



## RF TEST REPORT

|                   |                               |
|-------------------|-------------------------------|
| <b>Applicant</b>  | Nokia Shanghai Bell Co., Ltd. |
| <b>FCC ID</b>     | 2ADZRG240WJ                   |
| <b>Product</b>    | 7368 ISAM ONT                 |
| <b>Model</b>      | G-240W-J                      |
| <b>Report No.</b> | R1905B0068-R2V3               |
| <b>Issue Date</b> | September 27, 2019            |

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15E (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Peng Tao

Approved by: Kai Xu

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## Summary of measurement results

| Number                                           | Test Case                      | Clause in FCC rules | Verdict |
|--------------------------------------------------|--------------------------------|---------------------|---------|
| 1                                                | Average conducted output power | 15.407(a)           | PASS    |
| 2                                                | Occupied bandwidth             | 15.407(e)           | PASS    |
| 3                                                | Frequency stability            | 15.407(g)           | PASS    |
| 4                                                | Power spectral density         | 15.407(a)           | PASS    |
| 5                                                | Unwanted Emissions             | 15.407(b)           | PASS    |
| 6                                                | Conducted Emissions            | 15.207              | PASS    |
| Date of Testing: May 30, 2019~ September 5, 2019 |                                |                     |         |



## 1. Test Laboratory

### 1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

### 1.2. Test facility

#### **FCC (Designation number: CN1179, Test Firm Registration Number: 446626)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

#### **IC (recognition number is 8510A)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

#### **VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

#### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



### 1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong  
City: Shanghai  
Post code: 201201  
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## 2. General Description of Equipment under Test

### Client Information

|                               |                                                                                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant</b>              | Nokia Shanghai Bell Co., Ltd.                                                                                          |
| <b>Applicant address</b>      | No. 388, Ningqiao Rd. Pilot Free Trade Zone, Shanghai, China                                                           |
| <b>Manufacturer 1</b>         | TAICANG T&W ELECTRONICS CO.,LTD                                                                                        |
| <b>Manufacturer address 1</b> | 89# Jiang Nan RD, Lu Du, Taicang, Jiangsu, China                                                                       |
| <b>Manufacturer 2</b>         | SHENZHEN TWOWING TECHNOLOGIES CO., LTD                                                                                 |
| <b>Manufacturer address 2</b> | 1st-12th Floor, Nangang Industrial Building, Tangtou Industrial Park, Shiyan, Baoan, Shenzhen, Guangdong 518108, China |

### General information

| EUT Description              |                                                                              |
|------------------------------|------------------------------------------------------------------------------|
| Model                        | G-240W-J                                                                     |
| IMEI                         | /                                                                            |
| Hardware Version             | PEM2                                                                         |
| Software Version             | 3FE48164AGCA97                                                               |
| Power Supply                 | AC adapter                                                                   |
| Antenna Type                 | Internal Antenna                                                             |
| Antenna Gain                 | Antenna 1: 3 dBi<br>Antenna 2: 3 dBi<br>Antenna 3: 3 dBi<br>Antenna 4: 3 dBi |
| Test Mode(s)                 | U-NII-1(5150MHz-5250MHz)<br>U-NII-3(5725MHz-5850MHz)                         |
| Modulation Type              | 802.11a/n (HT20/HT40) : OFDM<br>802.11ac (VHT20/VHT40/VHT80): OFDM           |
| Max. Conducted Power         | 29.81 dBm                                                                    |
| Operating Frequency Range(s) | U-NII-1: 5150-5250MHz<br>U-NII-3: 5725-5850MHz                               |
| Operating temperature range: | -5 ° C to 45° C                                                              |
| Operating voltage range:     | 10 V to 14 V                                                                 |
| State DC voltage:            | 12V                                                                          |
| Used environment:            | Indoor                                                                       |



| EUT Accessory                                                     |                                                                                               |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Adapter 1                                                         | Manufacturer: Shenzhen SOY Technology Co., Ltd<br>Model: SUN-1200300                          |
| Adapter 2                                                         | Manufacturer: RUIDE(SHENZHEN) ELECTRONIC<br>INDUSTRIAL CO., LTD.<br>Model: RD1203000-C55-20MG |
| Note: The information of the EUT is declared by the manufacturer. |                                                                                               |

|              | Kit Code       | EMA            | Part Description                                                                                          | Power Adaptor                         |
|--------------|----------------|----------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------|
| G-240<br>W-J | 3FE4800<br>8AA | 3FE48009A<br>A | 2 POTS, 4 GE, Dual band WIFI<br>AC3000 802.11ac 4x4/802.11n 3x3<br>US Plug in, 2Pin, Wall Mounted,<br>12V | SUN-1200300<br>RD1203000-C55-20<br>MG |



### 3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC CFR47 Part 15E (2018)** Unlicensed National Information Infrastructure Devices

**ANSI C63.10 (2013)**

**KDB 789033 D02 General UNII Test Procedures New Rules v02r01**

**KDB 662911 D01 Multiple Transmitter Output v02r01**

## 4. Test Configuration

### Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

| Band           | Data Rate      |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
|                | MIMO Antenna 1 | MIMO Antenna 2 | MIMO Antenna 3 | MIMO Antenna 4 |
| 802.11a        | 6 Mbps         | 6 Mbps         | 6 Mbps         | 6 Mbps         |
| 802.11n HT20   | MCS0           | MCS0           | MCS0           | MCS0           |
| 802.11n HT40   | MCS0           | MCS0           | MCS0           | MCS0           |
| 802.11ac VHT20 | MCS0           | MCS0           | MCS0           | MCS0           |
| 802.11ac VHT40 | MCS0           | MCS0           | MCS0           | MCS0           |
| 802.11ac VHT80 | MCS0           | MCS0           | MCS0           | MCS0           |

The worst case Antenna mode for each of the following tests for Wi-Fi:

| Test Cases                     | MIMO Antenna 1 | MIMO Antenna 2 | MIMO Antenna 3 | MIMO Antenna 4 |
|--------------------------------|----------------|----------------|----------------|----------------|
| Average conducted output power | O              | O              | O              | O              |
| Occupied bandwidth             | O              | --             | --             | --             |
| Frequency stability            | O              | --             | --             | --             |
| Power Spectral Density         | O              | O              | O              | O              |
| Unwanted Emissions             | O              | --             | --             | --             |
| Conducted Emissions            | O              | --             | --             | --             |
| Note: "O": test all bands      |                |                |                |                |

According to RF Output power results in chapter 5.1, MIMO Antenna 1 was selected as the worst antenna.

During the test, the pre-test was performed in all modes, including beamforming and non beamforming mode, the test data of the worst-case condition was recorded in this report.

**Wireless Technology and Frequency Range**

| Wireless Technology                                                                                        |         | Bandwidth | Channel | Frequency |
|------------------------------------------------------------------------------------------------------------|---------|-----------|---------|-----------|
| Wi-Fi                                                                                                      | U-NII-1 | 20 MHz    | 36      | 5180MHz   |
|                                                                                                            |         |           | 40      | 5200MHz   |
|                                                                                                            |         |           | 44      | 5220MHz   |
|                                                                                                            |         |           | 48      | 5240MHz   |
|                                                                                                            |         | 40 MHz    | 38      | 5190MHz   |
|                                                                                                            |         |           | 46      | 5230MHz   |
|                                                                                                            |         | 80 MHz    | 42      | 5210MHz   |
|                                                                                                            | U-NII-3 | 20 MHz    | 149     | 5745MHz   |
|                                                                                                            |         |           | 153     | 5765MHz   |
|                                                                                                            |         |           | 157     | 5785MHz   |
|                                                                                                            |         |           | 161     | 5805MHz   |
|                                                                                                            |         |           | 165     | 5825MHz   |
|                                                                                                            |         | 40 MHz    | 151     | 5755MHz   |
|                                                                                                            |         |           | 159     | 5795MHz   |
|                                                                                                            |         | 80 MHz    | 155     | 5775MHz   |
| Does this device support TPC Function? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |         |           |         |           |
| Does this device support TDWR Band? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    |         |           |         |           |

## 5. Test Case Results

### 5.1. Occupied Bandwidth

#### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

#### Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

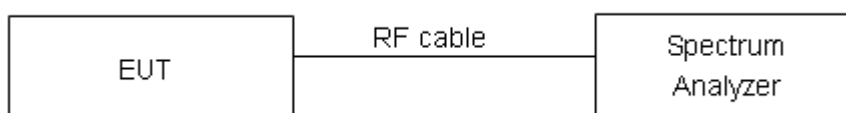
For U-NII-1/U-NII-2A/U-NII-2C, set RBW  $\approx$  1% OCB kHz, VBW  $\geq 3 \times$  RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

For U-NII-3, Set RBW = 100 kHz, VBW  $\geq 3 \times$  RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

Use the 99 % power bandwidth function of the instrument

#### Test Setup



#### Limits

Rule FCC Part §15.407(e)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 936$  Hz.

**Test Results:**
**U-NII-1**

| Network Standards | Carrier frequency (MHz) | 99% bandwidth (MHz) | Minimum 26 dB bandwidth (MHz) | Conclusion |
|-------------------|-------------------------|---------------------|-------------------------------|------------|
| 802.11a           | 5180                    | 16.728              | 21.28                         | PASS       |
|                   | 5200                    | 16.703              | 21.06                         | PASS       |
|                   | 5240                    | 16.719              | 21.00                         | PASS       |
| 802.11n HT20      | 5180                    | 17.869              | 21.29                         | PASS       |
|                   | 5200                    | 17.858              | 21.54                         | PASS       |
|                   | 5240                    | 17.851              | 21.56                         | PASS       |
| 802.11n HT40      | 5190                    | 36.352              | 39.83                         | PASS       |
|                   | 5230                    | 36.305              | 40.05                         | PASS       |
| 802.11ac VHT20    | 5180                    | 17.826              | 21.51                         | PASS       |
|                   | 5200                    | 17.858              | 21.32                         | PASS       |
|                   | 5240                    | 17.826              | 21.50                         | PASS       |
| 802.11ac VHT40    | 5190                    | 36.340              | 42.30                         | PASS       |
|                   | 5230                    | 36.312              | 39.82                         | PASS       |
| 802.11ac VHT80    | 5210                    | 75.082              | 86.22                         | PASS       |

**U-NII-3**

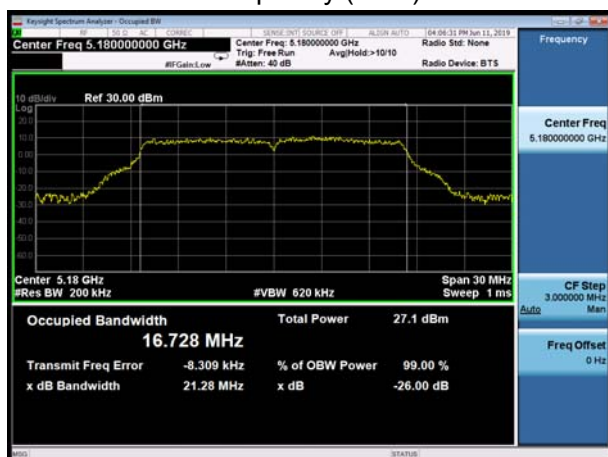
| Network Standards | Carrier frequency (MHz) | 99% bandwidth (MHz) | Minimum 6 dB bandwidth (MHz) | Limit (kHz) | Conclusion |
|-------------------|-------------------------|---------------------|------------------------------|-------------|------------|
| 802.11a           | 5745                    | 16.757              | 16.34                        | 500         | PASS       |
|                   | 5785                    | 16.712              | 16.35                        | 500         | PASS       |
|                   | 5825                    | 16.750              | 16.34                        | 500         | PASS       |
| 802.11n HT20      | 5745                    | 17.827              | 17.36                        | 500         | PASS       |
|                   | 5785                    | 17.766              | 17.00                        | 500         | PASS       |
|                   | 5825                    | 17.779              | 17.32                        | 500         | PASS       |
| 802.11n HT40      | 5755                    | 36.308              | 36.20                        | 500         | PASS       |
|                   | 5795                    | 36.263              | 36.00                        | 500         | PASS       |
| 802.11ac VHT20    | 5745                    | 17.882              | 17.35                        | 500         | PASS       |
|                   | 5785                    | 17.832              | 17.37                        | 500         | PASS       |
|                   | 5825                    | 17.805              | 17.58                        | 500         | PASS       |
| 802.11ac VHT40    | 5755                    | 36.310              | 36.31                        | 500         | PASS       |
|                   | 5795                    | 36.303              | 35.74                        | 500         | PASS       |
| 802.11ac VHT80    | 5775                    | 75.800              | 75.41                        | 500         | PASS       |



