

# TEST REPORT

Report No.: SHE23100101-02FE

Date: 2024-05-24

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**Applicant** : SKYTECH USA LLC.  
**Address of Applicant** : INCORP SERVICES, INC. 3458 LAKESHORE DRIVE  
TALLAHASSEE, FL 32312 US

**Product Name** : ALL IN ONE  
**Brand Name** : STGsivir & STGSivir  
**Model Name** : SIV0223  
**Sample Acquisition Method** : Sent by Client  
**Sample No.** : E23100101-02#01

**FCC ID** : 2BGCASIV0223

**Standards** : FCC CFR47 Part 15, Subpart E

**Date of Receipt** : 2023-11-03  
**Date of Test** : 2023-11-17~ 2023-12-29  
**Date of Issue** : 2024-05-24

## 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    | SKYTECH USA LLC.                                                    |
| Address                   | INCORP SERVICES, INC. 3458 LAKESHORE DRIVE TALLAHASSEE, FL 32312 US |
| Contact Person            | Hu yan                                                              |
| Telephone                 | 001-647-8892-868                                                    |
| Email                     | yan.hu@astsys.com                                                   |
| Manufacturer Company Name | SKYTECH USA LLC.                                                    |
| Address                   | INCORP SERVICES, INC. 3458 LAKESHORE DRIVE TALLAHASSEE, FL 32312 US |
| Factory Company Name      | SKYTECH USA LLC.                                                    |
| Address                   | INCORP SERVICES, INC. 3458 LAKESHORE DRIVE TALLAHASSEE, FL 32312 US |

### 1.3 Details of EUT

|                           |                                                                          |
|---------------------------|--------------------------------------------------------------------------|
| Product Name              | ALL IN ONE                                                               |
| Brand Name                | STGsivir & STGSivir                                                      |
| Test Model Name           | SIV0223                                                                  |
| ISED Number               | 2BGCASIV0223                                                             |
| Mode of Operation         | WLAN 802.11a/n(HT20/40)/ac(VHT20/40/80)                                  |
| Operation Frequency       | Band I:5150MHz~5250MHz;<br>Band IV: 5725MHz ~ 5850MHz                    |
| Modulation Type           | 256QAM, 64QAM, 16QAM, BPSK, QPSK, 128QAM, OFDM                           |
| Number of Channels        | 39                                                                       |
| Channel Bandwidth         | 802.11a: 20MHz<br>802.11n: 20MHz, 40MHz<br>802.11ac: 20MHz, 40MHz, 80MHz |
| Antenna Type              | Internal Antenna                                                         |
| Antenna Gain              | 2.45dBi                                                                  |
| Extreme Temperature Range | 0℃~ +70℃                                                                 |
| Test Voltage              | AC 100-240V 50/60Hz                                                      |

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|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Extreme Voltage             | Low Voltage: AC 100V<br>High Voltage: AC 240V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Product Type                | Mobile and portable for FCC standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Hardware Version            | 1.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Software Version            | 2024.10.139.200_Drv_3.00.0044.L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| RF power setting in TEST SW | 802.11a: Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_52 for Band I<br>802.11a: Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_52 for Band IV<br>802.11n(HT20): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_52for Band I<br>802.11n(HT20): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_52 for Band IV<br>802.11n(HT40): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_50 for Band I<br>802.11n(HT40): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_50 for Band IV<br>802.11ac(VHT20): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_52for Band I<br>802.11ac(VHT20): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_52 for Band IV<br>802.11ac(VHT40): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_50 for Band I<br>802.11ac(VHT40): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_50 for Band IV<br>802.11ac(VHT80): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_46 for Band I<br>802.11ac(VHT80): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_48 for Band IV |

- Note:
- 1. The above information was declared by the manufacture.
  - 2. The EUT is designed as master device.
  - 3. The EUT do not support TPC.
  - 4. For more details, please refer to the User’s manual of the EUT.

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Channel List

| Frequency Band     | Channel Number | Frequency |
|--------------------|----------------|-----------|
| 5150 MHz ~ 5250MHz | 36             | 5180 MHz  |
|                    | 38             | 5190 MHz  |
|                    | 40             | 5200 MHz  |
|                    | 42             | 5210 MHz  |
|                    | 44             | 5220 MHz  |
|                    | 46             | 5230 MHz  |
|                    | 48             | 5240 MHz  |
| 5725 MHz ~ 5850MHz | 149            | 5745 MHz  |
|                    | 151            | 5755 MHz  |
|                    | 153            | 5765 MHz  |
|                    | 155            | 5775 MHz  |
|                    | 157            | 5785 MHz  |
|                    | 159            | 5795 MHz  |
|                    | 165            | 5825 MHz  |

*Note: For 20MHZ bandwidth system use Channel 36,44,48,149,157,165;*  
*For 40MHZ bandwidth system use Channel 38,46,151,159;*  
*For 80MHZ bandwidth system use Channel 42,155.*

1.4 Test Methodology

|                                   |                                                                                                                        |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 47 CFR Part 15, Subpart E         | Subpart E—Unlicensed National Information Infrastructure Devices                                                       |
| KDB Publication 789033 D02 v02r01 | Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E |
| 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

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## 1.5 Test Summary

| Test Item                                       | FCC Rules                          | Result |
|-------------------------------------------------|------------------------------------|--------|
| Antenna Requirement                             | FCC Part 15.407(a), 15.203         | PASS   |
| Maximum Conducted Output Power                  | FCC Part 15.407(a)                 | PASS   |
| 26dB Bandwidth and 99% Bandwidth                | FCC Part 15.407(a)                 | PASS   |
| 6dB Bandwidth                                   | FCC Part 15.407(e)                 | PASS   |
| Maximum Conducted Output Power Spectral Density | FCC Part 15.407(a)                 | PASS   |
| Conducted Spurious Emission                     | FCC Part 15.407(b), 15.209         | PASS   |
| Radiated Emission                               | FCC Part 15.407(b), 15.209, 15.205 | PASS   |
| Band Edge (Restricted-band band-edge)           | FCC Part 15.407(b), 15.205, 15.209 | PASS   |
| Frequency Stability                             | FCC Part 15.407(g)                 | PASS   |
| Conducted Emission on AC Mains                  | FCC Part 15.207(a)                 | PASS   |

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## 2 Test Condition

### 2.1 Environmental conditions

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

### 2.2 Equipment List

| Name of Equipment                  | Manufacturer    | Model        | Serial No.        | Cal. Date  | Cal. Due   |
|------------------------------------|-----------------|--------------|-------------------|------------|------------|
| Spectrum Analyzer                  | Keysight        | N9020B       | MY59260184        | 2023-07-27 | 2024-07-26 |
| Spectrum Analyzer                  | Rohde & Schwarz | FSV40N       | 101450            | 2023-06-08 | 2024-06-07 |
| Signal Generator                   | Rohde & Schwarz | SMR27        | 100184            | 2023-07-27 | 2024-07-26 |
| EMI Test Receiver                  | Rohde & Schwarz | ESPI3        | 100173            | 2023-06-08 | 2024-06-07 |
| EMI Test Receiver                  | Rohde & Schwarz | ESR 7        | 101911            | 2023-06-08 | 2024-06-07 |
| V-network                          | SCHWARZBECK     | NSLK 8127    | 8127-902          | 2023-06-07 | 2024-06-06 |
| Attenuator                         | SCHWARZBECK     | VTSD 9561-FN | /                 | 2023-06-06 | 2024-06-05 |
| Broadband Antenna                  | SCHWARZBECK     | VULB9163     | 9163-1037         | 2023-03-22 | 2025-03-21 |
| Horn Antenna-18G                   | SCHWARZBECK     | BBHA9120D    | 9120D-1775        | 2023-06-13 | 2025-06-12 |
| Loop Antenna                       | SCHWARZBECK     | FMZB 1513    | N/A               | 2023-06-09 | 2024-06-08 |
| Horn Antenna-40G                   | YINGLIAN        | LB-180400-KF | N/A               | 2023-06-18 | 2025-06-17 |
| Broadband Preamplifier             | SCHWARZBECK     | BBV 9718     | 346               | 2023-06-08 | 2024-06-07 |
| DC Power Supply                    | ITECH           | IT6952A      | N/A               | 2022-06-07 | 2024-06-06 |
| Temperature Box                    | ESPEC           | ECT-2        | 055239A           | 2023-11-09 | 2024-11-08 |
| EMC chamber 9*6*6(L*W*H)           | CHANGNING       | 966          | N/A               | 2023-06-09 | 2025-06-08 |
| Shielded Enclosure<br>8*5*4(L*W*H) | CHANGNING       | 854          | N/A               | 2023-06-09 | 2025-06-08 |
| 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        |

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## 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   |
|-------------------------------------------------|--------------|---------------|
| Antenna Port Conducted Emission                 | < 1GHz       | $\pm 1.5$ dB  |
|                                                 | > 1GHz       | $\pm 1.5$ dB  |
| Radiated Emission                               | < 1GHz       | $\pm 5.01$ dB |
|                                                 | > 1GHz       | $\pm 5.21$ dB |
| Conducted Emission on AC Mains                  | 150KHz-30MHz | $\pm 2.68$ dB |
| Occupied Channel Bandwidth                      |              | $\pm 5$ %     |
| Maximum Conducted Output Power                  |              | $\pm 0.64$ dB |
| Maximum Conducted Output Power Spectral Density |              | $\pm 1.18$ dB |
| Frequency Stability                             |              | $\pm 10$ ppm  |

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## 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 802.11a/n(HT20), 802.11ac (VHT20)

| Band I (5150 – 5250 MHz)  |           | Band IV (5725 – 5850 MHz)  |           |
|---------------------------|-----------|----------------------------|-----------|
| Channel                   | Frequency | Channel                    | Frequency |
| The lowest channel(CH36)  | 5180MHz   | The lowest channel(CH149)  | 5745MHz   |
| The middle channel(CH44)  | 5220MHz   | The middle channel(CH157)  | 5785MHz   |
| The highest channel(CH48) | 5240MHz   | The highest channel(CH165) | 5825MHz   |

For 802.11n(HT40), 802.11ac (VHT40)

| Band I (5150 – 5250 MHz)  |           | Band IV (5725 – 5850 MHz)  |           |
|---------------------------|-----------|----------------------------|-----------|
| Channel                   | Frequency | Channel                    | Frequency |
| The lowest channel(CH38)  | 5190MHz   | The lowest channel(CH151)  | 5755MHz   |
| The highest channel(CH46) | 5230MHz   | The highest channel(CH159) | 5795MHz   |

For 802.11ac (VHT80)

| Band I (5150 – 5250 MHz) |           | Band IV (5725 – 5850 MHz) |           |
|--------------------------|-----------|---------------------------|-----------|
| Channel                  | Frequency | Channel                   | Frequency |
| The lowest channel(CH42) | 5210MHz   | The lowest channel(CH155) | 5775MHz   |

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 |
|------------------------------------|-----------|
| 802.11a                            | 48Mbps    |
| 802.11n(HT20), 802.11n(HT40)       | MCS6      |
| 802.11ac (VHT20), 802.11ac (VHT40) | MCS6      |
| 802.11ac (VHT80)                   | MCS8      |

The basic operation modes are:

- A. On
  - 1. WLAN mode
    - a. Transmitting
    - b. Receiving
- B. Standby
- C. Off

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## 3.2 Special Accessories and Auxiliary Equipment

| Description   | Manufacturer                                  | Model Name      | Serial No.                  |
|---------------|-----------------------------------------------|-----------------|-----------------------------|
| AC/DC ADAPTER | Guangdong Mingxin Power Technologies Co., Ltd | MX120Z-19006300 | MX120Z19006300              |
| Mouse         | Dell                                          | MS116t1         | CN-065K5F-LO300-248-0VP2    |
| Keyboard      | Dell                                          | KB216P          | CN-0M4W71-73826-6C801SQ-A02 |

## 3.3 Support Software

| Description | Manufacturer | Software Name                                                         |
|-------------|--------------|-----------------------------------------------------------------------|
| Software    | N/A          | Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801 |

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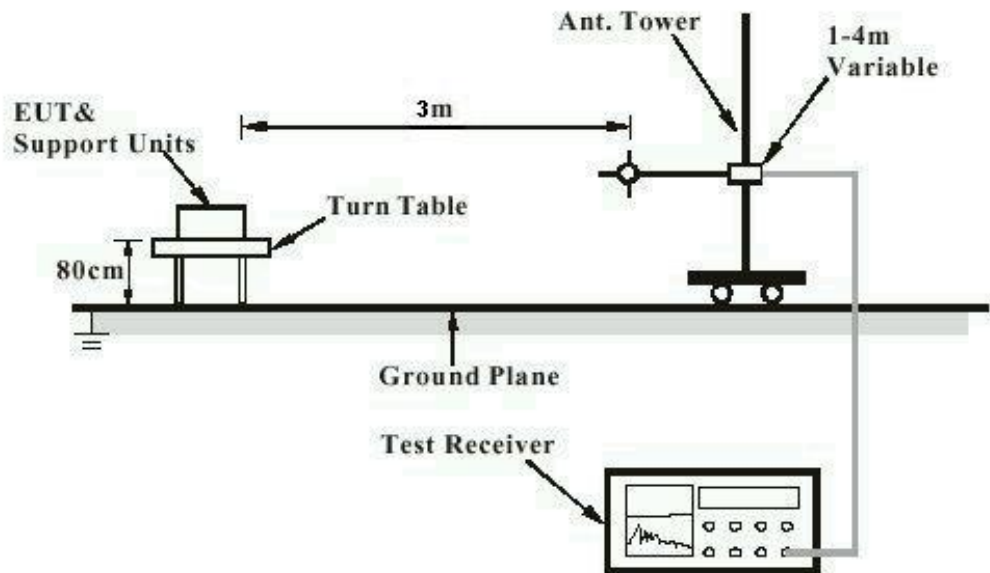
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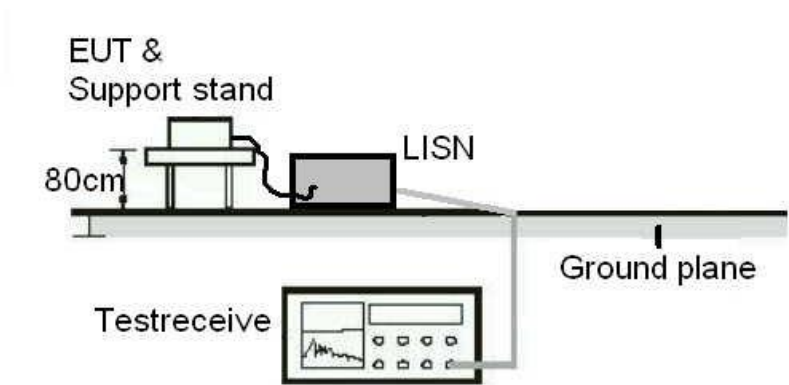
## 3.4 Test Setup Diagram

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 Configuration for Conduction Test



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Diagram of Measurement Configuration for Transmitter Test

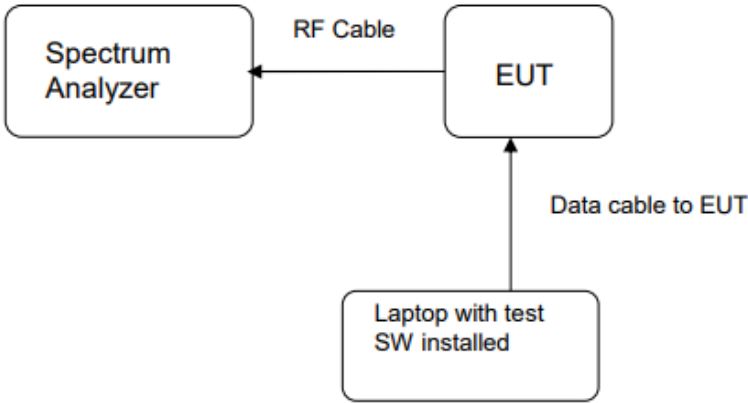
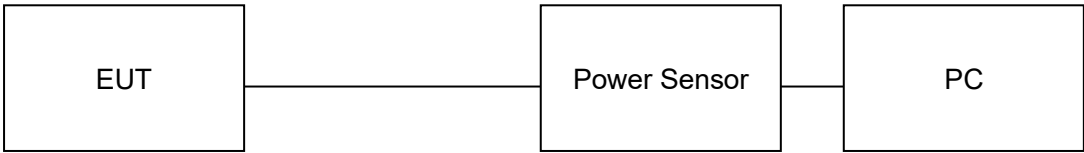


Diagram of Measurement Equipment Configuration for conducted output power setup



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## 4 Test Results

### 4.1 Transmitter Requirement & Test Suites

#### 4.1.1 Antenna Requirement

RESULT:

PASS

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test standard | : FCC Part 15.407(a), 15.203                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Requirement   | : An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. In addition, If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. |

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 2.45dBi. The antenna is an internal 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.

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## 4.1.2 Maximum Conducted Output Power

RESULT:

PASS

Test standard : FCC Part 15.407(a)

Requirement : ANSI C63.10-2013 clause 12.3.3.1, KDB 789033

Kind of test site : Shielded room

### Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 23.8°C

Relative humidity : 46%

Table 1: Maximum Conducted Output Power for Band I (5150MHz~5250MHz)

| Test Mode       | Duty Cycle (%) | Test Channel (MHz) | Maximum Conducted Output Power |       | Applicable Limit    |
|-----------------|----------------|--------------------|--------------------------------|-------|---------------------|
|                 |                |                    | (dBm)                          | (mW)  |                     |
| 802.11a         | 100            | 5180               | 11.71                          | 14.83 | 250mW<br>(23.98dBm) |
|                 |                | 5220               | 12.23                          | 16.71 |                     |
|                 |                | 5240               | 12.61                          | 18.24 |                     |
| 802.11n(HT20)   | 100            | 5180               | 11.69                          | 14.76 |                     |
|                 |                | 5220               | 12.34                          | 17.14 |                     |
|                 |                | 5240               | 12.63                          | 18.32 |                     |
| 802.11ac(VHT20) | 100            | 5180               | 11.74                          | 14.93 |                     |
|                 |                | 5220               | 12.16                          | 16.44 |                     |
|                 |                | 5240               | 12.73                          | 18.75 |                     |
| 802.11n(HT40)   | 100            | 5190               | 10.96                          | 12.47 |                     |
|                 |                | 5230               | 11.90                          | 15.49 |                     |
| 802.11ac(VHT40) | 100            | 5190               | 10.99                          | 12.56 |                     |
|                 |                | 5230               | 11.49                          | 14.09 |                     |
| 802.11ac(VHT80) | 100            | 5210               | 9.36                           | 8.63  |                     |

Notes:

1. Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

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Table 2: Maximum Conducted Output Power for Band IV (5725MHz~5850MHz)

| Test Mode       | Duty Cycle (%) | Test Channel (MHz) | Maximum Conducted Output Power |       | Applicable Limit |
|-----------------|----------------|--------------------|--------------------------------|-------|------------------|
|                 |                |                    | (dBm)                          | (mW)  |                  |
| 802.11a         | 100            | 5745               | 13.09                          | 20.37 | 1W(30dBm)        |
|                 |                | 5785               | 13.55                          | 22.65 |                  |
|                 |                | 5825               | 12.64                          | 18.37 |                  |
| 802.11n(HT20)   | 100            | 5745               | 12.92                          | 19.59 |                  |
|                 |                | 5785               | 13.41                          | 21.93 |                  |
|                 |                | 5825               | 12.73                          | 18.75 |                  |
| 802.11ac(VHT20) | 100            | 5745               | 12.19                          | 16.56 |                  |
|                 |                | 5785               | 12.29                          | 16.94 |                  |
|                 |                | 5825               | 12.28                          | 16.90 |                  |
| 802.11n(HT40)   | 100            | 5755               | 12.72                          | 18.71 |                  |
|                 |                | 5795               | 12.28                          | 16.90 |                  |
| 802.11ac(VHT40) | 100            | 5755               | 12.08                          | 16.14 |                  |
|                 |                | 5795               | 12.12                          | 16.29 |                  |
| 802.11ac(VHT80) | 100            | 5775               | 11.18                          | 13.12 |                  |

Notes:

1. Add  $[10 \log (1 / D)]$ , where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

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## 4.1.3 26dB Bandwidth and 99% Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.407(a)

Requirement : ANSI C63.10-2013 clause 12.4, KDB 789033

Kind of test site : Shielded room

### Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 23.8°C

Relative humidity : 46%

Table 3: 26dB Bandwidth and 99% Bandwidth for Band I (5150MHz~5250 MHz)

| Test Mode       | Test Channel (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|-----------------|--------------------|----------------------|---------------------|
| 802.11a         | 5180               | 19.74                | 16.555              |
|                 | 5220               | 20.01                | 16.561              |
|                 | 5240               | 19.53                | 16.539              |
| 802.11n(HT20)   | 5180               | 20.69                | 17.677              |
|                 | 5220               | 20.80                | 17.716              |
|                 | 5240               | 20.39                | 17.733              |
| 802.11ac(VHT20) | 5180               | 20.64                | 17.713              |
|                 | 5220               | 21.03                | 17.717              |
|                 | 5240               | 20.91                | 17.698              |
| 802.11n(HT40)   | 5190               | 41.51                | 36.354              |
|                 | 5230               | 41.54                | 36.183              |
| 802.11ac(VHT40) | 5190               | 40.19                | 36.100              |
|                 | 5230               | 39.85                | 36.201              |
| 802.11ac(VHT80) | 5210               | 81.39                | 75.738              |

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Figure 1: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11a, 5180MHz

