

5190MHz by 802.11ac(40MHz):



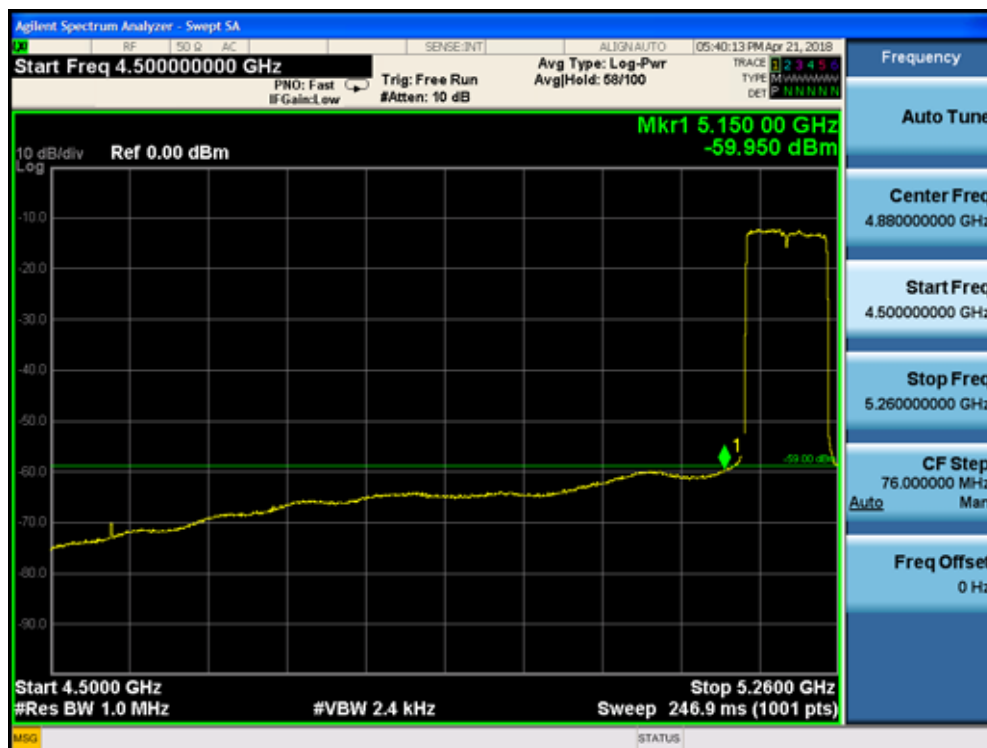
5310MHz by 802.11ac(40MHz):



5510MHz by 802.11ac(40MHz):



## 5210MHz by 802.11ac(80MHz)



## 5290MHz by 802.11ac(80MHz)



**5530MHz by 802.11ac(80MHz)**

5180MHz by 802.11ax(20MHz):



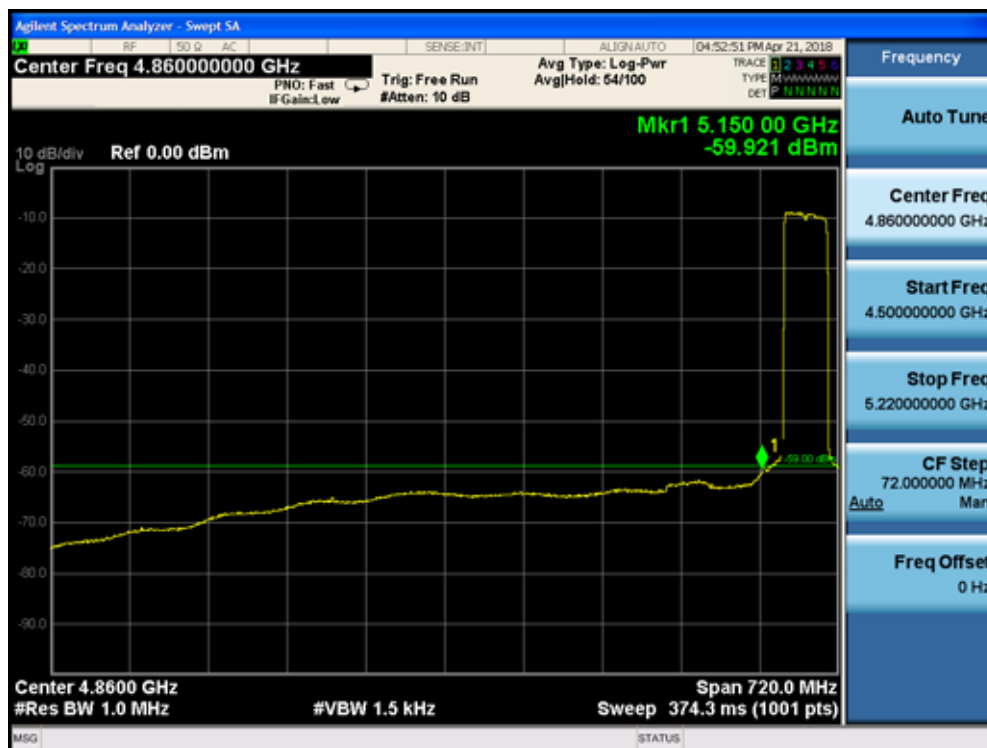
5320MHz by 802.11ax(20MHz):



5500MHz by 802.11ax(20MHz):



5190MHz by 802.11ax(40MHz):



5310MHz by 802.11ax(40MHz):

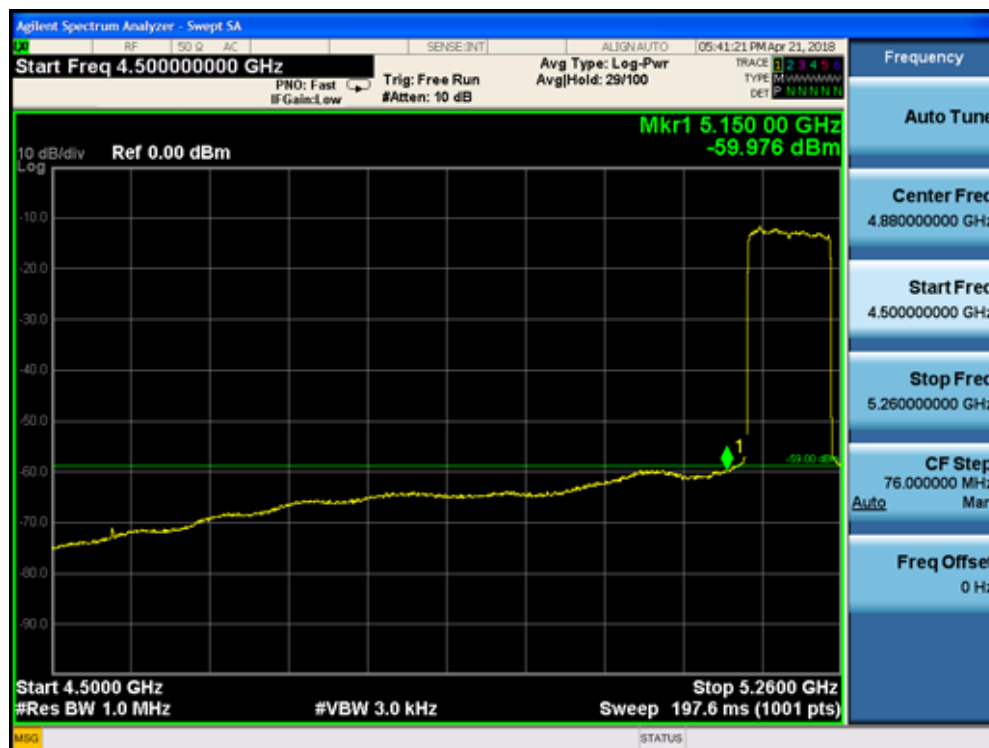


5510MHz by 802.11ax(40MHz):





## 5210MHz by 802.11ax(80MHz)



## 5290MHz by 802.11ax(80MHz)



## 5530MHz by 802.11ax(80MHz)



## 5250MHz by 802.11ax(160MHz)



## 5570MHz by 802.11ax(160MHz)



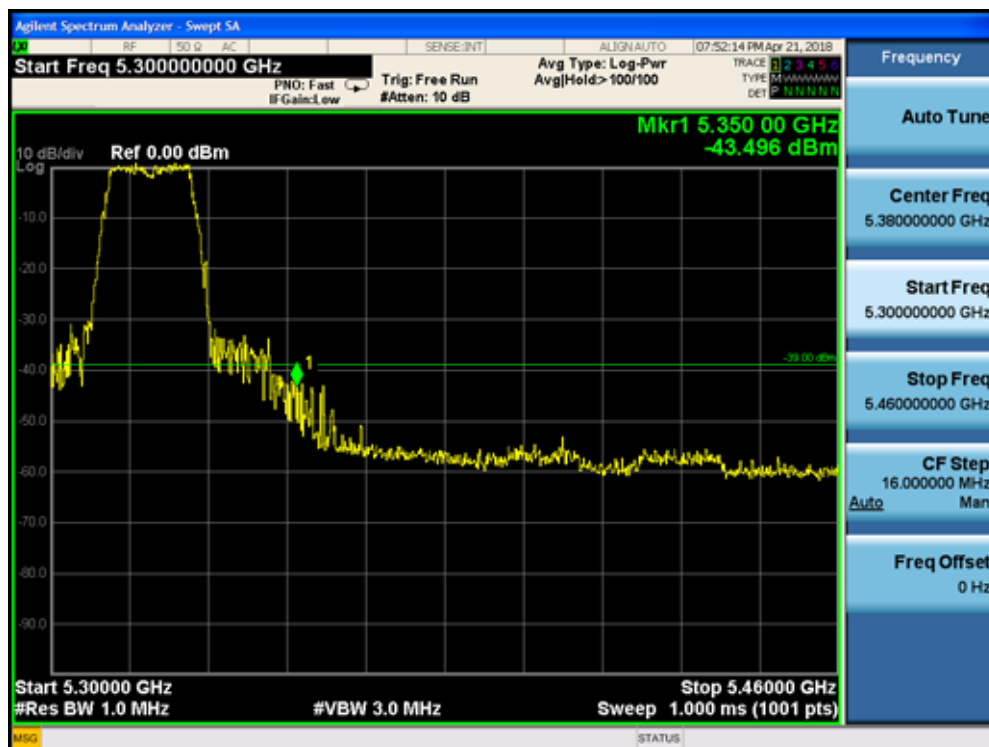
PK-Ant 0+1+2+3 with Beam-forming:

Band I PK Limit=74 dBuV/m-95.2-10lg4 (4tx) -12 (Directional Gain) =-39.2dbm

5180MHz by 802.11a:



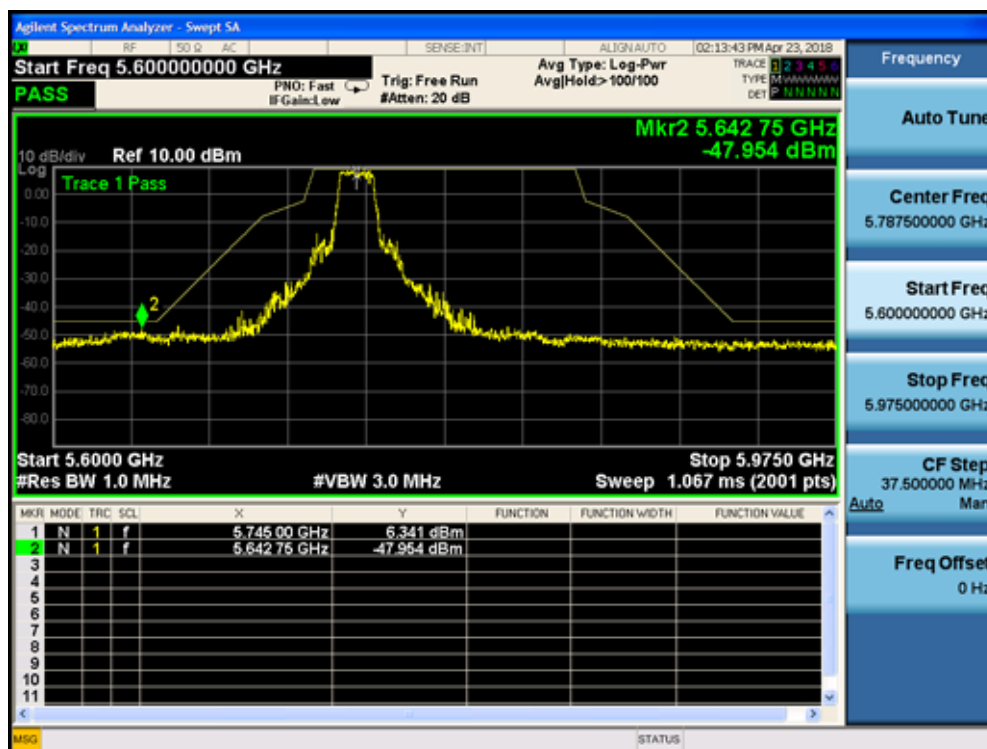
5320MHz by 802.11a:



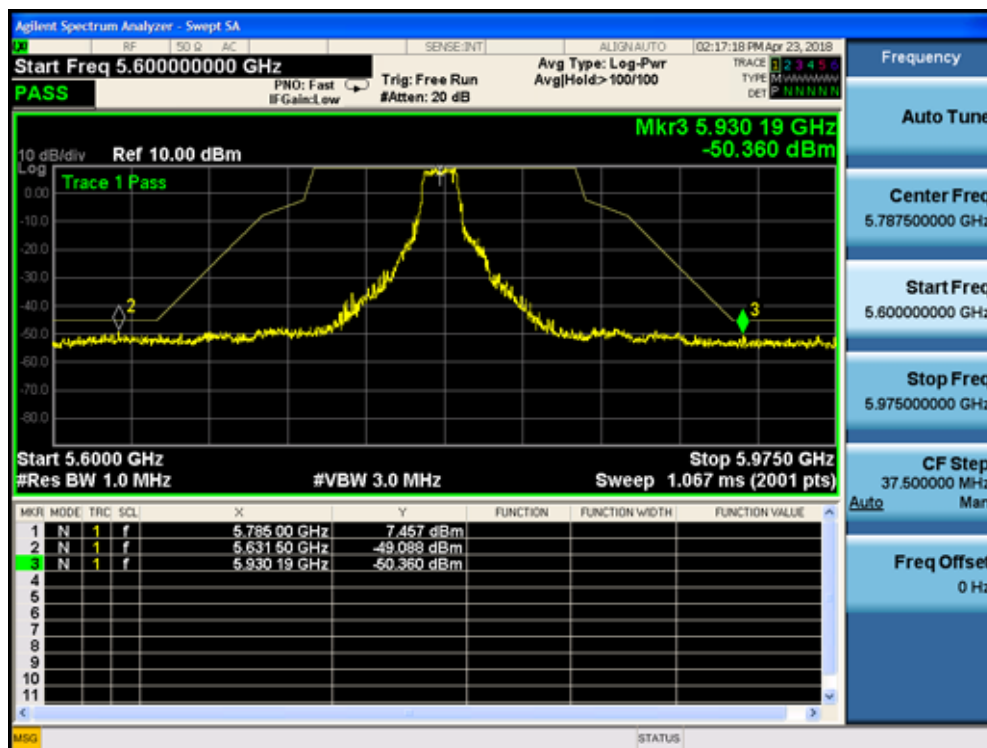
5500MHz by 802.11a:



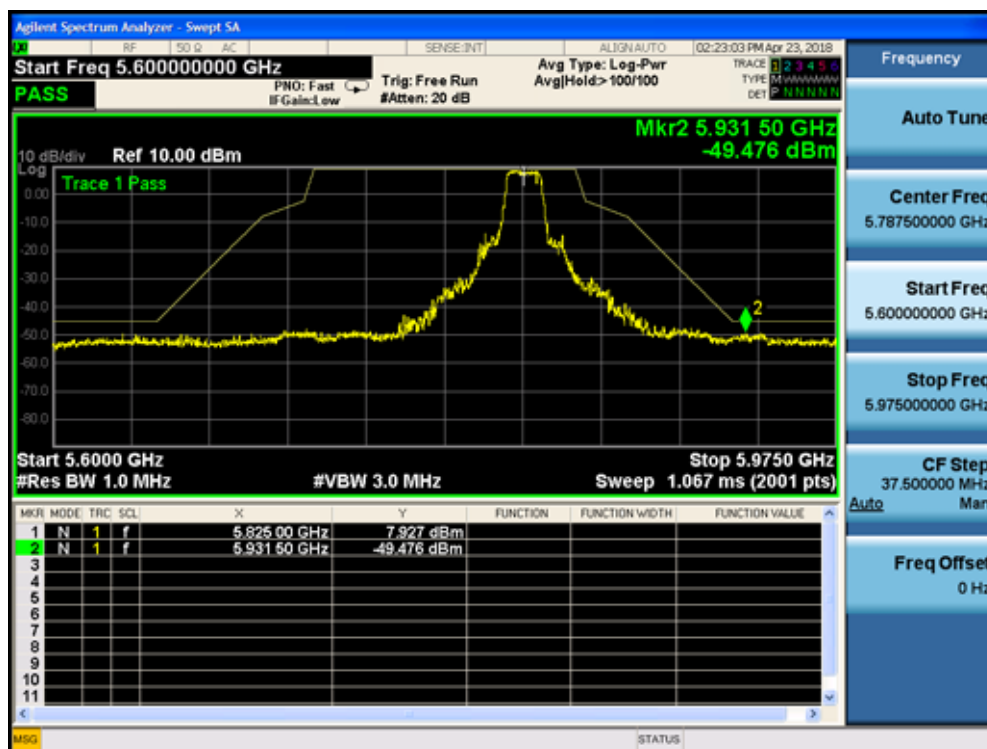
5745MHz by 802.11a:



5785MHz by 802.11a:



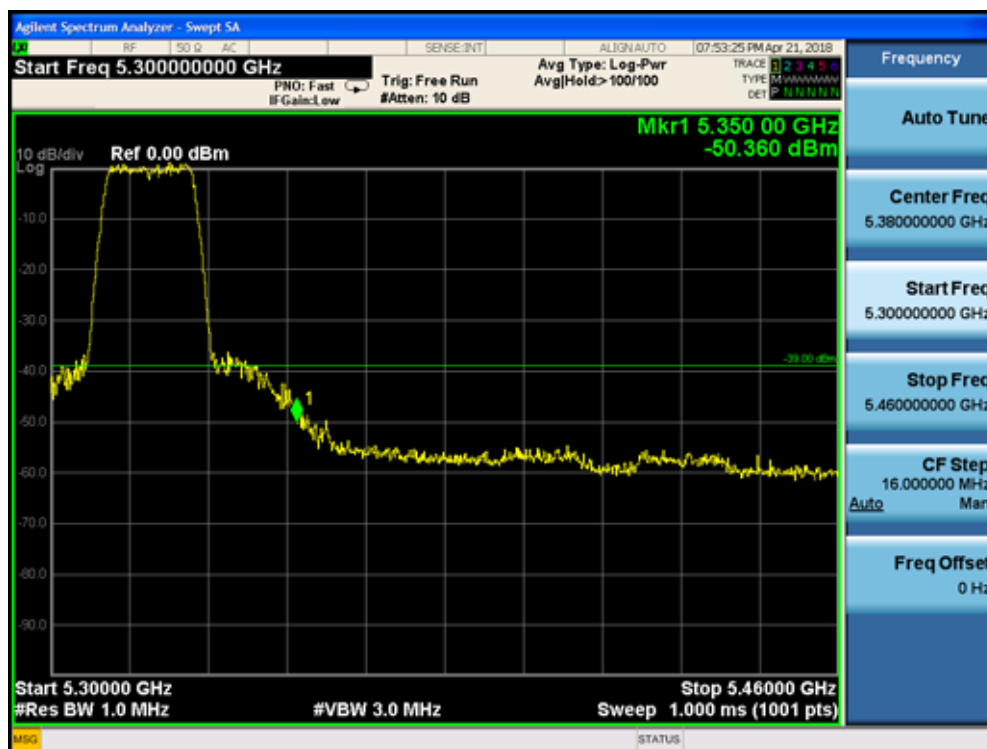
5825MHz by 802.11a:



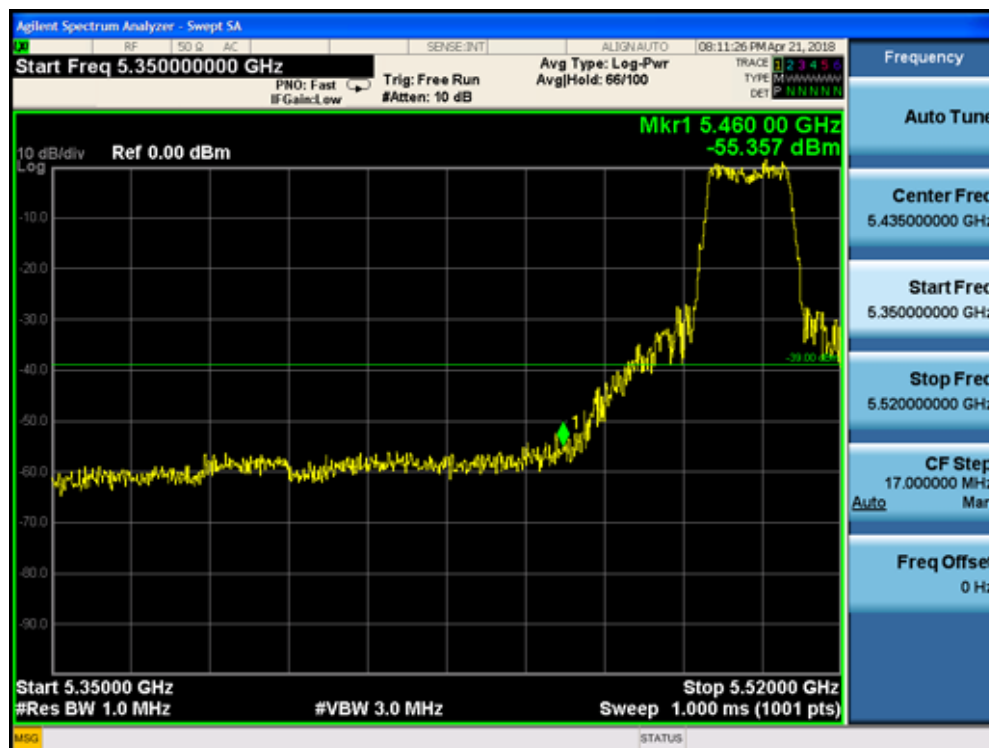
5180MHz by 802.11n(20MHz):



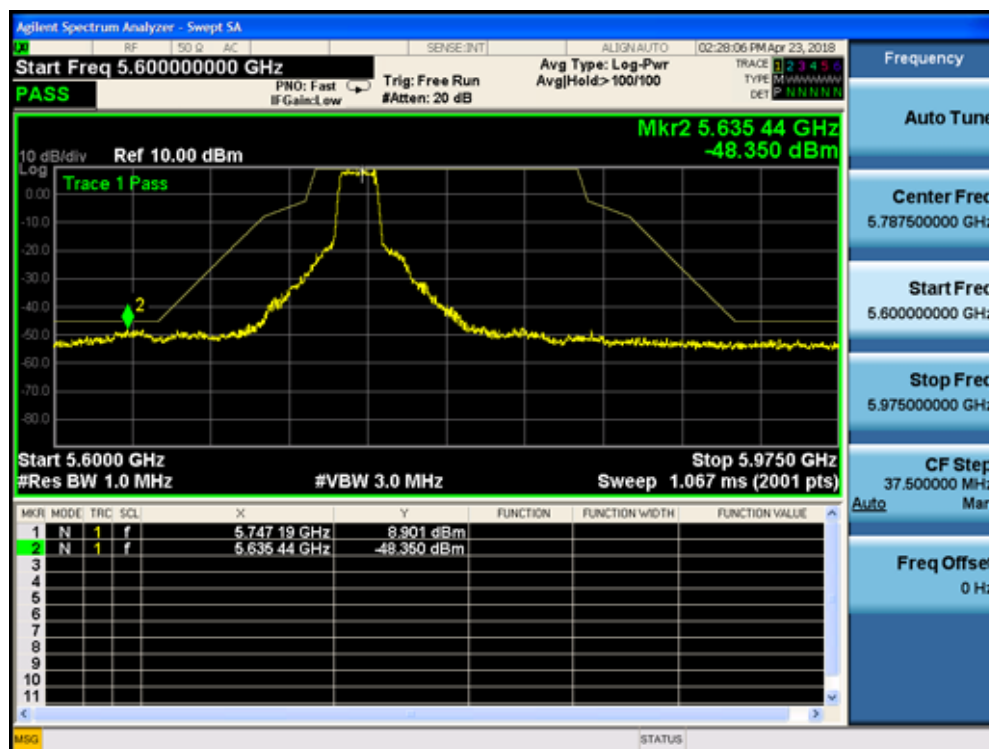
5320MHz by 802.11n(20MHz):



5500MHz by 802.11n(20MHz):

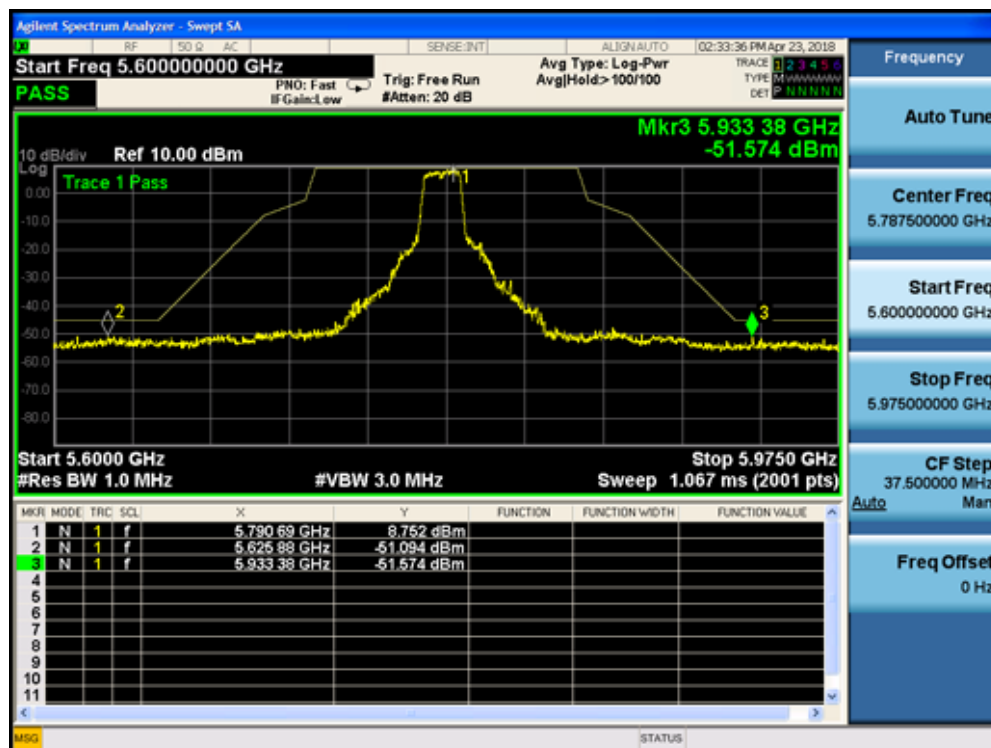


5745MHz by 802.11n(20MHz):

