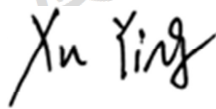


# Test Report

**Applicant** Suzhou MobyData Smart System Co., Ltd.  
**Product** Mobile Computer  
**Model** M63S; M63; OA66; MB68; SA68  
**Report No.** EFTA25060022-IE-02-R2  
**Issue Date** July 15, 2025

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **Article 49-20, MIC notification. No.88 of 2004, Annex 43**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.



Prepared by: Xu Ying



Approved by: Xu Kai

**Eurofins TA Technology (Shanghai) Co., Ltd.**

Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000

## TABLE OF CONTENT

|                                                                 |     |
|-----------------------------------------------------------------|-----|
| 1. Test Laboratory .....                                        | 4   |
| 1.1. Notes of the Test Report .....                             | 4   |
| 1.2. Testing Location .....                                     | 4   |
| 2. General Description of Equipment Under Test .....            | 5   |
| 2.1. Applicant and Manufacturer Information .....               | 5   |
| 2.2. General Information .....                                  | 5   |
| 3. Applied Standards .....                                      | 7   |
| 4. Test Configuration .....                                     | 8   |
| 5. Test Case Results .....                                      | 9   |
| 5.1. Frequency Error Measurement .....                          | 9   |
| 5.2. Occupied Bandwidth Measurement .....                       | 13  |
| 5.3. Spread Bandwidth and Spread Factor Measurement .....       | 23  |
| 5.4. Antenna Power (Conducted) Measurement .....                | 30  |
| 5.5. Transmission Radiation Angle Width (3dB Beamwidth) .....   | 34  |
| 5.6. Unwanted Emission Strength Measurement .....               | 36  |
| 5.7. Secondarily Emitted Radio Wave Strength Measurement .....  | 79  |
| 5.8. Retention Time .....                                       | 98  |
| 5.9. Radio Interference Prevention Capability Measurement ..... | 109 |
| 5.10. Construction Protection Confirmation Method .....         | 111 |
| 6. Uncertainty Measurement .....                                | 113 |
| 7. Main Test Instruments .....                                  | 114 |
| ANNEX A: The EUT Appearance .....                               | 115 |
| ANNEX B: Test Setup Photos .....                                | 116 |

## Summary of Measurement Results

| Number                                                                                                                                                                                                                                                                                   | Summary of Measurements of Results                   | Verdict |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------|
| 1                                                                                                                                                                                                                                                                                        | Frequency Error Measurement                          | PASS    |
| 2                                                                                                                                                                                                                                                                                        | Occupied Bandwidth Measurement                       | PASS    |
| 3                                                                                                                                                                                                                                                                                        | Spread Bandwidth and Spread Factor Measurement       | PASS    |
| 4                                                                                                                                                                                                                                                                                        | Antenna Power (Conducted) Measurement                | PASS    |
| 5                                                                                                                                                                                                                                                                                        | Transmission Radiation Angle Width (3dB Beamwidth)   | N/A     |
| 6                                                                                                                                                                                                                                                                                        | Unwanted Emission Strength Measurement               | PASS    |
| 7                                                                                                                                                                                                                                                                                        | Secondarily Emitted Radio Wave Strength Measurement  | PASS    |
| 8                                                                                                                                                                                                                                                                                        | Retention Time                                       | PASS    |
| 9                                                                                                                                                                                                                                                                                        | Radio Interference Prevention Capability Measurement | PASS    |
| 10                                                                                                                                                                                                                                                                                       | Construction Protection Confirmation Method          | PASS    |
| Date of Testing: June 10, 2025~ June 24, 2025                                                                                                                                                                                                                                            |                                                      |         |
| Date of Sample Received: June 3, 2025                                                                                                                                                                                                                                                    |                                                      |         |
| Note: N/A = Not applicable.                                                                                                                                                                                                                                                              |                                                      |         |
| All indications of Pass/Fail in this report are opinions expressed by Eurofins TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. |                                                      |         |

## 1. Test Laboratory

### 1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **Eurofins TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

### 1.2. Testing Location

Company: Eurofins TA Technology (Shanghai) Co., Ltd.  
Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China  
City: Shanghai  
Post code: 201201  
Country: P. R. China  
Contact: Xu Kai  
Telephone: +86-021-50791141/2/3  
Fax: +86-021-50791141/2/3-8000  
Website: <https://www.eurofins.com/electrical-and-electronics>  
E-mail: [Kain.Xu@cpt.eurofinscn.com](mailto:Kain.Xu@cpt.eurofinscn.com)

## 2. General Description of Equipment Under Test

### 2.1. Applicant and Manufacturer Information

|                      |                                                                                            |
|----------------------|--------------------------------------------------------------------------------------------|
| Applicant            | Suzhou MobyData Smart System Co., Ltd.                                                     |
| Applicant address    | 3f, building E, Yida Science Park, No.11 Jinpu Road, SIP, Suzhou, Jiangsu Province, China. |
| Manufacturer         | MOBIWIRE MOBILES(NINGBO)CO.,LTD                                                            |
| Manufacturer address | No.518, Changting East Road,Fenghua District,Ningbo City, Zhejiang Province                |

### 2.2. General Information

| EUT Description                                                                                                      |                                                                             |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Model                                                                                                                | M63S; M63; OA66; MB68; SA68                                                 |
| SN                                                                                                                   | 25C21L0010                                                                  |
| Hardware Version                                                                                                     | V01                                                                         |
| Software Version                                                                                                     | M14.01.06.20250703                                                          |
| Antenna Type                                                                                                         | PIFA Antenna                                                                |
| Antenna Gain                                                                                                         | 1.46 dBi                                                                    |
| Device Operating Configurations                                                                                      |                                                                             |
| Test Mode:                                                                                                           | Bluetooth, Bluetooth (Low Energy);                                          |
| Operating Frequency Range(s)                                                                                         | 2402MHz ~ 2480MHz                                                           |
| Test Modulation:                                                                                                     | Bluetooth: GFSK, $\pi/4$ -DQPSK, 8-DPSK<br>Bluetooth v5.1 LE: GFSK          |
| Test Frequency Range(s)                                                                                              | Bluetooth: 2400MHz to 2483.5MHz<br>Bluetooth (Low Energy):2402MHz ~ 2480MHz |
| Operating voltage range:                                                                                             | 3.6 V to 4.35 V                                                             |
| State DC voltage:                                                                                                    | 3.8V                                                                        |
| Number of subcarriers:                                                                                               | The number of the subcarriers per MHz is 1 or more.                         |
| Note: The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant. |                                                                             |

| Environment of Test Site                                                                                                                                                                                                                         |                     |                                                     |                     |                          |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------|---------------------|--------------------------|--------------|
| Temperature:                                                                                                                                                                                                                                     |                     | 25℃                                                 |                     |                          |              |
| Huidity:                                                                                                                                                                                                                                         |                     | 59%                                                 |                     |                          |              |
| Atmospheric Pressure:                                                                                                                                                                                                                            |                     | 100.77 kpa                                          |                     |                          |              |
| Test Voltage:                                                                                                                                                                                                                                    |                     | Normal Voltage: 3.8V<br>Extreme Voltage: 3.6V-4.35V |                     |                          |              |
| Note: For extreme voltage test, we have tested the relationship between the external power supply and RF IC power supply. Base on the test results. only the normal voltage was selected to perform all items. The details information as below: |                     |                                                     |                     |                          |              |
| External Power Supply(V)                                                                                                                                                                                                                         | IC power supply1(V) | IC power supply2(V)                                 | IC power supply3(V) | Deviation from normal(V) | Deviation(%) |
| NV: 3.8V                                                                                                                                                                                                                                         | 2.8V                | 3.3V                                                | 1.8V                | --                       | --           |
| LV: 3.6V                                                                                                                                                                                                                                         | 2.8V                | 3.3V                                                | 1.8V                | 0.00V                    | 0.00%        |
| HV: 4.35V                                                                                                                                                                                                                                        | 2.8V                | 3.3V                                                | 1.8V                | 0.00V                    | 0.00%        |

### 3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**Article 49-20**

**MIC notification. No.88 of 2004, Annex 43**

**Article 2, Paragraph 1, Item (19)**

#### 4. Test Configuration

For all the test items, an engineering test program installed in notebook was used to make the EUT continuously transmit/receive.

| Packet Type                  | Frequency (MHz) | Channel |
|------------------------------|-----------------|---------|
| Bluetooth<br>(DH5/2DH5/3DH5) | 2402            | 0       |
|                              | 2441            | 39      |
|                              | 2480            | 78      |
| Bluetooth LE                 | 2402            | 0       |
|                              | 2440            | 19      |
|                              | 2480            | 39      |

## 5. Test Case Results

### 5.1. Frequency Error Measurement

#### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

#### Methods of Measurement

(1) Two methods for the item:

a. CW Tone method

i. Set the spectrum analyzer RBW=10kHz, VBW=10kHz, Span=1MHz.

ii. Use peak search function to find the max peak value and record the measuring frequency as f.

b. 10dB down method

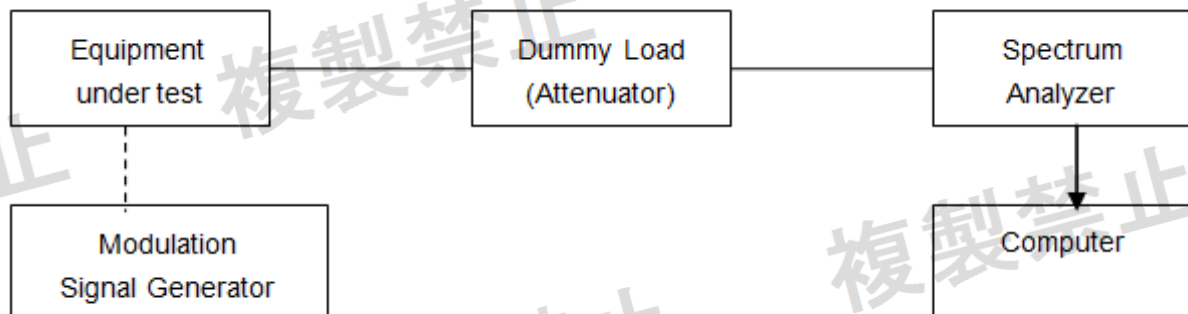
i. Set the spectrum analyzer RBW=100kHz, VBW=100kHz, Trace: Max Hold.

ii. Display line Level = Max. level - 10dB to place two markers, highest(fH) and lowest(fL) frequency

iii. Determine measuring frequency  $f = (fH + fL) / 2$

(2) Calculate frequency tolerance by the formula  $(f - f_c) / f_c \times 10^6$

#### Test Setup



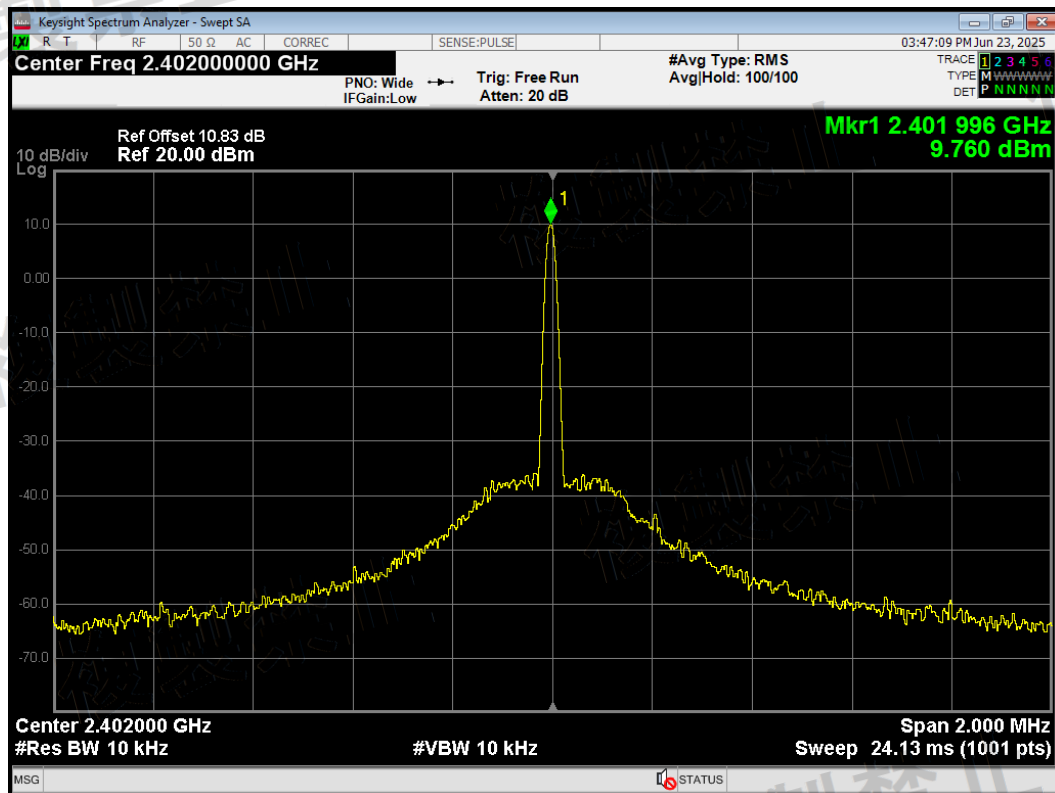
#### Limits

Frequency Tolerance +/-50 ppm.

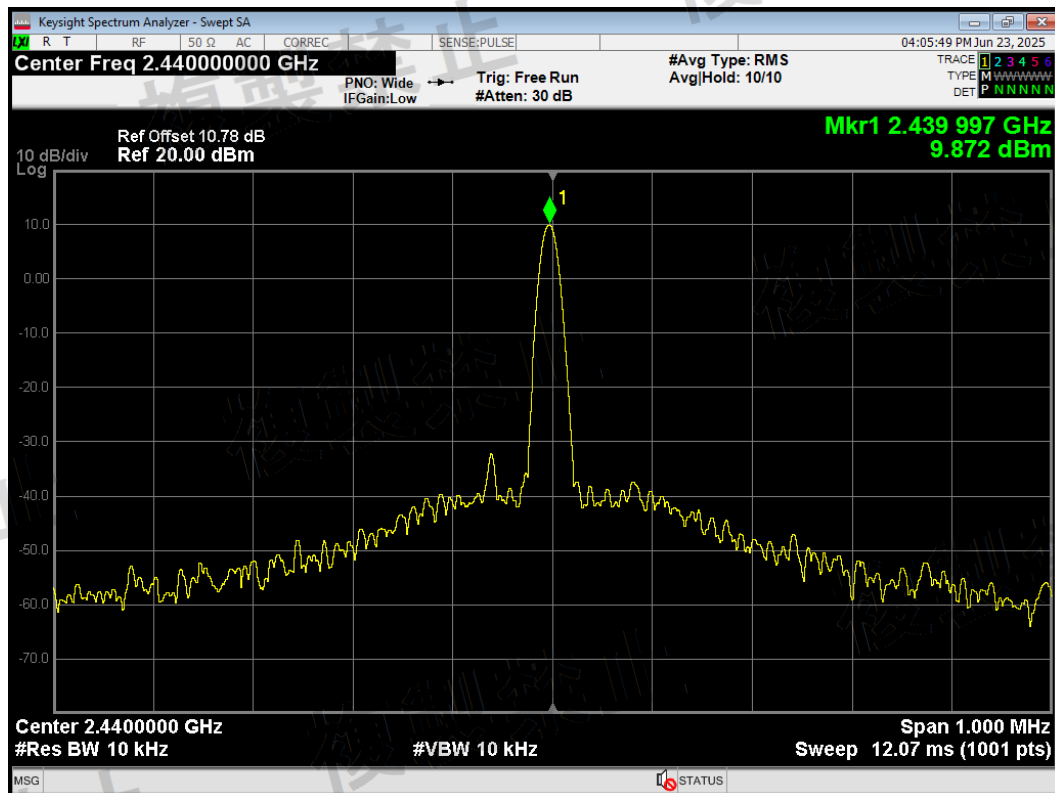
## Test Results

| Test Mode | Carrier frequency (MHz) | Frequency Error (MHz) | Frequency Error (ppm) | Limit (ppm) | Conclusion |
|-----------|-------------------------|-----------------------|-----------------------|-------------|------------|
| CW        | 2402                    | 2401.996              | -1.67                 | +/-50       | PASS       |
|           | 2440                    | 2439.997              | -1.23                 | +/-50       | PASS       |
|           | 2441                    | 2440.996              | -1.64                 | +/-50       | PASS       |
|           | 2480                    | 2479.996              | -1.61                 | +/-50       | PASS       |

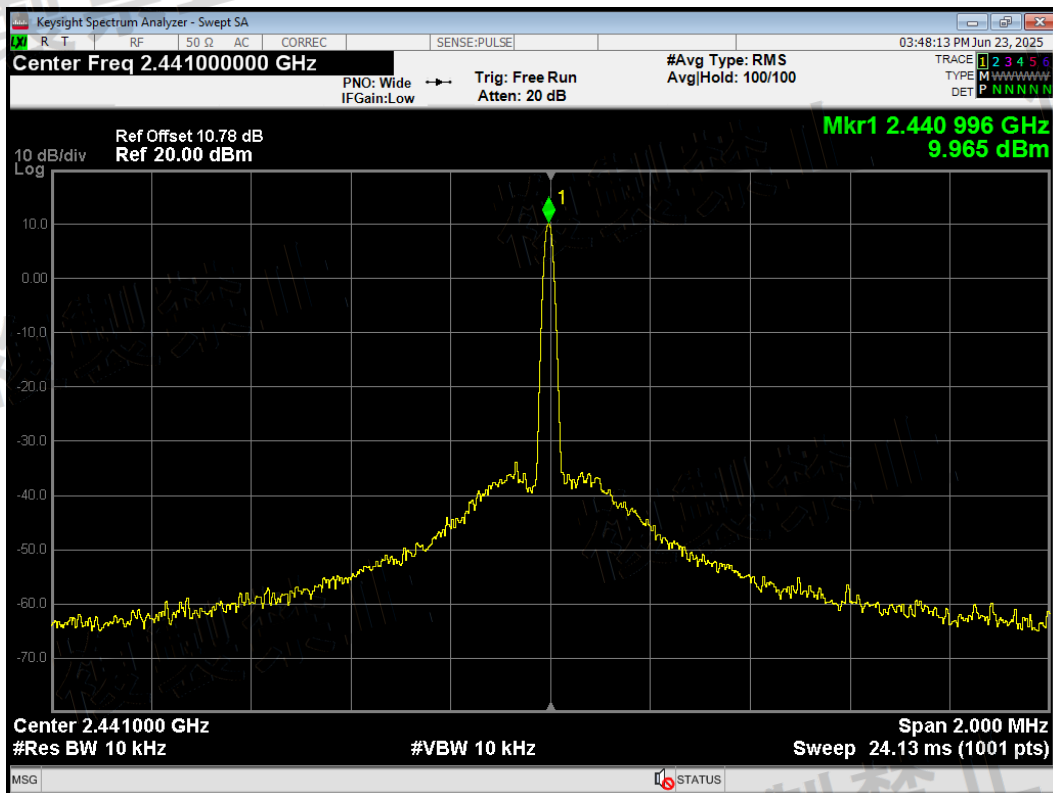
Freq. Error 2402MHz



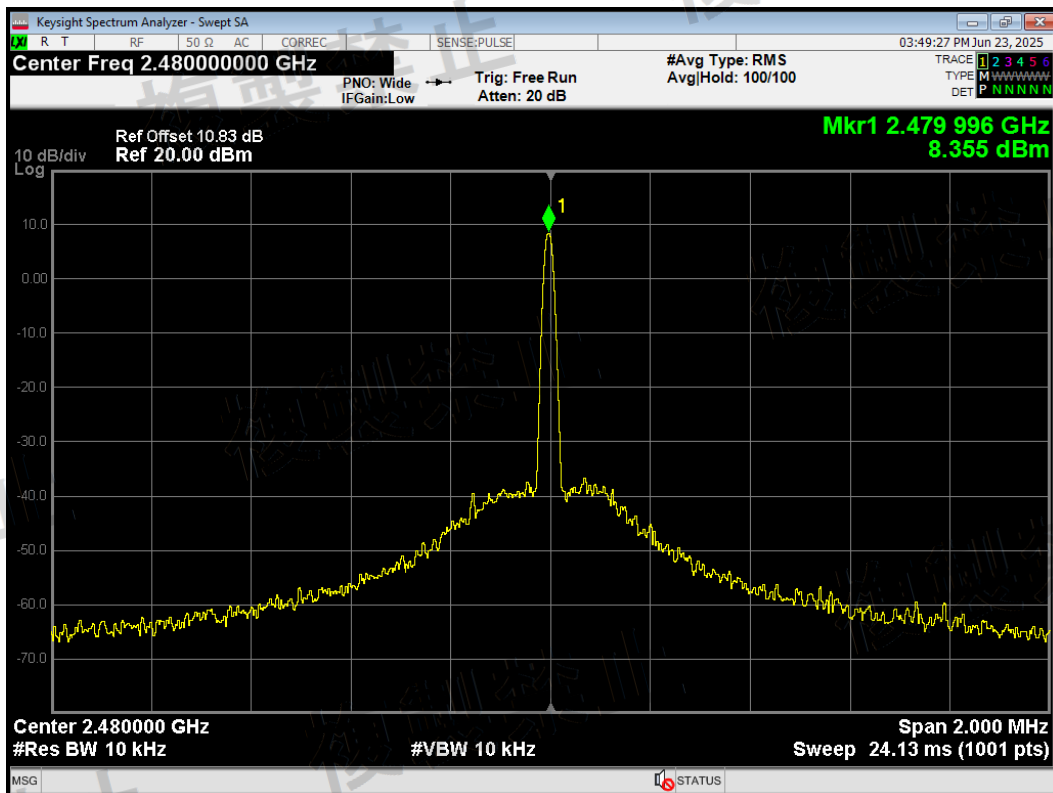
Freq. Error 2440MHz



Freq. Error 2441MHz



Freq. Error 2480MHz



## 5.2. Occupied Bandwidth Measurement

### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Method of Measurement

Spectrum Analyzer Setting

SPAN:  $2BW \leq \text{SPAN} \leq 3.5BW$

RBW: Less than 3% of BW

VBW: Equal RBW

Sweep Time: AUTO (Minimum time to ensure measurement accuracy.)

Data Points: 401 points or more

Indication mode: Max hold

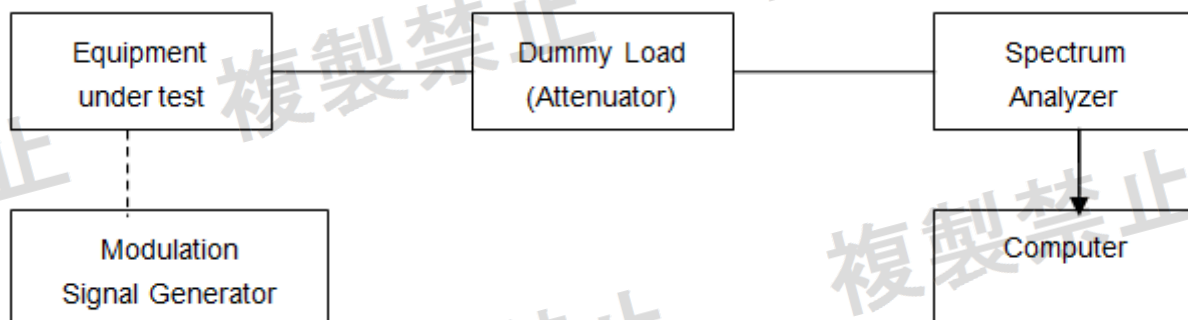
Detection Mode: Positive Peak

Storage Mode: Normal

Y-axis Scale: 10 dB/Div.

Reference Level: Enough level for maximum dynamic range

### Test Setup



### Limits

Others: Occupied Bandwidth  $\leq 26$  MHz.

FHSS: Occupied Bandwidth  $\leq 83.5$  MHz.

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 936$  Hz.

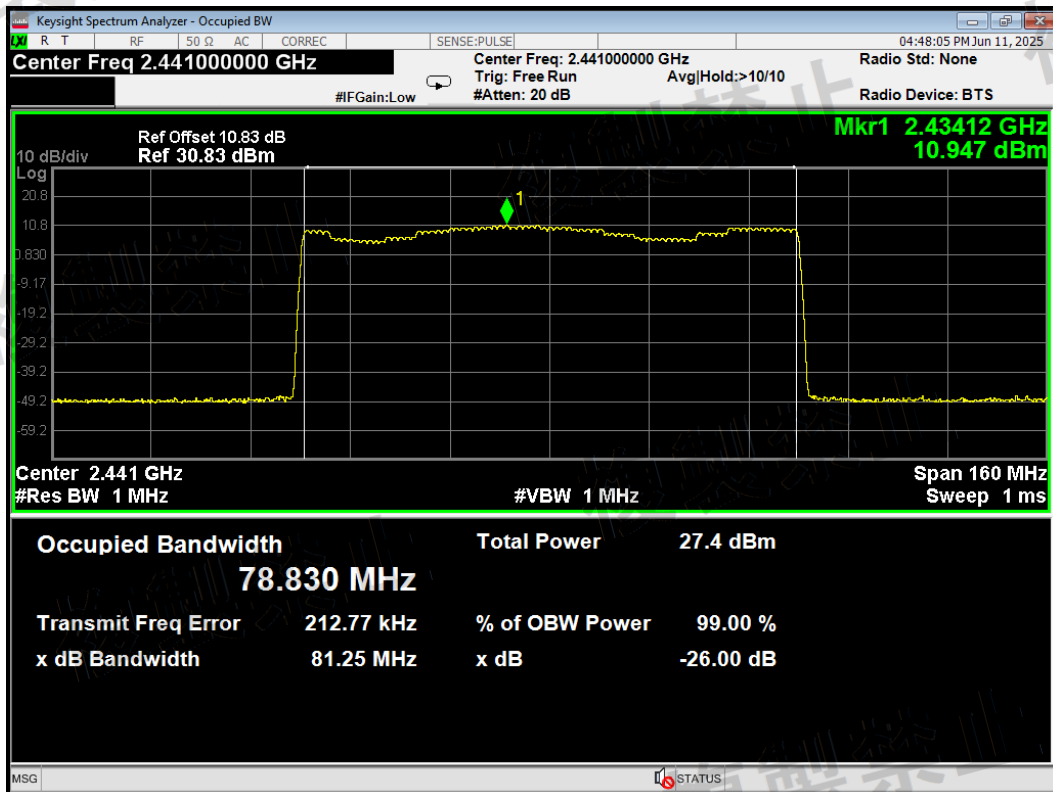
## Test Results

| Network Standards |      | Carrier frequency (MHz) | 99% bandwidth (MHz) | Limit (MHz) | Result |
|-------------------|------|-------------------------|---------------------|-------------|--------|
| Bluetooth         | DH5  | 2402                    | 78.830              | $\leq 83.5$ | Pass   |
|                   |      | 2441                    | 78.828              | $\leq 83.5$ | Pass   |
|                   |      | 2480                    | 78.826              | $\leq 83.5$ | Pass   |
|                   | 2DH5 | 2402                    | 78.919              | $\leq 83.5$ | Pass   |
|                   |      | 2441                    | 78.871              | $\leq 83.5$ | Pass   |
|                   |      | 2480                    | 78.904              | $\leq 83.5$ | Pass   |
|                   | 3DH5 | 2402                    | 78.909              | $\leq 83.5$ | Pass   |
|                   |      | 2441                    | 78.954              | $\leq 83.5$ | Pass   |
|                   |      | 2480                    | 78.913              | $\leq 83.5$ | Pass   |

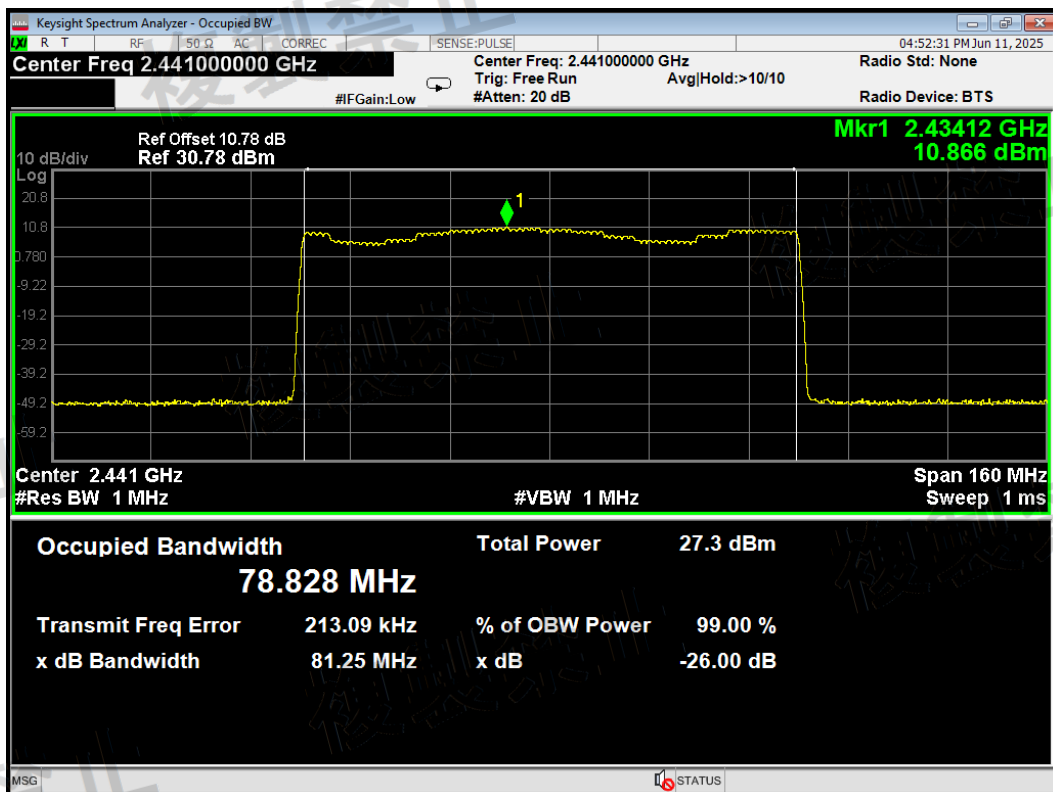
| Network Standards |  | Carrier frequency (MHz) | 99% bandwidth (MHz) | Limit (MHz) | Result |
|-------------------|--|-------------------------|---------------------|-------------|--------|
| Bluetooth LE (1M) |  | 2402                    | 1.040               | $\leq 26$   | Pass   |
|                   |  | 2440                    | 1.048               | $\leq 26$   | Pass   |
|                   |  | 2480                    | 1.044               | $\leq 26$   | Pass   |
| Bluetooth LE (2M) |  | 2402                    | 2.083               | $\leq 26$   | Pass   |
|                   |  | 2440                    | 2.085               | $\leq 26$   | Pass   |
|                   |  | 2480                    | 2.076               | $\leq 26$   | Pass   |

## Bluetooth

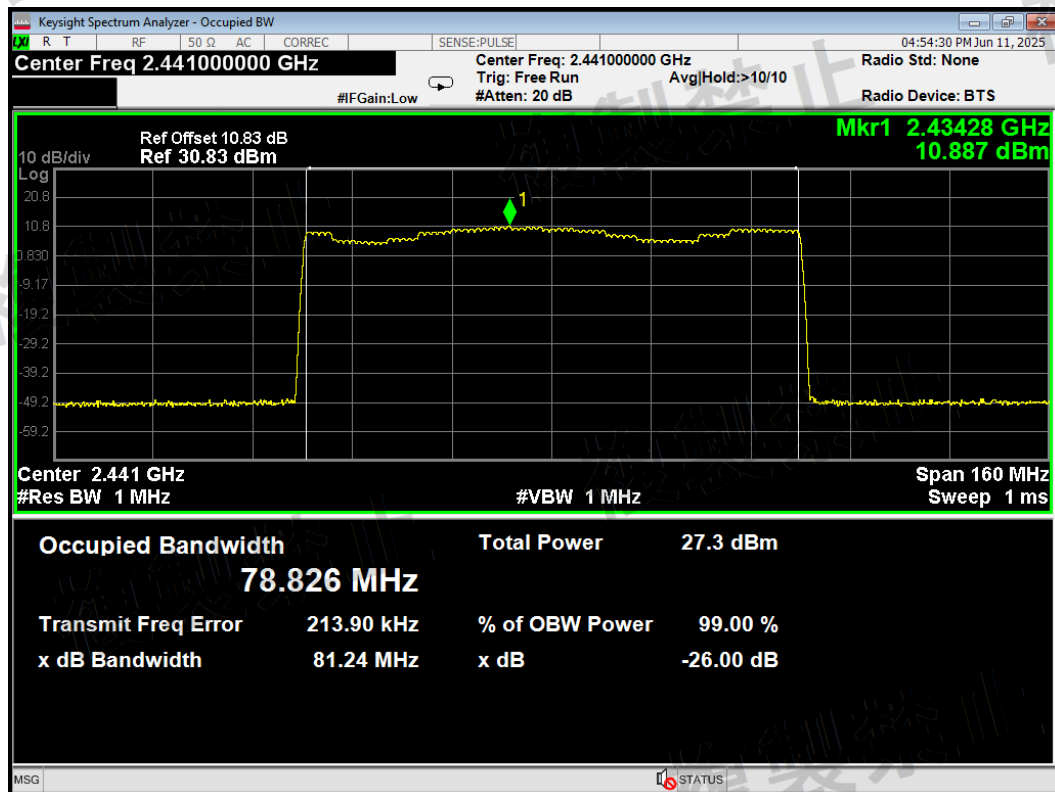
## OBW (Hopping) 1-DH5 2402MHz



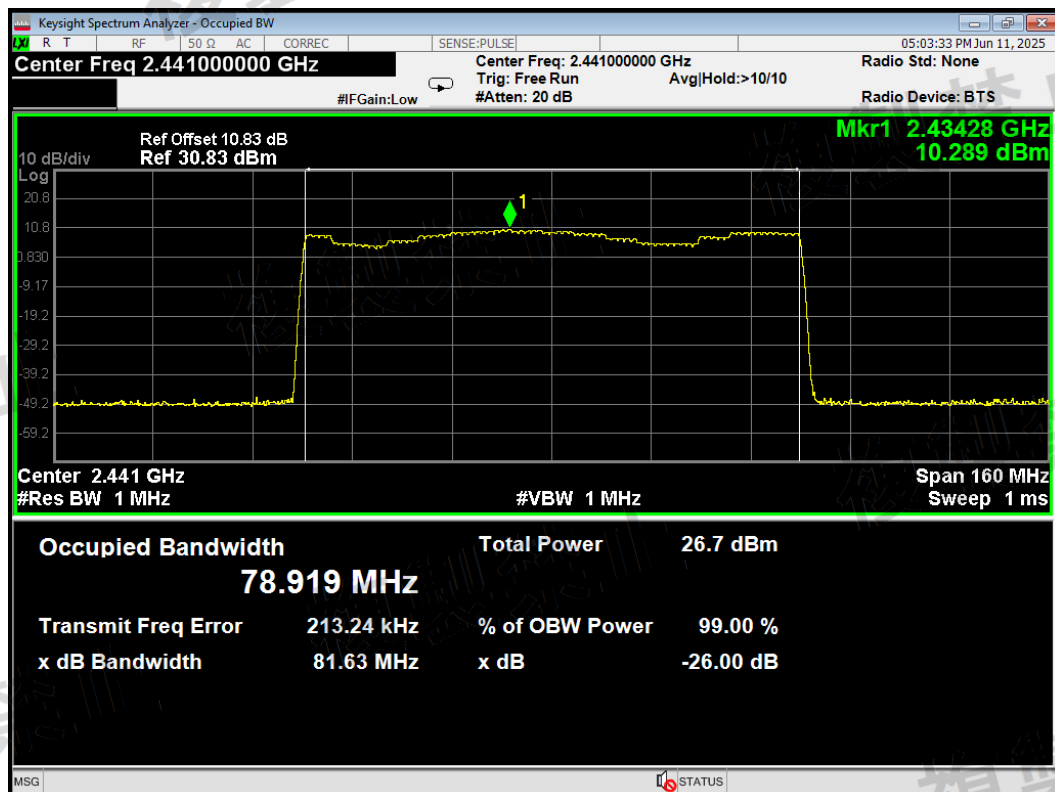
## OBW (Hopping) 1-DH5 2441MHz



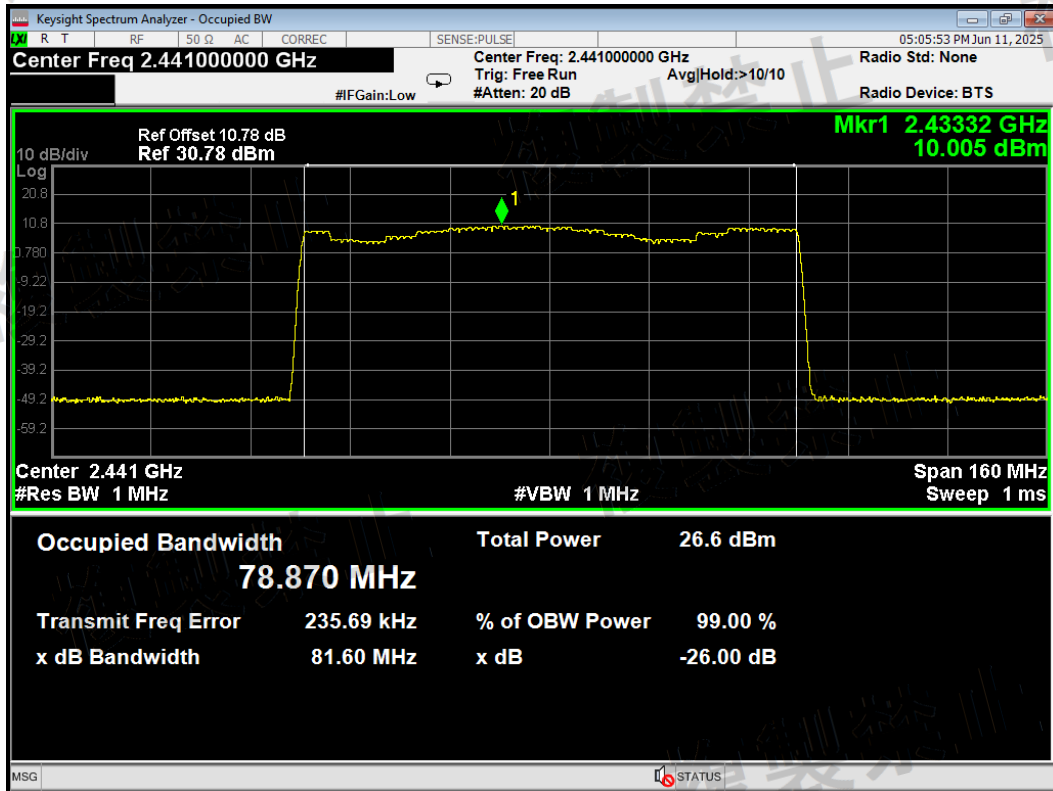
## OBW (Hopping) 1-DH5 2480MHz



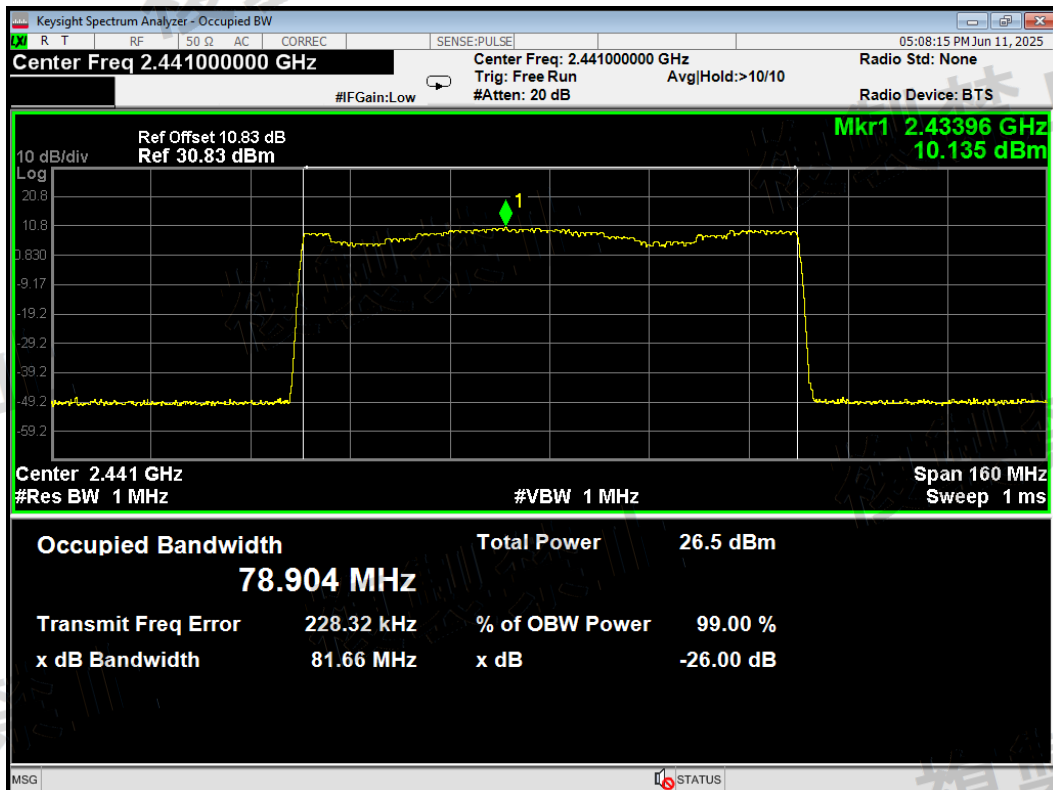
## OBW (Hopping) 2-DH5 2402MHz



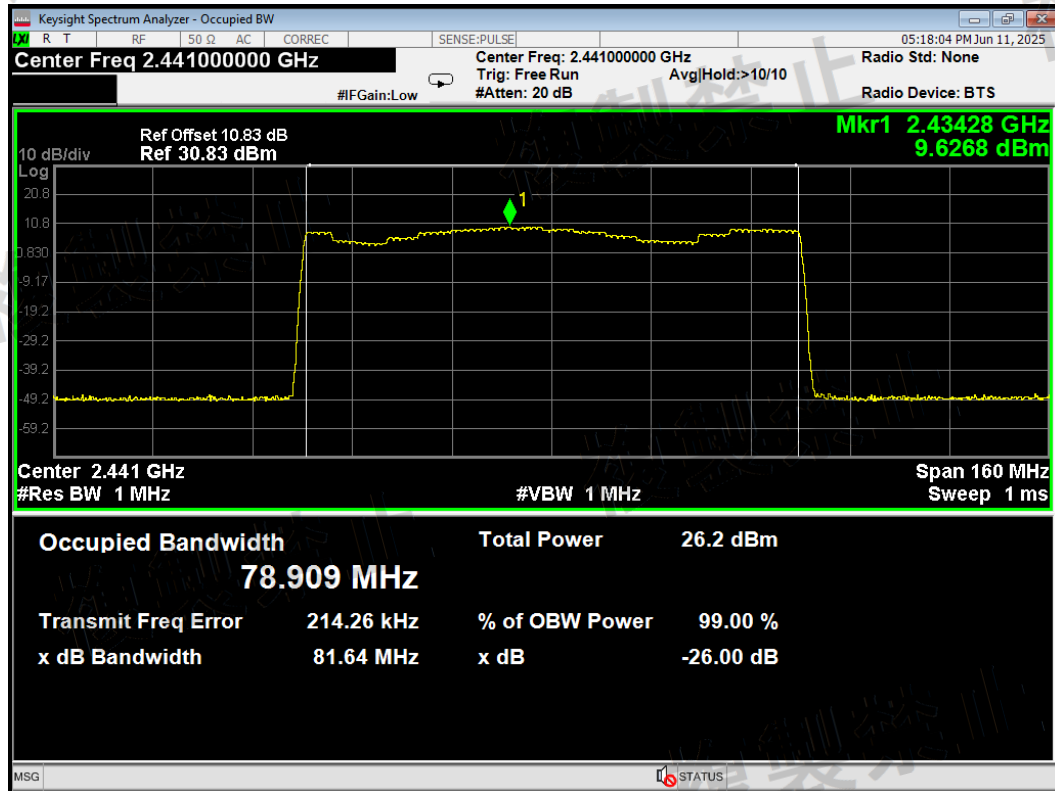
## OBW (Hopping) 2-DH5 2441MHz



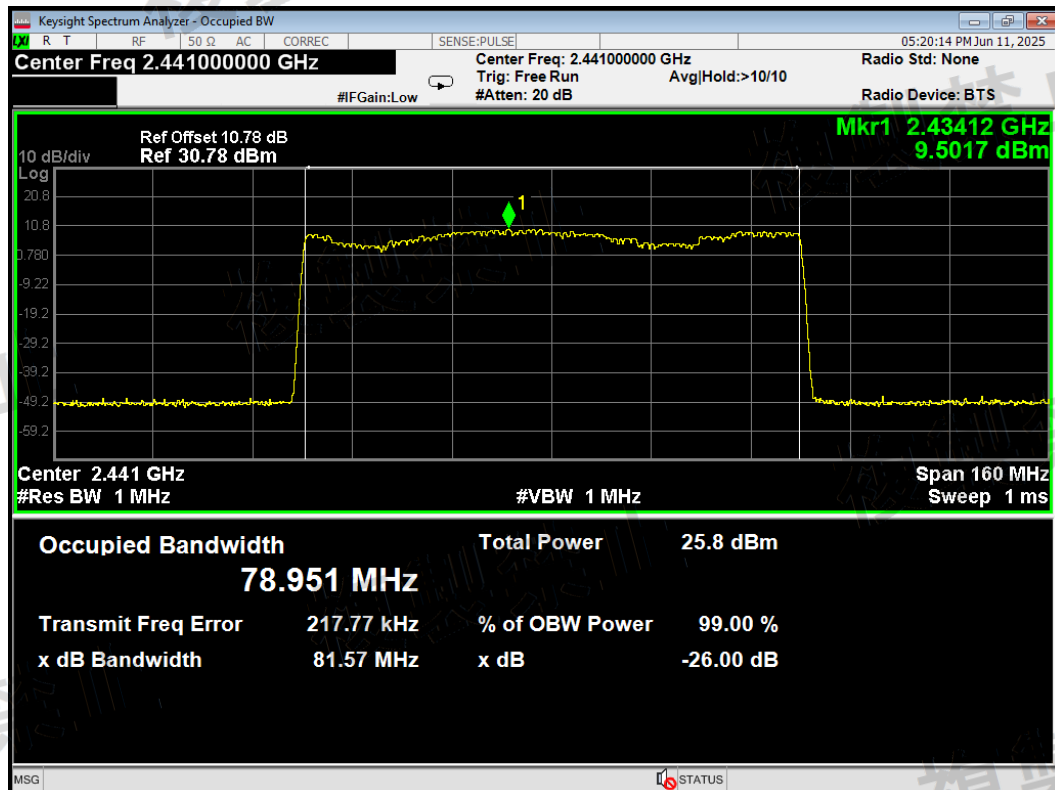
## OBW (Hopping) 2-DH5 2480MHz



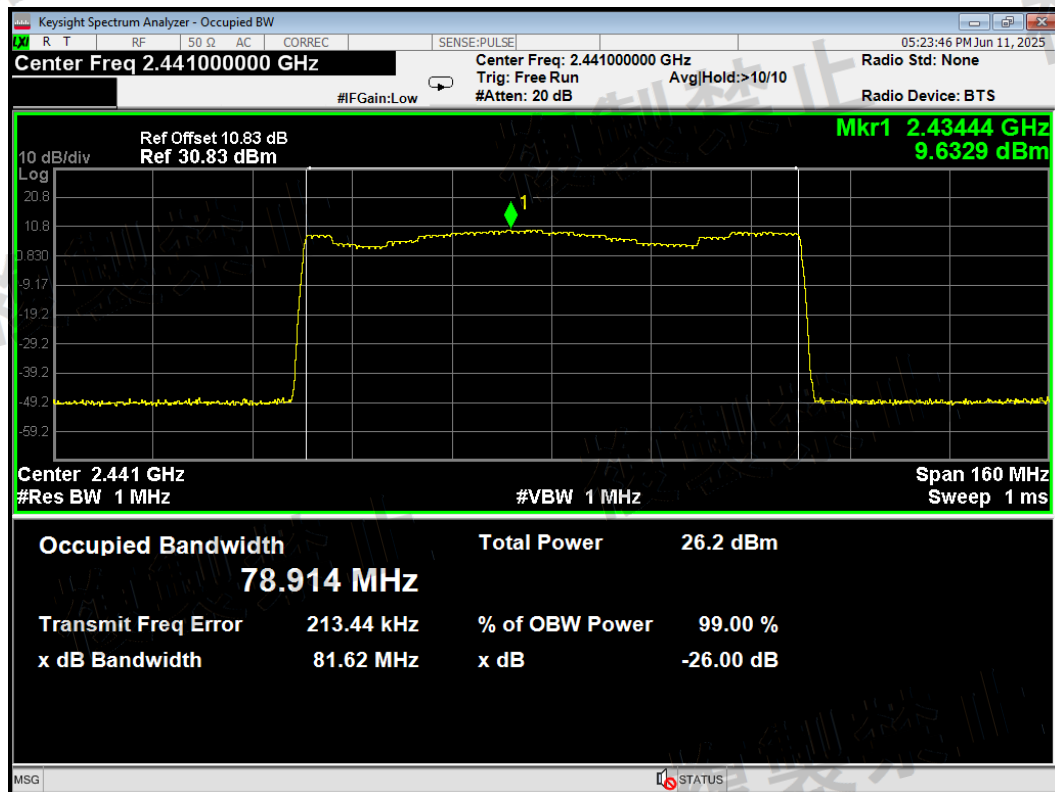
OBW (Hopping) 3-DH5 2402MHz



OBW (Hopping) 3-DH5 2441MHz

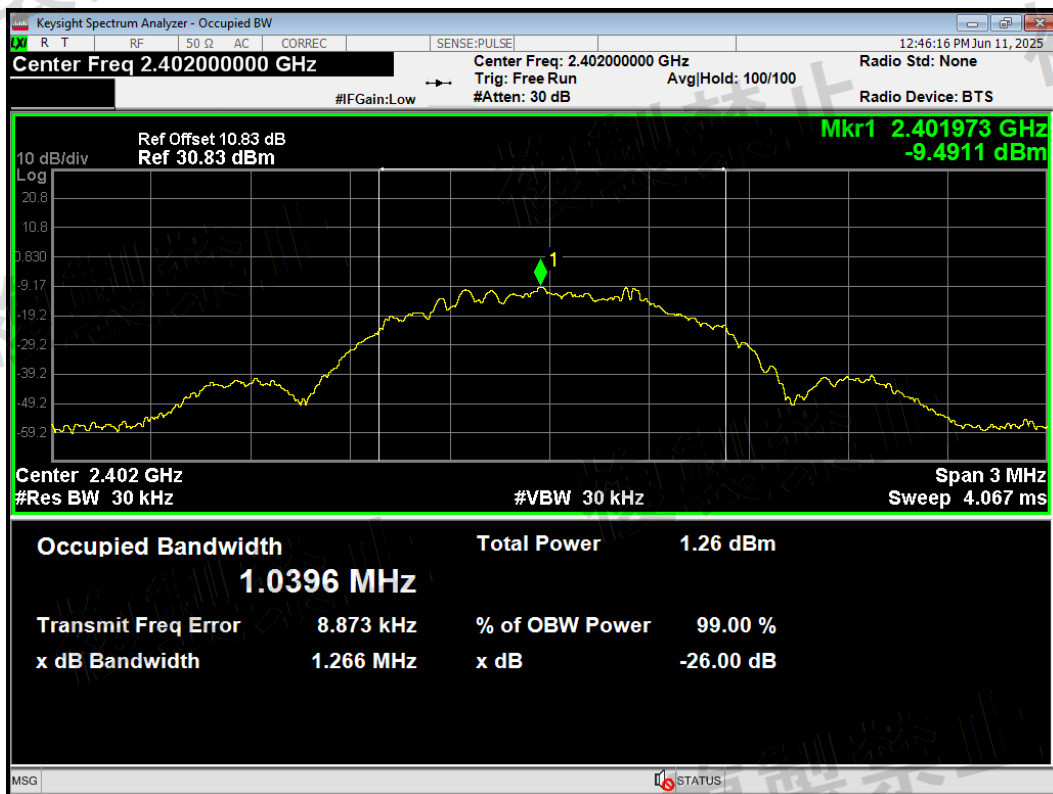


## OBW (Hopping) 3-DH5 2480MHz

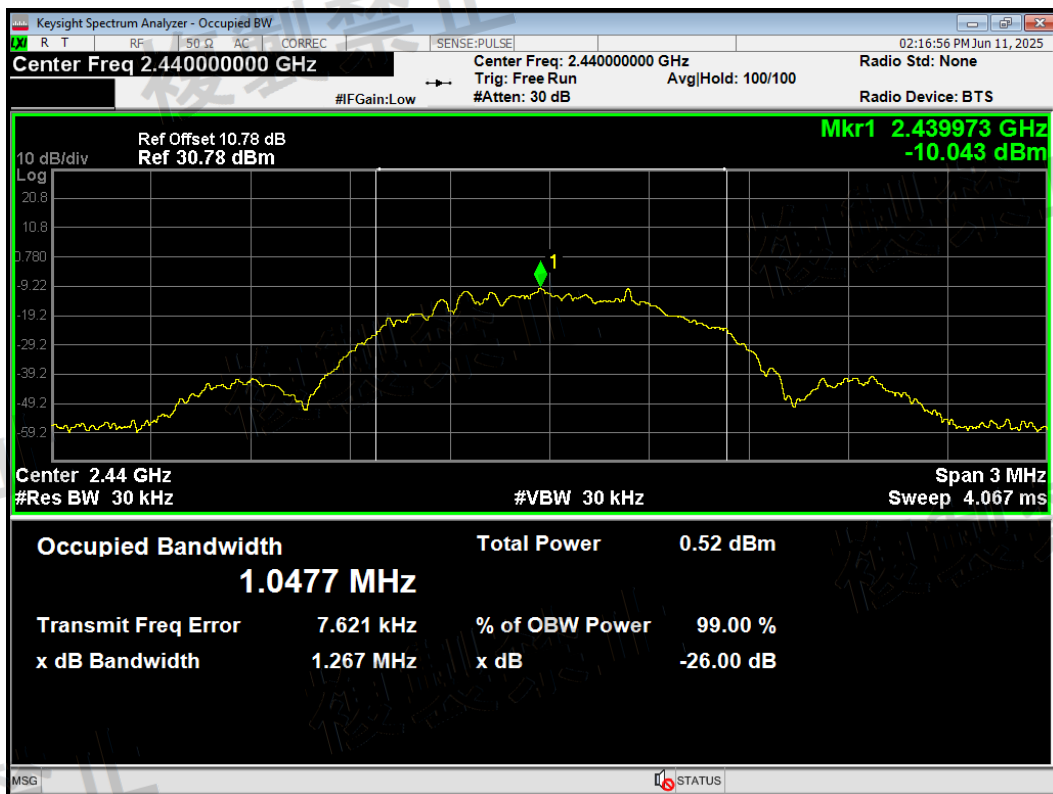


## Bluetooth LE

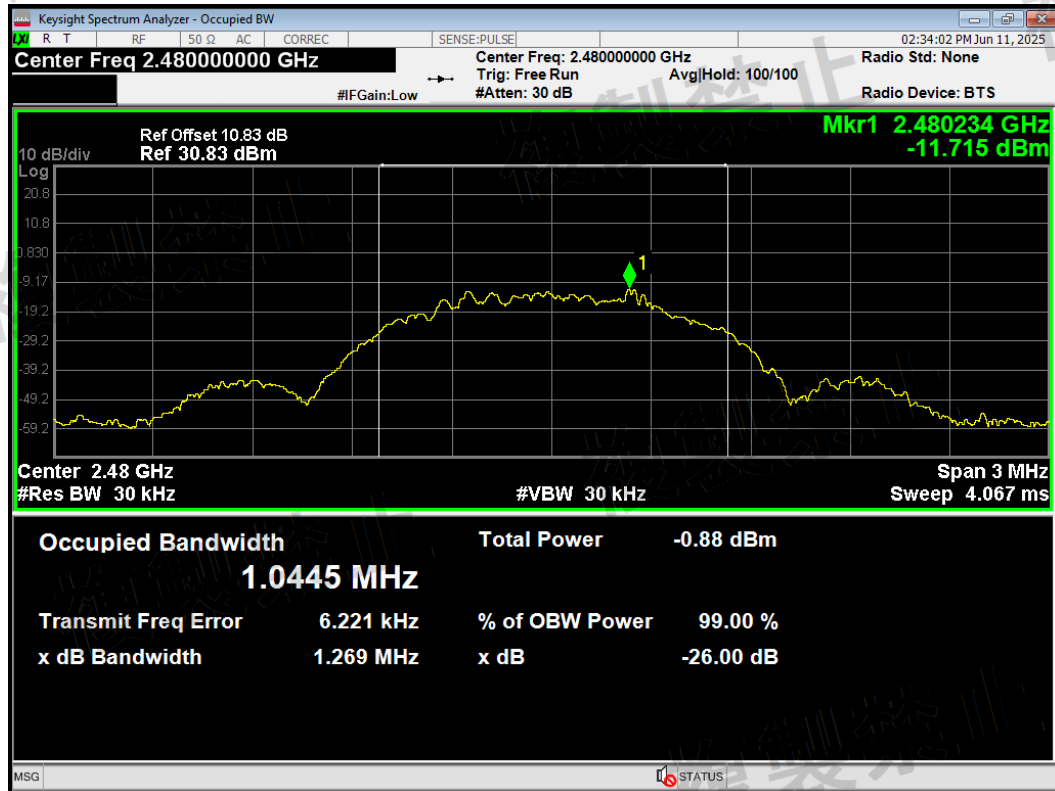
OBW BLE (1M) 2402MHz



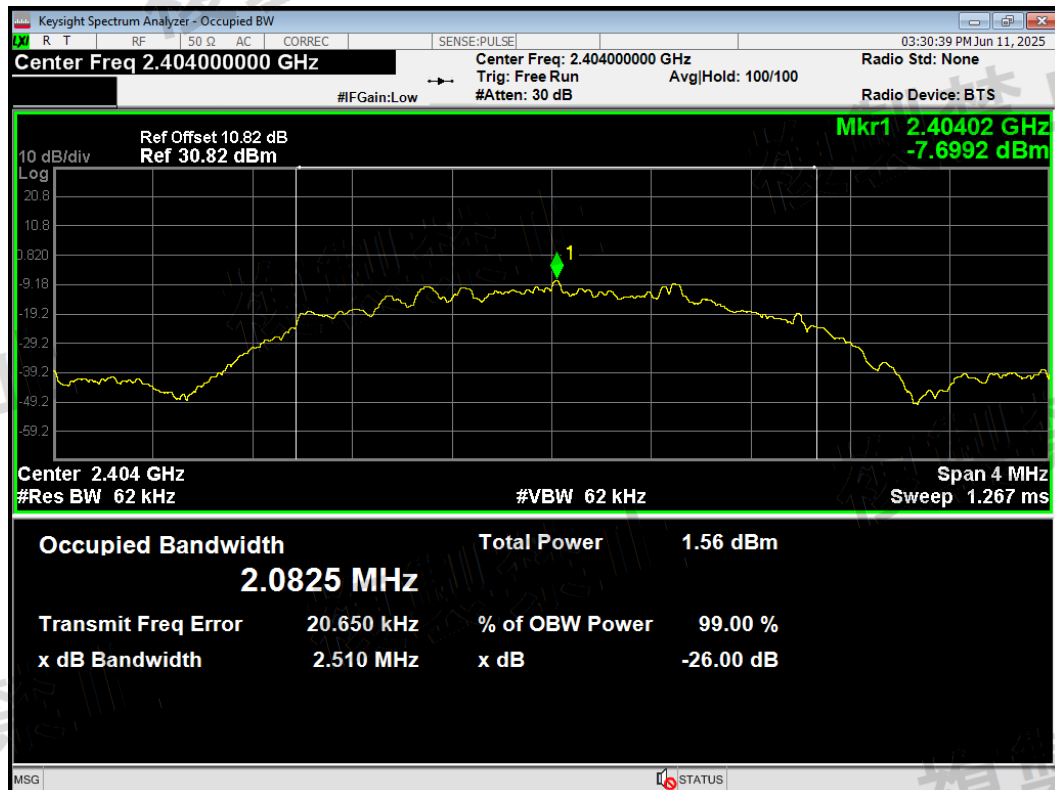
OBW BLE (1M) 2440MHz



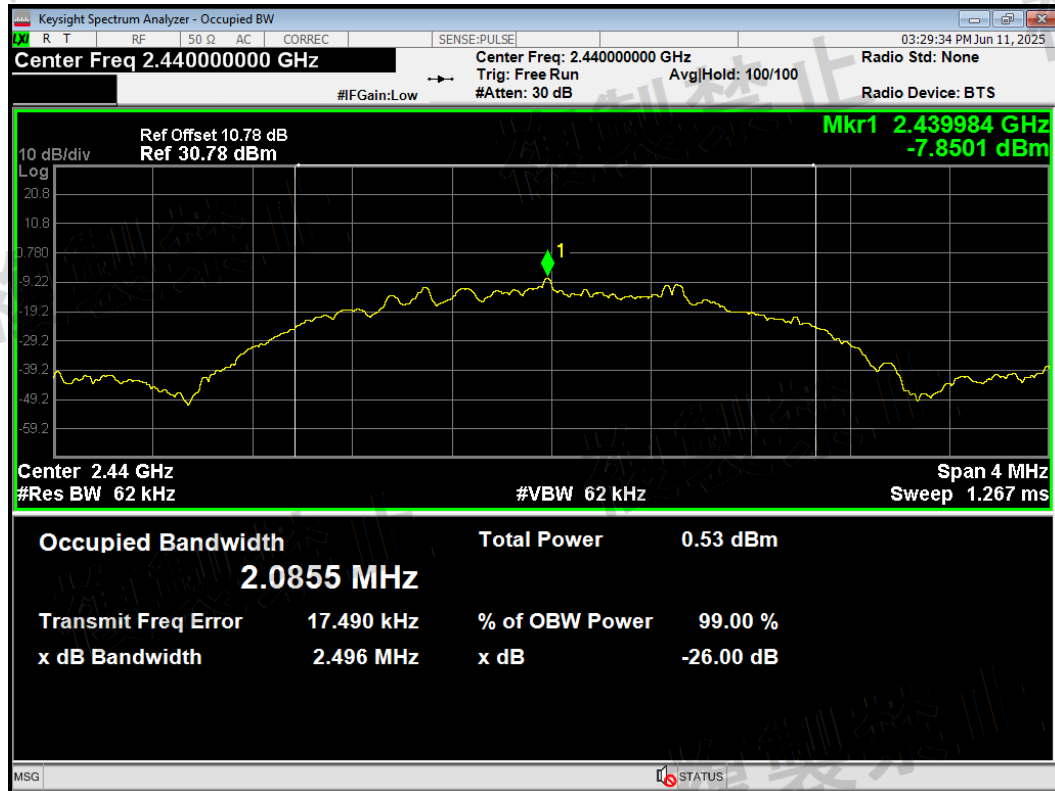
## OBW BLE (1M) 2480MHz



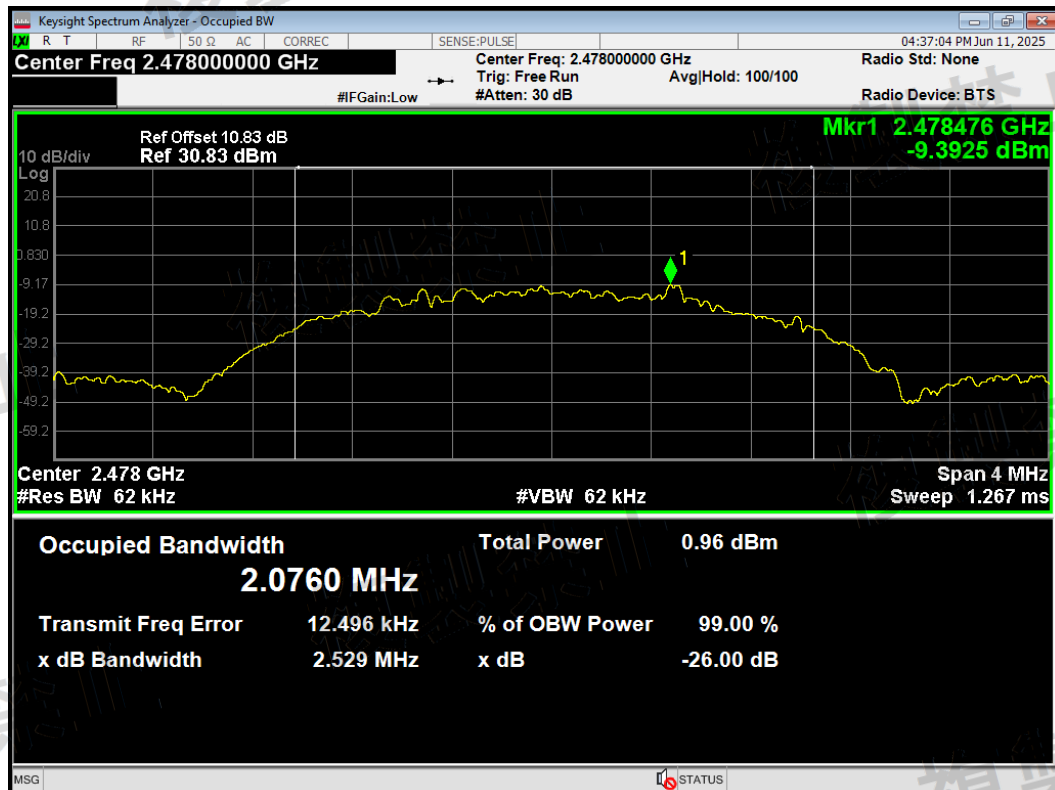
## OBW BLE (2M) 2404MHz



## OBW BLE (2M) 2440MHz



## OBW BLE (2M) 2478MHz



### 5.3. Spread Bandwidth and Spread Factor Measurement

#### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

#### Method of Measurement

Spectrum Analyzer Setting

SPAN:  $2BW \leq \text{SPAN} \leq 3.5BW$

RBW: Less than 3% of BW

VBW: Equal RBW

Sweep Time: AUTO (Minimum time to ensure measurement accuracy.)

