

Test Report

Applicant: Marshall Group AB

Address: Centralplan 15 111 20 Stockholm Sweden

Manufacturer: Marshall Group AB

Address: Centralplan 15 111 20 Stockholm Sweden

Product(s): PARTY SPEAKER

Brand(s): Marshall, *Marshall*

Test Model(s): BROMLEY 150

Series Model(s): N/A

Test Date: Apr. 27, 2026 ~ May 17, 2026

Issued Date: May 18, 2026

Issued By: Hwa-Hsing (Dongguan) Testing Co., Ltd.

Address: No.101, Building N1, Yuyuan 2 Road, Yuyuan Industrial Park,
HuangJiang Town, Dongguan City, People's Republic of China

Standards: Article 2 Paragraph 1, item 19, MIC notice 88 Appendix 43

The above equipment has been tested by **Hwa-Hsing (Dongguan) Testing Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :

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Reviewed by :



Approved by :

Scott He

Scott He

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Release Control Record

Issue No.	Description	Date Issued
26040707-RF-JP-02	Original Release	May 18, 2026

1 Summary of Test Results

The EUT has been tested according to the following specifications:

Article 2 Paragraph 1, item 19	ARIB STD-T66	Report reference	Parameter	Test Results (Note)
General provisions				
C	3.2(4)	4.1	Frequency tolerance	C
D	3.2(7)	4.2	Occupied bandwidth	C
E	3.2(6)	4.4	Spurious emissions	C
Transmitting equipment				
F	3.2(1)	4.5	Antenna power	C
---	--	--	SAR	NA
Transmitting antenna				
--	--	2.25	Type, configuration, etc. of transmitting antenna	C
--	--	2.25	Direction pattern of transmitting antenna	C
Receiving equipment				
G	3.3(1)	4.6	Spurious emissions of receiver	C
--	--	2.25	Refer to all articles for transmitting antenna	C
Operating frequency 2400 to 2483.5MHz				
--	3.7(1)	3.23	High Frequency /modulation section cannot be opened easily	C
--	3.1(1)	2.1	Communication method	C
--	3.2(1)a	2.1	Modulation method	C
--	3.2(1)a	2.1	Spread spectrum method	C
--	3.2(2)	4.5	Antenna power	C
--	3.6(2)	4.5	Absolute gain of transmitting antenna	C
--	3.6(2)	4.5	Angular width of principal radiation (AWPR)	C
--	3.2(10)	4.2	Number of carriers within 1MHz band within OFDM	C
--	3.2(8)	4.3	Diffusion bandwidth	C
--	3.2(9)	4.3	Spreading factor	C
--	3.4.1(1)	4.7	Interference Prevention Function	C
--	3.4.1(3)	4.7	Carrier Sense Capability	C
Note: C = Conform; NC = Not Conform; NT = Not Tested; NA = Not Applicable;				

1.1 Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.Date	Calibration Method
Spectrum	Keysight	N9020A	MY51240612	2026-07-23	C
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2026-07-23	C
Power Meter 10Hz~18GHz	Tonscend	JS0806-2	188060126	2026-07-23	C
Signal generator	Keysight	E4421B	GB40051020	2026-05-18	C
Horn Antenna	Schwarzbeck	BBHA 9120 D	1959	2027-07-26*	C
Attenuator	Weinschael	54A-10	N/A	2026-07-23	C
Universal Switch Control Unit	Rohde&Schwarz	CMW500	12010002k50	2026-07-23	C
Test Software	Tonscend	JS0806-2	NA	NA	C
Humidity tester	Jingchuang	GSP-8A	CMA22B000592	2026-07-28	C

Note:

1. The test was witness in 966 Chamber and RF Oven room.
2. The calibration interval of the above test instruments is 12/24* months and the calibrations are traceable to LISAI/CHINA.
- 3: Calibration body's name: GUANGZHOU LISAI CALIBRATION AND TESTING CO., LTD.
Address: No.8 South Street Shi Ji Institute Guangzhou. Guangdong. China.

Calibration Method:

- a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1)
- b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)
- c) Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)
- d) Calibration conducted by using measuring instruments and other equipment listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from a) to c)

1.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Parameter	Uncertainty
Occupied Bandwidth	206.50 Hz
Spurious emissions	$\pm 3.84\text{dB}$
Output power density	1.37dB
Out of band radiated power	2.52 dB
Frequency Tolerance	0.104 ppm
Temperature	$\pm 0.23^{\circ}\text{C}$
Humidity	$\pm 0.3\%$
DC and low frequency voltages	$\pm 0.3\%$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

1.3 Modification Record

There were no modifications required for compliance.

2 General Information**2.1 General Description of EUT**

Product Name	PARTY SPEAKER
Test Model Name	BROMLEY 150
Series Models Name	N/A
Power Supply Rating	100-240V~, 50/60Hz, 100W or DC 12.8V from battery
Temperature Operating Range	0 ~ 45℃
Modulation Type	BT-LE(GFSK)
Modulation Technology	DTS
Transfer Rate	1 Mbps; 2Mbps
Operating Frequency	1M: 2402 ~ 2480MHz 2M: 2404 ~ 2478MHz
Rated RF output power density	Please see Note 1
Conducted power density	Please see Note 1
EIRP power density	Please see Note 1
Antenna Type	PCB Antenna
Antenna Gain	2.798dBi
Accessory Device	AC cable 200cm
Radio FW	V0.1.1
Radio HW	PP1

Note:

1. The power table as below table:

Test condition for Modulation Technology	Rated output power density (mW)	Conducted power density (mW)	EIRP power density (mW)
GFSK (1 Mbps)	4	3.839	7.312
GFSK (2 Mbps)	4	3.963	7.548

- The above EUT information was declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or user's manual.
- Hwa-Hsing (Dongguan) Testing Co., Ltd. is not responsible for the accuracy of the information provided by the manufacturer.
- Please refer to the EUT photo document (Reference No.: 26040707) for detailed product photo.
- For the test results, the EUT had been tested with all conditions, and only the worst case was shown in the test report.
- This product can be sold with or without battery pack.

2.2 Description of test modes

2.2.1 Channel list of this EUT:

40 channels are provided to BT-LE (1Mbps):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

37 channels are provided to BT-LE (2Mbps):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
-	-	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	-	-	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	-	-

Note:

- 1.The channels which were indicated in bold type of the above channel list were selected as presentative test channel. There fore, only the data of the test channels were recorded in this report.
- 2.By means of test software for BT LE provided by manufacture, the power levels during the tests were set according to the following codes:

2.2.2 Test mode applicability and tested channel detail

Test items		Test Conditions for voltage supply	Environmental Conditions
1	Frequency tolerance measurement	V _{normal}	21.2deg. C, 52%RH
2	Occupied bandwidth measurement (99% power bandwidth)		
3	Spreading bandwidth measurement (90% power bandwidth)		
4	Spurious emissions for transmitter measurement		
5	Antenna power measurement		
6	Spurious emissions for receiver		

EUT Configure mode No.	Test conditions for modulation technology
Mode A	GFSK 1Mbps
Mode B	GFSK 2Mbps
RF power setting value	
Channel	Power setting
Low	51
Middle	51
High	51

Note:

- For the test results, the EUT had been tested with all conditions, and the worst-case mode of data will record in the report.
- By means of test software which provided by manufacture, the power levels during the tests were set according to the above table.

2.2.3 Assembly

The RF circuit was located inside of the EUT.

2.2.4 Applicable Standard

When there is a fluctuation of +/-10% input voltage from external power to the test equipment. If the fluctuation of input voltage to the circuit of the radio part (excl. power) in the test equipment is confirmed below +/-1%, Measurement shall be tested with the rated voltage.

2.2.5 Antenna Specifications

Ant. Type	Highest Peak Gain (dBi) 2.4GHz ~ 2.5GHz
PCB Antenna	2.798dBi

Note: The Antenna pattern Please refer to the attached file (Antenna report).

2.3 Description of Support Units

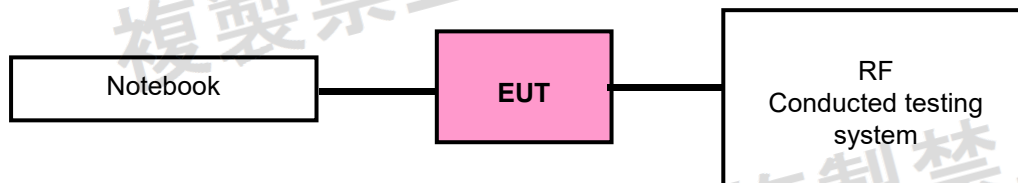
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	Notebook	HUAWEI	NbD-WFH9	EUEPM21725002655	N/A
2	Notebook	DELL	Inspiron 14R Aluminum Edition	6WPG9-63PV4-RBPF2-T6RHW-W9GBP	N/A

No.	Signal Cable Description of The Above Support Units
1	USB Cable: Unshielded, Detachable 1.2m;

2.3.1 Configuration of System under Test

Bluetooth TX/RX:



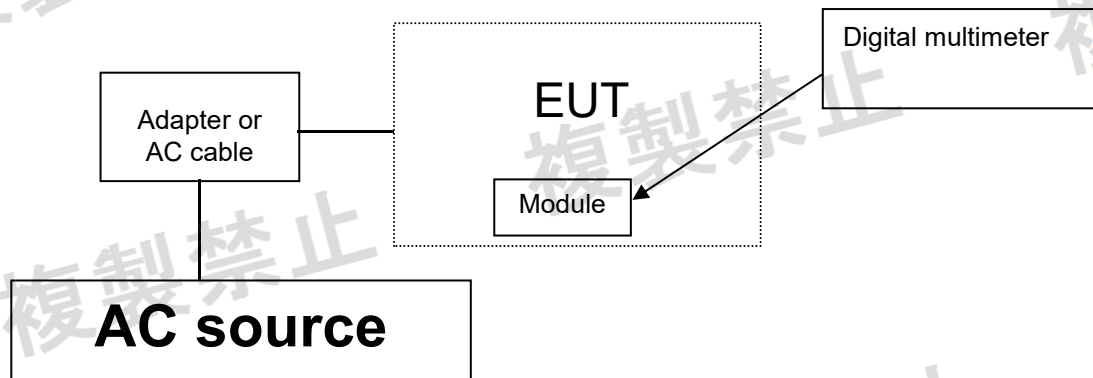
3 Wireless module voltage test in extreme conditions

3.1 Applicable Standard

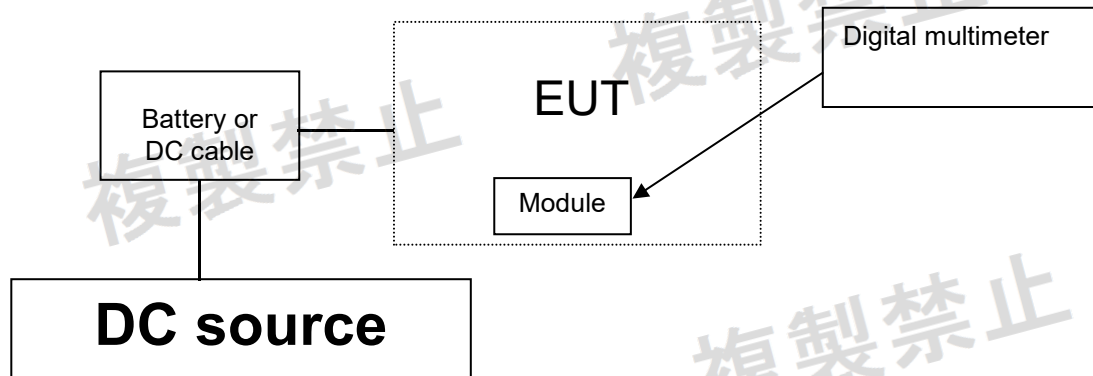
When there is a fluctuation of $\pm 10\%$ input voltage from external power to the test equipment. If the fluctuation of input voltage to the circuit of the radio part (excl. power) in the test equipment is confirmed below $\pm 1\%$, Measurement shall be tested with the rated voltage.

3.2 Test Configuration

Config A



Config B



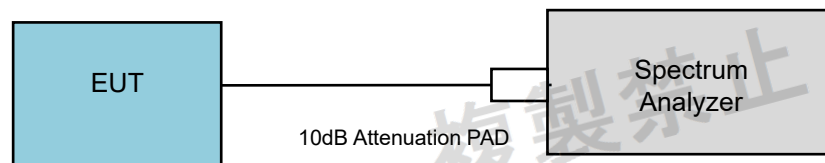
4 Test types and results

4.1 Frequency tolerance measurement

4.1.1 Limits of frequency tolerance measurement

Condition	Tolerance of frequency Limit (e.i.r.p)
Under all test conditions	Within +/- 50ppm

4.1.2 Test Setup



4.1.3 Deviation from Test Standard

No deviation.

4.1.4 Test Procedure

If the fluctuation of input voltage to the circuit of the radio part (excl. power) in the test equipment is confirmed below +/-1%, Measurement shall be tested with the rated voltage.

When there is a fluctuation of +/-10% input voltage from external power to the test equipment. In case the test equipment is designed to function only within the specified fluctuation range of +/-10% for the voltage source tests shall be conducted applying the rated voltage and a respective specified maximum/minimum value of fluctuation range.

Test method according to Clause 5 of Annex No.43 of MIC Notification No.88.

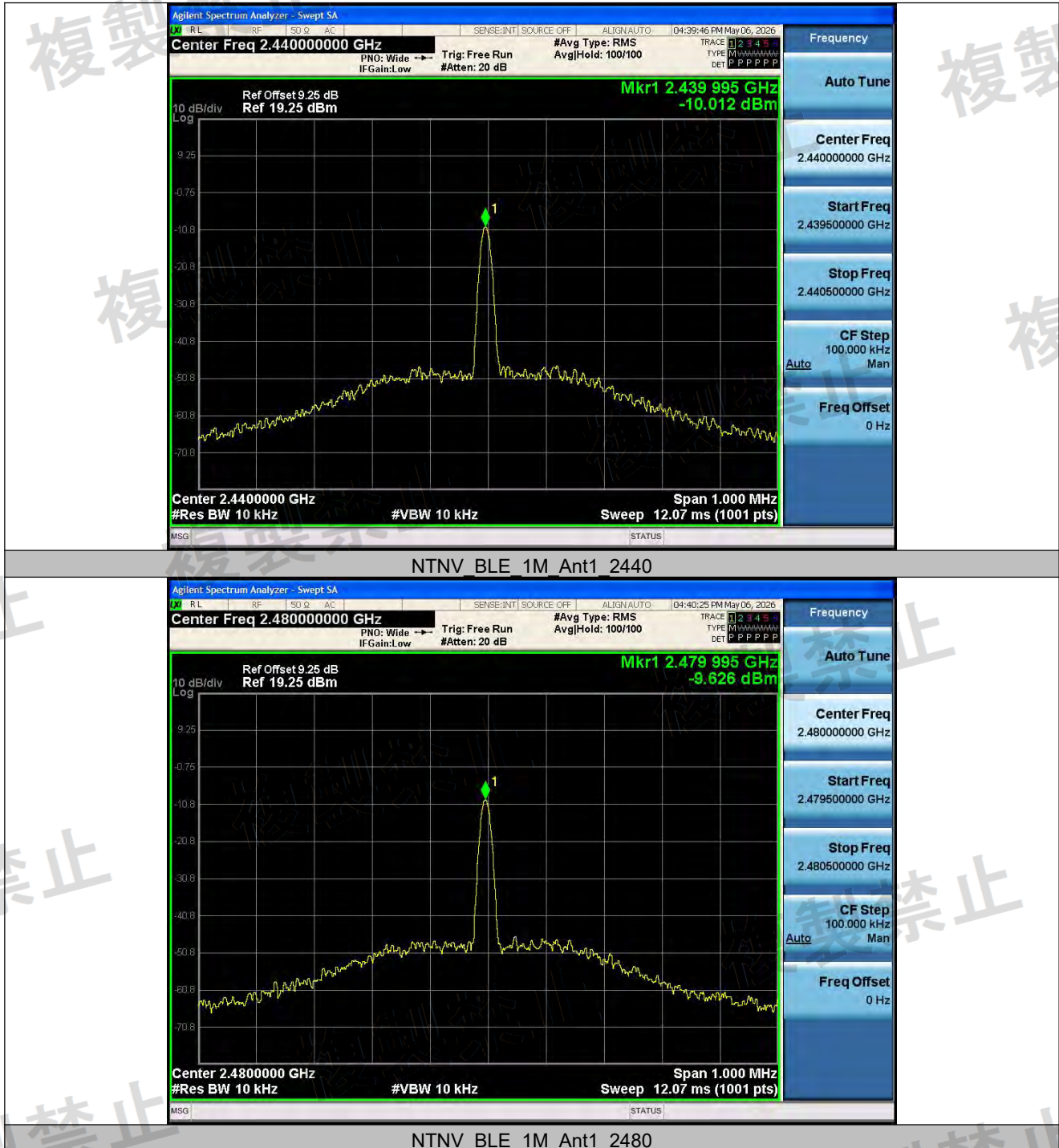
- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- The EUT was transmitted non-modulated frequencies.
- In case of a test mode generating specific frequency spectrum, the spectrum frequency is measured with the spectrum analyzer.

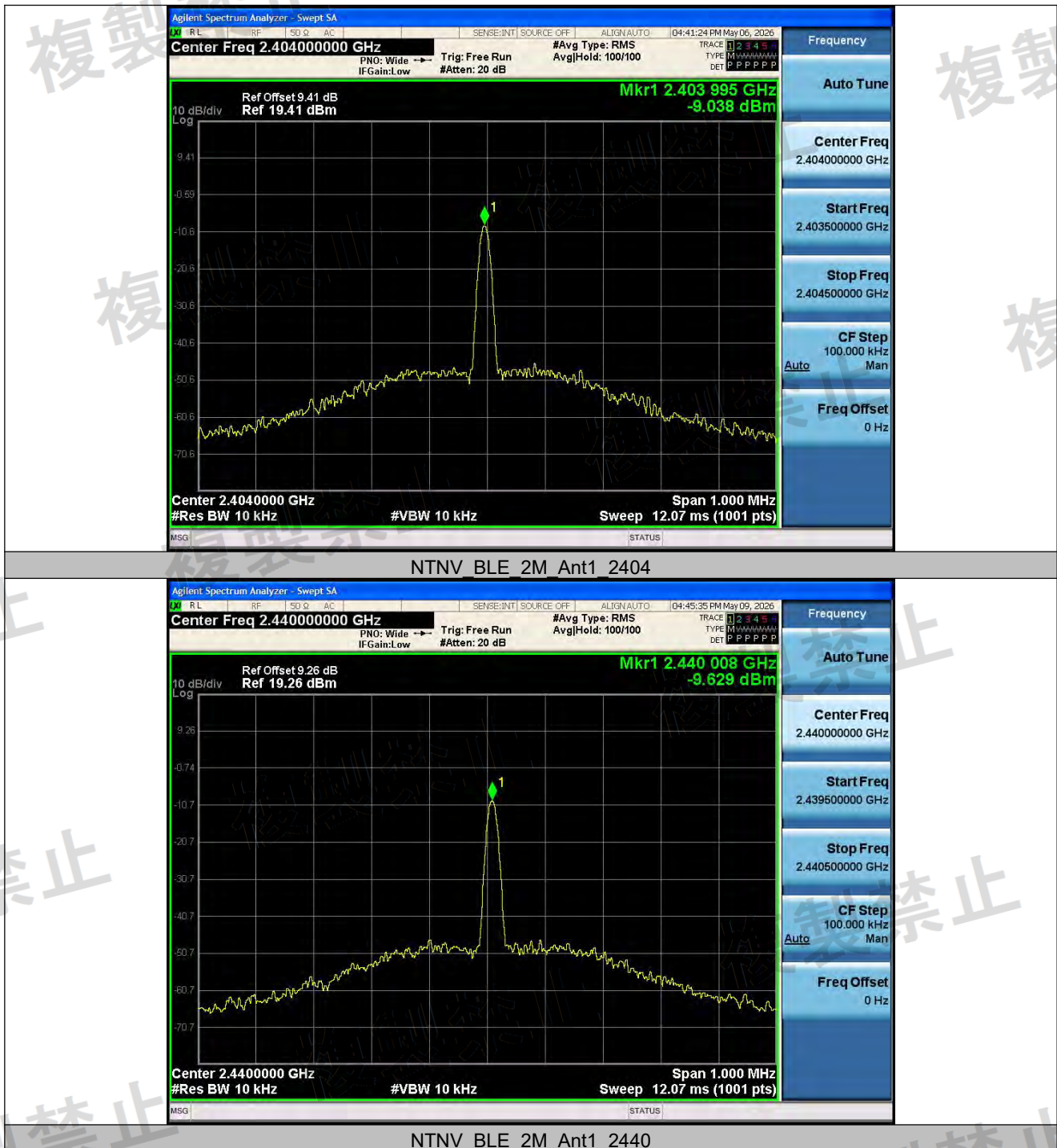
4.1.5 Test Results

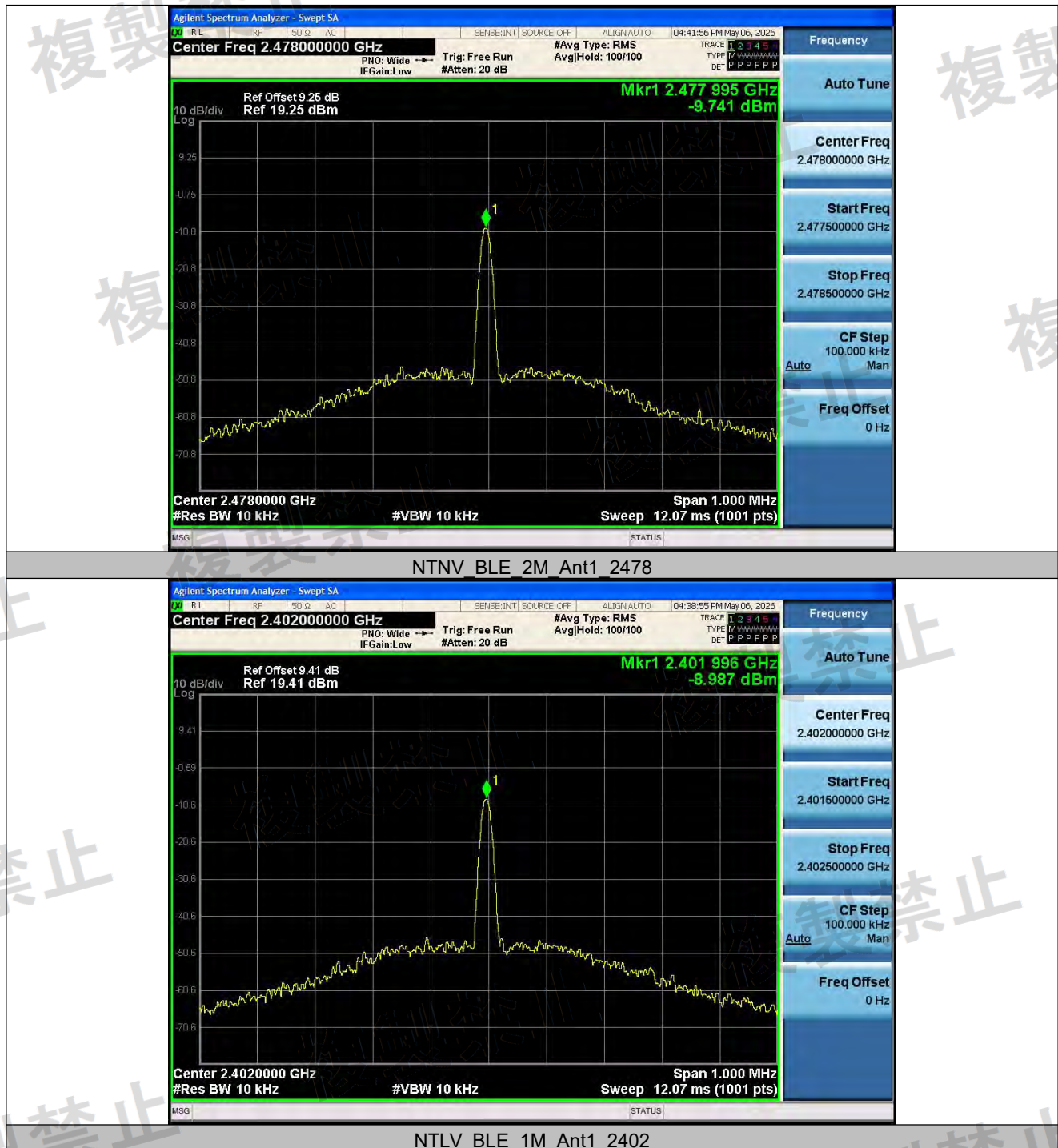
Test Condition	Test Mode	Antenna	Channel	Result[ppm]	Limit[ppm]	Verdict
NTNV	BLE_1M	Ant1	2402	-1.66528	±50	PASS
			2440	-2.04918	±50	PASS
			2480	-2.01613	±50	PASS
	BLE_2M	Ant1	2404	-2.07987	±50	PASS
			2440	3.27869	±50	PASS
			2478	-2.01776	±50	PASS
NTLV	BLE_1M	Ant1	2402	-1.66528	±50	PASS
			2440	-1.63934	±50	PASS
			2480	-1.61290	±50	PASS
	BLE_2M	Ant1	2404	-2.07987	±50	PASS
			2440	3.27869	±50	PASS
			2478	-2.01776	±50	PASS
NTHV	BLE_1M	Ant1	2402	-1.66528	±50	PASS
			2440	-2.04918	±50	PASS
			2480	-2.01613	±50	PASS
	BLE_2M	Ant1	2404	-2.07987	±50	PASS
			2440	3.27869	±50	PASS
			2478	-2.01776	±50	PASS

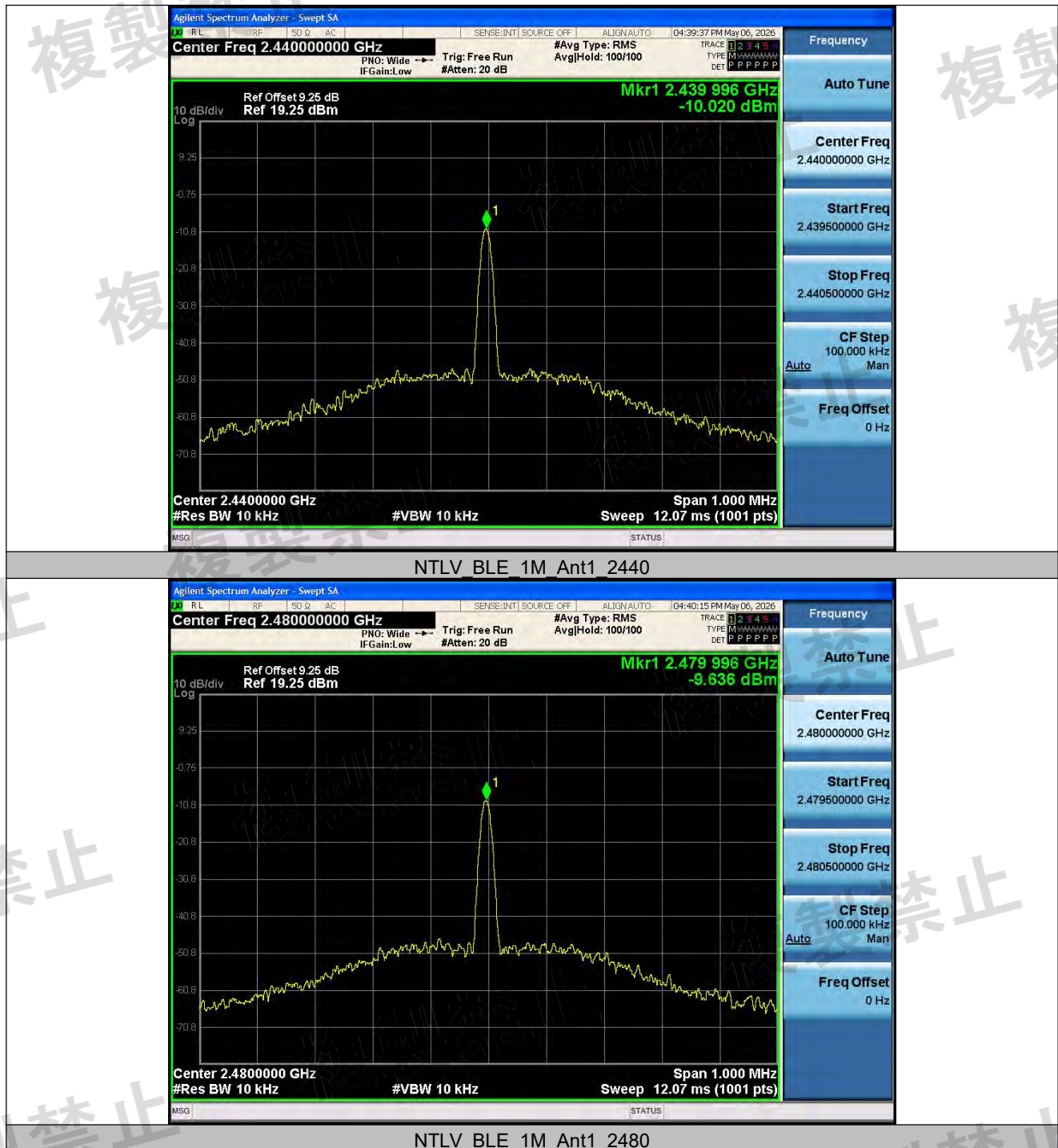
- The test plots listing in the below pages.

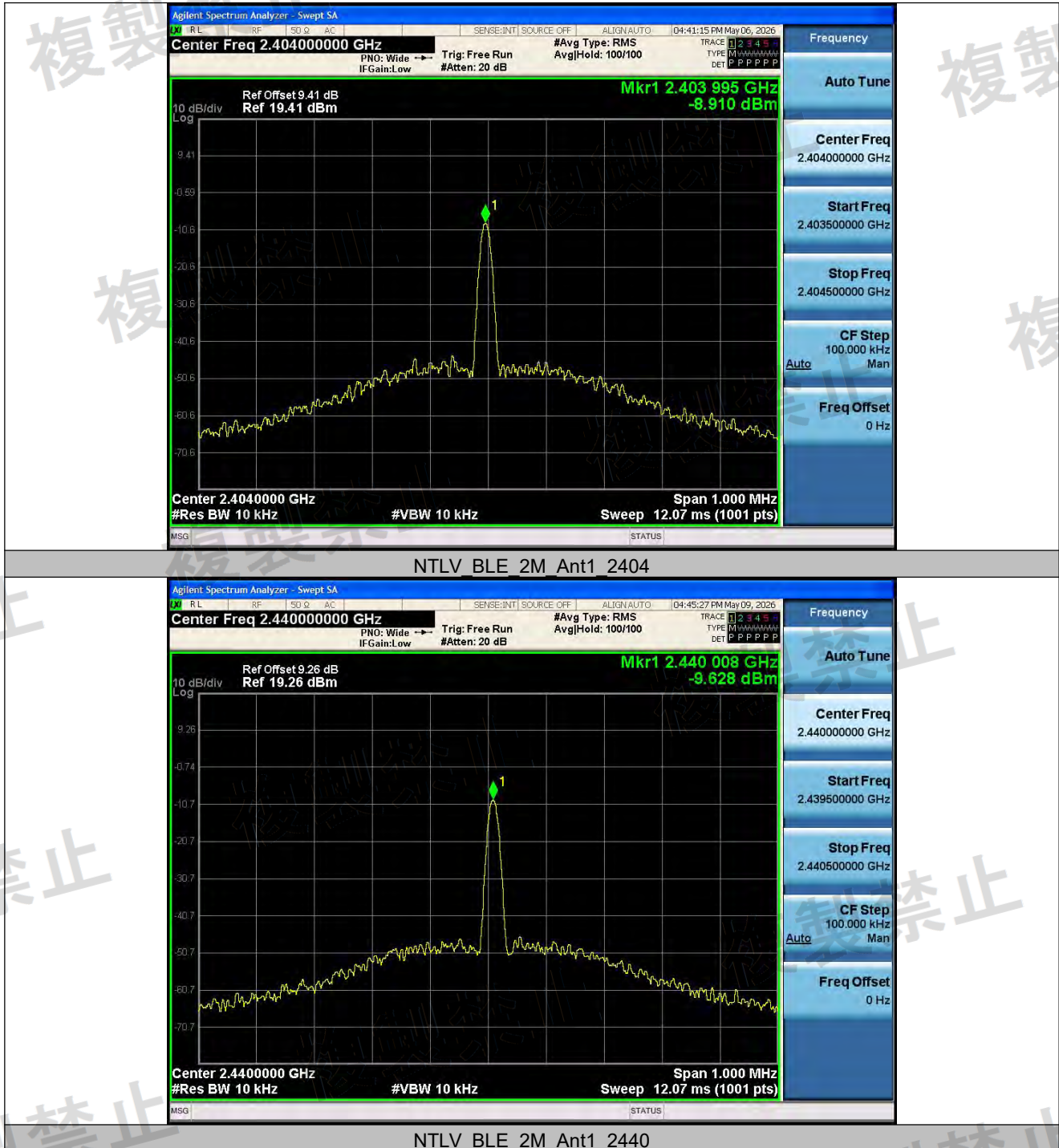


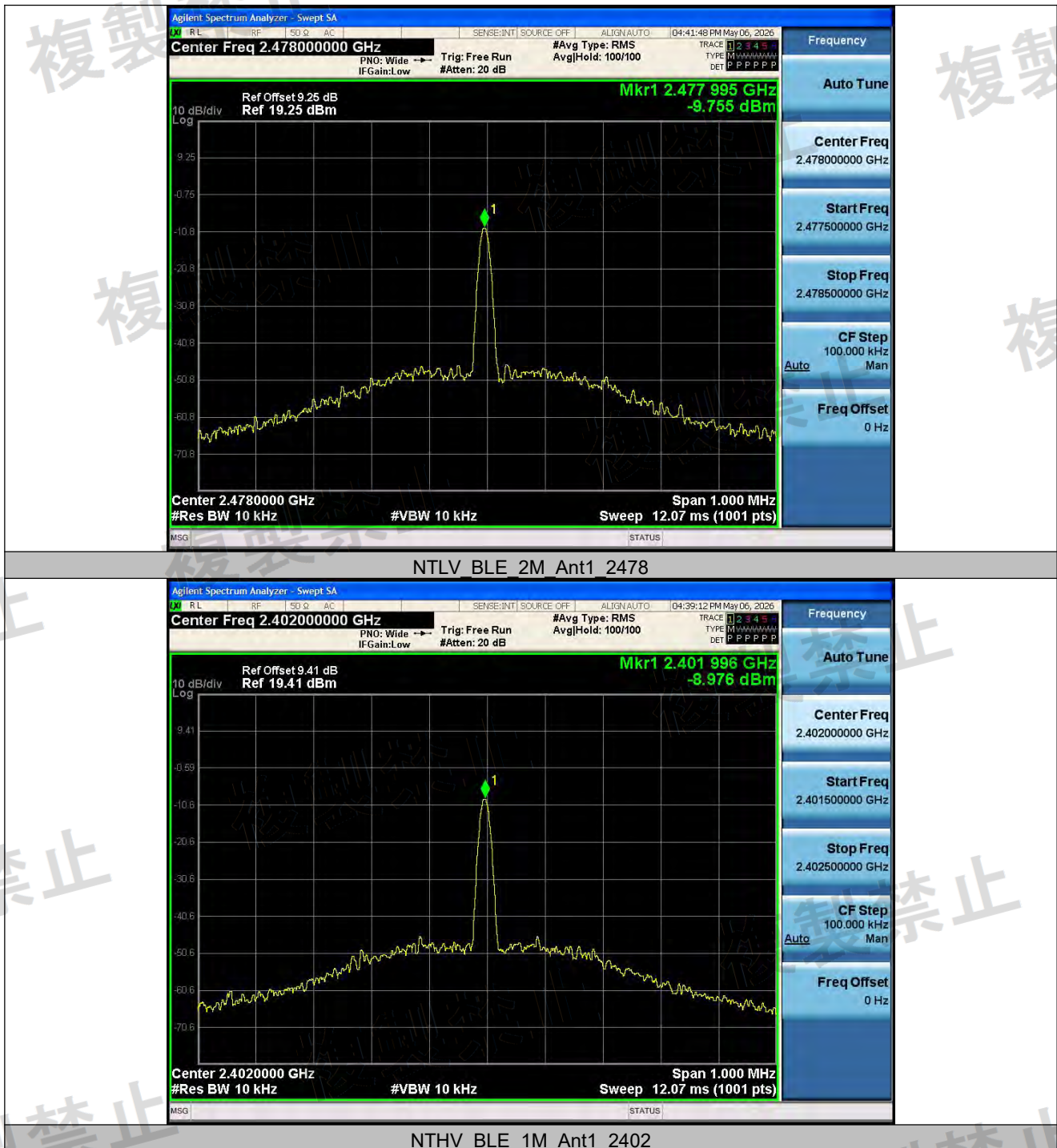












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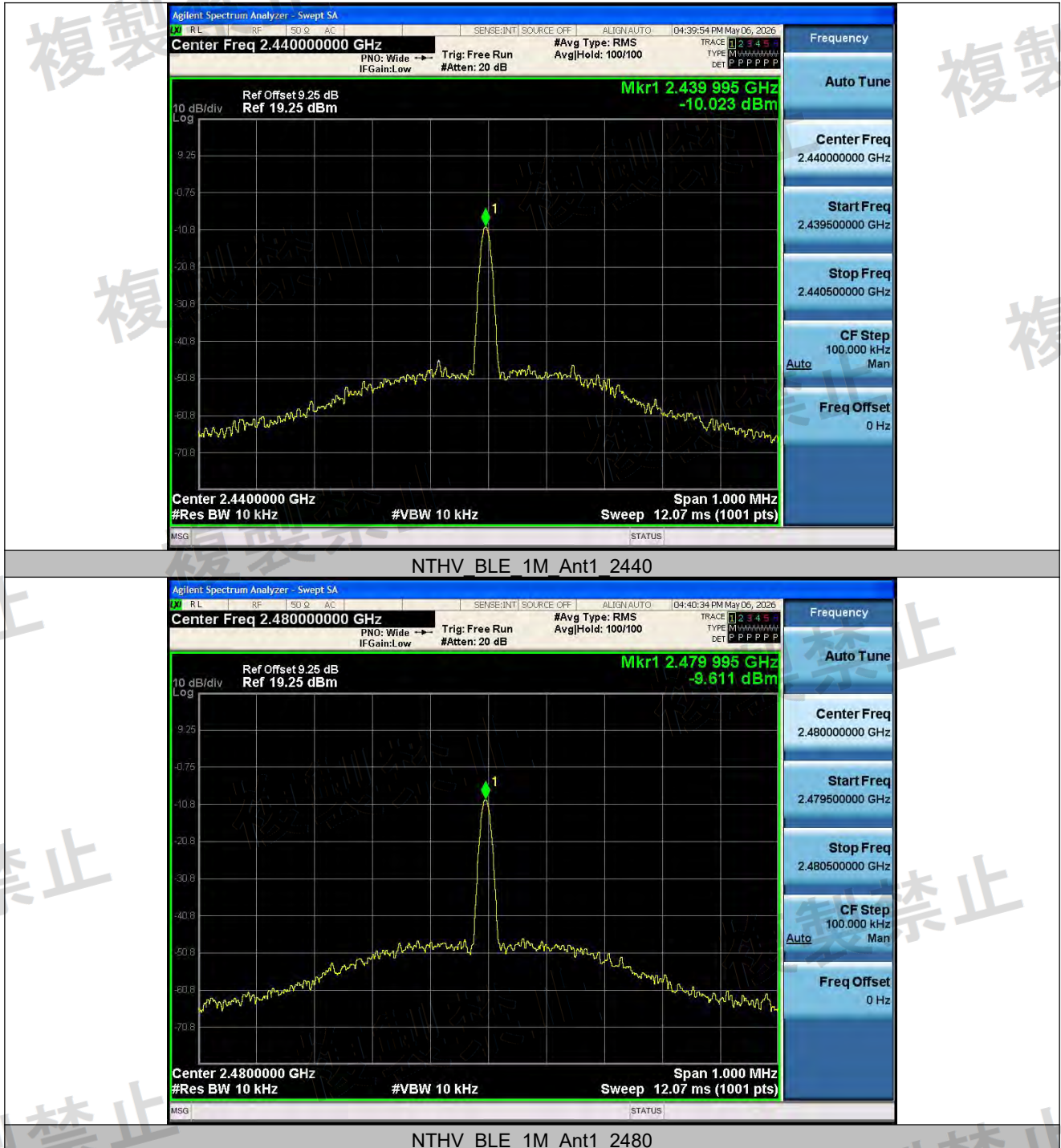
Tel: [0769-85598986](#)

