

# TEST REPORT

Report No.: SHE24090032-03AE

Date: 2025-04-22

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**Applicant** : PETKIT Network Technology (Shanghai) Co., Ltd.  
**Address of Applicant** : Room 4139, Building 2, 588 Zixing Road, Minhang District, Shanghai

**Product Name** : PETKIT PUROBOT ULTRA WITH CAMERA  
SELF-CLEANING CAT LITTER BOX

**Brand Name** : PETKIT  
**Model Name** : P9903  
**Sample Acquisition Method** : Sent by Client  
**Sample No.** : E24080007-01#01

**Standards** : MIC Notice No.88 Appendix No.43  
Article 2, Paragraph 1, Item 19

**Date of Receipt** : 2024-08-06  
**Date of Test** : 2024-08-19~ 2024-09-11  
**Date of Issue** : 2025-04-22

**Remark:**  
*This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.*

Prepared by: Erik Yang (Erik Yang)      Reviewed by: Jennifer Zhou (Jennifer Zhou)      Approved by: Echo Mu (Authorized signatory: Echo Mu)

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## 1 General Information

### 1.1 Testing Laboratory

|              |                                                         |
|--------------|---------------------------------------------------------|
| Company Name | ICAS Testing Technology Service (Shanghai) Co., Ltd.    |
| Address      | No.1298, Pingan Road, Minhang District, Shanghai, China |
| Telephone    | 0086 21-51682999                                        |
| Fax          | 0086 21-54711112                                        |
| Homepage     | www.icasiso.com                                         |

### 1.2 Details of Application

|                           |                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------------|
| Applicant Company Name    | PETKIT Network Technology (Shanghai) Co., Ltd.                                                    |
| Address                   | Room 4139, Building 2, 588 Zixing Road, Minhang District, Shanghai                                |
| Contact Person            | TingHe                                                                                            |
| Telephone                 | +86 13916991059                                                                                   |
| Email                     | ting.he@petkit.com                                                                                |
| Manufacturer Company Name | Dongguan Zhihang Electronic Technology Co., LTD.                                                  |
| Address                   | Room 701, Building 15, No.1, Pushi Road I, Qiaotou Town, Dongguan City,Guangdong Province, China. |
| Factory Company Name      | Dongguan Zhihang Electronic Technology Co., LTD.                                                  |
| Address                   | Room 701, Building 15, No.1, Pushi Road I, Qiaotou Town, Dongguan City,Guangdong Province, China. |

### 1.3 Details of EUT

|                       |                                                                                    |
|-----------------------|------------------------------------------------------------------------------------|
| Product Name          | PETKIT PUROBOT ULTRA WITH CAMERA SELF-CLEANING CAT LITTER BOX                      |
| Brand Name            | PETKIT                                                                             |
| Model Name            | P9903                                                                              |
| Wireless Description  | WIFI 802.11b/g/n(20M)                                                              |
| Frequency Range       | 2412 MHz – 2472 MHz                                                                |
| Channel No.           | 13                                                                                 |
| Modulation Type       | 802.11b: DSSS(CCK, DQPSK, DBPSK)<br>802.11g/n(20M): OFDM(64QAM, 16QAM, QPSK, BPSK) |
| Hardware version      | V1.0                                                                               |
| Software version      | 2.49                                                                               |
| Antenna Type          | Internal Antenna                                                                   |
| Antenna Gain          | 3.70dBi                                                                            |
| Normal Temperature    | 25 °C                                                                              |
| Normal Test Voltage   | Input: AC 100-240V 50/60Hz 1.5A Max<br>Output: DC 12V 4A                           |
| Extreme Voltage Range | AC 90V-240V (Low Voltage is 90V; High Voltage is 240V)                             |

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|                             |                                                                                                                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| RF power setting in TEST SW | SecureCRT Version 7.0.4 and rtwpriv command_<br>Power setting_802.11b_patha=42<br>Power setting_802.11g_patha=63<br>Power setting_802.11n_patha=63 |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|

## Note:

1. The above information was declared by the manufacture.
2. EUT has only one antenna in use.
3. The EUT has single chip with one antenna and the output of the antenna feeder is 50 Ohm.
4. For more details, please refer to the User's manual of the EUT.

## Channel List

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|
| 1       | 2.412GHz  | 6       | 2.437GHz  | 11      | 2.462GHz  |
| 2       | 2.417GHz  | 7       | 2.442GHz  | 12      | 2.467GHz  |
| 3       | 2.422GHz  | 8       | 2.447GHz  | 13      | 2.472GHz  |
| 4       | 2.427GHz  | 9       | 2.452GHz  |         |           |
| 5       | 2.432GHz  | 10      | 2.457GHz  |         |           |

Note: For 20MHz bandwidth system use Channel 1 to Channel 13

## 1.4 Test Summary

| No.  | Test Item                                                                     | Result                           |
|------|-------------------------------------------------------------------------------|----------------------------------|
| 1    | Frequency Error                                                               | Compliance                       |
| 2    | Occupied Bandwidth and Spreading Bandwidth                                    | Compliance                       |
| 3    | Transmitter Spurious Emission Strength and Unwanted Emission Intensity        | Compliance                       |
| 4    | Antenna Output Power and Output Power Tolerance and Transmission Antenna Gain | Compliance                       |
| 5    | Receiver Spurious Emission and Unwanted Emission Intensity                    | Compliance                       |
| 6    | Transmission Radiation Angle Width                                            | Not Applicable                   |
| 7    | Frequency Hopping Dwell Time                                                  | Not Applicable <sup>Note 1</sup> |
| 8    | Carrier sense capability                                                      | Not Applicable                   |
| 9    | Interference Prevention Function                                              | Compliance                       |
| Note | Construction Protection Confirmation                                          | Compliance                       |

## Note(s):

1. Testing is only required for FHSS system devices.

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## 2 Test Condition

### 2.1 Environmental Conditions

|                            |          |
|----------------------------|----------|
| Temperature (°C)           | 23.8°C   |
| Humidity (%RH)             | 40%RH    |
| Barometric Pressure (mbar) | 1001mbar |

Note: Actual values will be recorded during the test.

### 2.2 Equipment List

| Name of Equipment  | Manufacturer    | Model   | Serial No.        | Cal. Date  | Cal. Due   | Calibration Company |
|--------------------|-----------------|---------|-------------------|------------|------------|---------------------|
| Spectrum Analyzer  | Keysight        | N9020B  | MY59260184        | 2024-06-26 | 2025-06-25 | TI                  |
| DC Power Supply    | ITECH           | IT6512A | N/A               | 2024-06-27 | 2026-06-26 | TI                  |
| Signal Generator   | Rohde & Schwarz | SMR27   | 100184            | 2024-06-26 | 2025-06-25 | TI                  |
| Digital Hygrograph | KE JIAN         | HTC-1   | N/A               | 2024-07-05 | 2025-07-04 | NEM METROLOGY       |
| Test Software      | BL              | BL410_R | Version:2.1.1.409 | N/A        | N/A        | N/A                 |

Note:

“TI” Full name is Shenzhen Branch of TI Testing and Certification Group Co., Ltd.  
“NEM METROLOGY” Full name is Guangzhou NEW METROLOGY&TEST TECHNOLOGY CO., LTD.

### 2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI. The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95.45%.

| Parameter                   | Uncertainty    |
|-----------------------------|----------------|
| Bandwidth                   | $\pm 0.20$ ppm |
| Antenna Power               | $\pm 0.30$ dB  |
| Frequency Tolerance         | $\pm 5.00$ ppm |
| Conducted spurious emission | $\pm 1.5$ dB   |

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## 3 Test Set-up and Operation Modes

### 3.1 Details of Test Mode

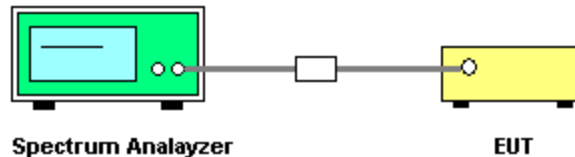
The EUT was tested on a stand-alone basis (only attached to the test jig) and the test system was configured in a typical fashion (as a customer would normally use it).

For 802.11b/g/n(20MHz)

| Channel                    | Frequency |
|----------------------------|-----------|
| The lowest channel (CH1)   | 2412MHz   |
| The middle channel (CH7)   | 2442MHz   |
| The highest channel (CH13) | 2472MHz   |

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

### 3.2 Block Diagram of Test Setup



### 3.3 Special Accessories and Auxiliary Equipment

| Description | Manufacturer | Model Name        | Serial No.                                             |
|-------------|--------------|-------------------|--------------------------------------------------------|
| Laptop      | HP           | HP ZHAN 66 PRO G1 | 5CD7438R1J                                             |
| AC Adapter  | N/A          | GQ48-120400-AX    | Input: AC 100-240V 50/60Hz 1.5A Max; Output: DC 12V 4A |

### 3.4 Support Software

| Description | Manufacturer | Software Name                               |
|-------------|--------------|---------------------------------------------|
| Software    | N/A          | SecureCRT Version 7.0.4 and rtwpriv command |

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## 4 Test Results

### 4.1 FREQUENCY ERROR

#### 4.1.1 Limit

| Item                               | Limits              |
|------------------------------------|---------------------|
| Frequency Tolerance (2412~2472MHz) | $\leq 50\text{ppm}$ |

#### 4.1.2 Test Setup

Set the EUT to the measurement frequency without modulation.

Setting of SA is following as: RB: 10kHz / VB: 10kHz

Center Frequency: The center frequency of testing for EUT

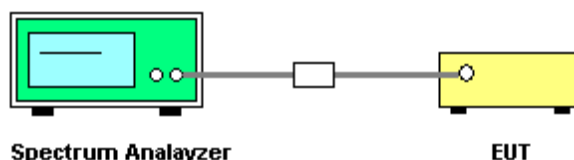
Sweep time: Auto

Sweep mode: Continuous sweep

Detect mode: Positive peak

Mark function: Frequency Counter (Resolution 100Hz)

If the EUT can't set at un-modulation mode, measure the 10dBc center frequency.



#### 4.1.3 Test Record

| Voltage (V) | Center Frequency (MHz) | Measure Frequency (MHz) | Frequency Tolerance (ppm) | Limit (ppm) | P/F  |
|-------------|------------------------|-------------------------|---------------------------|-------------|------|
| Normal      | 2412                   | 2411.979450             | -8.52                     | $\pm 50$    | Pass |
|             | 2442                   | 2441.978775             | -8.69                     | $\pm 50$    | Pass |
|             | 2472                   | 2471.979525             | -8.28                     | $\pm 50$    | Pass |
| Low         | 2412                   | 2411.978700             | -8.83                     | $\pm 50$    | Pass |
|             | 2442                   | 2441.979075             | -8.57                     | $\pm 50$    | Pass |
|             | 2472                   | 2471.978325             | -8.77                     | $\pm 50$    | Pass |
| High        | 2412                   | 2411.979450             | -8.52                     | $\pm 50$    | Pass |
|             | 2442                   | 2441.978925             | -8.63                     | $\pm 50$    | Pass |
|             | 2472                   | 2471.978850             | -8.56                     | $\pm 50$    | Pass |

Note: Frequency Tolerance (ppm) =  $[(\text{Measure frequency} - \text{Center Frequency}) / \text{Center Frequency}] * 10^6$

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## Normal Voltage

Figure 1-Test Frequency: 2412MHz

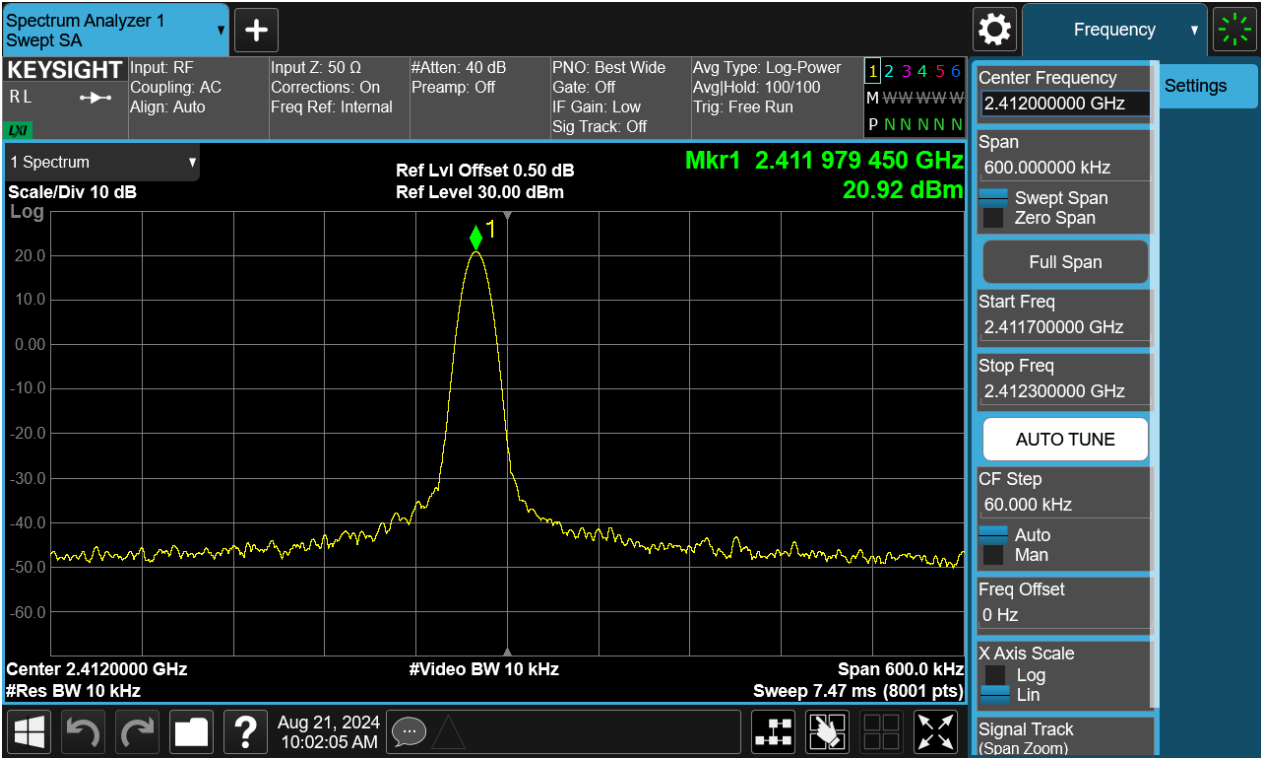
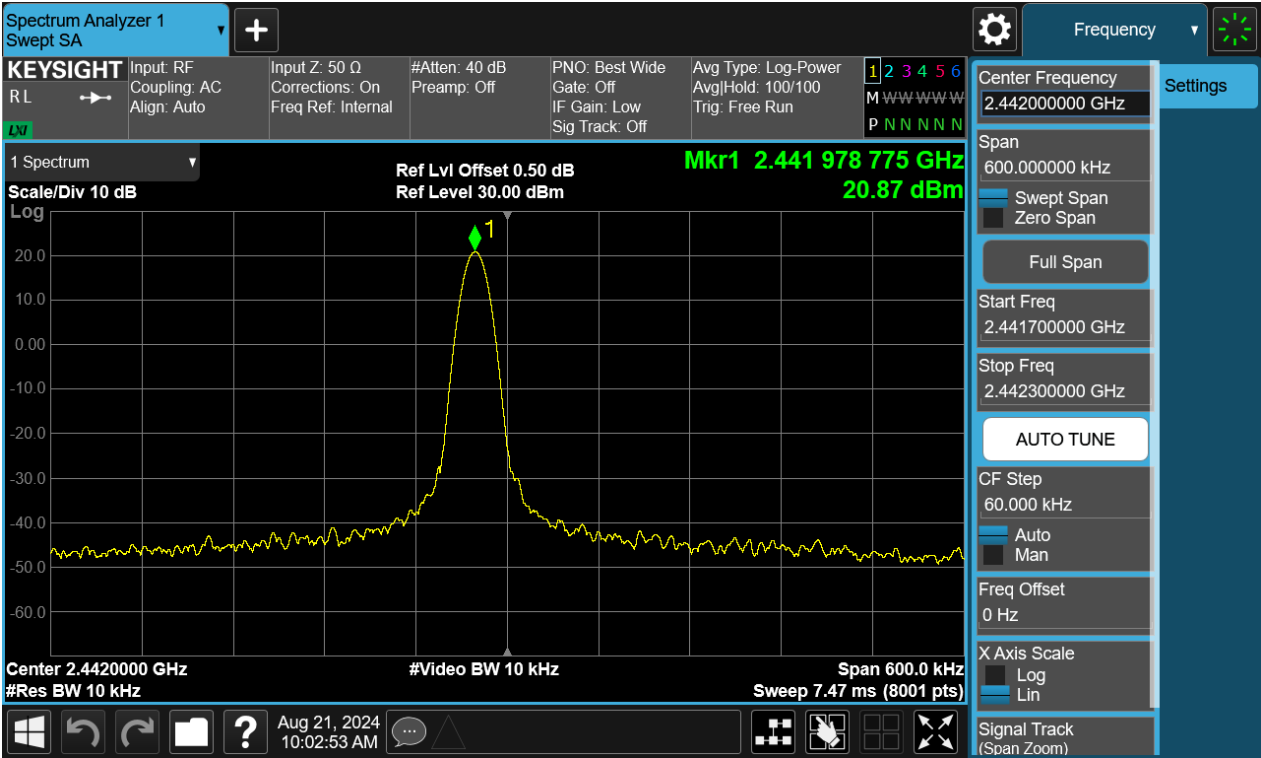


Figure 2-Test Frequency: 2442MHz



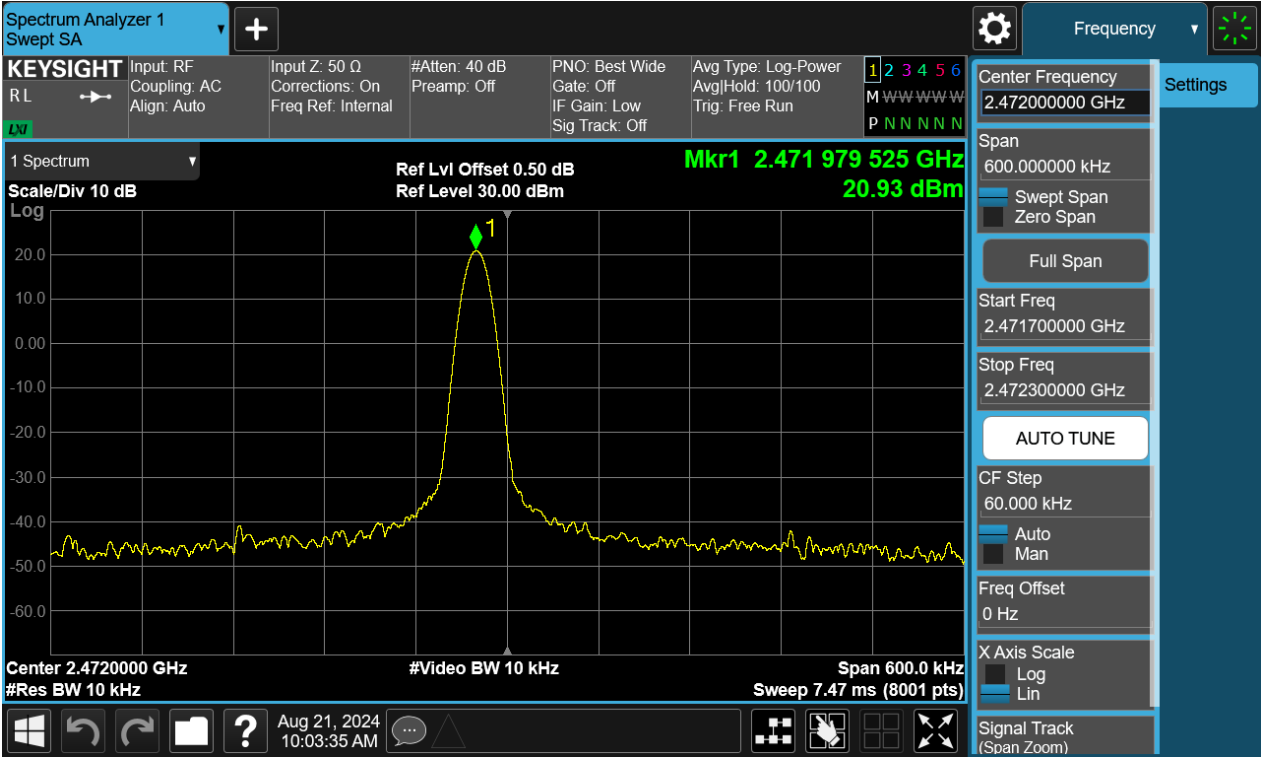
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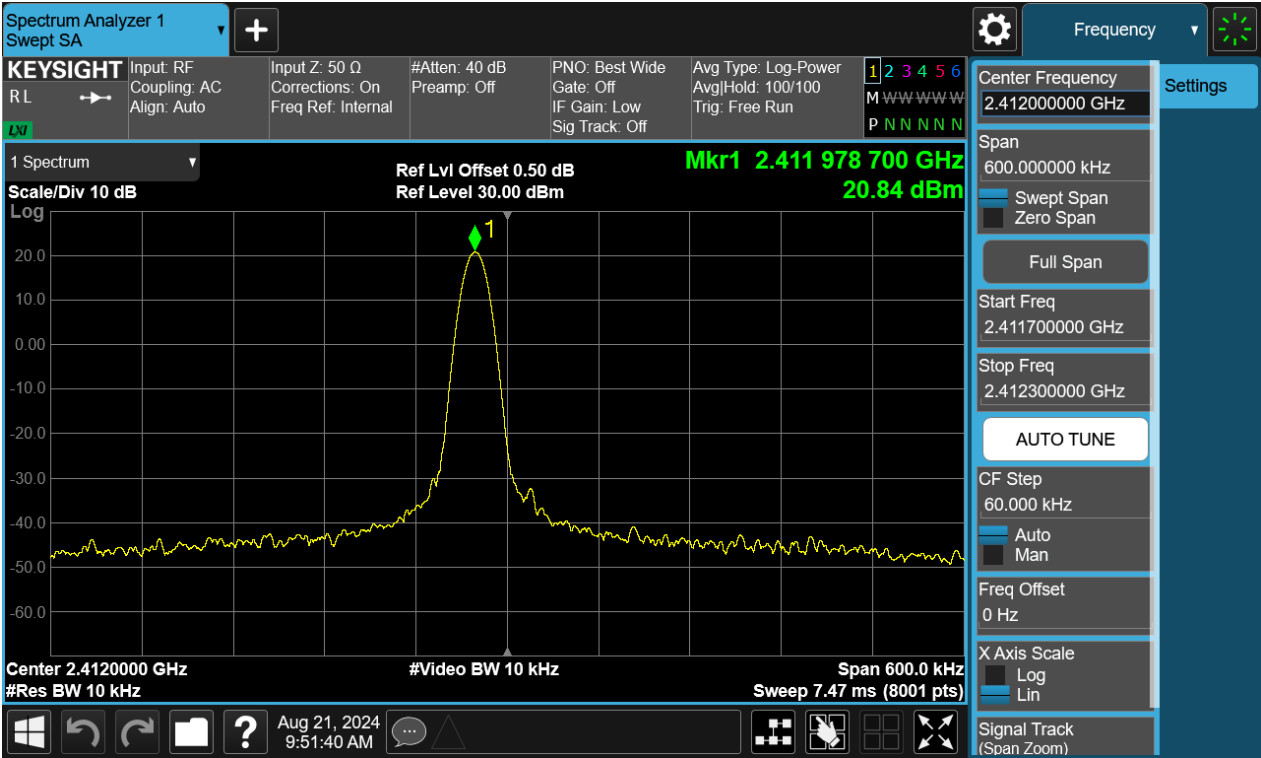
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Figure 3-Test Frequency: 2472MHz



## Low Voltage

Figure 4-Test Frequency: 2412MHz



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Figure 5-Test Frequency: 2442MHz

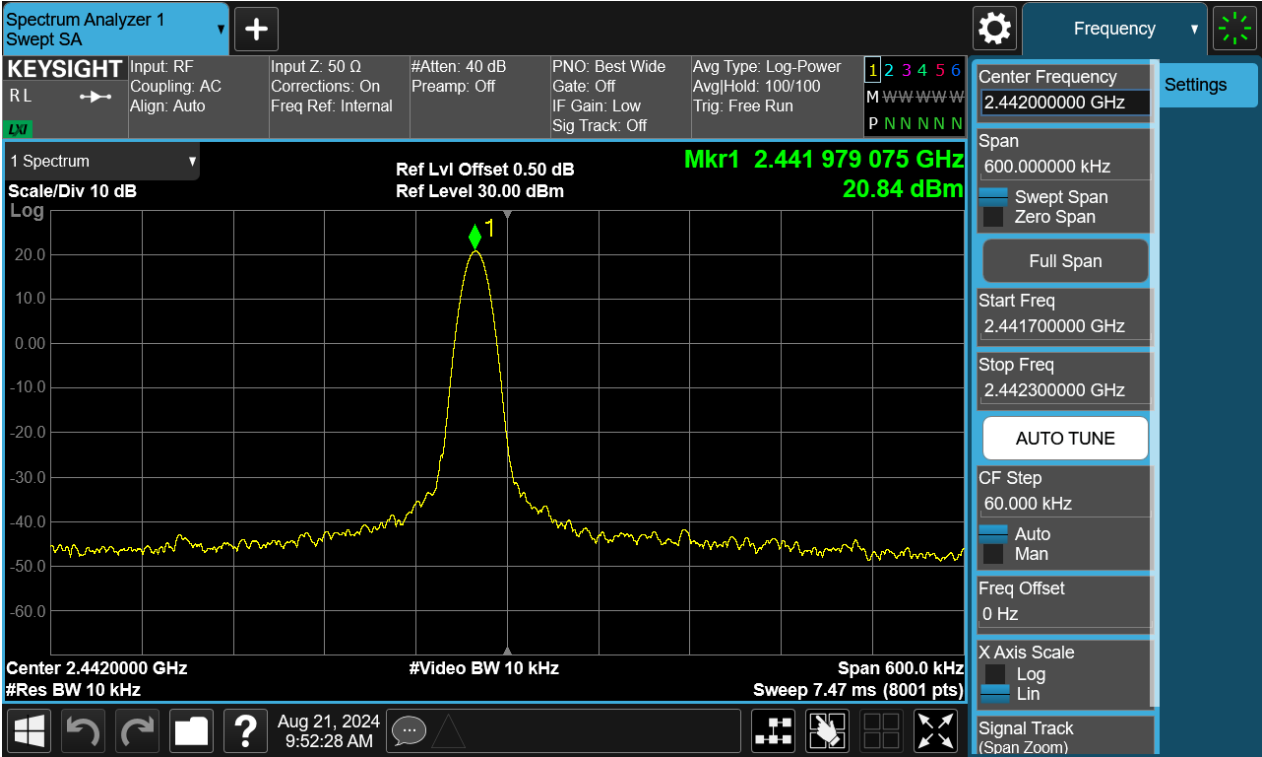
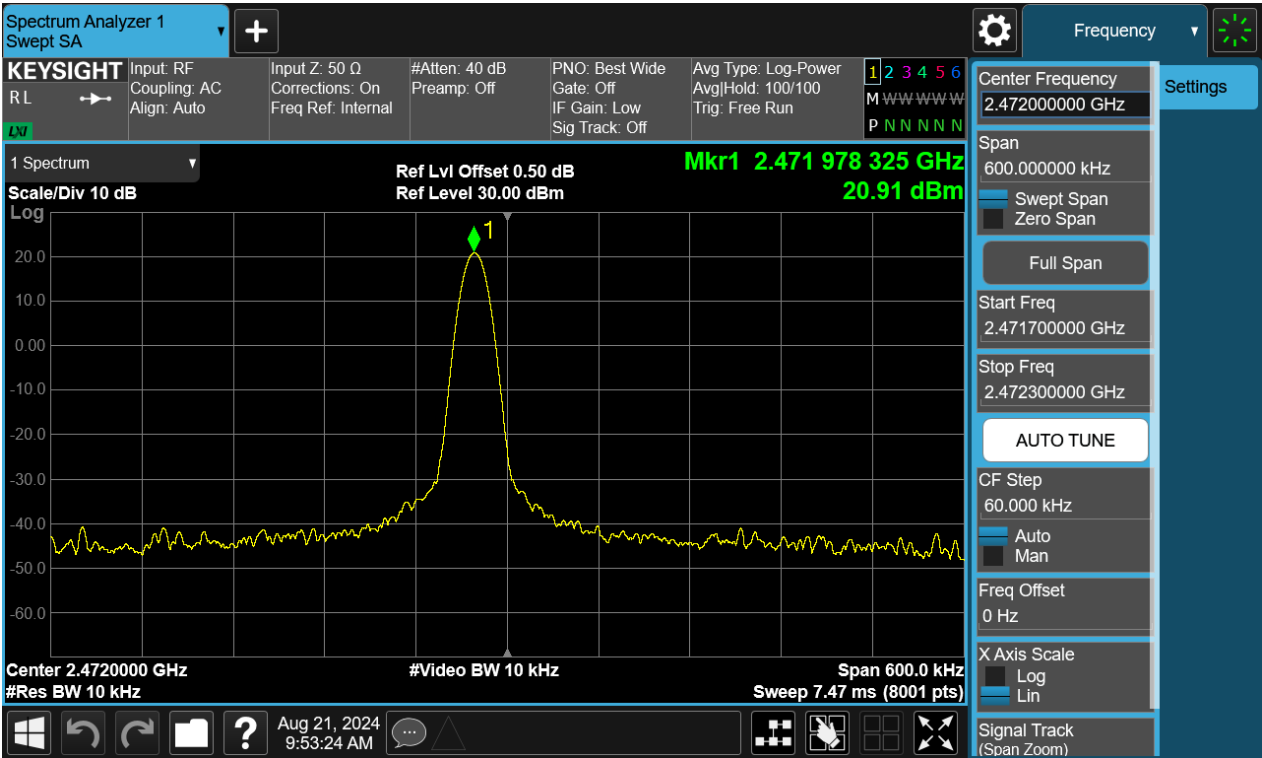


Figure 6-Test Frequency: 2472MHz



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High Voltage

Figure 7-Test Frequency: 2412MHz

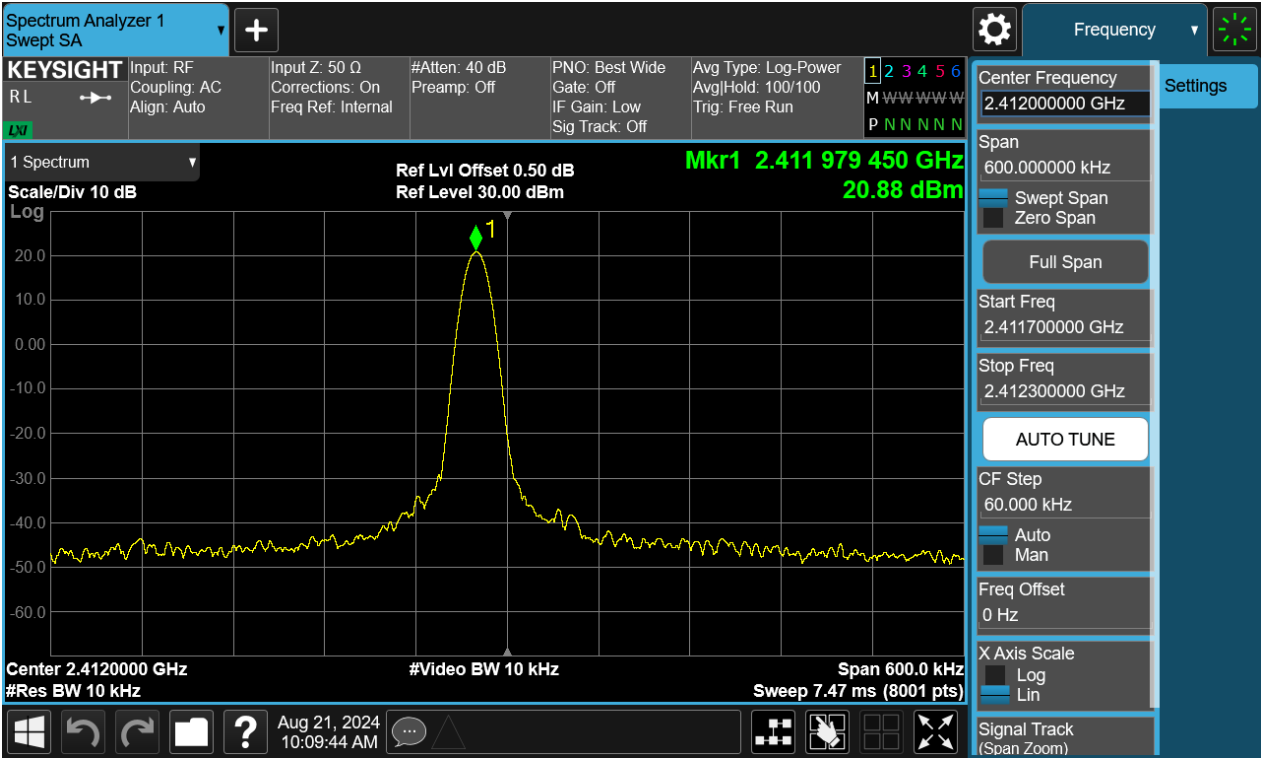
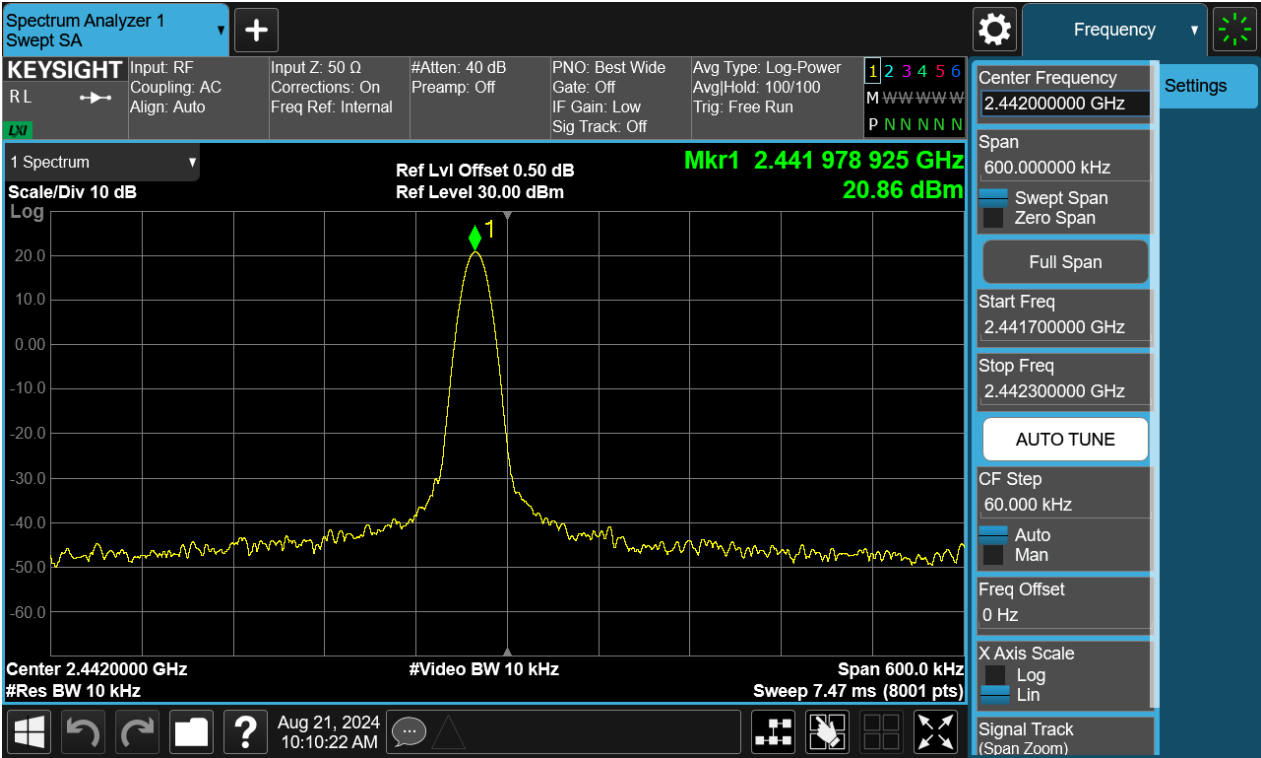


Figure 8-Test Frequency: 2442MHz



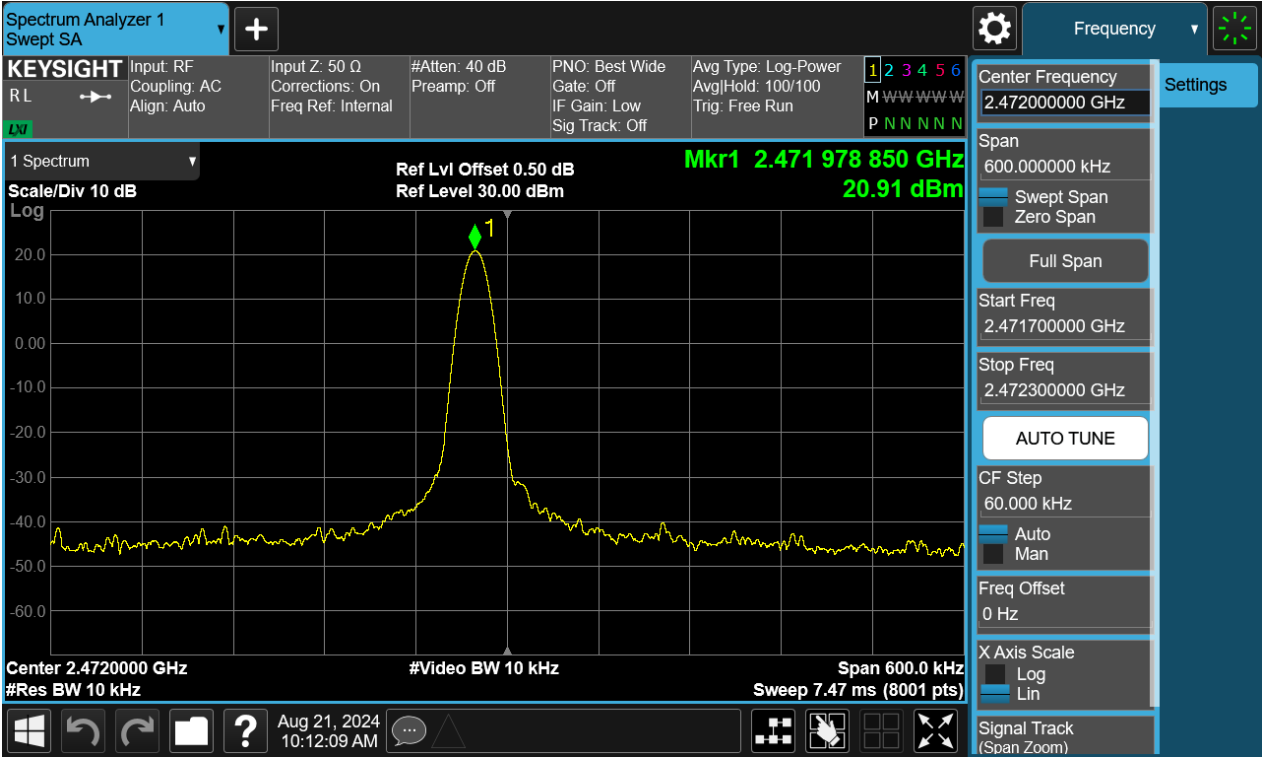
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Figure 9-Test Frequency: 2472MHz



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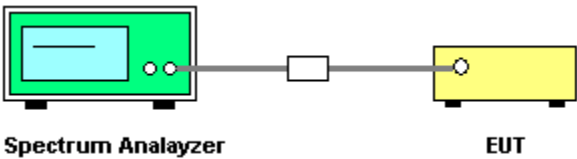
## 4.2 OCCUPIED BANDWIDTH

### 4.2.1 Limit

| Item                | Limits                                                                                                     |
|---------------------|------------------------------------------------------------------------------------------------------------|
| Occupied Bandwidth: | $FH \leq 83.5\text{MHz}$ ; $DS \leq 26\text{ MHz}$ ; $OFDM \leq 40\text{MHz}$ ; Others $\leq 26\text{MHz}$ |

### 4.2.2 Test Setup

- Setting of SA is following as: RB: 300 kHz / VB: 300 kHz / SPAN: 40 MHz / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
- EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth.
- EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 90% of occupied bandwidth to measure spread bandwidth.
- Spread Factor=Spread Bandwidth/modulation rate. The modulation rate: MR=1.375 for 802.11b. The spread factor is not required for 802.11g/n20



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## 4.2.3 Test Record

| Voltage<br>(V) | Mode         | Item               | Result    |           |           | Limit    | P/F  |
|----------------|--------------|--------------------|-----------|-----------|-----------|----------|------|
|                |              |                    | 2412MHz   | 2442MHz   | 2472MHz   |          |      |
| Normal         | 802.11b      | Occupied Bandwidth | 13.750MHz | 13.712MHz | 13.744MHz | ≤ 26 MHz | Pass |
|                | 802.11g      | Occupied Bandwidth | 16.558MHz | 16.550MHz | 16.471MHz | ≤ 40 MHz | Pass |
|                | 802.11n(20M) | Occupied Bandwidth | 17.712MHz | 17.583MHz | 17.584MHz | ≤ 40 MHz | Pass |
| Low            | 802.11b      | Occupied Bandwidth | 13.789MHz | 13.792MHz | 13.786MHz | ≤ 26 MHz | Pass |
|                | 802.11g      | Occupied Bandwidth | 16.519MHz | 16.639MHz | 16.476MHz | ≤ 40 MHz | Pass |
|                | 802.11n(20M) | Occupied Bandwidth | 17.643MHz | 17.625MHz | 17.574MHz | ≤ 40 MHz | Pass |
| High           | 802.11b      | Occupied Bandwidth | 13.746MHz | 13.814MHz | 13.760MHz | ≤ 26 MHz | Pass |
|                | 802.11g      | Occupied Bandwidth | 16.527MHz | 16.507MHz | 16.482MHz | ≤ 40 MHz | Pass |
|                | 802.11n(20M) | Occupied Bandwidth | 17.647MHz | 17.629MHz | 17.506MHz | ≤ 40 MHz | Pass |

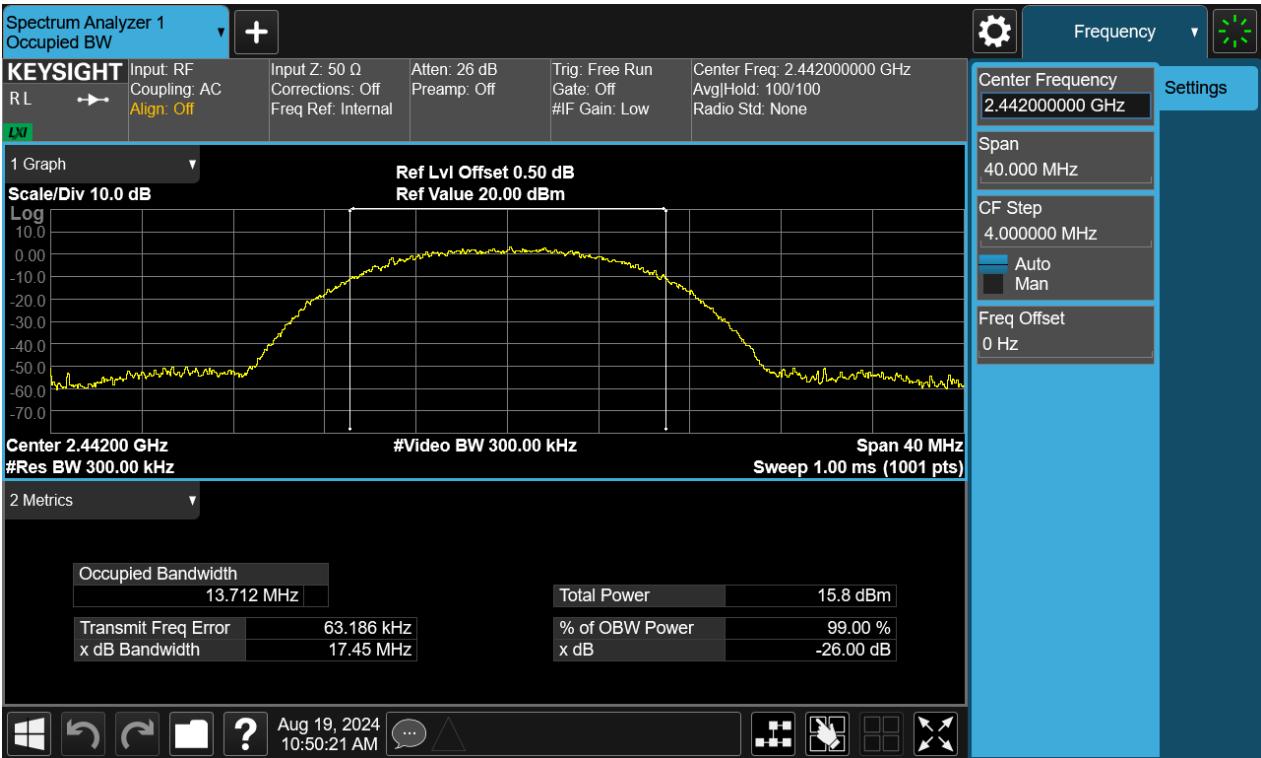
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Figure 10-Occupied Bandwidth of 2412MHz, 802.11b



Figure 11-Occupied Bandwidth of 2442MHz, 802.11b



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Figure 12-Occupied Bandwidth of 2472MHz, 802.11b

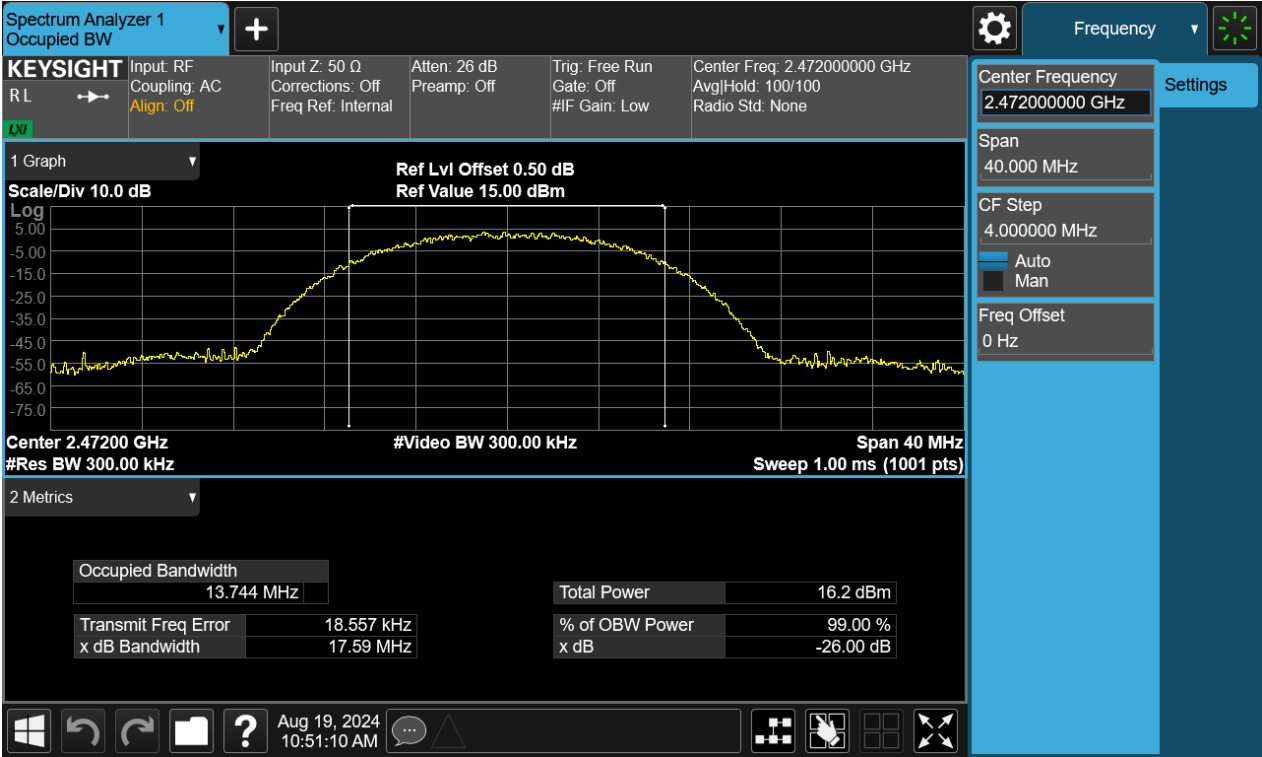
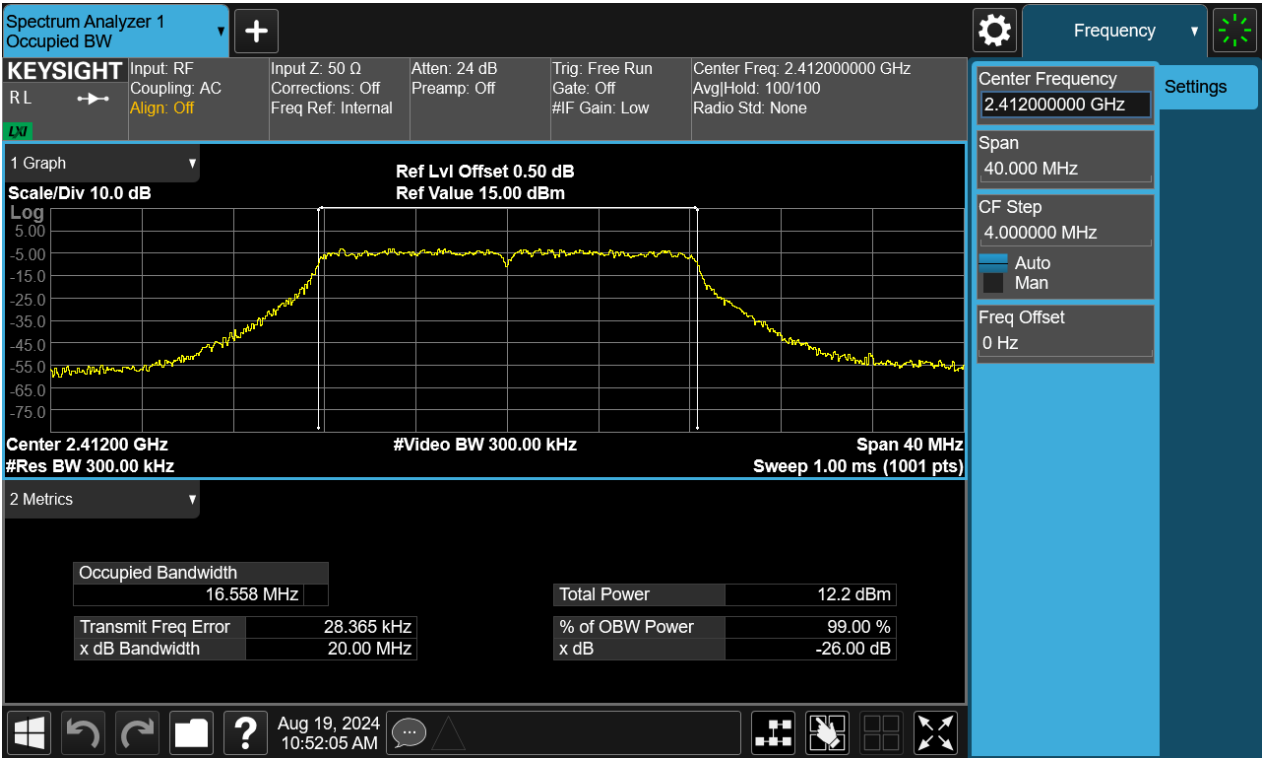


Figure 13-Occupied Bandwidth of 2412MHz, 802.11g



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Figure 14-Occupied Bandwidth of 2442MHz, 802.11g

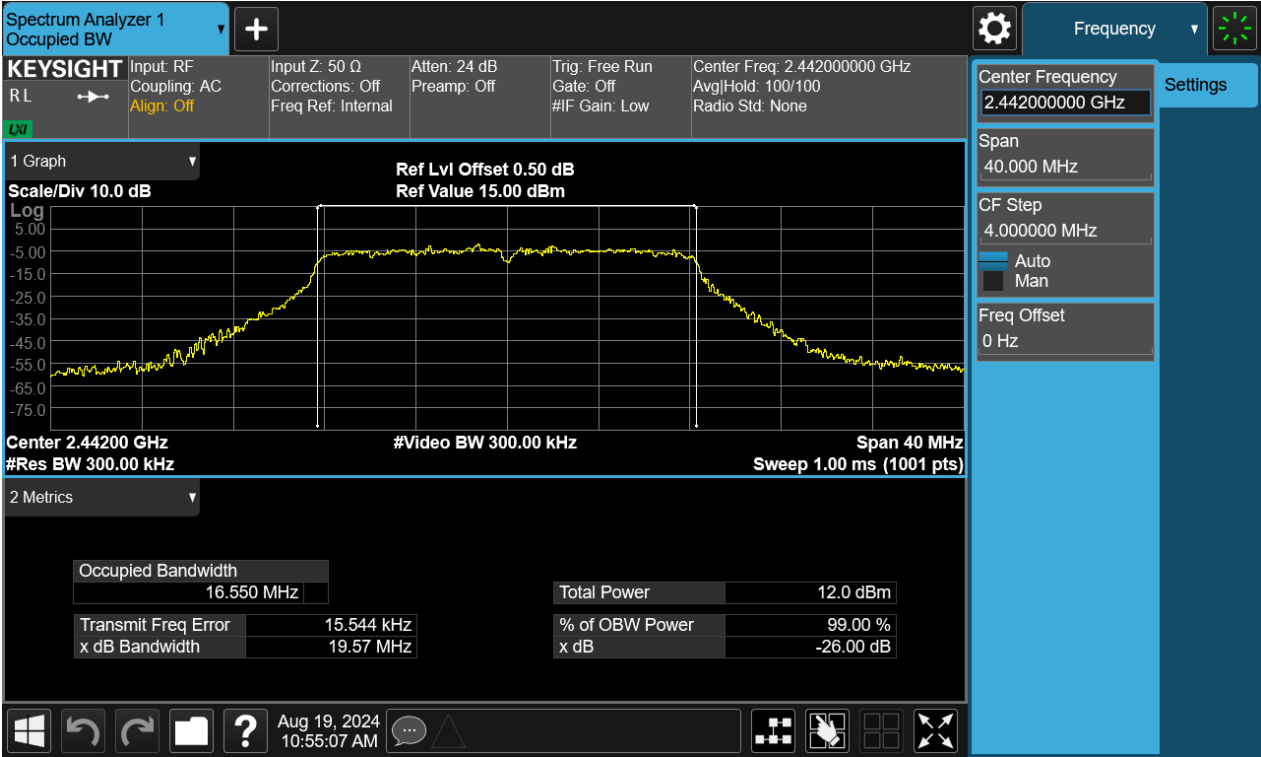
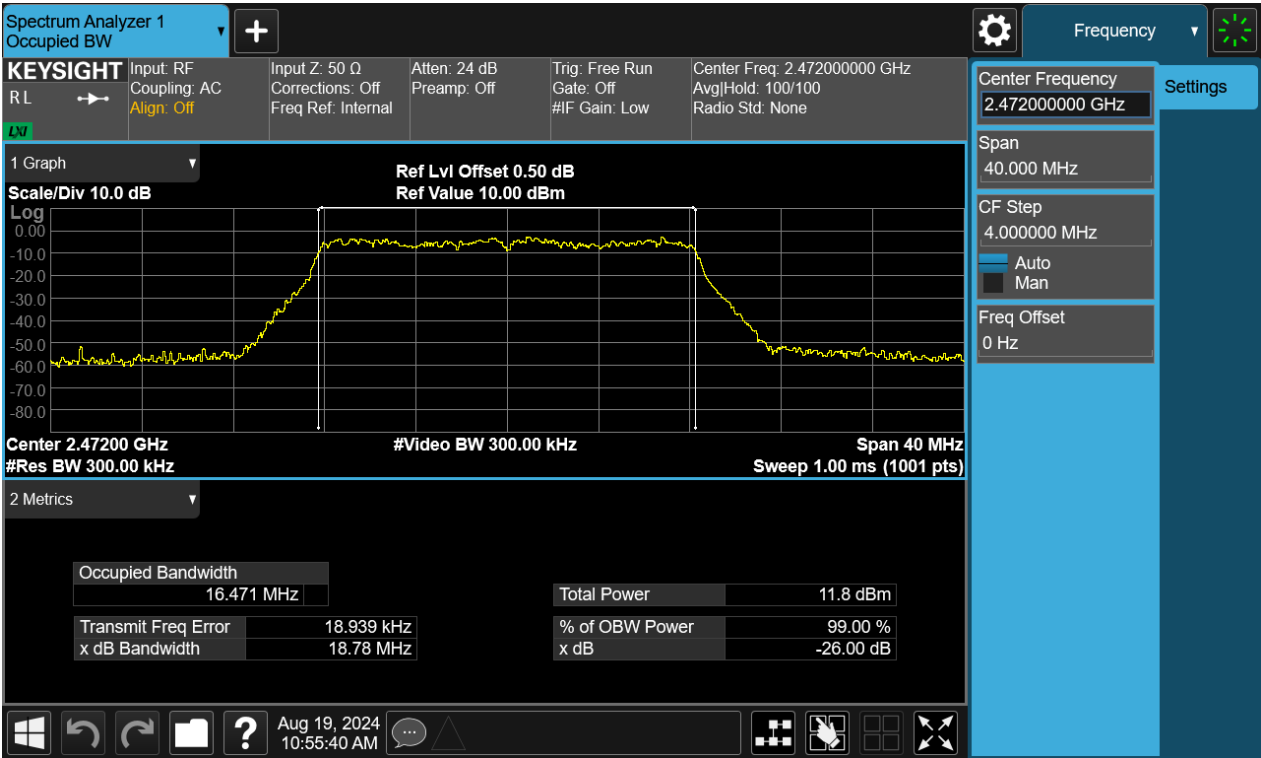


