

## Appendix B

### RF Test Data for 5.8G WLAN (Conducted Measurement)

**Product Name: VPIXEL Phantom Wireless audio and video transceiver system**

**Trade Mark: VANXVM**

**Test Model: Vpixel\_S**

#### Environmental Conditions

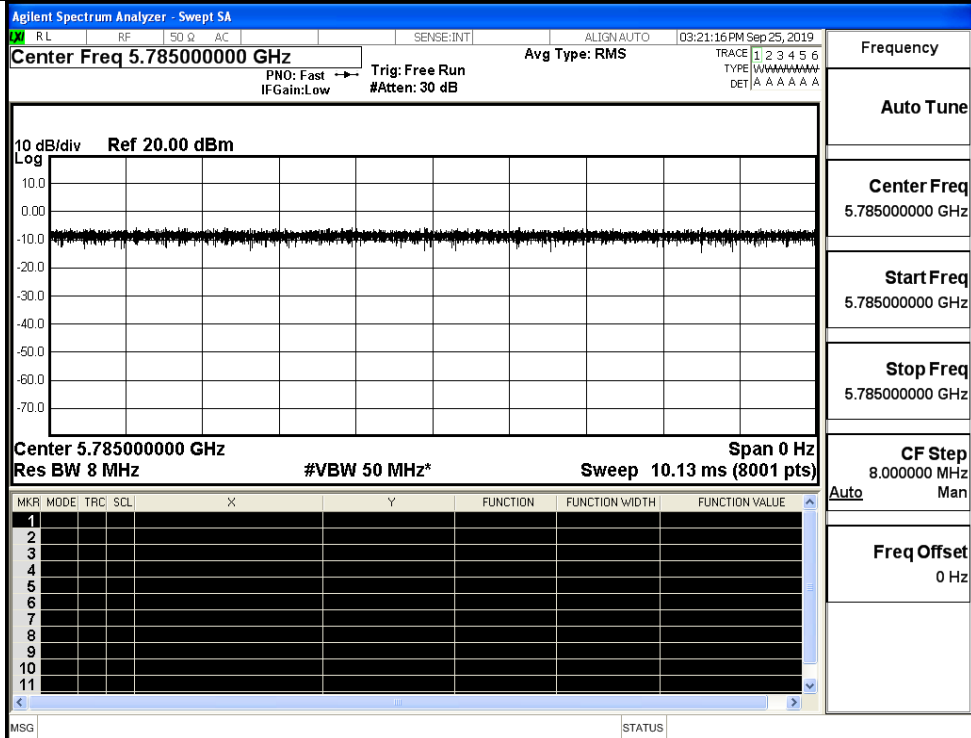
|                    |             |
|--------------------|-------------|
| Temperature:       | 23.2 ° C    |
| Relative Humidity: | 52.9%       |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | JK Zhou     |
| Supervised by:     | Wang Chuang |

#### B.1 Duty Cycle

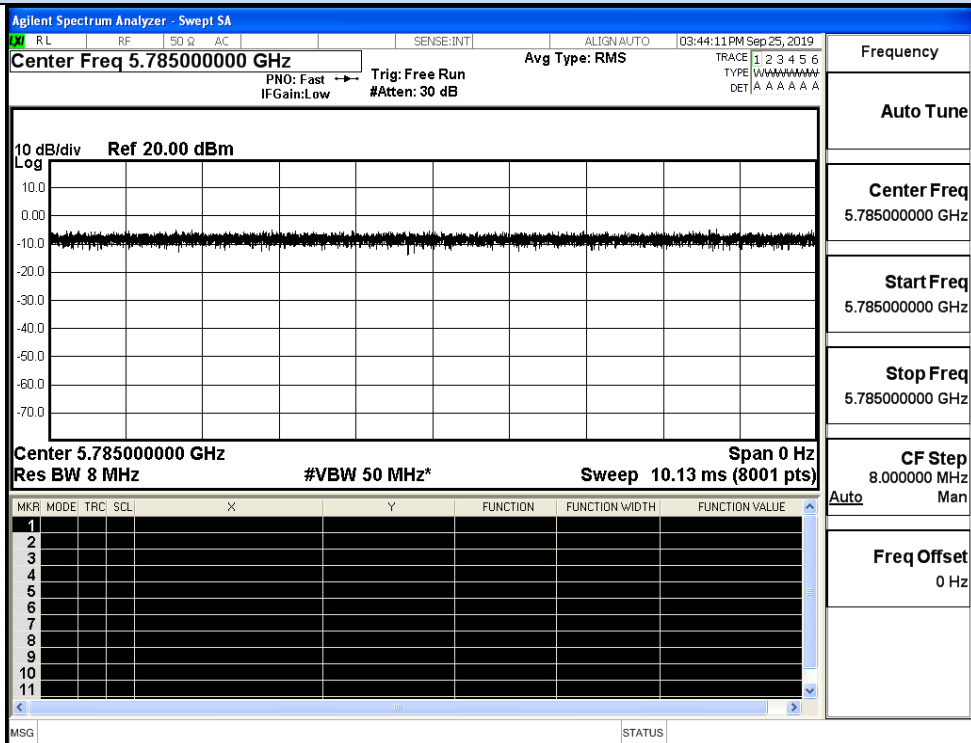
##### Ant0

| Test Mode  | Test Frequency (MHz) | Duty Cycle (%) | 10log(1/x) Factor (dB) | 1/B Minimum VBW(KHz) |
|------------|----------------------|----------------|------------------------|----------------------|
| 11A        | 5785                 | 100            | 0.00                   | 0.01                 |
| 11N20 SISO | 5785                 | 100            | 0.00                   | 0.01                 |

## On Time and Duty Cycle



## IEEE 802.11a

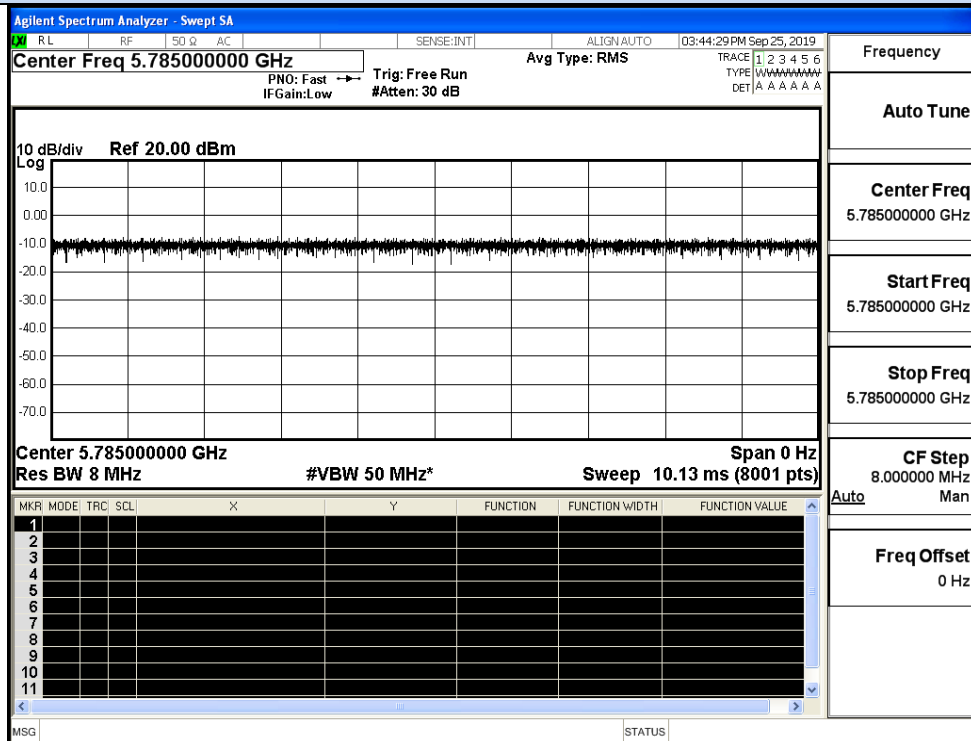


## IEEE 802.11n HT20

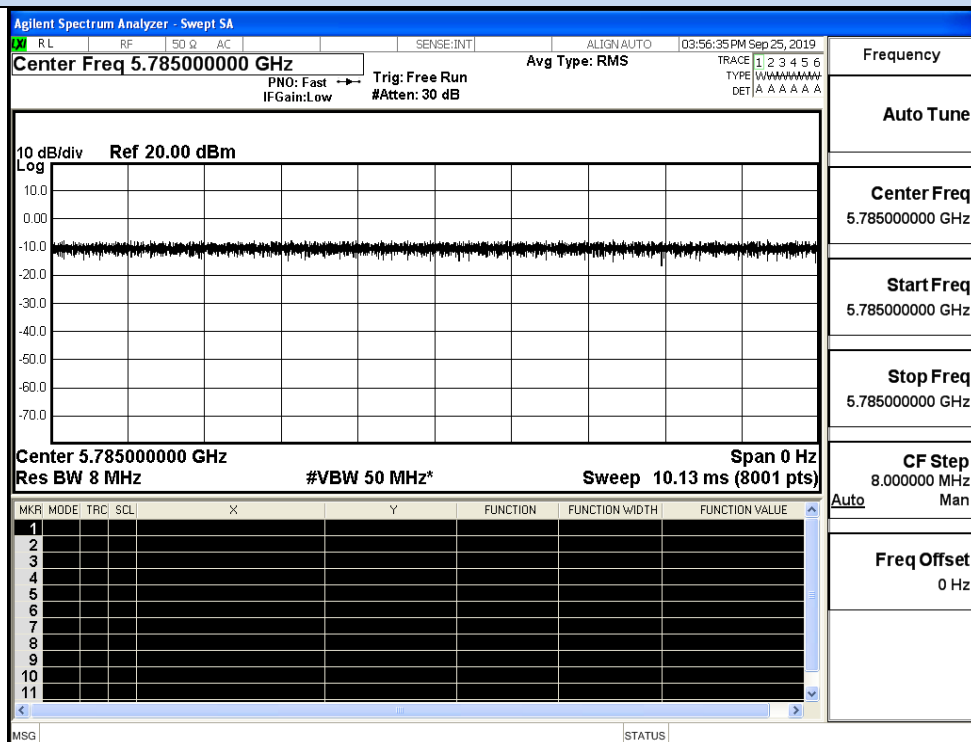
## Ant1

| Test Mode  | Test Frequency (MHz) | Duty Cycle (%) | 10log(1/x) Factor (dB) | 1/B Minimum VBW(KHz) |
|------------|----------------------|----------------|------------------------|----------------------|
| 11A        | 5785                 | 100            | 0.00                   | 0.01                 |
| 11N20 SISO | 5785                 | 100            | 0.00                   | 0.01                 |

## On Time and Duty Cycle



## IEEE 802.11a



## IEEE 802.11n HT20

**B.2 Maximum Conduct Output Power****Ant0**

| Test Mode  | Channel | Frequency (MHz) | AVG Conducted Power (dBm) | Duty Cycle Factor(dB) | Report Conducted Power(dBm) | Limit (dBm) | Verdict |
|------------|---------|-----------------|---------------------------|-----------------------|-----------------------------|-------------|---------|
| 11A        | 149     | 5745            | 6.87                      | 0                     | 6.87                        | 30.0        | Pass    |
|            | 157     | 5785            | 7.25                      | 0                     | 7.25                        |             | Pass    |
|            | 165     | 5825            | 6.17                      | 0                     | 6.17                        |             | Pass    |
| 11N20 SISO | 149     | 5745            | 7.33                      | 0                     | 7.33                        | 30.0        | Pass    |
|            | 157     | 5785            | 6.72                      | 0                     | 6.72                        |             | Pass    |
|            | 165     | 5825            | 6.54                      | 0                     | 6.54                        |             | Pass    |

**Ant1**

| Test Mode  | Channel | Frequency (MHz) | AVG Conducted Power (dBm) | Duty Cycle Factor(dB) | Report Conducted Power(dBm) | Limit (dBm) | Verdict |
|------------|---------|-----------------|---------------------------|-----------------------|-----------------------------|-------------|---------|
| 11A        | 149     | 5745            | 5.64                      | 0                     | 5.64                        | 30.0        | Pass    |
|            | 157     | 5785            | 5.96                      | 0                     | 5.96                        |             | Pass    |
|            | 165     | 5825            | 6.29                      | 0                     | 6.29                        |             | Pass    |
| 11N20 SISO | 149     | 5745            | 6.54                      | 0                     | 6.54                        | 30.0        | Pass    |
|            | 157     | 5785            | 6.55                      | 0                     | 6.55                        |             | Pass    |
|            | 165     | 5825            | 6.7                       | 0                     | 6.7                         |             | Pass    |

**Ant0+Ant1**

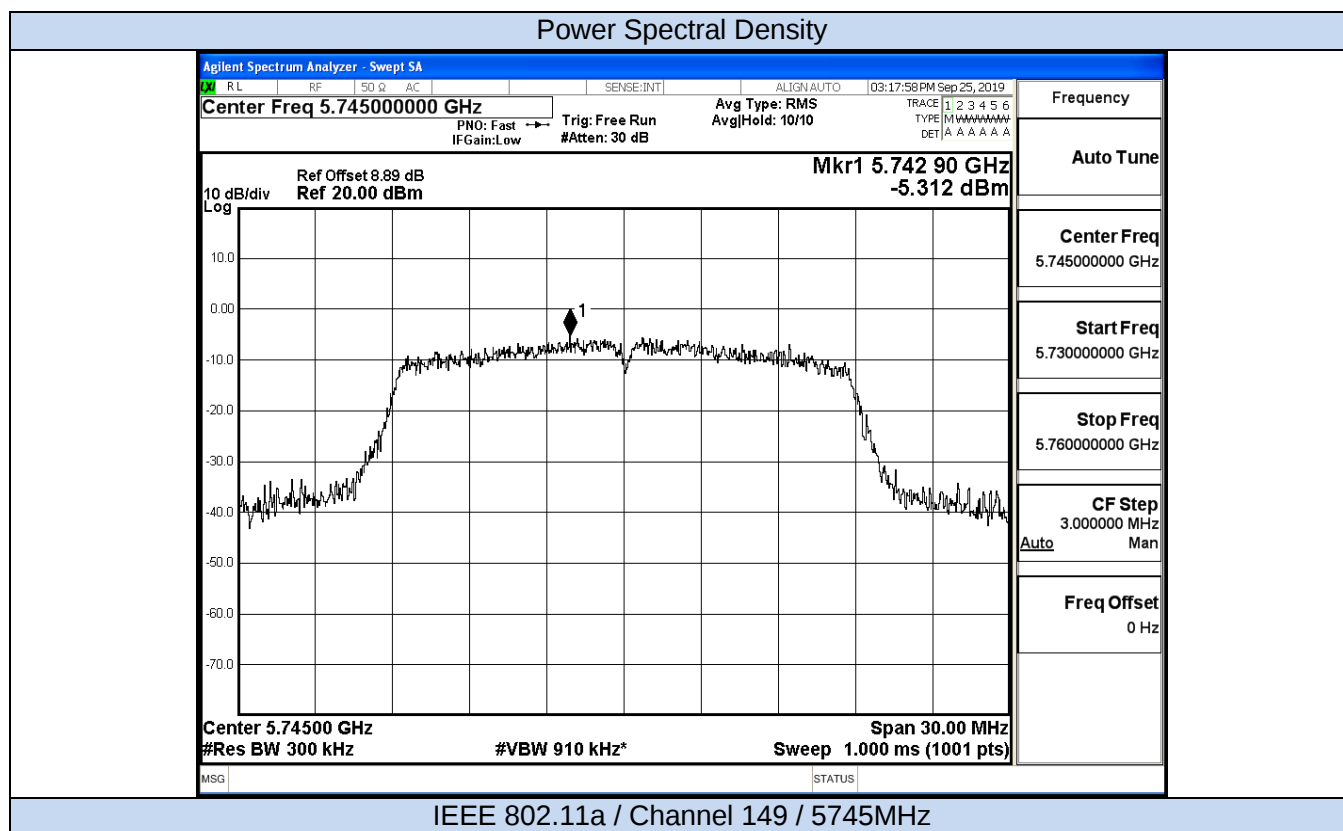
| Test Mode  | Channel | Frequency (MHz) | AVG Conducted Power (dBm) |      |      | Duty Cycle Factor(dB) | Report Conducted Power(dBm) |      |      | Limit (dBm) | Verdict |
|------------|---------|-----------------|---------------------------|------|------|-----------------------|-----------------------------|------|------|-------------|---------|
|            |         |                 | ANT0                      | ANT1 | SUM  |                       | ANT0                        | ANT1 | SUM  |             |         |
| 11N20 SISO | 149     | 5745            | 7.33                      | 6.54 | 9.96 | 0                     | 7.33                        | 6.54 | 9.96 | 29.99       | Pass    |
|            | 157     | 5785            | 6.72                      | 6.55 | 9.65 | 0                     | 6.72                        | 6.55 | 9.65 |             | Pass    |
|            | 165     | 5825            | 6.54                      | 6.7  | 9.63 | 0                     | 6.54                        | 6.7  | 9.63 |             | Pass    |