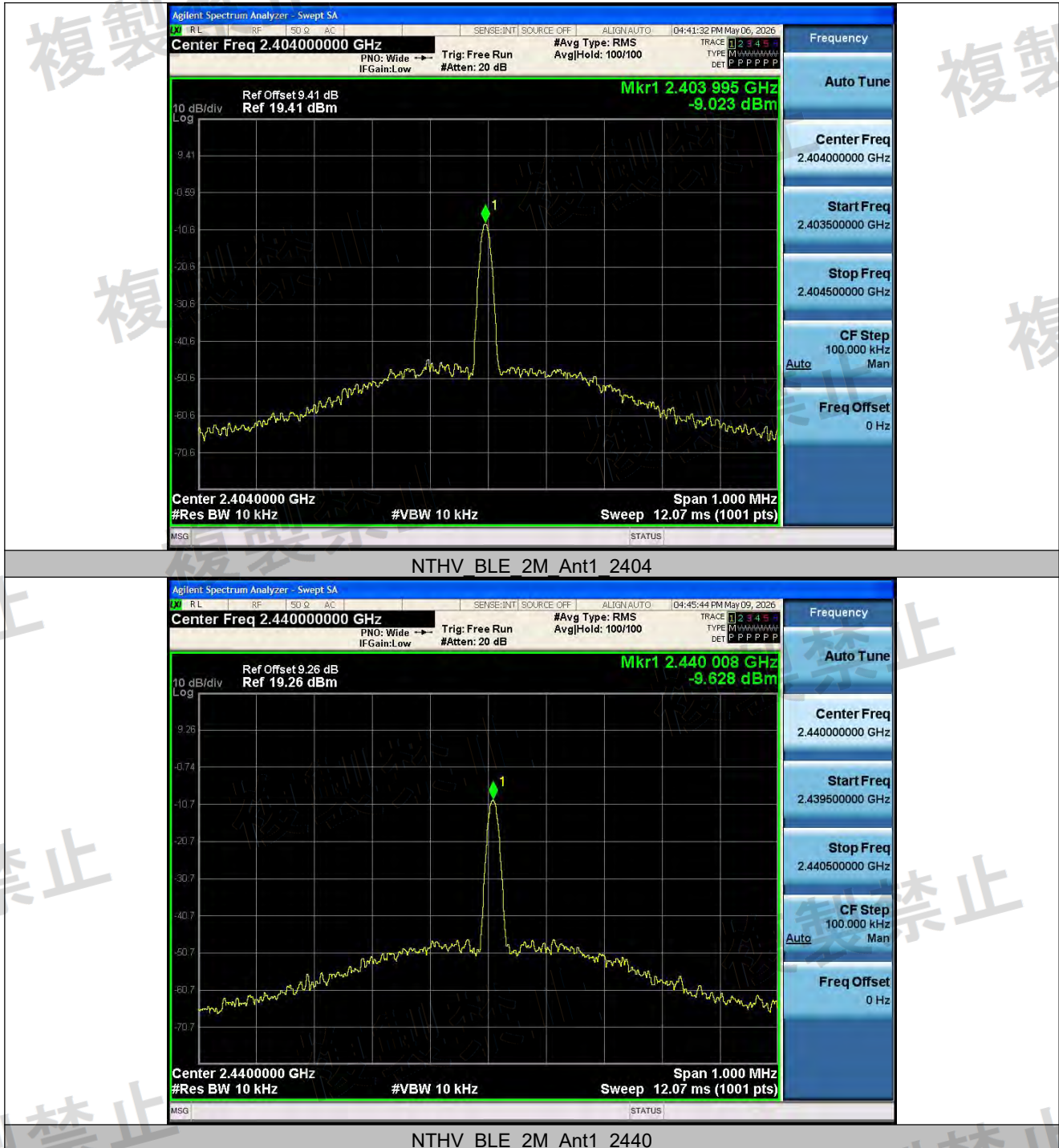
Web.: [www.lyns-tci.com](#)

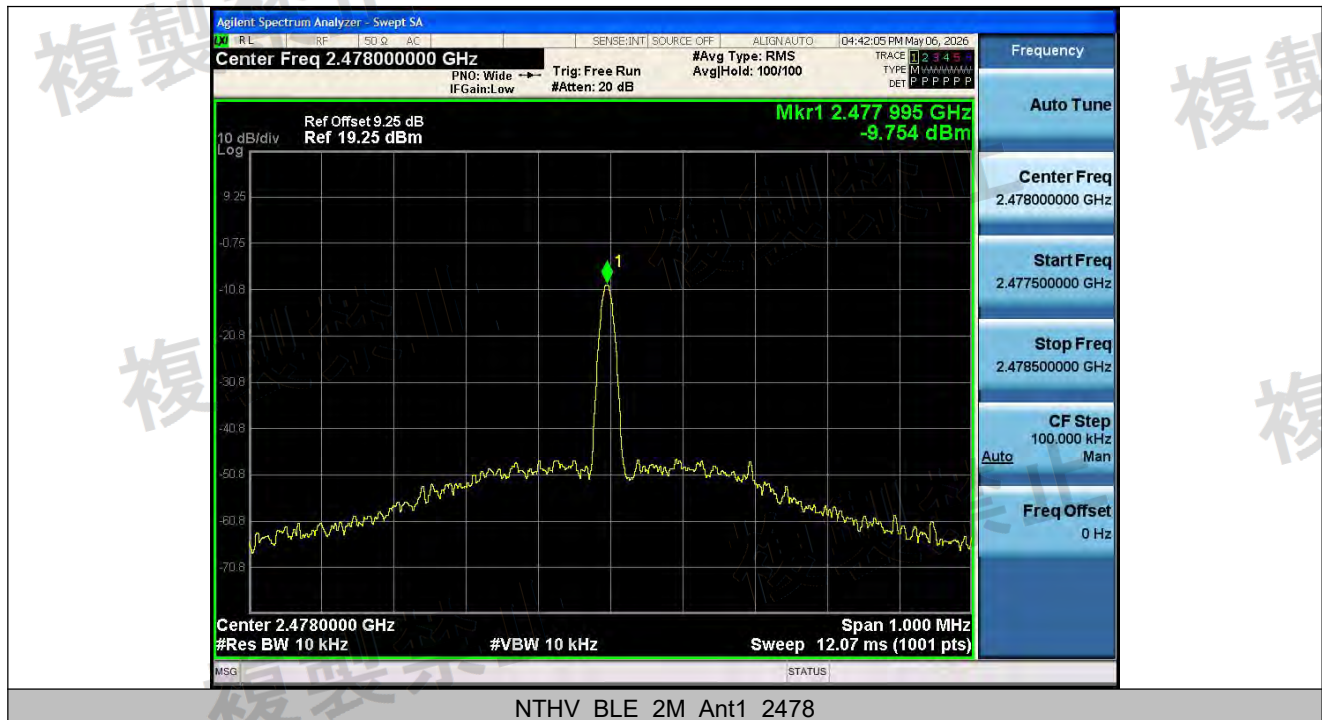
E-Mail: [service-hs@lyns-tci.com](#)

Release

[Ver. 1.5](#)







4.2 Occupied bandwidth measurement (99% power bandwidth)

4.2.1 Limits of occupied bandwidth measurement

Condition	Occupied bandwidth Limit	Remark
Occupied bandwidth	<26MHz	For 802.11b, g & 802.11n (HT20)
Occupied bandwidth	<26MHz	For BT-LE (GFSK)

4.2.2 Test Setup



4.2.3 Deviation of Test Standard

No deviation.

4.2.4 Test Procedure

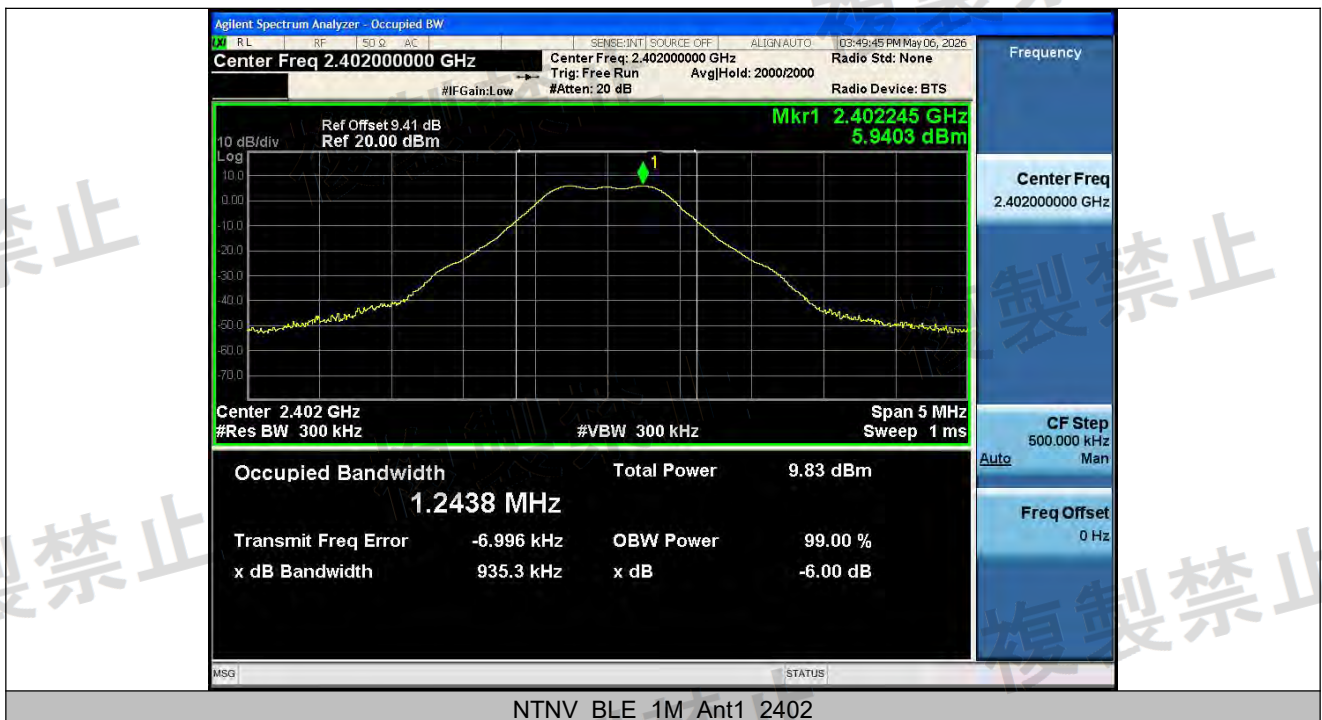
Test method according to Clause 5 of Annex No.43 of MIC Notification No.88.

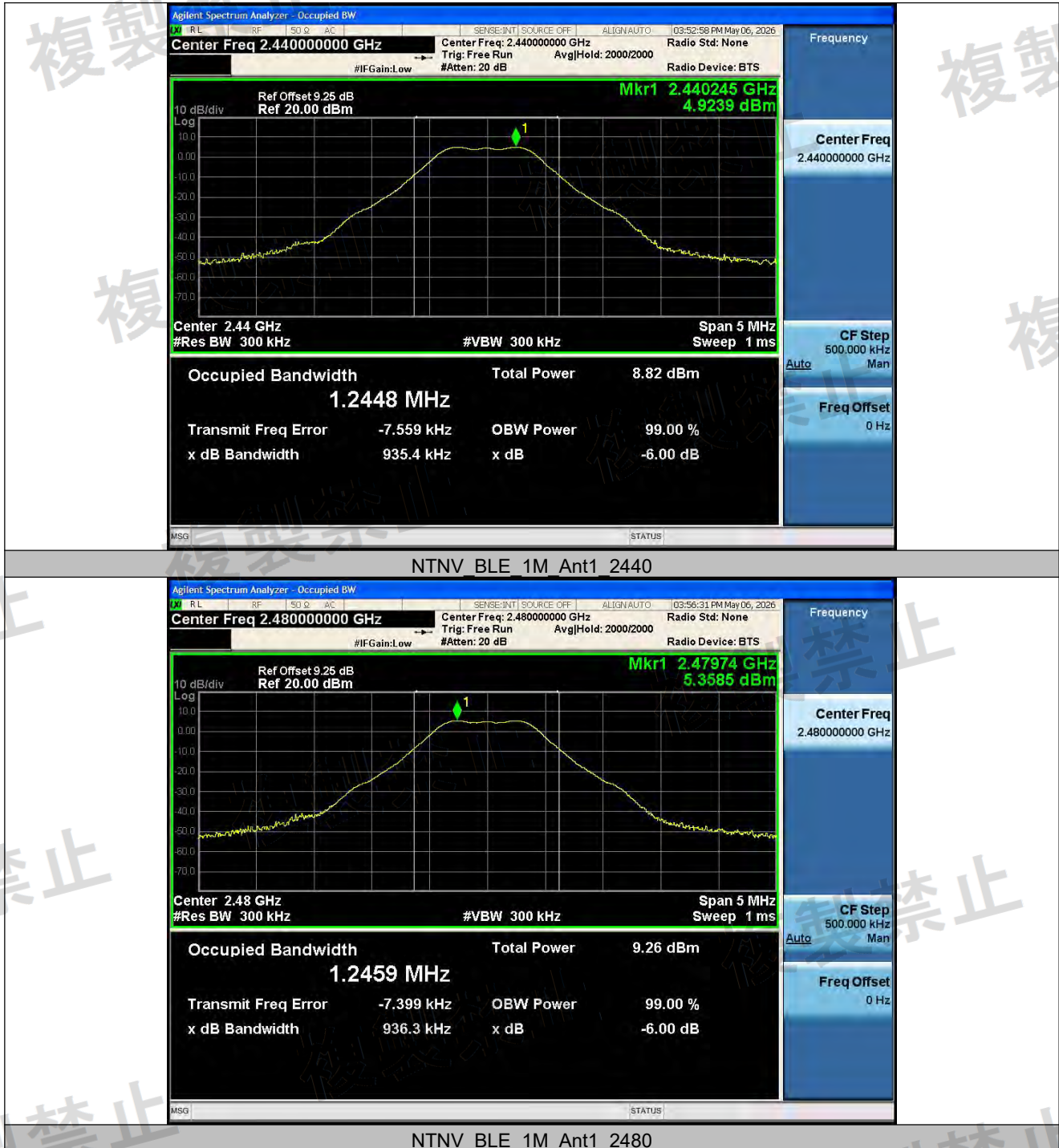
The EUT was placed inside the environmental test chamber and powered by nominal DC voltage. The bandwidth of the fundamental frequency was measured by spectrum analyzer. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

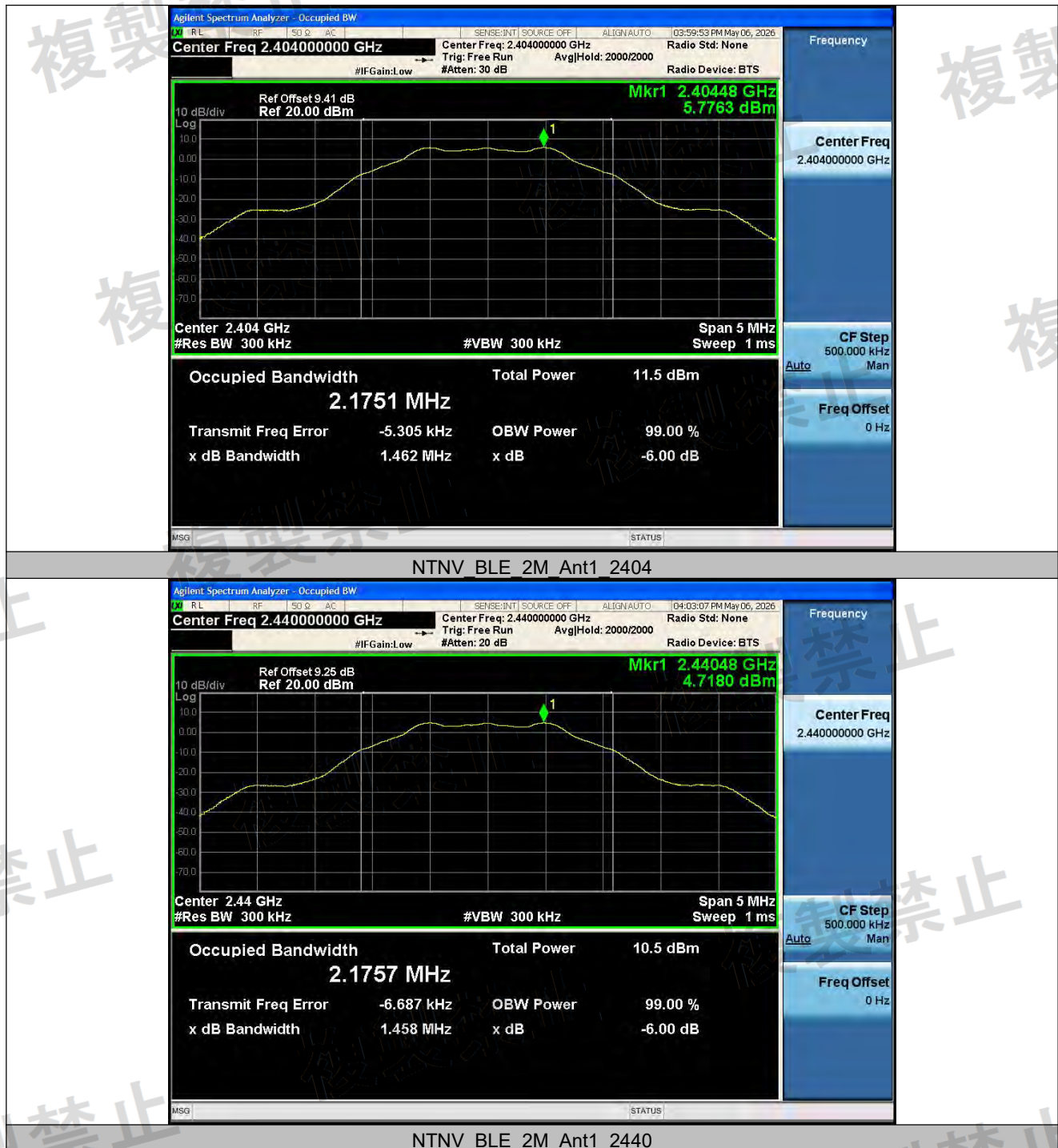
4.2.5 Test Results

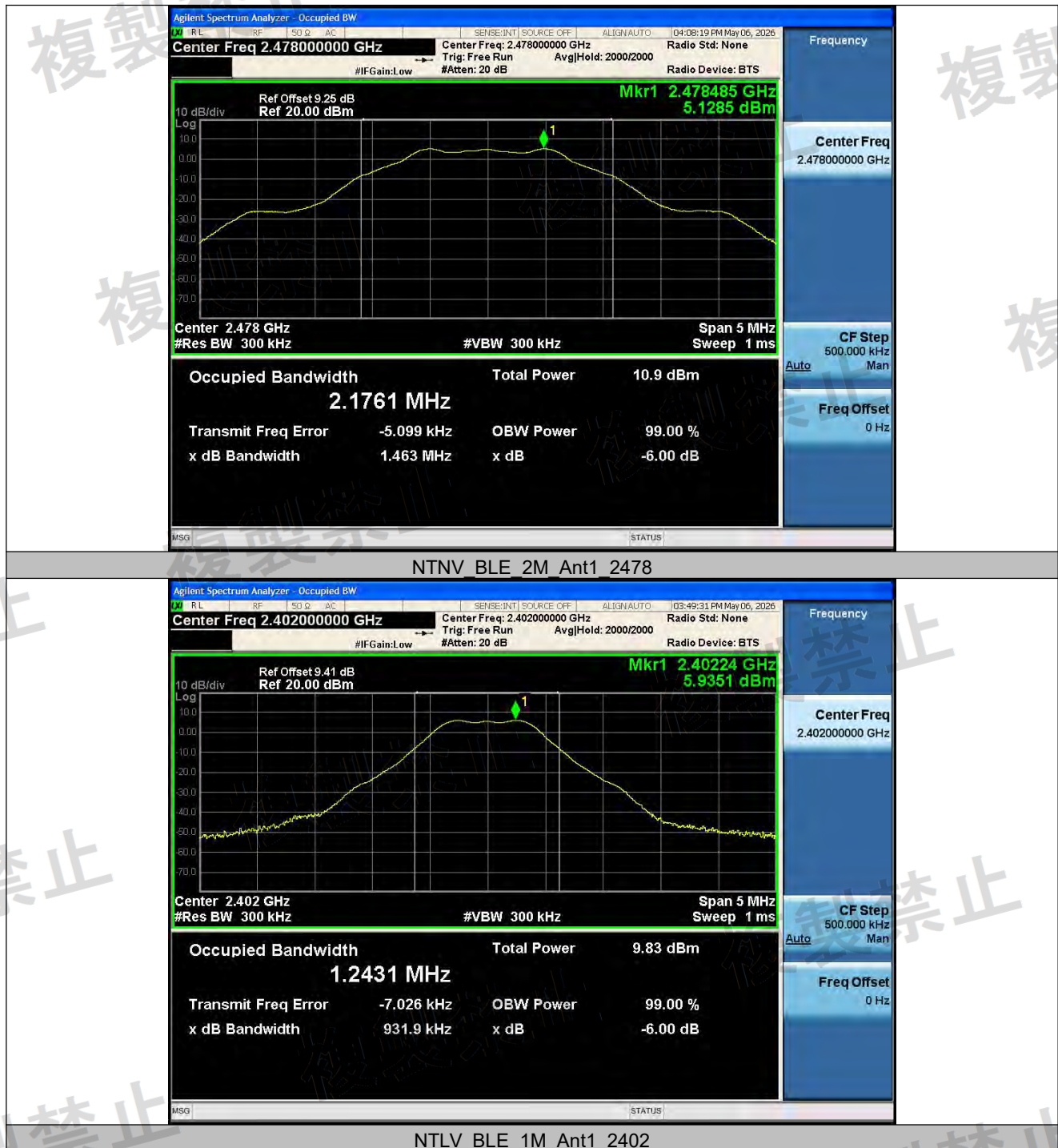
Test Condition	Test Mode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	1.244	≤26	PASS
			2440	1.245	≤26	PASS
			2480	1.246	≤26	PASS
	BLE_2M	Ant1	2404	2.175	≤26	PASS
			2440	2.176	≤26	PASS
			2478	2.176	≤26	PASS
NTLV	BLE_1M	Ant1	2402	1.243	≤26	PASS
			2440	1.244	≤26	PASS
			2480	1.246	≤26	PASS
	BLE_2M	Ant1	2404	2.175	≤26	PASS
			2440	2.176	≤26	PASS
			2478	2.177	≤26	PASS
NTHV	BLE_1M	Ant1	2402	1.245	≤26	PASS
			2440	1.244	≤26	PASS
			2480	1.244	≤26	PASS
	BLE_2M	Ant1	2404	2.175	≤26	PASS
			2440	2.176	≤26	PASS
			2478	2.176	≤26	PASS

Note: For the test plots please refer to the below.



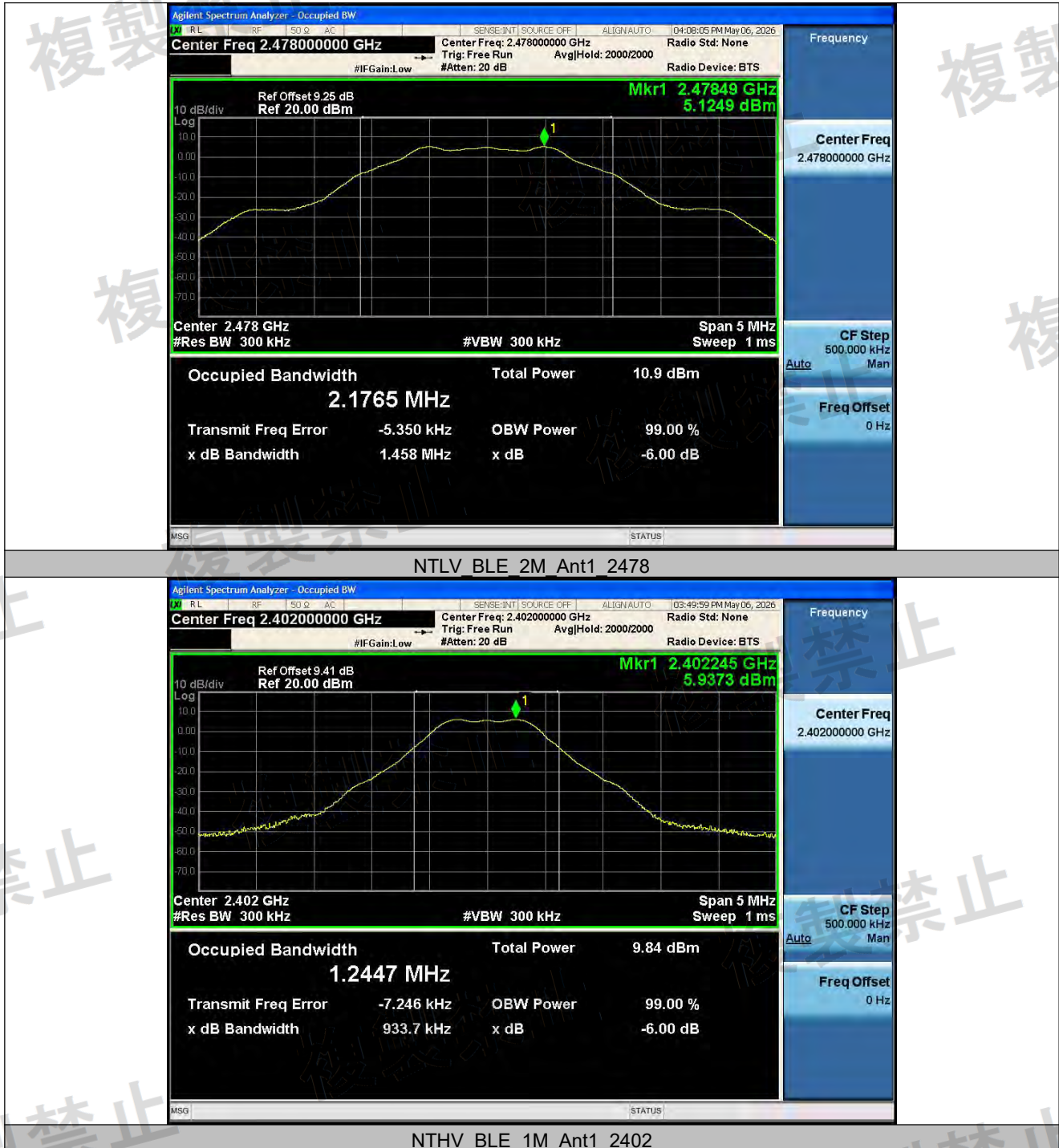


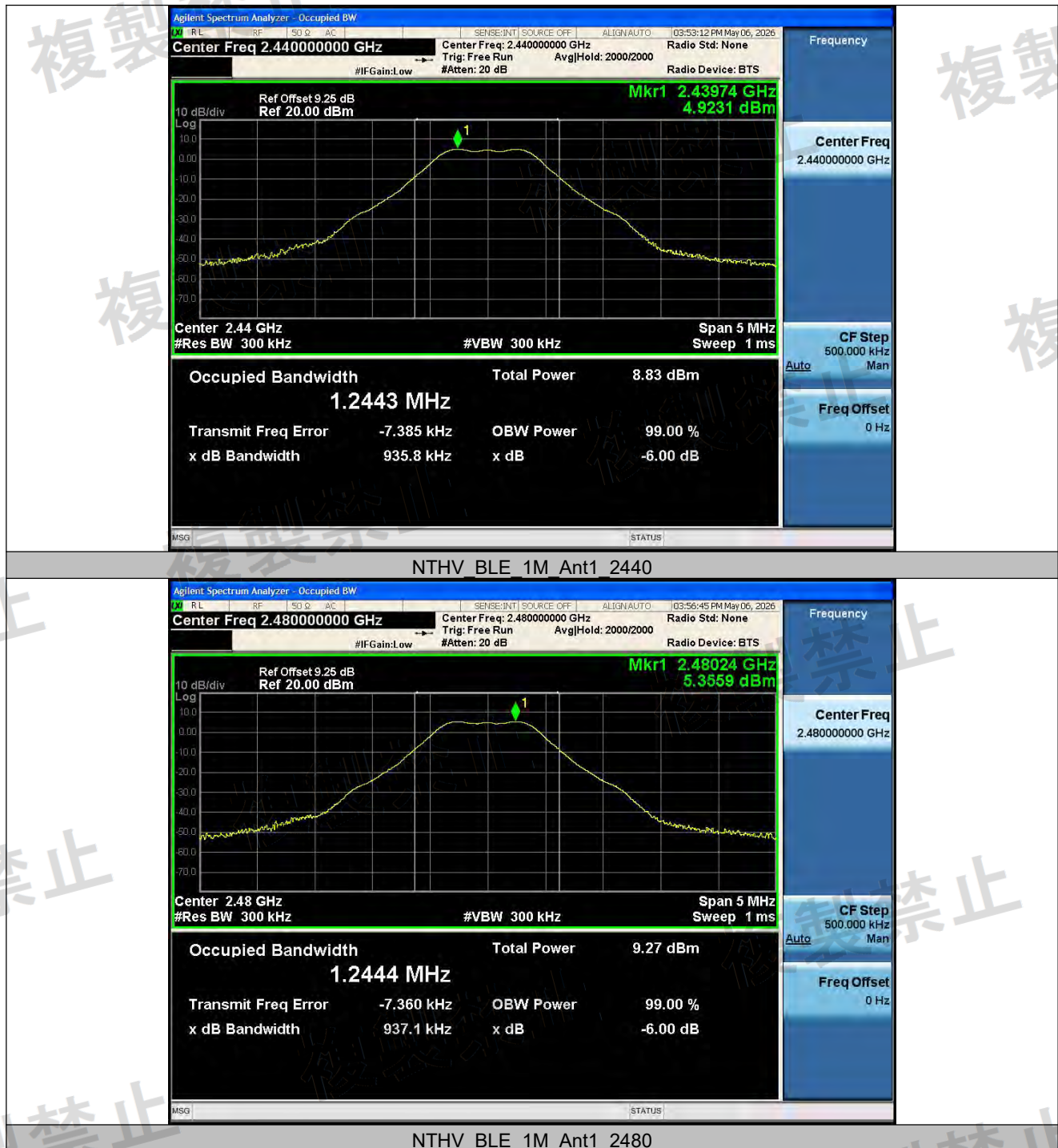




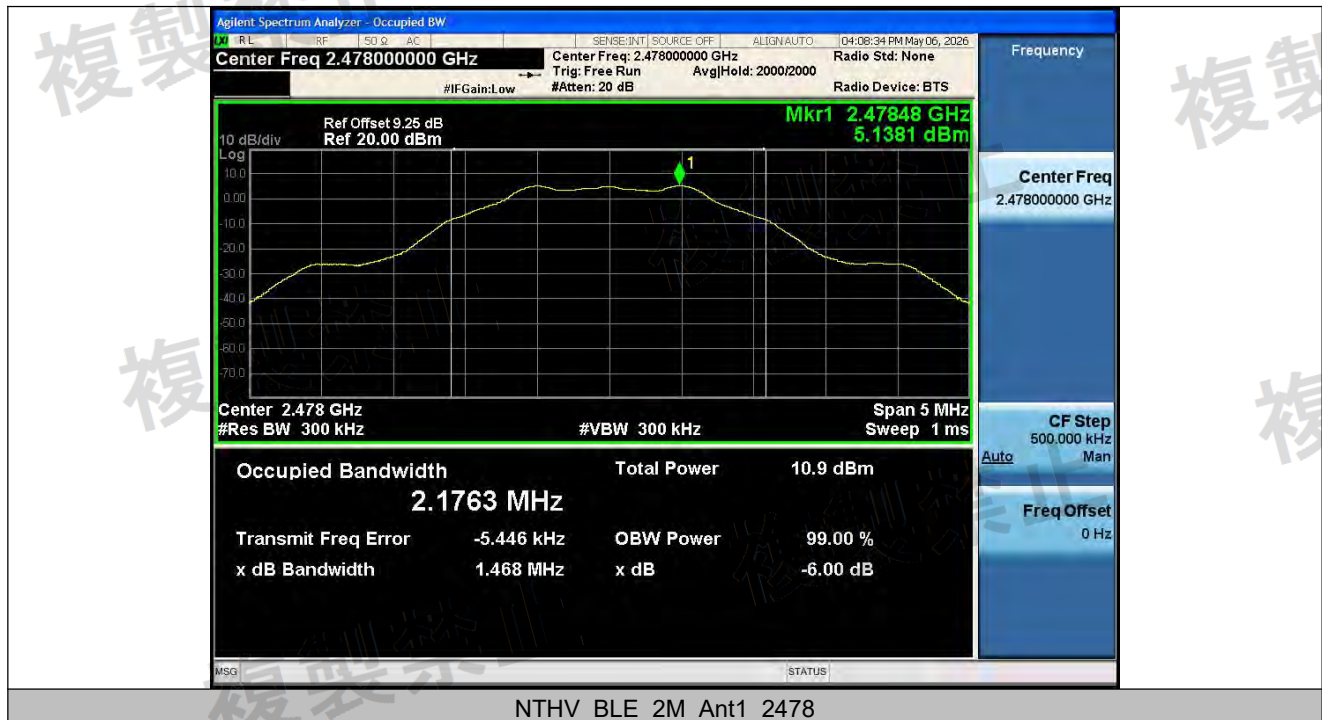










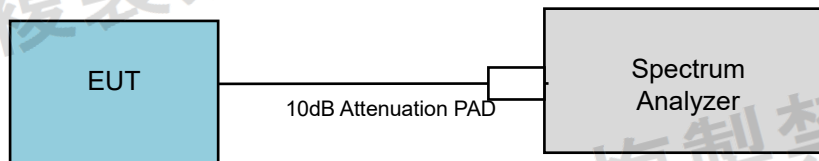


4.3 Spreading bandwidth measurement (90% power bandwidth)

4.3.1 Limits of spreading bandwidth and spreading factor

Condition	Limit	Remark
Spreading Bandwidth	$\geq 500\text{kHz}$	N/A

4.3.2 Test Procedure



4.3.3 Deviation from Test Standard

No deviation.

4.3.4 Test Procedure

Test method according to Clause 5 of Annex No.43 of MIC Notification No.88.
The EUT was placed inside the environmental test chamber and powered by nominal DC voltage. The bandwidth of the fundamental frequency was measured by spectrum analyzer. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 5 %of the total mean power of a given emission.

4.3.5 Test Results

Test Condition	Test Mode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	0.833	≥ 0.5	PASS
			2440	0.835	≥ 0.5	PASS
			2480	0.835	≥ 0.5	PASS
	BLE_2M	Ant1	2404	1.382	≥ 0.5	PASS
			2440	1.382	≥ 0.5	PASS
			2478	1.383	≥ 0.5	PASS
NTLV	BLE_1M	Ant1	2402	0.834	≥ 0.5	PASS
			2440	0.834	≥ 0.5	PASS
			2480	0.834	≥ 0.5	PASS
	BLE_2M	Ant1	2404	1.382	≥ 0.5	PASS
			2440	1.383	≥ 0.5	PASS
			2478	1.384	≥ 0.5	PASS
NTHV	BLE_1M	Ant1	2402	0.834	≥ 0.5	PASS
			2440	0.834	≥ 0.5	PASS
			2480	0.834	≥ 0.5	PASS
	BLE_2M	Ant1	2404	1.382	≥ 0.5	PASS
			2440	1.382	≥ 0.5	PASS
			2478	1.383	≥ 0.5	PASS

Note: For the test plots please refer to the below.

