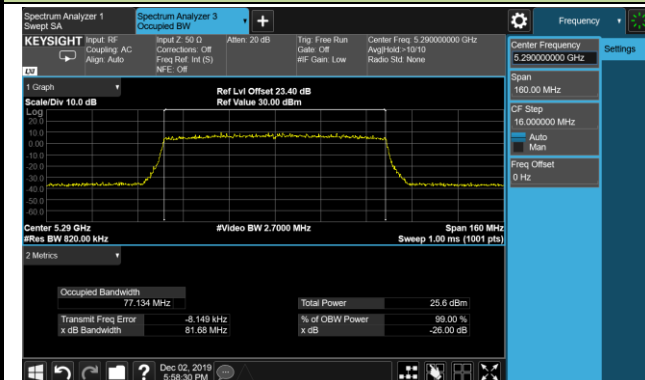
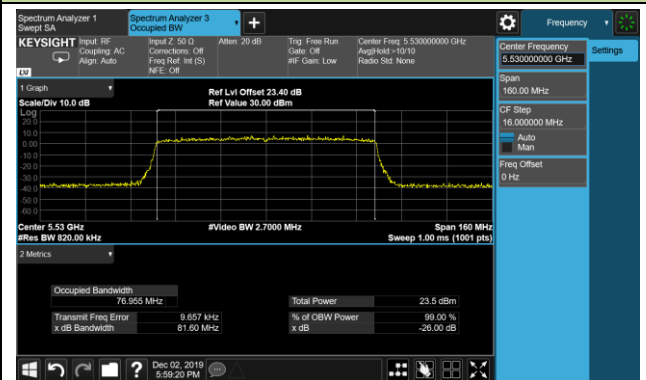


# 802.11ax-HE80 26dB Bandwidth & 99% Bandwidth - Ant 0 / Ant 0 + 1 + 2 + 3

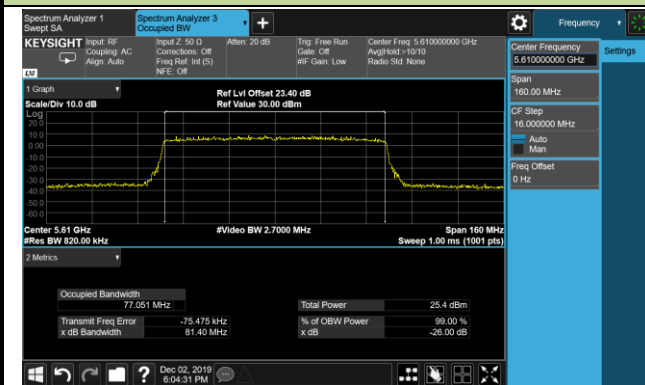
## Channel 58 (5290MHz)



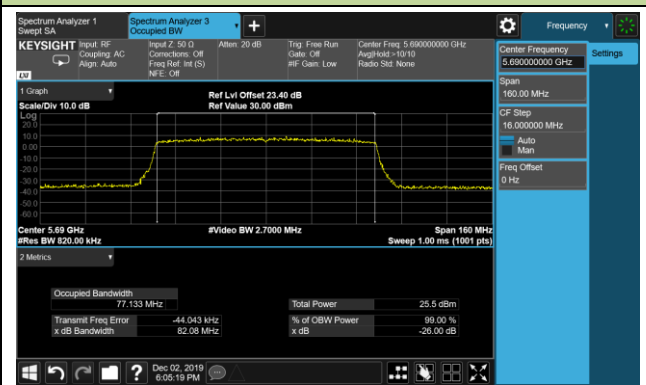
## Channel 106 (5530MHz)