## MIMO Antenna 1

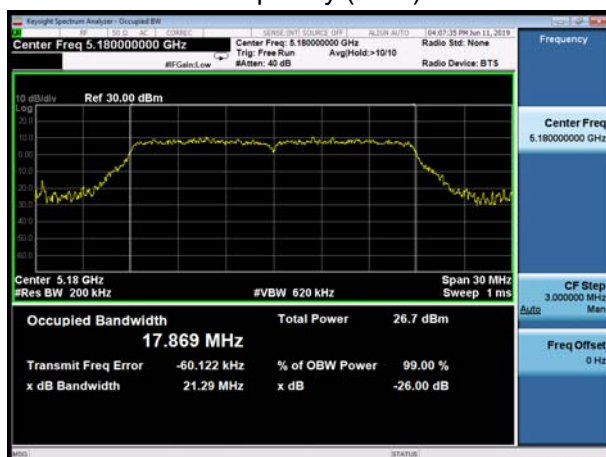
U-NII-1, 802.11a

Carrier frequency (MHz): 5180



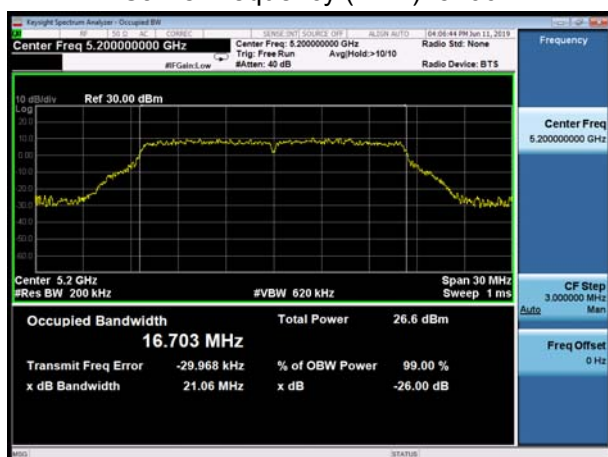
U-NII-1, 802.11n HT20

Carrier frequency (MHz): 5180



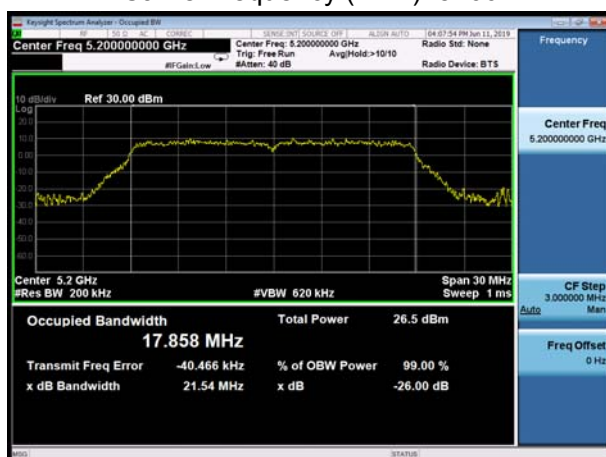
U-NII-1, 802.11a

Carrier frequency (MHz): 5200



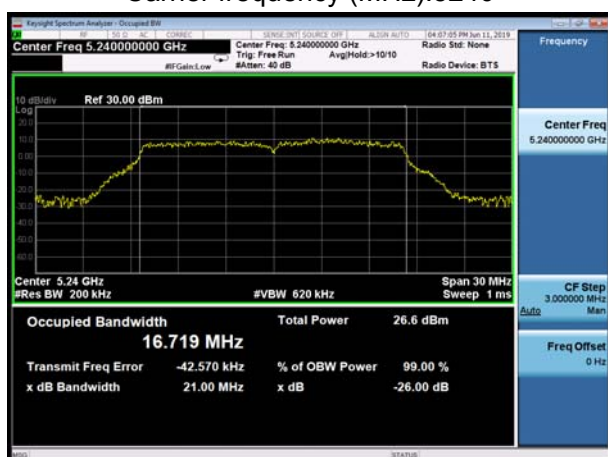
U-NII-1, 802.11n HT20

Carrier frequency (MHz): 5200



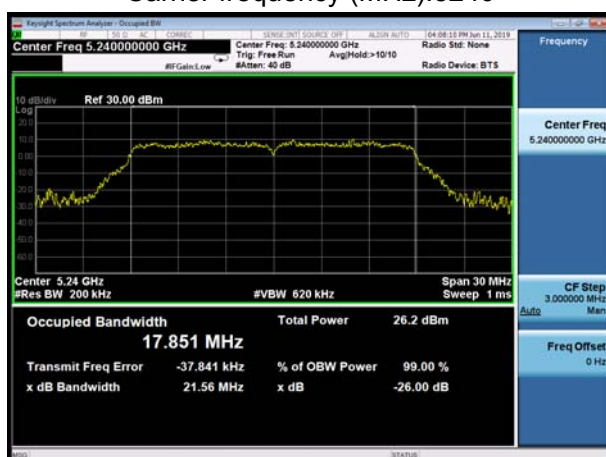
U-NII-1, 802.11a

Carrier frequency (MHz): 5240



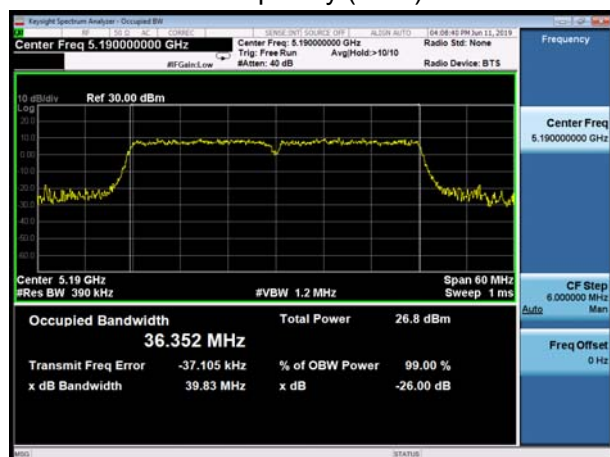
U-NII-1, 802.11n HT20

Carrier frequency (MHz): 5240

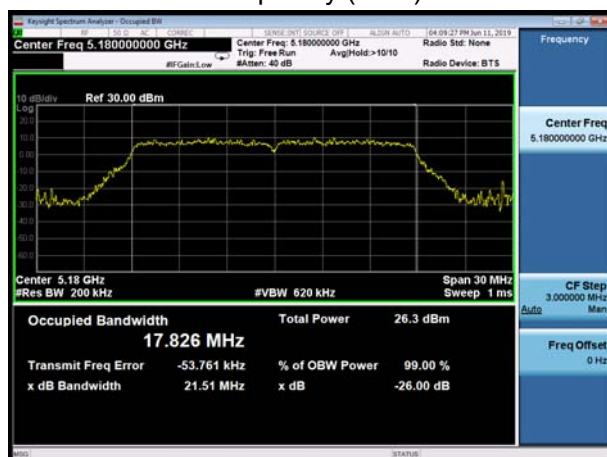




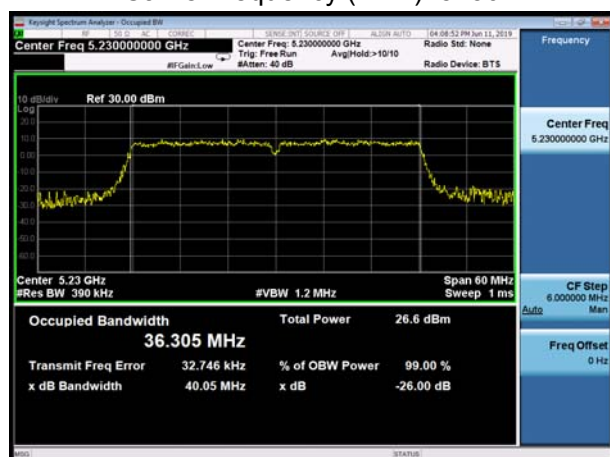
U-NII-1, 802.11n HT40  
Carrier frequency (MHz): 5190



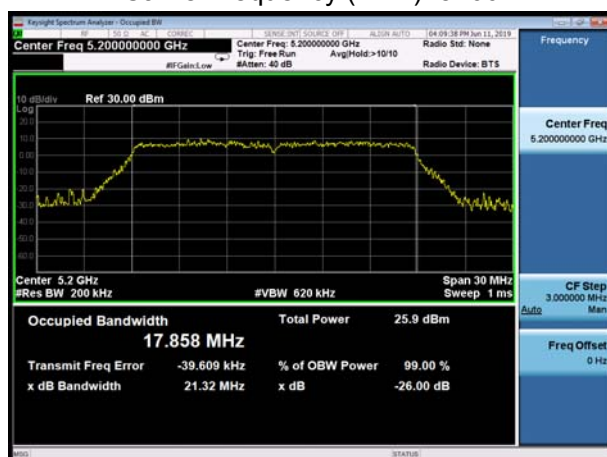
U-NII-1, 802.11ac VHT20  
Carrier frequency (MHz): 5180



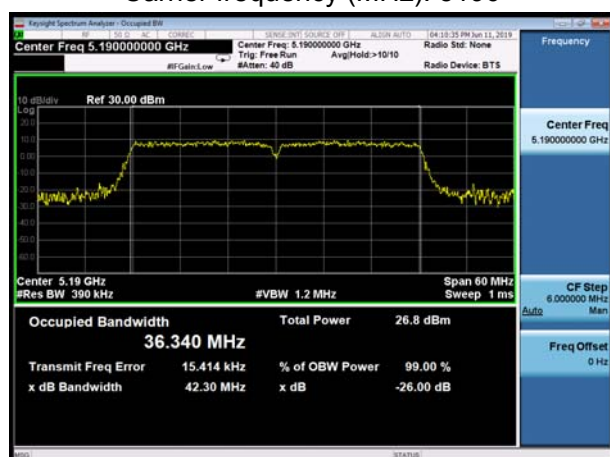
U-NII-1, 802.11n HT40  
Carrier frequency (MHz): 5230



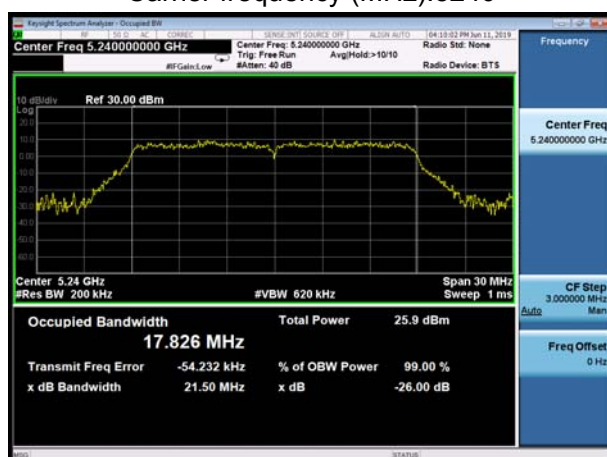
U-NII-1, 802.11ac VHT20  
Carrier frequency (MHz): 5200

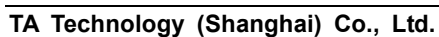


U-NII-1, 802.11ac VHT40  
Carrier frequency (MHz): 5190



U-NII-1, 802.11ac VHT20  
Carrier frequency (MHz): 5240







## 99% bandwidth

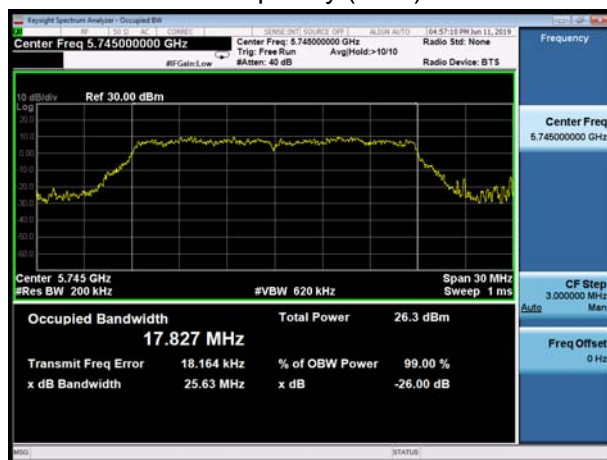
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



U-NII-3, 802.11a

Carrier frequency (MHz): 5785



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785



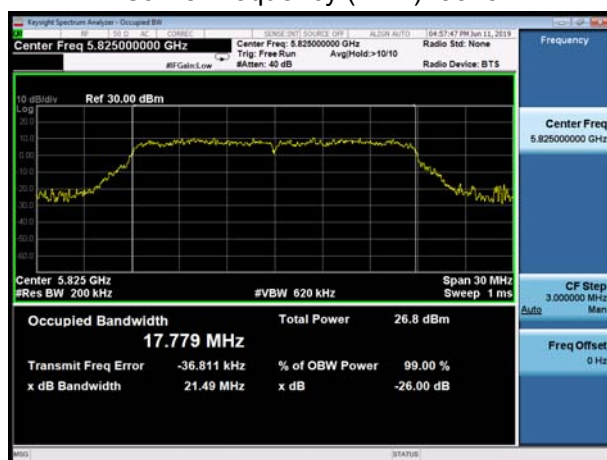
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



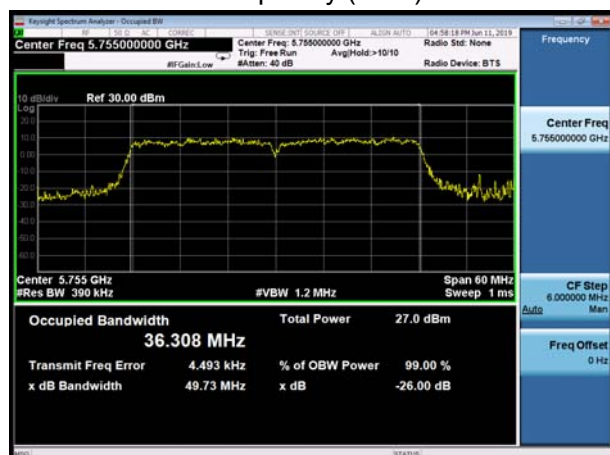
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825





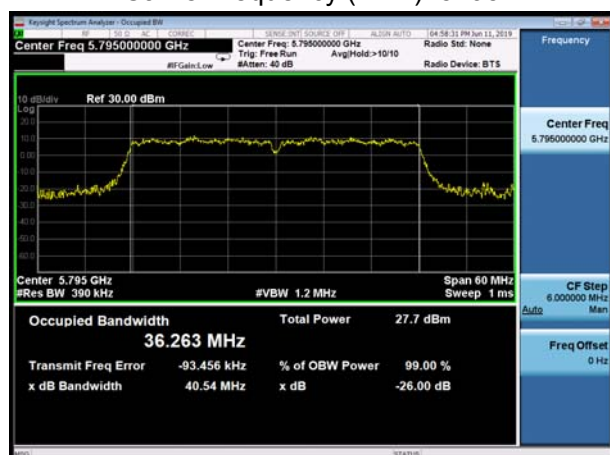
U-NII-3, 802.11n HT40  
Carrier frequency (MHz): 5755



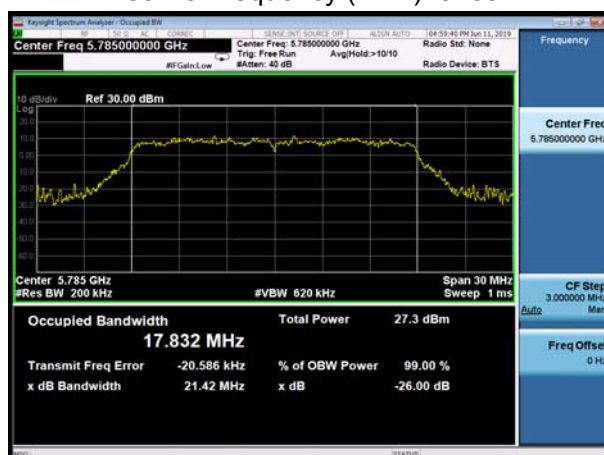
U-NII-3, 802.11ac VHT20  
Carrier frequency (MHz): 5745



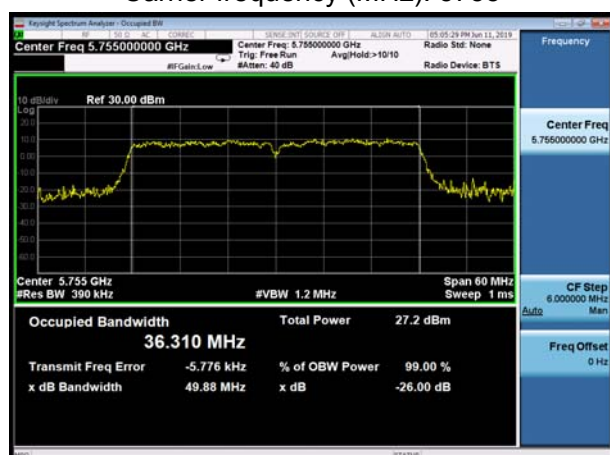
U-NII-3, 802.11n HT40  
Carrier frequency (MHz): 5795



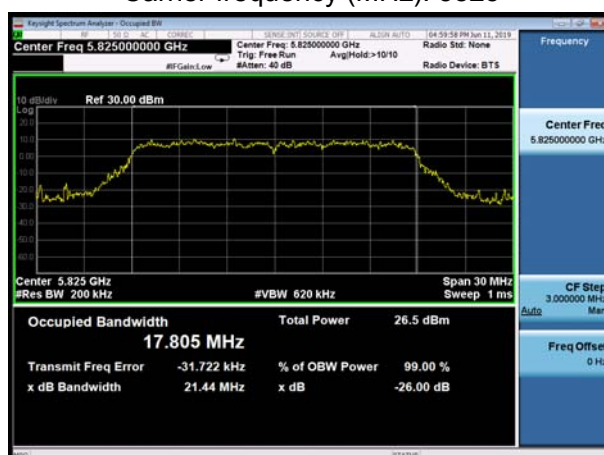
U-NII-3, 802.11ac VHT20  
Carrier frequency (MHz): 5785



U-NII-3, 802.11ac VHT40  
Carrier frequency (MHz): 5755



U-NII-3, 802.11ac VHT20  
Carrier frequency (MHz): 5825





U-NII-3, 802.11ac VHT40  
Carrier frequency (MHz): 5795



U-NII-3, 802.11ac VHT80  
Carrier frequency (MHz): 5775





## Minimum 6 dB bandwidth

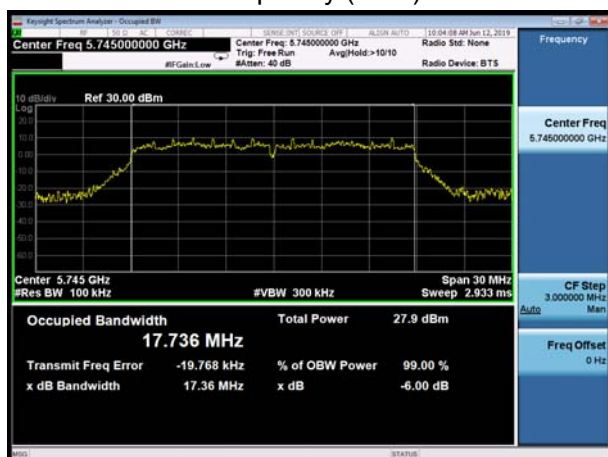
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



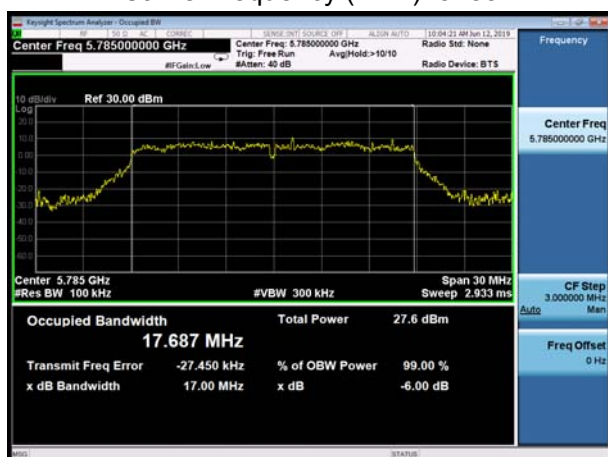
U-NII-3, 802.11a

Carrier frequency (MHz): 5785



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785



U-NII-3, 802.11a

Carrier frequency (MHz): 5825

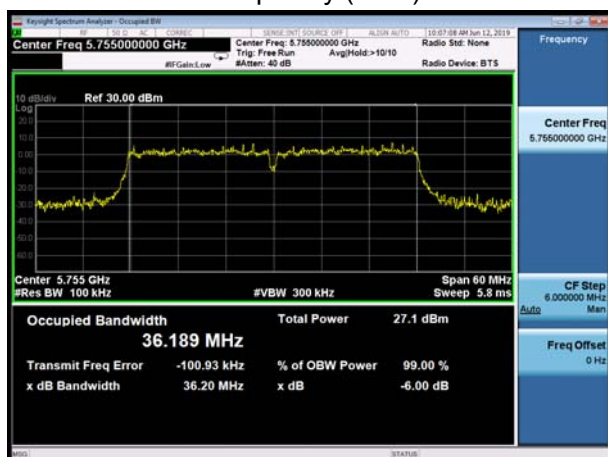


U-NII-3, 802.11n HT20

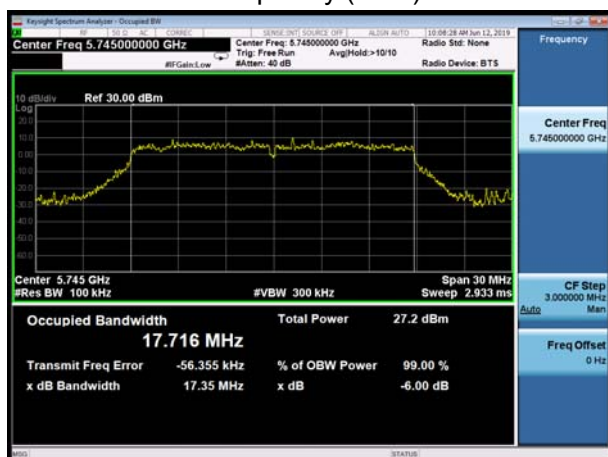
Carrier frequency (MHz): 5825



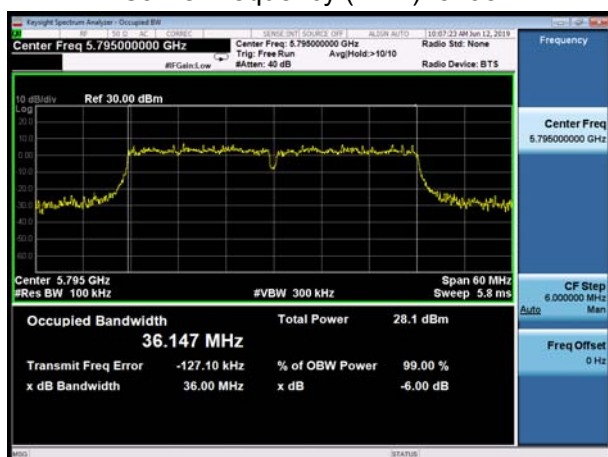
U-NII-3, 802.11n HT40  
Carrier frequency (MHz): 5755