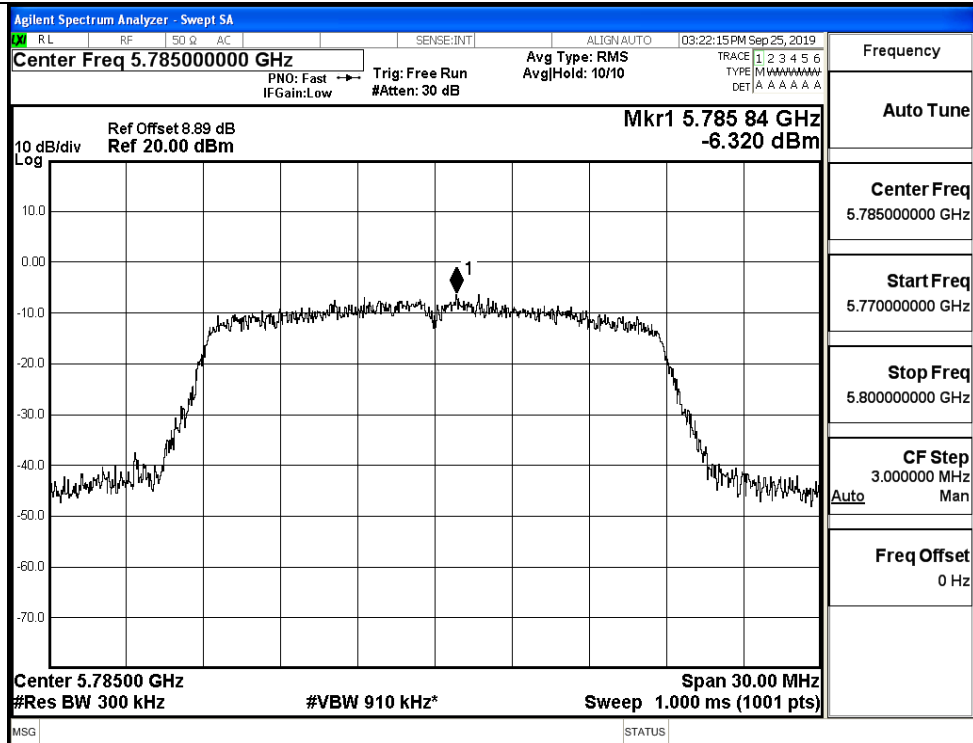
Directional gain=3dBi+10 log (2) = 6.01dBi > 6dBi, So the Conducted Power limit shall be reduced to 30-(6.01-6) = 29.99

## B.3 Power Spectral Density

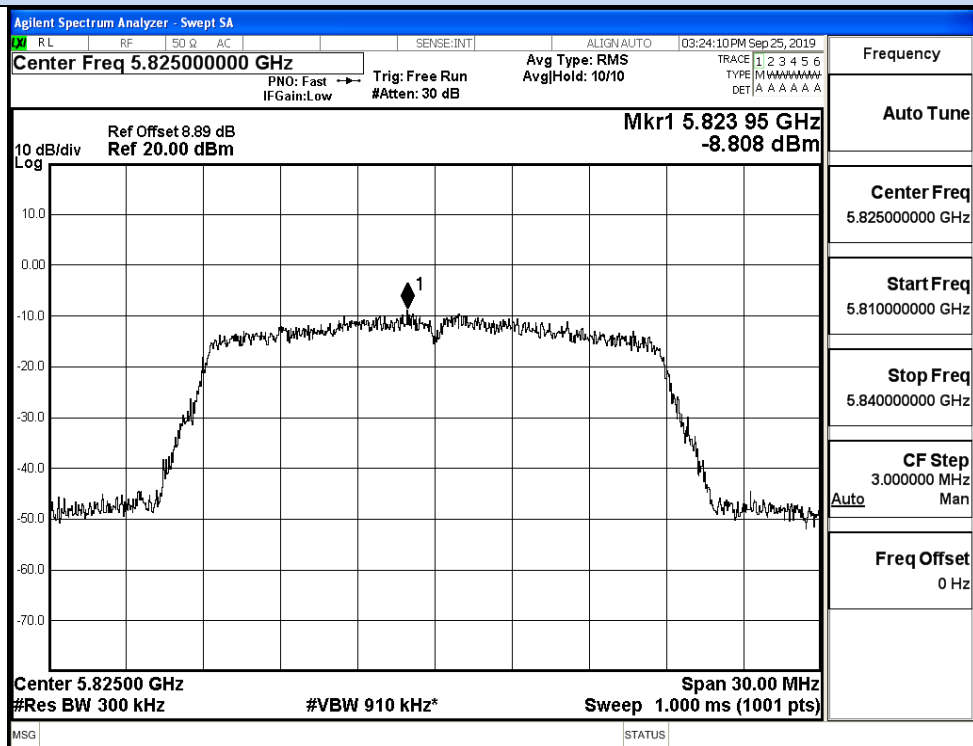
### Ant0

| Test Mode  | Channel | Frequency (MHz) | Power Density (dBm/300KHz) | Duty Cycle Factor (dB) | RBW Factor (dB) | Report Power Density (dBm/500KHz) | Limit (dBm/500KHz) | Verdict |
|------------|---------|-----------------|----------------------------|------------------------|-----------------|-----------------------------------|--------------------|---------|
| 11A        | 149     | 5745            | -5.31                      | 0                      | 2.218           | -3.09                             | 30.0               | Pass    |
|            | 157     | 5785            | -6.32                      | 0                      | 2.218           | -4.10                             |                    | Pass    |
|            | 165     | 5825            | -8.81                      | 0                      | 2.218           | -6.59                             |                    | Pass    |
| 11N20 SISO | 149     | 5745            | -6.26                      | 0                      | 2.218           | -4.04                             | 30.0               | Pass    |
|            | 157     | 5785            | -6.17                      | 0                      | 2.218           | -3.96                             |                    | Pass    |
|            | 165     | 5825            | -6.51                      | 0                      | 2.218           | -4.29                             |                    | Pass    |



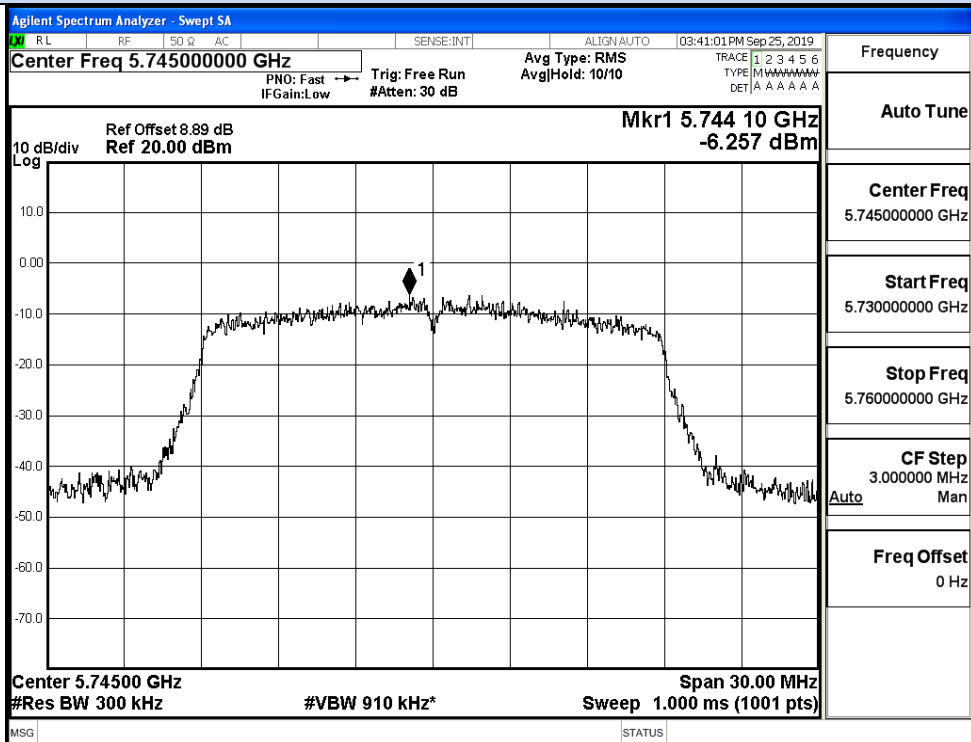


IEEE 802.11na / Channel 157 / 5785MHz

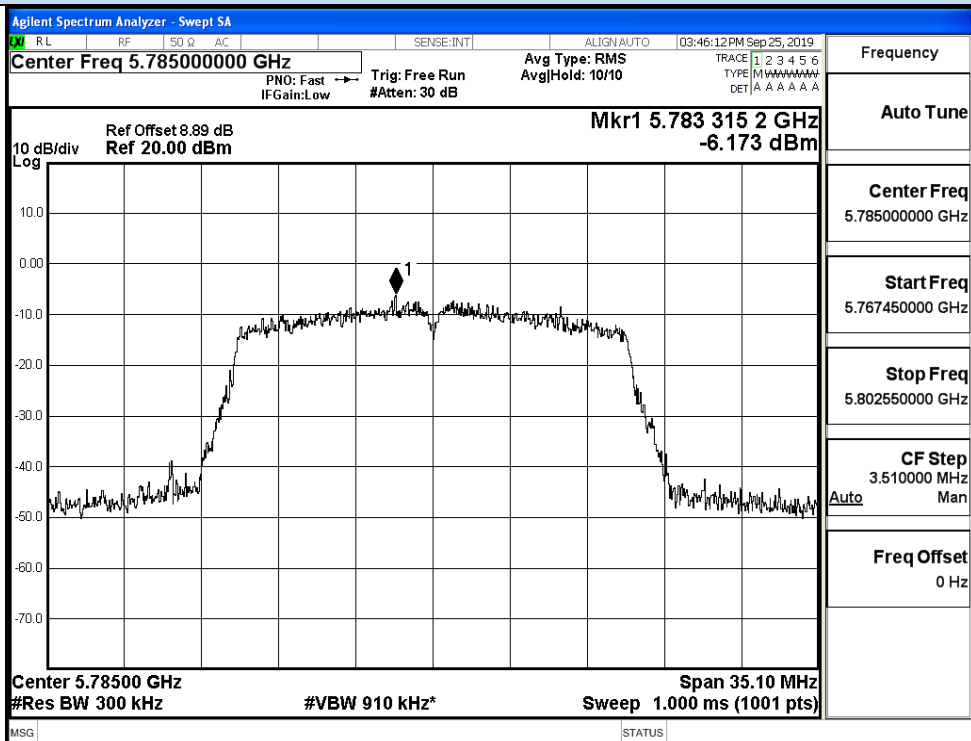


IEEE 802.11na / Channel 165 / 5825MHz

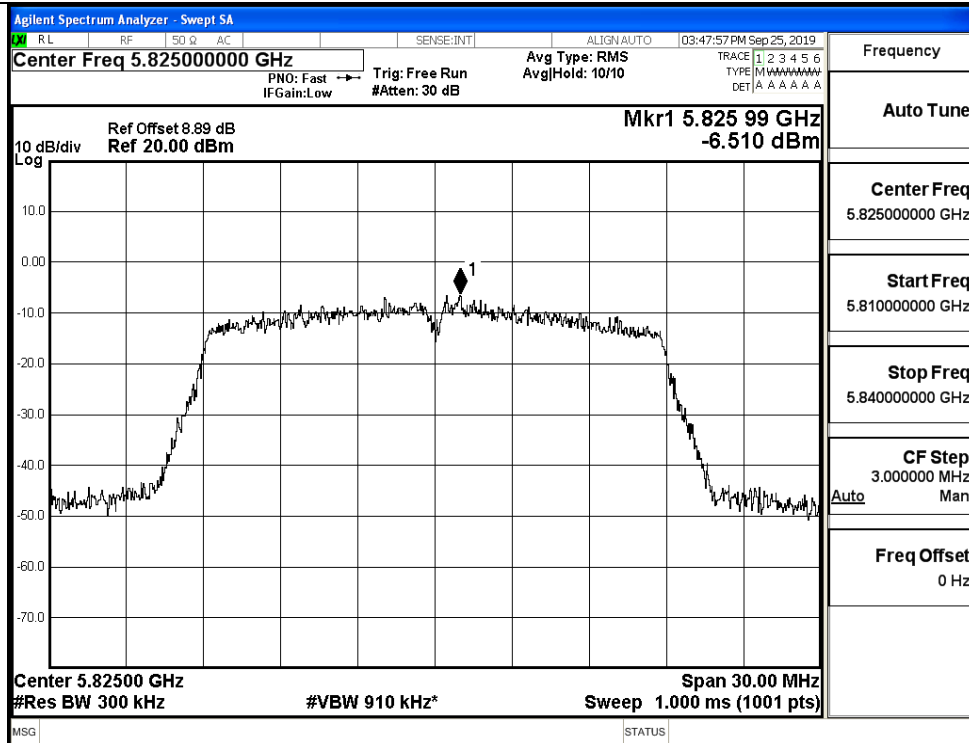
## Power Spectral Density



## IEEE 802.11n20 / Channel 149 / 5745MHz



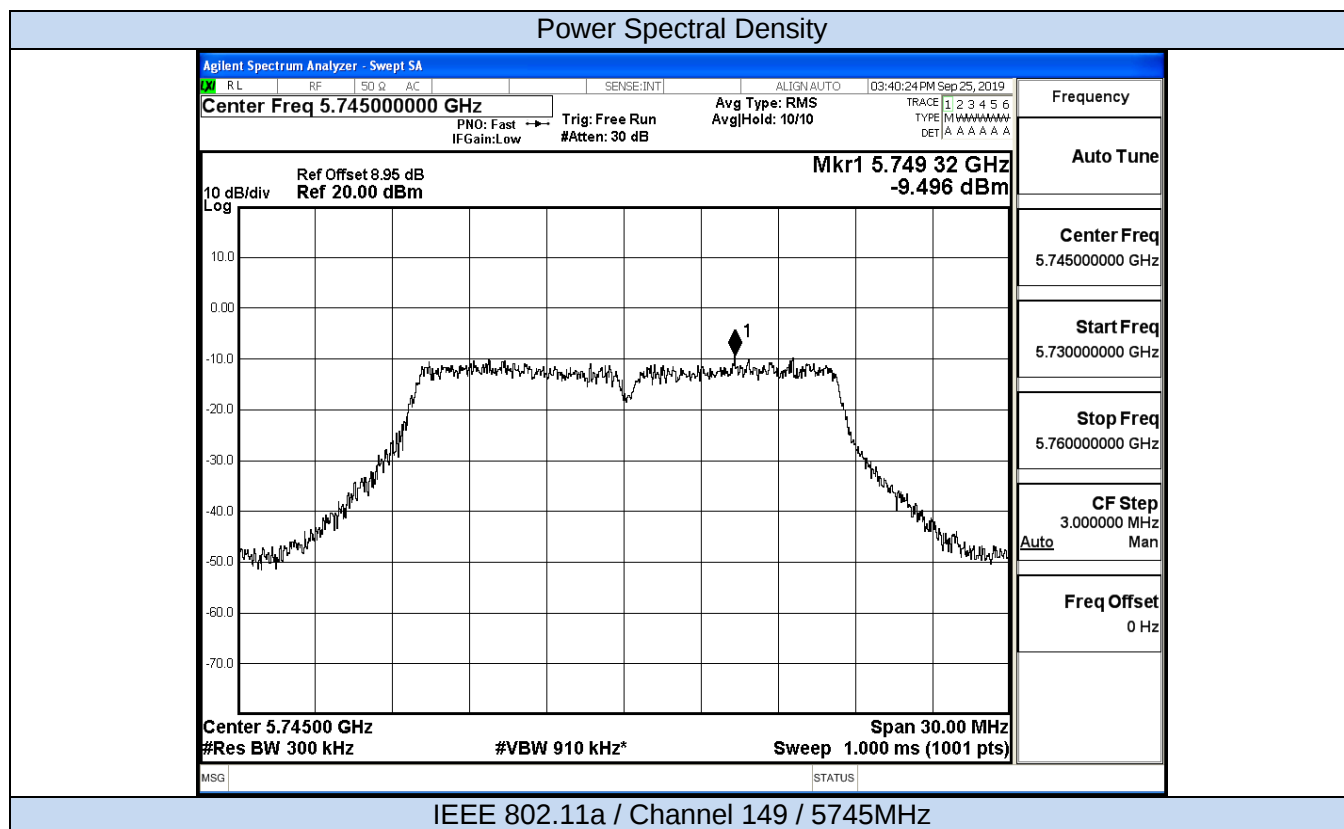
## IEEE 802.11n20 / Channel 157 / 5785MHz