Figure 15-Occupied Bandwidth of 2472MHz, 802.11g



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Figure 16-Occupied Bandwidth of 2412MHz, 802.11n(20M)

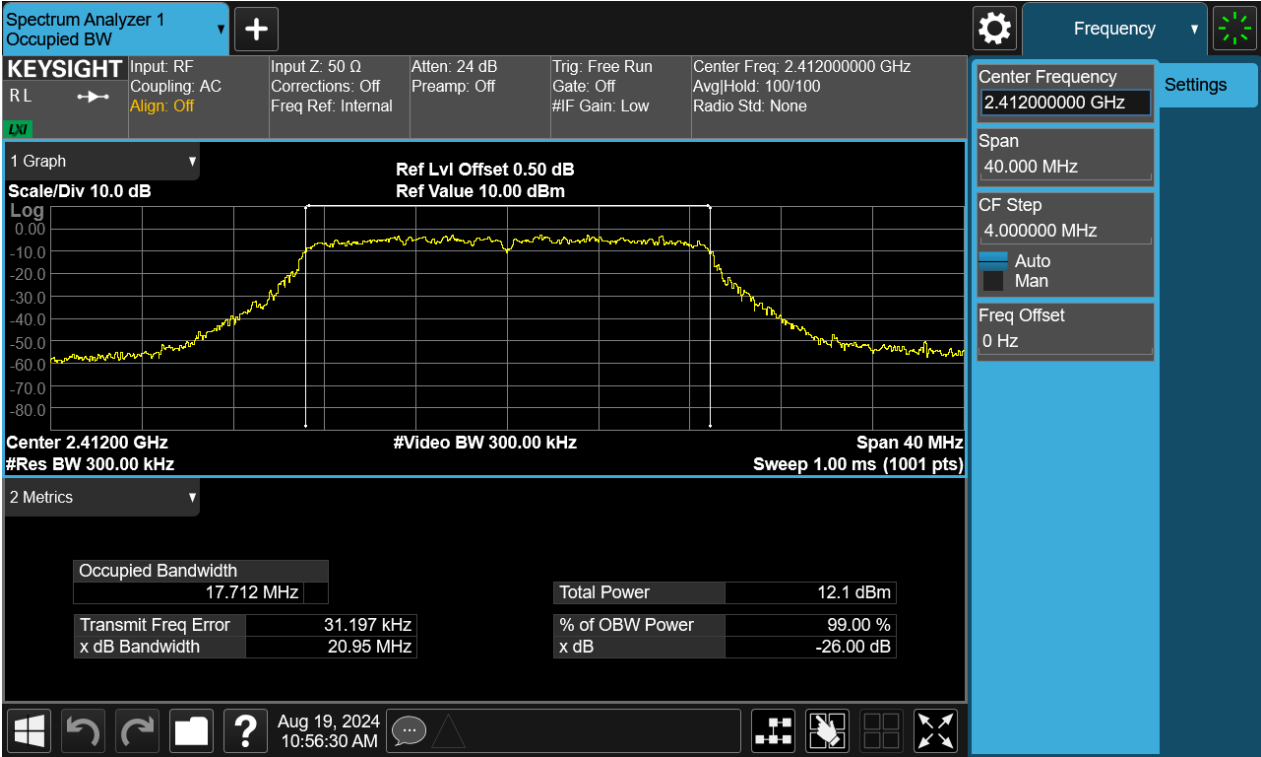
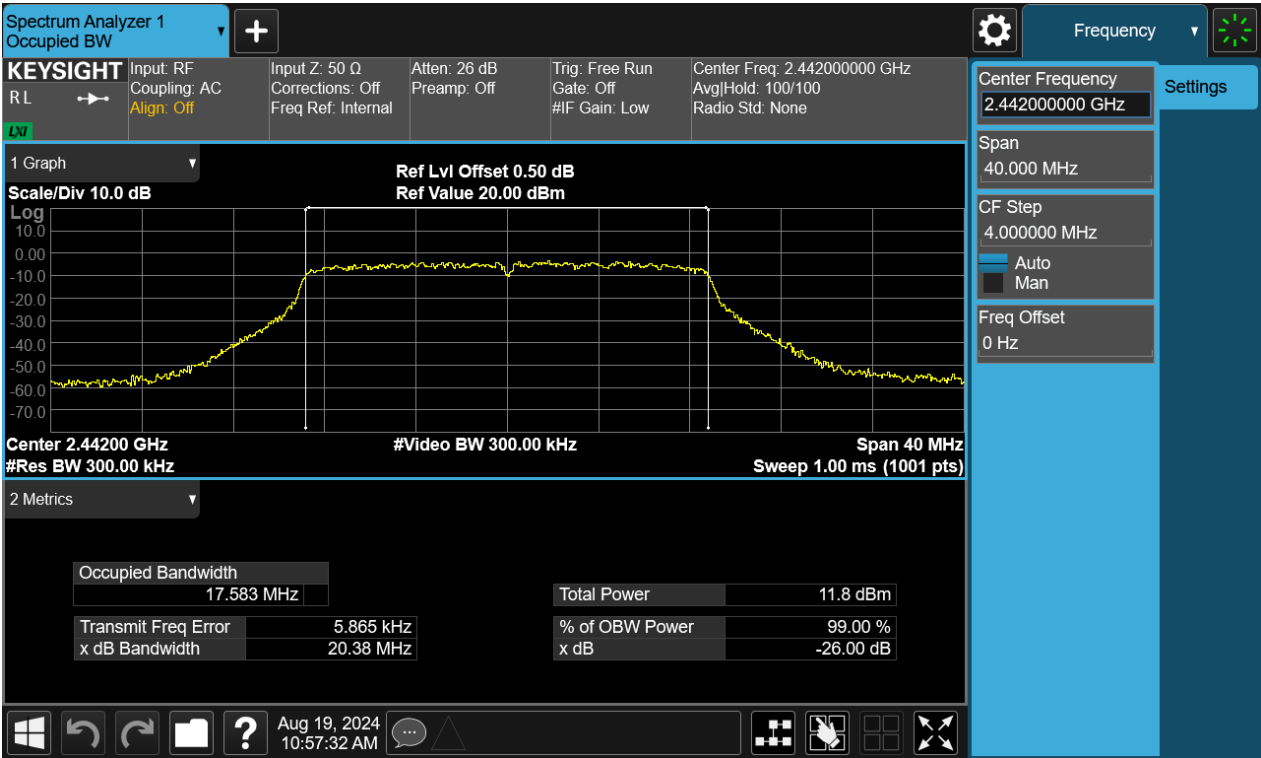


Figure 17-Occupied Bandwidth of 2442MHz, 802.11n(20M)



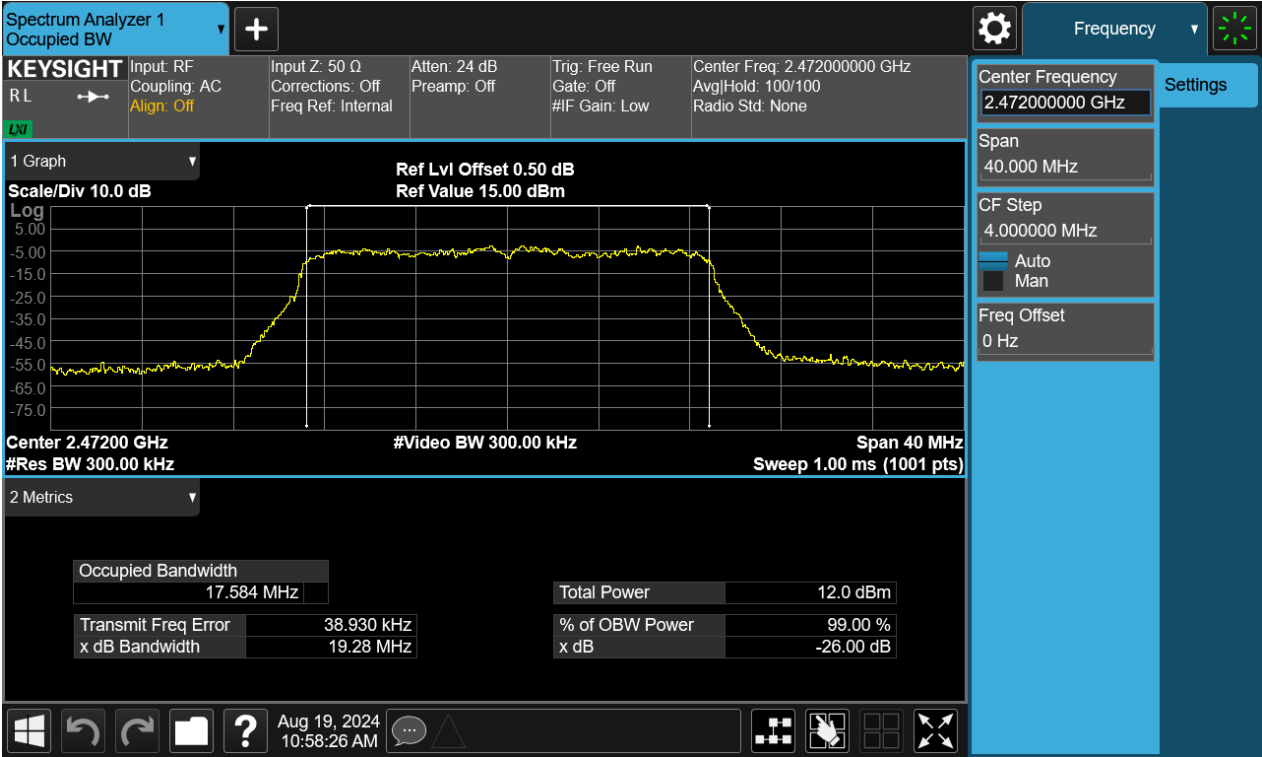
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Figure 18-Occupied Bandwidth of 2472MHz, 802.11n(20M)



## Low Voltage

Figure 19-Occupied Bandwidth of 2412MHz, 802.11b



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Figure 20-Occupied Bandwidth of 2442MHz, 802.11b

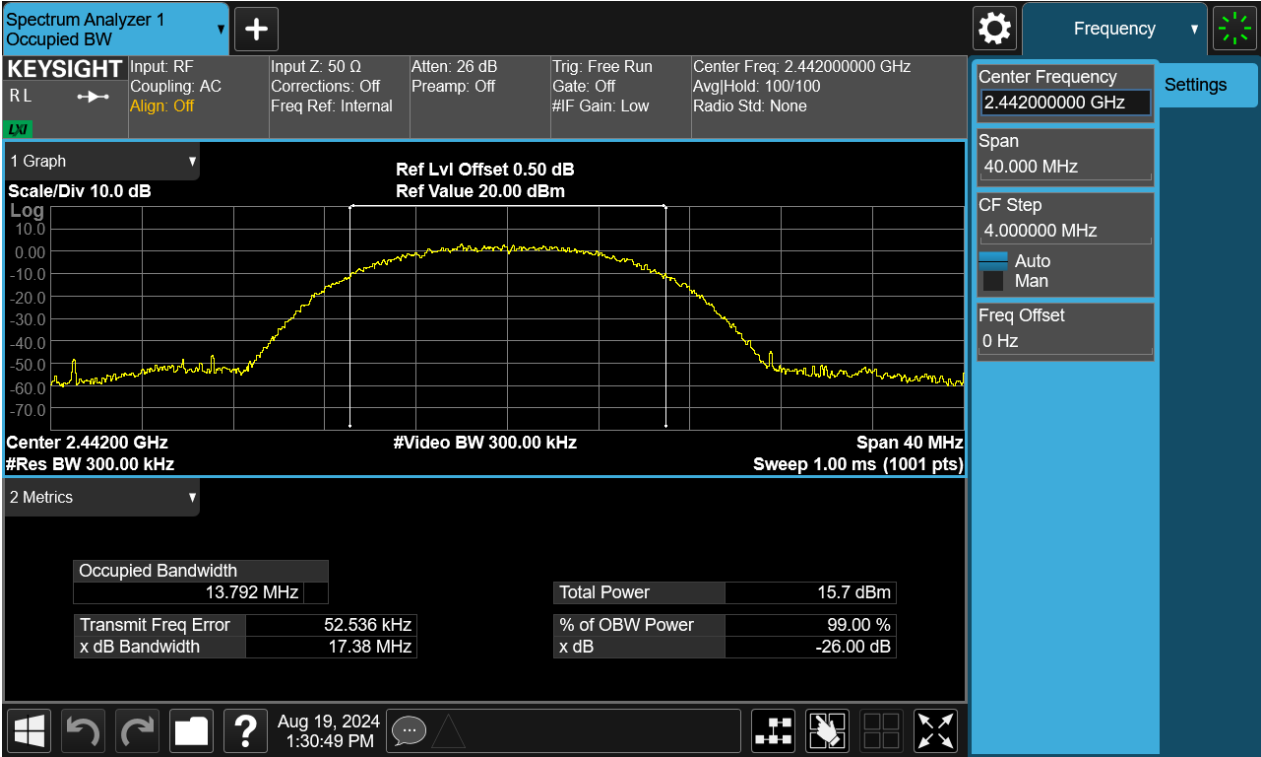
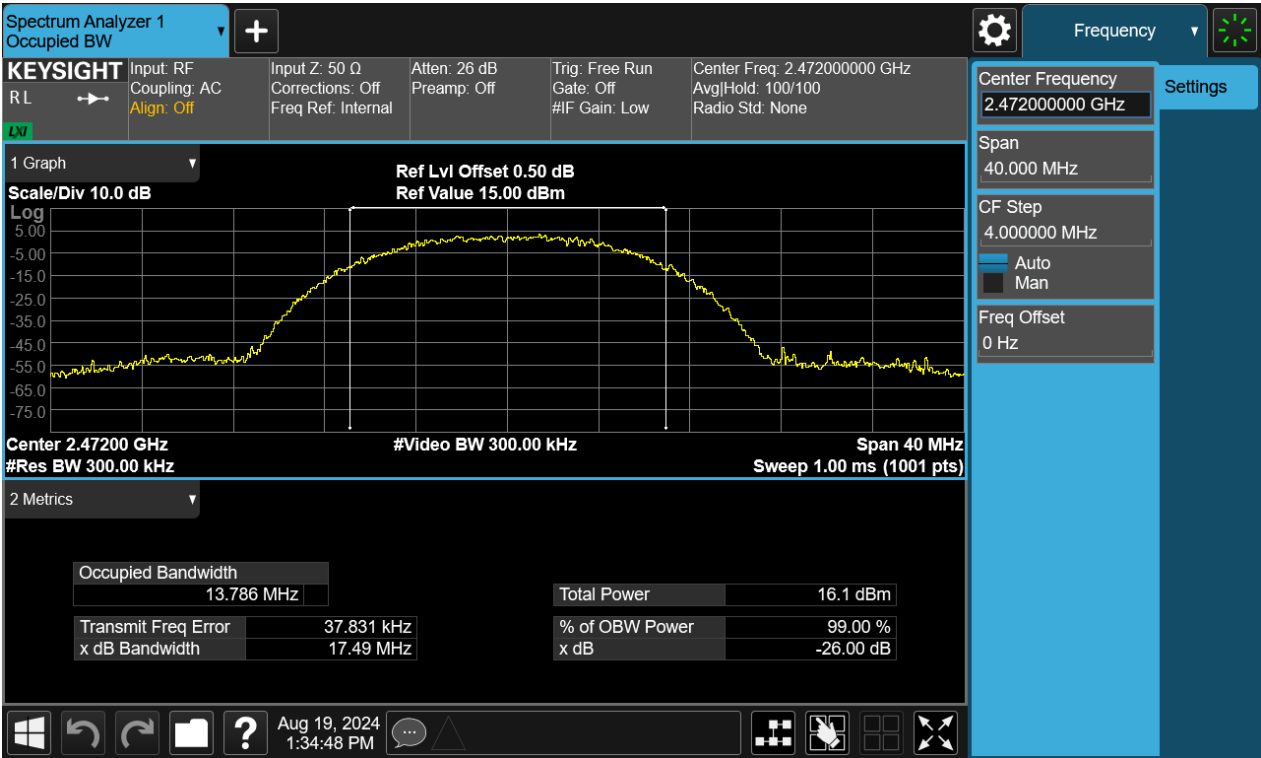


Figure 21-Occupied Bandwidth of 2472MHz, 802.11b



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Figure 22-Occupied Bandwidth of 2412MHz, 802.11g

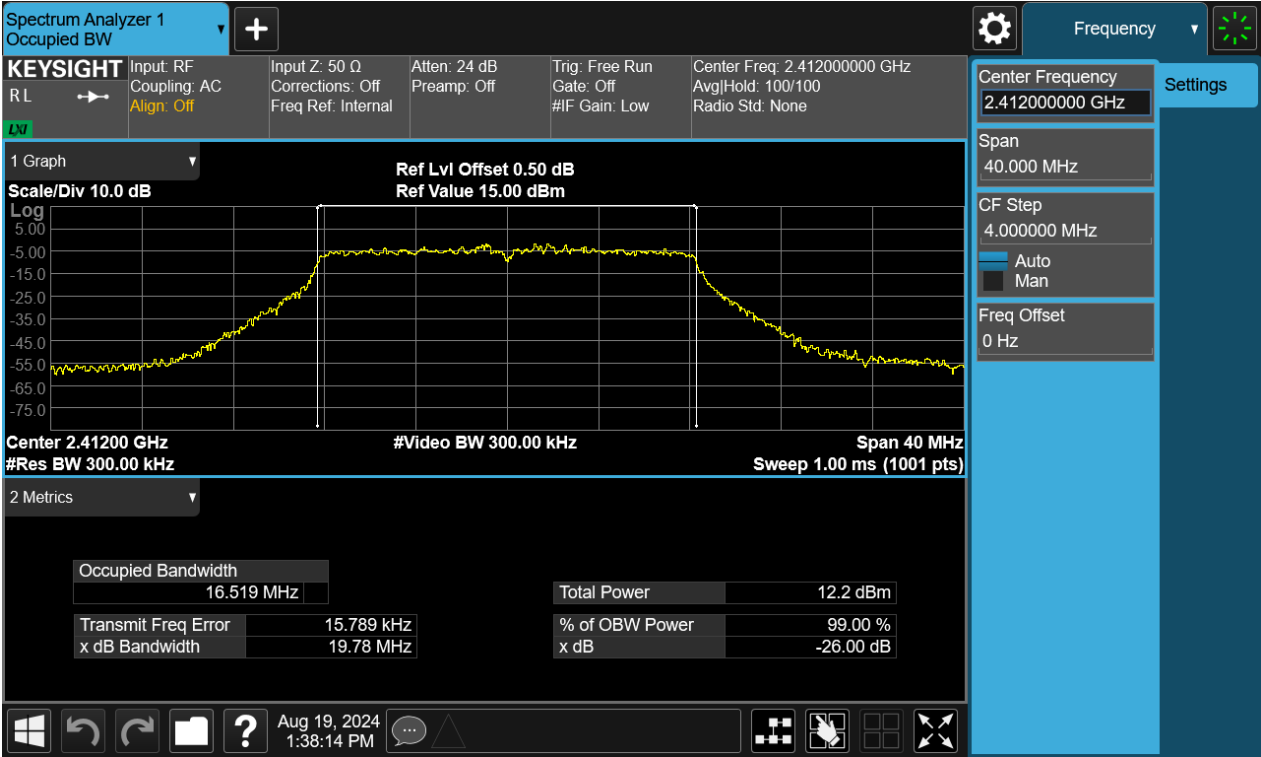
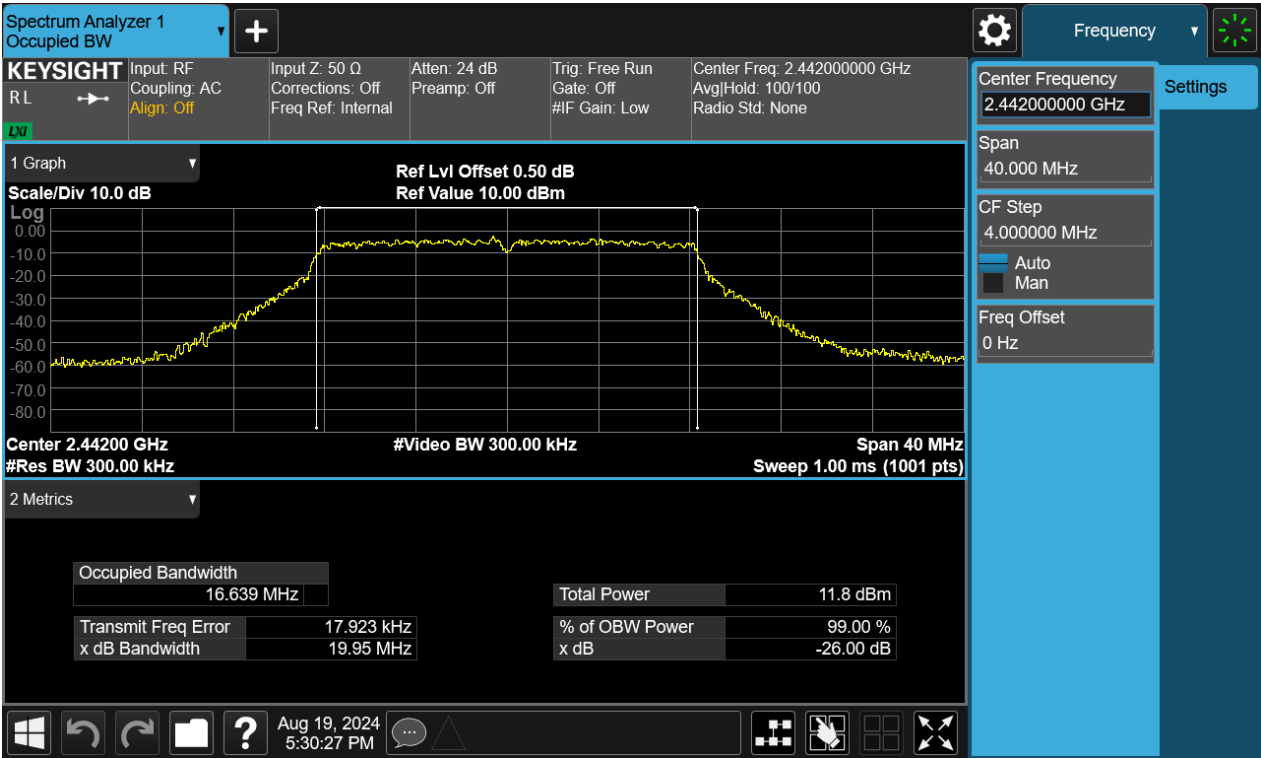


Figure 23-Occupied Bandwidth of 2442MHz, 802.11g



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Figure 24-Occupied Bandwidth of 2472MHz, 802.11g

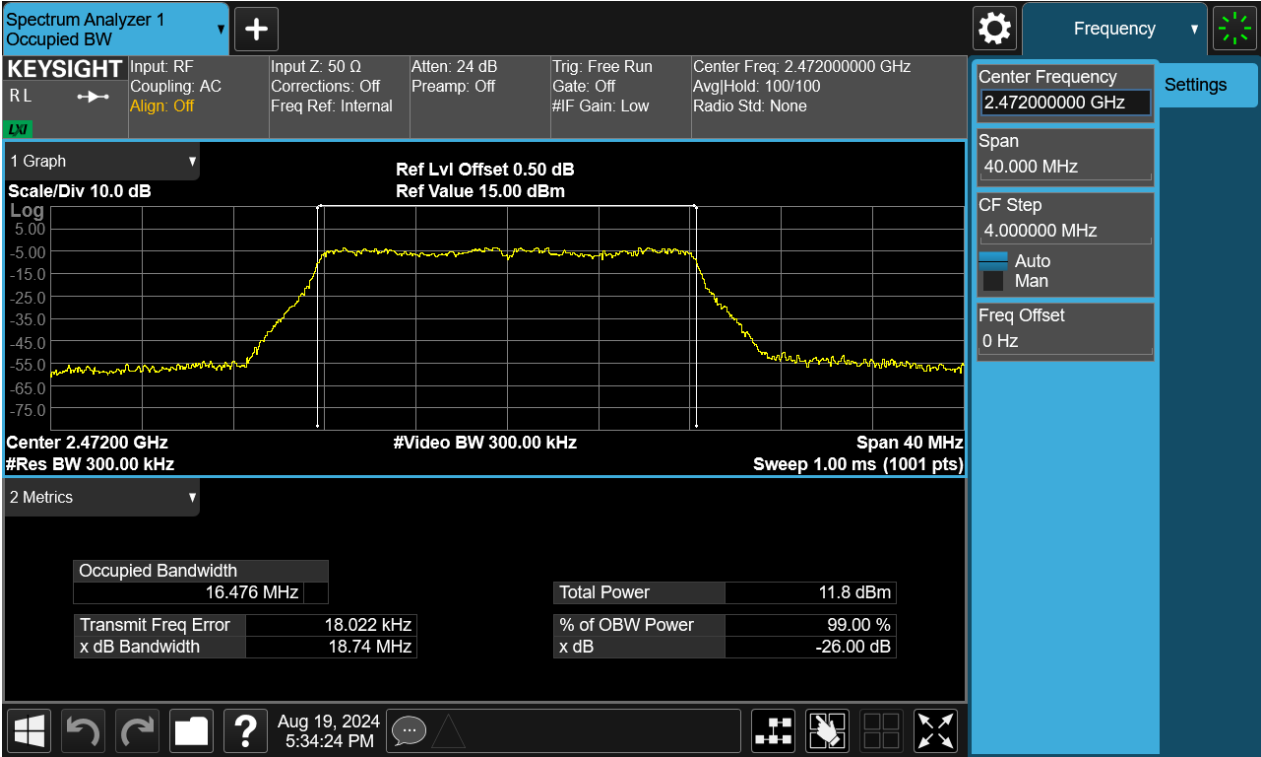
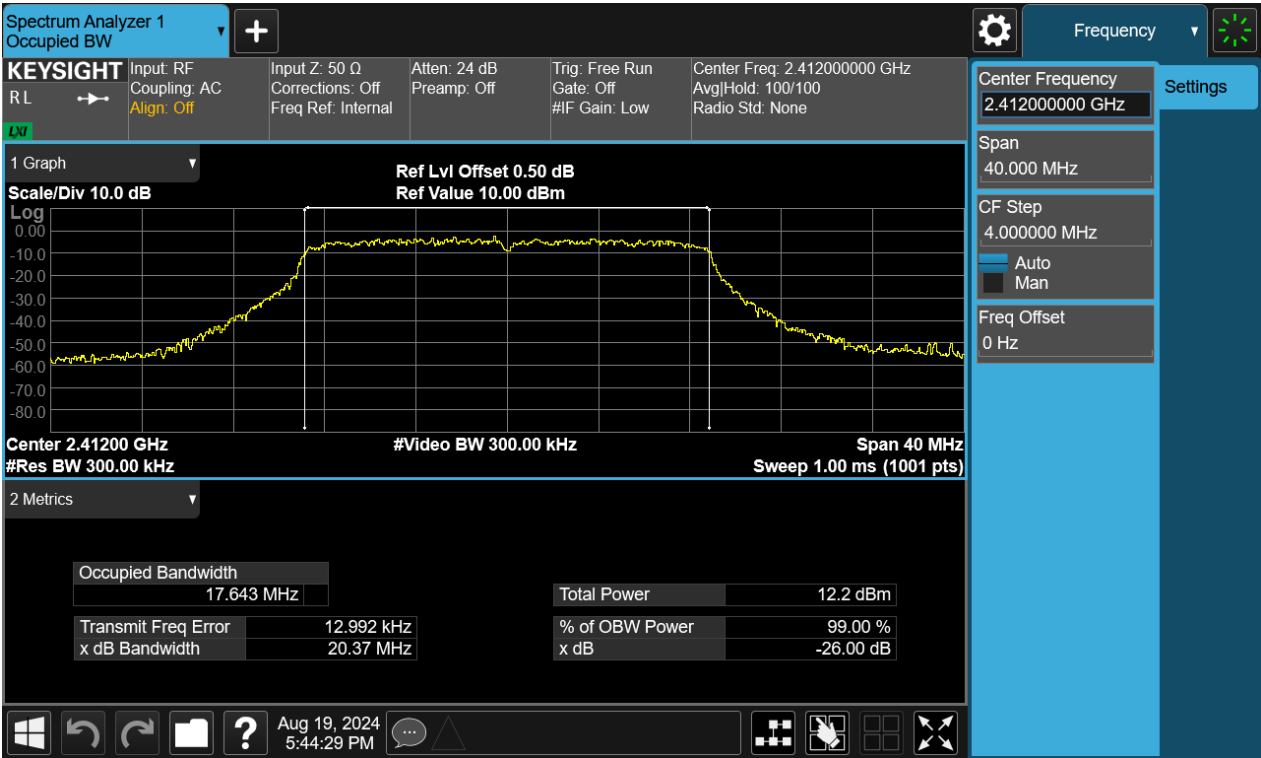


Figure 25-Occupied Bandwidth of 2412MHz, 802.11n(20M)



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Figure 26-Occupied Bandwidth of 2442MHz, 802.11n(20M)

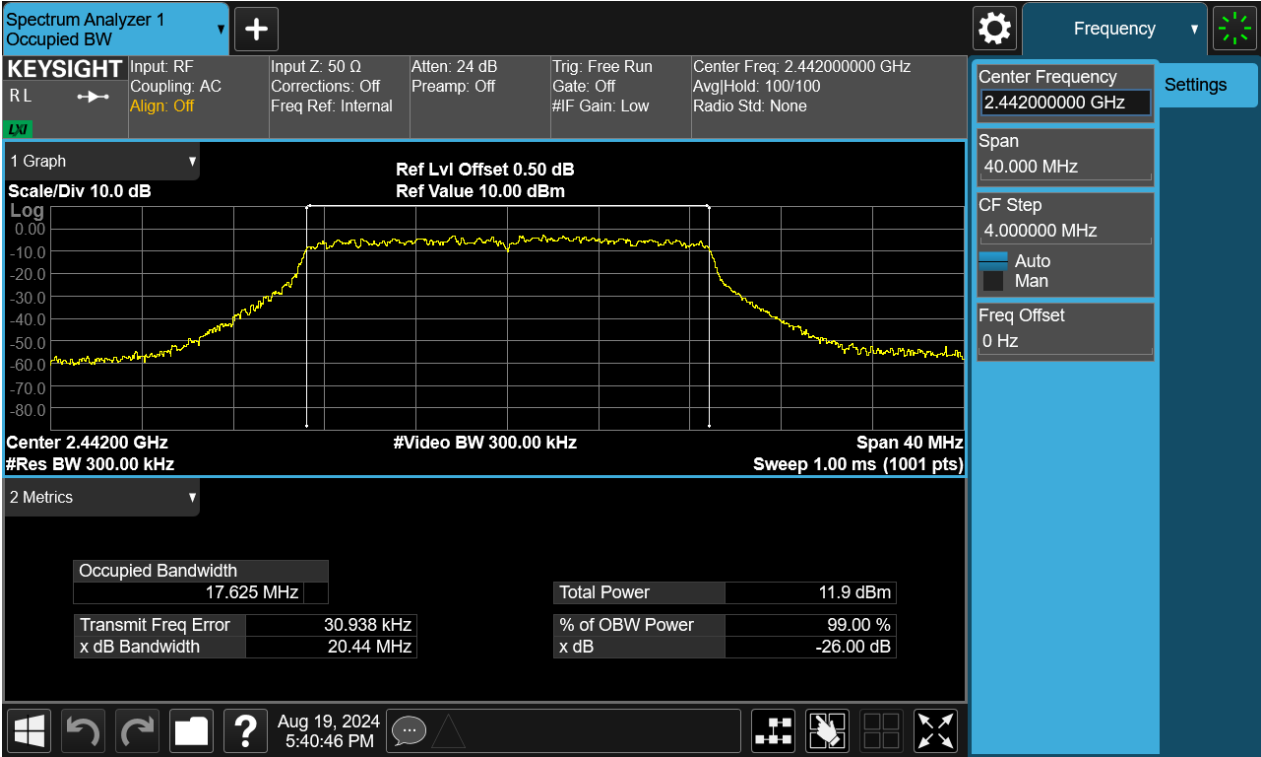
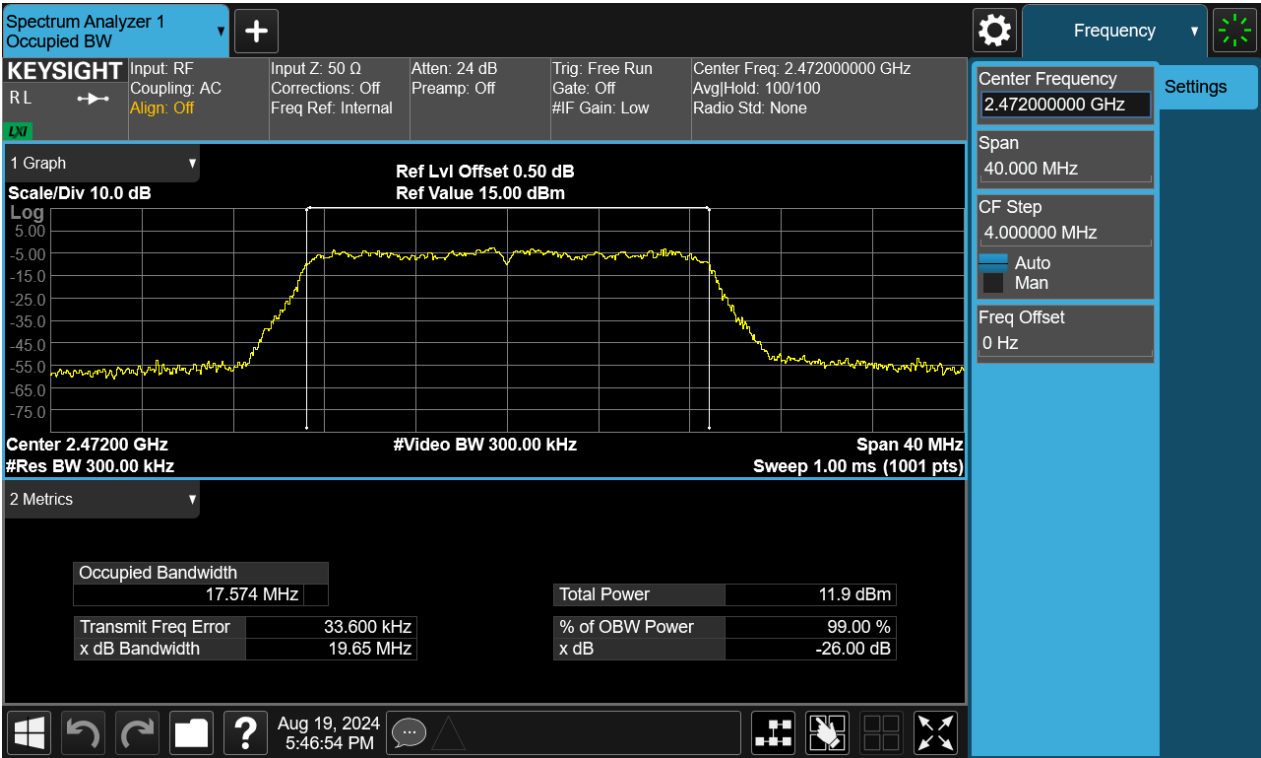


Figure 27-Occupied Bandwidth of 2472MHz, 802.11n(20M)



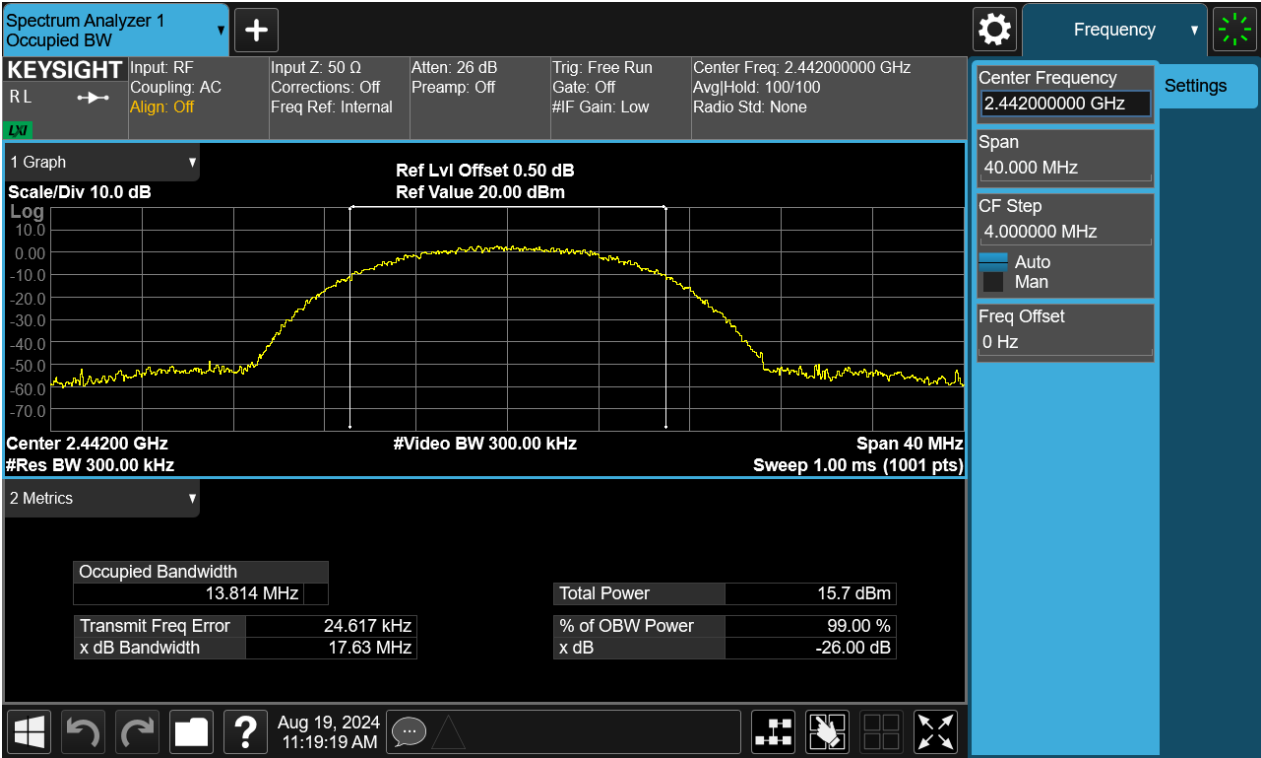
# TEST REPORT

## High Voltage

Figure 28-Occupied Bandwidth of 2412MHz, 802.11b



Figure 29-Occupied Bandwidth of 2442MHz, 802.11b



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Figure 30-Occupied Bandwidth of 2472MHz, 802.11b

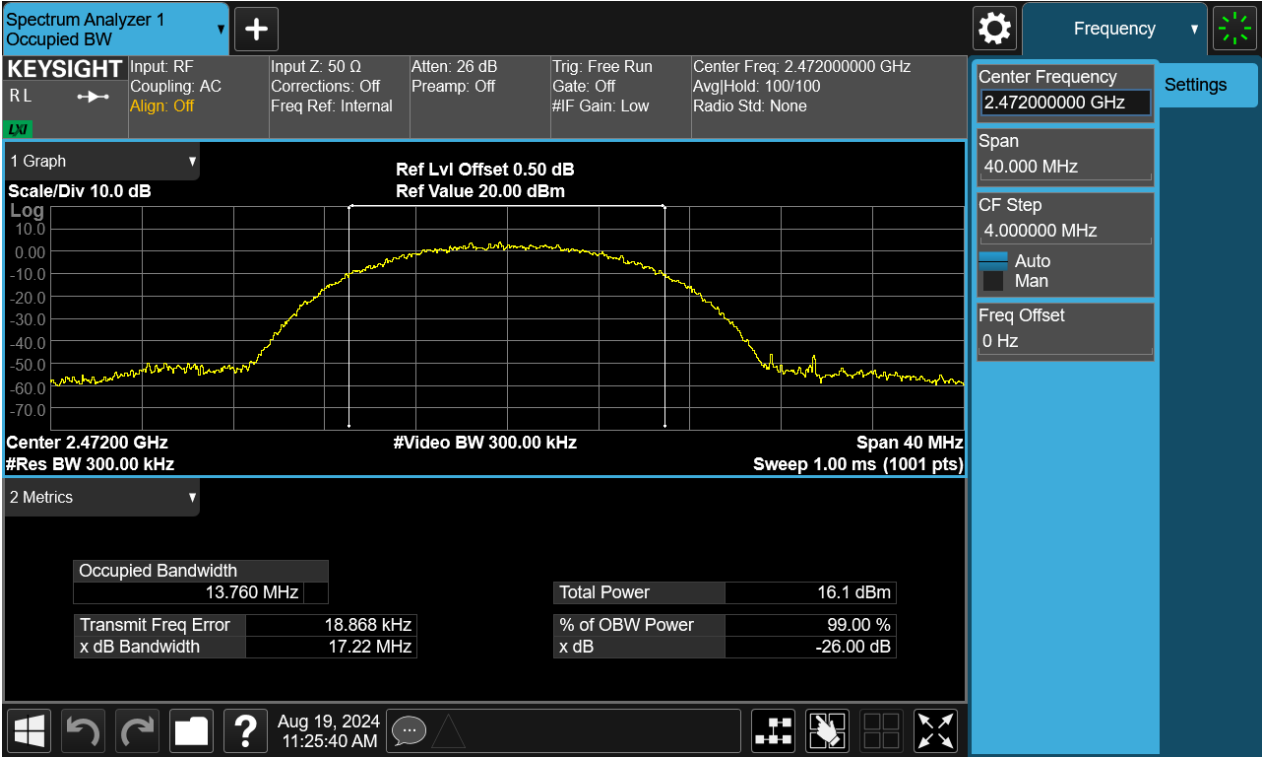
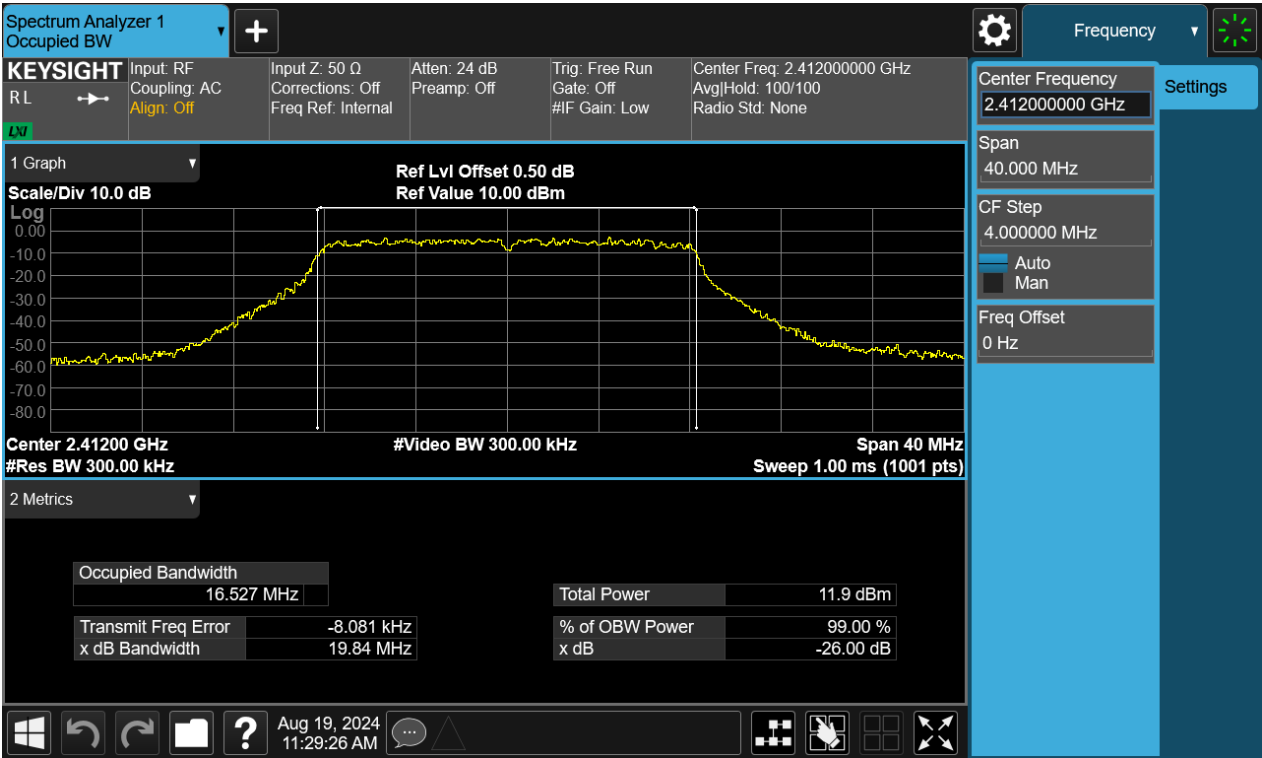


Figure 31-Occupied Bandwidth of 2412MHz, 802.11g



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Figure 32-Occupied Bandwidth of 2442MHz, 802.11g

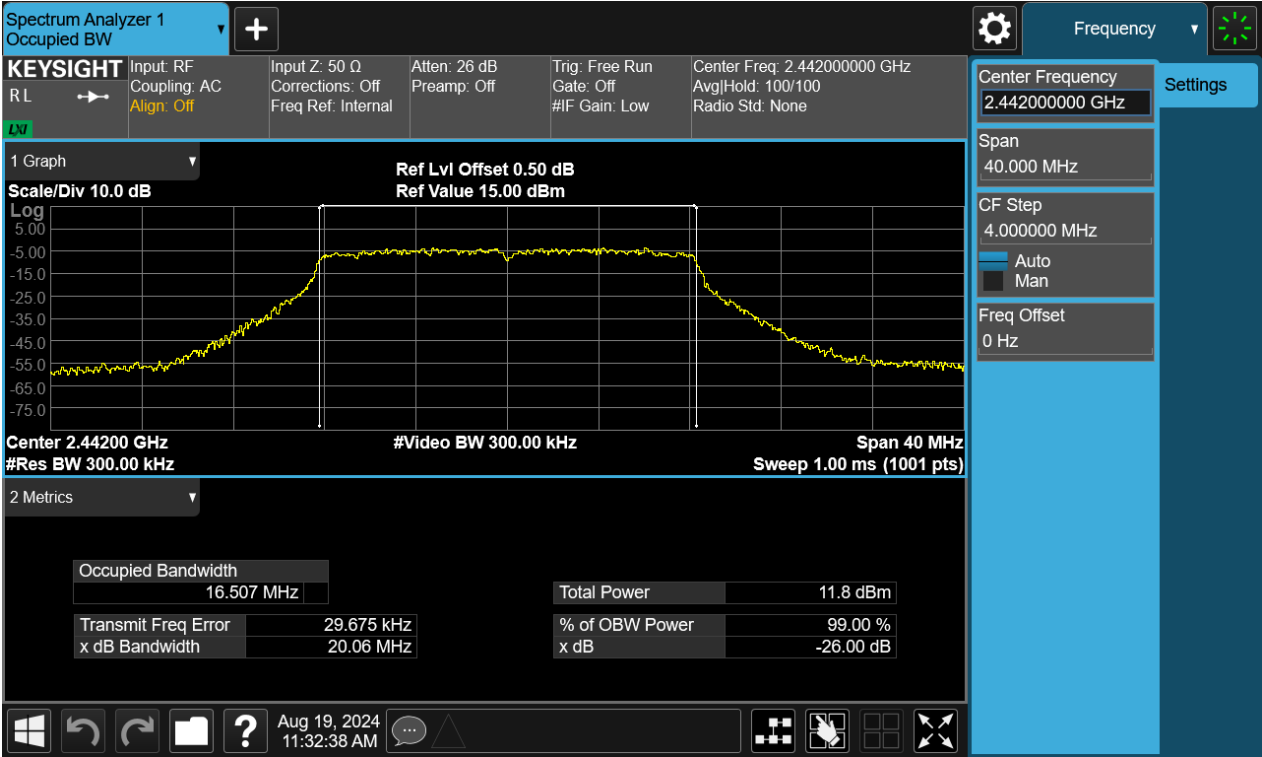
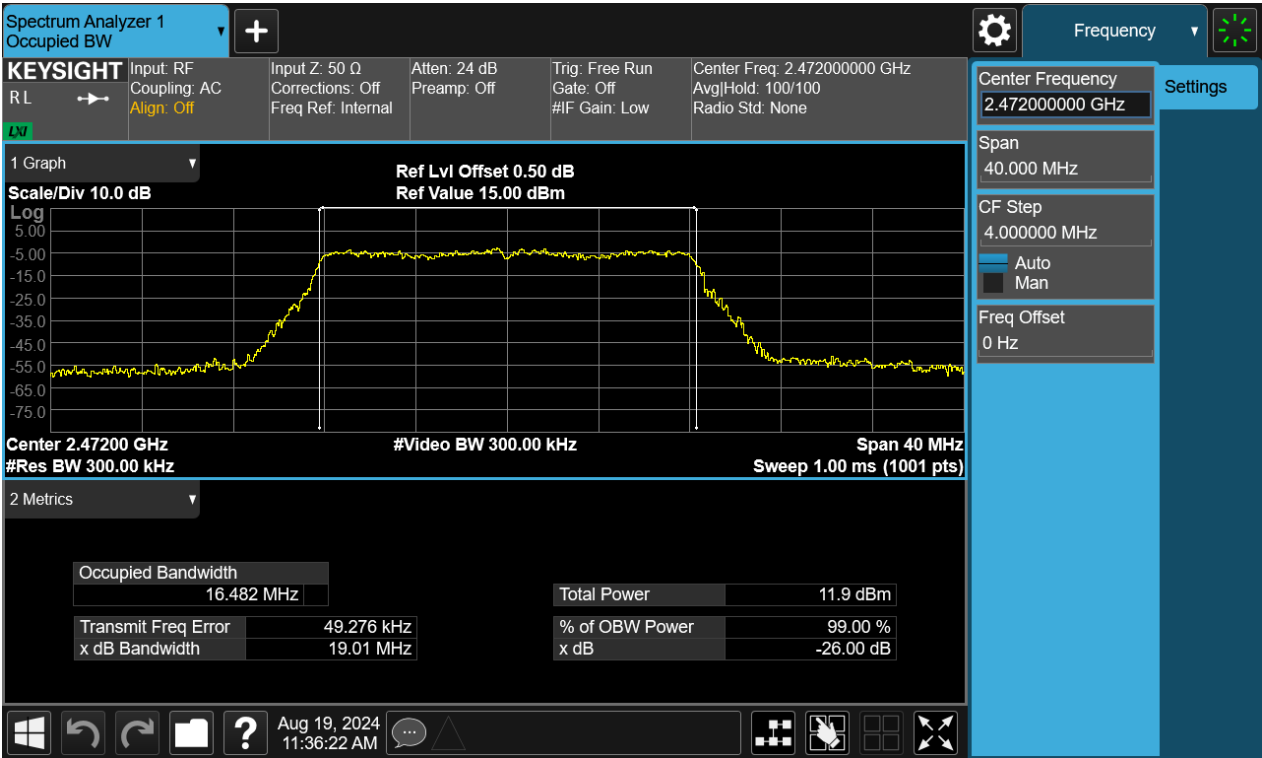


Figure 33-Occupied Bandwidth of 2472MHz, 802.11g



# TEST REPORT

Figure 34-Occupied Bandwidth of 2412MHz, 802.11n(20M)

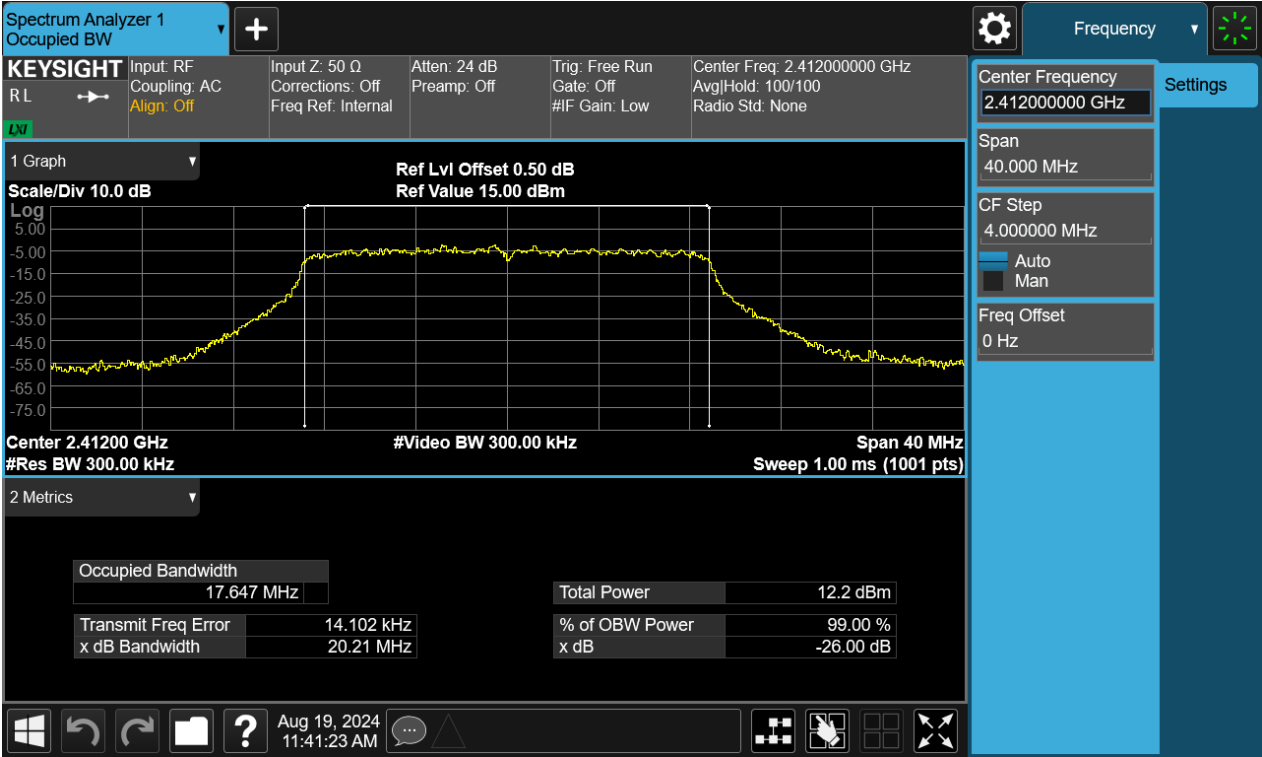
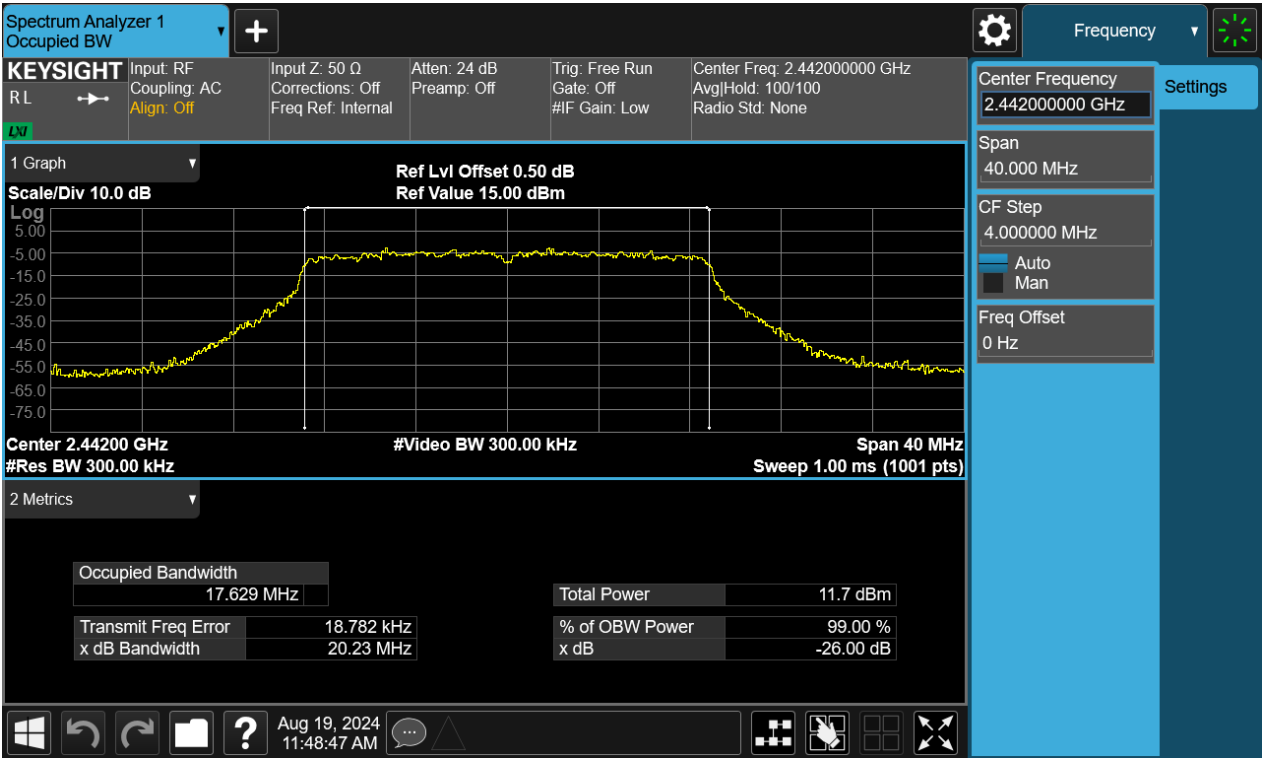


Figure 35-Occupied Bandwidth of 2442MHz, 802.11n(20M)



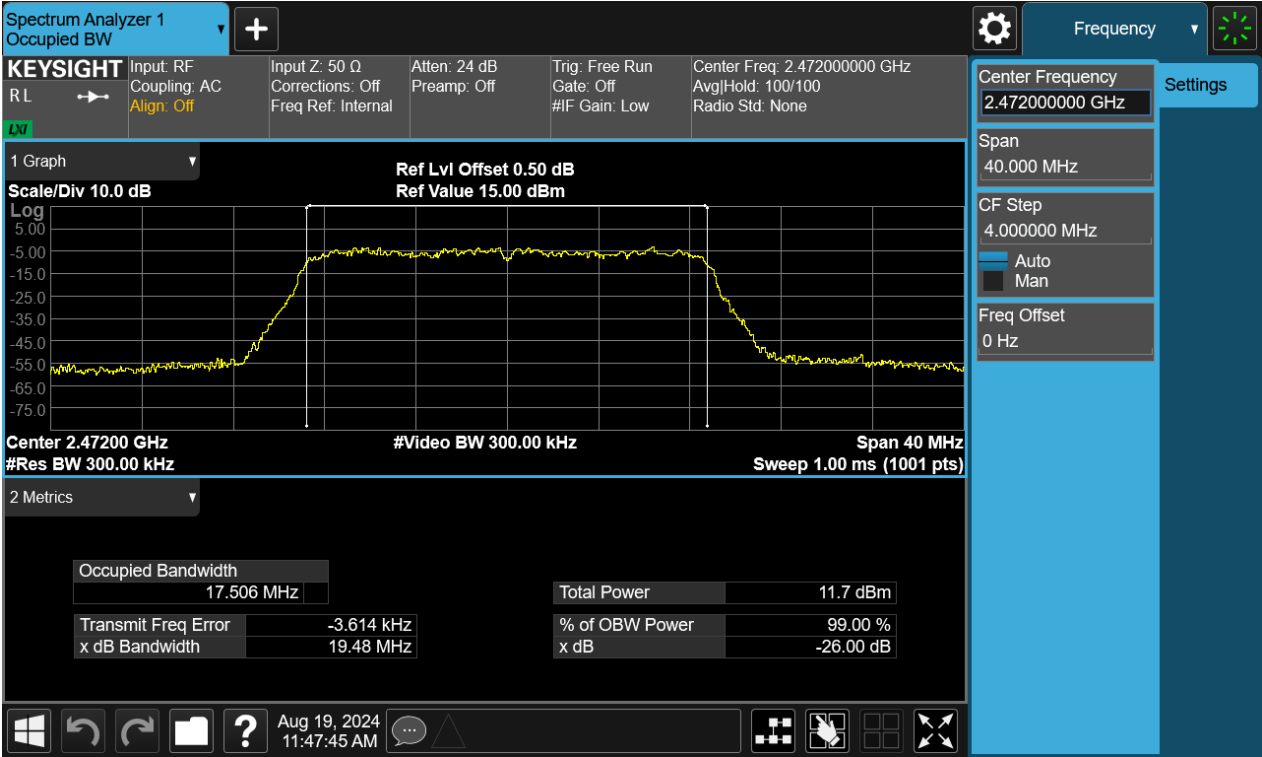
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Figure 36-Occupied Bandwidth of 2472MHz, 802.11n(20M)



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## 4.3 TRANSMITTER SPURIOUS EMISSION STRENGTH AND UNWANTED EMISSION INTENSITY

### 4.3.1 Limit

| Item                               | Limits                                                                               |
|------------------------------------|--------------------------------------------------------------------------------------|
| TX Spurious Emission(2412~2472MHz) | $\leq 2.5\mu\text{W}(-26\text{dBm})$ ( $30\text{MHz} \leq f \leq 1000\text{MHz}$ )   |
|                                    | $\leq 2.5\mu\text{W}(-26\text{dBm})$ ( $1000\text{MHz} < f \leq 2387\text{MHz}$ )    |
|                                    | $\leq 25\mu\text{W}(-16\text{dBm})$ ( $2387\text{MHz} < f \leq 2400\text{MHz}$ )     |
|                                    | $\leq 25\mu\text{W}(-16\text{dBm})$ ( $2483.5\text{MHz} \leq f < 2496.5\text{MHz}$ ) |
|                                    | $\leq 2.5\mu\text{W}(-26\text{dBm})$ ( $2496.5\text{MHz} \leq f < 12500\text{MHz}$ ) |

### 4.3.2 Test Setup

The modulation state shall be in continuously transmitting mode.

