



RADIO TEST REPORT-BLE
Article 2 paragraph 1 item (19)
MIC Notice No.88 Appendix No.43

Product: SwitchBot Standing Circulator Fan

Trade Mark: SwitchBot

Model No.: W3800520

Family Model: W3800521, W3800522, W3800523,
W3800524, W3800525

Report No.: S25011300902001

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name.....: Woan Technology (Shenzhen) Co., Ltd.

Address.....: Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100

Manufacturer's Name.....: Woan Technology (Shenzhen) Co., Ltd.

Address.....: Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100

Test specification:

Standard: Article 2 paragraph 1 item (19)
MIC Notice No.88 Appendix No.43

Test item description

Product name: SwitchBot Standing Circulator Fan

Trade Mark.....: SwitchBot

Model and/or type reference : W3800520, W3800521, W3800522, W3800523, W3800524, W3800525

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with MIC requirements. And it is applicable only to the tested sample identified in the report.

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Test Sample Number..... S250113009002

Date (s) of performance of tests Feb. 07, 2025 ~ Feb. 13, 2025

Date of Issue Feb. 13, 2025

Test Result..... **Pass**

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※※Revision History※※

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Standard	Method	Description of Test	Result
Article 2 paragraph 1 item (19)	MIC Notice No.88 Appendix No.43.3	Frequency Error	Complies
	MIC Notice No.88 Appendix No.43.4	Occupied Bandwidth (99%)	Complies
		Spread-spectrum Bandwidth (90%)	N/A
	MIC Notice No.88 Appendix No.43.5	Unwanted Emission Intensity	Complies
	MIC Notice No.88 Appendix No.43.6	Antenna Power Error	Complies
	MIC Notice No.88 Appendix No.43.7	Limitation of Collateral Emission of Receiver	Complies
	MIC Notice No.88 Annex No.43.10	Transmission Antenna Gain (EIRP Antenna Power)	Complies
	MIC Notice No.88 Annex No.43.11	Transmission Radiation Angle Width (3dB Beamwidth)	N/A
	MIC Notice No.88 Annex No.43.12	Radio Interference Prevention Capability	Complies
	MIC Notice No.88 Appendix No.43.13	Spreading Factor	N/A
	MIC Notice No.88 Appendix No.43.8	Carrier Sense Capability ^{Note(3)}	N/A
		Carrier Sense Capability ^{Note (4)}	N/A
	Note 2	Construction Protection Confirmation	Please refer to Japan Radio Protection Declaration

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) MIC Ordinance Regulating Radio Equipment Section 1.A of Article 49.20
- (3) Not apply to this device, since EIRP does not require compensation through Antenna Power.
- (4) Apply for 802.11n40 which the Occupied bandwidth within 26MHz-40MHz

1.1 TEST FACILITY

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FCC RegistrationNo.:463705; IC RegistrationNo.:9270A-1
CNAS Registration No.:L5516

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	Conducted Emission Test	$\pm 3.2\text{dB}$
2	Radiated Emission Test	$\pm 4.7\text{dB}$
3	RF power,conducted	$\pm 0.16\text{dB}$
4	Spurious emissions,conducted	$\pm 0.21\text{dB}$
5	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
6	All emissions,radiated(>1G)	$\pm 5.0\text{dB}$
7	Radio Frequency	$\pm 1 \times 10^{-6}$
8	Occupied bandwidth	$\pm 4.7\text{dB}$

2. GENERAL INFORMATION**2.1 GENERAL DESCRIPTION OF EUT**

Equipment	SwitchBot Standing Circulator Fan	
Trade Mark	SwitchBot	
Model Name.	W3800520	
Family Model	W3800521, W3800522, W3800523, W3800524, W3800525	
Model Difference	All models are the same circuit and RF module, except for model names.	
Product Description	The EUT is a SwitchBot Standing Circulator Fan	
	Operation Frequency:	2402~2480 MHz
	Modulation Type:	GFSK
	Number Of Channel	40CH
	Antenna Designation:	PCB Antenna
	Antenna Gain(Peak)	2.85dBi
Channel List	Please refer to the Note 2.	
Adapter	N/A	
Battery	DC 11.1V ,2400mAh, 26.64Wh	
Rating(s)	DC 11.1V from battery or DC 5V from type-c port or AC 100V from charging port	
Hardware Version	N/A	
Software Version	N/A	

Note:

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

- 2.

Channel	Frequency (MHz)
00	2402
01	2404
.....	
.....	
...	...
.....	
38	2478
39	2480

2.2 DESCRIPTION OF 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.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39

2.3 TEST CONDITIONS

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

Power Supply Voltage Fluctuation Test

Voltage Fluctuation Test	Normal Voltage	High Voltage + 10% of Normal Voltage	Low Voltage - 10% of Normal Voltage
DC Power	DC 11.1V	DC 12.21V	DC 9.99V
RF Chip	DC 3.3V	DC 3.3V	DC 3.3V

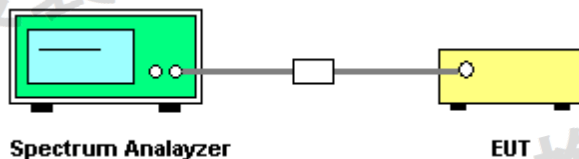
Note:

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%, + / - 10% of the external power change, will not affect the voltage of the RF, so only operated in normal voltage to test all regulations.

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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.

Item	Equipment	Model/Type No.	Series No.	Note
E-1	SwitchBot Standing Circulator Fan	W3800520	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded”“with core”; “NO” is means “unshielded”“without core”.

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period	Cal.Infor. Method
1	SPECTRUM ANALYZER	AGLIENT	E4440A	MY41000130	2024.04.26	2025.04.25	1 Year	C
2	SPECTRUM ANALYZER	AGILENT	N9020A	MY49100060	2024.04.25	2025.04.24	1 Year	C
3	TEST RECEIVER	R&S	ESPI7	101318	2024.04.26	2025.04.25	1 Year	C
4	50Ω COAXIAL SWITCH	ANRITSU	MP59B	6200983705	2024.04.26	2027.04.25	3 Year	C
5	HORN ANTENNA	SCHWARZBECK	BBHA 9120 D	2816	2024.05.18	2027.05.17	3 Year	C
6	HORN ANT	SCHWARZBECK	BBHA 9170	9170-181	2024.05.12	2027.05.11	3 Year	C
7	PRE-AMPLIFIER	EMC	EMC051835SE	980246	2024.04.25	2025.04.24	1 Year	C
8	POWER METER	DARE	RPR3006W	15I00041SNO84	2024.04.25	2025.04.24	1 Year	C
9	TEMPORARY ANTENNA CONNECTOR (NOTE)	NTS	R001	N/A	N/A	N/A	N/A	N/A
10	DC POWER SUPPLY	ZHAOXIN	PS-6005D	20170402923	2023.05.06	2026.05.05	3 year	C
11	ESG VETCTOR SIGNAL GENERAROR	AGILENT	E4438C	MY45093347	2024.04.13	2025.04.12	1 year	C
12	PSG ANALOG SIGNAL GENERATOR	AGILENT	E8257D	MY51110112	2024.05.30	2025.05.29	1 year	C

Note:

Calibration Method:

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

(b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992)

(c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph

(d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).

The calibration corresponds to c described above.

All the equipments for Guangzhou Lisai Calibration.

3. TEST RESULT FOR BT

3.1 FREQUENCY ERROR

3.2 LIMIT

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

3.3 MEASURING INSTRUMENTS AND SETTING

The following table is the setting of Spectrum Analyzer.

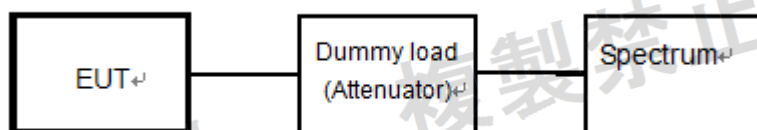
Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10/30KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.4 TEST PROCEDURES

- (1) In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a Spectrum analyzer.
- (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.

3.5 TEST SETUP LAYOUT



4.1.5. EUT OPERATION DURING TEST

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

3.5.1 TEST RESULT

EUT :	SwitchBot Standing Circulator Fan	Model:	W3800520
Temperature:	25°C	Pressure :	1012 hPa
Humidity:	55 % RH	Test Voltage	DC 11.1V
Operation Mode:	unmodulated		

Test data reference attachment

4. ANTENNA POWER

4.1 LIMIT

Modulation	Frequency band	Antenna power	Max EIRP		Antenna power Tolerance
			Non-directional	Beam directional ^{Note1}	
DS	2,400-2,483.5 MHz	10mW/MHz z	12.14dBm/MHz z	22.14dBm/MHz	+20% No lower limit
OFDM1 ^{Note2}	2,400-2,483.5 MHz	10mW/MHz z	12.14dBm/MHz z	22.14dBm/MHz	
OFDM2	2,400-2,483.5 MHz	5mW/MHz	9.13dBm/MHz	19.13dBm/MHz	
FH,DS-FH,FH-OFDM	2,400-2,483.5 MHz	3mW/MHz	6.91dBm/MHz	16.91dBm/MHz	
	2,427-2,470.75 MHz	10mW/MHz z	12.14dBm/MHz z	22.14dBm/MHz	
Other than those above	2,400-2,483.5 MHz	10mW	12.14dBm	22.14dBm	

Note 1: The half-value angle of the beam directivity must be less than $360 \div A$ degrees. A shall be the rate at which the EIRP exceeds the upper limit of the omnidirectional EIRP.

Note 2: OFDM 1 in the modulation method column indicates that the occupied frequency band width is 26 MHz or less, and OFDM 2 indicates the occupied frequency bandwidth exceeding 26 MHz and 40 MHz or less.

4.2 TEST SETUP LAYOUT



4.3 TEST DEVIATION

There is no deviation with the original standard.

4.4 TEST PROCEDURES

1. Connect the UUT to the Power meter:
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth not less than RB Resolution bandwidth

4.5 TEST RESULT

EUT :	SwitchBot Standing Circulator Fan	Model:	W3800520
Temperature:	25°C	Pressure :	1012 hPa
Humidity:	55 % RH	Test Voltage	DC 11.1V
Operation Mode:	Transmit-GFSK		

Test data reference attachment

5. OCCUPIED BANDWIDTH

5.1 LIMIT

Item	Limits
Occupied Band Width:	FH 83.5MHz; OFDM1,DS ≤ 26 MHz; 26MHz $\leq$ OFDM 40MHz system ≤ 40 MHz.; Others ≤ 26 MHz
Spreading Bandwidth:	N/A

5.2 MEASURING INSTRUMENTS AND SETTING

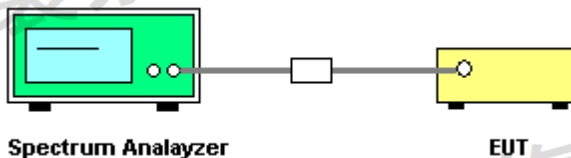
5.3 TEST PROCEDURES

Set the spectrum analyzer as follows :

Center frequency:	Test frequency
Frequency sweep width:	About 2~3.5 times of the Nominal bandwidth
Resolution bandwidth:	3% or less of the Nominal bandwidth
Video bandwidth:	Equal to RBW
Sweep time:	Minimum time to ensure the measuring accuracy (In the case of burst wave, one burst shall be included per data point.)
Sweep mode:	Continuous sweep
Detection mode:	Positive peak
Display mode:	Maximum hold

Note: 1. Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
2. Spread Spectrum Factor limit is greater than 5

5.4 TEST SETUP LAYOUT



5.5 TEST DEVIATION

There is no deviation with the original standard.

5.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

5.7 TEST RESULT

EUT:	SwitchBot Standing Circulator Fan	Model:	W3800520
Temperature:	25°C	Pressure :	1012 hPa
Humidity:	55 % RH	Test Voltage	DC 11.1V
Operation Mode:	Transmit-GFSK		

Test data reference attachment

6. UNWANTED EMISSION INTENSITY MEASUREMENT

6.1 LIMIT

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

6.2 MEASURING INSTRUMENTS AND SETTING

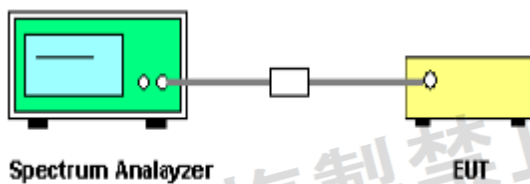
Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Detector	Average
Trace	Max Hold
Sweep Time	Auto

6.3 TEST PROCEDURES

- EUT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA is following as:
RB:1MHz / VB:1MHz / AT: 10dB Ref: 0dBm / Sweep time: Auto
Sweep Mode: Continuous sweep / Detect mode: Average
Trace mode: Max hold
- Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW .
- 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 .
- SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25 μW .
- 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 .
- SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW .
- 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.

6.4 TEST SETUP LAYOUT



6.5 TEST DEVIATION

There is no deviation with the original standard.

6.6 TEST RESULT

EUT :	SwitchBot Standing Circulator Fan	Model:	W3800520
Temperature:	25°C	Pressure :	1012 hPa
Humidity:	55 % RH	Test Voltage	DC 11.1V
Operation Mode:	Transmit-GFSK (CH00, CH19, CH39)		

Test data reference attachment

7. IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT

7.1 LIMIT

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

7.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. 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	Average
Trace	Max Hold
Sweep Time	Auto

7.3 TEST PROCEDURES

- EUT have the continuous reception mode and fixed only one channelize.
- 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: Average / Trace mode: Max hold
- 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
- SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
- 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.

7.4 TEST RESULT

EUT :	SwitchBot Standing Circulator Fan	Model:	W3800520
Temperature:	25℃	Pressure :	1012 hPa
Humidity:	55 % RH	Test Voltage	DC 11.1V
Operation Mode:	Receiver-GFSK (CH00, CH19, CH39)		

Test data reference attachment

8. TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER) MEASUREMENT

8.1 LIMIT

Modulation	Frequency band	Antenna power	Max EIRP	
			Non-directional	Beam directional ^{Note1}
DS	2,400-2,483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
OFDM1 ^{Note2}	2,400-2,483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
OFDM2	2,400-2,483.5MHz	5mW/MHz	9.13dBm/MHz	19.13dBm/MHz
FH,DS-FH,FH-O FDM	2,400-2,483.5MHz	3mW/MHz	6.91dBm/MHz	16.91dBm/MHz
	2,427-2,470.75MHz z	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
Other than those above	2,400-2,483.5MHz	10mW	12.14dBm	22.14dBm

Note 1: The half-value angle of the beam directivity must be less than $360 \div A$ degrees. A shall be the rate at which the EIRP exceeds the upper limit of the omnidirectional EIRP.

Note 2: OFDM 1 in the modulation method column indicates that the occupied frequency band width is 26 MHz or less, and OFDM 2 indicates the occupied frequency bandwidth exceeding 26 MHz and 40 MHz or less.

8.2 TEST SETUP LAYOUT



8.3 TEST DEVIATION

There is no deviation with the original standard.

8.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

8.5 RESULTS OF TRANSMISSION ANTENNA GAIN

EUT :	SwitchBot Standing Circulator Fan	Model:	W3800520
Temperature:	25°C	Pressure :	1012 hPa
Humidity:	55 % RH	Test Voltage	DC 11.1V
Operation Mode:	GFSK (CH00, CH19, CH39)		

Test data reference attachment

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

9.1 LIMIT

Item	Limits
3dB antenna beam width	$360/A$ (If $A < 1$; then $A=1$) $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$
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	

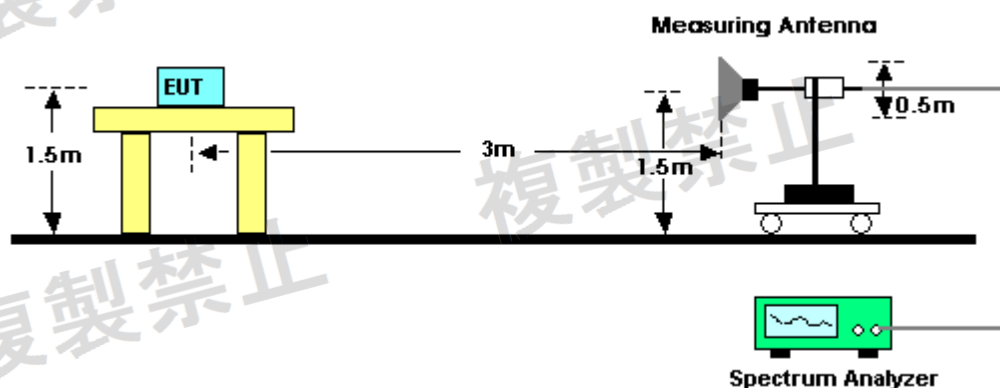
9.2 MEASURING INSTRUMENTS AND SETTING

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

9.3 TEST PROCEDURES

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. 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 $A=1$).
 $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or
 $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$

9.4 TEST SETUP LAYOUT



9.5 TEST DEVIATION

There is no deviation with the original standard.

9.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

9.7 TEST RESULT OF TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH)

EUT :	SwitchBot Standing Circulator Fan	Model:	W3800520
Temperature:	25°C	Pressure :	1012 hPa
Humidity:	55 % RH	Test Voltage	N/A
Operation Mode:	N/A		

Note: This item is not applicable, when EIRP power is lower than the limit of 12.14dBm.

10. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

10.1 LIMIT

Item	Limits
Identification code	≥ 48 bits

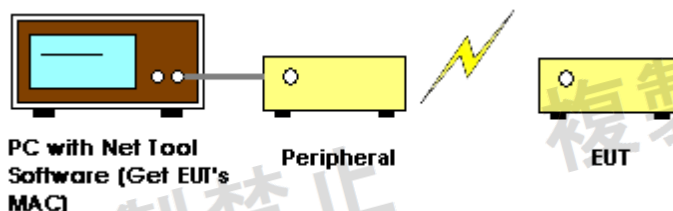
10.2 MEASURING ID CODE SOFTWARE

Item	Limits
MAC IP List	MAC Scan

10.3 TEST PROCEDURES

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

10.4 TEST SETUP LAYOUT



10.5 TEST DEVIATION

There is no deviation with the original standard.