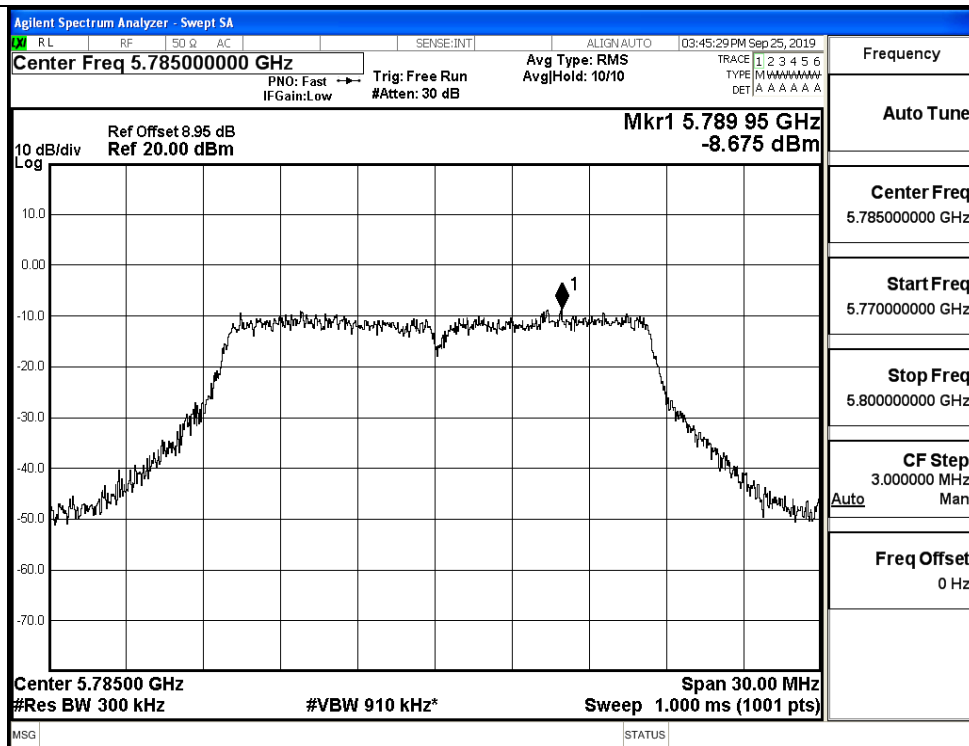


IEEE 802.11n20 / Channel 165 / 5825MHz

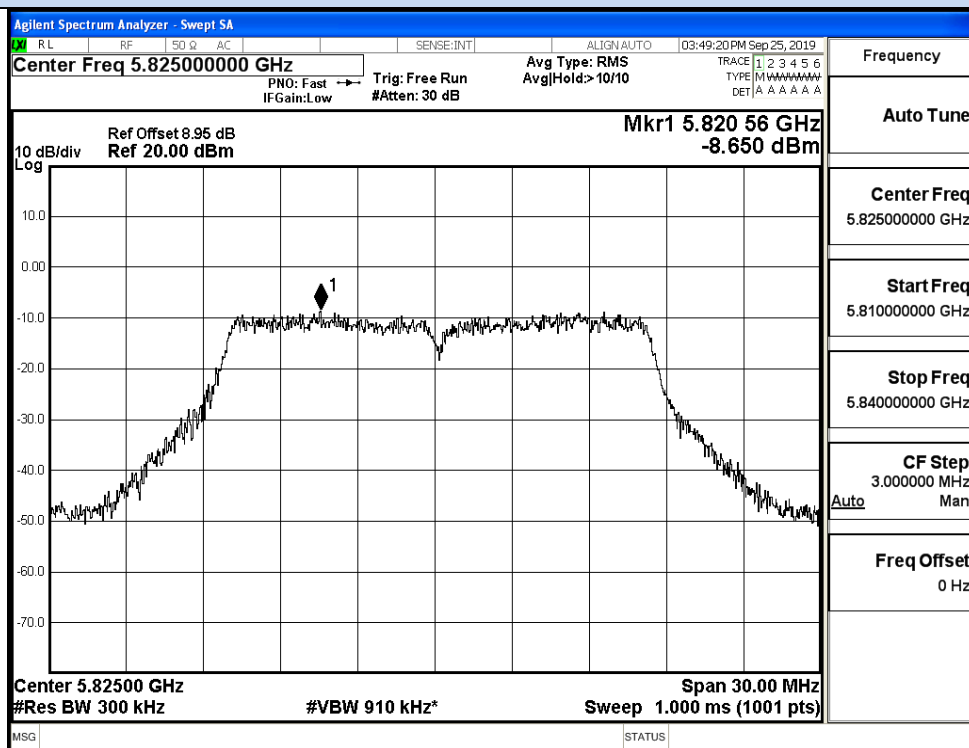
## Ant1

| Test Mode  | Channel | Frequency (MHz) | Power Density (dBm/300KHz) | Duty Cycle Factor (dB) | RBW Factor (dB) | Report Power Density (dBm/500KHz) | Limit (dBm/500KHz) | Verdict |
|------------|---------|-----------------|----------------------------|------------------------|-----------------|-----------------------------------|--------------------|---------|
| 11A        | 149     | 5745            | -9.50                      | 0                      | 2.218           | -7.28                             | 30.0               | Pass    |
|            | 157     | 5785            | -8.68                      | 0                      | 2.218           | -6.46                             |                    | Pass    |
|            | 165     | 5825            | -8.65                      | 0                      | 2.218           | -6.43                             |                    | Pass    |
| 11N20 SISO | 149     | 5745            | -8.80                      | 0                      | 2.218           | -6.58                             | 30.0               | Pass    |
|            | 157     | 5785            | -8.19                      | 0                      | 2.218           | -5.97                             |                    | Pass    |
|            | 165     | 5825            | -8.43                      | 0                      | 2.218           | -6.21                             |                    | Pass    |



