



# TEST REPORT

Applicant: Alpha Audio Technology(ShenZhen)Co.,Ltd.  
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Manufacturer Alpha Audio Technology(ShenZhen)Co.,Ltd.  
Address of Manufacturer 904A,fencheng zhigu Building,No60,Tiedu Road,Xixiang Street, Bao'an District 518000 Shenzhen City China  
Factory: Alpha Audio Technology(ShenZhen)Co.,Ltd.  
Address of Factory: 904A,fencheng zhigu Building,No60,Tiedu Road,Xixiang Street, Bao'an District 518000 Shenzhen City China  
Product Name: Streaming media player  
Model No.: MX-5S  
Trade Mark: N/A  
FCC ID: 2BMGU-MX5S  
Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407  
Date of Test: Sept.29, 2024-Nov.28, 2024  
Date of report issued: Nov.29, 2024

*Remark:*

*The results shown in this test report refer only to the sample(s) tested , this test report cannot be reproduced, except in full without prior written permission of the company.*

*The report would be invalid without specific stamp of test institute and the signatures of compiler and approver*

## Prepared By

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| Report Revision History |             |              |
|-------------------------|-------------|--------------|
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## 1 Test Summary

| Test Item                                    | Section in CFR 47                           | Result | Test by   |
|----------------------------------------------|---------------------------------------------|--------|-----------|
| Antenna requirement                          | 15.203                                      | Pass   | /         |
| AC Power Line Conducted Emission             | 15.207                                      | Pass   | Carr Kang |
| Conducted Output Power                       | 15.407 (a)(1)/(a)(3)                        | Pass   | Yvan Fan  |
| 26dB Bandwidth and<br>99% Occupied Bandwidth | 15.407 (a)(12)                              | Pass   | Yvan Fan  |
| 6dB Bandwidth                                | 15.407 (e)                                  | Pass   | Yvan Fan  |
| Power Spectral Density                       | 15.407(a)(1)/(a)(3)                         | Pass   | Yvan Fan  |
| Band Edge                                    | 15.407(b)(1)/(b)(4)                         | Pass   | Yvan Fan  |
| Spurious Emission                            | 15.205/15.209<br>15.407(b)(1)/(b)(4)/(b)(8) | Pass   | Carr Kang |
| Frequency Stability                          | 15.407(g)                                   | Pass   | Yvan Fan  |

### Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013
3. Note: Compliance determination rules
  - 1).The Compliance determination of test results does not take into account measurement uncertainty. Measurement results are determined based on regulatory limitations or requirements specified by the applicant/manufacturer. If measurement uncertainty is taken into account, the applicant/manufacturer will bear all possible risks of non-compliance.
  - 2).The measurement uncertainty please refer to each test result in the "Measurement Uncertainty"

### 1.1 Measurement Uncertainty

| Test Item                         | Measurement Uncertainty | Notes |
|-----------------------------------|-------------------------|-------|
| Occupied Channel Bandwidth        | ±0.55%                  | (1)   |
| RF output power, conducted        | ±0.99dB                 | (1)   |
| Power Spectral Density, conducted | ±0.61dB                 | (1)   |
| Unwanted Emissions, conducted     | ±0.64dB                 | (1)   |
| AC Power Line Conducted Emission  | ± 2.64 dB               | (1)   |
| Radiated emissions 9K-30MHz       | ±3.98dB                 | (1)   |
| Radiated emissions 30M- 1GHz      | ±4.32dB                 | (1)   |
| Radiated emissions 1GHz-18GHz     | ±4.56dB                 | (1)   |
| Radiated emissions 18GHz-40GHz    | ±4.59 dB                | (1)   |

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

## 2 General Information

### 2.1 General Description of EUT

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:          | Streaming media player                                                                                                                                                                                                                                                                                                                                                                                                          |
| Model No.:             | MX-5S                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Difference of model(s) | N/A                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Test Model:            | MX-5S                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Hardware Version:      | N/A                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Software Version:      | N/A                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Sample(s) Status:      | Engineer sample                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Operation Frequency:   | <input checked="" type="checkbox"/> 5180-5240MHz for 802.11a/n(HT20)/ac20;<br>5190-5230MHz for 802.11n(HT40)/ac40;<br>5210MHz for 802.11 ac80;<br><input checked="" type="checkbox"/> 5745-5825 MHz for 802.11a/n(HT20)/ac20;<br>5755-5795 MHz for 802.11n(HT40)/ac40;<br>5775MHz for 802.11 ac80;                                                                                                                              |
| Channel numbers:       | <input checked="" type="checkbox"/> 4 channels for 802.11a/n20/ac20 in the 5180-5240MHz band;<br>2 channels for 802.11 n40/ac40 in the 5190-5230MHz band ;<br>1 channels for 802.11 ac80 in the 5210MHz band ;<br><input checked="" type="checkbox"/> 5 channels for 802.11a/n20/ac20 in the 5745-5825MHz band ;<br>2 channels for 802.11 n40/ac40 in the 5755-5795MHz band ;<br>1 channels for 802.11 ac80 in the 5775MHz band |
| Channel bandwidth:     | 802.11a/802.11n(HT20)/ 802.11ac(HT20): 20MHz<br>802.11n(HT40)/ 802.11ac(HT40) : 40MHz<br>802.11ac(HT80) : 80MHz                                                                                                                                                                                                                                                                                                                 |
| Data Rate              | 802.11a: 6,9,12,18,24,36,48,54Mbps;<br>802.11n(HT20/HT40):MCS0-MCS15;<br>802.11ac(VHT/20/40/80):NSS1, MCS0-MCS9                                                                                                                                                                                                                                                                                                                 |
| Modulation technology: | Orthogonal Frequency Division Multiplexing (OFDM)<br>with BPSK/QPSK/16QAM/64QAM/256QAM                                                                                                                                                                                                                                                                                                                                          |
| Antenna Type:          | Integrated antenna                                                                                                                                                                                                                                                                                                                                                                                                              |
| Antenna gain:          | 4.98dBi (Note: Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.)                                                                                                                                                                                                                                                                                               |
| Battery                | N/A                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Adapter Model:         | N/A                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Power supply:          | AC 100-240V 50/60Hz                                                                                                                                                                                                                                                                                                                                                                                                             |

| Operation Frequency each of channel |           |         |           |         |           |         |           |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 36                                  | 5180MHz   | 38      | 5190MHz   | 40      | 5200MHz   | 42      | 5210MHz   |
| 44                                  | 5220MHz   | 46      | 5230MHz   | 48      | 5240MHz   | /       | /         |
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 149                                 | 5745MHz   | 151     | 5755MHz   | 153     | 5765MHz   | 155     | 5775MHz   |
| 157                                 | 5785MHz   | 159     | 5795MHz   | 161     | 5805MHz   | /       | /         |
| 165                                 | 5825MHz   | /       |           |         |           |         |           |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Test channel    | Frequency (MHz)            |                         |                |
|-----------------|----------------------------|-------------------------|----------------|
|                 | 802.11 a /n(HT20)/ac(HT20) | 802.11 n(HT40)/ac(HT40) | 802.11ac(HT80) |
| Lowest channel  | 5180                       | 5190                    | 5210           |
| Middle channel  | 5200                       |                         |                |
| Highest channel | 5240                       | 5230                    |                |

| Test channel    | Frequency (MHz)            |                         |                |
|-----------------|----------------------------|-------------------------|----------------|
|                 | 802.11 a /n(HT20)/ac(HT20) | 802.11 n(HT40)/ac(HT40) | 802.11ac(HT80) |
| Lowest channel  | 5745                       | 5755                    | 5775           |
| Middle channel  | 5785                       |                         |                |
| Highest channel | 5825                       | 5795                    |                |

## 2.2 Test mode

|                                                                                                                                                                                                                                              |                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Transmitting mode                                                                                                                                                                                                                            | Keep the EUT in continuously transmitting mode(or with a duty cycle $\geq 98\%$ ) |
| <i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i> |                                                                                   |

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

| Pretest Mode | Description                                                            |
|--------------|------------------------------------------------------------------------|
| Mode 1       | 802.11a / n 20 CH36/ CH40/ CH 48<br>802.11a /n 20 CH149/ CH157/ CH 165 |
| Mode 2       | 802.11n 40 CH38/ CH 46<br>802.11n 40 CH 151 / CH 159                   |
| Mode 3       | 802.11 ac80 CH 42/CH 155                                               |
| Mode 4       | /                                                                      |
| Mode 5       | Link Mode                                                              |

| Conducted Emission |             |
|--------------------|-------------|
| Final Test Mode    | Description |
| Mode 5             | Link Mode   |

| For Radiated Emission |                                                                        |
|-----------------------|------------------------------------------------------------------------|
| Final Test Mode       | Description                                                            |
| Mode 1                | 802.11a / n 20 CH36/ CH40/ CH 48<br>802.11a /n 20 CH149/ CH157/ CH 165 |
| Mode 2                | 802.11n 40 CH38/ CH 46<br>802.11n 40 CH 151 / CH 159                   |
| Mode 3                | 802.11 ac80 CH 42/CH 155                                               |
| Mode 4                | /                                                                      |

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

## 2.3 Description of Support Units

| No. | Description | Manufacturer | Model | Serial Number |
|-----|-------------|--------------|-------|---------------|
| 1   | monitor     | SKYWORTH     | 2BU1  | /             |
| /   | /           | /            | /     | /             |
| /   | /           | /            | /     | /             |

## 2.4 Deviation from Standards

None.

## 2.5 Abnormalities from Standard Conditions

None.

## 2.6 Test Facility

Test laboratory: Shenzhen ETR Standard Technology Co., Ltd.  
CNAS Registration Number: L11864  
A2LA Certificate Number: 6640.01  
FCC Designation Number: CN1326  
FCC Test Firm Registration: 183064

## 2.7 Test Location

All tests were performed at:

Laboratory location: No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China  
Telephone: +86 755 85259392

## 2.8 Additional Instructions

|                   |                                         |
|-------------------|-----------------------------------------|
| Test Software     | Manufacturer's special COM port command |
| Power level setup | Default                                 |

### 3 Test Instruments list

#### Conducted Emission

| Item | Equipment name           | Manufacturer  | Model    | Serial No. | Calibration date | Due date  |
|------|--------------------------|---------------|----------|------------|------------------|-----------|
| 1    | EMI Test Receiver        | Rohde&schwarz | ESCI3    | 100605     | 2024.3.12        | 2025.3.11 |
| 2    | Artificial power network | schwarabeck   | NSLK8127 | 8127483    | 2024.3.12        | 2025.3.11 |
| 3    | Artificial power network | ETS           | 3186/2NM | 1132       | 2024.3.12        | 2025.3.11 |
| 4    | 10dB attenuator          | HUBER+SUHNER  | 10dB     | /          | 2024.3.12        | 2025.3.11 |
| 5    | Cable 4                  | HUBER SUNNER  | 3M       | /          | 2024.3.12        | 2025.3.11 |
| 6    | Absorbing Clamp          | schwarabeck   | MDS21    | D69250     | 2024.3.12        | 2025.3.11 |

#### Radiated Emission &RF Conducted test:

| Item | Equipment name          | Manufacturer   | Model          | Serial No.             | Calibration date | Due date  |
|------|-------------------------|----------------|----------------|------------------------|------------------|-----------|
| 1    | EMI Test Receiver       | Rohde&schwarz  | ESCI7          | 101032                 | 2024.3.12        | 2025.3.11 |
| 2    | Broadband antenna       | schwarabeck    | VULB9168       | 1064                   | 2024.3.19        | 2026.3.21 |
| 3    | Horn antenna            | schwarabeck    | BBHA9120D      | 9120D-1145             | 2024.3.19        | 2026.3.21 |
| 4    | Amplifier               | EMtrace        | RP01A          | 50117                  | 2024.3.12        | 2025.3.11 |
| 5    | Amplifier               | Space-Dtronics | EWLAN0118G-P40 | 19113001               | 2024.3.12        | 2025.3.11 |
| 6    | Spectrum analyzer       | KEYSIGHT       | N9020A         | MY55370280             | 2024.3.12        | 2025.3.11 |
| 7    | Power detector meter    | MWRFtest       | MW100-PSB      | MW201020JYT            | 2024.3.12        | 2025.3.11 |
| 8    | Signal generator        | Agilent        | N5182A         | MY49060455             | 2024.3.12        | 2025.3.11 |
| 9    | Spectrum analyzer       | Rohde&schwarz  | FSU40          | 1166.1660K43           | 2024.3.12        | 2025.3.11 |
| 10   | Amplifier               | SKET           | LNPA_1840-50   | SK2019040302           | 2024.3.12        | 2025.3.11 |
| 11   | Horn antenna            | schwarabeck    | BBHA 9170      | 946                    | 2024.3.19        | 2026.3.21 |
| 12   | Loop antenna            | schwarabeck    | FMZB 1519 B    | 1519                   | 2024.3.19        | 2026.3.21 |
| 13   | Cable 6                 | HUBER SUNNER   | 0.5M           | /                      | 2024.3.12        | 2025.3.11 |
| 14   | Cable7                  | HUBER SUNNER   | 2.0M           | /                      | 2024.3.12        | 2025.3.11 |
| 15   | Cable8                  | HUBER SUNNER   | 6.0M           | /                      | 2024.3.12        | 2025.3.11 |
| 16   | Filter                  | Xin bo         | XBLBQ-GTA29    | 210410-3-2             | 2024.3.12        | 2025.3.11 |
| 17   | Power meter             | Rohde&Schwarz  | NRP-Z11        | 1138.3004.02-117725-vh | 2024.3.12        | 2025.3.11 |
| 18   | Temp.& Humidity Chamber | Jiecheng       | QA-LP-80       | 20160705001            | 2024.04.23       | 2025.4.22 |

Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

| Software Name           | Manufacturer | Model    | Version           |
|-------------------------|--------------|----------|-------------------|
| RF test software        | MWRFtest     | MTS 8310 | V2.0.0.0          |
| Conducted test software | EZ-EMC       | Farad    | Ver.EMC-CON 3A1.1 |
| Radiated test software  | EZ-EMC       | Farad    | Ver.FA-03A2 RE    |

## 4 Test results and Measurement Data

### 4.1 Antenna requirement

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Standard requirement:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FCC Part15 C Section 15.203 |
| <i>15.203 requirement:<br/>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, 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.</i> |                             |
| <b>E.U.T Antenna:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |
| <i>The antennas are Integrated antenna, the best case gain of the antennas are 4.98dBi, reference to the appendix II for details</i>                                                                                                                                                                                                                                                                                                                                              |                             |

## 4.2 Conducted Emissions

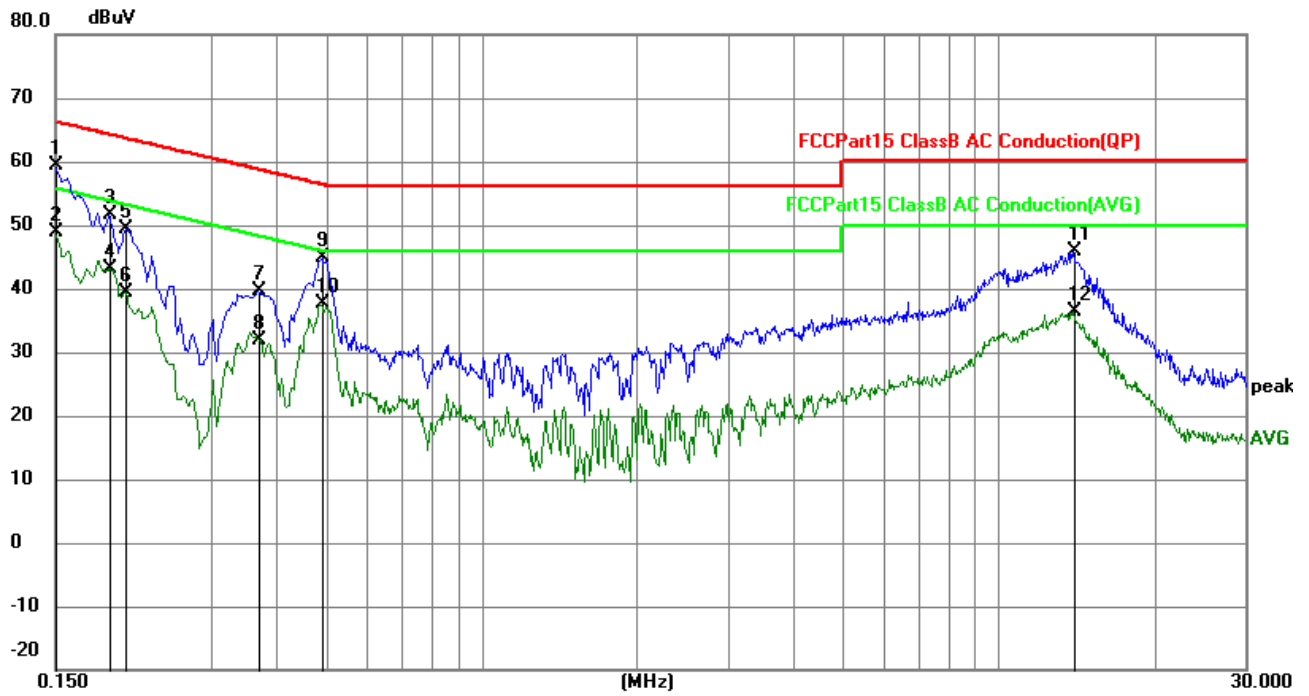
|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |              |     |           |          |  |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------|-----|-----------|----------|--|
| Test Requirement:                                | FCC Part15 C Section 15.207                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |              |     |           |          |  |
| Test Method:                                     | ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |              |     |           |          |  |
| Test Frequency Range:                            | 150KHz to 30MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |              |     |           |          |  |
| Class / Severity:                                | Class B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |              |     |           |          |  |
| Receiver setup:                                  | RBW=9KHz, VBW=30KHz, Sweep time=auto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |              |     |           |          |  |
| Limit:                                           | Frequency range (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        | Limit (dBuV) |     |           |          |  |
|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        | Quasi-peak   |     | Average   |          |  |
|                                                  | 0.15-0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        | 66 to 56*    |     | 56 to 46* |          |  |
|                                                  | 0.5-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        | 56           |     | 46        |          |  |
|                                                  | 5-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        | 60           |     | 50        |          |  |
| * Decreases with the logarithm of the frequency. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |              |     |           |          |  |
| Test setup:                                      | <div><p style="text-align: center;">Reference Plane</p><p style="text-align: center;">40cm</p><p style="text-align: center;">80cm</p><p style="text-align: center;">Test table/Insulation plane</p><p>Remark:<br/>E.U.T: Equipment Under Test<br/>LISN: Line Impedance Stabilization Network<br/>Test table height=0.8m</p></div>                                                                                                                                                                                                                                                                                                                                                                                                    |        |              |     |           |          |  |
| Test procedure:                                  | <div><div>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</div><div>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</div><div>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.</div></div> |        |              |     |           |          |  |
| Test Instruments:                                | Refer to section 3.0 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |              |     |           |          |  |
| Test mode:                                       | Refer to section 2.2 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |              |     |           |          |  |
| Test environment:                                | Temp.:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 24.4°C | Humid.:      | 43% | Press.:   | 1012mbar |  |
| Test voltage:                                    | AC 120V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |              |     |           |          |  |
| Test results:                                    | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |              |     |           |          |  |

Remark:

1. Both high voltage and low voltage have been tested, and the report only shows the worst case data with AC 120V/60Hz.
2. All mode have been tested, the report only shows the worst mode (802.11ac20 5180MHz)

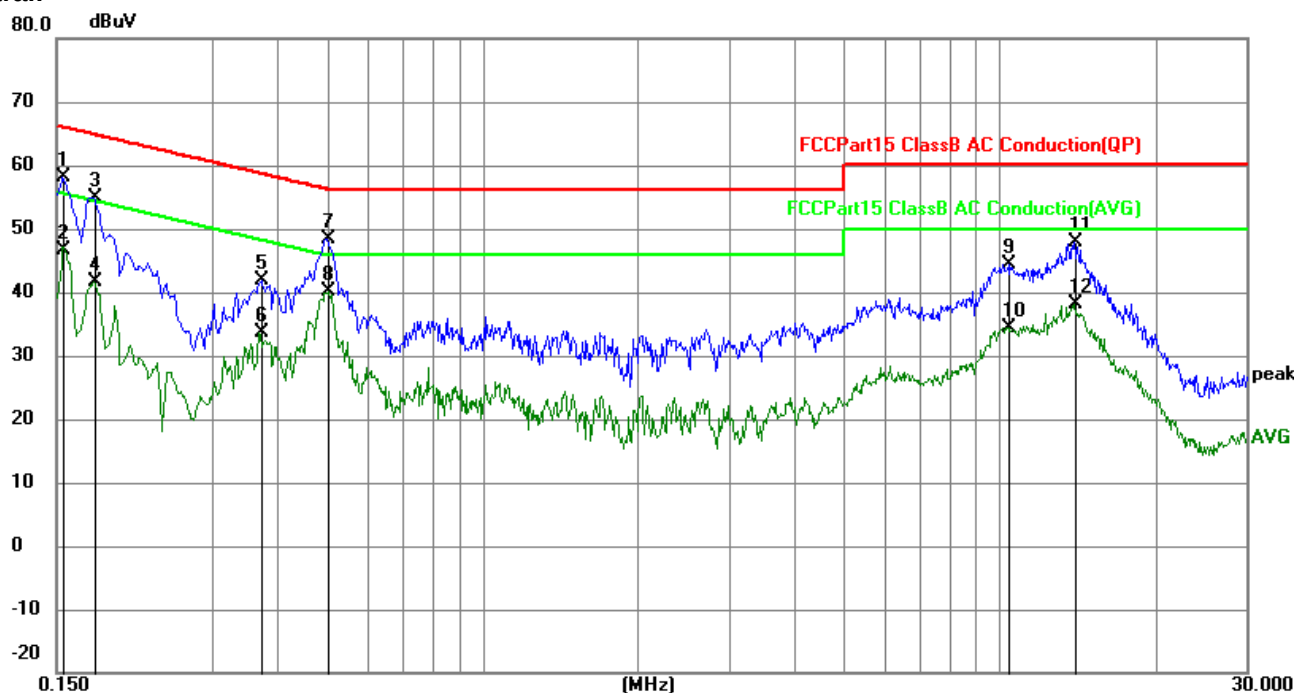
## Measurement Result

Line:



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|
| 1   | 0.1500          | 49.47          | 9.80        | 59.27        | 66.00        | -6.73       | QP       |
| 2   | 0.1500          | 39.20          | 9.80        | 49.00        | 56.00        | -7.00       | AVG      |
| 3   | 0.1905          | 41.78          | 9.81        | 51.59        | 64.01        | -12.42      | QP       |
| 4   | 0.1905          | 33.30          | 9.81        | 43.11        | 54.01        | -10.90      | AVG      |
| 5   | 0.2048          | 39.69          | 9.81        | 49.50        | 63.41        | -13.91      | QP       |
| 6   | 0.2048          | 29.68          | 9.81        | 39.49        | 53.41        | -13.92      | AVG      |
| 7   | 0.3704          | 29.80          | 9.89        | 39.69        | 58.49        | -18.80      | QP       |
| 8   | 0.3704          | 22.11          | 9.89        | 32.00        | 48.49        | -16.49      | AVG      |
| 9   | 0.4919          | 35.03          | 9.94        | 44.97        | 56.14        | -11.17      | QP       |
| 10  | 0.4919          | 27.59          | 9.94        | 37.53        | 46.14        | -8.61       | AVG      |
| 11  | 13.9380         | 36.06          | 9.77        | 45.83        | 60.00        | -14.17      | QP       |
| 12  | 13.9380         | 26.56          | 9.77        | 36.33        | 50.00        | -13.67      | AVG      |

Neutral:

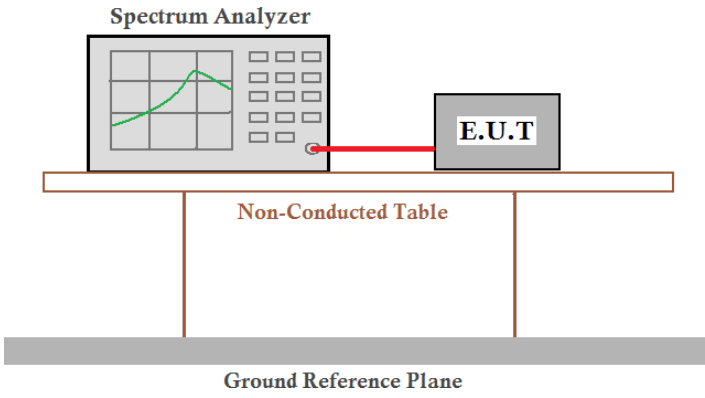


| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|
| 1   | 0.1544          | 48.45          | 9.80        | 58.25        | 65.76        | -7.51       | QP       |
| 2   | 0.1544          | 36.73          | 9.80        | 46.53        | 55.76        | -9.23       | AVG      |
| 3   | 0.1768          | 45.15          | 9.81        | 54.96        | 64.63        | -9.67       | QP       |
| 4   | 0.1768          | 31.71          | 9.81        | 41.52        | 54.63        | -13.11      | AVG      |
| 5   | 0.3750          | 32.01          | 9.89        | 41.90        | 58.39        | -16.49      | QP       |
| 6   | 0.3750          | 23.75          | 9.89        | 33.64        | 48.39        | -14.75      | AVG      |
| 7   | 0.5010          | 38.38          | 9.94        | 48.32        | 56.00        | -7.68       | QP       |
| 8   | 0.5010          | 30.18          | 9.94        | 40.12        | 46.00        | -5.88       | AVG      |
| 9   | 10.4280         | 34.66          | 9.83        | 44.49        | 60.00        | -15.51      | QP       |
| 10  | 10.4280         | 24.66          | 9.83        | 34.49        | 50.00        | -15.51      | AVG      |
| 11  | 13.9425         | 38.18          | 9.77        | 47.95        | 60.00        | -12.05      | QP       |
| 12  | 13.9425         | 28.41          | 9.77        | 38.18        | 50.00        | -11.82      | AVG      |

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

### 4.3 Duty cycle

|                   |                                                                                                                                                                                                                                                                                                                                                          |               |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Test Method :     | ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                         |               |
| Limit:            | /                                                                                                                                                                                                                                                                                                                                                        |               |
| Test setup:       |  <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p> |               |
| Test Instruments: | Refer to section 3.0 for details                                                                                                                                                                                                                                                                                                                         |               |
| Test mode:        | Refer to section 2.2 for details                                                                                                                                                                                                                                                                                                                         |               |
| Test environment: | Temp.: 25.5°C                                                                                                                                                                                                                                                                                                                                            | Humid.: 51%RH |
| Test voltage:     | AC 120V                                                                                                                                                                                                                                                                                                                                                  |               |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                     |               |