U-NII-3, 802.11ac VHT20  
Carrier frequency (MHz): 5745



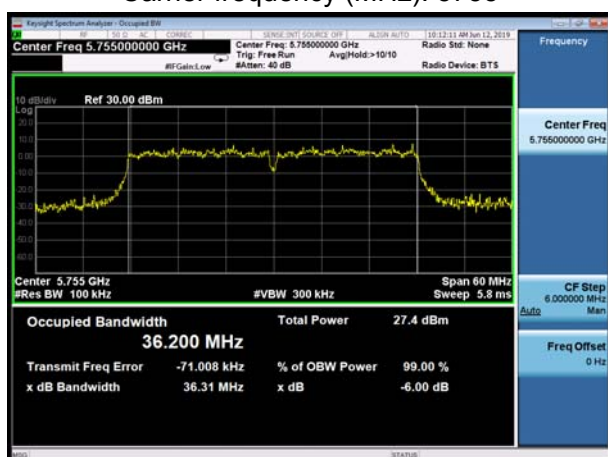
U-NII-3, 802.11n HT40  
Carrier frequency (MHz): 5795



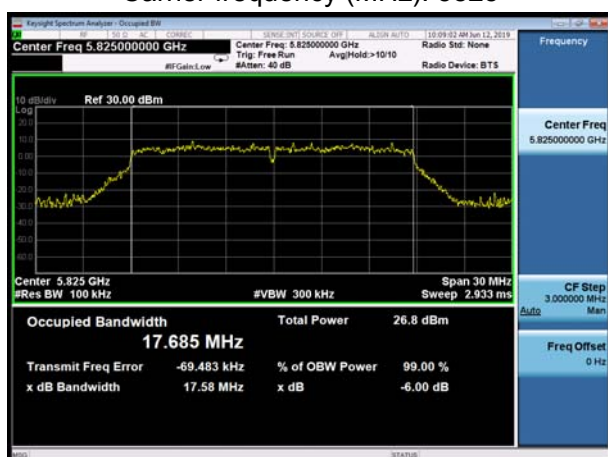
U-NII-3, 802.11ac VHT20  
Carrier frequency (MHz): 5785



U-NII-3, 802.11ac VHT40  
Carrier frequency (MHz): 5755



U-NII-3, 802.11ac VHT20  
Carrier frequency (MHz): 5825

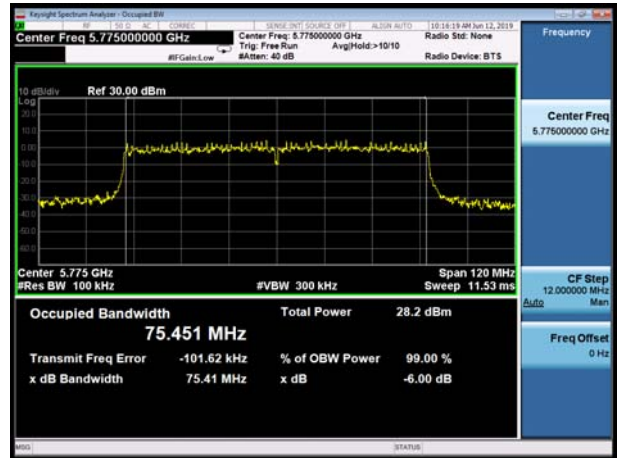




U-NII-3, 802.11ac VHT40  
Carrier frequency (MHz): 5795



U-NII-3, 802.11ac VHT80  
Carrier frequency (MHz): 5775



## 5.2. Average Power Output –Conducted

### Ambient condition

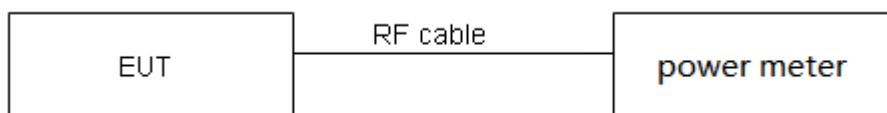
| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Methods of Measurement

During the process of the testing, The EUT was connected to the average power meter through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. We use Maximum average Conducted Output Power Level Method in KDB789033 for this test

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

### Test Setup



### Limits

Rule FCC Part 15.407(a)(1)(2)(3)

(1) For the band 5.15-5.25 GHz.

(i) 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23

dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) 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  $11 \text{ dBm} + 10 \log B$ , where  $B$  is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.44 \text{ dB}$ .

**Test Results**

| Band                                                                   | T <sub>on</sub> (ms) | T <sub>(on+off)</sub> (ms) | Duty cycle | Duty cycle correction Factor(dB) |
|------------------------------------------------------------------------|----------------------|----------------------------|------------|----------------------------------|
| 802.11a                                                                | 2.06                 | 2.17                       | 0.95       | 0.21                             |
| 802.11n HT20                                                           | 1.92                 | 2.02                       | 0.95       | 0.21                             |
| 802.11n HT40                                                           | 0.94                 | 1.04                       | 0.90       | 0.44                             |
| 802.11ac VHT20                                                         | 1.93                 | 1.95                       | 0.99       | NA                               |
| 802.11ac VHT40                                                         | 0.95                 | 0.98                       | 0.97       | 0.14                             |
| 802.11ac VHT80                                                         | 0.46                 | 0.49                       | 0.94       | 0.28                             |
| Note: when Duty cycle>0.98, Duty cycle correction Factor not required. |                      |                            |            |                                  |



Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

### MIMO (Without Beamforming)

#### U-NII-1

| Network Standards | Channel/<br>Frequency (MHz) | MIMO Antenna 1               |                                      | MIMO Antenna 2               |                                      | MIMO Antenna3                |                                      | MIMO Antenna4                |                                      | Total Power (dBm) | Limit (dBm) | Conclusion |
|-------------------|-----------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|-------------------|-------------|------------|
|                   |                             | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) |                   |             |            |
| 802.11a           | 36/5180                     | 18.24                        | 18.45                                | 18.01                        | 18.22                                | 17.73                        | 17.94                                | 17.95                        | 18.16                                | 24.22             | 30.00       | PASS       |
|                   | 40/5200                     | 18.29                        | 18.50                                | 18.16                        | 18.37                                | 17.82                        | 18.03                                | 17.64                        | 17.85                                | 24.22             | 30.00       | PASS       |
|                   | 48/5240                     | 18.37                        | 18.58                                | 18.27                        | 18.48                                | 17.81                        | 18.02                                | 17.63                        | 17.84                                | 24.27             | 30.00       | PASS       |
| 802.11n HT20      | 36/5180                     | 18.25                        | 18.46                                | 18.06                        | 18.27                                | 17.63                        | 17.84                                | 17.86                        | 18.07                                | 24.19             | 30.00       | PASS       |
|                   | 40/5200                     | 18.15                        | 18.36                                | 18.11                        | 18.32                                | 17.58                        | 17.79                                | 17.89                        | 18.10                                | 24.17             | 30.00       | PASS       |
|                   | 48/5240                     | 18.23                        | 18.44                                | 18.03                        | 18.24                                | 17.59                        | 17.80                                | 17.93                        | 18.14                                | 24.18             | 30.00       | PASS       |
| 802.11n HT40      | 38/5190                     | 17.32                        | 17.76                                | 17.58                        | 18.02                                | 16.75                        | 17.19                                | 17.03                        | 17.47                                | 23.64             | 30.00       | PASS       |
|                   | 46/5230                     | 18.43                        | 18.87                                | 18.66                        | 19.10                                | 17.96                        | 18.40                                | 18.15                        | 18.59                                | 24.77             | 30.00       | PASS       |
| 802.11ac VHT20    | 36/5180                     | 18.41                        | 18.41                                | 18.39                        | 18.39                                | 17.25                        | 17.25                                | 18.03                        | 18.03                                | 24.07             | 30.00       | PASS       |
|                   | 40/5200                     | 18.46                        | 18.46                                | 18.31                        | 18.31                                | 17.38                        | 17.38                                | 18.15                        | 18.15                                | 24.11             | 30.00       | PASS       |
|                   | 48/5240                     | 18.38                        | 18.38                                | 18.25                        | 18.25                                | 17.44                        | 17.44                                | 18.09                        | 18.09                                | 24.08             | 30.00       | PASS       |
| 802.11ac VHT40    | 38/5190                     | 20.59                        | 20.73                                | 19.47                        | 19.61                                | 19.65                        | 19.79                                | 20.28                        | 20.42                                | 26.19             | 30.00       | PASS       |
|                   | 46/5230                     | 20.46                        | 20.60                                | 20.23                        | 20.37                                | 19.92                        | 20.06                                | 20.51                        | 20.65                                | 26.45             | 30.00       | PASS       |
| 802.11ac VHT80    | 42/5210                     | 14.73                        | 15.01                                | 15.01                        | 15.29                                | 14.44                        | 14.72                                | 14.92                        | 15.20                                | 21.08             | 30.00       | PASS       |

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power =  $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)} + 10^{(\text{Power antenna3 in dBm}/10)} + 10^{(\text{Power antenna4 in dBm}/10)})$ .

2. The manufacturer declared the transmitter output signals is CDD mode And  $N_{ss}=1$ . According to KDB 662911 D01

Multiple Transmitter Output v02r01 2)f(i): If all antennas have the same gain, Directional gain =  $G_{ANT} + \text{Array Gain}$ ,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ ;

Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any  $N_{ANT}$ ;

Array Gain =  $5 \log(N_{ANT}/N_{ss})$  dB or 3 dB, whichever is less, for 20-MHz channel widths with  $N_{ANT} \geq 5$ .

So directional gain =  $G_{ANT} + \text{Array Gain} = 3 + 0 = 3 \text{ dBi} < 6 \text{ dBi}$ . So the power limit is 30dBm.



## U-NII-3

| Network Standards | Channel/<br>Frequency (MHz) | MIMO Antenna 1               |                                      | MIMO Antenna 2               |                                      | MIMO Antenna3                |                                      | MIMO Antenna4                |                                      | Total Power (dBm) | Limit (dBm) | Conclusion |
|-------------------|-----------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|-------------------|-------------|------------|
|                   |                             | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) |                   |             |            |
| 802.11a           | 149/5745                    | 22.58                        | 22.79                                | 23.01                        | 23.22                                | 23.33                        | 23.54                                | 22.35                        | 22.56                                | 29.07             | 30.00       | PASS       |
|                   | 157/5785                    | 22.64                        | 22.85                                | 22.86                        | 23.07                                | 23.22                        | 23.43                                | 22.47                        | 22.68                                | 29.04             | 30.00       | PASS       |
|                   | 165/5825                    | 22.74                        | 22.95                                | 22.96                        | 23.17                                | 23.38                        | 23.59                                | 22.38                        | 22.59                                | 29.11             | 30.00       | PASS       |
| 802.11n HT20      | 149/5745                    | 23.34                        | 23.55                                | 23.74                        | 23.95                                | 23.87                        | 24.08                                | 23.02                        | 23.23                                | 29.74             | 30.00       | PASS       |
|                   | 157/5785                    | 23.42                        | 23.63                                | 23.84                        | 24.05                                | 23.91                        | 24.12                                | 23.11                        | 23.32                                | 29.81             | 30.00       | PASS       |
|                   | 165/5825                    | 23.36                        | 23.57                                | 23.79                        | 24.00                                | 23.75                        | 23.96                                | 23.19                        | 23.40                                | 29.76             | 30.00       | PASS       |
| 802.11n HT40      | 151/5755                    | 21.68                        | 22.12                                | 22.18                        | 22.62                                | 22.67                        | 23.11                                | 21.95                        | 22.39                                | 28.59             | 30.00       | PASS       |
|                   | 159/5795                    | 21.73                        | 22.17                                | 22.24                        | 22.68                                | 22.78                        | 23.22                                | 22.01                        | 22.45                                | 28.67             | 30.00       | PASS       |
| 802.11ac VHT20    | 149/5745                    | 21.49                        | 21.49                                | 22.02                        | 22.02                                | 22.37                        | 22.37                                | 21.39                        | 21.39                                | 27.86             | 30.00       | PASS       |
|                   | 157/5785                    | 21.58                        | 21.58                                | 21.96                        | 21.96                                | 22.45                        | 22.45                                | 21.37                        | 21.37                                | 27.88             | 30.00       | PASS       |
|                   | 165/5825                    | 21.52                        | 21.52                                | 21.93                        | 21.93                                | 22.41                        | 22.41                                | 21.42                        | 21.42                                | 27.86             | 30.00       | PASS       |
| 802.11ac VHT40    | 151/5755                    | 20.86                        | 21.00                                | 21.58                        | 21.72                                | 21.96                        | 22.10                                | 21.06                        | 21.20                                | 27.55             | 30.00       | PASS       |
|                   | 159/5795                    | 20.79                        | 20.93                                | 21.62                        | 21.76                                | 21.99                        | 22.13                                | 20.86                        | 21.00                                | 27.51             | 30.00       | PASS       |
| 802.11ac VHT80    | 155/5775                    | 19.48                        | 19.76                                | 19.73                        | 20.01                                | 20.58                        | 20.86                                | 19.43                        | 19.71                                | 26.13             | 30.00       | PASS       |

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power =  $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)} + 10^{(\text{Power antenna3 in dBm}/10)} + 10^{(\text{Power antenna4 in dBm}/10)})$ .

2. The manufacturer declared the transmitter output signals is CDD mode And  $N_{ss}=1$ . According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f(i): If all antennas have the same gain, Directional gain =  $G_{ANT} + \text{Array Gain}$ ,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ ;

Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any  $N_{ANT}$ ;

Array Gain =  $5 \log(N_{ANT}/N_{SS})$  dB or 3 dB, whichever is less, for 20-MHz channel widths with  $N_{ANT} \geq 5$ .

So directional gain =  $G_{ANT} + \text{Array Gain} = 3 + 0 = 3$  dBi < 6 dBi. So the power limit is 30 dBm.

**MIMO (With Beamforming)****U-NII-1**

| Network Standards | Channel/<br>Frequency (MHz) | MIMO Antenna 1               |                                      | MIMO Antenna 2               |                                      | MIMO Antenna3                |                                      | MIMO Antenna4                |                                      | Total Power (dBm) | Limit (dBm) | Conclusion |
|-------------------|-----------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|-------------------|-------------|------------|
|                   |                             | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) |                   |             |            |
| 802.11n HT20      | 36/5180                     | 18.24                        | 18.45                                | 18.01                        | 18.22                                | 17.58                        | 17.79                                | 17.85                        | 18.06                                | 24.16             | 26.98       | PASS       |
|                   | 40/5200                     | 18.11                        | 18.32                                | 18.10                        | 18.31                                | 17.56                        | 17.77                                | 17.82                        | 18.03                                | 24.14             | 26.98       | PASS       |
|                   | 48/5240                     | 18.20                        | 18.41                                | 18.02                        | 18.23                                | 17.57                        | 17.78                                | 17.91                        | 18.12                                | 24.16             | 26.98       | PASS       |
| 802.11n HT40      | 38/5190                     | 17.28                        | 17.72                                | 17.57                        | 18.01                                | 16.73                        | 17.17                                | 16.96                        | 17.40                                | 23.60             | 26.98       | PASS       |
|                   | 46/5230                     | 18.37                        | 18.81                                | 18.63                        | 19.07                                | 17.92                        | 18.36                                | 18.03                        | 18.47                                | 24.70             | 26.98       | PASS       |
| 802.11ac VHT20    | 36/5180                     | 18.36                        | 18.36                                | 18.38                        | 18.38                                | 17.24                        | 17.24                                | 17.98                        | 17.98                                | 24.03             | 26.98       | PASS       |
|                   | 40/5200                     | 18.41                        | 18.41                                | 18.28                        | 18.28                                | 17.35                        | 17.35                                | 18.12                        | 18.12                                | 24.08             | 26.98       | PASS       |
|                   | 48/5240                     | 18.32                        | 18.32                                | 18.22                        | 18.22                                | 17.42                        | 17.42                                | 18.02                        | 18.02                                | 24.03             | 26.98       | PASS       |
| 802.11ac VHT40    | 38/5190                     | 20.55                        | 20.69                                | 19.43                        | 19.57                                | 19.63                        | 19.77                                | 20.27                        | 20.41                                | 26.16             | 26.98       | PASS       |
|                   | 46/5230                     | 20.44                        | 20.58                                | 20.17                        | 20.31                                | 19.88                        | 20.02                                | 20.46                        | 20.60                                | 26.41             | 26.98       | PASS       |
| 802.11ac VHT80    | 42/5210                     | 14.69                        | 14.97                                | 14.96                        | 15.24                                | 14.39                        | 14.67                                | 14.83                        | 15.11                                | 21.02             | 26.98       | PASS       |

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),  
The Total Power =  $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)} + 10^{(\text{Power antenna3 in dBm}/10)} + 10^{(\text{Power antenna4 in dBm}/10)})$ .

