# TEST REPORT



| | | |
|---|---|---|
| **Applicant** | : | SIMCom Wireless Solutions Limited |
| **Address of Applicant** | : | SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China |
| **Product Name** | : | Wi-Fi & BT Module |
| **Brand Name** | : | SIMCom |
| **Model Name** | : | W58 |
| **Sample Acquisition Method** | : | Sent by Client |
| **Sample No.** | : | E22110054-01#05<br>E22110054-01#08 |
| **FCC ID** | : | 2AJYU-8PYA00C |
| **ISED Number** | : | 23761-8PYA010 |
| **Standards** | : | FCC CFR47 Part 15, Subpart C<br>RSS-Gen (Issue 5, Amd.2-Feb 2021)<br>RSS-247 (Issue 2, February 2017) |
| **Date of Receipt** | : | 2023-02-15 |
| **Date of Test** | : | 2023-03-13 ~ 2023-04-17 |
| **Date of Issue** | : | 2023-04-17 |

***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: Guoyou Chi (Authorized signatory: Guoyou Chi)

# Contents

# 1 General Information

## 1.1 Testing Laboratory

| | |
|---|---|
| **ISED CAB identifier #** | CN0081 |
| **Company Name** | ICAS Testing Technology Service (Shanghai) Co., Ltd. |
| **Address** | No.1298 Pingan Rd, Minhang District, Shanghai, China |
| **Telephone** | 0086 21-51682999 |
| **Fax** | 0086 21-54711112 |
| **Homepage** | www.icasiso.com |

## 1.2 Details of Application

| | |
|---|---|
| **Applicant Company Name** | SIMCom Wireless Solutions Limited |
| **Address** | SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China |
| **Contact Person** | Yongsheng Li |
| **Telephone** | +86 21 3252 3134 |
| **Email** | yongsheng.li@simcom.com |
| **Manufacturer Company Name** | SIMCom Wireless Solutions Limited |
| **Address** | SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China |
| **Factory Company Name** | SIMCom Wireless Solutions Limited |
| **Address** | SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China |

## 1.3 Details of EUT

| | |
|---|---|
| **Product Name** | Wi-Fi & BT Module |
| **Brand Name** | SIMCom |
| **Test Model Name** | W58 |
| **FCC ID** | 2AJYU-8PYA00C |
| **ISED Number** | 23761-8PYA010 |
| **Mode of Operation** | WLAN 802.11b/g/n(HT20/40) |
| **Frequency Range** | 2400MHz ~ 2483.5MHz |
| **Channel Separation** | 5 MHz |
| **Modulation Type** | DSSS, OFDM |
| **Antenna Type** | External Antenna |
| **Antenna Gain** | 2.97dBi |
| **Test Voltage** | DC 3.3V |
| **Hardware version** | W58_V2.02_PCB |
| **Software version** | LE20B01V04SIM7600G22_MIFI2 |

| | |
|---|---|
| **Test SW Version** | BL410_R; BL410_E |
| **RF power setting in TEST SW** | 802.11b: QRCT_Power level setting_17dBm<br>802.11g: QRCT_Power level setting_13dBm<br>802.11n(HT20): QRCT_Power level setting_11dBm<br>802.11n(HT40): QRCT_Power level setting_10dBm |

*Note:*

1. *The above information was declared by the manufacture.*
2. *For more details, please refer to the User's manual of the EUT.*

**Channel List**

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

*Note:*

*For 20MHz bandwidth system use Channel 1 to Channel 11*

*For 40MHz bandwidth system use Channel 3 to Channel 9*

## 1.4 Test Methodology

| | |
|---|---|
| 47 CFR Part 15, Subpart C | Telecommunication-Radio Frequency Devices-Intentional Radiators |
| KDB Publication 558074 D01 v05r02 | 15.247 Measure Guidance. |
| RSS-Gen (Issue 5, Amd.2-Feb 2021) | General Requirements for Compliance of Radio Apparatus |
| RSS-247 (Issue 2, February 2017) | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices |
| ANSI C63.10-2013 | American National Standard for Testing Unlicensed Wireless Devices |

**Note(s):**

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

## 1.5 Test Summary

| Test Item | FCC Rules | ISED Rules | Result |
|---|---|---|---|
| Antenna Requirement | FCC Part 15.247(b)(4), Part 15.203 | RSS-247 5.4(f) RSS-GEN 6.8 | PASS |
| Maximum peak conducted output power and E.I.R.P | FCC Part 15.247(b)(3) | RSS-247 5.4(d) | PASS |
| 6dB Bandwidth and 99% Bandwidth | FCC Part 15.247(a)(2) | RSS-247 5.2(a) RSS-Gen 6.7 | PASS |
| Maximum conducted output power spectral density | FCC Part 15.247(e) | RSS-247 5.2(b) | PASS |
| Conducted Spurious Emission & Authorized-band band-edge | FCC Part 15.247(d) | RSS-247 5.5 | PASS |
| Radiated Emission | FCC Part 15.247(d), 15.205, 15.209 | RSS-GEN 8.9 | PASS |
| Band Edge (Restricted-band band-edge) | FCC Part 15.247(d), 15.205, 15.209 | RSS-GEN 8.10 | PASS |
| Conducted Emission on AC Mains | FCC Part 15.207(a) | RSS-Gen 8.8 | PASS |

# 2 Test Condition

## 2.1 Test Facility

## 2.2 Environmental conditions

| | |
|---|---|
| **Temperature (°C)** | 18-25 |
| **Humidity (%RH)** | 40-65 |
| **Barometric Pressure (mbar)** | 960-1060 |

## 2.3 Equipment List

| Name of Equipment | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
|---|---|---|---|---|---|
| Spectrum Analyzer | Keysight | N9020B | MY59260184 | 2022-08-02 | 2023-08-01 |
| Spectrum Analyzer | Keysight | N9020A | MY54101709 | 2022-08-02 | 2023-08-01 |
| Spectrum Analyzer | Rohde & Schwarz | FSV40N | 101450 | 2022-06-10 | 2023-06-09 |
| Signal Generator | Rohde & Schwarz | SMR27 | 100184 | 2022-08-02 | 2023-08-01 |
| EMI Test Receiver | Rohde & Schwarz | ESR 7 | 101911 | 2022-06-10 | 2023-06-09 |
| EMI Test Receiver | Rohde & Schwarz | ESPI3 | 100173 | 2022-06-10 | 2023-06-09 |
| V-network | SCHWARZBECK | NSLK8127 | 8127-902 | 2022-06-10 | 2023-06-09 |
| Broadband Antenna | SCHWARZBECK | VULB9163 | 9163-1037 | 2021-06-08 | 2023-06-07 |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 9120D-1775 | 2021-06-08 | 2023-06-07 |
| Loop Antenna | SCHWARZBECK | FMZB 1513 | / | 2022-06-10 | 2023-06-09 |
| Broadband Preamplifier | SCHWARZBECK | BBV 9718 | 346 | 2022-06-10 | 2023-06-09 |
| EMC chamber 9*6*6（L*W*H) | CHANGNING | 966 | N/A | 2022-06-10 | 2023-06-09 |
| Shielded Enclosure 8*5*4（L*W*H) | CHANGNING | 854 | N/A | 2022-06-10 | 2023-06-09 |
| Test Software | BL | BL410_E | Version:1.0.0.117 | N/A | N/A |
| Test Software | BL | BL410_R | Version:2.1.1.409 | N/A | N/A |

## 2.4 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 ±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 |
|---|---|---|
| Antenna Port Conducted Emission | < 1GHz | ± 1.5 dB |
| | > 1GHz | ± 1.5 dB |
| Radiated Emission | 9KHz – 30MHz | ± 3.42 dB |
| | 30 MHz – 1GHz | ± 5.00 dB |
| | > 1GHz | ± 4.88 dB |
| Conducted Emission on AC Mains | 150kHz-30MHz | ± 2.68 dB |
| Occupied Channel Bandwidth | | ±5 % |

# 3 Test Set-up and Operation Modes

## 3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. Select test channel as below:
For 802.11b/g/n (HT20)

| Channel | Frequency |
|---|---|
| The lowest channel(CH1) | 2412MHz |
| The middle channel(CH6) | 2437MHz |
| The Highest channel(CH11) | 2462MHz |

For 802.11n(HT40)

| Channel | Frequency |
|---|---|
| The lowest channel(CH3) | 2422MHz |
| The middle channel(CH6) | 2437MHz |
| The Highest channel(CH9) | 2452MHz |

Through Pre-scan under all rate at lowest channel, the data rate as below table described is the worst case, so we choose these data rate for test.

| Type | Data rate |
|---|---|
| 802.11b | 5.5Mbps |
| 802.11g | 36Mbps |
| 802.11n(20M) | MCS4 |
| 802.11n(40M) | MCS7 |

The basic operation modes are:

A. On
    1. WLAN mode
        a. Transmitting
            i. Low Channel
            ii. Middle Channel
            iii. High Channel
        b. Receiving
B. Standby
C. Off

## 3.2 Special Accessories and Auxiliary Equipment

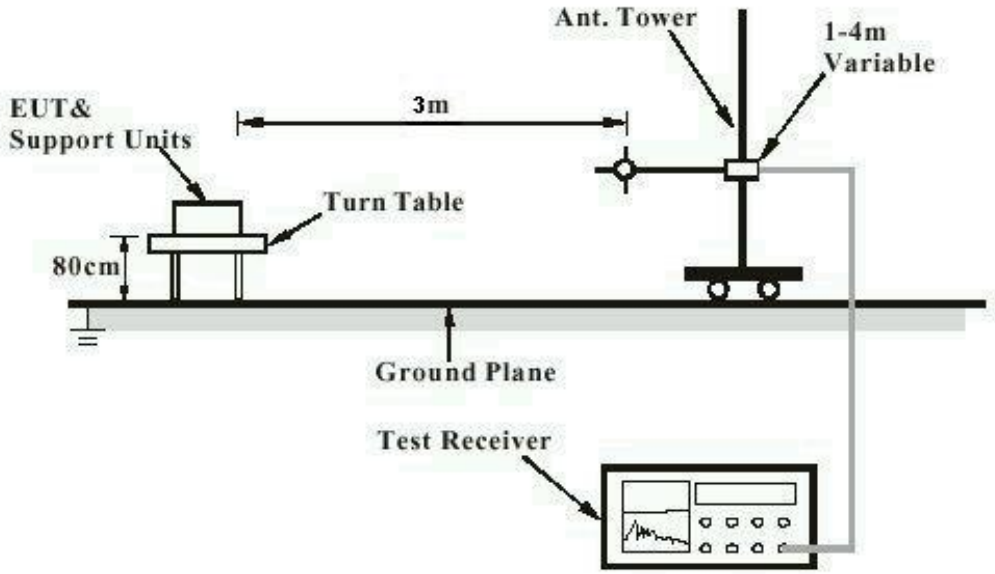
| Description | Manufacturer | Model Name | Serial No. |
|---|---|---|---|
| Laptop | Lenovo | TP00083A | PF-0PRDGN 17/03 |
| Adapter | Something High Electric(Xiamen) Company Inc. | P-050B-050200EU | N/A |
| EVB Debug Board | SIMCom | 8PYA00-SIMCOM-EVB_V1.02 | N/A |
| USB Cable | SIMCom | N/A | 1.00m Unshielded |

## 3.3 Support Software

| Description | Manufacturer | Software Name |
|---|---|---|
| Software | Qualcomm | QRCT Version 4.0.00166.0 |

## 3.4 Test Setup Diagram

**Diagram of Measurement Configuration for Radiation Test**




Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

**Diagram of Measurement Equipment Configuration for Conduction Measurement**

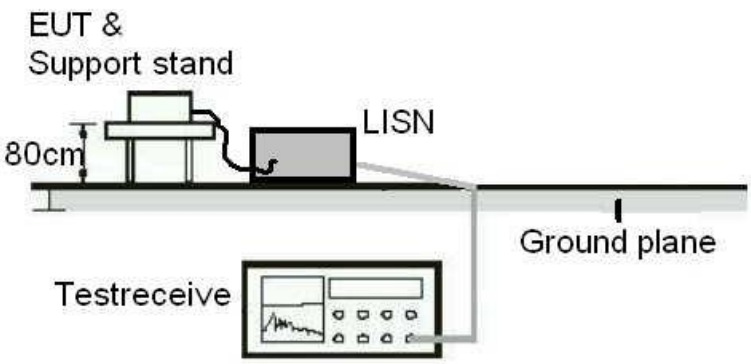


**Diagram of Measurement Equipment Configuration for Transmitter Measurement**

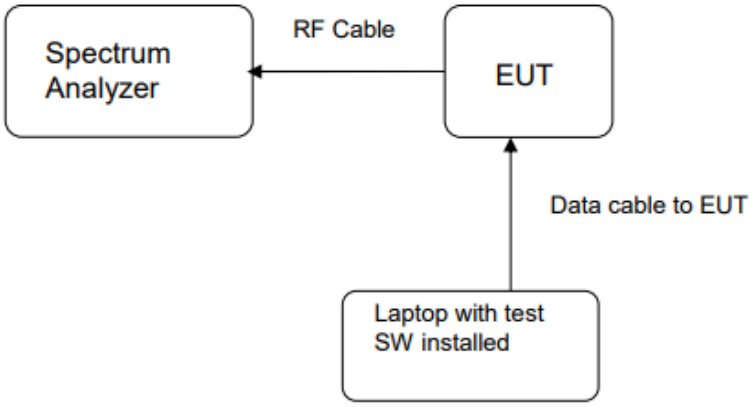
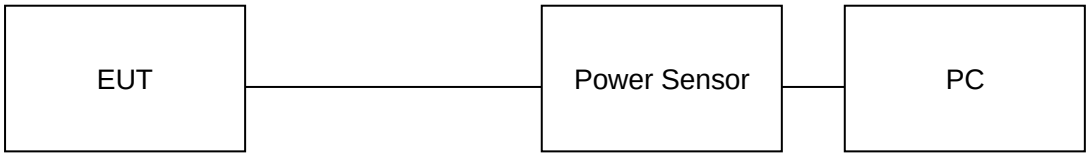



**Diagram of Measurement Equipment Configuration for conducted output power setup**



# 4 Test Results

## 4.1 Transmitter Requirement & Test Suites

### 4.1.1 Antenna Requirement

**RESULT:** **PASS**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(b)(4), Part 15.203<br>RSS-247 5.4(f), RSS-GEN 6.8 |
| Requirement | : | The use of approved antennas only with directional gains that do not exceed 6dBi |

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 2.97dBi. The antenna is an external antenna with no possibility of replacement with a non-approved antenna by the end-user.

Therefore, the EUT is considered to comply with this provision.

### 4.1.2 Maximum peak conducted output power and E.I.R.P

**RESULT:** **PASS**

Test standard : FCC Part 15.247(b)(3), RSS-247 5.4(d)
Requirement : ANSI C63.10-2013 clause 11.9.1.3,
KDB 558074 clause 8.3.1.3
Kind of test site : Shielded room

**Test setup**

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 24.7°C
Relative humidity : 60%

**Table 1: Maximum peak conducted output power**

| Test Mode | Test Channel (MHz) | Maximum peak conducted output power | | Limit (W) |
|---|---|---|---|---|
| | | (dBm) | (mW) | |
| 802.11b | 2412 | 16.57 | 45.39 | < 1 |
| | 2437 | 16.17 | 41.40 | |
| | 2462 | 15.93 | 39.17 | |
| 802.11g | 2412 | 13.52 | 22.49 | |
| | 2437 | 13.33 | 21.53 | |
| | 2462 | 12.76 | 18.88 | |
| 802.11n(HT20) | 2412 | 11.29 | 13.46 | |
| | 2437 | 11.44 | 13.93 | |
| | 2462 | 11.52 | 14.19 | |
| 802.11n(HT40) | 2422 | 11.39 | 13.77 | |
| | 2437 | 11.48 | 14.06 | |
| | 2452 | 11.28 | 13.43 | |

**Table 2: E.I.R.P**

| Test Mode | Test Channel (MHz) | E.I.R.P | | Limit (W) |
|---|---|---|---|---|
| | | (dBm) | (mW) | |
| 802.11b | 2412 | 19.54 | 89.95 | < 4 |
| | 2437 | 19.14 | 82.04 | |
| | 2462 | 18.90 | 77.62 | |
| 802.11g | 2412 | 16.49 | 44.57 | |
| | 2437 | 16.30 | 42.66 | |
| | 2462 | 15.73 | 37.41 | |
| 802.11n(HT20) | 2412 | 14.26 | 26.67 | |
| | 2437 | 14.41 | 27.61 | |
| | 2462 | 14.49 | 28.12 | |
| 802.11n(HT40) | 2422 | 14.36 | 27.29 | |
| | 2437 | 14.45 | 27.86 | |
| | 2452 | 14.25 | 26.61 | |

*Notes：*

1. EIRP = Conducted output power + Antenna Gain.
2. Antenna Gain is 2.97dBi.

### 4.1.3 6dB Bandwidth and 99% Bandwidth

**RESULT:** **PASS**

Test standard : FCC Part 15.247(a)(2), RSS-247 5.2(a)
RSS-Gen 6.7
Requirement : ANSI C63.10-2013 clause 11.8.1,
KDB 558074 clause 8.2
Kind of test site : Shielded room

**Test setup**

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 24.7°C
Relative humidity : 60%

**Table 3: 6dB Bandwidth and 99% Bandwidth**

| Test Mode | Test Channel (MHz) | 6dB Bandwidth (MHz) | 99% Bandwidth (MHz) | 6 dB Bandwidth Limit (MHz) |
|---|---|---|---|---|
| 802.11b | 2412 | 8.116 | 13.086 | ≥0.5 |
| | 2437 | 8.637 | 12.638 | |
| | 2462 | 7.430 | 13.051 | |
| 802.11g | 2412 | 16.450 | 17.017 | |
| | 2437 | 16.170 | 16.790 | |
| | 2462 | 16.390 | 16.899 | |
| 802.11n(HT20) | 2412 | 17.310 | 18.024 | |
| | 2437 | 17.320 | 17.903 | |
| | 2462 | 17.300 | 18.075 | |
| 802.11n(HT40) | 2422 | 35.750 | 36.478 | |
| | 2437 | 35.180 | 36.098 | |
| | 2452 | 35.330 | 36.082 | |