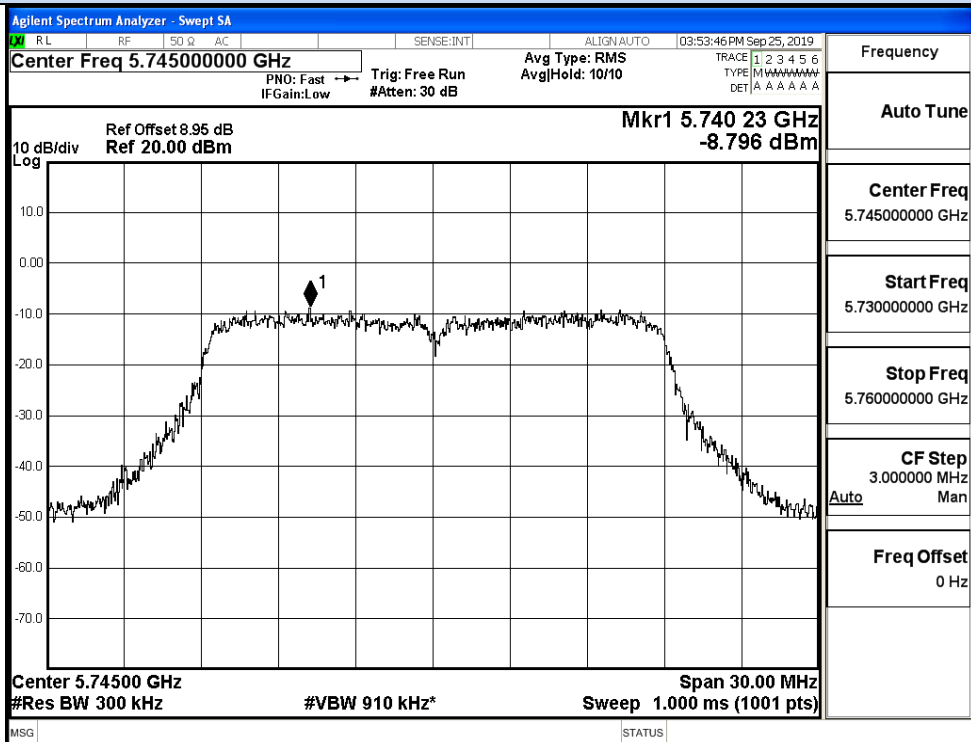


IEEE 802.11na / Channel 157 / 5785MHz

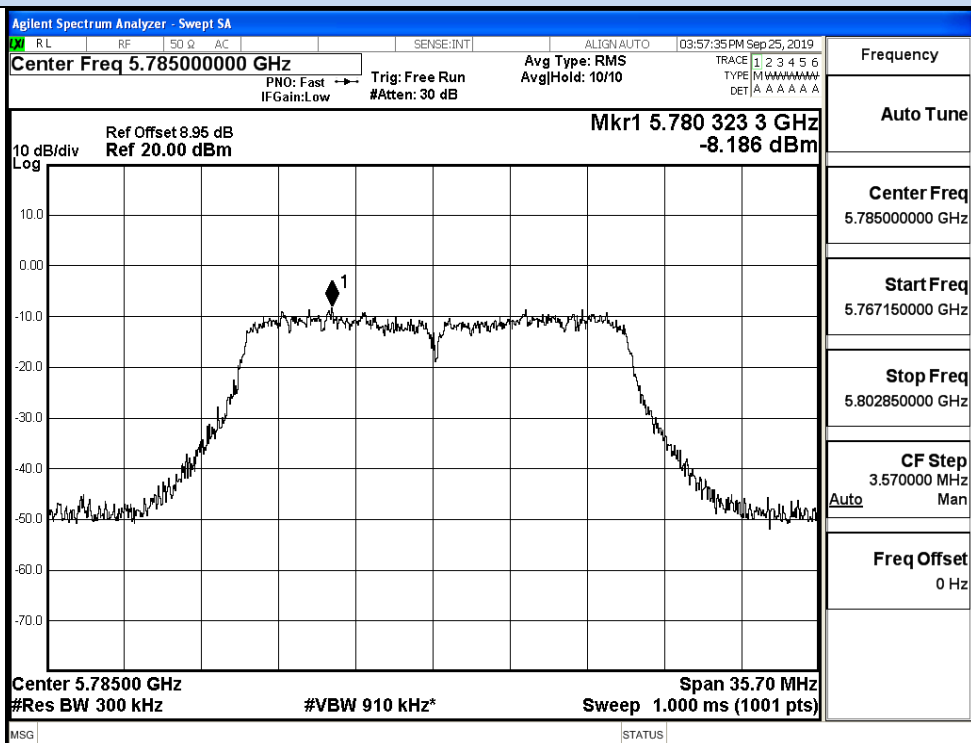


IEEE 802.11na / Channel 165 / 5825MHz

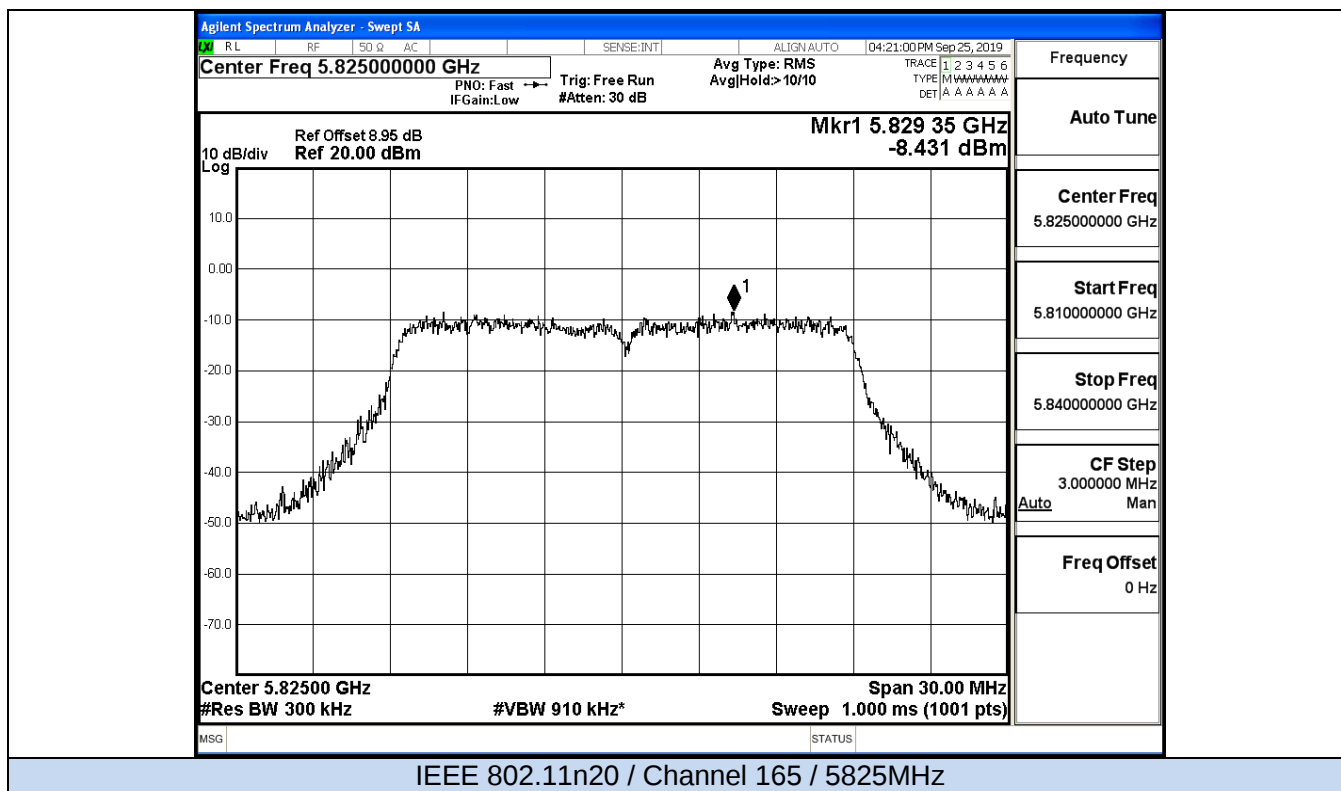
## Power Spectral Density



IEEE 802.11n20 / Channel 149 / 5745MHz



IEEE 802.11n20 / Channel 157 / 5785MHz



## Ant0+Ant1

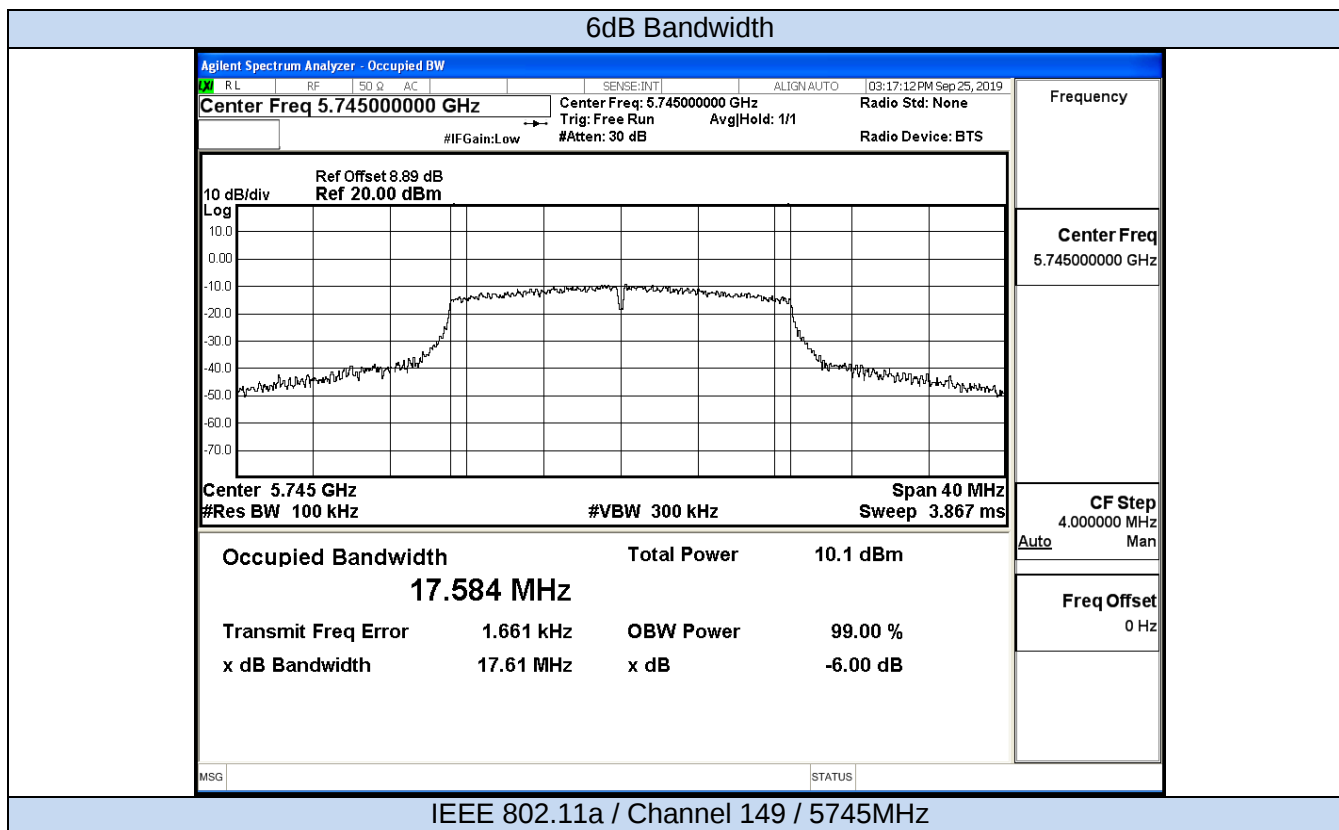
| Test Mode         | Channel | Frequency (MHz) | Power Density (dBm/MHz) |       |       | Duty Cycle Factor (dB) | RBW Factor (dB) | Report Power Density (dBm/MHz) |       |       | Limit (dBm/MHz) | Verdict |
|-------------------|---------|-----------------|-------------------------|-------|-------|------------------------|-----------------|--------------------------------|-------|-------|-----------------|---------|
|                   |         |                 | Ant0                    | Ant1  | sum   |                        |                 | Ant0                           | Ant1  | sum   |                 |         |
| 11N2<br>0<br>SISO | 149     | 5745            | -6.26                   | -8.8  | -4.34 | 0                      | 2.218           | -4.04                          | -6.58 | -2.12 | 29.99           | Pass    |
|                   | 157     | 5785            | -6.17                   | -8.19 | -4.05 | 0                      | 2.218           | -3.96                          | -5.97 | -1.84 |                 | Pass    |
|                   | 165     | 5825            | -6.51                   | -8.43 | -4.35 | 0                      | 2.218           | -4.29                          | -6.21 | -2.13 |                 | Pass    |

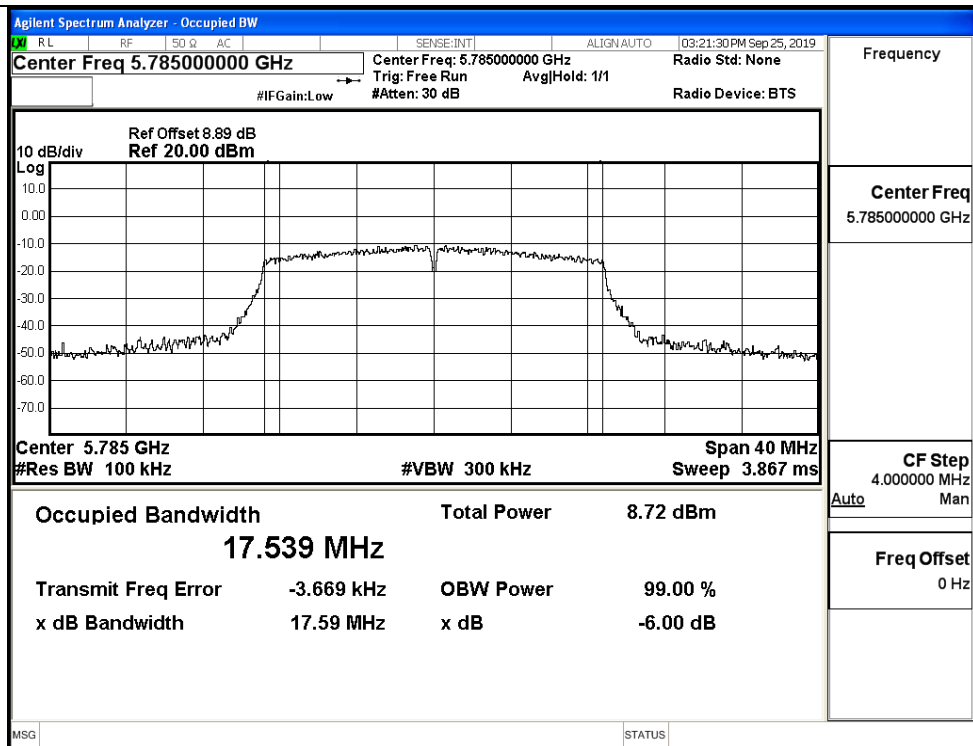
Directional gain=3dBi+10 log (2) = 6.01dBi > 6dBi, So the Conducted Power limit shall be reduced to 30-(6.01-6) = 29.99

## B.4 Emission Bandwidth

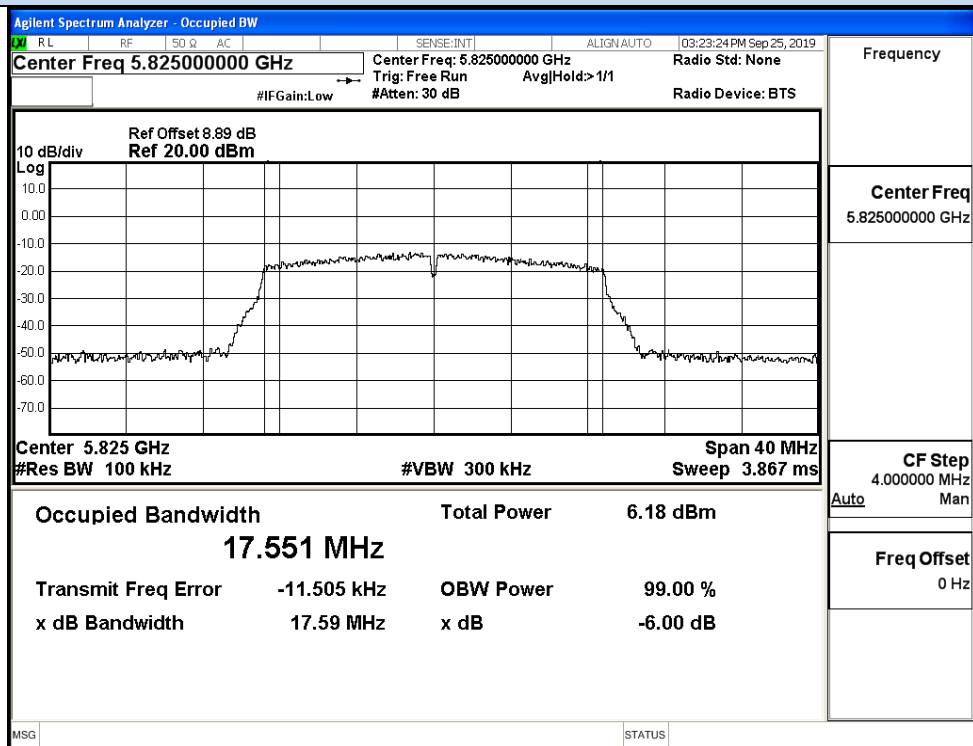
### Ant0

| Test Mode  | Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | Verdict |
|------------|---------|-----------------|---------------------|-------------|---------|
| 11A        | 149     | 5745            | 17.61               | >=0.5       | Pass    |
|            | 157     | 5785            | 17.59               |             | Pass    |
|            | 165     | 5825            | 17.59               |             | Pass    |
| 11N20 SISO | 149     | 5745            | 17.54               | >=0.5       | Pass    |
|            | 157     | 5785            | 17.55               |             | Pass    |
|            | 165     | 5825            | 17.22               |             | Pass    |