**Measurement Result**

5180-5240MHz

| Mode               | Duty cycle (%) | Correction Factor (dB) |
|--------------------|----------------|------------------------|
| TX 802.11a Mode    | 98.09          | 0.08                   |
| TX 802.11n20 Mode  | 96.06          | 0.17                   |
| TX 802.11ac20 Mode | 96.04          | 0.18                   |
| TX 802.11n40 Mode  | 86.30          | 0.64                   |
| TX 802.11a40 Mode  | 83.02          | 0.81                   |
| TX 802.11ac80 Mode | 77.75          | 1.09                   |

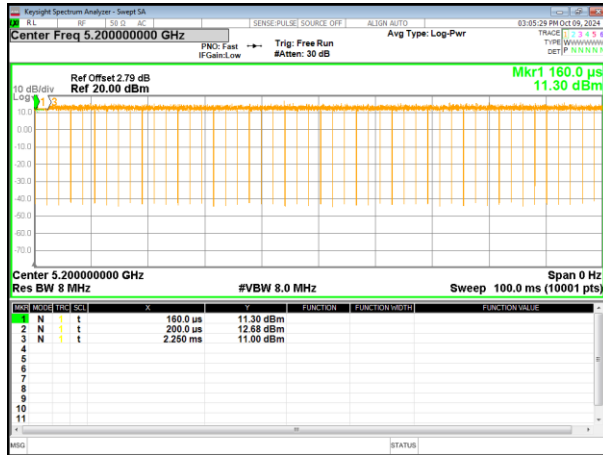
5745-5825 MHz

| Mode               | Duty cycle (%) | Correction Factor (dB) |
|--------------------|----------------|------------------------|
| TX 802.11a Mode    | 95.54          | 0.20                   |
| TX 802.11n20 Mode  | 96.06          | 0.17                   |
| TX 802.11ac20 Mode | 95.61          | 0.19                   |
| TX 802.11n40 Mode  | 86.32          | 0.64                   |
| TX 802.11a40 Mode  | 98.90          | 0.05                   |
| TX 802.11ac80 Mode | 93.71          | 0.28                   |

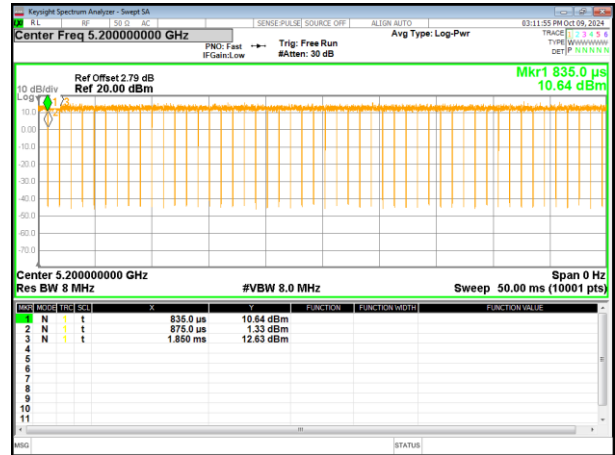
## Test plot

### 5180-5240MHz

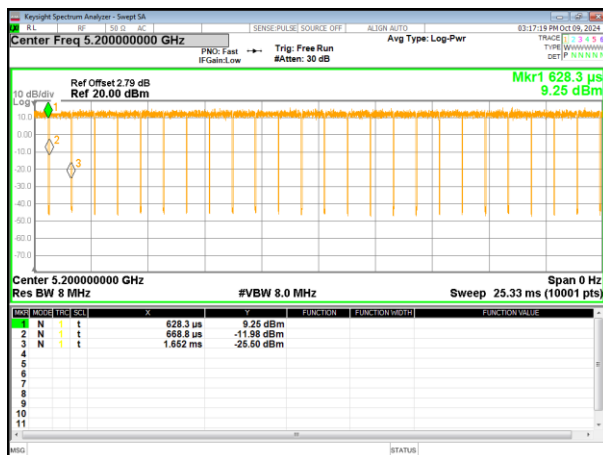
(802.11a) plot on channel 40



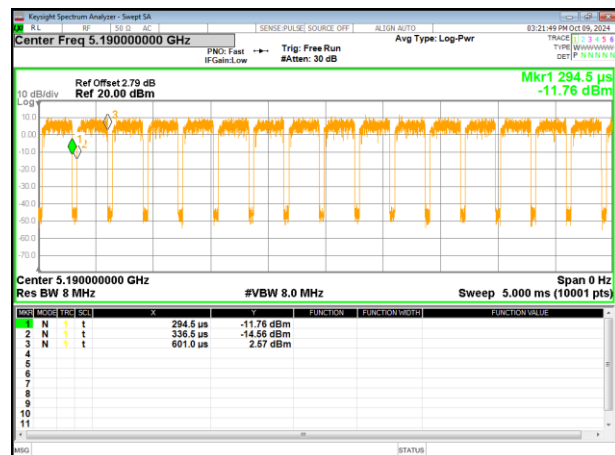
(802.11 n20) plot on channel 40



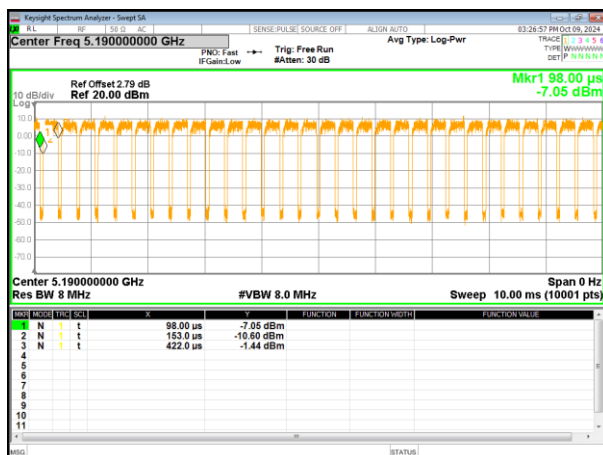
(802.11ac20) plot on channel 40



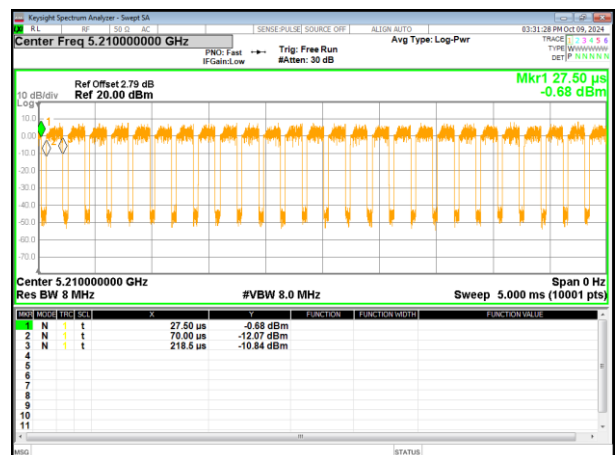
(802.11 n40) plot on channel 38



(802.11ac40) plot on channel 38

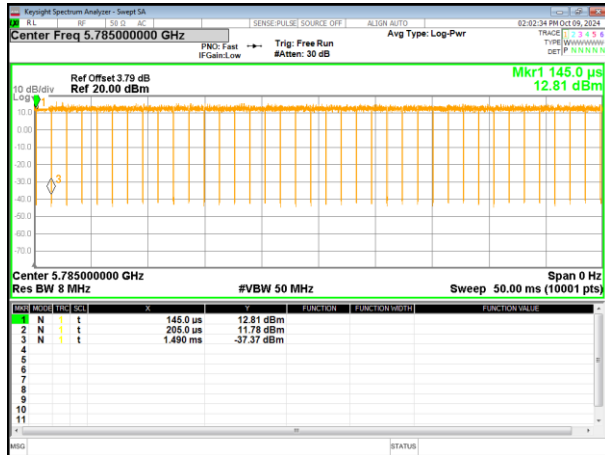


(802.11ac80) plot on channel 42

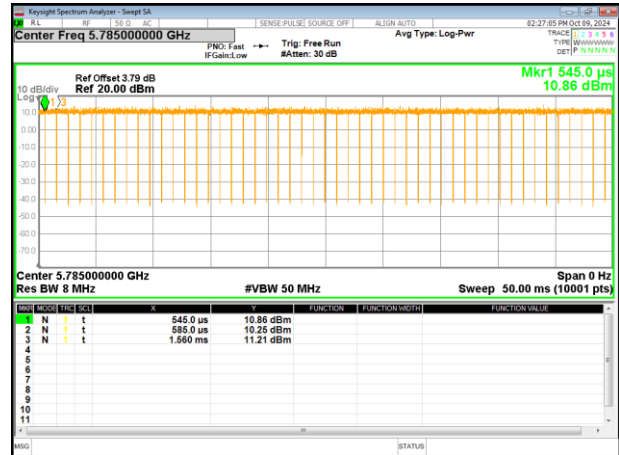


5745-5825 MHz

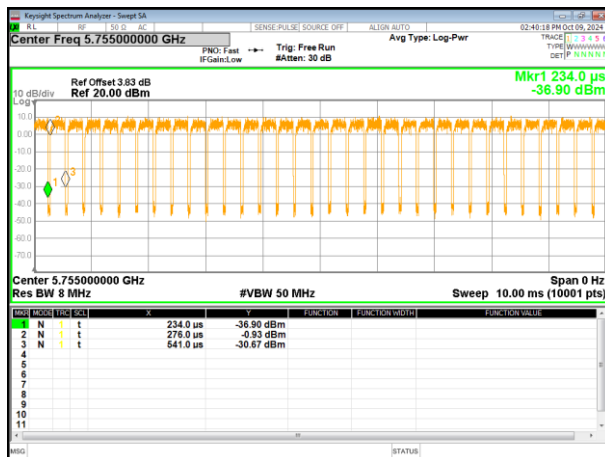
(802.11a) plot on channel 40



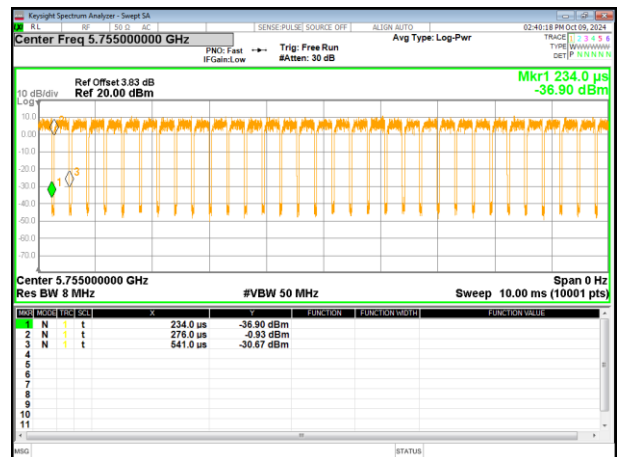
(802.11 n20) plot on channel 40



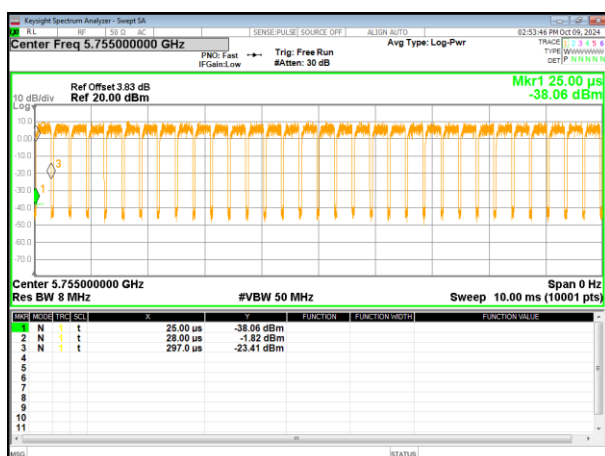
(802.11ac20) plot on channel 40



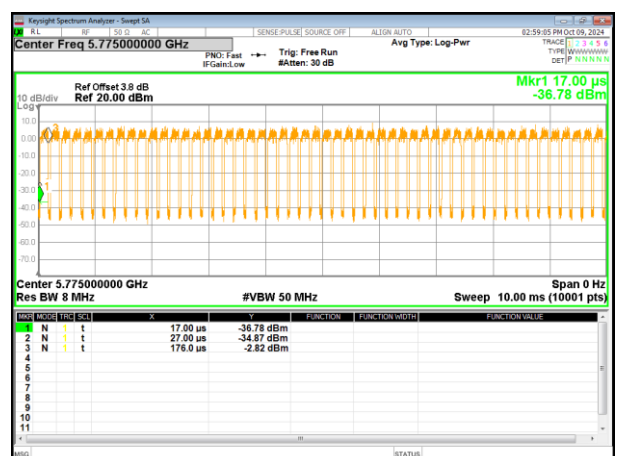
(802.11 n40) plot on channel 38



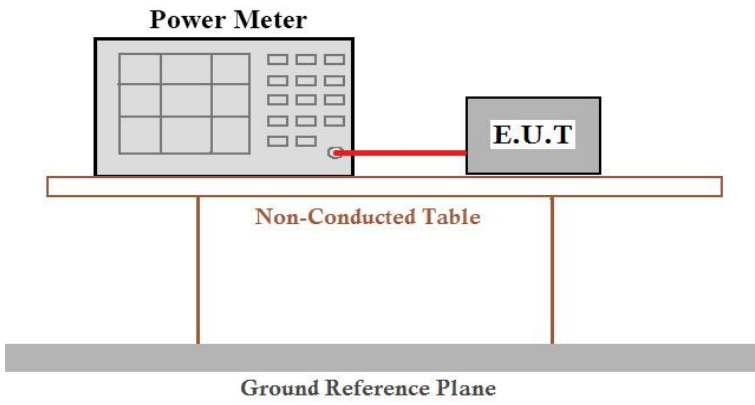
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



