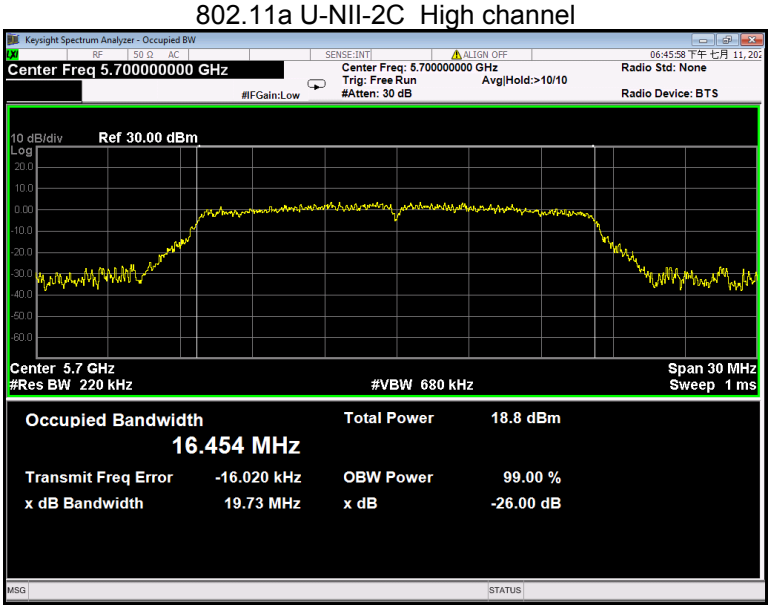
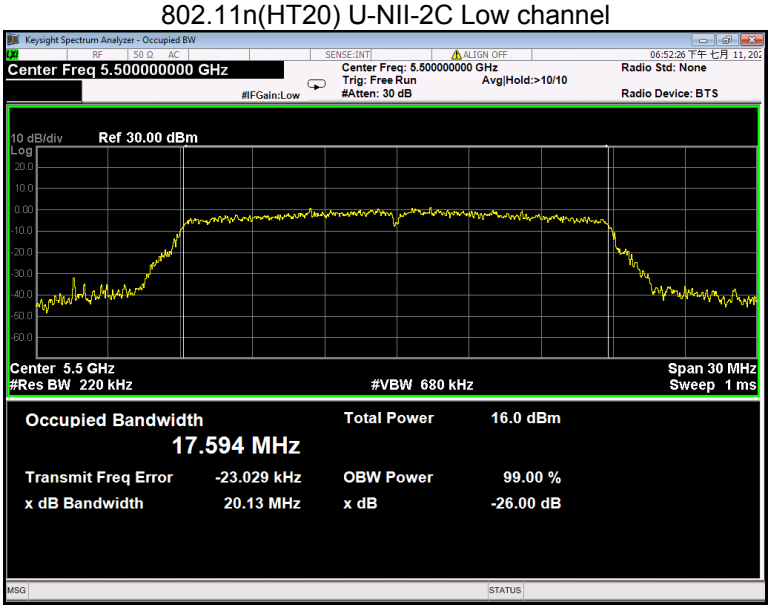
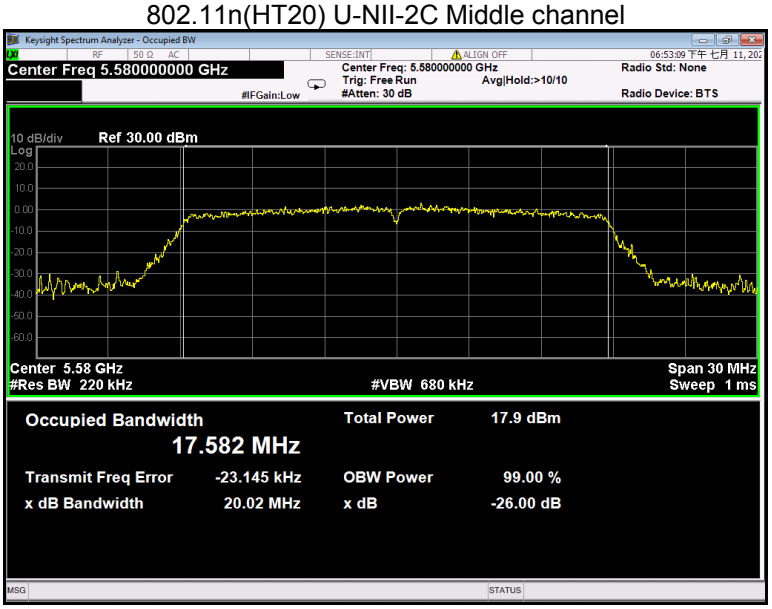
802.11a U-NII-2C High channel



