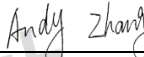




TEST REPORT

Report Reference No. :	TZ0103241201TRF01	
Prepared by (position+printed name+signature) .. :	Lena Wen (File administrators)	
Supervised by (position+printed name+signature) .. :	Max Zhang (Technique principal)	
Approved by (position+printed name+signature) .. :	Andy Zhang (General Manager)	
Date of issue	2024-12-20	
Testing Laboratory Name	Shenzhen Tongzhou Testing Co., Ltd.	
Address	1st Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China	
Applicant's name	GEO CORPORATION	
Address	OMC Bldg,8 -8,Fujimi-cho,Naka-ku,Nagoya,Aichi, Japan	
Manufacturer's name	Shenzhen Kingstar Industrial Co., Ltd.	
Address	Room 210 -211, MinLe Technology Building, MinLe Industrial Park, Meiban Road, Longhua, Shenzhen, Guangdong, China	
Test specification		
Standard.....	ARIB STD T-66 Ver.3.7 MIC Notice No.88 Appendix No.43 Article 2, paragraph 1, item 19	
TRF Originator	SZTZ	
Master TRF	Dated 2024-08	
Shenzhen Tongzhou Testing Co.,Ltd. All rights reserved. This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Tongzhou Testing Co.,Ltd. is acknowledged as copyright owner and source of the material. Shenzhen Tongzhou Testing Co.,Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.		
Test item description	Wireless Earphone	
Trade Mark.....	GEO	
Model/Type reference	GRSKS-TWS KS17	
Ratings	Input: 5V, DC 3.7V by battery	
Result	PASS	



Report No.: TZ0103241201TRF01

**** Report Revise Record ****

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2024-12-20	Valid	Initial release



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1. Test Standards and description

1.1. Test Standards

The tests were performed according to following standards:

Regulation: Item I of Article 49-20 and the relevant Articles of the ordinance of Regulatory Radio Equipment.

Test Method: (1)the test method suppressed on is equal to Appendix No.43 of MIC Notification No 88

1.2. Test description

Test Item	Test Method	Result
Antenna Power	Appendix No.43 of MIC Notification No 88 section 6	Pass
Frequency Error	Appendix No.43 of MIC Notification No 88 section 3	Pass
Interference prevention function	Appendix No.43 of MIC Notification No 88 section 12	Pass
99% Occupied bandwidth	Appendix No.43 of MIC Notification No 88 section 4	Pass
Spurious Emissions Intensity	Appendix No.43 of MIC Notification No 88 section 5	Pass
Limit of secondary radiated emissions	Appendix No.43 of MIC Notification No 88 section 7	Pass
Dwell Time	Appendix No.43 of MIC Notification No 88 section 13	Pass
Transmission Antenna Gain (EIRP antenna power)	Appendix No.43 of MIC Notification No 88 section 10	Pass
Transmission Radiation Angle Width (3db Beamwidth)	Appendix No.43 of MIC Notification No 88 section 11	N/A

N/A: means not applicable



2. Summary

2.1. General Remarks

Date of receipt of test sample : 2024-12-06

Testing commenced on : 2024-12-06

Testing concluded on : 2024-12-19

2.2. Product Description

Name of EUT	: Wireless Earphone
Trade Mark	: GEO
Model/Type reference	: GRSKS-TWS KS17
Test Model	: GRSKS-TWS KS17
Hardware Version	: JYX-Y17-R
Software Version	: V1.0
Power supply	: Input: 5V, DC 3.7V by battery

2.3. Wireless Function Tested in this report

Bluetooth	
Modulation	: BR ☒ GFSK:1Mbps; EDR ☒ π /4-DQPSK:2Mbps ☒ 8DPSK:3Mbps
Operation frequency	: 2402MHz~2480MHz
Channel number	: 79
Channel separation	: 1MHz
Antenna type	: Internal antenna
Antenna gain	: 0dBi

Operation Frequency List:

Channel No.	Frequency (GHz)	Channel No.	Frequency (GHz)	Channel No.	Frequency (GHz)
00	2.402	28	2.430	56	2.458
01	2.403	29	2.431	57	2.459
02	2.404	30	2.432	58	2.460
03	2.405	31	2.433	59	2.461
04	2.406	32	2.434	60	2.462
05	2.407	33	2.435	61	2.463
06	2.408	34	2.436	62	2.464
07	2.409	35	2.437	63	2.465
08	2.410	36	2.438	64	2.466
09	2.411	37	2.439	65	2.467
10	2.412	38	2.440	66	2.468
11	2.413	39	2.441	67	2.469
12	2.414	40	2.442	68	2.470
13	2.415	41	2.443	69	2.471



14	2.416	42	2.444	70	2.472
15	2.417	43	2.445	71	2.473
16	2.418	44	2.446	72	2.474
17	2.419	45	2.447	73	2.475
18	2.420	46	2.448	74	2.476
19	2.421	47	2.449	75	2.477
20	2.422	48	2.450	76	2.478
21	2.423	49	2.451	77	2.479
22	2.424	50	2.452	78	2.480
23	2.425	51	2.453		
24	2.426	52	2.454		
25	2.427	53	2.455		
26	2.428	54	2.456		
27	2.429	55	2.457		

2.4. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides software(bt_tool_v1.1.2/ Power index: default) to control the EUT for staying in continuous transmitting and receiving mode for testing.

2.5. Test Voltage

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input To EUT	DC 3.7V	DC 4.2V	DC 3.5V
Output To RF Module	DC 3.3V	DC 3.3V	DC 3.3V
Voltage Variation (%)	--	--	--

Note:

Voltage Variation (%)

= (Output high or Low Voltage - Output Normal Voltage)/ Output Normal Voltage* 100

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/-1%. Exempt extremely high and low supply voltage condition test, EUT only operated in normal voltage to test all regulations.



2.6. EUT configuration

(1) The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

☐ Adapter	Model:	MDY-10-EH
	Input:	Input 100-240VAC 50/60Hz 0.7A
	Output:	Output 5V 3A

(2) Protective Structure

- ☐ The exterior cover was sealed by Special screws, it can not be easily open.
- ☐ The enclosure was sealed with strong adhesive glue, it can not be easily open.
- ☐ All high-frequency section and modulation section was packaged in one IC, and shield by metal shield, it can not be easily open.
- ☐ The top and the bottom is connected with strong Buckles, it can not be easily open.
- ☒ Others: The top and the bottom is connected with strong Buckles, So We can not open the it easily at the normal condition. The high-frequency section and modulation section can not be capable of being opened easily



2.7. Modifications

No modifications were implemented to meet testing criteria.



3. Test Environment

3.1. Address of the test laboratory

Shenzhen Tongzhou Testing Co.,Ltd

1st Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2014) and CISPR Publication 22.

3.2. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Tongzhou Testing Co.,Ltd is reported:

Test Items	Measurement Uncertainty	Notes
Frequency stability	$U_c = \pm 25 \text{ Hz}$	(1)
Transmitter power conducted	$U_c = \pm 0.57 \text{ dB}$	(1)
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$	(1)
Uncertainty of RF Power Density, Conducted	$U_c = \pm 2.6 \text{ dB}$	(1)
Uncertainty of Spurious Emissions, Conducted (30MHz-1GHz)	$U_c = \pm 2.7 \text{ dB}$	(1)
Uncertainty of Spurious Emissions, Conducted (1GHz-26GHz)	$U_c = \pm 3.2 \text{ dB}$	(1)
Uncertainty of Dwell Time	$U_c = \pm 2\%$	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.



3.3. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Latest Cal.	Next Cal.
1	MXA Signal Analyzer	Keysight	N9020A	MY52091623	2024/1/4	2025/1/3
2	EMI Test Receiver	R&S	ESCI	100849/003	2024/1/4	2025/1/3
3	DC power supply	Chroma	RXN-305D	62012PD02811	2024/1/4	2025/1/3
4	Power Meter	Agilent	NRVD	835843/014	2024/1/4	2025/1/3
5	Wideband Radio Communication Tester	R&S	CMW500	101855	2024/1/4	2025/1/3
6	Oscilloscope	Tektronix	TDS2024C	C044925	2024/1/4	2025/1/3
7	Horn Antenna	schwarzbeck	BBHA 9120D	01989	2022/11/13	2025/11/12
8	Controller	MF	MF7802	N/A	N/A	N/A
9	Horn Antenna	ETS	3117	00218874	2022/11/13	2025/11/12
10	Signal Generator	Keysight	N5182A	MY4620709	2024/1/4	2025/1/3

Full Name of calibration company: Guangzhou Lisai Metrology & Test co., Ltd.

Calibration by the calibration agencies listed in the table correspond to paragraph 4 (ii) (c) of Article 24-2 in the Radio Law.

☐ (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18-1 of the Radio Act

☐ (b) Calibration conducted based on the regulations of Article 135 or 144 of the Measurement Act

☒ (c) Calibration conducted in foreign countries, which is equivalent to calibration conducted by the NICT or a designated calibration agency under Article 102-18-1 of the Radio Act

☐ (d) Calibration, etc. conducted by using measuring instruments and other facilities listed at the bottom of appended table 3 of the Radio Act, which is to have been calibrated as described in (a) through (c) above



4. Test conditions and Results

4.1. Antenna Power

TEST CONFIGURATION



TEST PROCEDURE

1. EUT have transmitted continuous maximum power..
2. Frequency hopping system or combined systems of direct spread and frequency hopping
 - i. Connect the high frequency Power Meter or Spectrum Analyzer to the output of the attenuator and measure the total power (without bandwidth limitation)
 - ii. Divide the total power by the spread bandwidth to find the "average" power per MHz.
The average power per MHz is equal to the power meter value dBm + cable loss dB.
 - iii. Set the antenna power as follows:
 - Continuous waves: value in ii.

LIMIT

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2400~2483.5MHz)
	$\leq 10\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz)
	$\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Antenna Power Error	$\leq 20\%$ (Base on manufacturer declare antenna power density)



TEST RESULTS

Report No.: TZ0103241201TRF01

Antenna Power								
Test Condition	Test Mode	Antenna	Channel	Ave. Burst Power [mW]	Spread BW [MHz]	Result (mW/ MHz)	Limit (mW/ MHz)	Verdict
NTNV	DH5	Ant1	Hop	1.3335	70.408	0.0189	≤3	PASS
	2DH5	Ant1	Hop	0.6039	70.473	0.0086	≤3	PASS
	3DH5	Ant1	Hop	0.7178	70.466	0.0102	≤3	PASS
NTLV	DH5	Ant1	Hop	1.3305	70.313	0.0189	≤3	PASS
	2DH5	Ant1	Hop	0.7447	70.524	0.0106	≤3	PASS
	3DH5	Ant1	Hop	1.0093	70.490	0.0143	≤3	PASS
NTHV	DH5	Ant1	Hop	0.9638	70.508	0.0137	≤3	PASS
	2DH5	Ant1	Hop	0.7430	70.693	0.0105	≤3	PASS
	3DH5	Ant1	Hop	0.6998	70.194	0.0100	≤3	PASS

Tolerance								
Test Condition	Test Mode	Antenna	Channel	Power (mW/ MHz)	Rated Power (mW/ MHz)	Result (%)	Limit (%)	Verdict
NTNV	DH5	Ant1	Hop	0.0189	3	-99.37	≤20	PASS
	2DH5	Ant1	Hop	0.0086	3	-99.71	≤20	PASS
	3DH5	Ant1	Hop	0.0102	3	-99.66	≤20	PASS
NTLV	DH5	Ant1	Hop	0.0189	3	-99.37	≤20	PASS
	2DH5	Ant1	Hop	0.0106	3	-99.65	≤20	PASS
	3DH5	Ant1	Hop	0.0143	3	-99.52	≤20	PASS
NTHV	DH5	Ant1	Hop	0.0137	3	-99.54	≤20	PASS
	2DH5	Ant1	Hop	0.0105	3	-99.65	≤20	PASS
	3DH5	Ant1	Hop	0.0100	3	-99.67	≤20	PASS

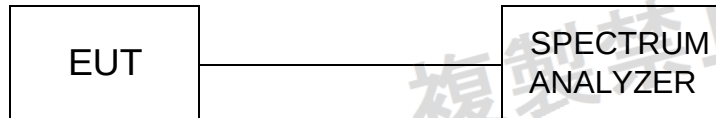
Remark:

- 1, The item was tested at 25℃ and 55% humidity condition;
- 2, Result = the power meter value + cable loss



4.2. Frequency Error

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: non-modulation

Spectrum Condition:

Frequency: test frequency

Span:1MHz

Rbw:10KHz

Vbw:10KHz

Sweep time:Auto

Dectector mode: Positive peak

Indication mode: max hold

LIMIT

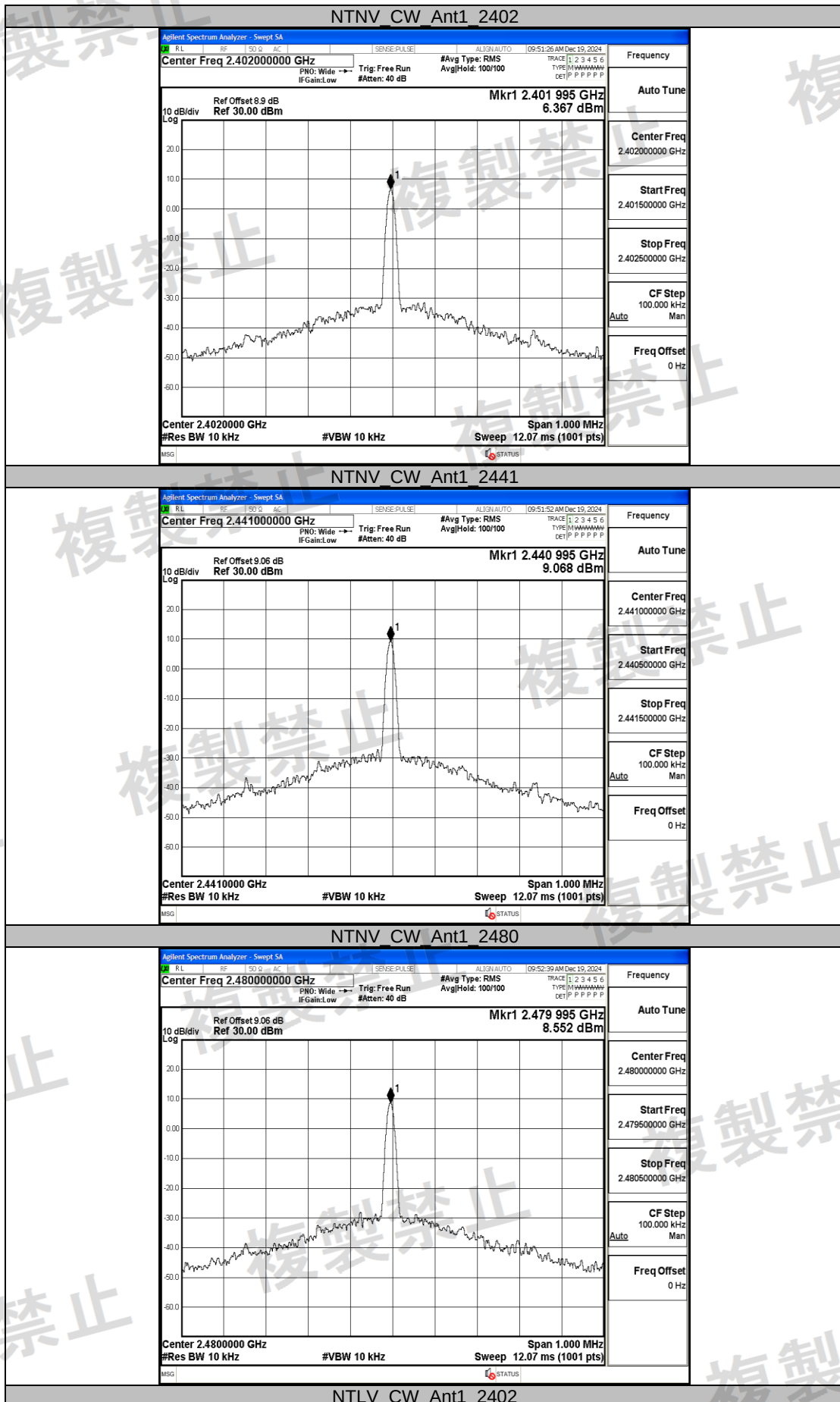
Tolerance of frequency shall be ± 50 ppm.

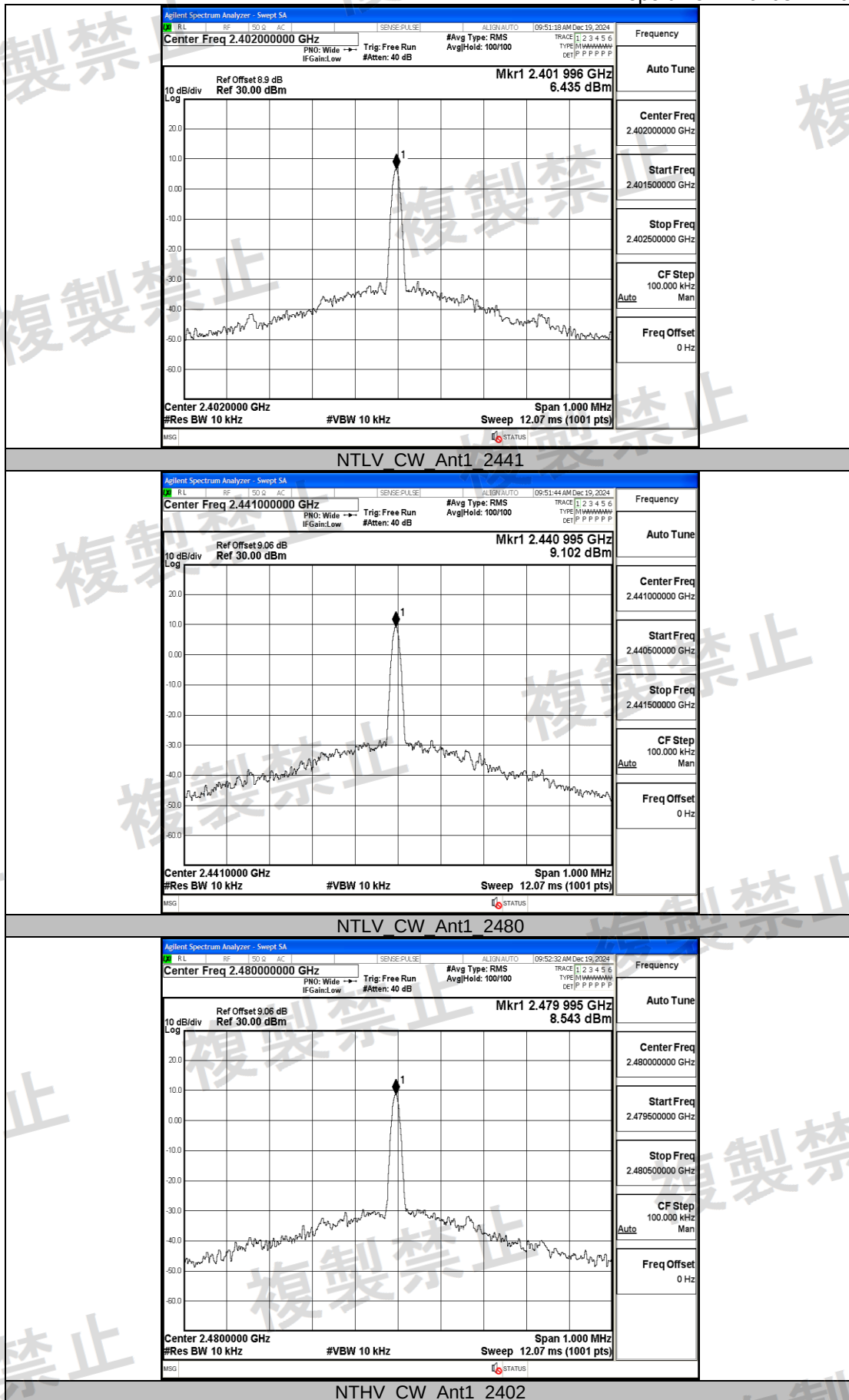
TEST RESULTS

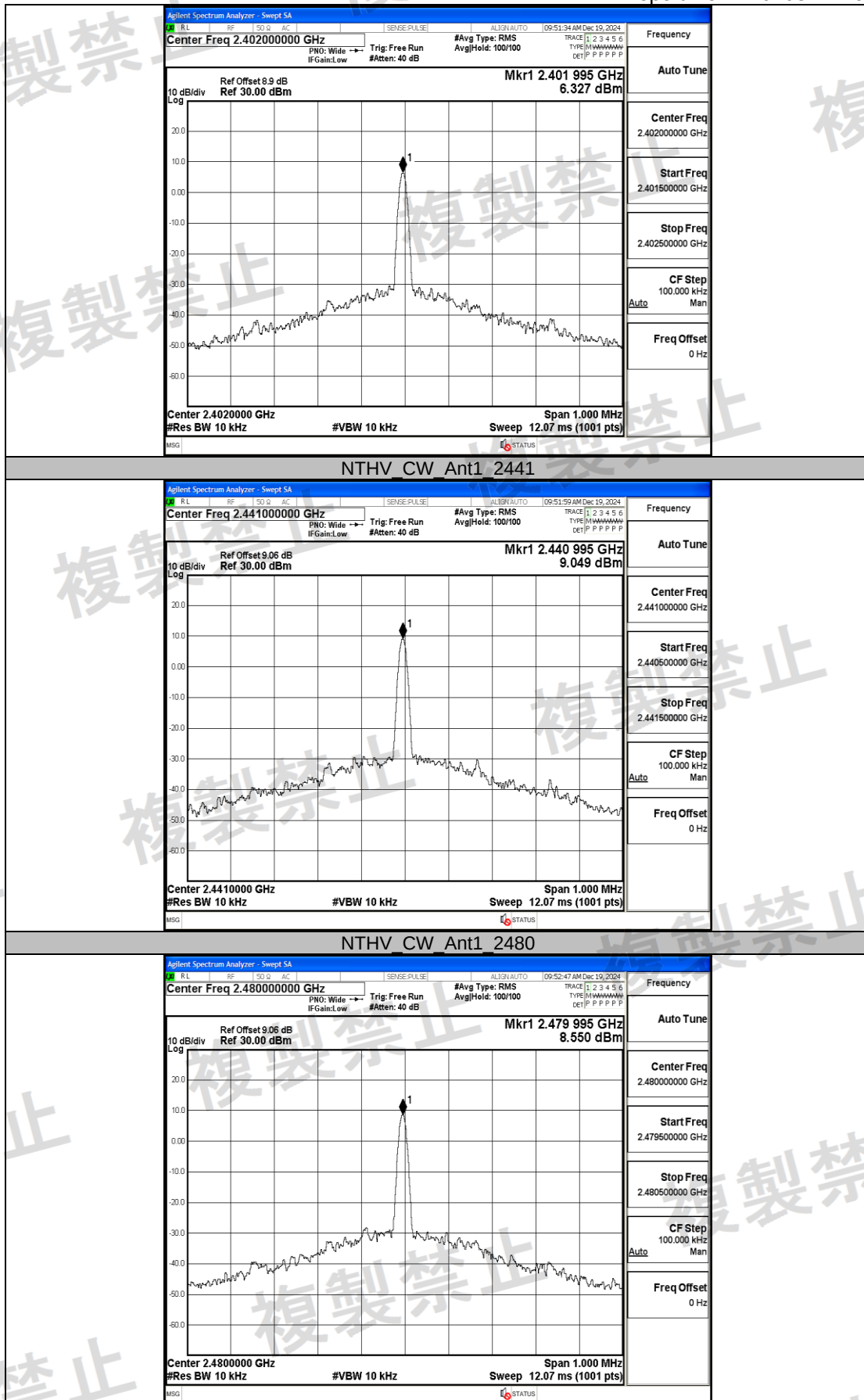
Test Condition	Test Mode	Antenna	Frequency [MHz]	Result [ppm]	Limit [ppm]	Verdict
NTNV	CW	Ant1	2402	-2.08160	± 50	PASS
			2441	-2.04834	± 50	PASS
			2480	-2.01613	± 50	PASS
NTLV	CW	Ant1	2402	-1.66528	± 50	PASS
			2441	-2.04834	± 50	PASS
			2480	-2.01613	± 50	PASS
NTHV	CW	Ant1	2402	-2.08160	± 50	PASS
			2441	-2.04834	± 50	PASS
			2480	-2.01613	± 50	PASS

- Note: 1. The test results including the cable lose.
2. The item was tested at 25 °C and 55% humidity condition;
3.All condition has been testd,list the worst case in this item

Test plot as follows:









4.3. Interference Prevention Function

The device consists of the Antenna and transmitter module. Component transmitter module also can use the protocol function to protect interference come from outside.

TEST EQUIPMENT

CMW500

TEST SOFTWARE

N/A

TEST PROCEDURE

1. Open the software
2. Scan for EUT, and read the MAC address.

TEST RESULTS

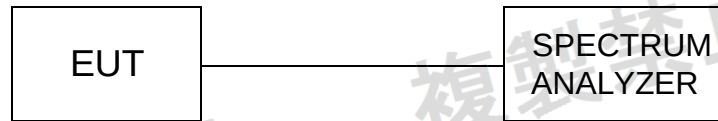
The unit does meet the requirements.

MAC Address:65:F5:EA:4F:2F:9E



4.4. Occupied Bandwidth (99%)

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

Frequency: Center frequency in the band to be used

Span:200MHz

RBW:1MHz

VBW:1MHz

Sweep time:Auto

Dectector mode: Positive peak

Indication mode: max hold

LIMIT

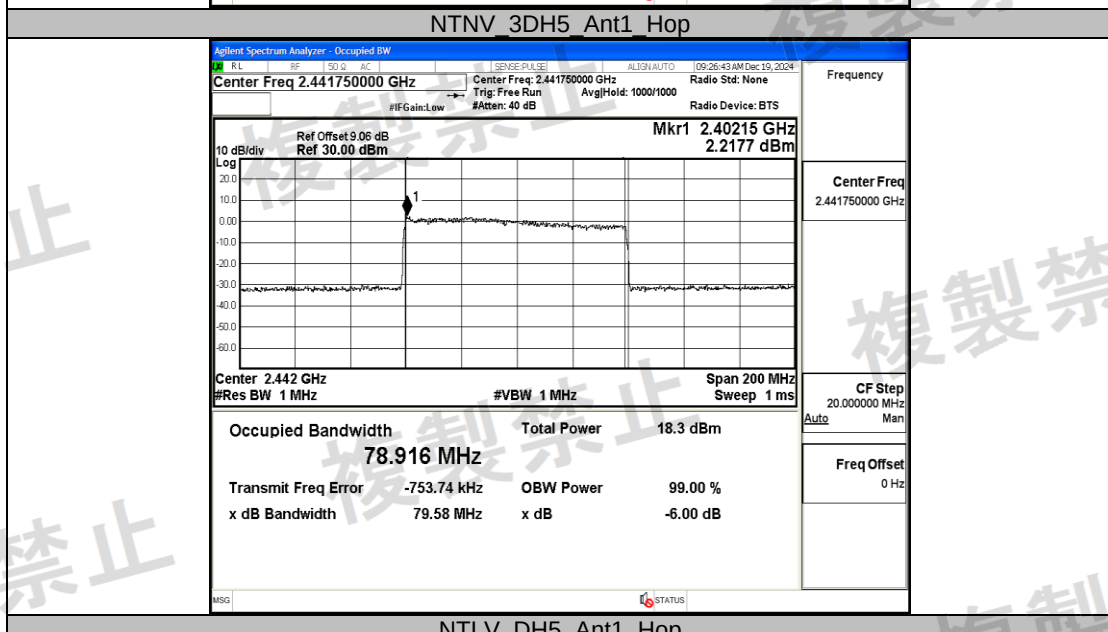
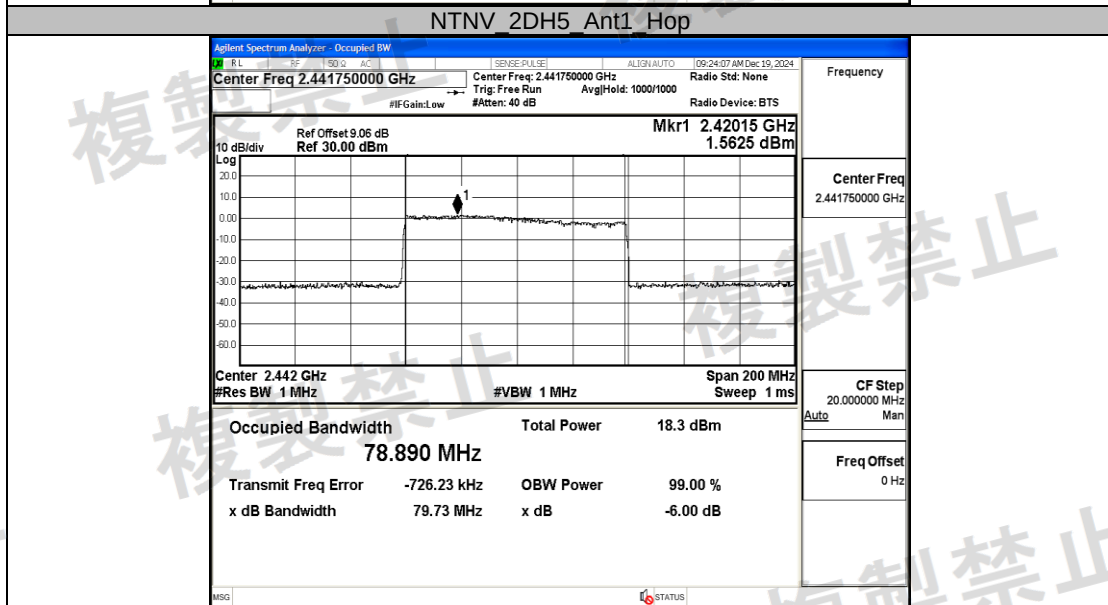
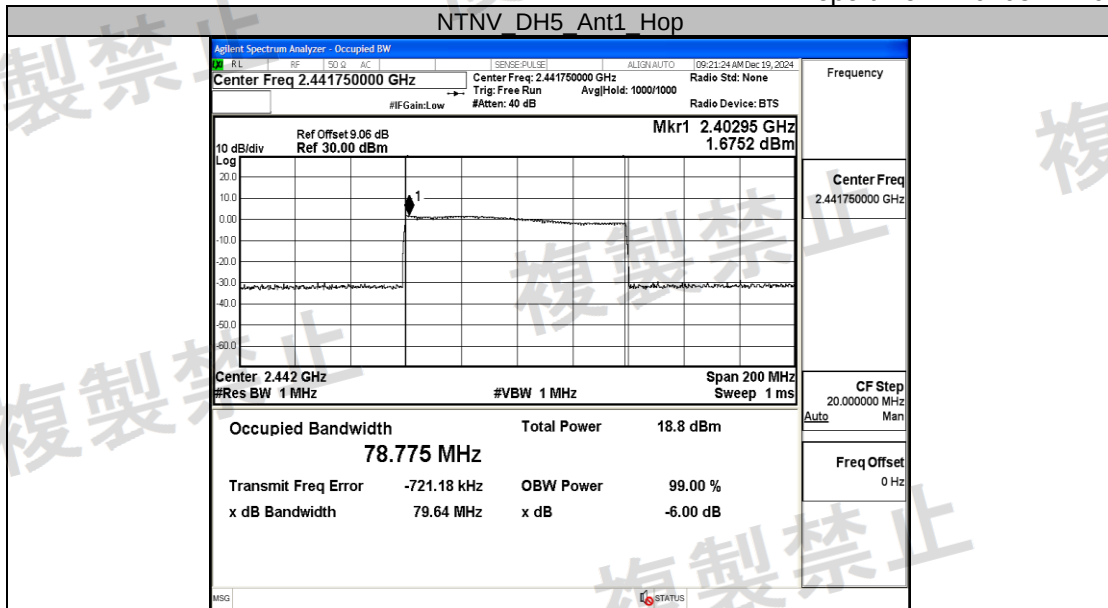
Permissible value for occupied bandwidth using the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems shall be 83.5 MHz or less, while necessary bandwidth (minimum occupied bandwidth sufficient to ensure information transmission of required quality at a required transmission rate for the system used under specified conditions for a given emission type) using a system other than any of the above shall be 26 MHz or less.

TEST RESULTS

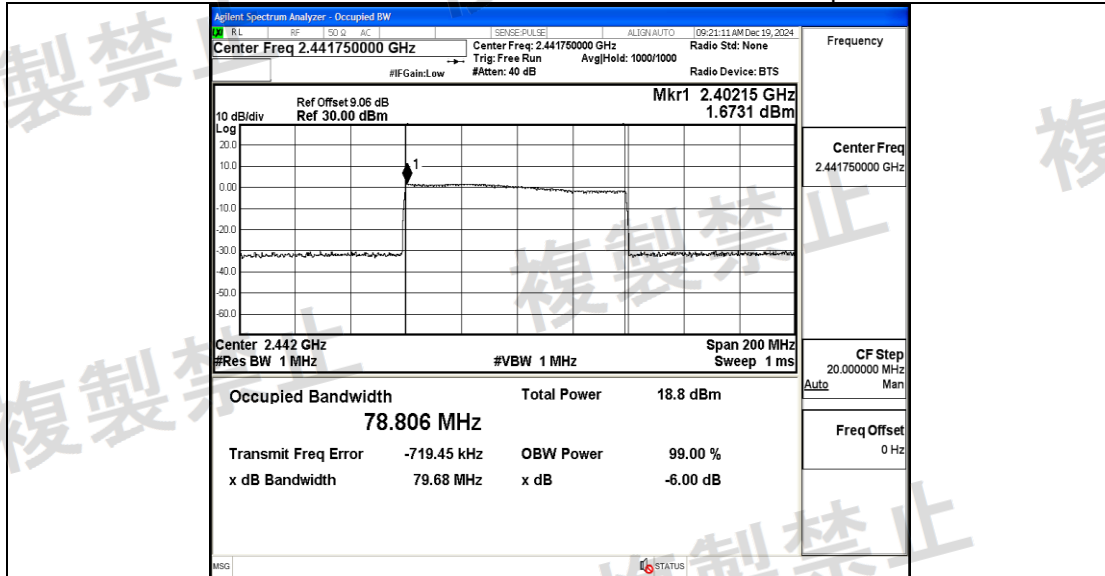
Test Condition	Test Mode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTNV	DH5	Ant1	Hop	78.775	≤83.5	PASS
	2DH5	Ant1	Hop	78.890	≤83.5	PASS
	3DH5	Ant1	Hop	78.916	≤83.5	PASS
NTLV	DH5	Ant1	Hop	78.806	≤83.5	PASS
	2DH5	Ant1	Hop	78.818	≤83.5	PASS
	3DH5	Ant1	Hop	78.857	≤83.5	PASS
NTHV	DH5	Ant1	Hop	78.736	≤83.5	PASS
	2DH5	Ant1	Hop	78.895	≤83.5	PASS
	3DH5	Ant1	Hop	78.835	≤83.5	PASS

Note: 1. The test results including the cable lose.
2. The item was tested at 25 ℃ and 55% humidity condition;
3.All condition has been testd,list the worst case in this item

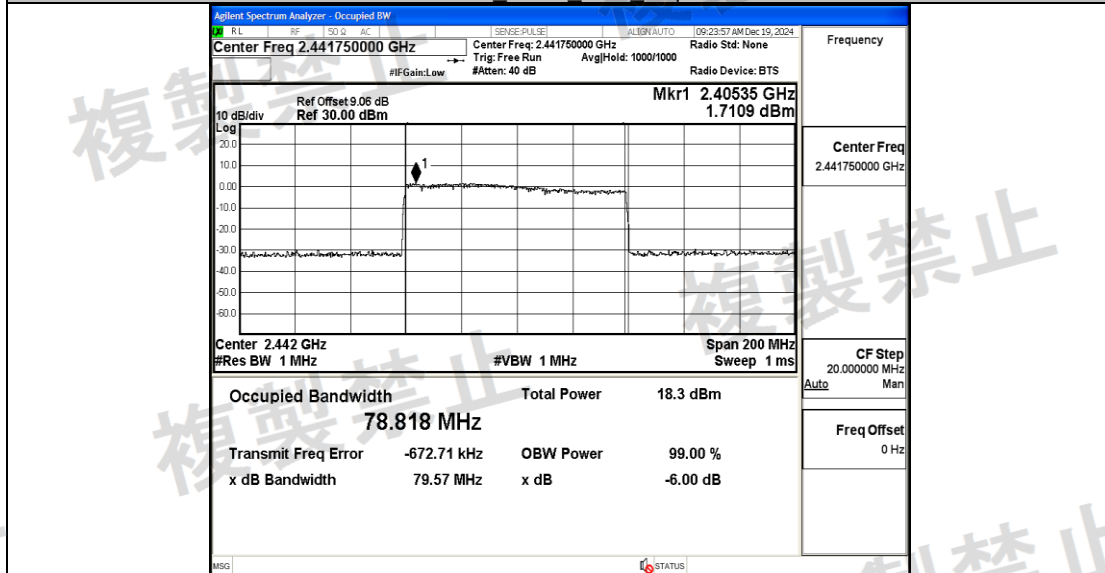
Test plot as follows:



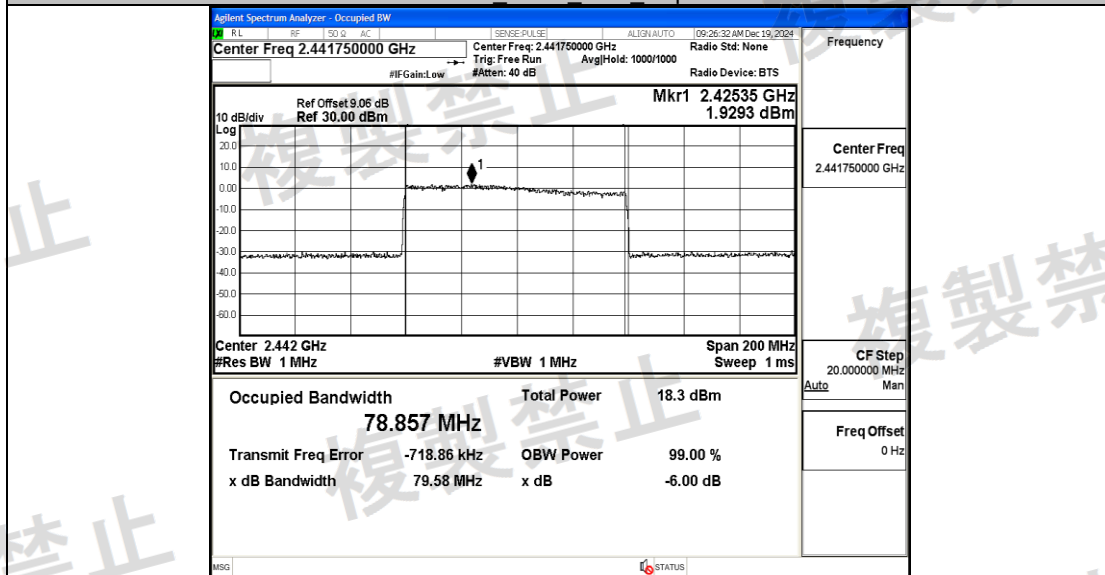
NTLV_DH5_Ant1_Hop



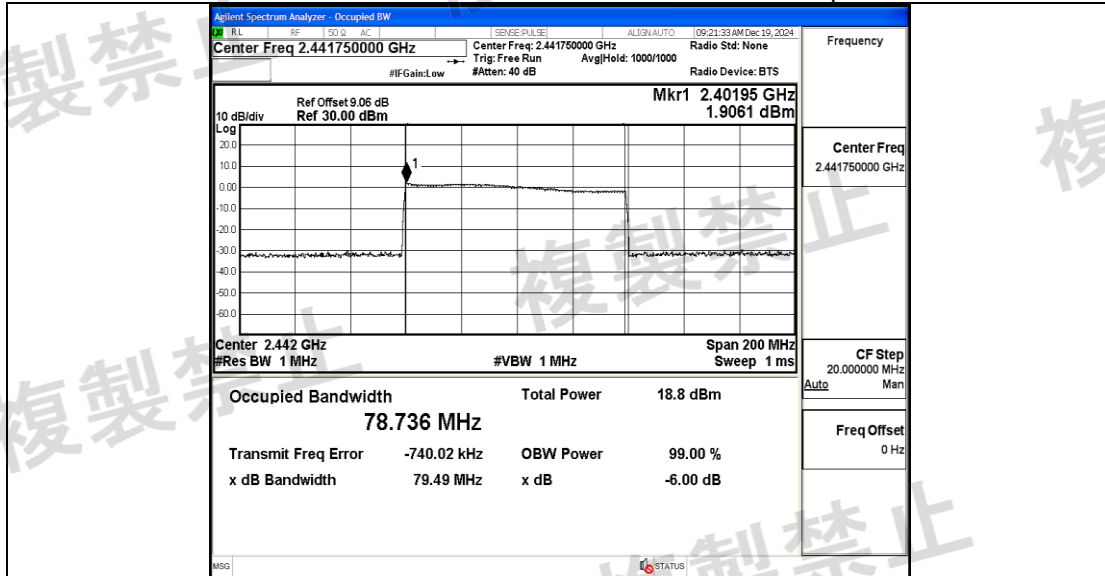
NTLV 2DH5 Ant1 Hop



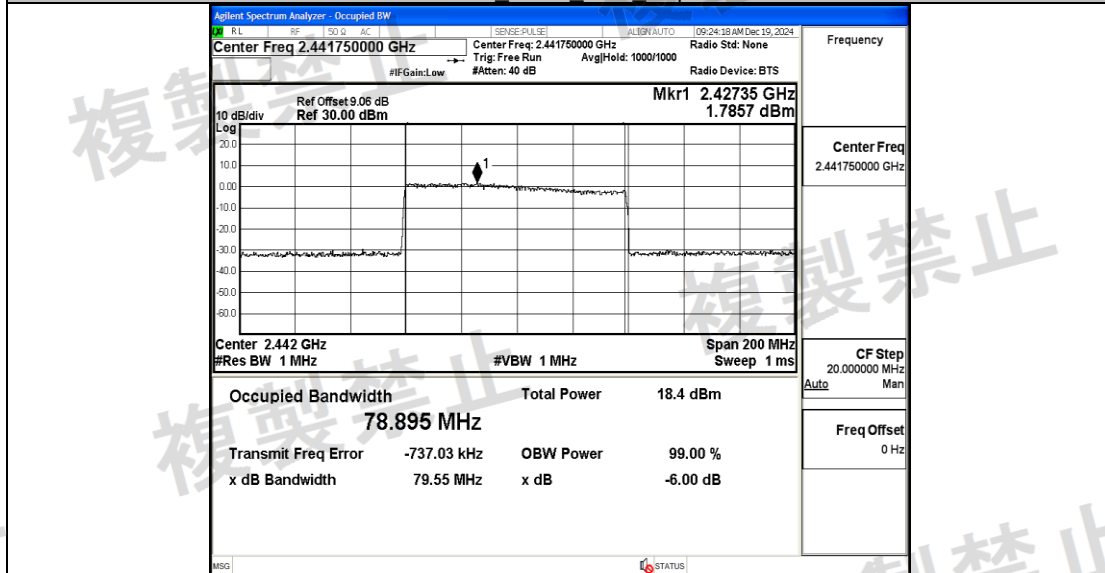
NTLV 3DH5 Ant1 Hop



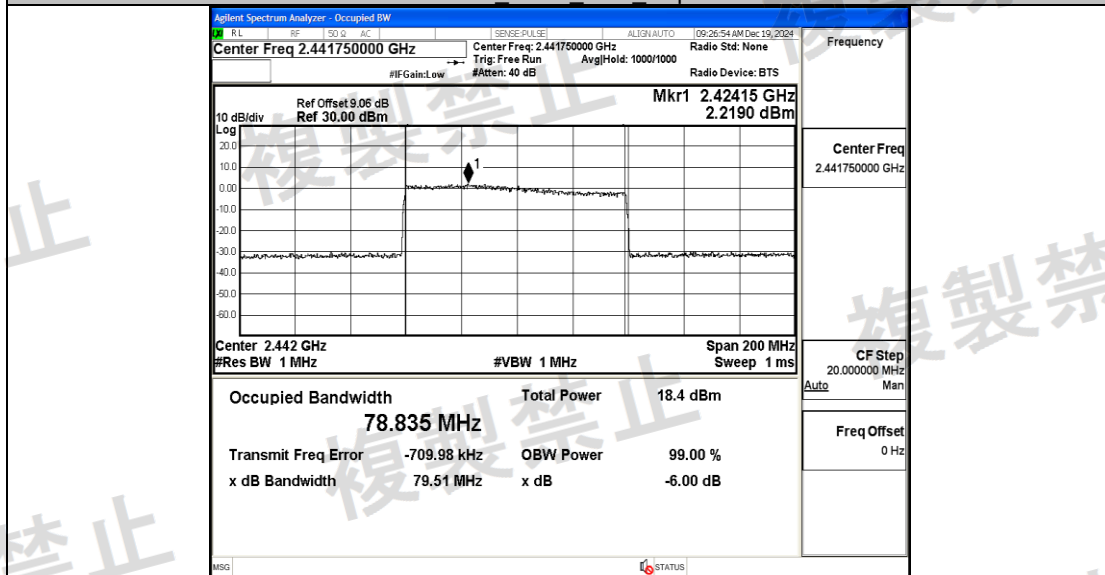
NTHV DH5 Ant1 Hop



NTHV 2DH5 Ant1 Hop



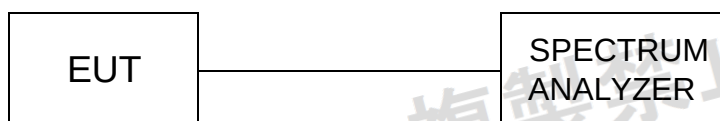
NTHV 3DH5 Ant1 Hop





4.5. Spectrum bandwidth (90%)

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

Frequency: Center frequency in the band to be used

Span:200MHz

RBW:1MHz

VBW: 1MHz

Sweep time:Auto

Dectector mode: Positive peak

Indication mode: max hold

Spread Factor =Spread Bandwidth/ Transssmission rate

LIMIT

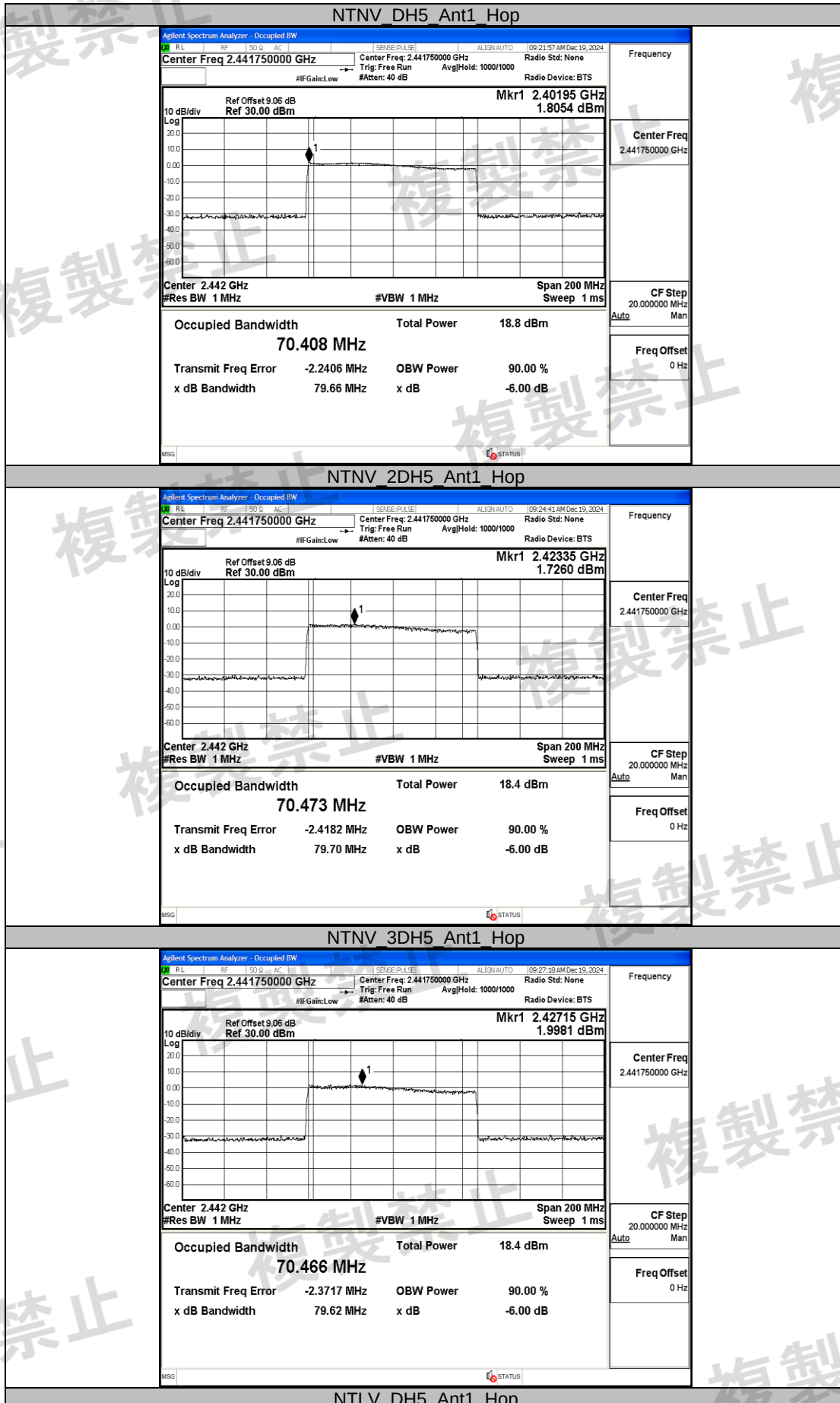
N/A

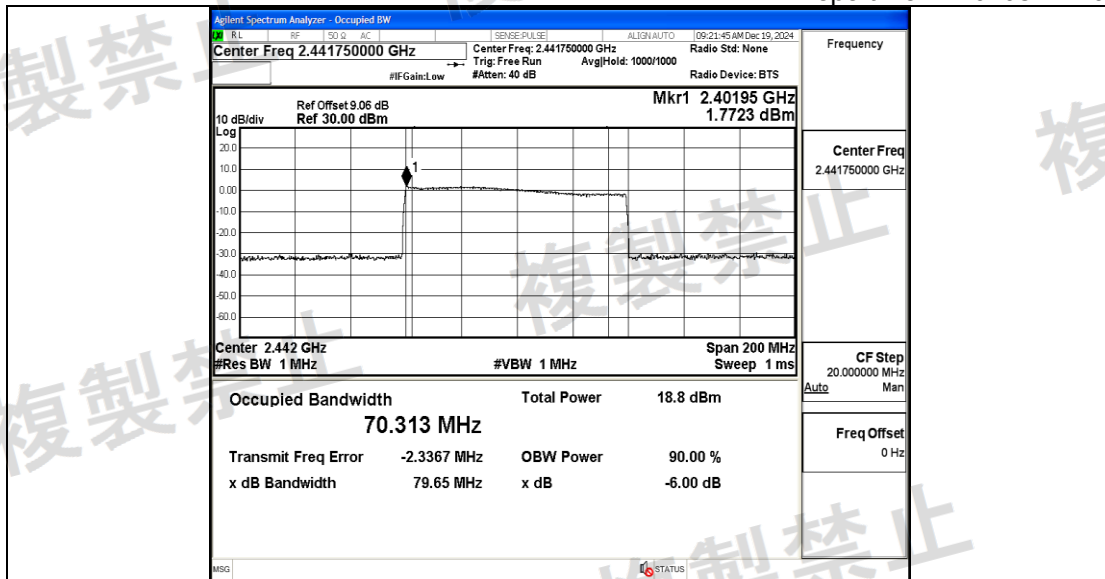
TEST RESULTS

TestCondition	TestMode	Antenna	Channel	Result [MHz]
NTNV	DH5	Ant1	Hop	70.408
	2DH5	Ant1	Hop	70.473
	3DH5	Ant1	Hop	70.466
NTLV	DH5	Ant1	Hop	70.313
	2DH5	Ant1	Hop	70.524
	3DH5	Ant1	Hop	70.490
NTHV	DH5	Ant1	Hop	70.508
	2DH5	Ant1	Hop	70.693
	3DH5	Ant1	Hop	70.194