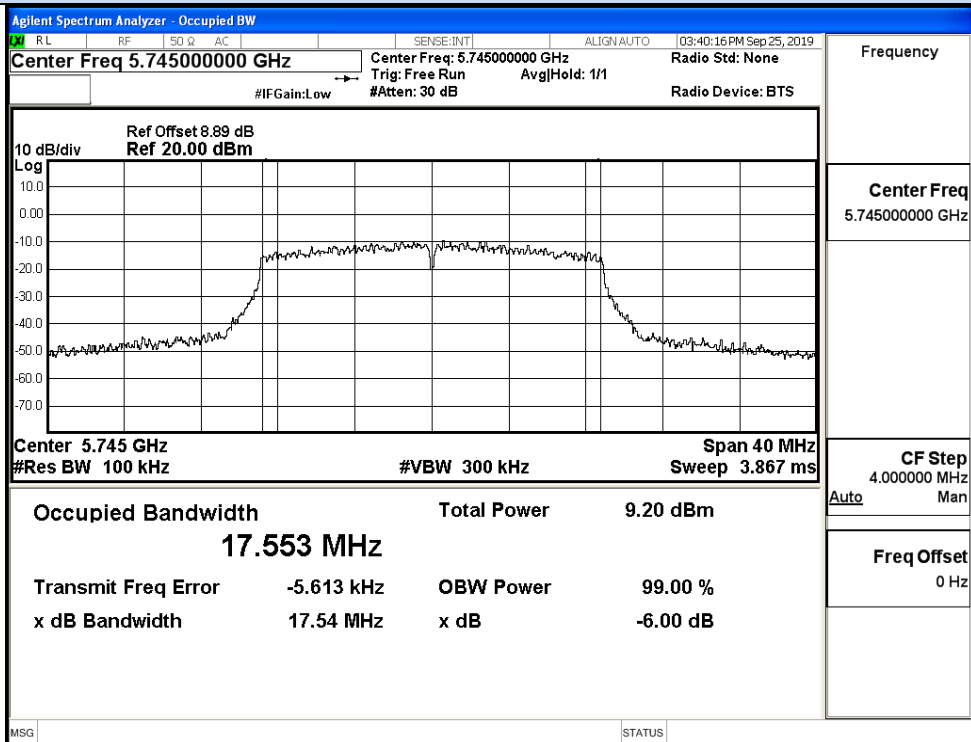


IEEE 802.11a / Channel 157 / 5785MHz

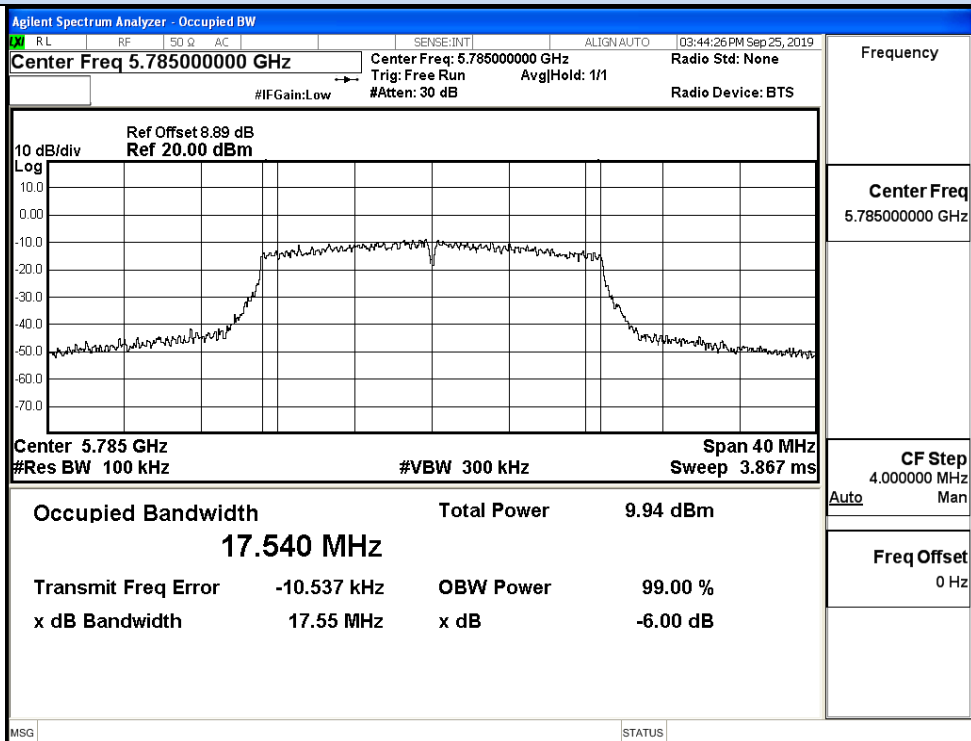


IEEE 802.11a / Channel 165 / 5825MHz

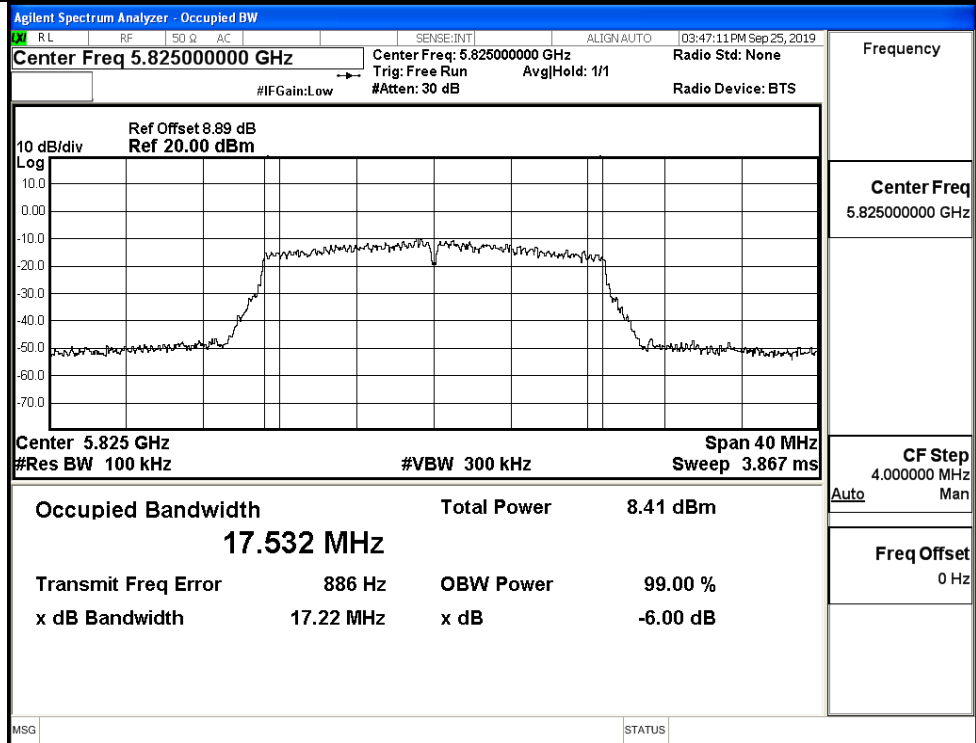
## 6dB Bandwidth



## IEEE 802.11n20 / Channel 149 / 5745MHz



## IEEE 802.11n20 / Channel 157 / 5785MHz

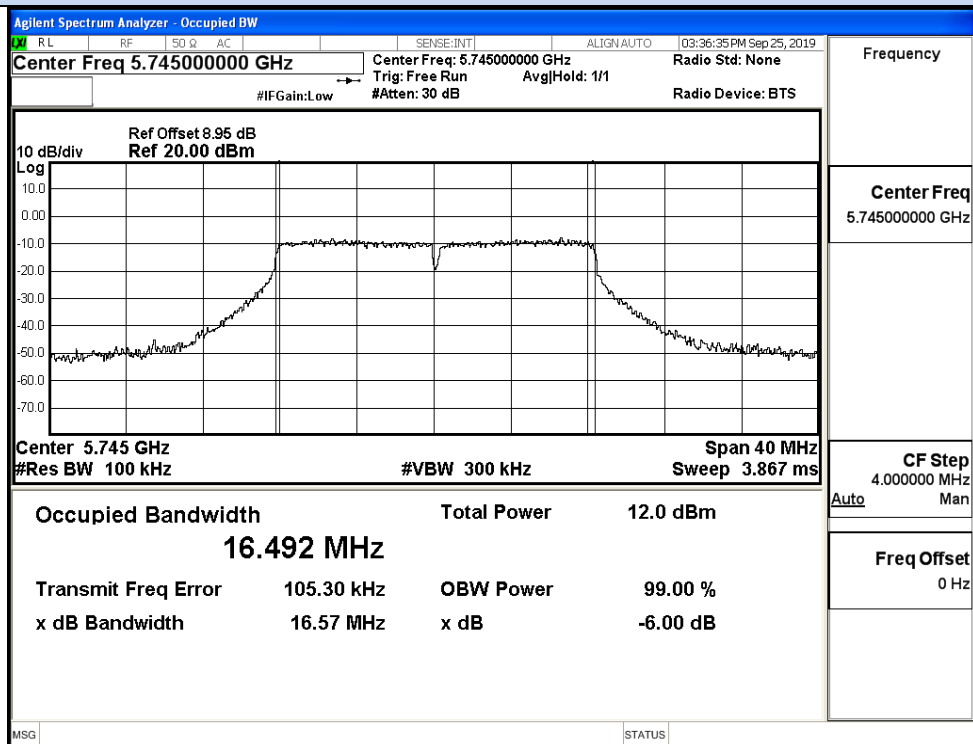


IEEE 802.11n20 / Channel 165 / 5825MHz

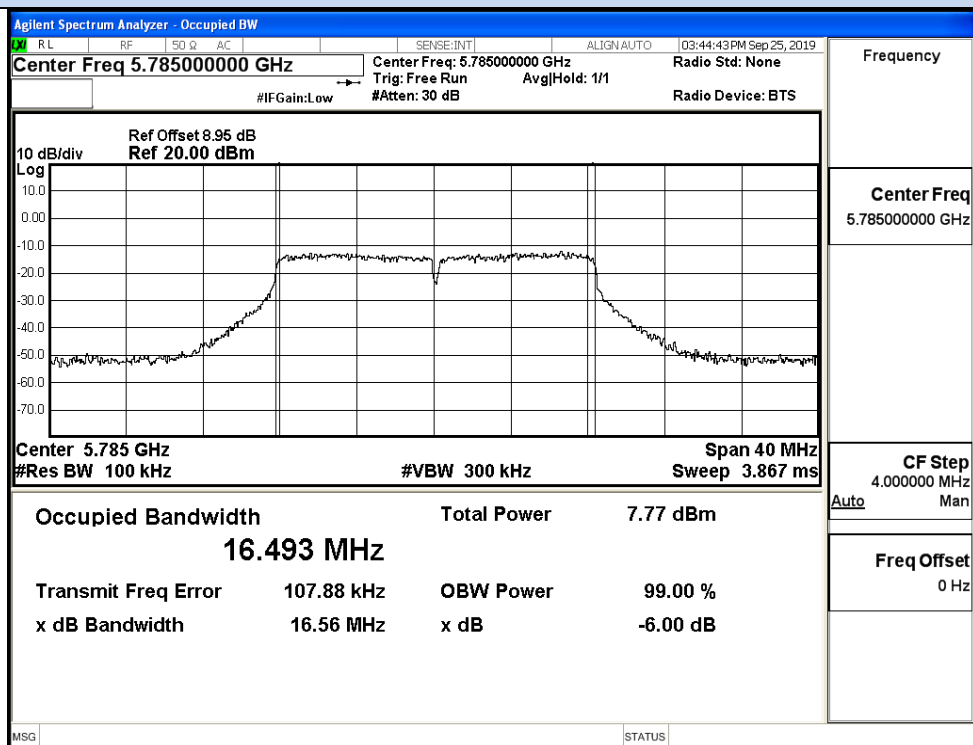
## Ant1

| Test Mode  | Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | Verdict |
|------------|---------|-----------------|---------------------|-------------|---------|
| 11A        | 149     | 5745            | 16.57               | >=0.5       | Pass    |
|            | 157     | 5785            | 16.56               |             | Pass    |
|            | 165     | 5825            | 16.56               |             | Pass    |
| 11N20 SISO | 149     | 5745            | 17.76               | >=0.5       | Pass    |
|            | 157     | 5785            | 17.85               |             | Pass    |
|            | 165     | 5825            | 17.78               |             | Pass    |