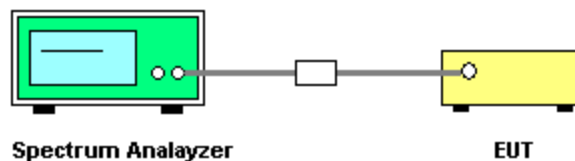
Setting of SA start 30MHz and stop frequency 1000MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 2.5μW.

Setting of SA start 1000MHz and stop frequency 2387MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 2.5μW.

Setting of SA start 2387MHz and stop frequency 2400MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 25μW.

Setting of SA start 2483.5MHz and stop frequency 2496.5MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 25μW.

Setting of SA start 2496.5MHz and stop frequency 12500MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 2.5μW.



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## 4.3.3 Test Record

| Voltage<br>(V) | Mode             | Frequency<br>Range<br>(MHz) | Max Value (dBm) |         |         | Limit<br>(dBm) | P/F  |
|----------------|------------------|-----------------------------|-----------------|---------|---------|----------------|------|
|                |                  |                             | 2412MHz         | 2442MHz | 2472MHz |                |      |
| Normal         | 802.11b          | 30 ~ 1000                   | -64.37          | -65.24  | -64.28  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -48.76          | -52.08  | -55.90  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -36.13          | -43.91  | -49.72  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -52.23          | -45.22  | -33.71  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -51.10          | -52.42  | -49.70  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.97          | -52.90  | -52.98  | -26            | Pass |
|                | 802.11g          | 30 ~ 1000                   | -64.98          | -65.51  | -64.28  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -52.72          | -54.33  | -55.68  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -29.84          | -52.71  | -53.52  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -51.88          | -51.59  | -42.08  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -54.65          | -54.90  | -52.88  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.81          | -53.02  | -52.90  | -26            | Pass |
|                | 802.11n<br>(20M) | 30 ~ 1000                   | -65.03          | -65.66  | -64.71  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -53.62          | -54.18  | -55.53  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -27.60          | -52.90  | -53.27  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -50.77          | -50.60  | -39.48  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -54.58          | -54.89  | -50.65  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.95          | -52.93  | -52.85  | -26            | Pass |

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| Voltage<br>(V) | Mode             | Frequency<br>Range<br>(MHz) | Max Value (dBm) |         |         | Limit<br>(dBm) | P/F  |
|----------------|------------------|-----------------------------|-----------------|---------|---------|----------------|------|
|                |                  |                             | 2412MHz         | 2442MHz | 2472MHz |                |      |
| Low            | 802.11b          | 30 ~ 1000                   | -64.29          | -63.95  | -63.93  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -47.71          | -51.07  | -52.26  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -36.27          | -44.61  | -49.80  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -51.93          | -44.69  | -32.91  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -51.53          | -51.05  | -44.51  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.83          | -53.19  | -53.00  | -26            | Pass |
|                | 802.11g          | 30 ~ 1000                   | -64.87          | -64.63  | -60.63  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -53.52          | -54.48  | -55.29  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -29.26          | -52.66  | -53.99  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -51.30          | -51.43  | -42.13  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -54.55          | -55.18  | -52.93  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.91          | -53.13  | -52.99  | -26            | Pass |
|                | 802.11n<br>(20M) | 30 ~ 1000                   | -64.44          | -64.62  | -64.83  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -52.76          | -54.97  | -55.19  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -28.73          | -53.04  | -53.57  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -50.97          | -51.27  | -38.21  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -54.19          | -54.99  | -52.02  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.53          | -53.02  | -52.98  | -26            | Pass |

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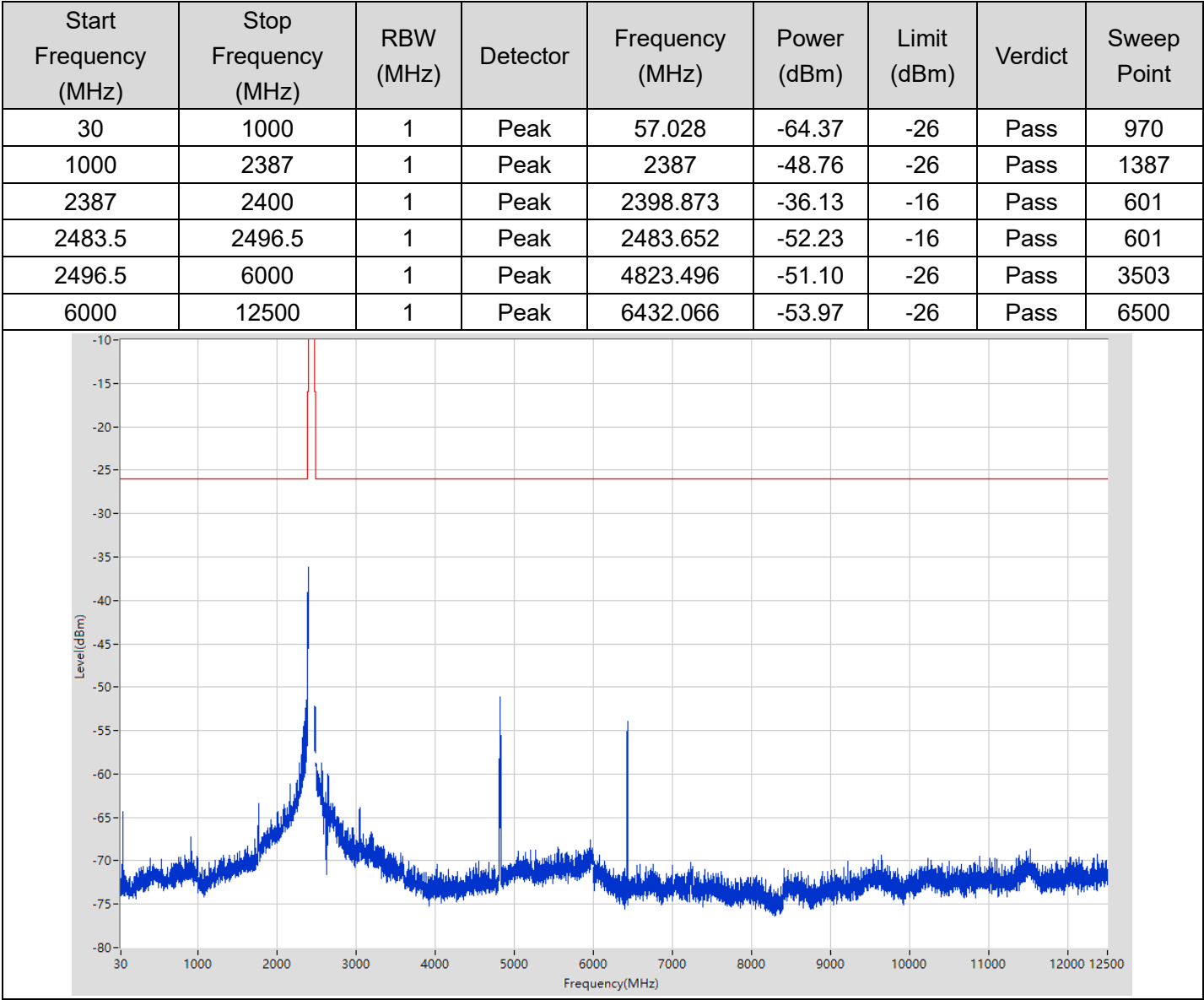
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| Voltage<br>(V) | Mode             | Frequency<br>Range<br>(MHz) | Max Value (dBm) |         |         | Limit<br>(dBm) | P/F  |
|----------------|------------------|-----------------------------|-----------------|---------|---------|----------------|------|
|                |                  |                             | 2412MHz         | 2442MHz | 2472MHz |                |      |
| High           | 802.11b          | 30 ~ 1000                   | -65.14          | -64.72  | -65.34  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -49.13          | -51.54  | -55.02  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -35.46          | -44.52  | -51.13  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -52.03          | -43.19  | -34.51  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -50.48          | -50.72  | -43.43  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.75          | -53.12  | -53.02  | -26            | Pass |
|                | 802.11g          | 30 ~ 1000                   | -64.42          | -65.21  | -64.87  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -52.55          | -54.98  | -55.43  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -29.94          | -52.65  | -52.92  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -51.51          | -50.69  | -39.88  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -54.77          | -54.60  | -50.66  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.81          | -53.20  | -53.04  | -26            | Pass |
|                | 802.11n<br>(20M) | 30 ~ 1000                   | -64.67          | -64.81  | -65.14  | -26            | Pass |
|                |                  | 1000 ~ 2387                 | -53.17          | -55.30  | -55.31  | -26            | Pass |
|                |                  | 2387 ~ 2400                 | -29.90          | -52.38  | -53.33  | -16            | Pass |
|                |                  | 2483.5 ~ 2496.5             | -51.45          | -51.31  | -40.60  | -16            | Pass |
|                |                  | 2496.5 ~ 6000               | -55.06          | -55.00  | -51.44  | -26            | Pass |
|                |                  | 6000 ~ 12500                | -53.88          | -53.05  | -52.93  | -26            | Pass |

# TEST REPORT

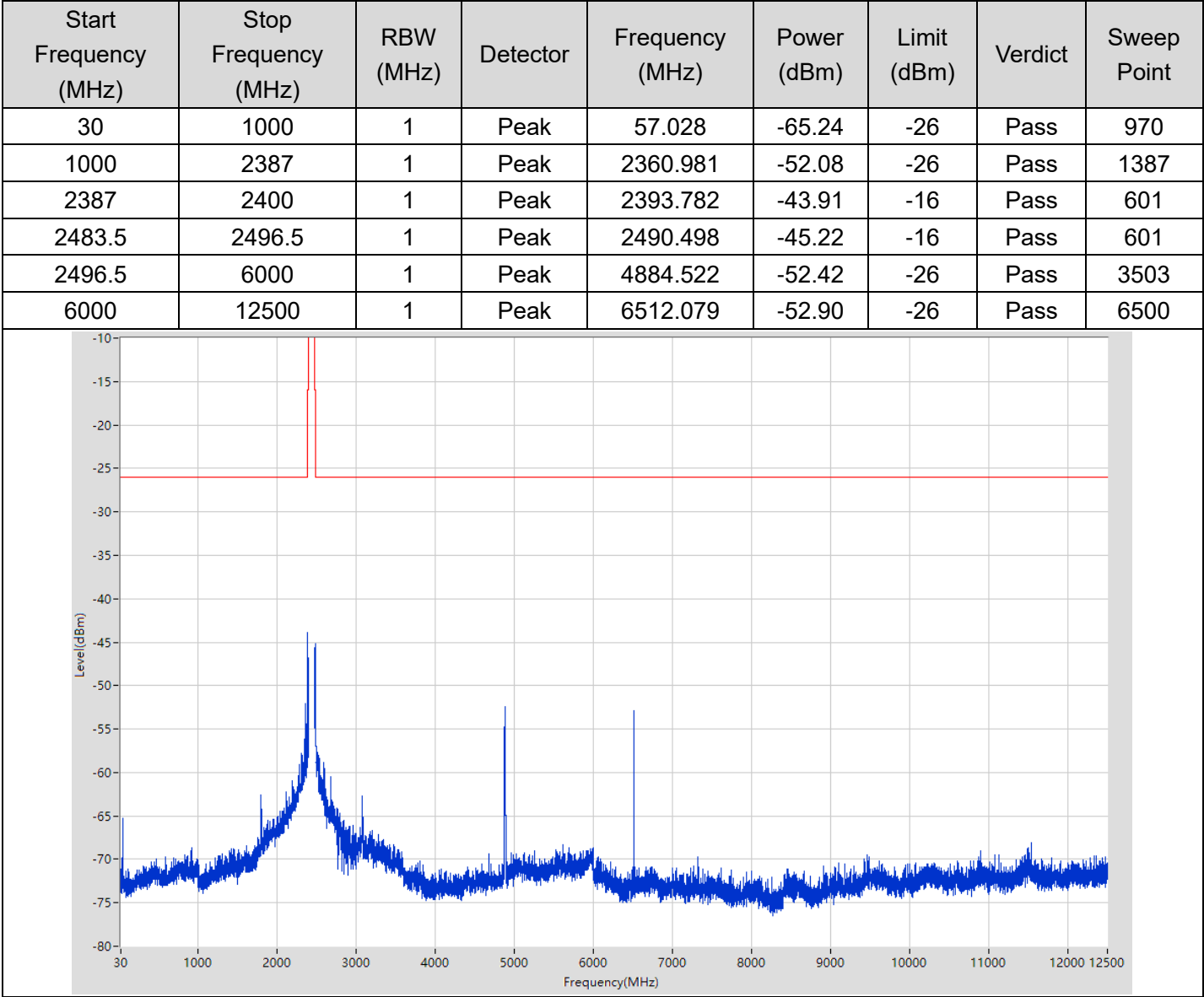
Normal Voltage

Figure 64-Test Frequency: 2412MHz, 802.11b



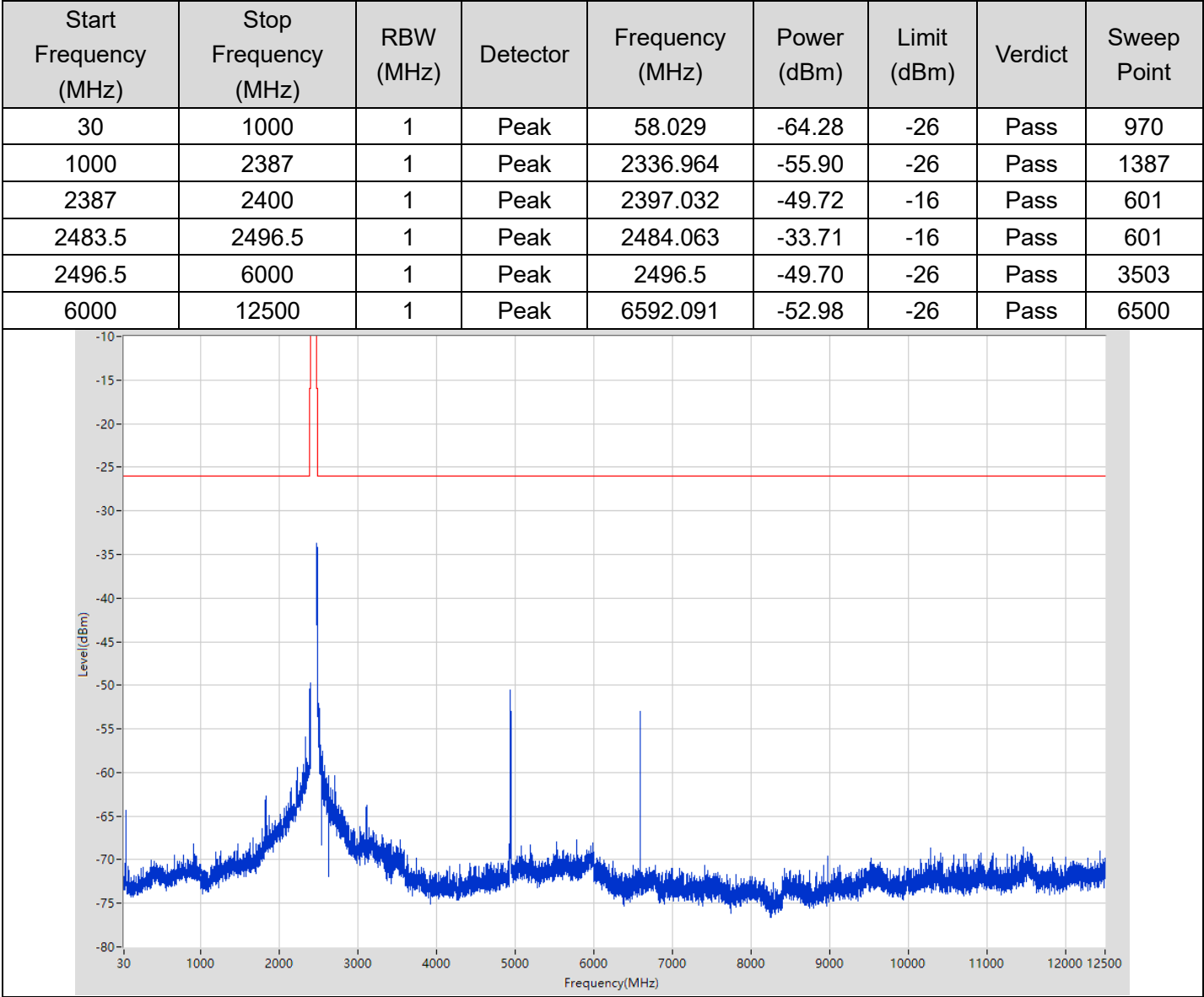
# TEST REPORT

Figure 65-Test Frequency: 2442MHz, 802.11b



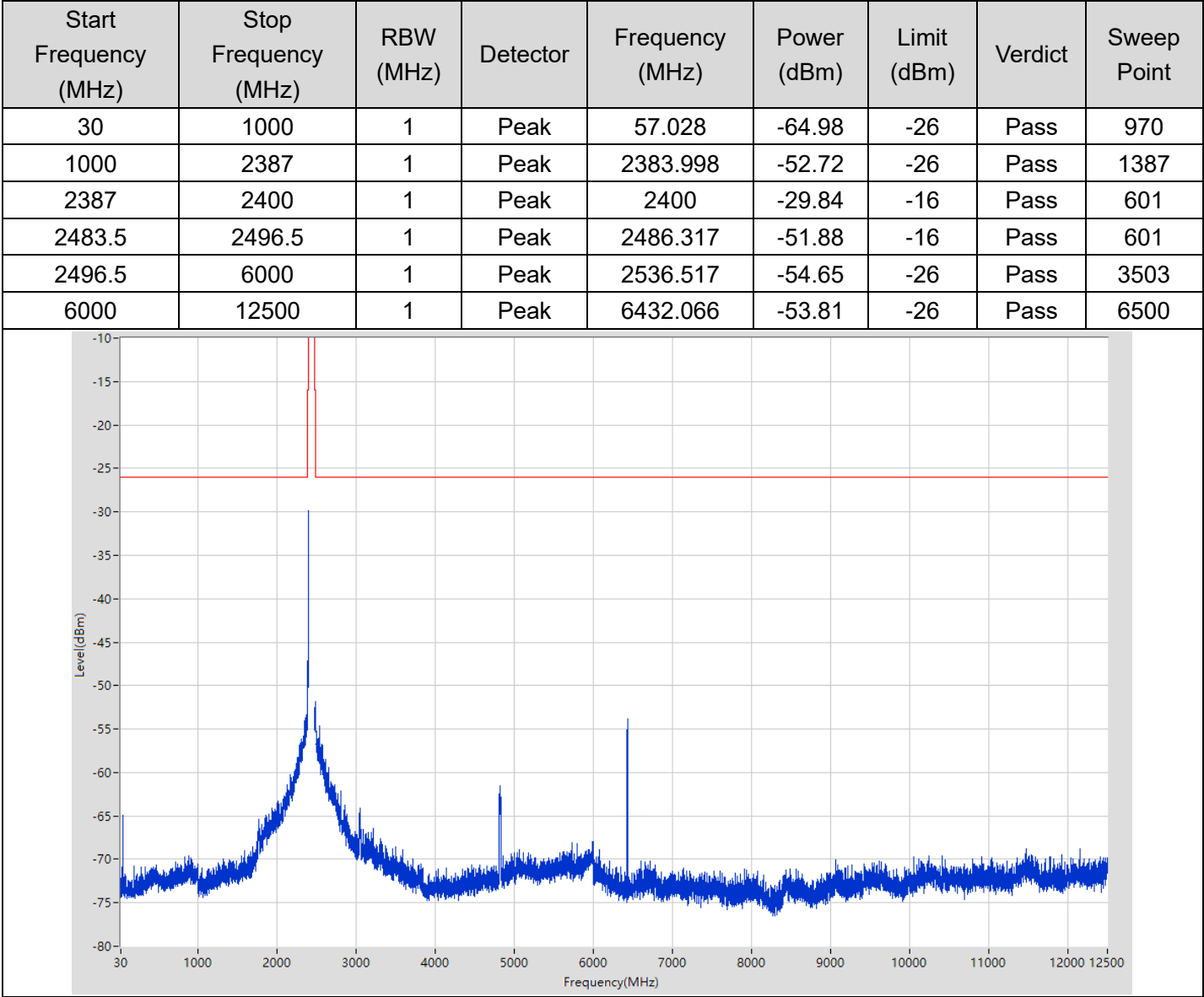
# TEST REPORT

Figure 66-Test Frequency: 2472MHz, 802.11b



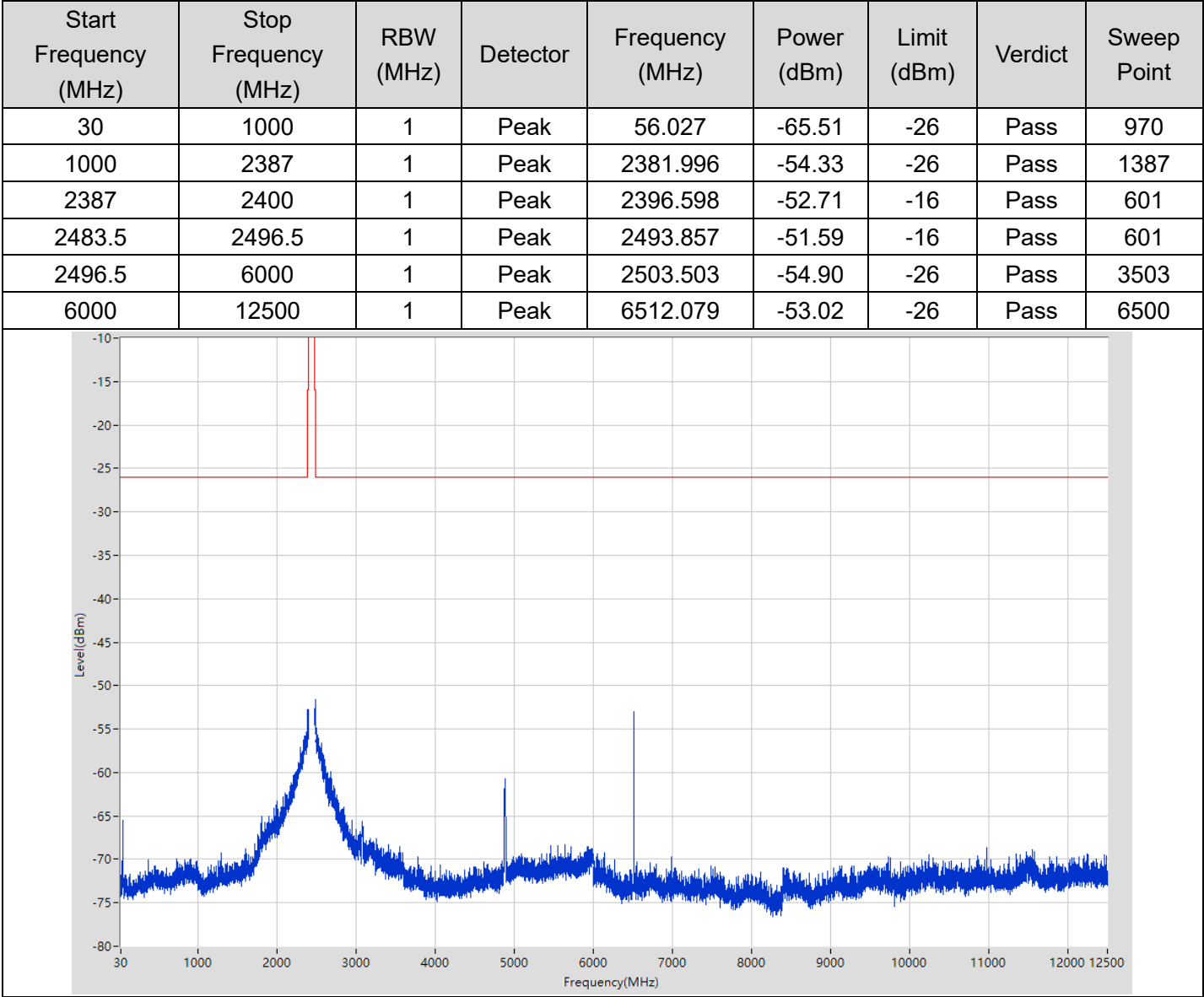
# TEST REPORT

Figure 67-Test Frequency: 2412MHz, 802.11g



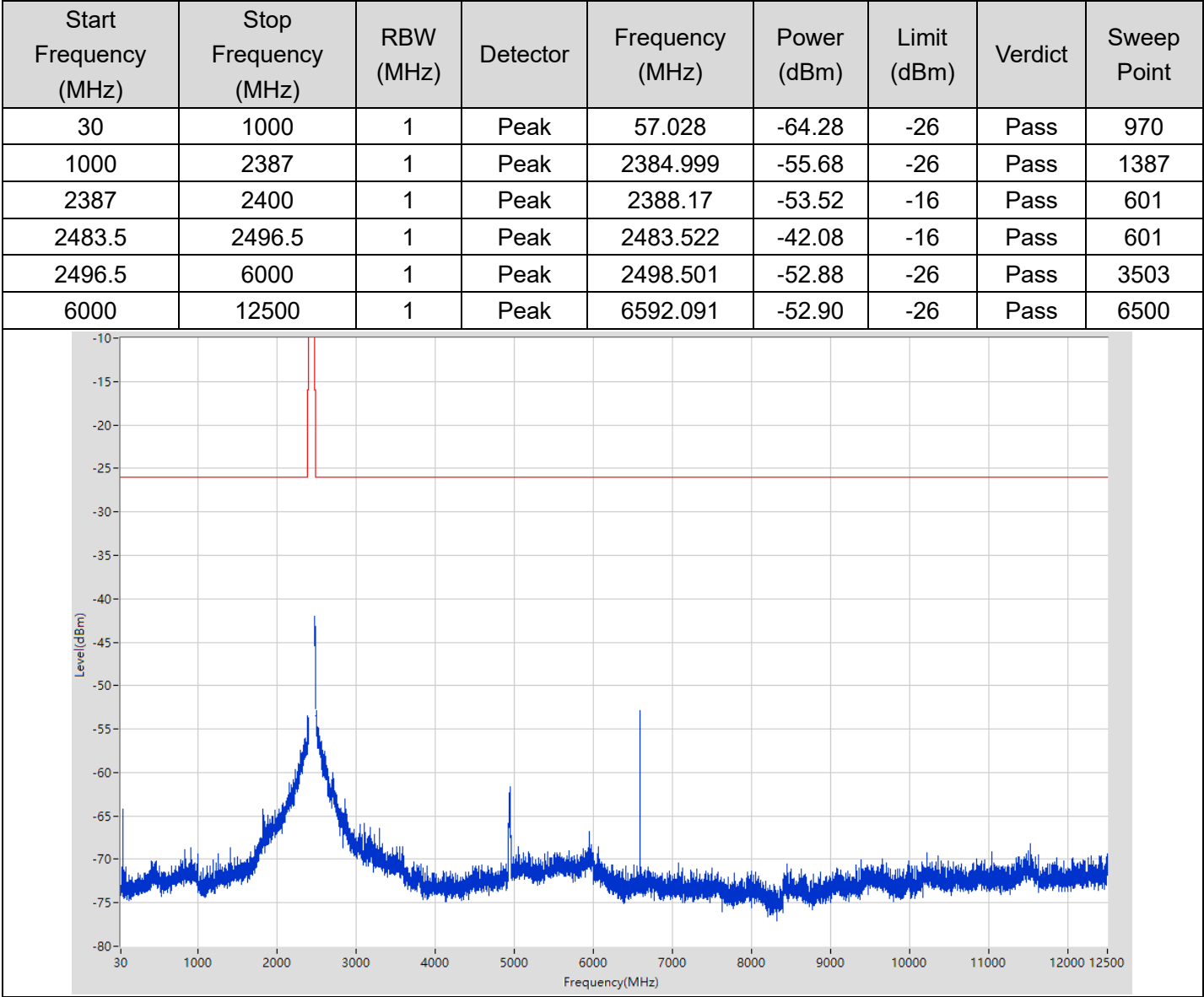
# TEST REPORT

Figure 68-Test Frequency: 2442MHz, 802.11g



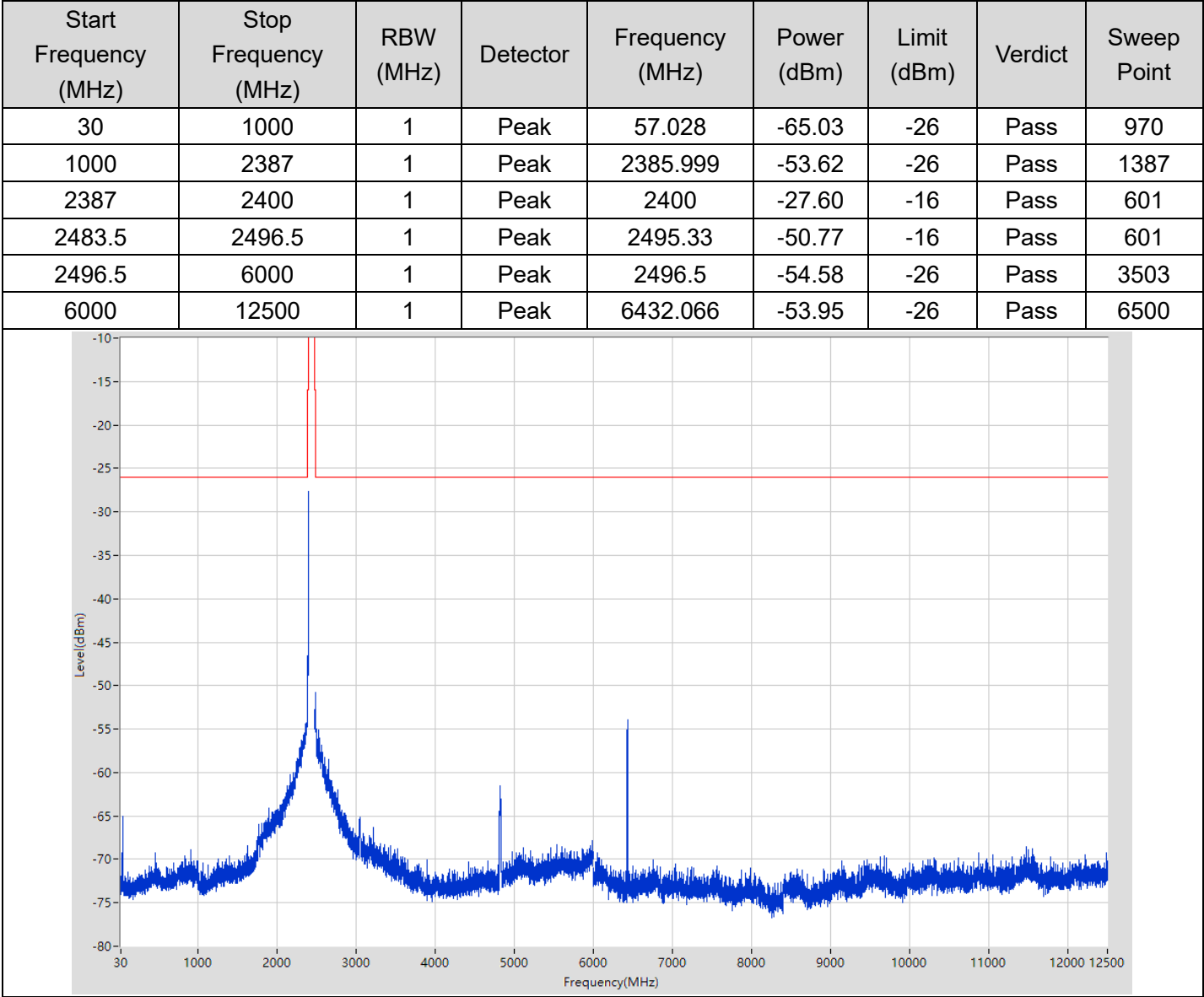
# TEST REPORT

Figure 69-Test Frequency: 2472MHz, 802.11g



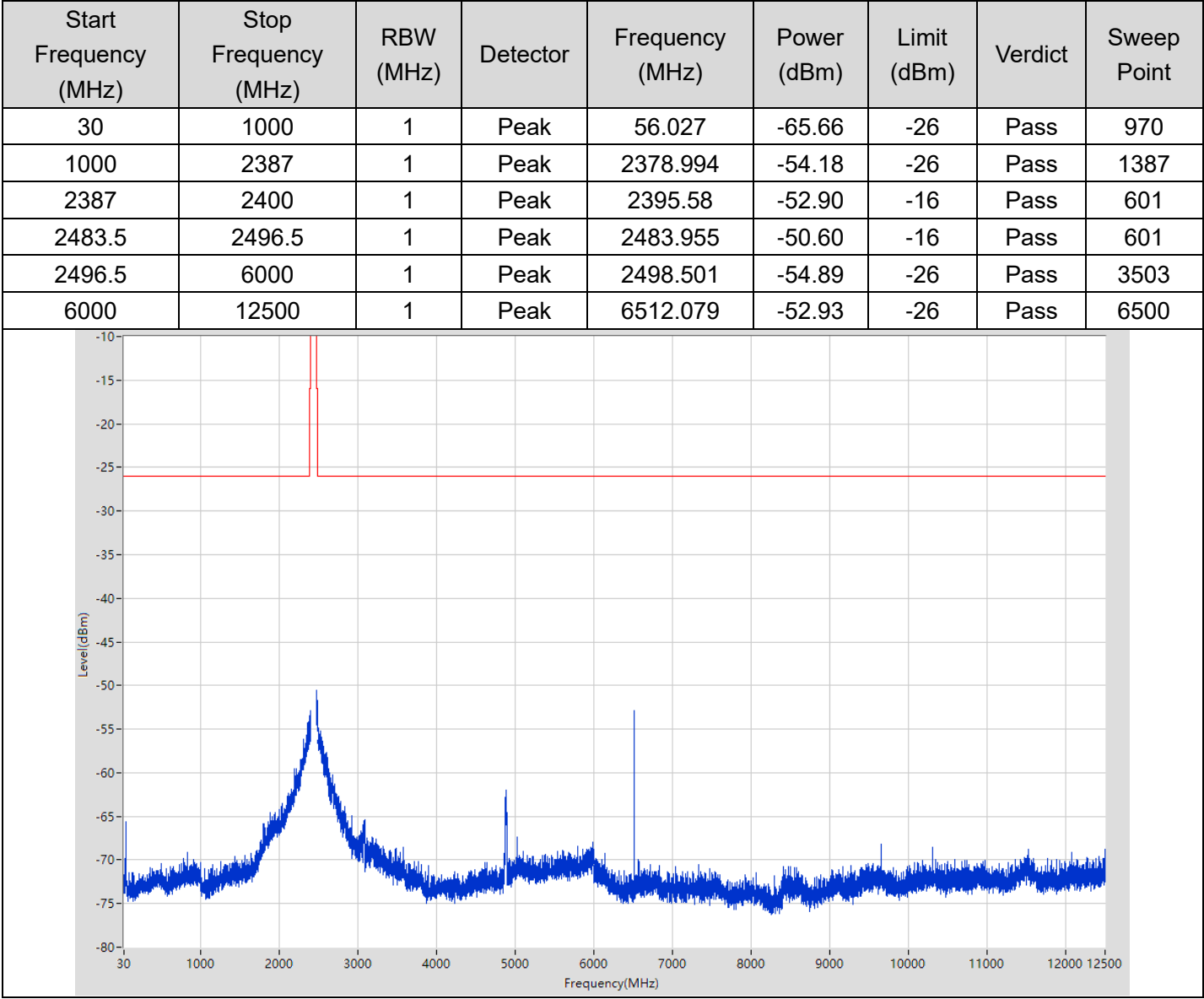
# TEST REPORT

Figure 70-Test Frequency: 2412MHz, 802.11n(20M)



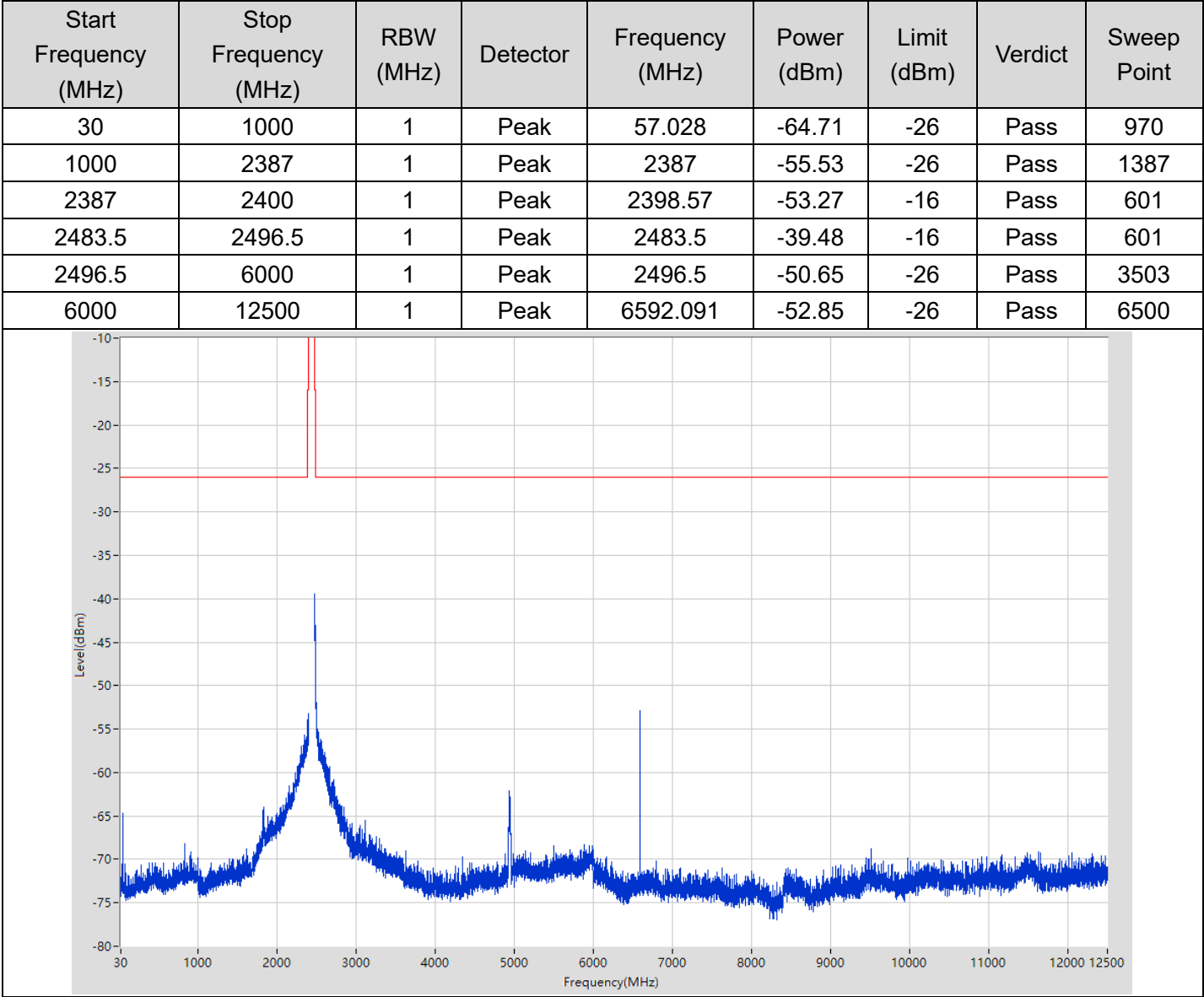
# TEST REPORT

Figure 71-Test Frequency: 2442MHz, 802.11n(20M)



# TEST REPORT

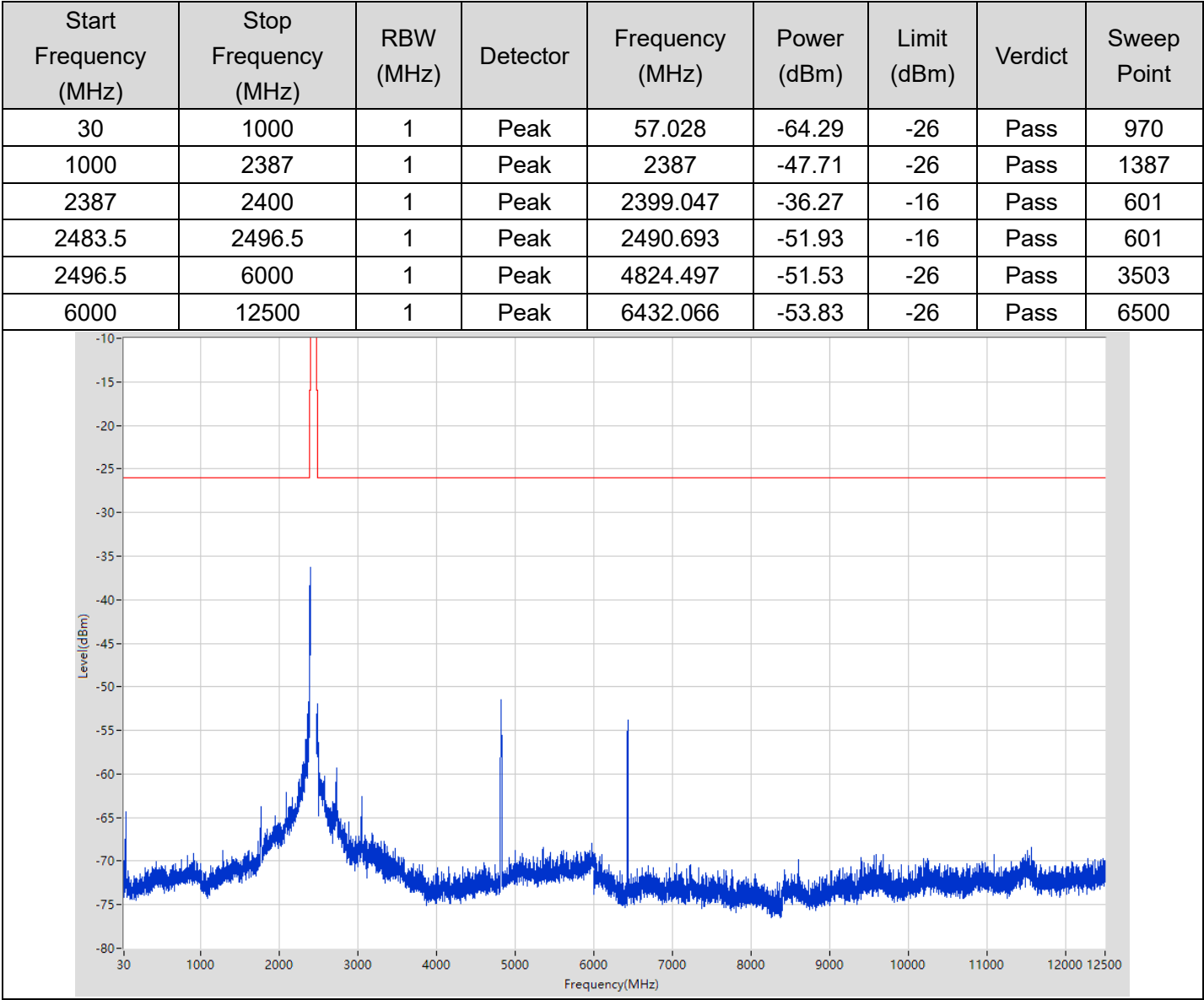
Figure 72-Test Frequency: 2472MHz, 802.11n(20M)