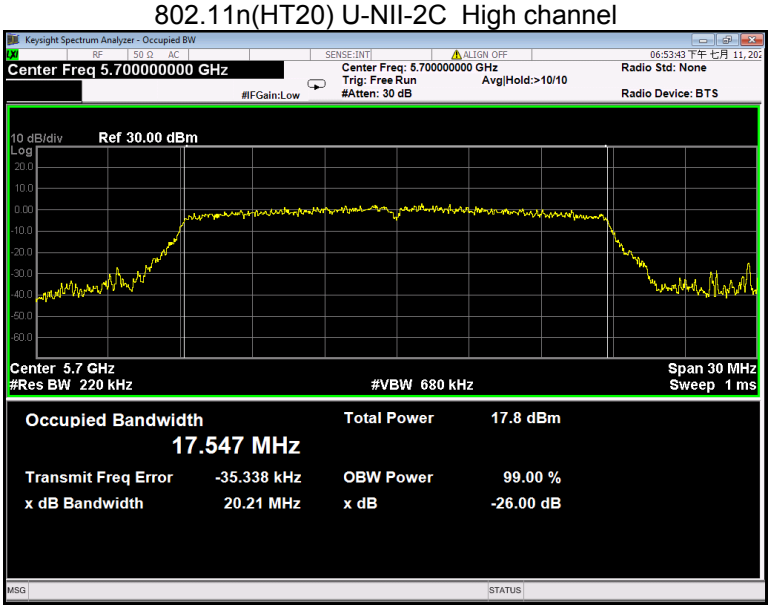

802.11n(HT20) U-NII-2C Low channel



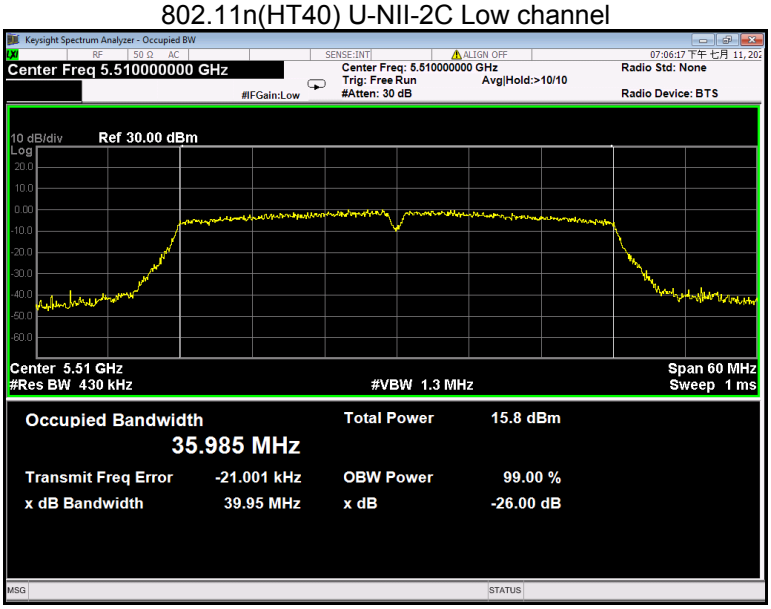
802.11n(HT20) U-NII-2C Middle channel



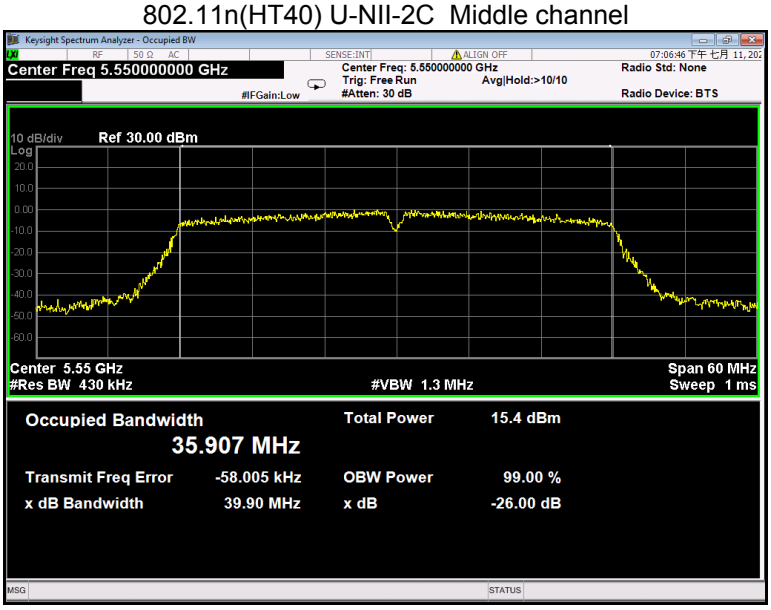

802.11n(HT20) U-NII-2C High channel



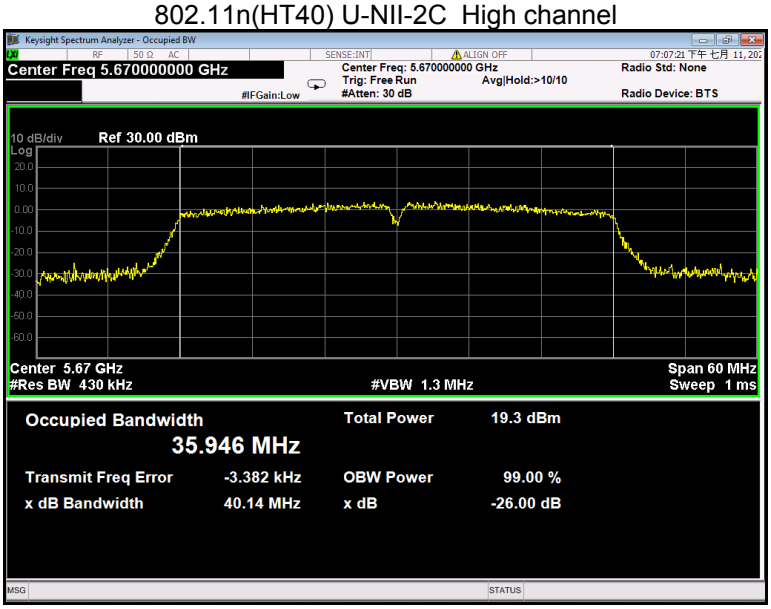
802.11n(HT40) U-NII-2C Low channel



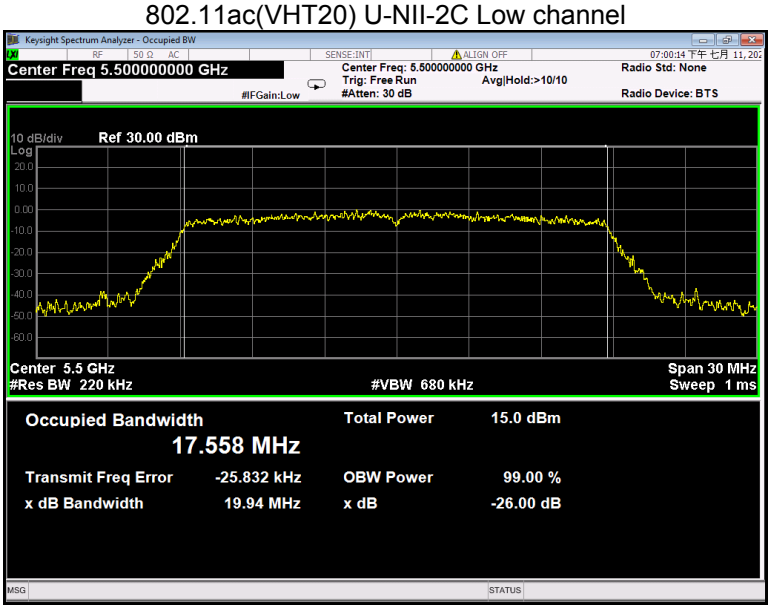

802.11n(HT40) U-NII-2C Middle channel



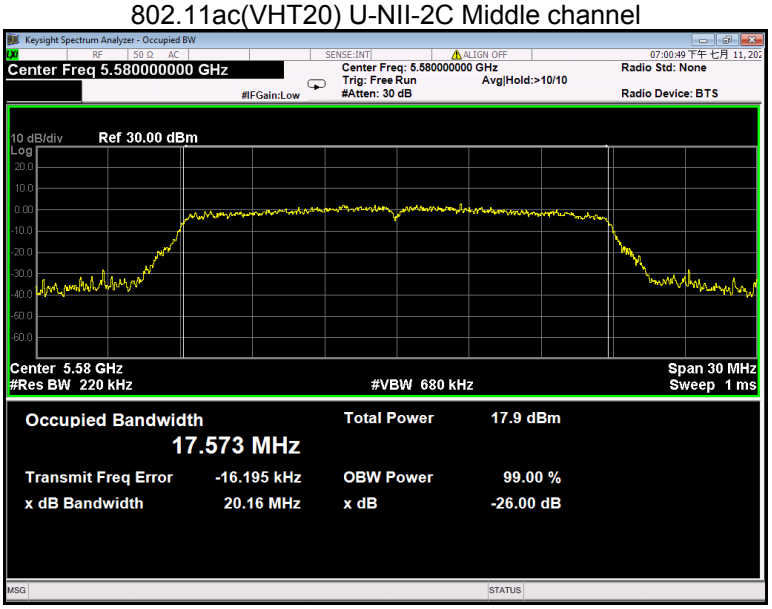
802.11n(HT40) U-NII-2C High channel



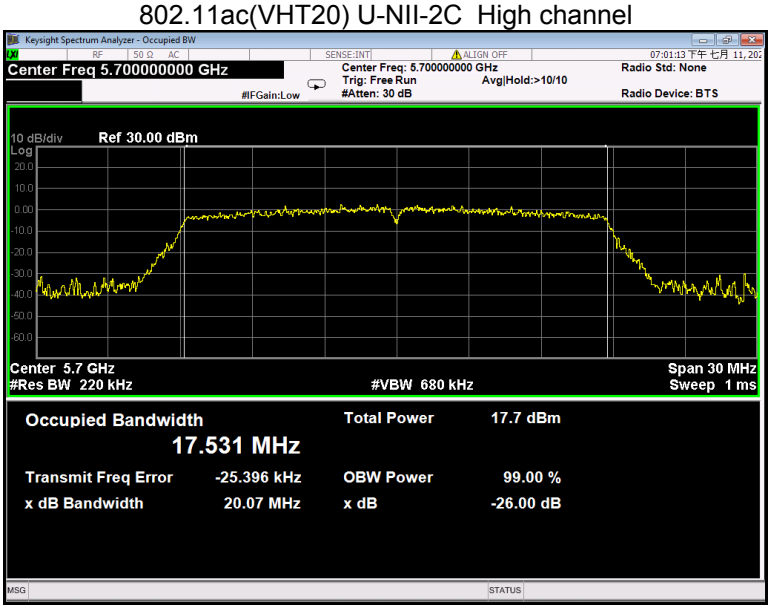

802.11ac(VHT20) U-NII-2C Low channel



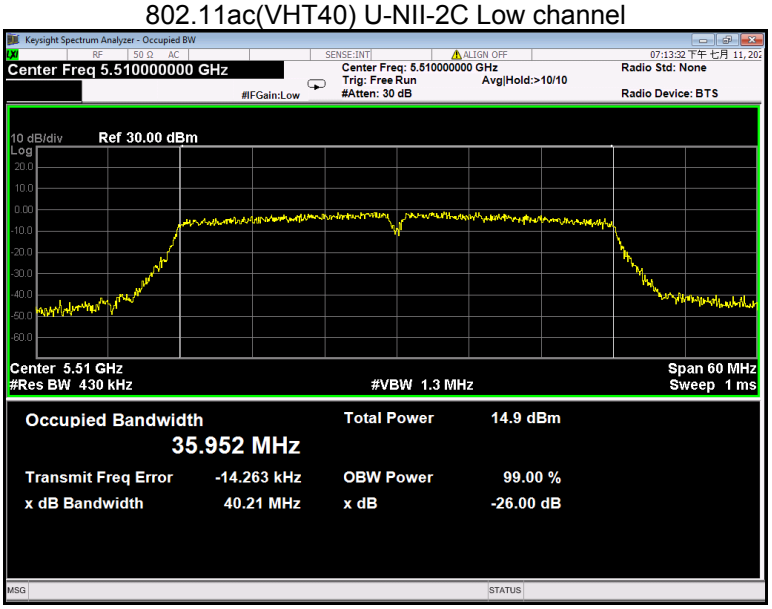
802.11ac(VHT20) U-NII-2C Middle channel



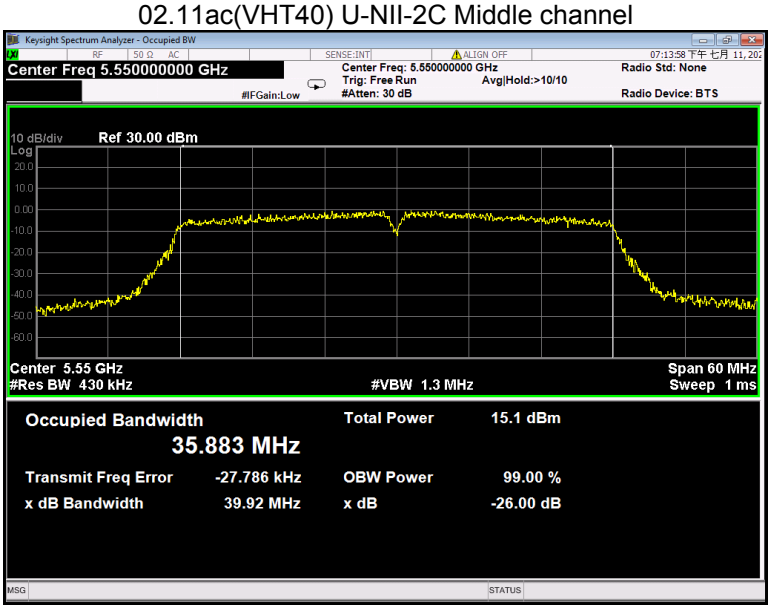

802.11ac(VHT20) U-NII-2C High channel



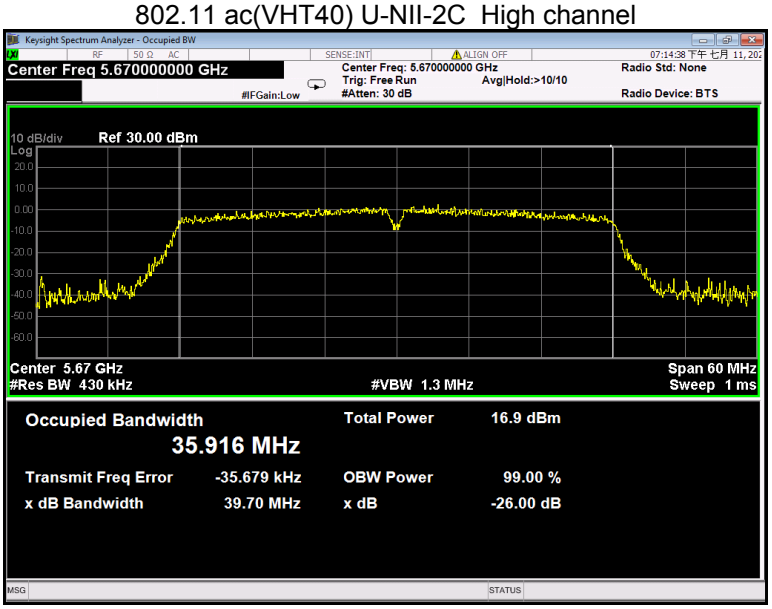
802.11ac(VHT40) U-NII-2C Low channel



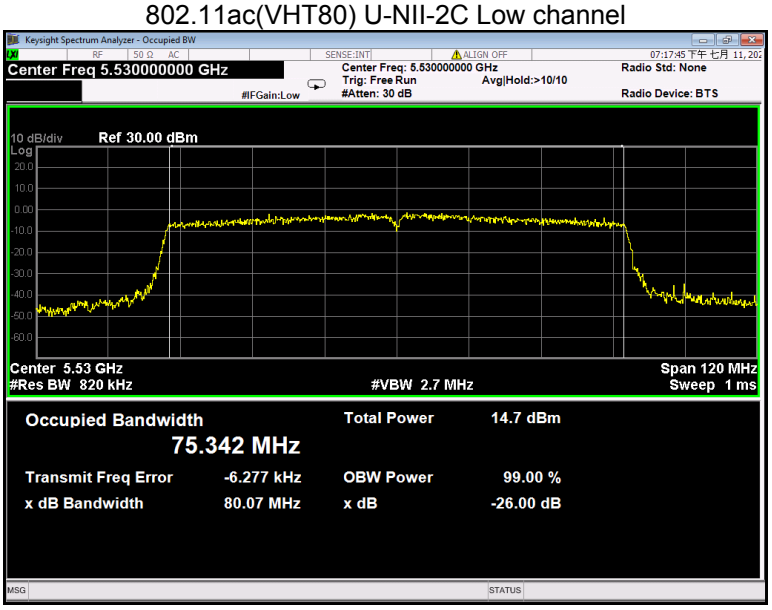

02.11ac(VHT40) U-NII-2C Middle channel



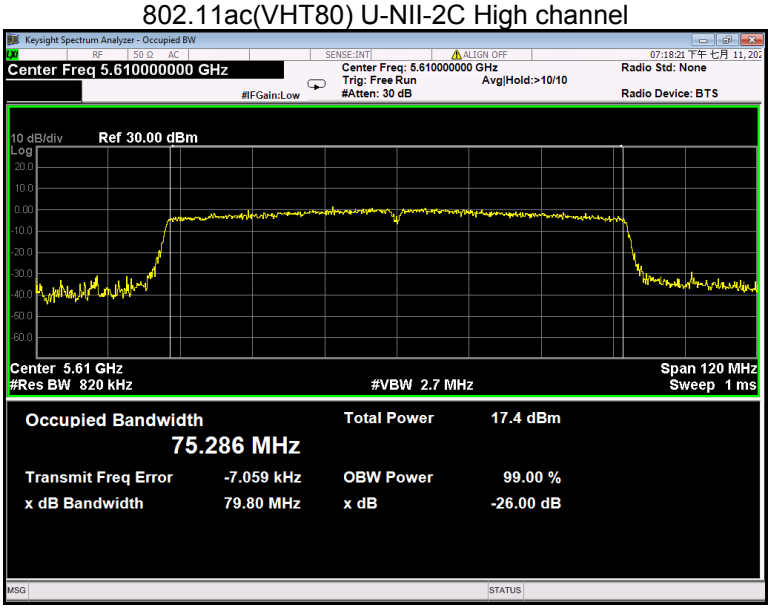
802.11 ac(VHT40) U-NII-2C High channel




802.11ac(VHT80) U-NII-2C Low channel

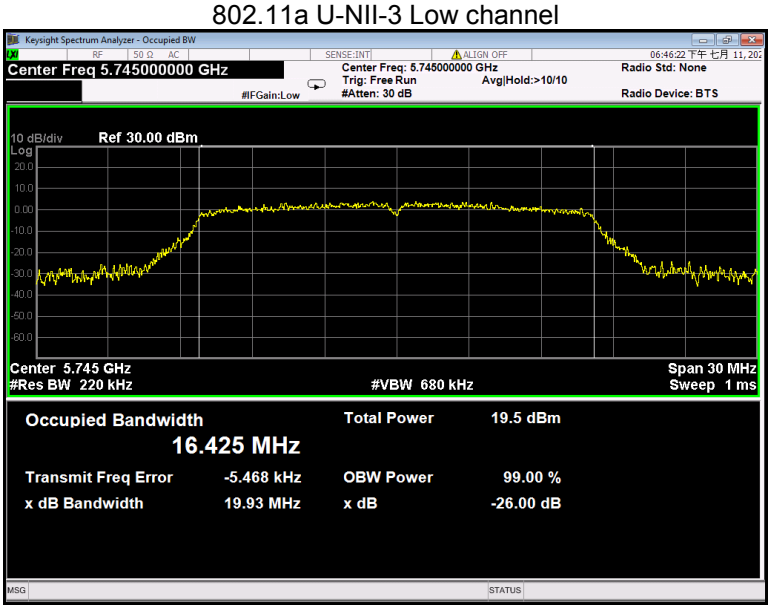


802.11ac(VHT80) U-NII-2C High channel

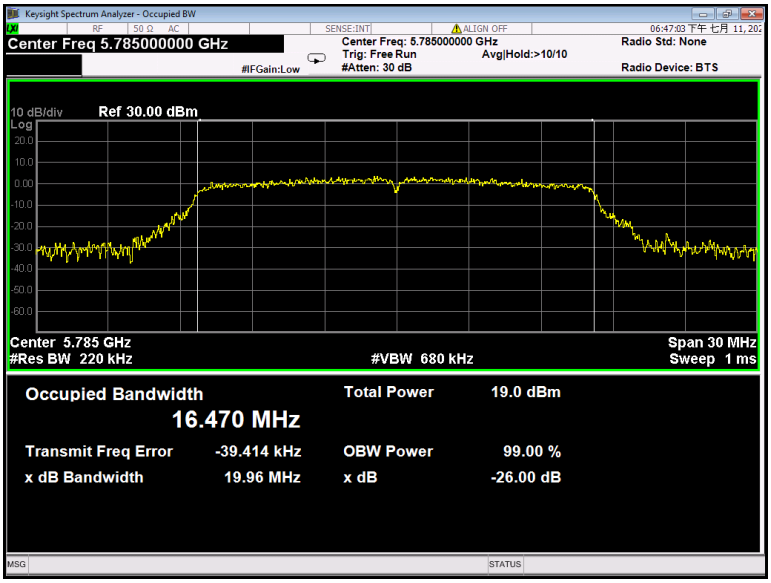


99% Occupied Bandwidth

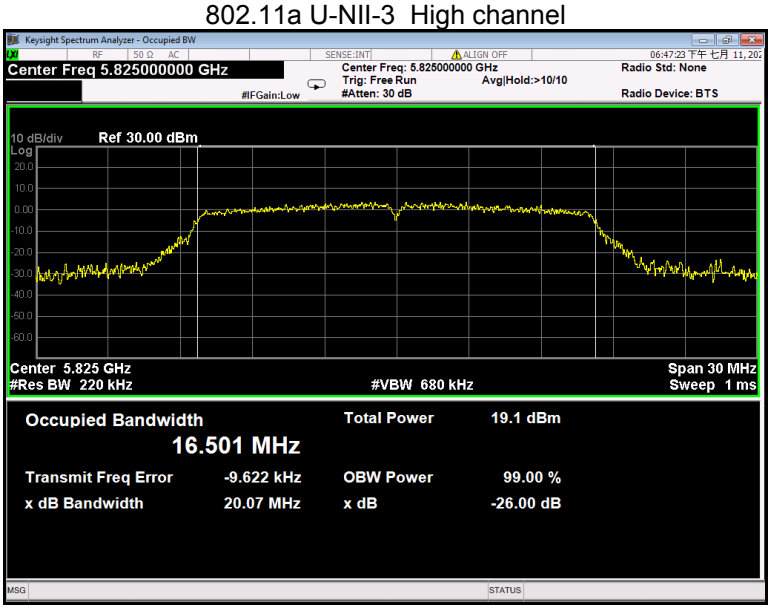
802.11a U-NII-3 Low channel



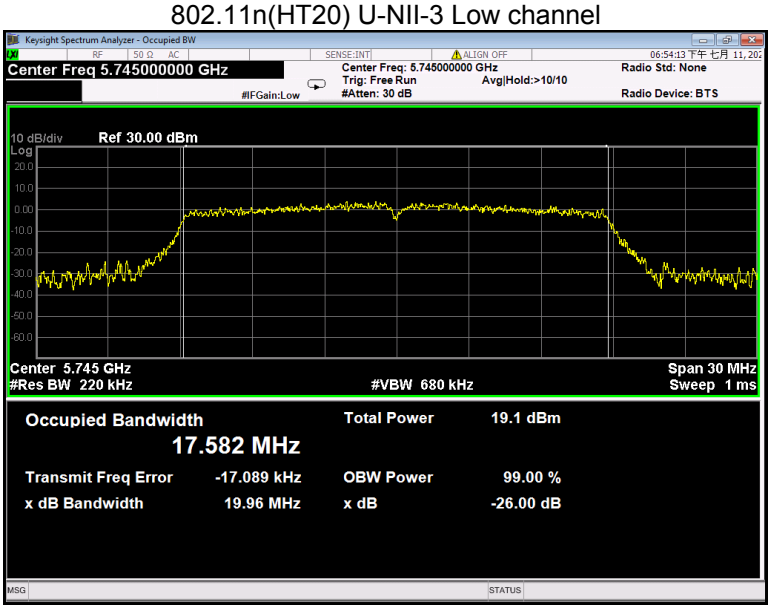

802.11a U-NII-3 Middle channel



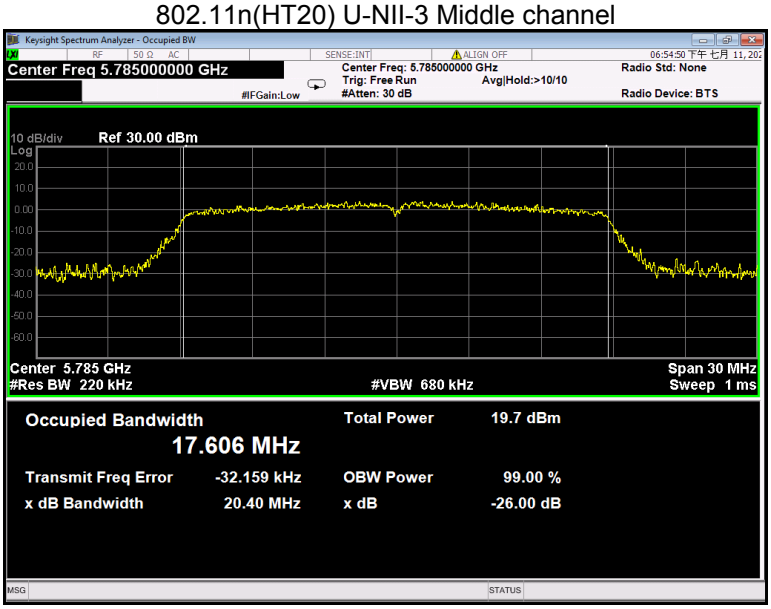
802.11a U-NII-3 High channel



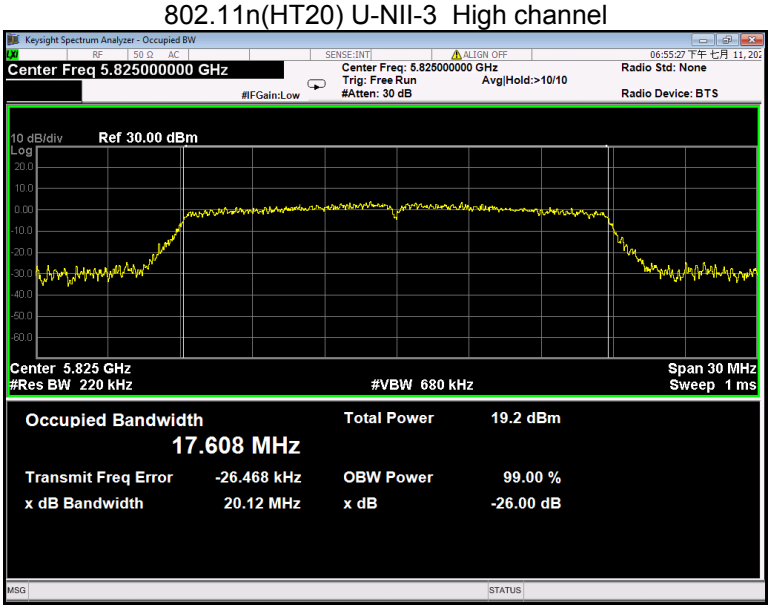

802.11n(HT20) U-NII-3 Low channel



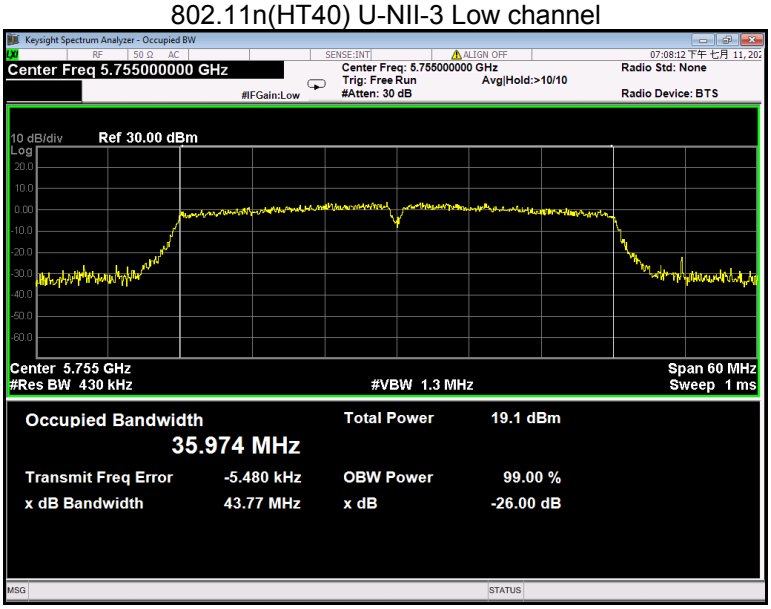
802.11n(HT20) U-NII-3 Middle channel



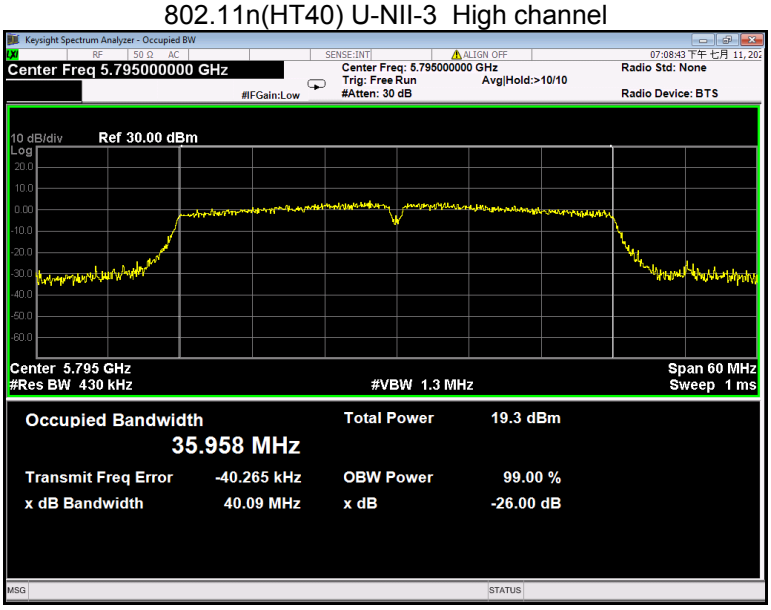

802.11n(HT20) U-NII-3 High channel



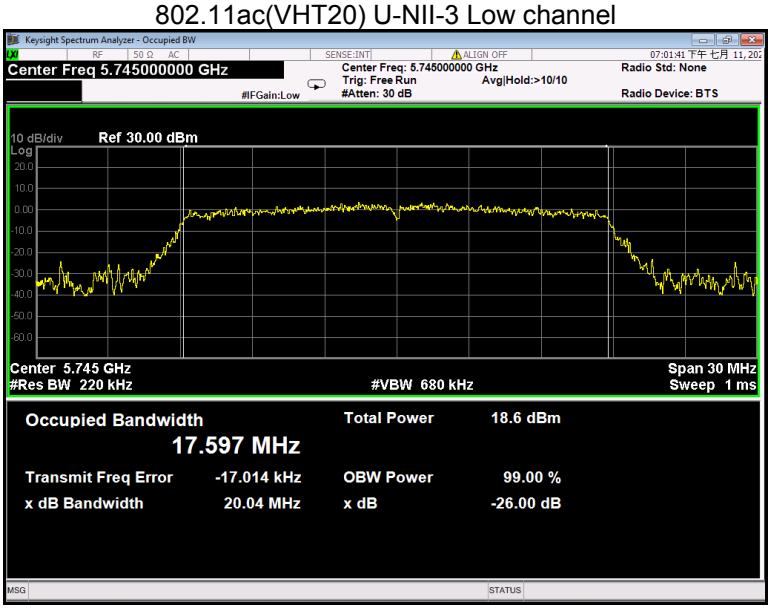
802.11n(HT40) U-NII-3 Low channel



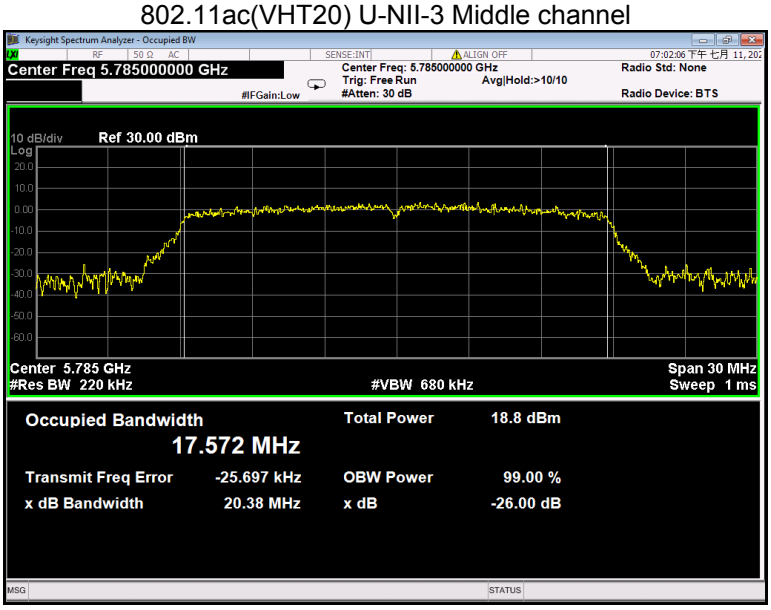

802.11n(HT40) U-NII-3 High channel



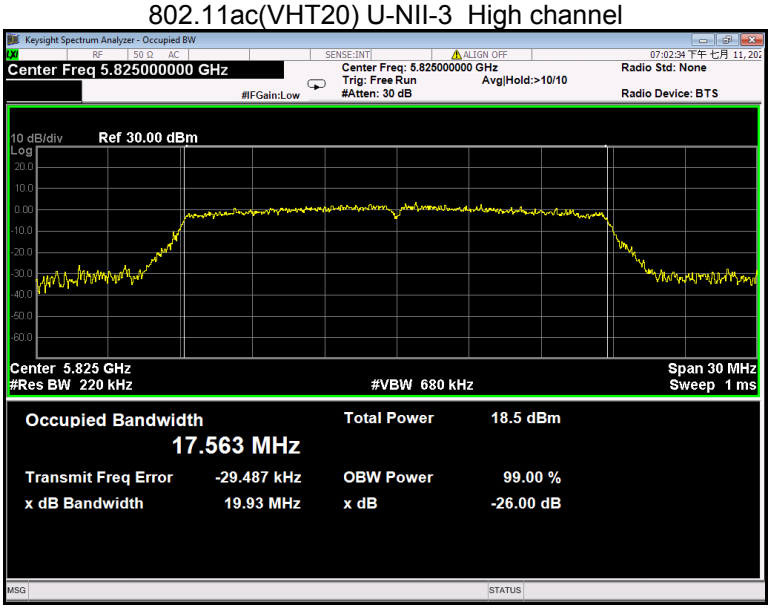
802.11ac(VHT20) U-NII-3 Low channel



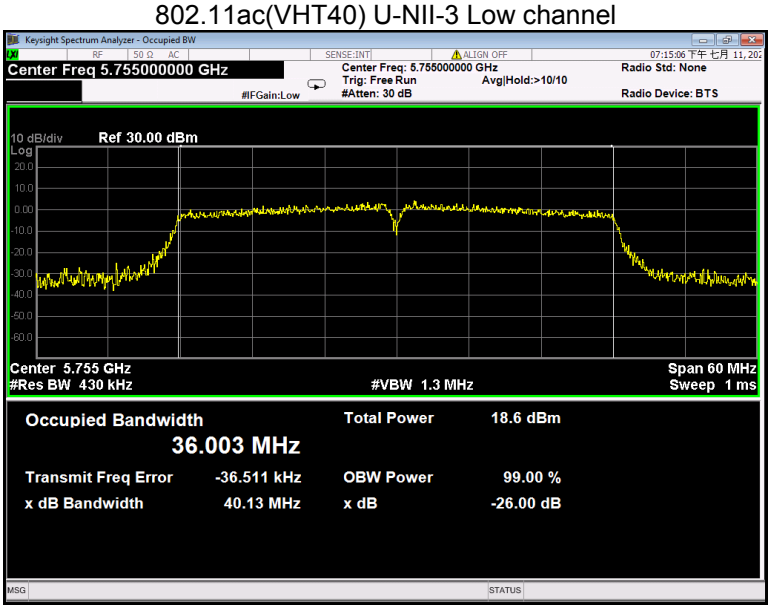

802.11ac(VHT20) U-NII-3 Middle channel



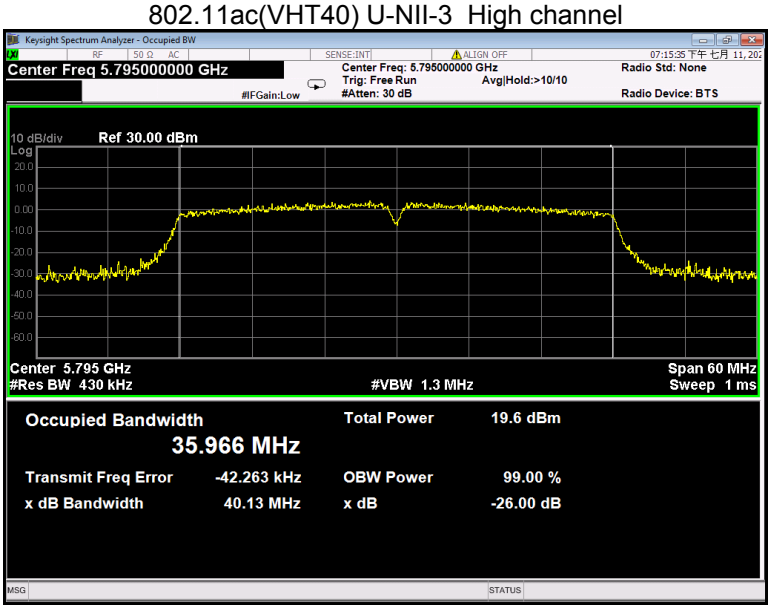
802.11ac(VHT20) U-NII-3 High channel



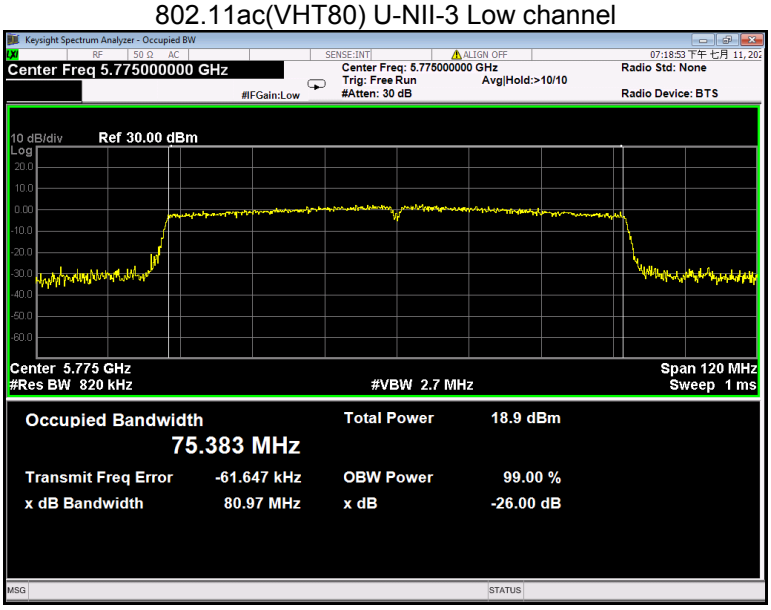

802.11ac(VHT40) U-NII-3 Low channel



802.11ac(VHT40) U-NII-3 High channel




802.11ac(VHT80) U-NII-3 Low channel



# 13 Conducted Output Power

| | |
|---|---|
| Test Requirement: | FCC 47CFR Part 15 Section 15.407(a) |
| Test Method: | KDB662911 D01 Multiple Transmitter Output v02r01<br>KDB789033 D02 General U-NII Test Procedures New Rules v02r01 Section E |
| Test Limit: | **For the band 5.15-5.25 GHz**<br>For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.<br>For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.<br>For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.<br>For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.<br>**For the 5.25-5.35 GHz and 5.47-5.725 GHz bands**<br>For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.<br>**For the band 5.725-5.850 GHz**<br>For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. |
| 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 |

## 13.1 Test Procedure

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
(ii) Set RBW = 1 MHz.
(iii) Set VBW ≥ 3 MHz.
(iv) Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
(v) Sweep time = auto.
(vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
(vii) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.”
(viii) Trace average at least 100 traces in power averaging (rms) mode.
(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

## 13.2 Test Result

| Band | Operation mode | Channel | Maximum Conducted Output Power (dBm) | Maximum Conducted Output Power Limit (dBm) |
|---|---|---|---|---|
| U-NII-1 | 802.11a | Low | 13.53 | 23.97 |
| | | Middle | **13.64** | 23.97 |
| | | High | 13.55 | 23.97 |
| | 802.11n(HT20) | Low | 13.14 | 23.97 |
| | | Middle | 13.10 | 23.97 |
| | | High | 13.08 | 23.97 |
| | 802.11n(HT40) | Low | 10.93 | 23.97 |
| | | Middle | / | 23.97 |
| | | High | 10.75 | 23.97 |
| | 802.11ac(VHT20) | Low | 11.71 | 23.97 |
| | | Middle | 11.84 | 23.97 |
| | | High | 11.74 | 23.97 |
| | 802.11ac(VHT40) | Low | 9.46 | 23.97 |
| | | Middle | / | 23.97 |
| | | High | 10.06 | 23.97 |
| | 802.11ac(VHT80) | Low | 9.07 | 23.97 |
| | | Middle | / | 23.97 |
| | | High | / | 23.97 |

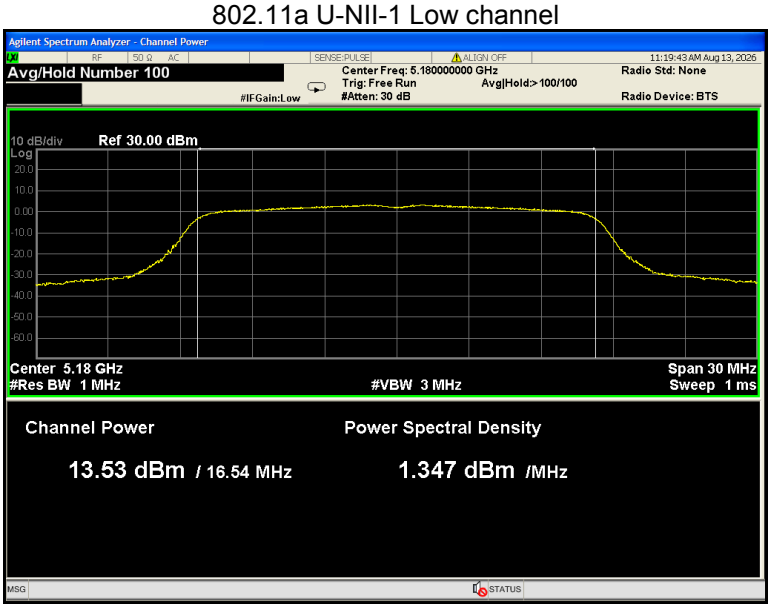
| Band | Operation mode | Channel | Maximum Conducted Output Power (dBm) | Maximum Conducted Output Power Limit (dBm) |
|---|---|---|---|---|
| U-NII-2A | 802.11a | Low | 12.02 | 23.97 |
| | | Middle | 12.05 | 23.97 |
| | | High | **12.30** | 23.97 |
| | 802.11n(HT20) | Low | 11.18 | 23.97 |
| | | Middle | 11.41 | 23.97 |
| | | High | 11.60 | 23.97 |
| | 802.11n(HT40) | Low | 10.11 | 23.97 |
| | | Middle | / | 23.97 |
| | | High | 10.44 | 23.97 |
| | 802.11ac(VHT20) | Low | 10.16 | 23.97 |
| | | Middle | 10.26 | 23.97 |
| | | High | 10.53 | 23.97 |
| | 802.11ac(VHT40) | Low | 9.06 | 23.97 |
| | | Middle | / | 23.97 |
| | | High | 9.31 | 23.97 |
| | 802.11ac(VHT80) | Low | 9.11 | 23.97 |
| | | Middle | / | 23.97 |
| | | High | / | 23.97 |

| Band | Operation mode | Channel | Maximum Conducted Output Power (dBm) | Maximum Conducted Output Power Limit (dBm) |
|---|---|---|---|---|
| U-NII-2C | 802.11a | Low | 10.15 | 23.97 |
| | | Middle | **12.30** | 23.97 |
| | | High | 12.29 | 23.97 |
| | 802.11n(HT20) | Low | 9.01 | 23.97 |
| | | Middle | 11.08 | 23.97 |
| | | High | 11.09 | 23.97 |
| | 802.11n(HT40) | Low | 9.07 | 23.97 |
| | | Middle | 8.92 | 23.97 |
| | | High | 11.04 | 23.97 |
| | 802.11ac(VHT20) | Low | 8.25 | 23.97 |
| | | Middle | 10.32 | 23.97 |
| | | High | 10.79 | 23.97 |
| | 802.11ac(VHT40) | Low | 8.31 | 23.97 |
| | | Middle | 8.34 | 23.97 |
| | | High | 10.59 | 23.97 |
| | 802.11ac(VHT80) | Low | 8.14 | 23.97 |
| | | Middle | / | 23.97 |
| | | High | 10.17 | 23.97 |

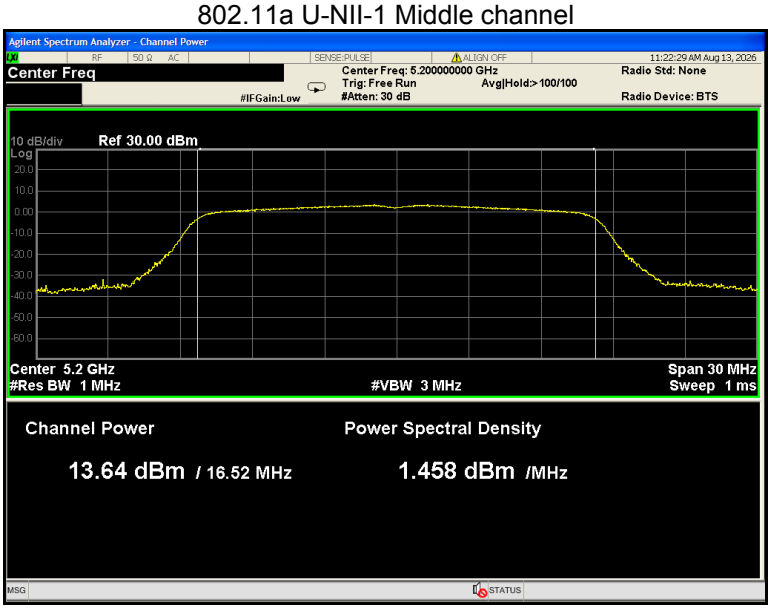
| Band | Operation mode | Channel | Maximum Conducted Output Power (dBm) | Maximum Conducted Output Power Limit (dBm) |
|---|---|---|---|---|
| U-NII-3 | 802.11a | Low | 12.73 | 30.00 |
| | | Middle | **12.78** | 30.00 |
| | | High | 12.77 | 30.00 |
| | 802.11n(HT20) | Low | 12.59 | 30.00 |
| | | Middle | 12.60 | 30.00 |
| | | High | 12.62 | 30.00 |
| | 802.11n(HT40) | Low | 12.30 | 30.00 |
| | | Middle | / | 30.00 |
| | | High | 12.46 | 30.00 |
| | 802.11ac(VHT20) | Low | 12.19 | 30.00 |
| | | Middle | 12.11 | 30.00 |
| | | High | 12.14 | 30.00 |
| | 802.11ac(VHT40) | Low | 12.12 | 30.00 |
| | | Middle | / | 30.00 |
| | | High | 11.95 | 30.00 |
| | 802.11ac(VHT80) | Low | 11.74 | 30.00 |
| | | Middle | / | 30.00 |
| | | High | / | 30.00 |

Test result plots shown as follows:

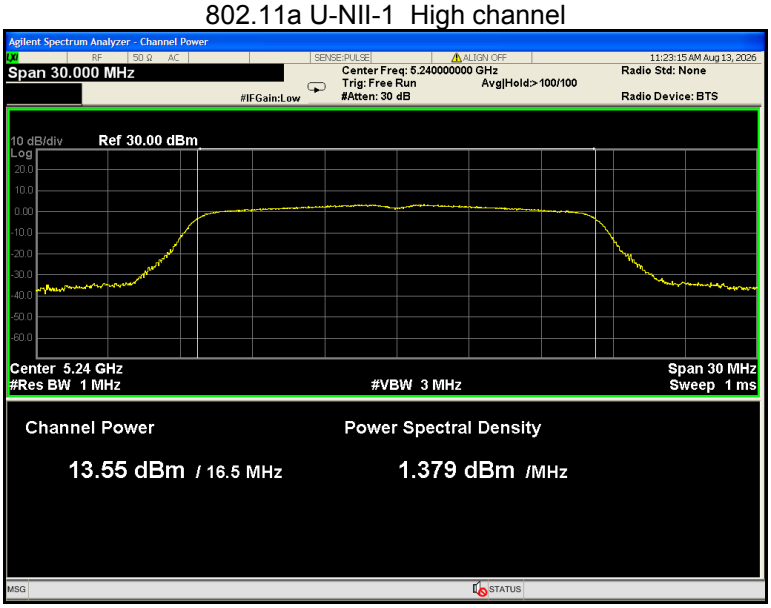
802.11a U-NII-1 Low channel



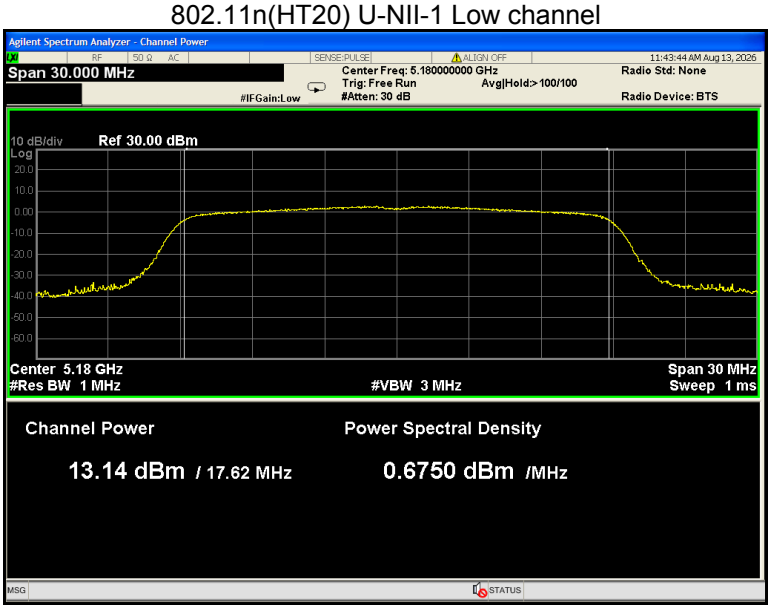

802.11a U-NII-1 Middle channel



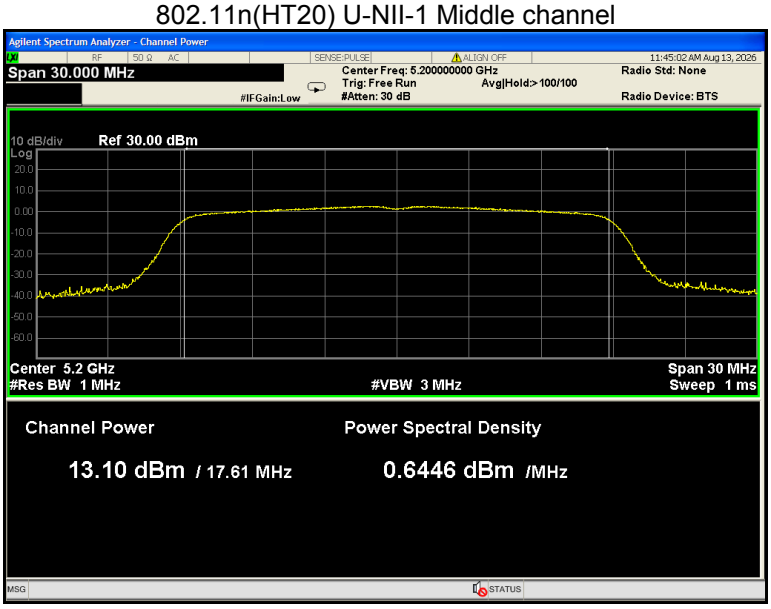
802.11a U-NII-1 High channel



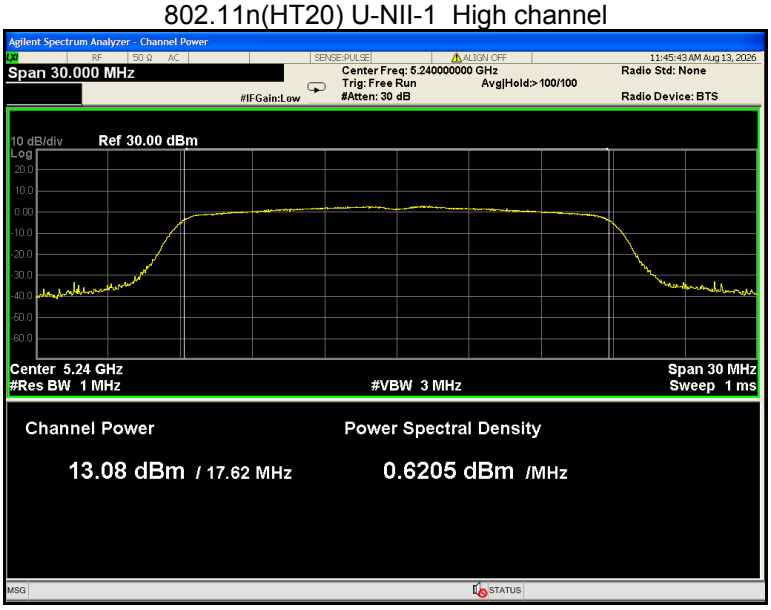

802.11n(HT20) U-NII-1 Low channel



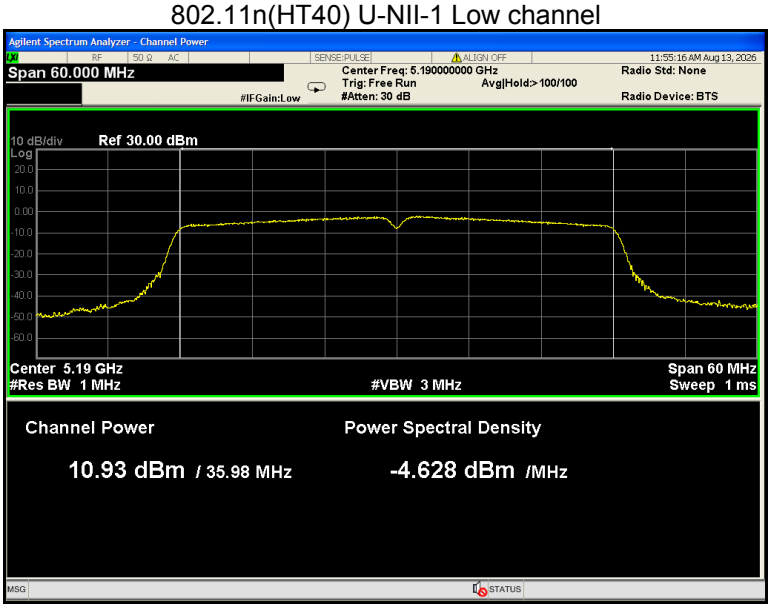
802.11n(HT20) U-NII-1 Middle channel



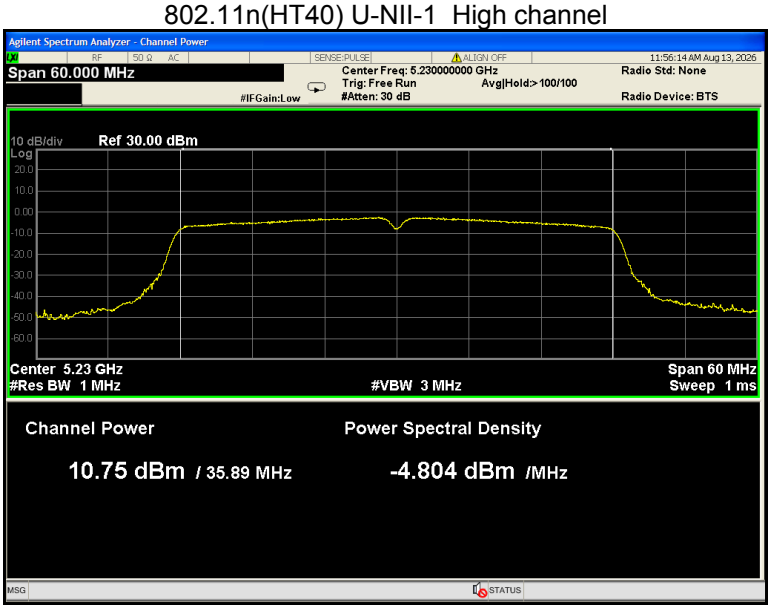

802.11n(HT20) U-NII-1 High channel



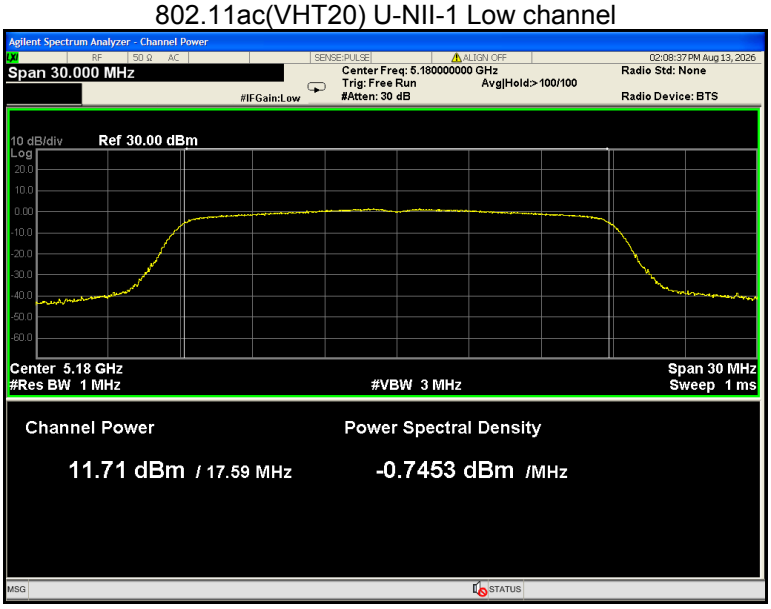
802.11n(HT40) U-NII-1 Low channel



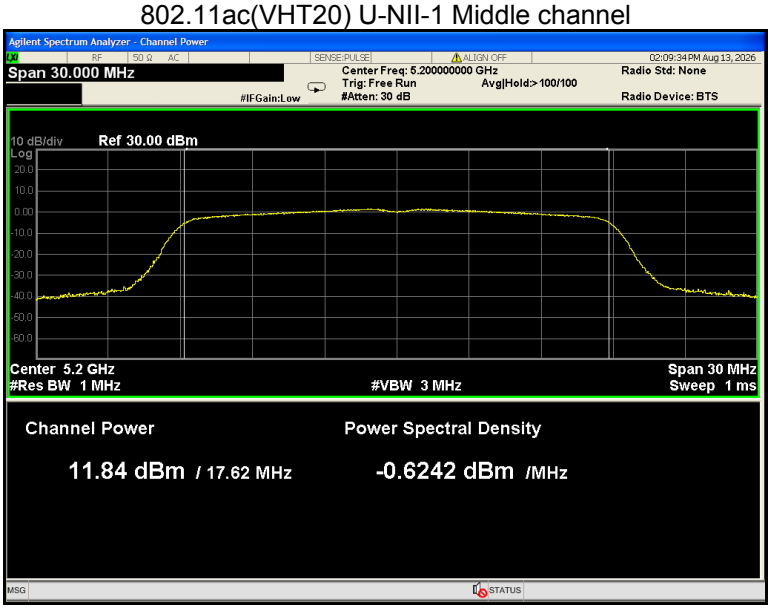

802.11n(HT40) U-NII-1 High channel



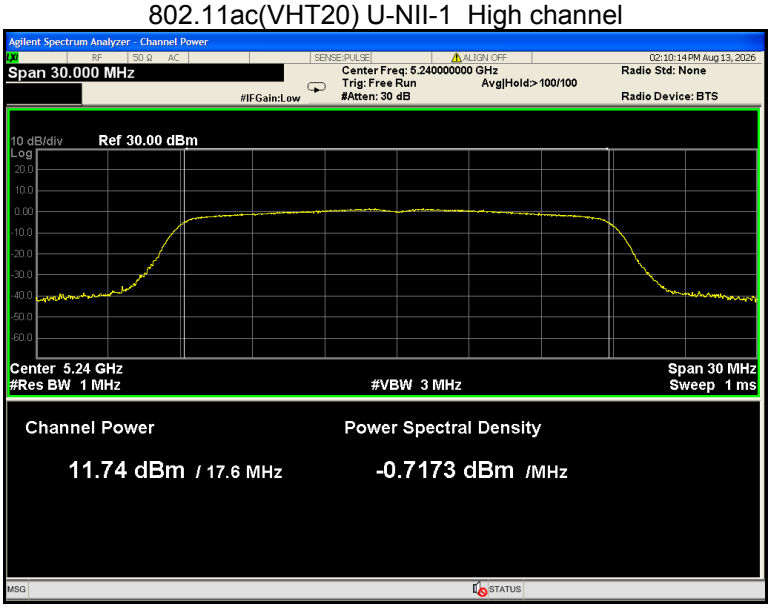
802.11ac(VHT20) U-NII-1 Low channel



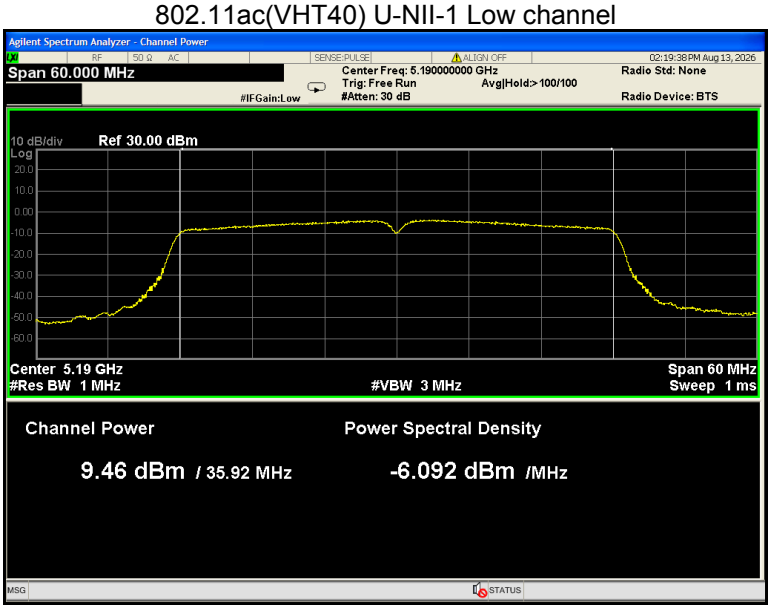

802.11ac(VHT20) U-NII-1 Middle channel



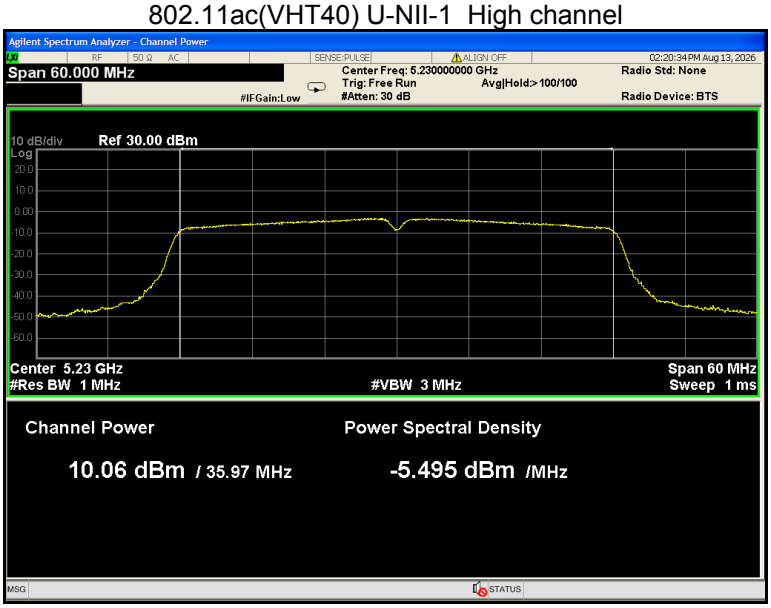
802.11ac(VHT20) U-NII-1 High channel



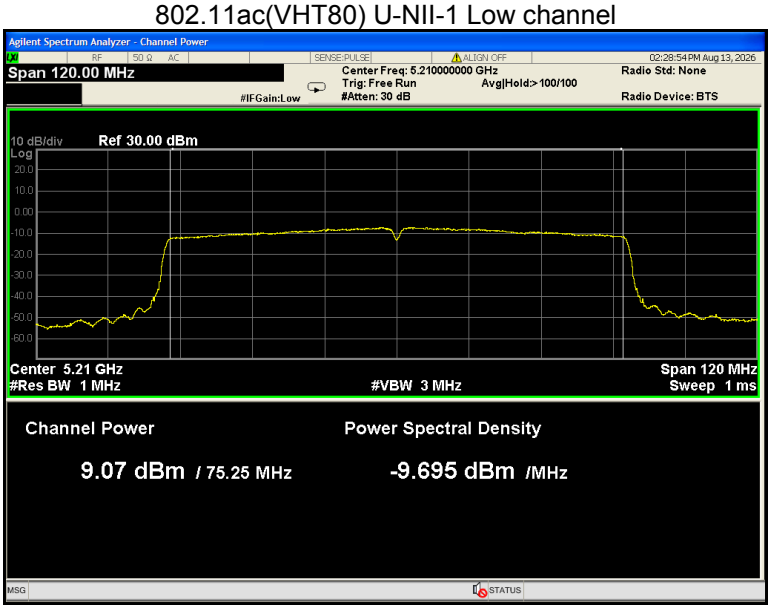

802.11ac(VHT40) U-NII-1 Low channel



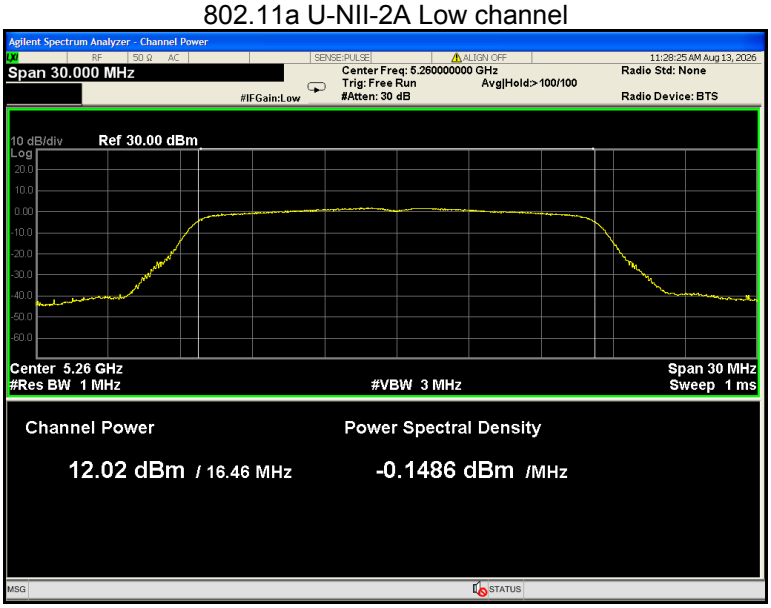
802.11ac(VHT40) U-NII-1 High channel



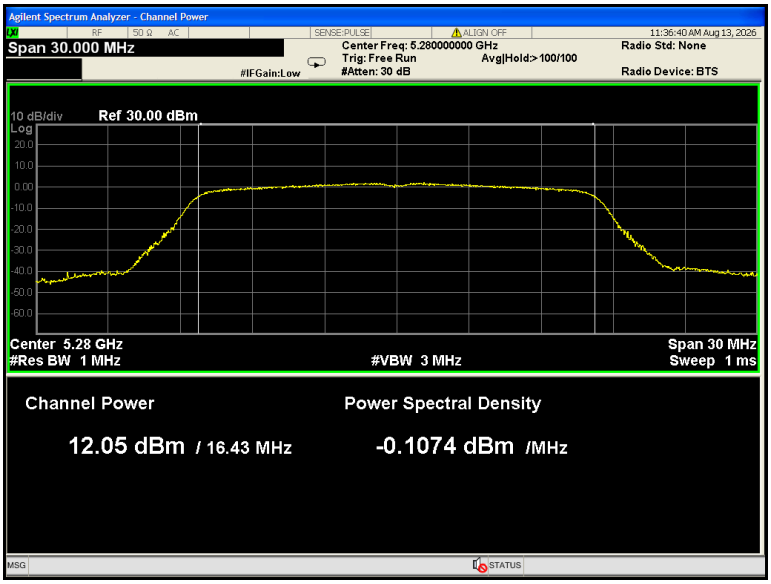

802.11ac(VHT80) U-NII-1 Low channel



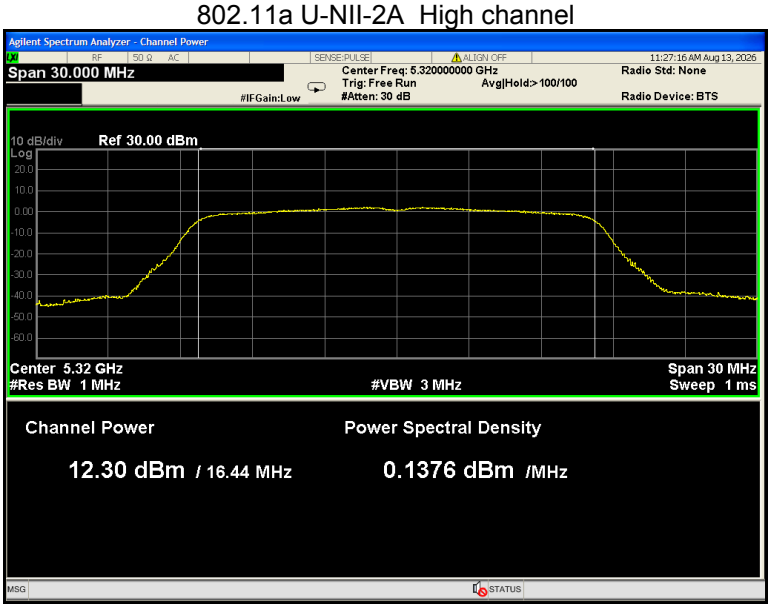
802.11a U-NII-2A Low channel



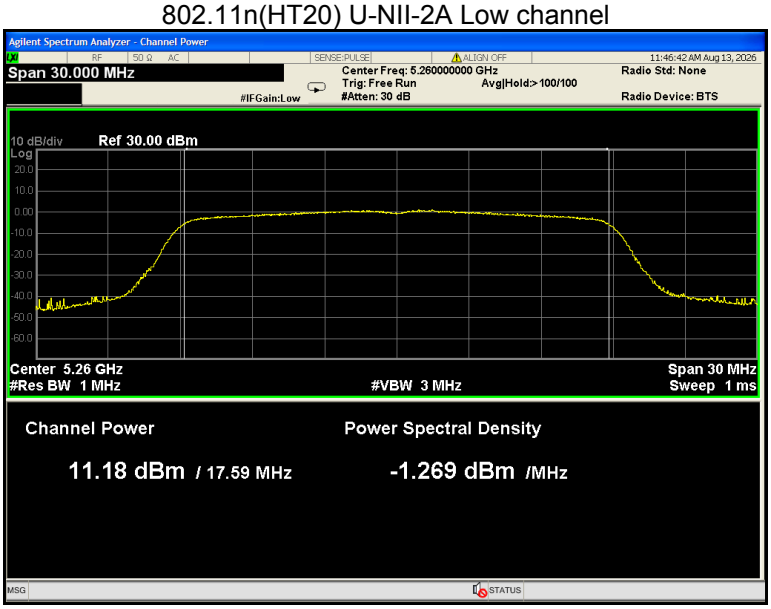

802.11a U-NII-2A Middle channel



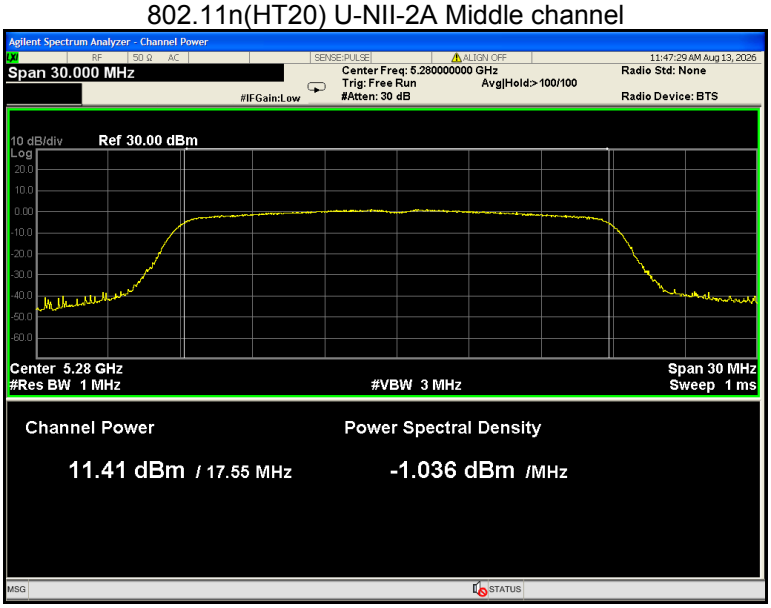
802.11a U-NII-2A High channel



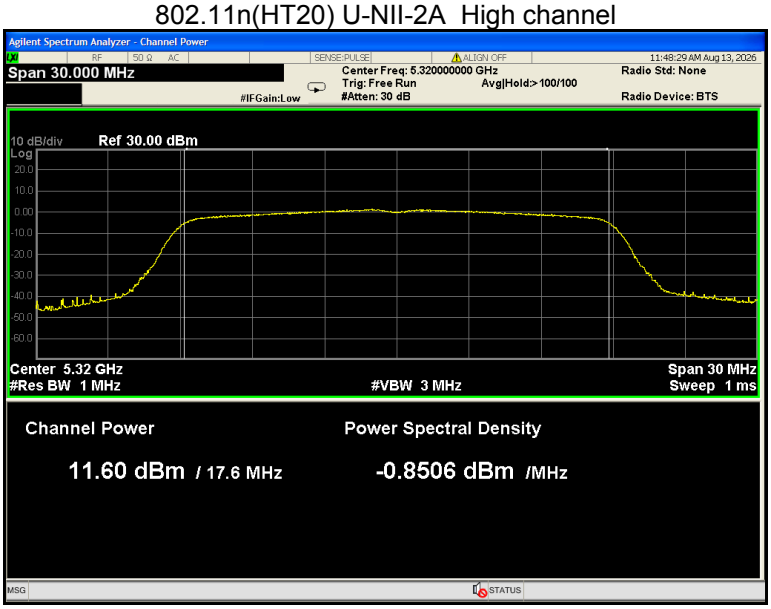

802.11n(HT20) U-NII-2A Low channel



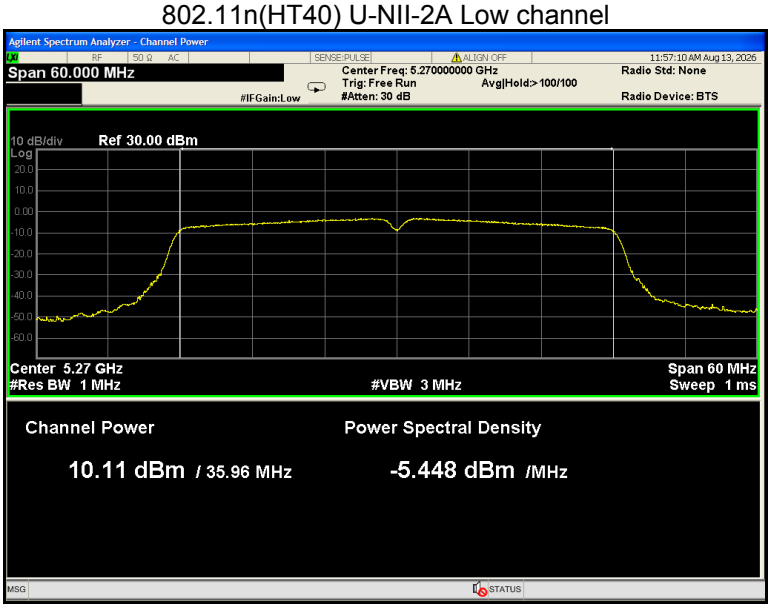
802.11n(HT20) U-NII-2A Middle channel



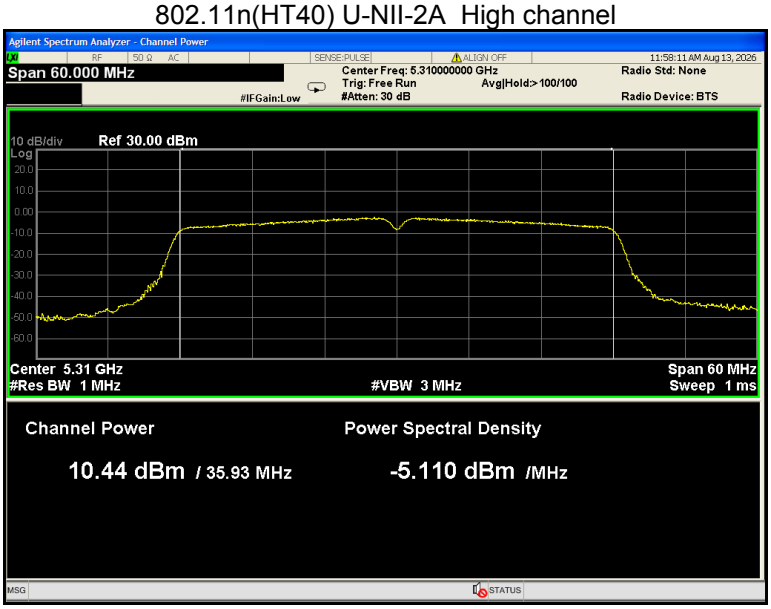

802.11n(HT20) U-NII-2A High channel



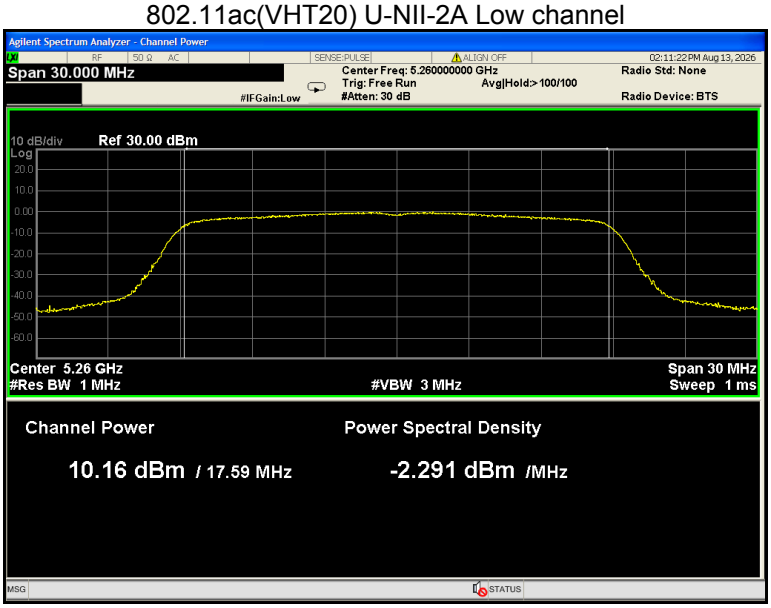
802.11n(HT40) U-NII-2A Low channel



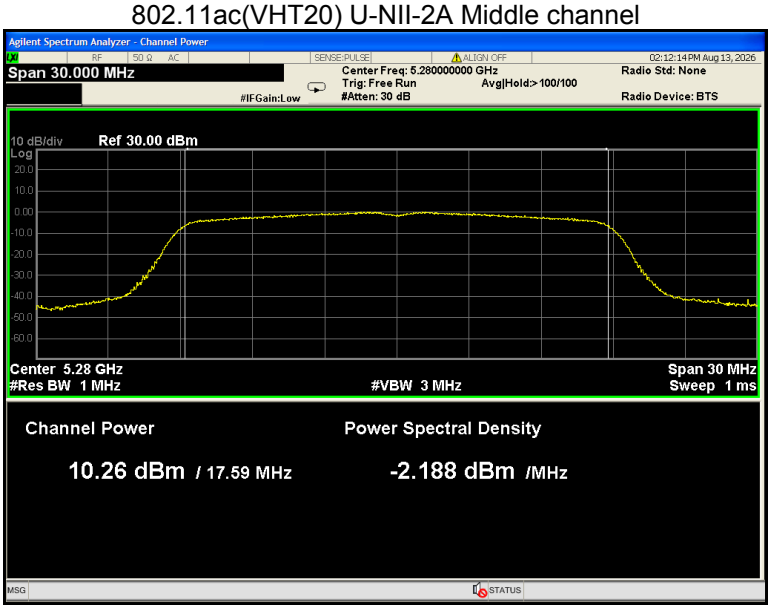

802.11n(HT40) U-NII-2A High channel



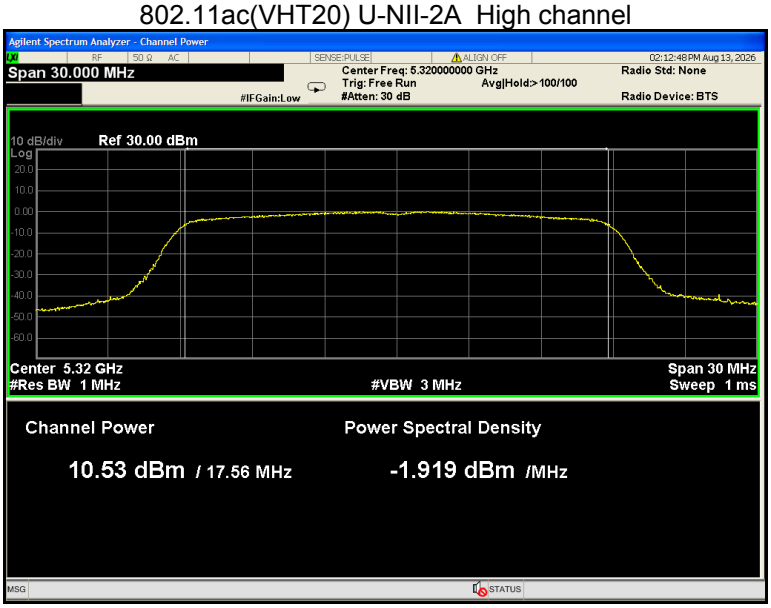
802.11ac(VHT20) U-NII-2A Low channel



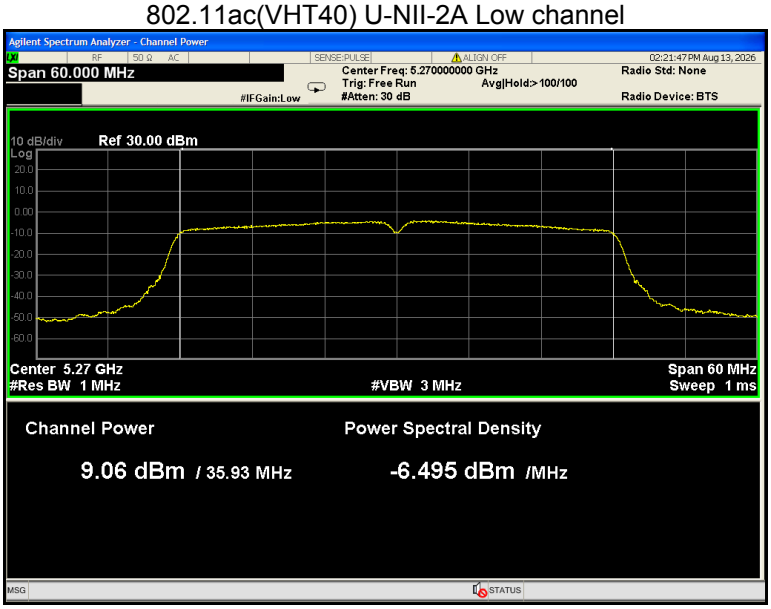

802.11ac(VHT20) U-NII-2A Middle channel



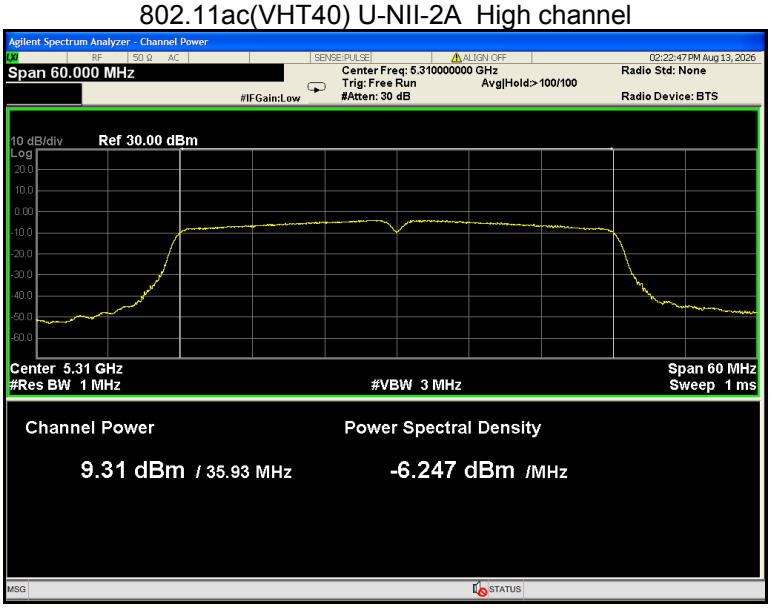
802.11ac(VHT20) U-NII-2A High channel



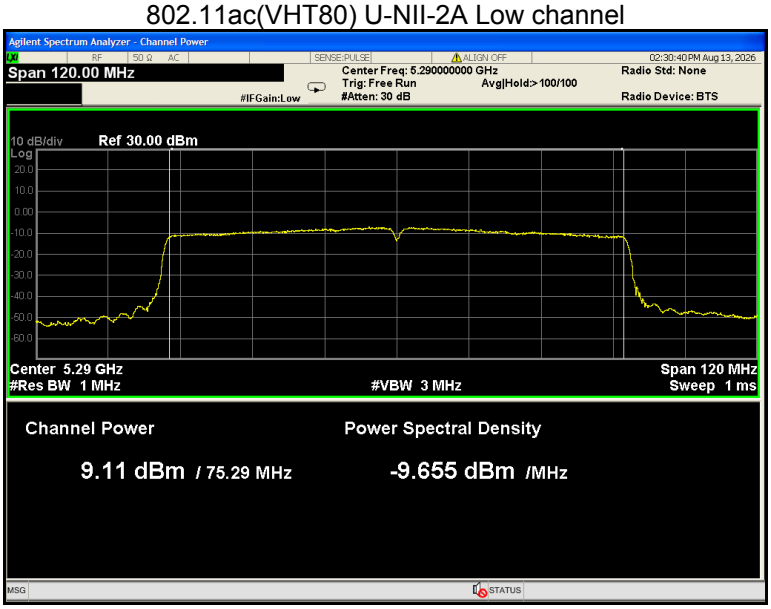

802.11ac(VHT40) U-NII-2A Low channel



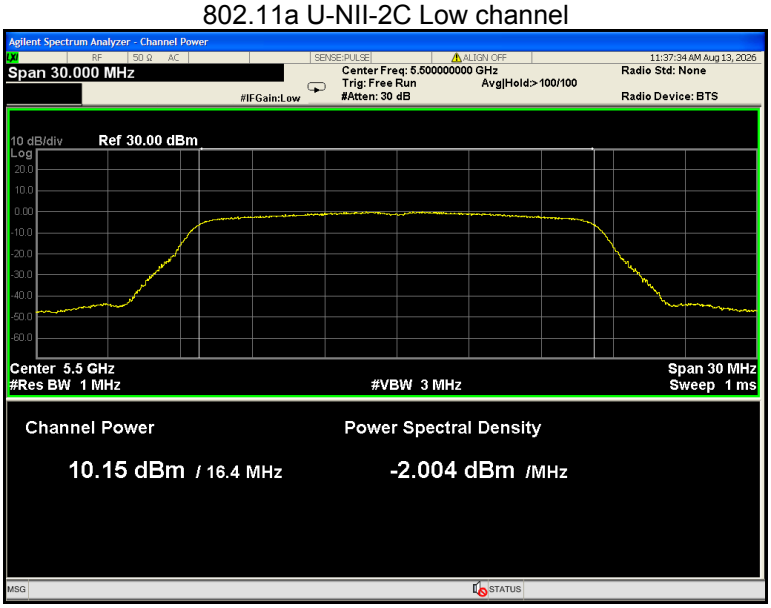
802.11ac(VHT40) U-NII-2A High channel



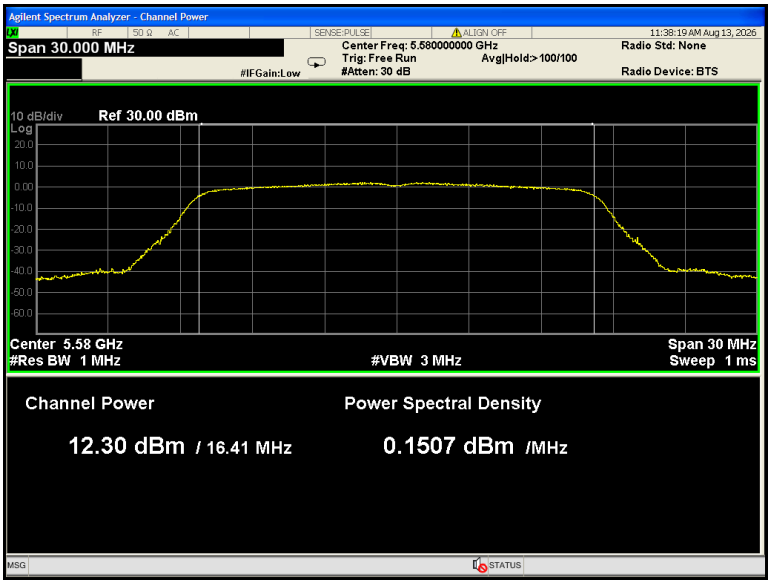

802.11ac(VHT80) U-NII-2A Low channel



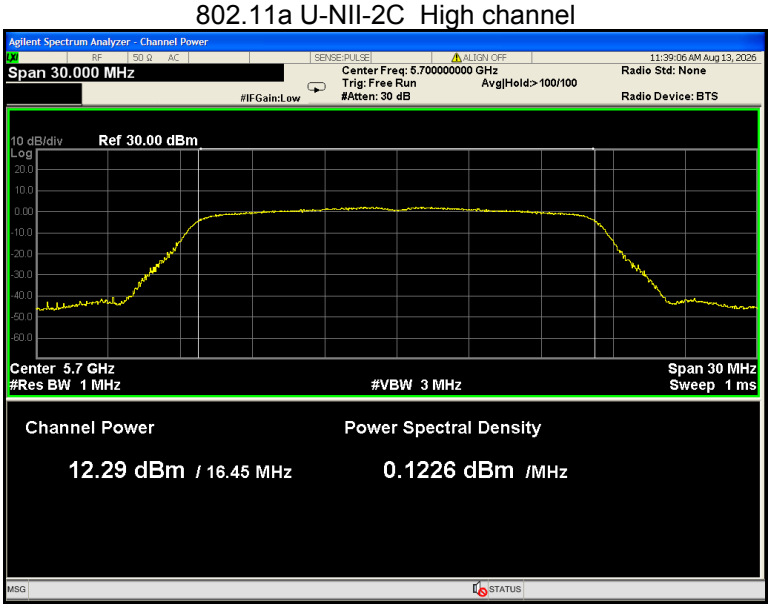
802.11a U-NII-2C Low channel



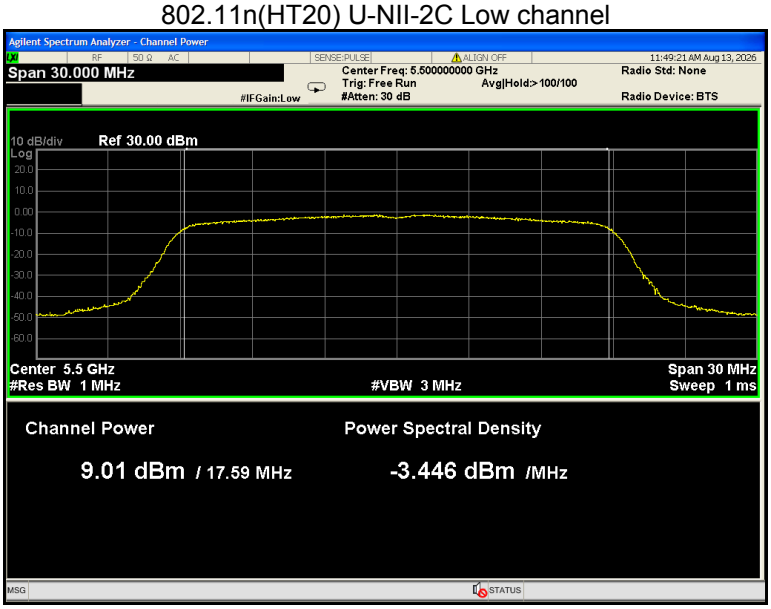

802.11a U-NII-2C Middle channel



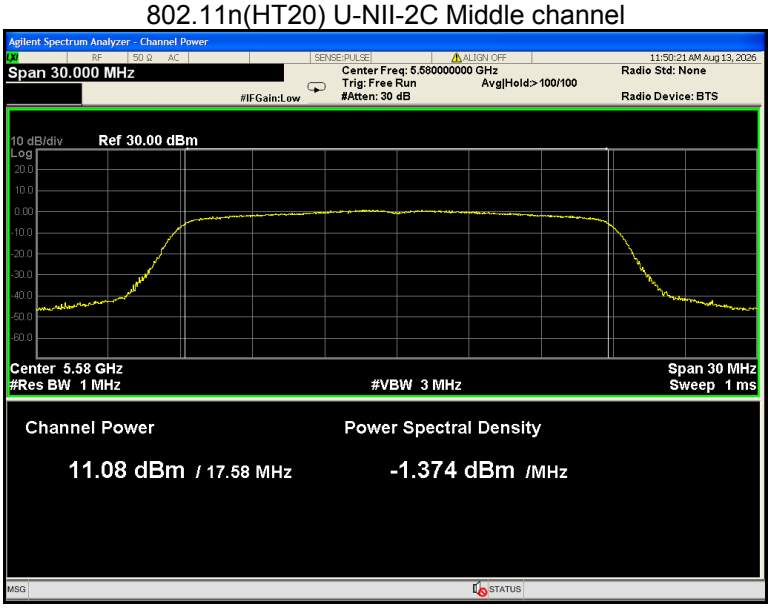
802.11a U-NII-2C High channel



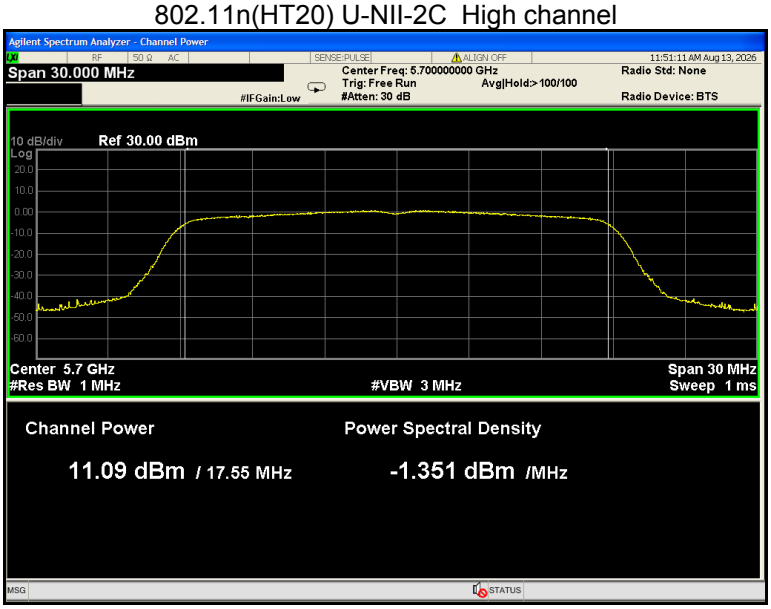

802.11n(HT20) U-NII-2C Low channel



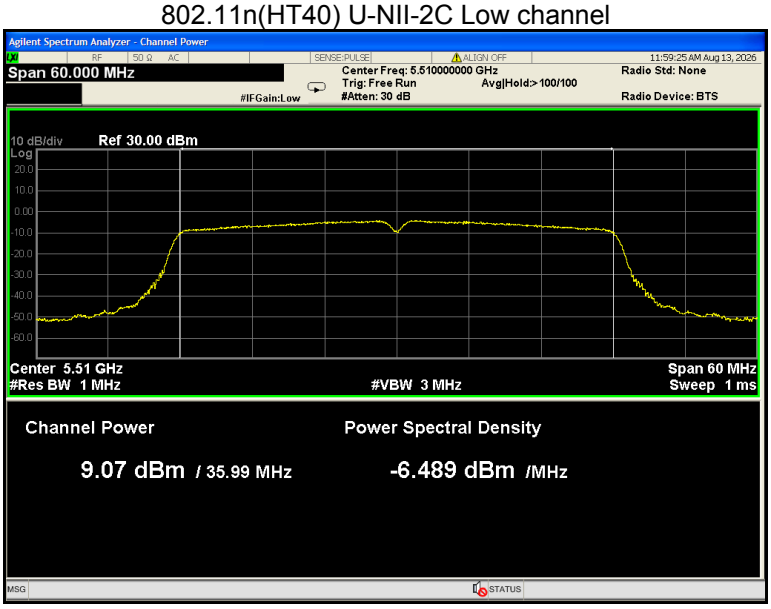
802.11n(HT20) U-NII-2C Middle channel



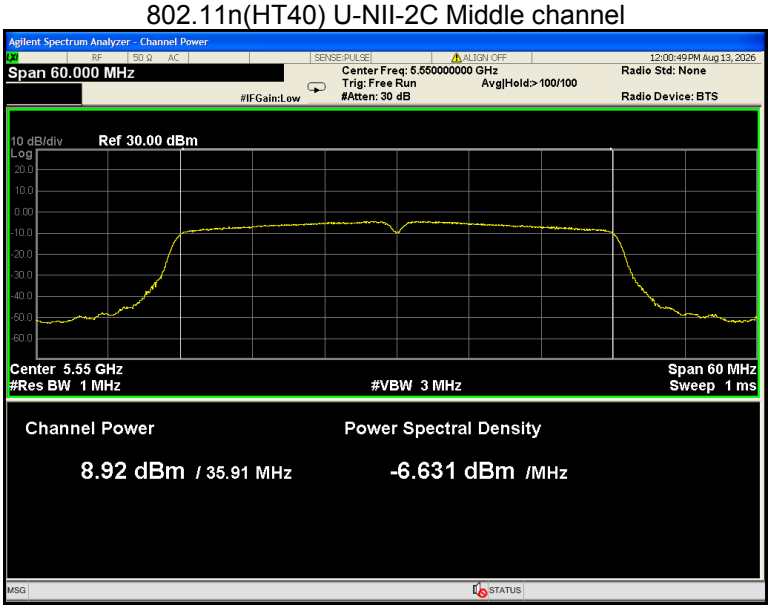

802.11n(HT20) U-NII-2C High channel