Lab: [Hwa-Hsing \(Dongguan\) Testing Co., Ltd.](#)

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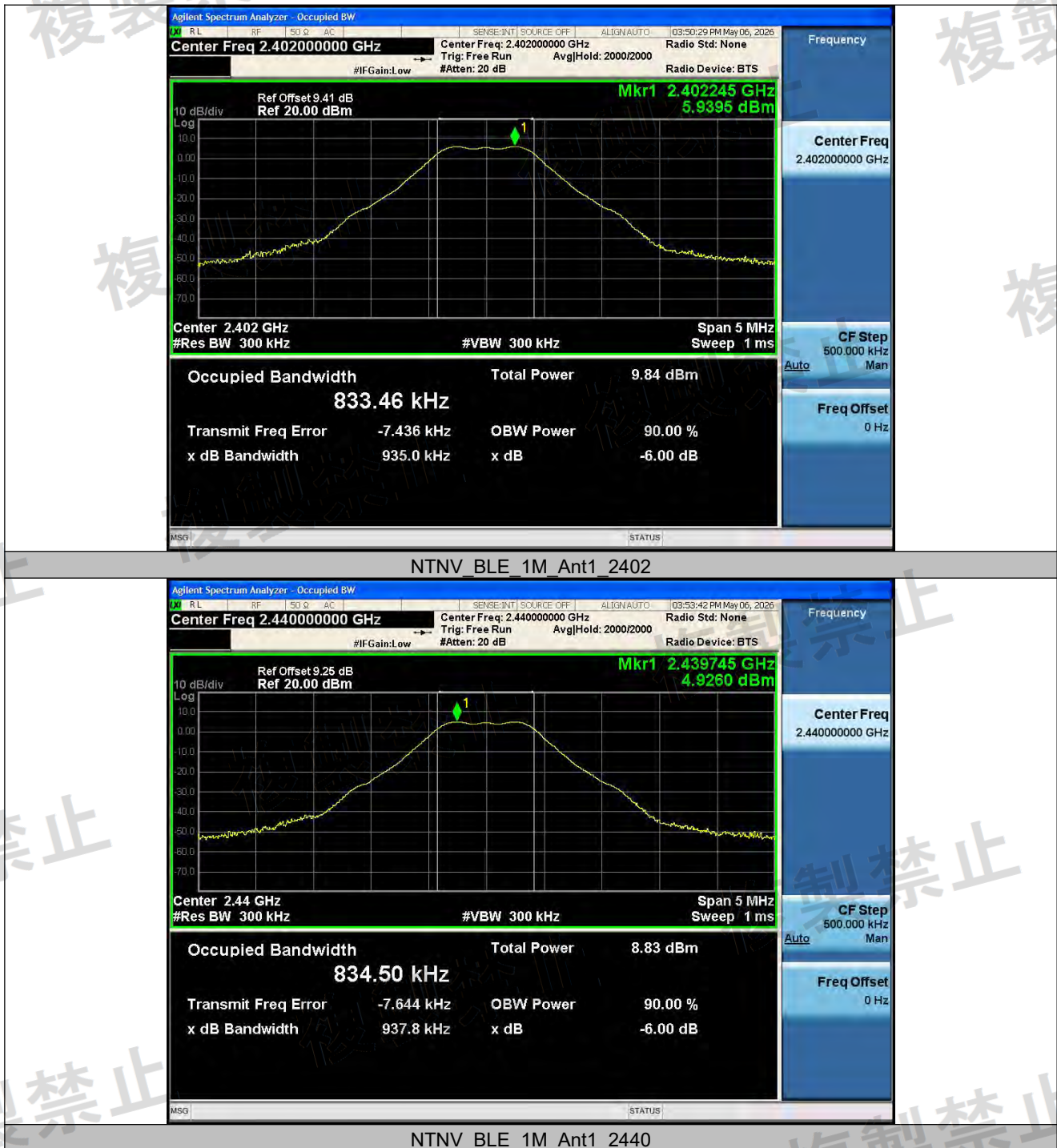
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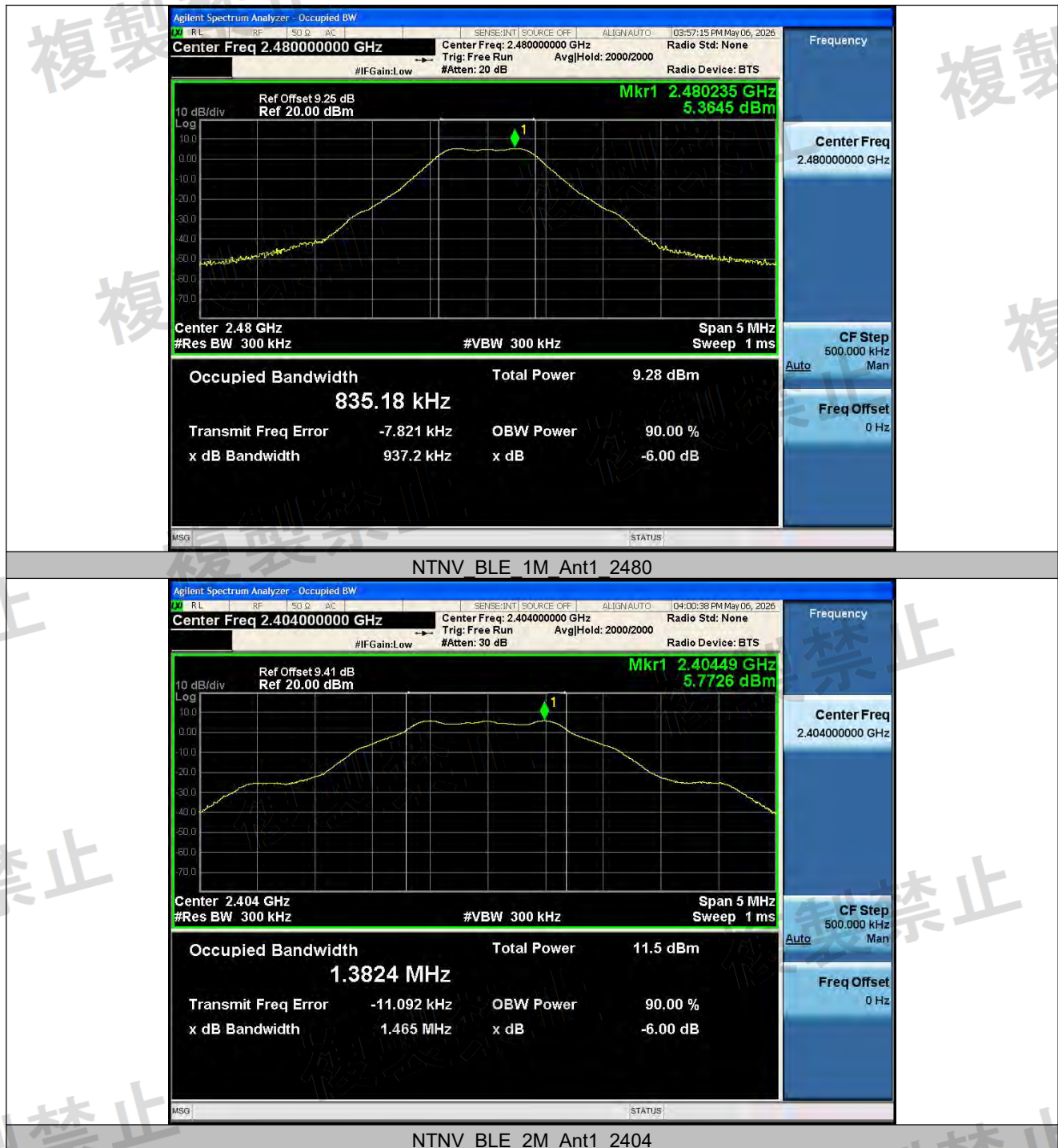
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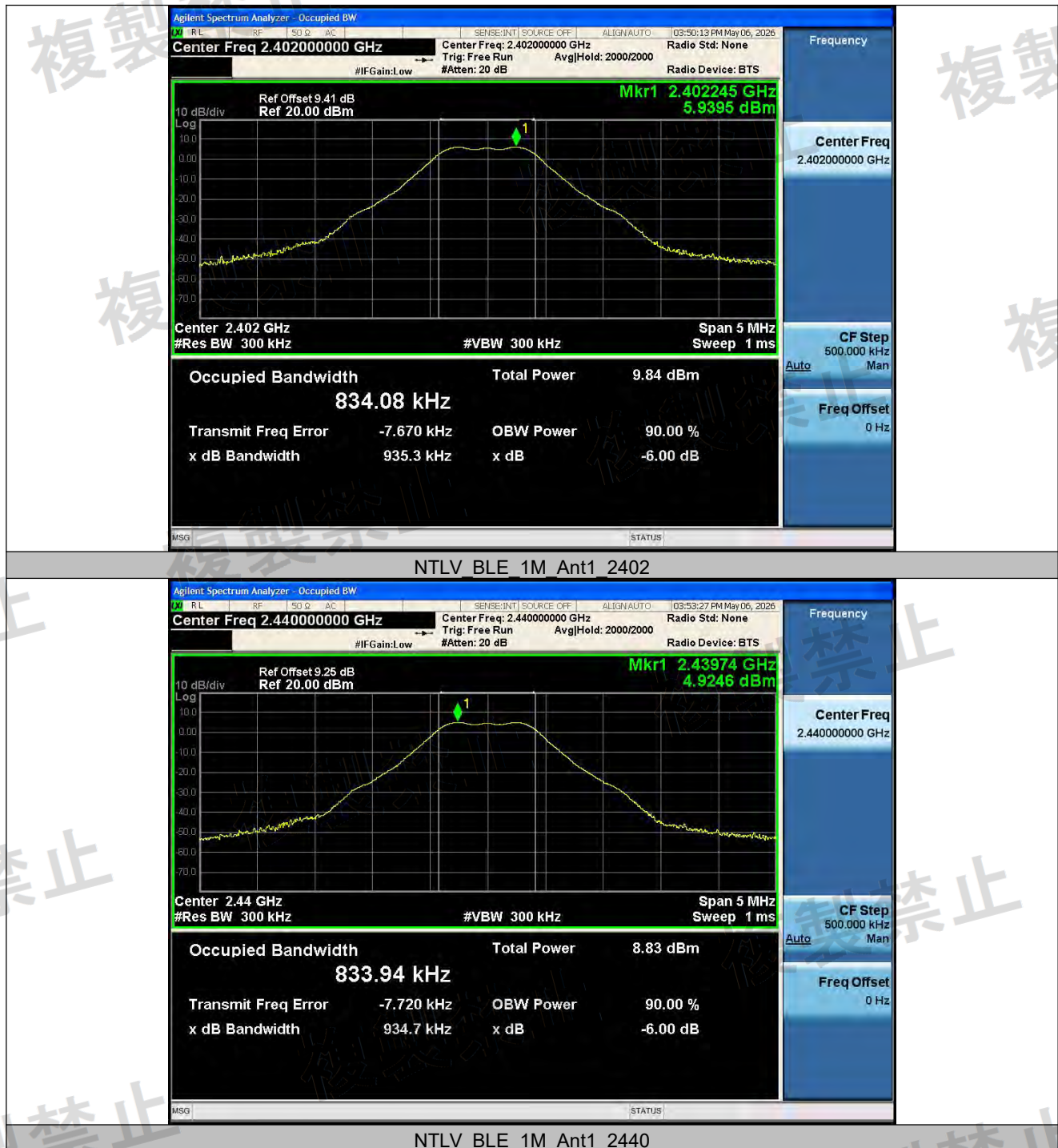
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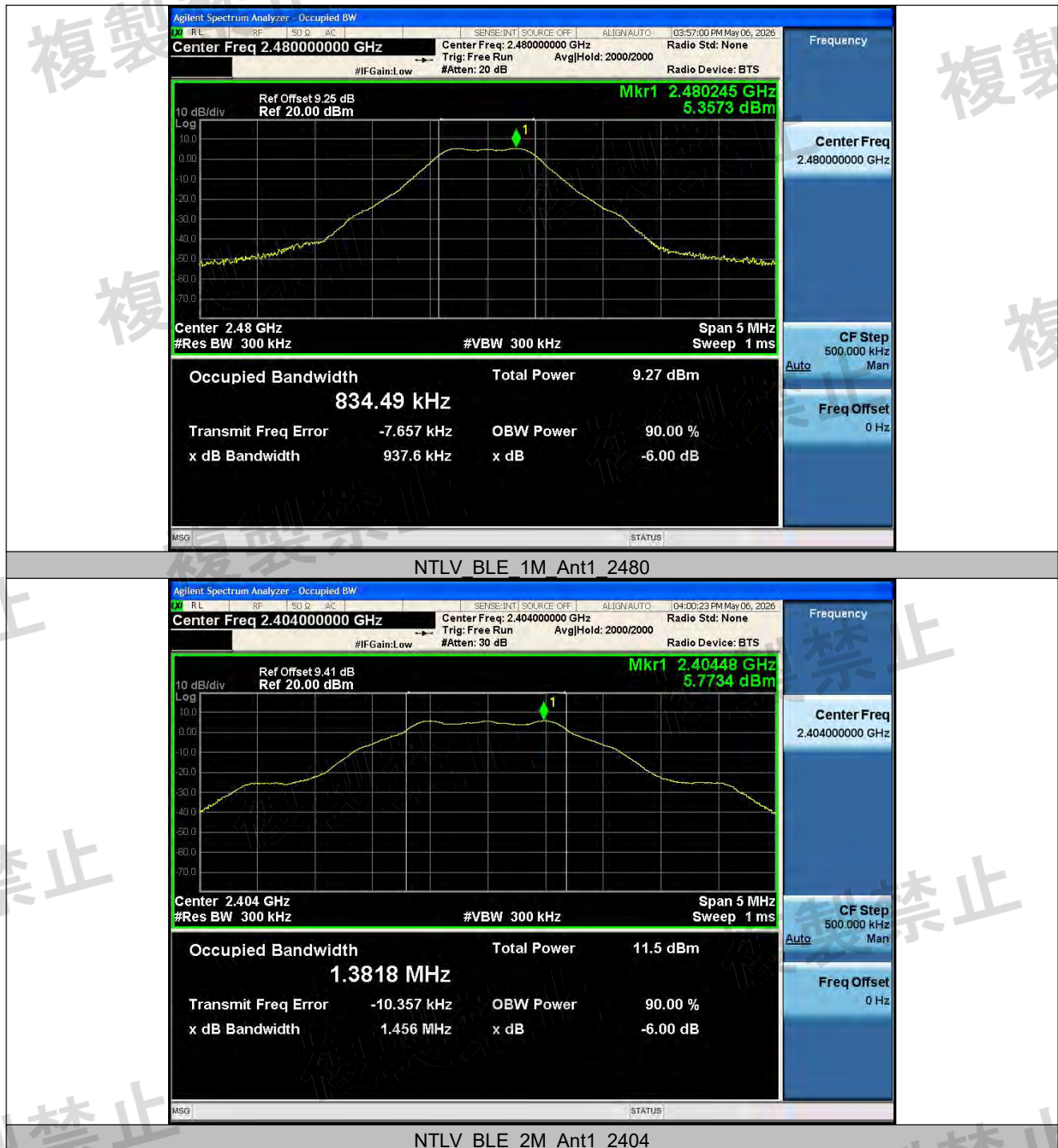
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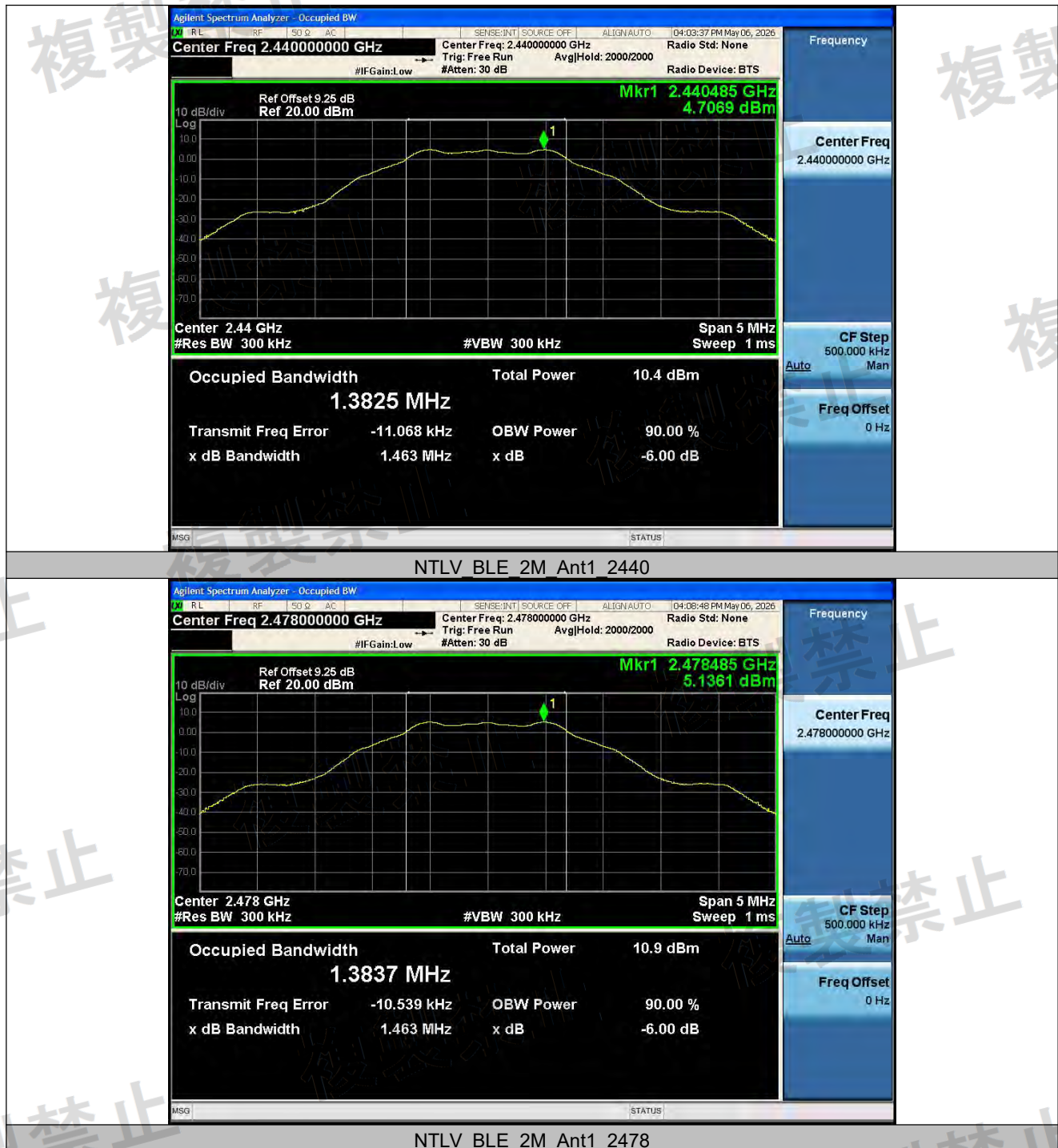


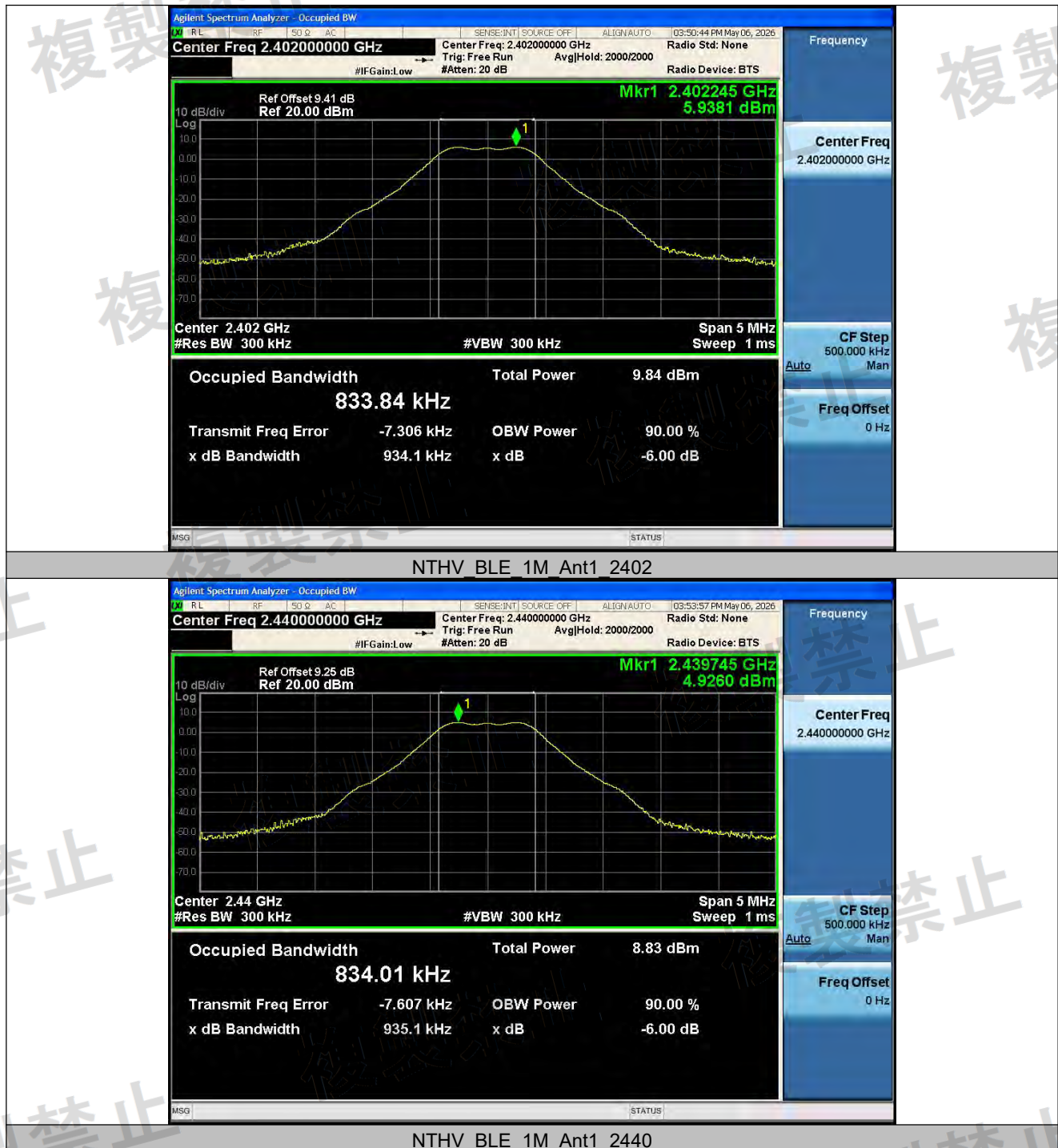


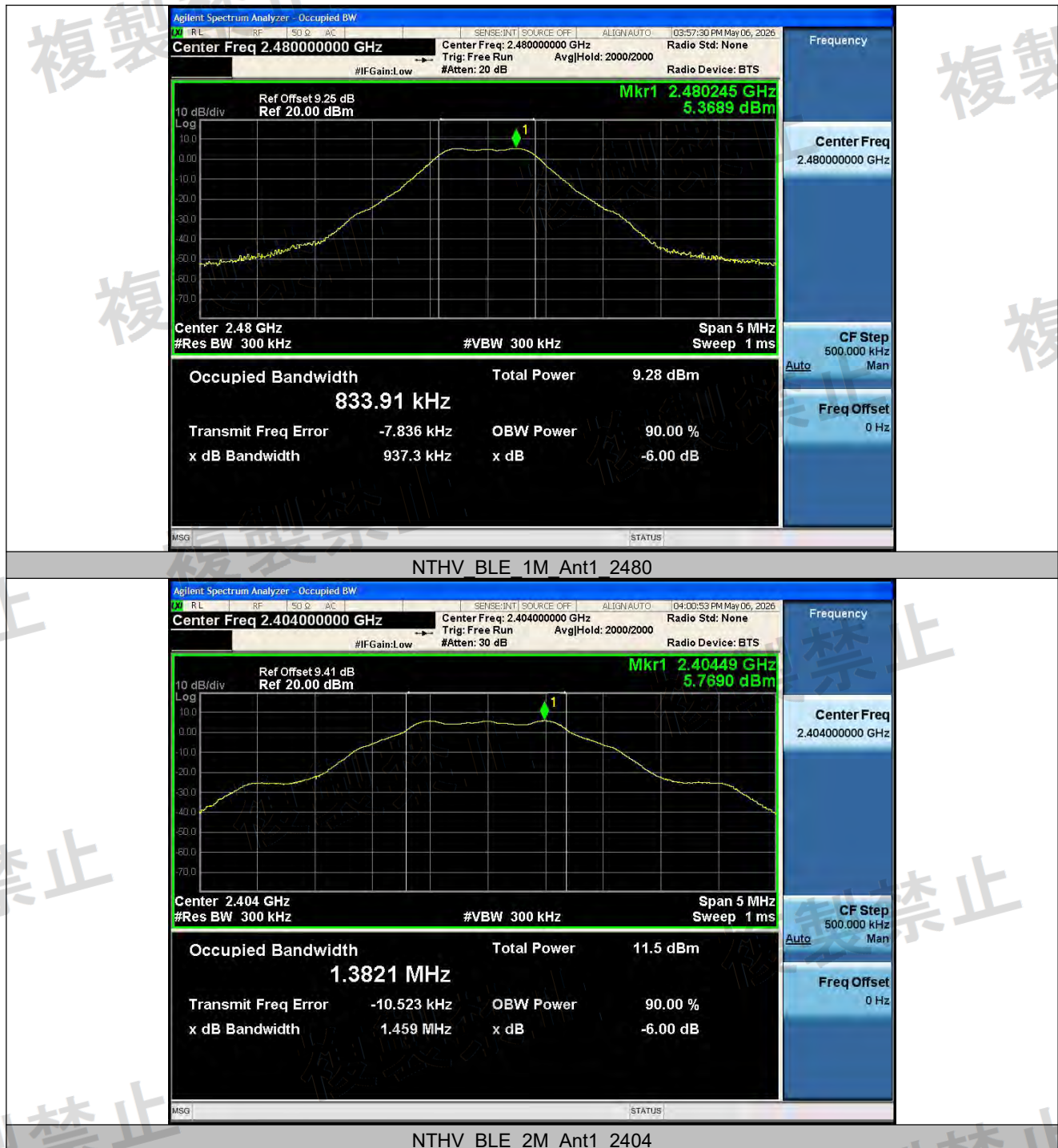


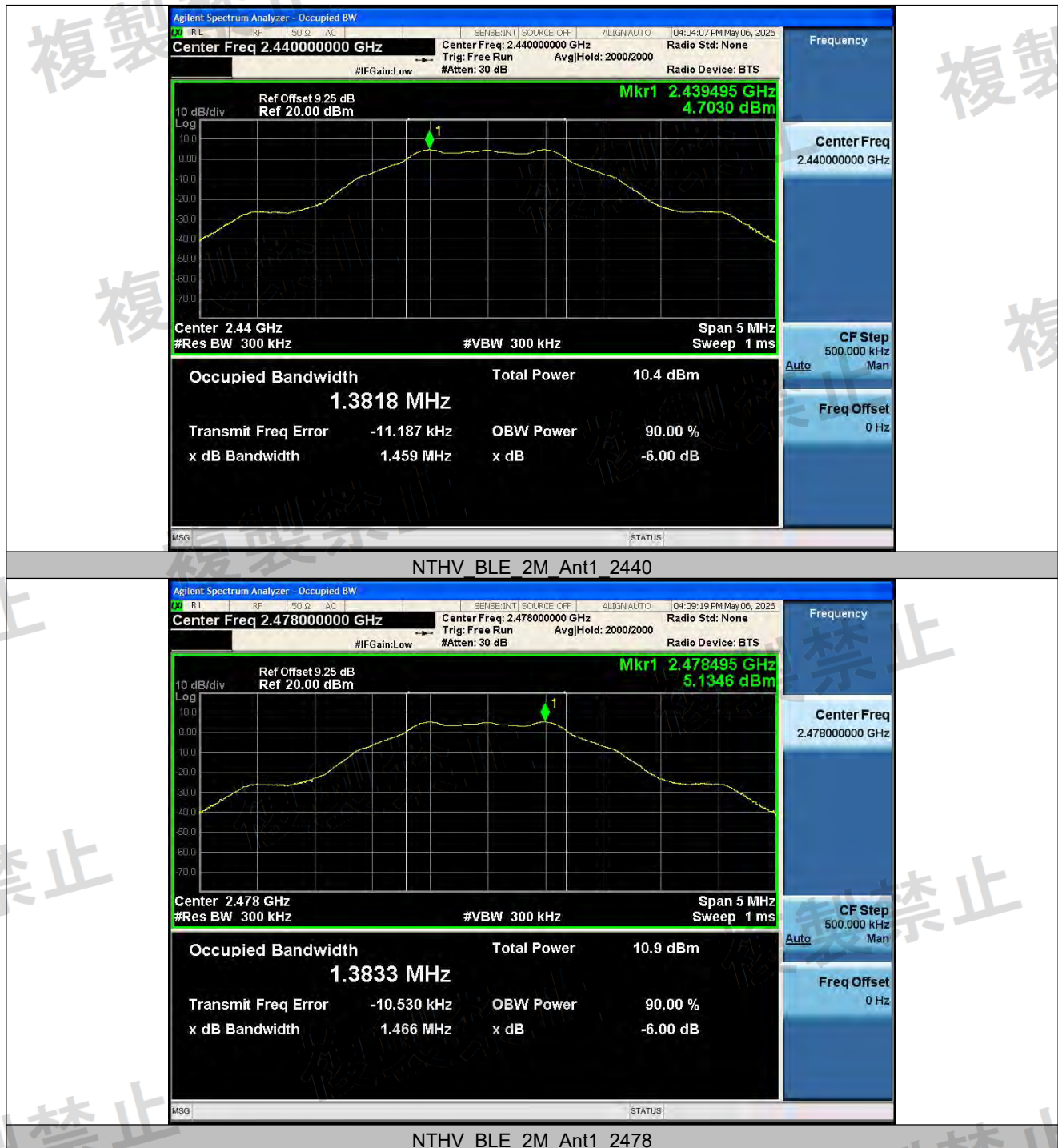










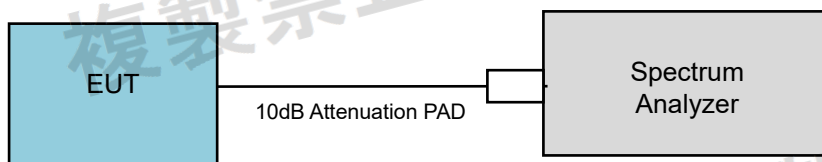


4.4 Spurious emissions for transmitter measurement

4.4.1 Limit of Spurious emissions for transmitter measurement

Frequencies (MHz)	Limit
Operating frequency 2400 to 2483.5MHz	
30.0MHz to 2387MHz	$\leq 2.5\mu\text{W}(-26\text{dBm})/\text{MHz}$
2387.0MHz to 2400.0MHz	$\leq 25\mu\text{W}(-16\text{dBm})/\text{MHz}$
2483.5MHz to 2496.5MHz	$\leq 25\mu\text{W}(-16\text{dBm})/\text{MHz}$
2496.5MHz to 12500.0MHz	$\leq 2.5\mu\text{W}(-26\text{dBm})/\text{MHz}$

4.4.2 Test Setup



4.4.3 Deviation from Test Standard

No deviation.

4.4.4 Test Procedure

Test method according to Clause 5 of Annex No.43 of MIC Notification No.88.

The EUT was placed inside the environmental test chamber and powered by nominal DC voltage. The spurious emissions for transmitter was measured by spectrum analyzer.

The settings of the spectrum analyzer during spurious searches are as follows:

- Sweep Bandwidth Starts spurious searches from the smallest possible frequencies to more than 5 times the carrier frequencies (for example from 30 MHz up to 12.5 GHz for a 2.4 GHz system).
- Resolution Bandwidth 1 MHz
- Video Bandwidth 1 MHz
- Y-Axis Scale 10 dB/Div
- Input Level: Maximum dynamic range value
- Sweep Time: Minimum amount of time to ensure measurement accuracy.
- Sweep Points: Over 400 points
- Detection Mode: Positive peak
- Display mode: Maximum hold

4.4.5 Test Results

Test Condition	Test Mode	Antenna	Channel	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [uW/MHz]	Limit [uW/MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	30~2387	2387.00	-57.36	≤-26	0.001836538	≤2.5	PASS
				2387~2400	2399.99	-31.05	≤-16	0.785235635	≤25	PASS
				2483.5~2497	2488.03	-59.97	≤-16	0.001006932	≤25	PASS
				2497~13000	4803.60	-56.33	≤-26	0.002328091	≤2.5	PASS
			2440	30~2387	2327.19	-59.20	≤-26	0.001202264	≤2.5	PASS
				2387~2400	2399.91	-59.98	≤-16	0.001004616	≤25	PASS
				2483.5~2497	2487.76	-57.88	≤-16	0.001629296	≤25	PASS
				2497~13000	4880.20	-56.75	≤-26	0.002113489	≤2.5	PASS
			2480	30~2387	2072.64	-60.01	≤-26	0.0009977	≤2.5	PASS
				2387~2400	2395.96	-60.28	≤-16	0.000937562	≤25	PASS
				2483.5~2497	2492.10	-44.62	≤-16	0.034514374	≤25	PASS
				2497~13000	4960.60	-54.93	≤-26	0.003213661	≤2.5	PASS
	BLE_2M	Ant1	2404	30~2387	2340.74	-57.26	≤-26	0.001879317	≤2.5	PASS
				2387~2400	2391.16	-46.41	≤-16	0.022855988	≤25	PASS
				2483.5~2497	2488.33	-57.37	≤-16	0.001832314	≤25	PASS
				2497~13000	4807.80	-57.27	≤-26	0.001874995	≤2.5	PASS
			2440	30~2387	2376.69	-57.80	≤-26	0.001659587	≤2.5	PASS
				2387~2400	2396.83	-61.00	≤-16	0.000794328	≤25	PASS
				2483.5~2497	2490.88	-54.53	≤-16	0.003523709	≤25	PASS
				2497~13000	9928.80	-57.83	≤-26	0.001648162	≤2.5	PASS
			2478	30~2387	2381.40	-60.32	≤-26	0.000928966	≤2.5	PASS
				2387~2400	2398.54	-60.69	≤-16	0.0008531	≤25	PASS
				2483.5~2497	2484.11	-44.29	≤-16	0.037239171	≤25	PASS
				2497~13000	2503.30	-53.92	≤-26	0.004055085	≤2.5	PASS
NTLV	BLE_1M	Ant1	2402	30~2387	2385.82	-55.50	≤-26	0.002818383	≤2.5	PASS
				2387~2400	2399.99	-31.41	≤-16	0.722769804	≤25	PASS
				2483.5~2497	2483.97	-59.86	≤-16	0.001032761	≤25	PASS
				2497~13000	4804.60	-56.30	≤-26	0.002344229	≤2.5	PASS
			2440	30~2387	2376.69	-59.48	≤-26	0.001127197	≤2.5	PASS
				2387~2400	2399.82	-60.42	≤-16	0.000907821	≤25	PASS
				2483.5~2497	2484.49	-58.66	≤-16	0.001361445	≤25	PASS
				2497~13000	4880.20	-55.91	≤-26	0.002564484	≤2.5	PASS
			2480	30~2387	2329.55	-58.50	≤-26	0.001412538	≤2.5	PASS
				2387~2400	2391.25	-59.44	≤-16	0.001137627	≤25	PASS
				2483.5~2497	2491.68	-48.18	≤-16	0.015205475	≤25	PASS
				2497~13000	4959.60	-56.45	≤-26	0.002264644	≤2.5	PASS
	BLE_2M	Ant1	2404	30~2387	2340.45	-55.25	≤-26	0.002985383	≤2.5	PASS
				2387~2400	2391.92	-44.68	≤-16	0.034040819	≤25	PASS
				2483.5~2497	2493.37	-57.88	≤-16	0.001629296	≤25	PASS
				2497~13000	12666.50	-56.92	≤-26	0.002032357	≤2.5	PASS
			2440	30~2387	2375.51	-57.27	≤-26	0.001874995	≤2.5	PASS
				2387~2400	2396.79	-60.43	≤-16	0.000905733	≤25	PASS
				2483.5~2497	2486.80	-54.34	≤-16	0.00368129	≤25	PASS
				2497~13000	5885.40	-57.27	≤-26	0.001874995	≤2.5	PASS
			2478	30~2387	2128.02	-59.98	≤-26	0.001004616	≤2.5	PASS
				2387~2400	2390.30	-60.61	≤-16	0.00086896	≤25	PASS
				2483.5~2497	2485.76	-45.13	≤-16	0.03069022	≤25	PASS
				2497~13000	2509.10	-53.51	≤-26	0.004456562	≤2.5	PASS
NTHV	BLE_1M	Ant1	2402	30~2387	2374.92	-58.70	≤-26	0.001348963	≤2.5	PASS

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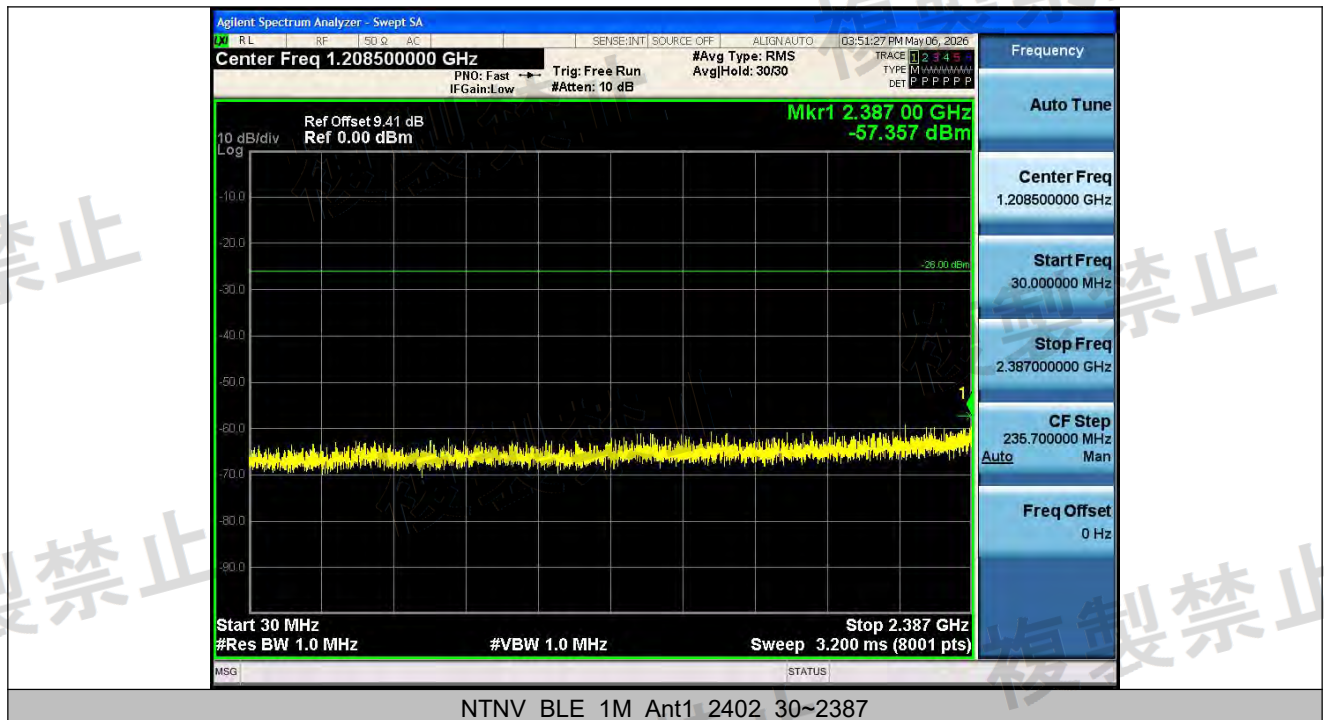
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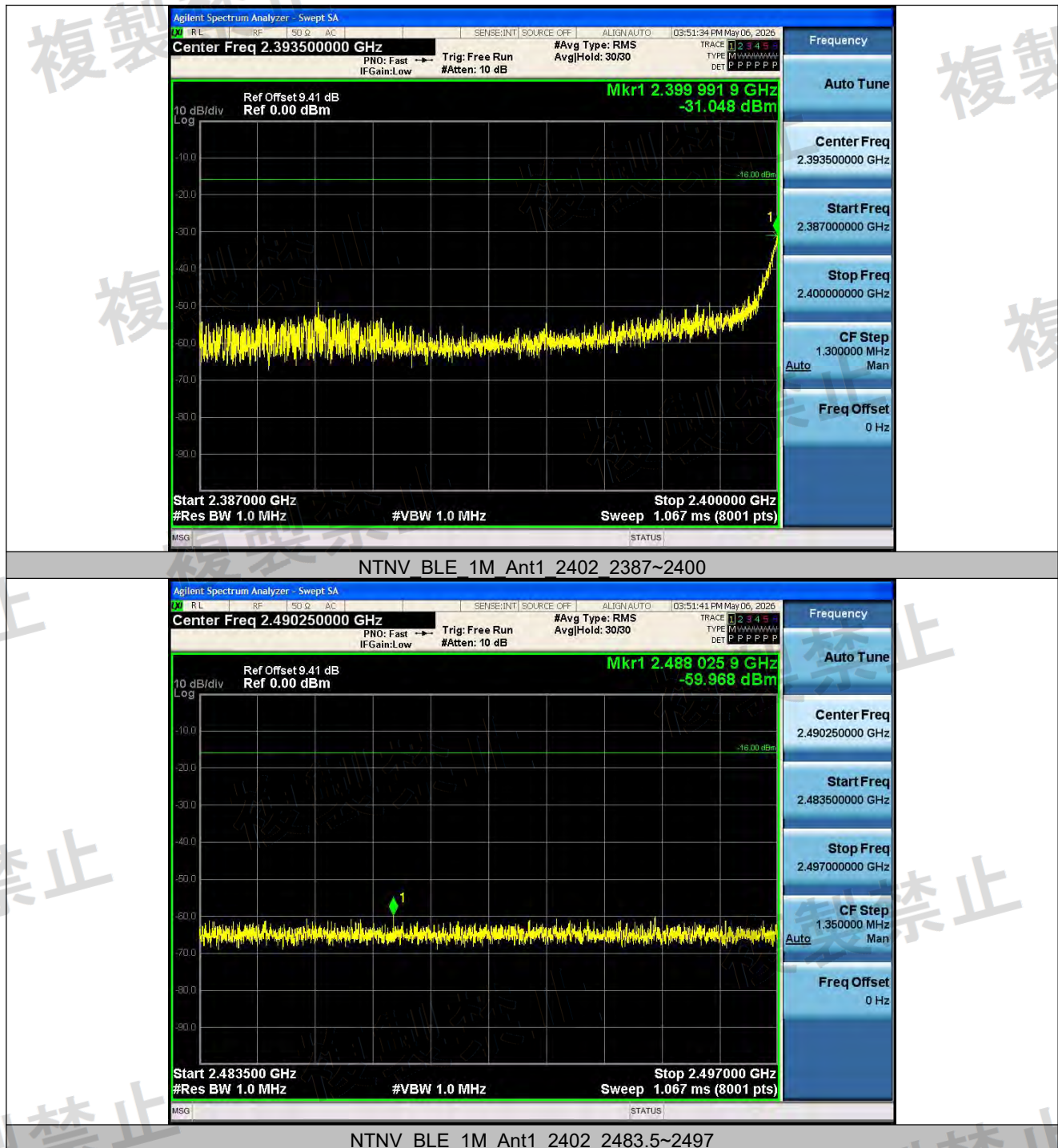
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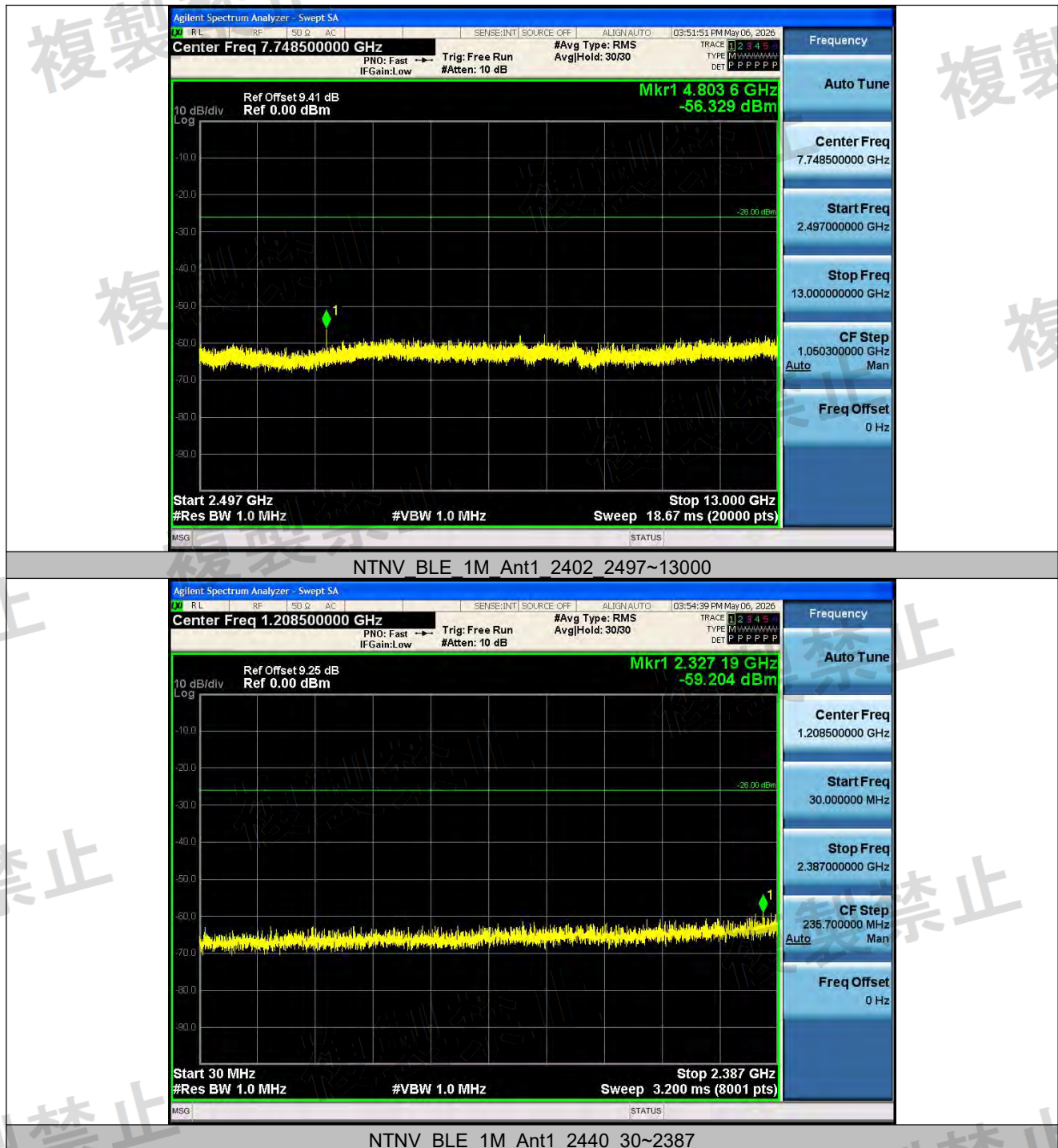
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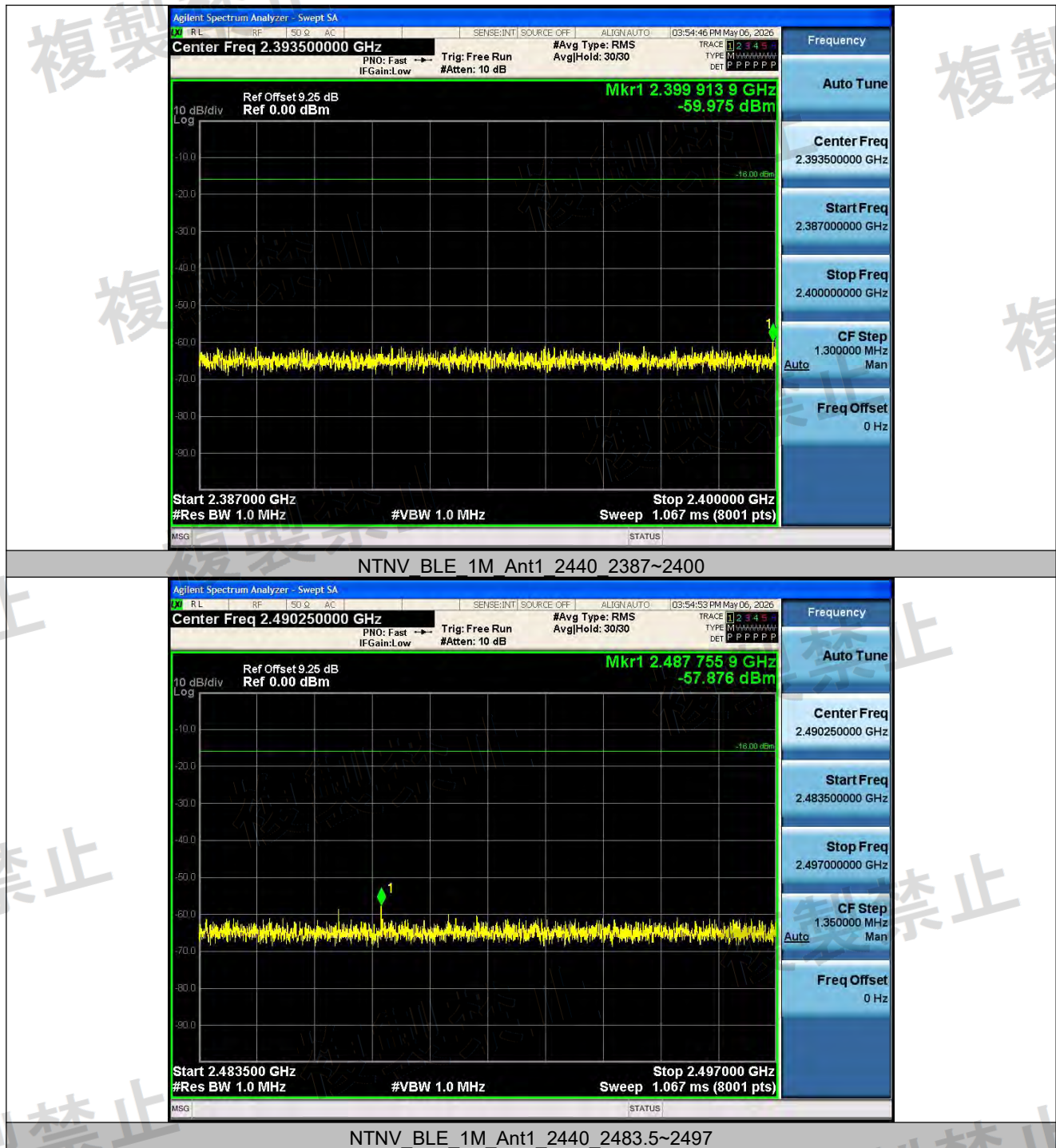
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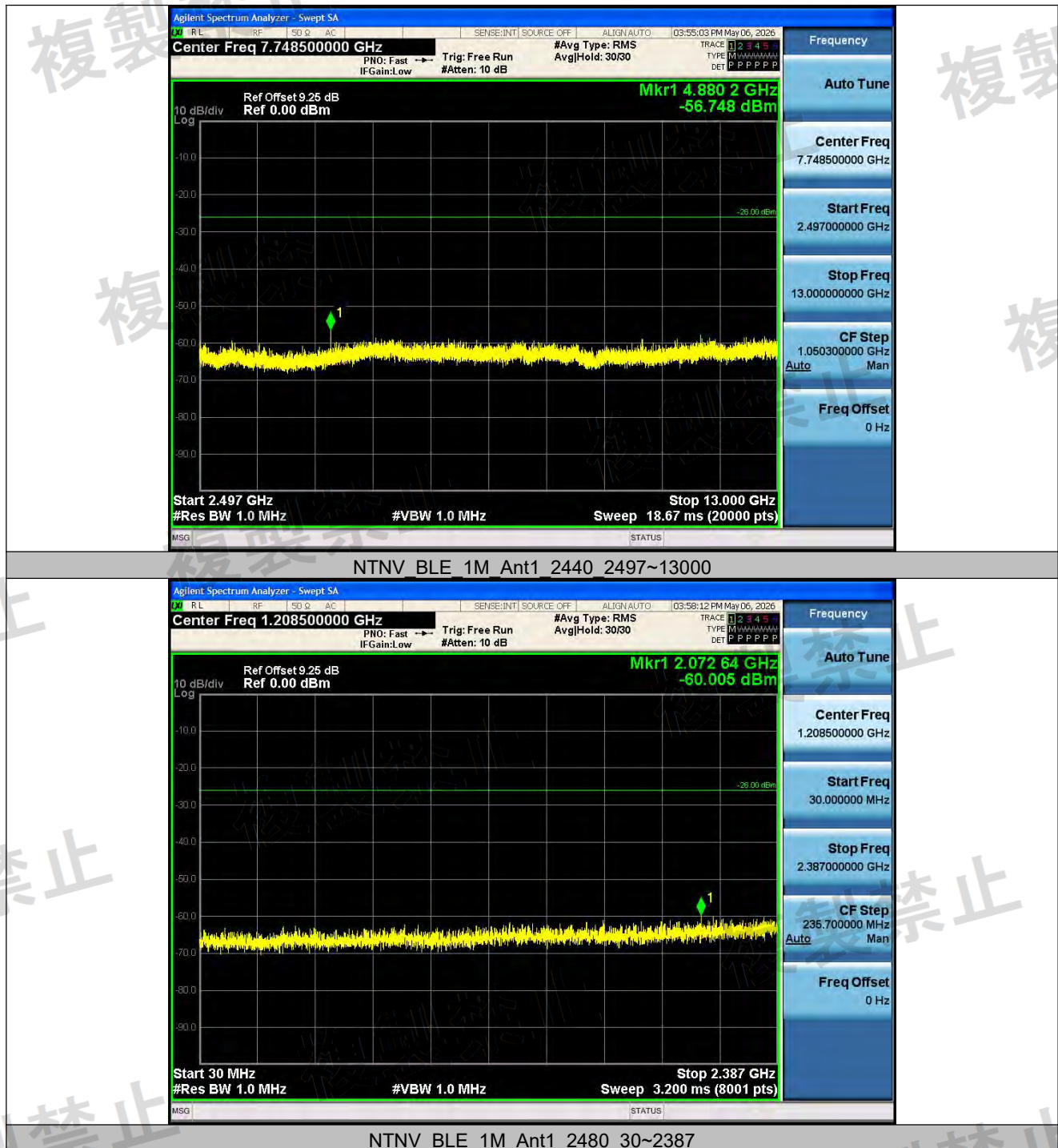
BLE_2M	Ant1	2440	2387~2400	2399.99	-31.04	≤-16	0.78704579	≤25	PASS
			2483.5~2497	2491.09	-60.61	≤-16	0.00086896	≤25	PASS
			2497~13000	4803.60	-56.89	≤-26	0.002046445	≤2.5	PASS
		2480	30~2387	2106.52	-59.55	≤-26	0.001109175	≤2.5	PASS
			2387~2400	2395.37	-60.32	≤-16	0.000928966	≤25	PASS
			2483.5~2497	2486.65	-57.77	≤-16	0.001671091	≤25	PASS
		2404	2497~13000	4880.20	-56.92	≤-26	0.002032357	≤2.5	PASS
			30~2387	2364.02	-59.05	≤-26	0.001244515	≤2.5	PASS
			2387~2400	2390.46	-60.68	≤-16	0.000855067	≤25	PASS
		2440	2483.5~2497	2491.48	-44.00	≤-16	0.039810717	≤25	PASS
			2497~13000	4960.60	-55.80	≤-26	0.002630268	≤2.5	PASS
			30~2387	2340.45	-56.73	≤-26	0.002123244	≤2.5	PASS
		2478	2387~2400	2392.67	-43.49	≤-16	0.04477133	≤25	PASS
			2483.5~2497	2483.89	-58.17	≤-16	0.001524053	≤25	PASS
			2497~13000	4807.80	-57.75	≤-26	0.001678804	≤2.5	PASS
		2440	30~2387	2377.28	-59.25	≤-26	0.001188502	≤2.5	PASS
			2387~2400	2393.70	-60.28	≤-16	0.000937562	≤25	PASS
			2483.5~2497	2489.92	-54.01	≤-16	0.003971915	≤25	PASS
		2478	2497~13000	2501.70	-55.17	≤-26	0.003040885	≤2.5	PASS
			30~2387	2374.33	-58.65	≤-26	0.001364583	≤2.5	PASS
			2387~2400	2391.88	-61.03	≤-16	0.00078886	≤25	PASS
		2440	2483.5~2497	2484.56	-44.34	≤-16	0.036812897	≤25	PASS
			2497~13000	2500.70	-49.94	≤-26	0.010139114	≤2.5	PASS