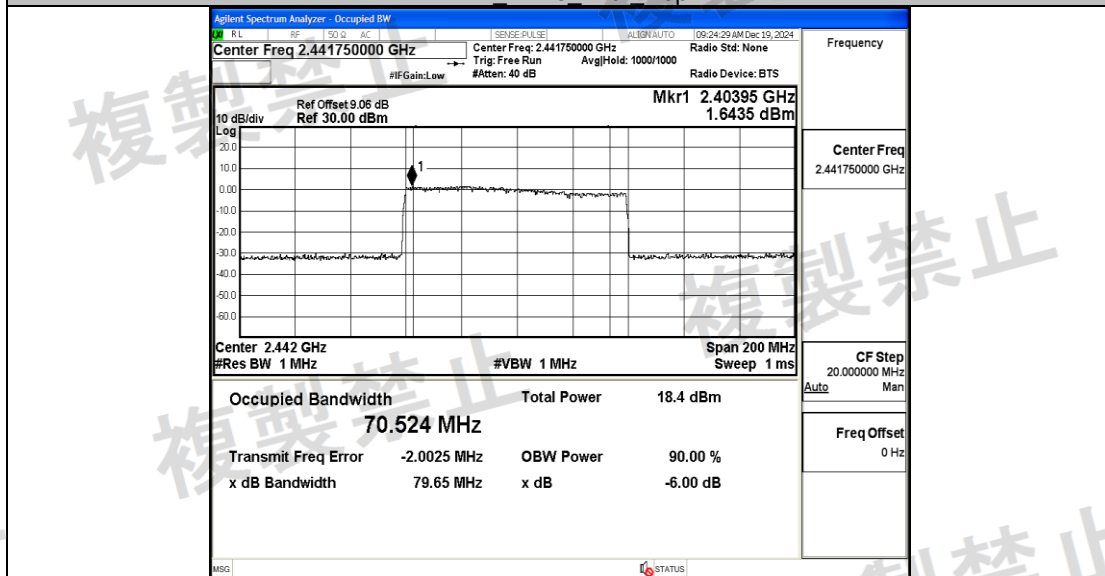
Note: 1. The test results including the cable lose.
2. The item was tested at 25 ℃ and 55% humidity condition;
3.All condition has been testd,list the worst case in this item

Test plot as follows:

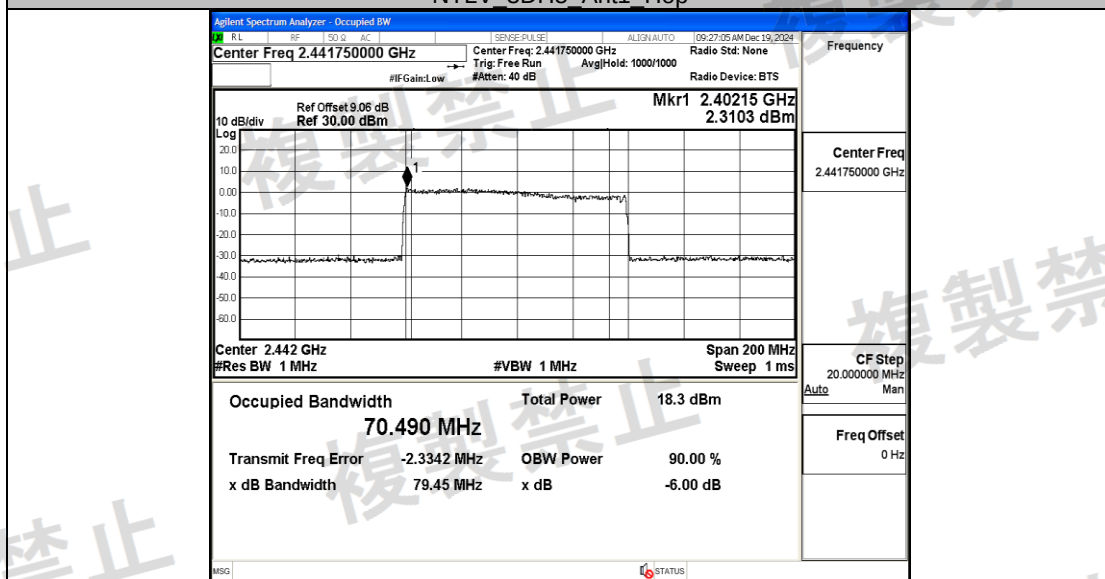




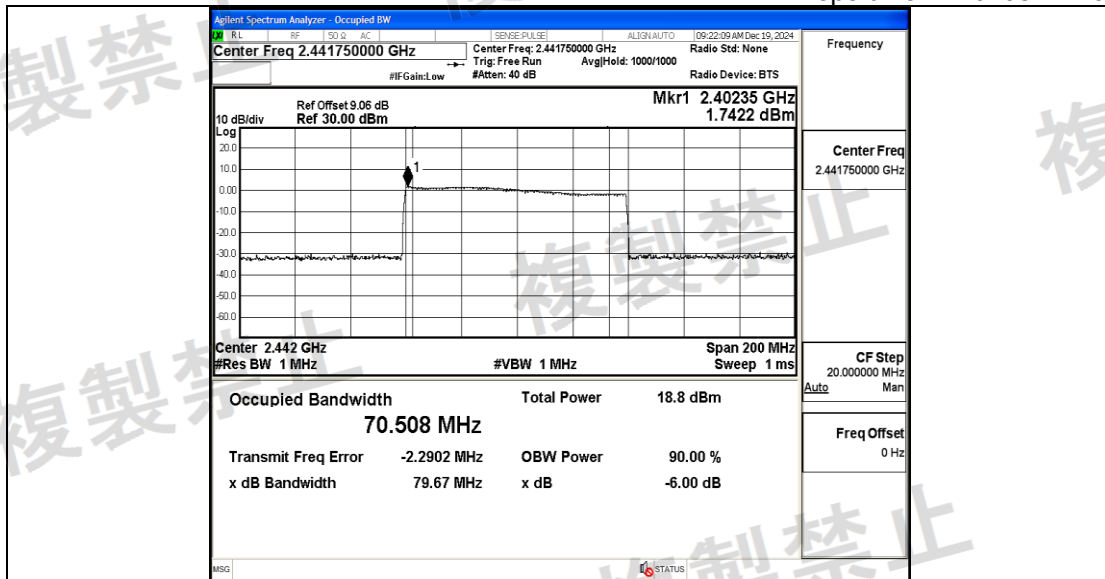
NTLV 2DH5 Ant1 Hop



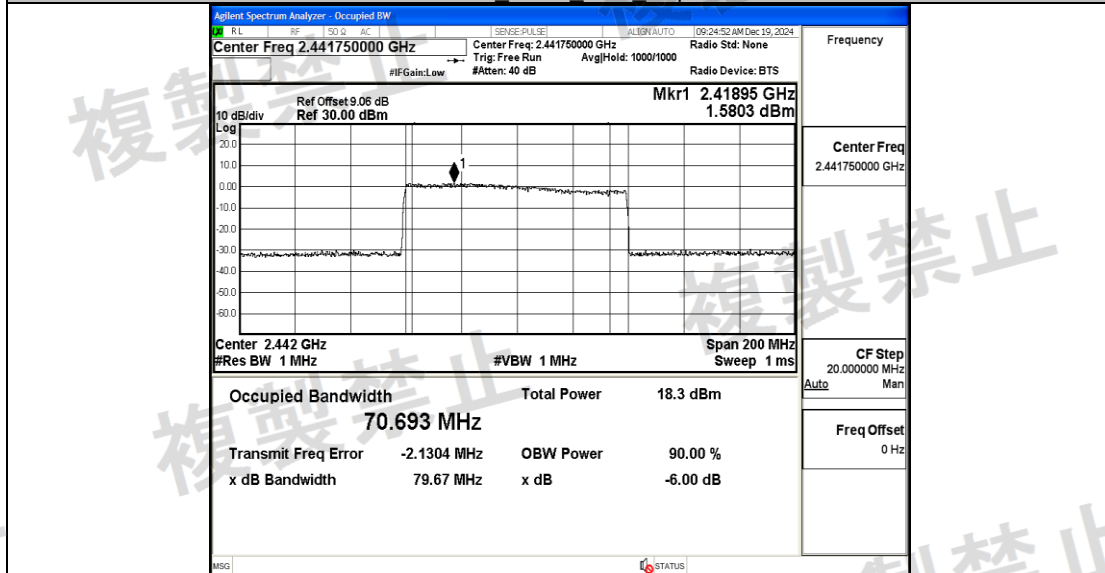
NTLV 3DH5 Ant1 Hop



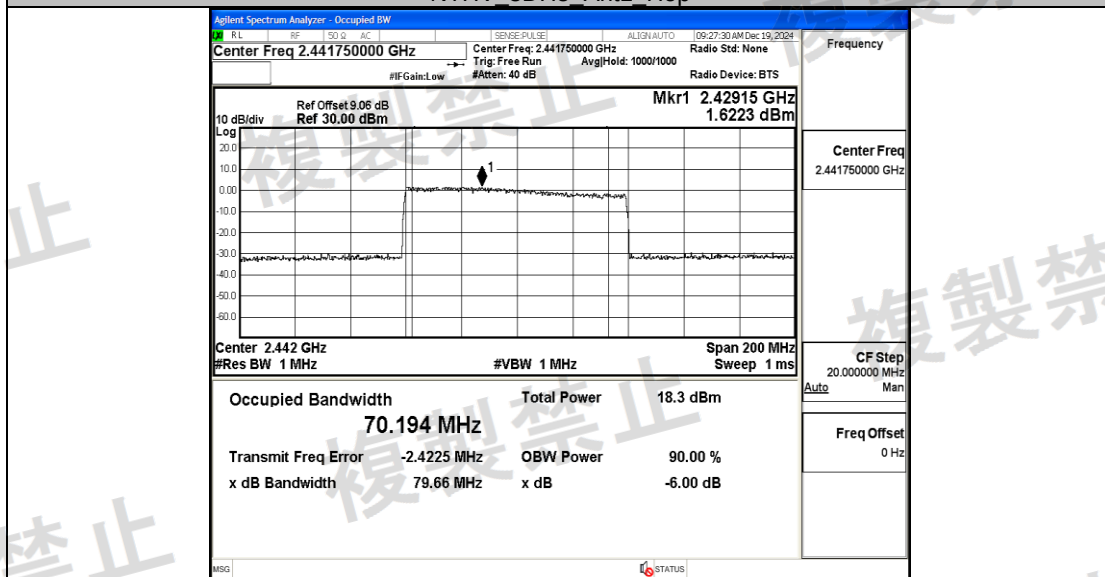
NTHV DH5 Ant1 Hop



NTHV 2DH5 Ant1 Hop



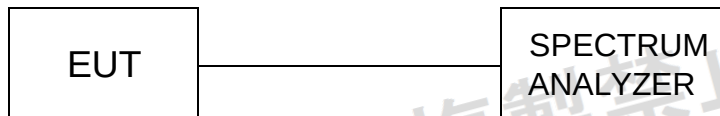
NTHV 3DH5 Ant1 Hop





4.6. Spurious emission intensity

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

Frequency: 30MHz-13GHz

RBW: 1MHz (30MHz-1GHz), 1MHz(1GHz-13GHz)

VBW: 1MHz (30MHz-1GHz), 1MHz(1GHz-13GHz)

Sweep time:Auto

Dectector mode: Positive peak

Indication mode: max hold

LIMIT

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:

- a. $2,387 \text{ MHz} \leq f \leq 2,400 \text{ MHz}$ and $2,483.5 \text{ MHz} < f \leq 2,496.5 \text{ MHz}$ $25 \mu\text{W/MHz} (-16\text{dBm/MHz})$ or less
- b. $2,387 \text{ MHz} > f$ and $2,496.5 \text{ MHz} < f$ $2.5 \mu\text{W/MHz} (-26\text{dBm/MHz})$ or less

TEST RESULTS

Test Condition	Test Mode	Antenna	Freq (MHz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Result [$\mu\text{W/MHz}$]	Limit [$\mu\text{W/MHz}$]	Verdict
NTNV	DH5	Ant 1	2402	30~2387	2385.23	-49.95	≤ -26	0.01012	≤ 2.5	PASS
				2387~2400	2399.97	-34.86	≤ -16	0.32659	≤ 25	PASS
				2483.5~2496.5	2489.80	-40.68	≤ -16	0.08551	≤ 25	PASS
				2496.5~13000	4804.23	-34.59	≤ -26	0.34754	≤ 2.5	PASS
			2441	30~2387	2332.79	-50.08	≤ -26	0.00982	≤ 2.5	PASS
				2387~2400	2387.59	-40.90	≤ -16	0.08128	≤ 25	PASS
				2483.5~2496.5	2488.96	-39.81	≤ -16	0.10447	≤ 25	PASS
				2496.5~13000	4882.49	-35.55	≤ -26	0.27861	≤ 2.5	PASS
			2480	30~2387	2327.49	-48.93	≤ -26	0.01279	≤ 2.5	PASS
				2387~2400	2394.69	-40.41	≤ -16	0.09099	≤ 25	PASS
				2483.5~2496.5	2483.70	-39.91	≤ -16	0.10209	≤ 25	PASS
				2496.5~13000	4960.74	-36.81	≤ -26	0.20845	≤ 2.5	PASS
	2DH5	Ant 1	2402	30~2387	2345.75	-49.22	≤ -26	0.01197	≤ 2.5	PASS
				2387~2400	2399.99	-33.08	≤ -16	0.49204	≤ 25	PASS
				2483.5~2496.5	2493.69	-40.86	≤ -16	0.08204	≤ 25	PASS
				2496.5~13000	4804.76	-34.72	≤ -26	0.33729	≤ 2.5	PASS
			2441	30~2387	2371.09	-50.02	≤ -26	0.00995	≤ 2.5	PASS
				2387~2400	2389.02	-40.00	≤ -16	0.10000	≤ 25	PASS
				2483.5~2496.5	2495.51	-40.68	≤ -16	0.08551	≤ 25	PASS
				2496.5~13000	4882.49	-36.52	≤ -26	0.22284	≤ 2.5	PASS
			2480	30~2387	1743.54	-46.12	≤ -26	0.02443	≤ 2.5	PASS
				2387~2400	2391.01	-40.44	≤ -16	0.09036	≤ 25	PASS
				2483.5~2496.5	2493.55	-41.36	≤ -16	0.07311	≤ 25	PASS
				2496.5~13000	4960.74	-37.72	≤ -26	0.16904	≤ 2.5	PASS
	3DH5	Ant 1	2402	30~2387	1743.54	-46.01	≤ -26	0.02506	≤ 2.5	PASS
				2387~2400	2399.96	-33.27	≤ -16	0.47098	≤ 25	PASS
				2483.5~2496.5	2492.34	-38.87	≤ -16	0.12972	≤ 25	PASS
				2496.5~13000	4804.76	-35.35	≤ -26	0.29174	≤ 2.5	PASS
			2441	30~2387	1743.83	-47.73	≤ -26	0.01687	≤ 2.5	PASS



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			2480	2387~2400	2390.28	-40.82	≤-16	0.08279	≤25	PASS
				2483.5~2496.5	2492.80	-40.90	≤-16	0.08128	≤25	PASS
				2496.5~13000	4883.01	-35.10	≤-26	0.30903	≤2.5	PASS
				30~2387	2377.57	-49.51	≤-26	0.01119	≤2.5	PASS
				2387~2400	2387.54	-40.31	≤-16	0.09311	≤25	PASS
				2483.5~2496.5	2490.11	-41.03	≤-16	0.07889	≤25	PASS
NTLV	DH5	Ant 1	2402	30~2387	2324.83	-50.36	≤-26	0.00920	≤2.5	PASS
				2387~2400	2399.89	-37.27	≤-16	0.18750	≤25	PASS
				2483.5~2496.5	2491.76	-40.72	≤-16	0.08472	≤25	PASS
				2496.5~13000	4804.76	-34.56	≤-26	0.34995	≤2.5	PASS
			2441	30~2387	2128.61	-49.90	≤-26	0.01023	≤2.5	PASS
				2387~2400	2396.52	-40.96	≤-16	0.08017	≤25	PASS
				2483.5~2496.5	2495.41	-40.76	≤-16	0.08395	≤25	PASS
				2496.5~13000	4882.49	-35.87	≤-26	0.25882	≤2.5	PASS
			2480	30~2387	2073.22	-49.83	≤-26	0.01040	≤2.5	PASS
				2387~2400	2397.62	-40.00	≤-16	0.10000	≤25	PASS
				2483.5~2496.5	2489.61	-40.48	≤-16	0.08954	≤25	PASS
				2496.5~13000	4961.27	-36.22	≤-26	0.23878	≤2.5	PASS
	2DH5	Ant 1	2402	30~2387	1749.43	-41.63	≤-26	0.06871	≤2.5	PASS
				2387~2400	2399.99	-33.98	≤-16	0.39994	≤25	PASS
				2483.5~2496.5	2489.51	-40.94	≤-16	0.08054	≤25	PASS
				2496.5~13000	4804.76	-34.39	≤-26	0.36392	≤2.5	PASS
			2441	30~2387	2336.91	-49.54	≤-26	0.01112	≤2.5	PASS
				2387~2400	2395.88	-40.15	≤-16	0.09661	≤25	PASS
				2483.5~2496.5	2495.27	-40.13	≤-16	0.09705	≤25	PASS
				2496.5~13000	4881.96	-36.55	≤-26	0.22131	≤2.5	PASS
			2480	30~2387	1740.89	-47.87	≤-26	0.01633	≤2.5	PASS
				2387~2400	2389.87	-40.84	≤-16	0.08241	≤25	PASS
				2483.5~2496.5	2487.54	-40.45	≤-16	0.09016	≤25	PASS
				2496.5~13000	4960.22	-38.19	≤-26	0.15171	≤2.5	PASS
	3DH5	Ant 1	2402	30~2387	1741.48	-47.93	≤-26	0.01611	≤2.5	PASS
				2387~2400	2399.99	-31.77	≤-16	0.66527	≤25	PASS
				2483.5~2496.5	2493.80	-39.73	≤-16	0.10641	≤25	PASS
				2496.5~13000	4804.76	-34.88	≤-26	0.32509	≤2.5	PASS
			2441	30~2387	2166.03	-49.87	≤-26	0.01030	≤2.5	PASS
				2387~2400	2388.27	-41.48	≤-16	0.07112	≤25	PASS
				2483.5~2496.5	2492.99	-40.07	≤-16	0.09840	≤25	PASS
				2496.5~13000	4881.96	-36.15	≤-26	0.24266	≤2.5	PASS
			2480	30~2387	2346.64	-49.21	≤-26	0.01199	≤2.5	PASS
				2387~2400	2389.53	-40.72	≤-16	0.08472	≤25	PASS
				2483.5~2496.5	2487.82	-40.81	≤-16	0.08299	≤25	PASS
				2496.5~13000	4960.74	-37.06	≤-26	0.19679	≤2.5	PASS
NTHV	DH5	Ant 1	2402	30~2387	2357.24	-49.89	≤-26	0.01026	≤2.5	PASS
				2387~2400	2399.96	-36.75	≤-16	0.21135	≤25	PASS
				2483.5~2496.5	2493.77	-40.75	≤-16	0.08414	≤25	PASS
				2496.5~13000	4804.76	-35.14	≤-26	0.30620	≤2.5	PASS
			2441	30~2387	1751.49	-44.34	≤-26	0.03681	≤2.5	PASS
				2387~2400	2398.25	-40.76	≤-16	0.08395	≤25	PASS
				2483.5~2496.5	2491.63	-40.27	≤-16	0.09397	≤25	PASS
				2496.5~13000	4883.01	-35.39	≤-26	0.28907	≤2.5	PASS
			2480	30~2387	2347.52	-49.42	≤-26	0.01143	≤2.5	PASS
				2387~2400	2395.58	-40.94	≤-16	0.08054	≤25	PASS
				2483.5~2496.5	2495.42	-40.78	≤-16	0.08356	≤25	PASS
				2496.5~13000	4960.74	-36.78	≤-26	0.20989	≤2.5	PASS
	2DH5	Ant 1	2402	30~2387	1753.26	-47.21	≤-26	0.01901	≤2.5	PASS
				2387~2400	2400.00	-31.54	≤-16	0.70146	≤25	PASS
				2483.5~2496.5	2490.91	-40.27	≤-16	0.09397	≤25	PASS
				2496.5~13000	4804.76	-34.73	≤-26	0.33651	≤2.5	PASS
			2441	30~2387	2262.96	-49.72	≤-26	0.01067	≤2.5	PASS
				2387~2400	2393.85	-40.69	≤-16	0.08531	≤25	PASS
				2483.5~2496.5	2489.19	-40.39	≤-16	0.09141	≤25	PASS
				2496.5~13000	4883.01	-36.77	≤-26	0.21038	≤2.5	PASS
			2480	30~2387	2377.57	-50.04	≤-26	0.00991	≤2.5	PASS
				2387~2400	2392.65	-40.54	≤-16	0.08831	≤25	PASS
				2483.5~2496.5	2485.06	-39.57	≤-16	0.11041	≤25	PASS



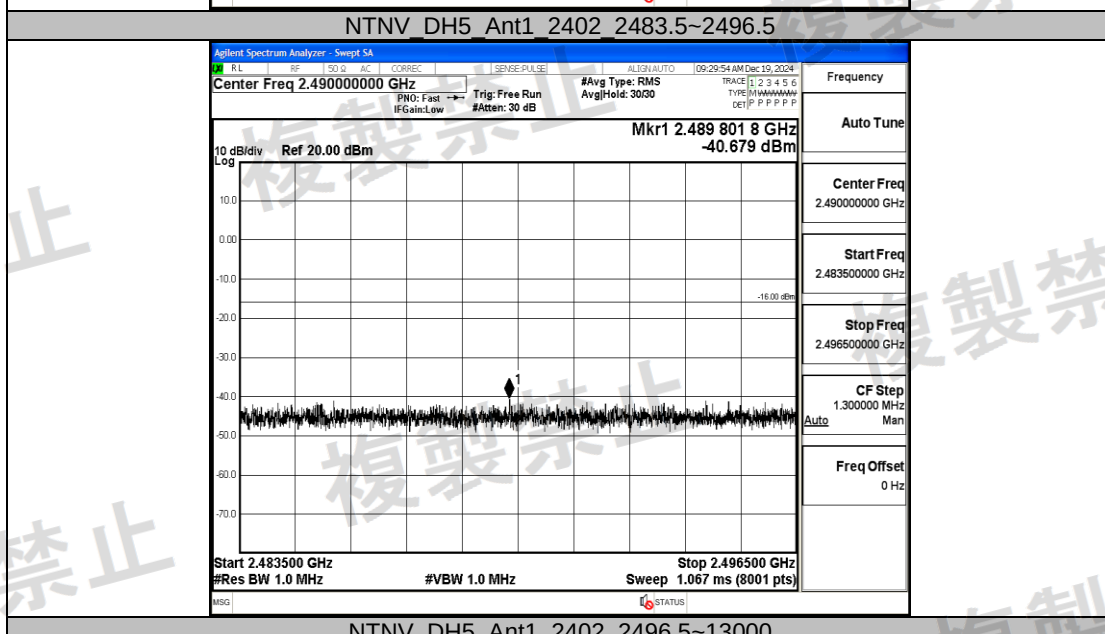
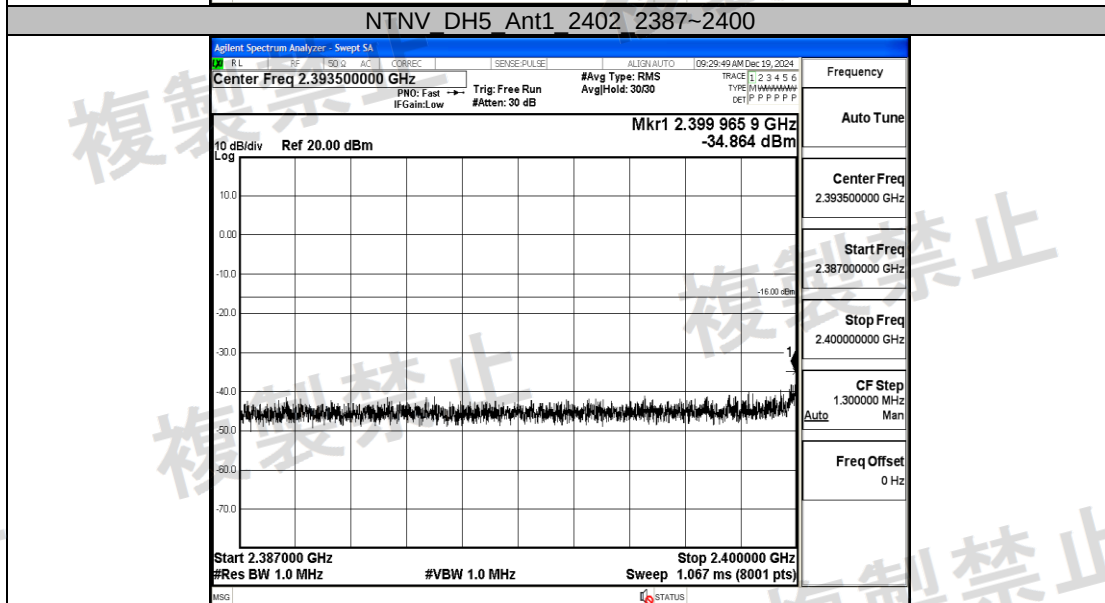
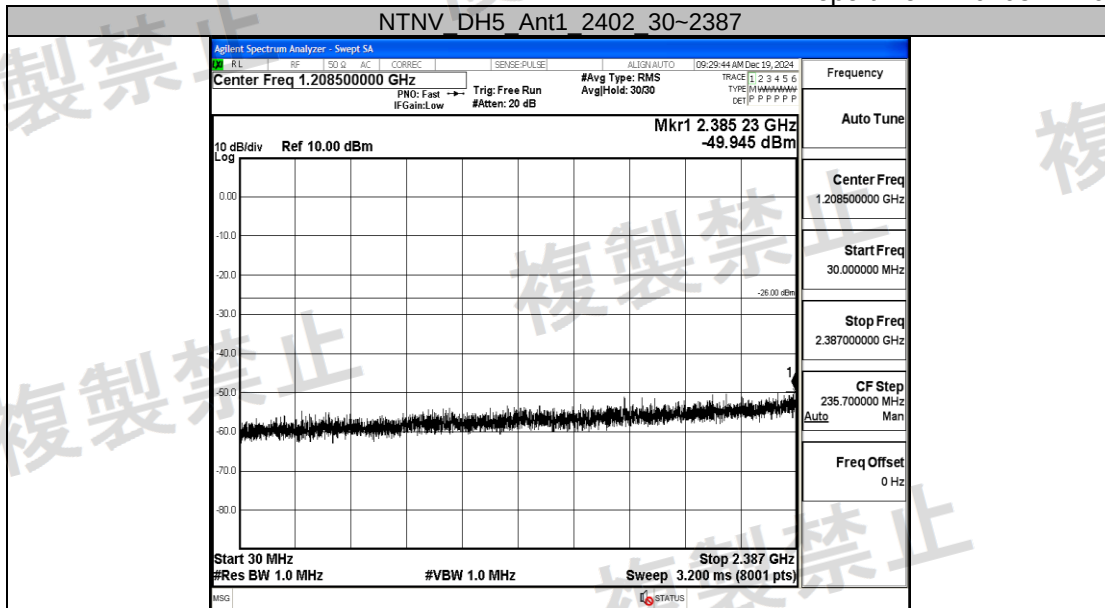
Report No.: TZ0103241201TRF01

	3DH5	Ant 1	2402	2496.5~13000	4960.22	-36.63	≤-26	0.21727	≤2.5	PASS
				30~2387	1744.13	-43.33	≤-26	0.04645	≤2.5	PASS
				2387~2400	2400.00	-32.91	≤-16	0.51168	≤25	PASS
				2483.5~2496.5	2495.99	-39.95	≤-16	0.10116	≤25	PASS
			2441	2496.5~13000	4804.23	-34.37	≤-26	0.36559	≤2.5	PASS
				30~2387	1738.53	-49.83	≤-26	0.01040	≤2.5	PASS
				2387~2400	2398.23	-40.95	≤-16	0.08035	≤25	PASS
				2483.5~2496.5	2486.66	-40.07	≤-16	0.09840	≤25	PASS
			2480	2496.5~13000	4883.01	-35.90	≤-26	0.25704	≤2.5	PASS
				30~2387	2324.54	-49.20	≤-26	0.01202	≤2.5	PASS
				2387~2400	2399.61	-40.53	≤-16	0.08851	≤25	PASS
				2483.5~2496.5	2490.41	-40.87	≤-16	0.08185	≤25	PASS
				2496.5~13000	4960.74	-37.87	≤-26	0.16331	≤2.5	PASS

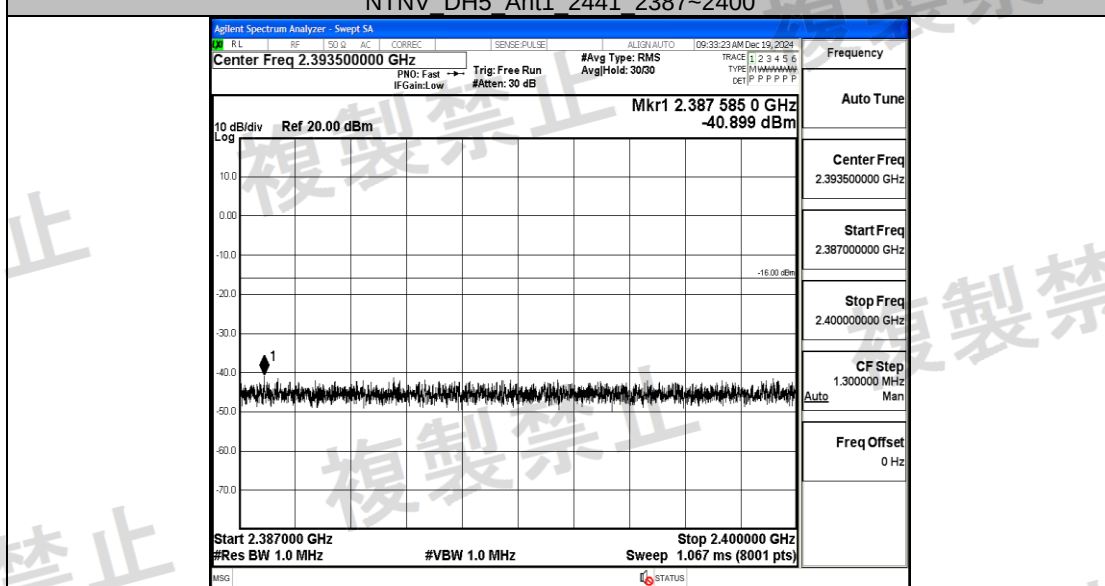
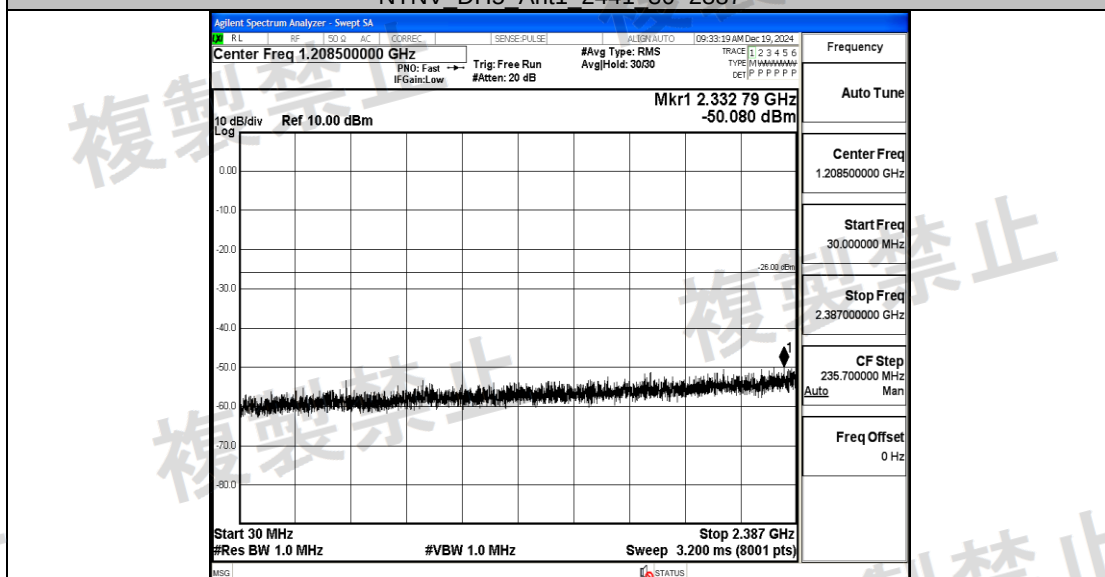
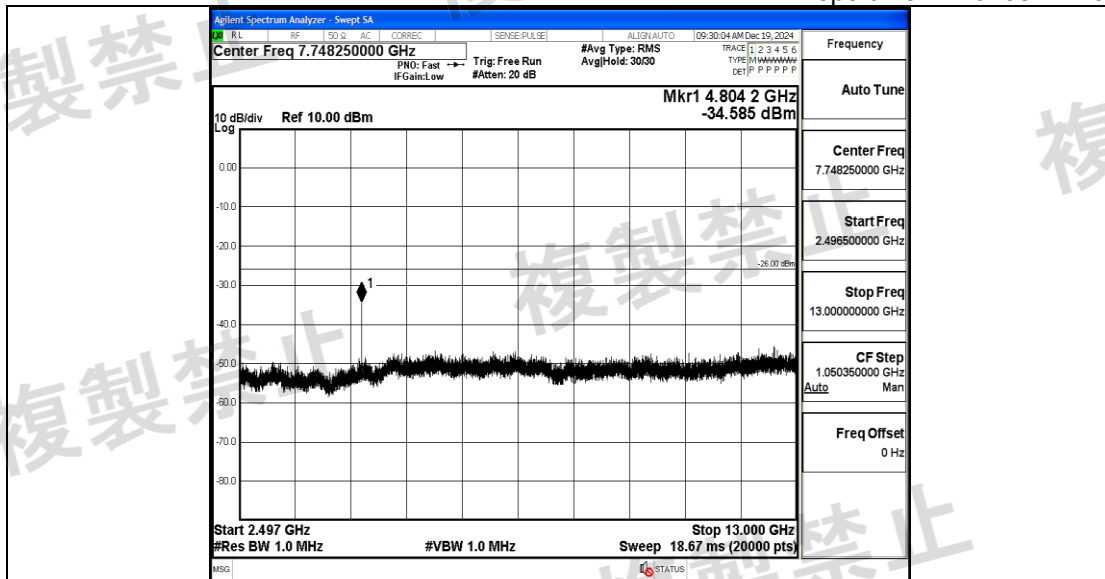
Note: 1. The product was tested at 25 °C and 55% humidity condition;

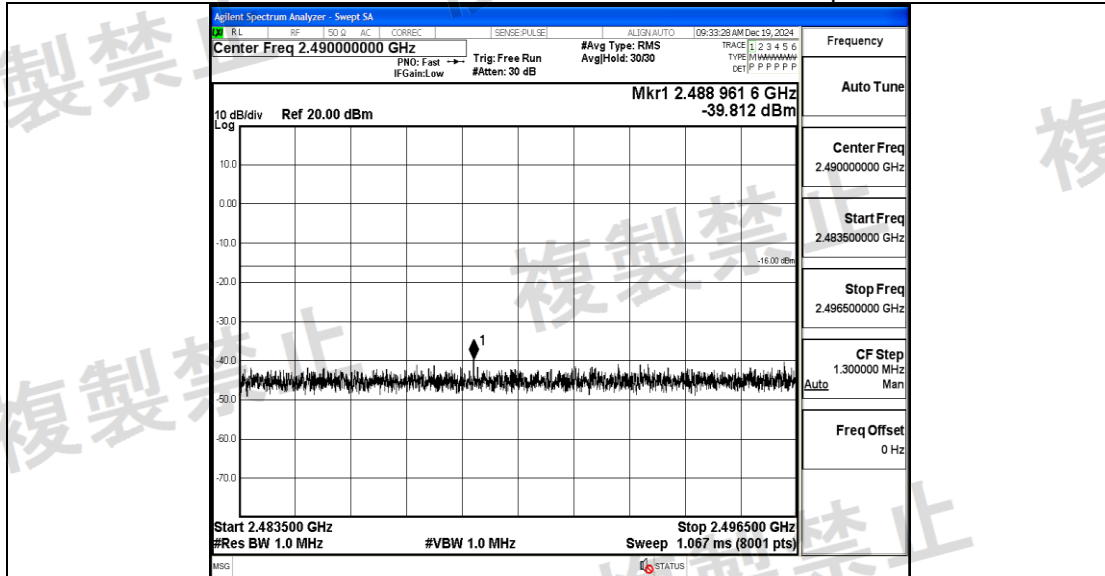
2. All condition has been tested, list the worst case in this item

3. SA set to from 2.4965GHz to 13GHz, plot shows from 2.497GHz to 13GHz as of SA's default format

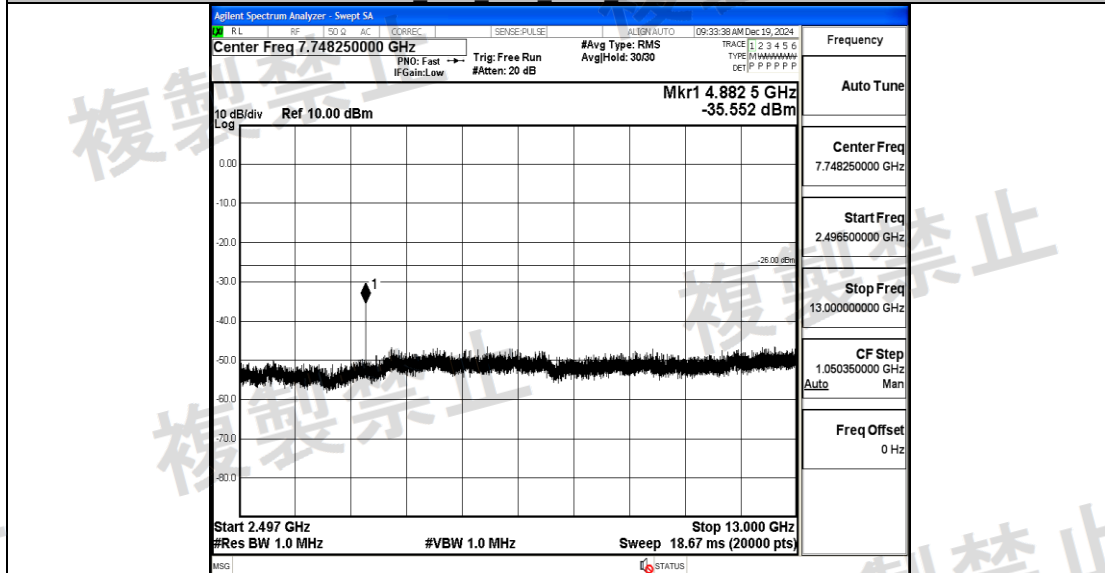


NTNV_DH5_Ant1_2402_2496.5~13000

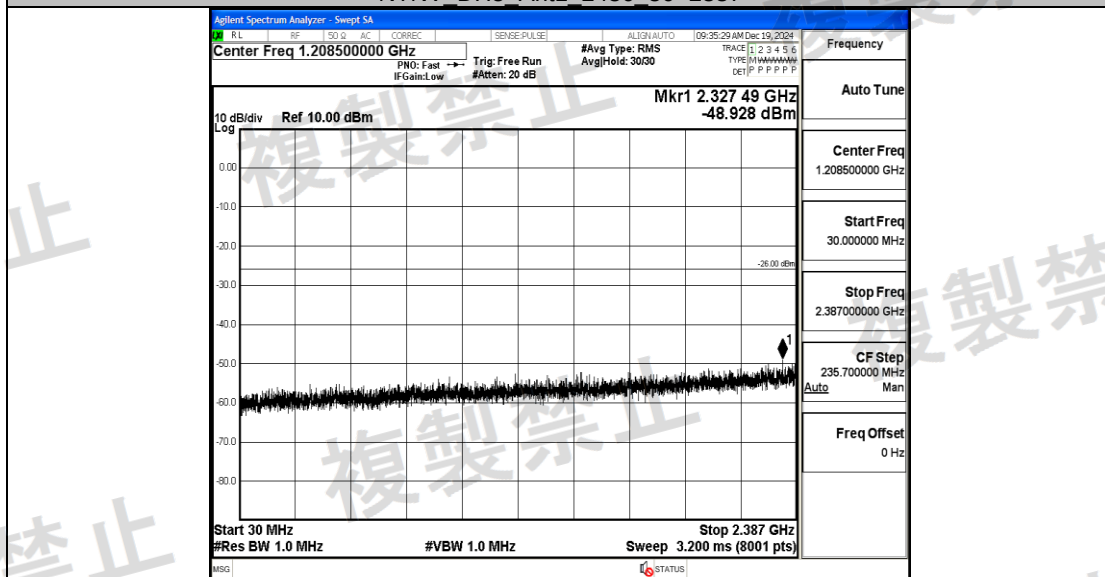




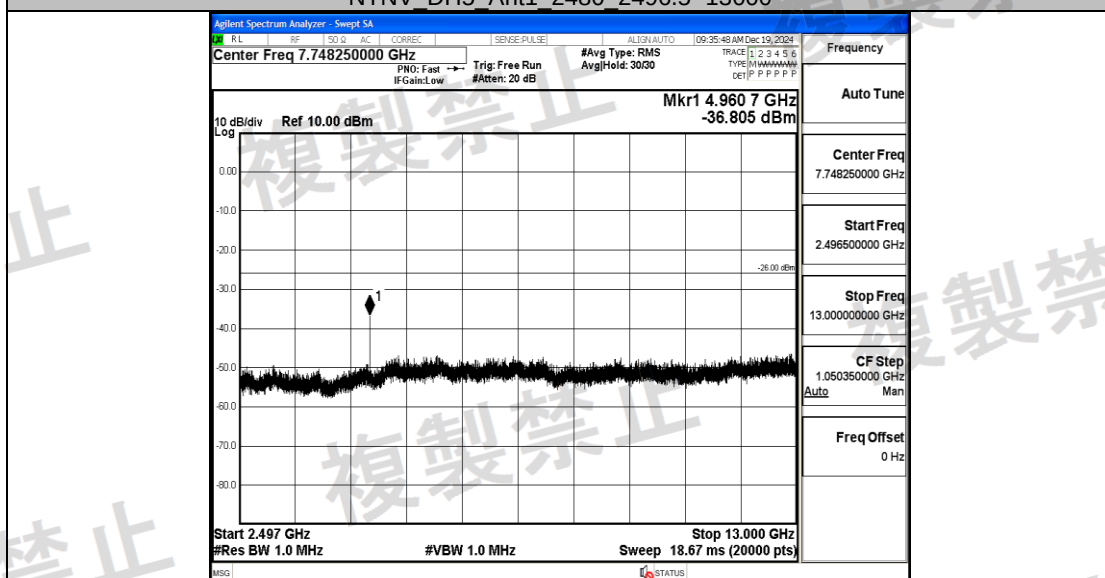
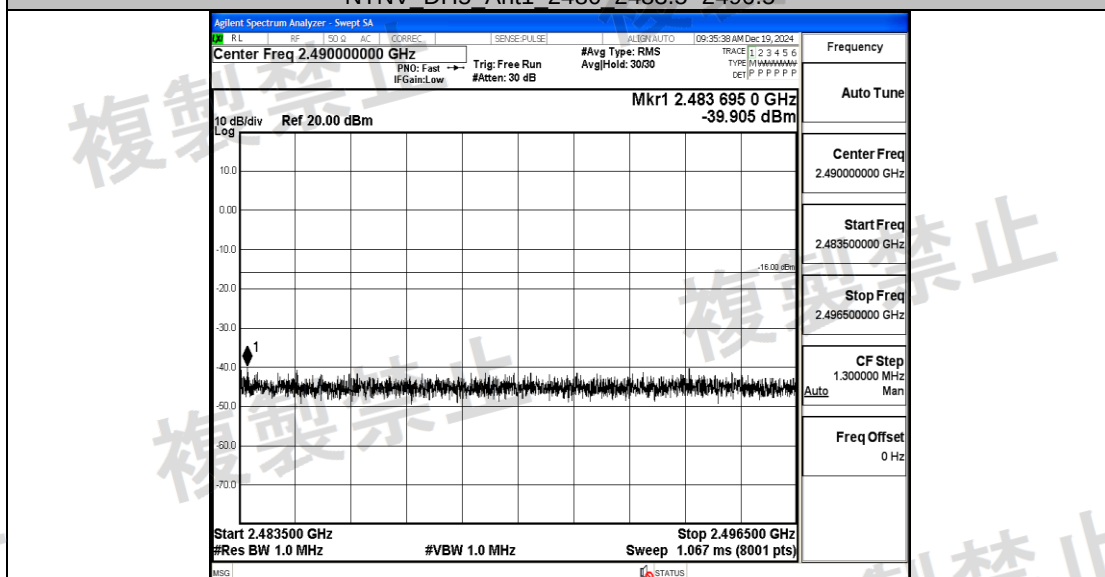
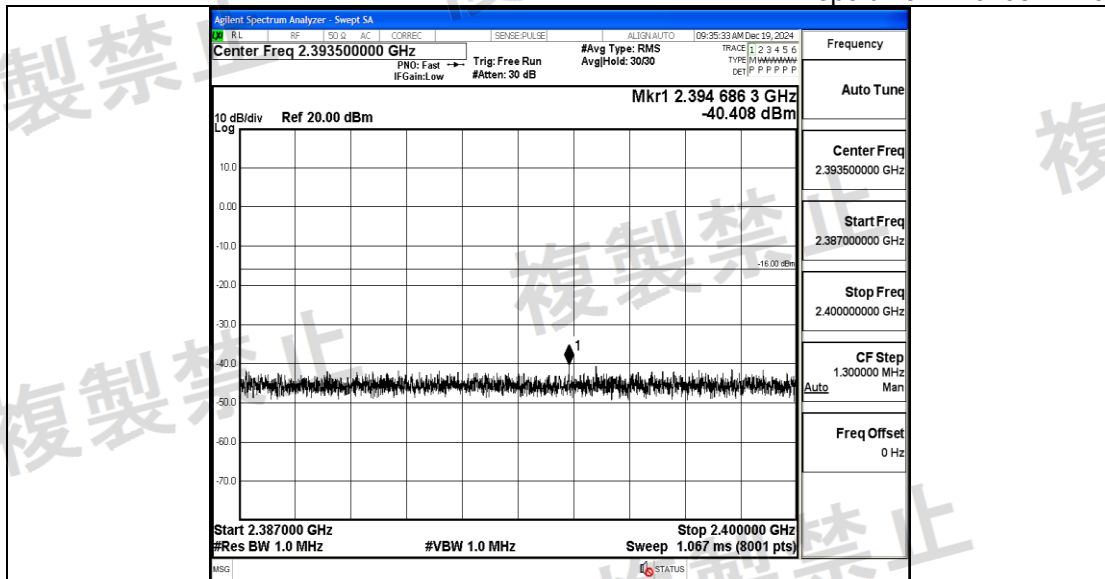
NTNV DH5 Ant1 2441 2496.5~13000

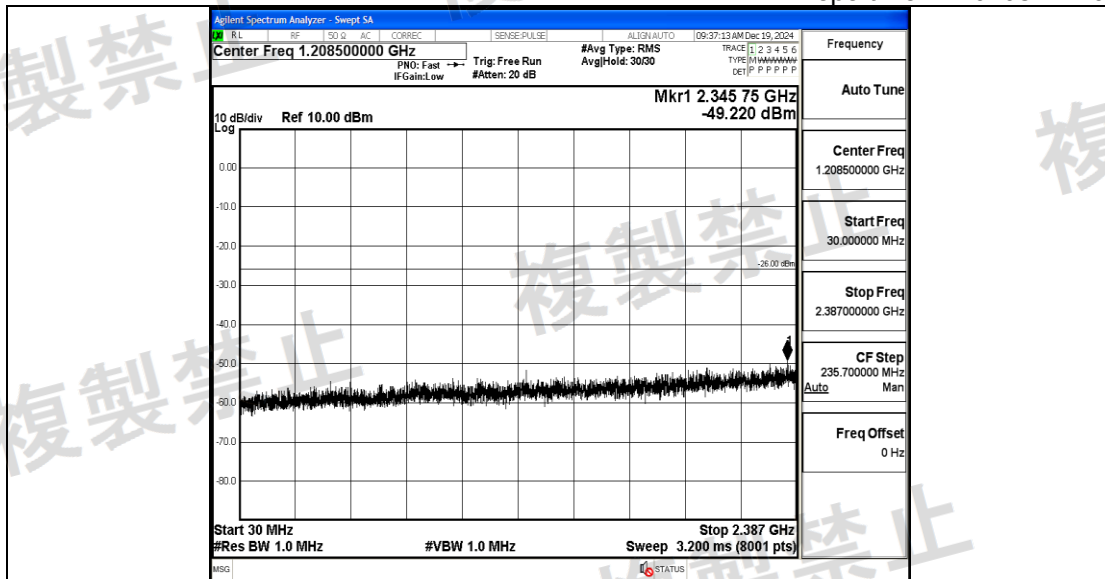


NTNV DH5 Ant1 2480 30~2387

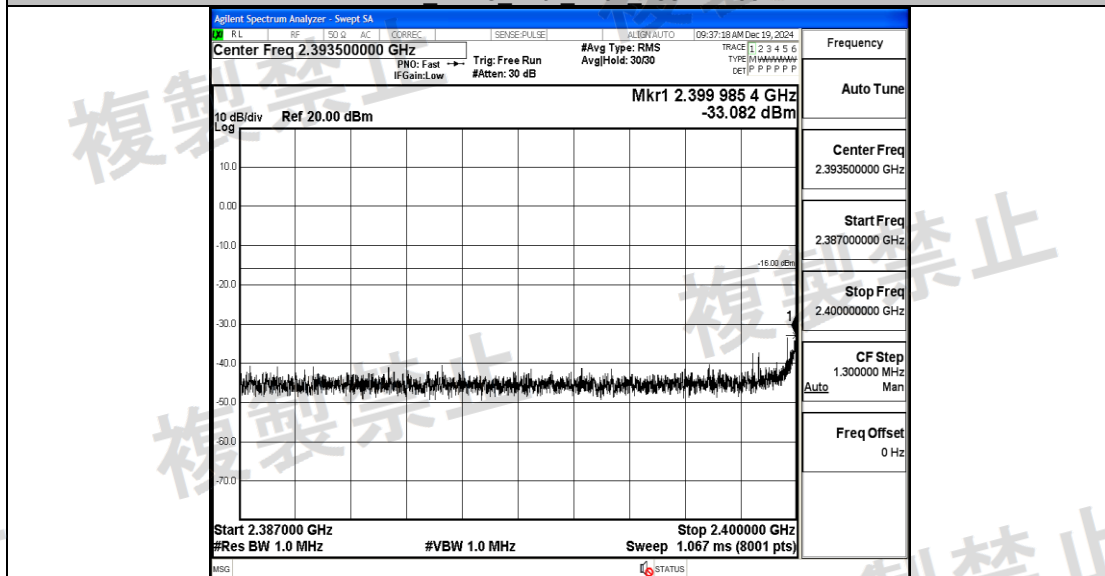


NTNV DH5 Ant1 2480 2387~2400

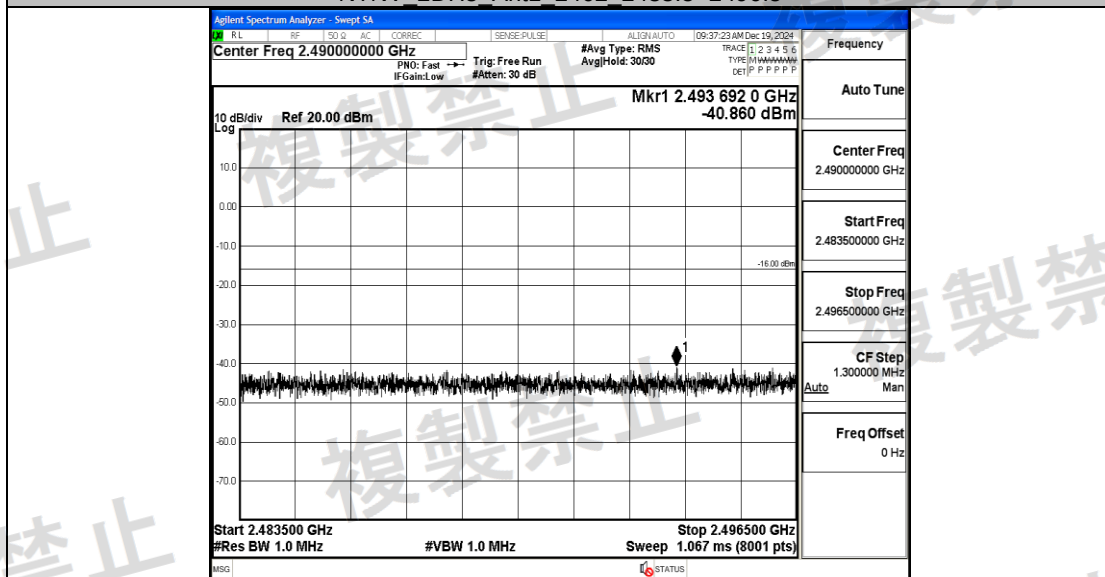




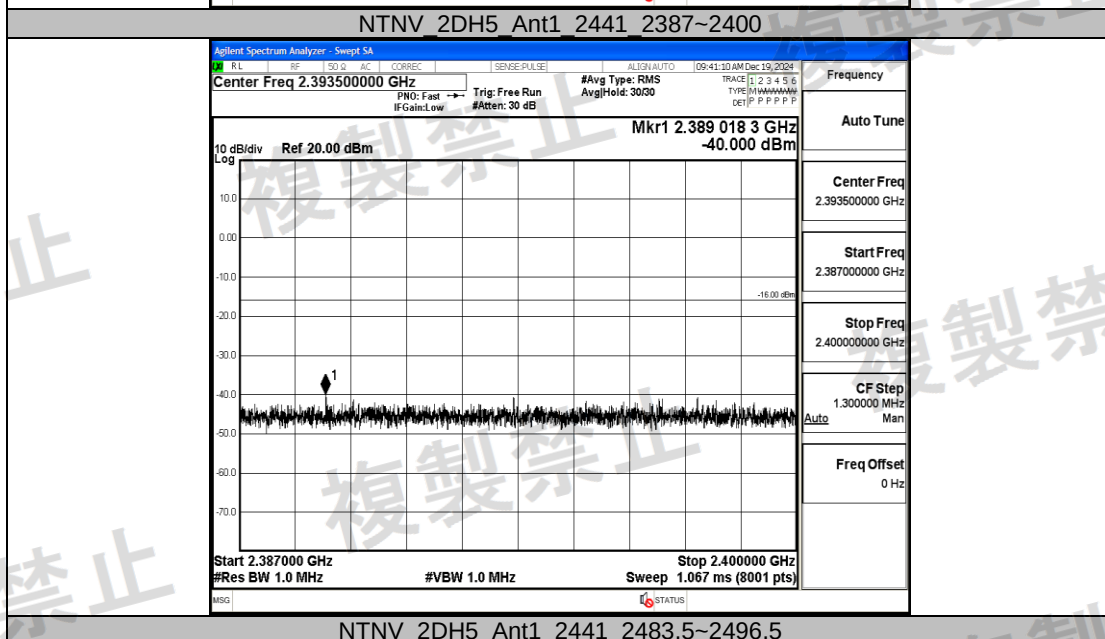
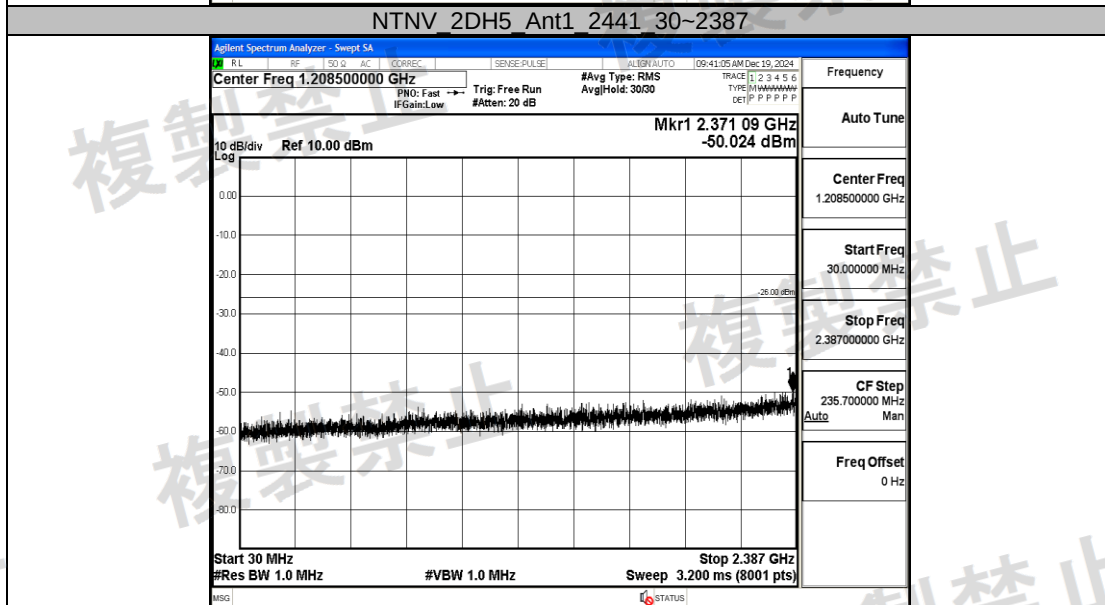
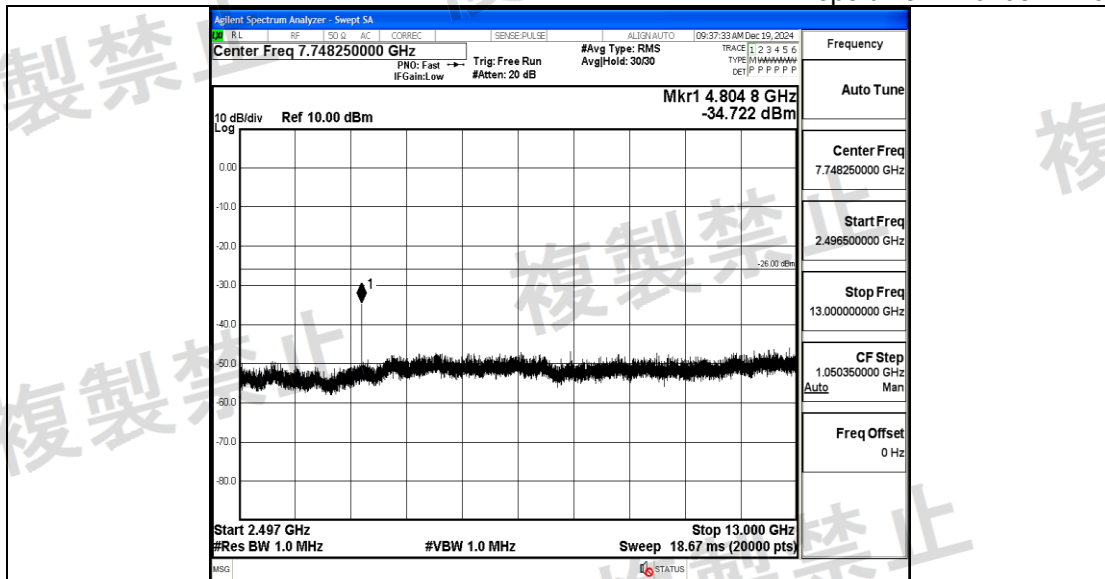
NTNV 2DH5 Ant1 2402 2387~2400

