



Radio Test Report

Report No.: STS2606320W04

Issued for

Runione Tech Co., Ltd

Building D, 3rd Floor, No.599 Gaojing Road, Qingpu District,
Shanghai, China

Product Name: Rugged Windows Tablet

Brand Name: N/A

Model Name: GTW8103(Standard)

Series Model(s): GTW8103(Handle), GTW8103(RJ45A),
GTW8103(RJ45AH), GTW8103

Test Standard: Article 2 Paragraph 1 of Item 19
MIC Notice No.88 Appendix No.43

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

**TEST REPORT**

Applicant's Name : Runione Tech Co., Ltd
Address : Building D, 3rd Floor, No.599 Gaojing Road, Qingpu District, Shanghai, China
Manufacturer's Name : Runione Tech Co., Ltd
Address : Building D, 3rd Floor, No.599 Gaojing Road, Qingpu District, Shanghai, China

Test specification:

Standard : Article 2 Paragraph 1 of Item 19
MIC Notice No.88 Appendix No.43

Product Description

Product Name : Rugged Windows Tablet
Brand Name : N/A
Model Name : GTW8103(Standard)
Series Model(s) : GTW8103(Handle), GTW8103(RJ45A), GTW8103(RJ45AH), GTW8103

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with Article 2 Paragraph 1 of Item 19, annex 43 requirements. And it is applicable only to the tested sample identified in the report.

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Testing

Date of receipt of test item : 31 July 2024
Date (s) of performance of tests : 31 July 2024~27 Aug. 2024
Date of Issue : 25 June 2026
Test Result : **Pass**

Testing Engineer :

Aaron Bu

(Aaron Bu)

Technical Manager :

Skylar Li

(Skylar Li)

Authorized Signatory :

Bovey Yang

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	27 Aug. 2024	STS2407338W14	ALL	Initial Issue
01	25 June 2026	STS2606320W04	ALL	Updated applicants and added models



1. SUMMARY OF TEST RESULTS

Rule Section	Description of Test	Judgment
3.2(4)	Frequency Error	PASS
3.2(7)	Occupied Bandwidth (99%)	PASS
3.2(6)	Unwanted Emission Intensity	PASS
3.2(3)	Power Error	PASS
3.3	Limitation of Collateral Emission of Receiver	PASS
3.6	Transmission Radiation power	PASS
3.6	Transmission Radiation Angle Width (3DB Beamwidth)	N/A
3.4	Radio Interference Prevention Capability	PASS
Note(3)	Carrier Sense Capability(1)	N/A
Note(4)	Carrier Sense Capability(2)	N/A
3.7	Construction Protection Confirmation	PASS

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) Article 2 Paragraph 1 of Item 19, MIC Notice No.88 Appendix No.43.
- (3) Application to transmitting devices which EIRP is less than (2.14dBi+ antenna power limit) and the shortage of EIRP is compensated by the antenna power. Not applicable to this product.
- (4) Application to transmitting devices which OFDM modulation occupied bandwidth greater than 26MHz.
- (5) All test data are referenced by the report number STS2407338W14.



1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.755\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.874\text{dB}$
3	Frequency tolerance	$\pm 0.03\text{ppm}$
4	Occupied Channel Bandwidth	$\pm 3.5\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Equipment	Rugged Windows Tablet	
Brand Name	N/A	
Model Name	GTW8103(Standard)	
Series Model(s)	GTW8103(Handle), GTW8103(RJ45A), GTW8103(RJ45AH), GTW8103	
Model Difference	GTW8103(Standard) Only the host; GTW8103(Handle) Host with handle; GTW8103(RJ45A) Host with RJ45+USB 2 in 1 module; GTW8103(RJ45AH) Host with handle and RJ45+USB 2 in 1 module; The USB interface of GTW8103 is modified to an aviation connector form based on GTW8103(RJ45AH), while all other aspects remain unchanged.	
Product Description	The EUT is Rugged Windows Tablet	
	Operation Frequency:	2402~2480 MHz
	Modulation Type:	GFSK
	Number Of Channel:	40CH
	Antenna Designation:	Please refer to the Note 3.
	Antenna Gain(Peak):	2.01 dBi
Based on the application, features, or specification exhibited in User Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User Manual.		
Channel List	Please refer to the Note 2.	
Ratings	Input: 19V---3.42A	
Battery	Model: BA6000 Rated Voltage:11.01V Charge Limit Voltage: 12.6V Capacity: 6000mAh	
	Model: BA880 Rated Voltage:7.4V Charge Limit Voltage: 8.4V Capacity: 880mAh	
Hardware version	E7255_MB_PCB_V20	
Software version	R.NB.00.00.02	
Connecting I/O Port(s)	Please refer to the Note 1.	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.



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Channel List for BLE							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480

3. Table for Filed Antenna

Ant.	Antenna Brand	Antenna Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1		SH241671B77-2	FPC	N/A	2.01	BLE ANT

Note: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.



2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description
Mode 1	TX Mode (CH00)
Mode 2	TX Mode (CH19)
Mode 3	TX Mode (CH39)

2.3 TABLE FOR PARAMETERS OF THE TEST SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. the RF output power selection is for the setting of RF output power expected by the customer and going to be fixed on the firmware of the final end product.

RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	Power Class
BLE(With 2M PHY)	BLE_1M PHY	GFSK	2.01	Default
	BLE_2M PHY	GFSK	2.01	Default

2.4 TEST CONDITIONS

The module was tested while in a continuous transmitter/receiver mode.

The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in all Modes to determine worst case levels.

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 22°C
- Humidity: 52 %
- Atmospheric pressure: 93 kpa

Power Supply Voltage Fluctuation Test

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input DC Power(V)	11.01	12.111	9.909
RF Chip Input DC Power(V)	3.251	3.263	3.247
Voltage Variation (%)	/	0.37	-0.12

Note: 1. Voltage Variation (%)

= (RF chip Input high or Low Voltage - RF chip Input Normal Voltage) / RF chip Input Normal Voltage * 100

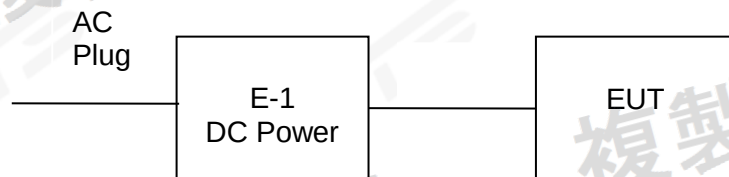
2. RF chip Input DC power fluctuation is verified at the power input PIN of the RF chip.

When the input supply voltage to the EUT from the external power source is varied by +/- 10%, the 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%, and the DC power fluctuation at the power input PIN of the RF chip is equal to or less than +/- 1%. Exempt extremely high and low supply voltage condition tests, EUT only operated in normal voltage to test all regulations.



2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Mode 1:



2.6 DESCRIPTION OF NECESSARY ACCESSORIES AND 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.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
E-1	DC Power	HONGSHENGFENG	DPS-305AF	N/A	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.7 EQUIPMENTS LIST FOR ALL TEST ITEMS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Generator	Keysight	N5182B	MY57301448	2023.09.26	2024.09.25
Signal Analyzer	Agilent	N9020A	MY51510623	2024.02.23	2025.02.22
Temperature & Humidity	SW-108	SuWei	N/A	2024.03.15	2025.03.14
Power Divider	eastsheep	PD-0.5/0.6-2S	B519	2024.02.23	2025.02.22
Power Sensor	Keysight	U2021XA	MY55520005	2023.09.26	2024.09.25
Attenuator	Agilent	8494B	DC-18G	2024.02.23	2025.02.22
Power Divider	eastsheep	PD-0.5/0.6-2S	B519	2024.02.23	2025.02.22
DC power supply	HONGSHENG FENG	DPS-305AF	17064939	2023.09.26	2024.09.25
Switch control box	MW	MW100-RFCB	N/A	N/A	N/A
Test SW	MW	MTS 8310_2.0.0.0			

Test Equipment Calibration

All of the test equipment is effective use and calibration certification institution, GRGT, the address is 163 tianhe district in huangpu road xiping cloud road .Guangzhou, China

Note: The calibration agency listed on the table corresponds to item ii c) of Article 24-2 paragraph 4.



3. CONSTRUCTION PROTECTION CONFIRMATION

Our products apply for Japanese radio frequency (rf) certification. We use the following methods to prevent unauthorized access and modification of RF and modulation parts. This wireless module uses a shielding cover to prevent users from disassembling and modifying it. For more information, see the following photo.





4. FREQUENCY ERROR

4.1 LIMIT

Item	Limits
Frequency Error	$\pm 50\text{ppm}$

4.2 TEST PROCEDURES

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- (1) In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a frequency meter.
- (2) In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
- (3) In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer.
- (4) In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.

In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

4.3 TEST SETUP



4.4 EUT OPERATION DURING TEST

The EUT was placed on the test table and programmed in un-modulation function.

4.5 TEST RESULT

Note: The test data please refer to APPENDIX 1.



5. ANTENNA POWER

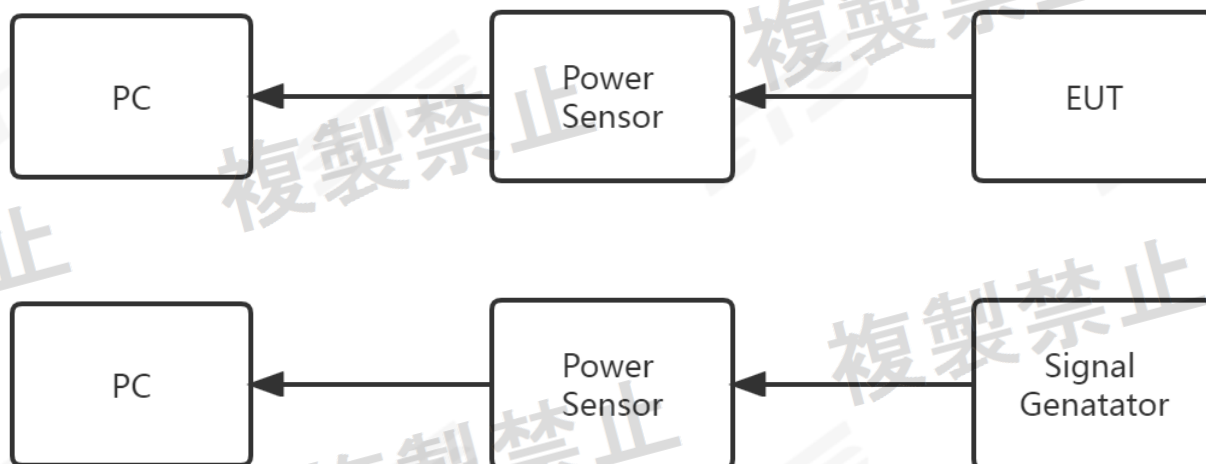
5.1 LIMIT

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH from 2400 – 2483.5 MHz) $\leq 10\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz,802.11b/g/n HT20) $\leq 5\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz,802.11n HT40) $\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Power Error	+20%, No lower limit (Base on manufacturer declare power)

5.2 TEST PROCEDURE

1. EUT turn to test frequency channel and keep continuous transmitting.
2. Reading the output power from the Power sensor as P_{EUT} .
3. Turn the Signal generator to frequency channel the same as the EUT.
4. Turn the level of Signal generator, scan with the power meter until the power equal to P_{EUT} , the level of Signal generator recorded as "P".
5. The antenna power of EUT is "P".
6. EIRP power="P"+antenna gain.

5.3 TEST SETUP



5.4 TEST DEVIATION

There is no deviation with the original standard.

5.5 TEST RESULT

Note: The test data please refer to APPENDIX 1.



6. RADIATION POWER

6.1 LIMIT

Item	Limits
Radiation power EIRP	FH from 2400 – 2483.5 MHz ,EIRP $\leq$ 6.91dBm/MHz CCK/OFDM/DBPSK (2400~2483.5MHz) OFDM or DS other than (802.11b/g/n HT20) EIRP $\leq$ 12.14 dBm/MHz OFDM or DS other than (802.11n HT40) EIRP $\leq$ 9.13dBm/MHz Other from 2400~2483.5MHz: 12.14 dBm or less

6.2 TEST RESULT

Note: The test data please refer to APPENDIX 1.



7. OCCUPIED BANDWITH

7.1 LIMIT

Item	Limits
Occupied Band Width:	$\leq 83.5\text{MHz}$ (FH;FH+DS;FH+OFDM) $\leq 26\text{MHz}$ (Others)

7.2 TEST PROCEDURES

- Setting of SA is following as: RB: 300KHz / VB: 300KHz / SPAN: 3MHz / AT: 30dB Ref: 10dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
- EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode (For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz(For DSSS or OFDM Device) or 83.5MHz(For FHSS Device).

7.3 TEST SETUP



7.4 TEST DEVIATION

There is no deviation with the original standard.

7.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULT

Note: The test data please refer to APPENDIX 1.



8. UNWANTED EMISSION INTENSITY MEASUREMENT

8.1 LIMIT

Item	Limits
TX Spurious Emission	$\leq 2.5 \mu\text{W}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq 2.5 \mu\text{W}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq 25 \mu\text{W}$ ($2387\text{MHz} < f \leq 2400\text{MHz}$)
	$\leq 25 \mu\text{W}$ ($2483.5\text{MHz} \leq f < 2496.5\text{MHz}$)
	$\leq 2.5 \mu\text{W}$ ($2496.5\text{MHz} \leq f < 12500\text{MHz}$)

8.2 TEST PROCEDURES

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	100KHz / 100KHz (Below 1GHz)
RB / VB	1MHz / 1MHz (Above 1GHz)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. Setting of SA is following as: Below 1GHz RB:100KHz / VB:100KHz, Above 1GHz RB:1MHz / VB:1MHz / AT: 10dB Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. Setting of SA is following as 30MHz and stop frequency 1000MHz. Then to mark peak reading value + cable loss shall be less than 0.25 μW .
4. Setting of SA is following as 1000MHz and stop frequency 2387MHz. Then to mark peak reading value + cable loss shall be less than 2.5 μW .
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25 μW .
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz. Then to mark peak reading value + cable loss shall be less than 25 μW .
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12750MHz. Then to mark peak reading value + cable loss shall be less than 2.5 μW .
8. When we tested 30MHz-1GHz, we used the RB 100KHz setting for the test. The limit on the test chart was converted. The conversion formula: $-26\text{dBm} + 10 \cdot \log(100\text{K}/1\text{M}) = -36\text{dBm}$.
9. If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.



8.3 TEST SETUP



8.4 TEST DEVIATION

There is no deviation with the original standard.

8.5 TEST RESULT

Note: The test data please refer to APPENDIX 1.



9. IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT

9.1 LIMIT

Item	Limits
RX Spurious Emission:	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)

9.2 TEST PROCEDURES

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

1. EUT have the continuous reception mode and fixed only one channelize.
2. Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) / AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
4. SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12750MHz. Search to mark peak reading value + cable loss shall be less than 20nW
5. If power level of lower emissions are more than 1/10 of limit (.0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

9.3 TEST RESULT

Note: The test data please refer to APPENDIX 1.



10. TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

10.1 LIMIT

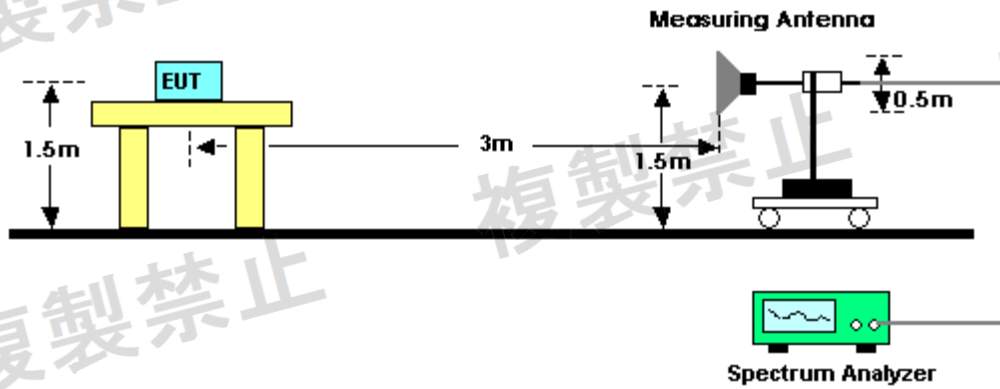
Item	Limits
3dB antenna beam width	$e \leq 360/A$ (The A is 10 in maximum) $A = \{EIRP \text{ Power [mW/MHz]} / \{2.14\text{dBi} + \text{output power}(10\text{mW /MHz}, 3\text{mW/MHz})\}\}$ Shall be 1 when A is lower than 1
Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

10.2 TEST PROCEDURES

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 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. "E" is the half-power beam width (angle between two points at which radiated power becomes 1/2)
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 $A = 1$).
 $A = \{EIRP \text{ Power [mW/MHz]} / \{2.14\text{dBi} + \text{output power}(10\text{mW /MHz}, 3\text{mW/MHz})\}\}$
Shall be 1 when A is lower than 1

10.3 TEST SETUP



10.4 TEST DEVIATION

There is no deviation with the original standard.

10.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

10.6 TEST RESULT

Note: The max EIRP less than 12.14 dBm/MHz, not applicable.

11. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

11.1 LIMIT

Item	Limits
Identification code	≥ 48 bits

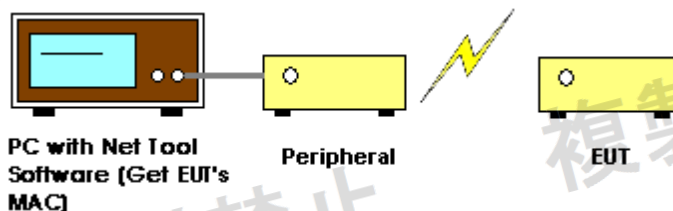
11.2 MEASURING ID CODE SOFTWARE

Item	Limits
MAC IP List	MAC Scan

11.3 TEST PROCEDURES

- In the case that the EUT has the function of automatically transmitting the identification code:
 - Transmit the predetermined identification codes from EUT.
 - Check the transmitted identification codes with the demodulator.
- In the case of receiving the identification code:
 - Transmit the predetermined identification codes from the counterpart.
 - Check if communication is normal.
 - Transmit the signals other than predetermined ID codes from the counterpart.
 - check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

11.4 TEST SETUP



11.5 TEST DEVIATION

There is no deviation with the original standard.

11.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.



11.7 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT

设备 MAC 地址

B0:3C:DC:DA:BC:A8

Note: The MAC Address is B0:3C:DC:DA:BC:A8.