2. Direction gain calculation according to KDB662911 D01 Multiple Transmitter Output v02r01 F) 2) e) (i), If all antennas have the same gain, directional gain = GANT + 10 log(NANT/NSS) = 3 + 10 log (4/1) = 9.02 dBi > 6dBi. So the power limit is 26.98dBm



## U-NII-3

| Network Standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Channel/<br>Frequency (MHz) | MIMO Antenna 1               |                                      | MIMO Antenna 2               |                                      | MIMO Antenna3                |                                      | MIMO Antenna4                |                                      | Total Power (dBm) | Limit (dBm) | Conclusion |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|------------------------------|--------------------------------------|-------------------|-------------|------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                             | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) | Average Power Measured (dBm) | Average Power with duty factor (dBm) |                   |             |            |
| 802.11n HT20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 149/5745                    | 20.35                        | 20.56                                | 21.01                        | 21.22                                | 21.24                        | 21.45                                | 20.05                        | 20.26                                | 26.92             | 26.98       | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 157/5785                    | 20.41                        | 20.62                                | 20.86                        | 21.07                                | 21.11                        | 21.32                                | 20.22                        | 20.43                                | 26.90             | 26.98       | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 165/5825                    | 20.37                        | 20.58                                | 20.94                        | 21.15                                | 21.07                        | 21.28                                | 20.19                        | 20.40                                | 26.89             | 26.98       | PASS       |
| 802.11n HT40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 151/5755                    | 19.84                        | 20.28                                | 20.61                        | 21.05                                | 20.95                        | 21.39                                | 20.09                        | 20.53                                | 26.85             | 26.98       | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 159/5795                    | 19.78                        | 20.22                                | 20.58                        | 21.02                                | 20.94                        | 21.38                                | 19.86                        | 20.30                                | 26.78             | 26.98       | PASS       |
| 802.11ac VHT20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 149/5745                    | 20.26                        | 20.26                                | 21.11                        | 21.11                                | 21.22                        | 21.22                                | 19.92                        | 19.92                                | 26.68             | 26.98       | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 157/5785                    | 20.54                        | 20.54                                | 20.79                        | 20.79                                | 21.03                        | 21.03                                | 20.27                        | 20.27                                | 26.69             | 26.98       | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 165/5825                    | 20.42                        | 20.42                                | 20.69                        | 20.69                                | 20.94                        | 20.94                                | 20.02                        | 20.02                                | 26.55             | 26.98       | PASS       |
| 802.11ac VHT40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 151/5755                    | 19.74                        | 19.88                                | 20.69                        | 20.83                                | 21.08                        | 21.22                                | 20.16                        | 20.30                                | 26.61             | 26.98       | PASS       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 159/5795                    | 19.86                        | 20.00                                | 20.74                        | 20.88                                | 21.34                        | 21.48                                | 19.99                        | 20.13                                | 26.69             | 26.98       | PASS       |
| 802.11ac VHT80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 155/5775                    | 19.37                        | 19.65                                | 20.01                        | 20.29                                | 20.57                        | 20.85                                | 19.33                        | 19.61                                | 26.15             | 26.98       | PASS       |
| <p>Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),<br/> The Total Power = <math>10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)} + 10^{(\text{Power antenna3 in dBm}/10)} + 10^{(\text{Power antenna4 in dBm}/10)})</math>.</p> <p>2. Direction gain calculation according to KDB662911 D01 Multiple Transmitter Output v02r01 F) 2) e) (i), If all antennas have the same gain, directional gain = GANT + 10 log(NANT/NSS) = 3 + 10 log (4/1) = 9.02 dBi &gt; 6dBi. So the power limit is 26.98dBm</p> |                             |                              |                                      |                              |                                      |                              |                                      |                              |                                      |                   |             |            |

### 5.3. Frequency Stability

#### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

#### Method of Measurement

##### 1. Frequency stability with respect to ambient temperature

- a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.
- b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.
- c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).
- d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.
- e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.
- f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.
- g) Measure the frequency at each of frequencies specified in 5.6.
- h) Switch OFF the EUT but do not switch OFF the oscillator heater.
- i) Lower the chamber temperature by not more than 10°C, and allow the temperature inside the chamber to stabilize.
- j) Repeat step f) through step i) down to the lowest specified temperature.

##### 2. Frequency stability when varying supply voltage

Unless otherwise specified, these tests shall be made at ambient room temperature (+15°C to +25 °C). An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

- a) Supply the EUT with nominal voltage or install a new or fully charged battery in the EUT. Turn ON the EUT and couple its output to a frequency counter or other frequency-measuring instrument.



- b) Tune the EUT to one of the number of frequencies required in 5.6. Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).
- c) Measure the frequency at each of the frequencies specified in 5.6.
- d) Repeat the above procedure at 85% and 115% of the nominal supply voltage.

**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.

**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 936\text{Hz}$

**Test Results**

| Voltage<br>(V) | Temperature<br>(°C) | U-NII-1 Test Results |             |             |             |
|----------------|---------------------|----------------------|-------------|-------------|-------------|
|                |                     | 5200MHz              |             |             |             |
|                |                     | 1min                 | 2min        | 5min        | 10min       |
| 12             | -5                  | 5199.990736          | 5199.980795 | 5199.972092 | 5199.964849 |
| 12             | 0                   | 5199.990988          | 5199.976635 | 5199.964538 | 5199.957984 |
| 12             | 5                   | 5199.984209          | 5199.972083 | 5199.964135 | 5199.954684 |
| 12             | 10                  | 5199.979163          | 5199.965518 | 5199.954449 | 5199.945402 |
| 12             | 20                  | 5199.975592          | 5199.965074 | 5199.952016 | 5199.935962 |
| 12             | 30                  | 5199.966396          | 5199.959184 | 5199.950439 | 5199.926973 |
| 12             | 40                  | 5199.956681          | 5199.950719 | 5199.945467 | 5199.921053 |
| 12             | 45                  | 5199.956204          | 5199.946308 | 5199.938629 | 5199.914868 |
| 10             | 20                  | 5199.953072          | 5199.946063 | 5199.930281 | 5199.906006 |
| 14             | 20                  | 5199.946735          | 5199.940718 | 5199.929073 | 5199.902882 |
| MHz            |                     | -0.053265            | -0.059282   | -0.070927   | -0.097118   |
| PPM            |                     | -10.243267           | -11.400378  | -13.639867  | -18.676481  |

| Voltage<br>(V) | Temperature<br>(°C) | U-NII-3 Test Results |             |             |             |
|----------------|---------------------|----------------------|-------------|-------------|-------------|
|                |                     | 5785MHz              |             |             |             |
|                |                     | 1min                 | 2min        | 5min        | 10min       |
| 12             | -5                  | 5785.008624          | 5785.004663 | 5784.995508 | 5784.986779 |
| 12             | 0                   | 5785.008419          | 5784.998577 | 5784.986801 | 5784.977178 |
| 12             | 5                   | 5785.007451          | 5784.998448 | 5784.979307 | 5784.969446 |
| 12             | 10                  | 5785.005769          | 5784.997960 | 5784.973030 | 5784.965250 |
| 12             | 20                  | 5785.000764          | 5784.991489 | 5784.969004 | 5784.964279 |
| 12             | 30                  | 5784.998194          | 5784.981957 | 5784.960428 | 5784.963604 |
| 12             | 40                  | 5784.993403          | 5784.972926 | 5784.954547 | 5784.960028 |
| 12             | 45                  | 5784.992023          | 5784.964620 | 5784.954529 | 5784.951402 |
| 10             | 20                  | 5784.988430          | 5784.958510 | 5784.949663 | 5784.942817 |
| 14             | 20                  | 5784.987020          | 5784.951218 | 5784.946879 | 5784.933121 |
| MHz            |                     | -0.012980            | -0.048782   | -0.053121   | -0.066879   |
| PPM            |                     | -2.243733            | -8.432539   | -9.182505   | -11.560732  |

## 5.4. Power Spectral Density

### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Method of Measurement

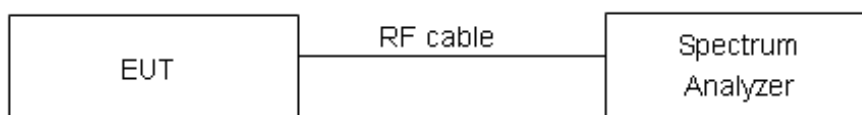
The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

Set RBW = 500 kHz, VBW =1.5MHz for the band 5.725-5.85 GHz

Set RBW = 1 MHz, VBW =3MHz for the band 5.150-5.250 GHz

The conducted PSD is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

### Test setup



### Limits

Rule FCC Part 15.407(a)(1)/ Part 15.407(a)(2) / Part 15.407(a)(3)

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. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

| Frequency Bands/MHz              | Limits       |
|----------------------------------|--------------|
| 5150-5250                        | 17/11dBm/MHz |
| 5.25-5.35 GHz and 5.47-5.725 GHz | 11dBm/MHz    |
| 5725-5850                        | 30dBm/500kHz |



## Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.75\text{dB}$ .

**Test Results:**

Note: Power Spectral Density = Read Value + Duty cycle correction factor

**MIMO (Without Beamforming)****U-NII-1**

| Network Standards | Channel/<br>Frequency<br>(MHz) | Power Spectral Density         |                      |                                |                      |                                |                      |                                |                      |                                 | Limit<br>(dBm/<br>MHz) | Conclusion |
|-------------------|--------------------------------|--------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|----------------------|---------------------------------|------------------------|------------|
|                   |                                | Antenna 1                      |                      | Antenna 2                      |                      | Antenna 3                      |                      | Antenna 4                      |                      | Total<br>Power<br>(dBm<br>/MHz) |                        |            |
|                   |                                | Read<br>Value<br>(dBm/<br>MHz) | PSD<br>(dBm/<br>MHz) | Read<br>Value<br>(dBm/<br>MHz) | PSD<br>(dBm/<br>MHz) | Read<br>Value<br>(dBm/<br>MHz) | PSD<br>(dBm/<br>MHz) | Read<br>Value<br>(dBm/<br>MHz) | PSD<br>(dBm/<br>MHz) |                                 |                        |            |
| 802.11a           | 36/5180                        | 7.73                           | 7.94                 | 7.42                           | 7.63                 | 6.92                           | 7.13                 | 7.30                           | 7.51                 | 13.58                           | 13.98                  | PASS       |
|                   | 40/5200                        | 7.42                           | 7.64                 | 7.37                           | 7.58                 | 6.68                           | 6.90                 | 7.26                           | 7.47                 | 13.43                           | 13.98                  | PASS       |
|                   | 48/5240                        | 7.99                           | 8.20                 | 7.86                           | 8.07                 | 7.09                           | 7.31                 | 7.31                           | 7.52                 | 13.81                           | 13.98                  | PASS       |
| 802.11n<br>HT20   | 36/5180                        | 7.69                           | 7.90                 | 7.03                           | 7.24                 | 6.30                           | 6.51                 | 6.38                           | 6.59                 | 13.12                           | 13.98                  | PASS       |
|                   | 40/5200                        | 7.29                           | 7.50                 | 7.28                           | 7.49                 | 6.66                           | 6.88                 | 6.83                           | 7.04                 | 13.26                           | 13.98                  | PASS       |
|                   | 48/5240                        | 7.40                           | 7.62                 | 7.38                           | 7.60                 | 6.72                           | 6.93                 | 7.41                           | 7.62                 | 13.47                           | 13.98                  | PASS       |
| 802.11n<br>HT40   | 38/5190                        | 3.11                           | 3.55                 | 3.12                           | 3.56                 | 2.35                           | 2.79                 | 2.73                           | 3.17                 | 9.30                            | 13.98                  | PASS       |
|                   | 46/5230                        | 4.10                           | 4.54                 | 4.39                           | 4.82                 | 3.85                           | 4.28                 | 3.92                           | 4.36                 | 10.53                           | 13.98                  | PASS       |
| 802.11ac<br>VHT20 | 36/5180                        | 7.53                           | 7.53                 | 7.27                           | 7.27                 | 6.98                           | 6.98                 | 7.26                           | 7.26                 | 13.28                           | 13.98                  | PASS       |
|                   | 40/5200                        | 7.53                           | 7.53                 | 7.44                           | 7.44                 | 6.93                           | 6.93                 | 6.91                           | 6.91                 | 13.23                           | 13.98                  | PASS       |
|                   | 48/5240                        | 7.85                           | 7.85                 | 7.40                           | 7.40                 | 6.59                           | 6.59                 | 7.07                           | 7.07                 | 13.27                           | 13.98                  | PASS       |
| 802.11ac<br>VHT40 | 38/5190                        | 7.19                           | 7.34                 | 6.84                           | 6.98                 | 6.58                           | 6.72                 | 6.69                           | 6.83                 | 12.99                           | 13.98                  | PASS       |
|                   | 46/5230                        | 7.41                           | 7.56                 | 7.09                           | 7.23                 | 7.05                           | 7.19                 | 7.11                           | 7.26                 | 13.33                           | 13.98                  | PASS       |
| 802.11ac<br>VHT80 | 42/5210                        | -1.40                          | -1.12                | -0.93                          | -0.65                | -1.47                          | -1.20                | -1.92                          | -1.64                | 4.88                            | 13.98                  | PASS       |

Note: 1. Power Spectral Density = Read Value + Duty cycle correction factor

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a), the power spectral density =  $10\log(10^{(\text{PSD antenna1 in dBm}/10)} + 10^{(\text{PSD antenna2 in dBm}/10)} + 10^{(\text{PSD antenna3 in dBm}/10)} + 10^{(\text{PSD antenna4 in dBm}/10)})$

3. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = GANT + Array Gain, For PSD measurements on all devices, Array Gain =  $10\log(\text{Nant}/\text{Nss})\text{dB}$ , so directional gain = GANT + Array Gain =  $3 + 10\log(4/1) = 9.02\text{ dBi}$  > 6 dBi. So the PSD limit is 13.98dBm.



## U-NII-3

| Network Standards | Channel/<br>Frequency<br>(MHz) | Power Spectral Density            |                         |                                   |                         |                                   |                         |                                   |                         |                                    | Limit<br>(dBm/<br>500kHz) | Conclusion |
|-------------------|--------------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|------------------------------------|---------------------------|------------|
|                   |                                | Antenna 1                         |                         | Antenna 2                         |                         | Antenna 3                         |                         | Antenna 4                         |                         | Total<br>Power<br>(dBm/<br>500kHz) |                           |            |
|                   |                                | Read<br>Value<br>(dBm/<br>500kHz) | PSD<br>(dBm/<br>500kHz) | Read<br>Value<br>(dBm/<br>500kHz) | PSD<br>(dBm/<br>500kHz) | Read<br>Value<br>(dBm/<br>500kHz) | PSD<br>(dBm/<br>500kHz) | Read<br>Value<br>(dBm/<br>500kHz) | PSD<br>(dBm/<br>500kHz) |                                    |                           |            |
| 802.11a           | 149/5745                       | 8.67                              | 8.89                    | 9.22                              | 9.43                    | 9.09                              | 9.30                    | 8.18                              | 8.39                    | 15.04                              | 26.98                     | PASS       |
|                   | 157/5785                       | 9.50                              | 9.71                    | 9.30                              | 9.51                    | 9.10                              | 9.31                    | 8.58                              | 8.79                    | 15.36                              | 26.98                     | PASS       |
|                   | 165/5825                       | 8.83                              | 9.04                    | 8.56                              | 8.77                    | 8.56                              | 8.77                    | 8.21                              | 8.42                    | 14.78                              | 26.98                     | PASS       |
| 802.11n<br>HT20   | 149/5745                       | 9.49                              | 9.70                    | 9.63                              | 9.85                    | 9.70                              | 9.92                    | 9.04                              | 9.25                    | 15.71                              | 26.98                     | PASS       |
|                   | 157/5785                       | 9.71                              | 9.93                    | 9.10                              | 9.31                    | 8.78                              | 8.99                    | 9.32                              | 9.53                    | 15.47                              | 26.98                     | PASS       |
|                   | 165/5825                       | 9.66                              | 9.87                    | 9.05                              | 9.27                    | 9.07                              | 9.28                    | 8.44                              | 8.65                    | 15.31                              | 26.98                     | PASS       |
| 802.11n<br>HT40   | 151/5755                       | 5.79                              | 6.22                    | 5.82                              | 6.25                    | 6.61                              | 7.05                    | 5.07                              | 5.51                    | 12.31                              | 26.98                     | PASS       |
|                   | 159/5795                       | 5.30                              | 5.74                    | 4.95                              | 5.38                    | 5.31                              | 5.75                    | 4.88                              | 5.31                    | 11.57                              | 26.98                     | PASS       |
| 802.11ac<br>VHT20 | 149/5745                       | 8.04                              | 8.04                    | 7.95                              | 7.95                    | 8.28                              | 8.28                    | 7.52                              | 7.52                    | 13.98                              | 26.98                     | PASS       |
|                   | 157/5785                       | 8.42                              | 8.42                    | 8.07                              | 8.07                    | 8.57                              | 8.57                    | 7.27                              | 7.27                    | 14.13                              | 26.98                     | PASS       |
|                   | 165/5825                       | 8.48                              | 8.48                    | 7.41                              | 7.41                    | 7.97                              | 7.97                    | 7.04                              | 7.04                    | 13.78                              | 26.98                     | PASS       |
| 802.11ac<br>VHT40 | 151/5755                       | 4.82                              | 4.97                    | 4.83                              | 4.97                    | 5.32                              | 5.46                    | 4.48                              | 4.63                    | 11.04                              | 26.98                     | PASS       |
|                   | 159/5795                       | 4.01                              | 4.16                    | 4.30                              | 4.44                    | 4.67                              | 4.81                    | 4.08                              | 4.22                    | 10.44                              | 26.98                     | PASS       |
| 802.11ac<br>VHT80 | 155/5775                       | -0.03                             | 0.24                    | -0.21                             | 0.07                    | 0.87                              | 1.14                    | -0.33                             | -0.06                   | 6.40                               | 26.98                     | PASS       |

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power =  $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)} + 10^{(\text{Power antenna3 in dBm}/10)} + 10^{(\text{PSD antenna4 in dBm}/10)})$ .

2. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01

Multiple Transmitter Output v02r01 2)f(i): If all antennas have the same gain, Directional gain = GANT + Array Gain, For PSD measurements on all devices, Array Gain =  $10\log(\text{Nant}/\text{Nss})\text{dB}$ , so directional gain = GANT + Array Gain =  $3 + 10\log(4/1) = 9.02\text{dBi} > 6\text{dBi}$ . So the PSD limit is 26.98dBm.

**MIMO (With Beamforming)****U-NII-1**

| Network Standards | Channel/<br>Frequency<br>(MHz) | Power Spectral Density         |                      |                                |                      |                                |                      |                                |                      |                                 | Limit<br>(dBm/<br>MHz) | Conclusion |
|-------------------|--------------------------------|--------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|----------------------|---------------------------------|------------------------|------------|
|                   |                                | Antenna 1                      |                      | Antenna 2                      |                      | Antenna 3                      |                      | Antenna 4                      |                      | Total<br>Power<br>(dBm<br>/MHz) |                        |            |
|                   |                                | Read<br>Value<br>(dBm/<br>MHz) | PSD<br>(dBm/<br>MHz) | Read<br>Value<br>(dBm/<br>MHz) | PSD<br>(dBm/<br>MHz) | Read<br>Value<br>(dBm/<br>MHz) | PSD<br>(dBm/<br>MHz) | Read<br>Value<br>(dBm/<br>MHz) | PSD<br>(dBm/<br>MHz) |                                 |                        |            |
| 802.11n<br>HT20   | 36/5180                        | 7.47                           | 7.69                 | 7.32                           | 7.53                 | 6.61                           | 6.82                 | 6.59                           | 6.80                 | 13.25                           | 13.98                  | PASS       |
|                   | 40/5200                        | 7.31                           | 7.52                 | 7.61                           | 7.82                 | 6.99                           | 7.20                 | 7.00                           | 7.21                 | 13.47                           | 13.98                  | PASS       |
|                   | 48/5240                        | 7.84                           | 8.05                 | 7.67                           | 7.88                 | 7.07                           | 7.28                 | 7.37                           | 7.58                 | 13.73                           | 13.98                  | PASS       |
| 802.11n<br>HT40   | 38/5190                        | 2.89                           | 3.33                 | 3.11                           | 3.55                 | 2.39                           | 2.82                 | 3.25                           | 3.68                 | 9.38                            | 13.98                  | PASS       |
|                   | 46/5230                        | 4.85                           | 5.29                 | 4.60                           | 5.03                 | 3.66                           | 4.09                 | 3.95                           | 4.39                 | 10.75                           | 13.98                  | PASS       |
| 802.11ac<br>VHT20 | 36/5180                        | 7.44                           | 7.44                 | 7.24                           | 7.24                 | 6.60                           | 6.60                 | 6.74                           | 6.74                 | 13.04                           | 13.98                  | PASS       |
|                   | 40/5200                        | 7.18                           | 7.18                 | 7.16                           | 7.16                 | 6.97                           | 6.97                 | 7.14                           | 7.14                 | 13.14                           | 13.98                  | PASS       |
|                   | 48/5240                        | 7.67                           | 7.67                 | 7.93                           | 7.93                 | 6.99                           | 6.99                 | 7.45                           | 7.45                 | 13.54                           | 13.98                  | PASS       |
| 802.11ac<br>VHT40 | 38/5190                        | 7.49                           | 7.63                 | 7.63                           | 7.78                 | 7.76                           | 7.91                 | 7.37                           | 7.51                 | 13.73                           | 13.98                  | PASS       |
|                   | 46/5230                        | 7.42                           | 7.57                 | 7.44                           | 7.58                 | 6.92                           | 7.06                 | 6.74                           | 6.88                 | 13.30                           | 13.98                  | PASS       |
| 802.11ac<br>VHT80 | 42/5210                        | -1.403                         | -1.13                | -1.21                          | -0.94                | -1.36                          | -1.09                | -1.17                          | -0.90                | 5.01                            | 13.98                  | PASS       |

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),the power spectral density= $10\log(10^{(\text{PSD antenna1 in dBm/10})} + 10^{(\text{PSD antenna2 in dBm/10})} + 10^{(\text{PSD antenna3 in dBm/10})} + 10^{(\text{PSD antenna4 in dBm/10})})$

3. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = GANT + Array Gain, For PSD measurements on all devices,Array Gain= $10\log(\text{Nant/Nss})\text{dB}$ ,so directional gain=GANT+Array Gain= $3+10\log(4/1)=9.02\text{dBi}>6\text{dBi}$ . So the PSD limit is 13.98dBm.



## U-NII-3

| Network Standards | Channel/<br>Frequency<br>(MHz) | Power Spectral Density            |                         |                                   |                         |                                   |                         |                                   |                         |                                    | Limit<br>(dBm/<br>500kHz) | Conclusion |
|-------------------|--------------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|-----------------------------------|-------------------------|------------------------------------|---------------------------|------------|
|                   |                                | Antenna 1                         |                         | Antenna 2                         |                         | Antenna 3                         |                         | Antenna 4                         |                         | Total<br>Power<br>(dBm/<br>500kHz) |                           |            |
|                   |                                | Read<br>Value<br>(dBm/<br>500kHz) | PSD<br>(dBm/<br>500kHz) | Read<br>Value<br>(dBm/<br>500kHz) | PSD<br>(dBm/<br>500kHz) | Read<br>Value<br>(dBm/<br>500kHz) | PSD<br>(dBm/<br>500kHz) | Read<br>Value<br>(dBm/<br>500kHz) | PSD<br>(dBm/<br>500kHz) |                                    |                           |            |
| 802.11n<br>HT20   | 149/5745                       | 9.01                              | 9.22                    | 9.28                              | 9.49                    | 9.17                              | 9.38                    | 8.57                              | 8.78                    | 15.25                              | 26.98                     | PASS       |
|                   | 157/5785                       | 9.59                              | 9.80                    | 9.53                              | 9.74                    | 9.35                              | 9.56                    | 8.84                              | 9.05                    | 15.57                              | 26.98                     | PASS       |
|                   | 165/5825                       | 9.20                              | 9.41                    | 9.50                              | 9.71                    | 9.56                              | 9.77                    | 9.03                              | 9.24                    | 15.56                              | 26.98                     | PASS       |
| 802.11n<br>HT40   | 151/5755                       | 5.57                              | 6.01                    | 5.76                              | 6.20                    | 5.58                              | 6.01                    | 5.62                              | 6.06                    | 12.09                              | 26.98                     | PASS       |
|                   | 159/5795                       | 5.79                              | 6.23                    | 6.68                              | 7.12                    | 5.65                              | 6.09                    | 5.83                              | 6.27                    | 12.47                              | 26.98                     | PASS       |
| 802.11ac<br>VHT20 | 149/5745                       | 8.24                              | 8.24                    | 8.03                              | 8.03                    | 8.16                              | 8.16                    | 8.49                              | 8.49                    | 14.25                              | 26.98                     | PASS       |
|                   | 157/5785                       | 8.05                              | 8.05                    | 8.18                              | 8.18                    | 8.10                              | 8.10                    | 8.18                              | 8.18                    | 14.15                              | 26.98                     | PASS       |
|                   | 165/5825                       | 8.06                              | 8.06                    | 8.13                              | 8.13                    | 8.19                              | 8.19                    | 7.99                              | 7.99                    | 14.11                              | 26.98                     | PASS       |
| 802.11ac<br>VHT40 | 151/5755                       | 4.32                              | 4.47                    | 4.78                              | 4.92                    | 4.59                              | 4.73                    | 4.83                              | 4.97                    | 10.80                              | 26.98                     | PASS       |
|                   | 159/5795                       | 4.95                              | 5.09                    | 4.64                              | 4.79                    | 4.88                              | 5.02                    | 4.76                              | 4.91                    | 10.98                              | 26.98                     | PASS       |
| 802.11ac<br>VHT80 | 155/5775                       | 0.04                              | 0.32                    | 0.10                              | 0.38                    | 0.14                              | 0.42                    | 0.09                              | 0.37                    | 6.39                               | 26.98                     | PASS       |

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power =  $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)} + 10^{(\text{Power antenna3 in dBm}/10)} + 10^{(\text{PSD antenna4 in dBm}/10)})$ .

2. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01

Multiple Transmitter Output v02r01 2)f(i): If all antennas have the same gain, Directional gain = GANT + Array Gain, For PSD measurements on all devices, Array Gain =  $10\log(N_{\text{ant}}/N_{\text{ss}})$  dB, so directional gain = GANT + Array Gain =  $3 + 10\log(4/1) = 9.02$  dBi > 6 dBi. So the PSD limit is 26.98 dBm.



## MIMO (Without Beamforming)

## Antenna 1

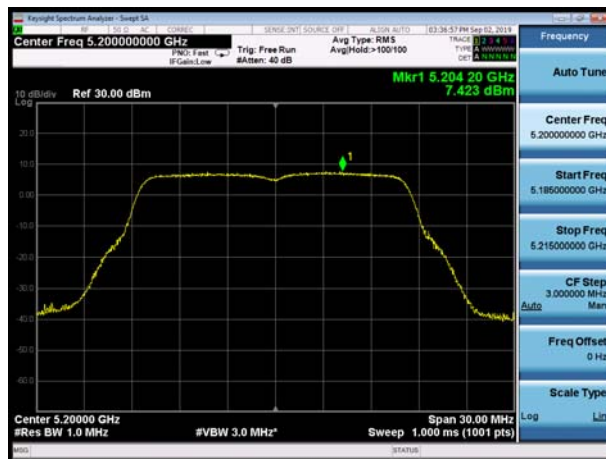
U-NII-1, 802.11a, Channel No.: 36



U-NII-1, 802.11n HT20, Channel No.: 36



U-NII-1, 802.11a, Channel No.: 40



U-NII-1, 802.11n HT20, Channel No.: 40



U-NII-1, 802.11a, Channel No.: 48

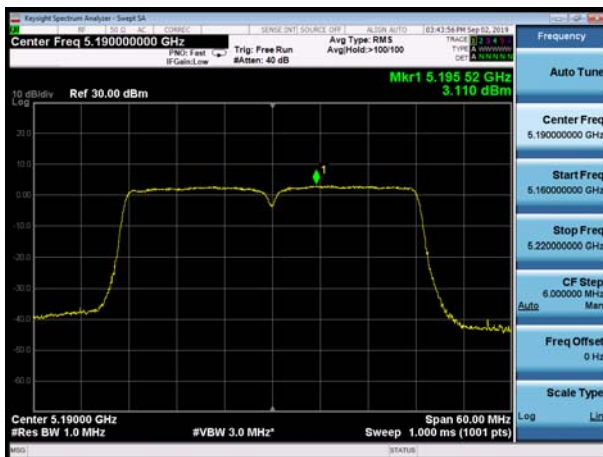


U-NII-1, 802.11n HT20, Channel No.: 48

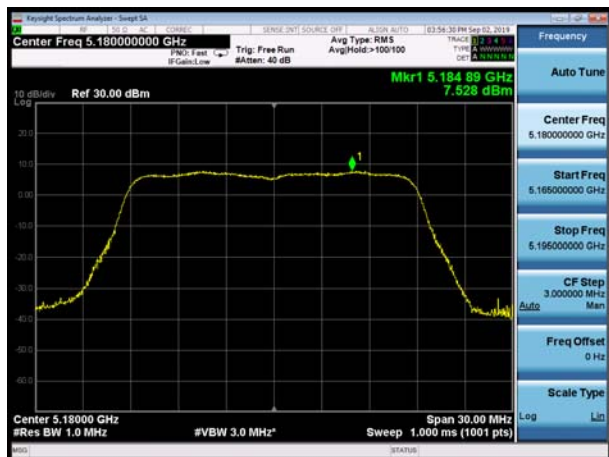




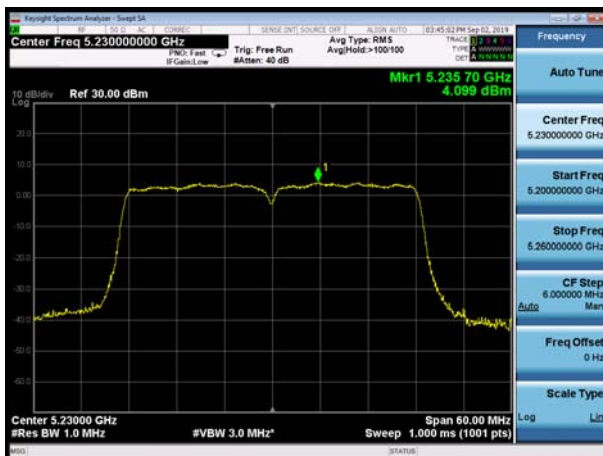
U-NII-1, 802.11n HT40, Channel No.: 38



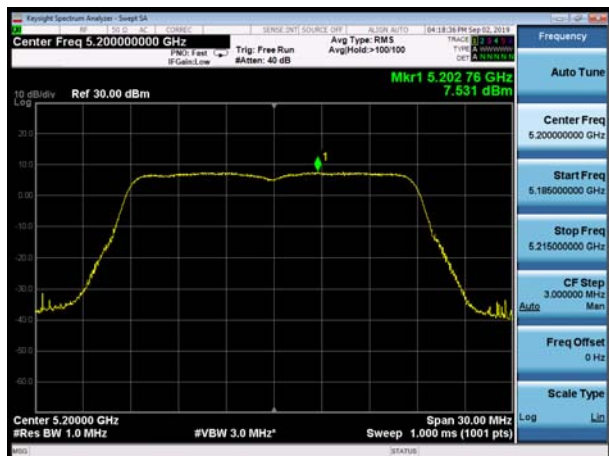
U-NII-1, 802.11ac VHT20, Channel No.: 36