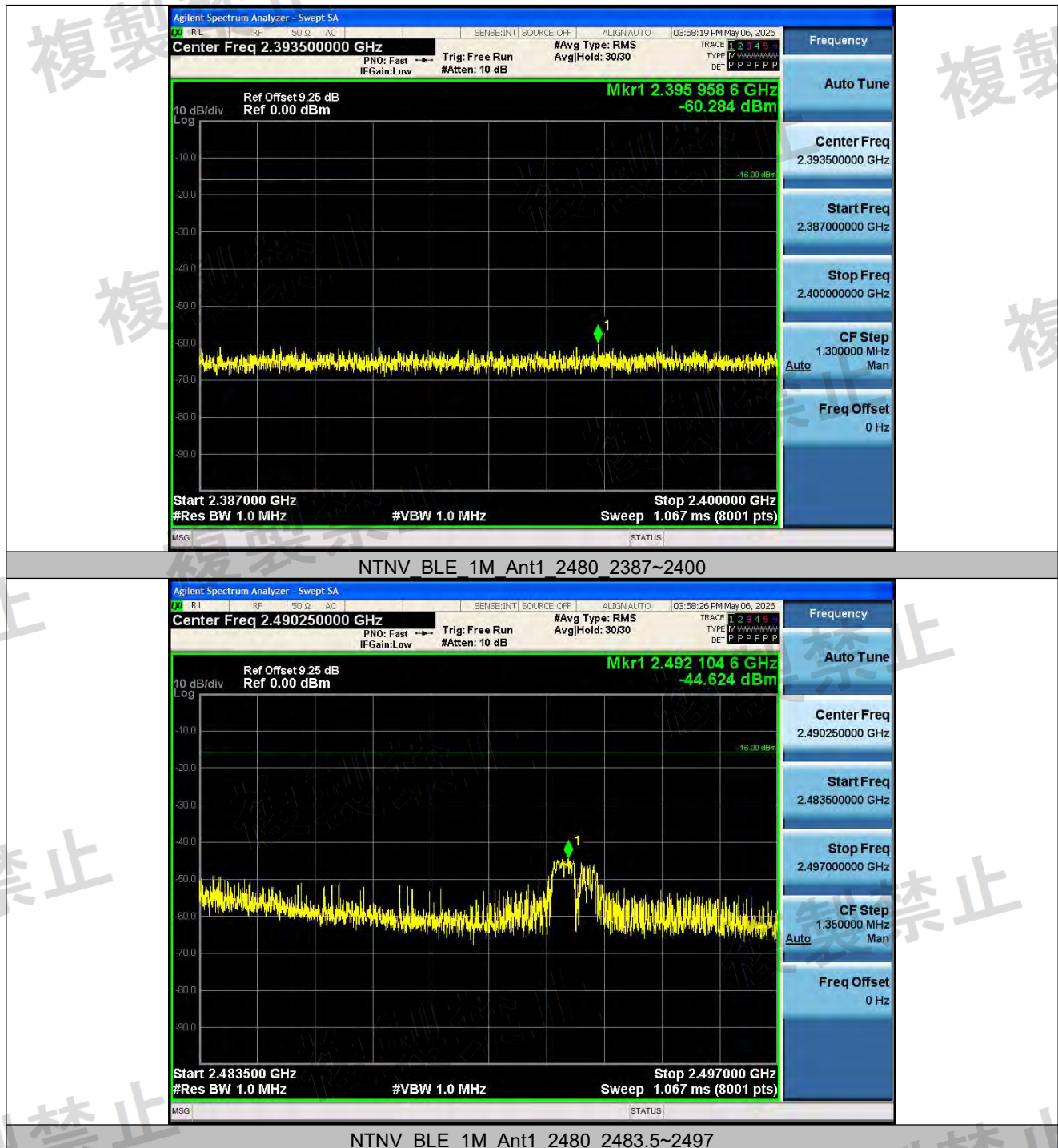




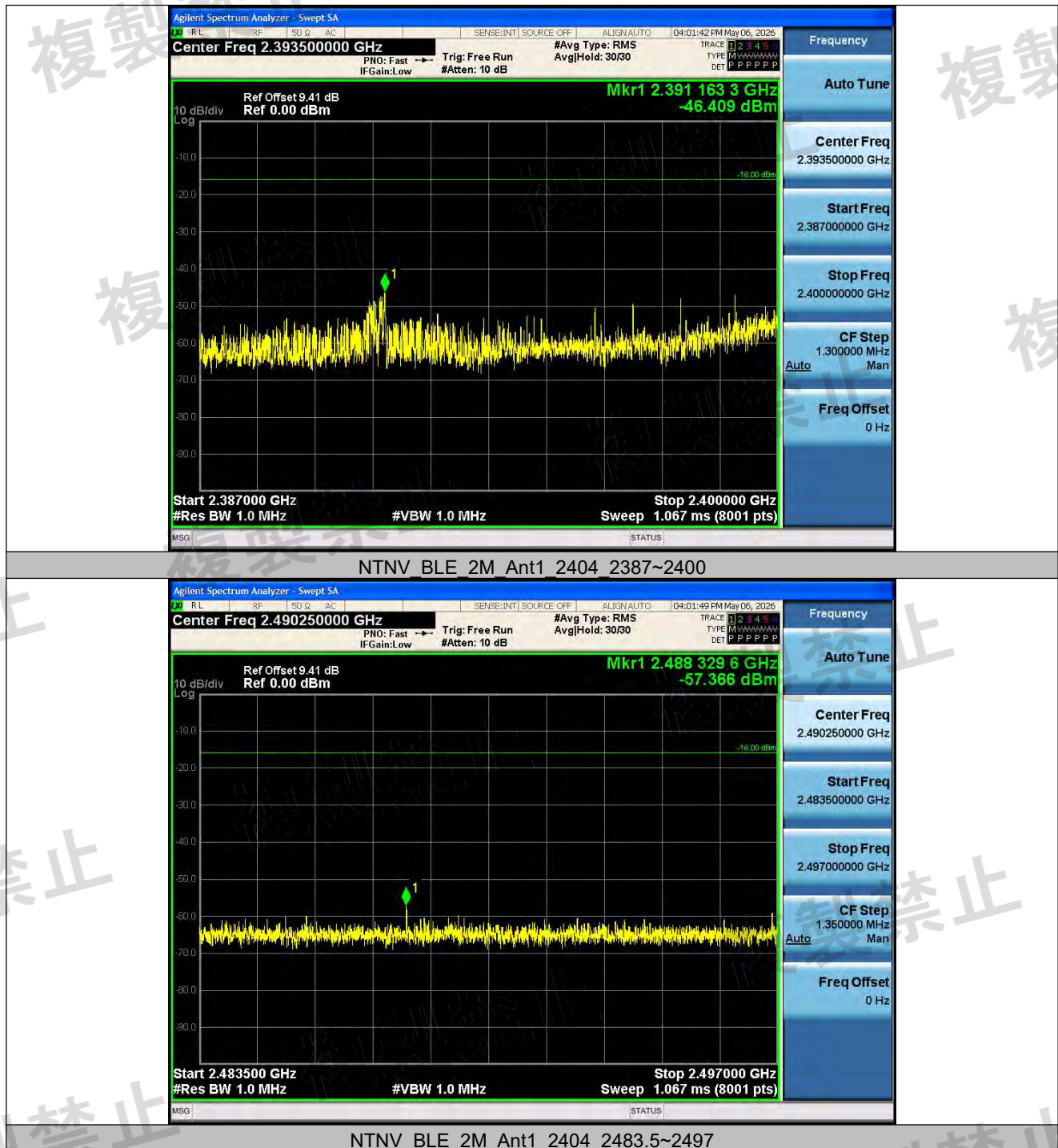


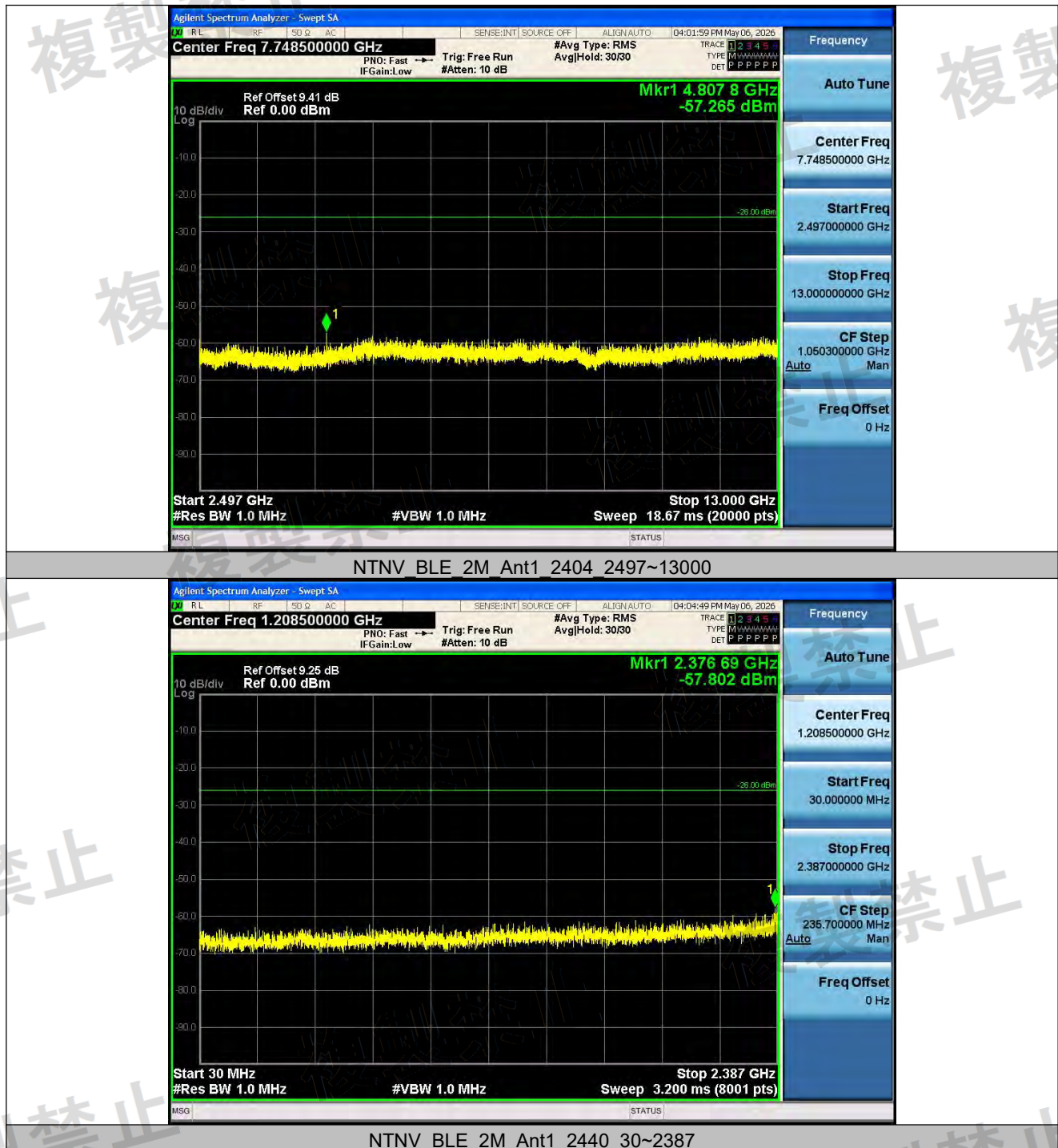


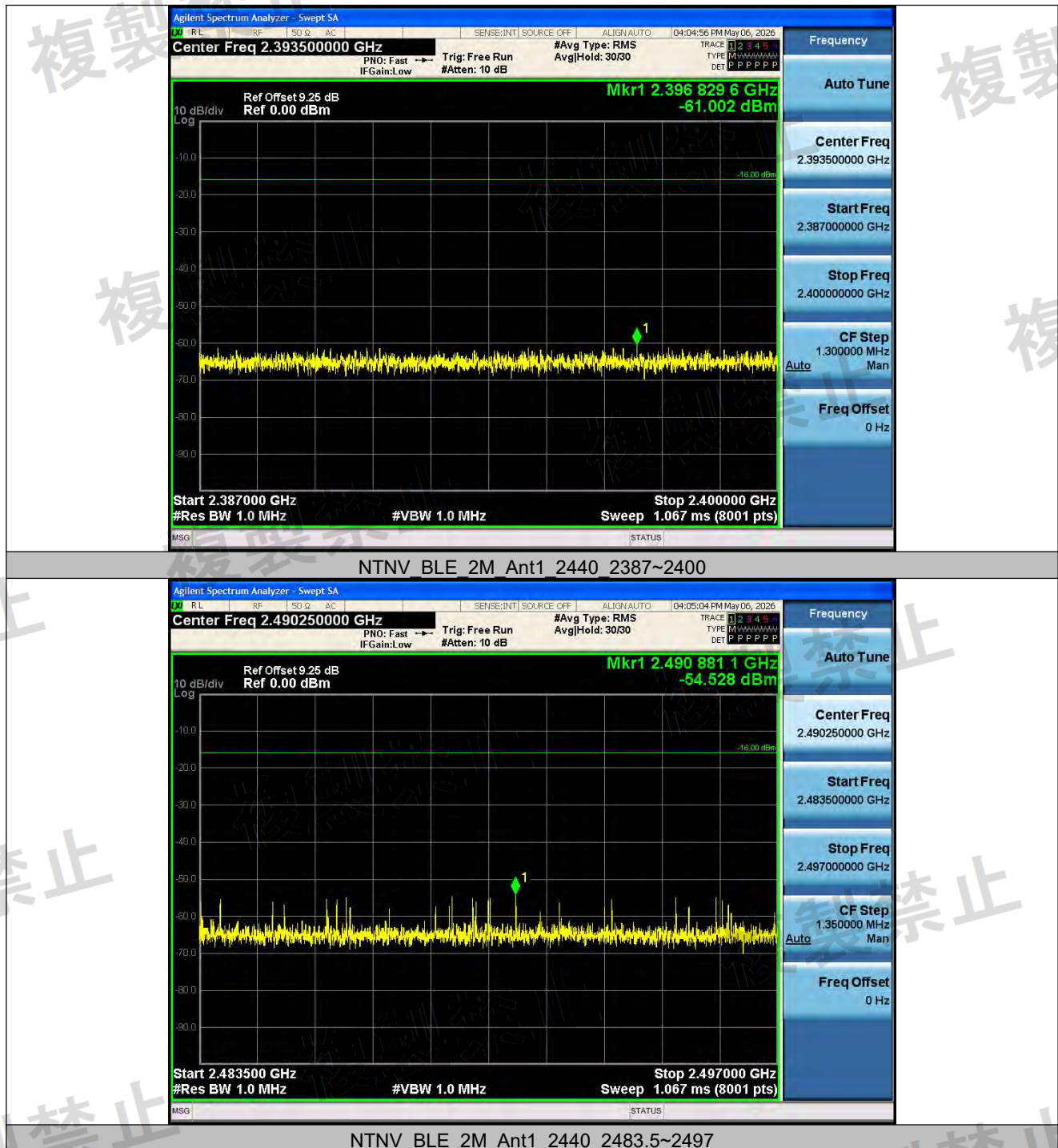


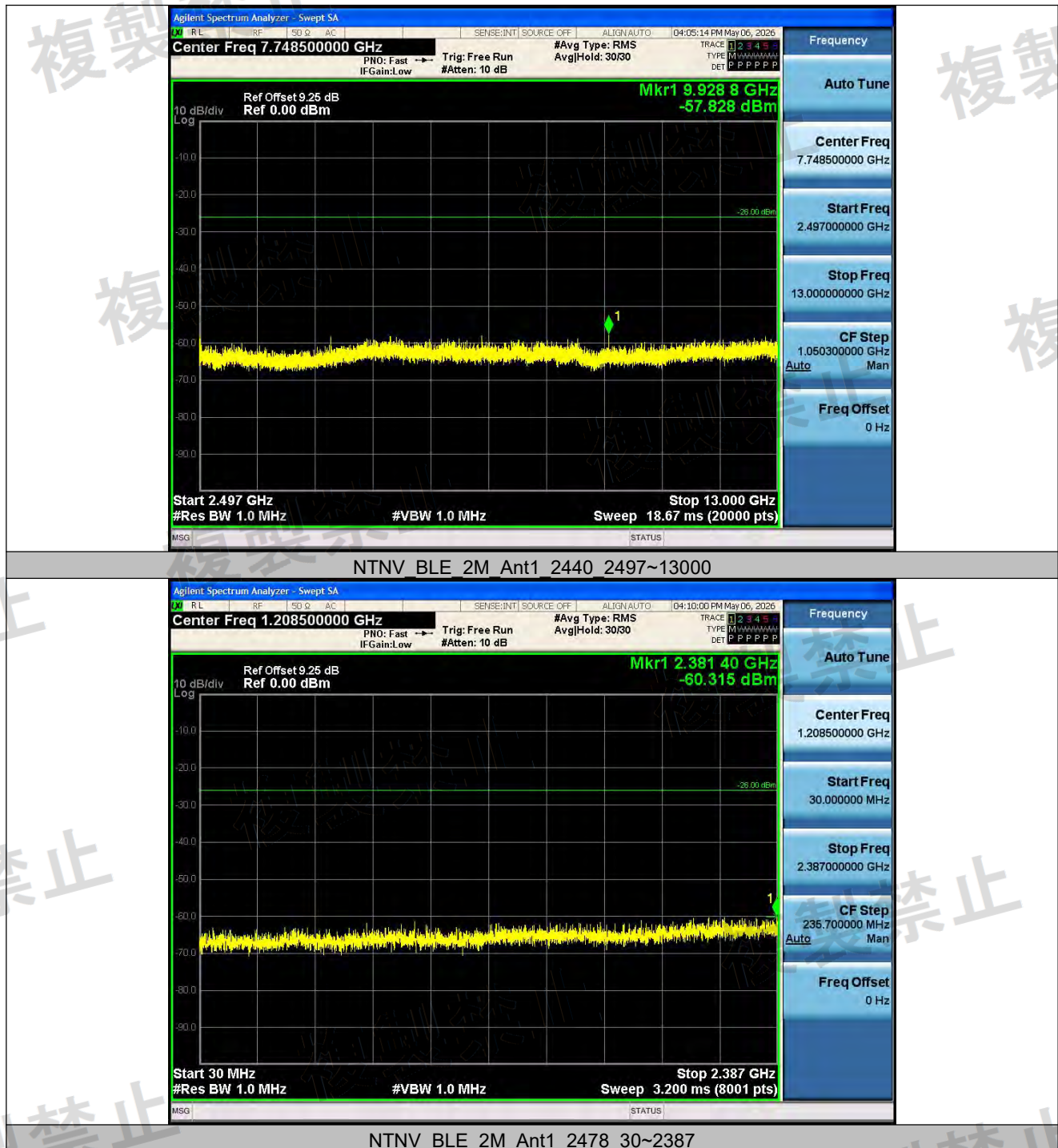
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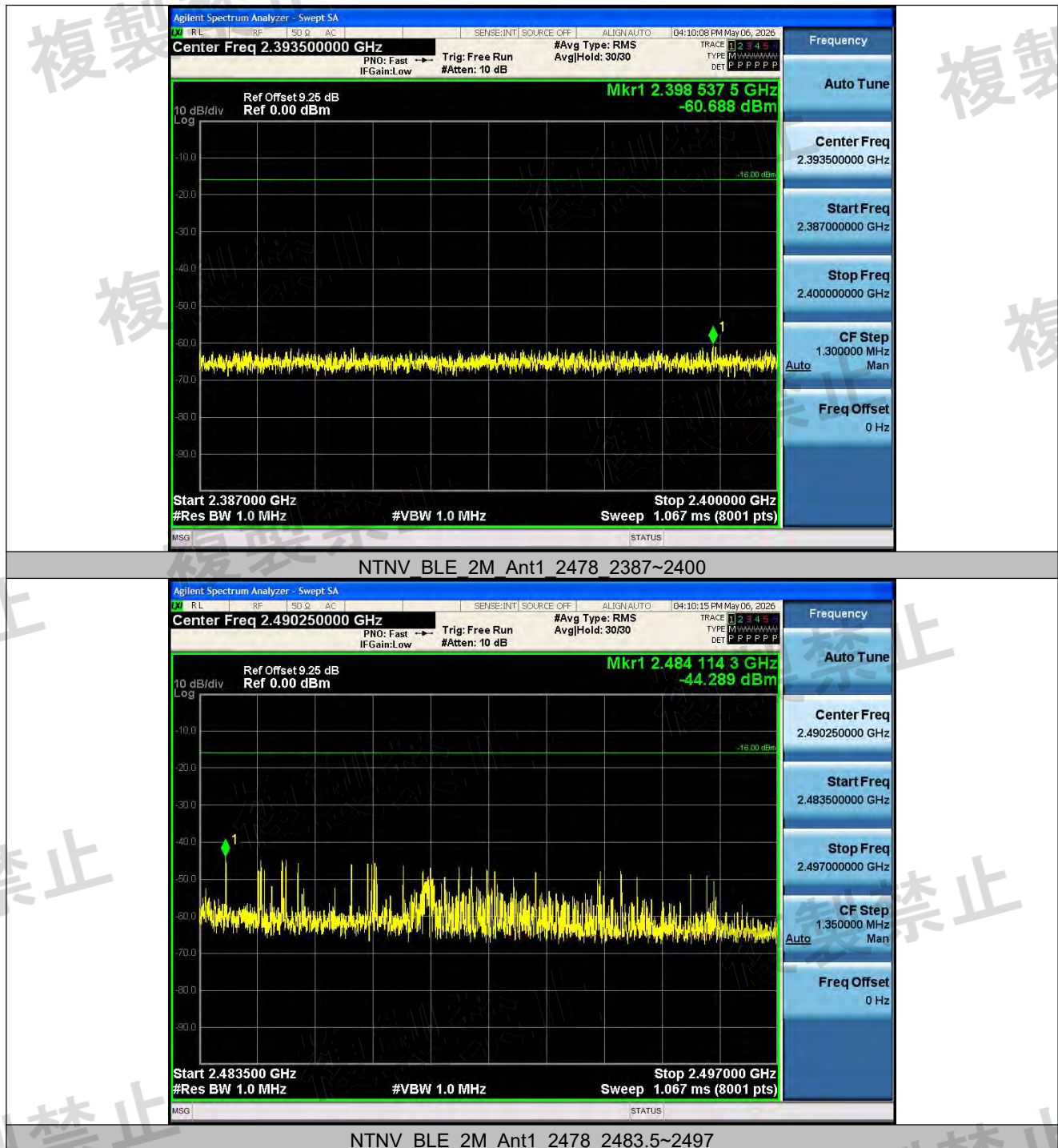