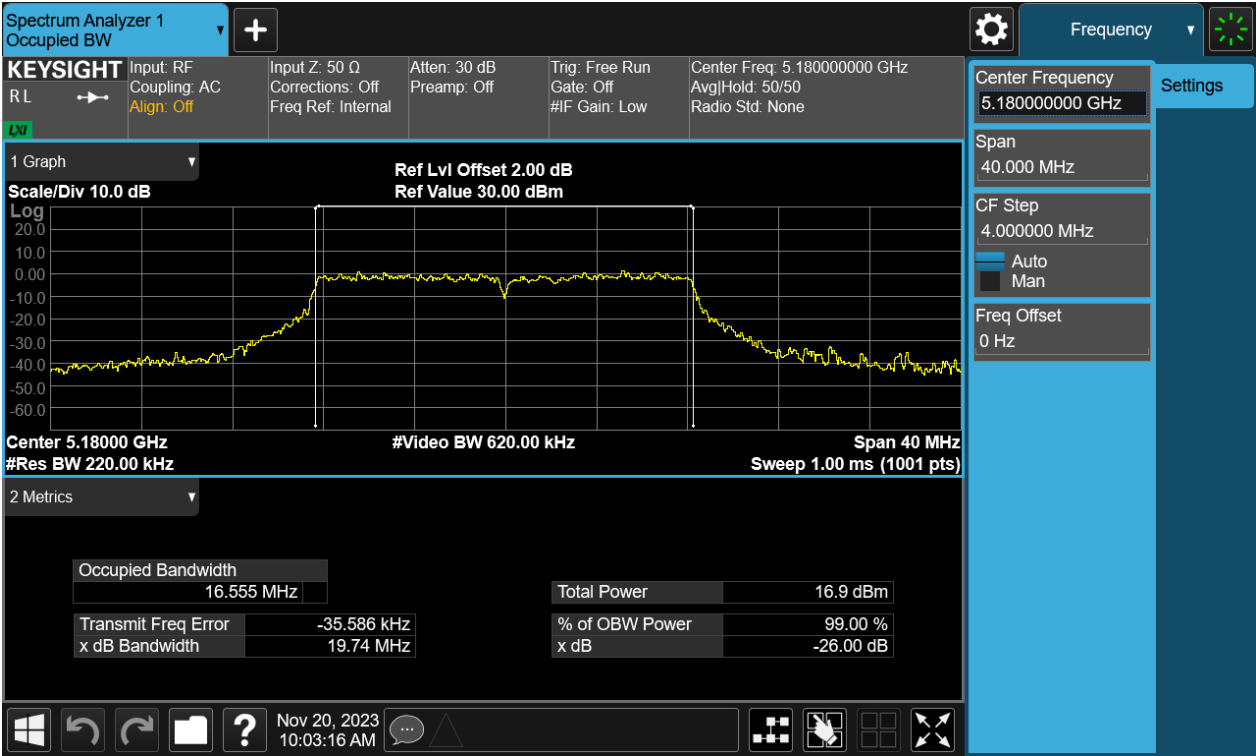
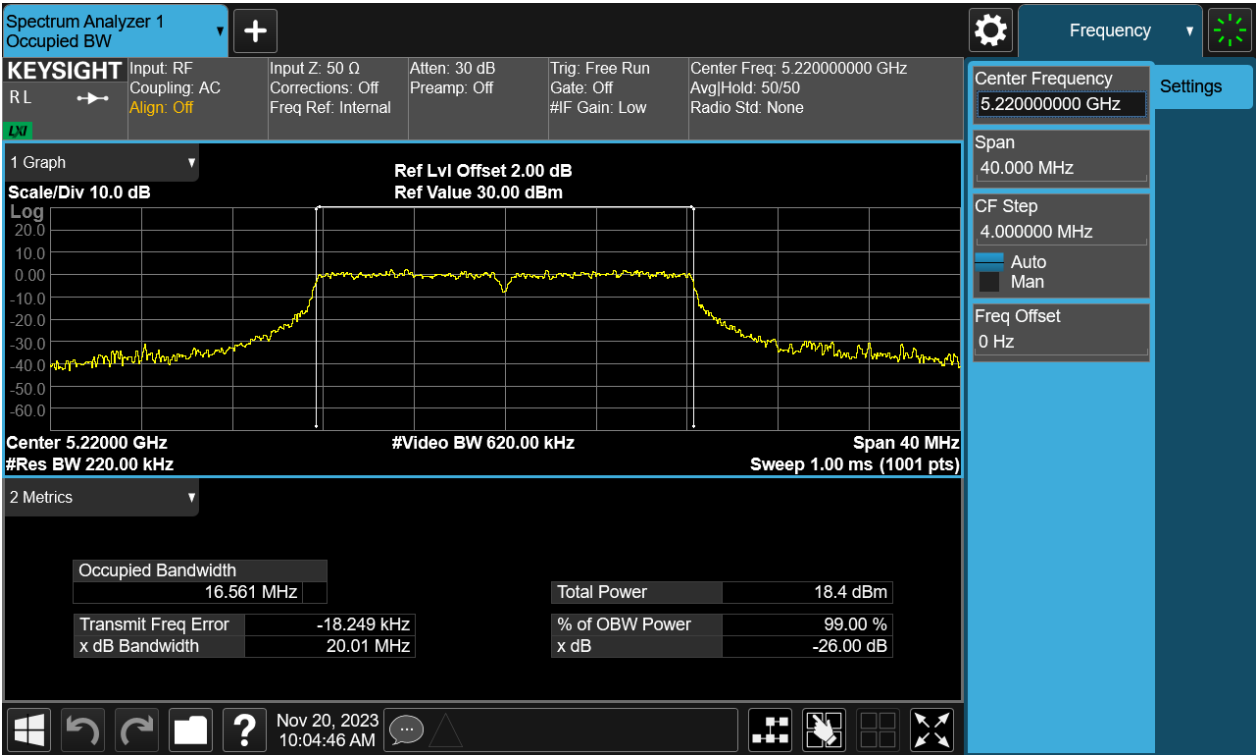


Figure 2: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11a, 5220MHz



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Figure 3: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11a, 5240MHz

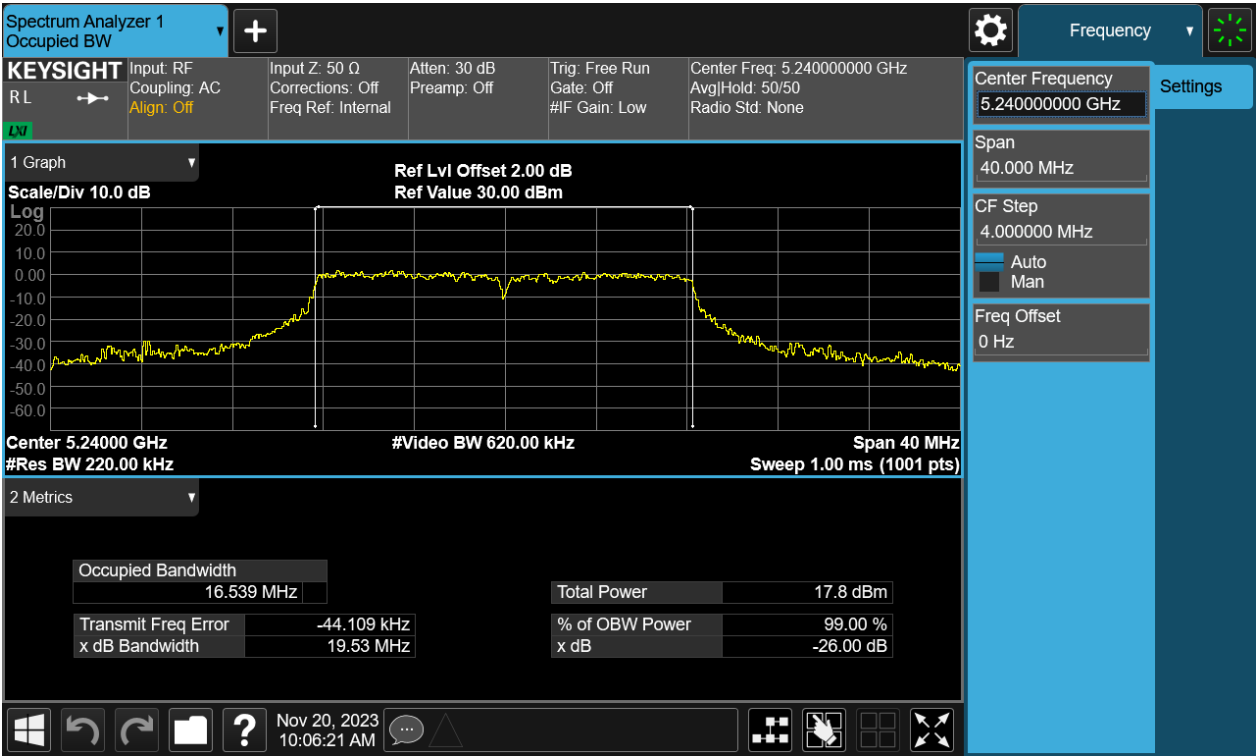
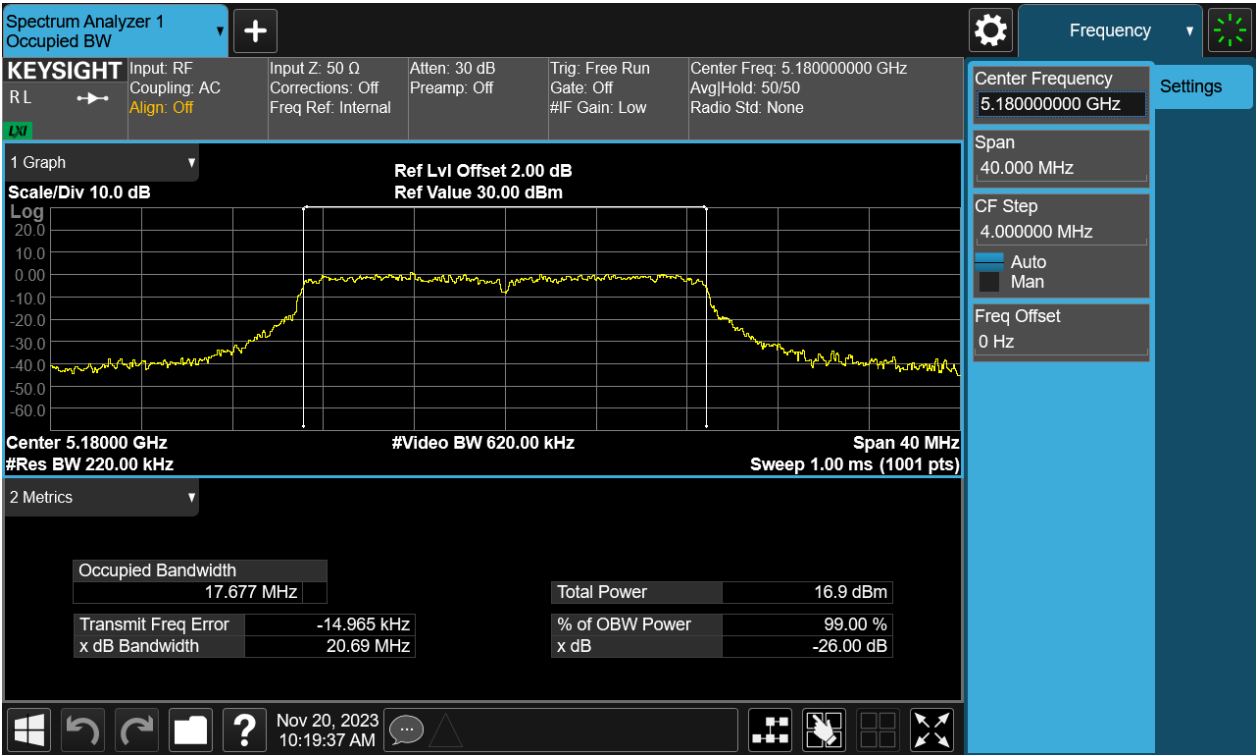


Figure 4: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11n(HT20), 5180MHz



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Figure 5: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11n(HT20), 5220MHz

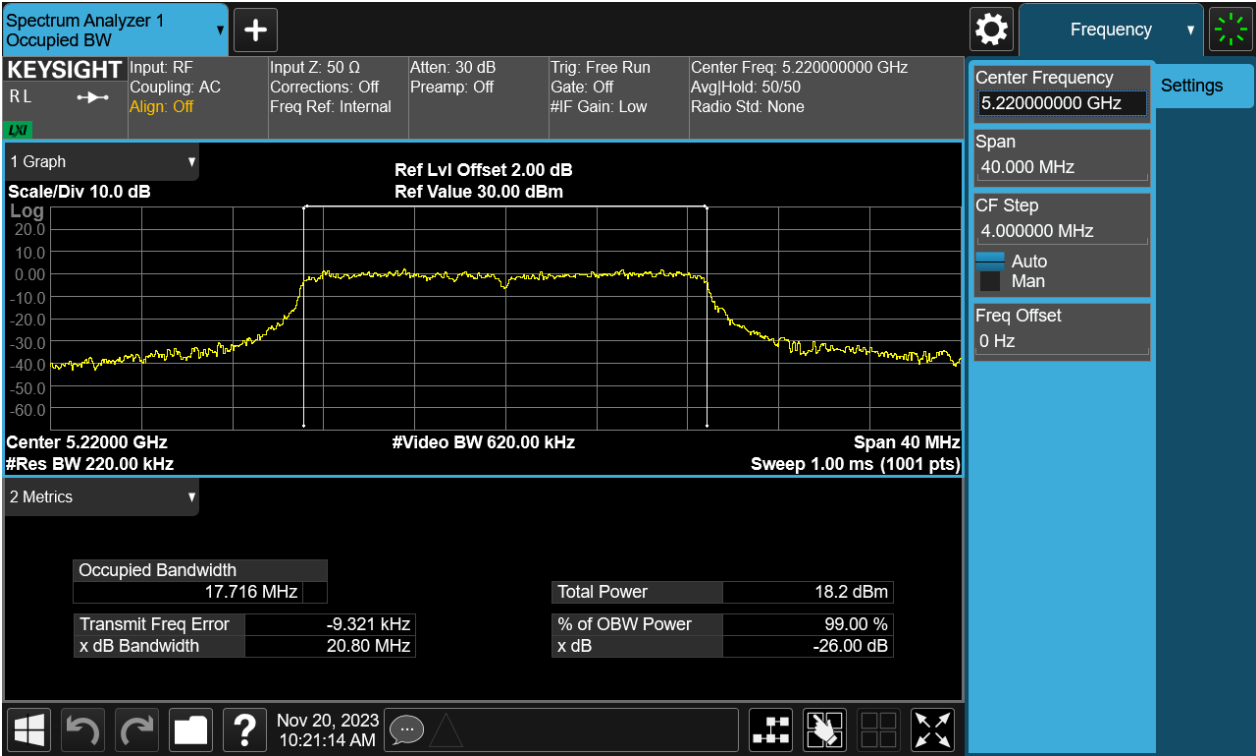
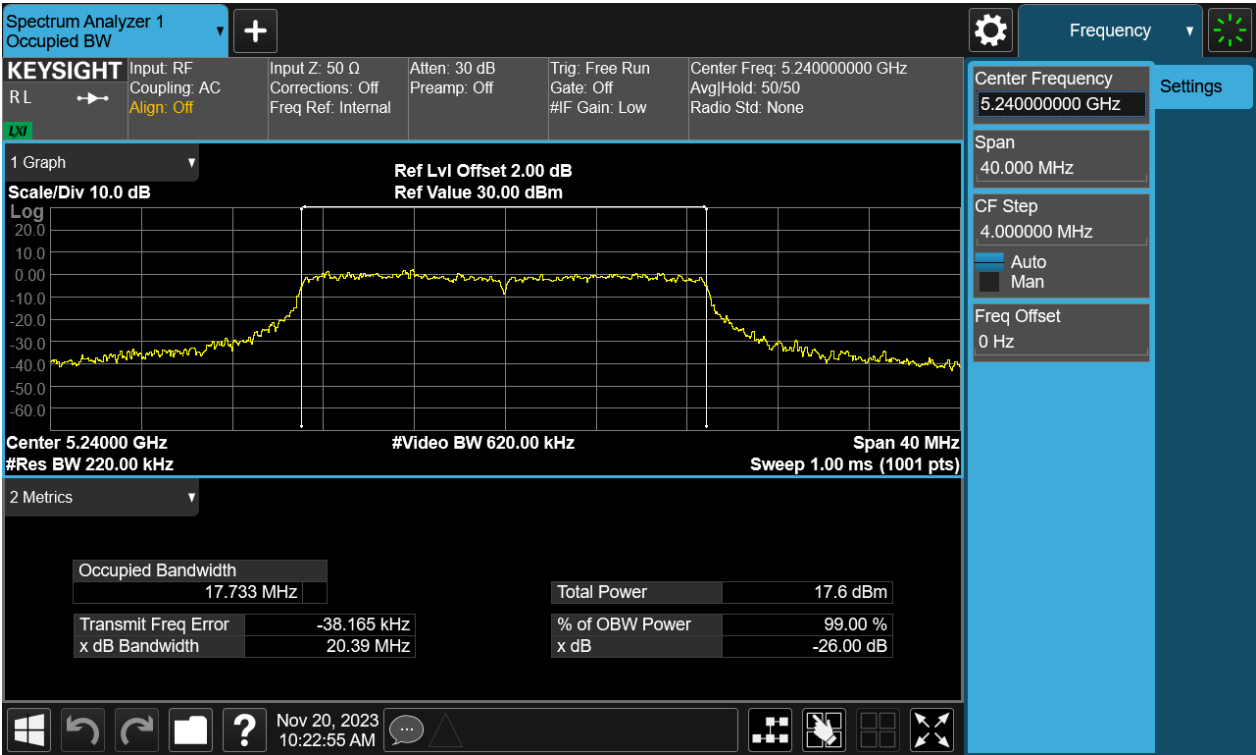


Figure 6: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11n(HT20), 5240MHz



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Figure 7: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11ac(VHT20), 5180MHz

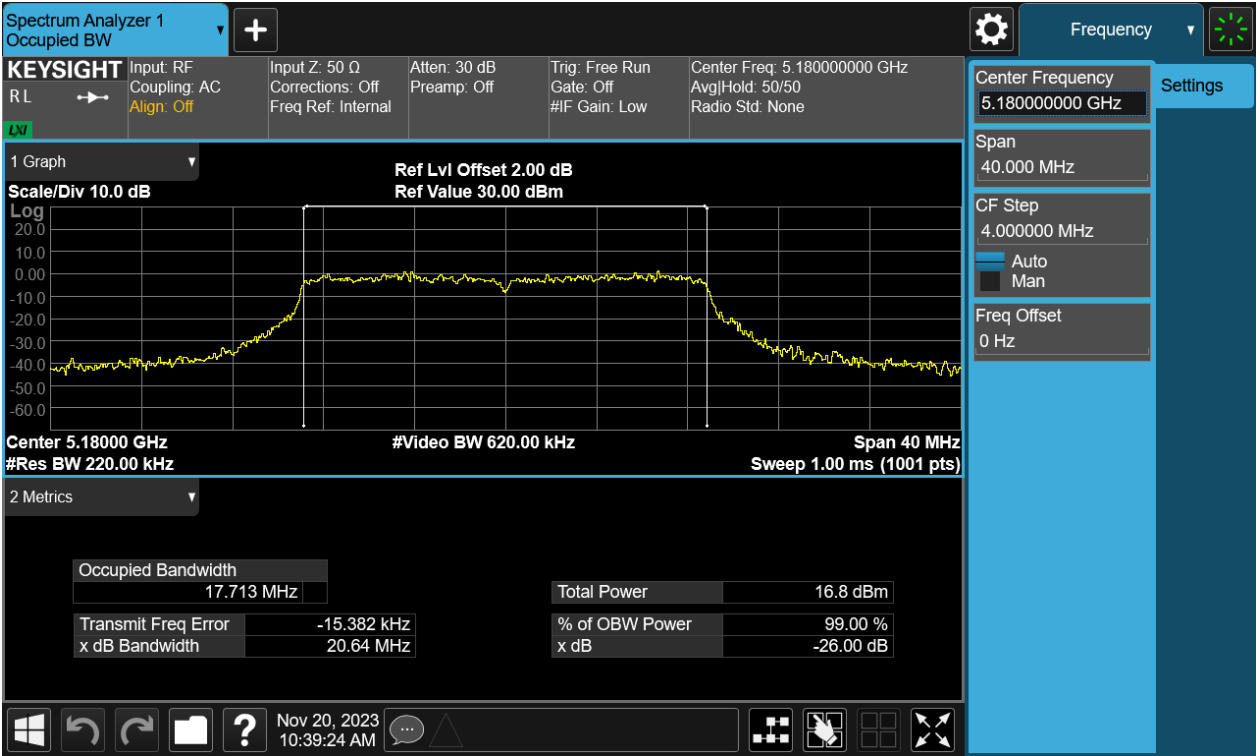
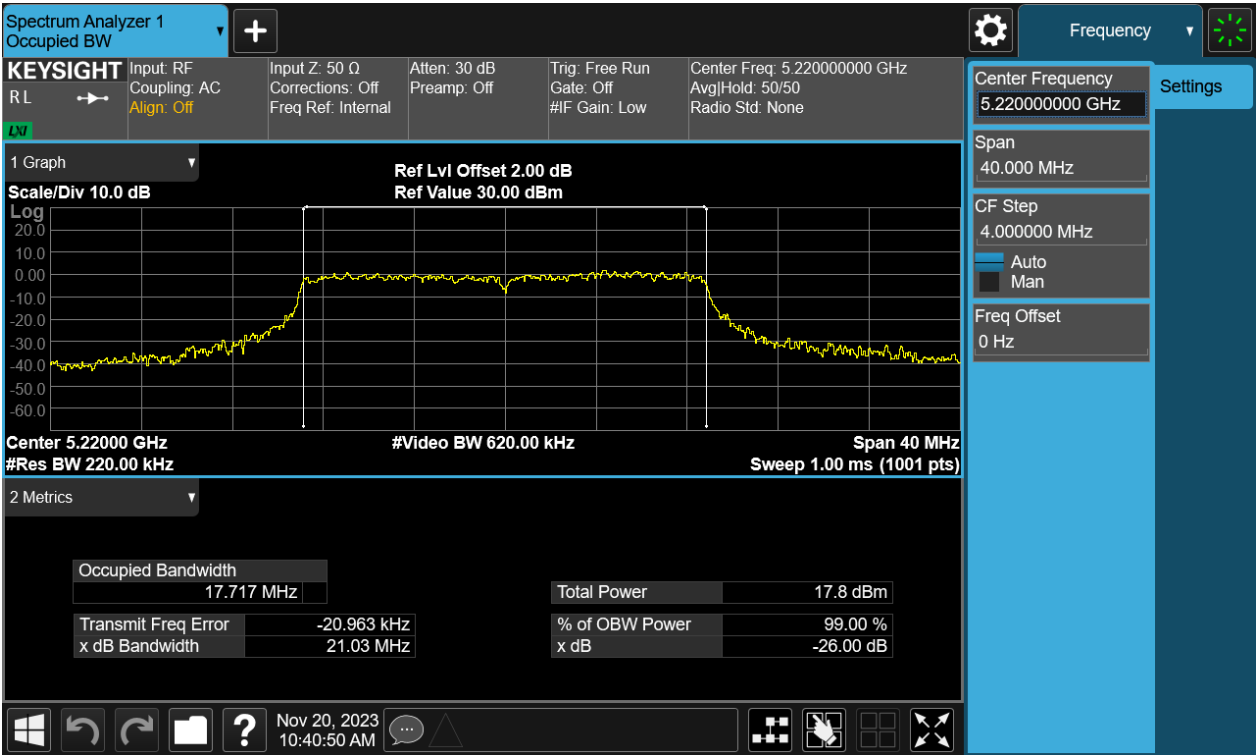


Figure 8: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11ac(VHT20), 5220MHz



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Figure 9: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11ac(VHT20), 5240MHz