U-NII-1, 802.11n HT40, Channel No.: 46



U-NII-1, 802.11ac VHT20, Channel No.: 40



U-NII-1, 802.11ac VHT40, Channel No.: 38

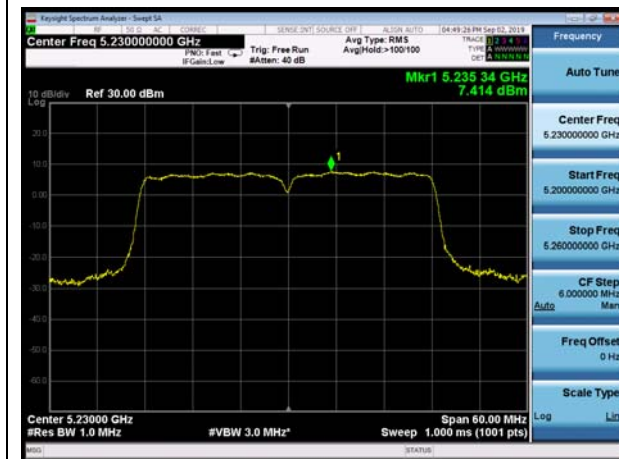


U-NII-1, 802.11ac VHT20, Channel No.: 48

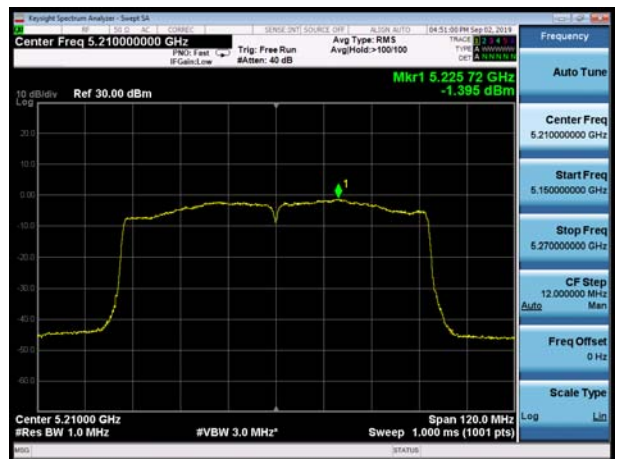




## U-NII-1, 802.11ac VHT40, Channel No.: 46



## U-NII-1, 802.11ac VHT80, Channel No.: 42





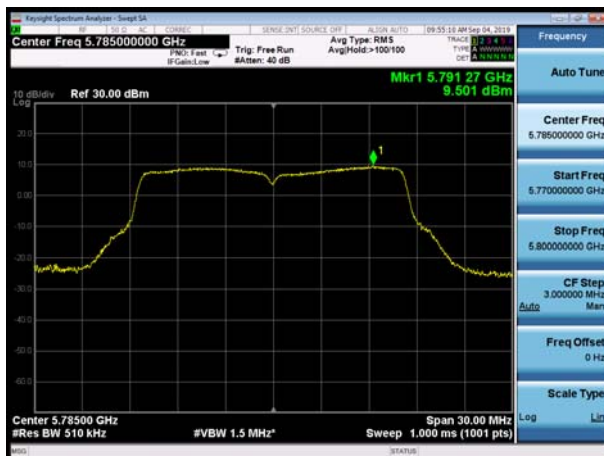
U-NII-3, 802.11a, Channel No.: 149



U-NII-3, 802.11n HT20, Channel No.: 149



U-NII-3, 802.11a, Channel No.: 157



U-NII-3, 802.11n HT20, Channel No.: 157



U-NII-3, 802.11a, Channel No.: 165



U-NII-3, 802.11n HT20, Channel No.: 165





U-NII-3, 802.11n HT40, Channel No.: 151



U-NII-3, 802.11ac VHT20, Channel No.: 149



U-NII-3, 802.11n HT40, Channel No.: 159



U-NII-3, 802.11ac VHT20, Channel No.: 157



U-NII-3, 802.11ac VHT40, Channel No.: 151

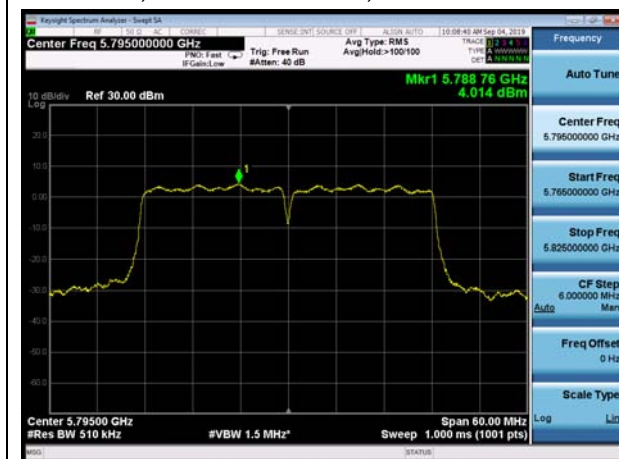


U-NII-3, 802.11ac VHT20, Channel No.: 165

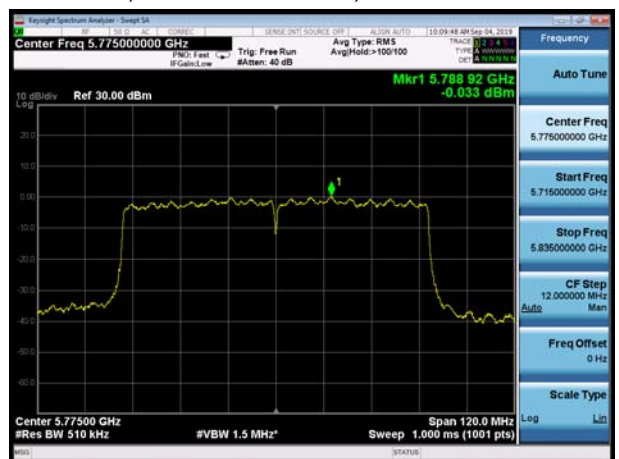




## U-NII-3, 802.11ac VHT40, Channel No.: 159



## U-NII-3, 802.11ac VHT80, Channel No.: 155





## Antenna 2

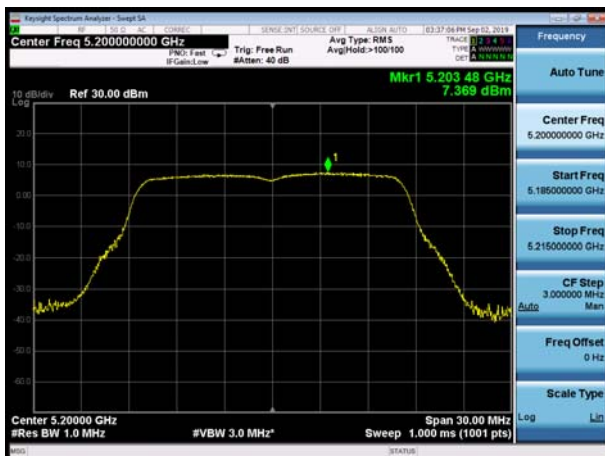
U-NII-1, 802.11a, Channel No.: 36



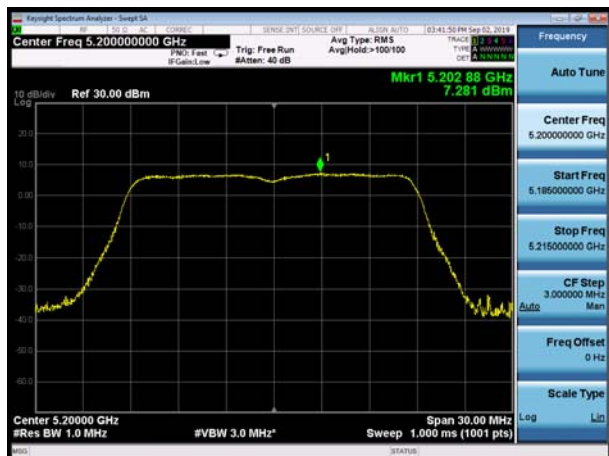
U-NII-1, 802.11n HT20, Channel No.: 36



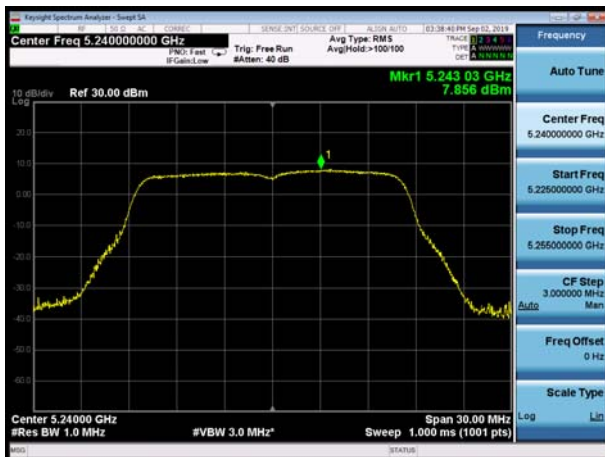
U-NII-1, 802.11a, Channel No.: 40



U-NII-1, 802.11n HT20, Channel No.: 40



U-NII-1, 802.11a, Channel No.: 48

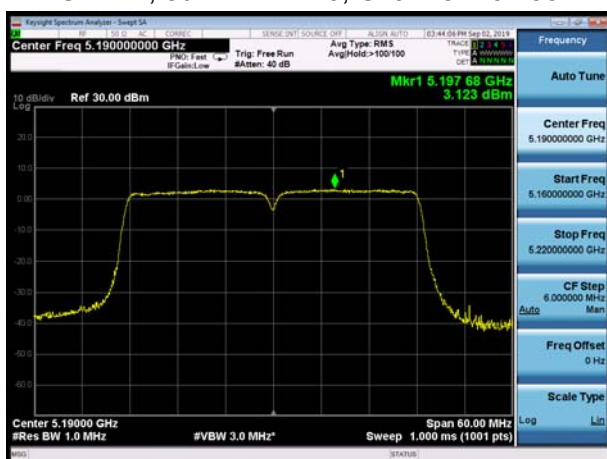


U-NII-1, 802.11n HT20, Channel No.: 48

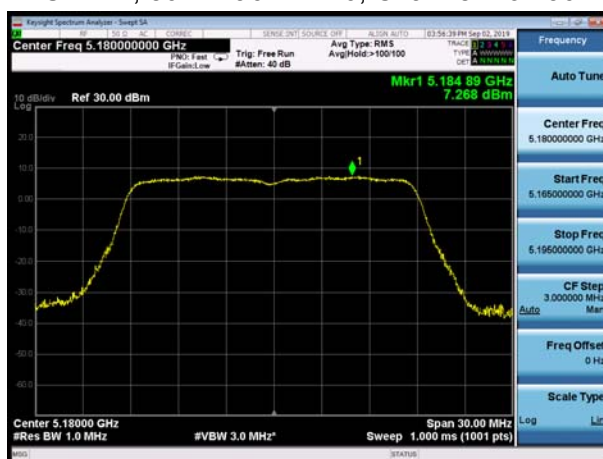




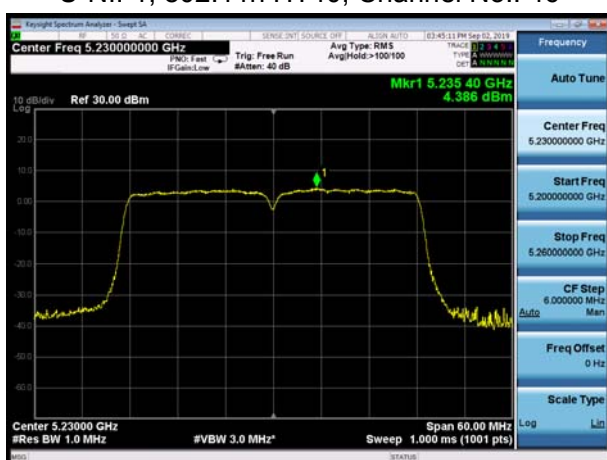
U-NII-1, 802.11n HT40, Channel No.: 38



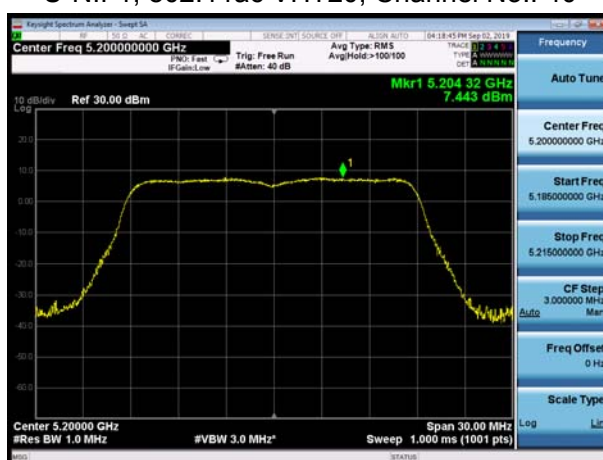
U-NII-1, 802.11ac VHT20, Channel No.: 36



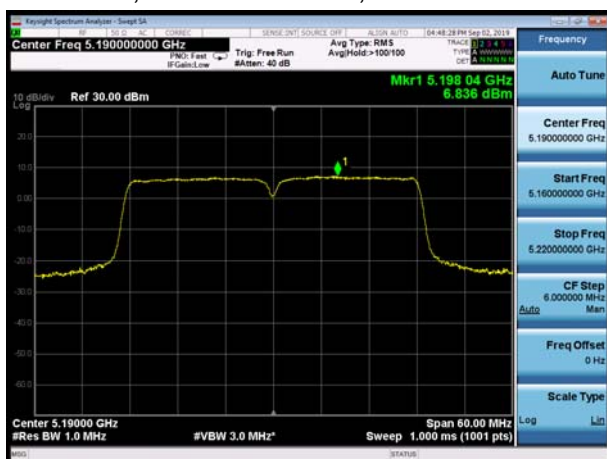
U-NII-1, 802.11n HT40, Channel No.: 46



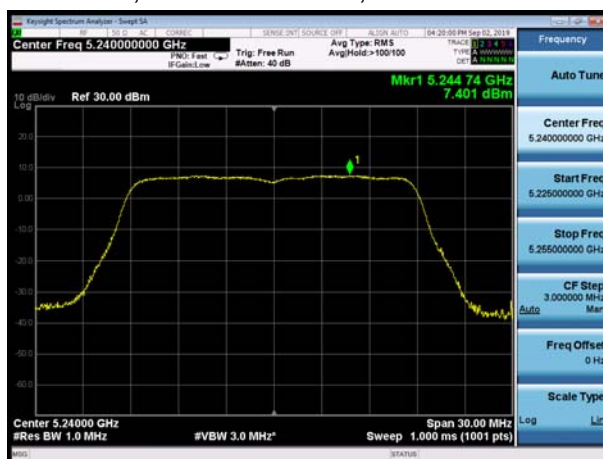
U-NII-1, 802.11ac VHT20, Channel No.: 40



U-NII-1, 802.11ac VHT40, Channel No.: 38

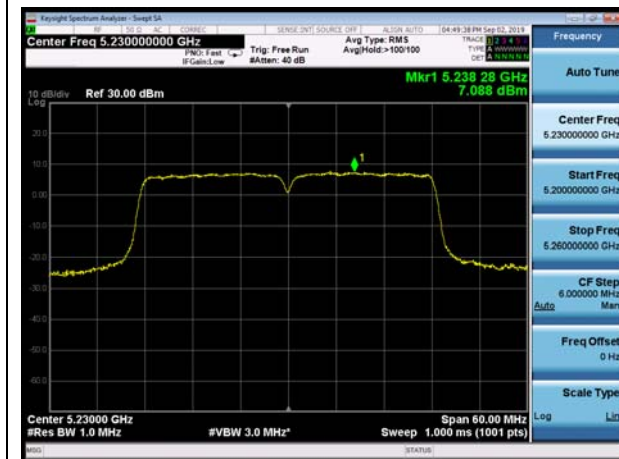


U-NII-1, 802.11ac VHT20, Channel No.: 48

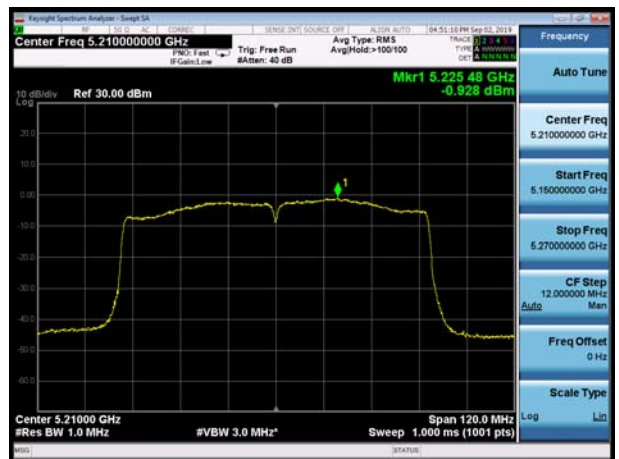




## U-NII-1, 802.11ac VHT40, Channel No.: 46



## U-NII-1, 802.11ac VHT80, Channel No.: 42





U-NII-3, 802.11a, Channel No.: 149



U-NII-3, 802.11n HT20, Channel No.: 149



U-NII-3, 802.11a, Channel No.: 157



U-NII-3, 802.11n HT20, Channel No.: 157



U-NII-3, 802.11a, Channel No.: 165

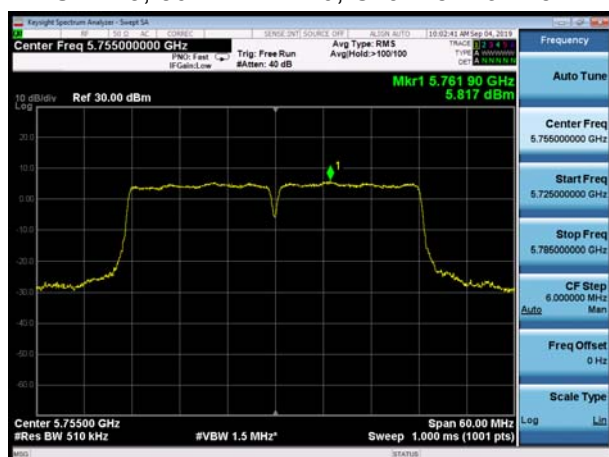


U-NII-3, 802.11n HT20, Channel No.: 165

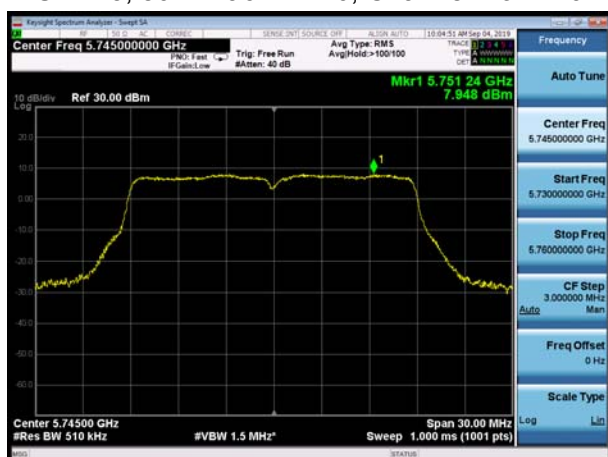




U-NII-3, 802.11n HT40, Channel No.: 151



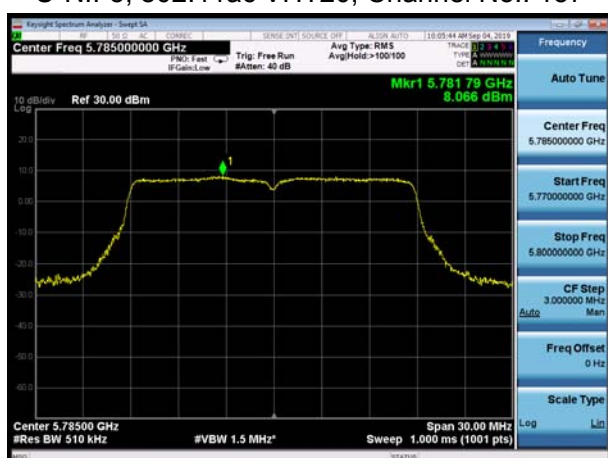
U-NII-3, 802.11ac VHT20, Channel No.: 149