**Figure 1: The plots of 6dB Bandwidth, 802.11b, 2412MHz**

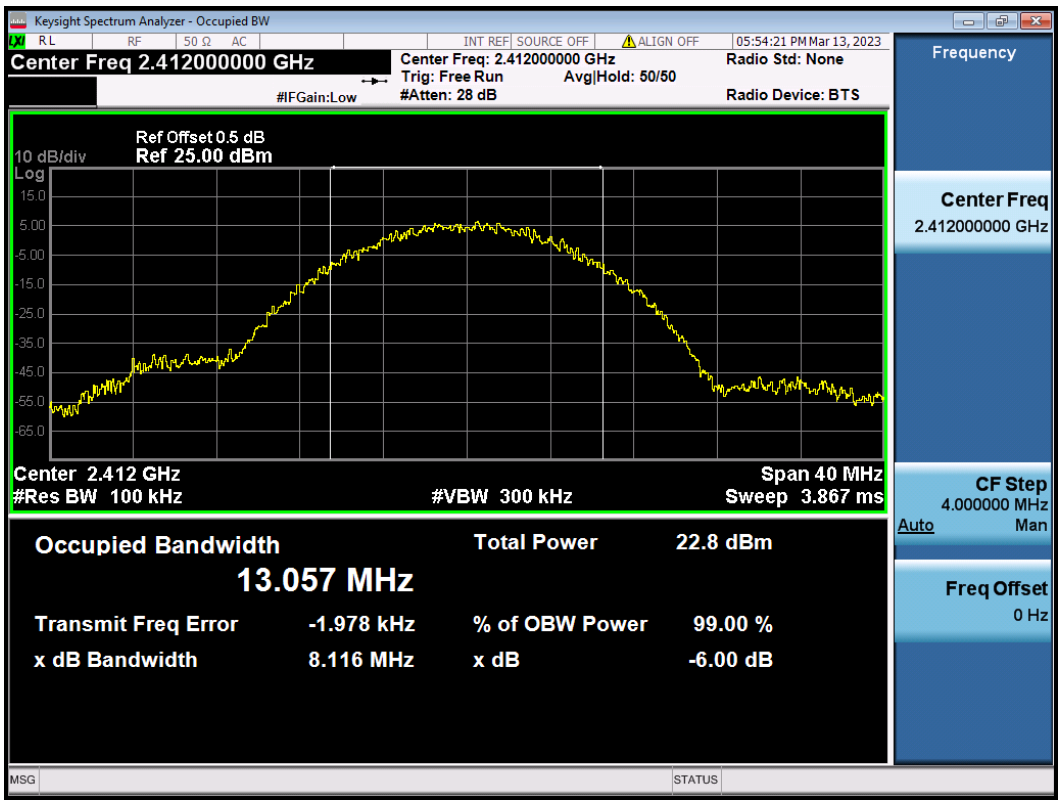



**Figure 2: The plots of 99% Bandwidth, 802.11b, 2412MHz**

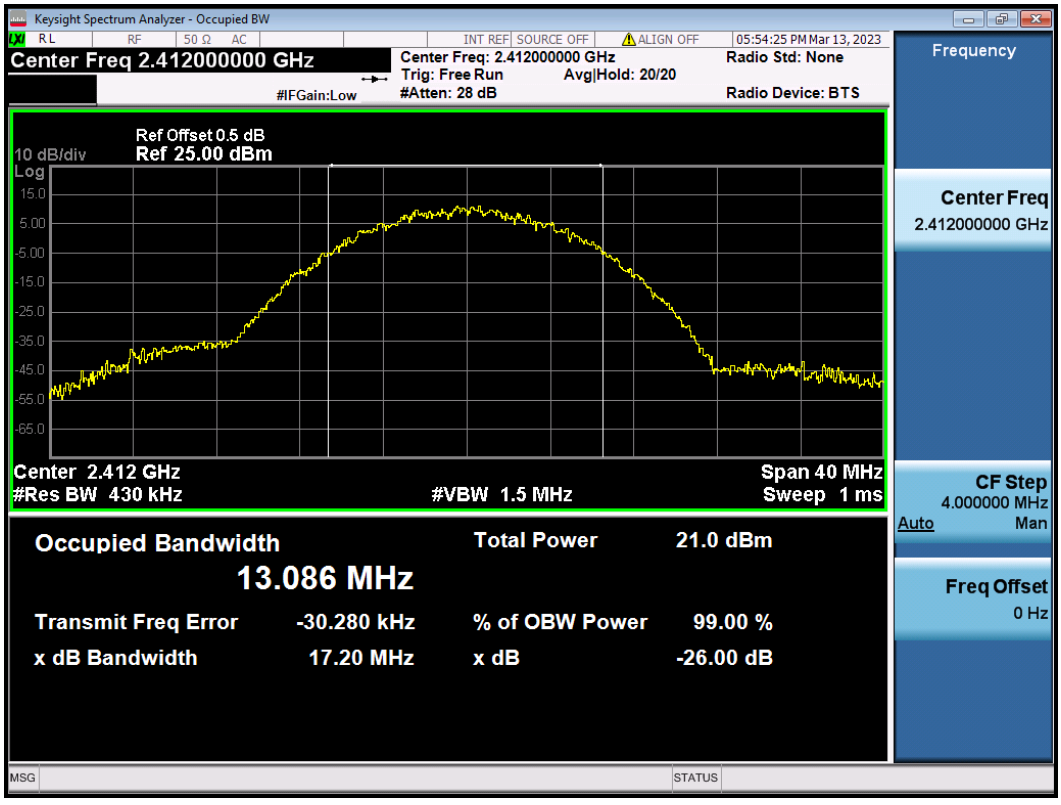


**Figure 3: The plots of 6dB Bandwidth, 802.11b, 2437MHz**

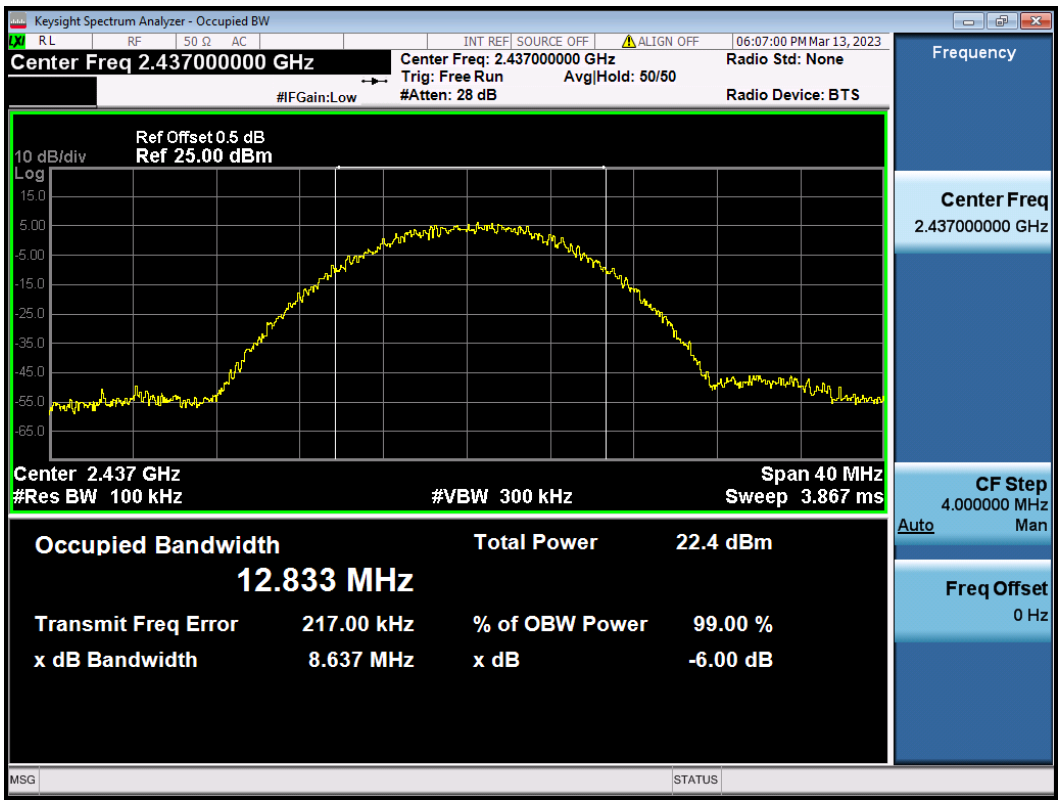



**Figure 4: The plots of 99% Bandwidth, 802.11b, 2437MHz**

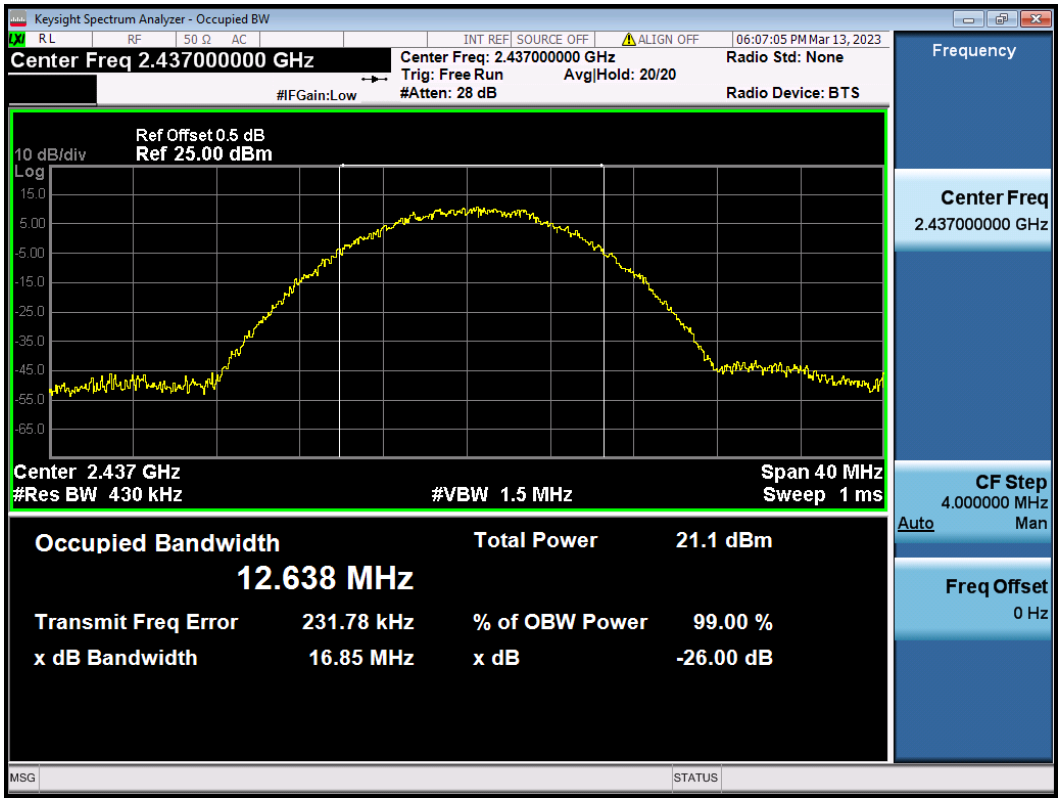


**Figure 5: The plots of 6dB Bandwidth, 802.11b, 2462MHz**

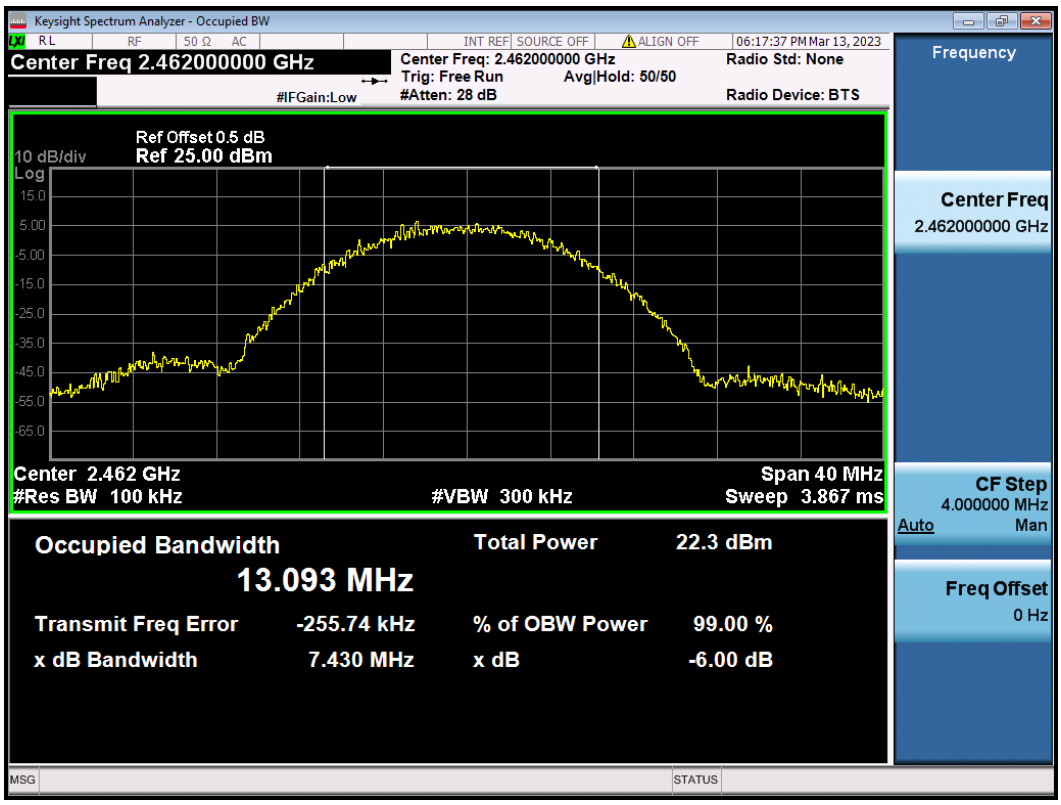



**Figure 6: The plots of 99% Bandwidth, 802.11b, 2462MHz**

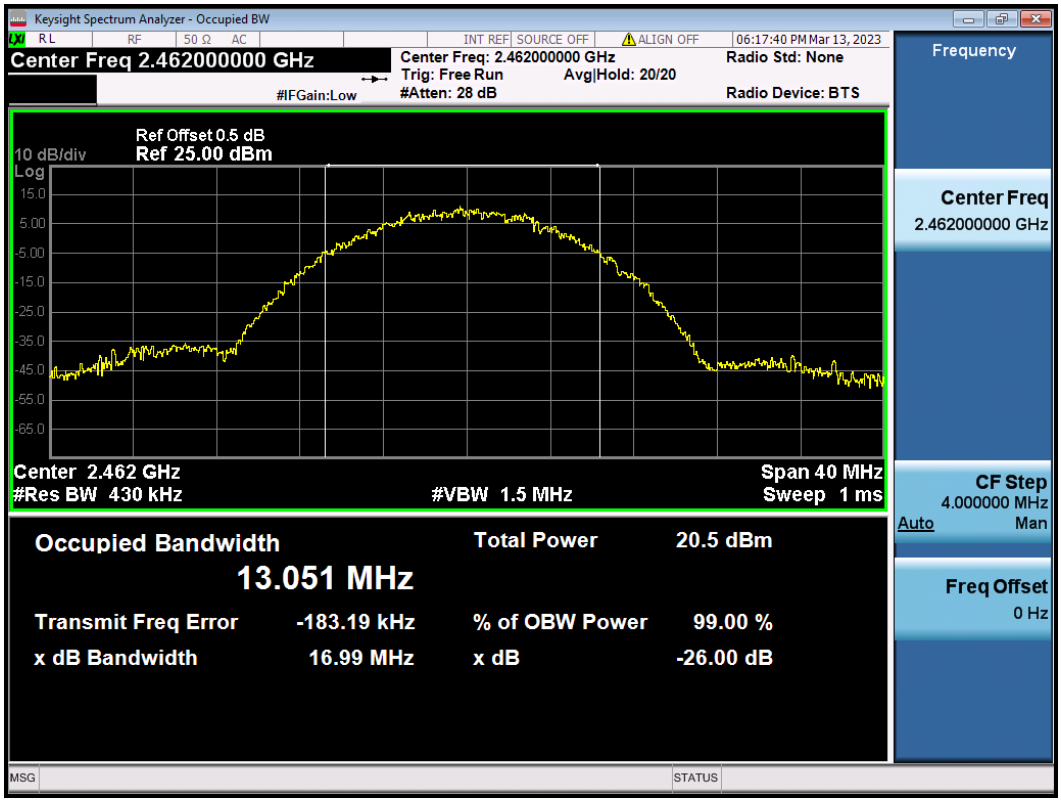


**Figure 7: The plots of 6dB Bandwidth, 802.11g, 2412MHz**

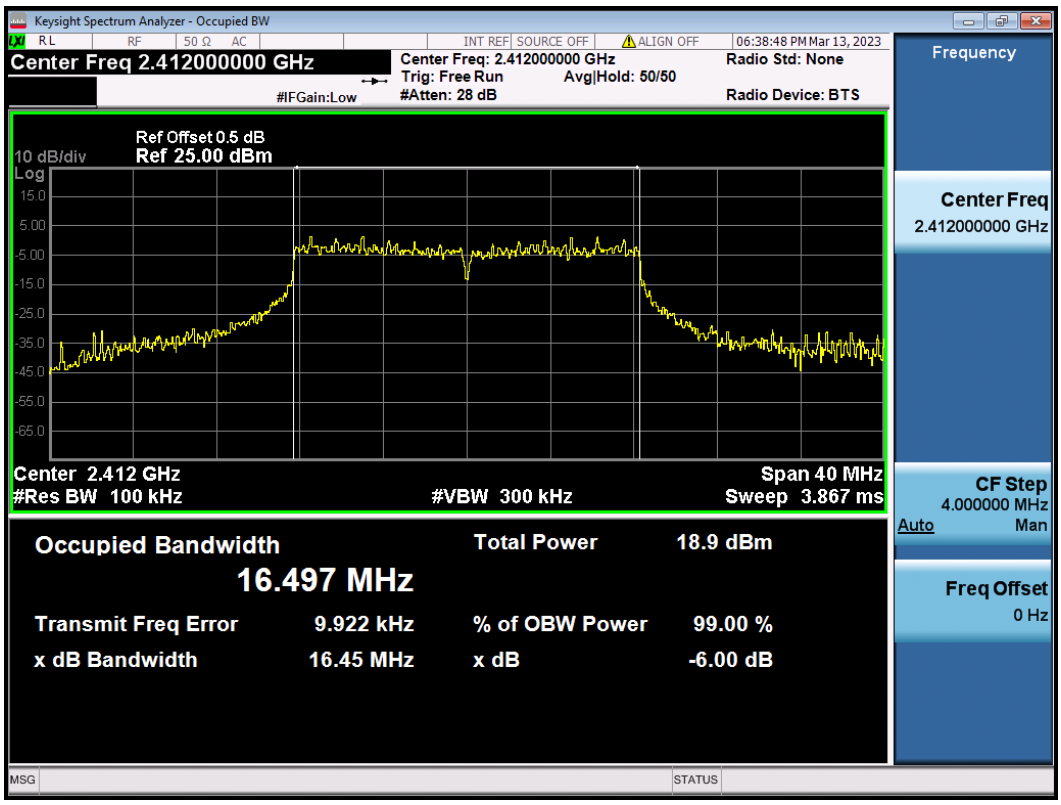



**Figure 8: The plots of 99% Bandwidth, 802.11g, 2412MHz**

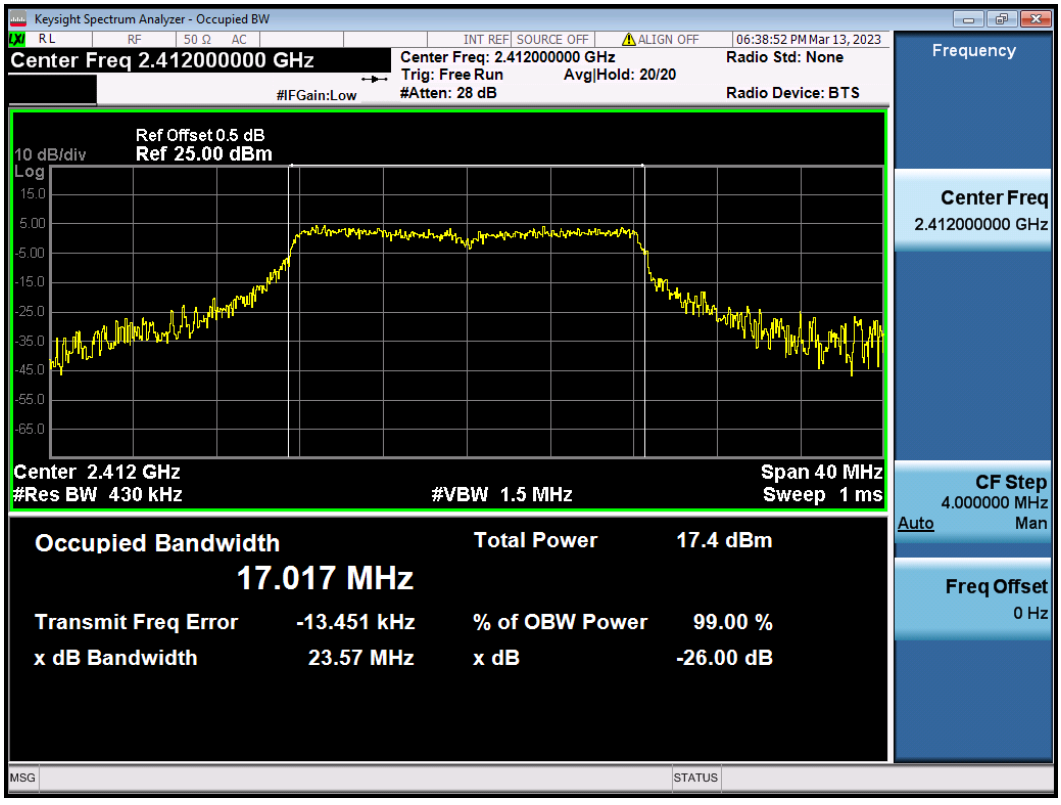


**Figure 9: The plots of 6dB Bandwidth, 802.11g, 2437MHz**


**Figure10: The plots of 99% Bandwidth, 802.11g, 2437MHz**

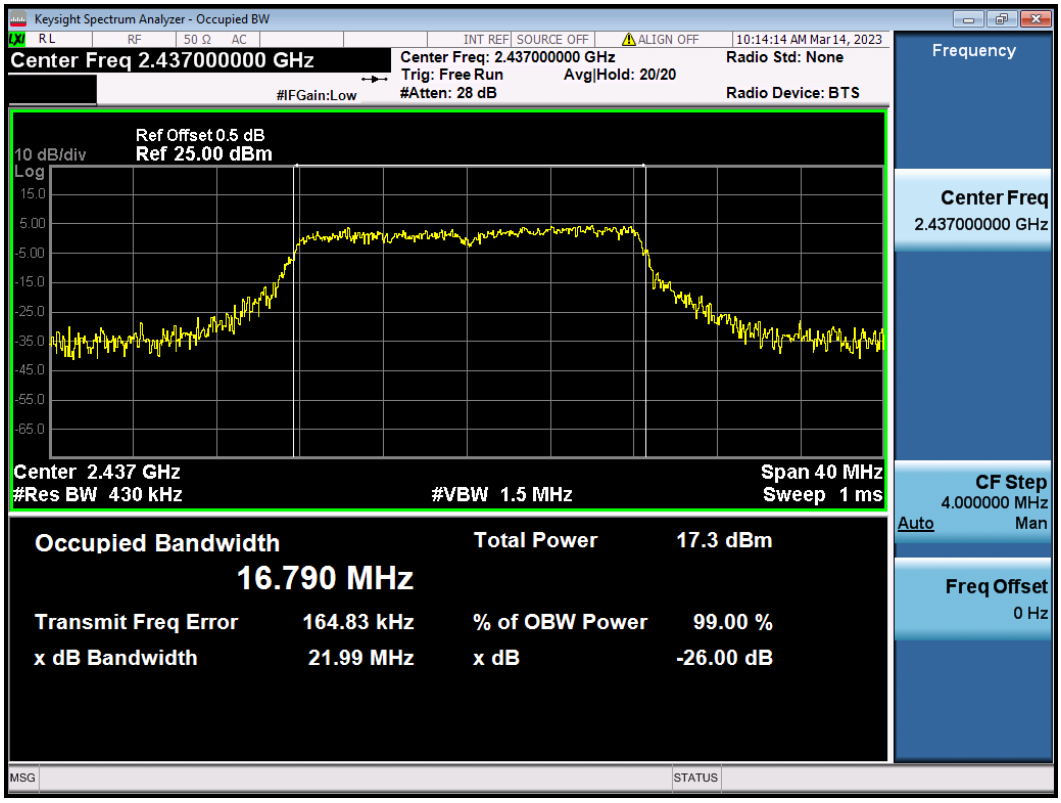


**Figure 11: The plots of 6dB Bandwidth, 802.11g, 2462MHz**

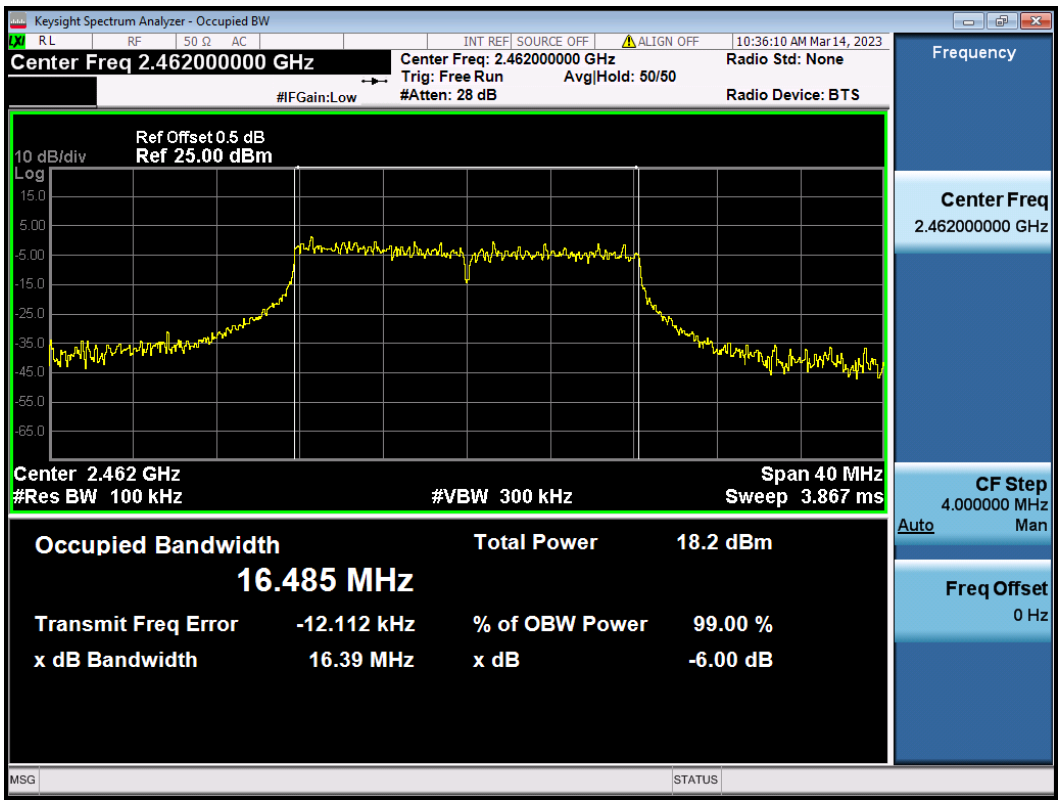



**Figure 12: The plots of 99% Bandwidth, 802.11g, 2462MHz**

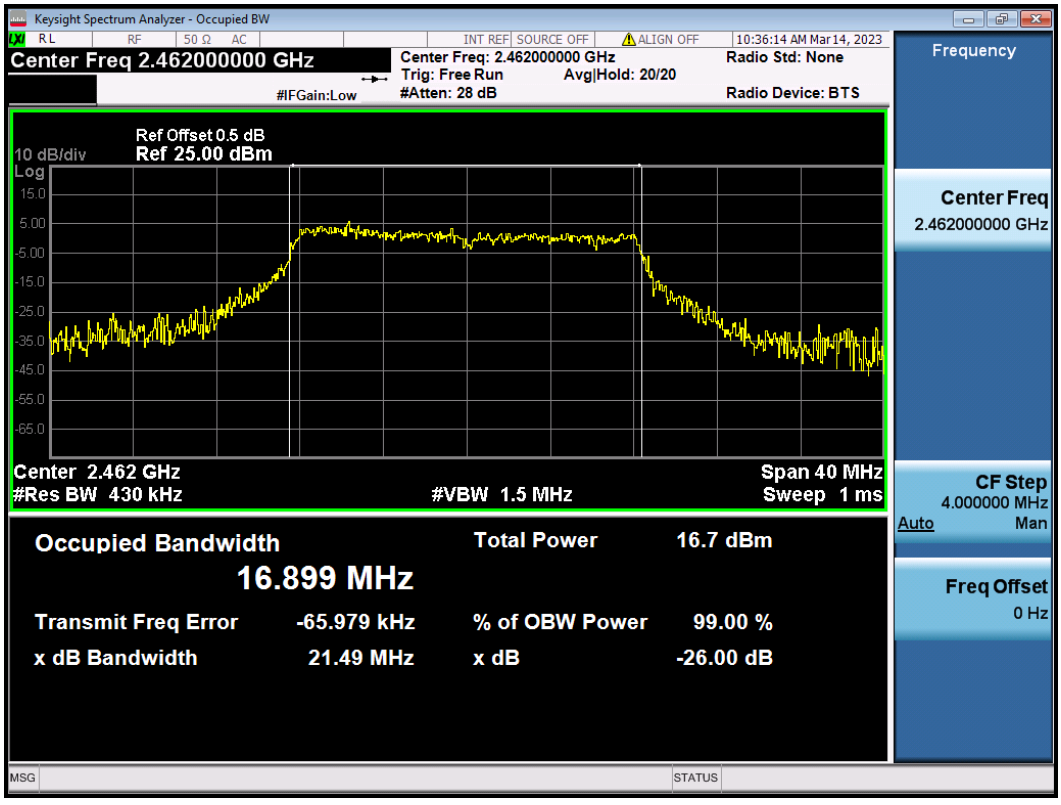


**Figure 13: The plots of 6dB Bandwidth, 802.11n(HT20), 2412MHz**

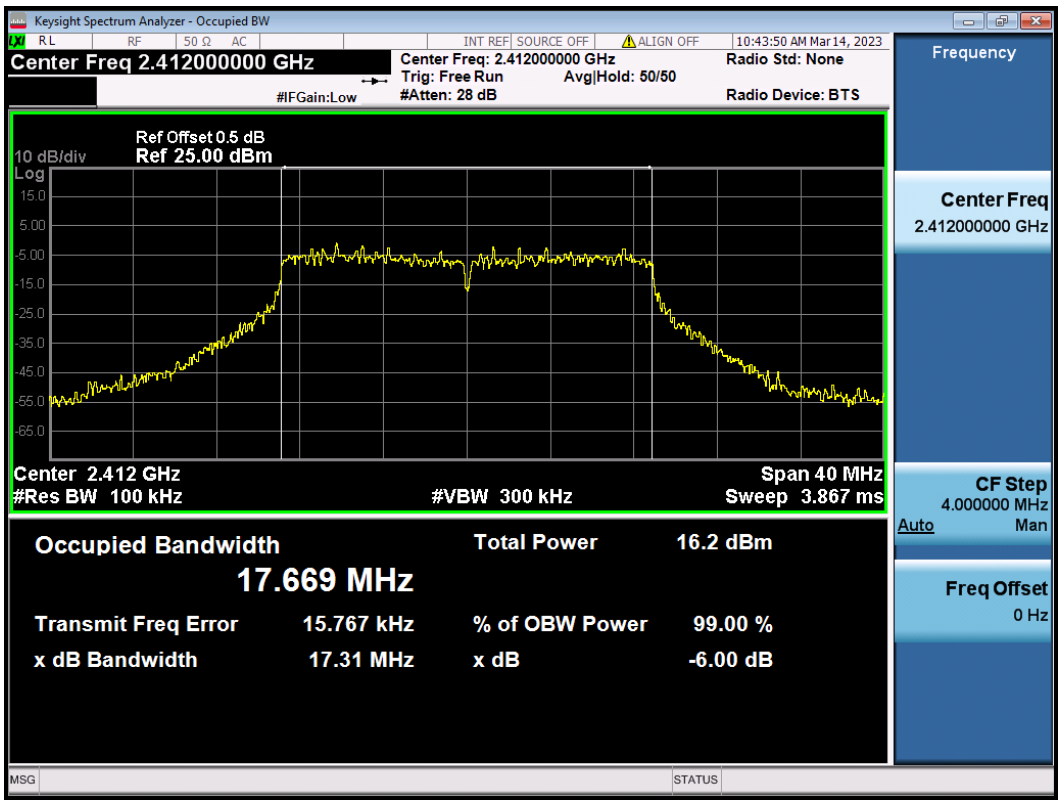



**Figure 14: The plots of 99% Bandwidth, 802.11n(HT20), 2412MHz**

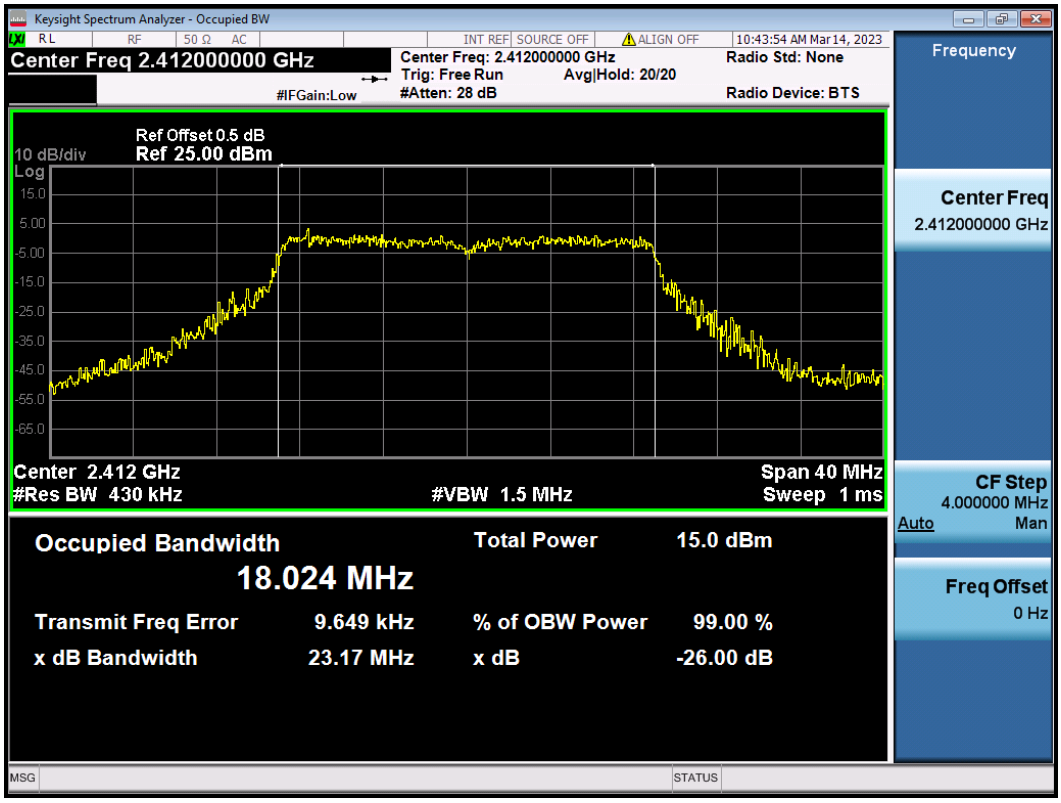


**Figure 15: The plots of 6dB Bandwidth, 802.11n(HT20), 2437MHz**

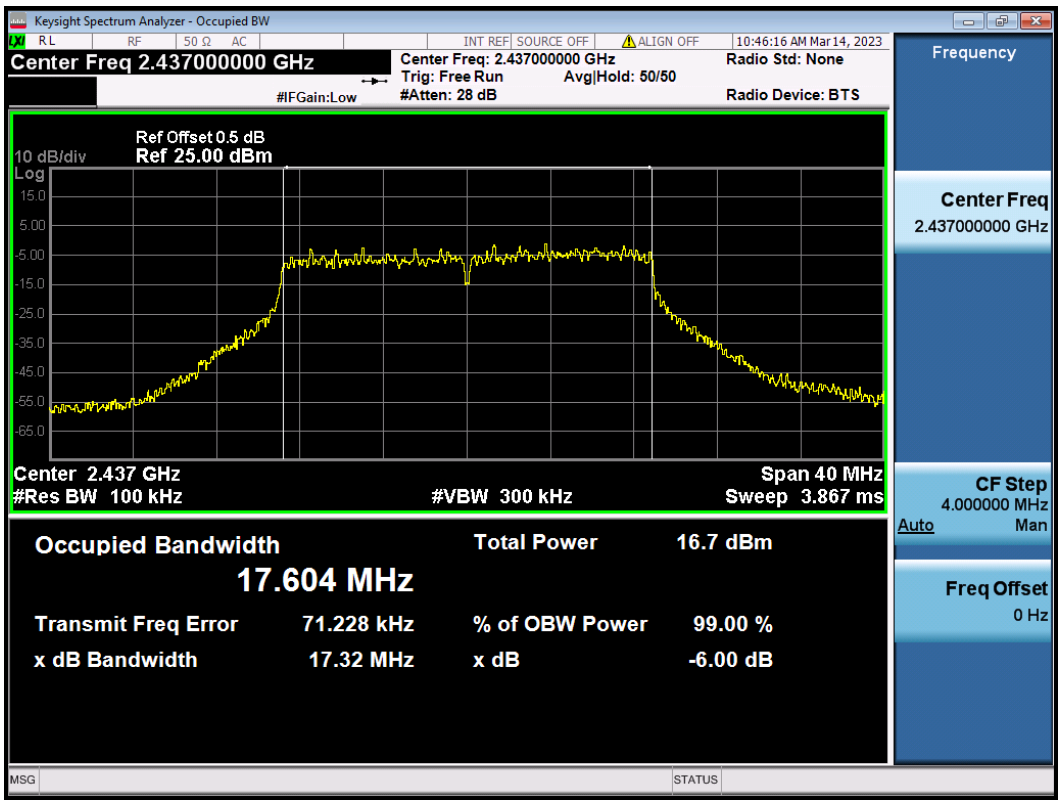



**Figure 16: The plots of 99% Bandwidth, 802.11n(HT20), 2437MHz**

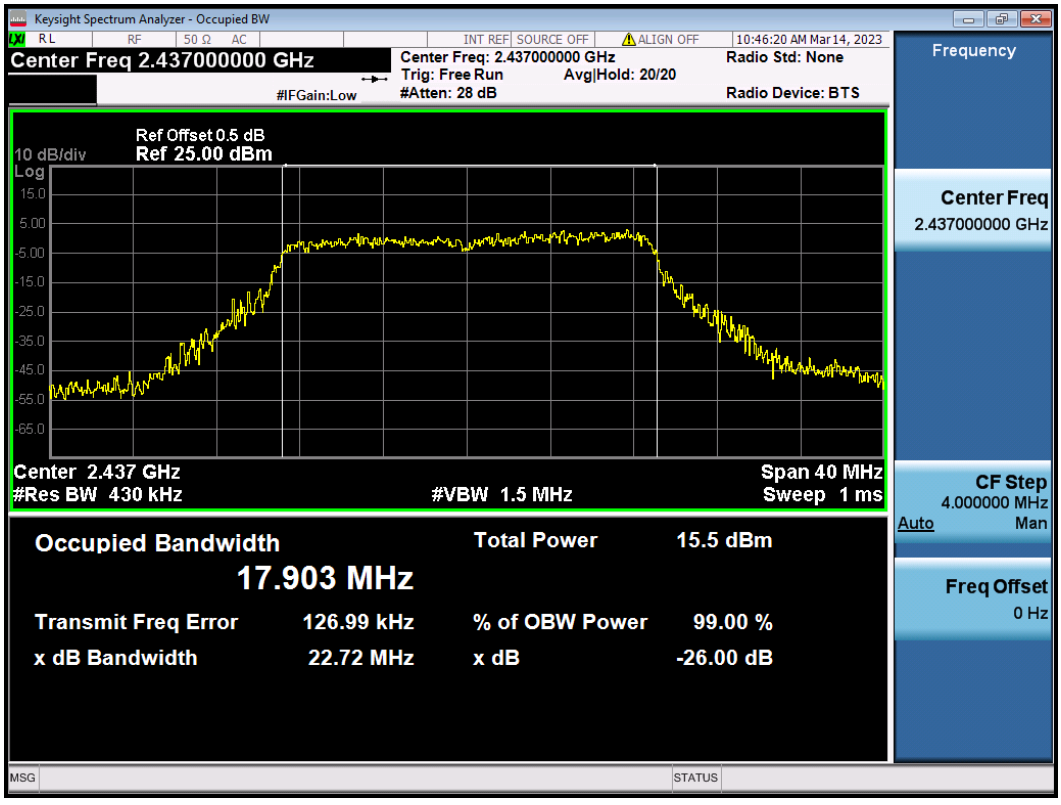