Data Points: 401 points or more

Indication mode: Max hold

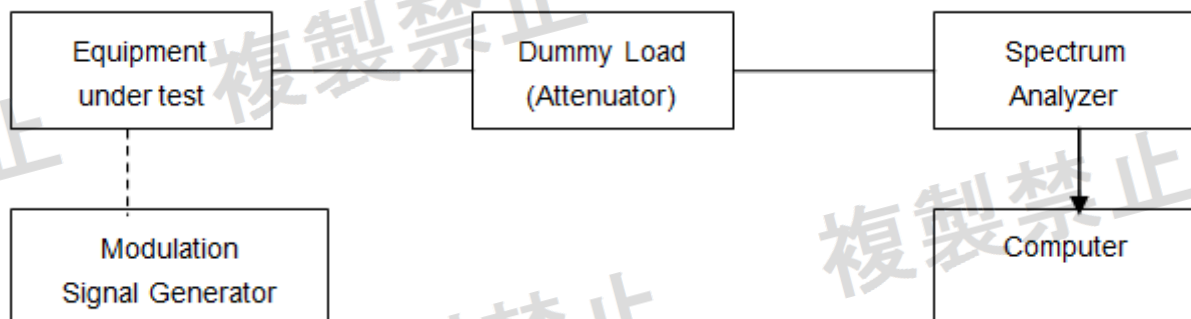
Detection Mode: Positive Peak

Storage Mode: Normal

Y-axis Scale: 10 dB/Div.

Reference Level: Enough level for maximum dynamic range

#### Test Setup



#### Limits

FHSS and DSSS: Spread Bandwidth  $\geq 0.5$  MHz.

FHSS and DSSS: Spread Factor  $\geq 5$

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 936$  Hz.

## Test Results

### Bluetooth

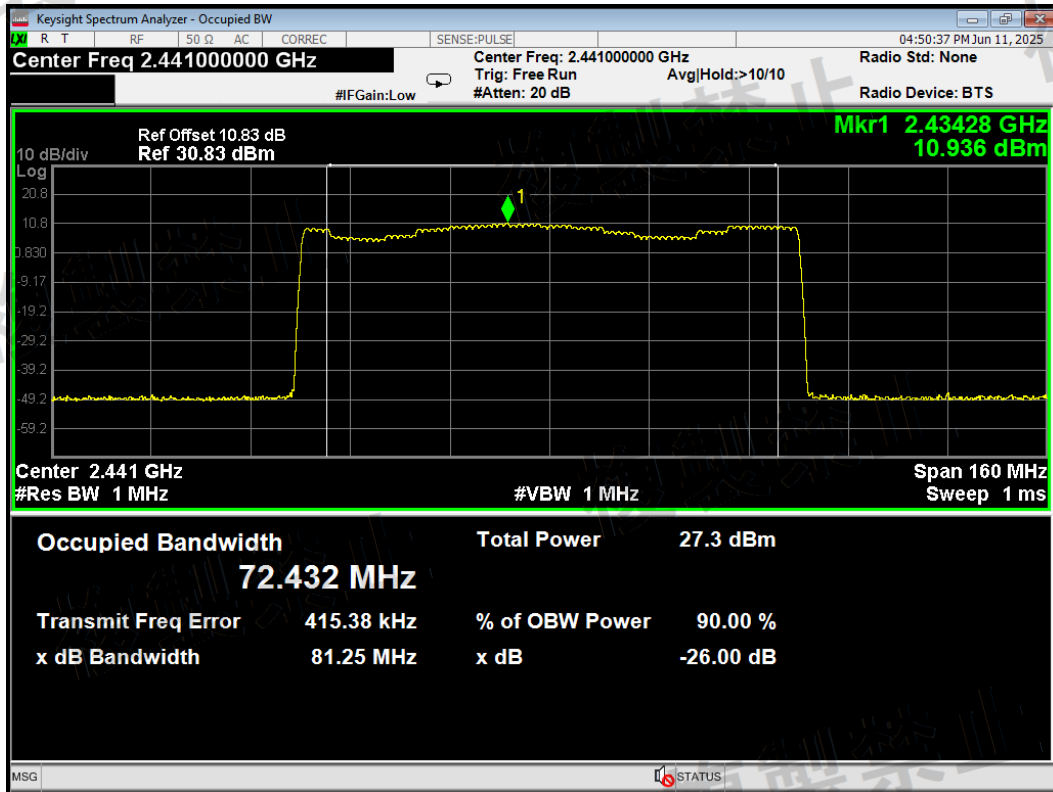
| Test Mode | Network Standards | Frequency (MHz) | 90% SBW (MHz) |
|-----------|-------------------|-----------------|---------------|
| Bluetooth | DH5               | 2402            | 72.432        |
|           |                   | 2441            | 72.409        |
|           |                   | 2480            | 72.420        |
|           | 2DH5              | 2402            | 72.438        |
|           |                   | 2441            | 72.411        |
|           |                   | 2480            | 72.278        |
|           | 3DH5              | 2402            | 72.649        |
|           |                   | 2441            | 72.617        |
|           |                   | 2480            | 72.612        |

### Bluetooth LE

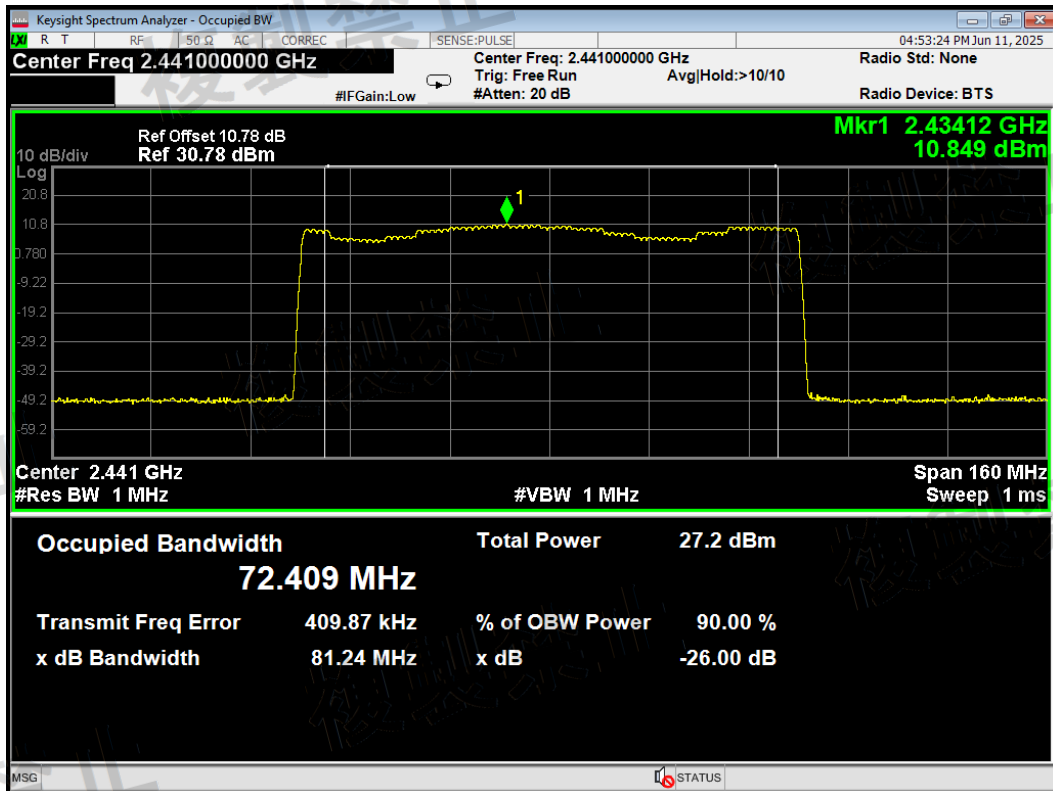
Only applicable for FHSS and DSSS.

# Bluetooth

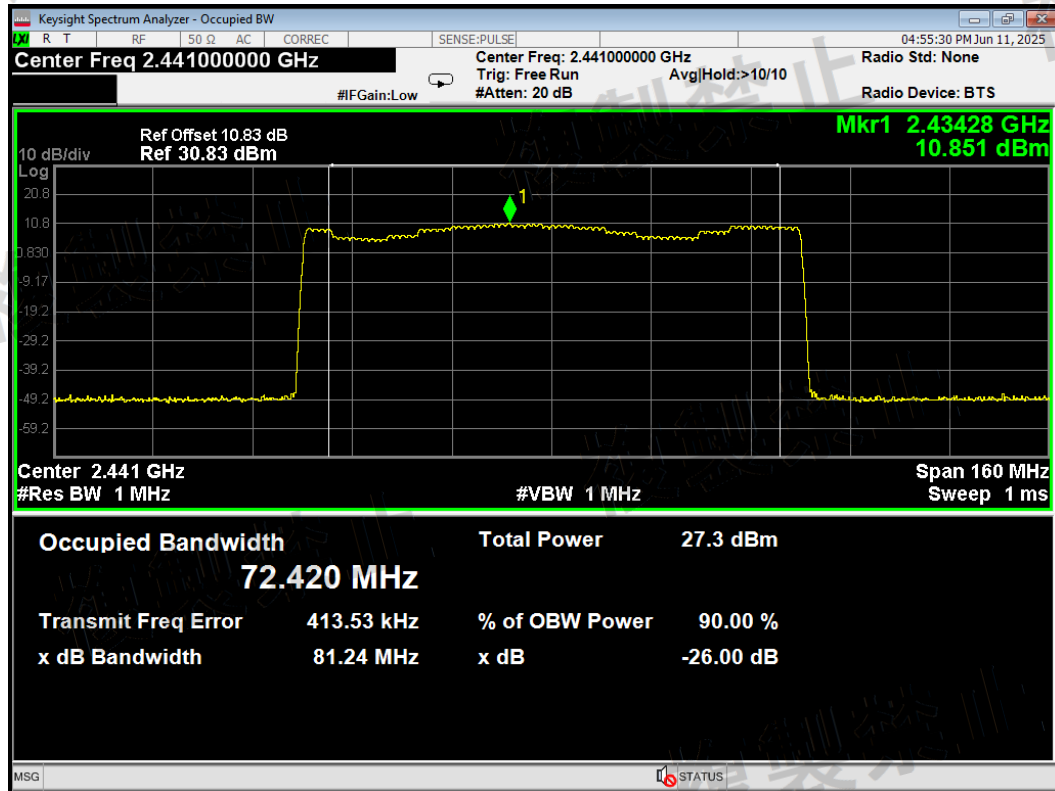
## Spreading Bandwidth 1-DH5 2402MHz



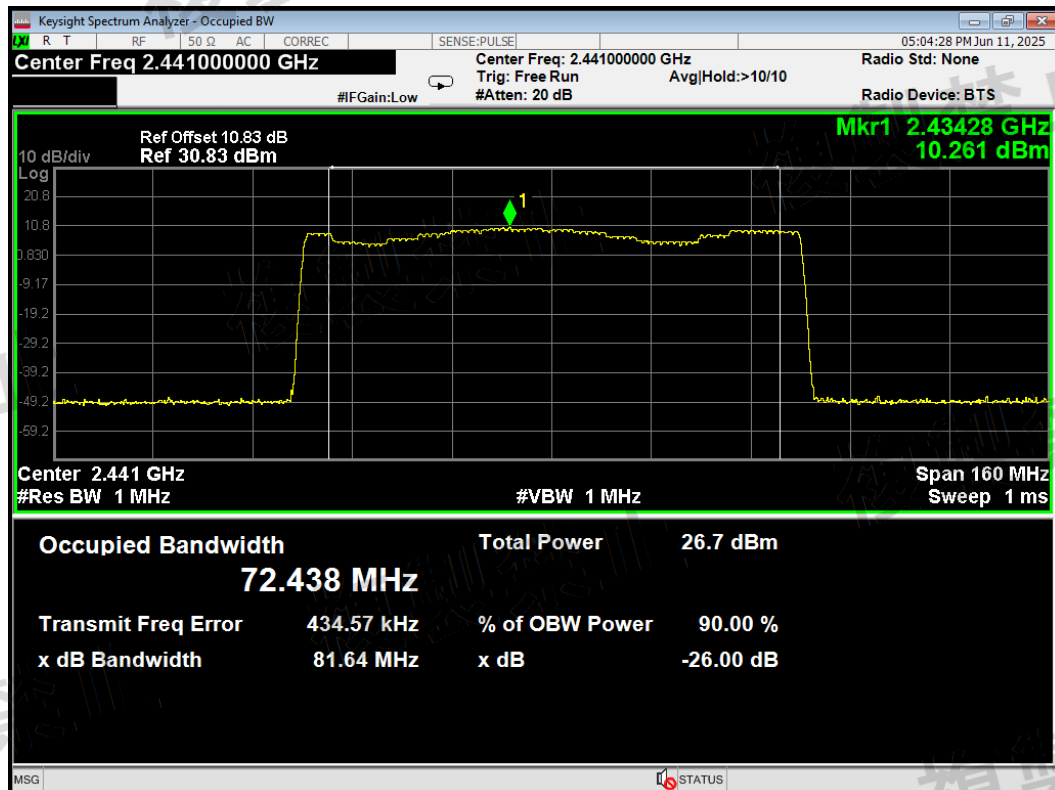
## Spreading Bandwidth 1-DH5 2441MHz



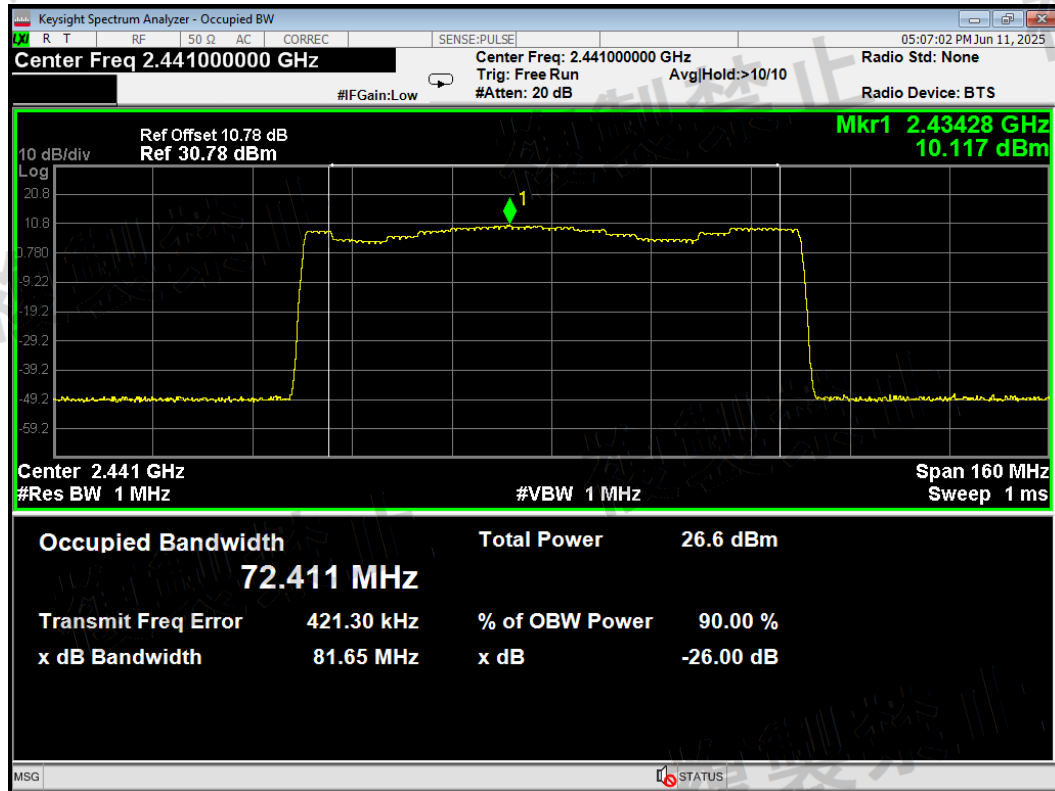
## Spreading Bandwidth 1-DH5 2480MHz



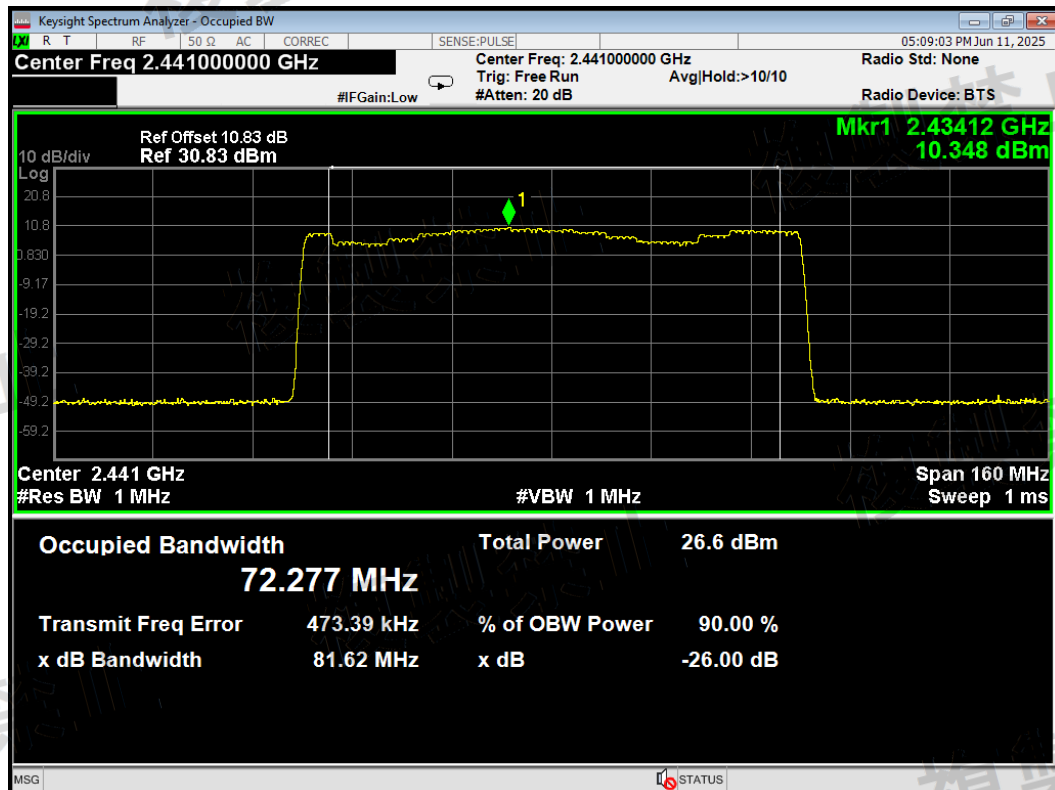
## Spreading Bandwidth 2-DH5 2402MHz



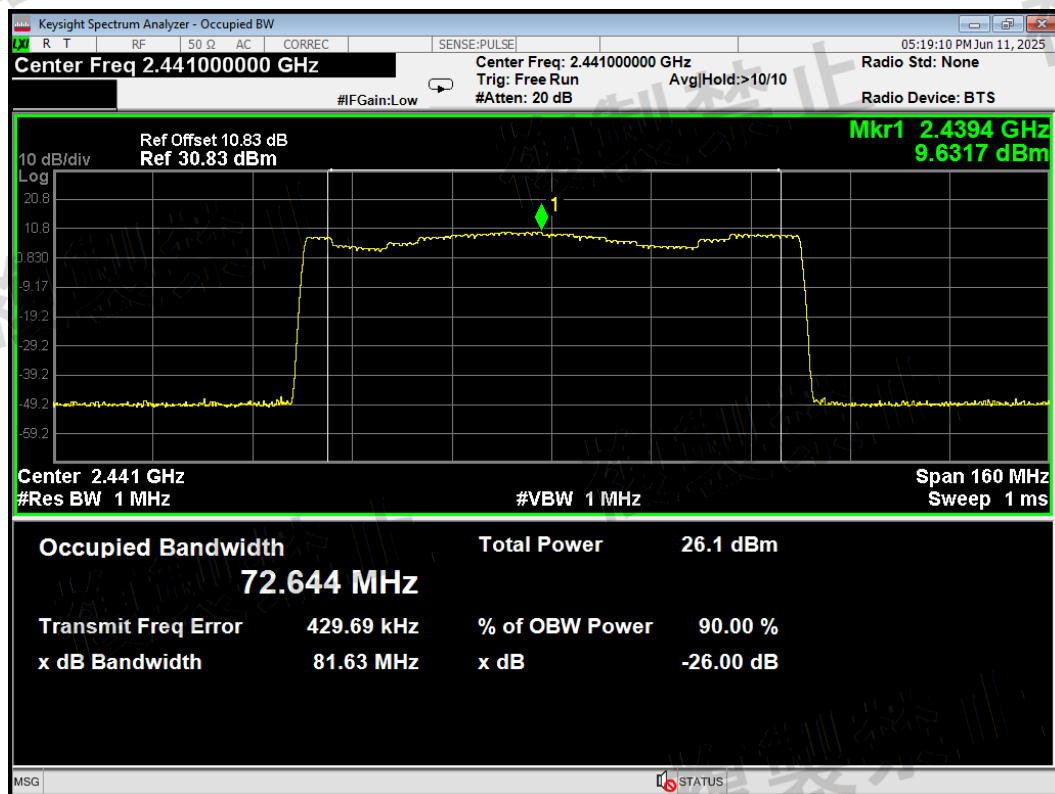
## Spreading Bandwidth 2-DH5 2441MHz



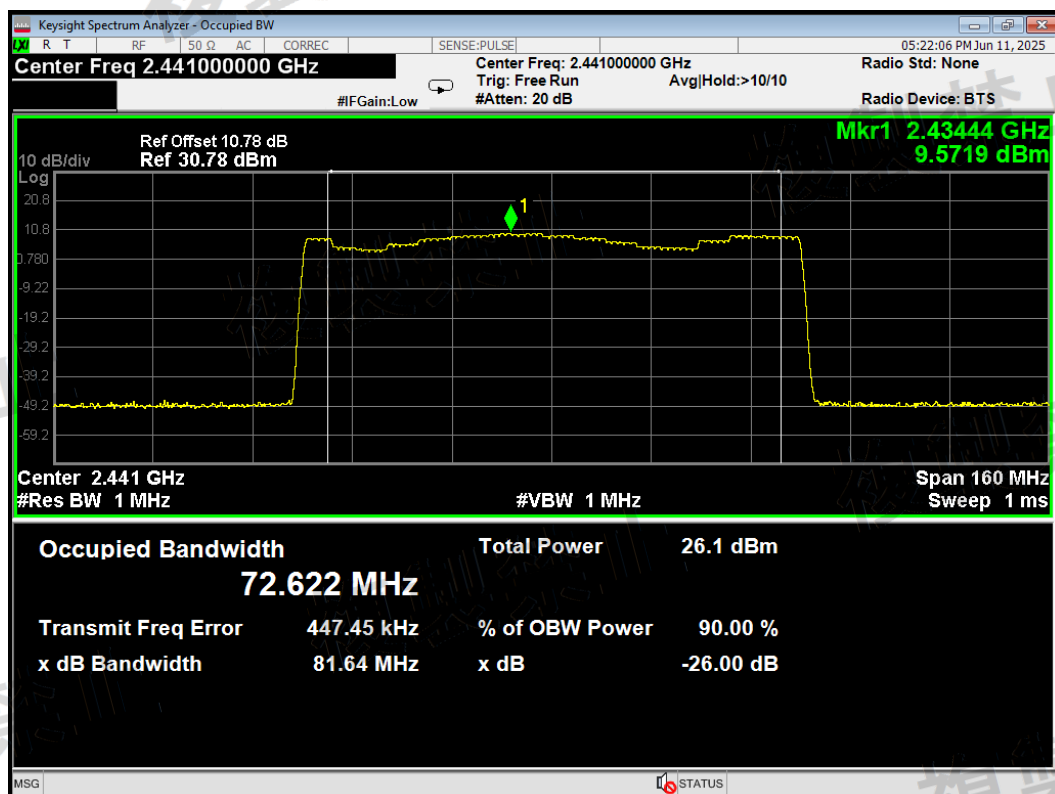
## Spreading Bandwidth 2-DH5 2480MHz



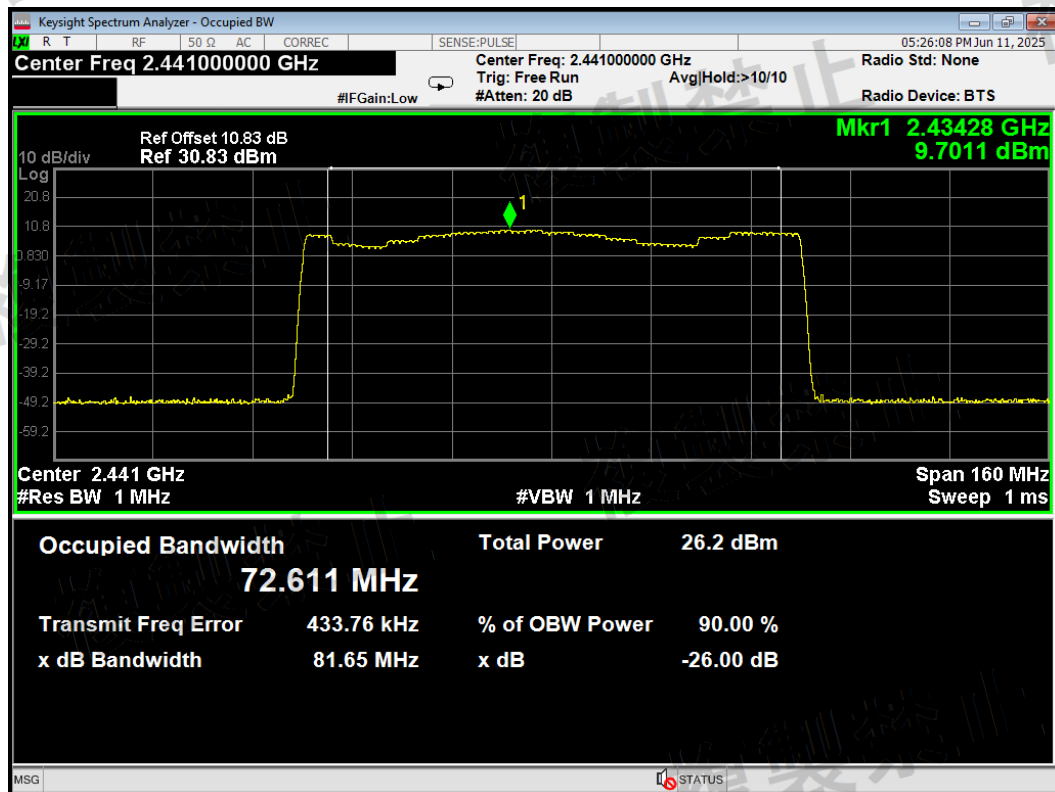
## Spreading Bandwidth 3-DH5 2402MHz



## Spreading Bandwidth 3-DH5 2441MHz



## Spreading Bandwidth 3-DH5 2480MHz



#### 5.4. Antenna Power (Conducted) Measurement

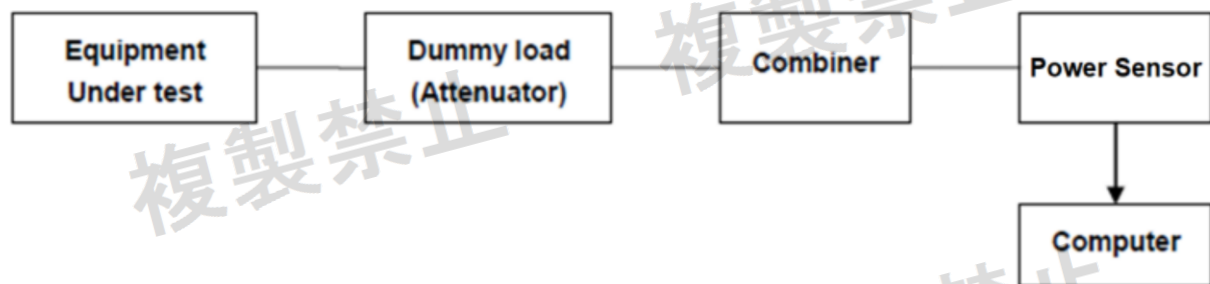
##### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~ 25°C | 45% ~ 50%         | 101.5kPa |

##### Methods of Measurement

Connect a power meter to the output of the dummy load (attenuator) and measure the total power.

##### Test Setup



##### Limits

FHSS: Antenna Power  $\leq 3$  mW/MHz;

EIRP Limit  $\leq 6.91$  dBm/MHz -  $16.91$  dBm/MHz (Limit is variable by the HPBA)

Others: Antenna Power  $\leq 10$  mW;

EIRP Limit  $\leq 12.14$  dBm -  $22.14$  dBm (Limit is variable by the HPBA)

##### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.44$  dB.

## Test Results:

### Bluetooth

| Test Mode |      | Power Index |
|-----------|------|-------------|
| Bluetooth | DH5  | default     |
|           | 2DH5 | default     |
|           | 3DH5 | default     |

### Bluetooth LE

| Test Mode                         | Carrier Frequency (MHz) | Power Index |
|-----------------------------------|-------------------------|-------------|
| Bluetooth<br>(Low Energy)<br>(1M) | 2402                    | default     |
|                                   | 2440                    | default     |
|                                   | 2480                    | default     |
| Bluetooth<br>(Low Energy)<br>(2M) | 2402                    | default     |
|                                   | 2440                    | default     |
|                                   | 2480                    | default     |

### Bluetooth

| Test Mode                                                      |      | Total Power (dBm) | Total Power (mW) | Spread Bandwidth 90% | Antenna Power (mW/MHz) | Limit (mW/MHz) | Antenna Power (dBm/MHz) | Declaration Antenna Power (mW/MHz) | Tolerance | Tolerance Limit | Result |
|----------------------------------------------------------------|------|-------------------|------------------|----------------------|------------------------|----------------|-------------------------|------------------------------------|-----------|-----------------|--------|
| Bluetooth                                                      | DH5  | -0.34             | 0.92             | 70.36                | 0.01                   | 3              | -18.81                  | 0.02                               | -34.30%   | [<20%]          | Pass   |
|                                                                | 2DH5 | -1.05             | 0.79             | 70.40                | 0.01                   | 3              | -19.52                  | 0.02                               | -44.18%   | [<20%]          | Pass   |
|                                                                | 3DH5 | -1.30             | 0.74             | 70.39                | 0.01                   | 3              | -19.78                  | 0.02                               | -47.34%   | [<20%]          | Pass   |
| Note: 1. Antenna Power= Total Power Density /Spread Band width |      |                   |                  |                      |                        |                |                         |                                    |           |                 |        |

| Test Mode                                                              |      | EIRP (dBm/MHz) | EIRP Limit (dBm/MHz) | Conclusion |
|------------------------------------------------------------------------|------|----------------|----------------------|------------|
| Bluetooth                                                              | DH5  | -17.35         | 6.91                 | PASS       |
|                                                                        | 2DH5 | -18.06         | 6.91                 | PASS       |
|                                                                        | 3DH5 | -18.32         | 6.91                 | PASS       |
| Note: 1. EIRP = Antenna Power + Antenna Gain (Antenna Gain = 1.46 dBi) |      |                |                      |            |

### Bluetooth LE

| Test Mode                         | Carrier Frequency (MHz) | Antenna Power (dBm) | Antenna Power (mW) | Limit (mW) | Declaration Antenna Power (mW) | Tolerance | Tolerance Limit | Result |
|-----------------------------------|-------------------------|---------------------|--------------------|------------|--------------------------------|-----------|-----------------|--------|
| Bluetooth<br>(Low Energy)<br>(1M) | 2402                    | -3.90               | 0.41               | 10         | 0.5                            | -18.58%   | [<20%]          | Pass   |
|                                   | 2440                    | -3.91               | 0.41               | 10         | 0.5                            | -18.79%   | [<20%]          | Pass   |
|                                   | 2480                    | -5.60               | 0.28               | 10         | 0.5                            | -44.94%   | [<20%]          | Pass   |
| Bluetooth<br>(Low Energy)<br>(2M) | 2402                    | -3.81               | 0.42               | 10         | 0.5                            | -16.89%   | [<20%]          | Pass   |
|                                   | 2440                    | -3.89               | 0.41               | 10         | 0.5                            | -18.28%   | [<20%]          | Pass   |
|                                   | 2480                    | -5.31               | 0.29               | 10         | 0.5                            | -41.10%   | [<20%]          | Pass   |

| Test Mode                         | Carrier Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Conclusion |
|-----------------------------------|-------------------------|------------|-------------|------------|
| Bluetooth<br>(Low Energy)<br>(1M) | 2402                    | -2.44      | 12.14       | PASS       |
|                                   | 2440                    | -2.45      | 12.14       | PASS       |
|                                   | 2480                    | -4.14      | 12.14       | PASS       |
| Bluetooth<br>(Low Energy)<br>(2M) | 2402                    | -2.35      | 12.14       | PASS       |
|                                   | 2440                    | -2.43      | 12.14       | PASS       |
|                                   | 2480                    | -3.85      | 12.14       | PASS       |

Note: 1. EIRP = Antenna Power + Antenna Gain (Antenna Gain = 1.46 dBi)

2. Gain ≤ 2.14 dBi, EIRP Limit = 12.14 dBm

Gain > 2.14 dBi, EIRP Limit = 12.14+ (Gain -2.14) dBm

## 5.5. Transmission Radiation Angle Width (3dB Beamwidth)

### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~ 25°C | 45% ~ 50%         | 101.5kPa |

### Methods of Measurement

Set EUT and measuring antenna at the same height and roughly facing each other.

Set spectrum analyzer RBW=1MHz, VBW=1MHz, SPAN=0Hz, Detector=Positive Peak and tune reference level to observer receiving signal position.

Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.

Move the measuring antenna height up and down with  $\pm 50\text{cm}$  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".

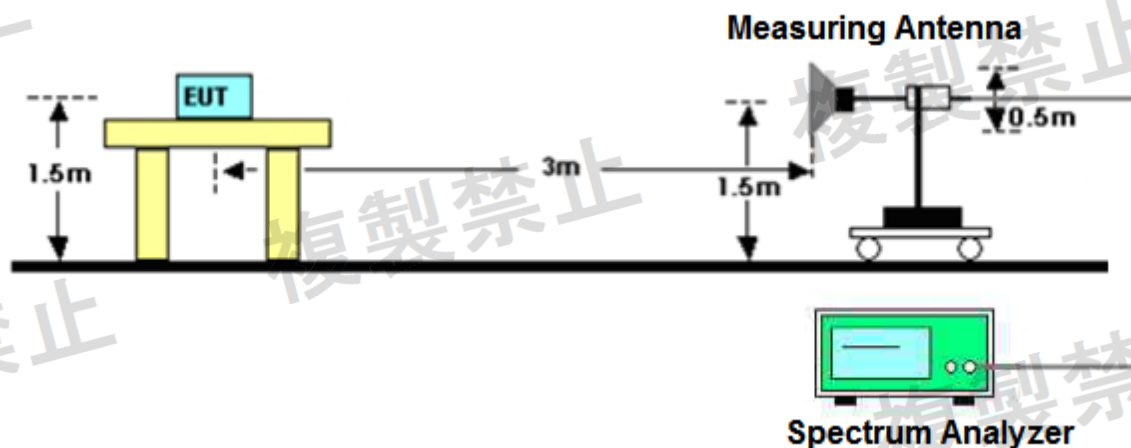
Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.

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

$A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$

### Test Setup



## Limit

| Item                                                                                     | Limits                                                                                                                                                                |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3dB Antenna beamwidth                                                                    | $360/A$ (if $A < 1$ ; then $A = 1$ )<br>$A = \{ \text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM} \}$ or<br>$A = \{ \text{EIRP Power [mW]} / 4.9 \text{ for FH} \}$ |
| Remark: This test item will not be applied to Antenna Gain of EUT is lower than 2.14dBi. |                                                                                                                                                                       |

## Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U = 3.55 \text{ dB}$ .

## Test Results

For Bluetooth mode, this test item will not be applied to EIRP of EUT is Lower than 6.91dBm/MHz.

For Bluetooth LE mode, this test item will not be applied to EIRP of EUT is Lower than 12.14 dBm.

## 5.6. Unwanted Emission Strength Measurement

### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 50%               | 101.5kPa |

### Method of Measurement

#### Step-1 (Search Mode)

Spectrum Analyzer Setting

SPAN: Measuring Frequency Range (Refer to the 4.7 of the page 18)

RBW: 1 MHz

VBW: Same as RBW

Sweep Time: AUTO (Minimum time to ensure measurement accuracy.

\*In case of burst wave, one burst shall be included per data point)

Data Points: 401 points or more

Sweep Mode: Single Sweep

Detection Mode: Positive Peak

Y-axis Scale: 10 dB/Div.

Reference Level: Enough level for maximum dynamic range

#### Step-2 (Measuring Mode \*Normal)

Spectrum Analyzer Setting

Center Frequency: Searched Frequency

SPAN: 1 MHz – 10 MHz (The SPAN that keeps accuracy of the frequency.)

RBW: 1 MHz

VBW: Same as RBW

Sweep Time: AUTO (Minimum time to ensure measurement accuracy.

\*In case of burst wave, one burst shall be included per data point)

Data Points: 401 points or more

Sweep Mode: Single Sweep

Detection Mode: Positive Peak

Y-axis Scale: 10 dB/Div.

Reference Level: Enough level for maximum dynamic range

#### Step-3 (Measuring Mode \*Zero Span)

Spectrum Analyzer Setting

Center Frequency: Searched Frequency

SPAN: 0 Hz (ZERO SPAN)

RBW: 1 MHz

VBW: Same as RBW

Sweep Time: AUTO (Minimum time to ensure measurement accuracy.

\*In case of burst wave, one burst shall be included per data point)

Data Points: 401 points or more

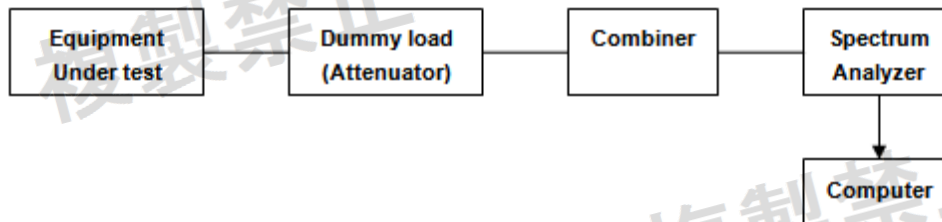
Sweep Mode: Single Sweep

Detection Mode: Sample

Y-axis Scale: 10 dB/Div.

Reference Level: Enough level for maximum dynamic range

## Test Setup



## Limit

| Frequency Range       | Limits (μW/MHz) |
|-----------------------|-----------------|
| 30MHz - 2387 MHz      | 2.5             |
| 2387MHz - 2400MHz     | 25              |
| 2483.5MHz - 2496.5MHz | 25              |
| 2496.5MHz - 12.5GHz   | 2.5             |

## Test Results

Note:

1. The value was tested under Measuring Mode \*Zero Span. (Pass<sup>Note1</sup>)
2. 30MHz-1000MHz Max Value=Mkr1+10\*log10(1000/100)

## Bluetooth

| Mode  | Frequency (MHz) | Range (MHz)   | Emission Frequency (MHz) | Max Value (dBm/MHz) | Max RMS Value (dBm/MHz) | Max Value (dBm/MHz) | Limit (dBm/MHz) | Verdict |
|-------|-----------------|---------------|--------------------------|---------------------|-------------------------|---------------------|-----------------|---------|
| 1-DH5 | 2402            | 30-1000       | 921.43                   | -49.49              | NA                      | -26                 | -26             | Pass    |
| 1-DH5 | 2402            | 1000-2387     | 2208.08                  | -47.70              | NA                      | -26                 | -26             | Pass    |
| 1-DH5 | 2402            | 2387-2400     | 2400.00                  | -37.70              | NA                      | -16                 | -16             | Pass    |
| 1-DH5 | 2402            | 2483.5-2496.5 | 2488.73                  | -48.56              | NA                      | -16                 | -16             | Pass    |
| 1-DH5 | 2402            | 2496.5-13000  | 11687.06                 | -45.51              | NA                      | -26                 | -26             | Pass    |
| 1-DH5 | 2441            | 30-1000       | 844.80                   | -49.60              | NA                      | -26                 | -26             | Pass    |
| 1-DH5 | 2441            | 1000-2387     | 2002.80                  | -48.57              | NA                      | -26                 | -26             | Pass    |
| 1-DH5 | 2441            | 2387-2400     | 2393.17                  | -48.52              | NA                      | -16                 | -16             | Pass    |
| 1-DH5 | 2441            | 2483.5-2496.5 | 2490.42                  | -48.42              | NA                      | -16                 | -16             | Pass    |
| 1-DH5 | 2441            | 2496.5-13000  | 5111.87                  | -46.49              | NA                      | -26                 | -26             | Pass    |
| 1-DH5 | 2480            | 30-1000       | 180.35                   | -48.20              | NA                      | -26                 | -26             | Pass    |
| 1-DH5 | 2480            | 1000-2387     | 2334.29                  | -48.45              | NA                      | -26                 | -26             | Pass    |
| 1-DH5 | 2480            | 2387-2400     | 2392.80                  | -48.74              | NA                      | -16                 | -16             | Pass    |
| 1-DH5 | 2480            | 2483.5-2496.5 | 2484.12                  | -47.08              | NA                      | -16                 | -16             | Pass    |
| 1-DH5 | 2480            | 2496.5-13000  | 11666.06                 | -45.98              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2402            | 30-1000       | 183.26                   | -48.90              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2402            | 1000-2387     | 2104.05                  | -48.32              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2402            | 2387-2400     | 2400.00                  | -27.11              | NA                      | -16                 | -16             | Pass    |
| 2-DH5 | 2402            | 2483.5-2496.5 | 2495.47                  | -48.57              | NA                      | -16                 | -16             | Pass    |
| 2-DH5 | 2402            | 2496.5-13000  | 12359.29                 | -46.06              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2441            | 30-1000       | 904.94                   | -48.89              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2441            | 1000-2387     | 2237.20                  | -48.49              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2441            | 2387-2400     | 2397.78                  | -48.83              | NA                      | -16                 | -16             | Pass    |
| 2-DH5 | 2441            | 2483.5-2496.5 | 2493.96                  | -48.74              | NA                      | -16                 | -16             | Pass    |
| 2-DH5 | 2441            | 2496.5-13000  | 12380.29                 | -46.17              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2480            | 30-1000       | 193.93                   | -49.13              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2480            | 1000-2387     | 2069.38                  | -48.74              | NA                      | -26                 | -26             | Pass    |
| 2-DH5 | 2480            | 2387-2400     | 2397.36                  | -48.82              | NA                      | -16                 | -16             | Pass    |
| 2-DH5 | 2480            | 2483.5-2496.5 | 2484.37                  | -46.79              | NA                      | -16                 | -16             | Pass    |
| 2-DH5 | 2480            | 2496.5-13000  | 6004.67                  | -45.65              | NA                      | -26                 | -26             | Pass    |
| 3-DH5 | 2402            | 30-1000       | 745.86                   | -48.97              | NA                      | -26                 | -26             | Pass    |
| 3-DH5 | 2402            | 1000-2387     | 2178.95                  | -48.97              | NA                      | -26                 | -26             | Pass    |
| 3-DH5 | 2402            | 2387-2400     | 2400.00                  | -27.15              | NA                      | -16                 | -16             | Pass    |
| 3-DH5 | 2402            | 2483.5-2496.5 | 2494.20                  | -47.69              | NA                      | -16                 | -16             | Pass    |

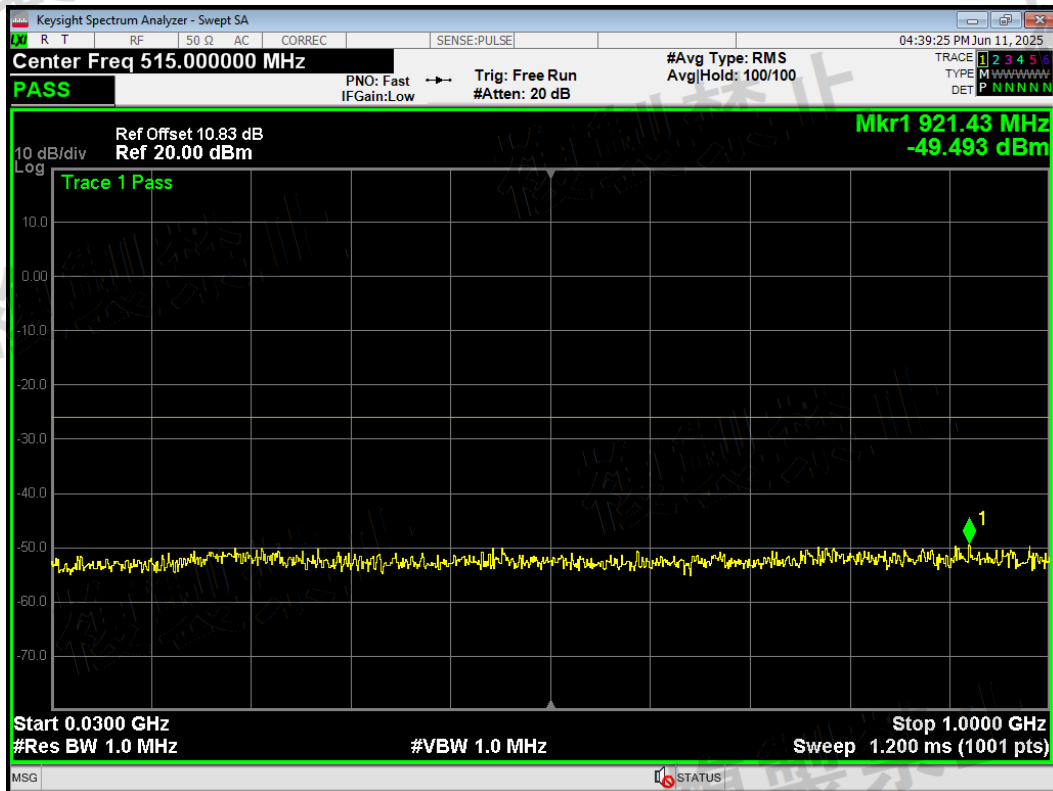
|       |      |               |          |        |    |     |     |      |
|-------|------|---------------|----------|--------|----|-----|-----|------|
| 3-DH5 | 2402 | 2496.5-13000  | 12968.49 | -46.19 | NA | -26 | -26 | Pass |
| 3-DH5 | 2441 | 30-1000       | 728.40   | -49.48 | NA | -26 | -26 | Pass |
| 3-DH5 | 2441 | 1000-2387     | 2353.71  | -48.69 | NA | -26 | -26 | Pass |
| 3-DH5 | 2441 | 2387-2400     | 2395.03  | -48.08 | NA | -16 | -16 | Pass |
| 3-DH5 | 2441 | 2483.5-2496.5 | 2489.79  | -48.21 | NA | -16 | -16 | Pass |
| 3-DH5 | 2441 | 2496.5-13000  | 6414.31  | -45.82 | NA | -26 | -26 | Pass |
| 3-DH5 | 2480 | 30-1000       | 553.80   | -49.14 | NA | -26 | -26 | Pass |
| 3-DH5 | 2480 | 1000-2387     | 2373.13  | -48.63 | NA | -26 | -26 | Pass |
| 3-DH5 | 2480 | 2387-2400     | 2398.22  | -48.57 | NA | -16 | -16 | Pass |
| 3-DH5 | 2480 | 2483.5-2496.5 | 2486.11  | -47.45 | NA | -16 | -16 | Pass |
| 3-DH5 | 2480 | 2496.5-13000  | 12338.28 | -46.22 | NA | -26 | -26 | Pass |