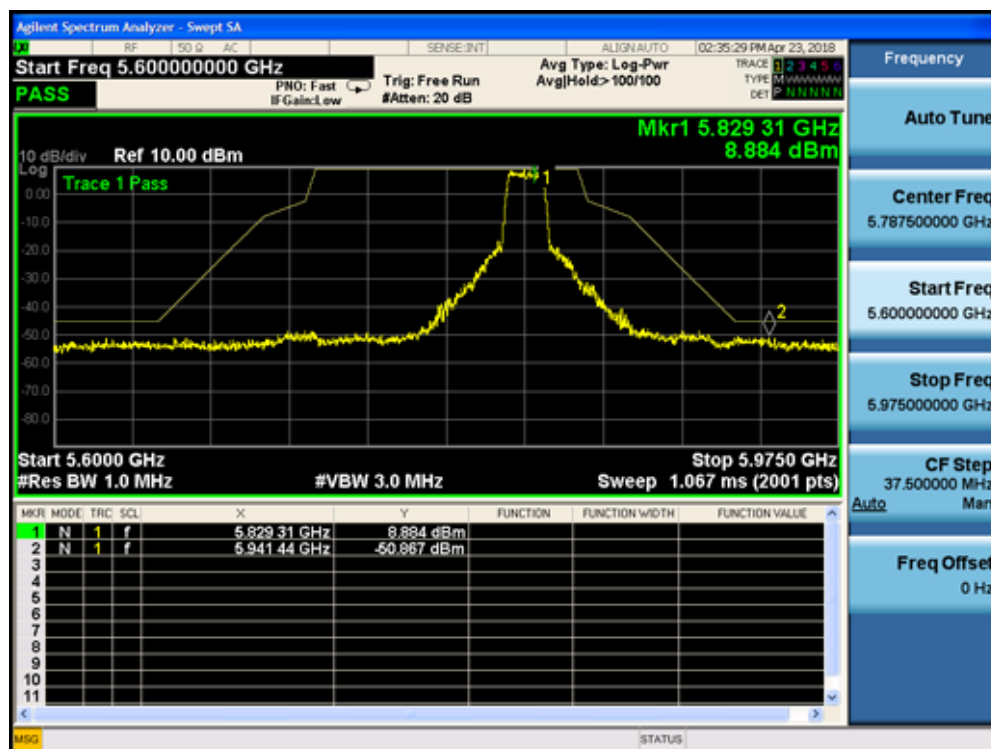




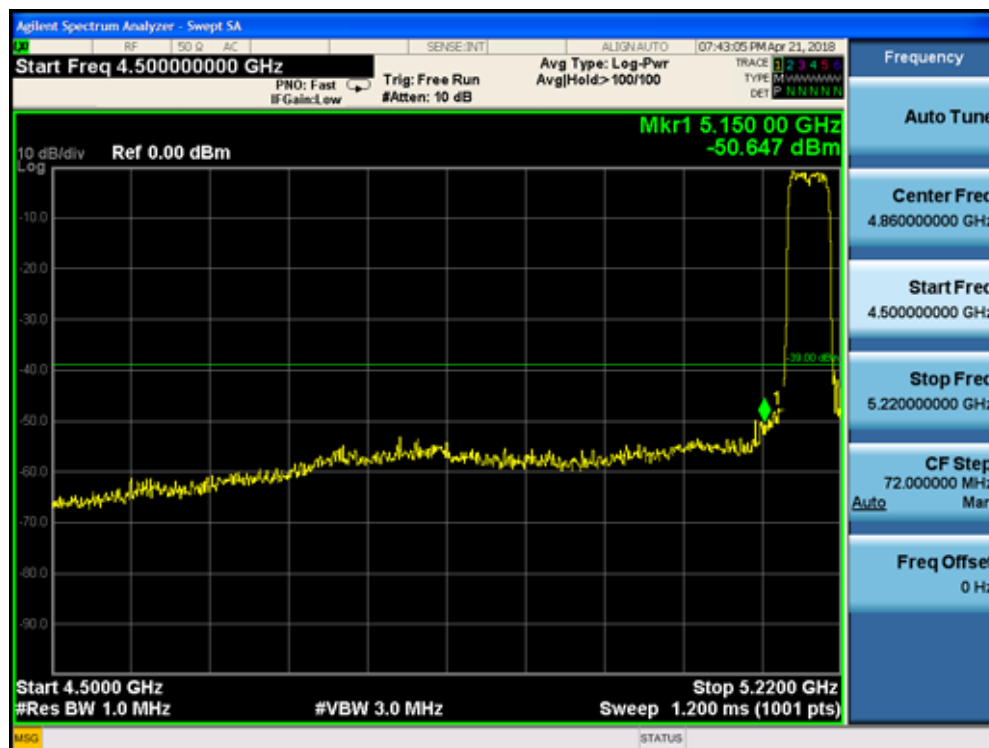
5785MHz by 802.11n(20MHz):



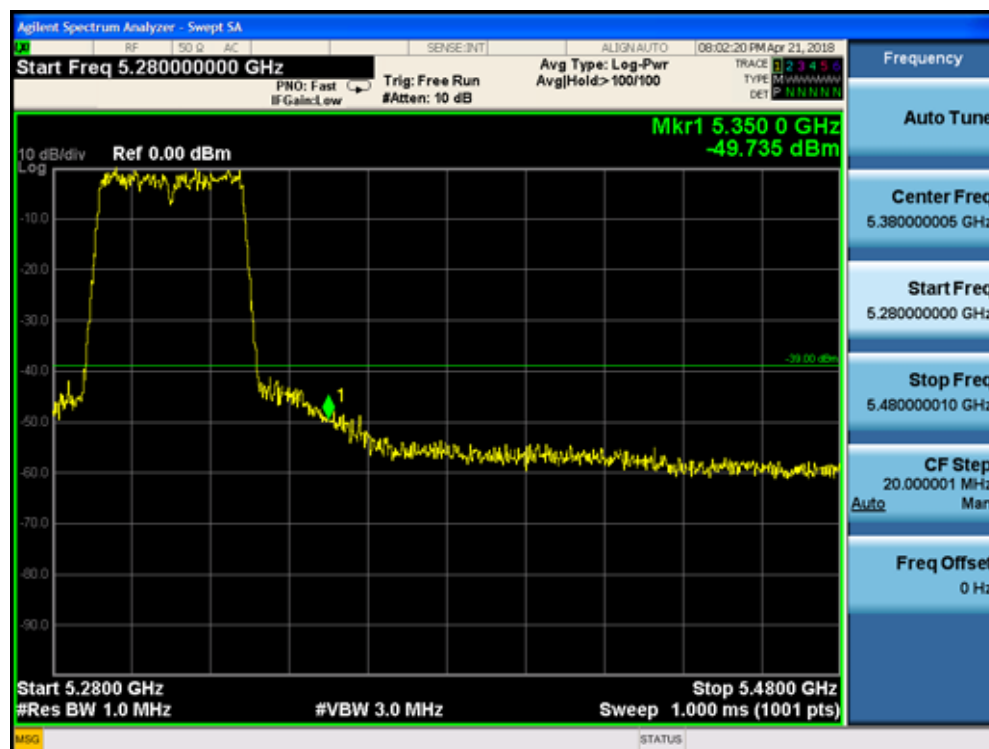
5825MHz by 802.11n(20MHz):



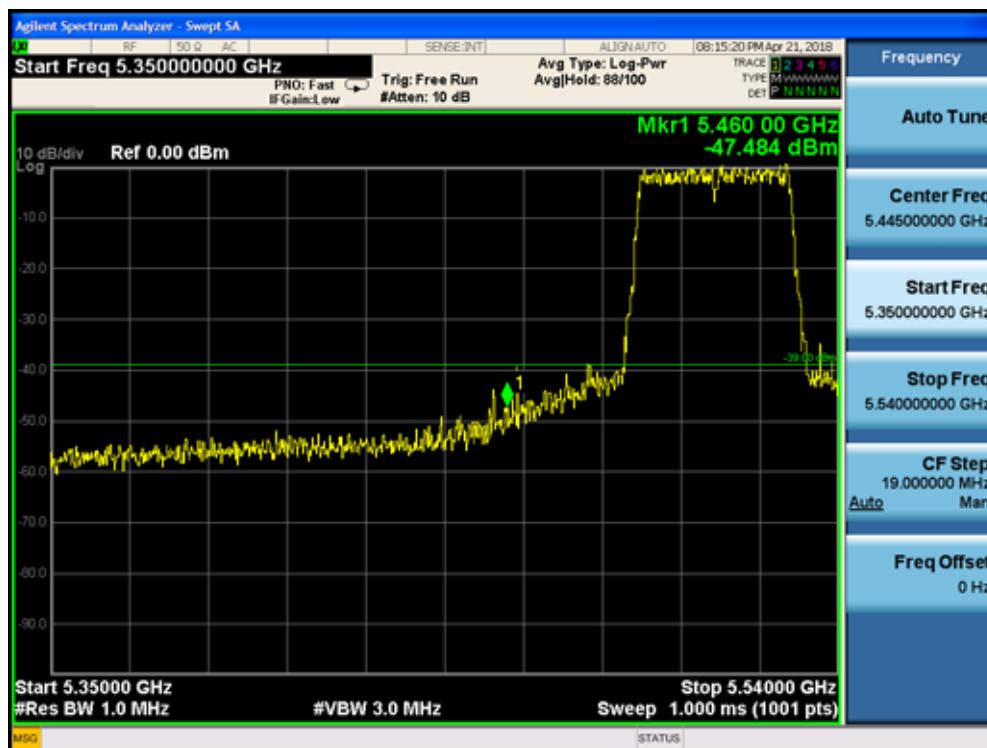
5190MHz by 802.11n(40MHz):



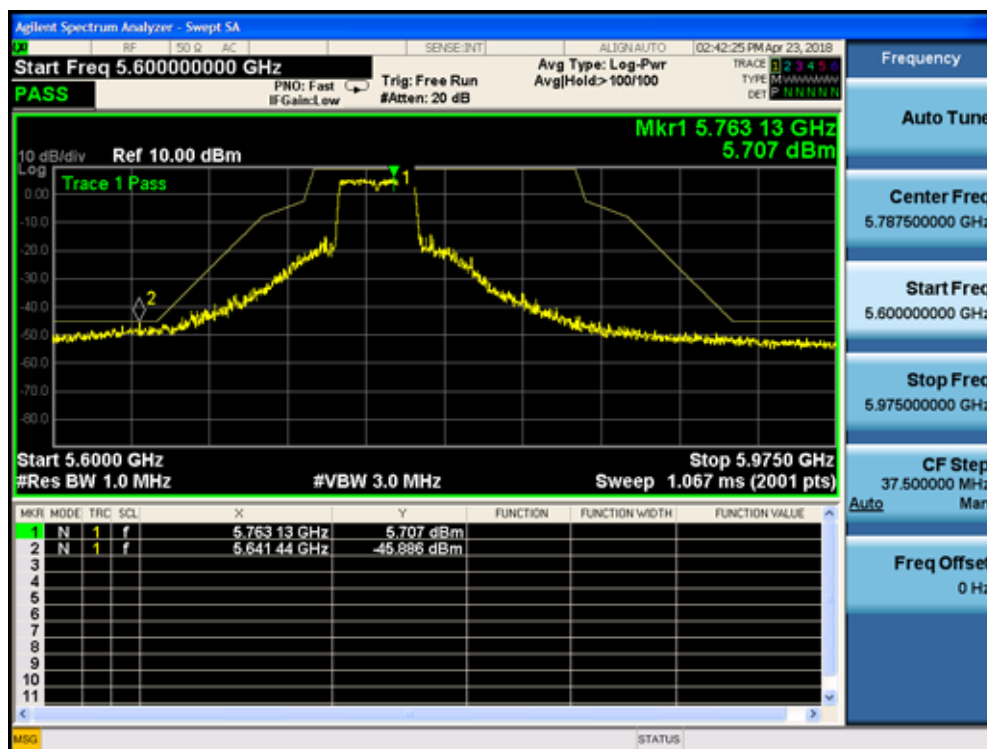
5310MHz by 802.11n(40MHz):



5510MHz by 802.11n(40MHz):