**Figure 17: The plots of 6dB Bandwidth, 802.11n(HT20), 2462MHz**

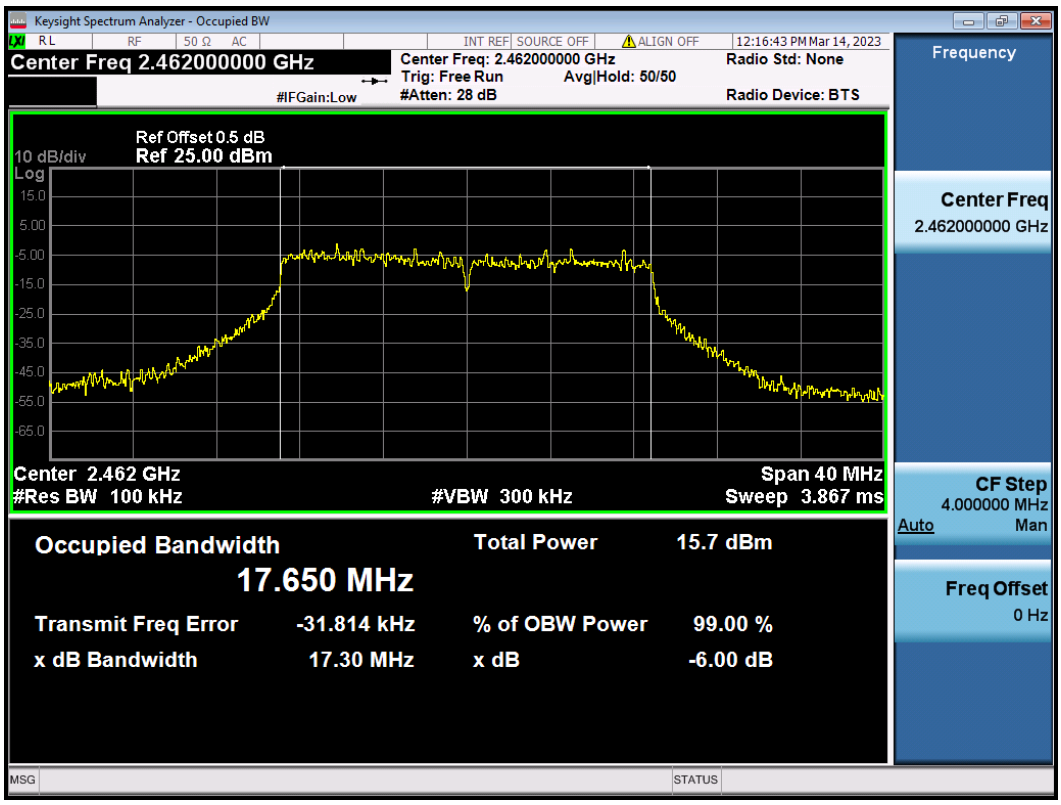



**Figure 18: The plots of 99% Bandwidth, 802.11n(HT20), 2462MHz**

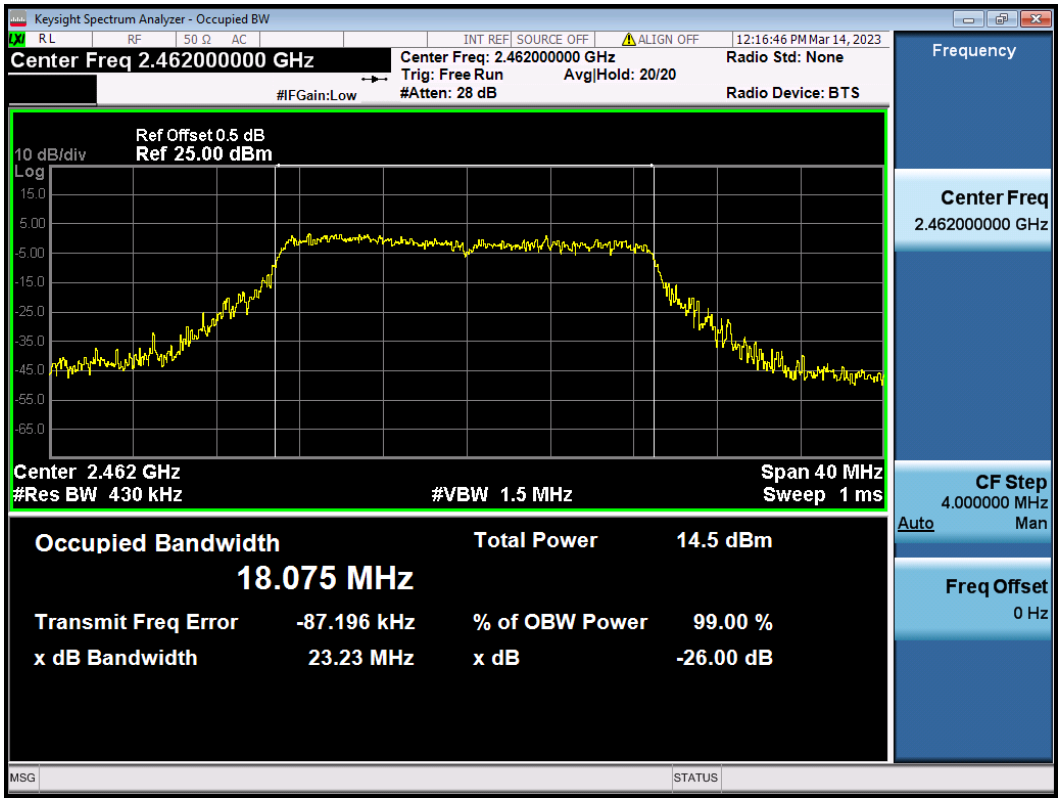


**Figure 19: The plots of 6dB Bandwidth, 802.11n(HT40), 2422MHz**

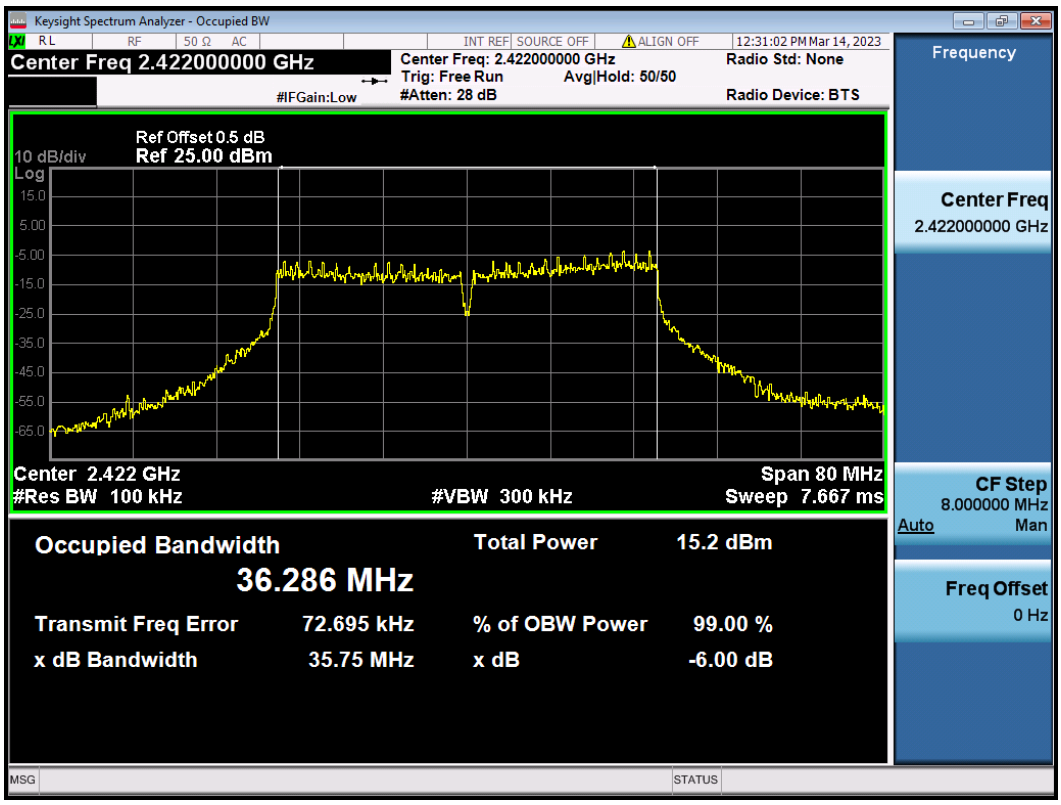



**Figure 20: The plots of 99% Bandwidth, 802.11n(HT40), 2422MHz**

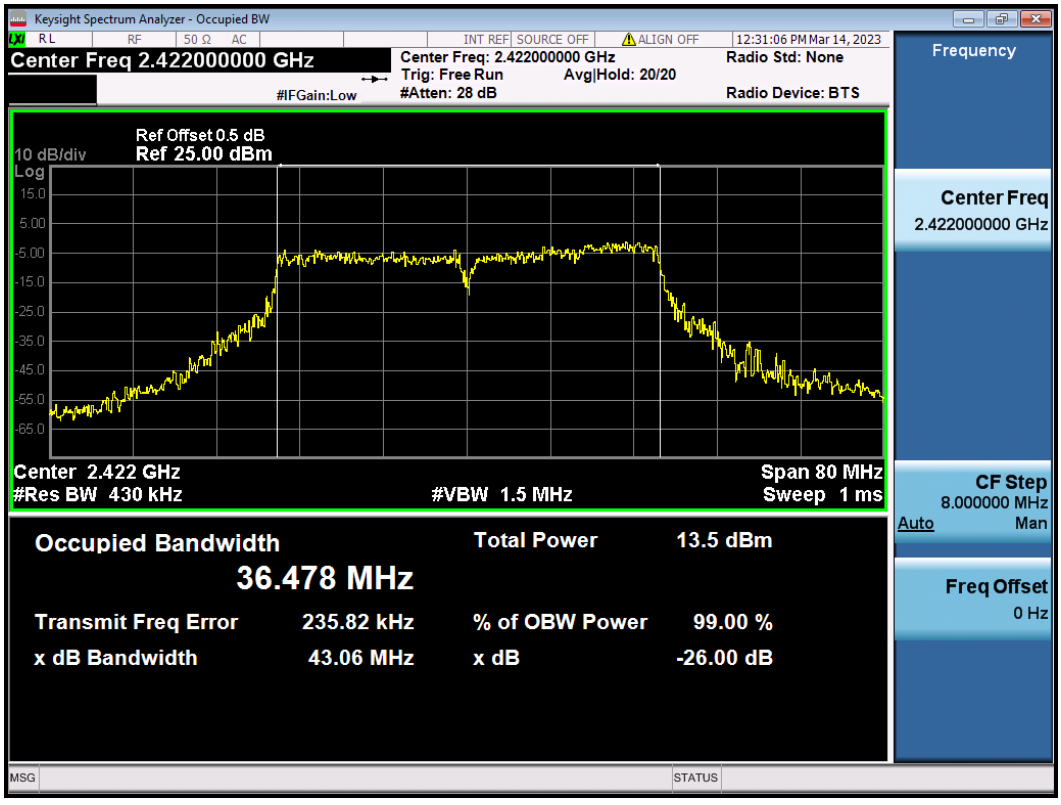


**Figure 21: The plots of 6dB Bandwidth, 802.11n(HT40), 2437MHz**

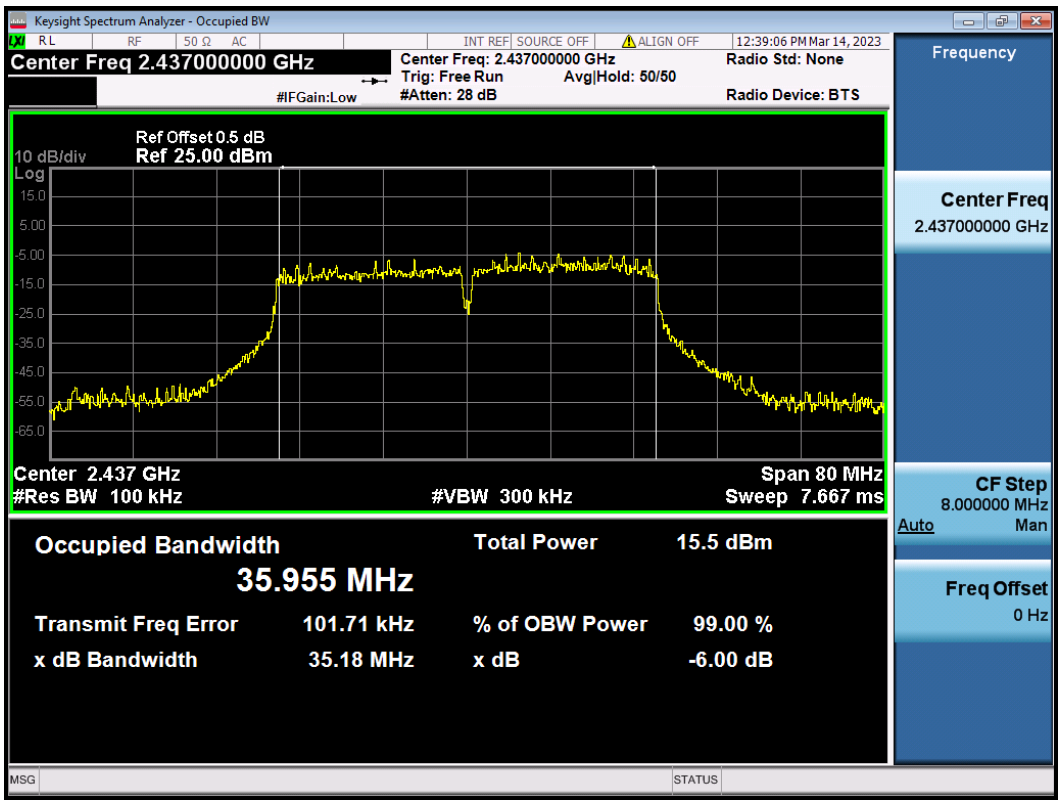



**Figure 22: The plots of 99% Bandwidth, 802.11n(HT40), 2437MHz**

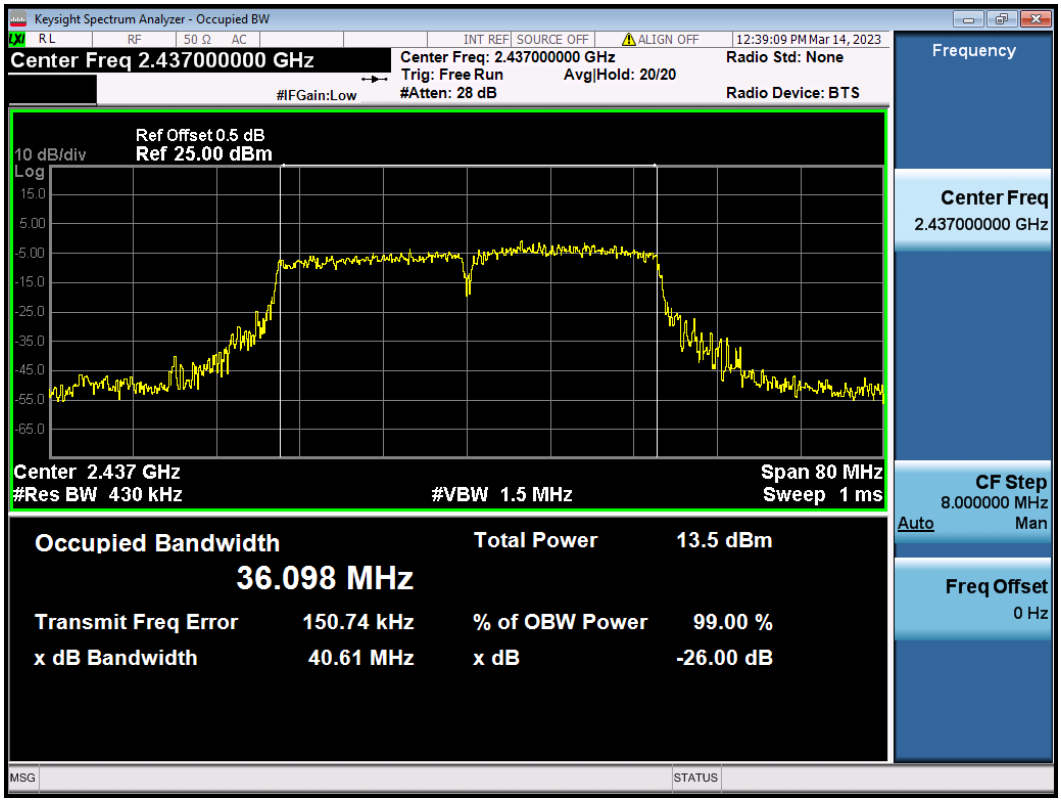


**Figure 23: The plots of 6dB Bandwidth, 802.11n(HT40), 2452MHz**

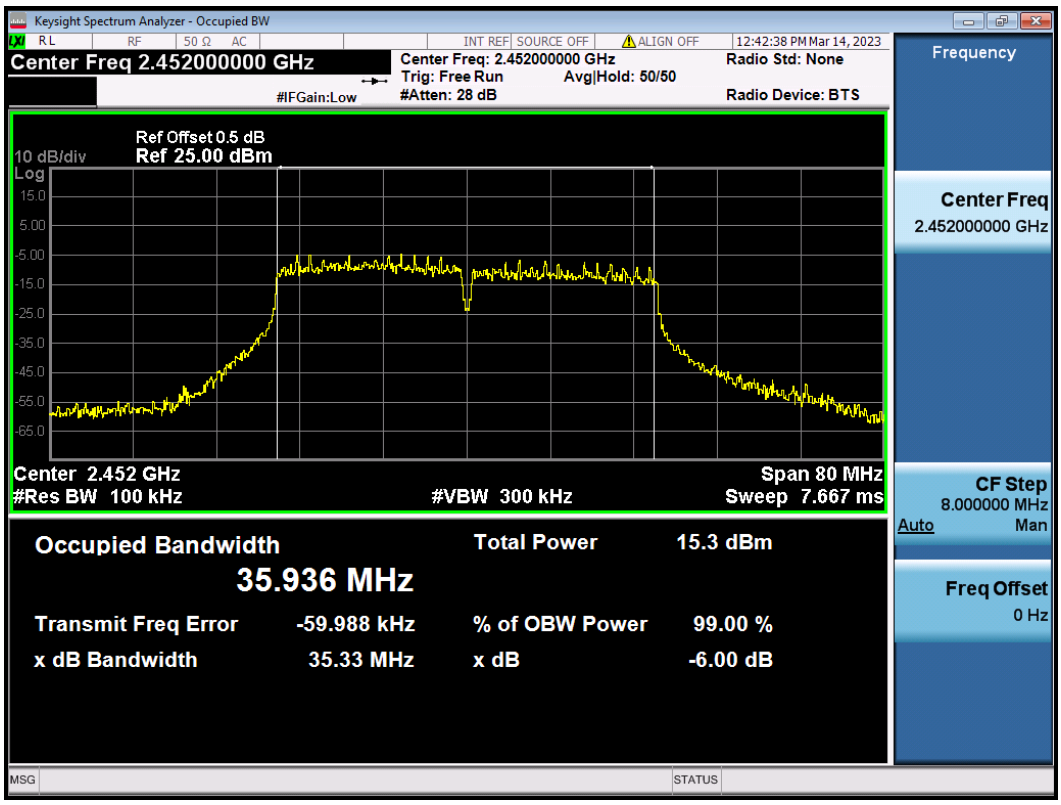
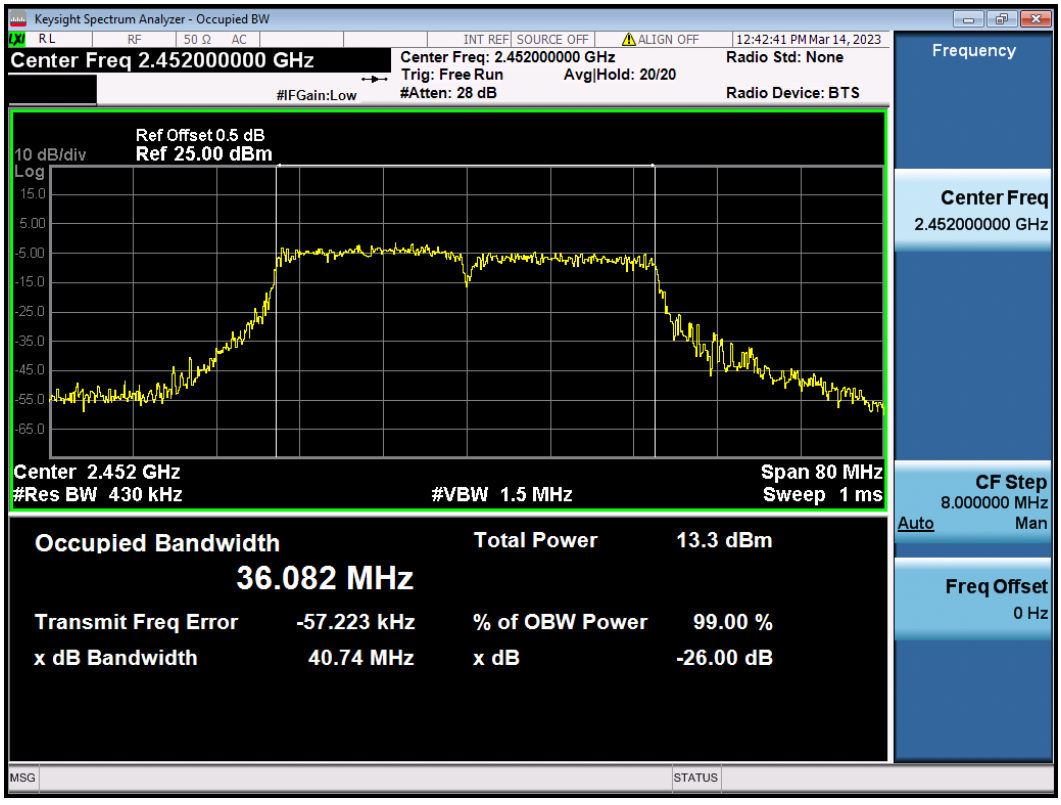



**Figure 24: The plots of 99% Bandwidth, 802.11n(HT40), 2452MHz**



### 4.1.4 Maximum conducted output power spectral density

**RESULT:** **PASS**

Test standard : FCC Part 15.247(e), RSS-247 5.2(b)
Requirement : ANSI C63.10-2013 clause 11.10.2,
KDB 558074 clause 8.4
Kind of test site : Shielded room

**Test setup**

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 24.7°C
Relative humidity : 60%

**Table 4: Power Spectral Density**

| Test Mode | Test Channel (MHz) | Measured Result (dBm/3kHz) | Limit (dBm/3kHz) |
|---|---|---|---|
| 802.11b | 2412 | -7.018 | 8 |
| | 2437 | -6.003 | |
| | 2462 | -7.796 | |
| 802.11g | 2412 | -13.010 | |
| | 2437 | -12.523 | |
| | 2462 | -13.929 | |
| 802.11n(HT20) | 2412 | -17.286 | |
| | 2437 | -15.865 | |
| | 2462 | -16.594 | |
| 802.11n(HT40) | 2422 | -18.459 | |
| | 2437 | -20.013 | |
| | 2452 | -20.230 | |