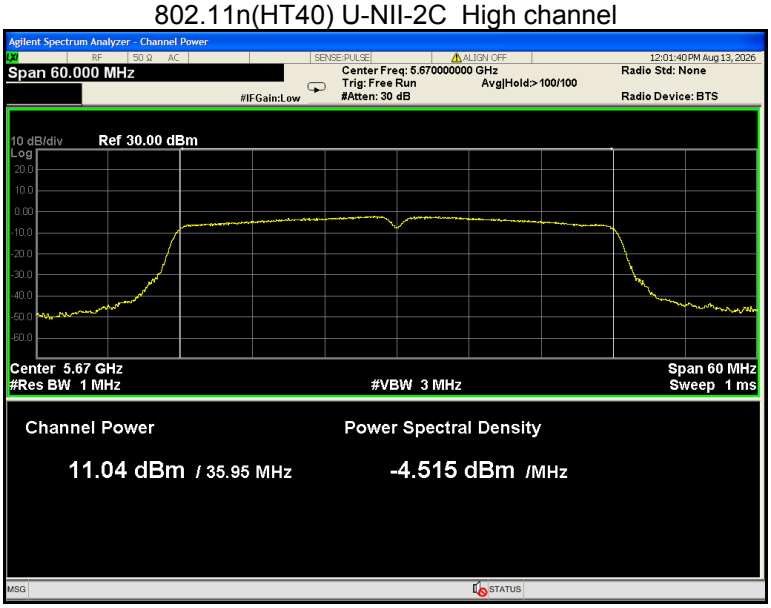
802.11n(HT40) U-NII-2C Low channel



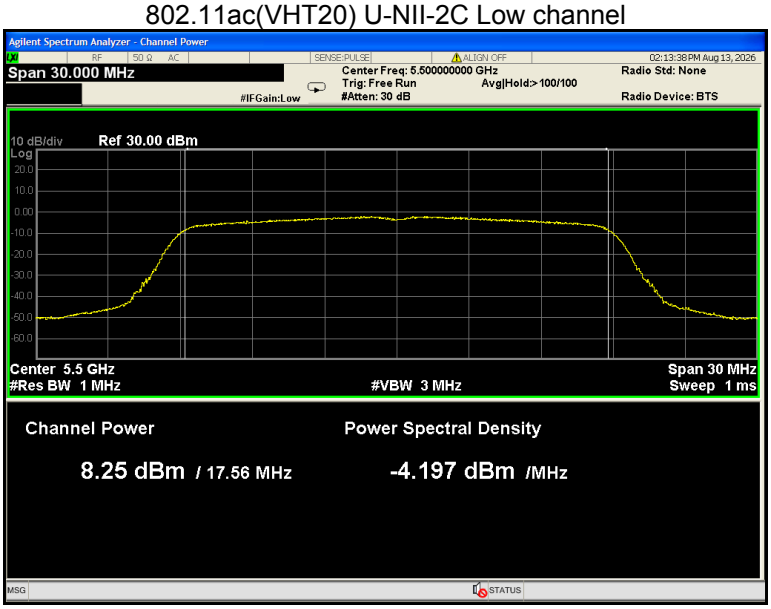

802.11n(HT40) U-NII-2C Middle channel



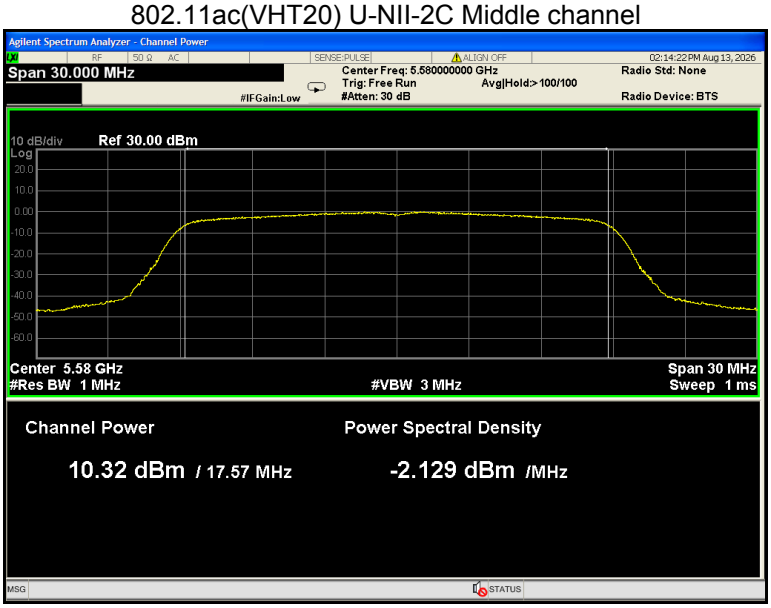
802.11n(HT40) U-NII-2C High channel



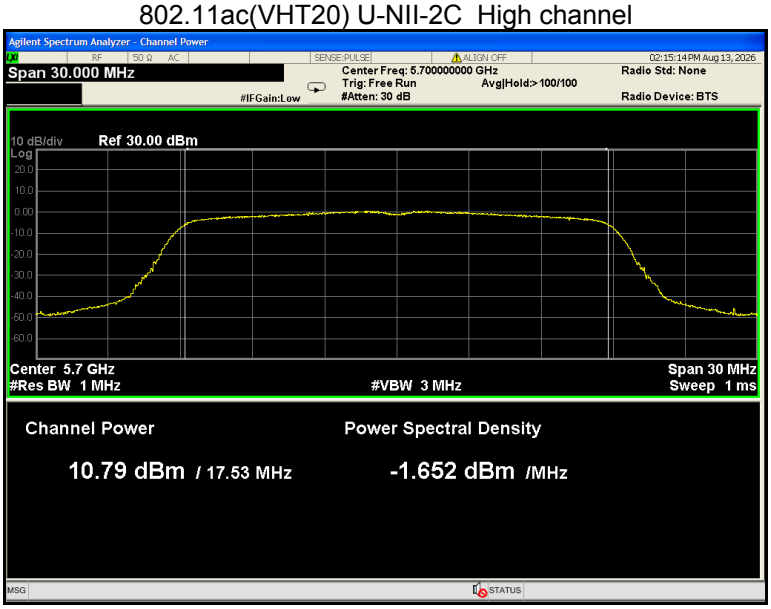

802.11ac(VHT20) U-NII-2C Low channel



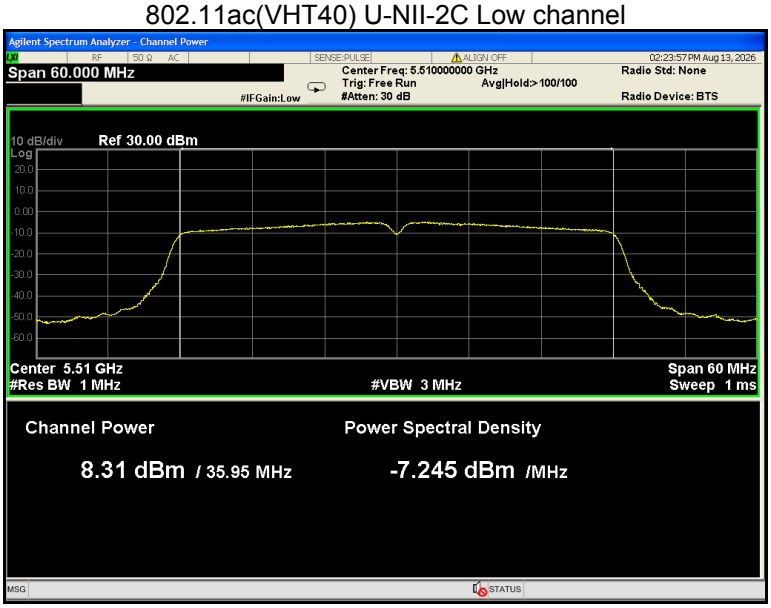
802.11ac(VHT20) U-NII-2C Middle channel



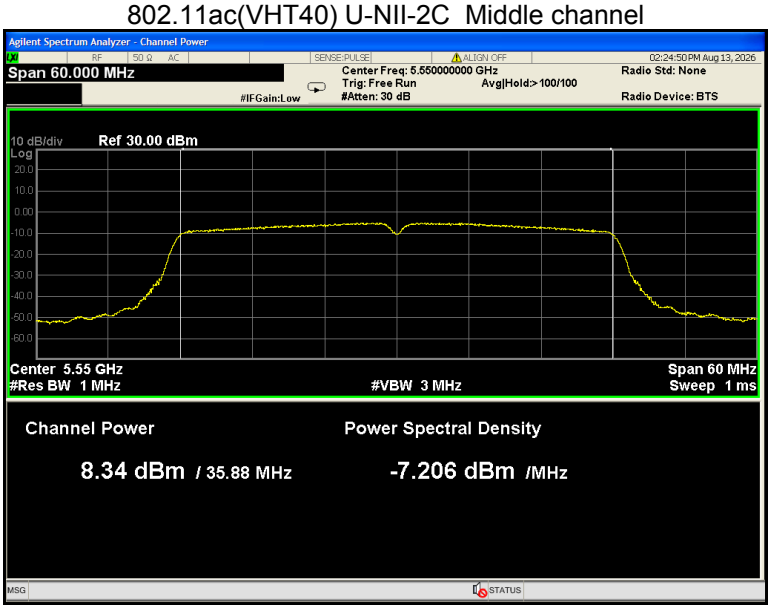

802.11ac(VHT20) U-NII-2C High channel



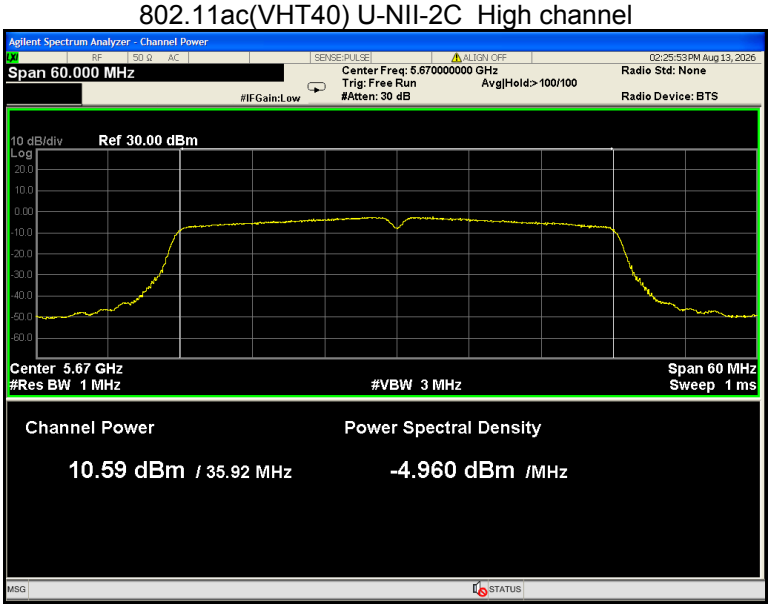
802.11ac(VHT40) U-NII-2C Low channel



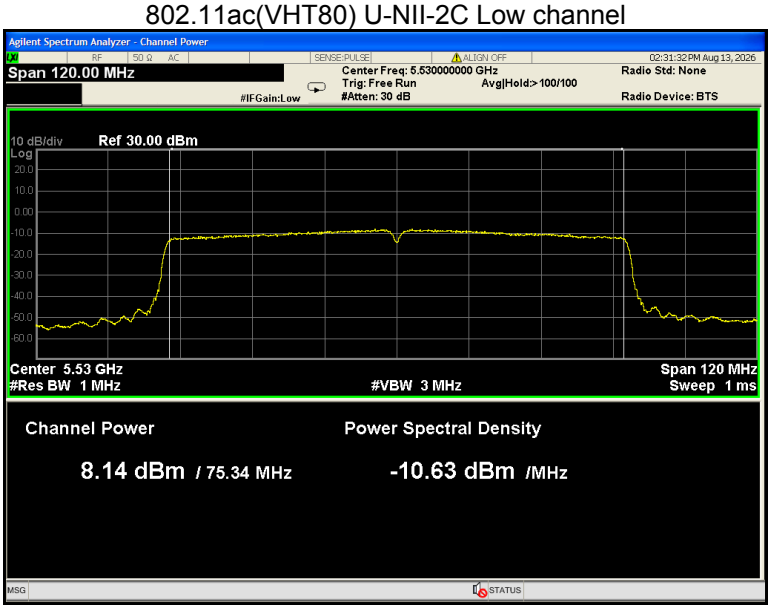

802.11ac(VHT40) U-NII-2C Middle channel



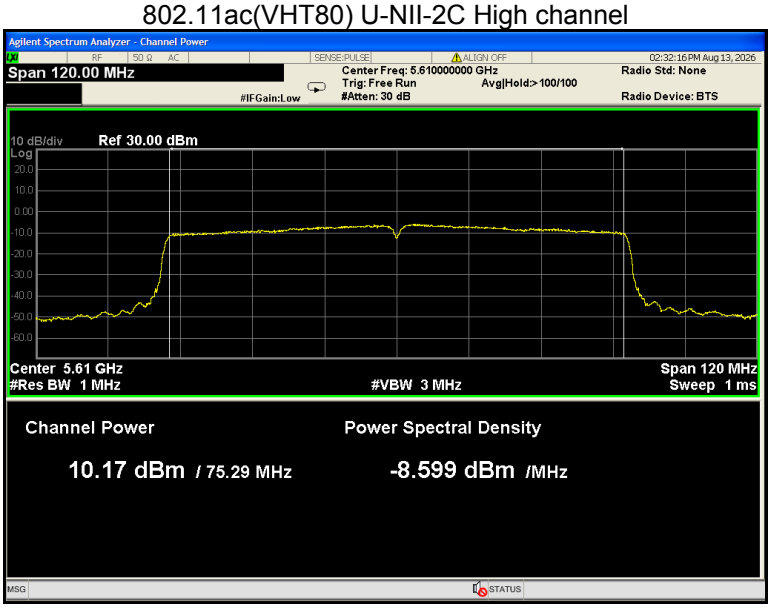
802.11ac(VHT40) U-NII-2C High channel



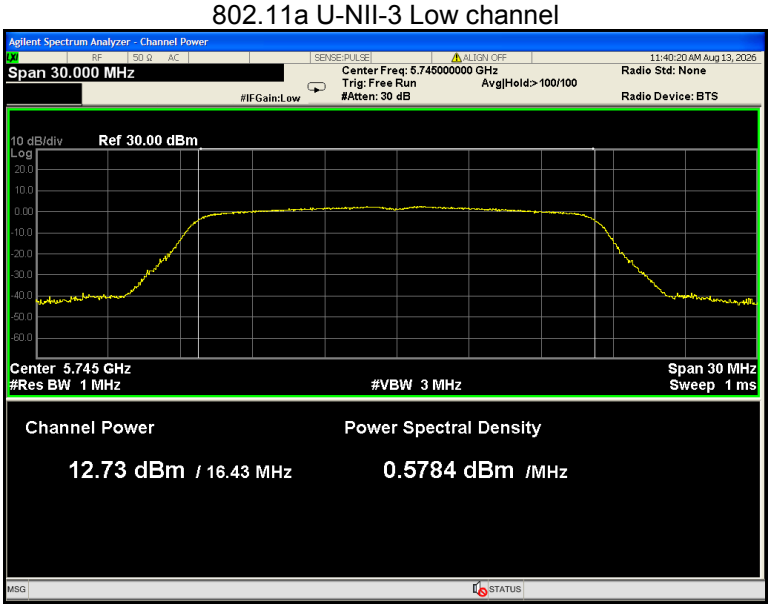

802.11ac(VHT80) U-NII-2C Low channel



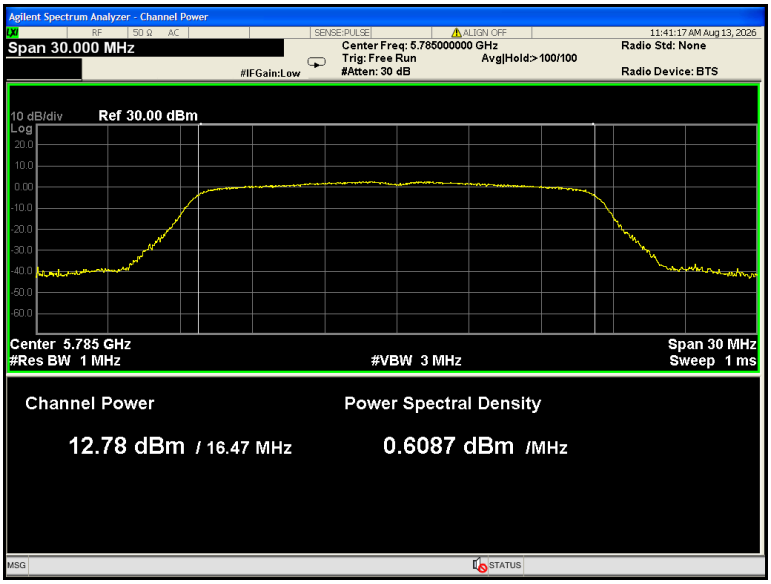
802.11ac(VHT80) U-NII-2C High channel



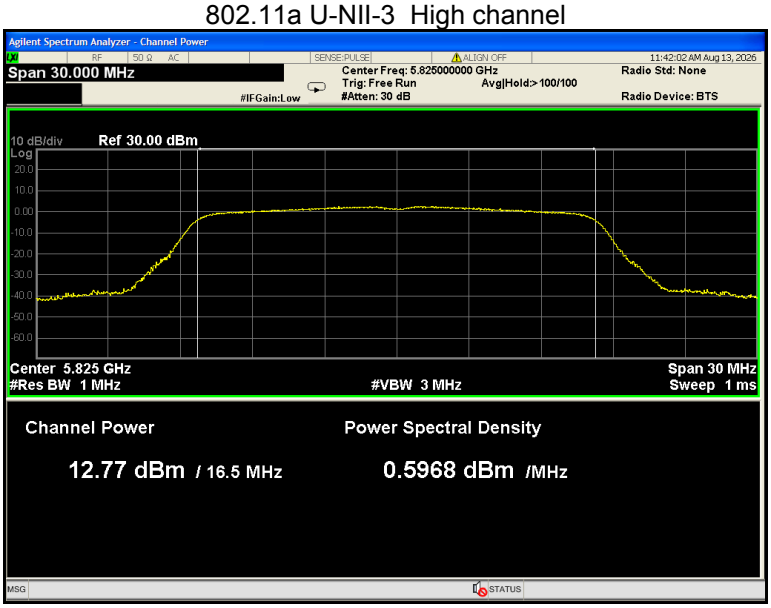
802.11a U-NII-3 Low channel



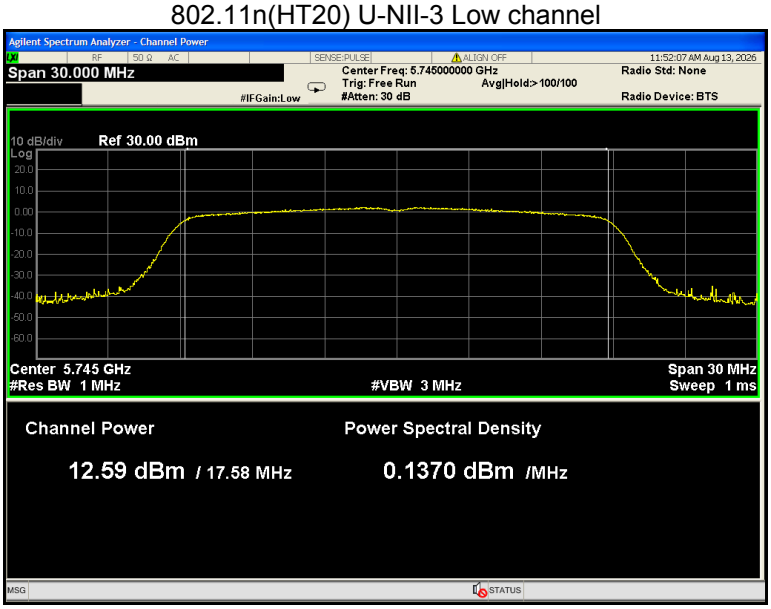

802.11a U-NII-3 Middle channel



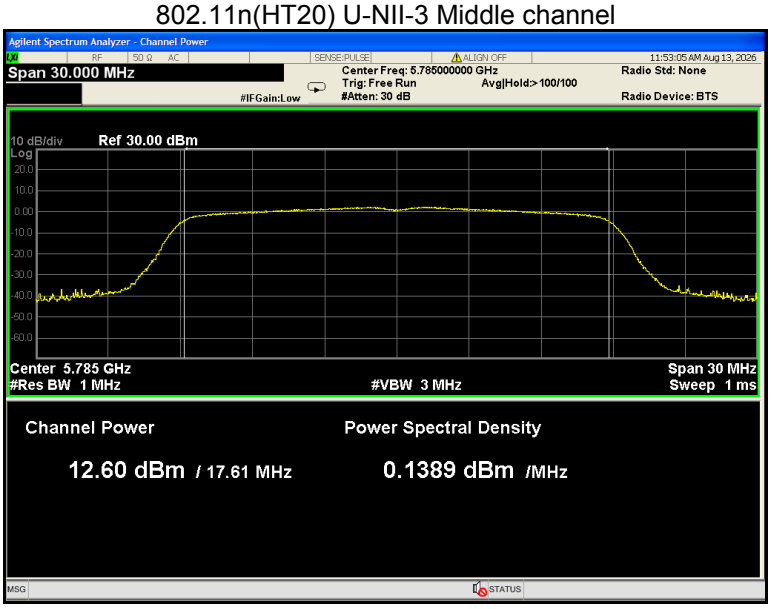
802.11a U-NII-3 High channel



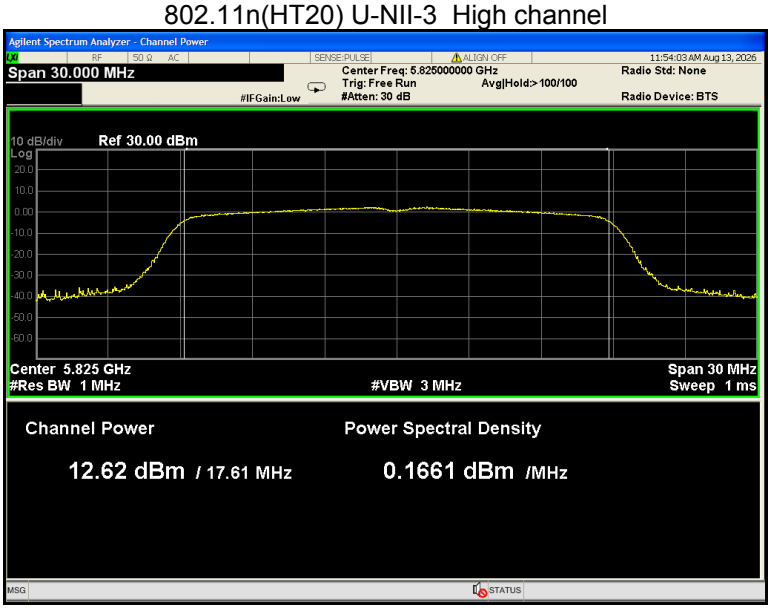

802.11n(HT20) U-NII-3 Low channel



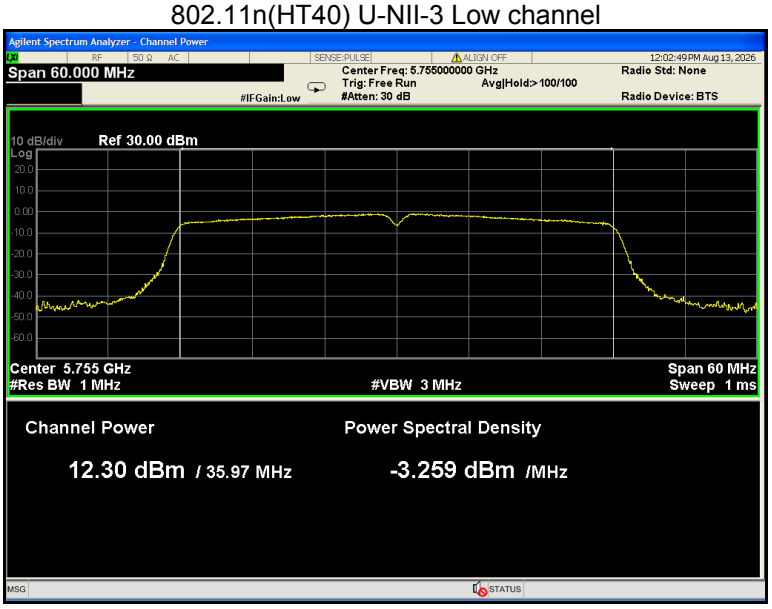
802.11n(HT20) U-NII-3 Middle channel



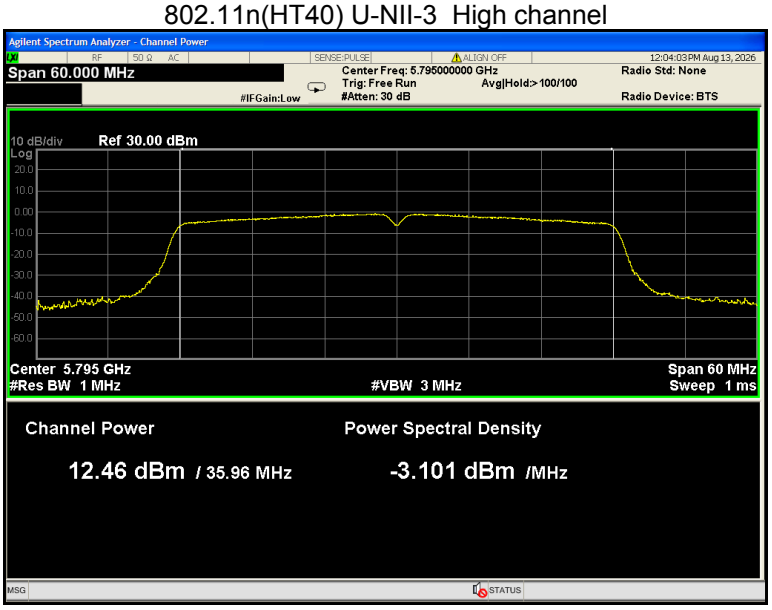

802.11n(HT20) U-NII-3 High channel



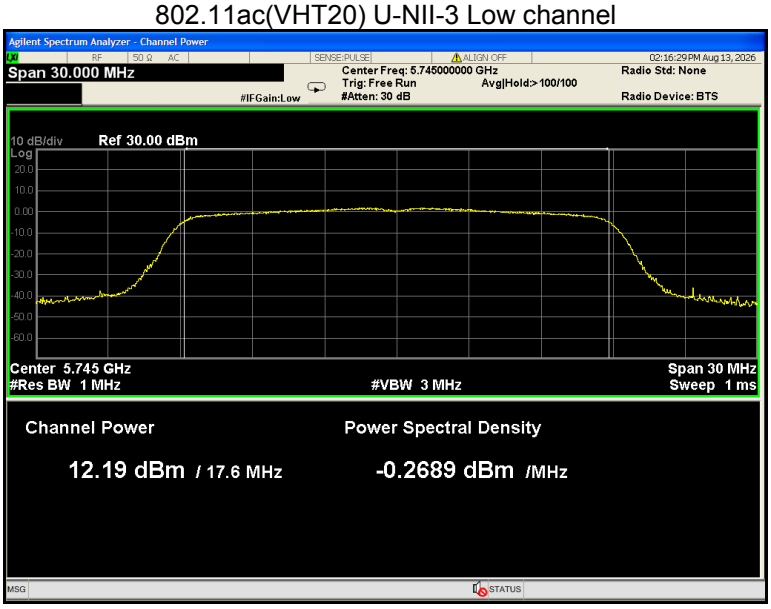
802.11n(HT40) U-NII-3 Low channel



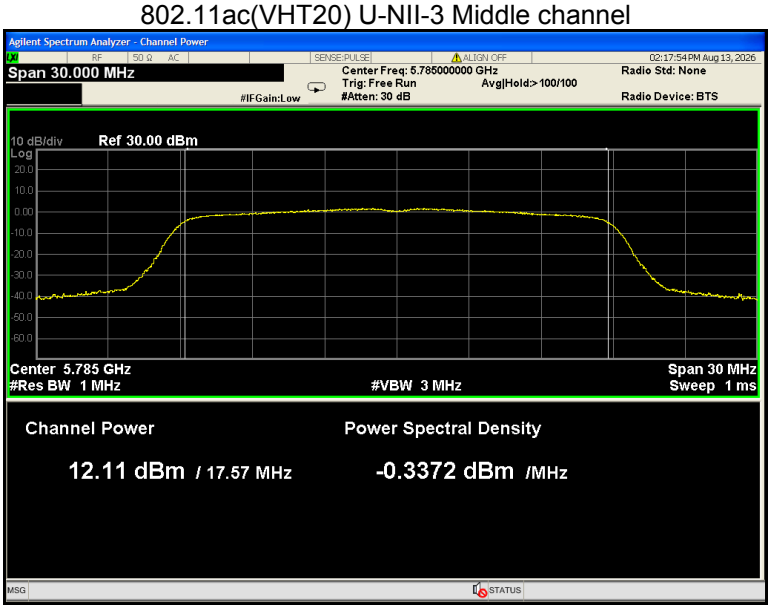

802.11n(HT40) U-NII-3 High channel



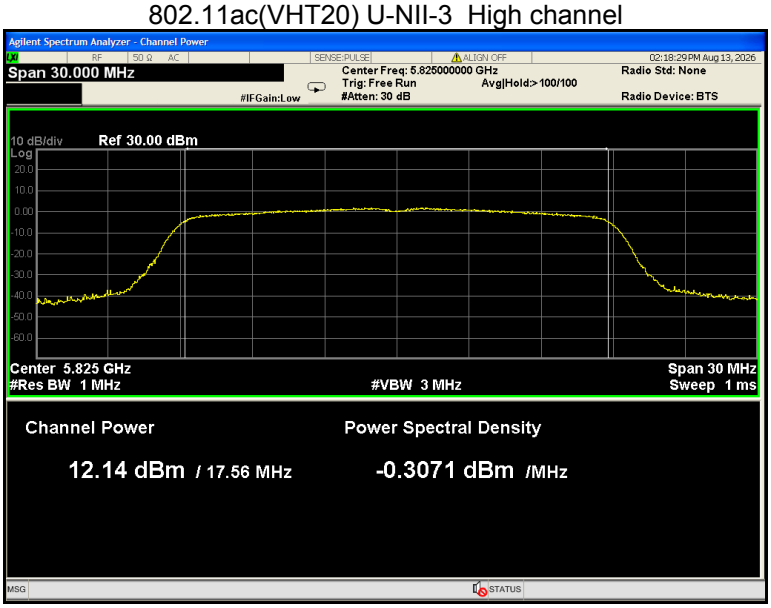
802.11ac(VHT20) U-NII-3 Low channel



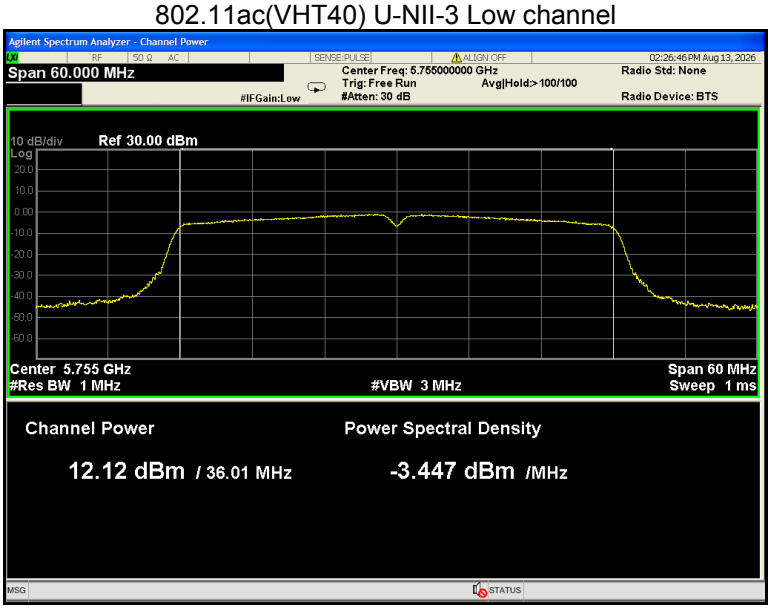

802.11ac(VHT20) U-NII-3 Middle channel



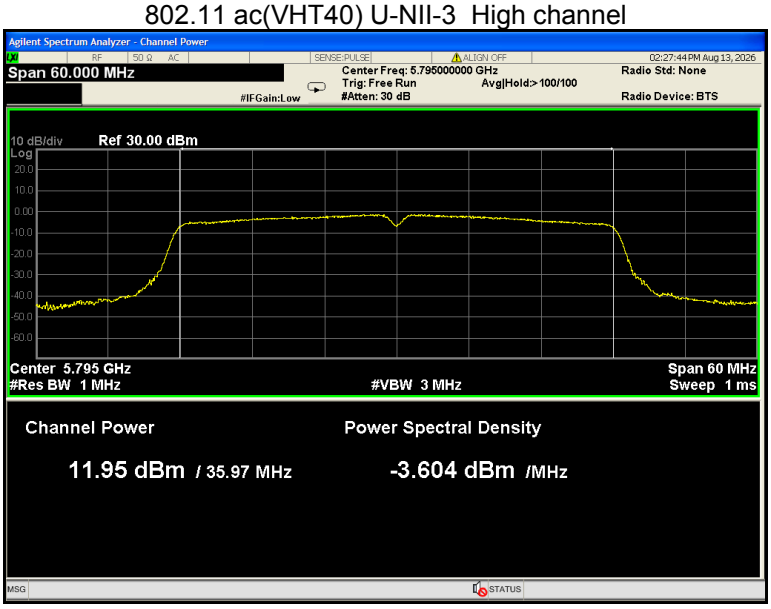
802.11ac(VHT20) U-NII-3 High channel



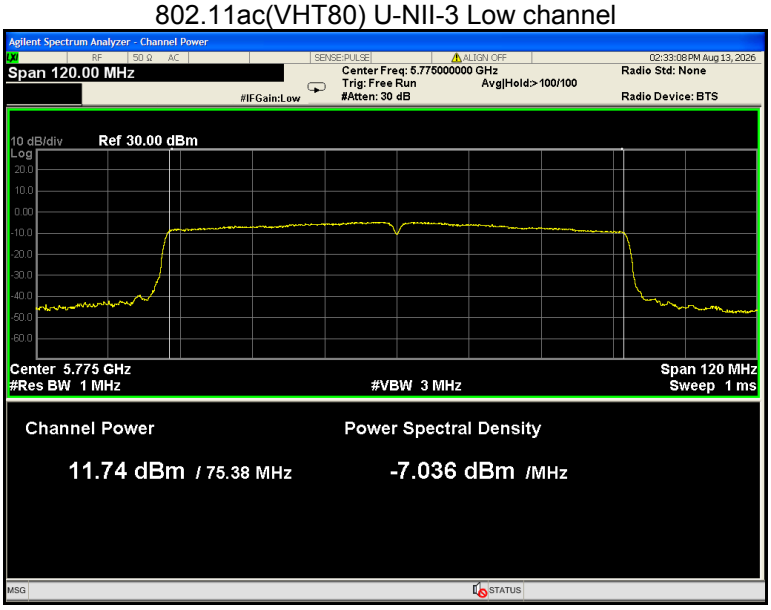

802.11ac(VHT40) U-NII-3 Low channel



802.11 ac(VHT40) U-NII-3 High channel




802.11ac(VHT80) U-NII-3 Low channel



# 14 Power Spectral Density

| | |
|---|---|
| Test Requirement: | FCC 47CFR Part 15 Section 15.407(a) |
| Test Method: | KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 |
| Test Limit: | **For the band 5.15-5.25 GHz**<br>For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.<br>For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.<br>For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.<br>For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.<br>**For the 5.25-5.35 GHz and 5.47-5.725 GHz bands**<br>The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.<br>**For the band 5.725-5.850 GHz**<br>The maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. |
| Test Result: | PASS |

