# TEST REPORT

| | | |
|---|---|---|
| **Reference No.** | : | WTD21D07068889W001 |
| **FCC ID** | : | 2AYMI2021JJRC3 |
| **Applicant** | : | GUANGDONG JIANJIAN INTELLIGENT TECHNOLOGY CO., LTD. |
| **Address** | : | No. 244, Huancui Road, Chenghai District, Shantou, Guangdong, China |
| **Manufacturer** | : | GUANGDONG JIANJIAN INTELLIGENT TECHNOLOGY CO., LTD. |
| **Address** | : | No. 244, Huancui Road, Chenghai District, Shantou, Guangdong, China |
| **Product** | : | DRONE |
| **Model(s)** | : | YG001 |
| **Standards** | : | FCC CFR47 Part 15 E Section 15.407 |
| **Date of Receipt sample** | : | 2021-07-12 |
| **Date of Test** | : | 2021-07-12 to 2021-07-19 |
| **Date of Issue** | : | 2021-07-28 |
| **Test Result** | : | Pass |

Remarks:
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.

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# 2 Contents

# 3 Revision History

| Test report No. | Date of Receipt sample | Date of Test | Date of Issue | Purpose | Comment | Approved |
|---|---|---|---|---|---|---|
| WTD21D07068889 W001 | 2021-07-12 | 2021-07-12 to 2021-07-19 | 2021-07-28 | Original | - | Valid |

# 4 General Information

## 4.1 General Description of E.U.T.

| | |
|---|---|
| Product: | DRONE |
| Model(s): | YG001 |
| Wi-Fi Specification: | 5G-802.11a/n HT20 /n HT40 |
| Hardware Version: | KY-XLL8813PRO-REV06 |
| Software Version: | KY-XLL8813PRO-330REV04 |

## 4.2 Details of E.U.T.

| | |
|---|---|
| Operation Frequency: | 802.11a/n(HT20):<br>U-NII-1: 5150-5250MHz, U-NII-3:5725-5850MHz<br>802.11n(HT40): U-NII-1: 5190-5230MHz, U-NII-3: 5755-5795MHz |
| Max. RF output power: | 19.43dBm |
| Type of Modulation: | OFDM |
| Antenna installation: | internal permanent antenna |
| Antenna Gain: | 0dBi |
| Ratings: | 7.4V For Battery |

## 4.3 Channel List

| U-NII-1 (5.15-5.25GHz) | | | |
|---|---|---|---|
| **channel** | **Frequency(MHz)** | **channel** | **Frequency(MHz)** |
| 36 | 5180 | 38 | 5190 |
| 40 | 5200 | 42 | 5210 |
| 44 | 5220 | 46 | 5230 |
| 48 | 5240 | | |

| U-NII-3 (5.725-5.85GHz) | | | |
|---|---|---|---|
| **channel** | **Frequency(MHz)** | **channel** | **Frequency(MHz)** |
| 149 | 5745 | 151 | 5755 |
| 153 | 5765 | 155 | 5775 |
| 157 | 5785 | 159 | 5795 |
| 161 | 5805 | 165 | 5825 |

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:

For 802.11a/n/(HT20):

| channel | Frequency(MHz) | channel | Frequency(MHz) |
|---|---|---|---|
| 36 | 5180 | 40 | 5200 |
| 48 | 5240 | | |

| channel | Frequency(MHz) | channel | Frequency(MHz) |
|---|---|---|---|
| 52 | 5260 | 56 | 5280 |
| 64 | 5320 | | |

| channel | Frequency(MHz) | channel | Frequency(MHz) |
|---|---|---|---|
| 100 | 5500 | 120 | 5600 |
| 140 | 5700 | | |

| channel | Frequency(MHz) | channel | Frequency(MHz) |
|---|---|---|---|
| 149 | 5745 | 157 | 5785 |
| 165 | 5825 | | |

For 802.11n(HT40)

| channel | Frequency(MHz) | channel | Frequency(MHz) |
|---|---|---|---|
| 38 | 5190 | 46 | 5230 |

| channel | Frequency(MHz) | channel | Frequency(MHz) |
|---|---|---|---|
| 151 | 5755 | 159 | 5795 |

## 4.4 Test Mode Description:

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.
Transmitting duty cycle is no less 98%.
The software is installed in operation system, named “SecureCRTPortable.exe” ,Version 7.1.1.264

| Test Items | Mode | Data Rate | TX/RX |
|---|---|---|---|
| Radiated Emissions | 802.11a (HT20) | 6 Mbps | TX |
| | 802.11n (HT20/40) | MCS0 | TX |
| Duty Cycle | 802.11a (HT20) | 6 Mbps | TX |
| | 802.11n (HT20/40) | MCS0 | TX |
| Band Edge | 802.11a (HT20) | 6 Mbps | TX |
| | 802.11n (HT20/40) | MCS0 | TX |
| 6dB Bandwidth | 802.11a (HT20) | 6 Mbps | TX |
| | 802.11n (HT20/40) | MCS0 | TX |
| 26dB Bandwidth and 99% Occupied Bandwidth | 802.11a (HT20) | 6 Mbps | TX |
| | 802.11n (HT20/40) | MCS0 | TX |
| Conducted Output Power | 802.11a (HT20) | 6 Mbps | TX |
| | 802.11n (HT20/40) | MCS0 | TX |
| Power Spectral Density | 802.11a (HT20) | 6 Mbps | TX |
| | 802.11n (HT20/40) | MCS0 | TX |
| Frequency Stability | Un-modulation | / | TX |

## 4.5 Test Facility

The test facility has a test site registered with the following organizations:

**ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.**

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

**FCC Designation No.: CN1201. Test Firm Registration No.: 523476.**

Waltek Testing Group Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

# 5 Equipment Used during Test

## 5.1 Equipments List

| Conducted Emissions Test Site 1# | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Calibration Date** | **Calibration Due Date** |
| 1. | EMI Test Receiver | R&S | ESCI | 100947 | 2020-07-30 | 2021-07-29 |
| 2. | LISN | R&S | ENV216 | 101215 | 2020-07-30 | 2021-07-29 |
| 3. | Cable | Top | TYPE16(3.5M) | - | 2020-07-30 | 2021-07-29 |
| **Conducted Emissions Test Site 2#** | | | | | | |
| **Item** | **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Calibration Date** | **Calibration Due Date** |
| 1. | EMI Test Receiver | R&S | ESCI | 101155 | 2020-07-30 | 2021-07-29 |
| 2. | LISN | SCHWARZBECK | NSLK 8128 | 8128-289 | 2020-07-30 | 2021-07-29 |
| 3. | Limiter | York | MTS-IMP-136 | 261115-001-0024 | 2020-07-30 | 2021-07-29 |
| 4. | Cable | LARGE | RF300 | - | 2020-07-30 | 2021-07-29 |
| **3m Semi-anechoic Chamber for Radiation Emissions Test site 1#** | | | | | | |
| **Item** | **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Calibration Date** | **Calibration Due Date** |
| 1 | EMC Analyzer | Agilent | E7405A | MY45114943 | 2020-07-30 | 2021-07-29 |
| 2 | Active Loop Antenna | Beijing Dazhi | ZN30900A | - | 2020-07-30 | 2021-07-29 |
| 3 | Trilog Broadband Antenna | SCHWARZBECK | VULB9163 | 336 | 2020-07-30 | 2021-07-29 |
| 4 | Coaxial Cable (below 1GHz) | Top | TYPE16(13M) | - | 2020-07-30 | 2021-07-29 |
| 5 | Broad-band Horn Antenna | SCHWARZBECK | BBHA 9120 D | 667 | 2020-07-30 | 2021-07-29 |
| 6 | Broad-band Horn Antenna | SCHWARZBECK | BBHA 9170 | 335 | 2020-07-30 | 2021-07-29 |
| 7 | Broadband Preamplifier | COMPLIANCE DIRECTION | PAP-1G18 | 2004 | 2020-07-30 | 2021-07-29 |
| 8 | Coaxial Cable (above 1GHz) | Top | 1GHz-25GHz | EW02014-7 | 2020-07-30 | 2021-07-29 |

| 3m Semi-anechoic Chamber for Radiation Emissions Test site 2# | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Equipment** | **Manufacturer** | **Model No.** | **Serial No** | **Last Calibration Date** | **Calibration Due Date** |
| 1 | Test Receiver | R&S | ESCI | 101296 | 2020-07-30 | 2021-07-29 |
| 2 | Trilog Broadband Antenna | SCHWARZBECK | VULB9160 | 9160-3325 | 2020-07-30 | 2021-07-29 |
| 3 | Amplifier | Compliance pirection systems inc | PAP-0203 | 22024 | 2020-07-30 | 2021-07-29 |
| 4 | Cable | HUBER+SUHNER | CBL2 | 525178 | 2020-07-30 | 2021-07-29 |
| **RF Conducted Testing** | | | | | | |
| **Ite** | **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Calibration Date** | **Calibration Due Date** |
| 1. | EMC Analyzer (9k~26.5GHz) | Agilent | E7405A | MY45114943 | 2020-07-30 | 2021-07-29 |
| 2. | Spectrum Analyzer (9k-6GHz) | R&S | FSL6 | 100959 | 2020-07-30 | 2021-07-29 |
| 3. | Signal Analyzer (9k~26.5GHz) | Agilent | N9010A | MY50520207 | 2020-07-30 | 2021-07-29 |

## 5.2 Description of Support Units

| Equipment | Manufacturer | Model No. | Series No. |
|---|---|---|---|
| Computer | Dell | K053 | / |
| Mouse | Lenovo | AP01 | / |

## 5.3 Measurement Uncertainty

| Parameter | Uncertainty |
|---|---|
| Radio Frequency | ± 1 x $10^{-6}$ |
| RF Power | ± 1.0 dB |
| RF Power Density | ± 2.2 dB |
| Radiated Spurious Emissions test | ± 5.03 dB (30M~1000MHz) |
| | ± 5.47 dB (1000M~25000MHz) |
| Conducted Spurious Emissions test | ± 3.64 dB (AC mains 150KHz~30MHz) |

## 5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

# 6 Test Summary

| Test Items | Test Requirement | Result |
|---|---|---|
| Conducted Emissions | 15.207(a) | N/A |
| Radiated Emissions | 15.407(a)<br>15.205(a)<br>15.209(a) | PASS |
| Duty Cycle | KDB 789033 | -- |
| 6dB Bandwidth | 15.407(a) | PASS |
| 26 dB Emission Bandwidth<br>& 99% Occupied Bandwidth | 15.407(a) | PASS |
| Maximum Conducted Output Power | 15.407(a) | PASS |
| Power Spectral Density | 15.407(a) | PASS |
| Unwanted Emissions that fall Outside of the Restricted Bands | 15.407(a) | PASS |
| Antenna Requirement | 15.203 | PASS |
| Maximum Permissible Exposure<br>(Exposure of Humans to RF Fields) | 1.1307(b)(1) | PASS |

# 7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.407

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

| Frequency (MHz) | Field Strength | | Field Strength Limit at 3m Measurement Distance | |
|---|---|---|---|---|
| | uV/m | Distance (m) | uV/m | dBuV/m |
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 | 10000 * 2400/F(kHz) | $20\log^{(2400/F(kHz))} + 80$ |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 | 100 * 24000/F(kHz) | $20\log^{(24000/F(kHz))} + 40$ |
| 1.705 ~ 30 | 30 | 30 | 100 * 30 | $20\log^{(30)} + 40$ |
| 30 ~ 88 | 100 | 3 | 100 | $20\log^{(100)}$ |
| 88 ~ 216 | 150 | 3 | 150 | $20\log^{(150)}$ |
| 216 ~ 960 | 200 | 3 | 200 | $20\log^{(200)}$ |
| Above 960 | 500 | 3 | 500 | $20\log^{(500)}$ |

## 7.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 □C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

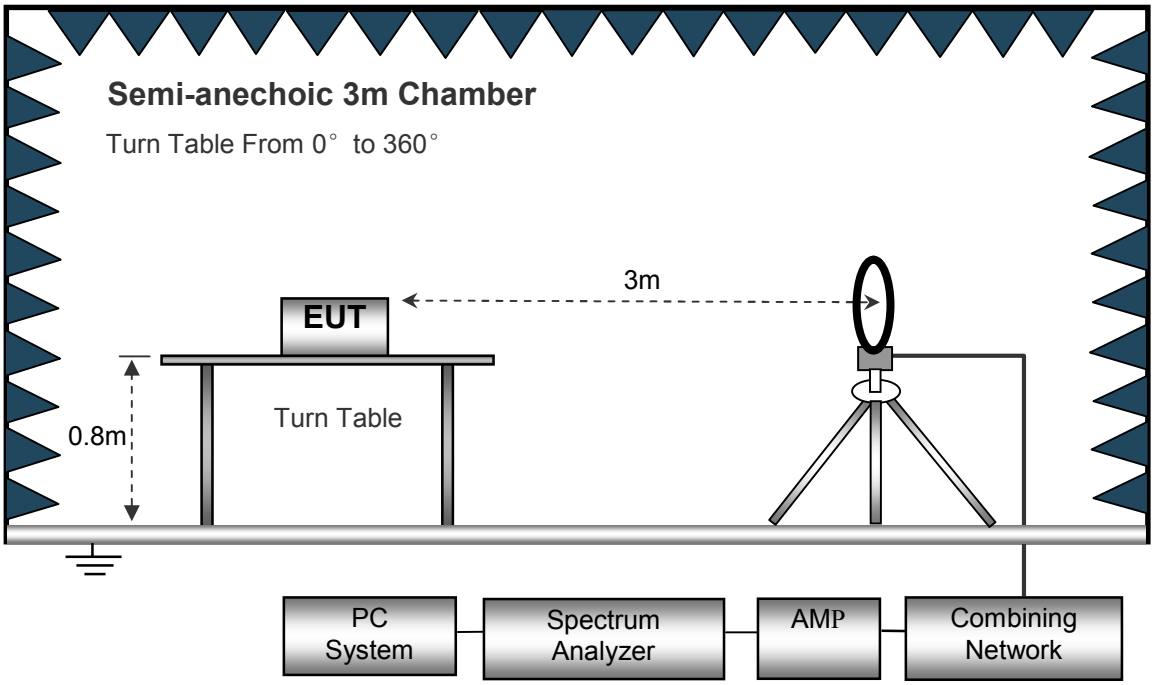
EUT Operation **:**

The test was performed in transmitting mode, the test data were shown in the report.

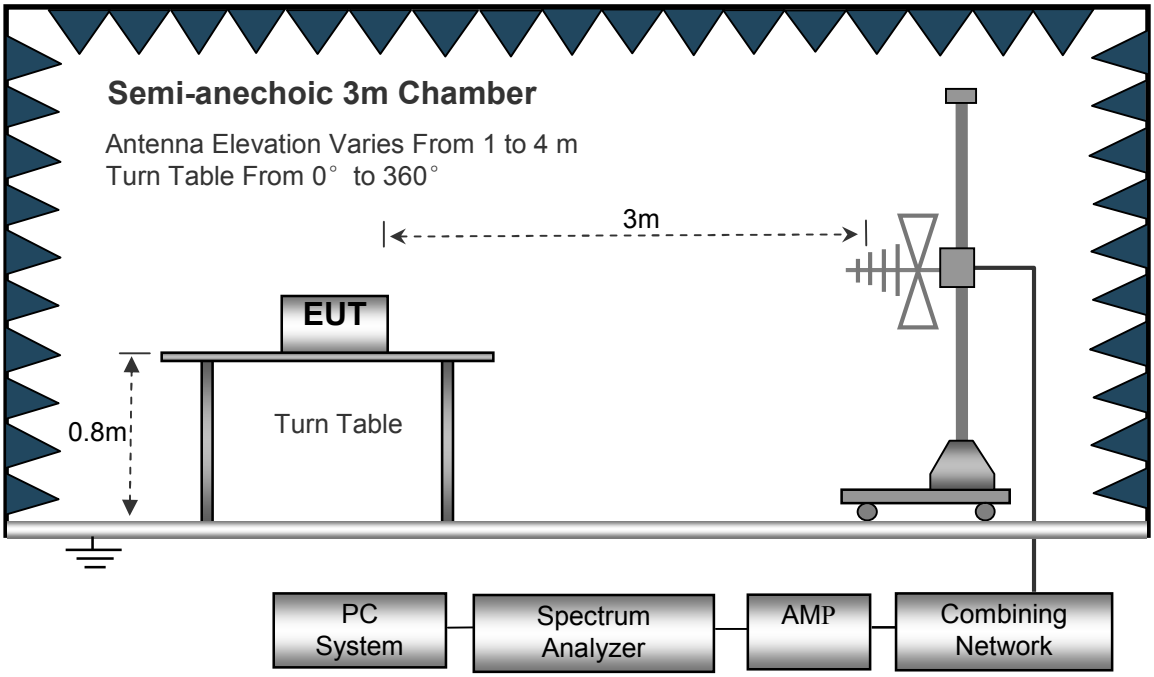
## 7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

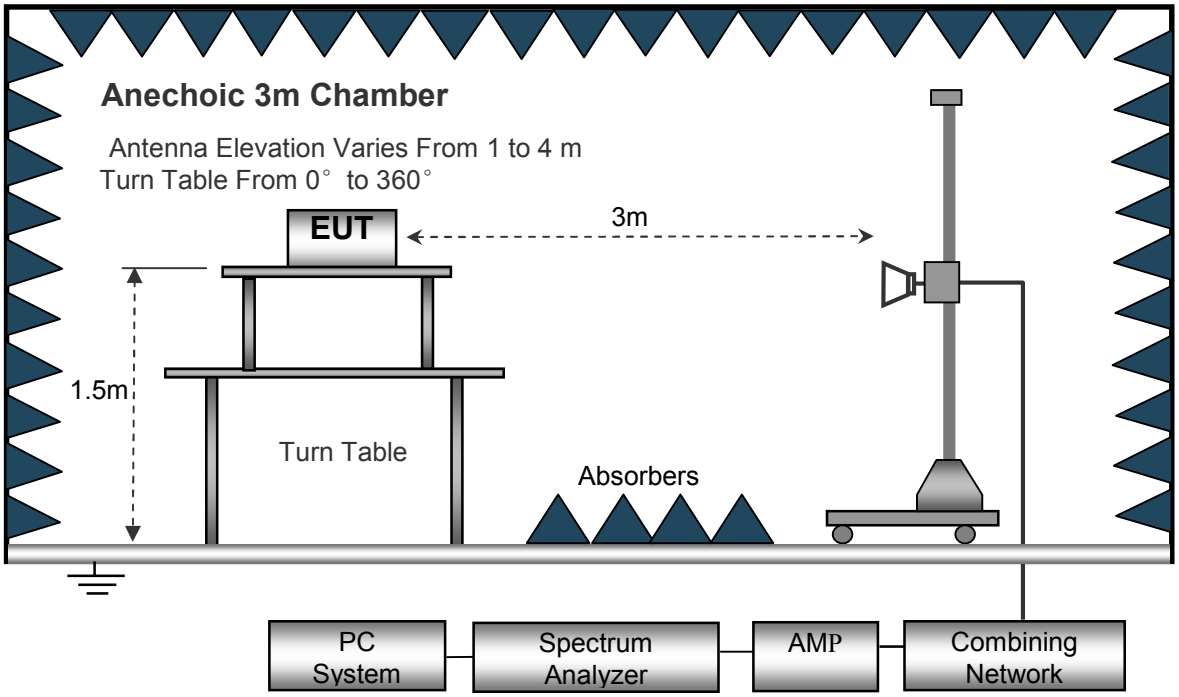
The test setup for emission measurement below 30MHz.