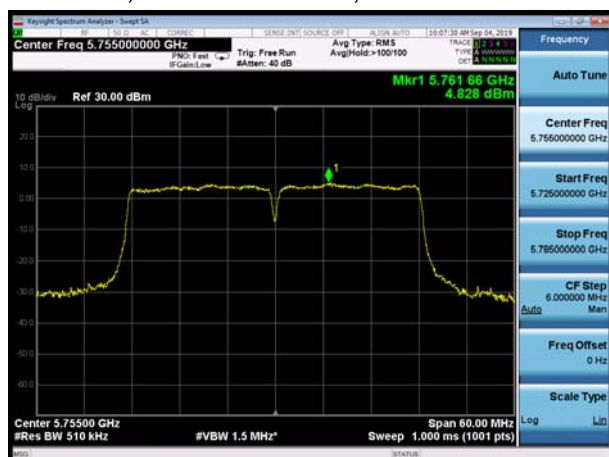
U-NII-3, 802.11n HT40, Channel No.: 159



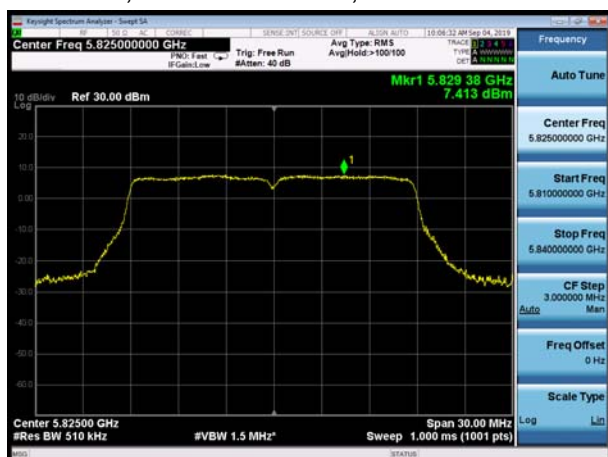
U-NII-3, 802.11ac VHT20, Channel No.: 157



U-NII-3, 802.11ac VHT40, Channel No.: 151

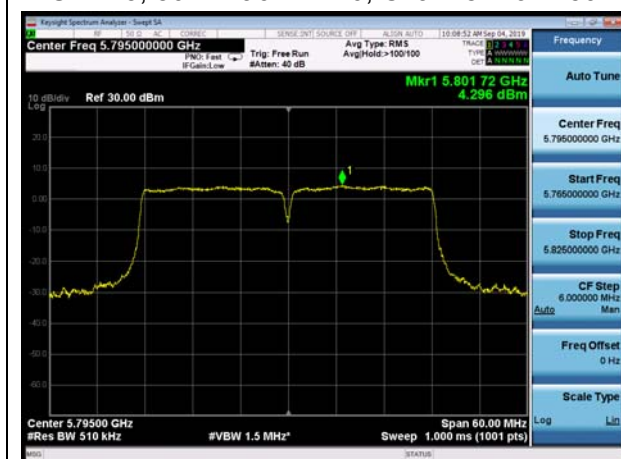


U-NII-3, 802.11ac VHT20, Channel No.: 165

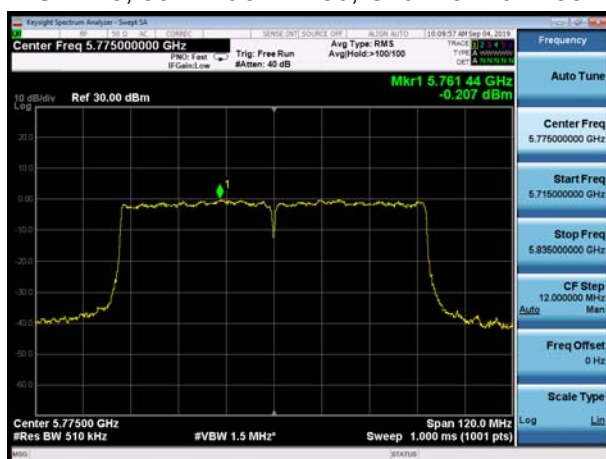




## U-NII-3, 802.11ac VHT40, Channel No.: 159



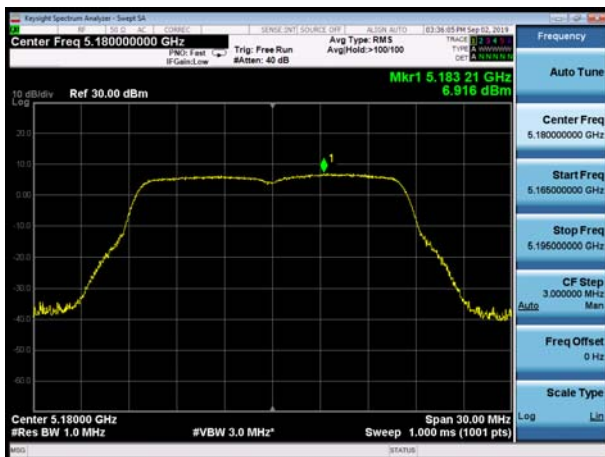
## U-NII-3, 802.11ac VHT80, Channel No.: 155





## Antenna 3

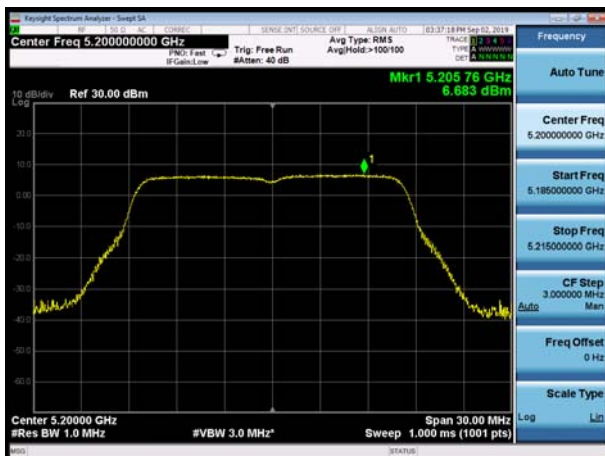
U-NII-1, 802.11a, Channel No.: 36



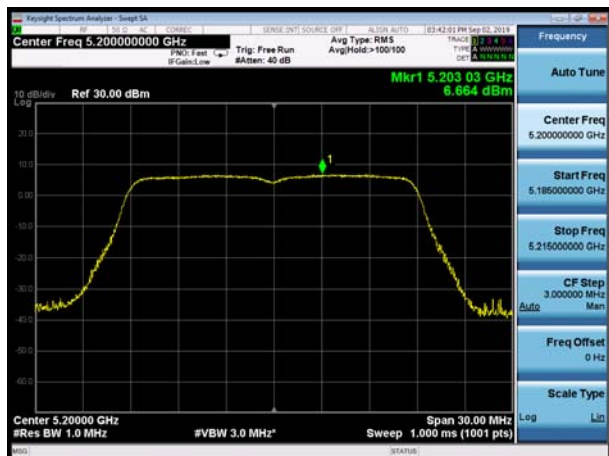
U-NII-1, 802.11n HT20, Channel No.: 36



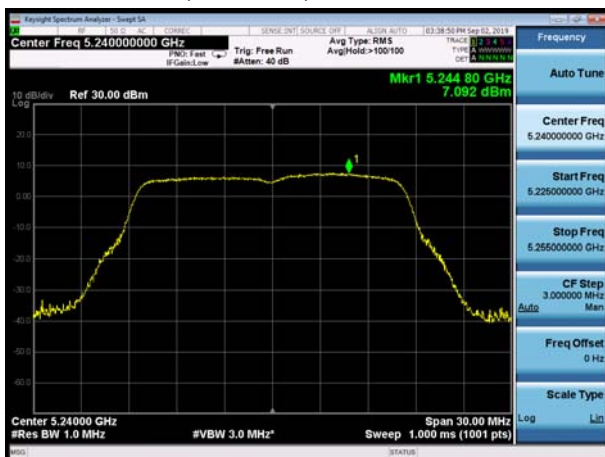
U-NII-1, 802.11a, Channel No.: 40



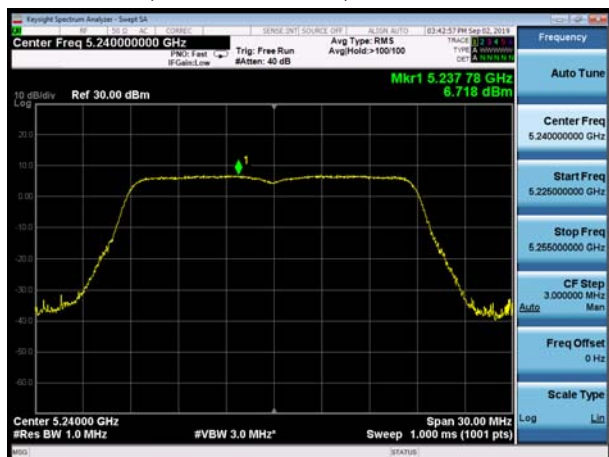
U-NII-1, 802.11n HT20, Channel No.: 40



U-NII-1, 802.11a, Channel No.: 48

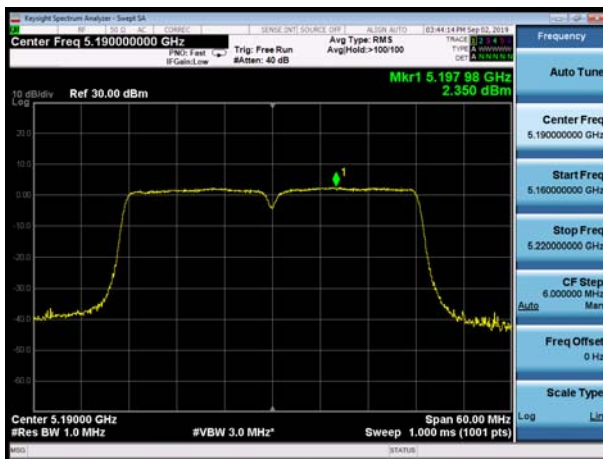


U-NII-1, 802.11n HT20, Channel No.: 48





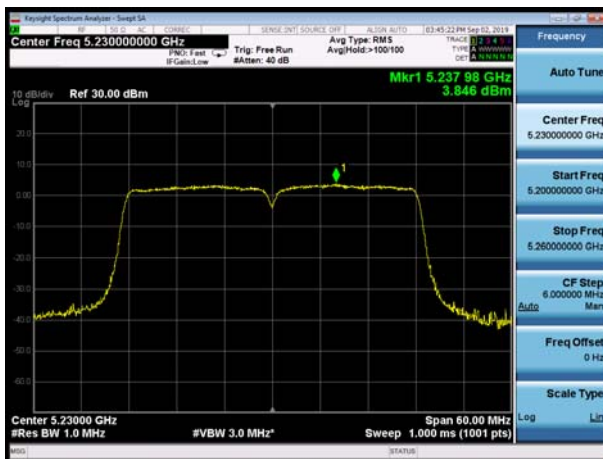
U-NII-1, 802.11n HT40, Channel No.: 38



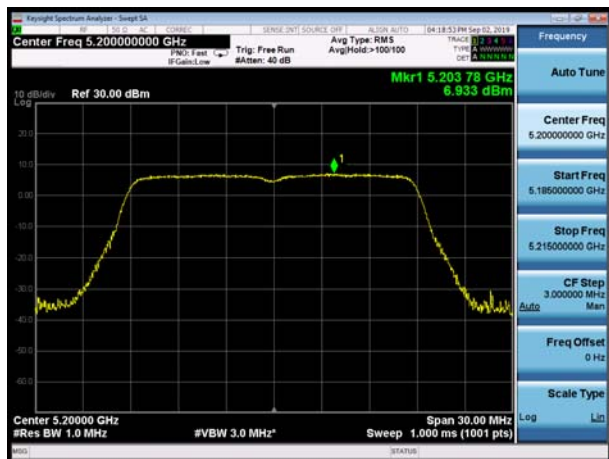
U-NII-1, 802.11ac VHT20, Channel No.: 36