#### 4.4 Conducted Output Power

|                   |                                                                                    |               |
|-------------------|------------------------------------------------------------------------------------|---------------|
| Test Requirement: | FCC Part15 E Section 15.407 (a)(1)/(a)(3)                                          |               |
| Test Method:      | ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 |               |
| Limit:            | 5150-5250MHz : 250mW<br>5725~5850MHz : 1W                                          |               |
| Test setup:       |  |               |
| Test Instruments: | Refer to section 3.0 for details                                                   |               |
| Test mode:        | Refer to section 2.2 for details                                                   |               |
| Test environment: | Temp.: 25.5°C                                                                      | Humid.: 51%RH |
| Test voltage:     | AC 120V                                                                            |               |
| Test results:     | Pass                                                                               |               |

## Measurement Result

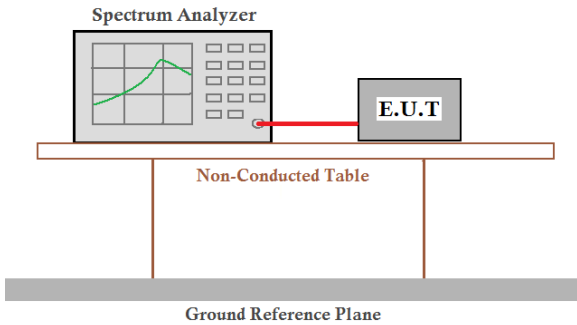
### 5180-5240MHz

| Test Channel        | Frequency | Correction Factor | Maximum output power | Total Power | LIMIT | Result |
|---------------------|-----------|-------------------|----------------------|-------------|-------|--------|
|                     | (MHz)     | (dB)              | (dBm)                | (dBm)       | dBm   |        |
| TX 802.11a Mode     |           |                   |                      |             |       |        |
| CH36                | 5180      | 0.08              | 14.61                | 14.69       | 23.98 | Pass   |
| CH40                | 5200      | 0.08              | 14.42                | 14.50       | 23.98 | Pass   |
| CH48                | 5240      | 0.08              | 14.32                | 14.40       | 23.98 | Pass   |
| TX 802.11 n20 Mode  |           |                   |                      |             |       |        |
| CH36                | 5180      | 0.17              | 14.68                | 14.85       | 23.98 | Pass   |
| CH40                | 5200      | 0.17              | 14.36                | 14.53       | 23.98 | Pass   |
| CH48                | 5240      | 0.17              | 14.07                | 14.24       | 23.98 | Pass   |
| TX 802.11 ac20 Mode |           |                   |                      |             |       |        |
| CH36                | 5180      | 0.18              | 14.85                | 15.03       | 23.98 | Pass   |
| CH40                | 5200      | 0.18              | 14.47                | 14.65       | 23.98 | Pass   |
| CH48                | 5240      | 0.18              | 14.19                | 14.37       | 23.98 | Pass   |
| TX 802.11 n40 Mode  |           |                   |                      |             |       |        |
| CH38                | 5190      | 0.64              | 13.66                | 14.30       | 23.98 | Pass   |
| CH46                | 5230      | 0.64              | 13.24                | 13.88       | 23.98 | Pass   |
| TX 802.11 ac40 Mode |           |                   |                      |             |       |        |
| CH38                | 5190      | 0.81              | 13.71                | 14.52       | 23.98 | Pass   |
| CH46                | 5230      | 0.81              | 13.41                | 14.22       | 23.98 | Pass   |
| TX 802.11 ac80 Mode |           |                   |                      |             |       |        |
| CH42                | 5210      | 1.09              | 12.15                | 13.24       | 23.98 | Pass   |

### 5745-5825 MHz

| Test Channel        | Frequency | Correction Factor | Maximum output power | Total Power | LIMIT | Result |
|---------------------|-----------|-------------------|----------------------|-------------|-------|--------|
|                     | (MHz)     | (dB)              | (dBm)                | (dBm)       | dBm   |        |
| TX 802.11a Mode     |           |                   |                      |             |       |        |
| CH149               | 5745      | 0.20              | 14.51                | 14.71       | 30    | Pass   |
| CH157               | 5785      | 0.20              | 14.43                | 14.63       | 30    | Pass   |
| CH165               | 5825      | 0.20              | 14.12                | 14.32       | 30    | Pass   |
| TX 802.11 n20 Mode  |           |                   |                      |             |       |        |
| CH149               | 5745      | 0.17              | 14.20                | 14.37       | 30    | Pass   |
| CH157               | 5785      | 0.17              | 14.73                | 14.90       | 30    | Pass   |
| CH165               | 5825      | 0.17              | 14.05                | 14.22       | 30    | Pass   |
| TX 802.11 ac20 Mode |           |                   |                      |             |       |        |
| CH149               | 5745      | 0.19              | 14.53                | 14.72       | 30    | Pass   |
| CH157               | 5785      | 0.19              | 14.46                | 14.65       | 30    | Pass   |
| CH165               | 5825      | 0.19              | 14.28                | 14.47       | 30    | Pass   |
| TX 802.11 n40 Mode  |           |                   |                      |             |       |        |
| CH151               | 5755      | 0.64              | 13.23                | 13.87       | 30    | Pass   |
| CH159               | 5795      | 0.64              | 13.85                | 14.49       | 30    | Pass   |
| TX 802.11 ac40 Mode |           |                   |                      |             |       |        |
| CH151               | 5755      | 0.05              | 13.18                | 13.23       | 30    | Pass   |
| CH159               | 5795      | 0.05              | 13.27                | 13.32       | 30    | Pass   |
| TX 802.11 ac80 Mode |           |                   |                      |             |       |        |
| CH155               | 5775      | 0.28              | 12.71                | 12.99       | 30    | Pass   |

#### 4.5 Bandwidth 99% Occupy Bandwidth

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Test Requirement: | FCC Part15 E Section 15.407(a)(12)&15.407(e)                                                                                                                                                                                                                                                                                                                                                                                                |               |
| Test Method:      | ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01                                                                                                                                                                                                                                                                                                                                                          |               |
| Limit:            | Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth. |               |
| Test setup:       |                                                                                                                                                                                                                                                                                                                                                          |               |
| Test Instruments: | Refer to section 3.0 for details                                                                                                                                                                                                                                                                                                                                                                                                            |               |
| Test mode:        | Refer to section 2.2 for details                                                                                                                                                                                                                                                                                                                                                                                                            |               |
| Test environment: | Temp.: 25.5°C                                                                                                                                                                                                                                                                                                                                                                                                                               | Humid.: 51%RH |
| Test voltage:     | AC 120V                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |

#### Measurement Result

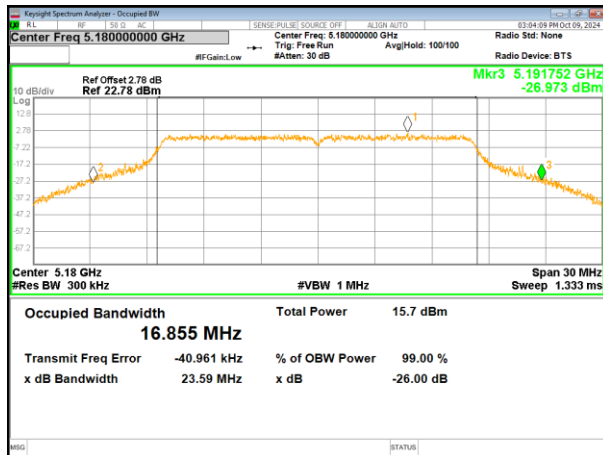
5180-5240MHz

| Test CH | -26dB Channel Bandwidth (MHz) |                |                 |                |                 |                 | Result |
|---------|-------------------------------|----------------|-----------------|----------------|-----------------|-----------------|--------|
|         | 802.11a                       | 802.11n (HT20) | 802.11ac (HT20) | 802.11n (HT40) | 802.11ac (HT40) | 802.11ac (HT80) |        |
| Lowest  | 23.59                         | 22.37          | 22.34           | 42.18          | 42.12           | --              | Pass   |
| Middle  | 22.87                         | 22.78          | 23.05           | --             | --              | 79.57           |        |
| Highest | 24.40                         | 22.54          | 22.69           | 41.02          | 41.19           | --              |        |

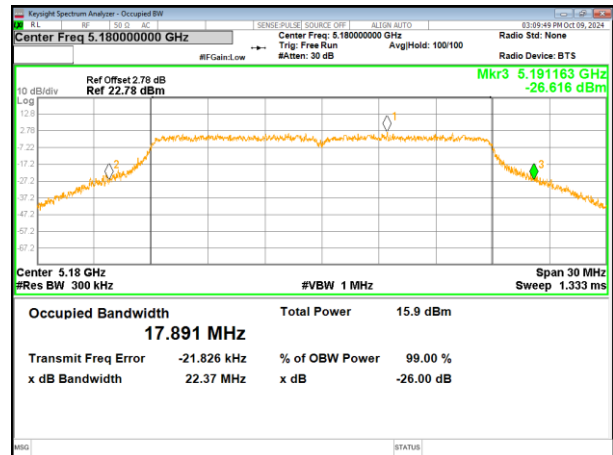
| Test CH | 99% Occupy Bandwidth (MHz) |                |                 |                |                 |                 | Result |
|---------|----------------------------|----------------|-----------------|----------------|-----------------|-----------------|--------|
|         | 802.11a                    | 802.11n (HT20) | 802.11ac (HT20) | 802.11n (HT40) | 802.11ac (HT40) | 802.11ac (HT80) |        |
| Lowest  | 16.669                     | 17.751         | 17.758          | 36.394         | 36.330          | --              | Pass   |
| Middle  | 16.702                     | 17.754         | 17.734          | --             | --              | 75.181          |        |
| Highest | 16.696                     | 17.751         | 17.761          | 36.358         | 36.370          | --              |        |

## Test plot -26dB Channel Bandwidth

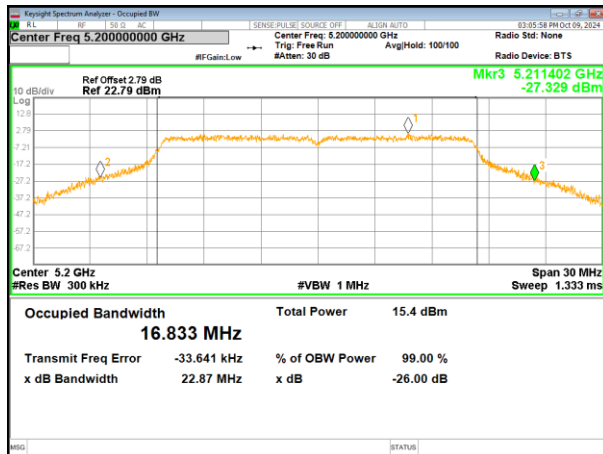
(802.11a) plot on channel 36



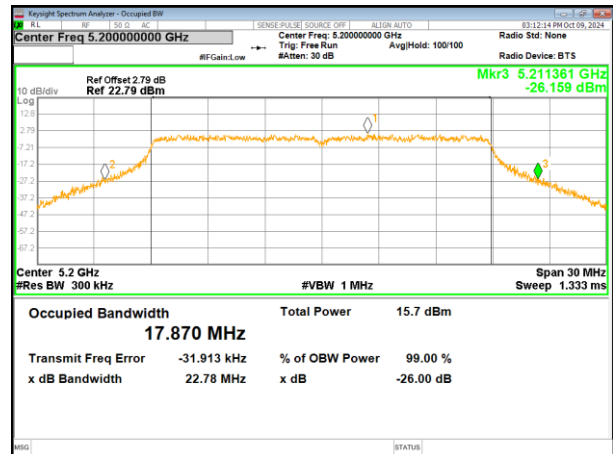
(802.11 n20) plot on channel 36



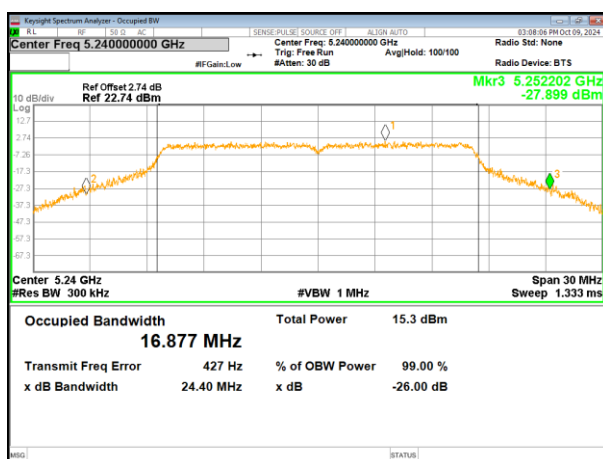
(802.11a) plot on channel 40



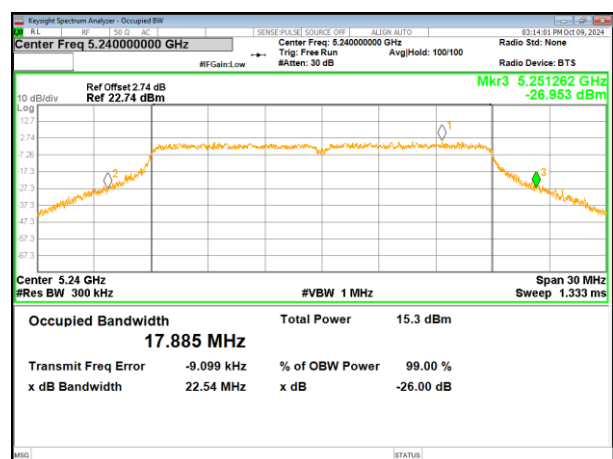
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