12. CARRIER SENSE CAPABILITY

12.1 INTERFERENCE PREVENTION FUNCTION

12.2 TEST REQUIREMENT

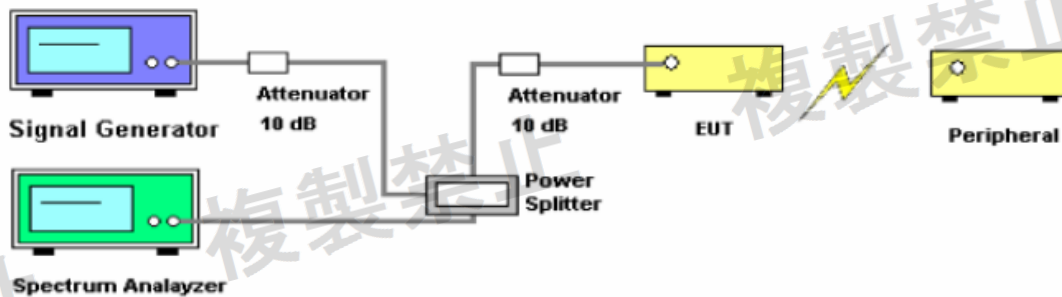
MIC Notice No.88 Appendix No.43

Article 2, Paragraph 1, Item 19 Rules Section 10

12.3 TEST PROCEDURE

1. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is $(on\ 22.79 + G - 20 \cdot \log(f) \text{ dBm})$ (G is the antenna gain, f is the test frequency).
2. turn off the RF signal of the SG.
3. EUT have transmitted the maximum modulation signal and fixed channelize.
4. Setting of SA :RBW/VBW=1MHz/1MHz, Span=50MHz, Sweep time=auto, Sweep mode=continuous, Detect mode=positive peak
5. SG RF signal on.
6. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous.

❖ Measurement System Diagram



❖ Conditions of Application Equipment (EUT)

- The EUT state shall be “normal mode link with wireless router”.

12.4 TEST RESULT

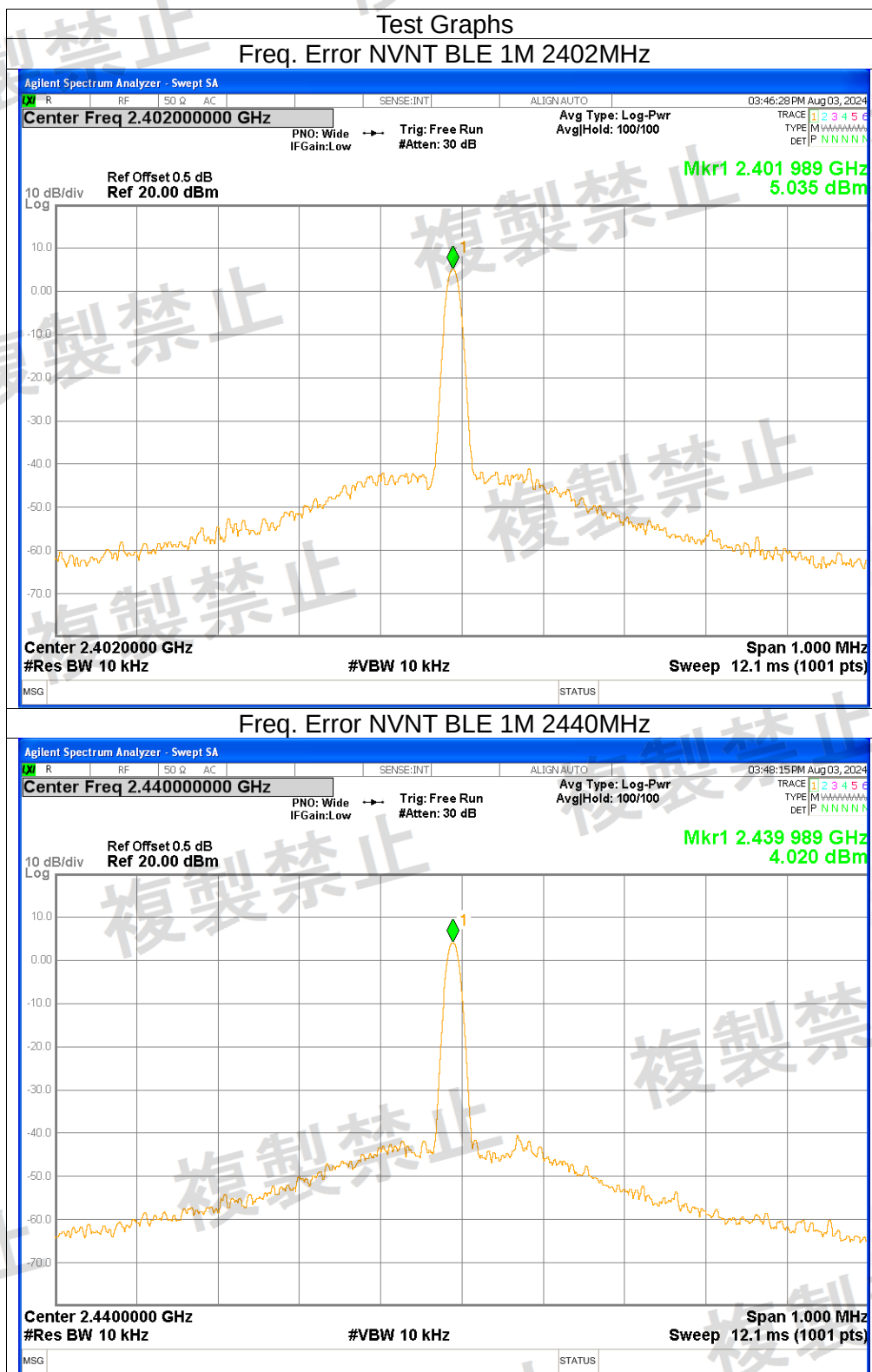
Note: no requirement.



APPENDIX 1-TEST DATA

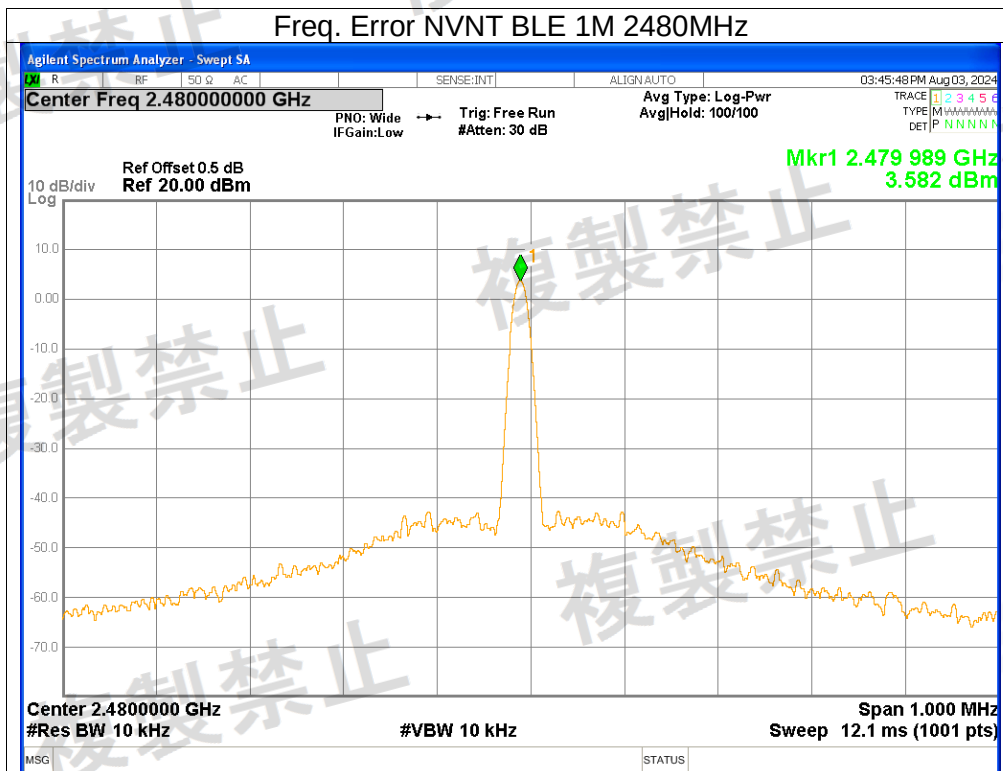
1. Frequency Error

Condition	Mode	Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	BLE 1M	2402	2401.989	-11000	-4.58	+50	Pass
NVNT	BLE 1M	2440	2439.989	-11000	-4.51	+50	Pass
NVNT	BLE 1M	2480	2479.989	-11000	-4.44	+50	Pass
NVNT	BLE 2M	2402	2401.989	-11000	-4.58	+50	Pass
NVNT	BLE 2M	2440	2439.989	-11000	-4.51	+50	Pass
NVNT	BLE 2M	2480	2479.989	-11000	-4.44	+50	Pass

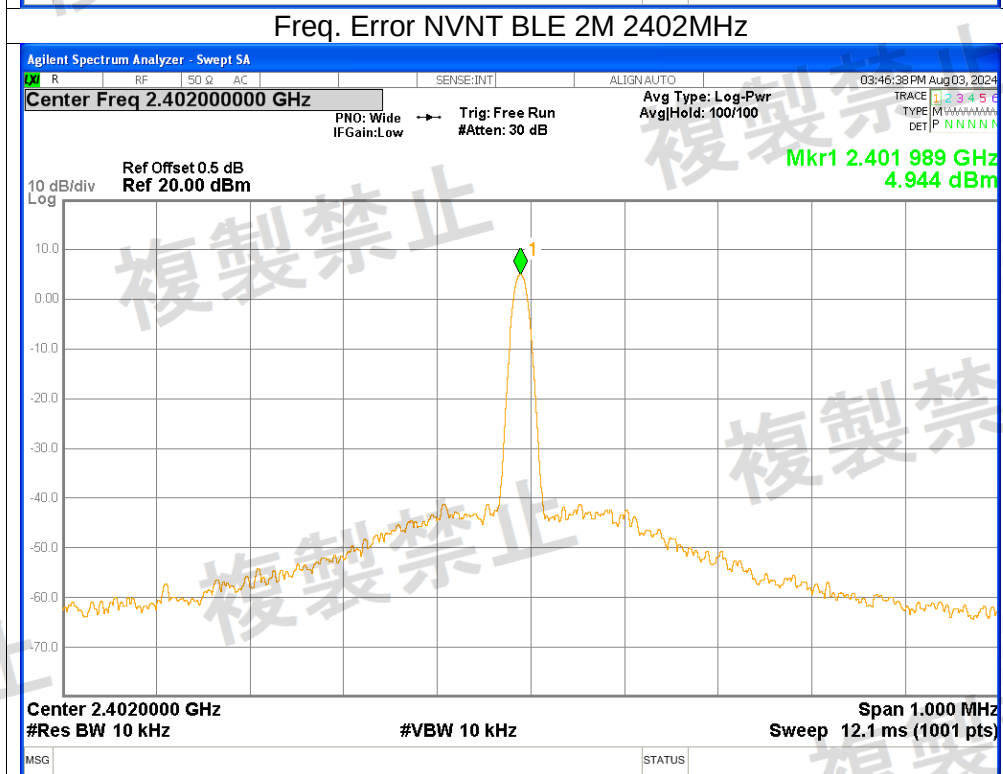




Freq. Error NVNT BLE 1M 2480MHz

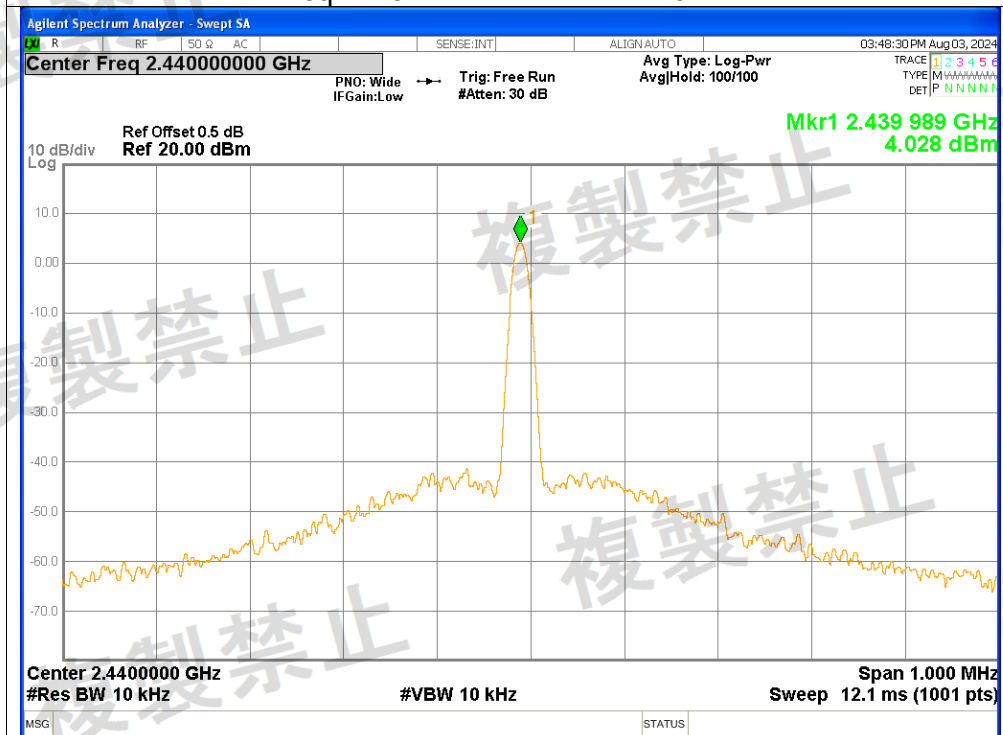


Freq. Error NVNT BLE 2M 2402MHz

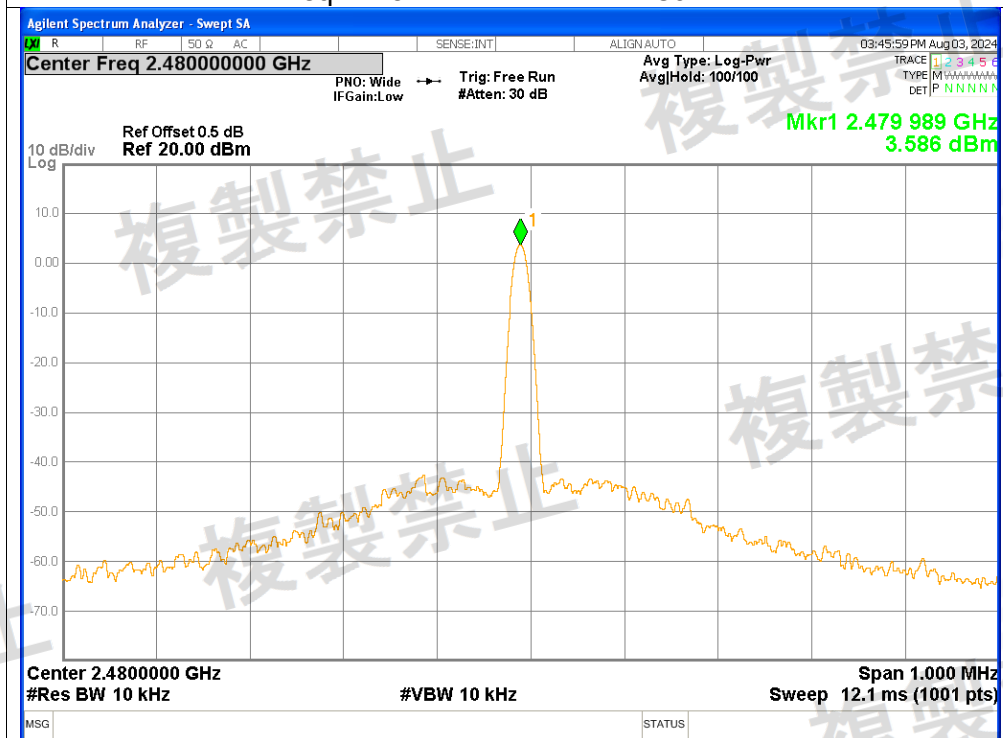




Freq. Error NVNT BLE 2M 2440MHz



Freq. Error NVNT BLE 2M 2480MHz





2. Antenna Power

Condition	Mode	Frequency (MHz)	Power (dBm)	Antenna Power (mW)	Limit (mW)	Declared Power (mW)	Tolerance (%)	Upper Limit (%)	Verdict
NVNT	BLE 1M	2402	4.69	2.944	10	3.5	-15.87	20	Pass
NVNT	BLE 1M	2440	4.28	2.679	10	3.5	-23.45	20	Pass
NVNT	BLE 1M	2480	4.91	3.097	10	3.5	-11.50	20	Pass
NVNT	BLE 2M	2402	4.71	2.958	10	3.5	-15.49	20	Pass
NVNT	BLE 2M	2440	4.27	2.673	10	3.5	-23.63	20	Pass
NVNT	BLE 2M	2480	4.91	3.097	10	3.5	-11.50	20	Pass



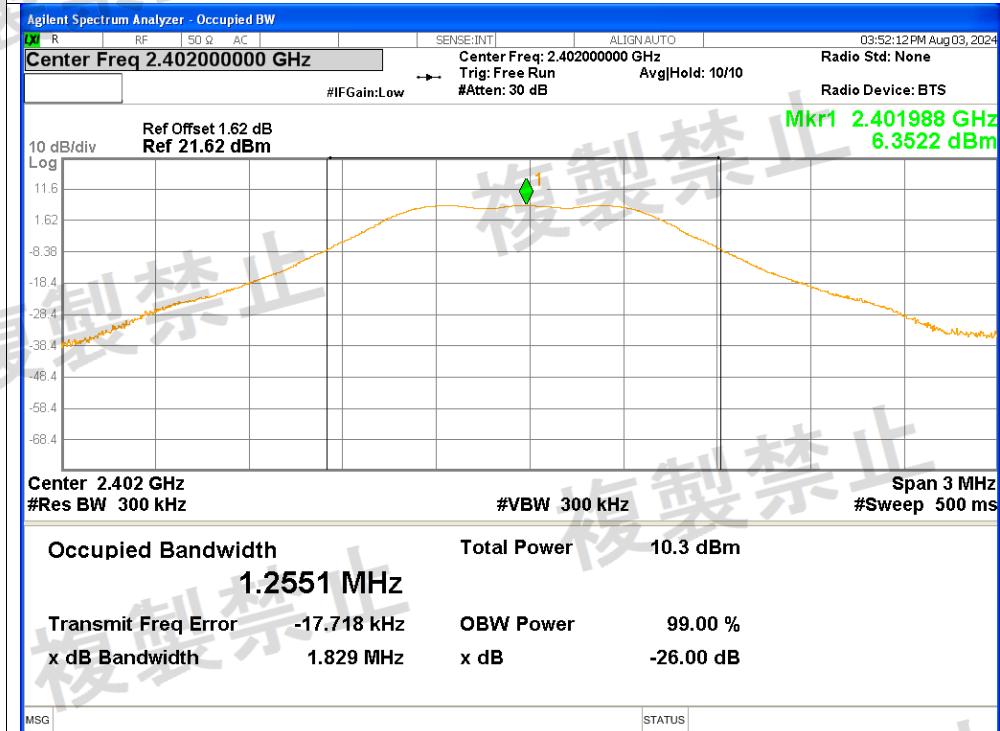
3. EIRP Power

Condition	Mode	Frequency (MHz)	Antenna Power (dBm)	Gain (dBi)	EIRP Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	4.69	2.01	6.70	12.14	Pass
NVNT	BLE 1M	2440	4.28	2.01	6.29	12.14	Pass
NVNT	BLE 1M	2480	4.91	2.01	6.92	12.14	Pass
NVNT	BLE 2M	2402	4.71	2.01	6.72	12.14	Pass
NVNT	BLE 2M	2440	4.27	2.01	6.28	12.14	Pass
NVNT	BLE 2M	2480	4.91	2.01	6.92	12.14	Pass