**Figure 25: The plots of Power Spectral Density, 802.11b, 2412MHz**

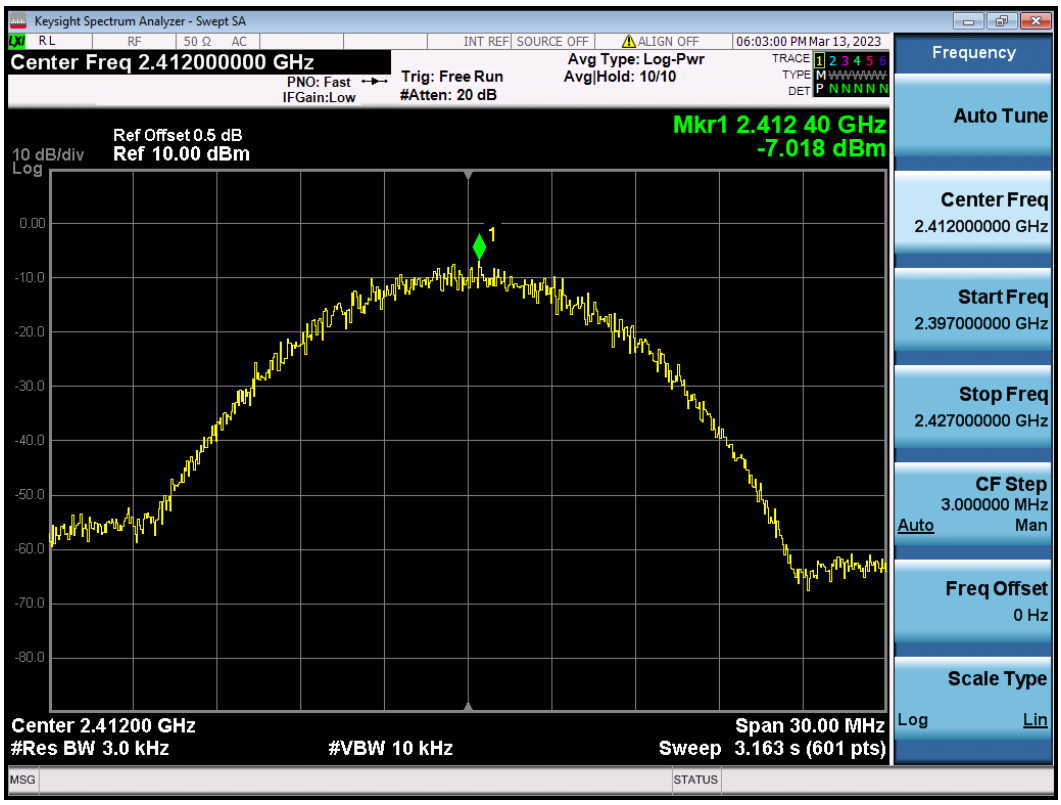



**Figure 26: The plots of Power Spectral Density, 802.11b, 2437MHz**

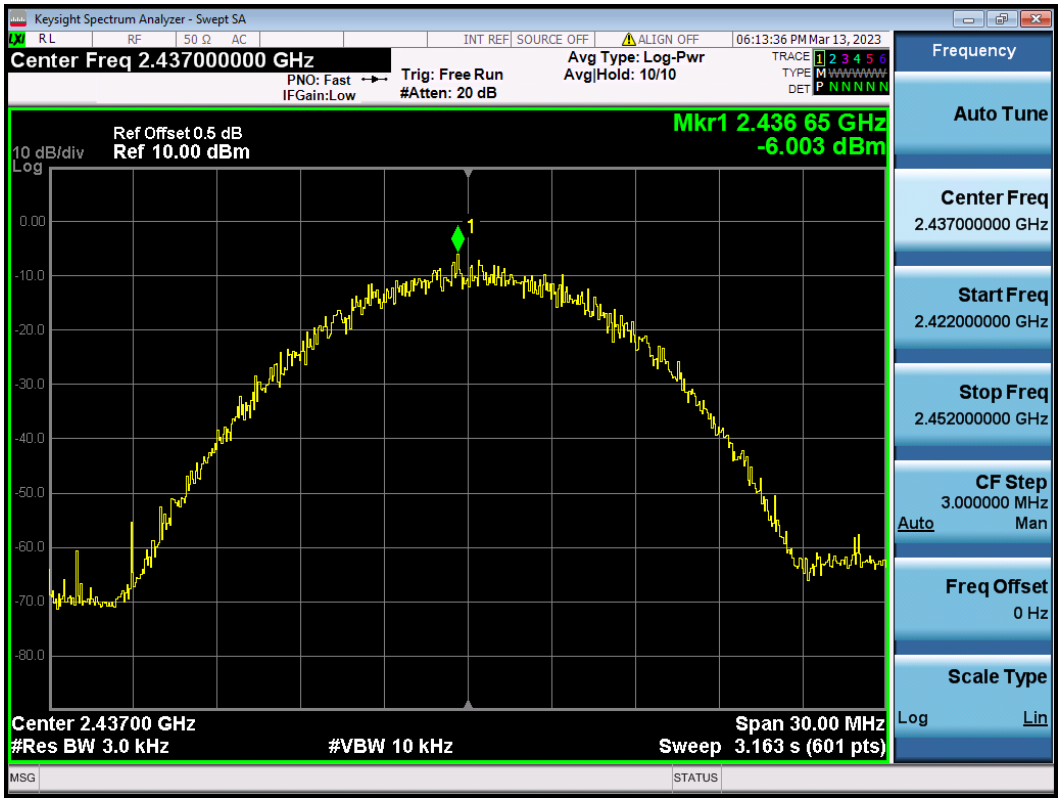


**Figure 27: The plots of Power Spectral Density, 802.11b, 2462MHz**


**Figure 28: The plots of Power Spectral Density, 802.11g, 2412MHz**

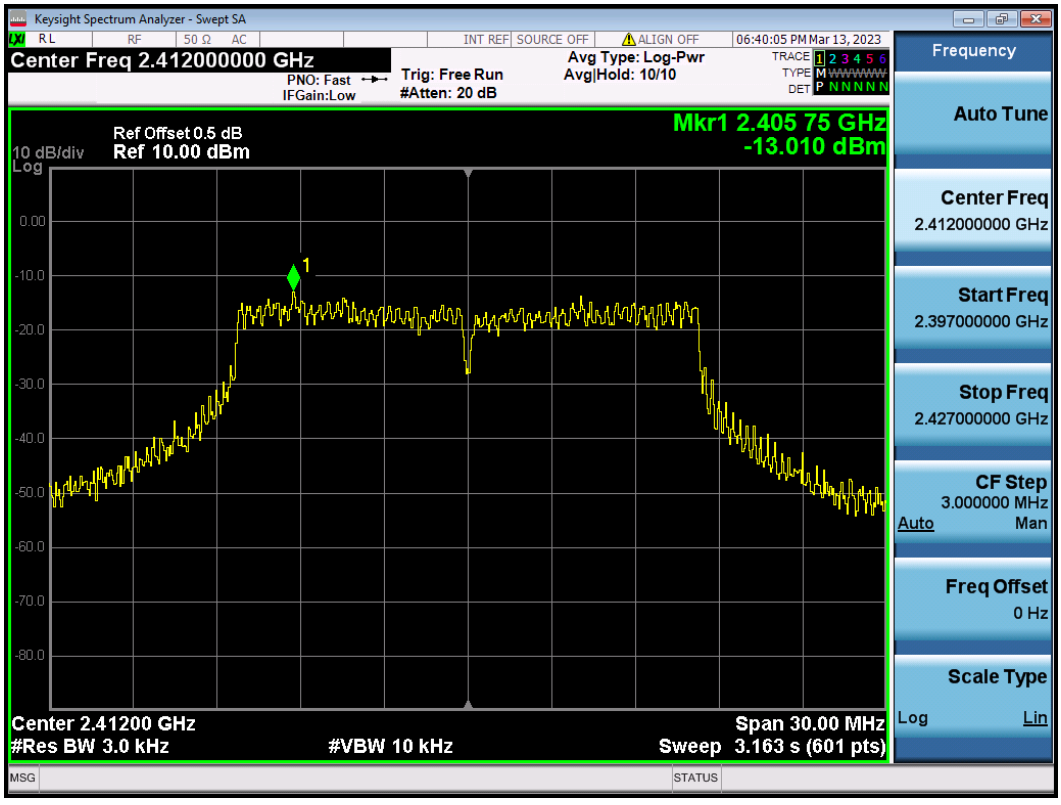


**Figure 29: The plots of Power Spectral Density, 802.11g, 2437MHz**

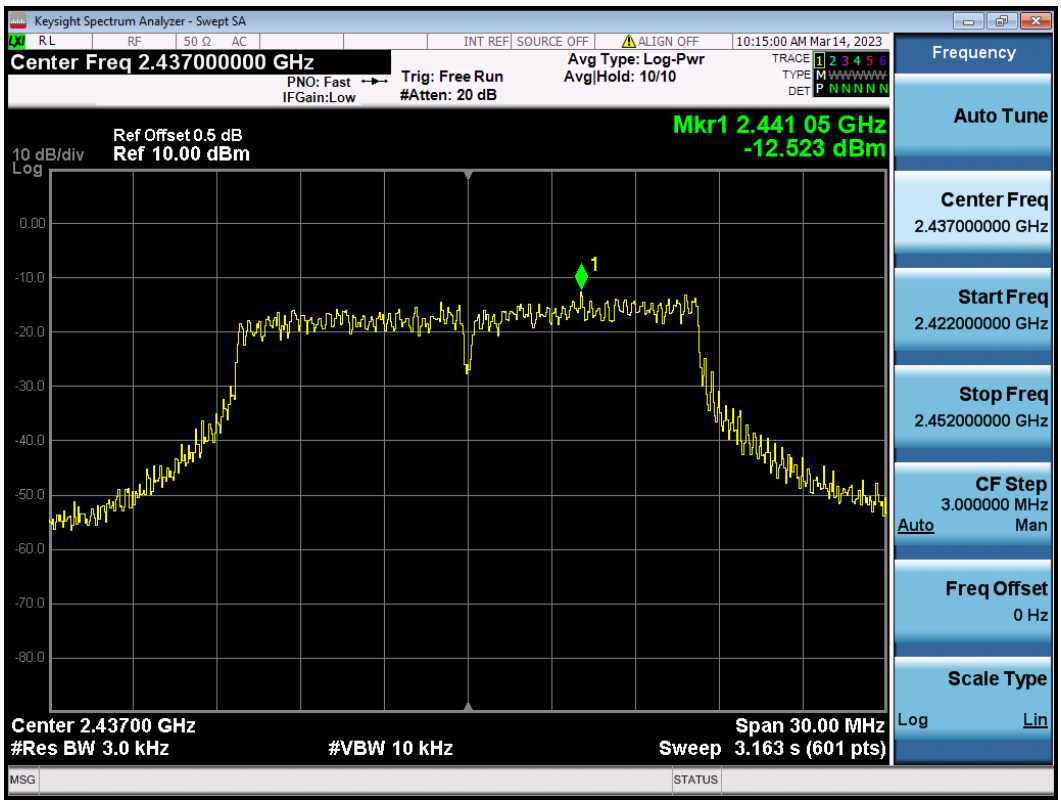



**Figure 30: The plots of Power Spectral Density, 802.11g, 2462MHz**

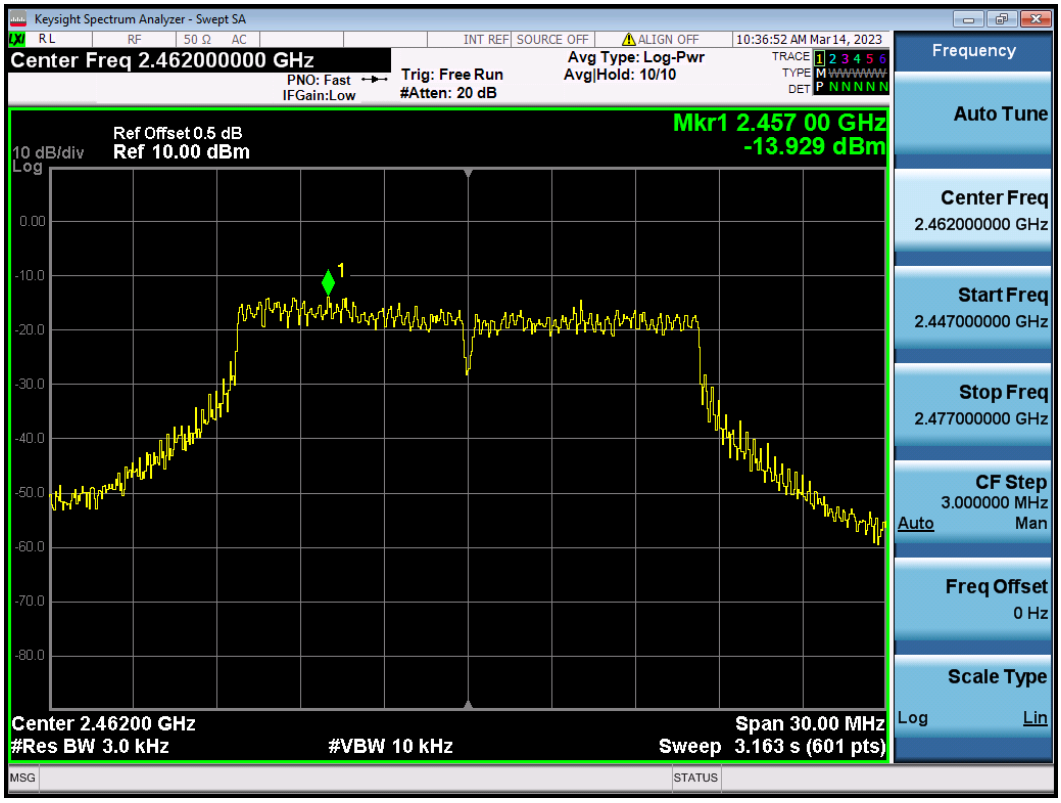


**Figure 31: The plots of Power Spectral Density, 802.11n(HT20), 2412MHz**

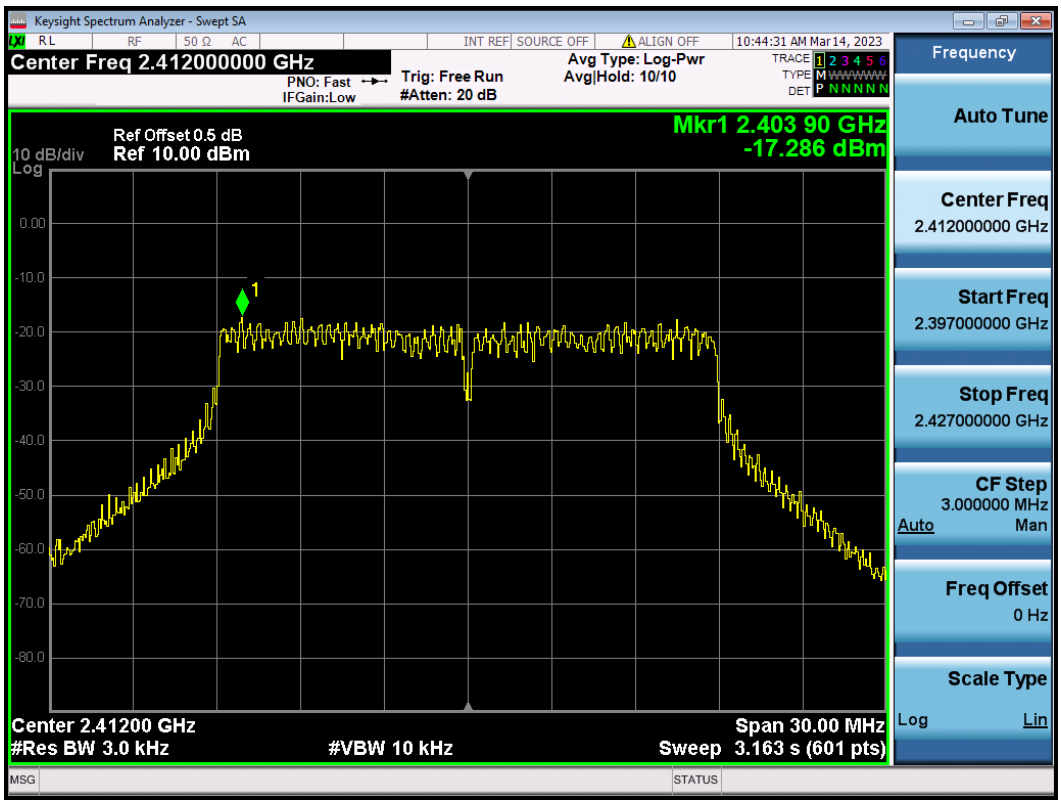



**Figure 32: The plots of Power Spectral Density, 802.11n(HT20), 2437MHz**

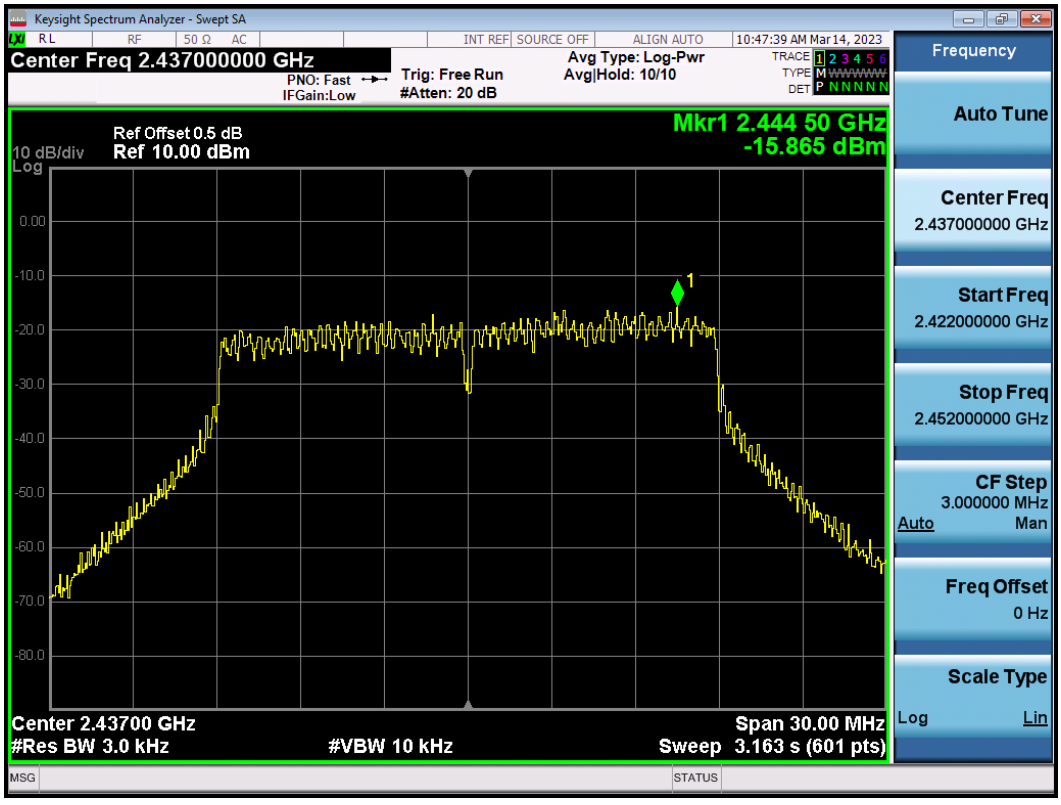


**Figure 33: The plots of Power Spectral Density, 802.11n(HT20), 2462MHz**

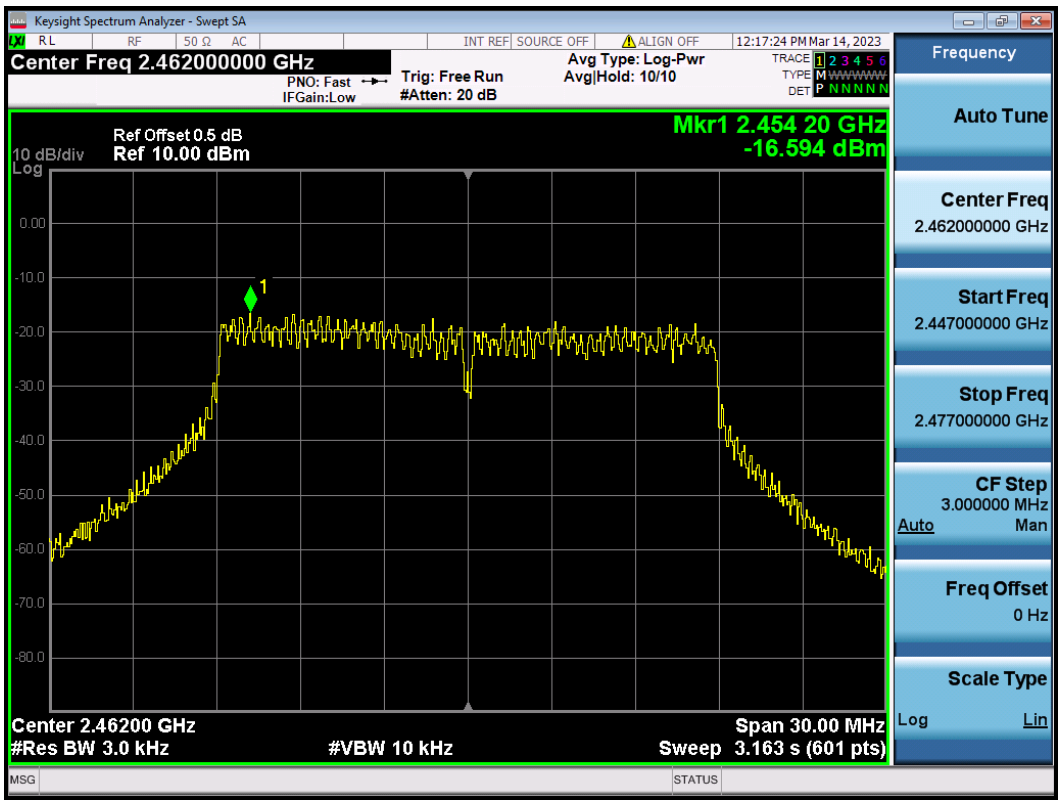



**Figure 34: The plots of Power Spectral Density, 802.11n(HT40), 2422M**

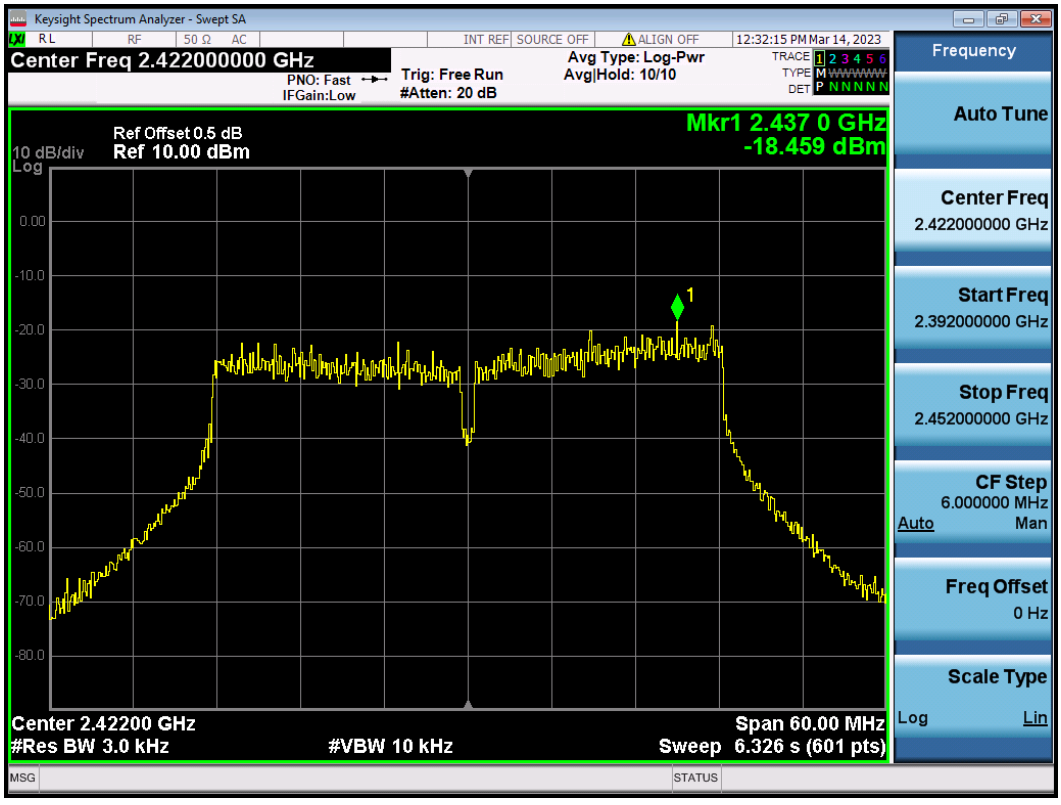


**Figure 35: The plots of Power Spectral Density, 802.11n(HT40), 2437MHz**

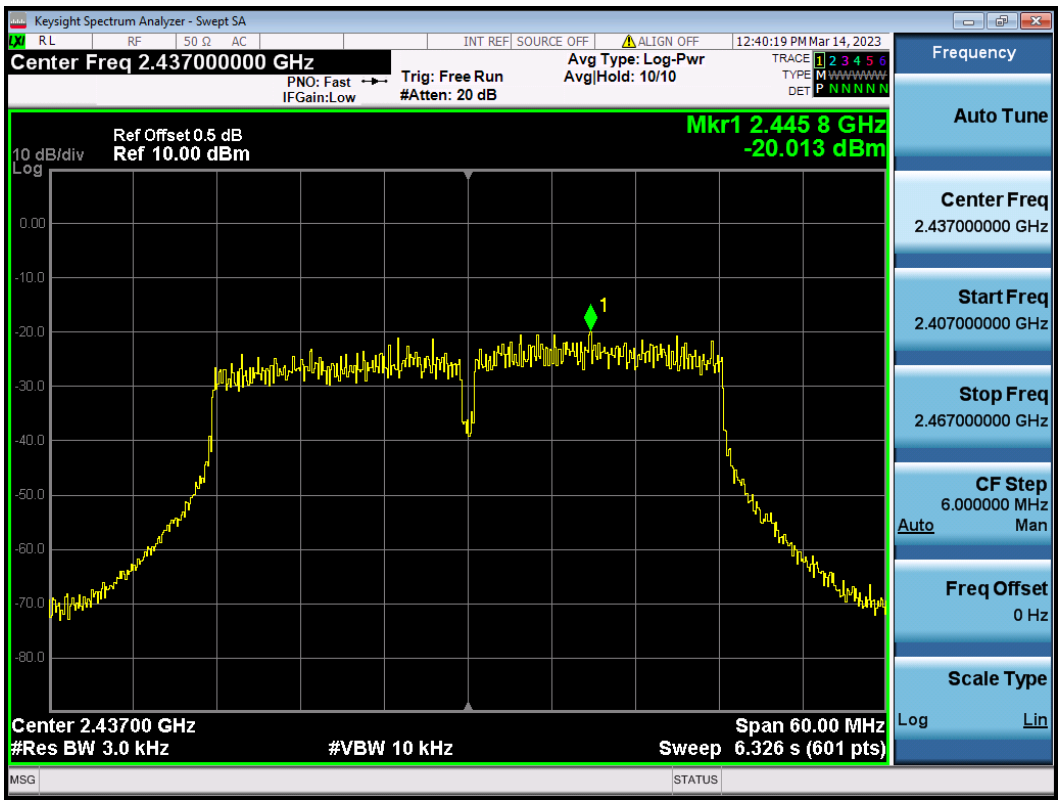
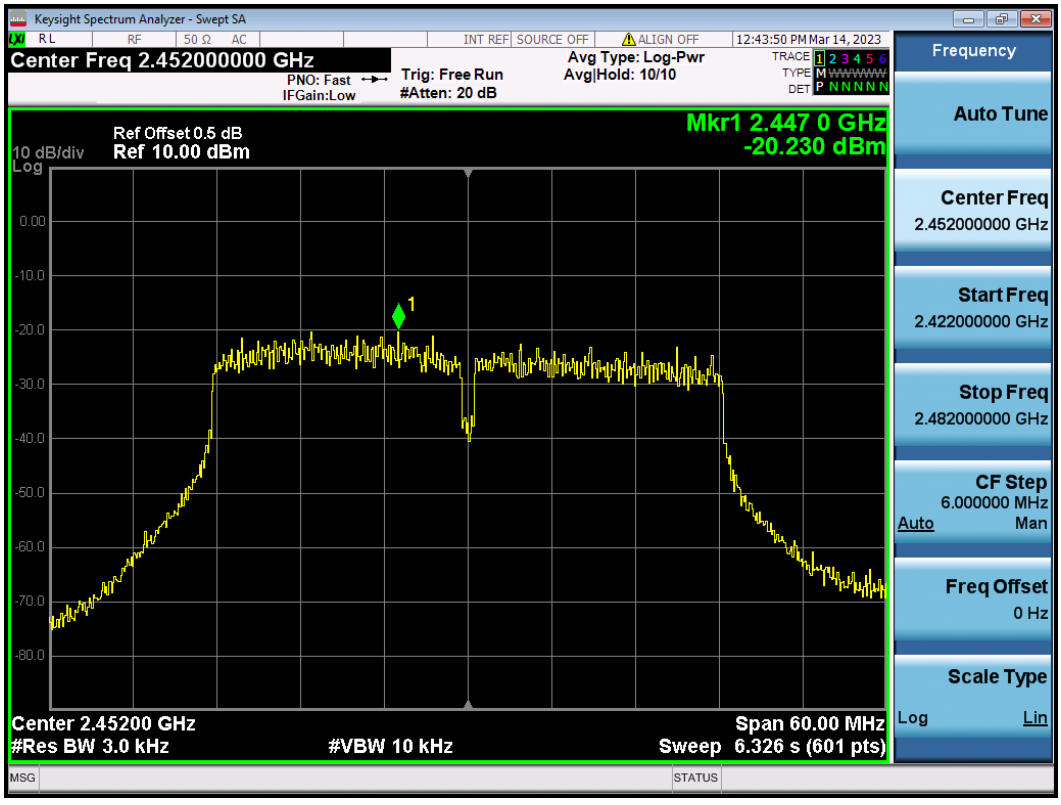



**Figure 36: The plots of Power Spectral Density, 802.11n(HT40), 2452MHz**



### 4.1.5 Conducted Spurious Emission & Authorized-band band-edge

**RESULT:** **PASS**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(d), RSS-247 5.5 |
| Requirement | : | ANSI C63.10-2013 clause 11.11, KDB 558074 clause 8.5 |
| Kind of test site | : | Shielded room |

**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Low/Middle/High for spurious, Low/High for Band Edge |
| Operation Mode | : | A.1.a |
| Ambient temperature | : | 24.7°C |
| Relative humidity | : | 60% |

For details refer to following test plot.