### Bluetooth LE

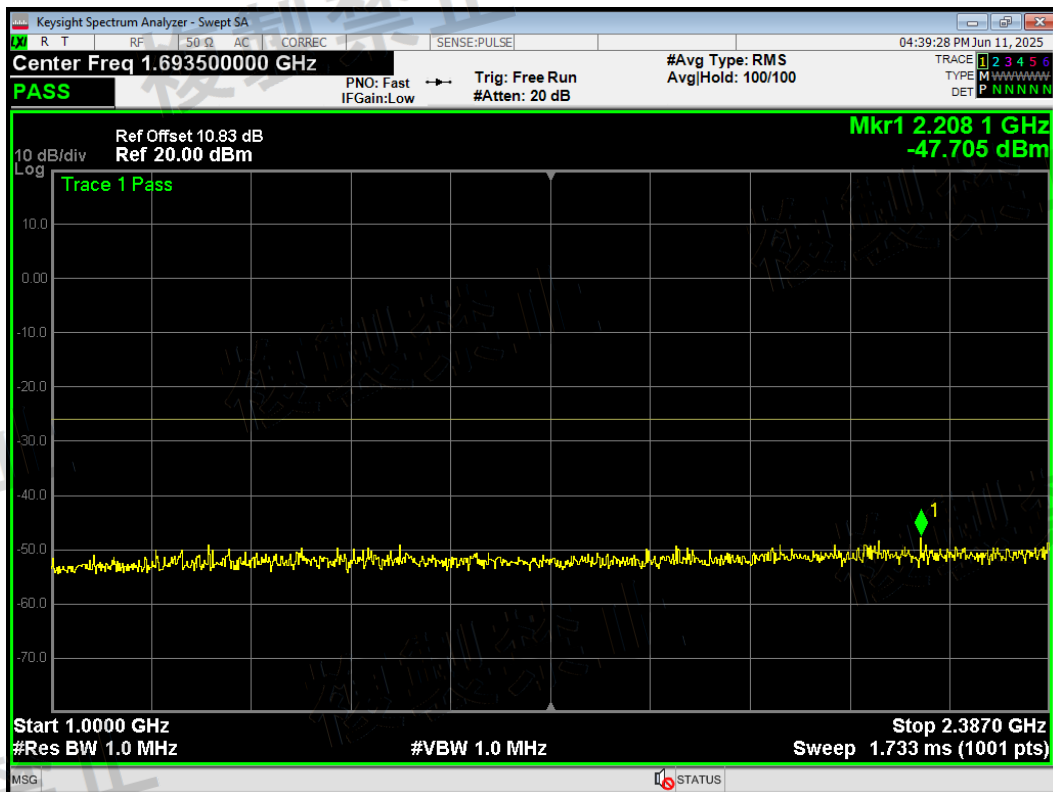
| Mode     | Frequency (MHz) | Range (MHz)   | Emission Frequency (MHz) | Max Value (dBm/MHz) | Max RMS Value (dBm/MHz) | Max Value (dBm/MHz) | Limit (dBm/MHz) | Verdict |
|----------|-----------------|---------------|--------------------------|---------------------|-------------------------|---------------------|-----------------|---------|
| BLE (1M) | 2402            | 30-1000       | 229.82                   | -49.48              | NA                      | -26                 | -26             | Pass    |
| BLE (1M) | 2402            | 1000-2387     | 2385.61                  | -48.44              | NA                      | -26                 | -26             | Pass    |
| BLE (1M) | 2402            | 2387-2400     | 2400.00                  | -42.24              | NA                      | -16                 | -16             | Pass    |
| BLE (1M) | 2402            | 2483.5-2496.5 | 2494.00                  | -48.84              | NA                      | -16                 | -16             | Pass    |
| BLE (1M) | 2402            | 2496.5-13000  | 5899.63                  | -45.73              | NA                      | -26                 | -26             | Pass    |
| BLE (1M) | 2440            | 30-1000       | 797.27                   | -49.23              | NA                      | -26                 | -26             | Pass    |
| BLE (1M) | 2440            | 1000-2387     | 2306.55                  | -48.63              | NA                      | -26                 | -26             | Pass    |
| BLE (1M) | 2440            | 2387-2400     | 2391.17                  | -48.63              | NA                      | -16                 | -16             | Pass    |
| BLE (1M) | 2440            | 2483.5-2496.5 | 2485.05                  | -48.31              | NA                      | -16                 | -16             | Pass    |
| BLE (1M) | 2440            | 2496.5-13000  | 3693.90                  | -46.37              | NA                      | -26                 | -26             | Pass    |
| BLE (1M) | 2480            | 30-1000       | 193.93                   | -48.26              | NA                      | -26                 | -26             | Pass    |
| BLE (1M) | 2480            | 1000-2387     | 2368.97                  | -48.35              | NA                      | -26                 | -26             | Pass    |
| BLE (1M) | 2480            | 2387-2400     | 2394.62                  | -48.39              | NA                      | -16                 | -16             | Pass    |
| BLE (1M) | 2480            | 2483.5-2496.5 | 2484.93                  | -48.71              | NA                      | -16                 | -16             | Pass    |
| BLE (1M) | 2480            | 2496.5-13000  | 6309.27                  | -46.32              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2404            | 30-1000       | 874.87                   | -49.00              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2404            | 1000-2387     | 2158.15                  | -48.51              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2404            | 2387-2400     | 2393.46                  | -48.55              | NA                      | -16                 | -16             | Pass    |
| BLE (2M) | 2404            | 2483.5-2496.5 | 2486.52                  | -49.18              | NA                      | -16                 | -16             | Pass    |
| BLE (2M) | 2404            | 2496.5-13000  | 12243.75                 | -46.28              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2440            | 30-1000       | 865.17                   | -49.15              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2440            | 1000-2387     | 2387.00                  | -48.90              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2440            | 2387-2400     | 2388.72                  | -48.78              | NA                      | -16                 | -16             | Pass    |
| BLE (2M) | 2440            | 2483.5-2496.5 | 2489.09                  | -48.80              | NA                      | -16                 | -16             | Pass    |
| BLE (2M) | 2440            | 2496.5-13000  | 12317.27                 | -45.61              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2478            | 30-1000       | 784.66                   | -49.06              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2478            | 1000-2387     | 2044.41                  | -47.96              | NA                      | -26                 | -26             | Pass    |
| BLE (2M) | 2478            | 2387-2400     | 2394.03                  | -48.18              | NA                      | -16                 | -16             | Pass    |
| BLE (2M) | 2478            | 2483.5-2496.5 | 2494.97                  | -48.59              | NA                      | -16                 | -16             | Pass    |
| BLE (2M) | 2478            | 2496.5-13000  | 12285.76                 | -44.73              | NA                      | -26                 | -26             | Pass    |

## Bluetooth

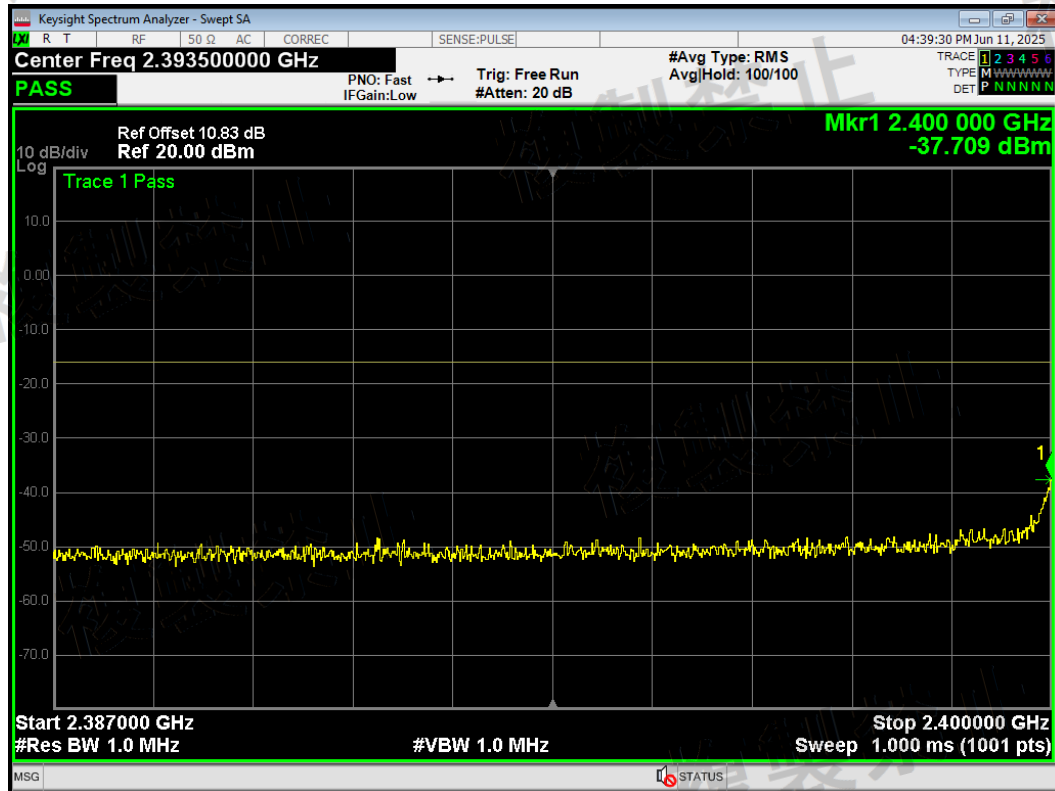
Tx. Spurious 1-DH5 2402MHz @ 30MHz-1000MHz



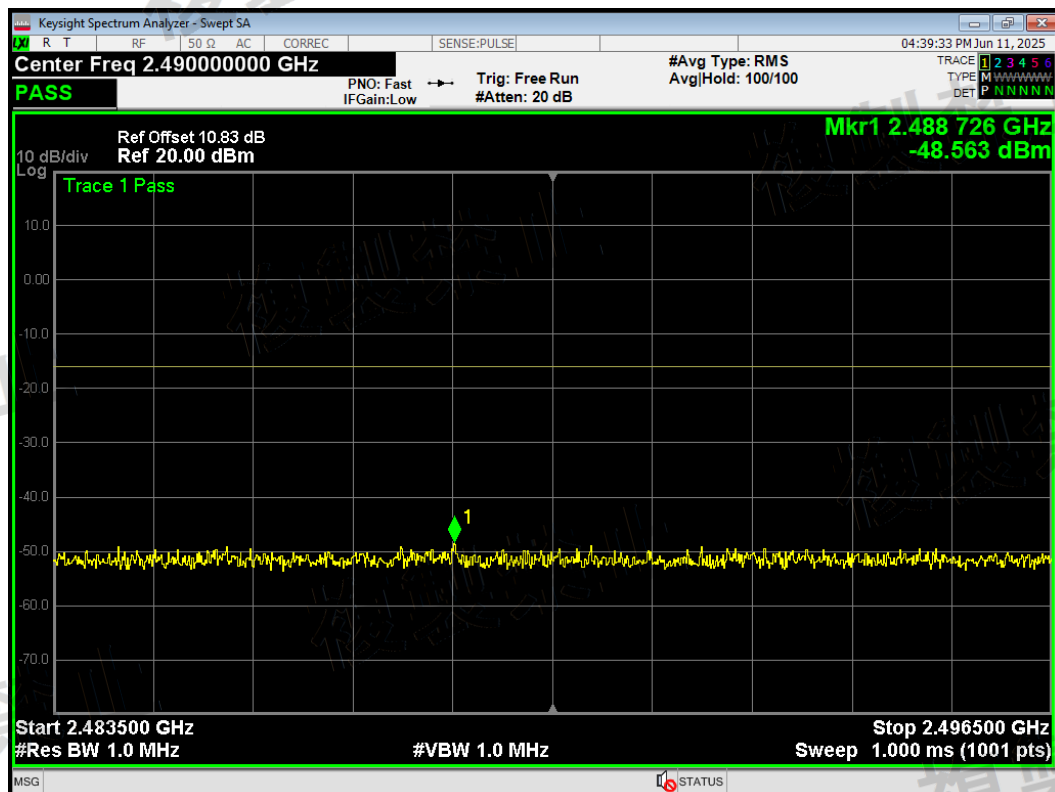
Tx. Spurious 1-DH5 2402MHz @ 1000MHz-2387MHz



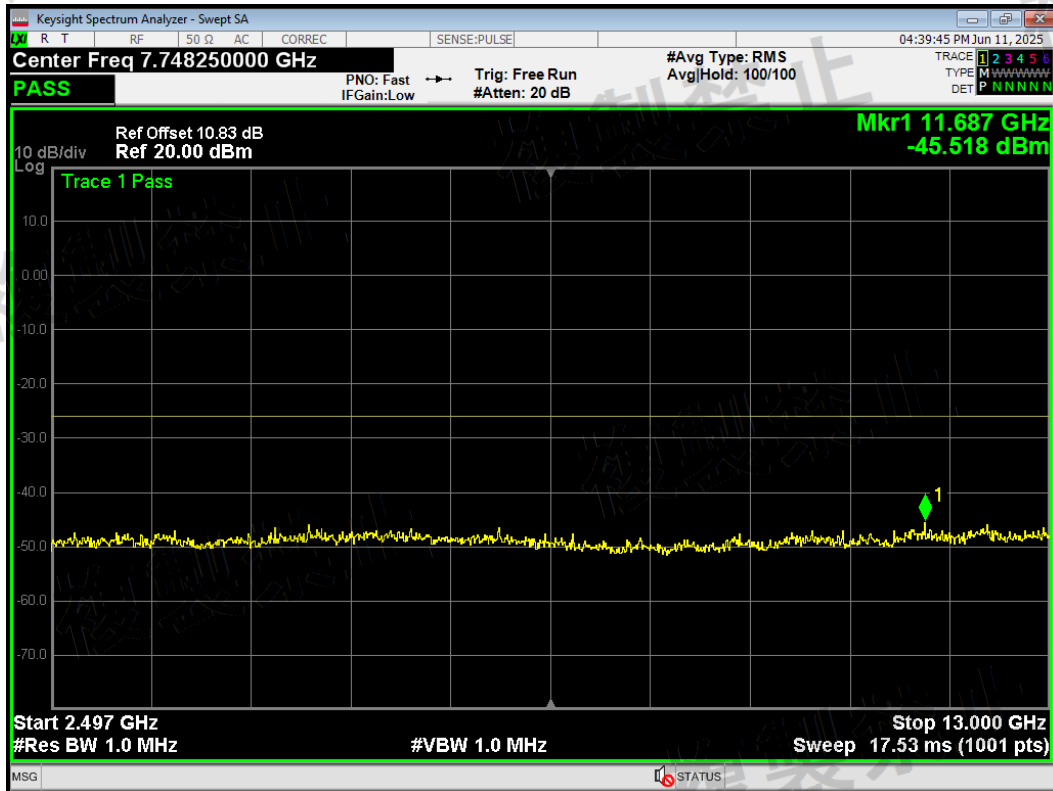
Tx. Spurious 1-DH5 2402MHz @ 2387MHz-2400MHz



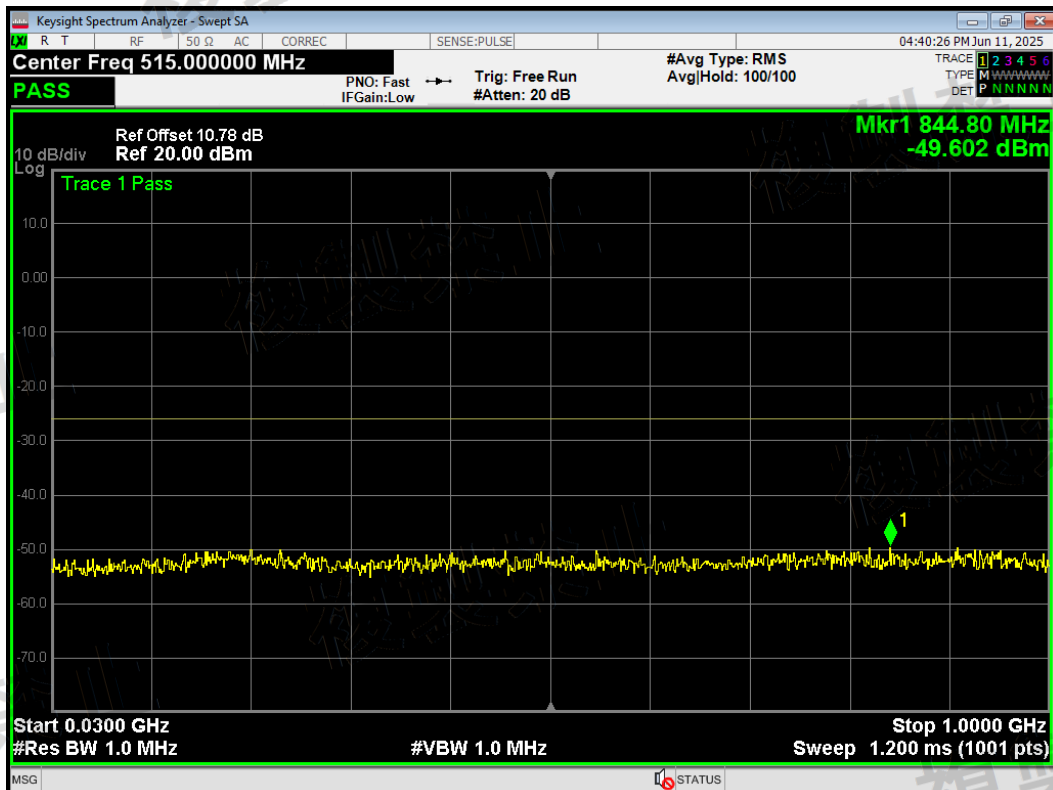
Tx. Spurious 1-DH5 2402MHz @ 2483.5MHz-2496.5MHz



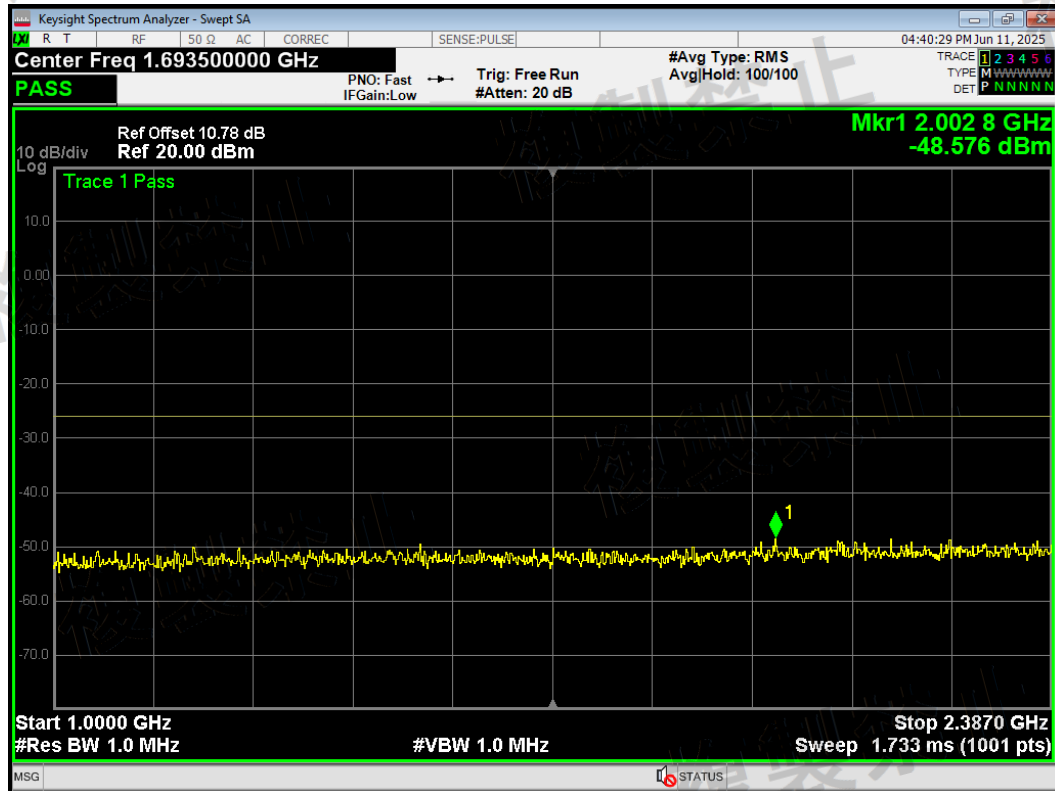
Tx. Spurious 1-DH5 2402MHz @ 2496.5MHz-13000MHz



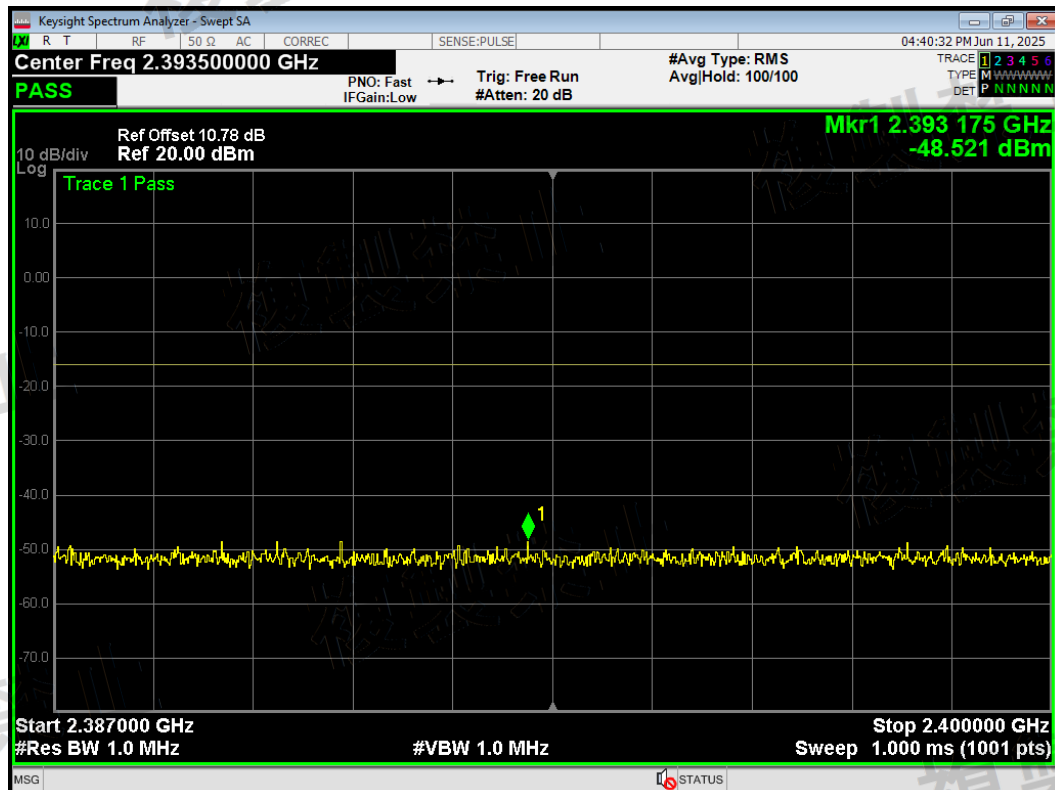
Tx. Spurious 1-DH5 2441MHz @ 30MHz-1000MHz



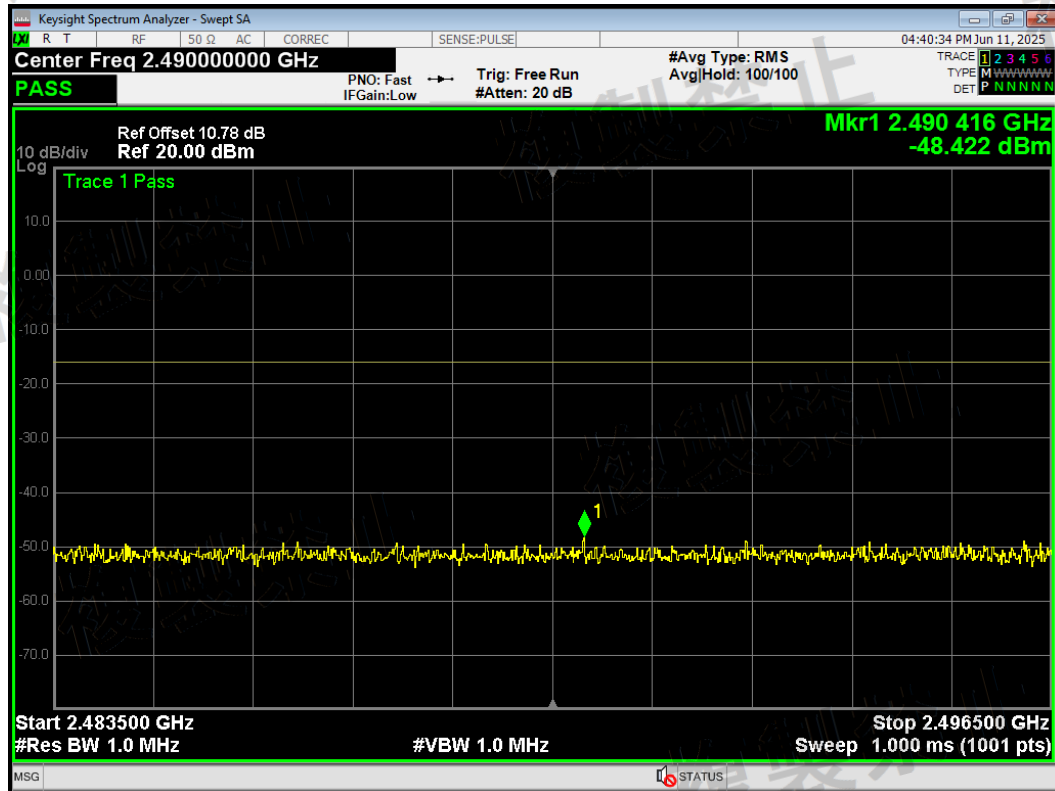
Tx. Spurious 1-DH5 2441MHz @ 1000MHz-2387MHz



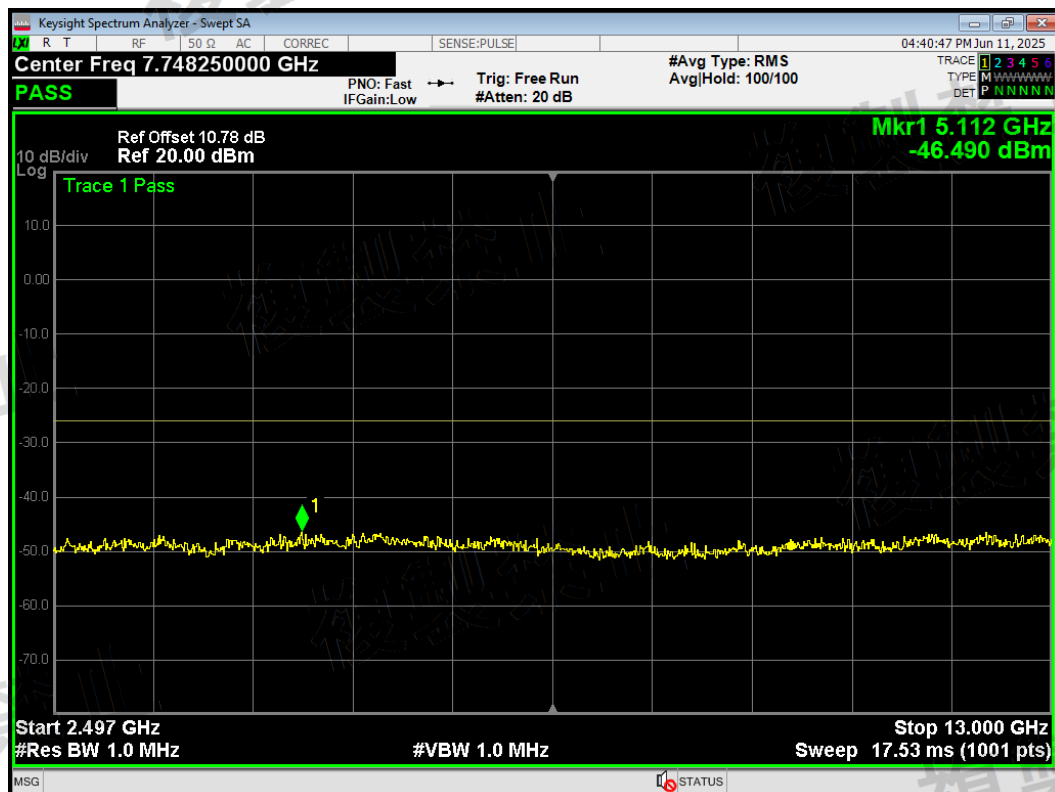
Tx. Spurious 1-DH5 2441MHz @ 2387MHz-2400MHz



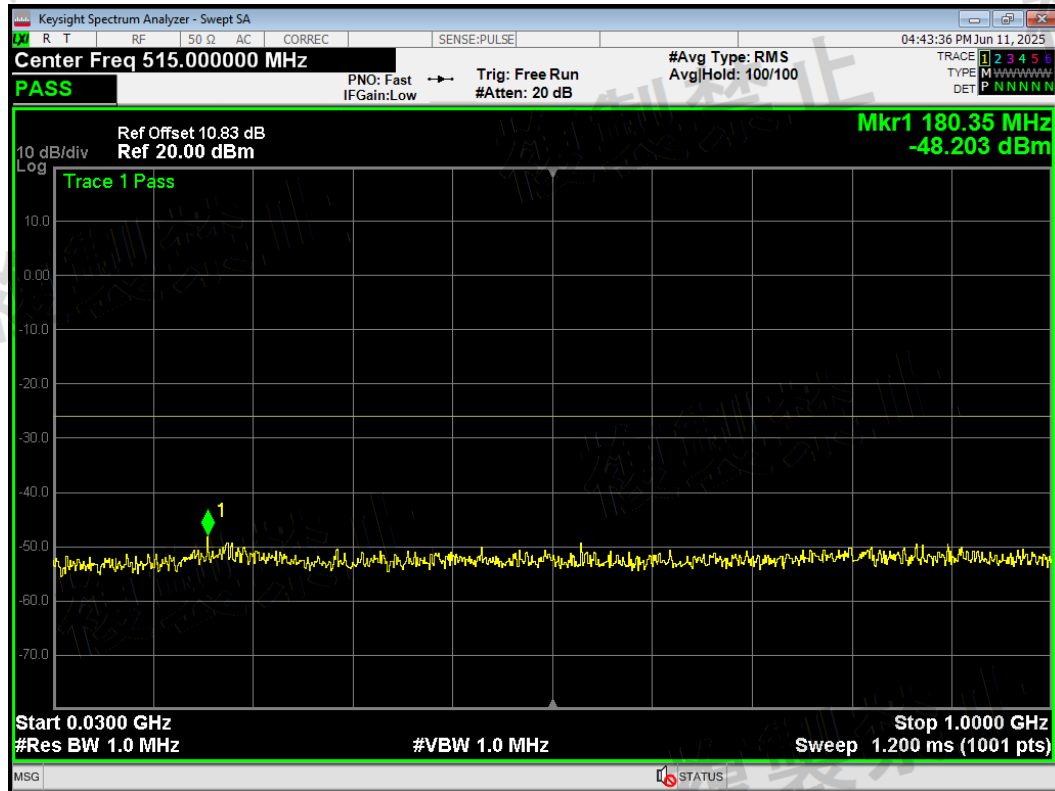
Tx. Spurious 1-DH5 2441MHz @ 2483.5MHz-2496.5MHz



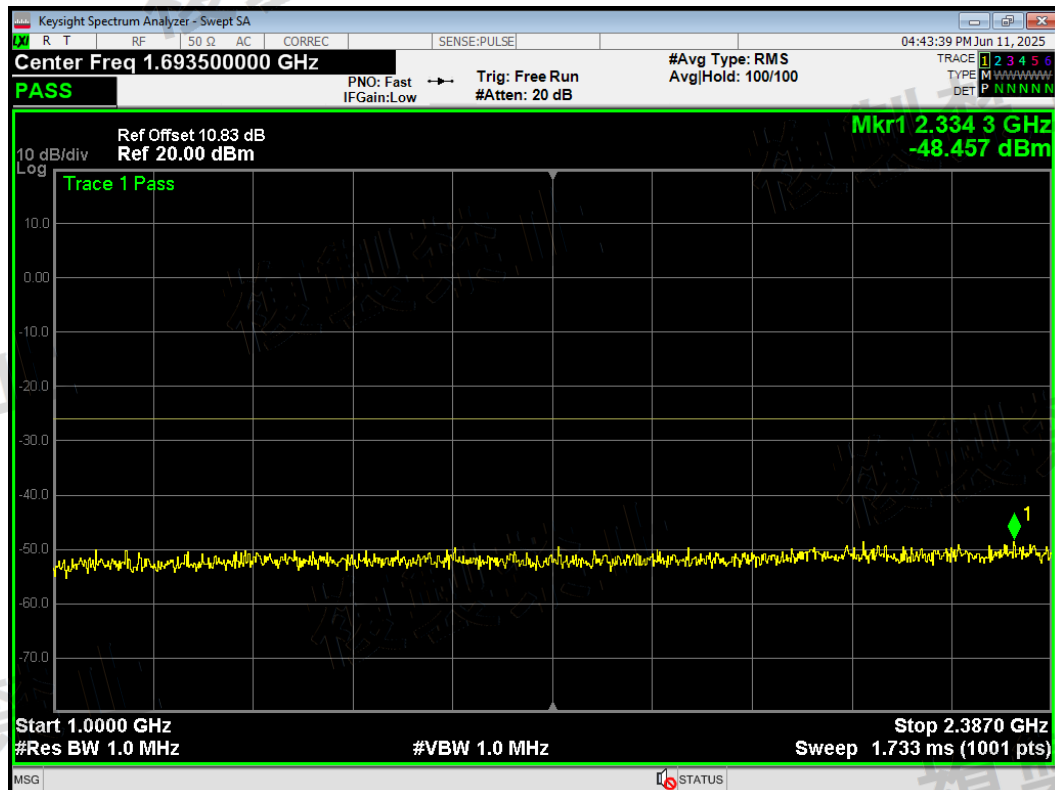
Tx. Spurious 1-DH5 2441MHz @ 2496.5MHz-13000MHz



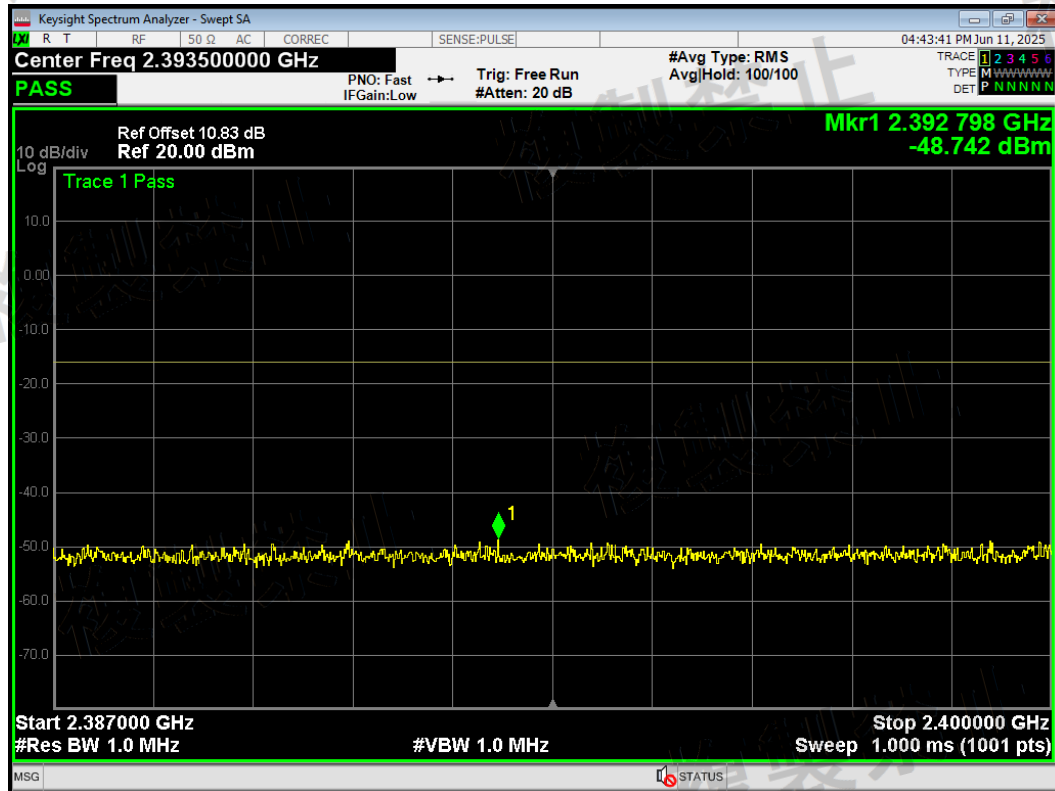
Tx. Spurious 1-DH5 2480MHz @ 30MHz-1000MHz



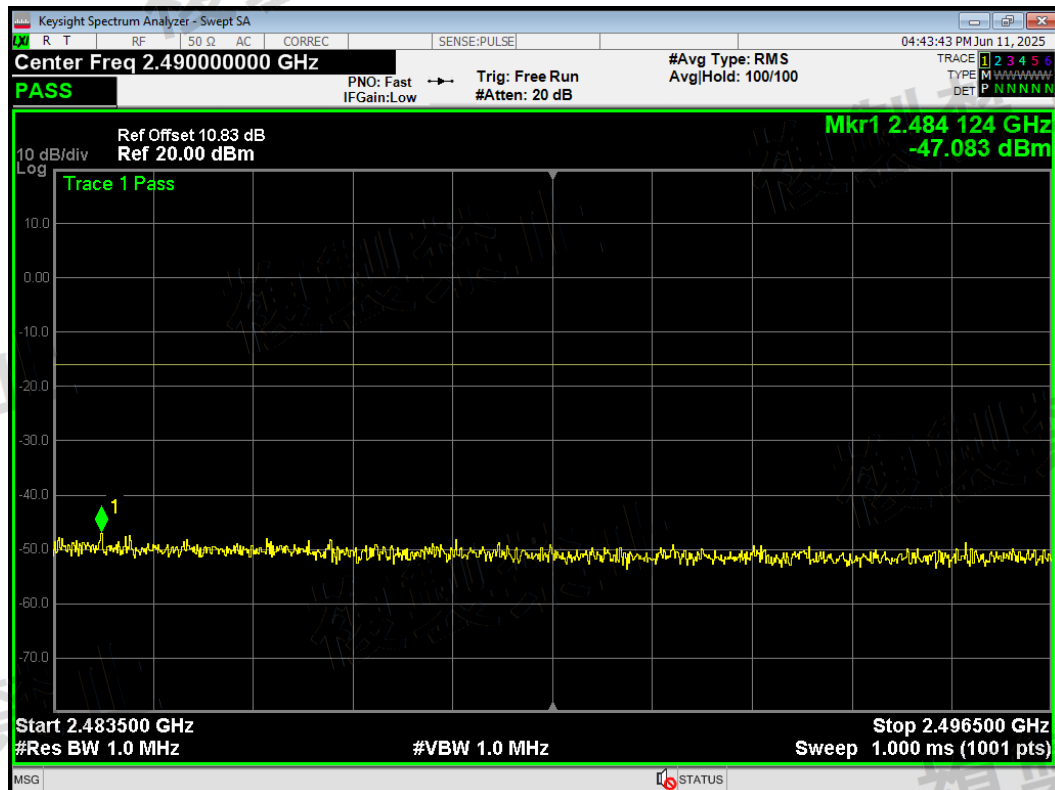
Tx. Spurious 1-DH5 2480MHz @ 1000MHz-2387MHz



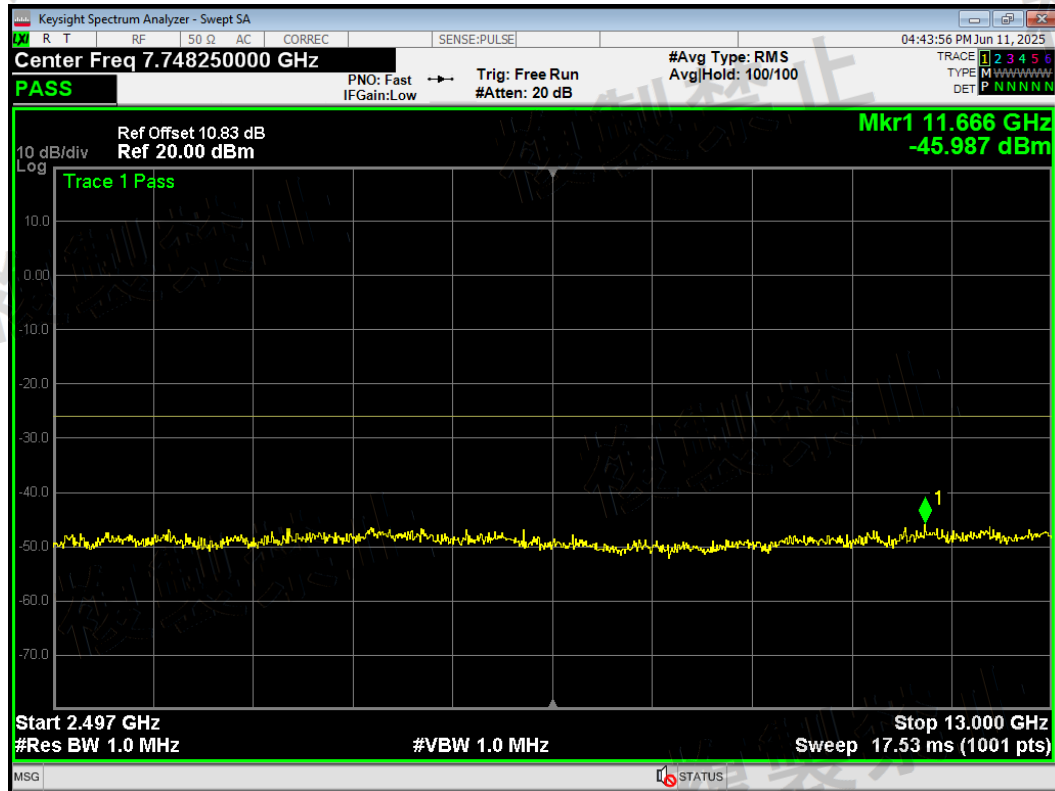
Tx. Spurious 1-DH5 2480MHz @ 2387MHz-2400MHz



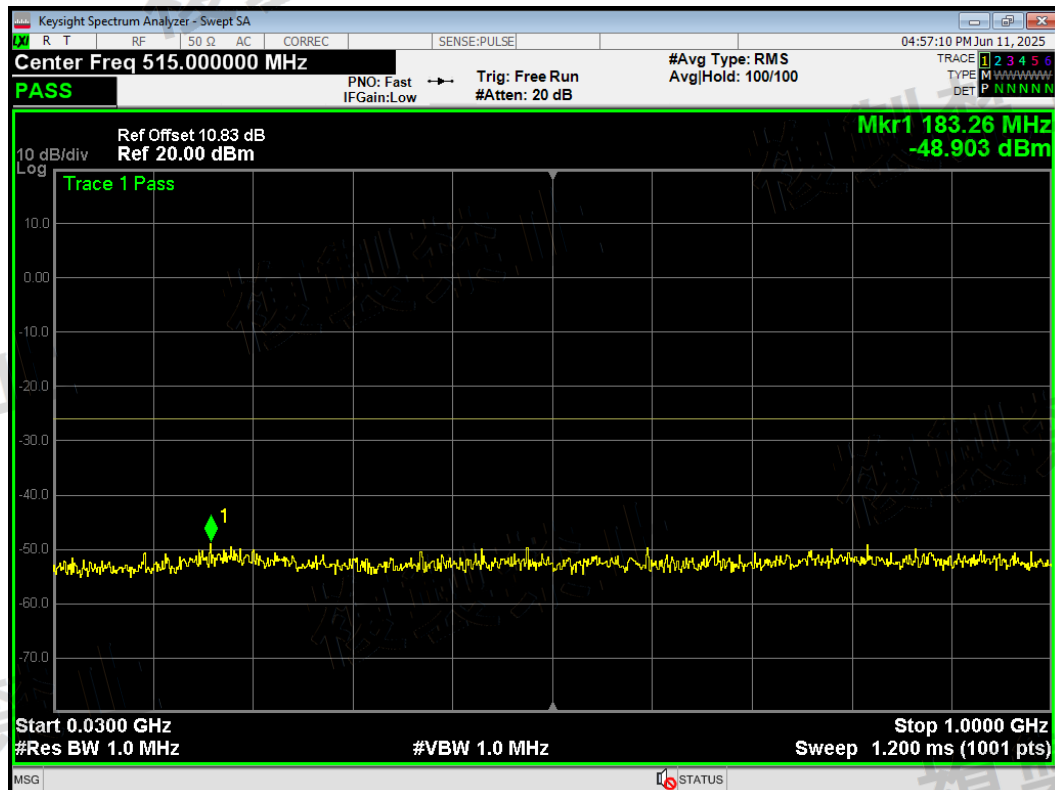
Tx. Spurious 1-DH5 2480MHz @ 2483.5MHz-2496.5MHz



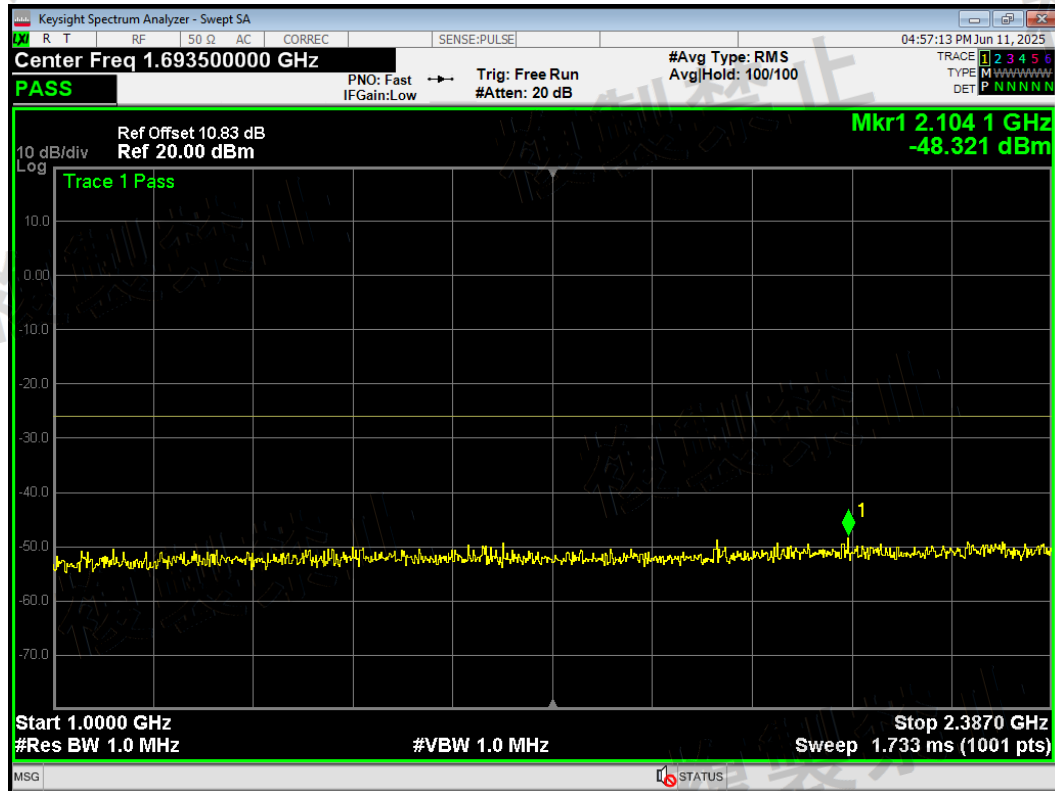
Tx. Spurious 1-DH5 2480MHz @ 2496.5MHz-13000MHz



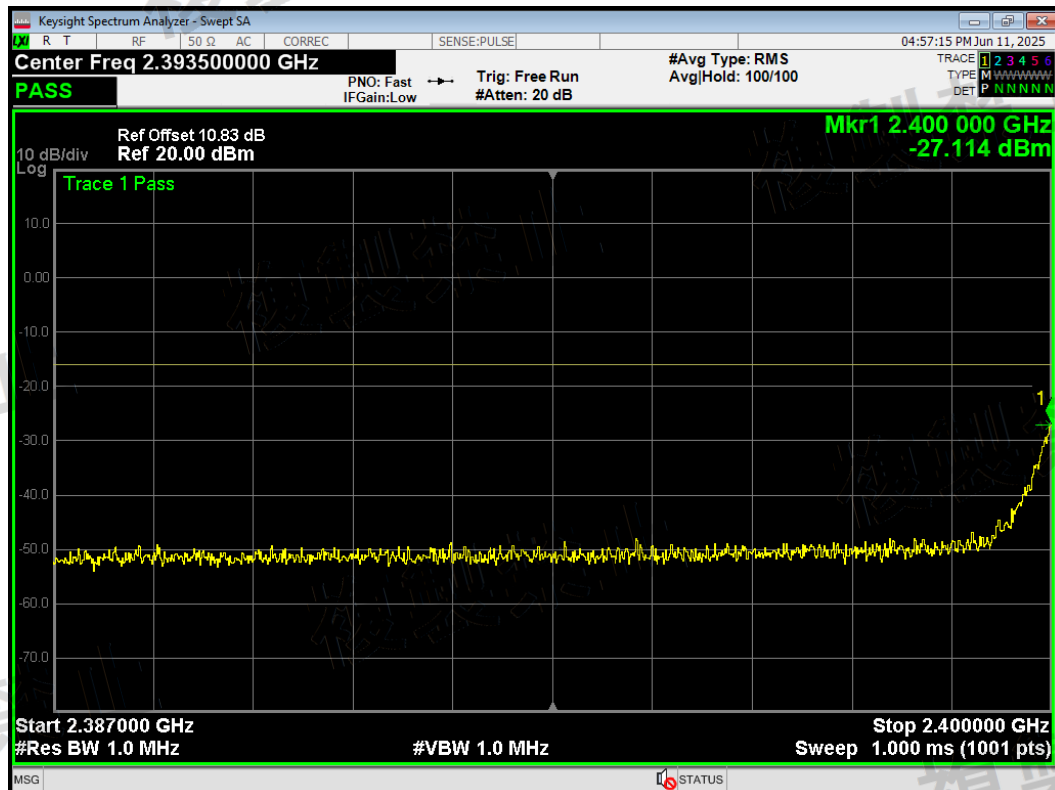
Tx. Spurious 2-DH5 2402MHz @ 30MHz-1000MHz



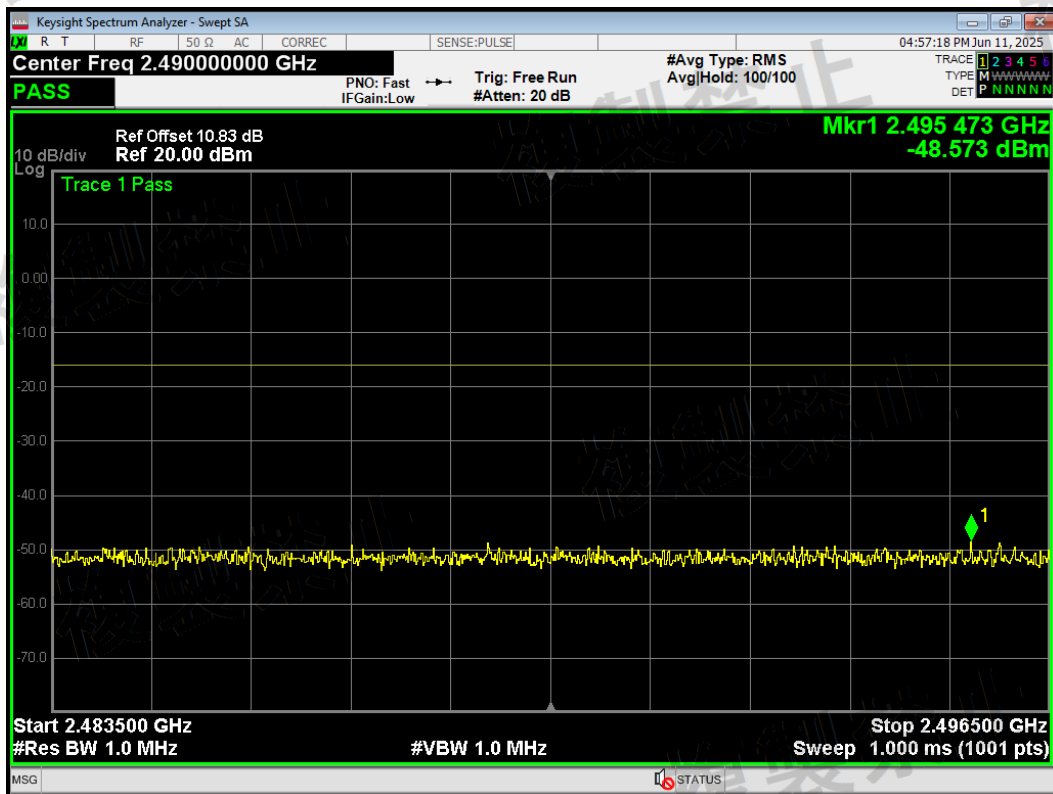
Tx. Spurious 2-DH5 2402MHz @ 1000MHz-2387MHz



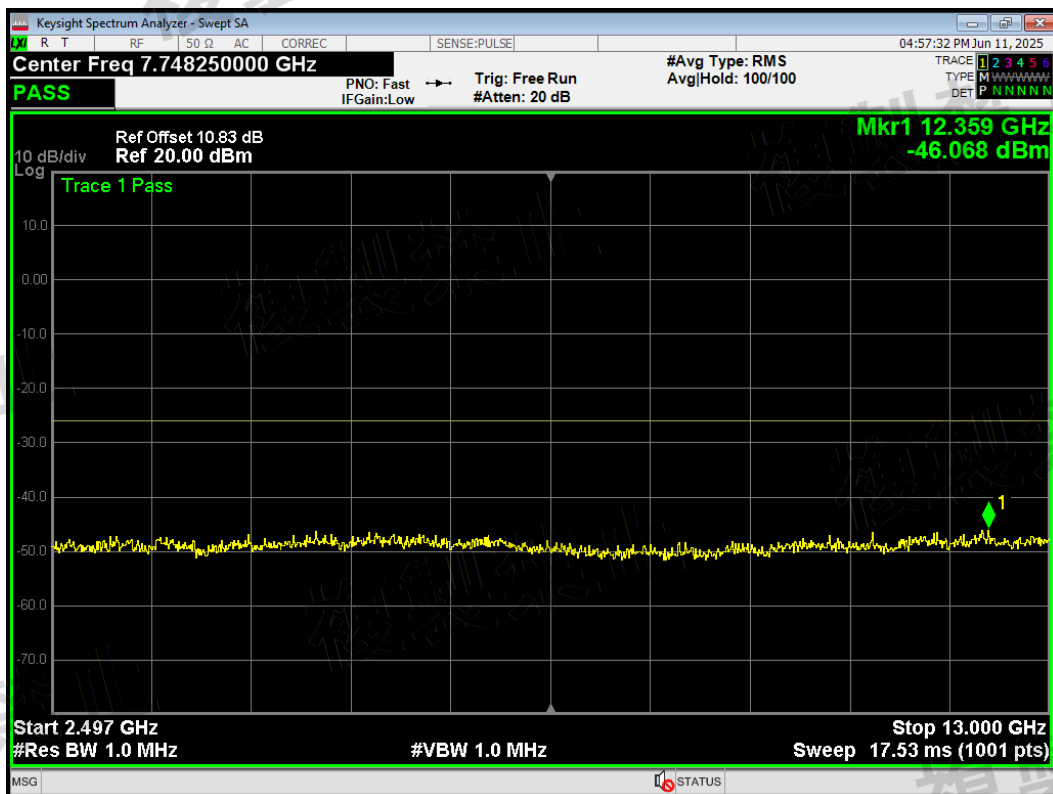
Tx. Spurious 2-DH5 2402MHz @ 2387MHz-2400MHz



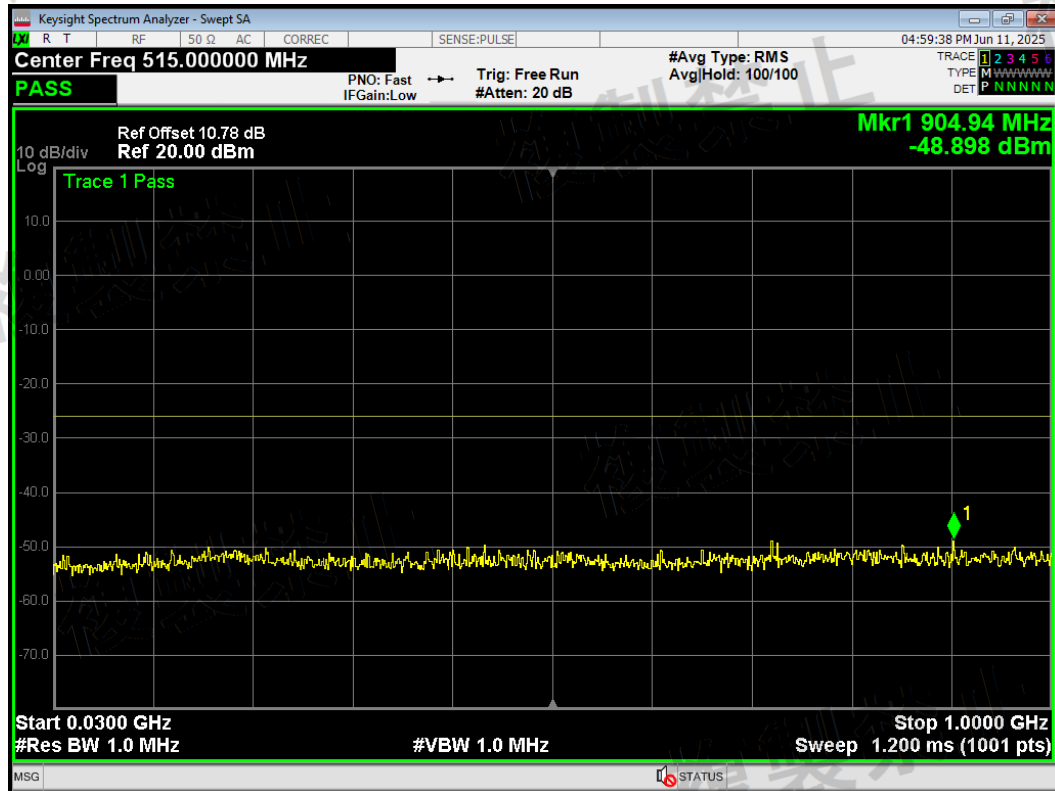
Tx. Spurious 2-DH5 2402MHz @ 2483.5MHz-2496.5MHz



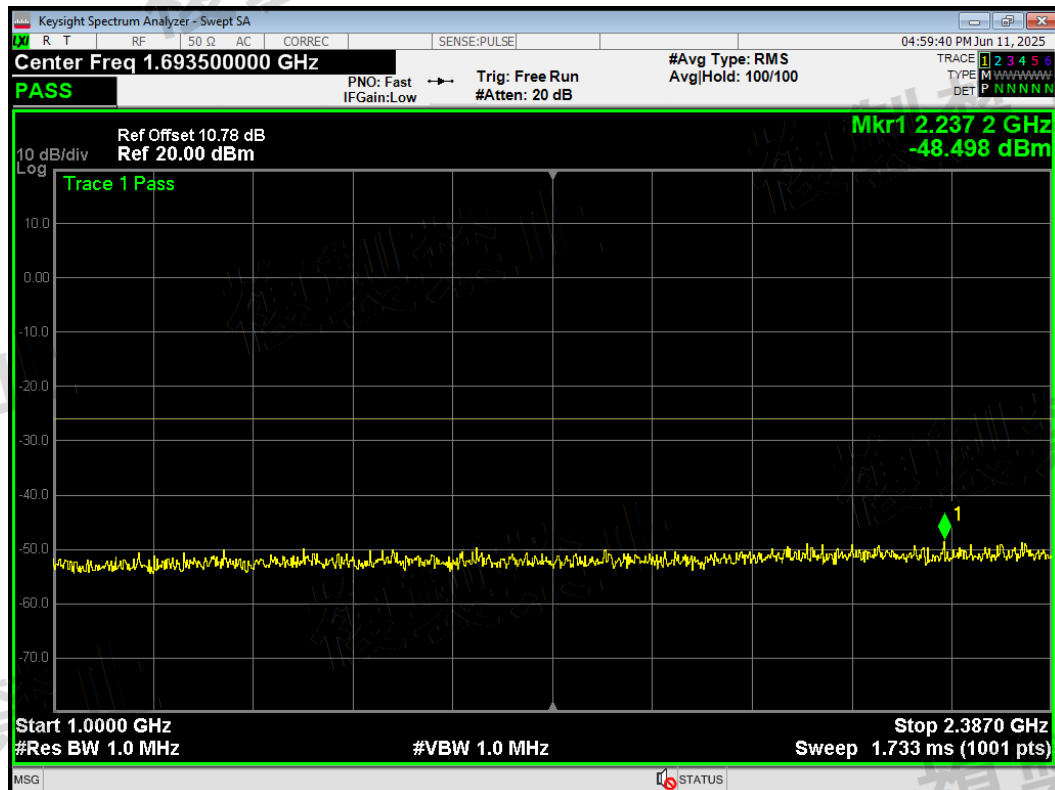
Tx. Spurious 2-DH5 2402MHz @ 2496.5MHz-13000MHz