# TEST REPORT

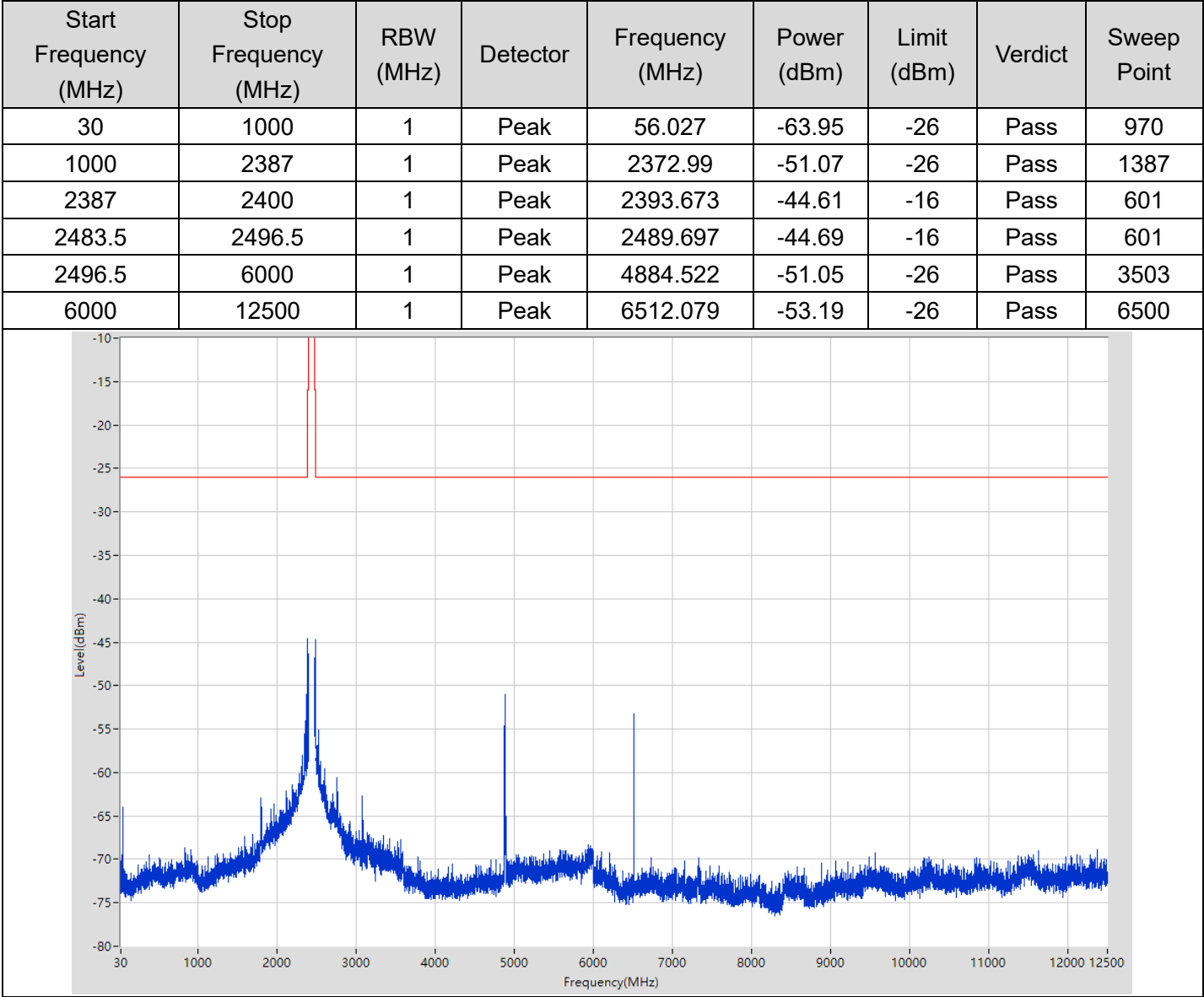
Low Voltage

Figure 73-Test Frequency: 2412MHz, 802.11b



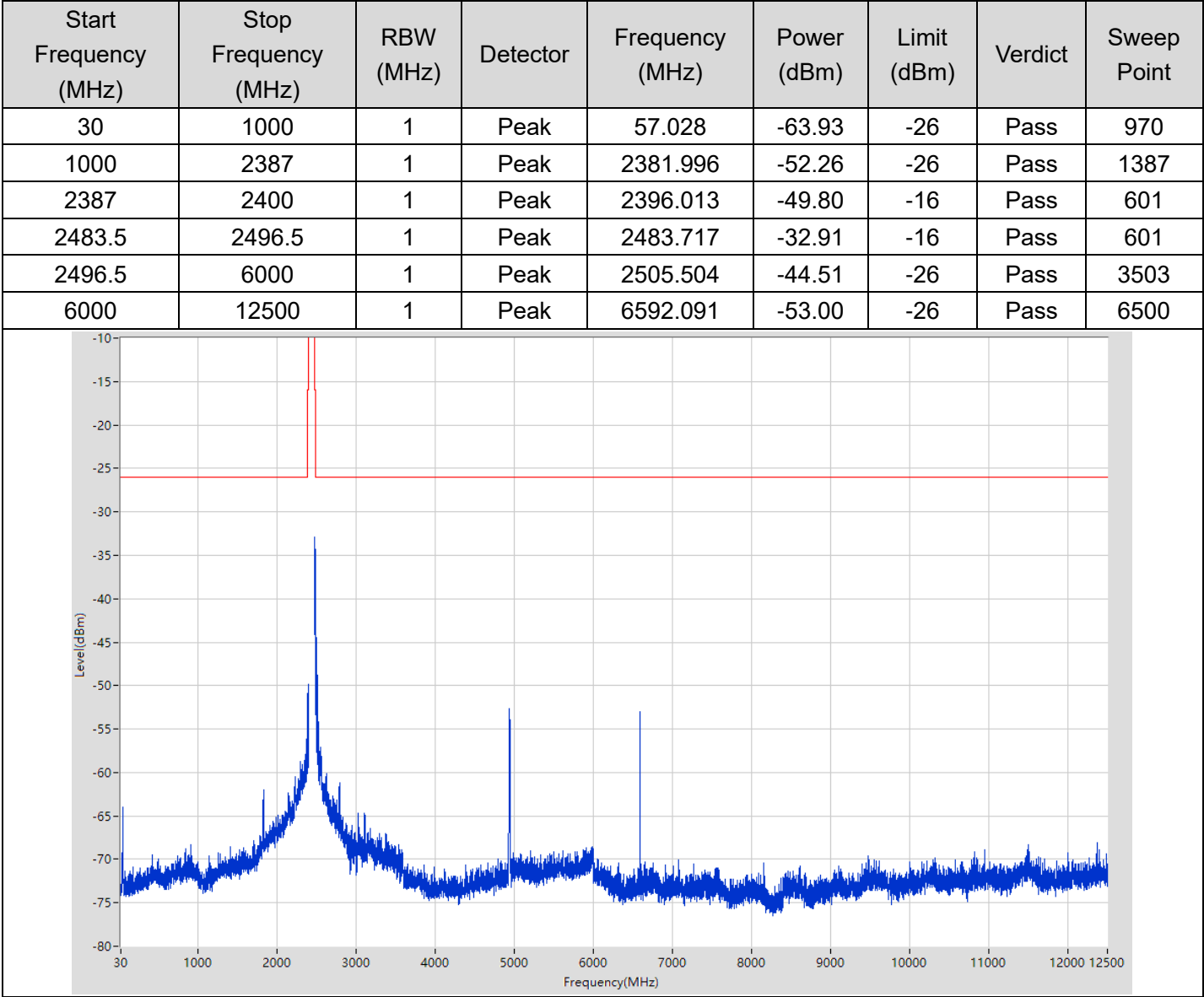
# TEST REPORT

Figure 74-Test Frequency: 2442MHz, 802.11b



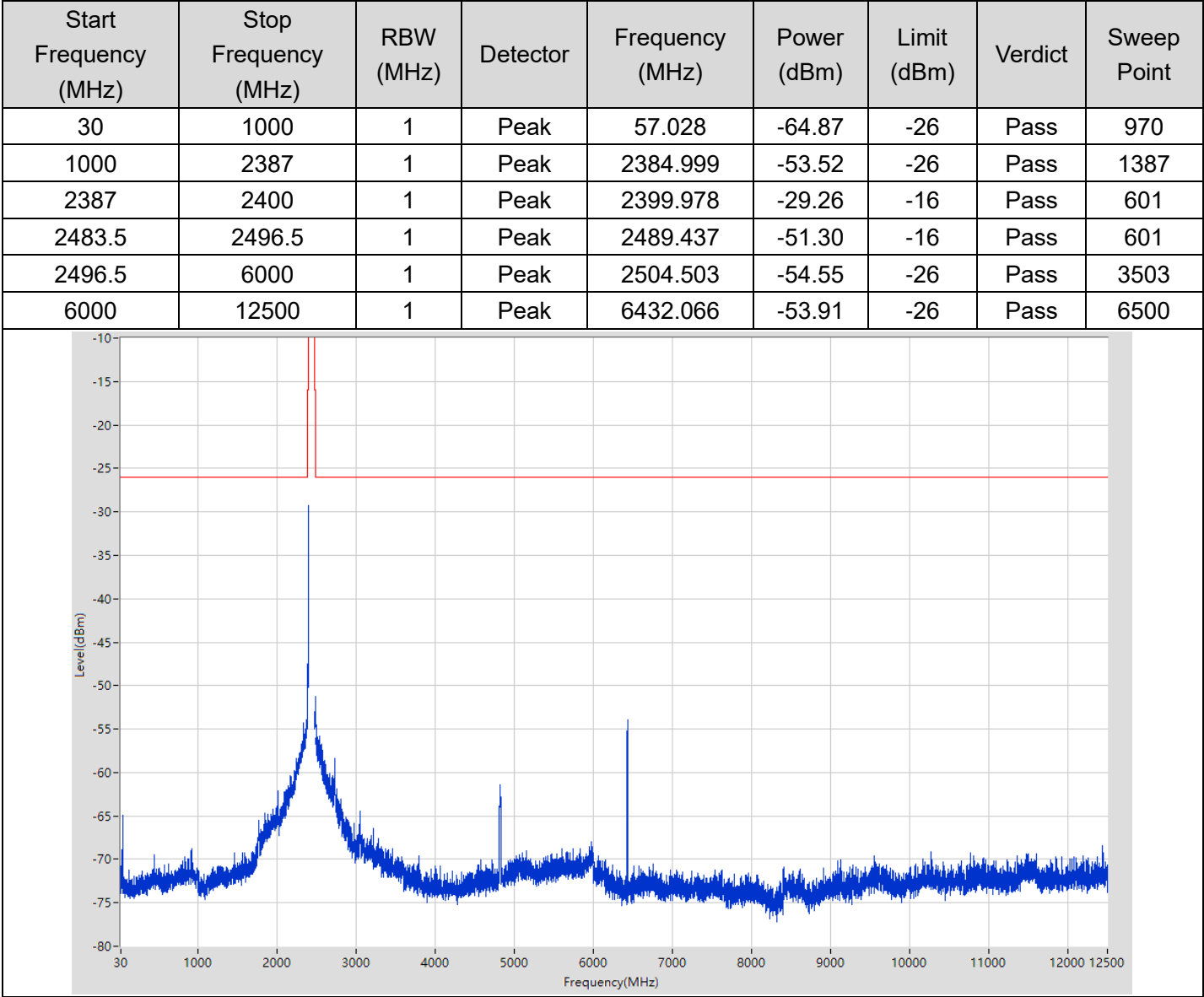
# TEST REPORT

Figure 75-Test Frequency: 2472MHz, 802.11b



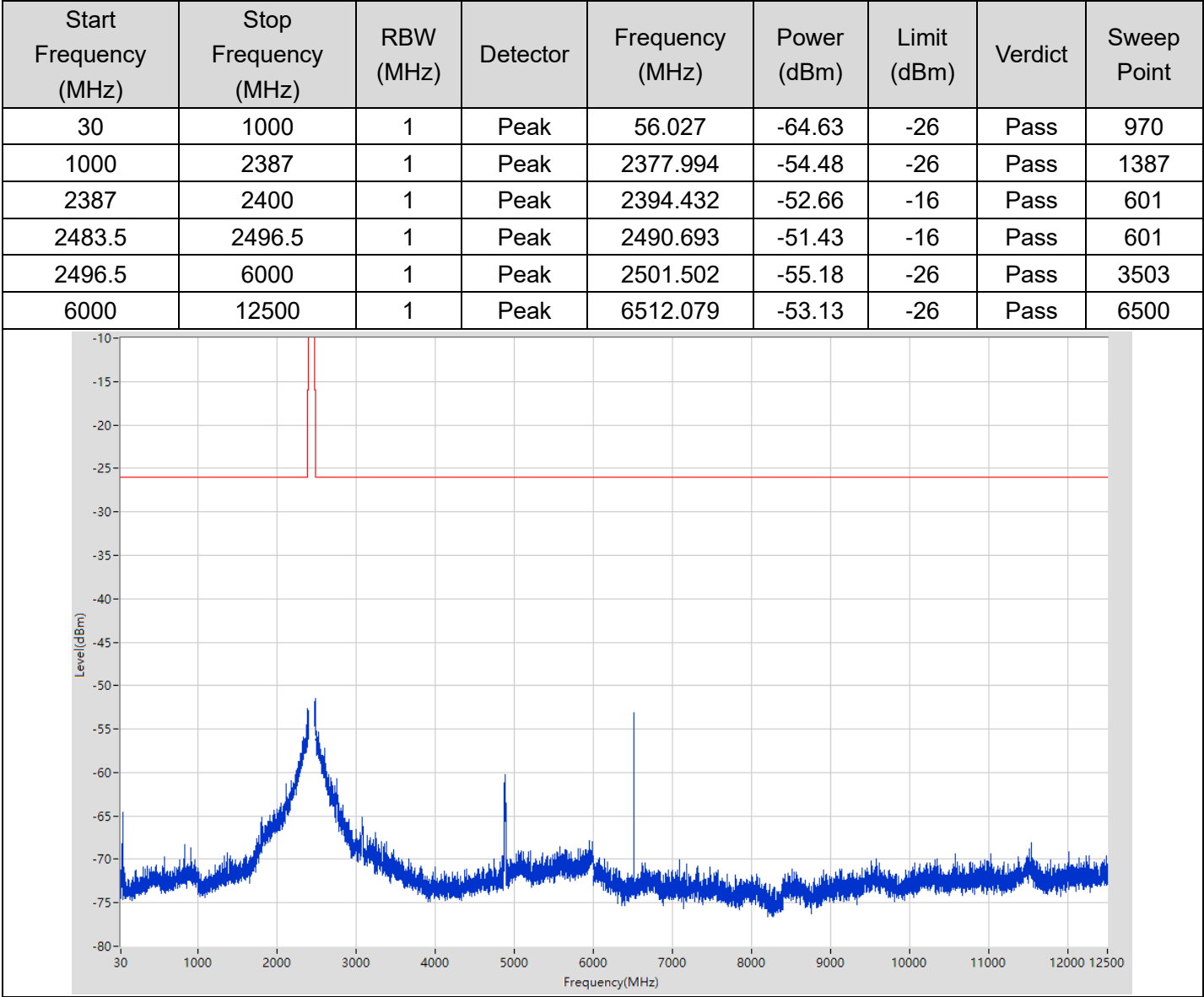
# TEST REPORT

Figure 76-Test Frequency: 2412MHz, 802.11g



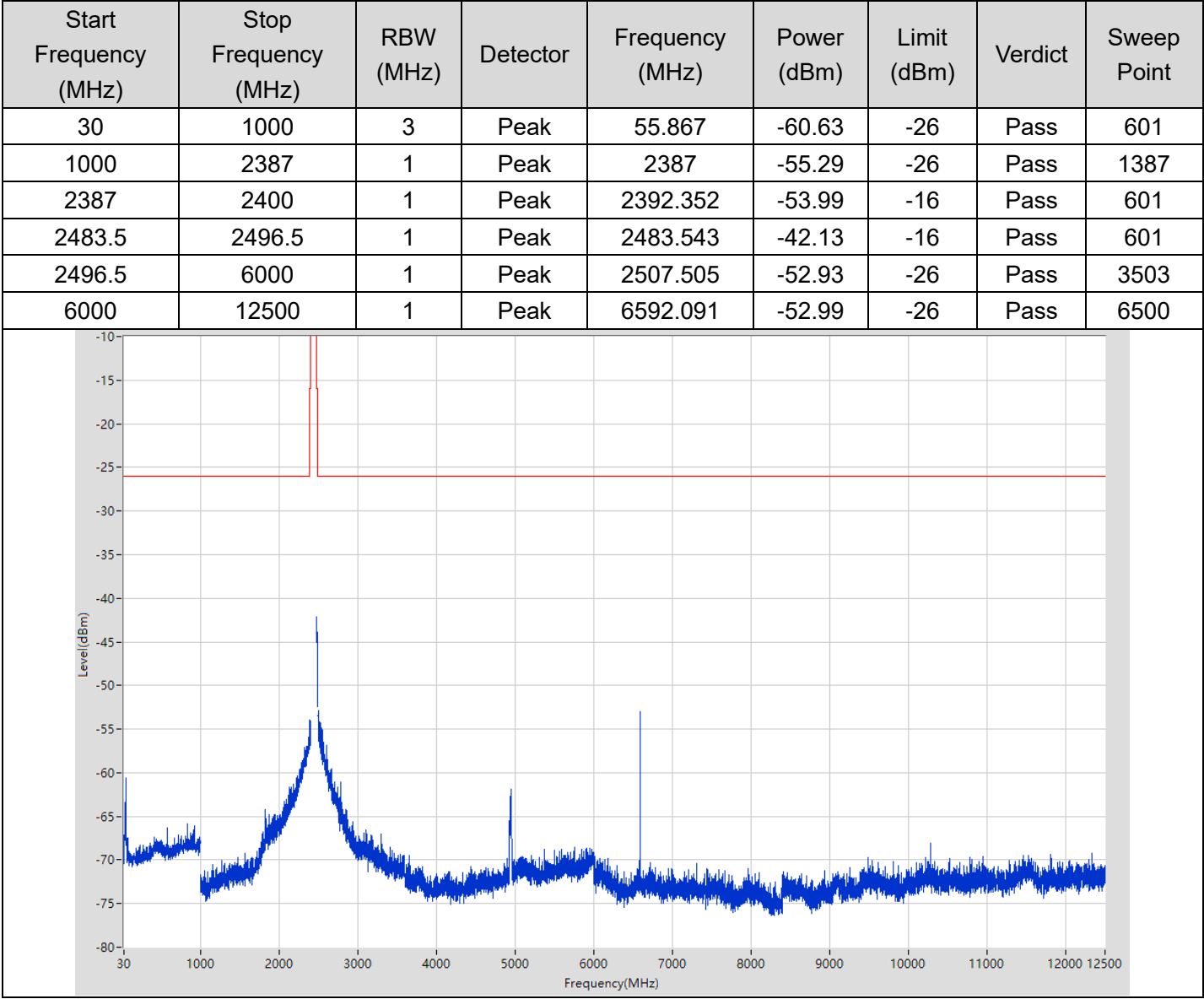
# TEST REPORT

Figure 77-Test Frequency: 2442MHz, 802.11g



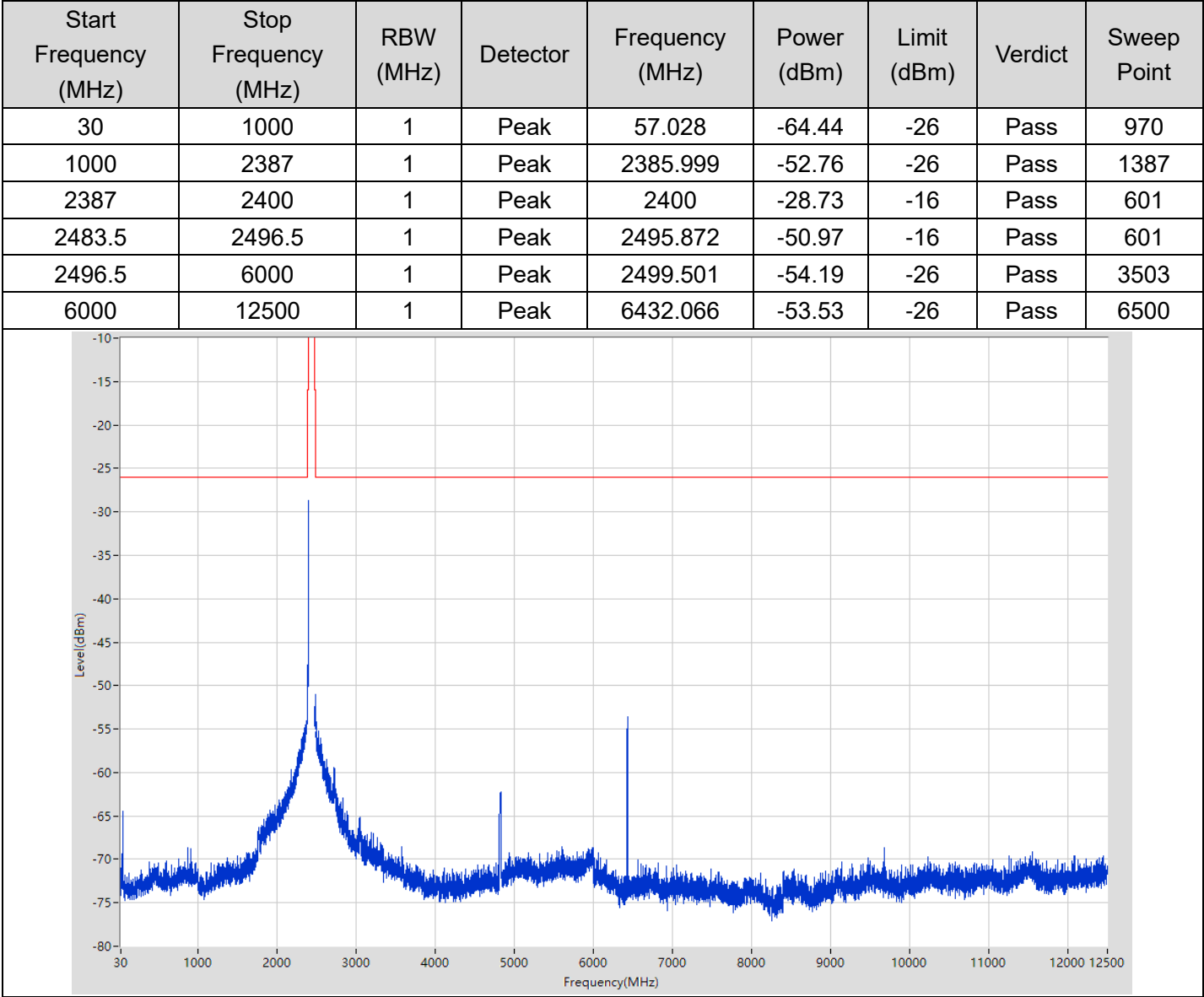
# TEST REPORT

Figure 78-Test Frequency: 2472MHz, 802.11g



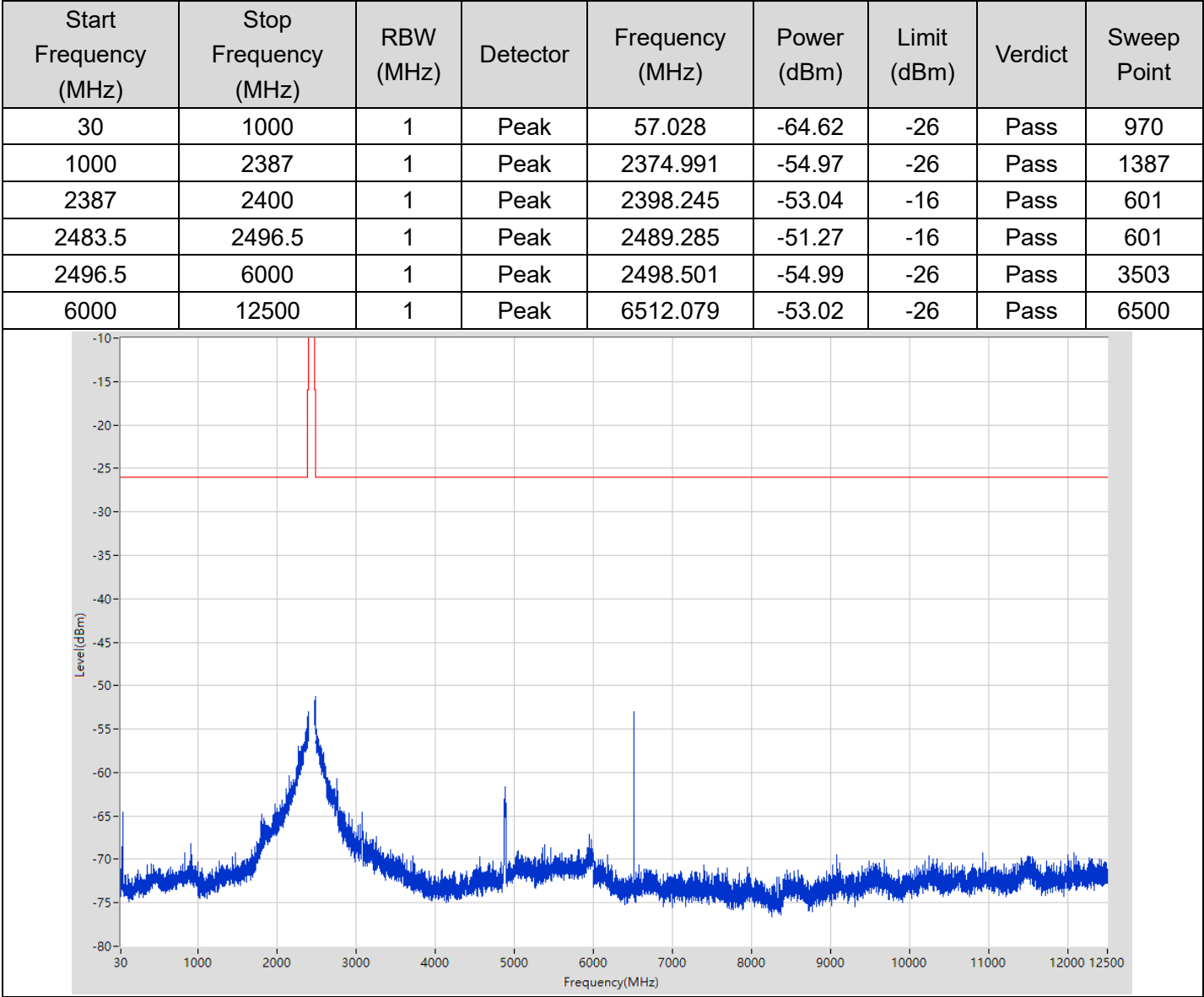
# TEST REPORT

Figure 79-Test Frequency: 2412MHz, 802.11n(20M)



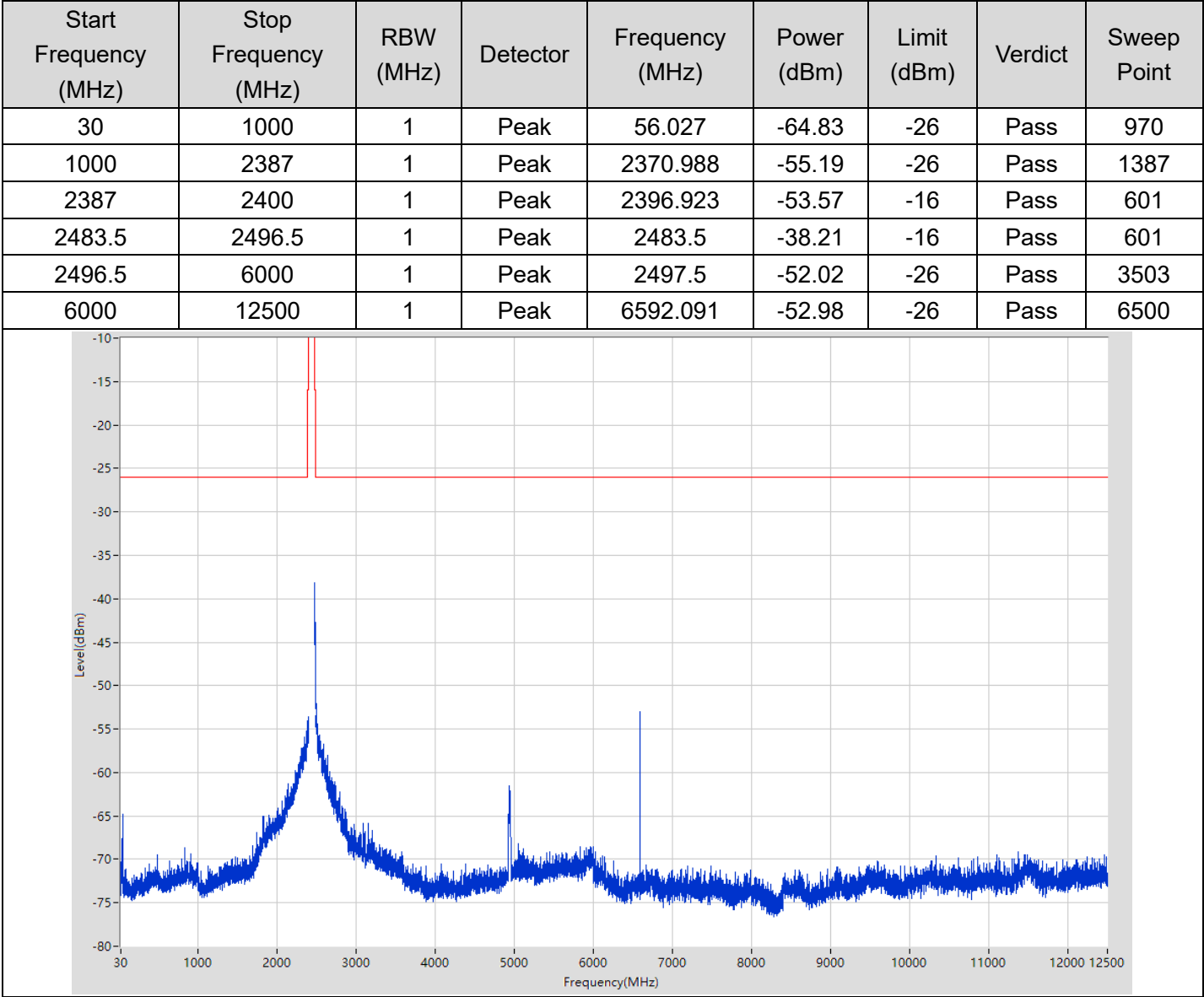
# TEST REPORT

Figure 80-Test Frequency: 2442MHz, 802.11n(20M)



# TEST REPORT

Figure 81-Test Frequency: 2472MHz, 802.11n(20M)

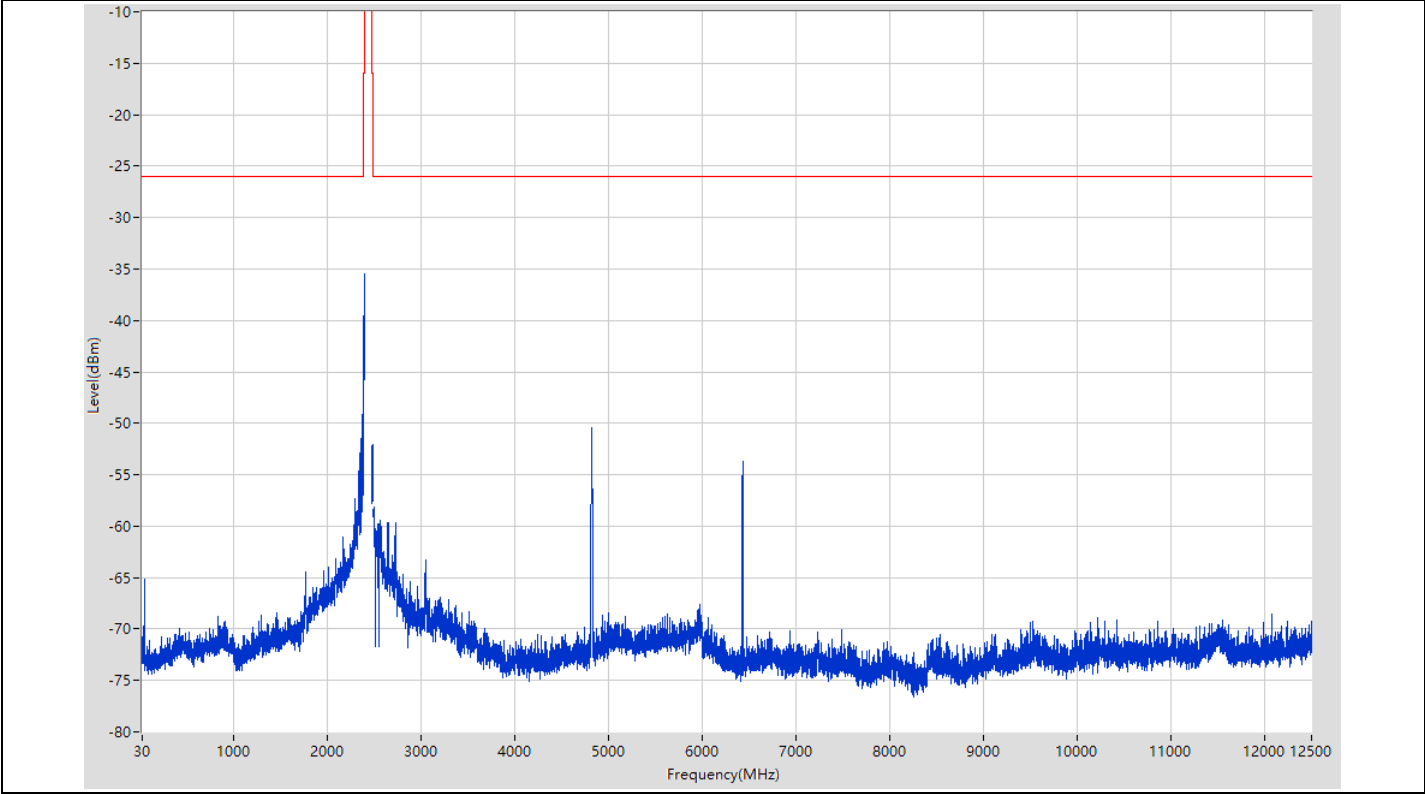


# TEST REPORT

High Voltage

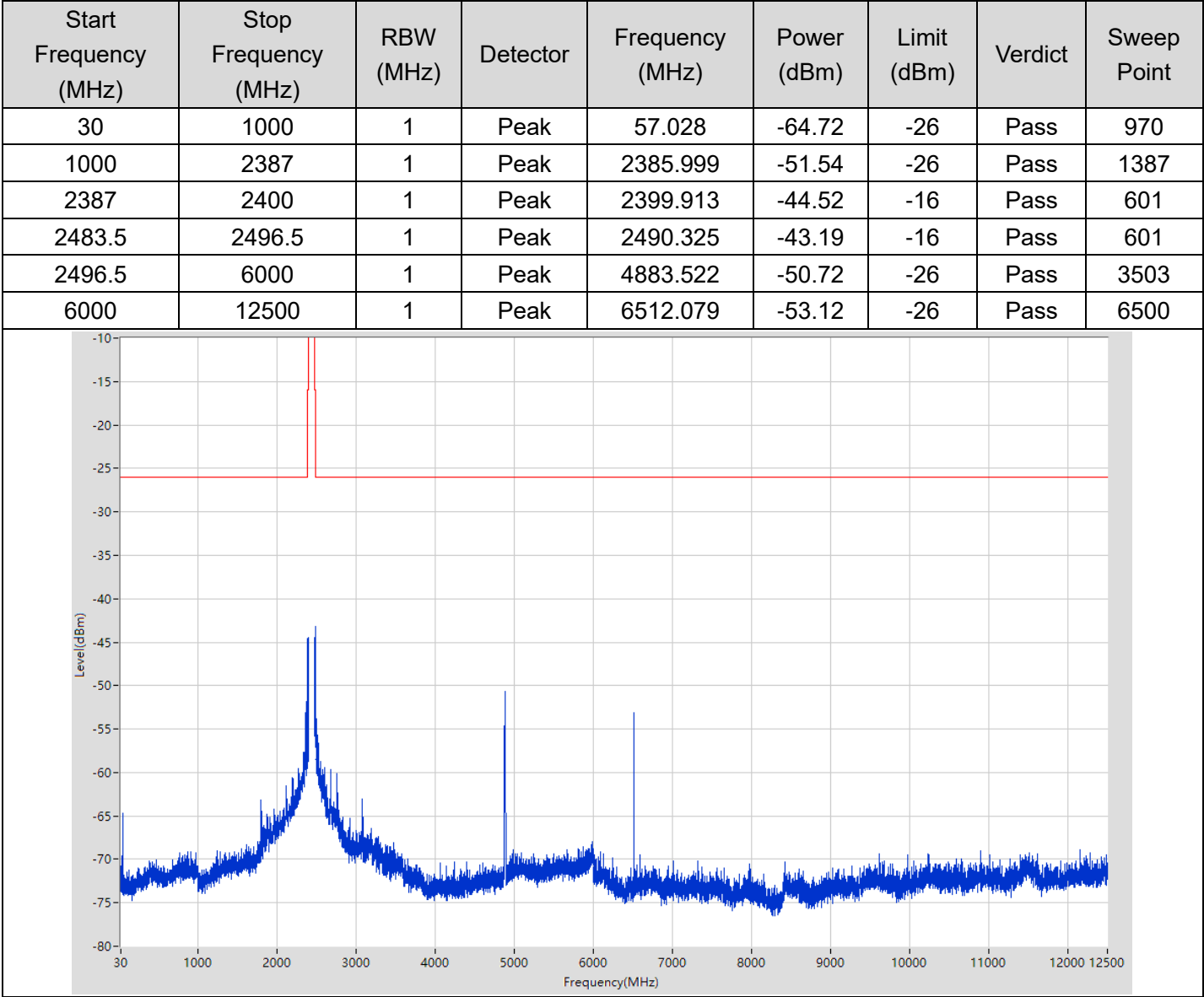
Figure 82-Test Frequency: 2412MHz, 802.11b

| Start Frequency (MHz) | Stop Frequency (MHz) | RBW (MHz) | Detector | Frequency (MHz) | Power (dBm) | Limit (dBm) | Verdict | Sweep Point |
|-----------------------|----------------------|-----------|----------|-----------------|-------------|-------------|---------|-------------|
| 30                    | 1000                 | 1         | Peak     | 56.027          | -65.14      | -26         | Pass    | 970         |
| 1000                  | 2387                 | 1         | Peak     | 2377.994        | -49.13      | -26         | Pass    | 1387        |
| 2387                  | 2400                 | 1         | Peak     | 2399.61         | -35.46      | -16         | Pass    | 601         |
| 2483.5                | 2496.5               | 1         | Peak     | 2491.733        | -52.03      | -16         | Pass    | 601         |
| 2496.5                | 6000                 | 1         | Peak     | 4824.497        | -50.48      | -26         | Pass    | 3503        |
| 6000                  | 12500                | 1         | Peak     | 6432.066        | -53.75      | -26         | Pass    | 6500        |



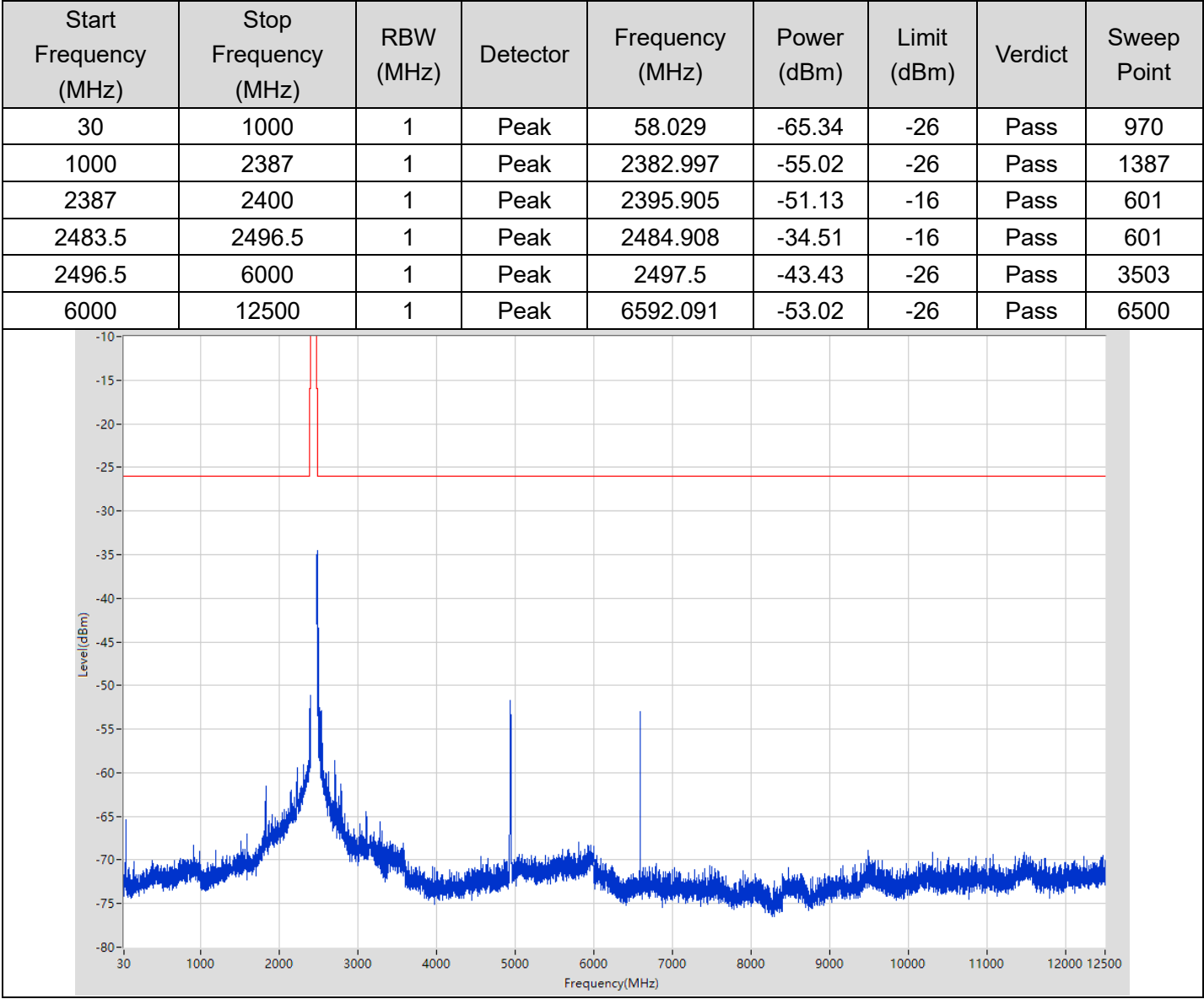
# TEST REPORT

Figure 83-Test Frequency: 2442MHz, 802.11b



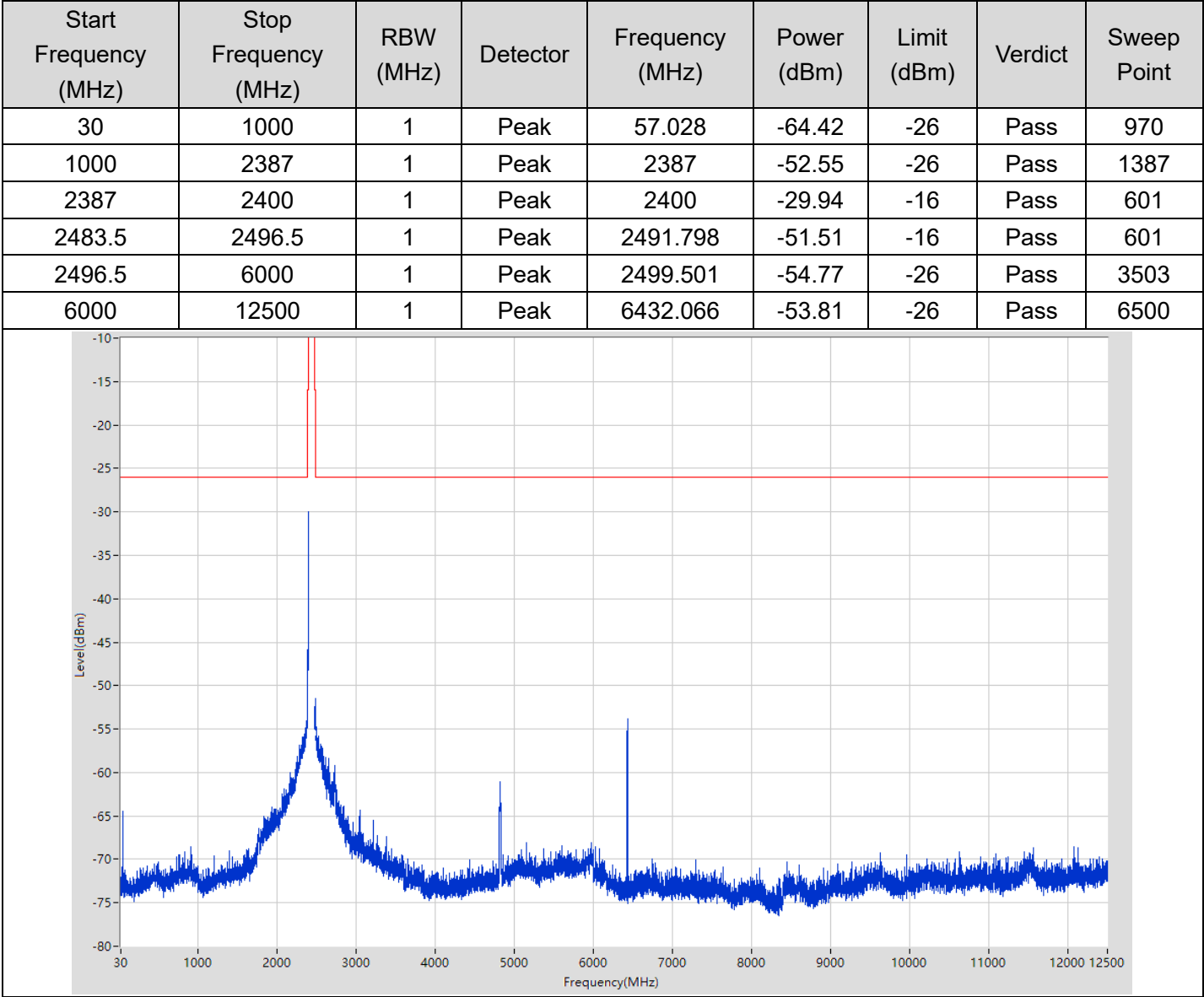
# TEST REPORT

Figure 84-Test Frequency: 2472MHz, 802.11b



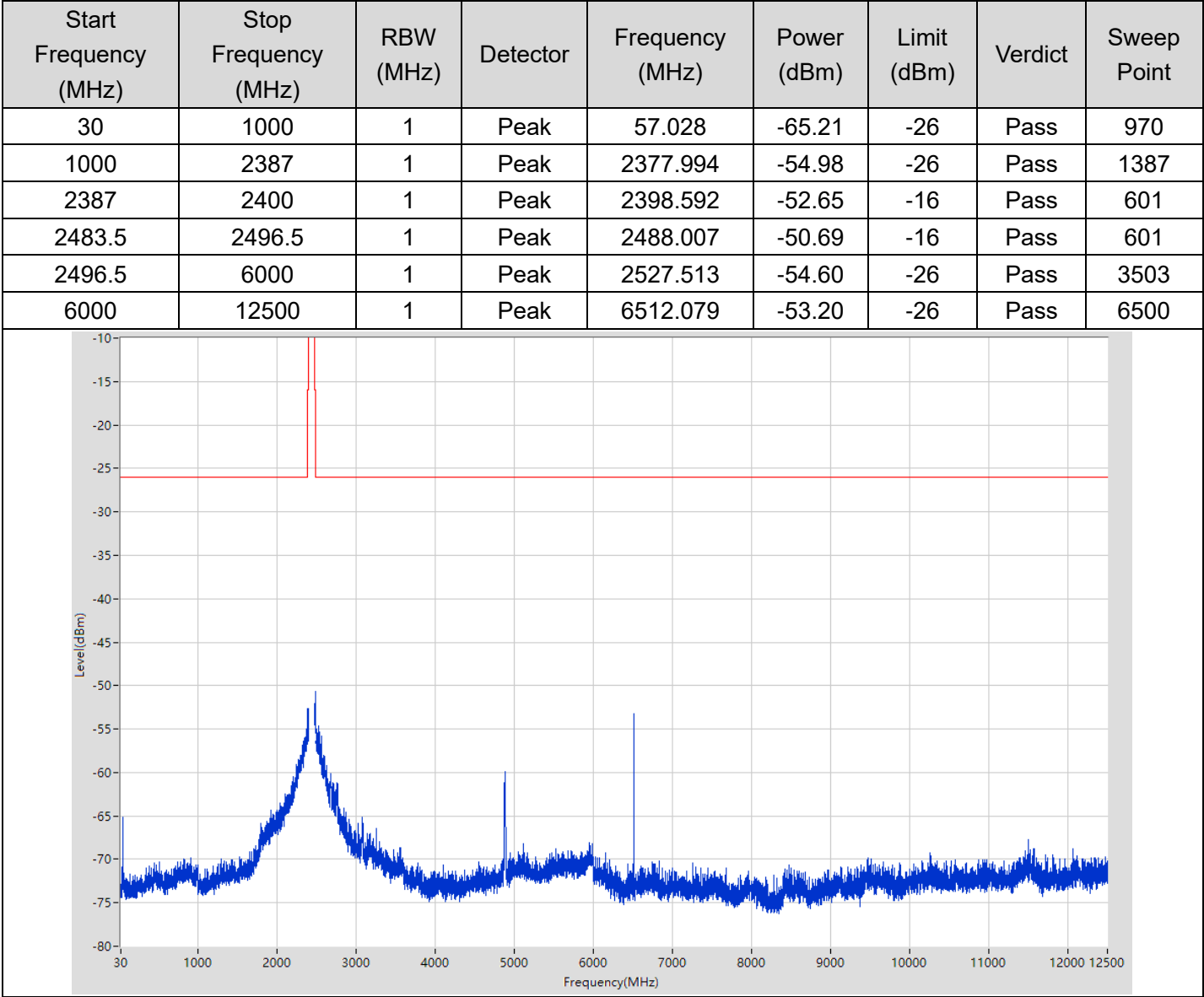
# TEST REPORT

Figure 85-Test Frequency: 2412MHz, 802.11g



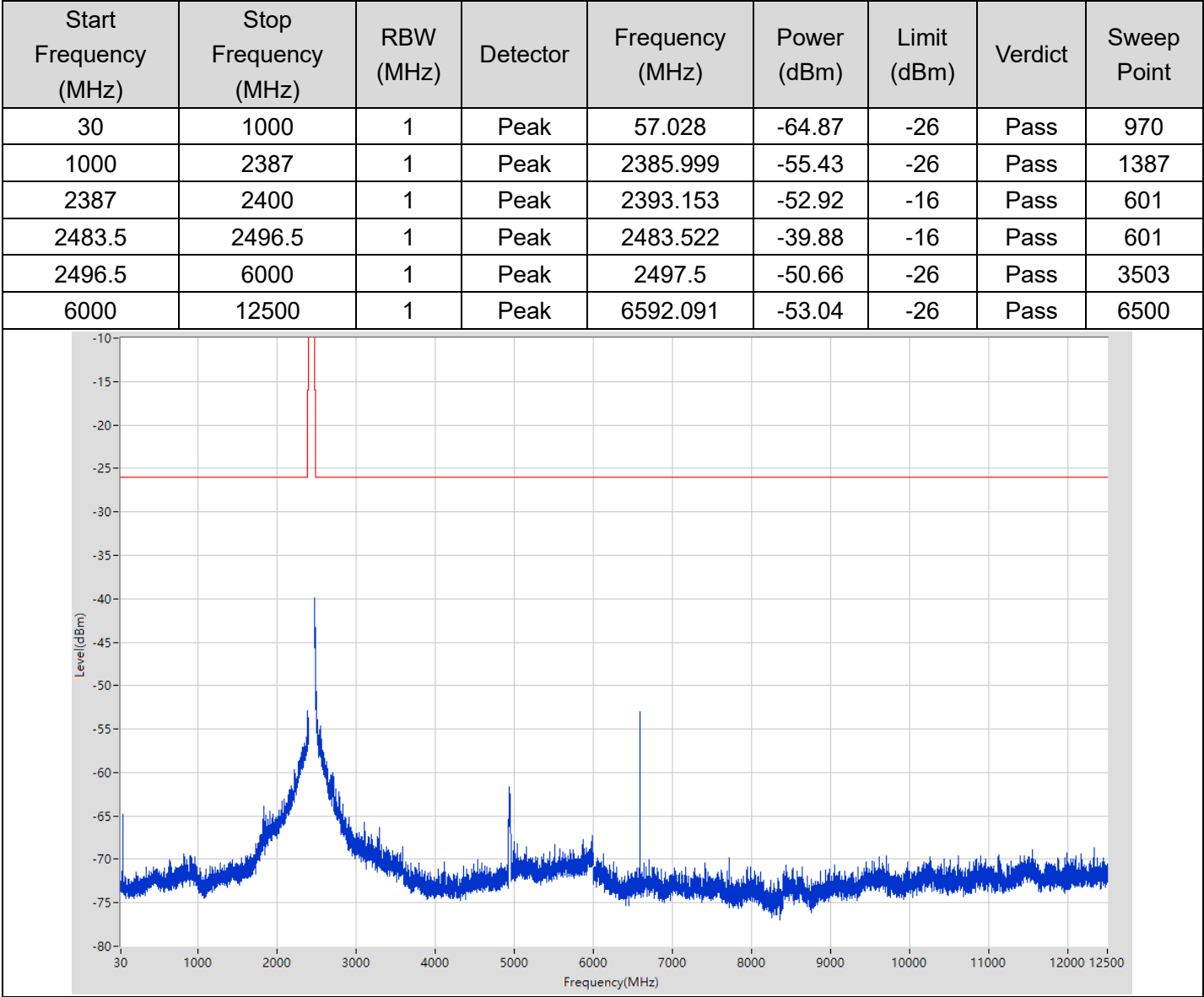
# TEST REPORT

Figure 86-Test Frequency: 2442MHz, 802.11g



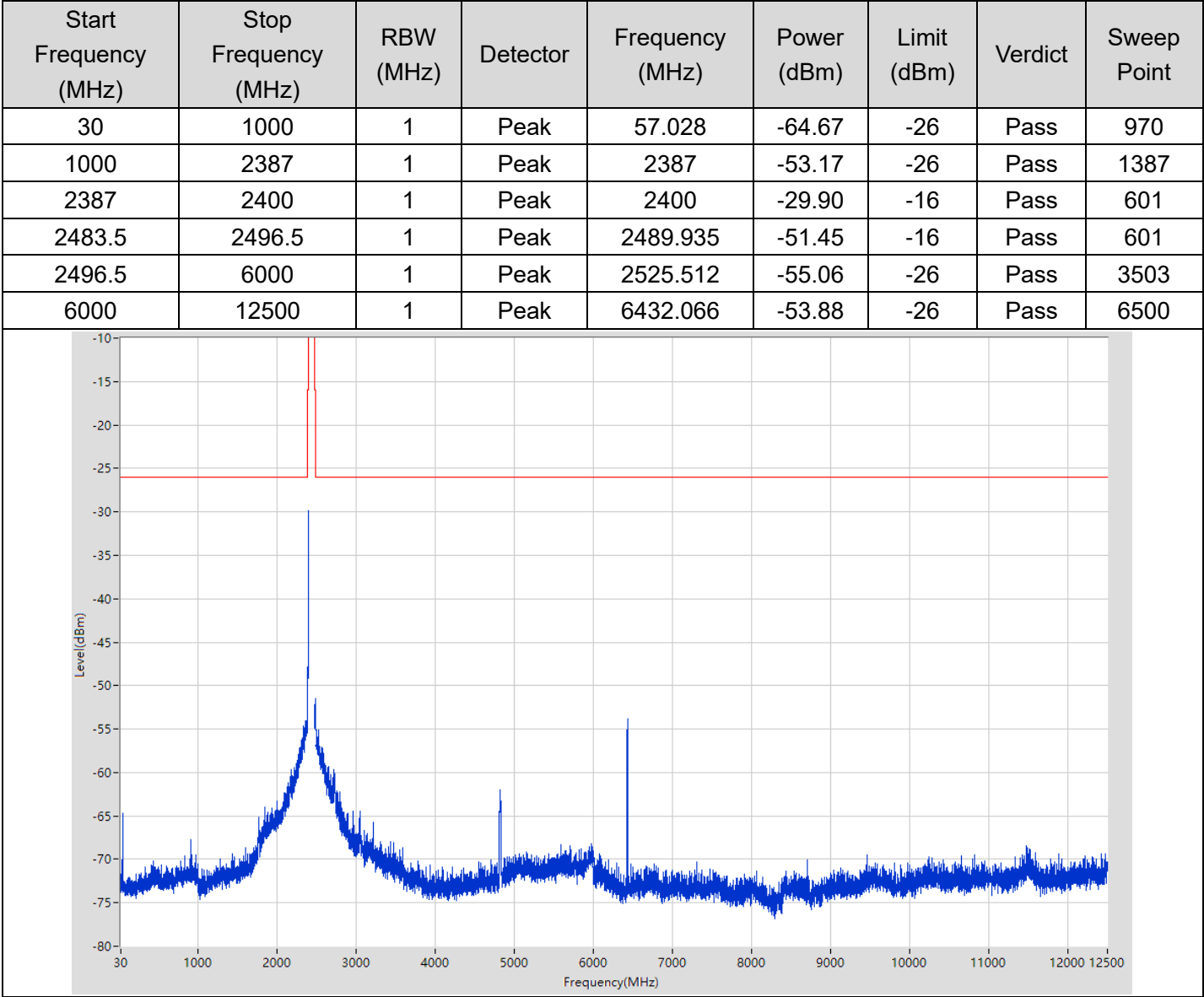
# TEST REPORT

Figure 87-Test Frequency: 2472MHz, 802.11g



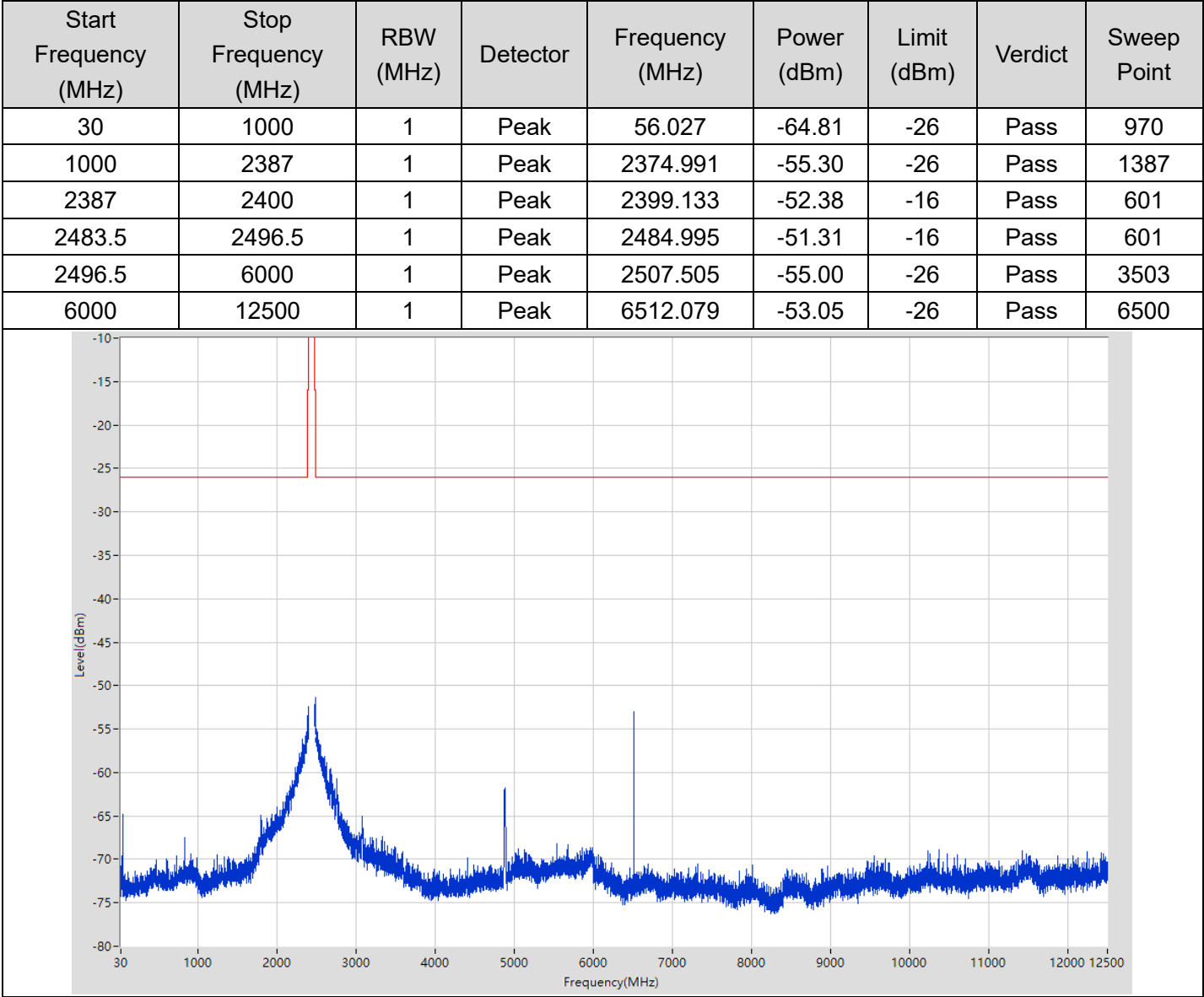
# TEST REPORT

Figure 88-Test Frequency: 2412MHz, 802.11n(20M)



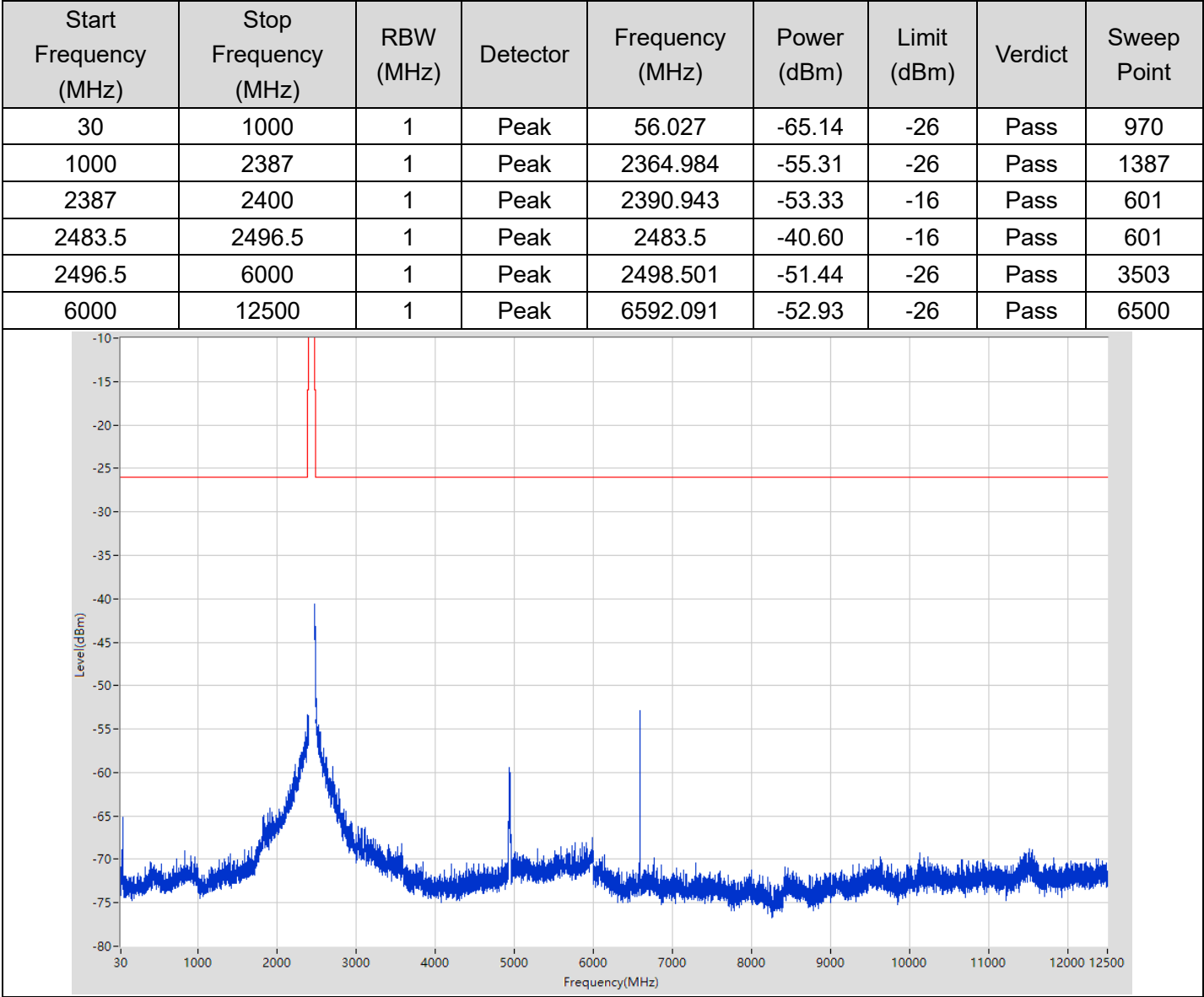
# TEST REPORT

Figure 89-Test Frequency: 2442MHz, 802.11n(20M)



# TEST REPORT

Figure 90-Test Frequency: 2472MHz, 802.11n(20M)



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## 4.4 ANTENNA OUTPUT POWER, ANTENNA POWER TOLERANCE AND TRANSMISSION ANTENNA GAIN

### 4.4.1 Limit

| Item                    | Limits                                                                                                                                                                                                                                                                                                       |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Antenna Power           | $\leq 3 \text{ mW /MHz}$ (FHSS from 2427-2470.75 MHz)<br>$\leq 10 \text{ mW/MHz}$ for within 26MHz Occupied Bandwidth (OFDM, DSSS from 2400-2483.5 MHz)<br>$\leq 5 \text{ mW/MHz}$ for 26MHz-38MHz Occupied Bandwidth (OFDM, DSSS from 2400-2483.5 MHz)<br>$\leq 10 \text{ mW}$ (other from 2400-2483.5 MHz) |
| E.I.R.P.                | 6.91-16.91dBm/MHz (FHSS from 2427-2470.75 MHz)<br>12.14-22.14 dBm/MHz for within 26MHz Occupied Bandwidth (OFDM, DSSS from 2400-2483.5 MHz)<br>9.13-19.13 dBm/MHz for 26MHz-38MHz Occupied Bandwidth (OFDM, DSSS from 2400-2483.5 MHz)<br>12.14-22.14 dBm/MHz (other from 2400-2483.5 MHz)                   |
| Antenna Power Tolerance | +20%                                                                                                                                                                                                                                                                                                         |

Note:

E.I.R.P will not be applied to the transmission antenna which has a gain of 2.14dBi or less.