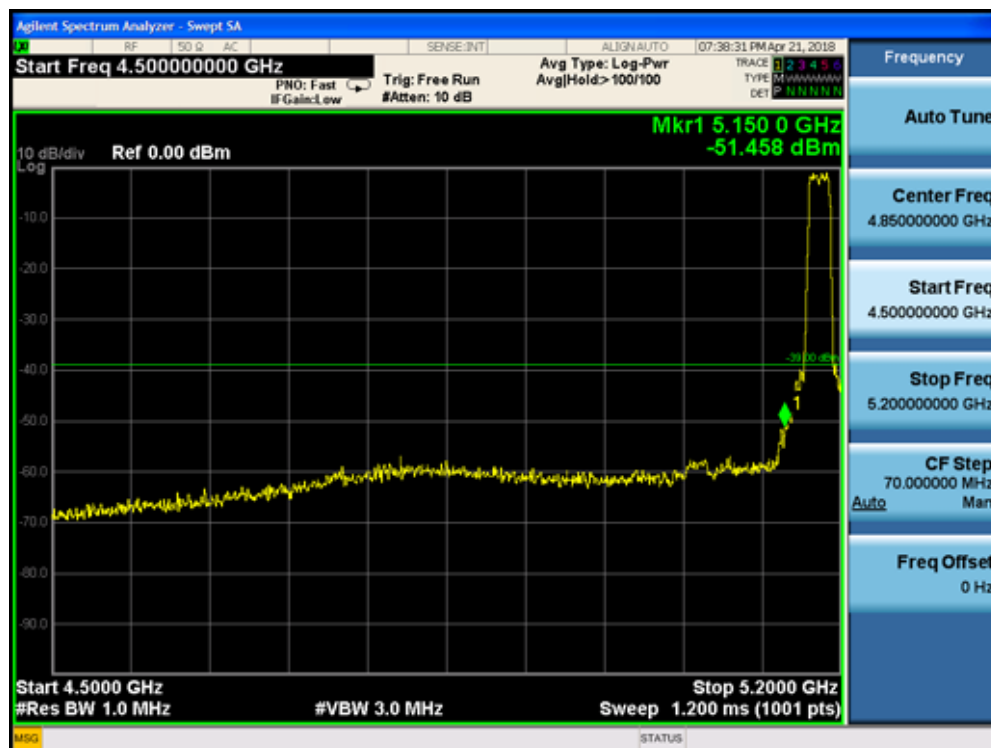
5755MHz by 802.11n(40MHz):



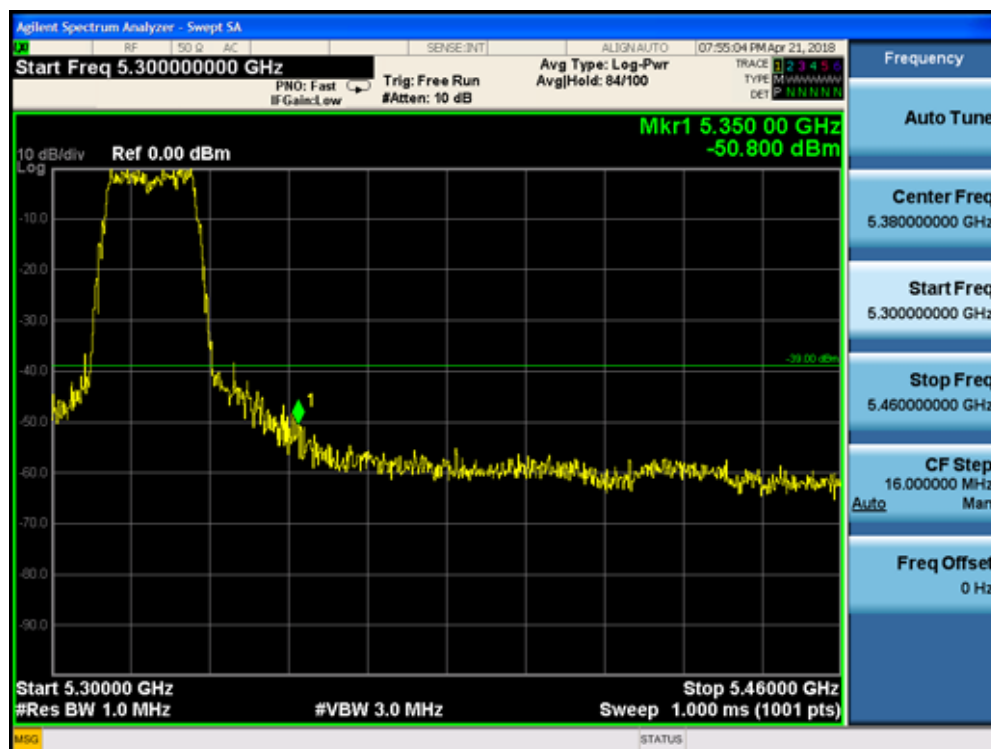
5795MHz by 802.11n(40MHz):



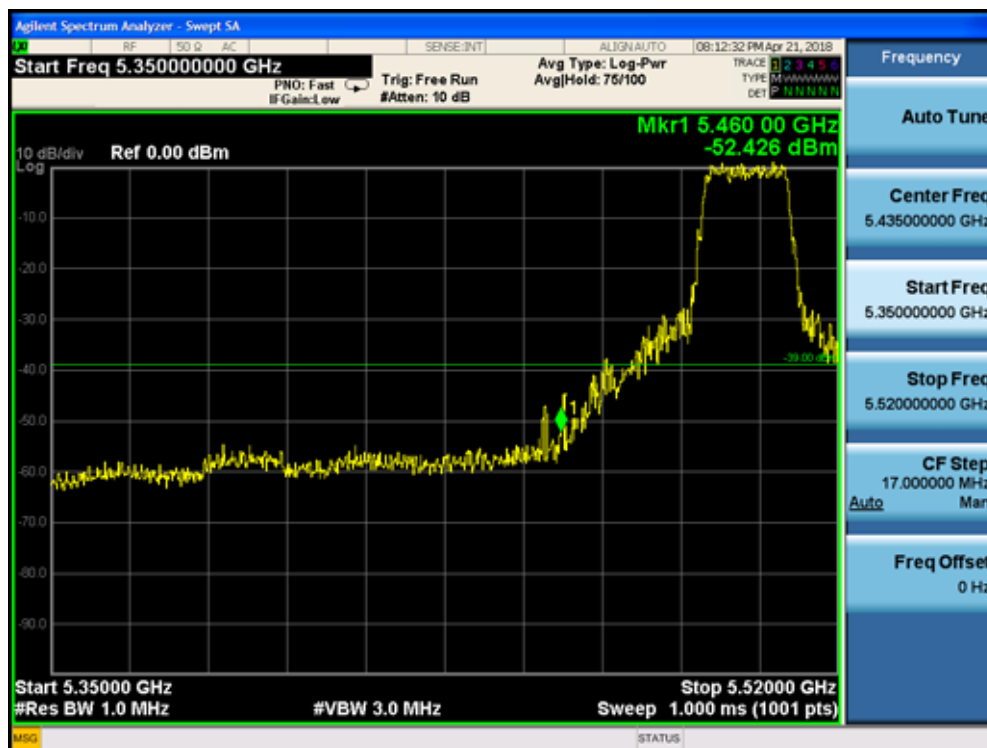
5180MHz by 802.11ac(20MHz):



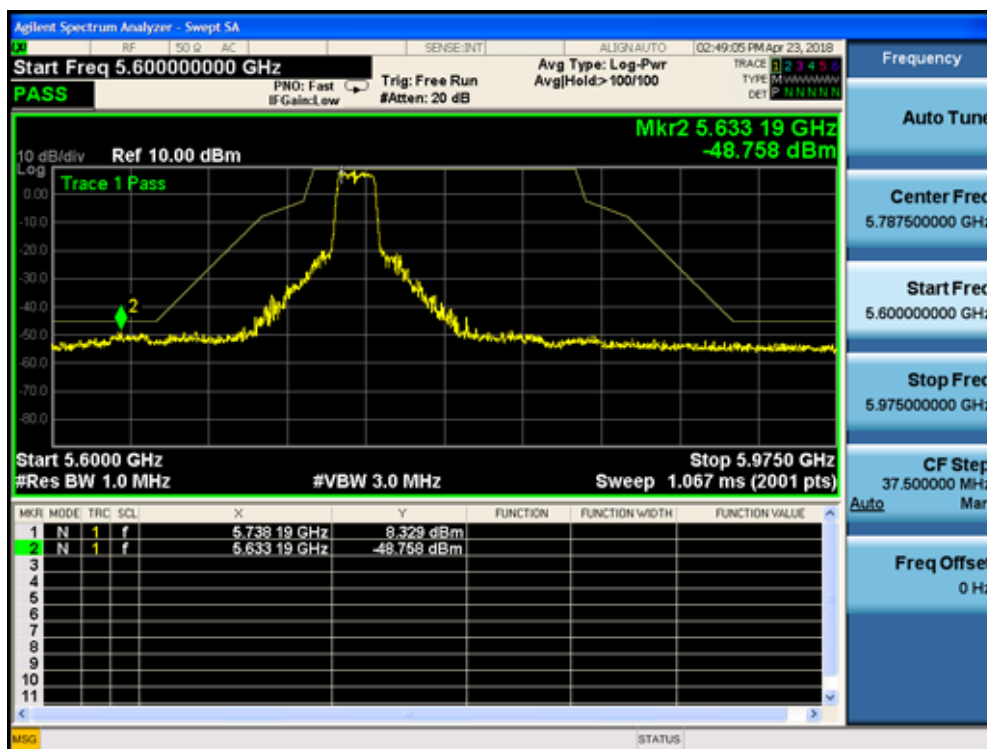
5320MHz by 802.11ac(20MHz):



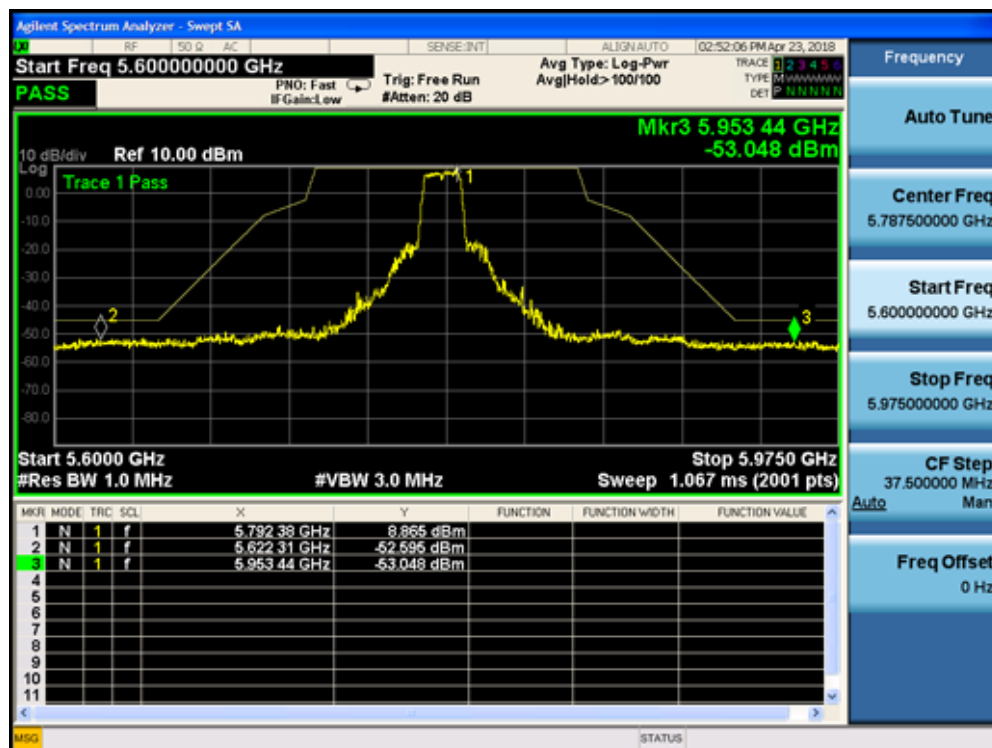
5500MHz by 802.11ac(20MHz):



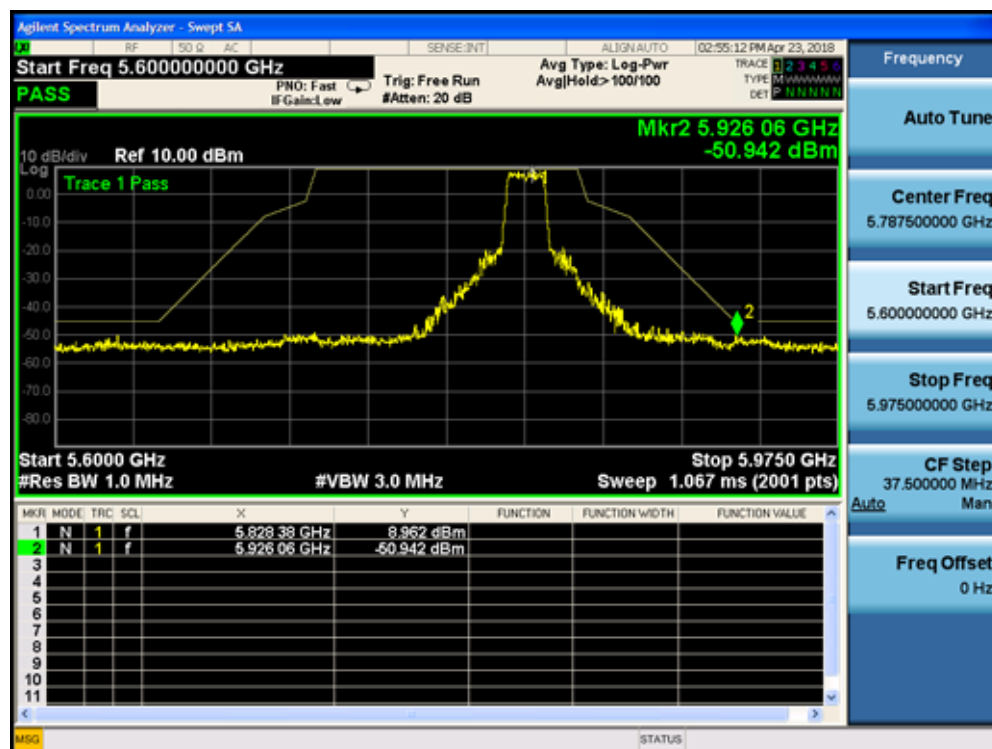
5745MHz by 802.11ac(20MHz):