**Figure 37: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz Carrier Level**

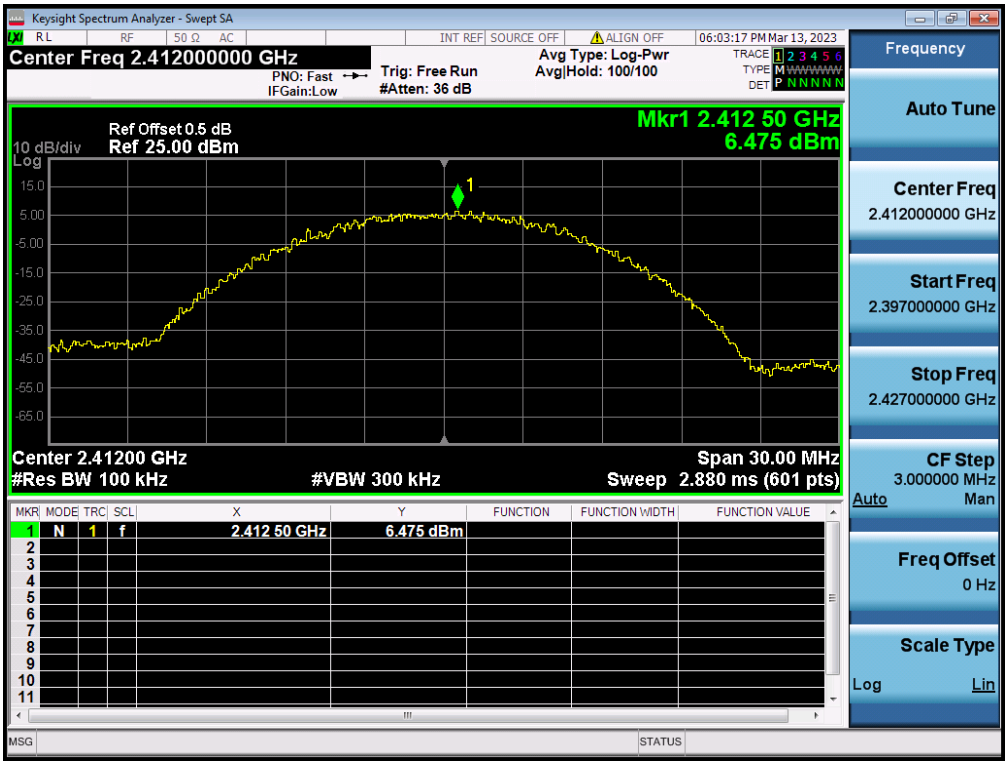



**Figure 38: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz Band Edge**

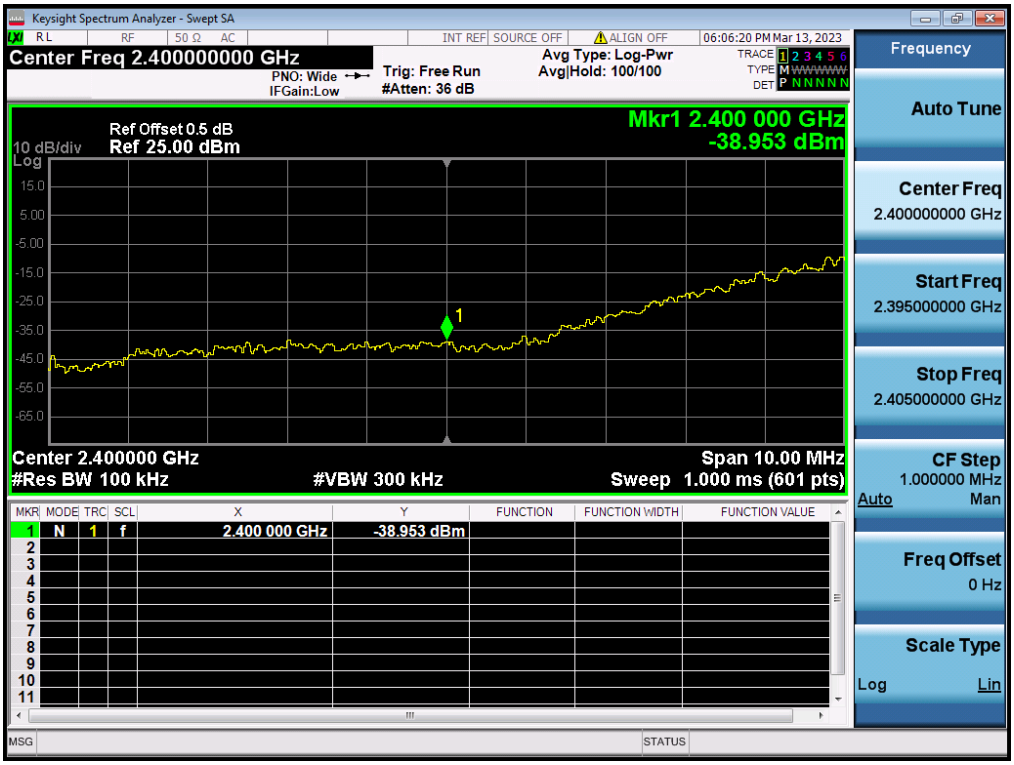


**Figure 39: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz**
**Conducted spurious emissions 30MHz-3GHz**

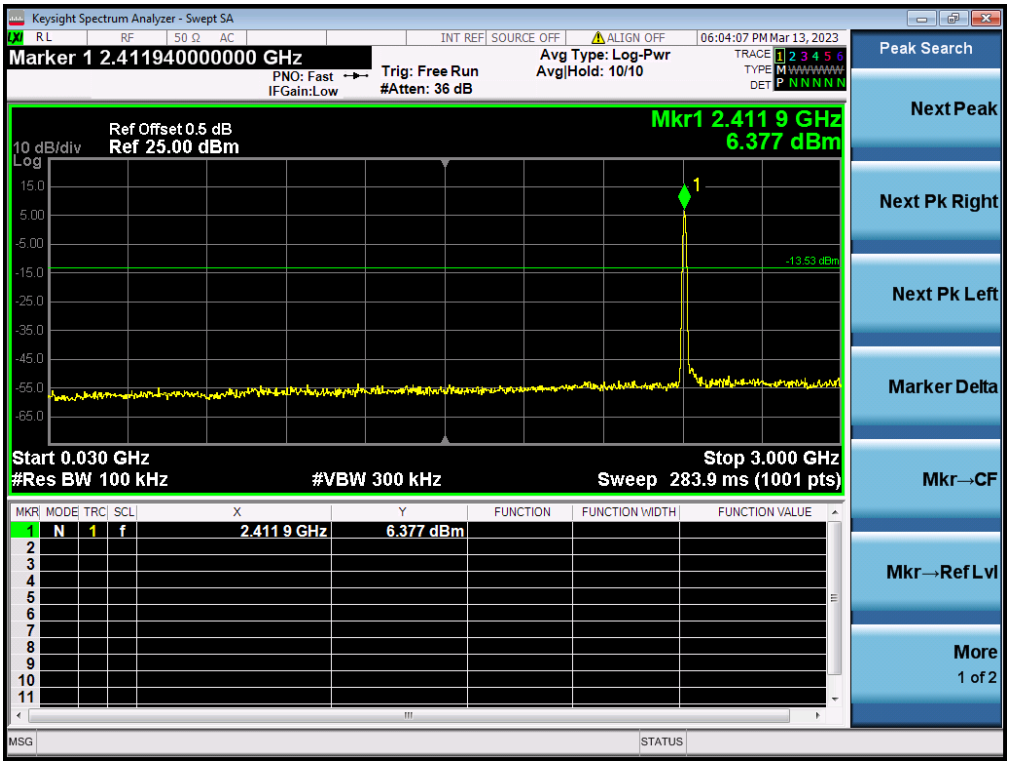



**Figure 40: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz**
**Conducted spurious emissions 2GHz-25GHz**

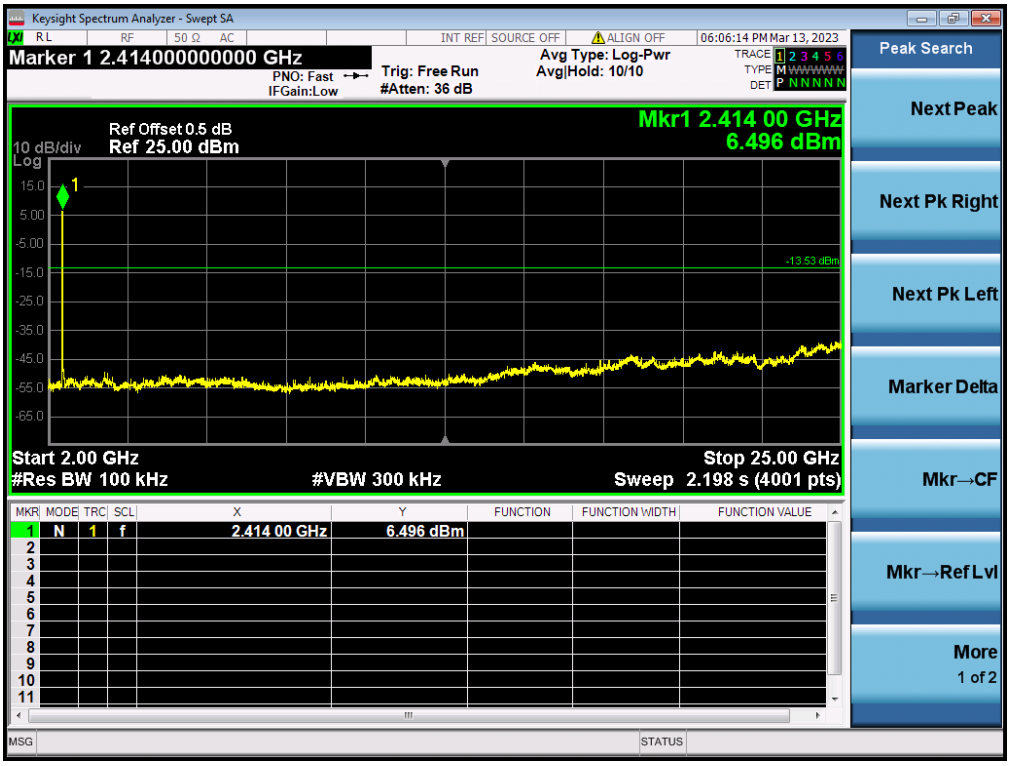


**Figure 41: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2437MHz Carrier Level**

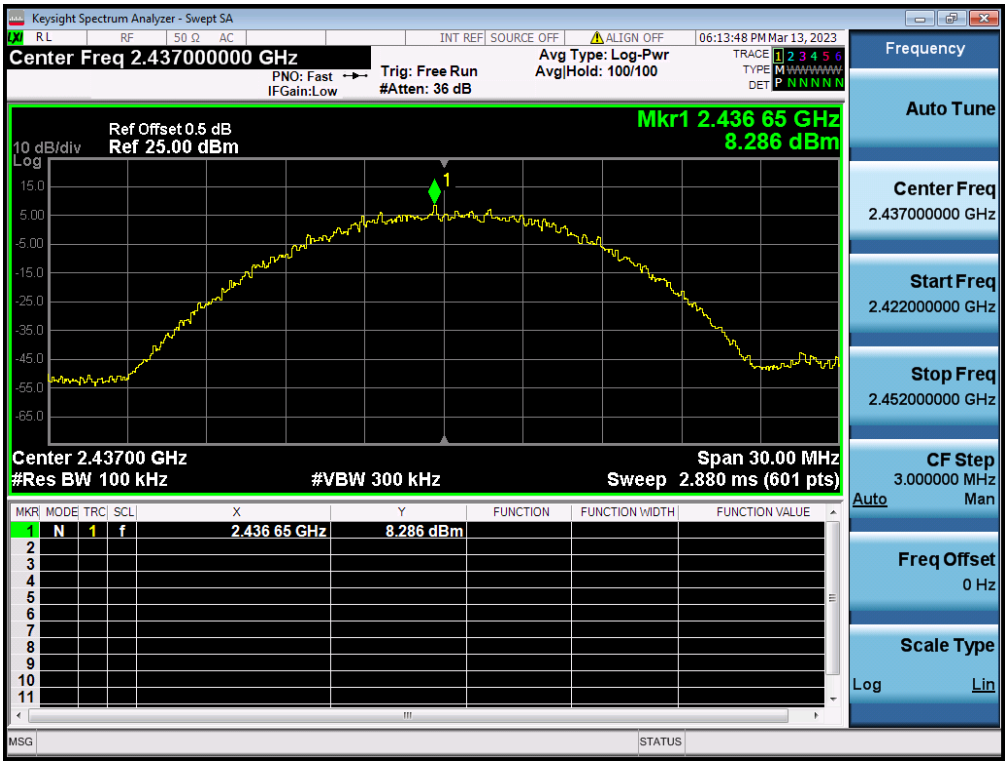



**Figure 42: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2437MHz Conducted spurious emissions 30MHz-3GHz**

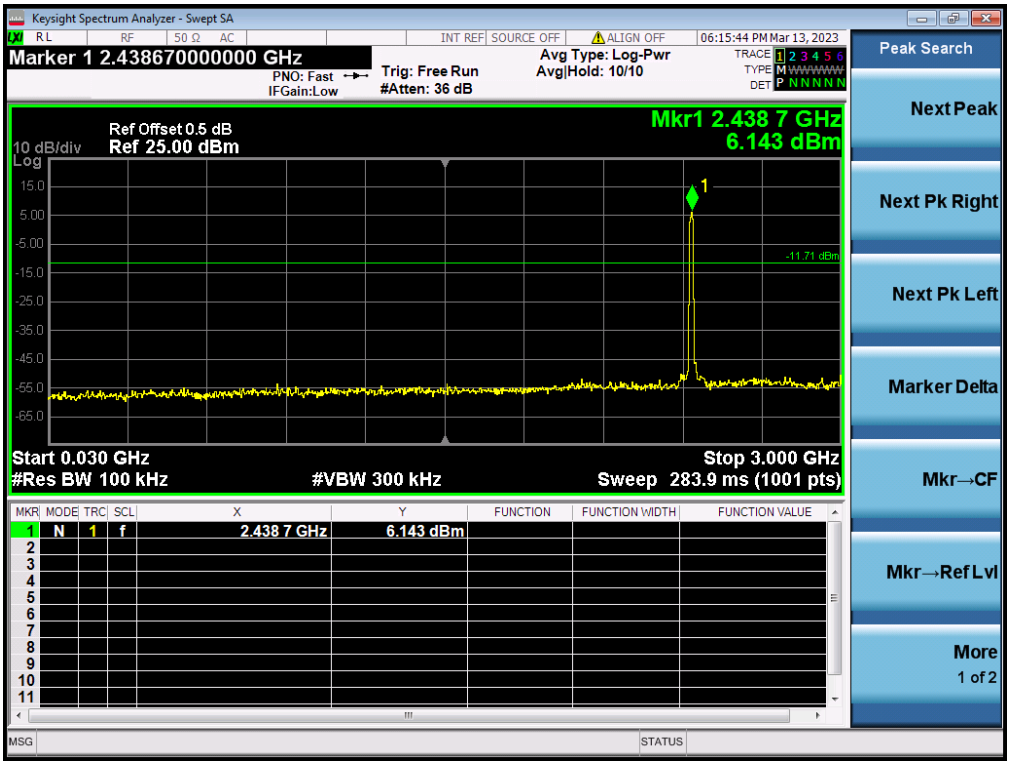


**Figure 43: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2437MHz**
**Conducted spurious emissions 2GHz-25GHz**

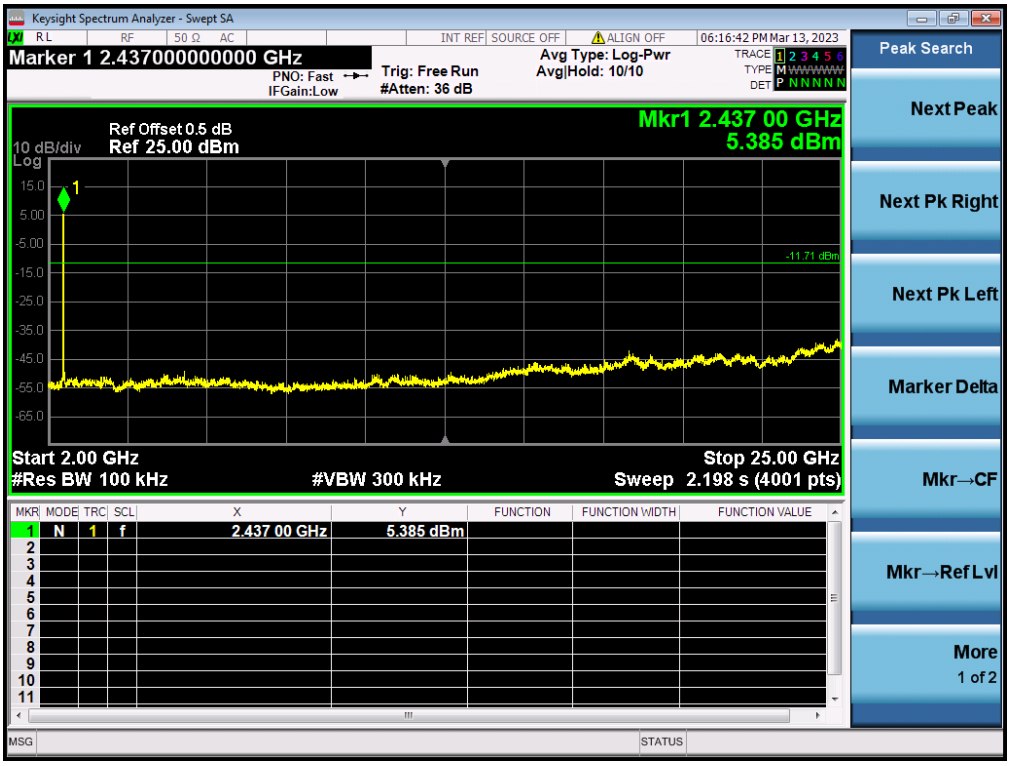



**Figure 44: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2462MHz**
**Carrier Level**

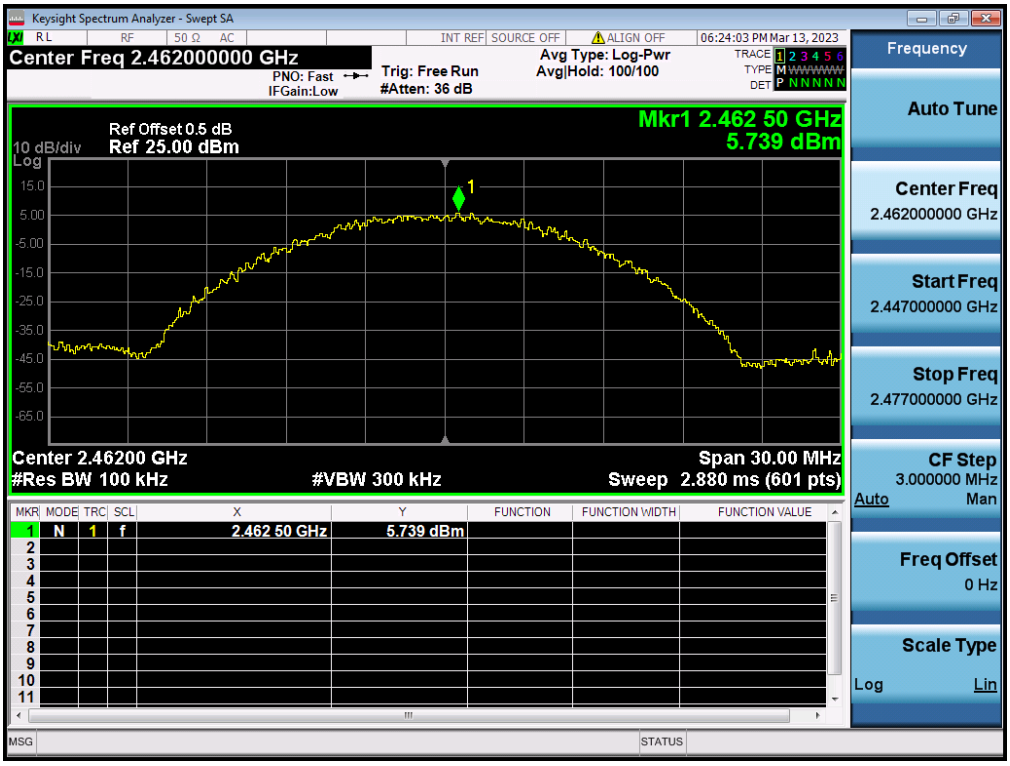


**Figure 45: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2462MHz Band Edge**

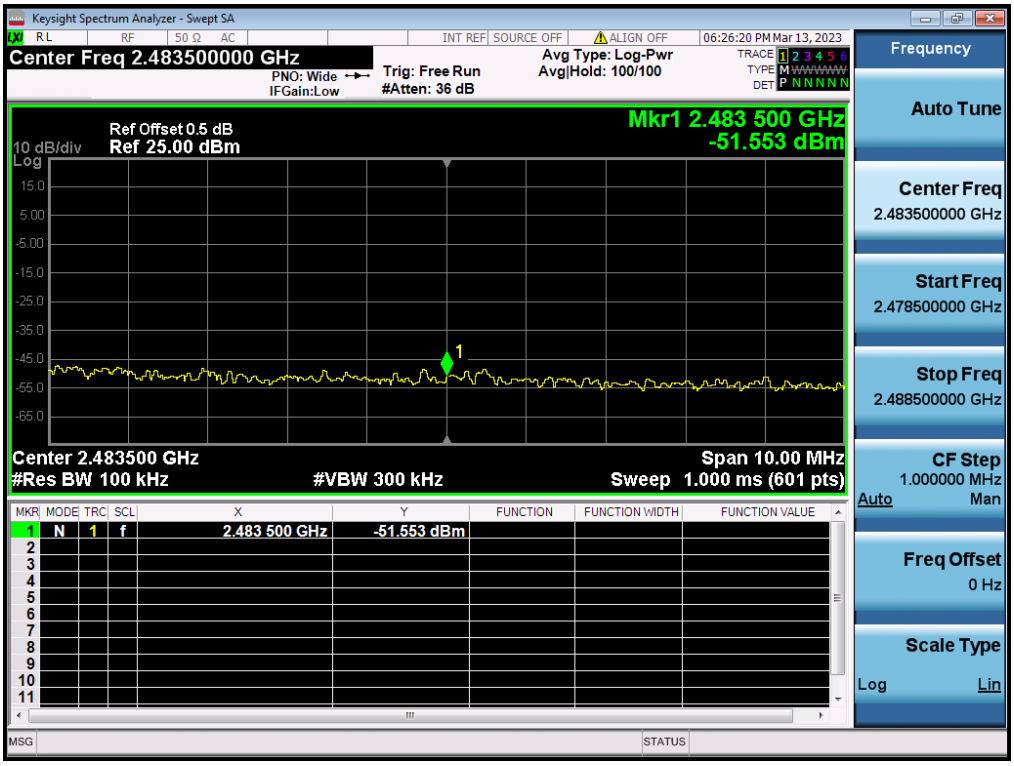



**Figure 46: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2462MHz Conducted spurious emissions 30MHz-3GHz**

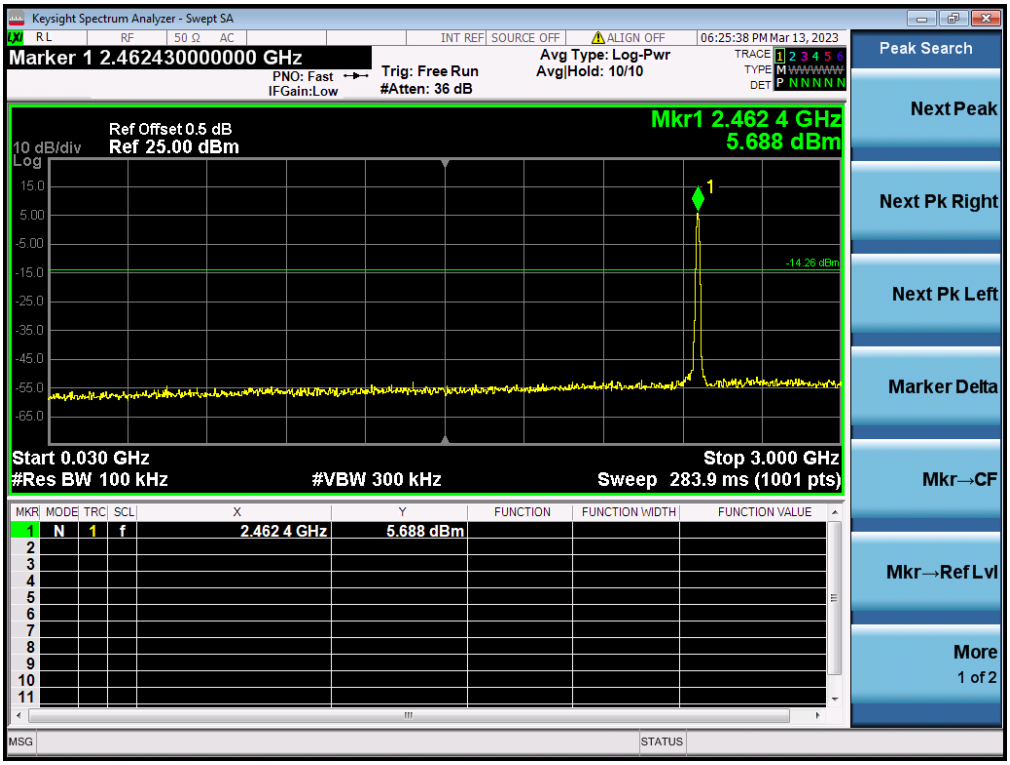


**Figure 47: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2462MHz**
**Conducted spurious emissions 2GHz-25GHz**

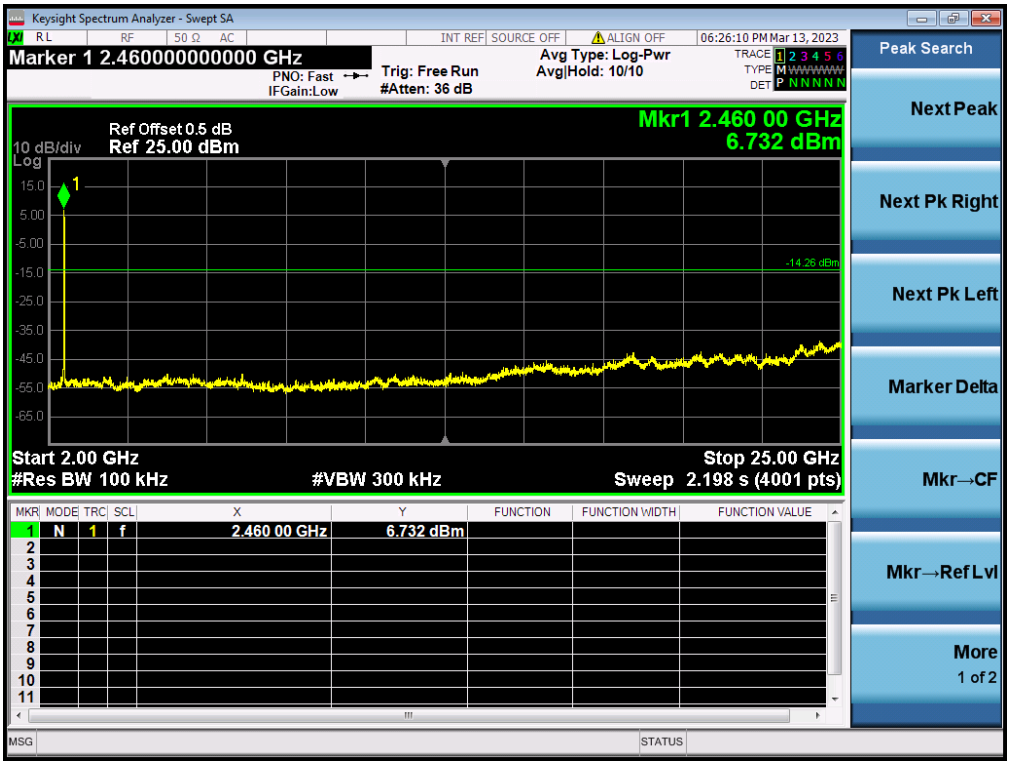



**Figure 48: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2412MHz**
**Carrier Level**

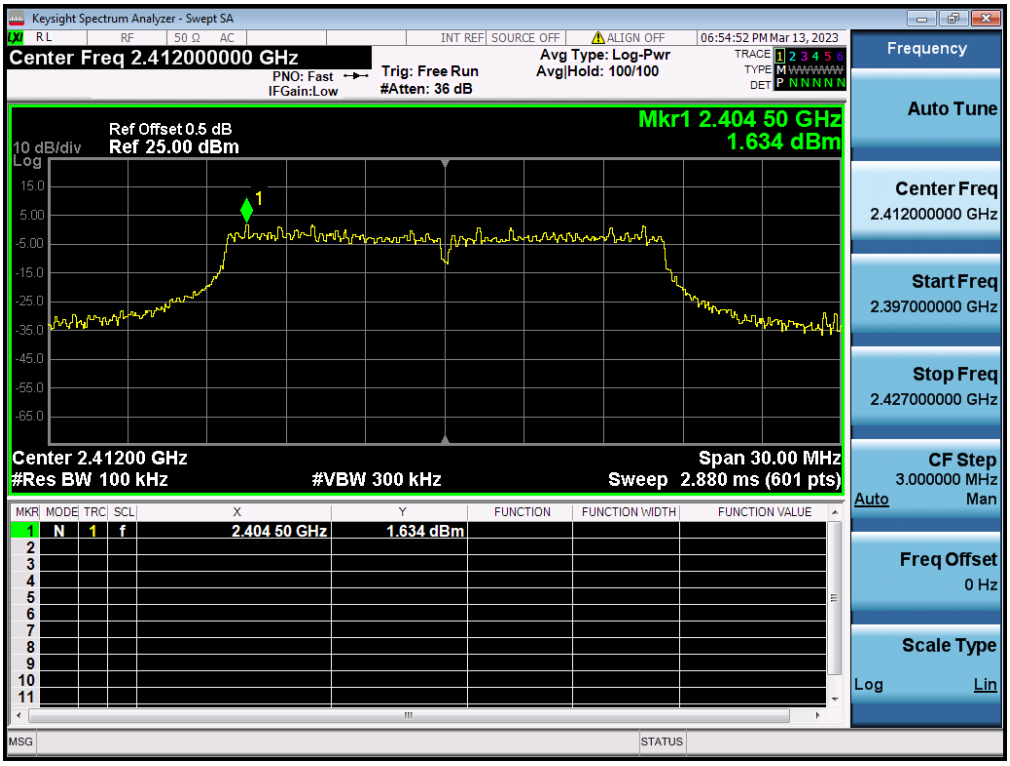


**Figure 49: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2412MHz Band Edge**


**Figure 50: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2412MHz Conducted spurious emissions 30MHz-3GHz**

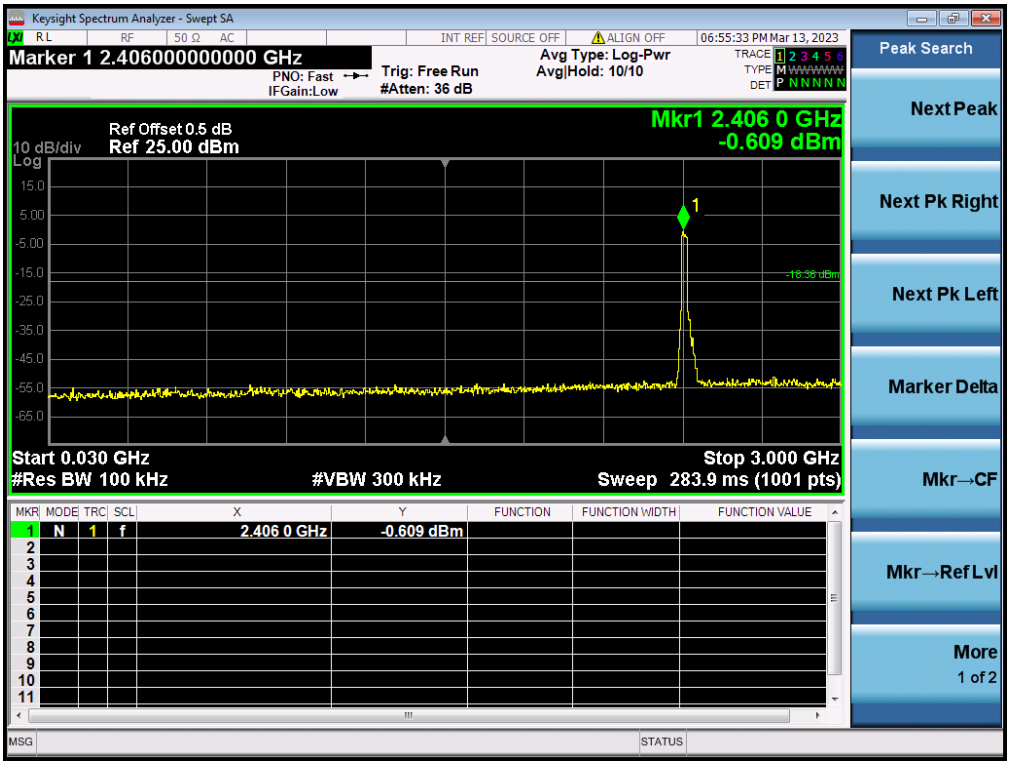


**Figure 51: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2412MHz**
**Conducted spurious emissions 2GHz-25GHz**

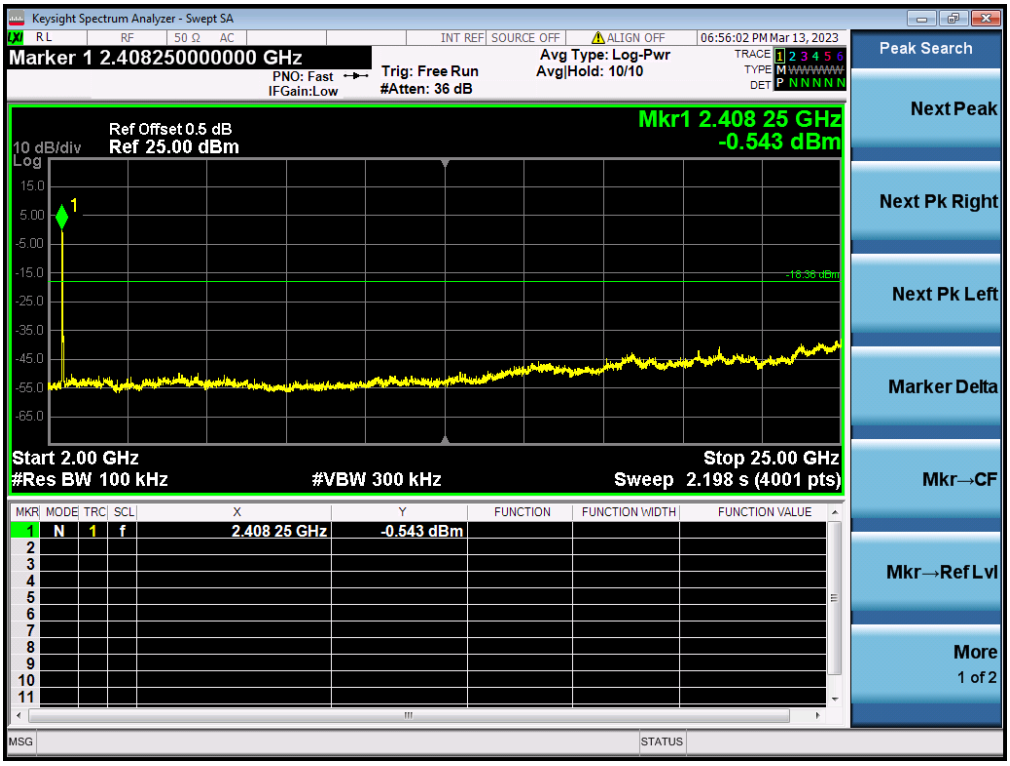



**Figure 52: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2437MHz**
**Carrier Level**

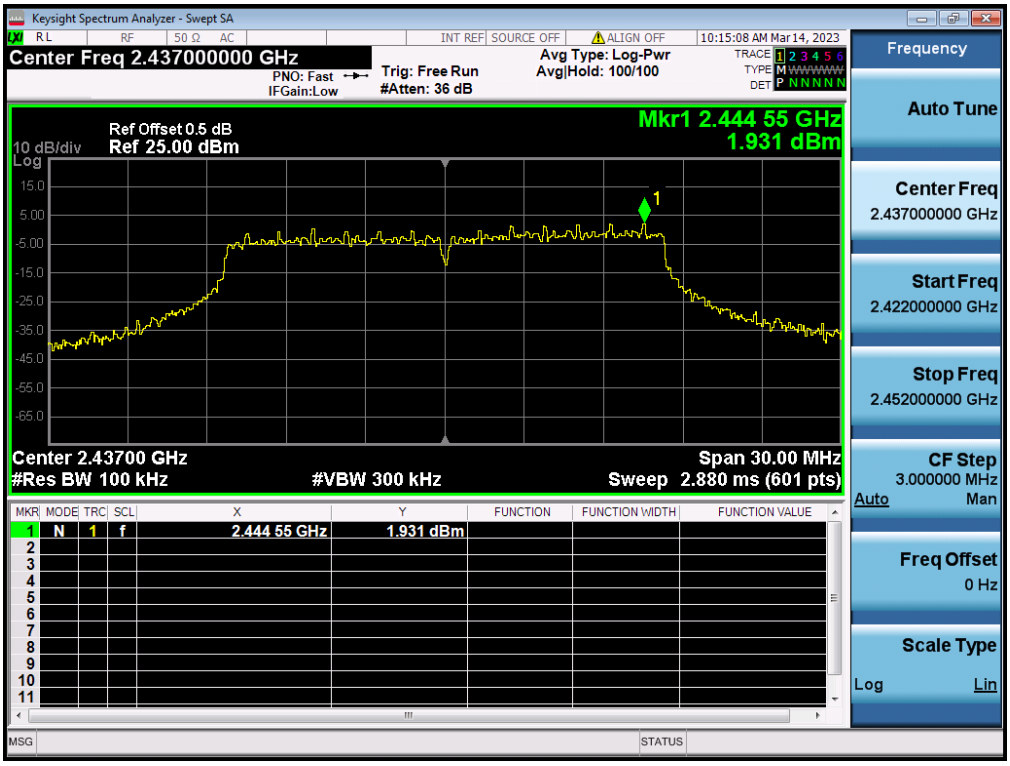


**Figure 53: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2437MHz**
**Conducted spurious emissions 30MHz-3GHz**

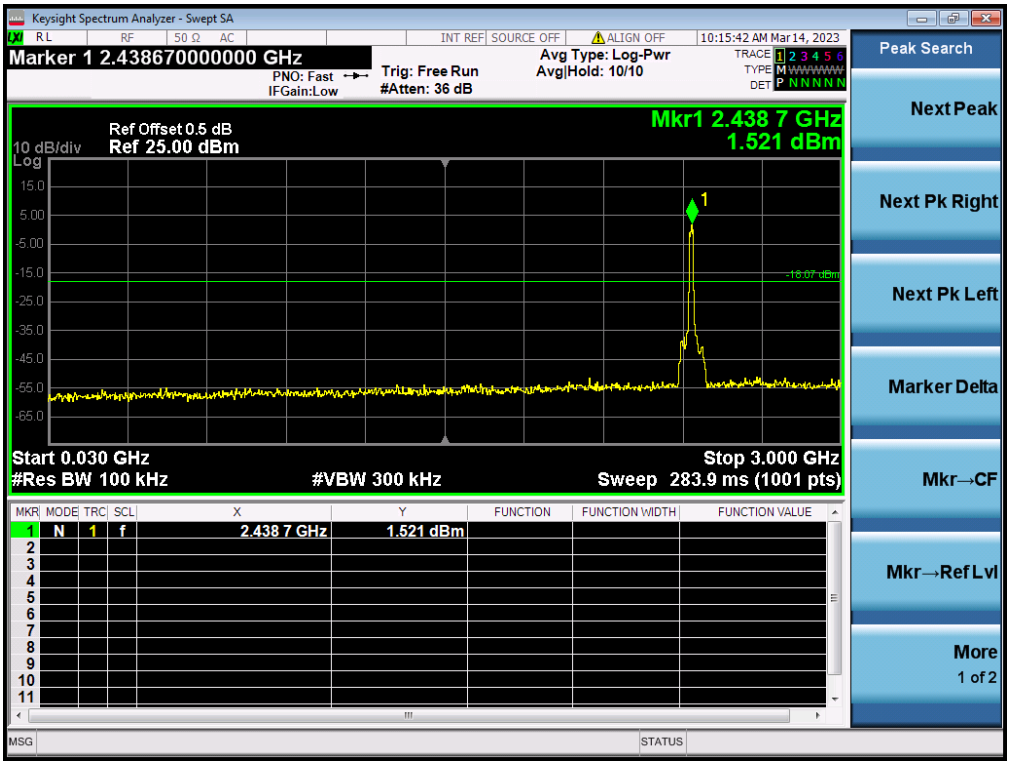



**Figure 54: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2437MHz**
**Conducted spurious emissions 2GHz-25GHz**

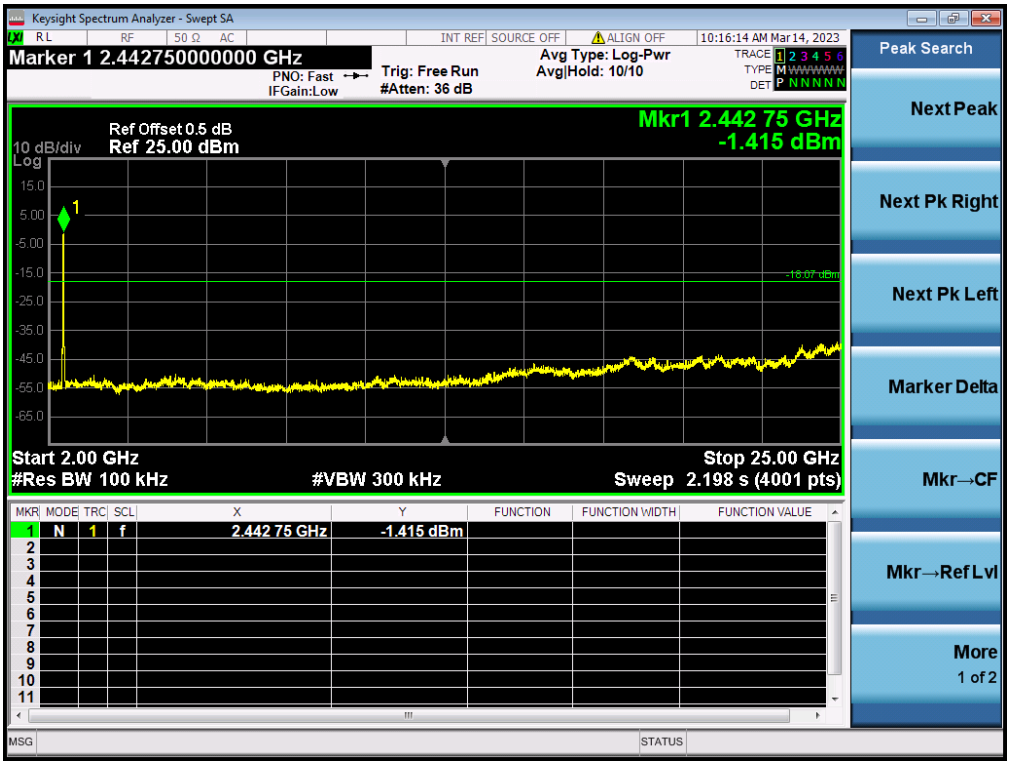


**Figure 55: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2462MHz Carrier Level**

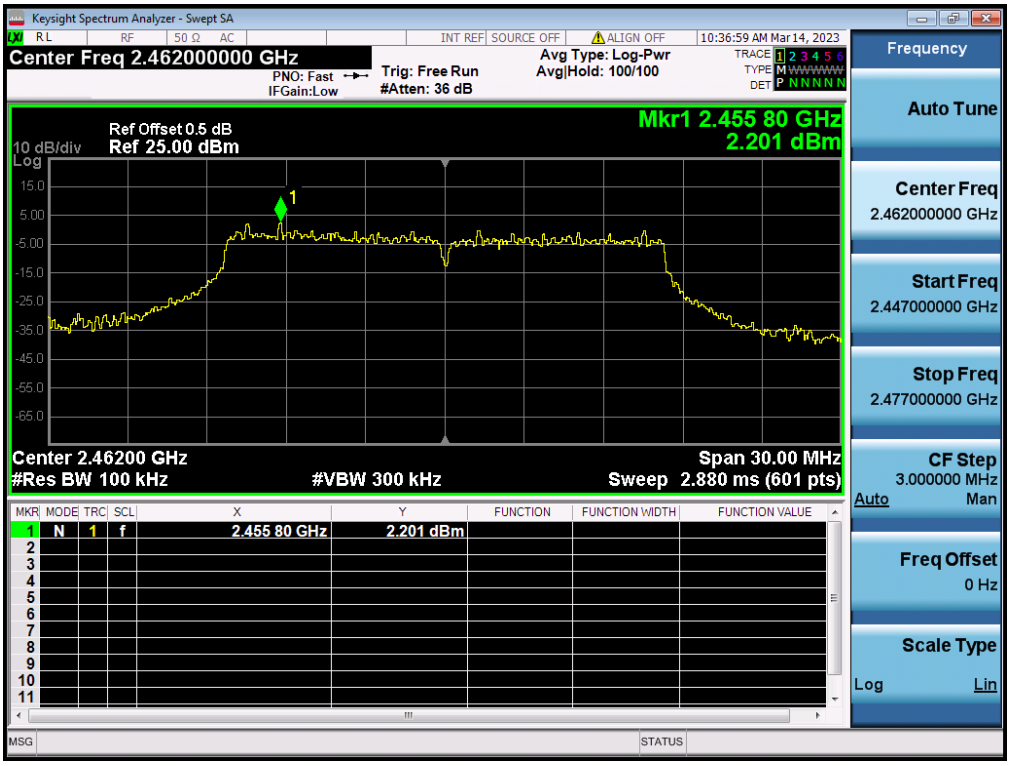