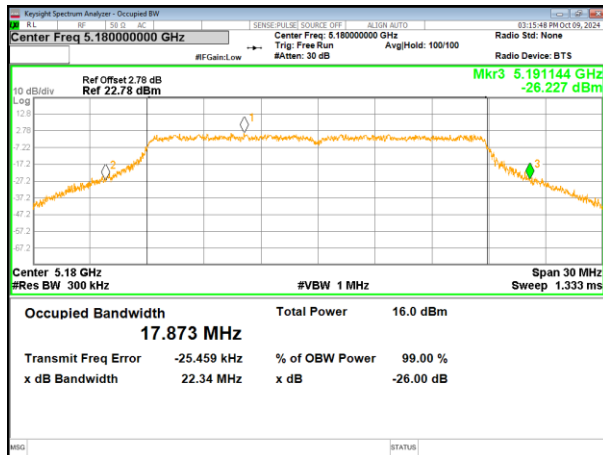


(802.11 n20) plot on channel 48

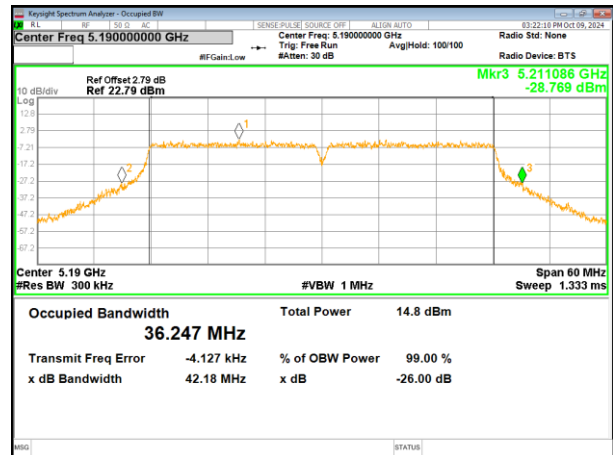


### Test plot

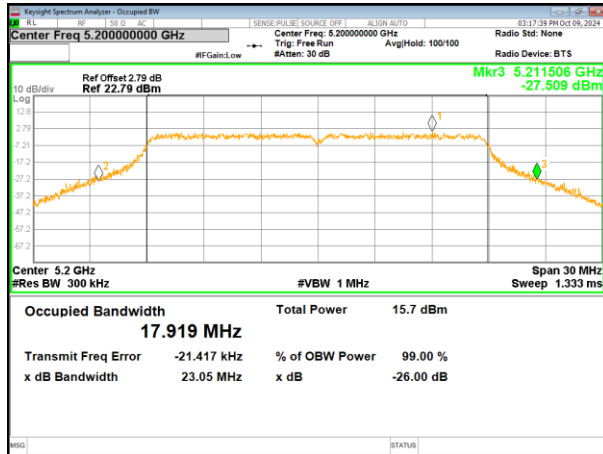
(802.11ac20) plot on channel 36



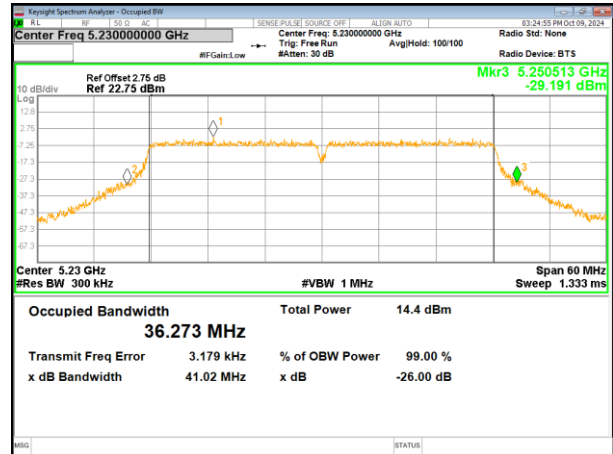
(802.11 n40) plot on channel 38



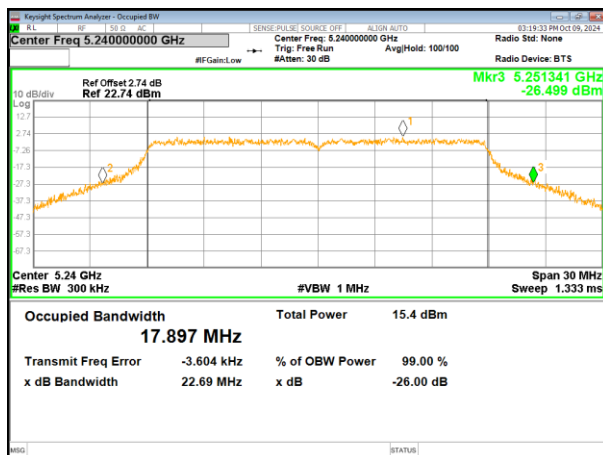
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

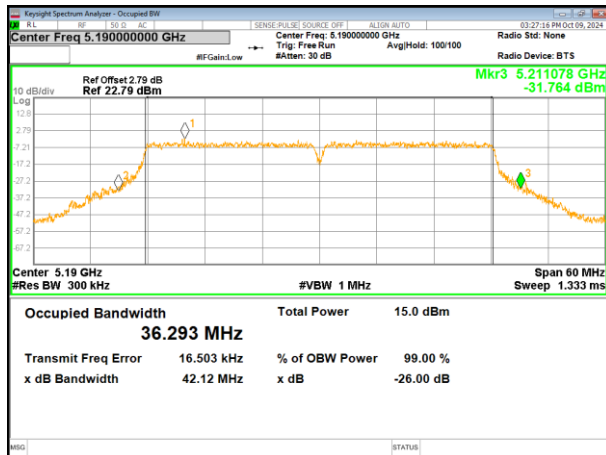


(802.11ac20) plot on channel 48

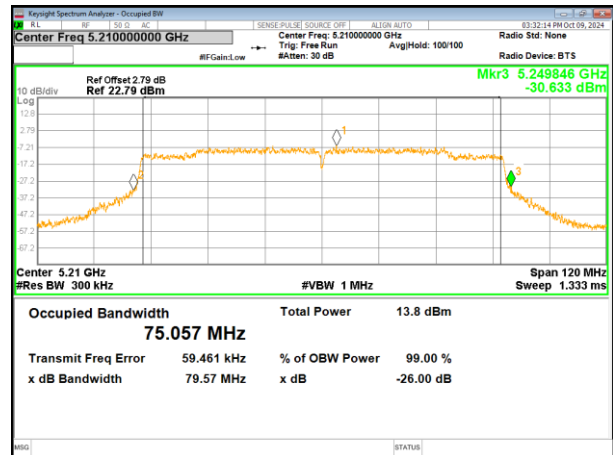


### Test plot

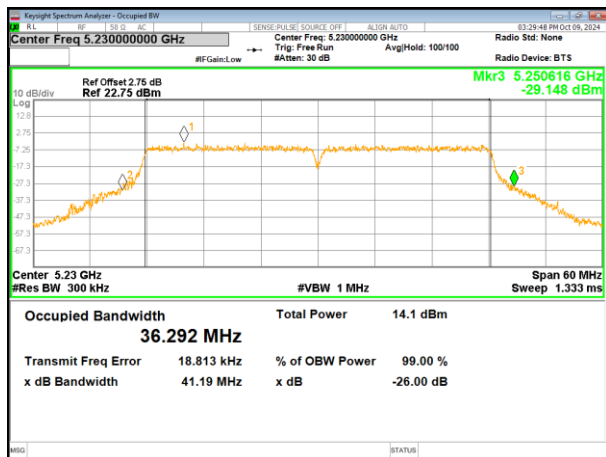
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42