### 4.4.2 Test Setup

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test.
- Resolution BW: 1MHz.
- Video BW: 3MHz.
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Peak.
- Trace Mode: Max Hold.

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyser:

- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: 0MHz.
- Resolution BW: 1 MHz.
- Video BW: 1 MHz.
- Sweep time: 1 minute.

# TEST REPORT

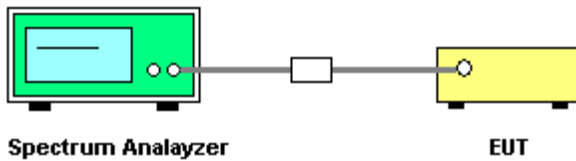
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The maximum PD, which is e.i.r.p. PSD (spectral density power) or power, is calculated from the above measured value D, and the applicable antenna assembly gain "G" in dBi, according to the formula below. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the highest gain shall be used.

$$PD = D + G$$



## 4.4.3 Test Record

| Voltage (V) | Mode          | Item                   | Result       |              |              | Limit        | P/F  |
|-------------|---------------|------------------------|--------------|--------------|--------------|--------------|------|
|             |               |                        | 2412MHz      | 2442MHz      | 2472MHz      |              |      |
| Normal      | 802.11b       | Antenna Power          | 6.86dBm/MHz  | 8.02dBm/MHz  | 7.18dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 4.85mW/MHz   | 6.34mW/MHz   | 5.22mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 6.00mW/MHz.  | 6.00mW/MHz.  | 6.00mW/MHz.  | /            | /    |
|             |               | Antenna Power Error    | -19.17%      | 5.67%        | -13.00%      | +20%         | Pass |
|             |               | EIRP                   | 10.56dBm/MHz | 11.72dBm/MHz | 10.88dBm/MHz | 12.14dBm/MHz | Pass |
|             | 802.11g       | Antenna Power          | 3.71dBm/MHz  | 3.74dBm/MHz  | 3.62dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 2.35mW/MHz   | 2.37mW/MHz   | 2.30mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 2.50mW/MHz   | 2.50mW/MHz   | 2.50mW/MHz   | /            | /    |
|             |               | Antenna Power Error    | -6.00%       | -5.20%       | -8.00%       | +20%         | Pass |
|             |               | EIRP                   | 7.41dBm/MHz  | 7.44dBm/MHz  | 7.32dBm/MHz  | 12.14dBm/MHz | Pass |
|             | 802.11n (20M) | Antenna Power          | 3.41dBm/MHz  | 3.04dBm/MHz  | 3.20dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 2.19mW/MHz   | 2.01mW/MHz   | 2.09mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 2.50mW/MHz   | 2.50mW/MHz   | 2.50mW/MHz   | /            | /    |
|             |               | Antenna Power Error    | -12.40%      | -19.60%      | -16.40%      | +20%         | Pass |
|             |               | EIRP                   | 7.11dBm/MHz  | 6.74dBm/MHz  | 6.90dBm/MHz  | 12.14dBm/MHz | Pass |

Note(s):

- The antenna gain is 3.70dBi.
- 802.11b mode: Declared Antenna power is 6.00mW/MHz.  
802.11g mode: Declared Antenna power is 2.50mW/MHz.  
802.11n(20M) mode: Declared Antenna power is 2.50mW/MHz.
- Antenna Power Error = [(Antenna Power - Declared Antenna Power) / Declared Antenna Power] \* 100%

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| Voltage (V) | Mode          | Item                   | Result       |              |              | Limit        | P/F  |
|-------------|---------------|------------------------|--------------|--------------|--------------|--------------|------|
|             |               |                        | 2412MHz      | 2442MHz      | 2472MHz      |              |      |
| Low         | 802.11b       | Antenna Power          | 6.89dBm/MHz  | 7.60dBm/MHz  | 6.65dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 4.89mW/MHz   | 5.75mW/MHz   | 4.62mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 6.00mW/MHz.  | 6.00mW/MHz.  | 6.00mW/MHz.  | /            | /    |
|             |               | Antenna Power Error    | -18.50%      | -4.17%       | -23.00%      | +20%         | Pass |
|             |               | EIRP                   | 10.59dBm/MHz | 11.30dBm/MHz | 10.35dBm/MHz | 12.14dBm/MHz | Pass |
|             | 802.11g       | Antenna Power          | 4.53dBm/MHz  | 3.02dBm/MHz  | 3.20dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 2.84mW/MHz   | 2.00mW/MHz   | 2.09mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 2.50mW/MHz   | 2.50mW/MHz   | 2.50mW/MHz   | /            | /    |
|             |               | Antenna Power Error    | 13.60%       | -20.00%      | -16.40%      | +20%         | Pass |
|             |               | EIRP                   | 8.23dBm/MHz  | 6.72dBm/MHz  | 6.90dBm/MHz  | 12.14dBm/MHz | Pass |
|             | 802.11n (20M) | Antenna Power          | 3.59dBm/MHz  | 3.08dBm/MHz  | 3.97dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 2.29mW/MHz   | 2.03mW/MHz   | 2.49mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 2.50mW/MHz   | 2.50mW/MHz   | 2.50mW/MHz   | /            | /    |
|             |               | Antenna Power Error    | -8.40%       | -18.80%      | -0.40%       | +20%         | Pass |
|             |               | EIRP                   | 7.29dBm/MHz  | 6.78dBm/MHz  | 7.67dBm/MHz  | 12.14dBm/MHz | Pass |

Note(s):

- The antenna gain is 3.70dBi.
- 802.11b mode: Declared Antenna power is 6.00mW/MHz.  
802.11g mode: Declared Antenna power is 2.50mW/MHz.  
802.11n(20M) mode: Declared Antenna power is 2.50mW/MHz.
- Antenna Power Error = [(Antenna Power - Declared Antenna Power) / Declared Antenna Power] \* 100%

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| Voltage (V) | Mode          | Item                   | Result       |              |              | Limit        | P/F  |
|-------------|---------------|------------------------|--------------|--------------|--------------|--------------|------|
|             |               |                        | 2412MHz      | 2442MHz      | 2472MHz      |              |      |
| High        | 802.11b       | Antenna Power          | 7.00dBm/MHz  | 7.72dBm/MHz  | 7.05dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 5.01mW/MHz   | 5.91mW/MHz   | 5.07mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 6.00mW/MHz   | 6.00mW/MHz   | 6.00mW/MHz   | /            | /    |
|             |               | Antenna Power Error    | -16.50%      | -1.50%       | -15.50%      | +20%         | Pass |
|             |               | EIRP                   | 10.70dBm/MHz | 11.42dBm/MHz | 10.75dBm/MHz | 12.14dBm/MHz | Pass |
|             | 802.11g       | Antenna Power          | 3.29dBm/MHz  | 3.22dBm/MHz  | 3.24dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 2.13mW/MHz   | 2.10mW/MHz   | 2.11mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 2.50mW/MHz   | 2.50mW/MHz   | 2.50mW/MHz   | /            | /    |
|             |               | Antenna Power Error    | -14.80%      | -16.00%      | -15.60%      | +20%         | Pass |
|             |               | EIRP                   | 6.99dBm/MHz  | 6.92dBm/MHz  | 6.94dBm/MHz  | 12.14dBm/MHz | Pass |
|             | 802.11n (20M) | Antenna Power          | 3.57dBm/MHz  | 2.73dBm/MHz  | 3.01dBm/MHz  | 10dBm/MHz    | Pass |
|             |               |                        | 2.28mW/MHz   | 1.87mW/MHz   | 2.00mW/MHz   | 10mW/MHz     | Pass |
|             |               | Declared Antenna Power | 2.50mW/MHz   | 2.50mW/MHz   | 2.50mW/MHz   | /            | /    |
|             |               | Antenna Power Error    | -8.80%       | -25.20%      | -20.00%      | +20%         | Pass |
|             |               | EIRP                   | 7.27dBm/MHz  | 6.43dBm/MHz  | 6.71dBm/MHz  | 12.14dBm/MHz | Pass |

Note(s):

- The antenna gain is 3.70dBi.
- 802.11b mode: Declared Antenna power is 6.00mW/MHz.  
802.11g mode: Declared Antenna power is 2.50mW/MHz.  
802.11n(20M) mode: Declared Antenna power is 2.50mW/MHz.
- Antenna Power Error =  $[(\text{Antenna Power} - \text{Declared Antenna Power}) / \text{Declared Antenna Power}] * 100\%$

# TEST REPORT

Normal Voltage

Figure 91- Antenna Power of 2412MHz, 802.11b

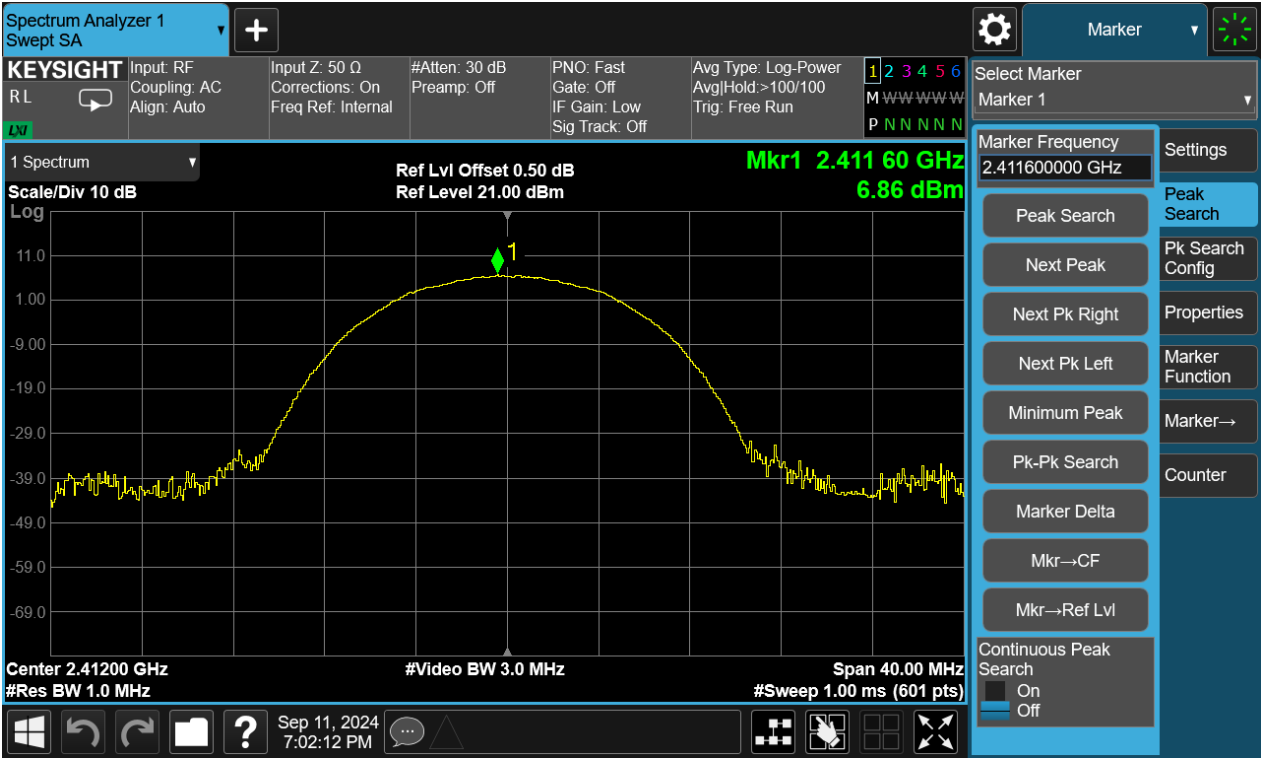
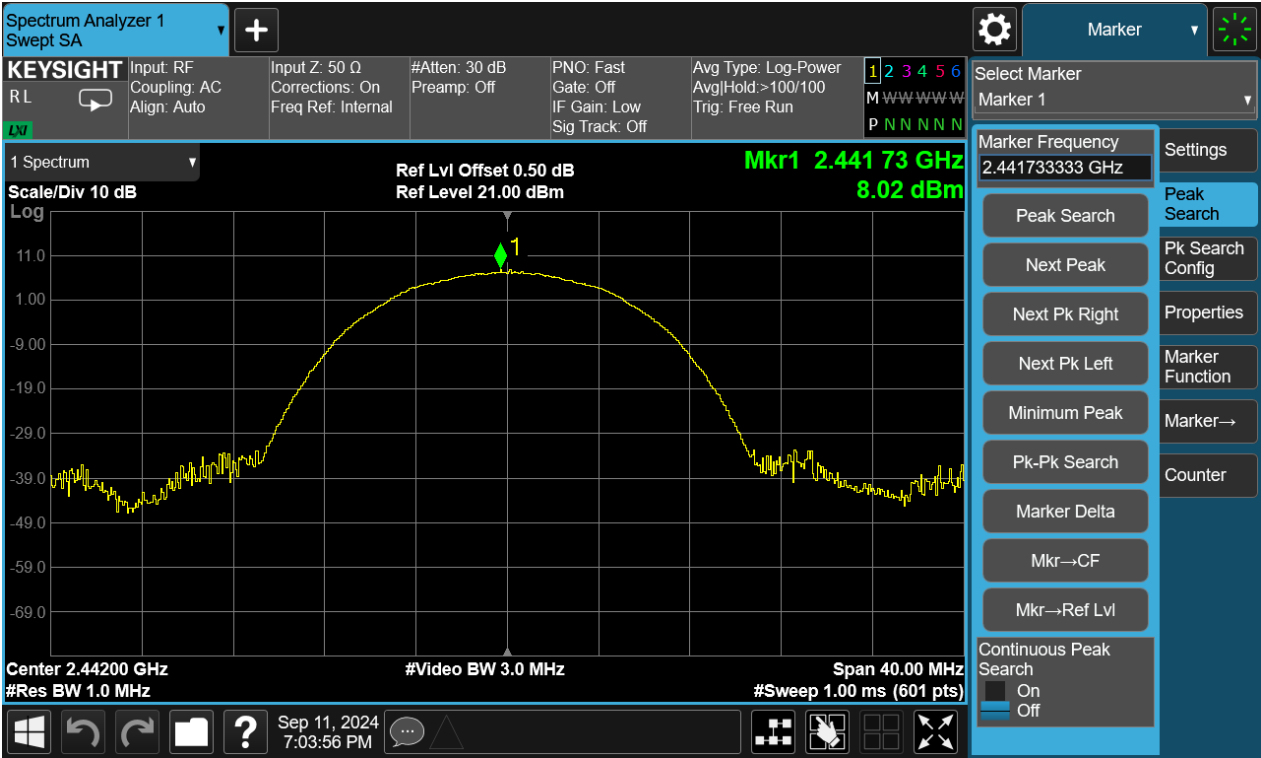


Figure 92- Antenna Power of 2442MHz, 802.11b



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Figure 93- Antenna Power of 2472MHz, 802.11b

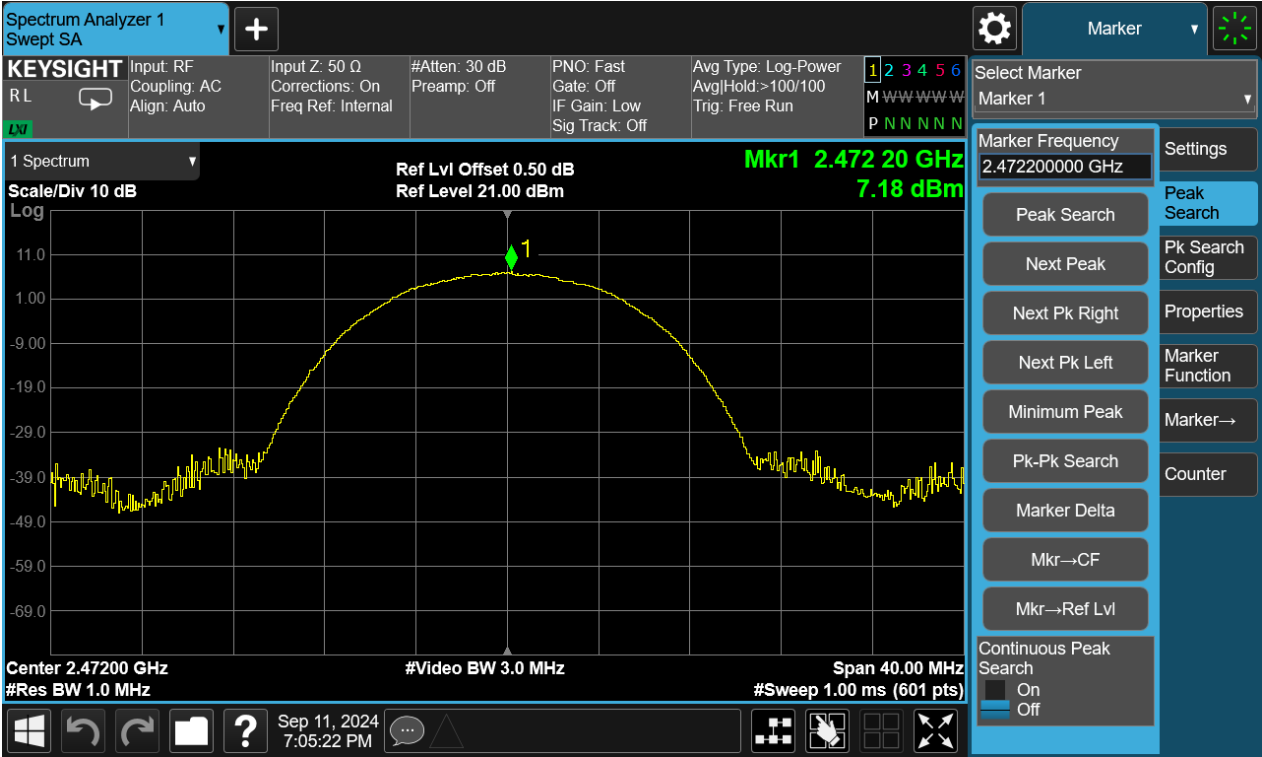
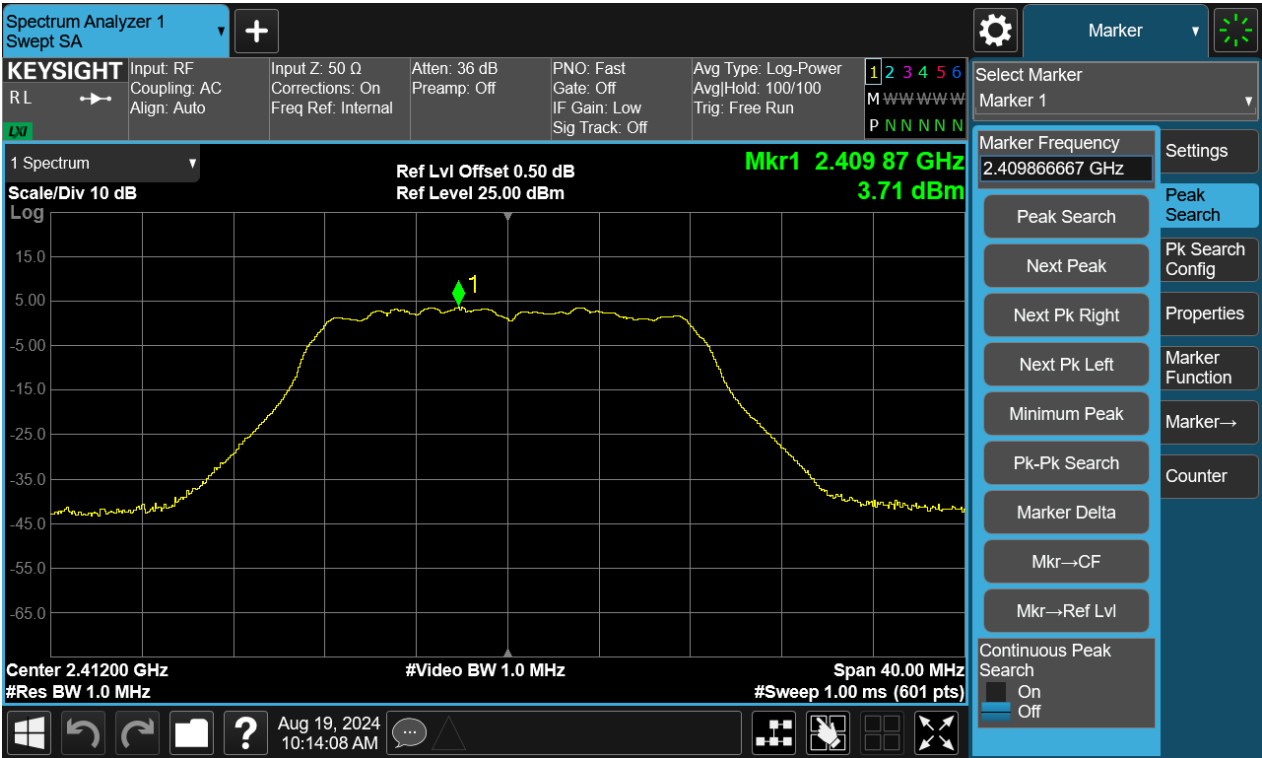


Figure 94- Antenna Power of 2412MHz, 802.11g



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Figure 95- Antenna Power of 2442MHz, 802.11g

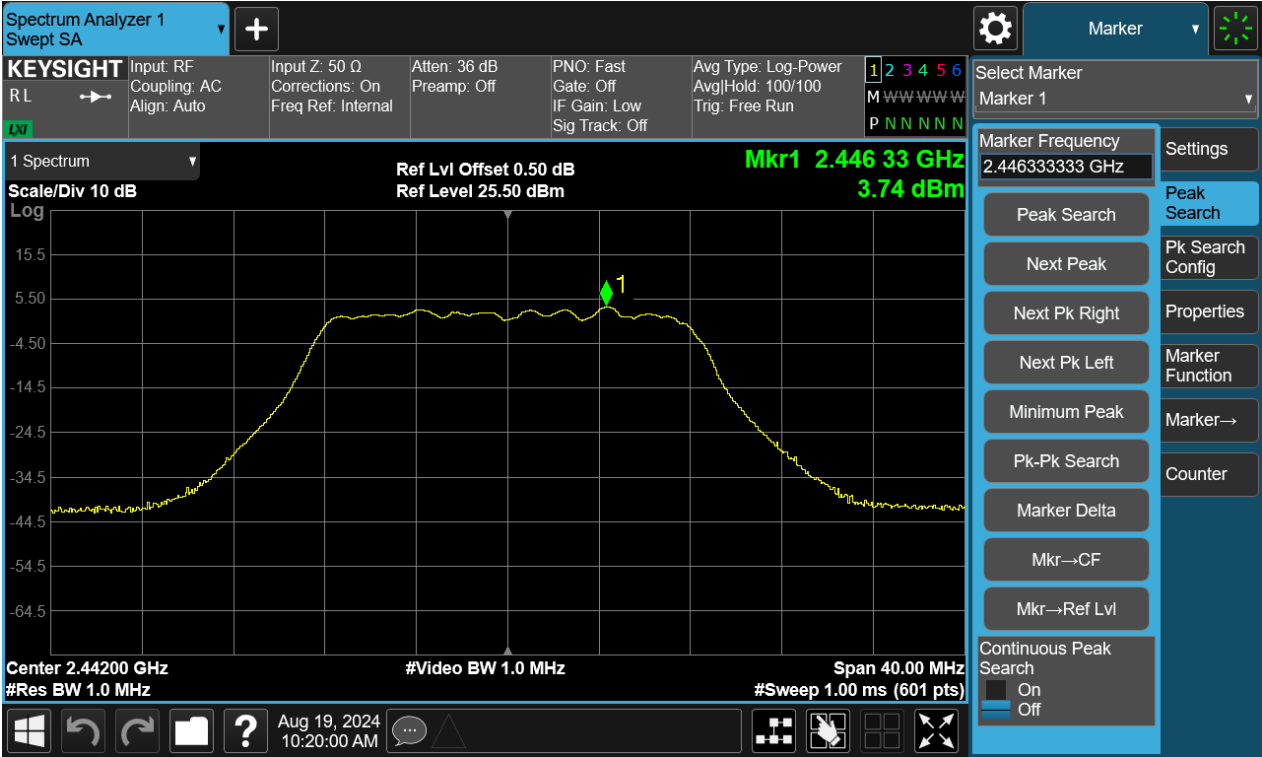
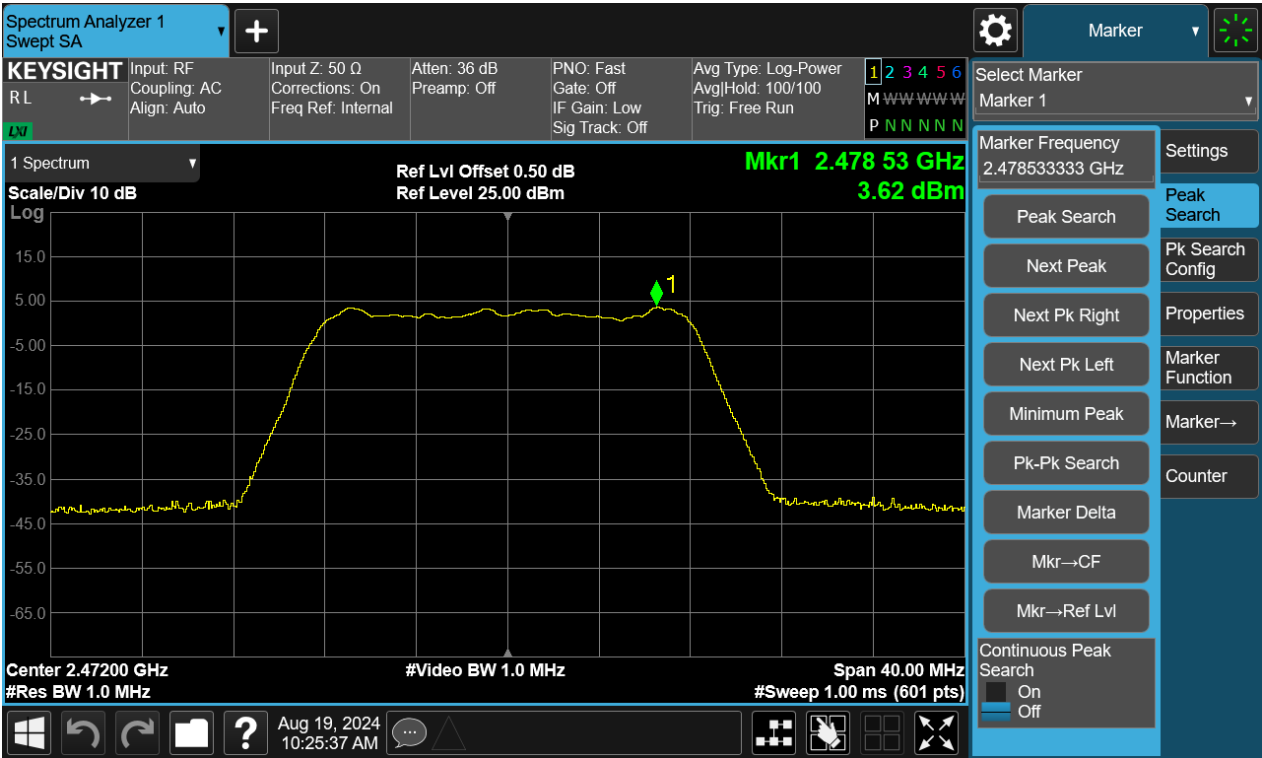


Figure 96- Antenna Power of 2472MHz, 802.11g



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Figure 97- Antenna Power of 2412MHz, 802.11n(20M)

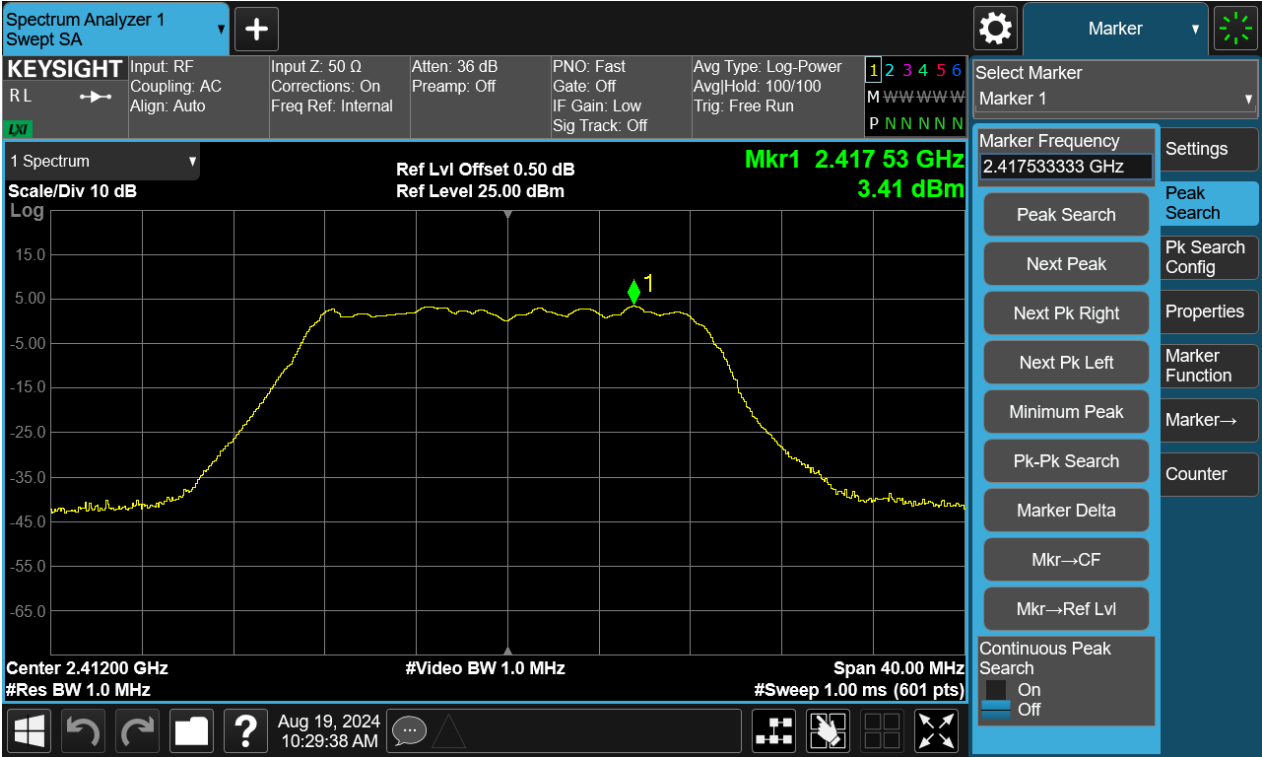
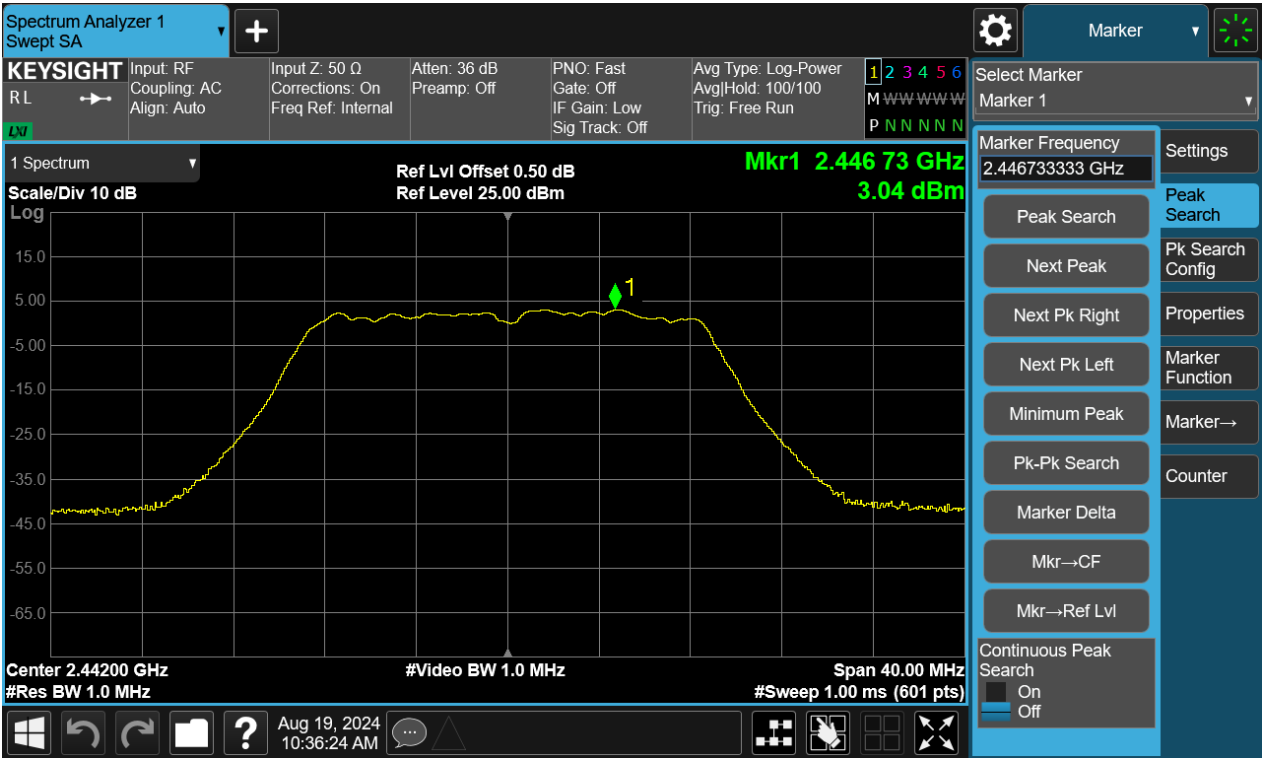


Figure 98- Antenna Power of 2442MHz, 802.11n(20M)



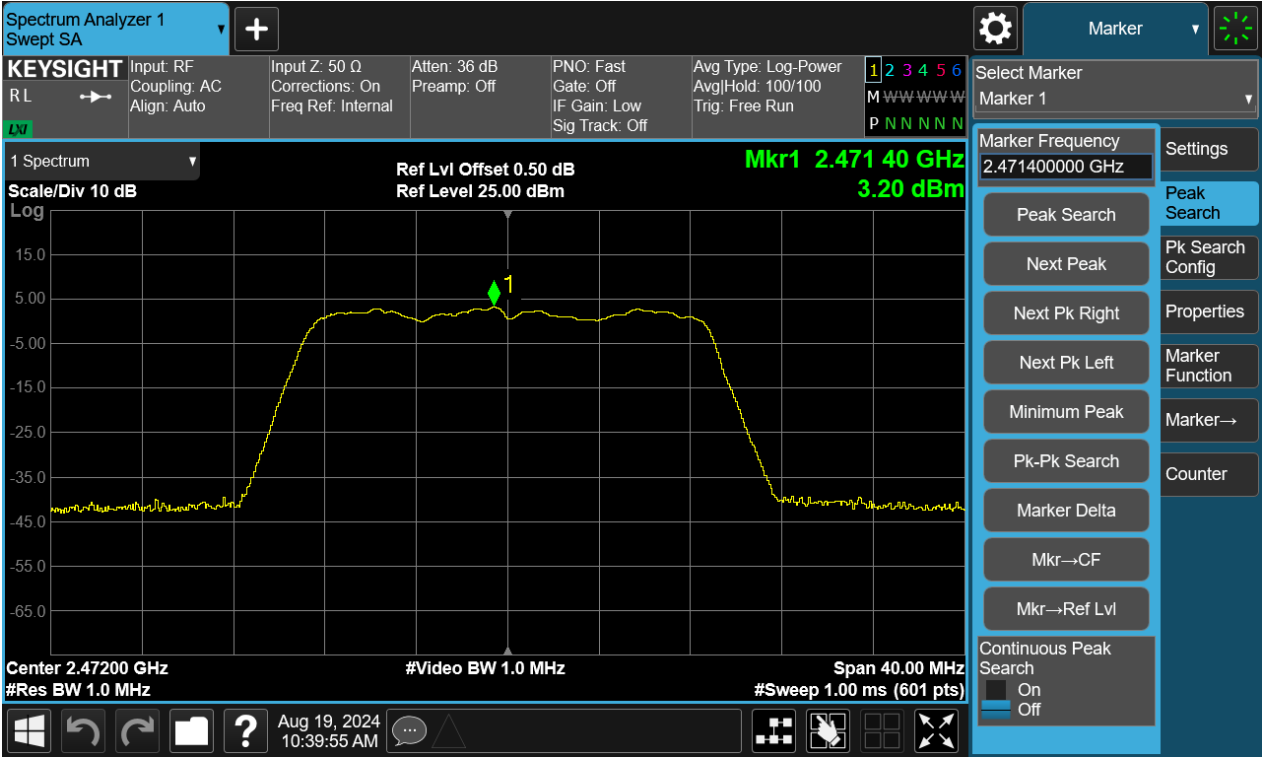
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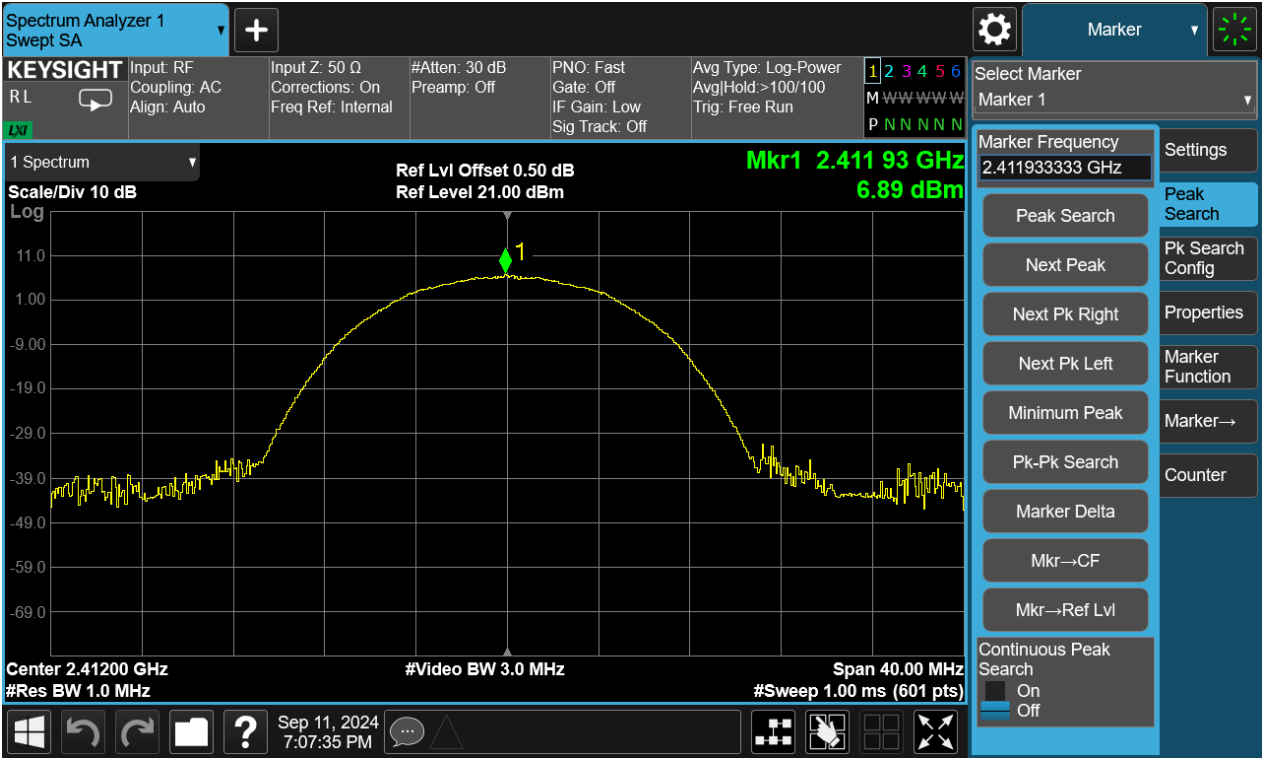
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Figure 99- Antenna Power of 2472MHz, 802.11n(20M)



## Low Voltage

Figure 100- Antenna Power of 2412MHz, 802.11b



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Figure 101- Antenna Power of 2442MHz, 802.11b

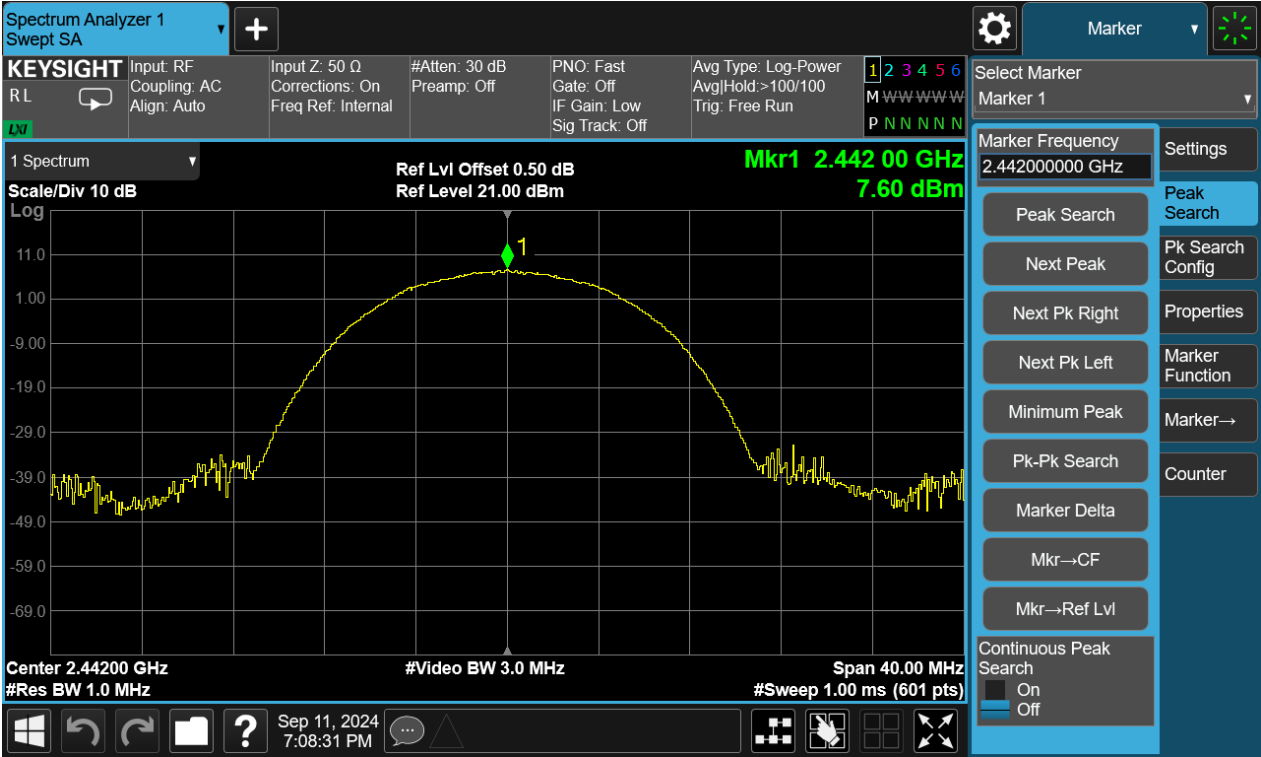
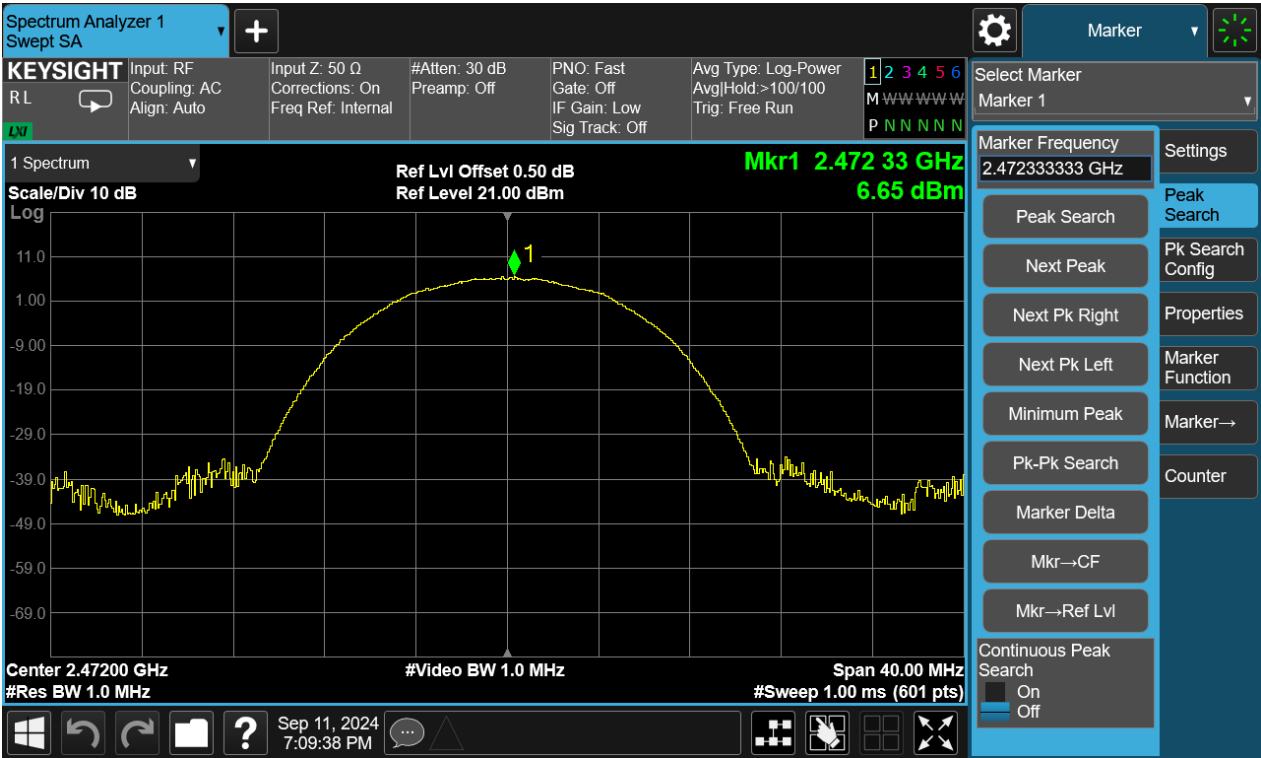


Figure 102- Antenna Power of 2472MHz, 802.11b



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Figure 103- Antenna Power of 2412MHz, 802.11g

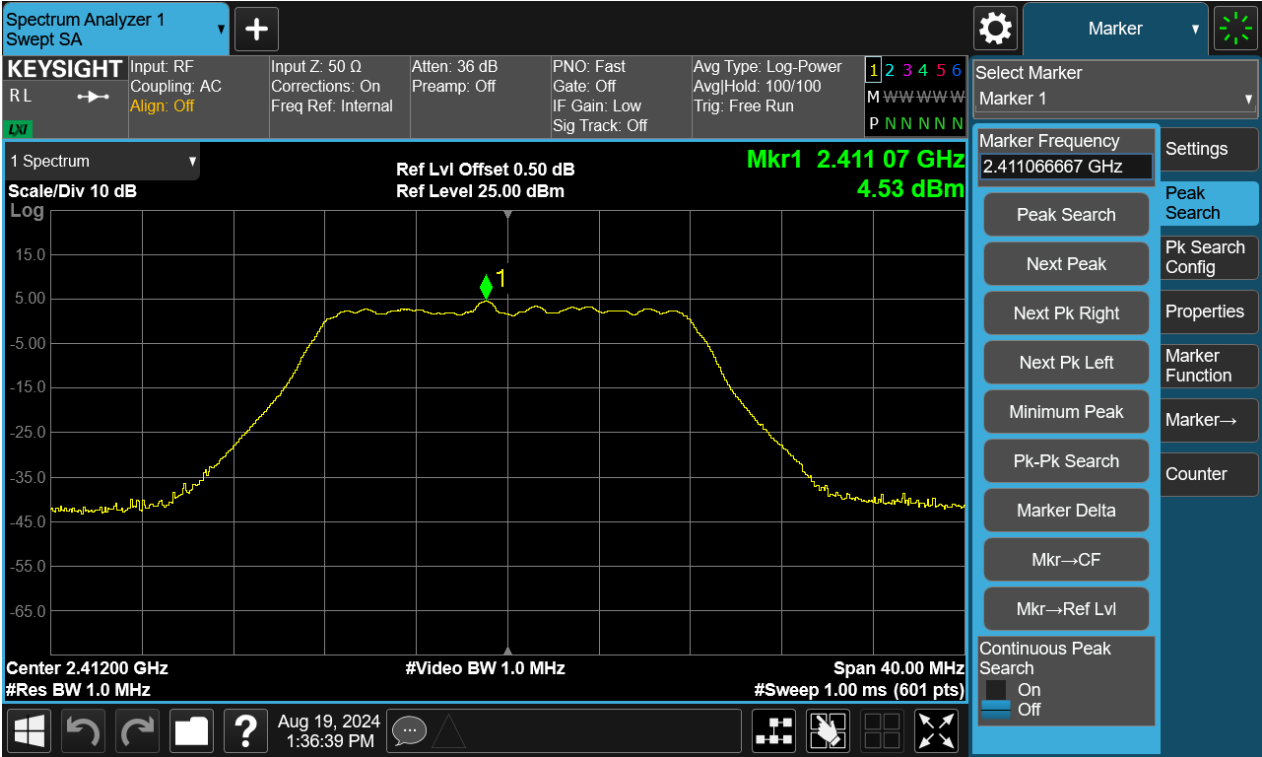
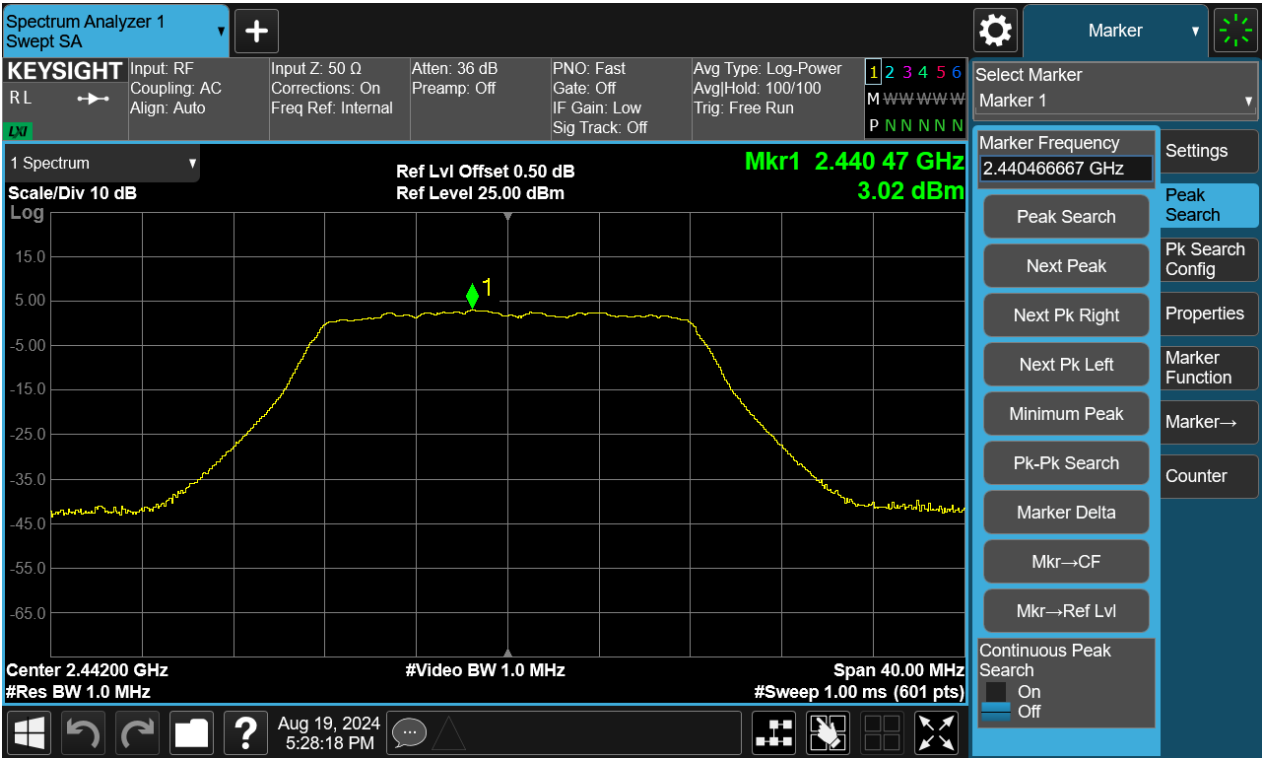