## Channel 122 (5610MHz)

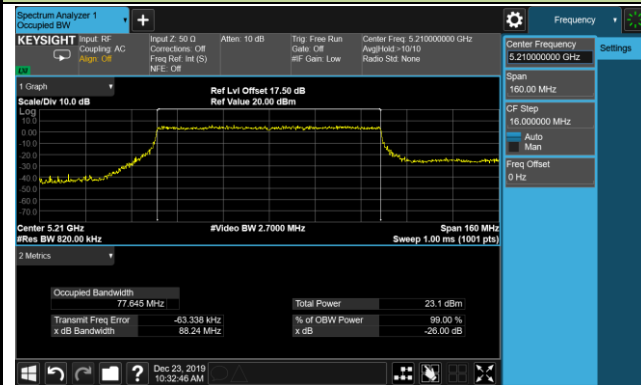


## Channel 138 (5690MHz)

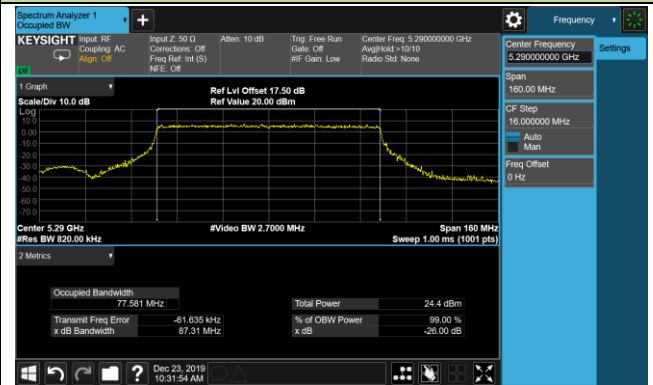


### 802.11ax-HE80+80 Contiguous 26dB Bandwidth & 99% Bandwidth - Ant 0 + 1 + 2 + 3

#### Channel 42 (5210MHz)



#### Channel 58 (5290MHz)

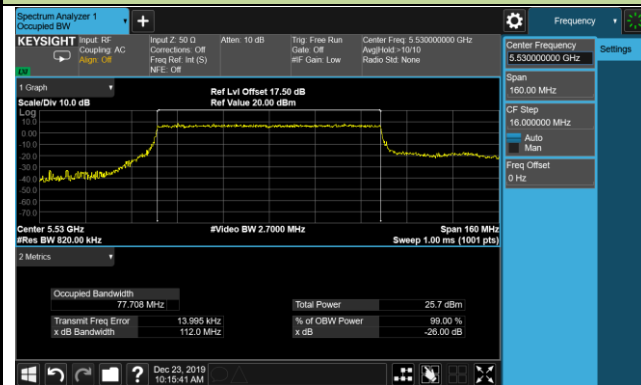


Note: 26dB OCW =  $[5290 + (87.31/2)] - [5210 - (88.24/2)] = 167.78$  MHz

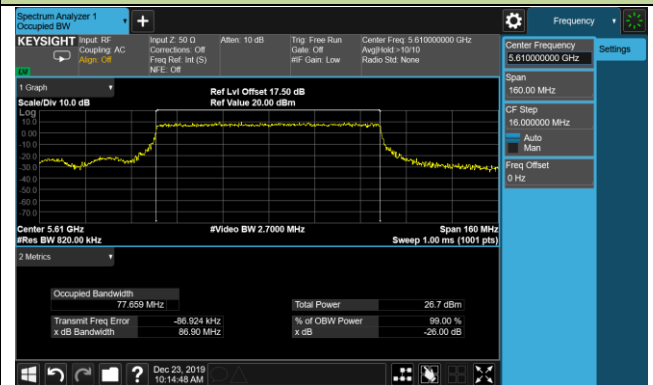
99% OCW =  $[5290 + (77.58/2)] - [5210 - (77.65/2)] = 157.62$  MHz