The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.




## 7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

## 7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.
8. A 2.4GHz high –pass filter is used druing radiated emissions above 1GHz measurement.

## 7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

## 7.6 Summary of Test Results

**Test Frequency: 9KHz~30MHz**

The measurements were more than 20 dB below the limit and not reported.

**Test Frequency : 30MHz ~ 18GHz**

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | FCC Part 15.407/209/205 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 802.11a U-NII-1 Low Channel 5180MHz | | | | | | | | | |
| 223.45 | 38.55 | QP | 111 | 1.1 | H | -11.62 | 26.93 | 46.00 | -19.07 |
| 223.45 | 35.83 | QP | 168 | 1.8 | V | -11.62 | 24.21 | 46.00 | -21.79 |
| 4521.52 | 50.51 | PK | 193 | 2.0 | H | -2.03 | 48.48 | 74.00 | -25.52 |
| 4521.52 | 46.25 | Ave | 193 | 2.0 | H | -2.03 | 44.22 | 54.00 | -9.78 |
| 5110.99 | 59.27 | PK | 59 | 1.2 | H | -1.02 | 58.25 | 74.00 | -15.75 |
| 5110.99 | 53.28 | Ave | 59 | 1.2 | H | -1.02 | 52.26 | 54.00 | -1.74 |
| 10360.00 | 40.83 | PK | 39 | 1.6 | H | 5.33 | 46.16 | 74.00 | -27.84 |
| 10360.00 | 36.74 | Ave | 39 | 1.6 | H | 5.33 | 42.07 | 54.00 | -11.93 |
| 802.11a U-NII-1 Middle channel 5200MHz | | | | | | | | | |
| 223.45 | 37.23 | QP | 5 | 1.0 | H | -11.62 | 25.61 | 46.00 | -20.39 |
| 223.45 | 36.06 | QP | 96 | 1.4 | V | -11.62 | 24.44 | 46.00 | -21.56 |
| 4516.13 | 50.94 | PK | 265 | 1.2 | H | -1.94 | 49.00 | 74.00 | -25.00 |
| 4516.13 | 45.49 | Ave | 265 | 1.2 | H | -1.94 | 43.55 | 54.00 | -10.45 |
| 5129.56 | 60.68 | PK | 88 | 1.1 | H | -1.06 | 59.62 | 74.00 | -14.38 |
| 5129.56 | 55.16 | Ave | 88 | 1.1 | H | -1.06 | 54.10 | 54.00 | 0.10 |
| 10400.00 | 41.77 | PK | 41 | 1.9 | H | 5.21 | 46.98 | 74.00 | -27.02 |
| 10400.00 | 36.21 | Ave | 41 | 1.9 | H | 5.21 | 41.42 | 54.00 | -12.58 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | FCC Part 15.407/209/205 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 802.11a U-NII-1 High channel 5240MHz | | | | | | | | | |
| 223.45 | 37.51 | QP | 293 | 1.6 | H | -11.62 | 25.89 | 46.00 | -20.11 |
| 223.45 | 37.05 | QP | 334 | 1.3 | V | -11.62 | 25.43 | 46.00 | -20.57 |
| 4530.73 | 49.65 | PK | 336 | 1.4 | H | -2.24 | 47.41 | 74.00 | -26.59 |
| 4530.73 | 44.27 | Ave | 336 | 1.4 | H | -2.24 | 42.03 | 54.00 | -11.97 |
| 5133.42 | 61.70 | PK | 6 | 1.8 | H | -1.09 | 60.61 | 74.00 | -13.39 |
| 5133.42 | 56.41 | Ave | 6 | 1.8 | H | -1.09 | 55.32 | 54.00 | 1.32 |
| 10480.00 | 40.05 | PK | 355 | 1.6 | H | 5.14 | 45.19 | 74.00 | -28.81 |
| 10480.00 | 37.18 | Ave | 355 | 1.6 | H | 5.14 | 42.32 | 54.00 | -11.68 |
| 802.11a U-NII-3 Low Channel 5745MHz | | | | | | | | | |
| 223.45 | 36.07 | QP | 306 | 1.1 | H | -11.62 | 24.45 | 46.00 | -21.55 |
| 223.45 | 37.15 | QP | 173 | 1.5 | V | -11.62 | 25.53 | 46.00 | -20.47 |
| 4528.13 | 48.17 | PK | 192 | 1.7 | H | -2.06 | 46.11 | 74.00 | -27.89 |
| 4528.13 | 43.03 | Ave | 192 | 1.7 | H | -2.06 | 40.97 | 54.00 | -13.03 |
| 11490.00 | 41.85 | PK | 196 | 1.2 | H | 5.93 | 47.78 | 68.20 | -20.42 |
| 11490.00 | 37.08 | Ave | 196 | 1.2 | H | 5.93 | 43.01 | 54.00 | -10.99 |
| 5359.75 | 46.08 | PK | 14 | 1.3 | H | -1.25 | 44.83 | 74.00 | -29.17 |
| 5359.75 | 39.12 | Ave | 14 | 1.3 | H | -1.25 | 37.87 | 54.00 | -16.13 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | FCC Part 15.407/209/205 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 802.11a U-NII-3 middle channel 5785MHz | | | | | | | | | |
| 223.45 | 36.80 | QP | 256 | 1.6 | H | -11.62 | 25.18 | 46.00 | -20.82 |
| 223.45 | 36.98 | QP | 280 | 1.9 | V | -11.62 | 25.36 | 46.00 | -20.64 |
| 4501.75 | 47.51 | PK | 128 | 1.7 | H | -2.03 | 45.48 | 74.00 | -28.52 |
| 4501.75 | 42.52 | Ave | 128 | 1.7 | H | -2.03 | 40.49 | 54.00 | -13.51 |
| 11570.00 | 41.89 | PK | 296 | 1.3 | H | 5.81 | 47.70 | 68.20 | -20.50 |
| 11570.00 | 35.93 | Ave | 296 | 1.3 | H | 5.81 | 41.74 | 54.00 | -12.26 |
| 5366.86 | 46.61 | PK | 226 | 1.6 | H | -1.22 | 45.39 | 74.00 | -28.61 |
| 5366.86 | 39.18 | Ave | 226 | 1.6 | H | -1.22 | 37.96 | 54.00 | -16.04 |
| 802.11a U-NII-3 High channel 5825MHz | | | | | | | | | |
| 223.45 | 37.08 | QP | 142 | 1.5 | H | -11.62 | 25.46 | 46.00 | -20.54 |
| 223.45 | 36.91 | QP | 178 | 1.6 | V | -11.62 | 25.29 | 46.00 | -20.71 |
| 4506.16 | 48.16 | PK | 276 | 1.6 | H | -1.84 | 46.32 | 74.00 | -27.68 |
| 4506.16 | 42.43 | Ave | 276 | 1.6 | H | -1.84 | 40.59 | 54.00 | -13.41 |
| 11650.00 | 42.23 | PK | 134 | 1.7 | H | 5.84 | 48.07 | 68.20 | -20.13 |
| 11650.00 | 35.29 | Ave | 134 | 1.7 | H | 5.84 | 41.13 | 54.00 | -12.87 |
| 5381.65 | 46.27 | PK | 343 | 1.5 | H | -1.30 | 44.97 | 74.00 | -29.03 |
| 5381.65 | 37.73 | Ave | 343 | 1.5 | H | -1.30 | 36.43 | 54.00 | -17.57 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | FCC Part 15.407/209/205 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 802.11n(HT20) U-NII-1 Low Channel 5180MHz | | | | | | | | | |
| 223.45 | 37.99 | QP | 65 | 1.1 | H | -11.62 | 26.37 | 46.00 | -19.63 |
| 223.45 | 37.01 | QP | 156 | 1.4 | V | -11.62 | 25.39 | 46.00 | -20.61 |
| 4517.34 | 49.19 | PK | 119 | 1.4 | H | -2.14 | 47.05 | 74.00 | -26.95 |
| 4517.34 | 41.70 | Ave | 119 | 1.4 | H | -2.14 | 39.56 | 54.00 | -14.44 |
| 5125.63 | 47.55 | PK | 150 | 1.4 | H | -1.06 | 46.49 | 74.00 | -27.51 |
| 5125.63 | 38.32 | Ave | 150 | 1.4 | H | -1.06 | 37.26 | 54.00 | -16.74 |
| 10360.00 | 42.11 | PK | 65 | 2.0 | H | 5.33 | 47.44 | 74.00 | -26.56 |
| 10360.00 | 35.45 | Ave | 65 | 2.0 | H | 5.33 | 40.78 | 54.00 | -13.22 |
| 802.11n(HT20) U-NII-1 Middle channel 5200MHz | | | | | | | | | |
| 223.45 | 37.41 | QP | 275 | 1.1 | H | -11.62 | 25.79 | 46.00 | -20.21 |
| 223.45 | 38.19 | QP | 132 | 1.4 | V | -11.62 | 26.57 | 46.00 | -19.43 |
| 4512.13 | 49.51 | PK | 311 | 1.5 | H | -2.12 | 47.39 | 74.00 | -26.61 |
| 4512.13 | 41.05 | Ave | 311 | 1.5 | H | -2.12 | 38.93 | 54.00 | -15.07 |
| 5128.02 | 48.74 | PK | 101 | 1.5 | H | -1.06 | 47.68 | 74.00 | -26.32 |
| 5128.02 | 37.79 | Ave | 101 | 1.5 | H | -1.06 | 36.73 | 54.00 | -17.27 |
| 10400.00 | 41.56 | PK | 117 | 1.1 | H | 5.21 | 46.77 | 74.00 | -27.23 |
| 10400.00 | 38.11 | Ave | 117 | 1.1 | H | 5.21 | 43.32 | 54.00 | -10.68 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | FCC Part 15.407/209/205 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 802.11n(HT20) U-NII-1 High channel 5240MHz | | | | | | | | | |
| 223.45 | 36.91 | QP | 212 | 1.3 | H | -11.62 | 25.29 | 46.00 | -20.71 |
| 223.45 | 38.65 | QP | 128 | 1.3 | V | -11.62 | 27.03 | 46.00 | -18.97 |
| 4535.63 | 49.58 | PK | 44 | 1.9 | H | -1.96 | 47.62 | 74.00 | -26.38 |
| 4535.63 | 41.45 | Ave | 44 | 1.9 | H | -1.96 | 39.49 | 54.00 | -14.51 |
| 5117.75 | 48.01 | PK | 270 | 1.4 | H | -1.06 | 46.95 | 74.00 | -27.05 |
| 5117.75 | 37.74 | Ave | 270 | 1.4 | H | -1.06 | 36.68 | 54.00 | -17.32 |
| 10480.00 | 40.93 | PK | 50 | 2.0 | H | 5.14 | 46.07 | 74.00 | -27.93 |
| 10480.00 | 37.65 | Ave | 50 | 2.0 | H | 5.14 | 42.79 | 54.00 | -11.21 |
| 802.11n(HT20) U-NII-3 Low Channel 5745MHz | | | | | | | | | |
| 223.45 | 38.73 | QP | 272 | 1.4 | H | -11.62 | 27.11 | 46.00 | -18.89 |
| 223.45 | 49.07 | QP | 282 | 1.1 | V | -11.62 | 37.45 | 46.00 | -8.55 |
| 4511.85 | 42.58 | PK | 113 | 1.1 | H | -2.06 | 40.52 | 74.00 | -33.48 |
| 4511.85 | 47.56 | Ave | 113 | 1.1 | H | -2.06 | 45.50 | 54.00 | -8.50 |
| 11490.00 | 34.62 | PK | 340 | 1.5 | H | 5.93 | 40.55 | 68.20 | -27.65 |
| 11490.00 | 45.65 | Ave | 340 | 1.5 | H | 5.93 | 51.58 | 54.00 | -2.42 |
| 5372.00 | 46.93 | PK | 135 | 1.6 | H | -1.25 | 45.68 | 74.00 | -28.32 |
| 5372.00 | 39.99 | Ave | 135 | 1.6 | H | -1.25 | 38.74 | 54.00 | -15.26 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | FCC Part 15.407/209/205 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 802.11n(HT20) U-NII-3 middle channel 5785MHz | | | | | | | | | |
| 223.45 | 37.56 | QP | 197 | 1.4 | H | -11.62 | 25.94 | 46.00 | -20.06 |
| 223.45 | 48.09 | QP | 13 | 1.4 | V | -11.62 | 36.47 | 46.00 | -9.53 |
| 4510.13 | 43.27 | PK | 62 | 1.5 | H | -2.03 | 41.24 | 74.00 | -32.76 |
| 4510.13 | 47.61 | Ave | 62 | 1.5 | H | -2.03 | 45.58 | 54.00 | -8.42 |
| 11570.00 | 35.12 | PK | 160 | 1.7 | H | 5.81 | 40.93 | 68.20 | -27.27 |
| 11570.00 | 47.06 | Ave | 160 | 1.7 | H | 5.81 | 52.87 | 54.00 | -1.13 |
| 5357.01 | 46.72 | PK | 1 | 1.8 | H | -1.22 | 45.50 | 74.00 | -28.50 |
| 5357.01 | 39.27 | Ave | 1 | 1.8 | H | -1.22 | 38.05 | 54.00 | -15.95 |
| 802.11n(HT20) U-NII-3 High channel 5825MHz | | | | | | | | | |
| 223.45 | 36.95 | QP | 257 | 1.9 | H | -11.62 | 25.33 | 46.00 | -20.67 |
| 223.45 | 49.16 | QP | 270 | 1.2 | V | -11.62 | 37.54 | 46.00 | -8.46 |
| 4530.80 | 42.62 | PK | 167 | 1.9 | H | -1.84 | 40.78 | 74.00 | -33.22 |
| 4530.80 | 46.99 | Ave | 167 | 1.9 | H | -1.84 | 45.15 | 54.00 | -8.85 |
| 11650.00 | 34.68 | PK | 159 | 1.4 | H | 5.84 | 40.52 | 68.20 | -27.68 |
| 11650.00 | 47.11 | Ave | 159 | 1.4 | H | 5.84 | 52.95 | 54.00 | -1.05 |
| 5369.07 | 45.35 | PK | 71 | 1.7 | H | -1.30 | 44.05 | 74.00 | -29.95 |
| 5369.07 | 39.14 | Ave | 71 | 1.7 | H | -1.30 | 37.84 | 54.00 | -16.16 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | FCC Part 15.407/209/205 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 802.11n(HT40) U-NII-1 Low Channel 5190MHz | | | | | | | | | |
| 223.45 | 35.58 | QP | 284 | 1.2 | H | -11.62 | 23.96 | 46.00 | -22.04 |
| 223.45 | 44.33 | QP | 78 | 1.6 | V | -11.62 | 32.71 | 46.00 | -13.29 |
| 4500.50 | 43.31 | PK | 326 | 1.9 | H | -1.89 | 41.42 | 74.00 | -32.58 |
| 4500.50 | 34.65 | Ave | 326 | 1.9 | H | -1.89 | 32.76 | 54.00 | -21.24 |
| 5136.15 | 46.73 | PK | 247 | 1.5 | H | -1.06 | 45.67 | 74.00 | -28.33 |
| 5136.15 | 39.02 | Ave | 247 | 1.5 | H | -1.06 | 37.96 | 54.00 | -16.04 |
| 10380.00 | 38.59 | PK | 78 | 1.3 | H | 5.26 | 43.85 | 74.00 | -30.15 |
| 10380.00 | 33.75 | Ave | 78 | 1.3 | H | 5.26 | 39.01 | 54.00 | -14.99 |
| 802.11n(HT40) U-NII-1 High channel 5230MHz | | | | | | | | | |
| 223.45 | 35.44 | QP | 284 | 1.5 | H | -11.62 | 23.82 | 46.00 | -22.18 |
| 223.45 | 43.84 | QP | 237 | 1.4 | V | -11.62 | 32.22 | 46.00 | -13.78 |
| 4516.30 | 42.62 | PK | 307 | 1.6 | H | -1.94 | 40.68 | 74.00 | -33.32 |
| 4516.30 | 35.61 | Ave | 307 | 1.6 | H | -1.94 | 33.67 | 54.00 | -20.33 |
| 5130.52 | 47.57 | PK | 273 | 1.8 | H | -1.06 | 46.51 | 74.00 | -27.49 |
| 5130.52 | 38.82 | Ave | 273 | 1.8 | H | -1.06 | 37.76 | 54.00 | -16.24 |
| 10460.00 | 40.01 | PK | 345 | 1.3 | H | 5.28 | 45.29 | 74.00 | -28.71 |
| 10480.00 | 35.97 | Ave | 345 | 1.3 | H | 5.28 | 41.25 | 54.00 | -12.75 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | FCC Part 15.407/209/205 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 802.11n(HT40) U-NII-3 Low Channel 5755MHz | | | | | | | | | |
| 223.45 | 35.51 | QP | 146 | 1.1 | H | -11.62 | 23.89 | 46.00 | -22.11 |
| 223.45 | 43.04 | QP | 38 | 1.7 | V | -11.62 | 31.42 | 46.00 | -14.58 |
| 4529.75 | 40.16 | PK | 28 | 1.4 | H | -1.96 | 38.20 | 74.00 | -35.80 |
| 4529.75 | 34.30 | Ave | 28 | 1.4 | H | -1.96 | 32.34 | 54.00 | -21.66 |
| 11510.00 | 38.19 | PK | 145 | 1.6 | H | 5.88 | 44.07 | 68.20 | -24.13 |
| 11510.00 | 34.72 | Ave | 145 | 1.6 | H | 5.88 | 40.60 | 54.00 | -13.40 |
| 5386.40 | 45.68 | PK | 40 | 1.2 | H | -1.01 | 44.67 | 74.00 | -29.33 |
| 5386.40 | 39.68 | Ave | 40 | 1.2 | H | -1.01 | 38.67 | 54.00 | -15.33 |
| 802.11n(HT40) U-NII-3 High Channel 5795MHz | | | | | | | | | |
| 223.45 | 34.85 | QP | 67 | 1.4 | H | -11.62 | 23.23 | 46.00 | -22.77 |
| 223.45 | 42.35 | QP | 223 | 1.9 | V | -11.62 | 30.73 | 46.00 | -15.27 |
| 4514.93 | 39.76 | PK | 221 | 1.6 | H | -1.92 | 37.84 | 74.00 | -36.16 |
| 4514.93 | 33.95 | Ave | 221 | 1.6 | H | -1.92 | 32.03 | 54.00 | -21.97 |
| 11590.00 | 41.10 | PK | 46 | 1.5 | H | 5.63 | 46.73 | 68.20 | -21.47 |
| 11590.00 | 37.44 | Ave | 46 | 1.5 | H | 5.63 | 43.07 | 54.00 | -10.93 |
| 5360.81 | 45.89 | PK | 309 | 1.3 | H | -1.04 | 44.85 | 74.00 | -29.15 |
| 5360.81 | 39.41 | Ave | 309 | 1.3 | H | -1.04 | 38.37 | 54.00 | -15.63 |

**Test Frequency: 18GHz~40GHz**

The measurements were more than 20 dB below the limit and not reported.