Figure 104- Antenna Power of 2442MHz, 802.11g



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Figure 105- Antenna Power of 2472MHz, 802.11g

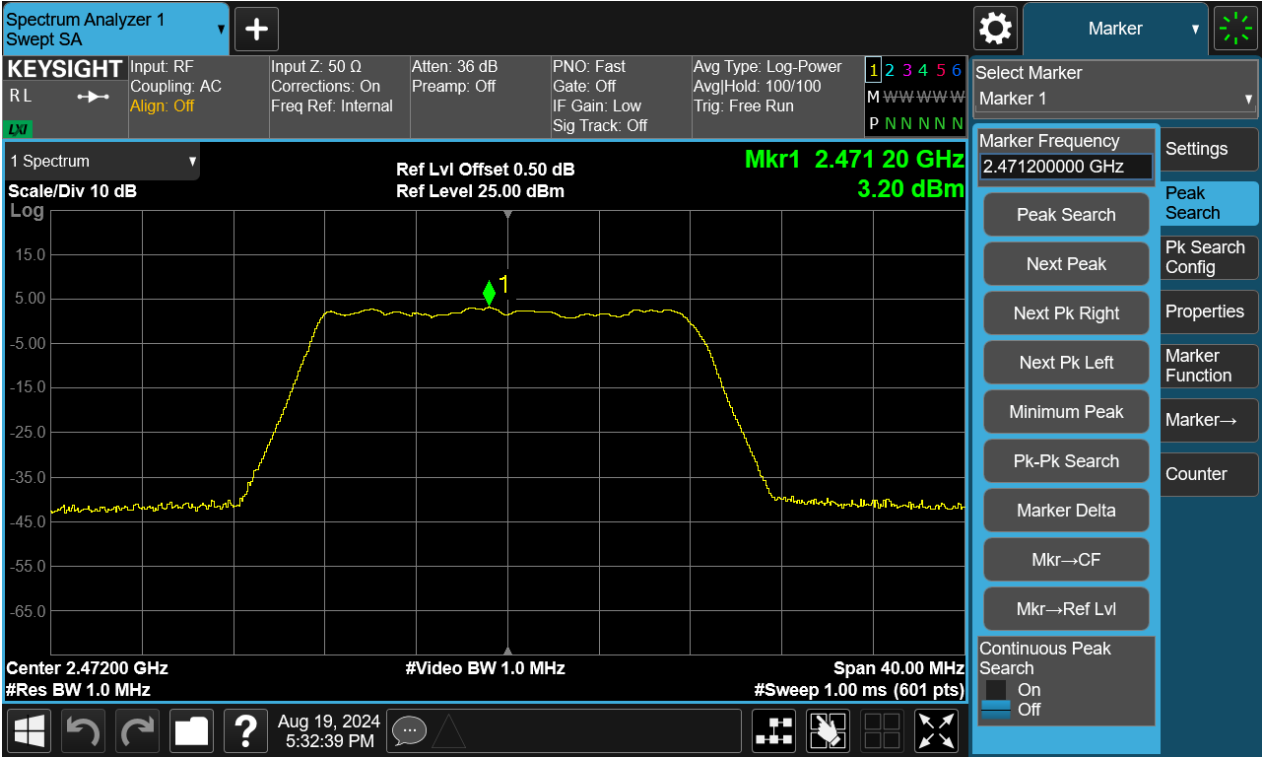
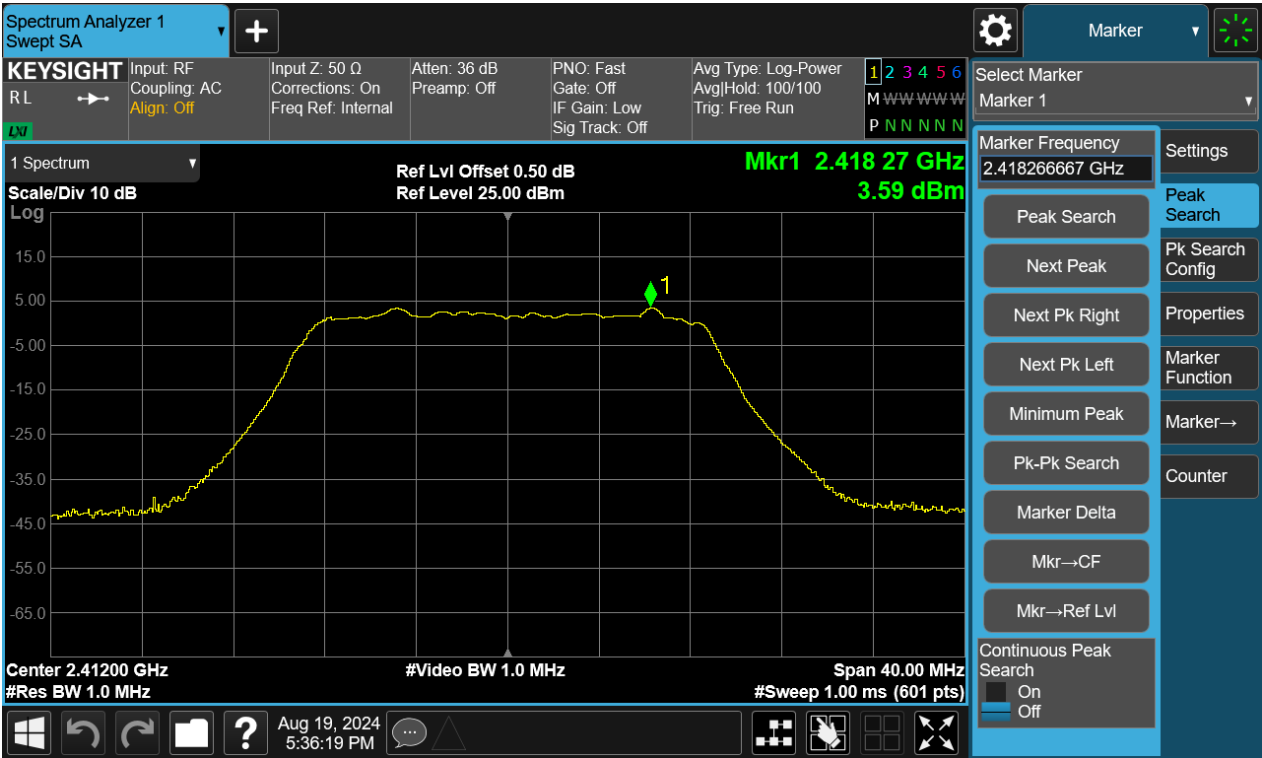


Figure 106- Antenna Power of 2412MHz, 802.11n(20M)



# TEST REPORT

Figure 107- Antenna Power of 2442MHz, 802.11n(20M)

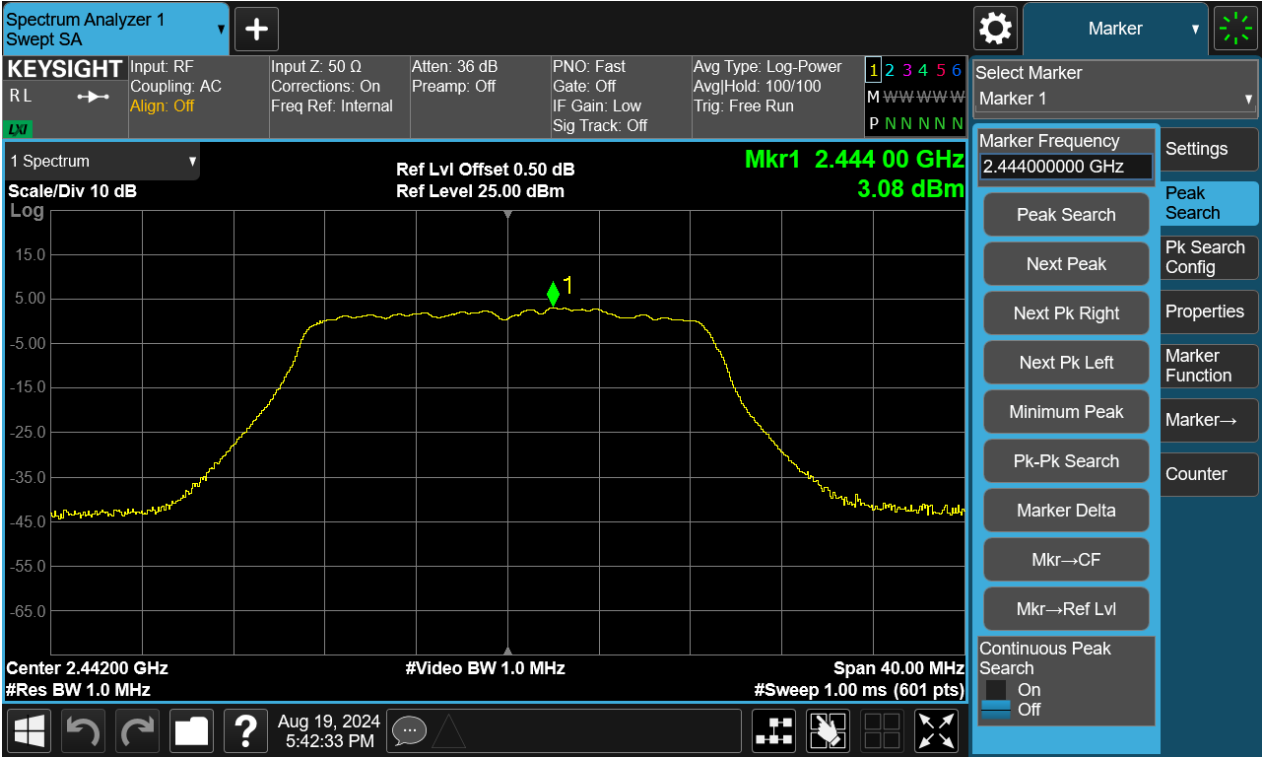
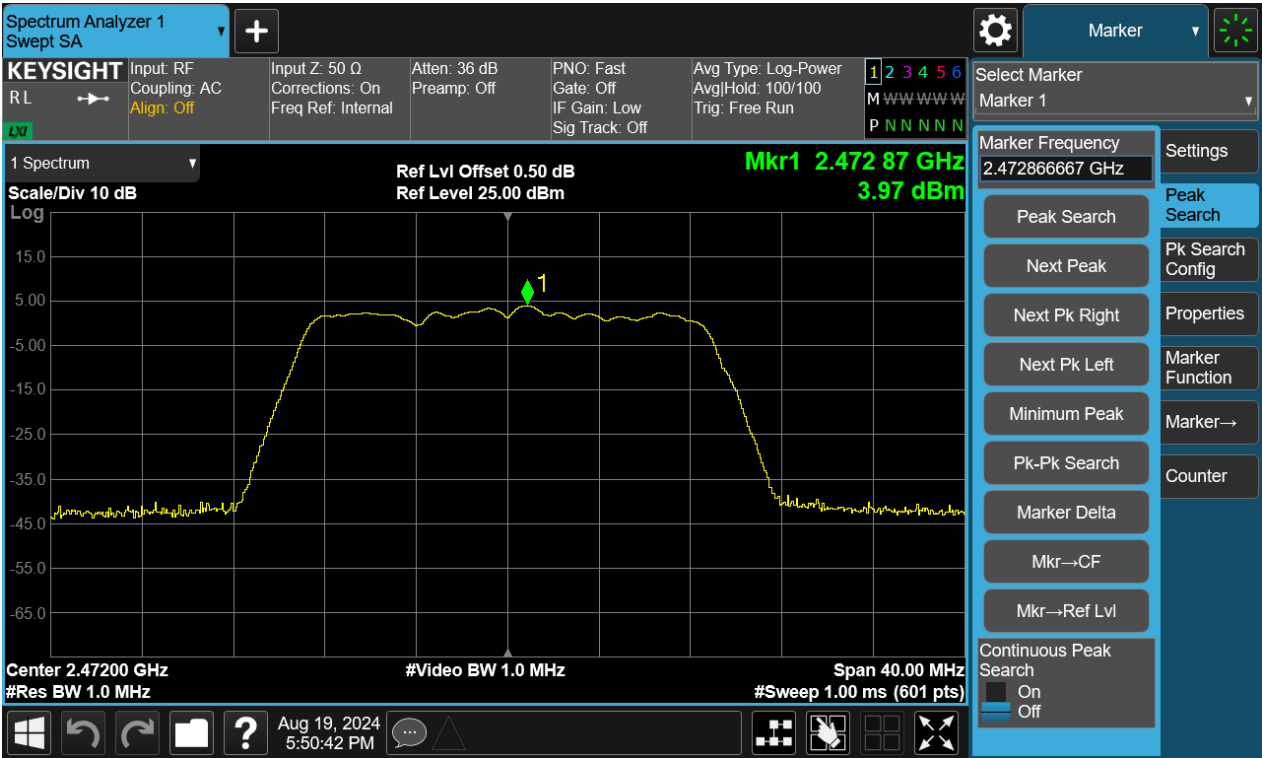


Figure 108- Antenna Power of 2472MHz, 802.11n(20M)



# TEST REPORT

High Voltage

Figure 109- Antenna Power of 2412MHz, 802.11b

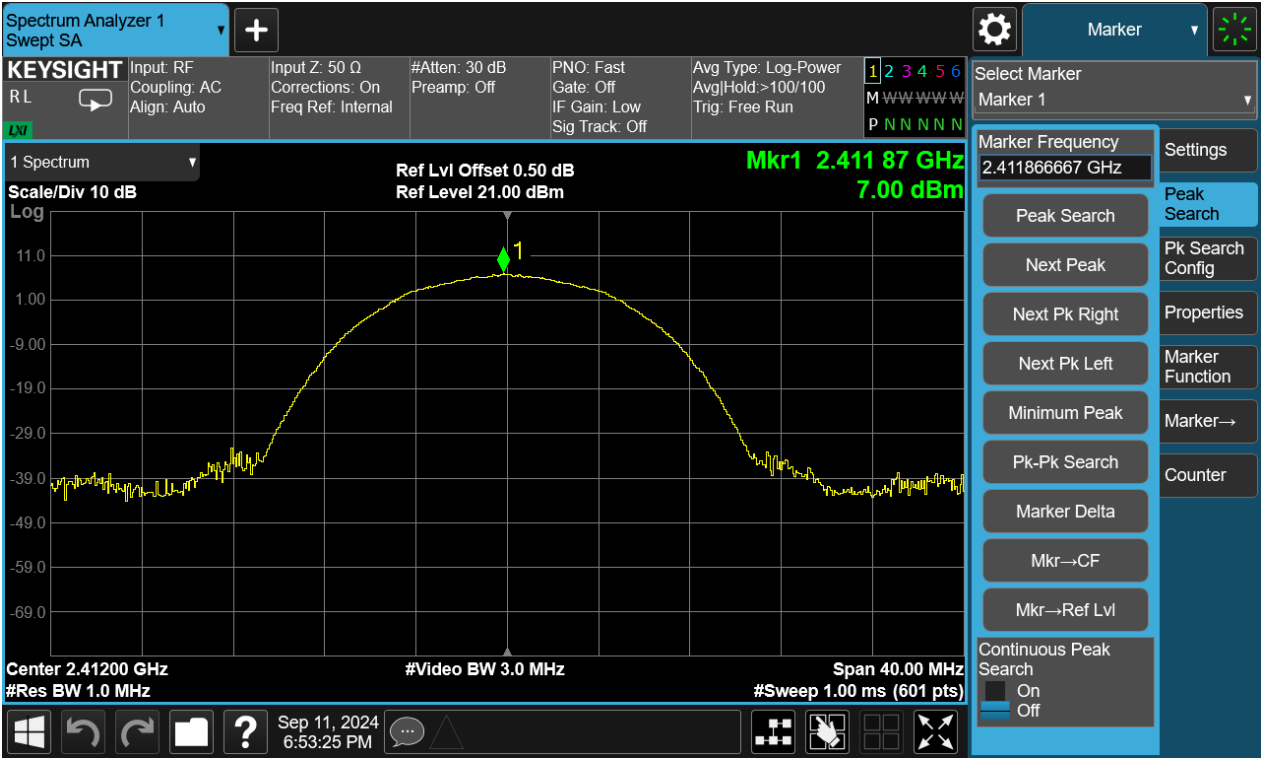


Figure 110- Antenna Power of 2442MHz, 802.11b



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Figure 111- Antenna Power of 2472MHz, 802.11b

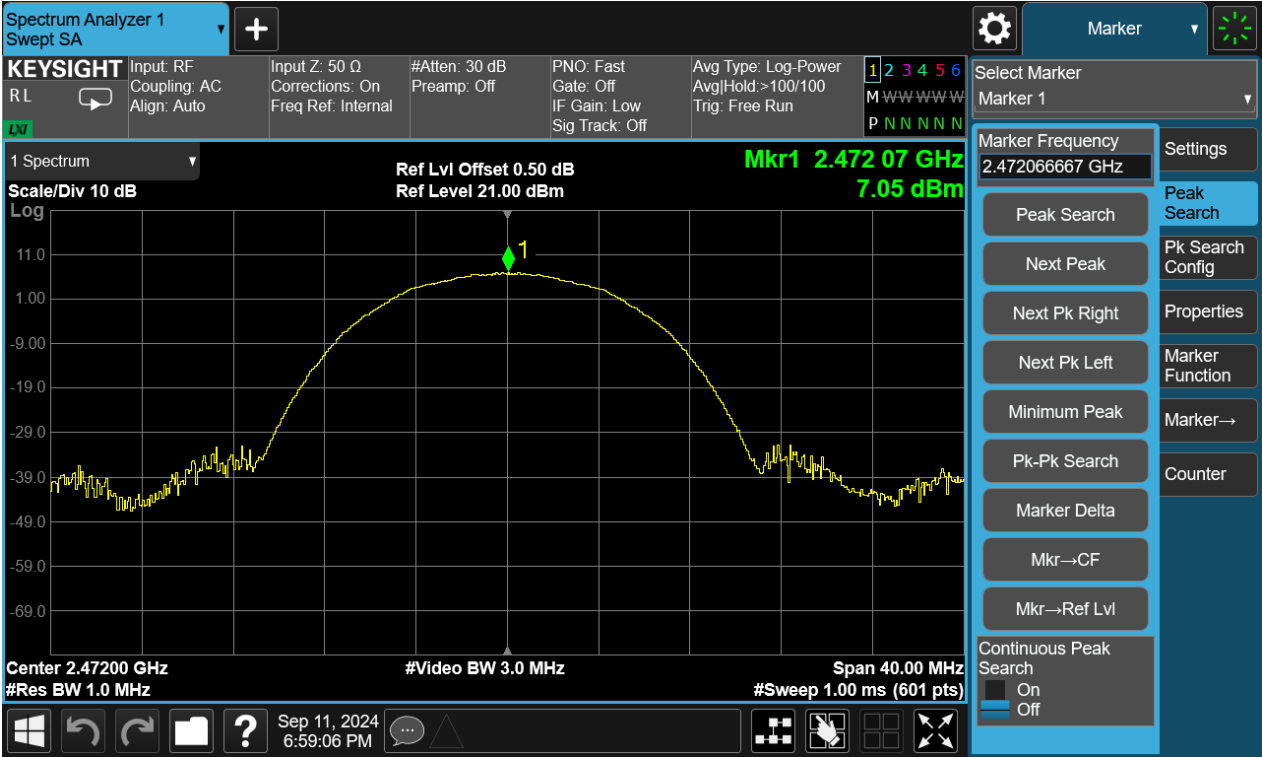
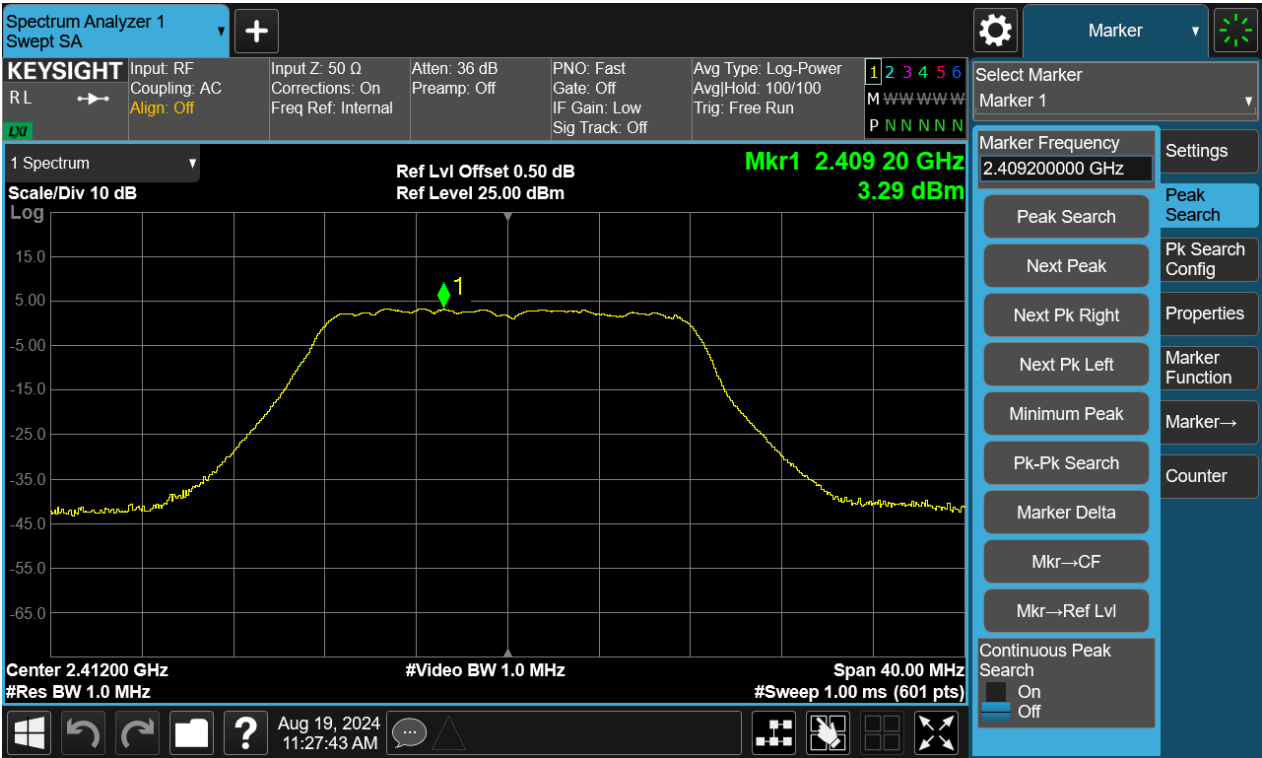


Figure 112- Antenna Power of 2412MHz, 802.11g



# TEST REPORT

Figure 113- Antenna Power of 2442MHz, 802.11g

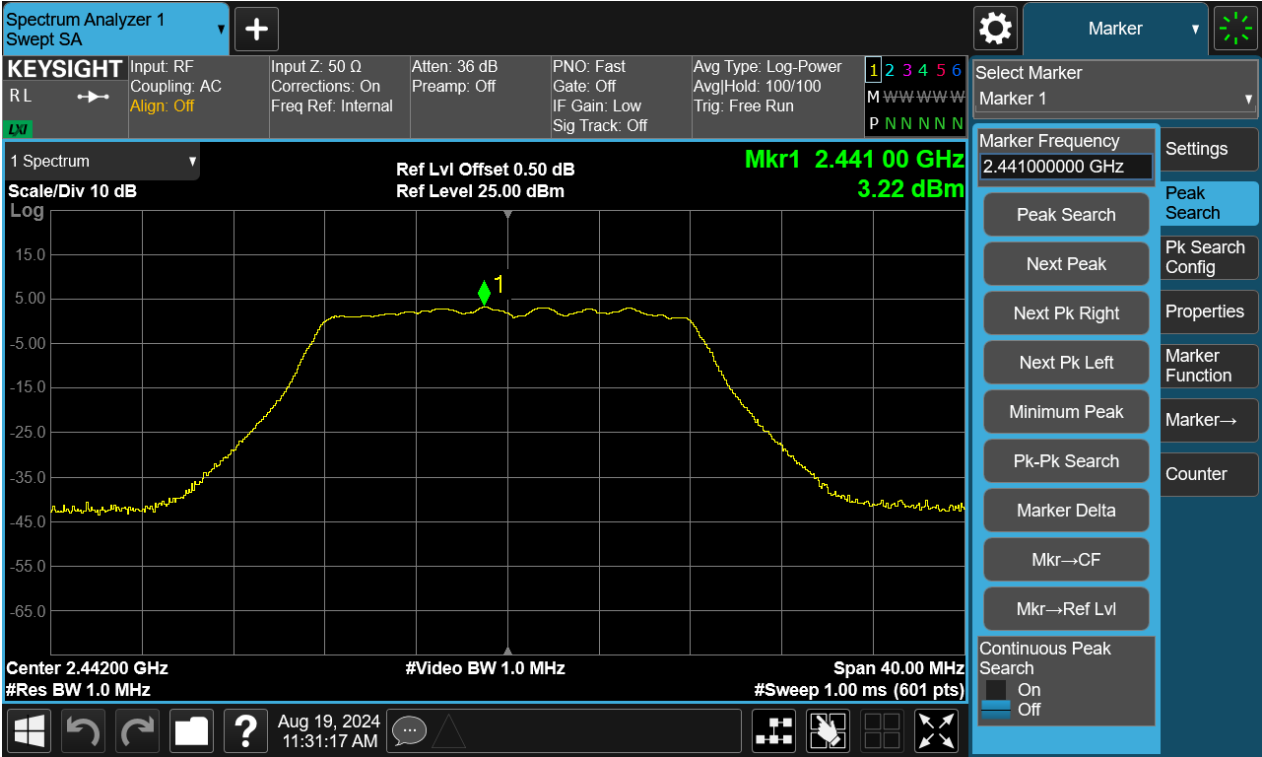
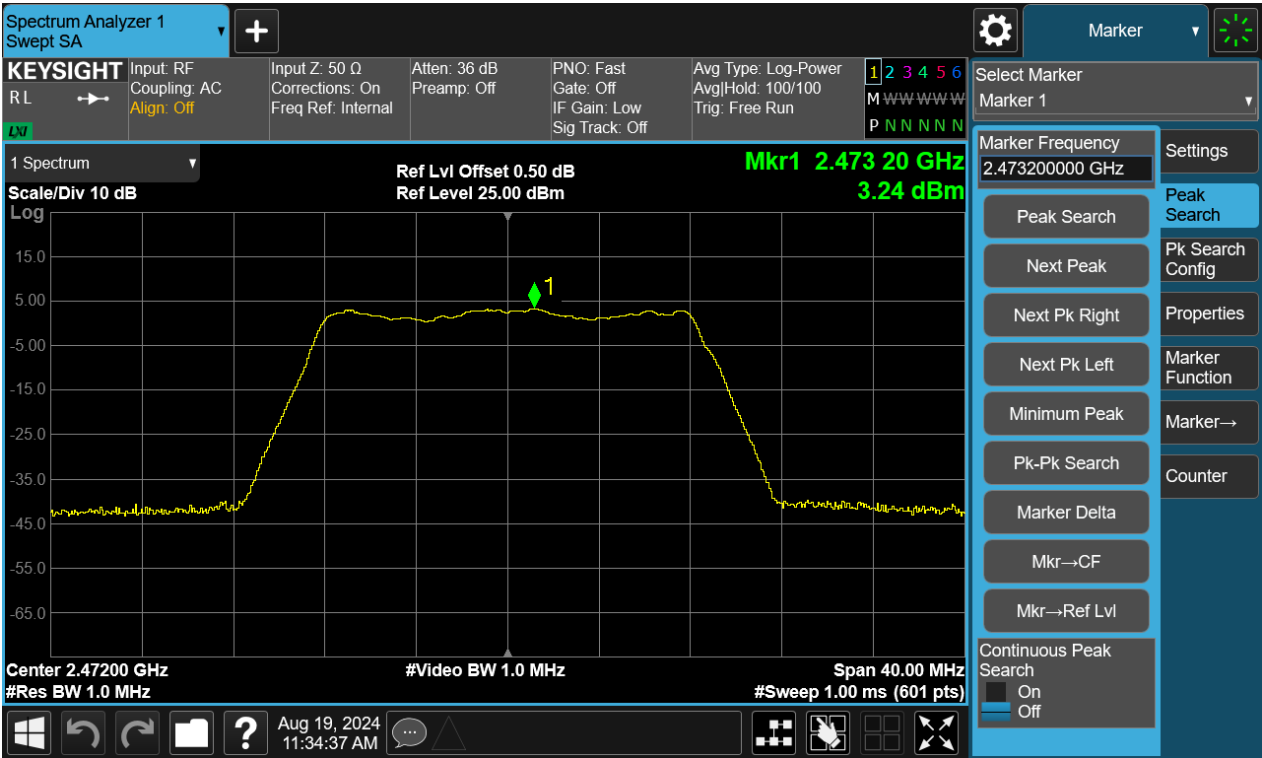


Figure 114- Antenna Power of 2472MHz, 802.11g



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Figure 115- Antenna Power of 2412MHz, 802.11n(20M)

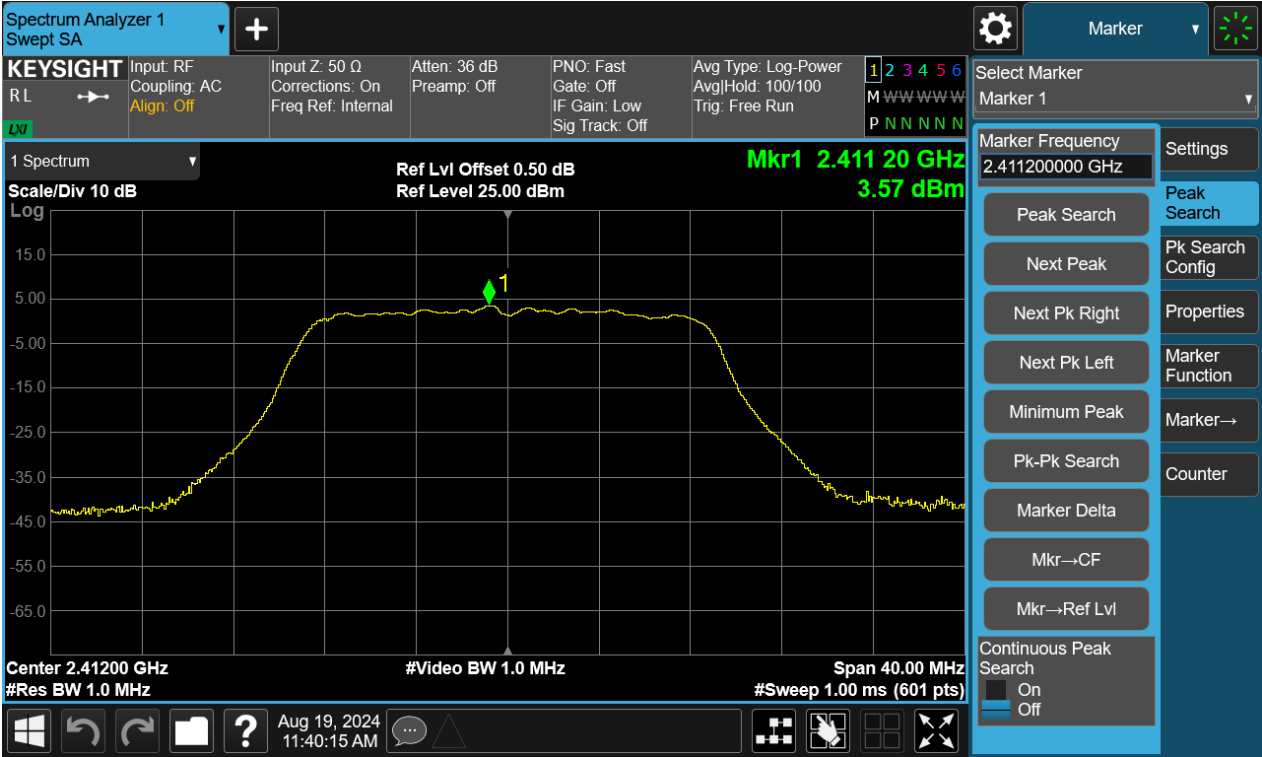
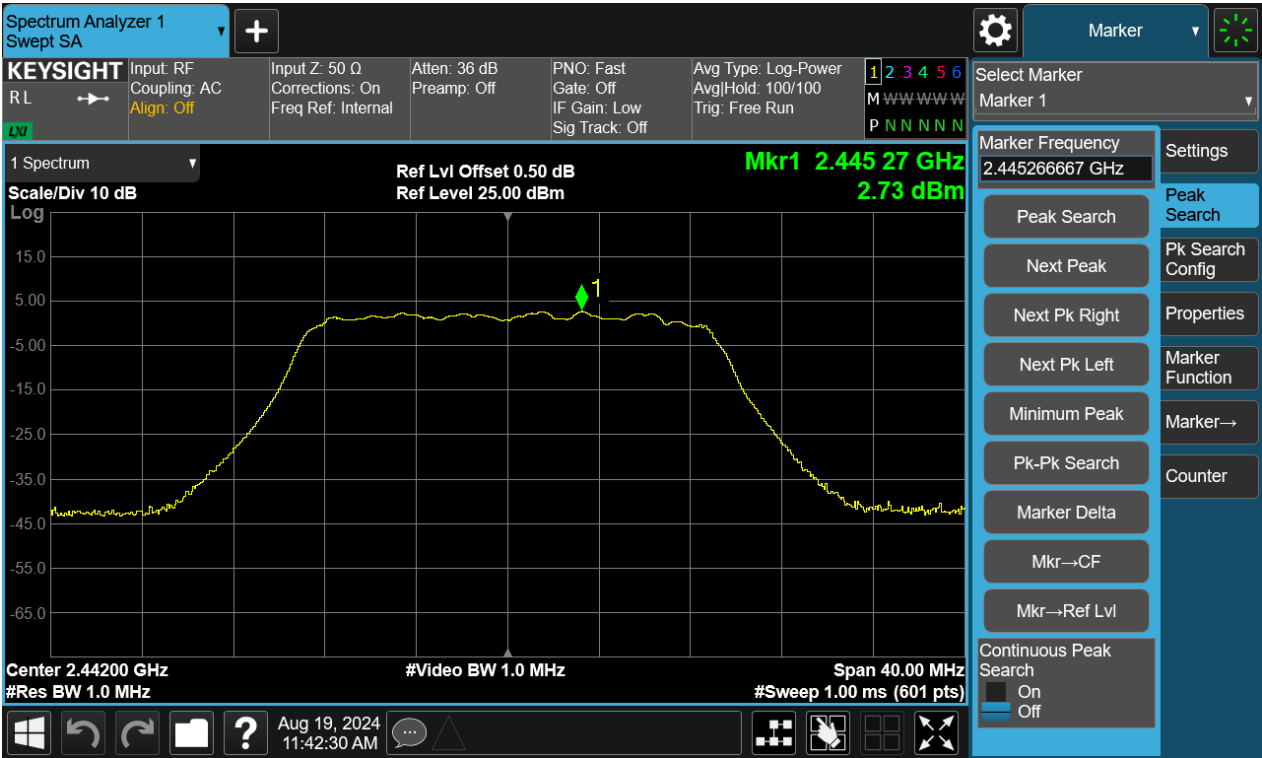


Figure 116- Antenna Power of 2442MHz, 802.11n(20M)



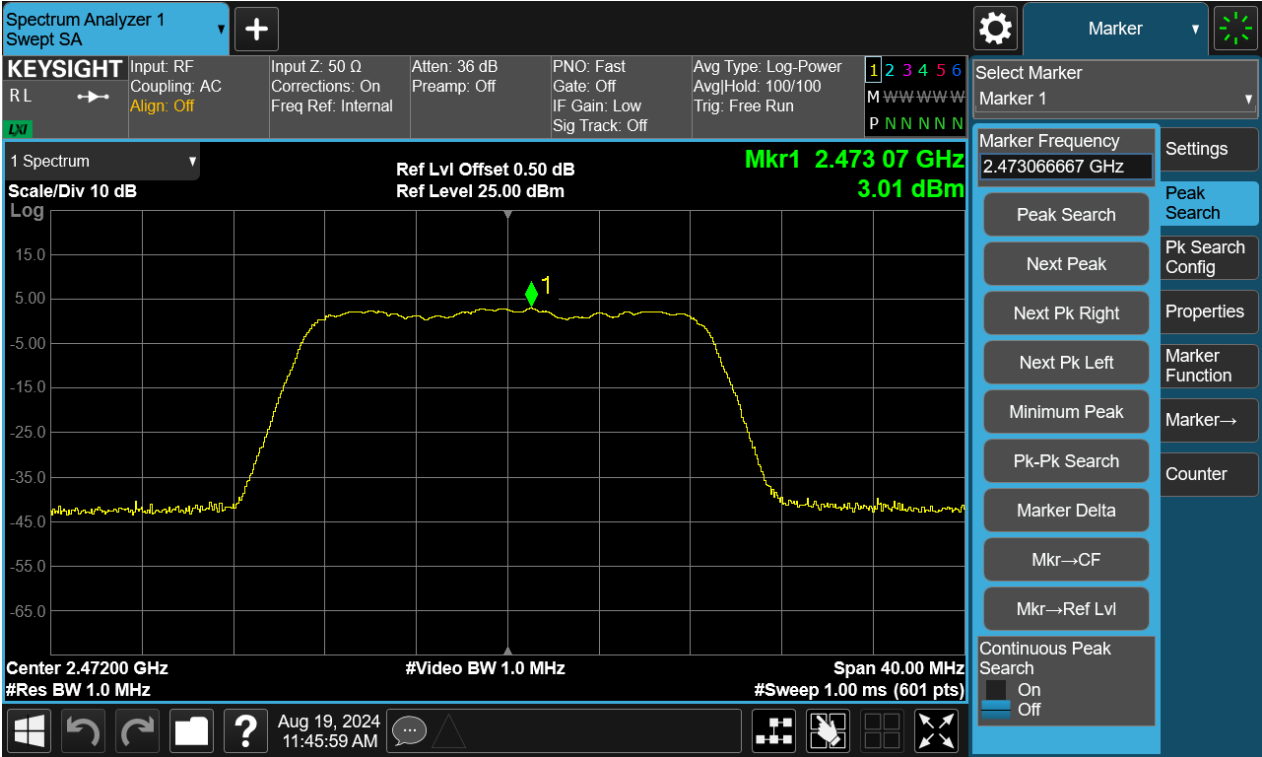
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Figure 117- Antenna Power of 2472MHz, 802.11n(20M)



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## 4.5 TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

### 4.5.1 Limit

| Item                                                                                                                                                                                                                                                                                         | Limits                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3dB antenna beam width                                                                                                                                                                                                                                                                       | 360/A (If $A < 1$ ; then $A = 1$ )<br>$A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or<br>$A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$ |
| Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power (Conducted) limit is 10mW/MHz (10dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less |                                                                                                                                                                 |

### 4.5.2 Measuring Instruments and setting

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

### 4.5.3 Test Procedures

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within  $\pm 50\text{cm}$  of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as "E"
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below  $360/A$  (If  $A < 1$ ; then  $A = 1$ ).  
 $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$  or  
 $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$

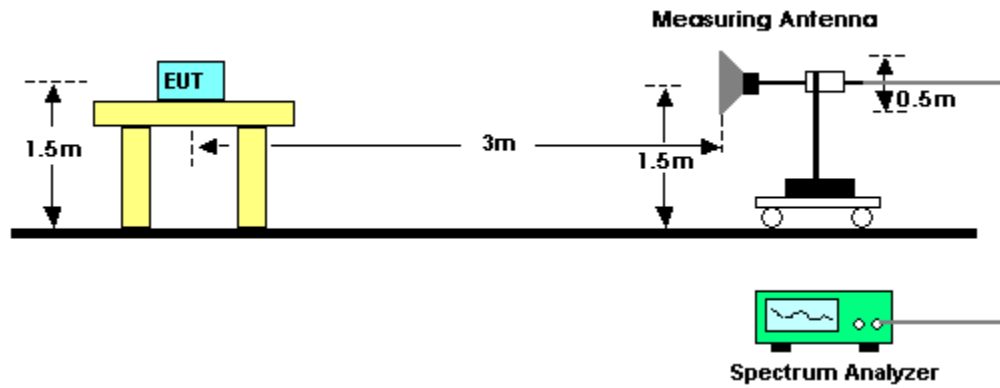
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## 4.5.4 Test Setup



## 4.5.5 Test Result

Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz.

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## 4.6 RECEIVER SPURIOUS EMISSION AND UNWANTED EMISSION INTENSITY

### 4.6.1 Limit

| Frequency Range | Limits         |
|-----------------|----------------|
| 30MHz ~ 1GHz    | 4 nW (-54dBm)  |
| 1GHz ~ 12.5GHz  | 20 nW (-47dBm) |

### 4.6.2 Test Setup

The modulation state shall be “continuous receiving mode”.

Start Frequency: Start Frequency of frequency range to measure (30MHz or 1GHz)

Stop Frequency: Stop Frequency of frequency range to measure (1GHz or 12.5GHz)

Span: AUTO (Measurement Range)

RBW: 100KHz, VBW: 100KHz for Frequency < 1 GHz

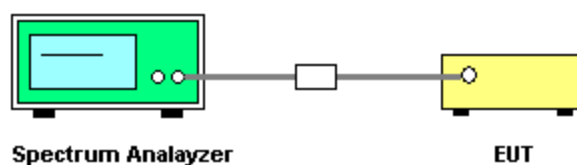
RBW: 1MHz, VBW: 1MHz for Frequency > 1 GHz

Sweep time: AUTO or more

Log scale: 10dB/Div, Data points: 501points (400 points or more)

Detection: Positive Peak

Reference Level: Enough level for maximum dynamic range



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## 4.6.3 Test Record

| Voltage<br>(V) | Frequency<br>Range<br>(MHz) | Max Value (dBm) |         |         | Limit<br>(dBm) | P/F  |
|----------------|-----------------------------|-----------------|---------|---------|----------------|------|
|                |                             | 2412MHz         | 2442MHz | 2472MHz |                |      |
| Normal         | 30 ~ 1000                   | -77.11          | -78.97  | -79.23  | -54            | Pass |
|                | 1000 ~ 6000                 | -68.44          | -66.97  | -67.89  | -47            | Pass |
|                | 6000 ~ 12500                | -53.44          | -52.85  | -53.06  | -47            | Pass |
| Low            | 30 ~ 1000                   | -79.19          | -77.95  | -77.95  | -54            | Pass |
|                | 1000 ~ 6000                 | -68.07          | -67.95  | -68.10  | -47            | Pass |
|                | 6000 ~ 12500                | -53.95          | -53.10  | -53.06  | -47            | Pass |
| High           | 30 ~ 1000                   | -79.02          | -79.90  | -78.64  | -54            | Pass |
|                | 1000 ~ 6000                 | -67.98          | -68.25  | -67.37  | -47            | Pass |
|                | 6000 ~ 12500                | -53.89          | -53.08  | -52.95  | -47            | Pass |

# TEST REPORT

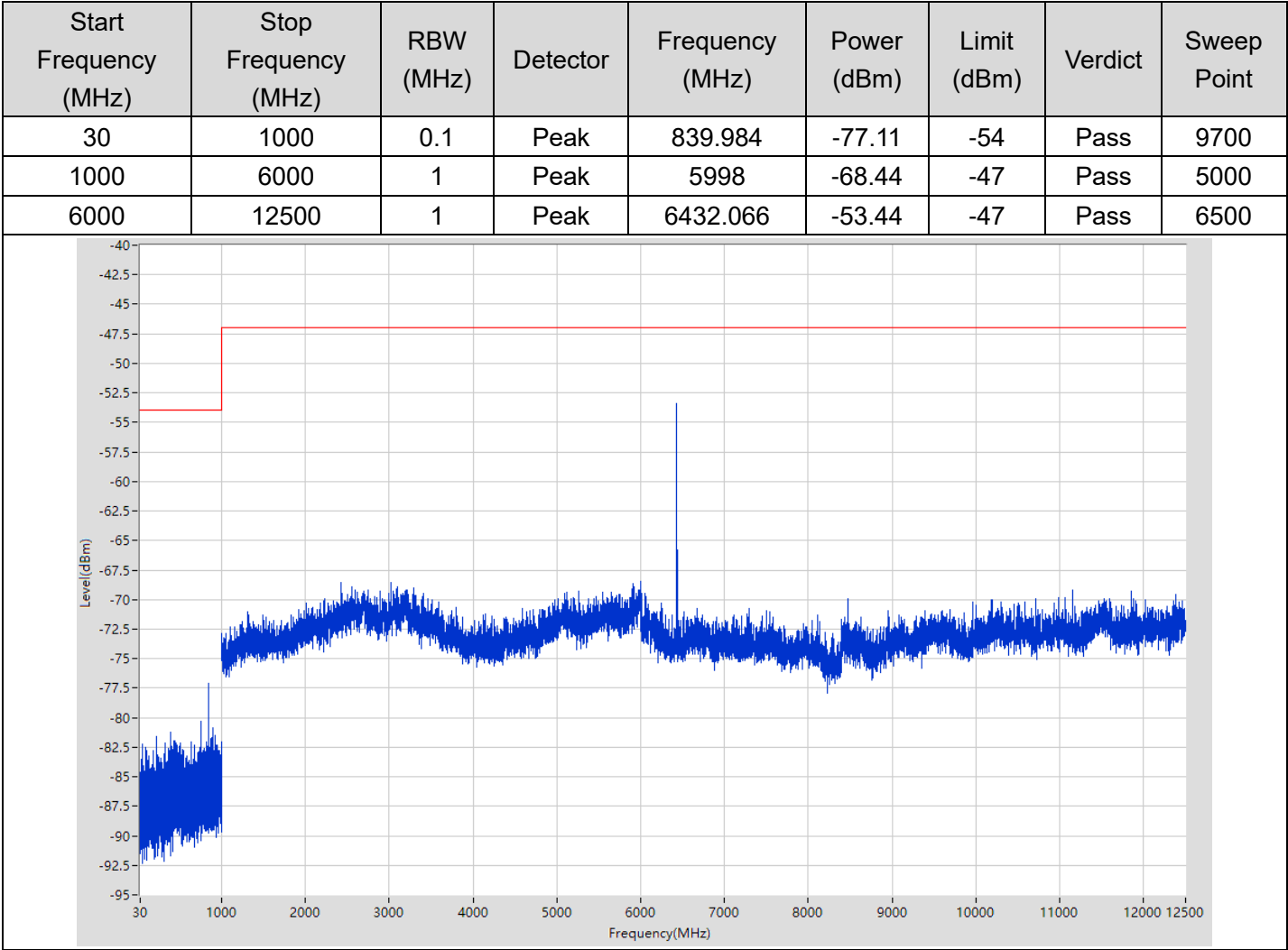
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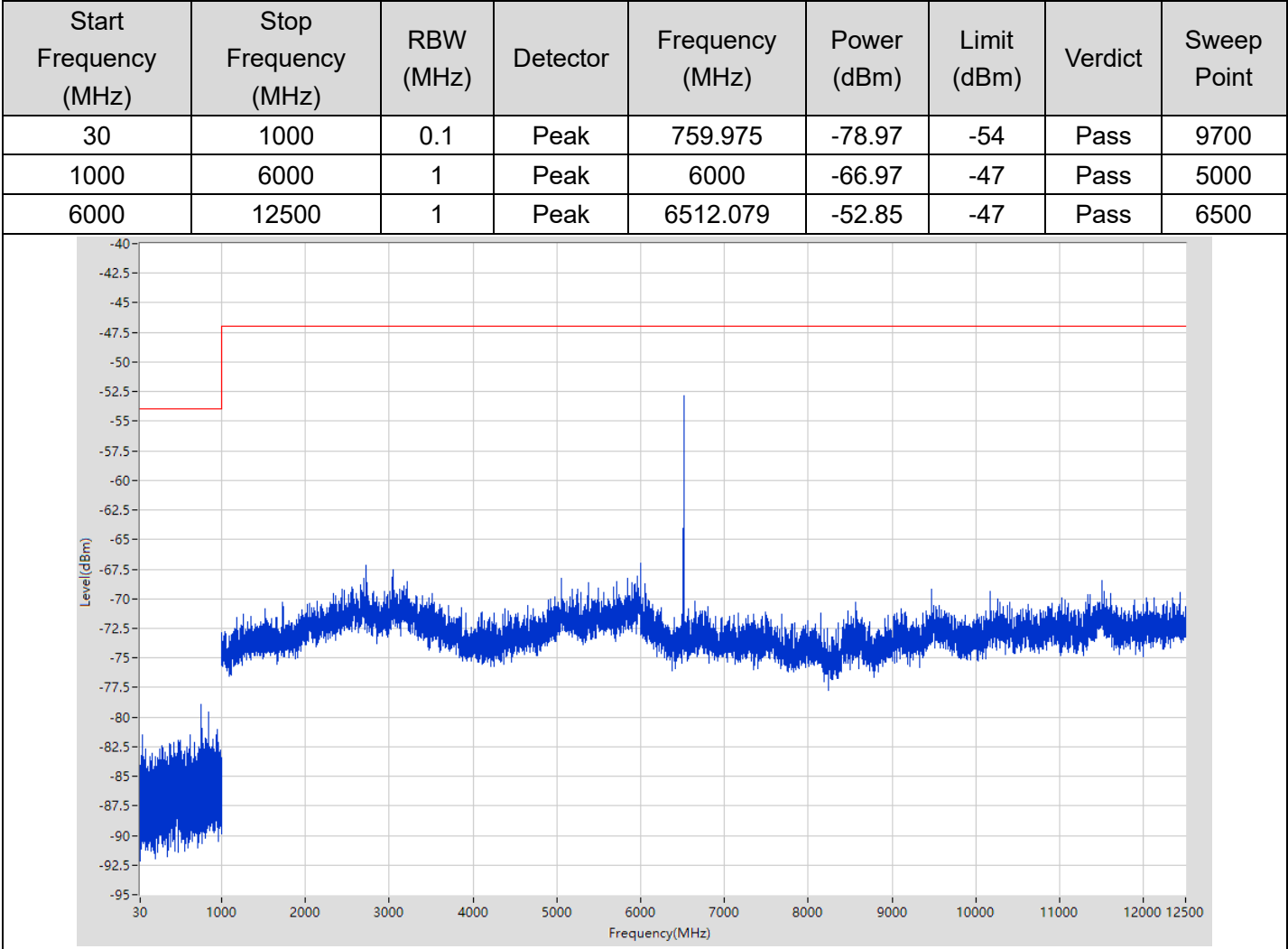
Normal Voltage