### 802.11ax-HE80+80 Contiguous 26dB Bandwidth & 99% Bandwidth - Ant 0 + 1 + 2 + 3

#### Channel 106 (5530MHz)



#### Channel 122 (5610MHz)



Note: 26dB OCW =  $[5610 + (86.90/2)] - [5530 - (112.0/2)] = 179.45$  MHz

99% OCW =  $[5610 + (77.66/2)] - [5530 - (77.71/2)] = 157.68$  MHz

### 7.3. 6dB Bandwidth Measurement

#### 7.3.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

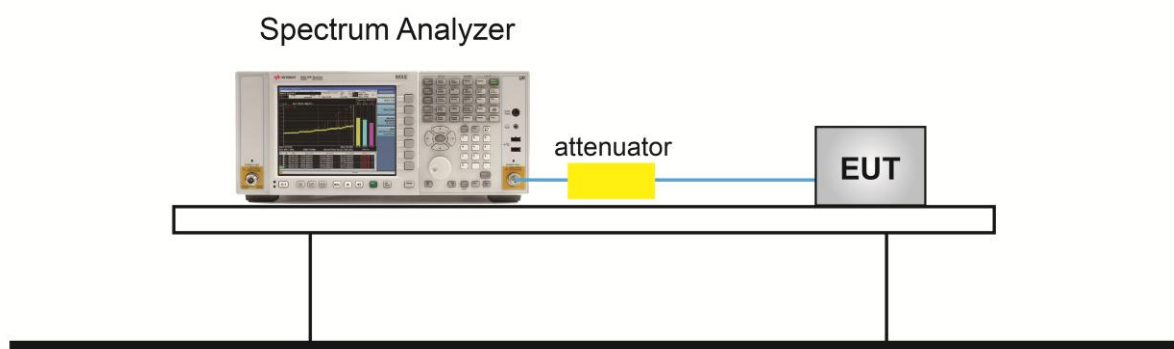
#### 7.3.2. Test Procedure used

ANSI C63.10-2013 - Section 6.9.2

#### 7.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW  $\geq 3 \times$  RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. 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.

#### 7.3.4. Test Setup



#### 7.3.5. Test Result

Not Applicable.

## 7.4. Output Power Measurement

### 7.4.1. Test Limit

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.

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

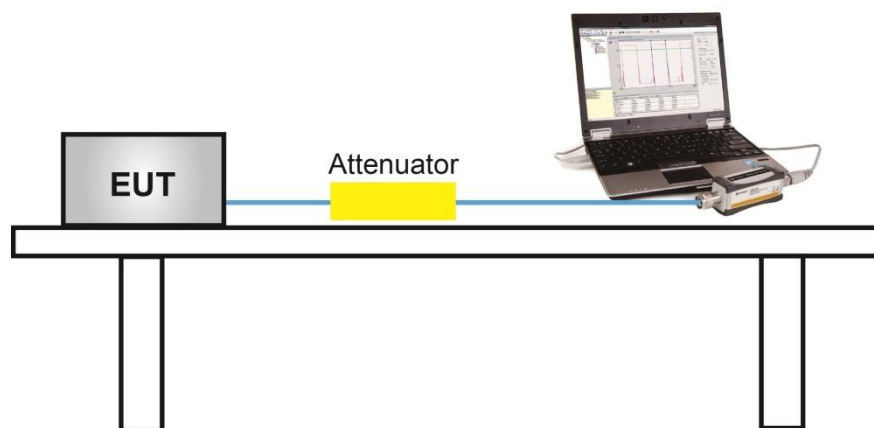
### 7.4.2. Test Procedure Used

KDB 789033 D02v02r01 - Section E) 3) b) Method PM-G

### 7.4.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

### 7.4.4. Test Setup



#### 7.4.5. Test Result

Power output test was verified over all data rates of each mode shown as below table, and then choose the maximum power output (yellow marker) for final test of each channel.

For Ant 0 / Ant 0 + 1 + 2 + 3 port:

| Test Mode | Bandwidth           | Channel | Frequency (MHz) | Data Rate/ MCS | Average Power (dBm) |
|-----------|---------------------|---------|-----------------|----------------|---------------------|
| 802.11a   | 20                  | 60      | 5320            | 6Mbps          | 16.93               |
|           |                     |         |                 | 24Mbps         | 16.73               |
|           |                     |         |                 | 54Mbps         | 16.57               |
| 802.11n   | 20                  | 60      | 5320            | MCS0           | 17.39               |
|           |                     |         |                 | MCS3           | 17.11               |
|           |                     |         |                 | MCS7           | 16.93               |
| 802.11n   | 40                  | 62      | 5310            | MCS0           | 17.30               |
|           |                     |         |                 | MCS3           | 17.18               |
|           |                     |         |                 | MCS7           | 16.94               |
| 802.11ac  | 20                  | 60      | 5320            | MCS0           | 17.32               |
|           |                     |         |                 | MCS4           | 17.10               |
|           |                     |         |                 | MCS8           | 16.87               |
| 802.11ac  | 40                  | 62      | 5310            | MCS0           | 17.20               |
|           |                     |         |                 | MCS4           | 16.98               |
|           |                     |         |                 | MCS9           | 16.74               |
| 802.11ac  | 80                  | 58      | 5290            | MCS0           | 17.16               |
|           |                     |         |                 | MCS4           | 16.86               |
|           |                     |         |                 | MCS9           | 16.63               |
| 802.11ac  | 80+80<br>Contiguous | 106     | 5530            | MCS0           | 15.04               |
|           |                     |         |                 | MCS4           | 14.87               |
|           |                     |         |                 | MCS9           | 14.62               |
| 802.11ax  | 20                  | 60      | 5320            | MCS0           | 17.12               |
|           |                     |         |                 | MCS4           | 16.92               |
|           |                     |         |                 | MCS11          | 16.79               |
| 802.11ax  | 40                  | 62      | 5310            | MCS0           | 17.46               |
|           |                     |         |                 | MCS4           | 17.21               |
|           |                     |         |                 | MCS11          | 17.03               |
| 802.11ax  | 80                  | 58      | 5290            | MCS0           | 17.40               |
|           |                     |         |                 | MCS4           | 17.18               |
|           |                     |         |                 | MCS11          | 17.03               |