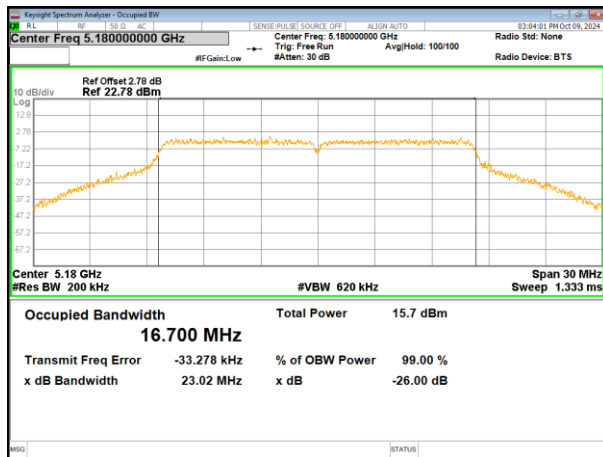


(802.11ac40) plot on channel 46

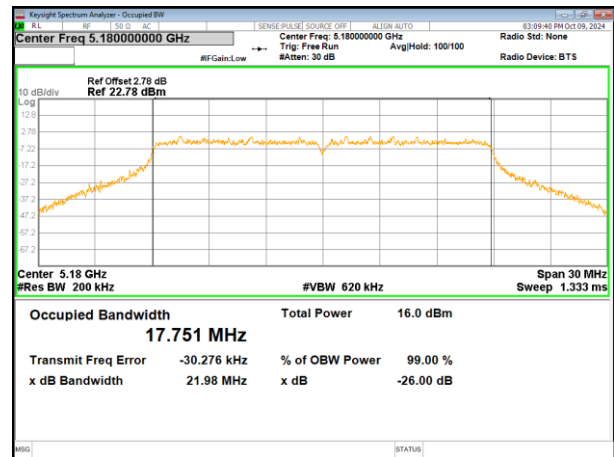


# Test plot 99% Occupy Bandwidth

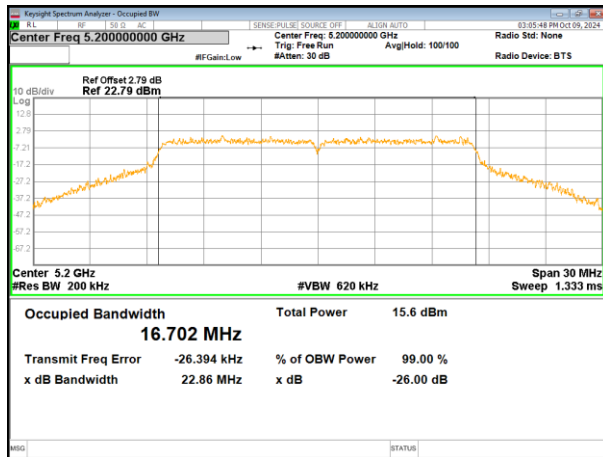
(802.11a) plot on channel 36



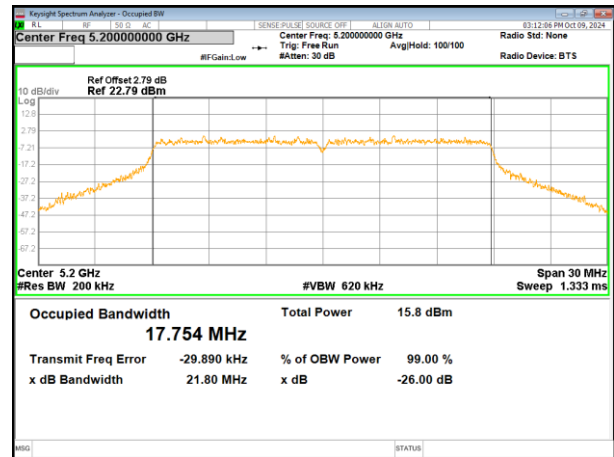
(802.11 n20) plot on channel 36



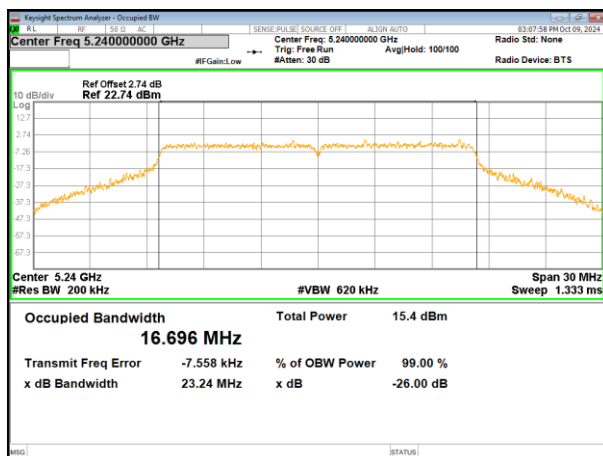
(802.11a) plot on channel 40



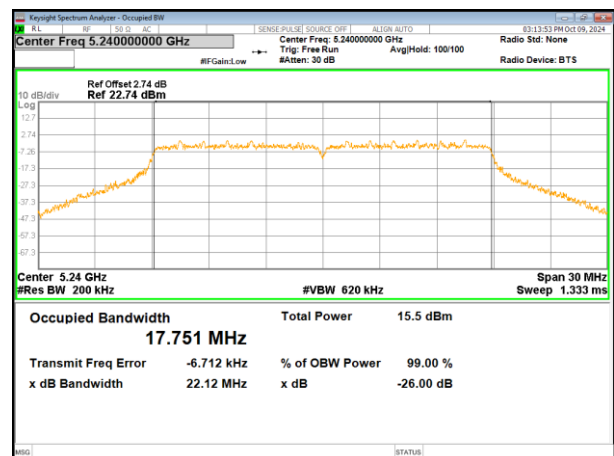
(802.11 n20) plot on channel 40



(802.11a) plot on channel 48

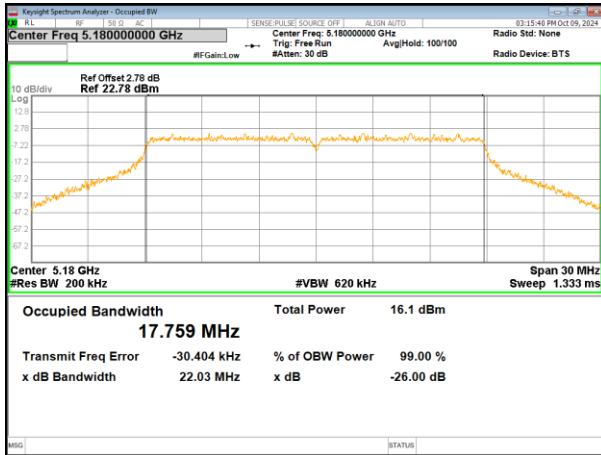


(802.11 n20) plot on channel 48

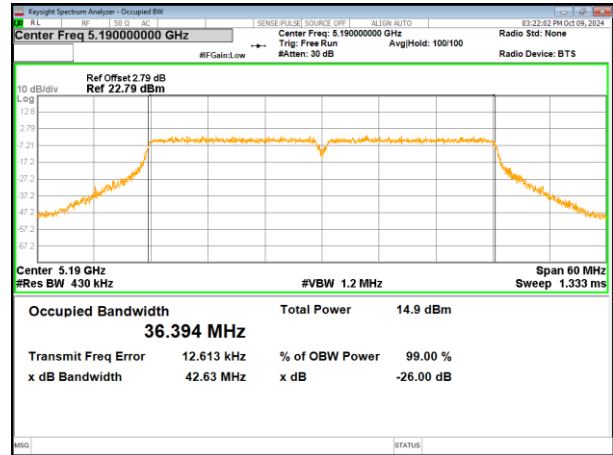


### Test plot

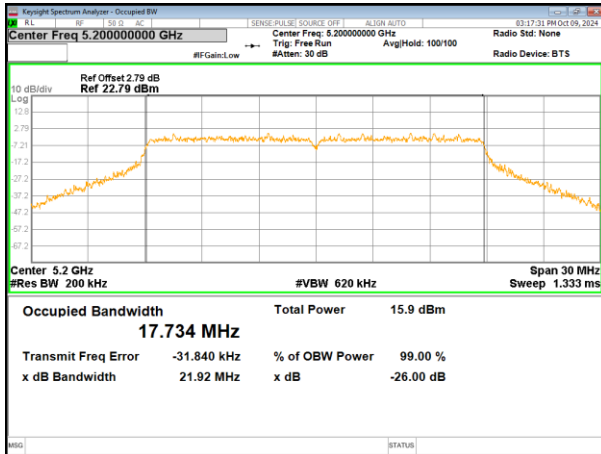
(802.11ac20) plot on channel 36



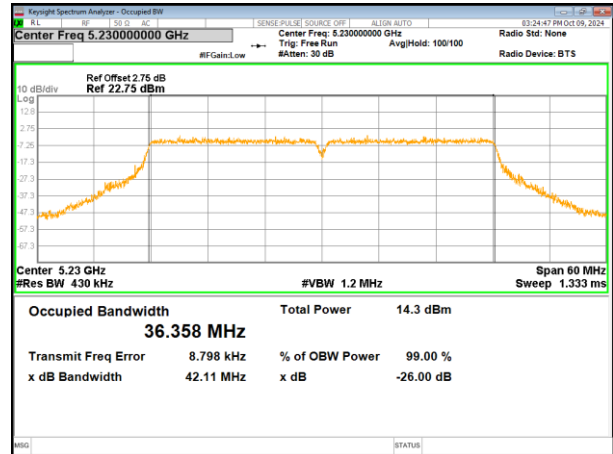
(802.11 n40) plot on channel 38



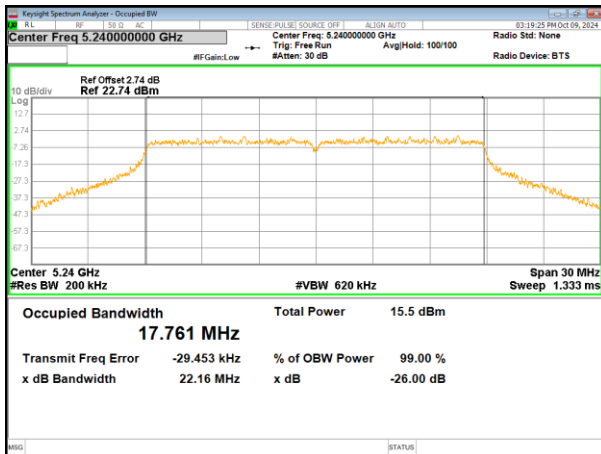
(802.11ac20) plot on channel 40



(802.11 n40) plot on channel 46

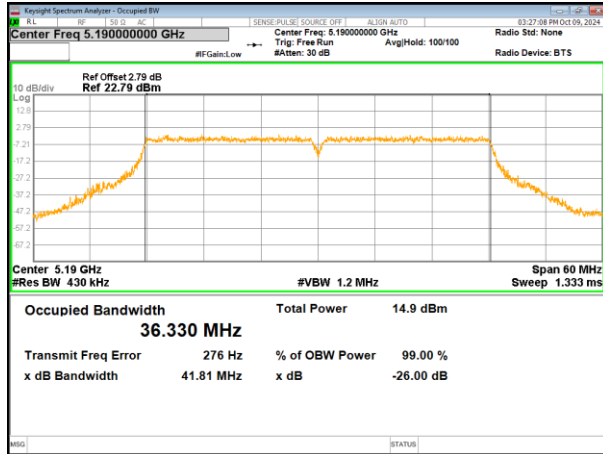


(802.11ac20) plot on channel 48

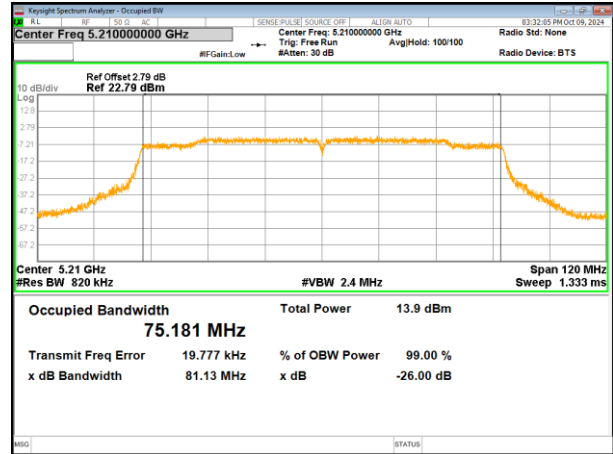


### Test plot

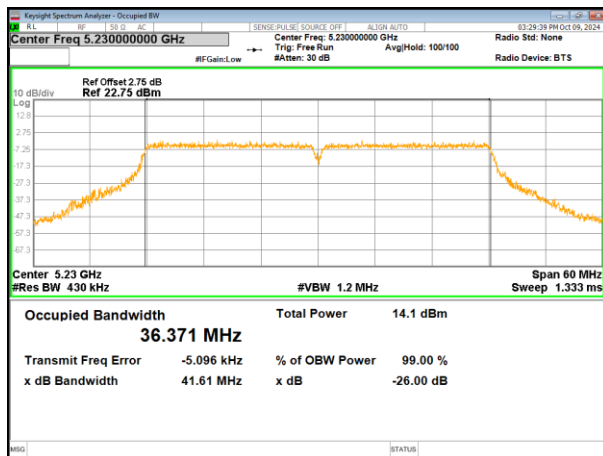
(802.11ac40) plot on channel 38



(802.11ac80) plot on channel 42



(802.11ac40) plot on channel 46



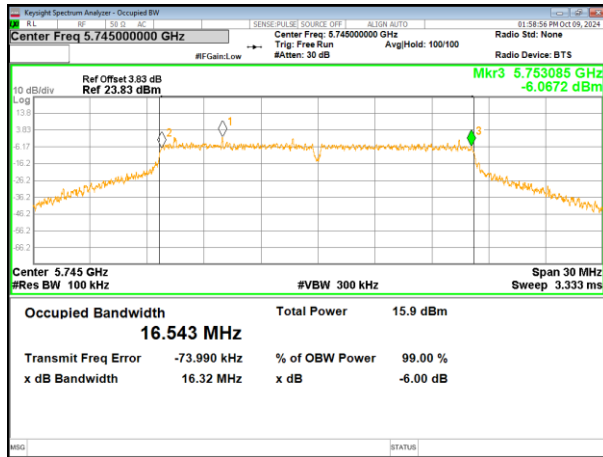
5745-5825MHz

| Test CH | -6dB Channel Bandwidth (MHz) |                |                 |                |                 |                 | Limit (KHz) | Result |
|---------|------------------------------|----------------|-----------------|----------------|-----------------|-----------------|-------------|--------|
|         | 802.11a                      | 802.11n (HT20) | 802.11ac (HT20) | 802.11n (HT40) | 802.11ac (HT40) | 802.11ac (HT80) |             |        |
| Lowest  | 16.32                        | 17.54          | 17.29           | 36.37          | 35.78           | --              | >500        | Pass   |
| Middle  | 16.34                        | 17.65          | 17.57           | --             | --              | 75.09           |             |        |
| Highest | 16.32                        | 17.54          | 17.60           | 36.42          | 36.40           | --              |             |        |