## 14.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
2. Refer to section 4 of this report, according to KDB 789033 and ANSI C63.10, select the appropriate test method: SA-1.
3. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
4. The result is the Maximum PSD over 1 MHz reference bandwidth.
5. For devices operating in the band 5.725−5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz).

## 14.2 Test Result

| Band | Operation mode | Channel | Power Spectral Density (dBm/MHz) |
|---|---|---|---|
| U-NII-1 | 802.11a | Low | 4.850 |
| | | Middle | 5.118 |
| | | High | 5.230 |
| | 802.11n(HT20) | Low | 4.364 |
| | | Middle | 4.449 |
| | | High | 4.297 |
| | 802.11n(HT40) | Low | -0.737 |
| | | Middle | / |
| | | High | -0.376 |
| | 802.11ac(VHT20) | Low | 3.916 |
| | | Middle | 4.331 |
| | | High | 4.276 |
| | 802.11ac(VHT40) | Low | -0.465 |
| | | Middle | / |
| | | High | -0.635 |
| | 802.11ac(VHT80) | Low | -4.285 |
| | | Middle | / |
| | | High | / |

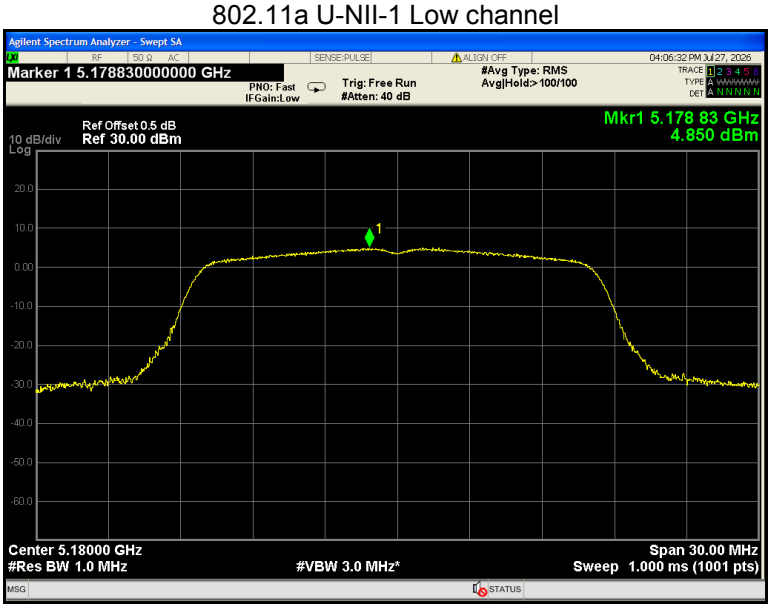
| Band | Operation mode | Channel | Power Spectral Density (dBm/MHz) |
|---|---|---|---|
| U-NII-2A | 802.11a | Low | 2.925 |
| | | Middle | 3.648 |
| | | High | 3.826 |
| | 802.11n(HT20) | Low | 2.079 |
| | | Middle | 2.468 |
| | | High | 2.310 |
| | 802.11n(HT40) | Low | -1.808 |
| | | Middle | / |
| | | High | -1.788 |
| | 802.11ac(VHT20) | Low | 2.265 |
| | | Middle | 2.407 |
| | | High | 2.464 |
| | 802.11ac(VHT40) | Low | -1.968 |
| | | Middle | / |
| | | High | -1.899 |
| | 802.11ac(VHT80) | Low | -5.840 |
| | | Middle | / |
| | | High | / |

| Band | Operation mode | Channel | Power Spectral Density (dBm/MHz) |
|---|---|---|---|
| U-NII-2C | 802.11a | Low | 1.852 |
| | | Middle | 3.909 |
| | | High | 4.287 |
| | 802.11n(HT20) | Low | 0.020 |
| | | Middle | 2.209 |
| | | High | 2.049 |
| | 802.11n(HT40) | Low | -2.923 |
| | | Middle | -2.826 |
| | | High | -0.978 |
| | 802.11ac(VHT20) | Low | 0.137 |
| | | Middle | 2.357 |
| | | High | 2.235 |
| | 802.11ac(VHT40) | Low | -2.849 |
| | | Middle | -2.849 |
| | | High | -0.828 |
| | 802.11ac(VHT80) | Low | -6.175 |
| | | Middle | / |
| | | High | -3.996 |

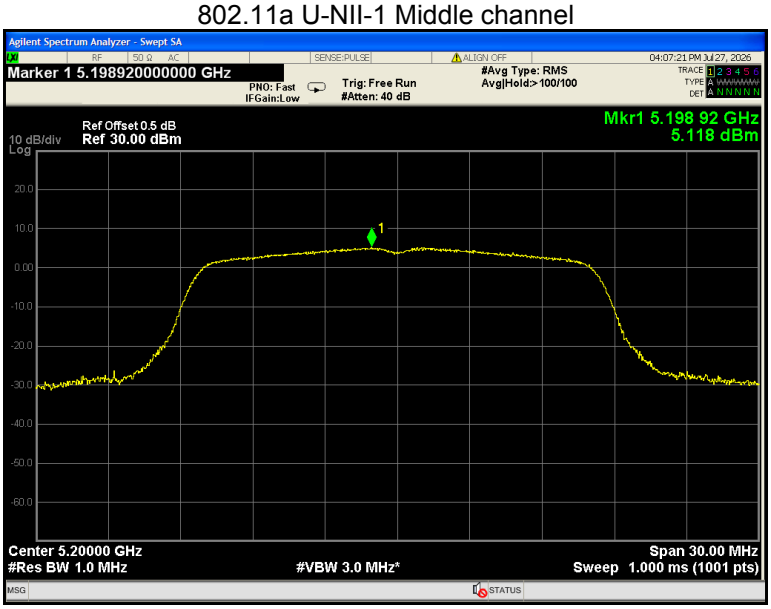
| Band | Operation mode | Channel | Power Spectral Density (dBm/500kHz) |
|---|---|---|---|
| U-NII-3 | 802.11a | Low | 1.933 |
| | | Middle | 1.671 |
| | | High | 1.803 |
| | 802.11n(HT20) | Low | 1.250 |
| | | Middle | 1.114 |
| | | High | 0.937 |
| | 802.11n(HT40) | Low | -1.877 |
| | | Middle | / |
| | | High | -2.224 |
| | 802.11ac(VHT20) | Low | 1.167 |
| | | Middle | 1.232 |
| | | High | 1.387 |
| | 802.11ac(VHT40) | Low | -1.921 |
| | | Middle | / |
| | | High | -1.669 |
| | 802.11ac(VHT80) | Low | -6.015 |
| | | Middle | / |
| | | High | / |

Test result plots shown as follows:

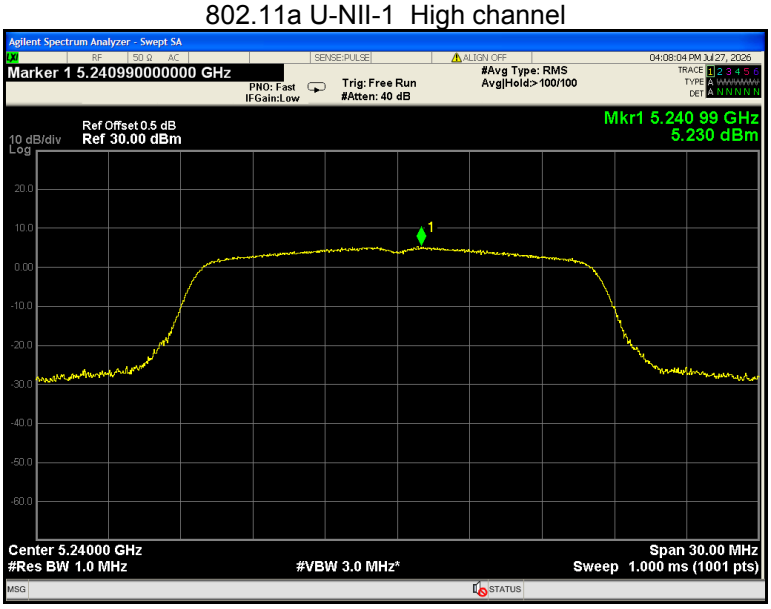
802.11a U-NII-1 Low channel



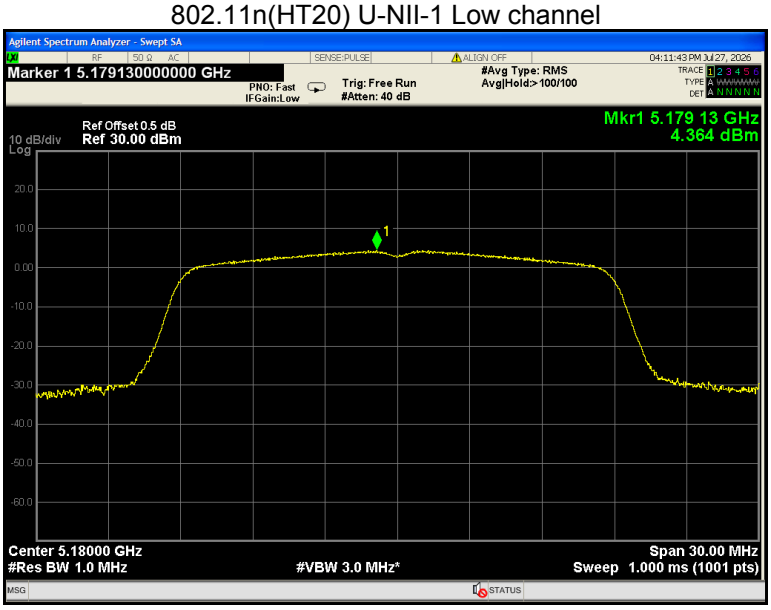

802.11a U-NII-1 Middle channel



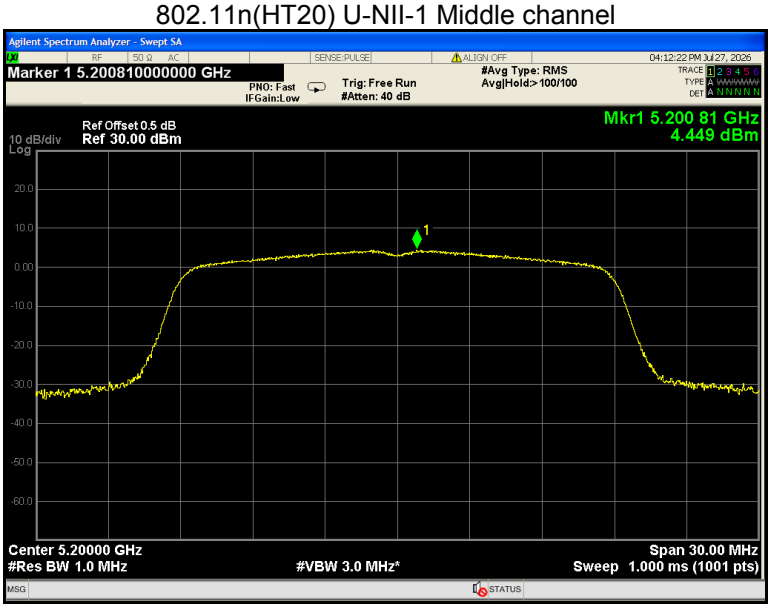
802.11a U-NII-1 High channel



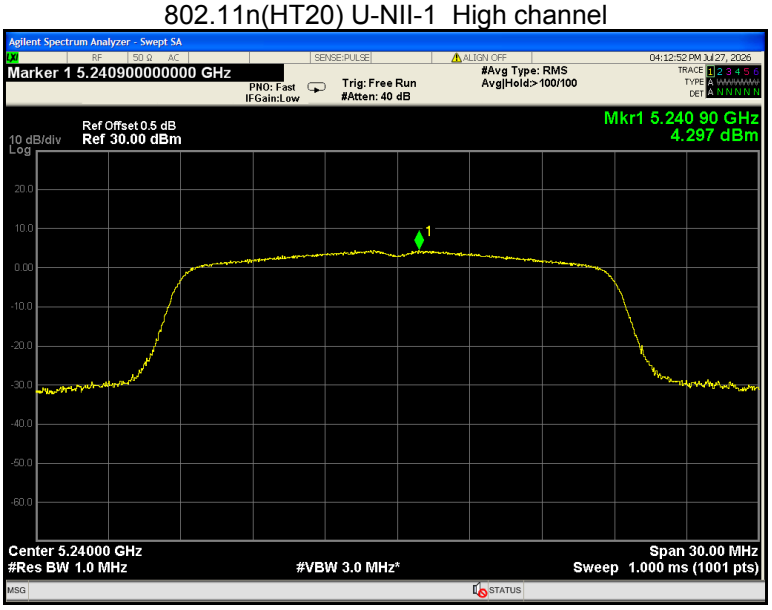

802.11n(HT20) U-NII-1 Low channel



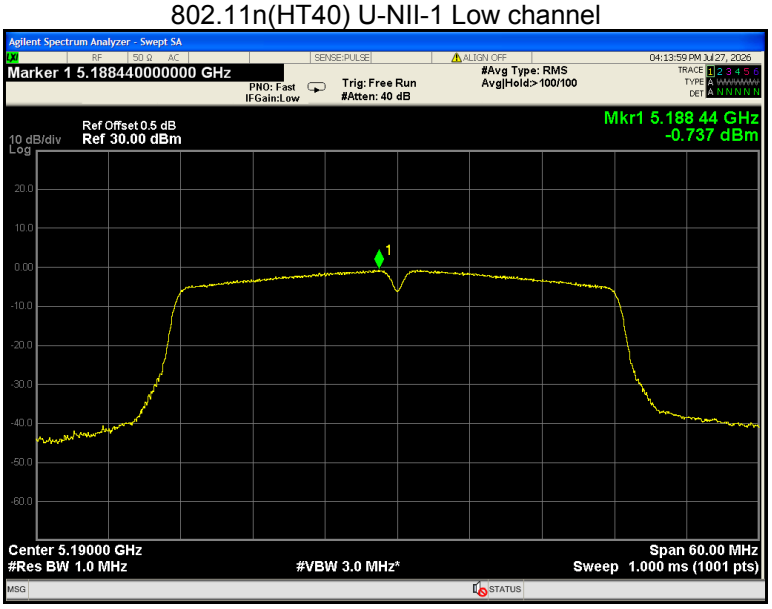
802.11n(HT20) U-NII-1 Middle channel



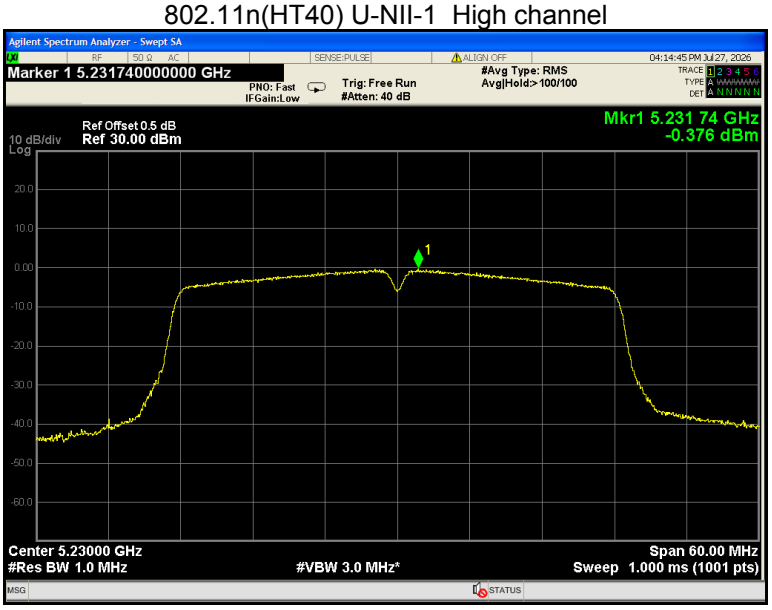

802.11n(HT20) U-NII-1 High channel



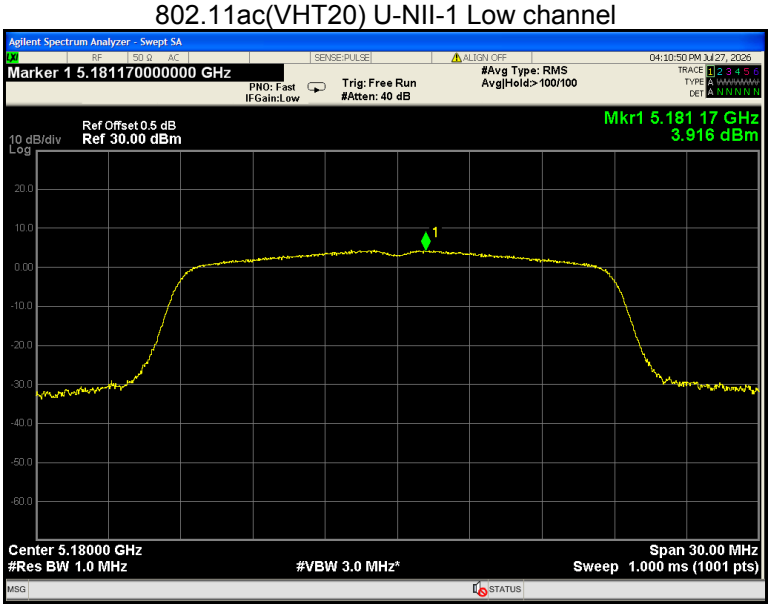
802.11n(HT40) U-NII-1 Low channel



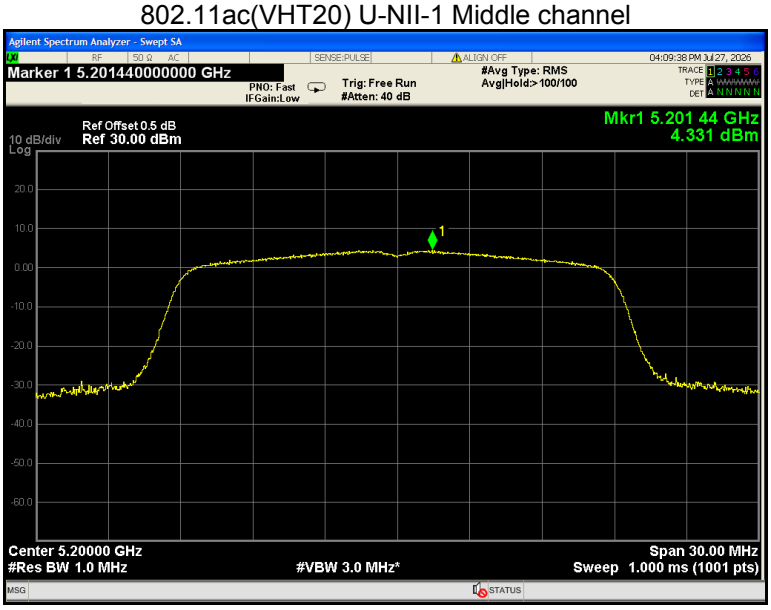

802.11n(HT40) U-NII-1 High channel



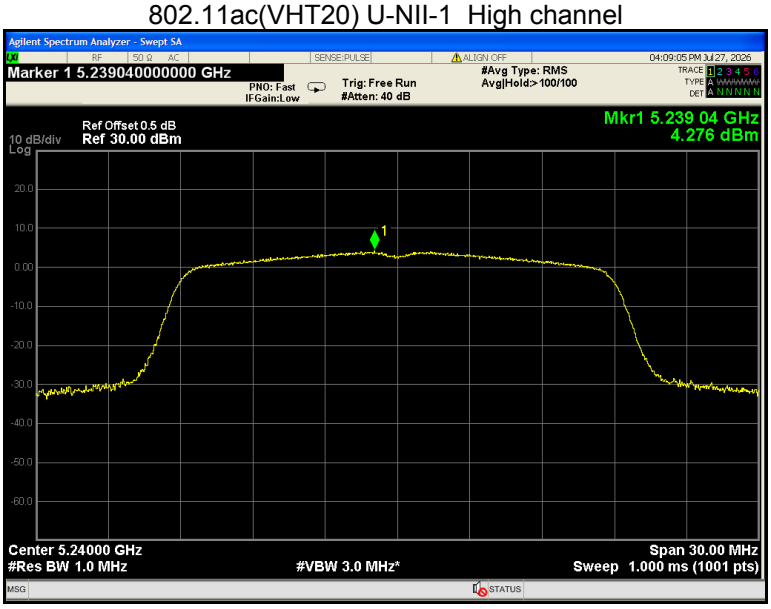
802.11ac(VHT20) U-NII-1 Low channel



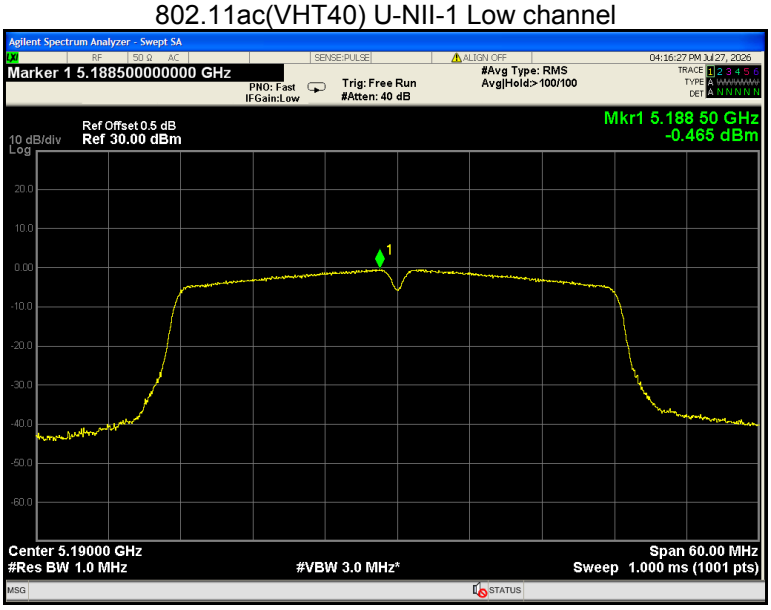

802.11ac(VHT20) U-NII-1 Middle channel



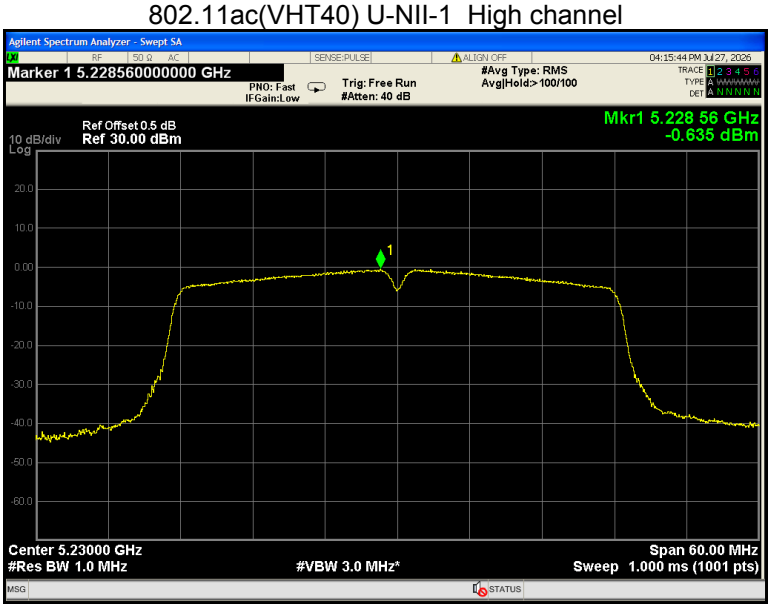
802.11ac(VHT20) U-NII-1 High channel



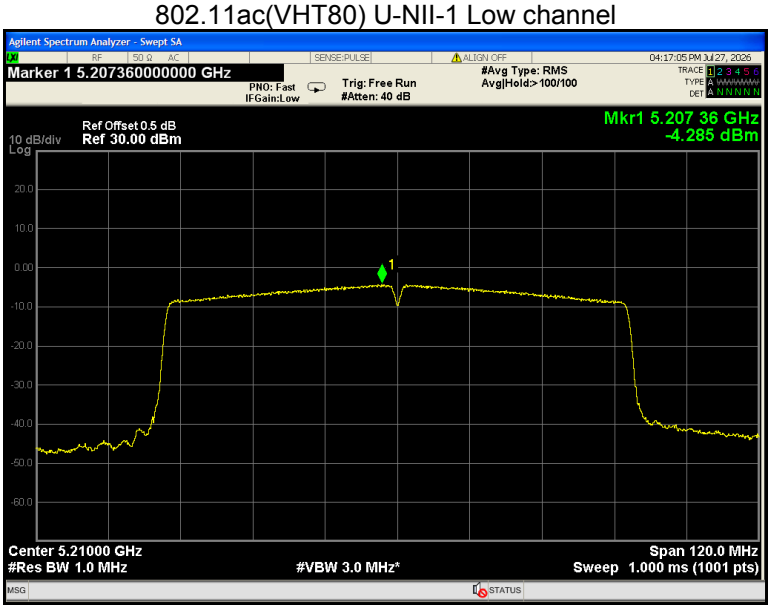

802.11ac(VHT40) U-NII-1 Low channel



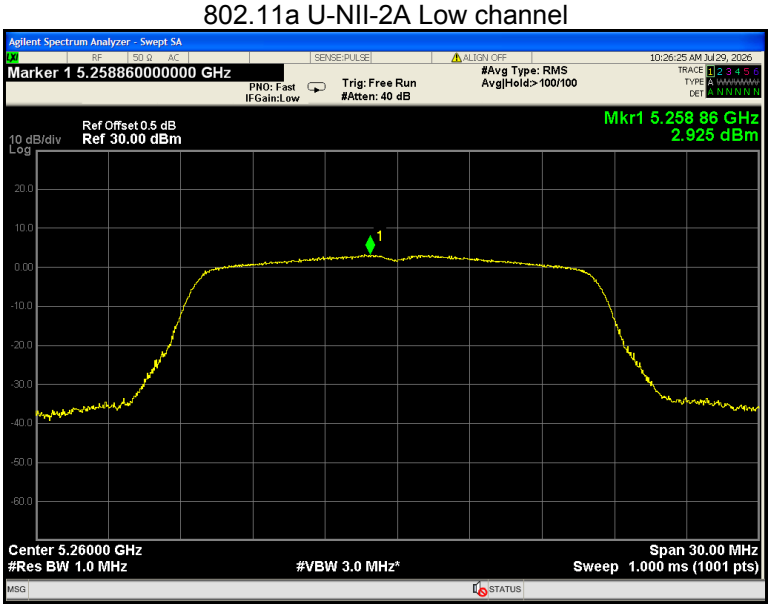
802.11ac(VHT40) U-NII-1 High channel



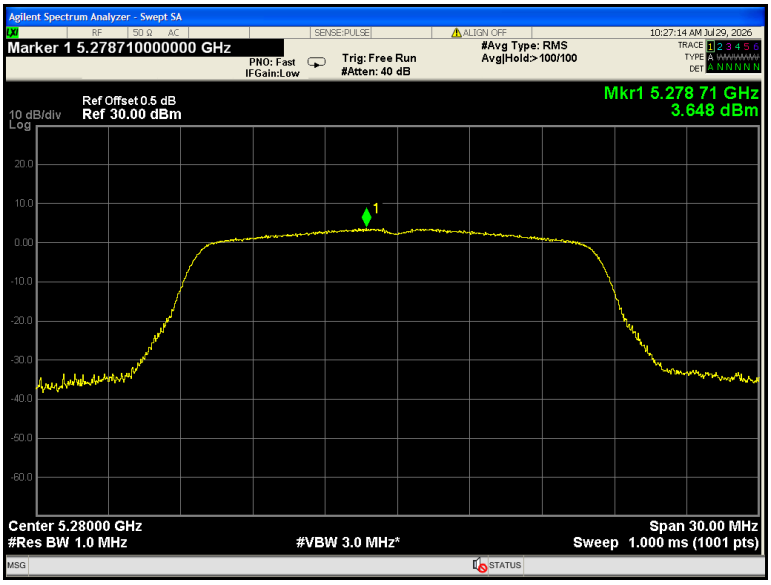

802.11ac(VHT80) U-NII-1 Low channel



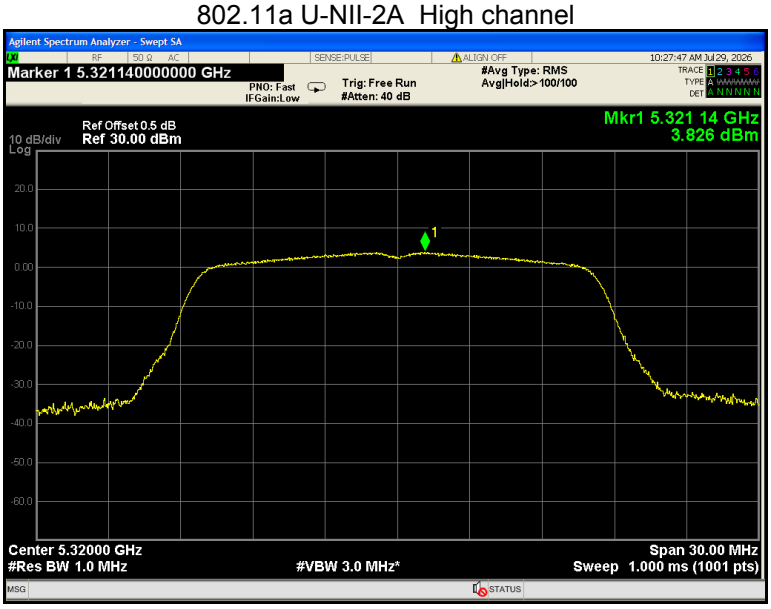
802.11a U-NII-2A Low channel



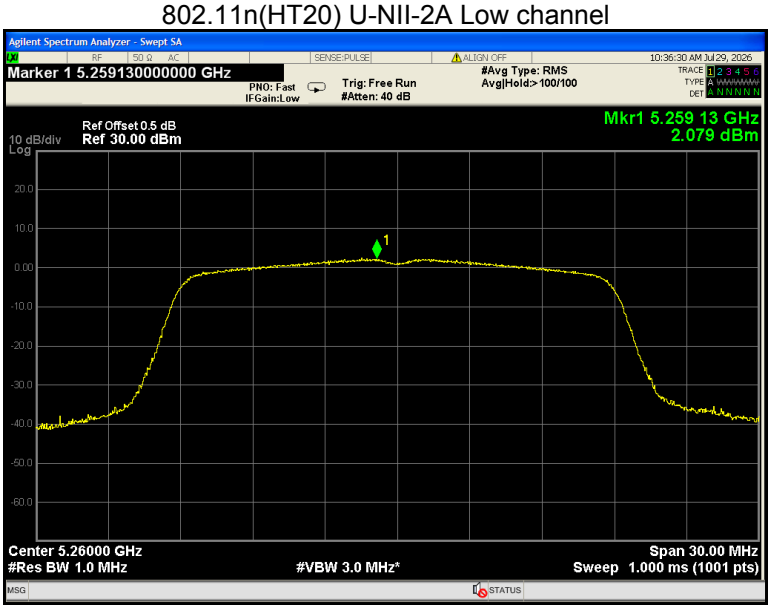

802.11a U-NII-2A Middle channel



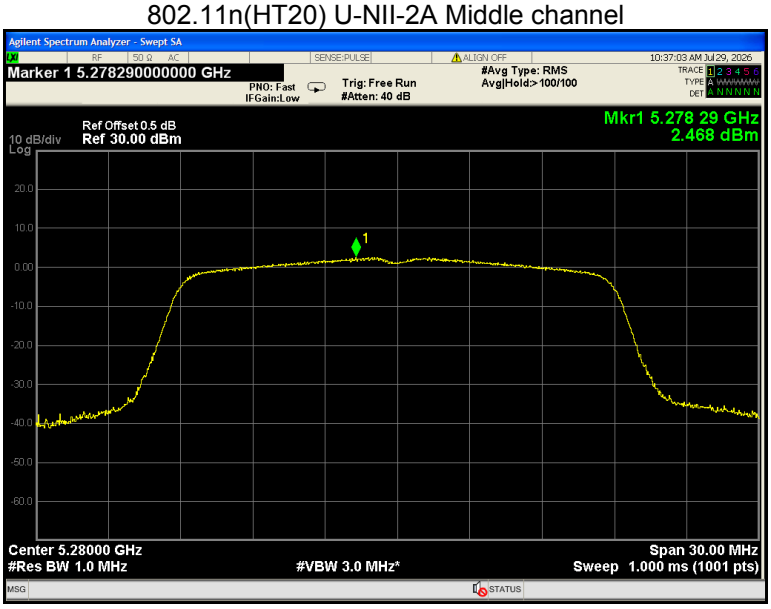
802.11a U-NII-2A High channel



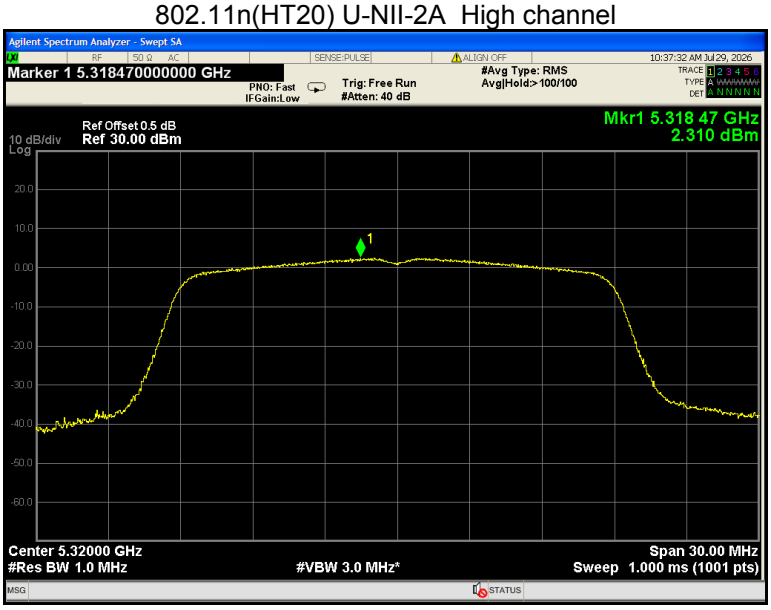

802.11n(HT20) U-NII-2A Low channel



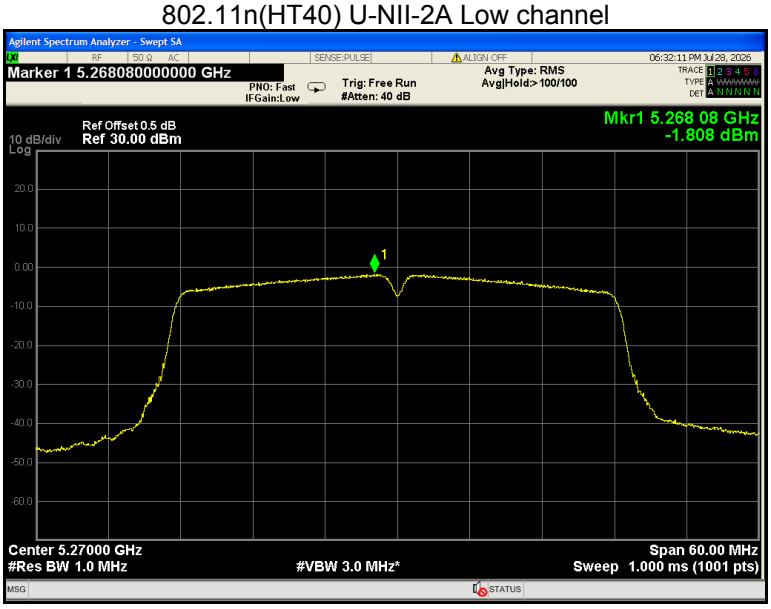
802.11n(HT20) U-NII-2A Middle channel



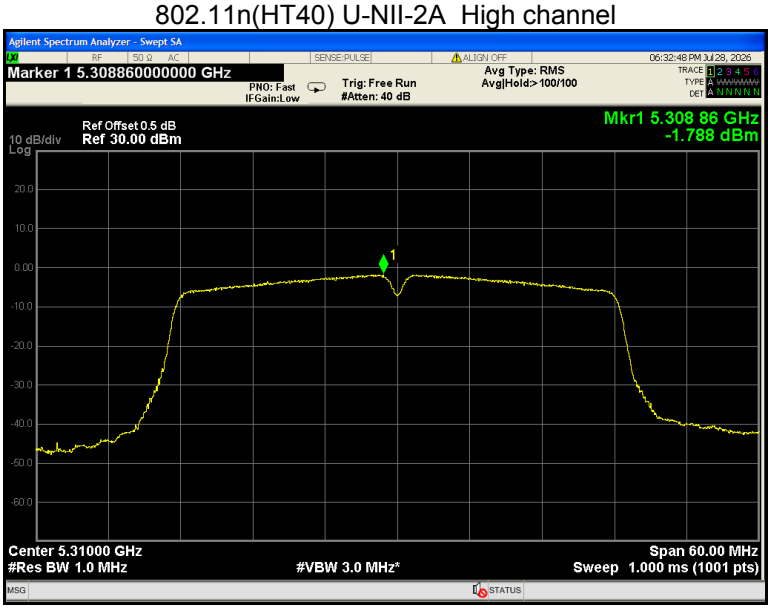

802.11n(HT20) U-NII-2A High channel



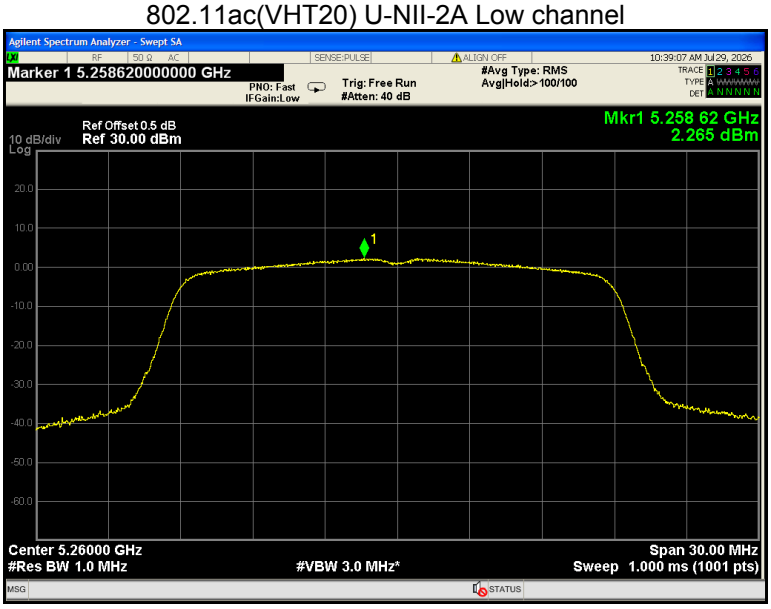
802.11n(HT40) U-NII-2A Low channel



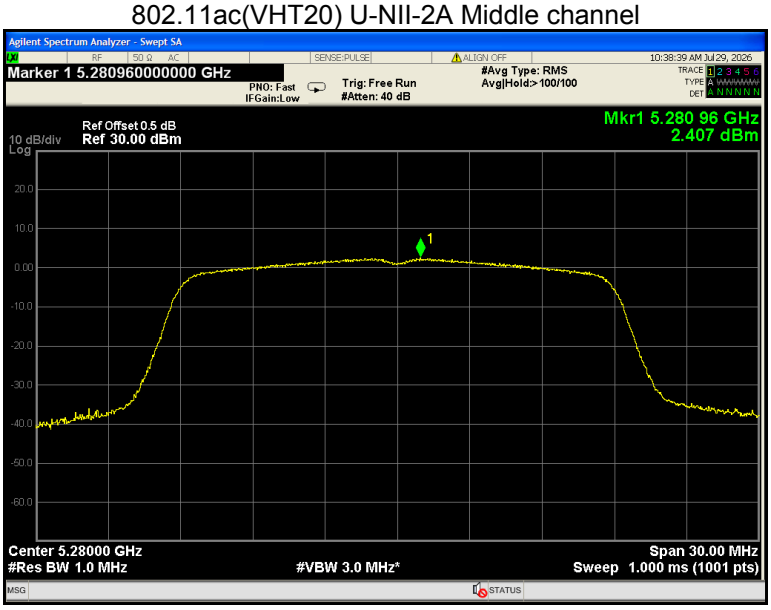

802.11n(HT40) U-NII-2A High channel



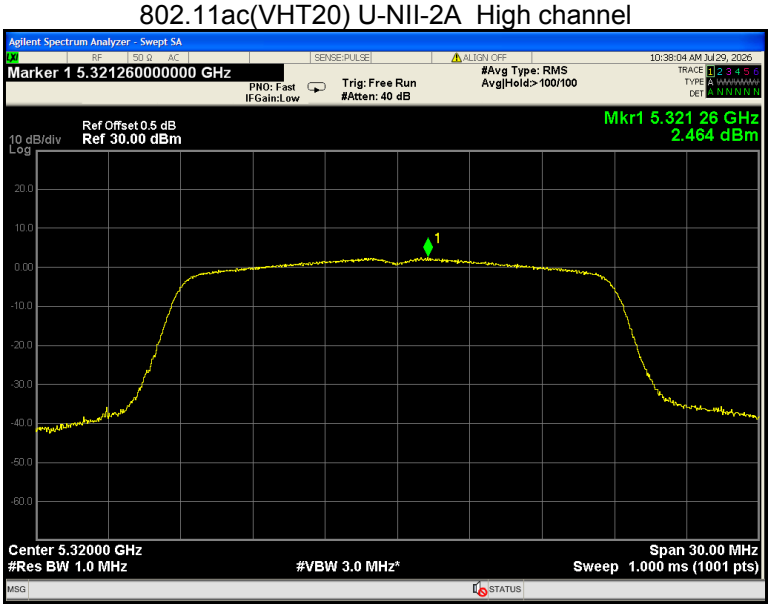
802.11ac(VHT20) U-NII-2A Low channel



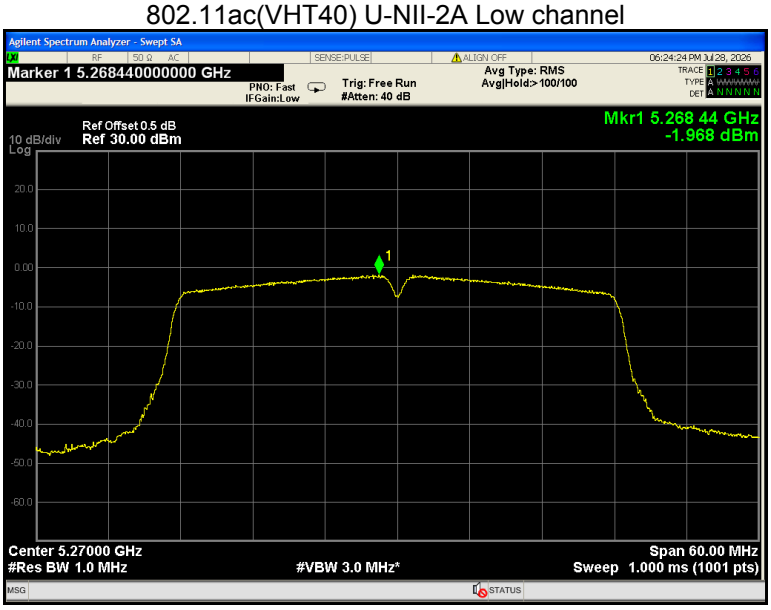

802.11ac(VHT20) U-NII-2A Middle channel



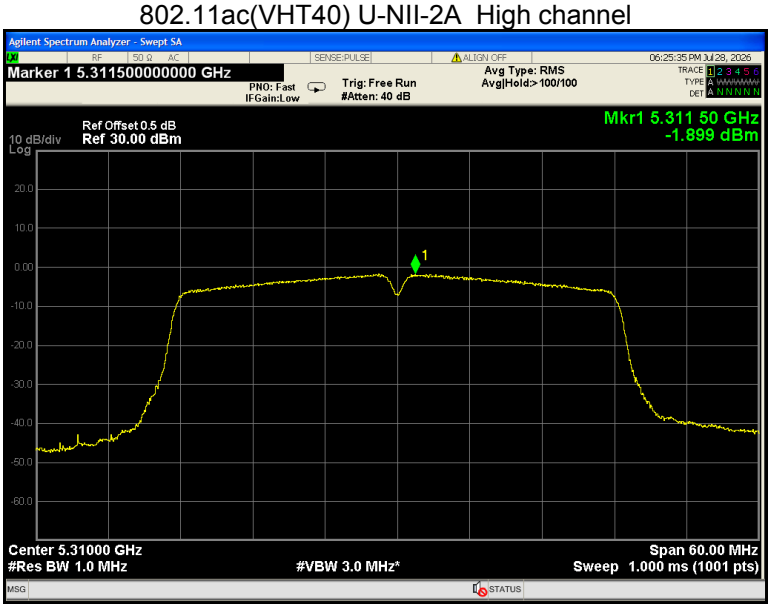
802.11ac(VHT20) U-NII-2A High channel



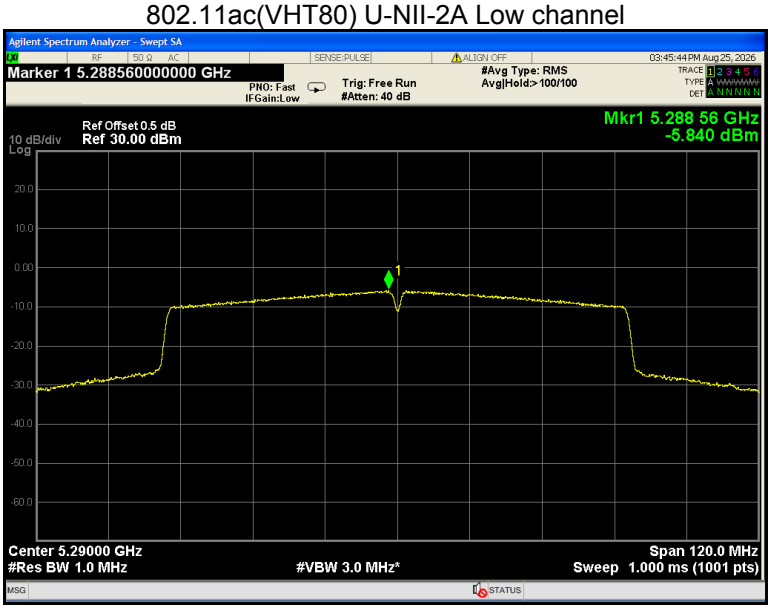

802.11ac(VHT40) U-NII-2A Low channel



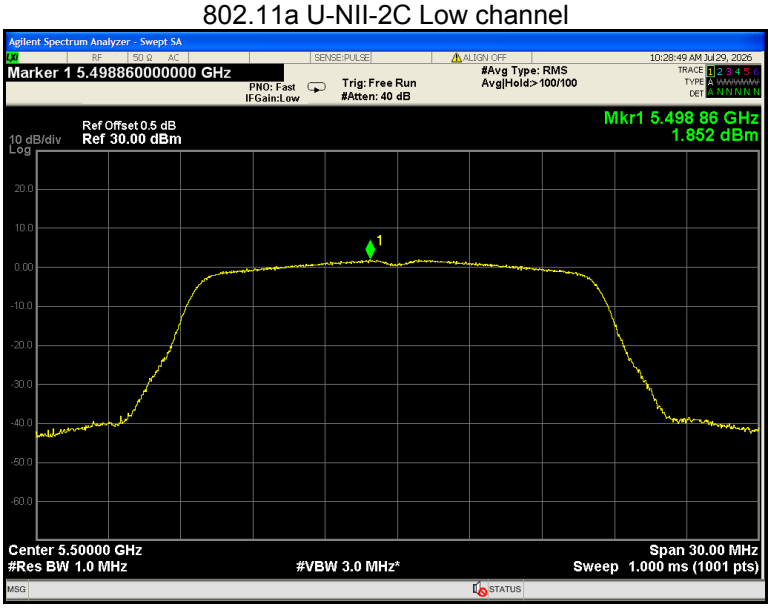
802.11ac(VHT40) U-NII-2A High channel



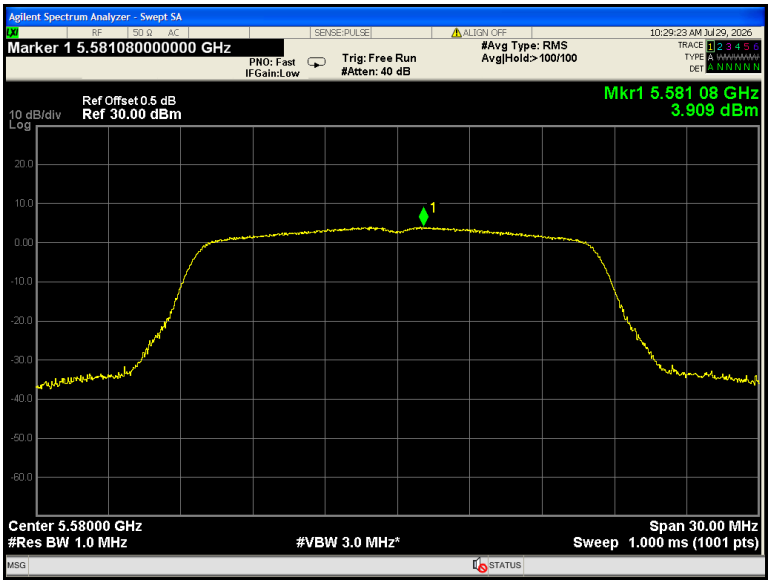

802.11ac(VHT80) U-NII-2A Low channel



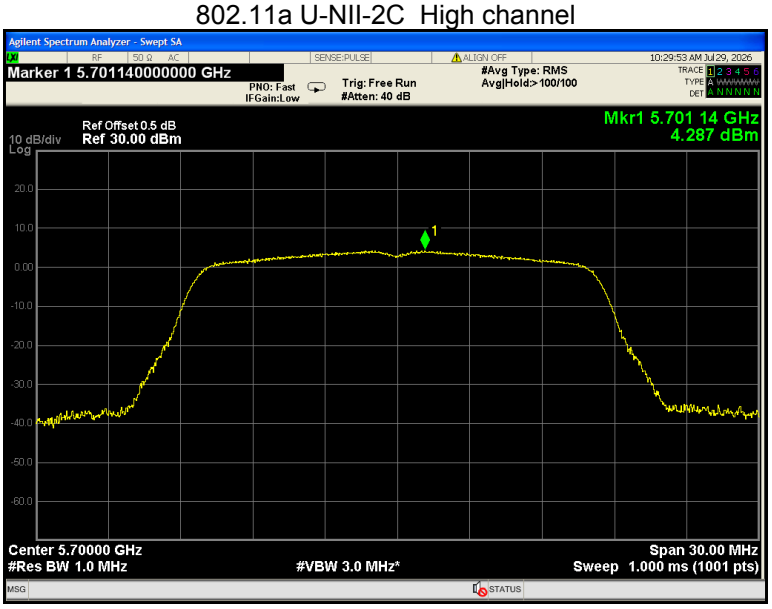
802.11a U-NII-2C Low channel



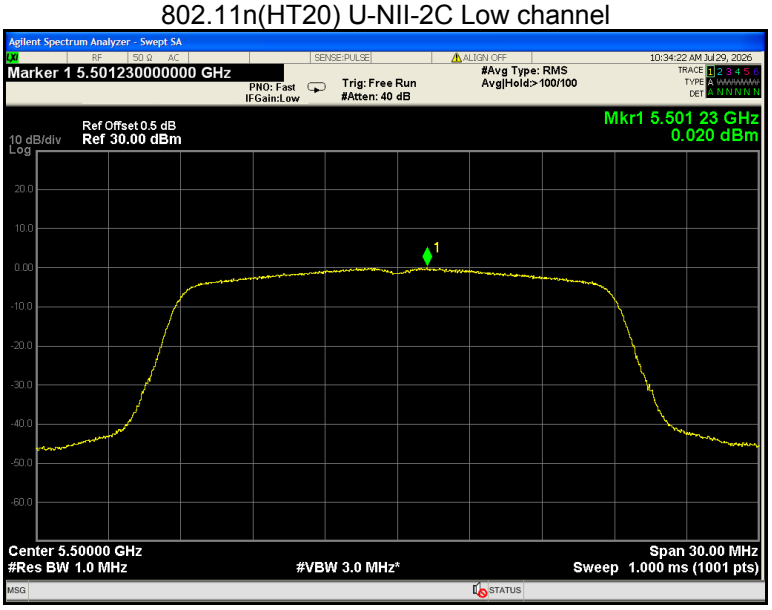

802.11a U-NII-2C Middle channel



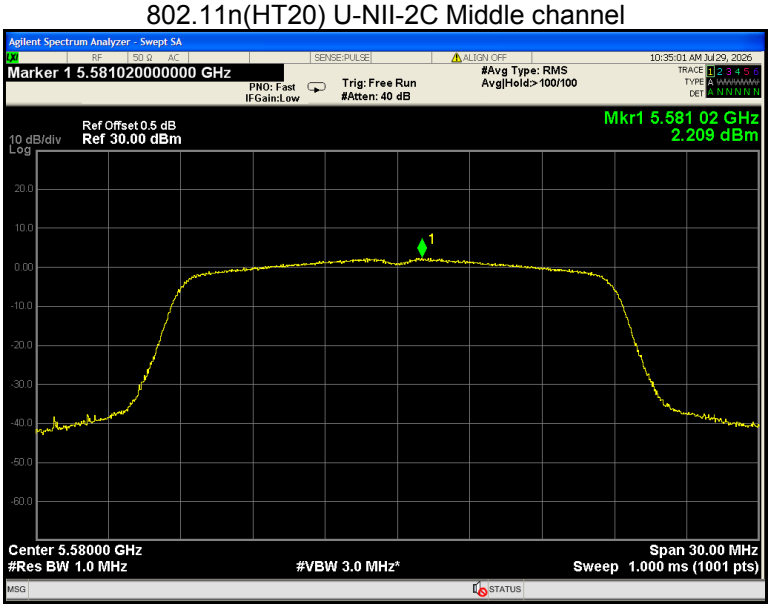
802.11a U-NII-2C High channel



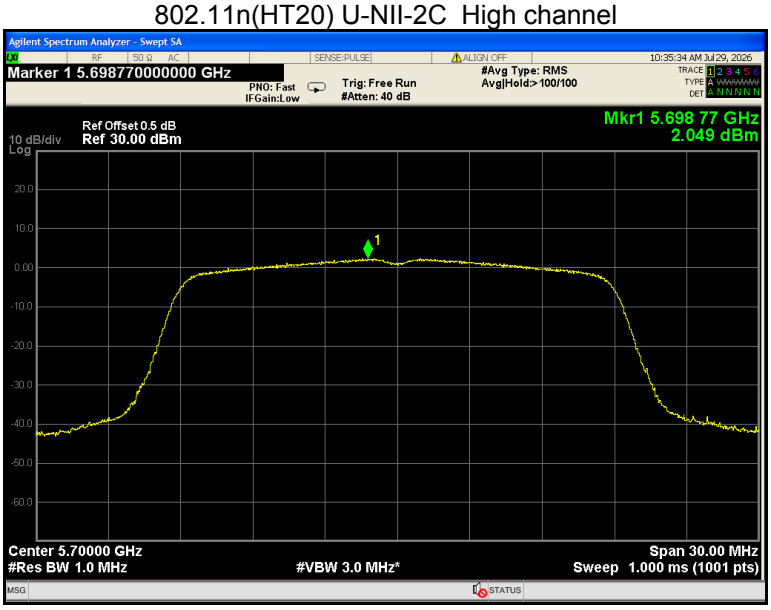

802.11n(HT20) U-NII-2C Low channel



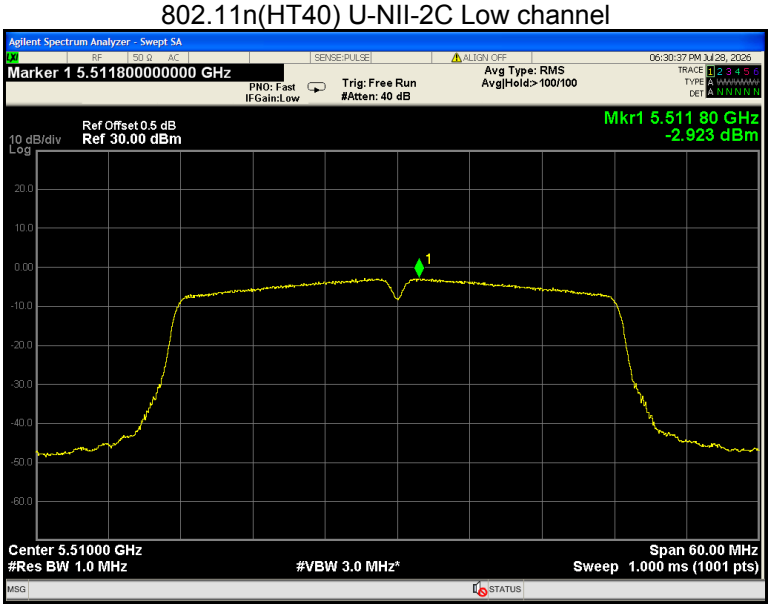
802.11n(HT20) U-NII-2C Middle channel



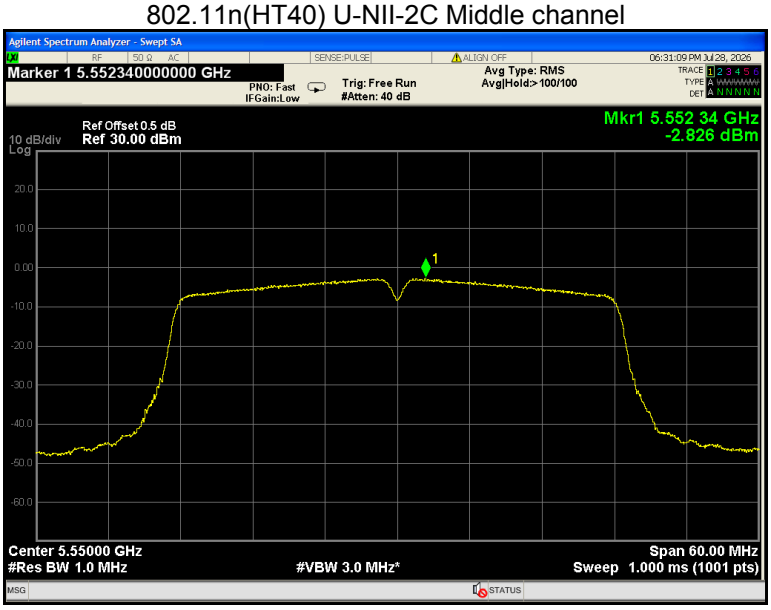

802.11n(HT20) U-NII-2C High channel



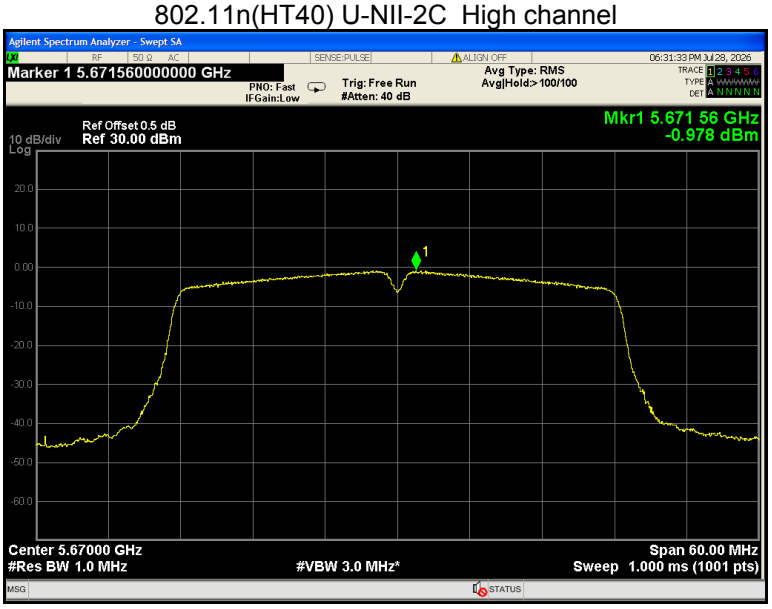