5785MHz by 802.11ac(20MHz):



5825MHz by 802.11ac(20MHz):

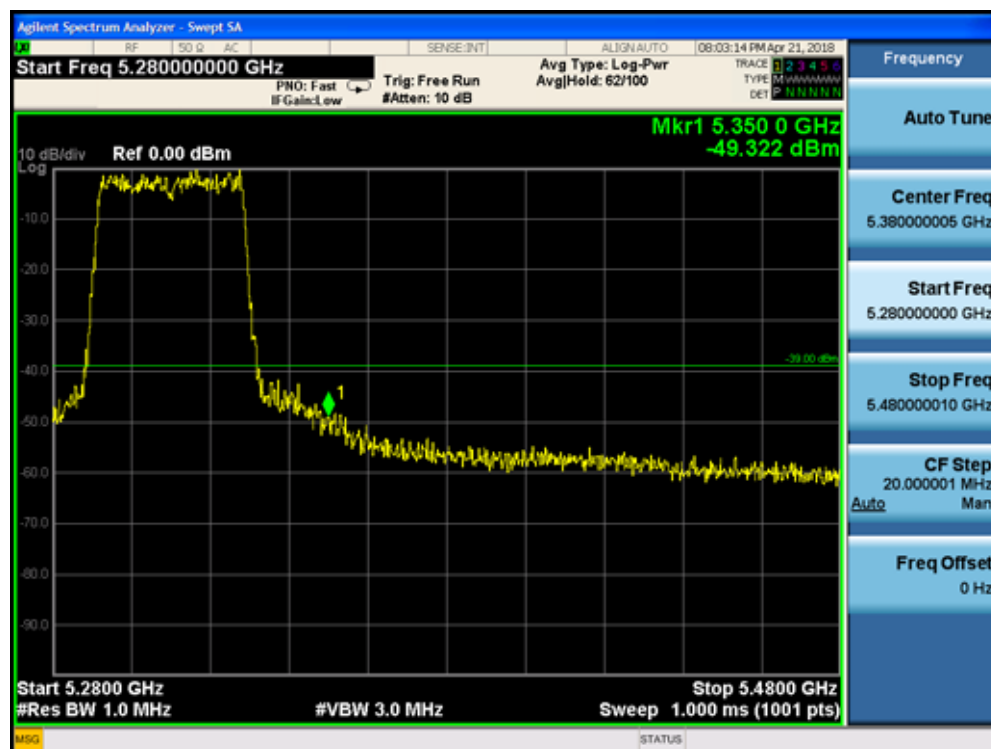




5190MHz by 802.11ac(40MHz):

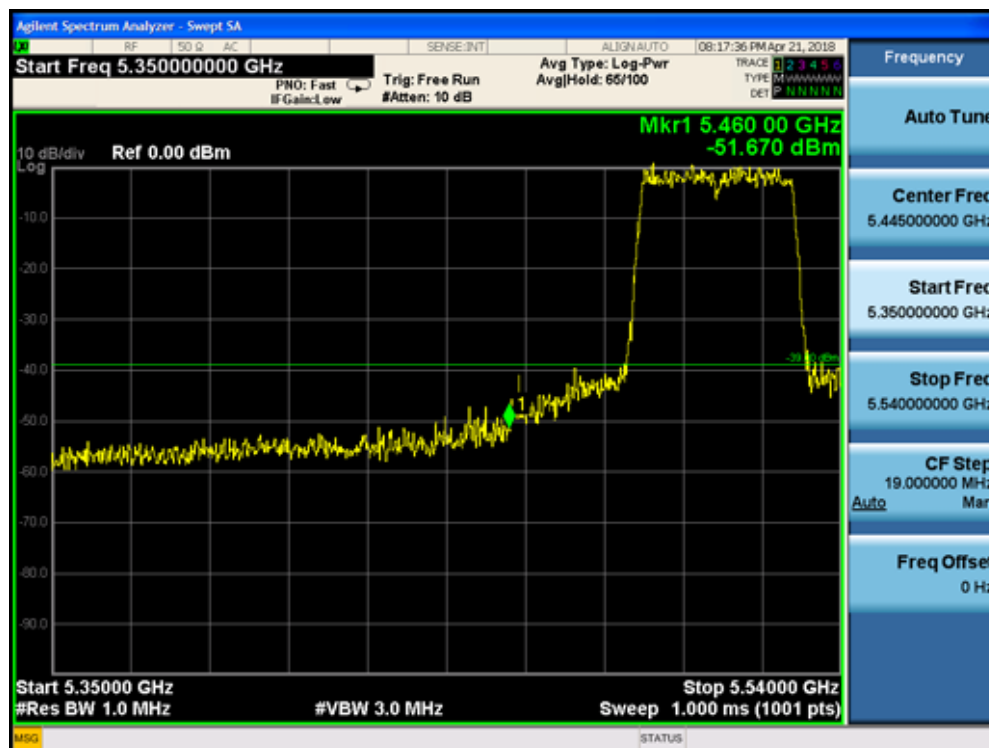


5310MHz by 802.11ac(40MHz):

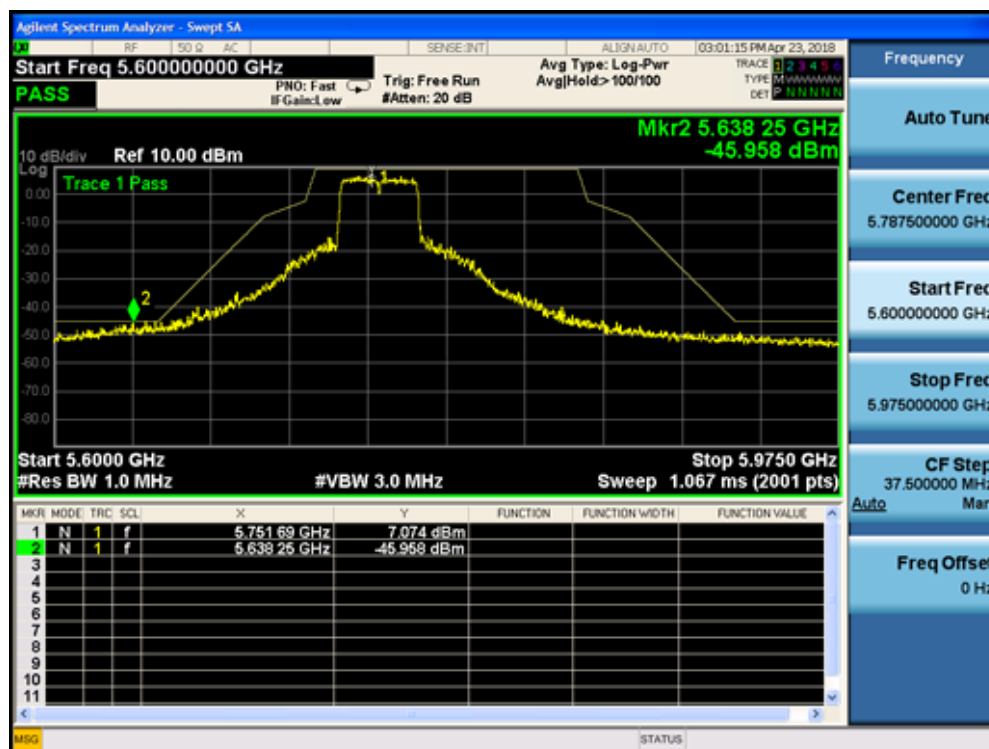




5510MHz by 802.11ac(40MHz):



5755MHz by 802.11ac(40MHz):



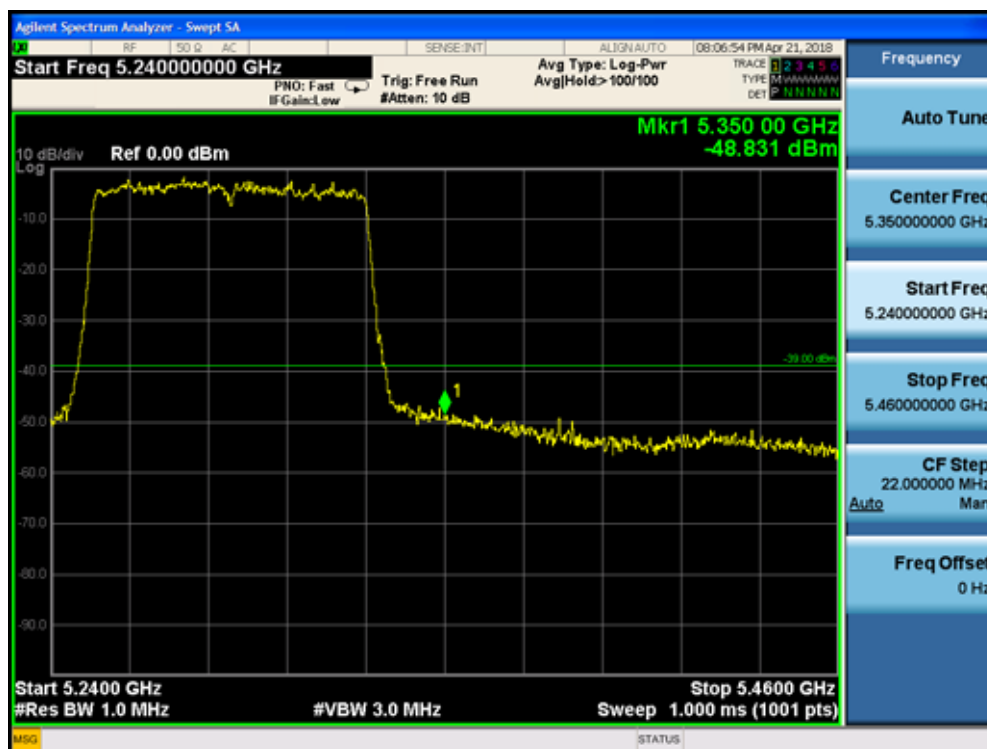
The screenshot displays the Agilent Spectrum Analyzer interface. The main plot shows a swept spectrum with a yellow trace. A peak is identified at 5.80381 GHz with a power level of 8.191 dBm. The reference level is set to 10.00 dBm. The sweep range is from 5.6000 GHz to 5.9750 GHz with a resolution bandwidth of 1.0 MHz and a video bandwidth of 3.0 MHz. The sweep time is 1.067 ms (2001 pts). The right-hand side of the screen contains various control panels for Frequency, Auto Tune, Center Freq, Start Freq, Stop Freq, CF Step, and Freq Offset.

| Mkr | Freq        | Pwr         |
|-----|-------------|-------------|
| 1   | 5.80381 GHz | 8.191 dBm   |
| 2   | 5.63788 GHz | -46.424 dBm |
| 3   | 5.92606 GHz | -45.158 dBm |

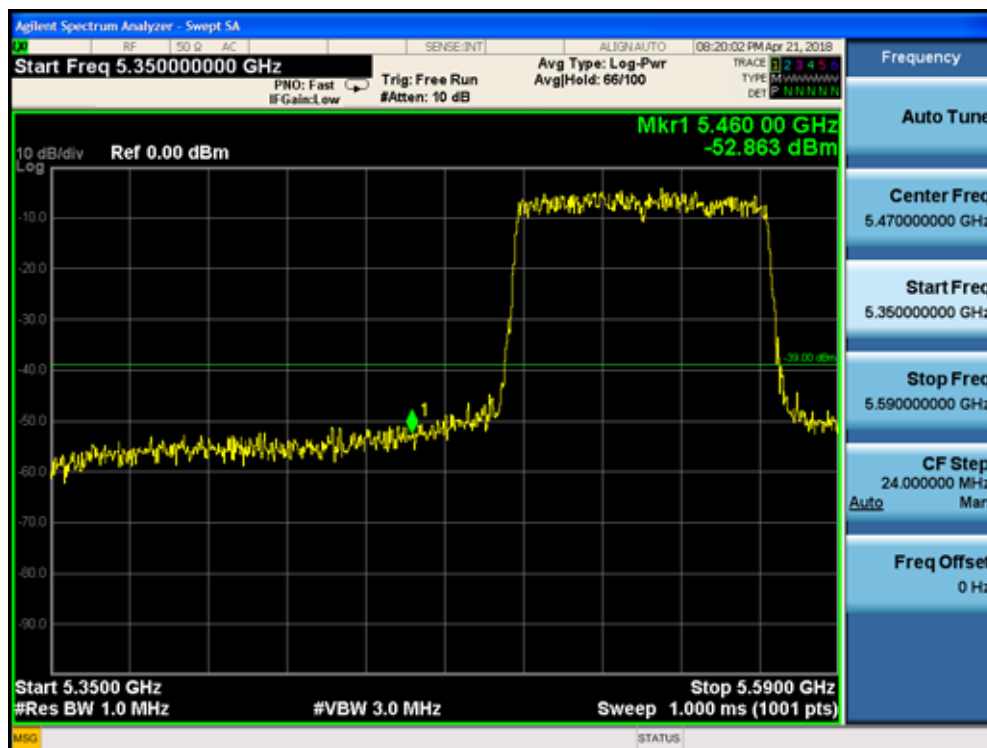
5210MHz by 802.11ac(80MHz):