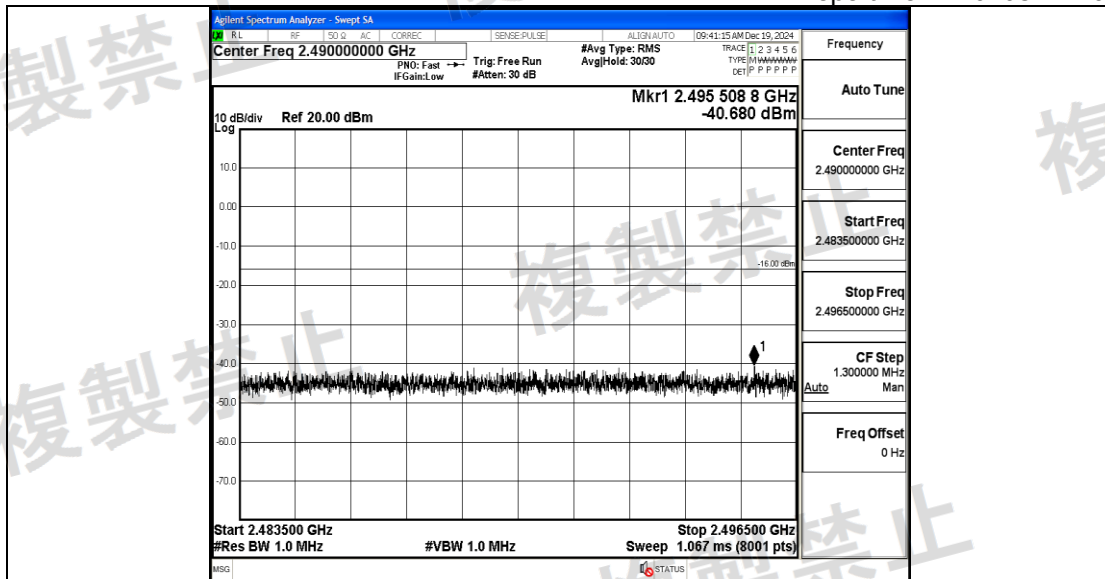


NTNV 2DH5 Ant1 2402 2483.5~2496.5

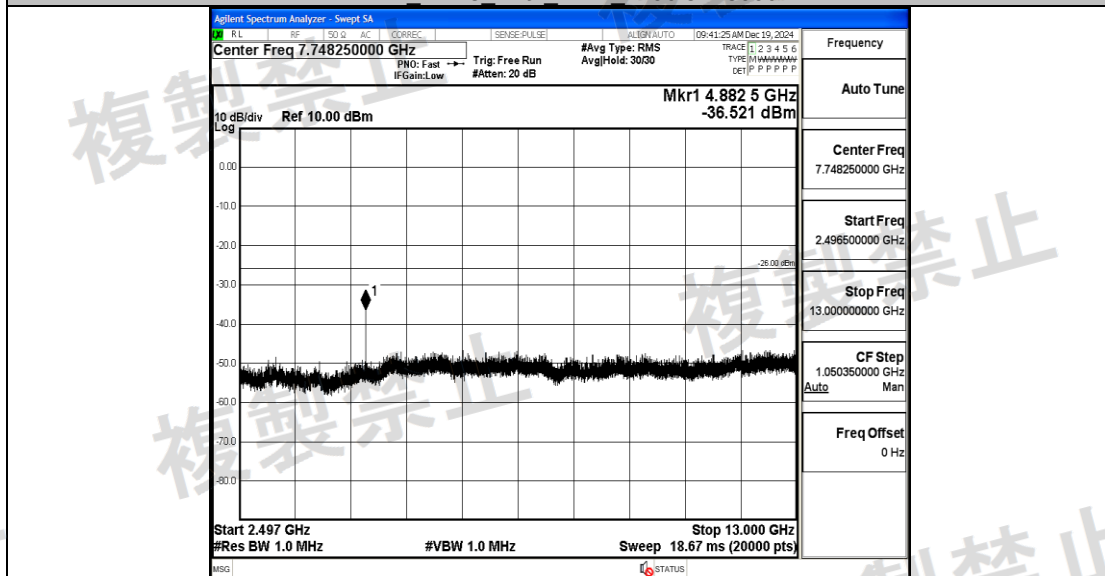


NTNV 2DH5 Ant1 2402 2496.5~13000

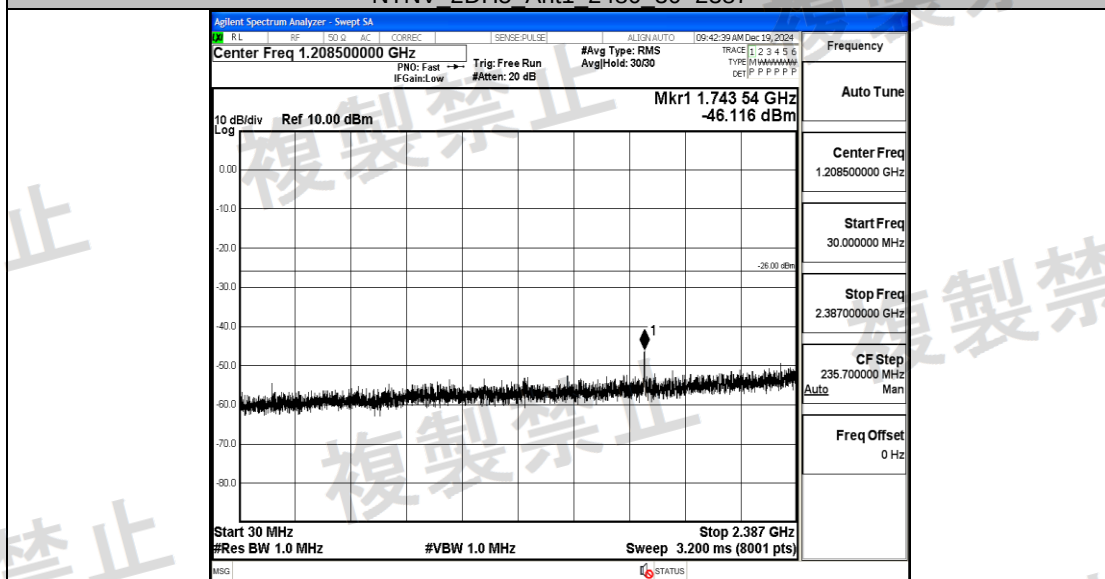




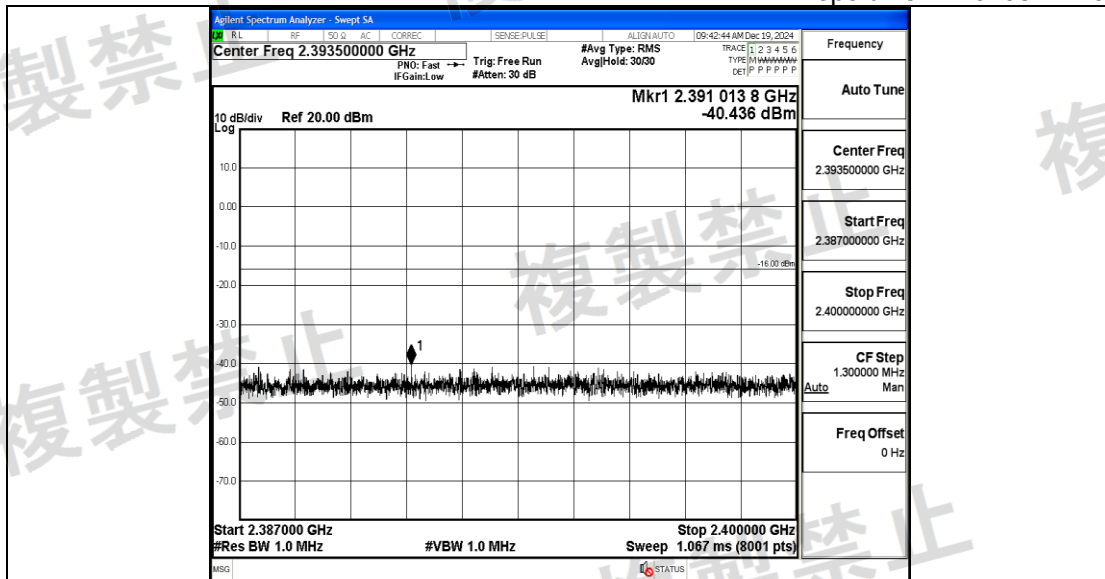
NTNV 2DH5 Ant1 2441 2496.5~13000



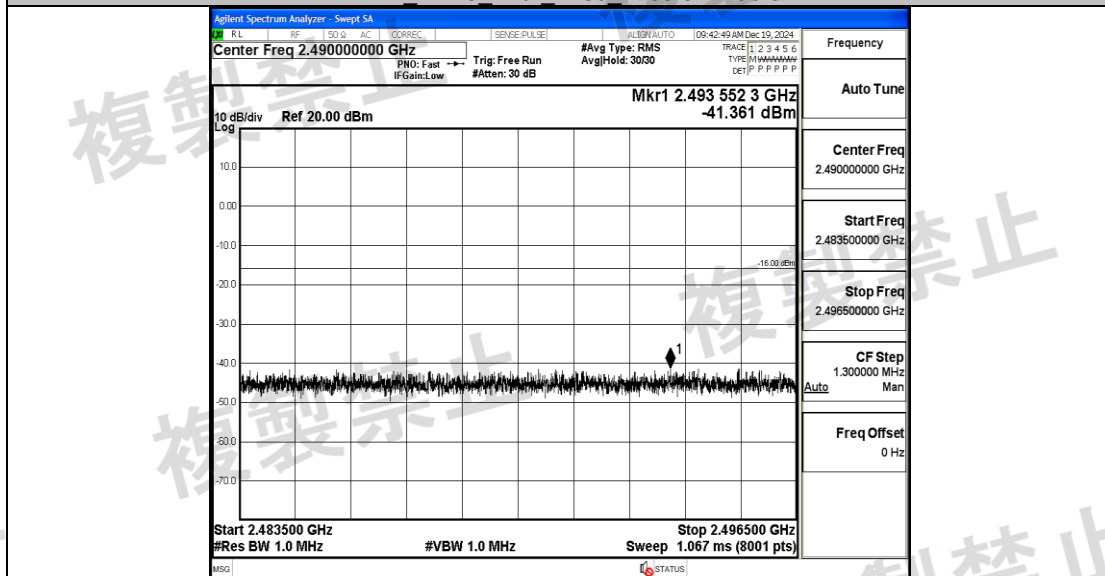
NTNV 2DH5 Ant1 2480 30~2387



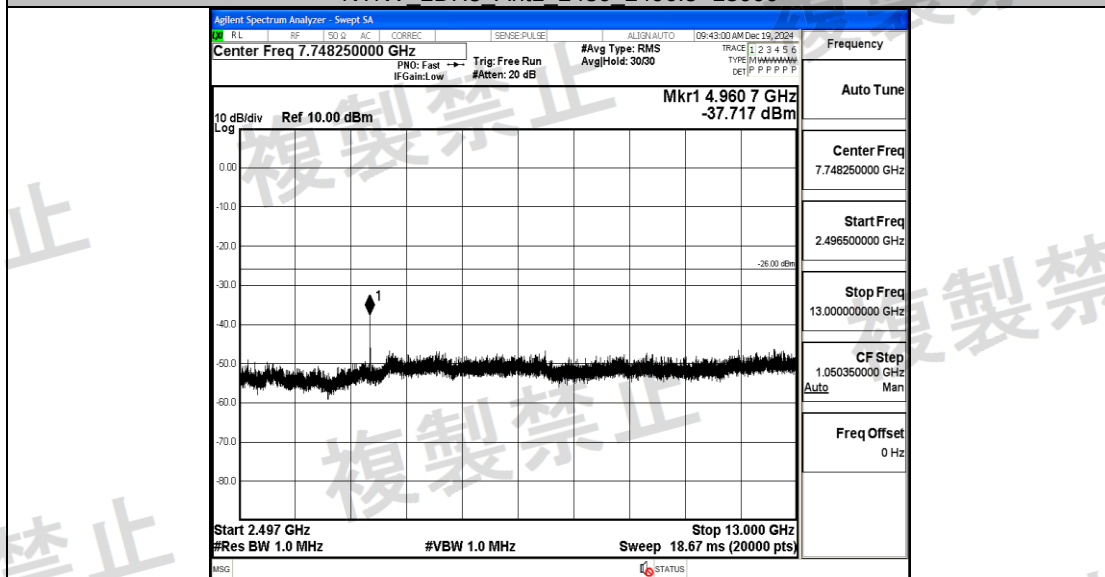
NTNV 2DH5 Ant1 2480 2387~2400



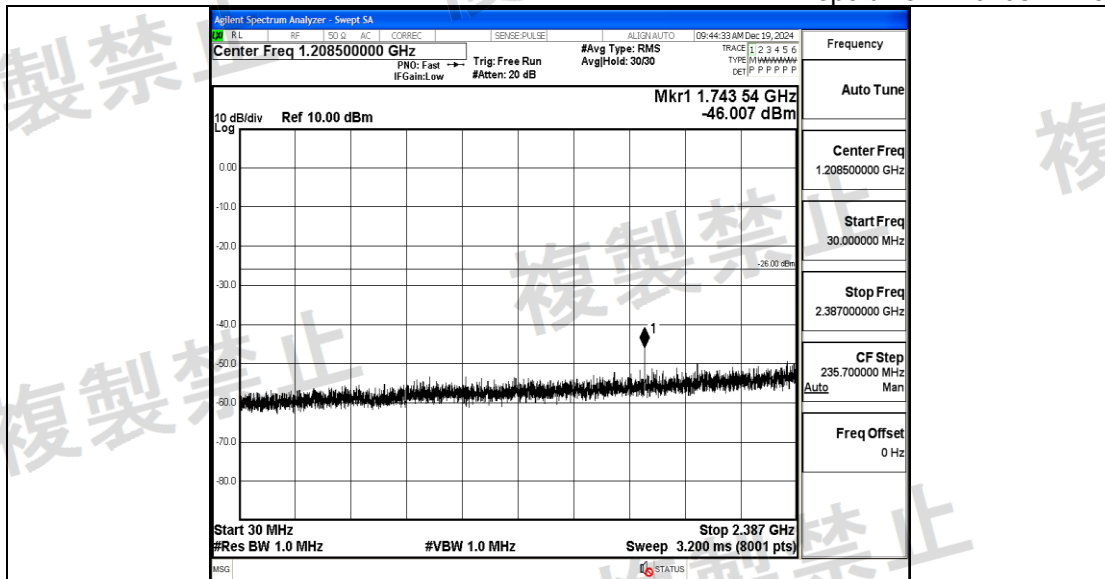
NTNV 2DH5 Ant1 2480 2483.5~2496.5



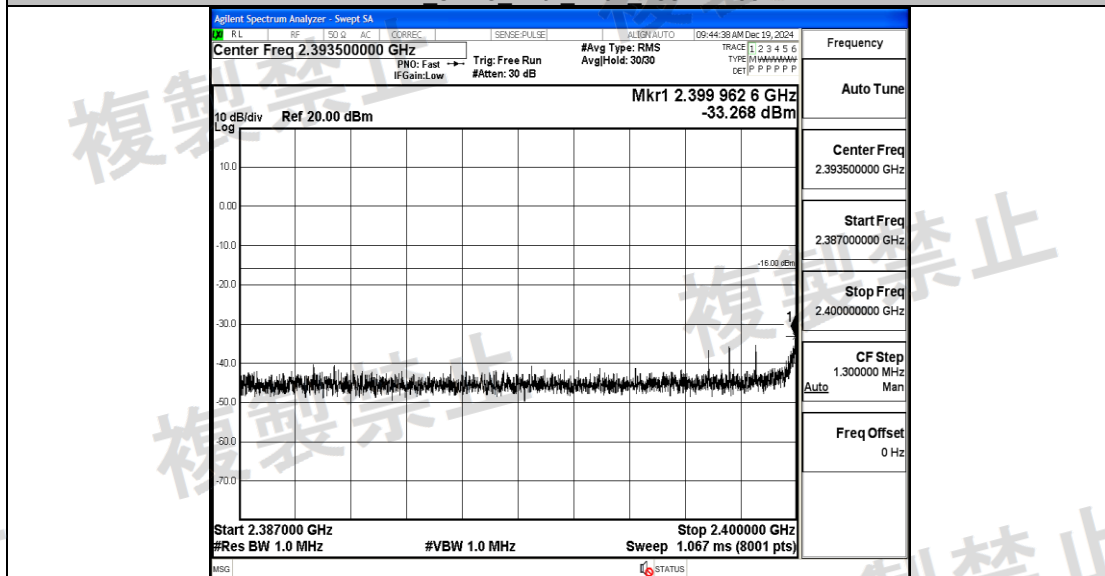
NTNV 2DH5 Ant1 2480 2496.5~13000



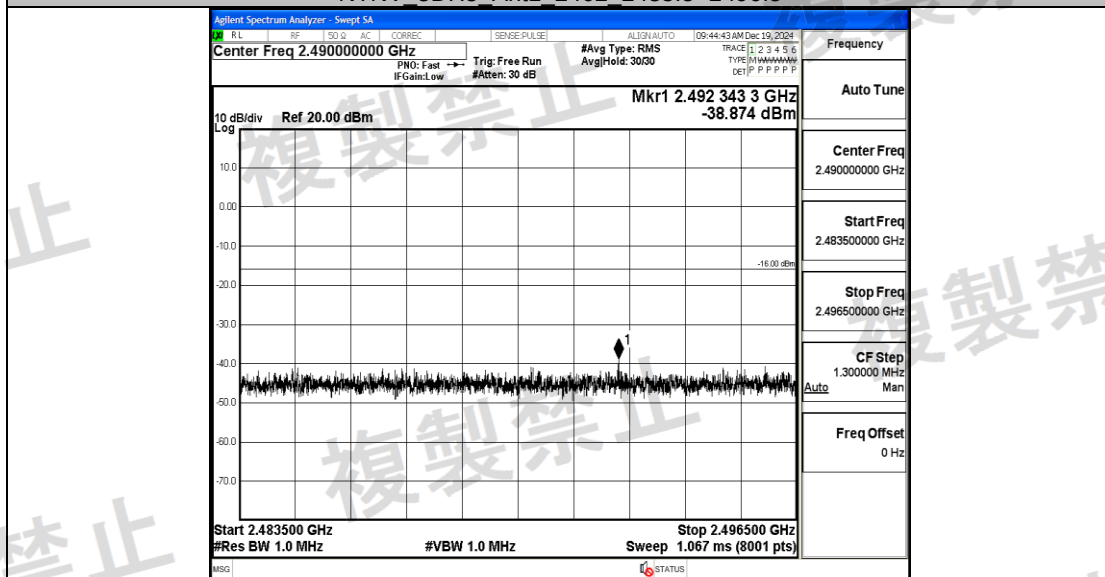
NTNV 3DH5 Ant1 2402 30~2387



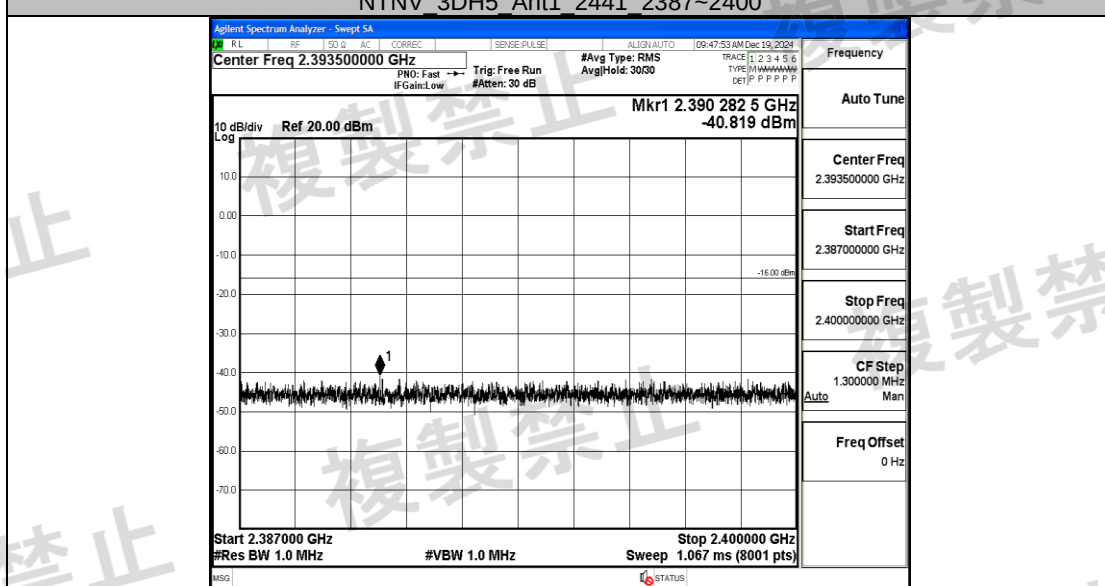
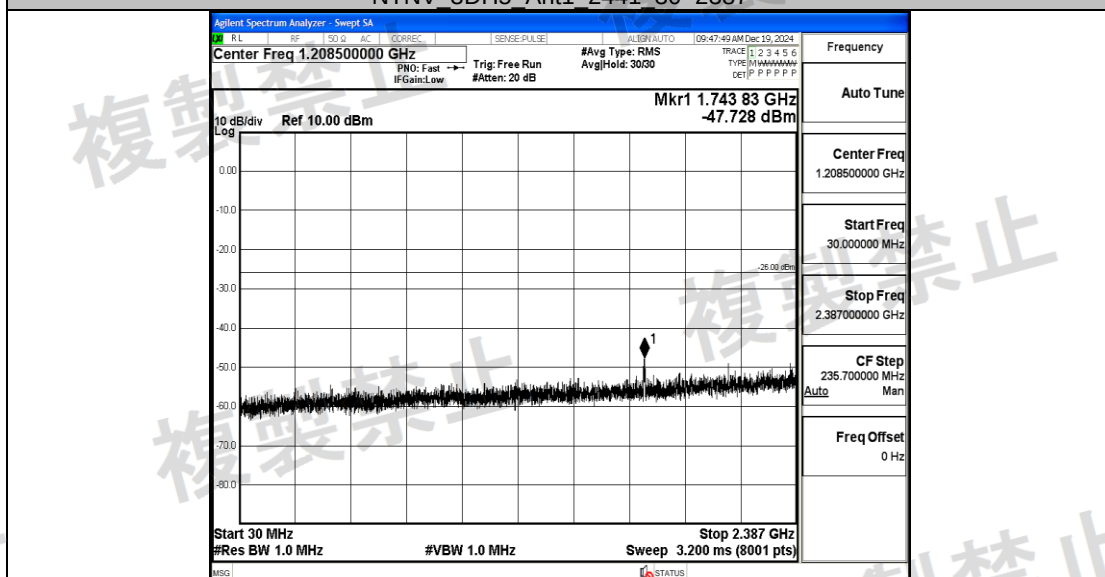
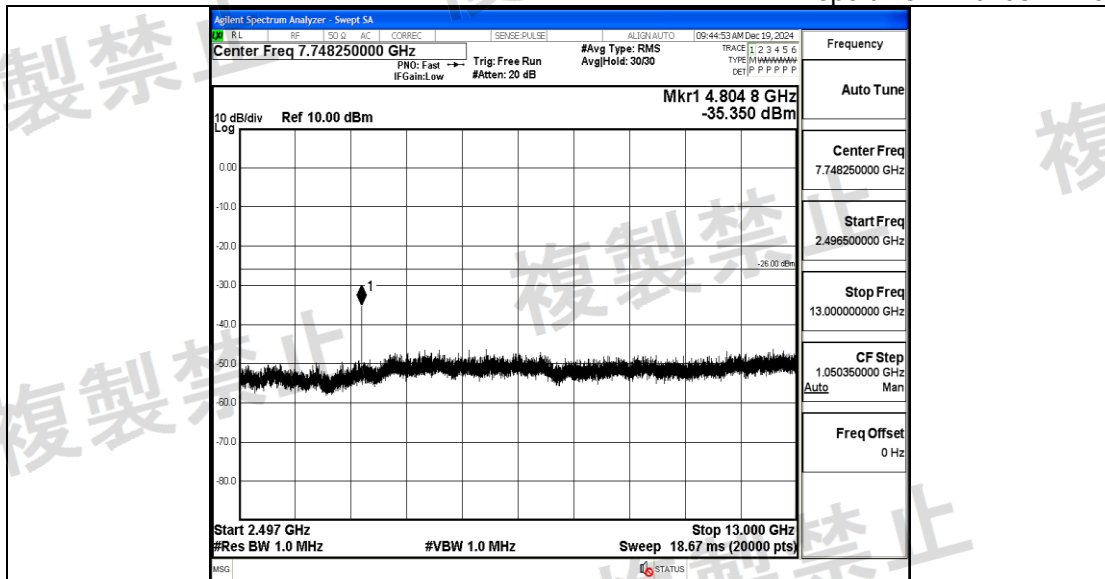
NTNV 3DH5 Ant1 2402 2387~2400

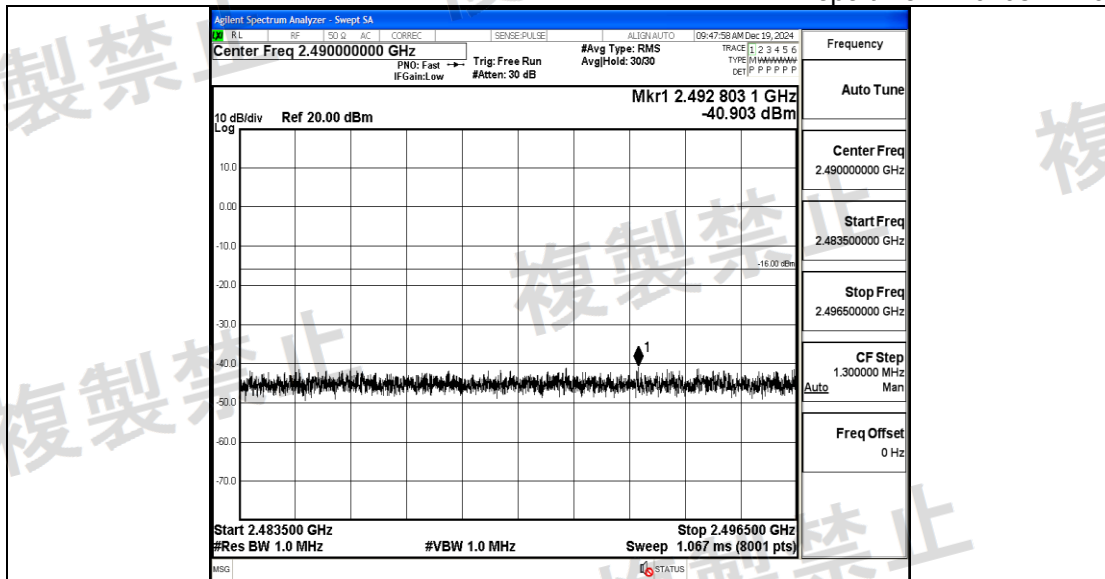


NTNV 3DH5 Ant1 2402 2483.5~2496.5

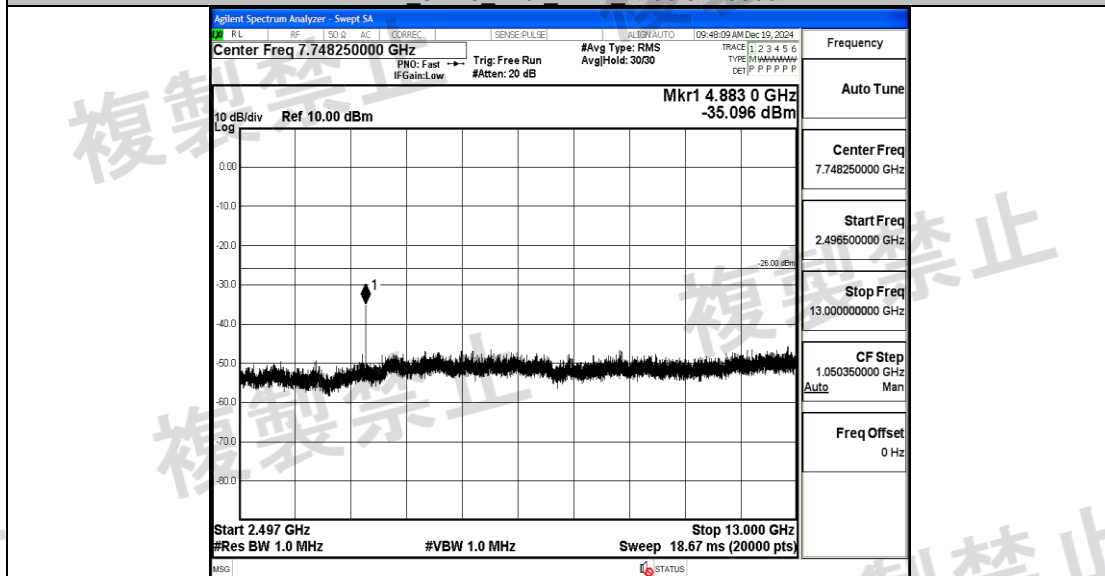


NTNV 3DH5 Ant1 2402 2496.5~13000

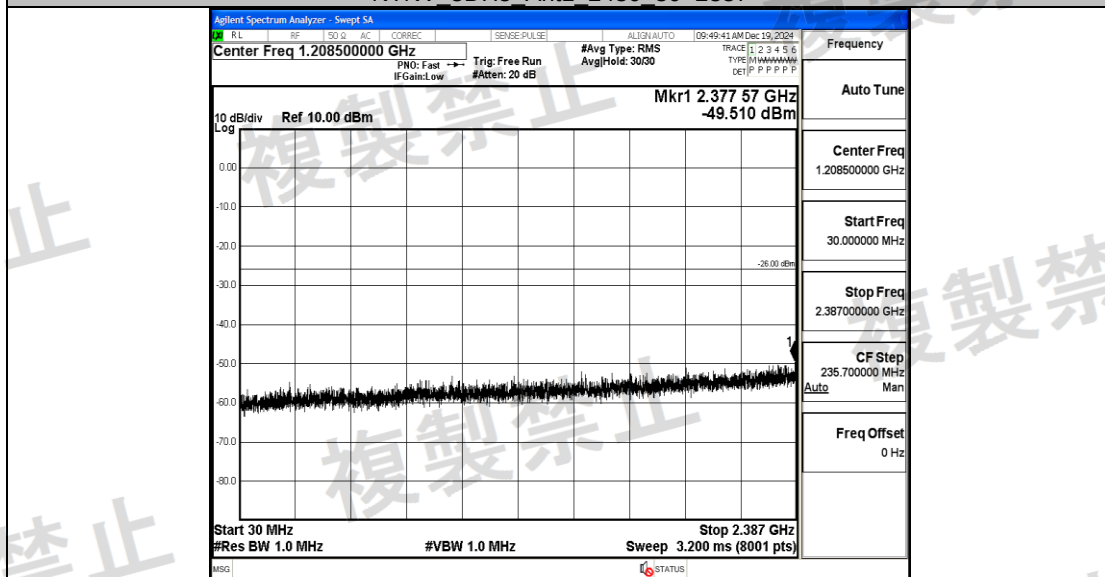




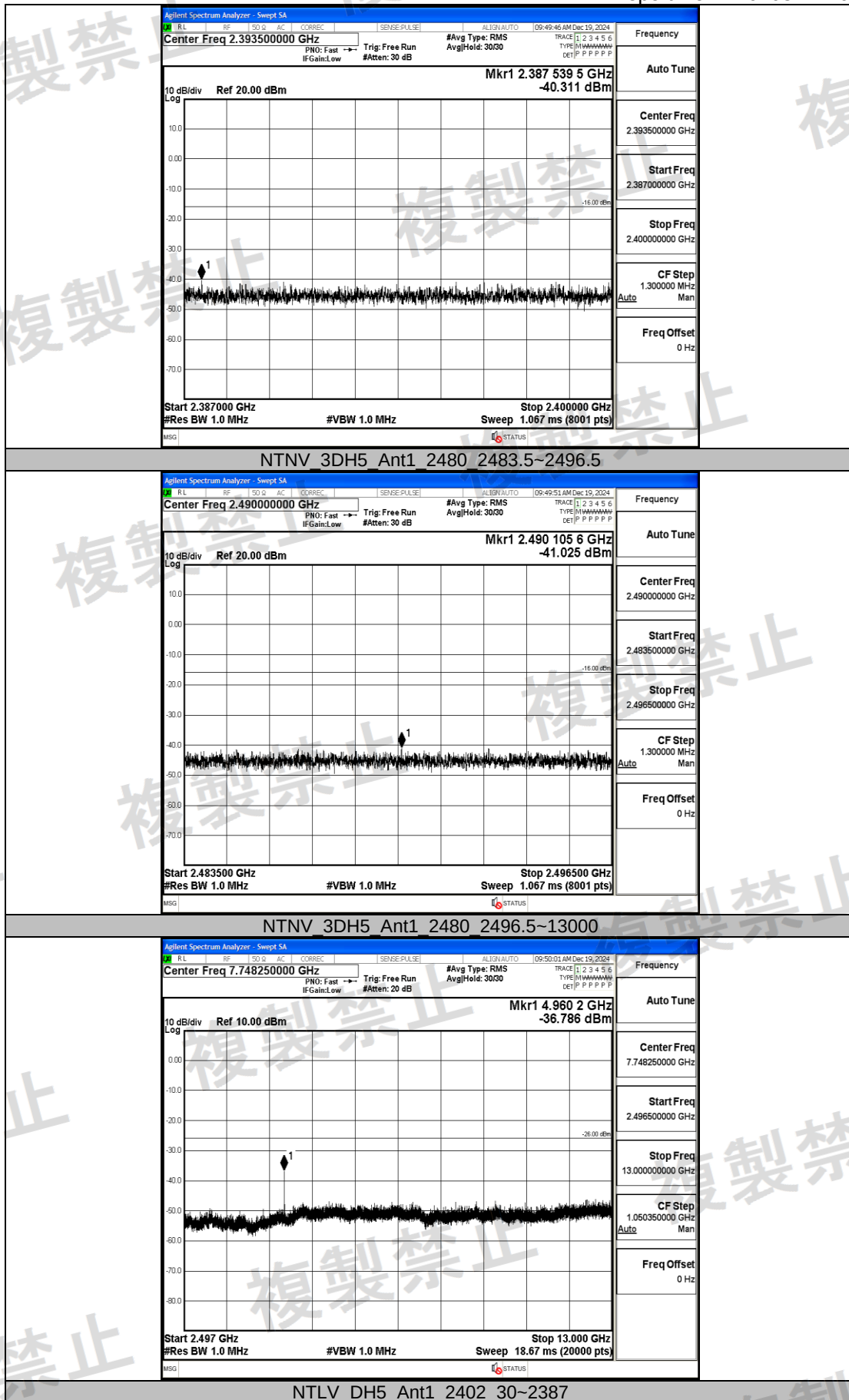
NTNV 3DH5 Ant1 2441 2496.5~13000

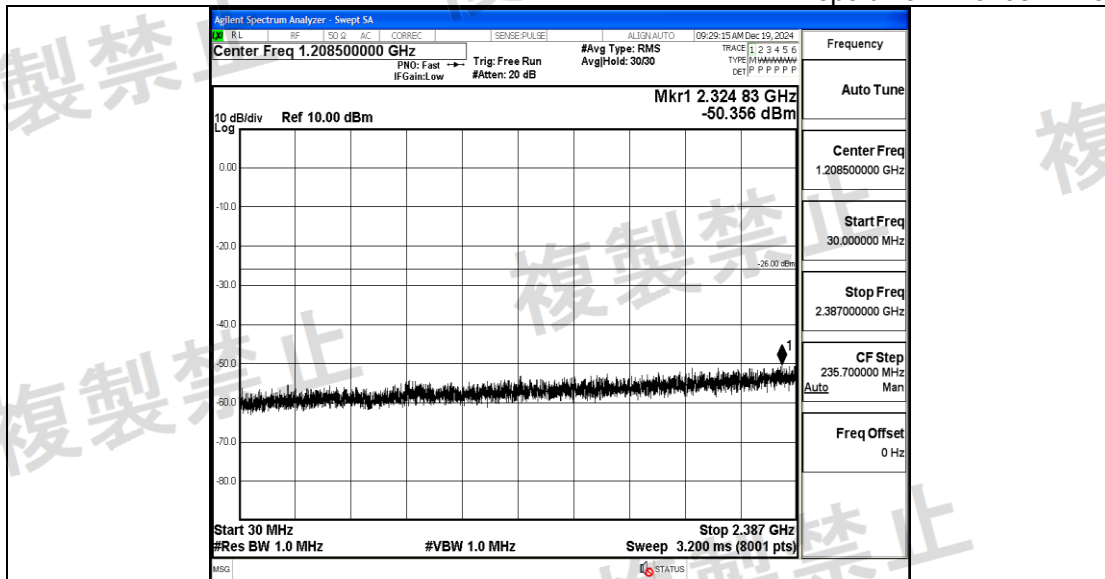


NTNV 3DH5 Ant1 2480 30~2387

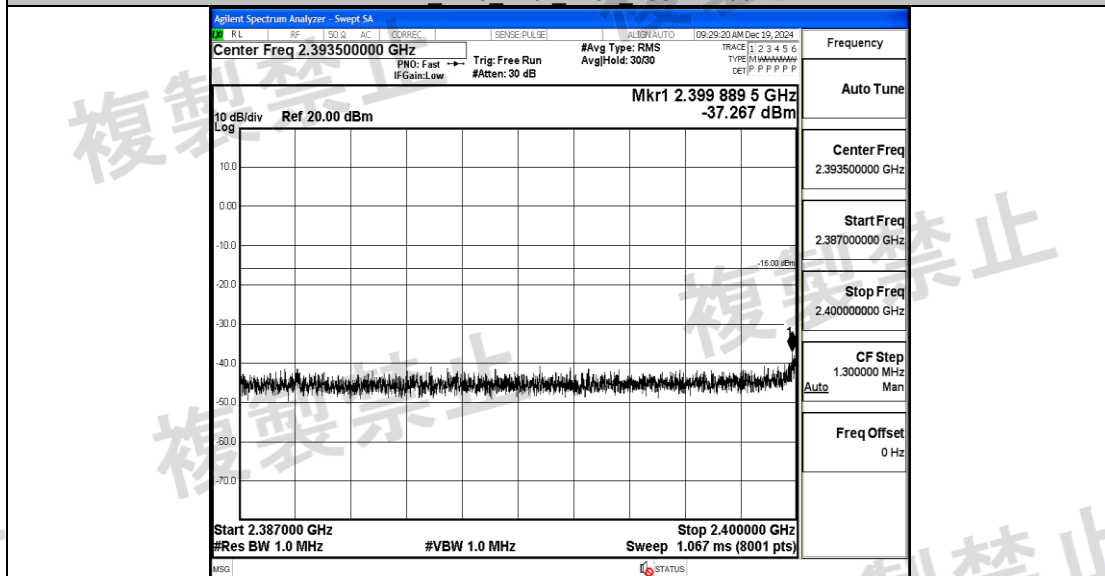


NTNV 3DH5 Ant1 2480 2387~2400

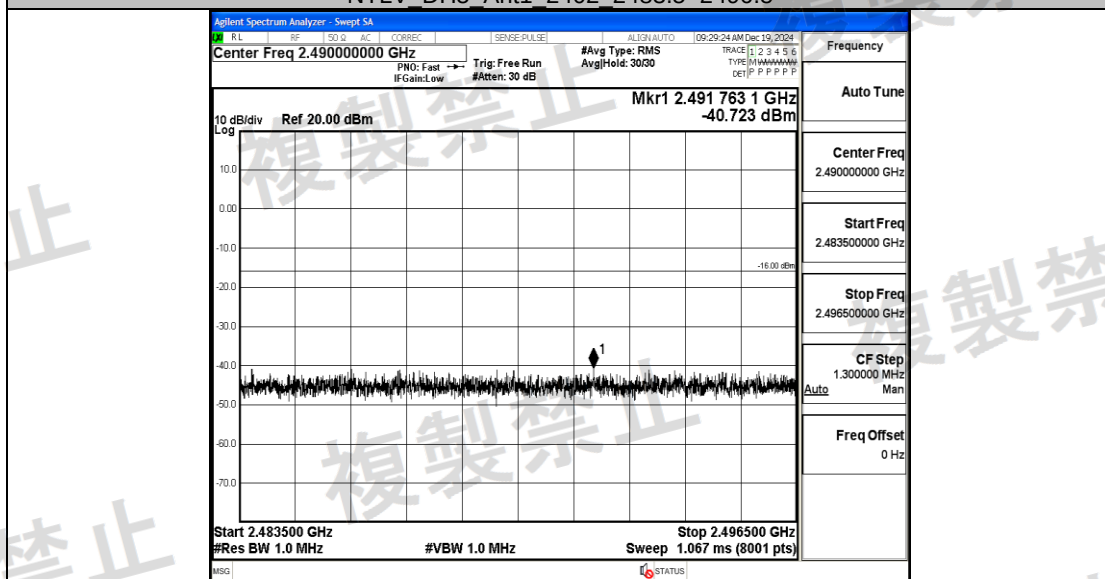




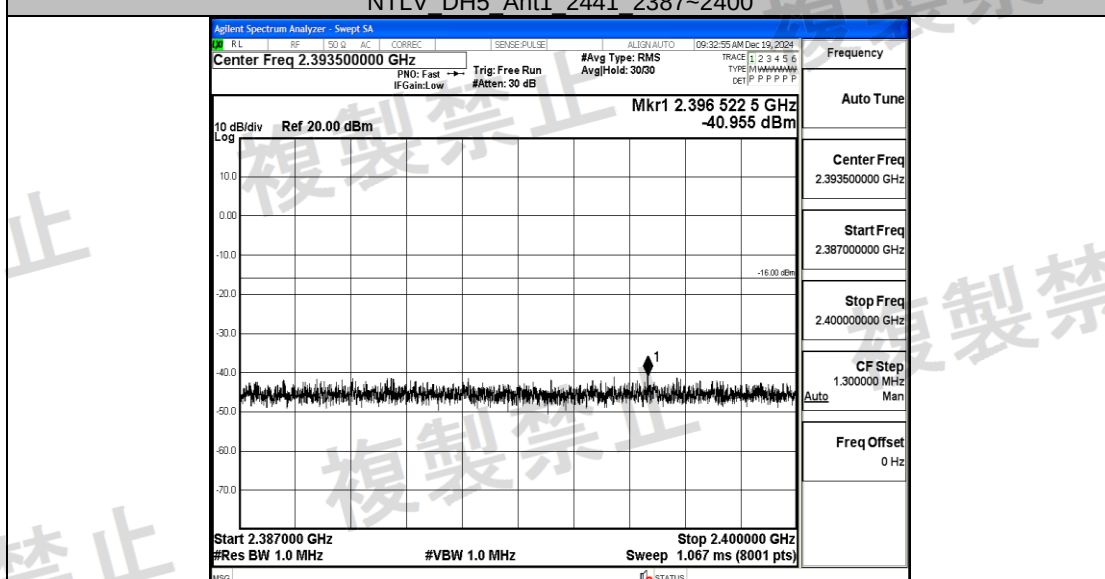
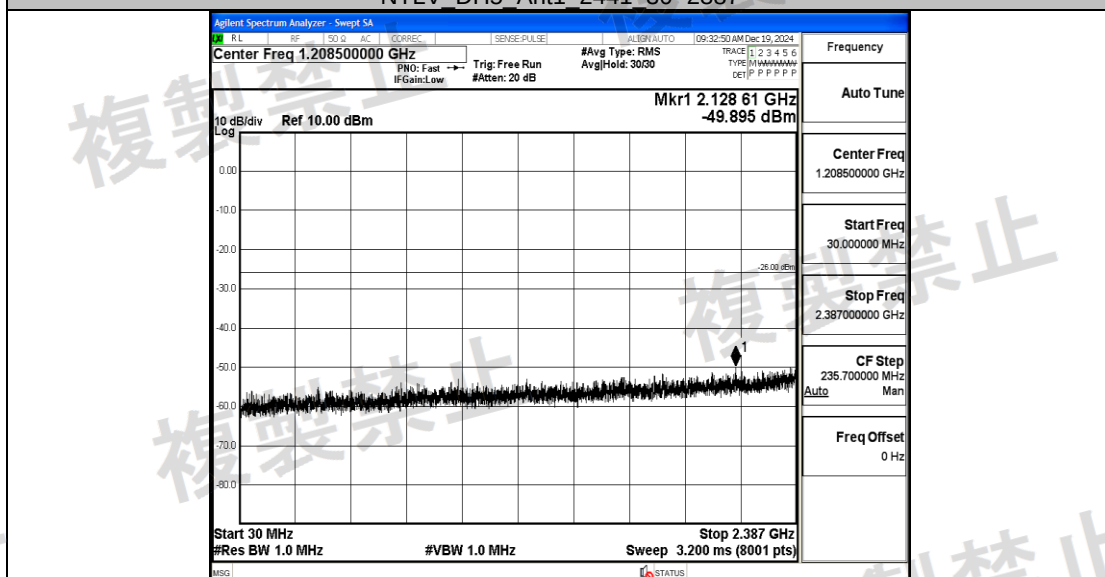
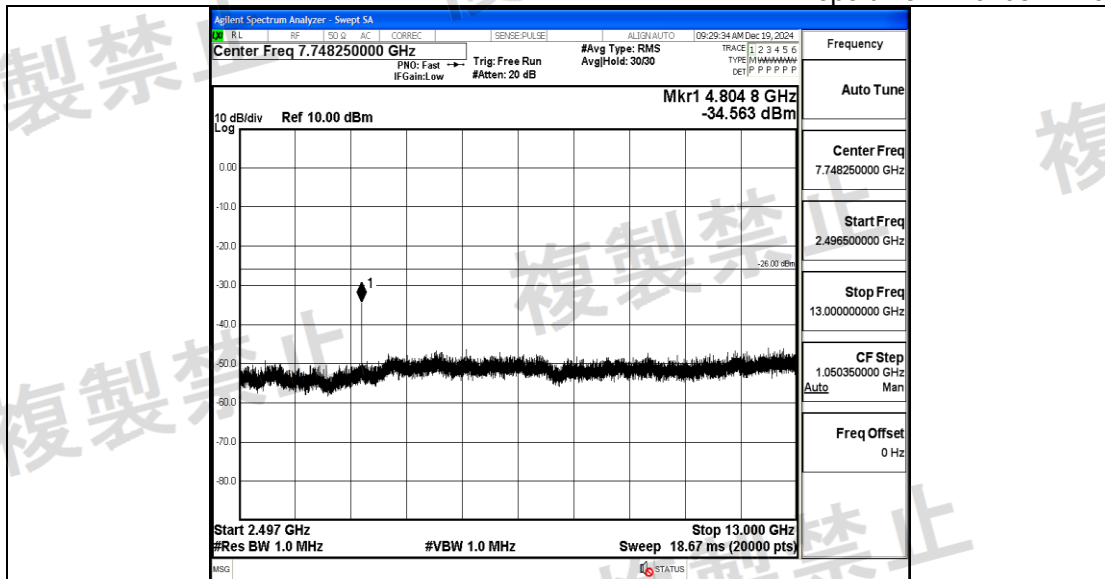
NTLV DH5 Ant1 2402 2387~2400