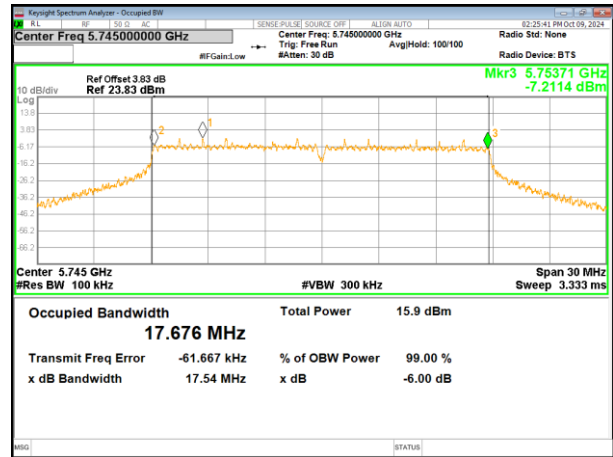
Remark: "---"is not applicable

Test plot

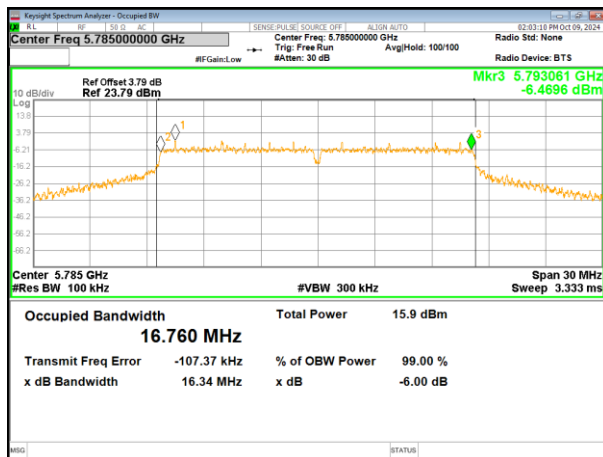
(802.11a) plot on channel 149



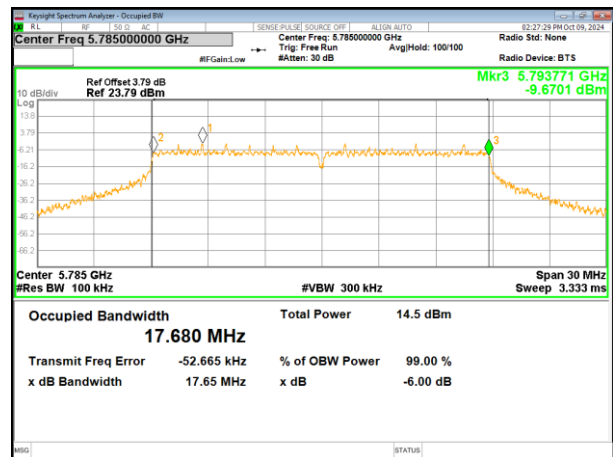
(802.11 n20) plot on channel 149



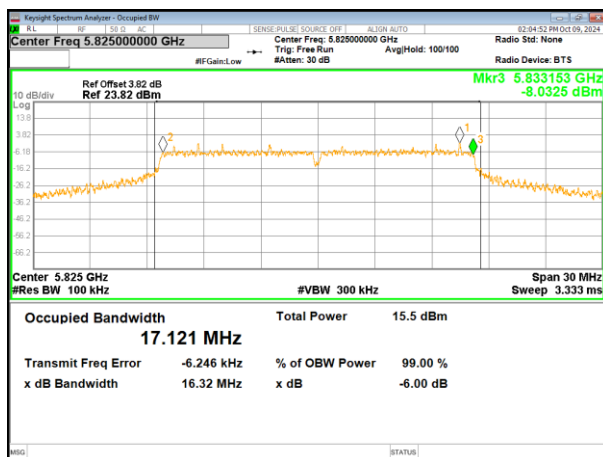
(802.11a) plot on channel 157



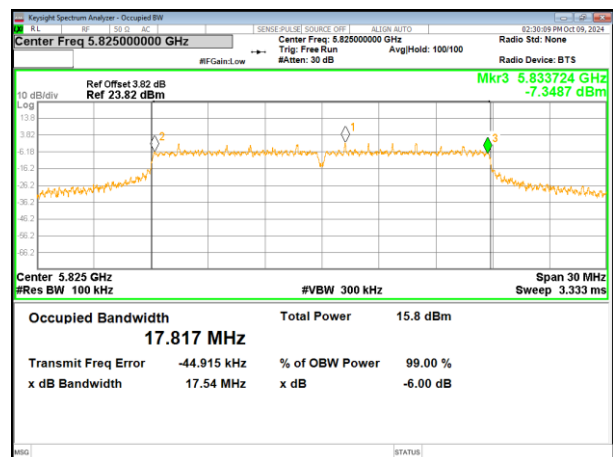
(802.11 n20) plot on channel 157



(802.11a) plot on channel 165

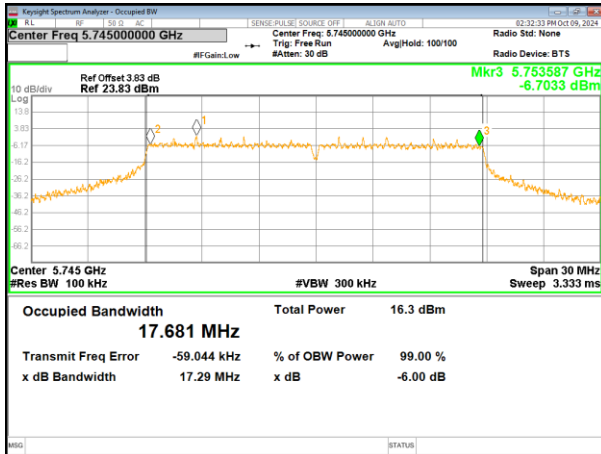


(802.11 n20) plot on channel 165

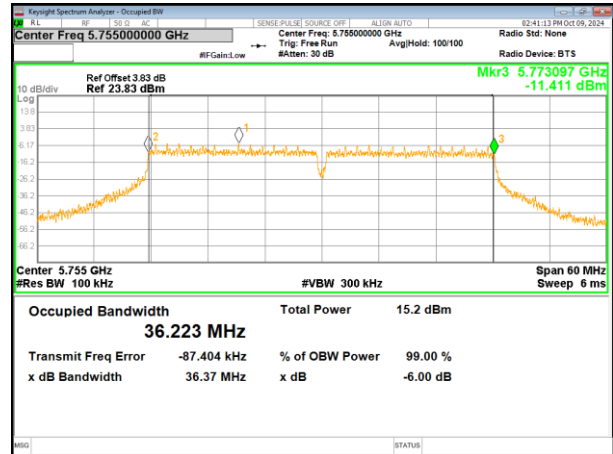


## Test plot

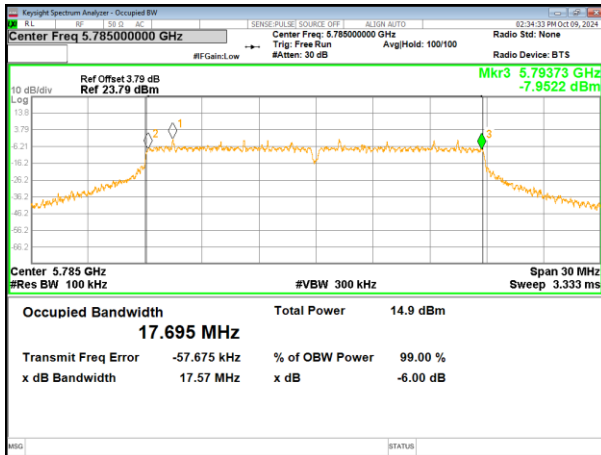
(802.11ac20) plot on channel 149



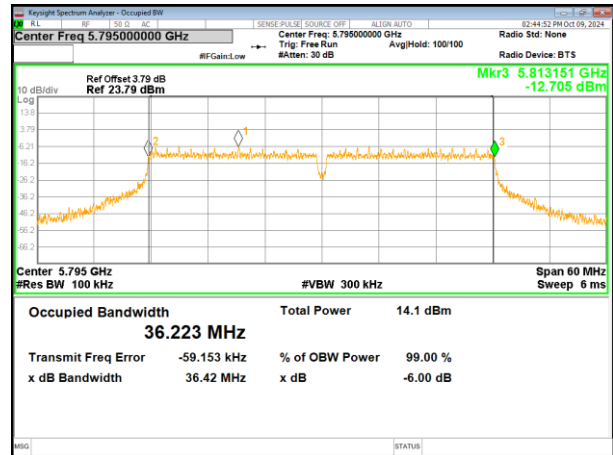
(802.11 n40) plot on channel 151



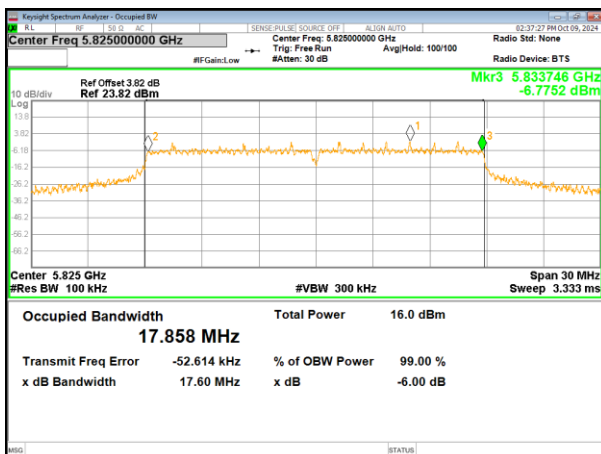
(802.11ac20) plot on channel 157



(802.11 n40) plot on channel 159

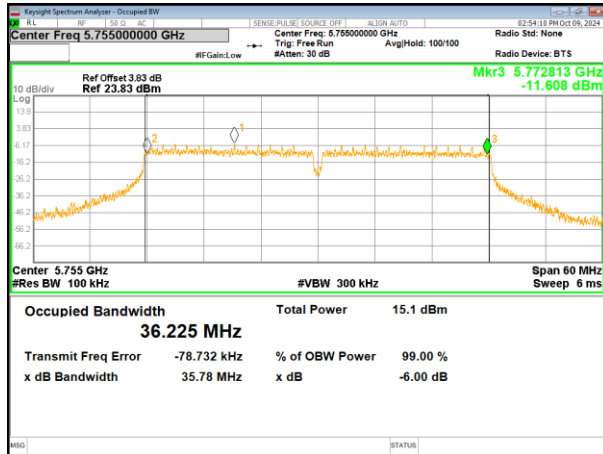


(802.11ac20) plot on channel 165

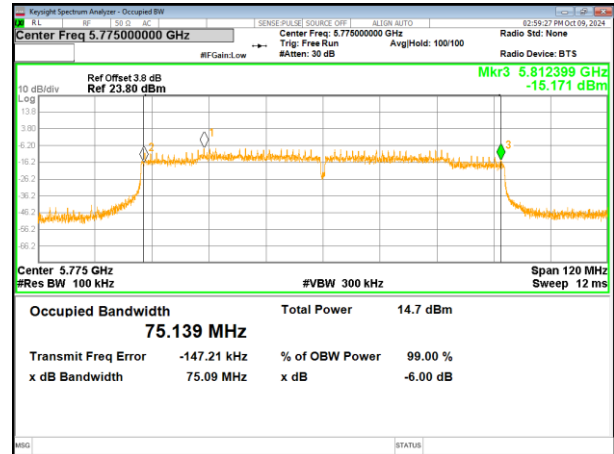


### Test plot

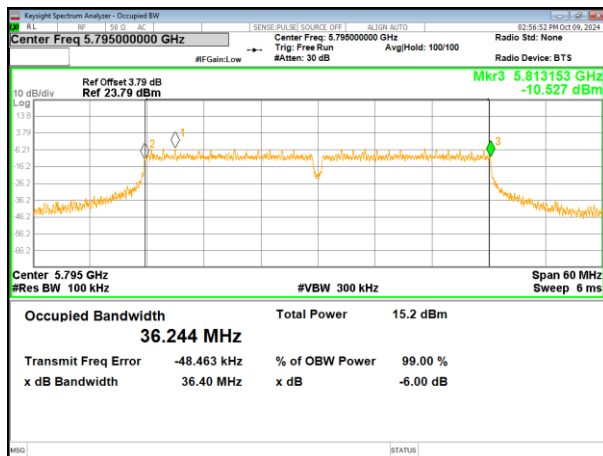
(802.11 ac40) plot on channel 151



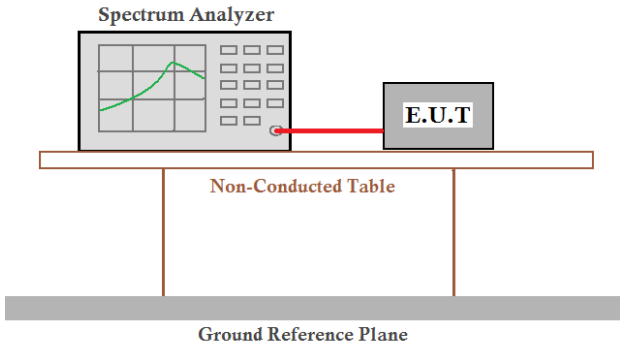
(802.11 ac80) plot on channel 155



(802.11 ac40) plot on channel 159



#### 4.6 Power Spectral Density

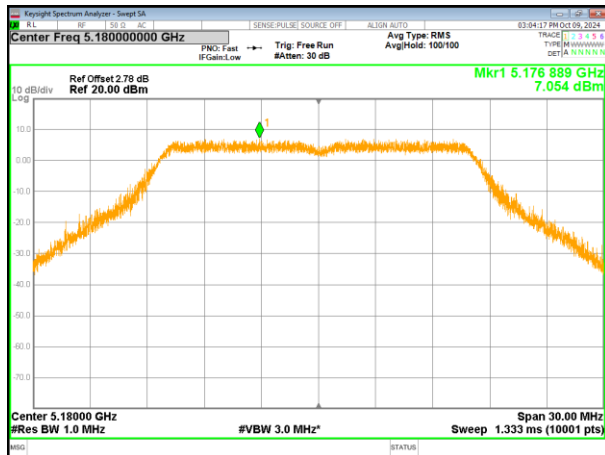
|                   |                                                                                     |                               |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------|
| Test Requirement: | FCC Part15 E Section 15.407(a)(1)/ (a)(3)                                           |                               |
| Test Method:      | ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01  |                               |
| Limit:            | Frequency band (MHz)                                                                | Limit                         |
|                   | 5150-5250                                                                           | ≤17dBm/1MHz for master device |
|                   |                                                                                     | ≤11dBm/1MHz for client device |
|                   | 5250-5350                                                                           | ≤11dBm/1MHz for client device |
|                   | 5470-5725                                                                           | ≤11dBm/1MHz for client device |
|                   | 5725-5850                                                                           | ≤30dBm/500kHz                 |
| Test setup:       |  |                               |
| Test Instruments: | Refer to section 3.0 for details                                                    |                               |
| Test mode:        | Refer to section 2.2 for details                                                    |                               |
| Test environment: | Temp.: 25.5°C                                                                       | Humid.: 51%RH                 |
| Test voltage:     | AC 120V                                                                             |                               |
| Test results:     | Pass                                                                                |                               |

#### Measurement Result

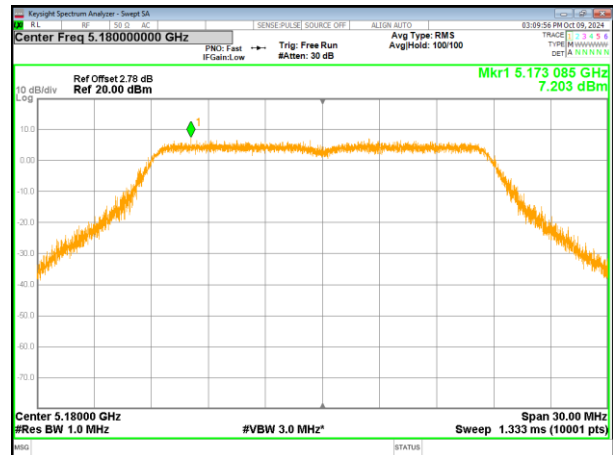
##### 5180-5240MHz

| Mode        | Frequency | Measured Power Density (dBm/MHz) | Correction Factor (dB) | Total Measured Power Density (dBm/MHz) | Limit (dBm/MHz) |
|-------------|-----------|----------------------------------|------------------------|----------------------------------------|-----------------|
| 802.11 a    | 5180 MHz  | 7.054                            | 0.08                   | 7.134                                  | 11              |
|             | 5200 MHz  | 6.810                            | 0.08                   | 6.890                                  | 11              |
|             | 5240 MHz  | 6.740                            | 0.08                   | 6.820                                  | 11              |
| 802.11 n20  | 5180 MHz  | 7.203                            | 0.17                   | 7.373                                  | 11              |
|             | 5200 MHz  | 7.393                            | 0.17                   | 7.563                                  | 11              |
|             | 5240 MHz  | 6.632                            | 0.17                   | 6.802                                  | 11              |
| 802.11 ac20 | 5180 MHz  | 7.281                            | 0.18                   | 7.461                                  | 11              |
|             | 5200 MHz  | 7.485                            | 0.18                   | 7.665                                  | 11              |
|             | 5240 MHz  | 7.100                            | 0.18                   | 7.280                                  | 11              |
| 802.11 n40  | 5190 MHz  | 2.834                            | 0.64                   | 3.474                                  | 11              |
|             | 5230 MHz  | 1.930                            | 0.64                   | 2.570                                  | 11              |
| 802.11 ac40 | 5190 MHz  | 3.473                            | 0.81                   | 4.283                                  | 11              |
|             | 5230 MHz  | 2.132                            | 0.81                   | 2.942                                  | 11              |
| 802.11 ac80 | 5210 MHz  | -0.258                           | 1.09                   | 0.832                                  | 11              |