10.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

10.7 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILITY

	Normal voltage
Result	OK

Mac address: 37:15:2A:6F:15:3C

Result: OK

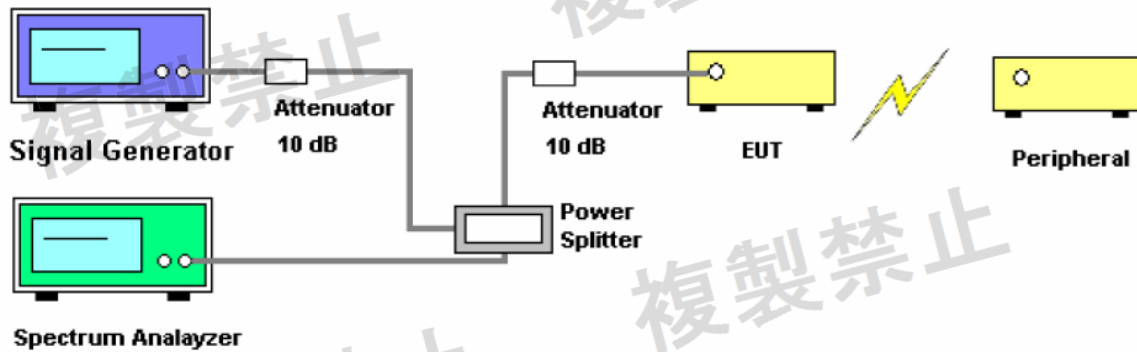
11. CARRIER SENSE CAPABILITY

11.1 LIMIT

EUT stop RF transmission signal after carrier inject to EUT

11.2 TEST PROCEDURE

Measurement System Diagram



1. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is $(on\ 22.79+G-20*\log(f)\text{dBm})$ (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 transmitted signal.
7. Result:
Note: Not Applicable

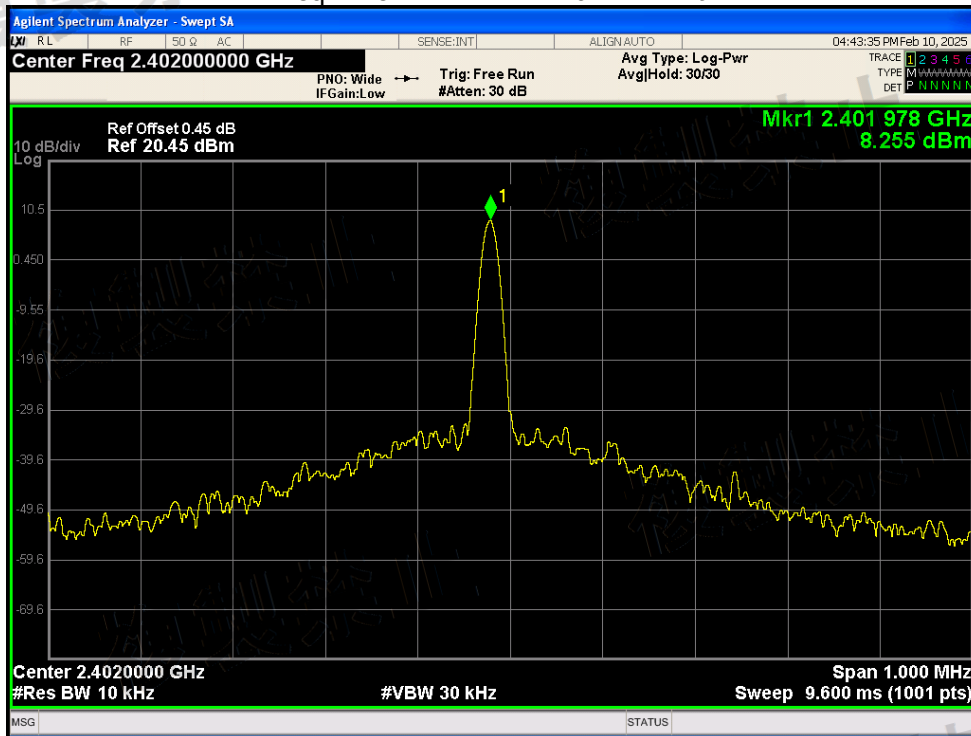
12. TEST RESULTS

12.1 1M

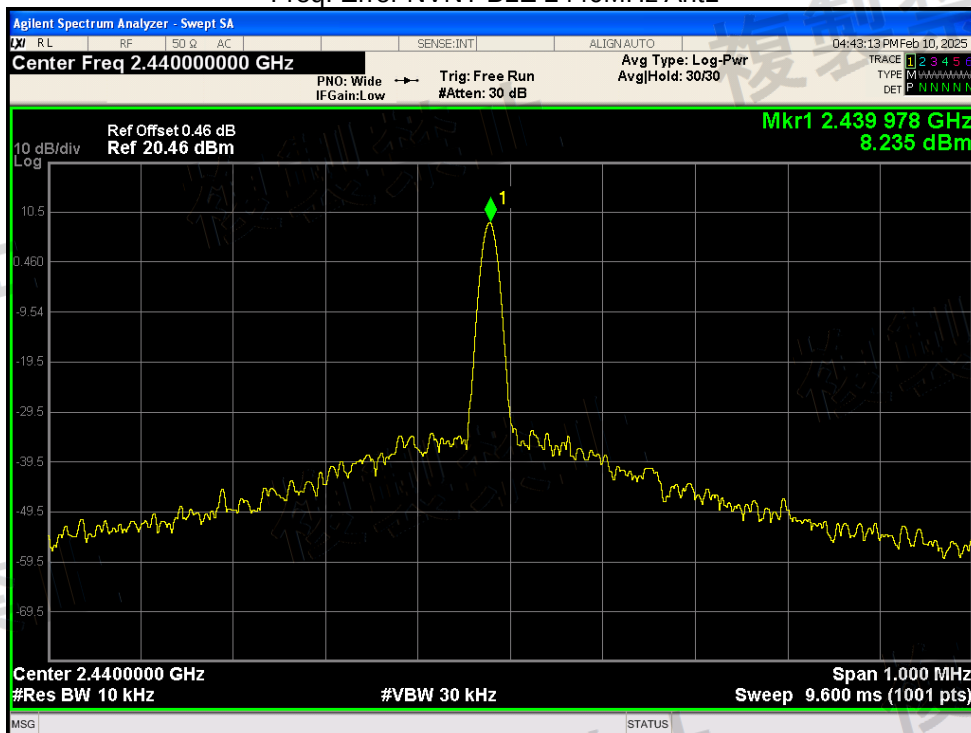
12.1.1 FREQUENCY ERROR

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	BLE	2402	Ant1	2401.978	-9.16	50	Pass
NVNT	BLE	2440	Ant1	2439.978	-9.02	50	Pass
NVNT	BLE	2480	Ant1	2479.977	-9.27	50	Pass

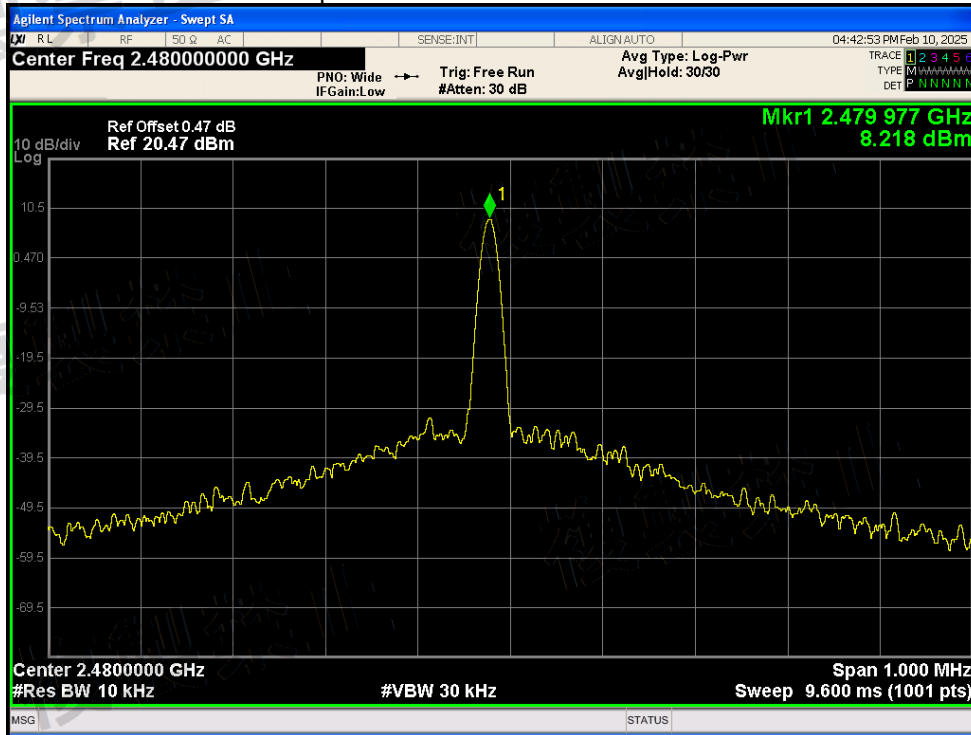
Freq. Error NVNT BLE 2402MHz Ant1



Freq. Error NVNT BLE 2440MHz Ant1



Freq. Error NVNT BLE 2480MHz Ant1



12.1.2 ANTENNA AND EIRP POWER

Condition	Mode	Frequency (MHz)	Antenna	Antenna Power (mW)	Declared Power (mW)	Tolerance (%)	Upper Limit (%)	Verdict
NVNT	BLE	2402	Ant1	4.588	5	-8.24	20	Pass
NVNT	BLE	2440	Ant1	4.562	5	-8.75	20	Pass
NVNT	BLE	2480	Ant1	4.486	5	-10.27	20	Pass

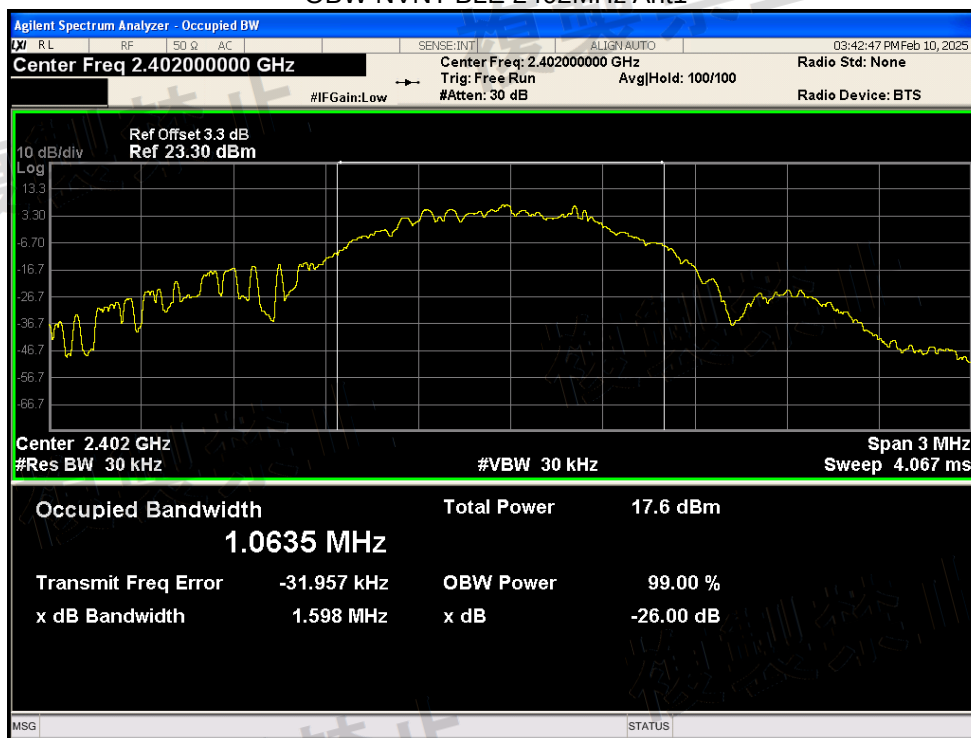
12.1.3 EIRP POWER

Condition	Mode	Frequency (MHz)	Antenna	Antenna Power (mW)	Gain (dBi)	EIRP Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant1	4.588	2.85	9.466	12.14	Pass
NVNT	BLE	2440	Ant1	4.562	2.85	9.442	12.14	Pass
NVNT	BLE	2480	Ant1	4.486	2.85	9.369	12.14	Pass

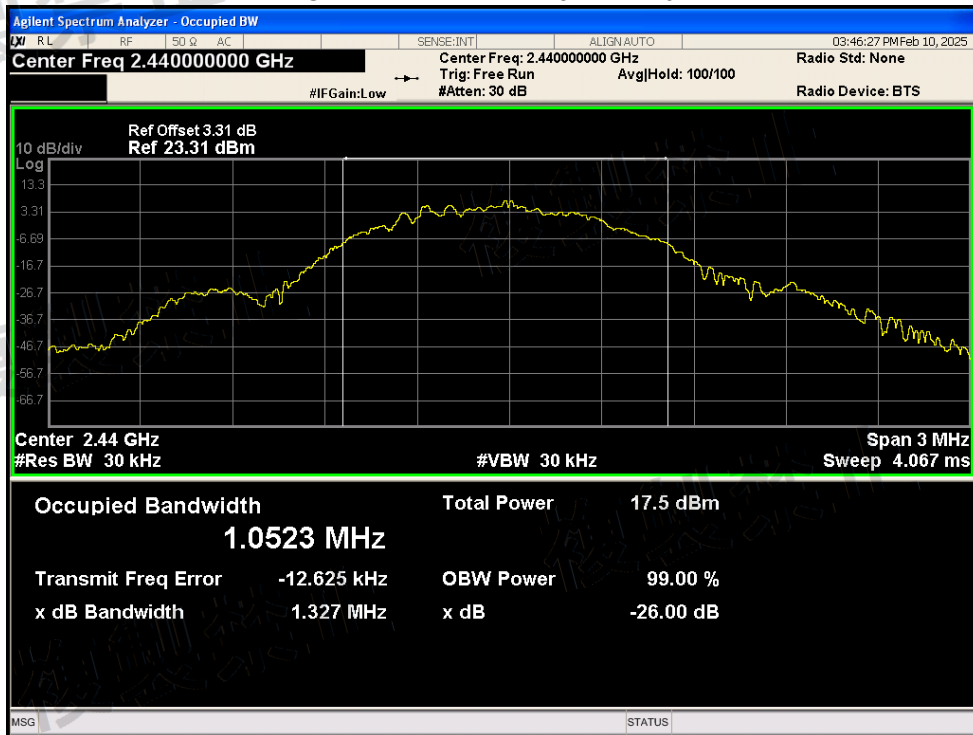
12.1.4 OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE	2402	Ant1	1.063
NVNT	BLE	2440	Ant1	1.052
NVNT	BLE	2480	Ant1	1.212