|          |                     |     |      |       |       |
|----------|---------------------|-----|------|-------|-------|
| 802.11ax | 80+80<br>Contiguous | 106 | 5530 | MCS0  | 15.30 |
|          |                     |     |      | MCS4  | 15.14 |
|          |                     |     |      | MCS11 | 14.89 |

|               |                   |                   |                         |
|---------------|-------------------|-------------------|-------------------------|
| Product       | GigaSpire         | Temperature       | 23 ~ 25°C               |
| Test Engineer | Bacon Dong        | Relative Humidity | 49 ~ 58%                |
| Test Site     | TR3               | Test Date         | 2019/12/02 ~ 2019/12/17 |
| Test Item     | Output Power Test |                   |                         |

| Test Mode             | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0<br>Average Power (dBm) | Ant 1<br>Average Power (dBm) | Ant 2<br>Average Power (dBm) | Ant 3<br>Average Power (dBm) | Total<br>Average Power (dBm) | Average Power Limit (dBm) | Result |
|-----------------------|-------------------|-------------|-------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|---------------------------|--------|
| Non Beam-Forming mode |                   |             |             |                              |                              |                              |                              |                              |                           |        |
| 11a                   | 6Mbps             | 52          | 5260        | 16.59                        | 16.65                        | 16.64                        | 16.22                        | 22.55                        | ≤ 23.79                   | Pass   |
| 11a                   | 6Mbps             | 60          | 5300        | 17.00                        | 16.82                        | 17.07                        | 16.64                        | 22.91                        | ≤ 23.79                   | Pass   |
| 11a                   | 6Mbps             | 64          | 5320        | 16.93                        | 17.06                        | 17.23                        | 16.89                        | 23.05                        | ≤ 23.79                   | Pass   |
| 11a                   | 6Mbps             | 100         | 5500        | 17.35                        | 16.79                        | 16.33                        | 16.25                        | 22.72                        | ≤ 23.79                   | Pass   |
| 11a                   | 6Mbps             | 120         | 5600        | 17.62                        | 16.82                        | 16.86                        | 16.75                        | 23.05                        | ≤ 23.79                   | Pass   |
| 11a                   | 6Mbps             | 140         | 5700        | 17.21                        | 16.86                        | 17.18                        | 17.53                        | 23.22                        | ≤ 23.79                   | Pass   |
| 11a                   | 6Mbps             | 144         | 5720        | 16.91                        | 16.65                        | 17.20                        | 17.20                        | 23.02                        | ≤ 23.79                   | Pass   |
| 11n-HT20              | MCS0              | 52          | 5260        | 17.45                        | 17.51                        | 17.59                        | 16.97                        | 23.41                        | ≤ 23.98                   | Pass   |
| 11n-HT20              | MCS0              | 60          | 5300        | 17.35                        | 17.14                        | 17.43                        | 16.87                        | 23.22                        | ≤ 23.98                   | Pass   |
| 11n-HT20              | MCS0              | 64          | 5320        | 17.39                        | 17.36                        | 17.58                        | 17.09                        | 23.38                        | ≤ 23.98                   | Pass   |
| 11n-HT20              | MCS0              | 100         | 5500        | 18.03                        | 17.29                        | 16.65                        | 16.78                        | 23.24                        | ≤ 23.98                   | Pass   |