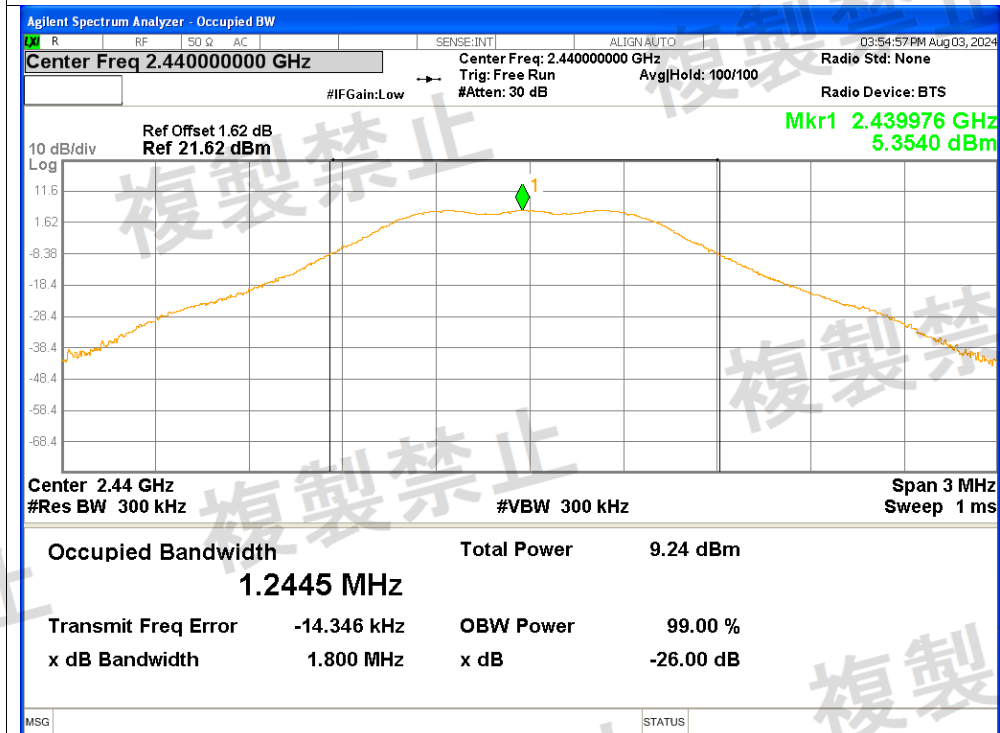


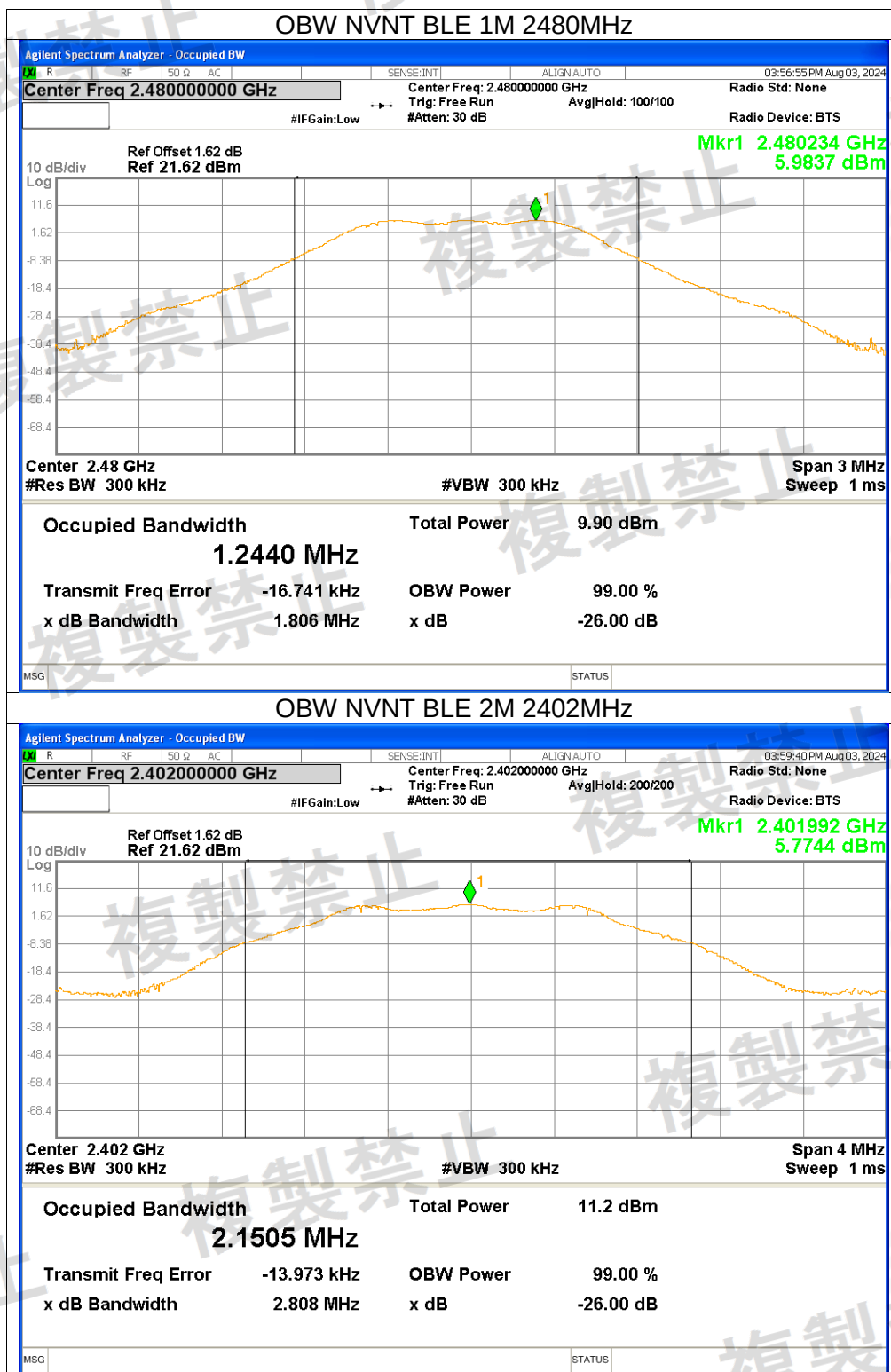
4. Occupied Channel Bandwidth

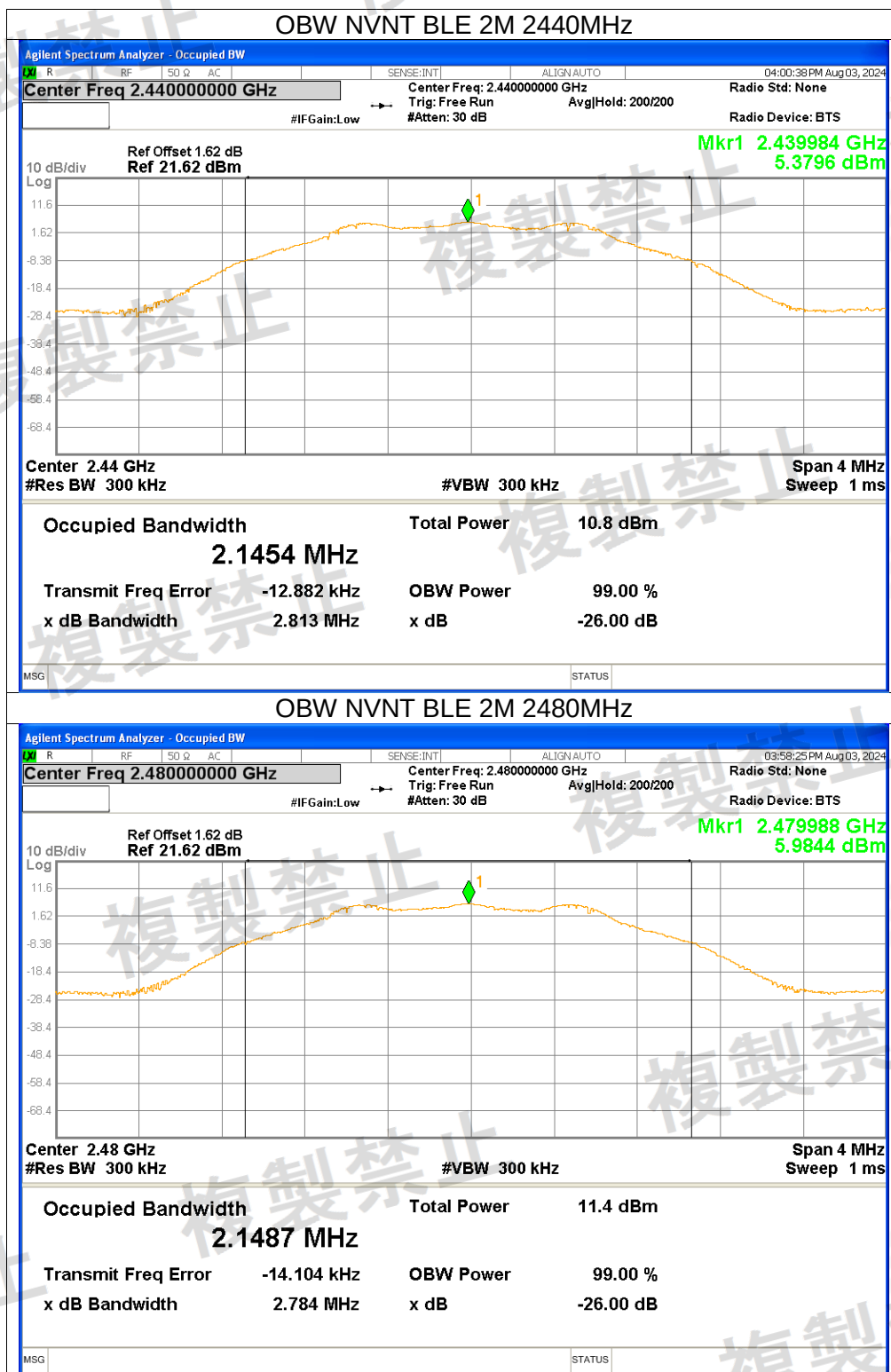
Condition	Mode	Frequency (MHz)	99% OBW (MHz)
NVNT	BLE 1M	2402	1.2551
NVNT	BLE 1M	2440	1.2445
NVNT	BLE 1M	2480	1.244
NVNT	BLE 2M	2402	2.1505
NVNT	BLE 2M	2440	2.1454
NVNT	BLE 2M	2480	2.1487

Test Graphs
OBW NVNT BLE 1M 2402MHz

OBW NVNT BLE 1M 2440MHz









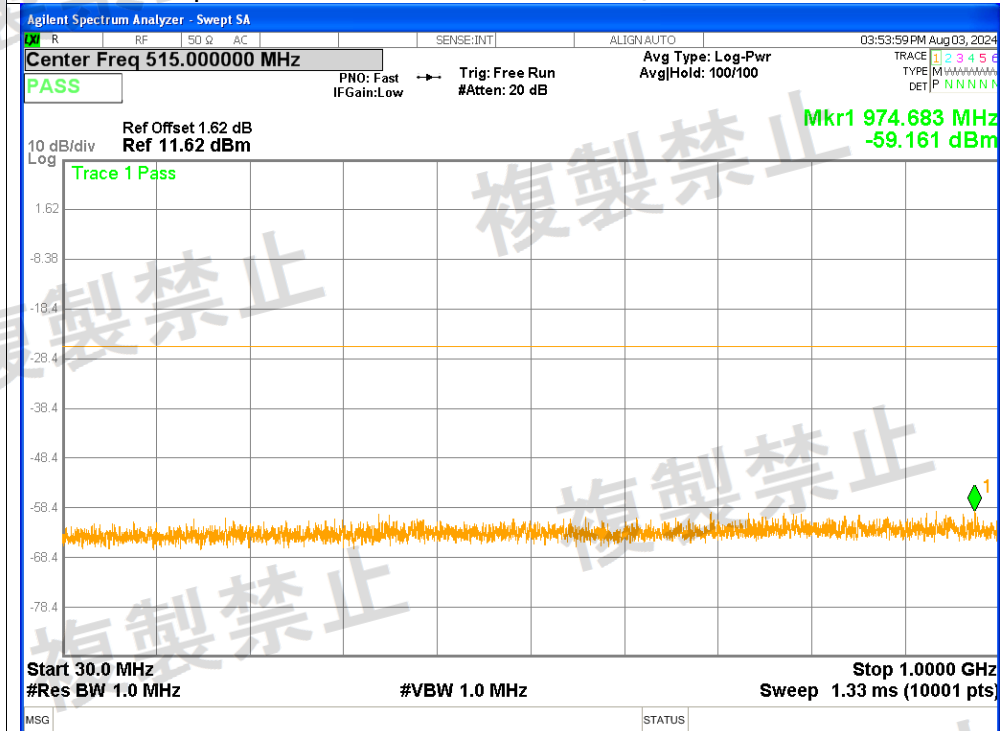
5. Tx Spurious Emission

Condition	Mode	Frequency (MHz)	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (uW)	Limit Start (uW)	Limit Stop (uW)	Verdict
NVNT	BLE 1M	2402	30-1000	974.68	-59.16	0.0012	2.5	2.5	Pass
NVNT	BLE 1M	2402	1000-2387	2342.48	-53.24	0.0047	2.5	2.5	Pass
NVNT	BLE 1M	2402	2387-2400	2400	-29.48	1.1272	25	25	Pass
NVNT	BLE 1M	2402	2483.5-2496.5	2495.22	-55.94	0.0025	25	25	Pass
NVNT	BLE 1M	2402	2496.5-13000	5637.05	-54.1	0.0039	2.5	2.5	Pass
NVNT	BLE 1M	2440	30-1000	931.91	-59.1	0.0012	2.5	2.5	Pass
NVNT	BLE 1M	2440	1000-2387	2380.48	-51.9	0.0065	2.5	2.5	Pass
NVNT	BLE 1M	2440	2387-2400	2389.89	-57.62	0.0017	25	25	Pass
NVNT	BLE 1M	2440	2483.5-2496.5	2494.73	-56.58	0.0022	25	25	Pass
NVNT	BLE 1M	2440	2496.5-13000	5786.2	-51.46	0.0071	2.5	2.5	Pass
NVNT	BLE 1M	2480	30-1000	956.83	-58.95	0.0013	2.5	2.5	Pass
NVNT	BLE 1M	2480	1000-2387	2359.95	-55.69	0.0027	2.5	2.5	Pass
NVNT	BLE 1M	2480	2387-2400	2395.84	-57.1	0.0019	25	25	Pass
NVNT	BLE 1M	2480	2483.5-2496.5	2487.37	-40.85	0.0822	25	25	Pass
NVNT	BLE 1M	2480	2496.5-13000	12439.11	-54.36	0.0037	2.5	2.5	Pass
NVNT	BLE 2M	2402	30-1000	975.36	-58.69	0.0014	2.5	2.5	Pass
NVNT	BLE 2M	2402	1000-2387	2342.34	-52.89	0.0051	2.5	2.5	Pass
NVNT	BLE 2M	2402	2387-2400	2399.99	-16.46	22.5944	25	25	Pass
NVNT	BLE 2M	2402	2483.5-2496.5	2492.83	-56.58	0.0022	25	25	Pass
NVNT	BLE 2M	2402	2496.5-13000	12517.89	-54.36	0.0037	2.5	2.5	Pass
NVNT	BLE 2M	2440	30-1000	795.04	-58.86	0.0013	2.5	2.5	Pass
NVNT	BLE 2M	2440	1000-2387	2380.48	-51.81	0.0066	2.5	2.5	Pass
NVNT	BLE 2M	2440	2387-2400	2398.68	-58.37	0.0015	25	25	Pass
NVNT	BLE 2M	2440	2483.5-2496.5	2494.9	-57.3	0.0019	25	25	Pass
NVNT	BLE 2M	2440	2496.5-13000	12476.93	-54.09	0.0039	2.5	2.5	Pass
NVNT	BLE 2M	2480	30-1000	791.06	-58.73	0.0013	2.5	2.5	Pass
NVNT	BLE 2M	2480	1000-2387	2173.12	-56.24	0.0024	2.5	2.5	Pass
NVNT	BLE 2M	2480	2387-2400	2388.19	-57.88	0.0016	25	25	Pass
NVNT	BLE 2M	2480	2483.5-2496.5	2487.47	-41.03	0.0789	25	25	Pass
NVNT	BLE 2M	2480	2496.5-13000	12314.12	-54.28	0.0037	2.5	2.5	Pass