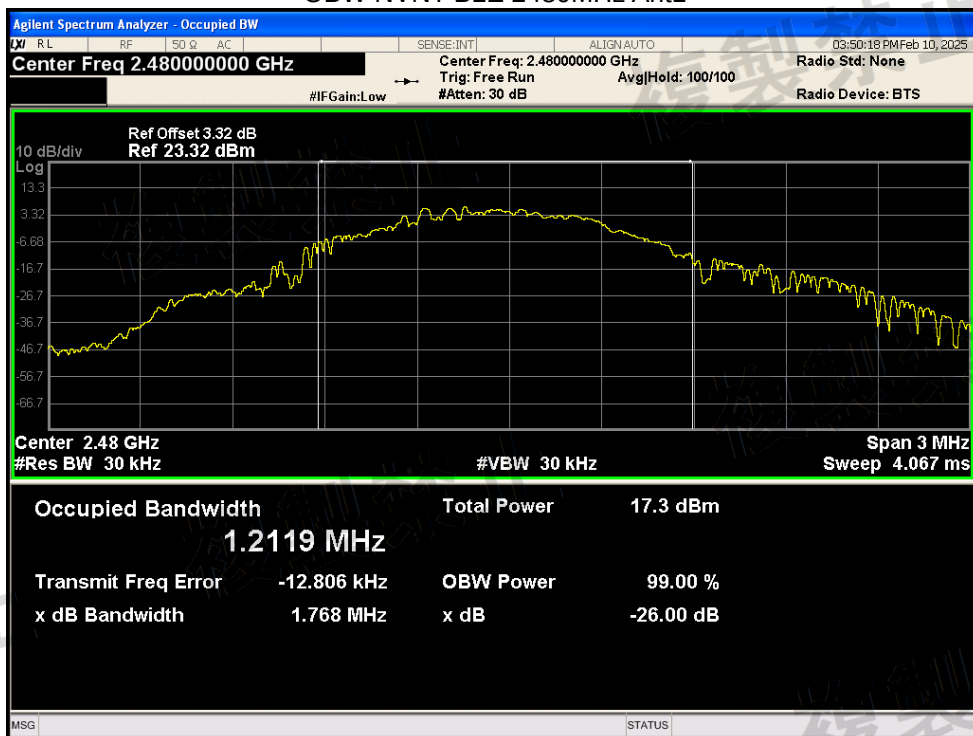
OBW NVNT BLE 2402MHz Ant1



OBW NVNT BLE 2440MHz Ant1



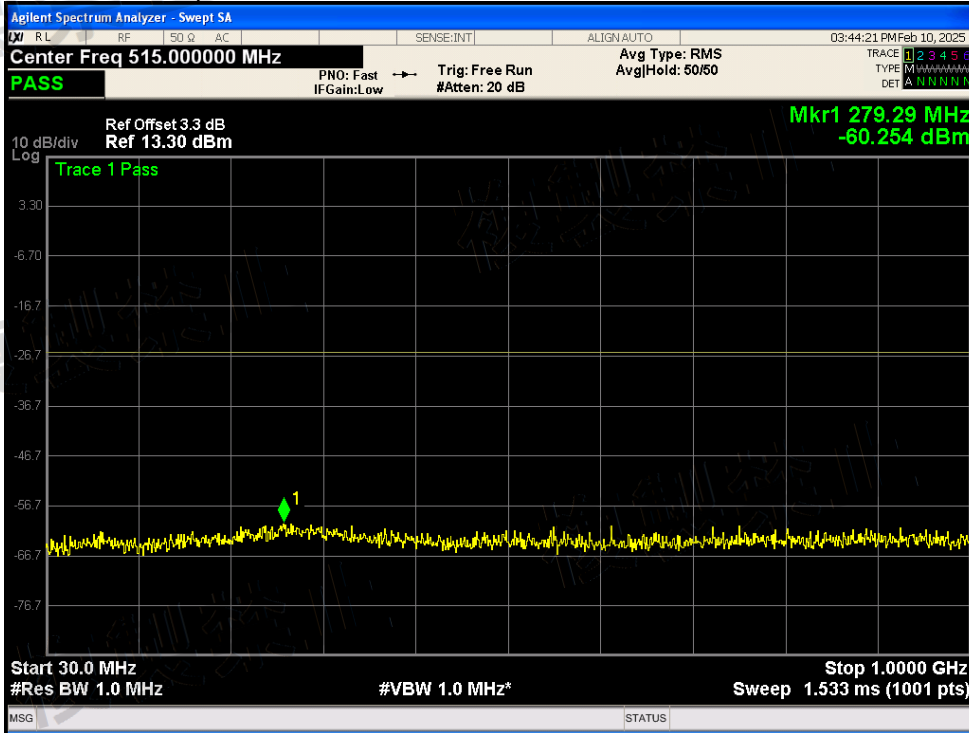
OBW NVNT BLE 2480MHz Ant1



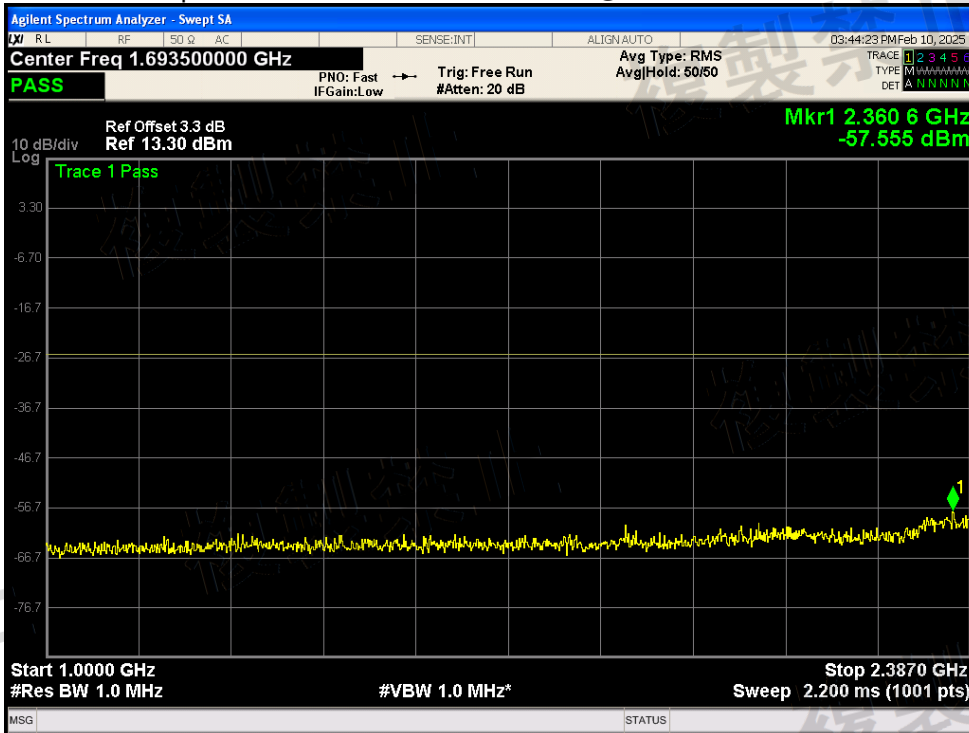
12.1.6 TX SPURIOUS EMISSION

Condition	Mode	Frequency (MHz)	Antenna	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (uW)	Limit Start(uW)	Limit Stop (uW)	Verdict
NVNT	BLE	2402	Ant1	30-1000	279.29	-60.25	0.0009	2.5	2.5	Pass
NVNT	BLE	2402	Ant1	1000-2387	2360.65	-57.56	0.0018	2.5	2.5	Pass
NVNT	BLE	2402	Ant1	2387-2400	2400	-26.43	2.2751	25	25	Pass
NVNT	BLE	2402	Ant1	2483.5-2496.5	2492.24	-57.04	0.002	25	25	Pass
NVNT	BLE	2402	Ant1	2496.5-13000	4807.27	-53.49	0.0045	2.5	2.5	Pass
NVNT	BLE	2440	Ant1	30-1000	352.04	-59.79	0.001	2.5	2.5	Pass
NVNT	BLE	2440	Ant1	1000-2387	2380.07	-57.32	0.0019	2.5	2.5	Pass
NVNT	BLE	2440	Ant1	2387-2400	2399.74	-55.33	0.0029	25	25	Pass
NVNT	BLE	2440	Ant1	2483.5-2496.5	2494.29	-56.5	0.0022	25	25	Pass
NVNT	BLE	2440	Ant1	2496.5-13000	4880.79	-52.25	0.006	2.5	2.5	Pass
NVNT	BLE	2480	Ant1	30-1000	298.69	-59.71	0.0011	2.5	2.5	Pass
NVNT	BLE	2480	Ant1	1000-2387	2384.23	-59.32	0.0012	2.5	2.5	Pass
NVNT	BLE	2480	Ant1	2387-2400	2400	-53.73	0.0042	25	25	Pass
NVNT	BLE	2480	Ant1	2483.5-2496.5	2483.68	-38.17	0.1524	25	25	Pass
NVNT	BLE	2480	Ant1	2496.5-13000	4964.82	-54.94	0.0032	2.5	2.5	Pass

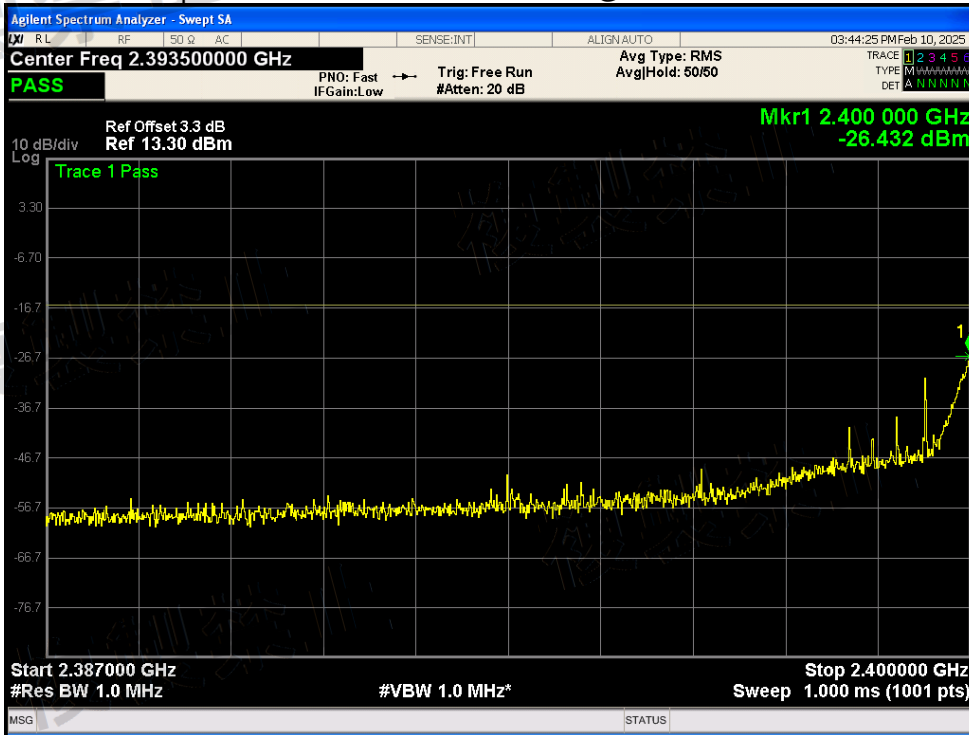
Tx. Spurious NVNT BLE 2402MHz Ant1 @ 30MHz-1000MHz



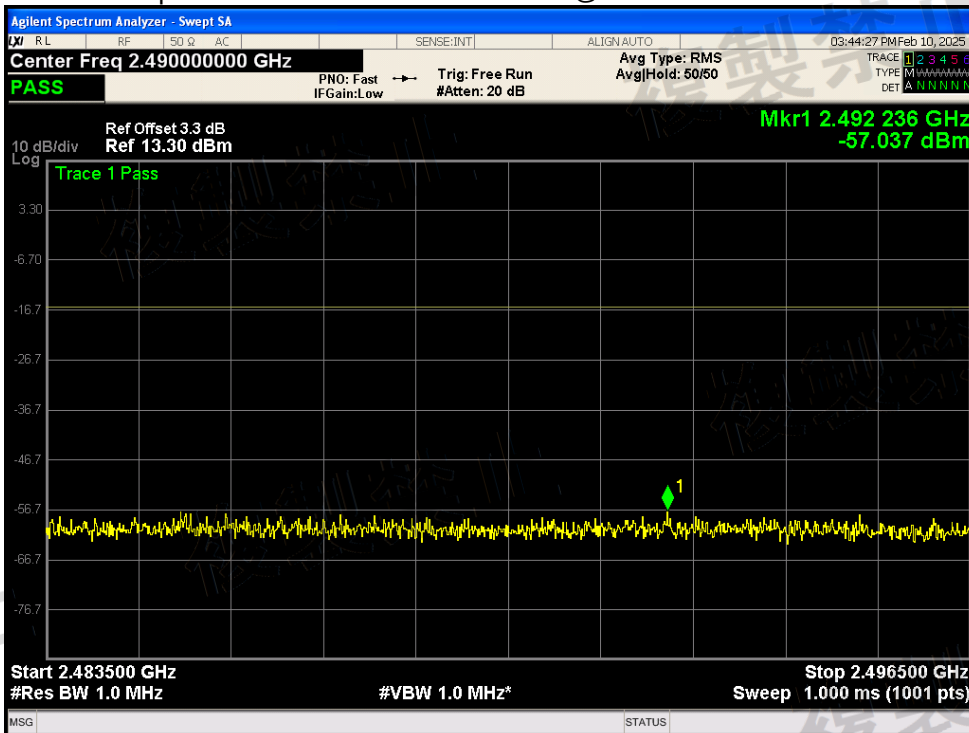
Tx. Spurious NVNT BLE 2402MHz Ant1 @ 1000MHz-2387MHz



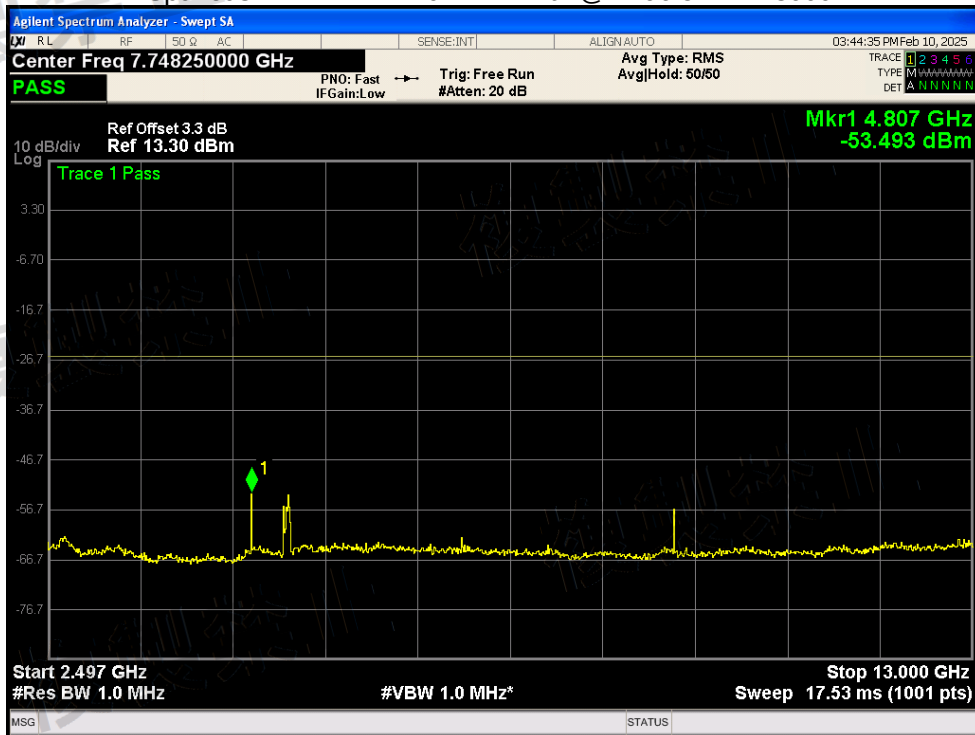
Tx. Spurious NVNT BLE 2402MHz Ant1 @ 2387MHz-2400MHz



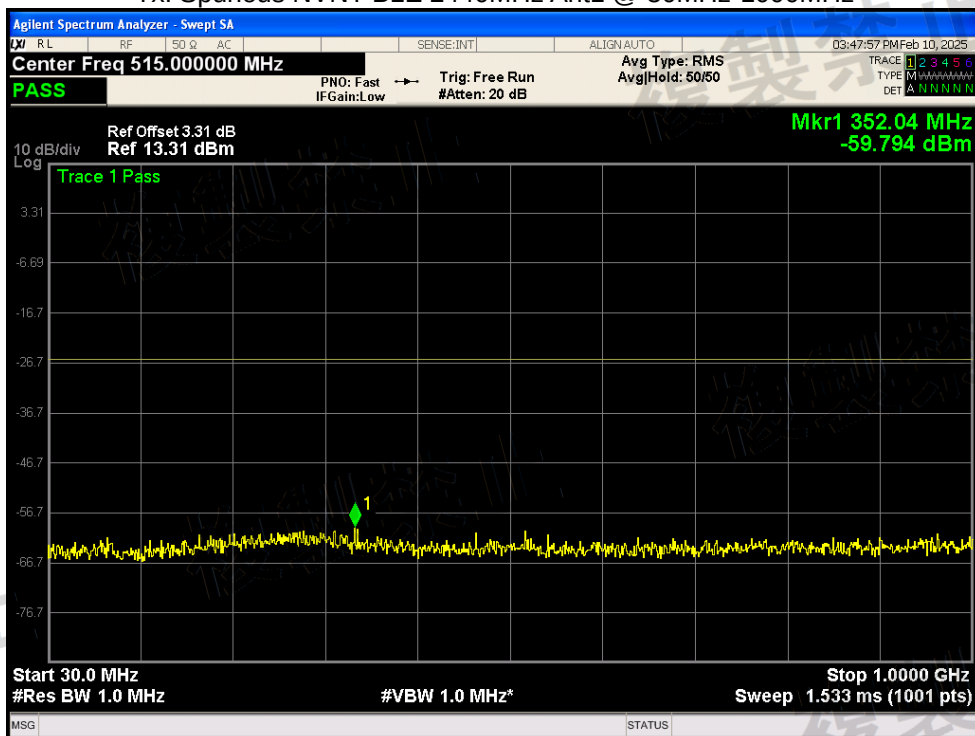
Tx. Spurious NVNT BLE 2402MHz Ant1 @ 2483.5MHz-2496.5MHz



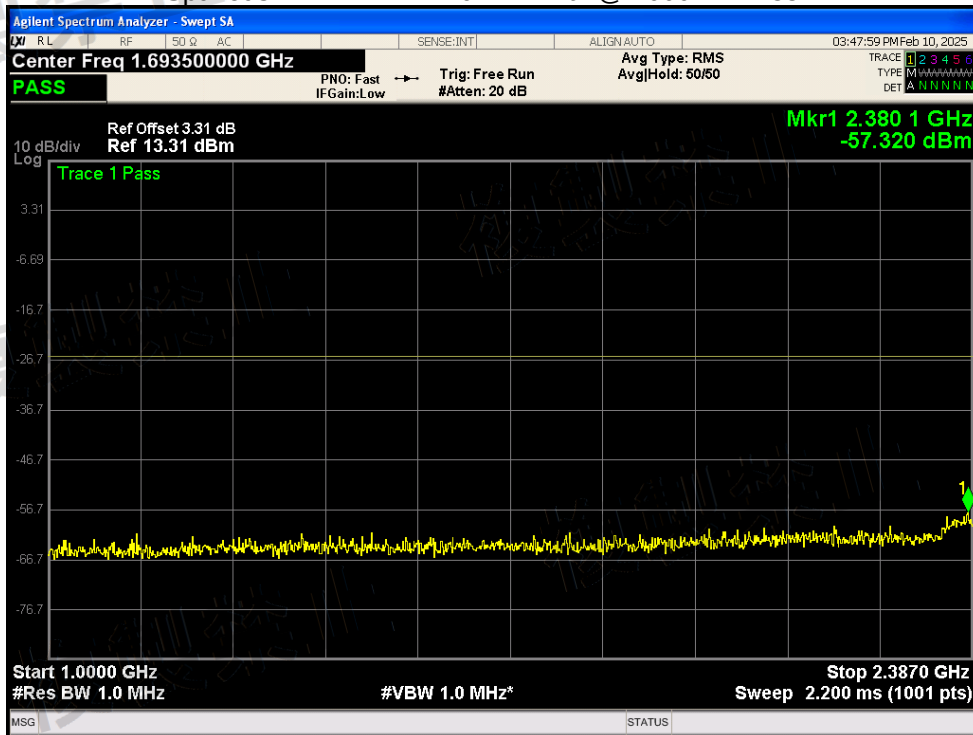
Tx. Spurious NVNT BLE 2402MHz Ant1 @ 2496.5MHz-13000MHz