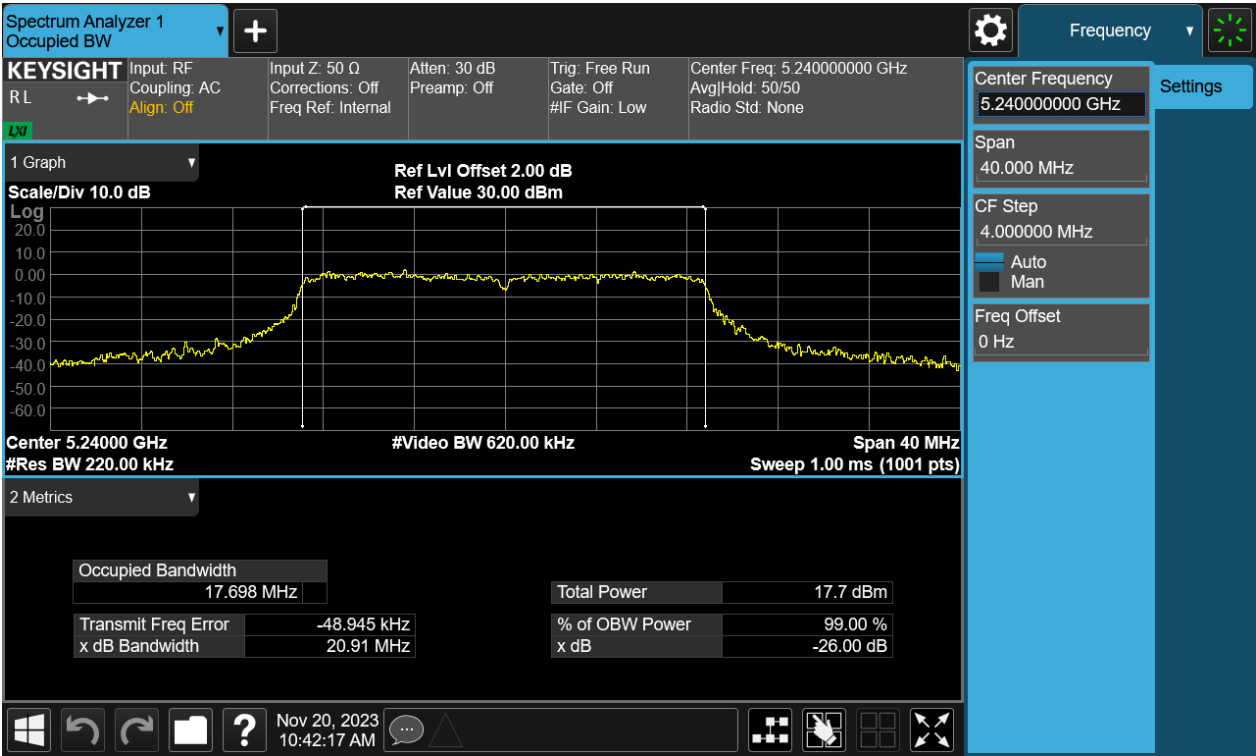
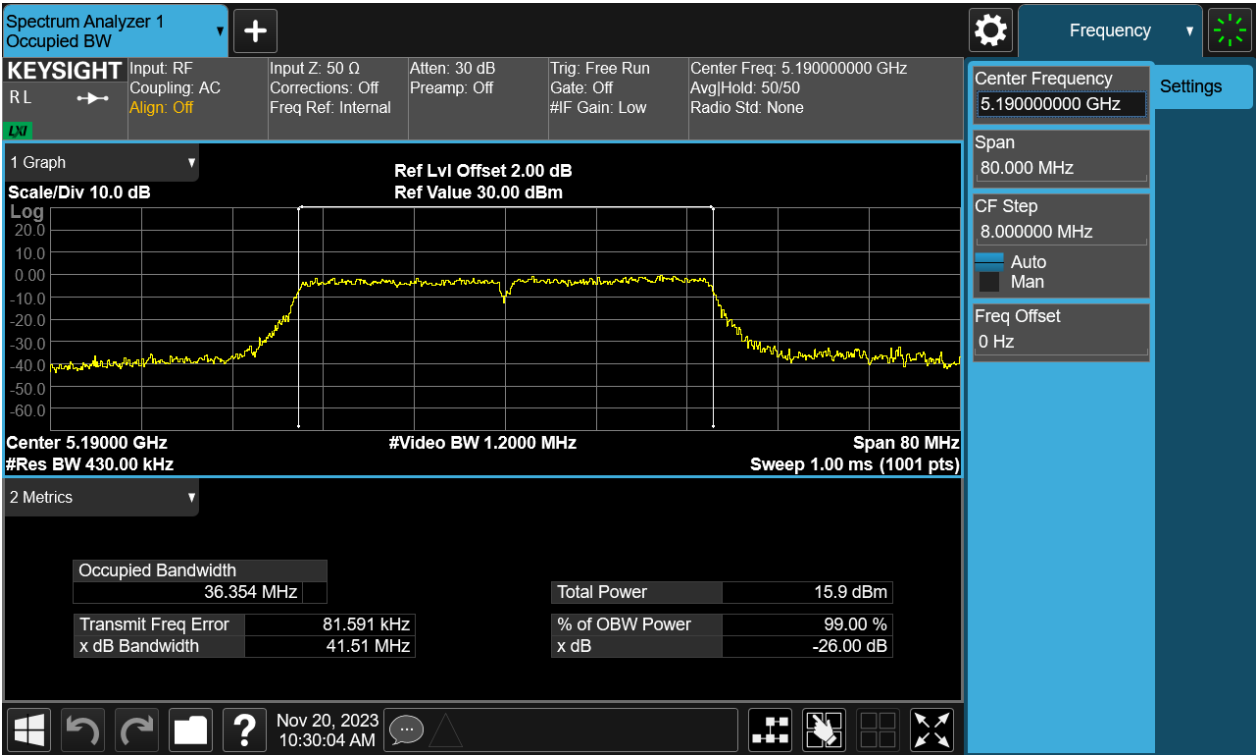


Figure 10: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11n(HT40), 5190MHz



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Figure 11: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11n(HT40), 5230MHz

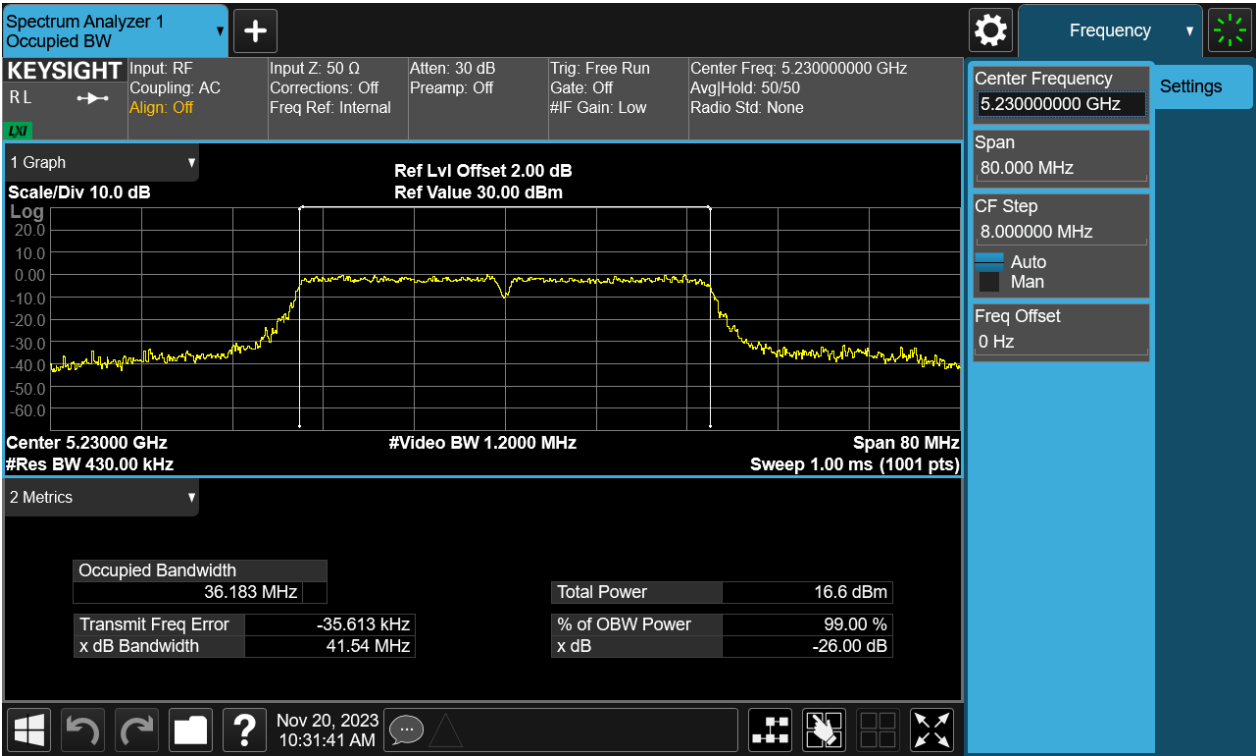
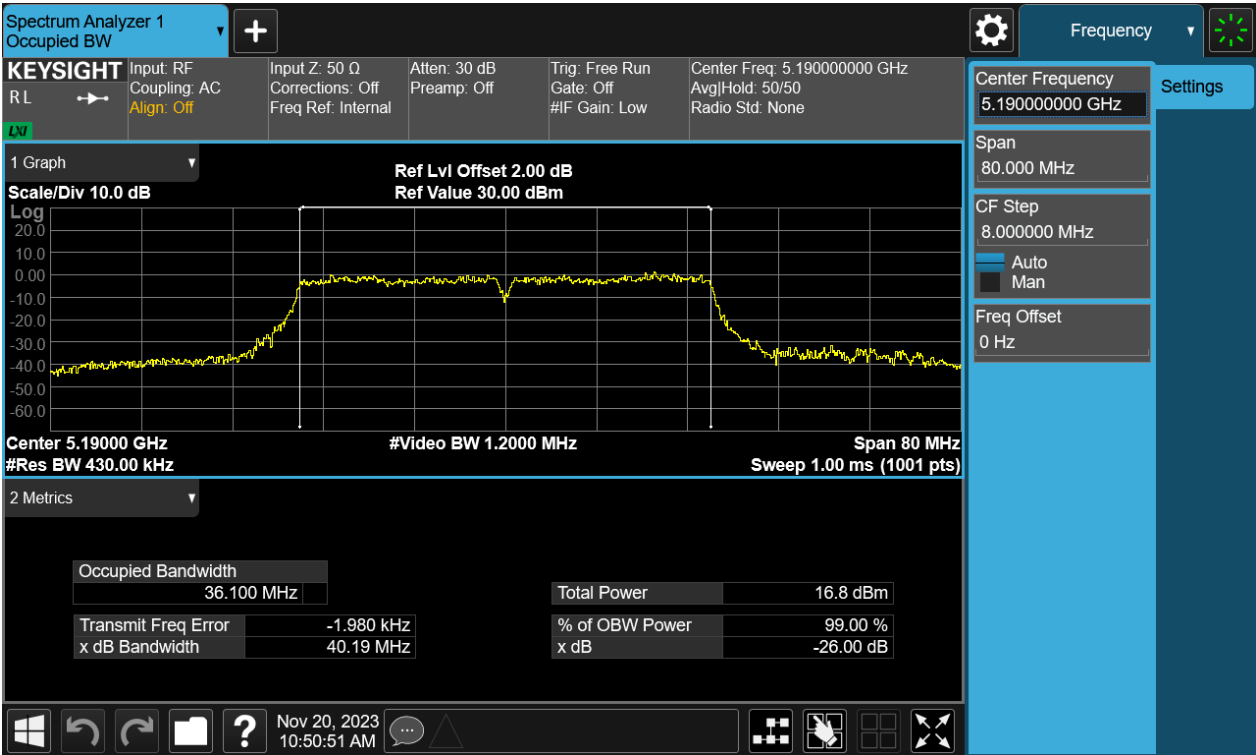


Figure 12: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11ac(VHT40), 5190MHz



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Figure 13: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11ac(VHT40), 5230MHz

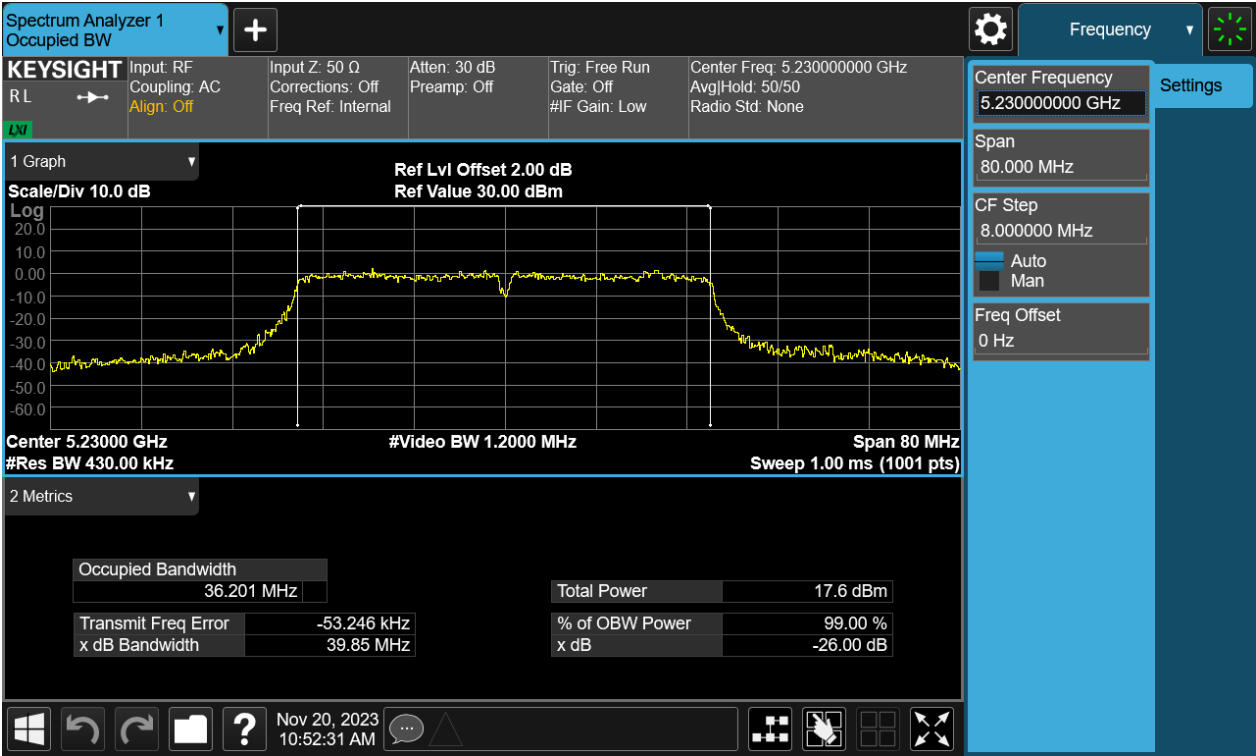
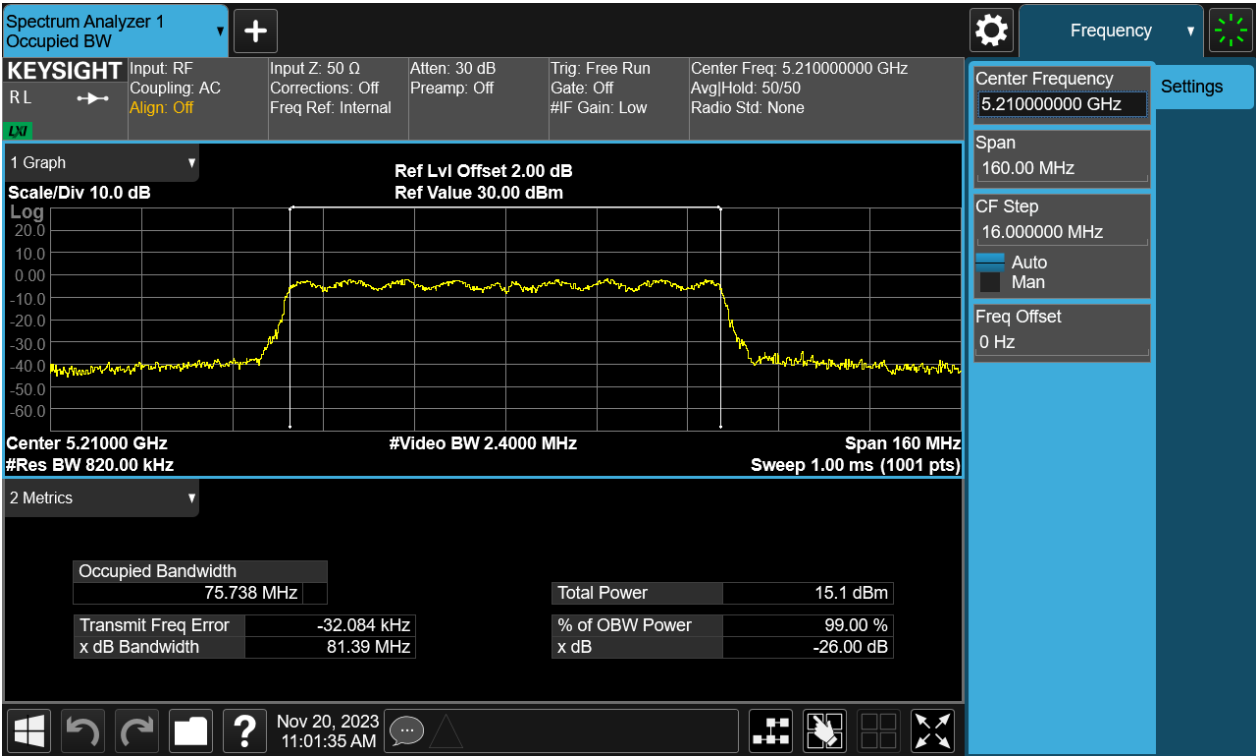


Figure 14: The plots of 26dB Bandwidth and 99% Bandwidth, 802.11ac(VHT80), 5210MHz



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## 4.1.4 6dB Bandwidth and 99% Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.407(e)

Requirement : ANSI C63.10-2013 clause 12.4, KDB 789033

Kind of test site : Shielded room

### Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 23.8°C

Relative humidity : 46%

Table 4: 6dB Bandwidth for Band IV (5725 – 5850 MHz)

| Test Mode       | Test Channel (MHz) | 6dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) | Applicable Limit (MHz) |
|-----------------|--------------------|---------------------|------------------------------|------------------------|
| 802.11a         | 5745               | 16.54               | 16.628                       | >0.5                   |
|                 | 5785               | 16.53               | 16.609                       |                        |
|                 | 5825               | 16.55               | 16.639                       |                        |
| 802.11n(HT20)   | 5745               | 17.74               | 17.708                       |                        |
|                 | 5785               | 17.74               | 17.715                       |                        |
|                 | 5825               | 17.78               | 17.711                       |                        |
| 802.11ac(VHT20) | 5745               | 17.74               | 17.746                       |                        |
|                 | 5785               | 17.74               | 17.743                       |                        |
|                 | 5825               | 17.73               | 17.755                       |                        |
| 802.11n(HT40)   | 5755               | 35.51               | 36.296                       |                        |
|                 | 5795               | 36.53               | 36.293                       |                        |
| 802.11ac(VHT40) | 5755               | 35.47               | 36.270                       |                        |
|                 | 5795               | 36.52               | 36.268                       |                        |
| 802.11ac(VHT80) | 5775               | 76.50               | 75.634                       |                        |

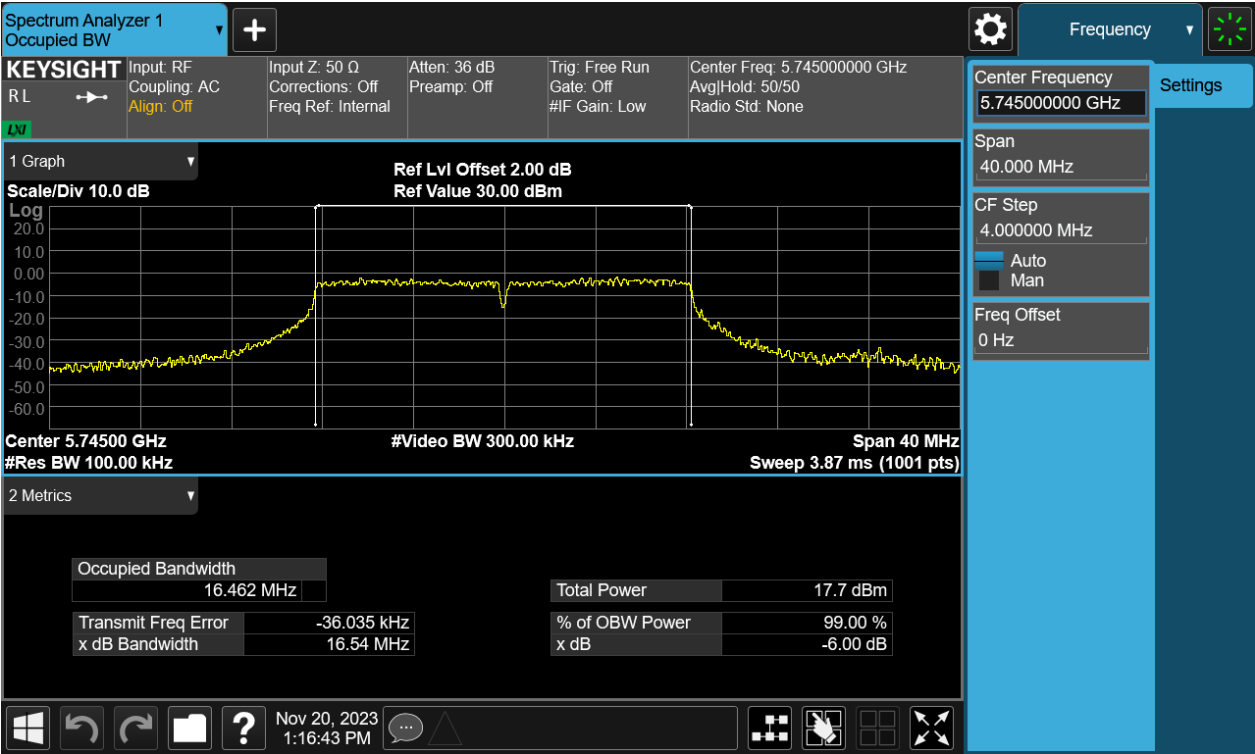
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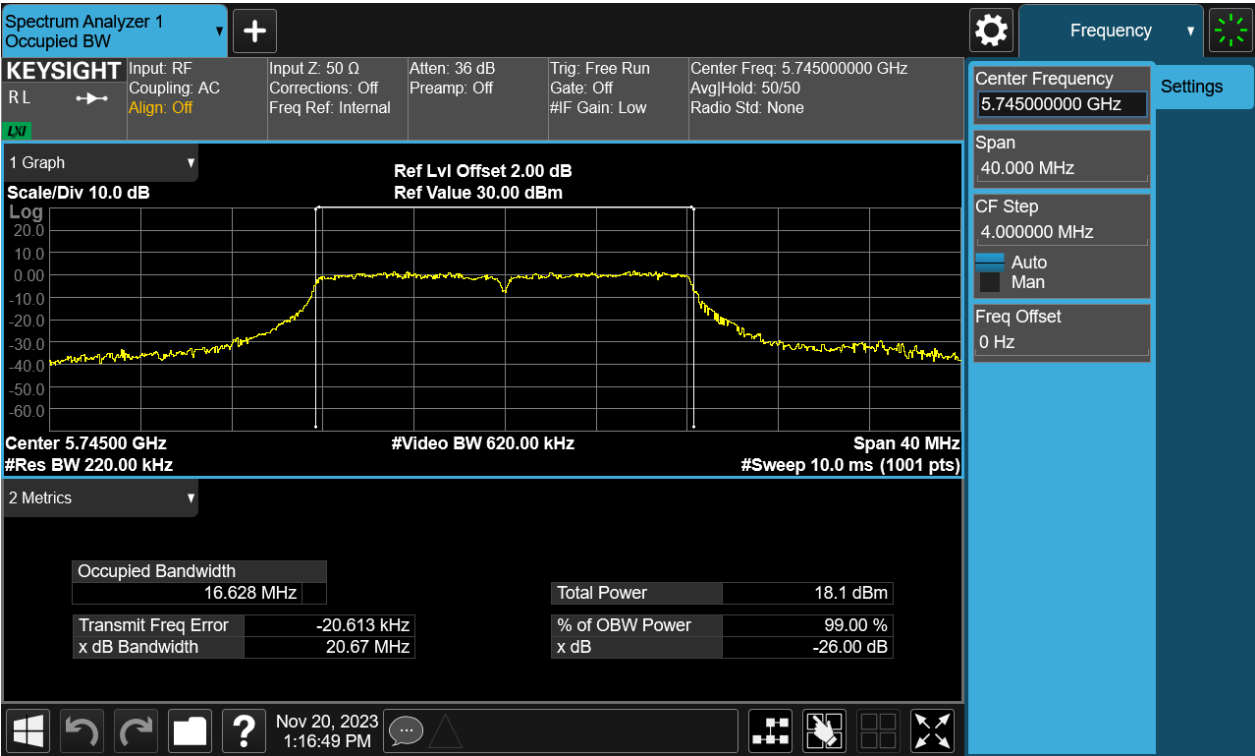
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Figure 15: 802.11a, 5745MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