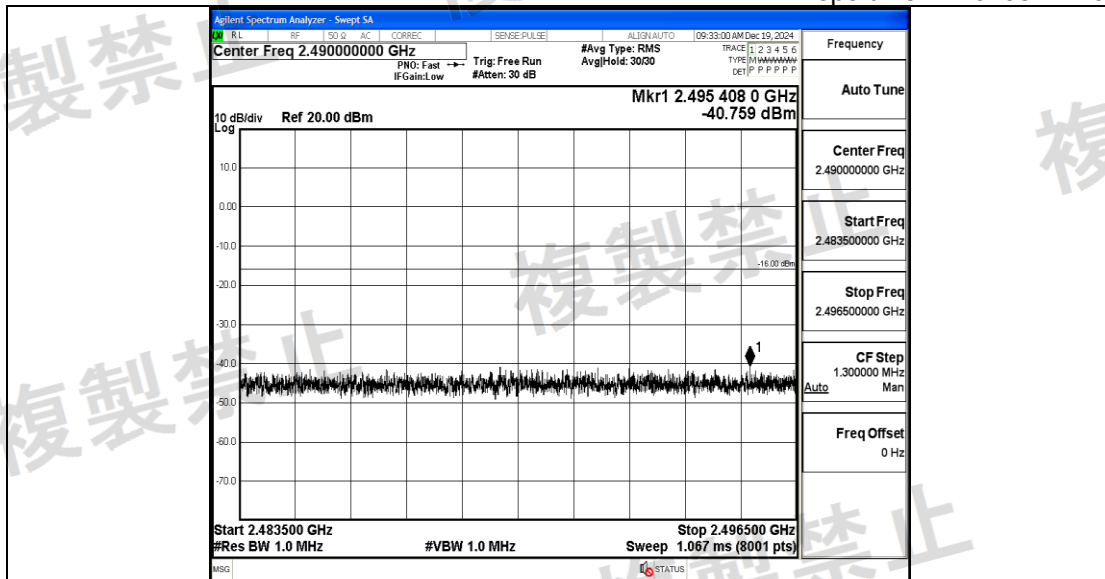


NTLV DH5 Ant1 2402 2483.5~2496.5

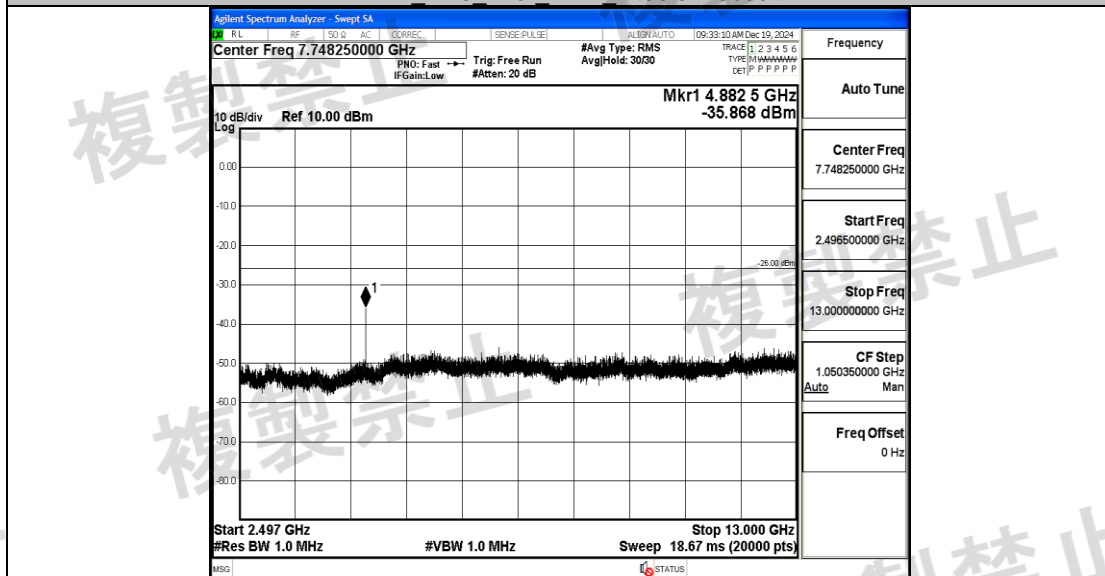


NTLV DH5 Ant1 2402 2496.5~13000

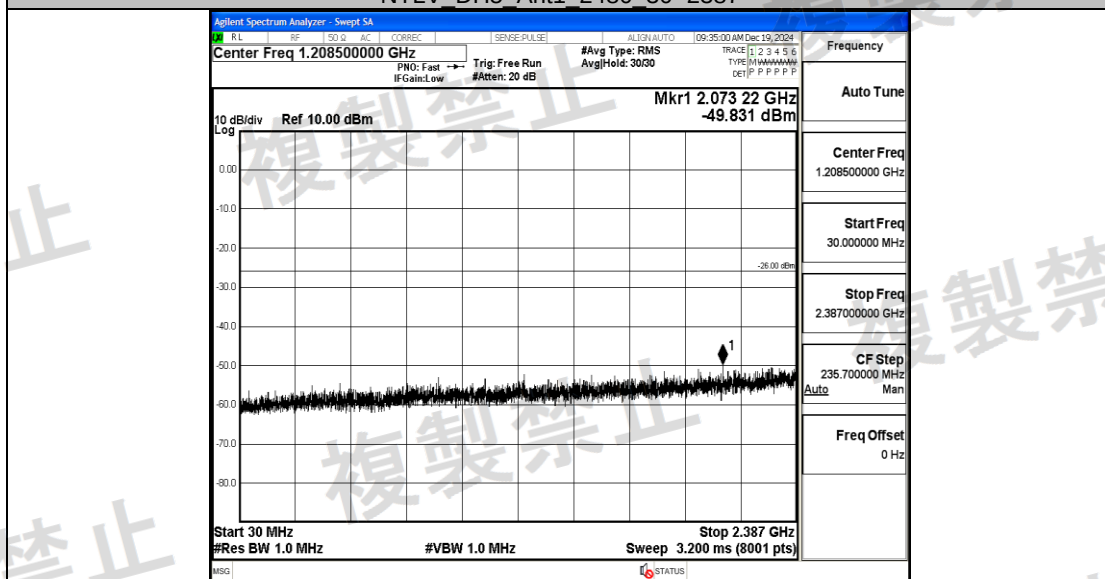




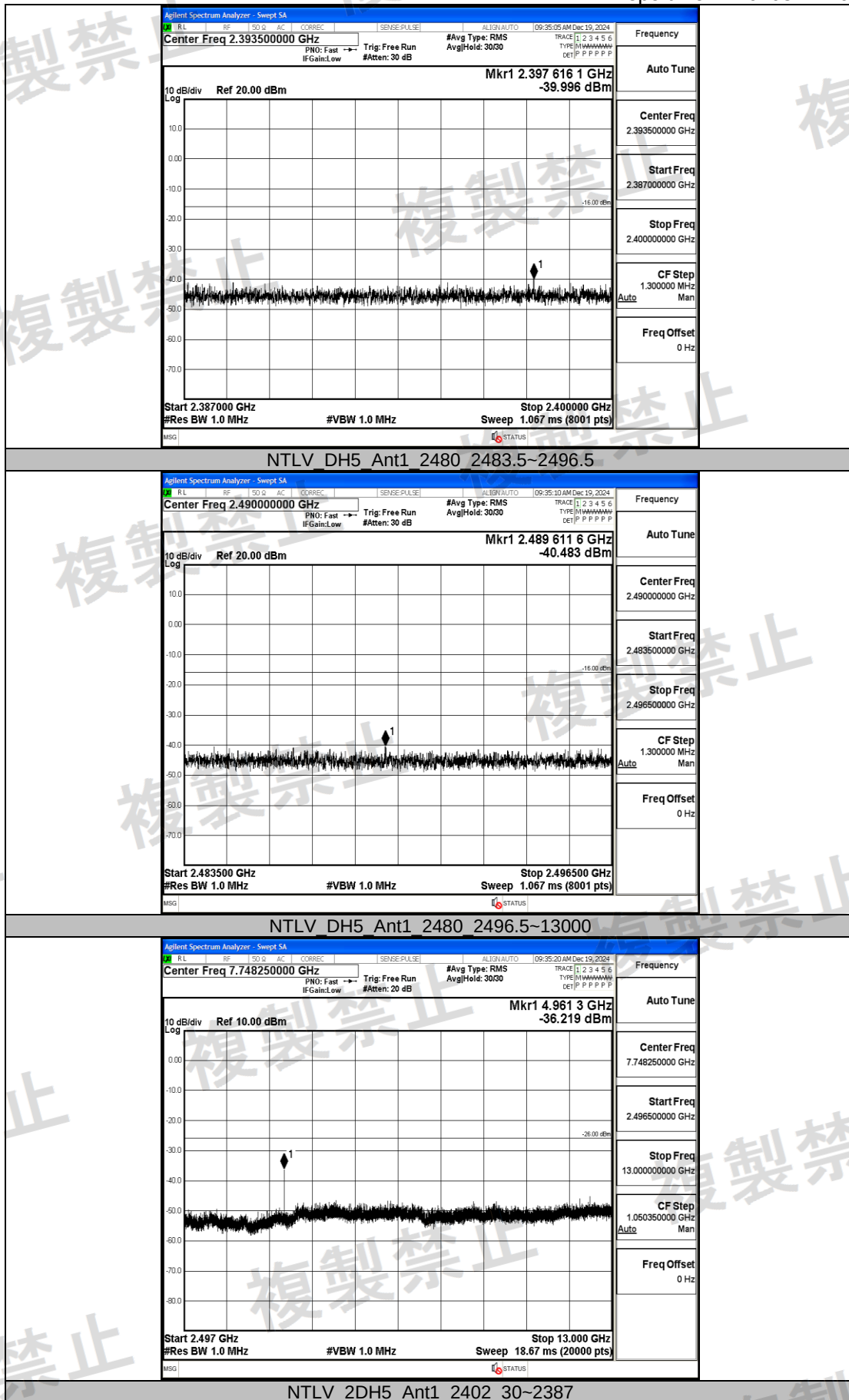
NTLV DH5 Ant1 2441 2496.5~13000

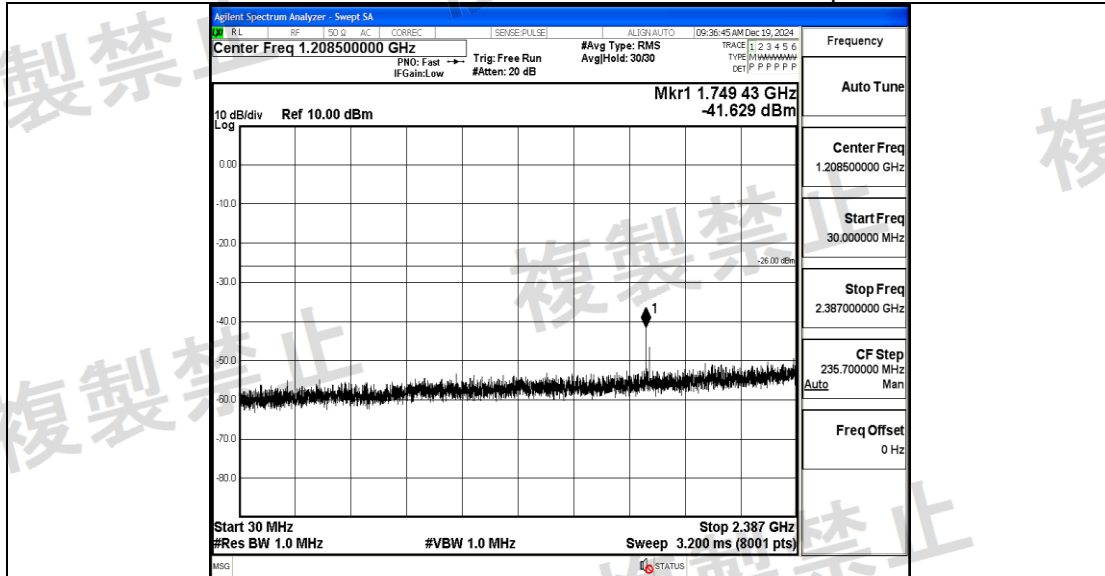


NTLV DH5 Ant1 2480 30~2387

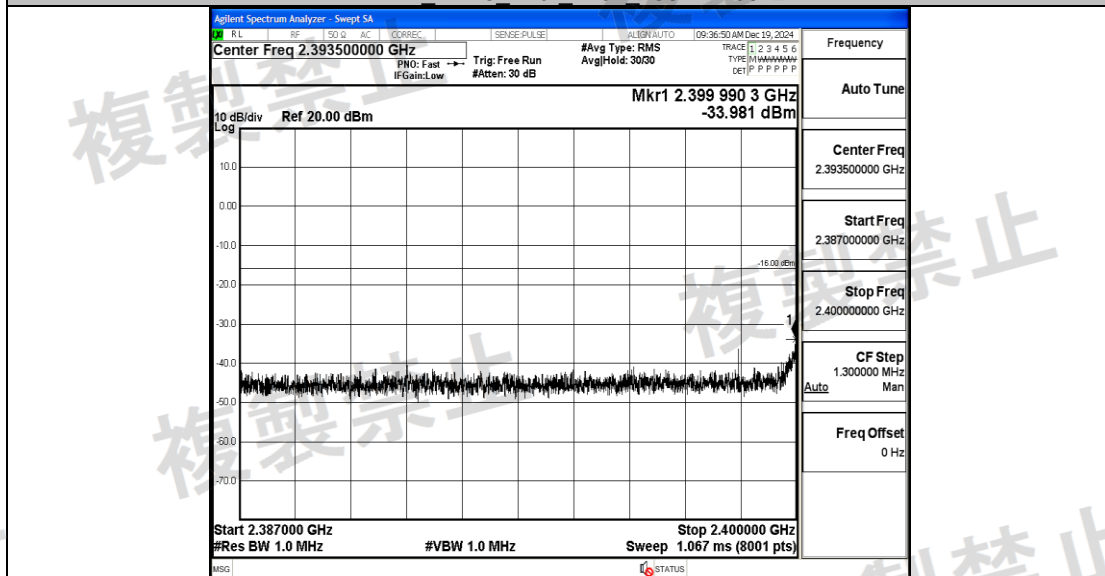


NTLV DH5 Ant1 2480 2387~2400

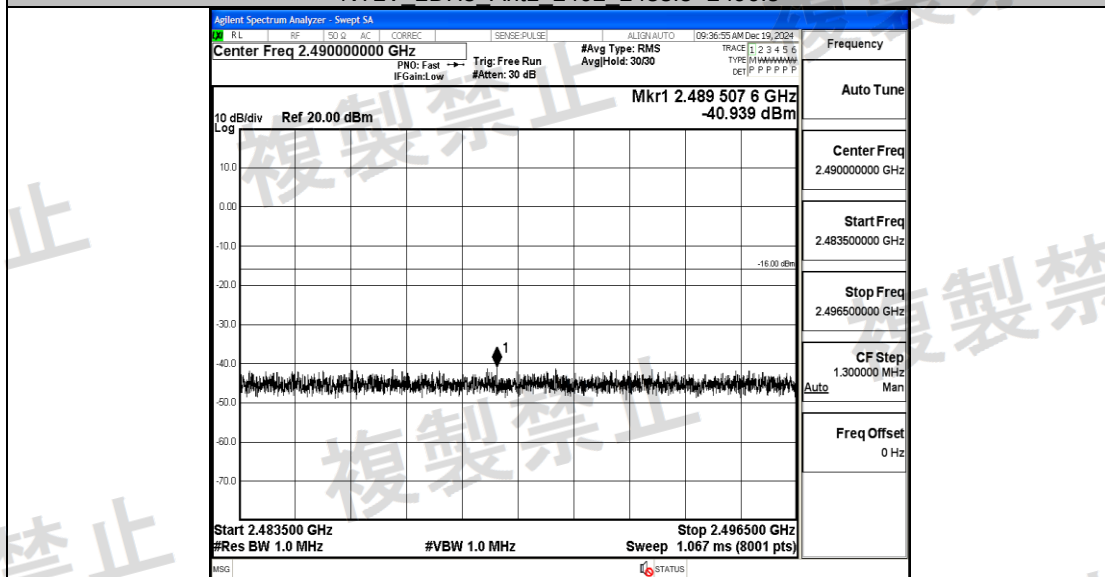




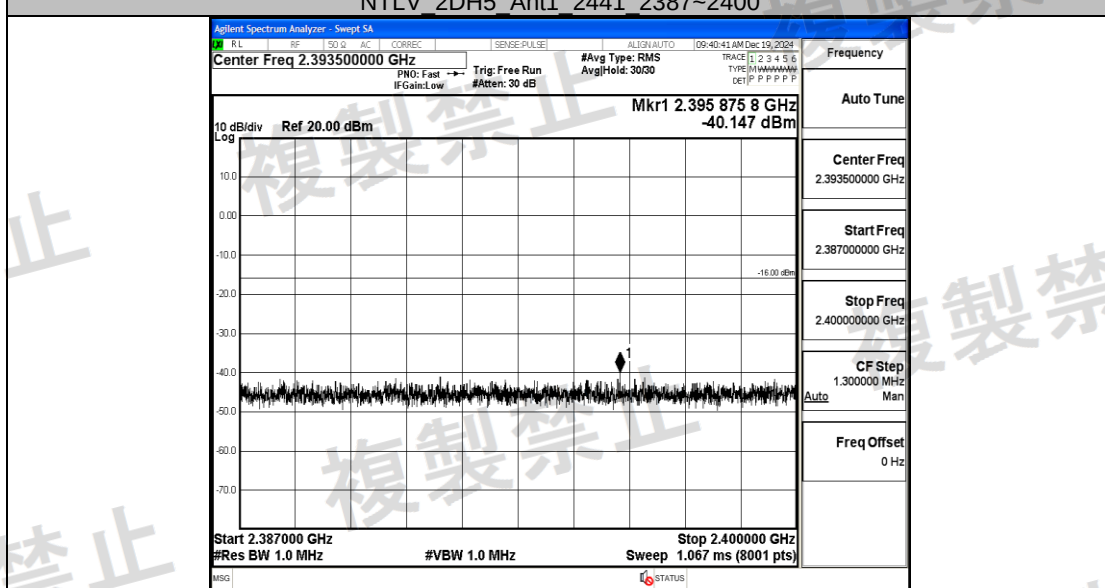
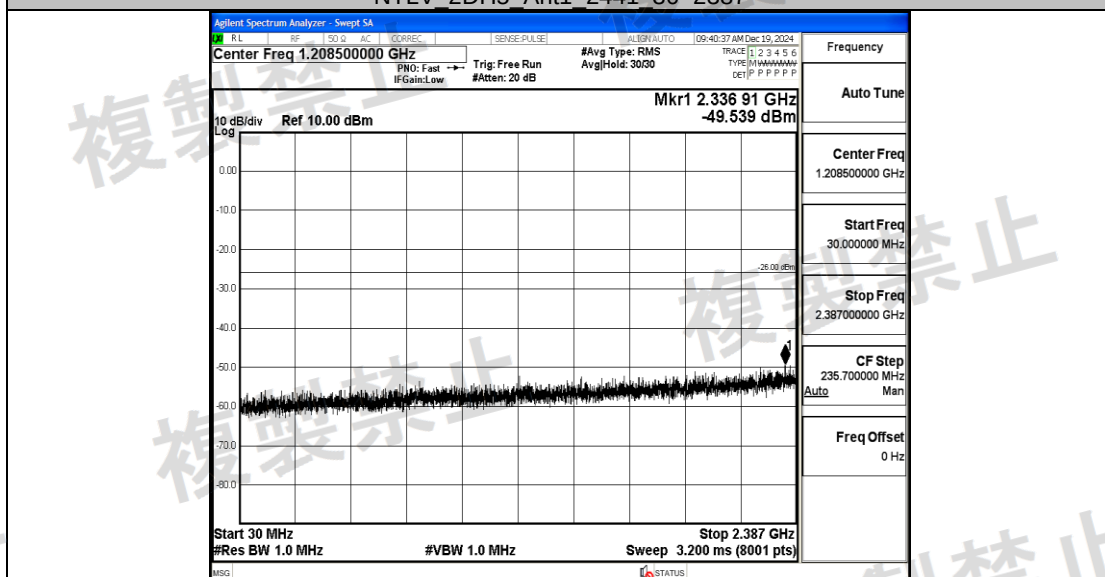
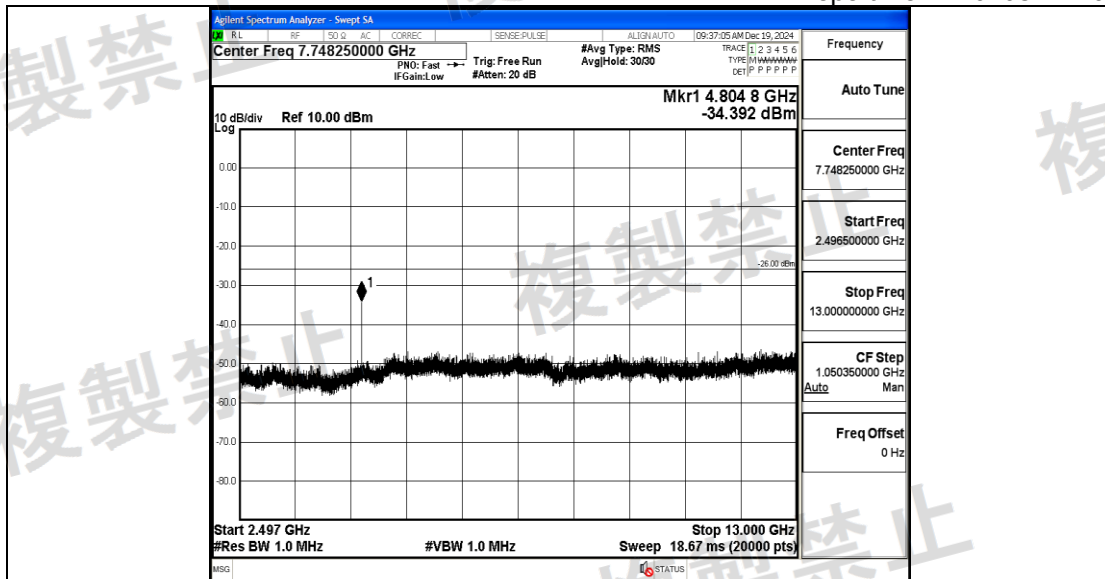
NTLV 2DH5 Ant1 2402 2387~2400

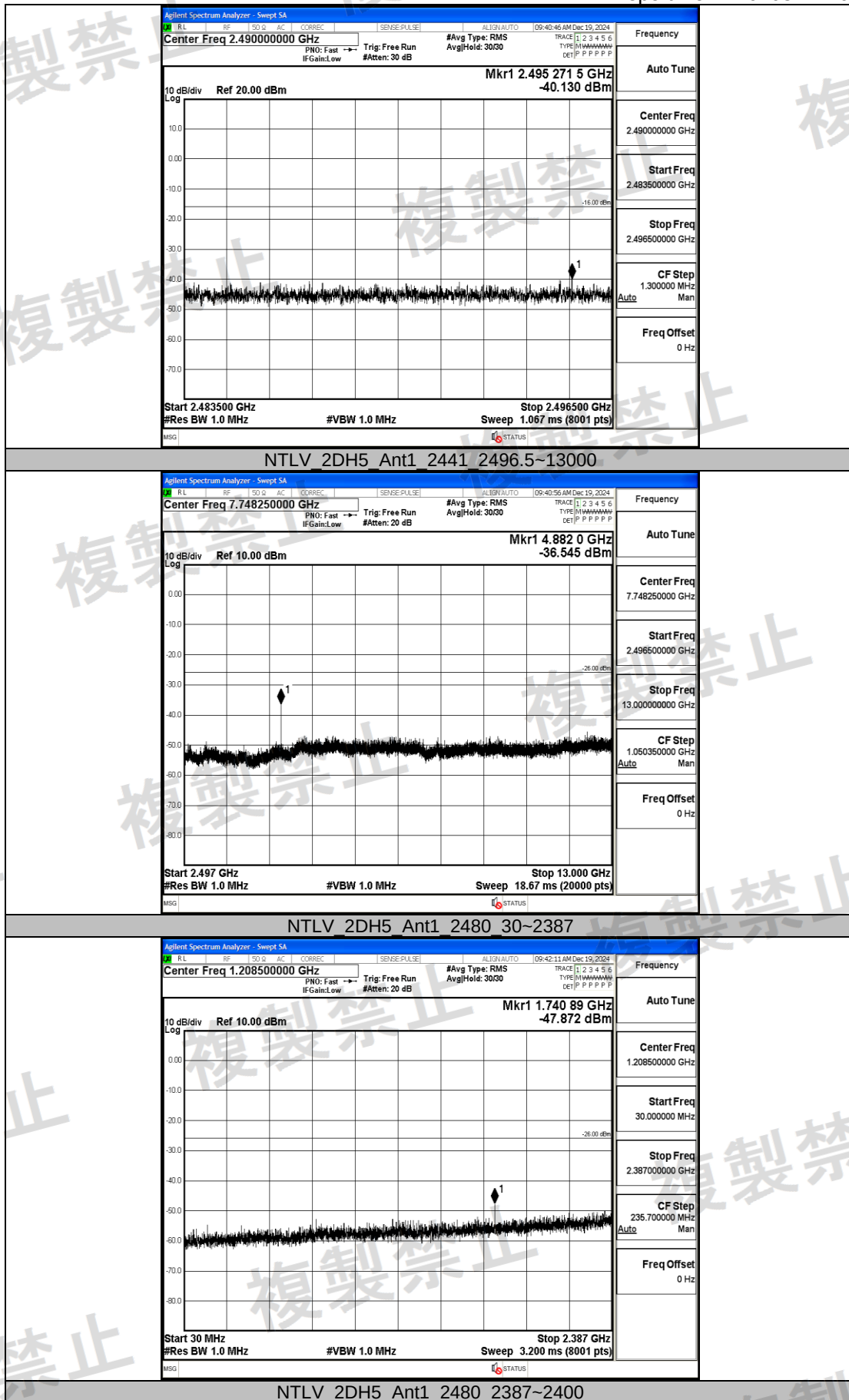


NTLV 2DH5 Ant1 2402 2483.5~2496.5

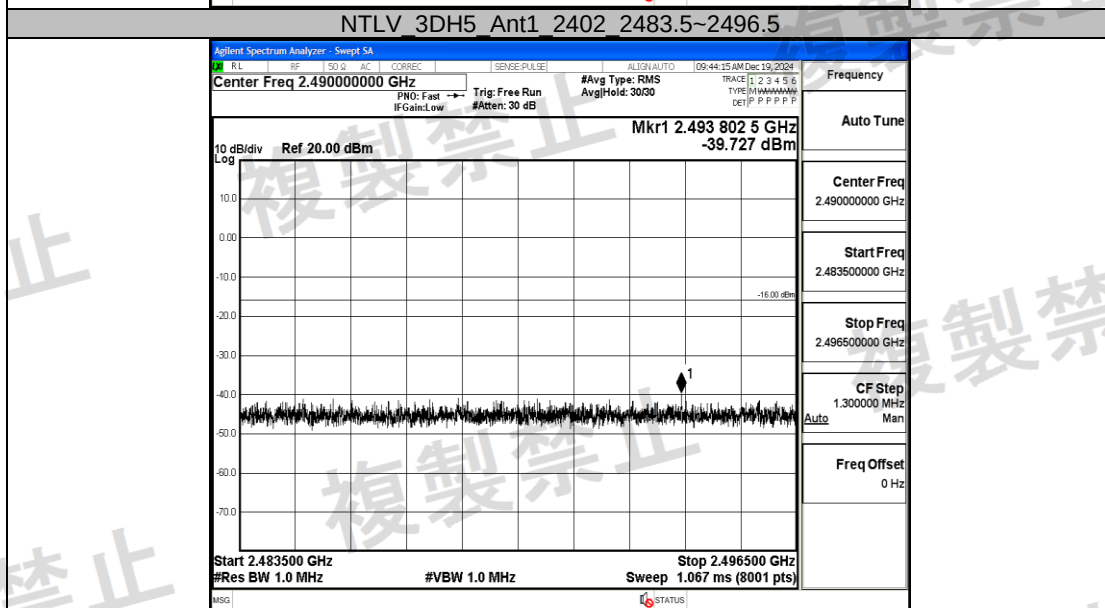
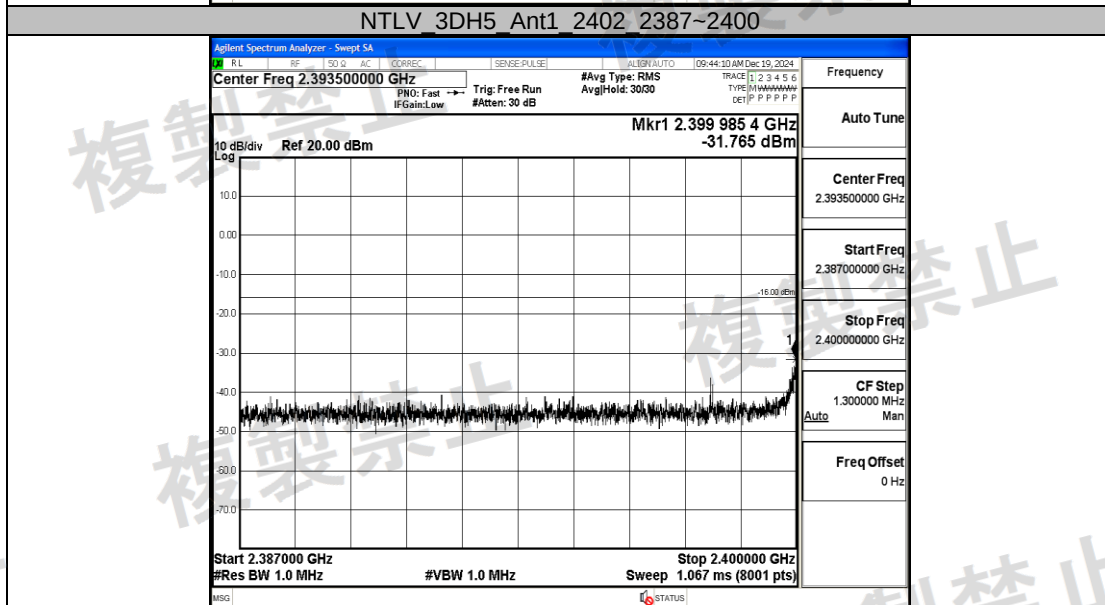
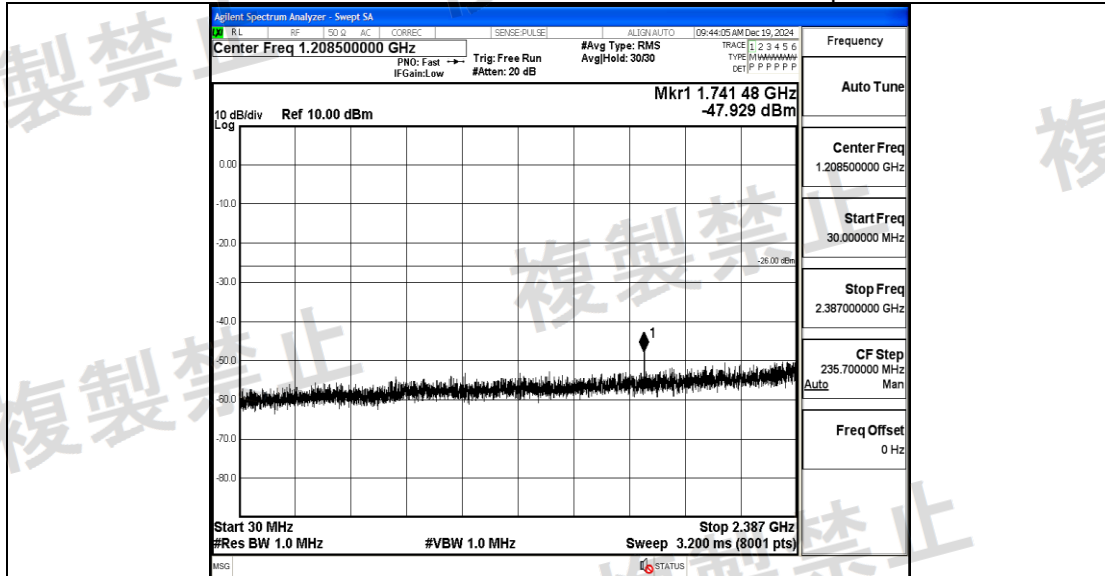


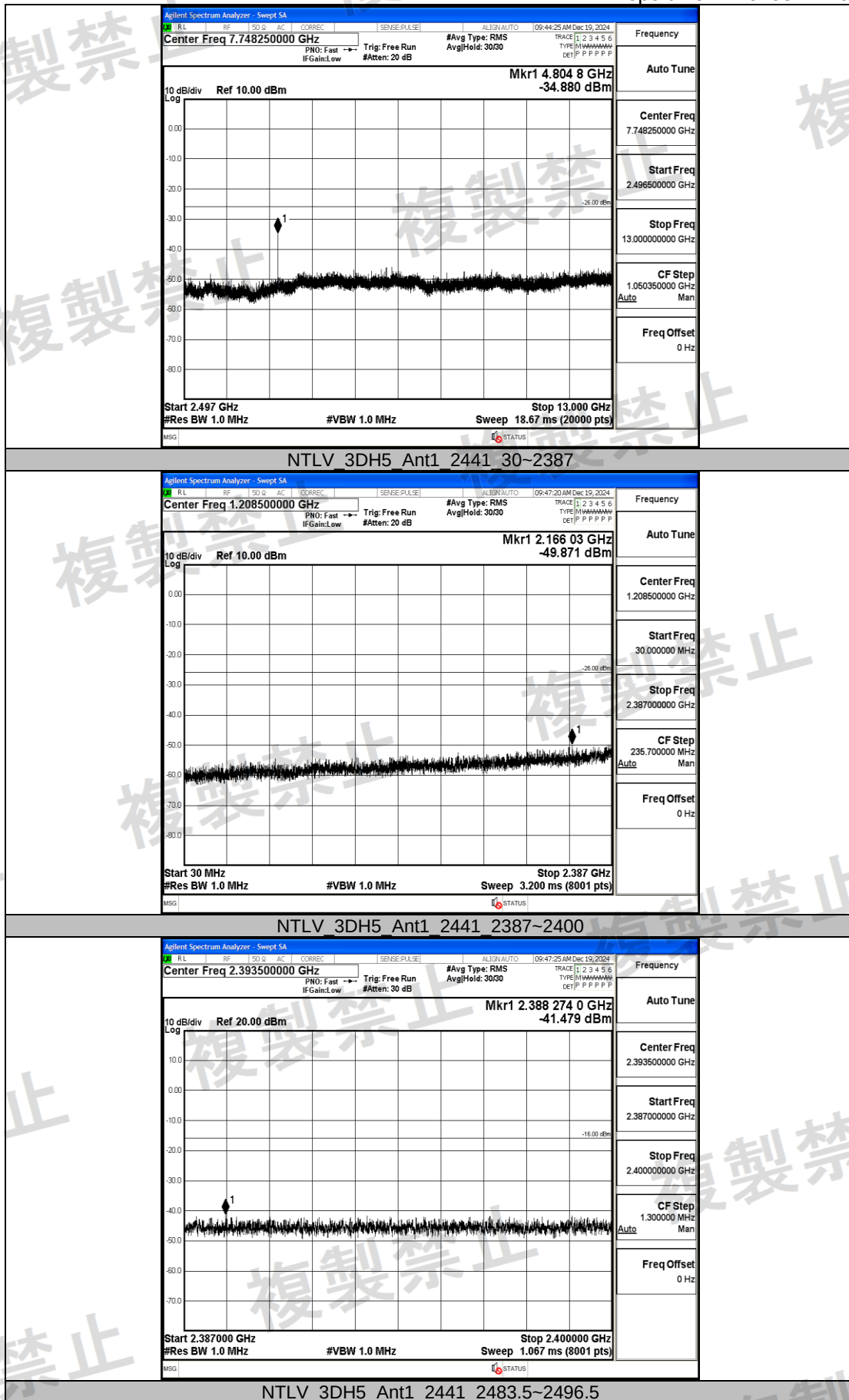
NTLV 2DH5 Ant1 2402 2496.5~13000

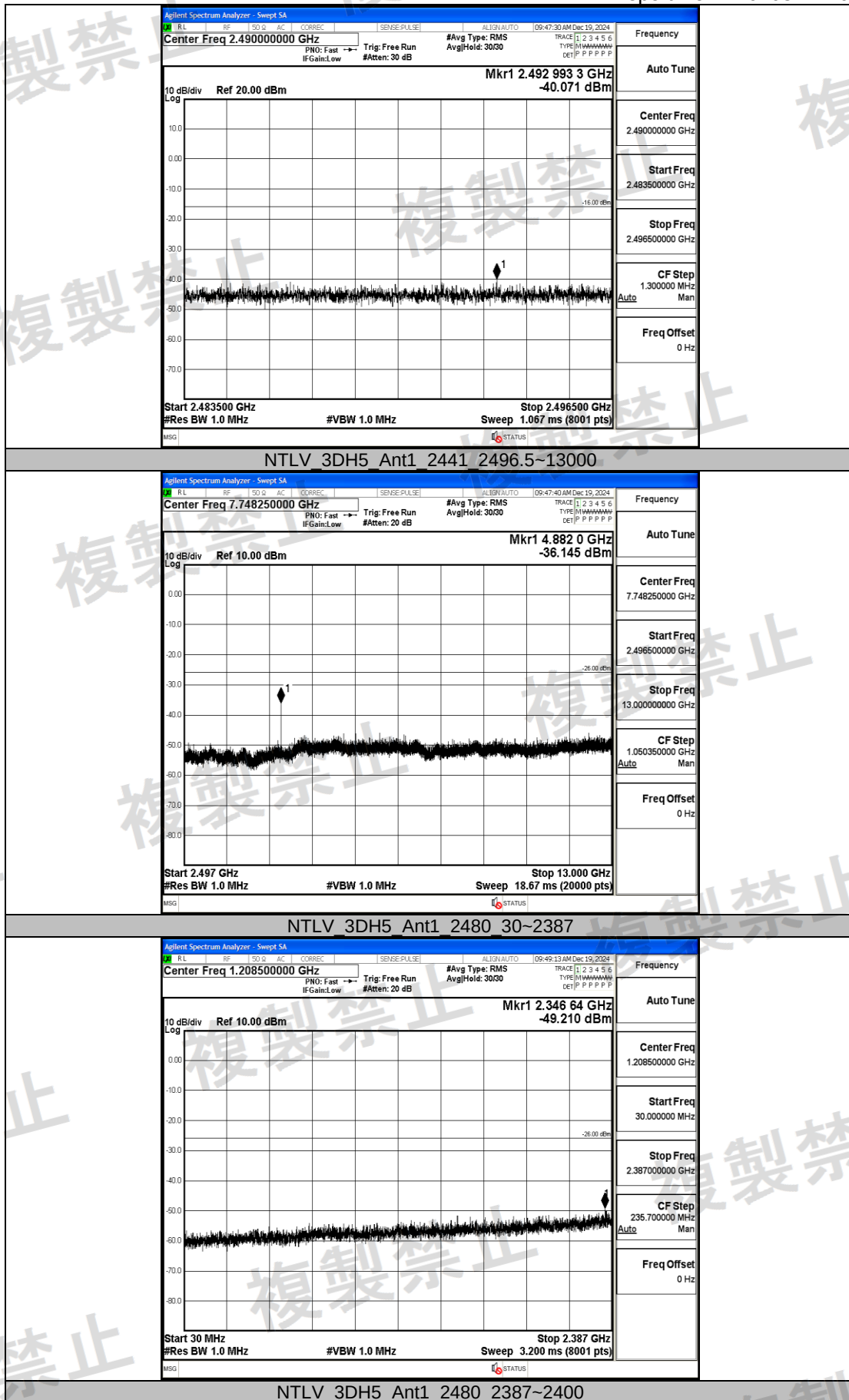


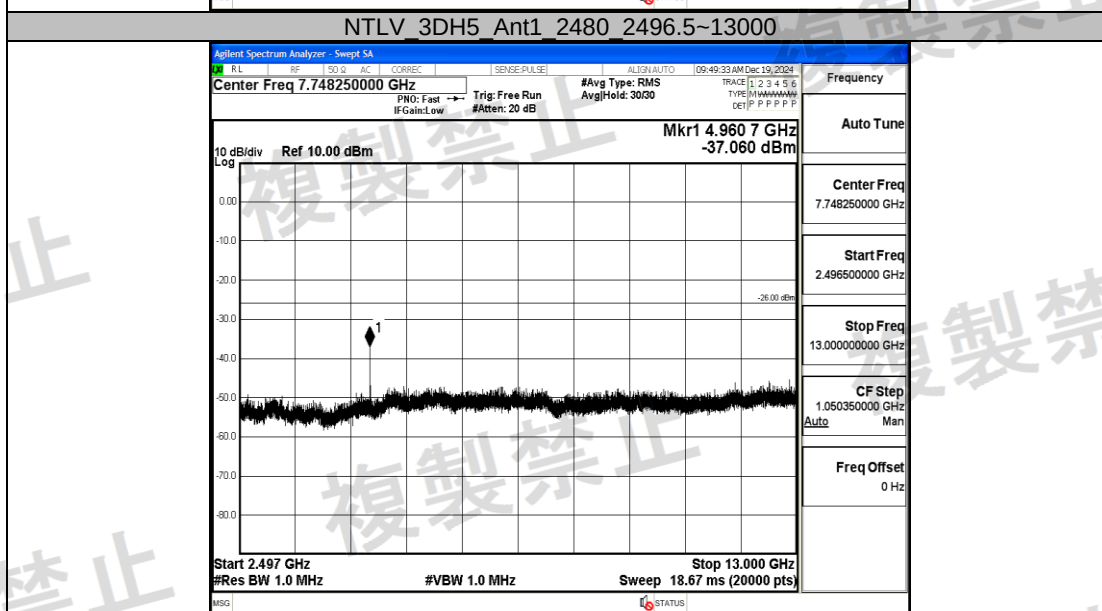
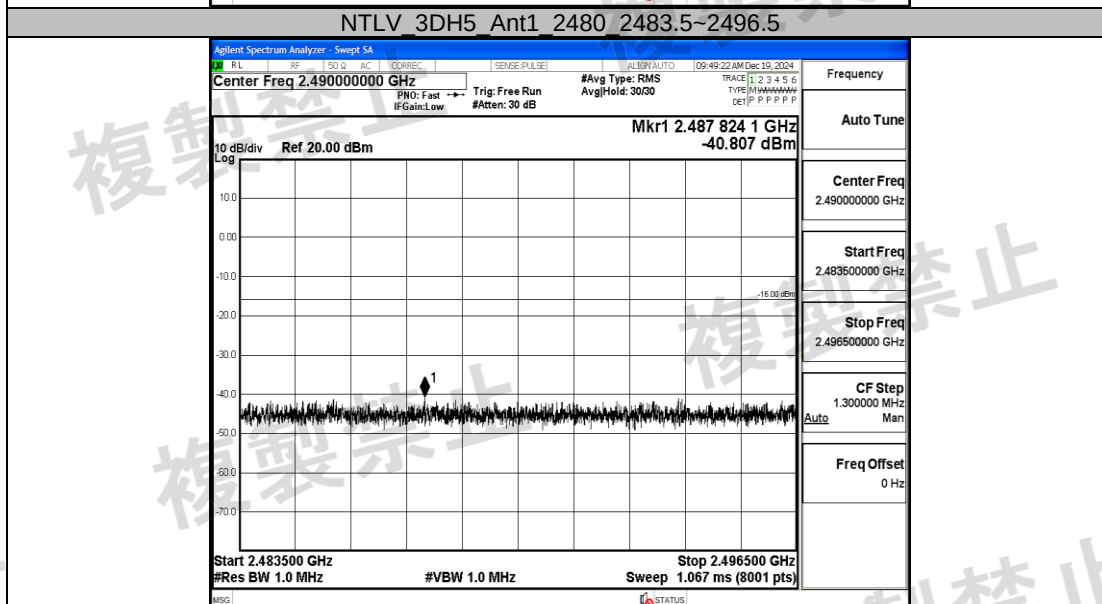
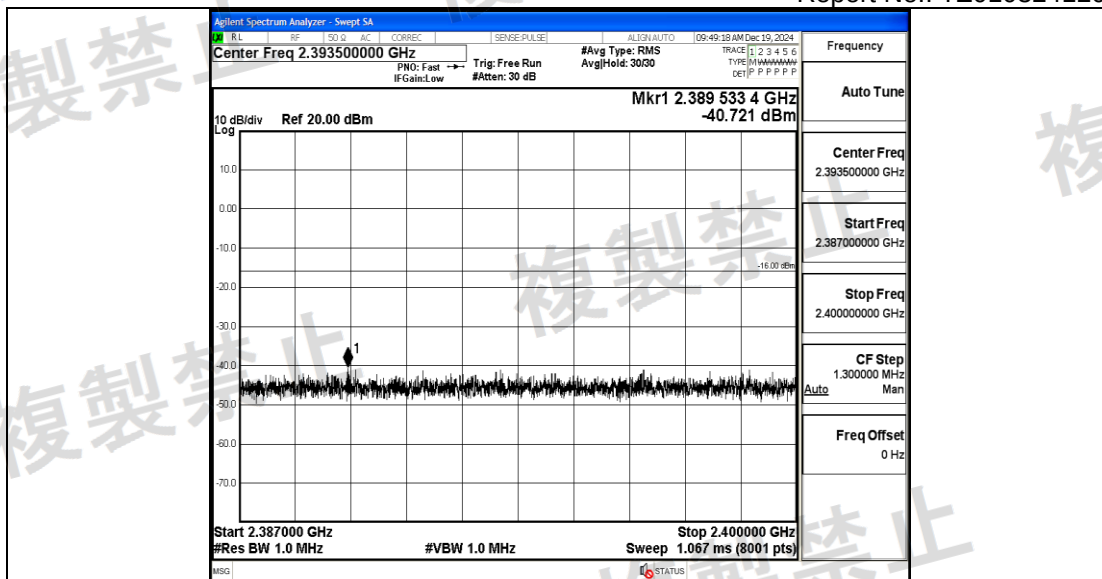