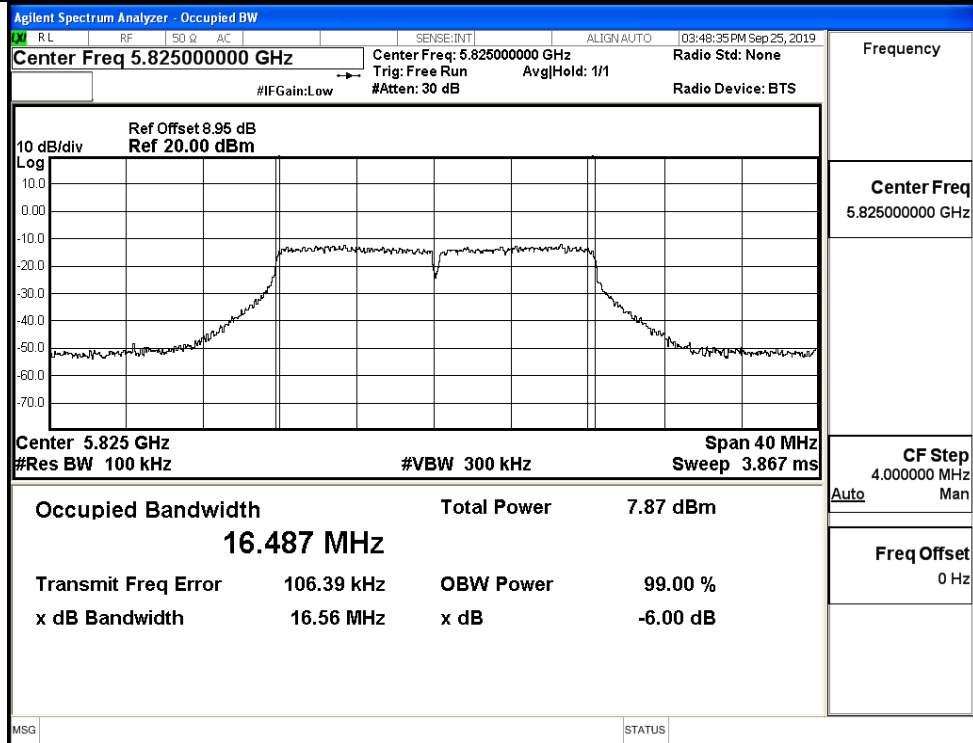
## 6dB Bandwidth



## IEEE 802.11a / Channel 149 / 5745MHz

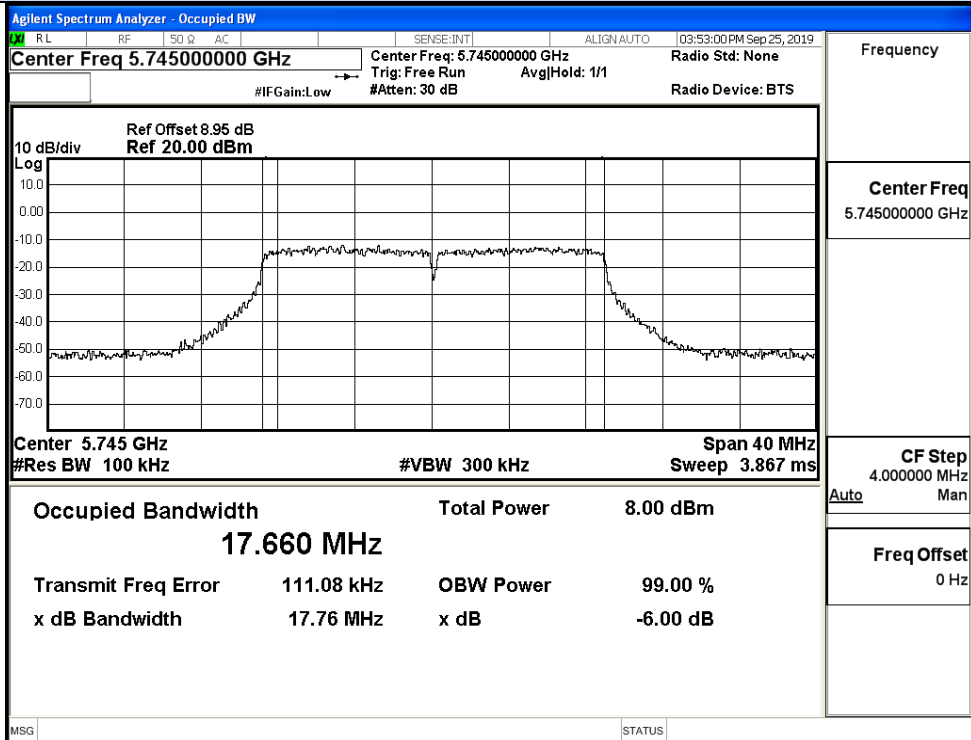


## IEEE 802.11a / Channel 157 / 5785MHz

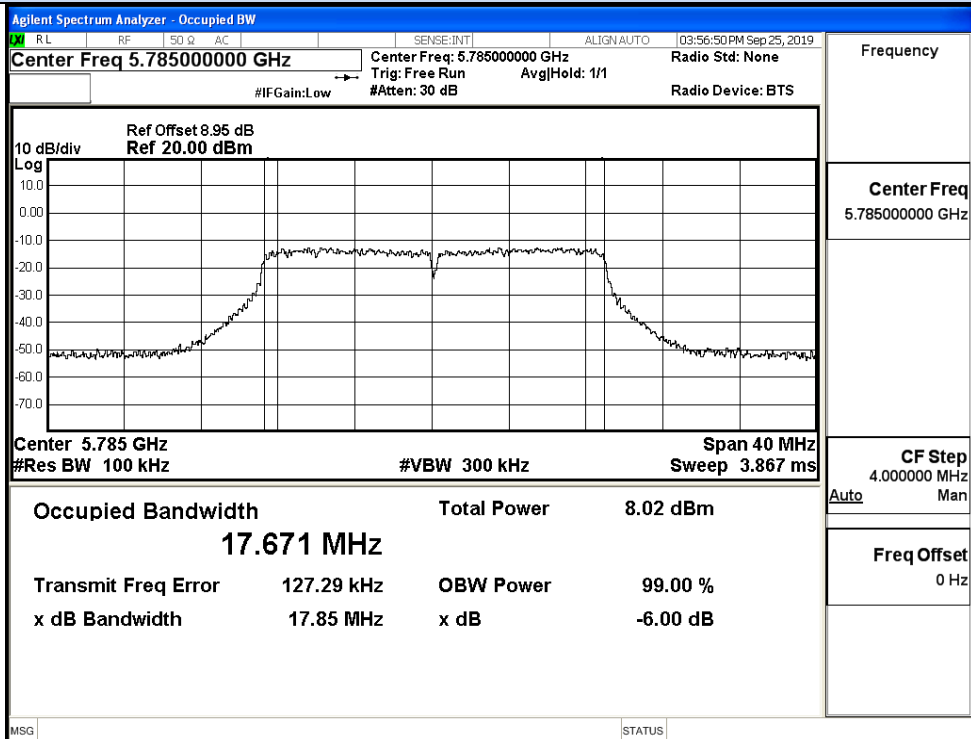


IEEE 802.11a / Channel 165 / 5825MHz

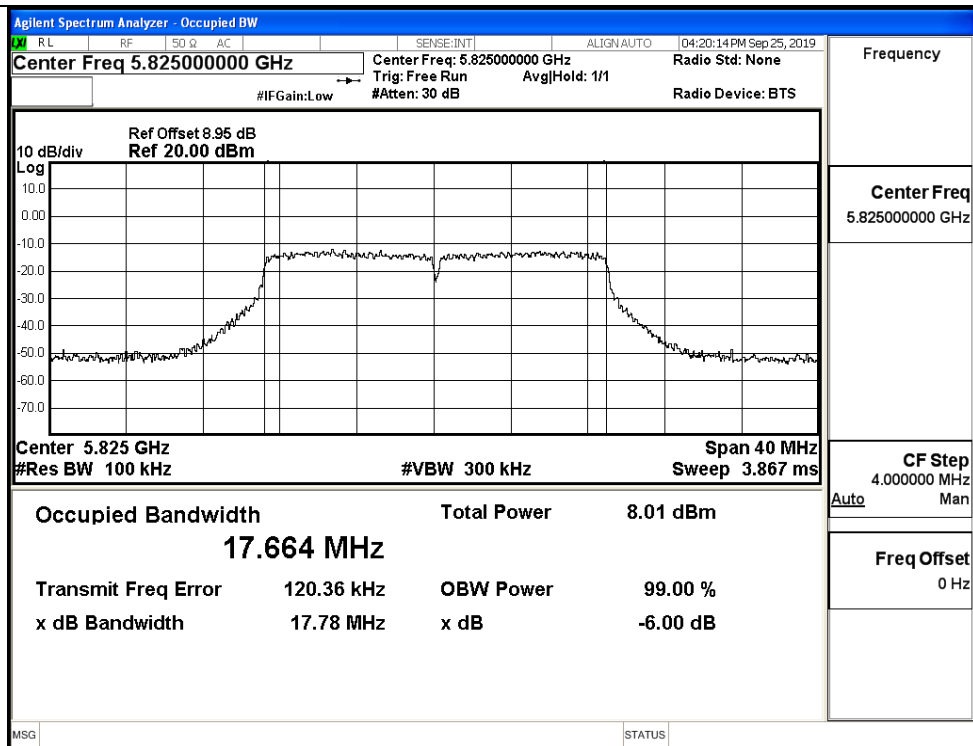
## 6dB Bandwidth



## IEEE 802.11n20 / Channel 149 / 5745MHz



## IEEE 802.11n20 / Channel 157 / 5785MHz



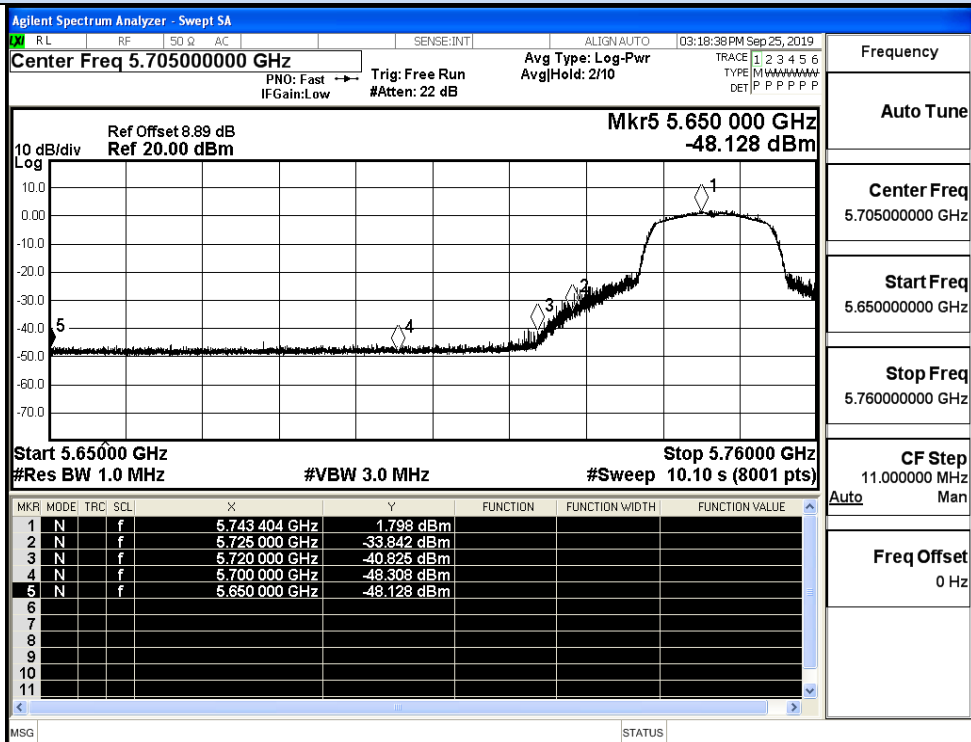
IEEE 802.11n20 / Channel 165 / 5825MHz

## B.5 Undesirable Emissions Measurement

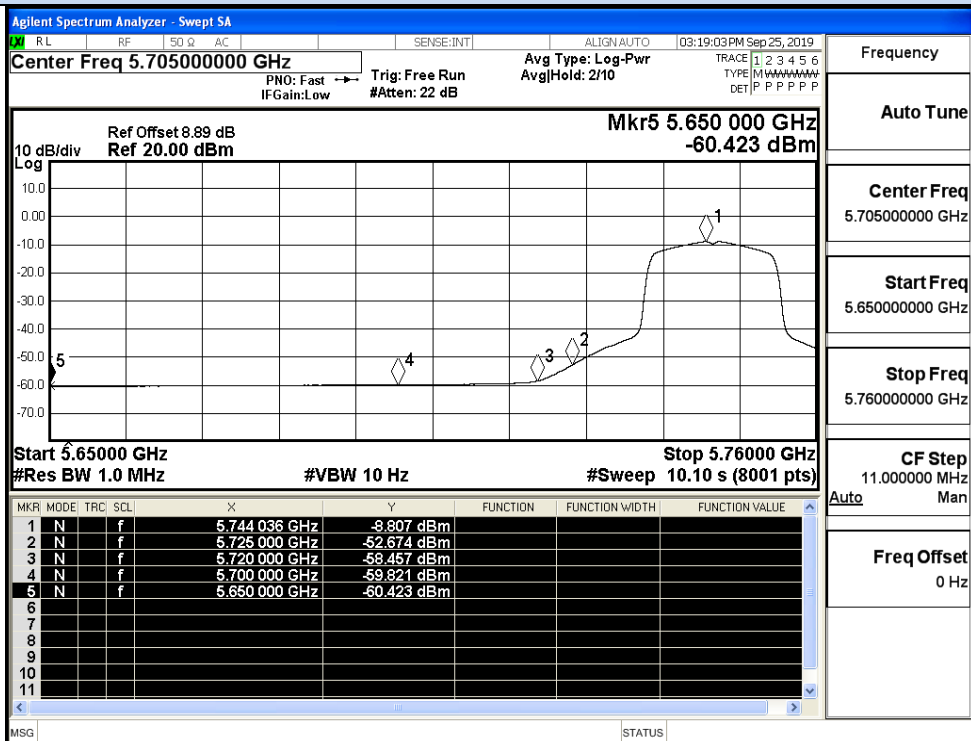
### Ant0

| Test Mode  | Channel | Frequency (MHz) | Conducted Power (dBm) | Antenna Gain (dBi) | EIRP (dBm/MHz) | Detector | Limit (dBm/MHz) | Verdict |
|------------|---------|-----------------|-----------------------|--------------------|----------------|----------|-----------------|---------|
| 11A        | 149     | 5650.0          | -48.13                | 3.00               | -45.13         | Peak     | -27.0           | Pass    |
|            |         | 5650.0          | -60.42                | 3.00               | -57.42         | Average  | -27.0           | Pass    |
|            |         | 5700.0          | -48.31                | 3.00               | -45.31         | Peak     | 10              | Pass    |
|            |         | 5700.0          | -59.82                | 3.00               | -56.82         | Average  | 10              | Pass    |
|            |         | 5720.0          | -40.83                | 3.00               | -37.83         | Peak     | 15.6            | Pass    |
|            |         | 5720.0          | -58.46                | 3.00               | -55.46         | Average  | 15.6            | Pass    |
|            |         | 5725.0          | -33.84                | 3.00               | -30.84         | Peak     | 27.0            | Pass    |
|            |         | 5725.0          | -52.67                | 3.00               | -49.67         | Average  | 27.0            | Pass    |
|            | 165     | 5850.0          | -47.58                | 3.00               | -44.58         | Peak     | 27.0            | Pass    |
|            |         | 5850.0          | -60.02                | 3.00               | -57.02         | Average  | 27.0            | Pass    |
|            |         | 5855.0          | -47.89                | 3.00               | -44.89         | Peak     | 15.6            | Pass    |
|            |         | 5855.0          | -60.13                | 3.00               | -57.13         | Average  | 15.6            | Pass    |
|            |         | 5875.0          | -49.46                | 3.00               | -46.46         | Peak     | 10              | Pass    |
|            |         | 5875.0          | -60.30                | 3.00               | -57.3          | Average  | 10              | Pass    |
|            |         | 5925.0          | -48.97                | 3.00               | -45.97         | Peak     | -27.0           | Pass    |
|            |         | 5925.0          | -60.71                | 3.00               | -57.71         | Average  | -27.0           | Pass    |
| 11N20 SISO | 149     | 5650.0          | -47.58                | 3.00               | -44.58         | Peak     | -27.0           | Pass    |
|            |         | 5650.0          | -60.51                | 3.00               | -57.51         | Average  | -27.0           | Pass    |
|            |         | 5700.0          | -48.10                | 3.00               | -45.1          | Peak     | 10              | Pass    |
|            |         | 5700.0          | -59.39                | 3.00               | -56.39         | Average  | 10              | Pass    |
|            |         | 5720.0          | -46.15                | 3.00               | -43.15         | Peak     | 15.6            | Pass    |
|            |         | 5720.0          | -60.03                | 3.00               | -57.03         | Average  | 15.6            | Pass    |
|            |         | 5725.0          | -42.48                | 3.00               | -39.48         | Peak     | 27.0            | Pass    |
|            |         | 5725.0          | -56.41                | 3.00               | -53.41         | Average  | 27.0            | Pass    |
|            | 165     | 5850.0          | -48.36                | 3.00               | -45.36         | Peak     | 27.0            | Pass    |
|            |         | 5850.0          | -59.94                | 3.00               | -56.94         | Average  | 27.0            | Pass    |
|            |         | 5855.0          | -48.85                | 3.00               | -45.85         | Peak     | 15.6            | Pass    |
|            |         | 5855.0          | -60.14                | 3.00               | -57.14         | Average  | 15.6            | Pass    |
|            |         | 5875.0          | -49.11                | 3.00               | -46.11         | Peak     | 10              | Pass    |
|            |         | 5875.0          | -60.34                | 3.00               | -57.34         | Average  | 10              | Pass    |
|            |         | 5925.0          | -49.09                | 3.00               | -46.09         | Peak     | -27.0           | Pass    |
|            |         | 5925.0          | -60.68                | 3.00               | -57.68         | Average  | -27.0           | Pass    |