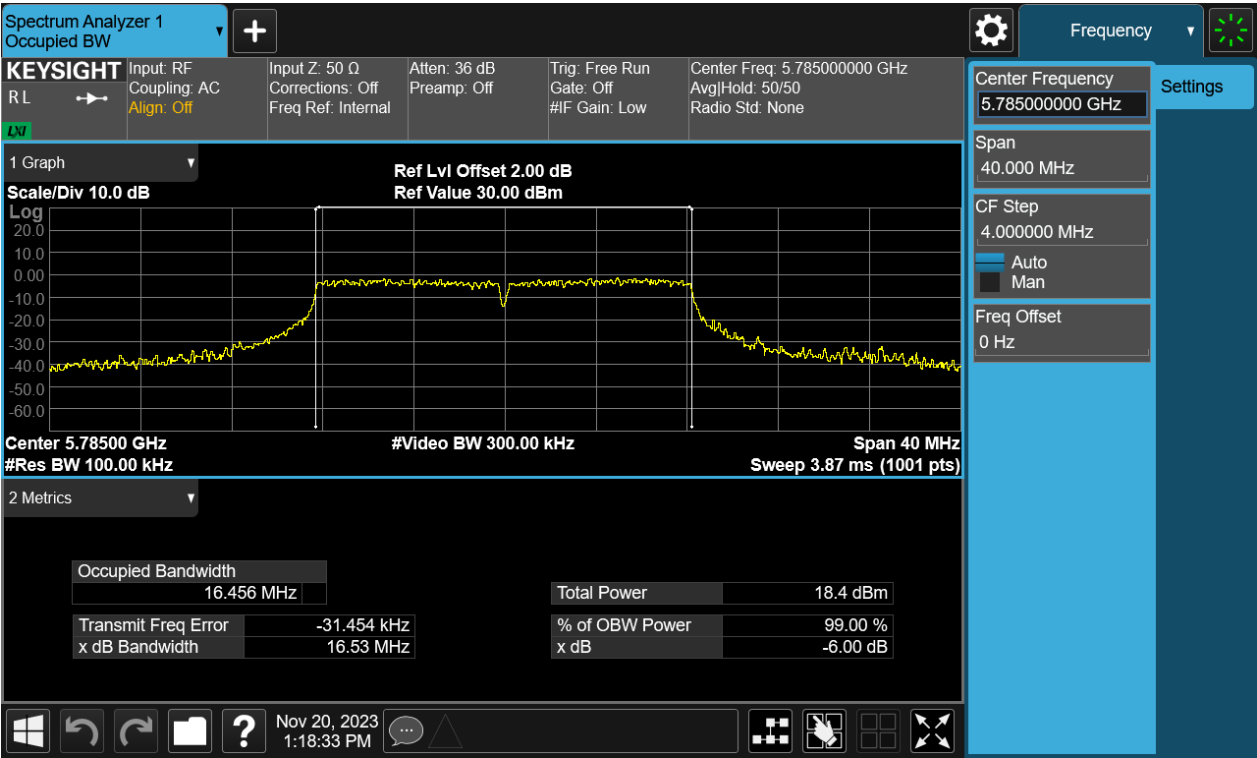
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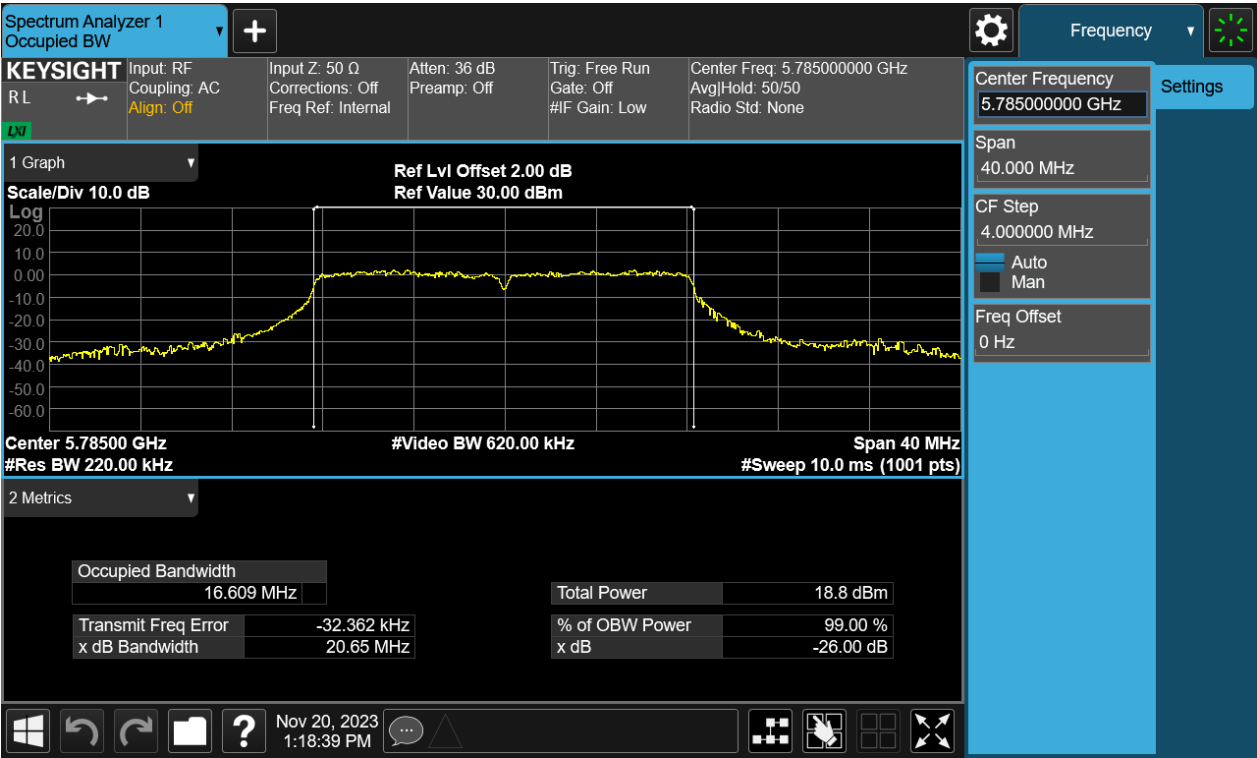
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Figure 16: 802.11a, 5785MHz  
Test Plot of -6dB Bandwidth

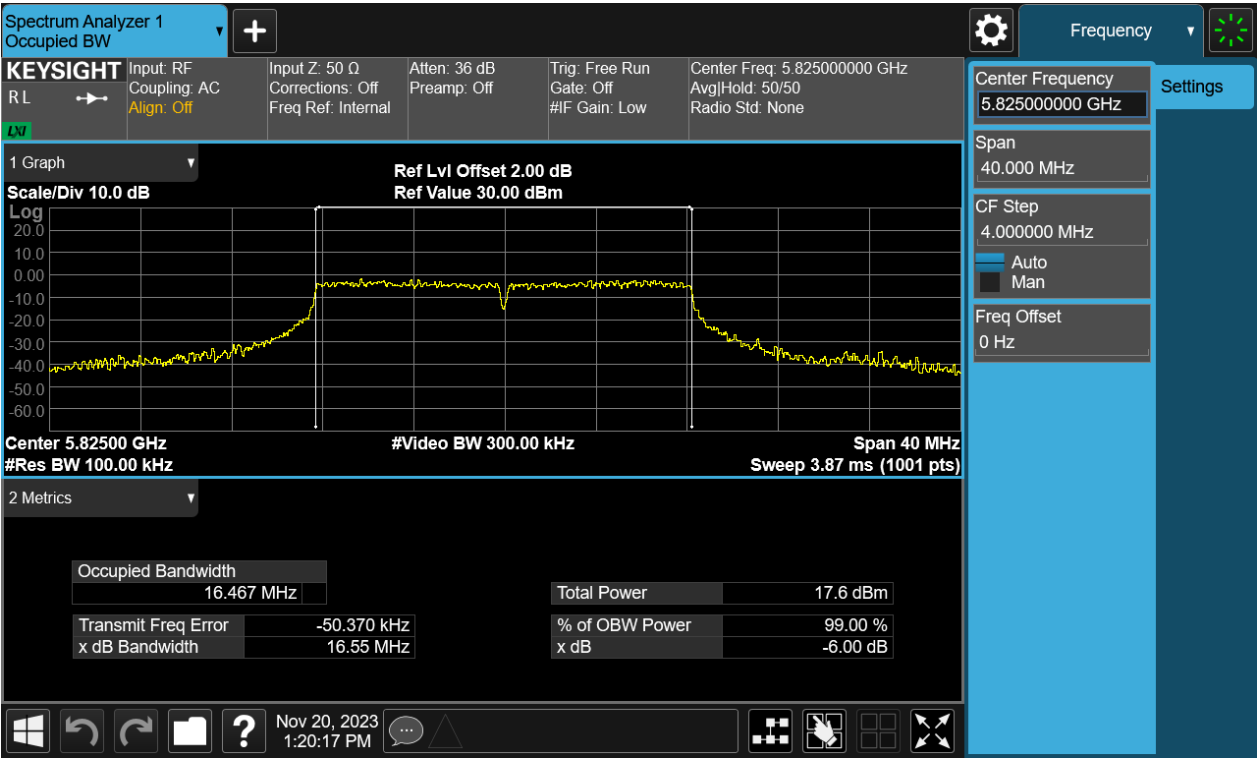


Test Plot of 99% Occupied Bandwidth

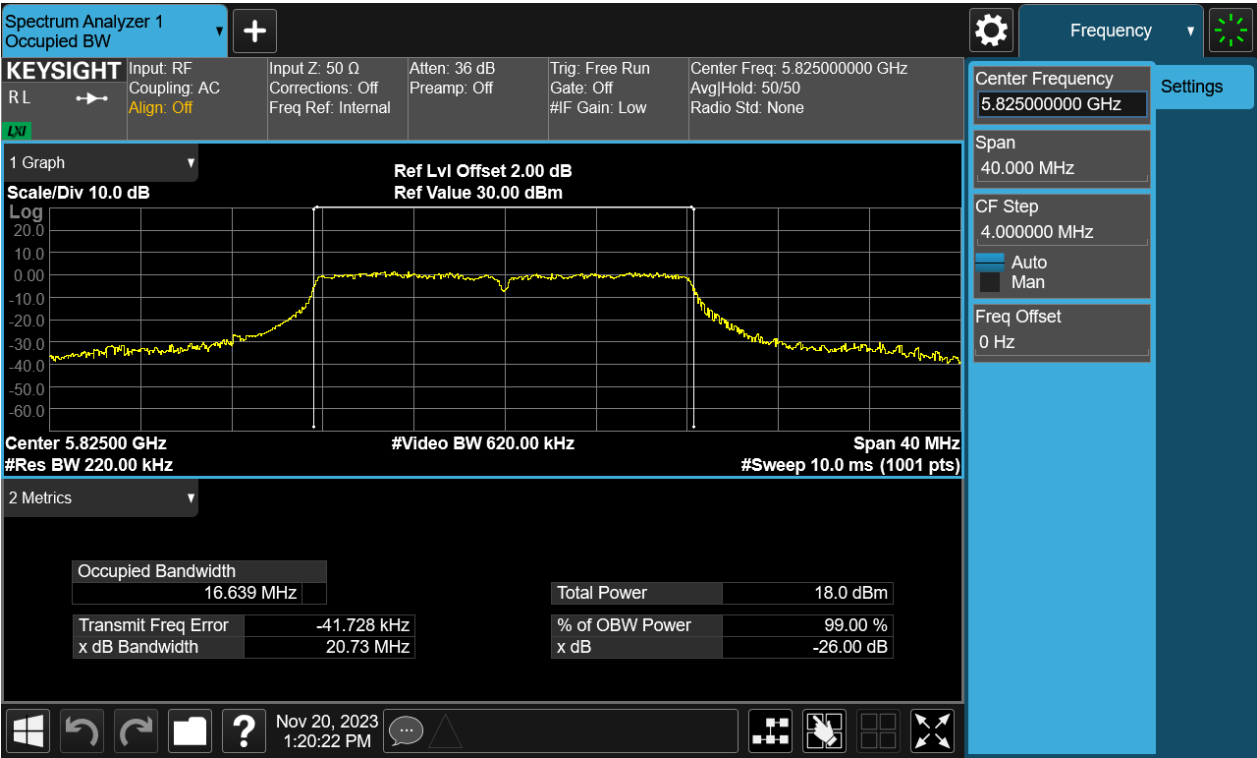


# TEST REPORT

Figure 17: 802.11a, 5825MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



# TEST REPORT

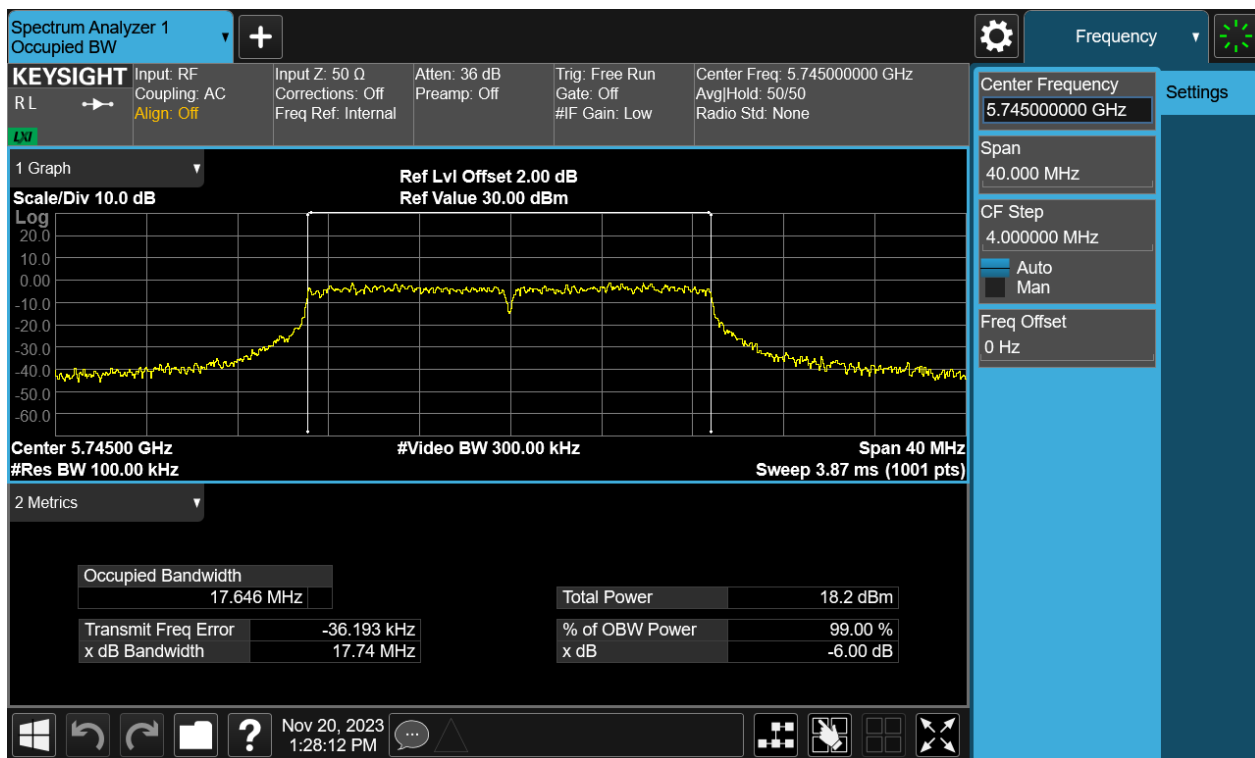
**Report No.:** SHE23100101-02FE

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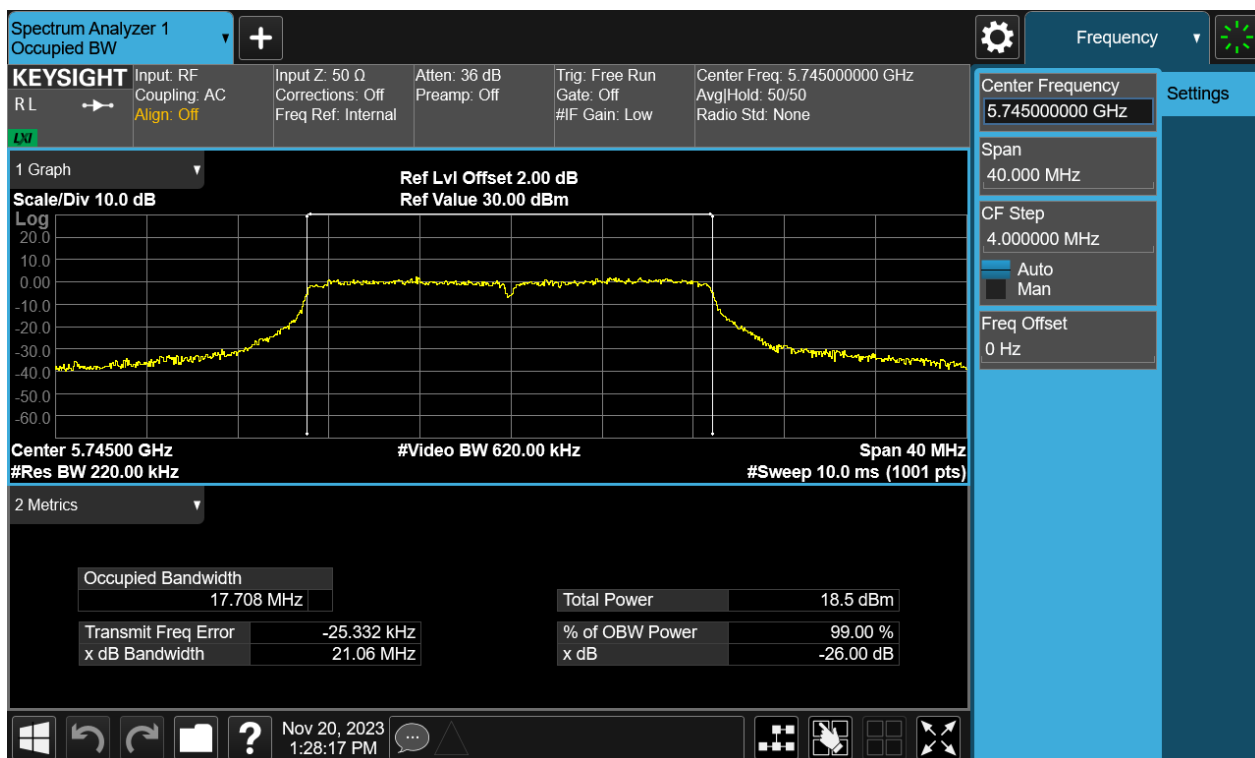
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**Figure 18: 802.11n(HT20), 5745MHz**