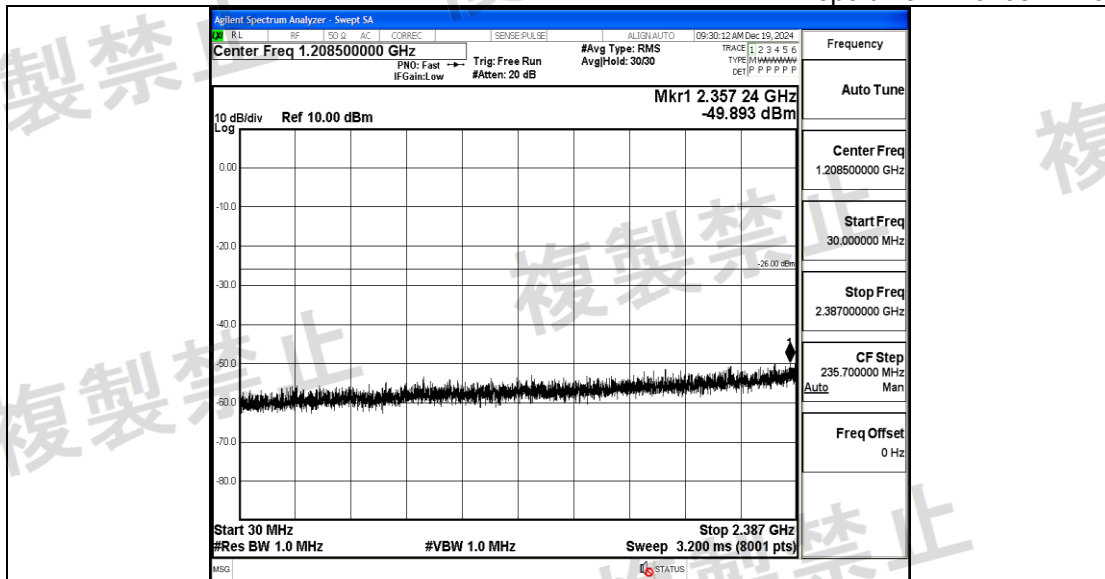




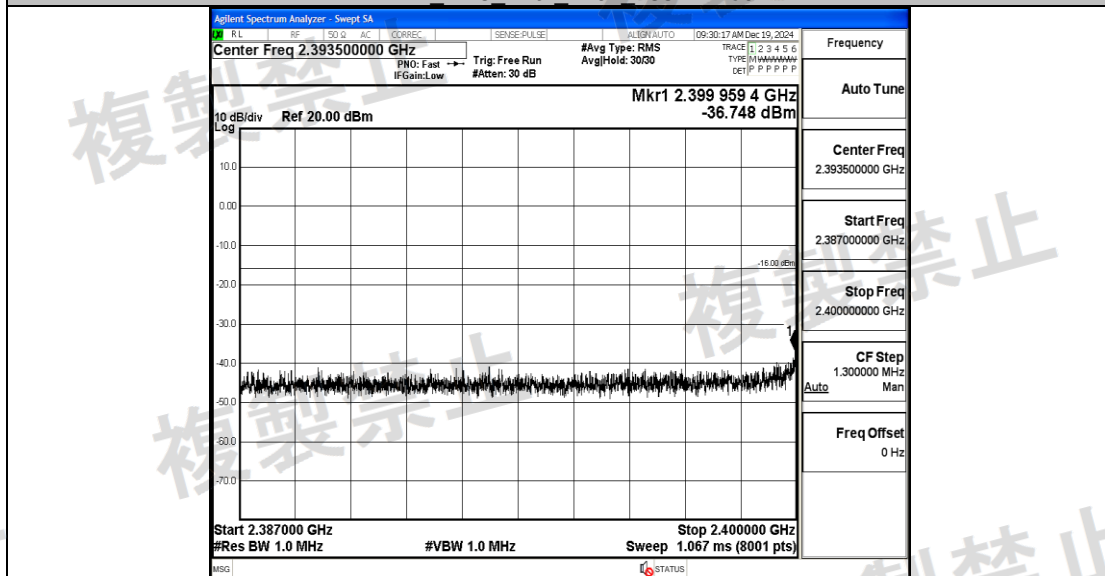




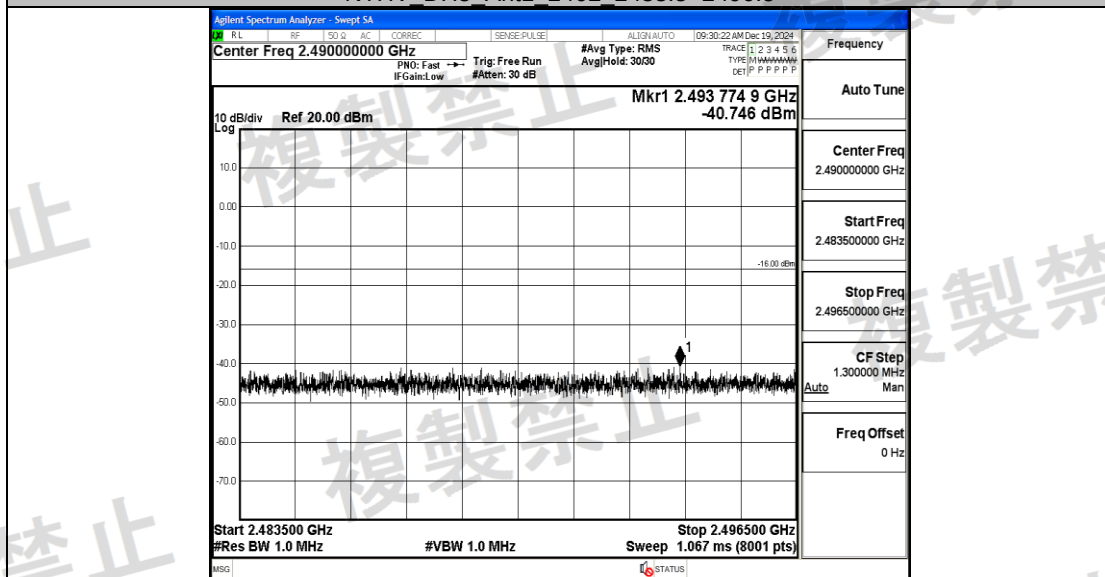




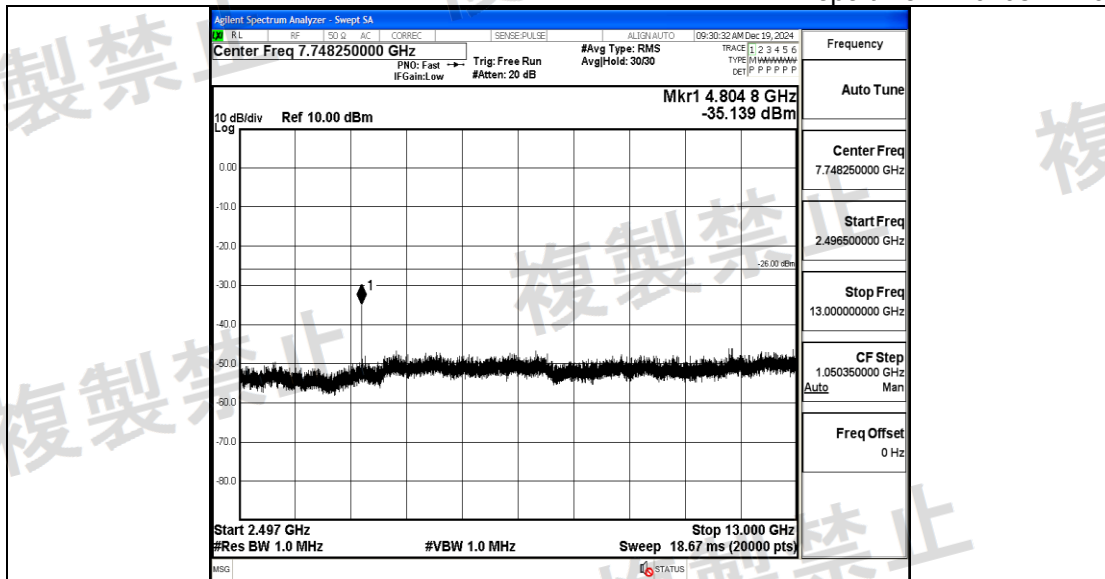
NTHV DH5 Ant1 2402 2387~2400



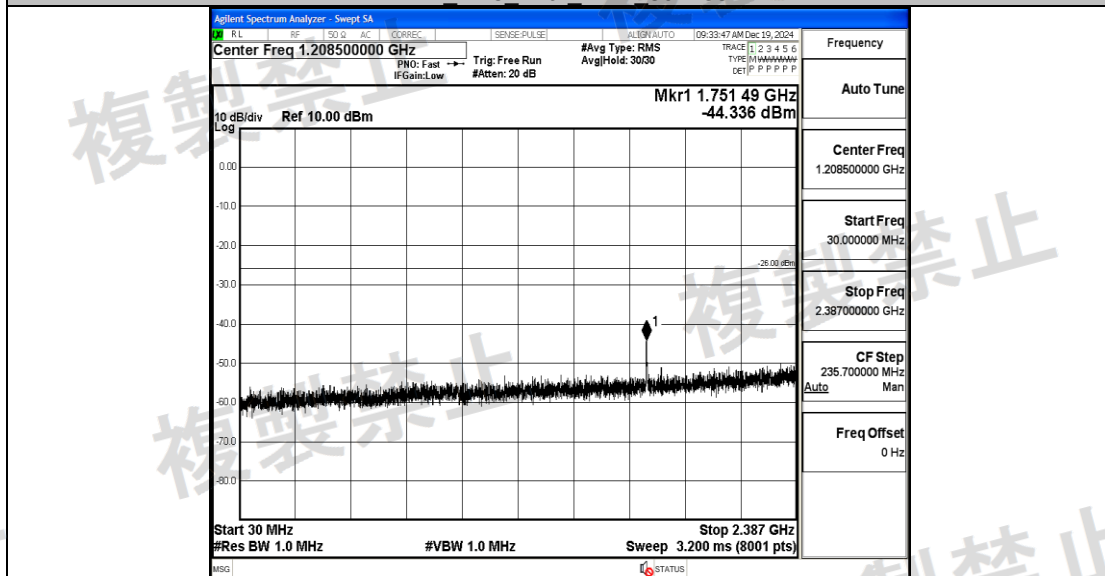
NTHV DH5 Ant1 2402 2483.5~2496.5



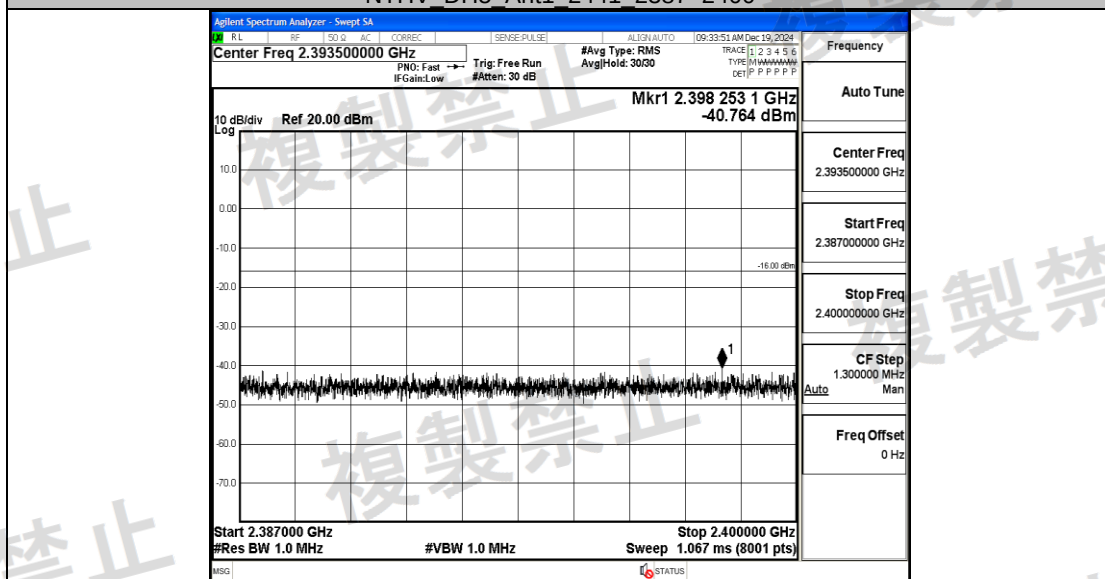
NTHV DH5 Ant1 2402 2496.5~13000



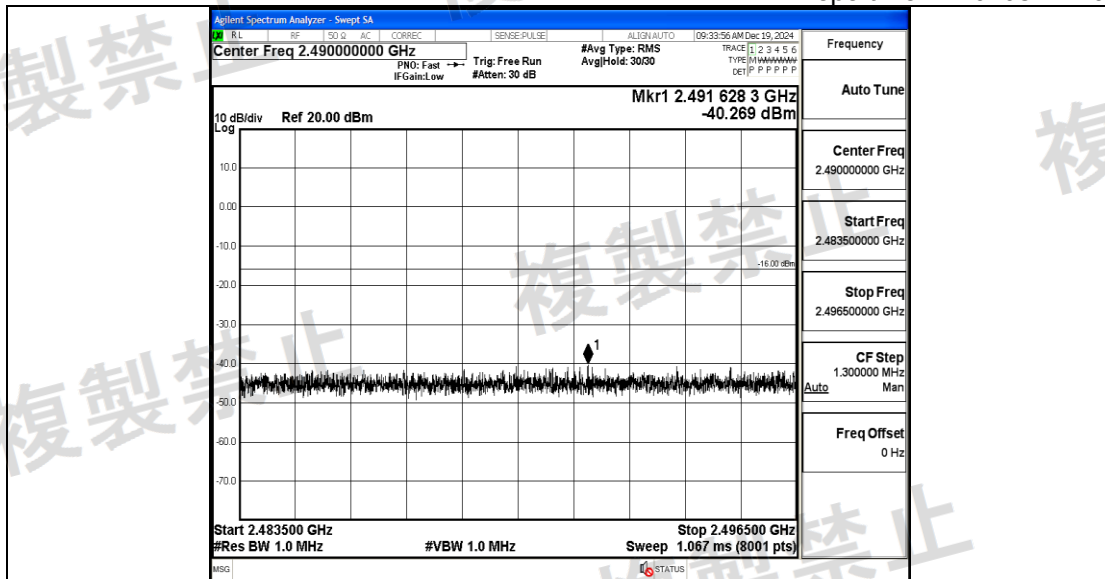
NTHV DH5 Ant1 2441 30~2387



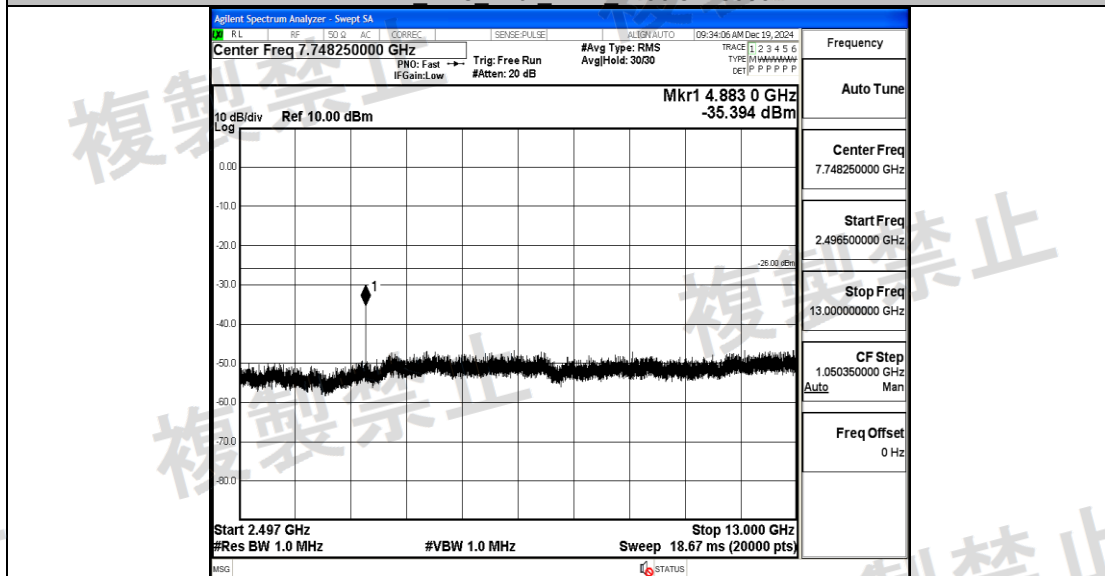
NTHV DH5 Ant1 2441 2387~2400



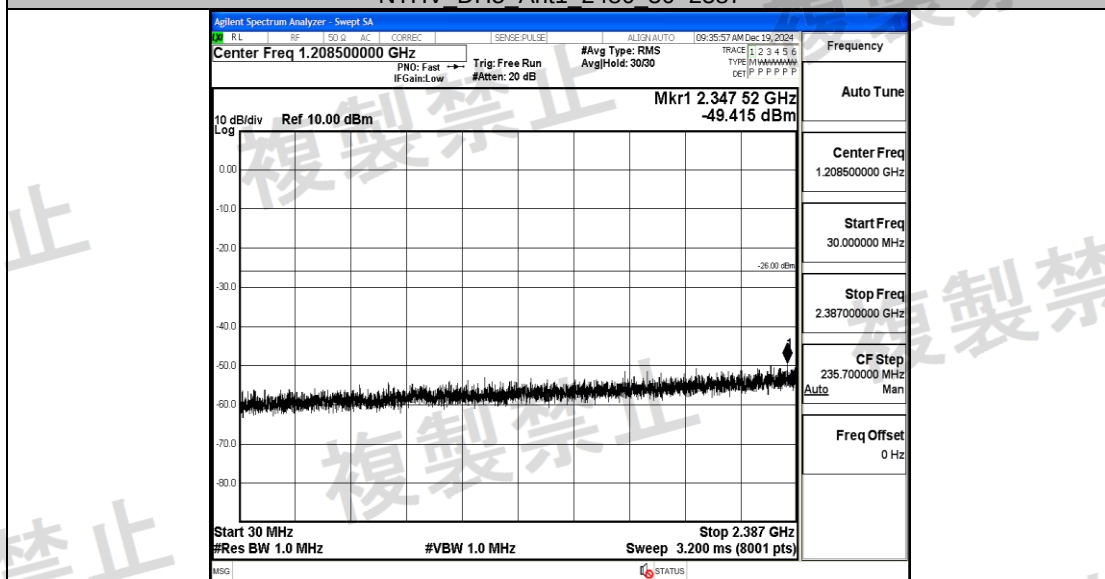
NTHV DH5 Ant1 2441 2483.5~2496.5



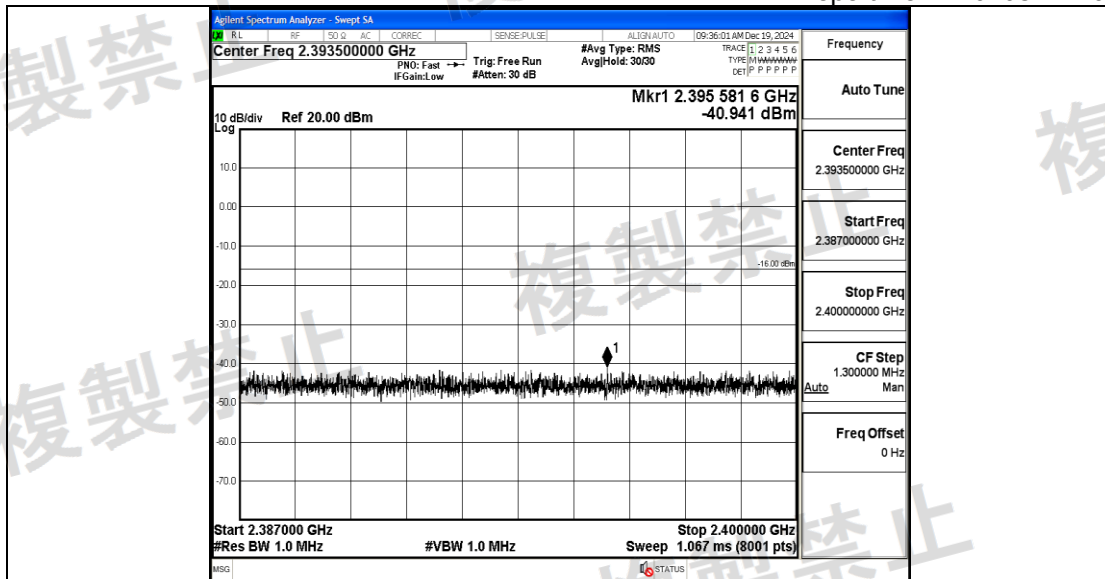
NTHV_DH5_Ant1_2441_2496.5~13000



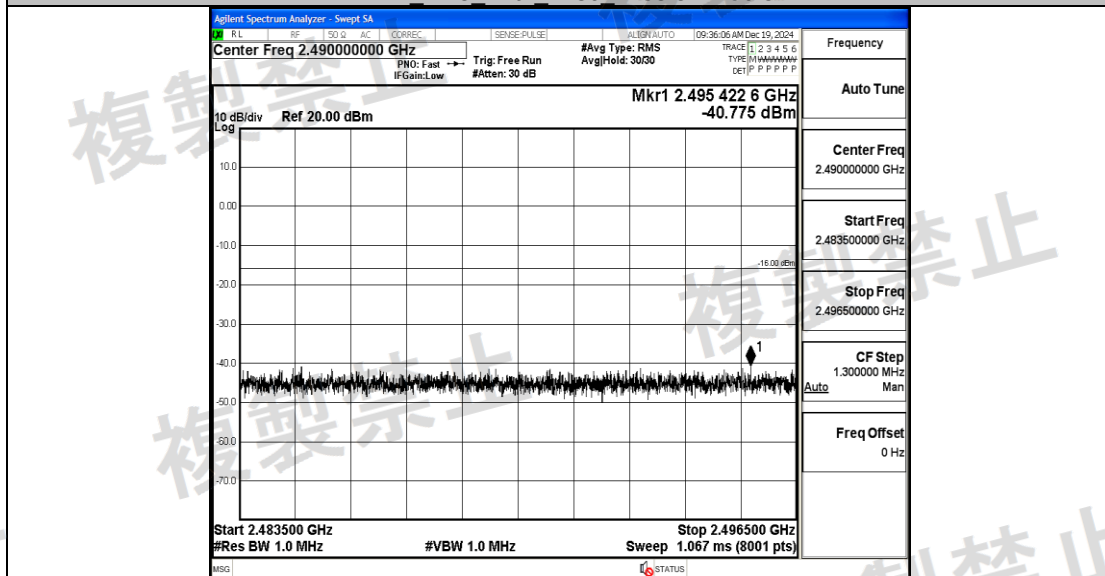
NTHV_DH5_Ant1_2480_30~2387



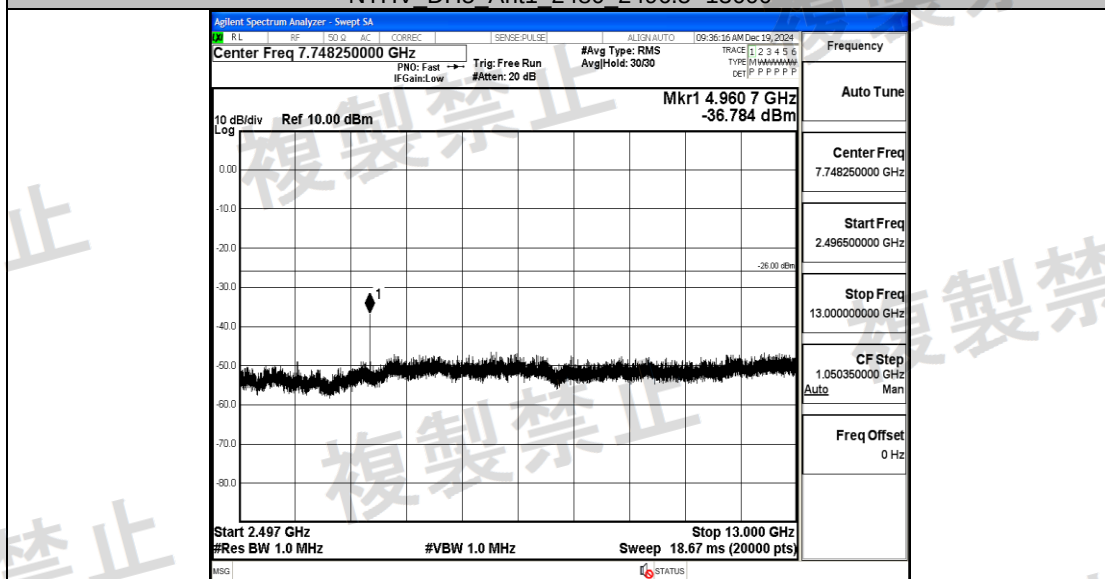
NTHV_DH5_Ant1_2480_2387~2400



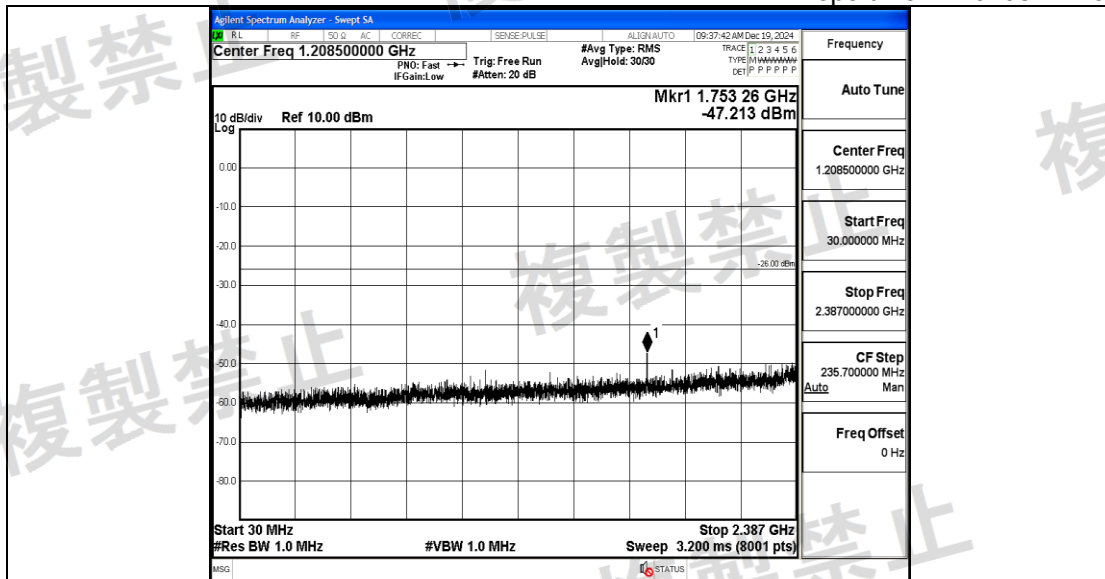
NTHV DH5 Ant1 2480 2483.5~2496.5



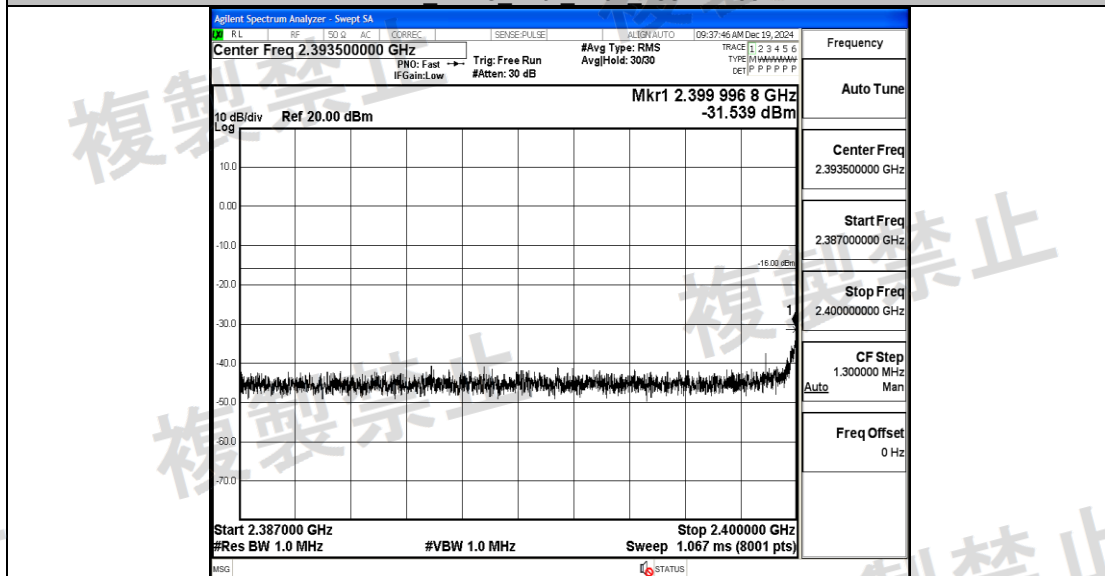
NTHV DH5 Ant1 2480 2496.5~13000



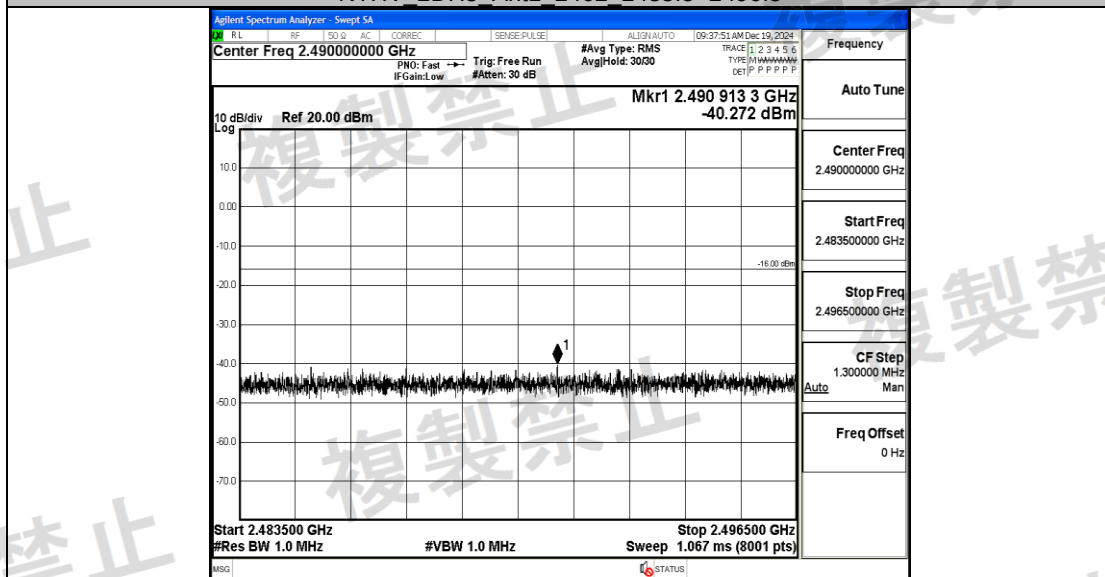
NTHV 2DH5 Ant1 2402 30~2387



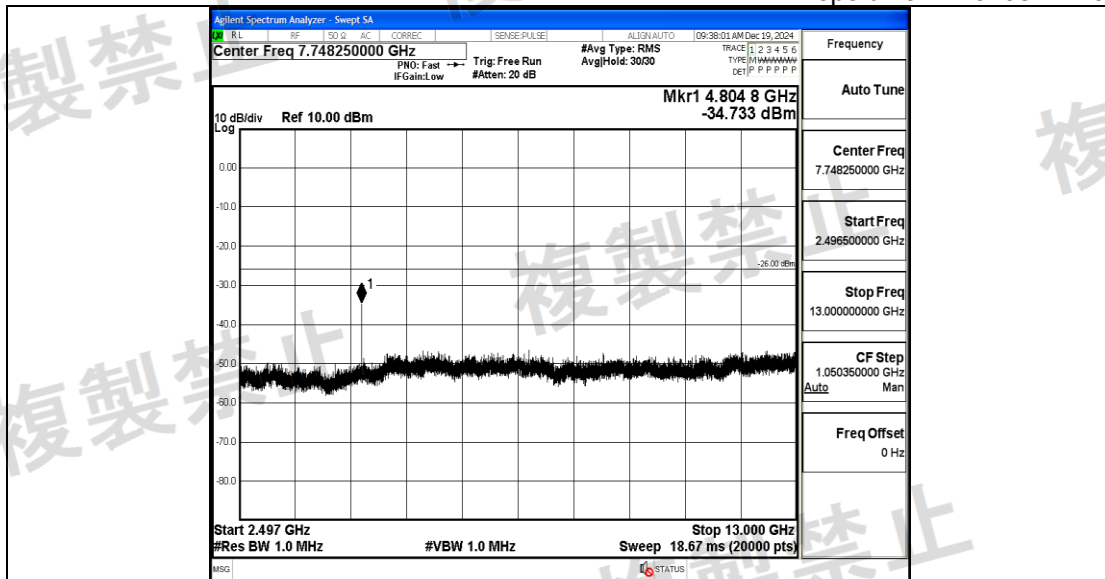
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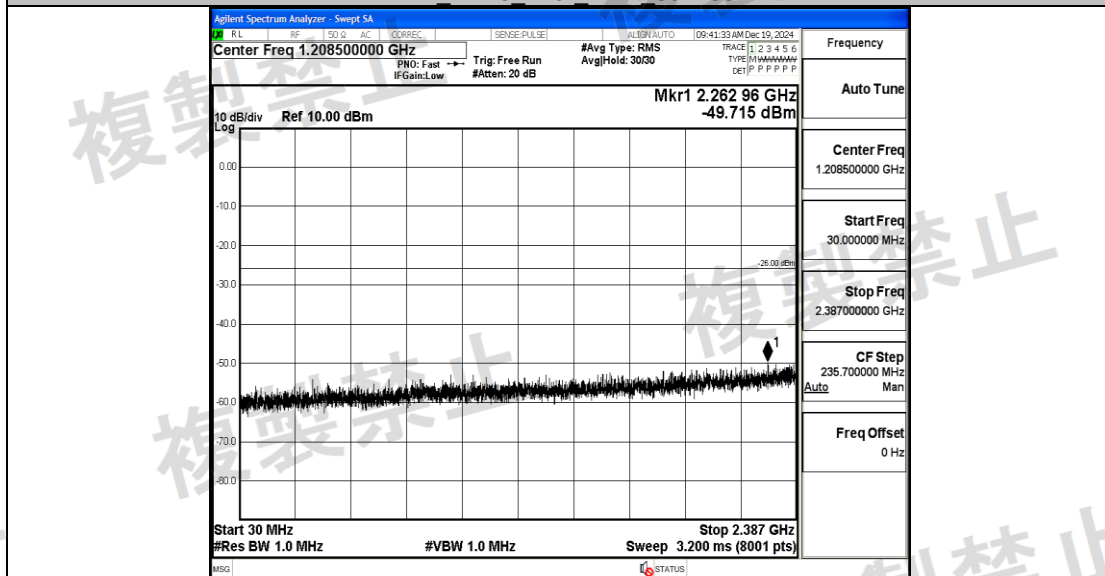
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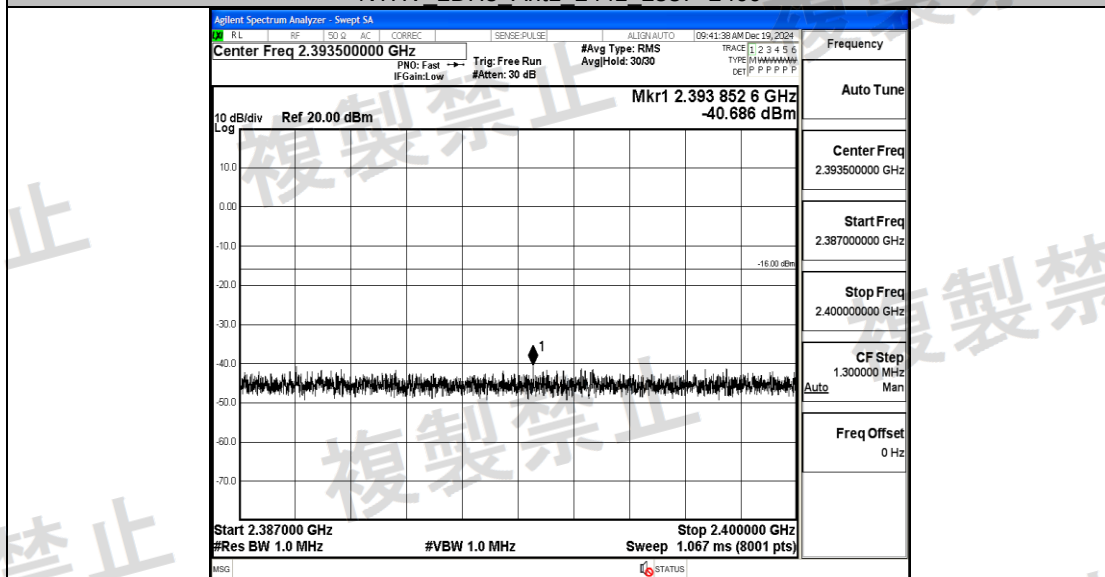
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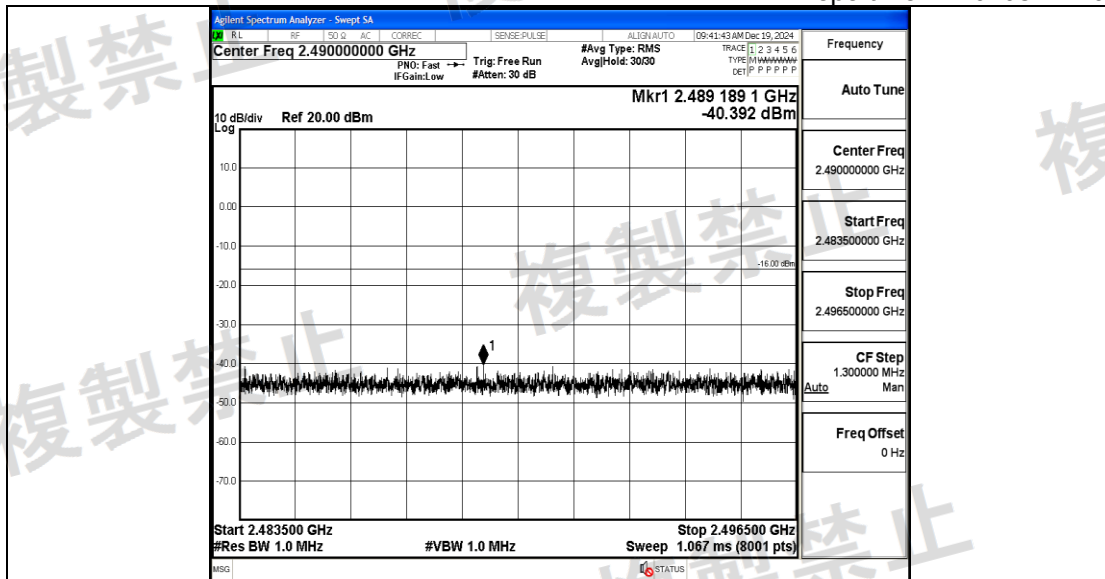
NTHV 2DH5 Ant1 2441 30~2387



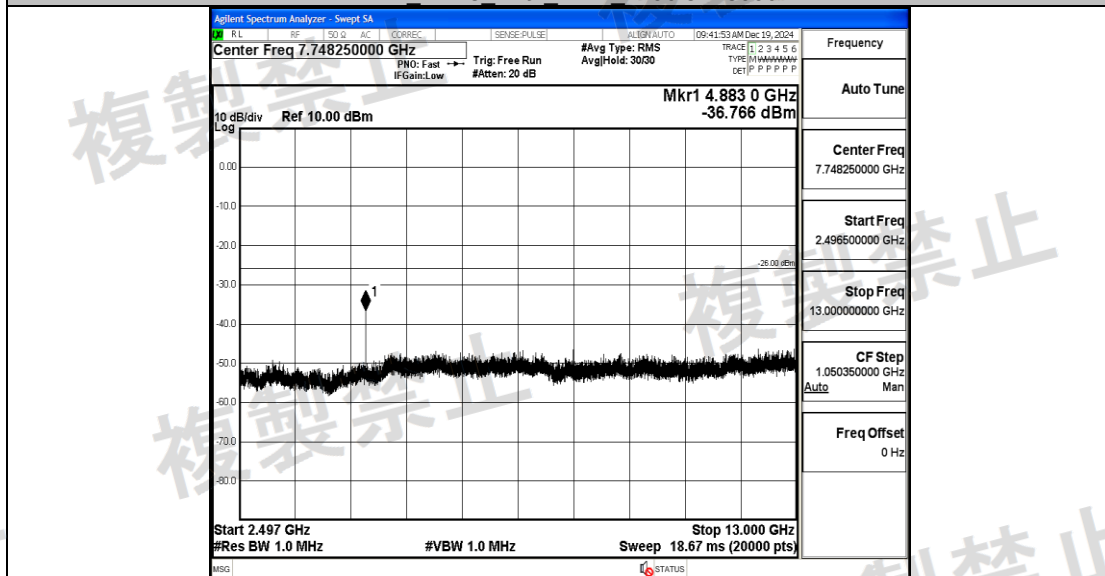
NTHV 2DH5 Ant1 2441 2387~2400



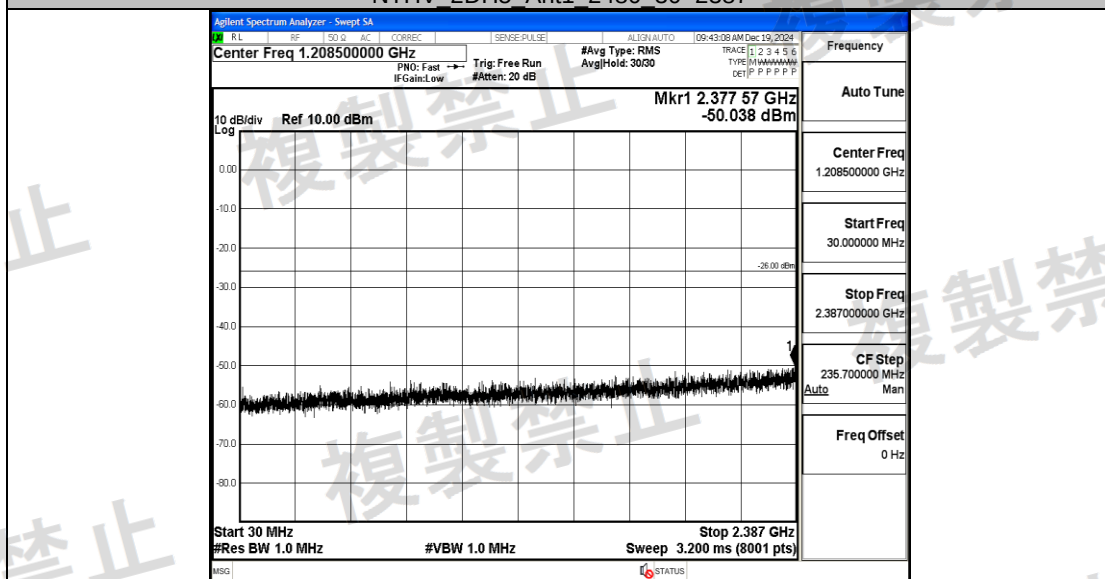
NTHV 2DH5 Ant1 2441 2483.5~2496.5



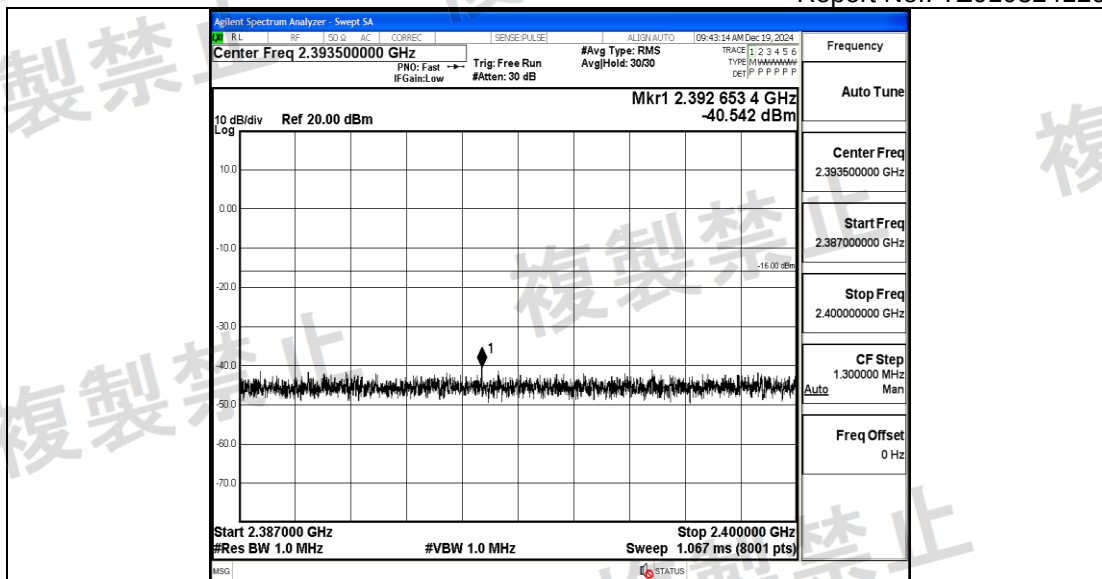
NTHV 2DH5 Ant1 2441 2496.5~13000



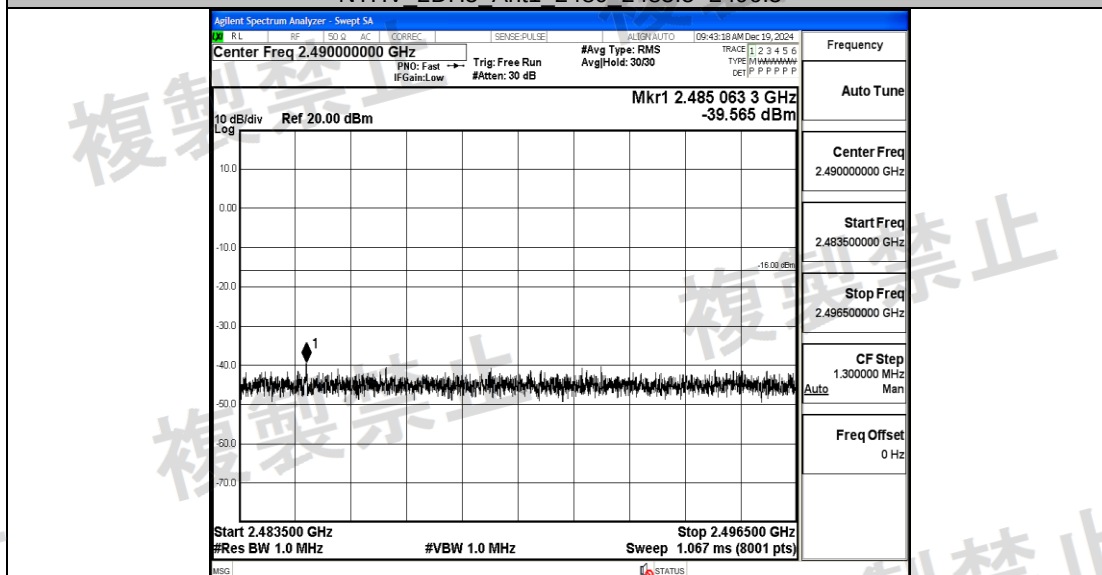
NTHV 2DH5 Ant1 2480 30~2387



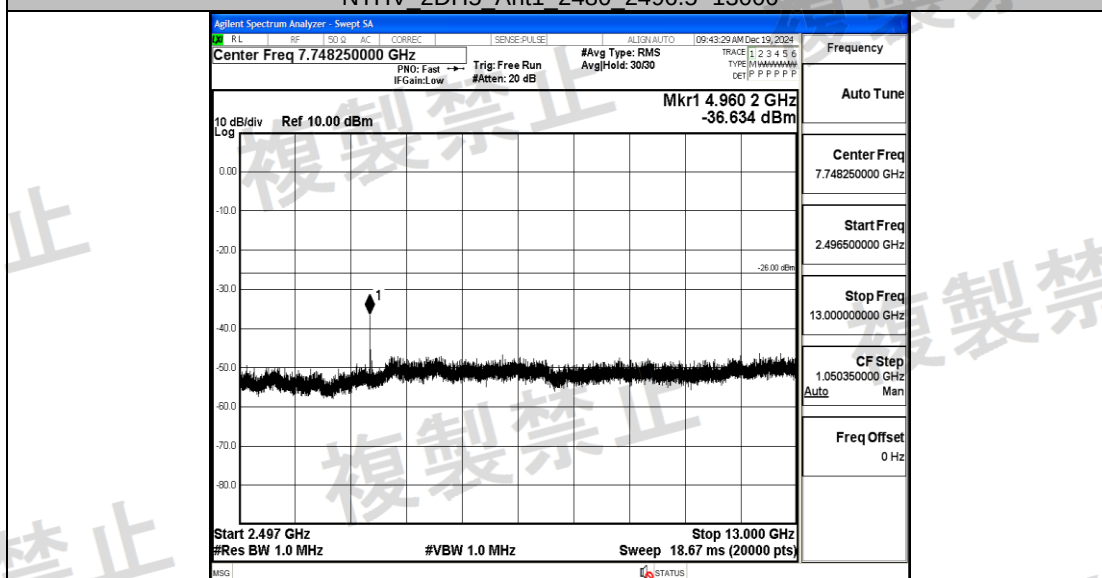
NTHV 2DH5 Ant1 2480 2387~2400



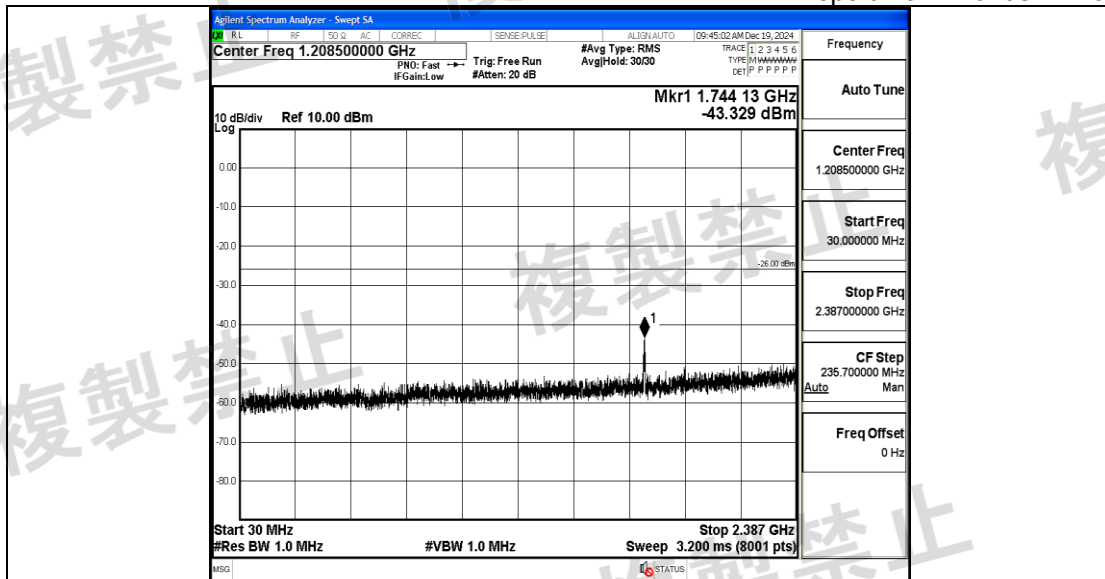
NTHV 2DH5 Ant1 2480 2483.5~2496.5



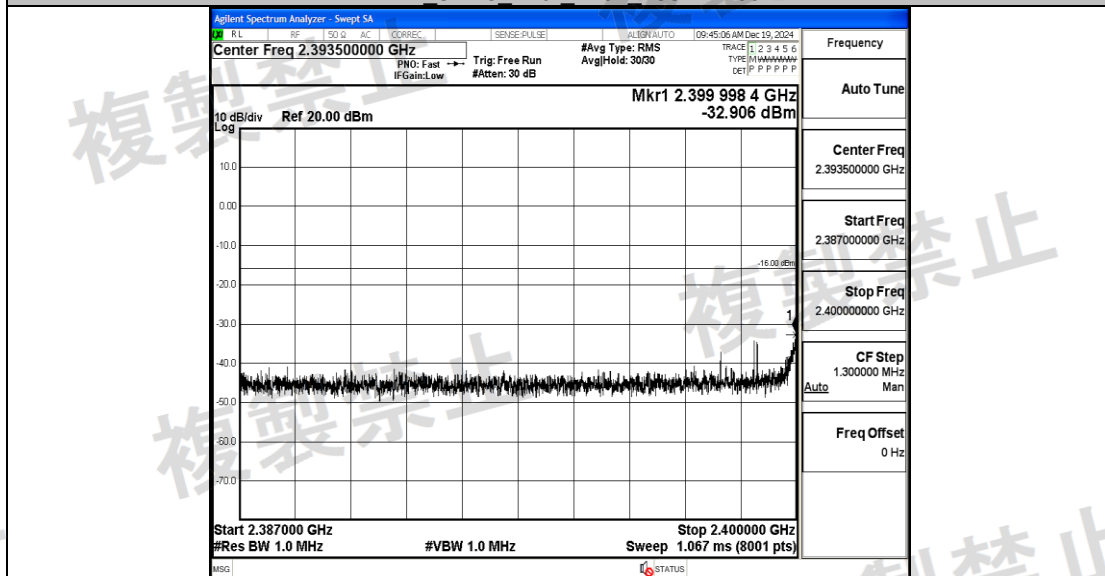
NTHV 2DH5 Ant1 2480 2496.5~13000



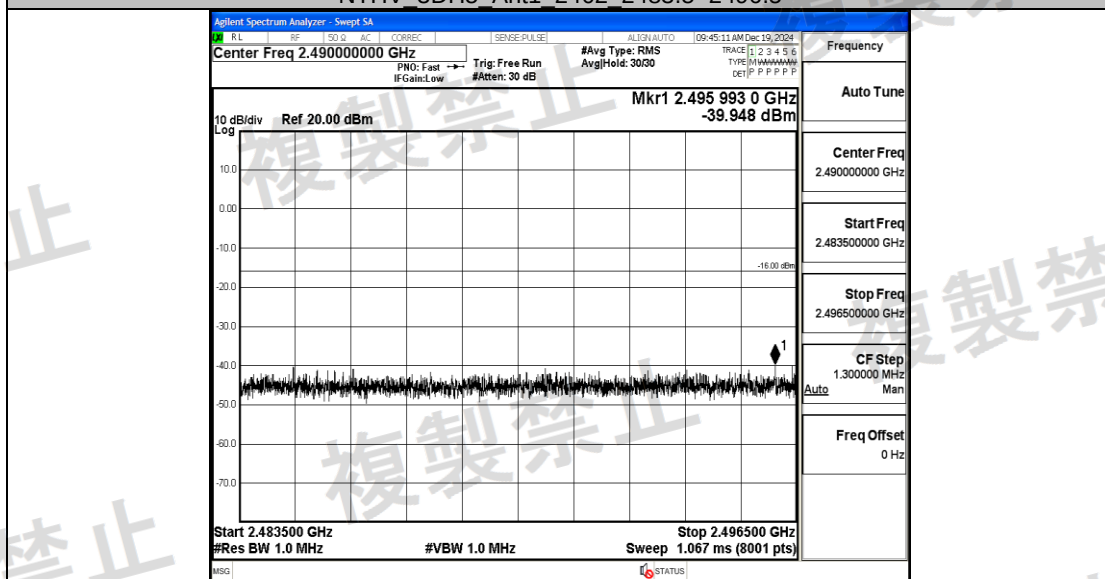
NTHV 3DH5 Ant1 2402 30~2387



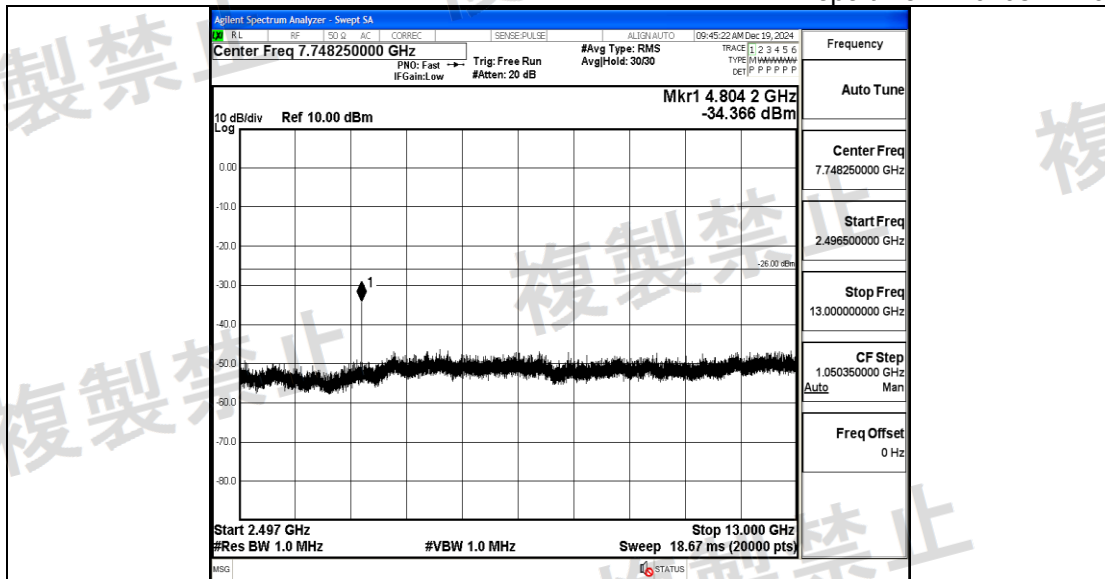
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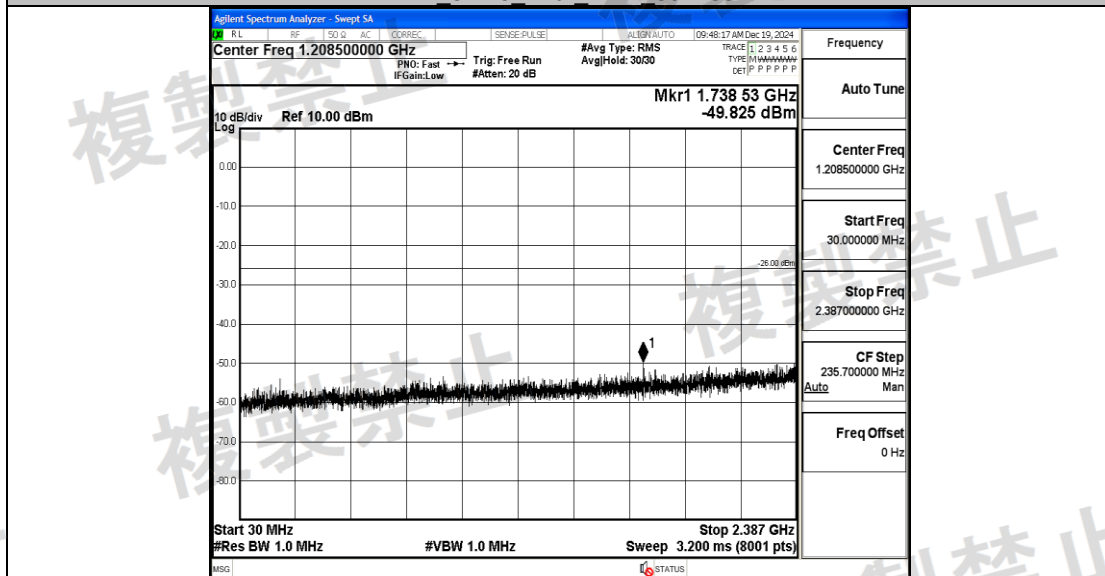
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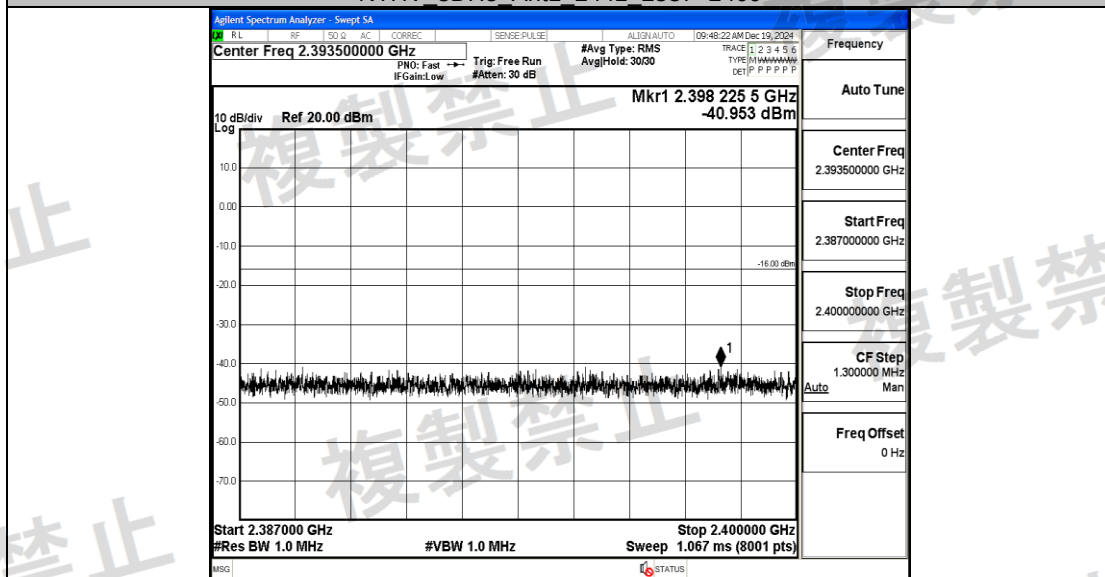
NTHV 3DH5 Ant1 2402 2496.5~13000