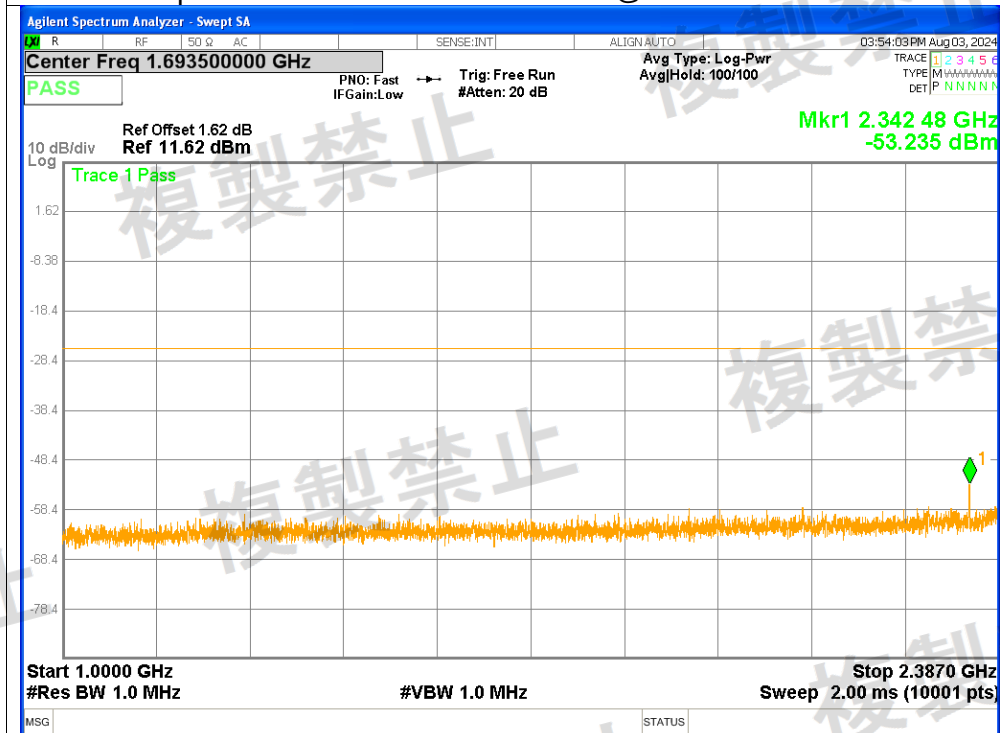


Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz @ 30MHz-1000MHz

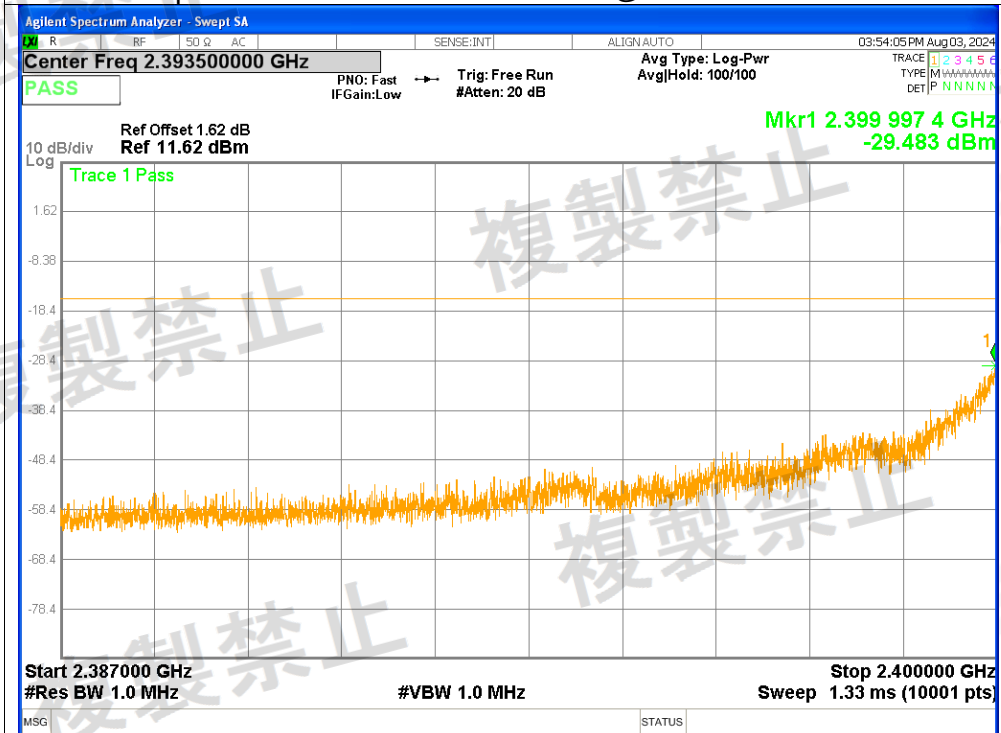


Tx. Spurious NVNT BLE 1M 2402MHz @ 1000MHz-2387MHz

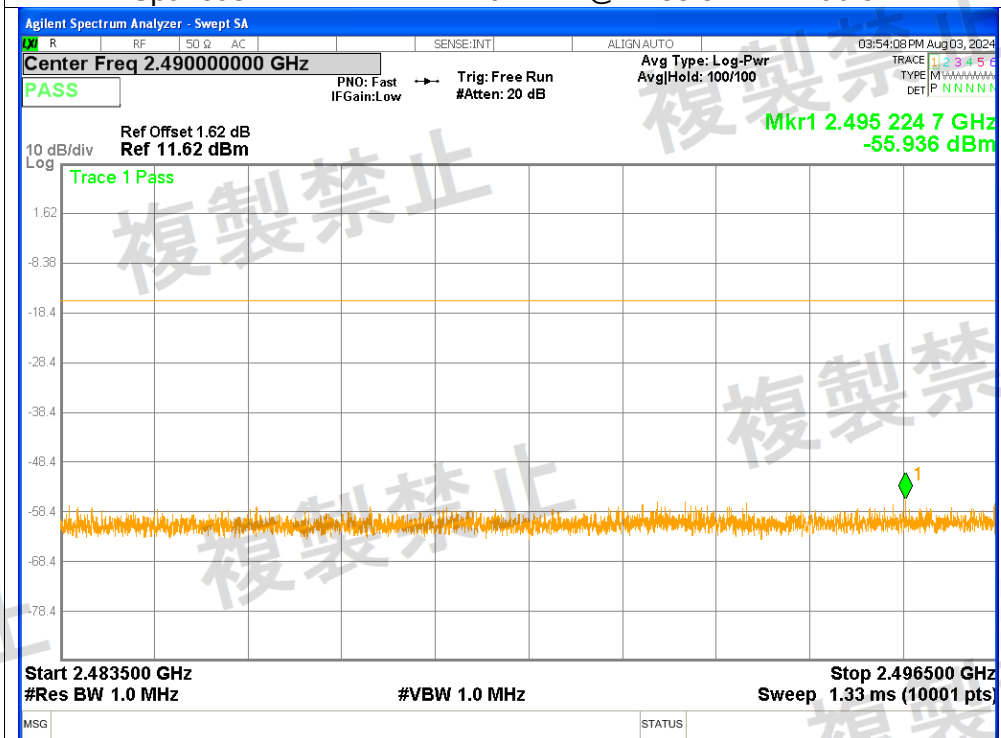




Tx. Spurious NVNT BLE 1M 2402MHz @ 2387MHz-2400MHz

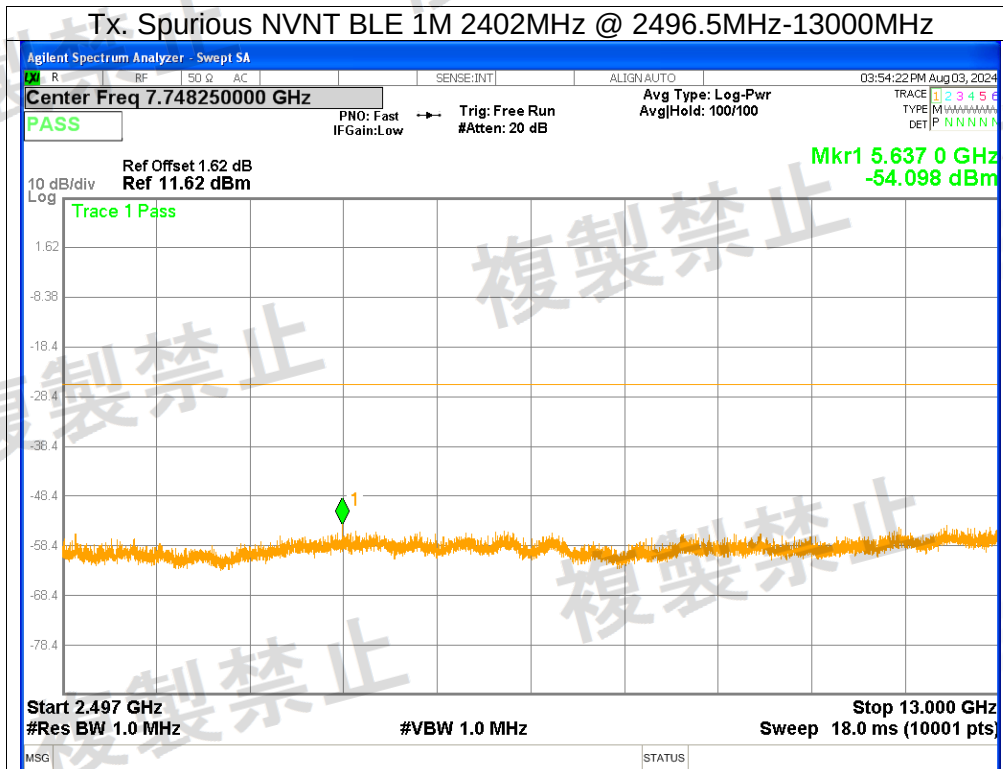


Tx. Spurious NVNT BLE 1M 2402MHz @ 2483.5MHz-2496.5MHz

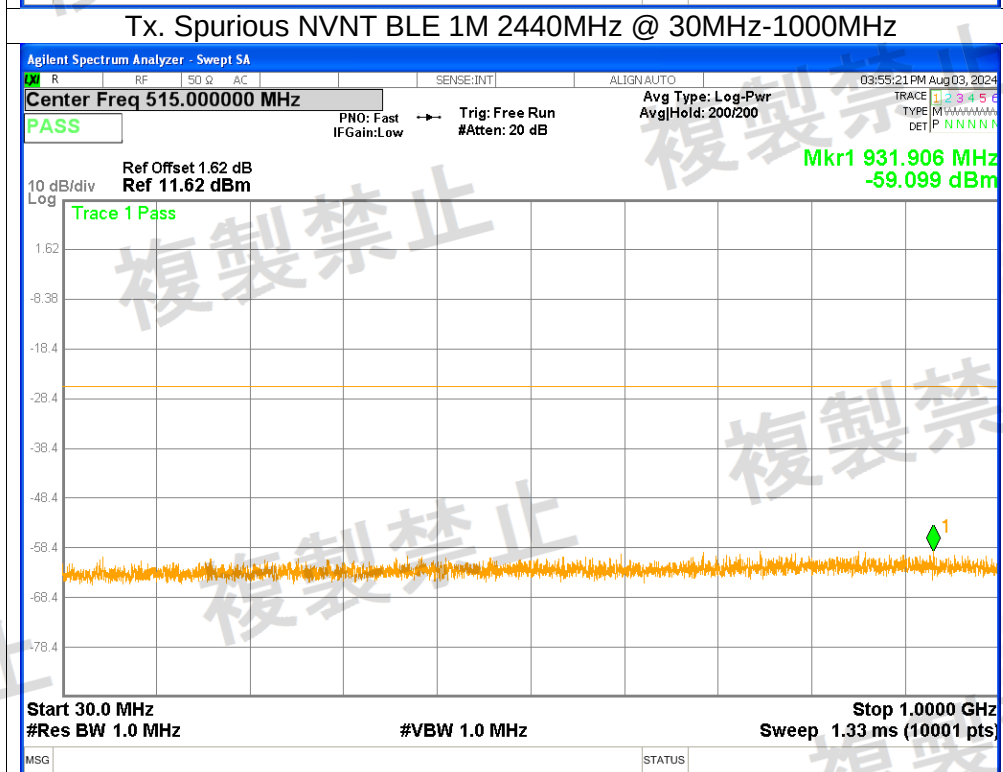




Tx. Spurious NVNT BLE 1M 2402MHz @ 2496.5MHz-13000MHz

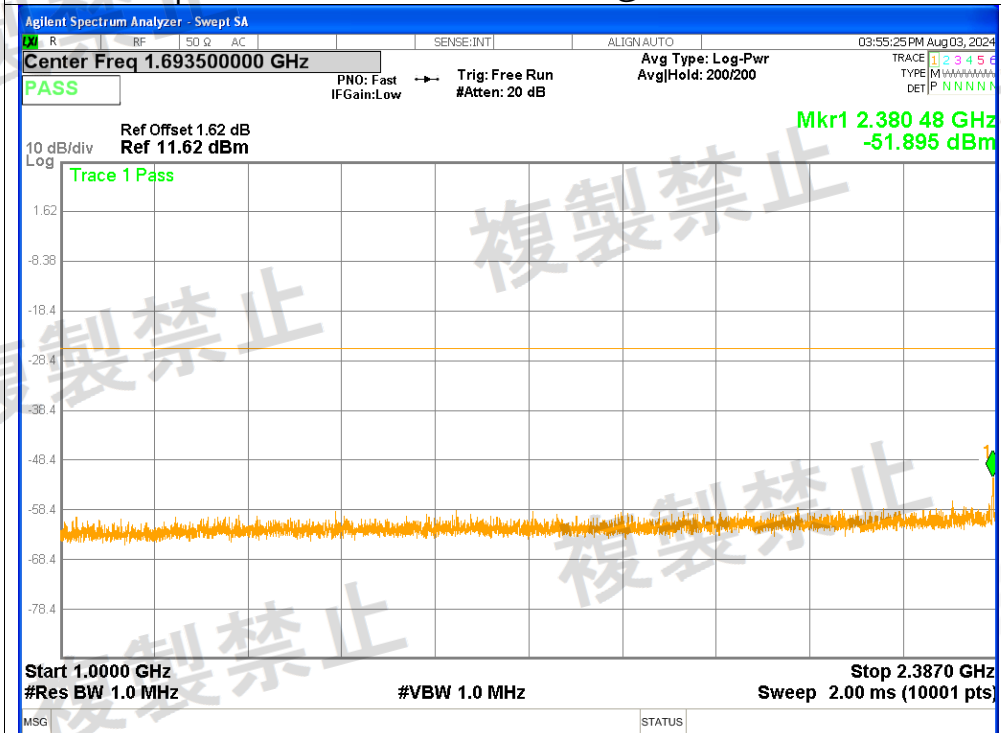