## Undesirable Emissions Measurement

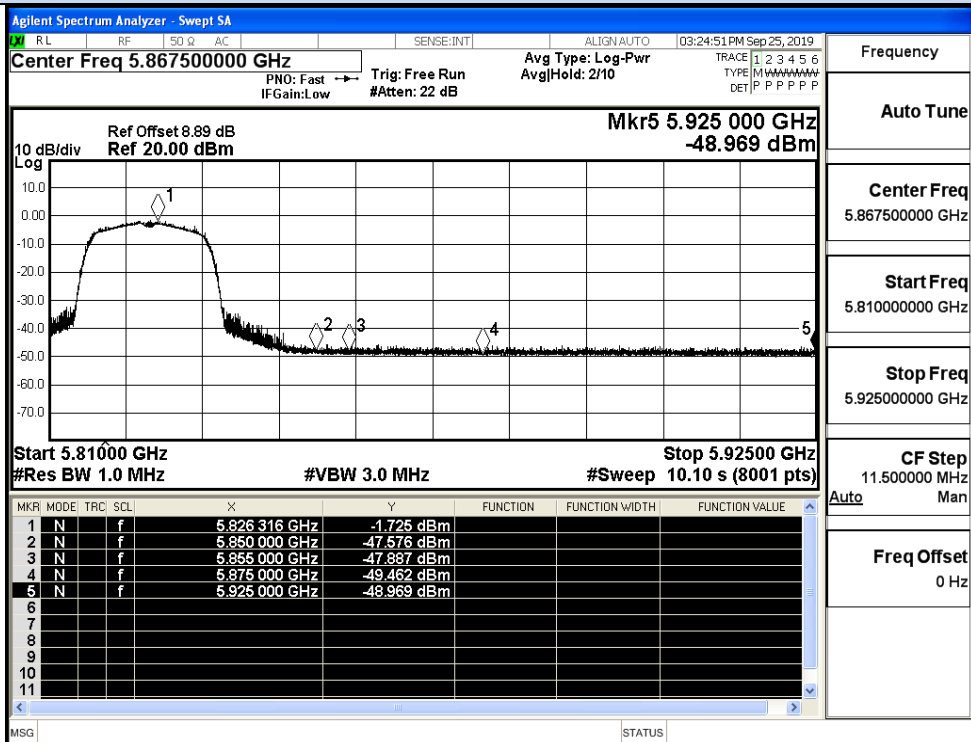


## IEEE 802.11a / Channel 149 / 5745MHz / Peak

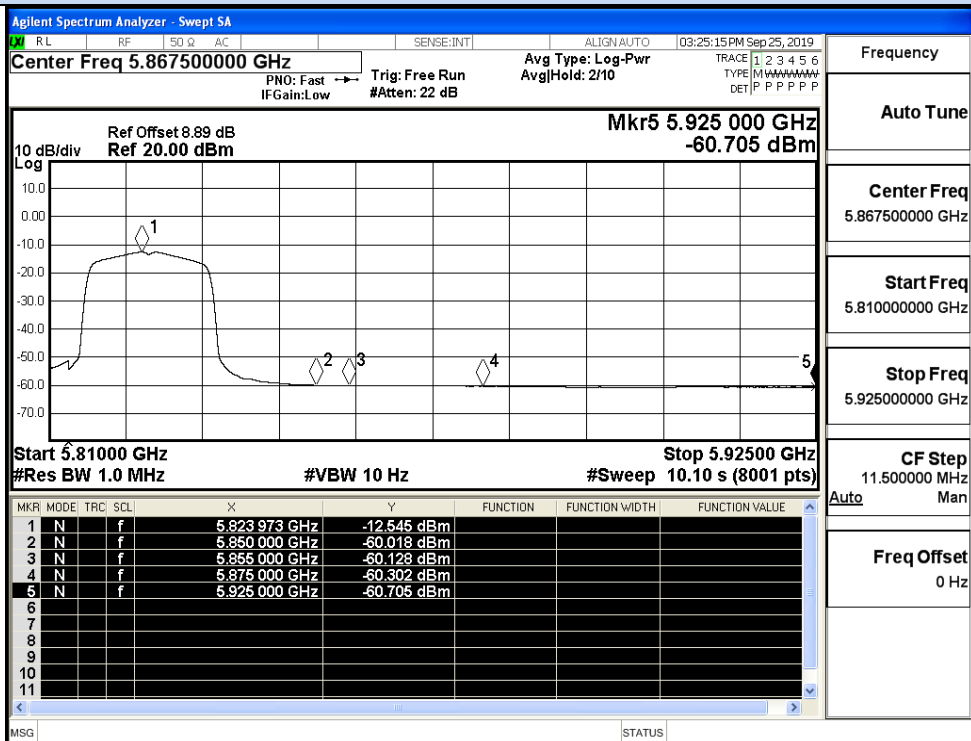


## IEEE 802.11a / Channel 148 / 5745MHz / Average

## Undesirable Emissions Measurement

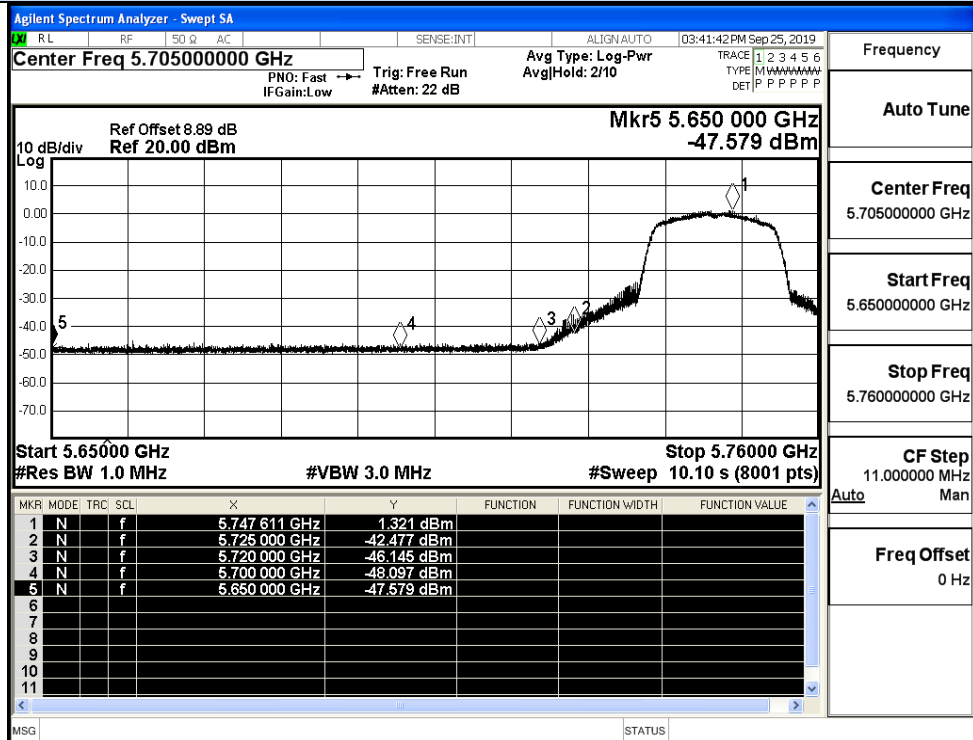


## IEEE 802.11a / Channel 165 / 5825MHz / Peak

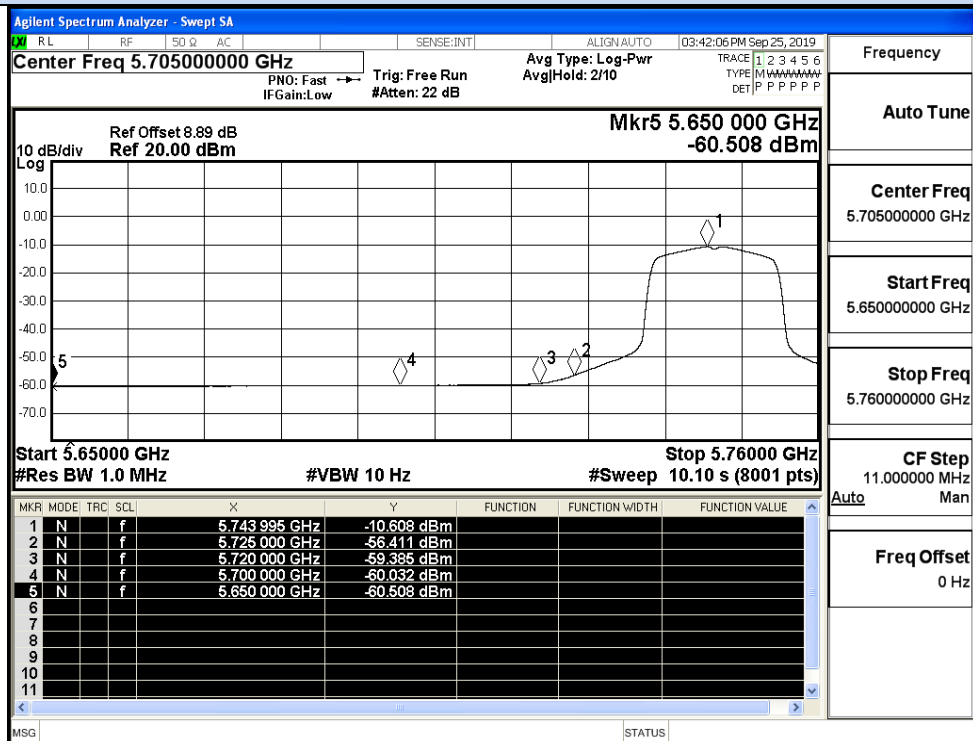


## IEEE 802.11a / Channel 165 / 5825MHz / Average

## Undesirable Emissions Measurement

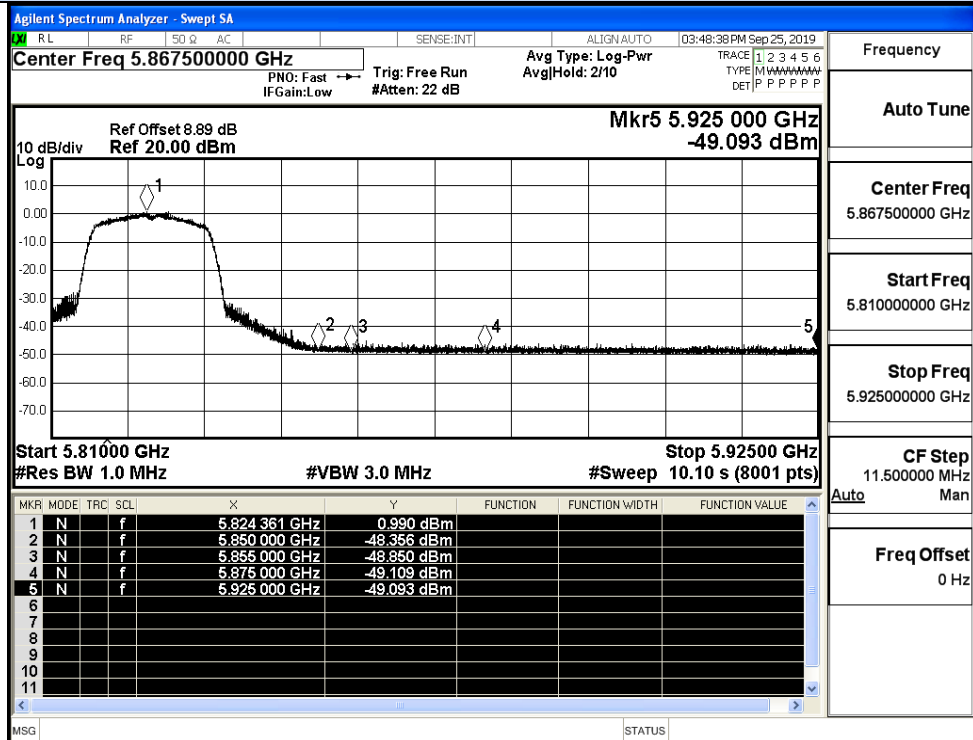


## IEEE 802.11n20 / Channel 149 / 5745MHz / Peak

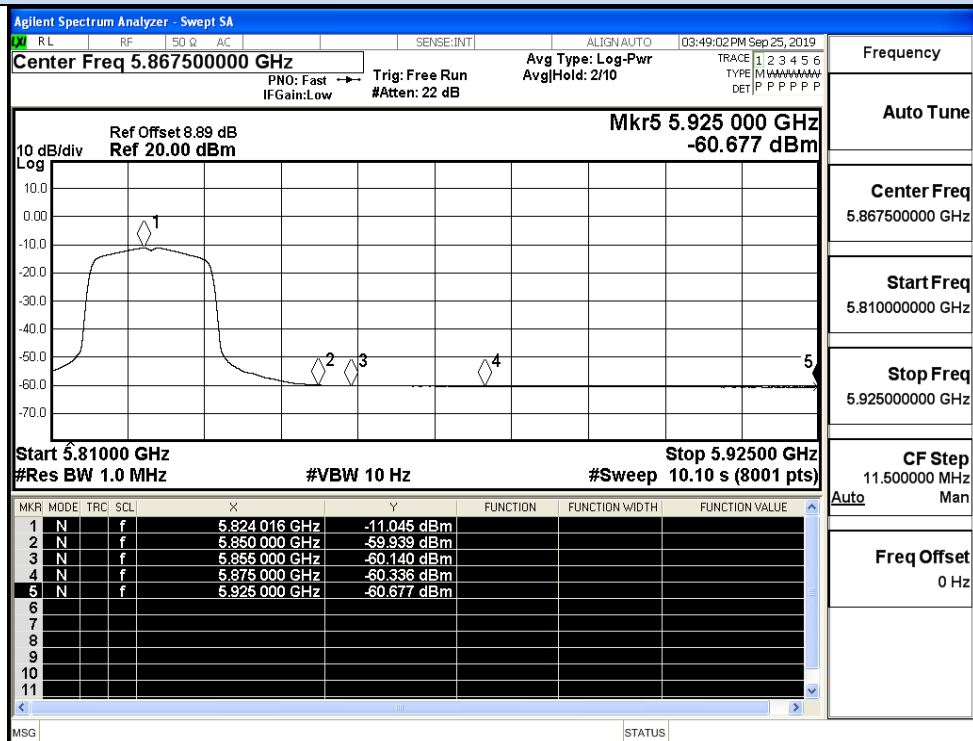


## IEEE 802.11n20 / Channel 149 / 5745MHz / Average

## Undesirable Emissions Measurement



## IEEE 802.11n20 / Channel 165 / 5825MHz / Peak

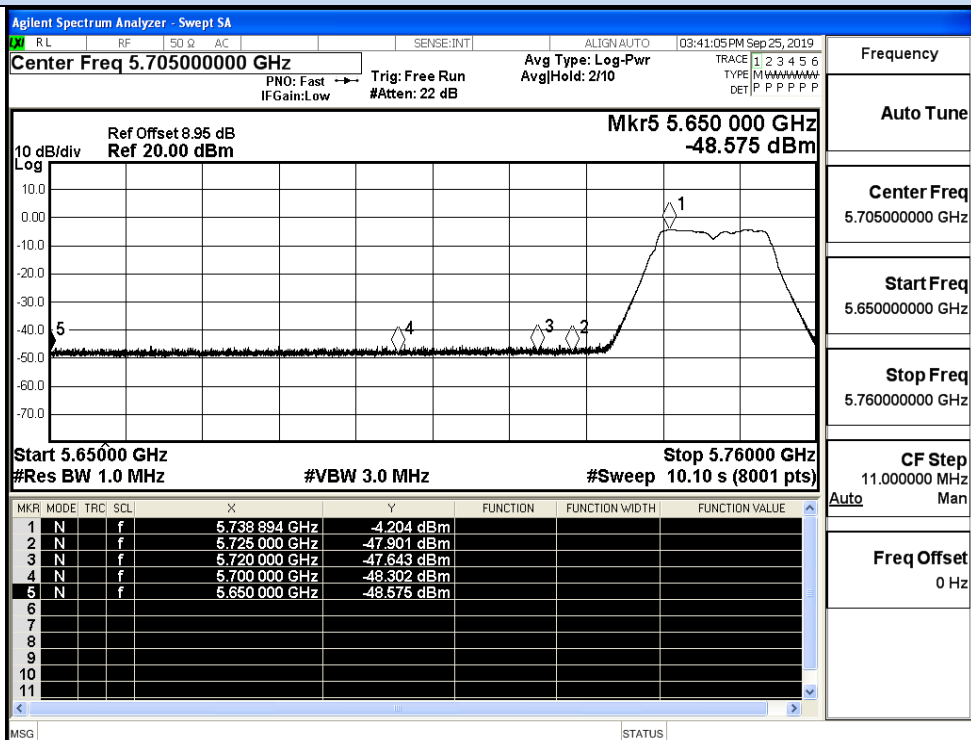


## IEEE 802.11n20 / Channel 165 / 5825MHz / Average

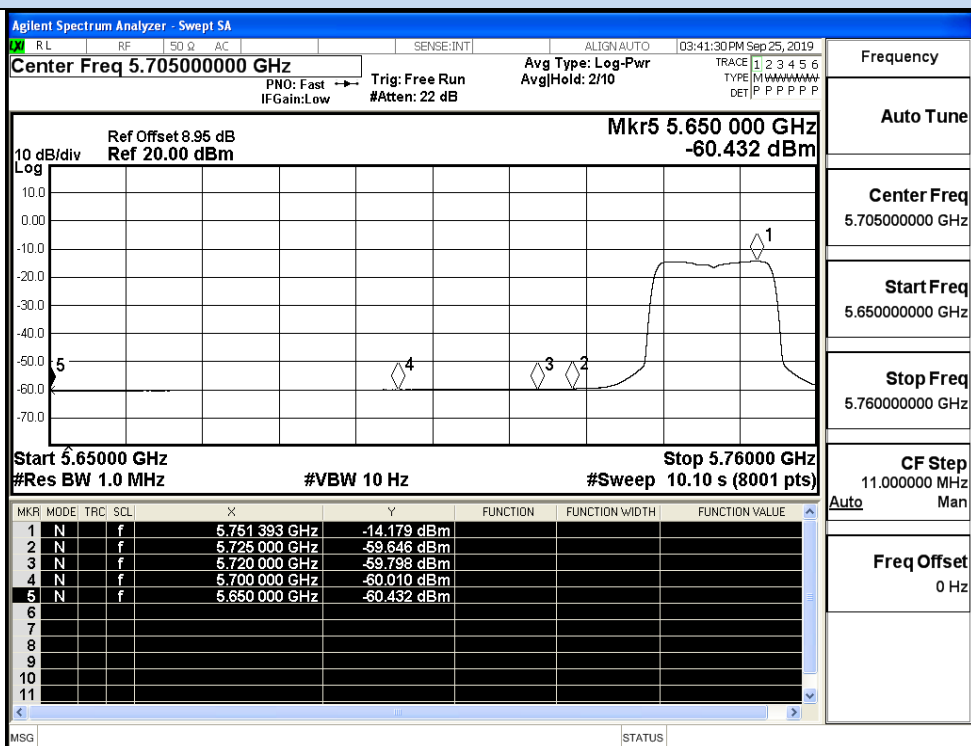
**Ant1**

| Test Mode  | Channel | Frequency (MHz) | Conducted Power (dBm) | Antenna Gain (dBi) | EIRP (dBm/MHz) | Detector | Limit (dBm/MHz) | Verdict |
|------------|---------|-----------------|-----------------------|--------------------|----------------|----------|-----------------|---------|
| 11A        | 149     | 5650.0          | -48.58                | 3.00               | -45.58         | Peak     | -27.0           | Pass    |
|            |         | 5650.0          | -60.43                | 3.00               | -57.43         | Average  | -27.0           | Pass    |
|            |         | 5700.0          | -48.30                | 3.00               | -45.3          | Peak     | 10              | Pass    |
|            |         | 5700.0          | -60.01                | 3.00               | -57.01         | Average  | 10              | Pass    |
|            |         | 5720.0          | -47.64                | 3.00               | -44.64         | Peak     | 15.6            | Pass    |
|            |         | 5720.0          | -59.80                | 3.00               | -56.8          | Average  | 15.6            | Pass    |
|            |         | 5725.0          | -47.90                | 3.00               | -44.9          | Peak     | 27.0            | Pass    |
|            |         | 5725.0          | -59.65                | 3.00               | -56.65         | Average  | 27.0            | Pass    |
|            | 165     | 5850.0          | -46.74                | 3.00               | -43.74         | Peak     | 27.0            | Pass    |
|            |         | 5850.0          | -59.16                | 3.00               | -56.16         | Average  | 27.0            | Pass    |
|            |         | 5855.0          | -47.74                | 3.00               | -44.74         | Peak     | 15.6            | Pass    |
|            |         | 5855.0          | -59.26                | 3.00               | -56.26         | Average  | 15.6            | Pass    |
|            |         | 5875.0          | -47.32                | 3.00               | -44.32         | Peak     | 10              | Pass    |
|            |         | 5875.0          | -59.61                | 3.00               | -56.61         | Average  | 10              | Pass    |
|            |         | 5925.0          | -48.40                | 3.00               | -45.4          | Peak     | -27.0           | Pass    |
|            |         | 5925.0          | -60.09                | 3.00               | -57.09         | Average  | -27.0           | Pass    |
| 11N20 SISO | 149     | 5650.0          | -48.69                | 3.00               | -45.69         | Peak     | -27.0           | Pass    |
|            |         | 5650.0          | -60.40                | 3.00               | -57.4          | Average  | -27.0           | Pass    |
|            |         | 5700.0          | -47.90                | 3.00               | -44.9          | Peak     | 10              | Pass    |
|            |         | 5700.0          | -59.77                | 3.00               | -56.77         | Average  | 10              | Pass    |
|            |         | 5720.0          | -47.89                | 3.00               | -44.89         | Peak     | 15.6            | Pass    |
|            |         | 5720.0          | -60.02                | 3.00               | -57.02         | Average  | 15.6            | Pass    |
|            |         | 5725.0          | -47.64                | 3.00               | -44.64         | Peak     | 27.0            | Pass    |
|            |         | 5725.0          | -59.62                | 3.00               | -56.62         | Average  | 27.0            | Pass    |
|            | 165     | 5850.0          | -47.52                | 3.00               | -44.52         | Peak     | 27.0            | Pass    |
|            |         | 5850.0          | -59.14                | 3.00               | -56.14         | Average  | 27.0            | Pass    |
|            |         | 5855.0          | -47.53                | 3.00               | -44.53         | Peak     | 15.6            | Pass    |
|            |         | 5855.0          | -59.28                | 3.00               | -56.28         | Average  | 15.6            | Pass    |
|            |         | 5875.0          | -46.75                | 3.00               | -43.75         | Peak     | 10              | Pass    |
|            |         | 5875.0          | -59.61                | 3.00               | -56.61         | Average  | 10              | Pass    |
|            |         | 5925.0          | -48.35                | 3.00               | -45.35         | Peak     | -27.0           | Pass    |
|            |         | 5925.0          | -60.09                | 3.00               | -57.09         | Average  | -27.0           | Pass    |