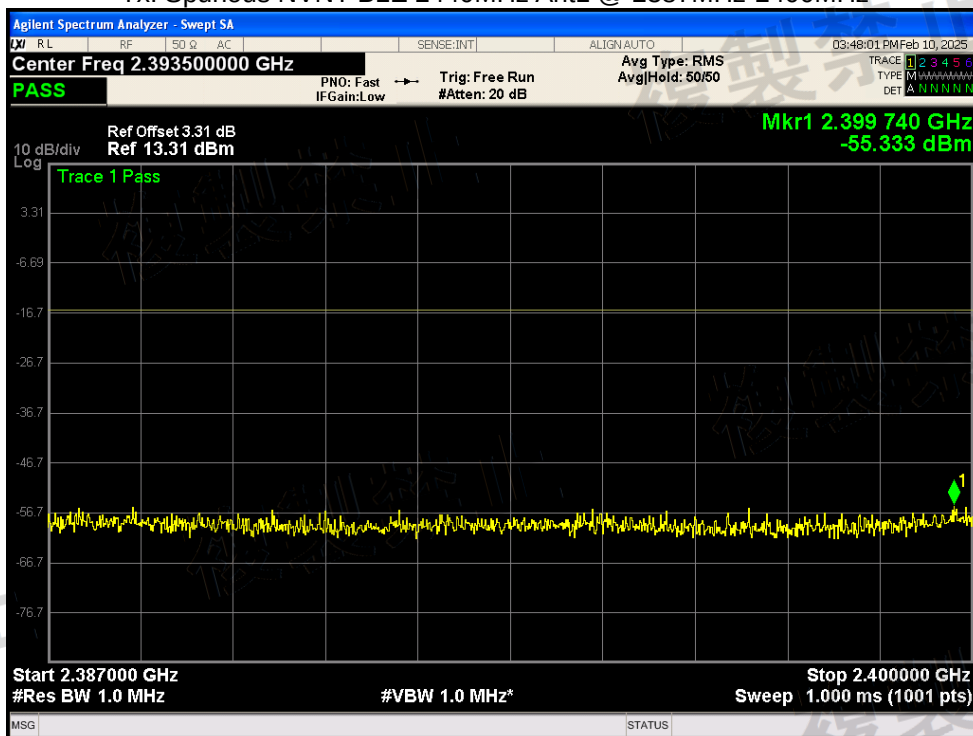
Tx. Spurious NVNT BLE 2440MHz Ant1 @ 30MHz-1000MHz



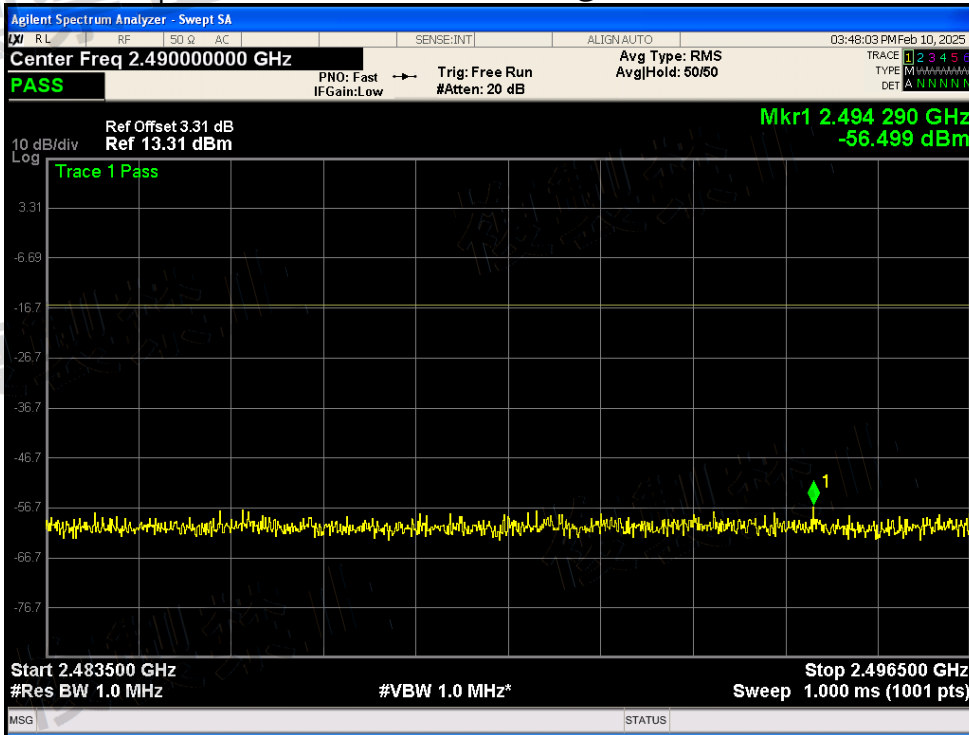
Tx. Spurious NVNT BLE 2440MHz Ant1 @ 1000MHz-2387MHz



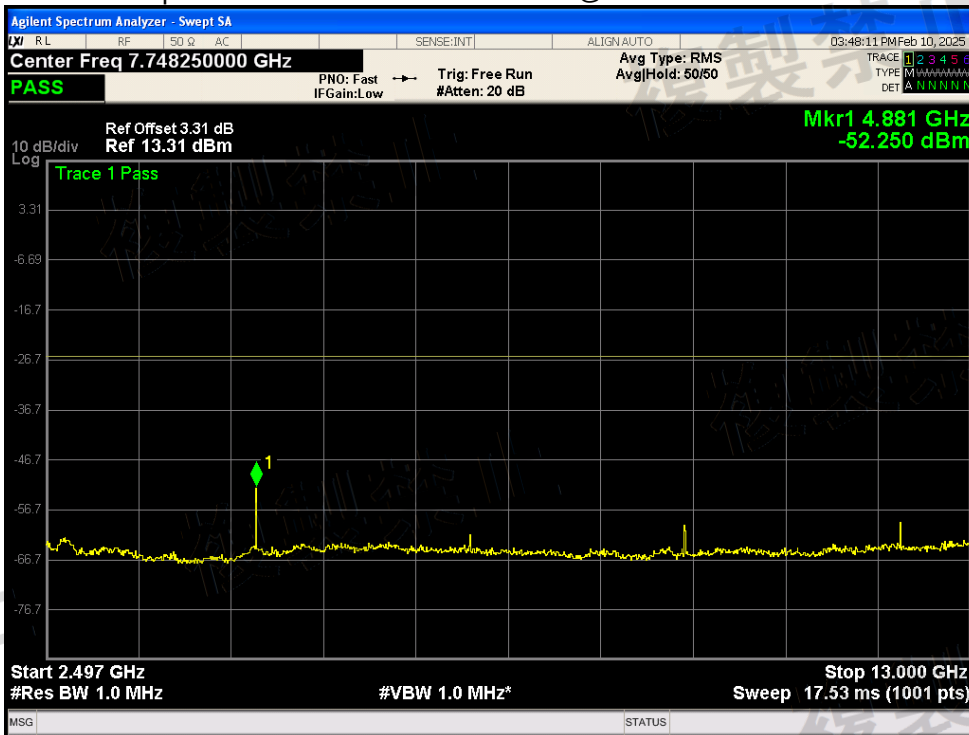
Tx. Spurious NVNT BLE 2440MHz Ant1 @ 2387MHz-2400MHz



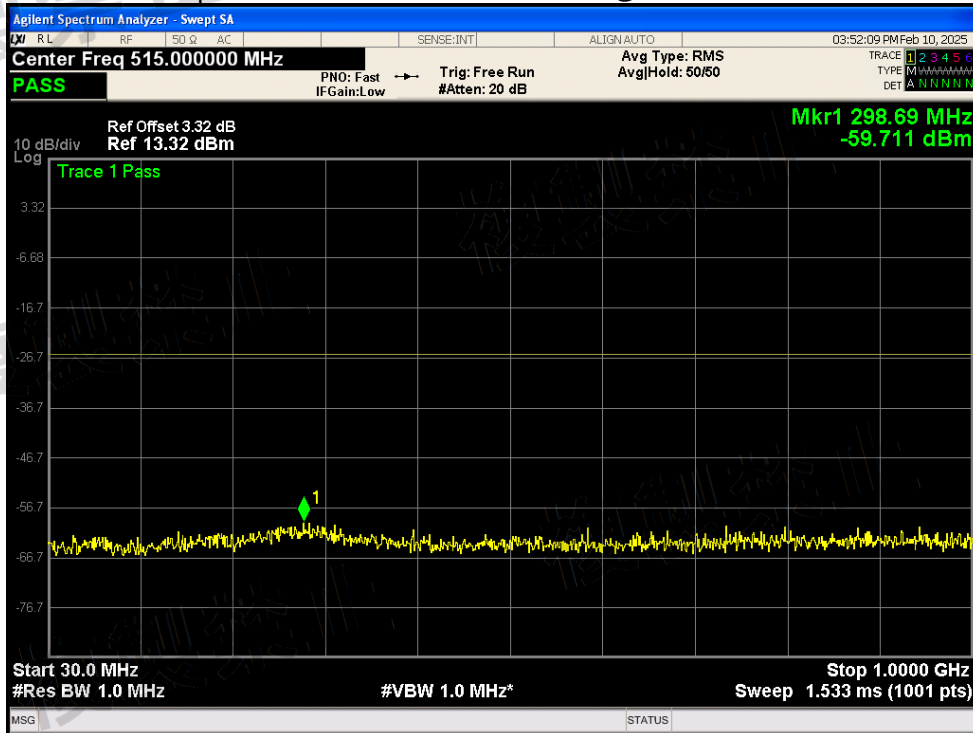
Tx. Spurious NVNT BLE 2440MHz Ant1 @ 2483.5MHz-2496.5MHz



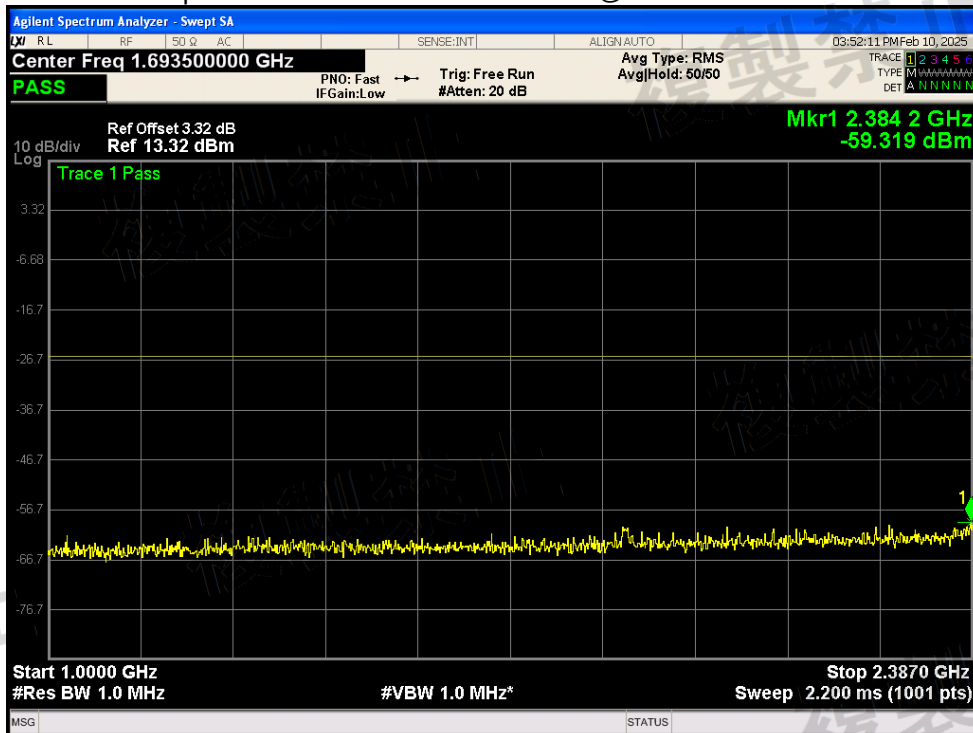
Tx. Spurious NVNT BLE 2440MHz Ant1 @ 2496.5MHz-13000MHz



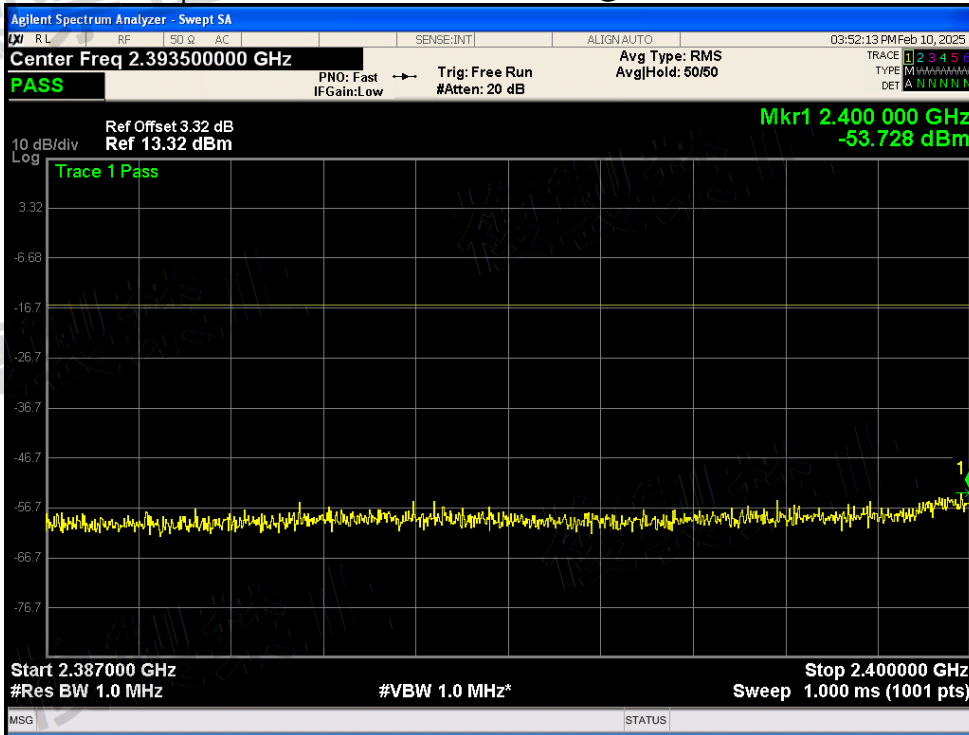
Tx. Spurious NVNT BLE 2480MHz Ant1 @ 30MHz-1000MHz



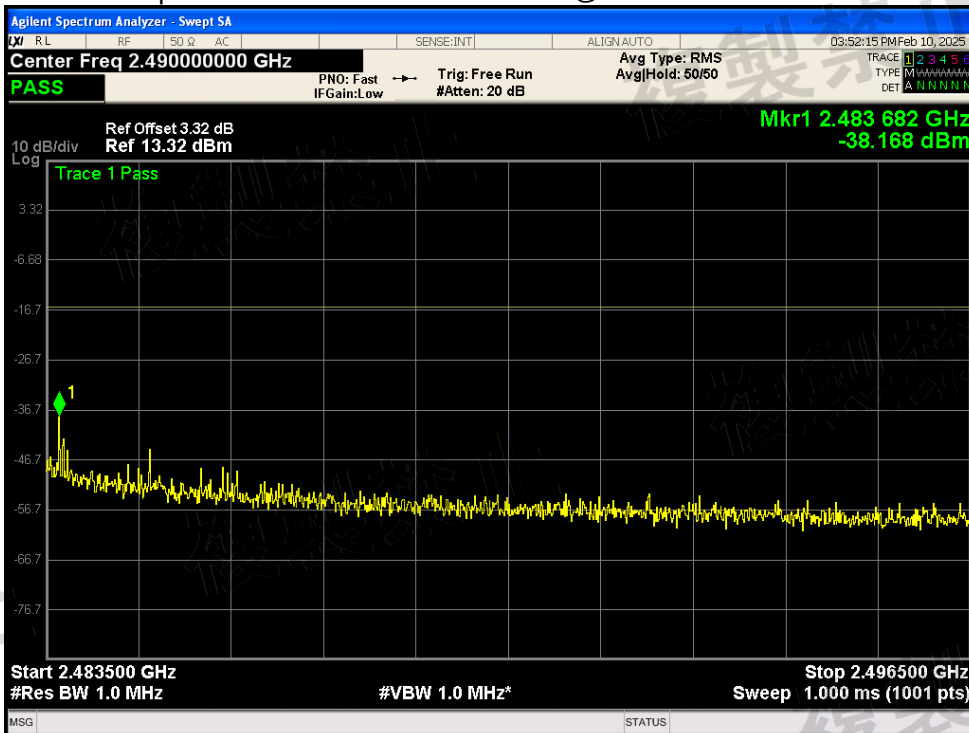
Tx. Spurious NVNT BLE 2480MHz Ant1 @ 1000MHz-2387MHz



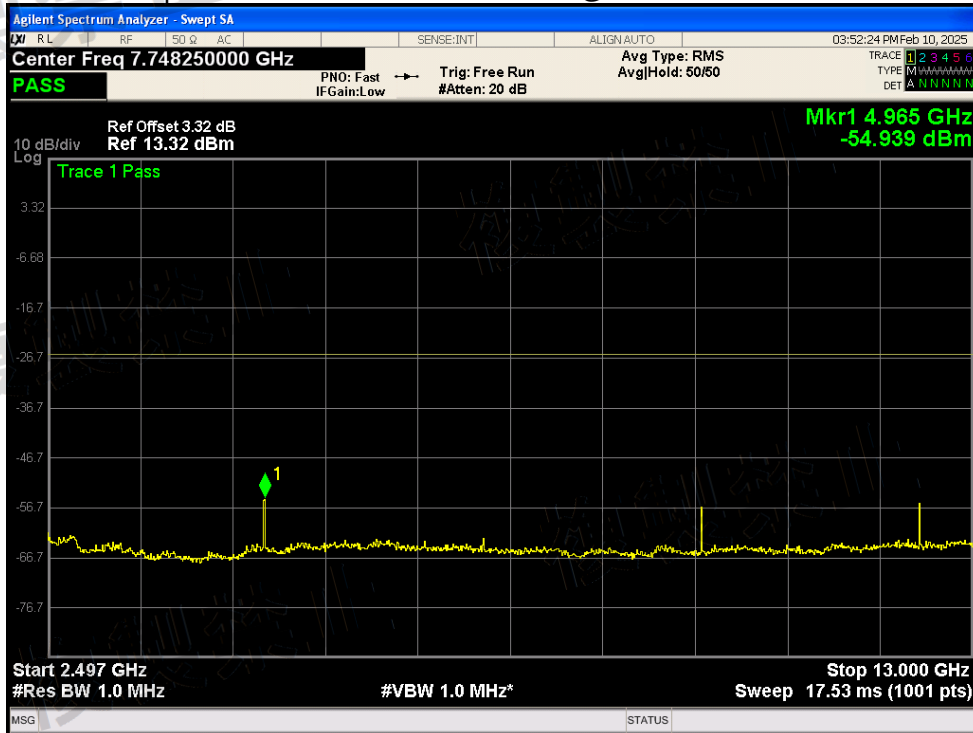
Tx. Spurious NVNT BLE 2480MHz Ant1 @ 2387MHz-2400MHz