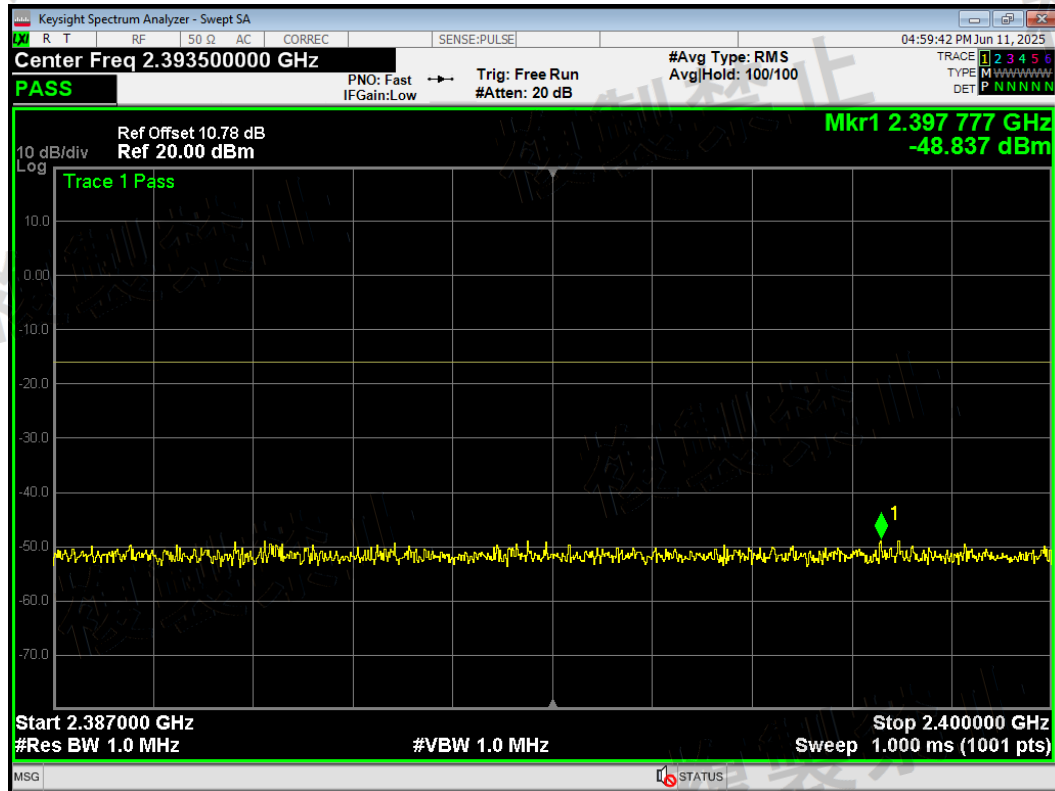
Tx. Spurious 2-DH5 2441MHz @ 30MHz-1000MHz



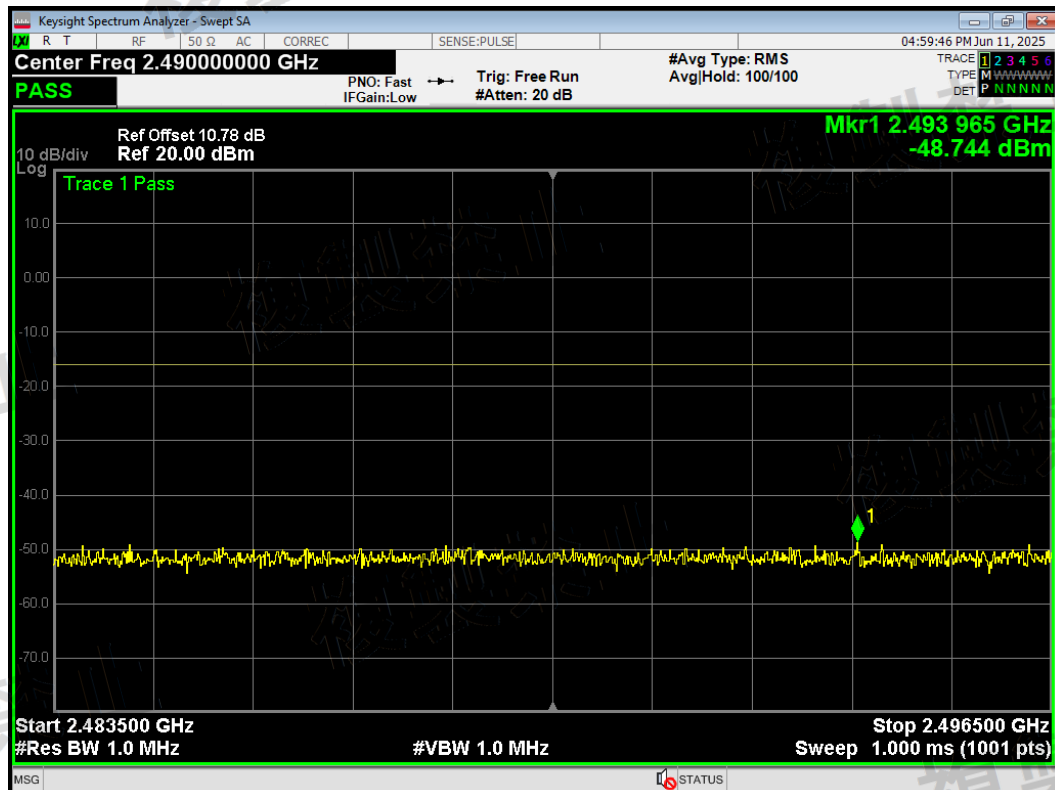
Tx. Spurious 2-DH5 2441MHz @ 1000MHz-2387MHz



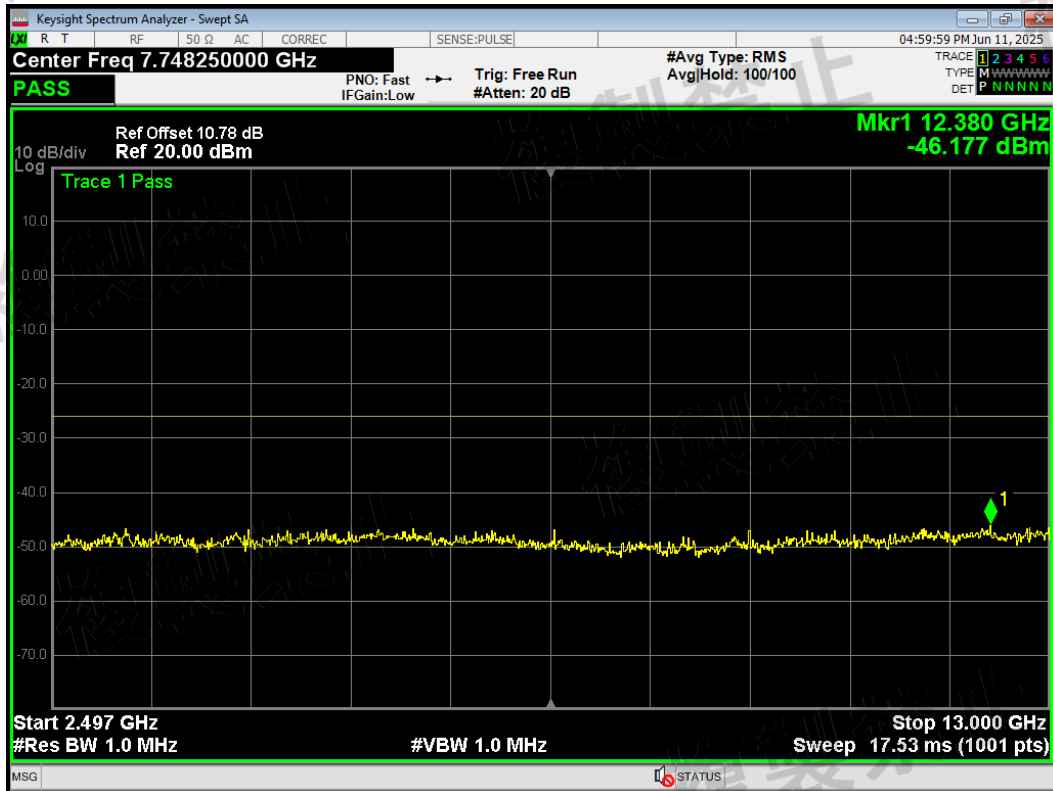
Tx. Spurious 2-DH5 2441MHz @ 2387MHz-2400MHz



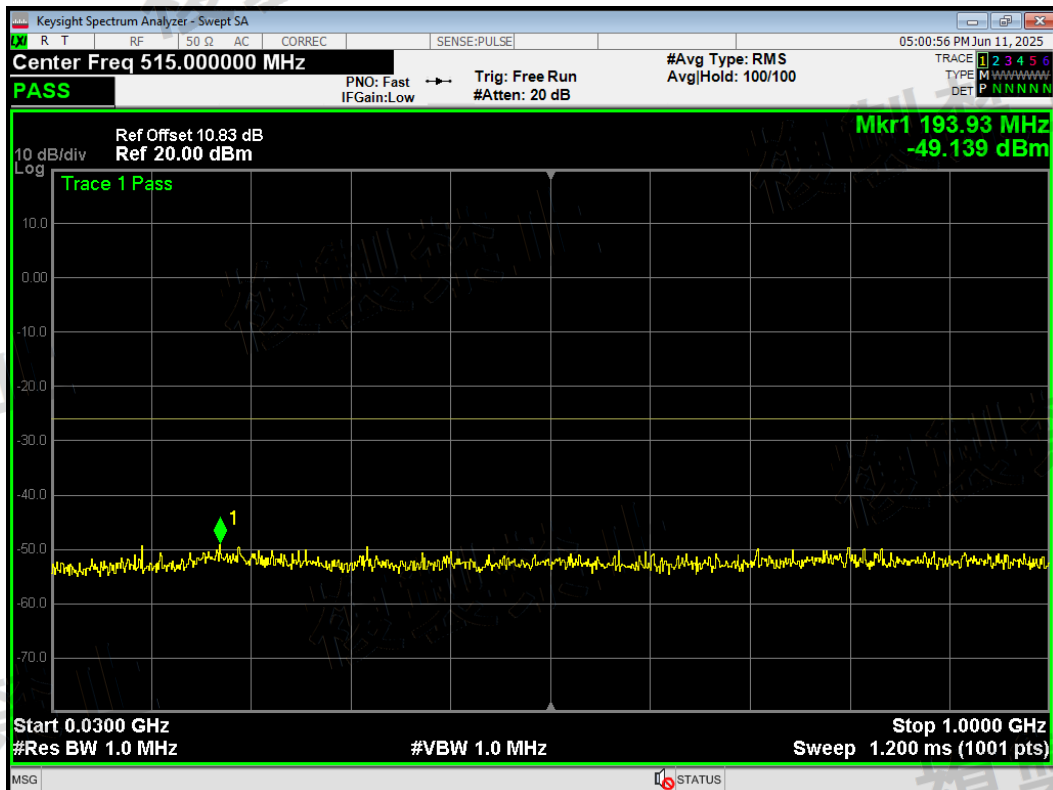
Tx. Spurious 2-DH5 2441MHz @ 2483.5MHz-2496.5MHz



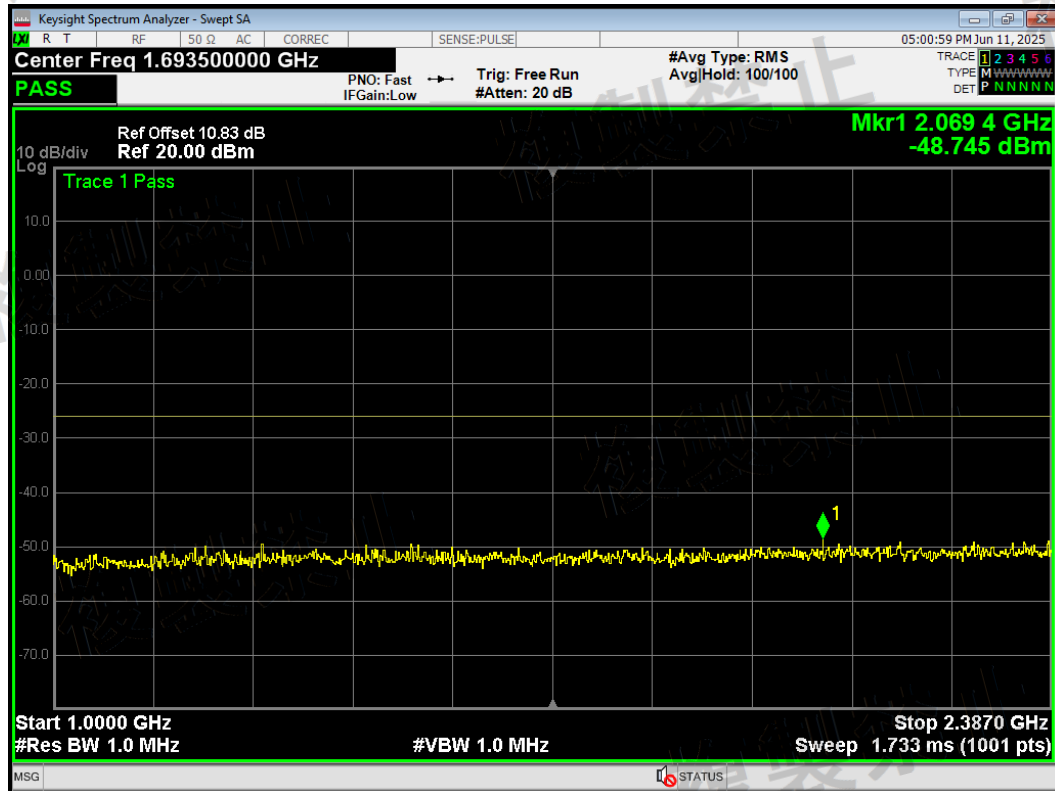
Tx. Spurious 2-DH5 2441MHz @ 2496.5MHz-13000MHz



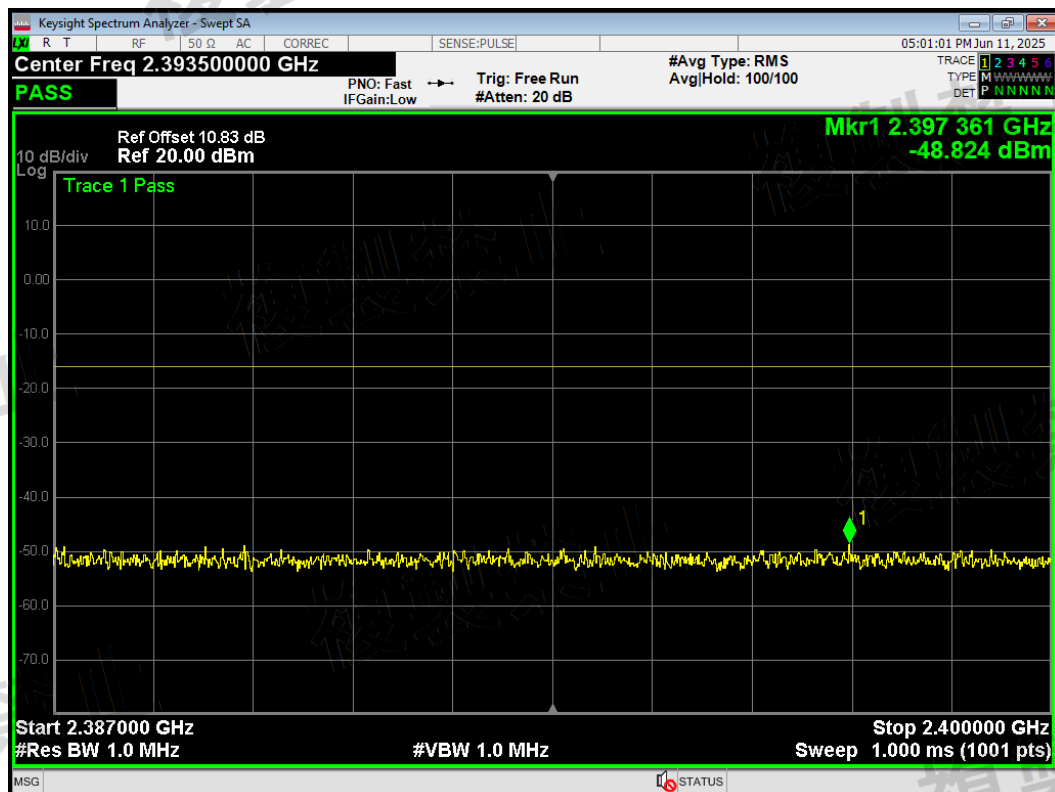
Tx. Spurious 2-DH5 2480MHz @ 30MHz-1000MHz



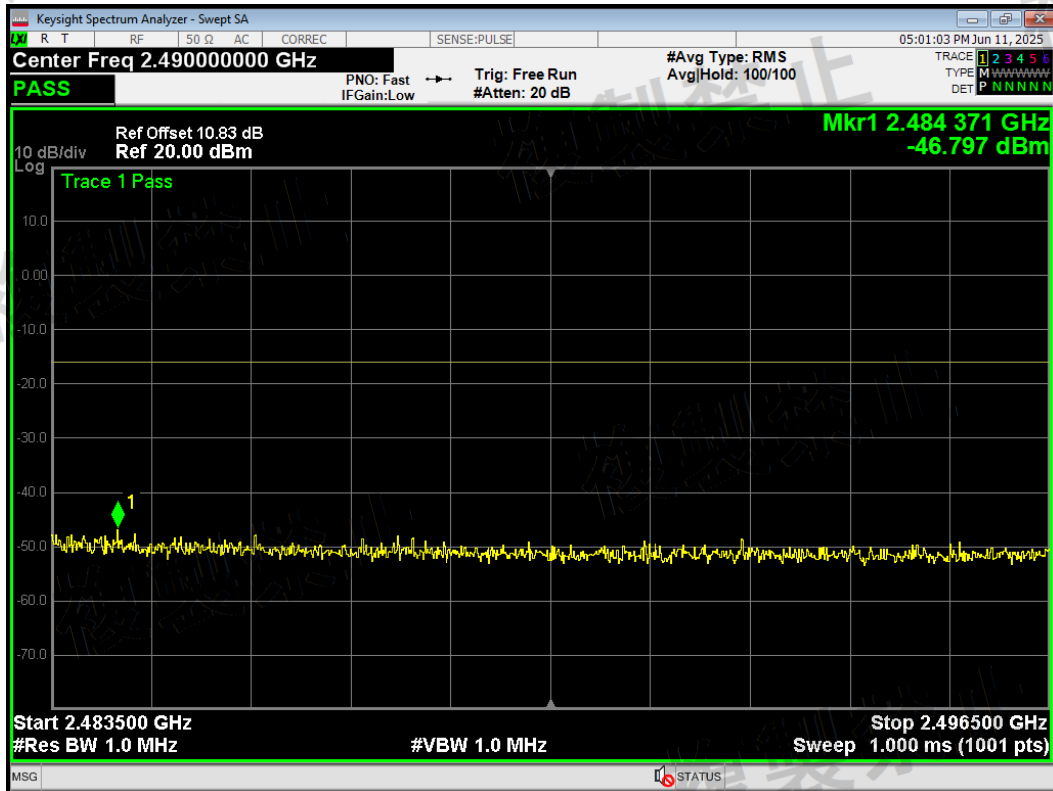
Tx. Spurious 2-DH5 2480MHz @ 1000MHz-2387MHz



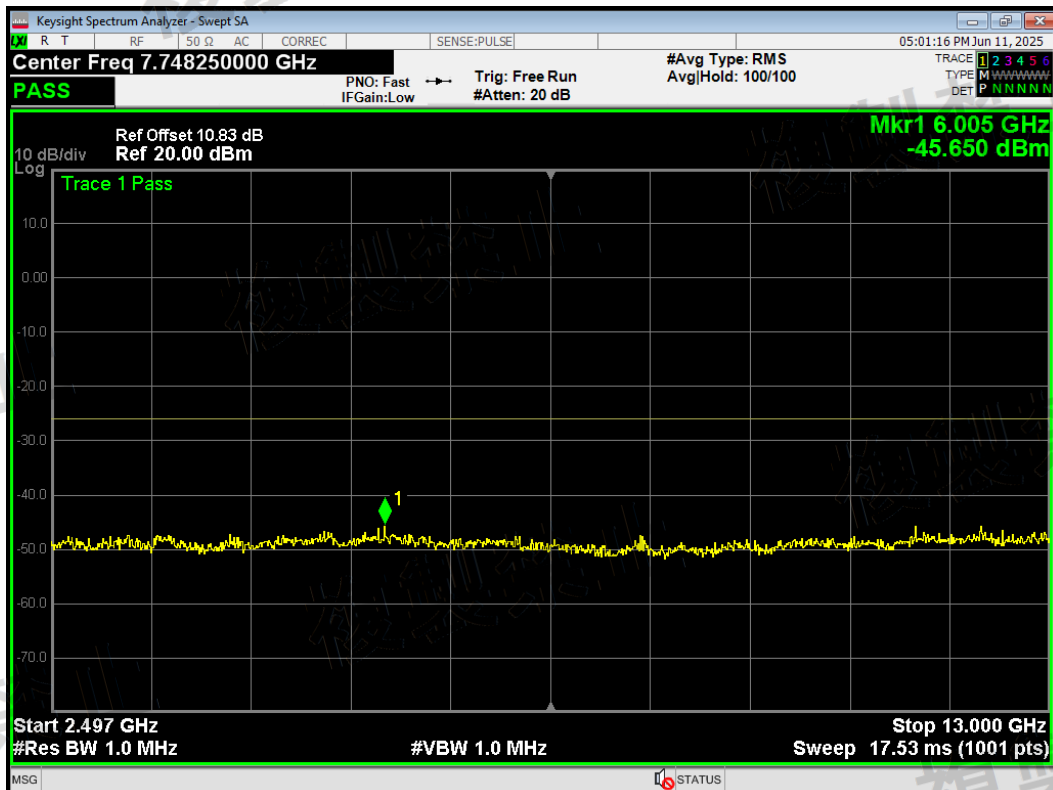
Tx. Spurious 2-DH5 2480MHz @ 2387MHz-2400MHz



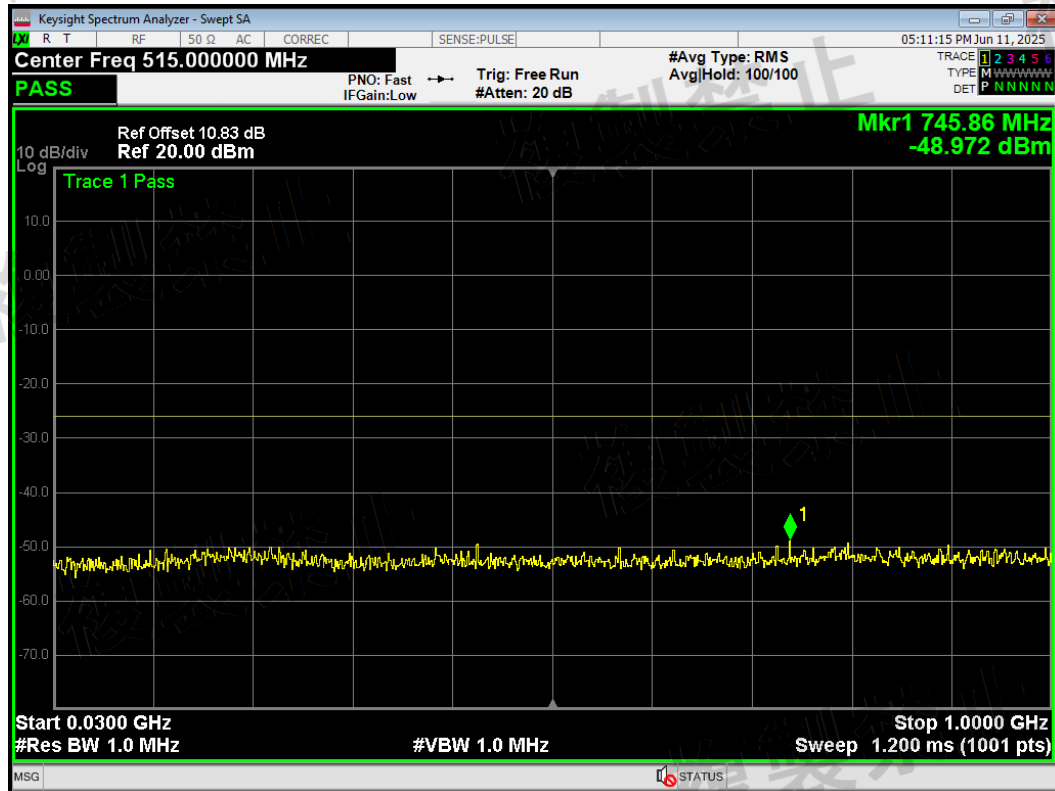
Tx. Spurious 2-DH5 2480MHz @ 2483.5MHz-2496.5MHz



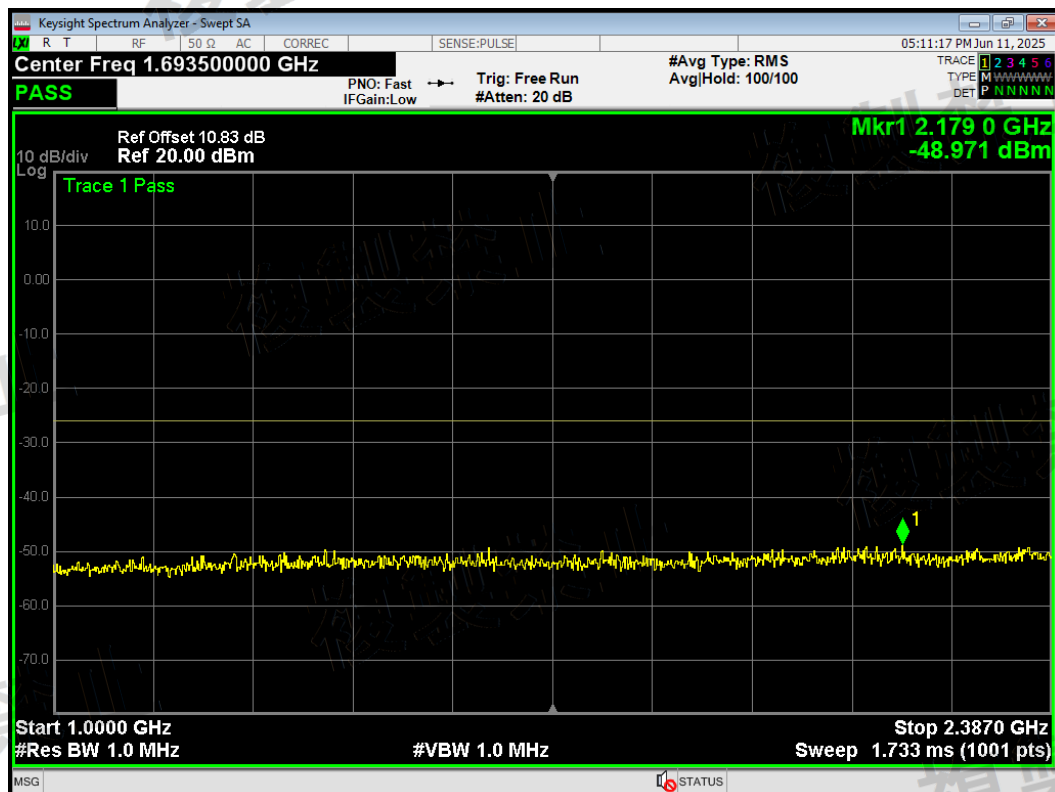
Tx. Spurious 2-DH5 2480MHz @ 2496.5MHz-13000MHz



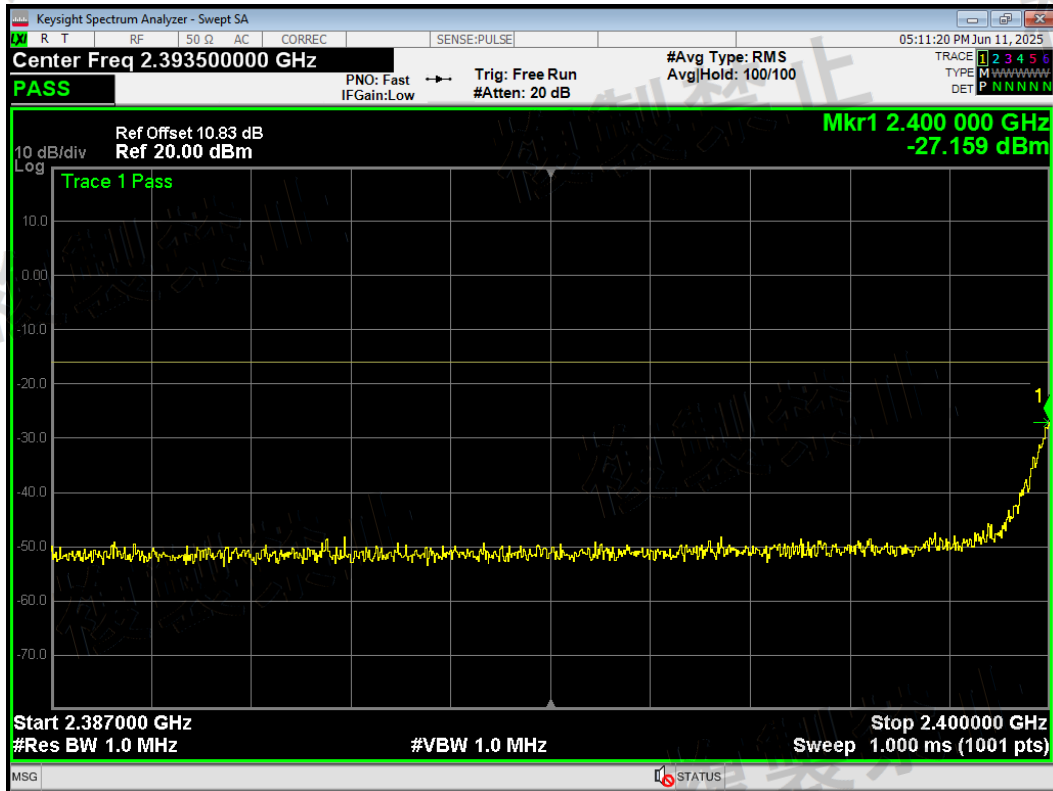
Tx. Spurious 3-DH5 2402MHz @ 30MHz-1000MHz



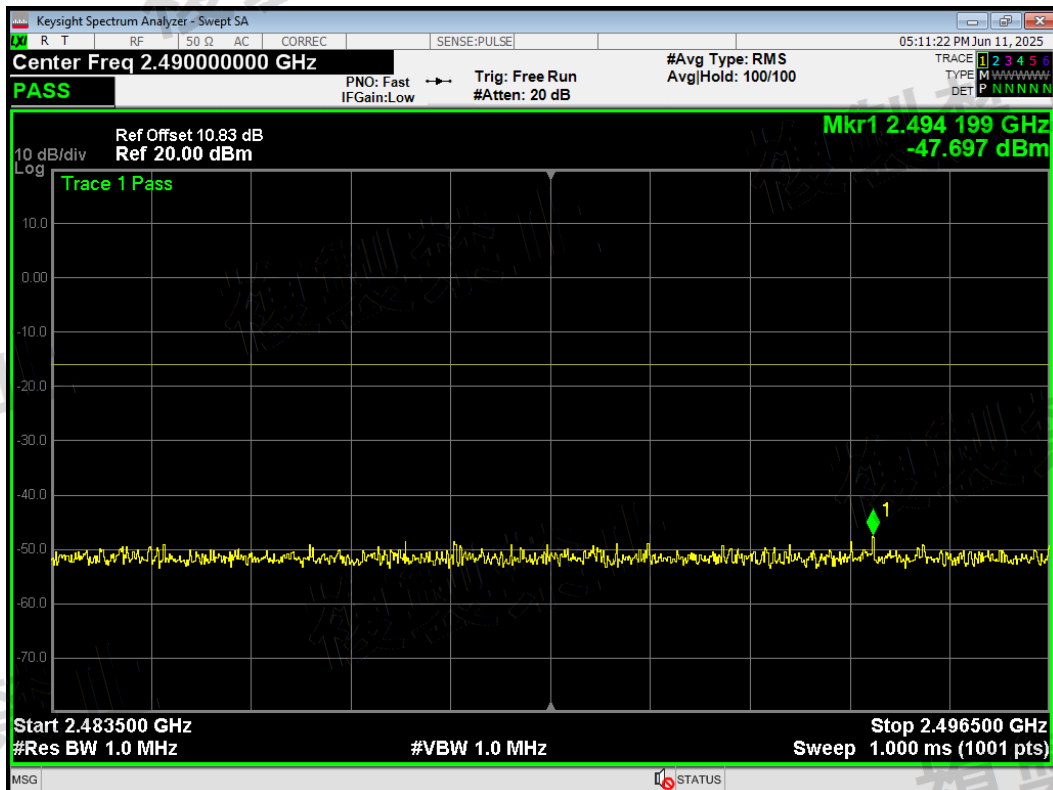
Tx. Spurious 3-DH5 2402MHz @ 1000MHz-2387MHz



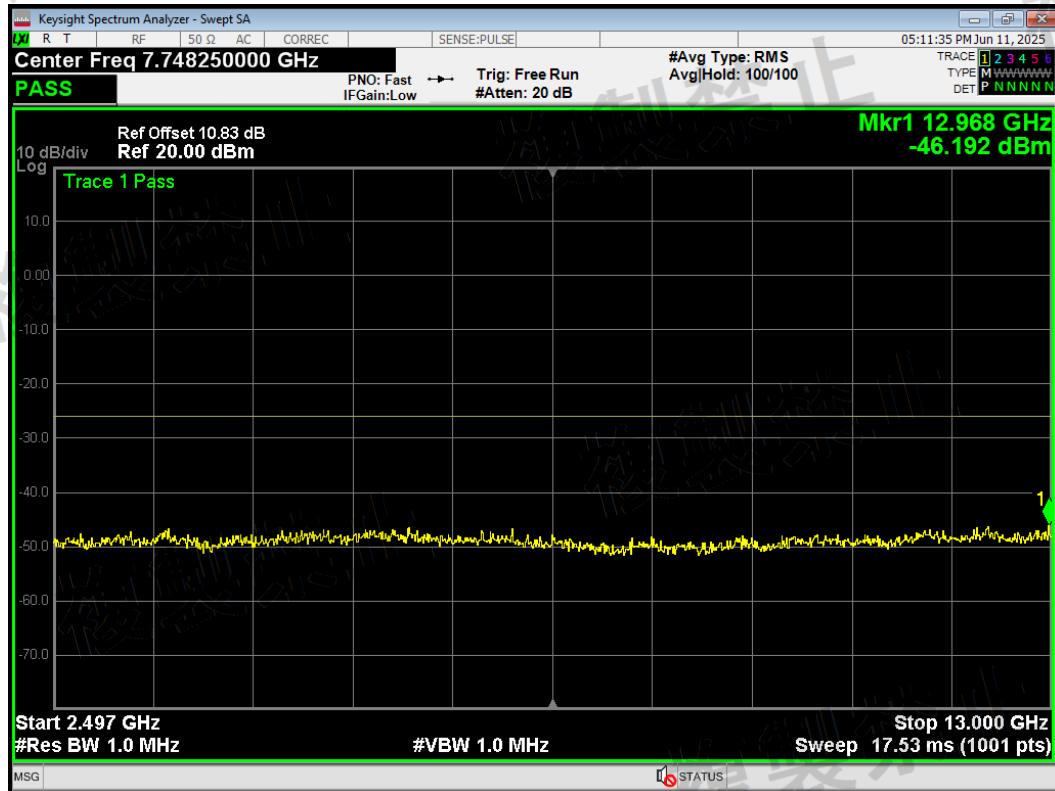
Tx. Spurious 3-DH5 2402MHz @ 2387MHz-2400MHz



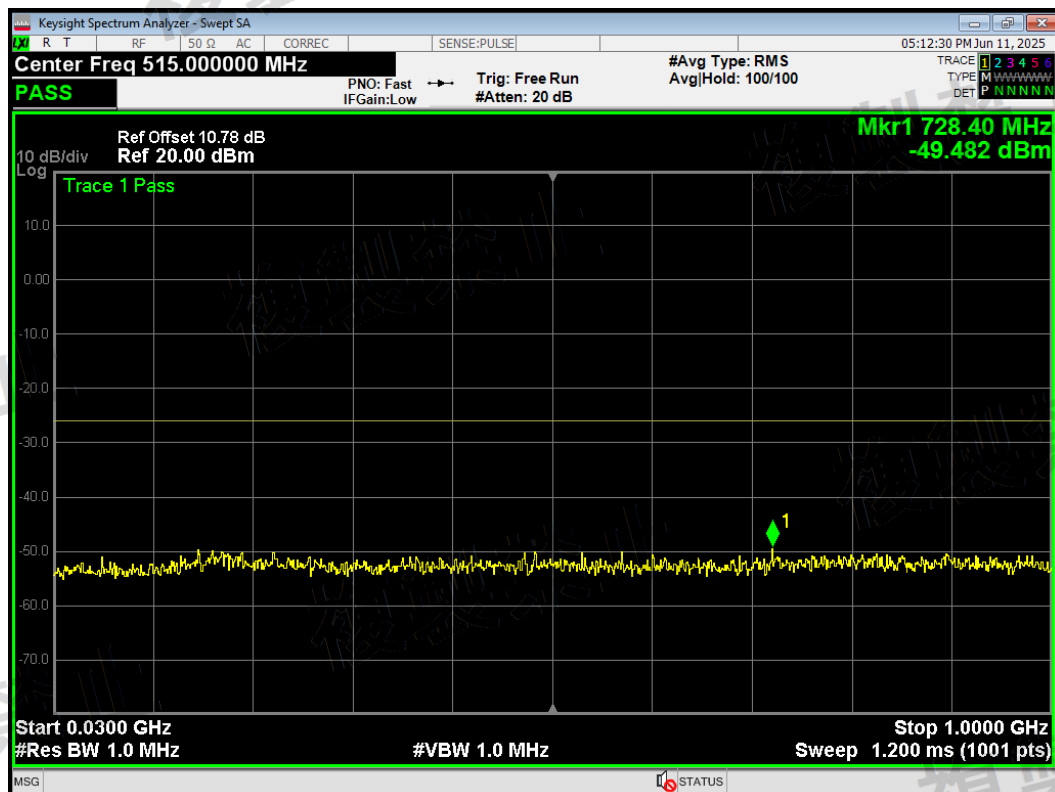
Tx. Spurious 3-DH5 2402MHz @ 2483.5MHz-2496.5MHz



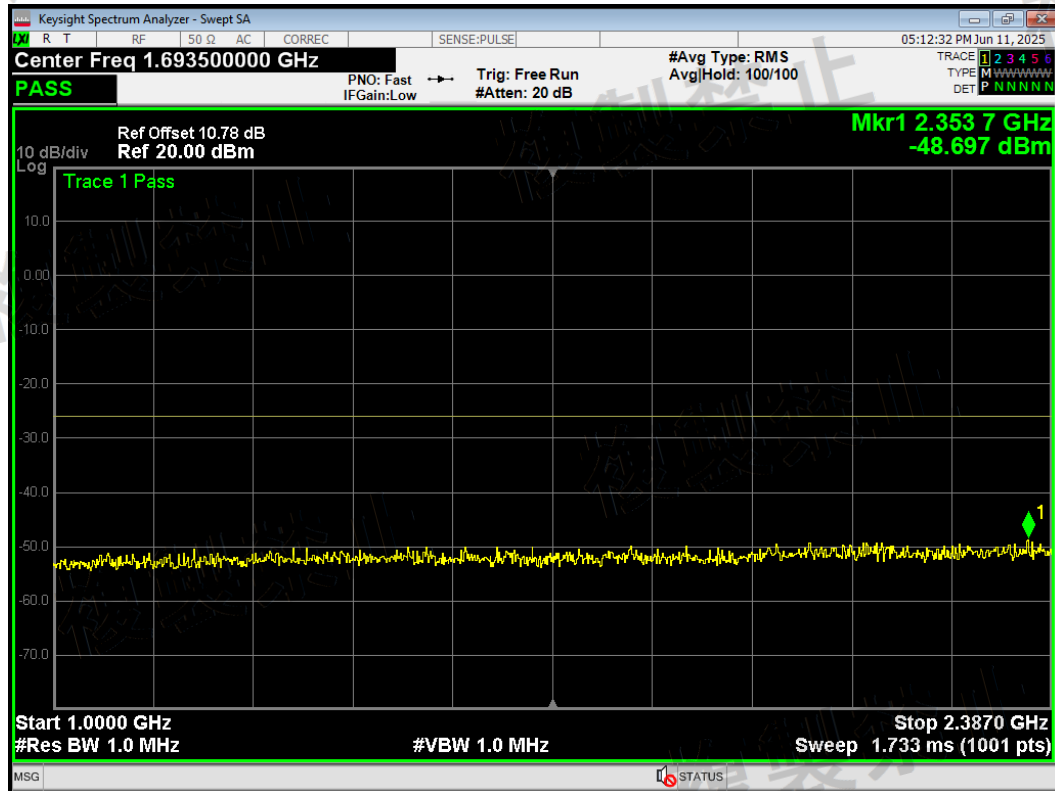
Tx. Spurious 3-DH5 2402MHz @ 2496.5MHz-13000MHz



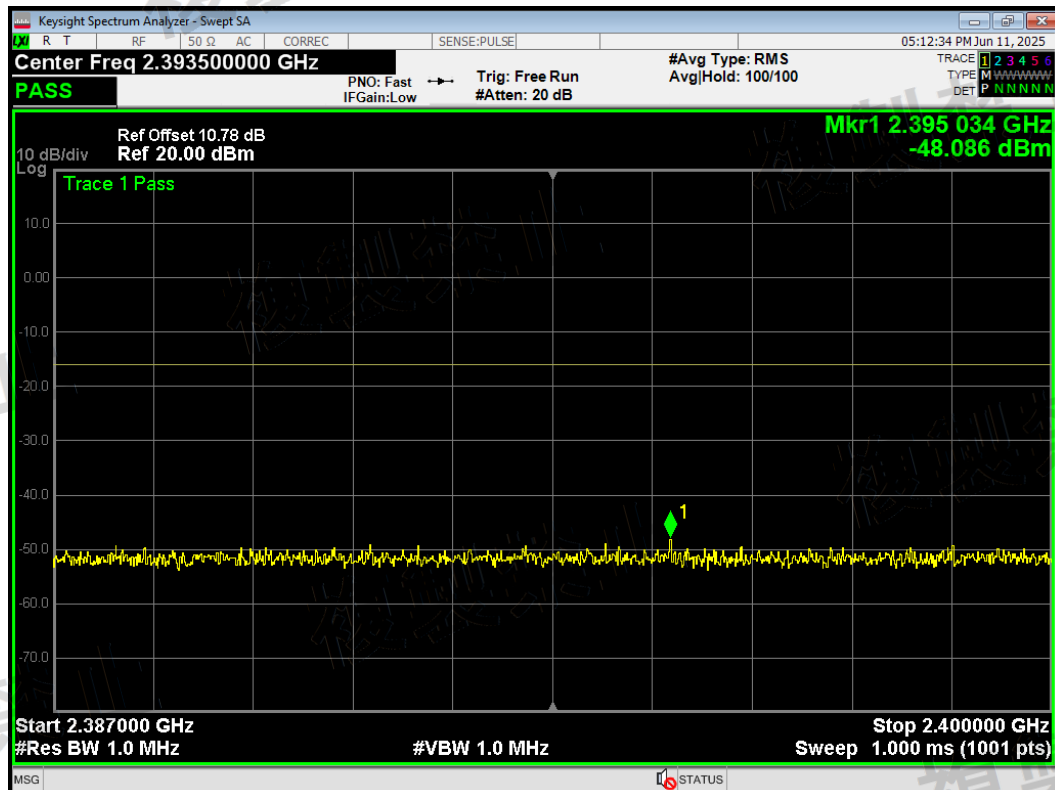
Tx. Spurious 3-DH5 2441MHz @ 30MHz-1000MHz



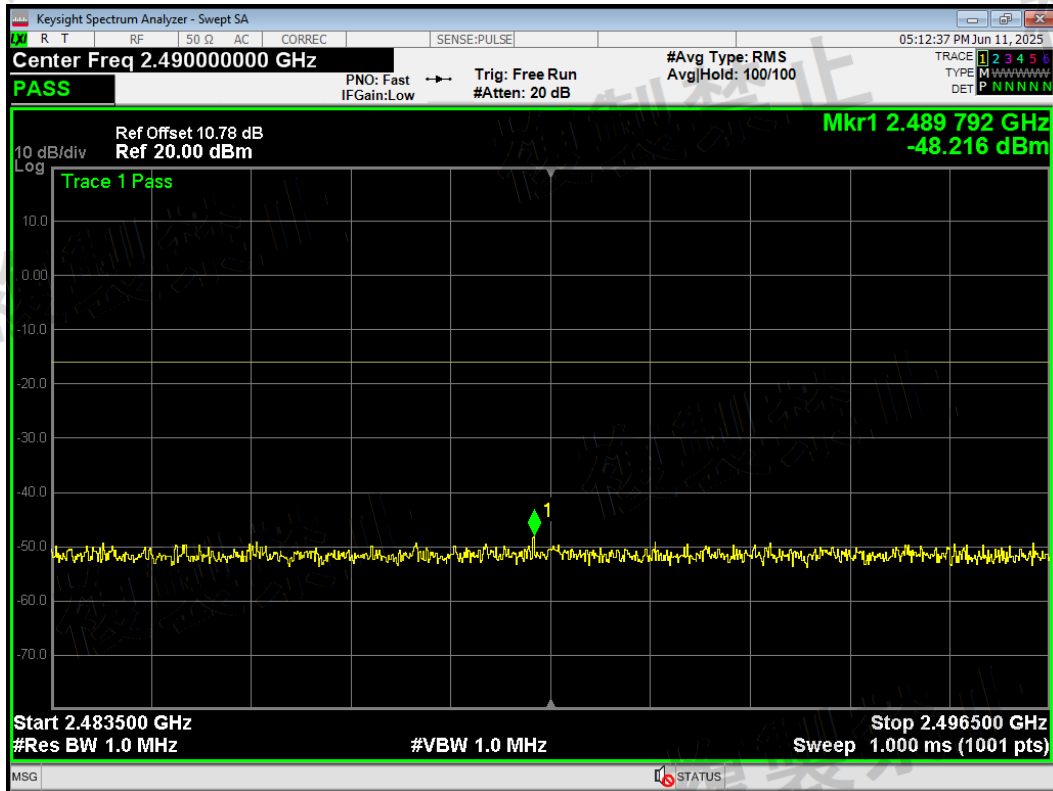
Tx. Spurious 3-DH5 2441MHz @ 1000MHz-2387MHz



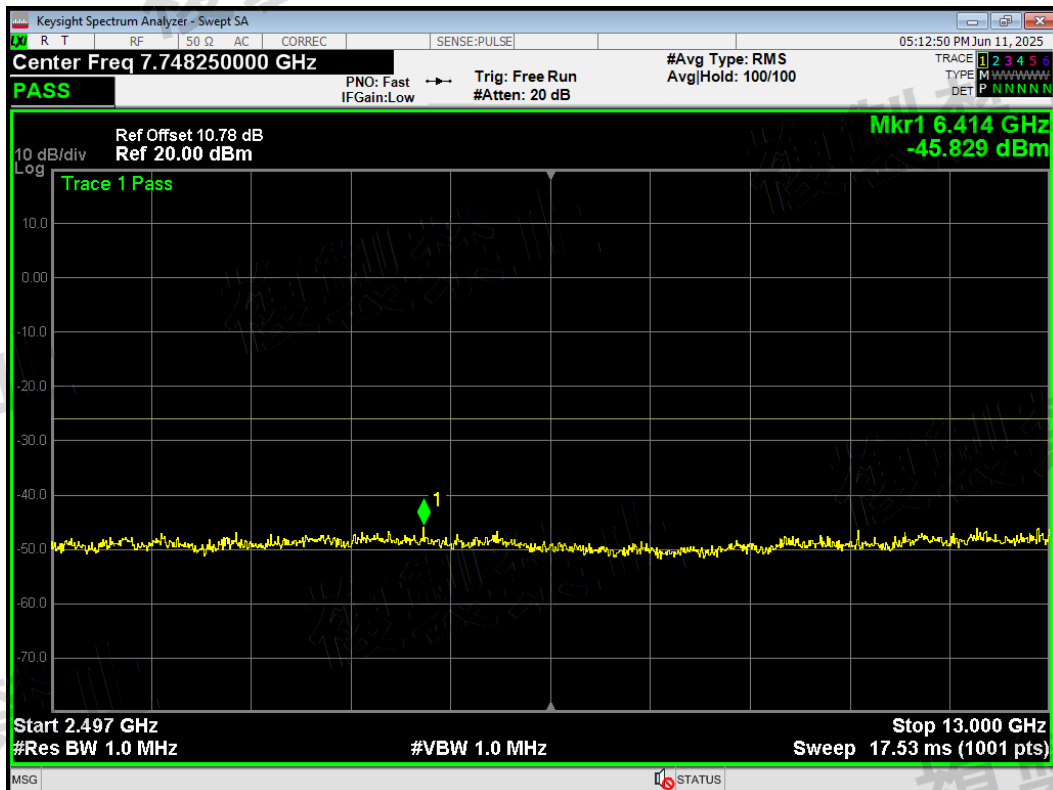
Tx. Spurious 3-DH5 2441MHz @ 2387MHz-2400MHz



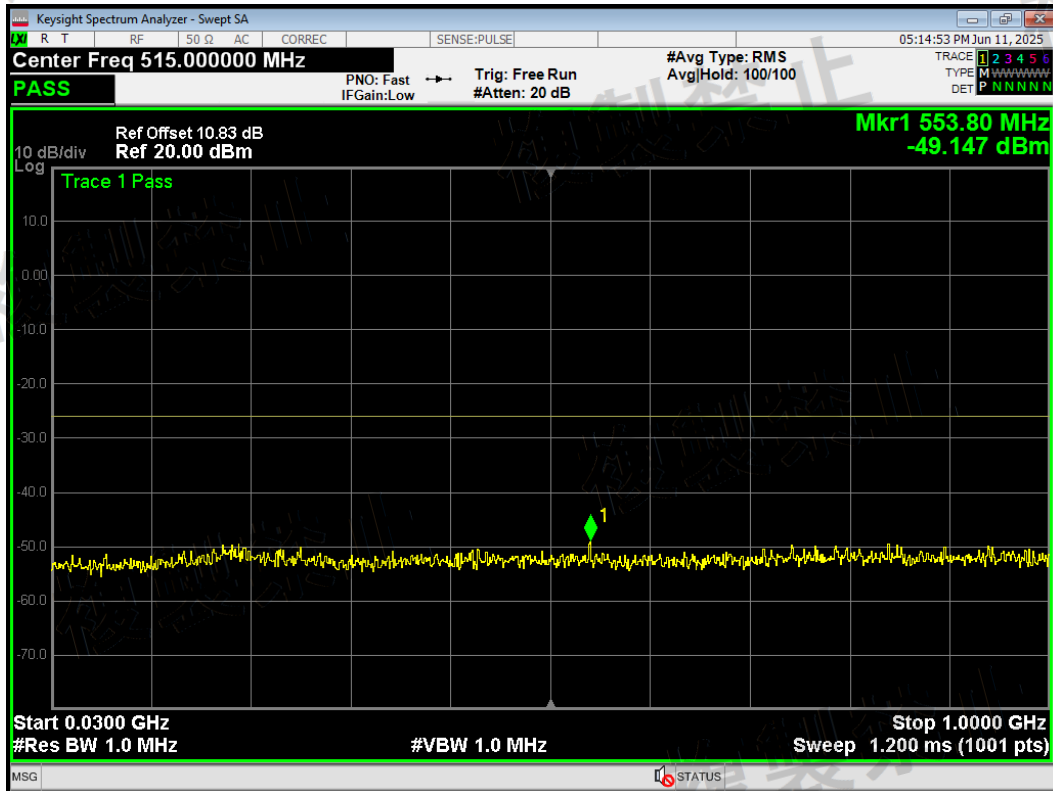
Tx. Spurious 3-DH5 2441MHz @ 2483.5MHz-2496.5MHz



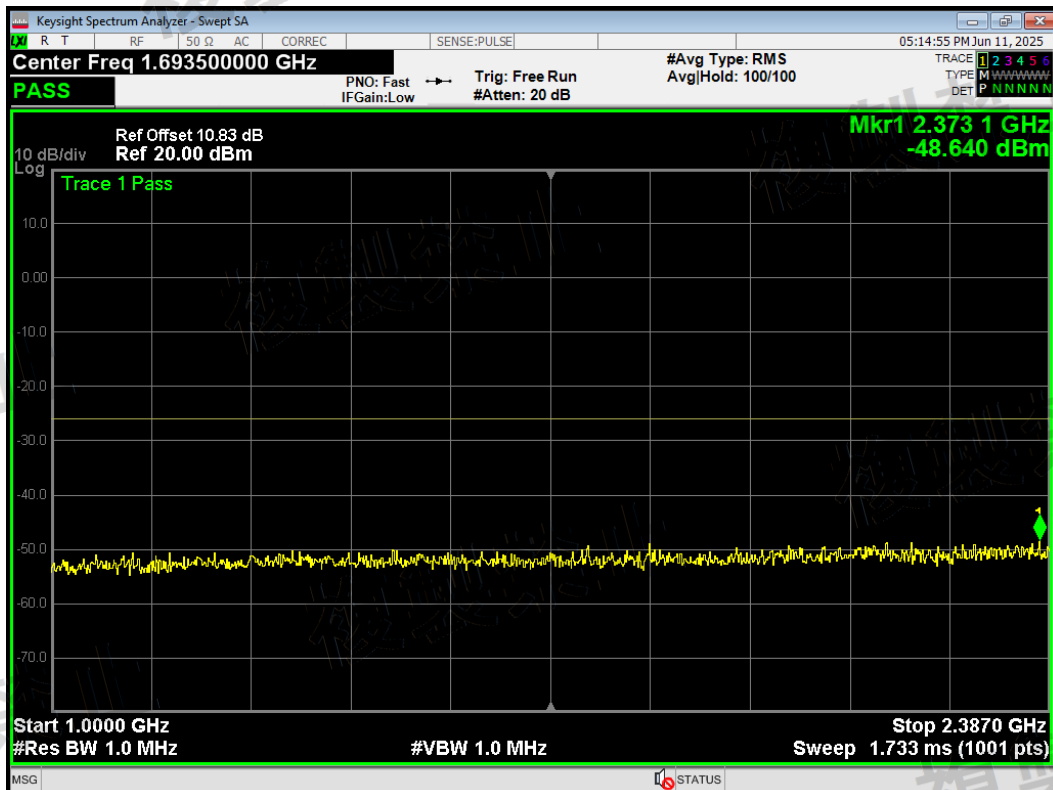
Tx. Spurious 3-DH5 2441MHz @ 2496.5MHz-13000MHz



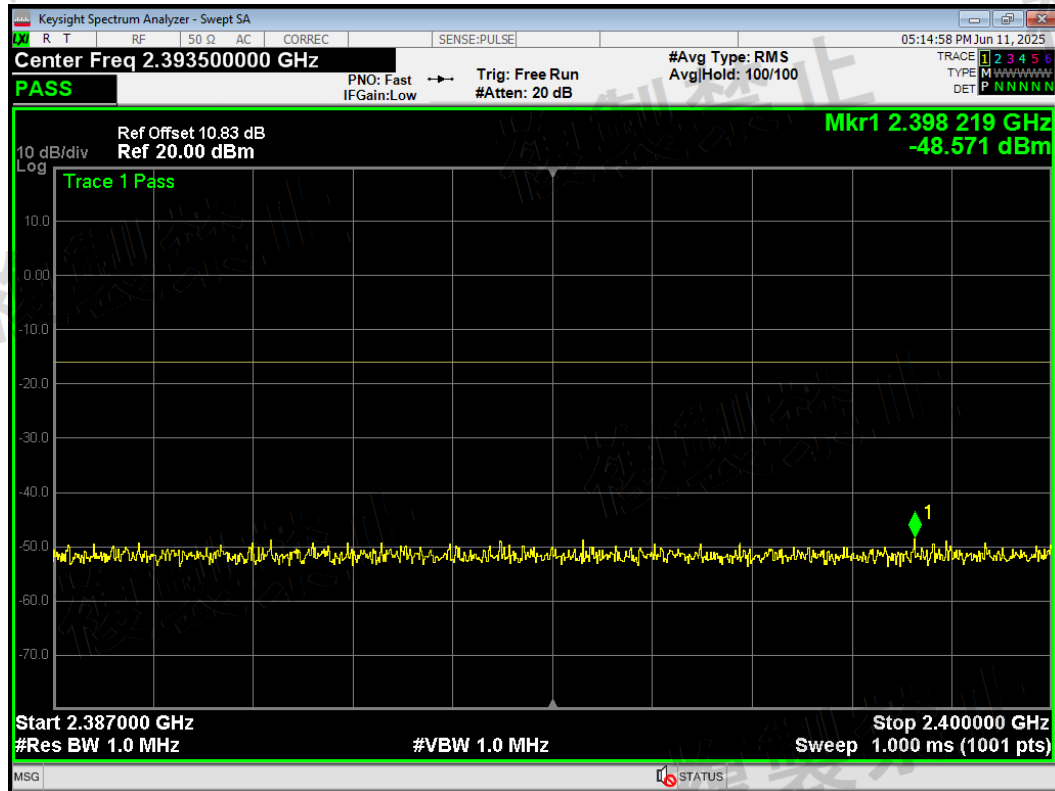
Tx. Spurious 3-DH5 2480MHz @ 30MHz-1000MHz