| 11n-HT20              | MCS0              | 120         | 5600        | 18.16                        | 17.30                        | 17.14                        | 17.19                        | 23.49                        | ≤ 23.98                   | Pass   |
| 11n-HT20              | MCS0              | 140         | 5700        | 17.59                        | 17.30                        | 17.46                        | 17.80                        | 23.56                        | ≤ 23.98                   | Pass   |
| 11n-HT20              | MCS0              | 144         | 5720        | 17.24                        | 17.03                        | 17.55                        | 17.57                        | 23.37                        | ≤ 23.98                   | Pass   |
| 11n-HT40              | MCS0              | 54          | 5270        | 17.40                        | 17.24                        | 17.54                        | 17.62                        | 23.47                        | ≤ 23.98                   | Pass   |
| 11n-HT40              | MCS0              | 62          | 5310        | 17.30                        | 17.18                        | 17.87                        | 17.64                        | 23.53                        | ≤ 23.98                   | Pass   |
| 11n-HT40              | MCS0              | 102         | 5510        | 17.49                        | 16.98                        | 17.31                        | 17.33                        | 23.30                        | ≤ 23.98                   | Pass   |
| 11n-HT40              | MCS0              | 118         | 5590        | 17.17                        | 17.30                        | 17.22                        | 17.67                        | 23.37                        | ≤ 23.98                   | Pass   |
| 11n-HT40              | MCS0              | 134         | 5670        | 17.08                        | 17.39                        | 17.37                        | 17.68                        | 23.41                        | ≤ 23.98                   | Pass   |
| 11n-HT40              | MCS0              | 142         | 5710        | 17.22                        | 17.63                        | 17.67                        | 18.03                        | 23.67                        | ≤ 23.98                   | Pass   |
| 11ac-VHT20            | MCS0              | 52          | 5260        | 17.42                        | 17.37                        | 17.72                        | 17.74                        | 23.59                        | ≤ 23.98                   | Pass   |
| 11ac-VHT20            | MCS0              | 60          | 5300        | 17.53                        | 17.38                        | 17.99                        | 17.80                        | 23.70                        | ≤ 23.98                   | Pass   |
| 11ac-VHT20            | MCS0              | 64          | 5320        | 17.32                        | 17.14                        | 17.86                        | 17.80                        | 23.56                        | ≤ 23.98                   | Pass   |
| 11ac-VHT20            | MCS0              | 100         | 5500        | 17.72                        | 17.31                        | 17.68                        | 17.69                        | 23.62                        | ≤ 23.98                   | Pass   |
| 11ac-VHT20            | MCS0              | 120         | 5600        | 17.19                        | 17.04                        | 17.21                        | 17.61                        | 23.29                        | ≤ 23.98                   | Pass   |
| 11ac-VHT20            | MCS0              | 140         | 5700        | 17.03                        | 17.30                        | 17.62                        | 17.80                        | 23.47                        | ≤ 23.98                   | Pass   |
| 11ac-VHT20            | MCS0              | 144         | 5720        | 16.88                        | 17.42                        | 17.38                        | 17.60                        | 23.35                        | ≤ 23.98                   | Pass   |