Tx. Spurious NVNT BLE 2480MHz Ant1 @ 2483.5MHz-2496.5MHz



Tx. Spurious NVNT BLE 2480MHz Ant1 @ 2496.5MHz-13000MHz



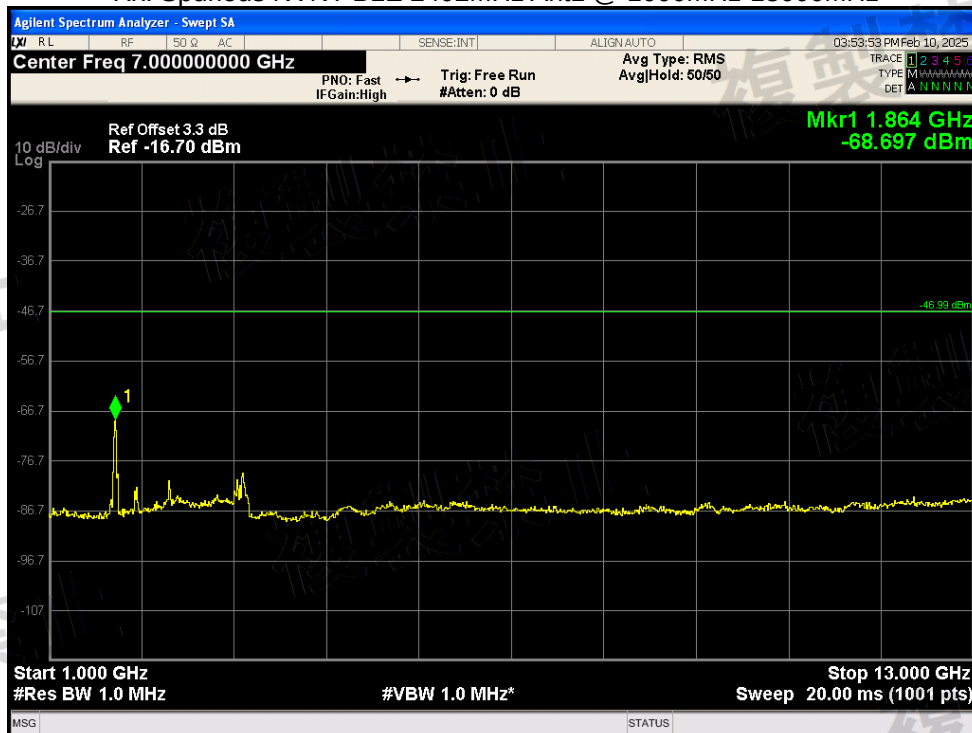
12.1.7 RX SPURIOUS EMISSION

Condition	Mode	Frequency (MHz)	Antenna	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (nW)	Limit (nW)	Verdict
NVNT	BLE	2402	Ant1	30-1000	290.93	-72.74	0.0532	4	Pass
NVNT	BLE	2402	Ant1	1000-13000	1864	-68.7	0.1349	20	Pass
NVNT	BLE	2440	Ant1	30-1000	290.93	-72.4	0.0575	4	Pass
NVNT	BLE	2440	Ant1	1000-13000	5176	-58.44	1.4322	20	Pass
NVNT	BLE	2480	Ant1	30-1000	298.69	-72.38	0.0578	4	Pass
NVNT	BLE	2480	Ant1	1000-13000	1864	-67.37	0.1832	20	Pass

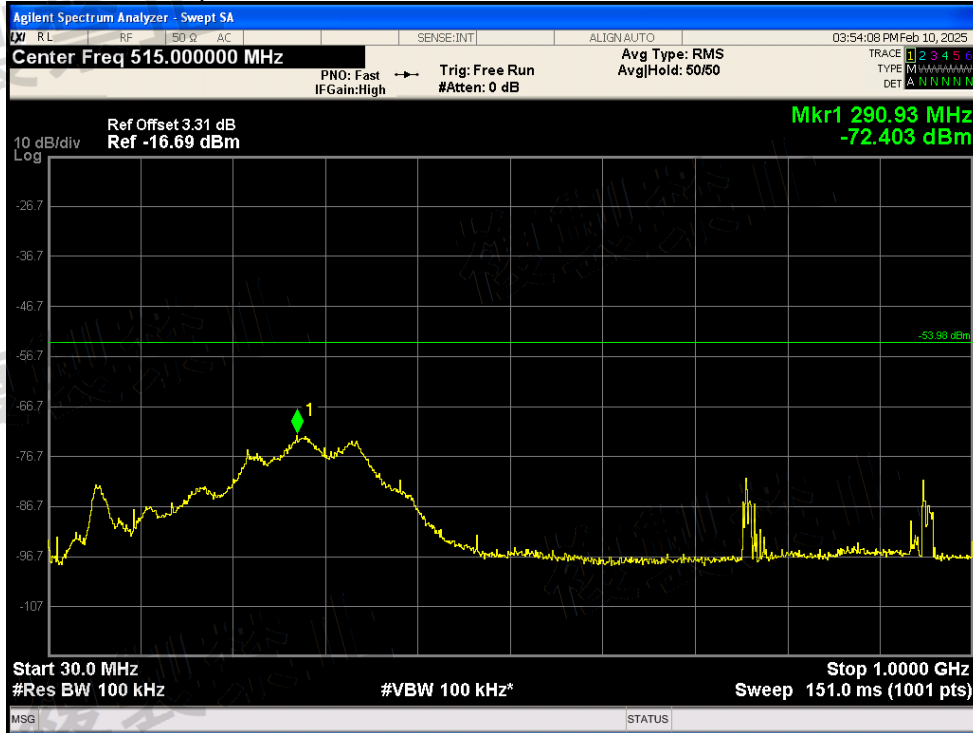
Rx. Spurious NVNT BLE 2402MHz Ant1 @ 30MHz-1000MHz



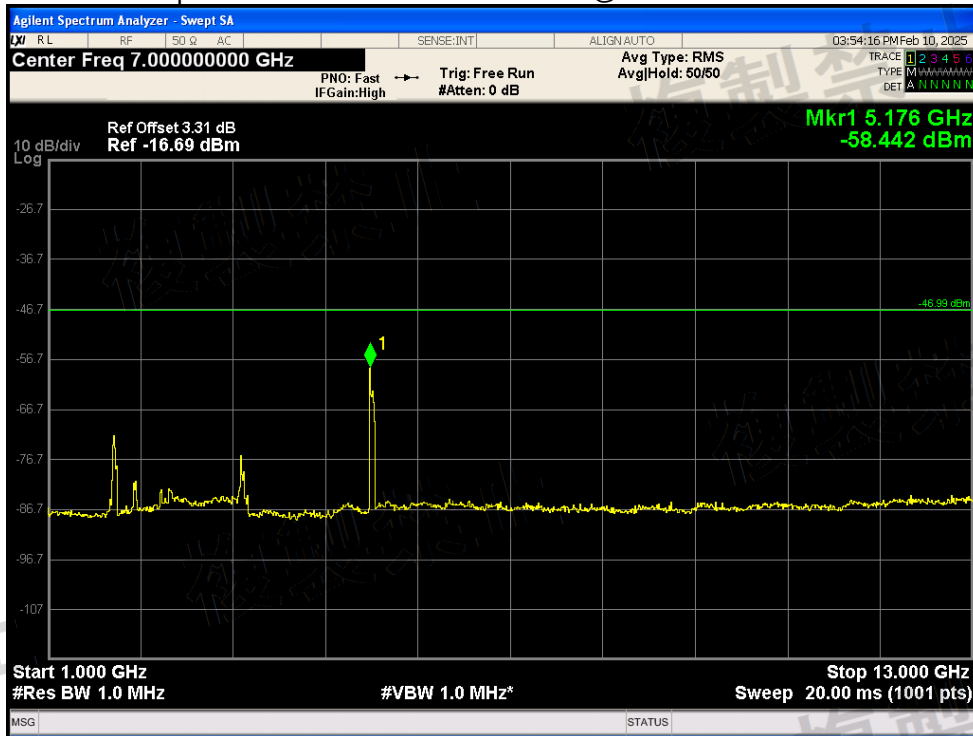
Rx. Spurious NVNT BLE 2402MHz Ant1 @ 1000MHz-13000MHz



Rx. Spurious NVNT BLE 2440MHz Ant1 @ 30MHz-1000MHz



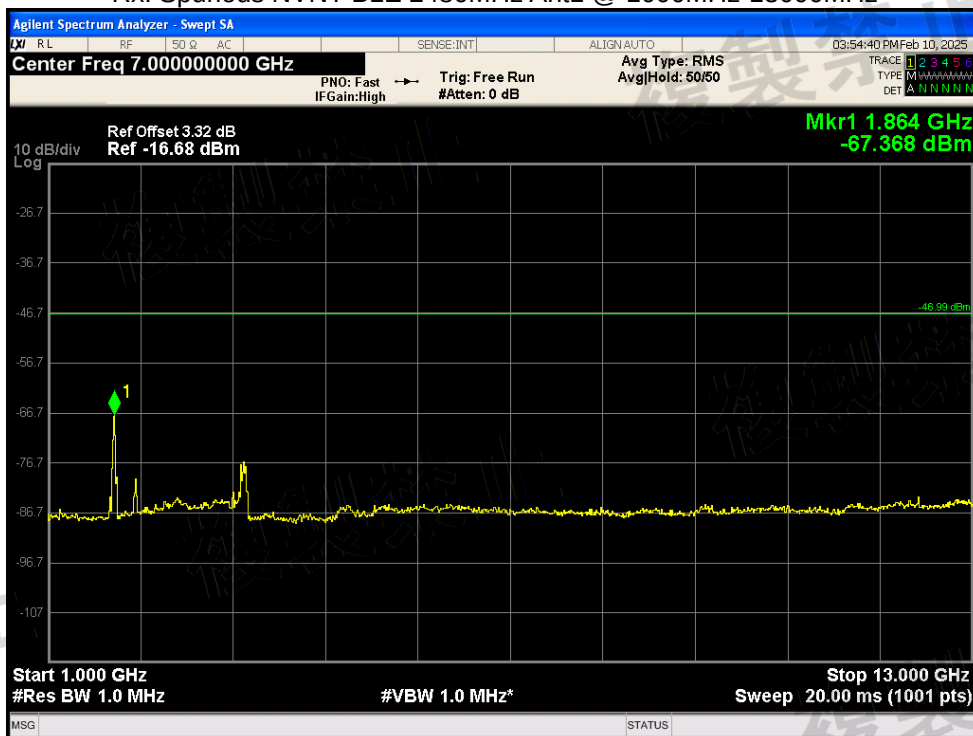
Rx. Spurious NVNT BLE 2440MHz Ant1 @ 1000MHz-13000MHz



Rx. Spurious NVNT BLE 2480MHz Ant1 @ 30MHz-1000MHz



Rx. Spurious NVNT BLE 2480MHz Ant1 @ 1000MHz-13000MHz

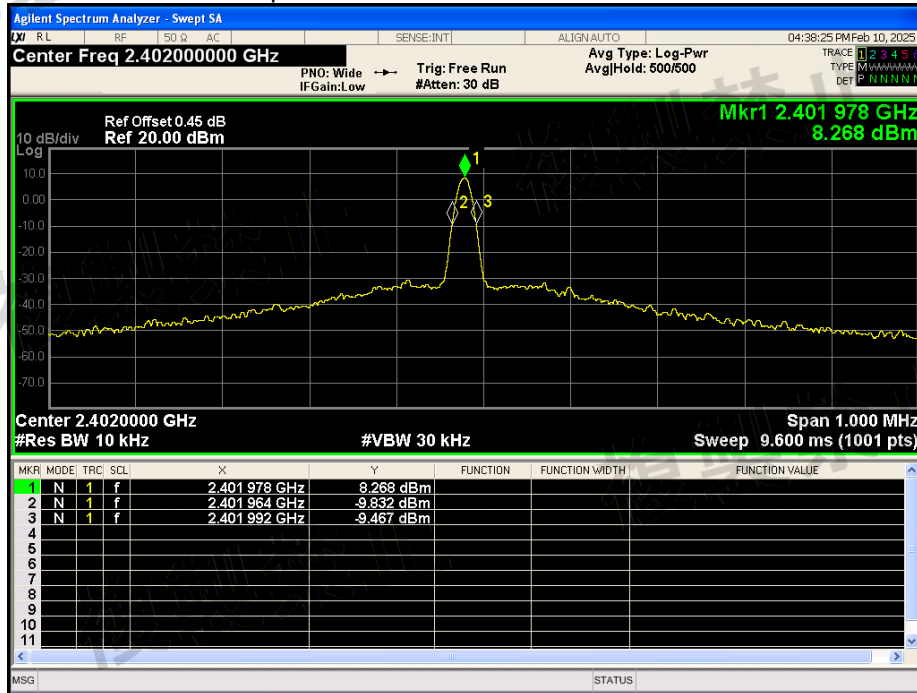


12.2 2M

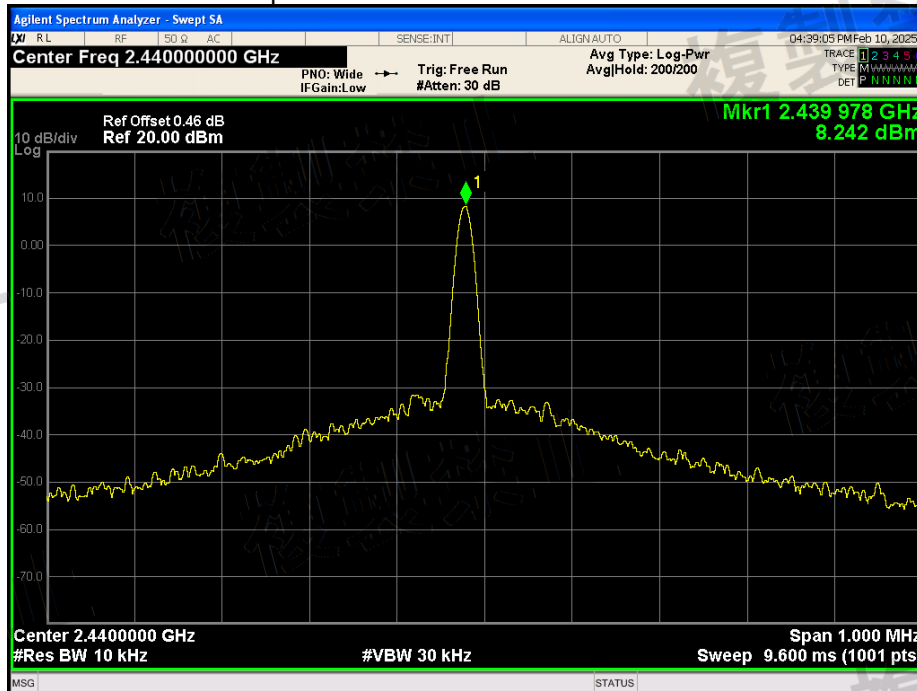
12.2.1 FREQUENCY ERROR

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	BLE 2M	2402	Ant1	2401.978	-9.16	50	Pass
NVNT	BLE 2M	2440	Ant1	2439.978	-9.02	50	Pass
NVNT	BLE 2M	2480	Ant1	2479.977	-9.27	50	Pass

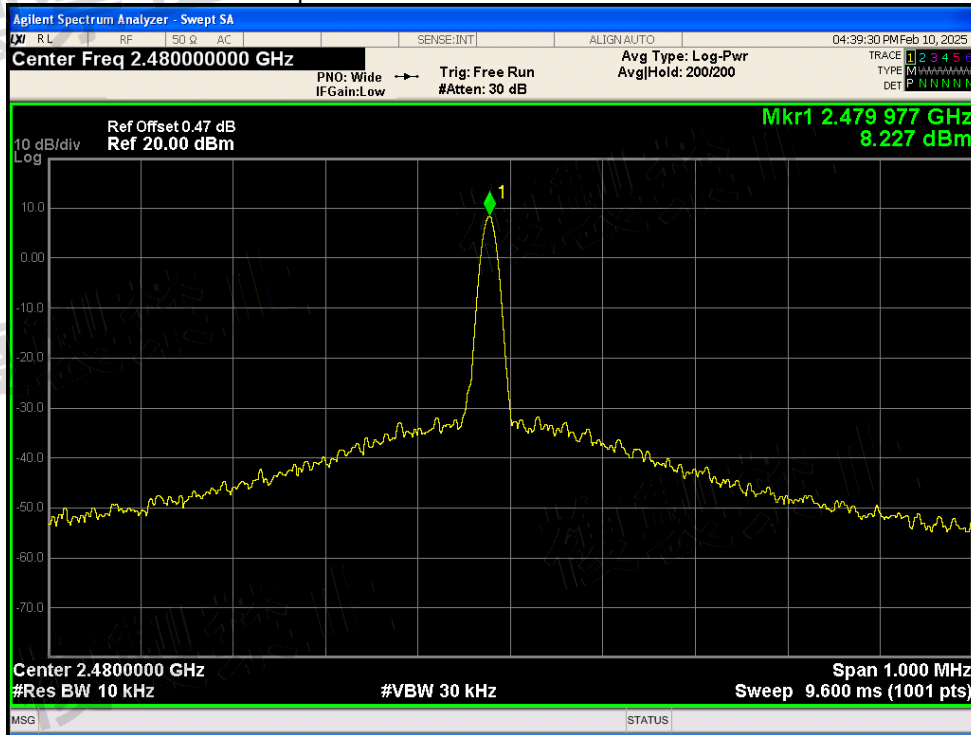
Freq. Error NVNT BLE 2M 2402MHz Ant1



Freq. Error NVNT BLE 2M 2440MHz Ant1



Freq. Error NVNT BLE 2M 2480MHz Ant1



12.2.2 ANTENNA AND EIRP POWER

Condition	Mode	Frequency (MHz)	Antenna	Antenna Power (mW)	Declared Power (mW)	Tolerance (%)	Upper Limit (%)	Verdict
NVNT	BLE 2M	2402	Ant1	2.004	3	-33.22	20	Pass
NVNT	BLE 2M	2440	Ant1	1.945	3	-35.17	20	Pass
NVNT	BLE 2M	2480	Ant1	1.951	3	-34.98	20	Pass