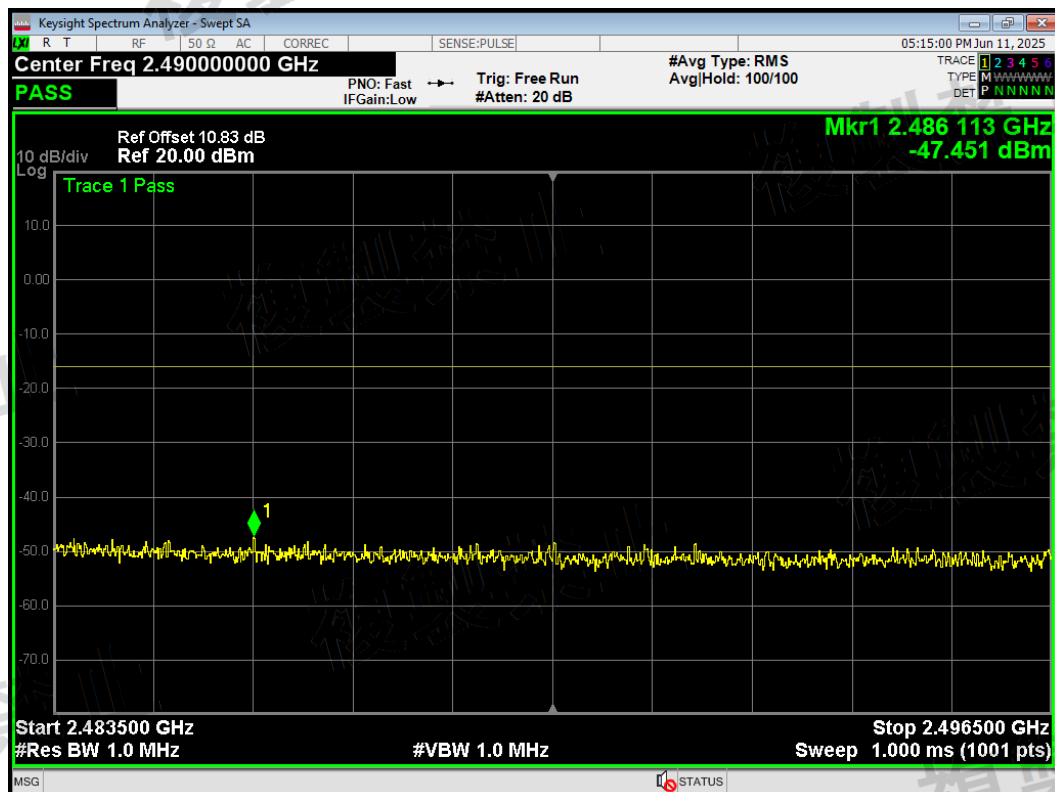
Tx. Spurious 3-DH5 2480MHz @ 1000MHz-2387MHz



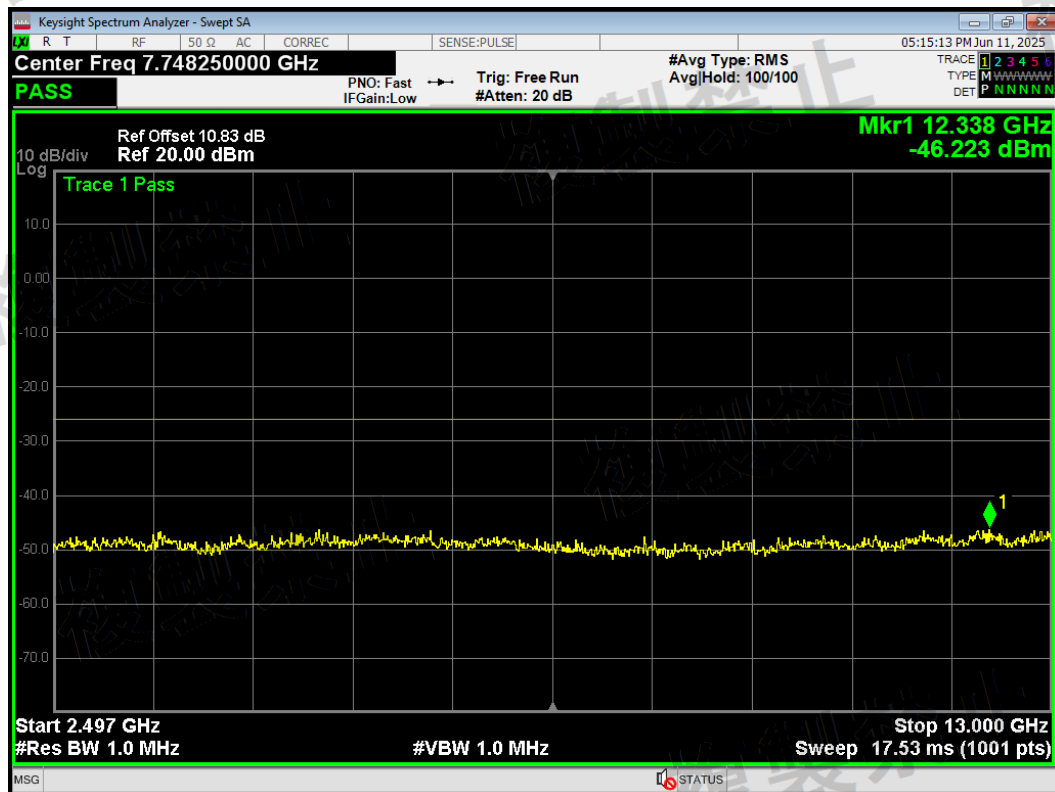
Tx. Spurious 3-DH5 2480MHz @ 2387MHz-2400MHz



Tx. Spurious 3-DH5 2480MHz @ 2483.5MHz-2496.5MHz

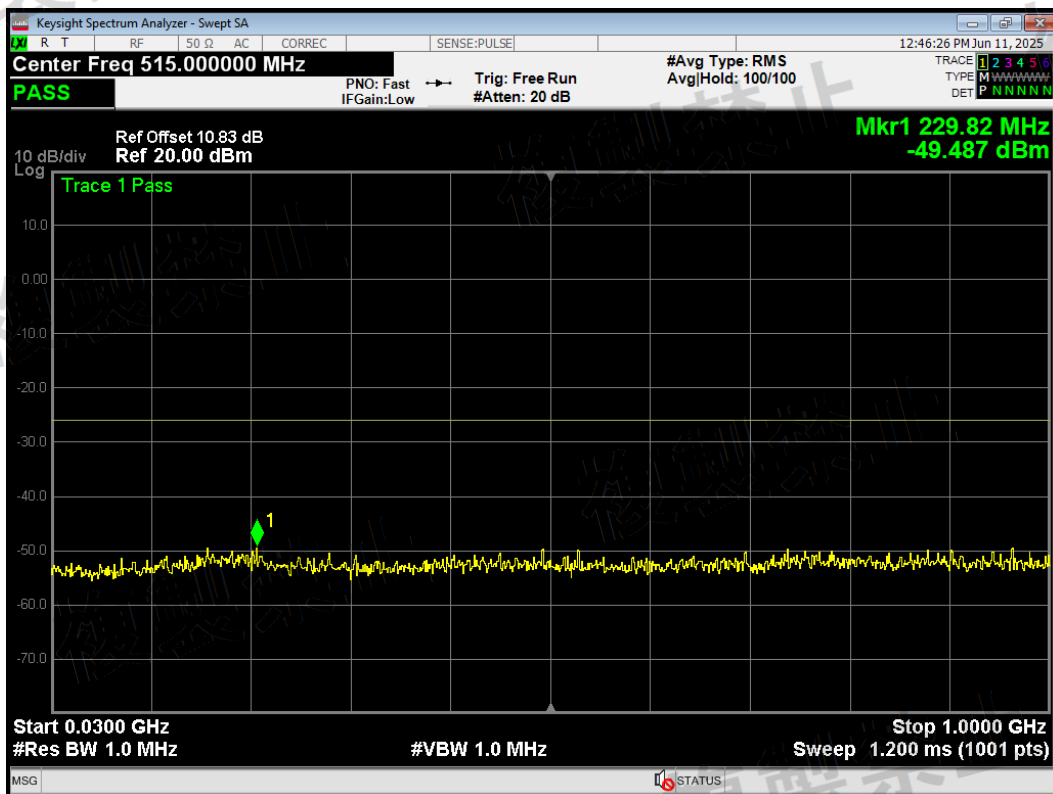


Tx. Spurious 3-DH5 2480MHz @ 2496.5MHz-13000MHz

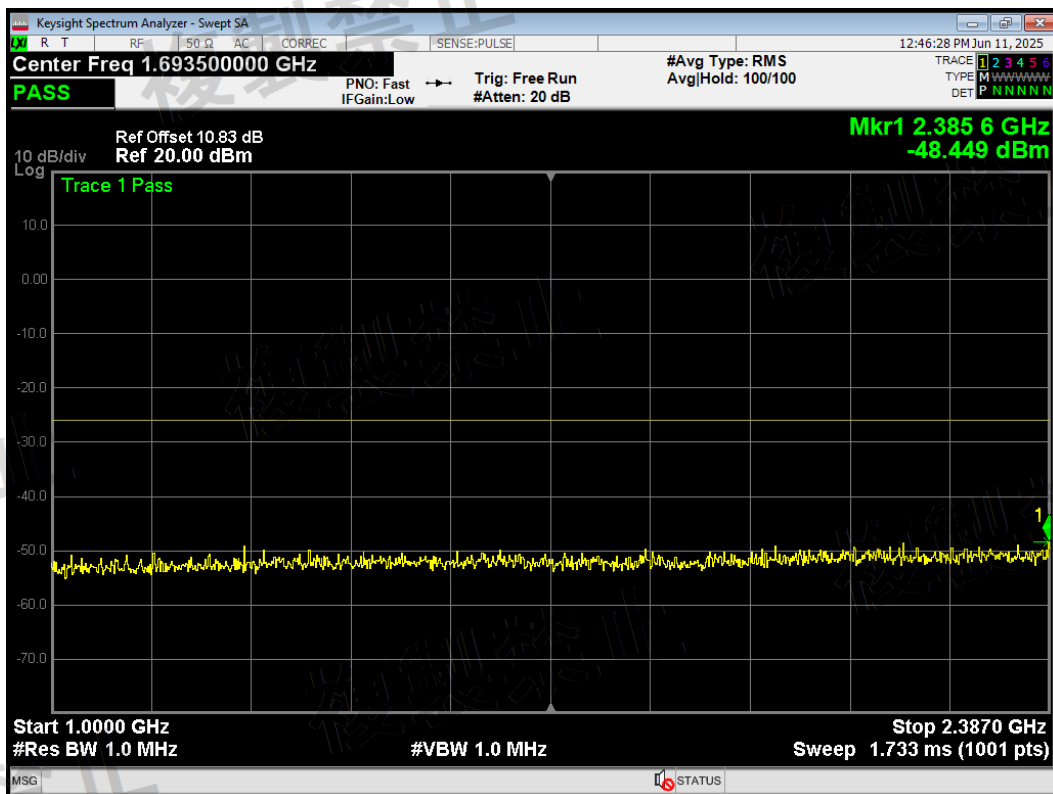


# Bluetooth LE

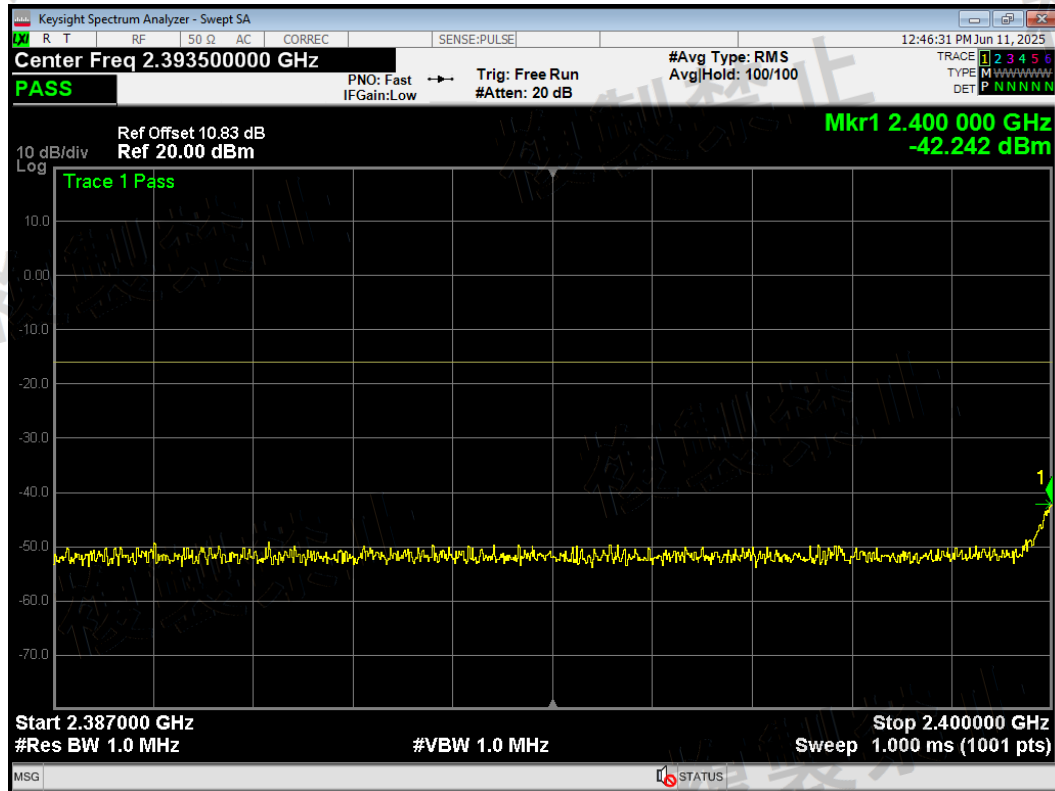
Tx. Spurious BLE (1M) 2402MHz @ 30MHz-1000MHz



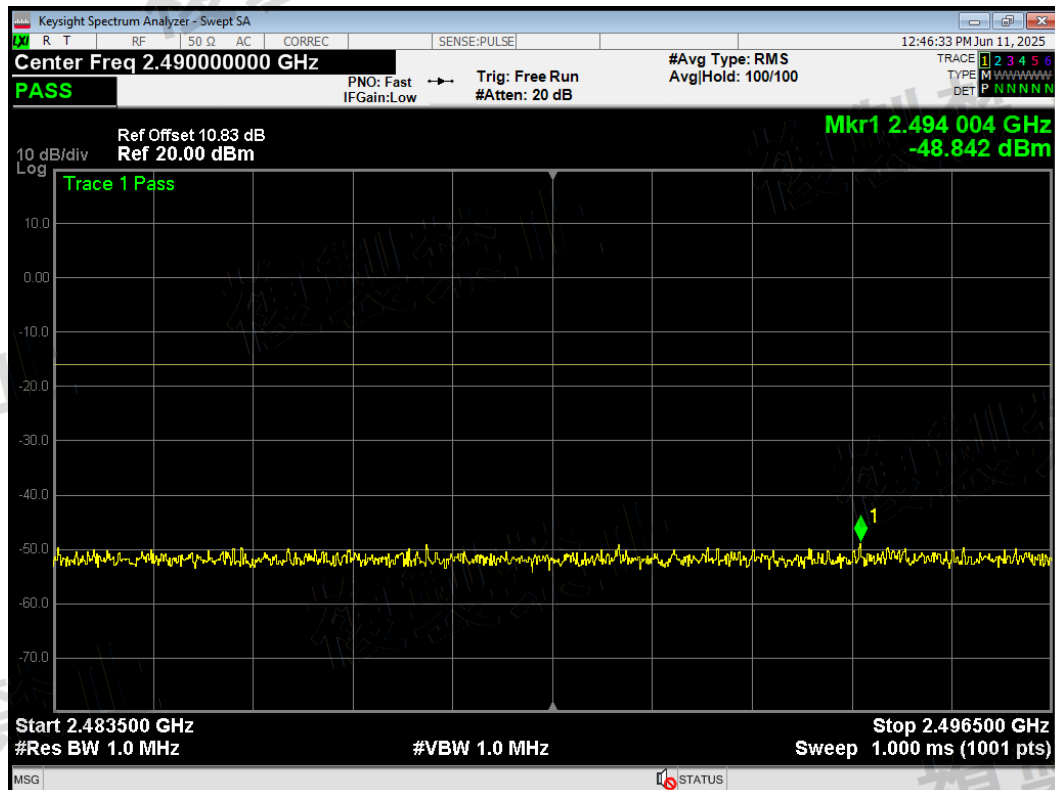
Tx. Spurious BLE (1M) 2402MHz @ 1000MHz-2387MHz



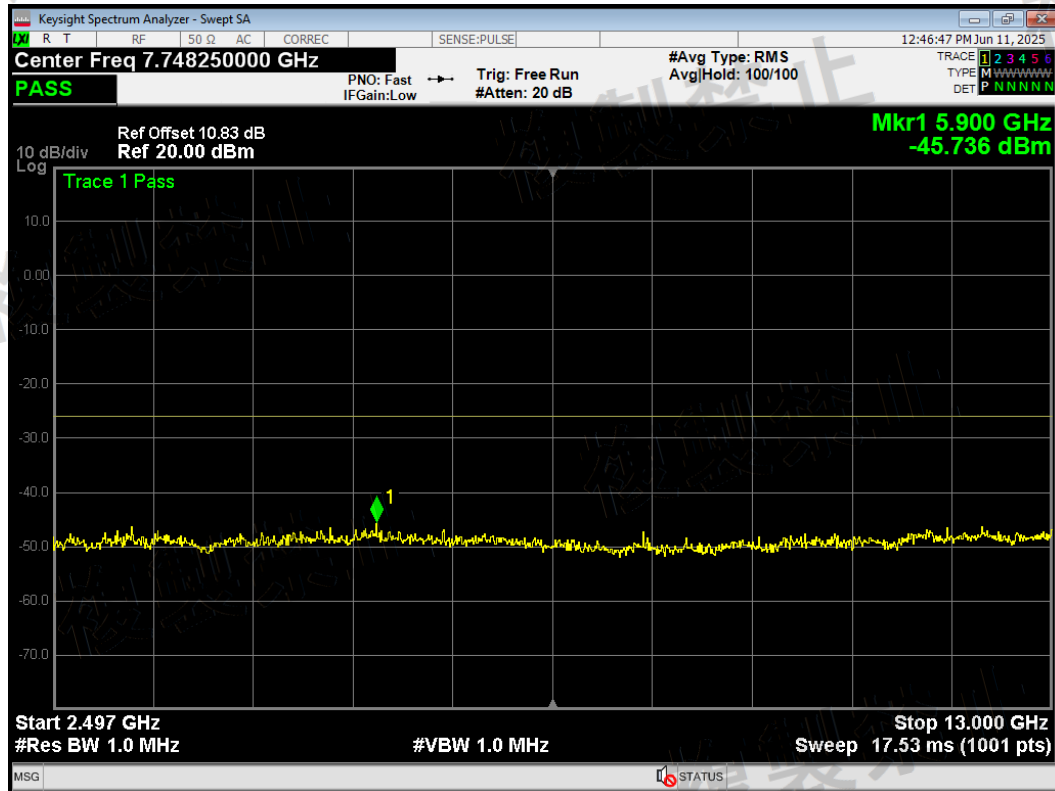
Tx. Spurious BLE (1M) 2402MHz @ 2387MHz-2400MHz



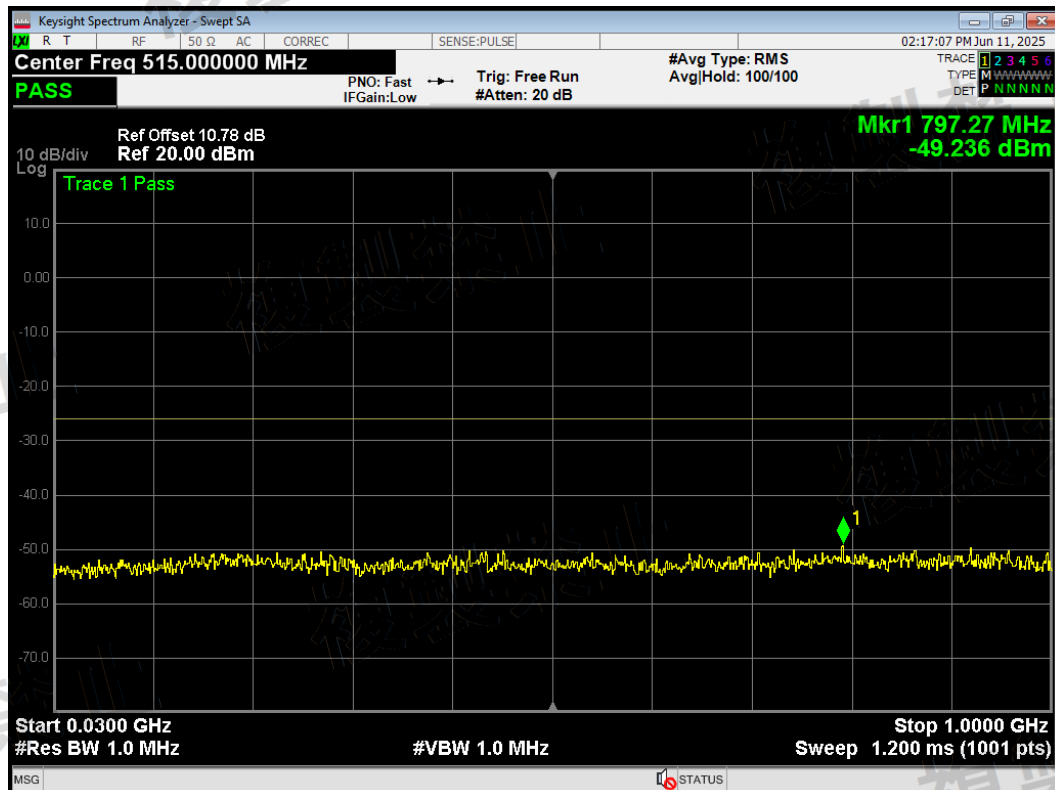
Tx. Spurious BLE (1M) 2402MHz @ 2483.5MHz-2496.5MHz



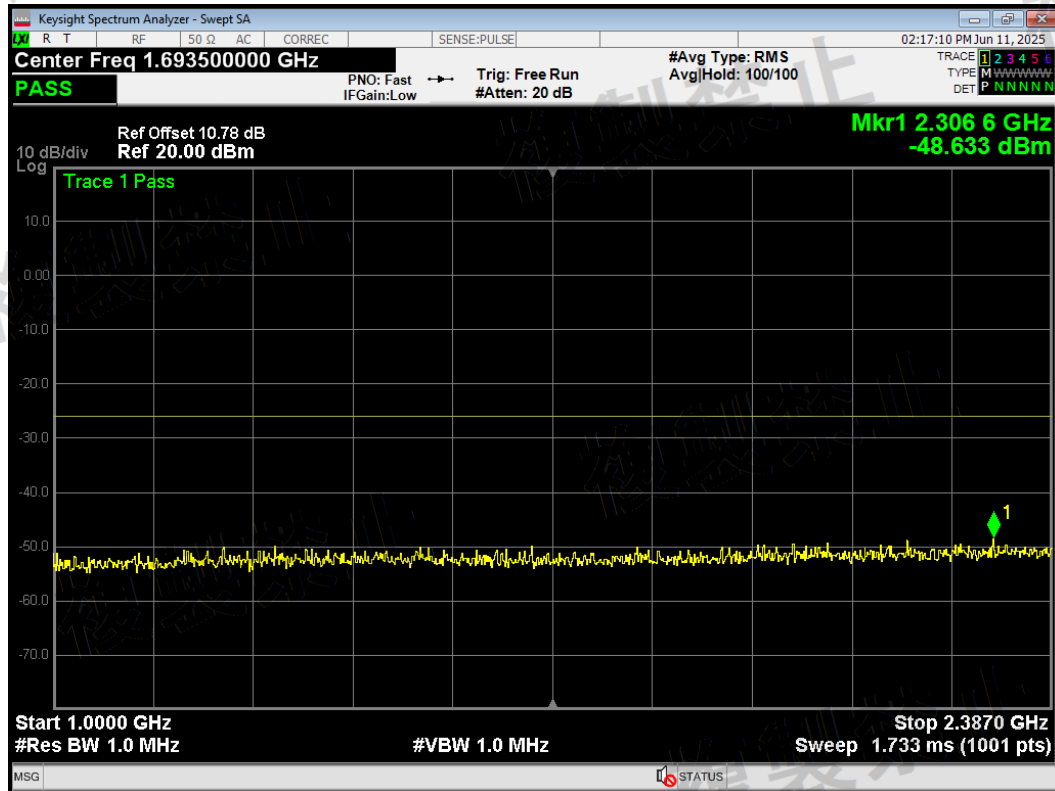
Tx. Spurious BLE (1M) 2402MHz @ 2496.5MHz-13000MHz



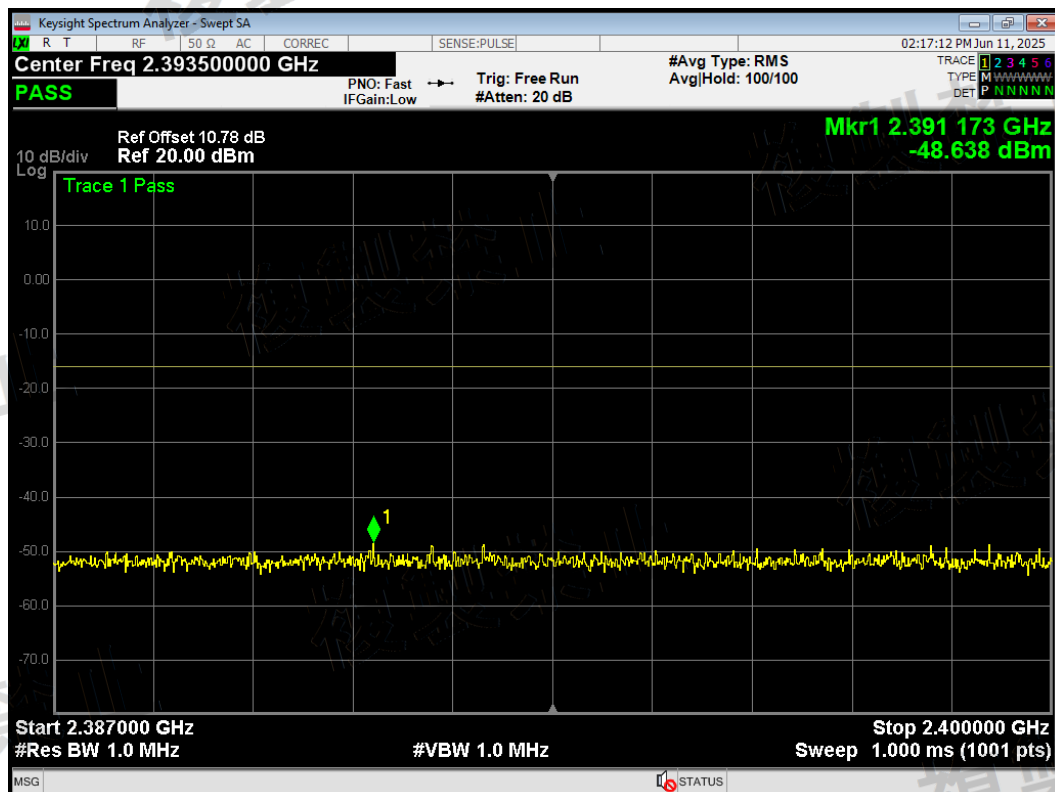
Tx. Spurious BLE (1M) 2440MHz @ 30MHz-1000MHz



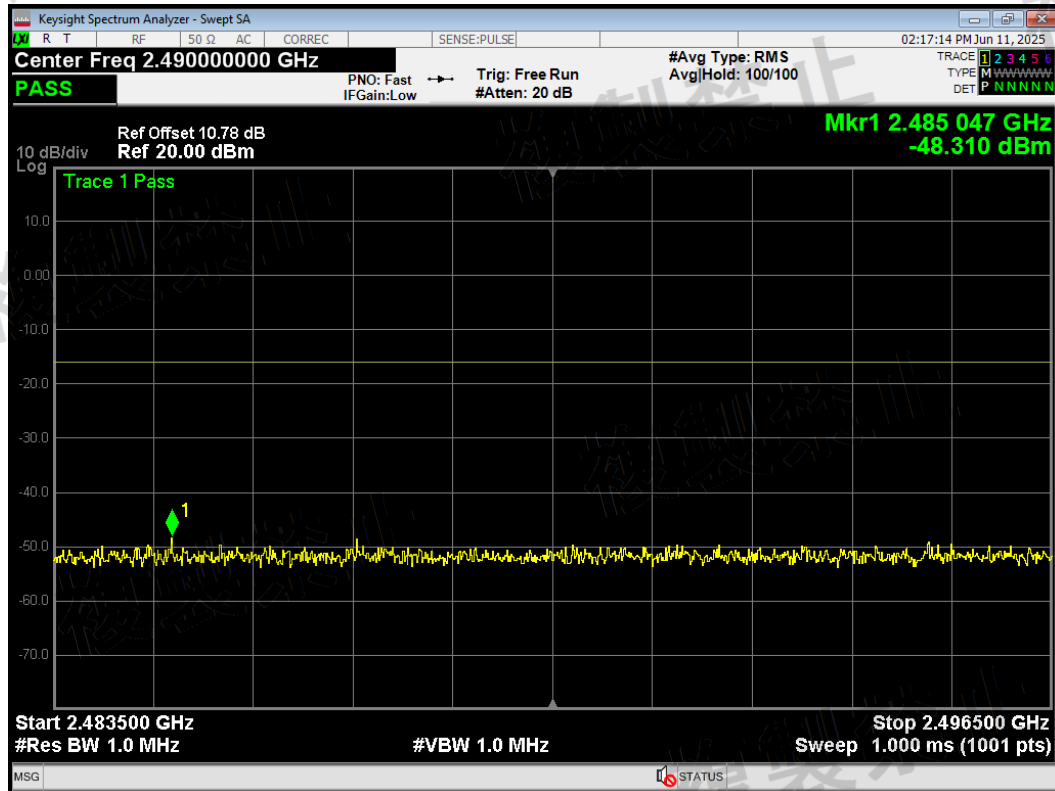
Tx. Spurious BLE (1M) 2440MHz @ 1000MHz-2387MHz



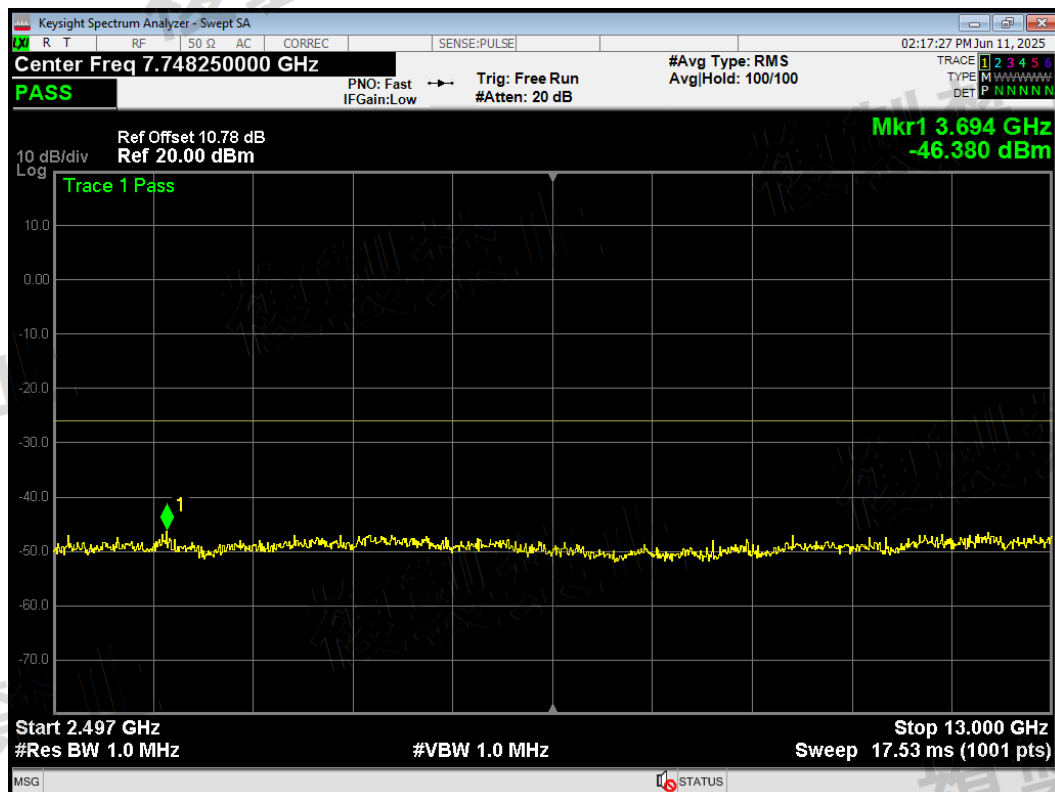
Tx. Spurious BLE (1M) 2440MHz @ 2387MHz-2400MHz



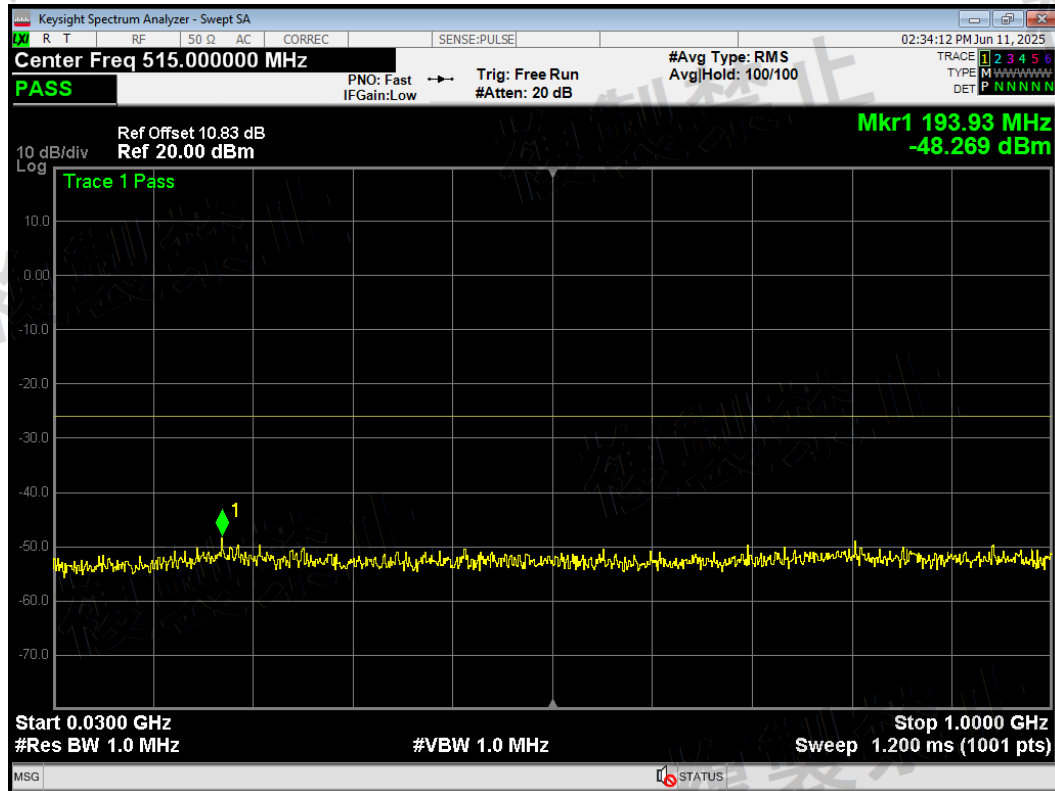
Tx. Spurious BLE (1M) 2440MHz @ 2483.5MHz-2496.5MHz



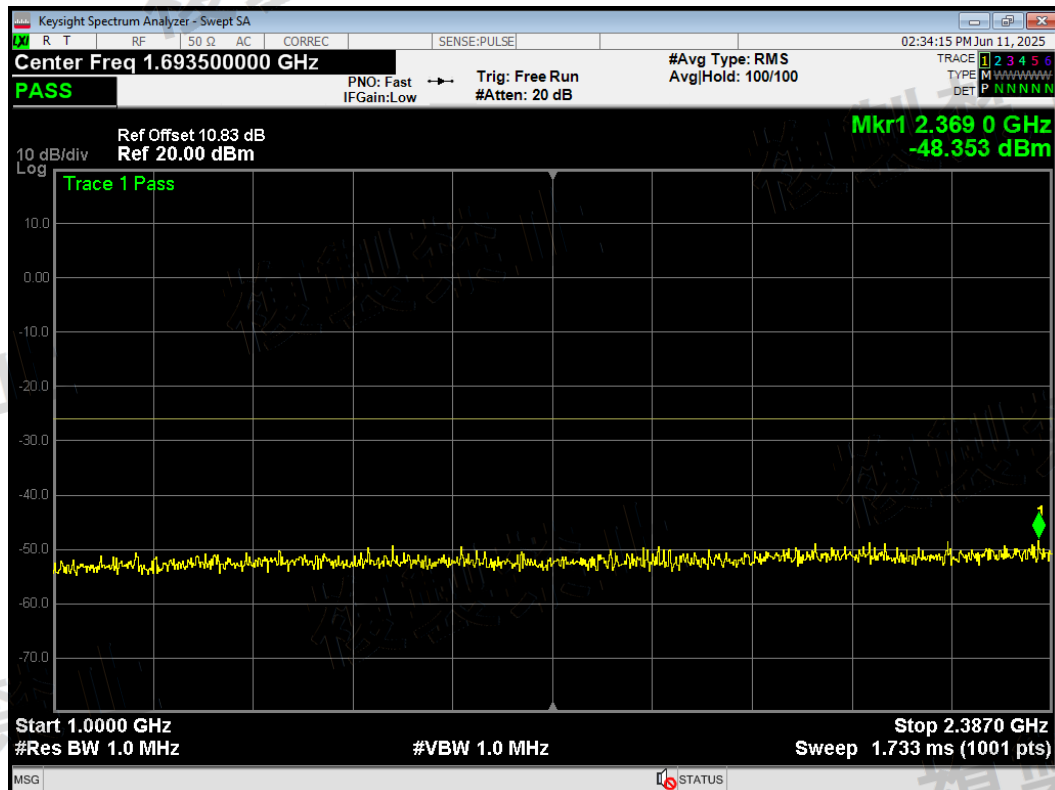
Tx. Spurious BLE (1M) 2440MHz @ 2496.5MHz-13000MHz



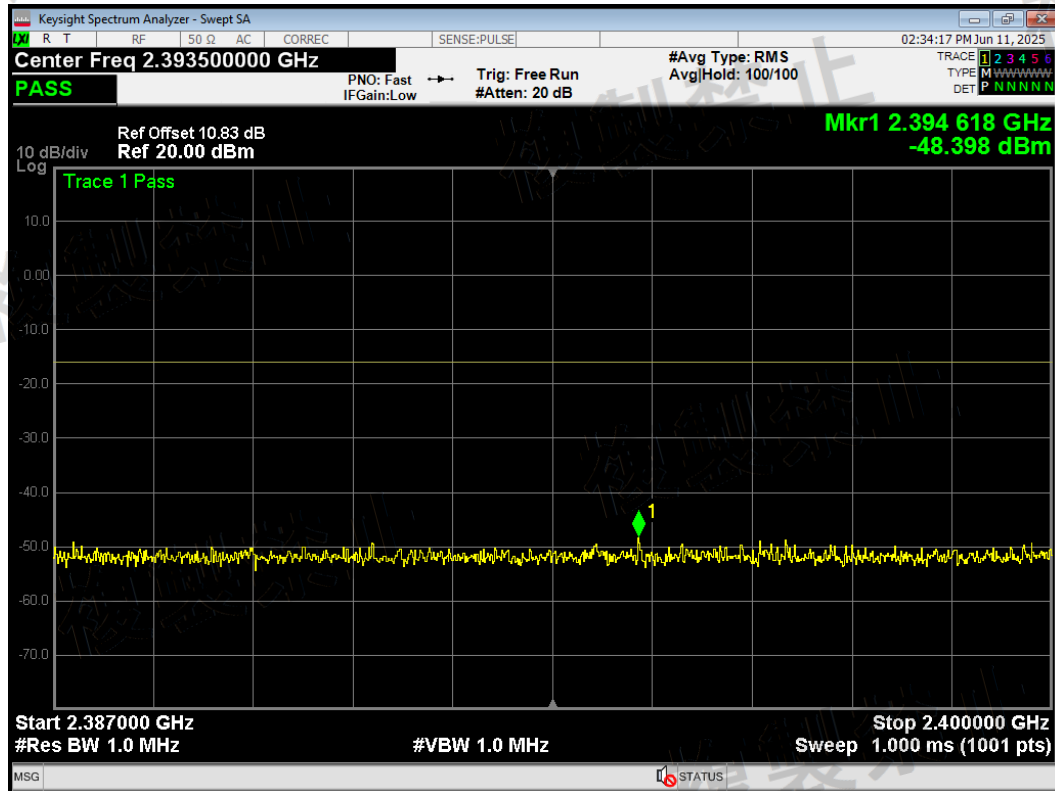
Tx. Spurious BLE (1M) 2480MHz @ 30MHz-1000MHz



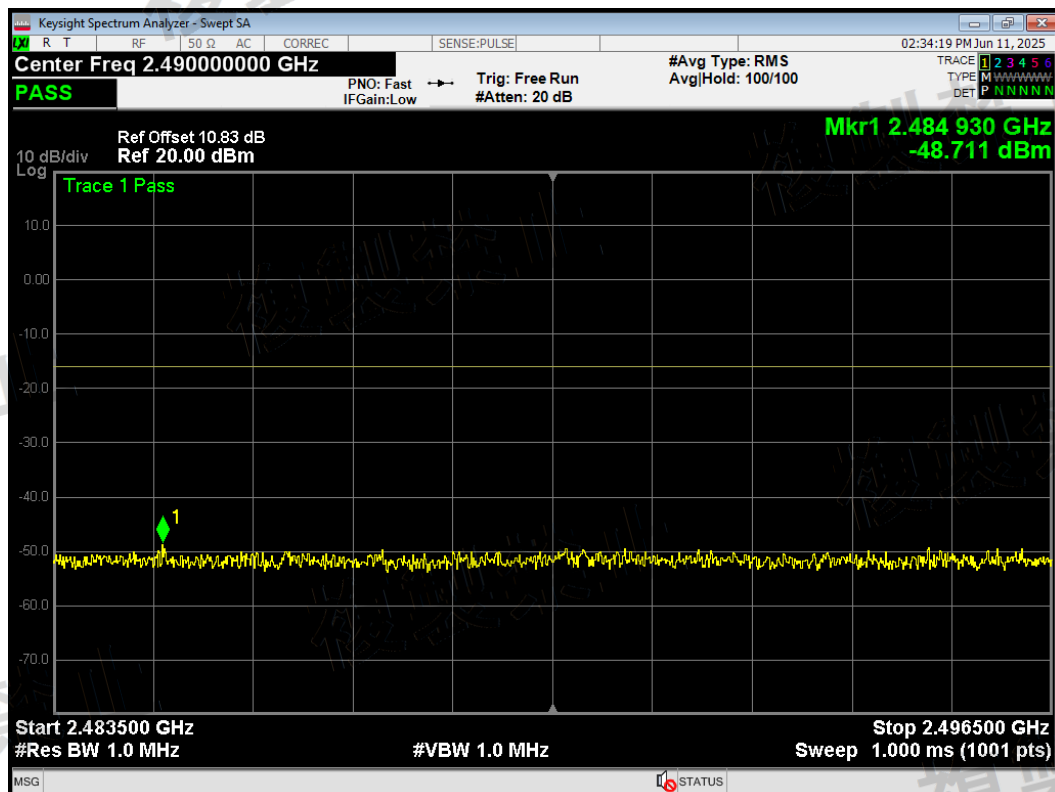
Tx. Spurious BLE (1M) 2480MHz @ 1000MHz-2387MHz



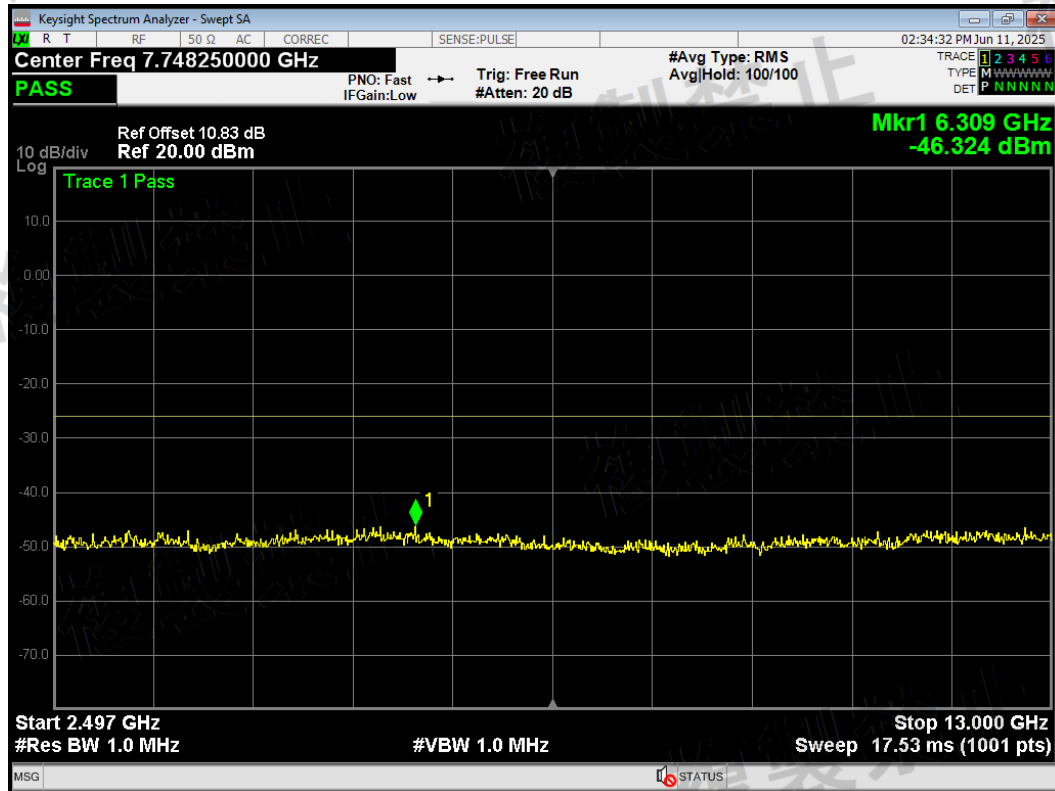
Tx. Spurious BLE (1M) 2480MHz @ 2387MHz-2400MHz



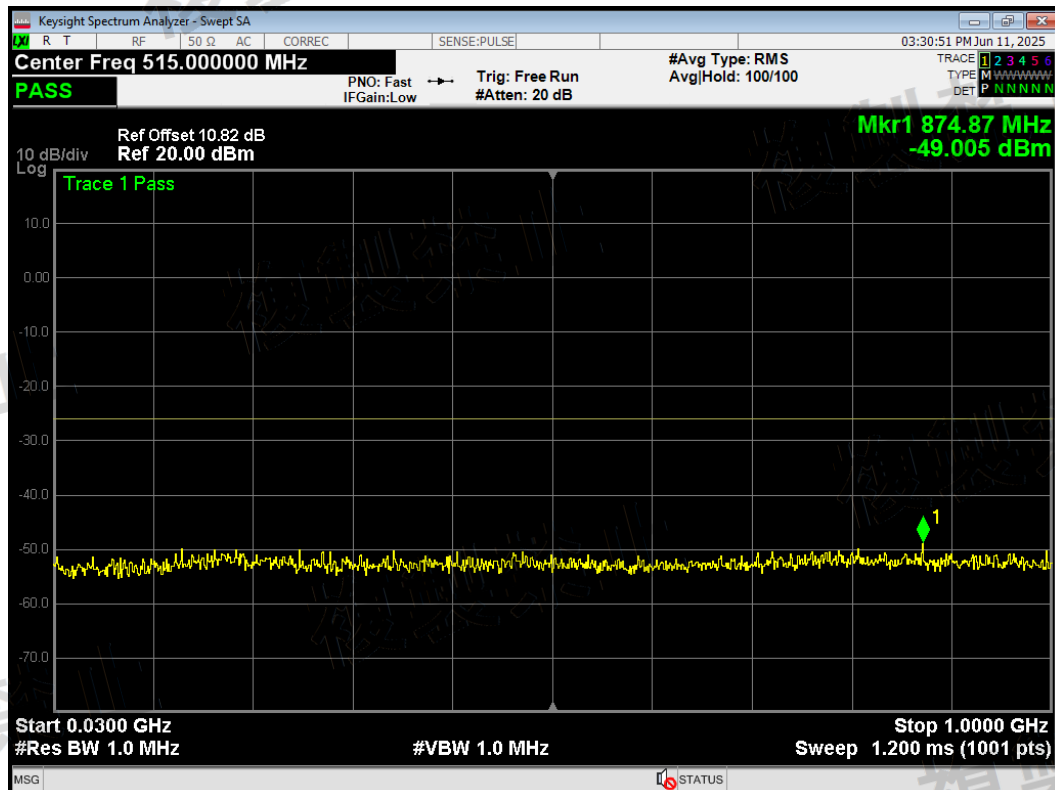
Tx. Spurious BLE (1M) 2480MHz @ 2483.5MHz-2496.5MHz



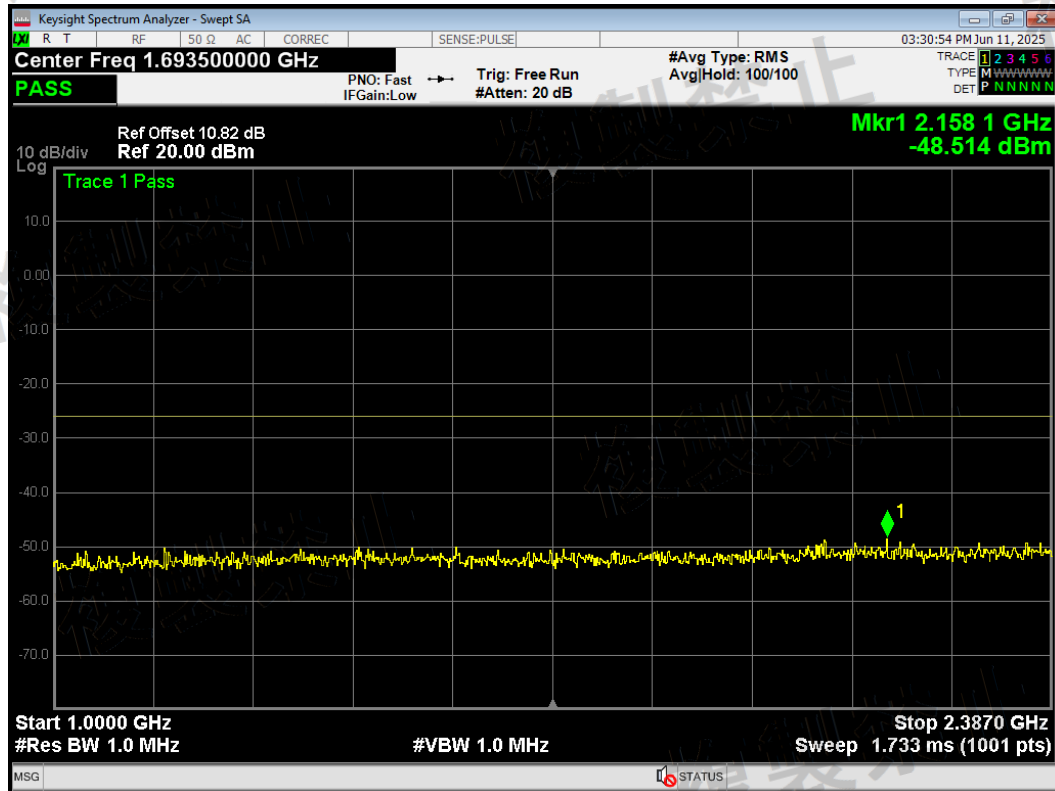
Tx. Spurious BLE (1M) 2480MHz @ 2496.5MHz-13000MHz



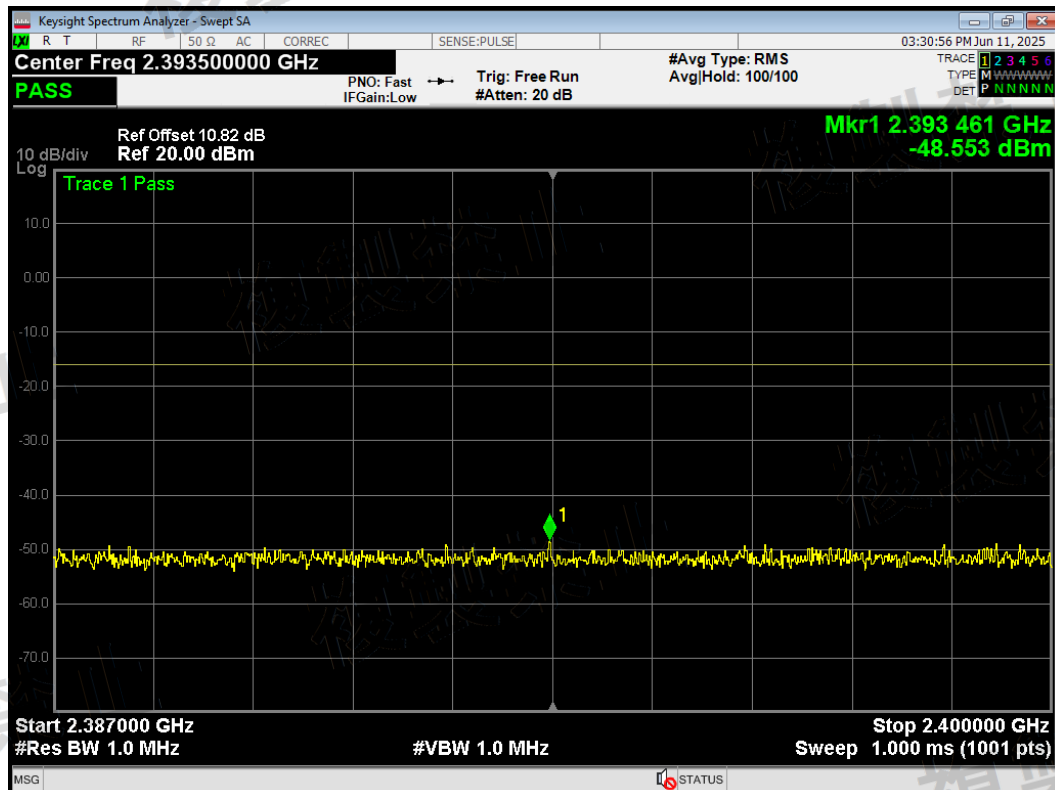
Tx. Spurious BLE (2M) 2404MHz @ 30MHz-1000MHz



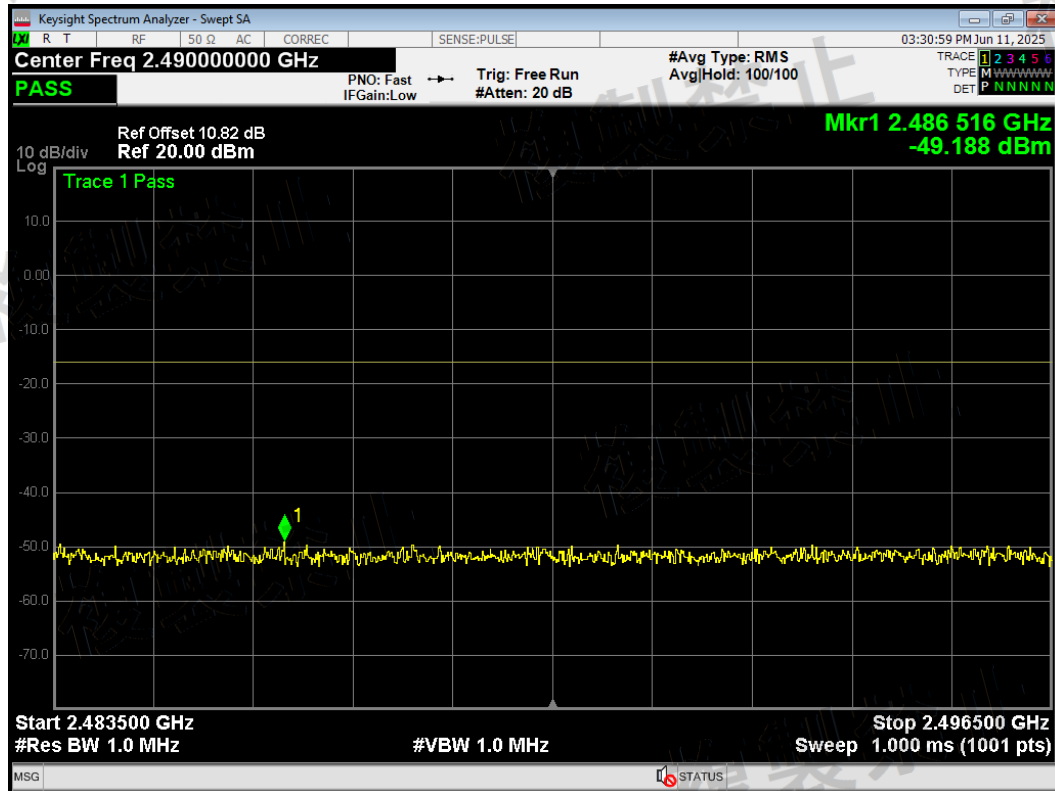
Tx. Spurious BLE (2M) 2404MHz @ 1000MHz-2387MHz