5290MHz by 802.11ac(80MHz):



5530MHz by 802.11ac(80MHz):



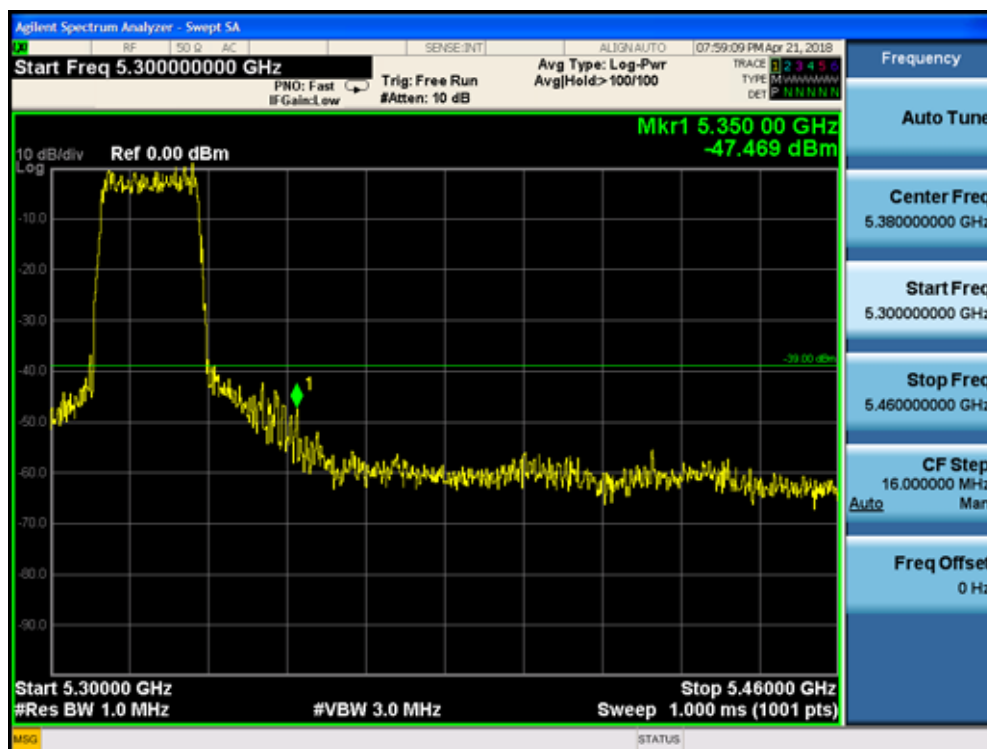
5775MHz by 802.11ac(80MHz):



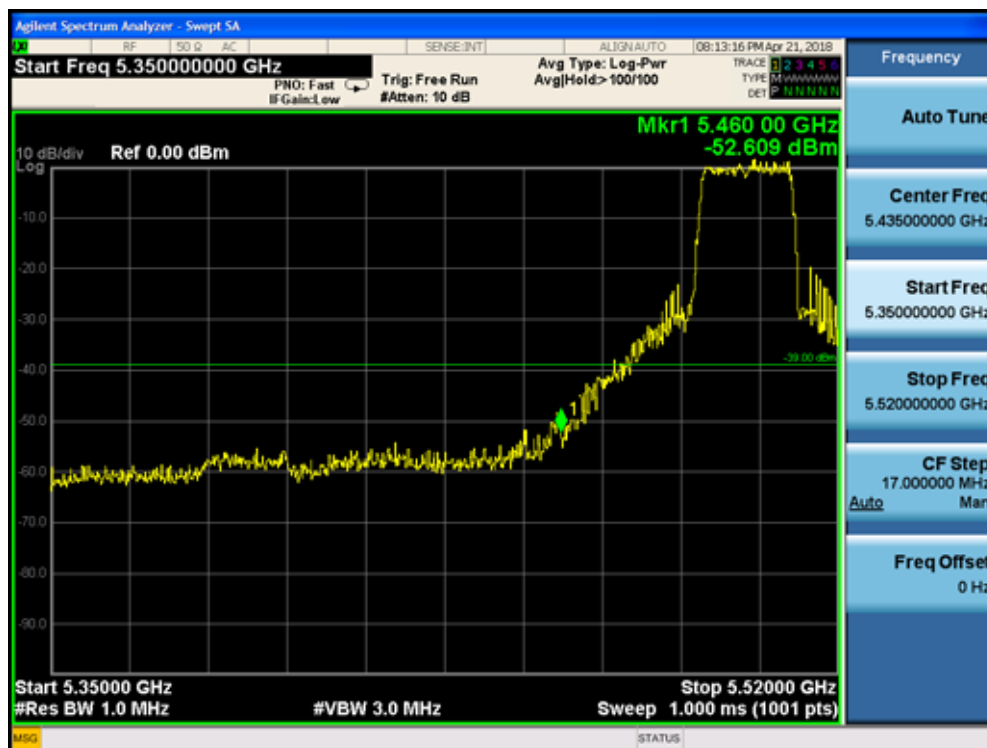
5180MHz by 802.11ax(20MHz):



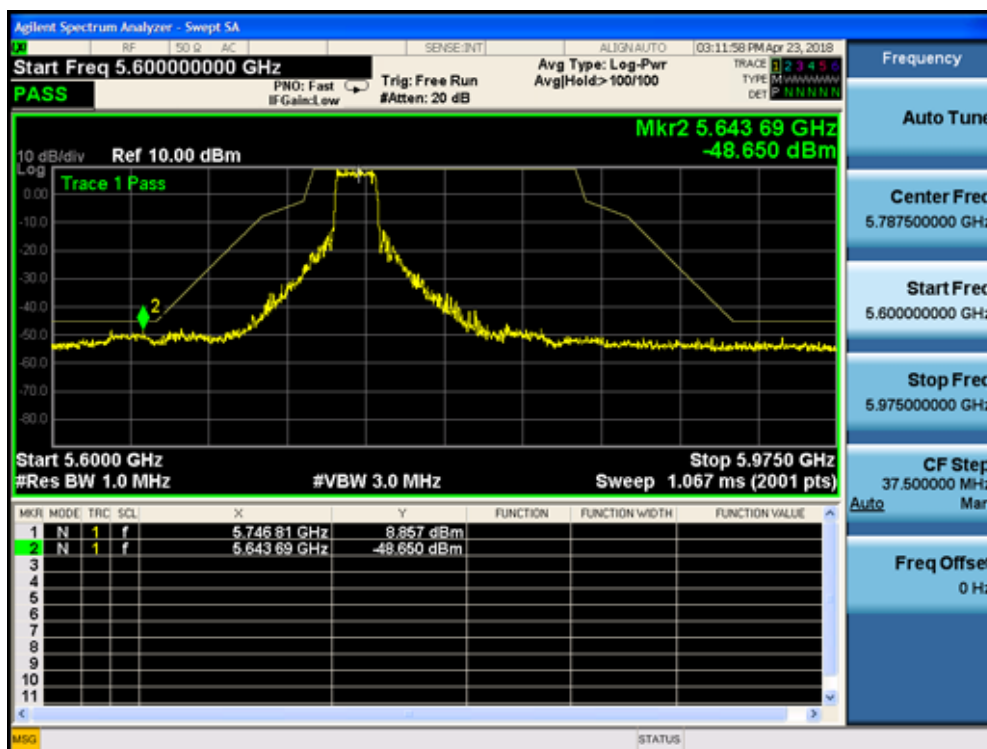
5320MHz by 802.11ax(20MHz):



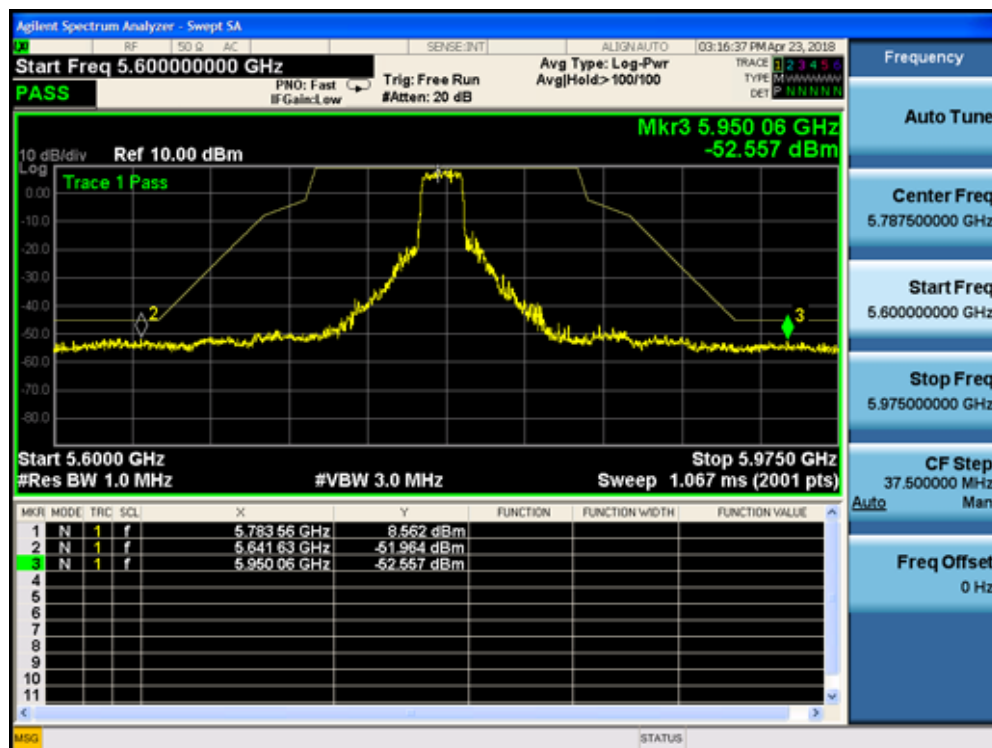
5500MHz by 802.11ax(20MHz):



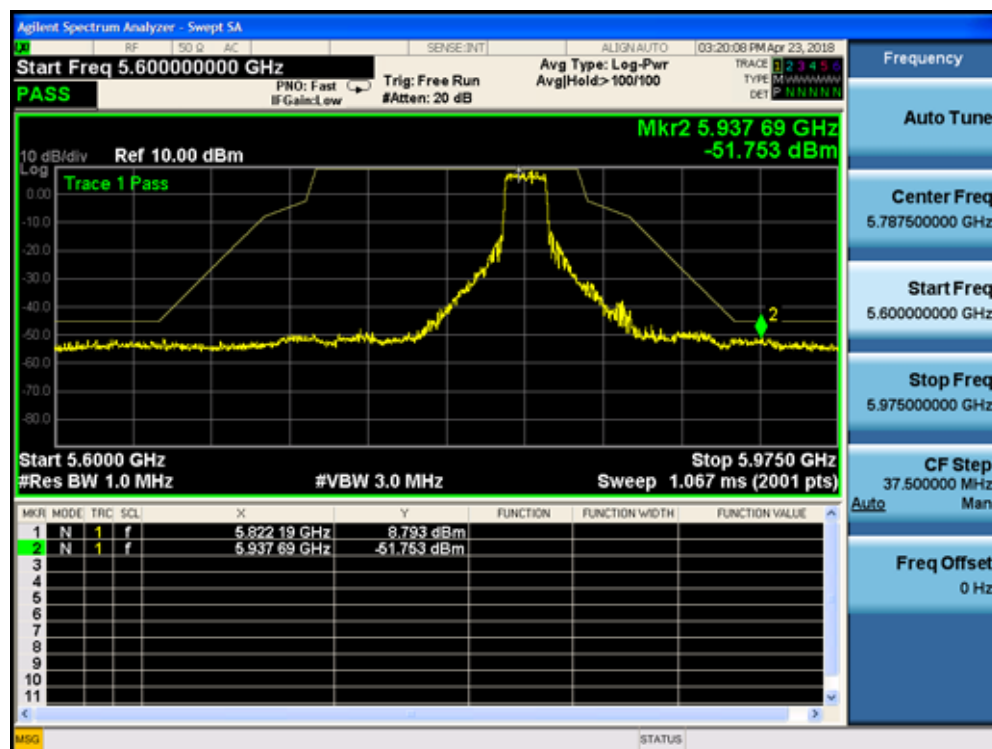
5745MHz by 802.11ax(20MHz):



5785MHz by 802.11ax(20MHz):



5825MHz by 802.11ax(20MHz):