# 8 Duty cycle

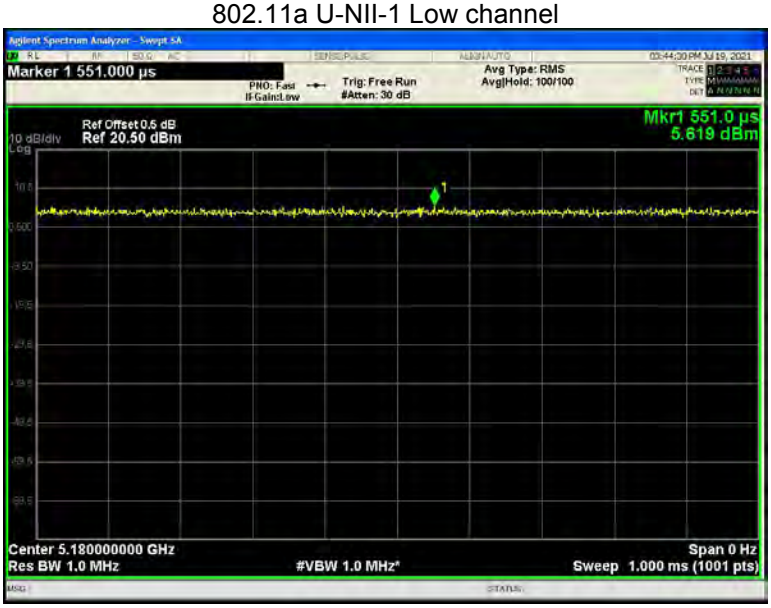
| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C 15.407<br>KDB789033 D02 General U-NII Test Procedures New Rules v02r01, Section (B) |
| Test Method: | ANSI C63.10: 2013 |
| Test Limit: | N/A |
| Test Result: | PASS |
| Remark: | Through Pre-scan, The duty cycle set for channel low, middle and high are same, and the duty cycle test is performed at channel low only. |

## 8.1 Summary of Test Results

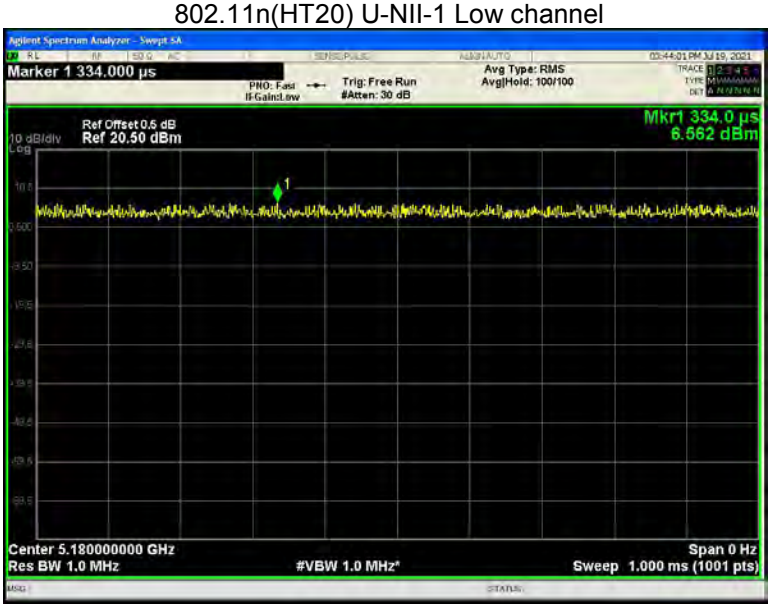
| 802.11a(HT20) mode | | | |
|---|---|---|---|
| channel | On time(ms) | Period(ms) | Duty Cycle(%) |
| 36 | 100 | 100 | 100 |
| 149 | 100 | 100 | 100 |
| 802.11n(HT20) mode | | | |
| channel | On time(ms) | Period(ms) | Duty Cycle(%) |
| 36 | 100 | 100 | 100 |
| 149 | 100 | 100 | 100 |
| 802.11n(HT40) mode | | | |
| channel | On time(ms) | Period(ms) | Duty Cycle(%) |
| 38 | 100 | 100 | 100 |
| 151 | 100 | 100 | 100 |

Test result plots shown as follows:

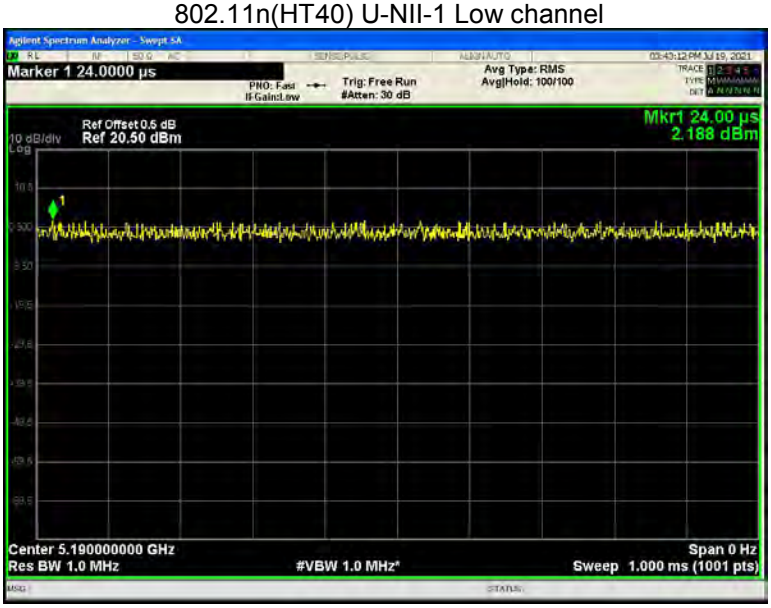
802.11a U-NII-1 Low channel



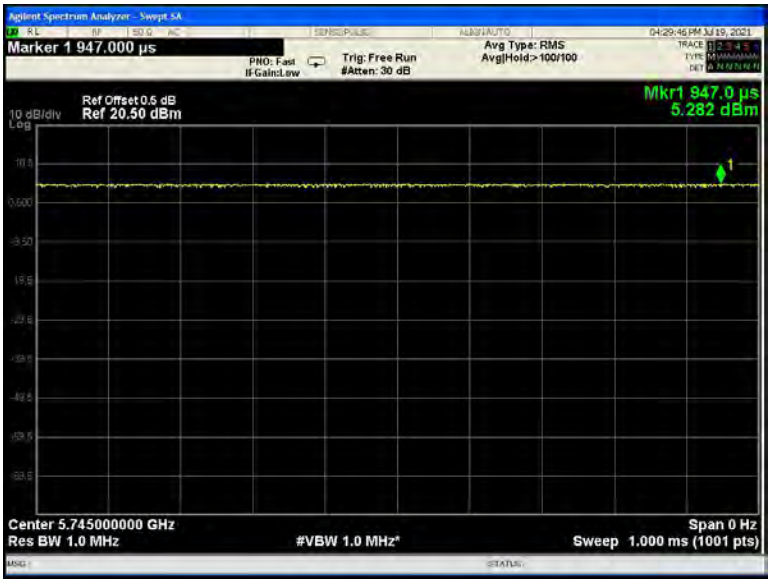

802.11n(HT20) U-NII-1 Low channel



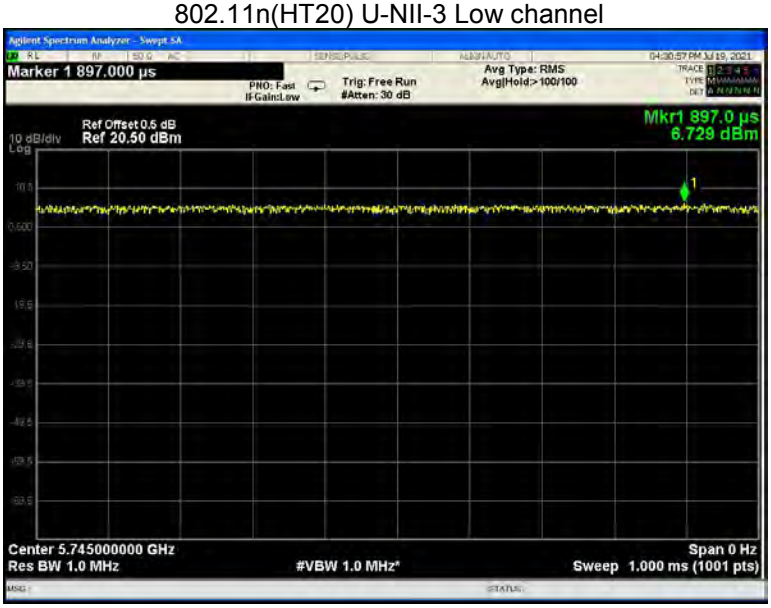
802.11n(HT40) U-NII-1 Low channel



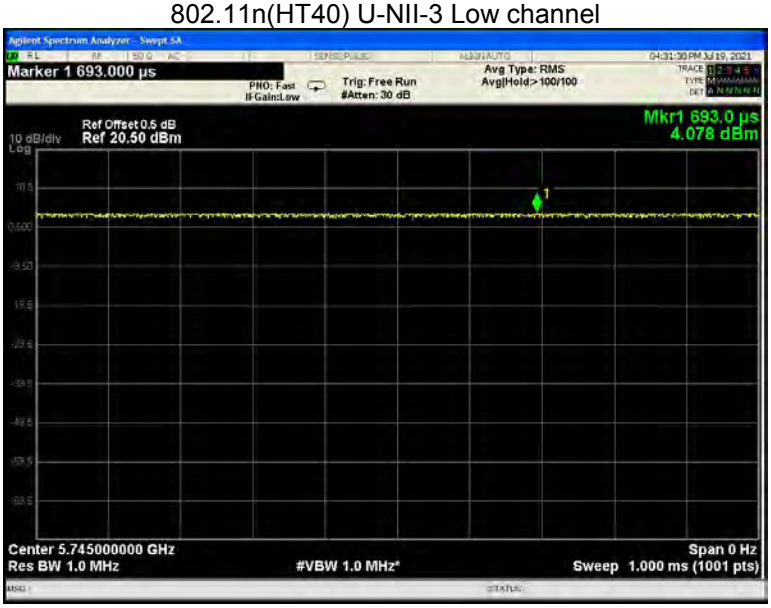

802.11a U-NII-3 Low channel



802.11n(HT20) U-NII-3 Low channel




802.11n(HT40) U-NII-3 Low channel



# 9 Band Edge

| | |
|---|---|
| Test Requirement: | FCC CFR47 Part 15 Section 15.407 |
| Test Method: | ANSI C63.10 2013 |
| Test Limit: | (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.<br>(2 For transmitters operating in the 5.725-5.85 GHz band:<br>(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.<br>(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020. |
| Test Result: | PASS |

## 9.1 Test Produce

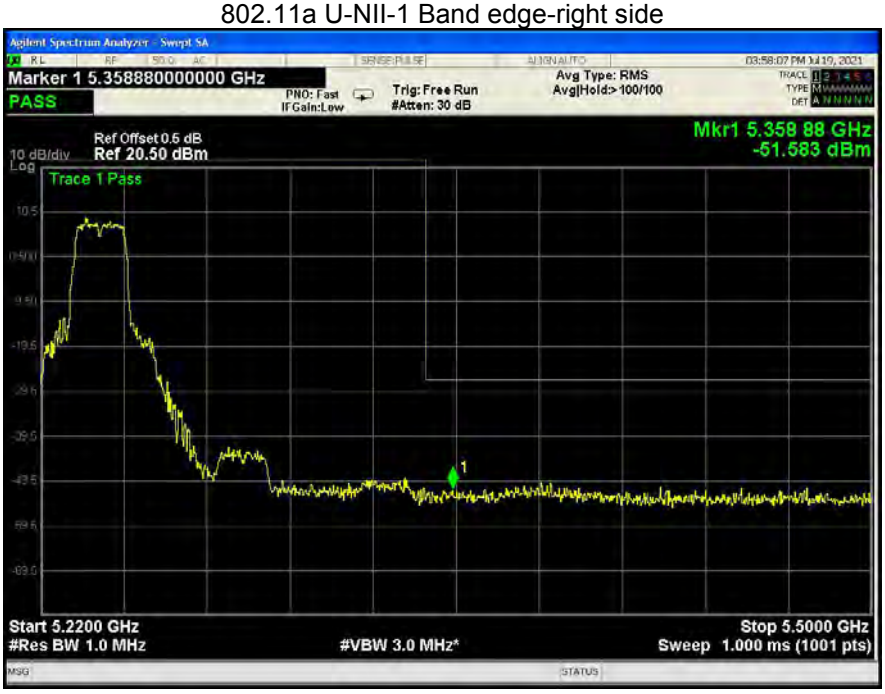
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

## 9.2 Test Result

Test result plots shown as follows:

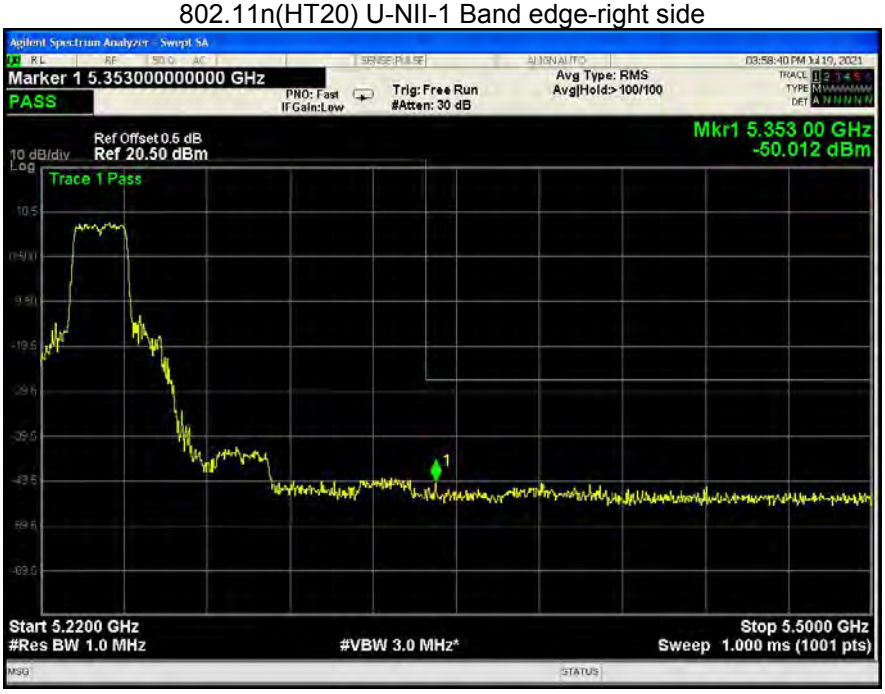
802.11a U-NII-1 Band edge-left side


802.11a U-NII-1 Band edge-right side

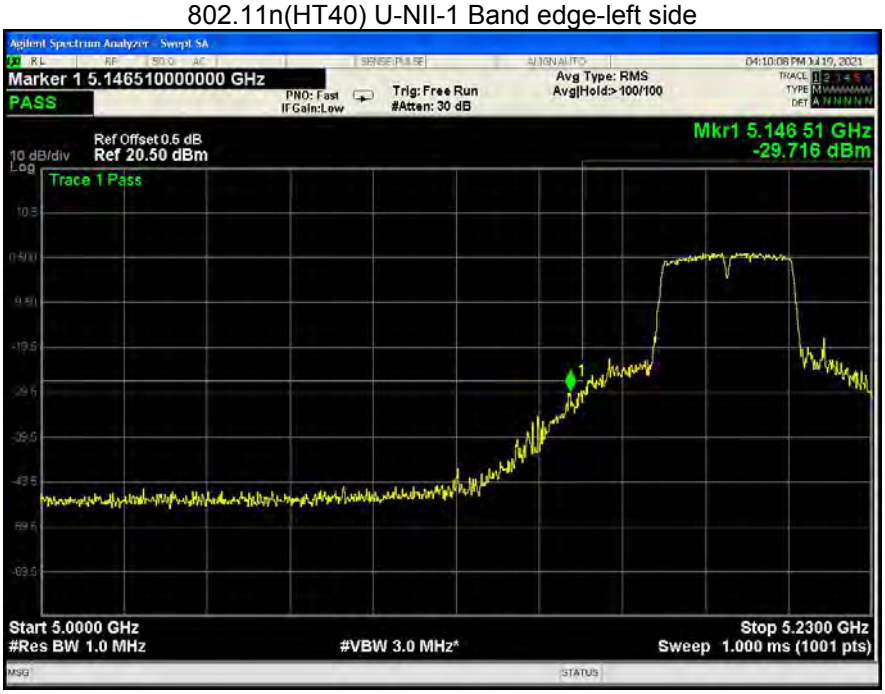


802.11n(HT20) U-NII-1 Band edge-left side

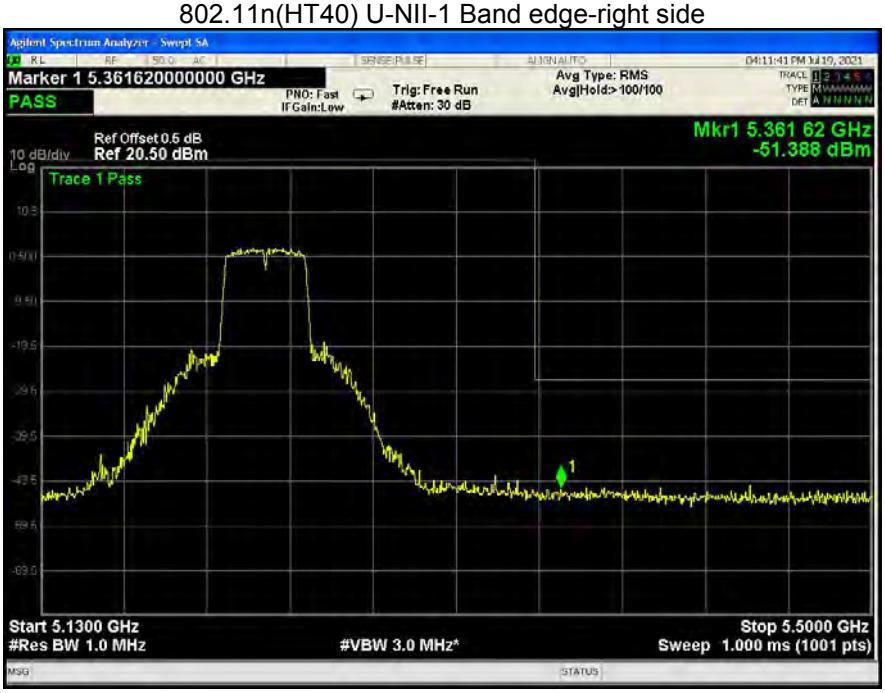

802.11n(HT20) U-NII-1 Band edge-right side



802.11n(HT40) U-NII-1 Band edge-left side

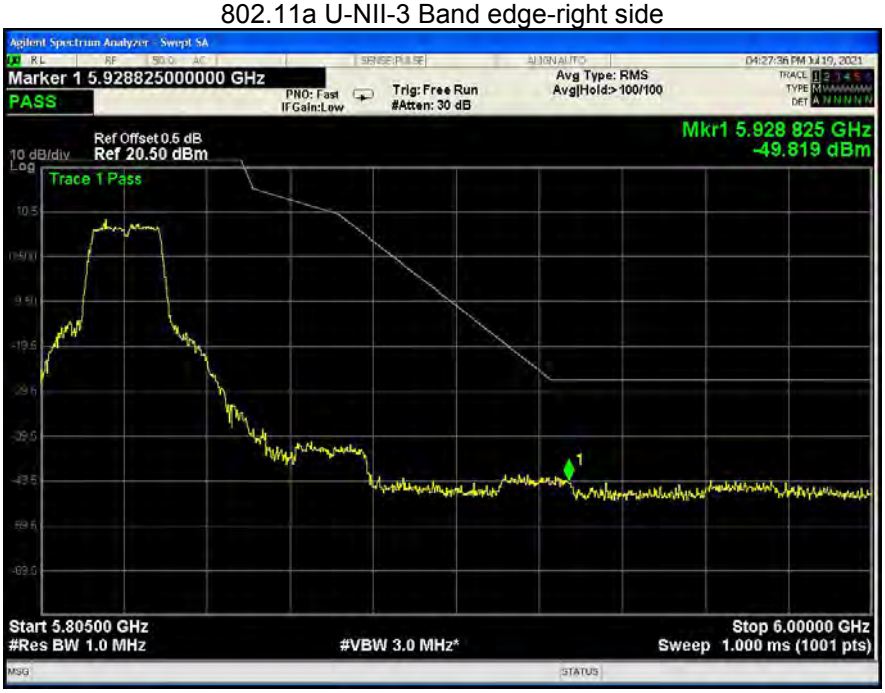



802.11n(HT40) U-NII-1 Band edge-right side



802.11a U-NII-3 Band edge-left side


802.11a U-NII-3 Band edge-right side



802.11n(HT20) U-NII-3 Band edge-left side


802.11n(HT20) U-NII-3 Band edge-right side

802.11n(HT40) U-NII-3 Band edge-left side


802.11n(HT40) U-NII-3 Band edge-right side

# 10 6 dB Bandwidth

| | |
|---|---|
| Test Requirement: | FCC CFR47 Part 15 Section 15.407(e) |
| Test Method: | KDB789033 D02 General U-NII Test Procedures New Rules v02r01 Section C |
| Test Limit: | ≥ 500 kHz |
| Test Result: | PASS |