Figure 118-Test Frequency: 2412MHz



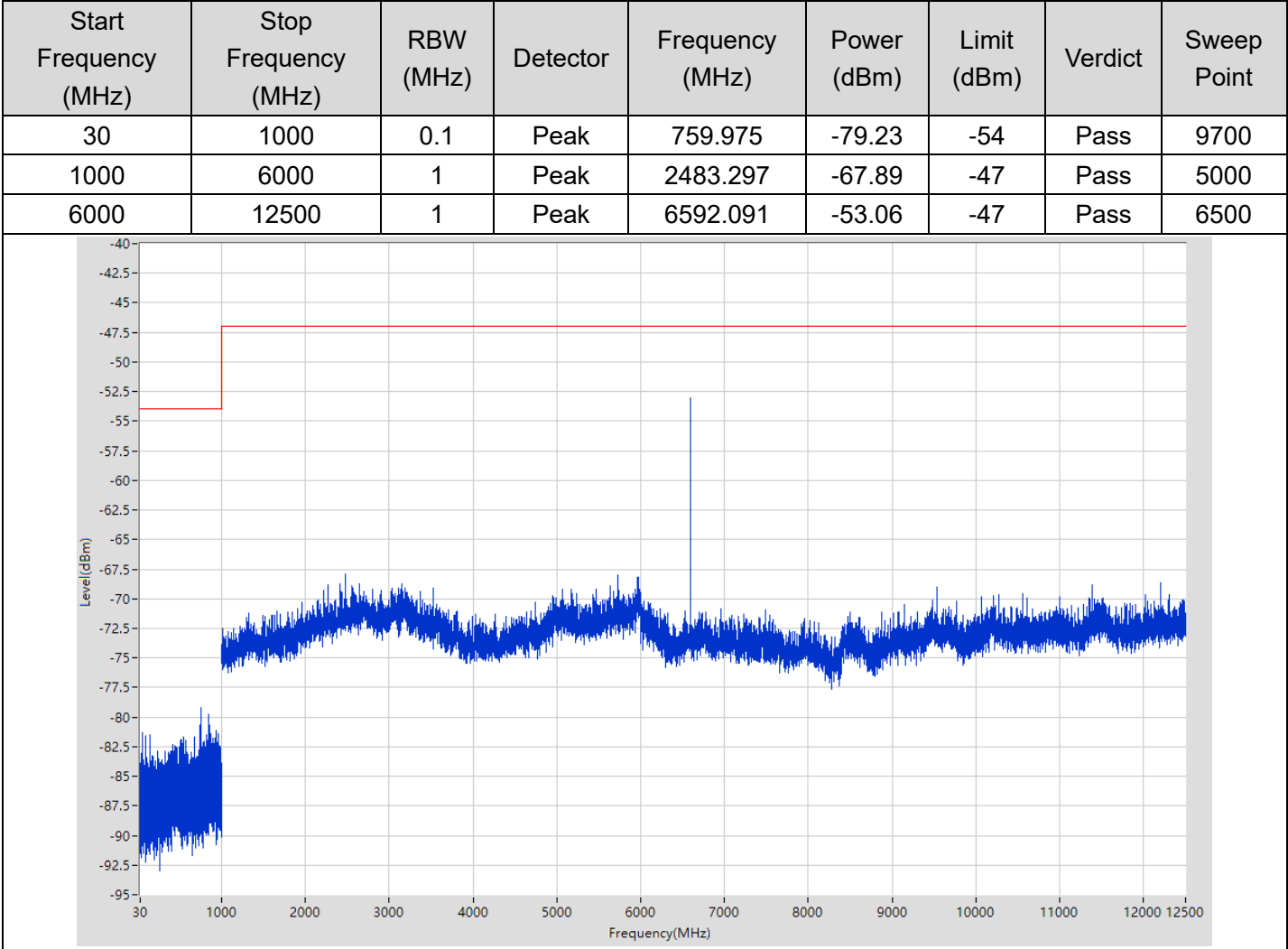
# TEST REPORT

Figure 119-Test Frequency: 2442MHz



# TEST REPORT

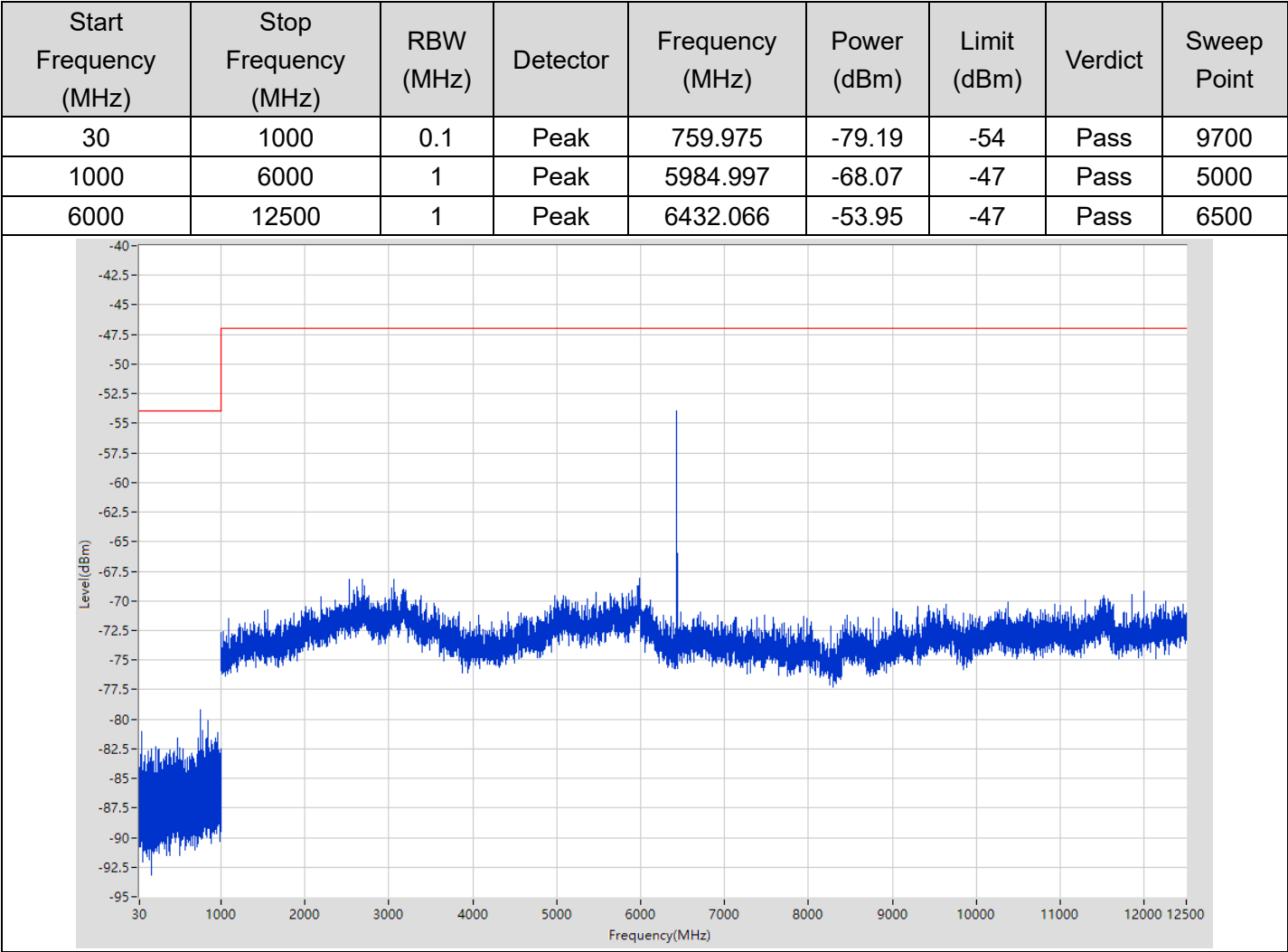
Figure 120-Test Frequency: 2472MHz



# TEST REPORT

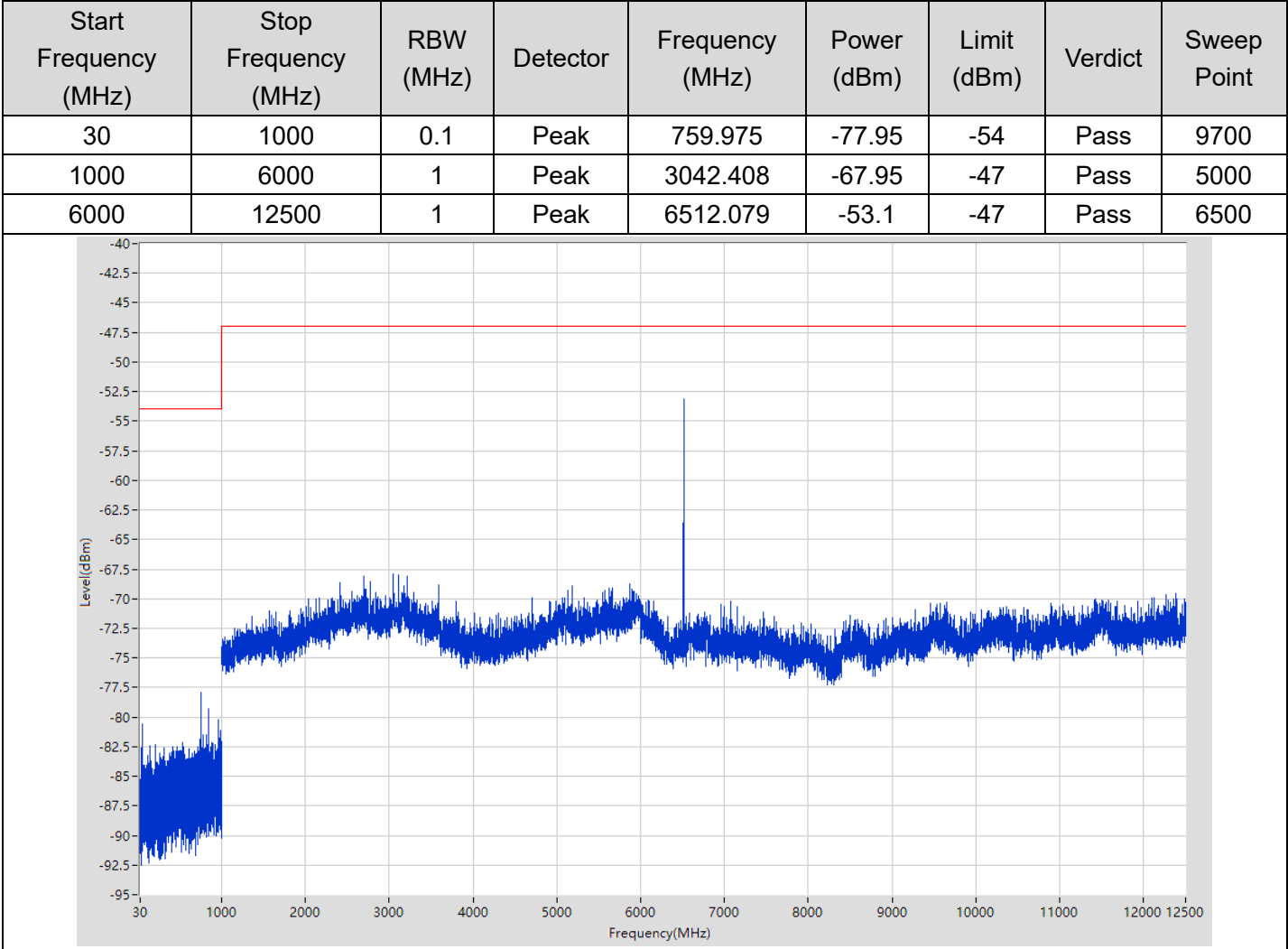
Low Voltage

Figure 121-Test Frequency: 2412MHz



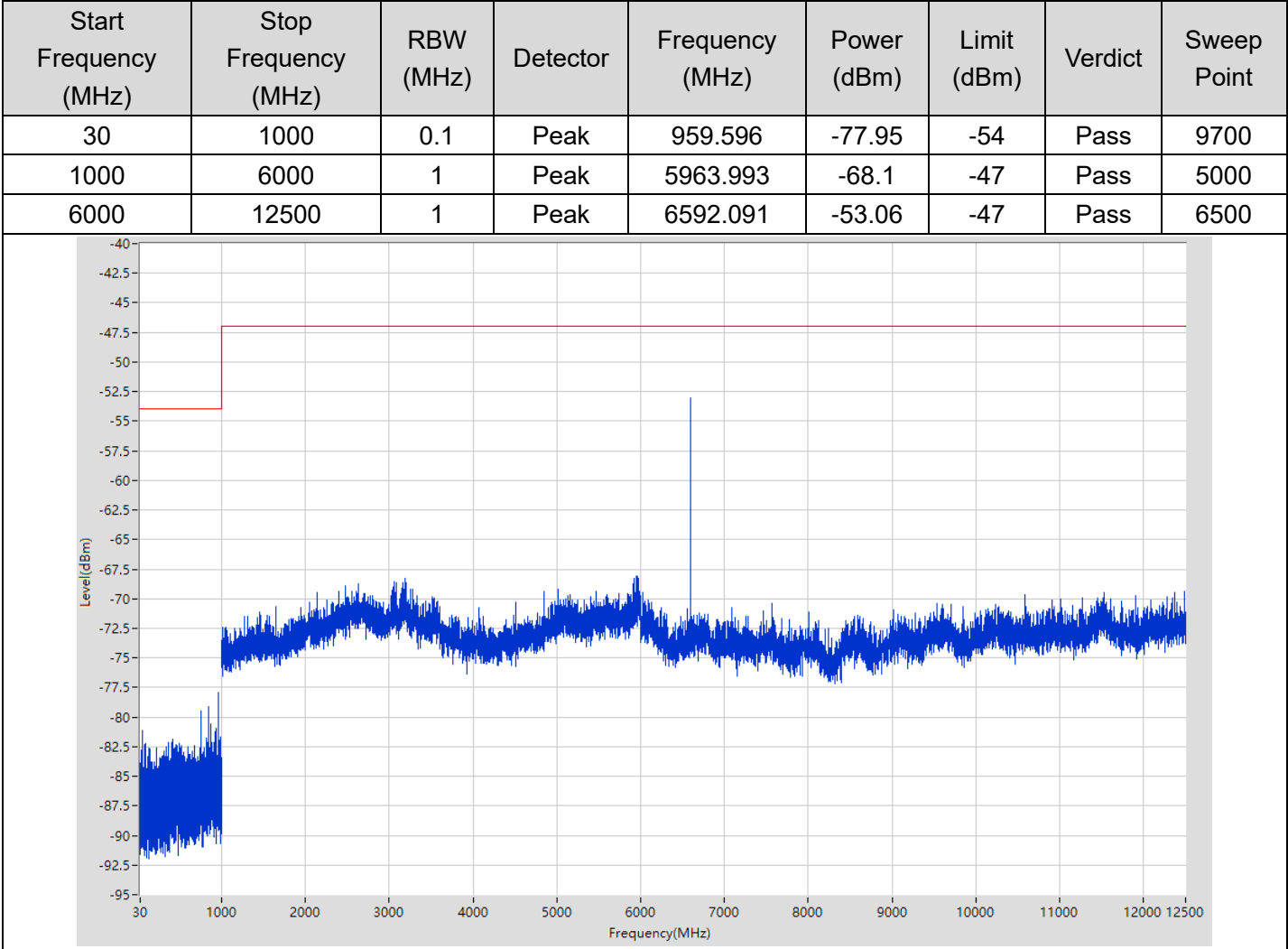
# TEST REPORT

Figure 122-Test Frequency: 2442MHz



# TEST REPORT

Figure 123-Test Frequency: 2472MHz

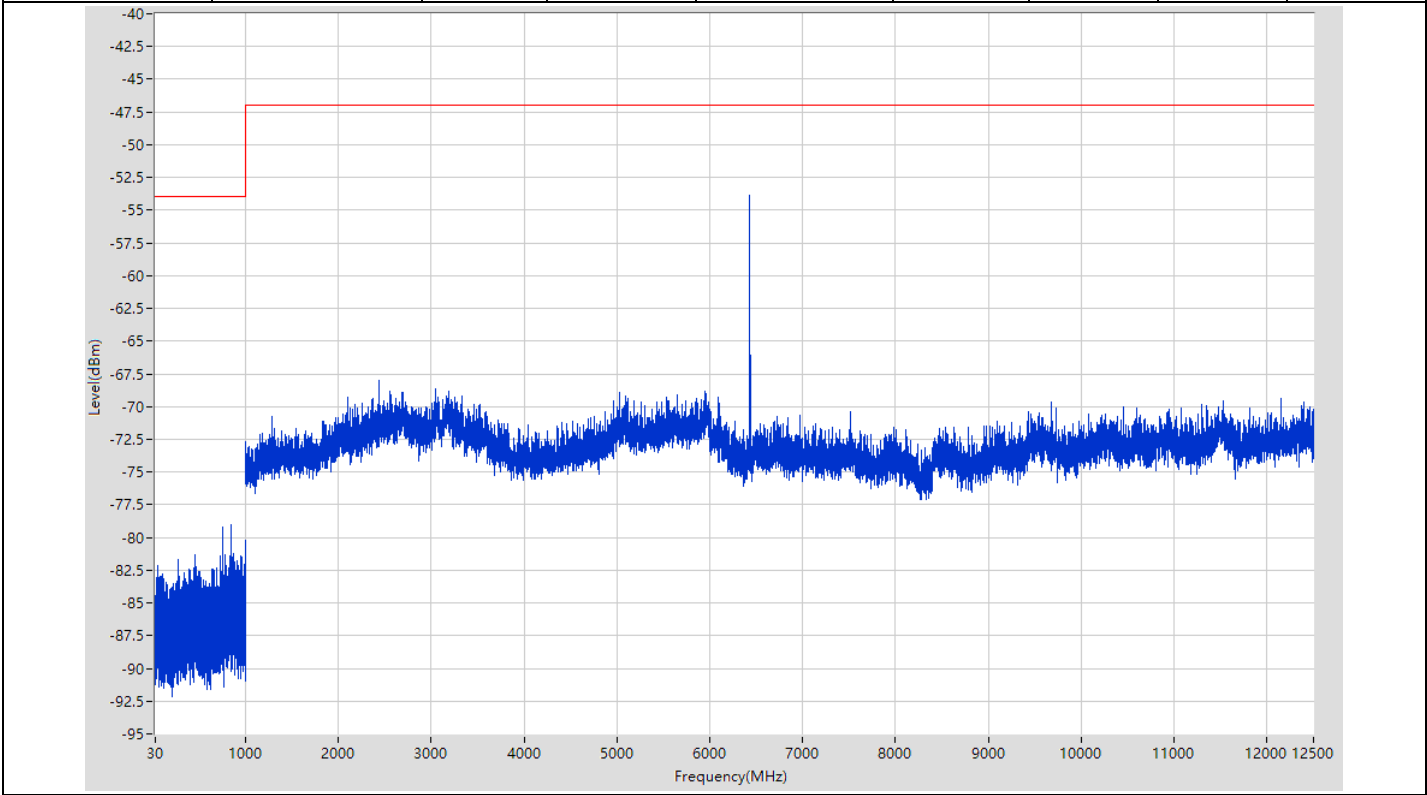


# TEST REPORT

High Voltage

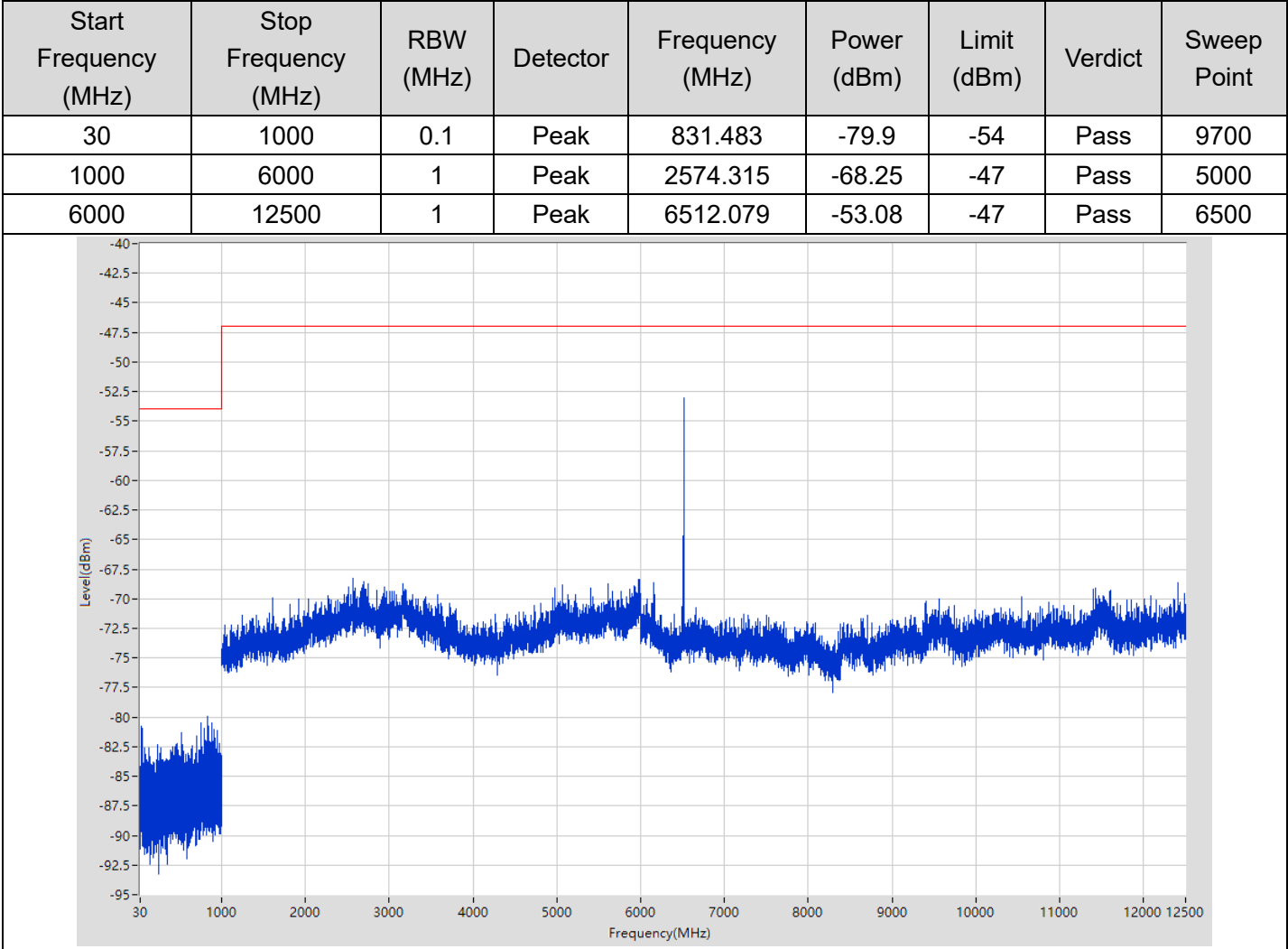
Figure 124-Test Frequency: 2412MHz

| Start Frequency (MHz) | Stop Frequency (MHz) | RBW (MHz) | Detector | Frequency (MHz) | Power (dBm) | Limit (dBm) | Verdict | Sweep Point |
|-----------------------|----------------------|-----------|----------|-----------------|-------------|-------------|---------|-------------|
| 30                    | 1000                 | 0.1       | Peak     | 839.984         | -79.02      | -54         | Pass    | 9700        |
| 1000                  | 6000                 | 1         | Peak     | 2435.287        | -67.98      | -47         | Pass    | 5000        |
| 6000                  | 12500                | 1         | Peak     | 6432.066        | -53.89      | -47         | Pass    | 6500        |



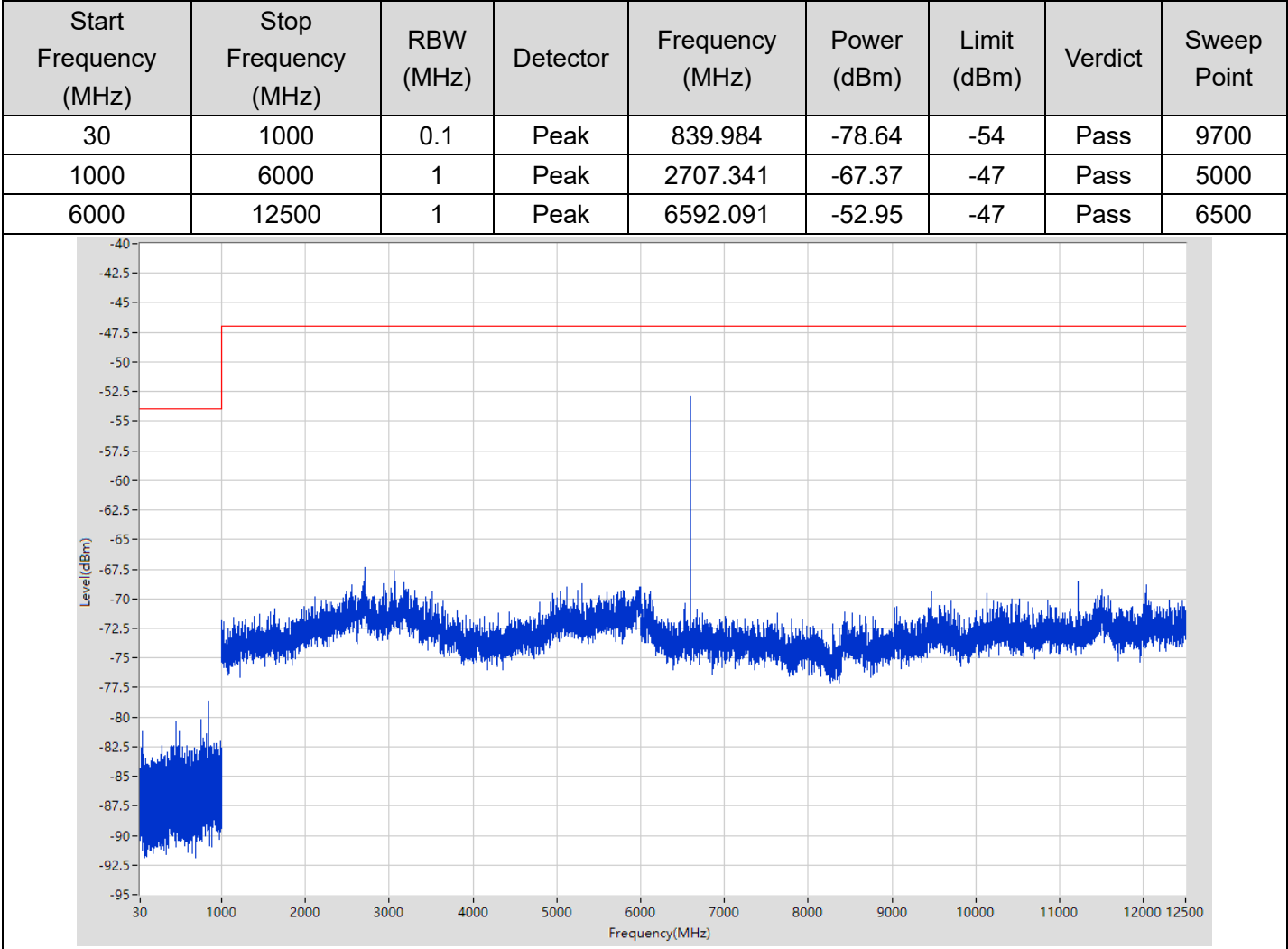
# TEST REPORT

Figure 125-Test Frequency: 2442MHz



# TEST REPORT

Figure 126-Test Frequency: 2472MHz



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## 4.7 RADIO INTERFERENCE PREVENTION CAPABILITY

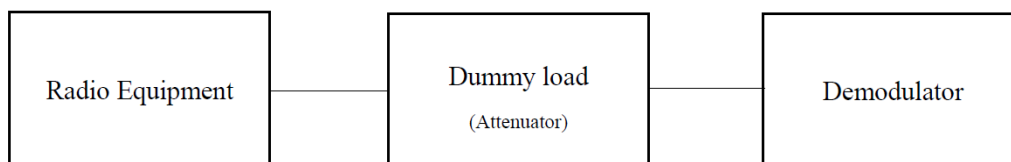
### 4.7.1 Limit

| Item                | Limit     |
|---------------------|-----------|
| Identification code | ≥ 48 bits |

### 4.7.2 Test Setup

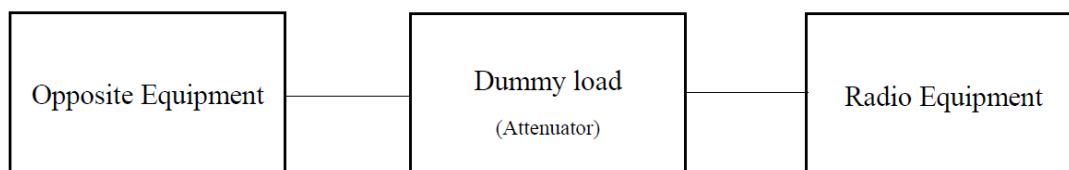
In the case that the EUT has the function of automatically transmitting the identification code:

- Transmit the assigned identification code from the radio equipment.
- Confirm the identification code received by the demodulator.



In the case of receiving the identification code:

- Transmit the assigned identification code from the opposite equipment.
- Confirm that the usual communication is available.
- Transmit the identification code distinct from the assigned one from the opposite equipment.
- Confirm that the radio equipment is stopped or an indication is displayed as the identification code is different.



### 4.7.3 Test Record

MAC Address: C8:FE:0F:1E:EC:43

# TEST REPORT

## 4.8 CONSTRUCTION PROTECTION CONFIRMATION

### 4.8.1 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.

### 4.8.2 Confirmation method

The RF and modulation portions are protected against illegal modification as following method:

| Protected Method    | Description                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------|
| WIFI Module Package | WIFI Module Package of RF (U1:RTL8731BU) and Modulation (TX: 40MHz) portions is 6pin and 13.0*12.3*2.2mm(L*W*H)±0.15mm             |
| Enclosure           | RF and Modulation components are covered within case of EUT and this case used special screw to protect anybody to open this case. |
| User Manual         | we will add some warning statements on the user manual to against illegal modification                                             |



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## 5 Appendixes

### 5.1 Photographs of the Sample



All of the sample



Front of the sample

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Rear of the sample



Left of the sample

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Right of the sample



Top of the sample

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Bottom of the sample



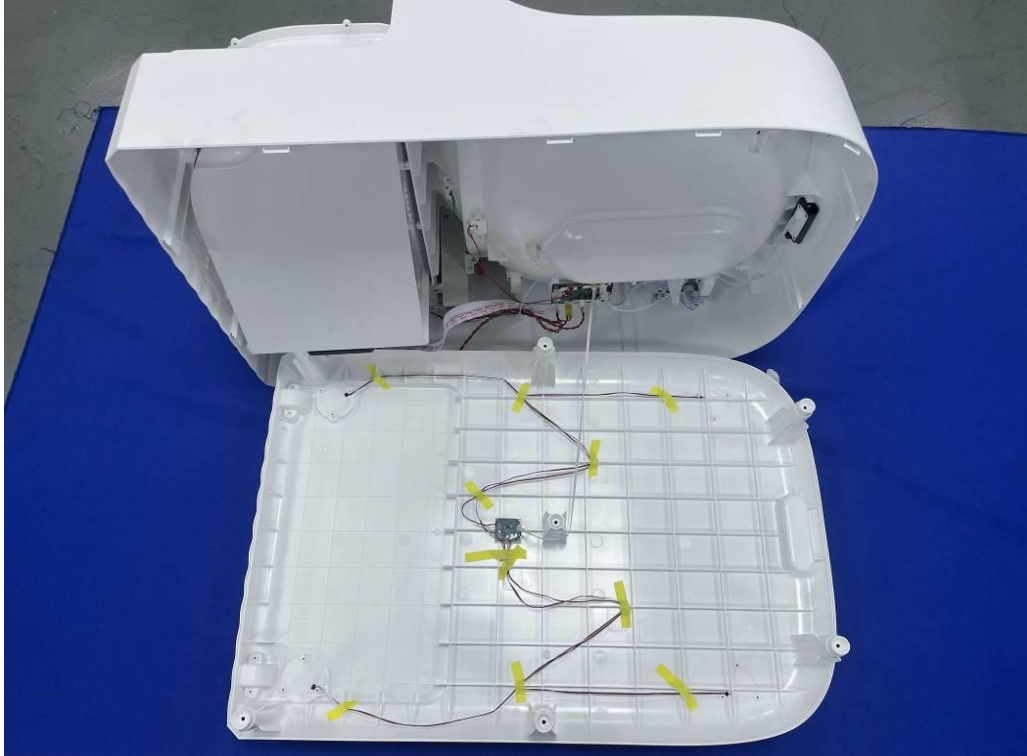
Open-1 of the sample

# TEST REPORT

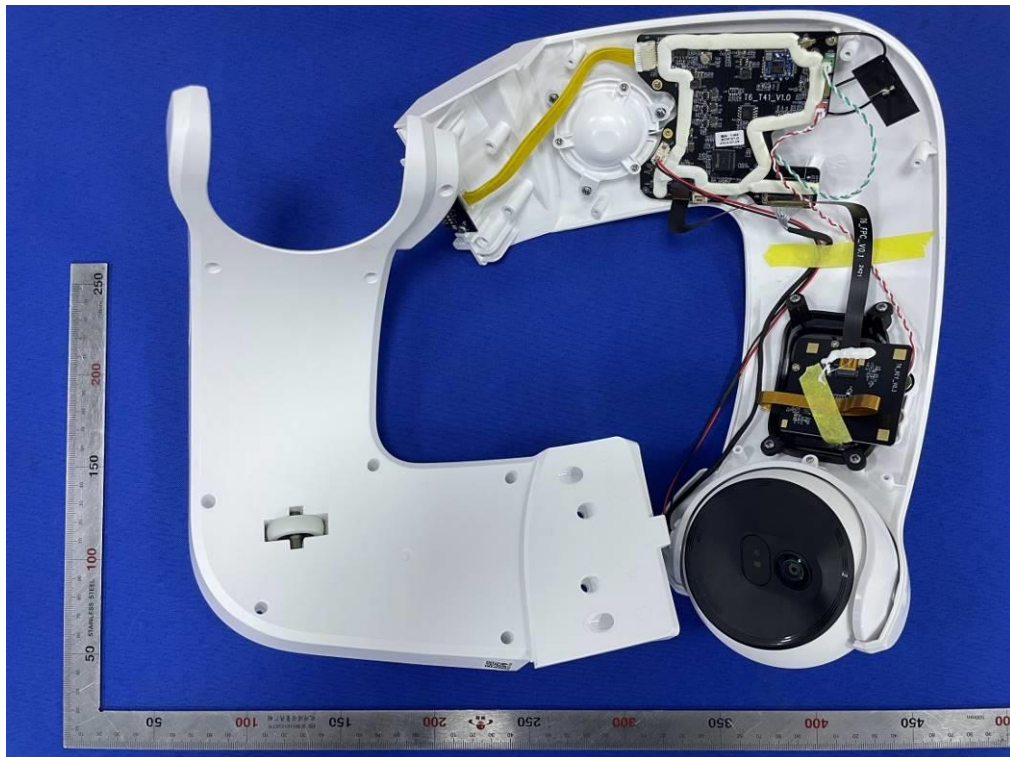
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Open-2 of the sample



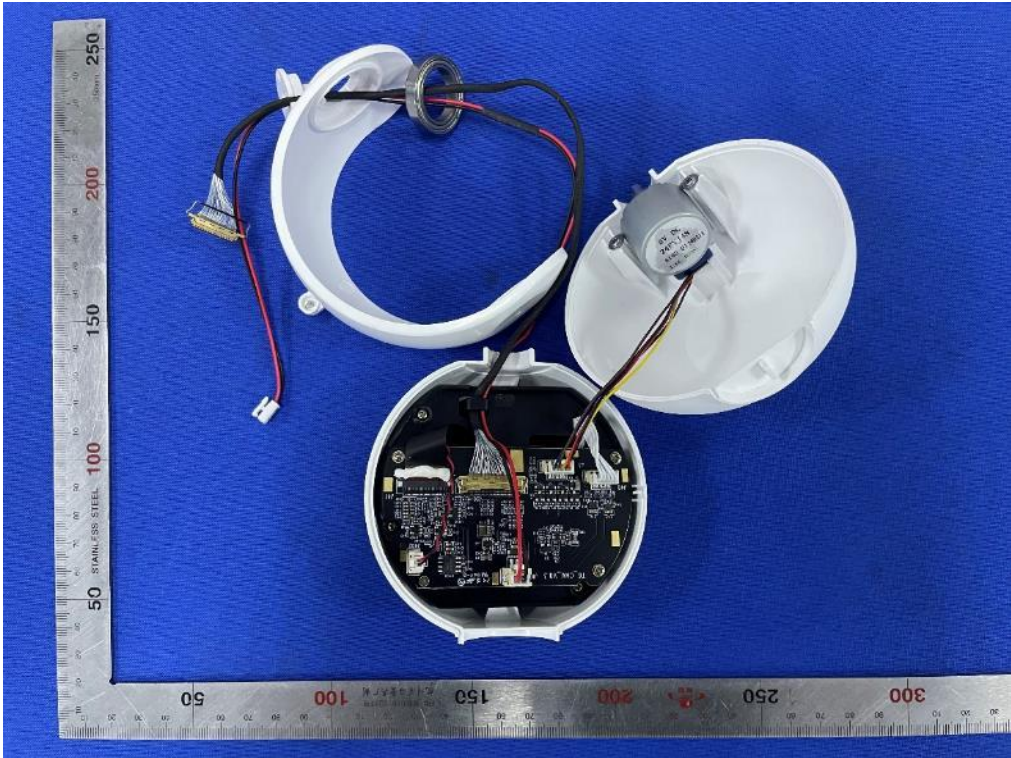
Open-3 of the sample

# TEST REPORT

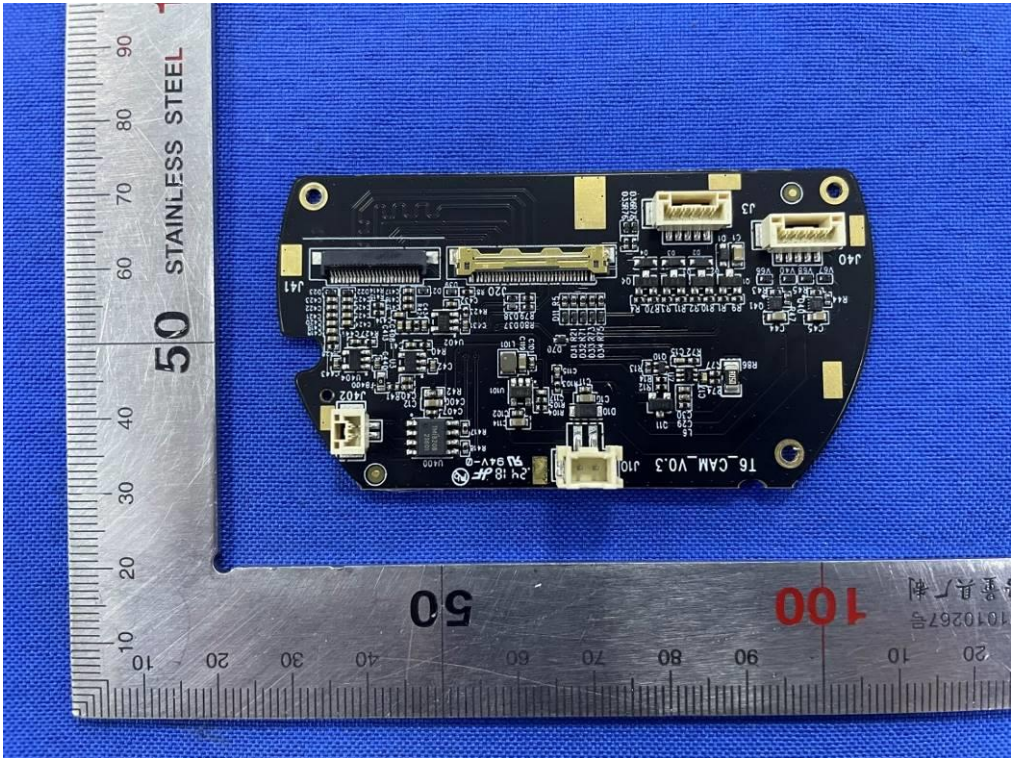
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Open-4 of the sample



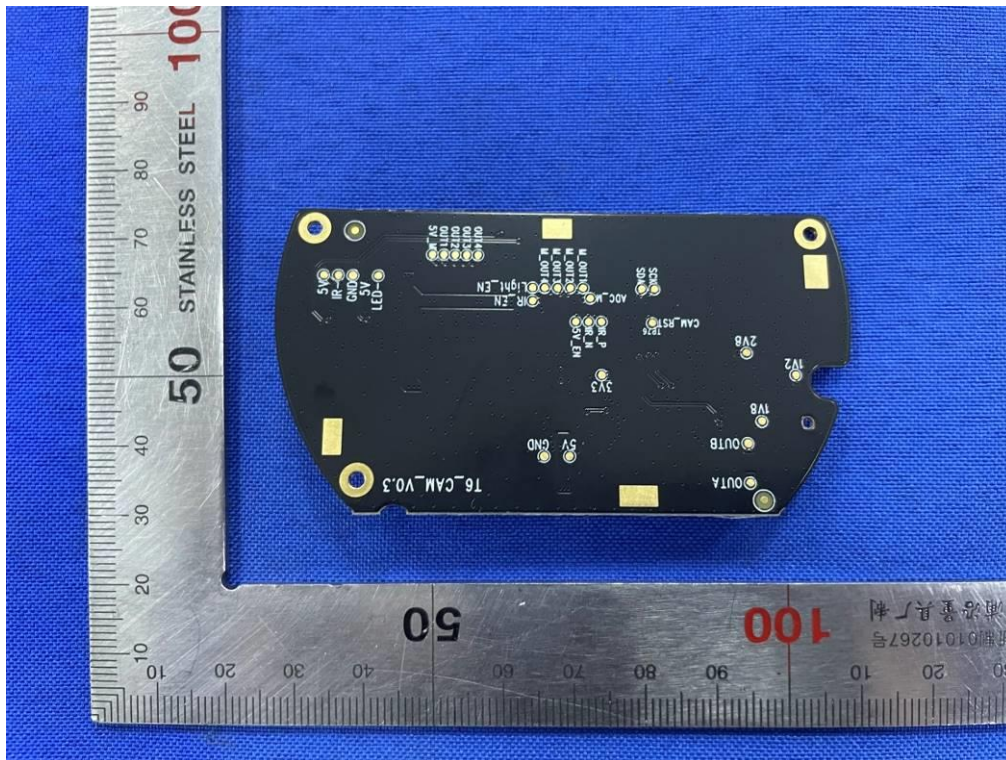
Internal-1 of the sample

# TEST REPORT

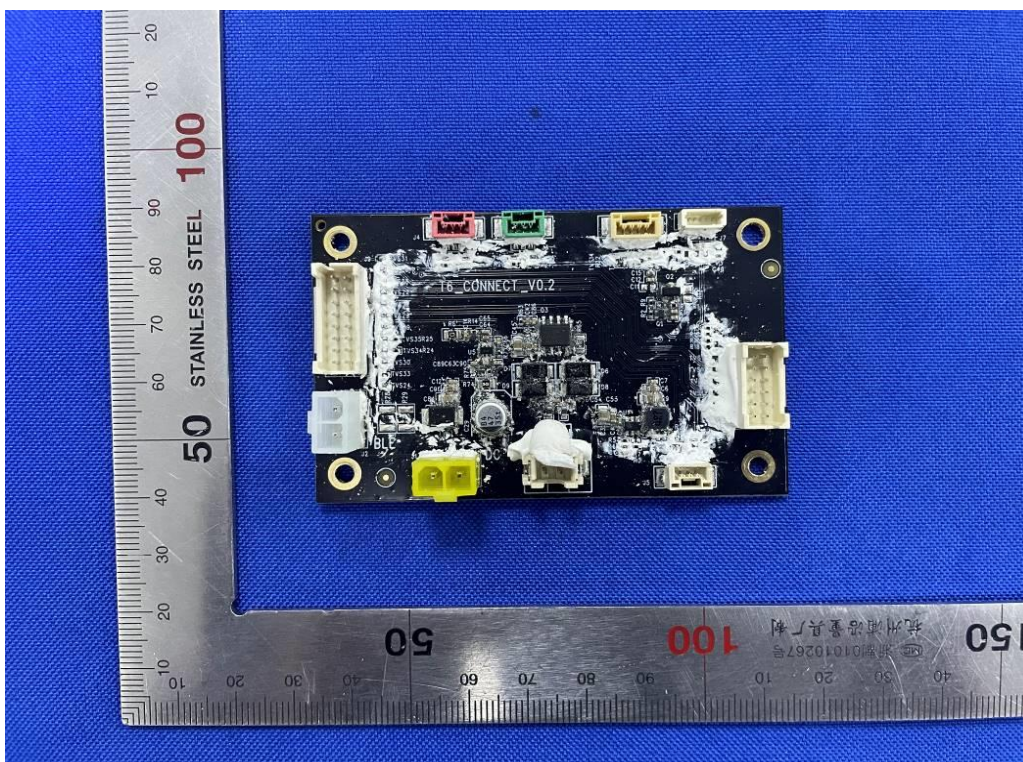
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Internal-2 of the sample



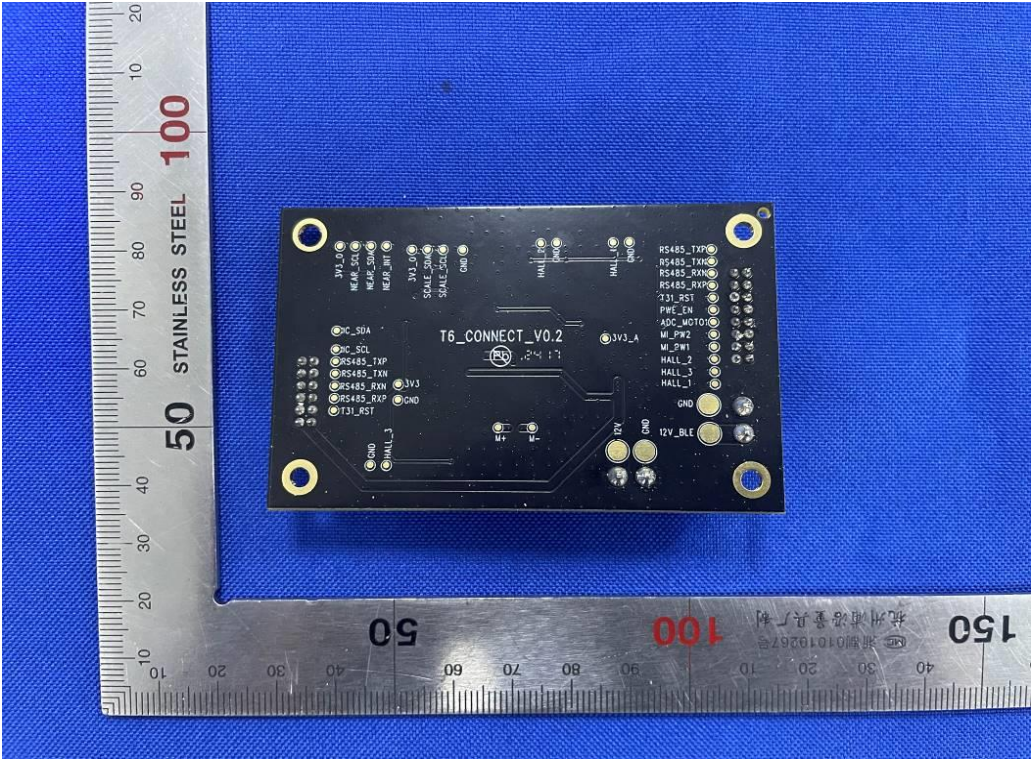
Internal-3 of the sample

# TEST REPORT

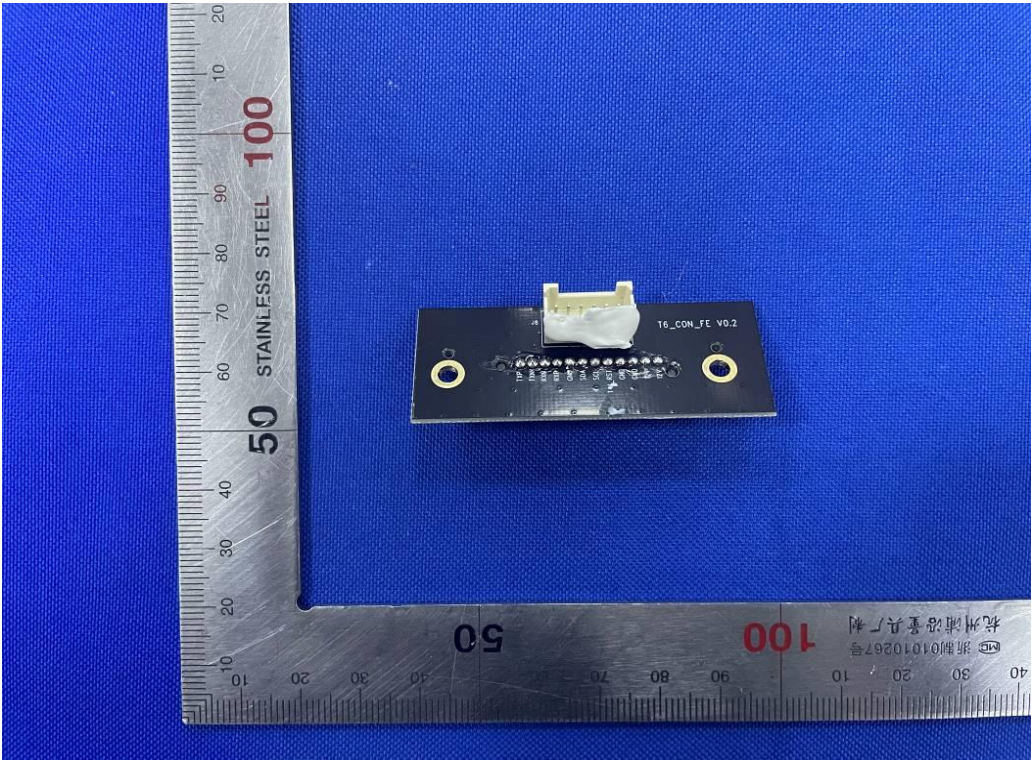
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Internal-4 of the sample



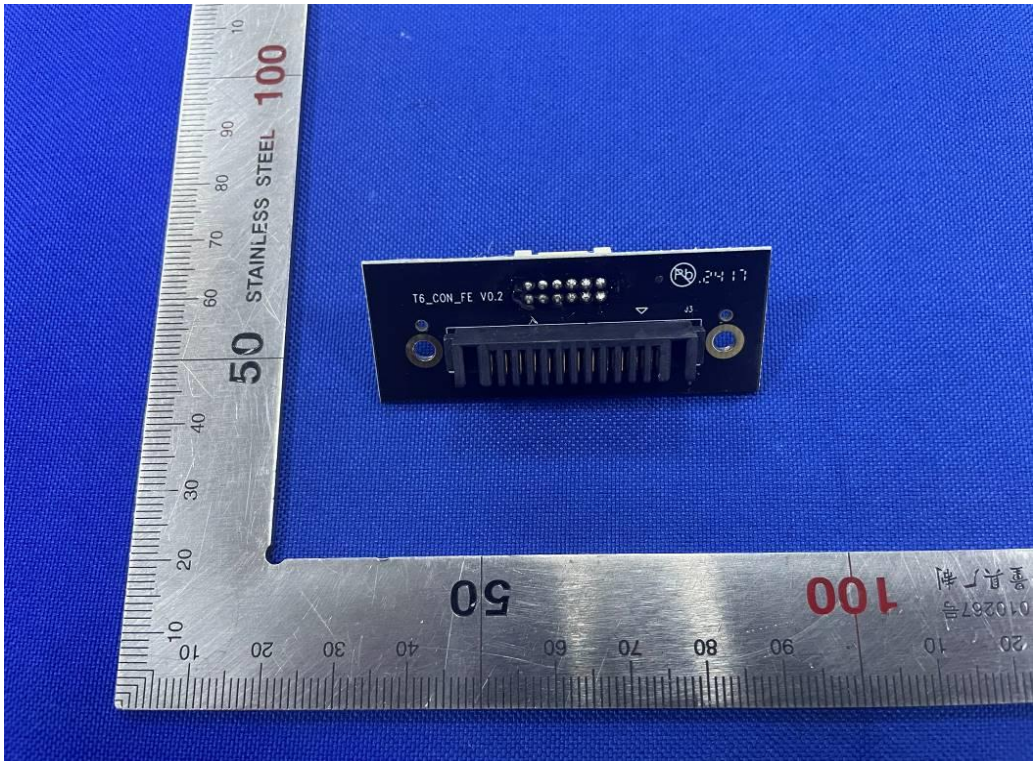
Internal-5 of the sample

# TEST REPORT

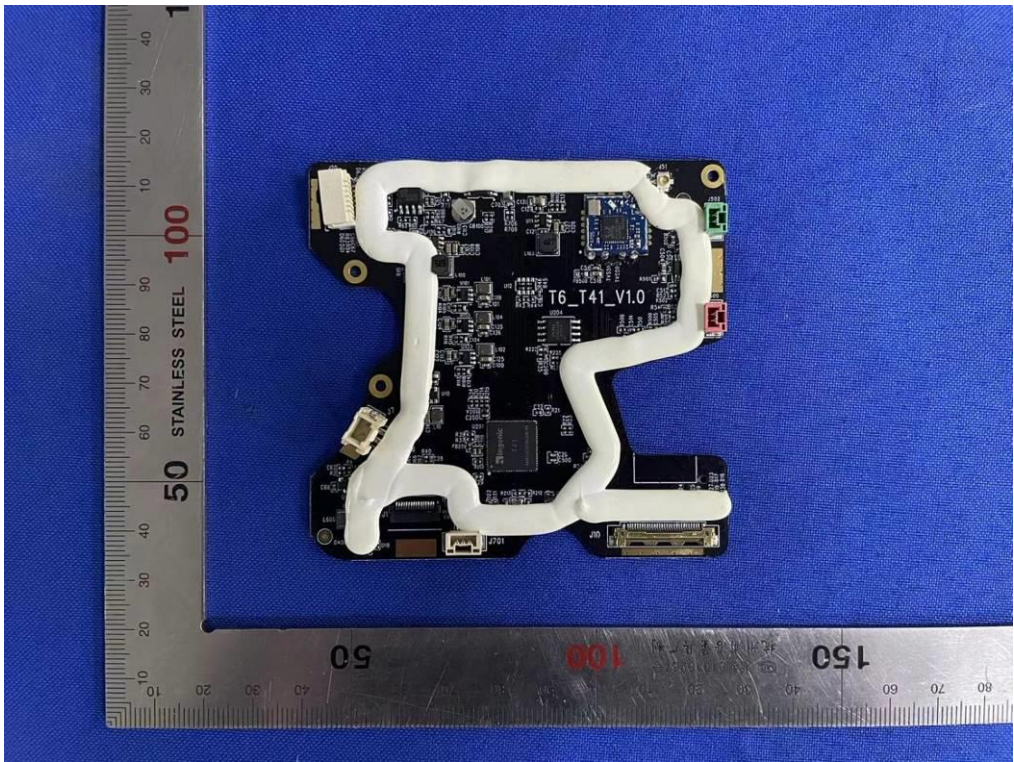
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Internal-6 of the sample



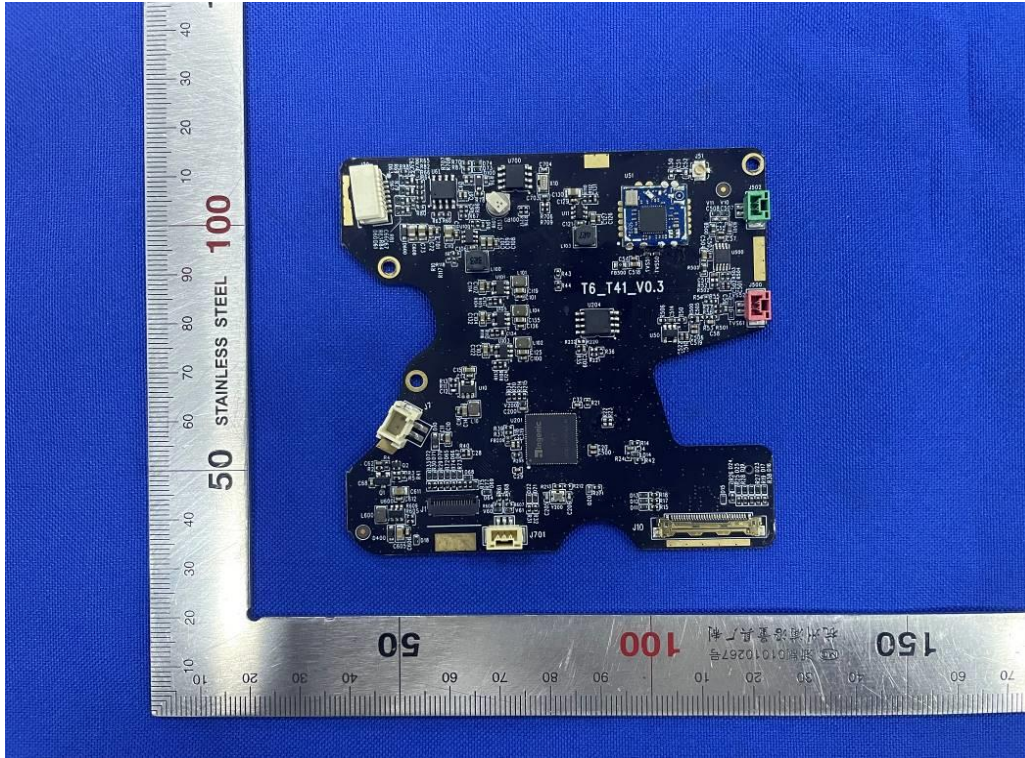
Internal-7 of the sample

# TEST REPORT

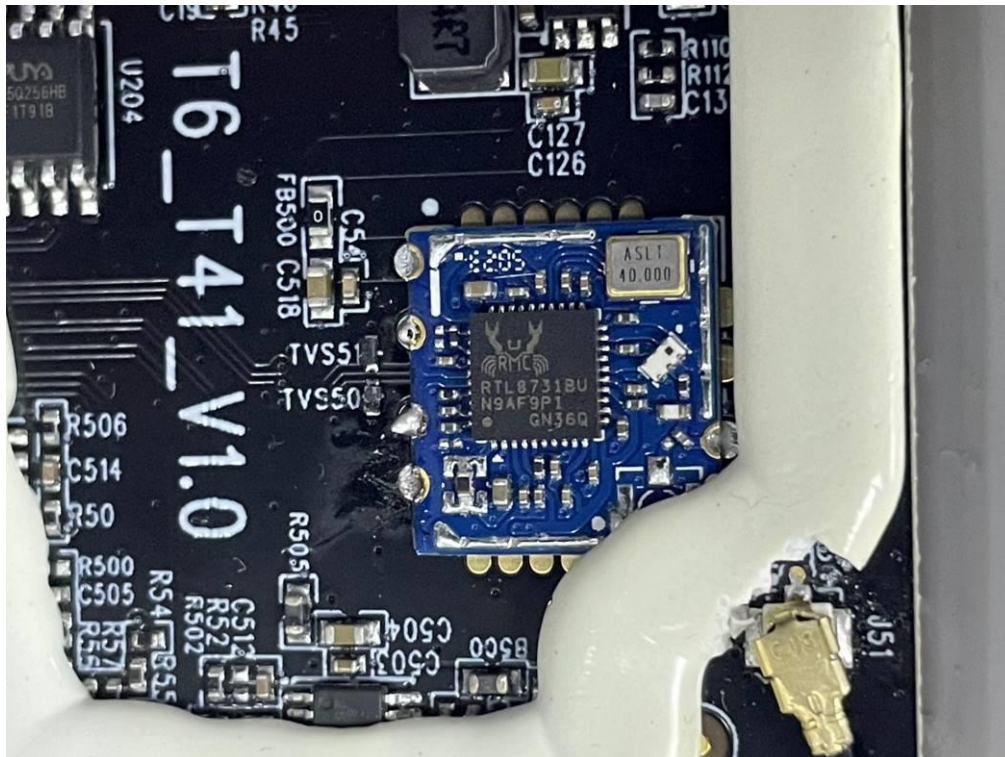
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Internal-8 of the sample