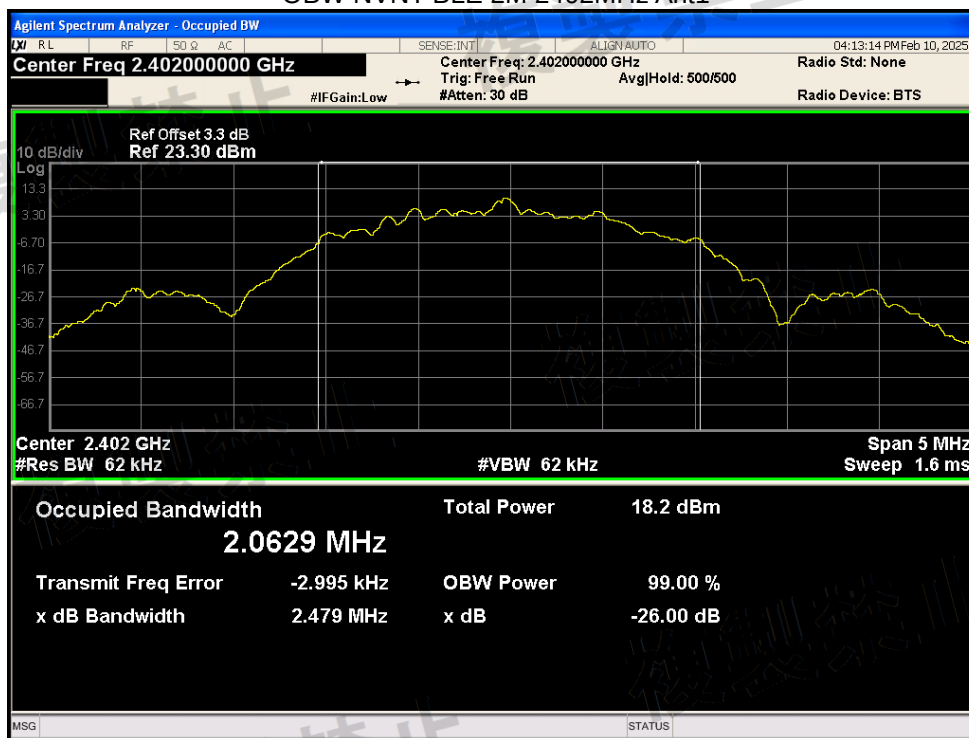
12.2.3 EIRP POWER

Condition	Mode	Frequency (MHz)	Antenna	Antenna Power (mW)	Gain (dBi)	EIRP Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 2M	2402	Ant1	2.004	2.85	5.868	12.14	Pass
NVNT	BLE 2M	2440	Ant1	1.945	2.85	5.739	12.14	Pass
NVNT	BLE 2M	2480	Ant1	1.951	2.85	5.752	12.14	Pass

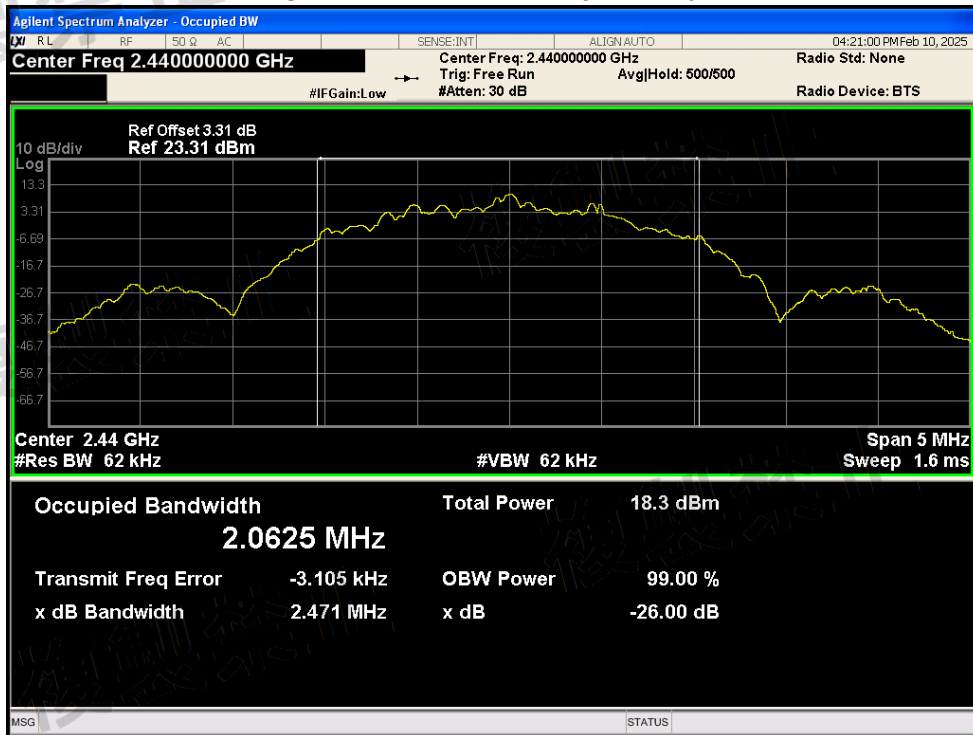
12.2.4 OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 2M	2402	Ant1	2.063
NVNT	BLE 2M	2440	Ant1	2.062
NVNT	BLE 2M	2480	Ant1	2.089

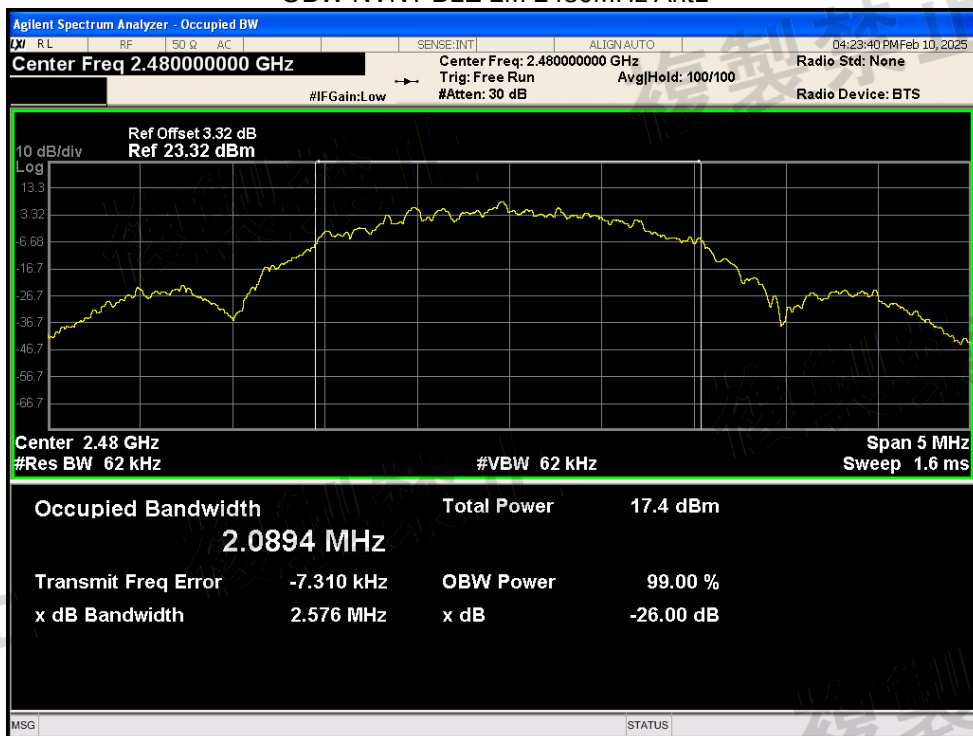
OBW NVNT BLE 2M 2402MHz Ant1



OBW NVNT BLE 2M 2440MHz Ant1



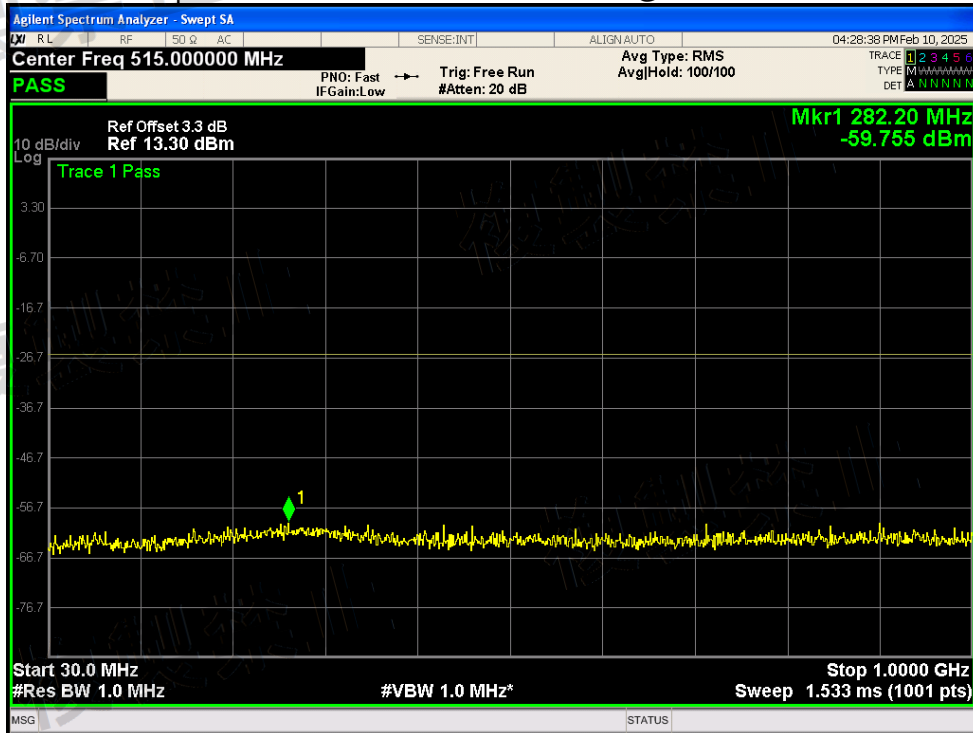
OBW NVNT BLE 2M 2480MHz Ant1



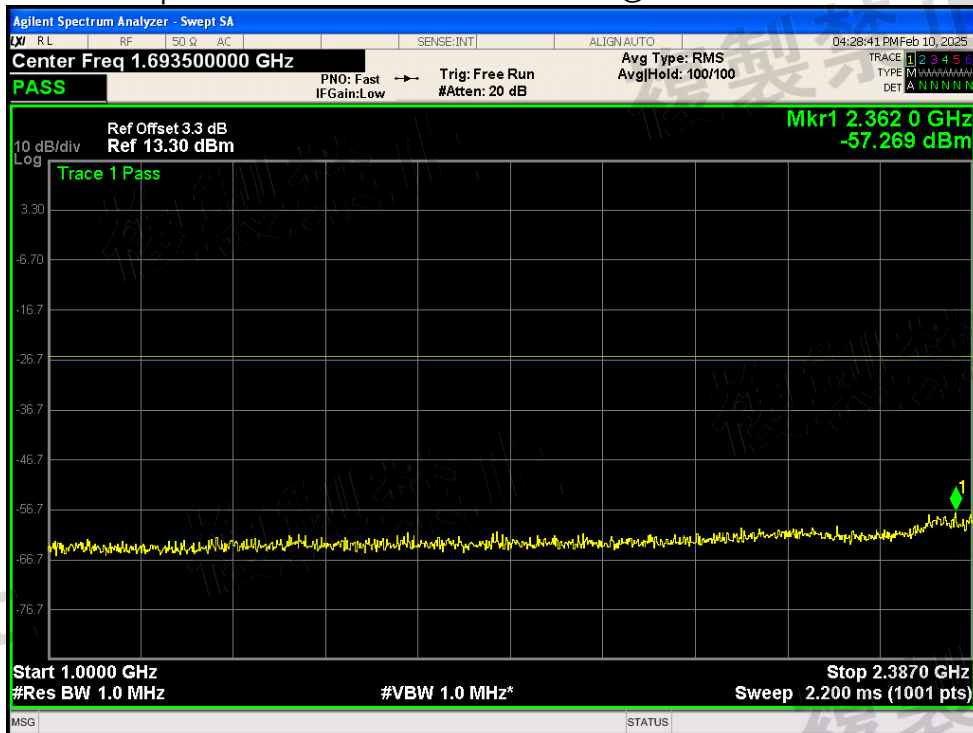
12.2.6 TX SPURIOUS EMISSION

Condition	Mode	Frequency (MHz)	Antenna	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (uW)	Limit Start(uW)	Limit Stop (uW)	Verdict
NVNT	BLE 2M	2402	Ant1	30-1000	282.2	-59.76	0.0011	2.5	2.5	Pass
NVNT	BLE 2M	2402	Ant1	1000-2387	2362.03	-57.27	0.0019	2.5	2.5	Pass
NVNT	BLE 2M	2402	Ant1	2387-2400	2400	-26.32	2.3335	25	25	Pass
NVNT	BLE 2M	2402	Ant1	2483.5-2496.5	2491.29	-55.95	0.0025	25	25	Pass
NVNT	BLE 2M	2402	Ant1	2496.5-13000	4807.27	-53.05	0.005	2.5	2.5	Pass
NVNT	BLE 2M	2440	Ant1	30-1000	304.51	-58.89	0.0013	2.5	2.5	Pass
NVNT	BLE 2M	2440	Ant1	1000-2387	2359.26	-57.18	0.0019	2.5	2.5	Pass
NVNT	BLE 2M	2440	Ant1	2387-2400	2396.78	-55.05	0.0031	25	25	Pass
NVNT	BLE 2M	2440	Ant1	2483.5-2496.5	2486.62	-57.02	0.002	25	25	Pass
NVNT	BLE 2M	2440	Ant1	2496.5-13000	4880.79	-52.66	0.0054	2.5	2.5	Pass
NVNT	BLE 2M	2480	Ant1	30-1000	321	-58.96	0.0013	2.5	2.5	Pass
NVNT	BLE 2M	2480	Ant1	1000-2387	1470.19	-59.79	0.001	2.5	2.5	Pass
NVNT	BLE 2M	2480	Ant1	2387-2400	2399.97	-53.58	0.0044	25	25	Pass
NVNT	BLE 2M	2480	Ant1	2483.5-2496.5	2484.07	-35.8	0.263	25	25	Pass
NVNT	BLE 2M	2480	Ant1	2496.5-13000	4964.82	-52.12	0.0061	2.5	2.5	Pass

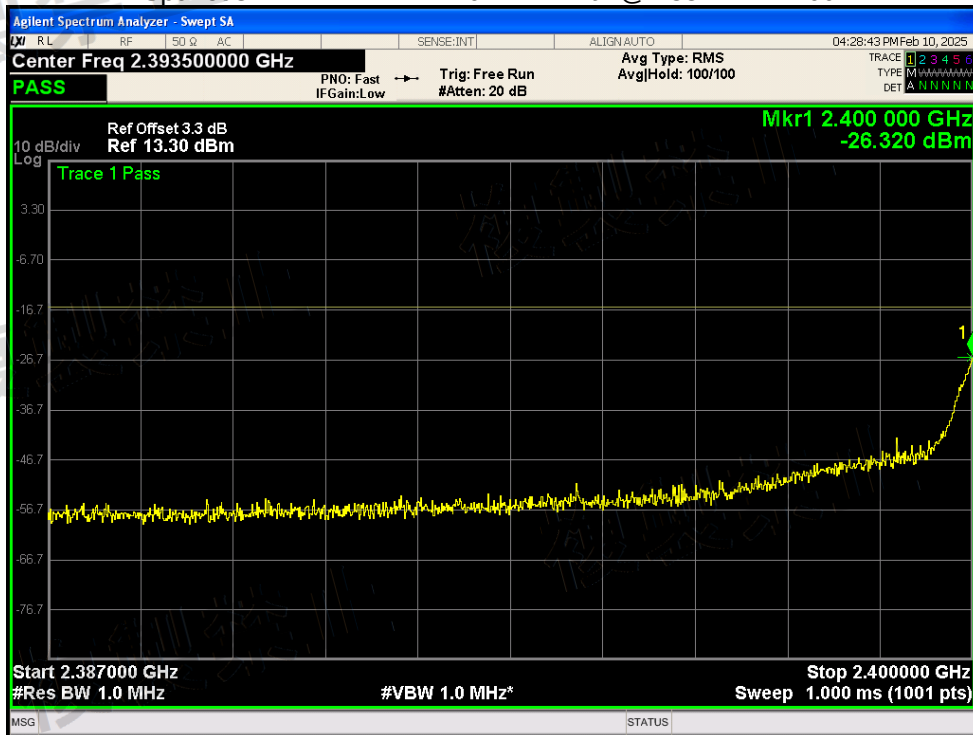
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 @ 30MHz-1000MHz