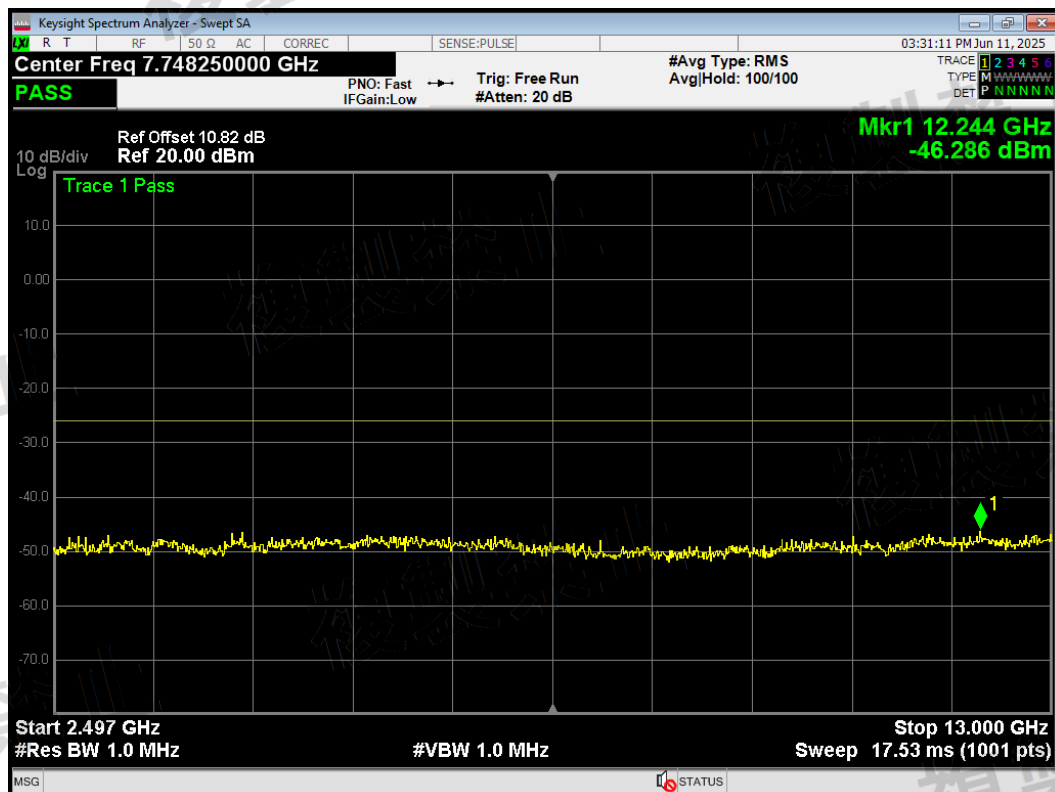
Tx. Spurious BLE (2M) 2404MHz @ 2387MHz-2400MHz



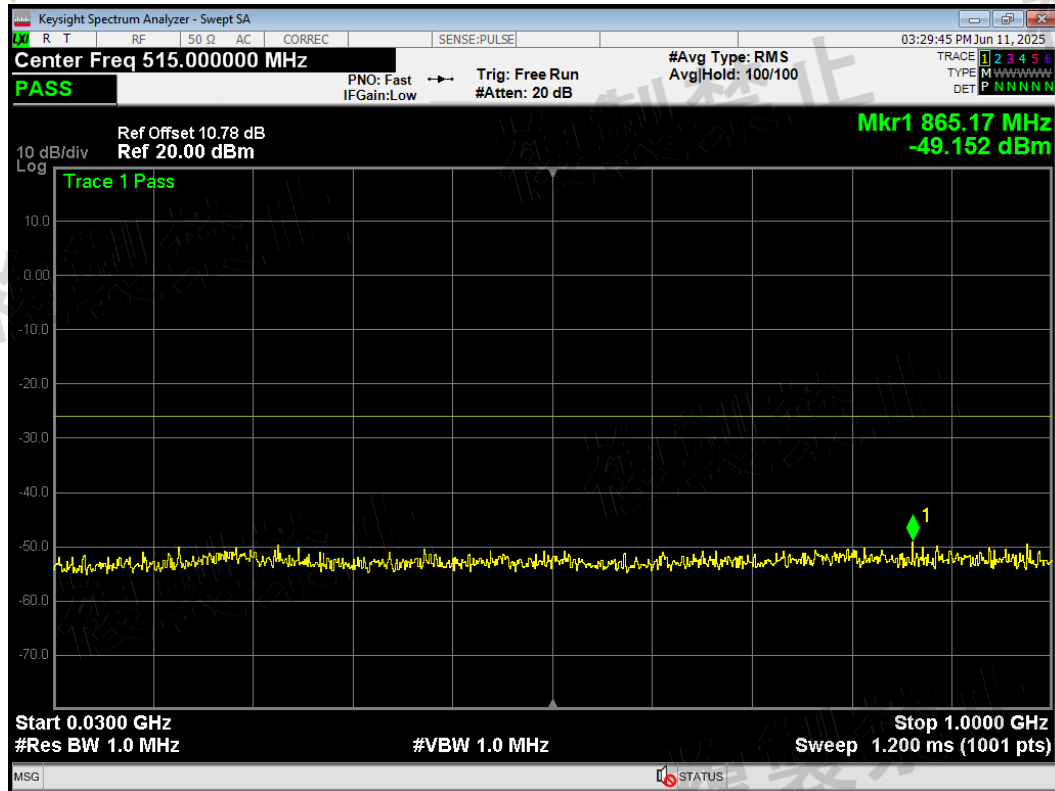
Tx. Spurious BLE (2M) 2404MHz @ 2483.5MHz-2496.5MHz



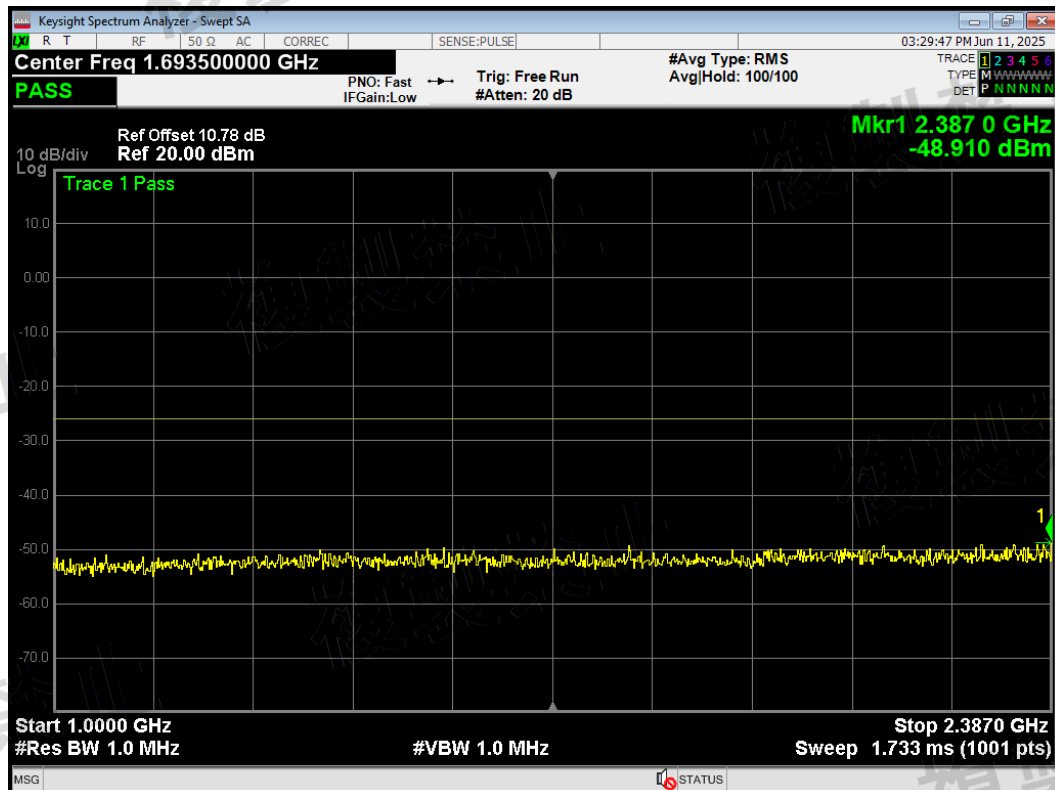
Tx. Spurious BLE (2M) 2404MHz @ 2496.5MHz-13000MHz



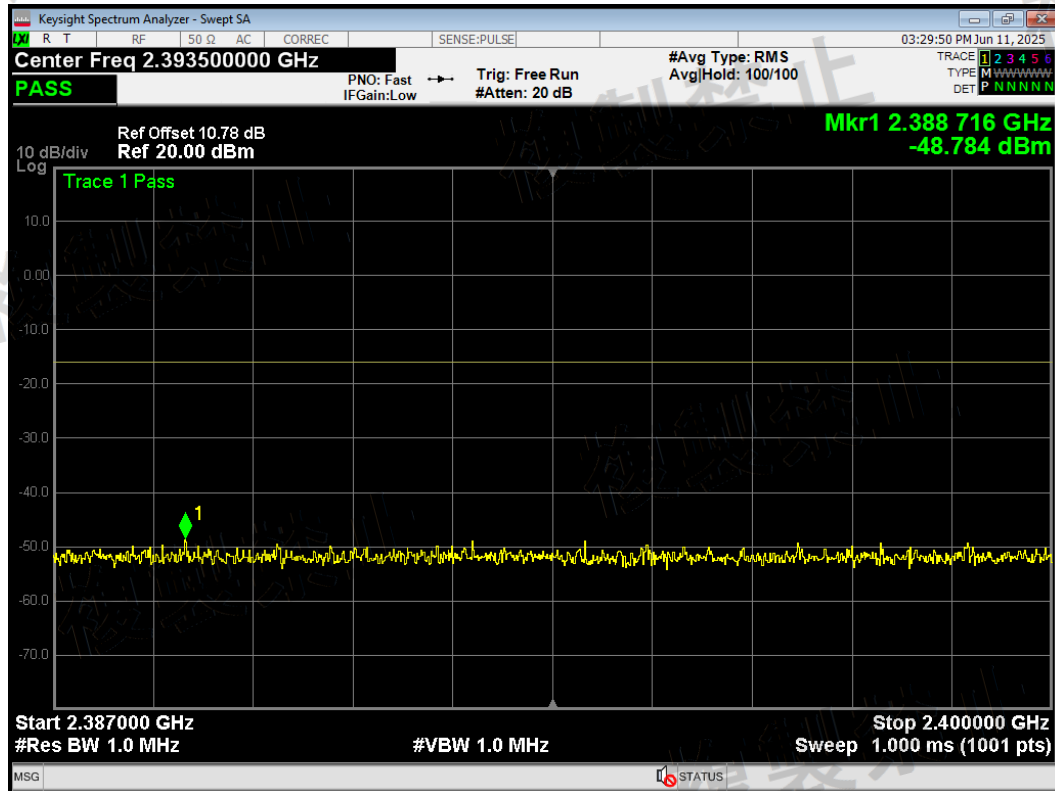
Tx. Spurious BLE (2M) 2440MHz @ 30MHz-1000MHz



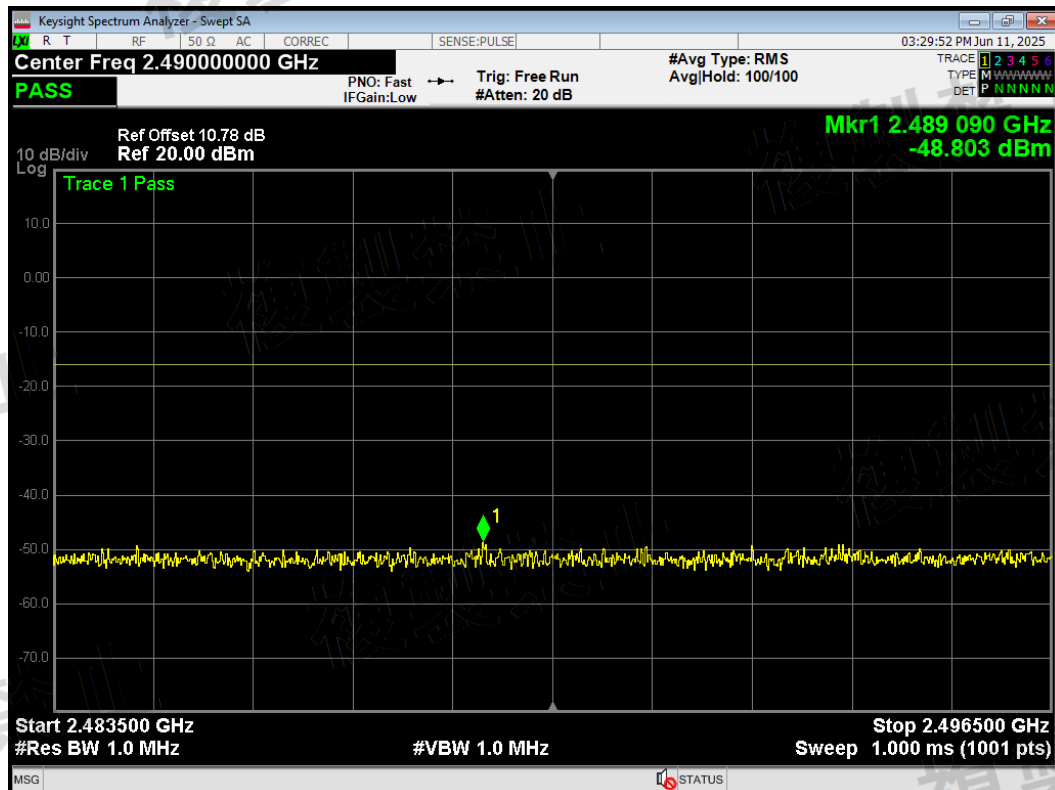
Tx. Spurious BLE (2M) 2440MHz @ 1000MHz-2387MHz



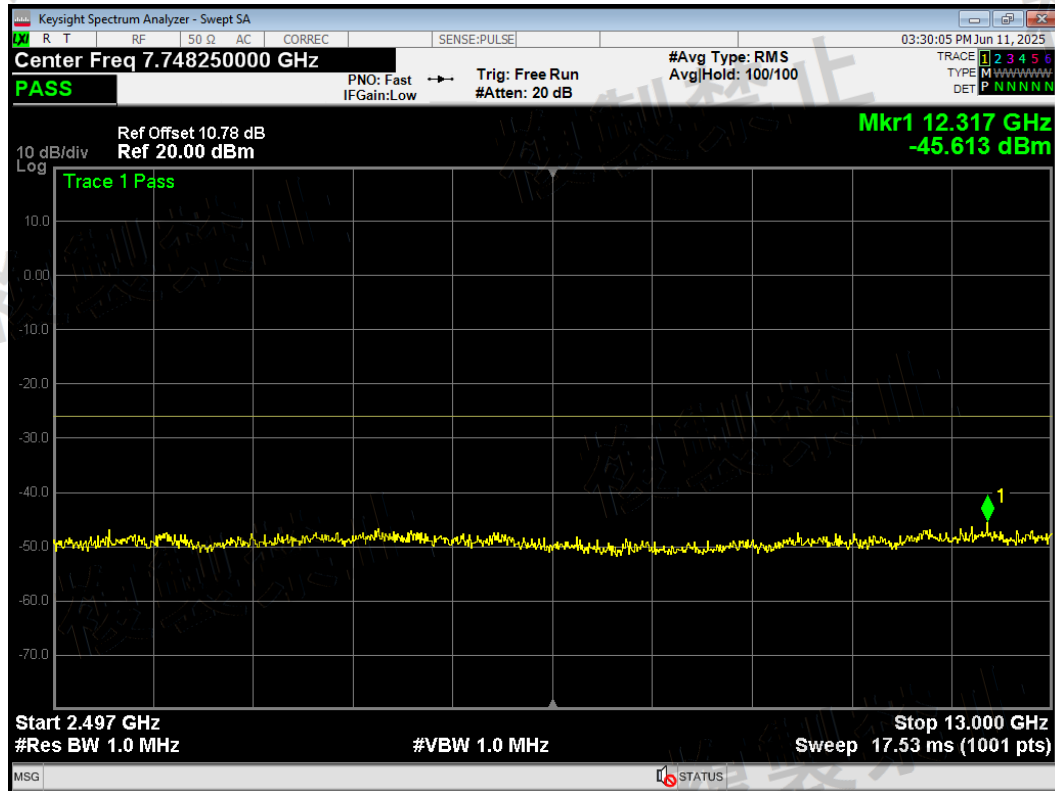
Tx. Spurious BLE (2M) 2440MHz @ 2387MHz-2400MHz



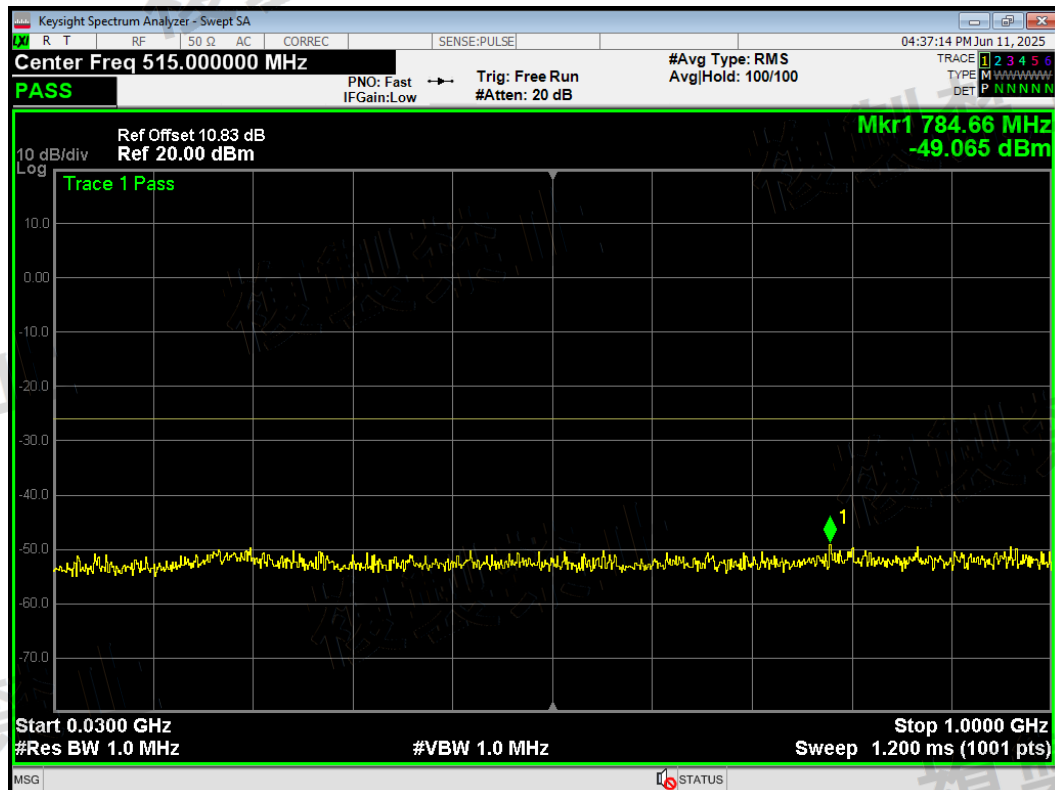
Tx. Spurious BLE (2M) 2440MHz @ 2483.5MHz-2496.5MHz



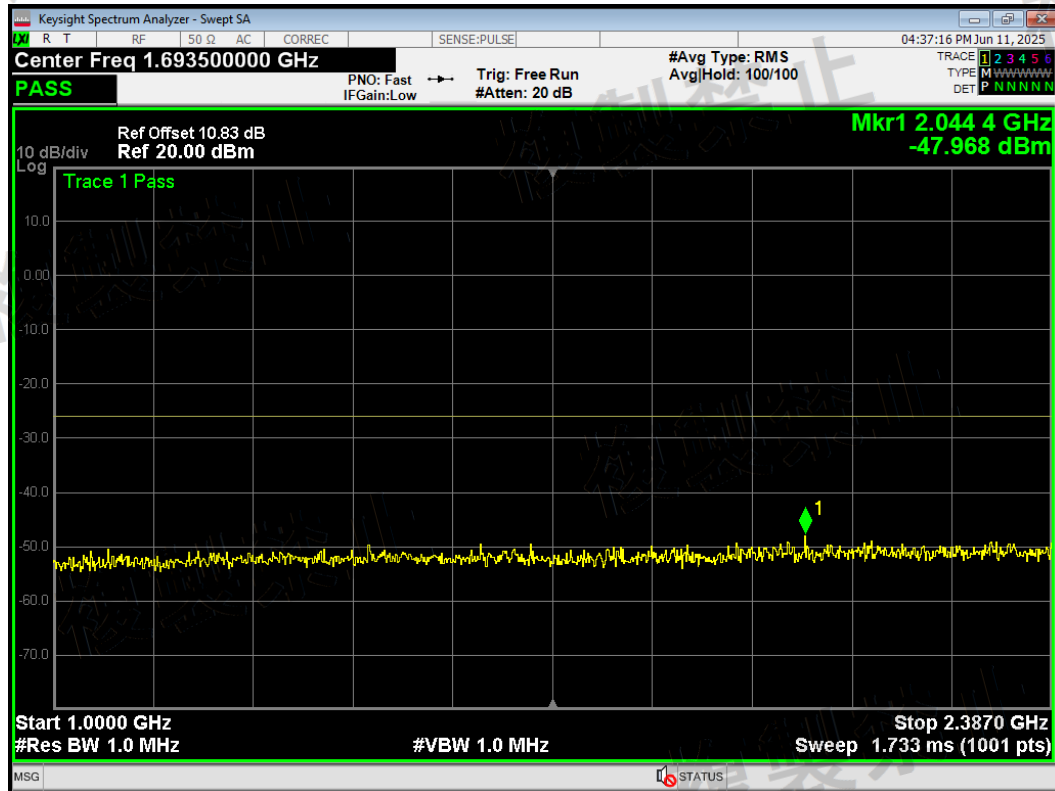
Tx. Spurious BLE (2M) 2440MHz @ 2496.5MHz-13000MHz



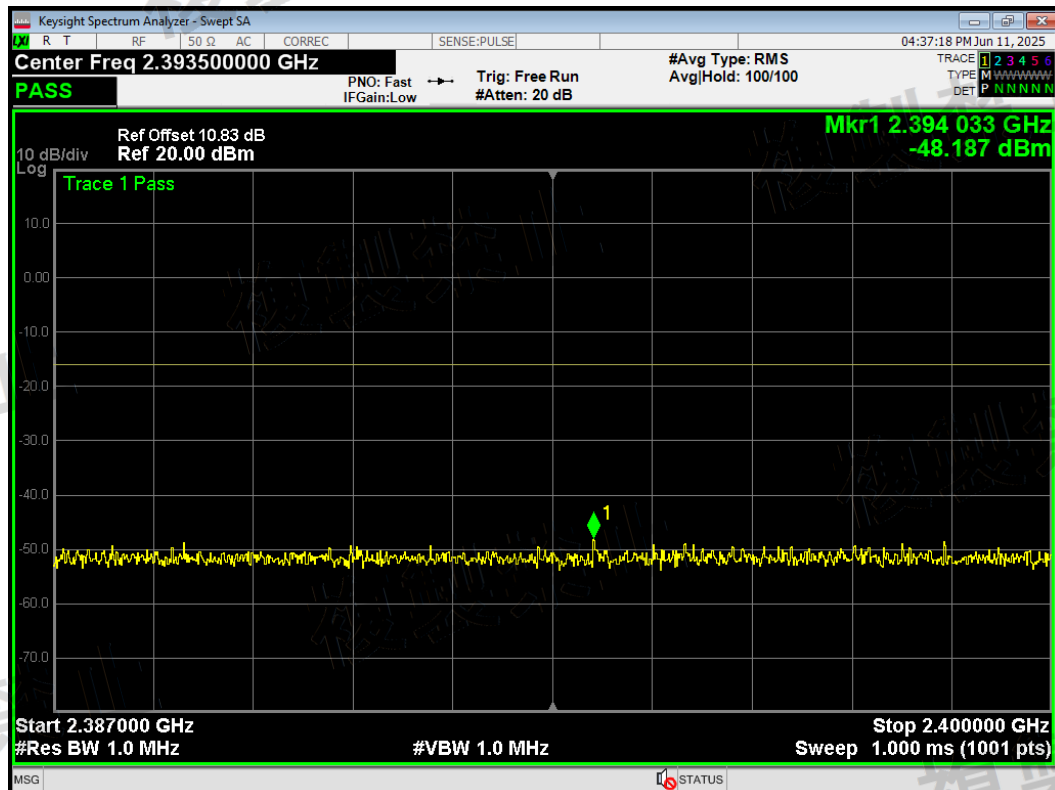
Tx. Spurious BLE (2M) 2478MHz @ 30MHz-1000MHz



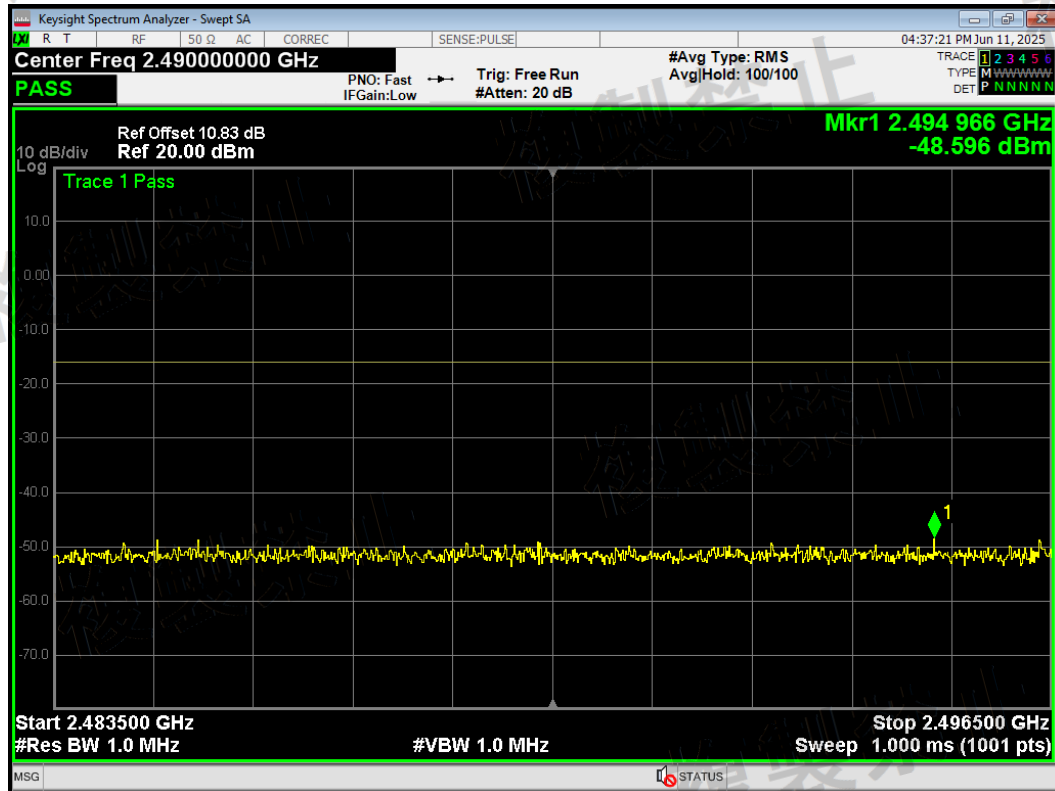
Tx. Spurious BLE (2M) 2478MHz @ 1000MHz-2387MHz



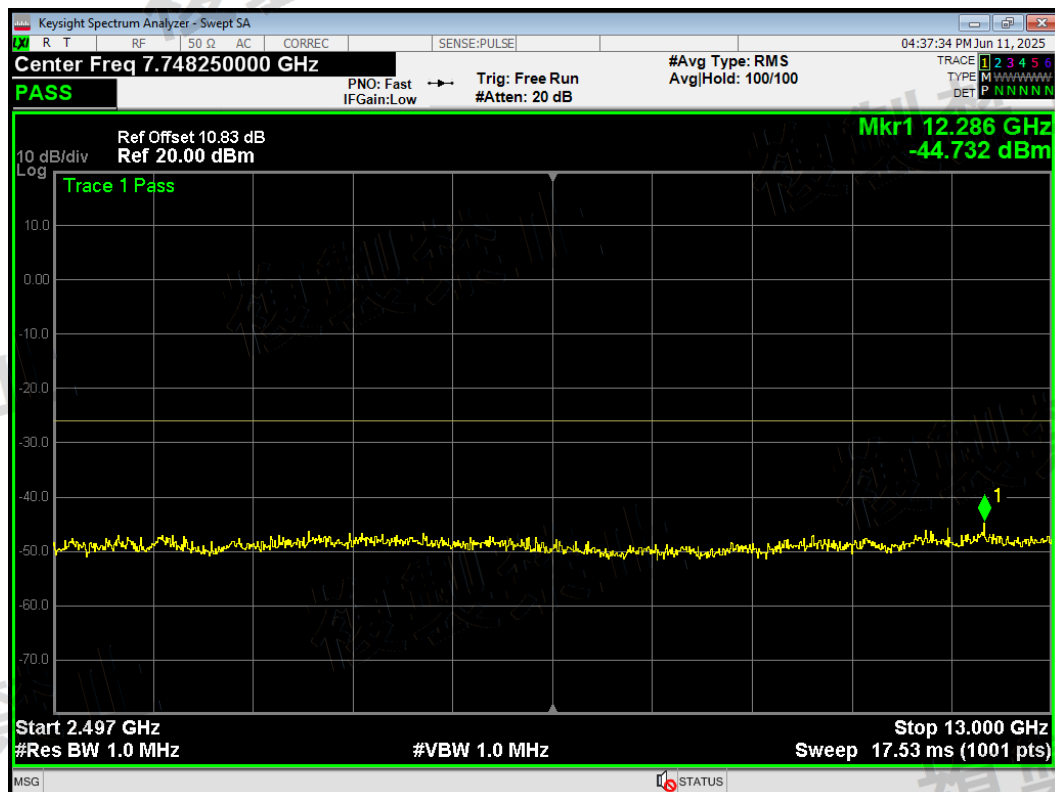
Tx. Spurious BLE (2M) 2478MHz @ 2387MHz-2400MHz



Tx. Spurious BLE (2M) 2478MHz @ 2483.5MHz-2496.5MHz



Tx. Spurious BLE (2M) 2478MHz @ 2496.5MHz-13000MHz



## 5.7. Secondarily Emitted Radio Wave Strength Measurement

### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 50%               | 101.5kPa |

### Method of Measurement

#### Step-1 (Search Mode)

Spectrum Analyzer Setting

SPAN: Measuring Frequency Range (Refer to the 4.7 of the page 18)

RBW: 1 MHz (frequency range; 1 GHz over), 100 kHz (frequency range; 30 MHz to 1 GHz)

VBW: Same as RBW (1 MHz or 100 kHz)

Sweep Time: AUTO (Minimum time to ensure measurement accuracy.

\*In case of burst wave, one burst shall be included per data point)

Data Points: 401 points or more

Sweep Mode: Single Sweep

Detection Mode: Positive Peak

Y-axis Scale: 10 dB/Div.

Reference Level: Enough level for maximum dynamic range

#### Step-2 (Measuring Mode \*Normal)

Spectrum Analyzer Setting

Center Frequency: Searched Frequency

SPAN: 1 MHz – 10 MHz (The SPAN that keeps accuracy of the frequency.)

RBW: 1 MHz (frequency range; 1 GHz over), 100 kHz (frequency range; 30 MHz to 1 GHz)

VBW: Same as RBW (1 MHz or 100 kHz)

Sweep Time: AUTO (Minimum time to ensure measurement accuracy.

\*In case of burst wave, one burst shall be included per data point)

Data Points: 401 points or more

Sweep Mode: Single Sweep

Detection Mode: Positive Peak

Y-axis Scale: 10 dB/Div.

Reference Level: Enough level for maximum dynamic range

#### Step-3 (Measuring Mode \*Zero Span)

Spectrum Analyzer Setting

Center Frequency: Searched Frequency SPAN: 0 Hz (ZERO SPAN)

RBW: 1 MHz (frequency range; 1 GHz over), 100 kHz (frequency range; 30 MHz to 1 GHz)

VBW: Same as RBW (1 MHz or 100 kHz)

Sweep Time: AUTO (Minimum time to ensure measurement accuracy.

\*In case of burst wave, one burst shall be included per data point)

Data Points: 401 points or more

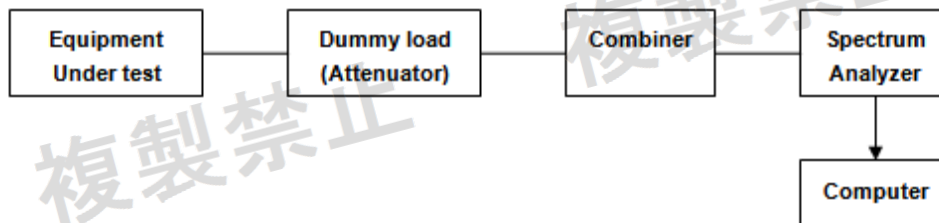
Sweep Mode: Single Sweep

Detection Mode: Sample

Y-axis Scale: 10 dB/Div.

Reference Level: Enough level for maximum dynamic range

### Test Setup



### Limit

| Frequency Range | Limits (nW) |
|-----------------|-------------|
| Under 1 GHz     | $\leq 4$    |
| 1GHz-12.5GHz    | $\leq 20$   |

## Test Results

### Bluetooth

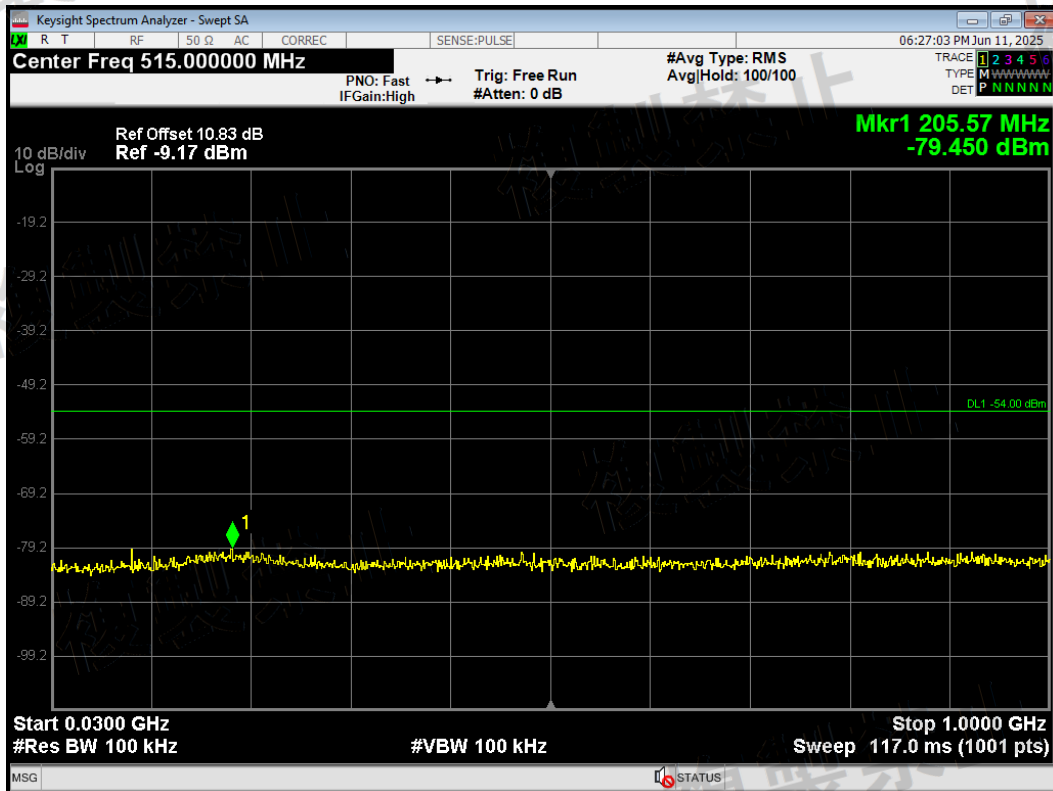
| Mode  | Frequency (MHz) | Range (MHz) | Emission Frequency (MHz) | Max Value (dBm) | Limit (dBm) | Verdict |
|-------|-----------------|-------------|--------------------------|-----------------|-------------|---------|
| 1-DH5 | 2402            | 30-1000     | 205.57                   | -79.45          | -54         | Pass    |
| 1-DH5 | 2402            | 1000-13000  | 3304                     | -68.49          | -47         | Pass    |
| 1-DH5 | 2441            | 30-1000     | 199.75                   | -79.18          | -54         | Pass    |
| 1-DH5 | 2441            | 1000-13000  | 3256                     | -68.15          | -47         | Pass    |
| 1-DH5 | 2480            | 30-1000     | 790.48                   | -79.04          | -54         | Pass    |
| 1-DH5 | 2480            | 1000-13000  | 3304                     | -67.4           | -47         | Pass    |
| 2-DH5 | 2402            | 30-1000     | 949.56                   | -78.93          | -54         | Pass    |
| 2-DH5 | 2402            | 1000-13000  | 2632                     | -68.58          | -47         | Pass    |
| 2-DH5 | 2441            | 30-1000     | 200.72                   | -79.04          | -54         | Pass    |
| 2-DH5 | 2441            | 1000-13000  | 3040                     | -68.18          | -47         | Pass    |
| 2-DH5 | 2480            | 30-1000     | 231.76                   | -79.02          | -54         | Pass    |
| 2-DH5 | 2480            | 1000-13000  | 3340                     | -68.14          | -47         | Pass    |
| 3-DH5 | 2402            | 30-1000     | 186.17                   | -79.1           | -54         | Pass    |
| 3-DH5 | 2402            | 1000-13000  | 5176                     | -68.89          | -47         | Pass    |
| 3-DH5 | 2441            | 30-1000     | 190.05                   | -79.03          | -54         | Pass    |
| 3-DH5 | 2441            | 1000-13000  | 2680                     | -67.2           | -47         | Pass    |
| 3-DH5 | 2480            | 30-1000     | 773.99                   | -78.98          | -54         | Pass    |
| 3-DH5 | 2480            | 1000-13000  | 5188                     | -68.75          | -47         | Pass    |

### Bluetooth LE

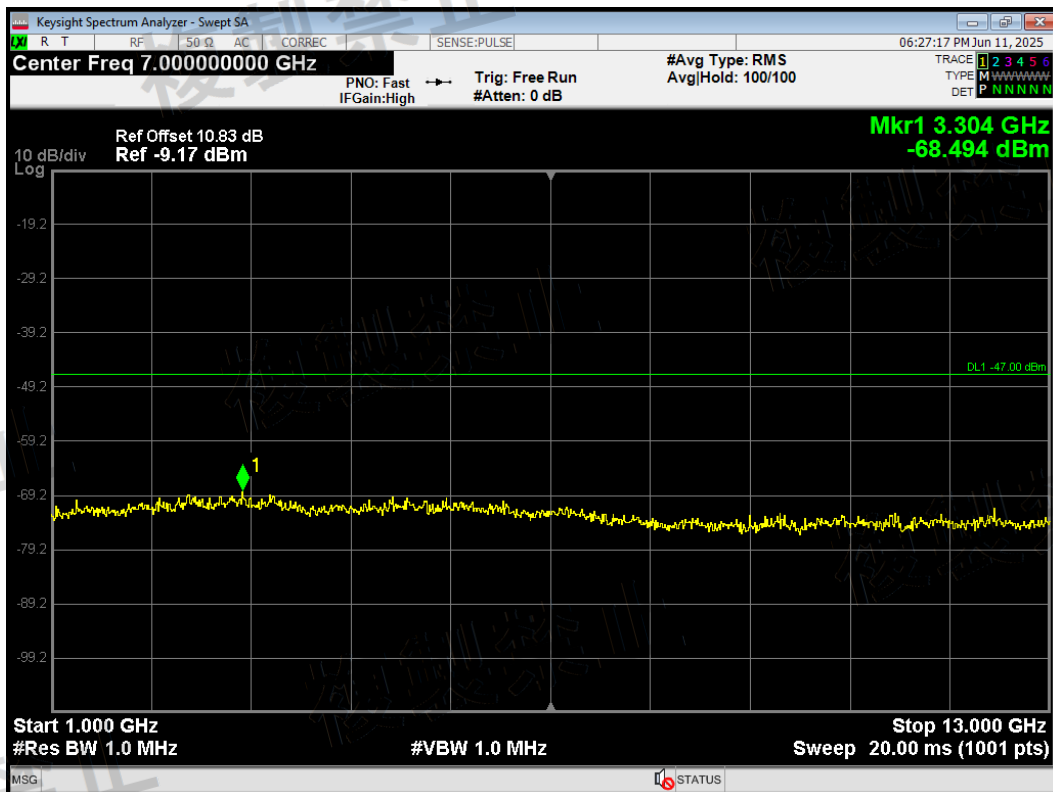
| Mode     | Frequency (MHz) | Range (MHz) | Emission Frequency (MHz) | Max Value (dBm) | Limit (dBm) | Verdict |
|----------|-----------------|-------------|--------------------------|-----------------|-------------|---------|
| BLE (1M) | 2402            | 30-1000     | 839.95                   | -79.19          | -54         | Pass    |
| BLE (1M) | 2402            | 1000-13000  | 3316                     | -68.18          | -47         | Pass    |
| BLE (1M) | 2440            | 30-1000     | 847.71                   | -79             | -54         | Pass    |
| BLE (1M) | 2440            | 1000-13000  | 2764                     | -68.41          | -47         | Pass    |
| BLE (1M) | 2480            | 30-1000     | 210.42                   | -78.36          | -54         | Pass    |
| BLE (1M) | 2480            | 1000-13000  | 3664                     | -68.59          | -47         | Pass    |
| BLE (2M) | 2404            | 30-1000     | 771.08                   | -78.79          | -54         | Pass    |
| BLE (2M) | 2404            | 1000-13000  | 3184                     | -68.63          | -47         | Pass    |
| BLE (2M) | 2440            | 30-1000     | 199.75                   | -78.67          | -54         | Pass    |
| BLE (2M) | 2440            | 1000-13000  | 3100                     | -68.9           | -47         | Pass    |
| BLE (2M) | 2478            | 30-1000     | 208.48                   | -79.18          | -54         | Pass    |
| BLE (2M) | 2478            | 1000-13000  | 5188                     | -67.91          | -47         | Pass    |

# Bluetooth

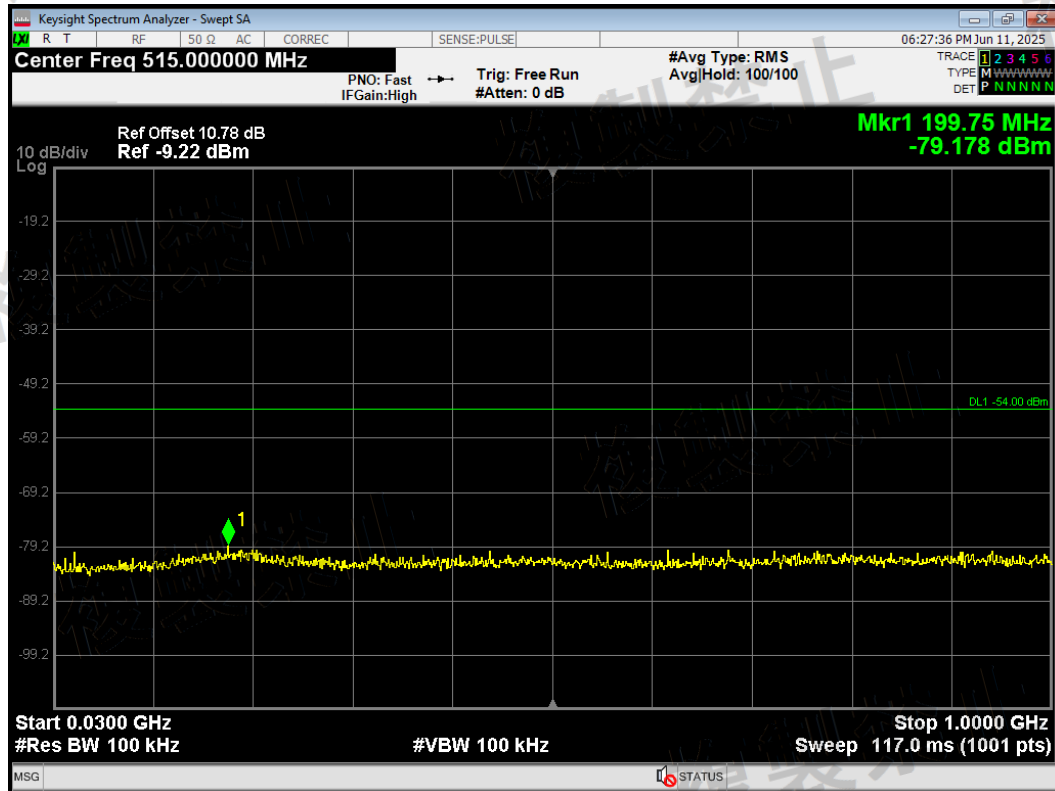
Rx. Spurious 1-DH5 2402MHz @ 30MHz-1000MHz



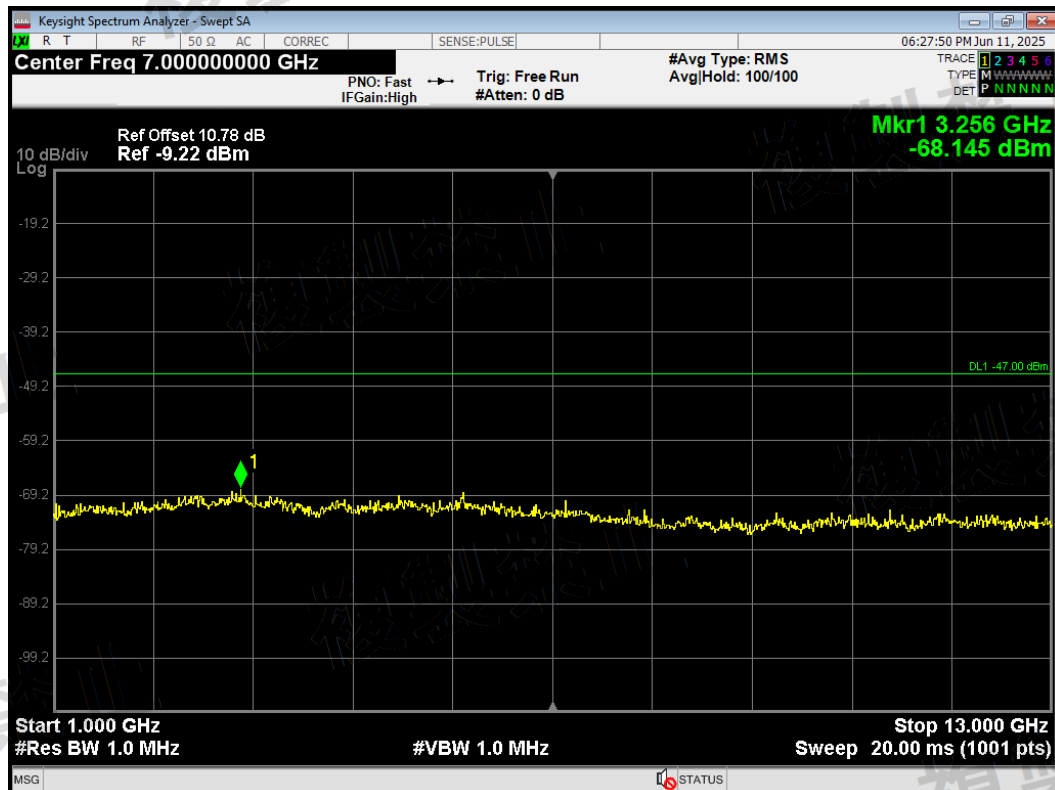
Rx. Spurious 1-DH5 2402MHz @ 1000MHz-13000MHz



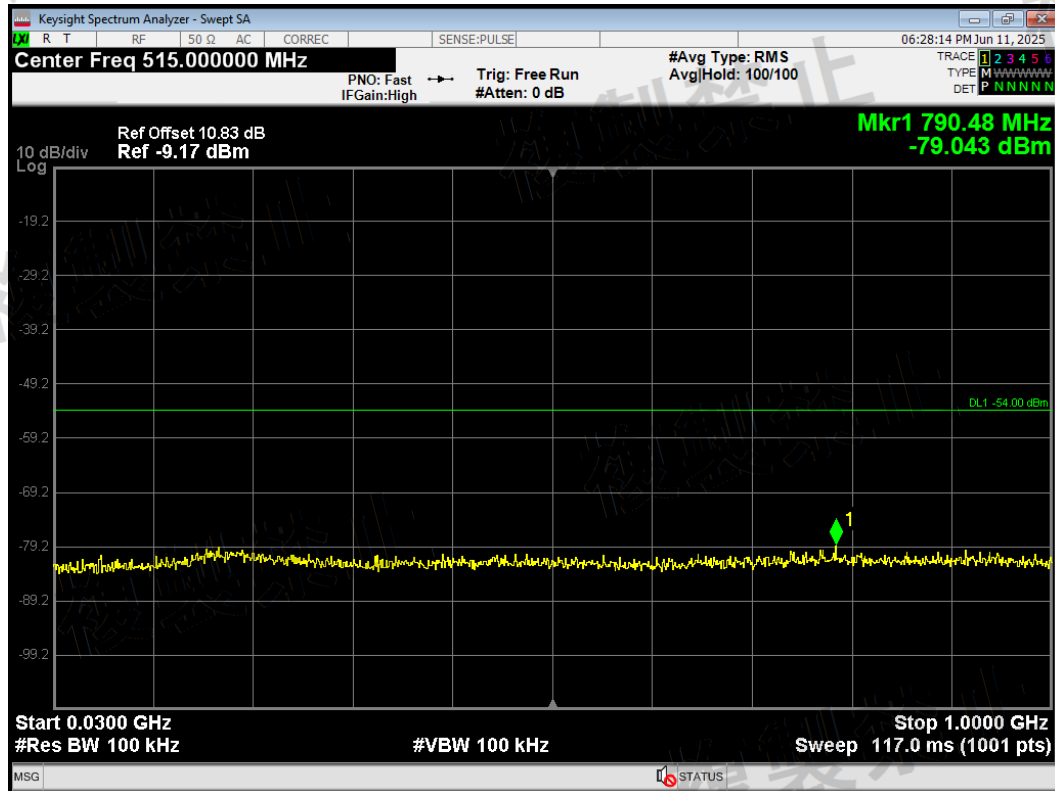
Rx. Spurious 1-DH5 2441MHz @ 30MHz-1000MHz



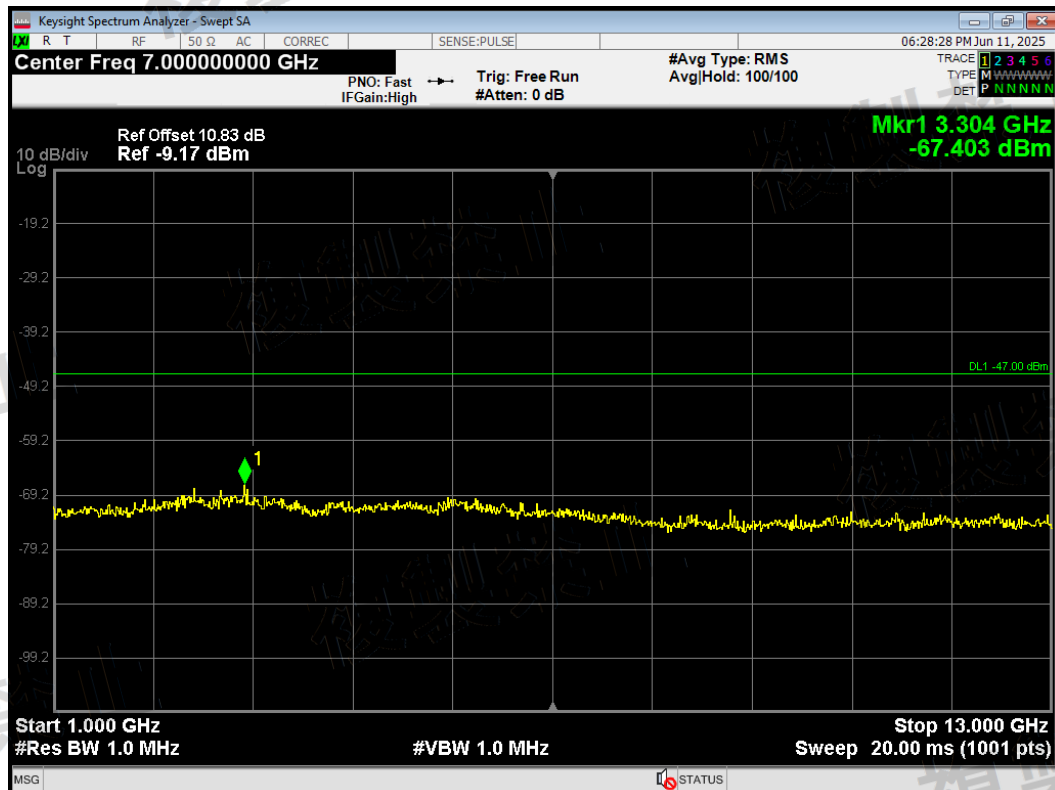
Rx. Spurious 1-DH5 2441MHz @ 1000MHz-13000MHz



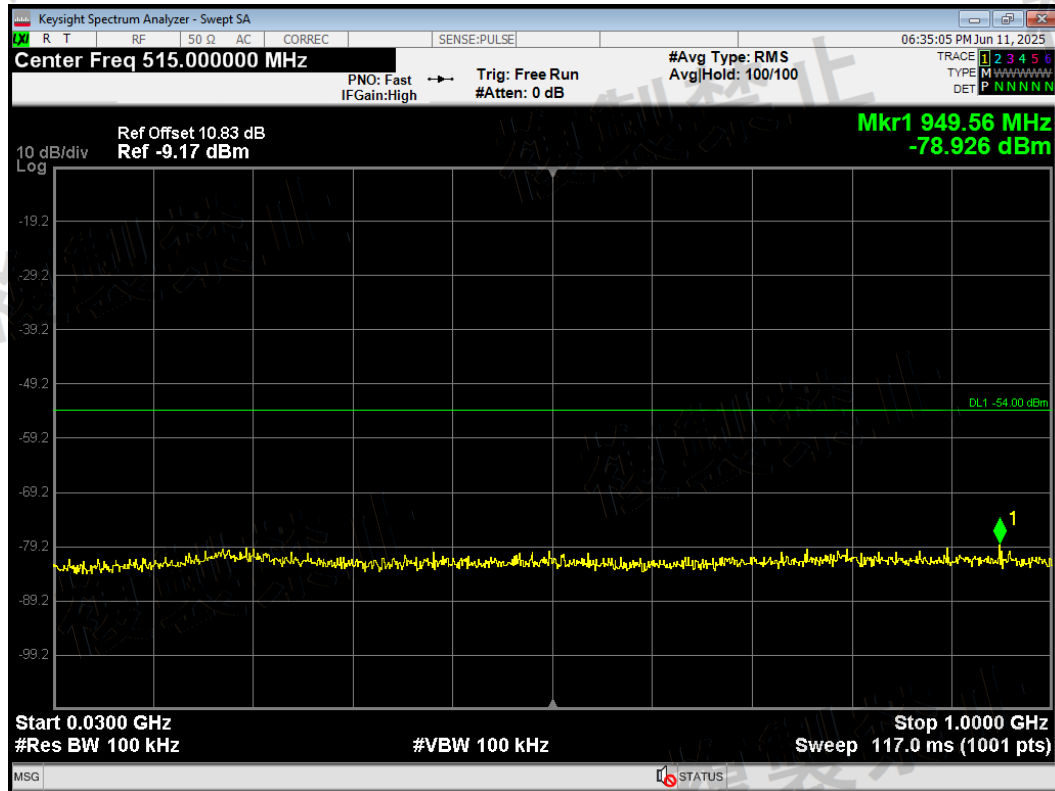
Rx. Spurious 1-DH5 2480MHz @ 30MHz-1000MHz



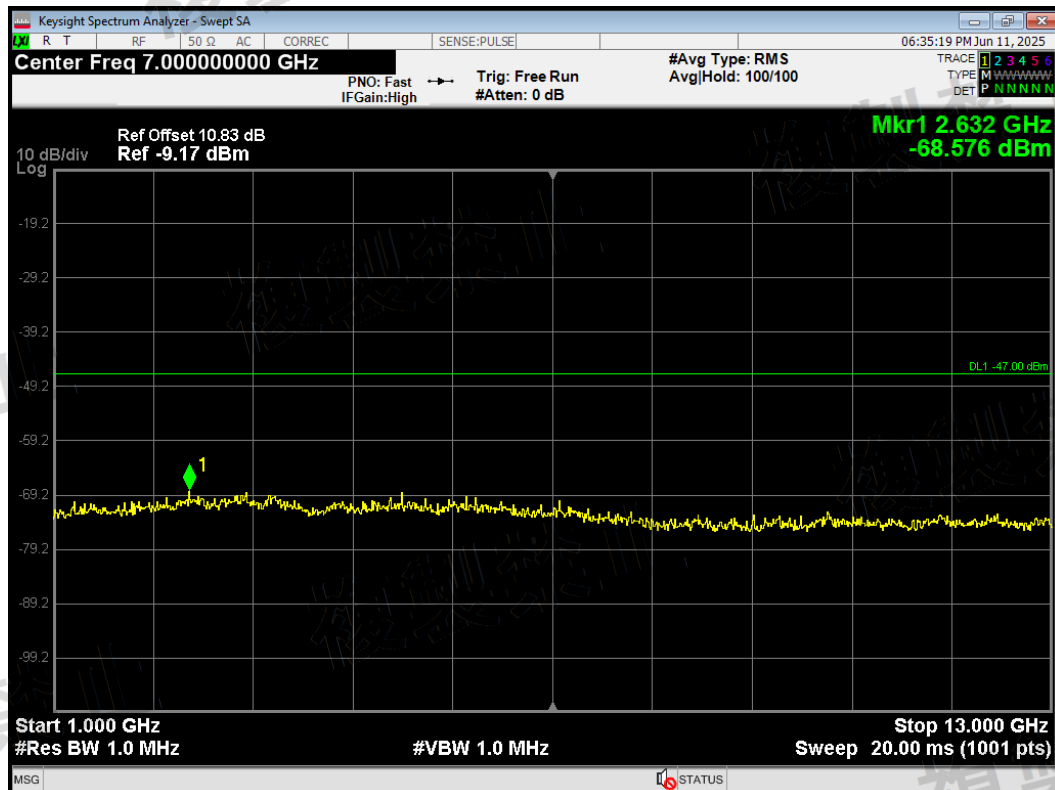
Rx. Spurious 1-DH5 2480MHz @ 1000MHz-13000MHz