## 10.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

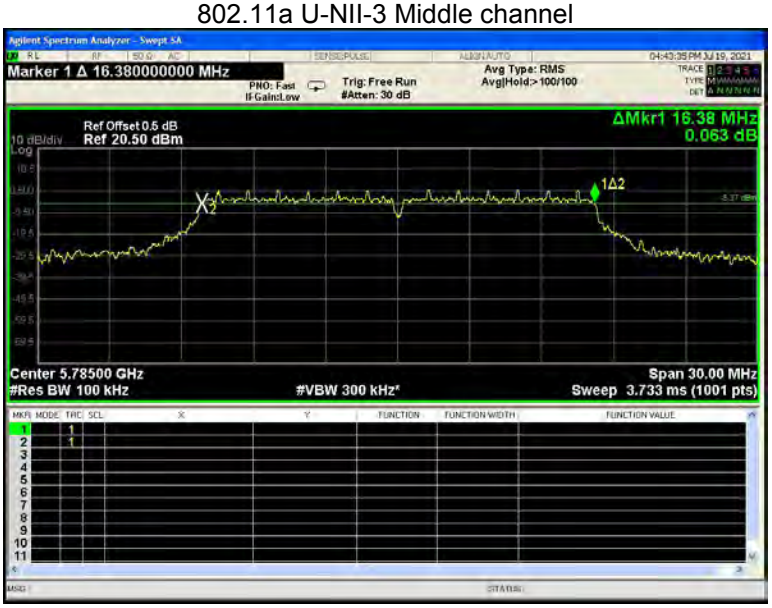
## 10.2 Test Result:

| Band | Operation mode | 6 dB Bandwidth (MHz) | | |
|---|---|---|---|---|
| | | Low | Middle | High |
| U-NII-3 | 802.11a | 16.38 | 16.38 | 16.35 |
| | 802.11n(HT20) | 17.52 | 17.55 | 17.58 |
| | 802.11n(HT40) | 35.94 | / | 36.00 |

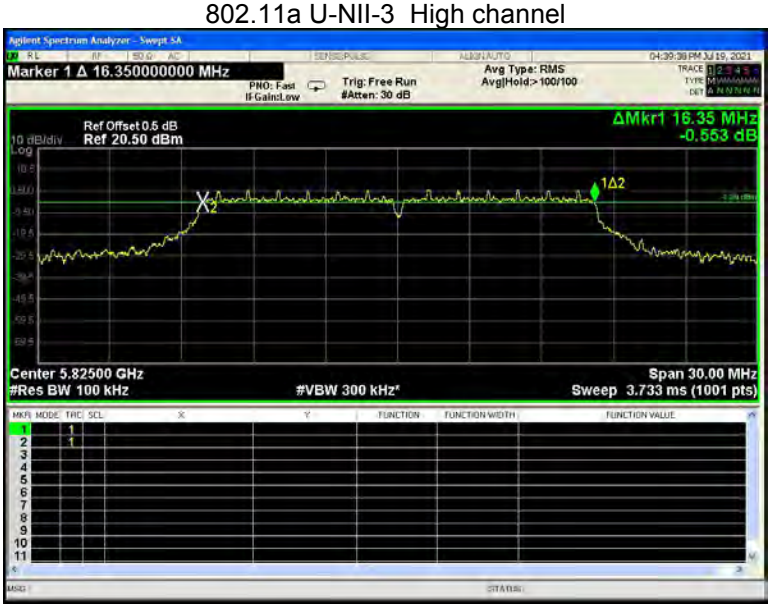
Test result plots shown as follows:

802.11a U-NII-3 Low channel

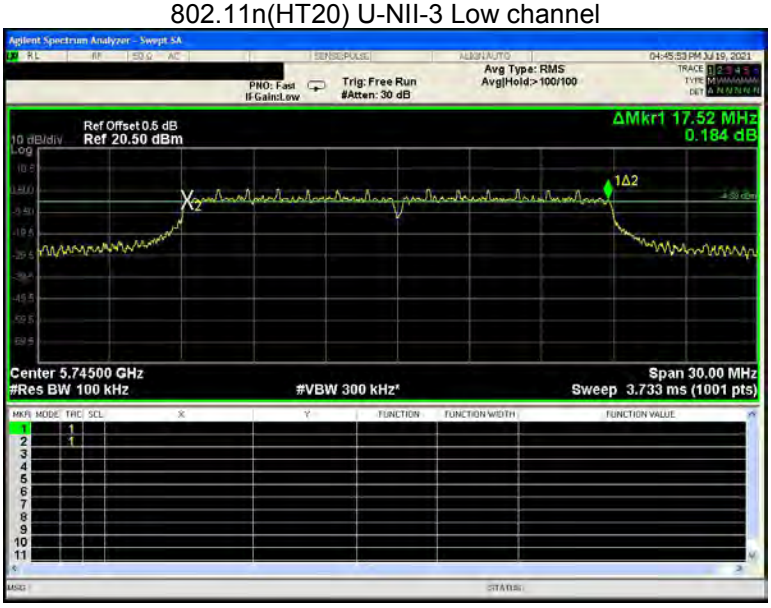

802.11a U-NII-3 Middle channel



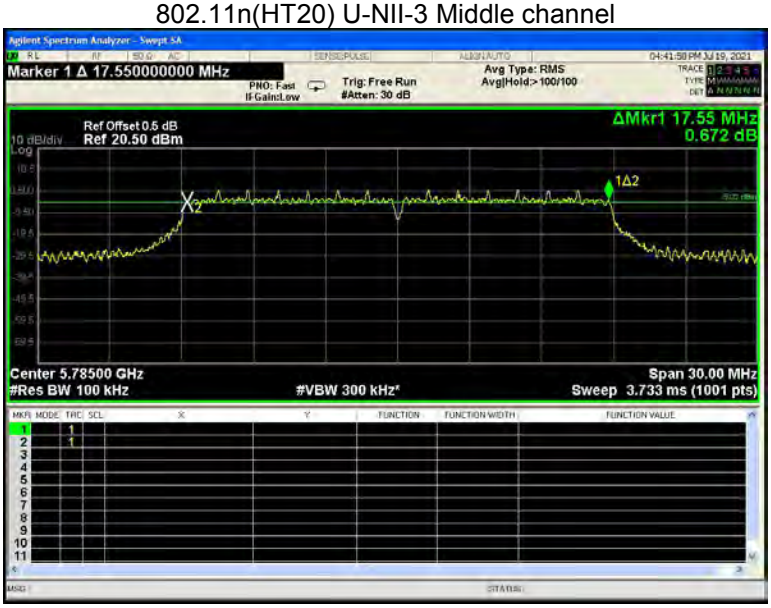
802.11a U-NII-3 High channel



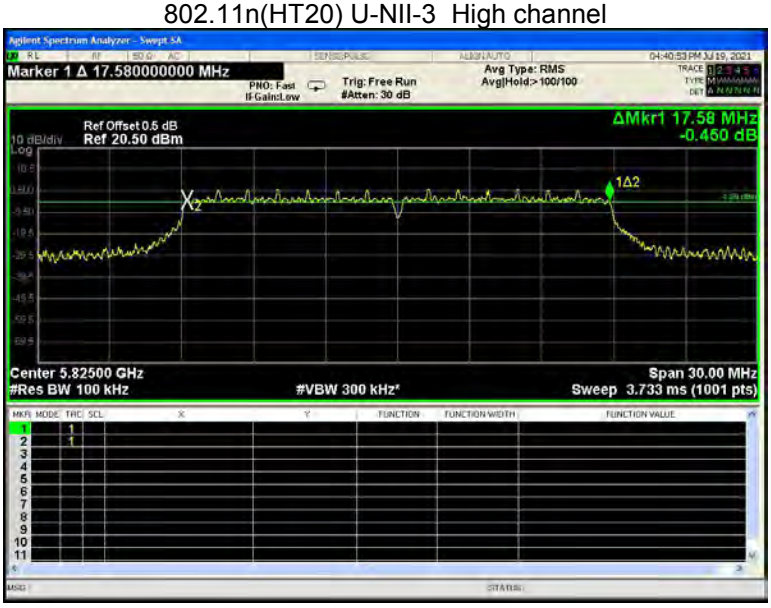

802.11n(HT20) U-NII-3 Low channel



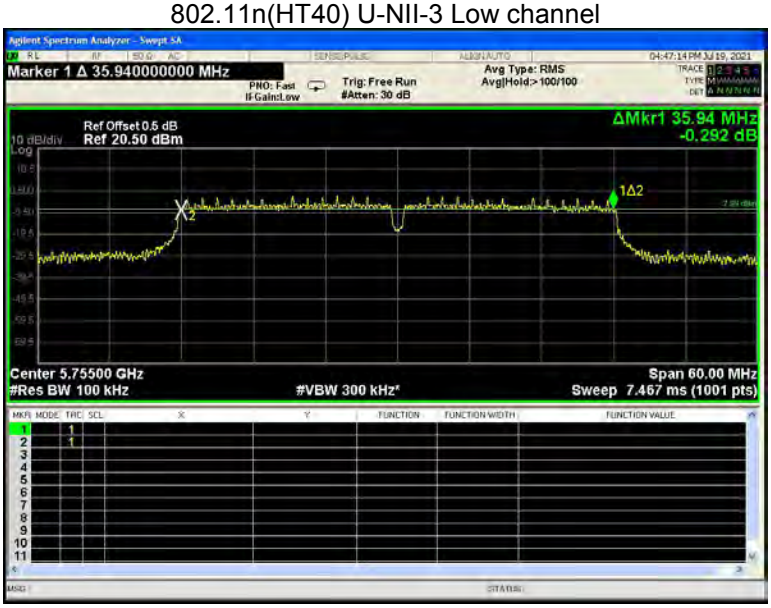
802.11n(HT20) U-NII-3 Middle channel



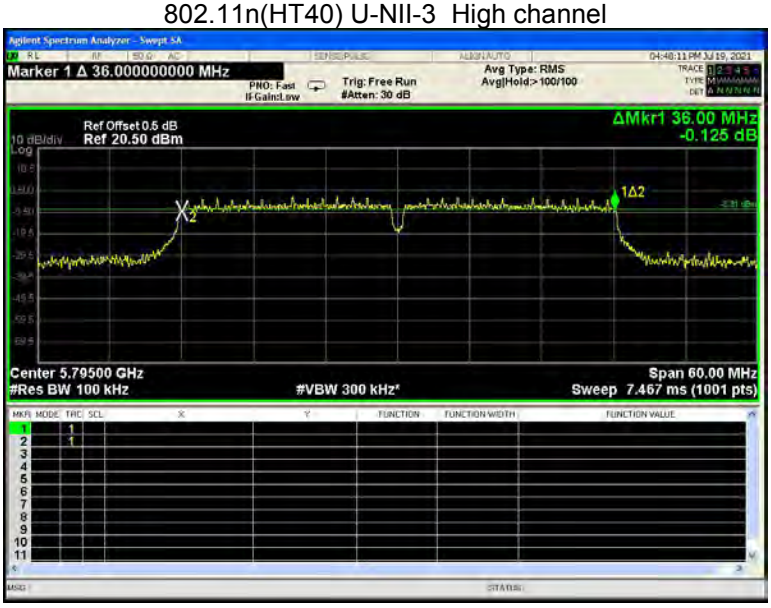

802.11n(HT20) U-NII-3 High channel



802.11n(HT40) U-NII-3 Low channel




802.11n(HT40) U-NII-3 High channel



# 11 26 dB Bandwidth and 99% Occupied Bandwidth

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.407 (a) |
| Test Method: | KDB789033 D02 General U-NII Test Procedures New Rules v02r01 Section D |
| Test Limit: | No restriction limits |
| Test Result: | PASS |

## 11.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: RBW = 1% to 5% of the OBW, VBW = 3x RBW

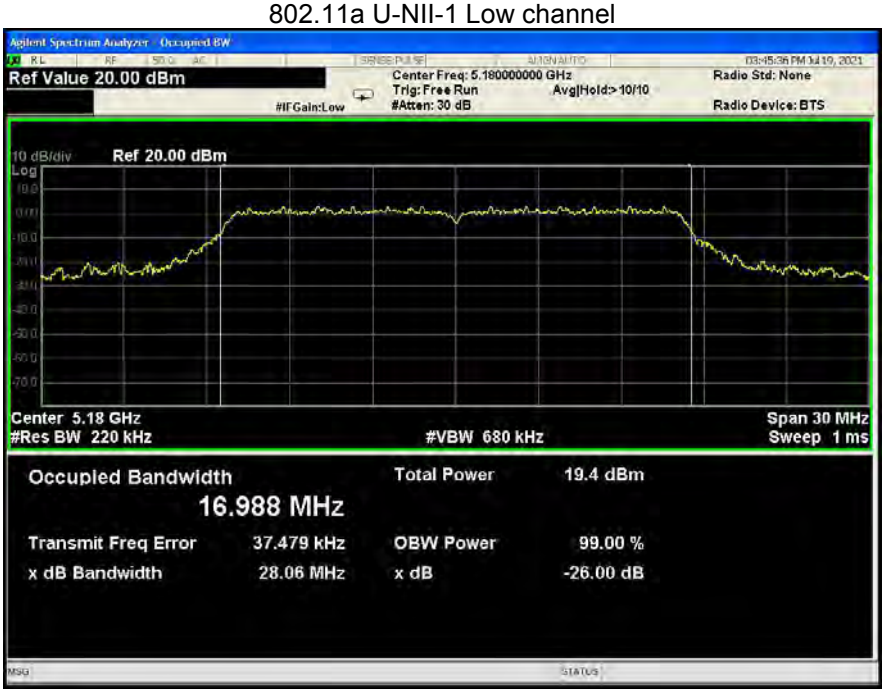
## 11.2 Test Result:

| Band | Operation mode | 26 dB Bandwidth (MHz) | | | 99% Bandwidth (MHz) | | |
|---|---|---|---|---|---|---|---|
| | | Low | Middle | High | Low | Middle | High |
| U-NII-1 | 802.11a | 28.06 | 27.98 | 27.64 | 16.988 | 16.899 | 16.838 |
| | 802.11n(HT20) | 26.42 | 25.79 | 27.18 | 17.931 | 17.915 | 17.909 |
| | 802.11n(HT40) | 50.78 | / | 58.27 | 36.401 | / | 36.455 |

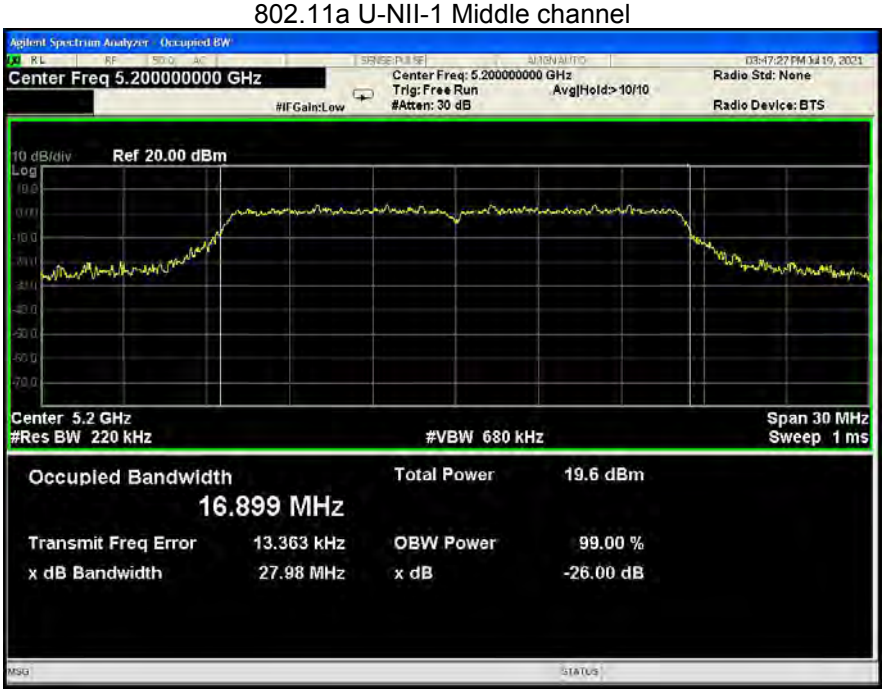
| Band | Operation mode | 26 dB Bandwidth (MHz) | | | 99% Bandwidth (MHz) | | |
|---|---|---|---|---|---|---|---|
| | | Low | Middle | High | Low | Middle | High |
| U-NII-3 | 802.11a | 29.23 | 25.64 | 26.78 | 17.122 | 16.895 | 16.943 |
| | 802.11n(HT20) | 29.67 | 25.42 | 28.03 | 18.003 | 17.906 | 17.904 |
| | 802.11n(HT40) | 59.71 | / | 59.84 | 36.585 | / | 36.453 |

Test result plots shown as follows:

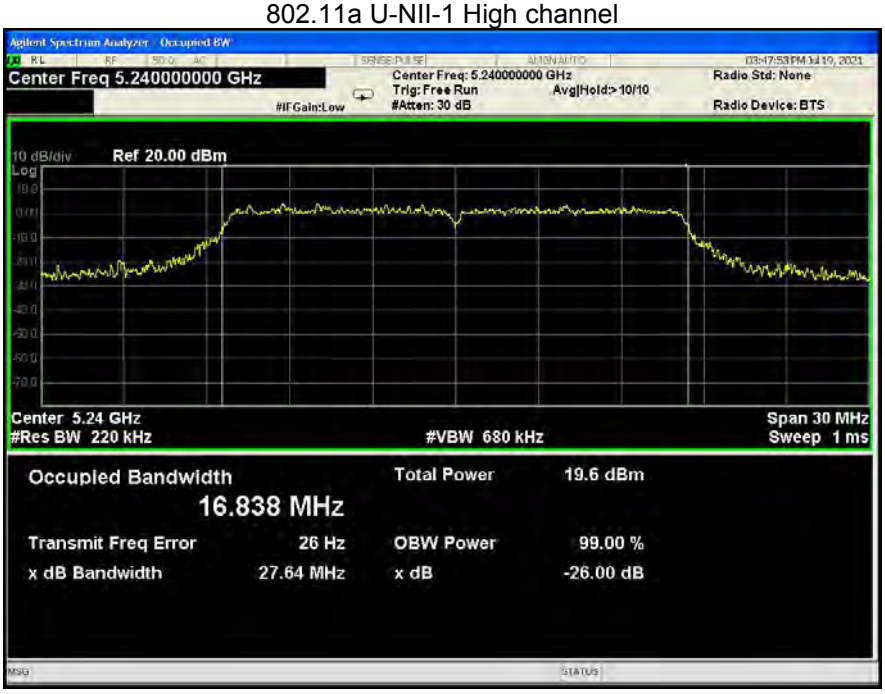
802.11a U-NII-1 Low channel



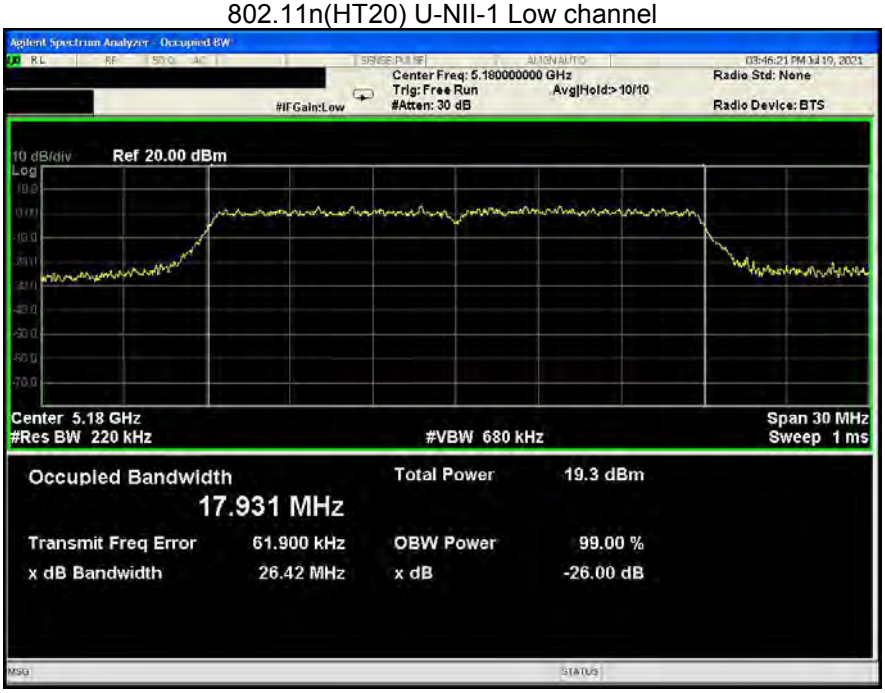

802.11a U-NII-1 Middle channel



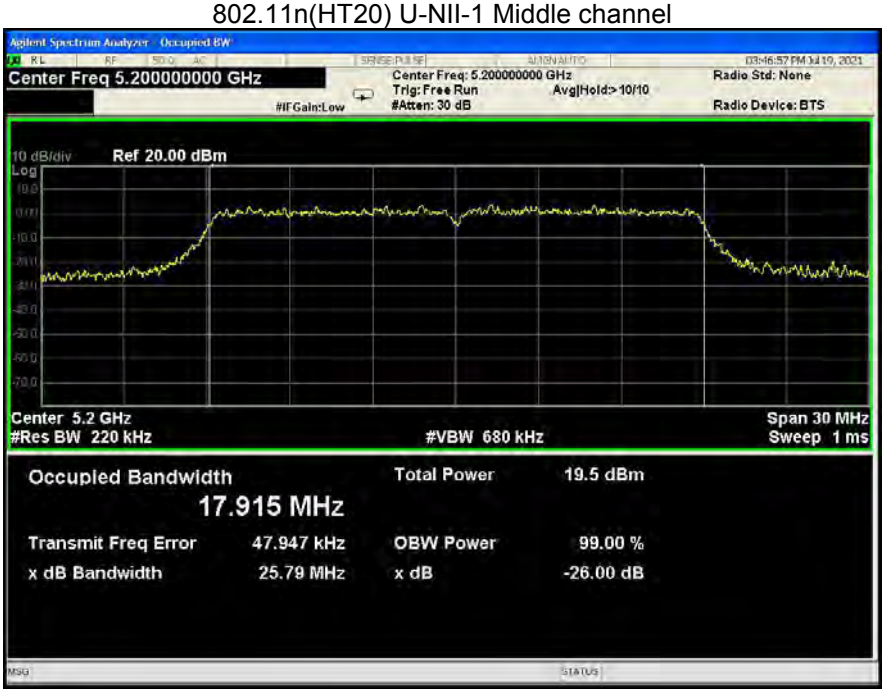
802.11a U-NII-1 High channel



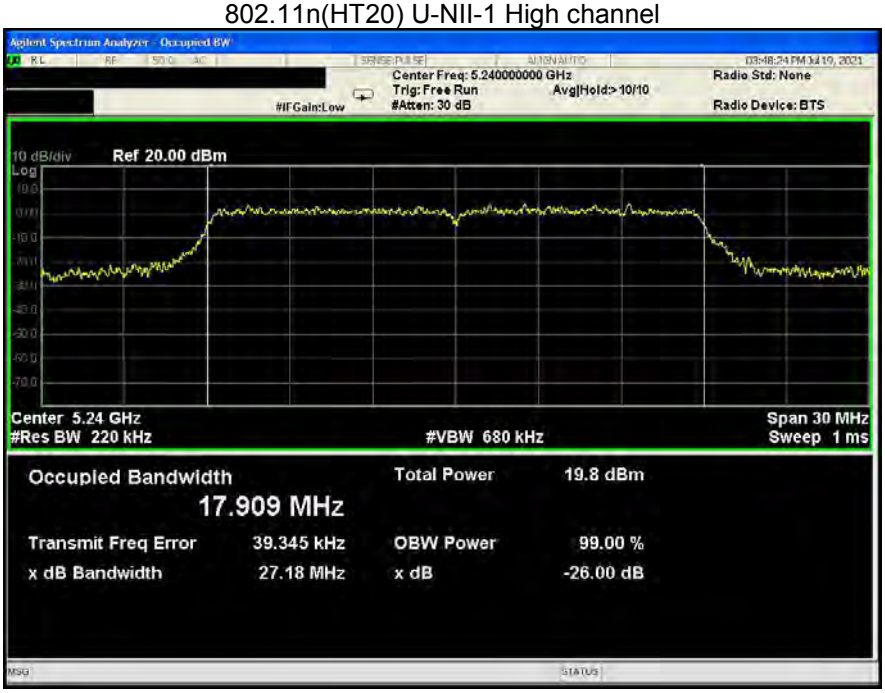

802.11n(HT20) U-NII-1 Low channel



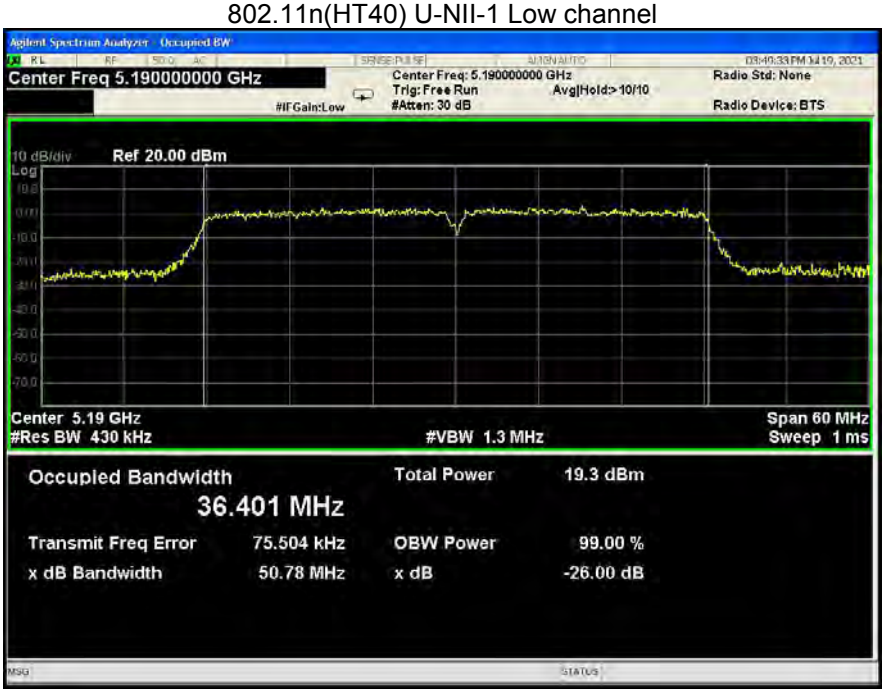
802.11n(HT20) U-NII-1 Middle channel



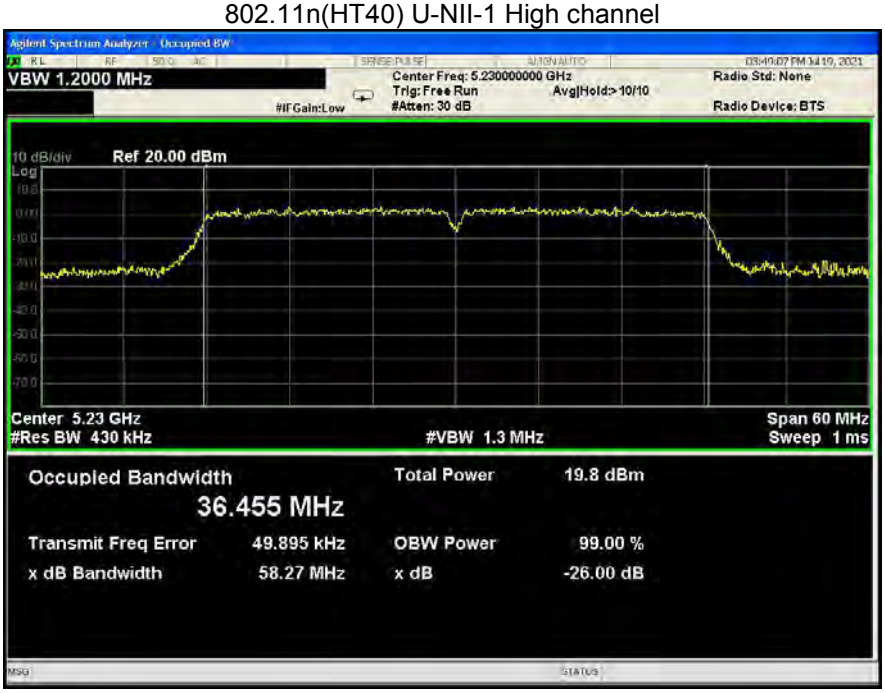

802.11n(HT20) U-NII-1 High channel



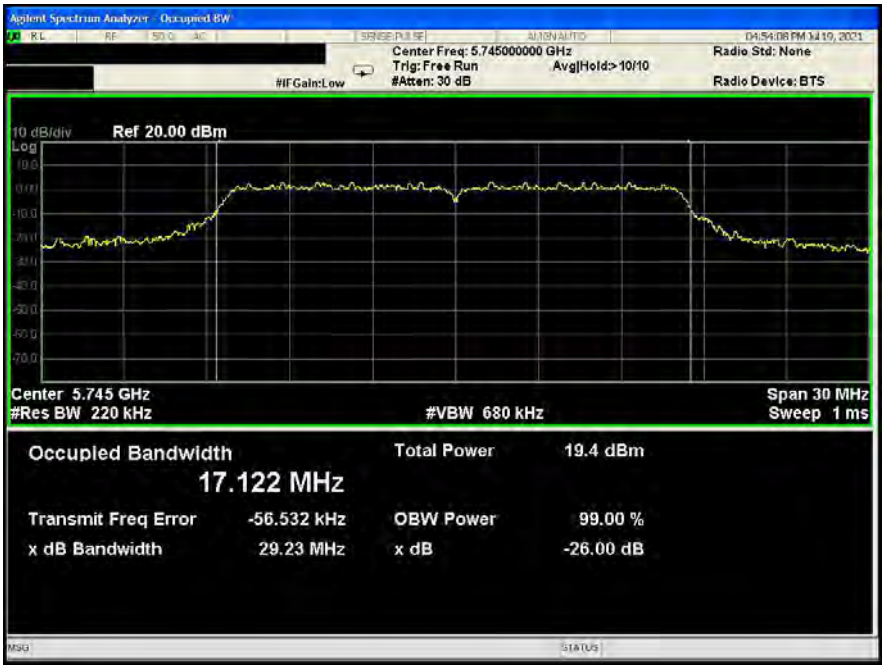
802.11n(HT40) U-NII-1 Low channel



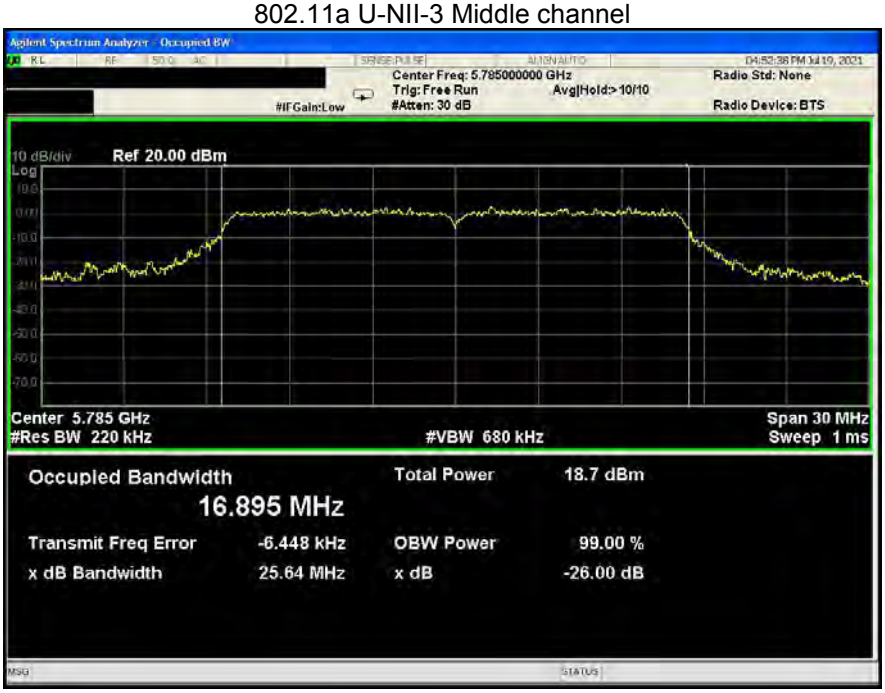
802.11n(HT40) U-NII-1 High channel



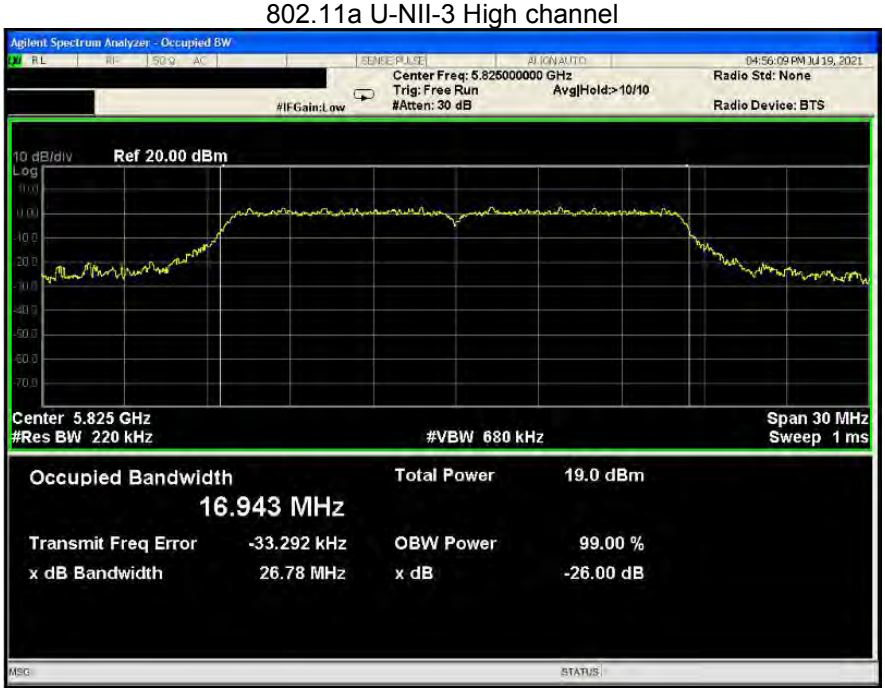

802.11a U-NII-3 Low channel



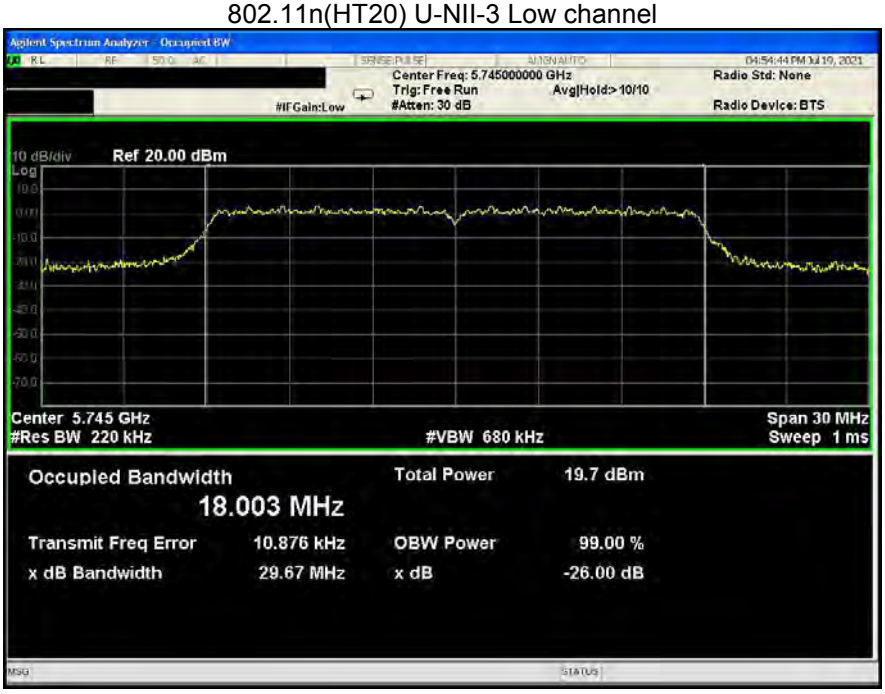
802.11a U-NII-3 Middle channel



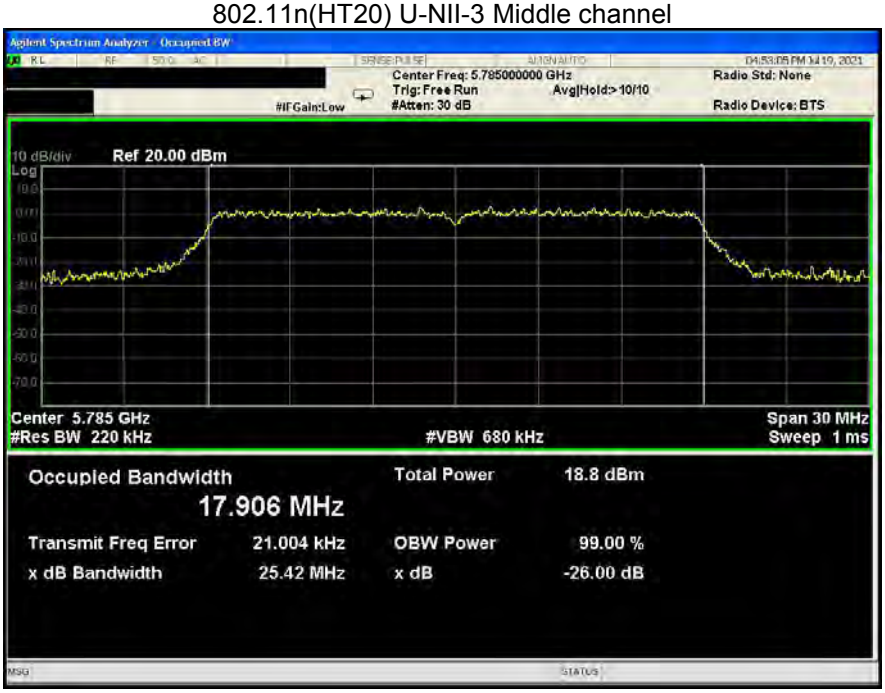

802.11a U-NII-3 High channel



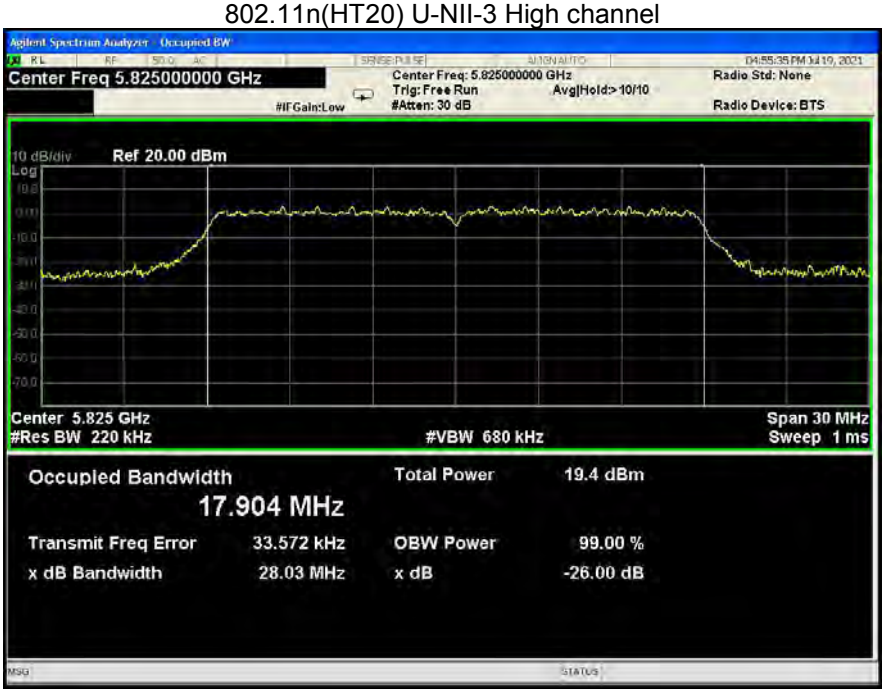
802.11n(HT20) U-NII-3 Low channel



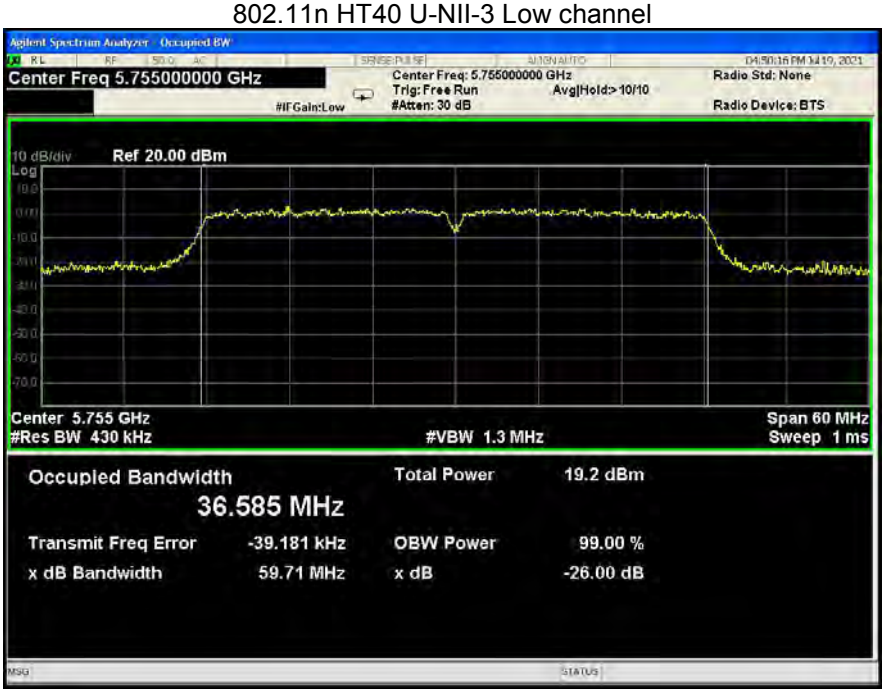

802.11n(HT20) U-NII-3 Middle channel



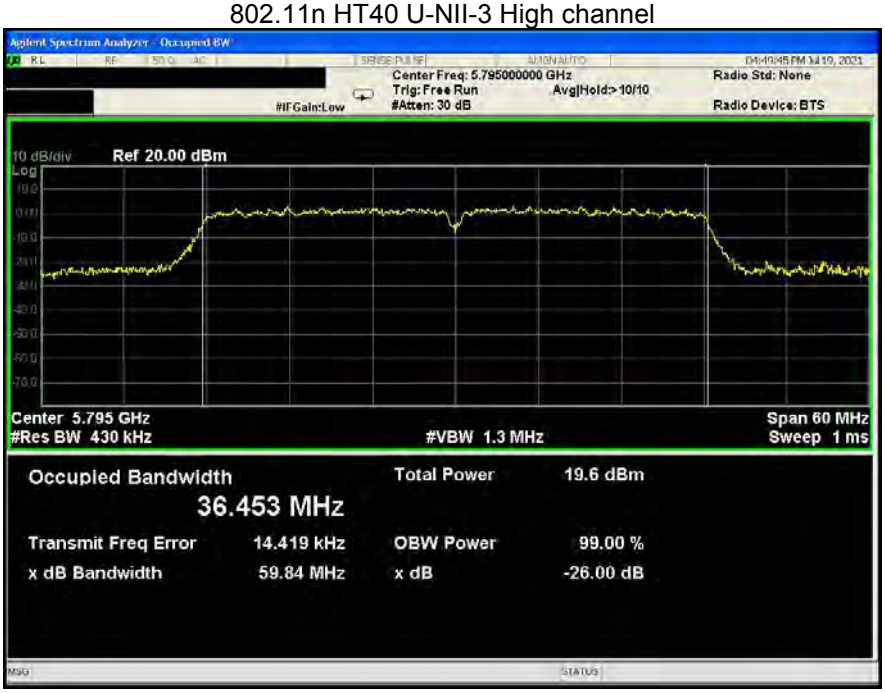
802.11n(HT20) U-NII-3 High channel




802.11n HT40 U-NII-3 Low channel



802.11n HT40 U-NII-3 High channel



# 12 Conducted Output Power

| | |
|---|---|
| Test Requirement: | FCC CFR47 Part 15 Section 15.407(a) |