Tx. Spurious NVNT BLE 1M 2440MHz @ 30MHz-1000MHz

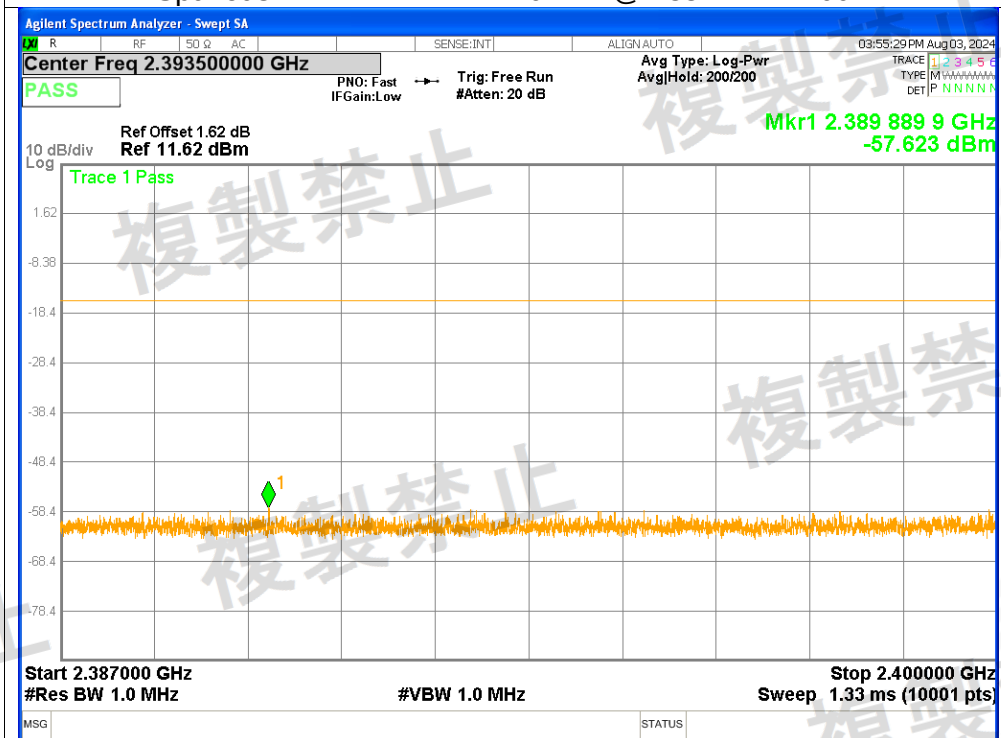




Tx. Spurious NVNT BLE 1M 2440MHz @ 1000MHz-2387MHz

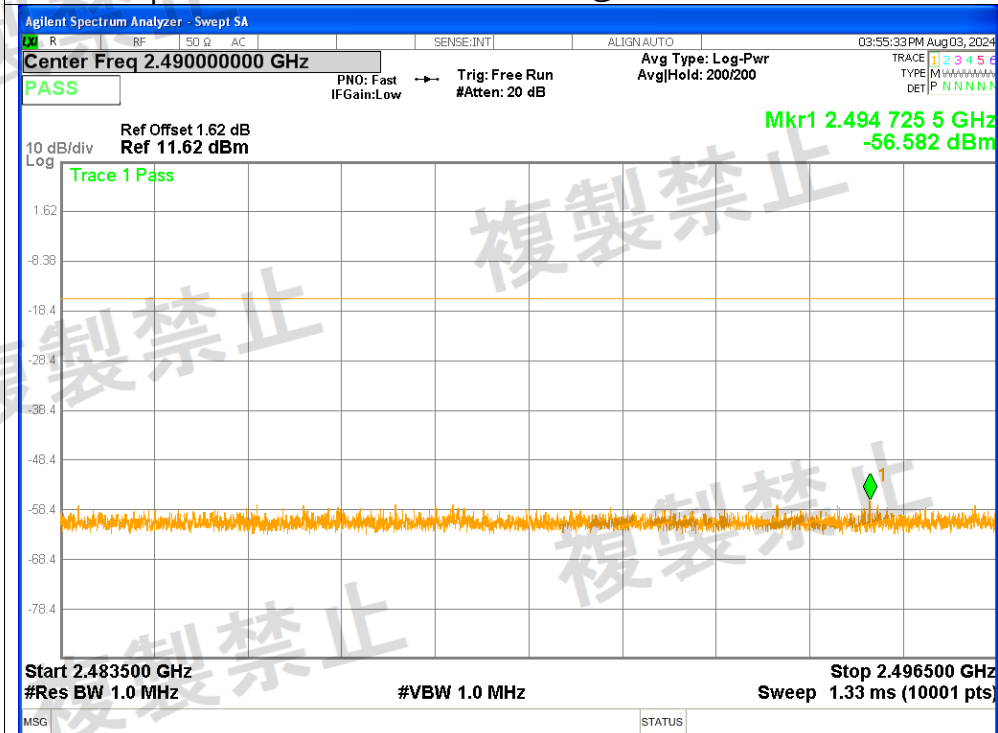


Tx. Spurious NVNT BLE 1M 2440MHz @ 2387MHz-2400MHz

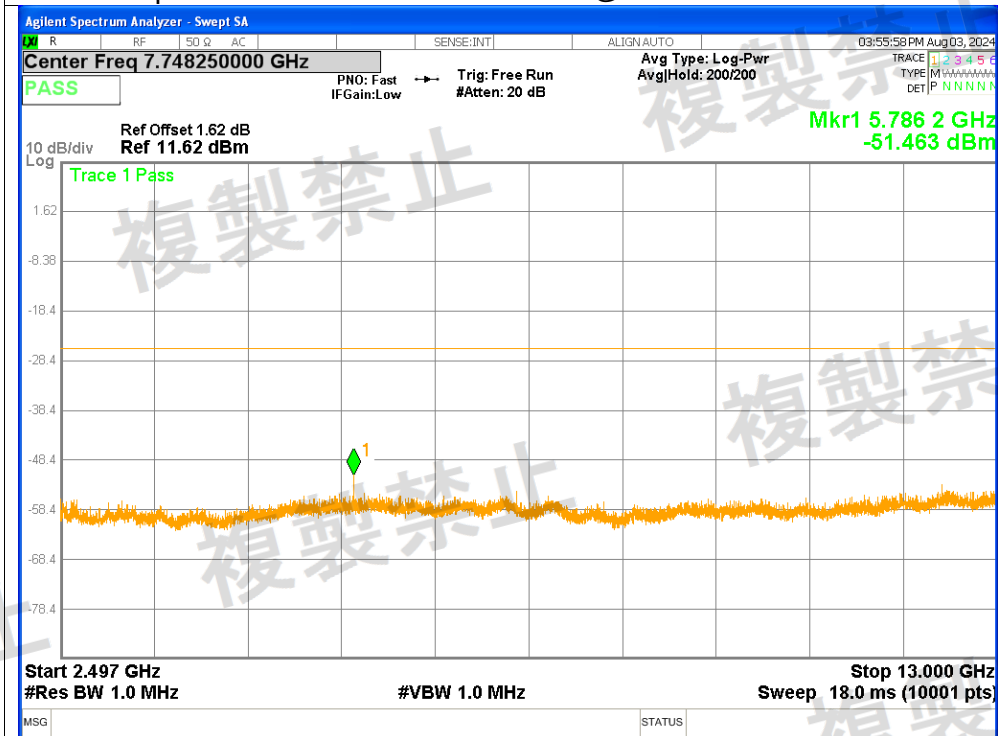


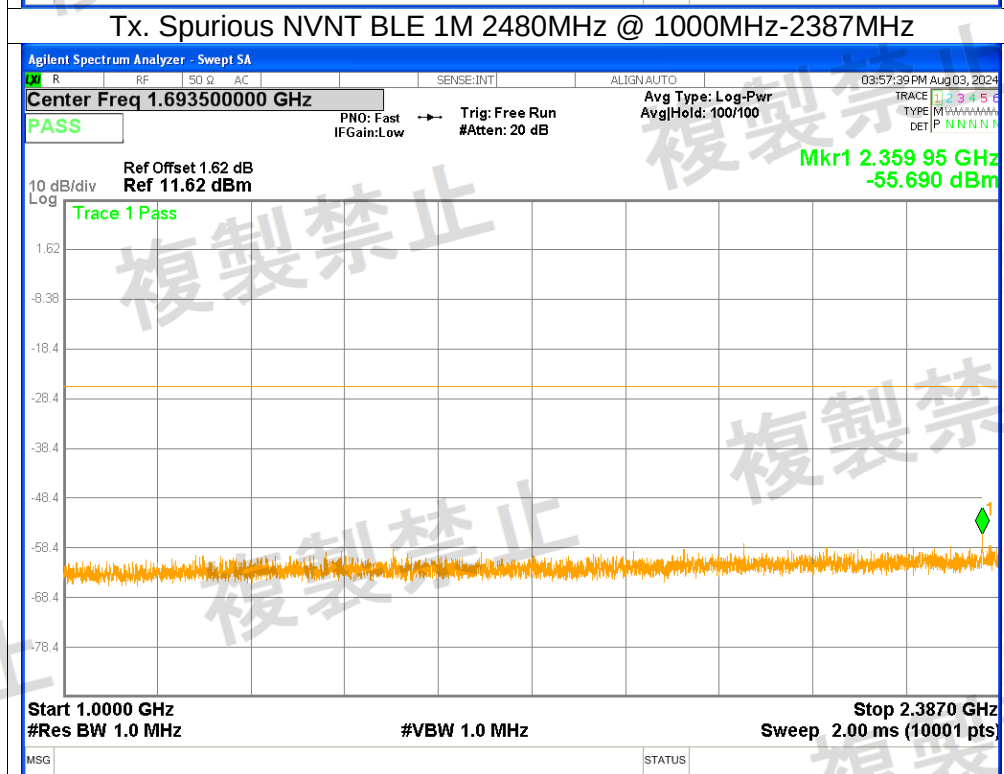
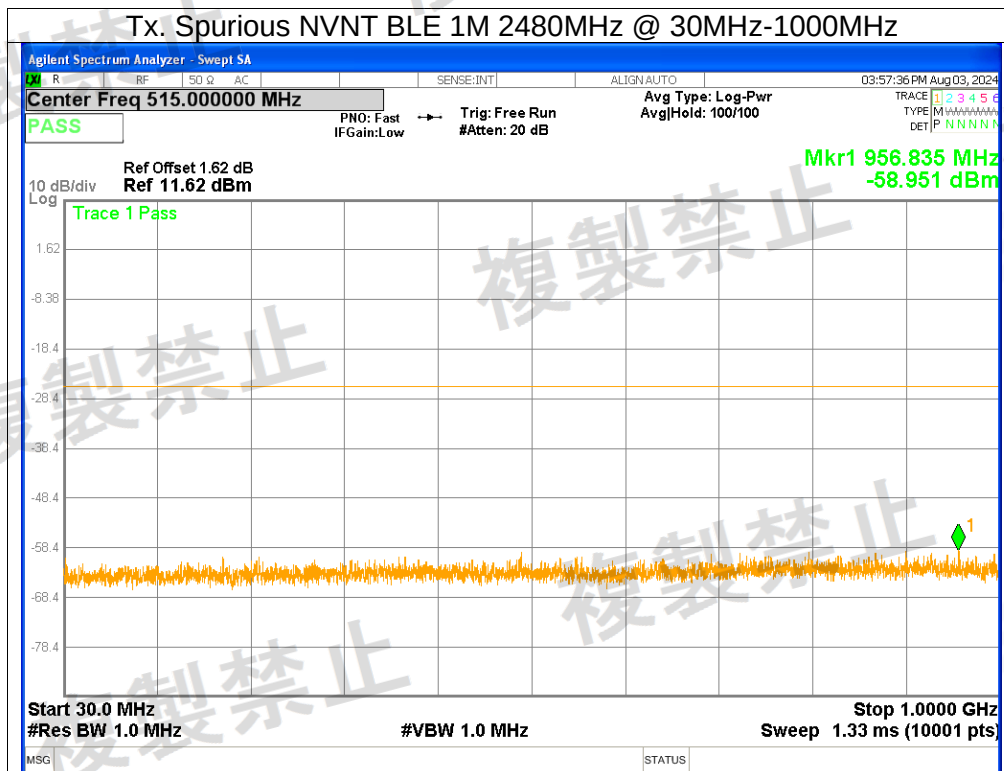


Tx. Spurious NVNT BLE 1M 2440MHz @ 2483.5MHz-2496.5MHz



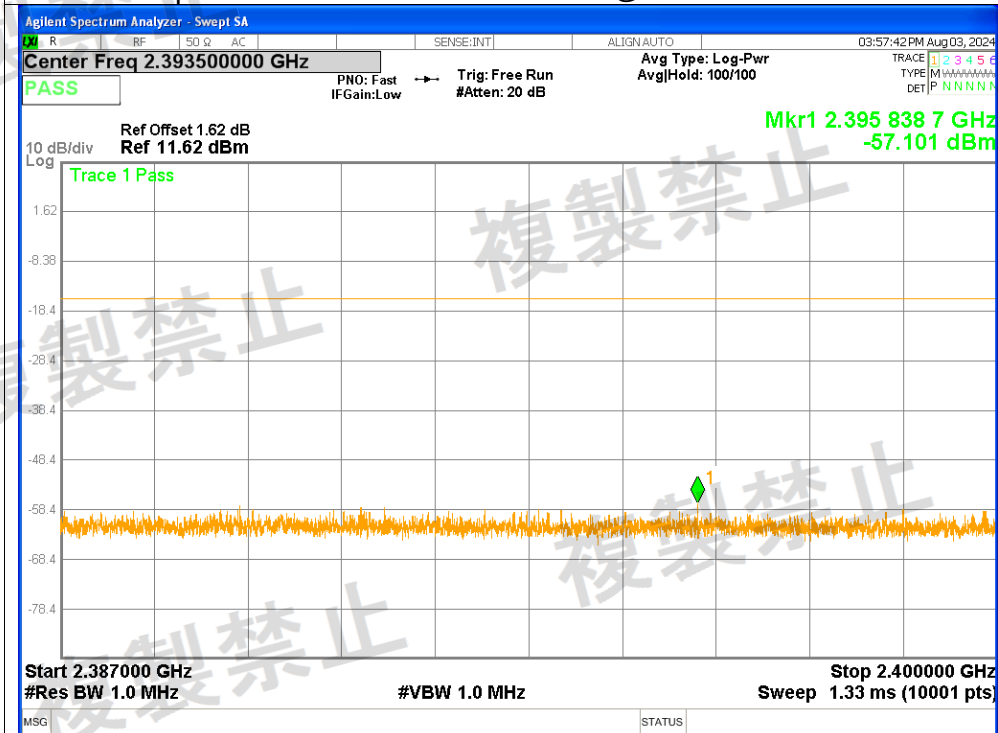
Tx. Spurious NVNT BLE 1M 2440MHz @ 2496.5MHz-13000MHz