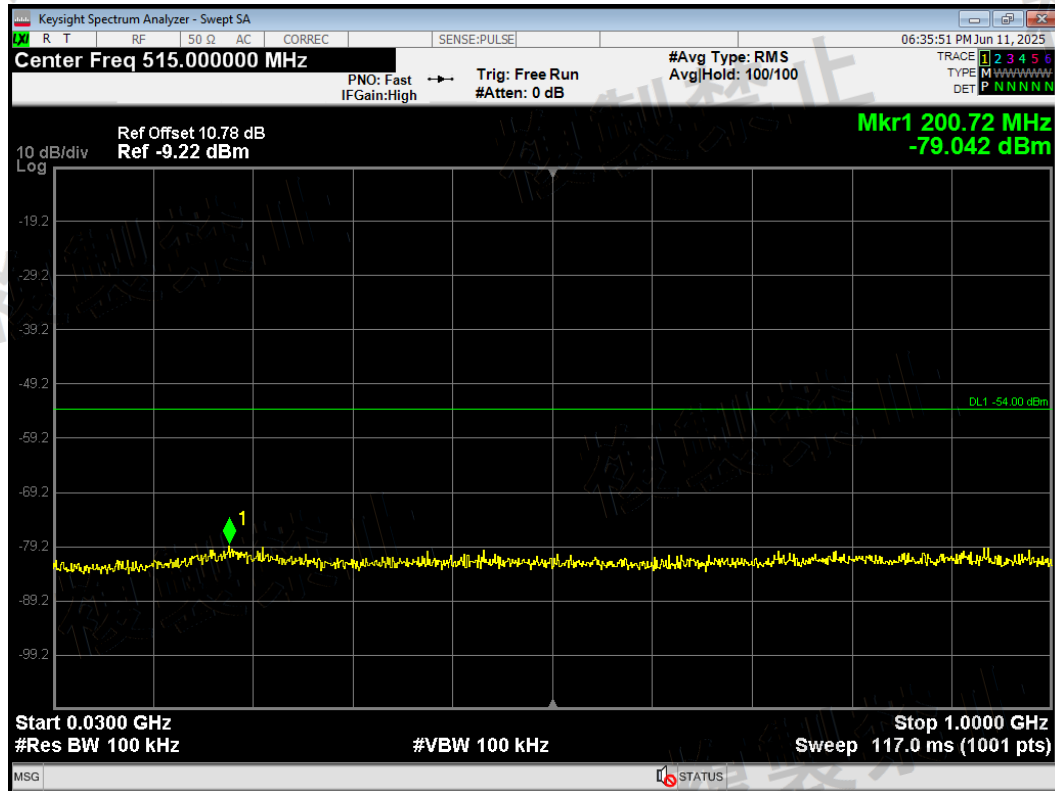
Rx. Spurious 2-DH5 2402MHz @ 30MHz-1000MHz



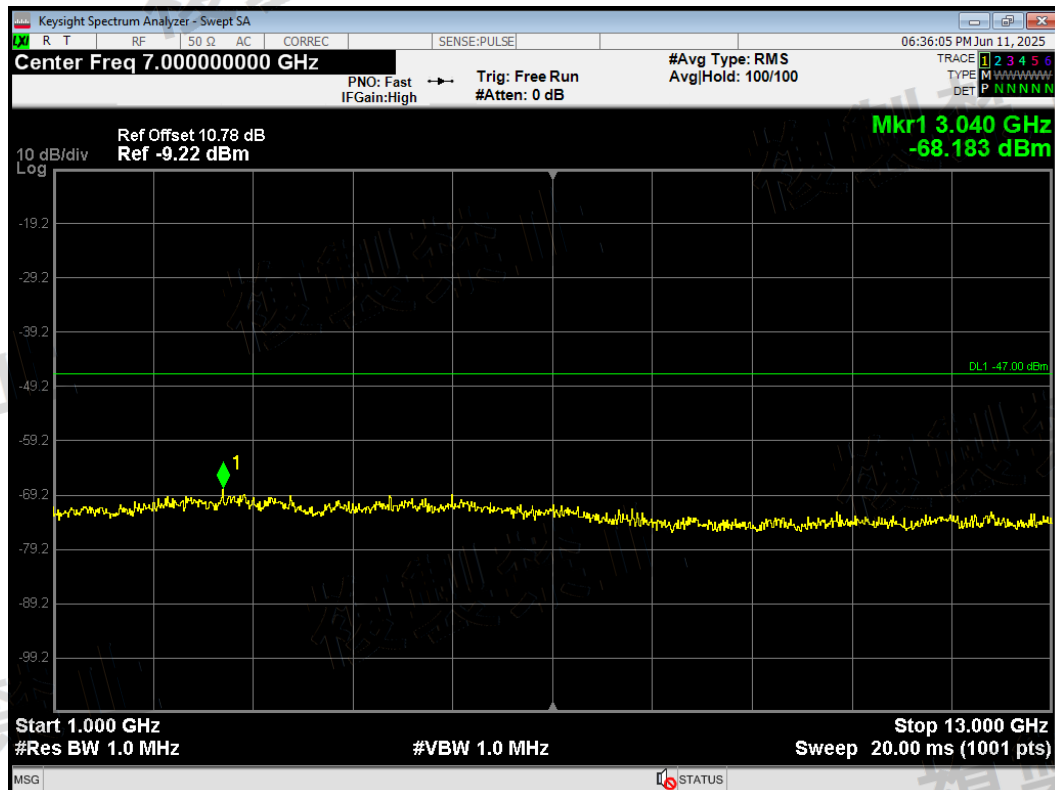
Rx. Spurious 2-DH5 2402MHz @ 1000MHz-13000MHz



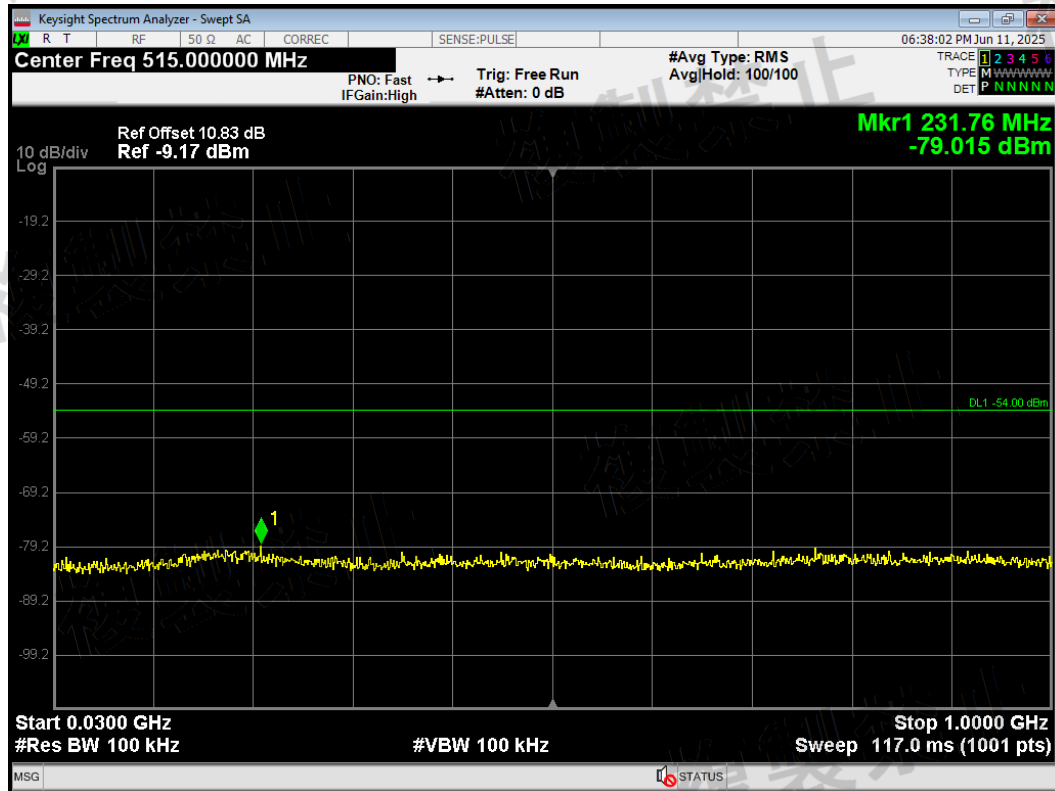
Rx. Spurious 2-DH5 2441MHz @ 30MHz-1000MHz



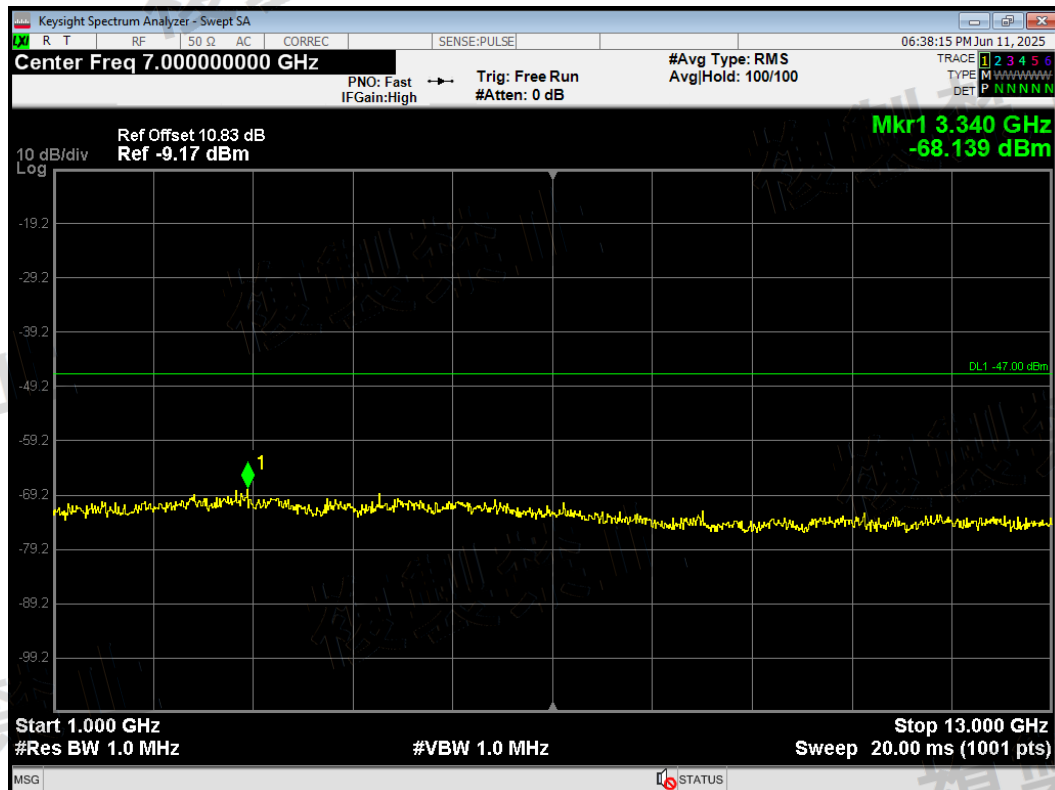
Rx. Spurious 2-DH5 2441MHz @ 1000MHz-13000MHz



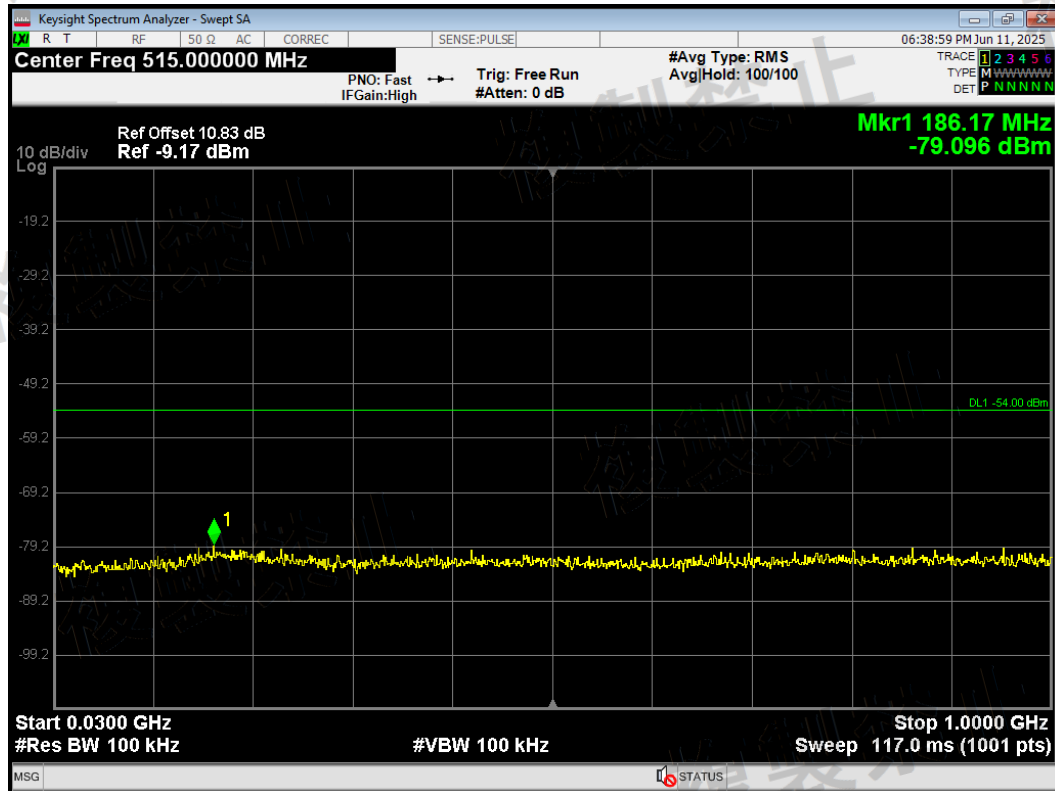
Rx. Spurious 2-DH5 2480MHz @ 30MHz-1000MHz



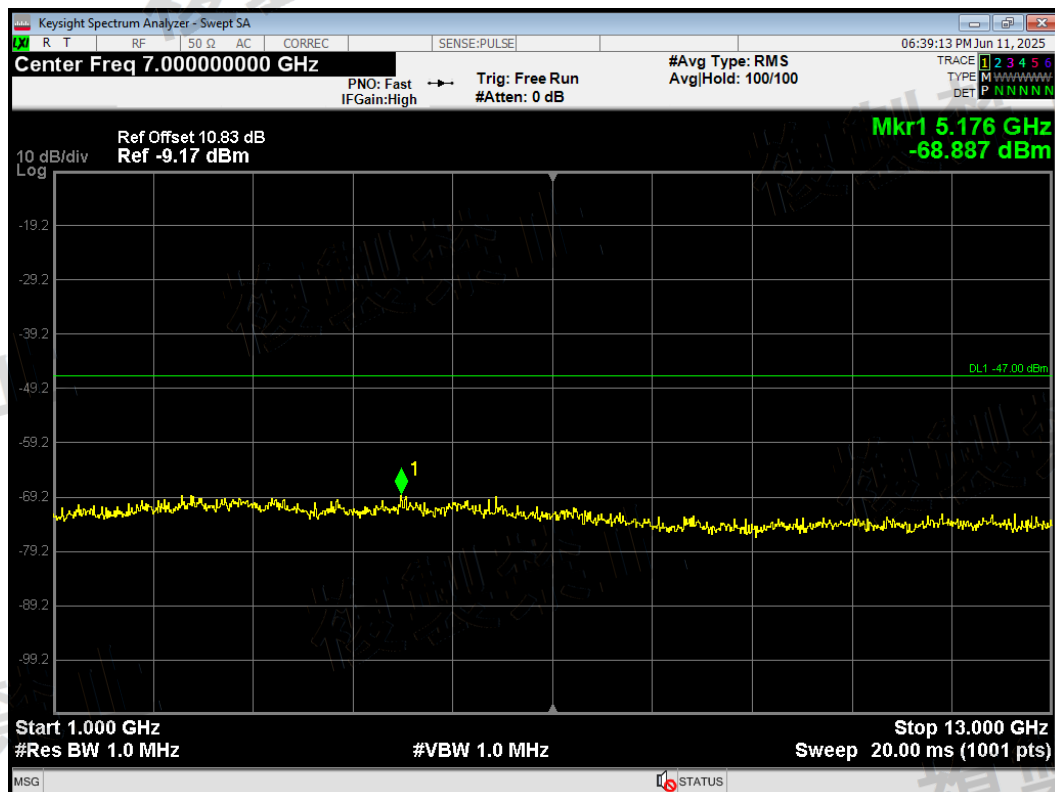
Rx. Spurious 2-DH5 2480MHz @ 1000MHz-13000MHz



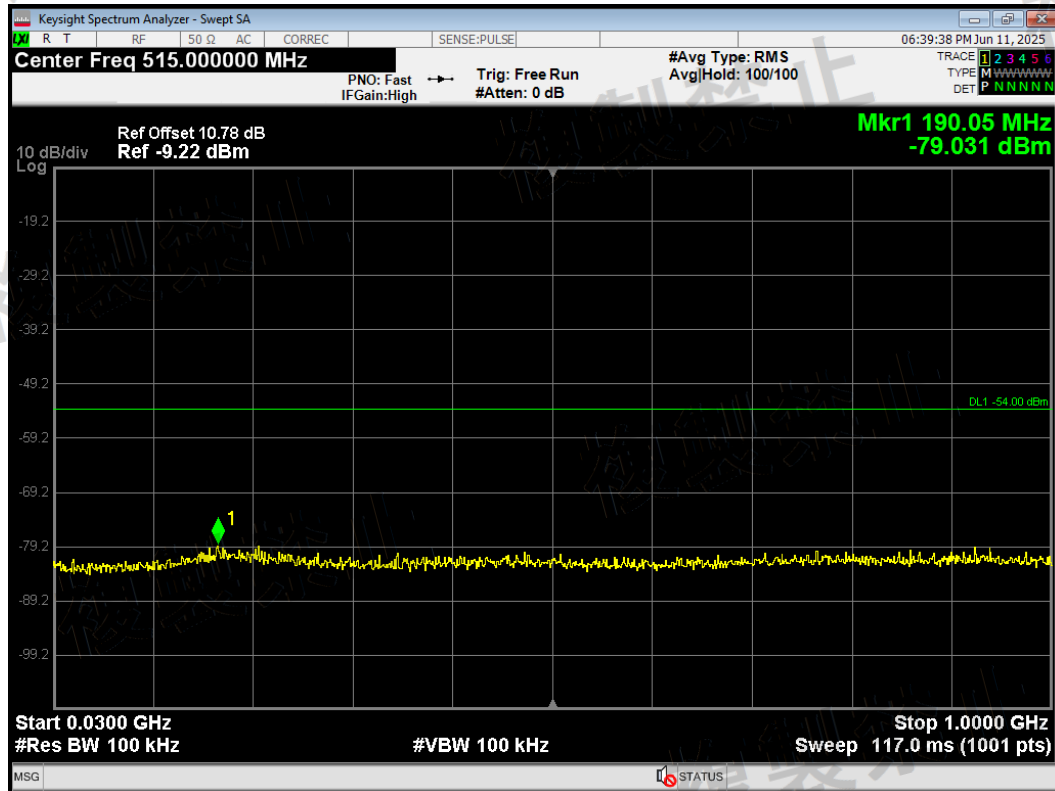
Rx. Spurious 3-DH5 2402MHz @ 30MHz-1000MHz



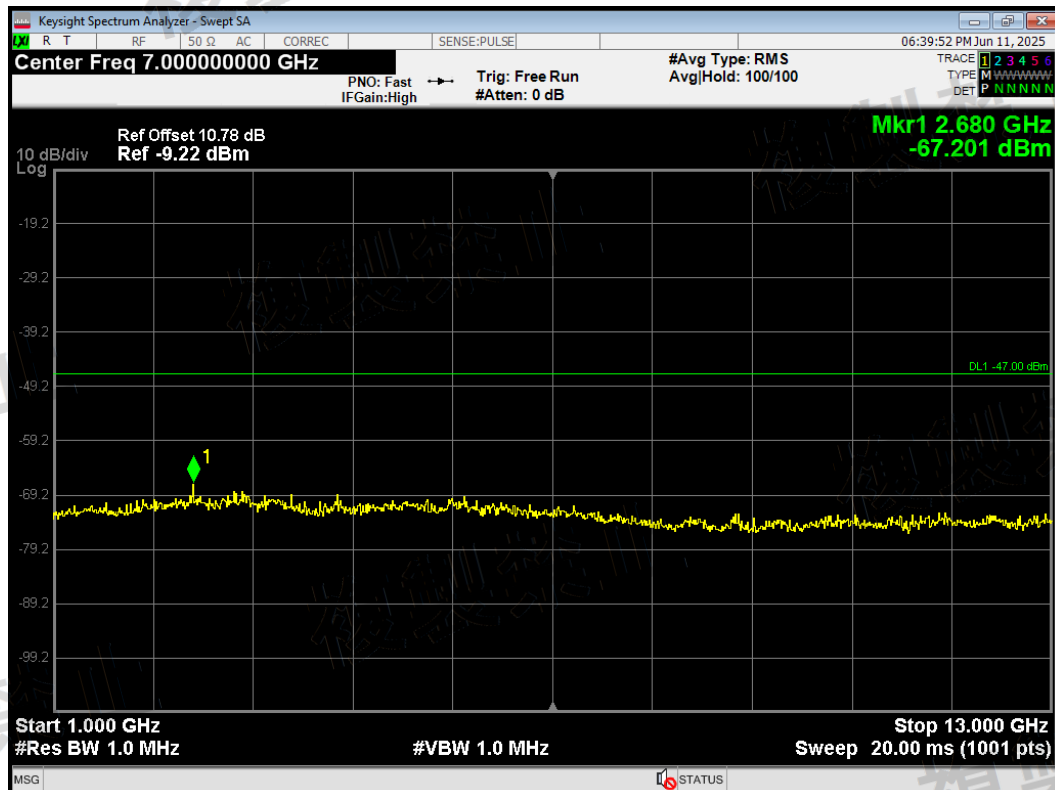
Rx. Spurious 3-DH5 2402MHz @ 1000MHz-13000MHz



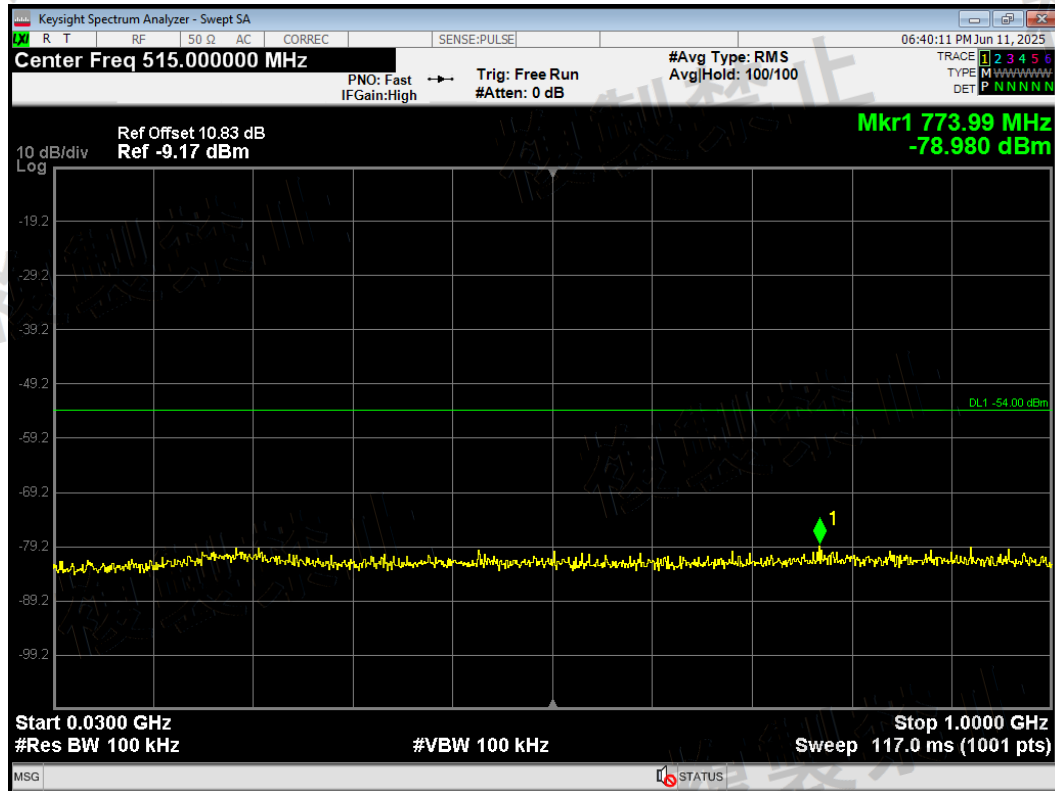
Rx. Spurious 3-DH5 2441MHz @ 30MHz-1000MHz



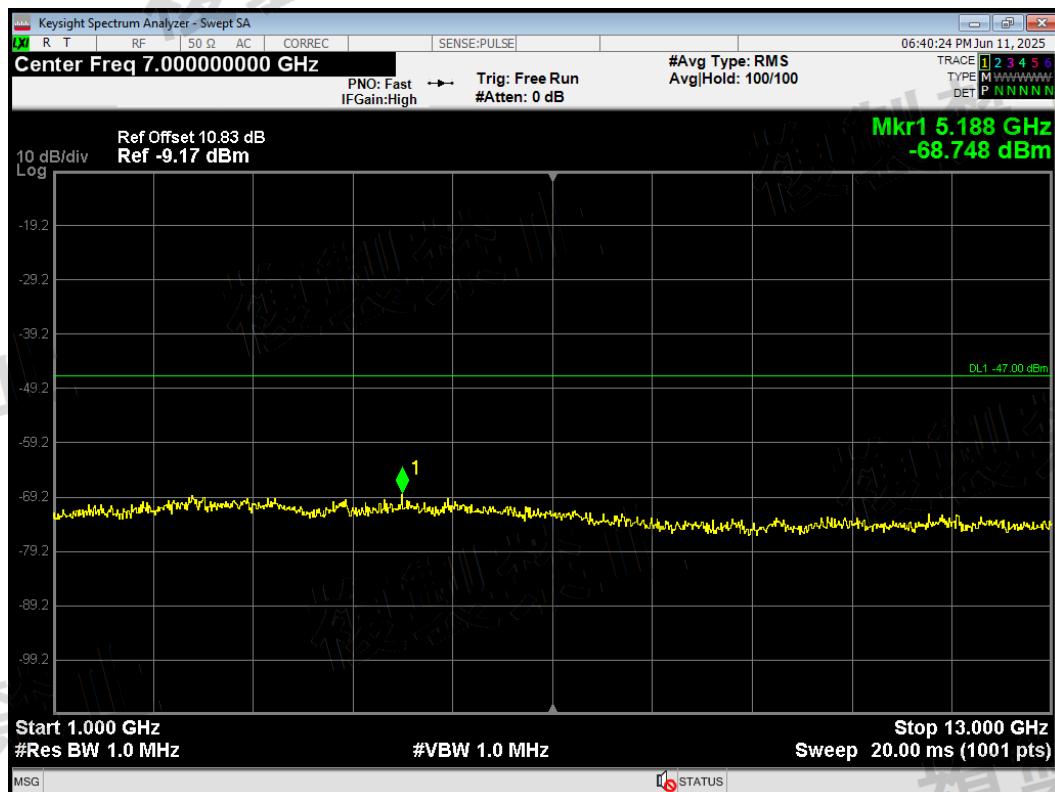
Rx. Spurious 3-DH5 2441MHz @ 1000MHz-13000MHz



Rx. Spurious 3-DH5 2480MHz @ 30MHz-1000MHz

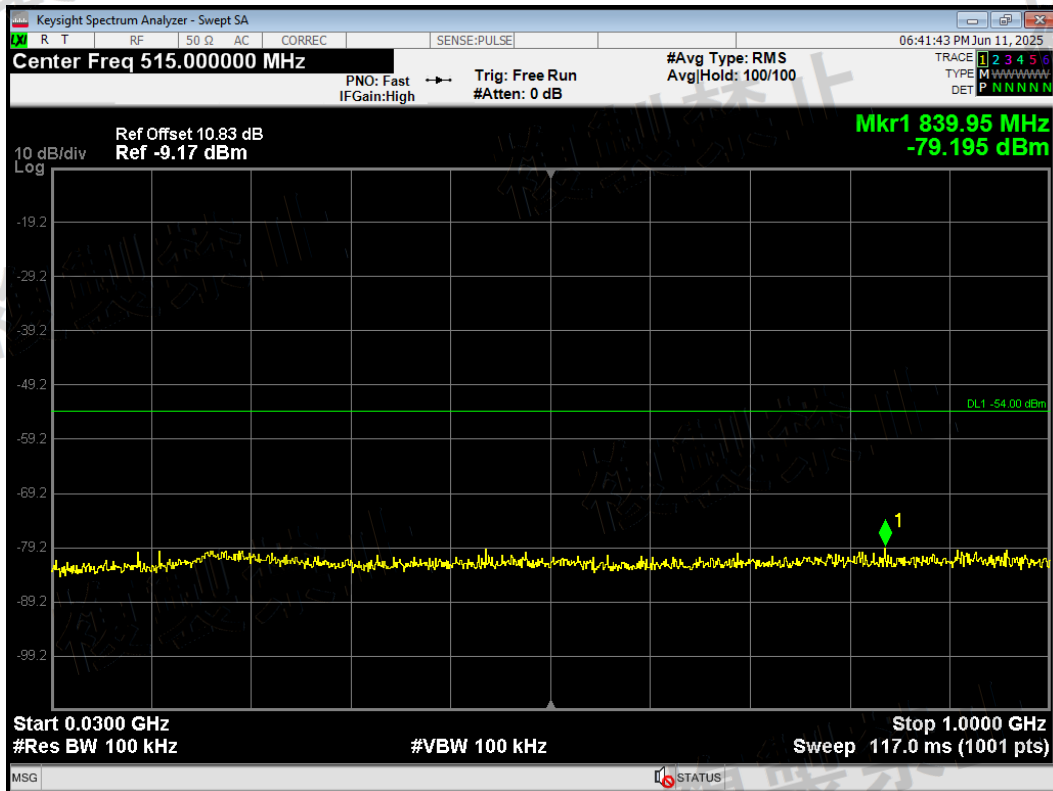


Rx. Spurious 3-DH5 2480MHz @ 1000MHz-13000MHz

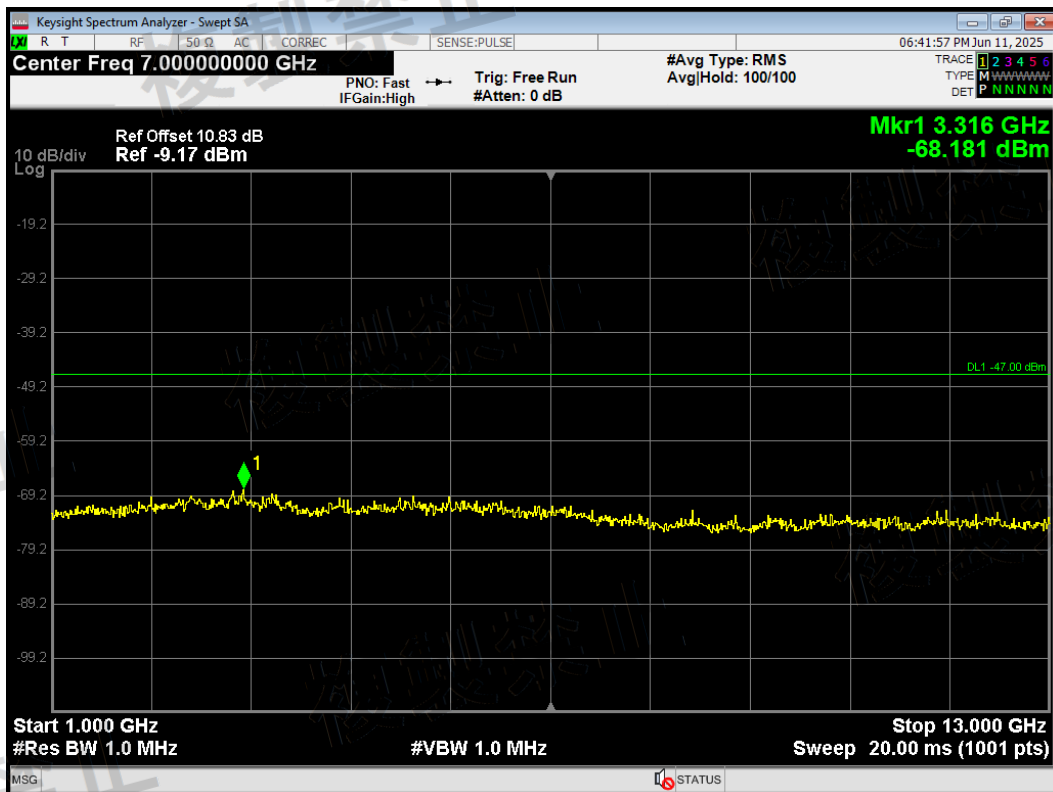


# Bluetooth LE

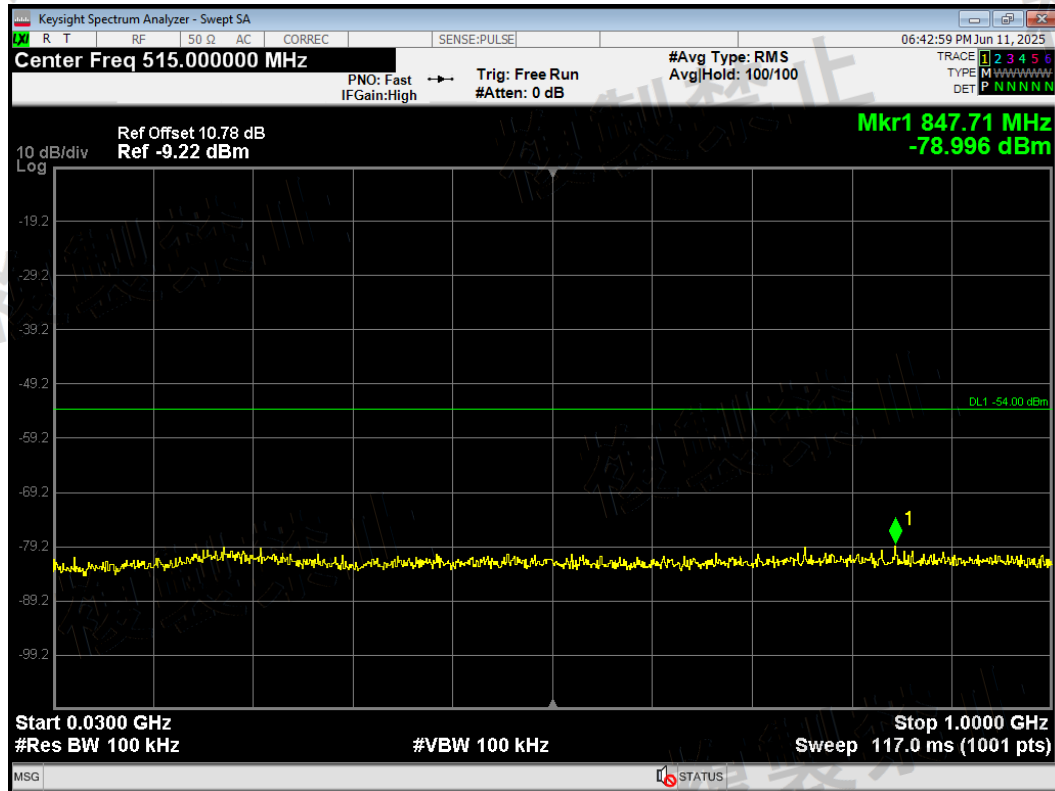
Rx. Spurious BLE (1M) 2402MHz @ 30MHz-1000MHz



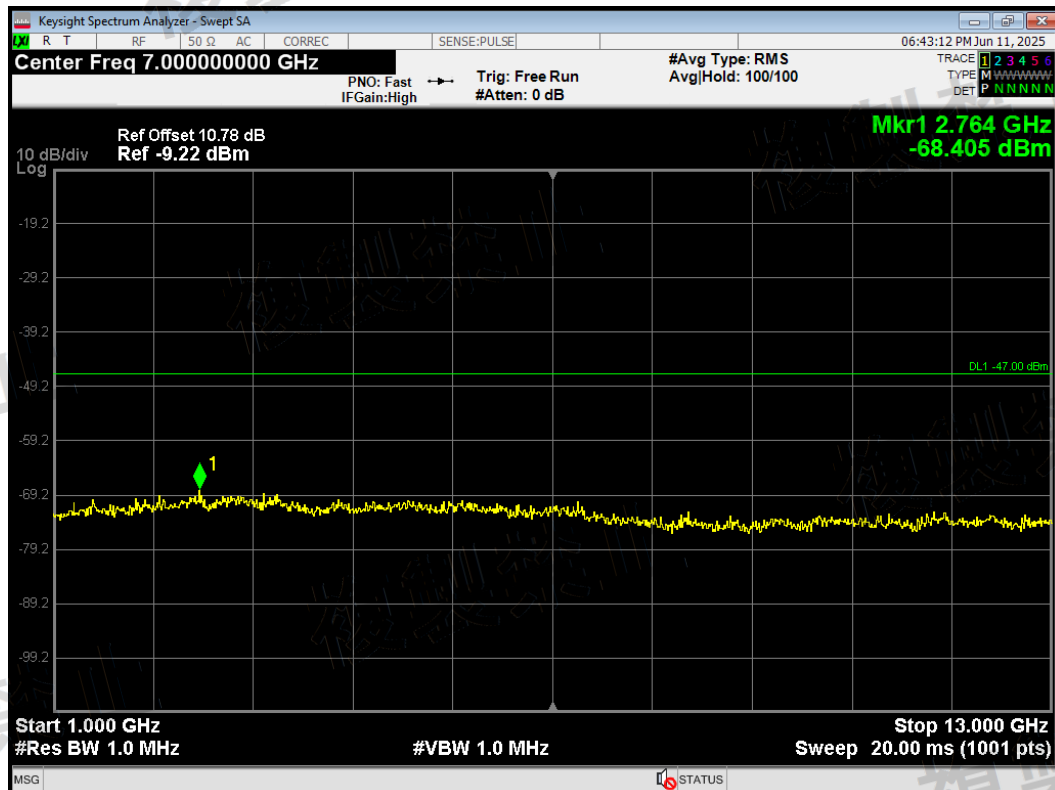
Rx. Spurious BLE (1M) 2402MHz @ 1000MHz-13000MHz



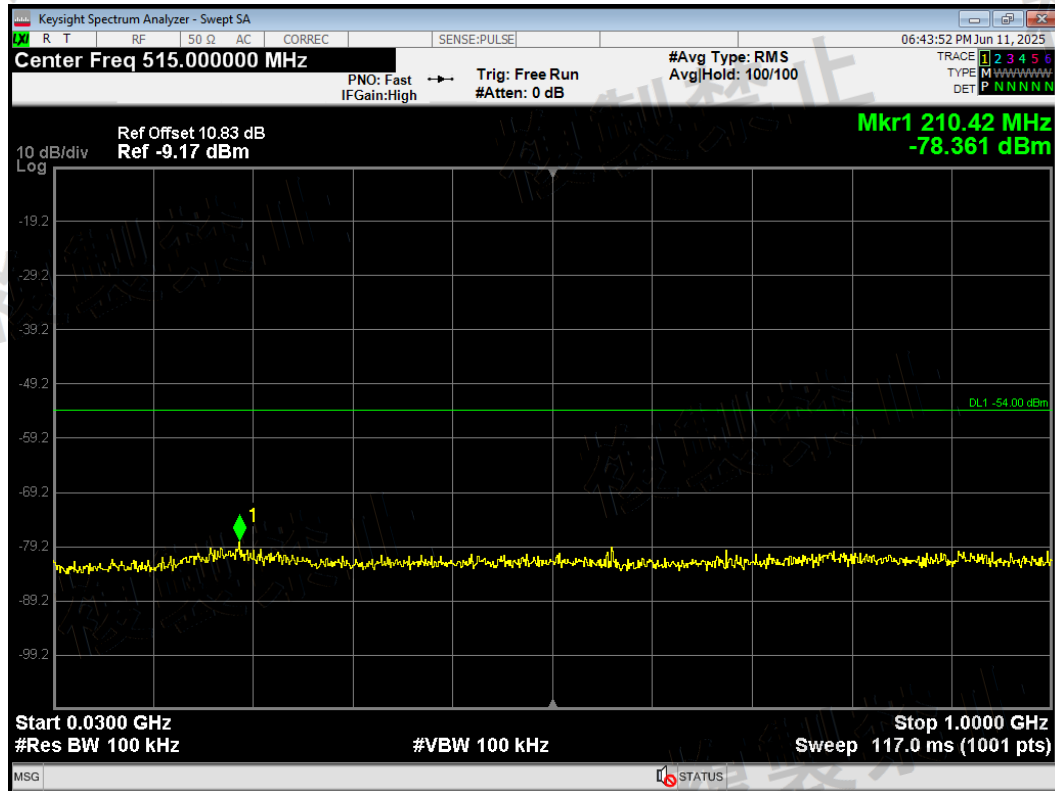
Rx. Spurious BLE (1M) 2440MHz @ 30MHz-1000MHz



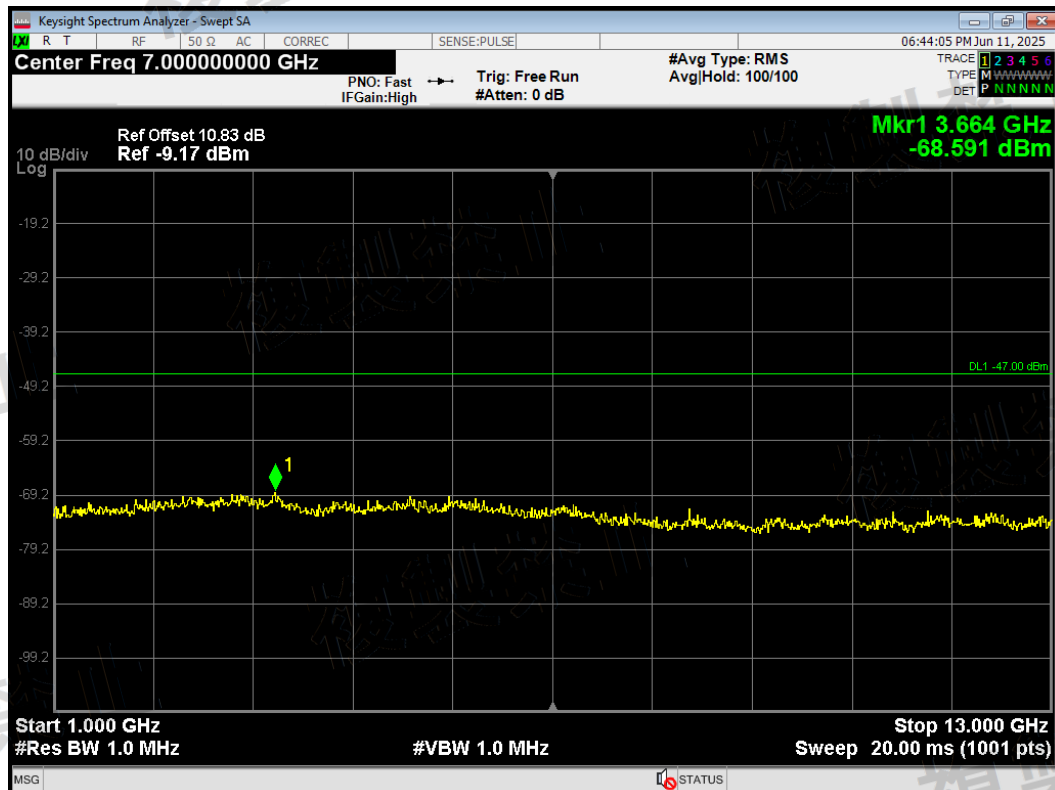
Rx. Spurious BLE (1M) 2440MHz @ 1000MHz-13000MHz



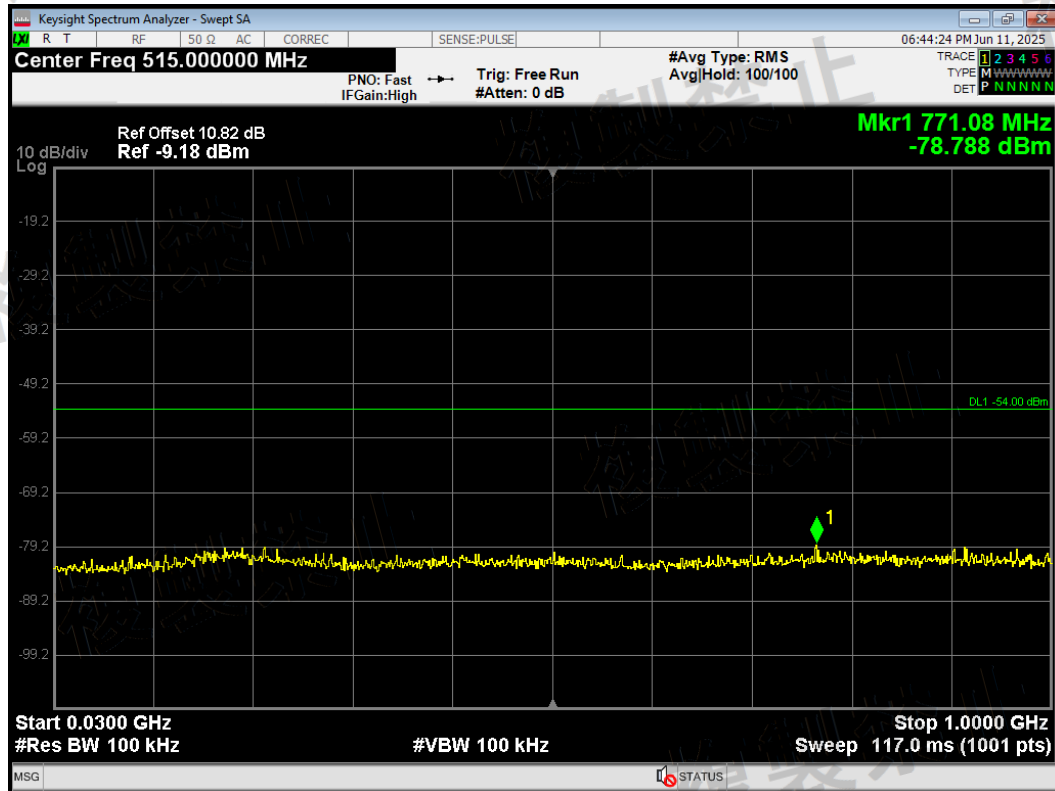
Rx. Spurious BLE (1M) 2480MHz @ 30MHz-1000MHz



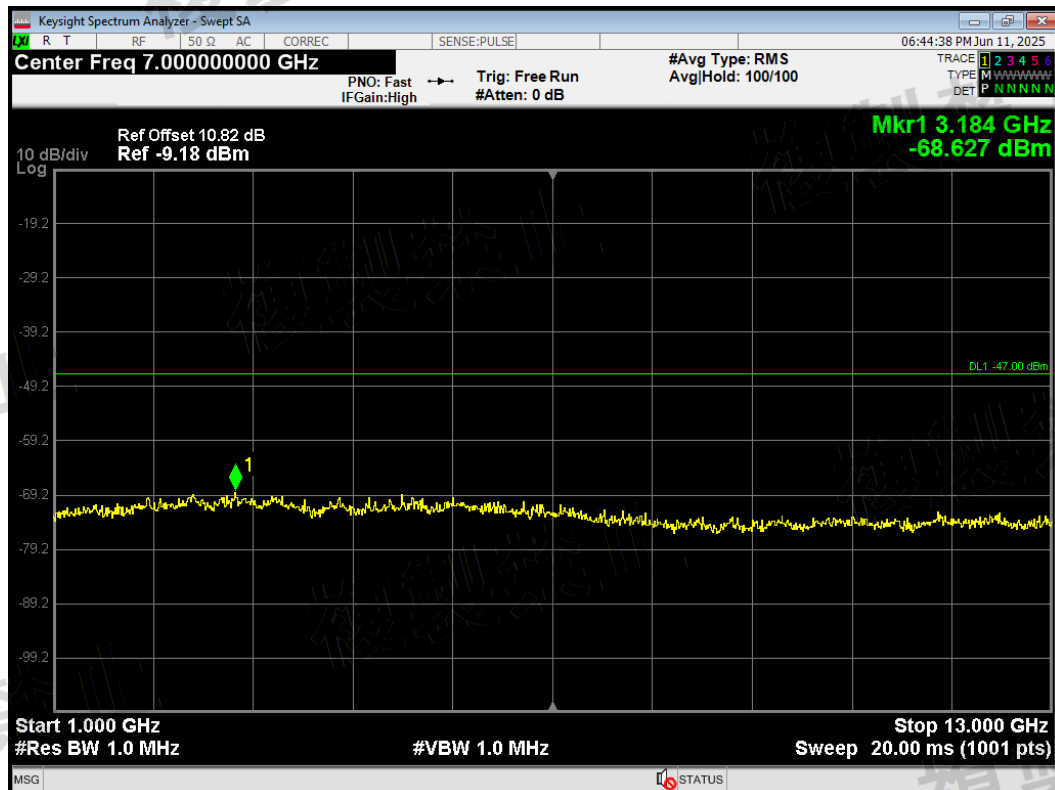
Rx. Spurious BLE (1M) 2480MHz @ 1000MHz-13000MHz



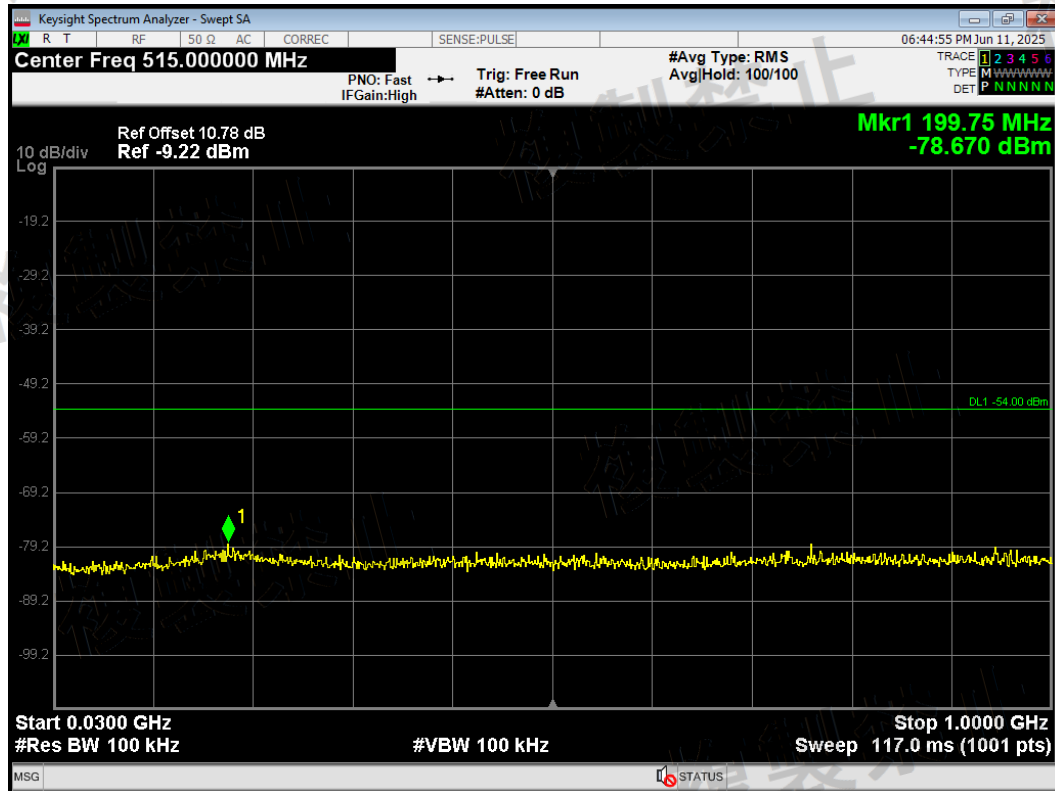
Rx. Spurious BLE (2M) 2404MHz @ 30MHz-1000MHz



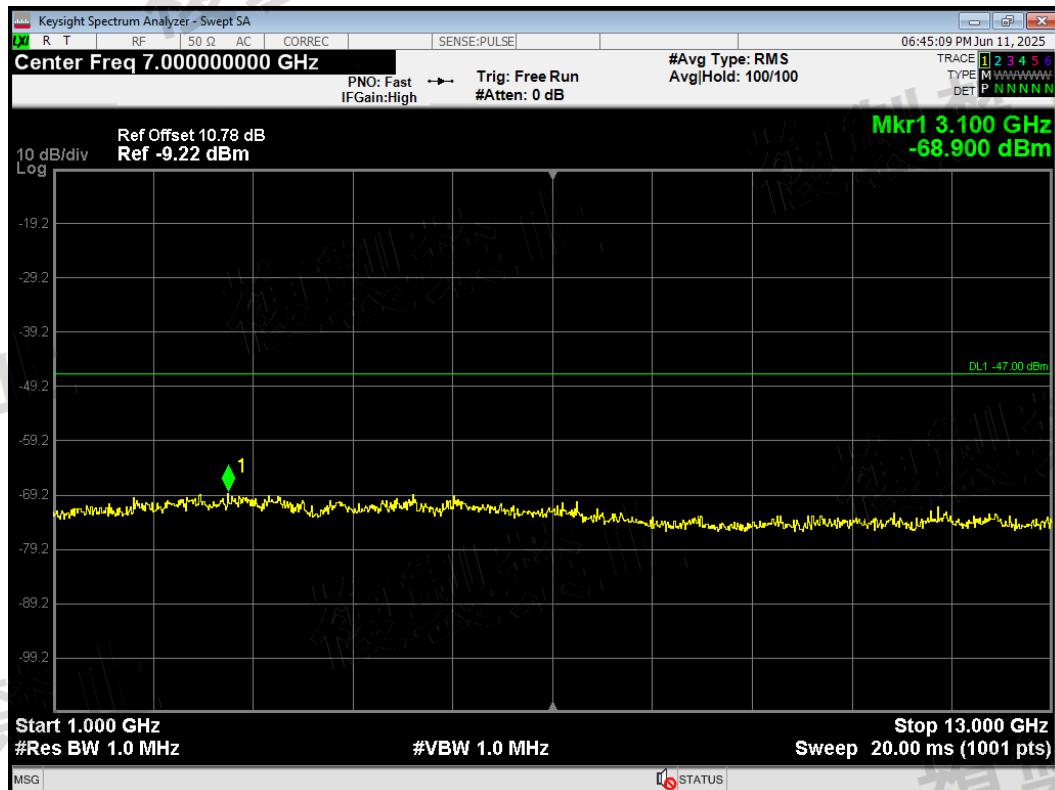
Rx. Spurious BLE (2M) 2404MHz @ 1000MHz-13000MHz



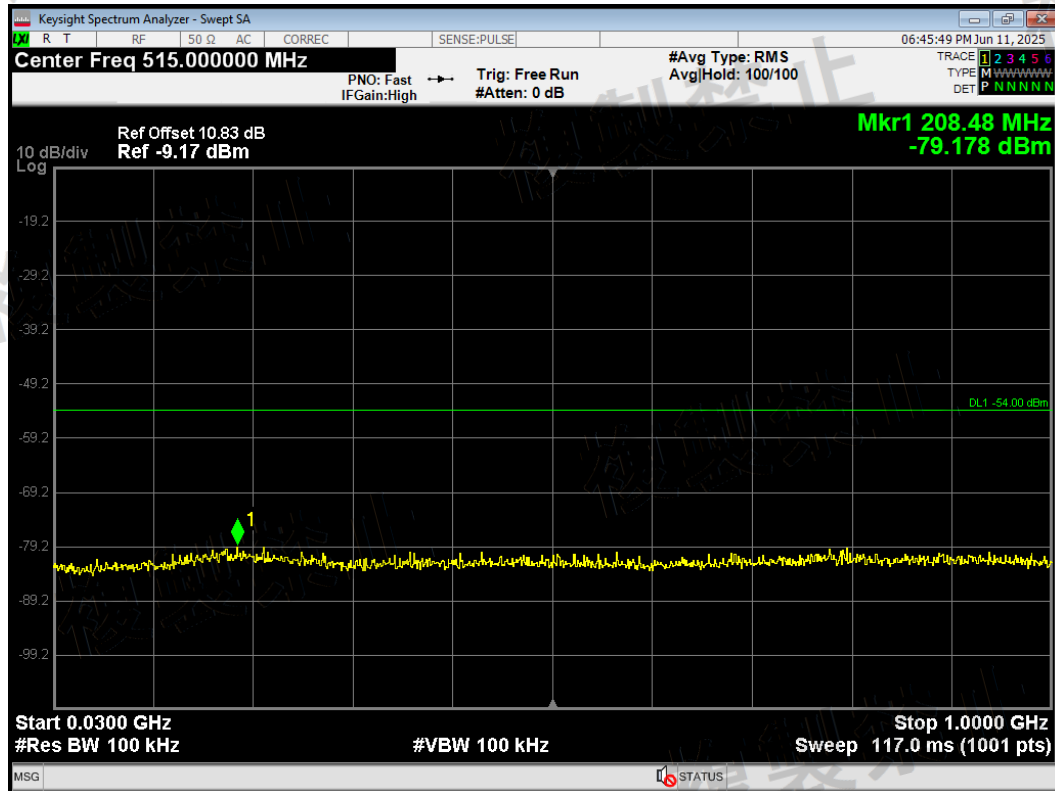
Rx. Spurious BLE (2M) 2440MHz @ 30MHz-1000MHz