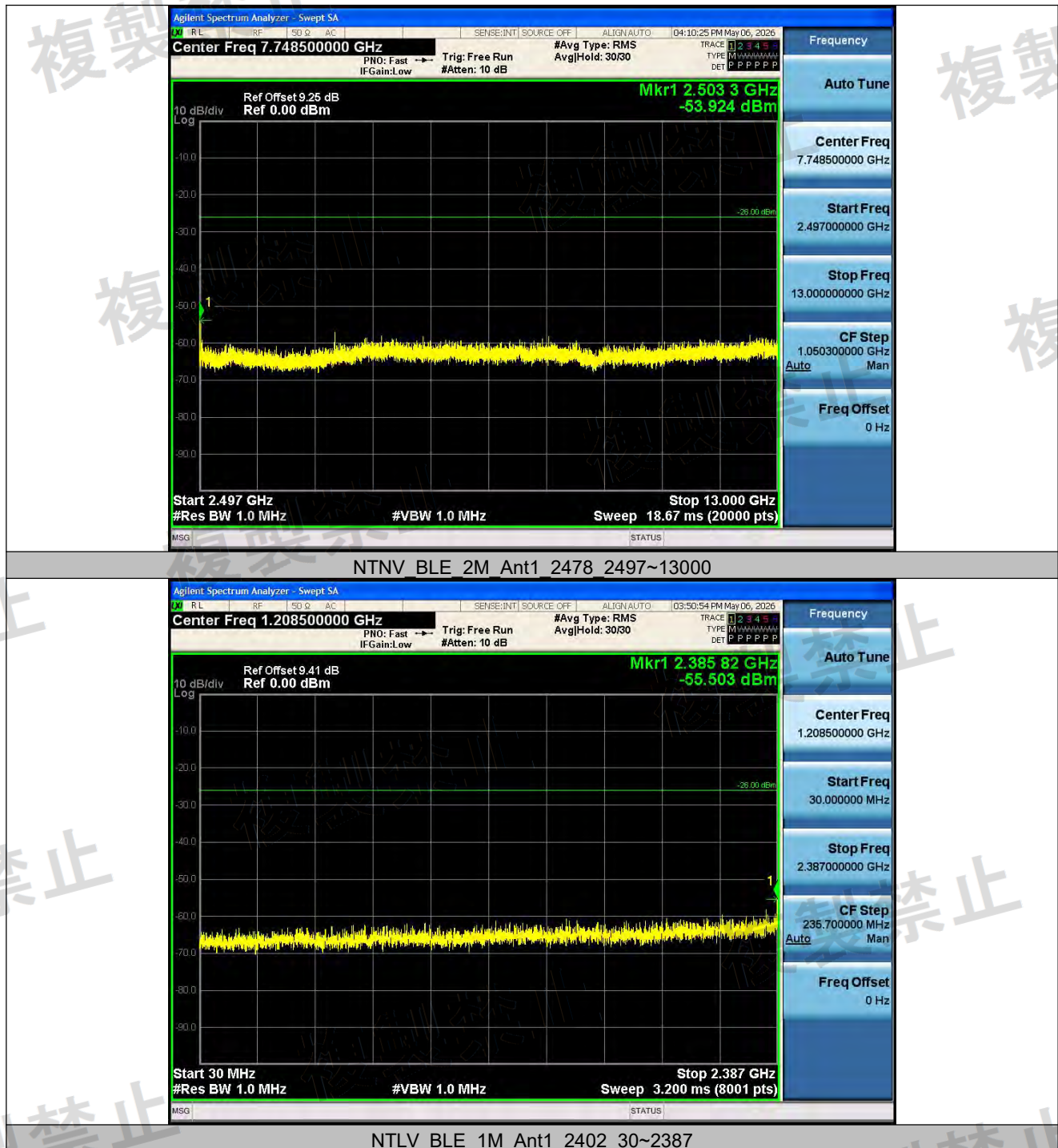


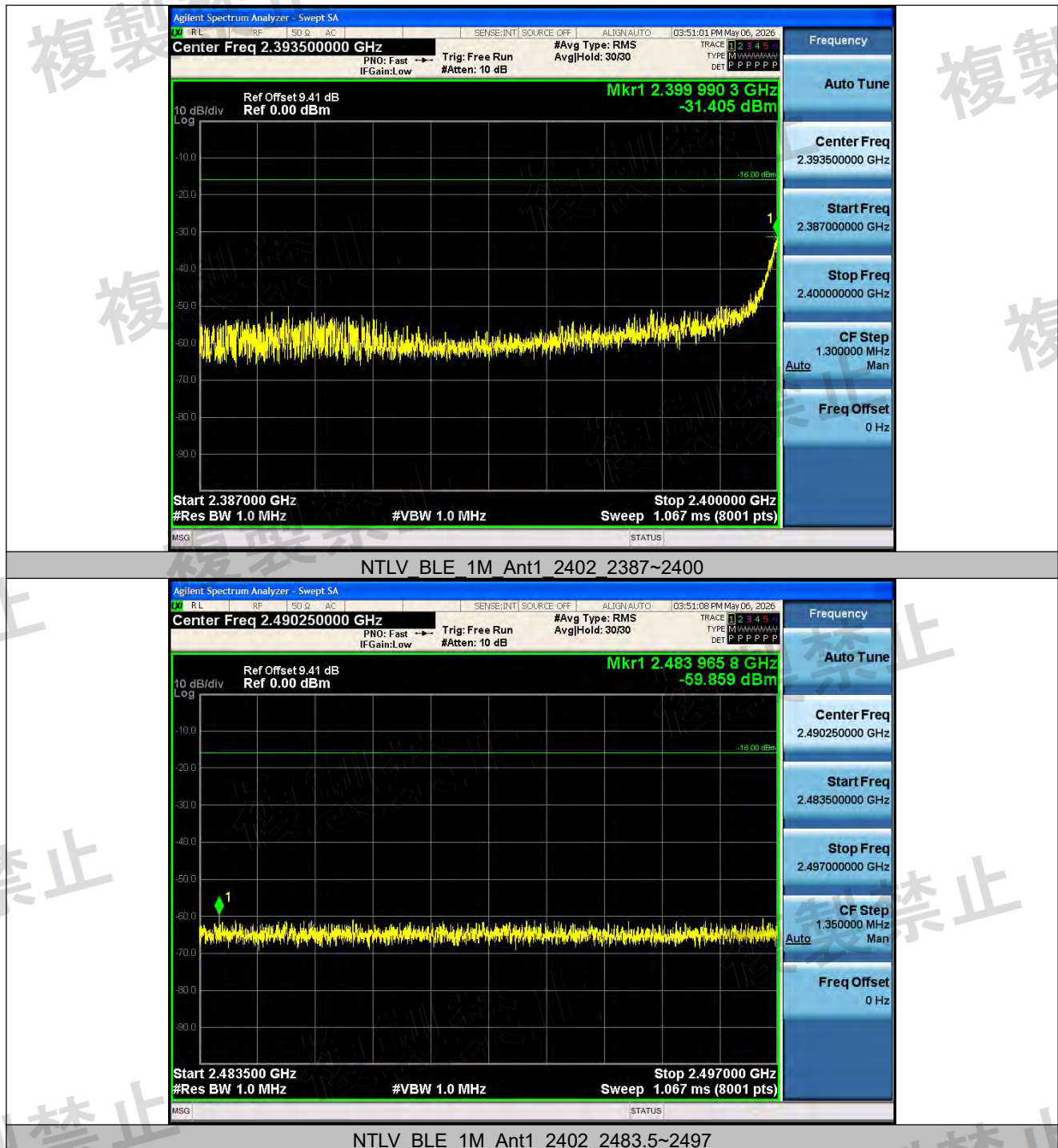


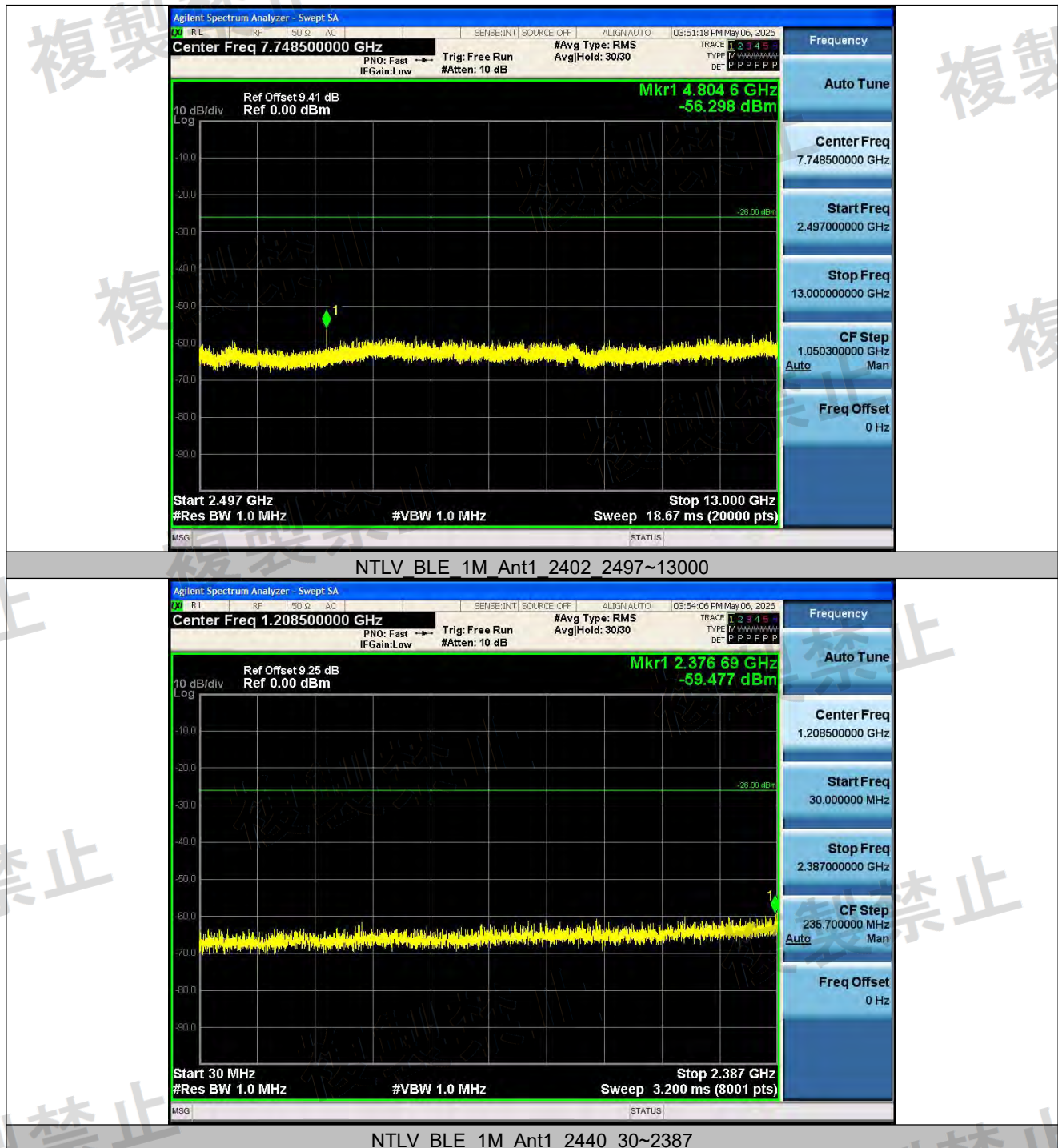


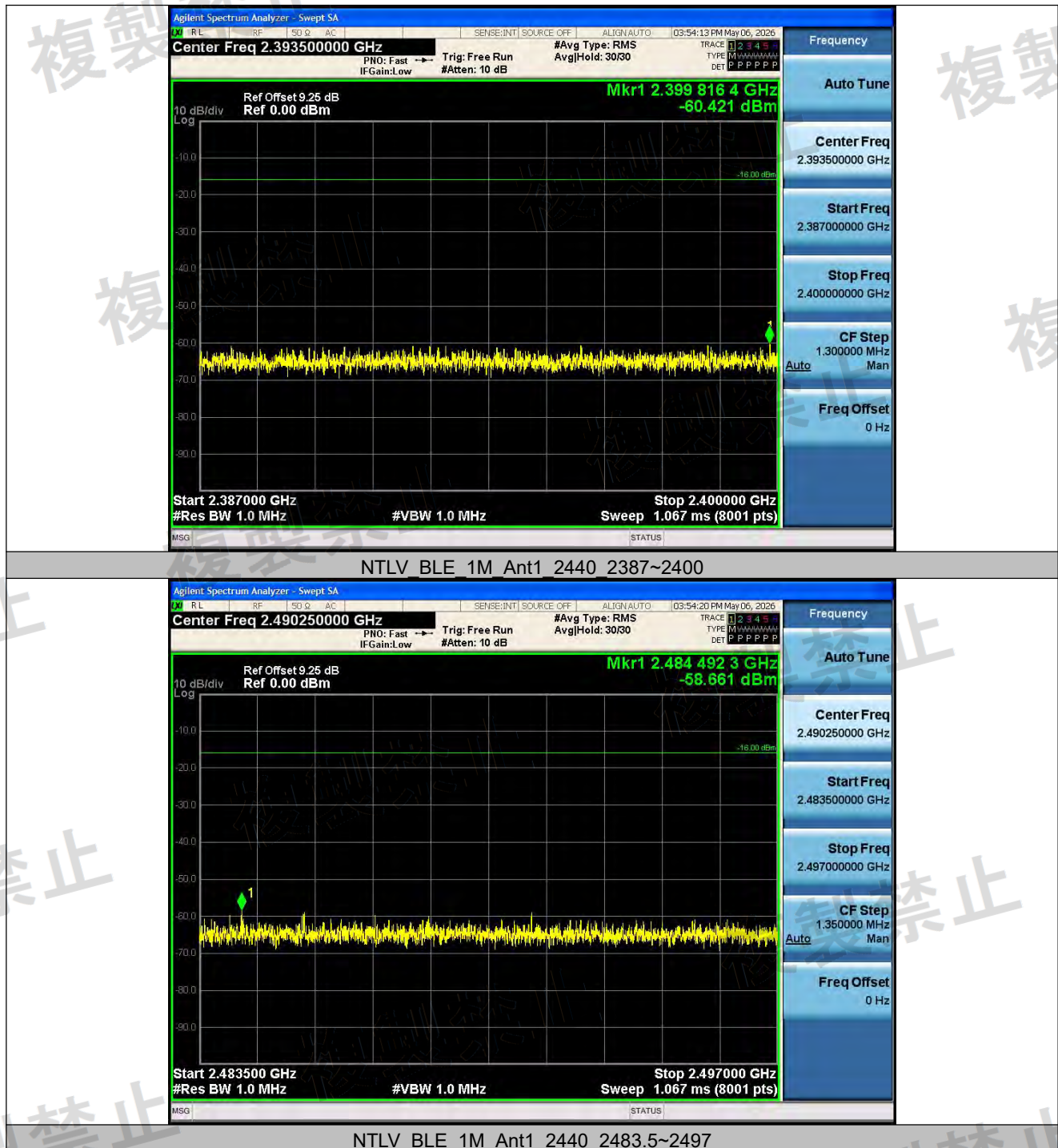


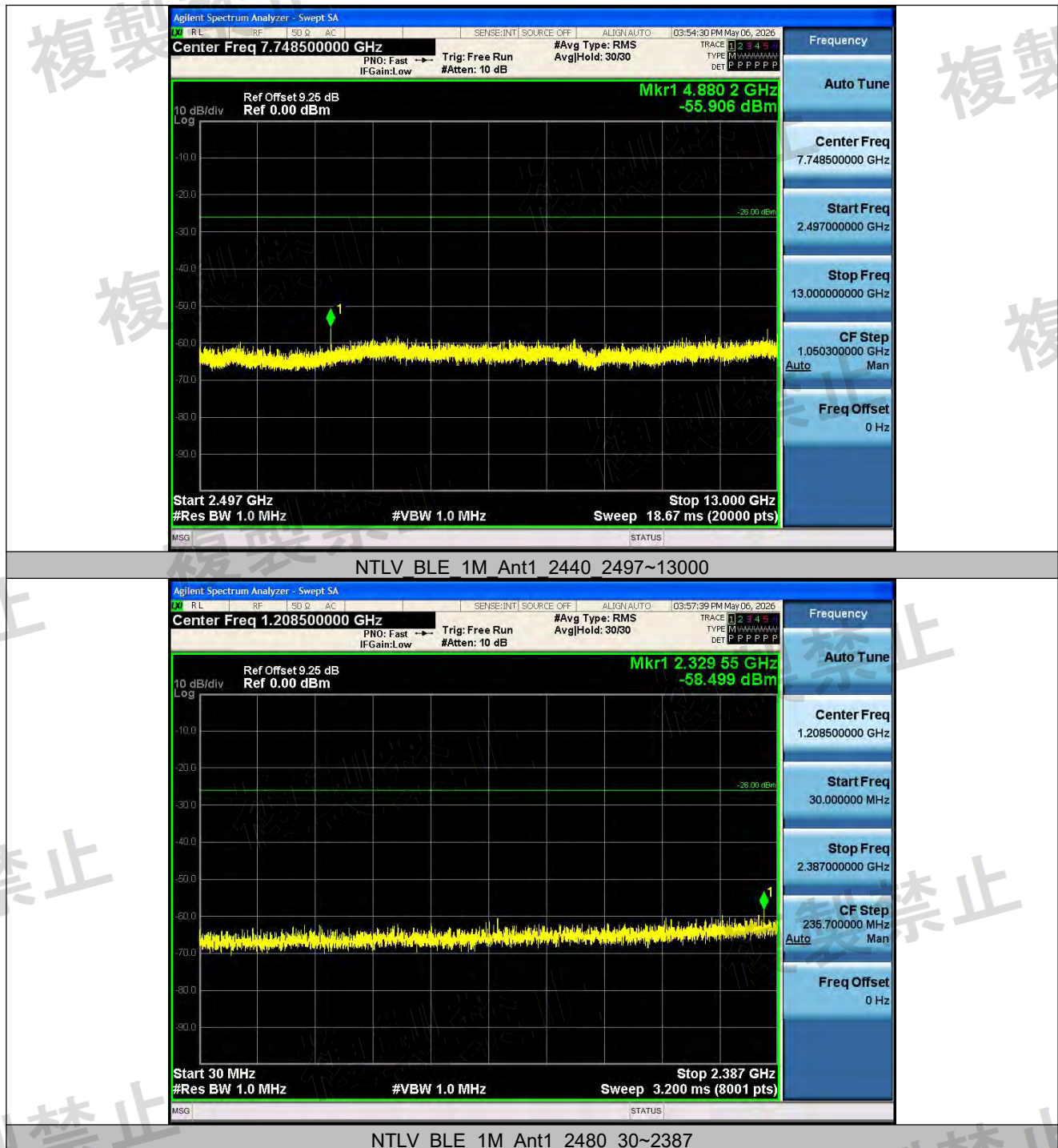


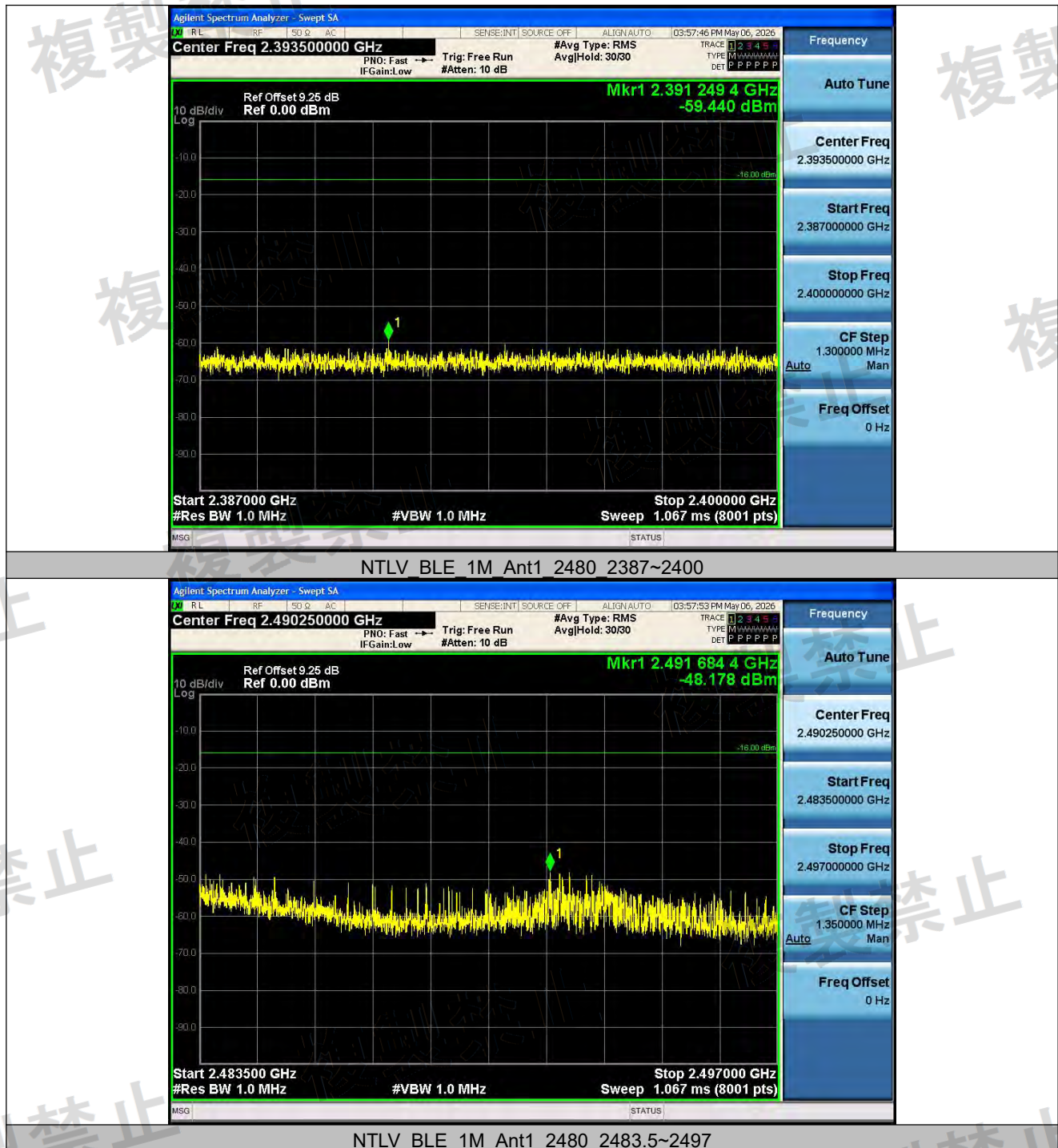






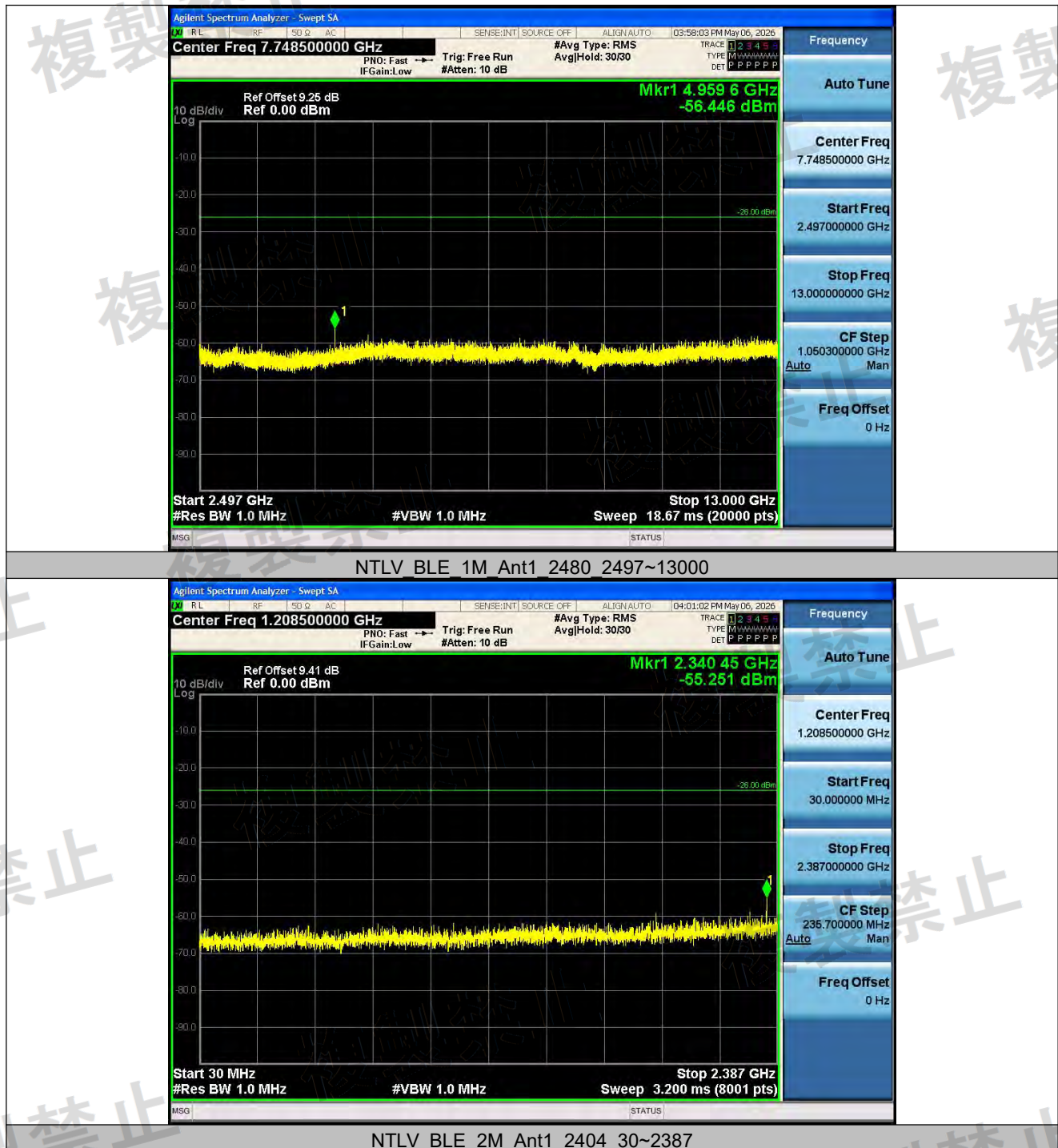


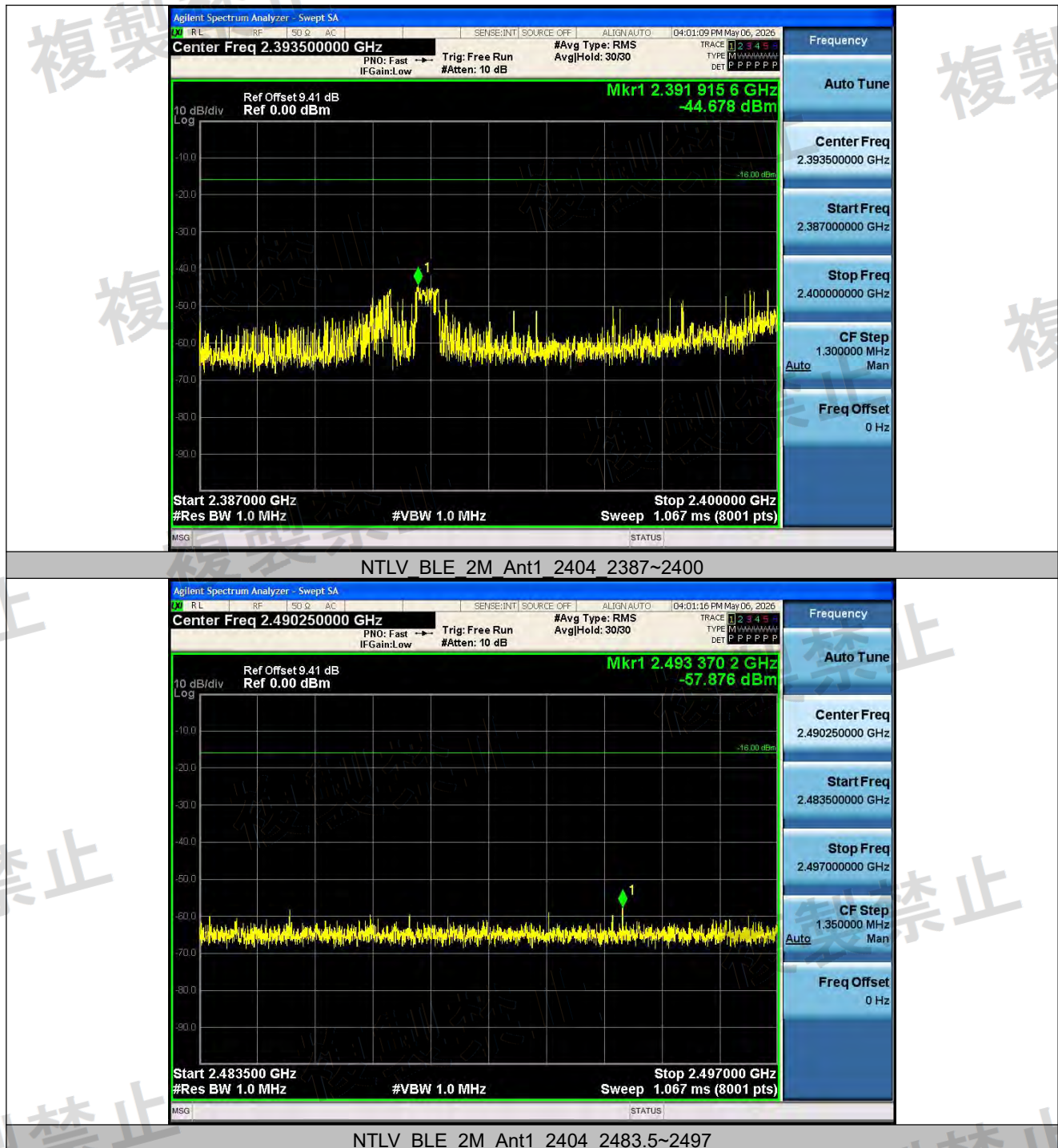


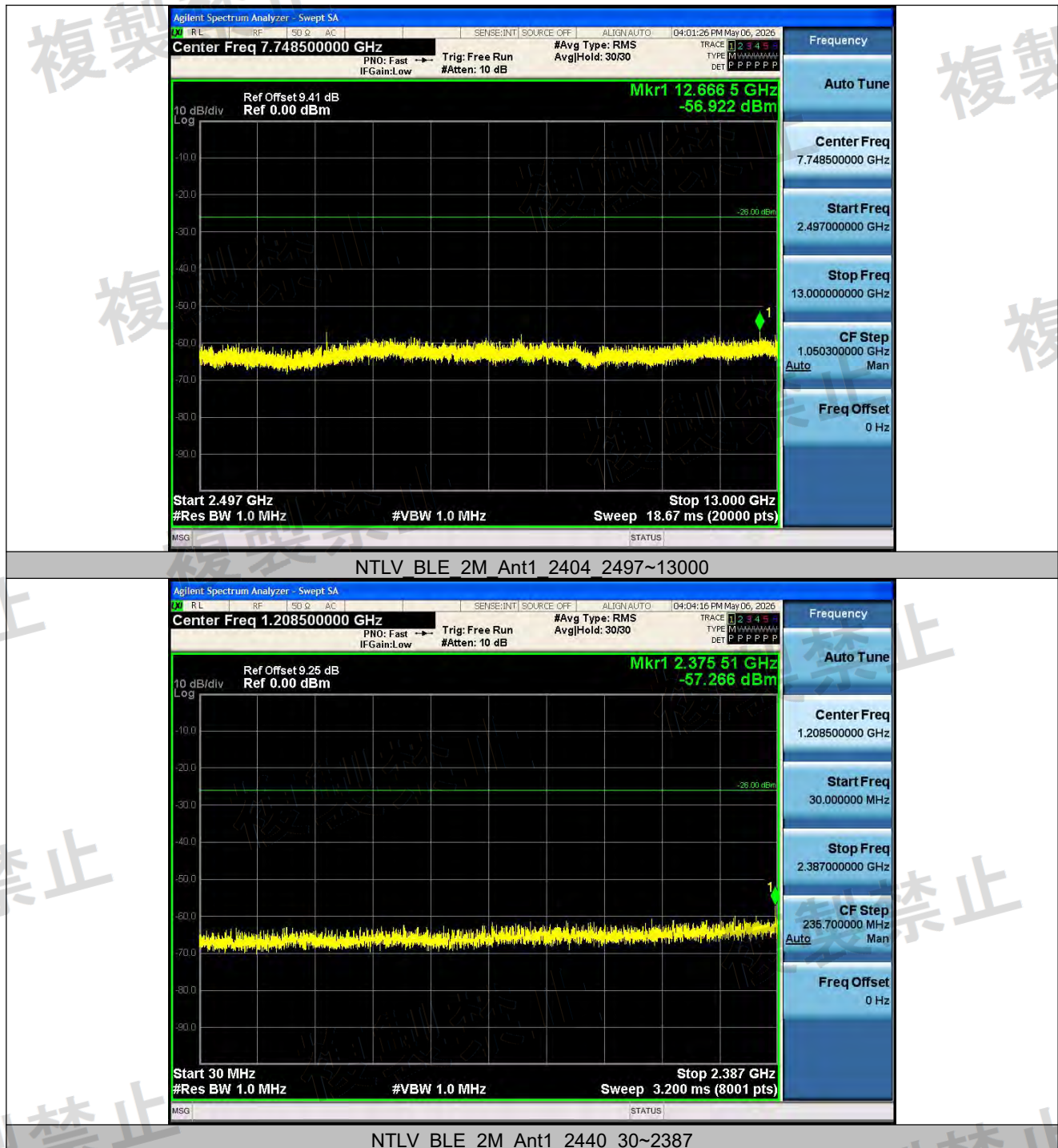
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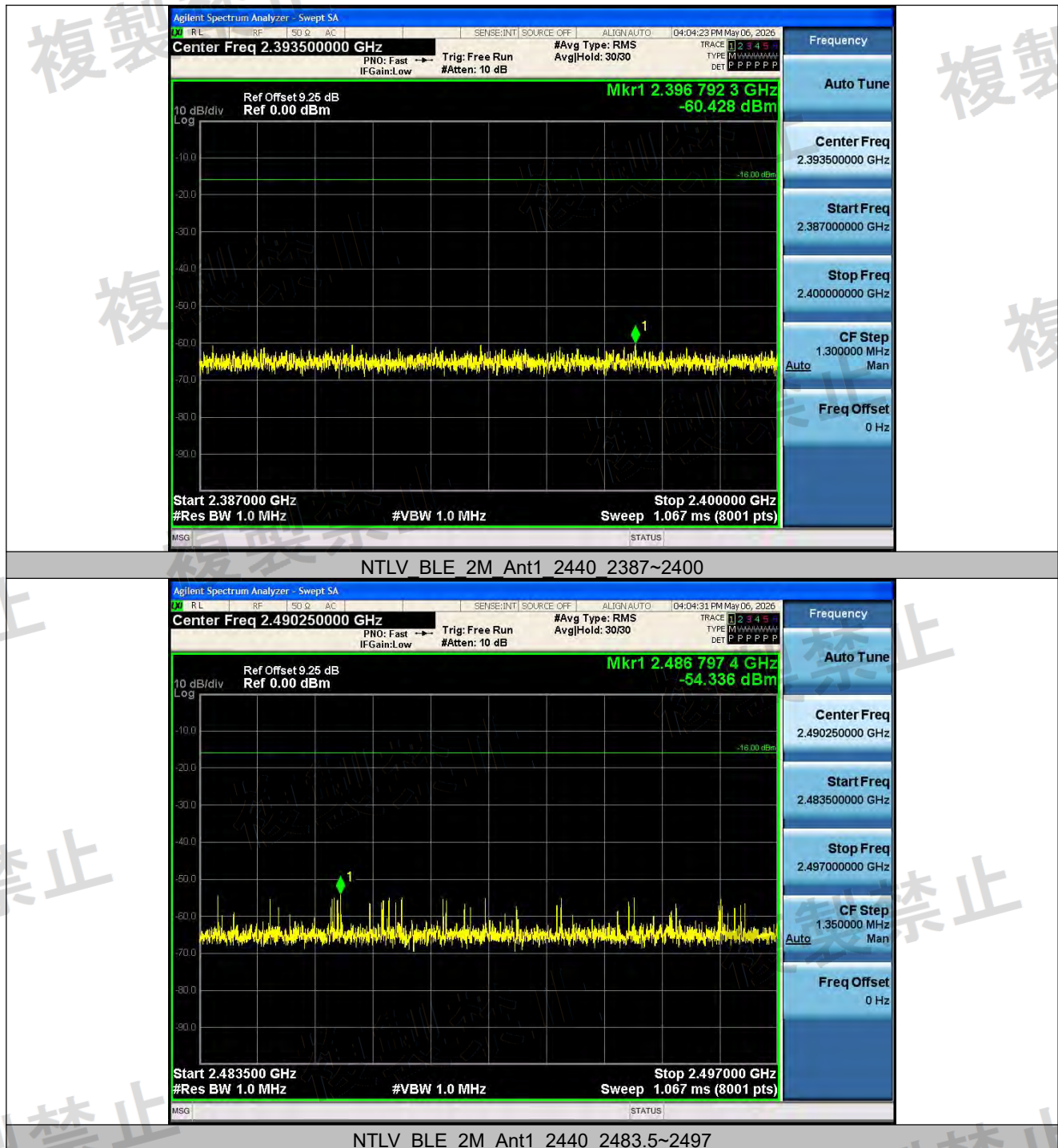
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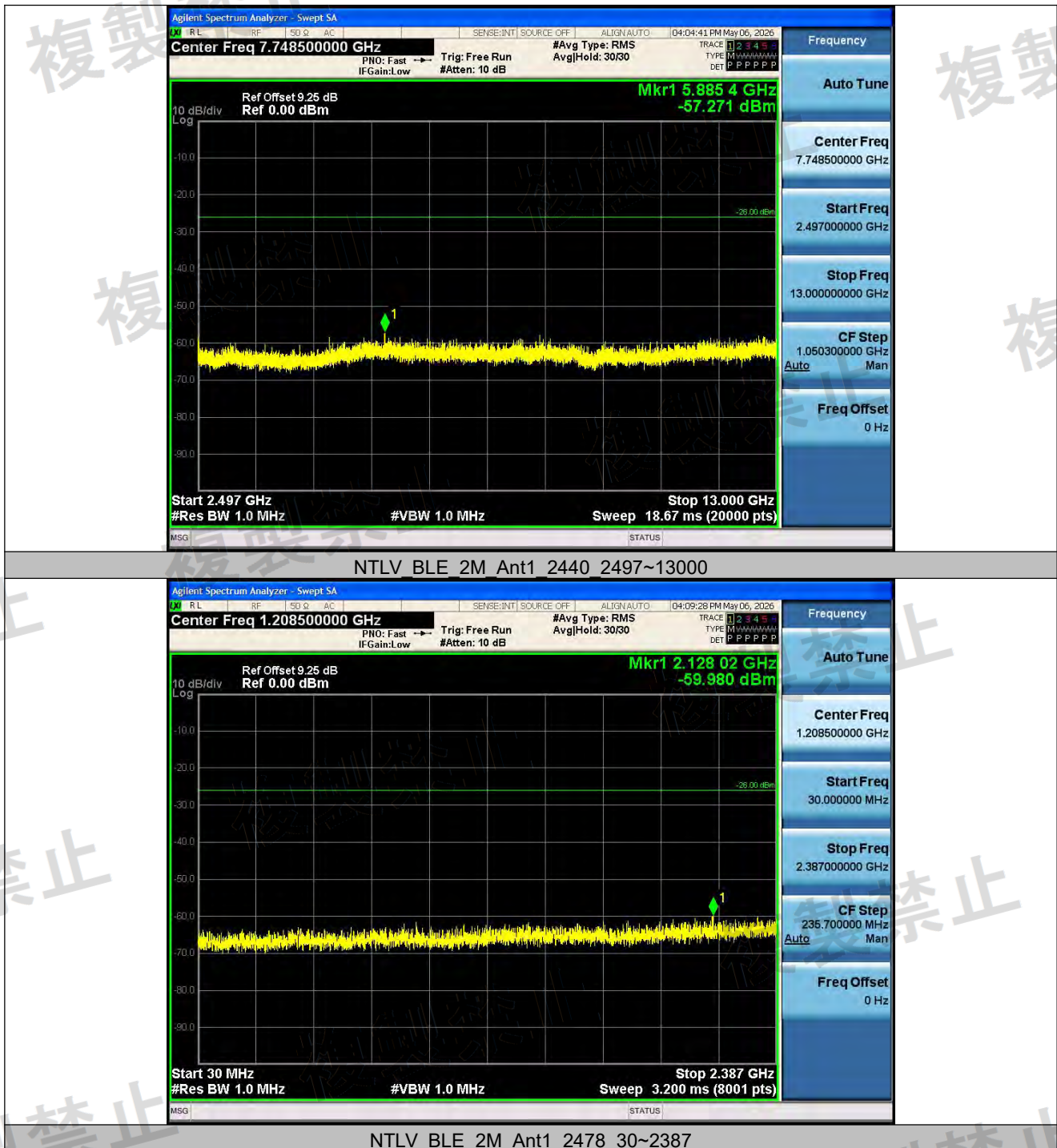
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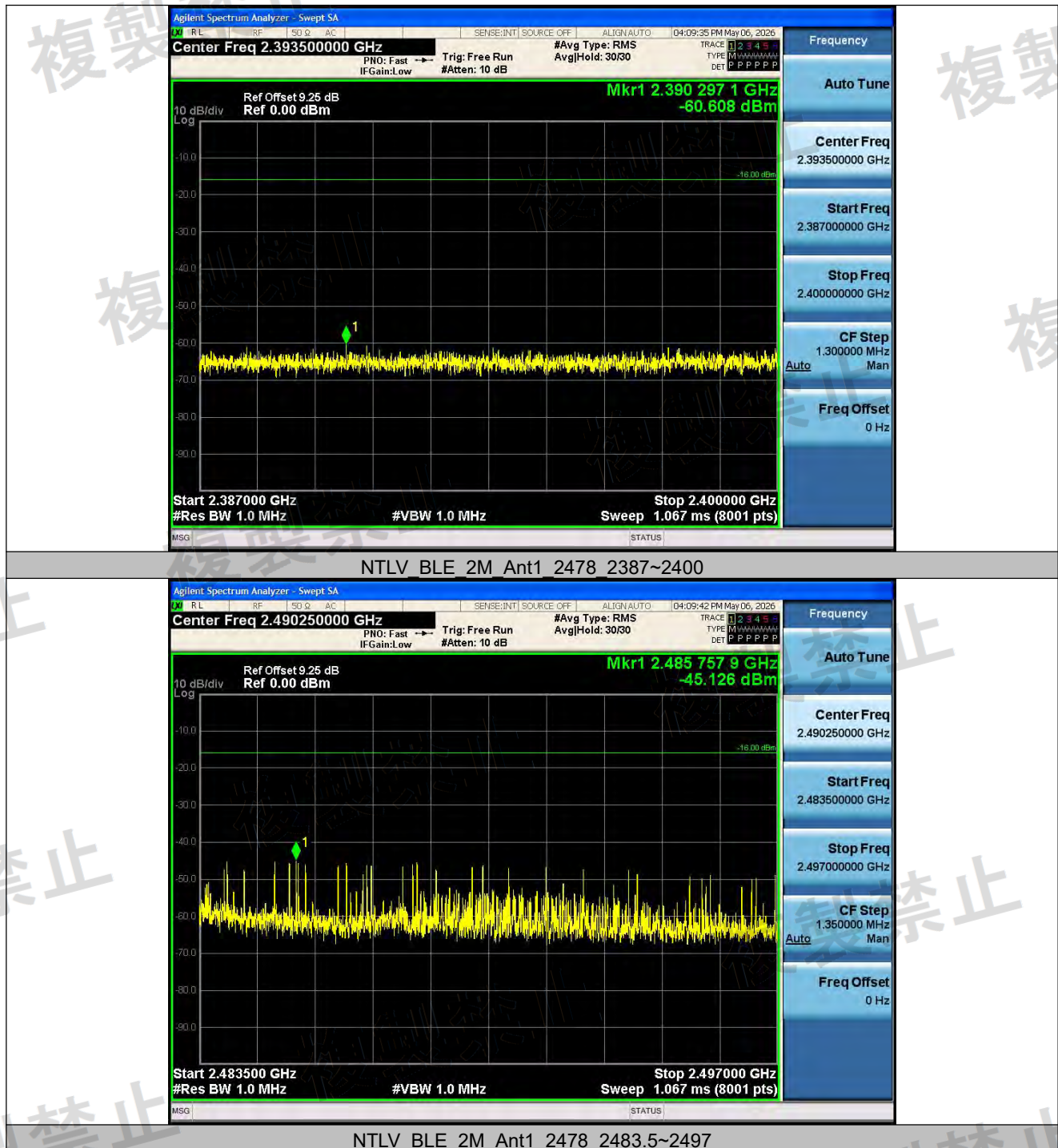