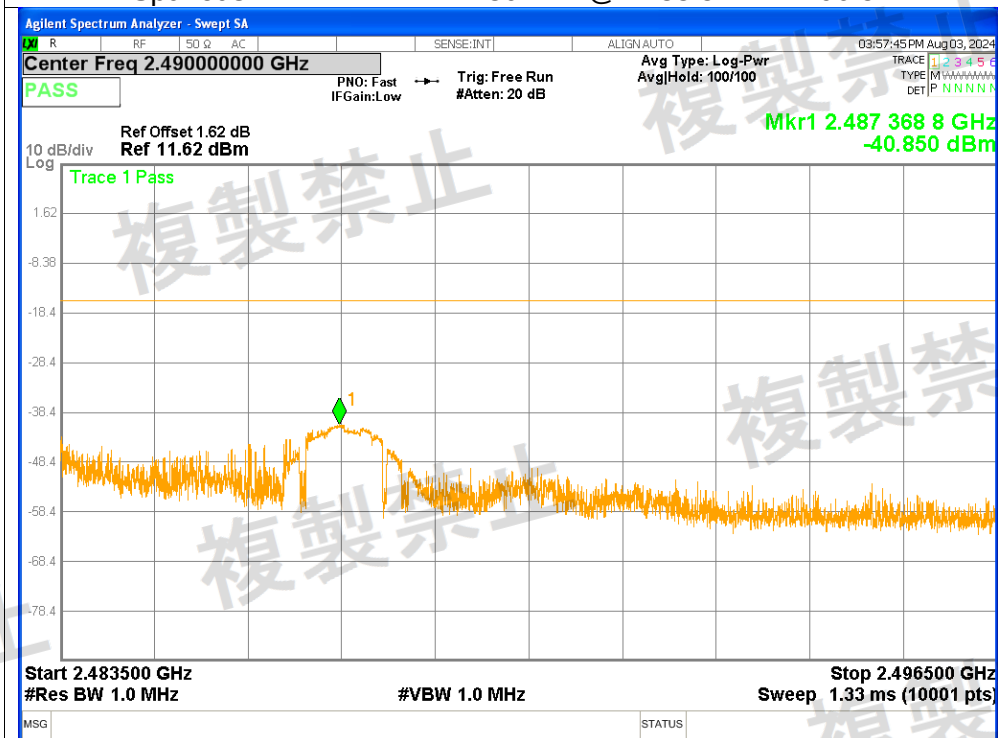




Tx. Spurious NVNT BLE 1M 2480MHz @ 2387MHz-2400MHz

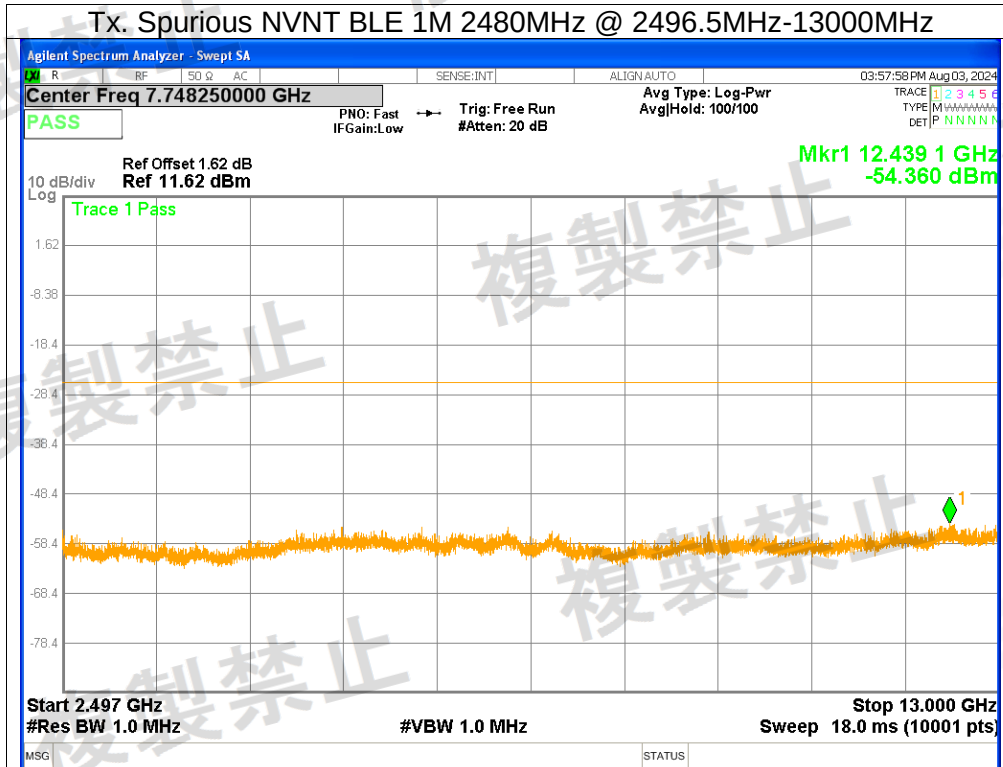


Tx. Spurious NVNT BLE 1M 2480MHz @ 2483.5MHz-2496.5MHz

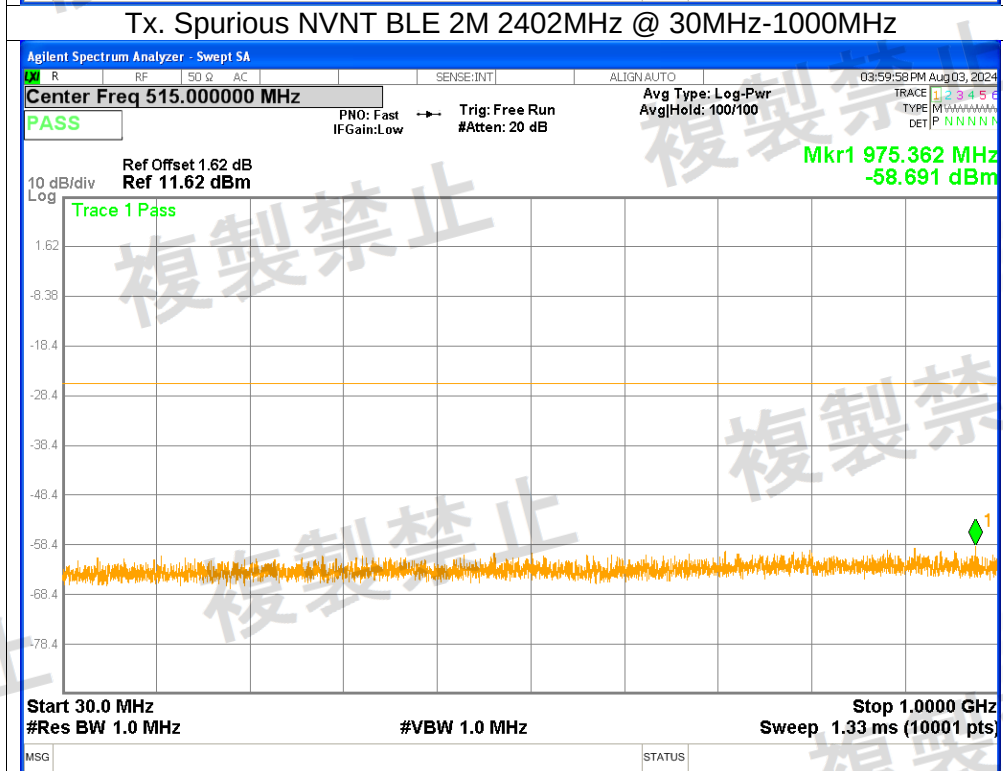




Tx. Spurious NVNT BLE 1M 2480MHz @ 2496.5MHz-13000MHz

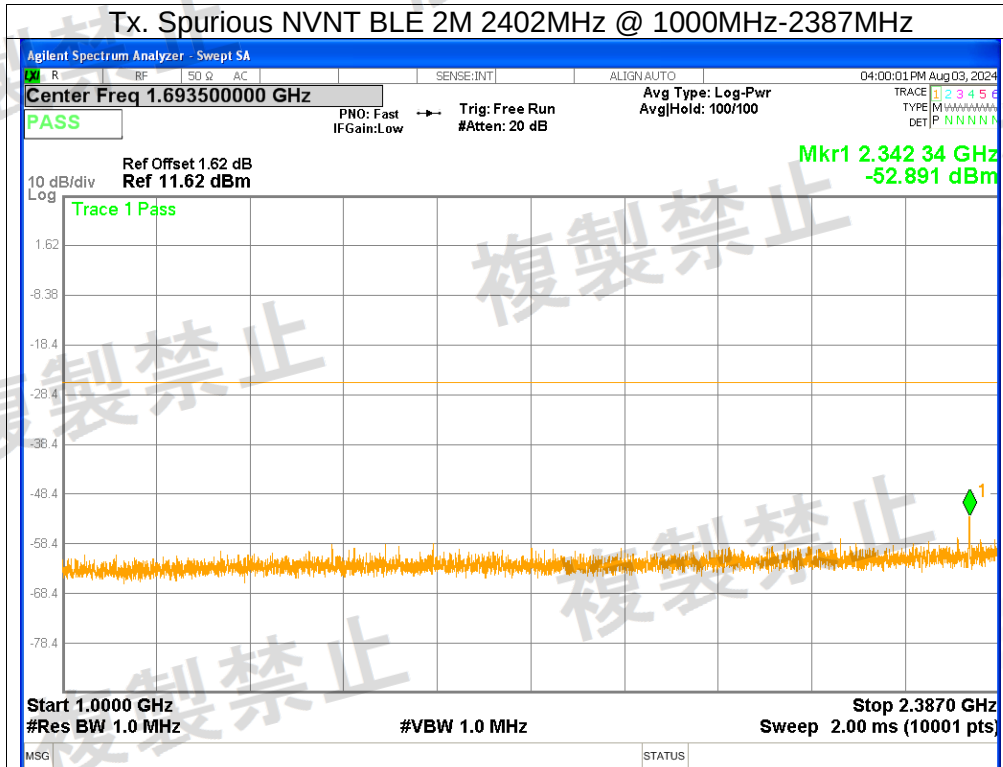


Tx. Spurious NVNT BLE 2M 2402MHz @ 30MHz-1000MHz

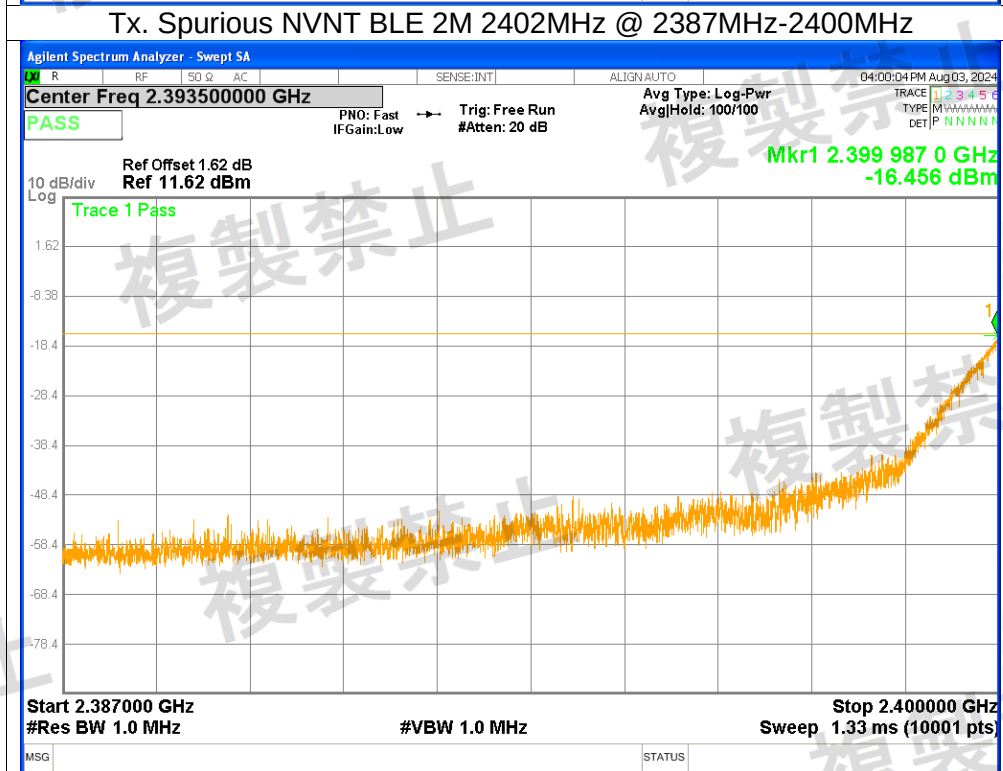




Tx. Spurious NVNT BLE 2M 2402MHz @ 1000MHz-2387MHz

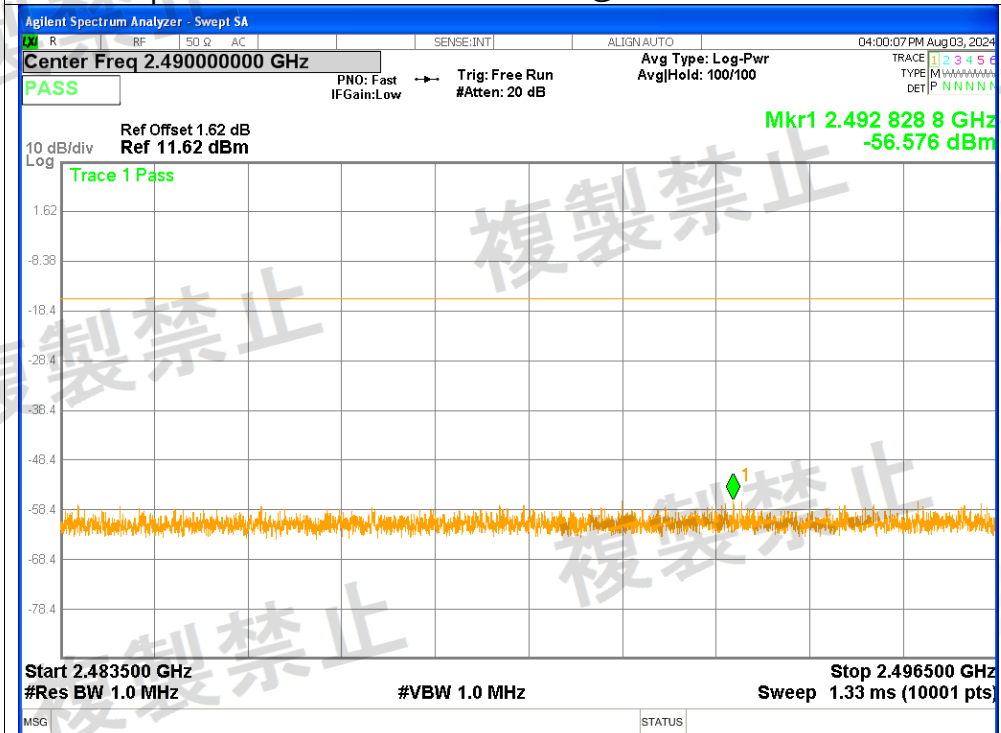


Tx. Spurious NVNT BLE 2M 2402MHz @ 2387MHz-2400MHz

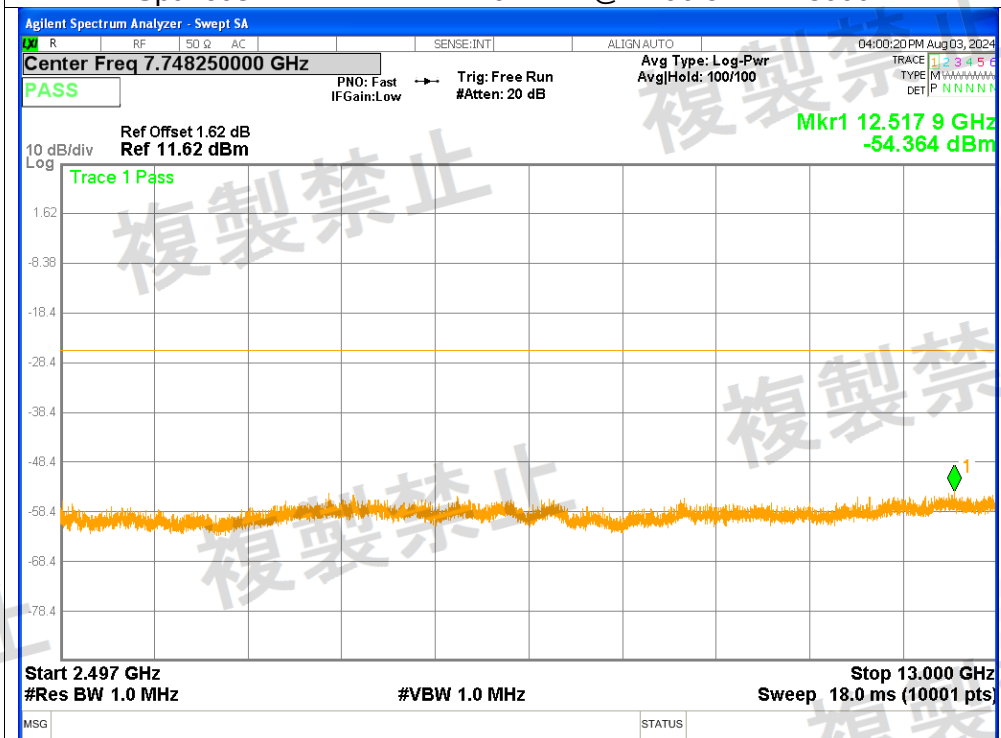


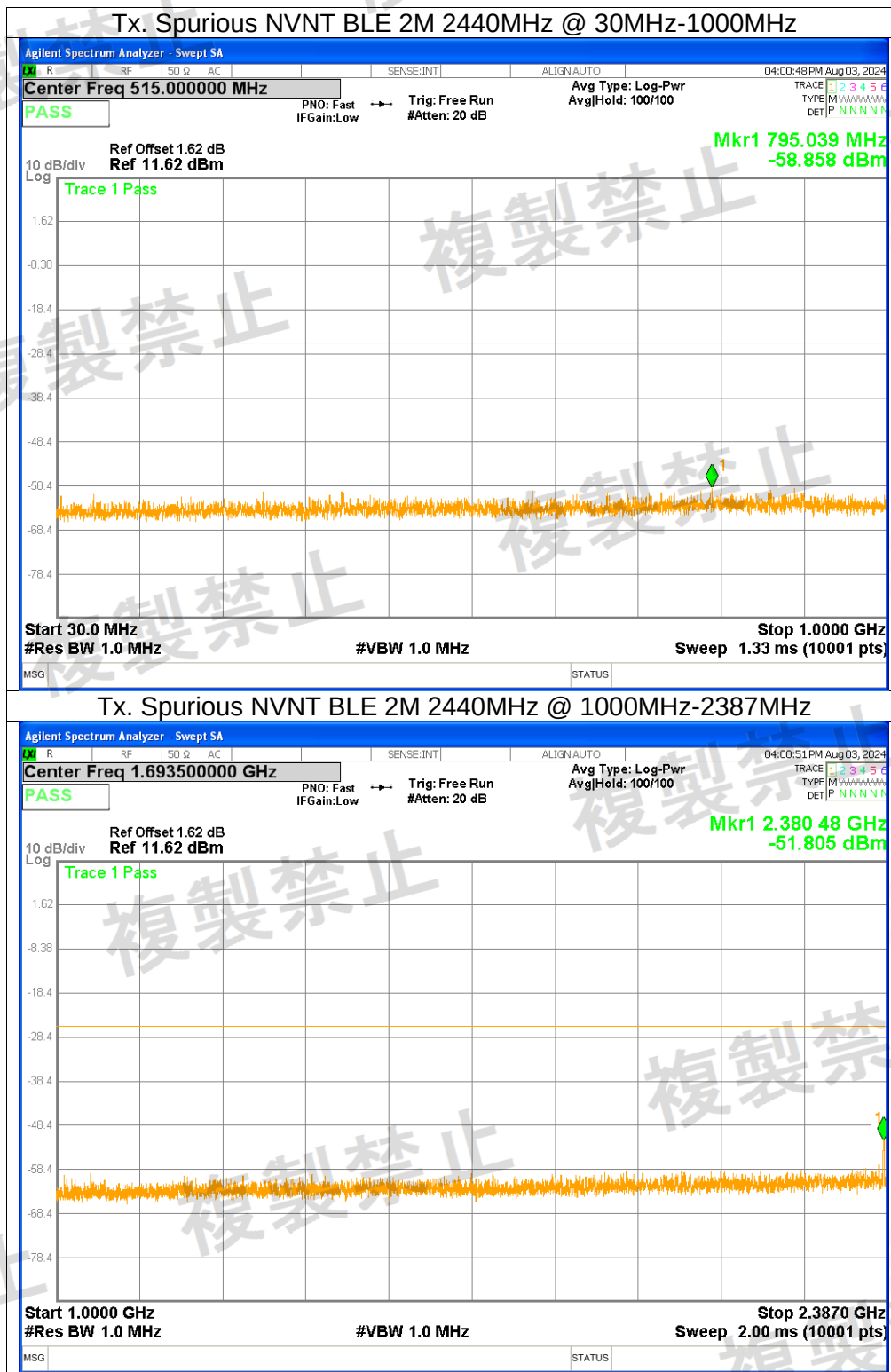


Tx. Spurious NVNT BLE 2M 2402MHz @ 2483.5MHz-2496.5MHz



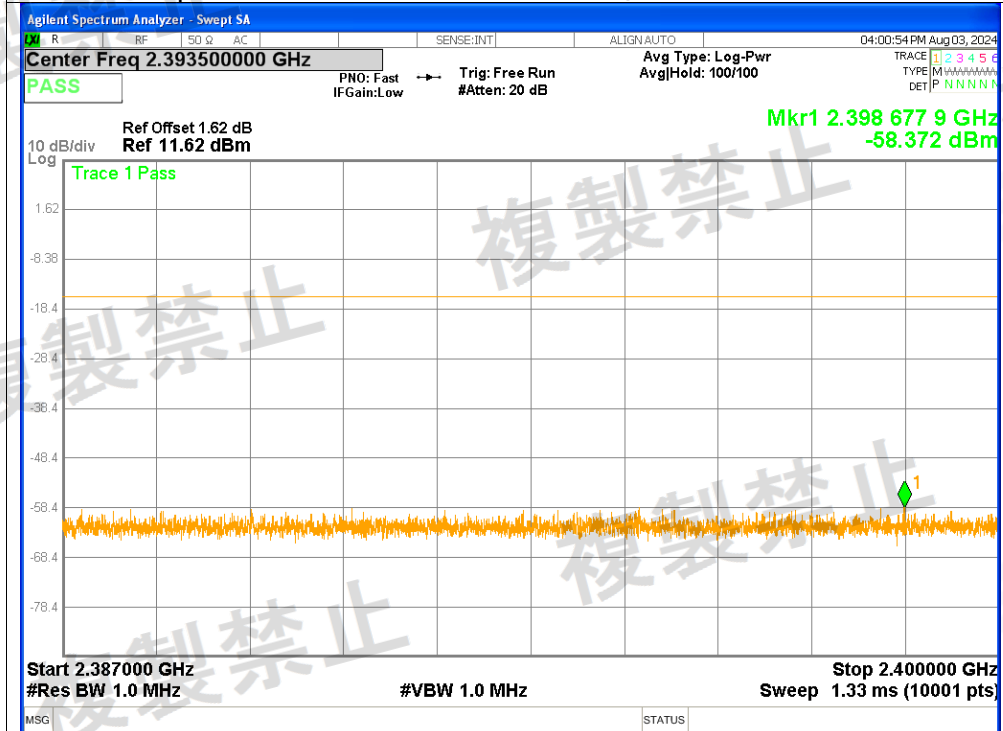
Tx. Spurious NVNT BLE 2M 2402MHz @ 2496.5MHz-13000MHz