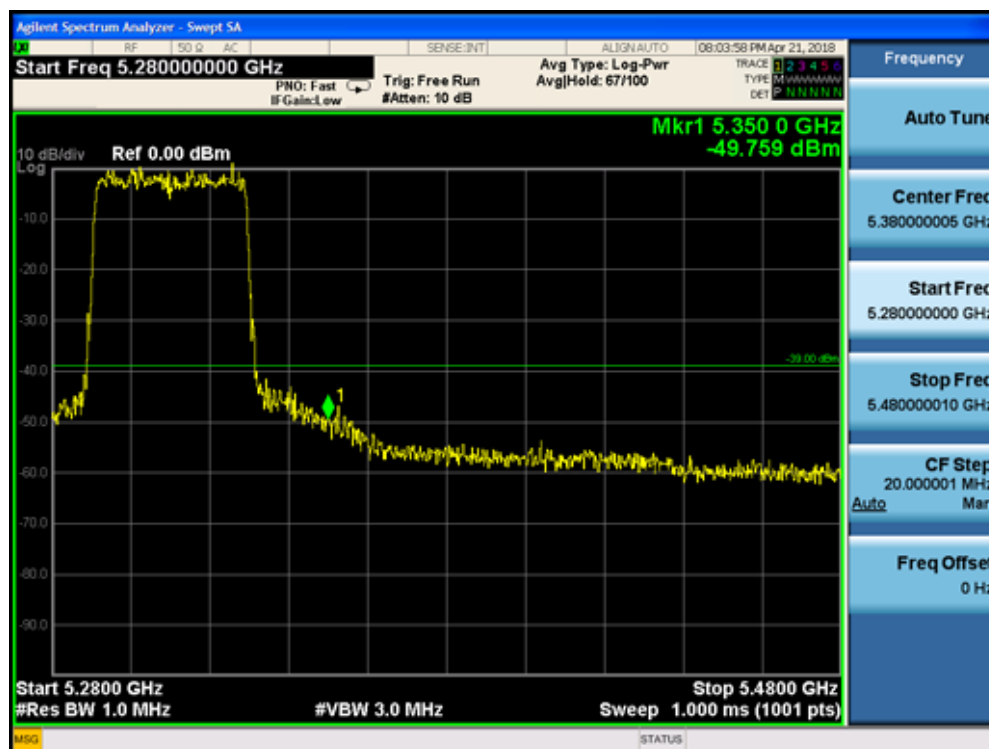




5190MHz by 802.11ax(40MHz):

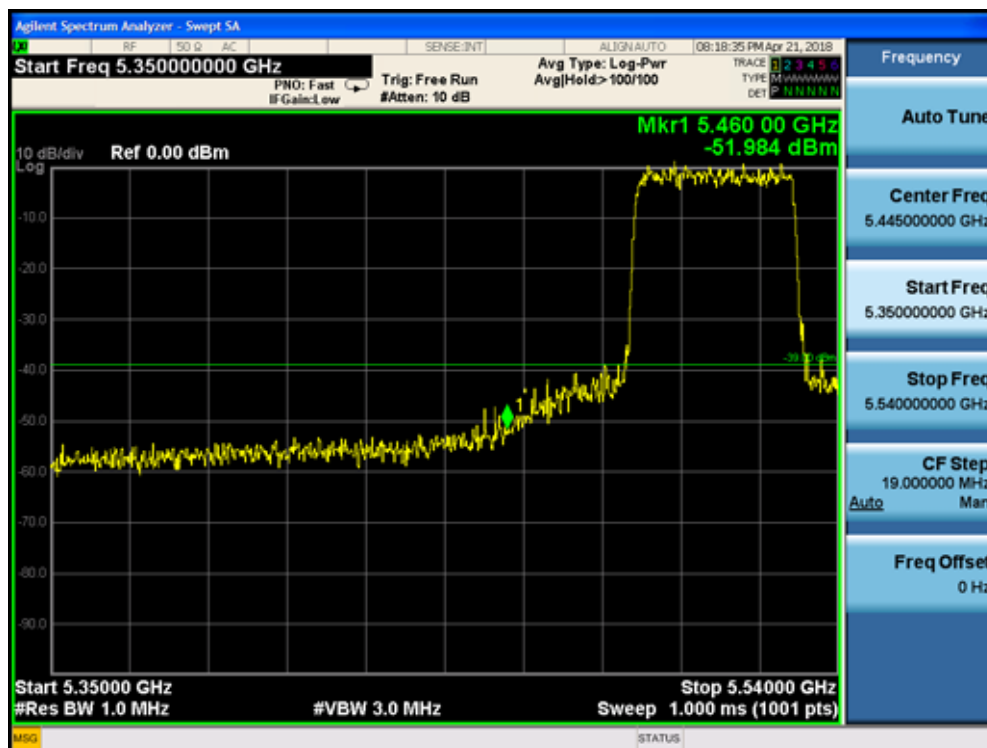


5310MHz by 802.11ax(40MHz):





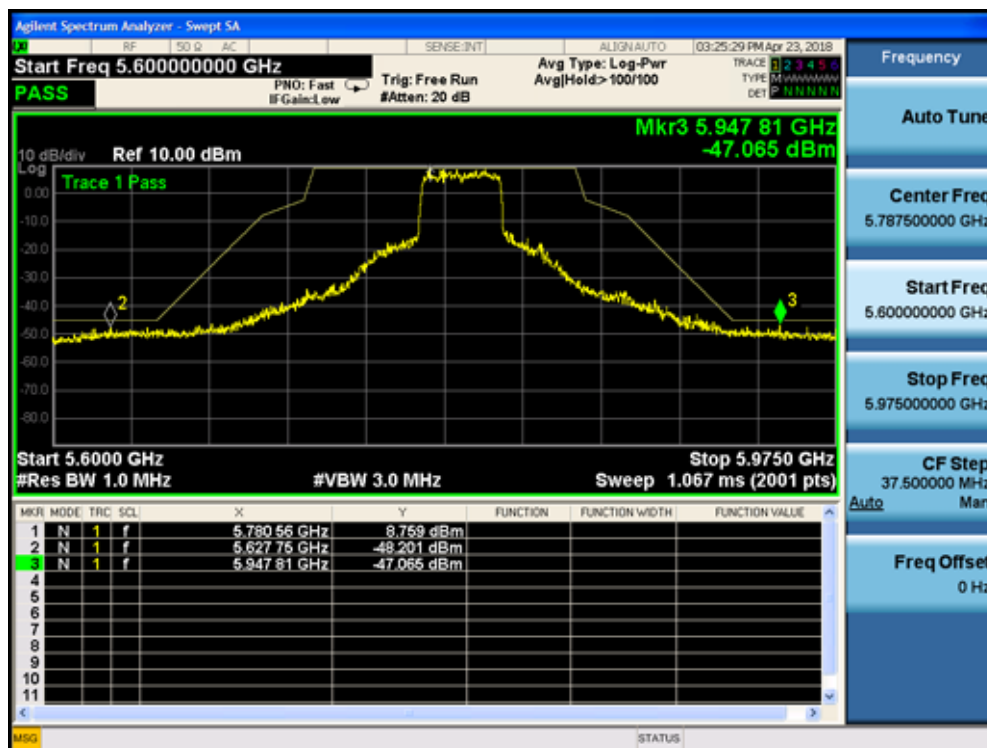
5510MHz by 802.11ax(40MHz):



5755MHz by 802.11ax(40MHz):



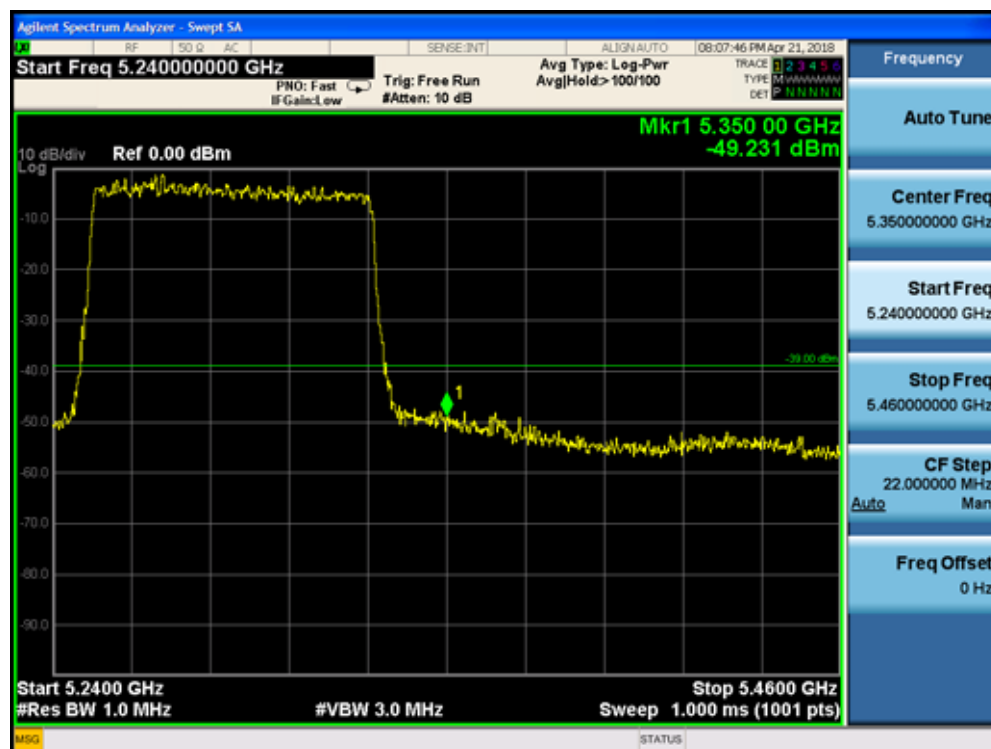
5795MHz by 802.11ax(40MHz):



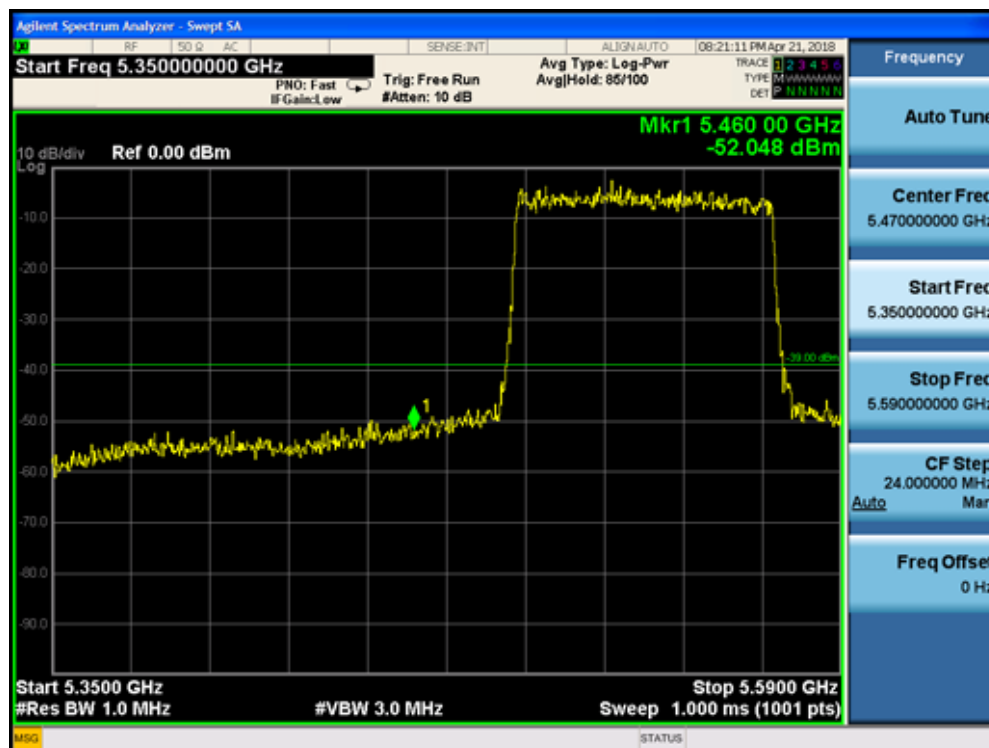
5210MHz by 802.11ax(80MHz):



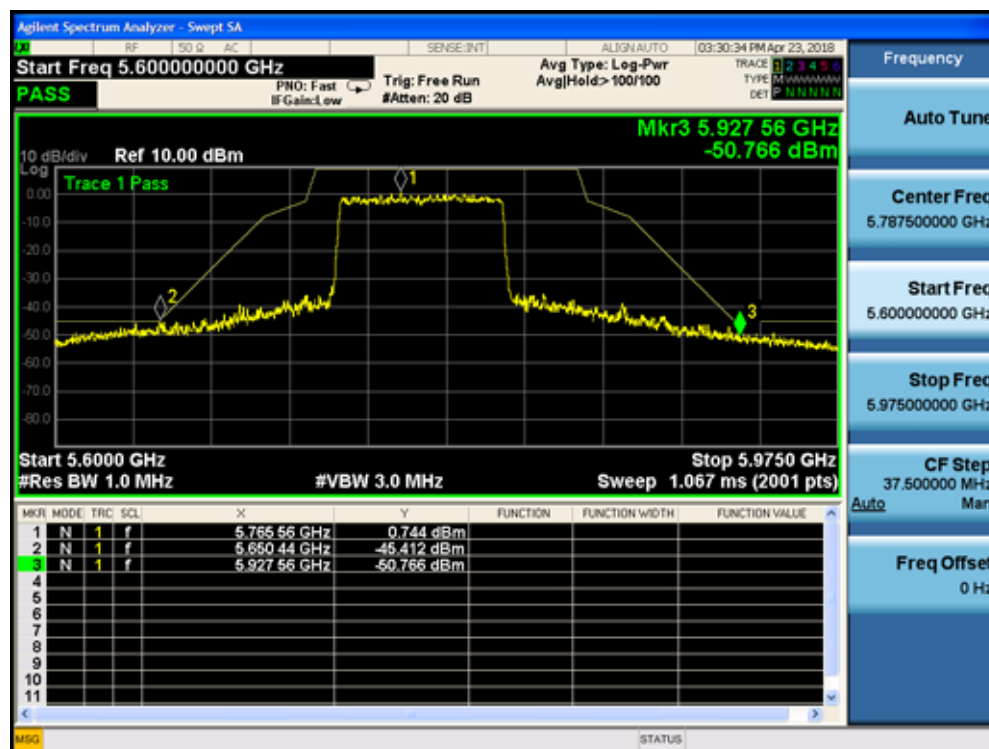
5290MHz by 802.11ax(80MHz):