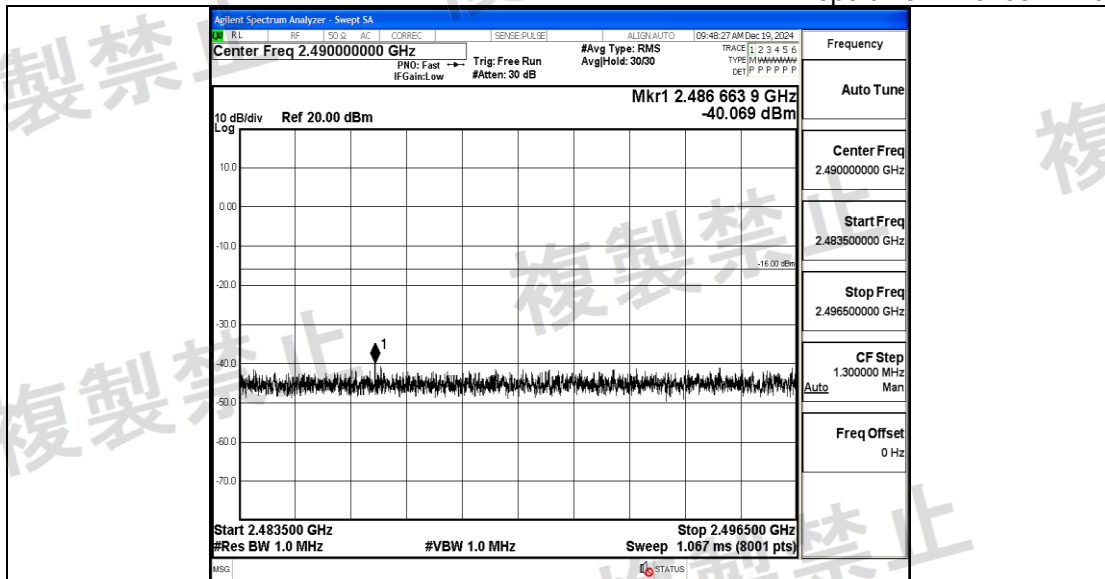
NTHV 3DH5 Ant1 2441 30~2387



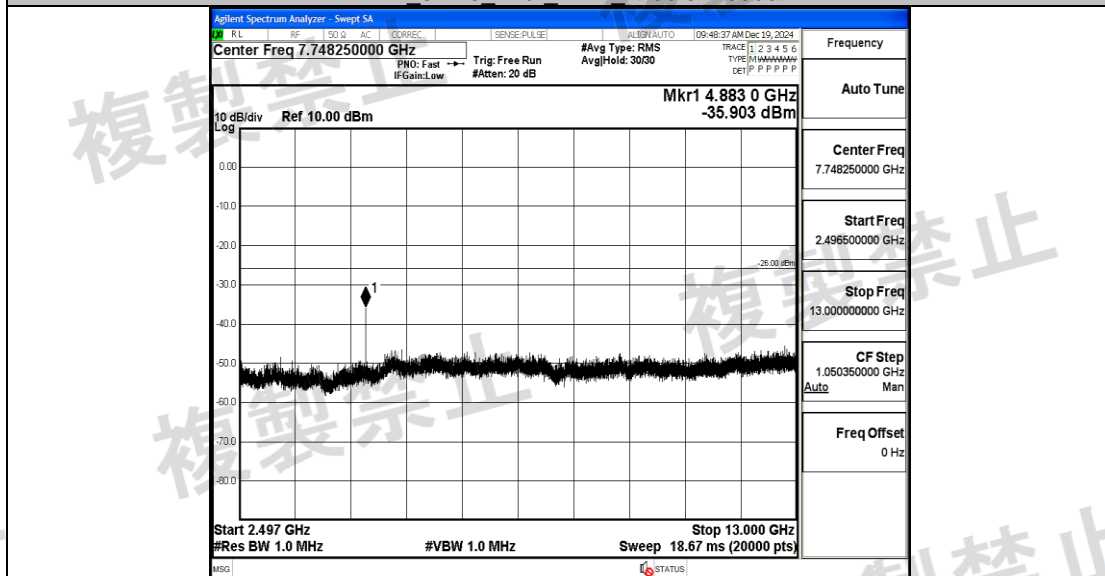
NTHV 3DH5 Ant1 2441 2387~2400



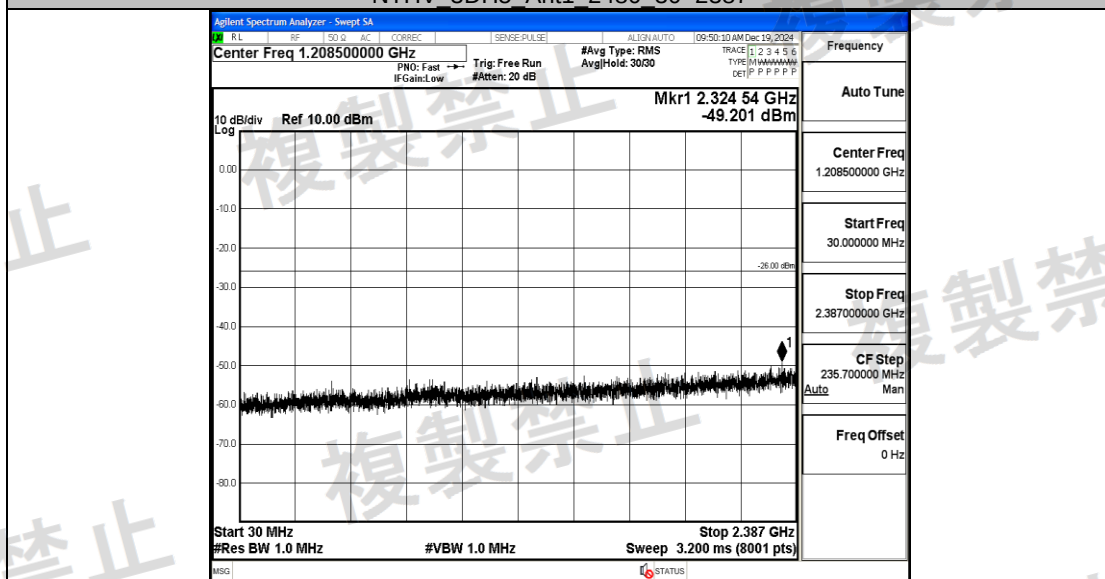
NTHV 3DH5 Ant1 2441 2483.5~2496.5



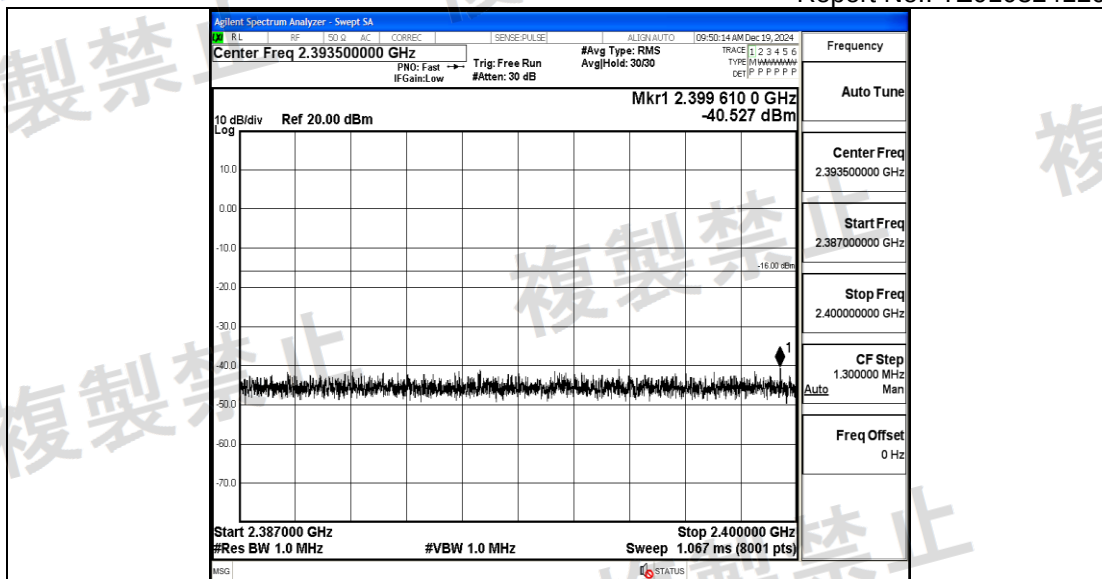
NTHV 3DH5 Ant1 2441 2496.5~13000



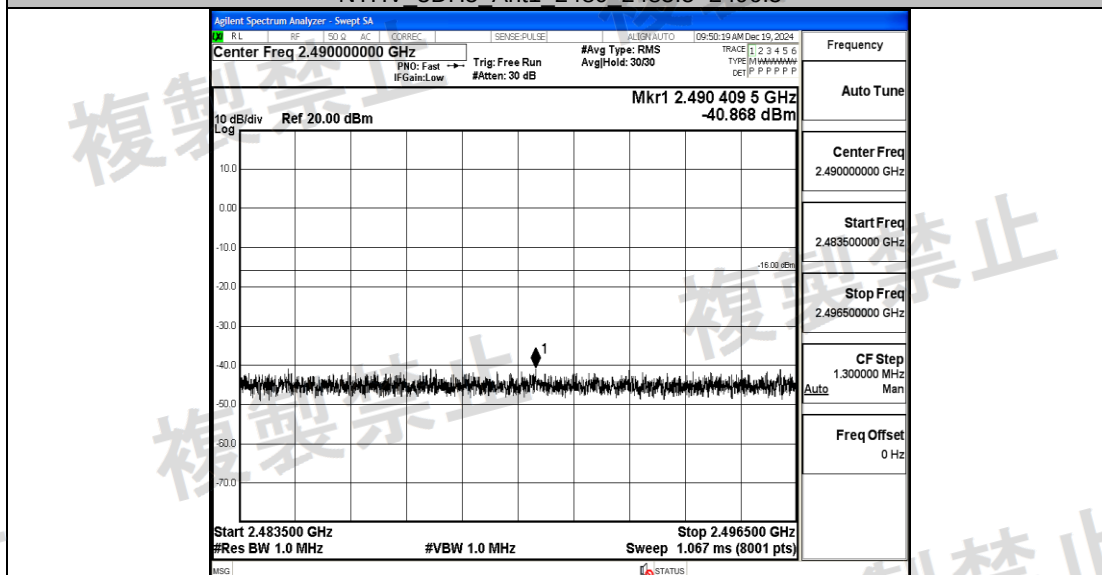
NTHV 3DH5 Ant1 2480 30~2387



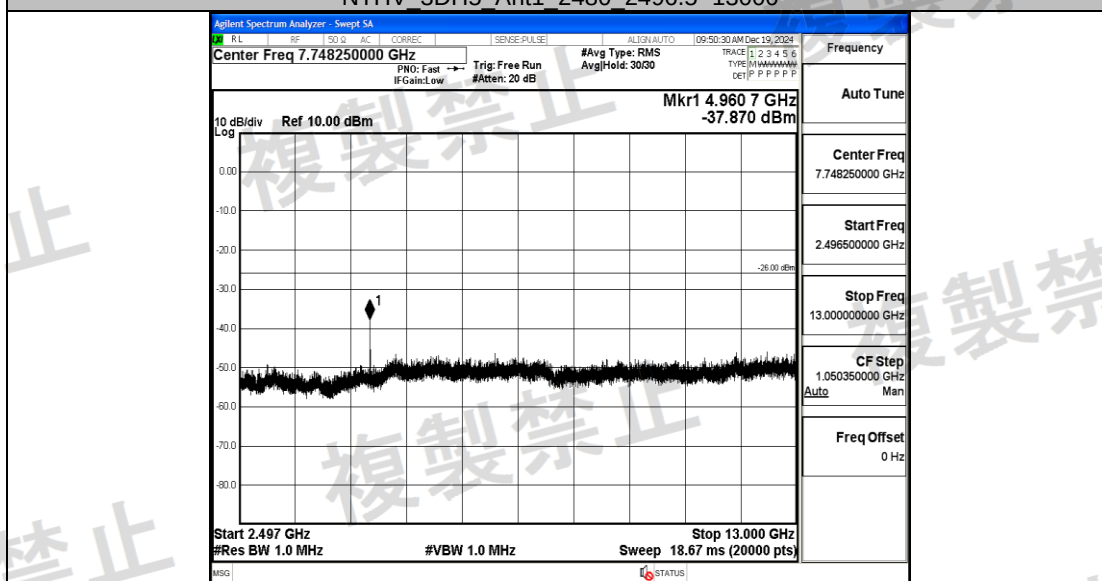
NTHV 3DH5 Ant1 2480 2387~2400



NTHV 3DH5 Ant1 2480 2483.5~2496.5



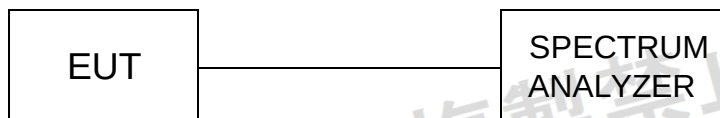
NTHV 3DH5 Ant1 2480 2496.5~13000





4.7. Limit of secondary radiated emissions

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

Frequency: 30MHz-13GHz

RBW:100KHz(30MHz-1GHz), 1MHz(1GHz-13GHz)

VBW:100KHz(30MHz-1GHz), 1MHz(1GHz-13GHz)

Sweep time:Auto

Dectector mode: Positive peak

Indication mode: max hold

LIMIT

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4 nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit

TEST RESULTS

Test Condition	Test Mode	Antenna	Freq (MHz)	Freq.Range [MHz]	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	DH5	Ant1	2402	30~1000	787.45	-72.61	≤-54	0.05483	≤4	PASS
				1000~13000	12450.97	-65.77	≤-47	0.26485	≤20	PASS
			2441	30~1000	715.18	-72.97	≤-54	0.05047	≤4	PASS
				1000~13000	12337.57	-66.07	≤-47	0.24717	≤20	PASS
			2480	30~1000	859.96	-72.09	≤-54	0.06180	≤4	PASS
				1000~13000	2426.27	-65.69	≤-47	0.26977	≤20	PASS
	2DH5	Ant1	2402	30~1000	984.84	-73.15	≤-54	0.04842	≤4	PASS
				1000~13000	7769.54	-66.91	≤-47	0.20370	≤20	PASS
			2441	30~1000	912.70	-73.14	≤-54	0.04853	≤4	PASS
				1000~13000	12498.37	-66.33	≤-47	0.23281	≤20	PASS
			2480	30~1000	855.83	-72.60	≤-54	0.05495	≤4	PASS
				1000~13000	11789.14	-67.06	≤-47	0.19679	≤20	PASS
	3DH5	Ant1	2402	30~1000	887.12	-72.19	≤-54	0.06039	≤4	PASS
				1000~13000	12280.56	-66.08	≤-47	0.24660	≤20	PASS
			2441	30~1000	761.14	-72.84	≤-54	0.05200	≤4	PASS
				1000~13000	12704.	-66.80	≤-47	0.2089	≤20	PASS



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					19			3		
			2480	30~1000	971.51	-72.58	≤-54	0.0552 1	≤4	PASS
NTLV	DH5	Ant1	2402	1000~13000	7703.5 4	-65.96	≤-47	0.2535 1	≤20	PASS
				30~1000	806.12	-73.12	≤-54	0.0487 5	≤4	PASS
			2441	1000~13000	12224. 16	-66.76	≤-47	0.2108 6	≤20	PASS
				30~1000	914.16	-72.96	≤-54	0.0505 8	≤4	PASS
			2480	1000~13000	12308. 17	-67.05	≤-47	0.1972 4	≤20	PASS
				30~1000	807.58	-73.07	≤-54	0.0493 2	≤4	PASS
	2DH5	Ant1	2402	1000~13000	6211.2 6	-66.65	≤-47	0.2162 7	≤20	PASS
				30~1000	781.02	-71.78	≤-54	0.0663 7	≤4	PASS
			2441	1000~13000	12434. 17	-66.19	≤-47	0.2404 4	≤20	PASS
				30~1000	968.11	-73.40	≤-54	0.0457 1	≤4	PASS
			2480	1000~13000	1751.2 4	-64.64	≤-47	0.3435 6	≤20	PASS
				30~1000	905.30	-70.90	≤-54	0.0812 8	≤4	PASS
	3DH5	Ant1	2402	1000~13000	12611. 78	-66.21	≤-47	0.2393 3	≤20	PASS
				30~1000	868.32	-72.52	≤-54	0.0559 8	≤4	PASS
			2441	1000~13000	12485. 17	-66.24	≤-47	0.2376 8	≤20	PASS
				30~1000	774.84	-73.00	≤-54	0.0501 2	≤4	PASS
			2480	1000~13000	12459. 37	-66.58	≤-47	0.2197 9	≤20	PASS
				30~1000	821.16	-72.73	≤-54	0.0533 3	≤4	PASS
NTHV	DH5	Ant1	2402	1000~13000	12674. 18	-66.83	≤-47	0.2074 9	≤20	PASS
				30~1000	990.54	-72.88	≤-54	0.0515 2	≤4	PASS
			2441	1000~13000	12593. 78	-66.15	≤-47	0.2426 6	≤20	PASS
				30~1000	917.19	-72.73	≤-54	0.0533 3	≤4	PASS
			2480	1000~13000	2480.2 7	-61.45	≤-47	0.7161 4	≤20	PASS
				30~1000	507.36	-73.20	≤-54	0.0478 6	≤4	PASS
	2DH5	Ant1	2402	1000~13000	12359. 17	-66.48	≤-47	0.2249 1	≤20	PASS
				30~1000	920.34	-72.47	≤-54	0.0566 2	≤4	PASS
			2441	1000~13000	7743.7 4	-66.14	≤-47	0.2432 2	≤20	PASS
				30~1000	900.21	-72.14	≤-54	0.0610 9	≤4	PASS
			2480	1000~13000	12174. 36	-66.81	≤-47	0.2084 5	≤20	PASS
				30~1000	891.24	-72.67	≤-54	0.0540 8	≤4	PASS
	3DH5	Ant1	2402	30~1000	11890. 54	-65.85	≤-47	0.2600 2	≤20	PASS
					889.54	-72.53	≤-54	0.0558 5	≤4	PASS



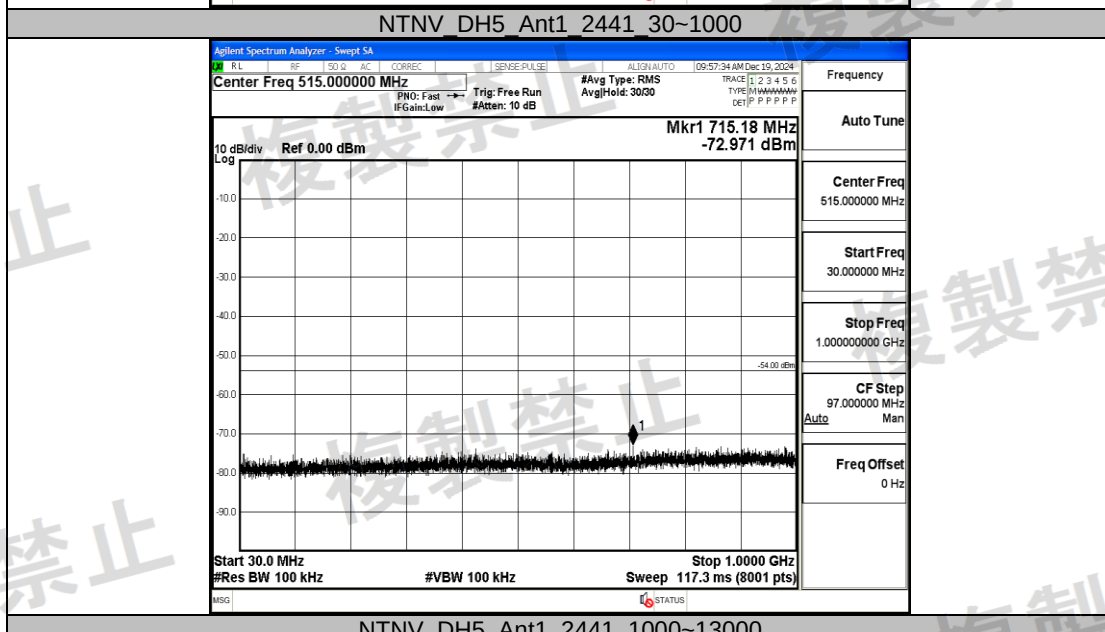
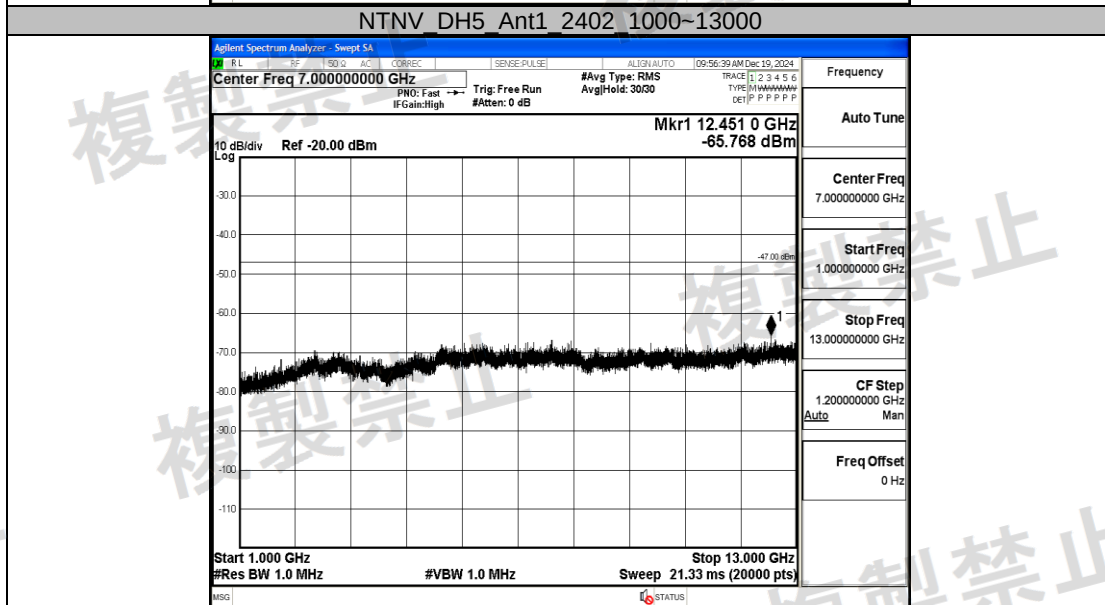
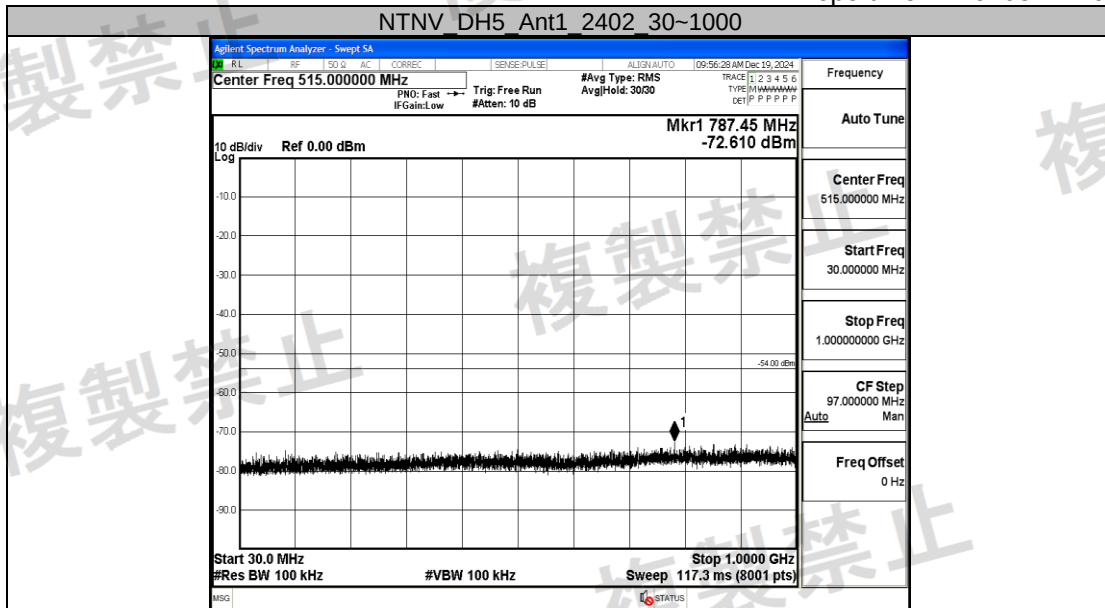
Report No.: TZ0103241201TRF01

				1000~13000	12951.40	-66.33	≤-47	0.23281	≤20	PASS
			2441	30~1000	928.71	-72.56	≤-54	0.05546	≤4	PASS
				1000~13000	12707.19	-65.95	≤-47	0.25410	≤20	PASS
			2480	30~1000	802.48	-72.64	≤-54	0.05445	≤4	PASS
				1000~13000	12566.78	-65.60	≤-47	0.27542	≤20	PASS

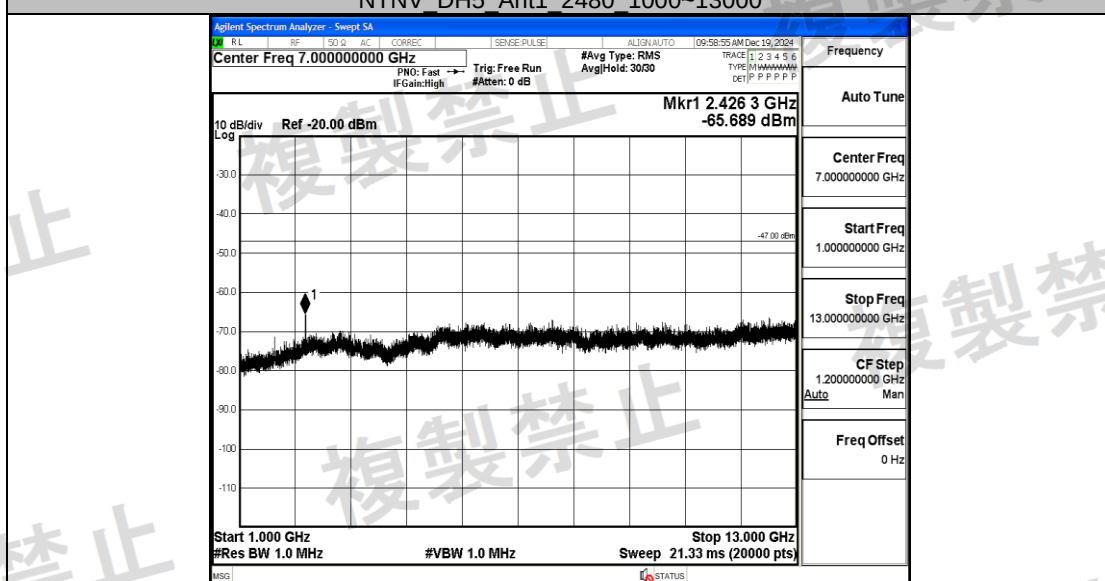
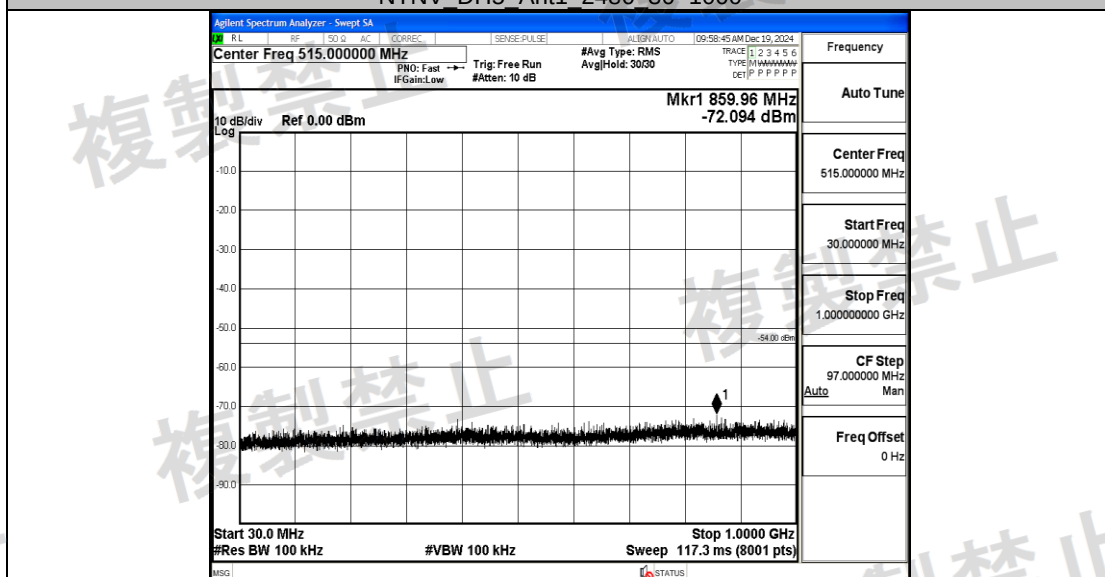
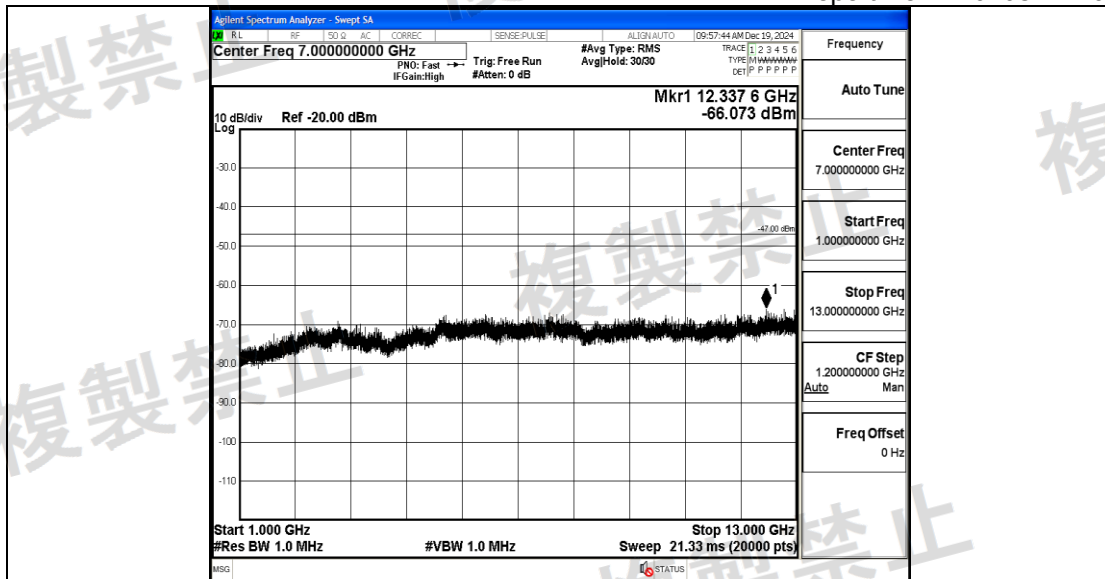
Note: 1. The product was tested at 25 °C and 55% humidity condition;

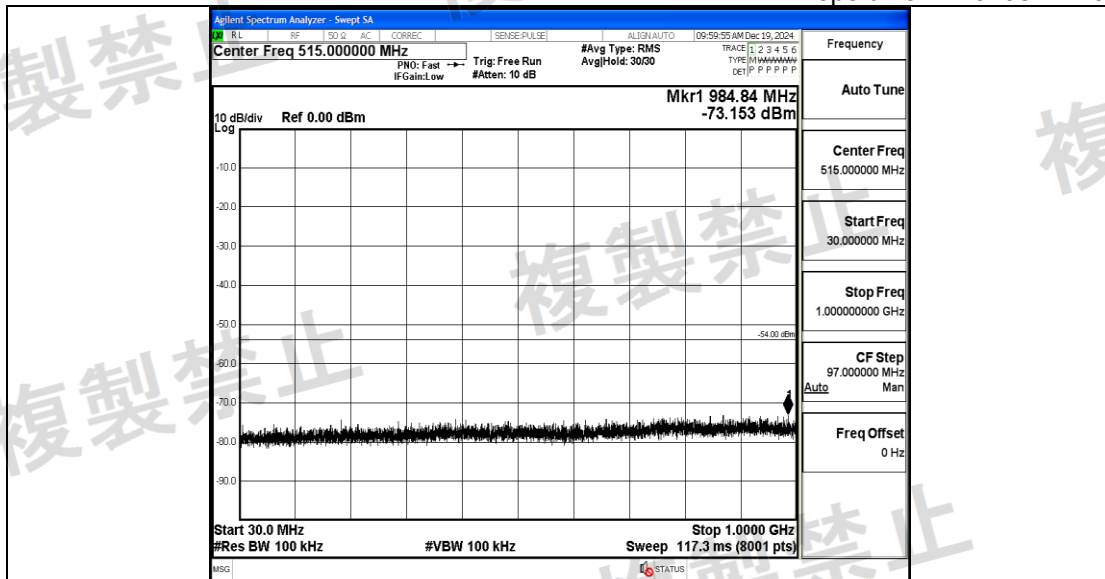
2. All condition has been tested, list the worst case in this item

Test plot as follows:

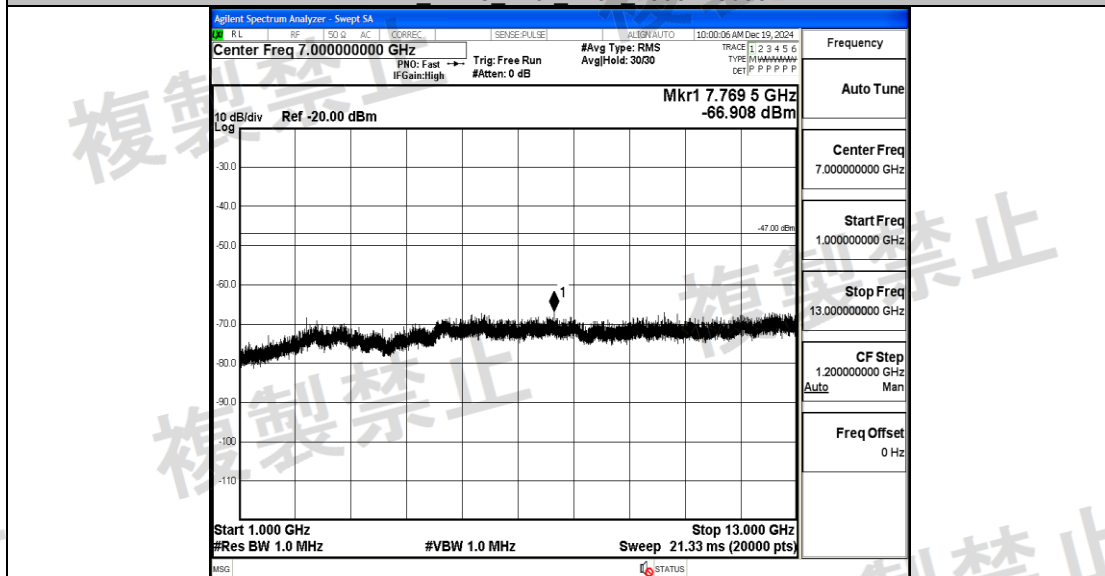


NTNV DH5 Ant1 2441 1000~13000

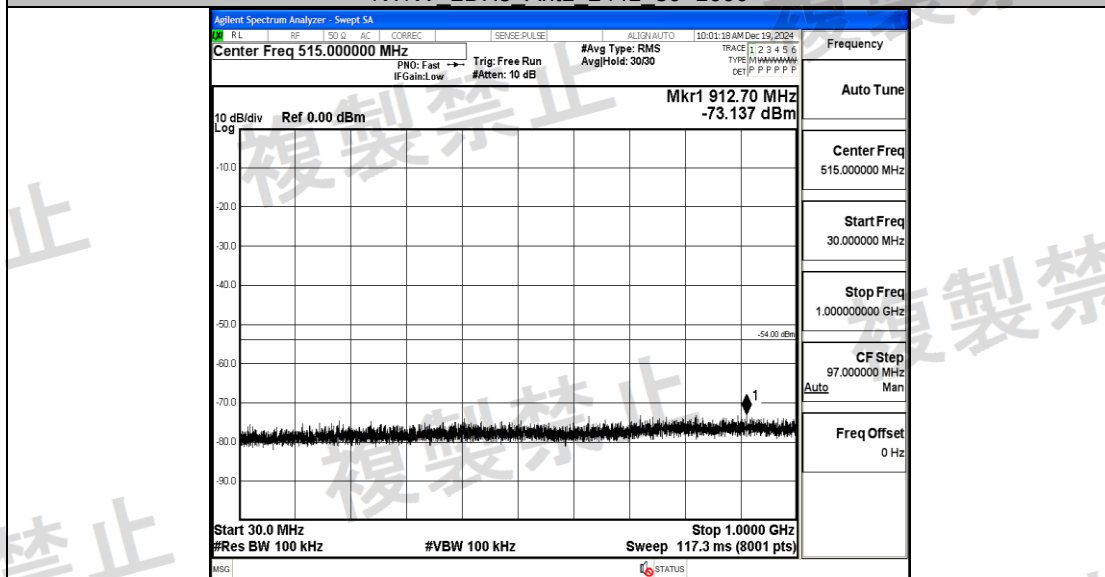




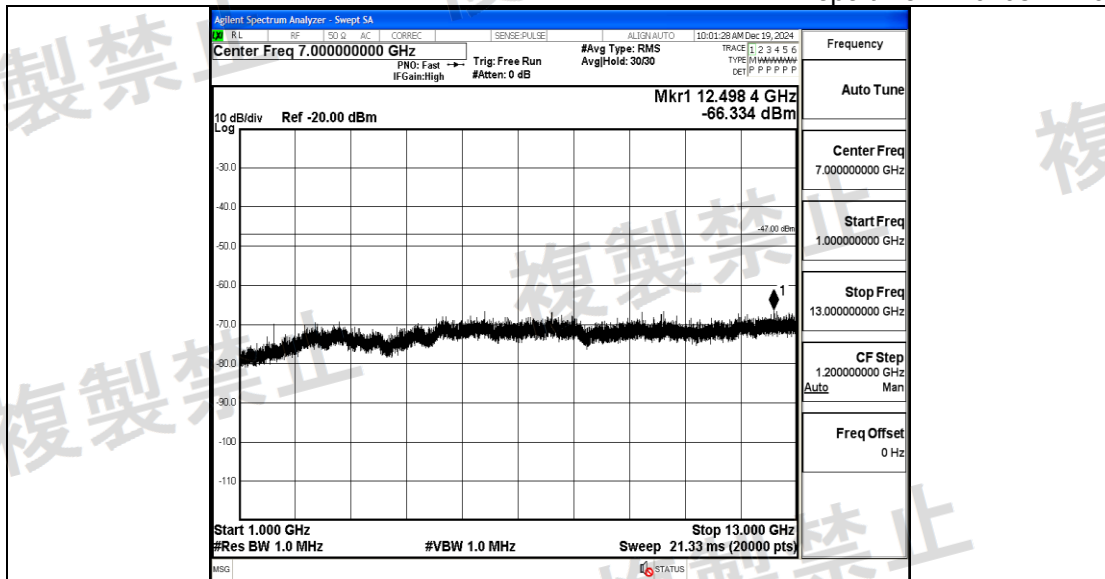
NTNV 2DH5 Ant1 2402 1000~13000



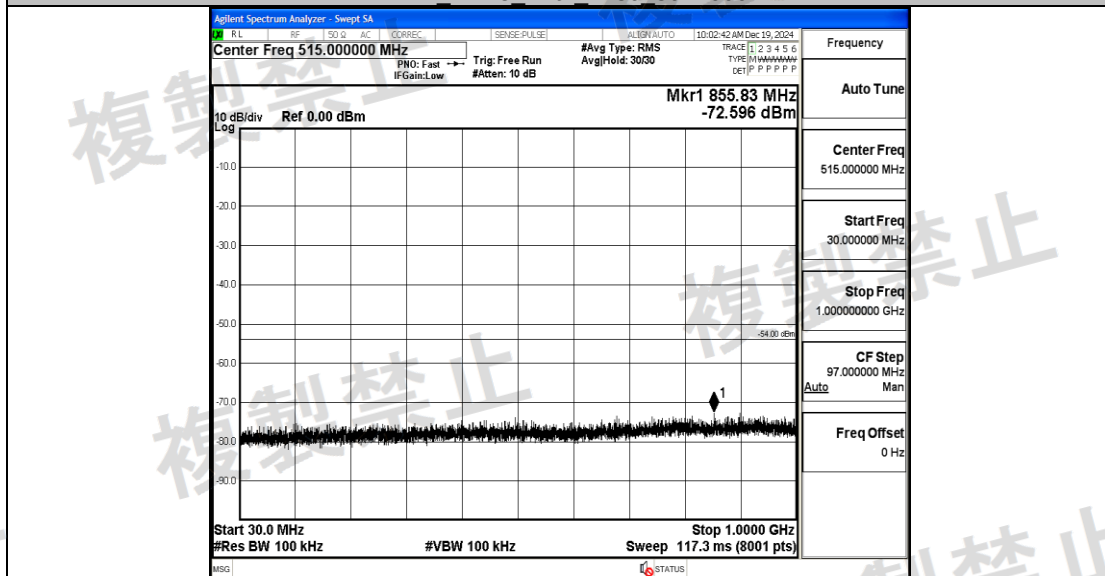
NTNV 2DH5 Ant1 2441 30~1000



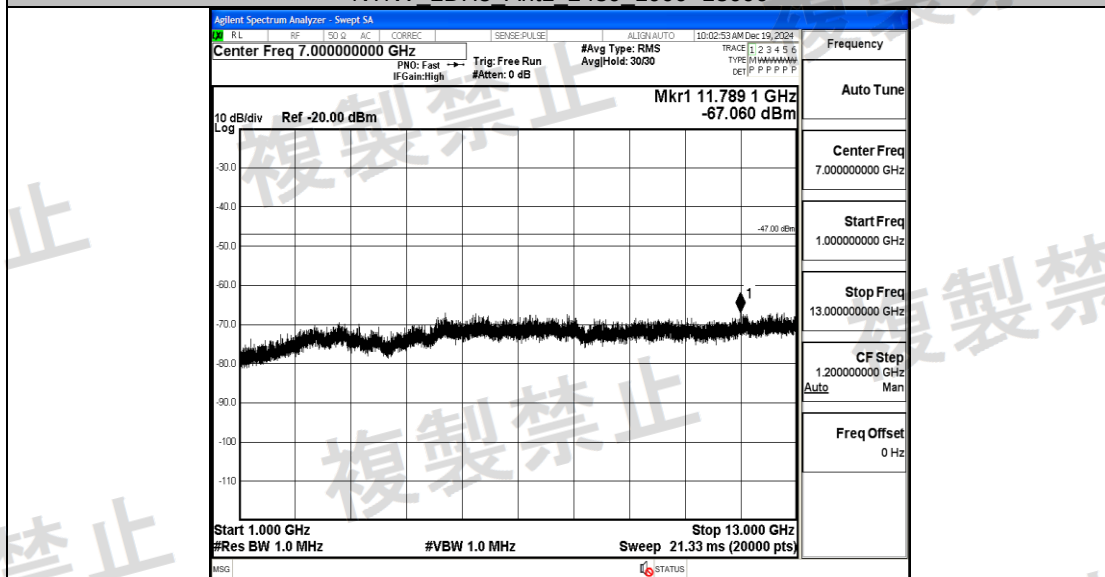
NTNV 2DH5 Ant1 2441 1000~13000



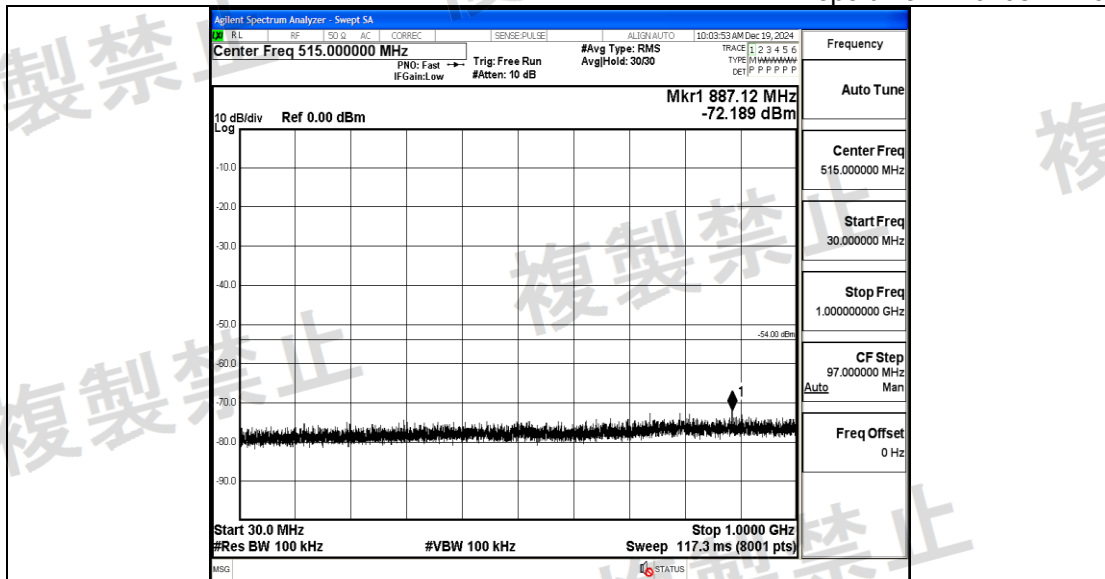
NTNV 2DH5 Ant1 2480 30~1000



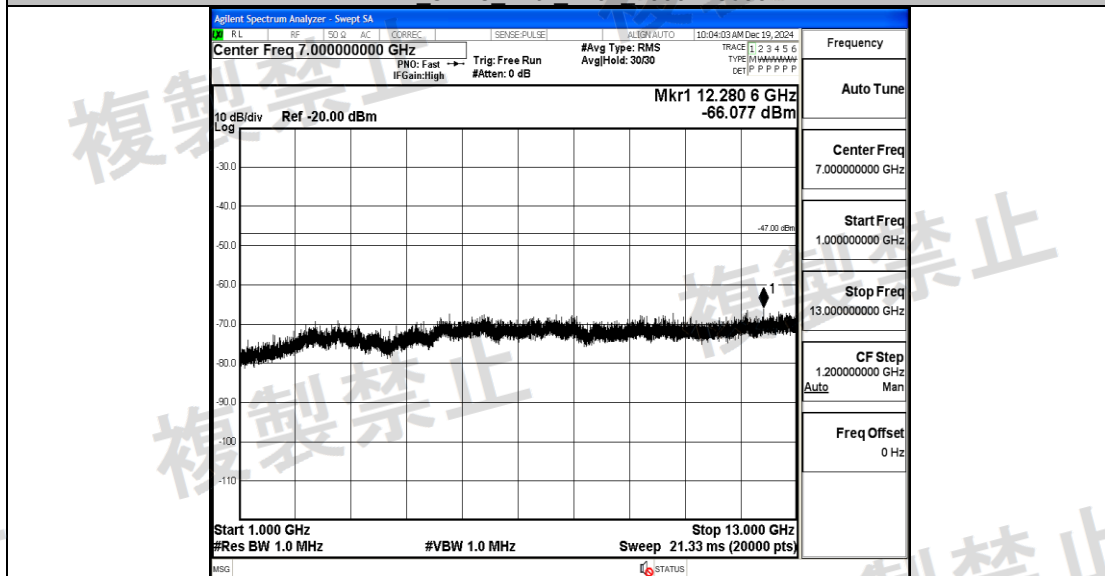
NTNV 2DH5 Ant1 2480 1000~13000



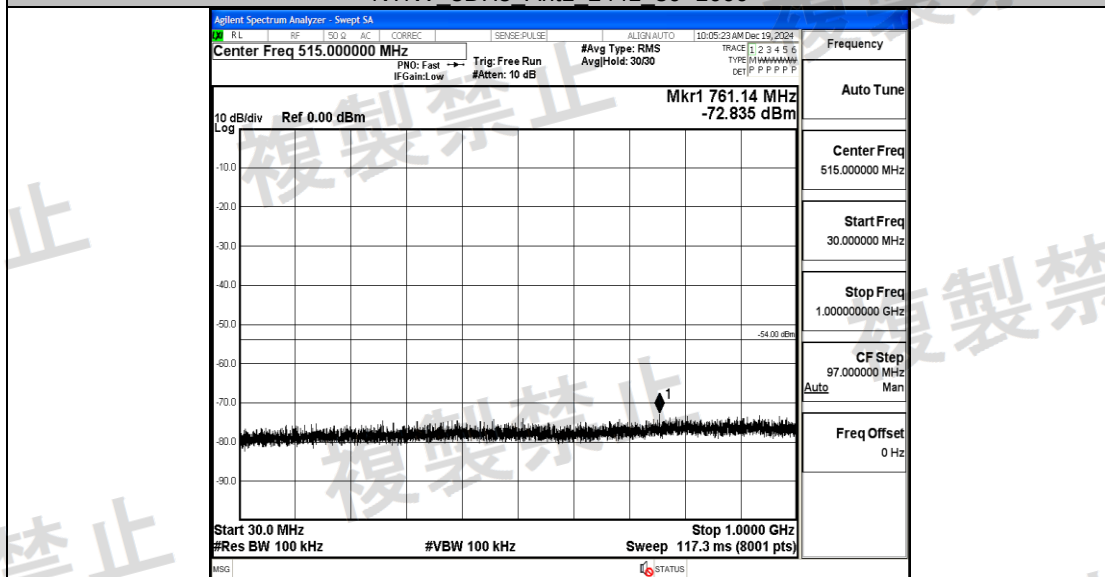
NTNV 3DH5 Ant1 2402 30~1000



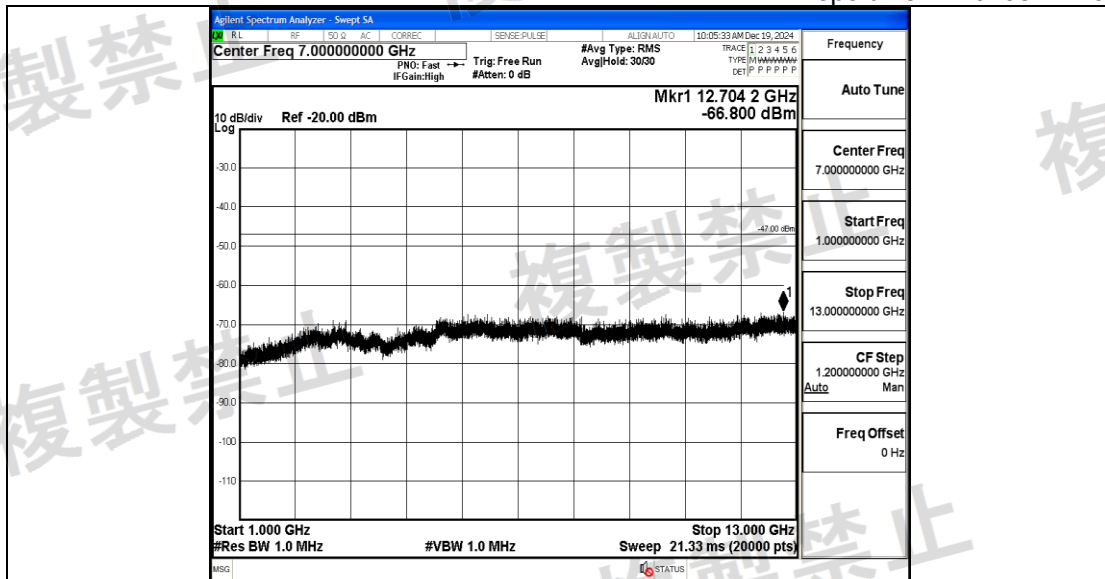
NTNV 3DH5 Ant1 2402 1000~13000



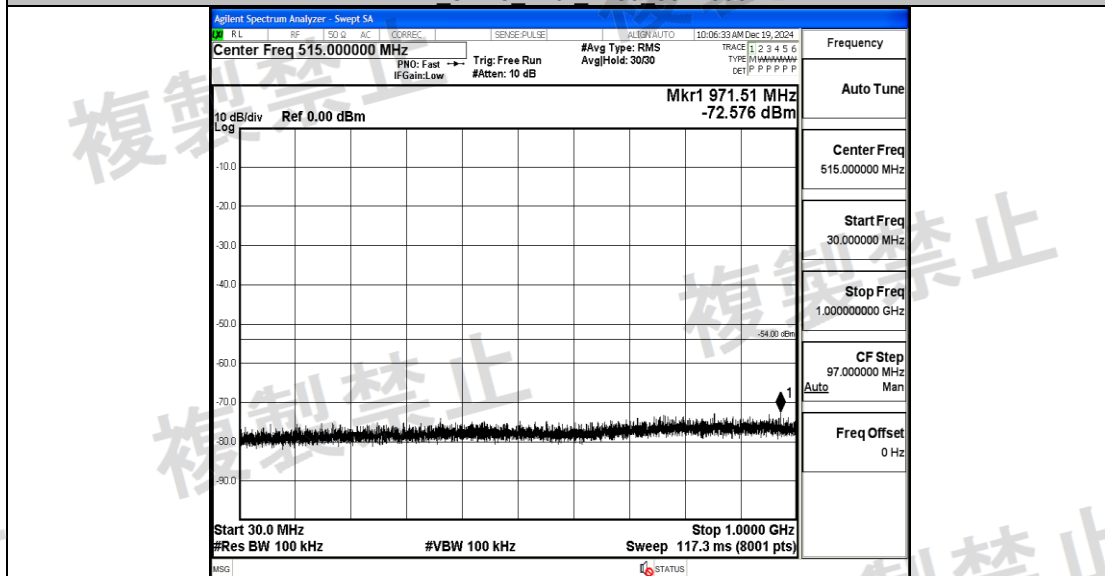
NTNV 3DH5 Ant1 2441 30~1000



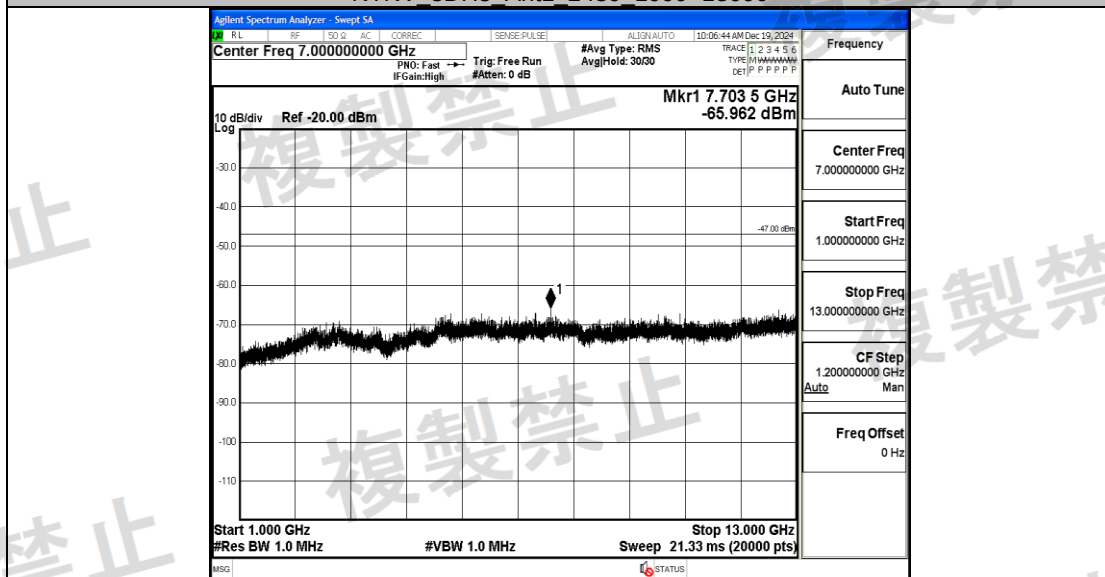
NTNV 3DH5 Ant1 2441 1000~13000



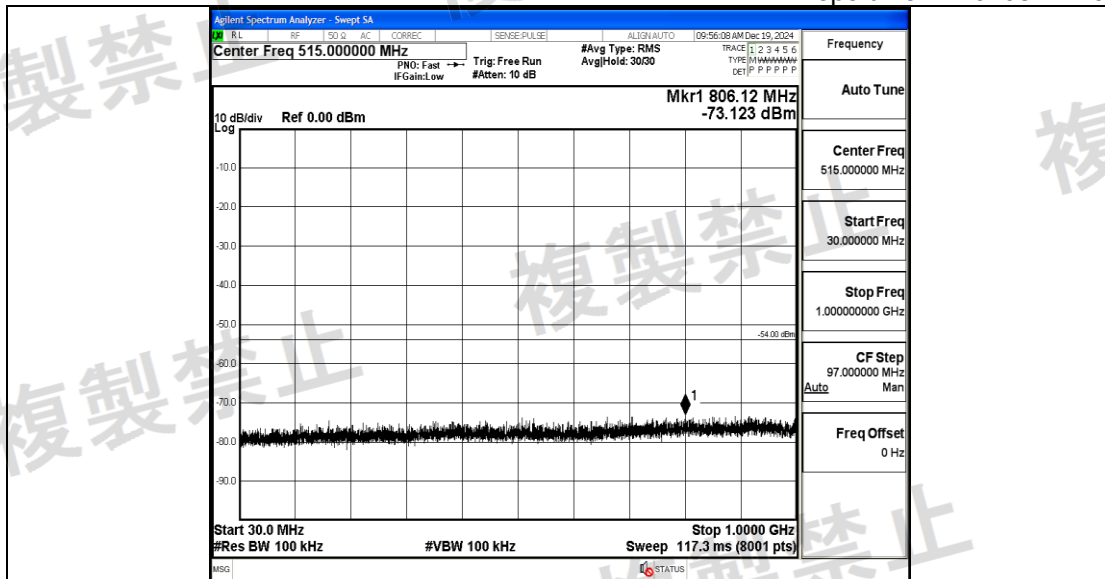
NTNV 3DH5 Ant1 2480 30~1000



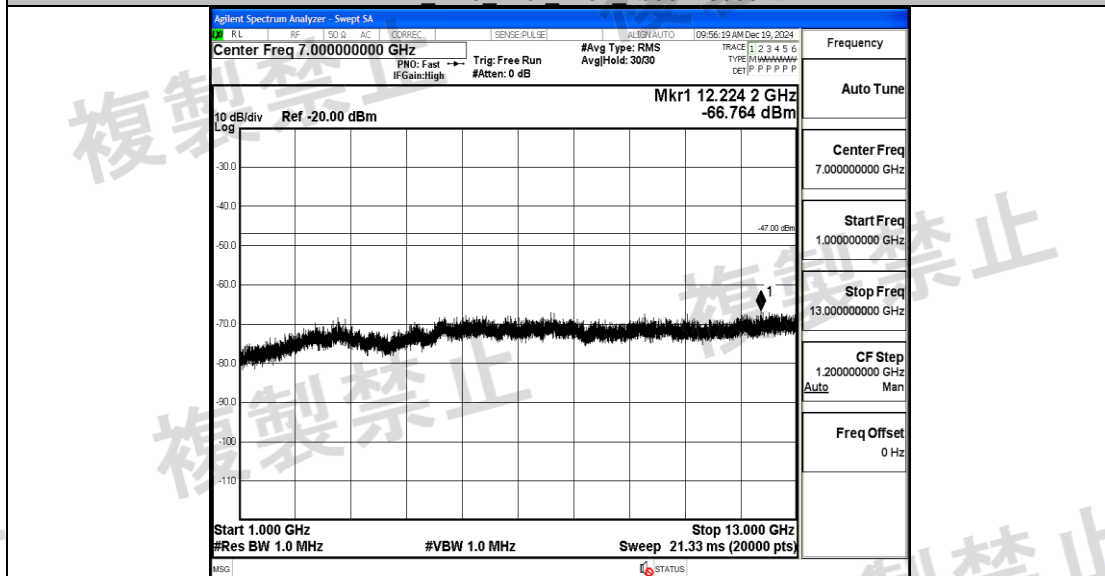
NTNV 3DH5 Ant1 2480 1000~13000



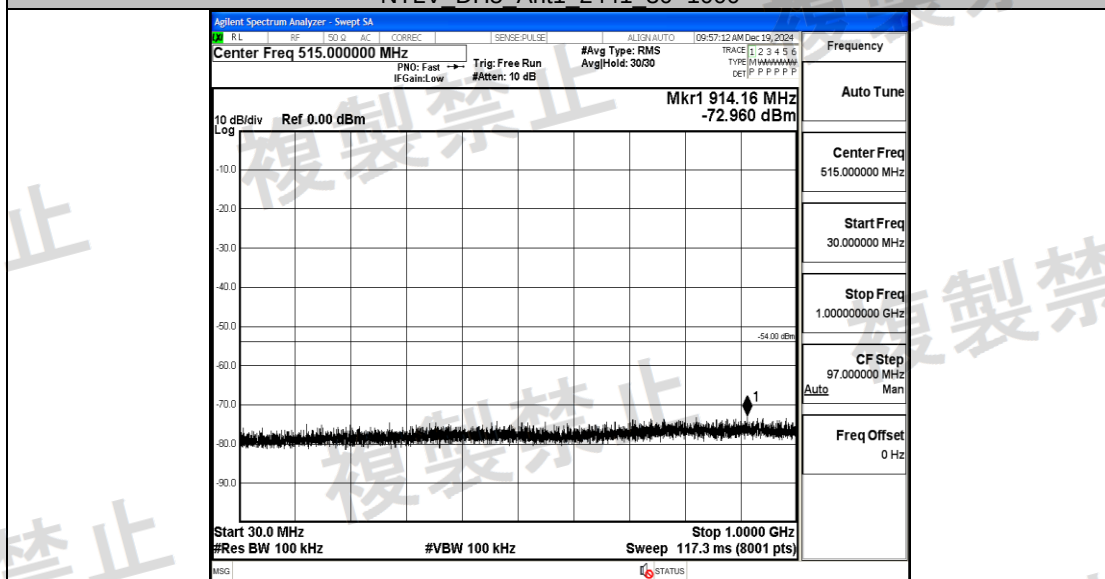
NTLV DH5 Ant1 2402 30~1000



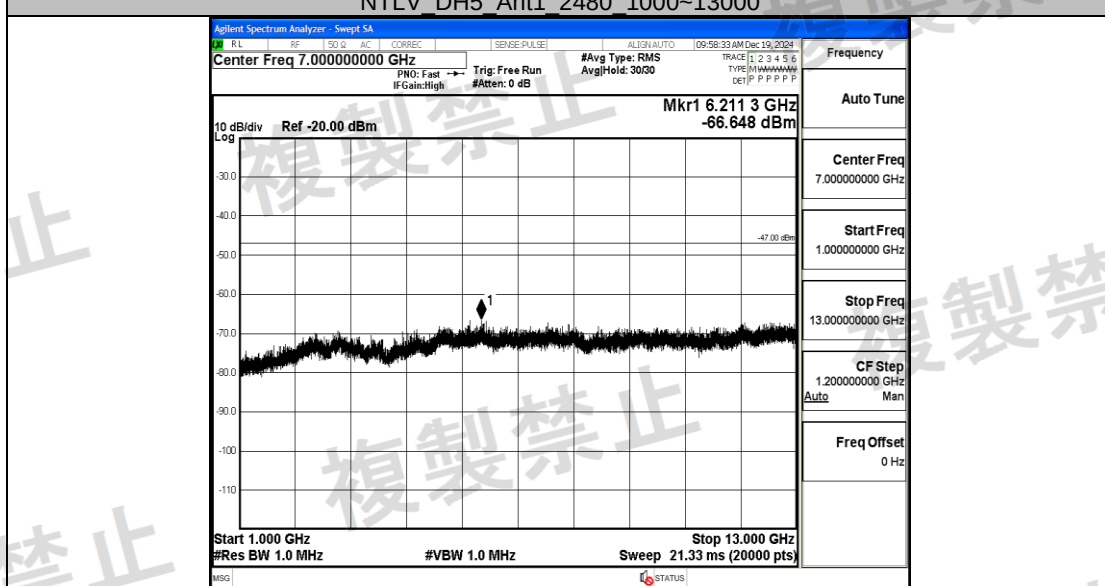
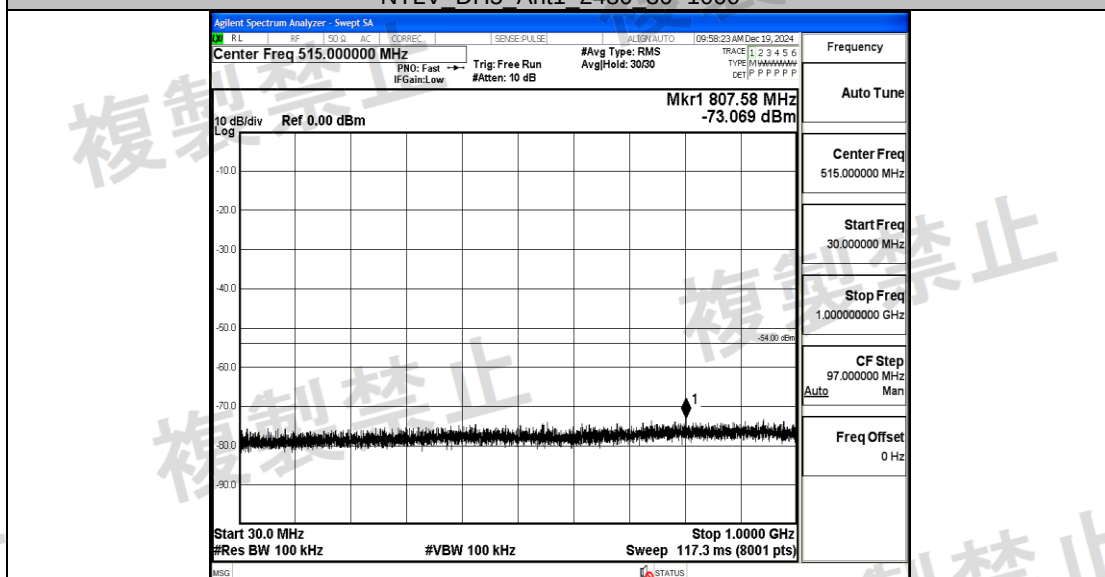
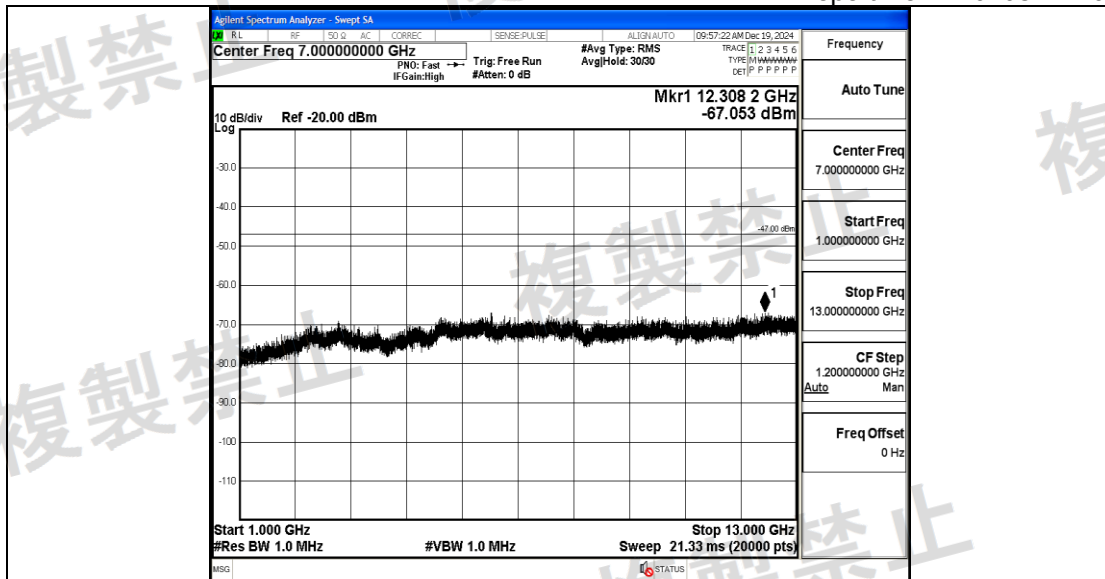
NTLV DH5 Ant1 2402 1000~13000

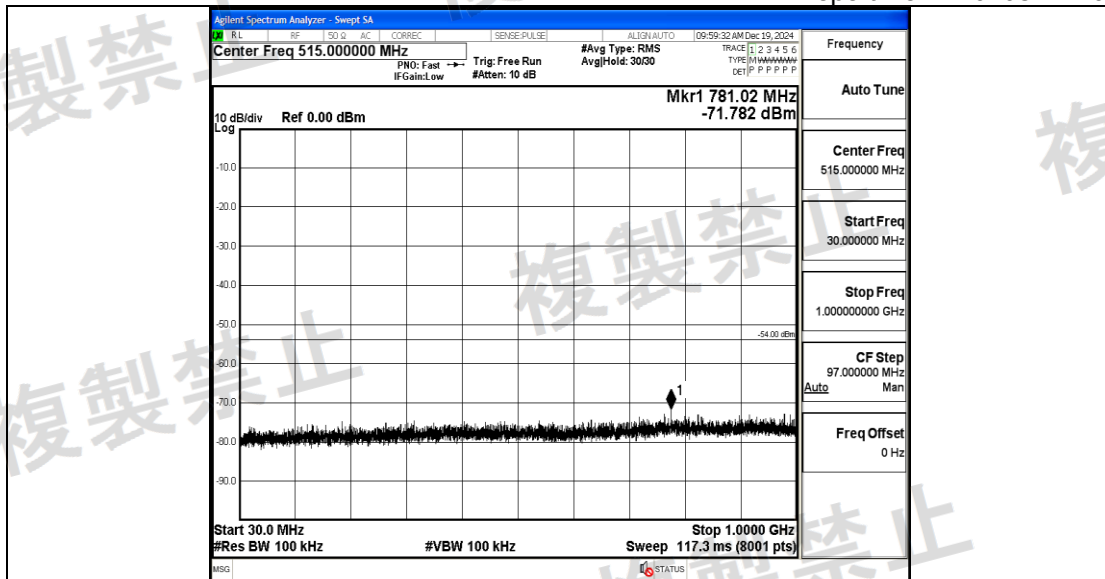


NTLV DH5 Ant1 2441 30~1000

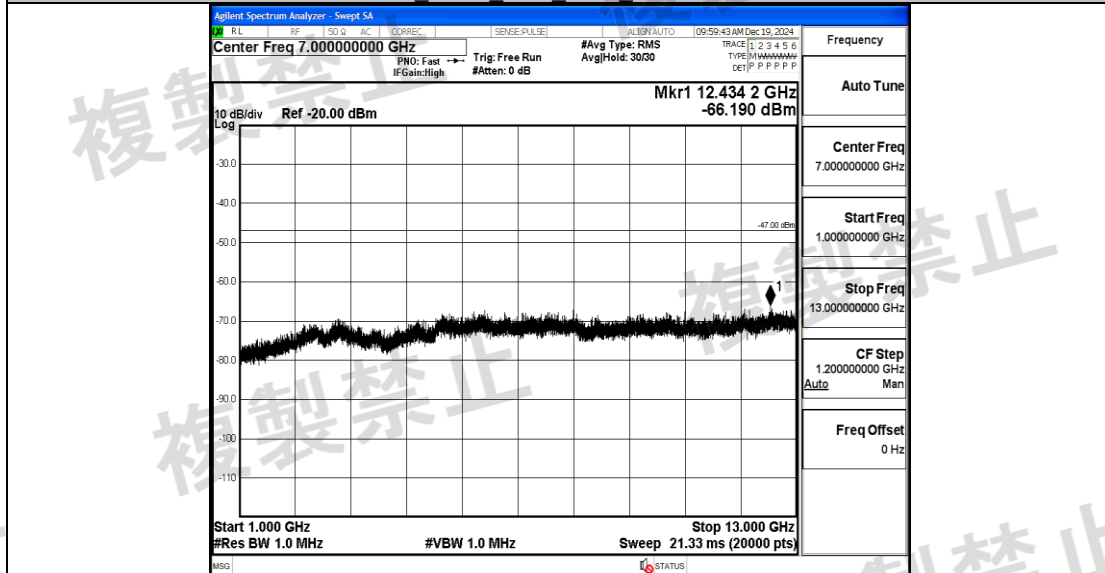


NTLV DH5 Ant1 2441 1000~13000

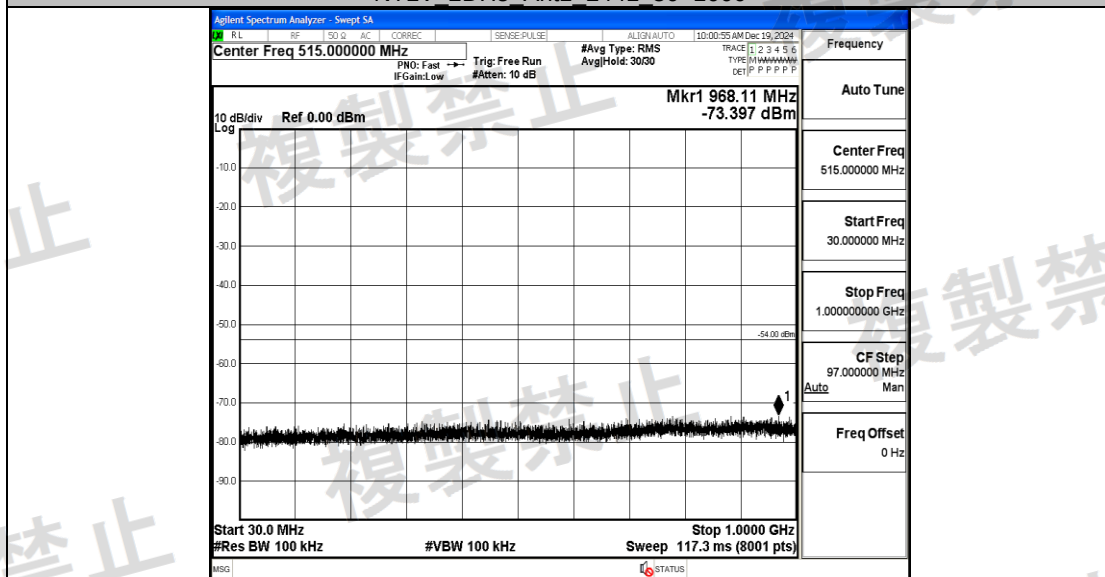




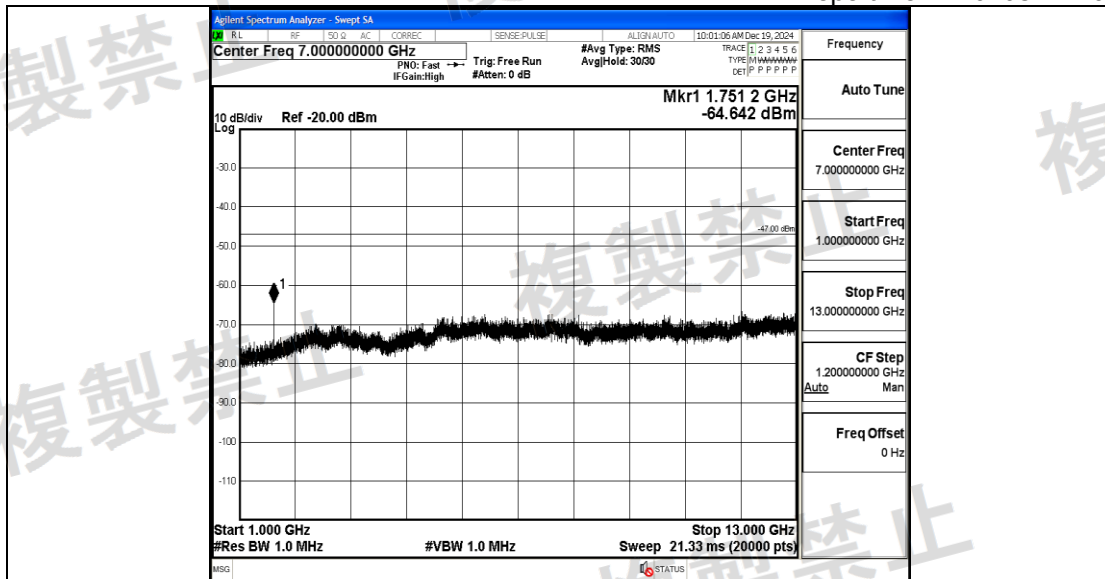
NTLV 2DH5 Ant1 2402 1000~13000



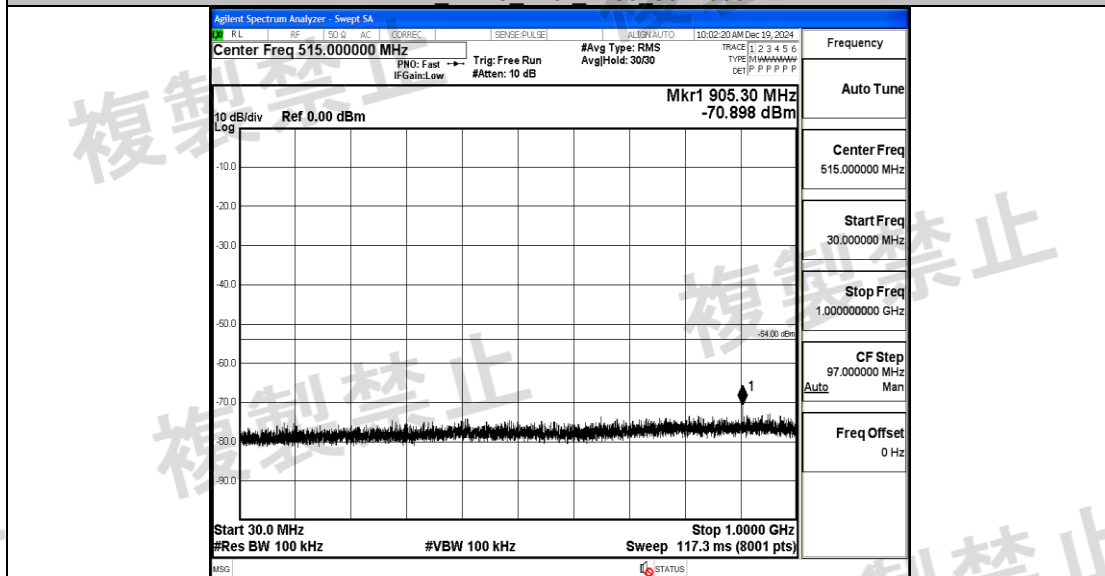
NTLV 2DH5 Ant1 2441 30~1000



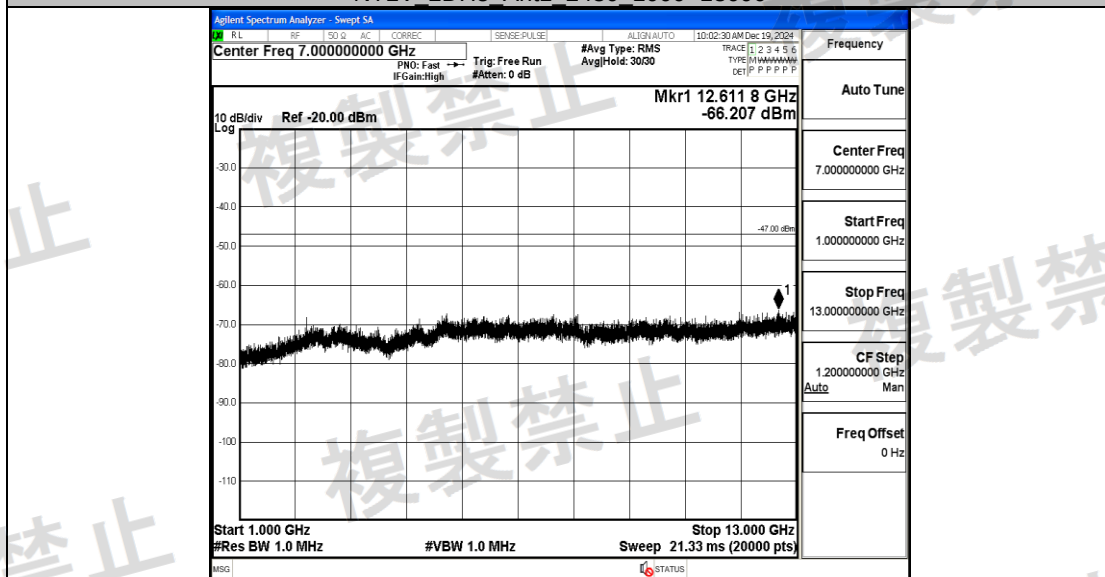
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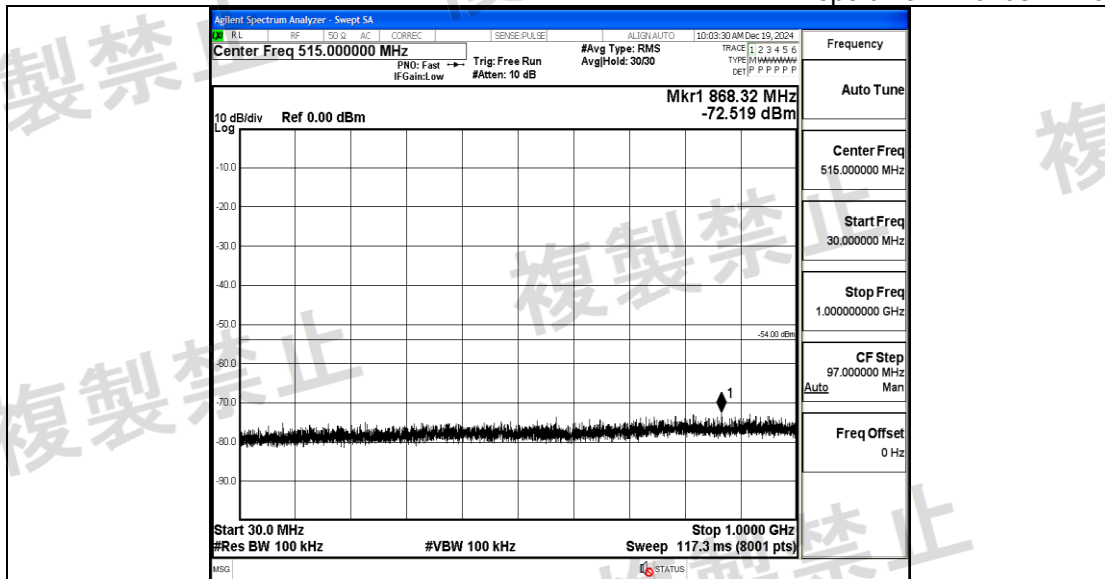
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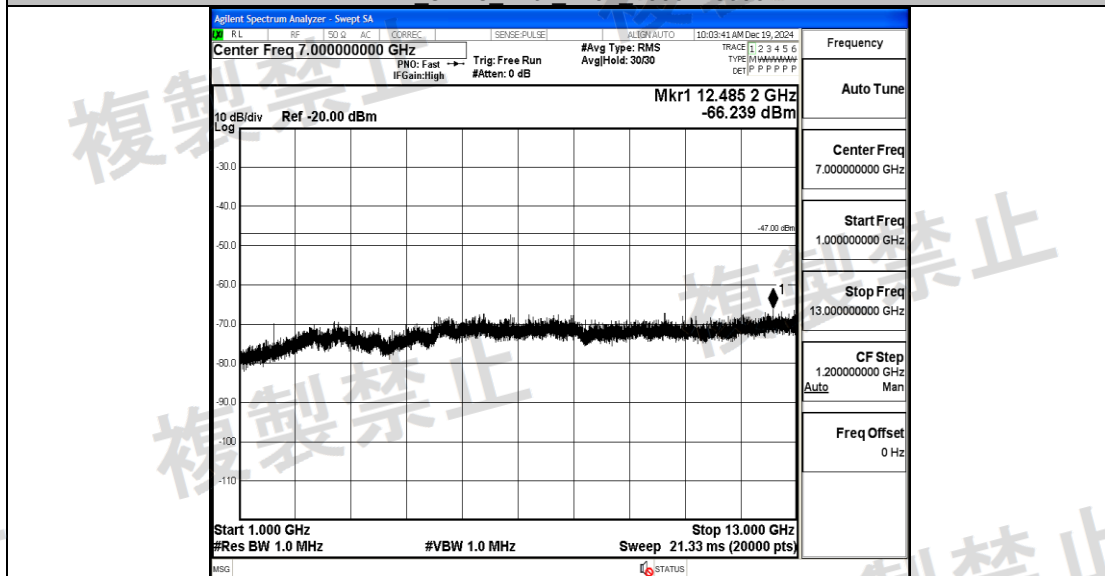
NTLV 2DH5 Ant1 2480 1000~13000



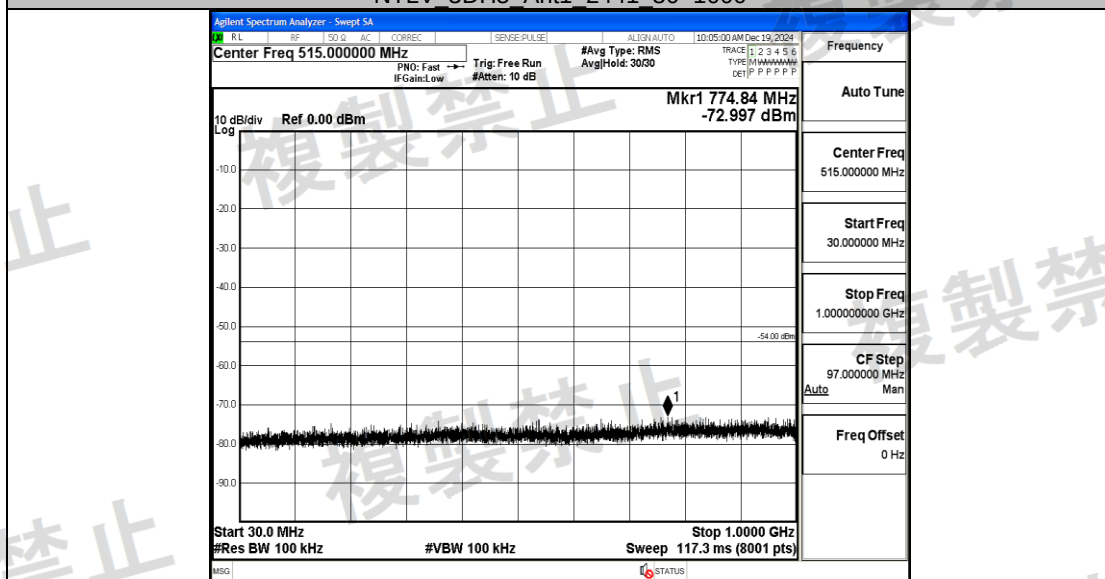
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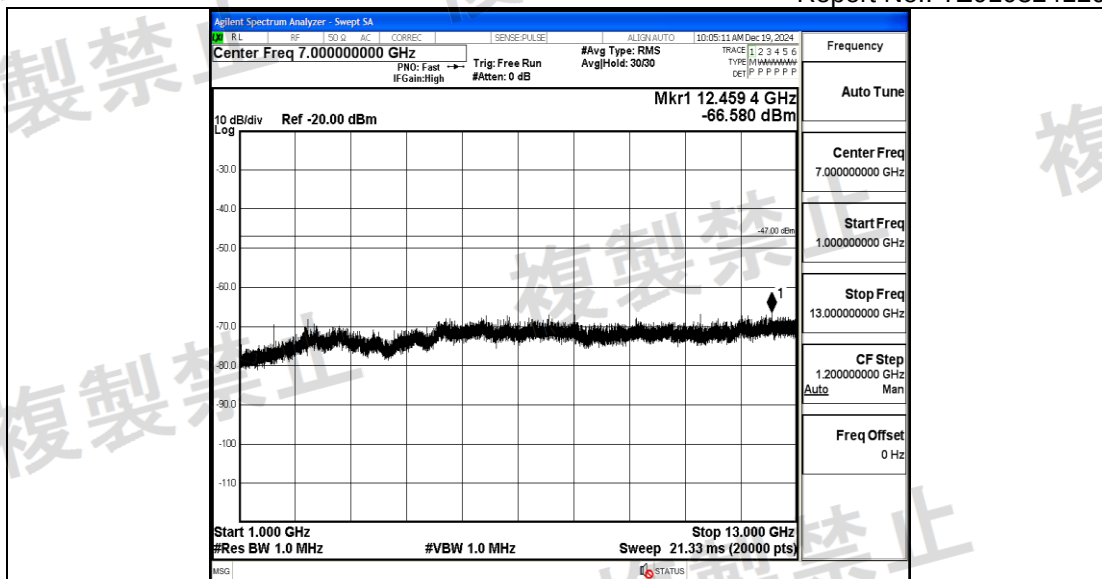
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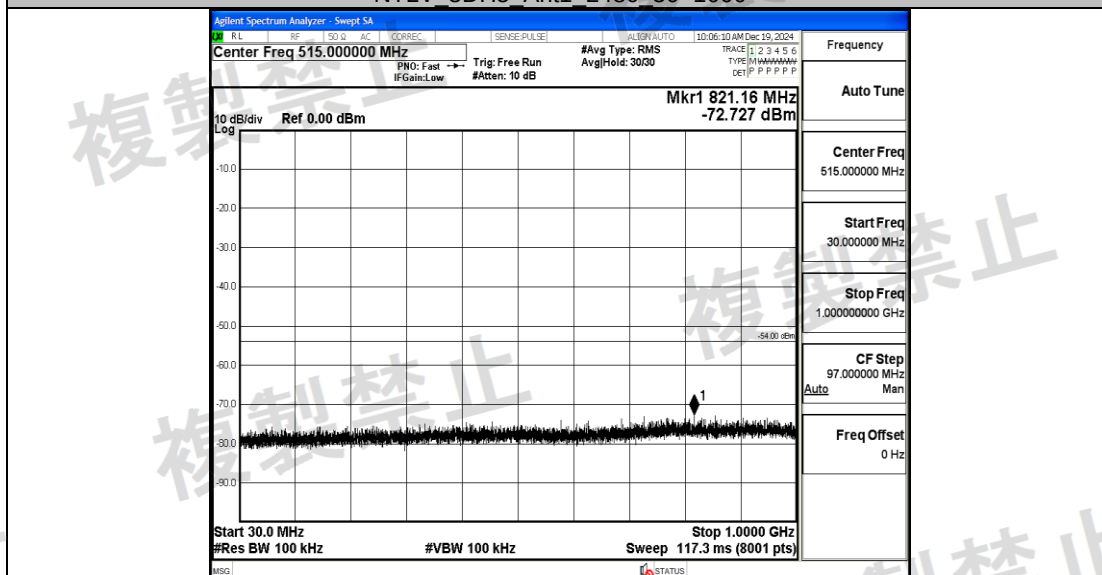
NTLV 3DH5 Ant1 2441 30~1000



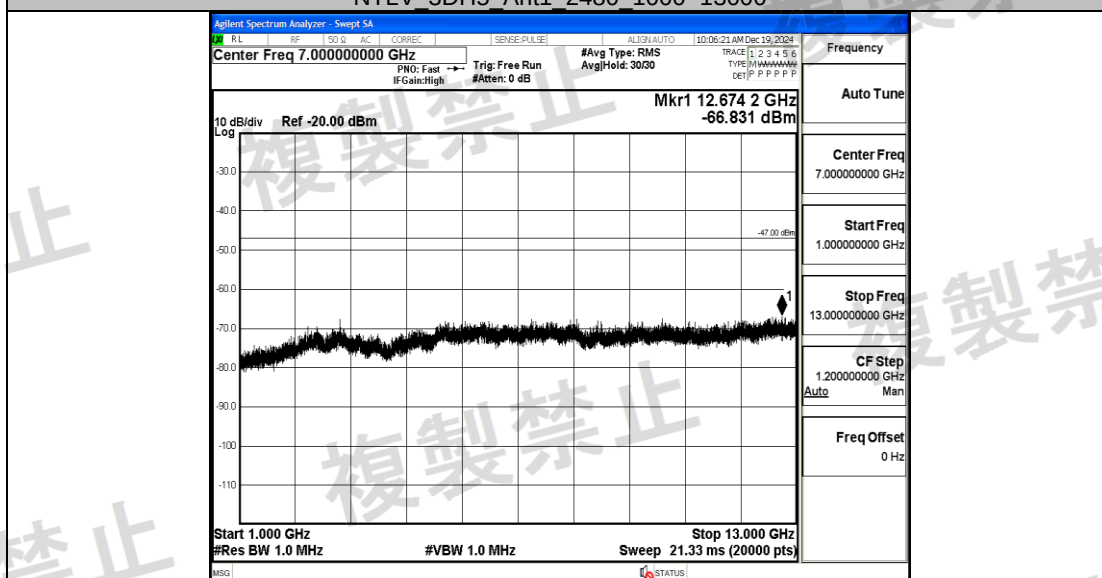
NTLV 3DH5 Ant1 2441 1000~13000



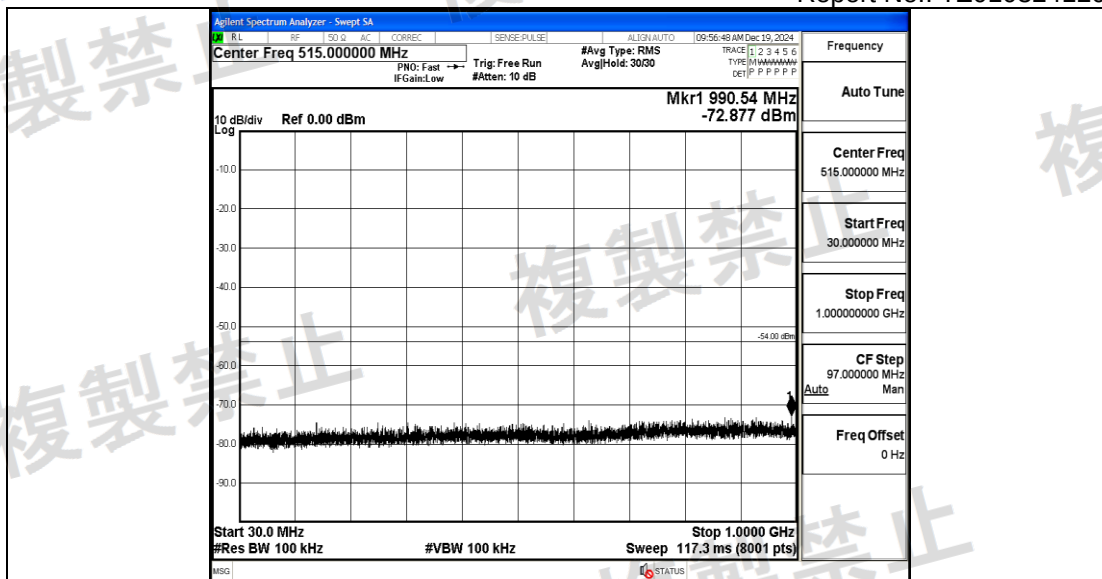
NTLV 3DH5 Ant1 2480 30~1000



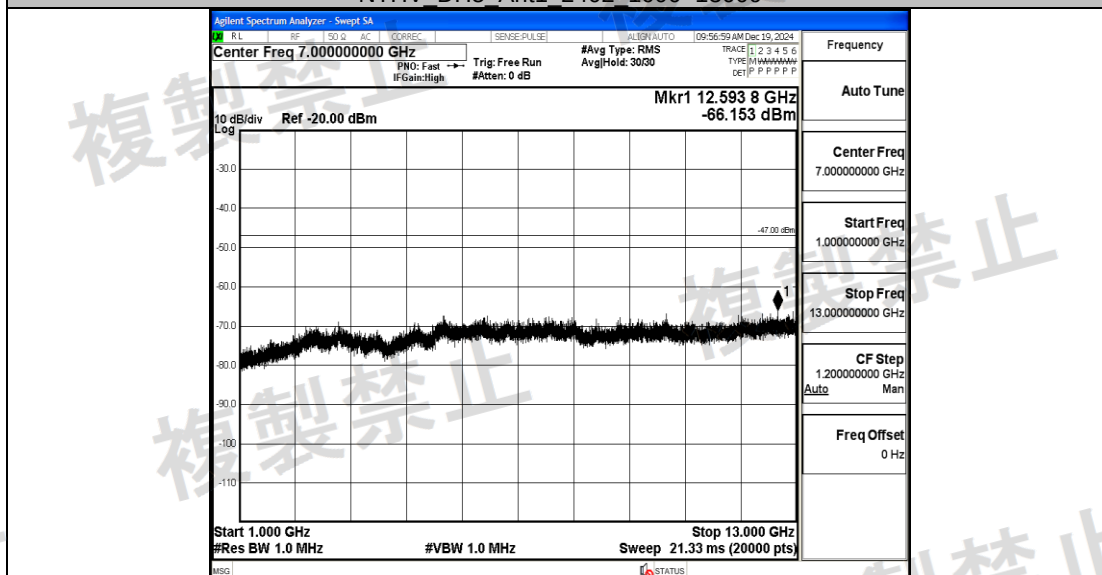
NTLV 3DH5 Ant1 2480 1000~13000



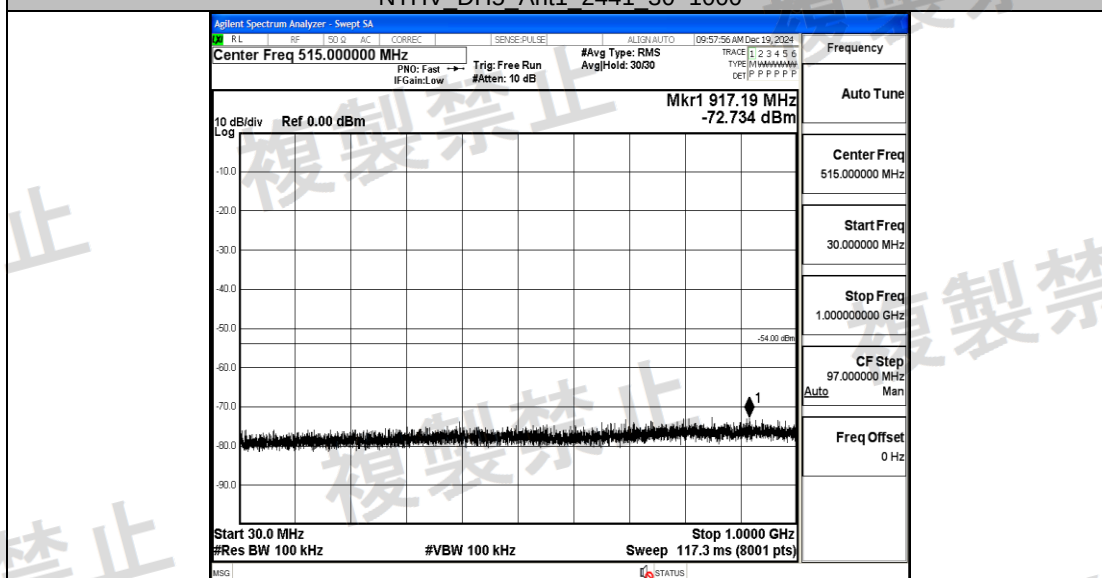
NTHV DH5 Ant1 2402 30~1000



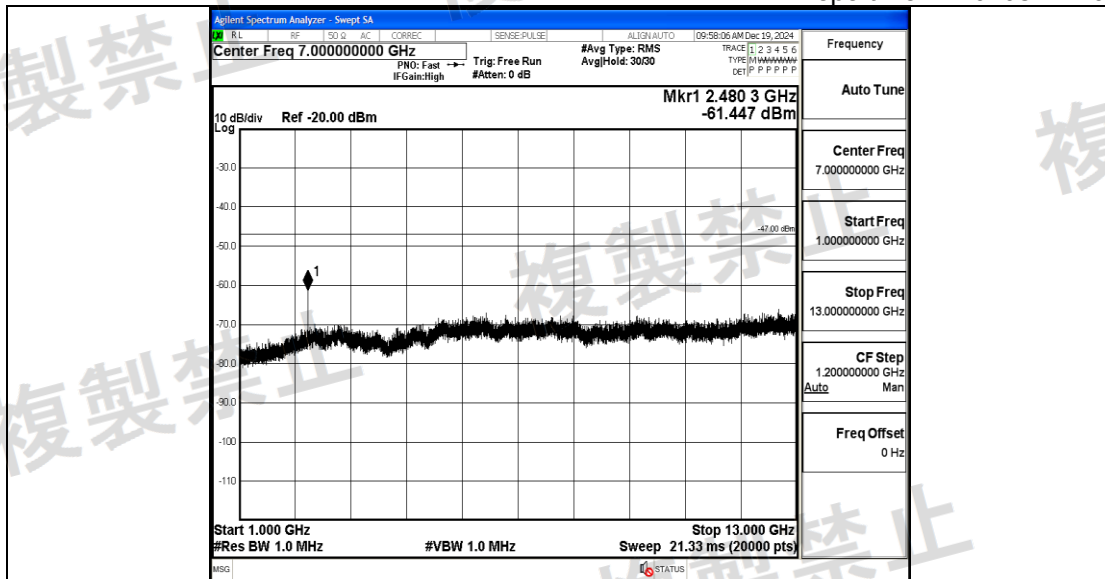
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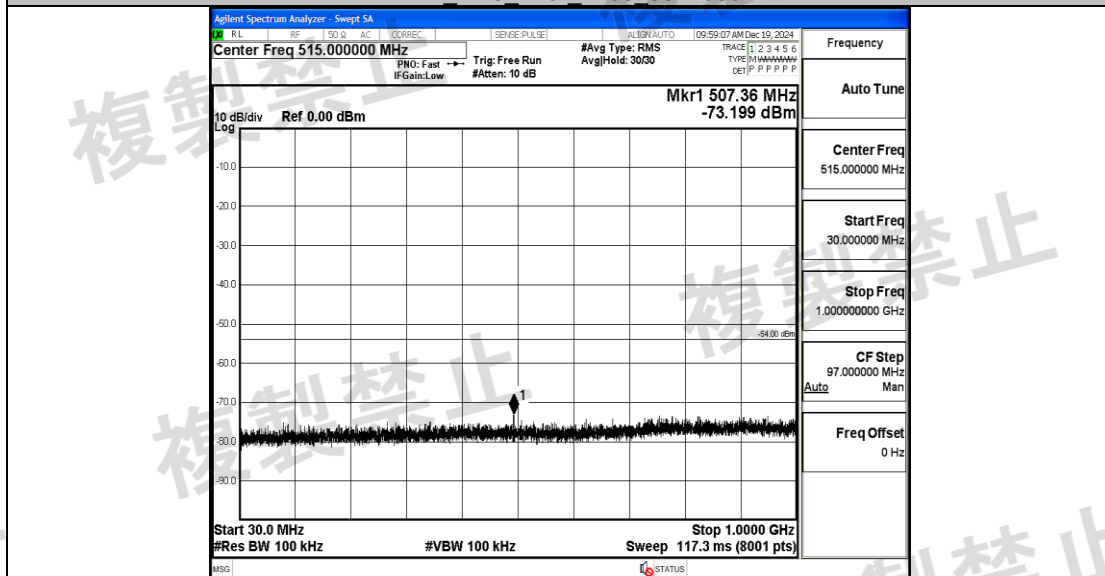
NTHV DH5 Ant1 2441 30~1000



