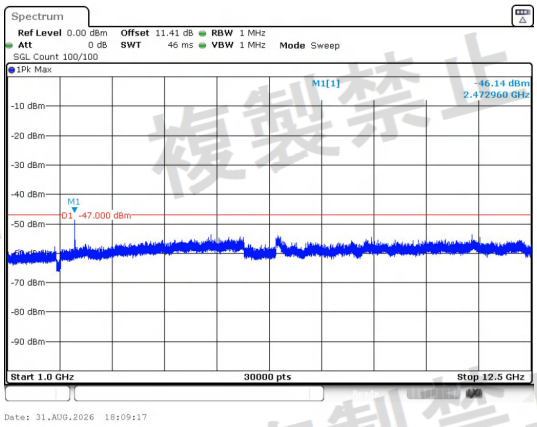
Unwant Emission Frequency: 30.62MHz
NT/NV_π/4DQPSK_2-DH5_Channel 0



Unwant Emission Frequency: 2474.11MHz
NT/NV_π/4DQPSK_2-DH5_Channel 0

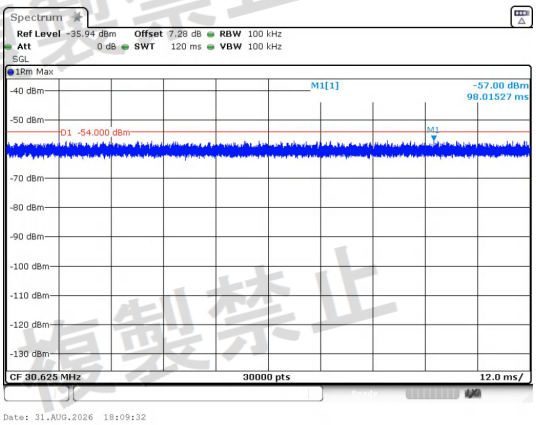


30MHz - 1000MHz
NT/NV_π/4DQPSK_2-DH5_Channel 39

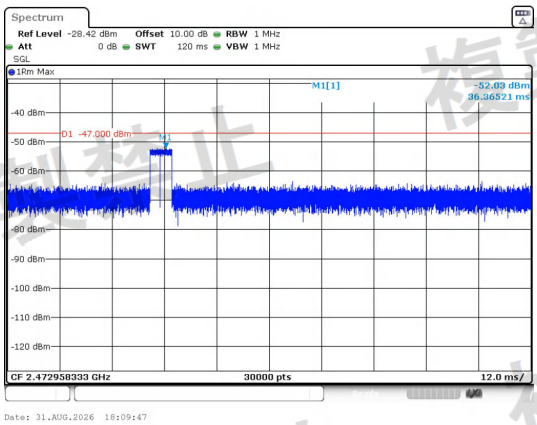


> 1GHz
NT/NV_π/4DQPSK_2-DH5_Channel 39

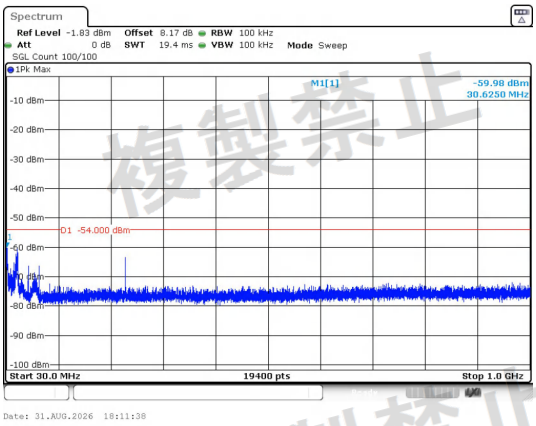
複製禁止



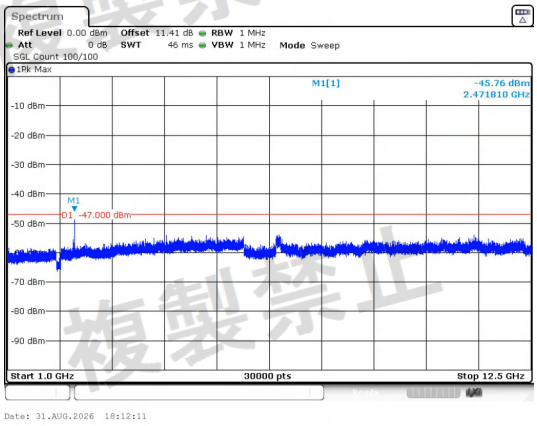
Unwant Emission Frequency: 30.62MHz
NT/NV_π/4DQPSK_2-DH5_Channel 39