### Test Plot of -6dB Bandwidth

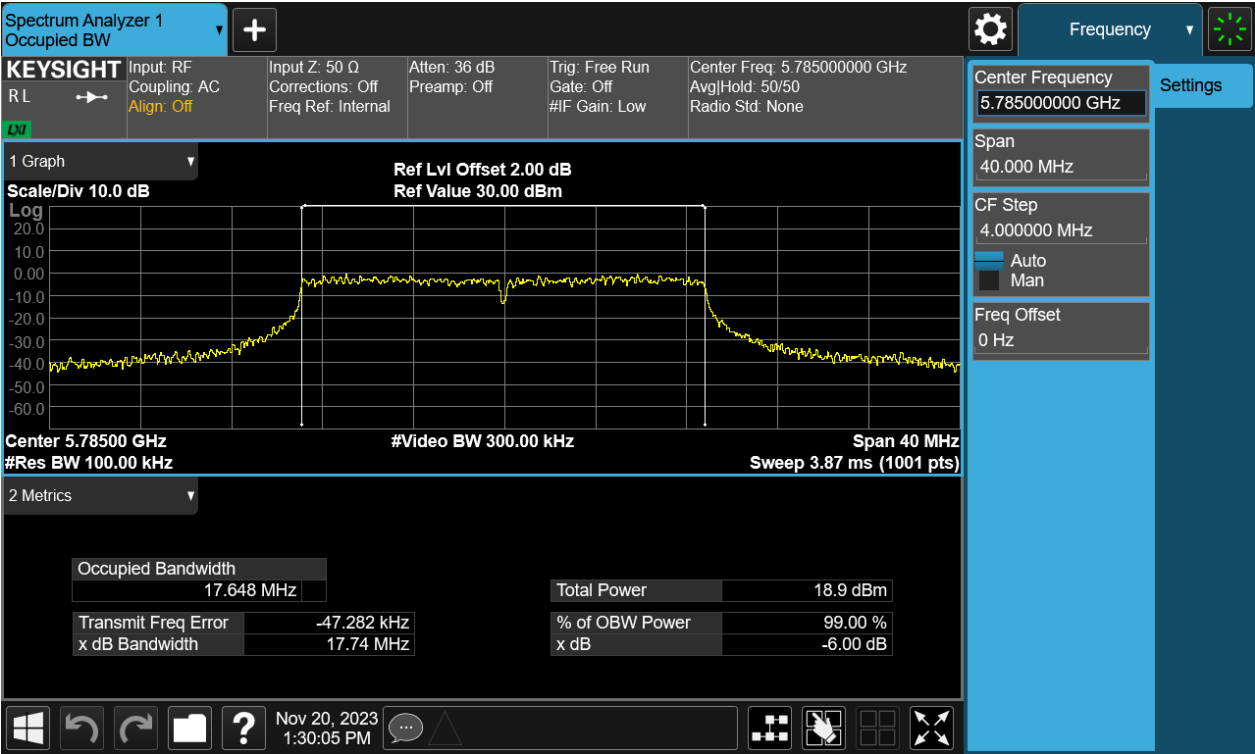


### Test Plot of 99% Occupied Bandwidth

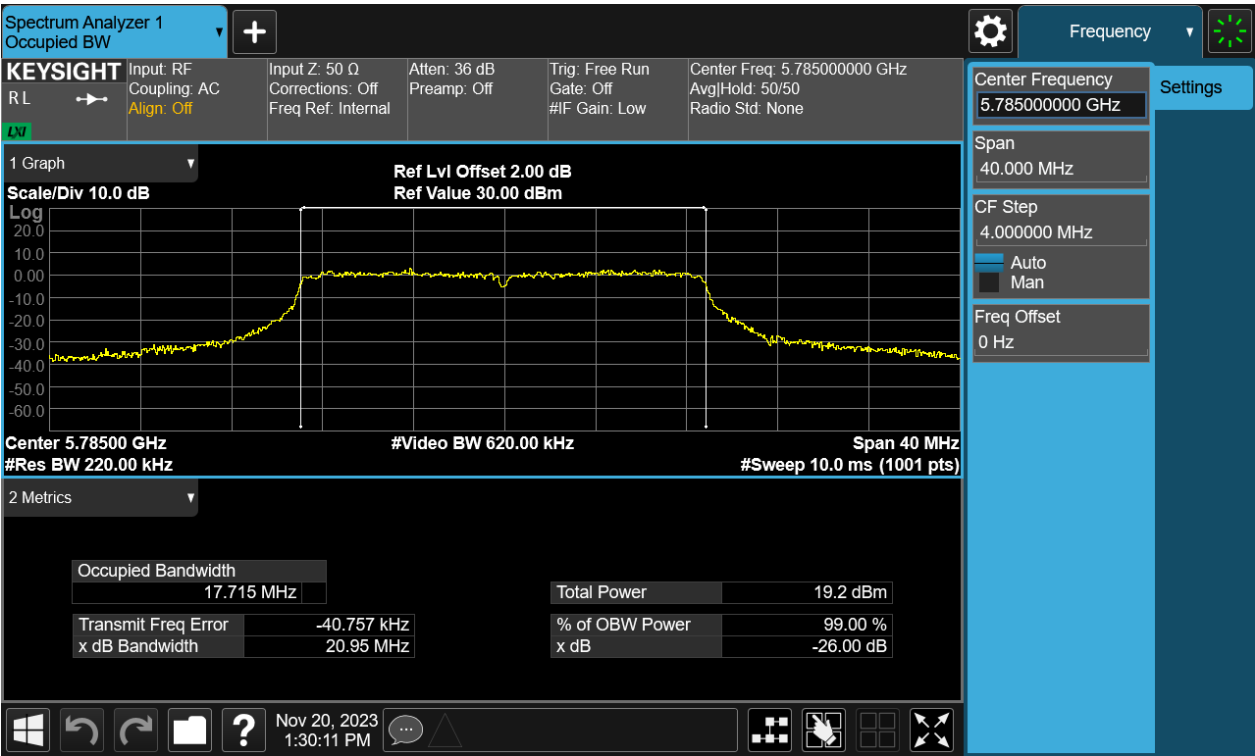


# TEST REPORT

Figure 19: The plots of 6dB Bandwidth, 802.11n(HT20), 5785MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



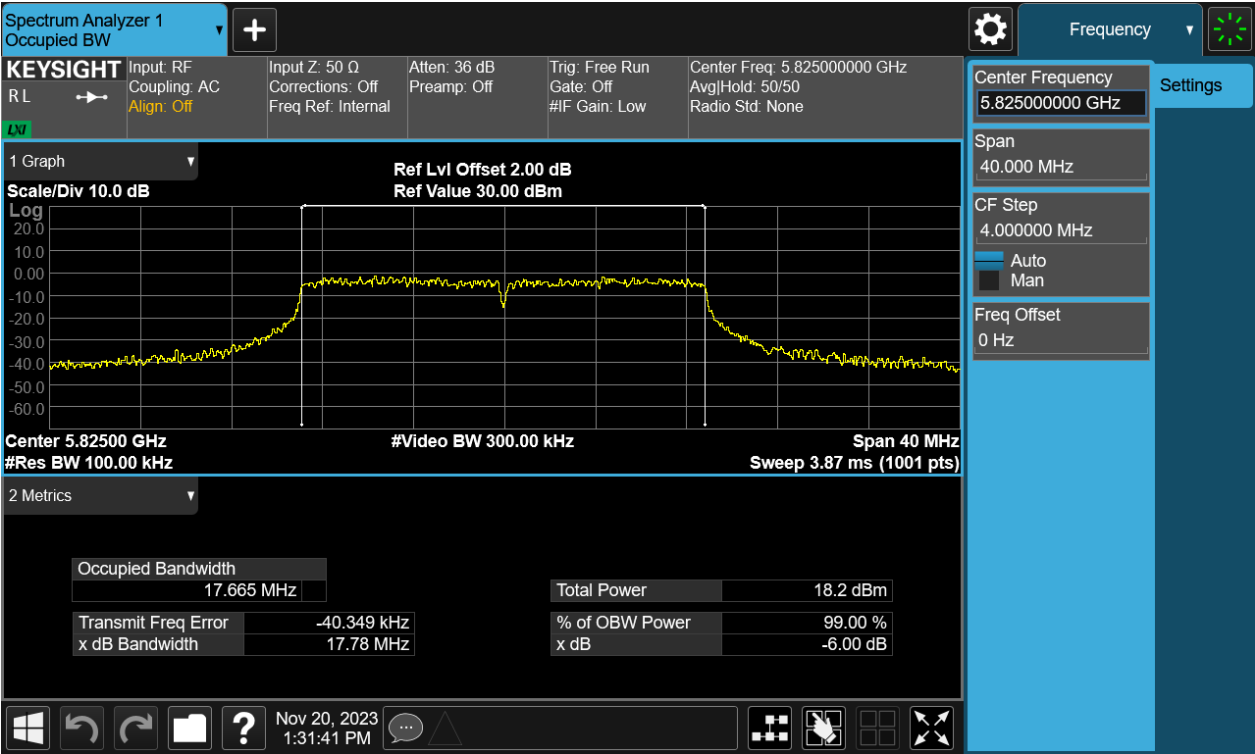
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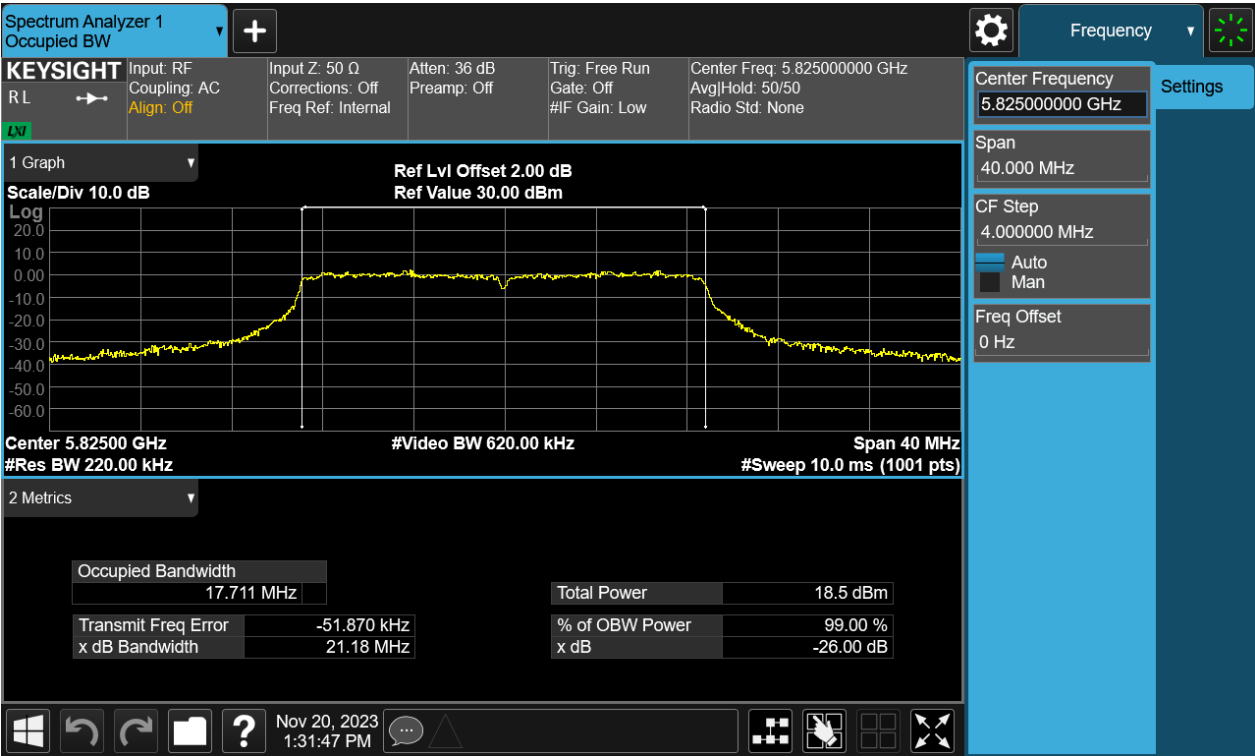
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Figure 20: The plots of 6dB Bandwidth, 802.11n(HT20), 5825MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



# TEST REPORT

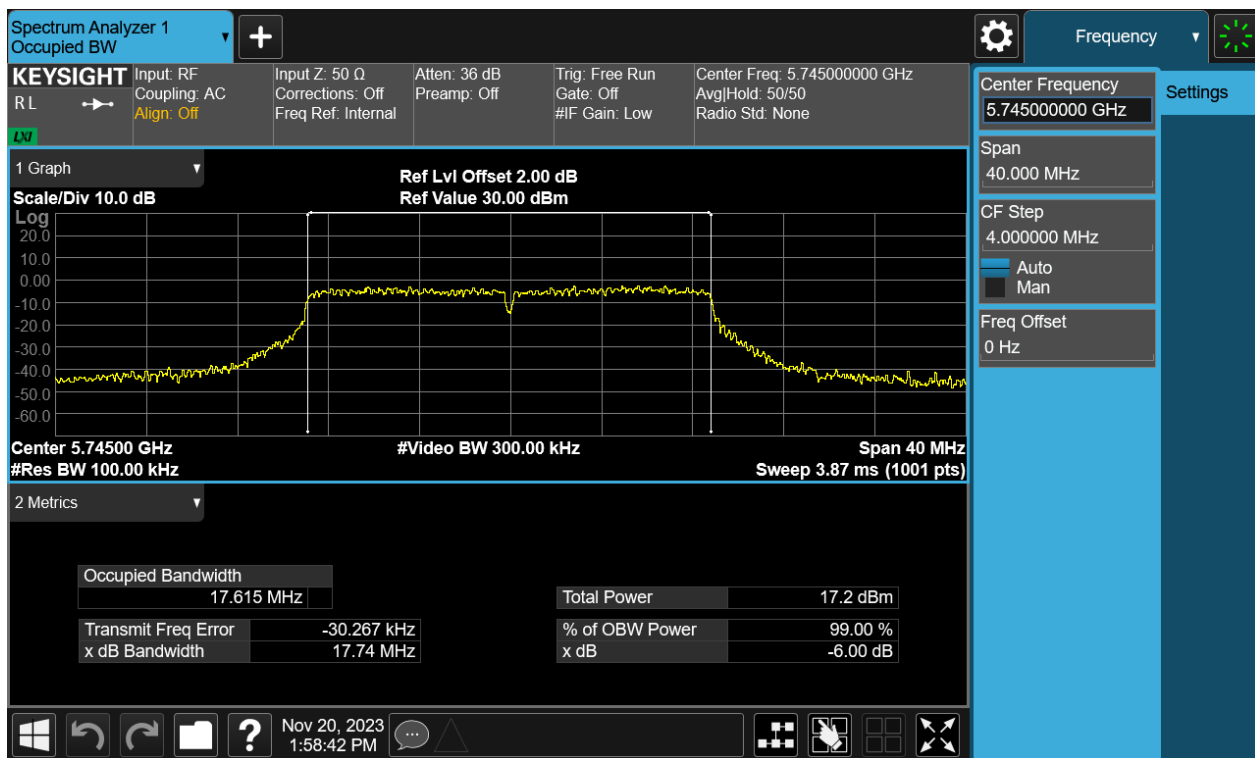
**Report No.:** SHE23100101-02FE

Date: 2024-05-24

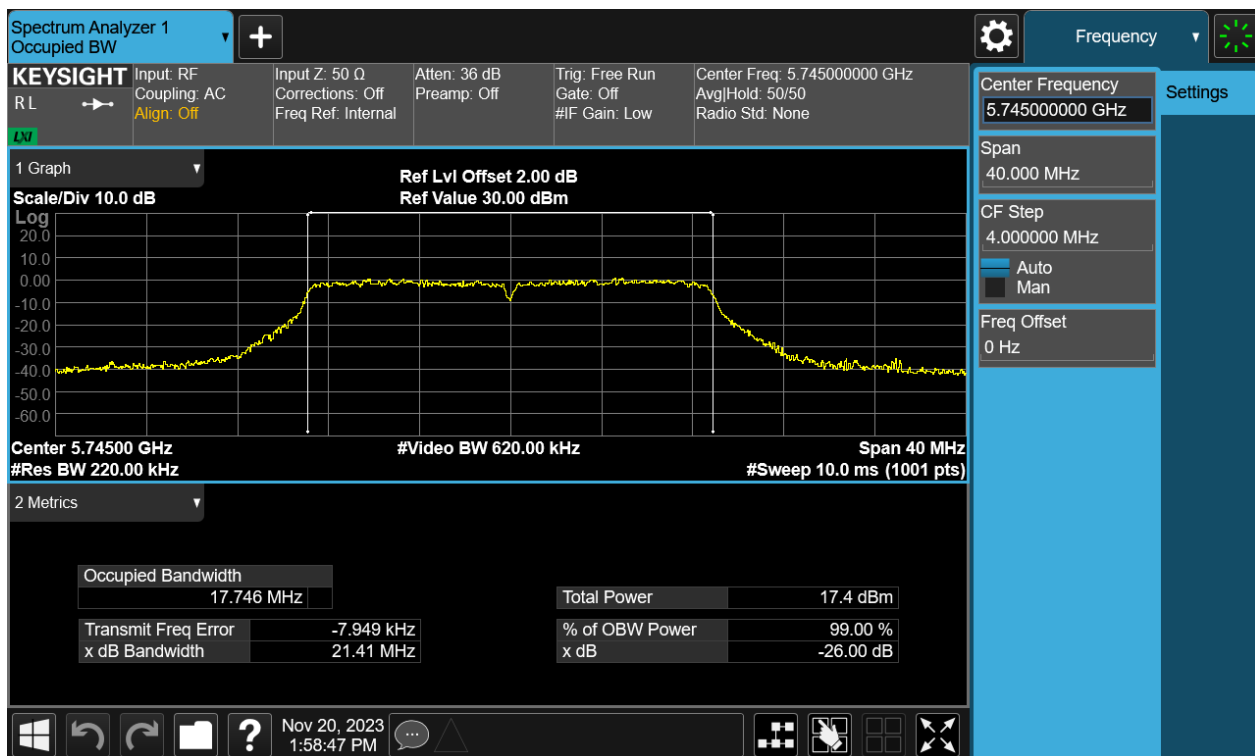
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**Figure 21: The plots of 6dB Bandwidth, 802.11ac(VHT20), 5745MHz**

### Test Plot of -6dB Bandwidth

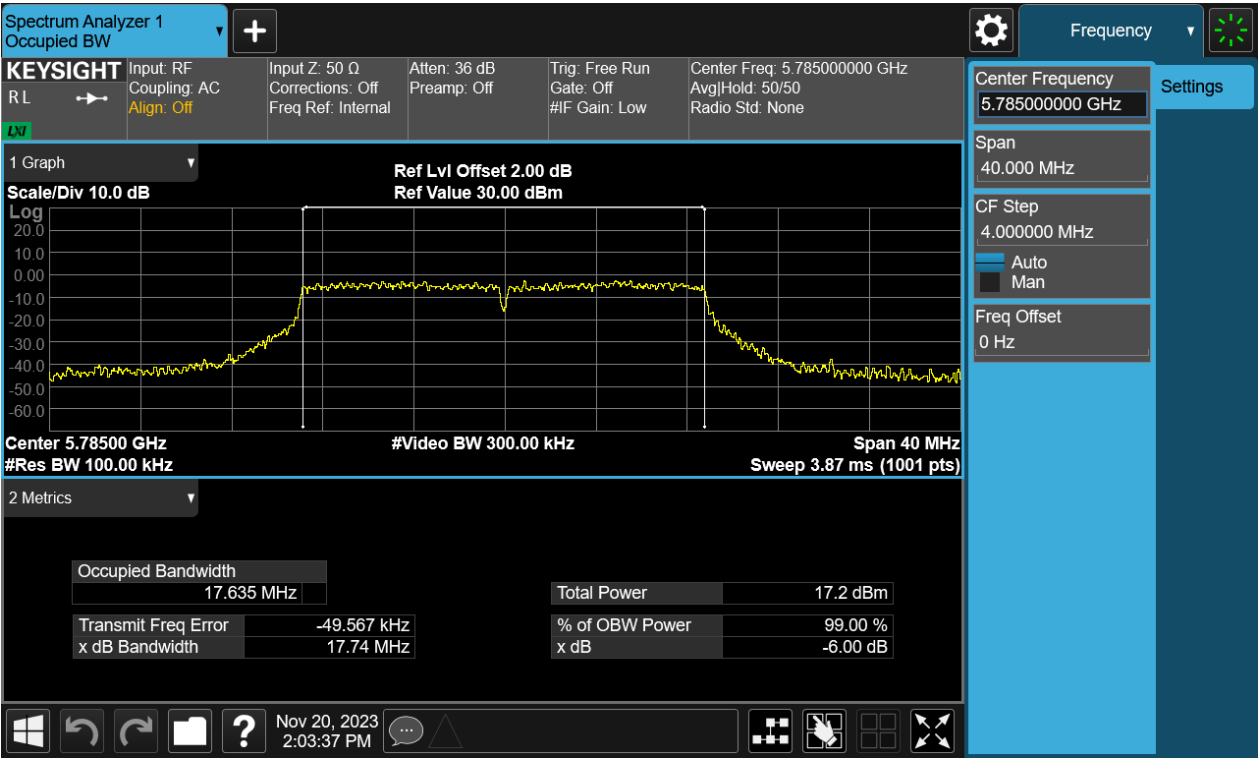


### Test Plot of 99% Occupied Bandwidth

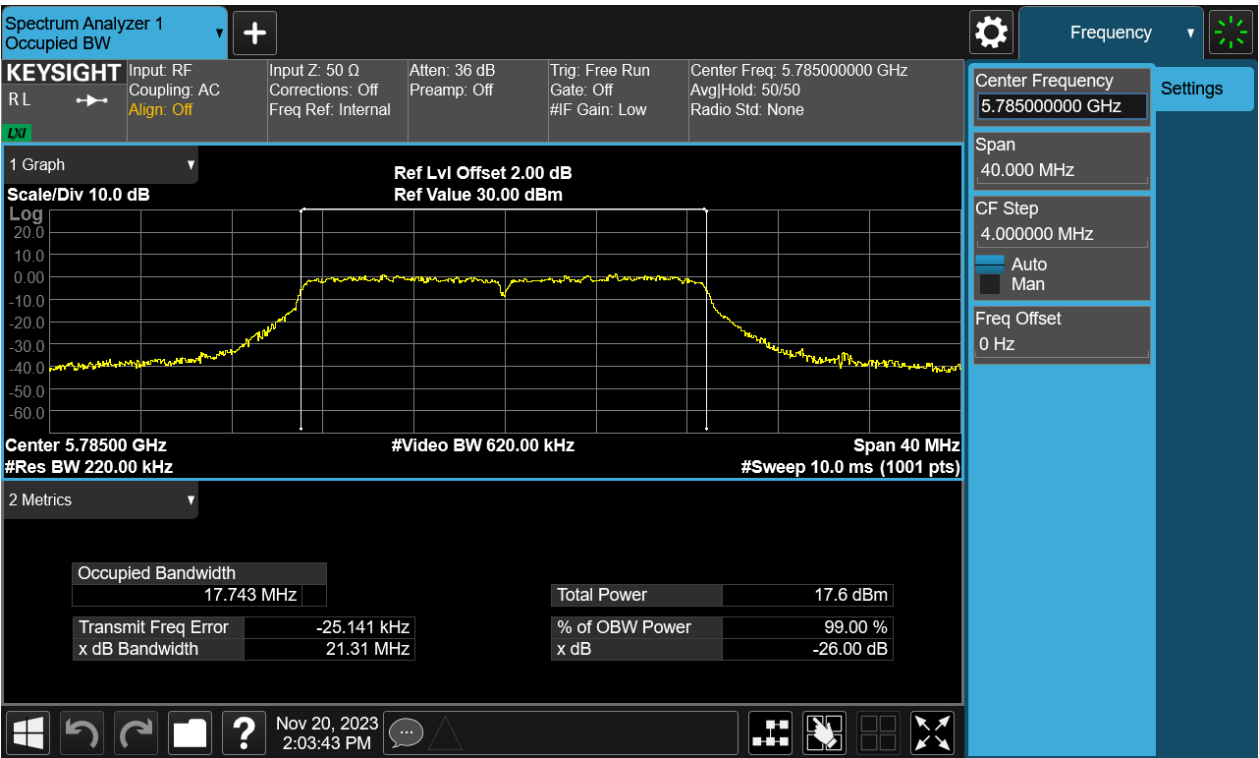


# TEST REPORT

Figure 22: The plots of 6dB Bandwidth, 802.11ac(VHT20), 5785MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