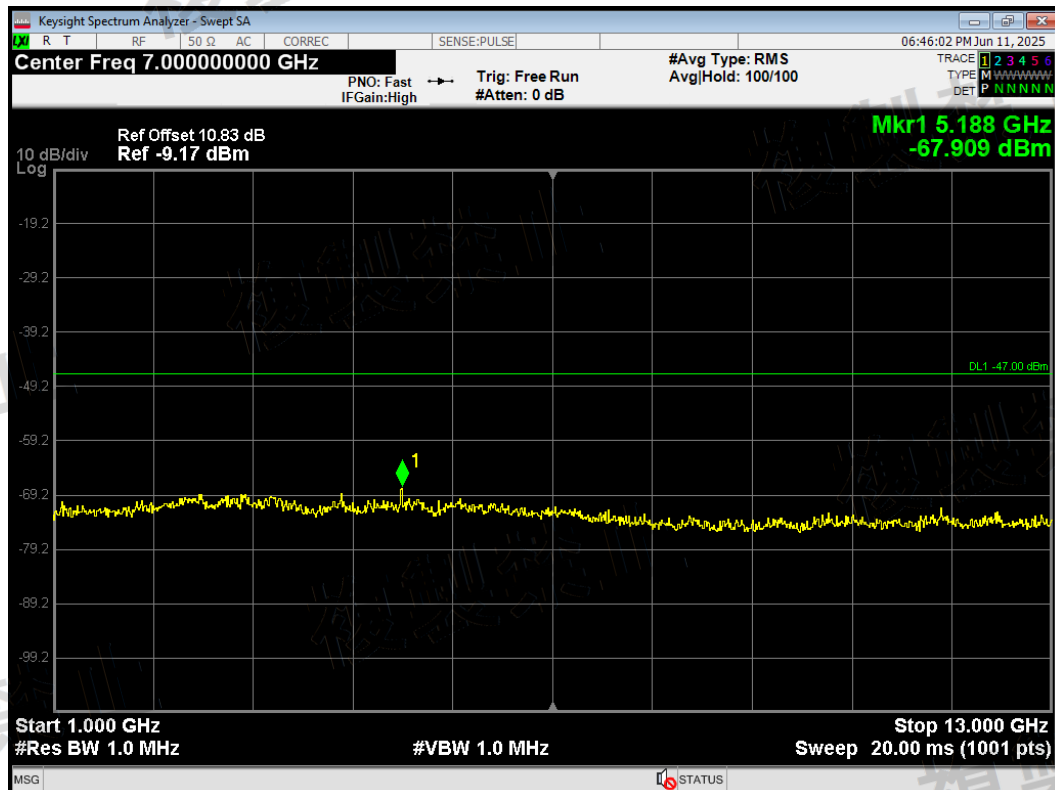
Rx. Spurious BLE (2M) 2440MHz @ 1000MHz-13000MHz



Rx. Spurious BLE (2M) 2478MHz @ 30MHz-1000MHz



Rx. Spurious BLE (2M) 2478MHz @ 1000MHz-13000MHz



## 5.8. Retention Time

### Ambient Condition

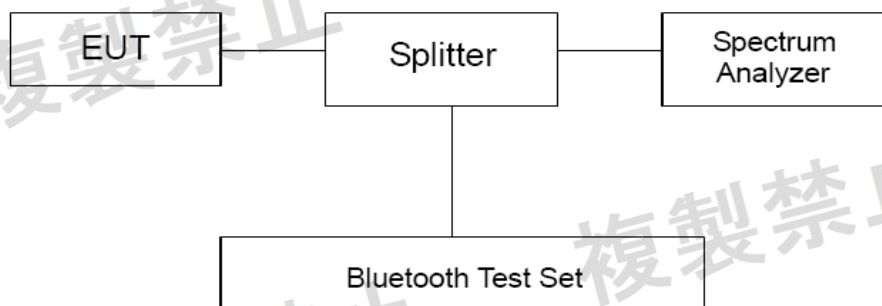
| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Methods of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 1MHz and VBW is set to 1MHz on spectrum analyzer. The Retention time is calculated by:

Retention time=Scanning times \* Pulse time length /1000

### Test Setup



### Limits

The total sum of the frequency retention time in any frequency within the time obtained by multiplying the diffusion rate by 0.4 second shall be 0.4 second or shorter.

|                |        |
|----------------|--------|
| Retention time | ≤ 0.4s |
|----------------|--------|

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ .

| Requirements   | Uncertainty |                   |      |                   |      |                   |
|----------------|-------------|-------------------|------|-------------------|------|-------------------|
| Retention time | DH5         | $U=0.70\text{ms}$ | 2DH5 | $U=0.70\text{ms}$ | 3DH5 | $U=0.70\text{ms}$ |

## Test Results:

### Bluetooth

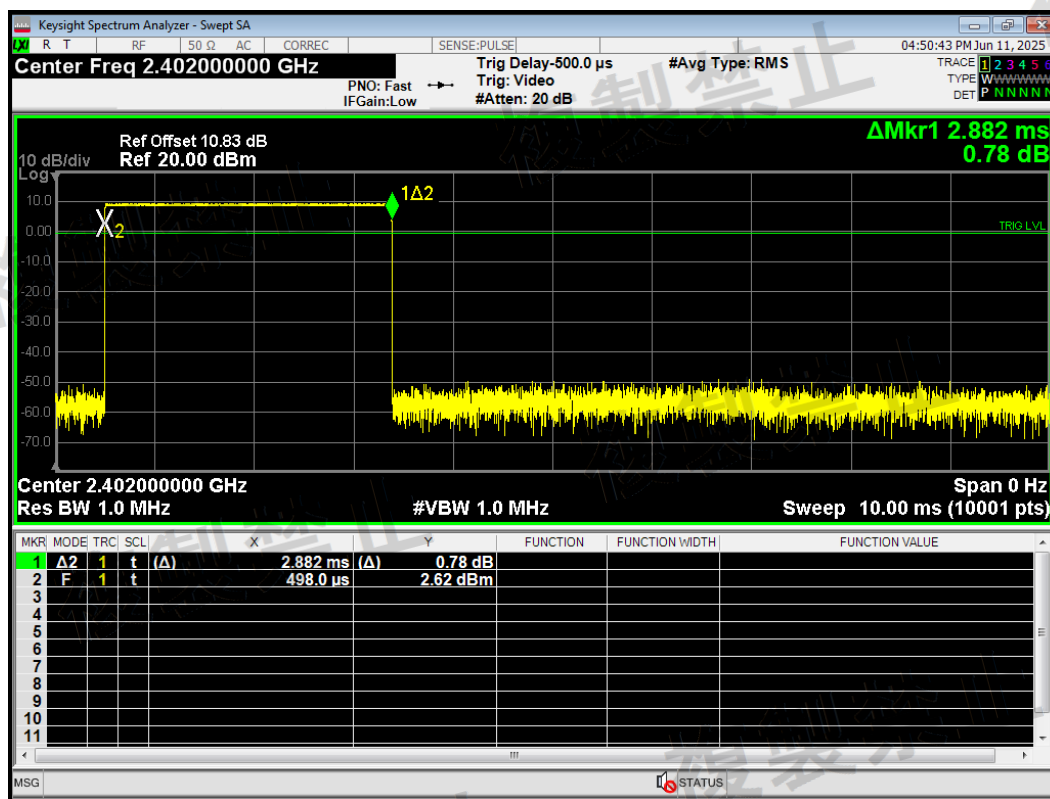
| Packet type                                                      | Frequency (MHz) | Scanning times N | Pulse time length t (ms) | Retention time (ms) | Limit (s) | Conclusion |
|------------------------------------------------------------------|-----------------|------------------|--------------------------|---------------------|-----------|------------|
| DH5                                                              | 2402            | 102              | 2.882                    | 293.964             | ≤ 0.4     | PASS       |
|                                                                  | 2441            | 83               | 2.881                    | 239.123             | ≤ 0.4     | PASS       |
|                                                                  | 2480            | 82               | 2.88                     | 236.16              | ≤ 0.4     | PASS       |
| 2DH5                                                             | 2402            | 96               | 2.881                    | 276.576             | ≤ 0.4     | PASS       |
|                                                                  | 2441            | 104              | 2.885                    | 300.040             | ≤ 0.4     | PASS       |
|                                                                  | 2480            | 91               | 2.886                    | 262.626             | ≤ 0.4     | PASS       |
| 3DH5                                                             | 2402            | 98               | 2.887                    | 282.926             | ≤ 0.4     | PASS       |
|                                                                  | 2441            | 89               | 2.887                    | 256.943             | ≤ 0.4     | PASS       |
|                                                                  | 2480            | 102              | 2.886                    | 294.372             | ≤ 0.4     | PASS       |
| Note: Retention time = Scanning times * Pulse time length / 1000 |                 |                  |                          |                     |           |            |

### Bluetooth LE

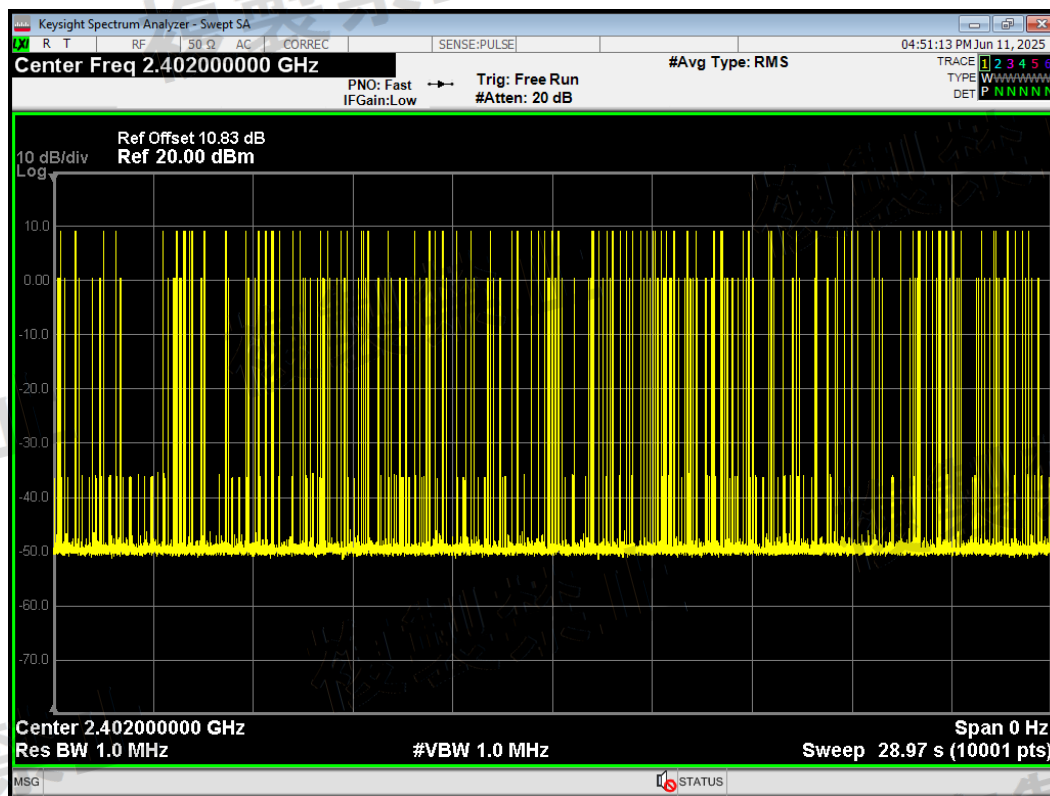
Only applicable for FHSS.

# Bluetooth

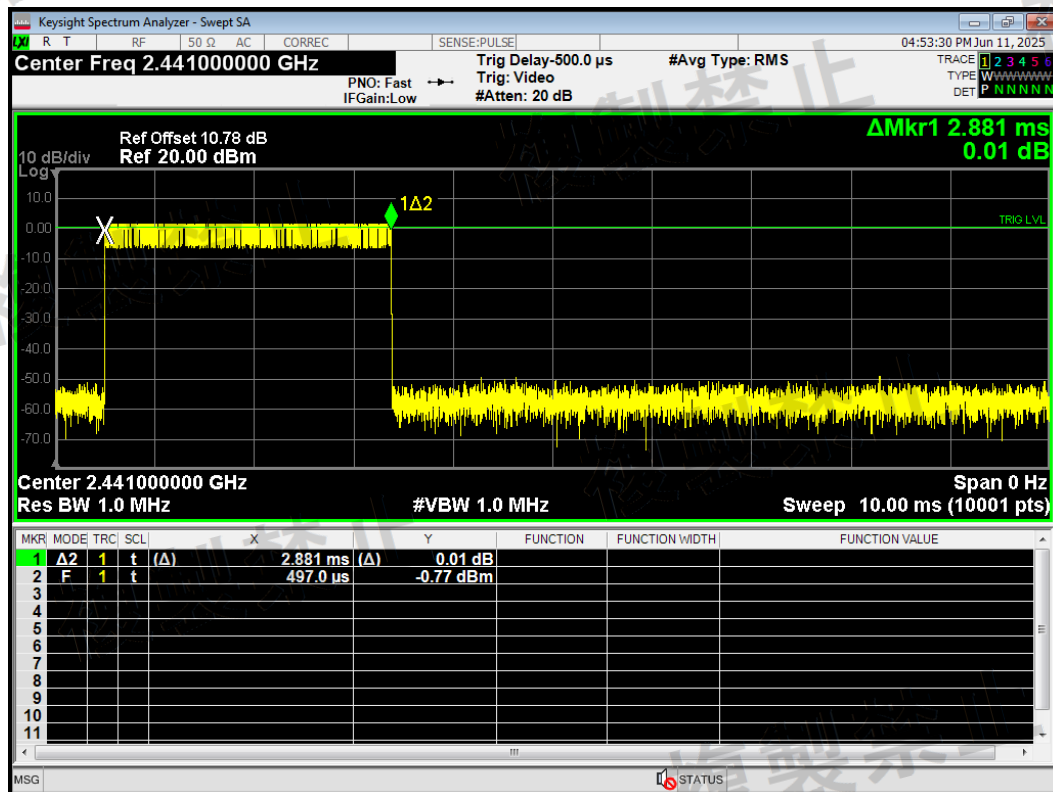
## Dwell 1-DH5 2402MHz One Burst



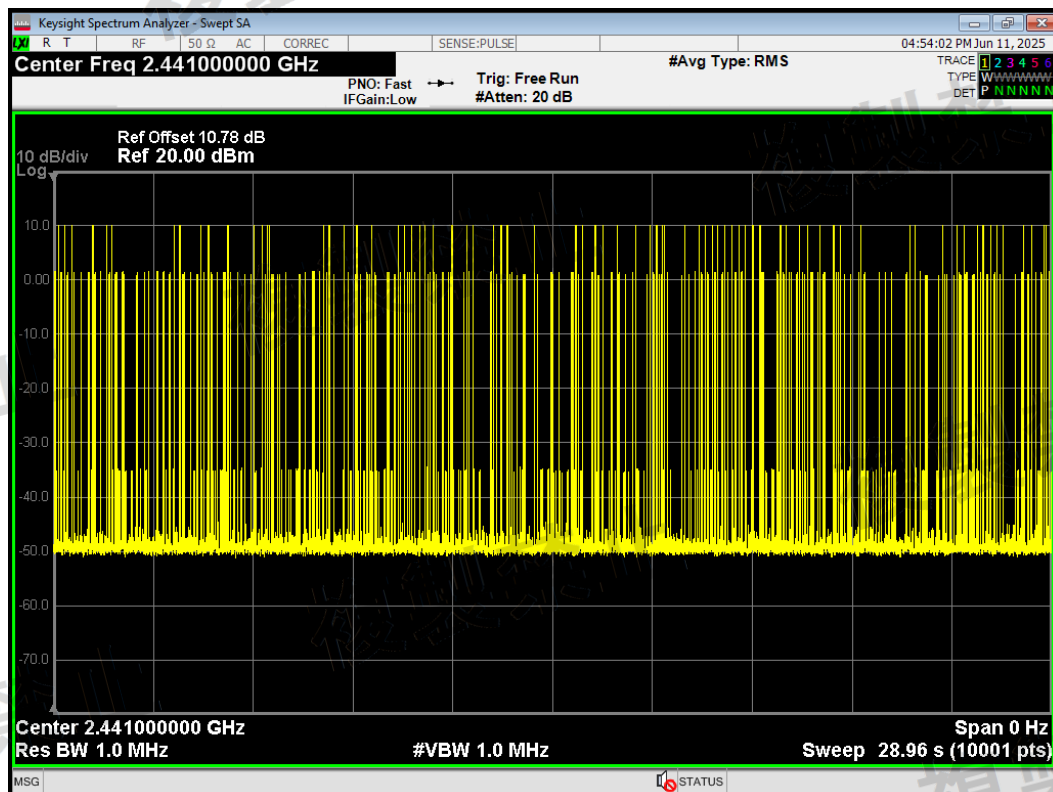
## Dwell 1-DH5 2402MHz Accumulated



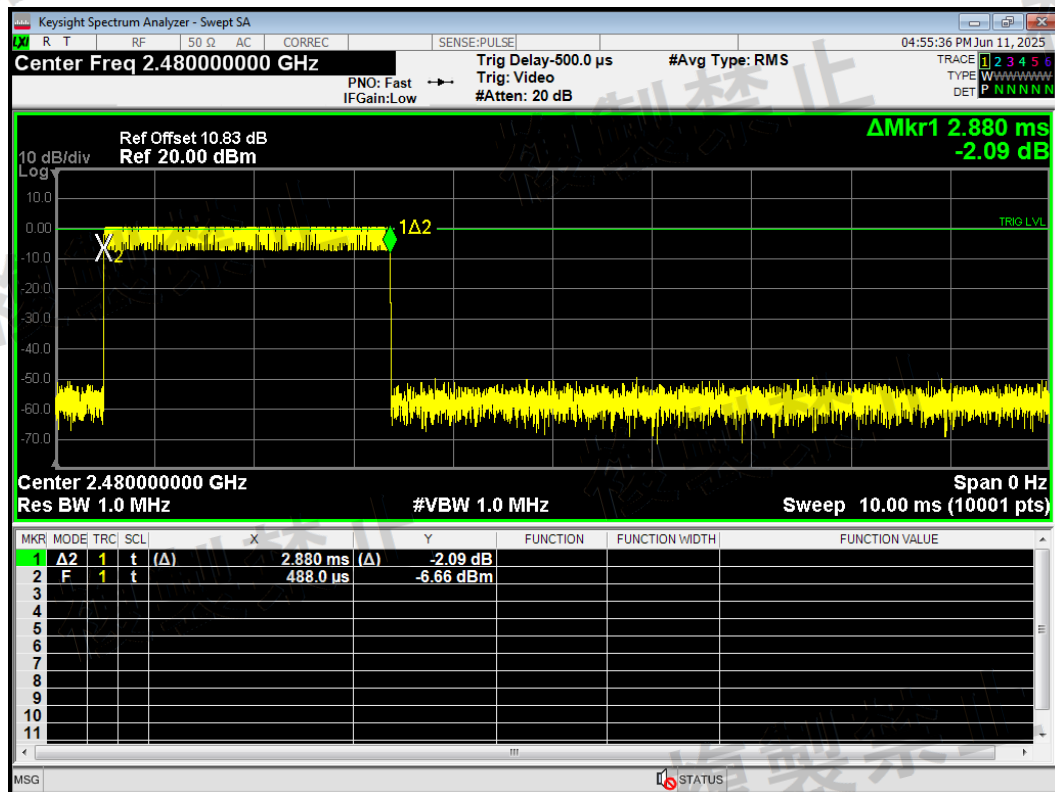
## Dwell 1-DH5 2441MHz One Burst



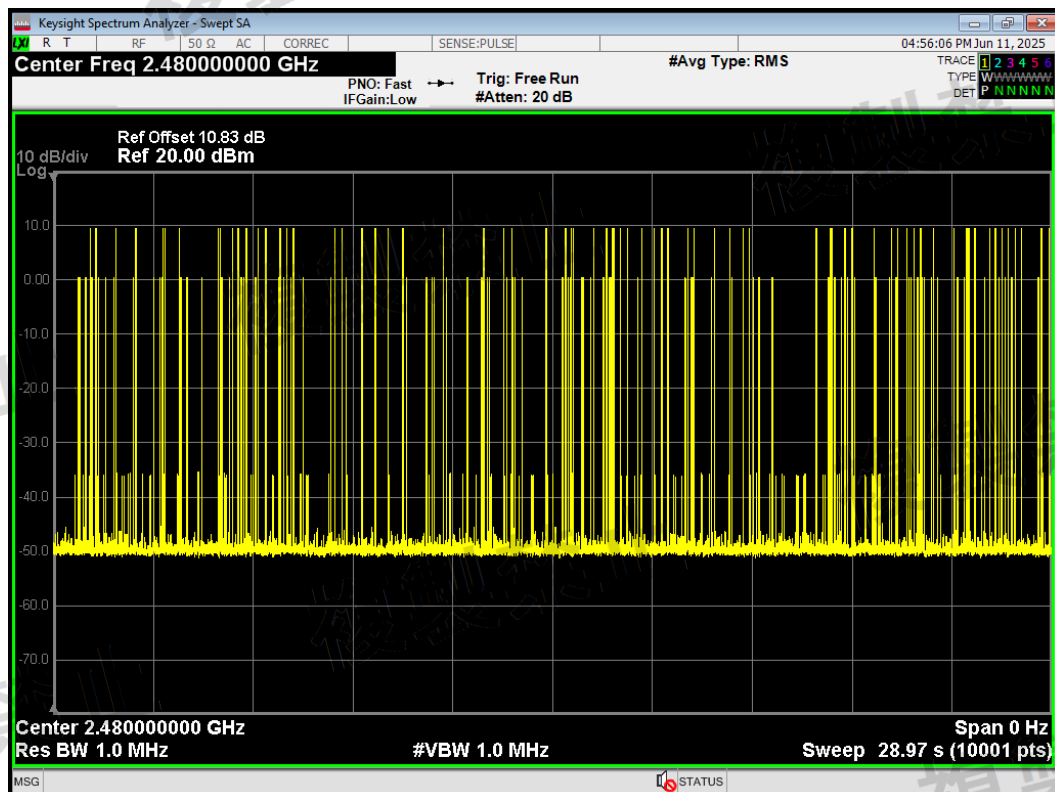
## Dwell 1-DH5 2441MHz Accumulated



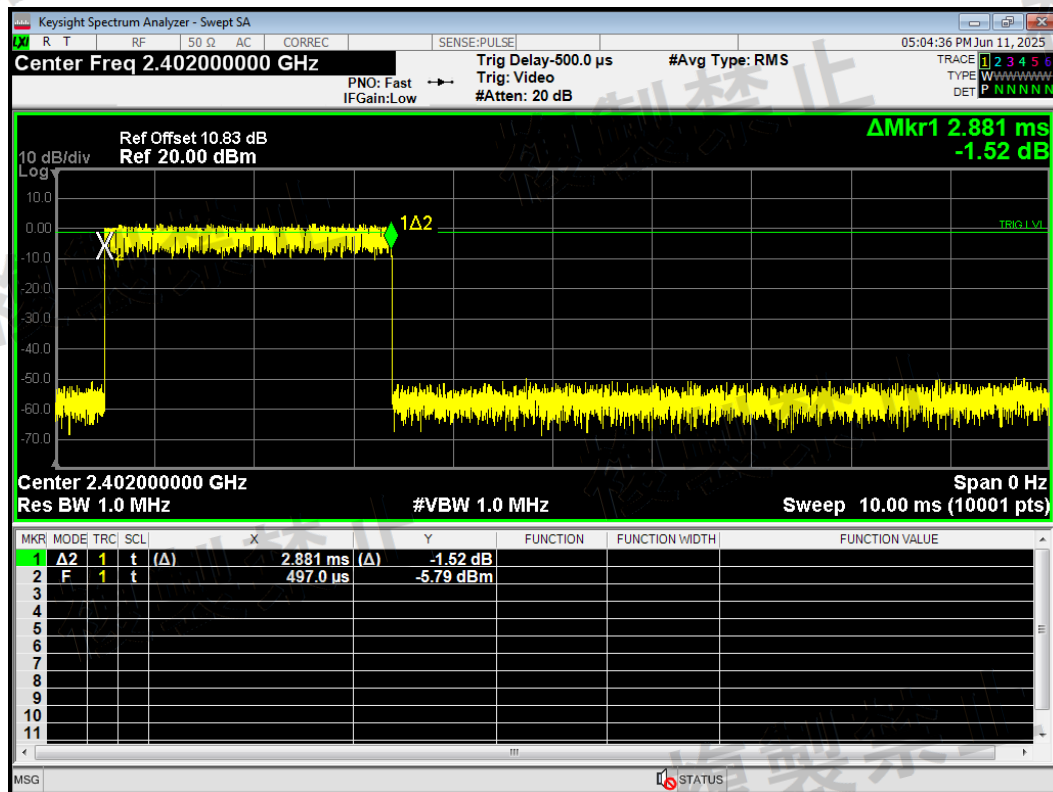
Dwell 1-DH5 2480MHz One Burst



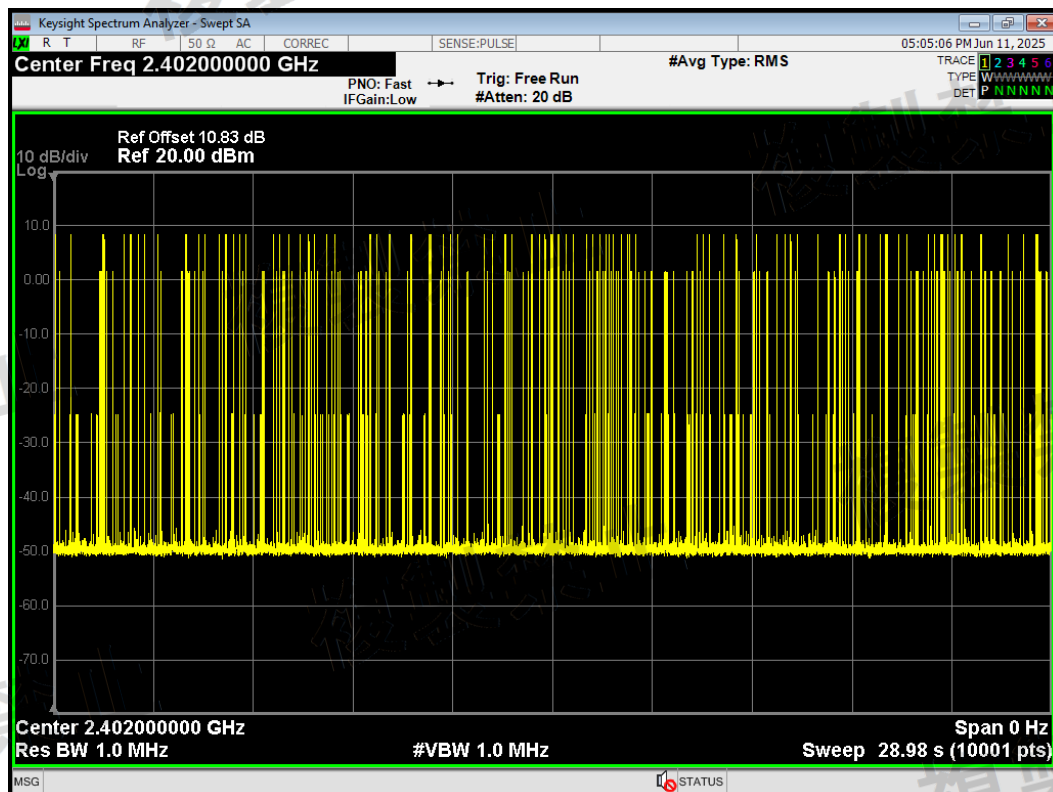
Dwell 1-DH5 2480MHz Accumulated



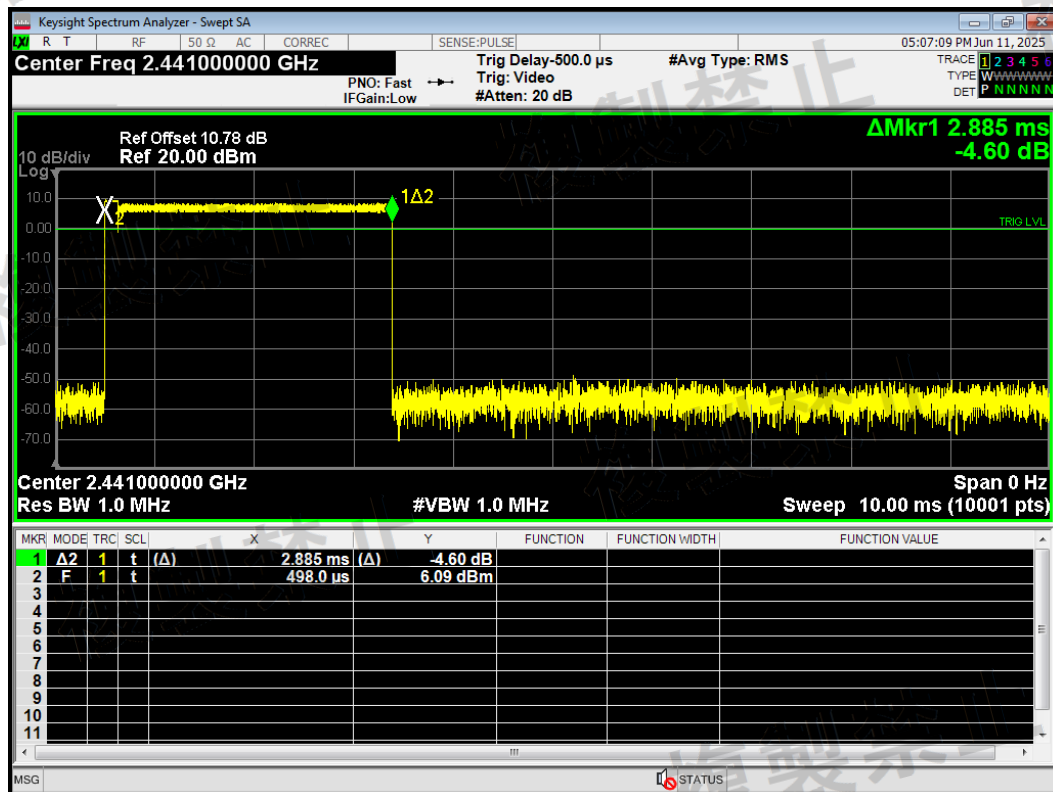
## Dwell 2-DH5 2402MHz One Burst



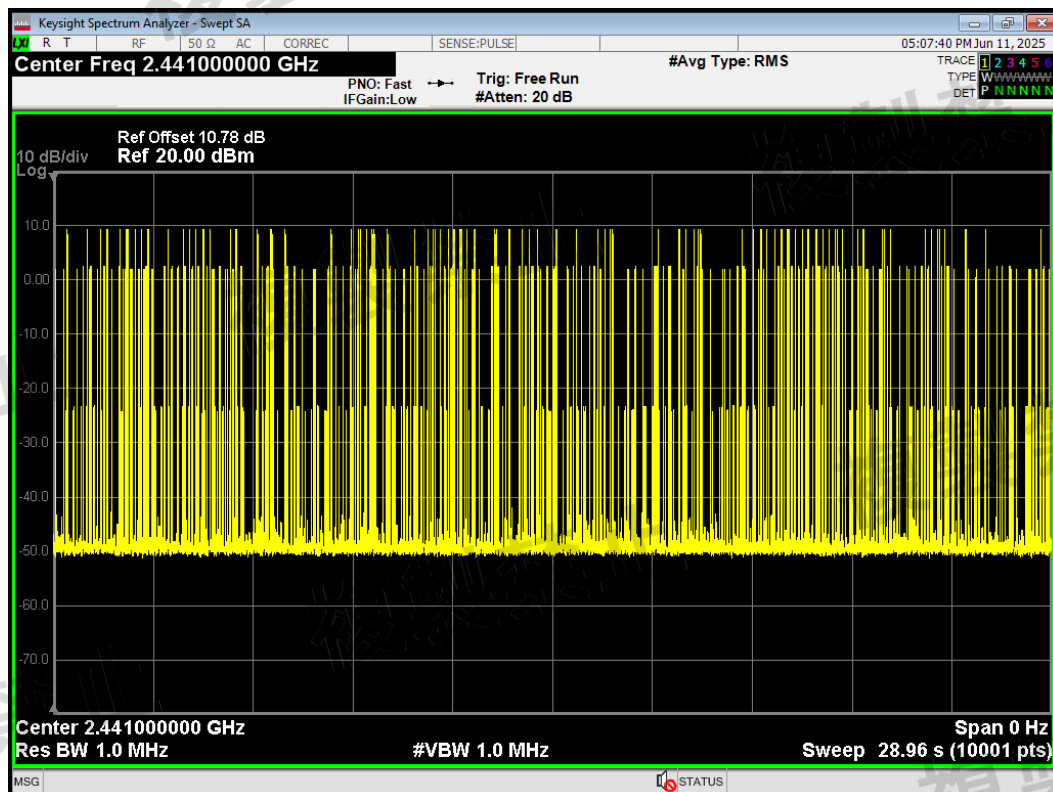
## Dwell 2-DH5 2402MHz Accumulated



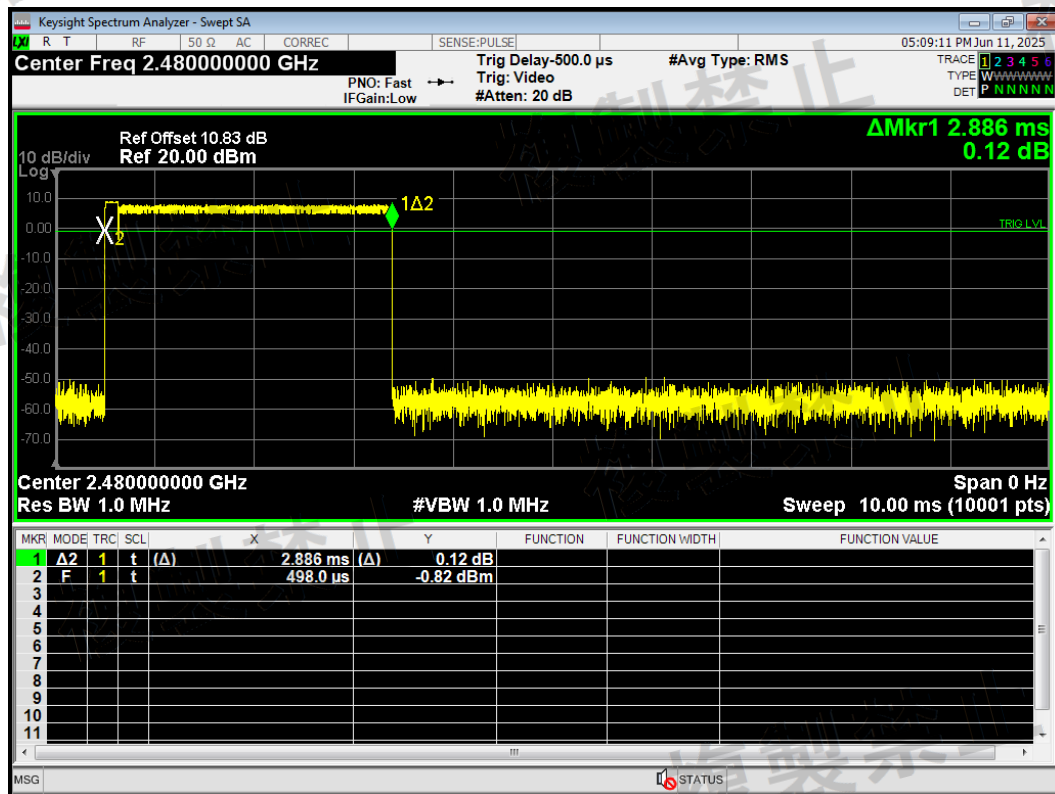
## Dwell 2-DH5 2441MHz One Burst



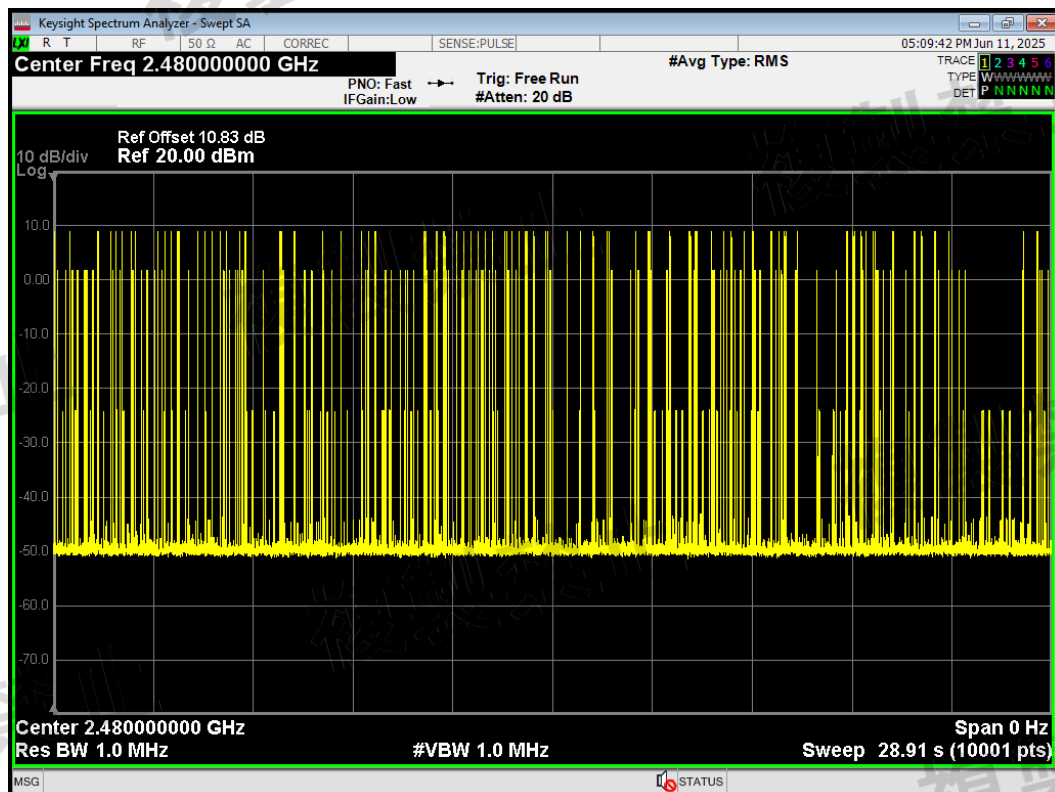
## Dwell 2-DH5 2441MHz Accumulated



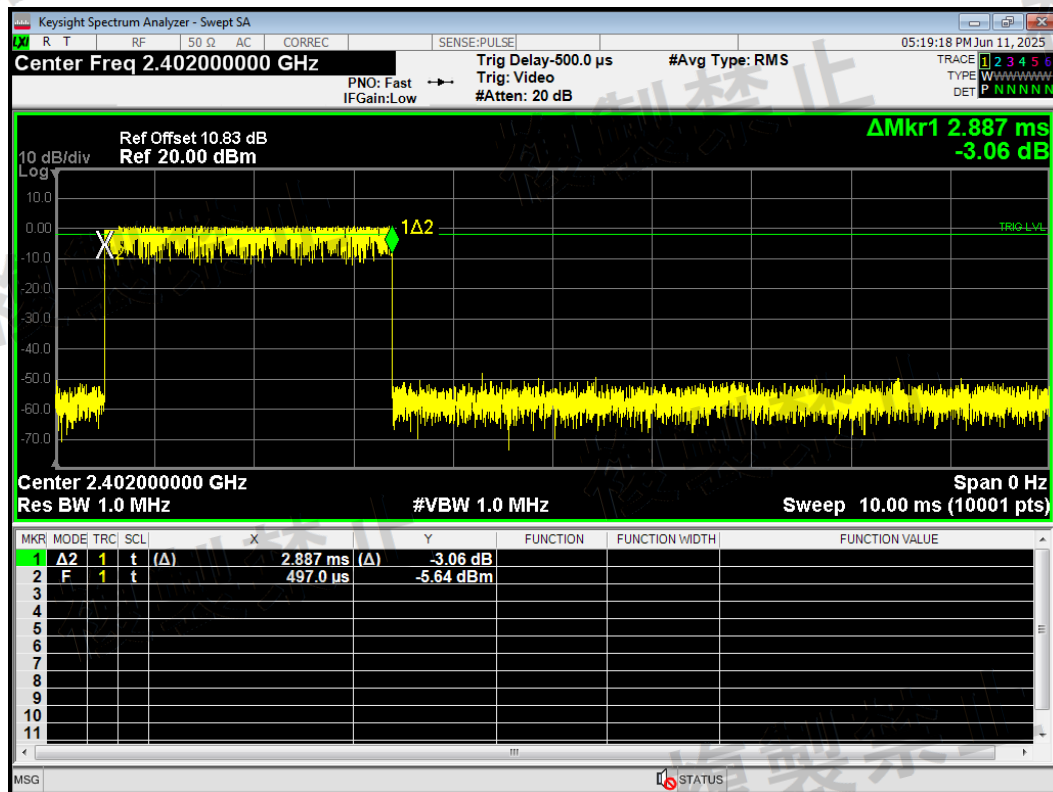
Dwell 2-DH5 2480MHz One Burst



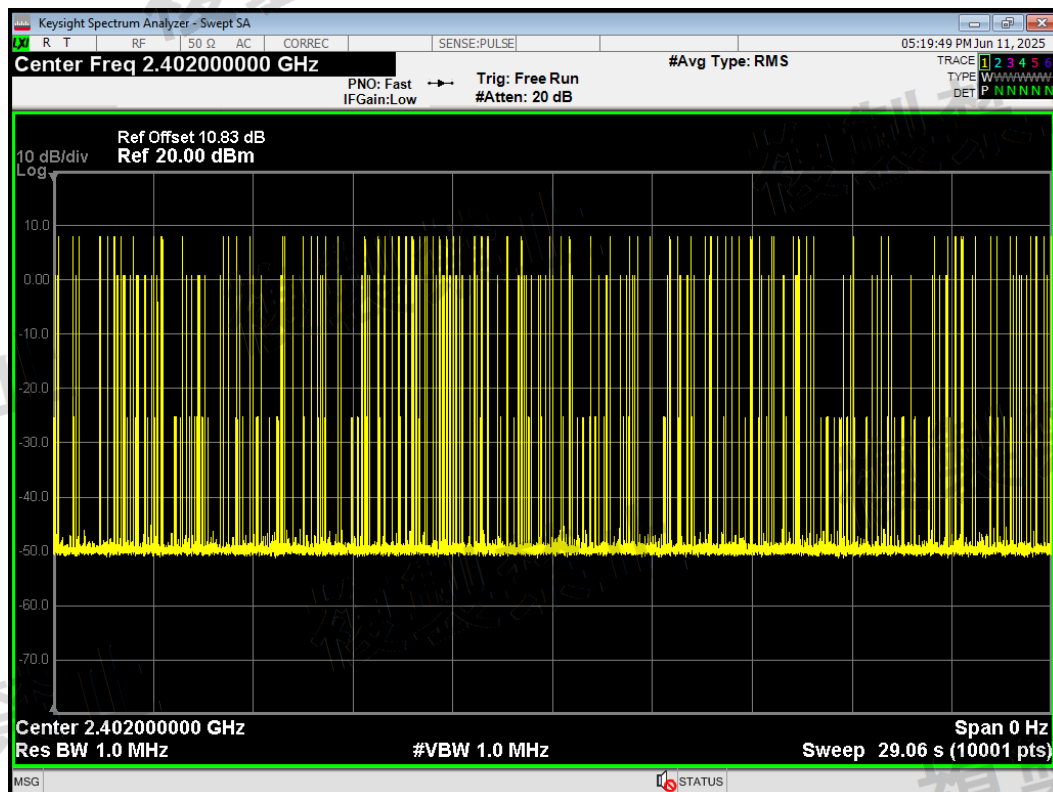
Dwell 2-DH5 2480MHz Accumulated



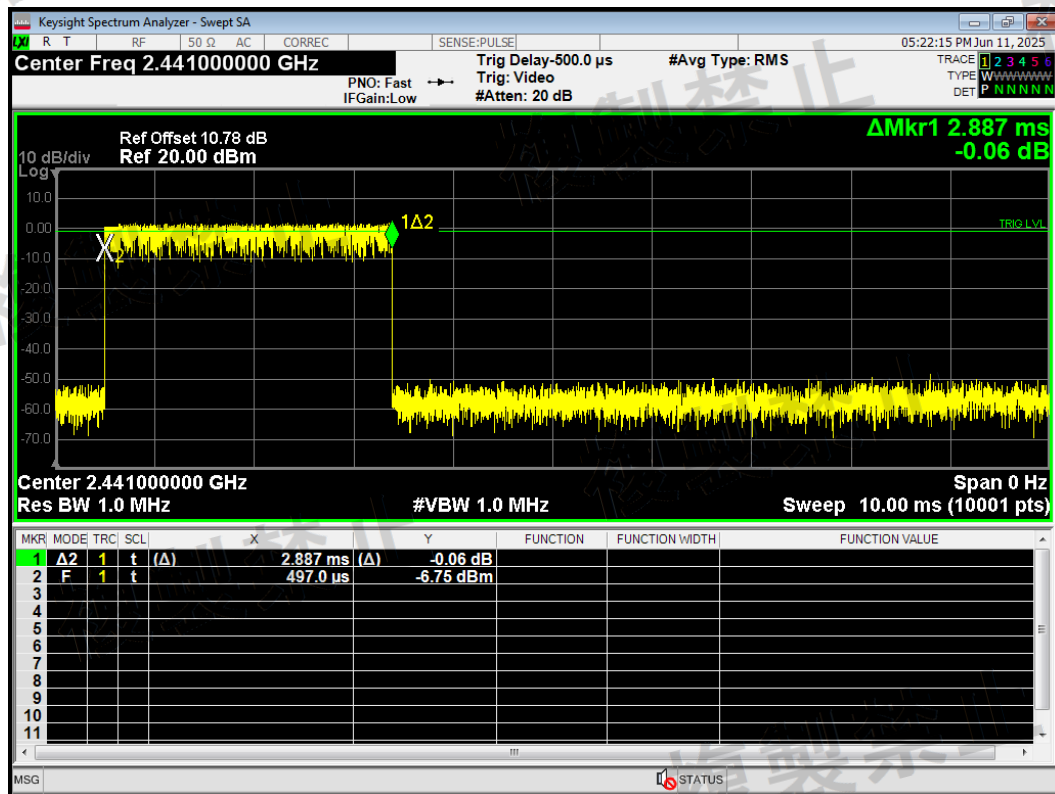
### Dwell 3-DH5 2402MHz One Burst



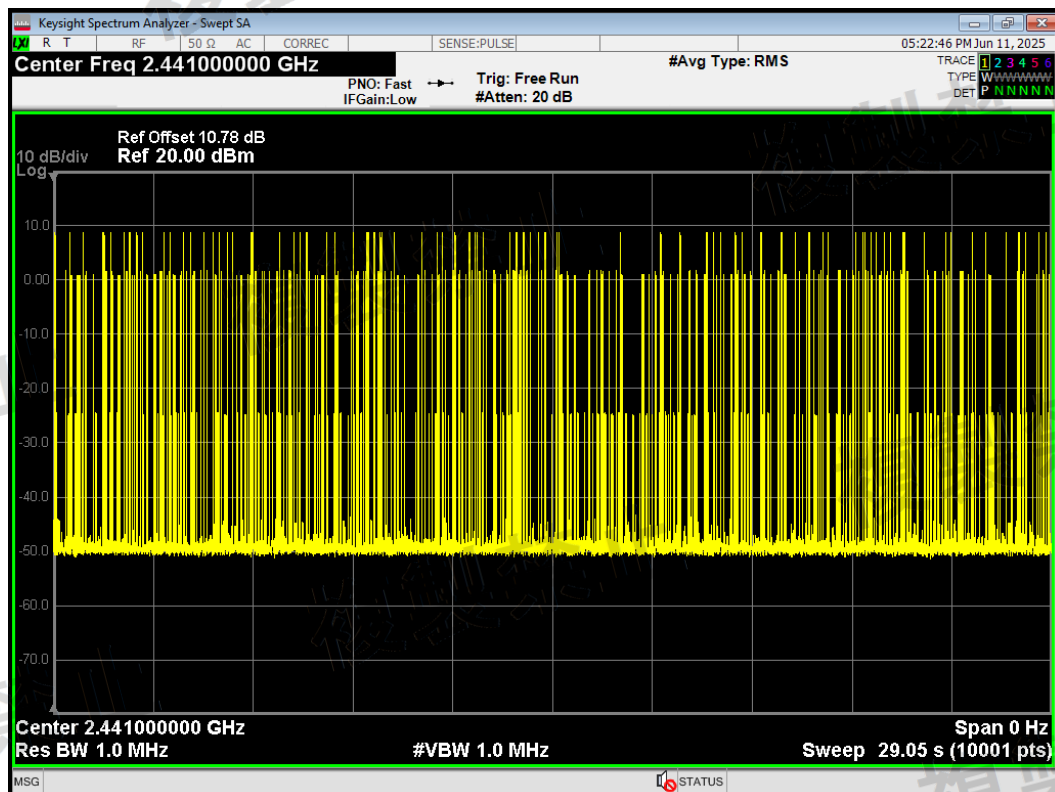
### Dwell 3-DH5 2402MHz Accumulated



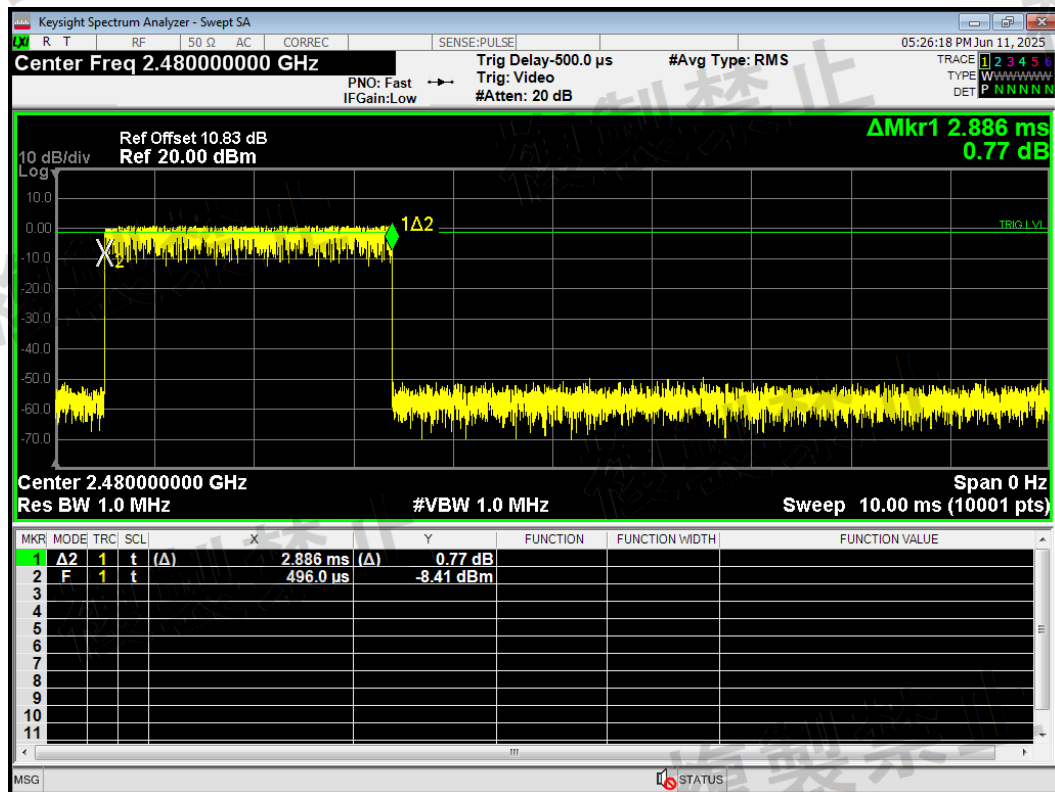
Dwell 3-DH5 2441MHz One Burst



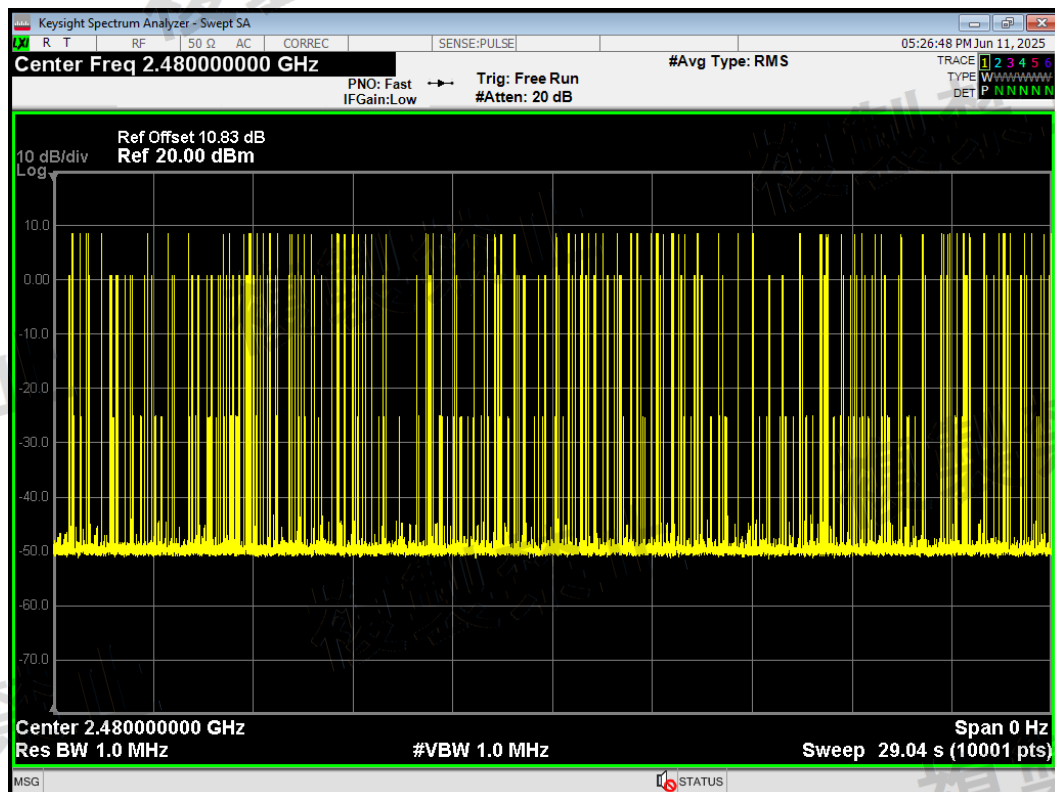
Dwell 3-DH5 2441MHz Accumulated



# Dwell 3-DH5 2480MHz One Burst



# Dwell 3-DH5 2480MHz Accumulated



## 5.9. Radio Interference Prevention Capability Measurement

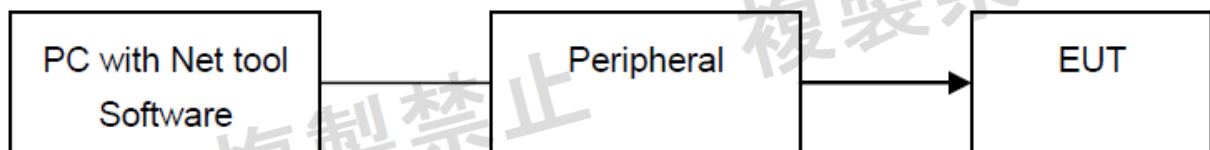
### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 50%               | 101.5kPa |

### Method of Measurement

1. 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.
2. 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.

### Test Setup



### Limit

Identification code  $\geq$  48 bits

# Test Results For Bluetooth

| Test Mode   | Test Frequency (MHz)                                                          | Identification code | Result |
|-------------|-------------------------------------------------------------------------------|---------------------|--------|
| Bluetooth   | 2402                                                                          | 48                  | Pass   |
|             | 2440                                                                          | 48                  | Pass   |
|             | 2480                                                                          | 48                  | Pass   |
| MAC address | <b>For Bluetooth</b><br><div>Bluetooth address<br/>7c:0c:92:12:2f:08</div>    |                     |        |
|             | <b>For Bluetooth LE</b><br><div>Bluetooth address<br/>7c:0c:92:12:2f:08</div> |                     |        |

## 5.10. Construction Protection Confirmation Method

### Ambient Condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 50%               | 101.5kPa |

### Limit

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

Test Results:

|                  |                                                                                                                                                                                                                                                                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protected Method | RF and Modulation components are covered with shielding case and this shielding case is soldered.                                                                                                                                                                                                                                                             |
| Description      | Bluetooth/BLE/WIFI RF chip is protected since IC package type is QFN under the package and are not accessible to the user.<br>Bluetooth/BLE/WIFI MCU pins are covered since IC package type is BGA – pins are soldered under the package and are not accessible to the user.<br>Bluetooth/WIFI RF chip and Bluetooth/WIFI MCU are protected by shielding can. |

Photo



## 6. Uncertainty Measurement

| Parameter                                                 | Uncertainty              |
|-----------------------------------------------------------|--------------------------|
| RF Output Power                                           | $\pm 1.25\text{dB}$      |
| Frequency Error Measurement                               | $\pm 2.5 \times 10^{-7}$ |
| Occupied Bandwidth and Spread-spectrum Bandwidth / Factor | $\pm 4.54\%$             |
| Unwanted Emission Strength Measurement                    | $\pm 1.23\text{dB}$      |
| Secondarily Emitted Radio Wave Strength                   | $\pm 1.12\text{ dB}$     |
| Carrier Sense                                             | $\pm 1.55\text{ dB}$     |

## 7. Main Test Instruments

| Name              | Type         | Manufacturer | Serial Number | Calibration<br>Unite                                       | Date of<br>Calibration | Expiry Date | Calibration<br>Method |
|-------------------|--------------|--------------|---------------|------------------------------------------------------------|------------------------|-------------|-----------------------|
| Power sensor      | R&S          | NRP18S       | 101954        | CHINA CEPREI<br>LABORATORY CALIBRATION<br>& TESTING CENTRE | 2025-05-06             | 2026-05-05  | c                     |
| Attenuator        | HASCO        | HA18A-10     | 0003          | /                                                          | /                      | /           | c                     |
| Test software     | MW           | MTS8310      | /             | /                                                          | /                      | /           | c                     |
| Splitter          | UCLMicrowave | 2 way        | UCL-PD0512-2S | /                                                          | /                      | /           | c                     |
| Spectrum Analyzer | KEYSIGHT     | N9020A       | MY51330870    | CHINA CEPREI<br>LABORATORY CALIBRATION<br>& TESTING CENTRE | 2025-05-06             | 2026-05-05  | c                     |

Note: The auxiliary devices of attenuation and splitter have been integrated into the system, and the system calibration has been included

Calibration Method:

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

## ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

## ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.

\*\*\*\*\*END OF REPORT \*\*\*\*\*