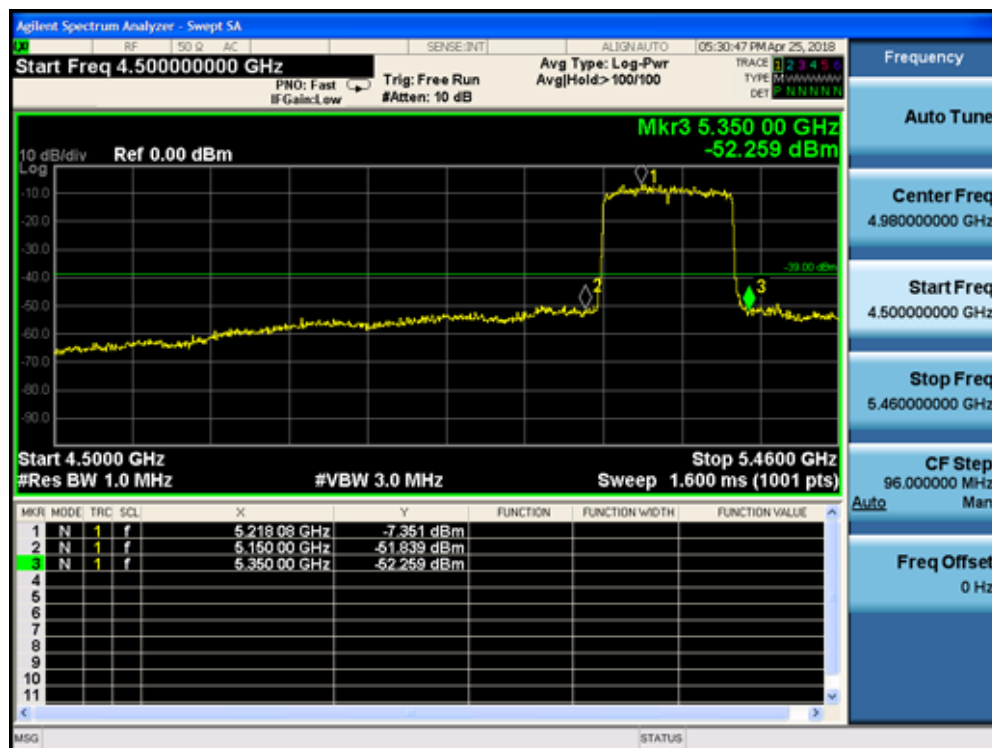
5530MHz by 802.11ax(80MHz):



5775MHz by 802.11ax(80MHz):



5250MHz by 802.11ax(160MHz):



5570MHz by 802.11ax(160MHz)



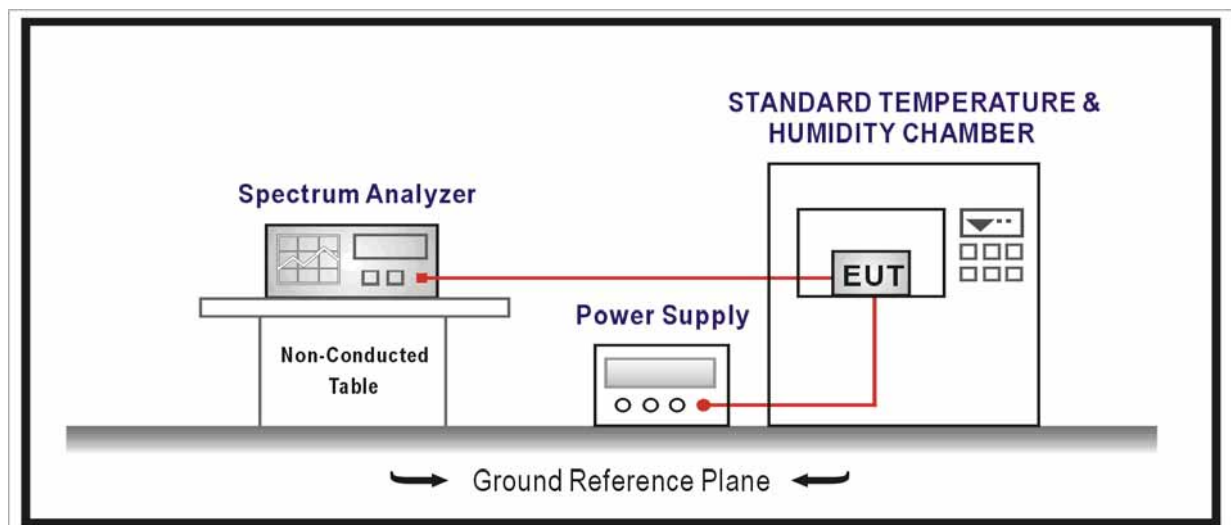
## 10. Frequency Stability

### 10.1. Test Equipment

| Frequency Stability / TR-8                  |              |              |              |            |               |
|---------------------------------------------|--------------|--------------|--------------|------------|---------------|
| Instrument                                  | Manufacturer | Type No.     | Serial No.   | Cal. Date  | Cal. Due Date |
| Spectrum Analyzer                           | Agilent      | N9010A       | MY48030494   | 2018.02.04 | 2019.02.03    |
| AC Power Supply                             | IDRC         | CF-500TP     | 979422       | 2018.09.18 | 2019.09.17    |
| DC Power Supply                             | IDRC         | CD-035-020PR | 977272       | 2018.09.16 | 2019.09.15    |
| Programmable Temperature & Humidity Chamber | Gaoyu        | TH-1P-B      | WIT-05121302 | 2018.01.03 | 2019.01.02    |
| Temperature/Humidity Meter                  | zhichen      | ZC1-2        | TR8-TH       | 2018.04.10 | 2019.04.09    |

Note: All equipment are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 10.2. Test Setup



### 10.3. Limit

| Frequency Stability Limit           |                                                                                                                                            |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| UNII Devices                        |                                                                                                                                            |
| <input checked="" type="checkbox"/> | In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.    |
| IEEE Std. 802.11n-2009              |                                                                                                                                            |
| <input checked="" type="checkbox"/> | The transmitter center frequency tolerance shall be $\pm 20$ ppm maximum for the 5 GHz band and $\pm 25$ ppm maximum for the 2.4 GHz band. |

## 10.4. Test Procedure

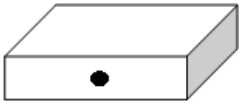
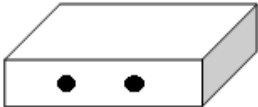
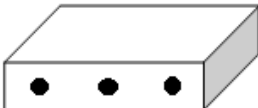
| Frequency Stability Test Method     |                                     |             |         |                                                         |
|-------------------------------------|-------------------------------------|-------------|---------|---------------------------------------------------------|
|                                     | References Rule                     |             | Chapter | Description                                             |
| <input checked="" type="checkbox"/> | ANSI C63.10                         |             | 6.8     | Frequency stability tests                               |
|                                     | <input checked="" type="checkbox"/> | ANSI C63.10 | 6.8.1   | Frequency stability with respect to ambient temperature |
|                                     | <input checked="" type="checkbox"/> | ANSI C63.10 | 6.8.2   | Frequency stability when varying supply voltage         |

## 10.5. Uncertainty

The measurement uncertainty is defined as  $\pm 100$  Hz



**10.6. EUT test Axis definition**

| Item            | Frequency Stability                                                                  |                                                                                      |         |
|-----------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|
| Device Category | <input type="checkbox"/>                                                             | Outdoor AP                                                                           |         |
|                 | <input checked="" type="checkbox"/>                                                  | Indoor AP                                                                            |         |
|                 | <input type="checkbox"/>                                                             | Fixed point-to-point AP                                                              |         |
|                 | <input type="checkbox"/>                                                             | Outdoor fixed point-to-multipoint AP                                                 |         |
|                 | <input type="checkbox"/>                                                             | Client                                                                               |         |
| Test mode       | Carrier Wave                                                                         |                                                                                      |         |
|                 | <input checked="" type="checkbox"/>                                                  | Conducted                                                                            |         |
|                 | <input checked="" type="checkbox"/>                                                  | Chain 1                                                                              |         |
|                 |                                                                                      |   |         |
|                 | <input type="checkbox"/>                                                             | Chain 1                                                                              | Chain 2 |
|                 |                                                                                      |  |         |
|                 | <input type="checkbox"/>                                                             | Chain 1                                                                              | Chain 2 |
|                 |  |                                                                                      |         |

**10.7. Test Result**

|              |   |                       |           |   |              |
|--------------|---|-----------------------|-----------|---|--------------|
| Product Name | : | Wireless Access Point | Power     | : | AC 120V/60Hz |
| Test Mode    | : | Carrier Wave          | Test Site | : | TR8          |
| Test Date    | : | 2018.06.20            |           |   |              |

Frequency Stability under Temperature at 0min

| Temperature Interval (°C) | Test Frequency (MHz) | Deviation (Hz) | ppm    | Limit |
|---------------------------|----------------------|----------------|--------|-------|
| -30                       | 5220.000             | 79             | 0.015  | ±20   |
| -20                       | 5220.000             | 215            | 0.041  | ±20   |
| -10                       | 5220.000             | 137            | 0.026  | ±20   |
| 0                         | 5220.000             | -10            | -0.002 | ±20   |
| 10                        | 5220.000             | 33             | 0.006  | ±20   |
| 20                        | 5220.000             | -70            | -0.013 | ±20   |
| 30                        | 5220.000             | -74            | -0.014 | ±20   |
| 40                        | 5220.000             | 49             | 0.009  | ±20   |
| 50                        | 5220.000             | -3             | -0.001 | ±20   |

## Frequency Stability under Temperature at 2min

| Temperature Interval (°C) | Test Frequency (MHz) | Deviation (Hz) | ppm    | Limit |
|---------------------------|----------------------|----------------|--------|-------|
| -30                       | 5220.000             | -210           | -0.040 | ±20   |
| -20                       | 5220.000             | -156           | -0.030 | ±20   |
| -10                       | 5220.000             | -37            | -0.007 | ±20   |
| 0                         | 5220.000             | 90             | 0.017  | ±20   |
| 10                        | 5220.000             | -90            | -0.017 | ±20   |
| 20                        | 5220.000             | -119           | -0.023 | ±20   |
| 30                        | 5220.000             | 107            | 0.020  | ±20   |
| 40                        | 5220.000             | -86            | -0.016 | ±20   |
| 50                        | 5220.000             | -94            | -0.018 | ±20   |

## Frequency Stability under Temperature at 5min

| Temperature Interval (°C) | Test Frequency (MHz) | Deviation (Hz) | ppm    | Limit |
|---------------------------|----------------------|----------------|--------|-------|
| -30                       | 5220.000             | -129           | -0.025 | ±20   |
| -20                       | 5220.000             | -122           | -0.023 | ±20   |
| -10                       | 5220.000             | 107            | 0.020  | ±20   |
| 0                         | 5220.000             | -88            | -0.017 | ±20   |
| 10                        | 5220.000             | 113            | 0.022  | ±20   |
| 20                        | 5220.000             | 179            | 0.034  | ±20   |
| 30                        | 5220.000             | 161            | 0.031  | ±20   |
| 40                        | 5220.000             | -95            | -0.018 | ±20   |
| 50                        | 5220.000             | -91            | -0.017 | ±20   |

## Frequency Stability under Temperature at 10min

| Temperature Interval (°C) | Test Frequency (MHz) | Deviation (Hz) | ppm    | Limit |
|---------------------------|----------------------|----------------|--------|-------|
| -30                       | 5220.000             | 123            | 0.024  | ±20   |
| -20                       | 5220.000             | 105            | 0.020  | ±20   |
| -10                       | 5220.000             | 94             | 0.018  | ±20   |
| 0                         | 5220.000             | 99             | 0.019  | ±20   |
| 10                        | 5220.000             | -100           | -0.019 | ±20   |
| 20                        | 5220.000             | 148            | 0.028  | ±20   |
| 30                        | 5220.000             | -123           | -0.024 | ±20   |
| 40                        | 5220.000             | 118            | 0.023  | ±20   |
| 50                        | 5220.000             | -94            | -0.018 | ±20   |

## Frequency Stability under Voltage

| AC Voltage (V) | Test Frequency (MHz) | Deviation (Hz) | ppm    | Limit |
|----------------|----------------------|----------------|--------|-------|
| 102            | 5220.000             | 114            | 0.022  | ±20   |
| 120            | 5220.000             | -105           | -0.020 | ±20   |
| 138            | 5220.000             | 163            | 0.031  | ±20   |

## 11. Antenna Requirement

### 11.1. Limit

| Antenna Requirement Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.</p> |  |

### 11.2. Antenna Connector Construction

| Antenna Connector Construction                                                             |                                                                  |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <input type="checkbox"/>                                                                   | The use of a permanently attached antenna                        |
| <input type="checkbox"/>                                                                   | The antenna use of a unique coupling to the intentional radiator |
| <input checked="" type="checkbox"/>                                                        | The use of a nonstandard antenna jack or electrical connector    |
| Please refer to the attached document "Internal Photograph" to show the antenna connector. |                                                                  |

\_\_\_\_\_ The End \_\_\_\_\_