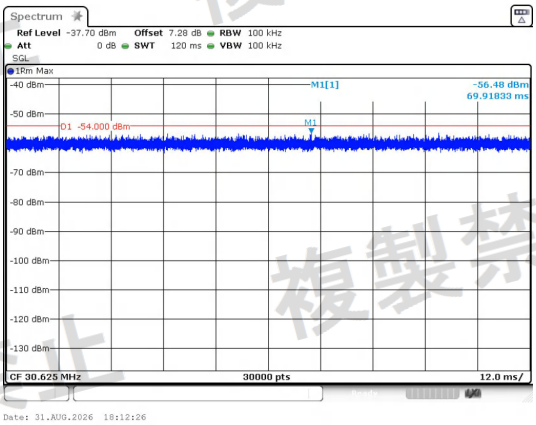
Unwant Emission Frequency: 2472.96MHz
NT/NV_π/4DQPSK_2-DH5_Channel 39



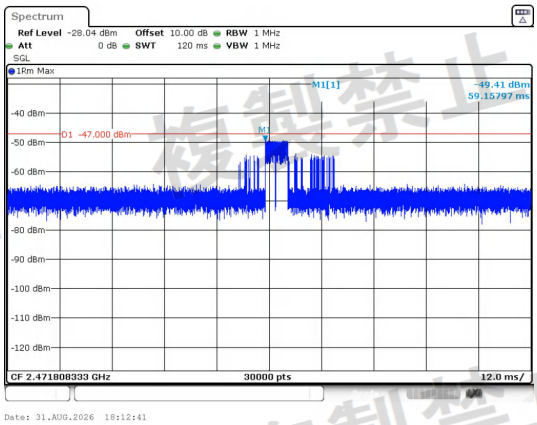
30MHz - 1000MHz
NT/NV_π/4DQPSK_2-DH5_Channel 78



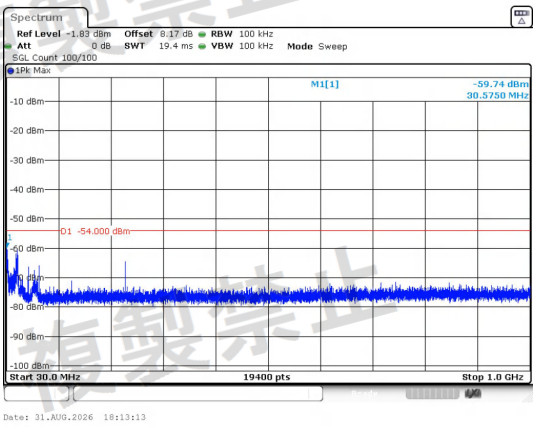
> 1GHz
NT/NV_π/4DQPSK_2-DH5_Channel 78



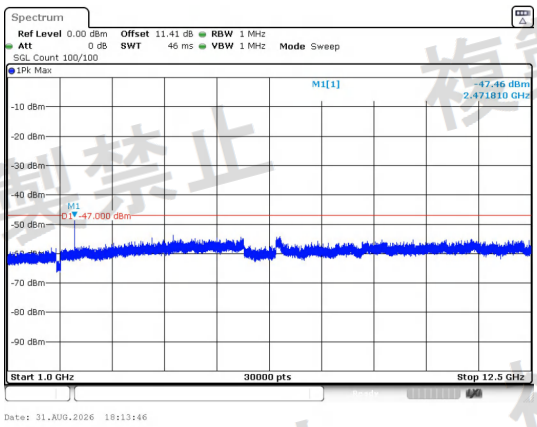
Unwant Emission Frequency: 30.62MHz
NT/NV_π/4DQPSK_2-DH5_Channel 78



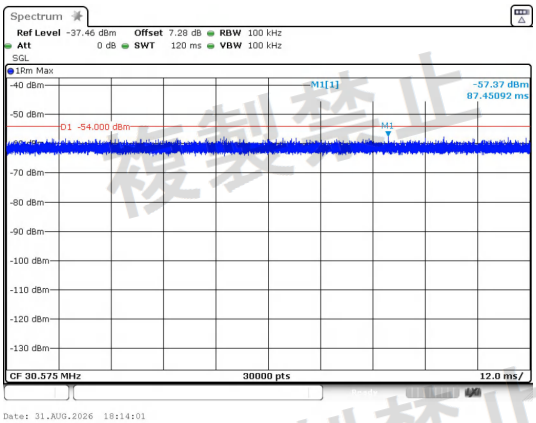
Unwant Emission Frequency: 2471.81MHz
NT/NV_π/4DQPSK_2-DH5_Channel 78