802.11n(HT40) U-NII-2C Low channel



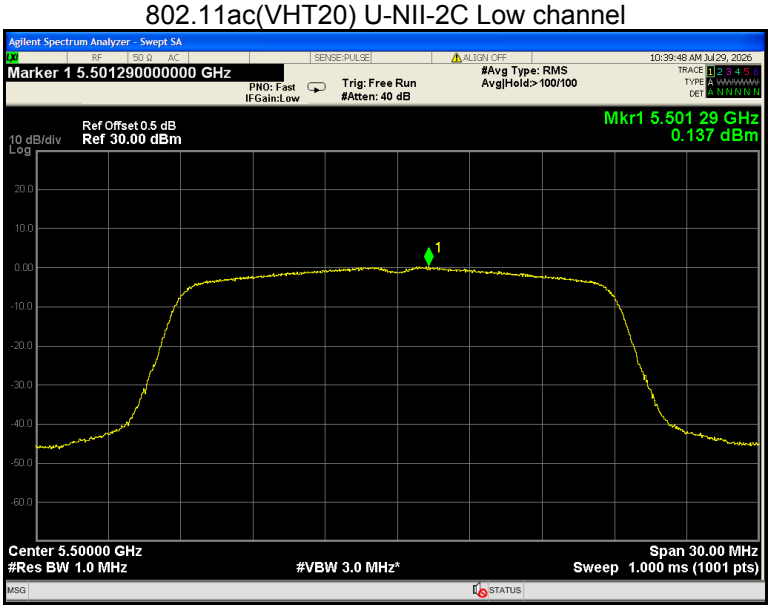

802.11n(HT40) U-NII-2C Middle channel



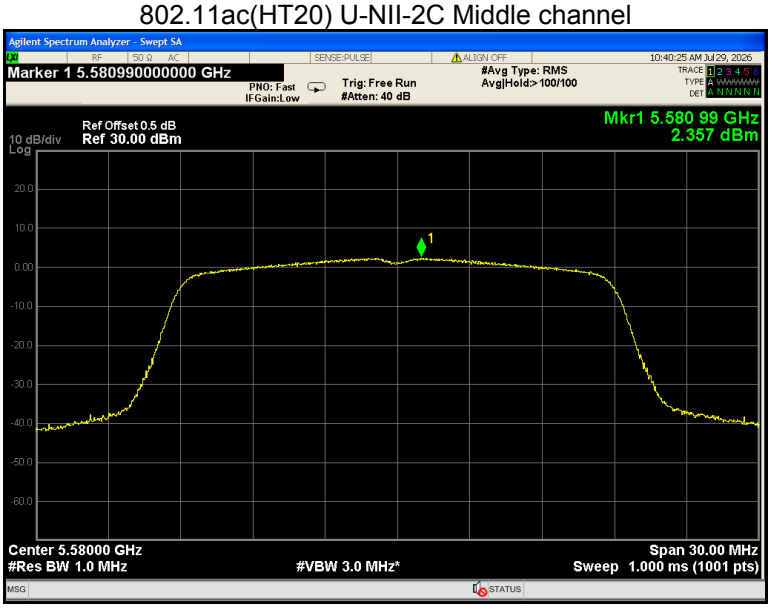
802.11n(HT40) U-NII-2C High channel



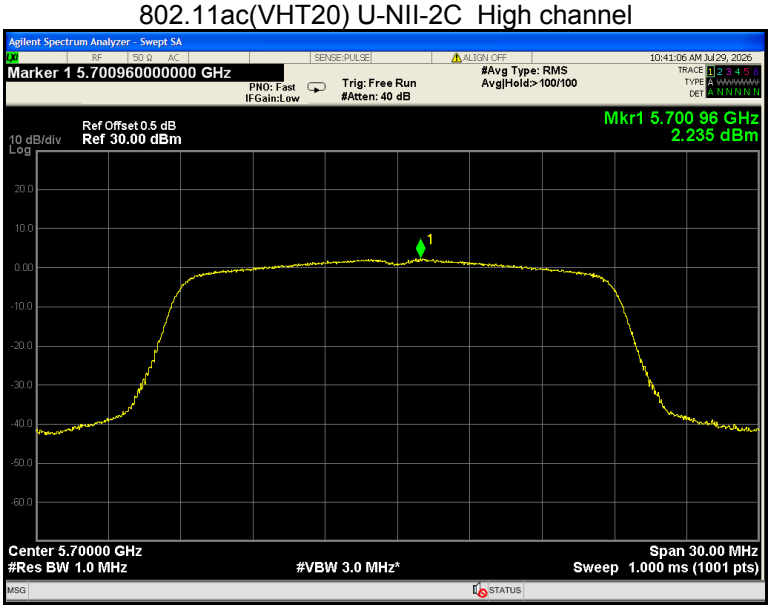

802.11ac(VHT20) U-NII-2C Low channel



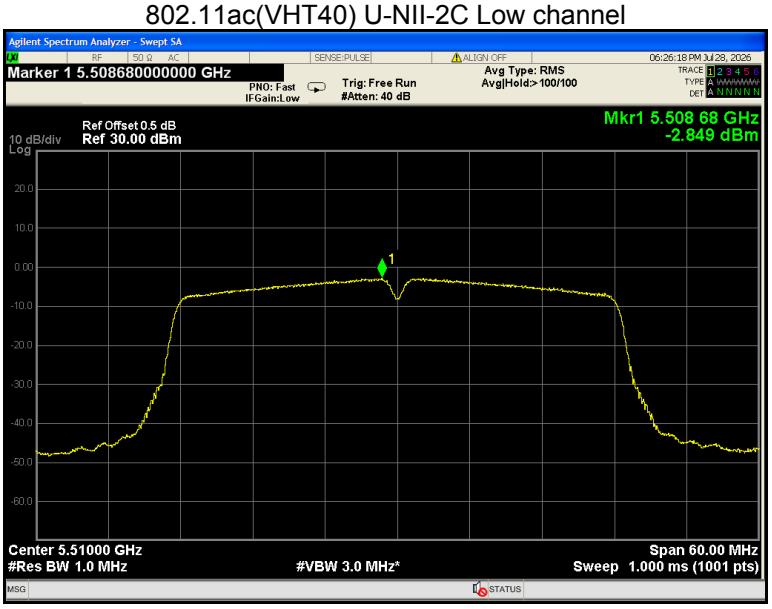
802.11ac(HT20) U-NII-2C Middle channel



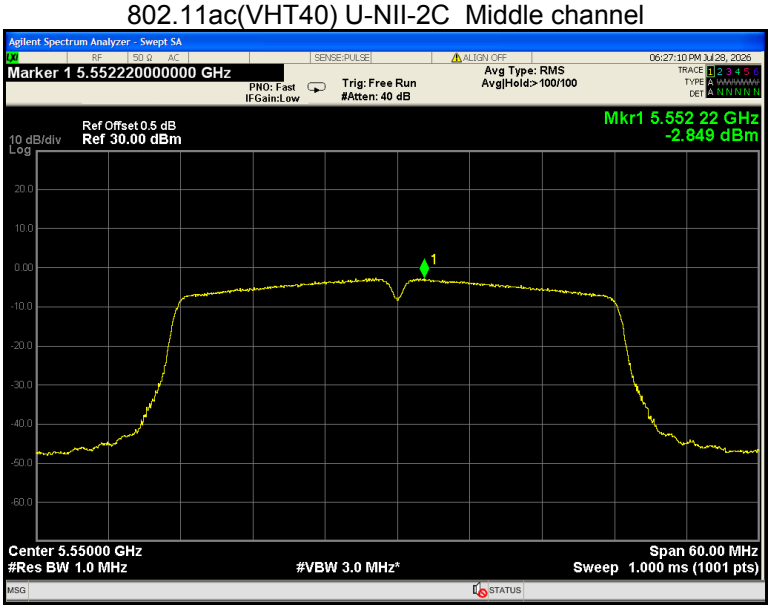

802.11ac(VHT20) U-NII-2C High channel



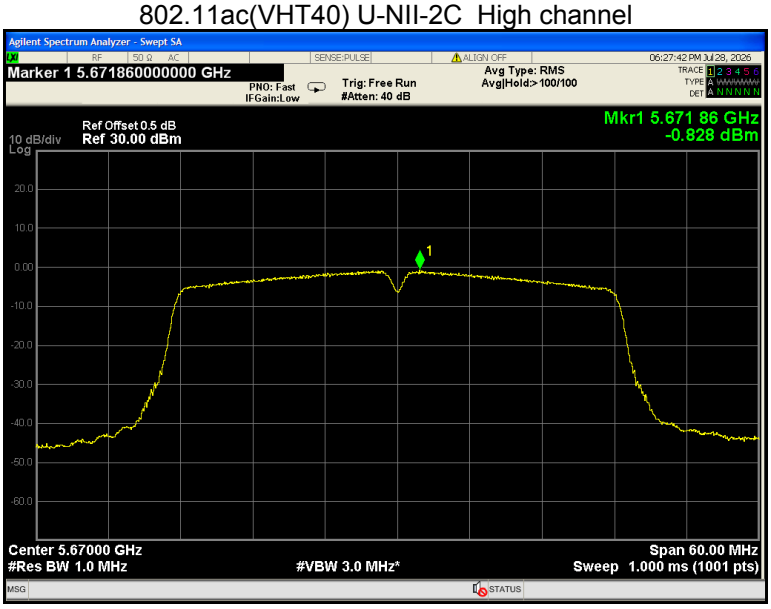
802.11ac(VHT40) U-NII-2C Low channel



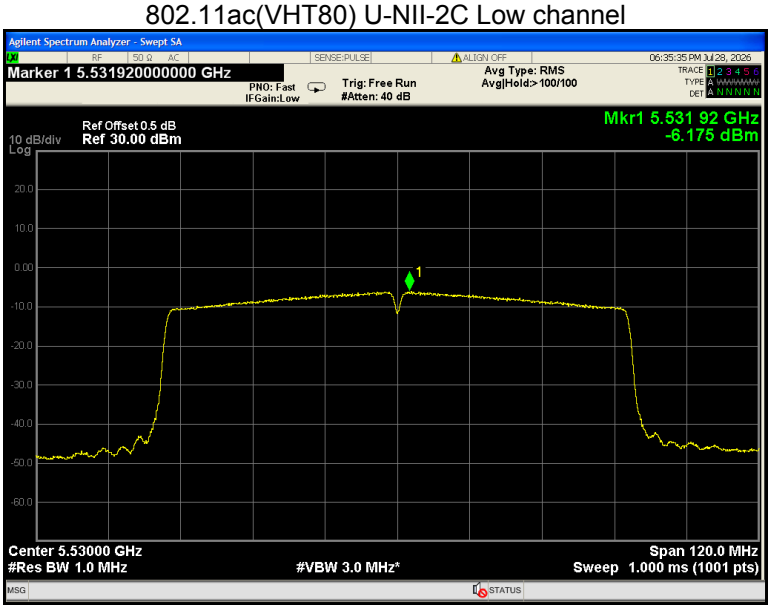

802.11ac(VHT40) U-NII-2C Middle channel



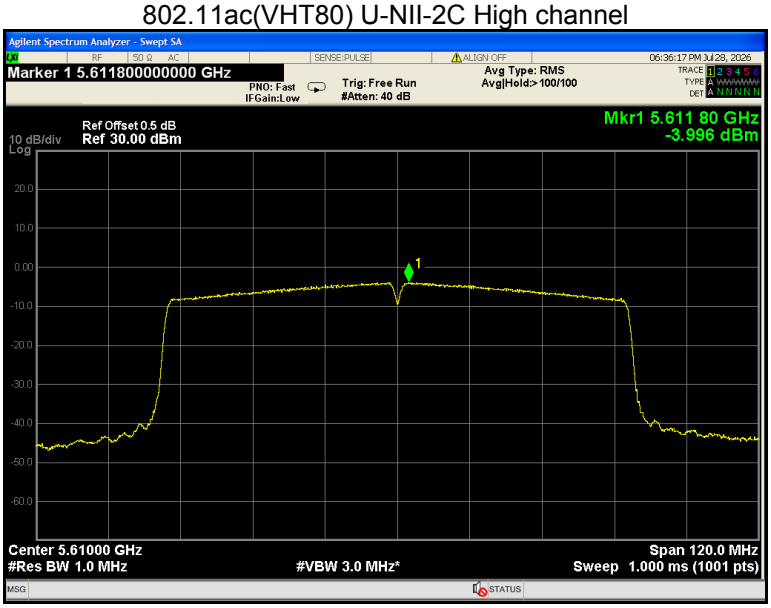
802.11ac(VHT40) U-NII-2C High channel



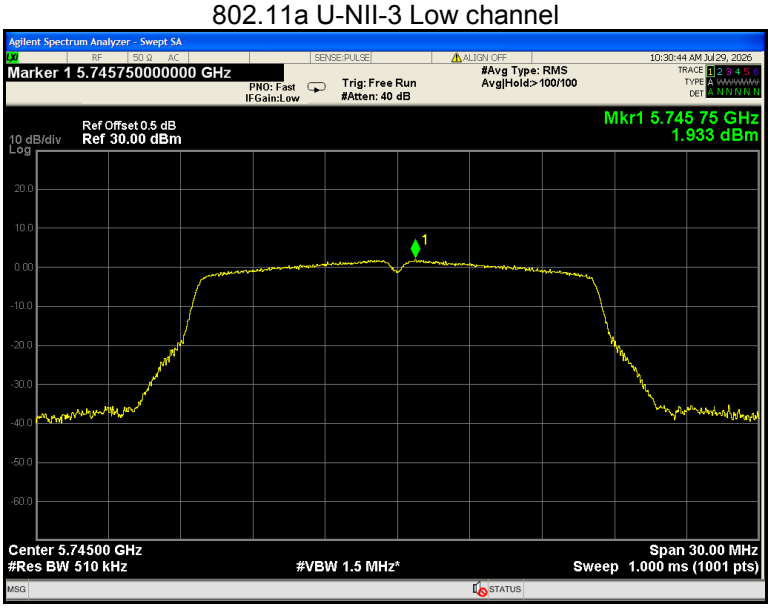

802.11ac(VHT80) U-NII-2C Low channel



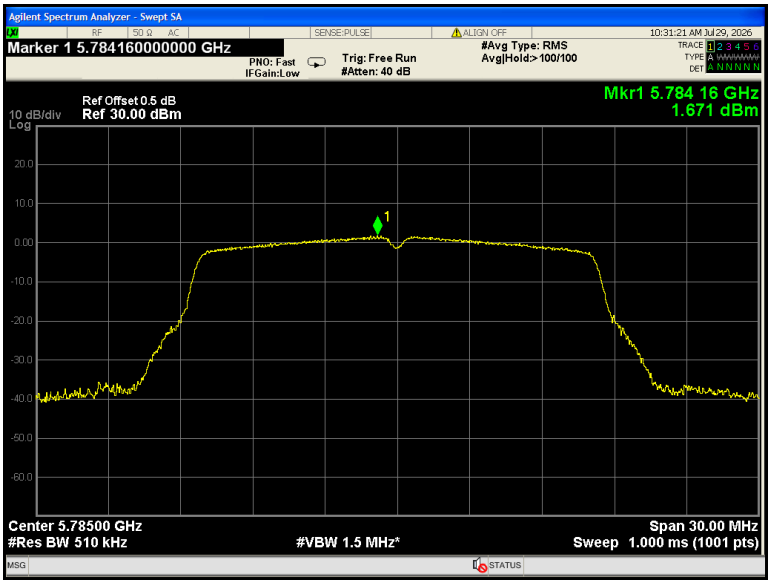
802.11ac(VHT80) U-NII-2C High channel



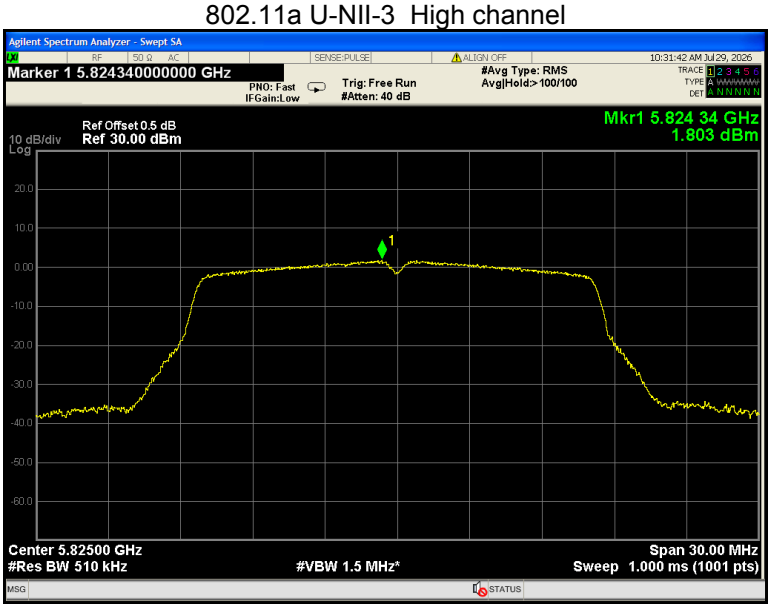
802.11a U-NII-3 Low channel



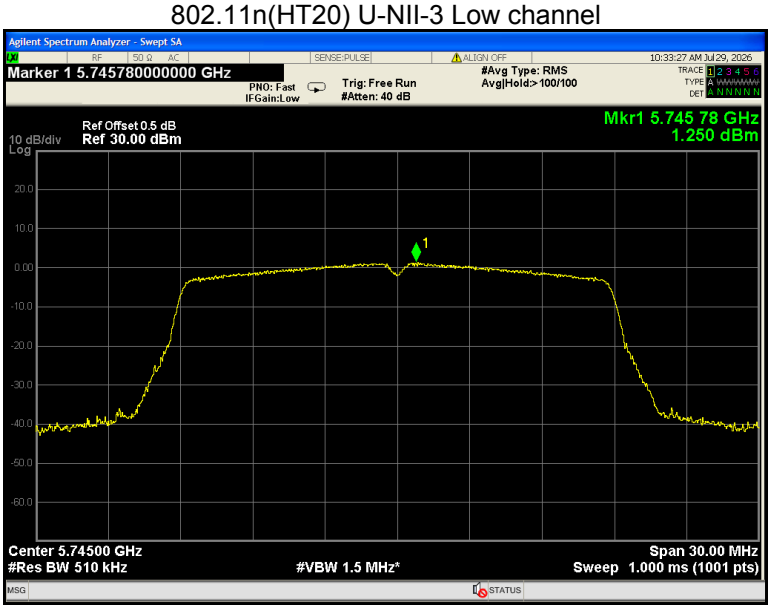

802.11a U-NII-3 Middle channel



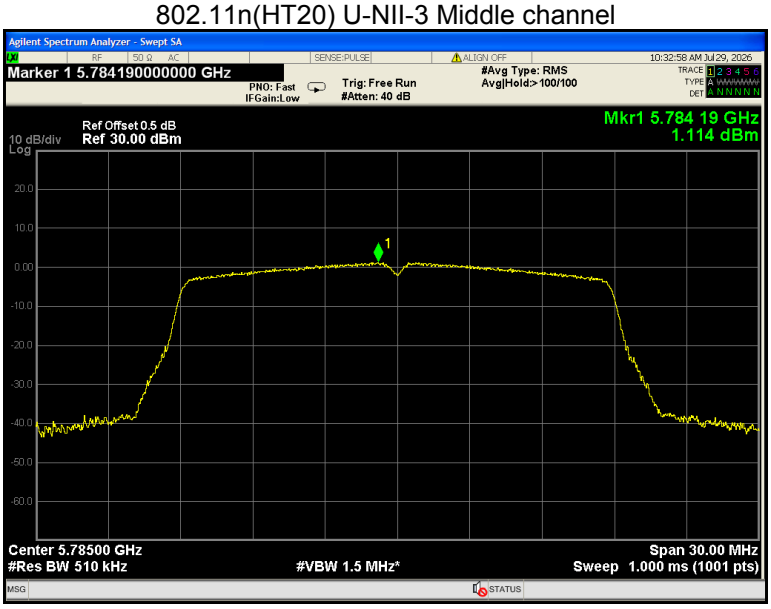
802.11a U-NII-3 High channel



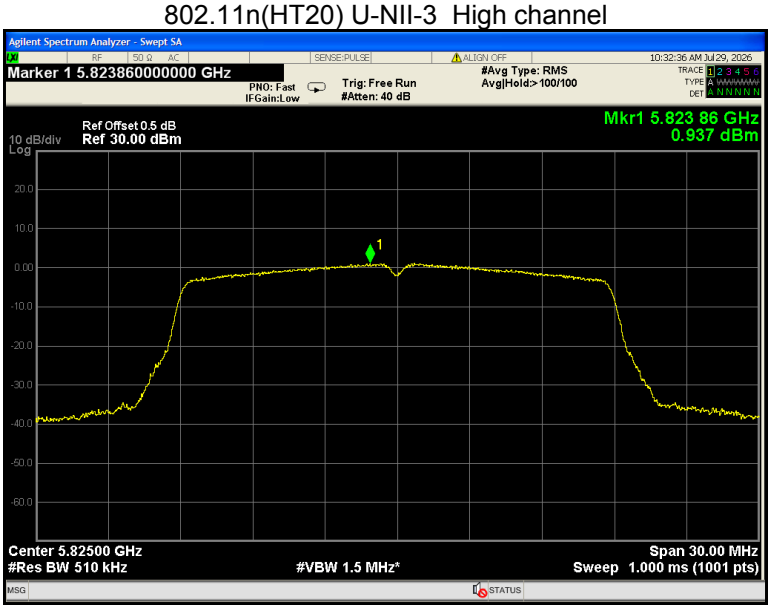

802.11n(HT20) U-NII-3 Low channel



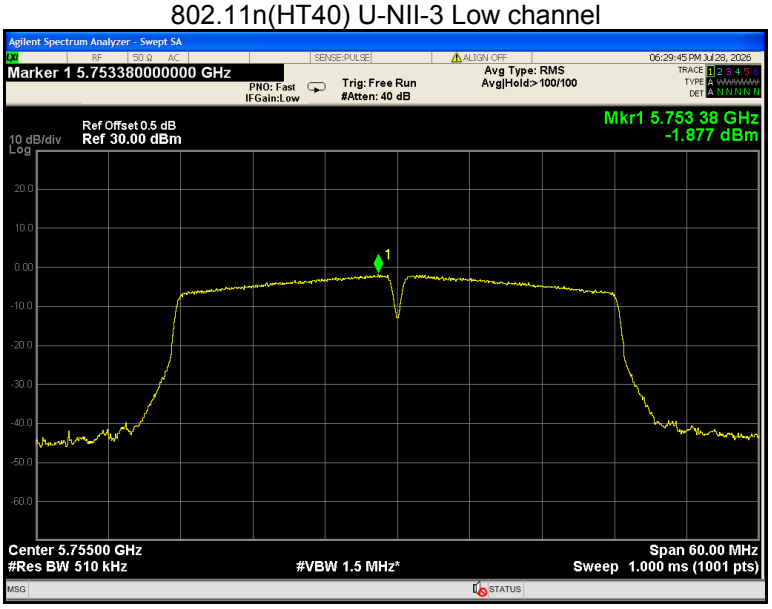
802.11n(HT20) U-NII-3 Middle channel



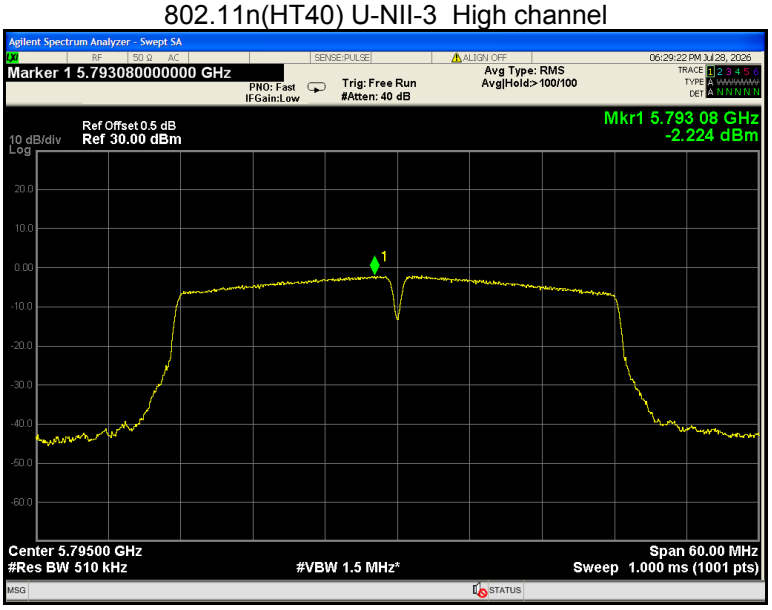

802.11n(HT20) U-NII-3 High channel



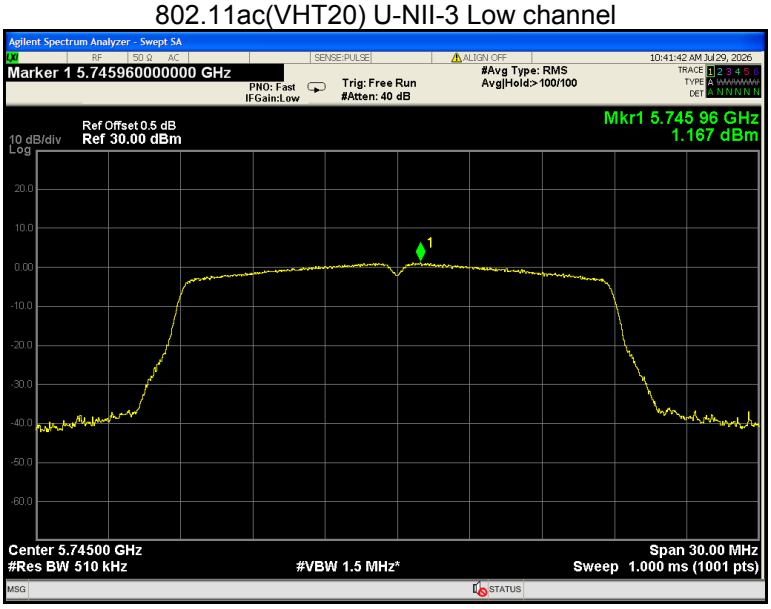
802.11n(HT40) U-NII-3 Low channel



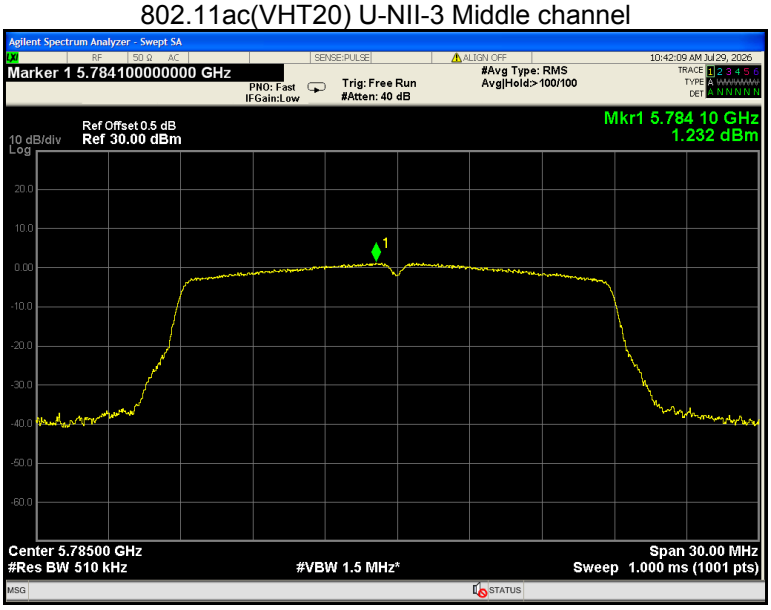

802.11n(HT40) U-NII-3 High channel



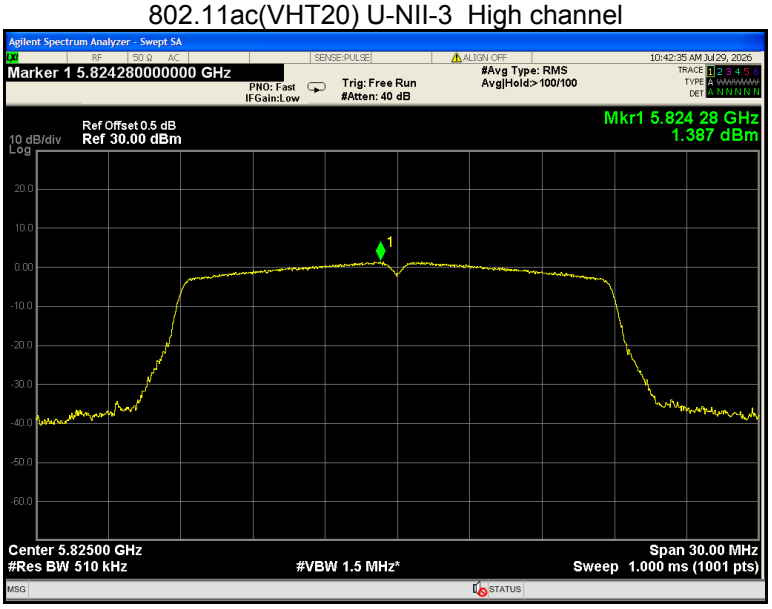
802.11ac(VHT20) U-NII-3 Low channel



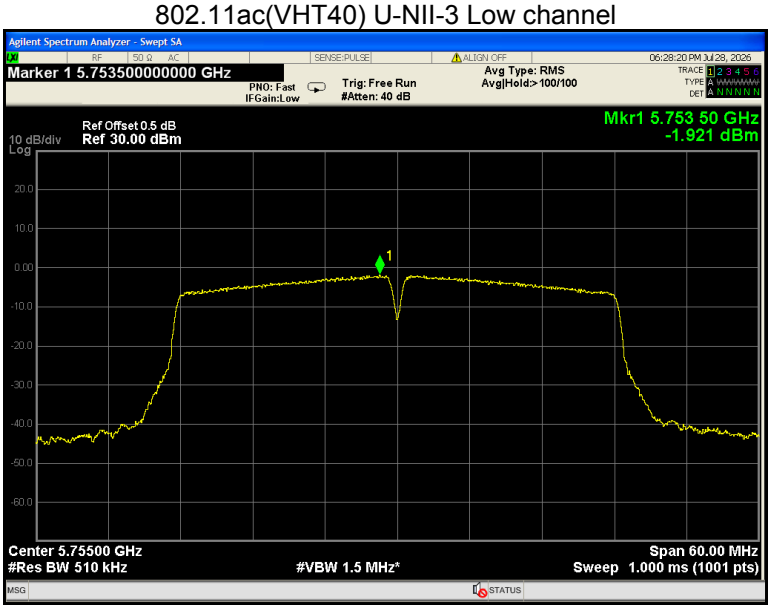

802.11ac(VHT20) U-NII-3 Middle channel



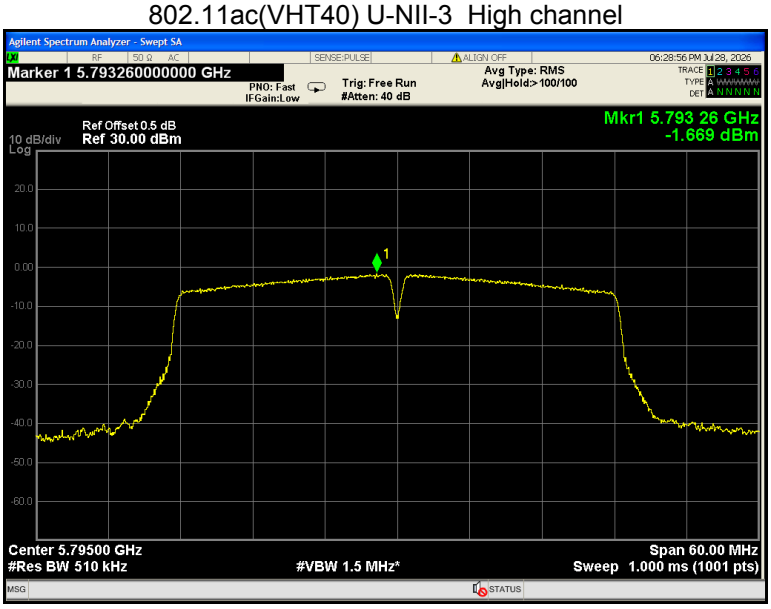
802.11ac(VHT20) U-NII-3 High channel



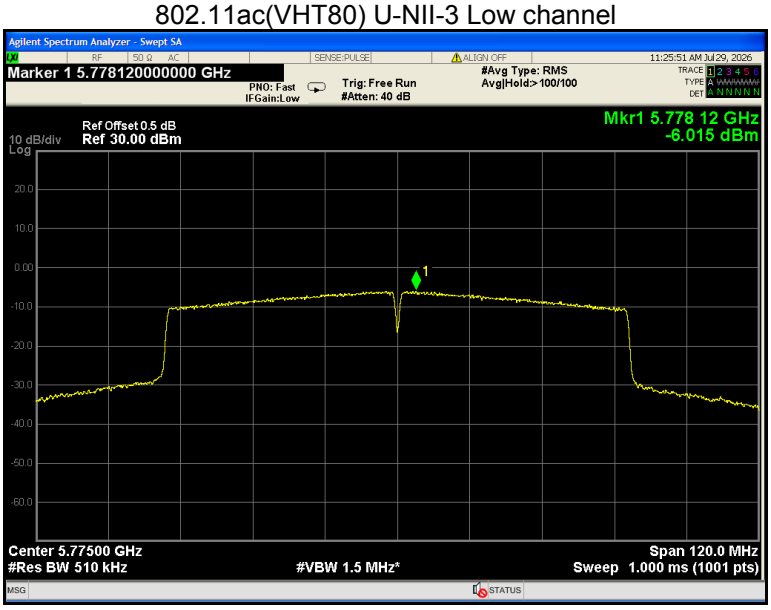

802.11ac(VHT40) U-NII-3 Low channel



802.11ac(VHT40) U-NII-3 High channel




802.11ac(VHT80) U-NII-3 Low channel



# 15 Frequency Stability

| | |
|---|---|
| Test Requirement: | FCC 47CFR Part 15 Section 15.407(g) |
| Test Method: | ANSI C63.10-2020 |
| 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 |
| Test Result: | PASS |

## 15.1 Test Procedure

1. The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure until the highest temperature of +50°C reached. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

2. Extreme temperature rule is -30°C~ 50°C.

## 15.2 Test Result

Note: only record the worst case result.

| U-NII-1 Test Frequency:5180MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Power Supply (VAC)** | **Frequency Error (MHz)** | **Frequency Error (ppm)** | **Limit** |
| 50 | 3.87 | -0.0017 | -0.33 | Within the band |
| 45 | | 0.0058 | 1.12 | Within the band |
| 30 | | 0.0043 | 0.84 | Within the band |
| 20 | | 0.0040 | 0.77 | Within the band |