| Test Method: | KDB789033 D02 General U-NII Test Procedures New Rules v02r01 Section E |
| Test Limit: | U-NII-1 250mW(24dBm)<br>U-NII-3 1W(30dBm) |
| Test Result: | PASS |
| Remark: | Conducted output power= measurement power+10log(1/x)<br>X is duty cycle=1, so 10log(1/1)=0<br>Conducted output power= measurement power<br>where B is the 26 dB emission bandwidth in megahertz |

## 12.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak, Set the span to fully encompass the 99% occupied bandwidth.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

## 12.2 Test Result :

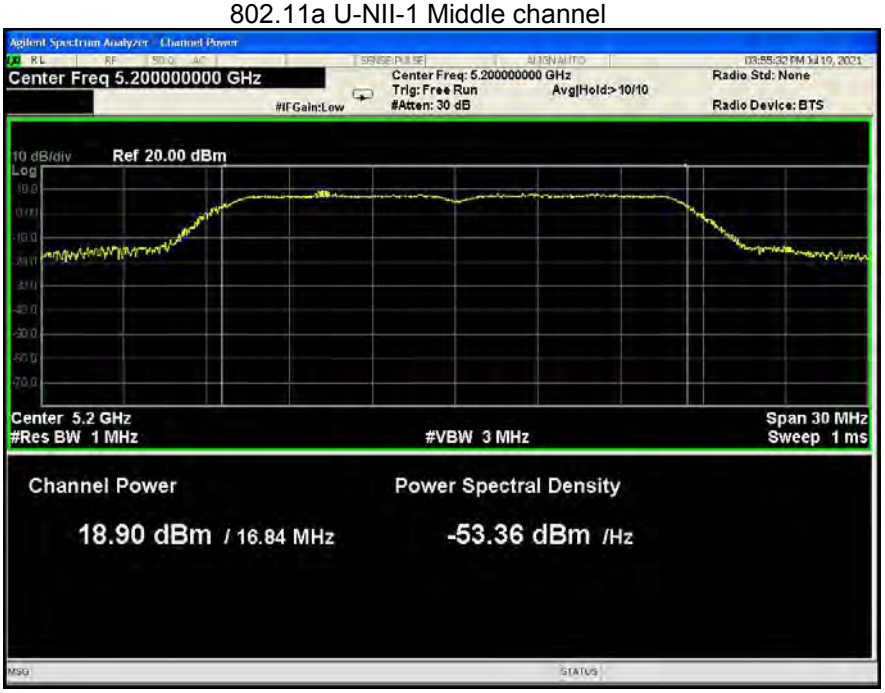
| Band | Operation mode | Conducted Output Power (dBm) | | |
|---|---|---|---|---|
| | | Low channel | Middle channel | High channel |
| U-NII-1 | 802.11a | 18.26 | 18.90 | 19.06 |
| | 802.11n(HT20) | 18.35 | 18.73 | 19.08 |
| | 802.11n(HT40) | 18.86 | / | **19.43** |

| Band | Operation mode | Conducted Output Power (dBm) | | |
|---|---|---|---|---|
| | | Low channel | Middle channel | High channel |
| U-NII-3 | 802.11a | 18.28 | 18.04 | 18.12 |
| | 802.11n(HT20) | 18.05 | 18.05 | 18.12 |
| | 802.11n(HT40) | 18.38 | / | 18.33 |

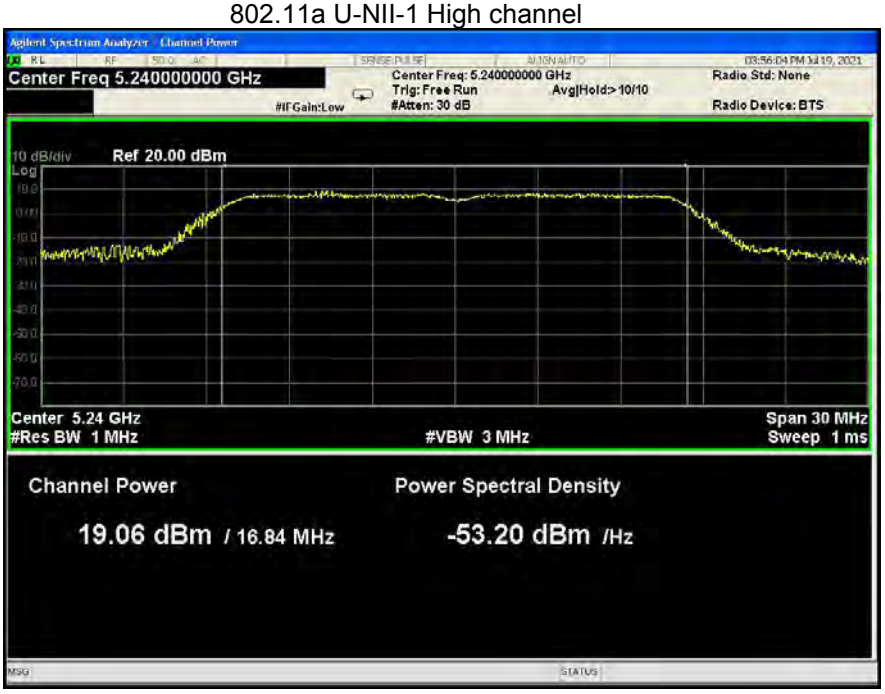
Test result plots shown as follows:

802.11a U-NII-1 Low channel

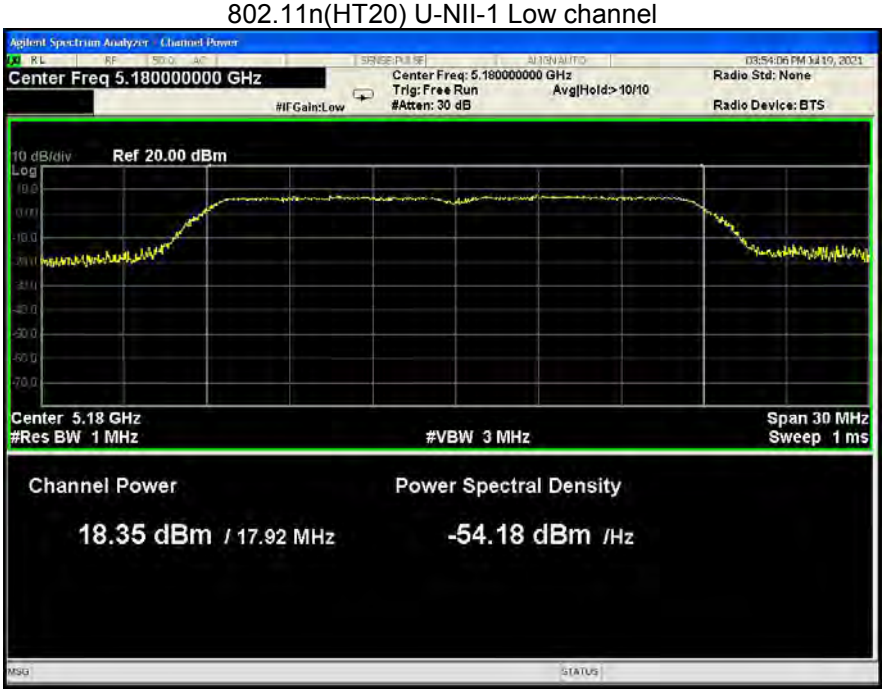

802.11a U-NII-1 Middle channel



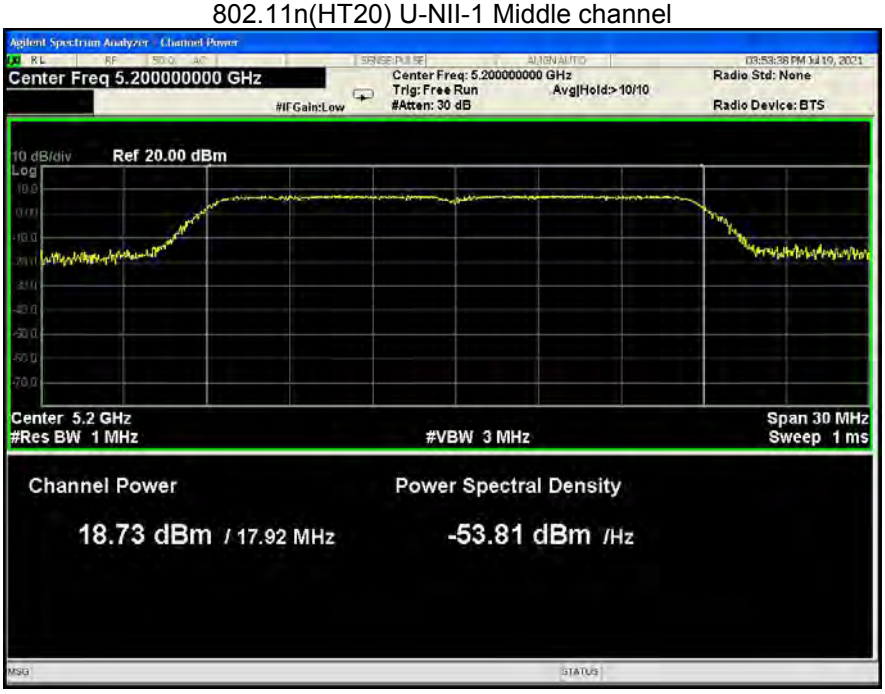
802.11a U-NII-1 High channel



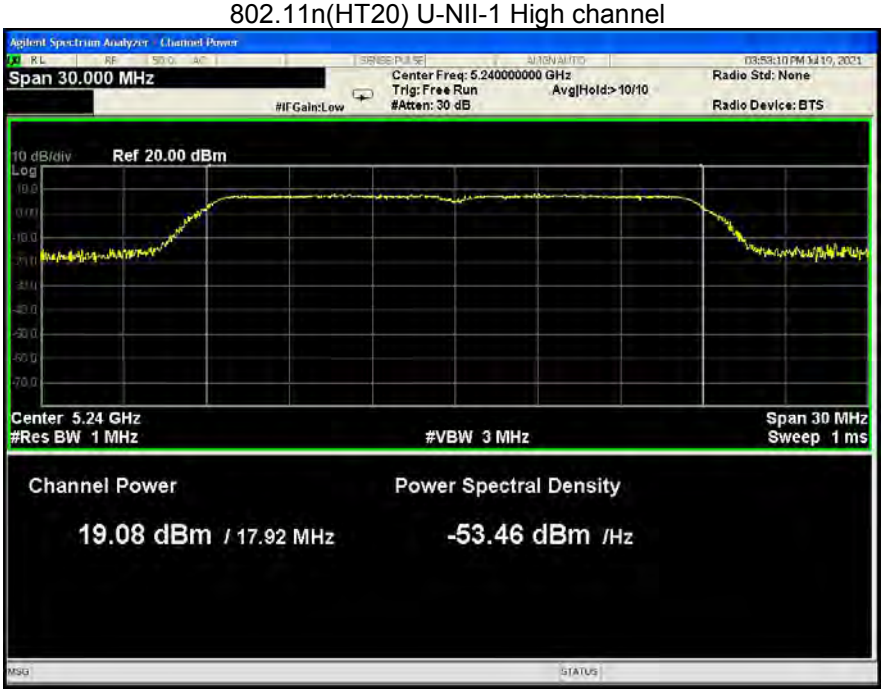

802.11n(HT20) U-NII-1 Low channel



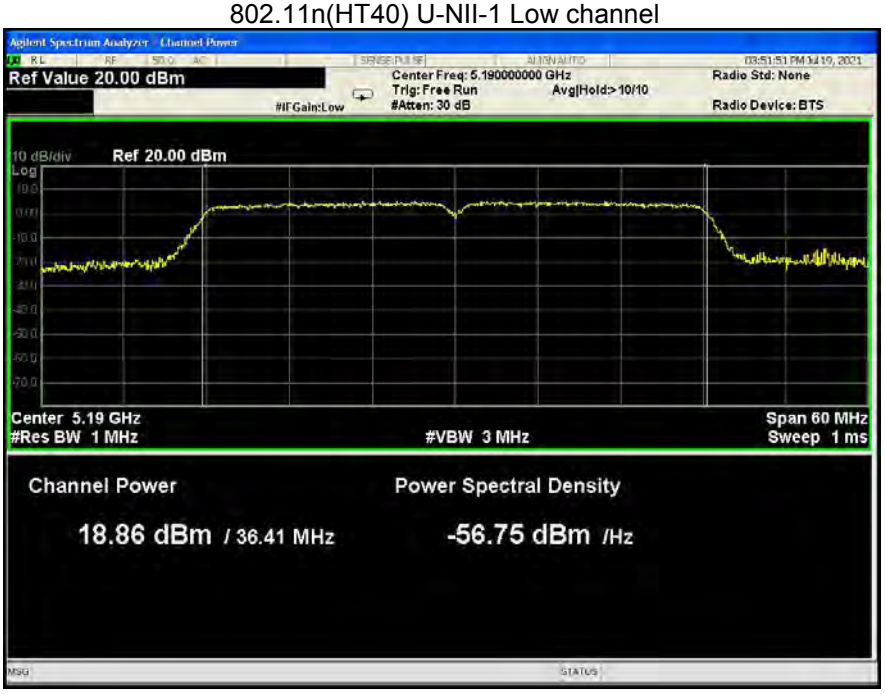
802.11n(HT20) U-NII-1 Middle channel



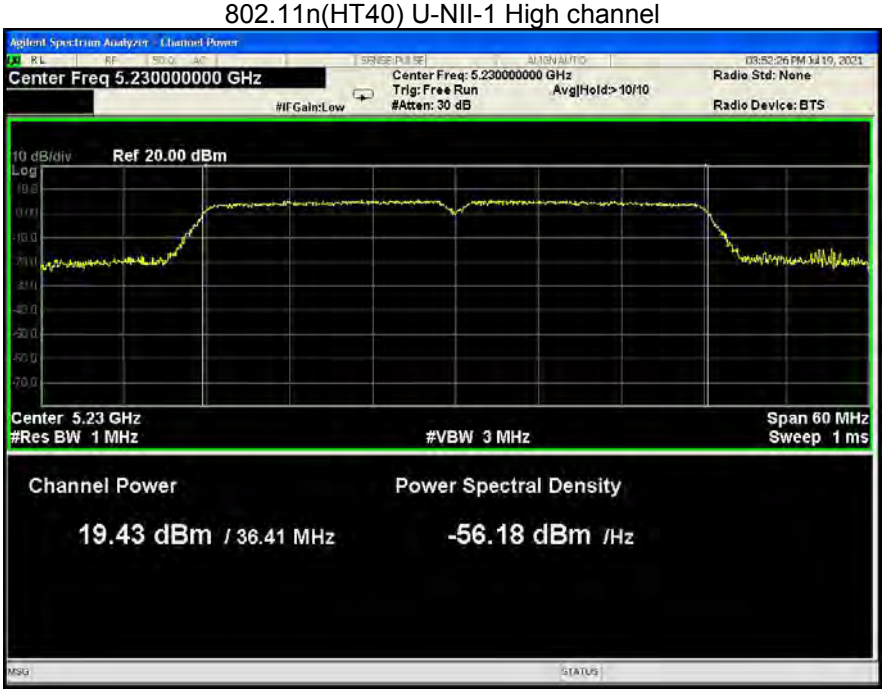

802.11n(HT20) U-NII-1 High channel



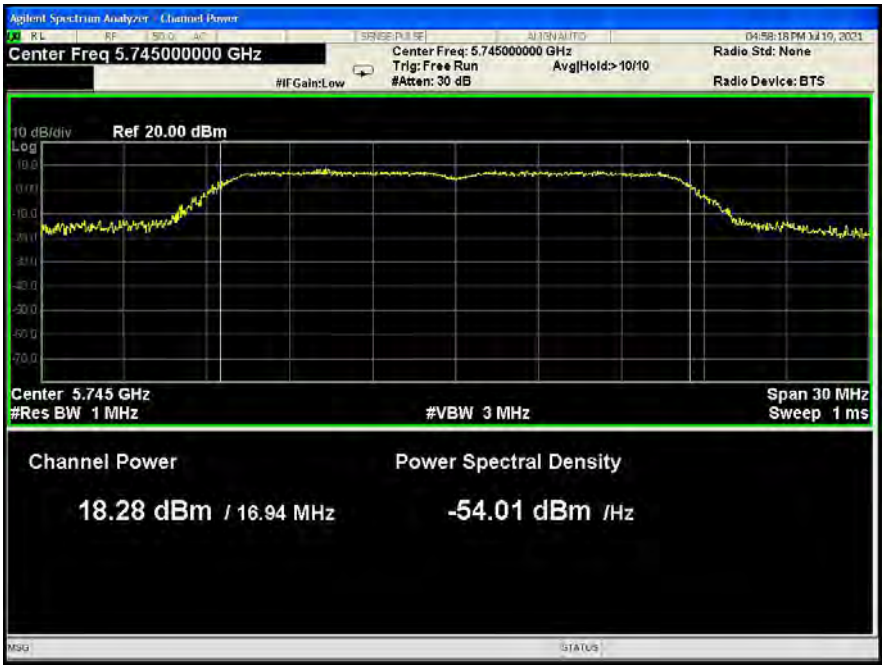
802.11n(HT40) U-NII-1 Low channel



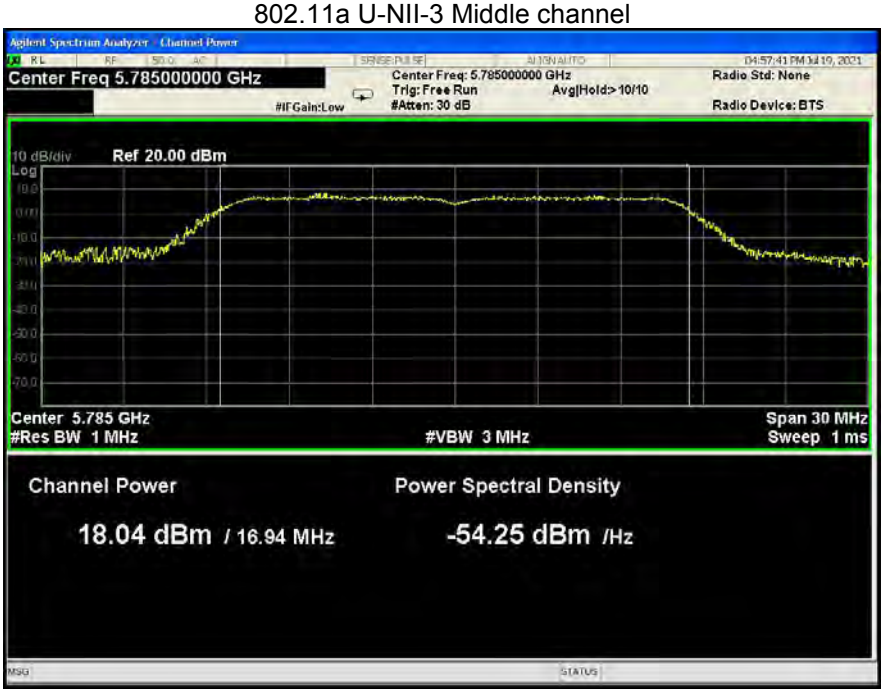

802.11n(HT40) U-NII-1 High channel



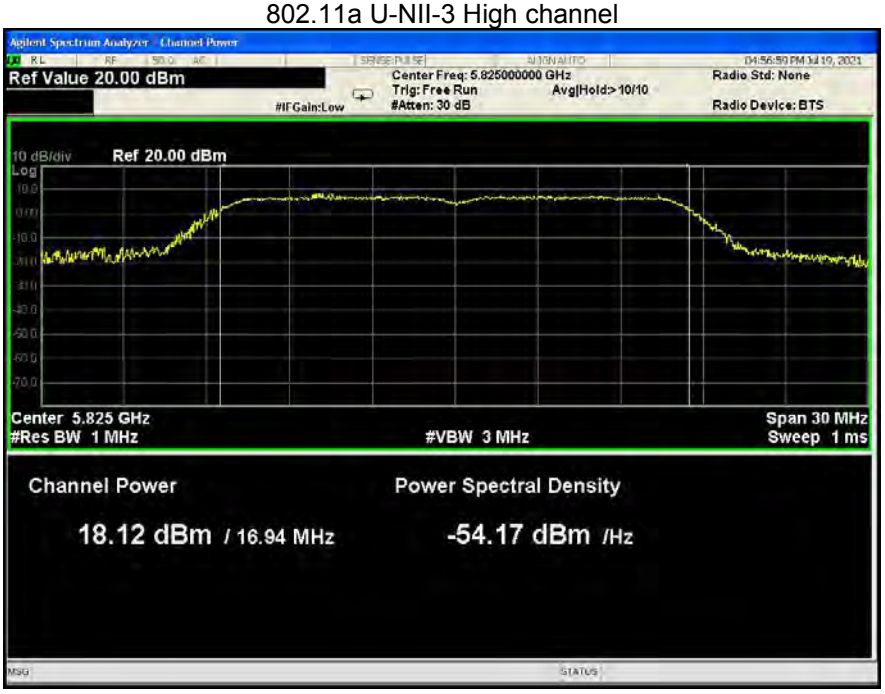
802.11a U-NII-3 Low channel



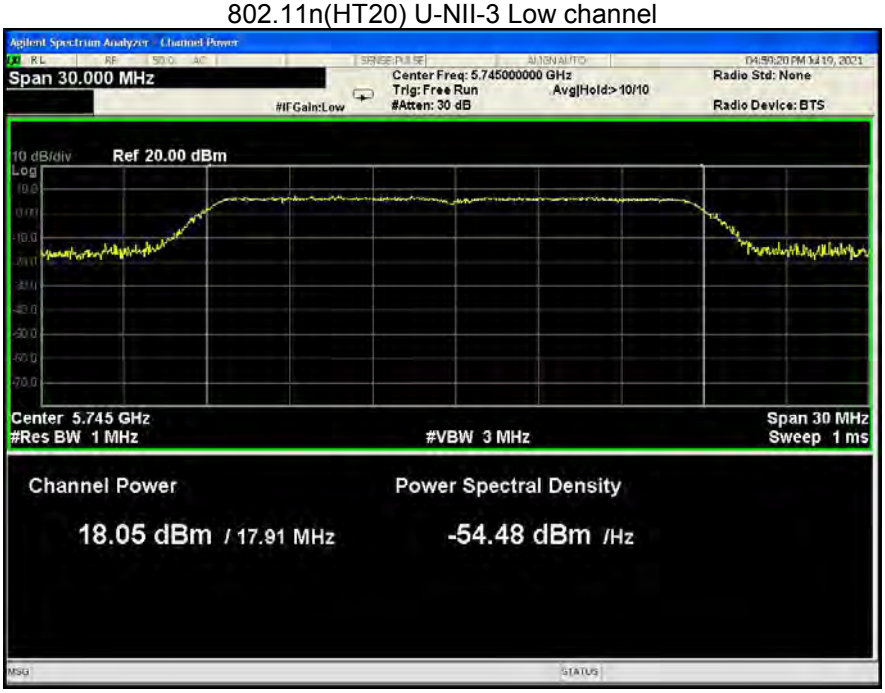

802.11a U-NII-3 Middle channel



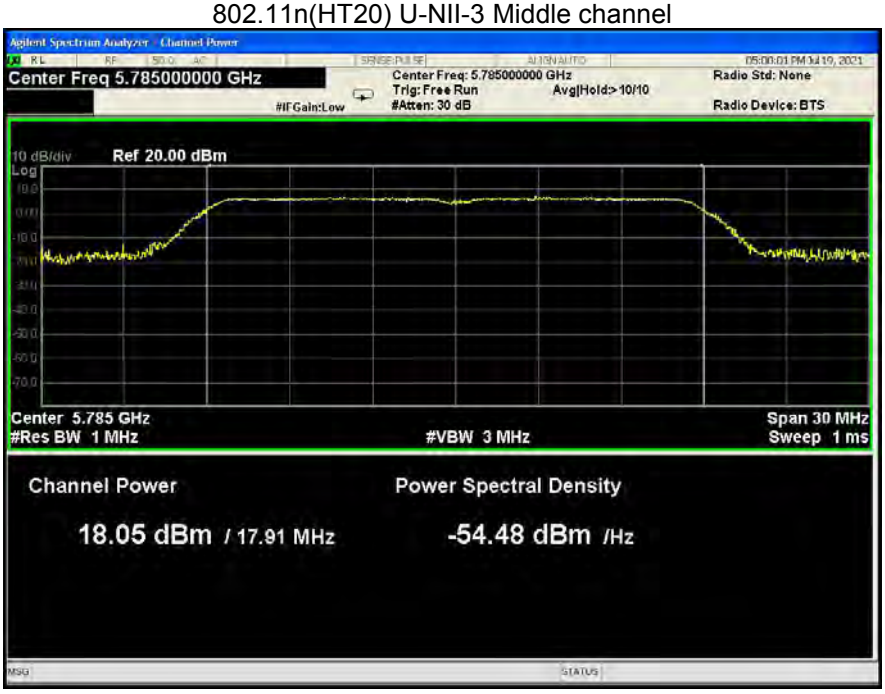
802.11a U-NII-3 High channel



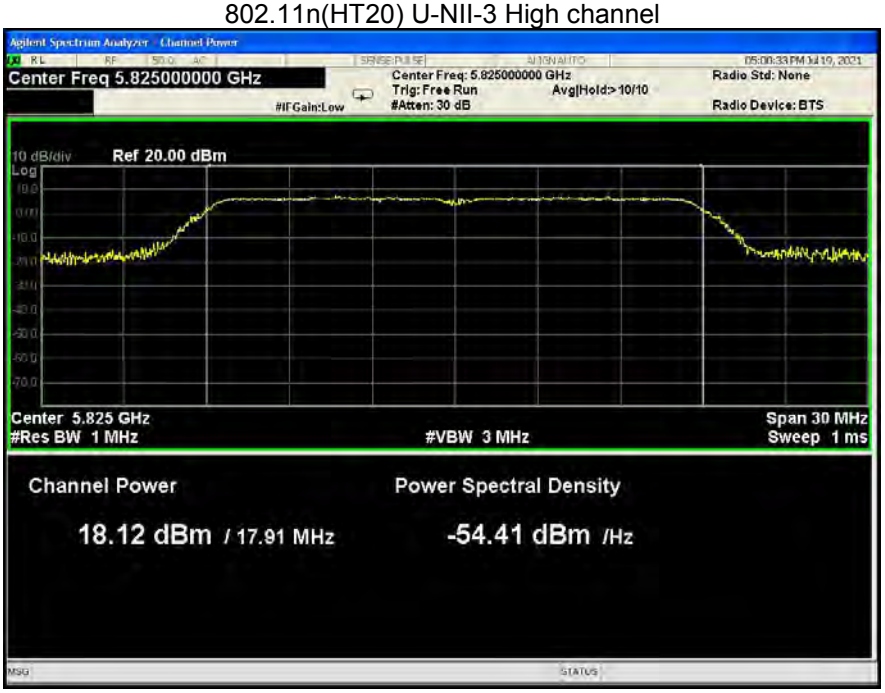

802.11n(HT20) U-NII-3 Low channel



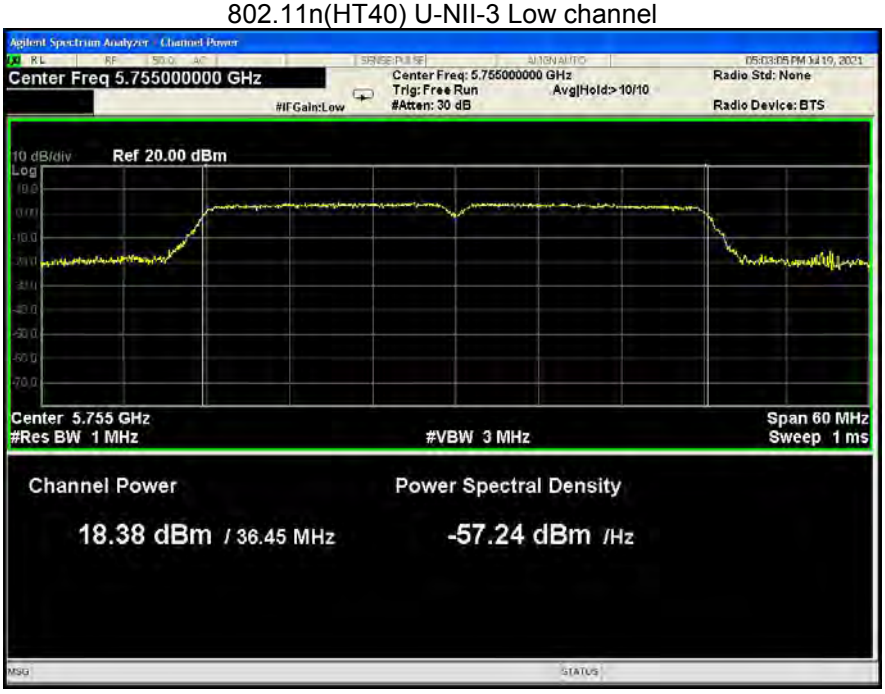
802.11n(HT20) U-NII-3 Middle channel



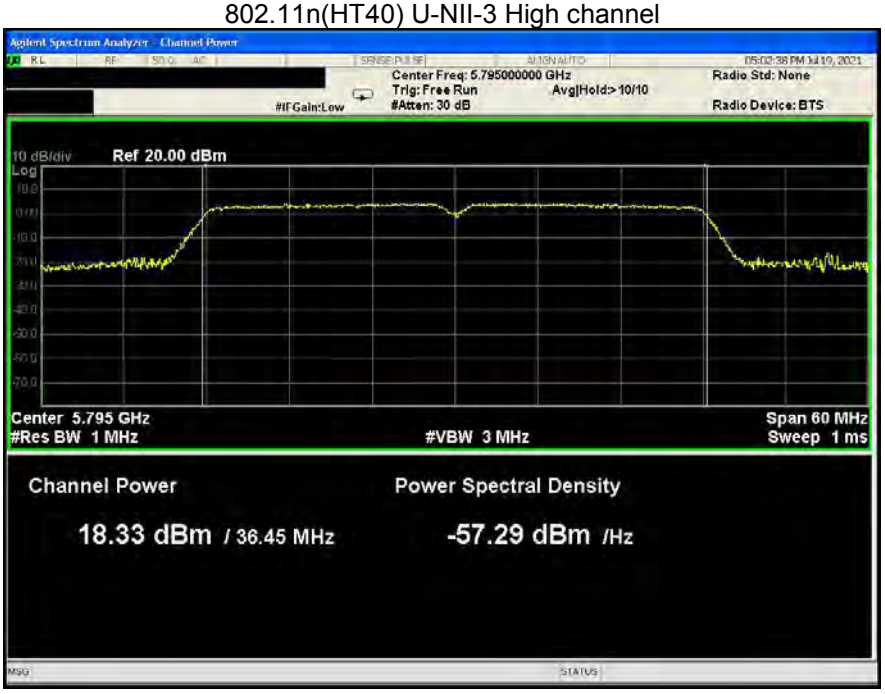

802.11n(HT20) U-NII-3 High channel



802.11n(HT40) U-NII-3 Low channel




802.11n(HT40) U-NII-3 High channel



# 13 Power Spectral density

| | |
|---|---|
| Test Requirement: | FCC CFR47 Part 15 Section 15.407(a) |
| Test Method: | KDB789033 D02 General U-NII Test Procedures New Rules v02r01, Section F |
| Test Limit: | ≤11.00dBm/MHz for Operation in the U-NII-1(5150MHz-5250MHz)of mobile device<br>≤30.00dBm/500KHz for Operation in the U-NII-3(5725MHz-5850MHz)of device |
| Test Result: | PASS |

## 13.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer:

U-NII-1

RBW = 1MHz, VBW ⩾3* RBW Sweep = auto; Detector Function = Peak. Trace = Max hold.