**Figure 56: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2462MHz Band Edge**

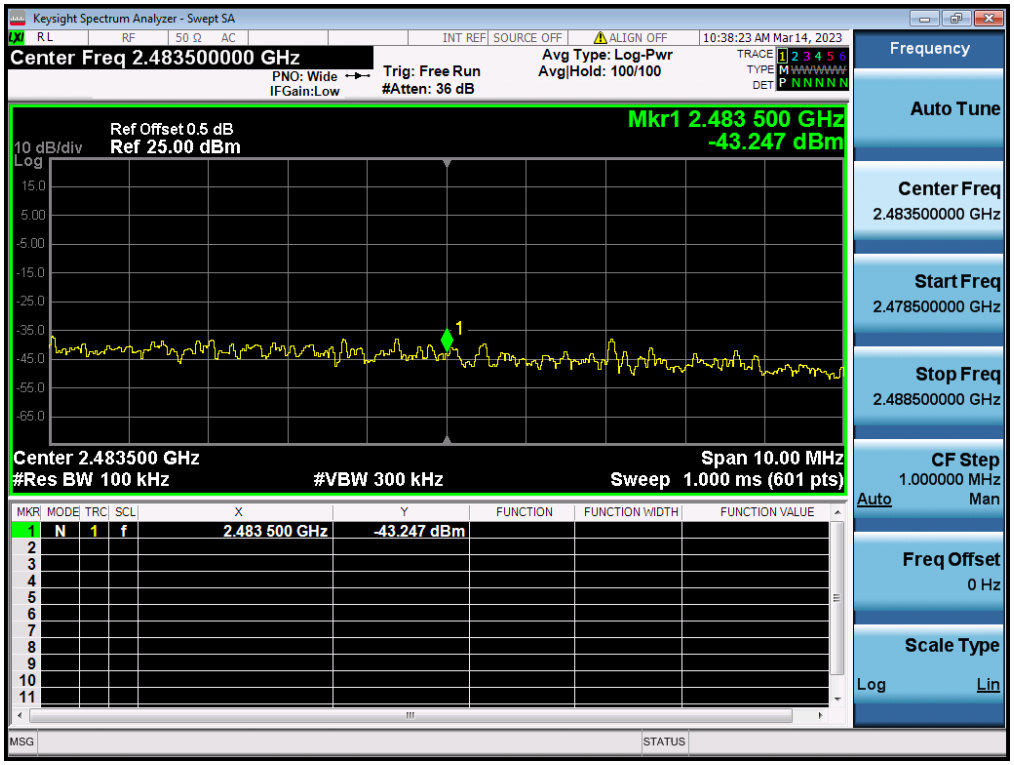


**Figure 57: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2462MHz**
**Conducted spurious emissions 30MHz-3GHz**

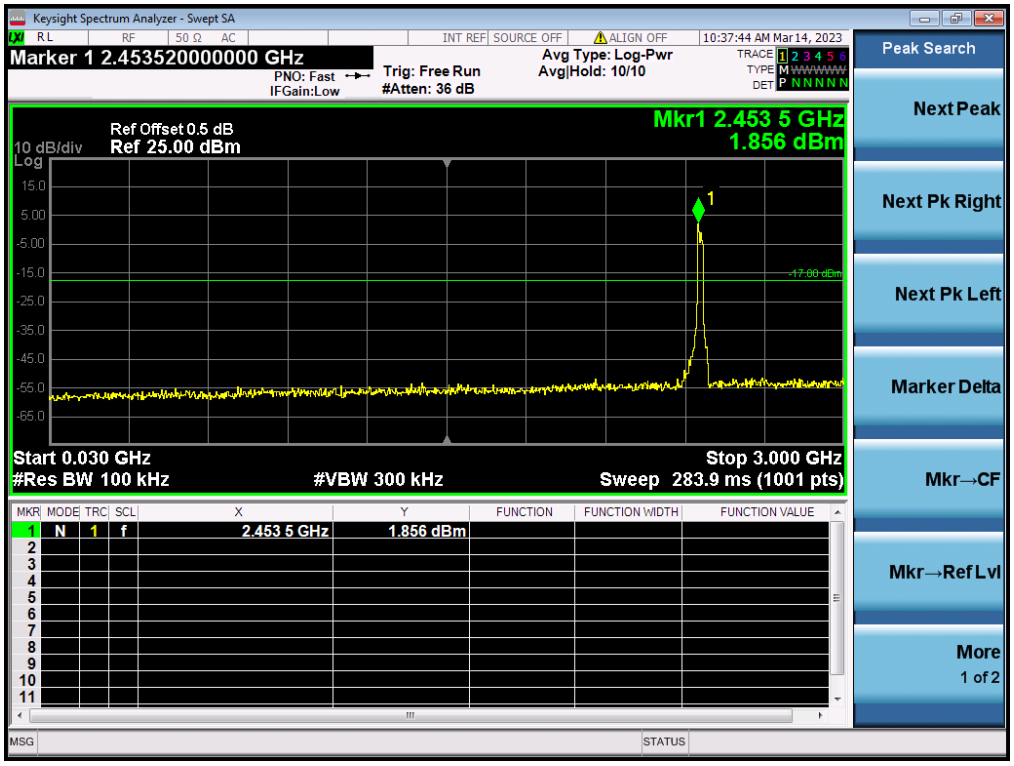



**Figure 58: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2462MHz**
**Conducted spurious emissions 2GHz-25GHz**

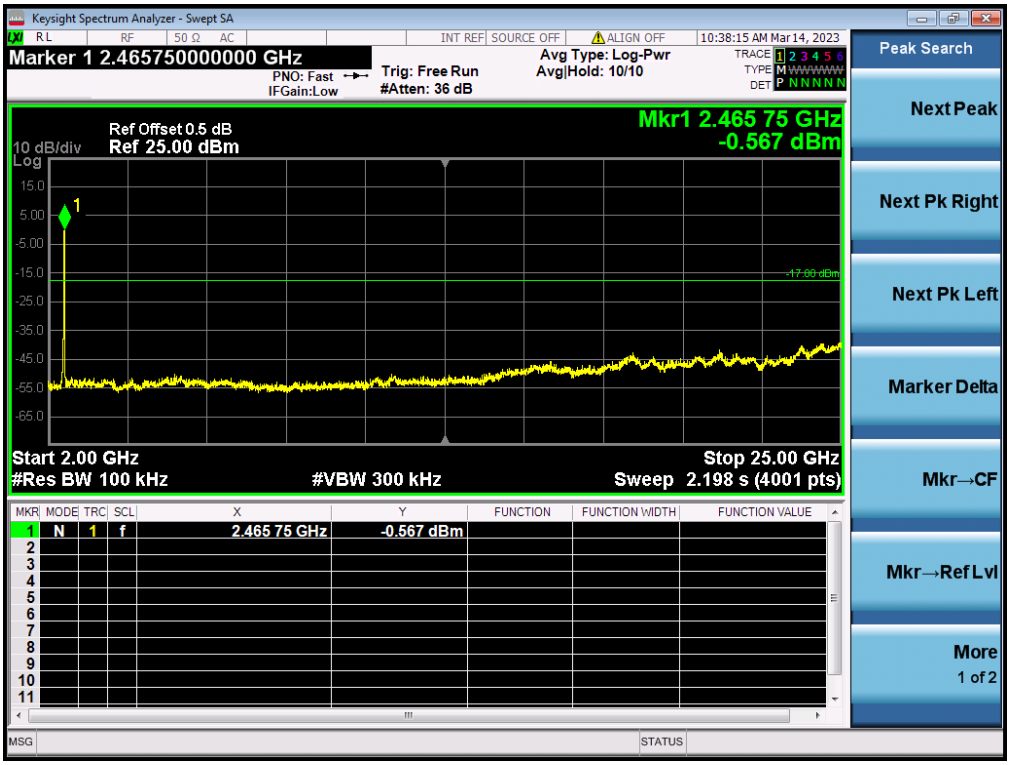


**Figure 59: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2412MHz Carrier Level**

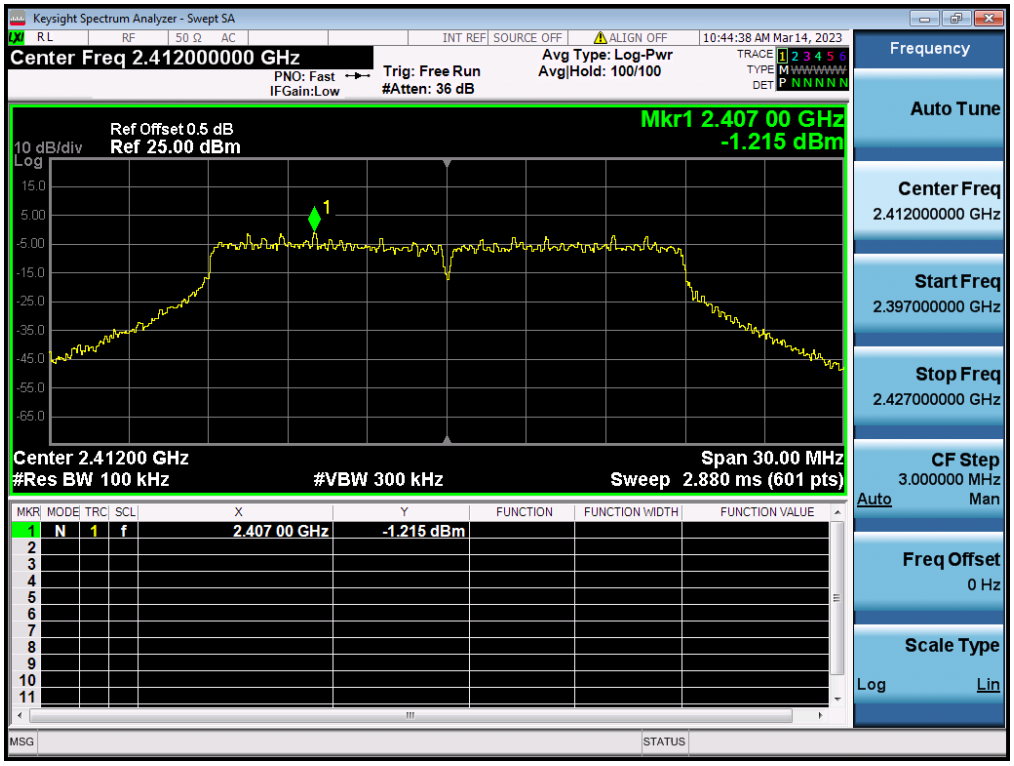



**Figure 60: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2412MHz Band Edge**

**Figure 61: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2412MHz**
**Conducted spurious emissions 30MHz-3GHz**

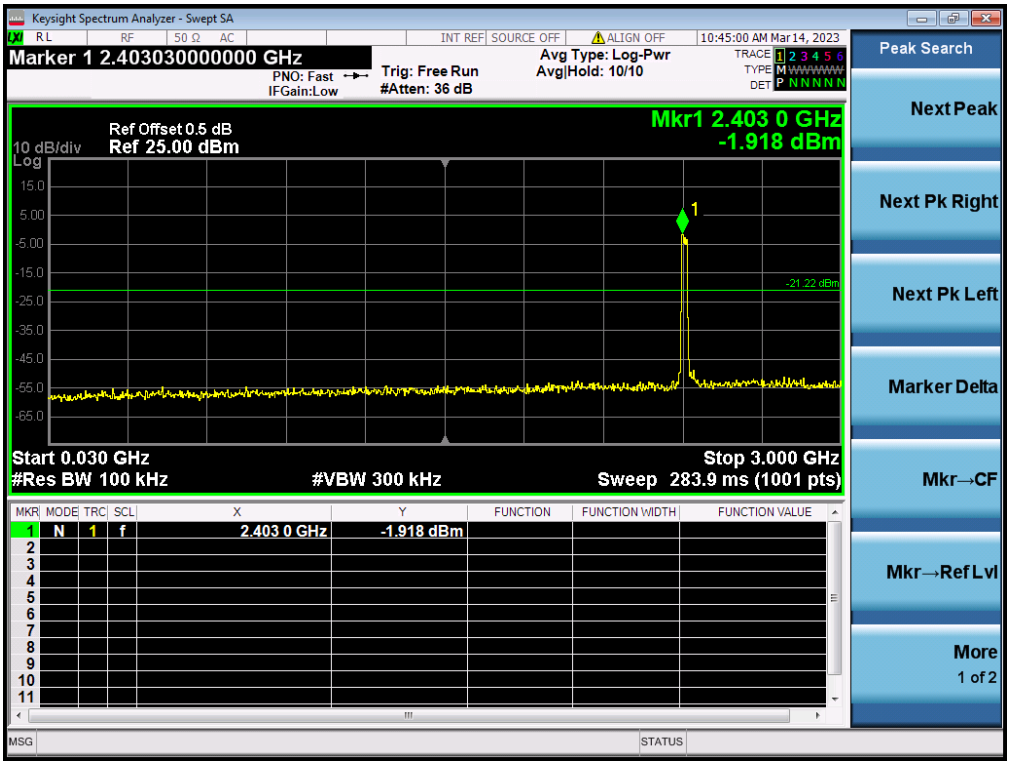



**Figure 62: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2412MHz**
**Conducted spurious emissions 2GHz-25GHz**

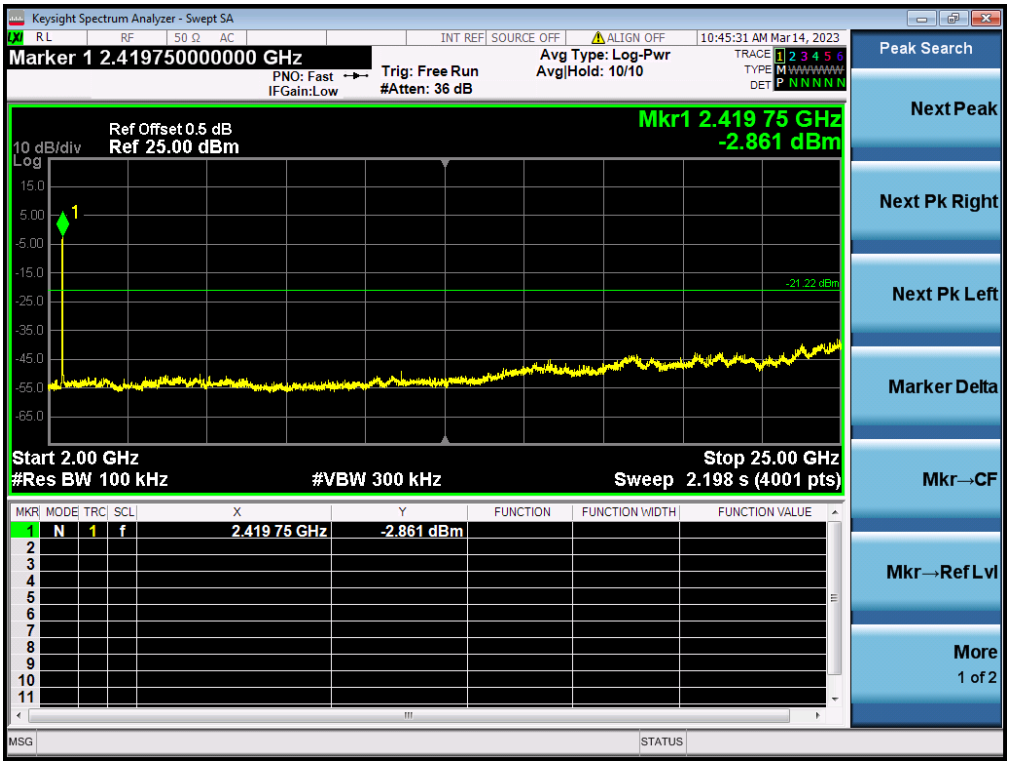


**Figure 63: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2437MHz Carrier Level**

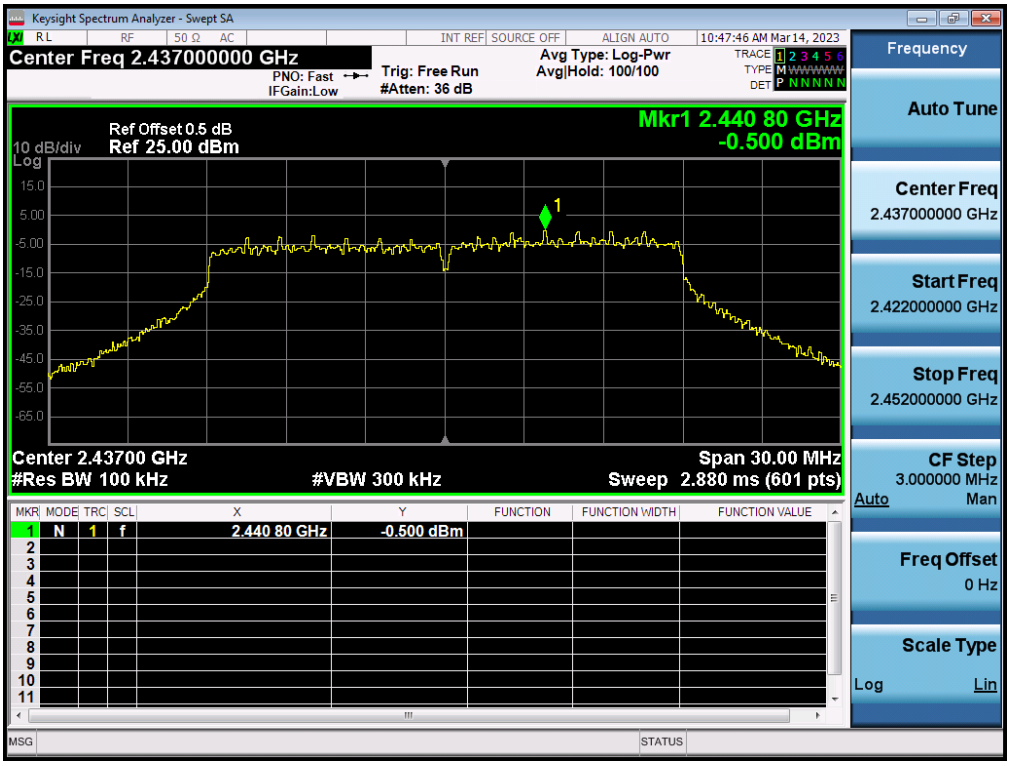



**Figure 64: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2437MHz Conducted spurious emissions 30MHz-3GHz**

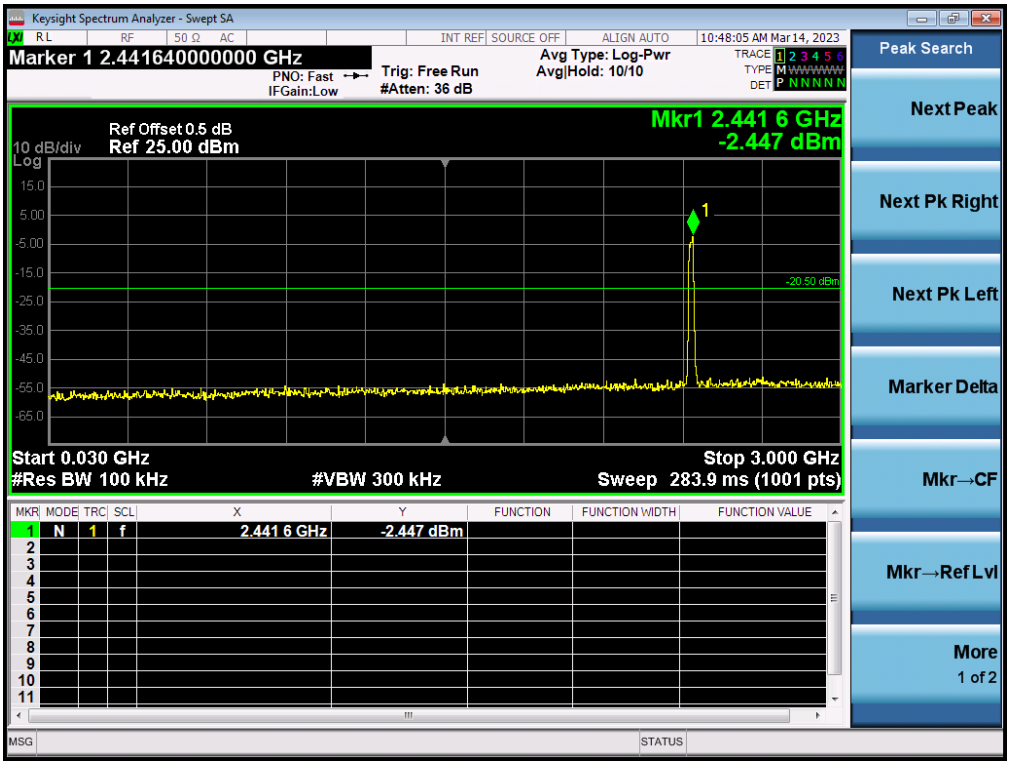


**Figure 65: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2437MHz**
**Conducted spurious emissions 2GHz-25GHz**

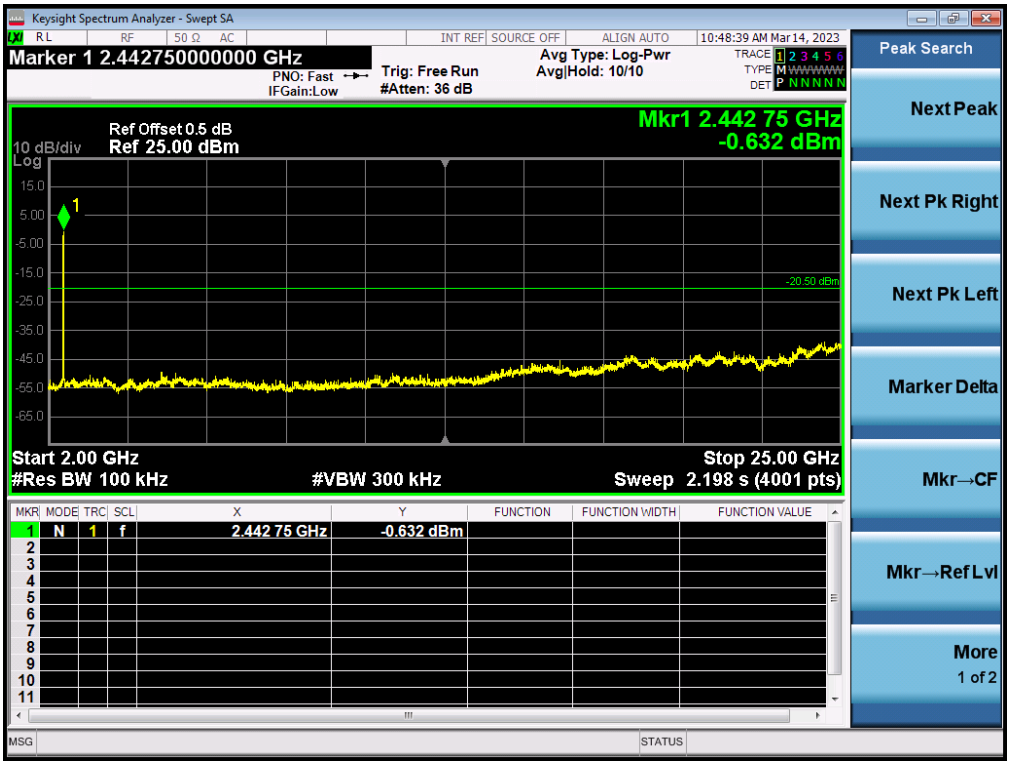



**Figure 66: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2462MHz**
**Carrier Level**

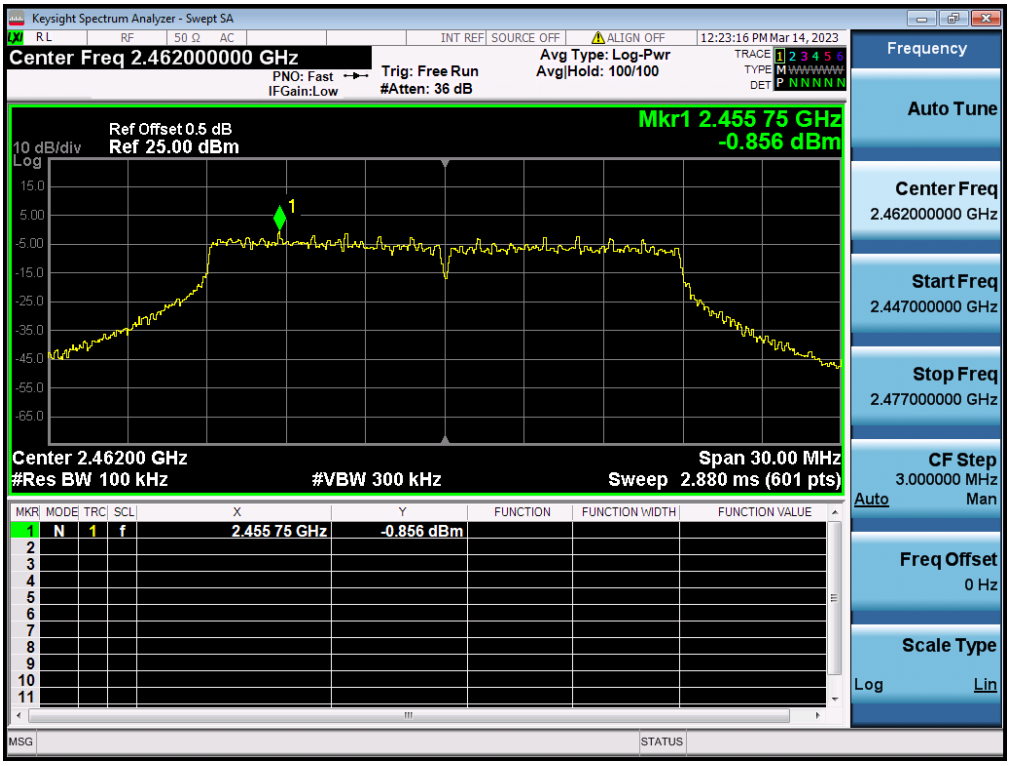


**Figure 67: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2462MHz Band Edge**

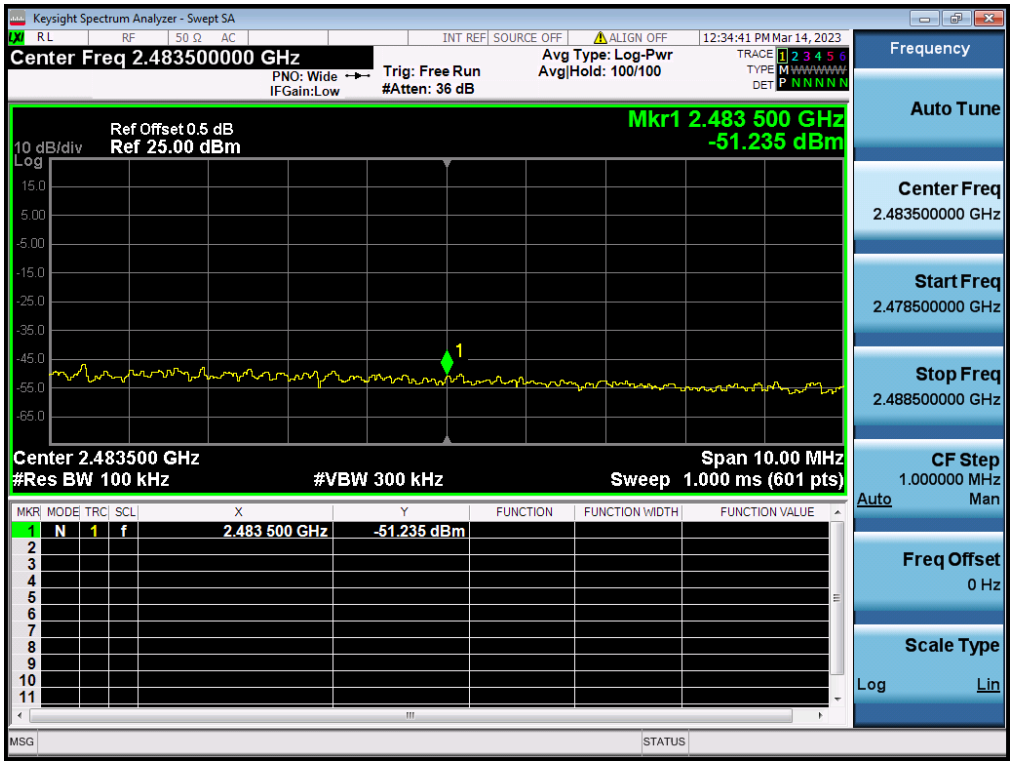



**Figure 68: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2462MHz Conducted spurious emissions 30MHz-3GHz**

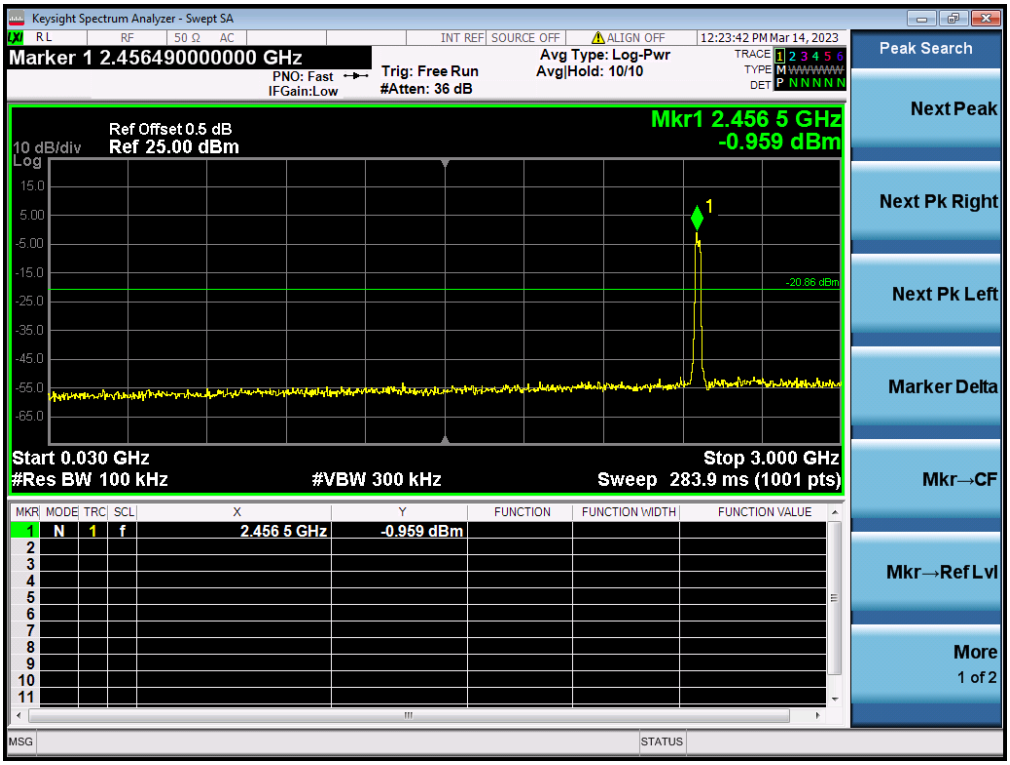


**Figure 69: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2462MHz**
**Conducted spurious emissions 2GHz-25GHz**

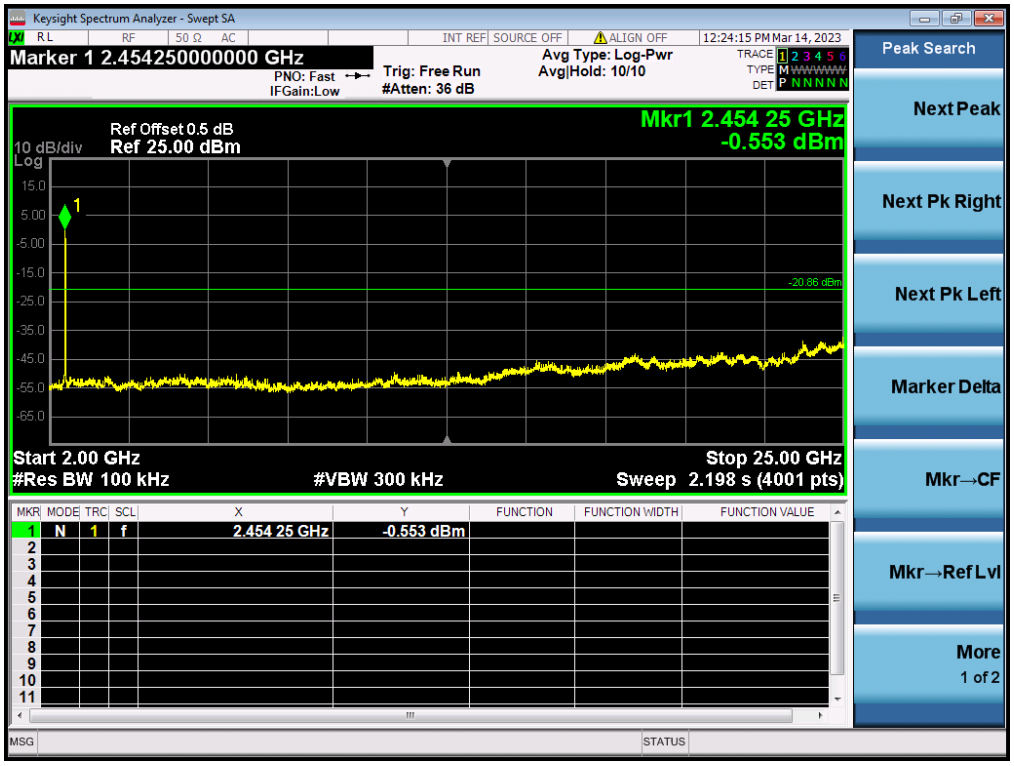



**Figure 70: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2422MHz**
**Carrier Level**

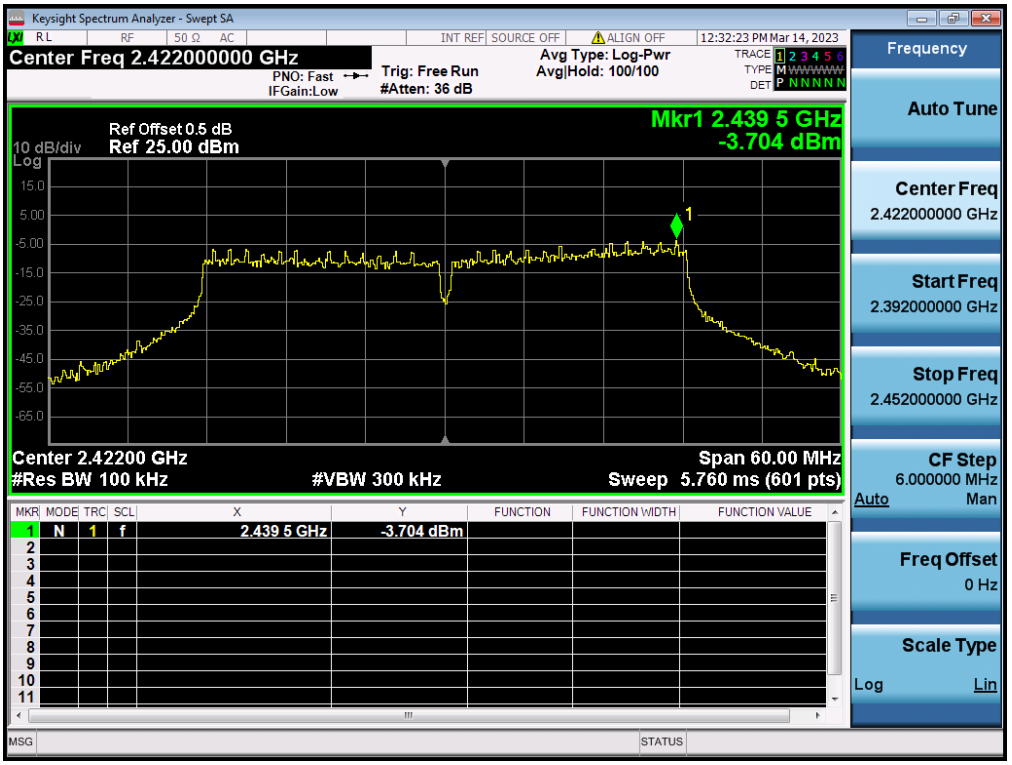


**Figure 71: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2422MHz Band Edge**


**Figure 72: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2422MHz Conducted spurious emissions 30MHz-3GHz**

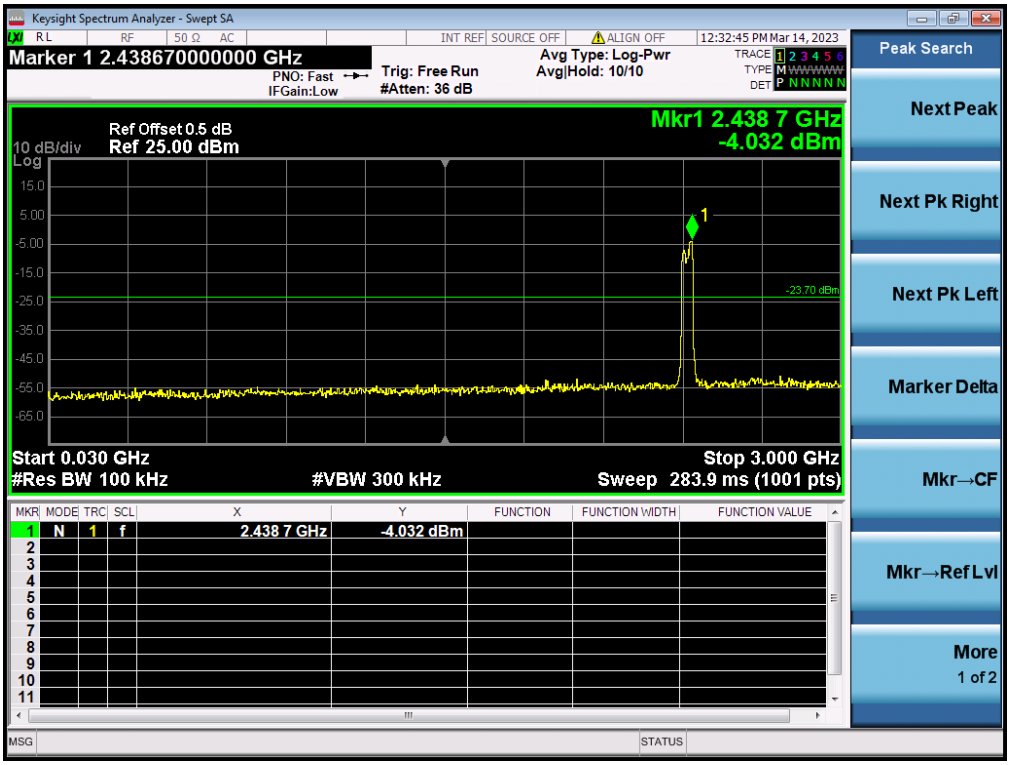


**Figure 73: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2422MHz**
**Conducted spurious emissions 2GHz-25GHz**

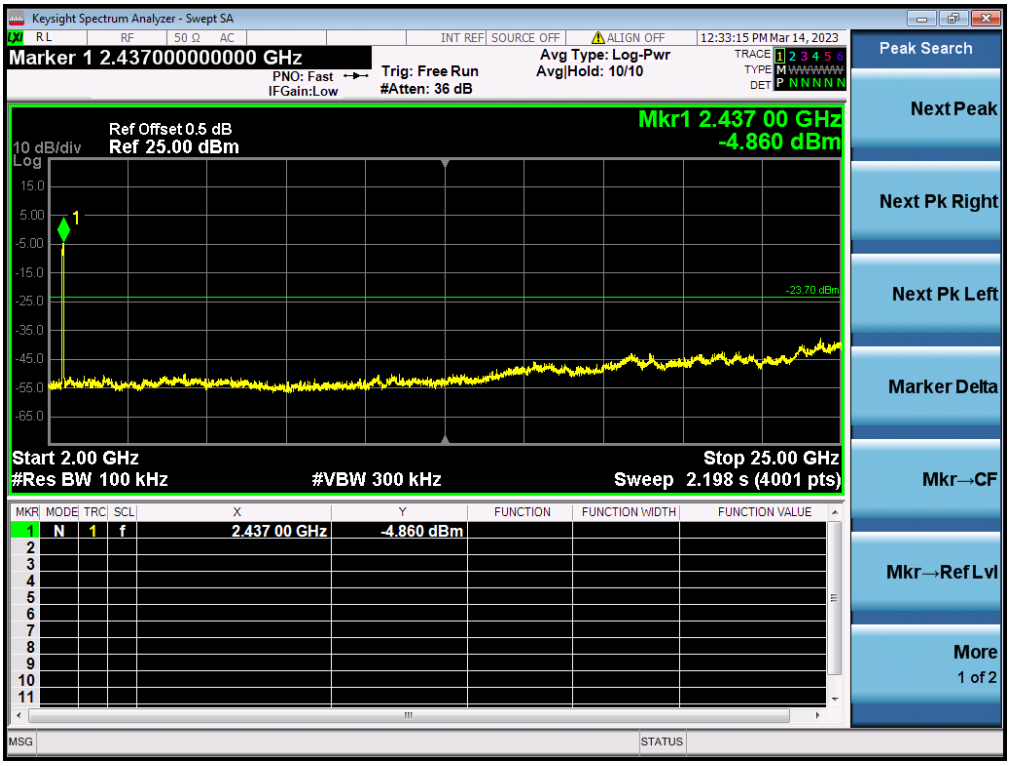



**Figure 74: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2437MHz**
**Carrier Level**

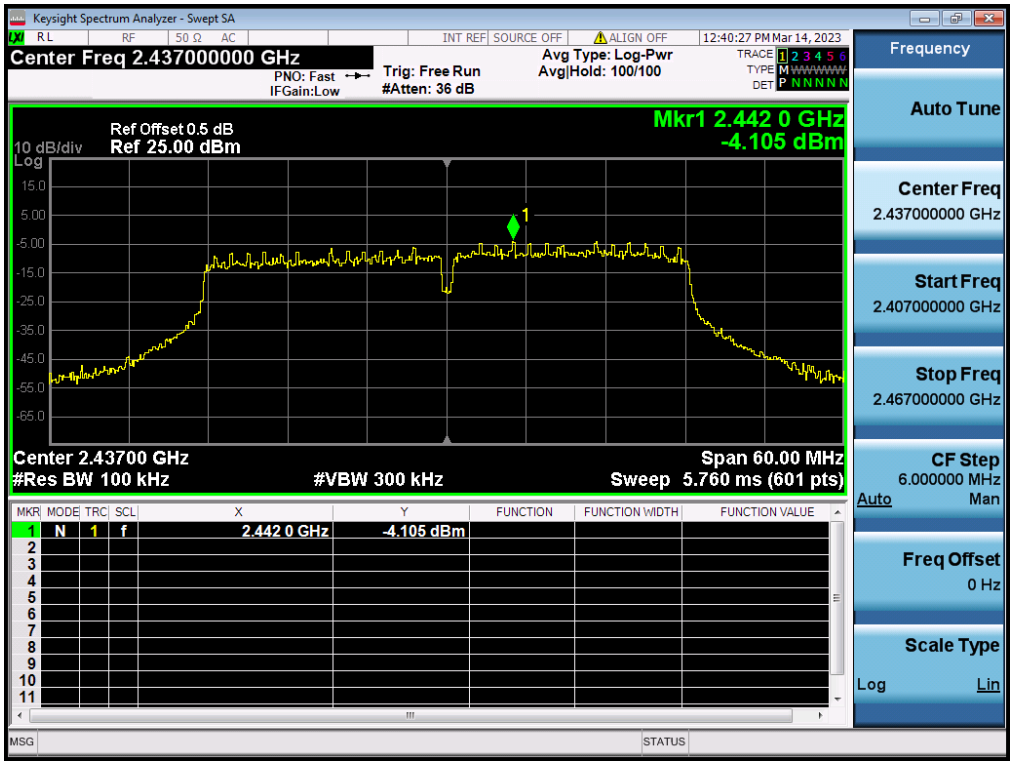