## Undesirable Emissions Measurement

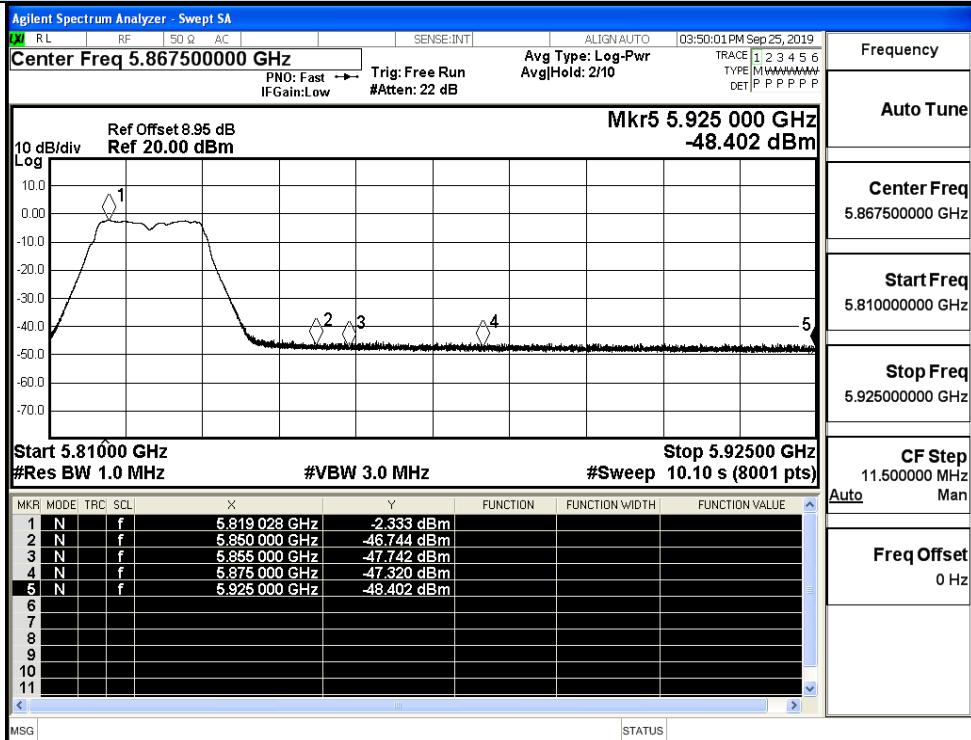


## IEEE 802.11a / Channel 149 / 5745MHz / Peak

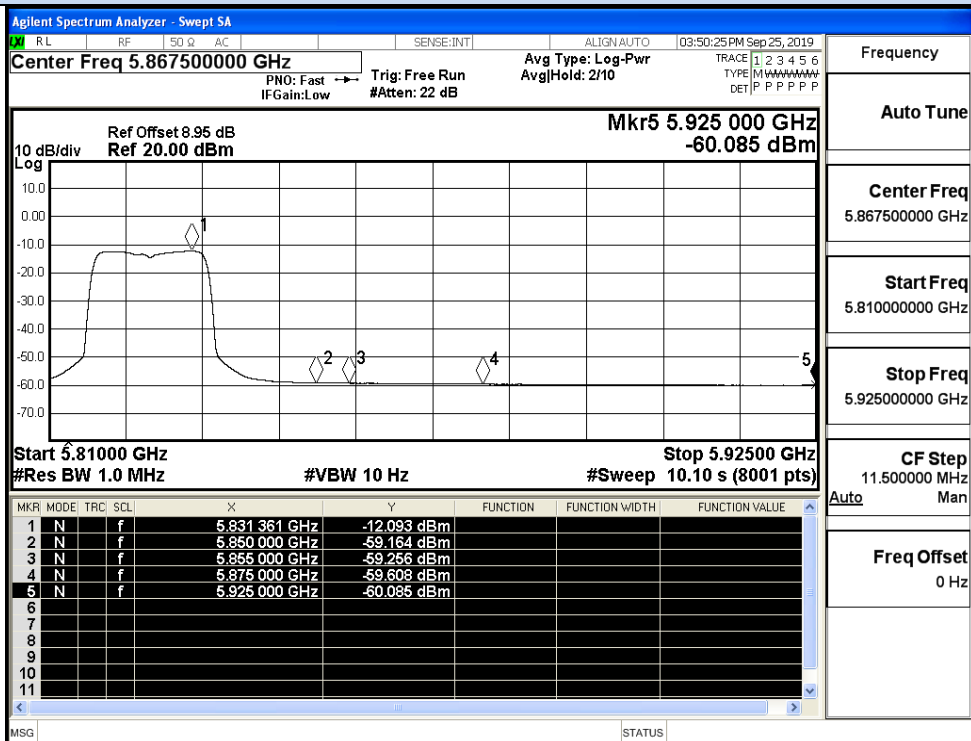


## IEEE 802.11a / Channel 148 / 5745MHz / Average

## Undesirable Emissions Measurement

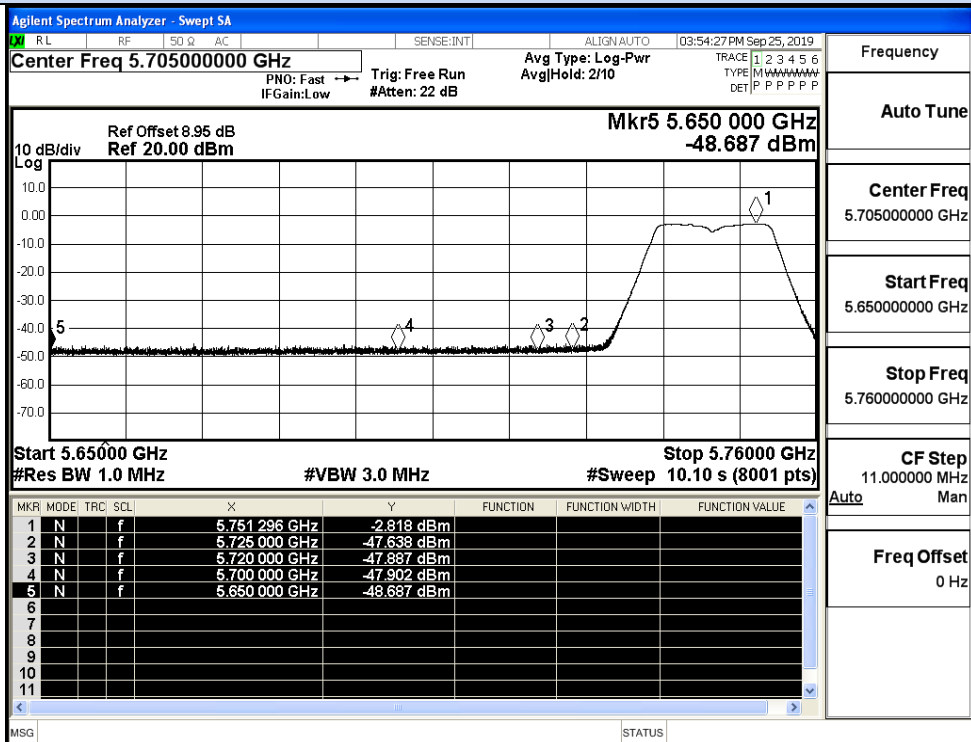


## IEEE 802.11a / Channel 165 / 5825MHz / Peak

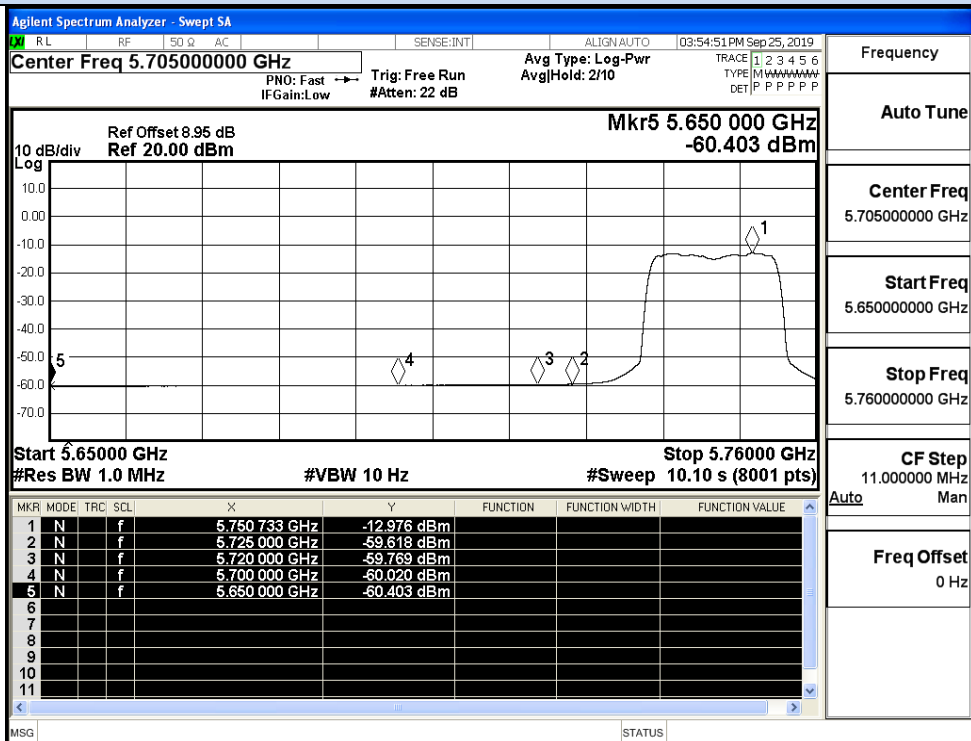


## IEEE 802.11a / Channel 165 / 5825MHz / Average

## Undesirable Emissions Measurement

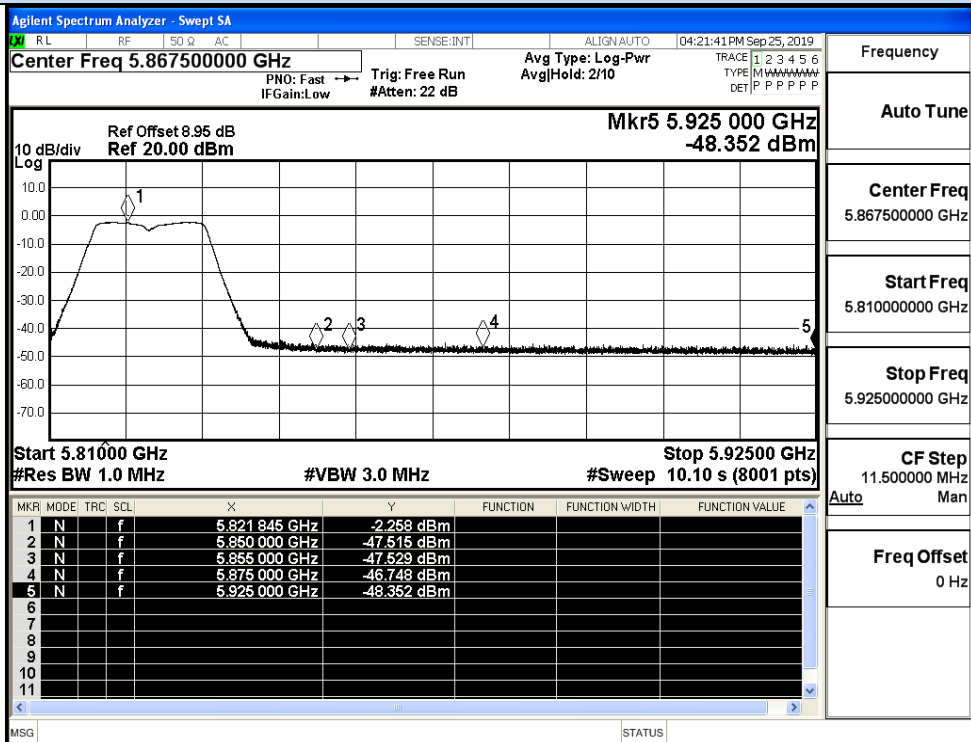


## IEEE 802.11n20 / Channel 149 / 5745MHz / Peak

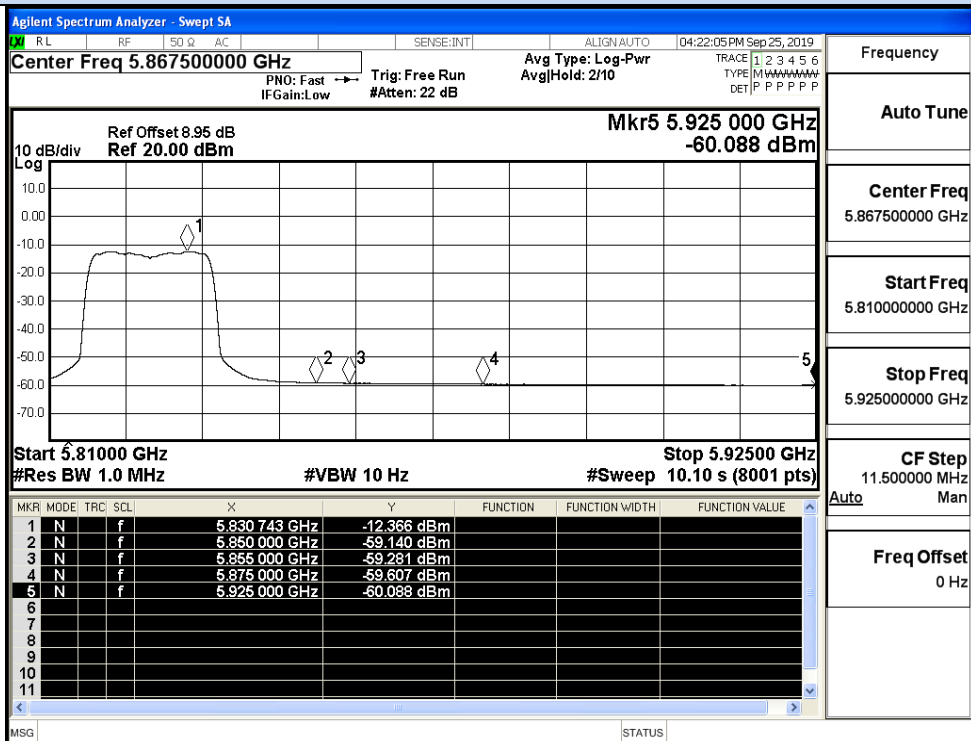


## IEEE 802.11n20 / Channel 149 / 5745MHz / Average

## Undesirable Emissions Measurement



## IEEE 802.11n20 / Channel 165 / 5825MHz / Peak



## IEEE 802.11n20 / Channel 165 / 5825MHz / Average

**Ant0+1**

| Test Mode  | Channel | Frequency (MHz) | ANT 0 Conducted Power (dBm) | ANT 1 Conducted Power (dBm) | ANT 0-1 Conducted Power (dBm) | Antenna Gain (dBi) | EIRP (dBm/MHz) | Detector | Limit (dBm/MHz) | Verdict |
|------------|---------|-----------------|-----------------------------|-----------------------------|-------------------------------|--------------------|----------------|----------|-----------------|---------|
| 11N20 SISO | 149     | 5650.0          | -47.58                      | -48.69                      | -45.09                        | 6.01               | -39.08         | Peak     | -27.0           | Pass    |
|            |         | 5650.0          | -60.51                      | -60.40                      | -57.44                        | 6.01               | -51.43         | Average  | -27.0           | Pass    |
|            |         | 5700.0          | -48.10                      | -47.90                      | -44.99                        | 6.01               | -38.98         | Peak     | 10              | Pass    |
|            |         | 5700.0          | -59.39                      | -59.77                      | -56.57                        | 6.01               | -50.56         | Average  | 10              | Pass    |
|            |         | 5720.0          | -46.15                      | -47.89                      | -43.92                        | 6.01               | -37.91         | Peak     | 15.6            | Pass    |
|            |         | 5720.0          | -60.03                      | -60.02                      | -57.01                        | 6.01               | -51.00         | Average  | 15.6            | Pass    |
|            |         | 5725.0          | -42.48                      | -47.64                      | -41.32                        | 6.01               | -35.31         | Peak     | 27.0            | Pass    |
|            | 165     | 5725.0          | -56.41                      | -59.62                      | -54.71                        | 6.01               | -48.70         | Average  | 27.0            | Pass    |
|            |         | 5850.0          | -48.36                      | -47.52                      | -44.91                        | 6.01               | -38.90         | Peak     | 27.0            | Pass    |
|            |         | 5850.0          | -59.94                      | -59.14                      | -56.51                        | 6.01               | -50.50         | Average  | 27.0            | Pass    |
|            |         | 5855.0          | -48.85                      | -47.53                      | -45.13                        | 6.01               | -39.12         | Peak     | 15.6            | Pass    |
|            |         | 5855.0          | -60.14                      | -59.28                      | -56.68                        | 6.01               | -50.67         | Average  | 15.6            | Pass    |
|            |         | 5875.0          | -49.11                      | -46.75                      | -44.76                        | 6.01               | -38.75         | Peak     | 10              | Pass    |
|            |         | 5875.0          | -60.34                      | -59.61                      | -56.95                        | 6.01               | -50.94         | Average  | 10              | Pass    |
|            |         | 5925.0          | -49.09                      | -48.35                      | -45.69                        | 6.01               | -39.68         | Peak     | -27.0           | Pass    |
|            |         | 5925.0          | -60.68                      | -60.09                      | -57.36                        | 6.01               | -51.35         | Average  | -27.0           | Pass    |

$EIRP(dBm/MHz) = \text{Conducted Power (dBm)} + \text{Antenna Gain (dBi)}$

The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 3.00dBi, whichever is greater

Directional gain=3.00dBi+10 log (2) = 6.01dBi