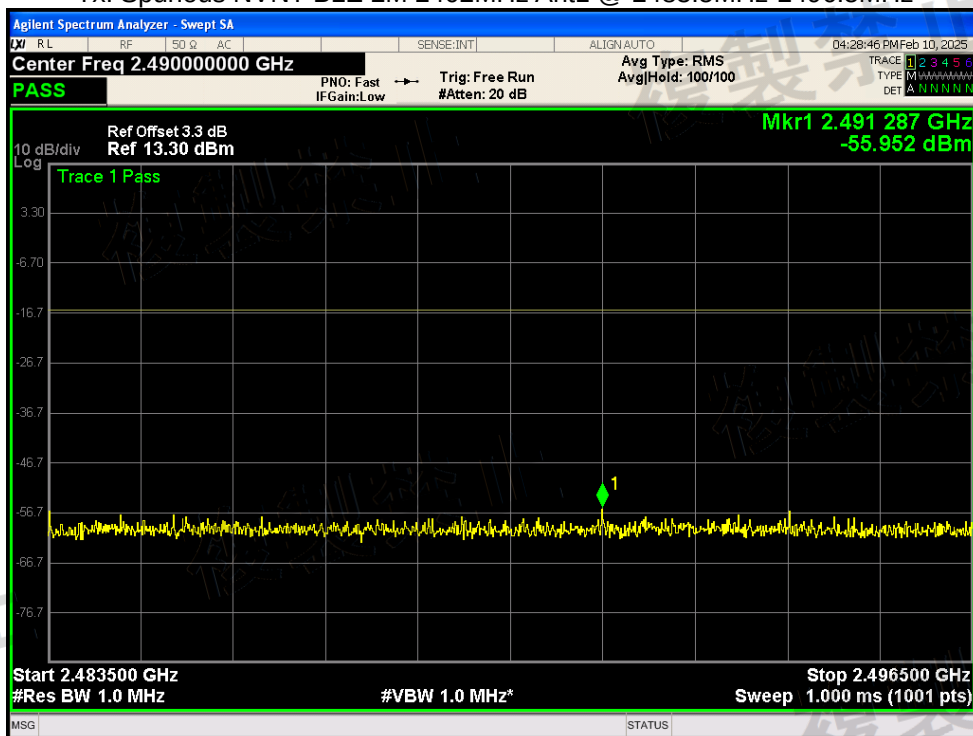
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 @ 1000MHz-2387MHz



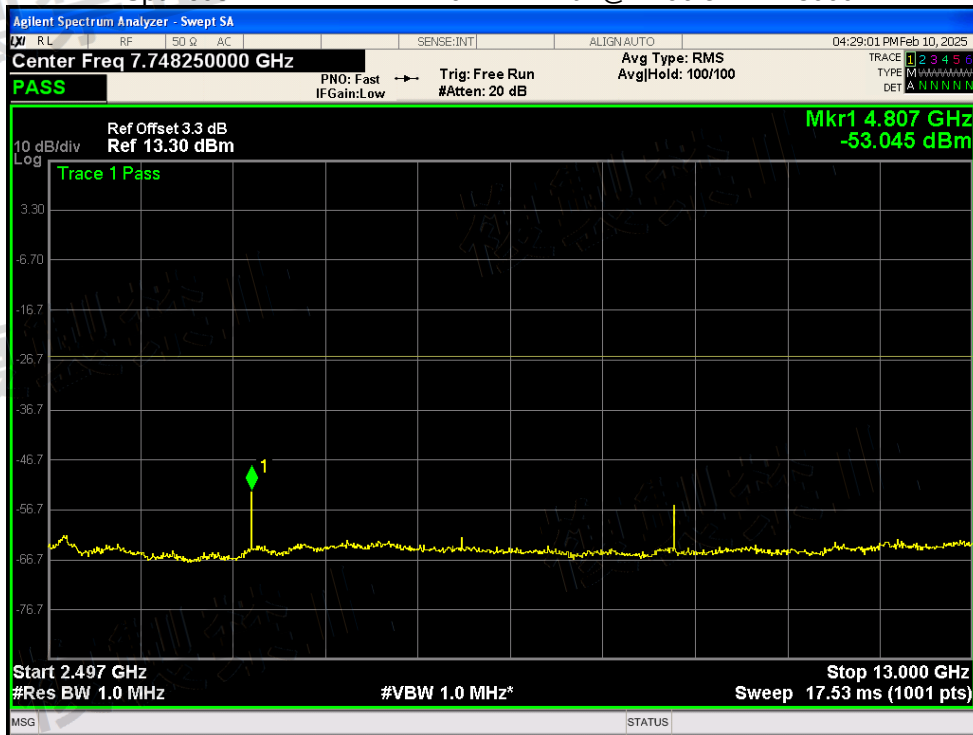
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 @ 2387MHz-2400MHz



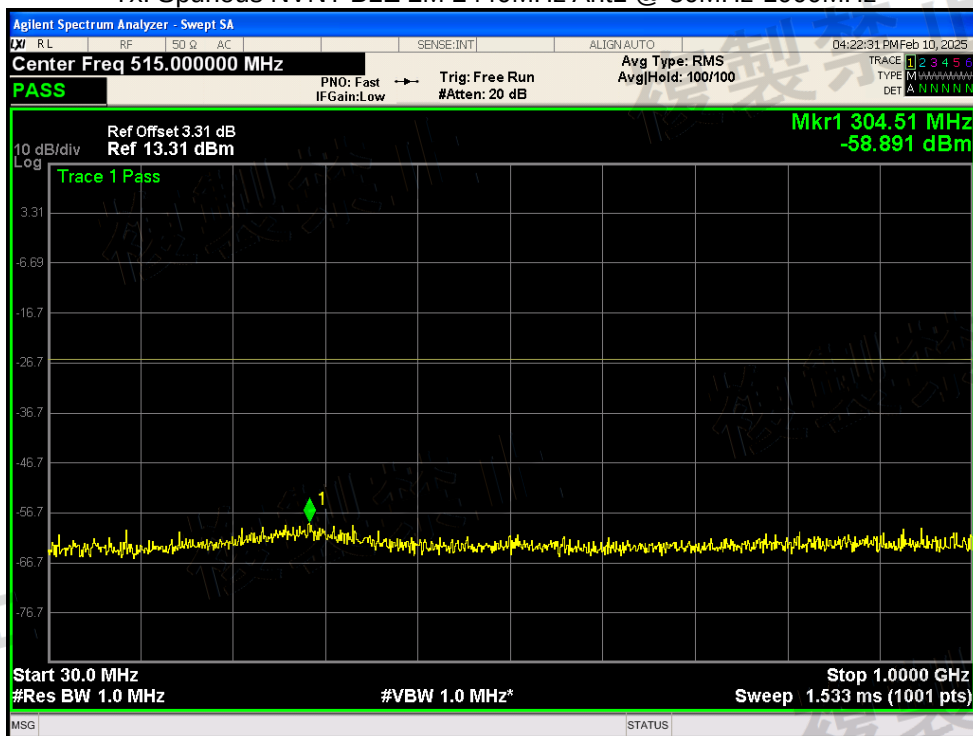
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 @ 2483.5MHz-2496.5MHz



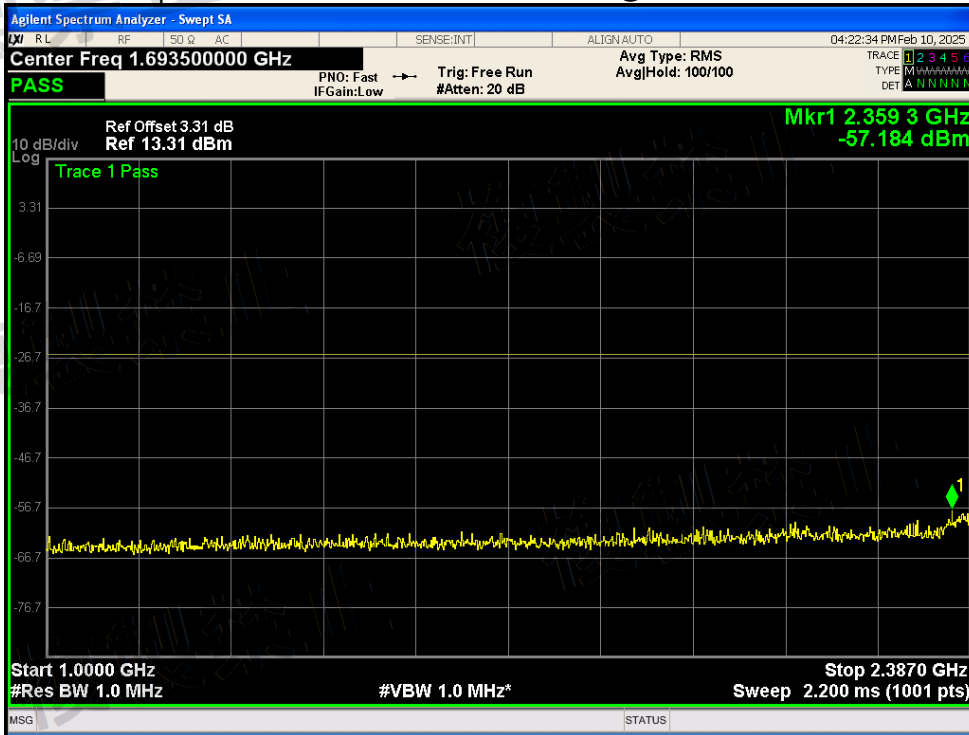
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 @ 2496.5MHz-13000MHz



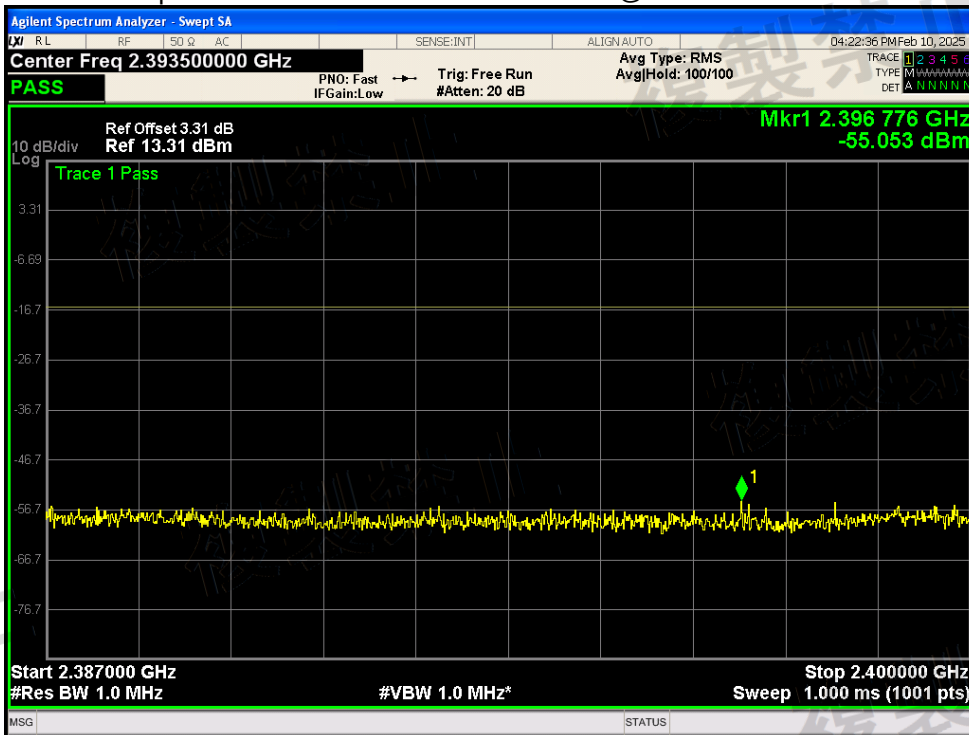
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 @ 30MHz-1000MHz



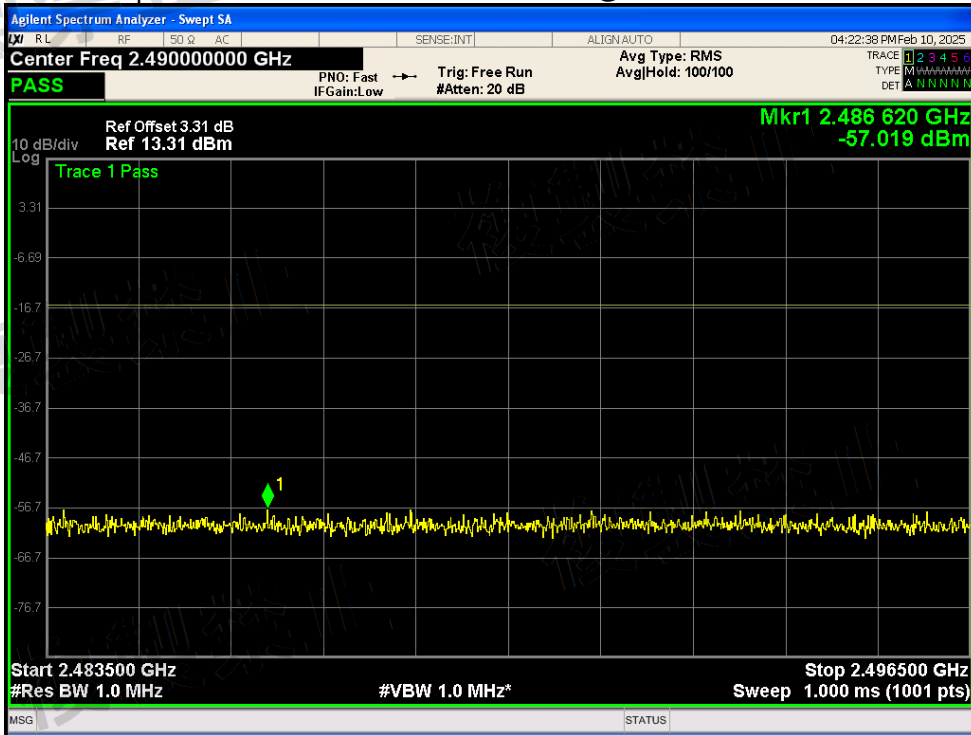
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 @ 1000MHz-2387MHz



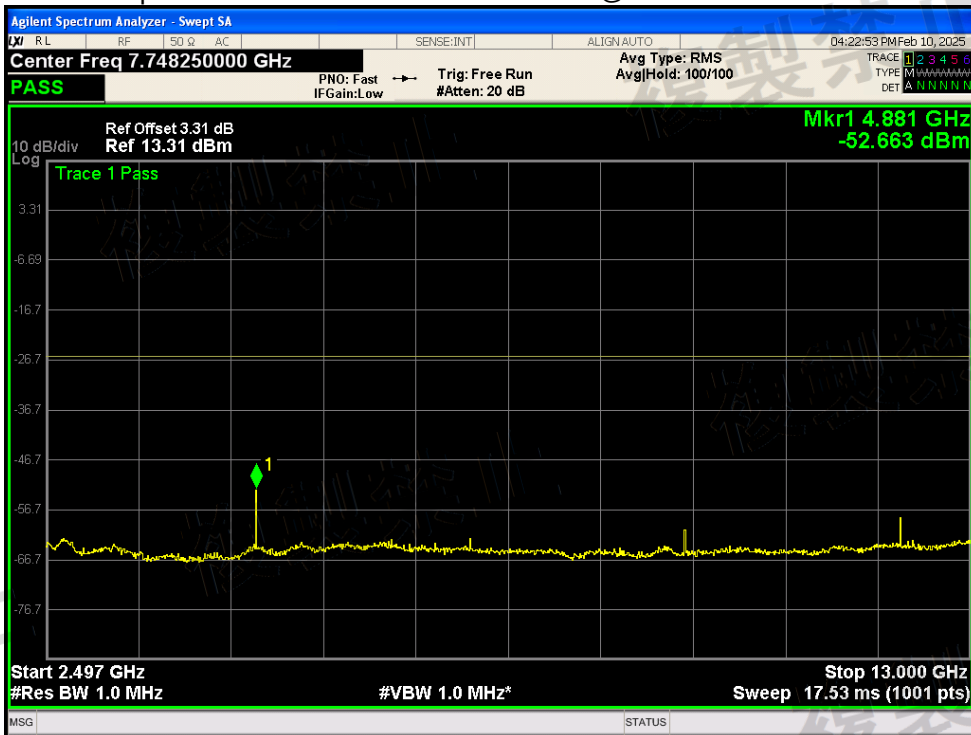
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 @ 2387MHz-2400MHz



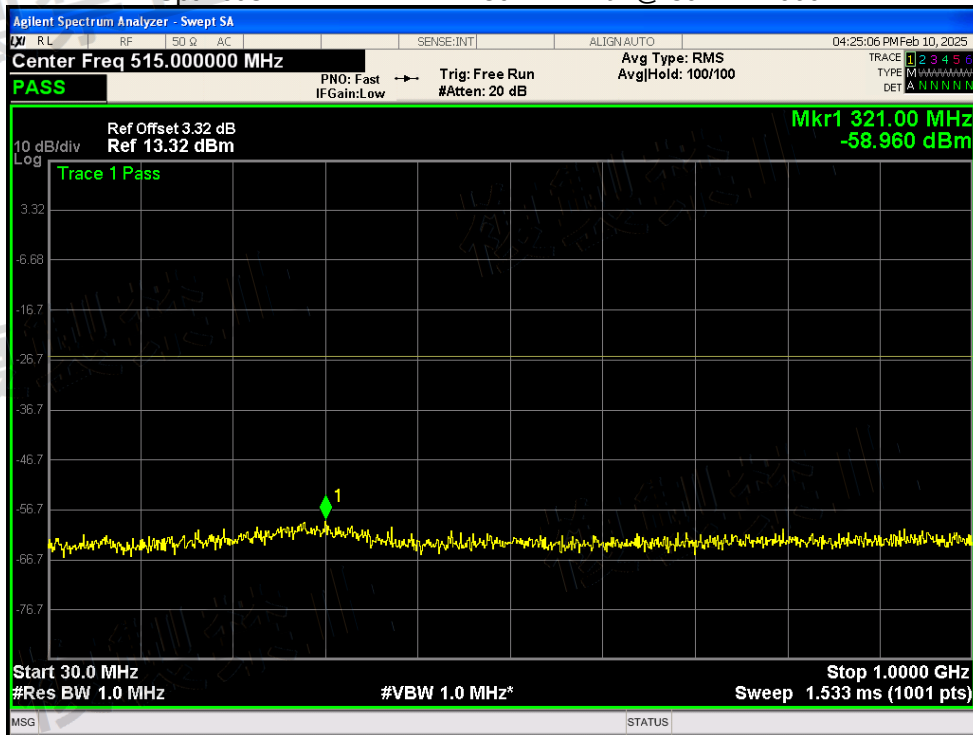
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 @ 2483.5MHz-2496.5MHz