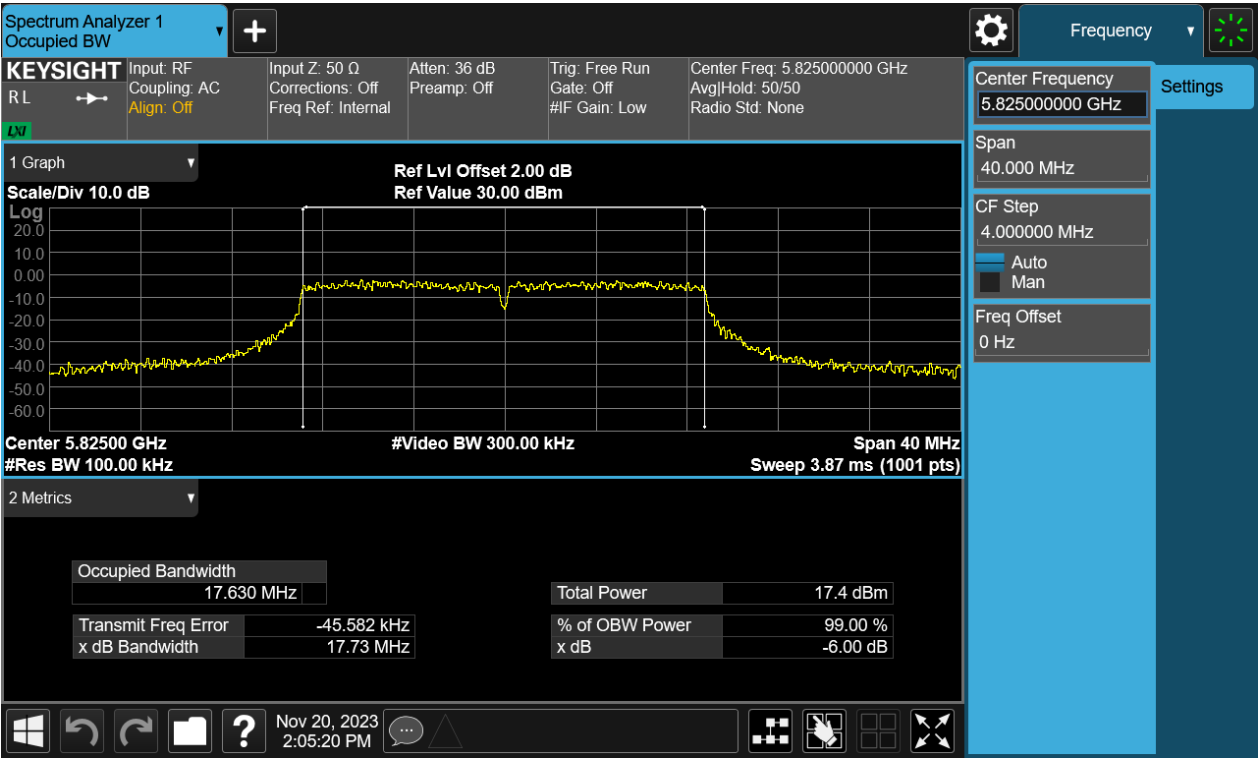
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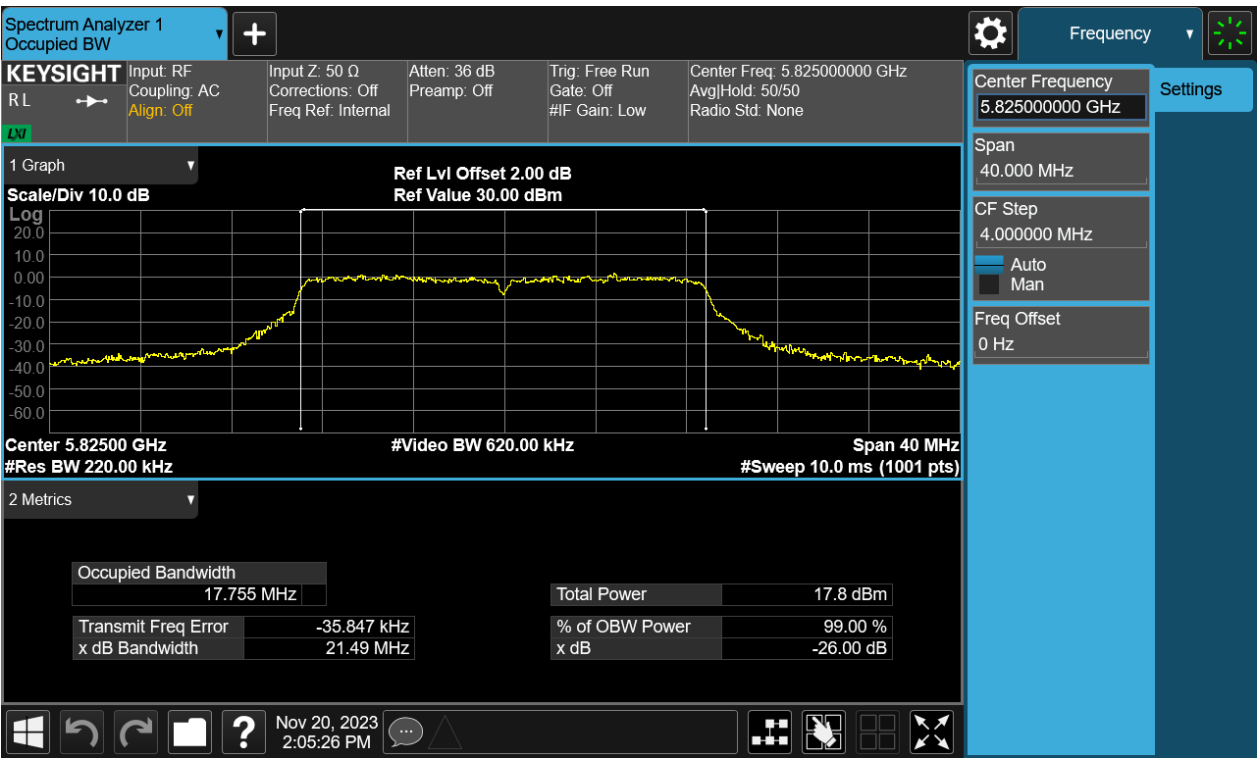
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Figure 23: The plots of 6dB Bandwidth, 802.11ac(VHT20), 5825MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



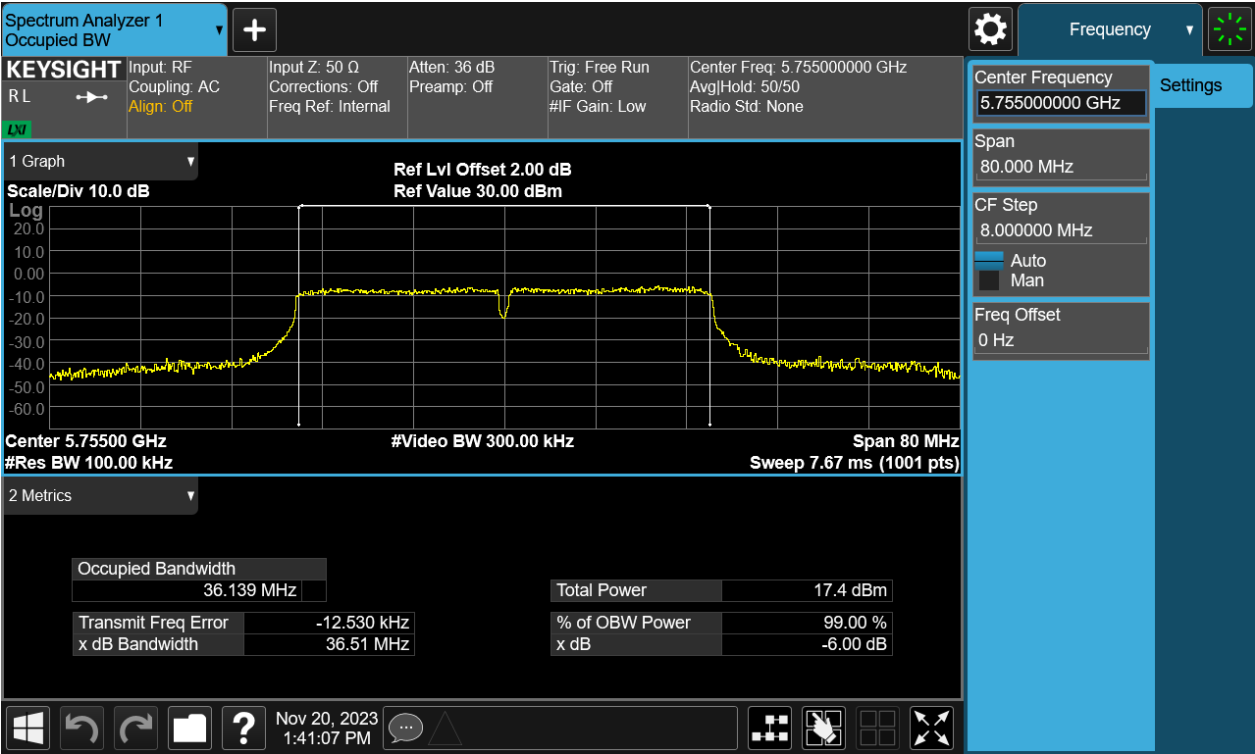
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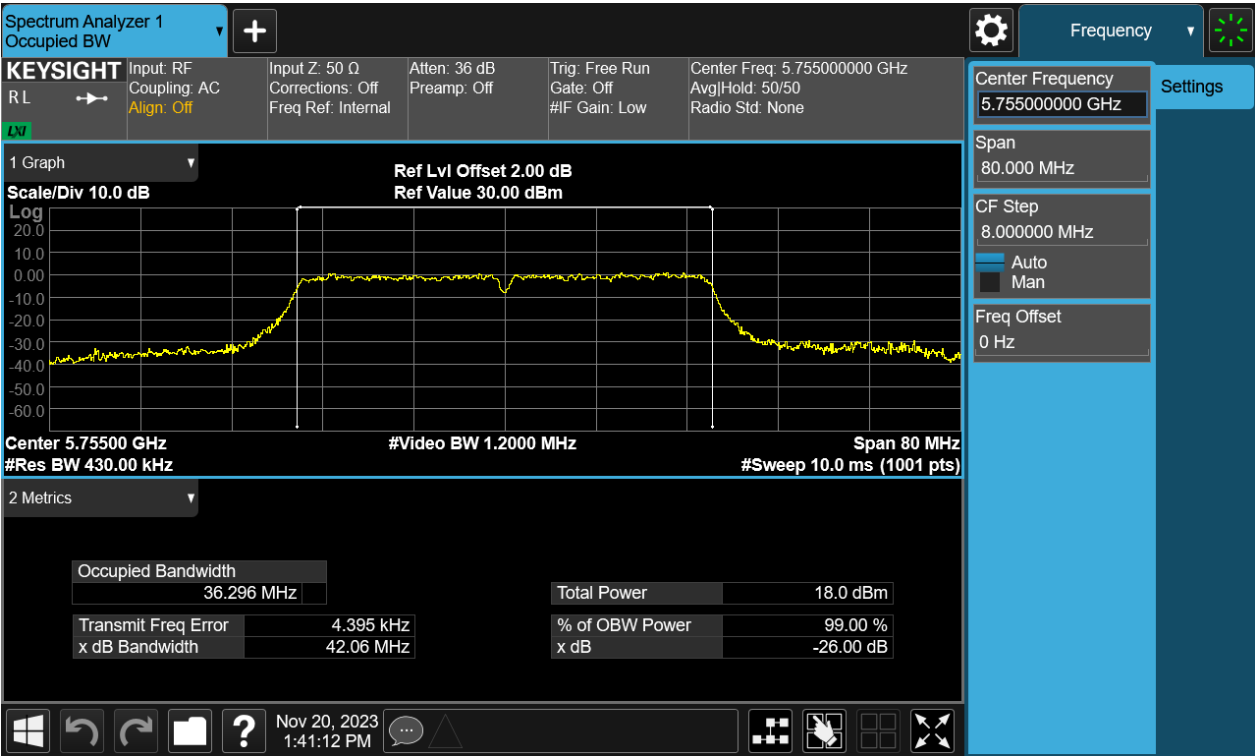
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Figure 24: The plots of 6dB Bandwidth, 802.11n(HT40), 5755MHz  
Test Plot of -6dB Bandwidth

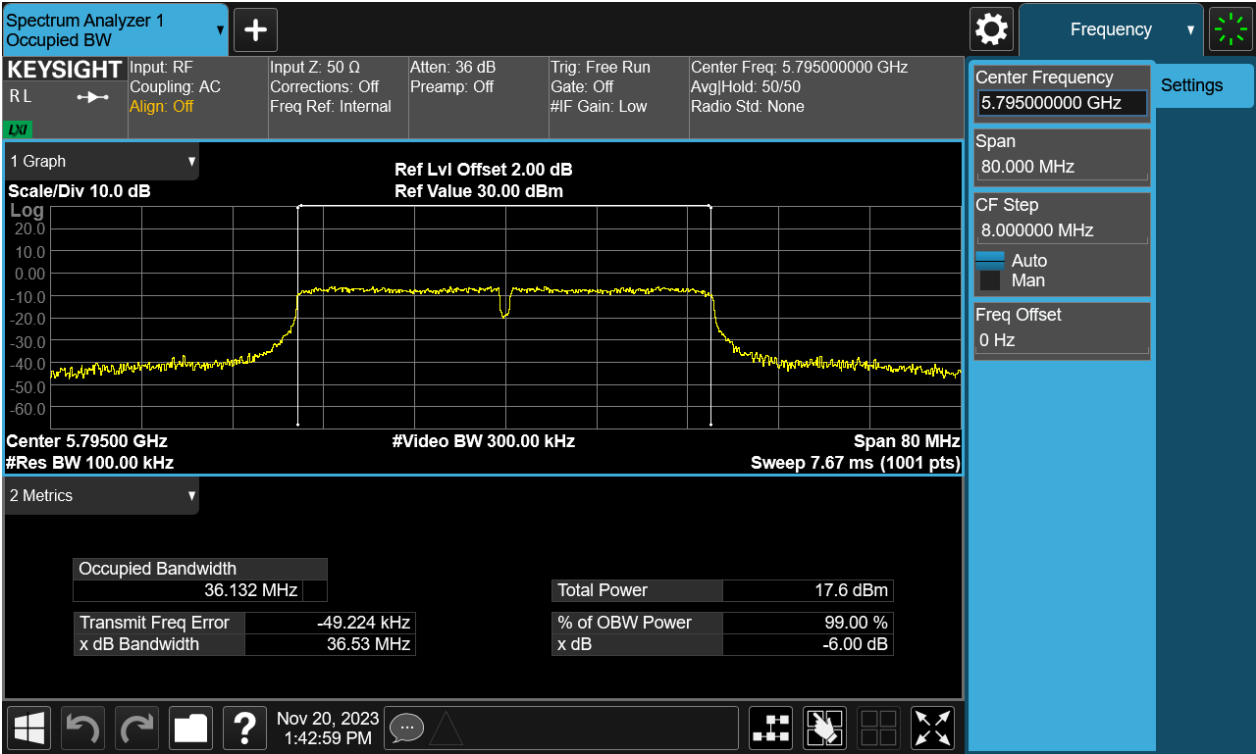


Test Plot of 99% Occupied Bandwidth

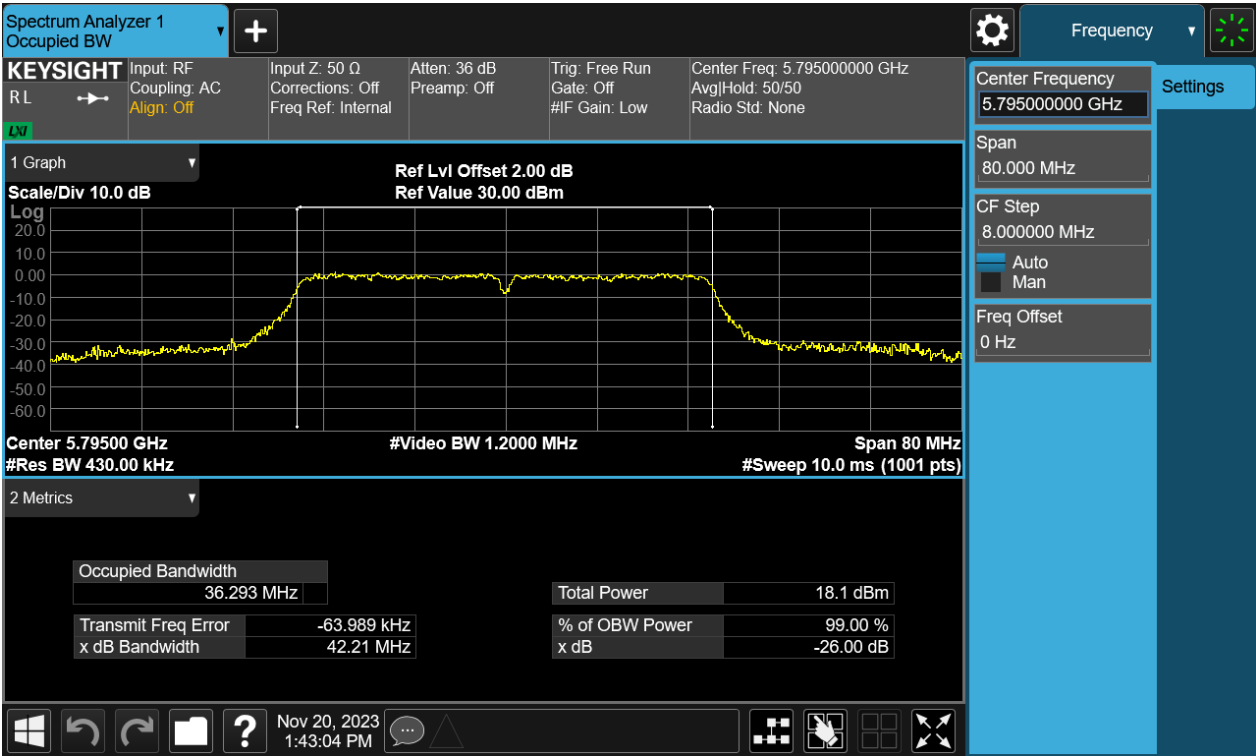


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Figure 25: The plots of 6dB Bandwidth, 802.11n(HT40), 5795MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



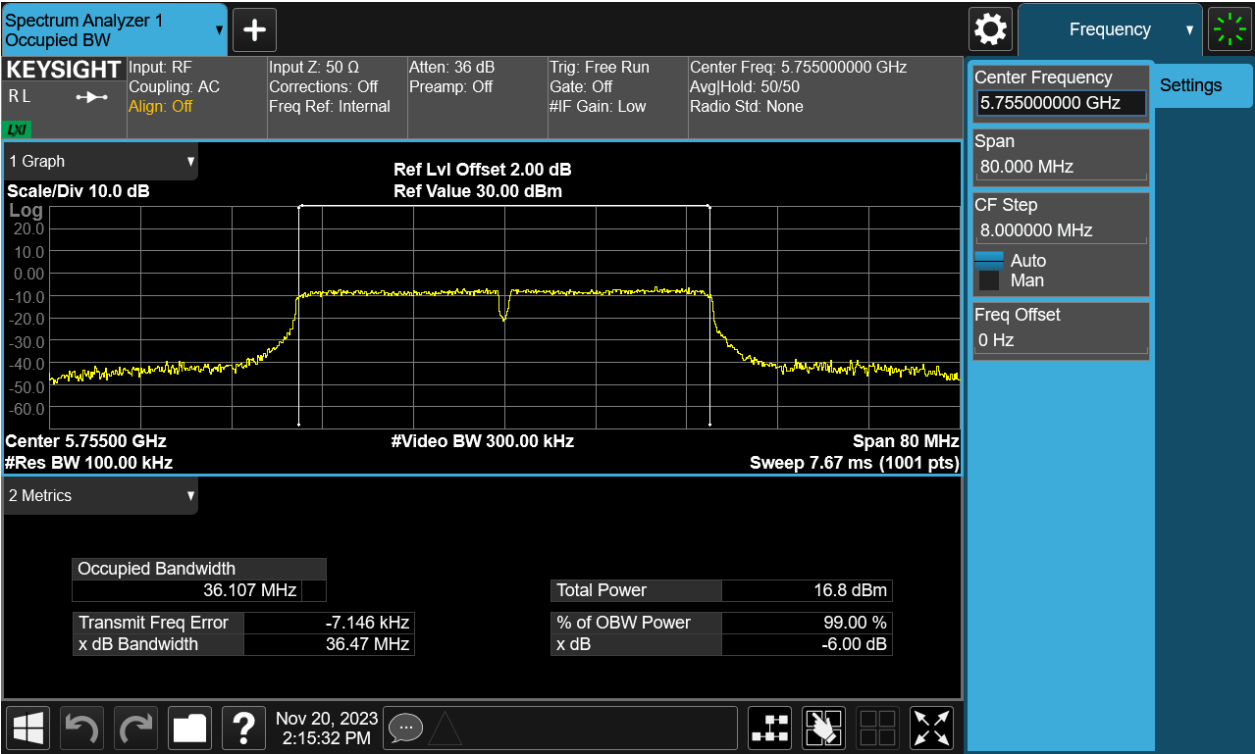
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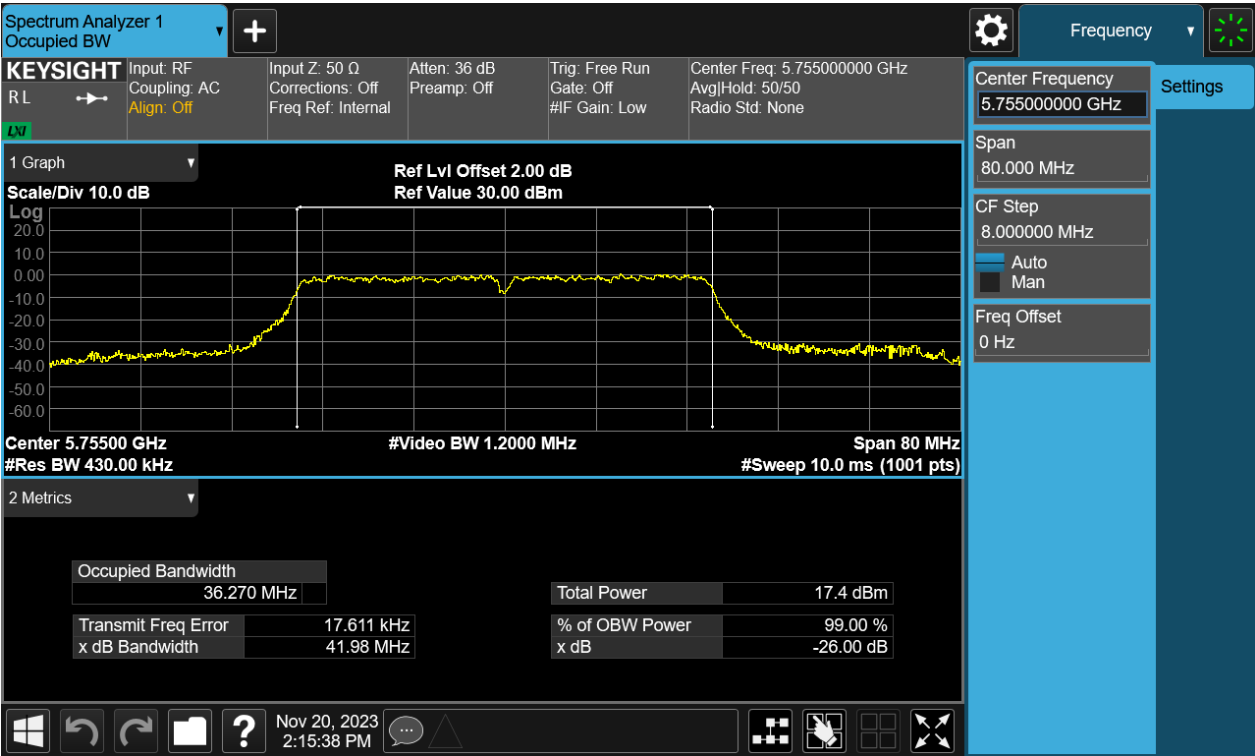
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Figure 26: The plots of 6dB Bandwidth, 802.11ac(VHT40), 5755MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