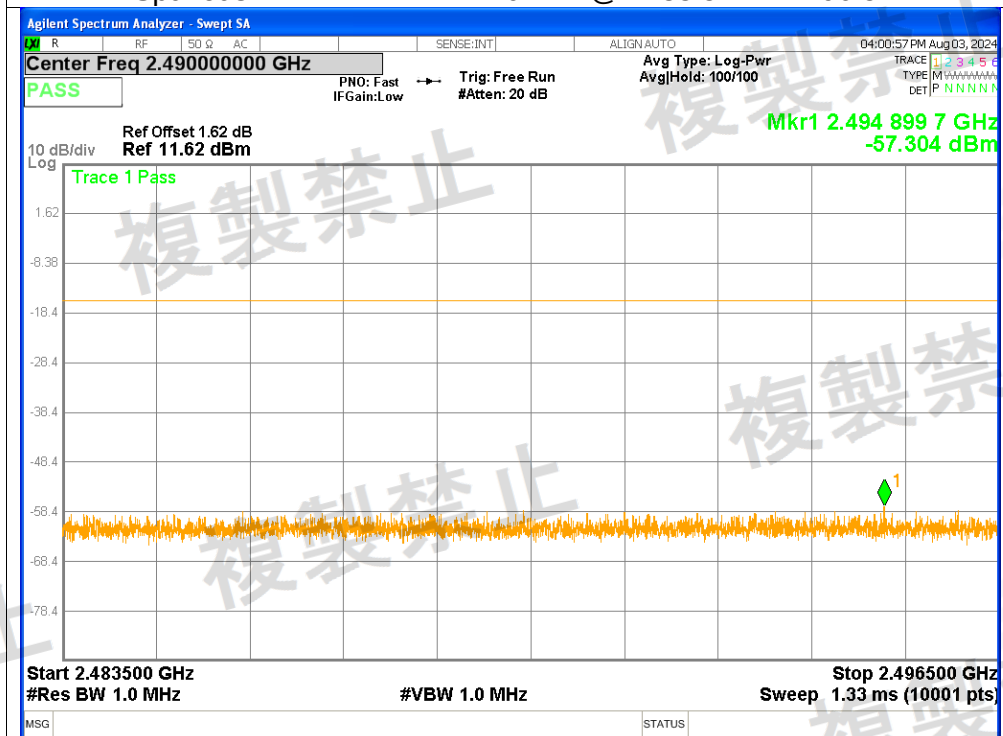




Tx. Spurious NVNT BLE 2M 2440MHz @ 2387MHz-2400MHz

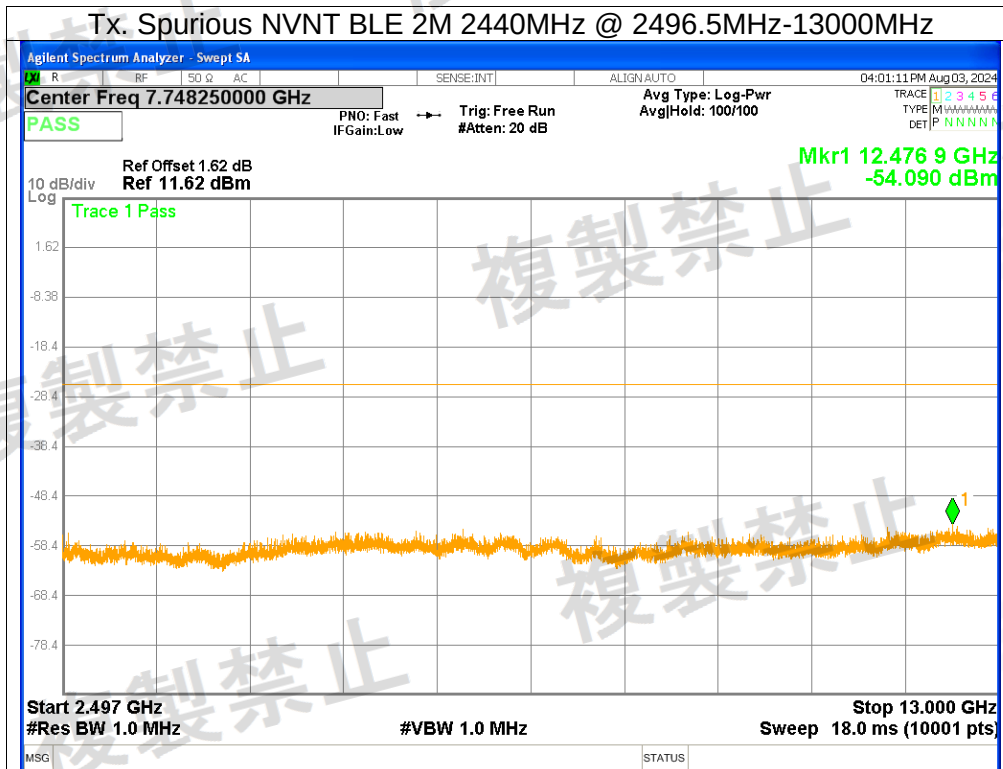


Tx. Spurious NVNT BLE 2M 2440MHz @ 2483.5MHz-2496.5MHz

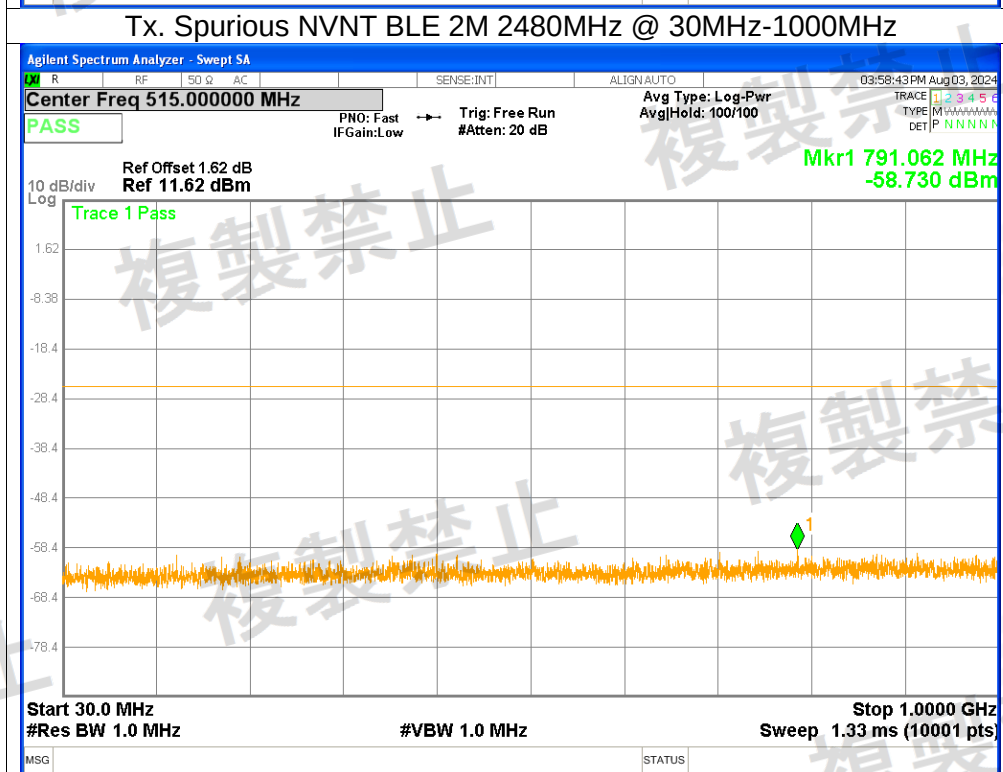




Tx. Spurious NVNT BLE 2M 2440MHz @ 2496.5MHz-13000MHz

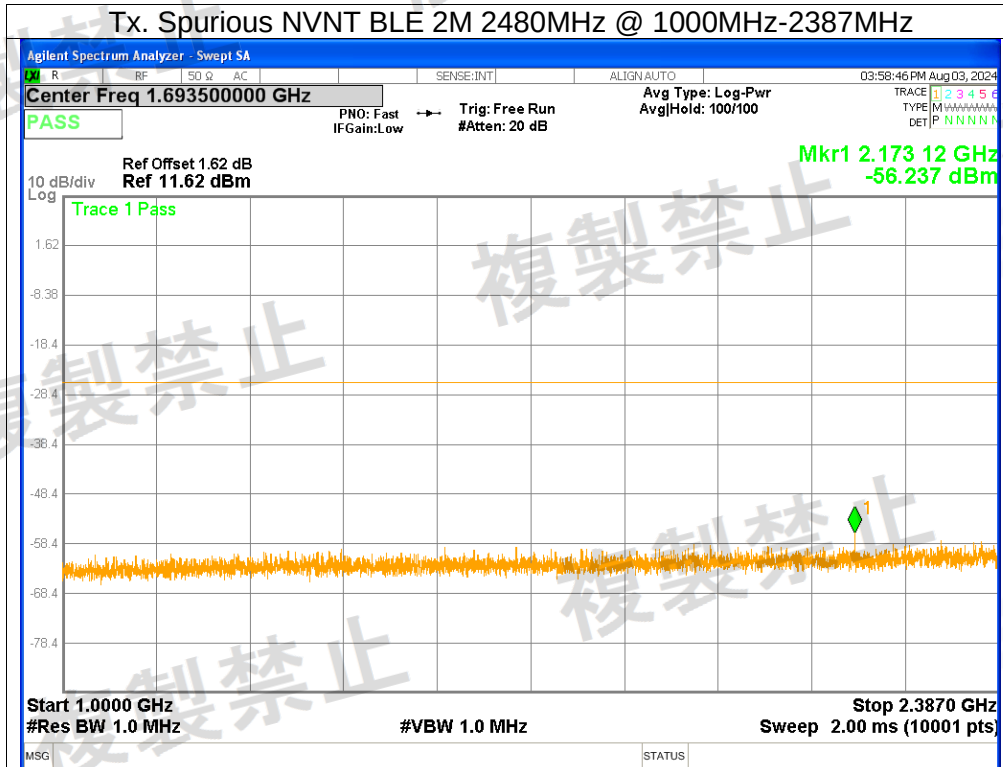


Tx. Spurious NVNT BLE 2M 2480MHz @ 30MHz-1000MHz

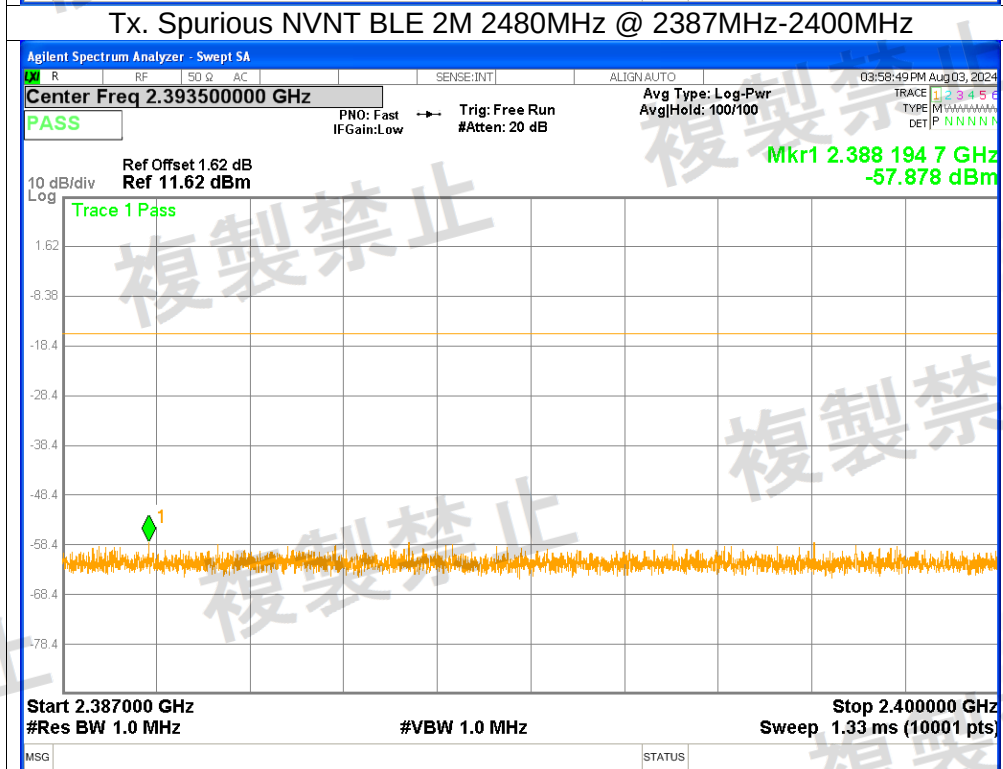




Tx. Spurious NVNT BLE 2M 2480MHz @ 1000MHz-2387MHz

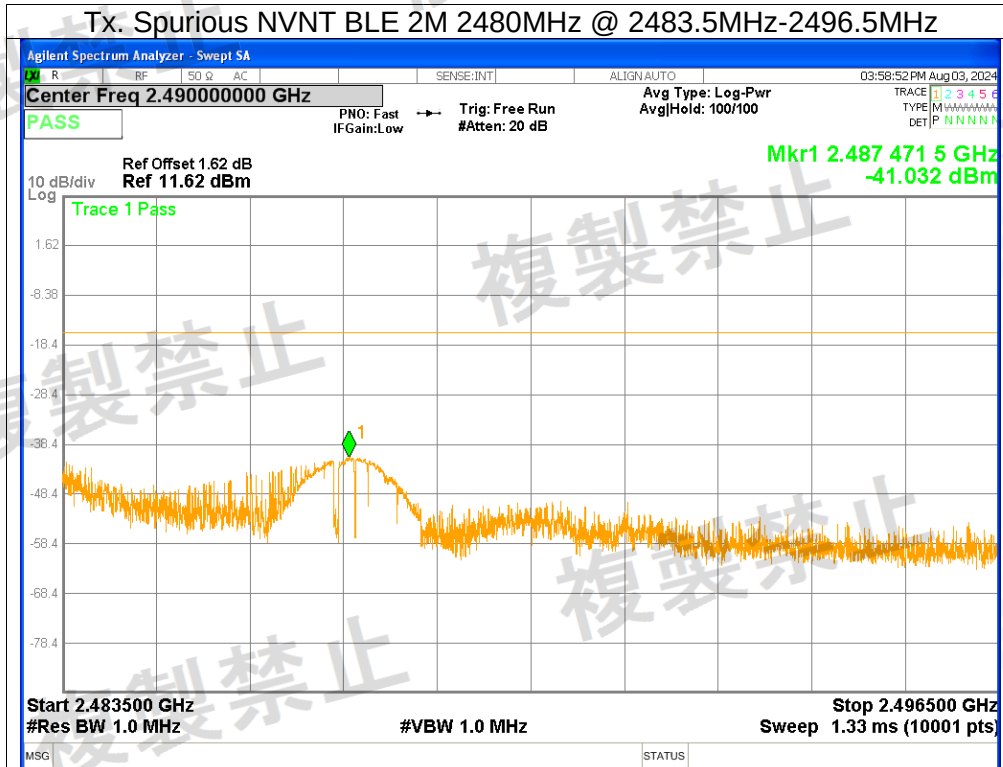


Tx. Spurious NVNT BLE 2M 2480MHz @ 2387MHz-2400MHz

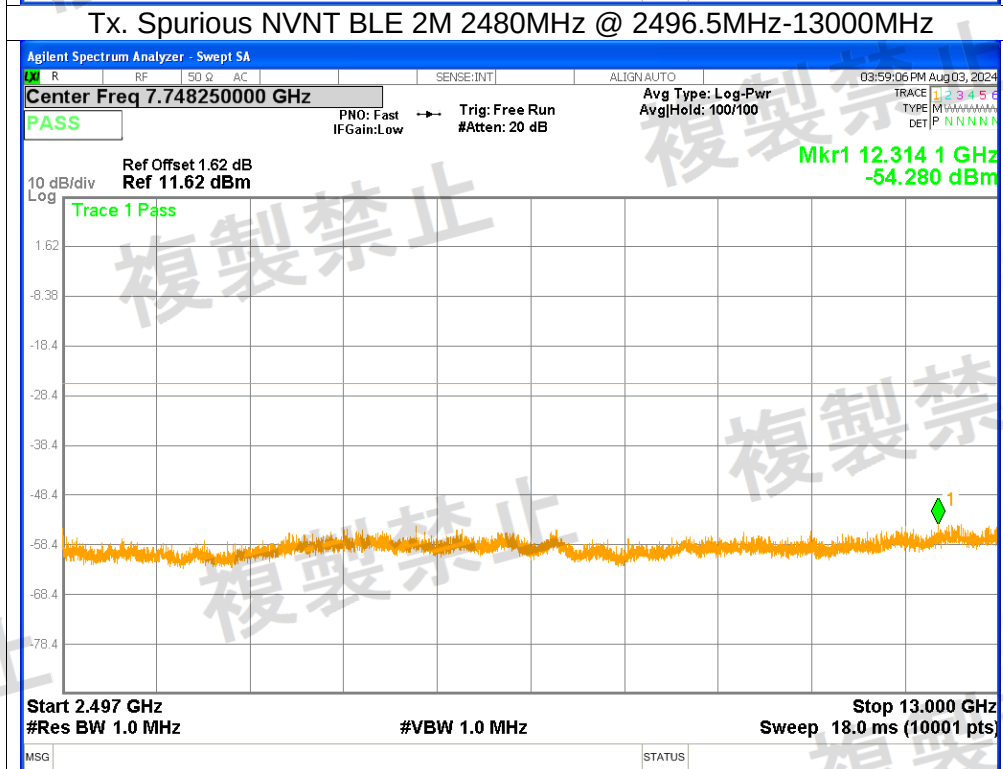




Tx. Spurious NVNT BLE 2M 2480MHz @ 2483.5MHz-2496.5MHz



Tx. Spurious NVNT BLE 2M 2480MHz @ 2496.5MHz-13000MHz





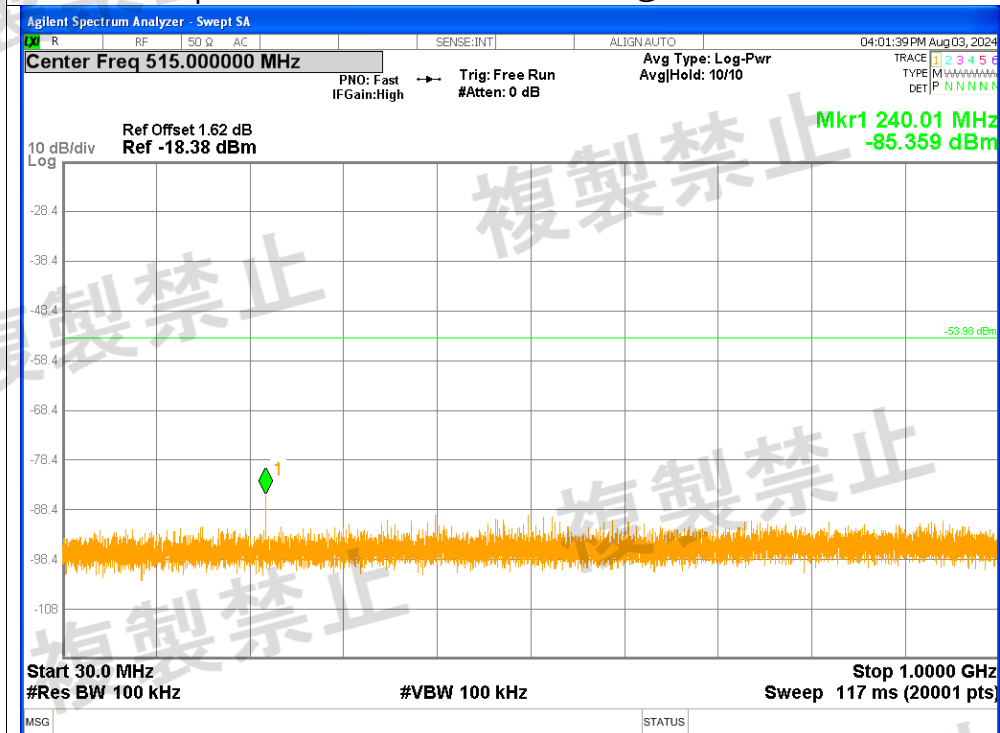
6. Rx Spurious Emission

Condition	Mode	Frequency (MHz)	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (nW)	Limit (nW)	Verdict
NVNT	BLE 1M	2402	30-1000	240.01	-85.36	0.0029	4	Pass
NVNT	BLE 1M	2402	1000-13000	2462.2	-70.75	0.0841	20	Pass
NVNT	BLE 1M	2440	30-1000	240.01	-85.62	0.0027	4	Pass
NVNT	BLE 1M	2440	1000-13000	5823.4	-72.81	0.0524	20	Pass
NVNT	BLE 1M	2480	30-1000	240.01	-86.93	0.002	4	Pass
NVNT	BLE 1M	2480	1000-13000	2461	-66.19	0.2404	20	Pass
NVNT	BLE 2M	2402	30-1000	240.01	-85.91	0.0026	4	Pass
NVNT	BLE 2M	2402	1000-13000	5816.8	-72.13	0.0612	20	Pass
NVNT	BLE 2M	2440	30-1000	240.01	-85.37	0.0029	4	Pass
NVNT	BLE 2M	2440	1000-13000	2460.4	-69.1	0.123	20	Pass
NVNT	BLE 2M	2480	30-1000	240.01	-85.93	0.0026	4	Pass
NVNT	BLE 2M	2480	1000-13000	5746	-69.96	0.1009	20	Pass