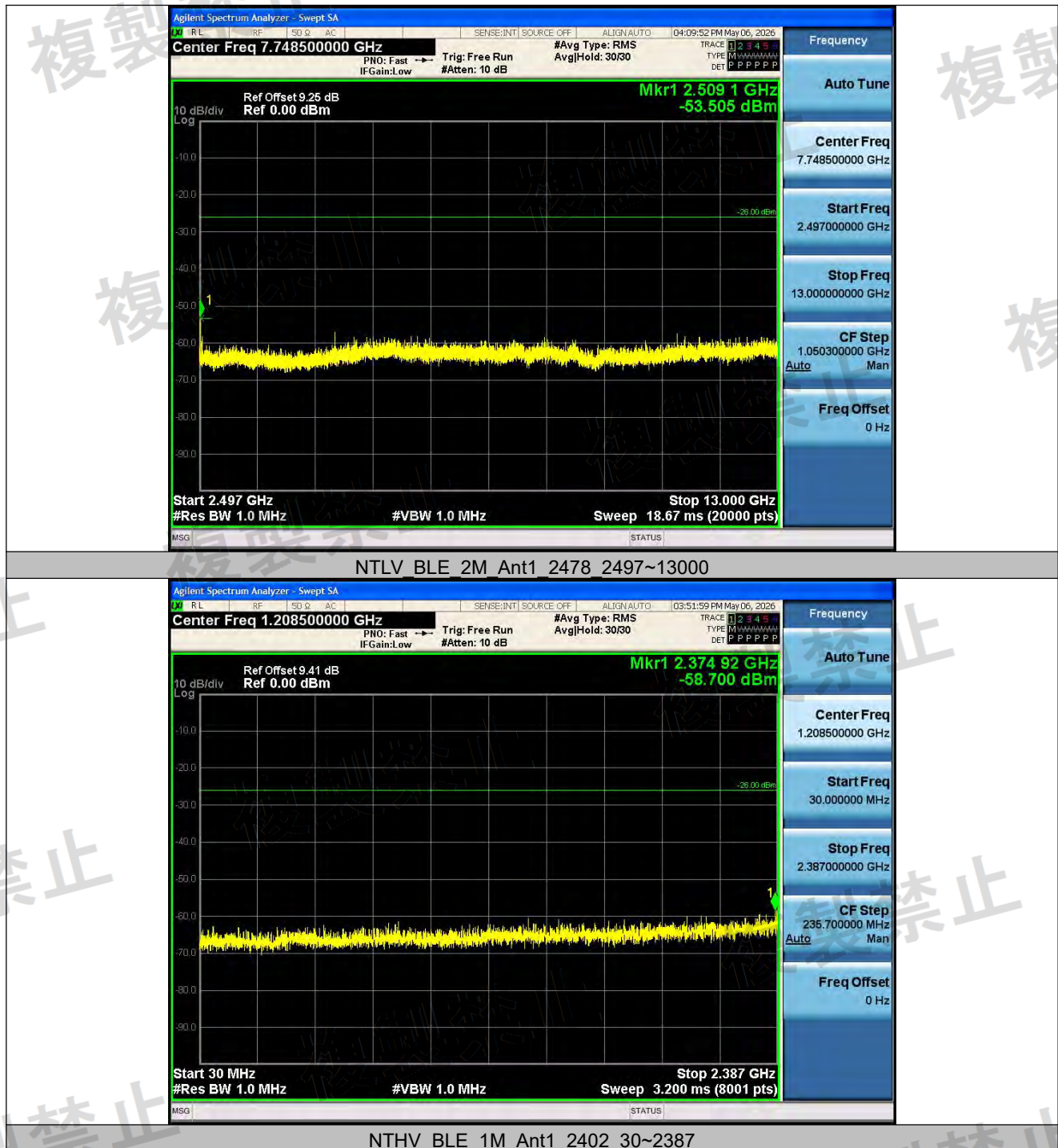


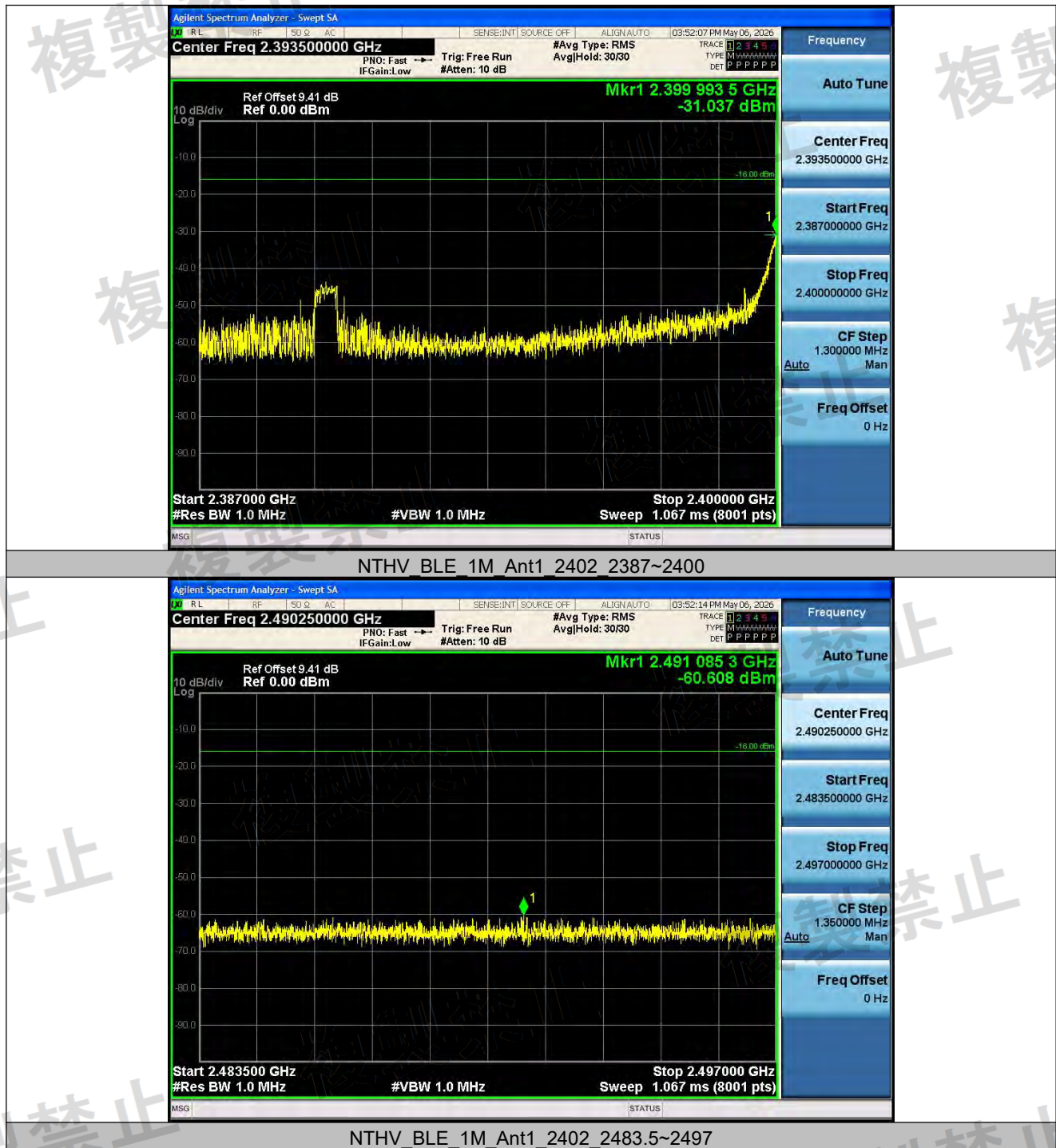


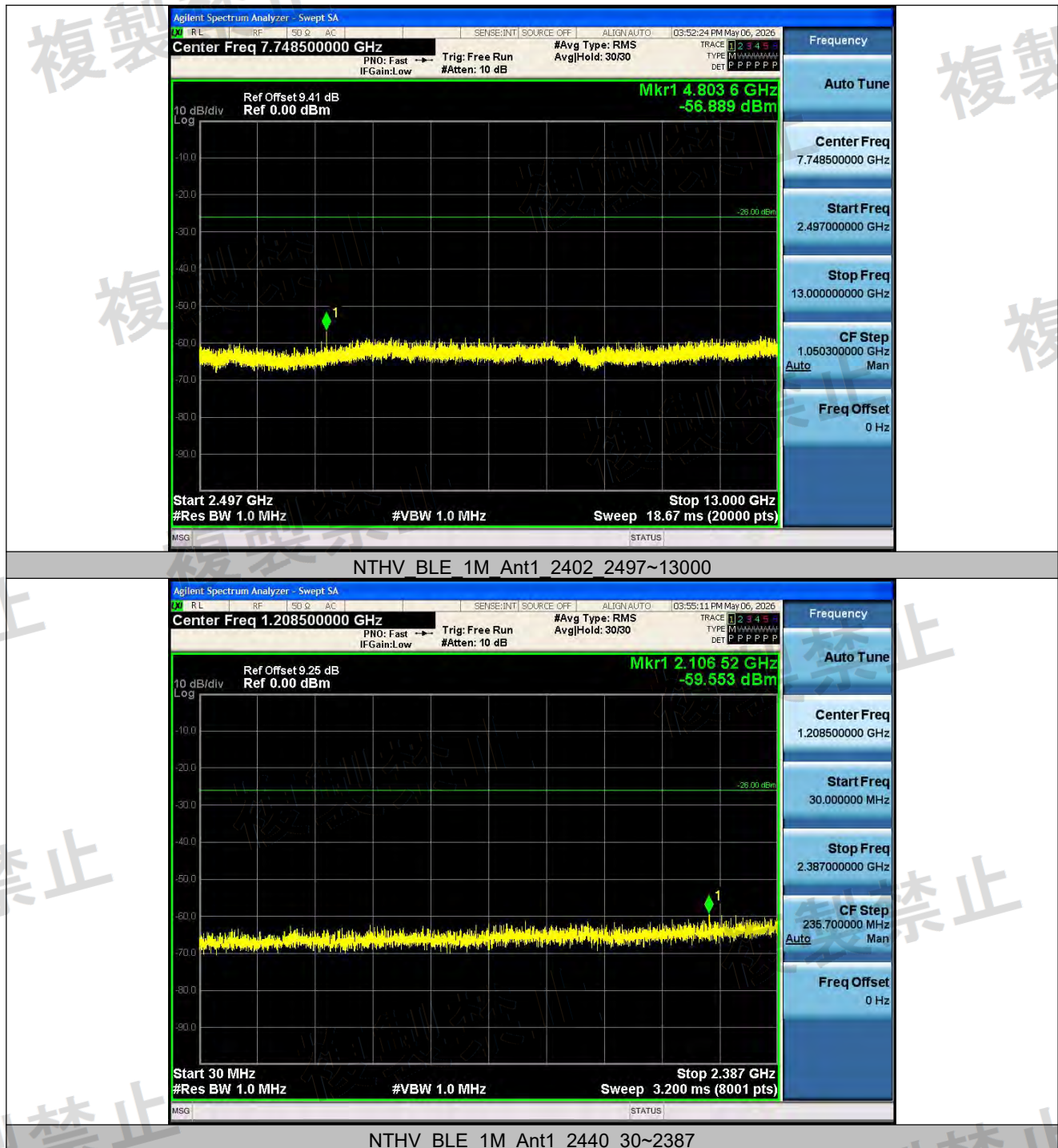


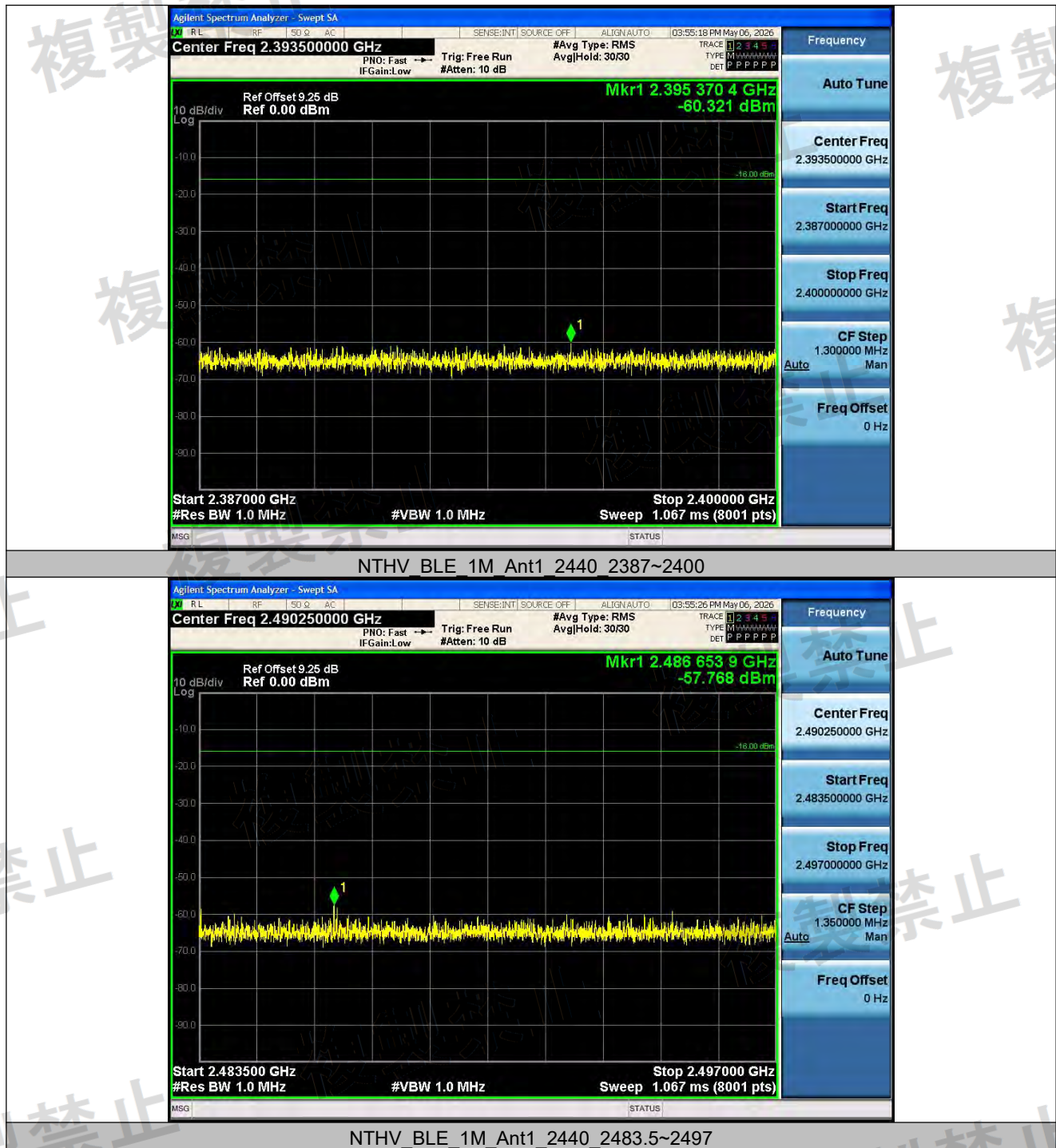


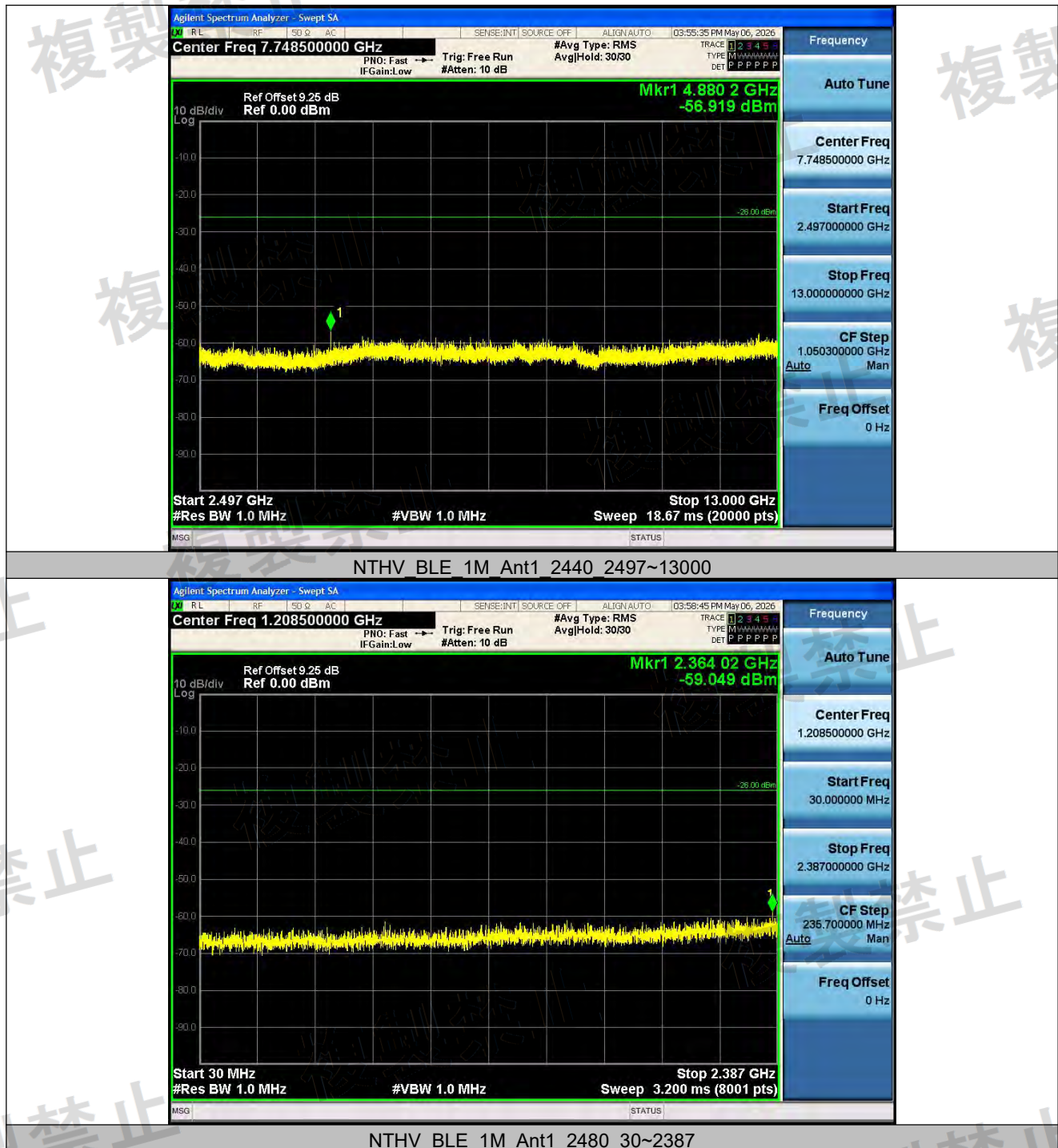


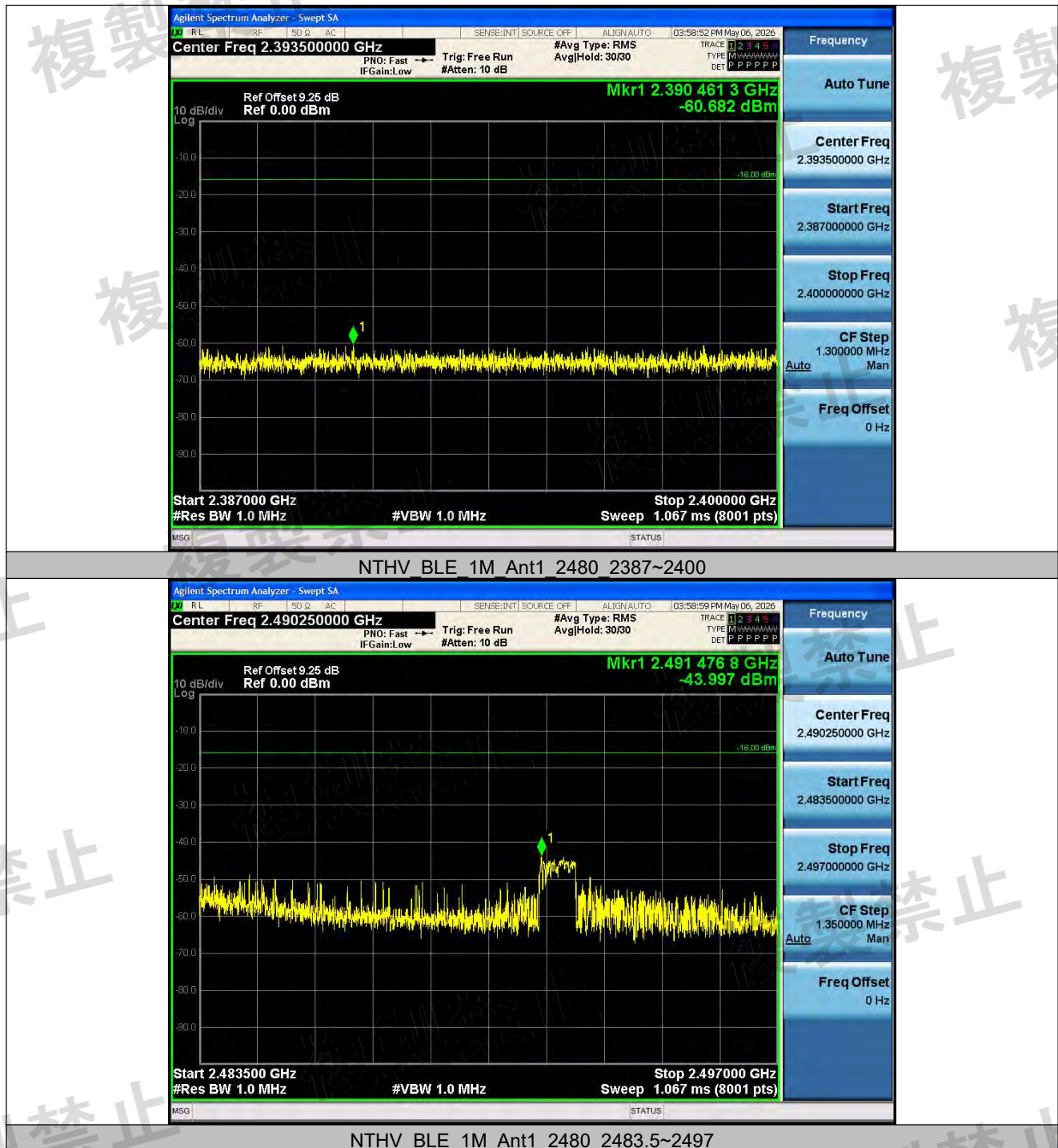


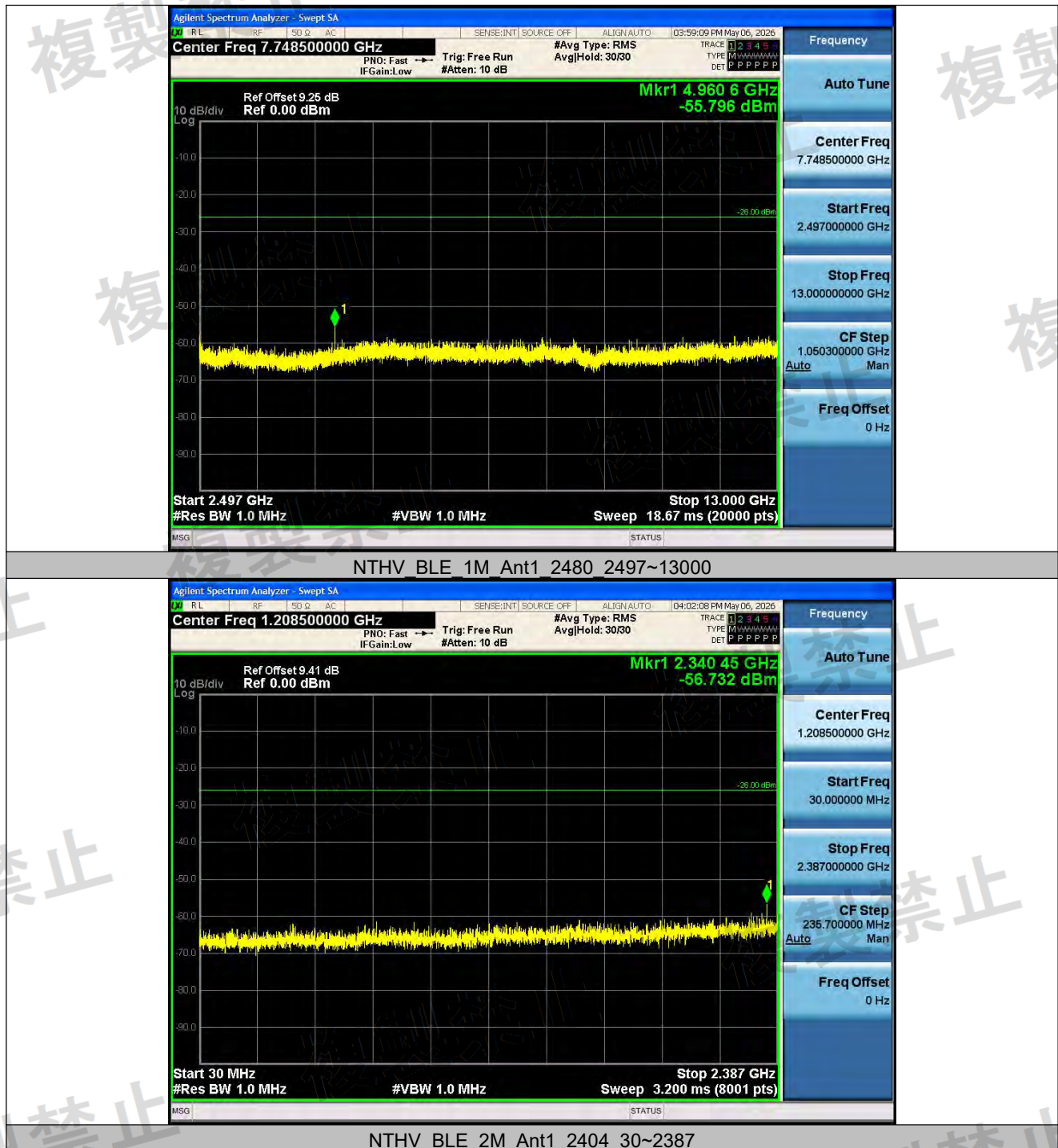


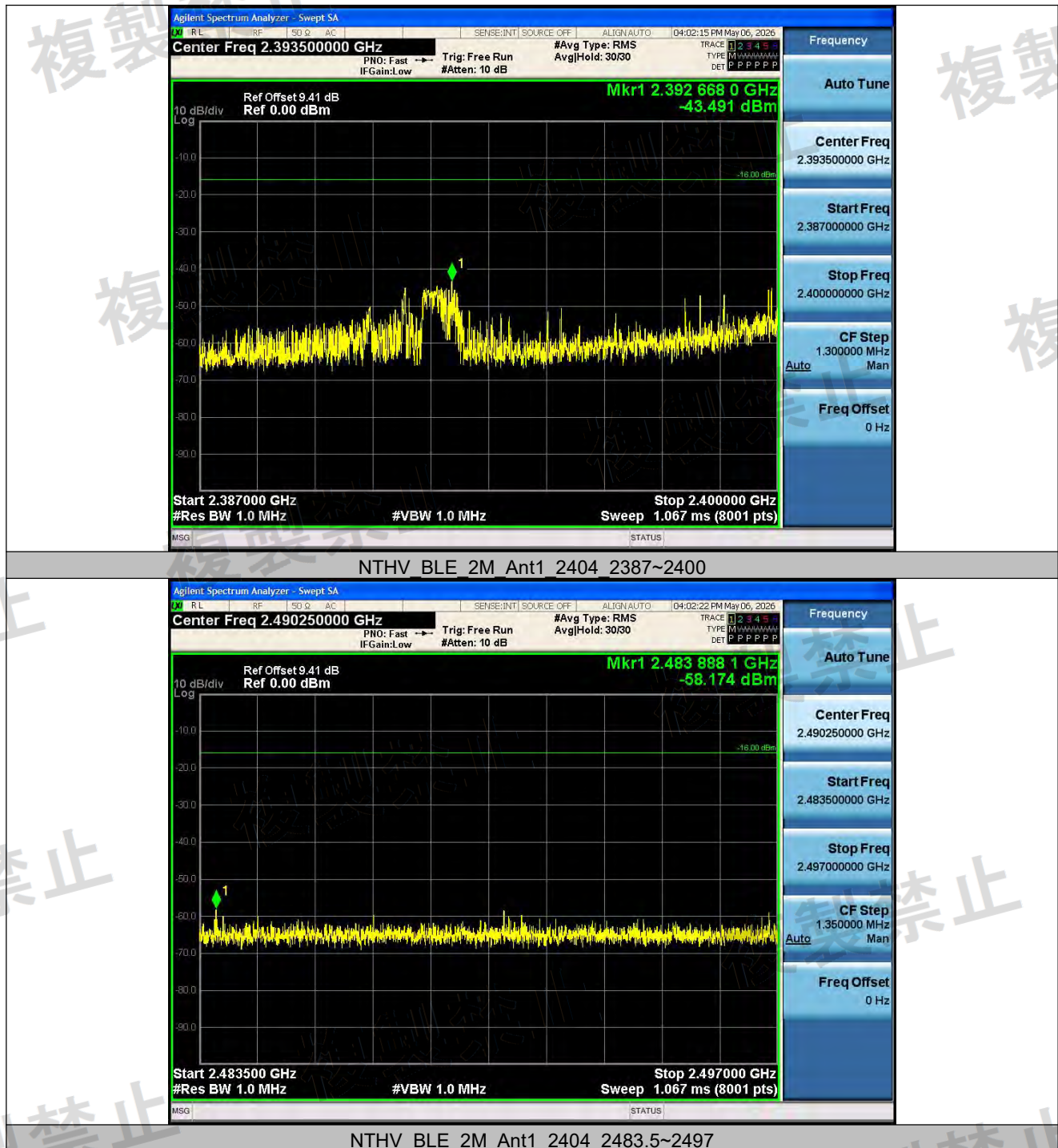


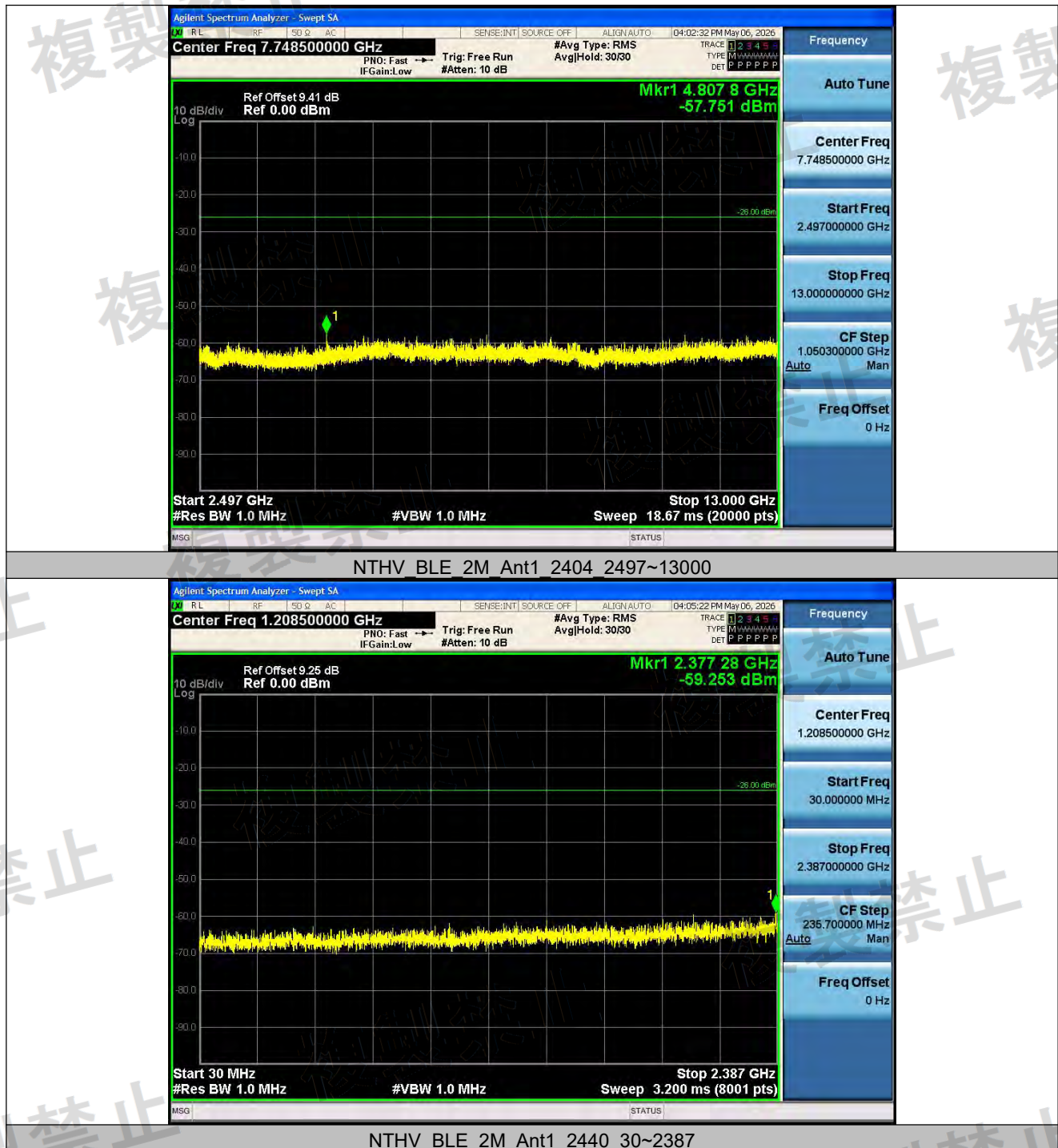


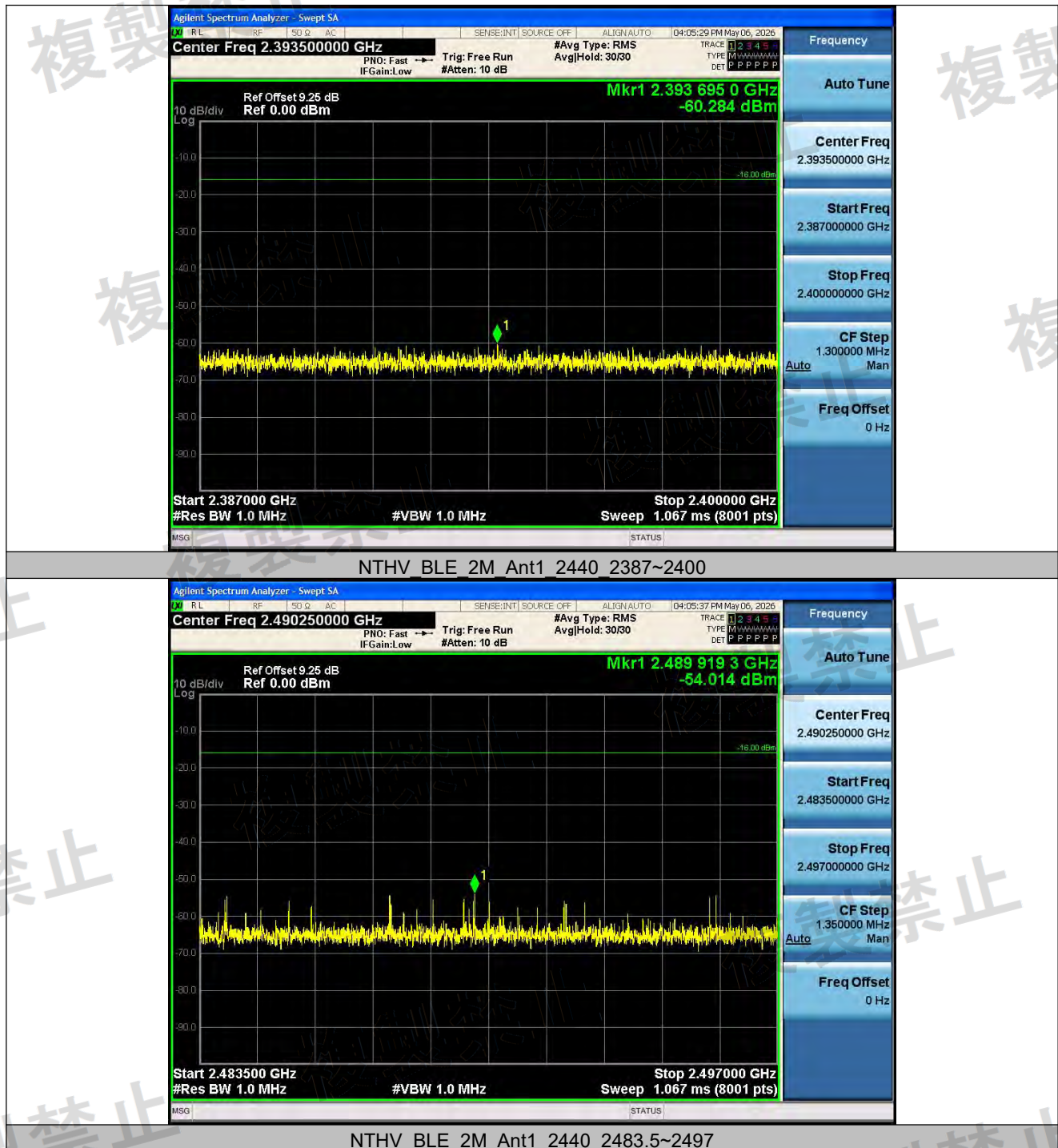


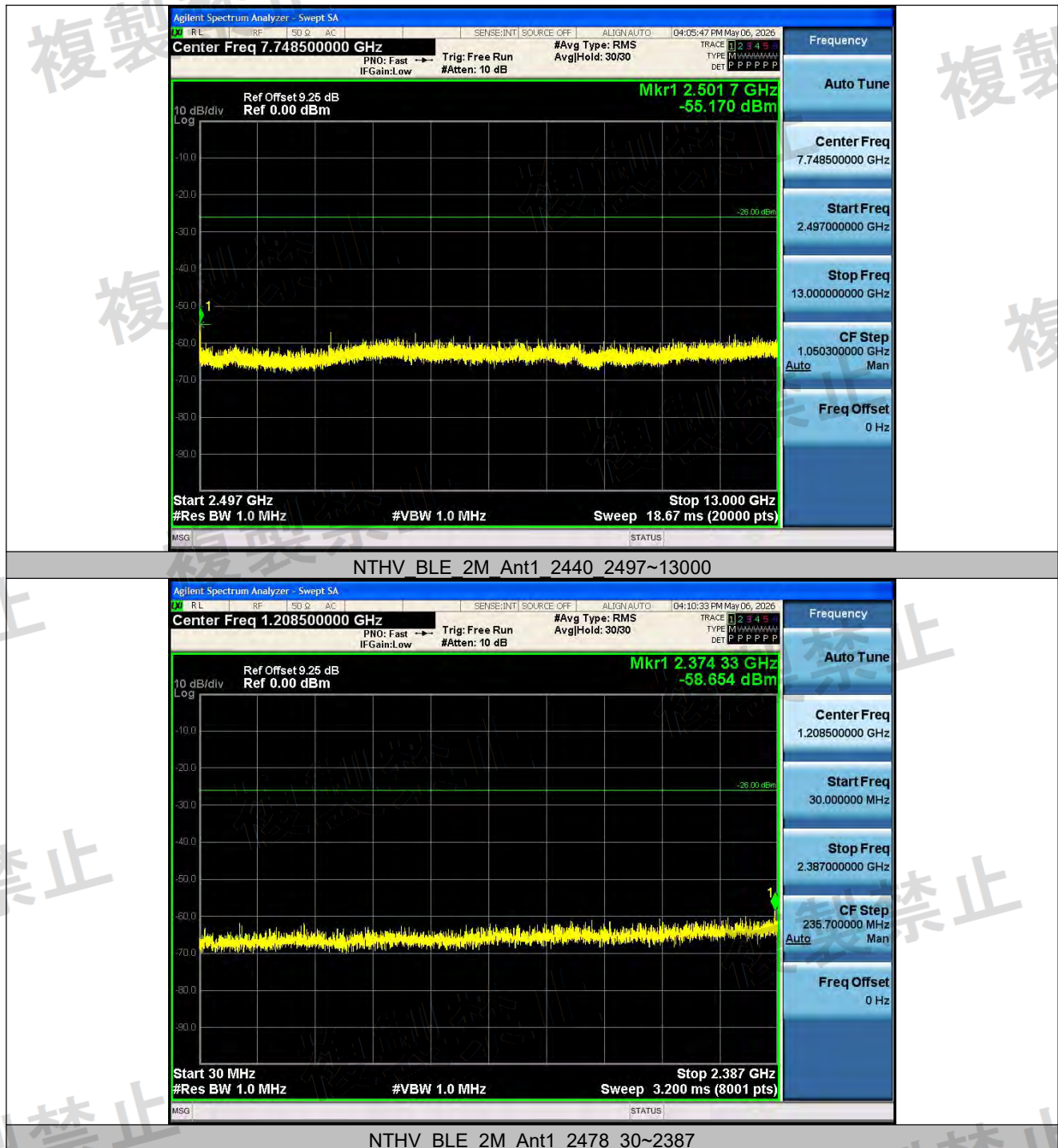


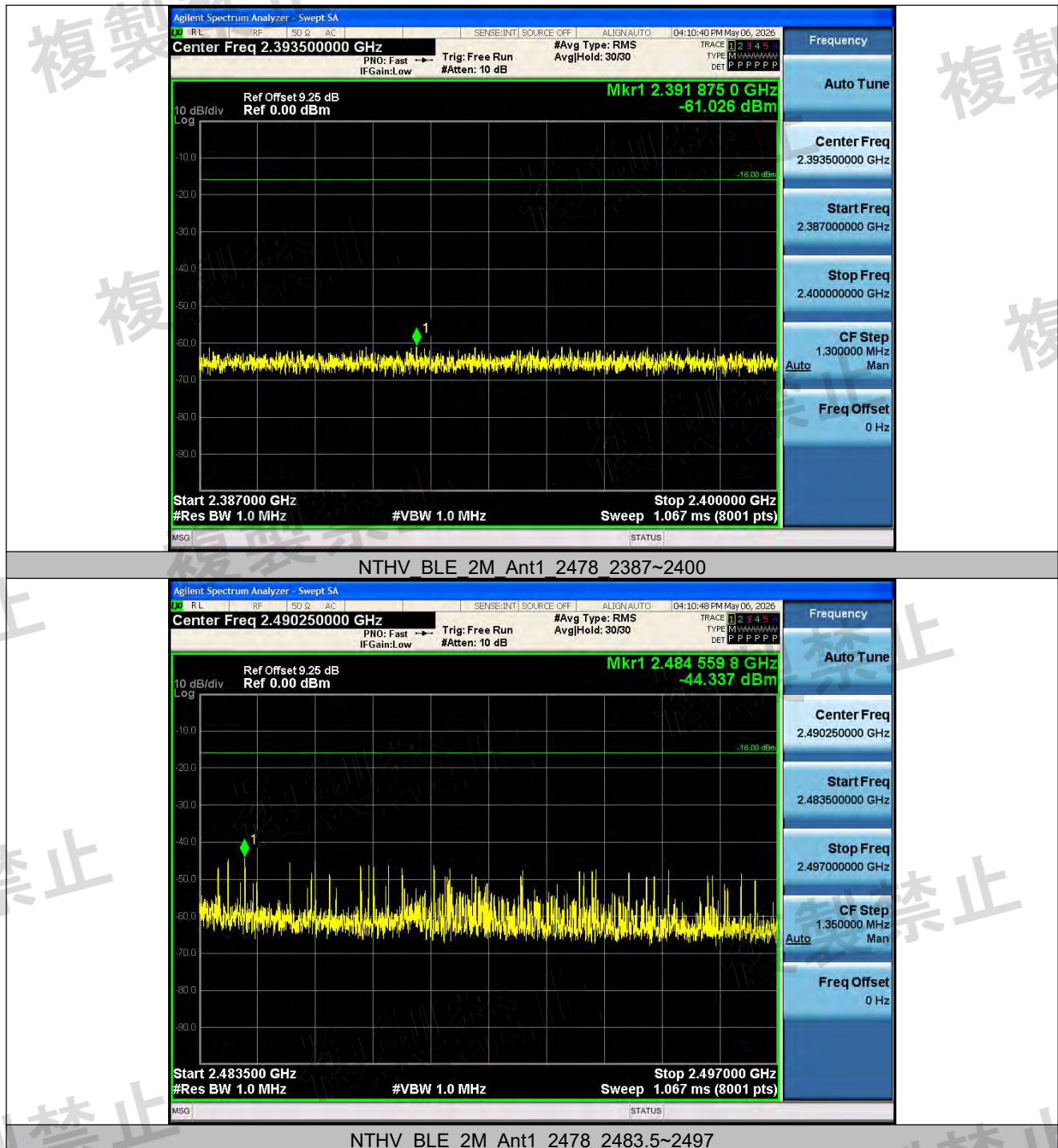


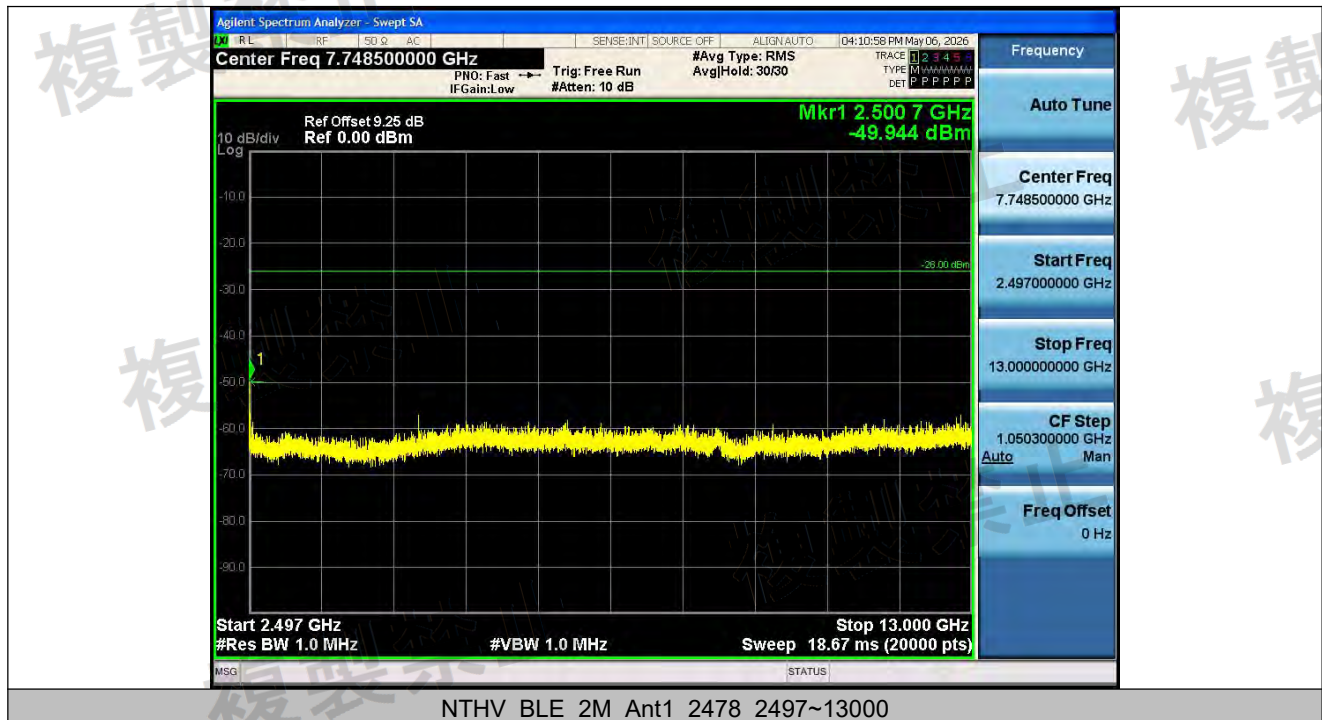








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4.5 Antenna power measurement

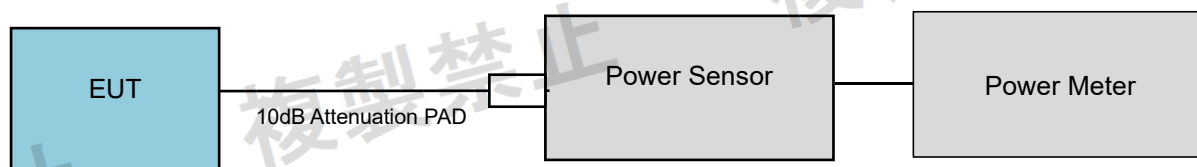
4.5.1 Limits of antenna power

Modulation system	Frequency band used	Antenna power (max.)	EIRP (max)	
			Omni-directional case	Directional case
DS-SS-SSB(Narrow-Band)	2,400–2,4835MHz	10mW/MHz	12.14dBm/MHz (16.367mW/MHz)	22.14dBm/MHz (163.682mW/MHz)
OFDM(Wide-Band)	2,400–2,4835MHz	5mW/MHz	9.13dBm/MHz (8.185mW/MHz)	19.13dBm/MHz (81.846mW/MHz)
DSSS	2,400–2,4835MHz	10mW	12.14dBm (16.367mW)	22.14dBm (163.682mW)

Tolerance of antenna power shall be +20% (upper value).