U-NII-1, 802.11n HT40, Channel No.: 46



U-NII-1, 802.11ac VHT20, Channel No.: 40



U-NII-1, 802.11ac VHT40, Channel No.: 38

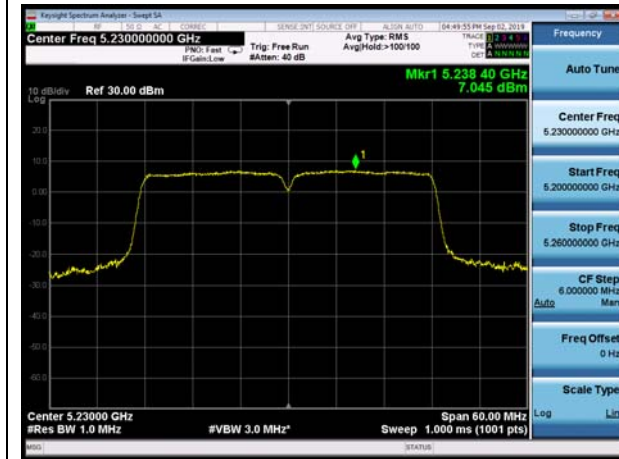


U-NII-1, 802.11ac VHT20, Channel No.: 48

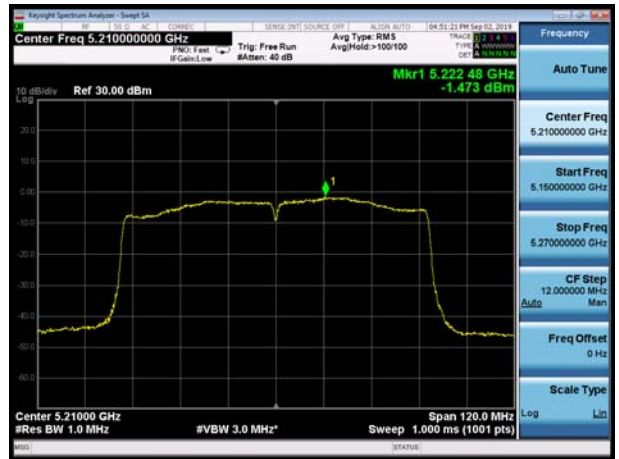




## U-NII-1, 802.11ac VHT40, Channel No.: 46

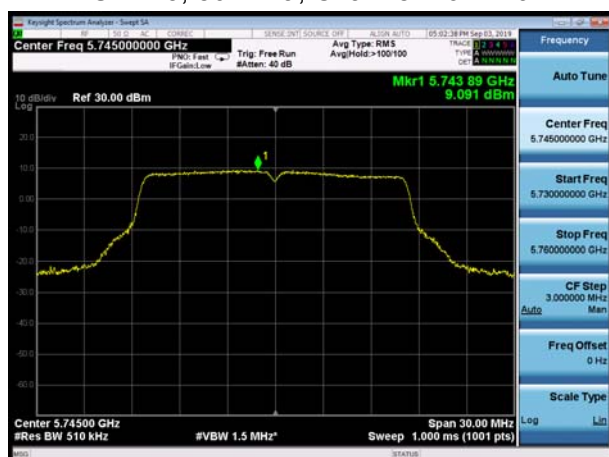


## U-NII-1, 802.11ac VHT80, Channel No.: 42

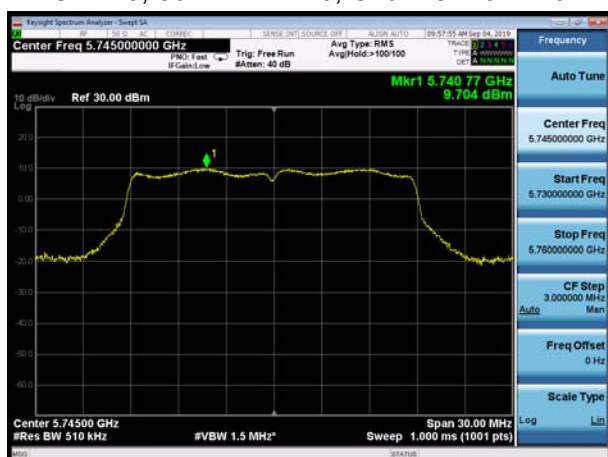




U-NII-3, 802.11a, Channel No.: 149



U-NII-3, 802.11n HT20, Channel No.: 149



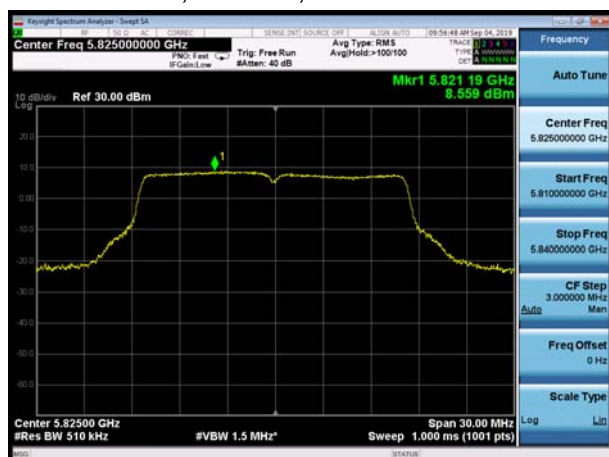
U-NII-3, 802.11a, Channel No.: 157



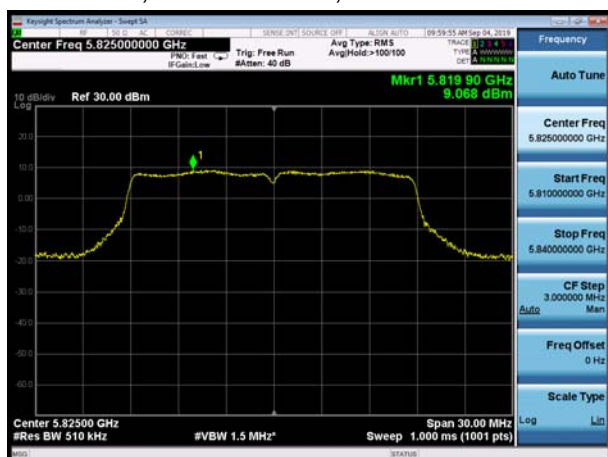
U-NII-3, 802.11n HT20, Channel No.: 157



U-NII-3, 802.11a, Channel No.: 165

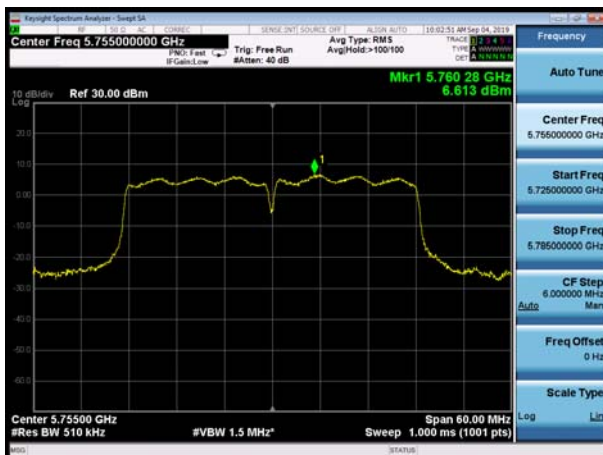


U-NII-3, 802.11n HT20, Channel No.: 165





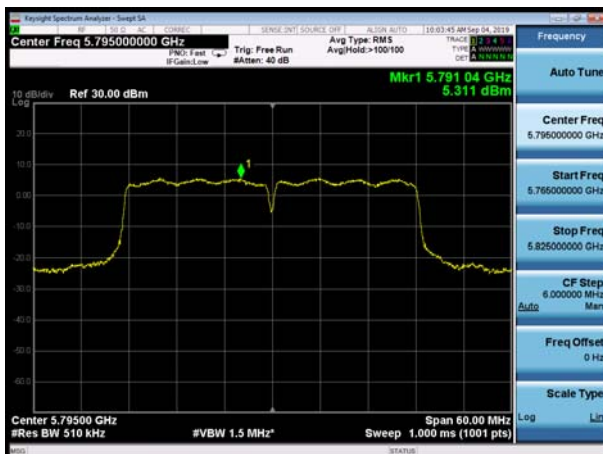
U-NII-3, 802.11n HT40, Channel No.: 151



U-NII-3, 802.11ac VHT20, Channel No.: 149



U-NII-3, 802.11n HT40, Channel No.: 159



U-NII-3, 802.11ac VHT20, Channel No.: 157



U-NII-3, 802.11ac VHT40, Channel No.: 151

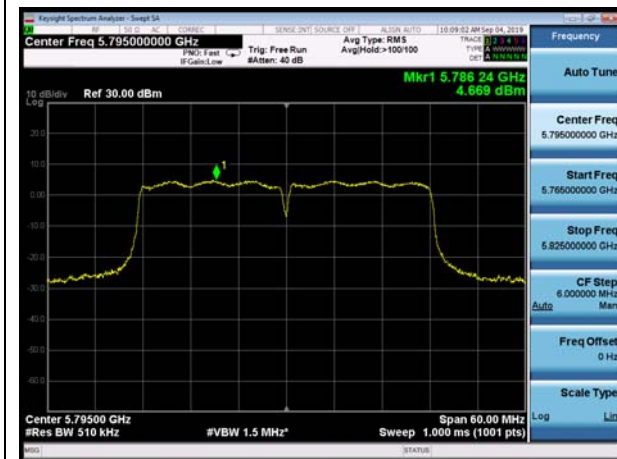


U-NII-3, 802.11ac VHT20, Channel No.: 165

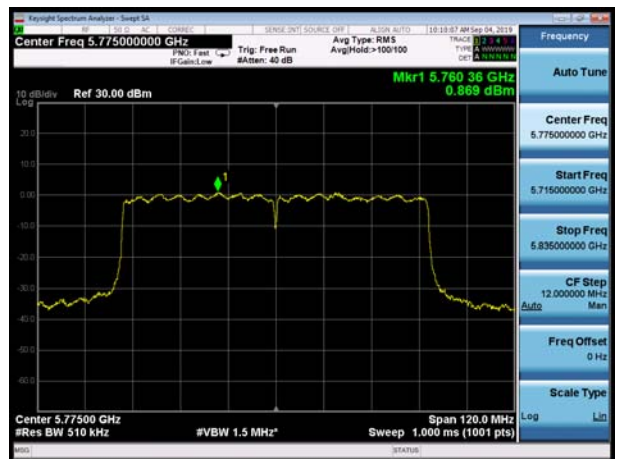




## U-NII-3, 802.11ac VHT40, Channel No.: 159



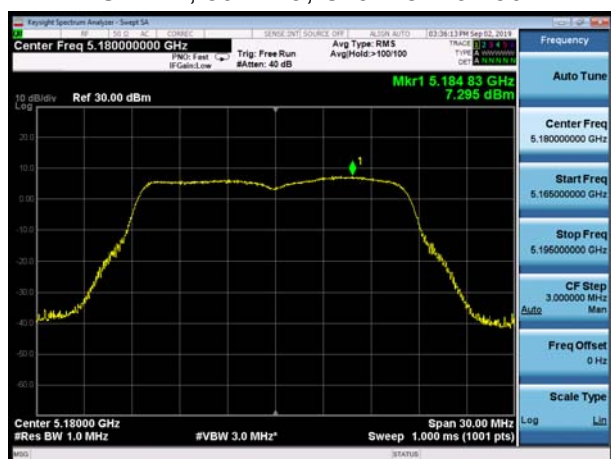
## U-NII-3, 802.11ac VHT80, Channel No.: 155



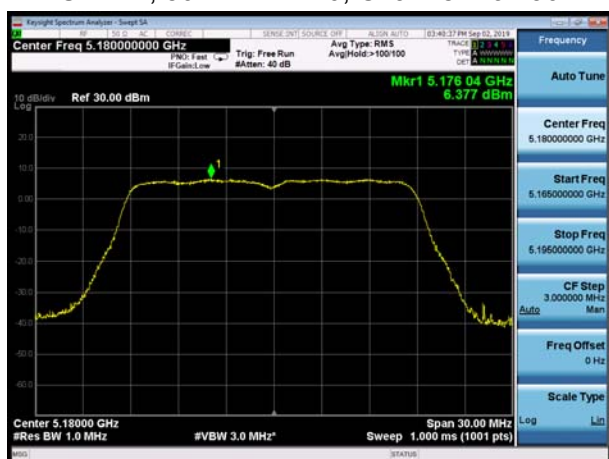


## Antenna 4

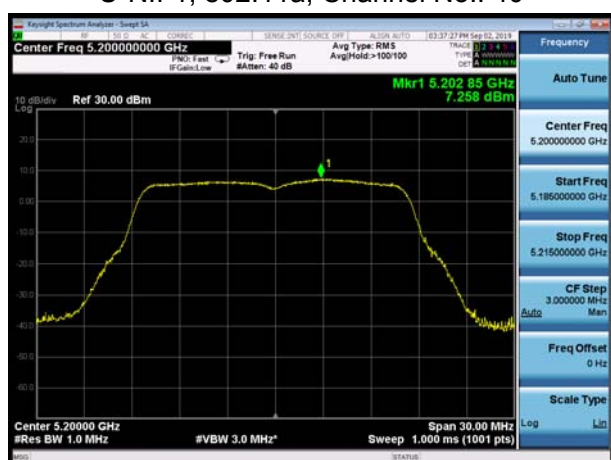
U-NII-1, 802.11a, Channel No.: 36



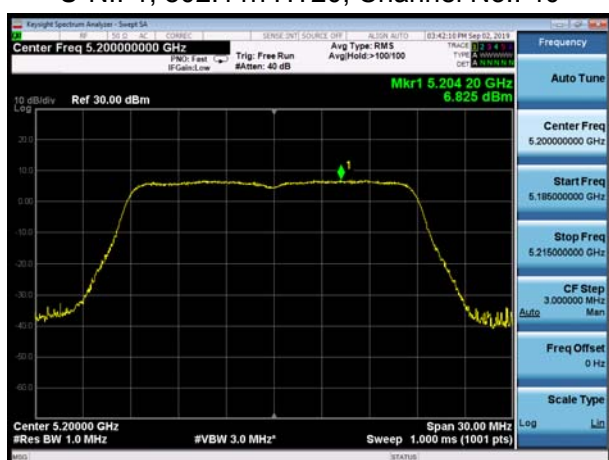
U-NII-1, 802.11n HT20, Channel No.: 36



U-NII-1, 802.11a, Channel No.: 40



U-NII-1, 802.11n HT20, Channel No.: 40



U-NII-1, 802.11a, Channel No.: 48

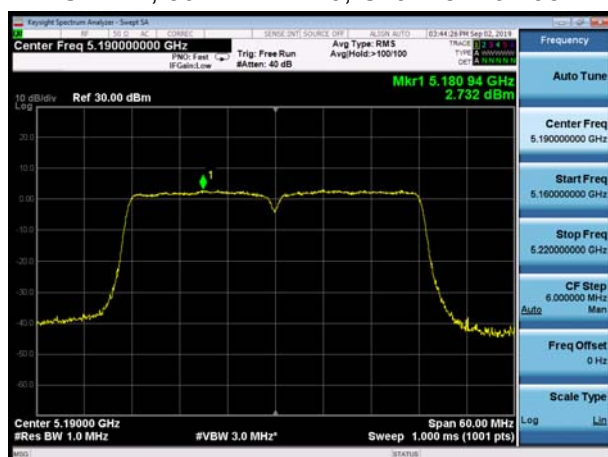


U-NII-1, 802.11n HT20, Channel No.: 48

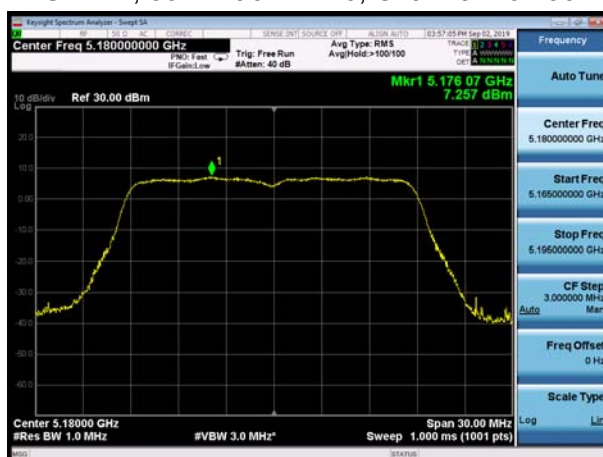




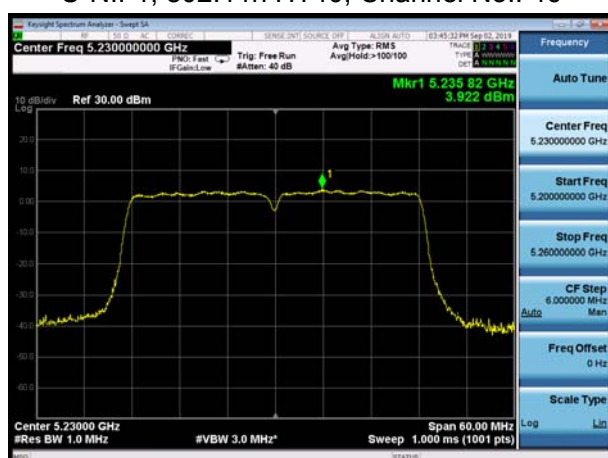
U-NII-1, 802.11n HT40, Channel No.: 38



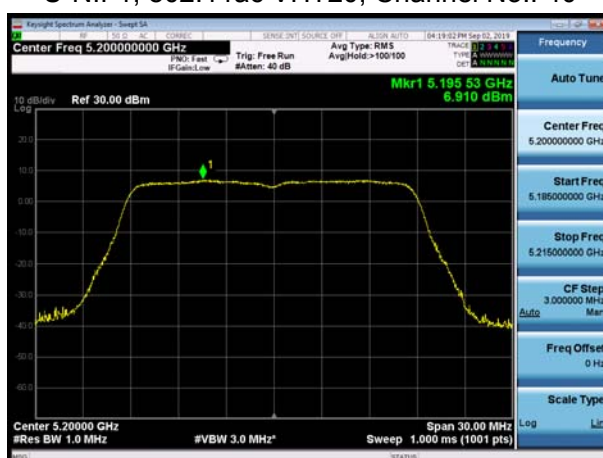
U-NII-1, 802.11ac VHT20, Channel No.: 36



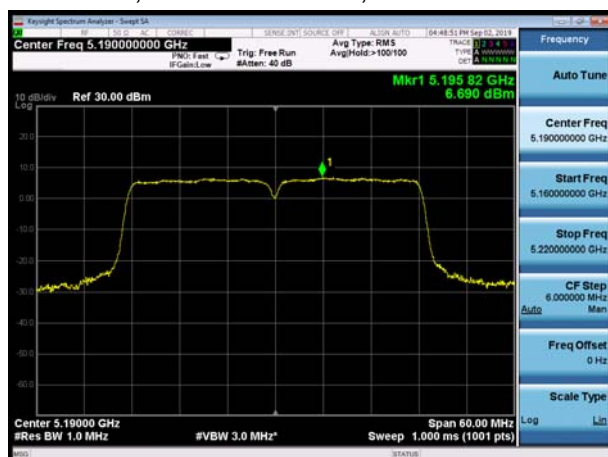
U-NII-1, 802.11n HT40, Channel No.: 46



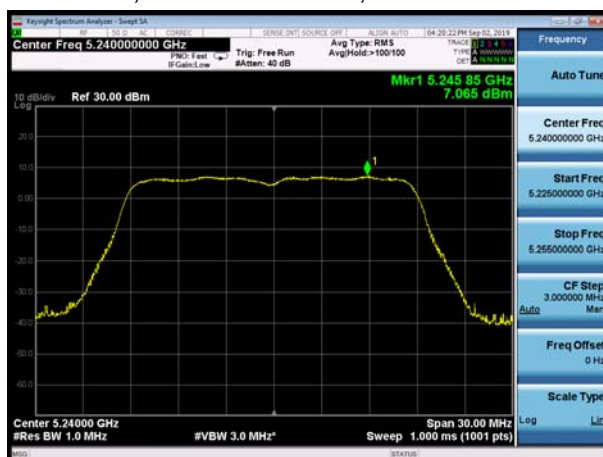
U-NII-1, 802.11ac VHT20, Channel No.: 40



U-NII-1, 802.11ac VHT40, Channel No.: 38

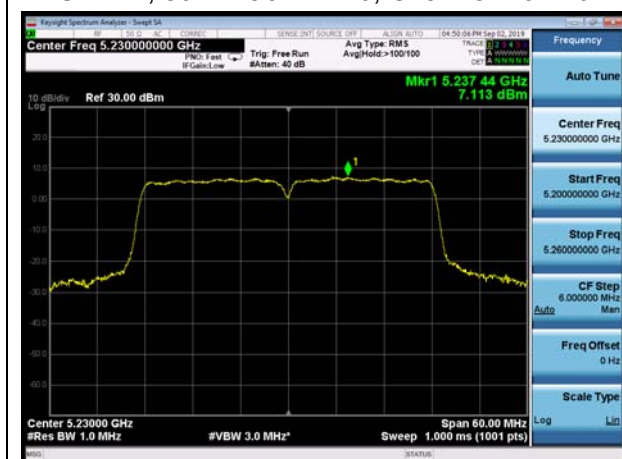


U-NII-1, 802.11ac VHT20, Channel No.: 48





## U-NII-1, 802.11ac VHT40, Channel No.: 46



## U-NII-1, 802.11ac VHT80, Channel No.: 42