**Figure 75: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2437MHz**
**Conducted spurious emissions 30MHz-3GHz**

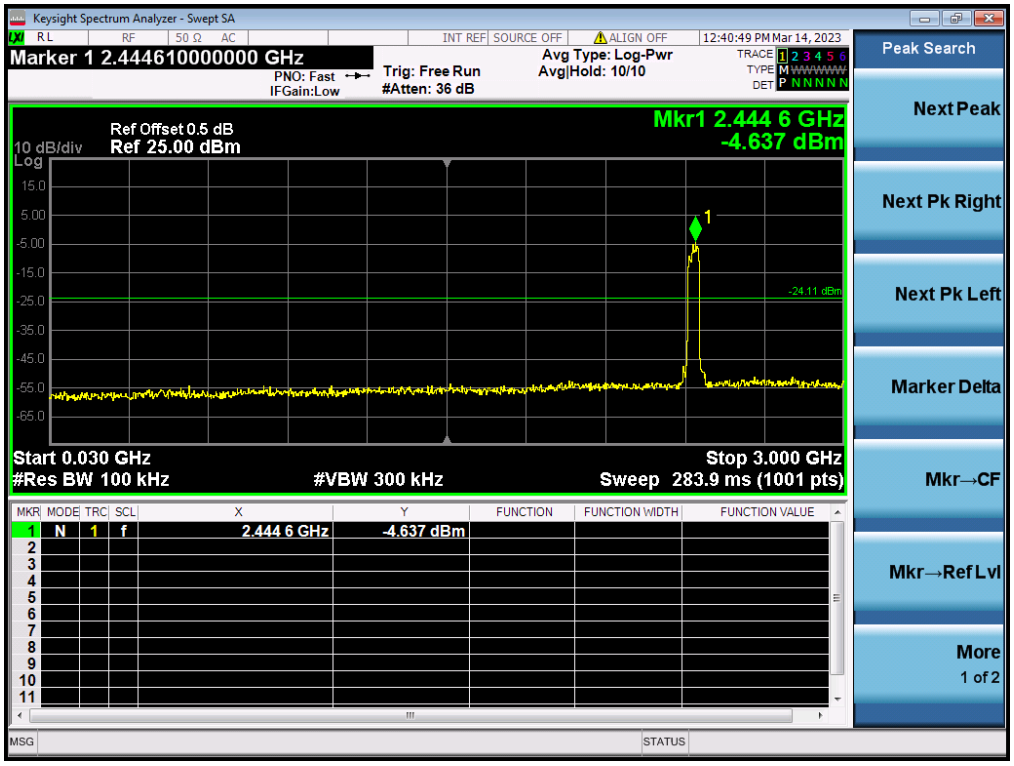



**Figure 76: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2437MHz**
**Conducted spurious emissions 2GHz-25GHz**

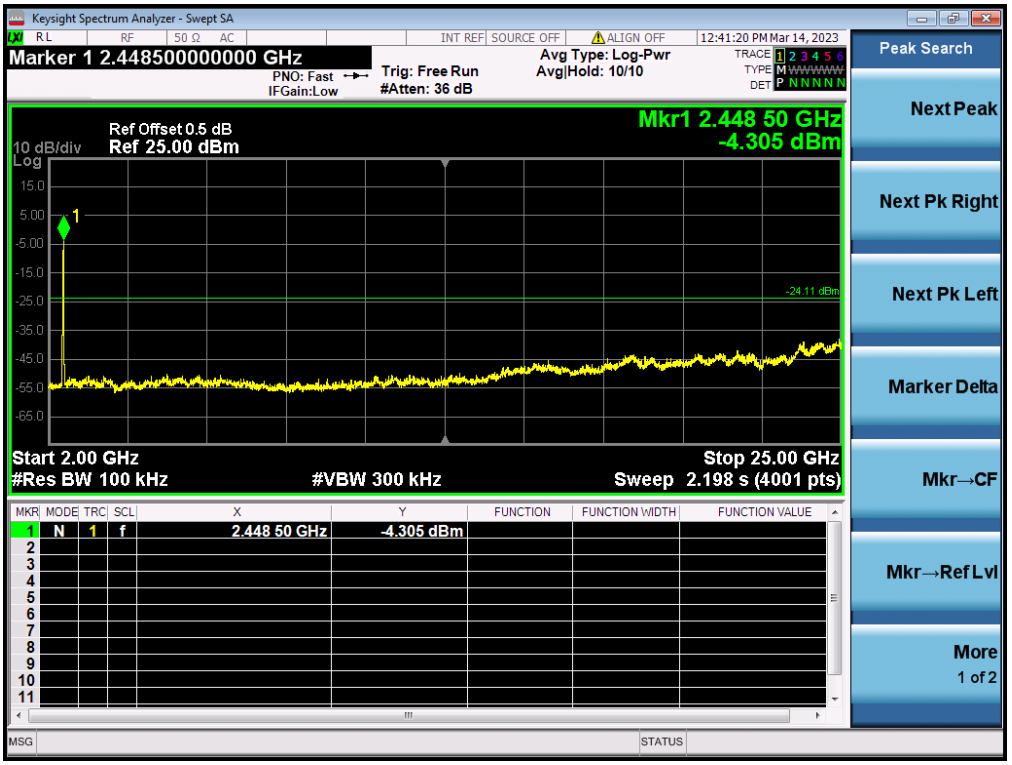


**Figure 77: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2452MHz Carrier Level**

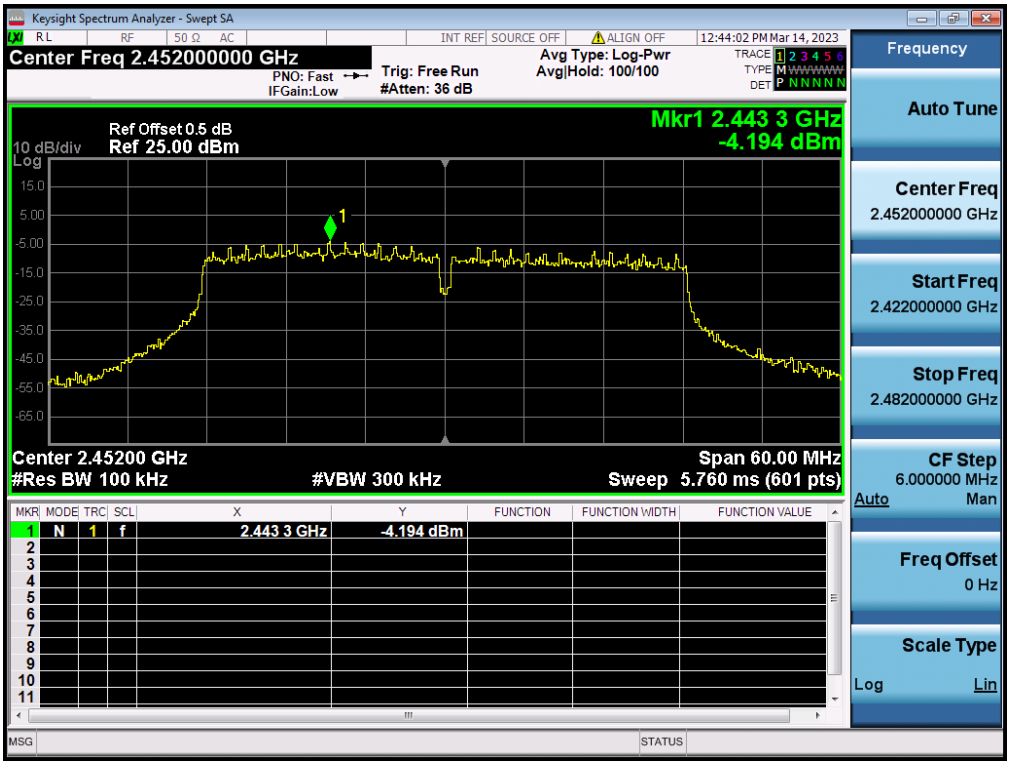



**Figure 78: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2452MHz Band Edge**

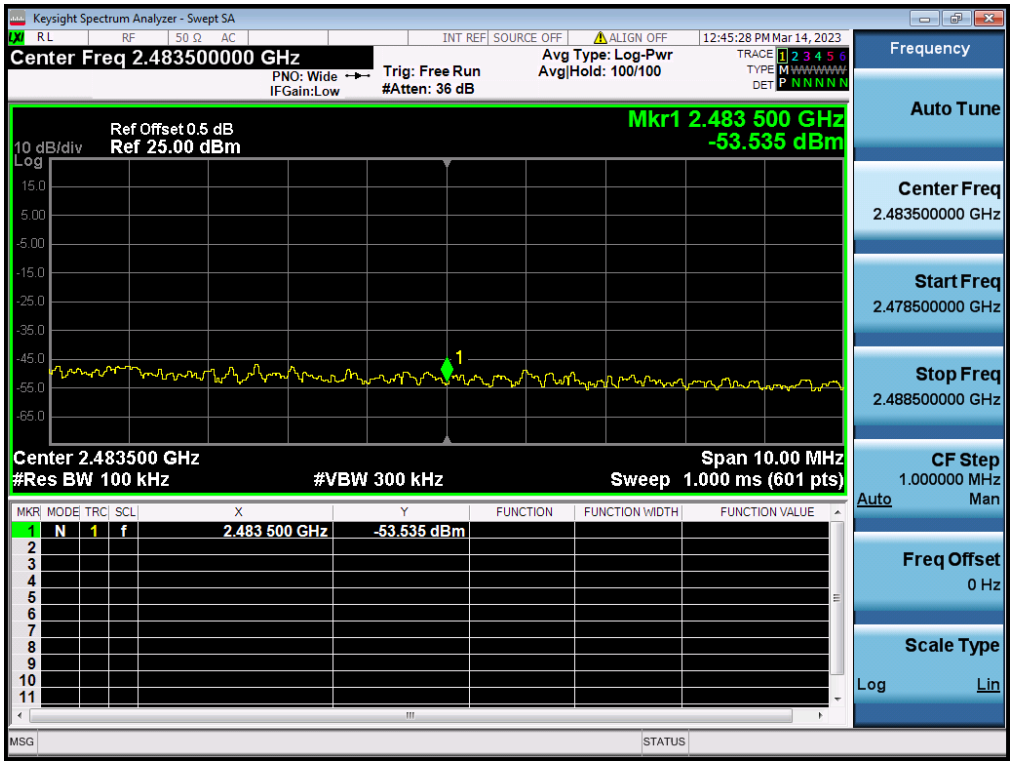


**Figure 79: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2452MHz**
**Conducted spurious emissions 30MHz-3GHz**

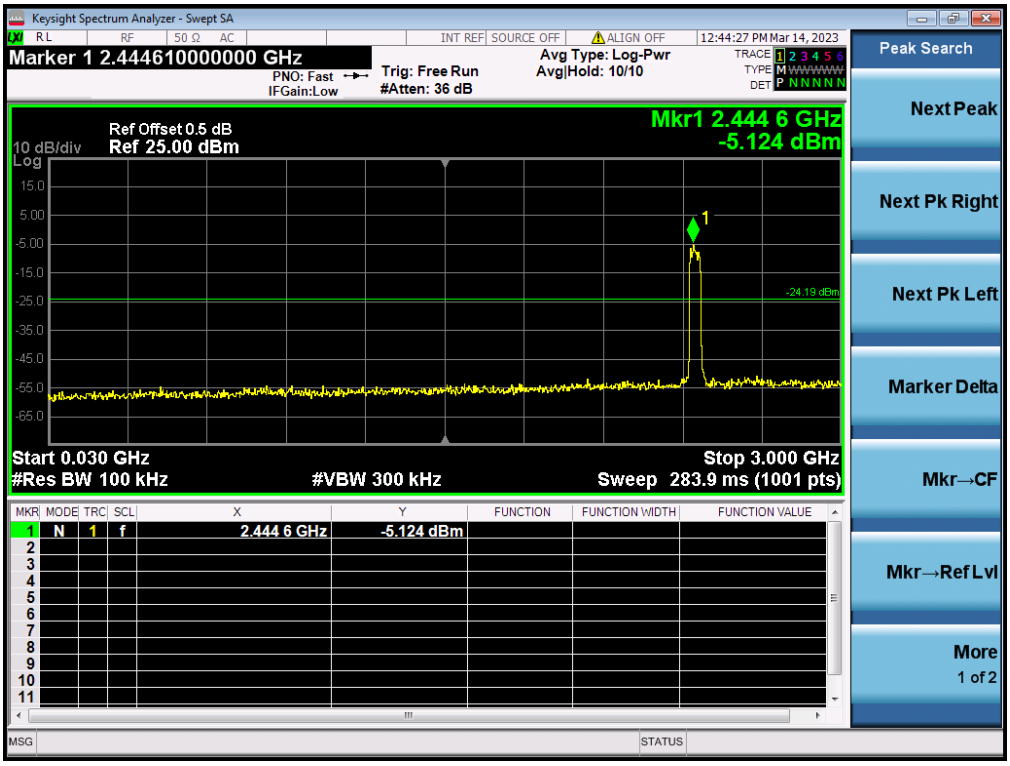
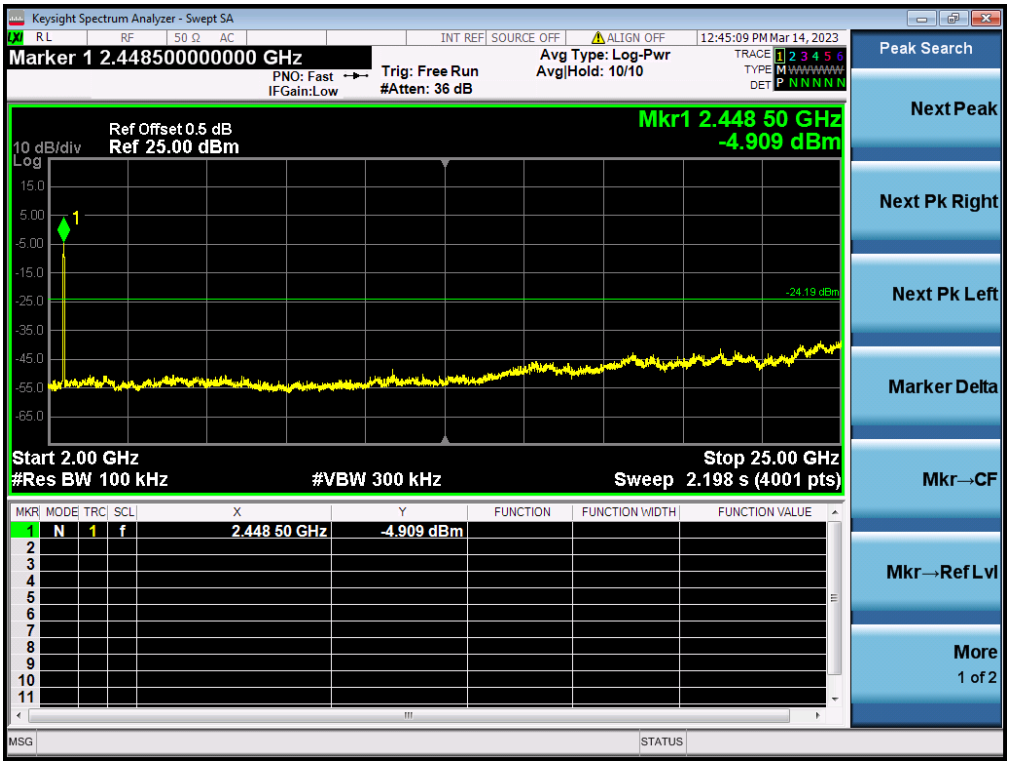



**Figure 80: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2452MHz**
**Conducted spurious emissions 2GHz-25GHz**



### 4.1.6 Radiated Spurious Emission

**RESULT:** **PASS**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(d), 15.205, 15.209<br>RSS-GEN 8.9 |
| Requirement | : | ANSI C63.10-2013 clause 11.12,<br>KDB 558074 clause 8.6 |
| Kind of test site | : | 3m Semi-Anechoic Chamber |

**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Low/Middle/High |
| Operation Mode | : | A.1.a |
| Ambient temperature | : | 23.2°C |
| Relative humidity | : | 42% |

Notes

*Test plots please refer to the annex document "SHE2211054-02AE DATA WIFI 2.4GHz-TX EXHIBIT A".*

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
3. The EUT is working in the Normal link mode below 1 GHz.
4. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

### 4.1.7 Band Edge (Restricted-band band-edge)

**RESULT:** **PASS**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(d), 15.205, 15.209<br>RSS-GEN 8.10 |
| Requirement | : | ANSI C63.10-2013 clause 11.13,<br>KDB 558074 clause 8.7 |
| Kind of test site | : | 3m Semi-Anechoic Chamber |

**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Low/Middle/High |
| Operation Mode | : | A.1.a |
| Ambient temperature | : | 24°C |
| Relative humidity | : | 49% |

*Notes:*

*Test plots please refer to the annex document "SHE22110054-02AE DATA WIFI 2.4GHz-TX EXHIBIT A".*

## 4.2 Mains Emissions

### 4.2.1 Conducted Emission on AC Mains

**RESULT:** **PASS**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.207(a), RSS-Gen 8.8 |
| Requirement | : | ANSI C63.10-2013 clause 6.2 |
| Kind of test site | : | Shielded room |

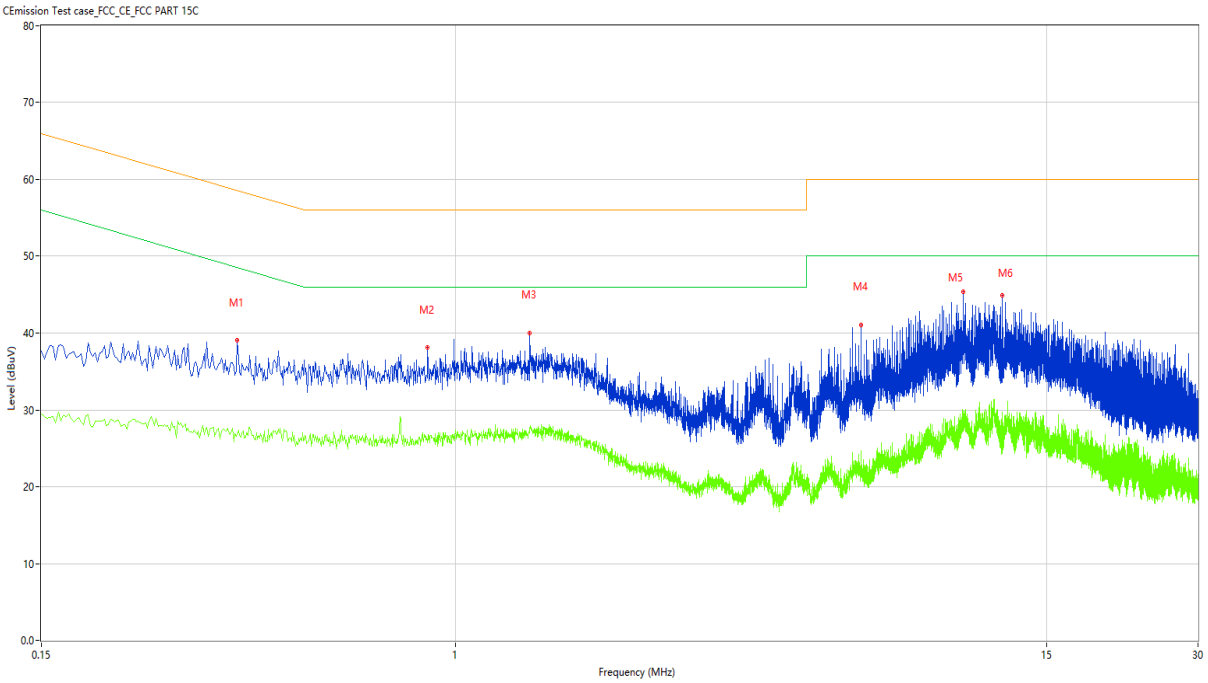
**Test setup**

| | | |
|---|---|---|
| Input Voltage | : | which received AC 120V, 60Hz Power |
| Operation Mode | : | A.1.a |
| Earthing | : | Not Connected |
| Ambient temperature | : | 23.2°C |
| Relative humidity | : | 52% |

For details refer to following test plot.