U-NII-3

RBW = 510KHz, VBW ⩾3* RBW Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

## 13.2 Test Result:

| Band | Operation mode | Power Spectral Density (dBm/MHz) | | |
|---|---|---|---|---|
| | | Low | Middle | High |
| U-NII-1 | 802.11a | 9.045 | 9.292 | 9.174 |
| | 802.11n(HT20) | 7.611 | 7.321 | 8.214 |
| | 802.11n(HT40) | 5.302 | / | 5.720 |
| | Limit | ≤11.00dBm/MHz | | |

| Band | Operation mode | Power Spectral Density (dBm/0.5MHz) | | |
|---|---|---|---|---|
| | | Low | Middle | High |
| U-NII-3 | 802.11a | 5.576 | 5.328 | 5.467 |
| | 802.11n(HT20) | 4.984 | 5.022 | 5.056 |
| | 802.11n(HT40) | 2.537 | / | 2.779 |
| | Limit | ≤30.00dBm/0.5MHz | | |

Test result plots shown as follows:

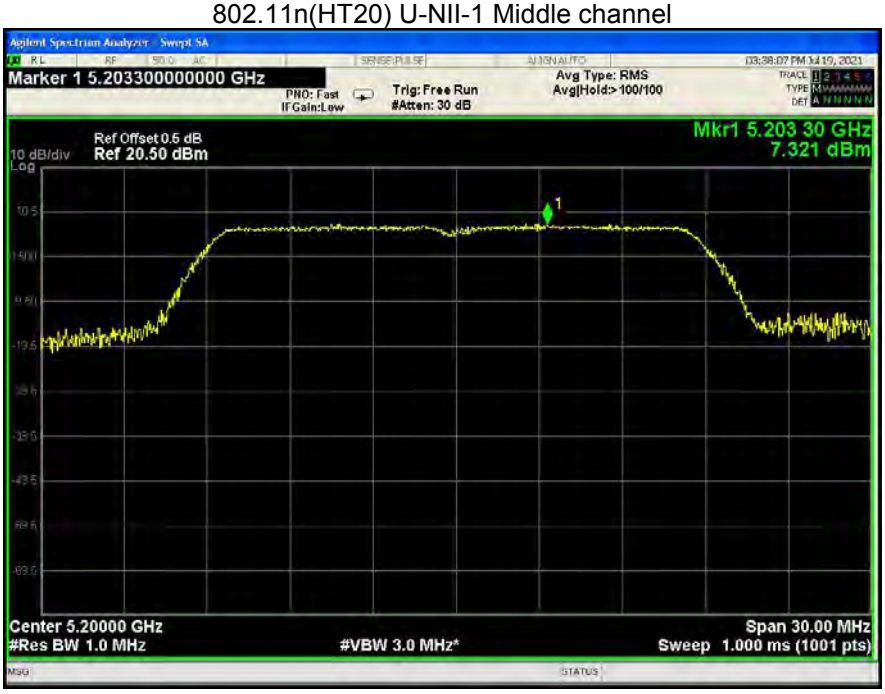
802.11a U-NII-1 Low channel


802.11a U-NII-1 Middle channel

802.11a U-NII-1 High channel

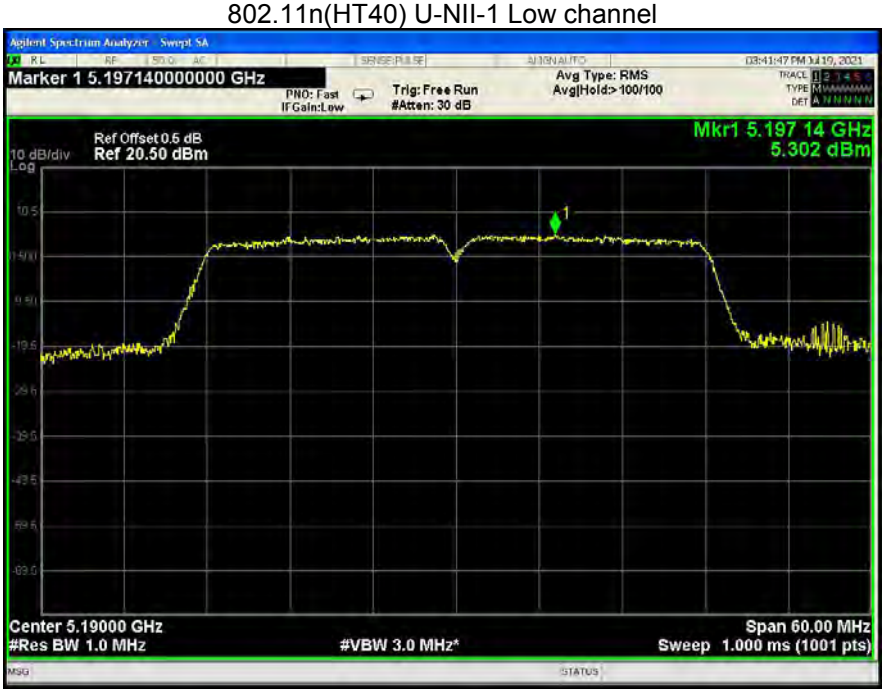

802.11n(HT20) U-NII-1 Low channel

802.11n(HT20) U-NII-1 Middle channel



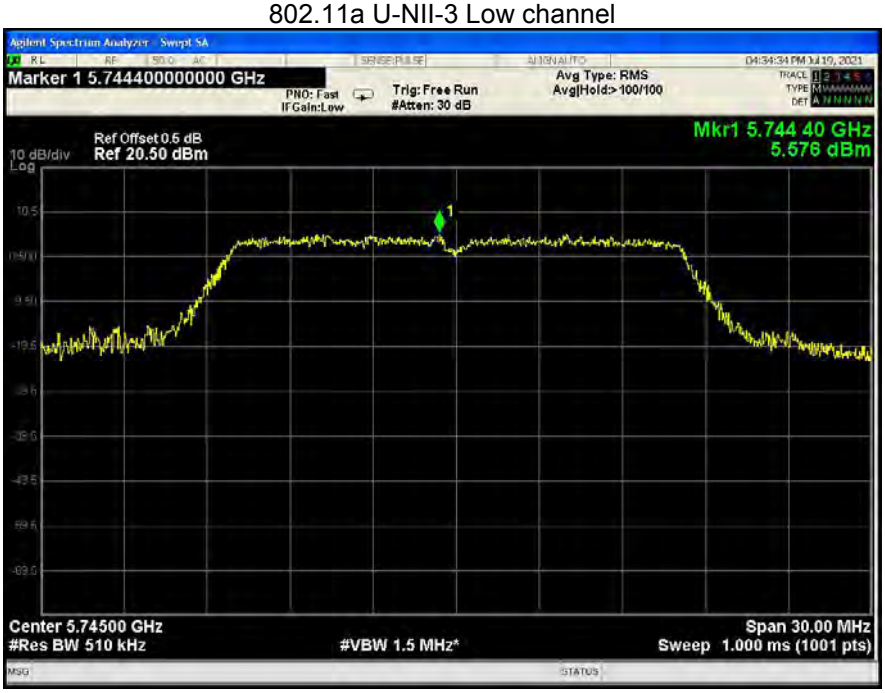

802.11n(HT20) U-NII-1 High channel

802.11n(HT40) U-NII-1 Low channel

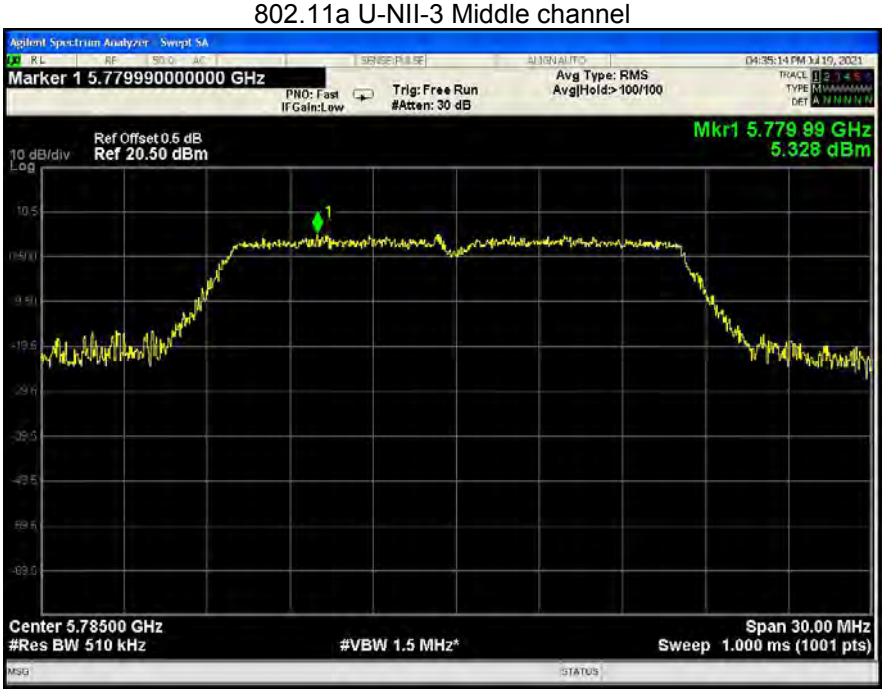



802.11n(HT40) U-NII-1 High channel

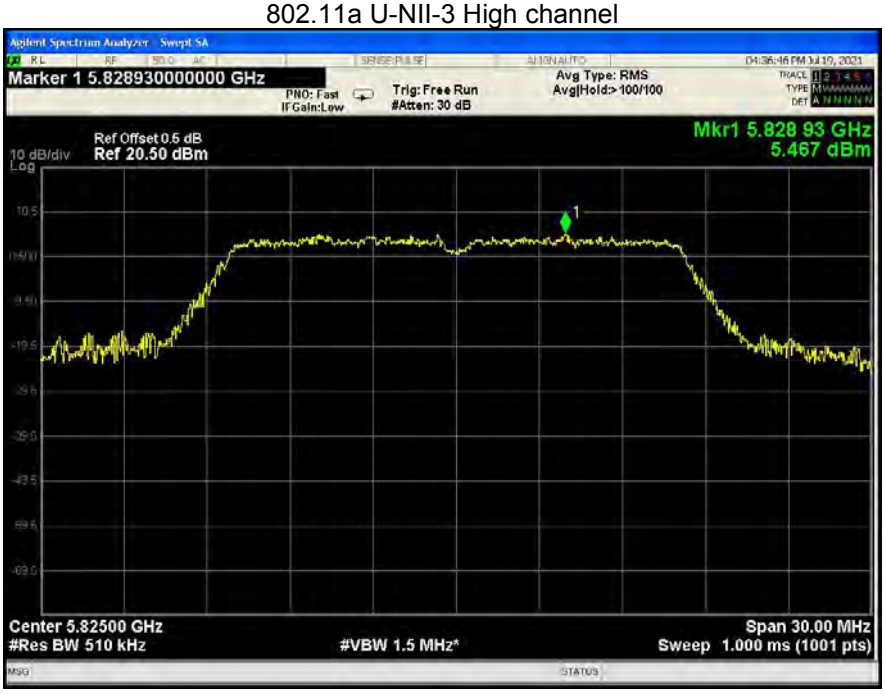
802.11a U-NII-3 Low channel



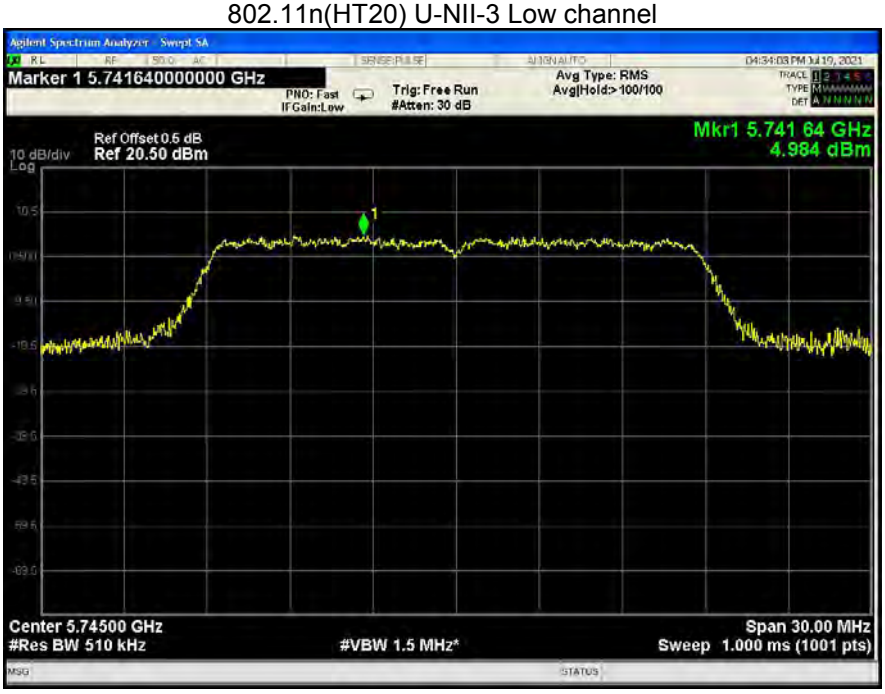

802.11a U-NII-3 Middle channel



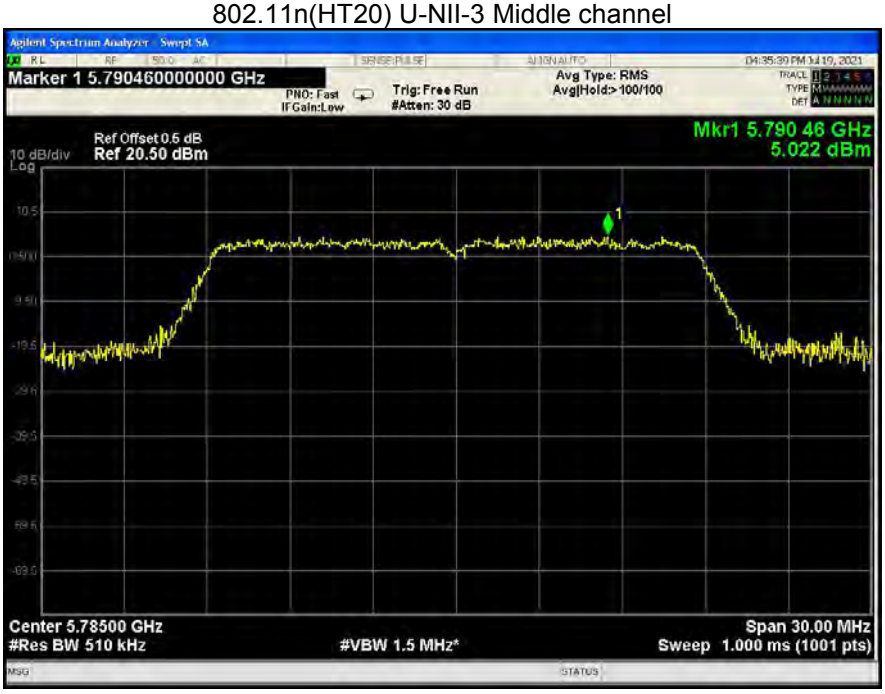
802.11a U-NII-3 High channel



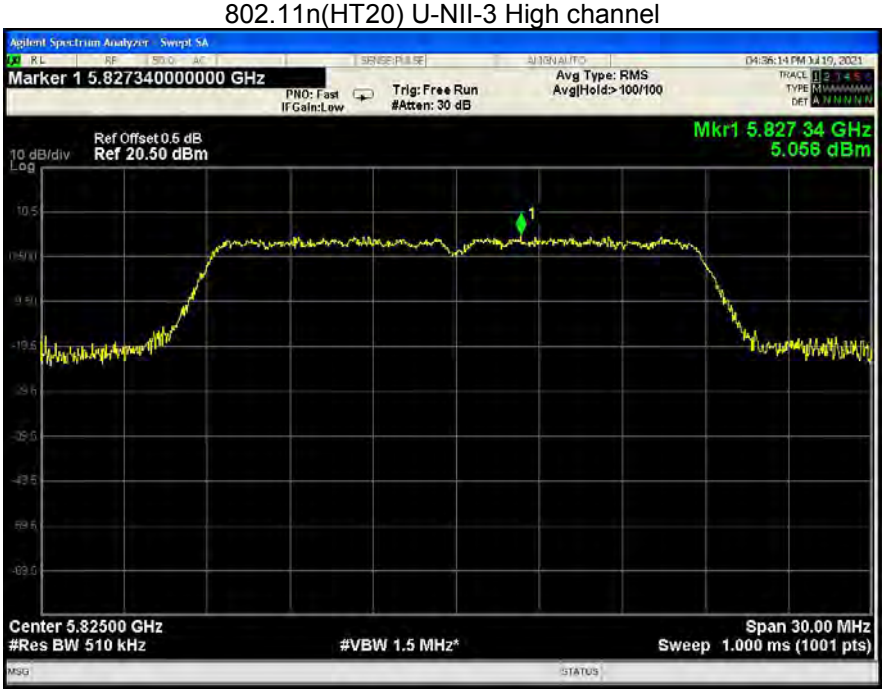

802.11n(HT20) U-NII-3 Low channel



802.11n(HT20) U-NII-3 Middle channel

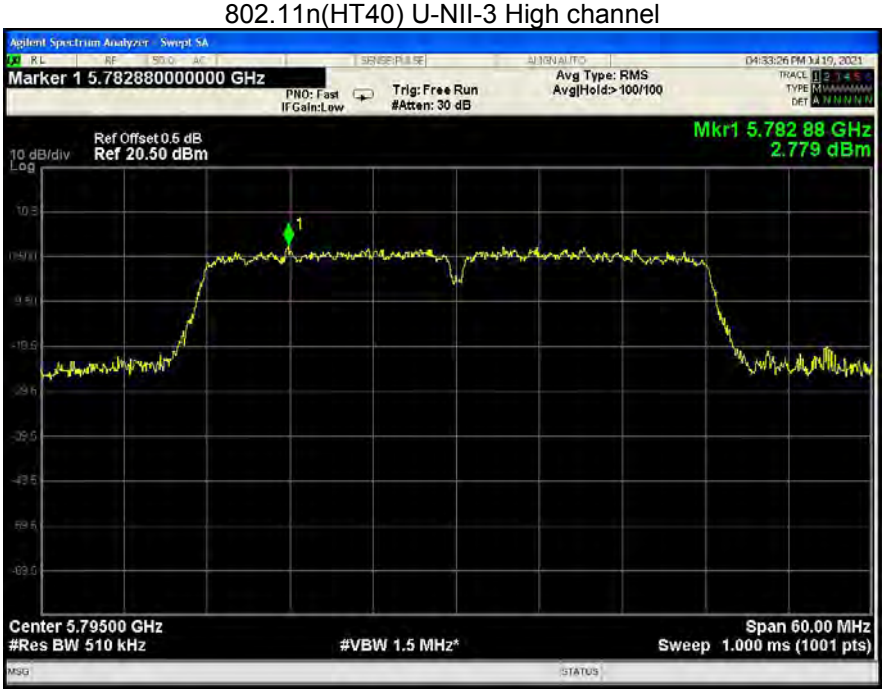



802.11n(HT20) U-NII-3 High channel



802.11n(HT40) U-NII-3 Low channel


802.11n(HT40) U-NII-3 High channel



# 14 Frequency Stability

| | |
|---|---|
| Test Requirement: | FCC CFR47 Part 15 Section 15.407(g) |
| Test Method: | ANSI C63.10:2013 |
| Test Limit: | Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual or 20ppm. |
| Test Result: | PASS |

# 15 Antenna 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

This device uses of one antennas that uses a specified coupling to the intentional radiator. Antenna connectors complied with the requirement.

# 16 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix- YG001-Photos.

======End of Report======