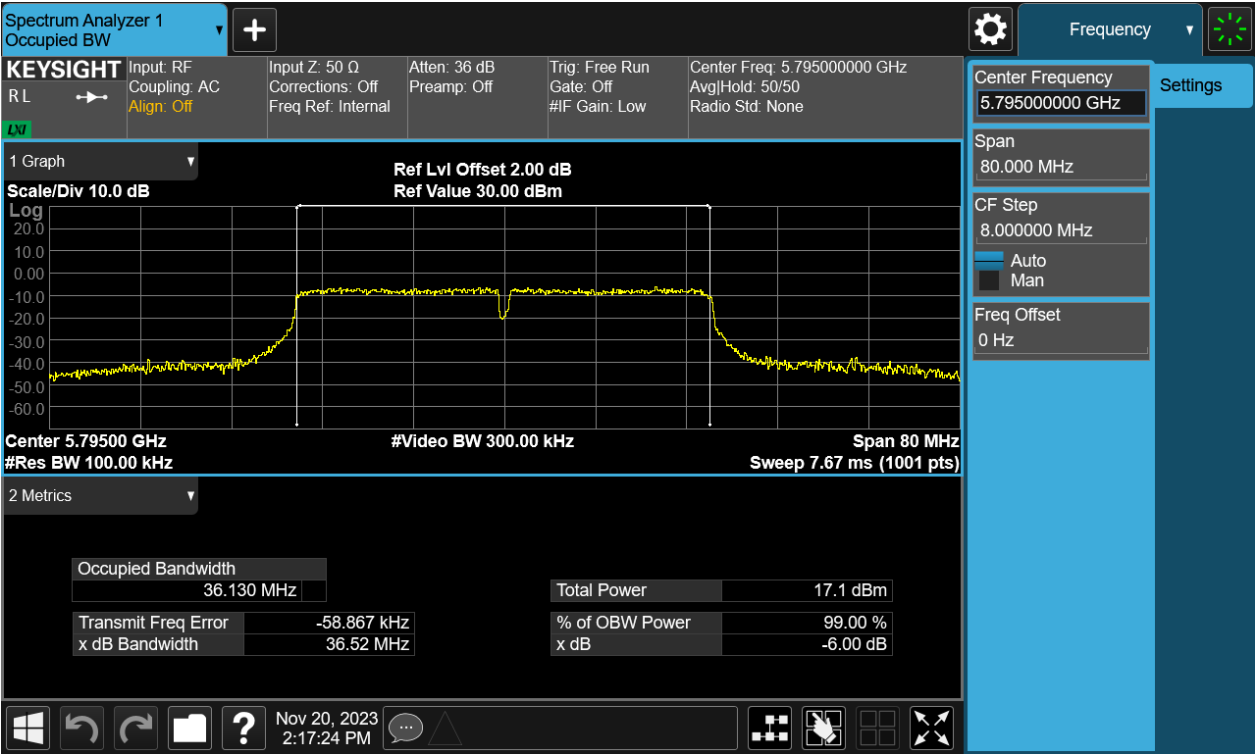
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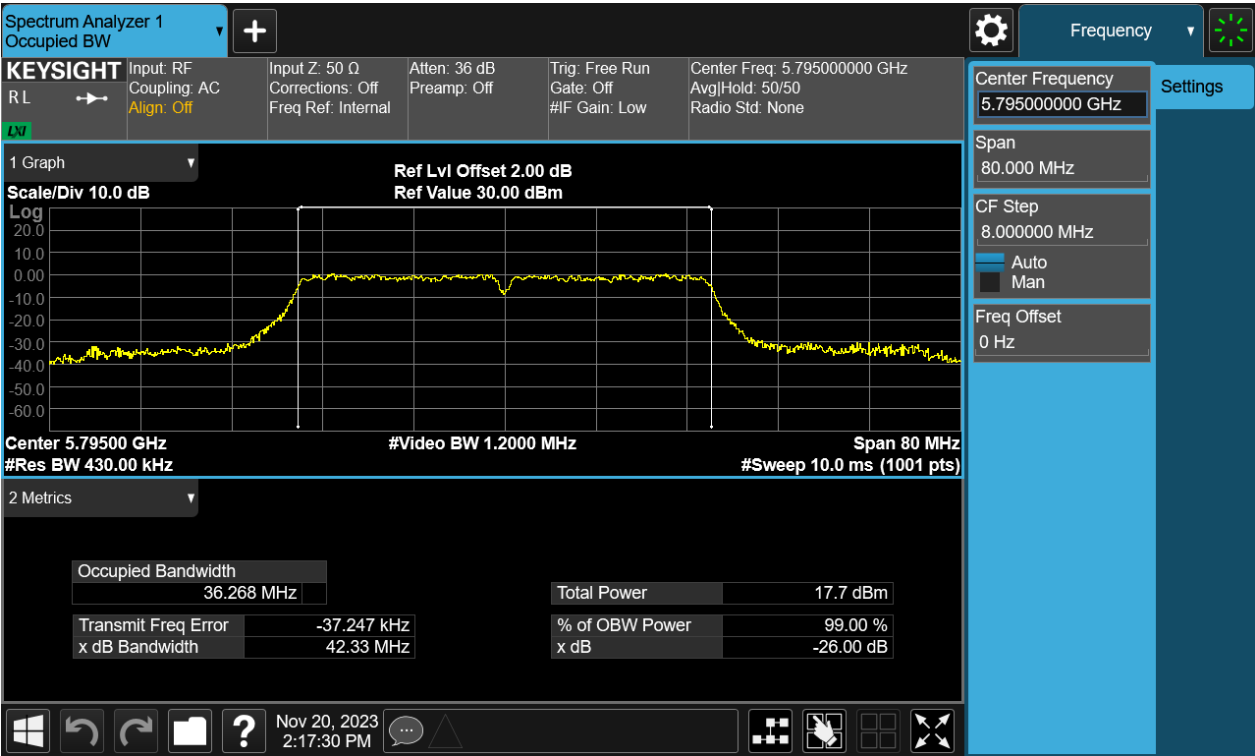
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Figure 27: The plots of 6dB Bandwidth, 802.11ac(VHT40), 5795MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



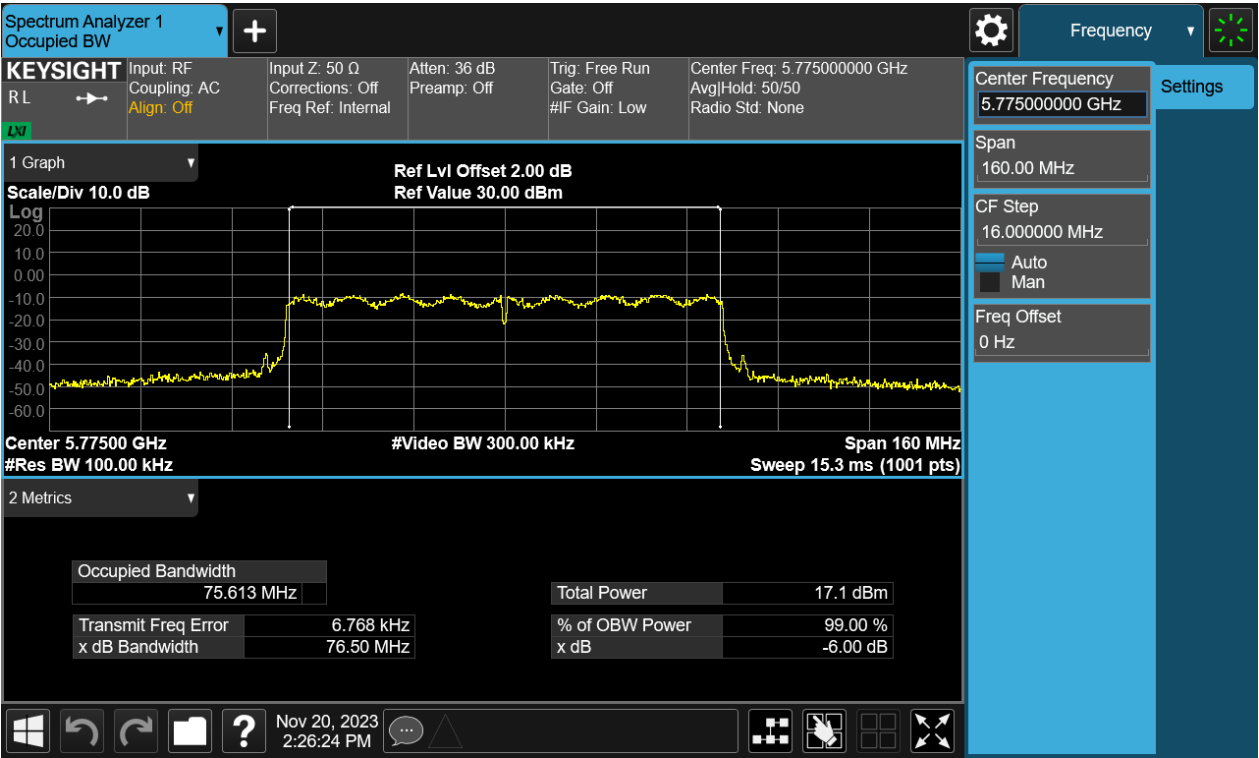
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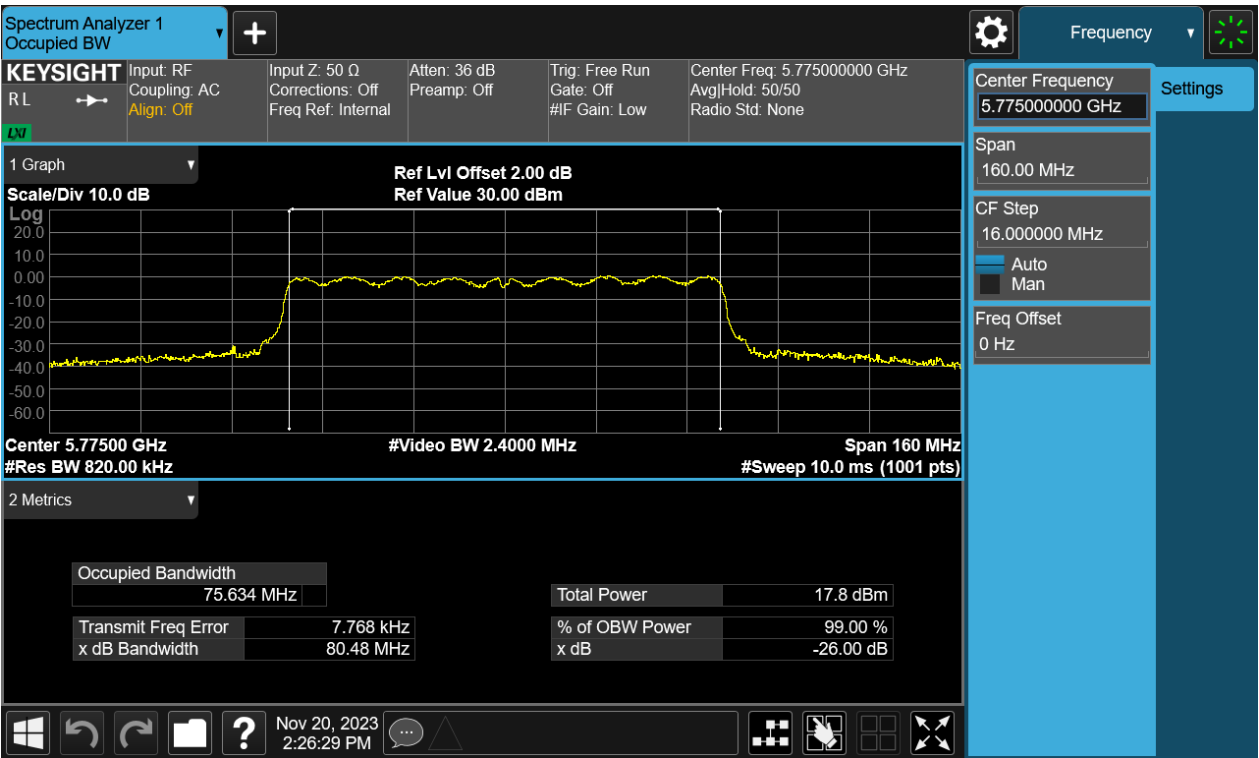
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Figure 28: The plots of 6dB Bandwidth, 802.11ac(VHT80), 5775MHz  
Test Plot of -6dB Bandwidth



Test Plot of 99% Occupied Bandwidth



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## 4.1.5 Maximum Conducted Output Power Spectral Density

RESULT:

PASS

Test standard : FCC Part 15.407(a)

Requirement : ANSI C63.10-2013 clause 12.5(SA-2), KDB 789033

Kind of test site : Shielded room

### Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 23.8°C

Relative humidity : 46%

Notes:

Test plots please refer to the annex document “SHE23100101-02FE DATA WIFI5GHz- Maximum Conducted Output Power Spectral Density EXHIBIT A”

Table 5: Maximum Conducted Output Power Spectral Density for Band I (5150MHz~5250MHz)

| Test Mode       | Duty Cycle | Test Channel (MHz) | Maximum PSD (dBm/MHz) | Applicable Limit (dBm/MHz) |
|-----------------|------------|--------------------|-----------------------|----------------------------|
| 802.11a         | 100        | 5180               | 6.00                  | 11                         |
|                 |            | 5220               | 5.90                  |                            |
|                 |            | 5240               | 5.70                  |                            |
| 802.11n(HT20)   | 100        | 5180               | 5.39                  |                            |
|                 |            | 5220               | 6.25                  |                            |
|                 |            | 5240               | 6.00                  |                            |
| 802.11ac(VHT20) | 100        | 5180               | 4.51                  |                            |
|                 |            | 5220               | 5.68                  |                            |
|                 |            | 5240               | 5.94                  |                            |
| 802.11n(HT40)   | 100        | 5190               | 0.03                  |                            |
|                 |            | 5230               | 1.19                  |                            |
| 802.11ac(VHT40) | 100        | 5190               | 2.11                  |                            |
|                 |            | 5230               | 1.96                  |                            |
| 802.11ac(VHT80) | 100        | 5210               | -3.90                 |                            |

Notes:

1. Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

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Table 6: Maximum Conducted Output Power Spectral Density for Band IV (5725MHz~5850MHz)

| Test Mode       | Duty Cycle | Test Channel (MHz) | Maximum PSD (dBm/500kHz) | Applicable Limit (dBm/500kHz) |
|-----------------|------------|--------------------|--------------------------|-------------------------------|
| 802.11a         | 100        | 5745               | 4.18                     | 30                            |
|                 |            | 5785               | 4.74                     |                               |
|                 |            | 5825               | 4.03                     |                               |
| 802.11n(HT20)   | 100        | 5745               | 4.12                     |                               |
|                 |            | 5785               | 4.53                     |                               |
|                 |            | 5825               | 3.30                     |                               |
| 802.11ac(VHT20) | 100        | 5745               | 3.31                     |                               |
|                 |            | 5785               | 2.79                     |                               |
|                 |            | 5825               | 3.38                     |                               |
| 802.11n(HT40)   | 100        | 5755               | -0.01                    |                               |
|                 |            | 5795               | -0.24                    |                               |
| 802.11ac(VHT40) | 100        | 5755               | -0.86                    |                               |
|                 |            | 5795               | -0.72                    |                               |
| 802.11ac(VHT80) | 100        | 5775               | -3.53                    |                               |

Notes:

1. Add  $[10 \log (1 / D)]$ , where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

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## 4.1.6 Conducted Spurious Emission

RESULT:

PASS

|                   |                                              |
|-------------------|----------------------------------------------|
| Test standard     | : FCC Part 15.407(b), 15.209                 |
| Requirement       | : ANSI C63.10-2013 clause 12.7.4, KDB 789033 |
| Kind of test site | : Shielded room                              |

### Test setup

|                     |                   |
|---------------------|-------------------|
| Test Channel        | : Low/Middle/High |
| Operation Mode      | : A.1.a           |
| Ambient temperature | : 23.8°C          |
| Relative humidity   | : 46%             |

Notes:

Test plots please refer to the annex document “SHE23100101-02FE DATA WLAN 5GHz-TX CSE EXHIBIT A”.

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## 4.1.7 Radiated Emission

RESULT: PASS

Test standard : FCC Part 15.407(b), 15.209, 15.205  
Requirement : ANSI C63.10-2013 clause 12.7.4, KDB 789033  
Kind of test site : 3m Semi-Anechoic Chamber

### Test setup

Test Channel : Low/Middle/High  
Operation Mode : A.1.a  
Ambient temperature : 23.5°C  
Relative humidity : 54%

### Notes:

Test plots please refer to the annex document “SHE23100101-02FE DATA WIFI5GHz-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 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. Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Results-Limit.

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

RESULT:

PASS

|                   |                                                |
|-------------------|------------------------------------------------|
| Test standard     | : FCC Part 15.407(b)                           |
| Requirement       | : ANSI C63.10-2013 clause 12.7.4.4, KDB 789033 |
| Kind of test site | : 3m Semi-Anechoic Chamber                     |

### Test setup

|                     |            |
|---------------------|------------|
| Test Channel        | : Low/High |
| Operation Mode      | : A.1.a    |
| Ambient temperature | : 23.5°C   |
| Relative humidity   | : 54%      |

### Notes:

- Test plots please refer to the annex document “SHE23100101-02FE DATA WIFI5GHz-TX EXHIBIT A”*
1. 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.
  2. Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Results-Limit.

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## 4.1.9 Frequency Stability

RESULT:

PASS

Test standard

: FCC Part 15.407(g)

Kind of test site

: Shielded room

### Test setup

Test Channel

: Low/Middle/High

Operation Mode

: A.1.a

Ambient temperature

: 23.8°C

Relative humidity

: 46%

Table 7: Frequency Stability

Band I (5150MHz – 5250MHz):  
Voltage vs. Frequency Stability (5180MHz)

| Test Conditions |             | Frequency<br>(MHz) | Max. Deviation<br>(ppm) | Limit<br>(ppm) |
|-----------------|-------------|--------------------|-------------------------|----------------|
| Temp (°C)       | Voltage (V) |                    |                         |                |
| 20              | AC 120V     | 5179.958850        | 7.94                    | ± 20           |
|                 | AC 100V     | 5179.958650        | 7.98                    |                |
|                 | AC 240V     | 5179.958600        | 7.99                    |                |

Temperature vs. Frequency Stability (5180MHz)

| Test Conditions |           | Frequency<br>(MHz) | Max. Deviation<br>(ppm) | Limit<br>(ppm) |
|-----------------|-----------|--------------------|-------------------------|----------------|
| Voltage (V)     | Temp (°C) |                    |                         |                |
| AC 120V         | 0         | 5179.958775        | 7.96                    | ± 20           |
|                 | 10        | 5179.958750        | 7.96                    |                |
|                 | 20        | 5179.958800        | 7.95                    |                |
|                 | 30        | 5179.960300        | 7.66                    |                |
|                 | 40        | 5179.959700        | 7.78                    |                |
|                 | 50        | 5179.959175        | 7.88                    |                |
|                 | 60        | 5179.959075        | 7.90                    |                |
|                 | 70        | 5179.959400        | 7.84                    |                |

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Band IV (5725MHz – 5850MHz):  
Voltage vs. Frequency Stability (5745MHz)

| Test Conditions |             | Frequency<br>(MHz) | Max. Deviation<br>(ppm) | Limit<br>(ppm) |
|-----------------|-------------|--------------------|-------------------------|----------------|
| Temp (°C)       | Voltage (V) |                    |                         |                |
| 20              | AC 120V     | 5744.952925        | 8.19                    | ± 20           |
|                 | AC 100V     | 5744.952950        | 8.19                    |                |
|                 | AC 240V     | 5744.953000        | 8.18                    |                |

Temperature vs. Frequency Stability (5745MHz)

| Test Conditions |           | Frequency<br>(MHz) | Max. Deviation<br>(ppm) | Limit<br>(ppm) |
|-----------------|-----------|--------------------|-------------------------|----------------|
| Voltage (V)     | Temp (°C) |                    |                         |                |
| AC 120V         | 0         | 5744.954550        | 7.91                    | ± 20           |
|                 | 10        | 5744.953975        | 8.01                    |                |
|                 | 20        | 5744.953725        | 8.05                    |                |
|                 | 30        | 5744.953400        | 8.11                    |                |
|                 | 40        | 5744.953250        | 8.14                    |                |
|                 | 50        | 5744.953200        | 8.15                    |                |
|                 | 60        | 5744.955200        | 7.80                    |                |
|                 | 70        | 5744.954475        | 7.92                    |                |

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

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## 4.2 Mains Emissions

### 4.2.1 Conducted Emission on AC Mains

RESULT:

PASS

|                   |                               |
|-------------------|-------------------------------|
| Test standard     | : FCC Part 15.207             |
| 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 | : 26°C                               |
| Relative humidity   | : 49%                                |

For details refer to following test plot.