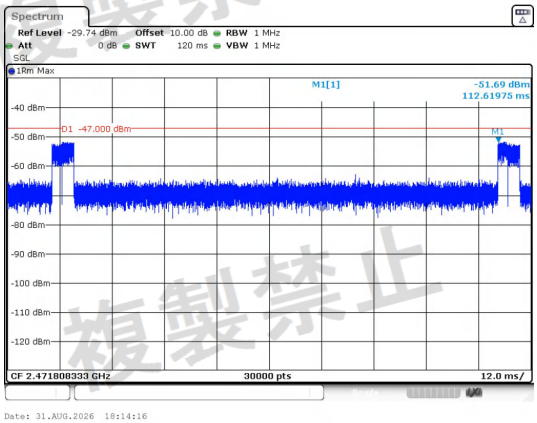
30MHz - 1000MHz
NT/NV_8DPSK_3-DH5_Channel 0



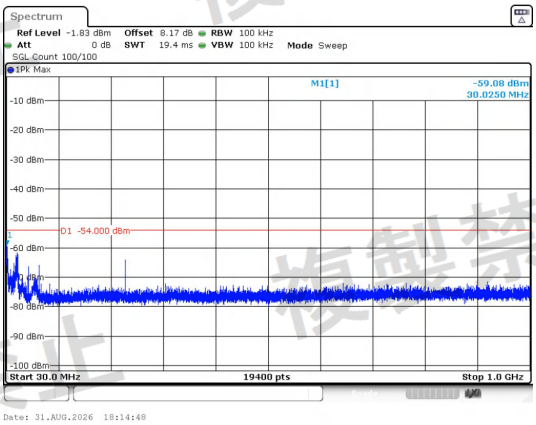
> 1GHz
NT/NV_8DPSK_3-DH5_Channel 0



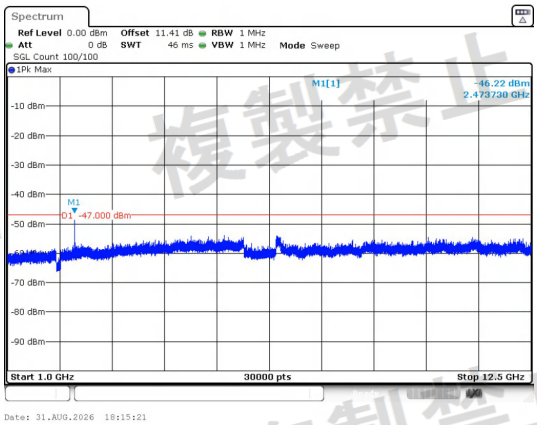
Unwant Emission Frequency: 30.57MHz
NT/NV_8DPSK_3-DH5_Channel 0



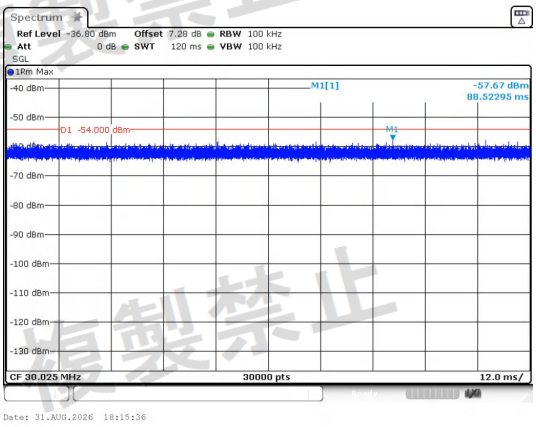
Unwant Emission Frequency: 2471.81MHz
NT/NV_8DPSK_3-DH5_Channel 0