| 10 | | 0.0007 | 0.14 | Within the band |
| 0 | | -0.0016 | -0.30 | Within the band |
| -10 | | 0.0041 | 0.79 | Within the band |
| -15 | | 0.0022 | 0.43 | Within the band |
| -30 | | -0.0021 | -0.40 | Within the band |
| 20 | 3.29 | 0.0005 | 0.09 | Within the band |
| 20 | 4.45 | -0.0010 | -0.20 | Within the band |

| U-NII-2A Test Frequency:5260MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Power Supply (VAC)** | **Frequency Error (MHz)** | **Frequency Error (ppm)** | **Limit** |
| 50 | 3.87 | -0.0003 | -0.05 | Within the band |
| 45 | | 0.0038 | 0.72 | Within the band |
| 30 | | 0.0087 | 1.66 | Within the band |
| 20 | | 0.0030 | 0.57 | Within the band |
| 10 | | 0.0056 | 1.07 | Within the band |
| 0 | | 0.0059 | 1.12 | Within the band |
| -10 | | 0.0087 | 1.65 | Within the band |
| -15 | | 0.0054 | 1.03 | Within the band |
| -30 | | 0.0096 | 1.82 | Within the band |
| 20 | 3.29 | -0.0018 | -0.34 | Within the band |
| 20 | 4.45 | -0.0044 | -0.84 | Within the band |

| U-NII-2C Test Frequency:5500MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Power Supply (VAC)** | **Frequency Error (MHz)** | **Frequency Error (ppm)** | **Limit** |
| 50 | 3.87 | -0.0026 | -0.47 | Within the band |
| 45 | | -0.0058 | -1.06 | Within the band |
| 30 | | 0.0047 | 0.85 | Within the band |
| 20 | | 0.0030 | 0.55 | Within the band |
| 10 | | 0.0114 | 2.08 | Within the band |
| 0 | | 0.0000 | -0.01 | Within the band |
| -10 | | 0.0044 | 0.80 | Within the band |
| -15 | | -0.0005 | -0.08 | Within the band |
| -30 | | 0.0026 | 0.47 | Within the band |
| 20 | 3.29 | 0.0059 | 1.08 | Within the band |
| 20 | 4.45 | 0.0073 | 1.33 | Within the band |

| U-NII-3 Test Frequency:5785MHz | | | | |
|---|---|---|---|---|
| **Temperature (℃)** | **Power Supply (VAC)** | **Frequency Error (MHz)** | **Frequency Error (ppm)** | **Limit** |
| 50 | 3.87 | 0.0031 | 0.54 | Within the band |
| 45 | | 0.0043 | 0.74 | Within the band |
| 30 | | 0.0021 | 0.36 | Within the band |
| 20 | | 0.0020 | 0.35 | Within the band |
| 10 | | 0.0030 | 0.52 | Within the band |
| 0 | | -0.0013 | -0.22 | Within the band |
| -10 | | 0.0055 | 0.94 | Within the band |
| -15 | | -0.0056 | -0.97 | Within the band |
| -30 | | 0.0087 | 1.51 | Within the band |
| 20 | 3.29 | 0.0037 | 0.64 | Within the band |
| 20 | 4.45 | 0.0003 | 0.05 | Within the band |

# 16 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 a FPC Antenna that uses a specified coupling to the intentional radiator. Antenna connectors complied with the requirement.

# 17 RF Exposure

Remark: Please refer to SAR test report: WTX26X07201760W.

# 18 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix-Black S3-Photos.

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