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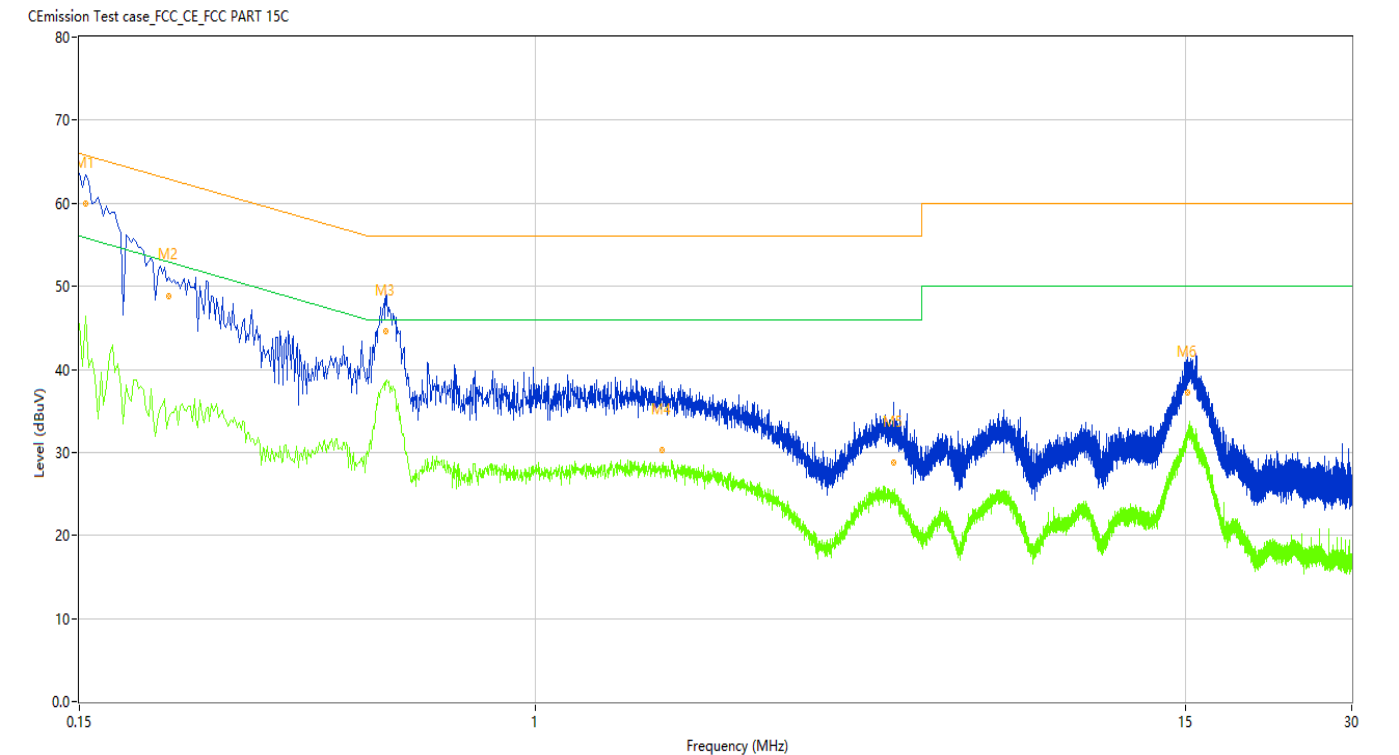
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Note: The all configurations were tested respectively, but only the worst configuration shown here.

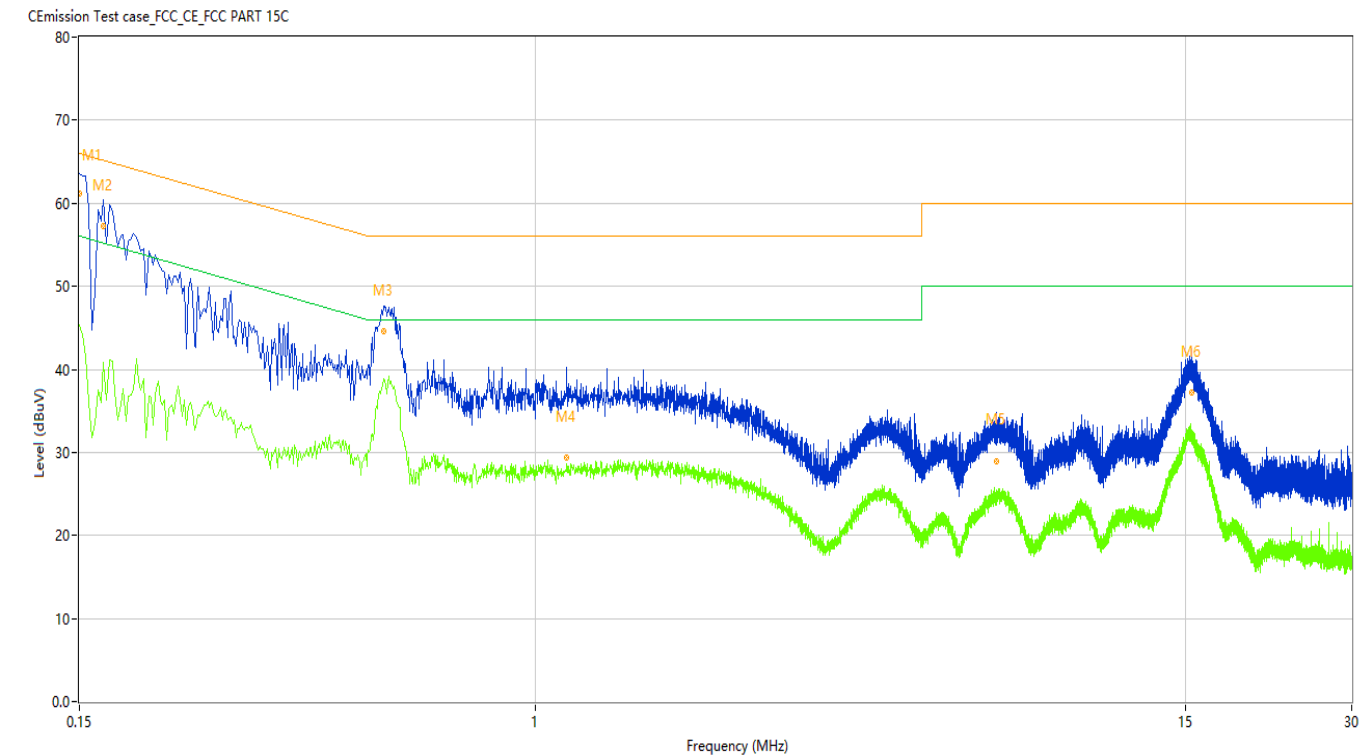
Figure 29: Conducted Emission on AC Mains, L Phase



| No. | Frequency (MHz) | Results (dBuV) | Factor (dB) | Limit (dBuV) | Margin (dB) | Detector | Line | Verdict |
|-----|-----------------|----------------|-------------|--------------|-------------|----------|------|---------|
| 1   | 0.154           | 64.04          | 9.93        | 65.78        | 1.74        | Peak     | L    | Pass    |
| 1*  | 0.154           | 59.93          | 9.93        | 65.78        | 5.85        | QP       | L    | Pass    |
| 1** | 0.154           | 46.33          | 9.93        | 55.78        | 9.45        | AV       | L    | Pass    |
| 2   | 0.218           | 54.05          | 9.96        | 62.89        | 8.84        | Peak     | L    | Pass    |
| 2*  | 0.218           | 48.85          | 9.96        | 62.89        | 14.04       | QP       | L    | Pass    |
| 2** | 0.218           | 34.20          | 9.96        | 52.89        | 18.69       | AV       | L    | Pass    |
| 3   | 0.538           | 50.17          | 9.96        | 56.00        | 5.83        | Peak     | L    | Pass    |
| 3*  | 0.538           | 44.58          | 9.96        | 56.00        | 11.42       | QP       | L    | Pass    |
| 3** | 0.538           | 38.45          | 9.96        | 46.00        | 7.55        | AV       | L    | Pass    |
| 4   | 1.698           | 35.75          | 9.85        | 56.00        | 20.25       | Peak     | L    | Pass    |
| 4*  | 1.698           | 30.24          | 9.85        | 56.00        | 25.76       | QP       | L    | Pass    |
| 4** | 1.698           | 28.48          | 9.85        | 46.00        | 17.52       | AV       | L    | Pass    |
| 5   | 4.450           | 34.87          | 9.82        | 56.00        | 21.13       | Peak     | L    | Pass    |
| 5*  | 4.450           | 28.81          | 9.82        | 56.00        | 27.19       | QP       | L    | Pass    |
| 5** | 4.450           | 25.21          | 9.82        | 46.00        | 20.79       | AV       | L    | Pass    |
| 6   | 15.170          | 43.92          | 9.52        | 60.00        | 16.08       | Peak     | L    | Pass    |
| 6*  | 15.170          | 37.22          | 9.52        | 60.00        | 22.78       | QP       | L    | Pass    |
| 6** | 15.170          | 32.07          | 9.52        | 50.00        | 17.93       | AV       | L    | Pass    |

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Figure 30: Conducted Emission on AC Mains, N Phase



| No. | Frequency (MHz) | Results (dBuV) | Factor (dB) | Limit (dBuV) | Margin (dB) | Detector | Line | Verdict |
|-----|-----------------|----------------|-------------|--------------|-------------|----------|------|---------|
| 1   | 0.150           | 64.52          | 10.02       | 66.00        | 1.48        | Peak     | N    | Pass    |
| 1*  | 0.150           | 61.20          | 10.02       | 66.00        | 4.80        | QP       | N    | Pass    |
| 1** | 0.150           | 45.32          | 10.02       | 56.00        | 10.68       | AV       | N    | Pass    |
| 2   | 0.166           | 61.97          | 10.03       | 65.16        | 3.19        | Peak     | N    | Pass    |
| 2*  | 0.166           | 57.28          | 10.03       | 65.16        | 7.88        | QP       | N    | Pass    |
| 2** | 0.166           | 40.90          | 10.03       | 55.16        | 14.26       | AV       | N    | Pass    |
| 3   | 0.532           | 49.86          | 10.06       | 56.00        | 6.14        | Peak     | N    | Pass    |
| 3*  | 0.532           | 44.60          | 10.06       | 56.00        | 11.40       | QP       | N    | Pass    |
| 3** | 0.532           | 38.79          | 10.06       | 46.00        | 7.21        | AV       | N    | Pass    |
| 4   | 1.142           | 36.97          | 9.94        | 56.00        | 19.03       | Peak     | N    | Pass    |
| 4*  | 1.142           | 29.40          | 9.94        | 56.00        | 26.60       | QP       | N    | Pass    |
| 4** | 1.142           | 27.89          | 9.94        | 46.00        | 18.11       | AV       | N    | Pass    |
| 5   | 6.830           | 33.64          | 9.83        | 60.00        | 26.36       | Peak     | N    | Pass    |
| 5*  | 6.830           | 28.89          | 9.83        | 60.00        | 31.11       | QP       | N    | Pass    |
| 5** | 6.830           | 25.54          | 9.83        | 50.00        | 24.46       | AV       | N    | Pass    |
| 6   | 15.418          | 44.58          | 9.58        | 60.00        | 15.42       | Peak     | N    | Pass    |
| 6*  | 15.418          | 37.19          | 9.58        | 60.00        | 22.81       | QP       | N    | Pass    |
| 6** | 15.418          | 31.72          | 9.58        | 50.00        | 18.28       | AV       | N    | Pass    |

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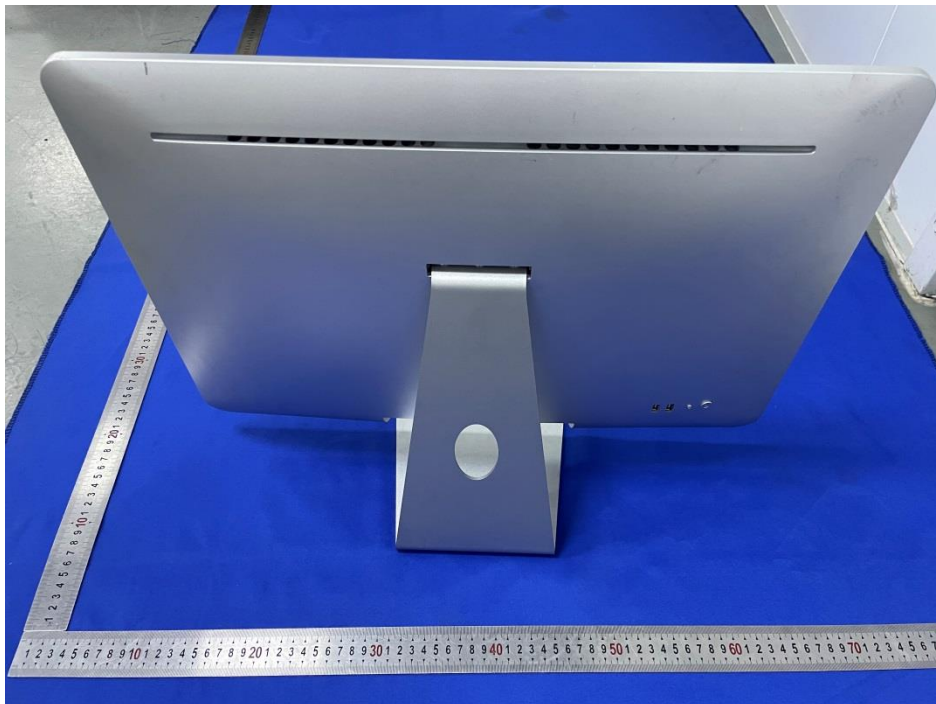
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## 5 Appendixes

### 5.1 Photographs of the Sample



Front of the sample



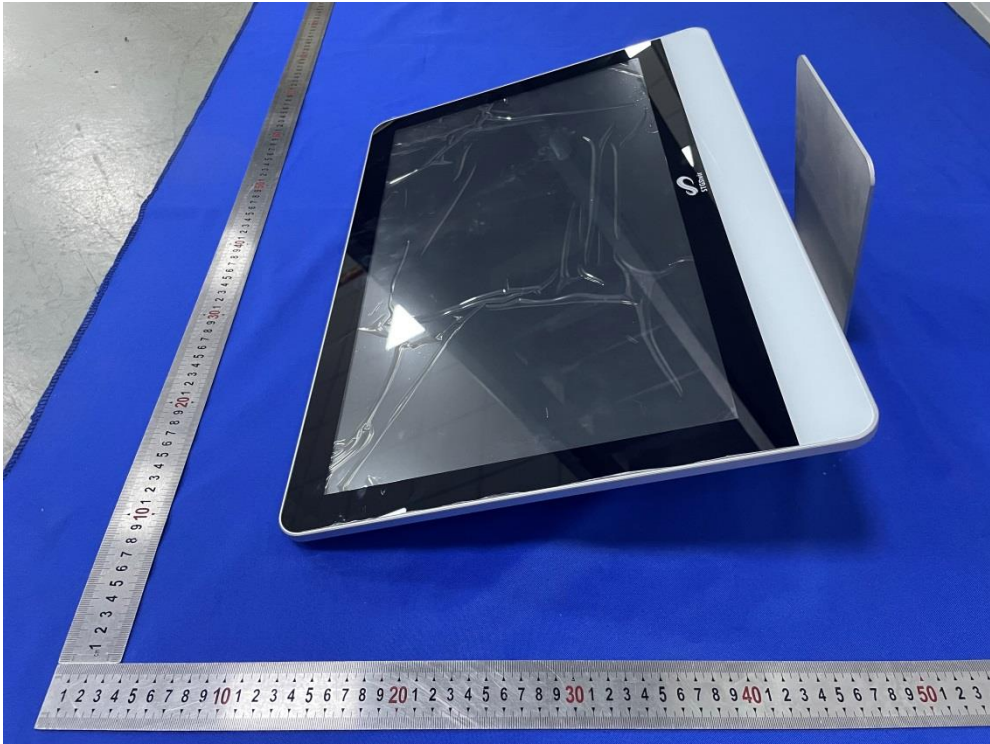
Rear of the sample

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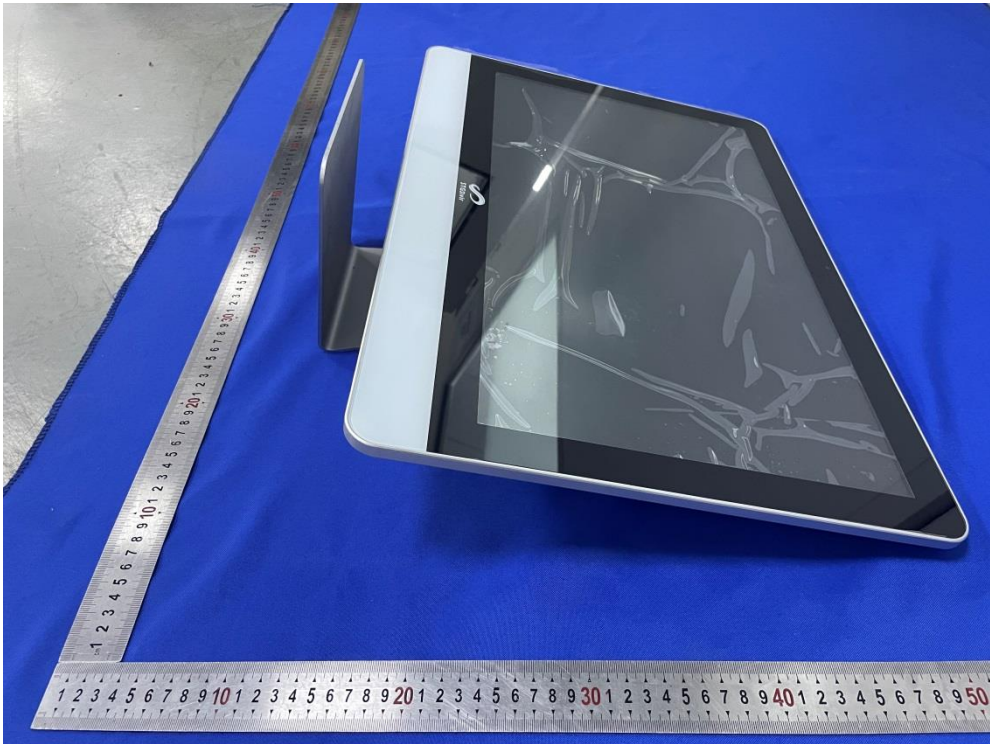
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Left of the sample



Right of the sample

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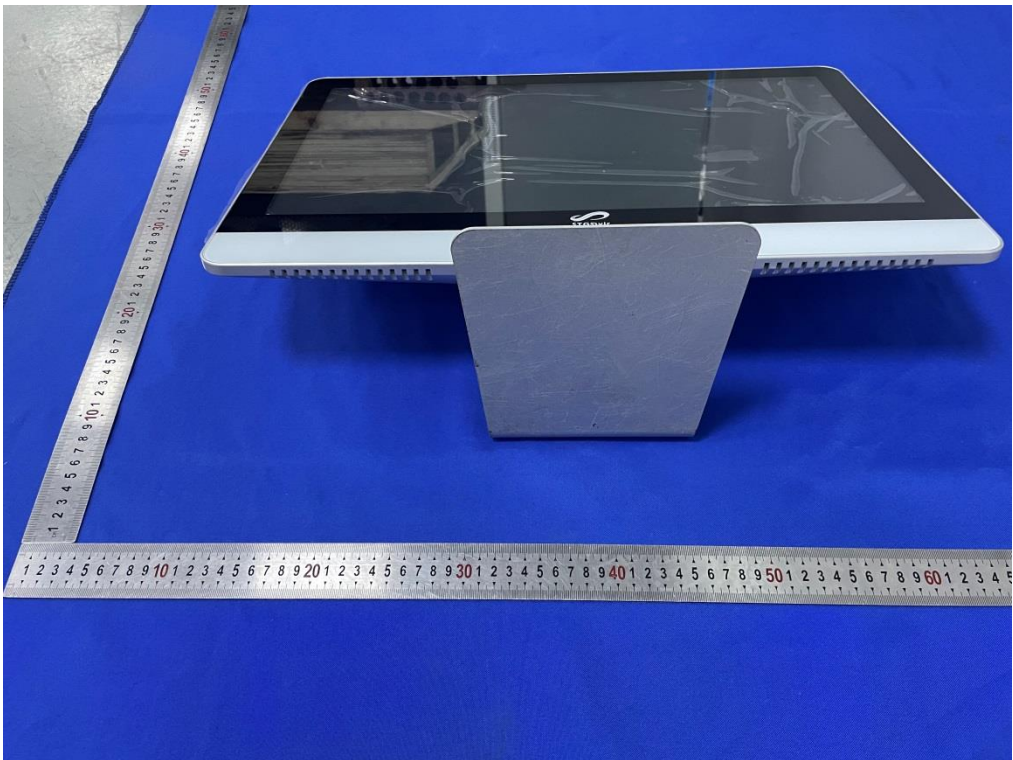
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Top of the sample



Bottom of the sample

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## 5.2 Set-up for Conducted Emissions



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



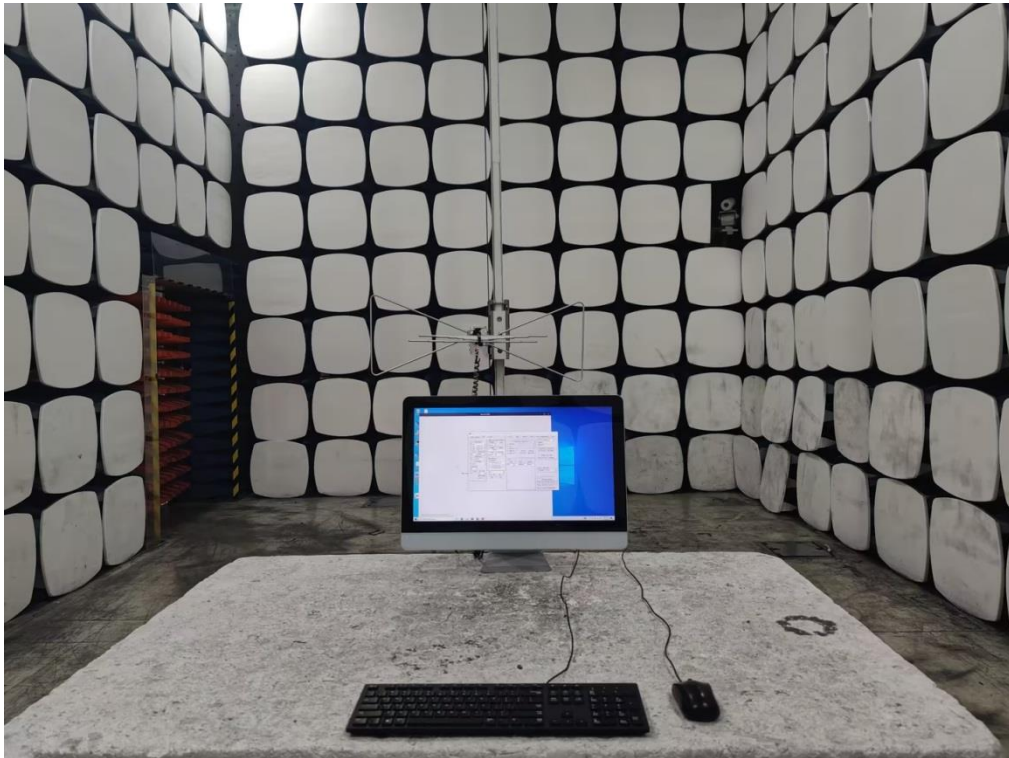
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## 5.4 Set-up for Spurious Emissions below 1GHz



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



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