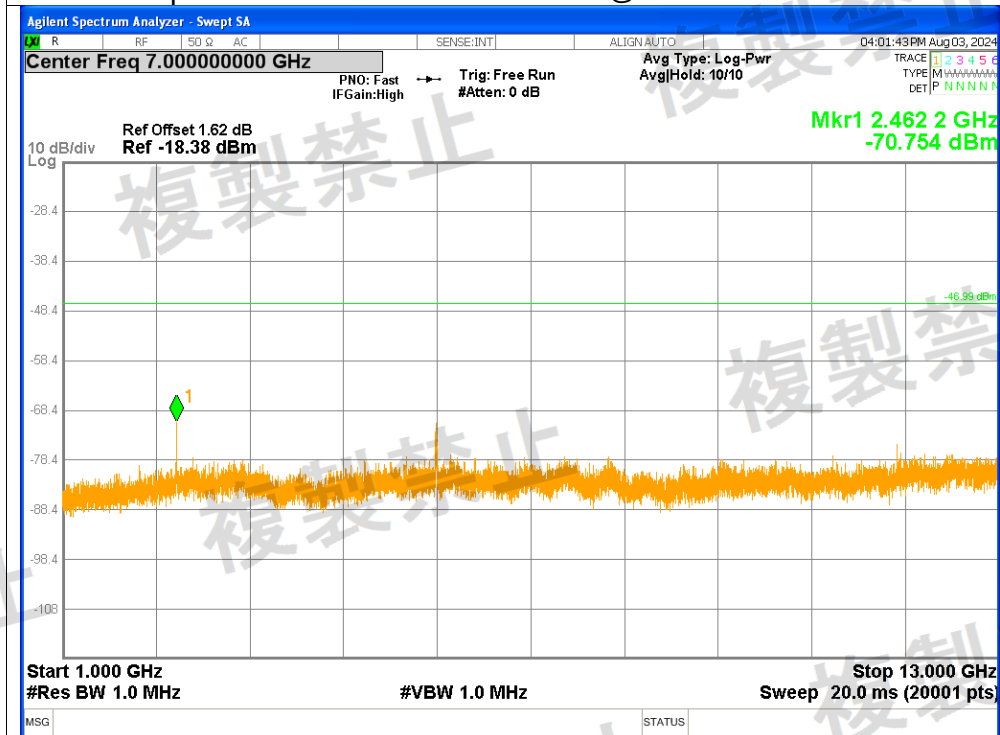


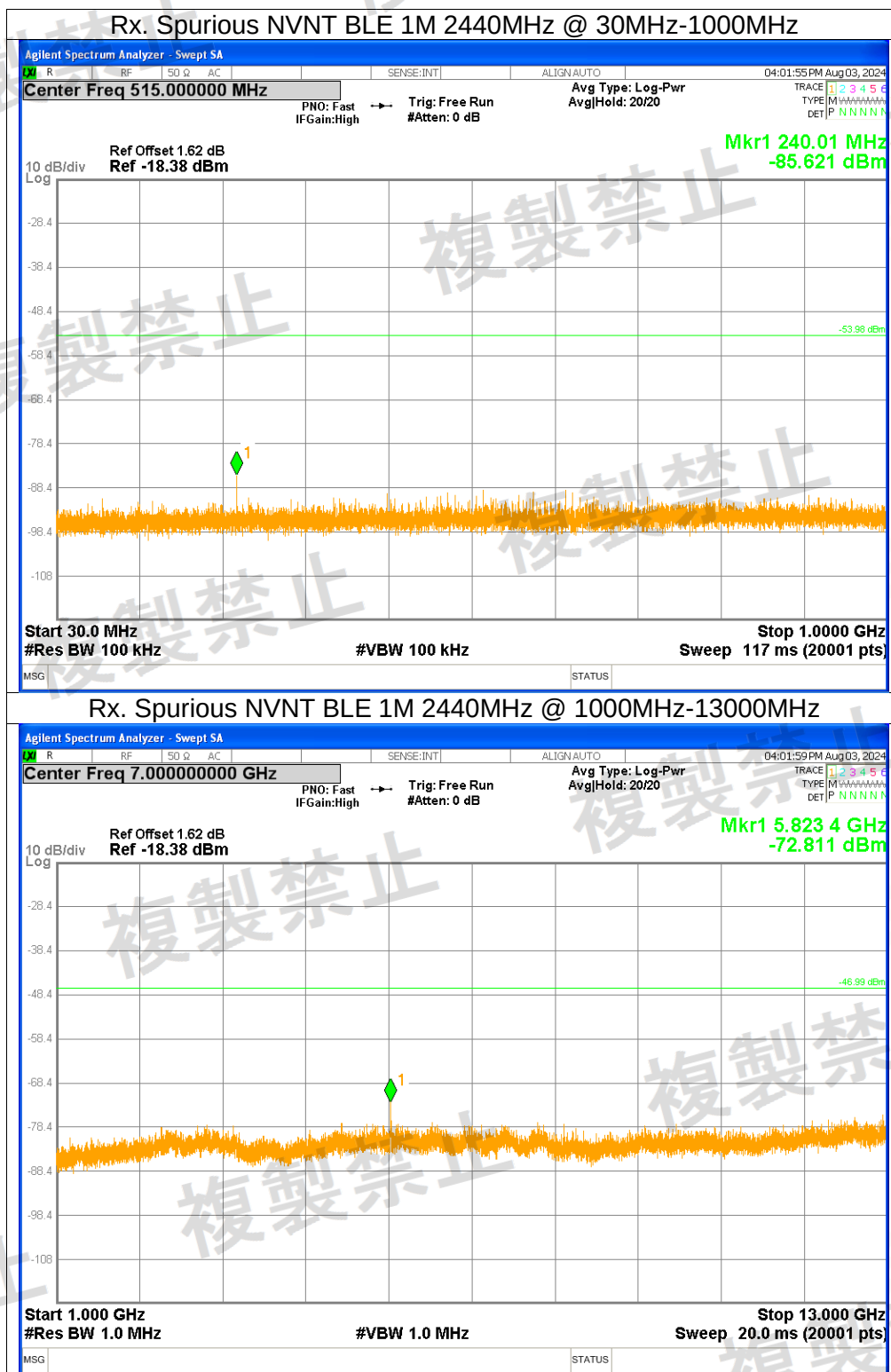
Test Graphs

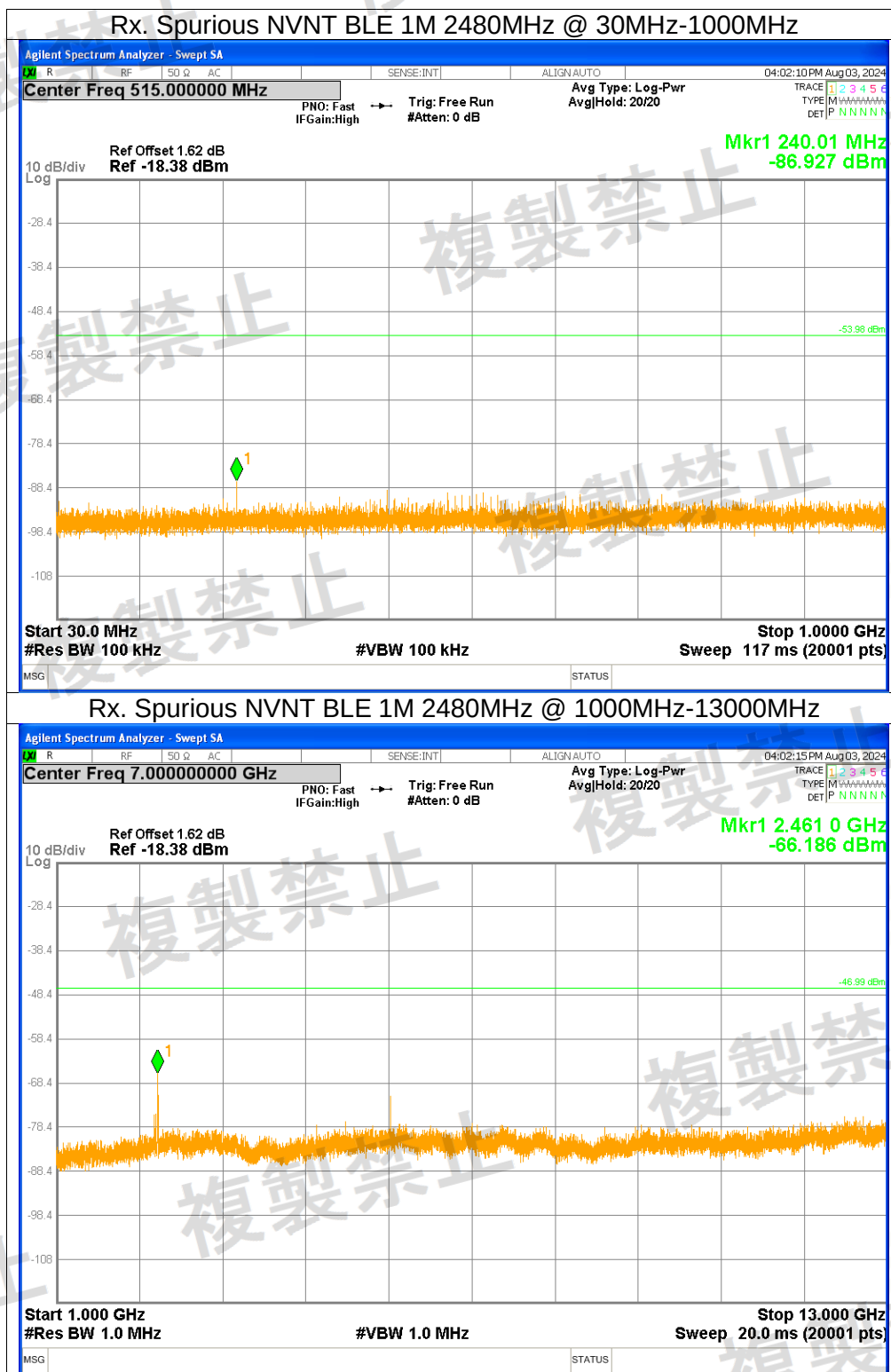
Rx. Spurious NVNT BLE 1M 2402MHz @ 30MHz-1000MHz

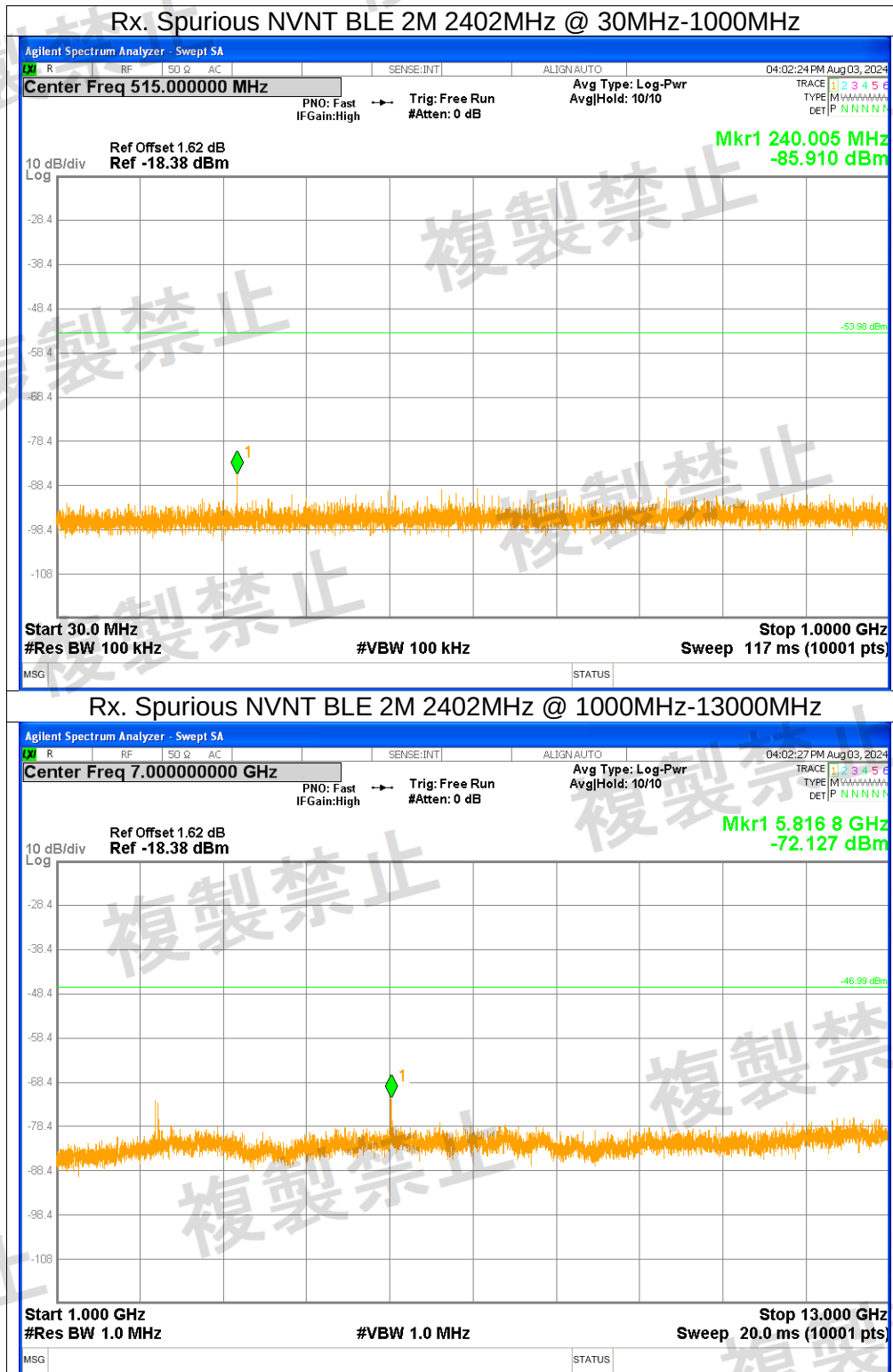


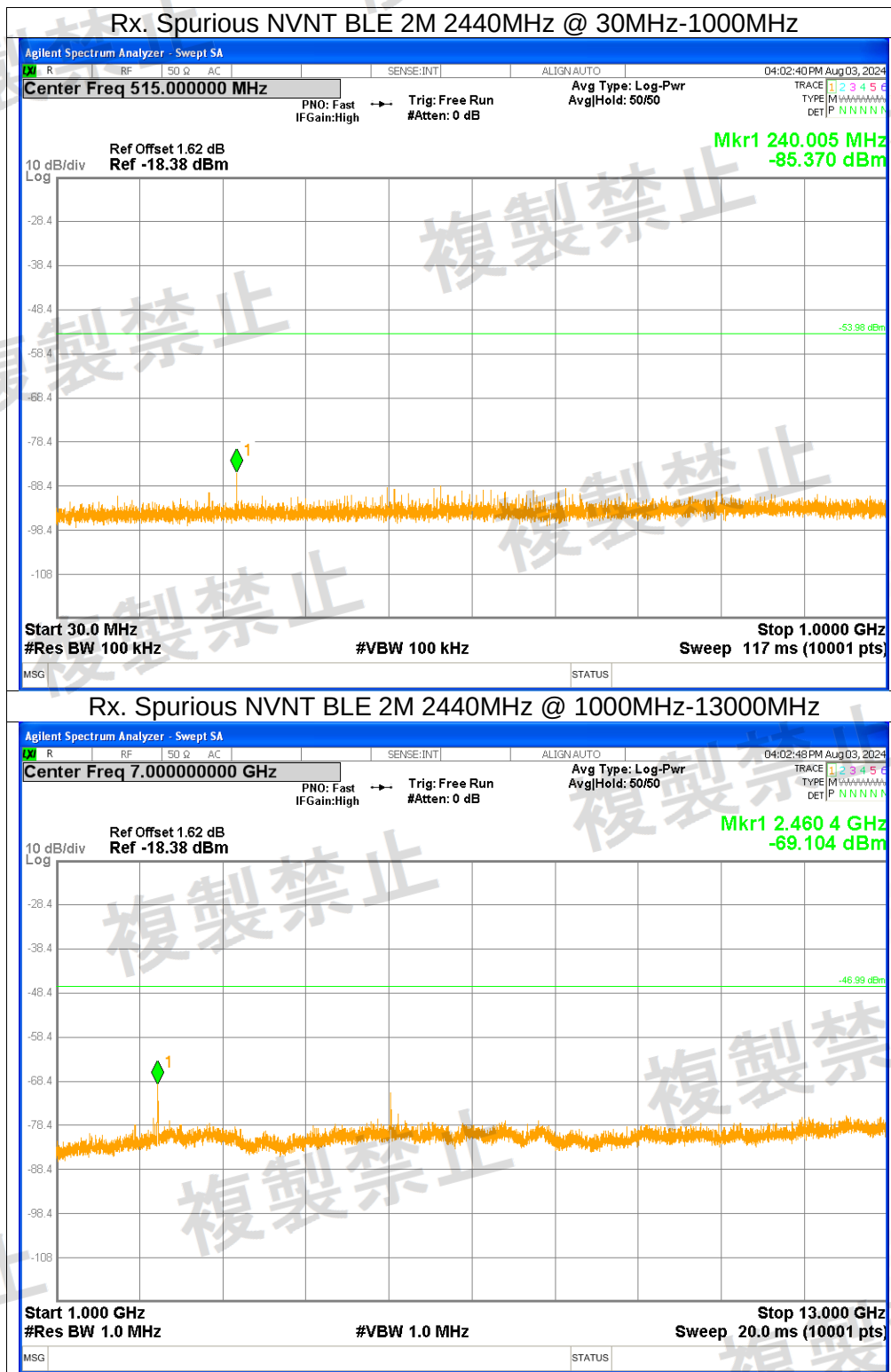
Rx. Spurious NVNT BLE 1M 2402MHz @ 1000MHz-13000MHz

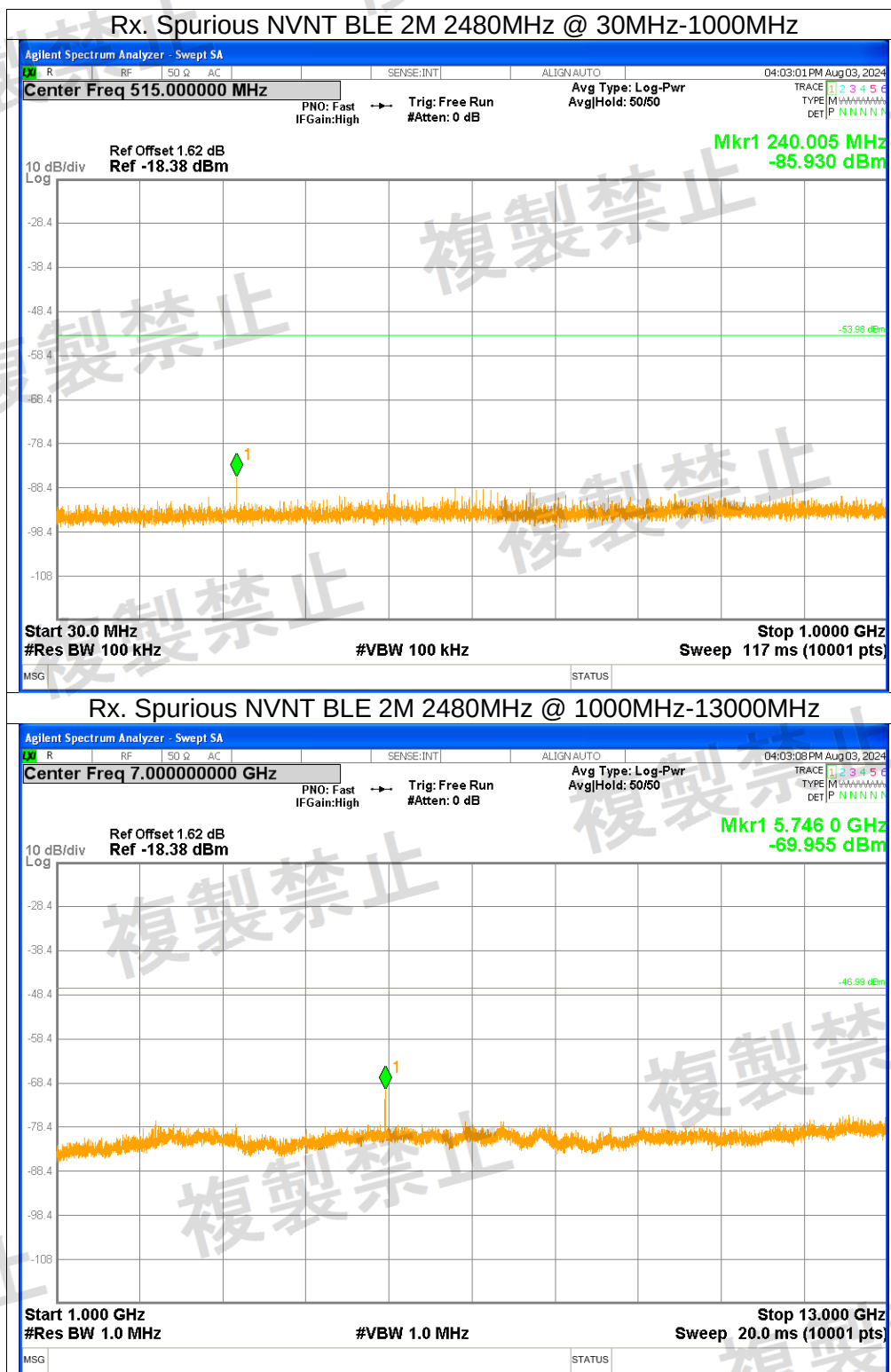














APPENDIX 2-EUT TEST PHOTO

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※END OF THE REPORT※※※※※