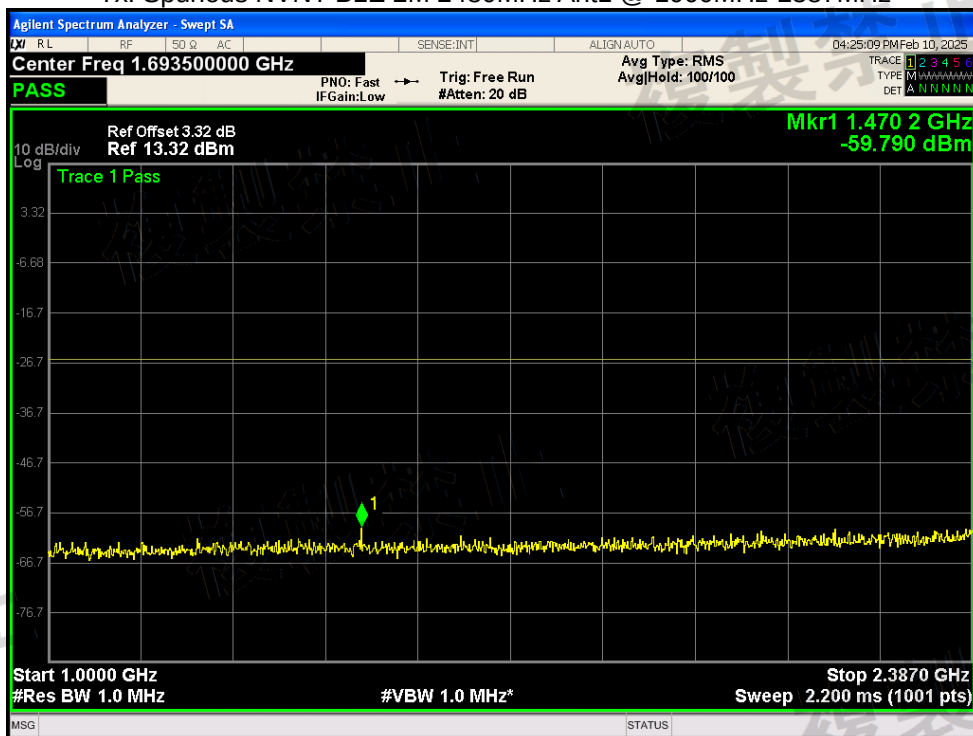
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 @ 2496.5MHz-13000MHz



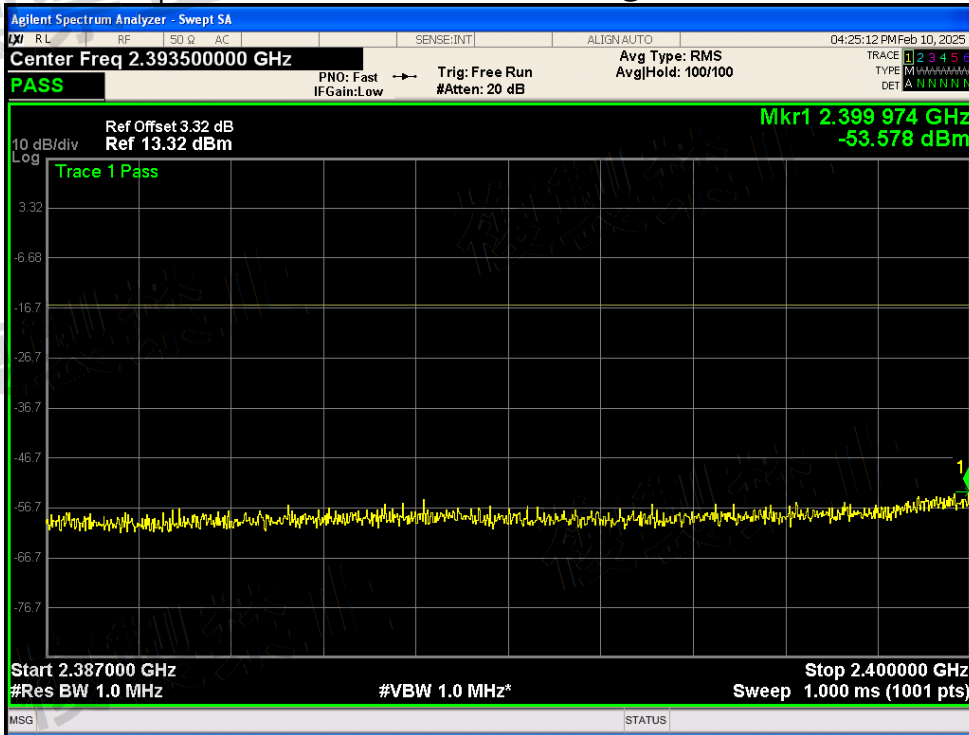
Tx. Spurious NVNT BLE 2M 2480MHz Ant1 @ 30MHz-1000MHz



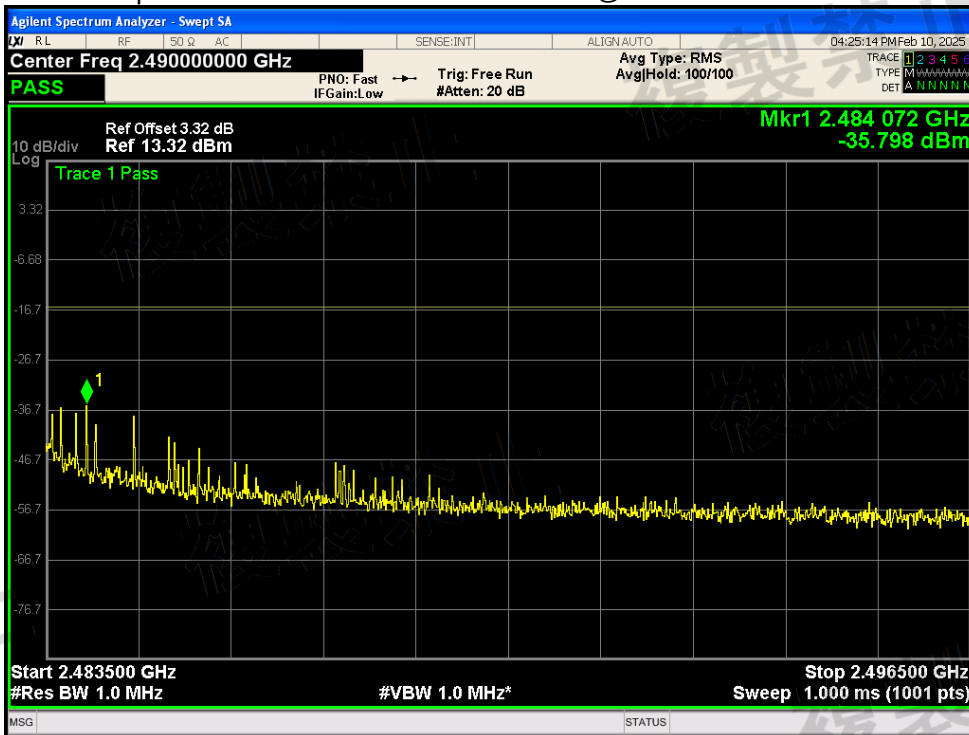
Tx. Spurious NVNT BLE 2M 2480MHz Ant1 @ 1000MHz-2387MHz



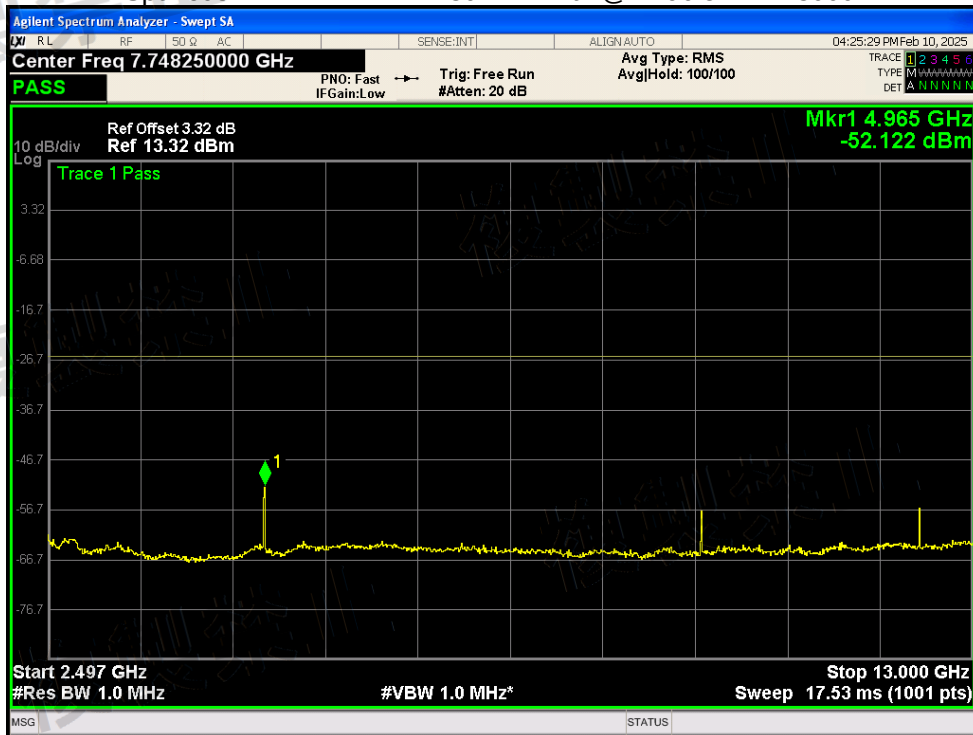
Tx. Spurious NVNT BLE 2M 2480MHz Ant1 @ 2387MHz-2400MHz



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 @ 2483.5MHz-2496.5MHz



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 @ 2496.5MHz-13000MHz



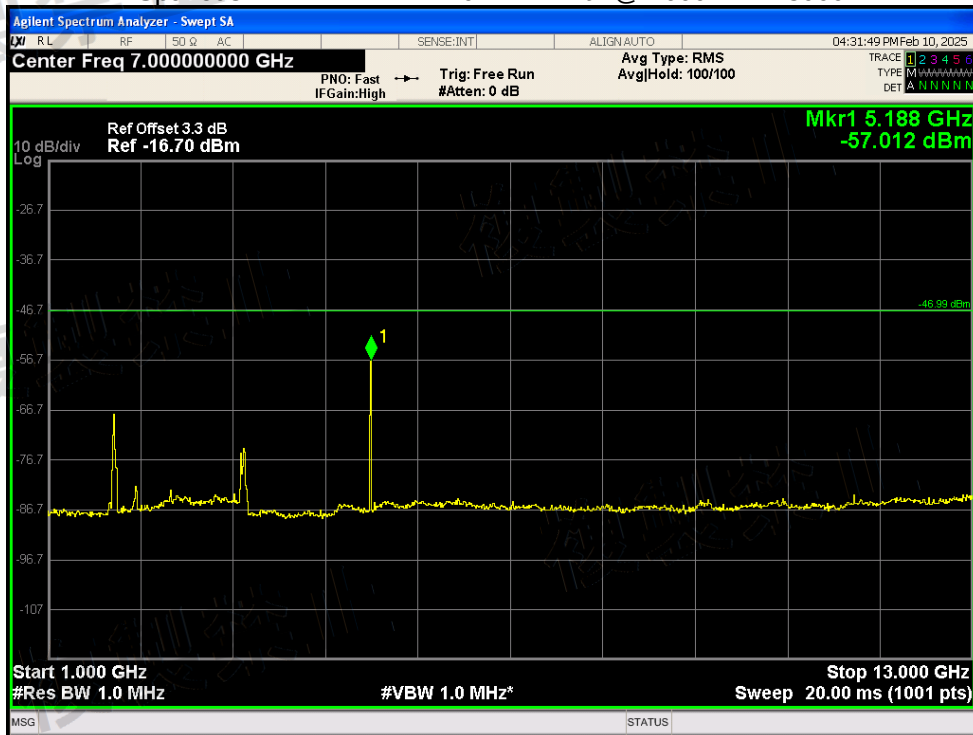
12.2.7 RX SPURIOUS EMISSION

Condition	Mode	Frequency (MHz)	Antenna	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Max Value (nW)	Limit (nW)	Verdict
NVNT	BLE 2M	2402	Ant1	30-1000	298.69	-72.28	0.0592	4	Pass
NVNT	BLE 2M	2402	Ant1	1000-13000	5188	-57.01	1.9907	20	Pass
NVNT	BLE 2M	2440	Ant1	30-1000	293.84	-72.28	0.0592	4	Pass
NVNT	BLE 2M	2440	Ant1	1000-13000	1864	-70.78	0.0836	20	Pass
NVNT	BLE 2M	2480	Ant1	30-1000	295.78	-72.42	0.0573	4	Pass
NVNT	BLE 2M	2480	Ant1	1000-13000	1864	-67.93	0.1611	20	Pass

Rx. Spurious NVNT BLE 2M 2402MHz Ant1 @ 30MHz-1000MHz



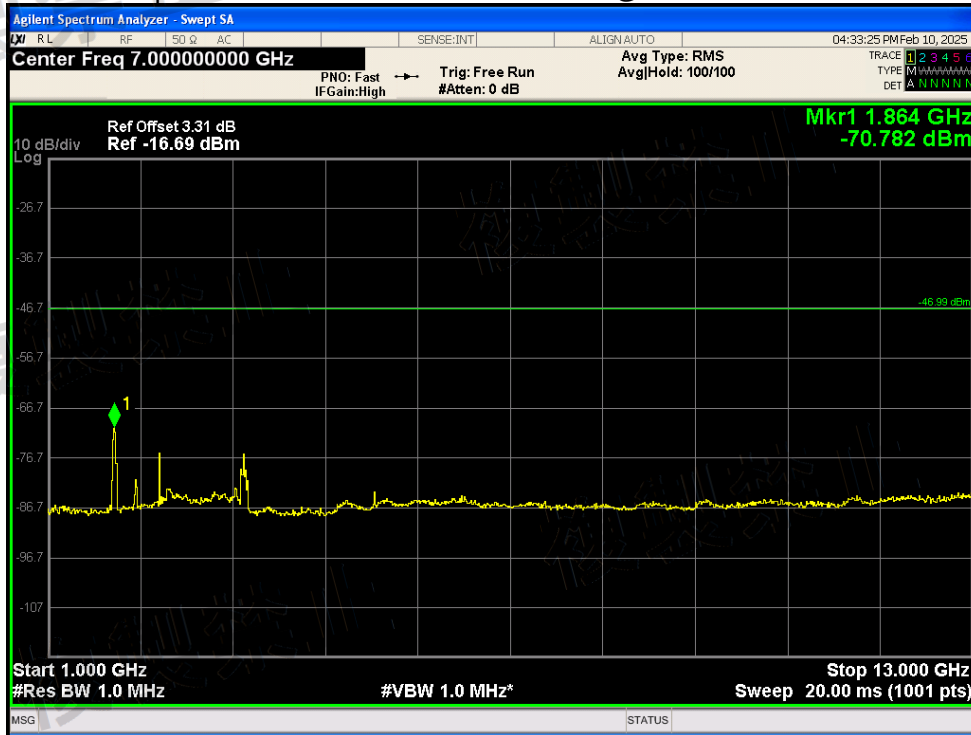
Rx. Spurious NVNT BLE 2M 2402MHz Ant1 @ 1000MHz-13000MHz



Rx. Spurious NVNT BLE 2M 2440MHz Ant1 @ 30MHz-1000MHz



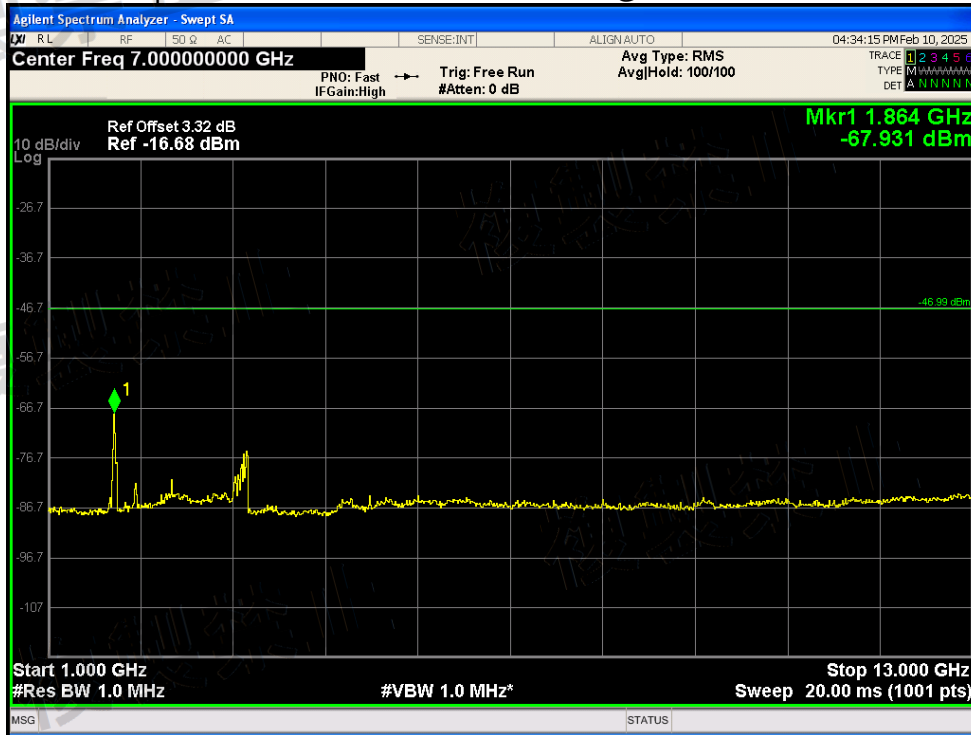
Rx. Spurious NVNT BLE 2M 2440MHz Ant1 @ 1000MHz-13000MHz



Rx. Spurious NVNT BLE 2M 2480MHz Ant1 @ 30MHz-1000MHz



Rx. Spurious NVNT BLE 2M 2480MHz Ant1 @ 1000MHz-13000MHz



REPORT IS FINISHED.