According article 49.20 f (2), the angular width of the principal radiation in the horizontal and vertical planes of the transmitting antenna shall not exceed the value obtained by the following expression. $360/A$ degree
A represents the value determined by dividing an equivalent power by the value obtained by applying an antenna power with the mean power to the transmitting antenna with its absolute gain being 2.14 dB, and shall be 1 when it is lower than 1.

4.5.2 Test Setup



4.5.3 Test Procedure

Test method according to Clause 6 of Annex No.43 of MIC Notification No.88.

The EUT was placed inside the environmental test chamber and powered by nominal DC voltage. The Antenna power was measured by power meter.

- Connect the high frequency power meter to the IF output of the spectrum analysers.
- Recording the power level.

4.5.4 Test result of conducted output power

BT-LE (GFSK-1 Mbps)

2 (CPK 1400)

Test condition	Conducted output power (mW)						Max.Limit (mW)
	CH 0 2402MHz		CH 19 2440MHz		CH 39 2480MHz		
	Power	Tolerance(%)	Power	Tolerance(%)	Power	Tolerance(%)	
Voltage normal	3.839	-4.03	3.023	-24.43	3.320	-17.00	10
Voltage high	3.835	-4.13	3.021	-24.48	3.460	-13.50	10
Voltage low	3.857	-3.58	3.033	-24.18	3.320	-17.00	10
Rated Power	4mW						
Test condition	EIRP output power (mW)						Max.Limit (mW)
	CH 0 2402MHz		CH 19 2440MHz		CH 39 2480MHz		
	Power	Tolerance(%)	Power	Tolerance(%)	Power	Tolerance(%)	
Voltage normal	7.312		5.758		6.323		16.367
Voltage high	7.304		5.754		6.590		16.367
Voltage low	7.346		5.777		6.323		16.367

BT-LE (GFSK-2 Mbps)

Test condition	Conducted output power (mW)						Max.Limit (mW)
	CH 1 2404MHz		CH 19 2440MHz		CH 38 2478MHz		
	Power	Tolerance(%)	Power	Tolerance(%)	Power	Tolerance(%)	
Voltage normal	3.963	-0.93	3.102	-22.45	3.405	-14.88	10
Voltage high	3.960	-1.00	3.102	-22.45	3.408	-14.80	10
Voltage low	3.959	-1.03	3.102	-22.45	3.398	-15.05	10
Rated Power	4mW						
Test condition	EIRP output power (mW)						Max.Limit (mW)
	CH 1 2404MHz		CH 19 2440MHz		CH 38 2478MHz		
	Power	Tolerance(%)	Power	Tolerance(%)	Power	Tolerance(%)	
Voltage normal	7.548		5.908		6.485		16.367
Voltage high	7.542		5.908		6.491		16.367
Voltage low	7.540		5.908		6.472		16.367

Note:

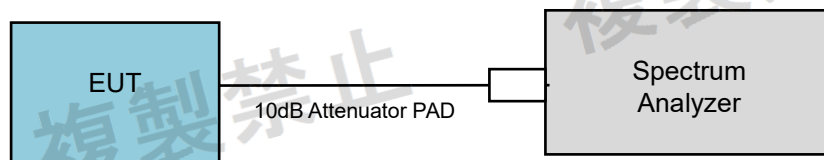
1. The value of EIRP densities are "calculated" values.
2. Formula: EIRP output power = Conducted RF output power + Antenna Gain.

4.6 Spurious emissions for receiver

4.6.1 Limits of spurious emissions for receiver

Frequencies(MHz)	Limit
Below 1GHz	$\leq 4\text{nW}$ (-54dBm)
Above 1GHz	$\leq 20\text{nW}$ (-47dBm)

4.6.2 Test Setup



4.6.3 Deviation from Test Standard

No deviation.

4.6.4 Test Procedure

Test method according to Clause 7 of Annex No.43 of MIC Notification No.88.

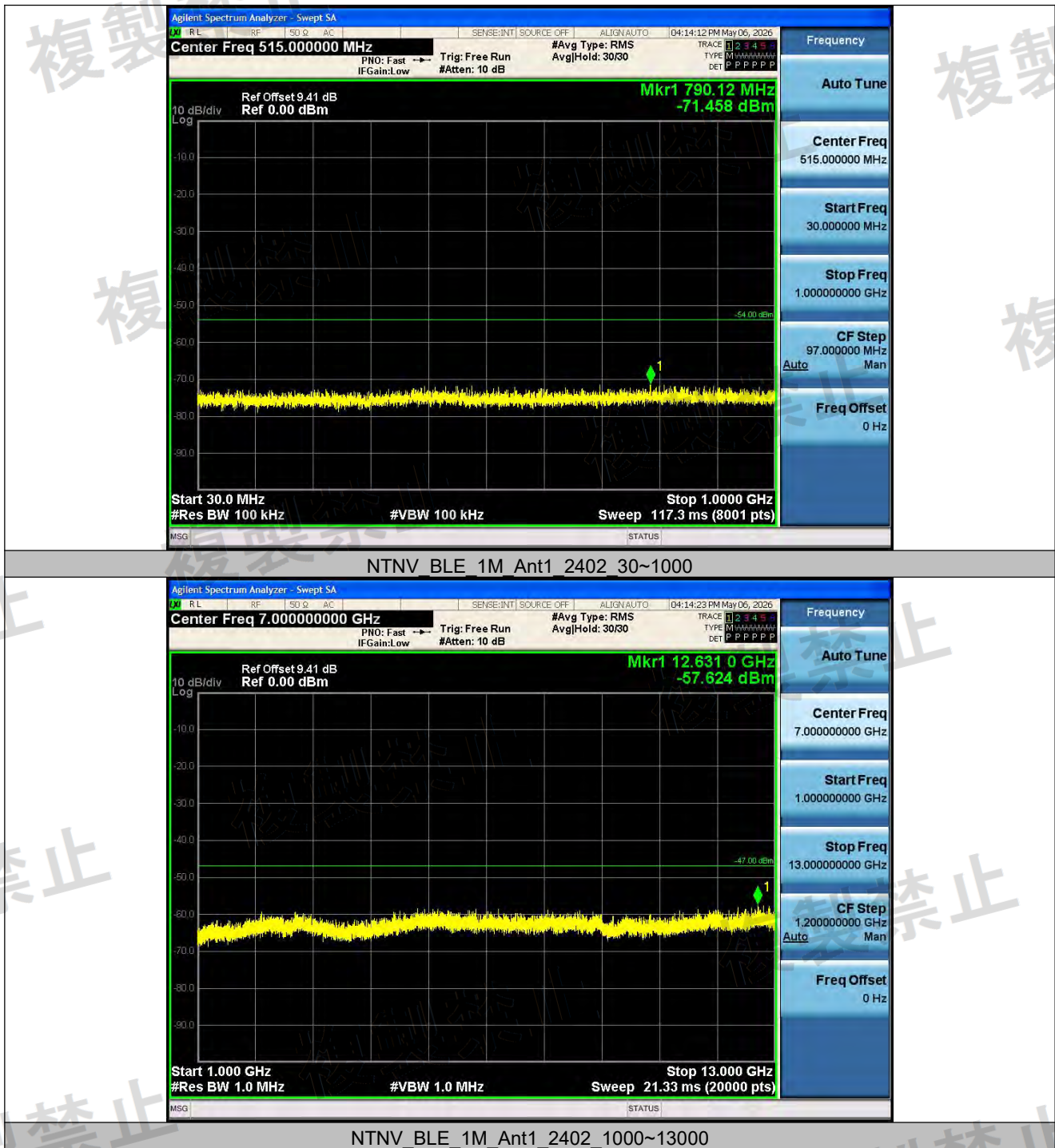
The EUT was placed inside the environmental test chamber and powered by nominal DC voltage. The spurious emissions for receiver was measured by spectrum analyzer.

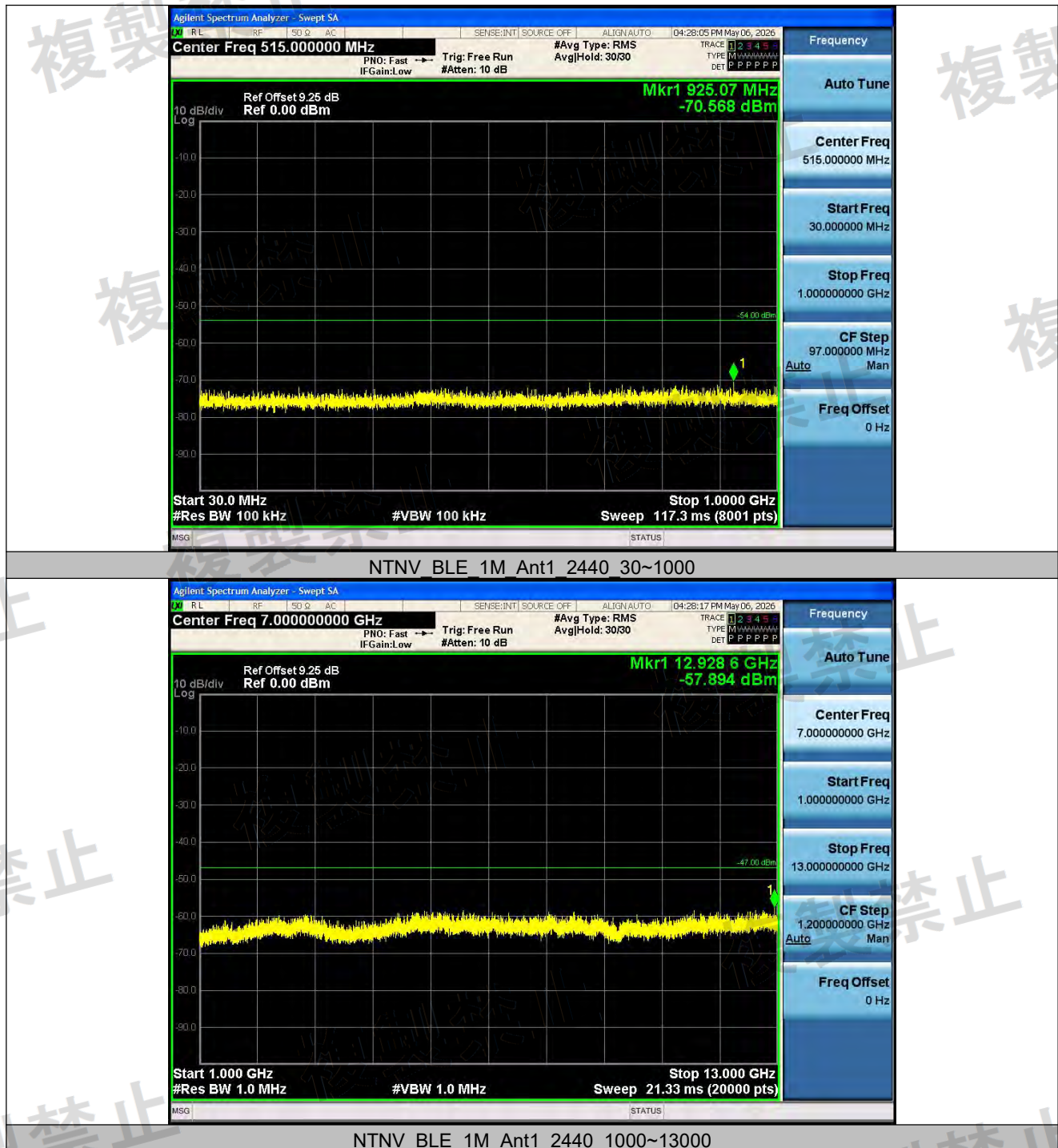
The settings of the spectrum analyzer during spurious searches are as follows:

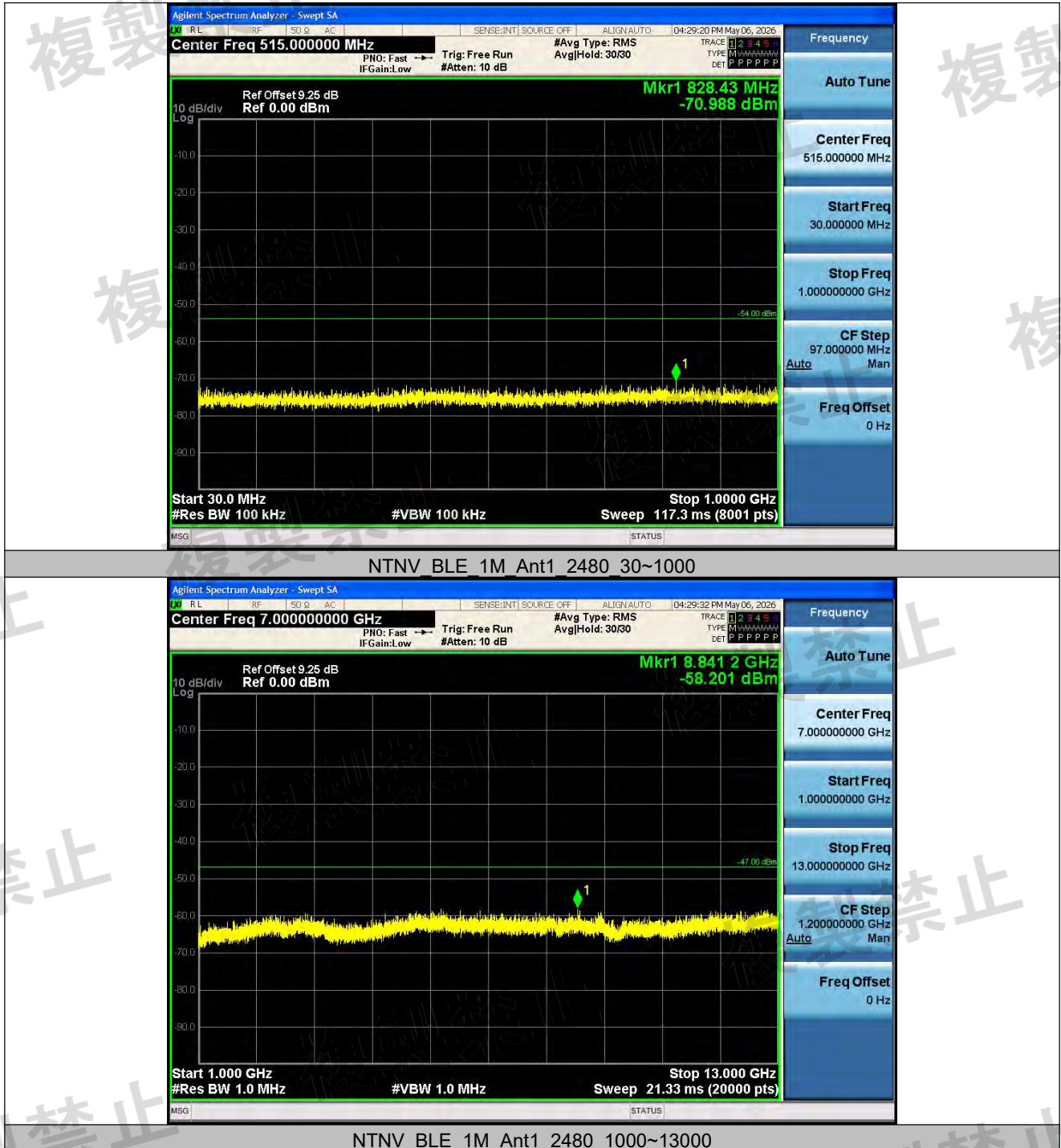
- Sweep Bandwidth Starts spurious searches from the smallest possible frequencies to more than 5 times the carrier frequencies (for example from 30 MHz up to 12.5 GHz for a 2.4 GHz system).
- Resolution Bandwidth 1 MHz
- Video Bandwidth 1 MHz
- Y-Axis Scale 10 dB/Div
- Input Level: Maximum dynamic range value
- Sweep Time: Minimum amount of time to ensure measurement accuracy.
- Sweep Points: Over 400 points
- Detection Mode: Positive peak
- Display mode: Maximum hold

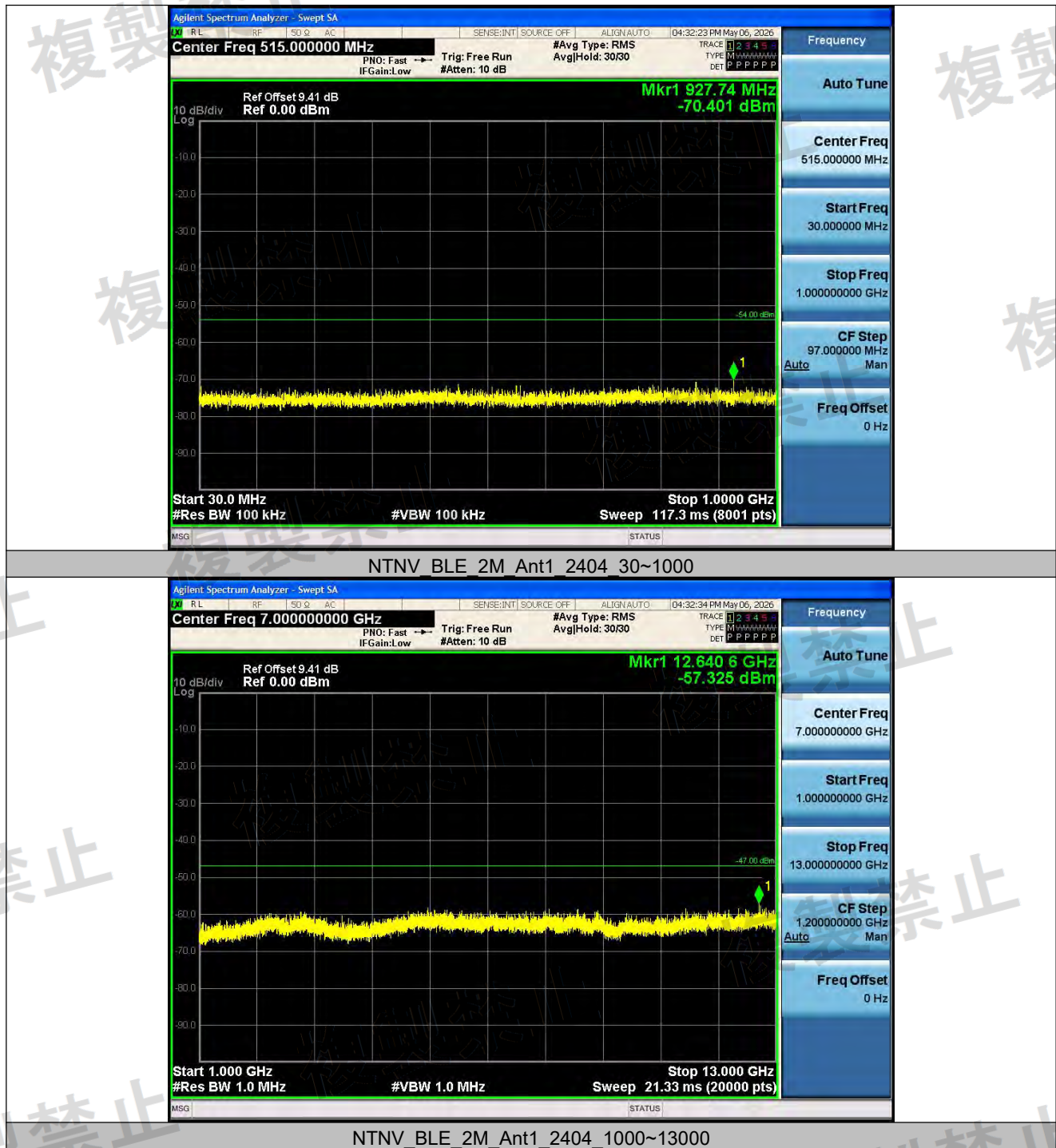
4.6.5 Test Results

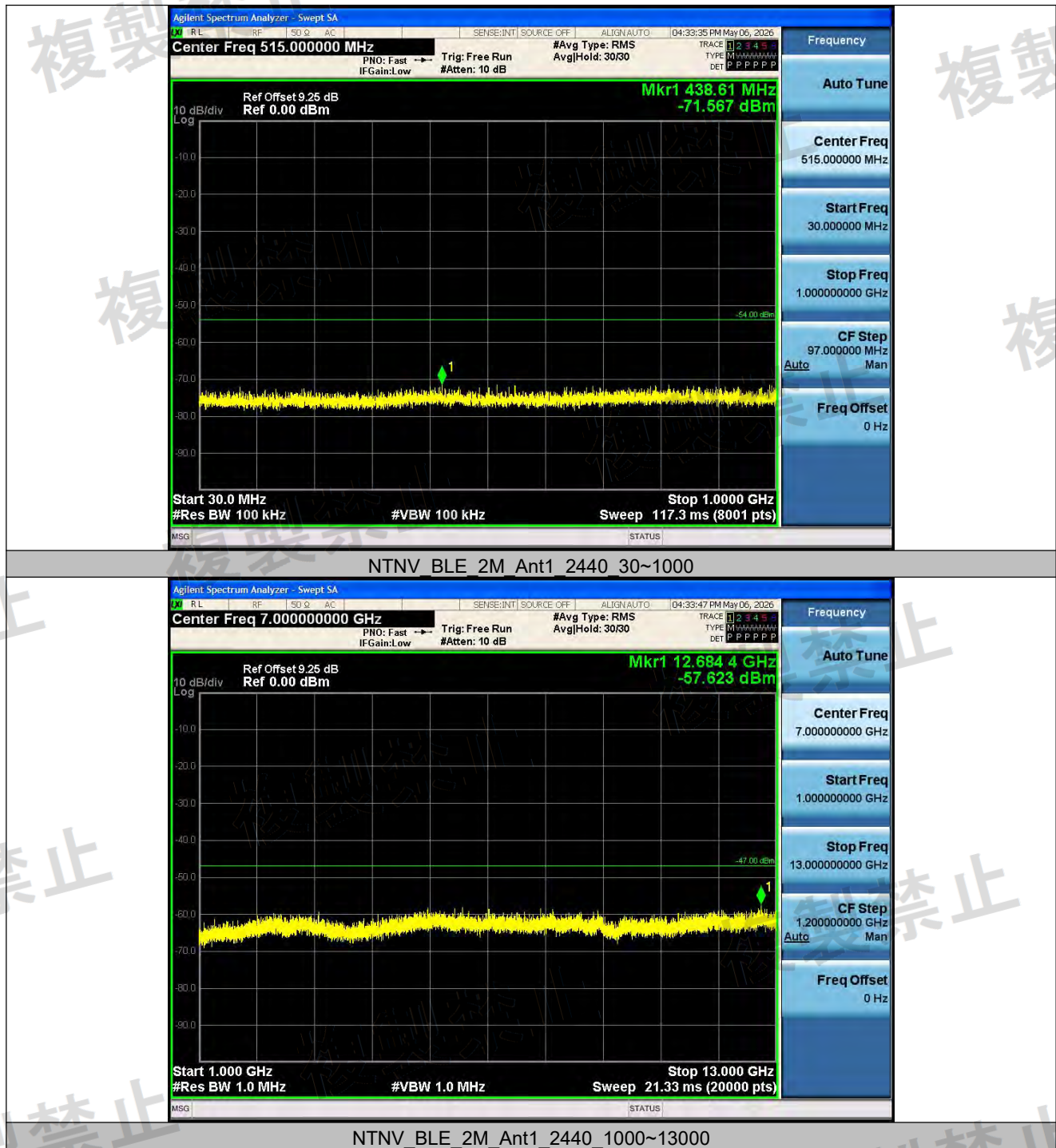
Test Condition	Test Mode	Antenna	Channel	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	BLE_1M	Ant1	2402	30~1000	790.12	-71.46	≤-54	0.07145	≤4	PASS
				1000~13000	12631.00	-57.62	≤-47	1.72982	≤20	PASS
			2440	30~1000	925.07	-70.57	≤-54	0.08770	≤4	PASS
				1000~13000	12928.60	-57.89	≤-47	1.62555	≤20	PASS
			2480	30~1000	828.43	-70.99	≤-54	0.07962	≤4	PASS
				1000~13000	8841.20	-58.2	≤-47	1.51356	≤20	PASS
	BLE_2M	Ant1	2404	30~1000	927.74	-70.4	≤-54	0.09120	≤4	PASS
				1000~13000	12640.60	-57.33	≤-47	1.84927	≤20	PASS
			2440	30~1000	438.61	-71.57	≤-54	0.06966	≤4	PASS
				1000~13000	12684.40	-57.62	≤-47	1.72982	≤20	PASS
			2478	30~1000	789.15	-71.42	≤-54	0.07211	≤4	PASS
				1000~13000	6270.10	-58.31	≤-47	1.47571	≤20	PASS
NTLV	BLE_1M	Ant1	2402	30~1000	793.03	-71.12	≤-54	0.07727	≤4	PASS
				1000~13000	12623.80	-57.49	≤-47	1.78238	≤20	PASS
			2440	30~1000	400.18	-70.92	≤-54	0.08091	≤4	PASS
				1000~13000	5964.60	-57.69	≤-47	1.70216	≤20	PASS
			2480	30~1000	855.47	-71.08	≤-54	0.07798	≤4	PASS
				1000~13000	6472.30	-57.88	≤-47	1.62930	≤20	PASS
	BLE_2M	Ant1	2404	30~1000	890.63	-71.34	≤-54	0.07345	≤4	PASS
				1000~13000	12534.40	-57.88	≤-47	1.62930	≤20	PASS
			2440	30~1000	797.03	-70.23	≤-54	0.09484	≤4	PASS
				1000~13000	12698.80	-57.48	≤-47	1.78649	≤20	PASS
			2478	30~1000	852.68	-70.74	≤-54	0.08433	≤4	PASS
				1000~13000	8195.60	-57.46	≤-47	1.79473	≤20	PASS
NTHV	BLE_1M	Ant1	2402	30~1000	165.56	-70.19	≤-54	0.09572	≤4	PASS
				1000~13000	12661.60	-57.5	≤-47	1.77828	≤20	PASS
			2440	30~1000	468.20	-70.61	≤-54	0.08690	≤4	PASS
				1000~13000	11720.10	-58.04	≤-47	1.57036	≤20	PASS
			2480	30~1000	869.05	-71.01	≤-54	0.07925	≤4	PASS
				1000~13000	5689.80	-57.64	≤-47	1.72187	≤20	PASS
	BLE_2M	Ant1	2404	30~1000	760.05	-70.31	≤-54	0.09311	≤4	PASS
				1000~13000	12658.00	-57.21	≤-47	1.90108	≤20	PASS
			2440	30~1000	895.85	-70.16	≤-54	0.09638	≤4	PASS
				1000~13000	5883.60	-57.79	≤-47	1.66341	≤20	PASS
			2478	30~1000	754.71	-71.71	≤-54	0.06745	≤4	PASS
				1000~13000	12930.40	-58.23	≤-47	1.50314	≤20	PASS