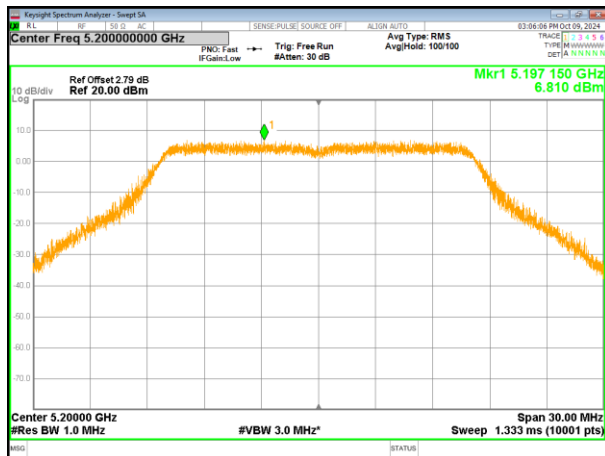
(802.11a) PSD plot on channel 36



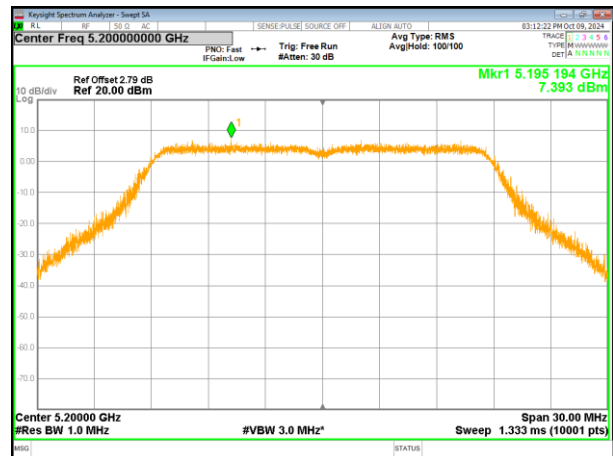
(802.11n20) PSD plot on channel 36



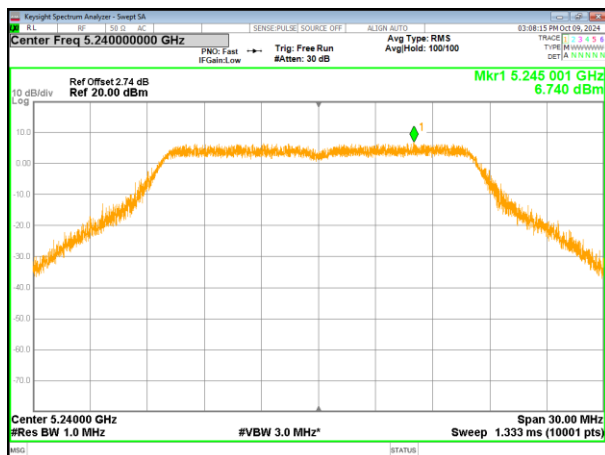
(802.11a) PSD plot on channel 40



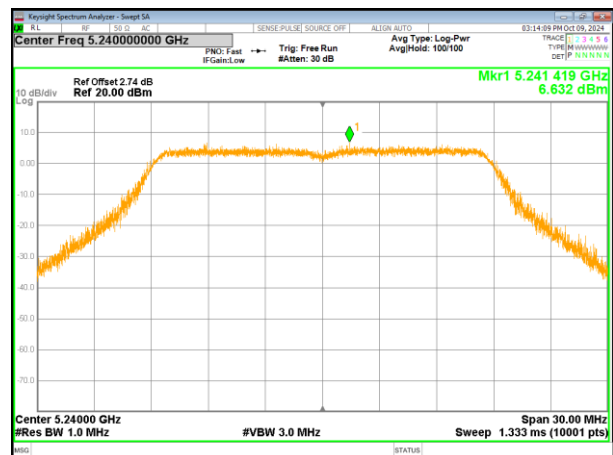
(802.11n20) PSD plot on channel 40



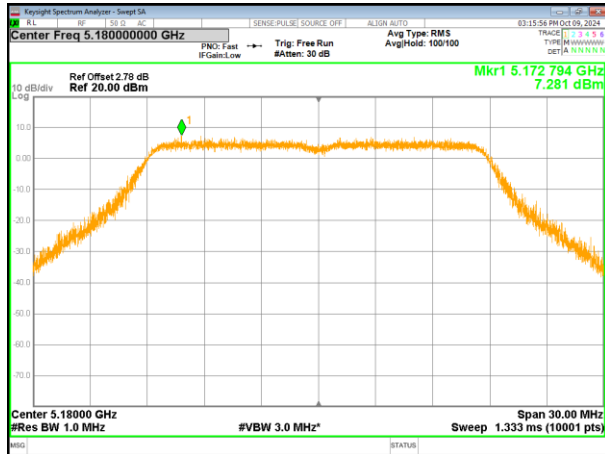
(802.11a) PSD plot on channel 48



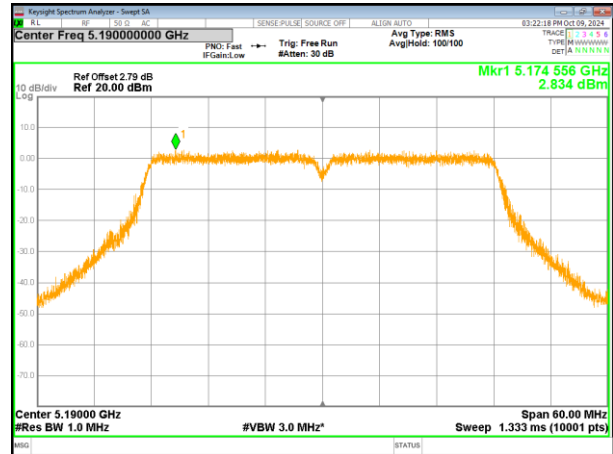
(802.11n20) PSD plot on channel 48



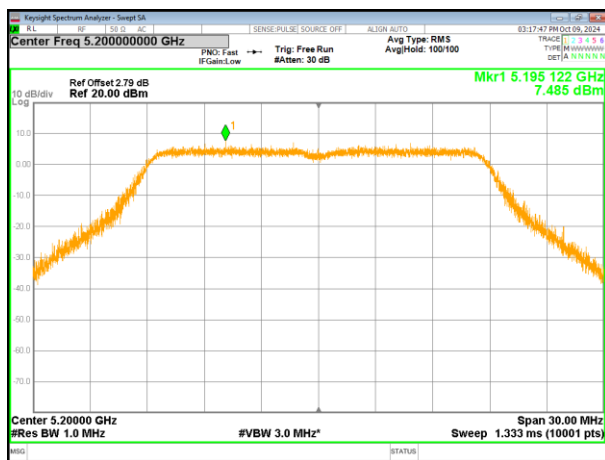
(802.11ac20) PSD plot on channel 36



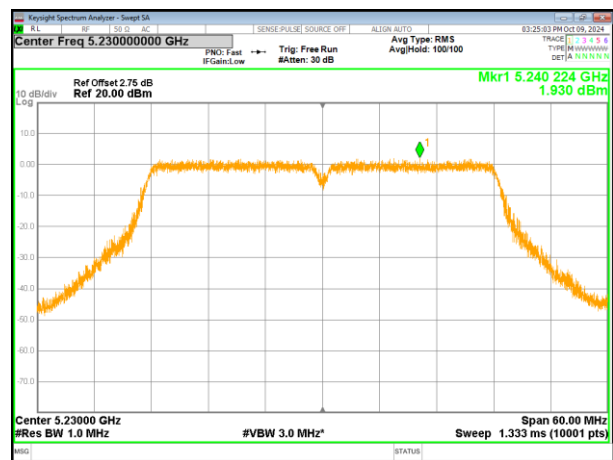
(802.11n40) PSD plot on channel 38



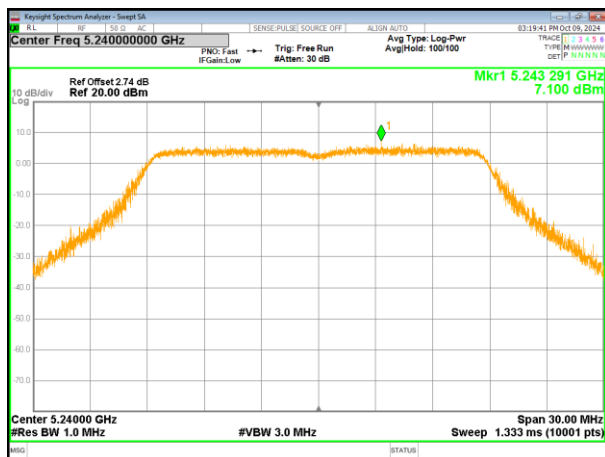
(802.11ac20) PSD plot on channel 40



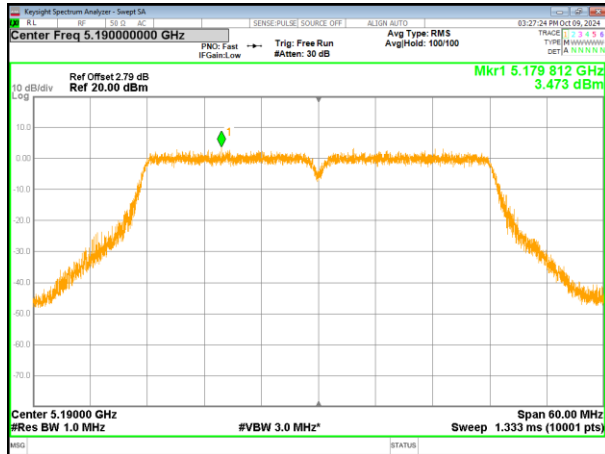
(802.11n40) PSD plot on channel 46



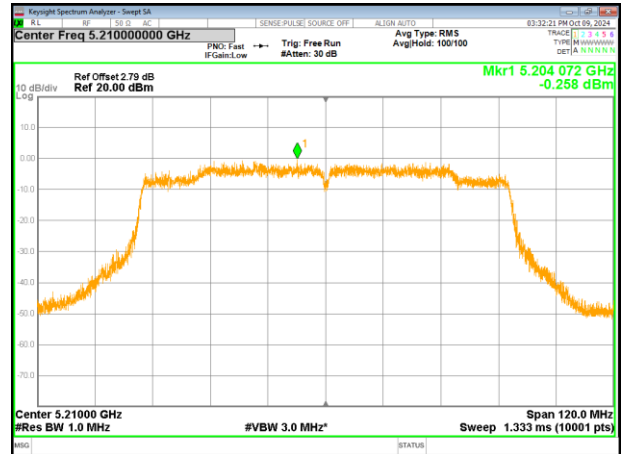
(802.11ac20) PSD plot on channel 48



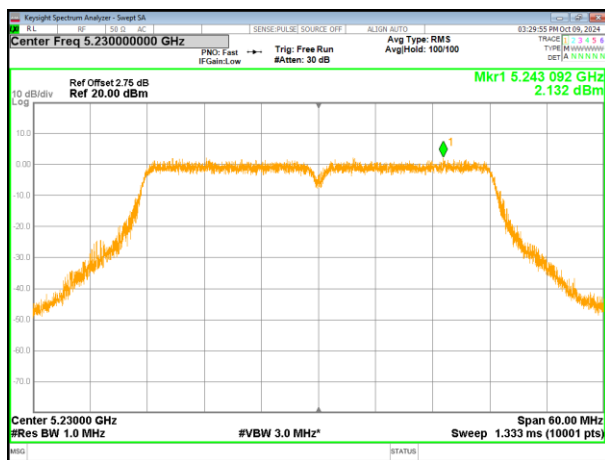
(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42



(802.11ac40) PSD plot on channel 46



| Mode       | Frequency | Measured Power Density (dBm/510KHz) | Measured Power Density(dBm/500KHz) | Correction Factor (dB) | Total Measured Power Density (dBm/500KHz) | Limit (dBm/MHz) |
|------------|-----------|-------------------------------------|------------------------------------|------------------------|-------------------------------------------|-----------------|
| 802.11 a   | 5745 MHz  | 3.517                               | 3.431                              | 0.200                  | 3.631                                     | 30              |
|            | 5785 MHz  | 2.916                               | 2.830                              | 0.200                  | 3.030                                     | 30              |
|            | 5825 MHz  | 3.015                               | 2.929                              | 0.200                  | 3.129                                     | 30              |
| 802.11 n20 | 5745 MHz  | 3.516                               | 3.430                              | 0.170                  | 3.600                                     | 30              |
|            | 5785 MHz  | 2.149                               | 2.063                              | 0.170                  | 2.233                                     | 30              |
|            | 5825 MHz  | 2.878                               | 2.792                              | 0.170                  | 2.962                                     | 30              |
| 802.11ac20 | 5745 MHz  | 3.720                               | 3.634                              | 0.190                  | 3.824                                     | 30              |
|            | 5785 MHz  | 2.565                               | 2.479                              | 0.190                  | 2.669                                     | 30              |
|            | 5825 MHz  | 3.746                               | 3.660                              | 0.190                  | 3.850                                     | 30              |
| 802.11 n40 | 5755 MHz  | 0.137                               | 0.051                              | 0.640                  | 0.691                                     | 30              |
|            | 5795 MHz  | -1.807                              | -1.893                             | 0.640                  | -1.253                                    | 30              |
| 802.11ac40 | 5755 MHz  | 0.267                               | 0.181                              | 0.050                  | 0.231                                     | 30              |
|            | 5795 MHz  | -0.542                              | -0.628                             | 0.050                  | -0.578                                    | 30              |
| 802.11ac80 | 5775 MHz  | -3.093                              | -3.179                             | 0.280                  | -2.899                                    | 30              |

Note: 1. If the measurement is X dBm/510kHz, thus  $X \text{ dBm/510kHz} = (10^{X/10}) * (500 / 510) \text{ dBm/500kHz}$

2. Correction Factor (dB)= duty cycle factor+RBW factor