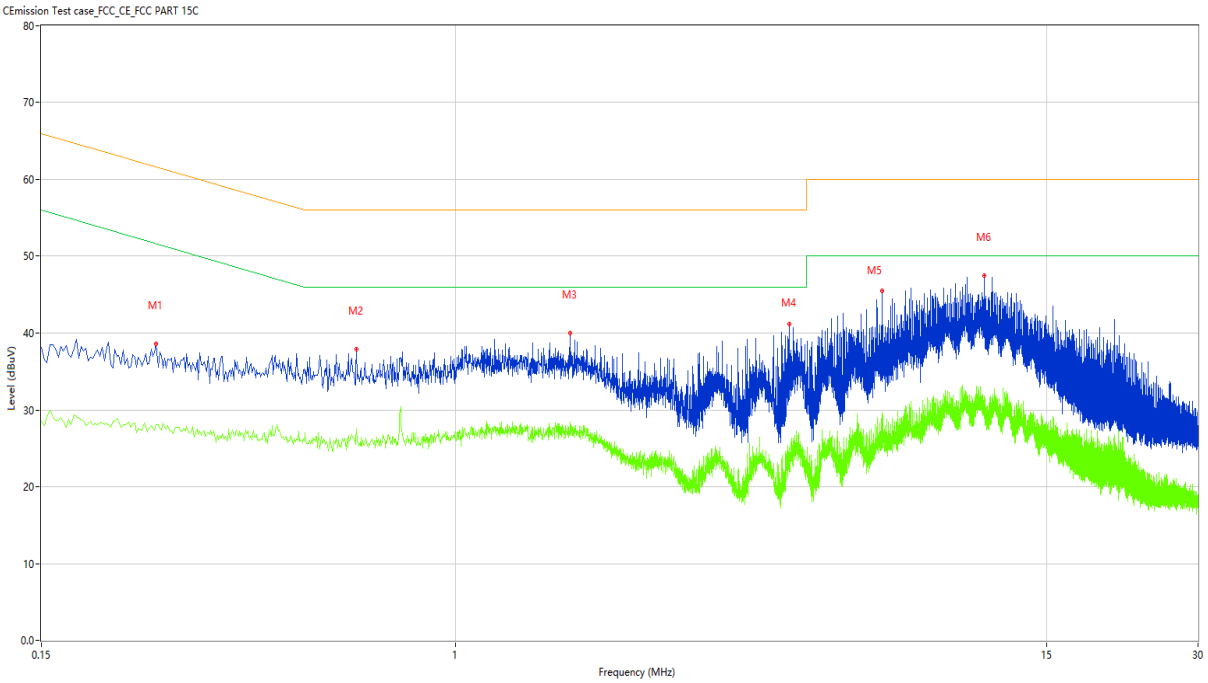
Note：The all configurations were tested respectively, but only the worst configuration shown here.

**Figure 81: Conducted Emission on AC Mains, L Phase**




| No. | Frequency (MHz) | Results (dBuV) | Factor (dB) | Limit (dBuV) | Margin (dB) | Detector | Line | Verdict |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.368 | 39.01 | 10.23 | 58.55 | 19.54 | Peak | L | Pass |
| 1** | 0.368 | 26.82 | 10.23 | 48.55 | 21.73 | AV | L | Pass |
| 2 | 0.880 | 38.10 | 10.21 | 56.00 | 17.90 | Peak | L | Pass |
| 2** | 0.880 | 25.67 | 10.21 | 46.00 | 20.33 | AV | L | Pass |
| 3 | 1.406 | 40.02 | 10.15 | 56.00 | 15.98 | Peak | L | Pass |
| 3** | 1.406 | 27.56 | 10.15 | 46.00 | 18.44 | AV | L | Pass |
| 4 | 6.418 | 41.06 | 10.41 | 60.00 | 18.94 | Peak | L | Pass |
| 4** | 6.418 | 24.64 | 10.41 | 50.00 | 25.36 | AV | L | Pass |
| 5 | 10.226 | 45.38 | 10.50 | 60.00 | 14.62 | Peak | L | Pass |
| 5** | 10.226 | 29.80 | 10.50 | 50.00 | 20.20 | AV | L | Pass |
| 6 | 12.240 | 44.88 | 10.60 | 60.00 | 15.12 | Peak | L | Pass |
| 6** | 12.240 | 29.75 | 10.60 | 50.00 | 20.25 | AV | L | Pass |

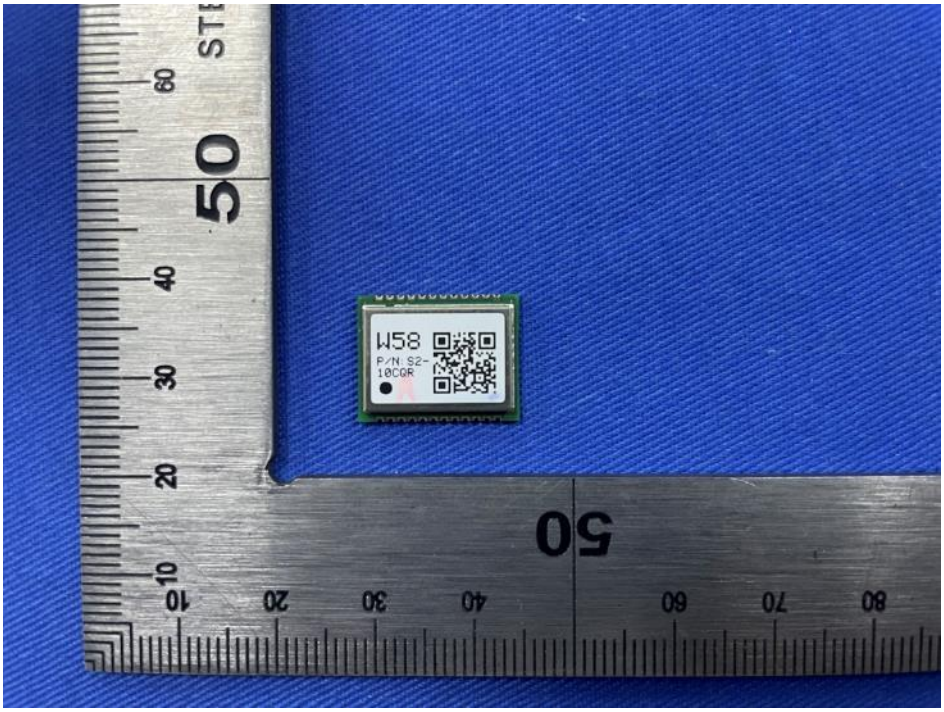
**Figure 82: Conducted Emission on AC Mains, N Phase**



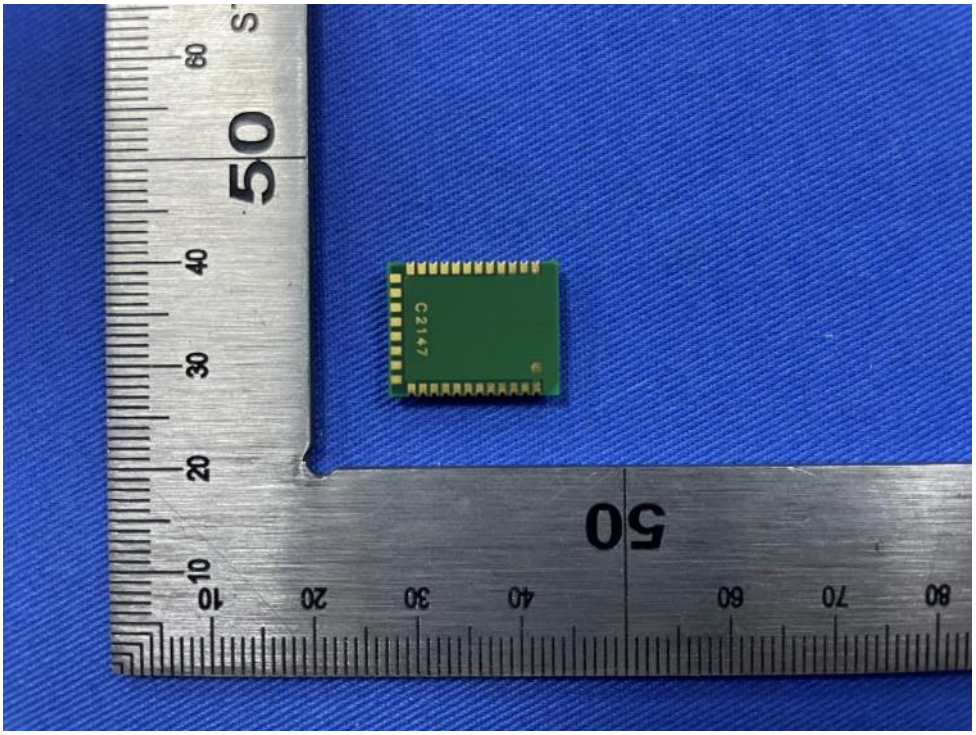

| No. | Frequency (MHz) | Results (dBuV) | Factor (dB) | Limit (dBuV) | Margin (dB) | Detector | Line | Verdict |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.254 | 38.64 | 10.27 | 61.63 | 22.99 | Peak | N | Pass |
| 1** | 0.254 | 28.12 | 10.27 | 51.63 | 23.51 | AV | N | Pass |
| 2 | 0.636 | 37.91 | 10.35 | 56.00 | 18.09 | Peak | N | Pass |
| 2** | 0.636 | 27.45 | 10.35 | 46.00 | 18.55 | AV | N | Pass |
| 3 | 1.690 | 39.99 | 10.20 | 56.00 | 16.01 | Peak | N | Pass |
| 3** | 1.690 | 28.44 | 10.20 | 46.00 | 17.56 | AV | N | Pass |
| 4 | 4.622 | 41.16 | 10.27 | 56.00 | 14.84 | Peak | N | Pass |
| 4** | 4.622 | 25.20 | 10.27 | 46.00 | 20.80 | AV | N | Pass |
| 5 | 7.068 | 45.53 | 10.35 | 60.00 | 14.47 | Peak | N | Pass |
| 5** | 7.068 | 29.70 | 10.35 | 50.00 | 20.30 | AV | N | Pass |
| 6 | 11.262 | 47.54 | 10.42 | 60.00 | 12.46 | Peak | N | Pass |
| 6** | 11.262 | 30.30 | 10.42 | 50.00 | 19.70 | AV | N | Pass |

# 5 Appendixes

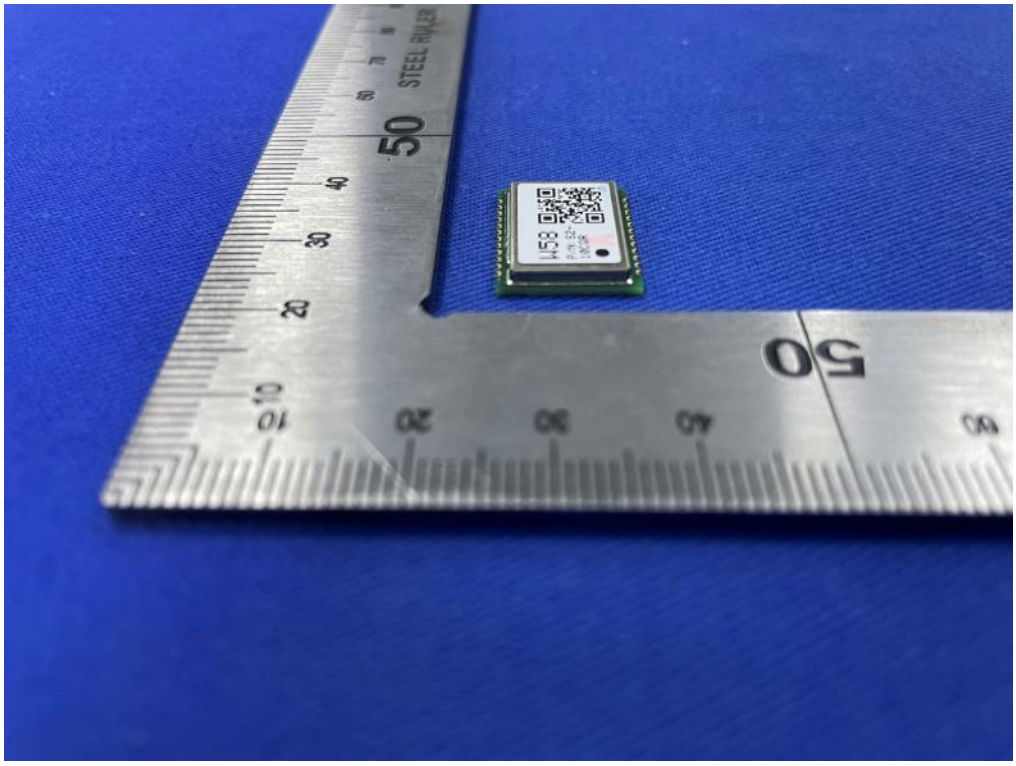
## 5.1 Photographs of the Sample



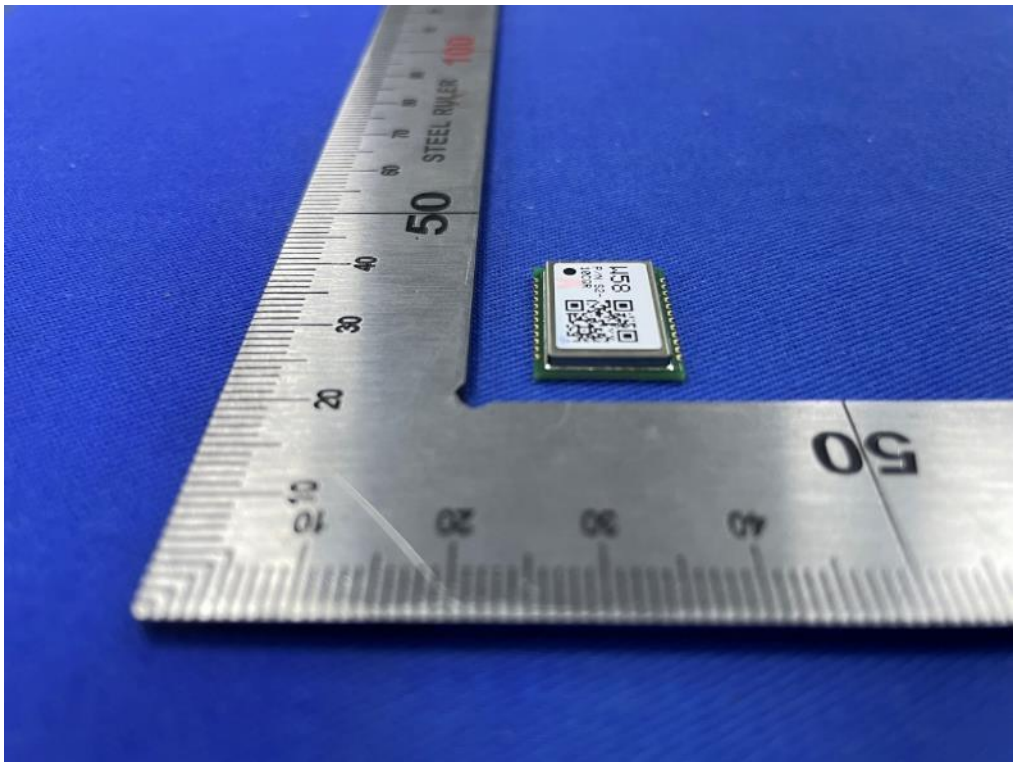

**Front of the sample**



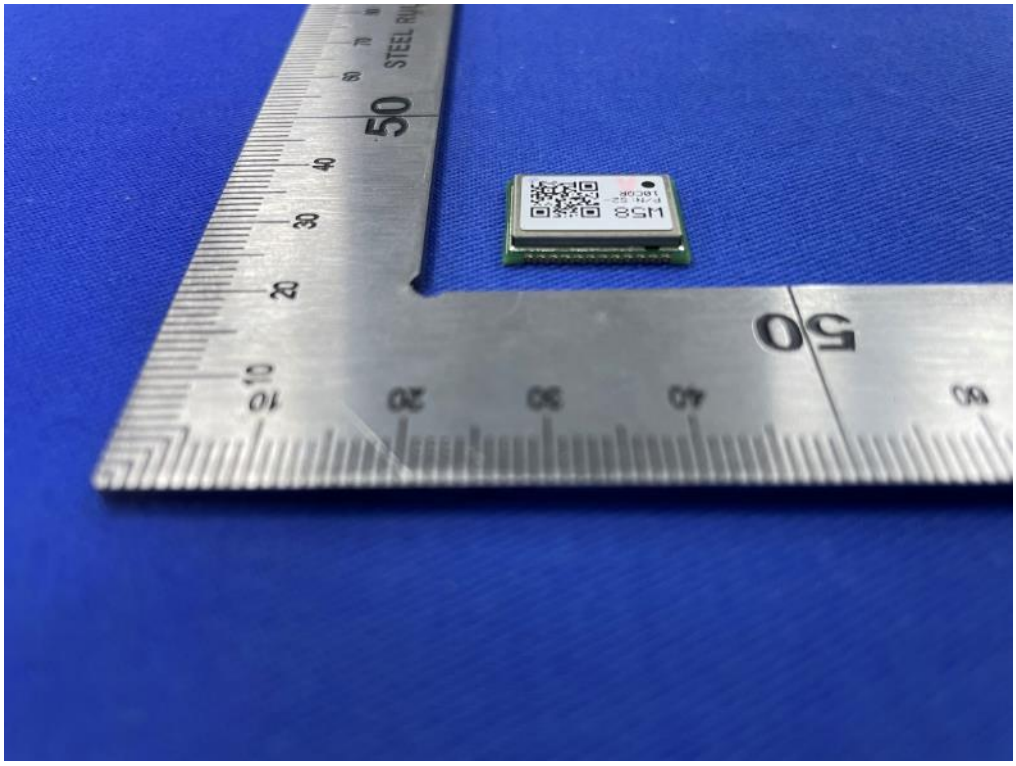

**Back of the sample**



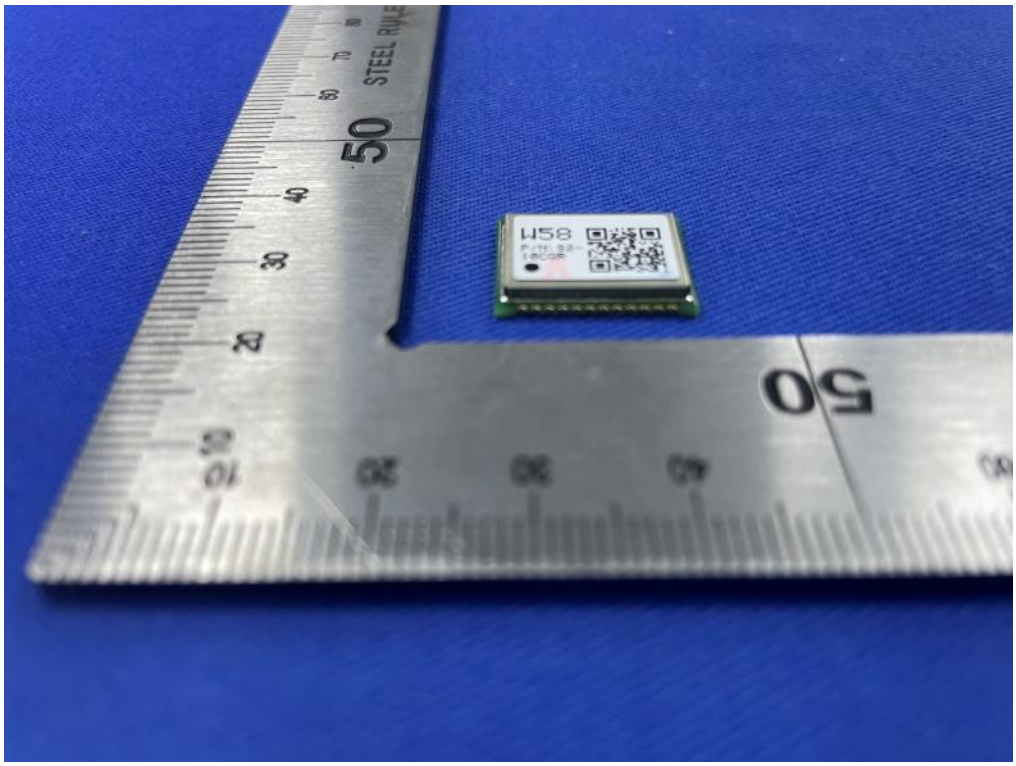

**Left of the sample**



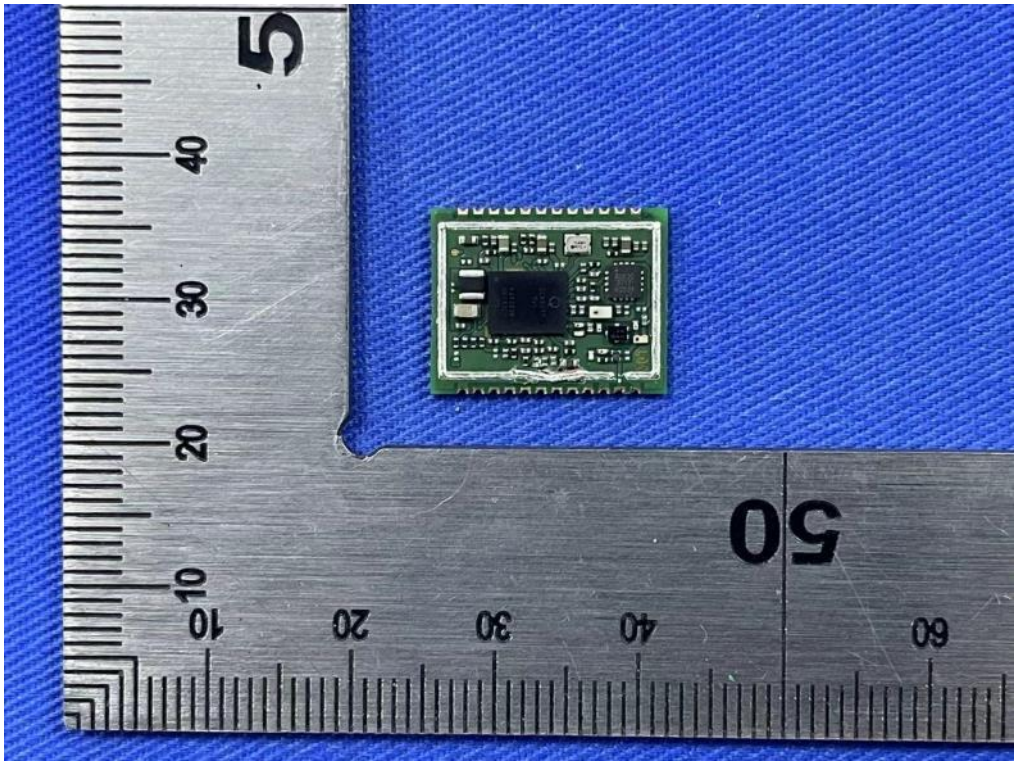

**Right of the sample**



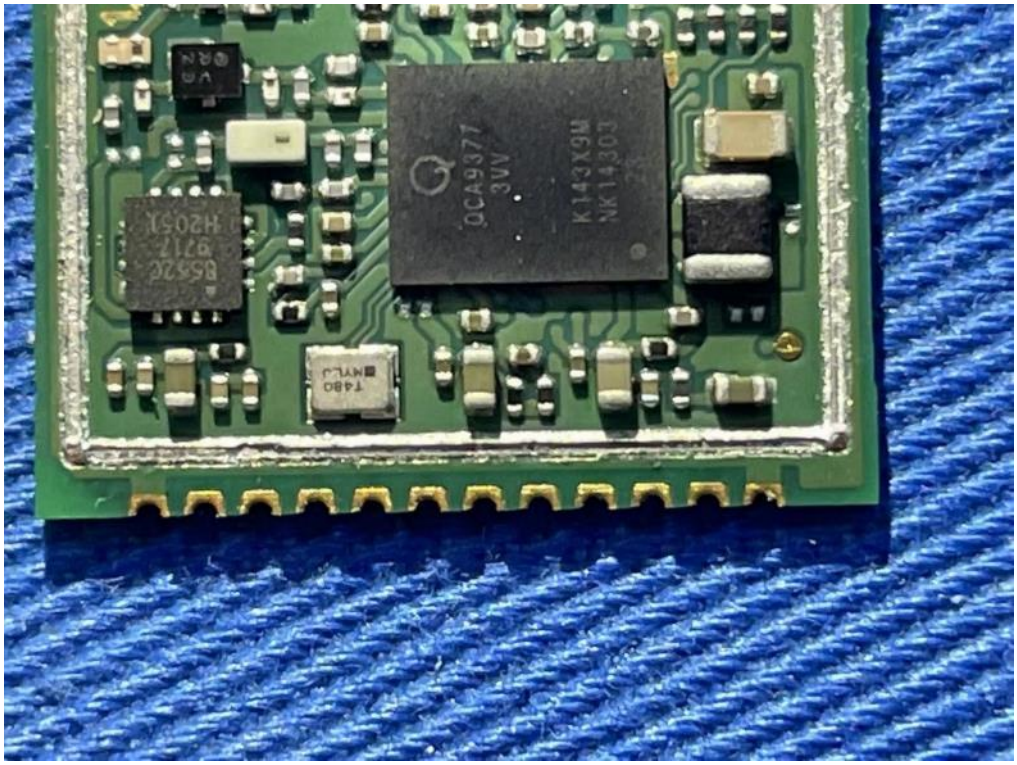
**Top of the sample**



**Bottom of the sample**



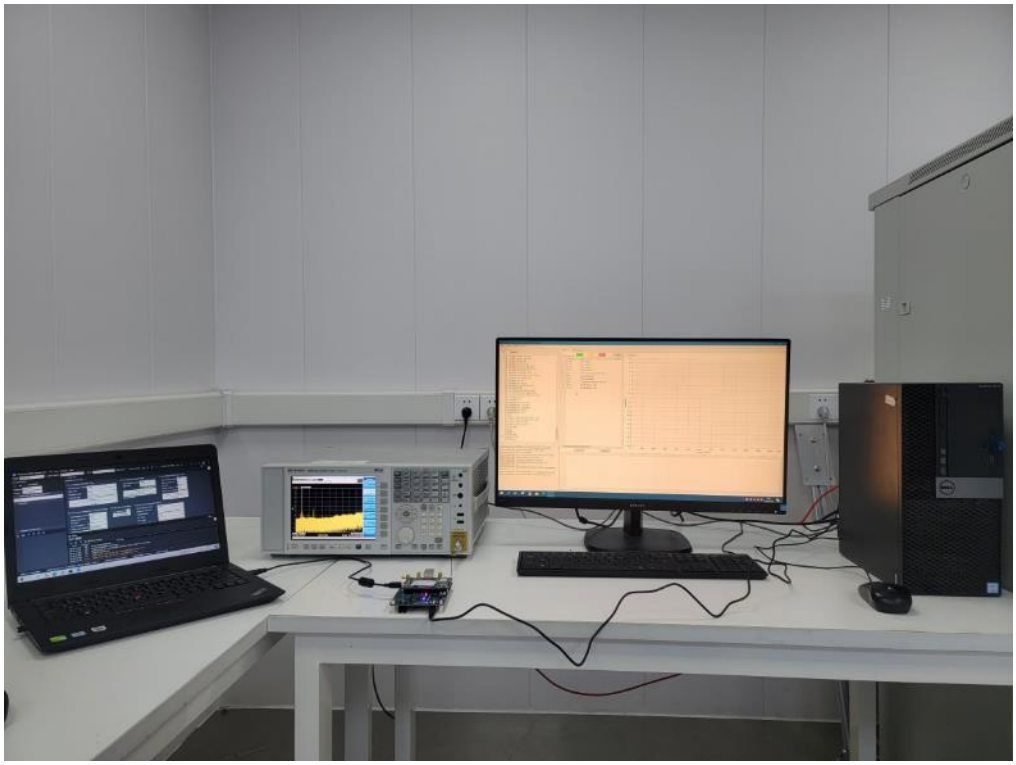
**Internal-1 of the sample**



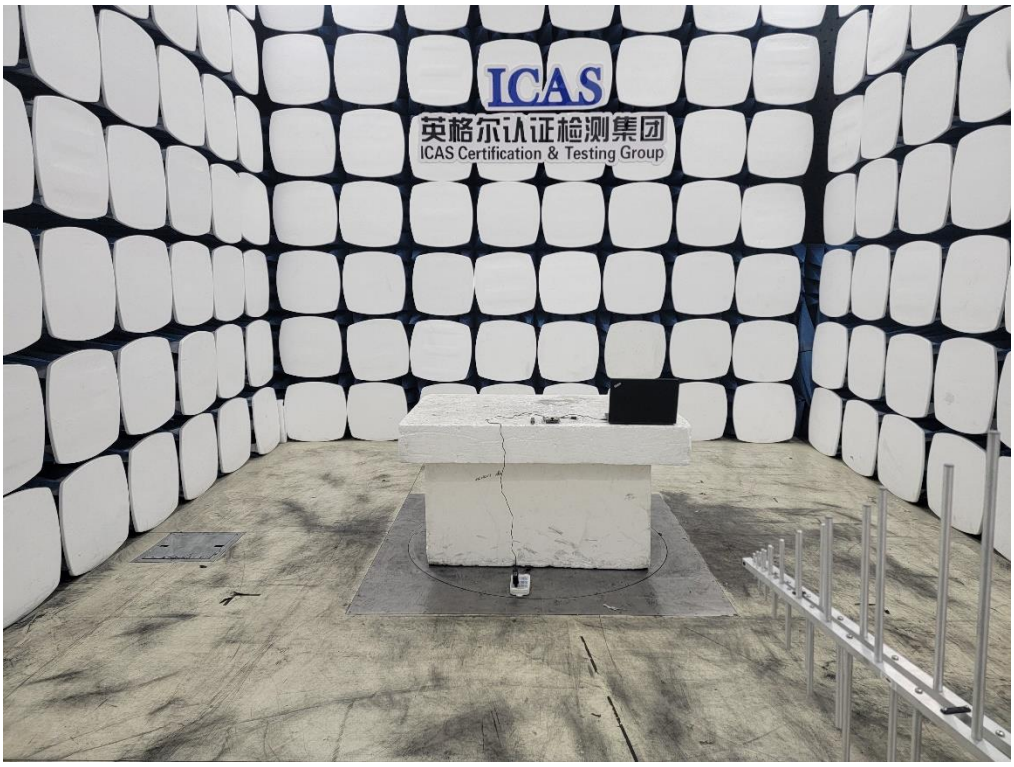
**Internal-2 of the sample**

## 5.2 Set-up for Conducted Emissions

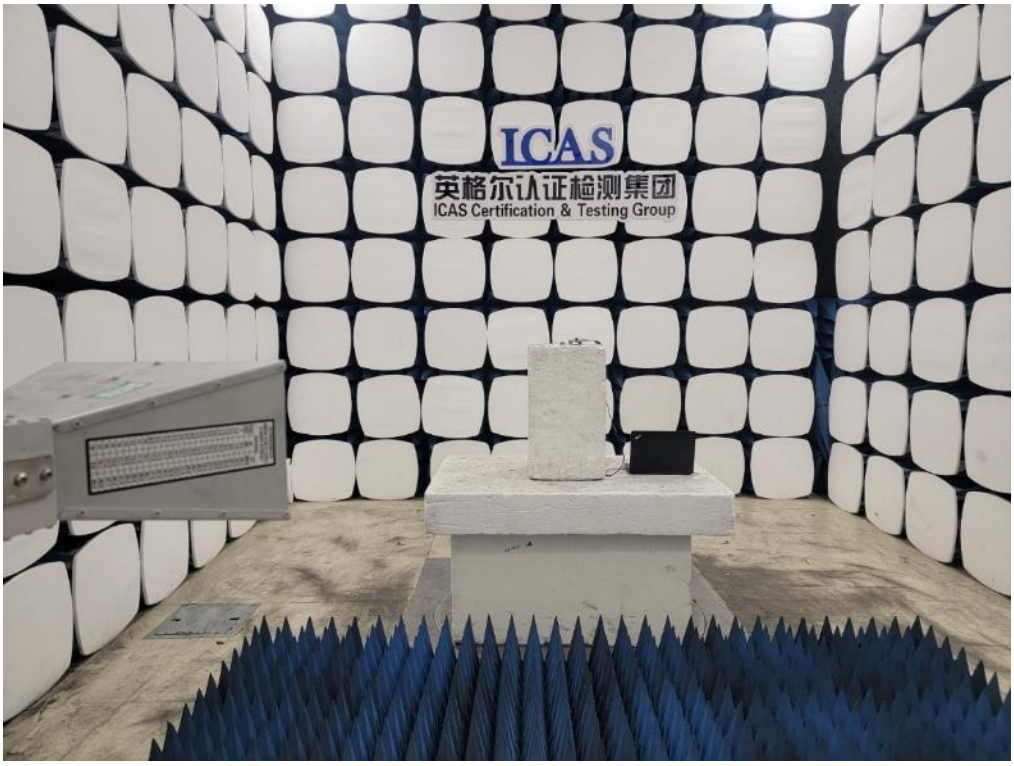
## 5.3 Set-up for Conducted RF test at Antenna Port



## 5.4 Set-up for Spurious Emissions below 1GHz




## 5.5 Set-up for Spurious Emissions above 1GHz




***End of the report***