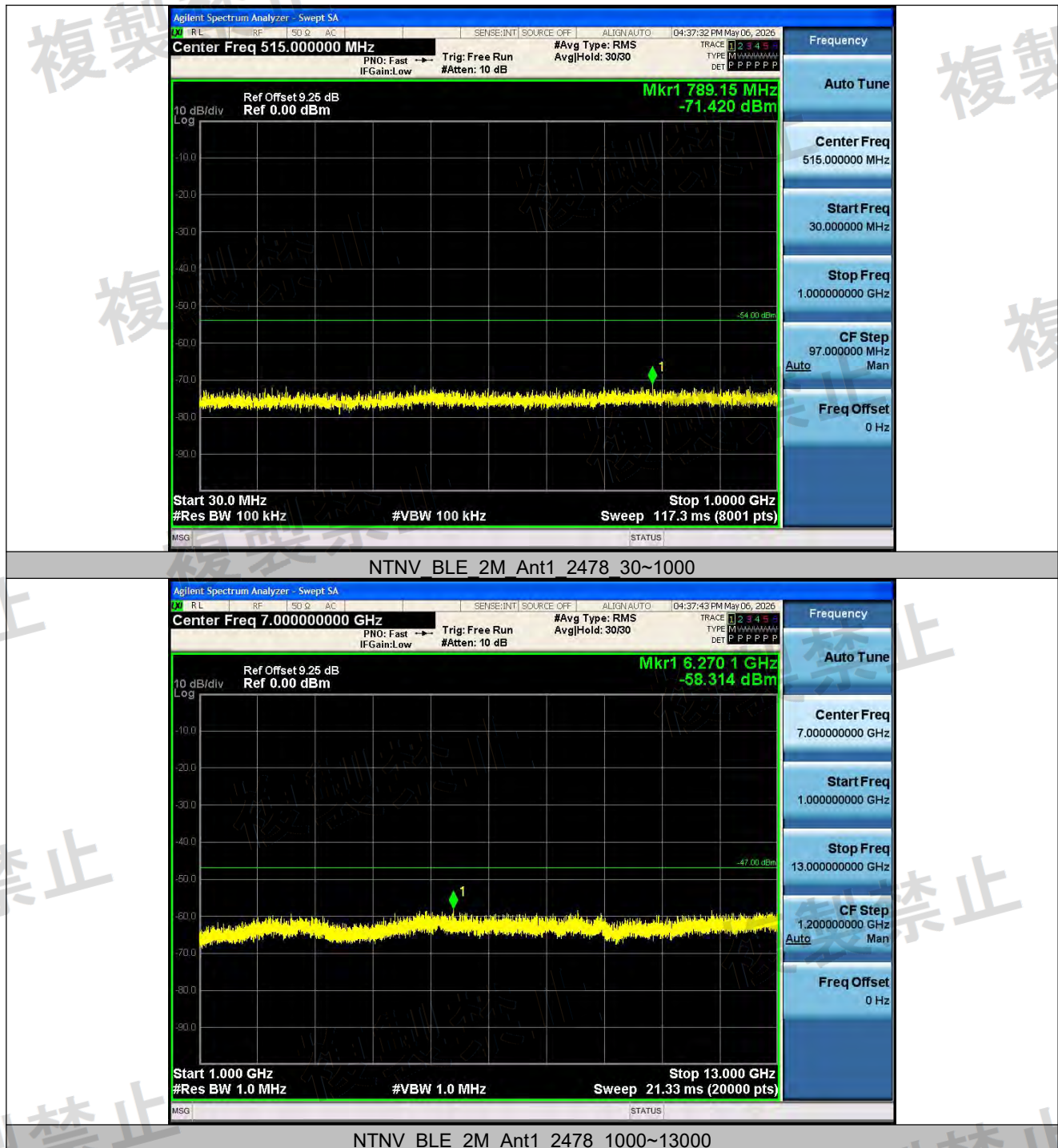


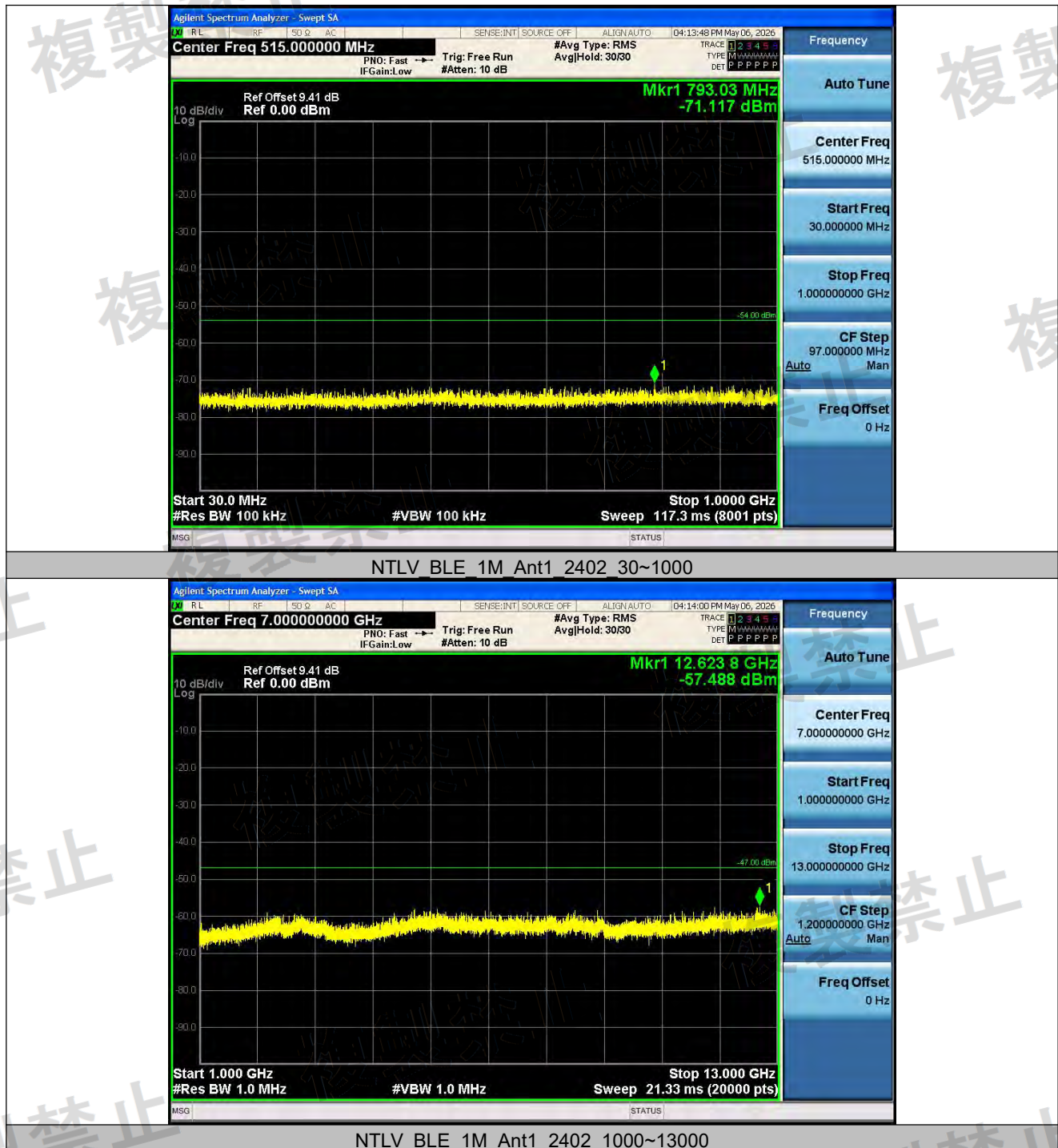


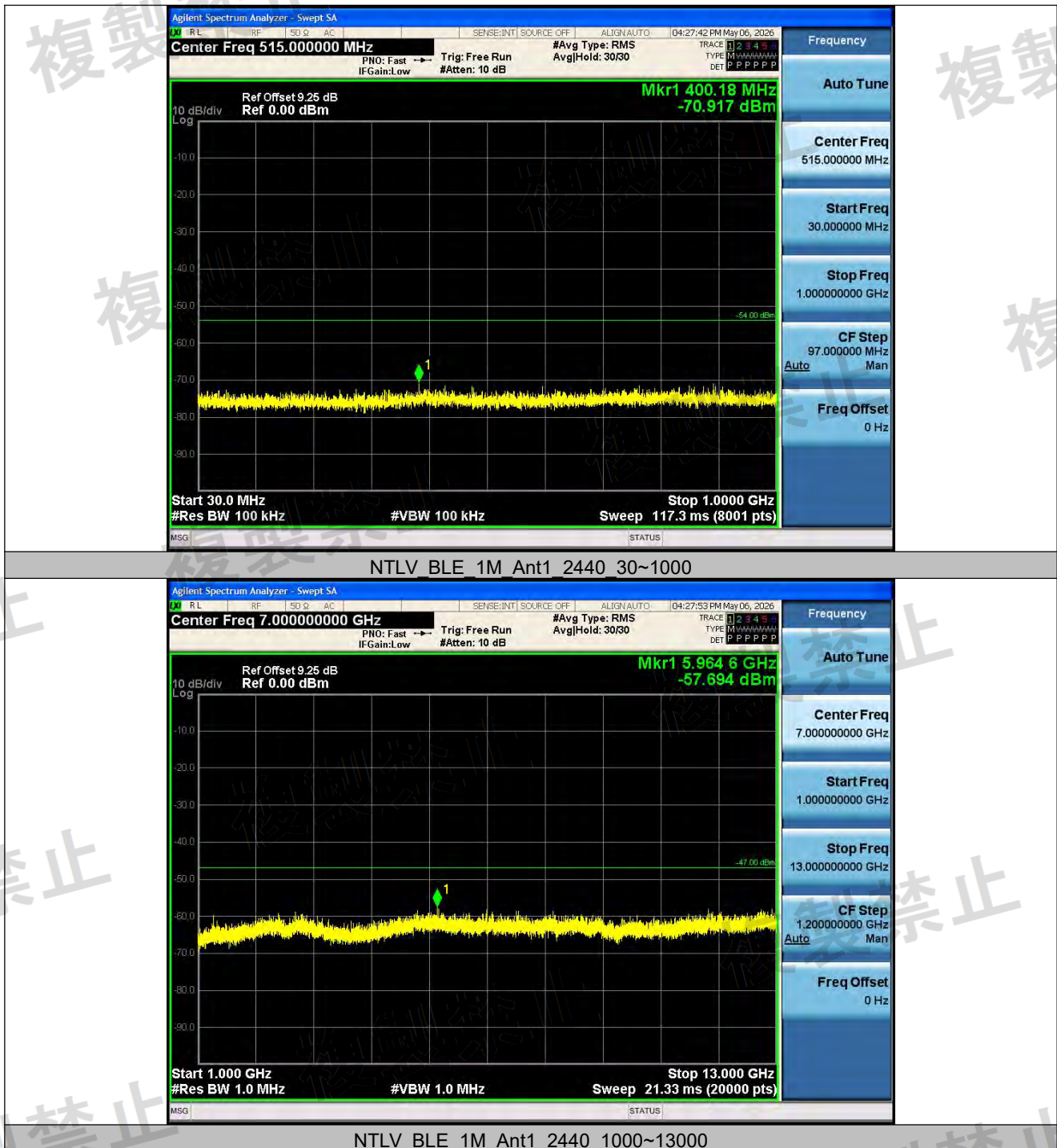


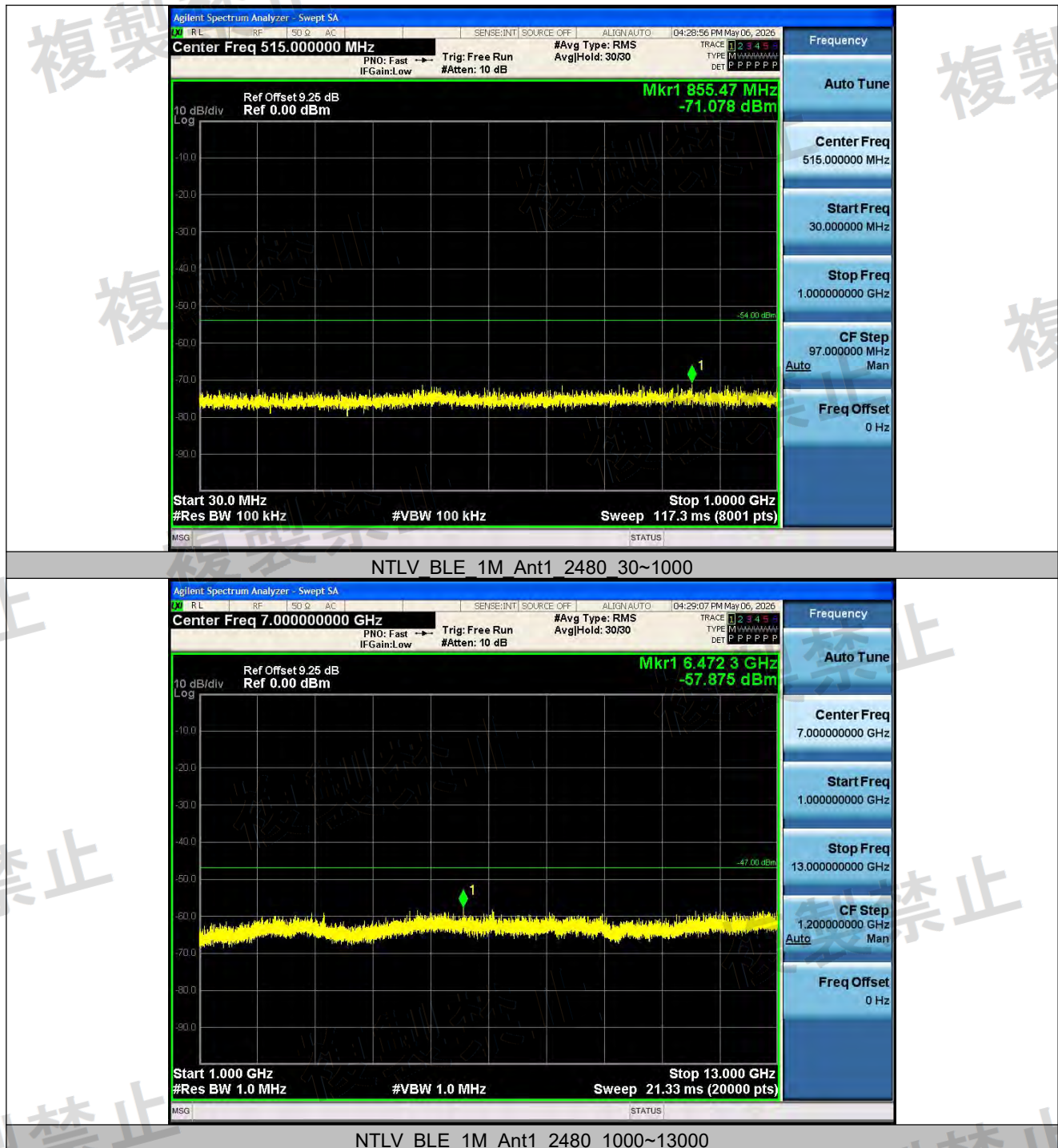


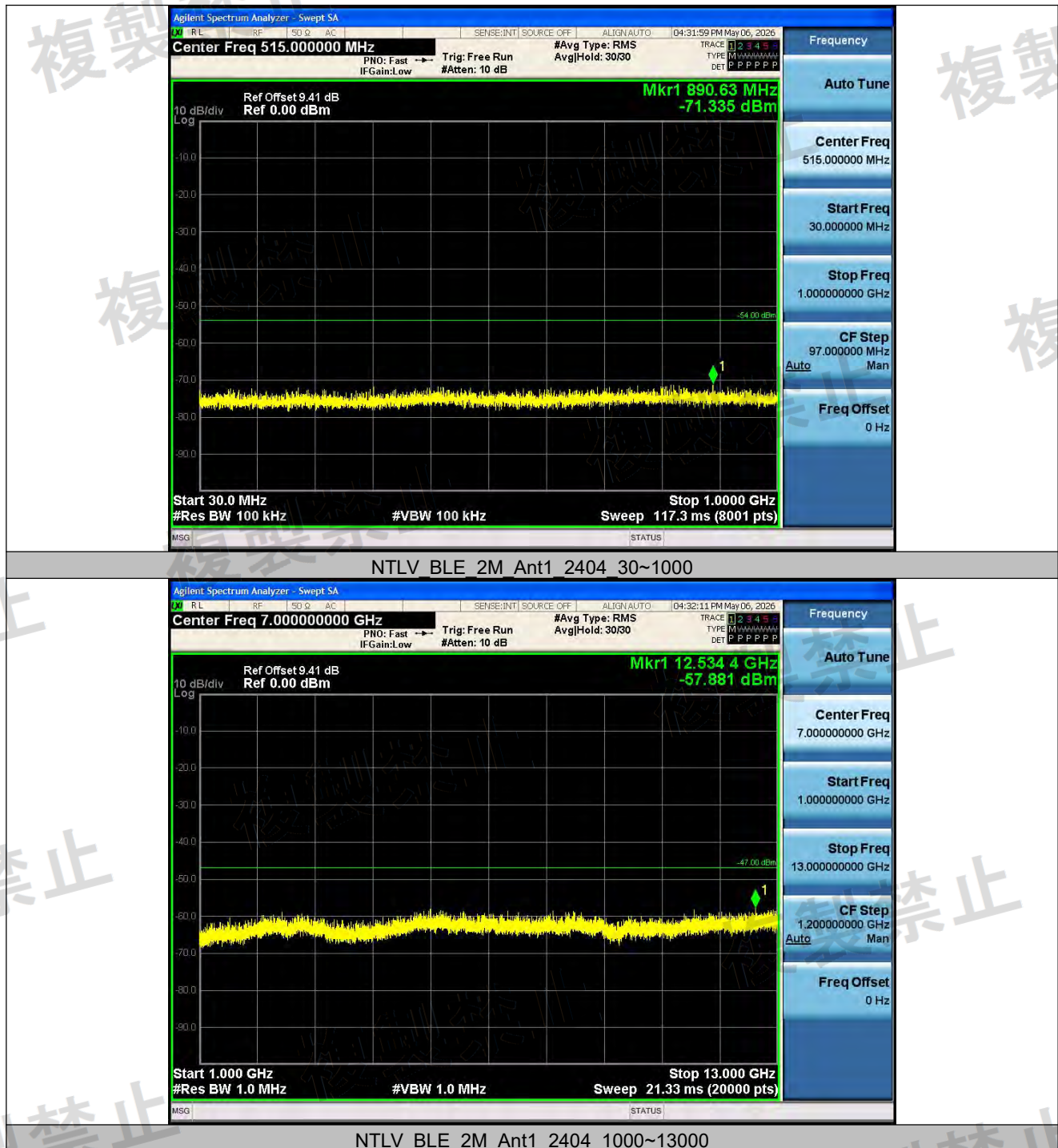


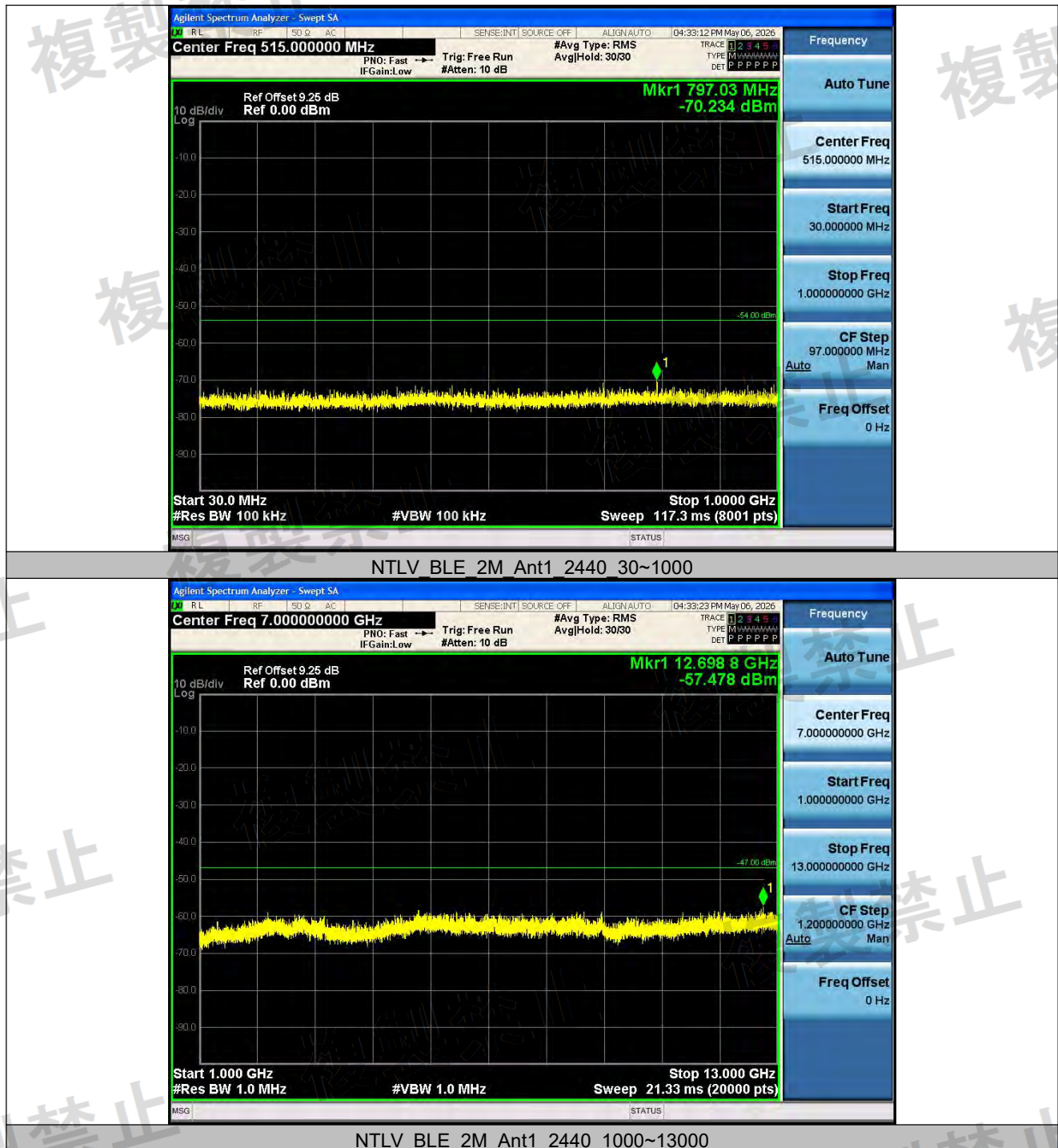


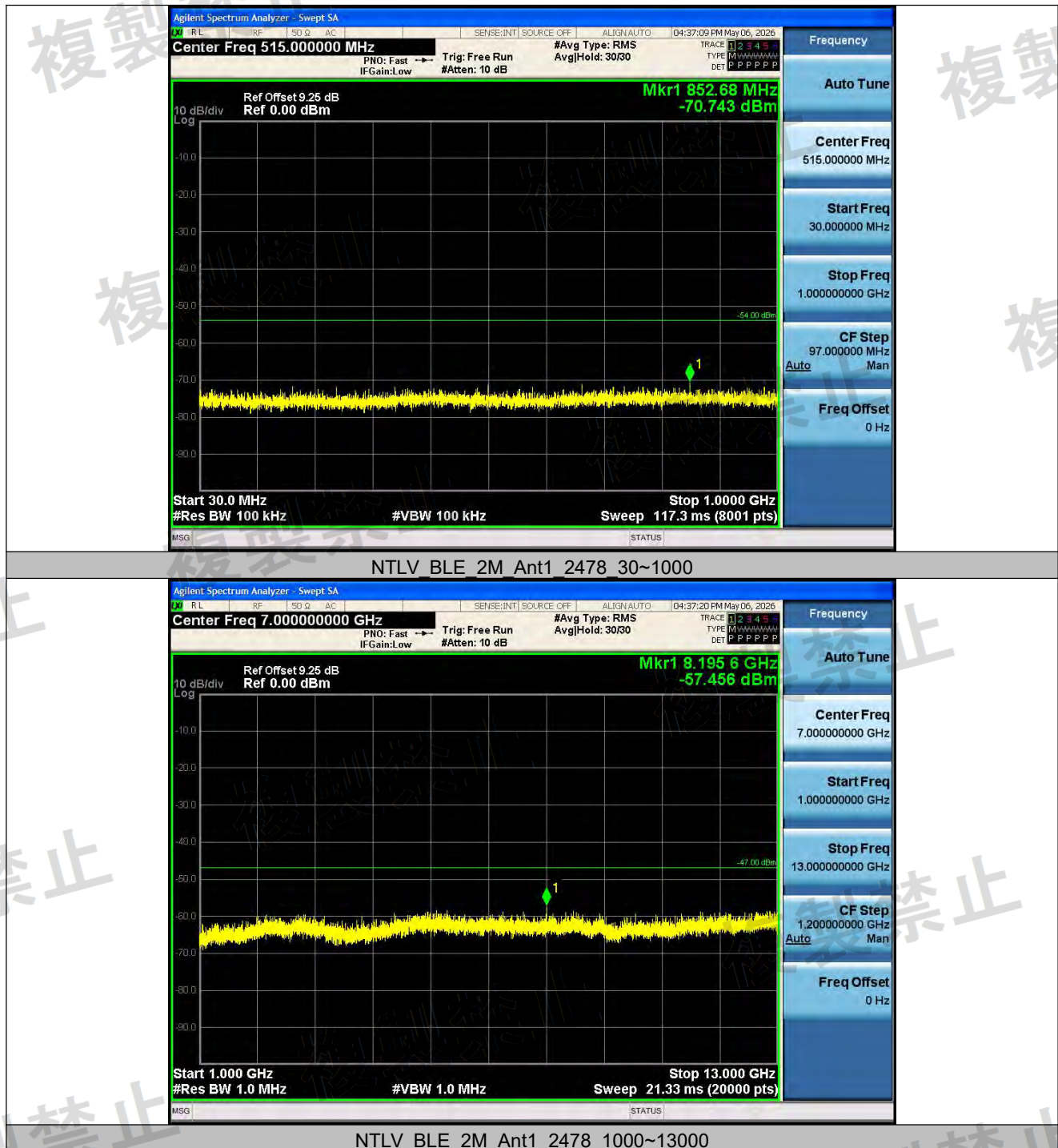


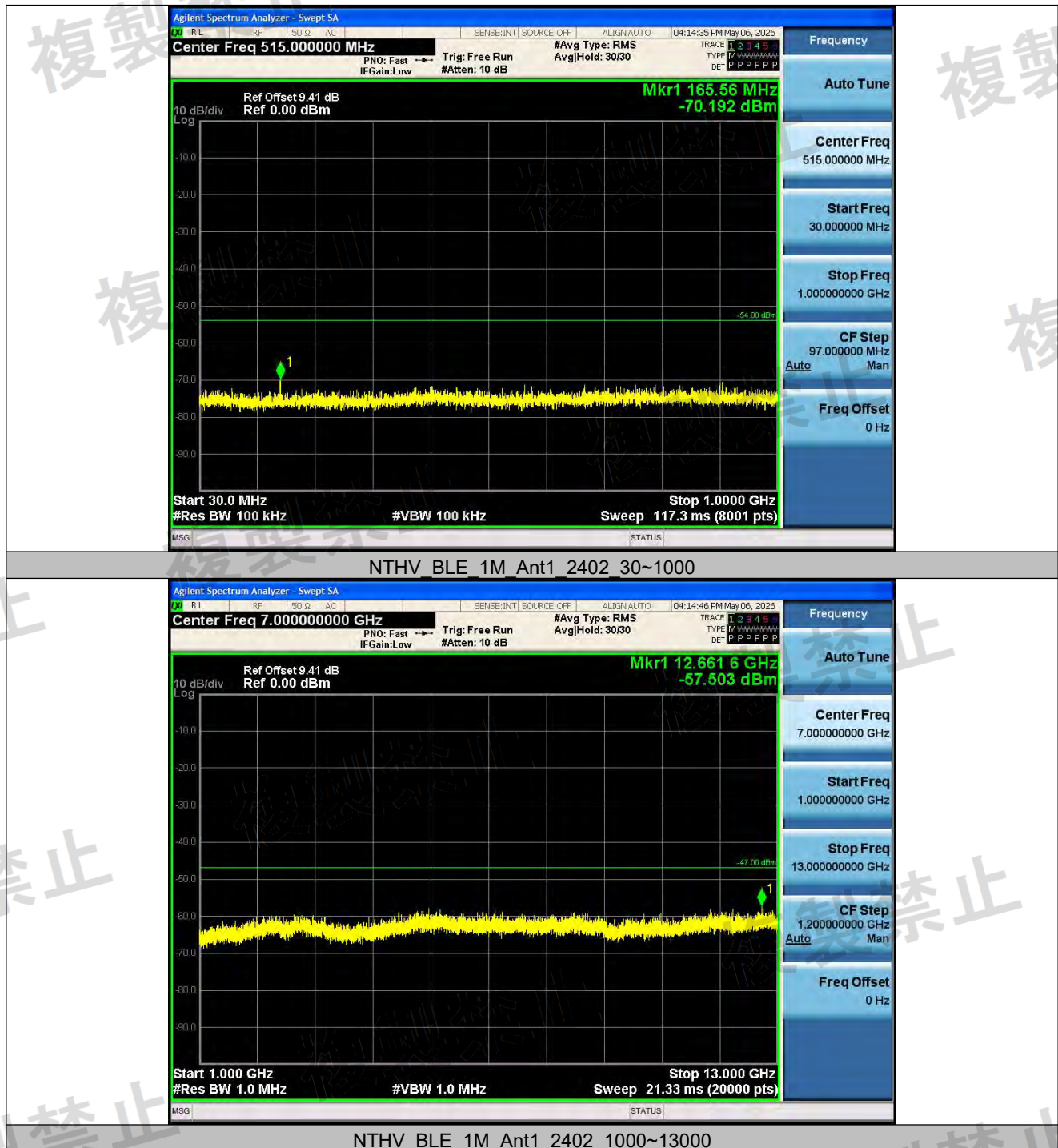


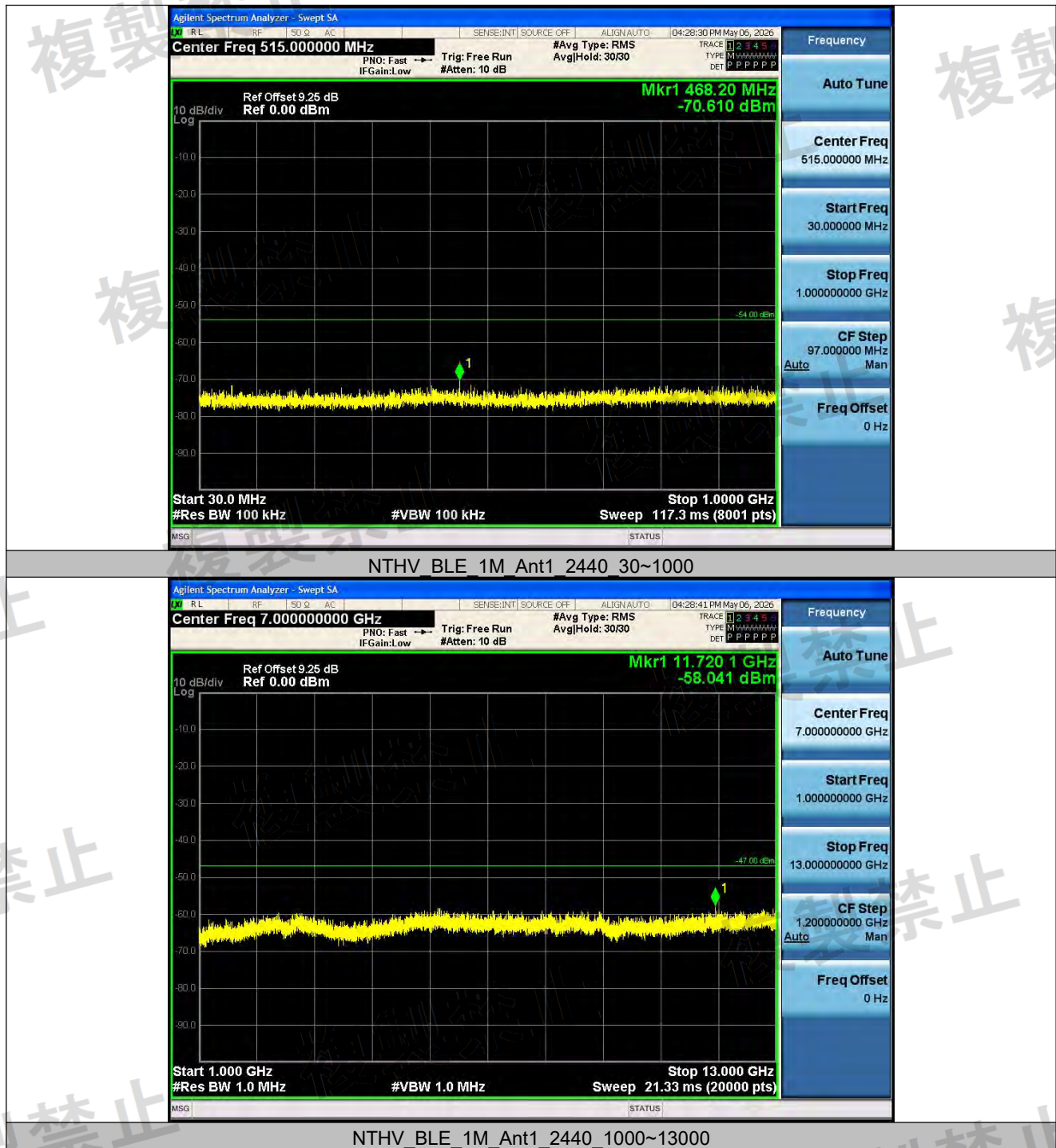


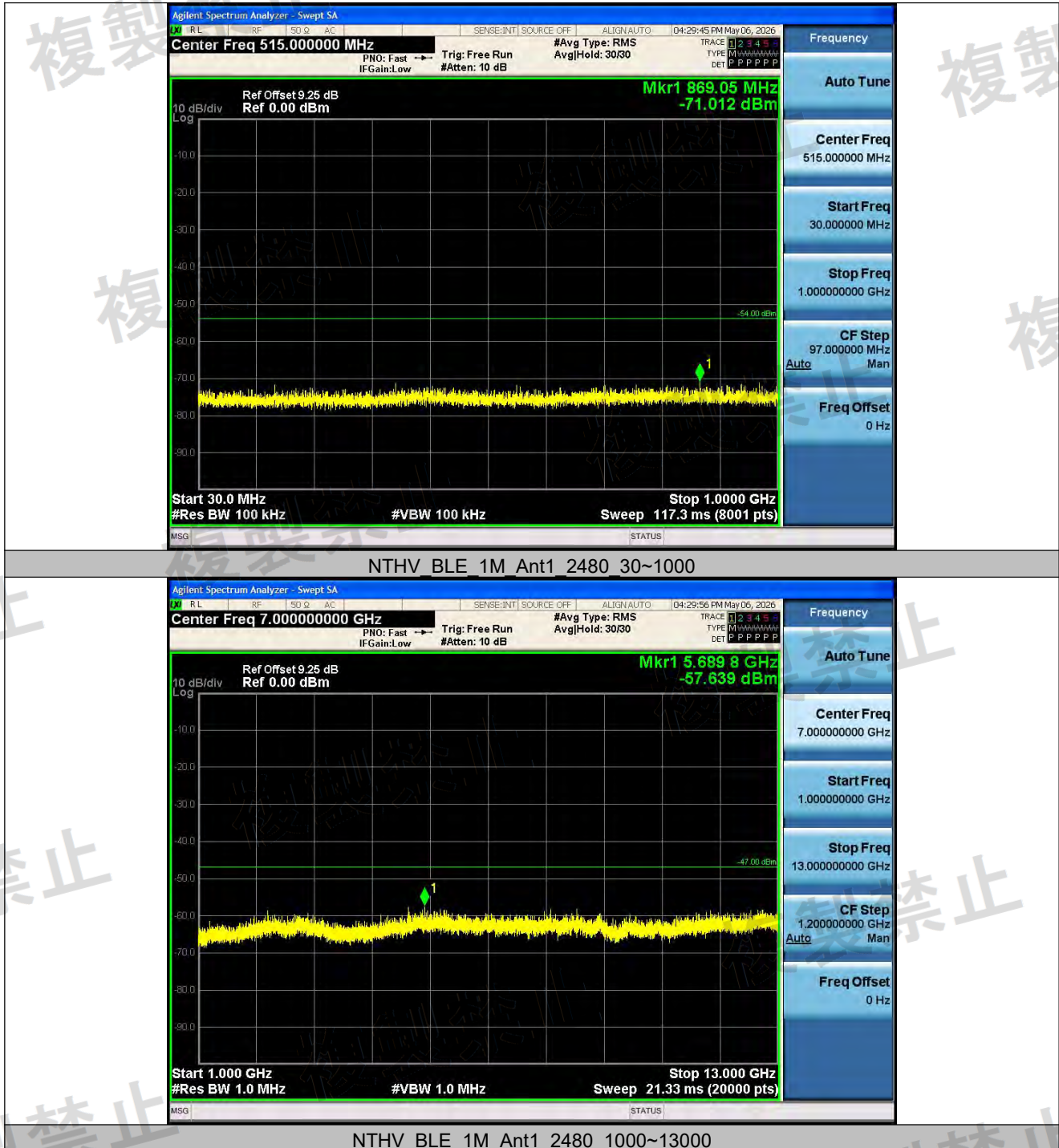


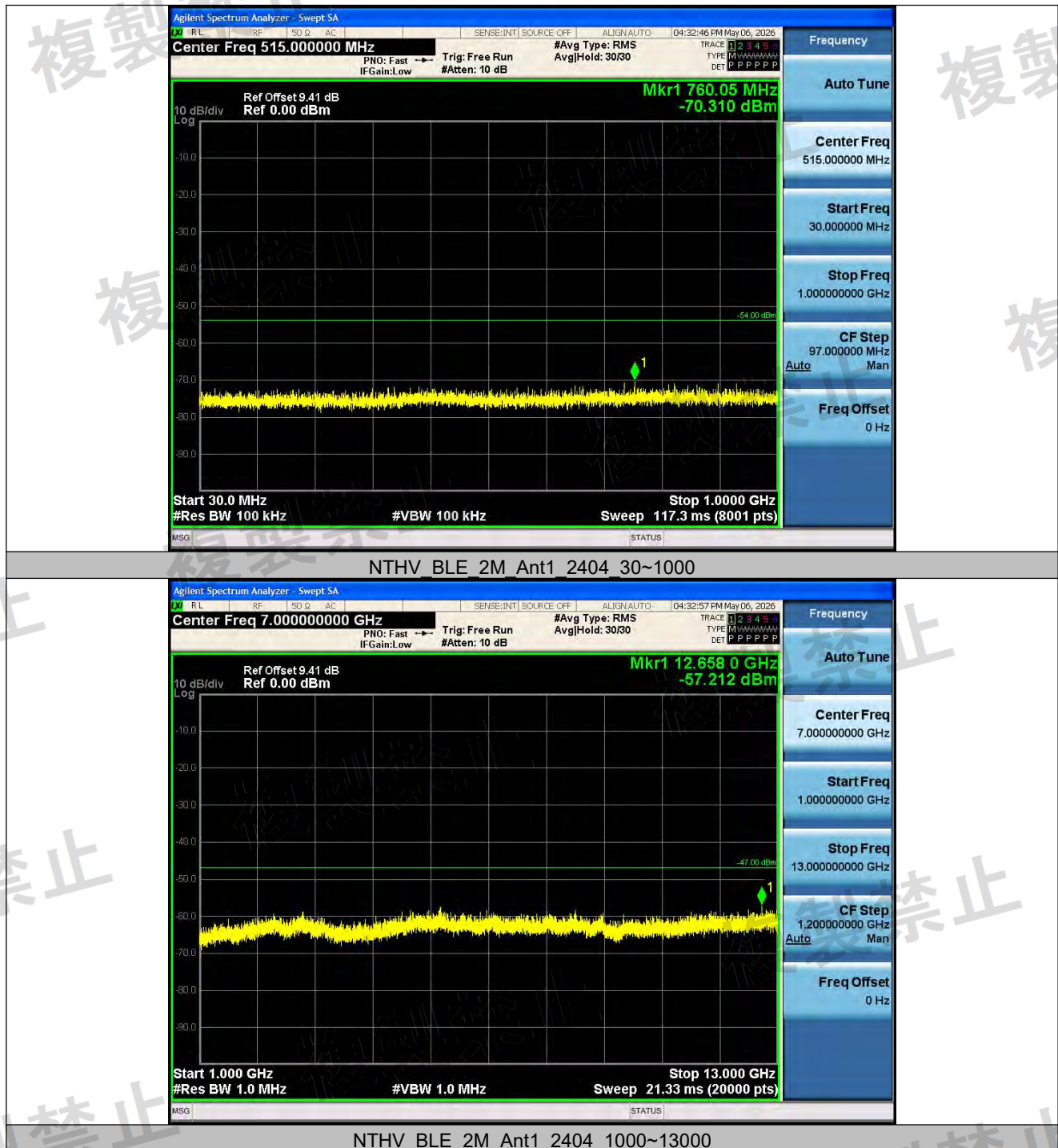


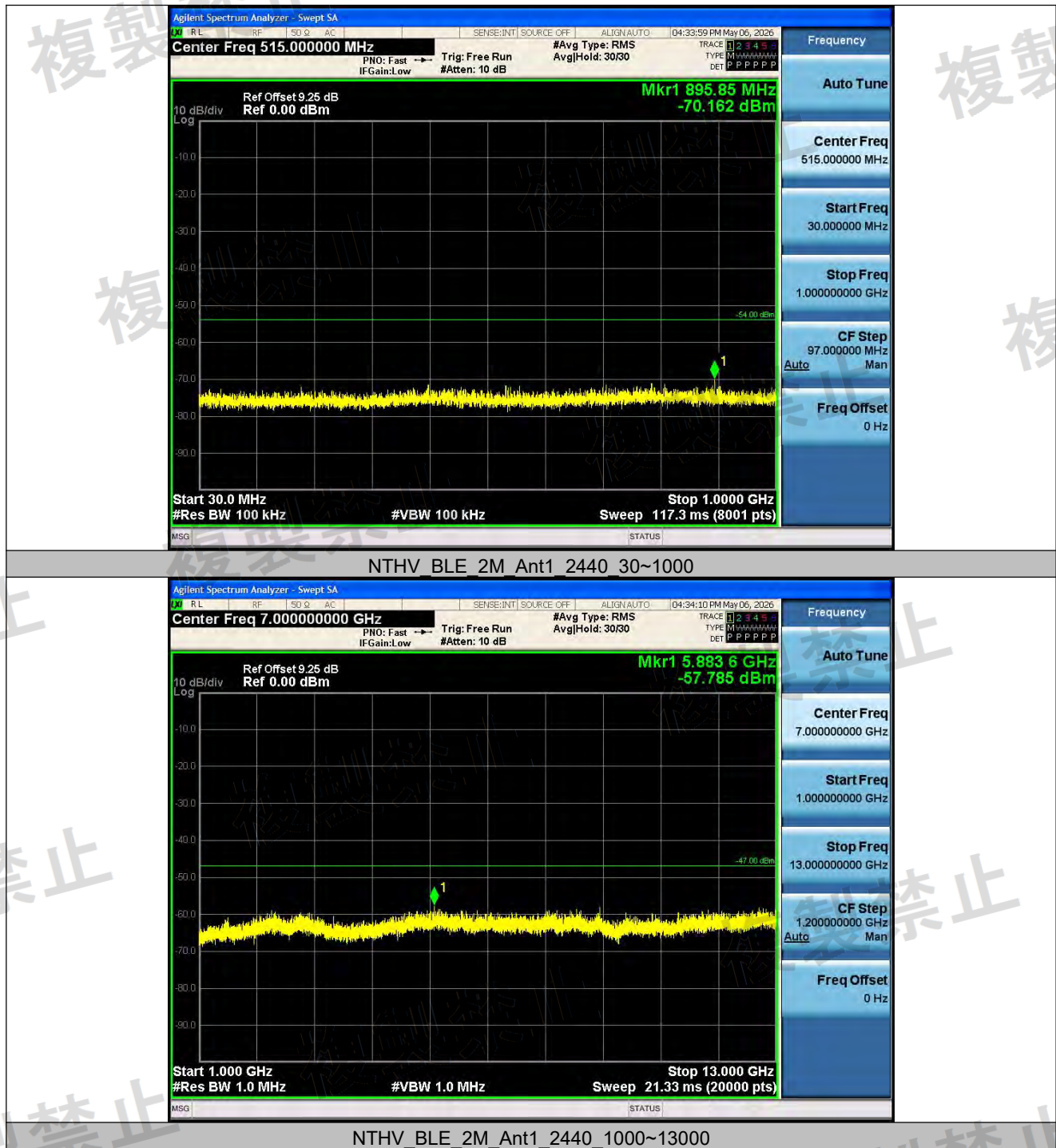


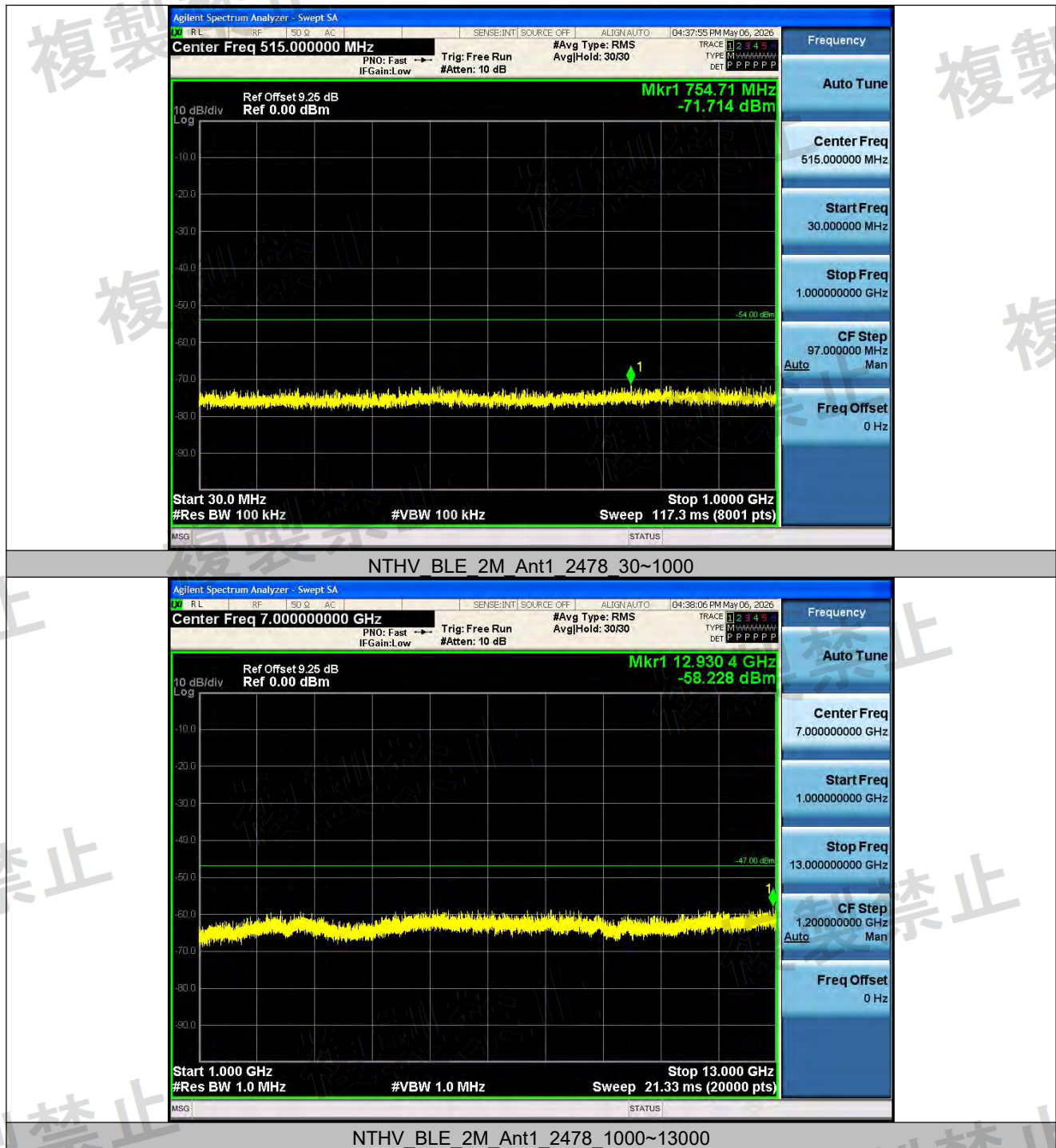












4.7 Interference prevention function

4.7.1 Limits of interference prevention function

No limit for use.

4.7.2 Test Procedure

The interference prevention requirement is a requirement that client devices should send an identification code to the master device in order to identify itself as a valid/authorized client.

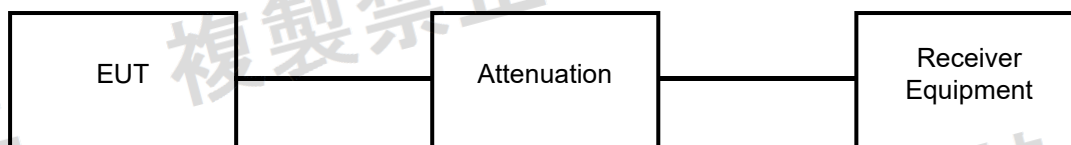
An acceptable result is to take a screenshot to demonstrate that the MAC address is 48 bits,

The intent of this requirement is that client devices which do not have a valid identification code cannot connect to the master device (such unauthorized client devices therefore cannot “interfere” with authorized client devices because unauthorized client devices will not be allowed to connect to the master).

This requirement applies to all 2.4 GHz devices (in fact, this requirement applies to most transmitters/transceivers when they are intended to be used in Japan). For 2.4 GHz devices, the identification code must consist of 48 bits. The majority of 2.4 GHz devices are still WLAN, Bluetooth or ZigBee devices. In such cases, one of the IEEE 802.xx protocols will be used. As it happens (and this is probably not a coincidence) the MAC address which is assigned to such devices consists of 48 bits.

As a result of said changes in the Japanese Radio Law, the test laboratory (now) needs to verify the operation/existence of the interference prevention function and needs to report the result(s) of this test in the test report.

4.7.3 Test Setup



4.7.4 Test results

Link mode	Test result
BT	Good
The MAC Adress	9C0DAC0FA261

5 Photographs of the test configuration



Appendix – Information on the Testing Laboratories

We, [Hwa-Hsing \(Dongguan\) Testing Co., Ltd.](#), A global provider of TESTING and CERTIFICATION services for consumer products, electronic products and wireless information technology products. Adhering to the core values “HONEST and TRUSTWORTHY, OBJECTIVE and IMPARTIALITY, RIGOROUS and AFFICIENT”, commitment to provide professional, perfect and efficient comprehensive ONE-STOP solution of TESTING and CERTIFICATION services for Manufacturers, Buyers, Traders, Brands, Retailers. Assist client to better manage risk, protect their brands, reduce costs and cut time to over 150 markets in global. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lab Address: [No.101, Building N1, Yuyuan 2 Road, Yuyuan Industrial Park, HuangJiang Town, Dongguan City, People's Republic of China](#)

Contact Tel: [0769-85598986](#)

Email: service-hs@lyns-tci.com

Web Site: www.lyns-tci.com

The address and road map of all our labs can be found in our web site also.

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