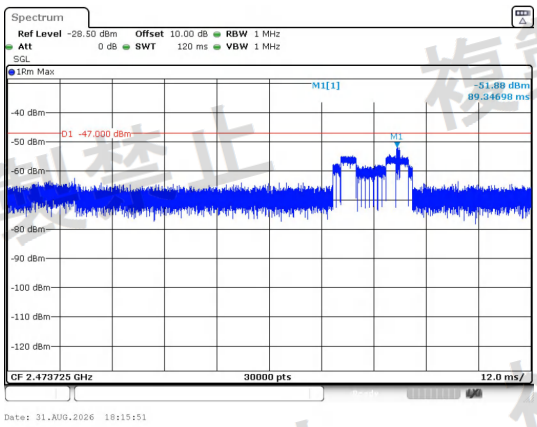
30MHz - 1000MHz
NT/NV_8DPSK_3-DH5_Channel 39



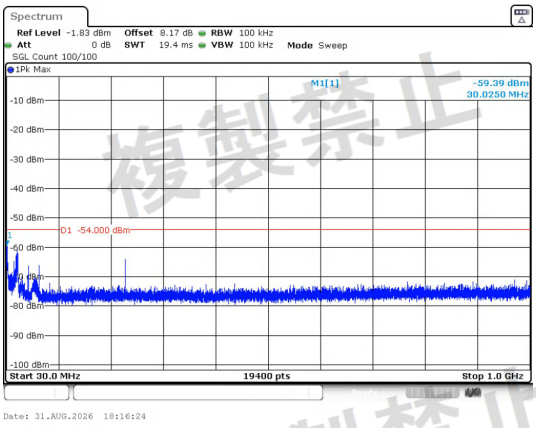
> 1GHz
NT/NV_8DPSK_3-DH5_Channel 39



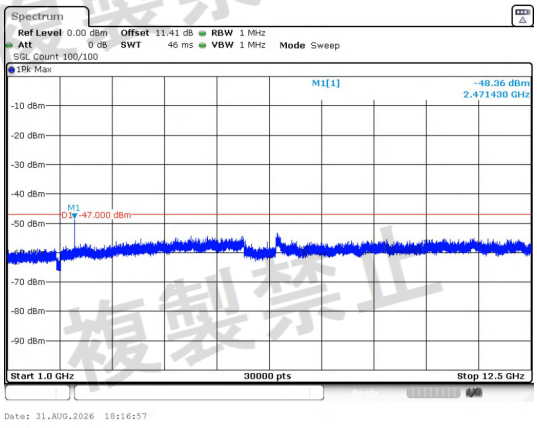
Unwant Emission Frequency: 30.02MHz
NT/NV_8DPSK_3-DH5_Channel 39



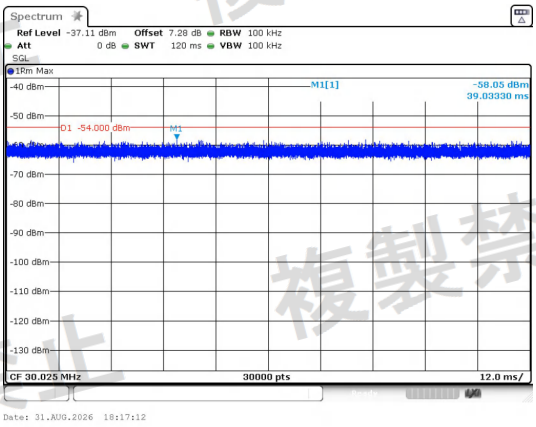
Unwant Emission Frequency: 2473.72MHz
NT/NV_8DPSK_3-DH5_Channel 39



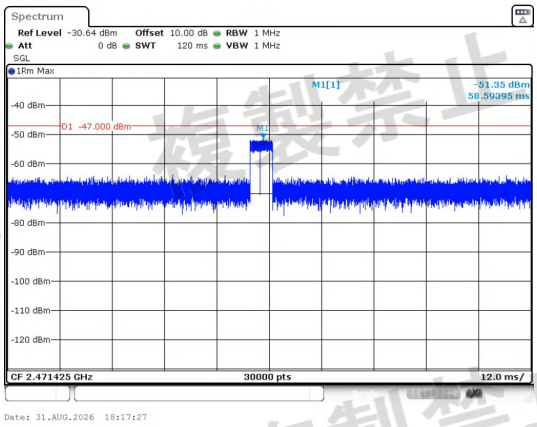
30MHz - 1000MHz
NT/NV_8DPSK_3-DH5_Channel 78



> 1GHz
NT/NV_8DPSK_3-DH5_Channel 78



Unwant Emission Frequency: 30.02MHz
NT/NV_8DPSK_3-DH5_Channel 78



Unwant Emission Frequency: 2471.43MHz
NT/NV_8DPSK_3-DH5_Channel 78

------End of the report-----