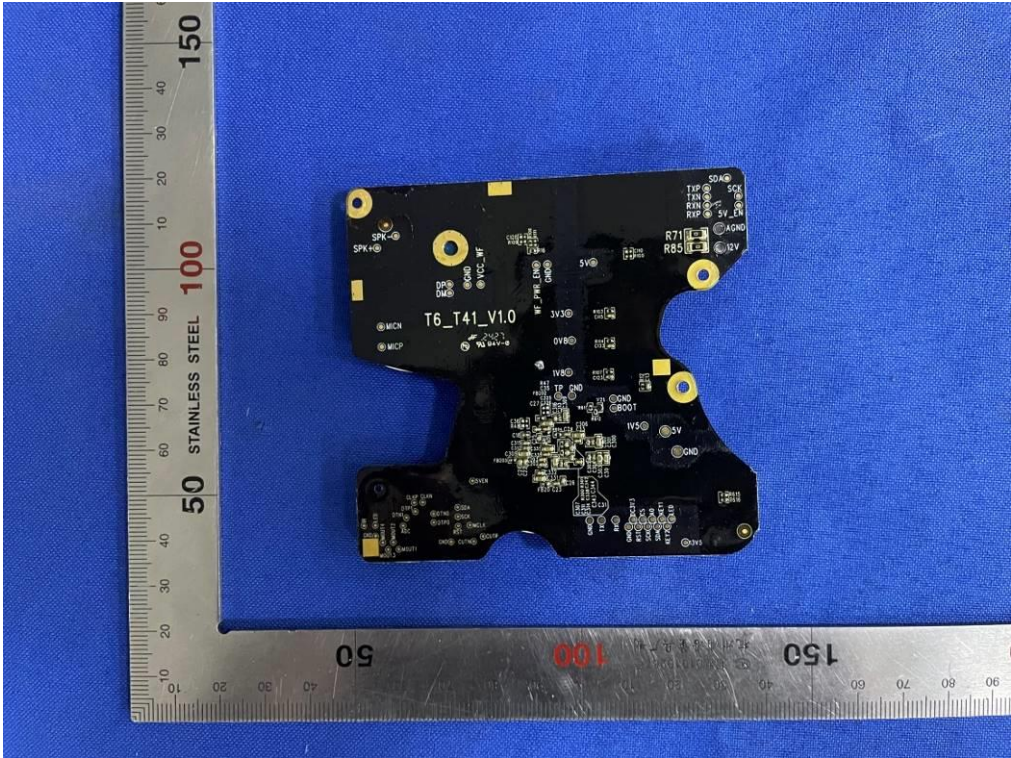
Internal-9 of the sample

# TEST REPORT

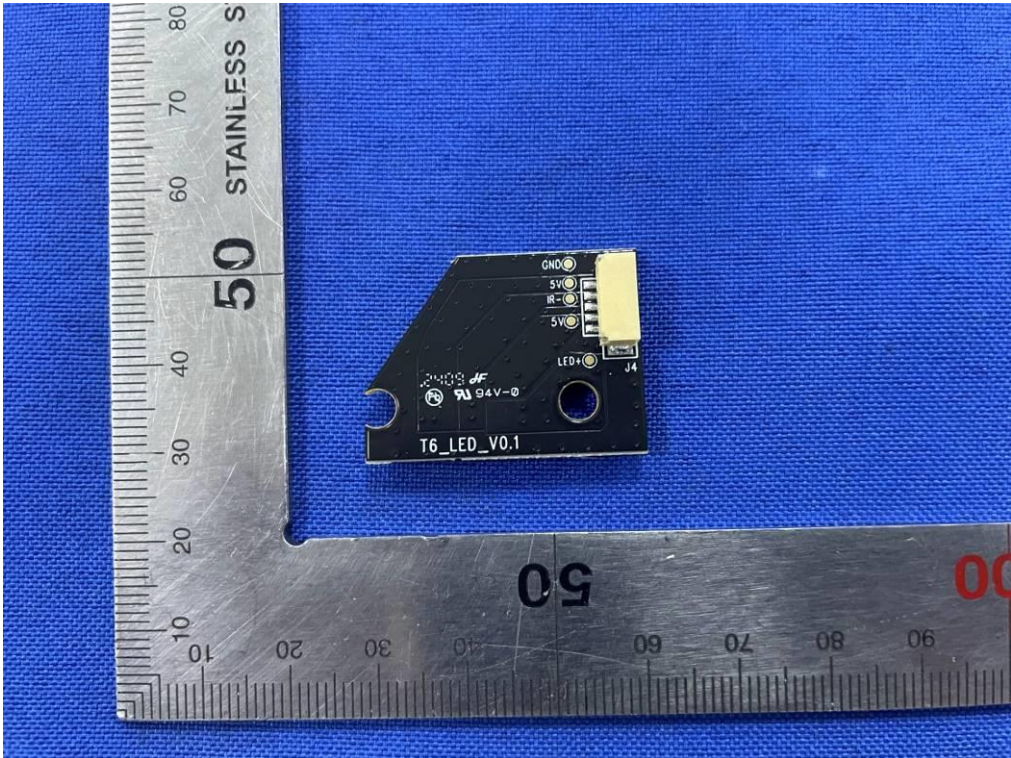
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Internal-10 of the sample



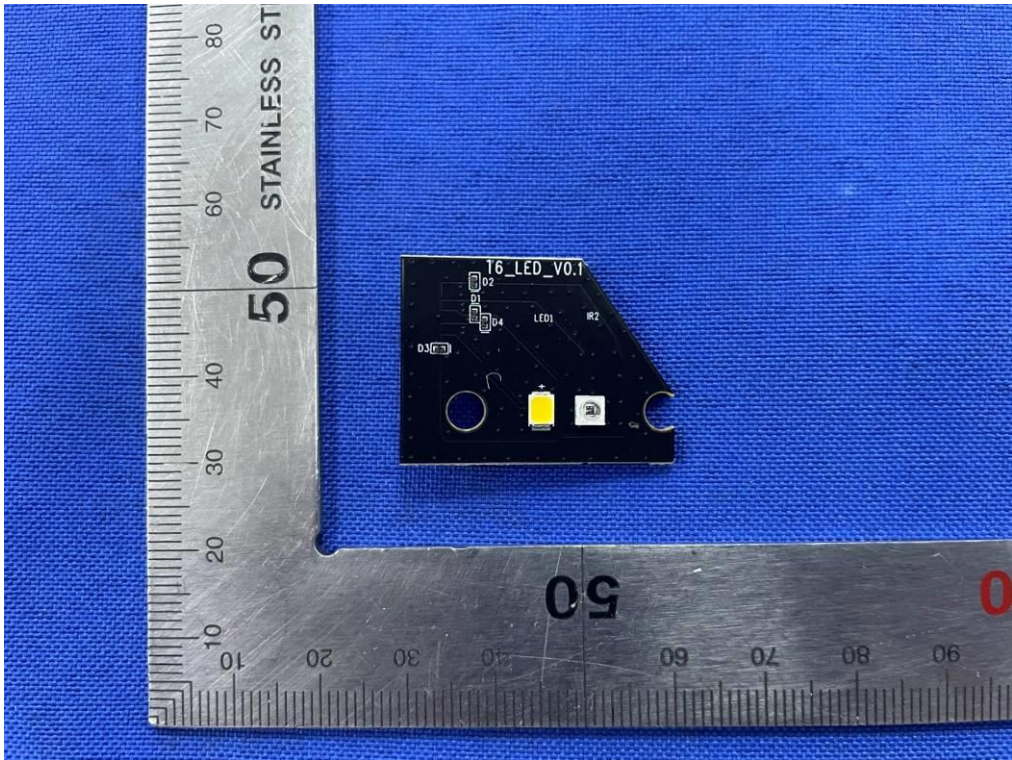
Internal-11 of the sample

# TEST REPORT

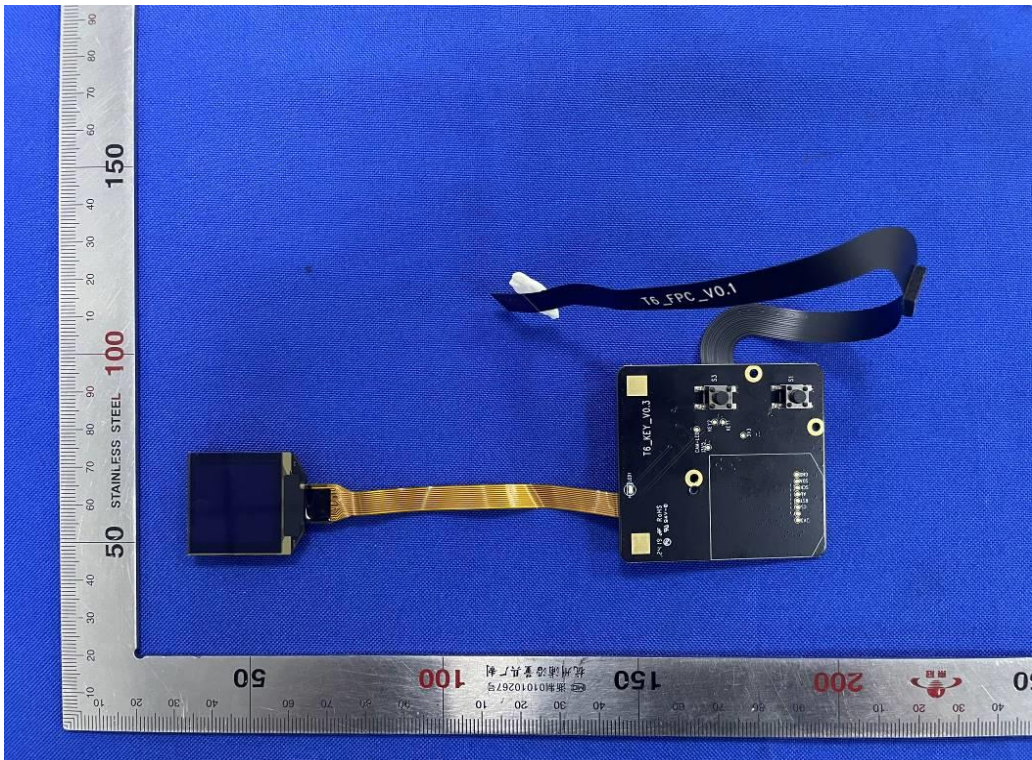
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Internal-12 of the sample



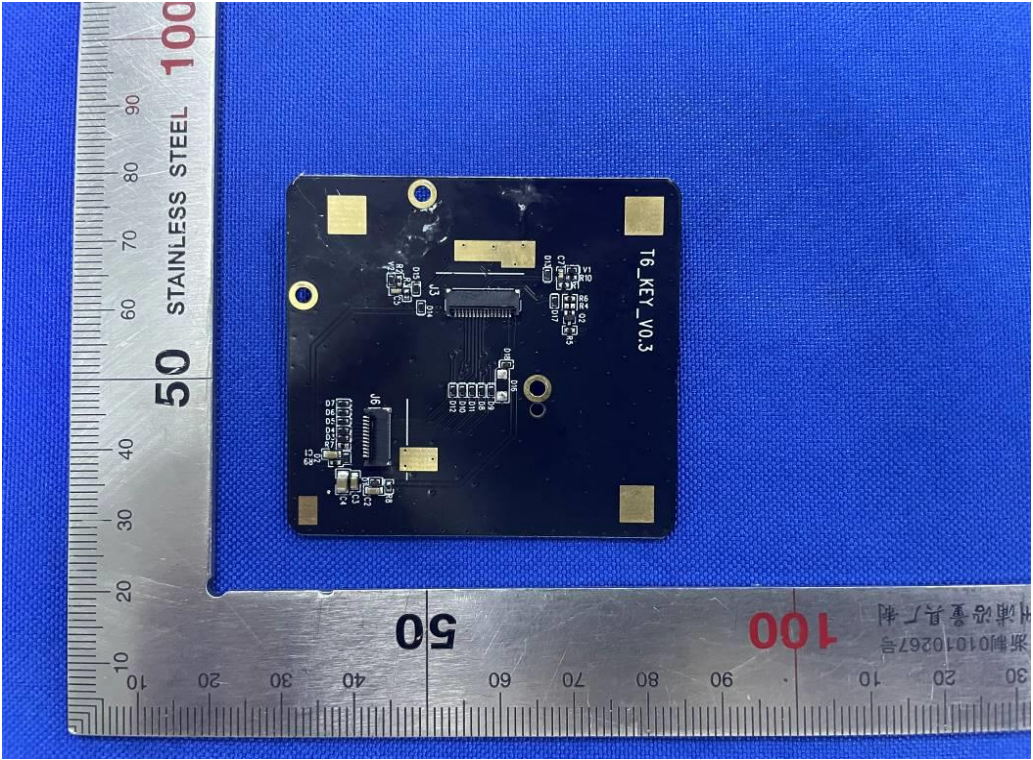
Internal-13 of the sample

# TEST REPORT

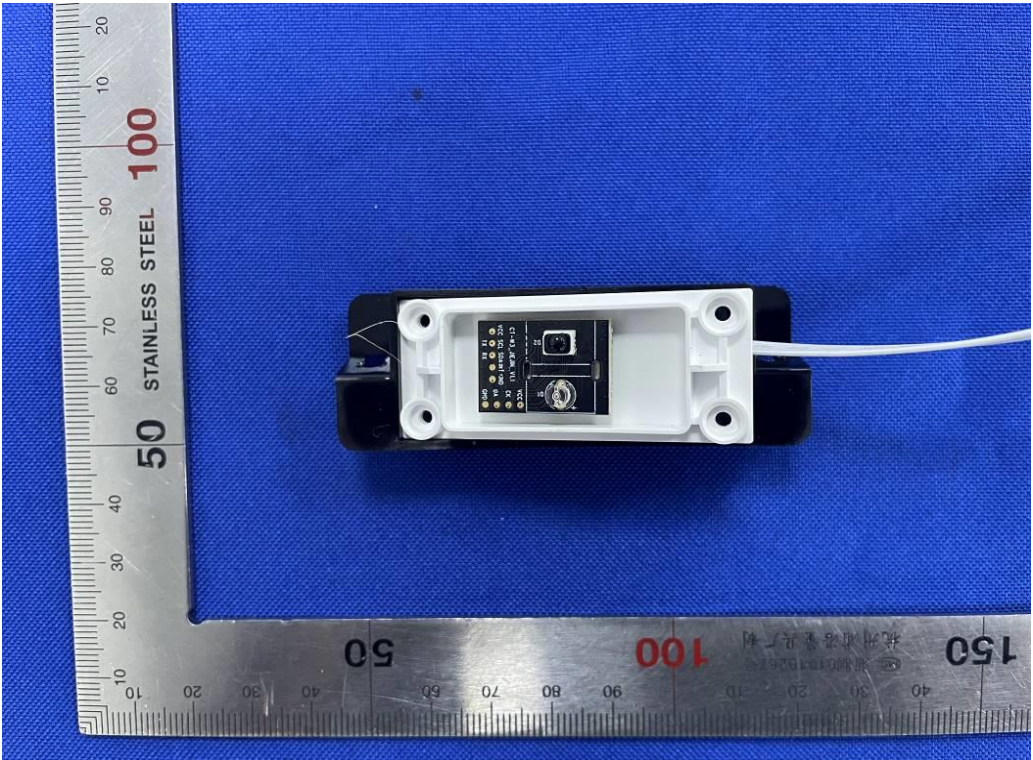
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Internal-14 of the sample



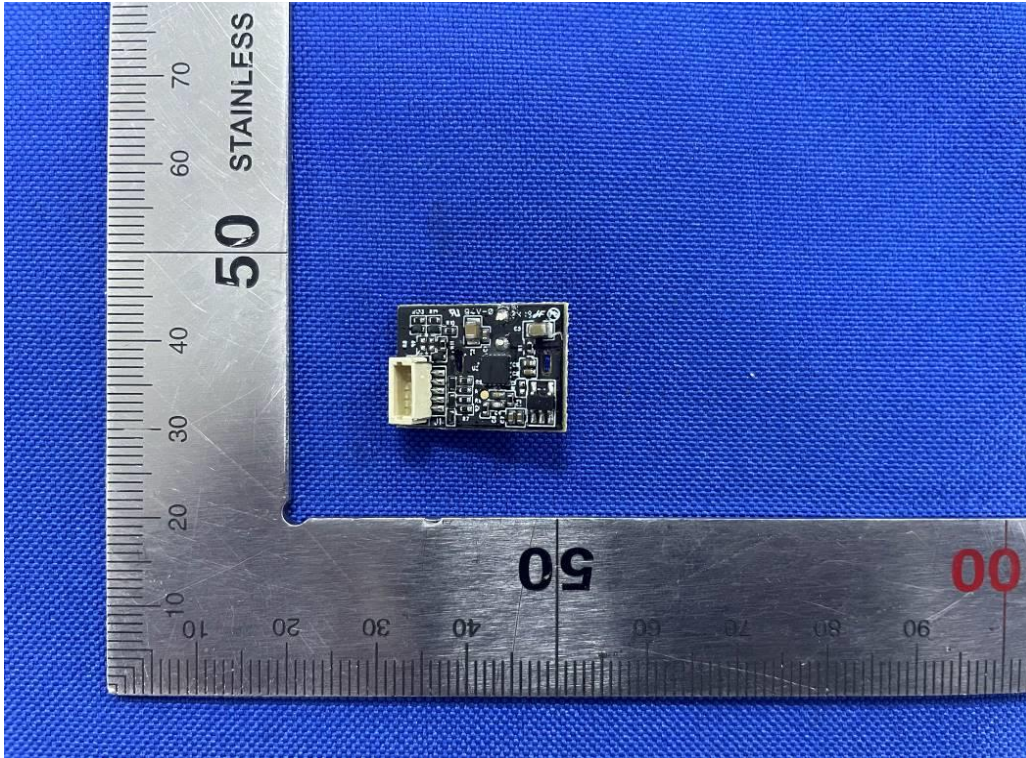
Internal-15 of the sample

# TEST REPORT

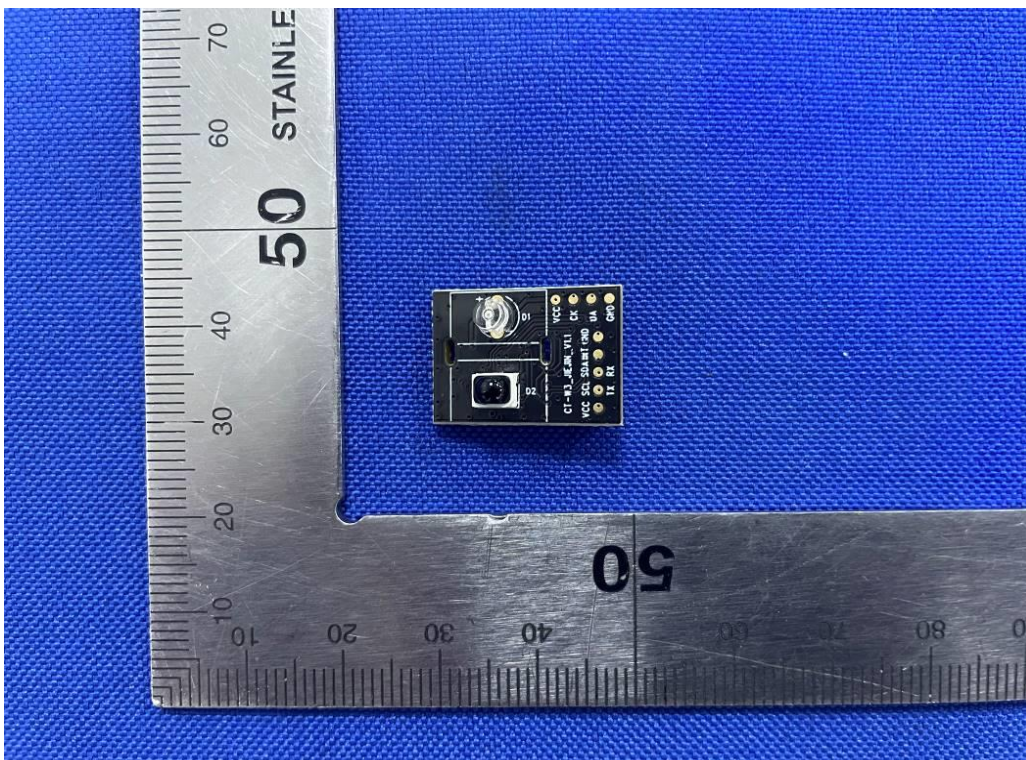
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Internal-16 of the sample



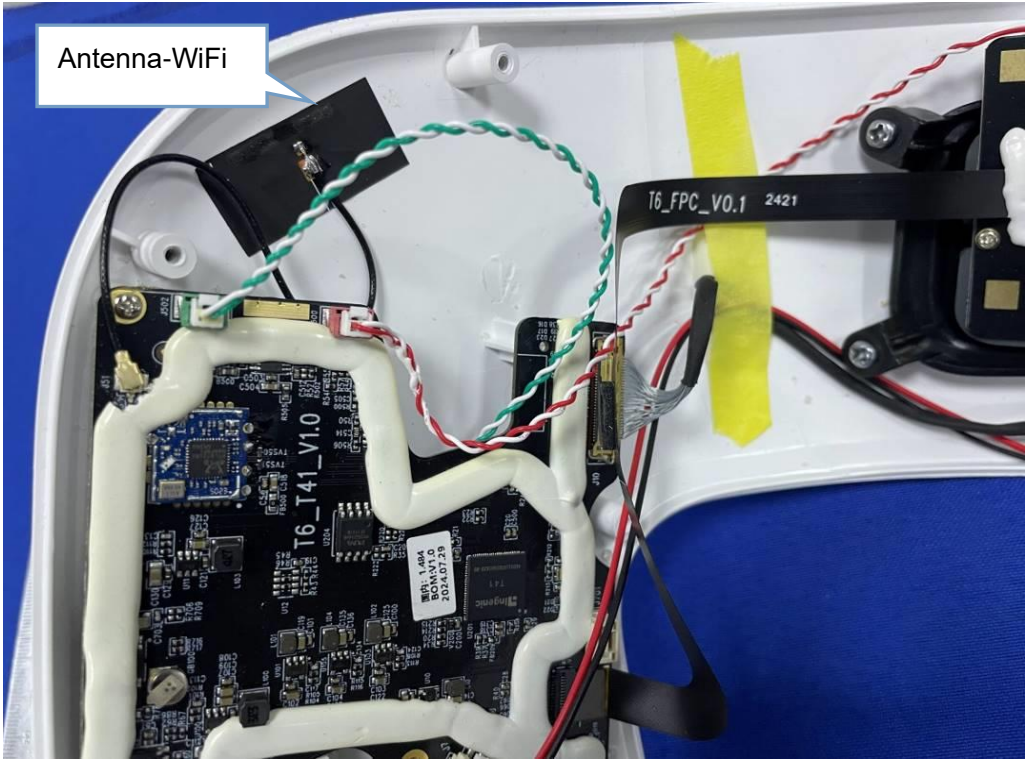
Internal-17 of the sample

# TEST REPORT

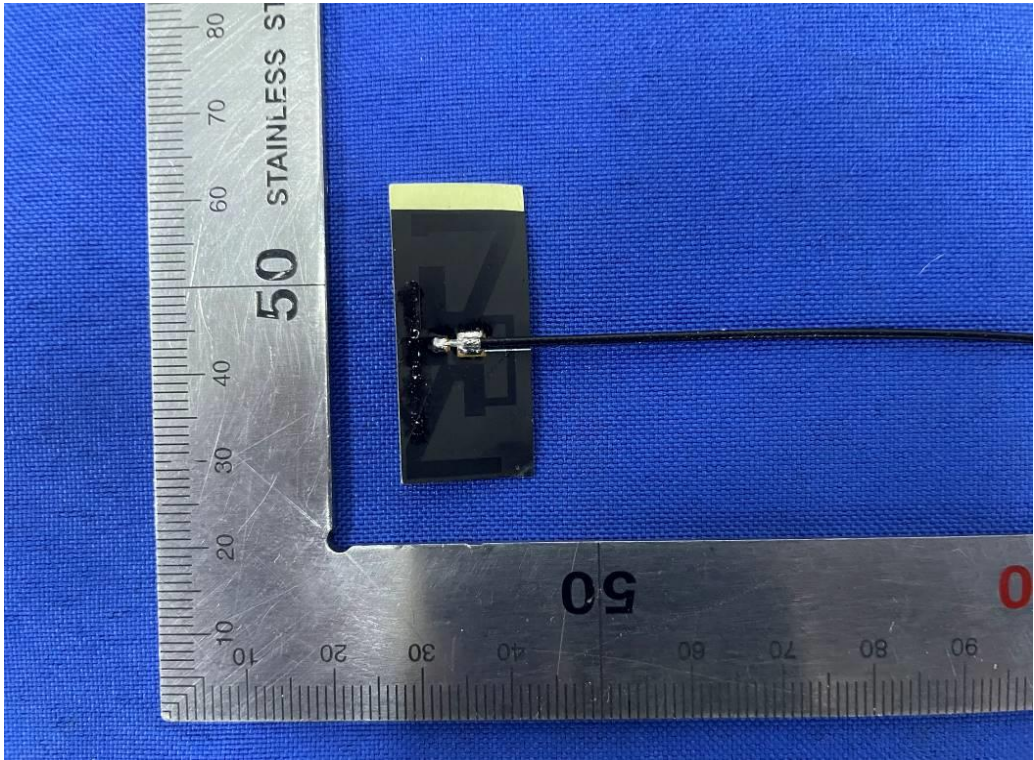
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Antenna position--WiFi



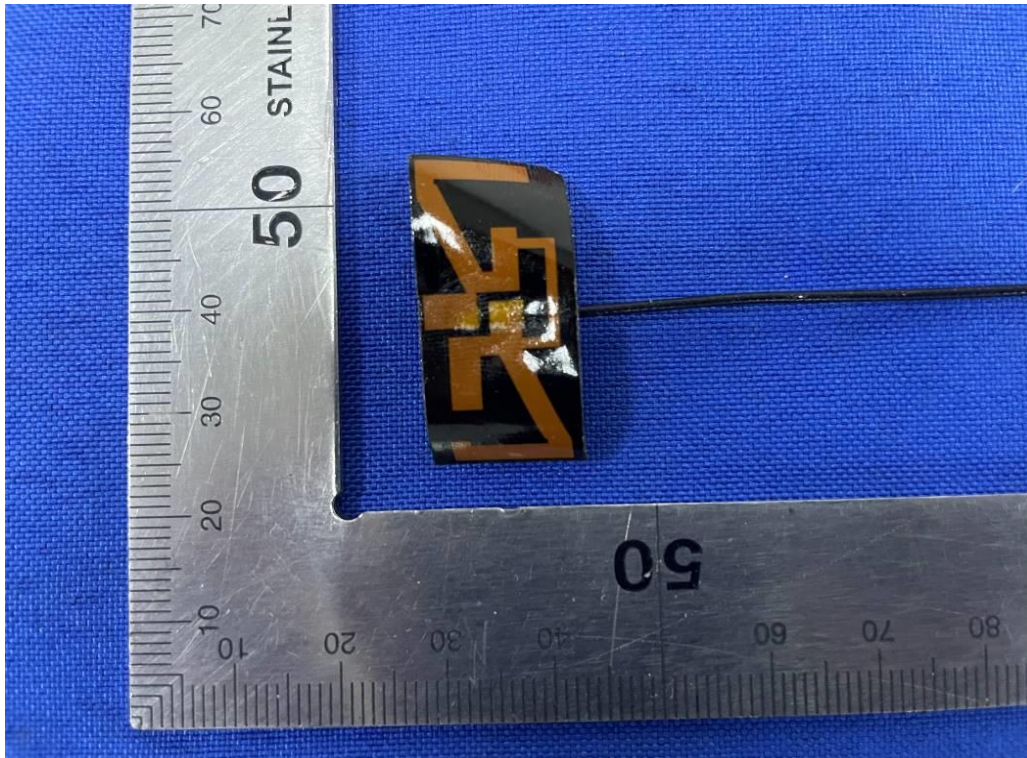
WiFi Antenna photo-1

# TEST REPORT

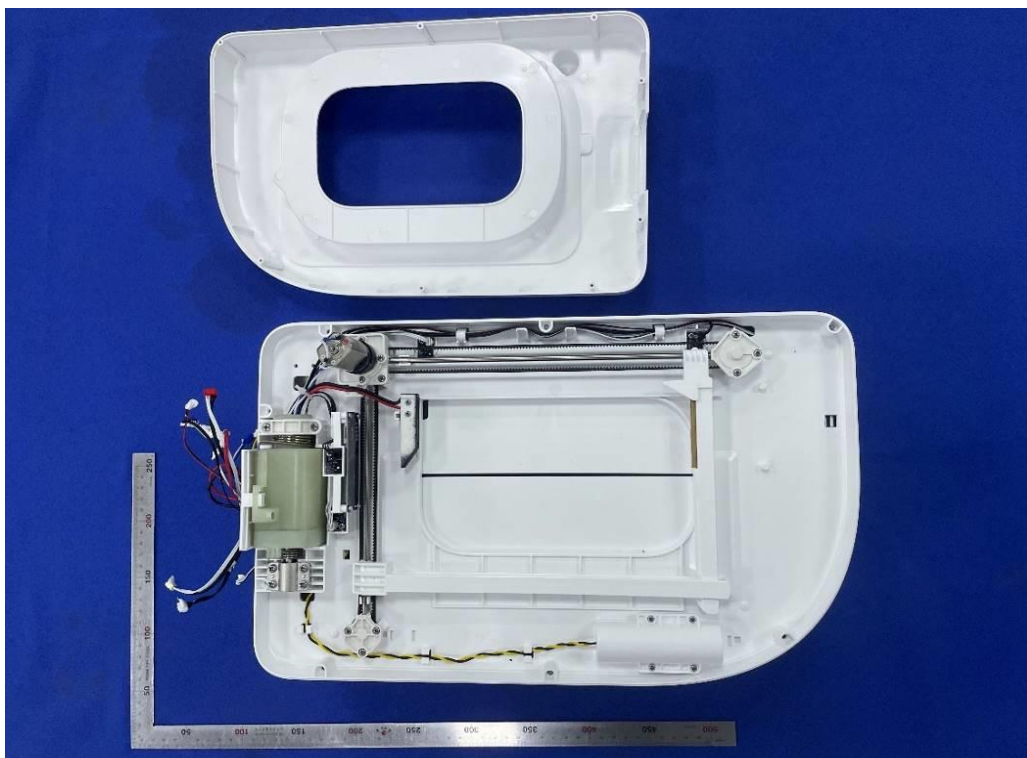
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WiFi Antenna photo-2



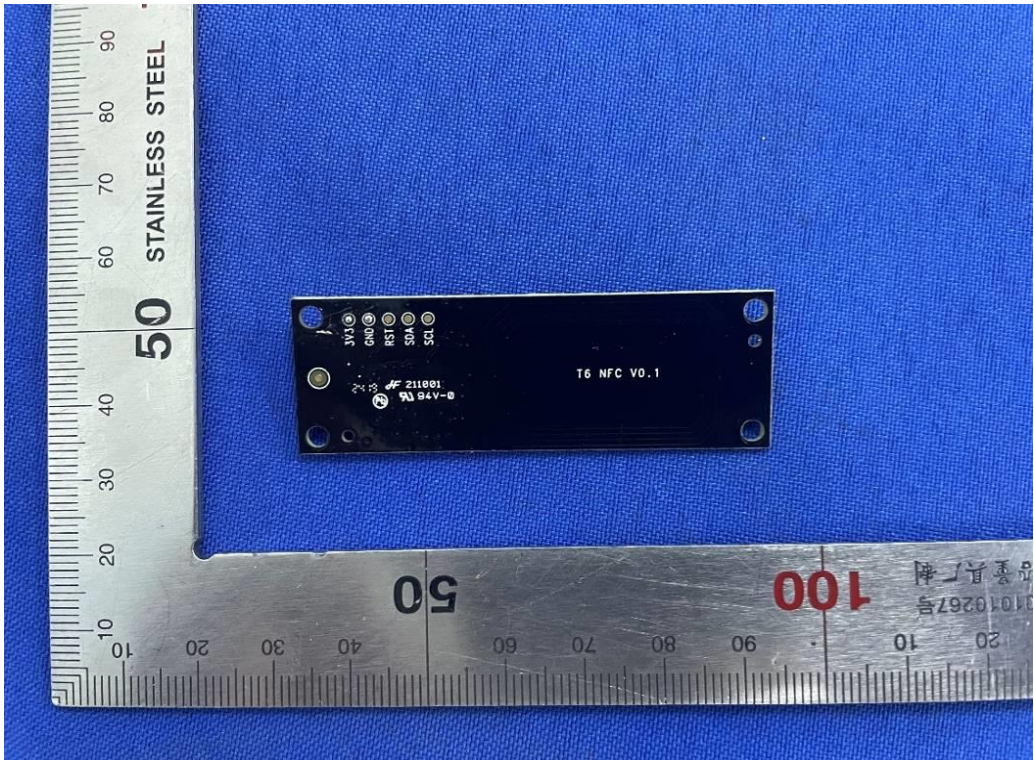
NFC-Open Photo

# TEST REPORT

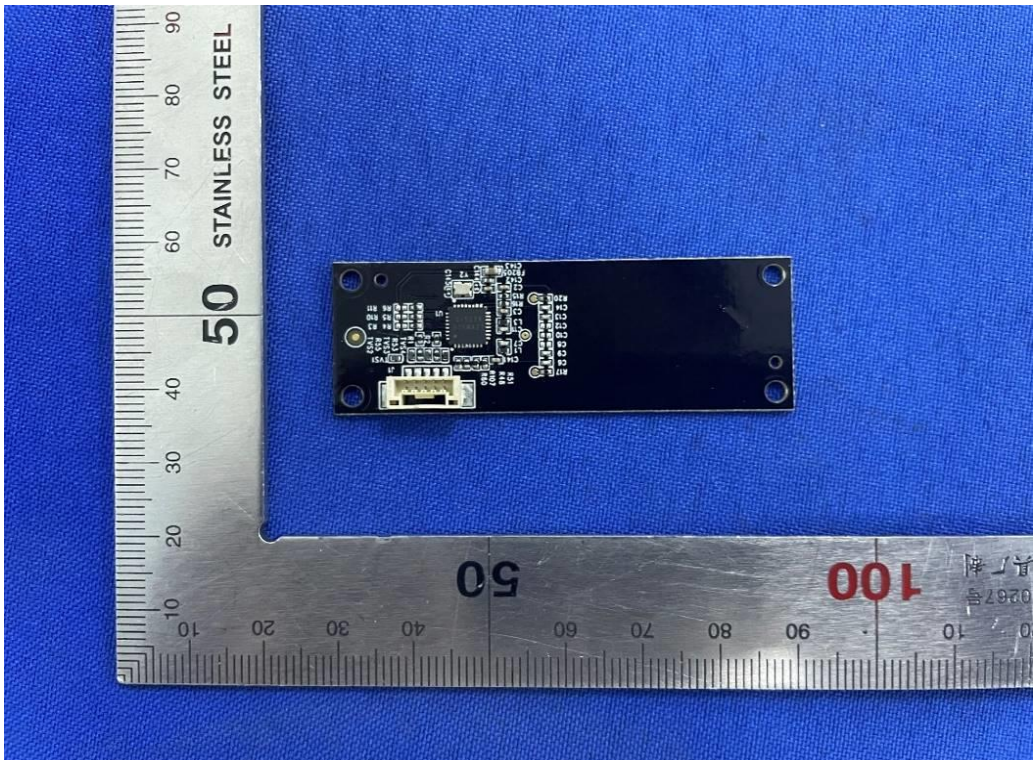
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NFC—PCB Board (Back)



NFC—PCB Board (Front)

# TEST REPORT

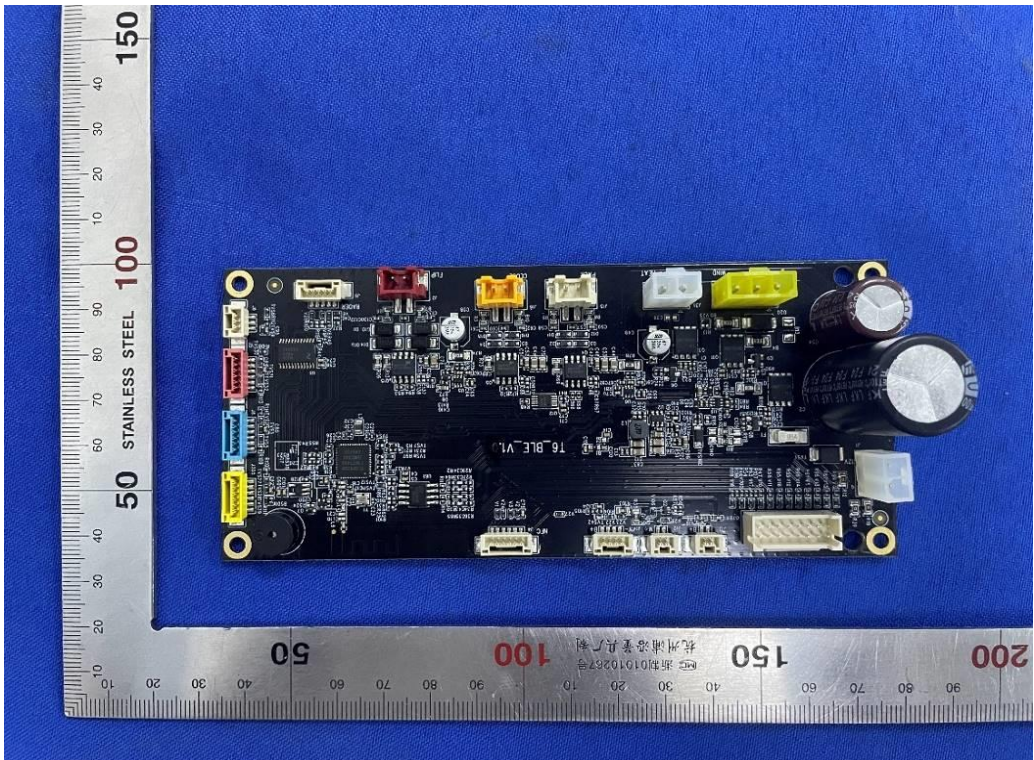
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Bluetooth LE-Open Photo



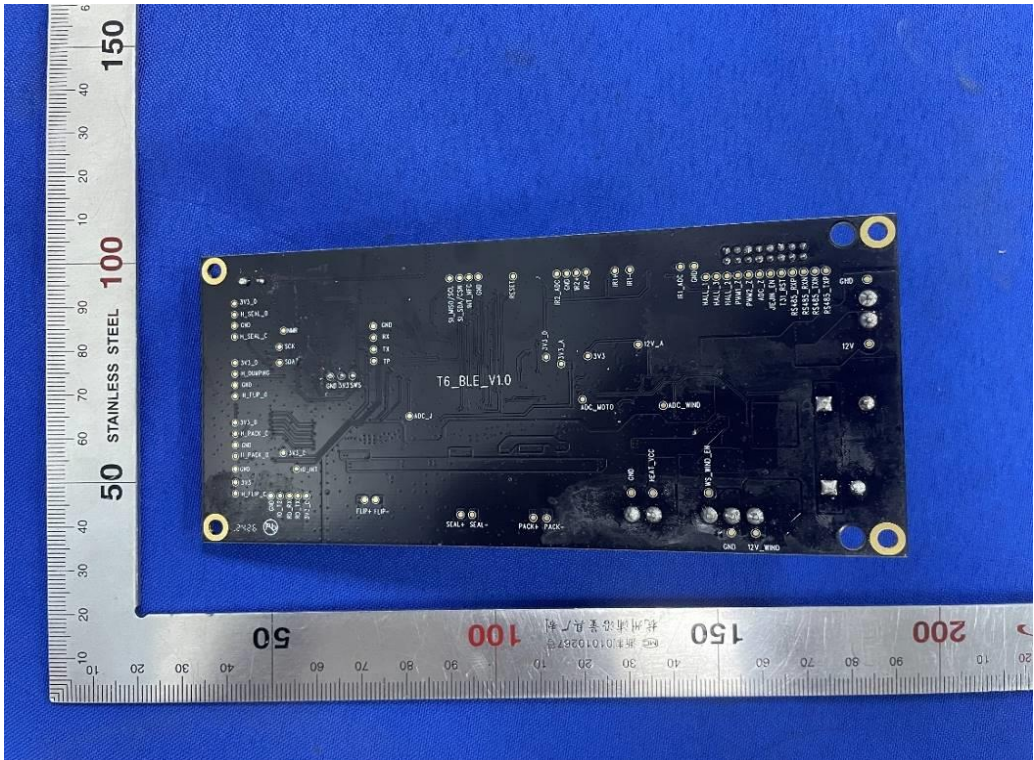
Bluetooth LE—PCB Board (Front)

# TEST REPORT

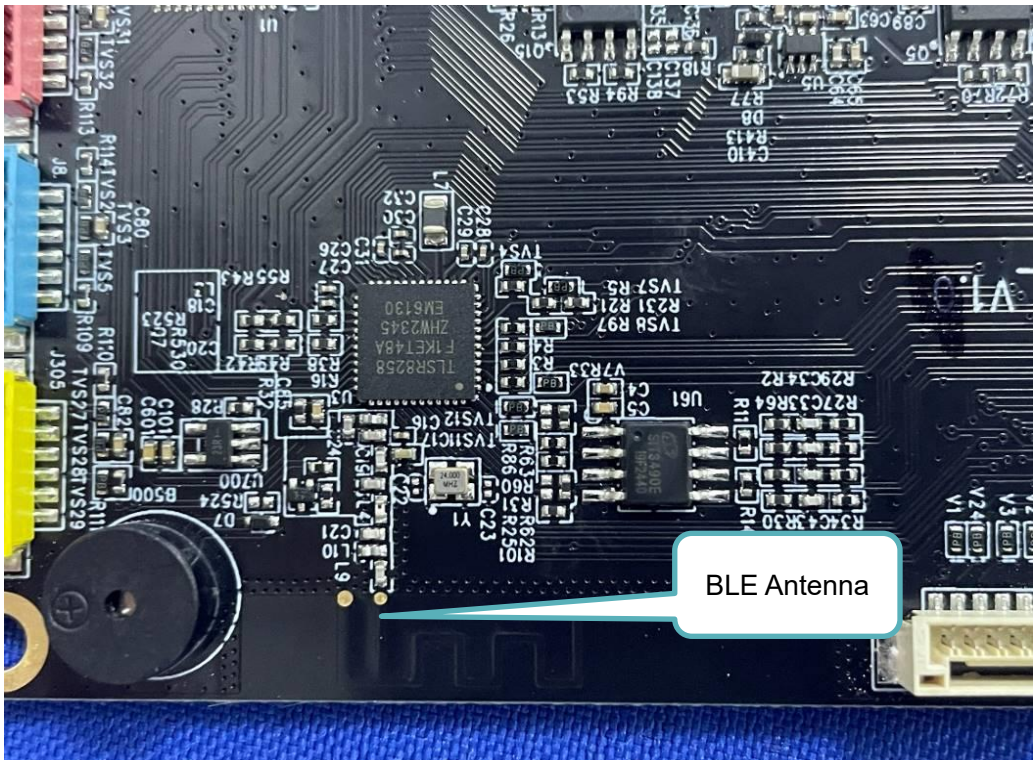
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Bluetooth LE—PCB Board (Back)



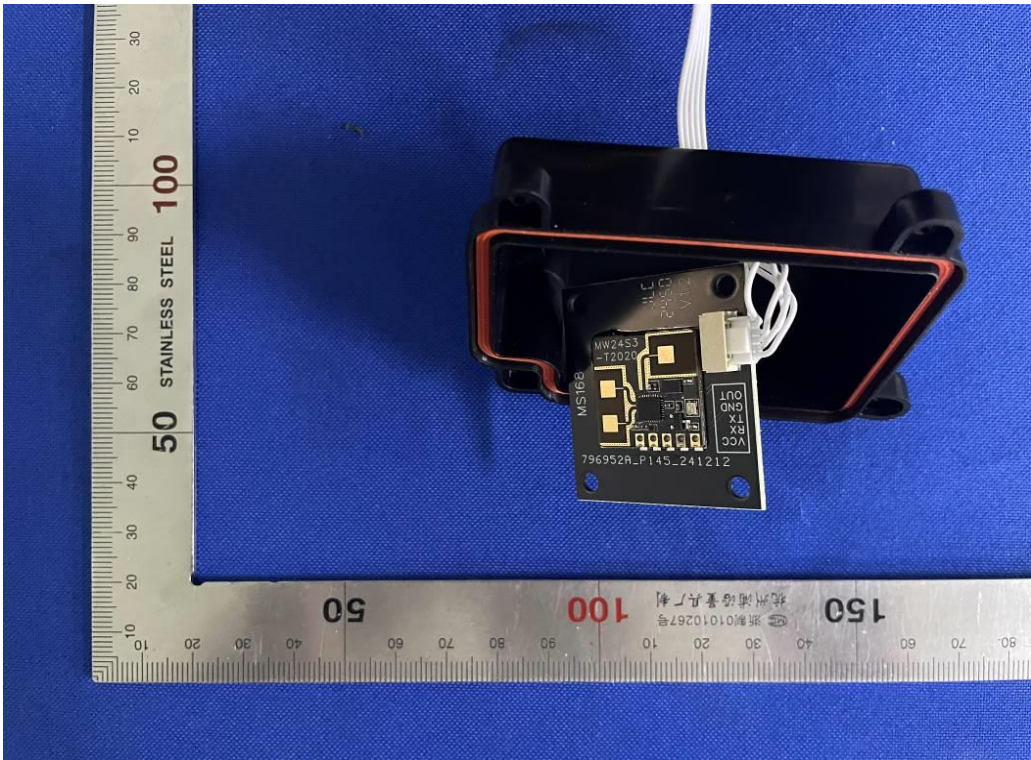
Bluetooth LE—Antenna Position

# TEST REPORT

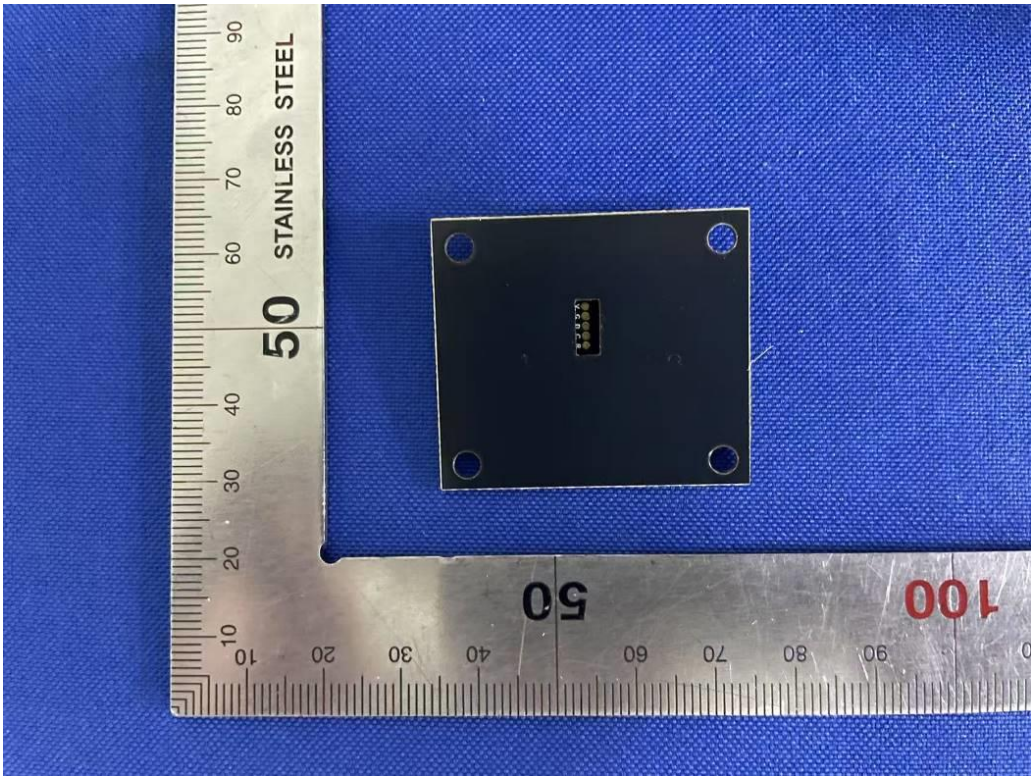
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Radar Photo-1



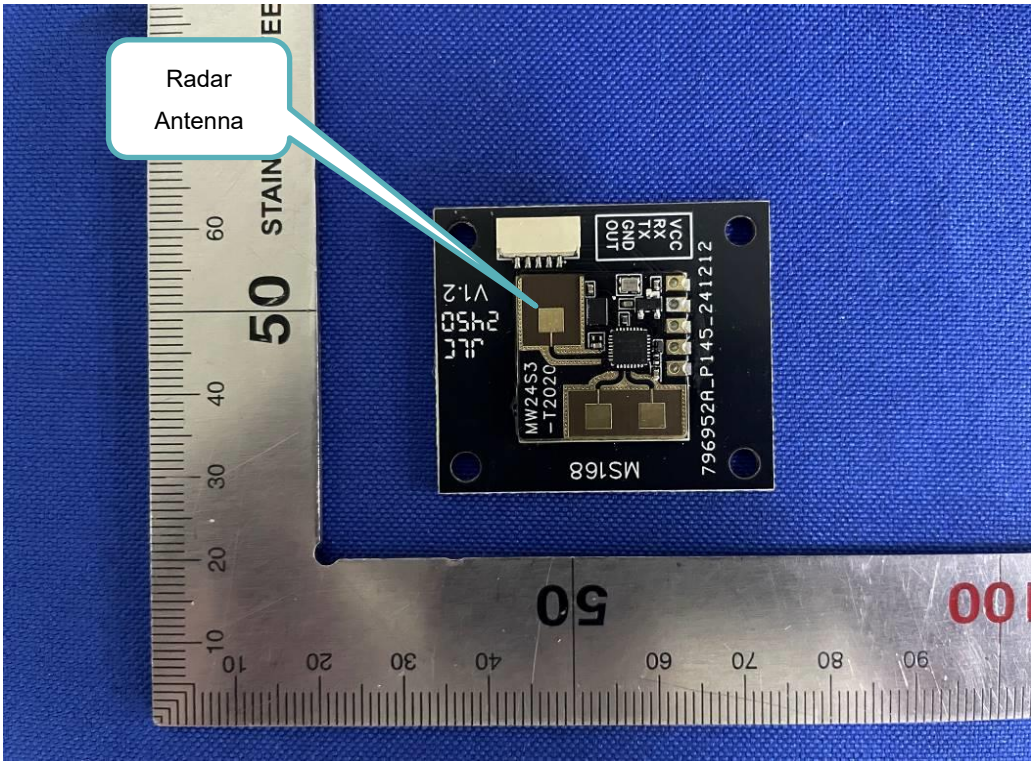
Radar Photo-2

# TEST REPORT

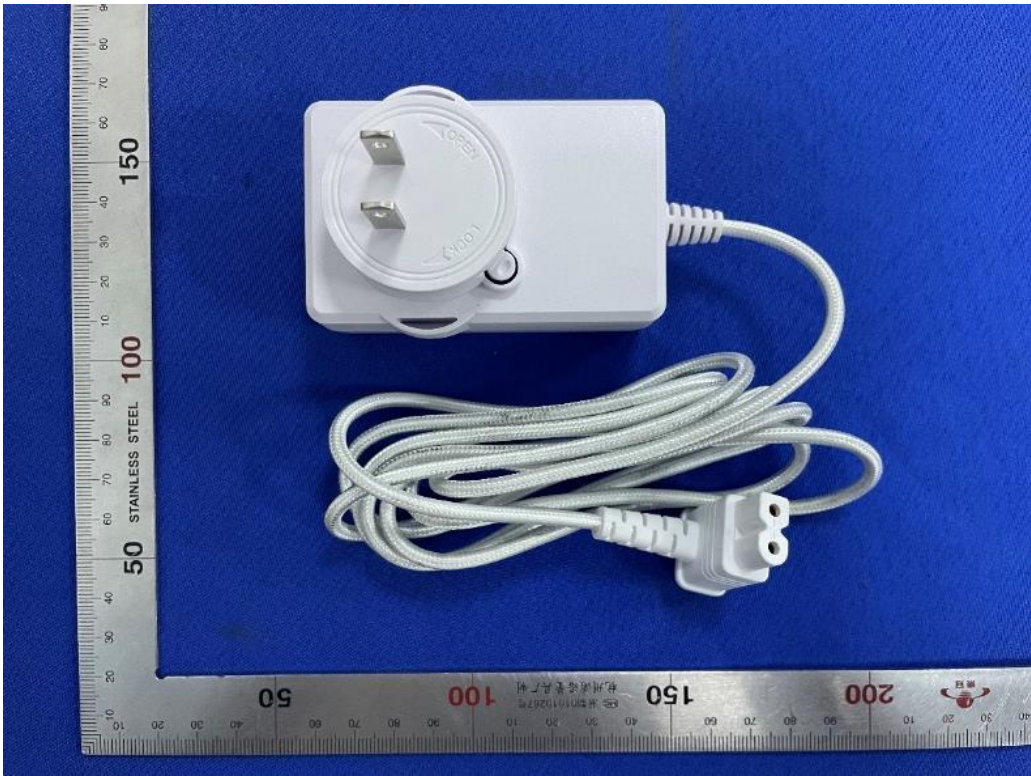
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Radar Photo-3



Adapter-1

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Adapter-2



Power Port

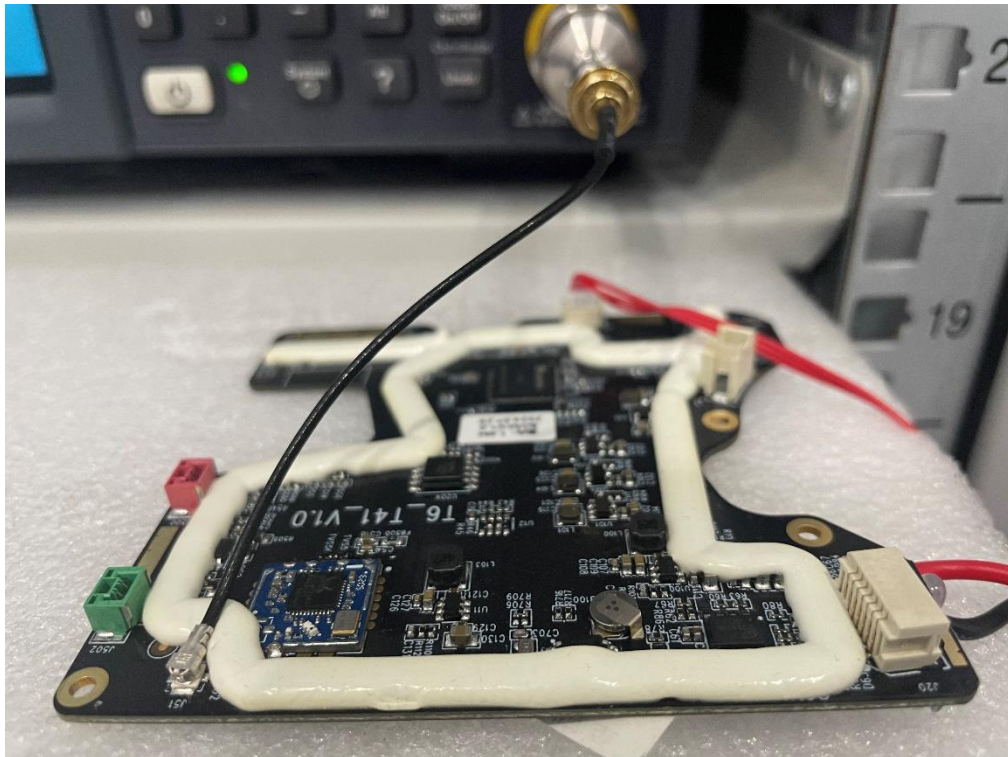
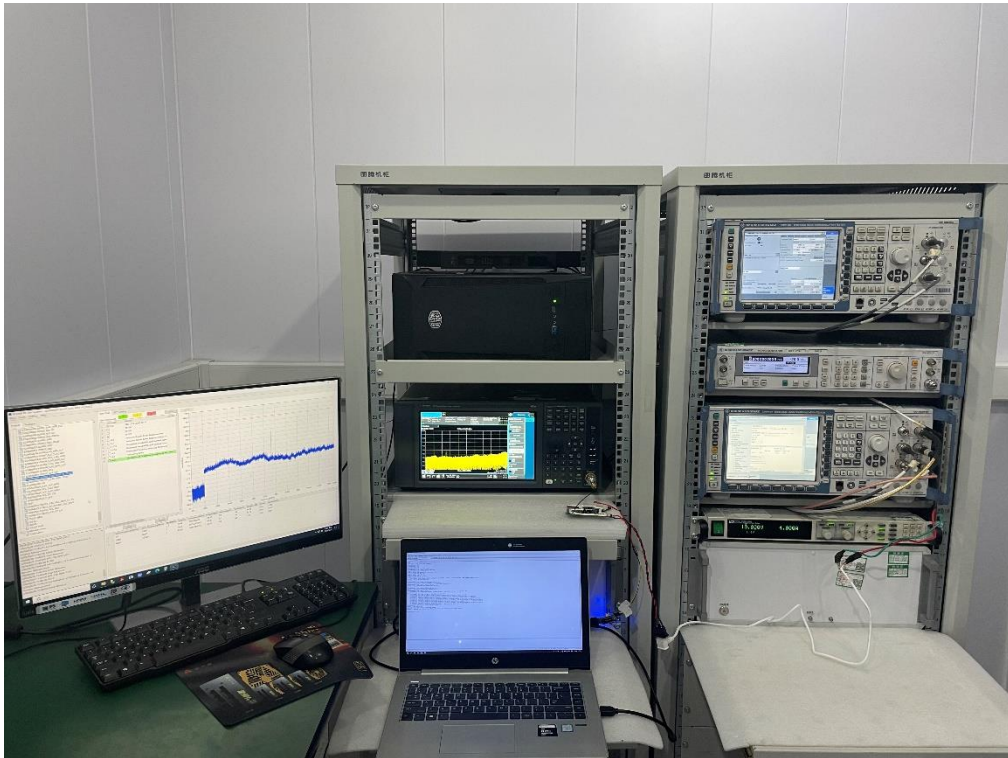
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## 5.2 Photographs of the Test Set-up



\*\*\*End of the report\*\*\*