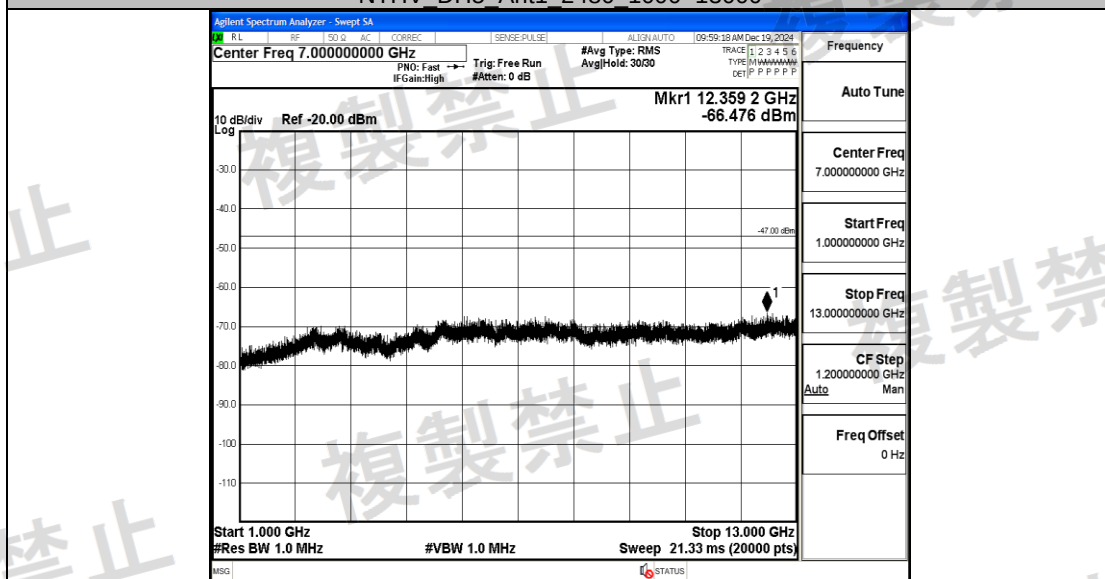
NTHV DH5 Ant1 2441 1000~13000



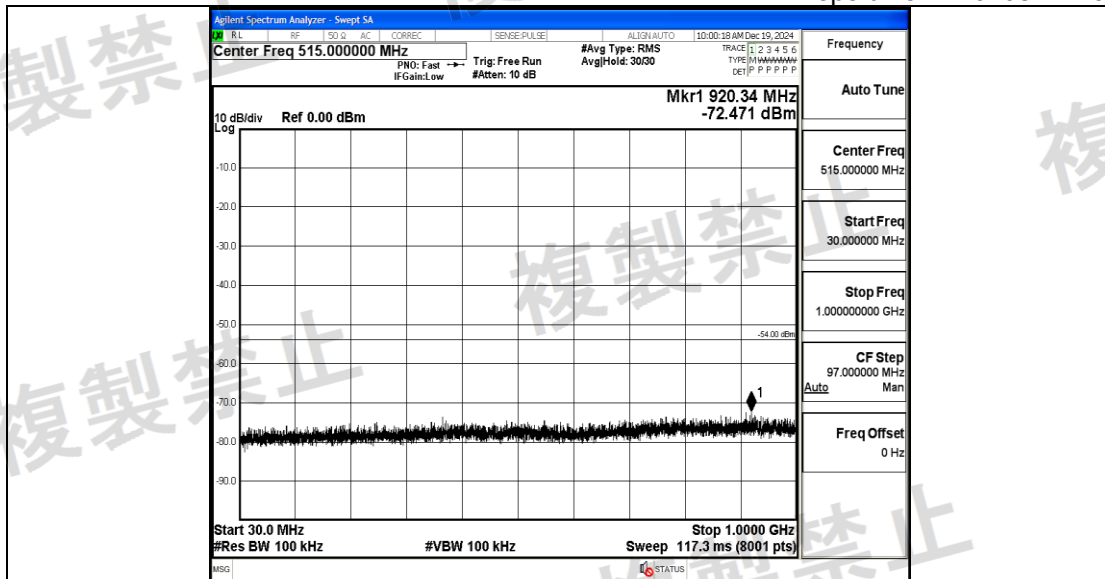
NTHV DH5 Ant1 2480 30~1000



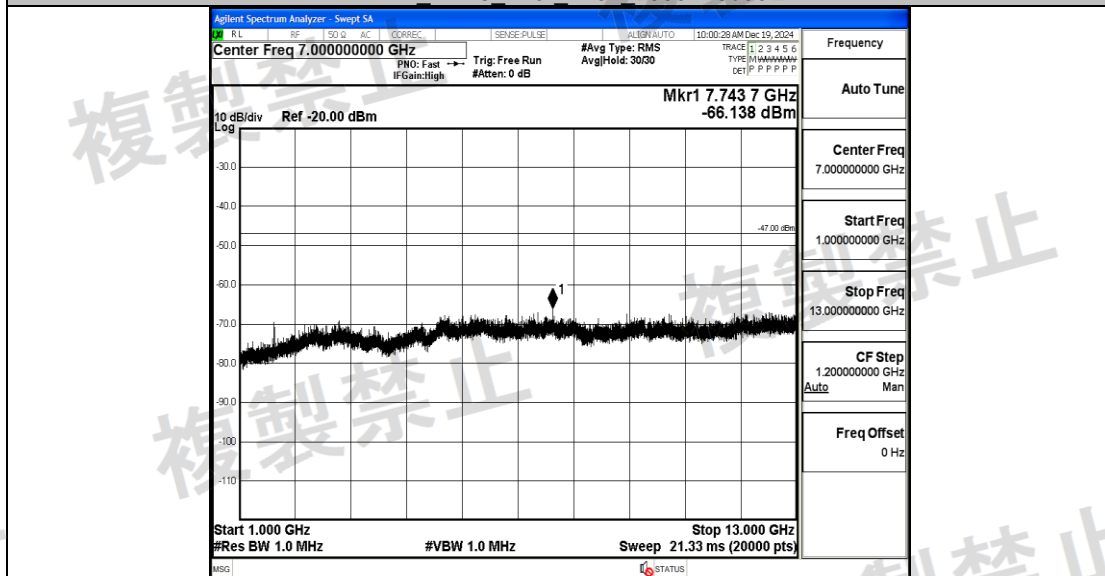
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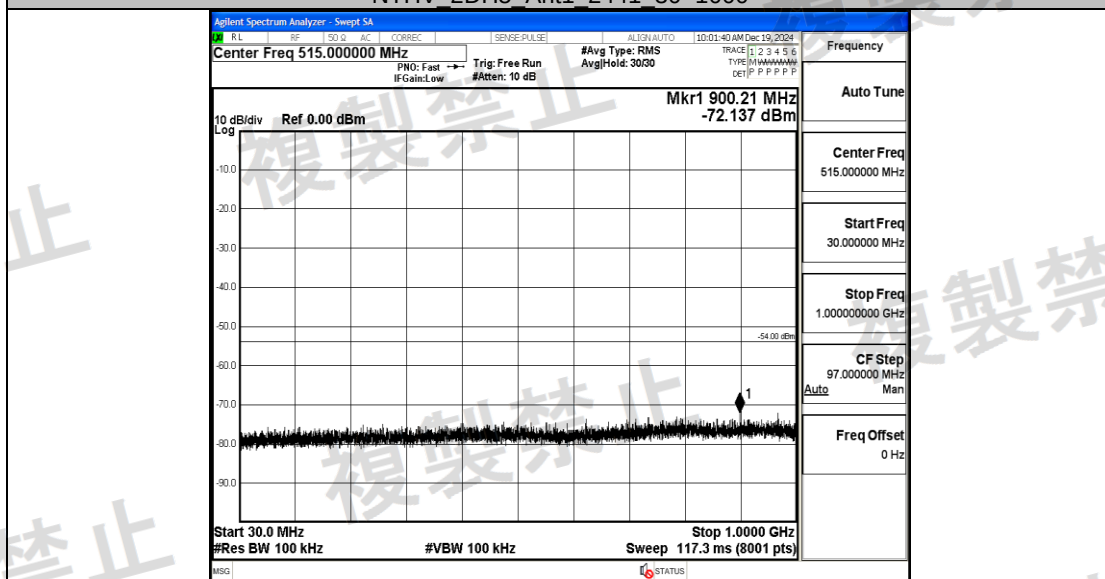
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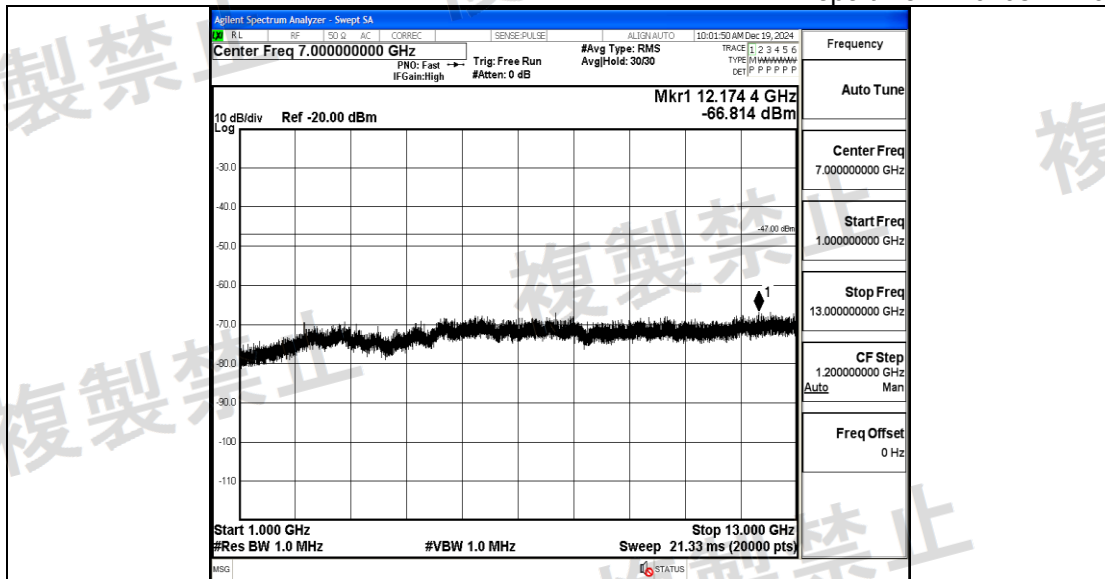
NTHV 2DH5 Ant1 2402 1000~13000



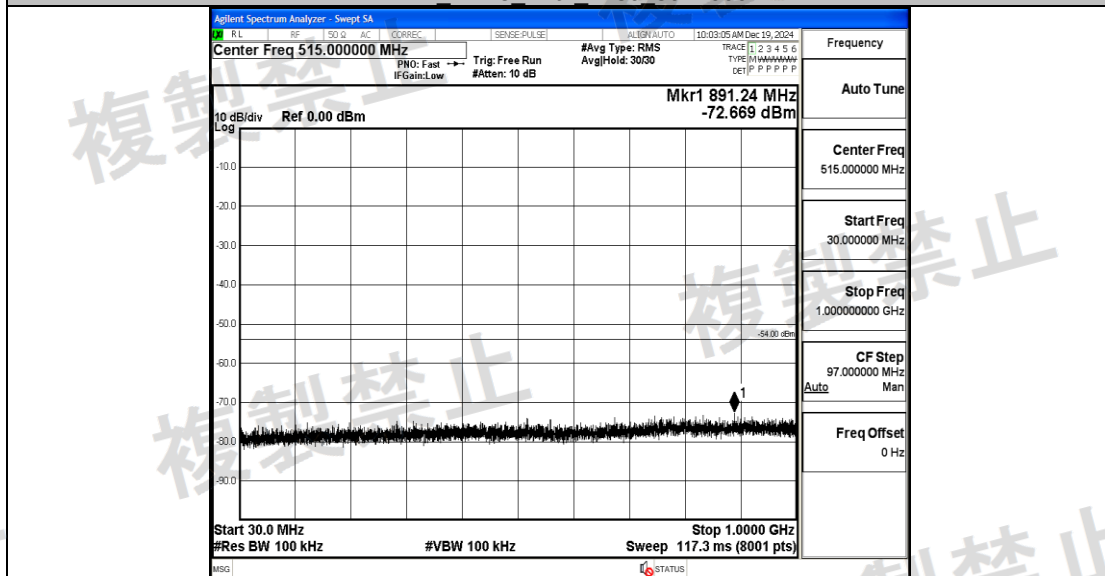
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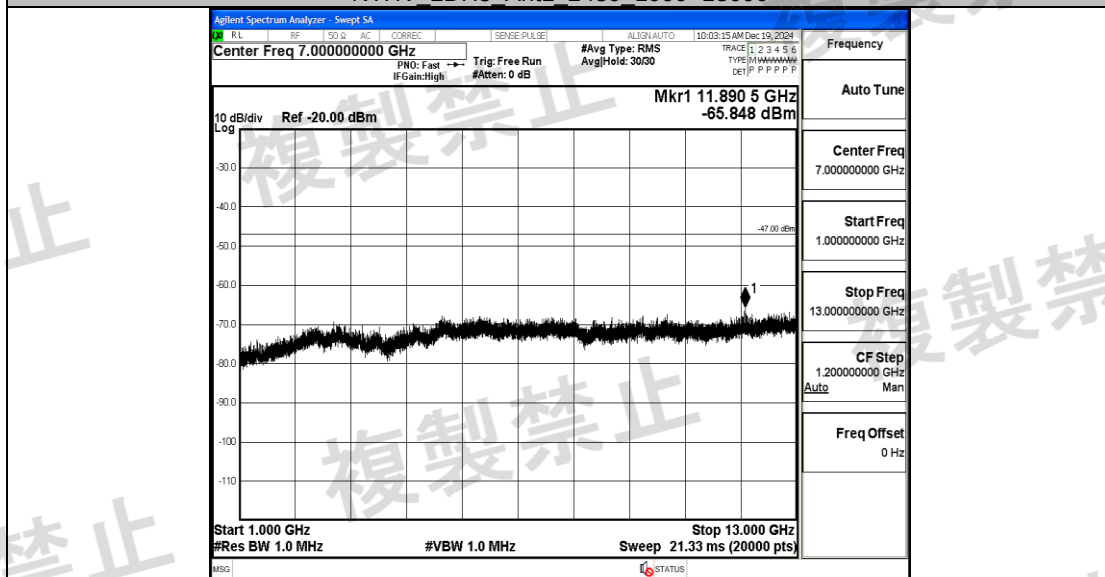
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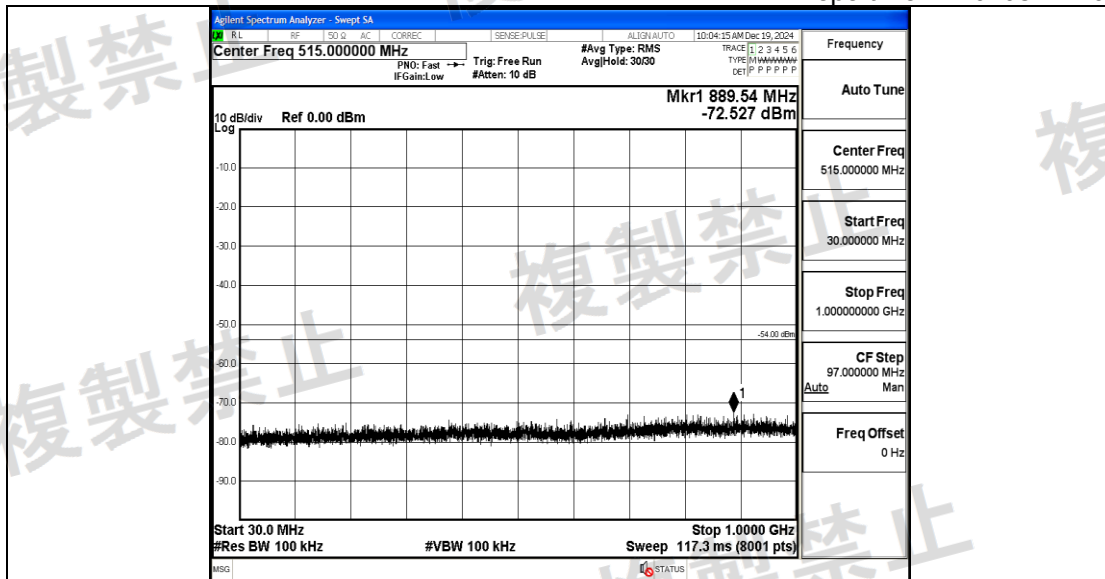
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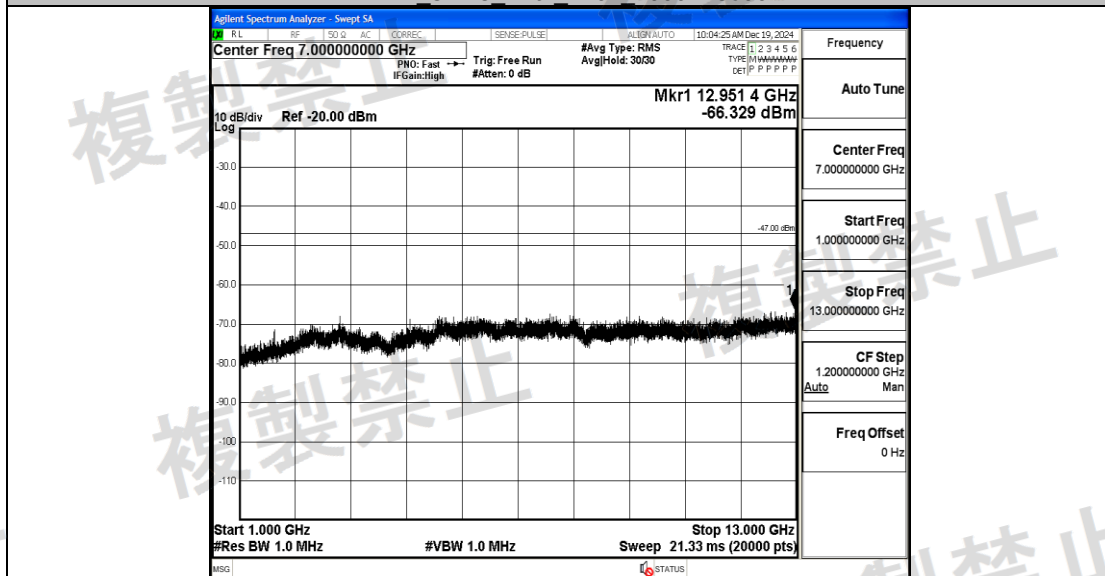
NTHV 2DH5 Ant1 2480 1000~13000



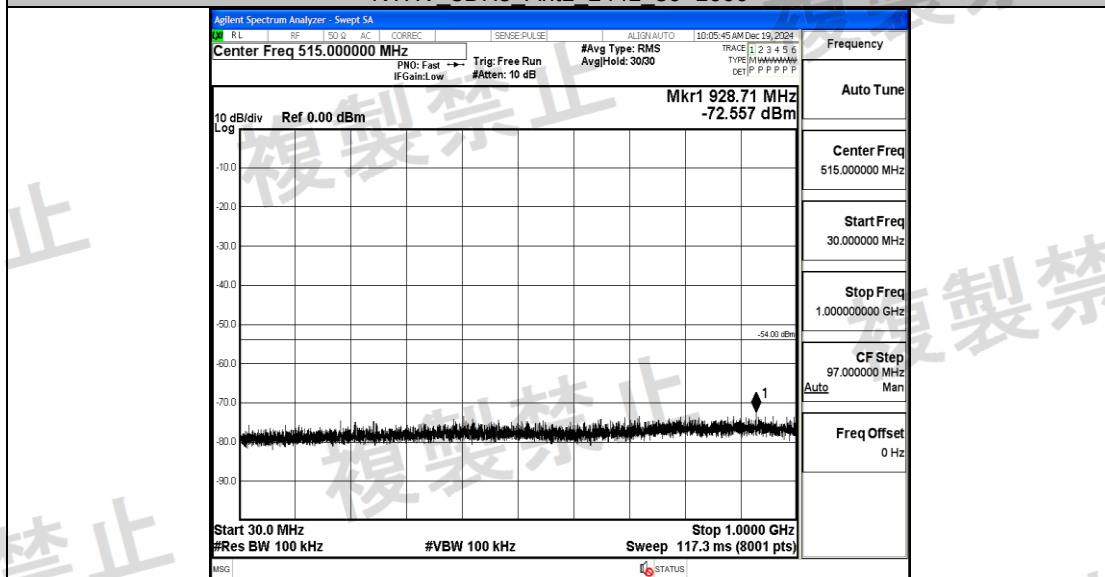
NTHV 3DH5 Ant1 2402 30~1000



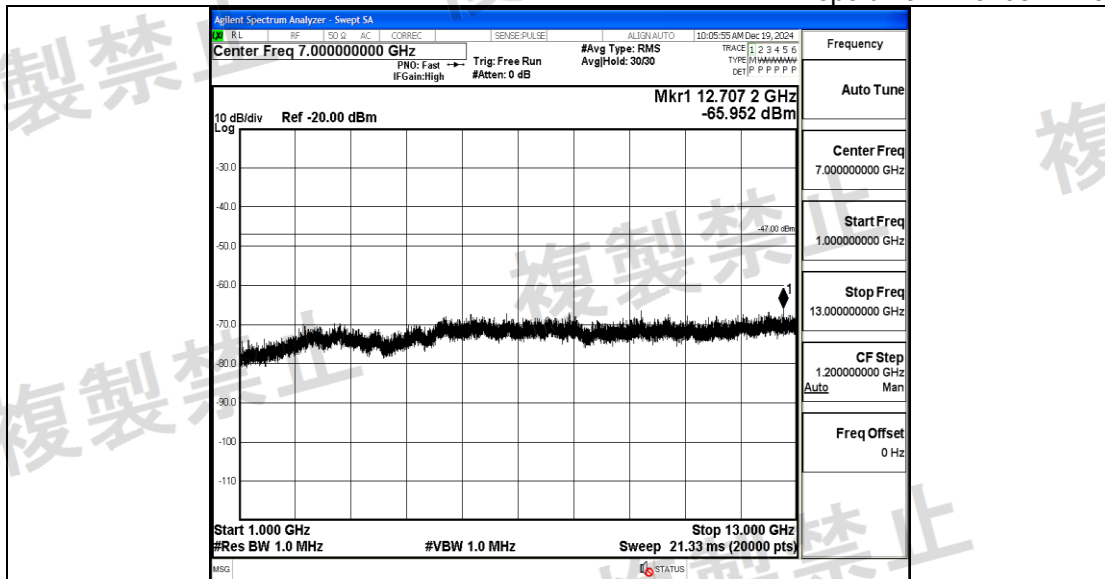
NTHV 3DH5 Ant1 2402 1000~13000



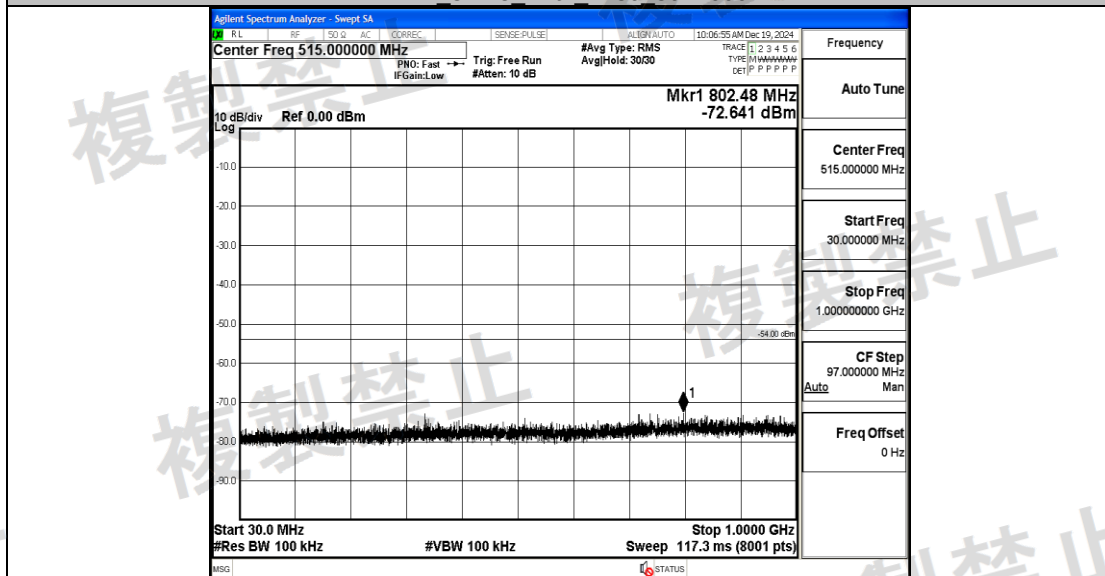
NTHV 3DH5 Ant1 2441 30~1000



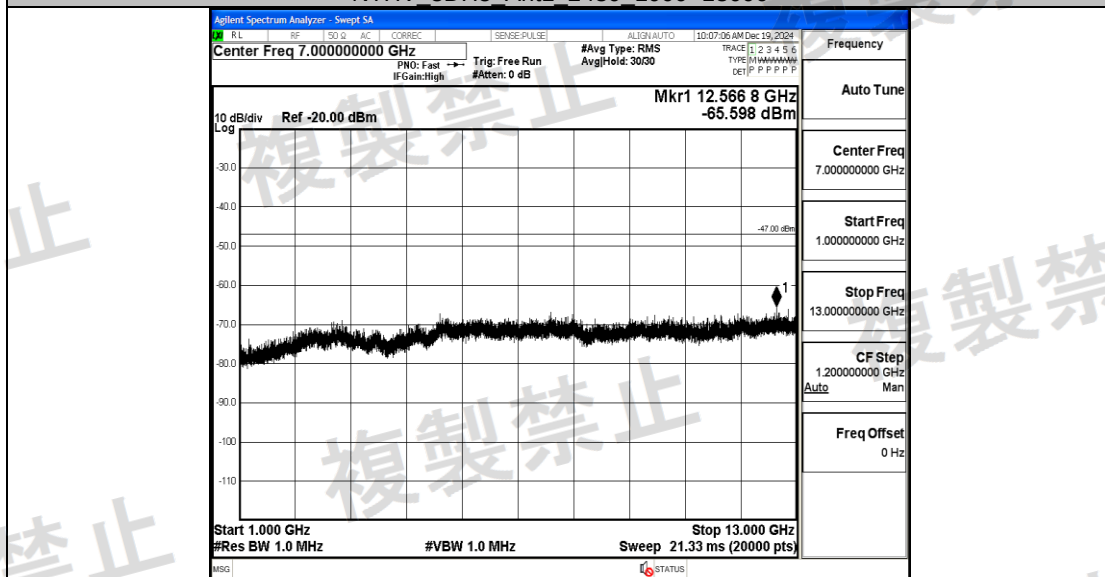
NTHV 3DH5 Ant1 2441 1000~13000



NTHV 3DH5 Ant1 2480 30~1000



NTHV 3DH5 Ant1 2480 1000~13000

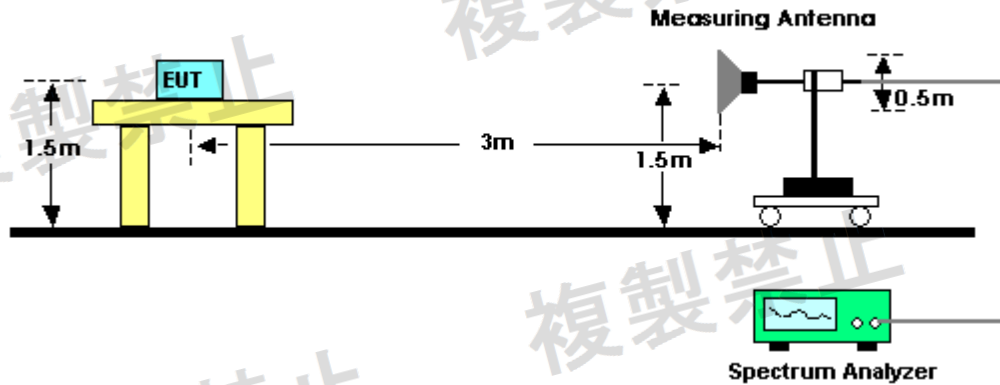




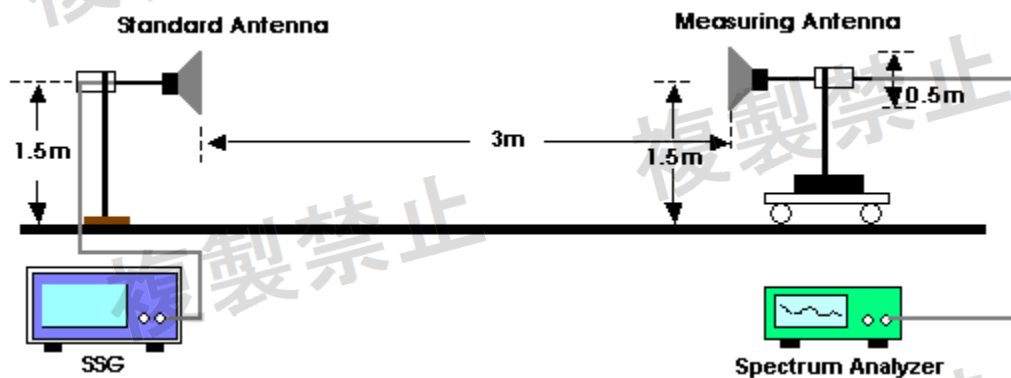
4.8. Transmission Antenna Gain (EIRP antenna power) Measurement

TEST CONFIGURATION

For EUT radiation measurement



For standard antenna measurement



TEST PROCEDURE

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read as "E".
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at P_t to give the equivalent output level of "E" or calculate P_t with SSG output which gives the nearest of "E" and difference ($\pm 1\text{dB}$). Record the P_t .
7. Calculate EIRP by the formula below $\text{EIRP} = G_t - L + P_t$.
Gt: gain of replacing antenna (dBi)
L: feeder loss between SSG and replacing antenna



Pt: Output power of the SSG

8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

LIMIT

Modulation system	Frequency band used	Antenna power (max.)	EIRP (max.)	
			Omnidirectional case	Directional case
DS, OFDM	2,400 - 2,483.5 MHz	10 mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
FH, DS-FH FH-OFDM	2,400 - 2,483.5 MHz	3 mW/MHz	6.91 dBm/MHz	16.91 dBm/MHz
	Excluding 2,427 - 2,470.75 MHz	10 mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
Other than the above	2,400 - 2,483.5 MHz	10 mW	12.14 dBm	22.14 dBm

Note: it is not applicable when Antenna gain do not exceed 2.14 dBi.

TEST RESULTS

N/A

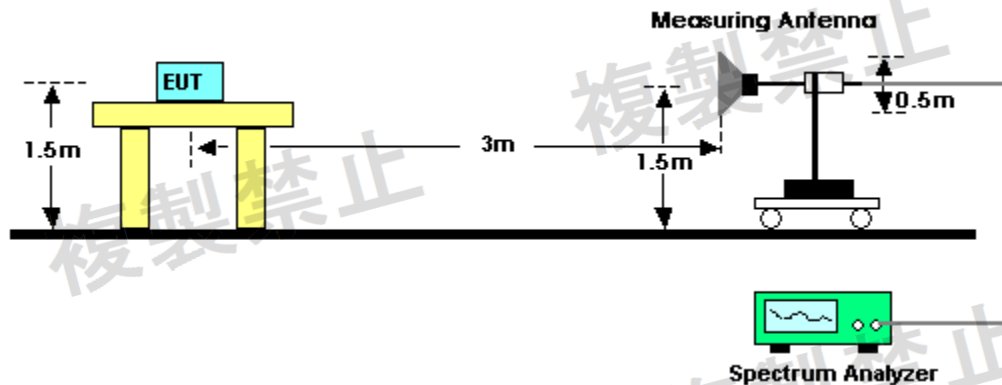
AS:

☒ Antenna gain do not exceed than 2.14 dBi



4.9. Transmission Radiation Angle Width (3db Beamwidth) Measurement

TEST CONFIGURATION



TEST PROCEDURE

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.8 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as "E".
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$).
 $A = \{ \text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM} \} = \{ \text{EIRP Power [dBm]} / 12.14 \text{ for DS, OFDM} \}$ or
 $A = \{ \text{EIRP Power [mW]} / 4.9 \text{ for FH} \} = \{ \text{EIRP Power [dBm]} / 6.91 \text{ for FH} \}$

LIMIT

Item	Upper Limits
3dB antenna beam width	$360/A$ (If $A < 1$; then $A = 1$) $A = \{ \text{EIRP [mW]} / 16.36 \text{ for DS, OFDM} \}$ or $A = \{ \text{EIRP [mW]} / 4.9 \text{ for FH} \}$
Note: it is not applicable when Antenna gain do not exceed 2.14 dBi or EIRP do not exceed the omnidirectional EIRP upper limit..	

TEST RESULTS

N/A

AS:

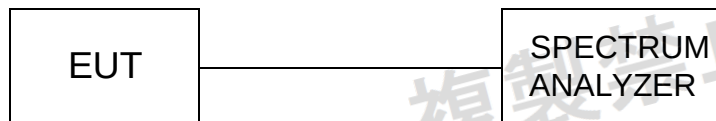
- ☒ Antenna gain do not exceed than 2.14 dBi
☐ EIRP do not exceed the omnidirectional EIRP upper limit



4.10. Dwell Time

Report No.: TZ0103241201TRF01

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set the spectrum analyzer as follows:
Center frequency: Measurement hopping frequency
Sweep frequency width: 0 Hz
Resolution bandwidth: About 1 MHz
Video bandwidth: Approximately the same as the resolution bandwidth
Sweep time: Hopping period
Trigger condition: Video trigger
Sweep mode: Single sweep
Detection mode: Positive peak
3. Set the EUT for DH5 packet transmitting.
4. Measure the maximum time duration of one single pulse.
5. Dwell time = [Spreading factor/79] x duty-cycle x 0.4 seconds (to be determined for each mode DH5)
Duty-cycle = [on time/total time] x 100%

LIMIT

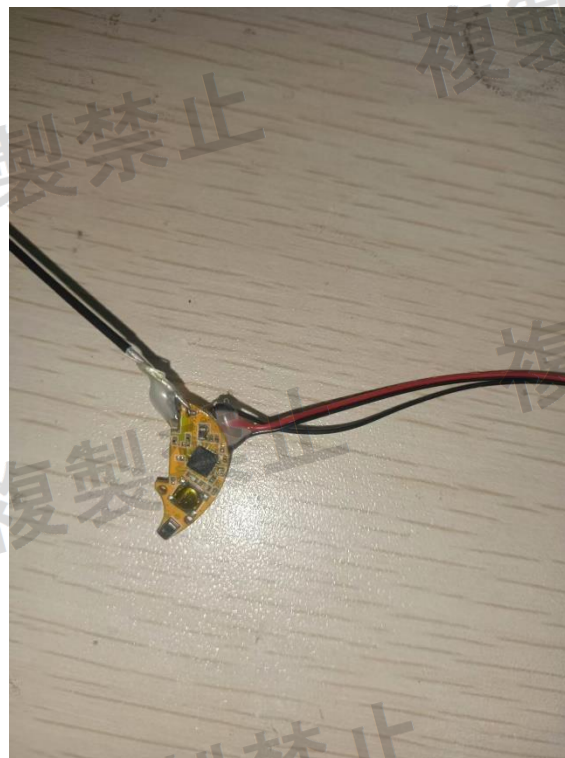
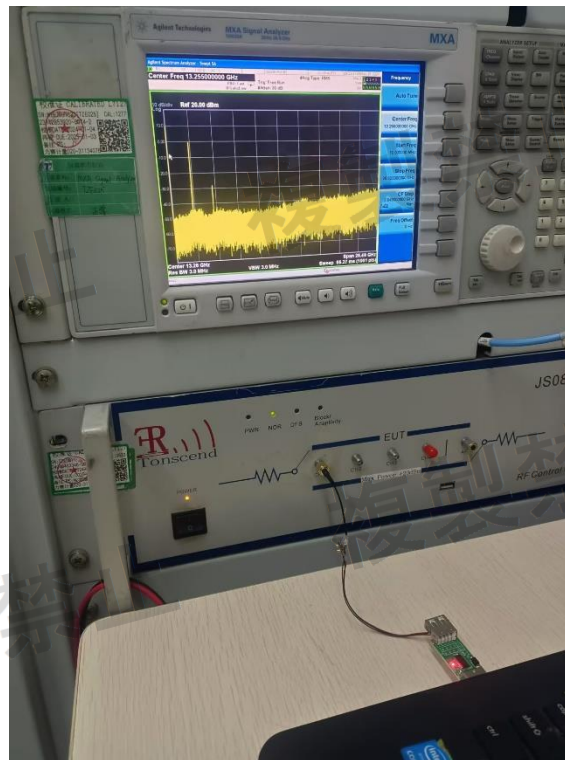
Item	Upper Limits
Dwell Time	≤ 0.4 sec

TEST RESULTS

Test Condition	Test Mode	Antenna	Frequency [MHz]	BurstWidth [ms]	Period [ms]	Result [s]	Limit [s]	Verdict
NTNV	DH5	Ant1	2441	2.91	3.75	0.28	<0.4	PASS
	2DH5	Ant1	2441	2.92	3.75	0.28	<0.4	PASS
	3DH5	Ant1	2441	2.92	3.75	0.28	<0.4	PASS
NTLV	DH5	Ant1	2441	2.91	3.75	0.28	<0.4	PASS
	2DH5	Ant1	2441	2.92	3.75	0.28	<0.4	PASS
	3DH5	Ant1	2441	2.92	3.75	0.28	<0.4	PASS
NTHV	DH5	Ant1	2441	2.91	3.75	0.28	<0.4	PASS
	2DH5	Ant1	2441	2.92	3.75	0.28	<0.4	PASS
	3DH5	Ant1	2441	2.92	3.75	0.28	<0.4	PASS



5. Test Setup Photos of the EUT

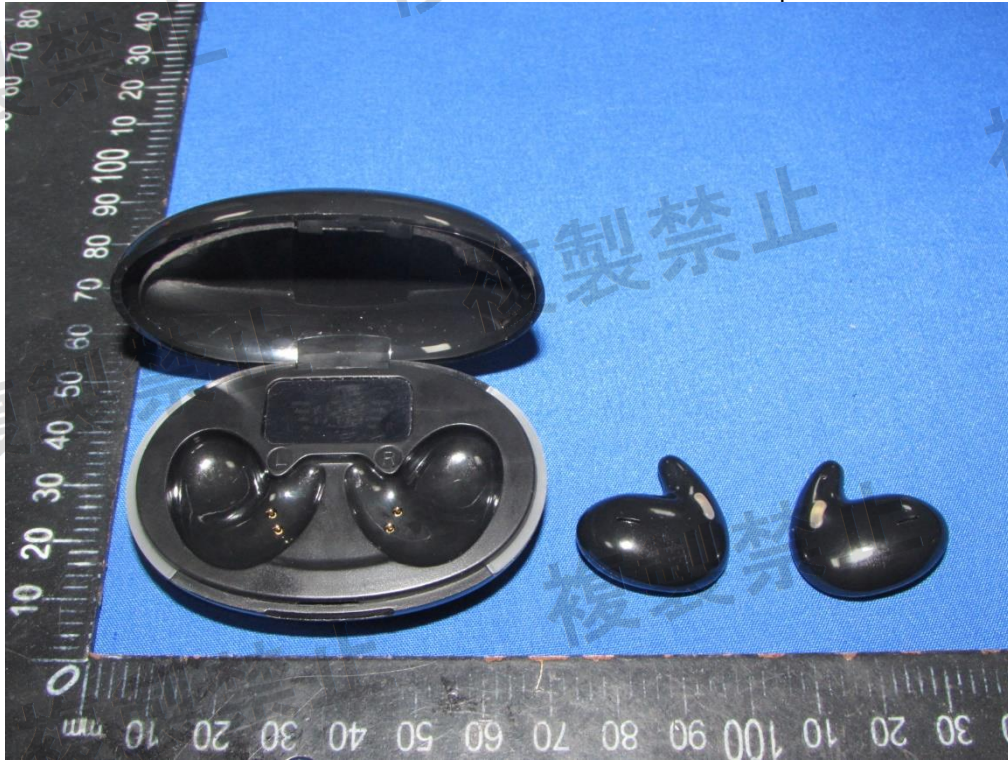




6. External and Internal Photos of the EUT

External Photos









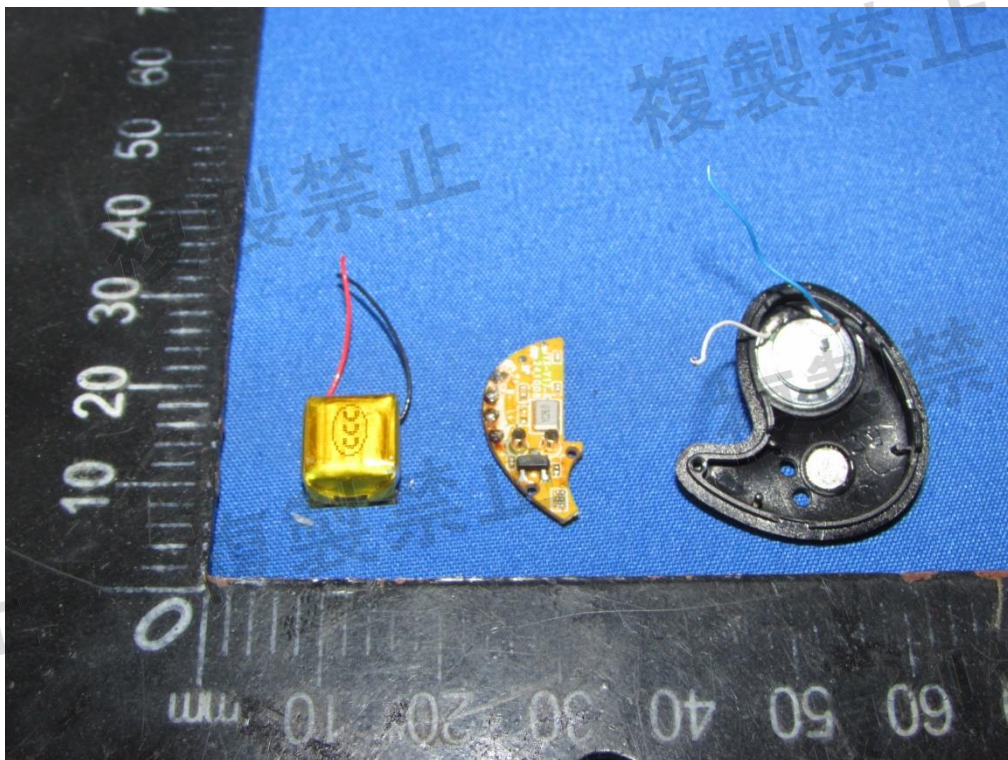
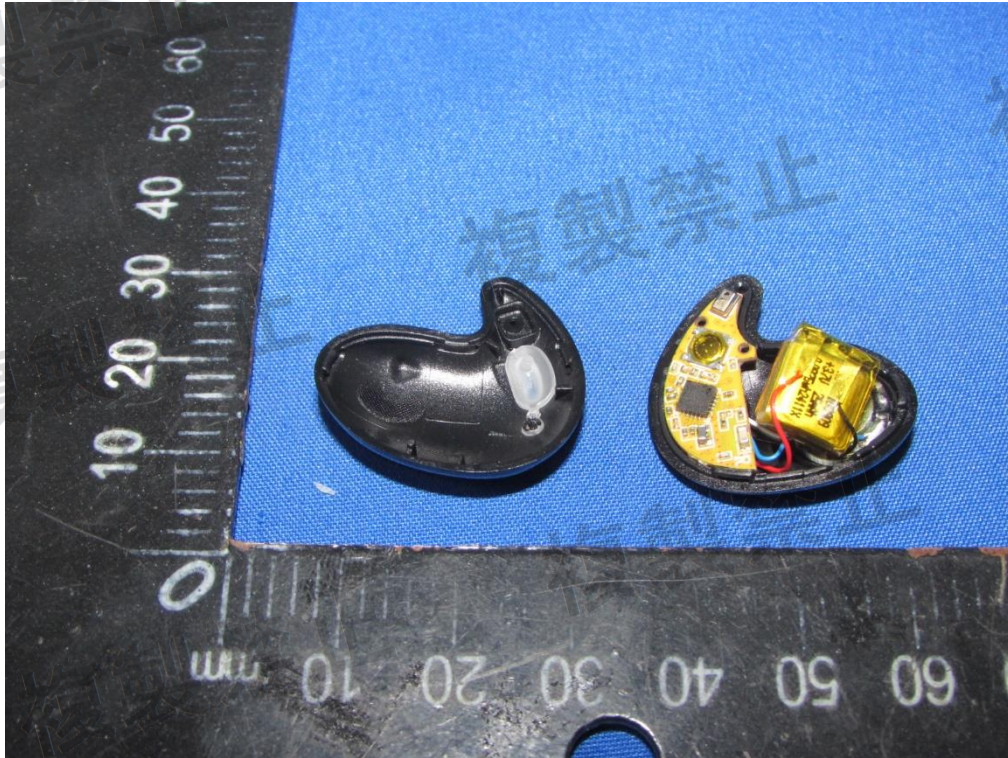


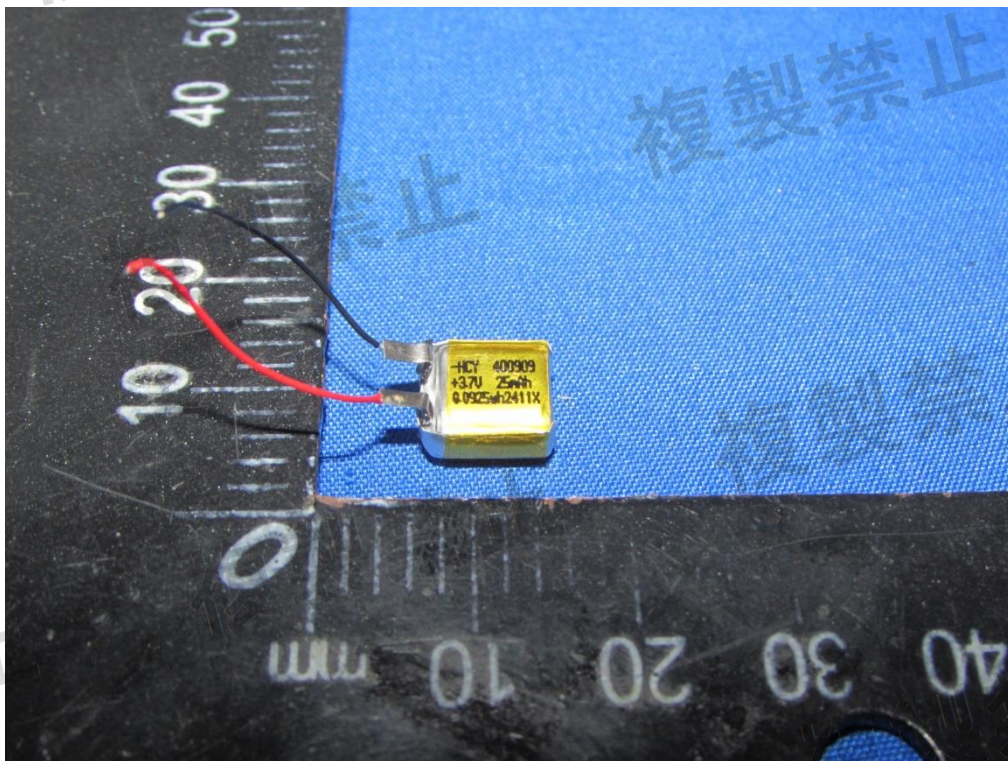
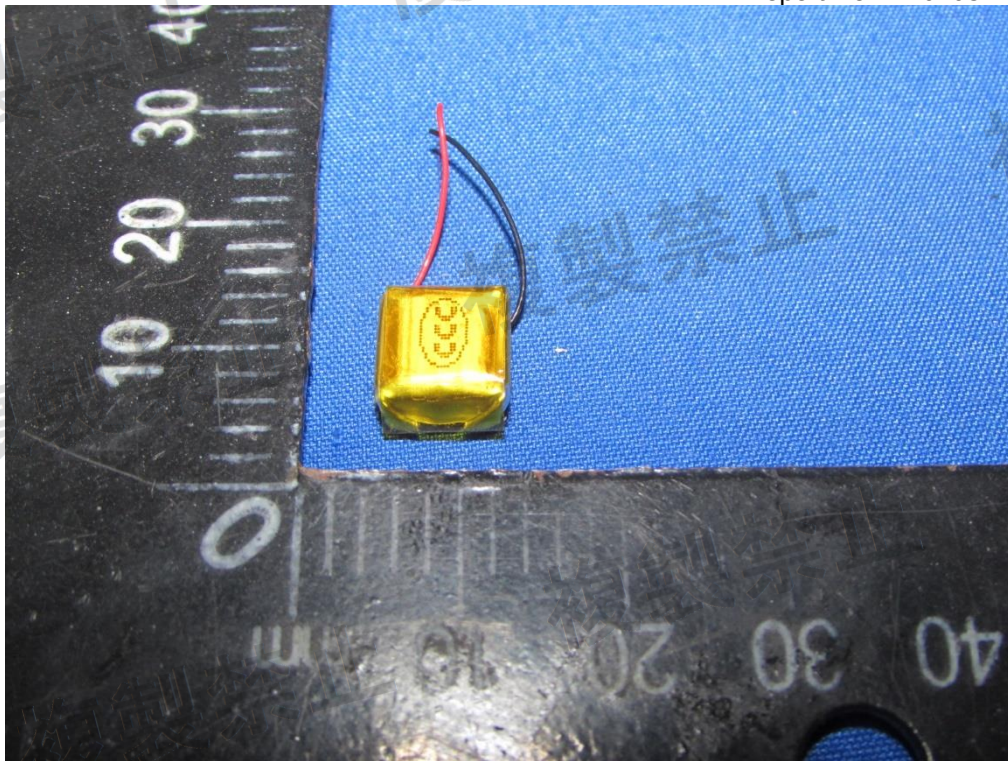


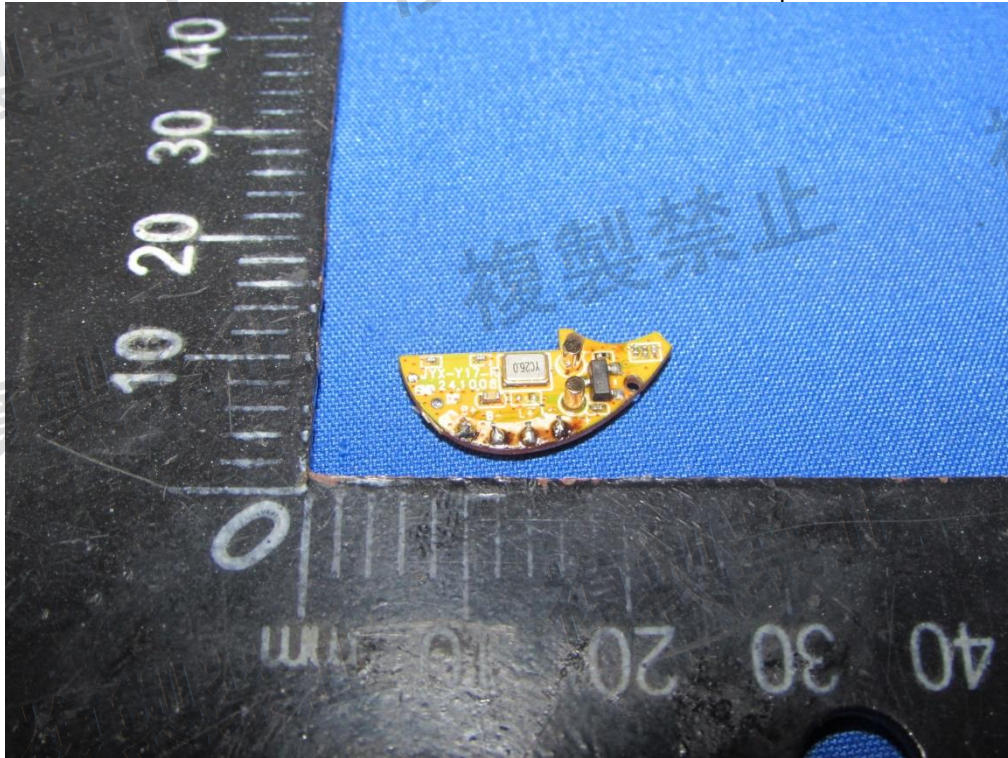
複製禁止

Report No.: TZ0103241201TRF01

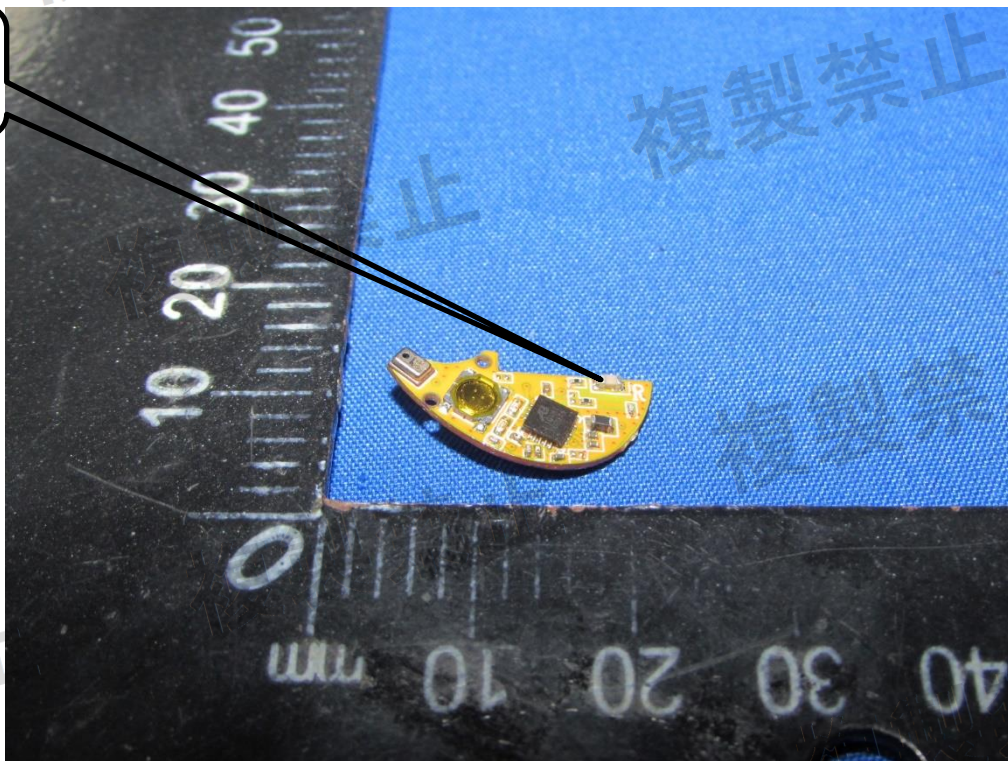
Internal Photos







Bluetooth antenna



.....End of Report.....