| Test Mode                          | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0<br>Average Power<br>(dBm) | Ant 1<br>Average Power<br>(dBm) | Ant 2<br>Average Power<br>(dBm) | Ant 3<br>Average Power<br>(dBm) | Total<br>Average Power<br>(dBm) | Average Power Limit<br>(dBm) | Result |
|------------------------------------|-------------------|-------------|-------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|------------------------------|--------|
| Non Beam-Forming mode              |                   |             |             |                                 |                                 |                                 |                                 |                                 |                              |        |
| 11ac-VHT40                         | MCS0              | 54          | 5270        | 17.23                           | 17.21                           | 17.52                           | 17.49                           | 23.39                           | ≤ 23.98                      | Pass   |
| 11ac-VHT40                         | MCS0              | 62          | 5310        | 17.20                           | 17.20                           | 17.78                           | 17.64                           | 23.48                           | ≤ 23.98                      | Pass   |
| 11ac-VHT40                         | MCS0              | 102         | 5510        | 17.68                           | 17.35                           | 17.79                           | 17.81                           | 23.68                           | ≤ 23.98                      | Pass   |
| 11ac-VHT40                         | MCS0              | 118         | 5590        | 17.33                           | 17.39                           | 17.25                           | 17.73                           | 23.45                           | ≤ 23.98                      | Pass   |
| 11ac-VHT40                         | MCS0              | 134         | 5670        | 17.09                           | 17.61                           | 17.52                           | 17.77                           | 23.53                           | ≤ 23.98                      | Pass   |
| 11ac-VHT40                         | MCS0              | 142         | 5710        | 16.94                           | 17.30                           | 17.12                           | 17.58                           | 23.26                           | ≤ 23.98                      | Pass   |
| 11ac-VHT80                         | MCS0              | 58          | 5290        | 17.16                           | 17.09                           | 17.66                           | 17.56                           | 23.40                           | ≤ 23.98                      | Pass   |
| 11ac-VHT80                         | MCS0              | 106         | 5530        | 17.29                           | 17.15                           | 17.31                           | 17.38                           | 23.30                           | ≤ 23.98                      | Pass   |
| 11ac-VHT80                         | MCS0              | 122         | 5610        | 17.47                           | 17.20                           | 17.25                           | 17.72                           | 23.44                           | ≤ 23.98                      | Pass   |
| 11ac-VHT80                         | MCS0              | 138         | 5690        | 17.13                           | 17.48                           | 17.62                           | 17.98                           | 23.58                           | ≤ 23.98                      | Pass   |
| 11ac-VHT80+80<br>(Contiguous mode) | MCS0              | 42          | 5210        | 15.5                            | 15.12                           | --                              | --                              | 18.32                           | ≤ 30.00                      | Pass   |
|                                    | MCS0              | 58          | 5290        | --                              | --                              | 15.87                           | 15.69                           | 18.79                           | ≤ 23.98                      | Pass   |
| 11ac-VHT80+80<br>(Contiguous mode) | MCS0              | 106         | 5530        | 15.14                           | 15.18                           | --                              | --                              | 21.26                           | ≤ 23.98                      | Pass   |
|                                    | MCS0              | 122         | 5610        | --                              | --                              | 15.58                           | 15.04                           |                                 |                              |        |
| 11ax-HE20                          | MCS0              | 52          | 5260        | 17.24                           | 16.96                           | 17.54                           | 17.38                           | 23.31                           | ≤ 23.98                      | Pass   |
| 11ax-HE20                          | MCS0              | 60          | 5300        | 17.36                           | 17.17                           | 17.77                           | 17.62                           | 23.51                           | ≤ 23.98                      | Pass   |
| 11ax-HE20                          | MCS0              | 64          | 5320        | 17.12                           | 16.98                           | 17.57                           | 17.58                           | 23.34                           | ≤ 23.98                      | Pass   |
| 11ax-HE20                          | MCS0              | 100         | 5500        | 17.42                           | 16.74                           | 17.46                           | 17.59                           | 23.34                           | ≤ 23.98                      | Pass   |
| 11ax-HE20                          | MCS0              | 120         | 5600        | 17.35                           | 17.45                           | 17.47                           | 17.63                           | 23.50                           | ≤ 23.98                      | Pass   |
| 11ax-HE20                          | MCS0              | 140         | 5700        | 17.30                           | 17.79                           | 17.77                           | 18.04                           | 23.75                           | ≤ 23.98                      | Pass   |
| 11ax-HE20                          | MCS0              | 144         | 5720        | 17.08                           | 17.48                           | 17.74                           | 17.74                           | 23.54                           | ≤ 23.98                      | Pass   |
| 11ax-HE40                          | MCS0              | 54          | 5270        | 17.35                           | 17.37                           | 17.65                           | 17.72                           | 23.55                           | ≤ 23.98                      | Pass   |
| 11ax-HE40                          | MCS0              | 62          | 5310        | 17.46                           | 17.35                           | 17.92                           | 17.72                           | 23.64                           | ≤ 23.98                      | Pass   |
| 11ax-HE40                          | MCS0              | 102         | 5510        | 17.72                           | 17.23                           | 17.37                           | 17.47                           | 23.47                           | ≤ 23.98                      | Pass   |
| 11ax-HE40                          | MCS0              | 118         | 5590        | 17.71                           | 17.47                           | 17.32                           | 17.89                           | 23.62                           | ≤ 23.98                      | Pass   |
| 11ax-HE40                          | MCS0              | 134         | 5670        | 17.29                           | 17.62                           | 17.58                           | 17.90                           | 23.62                           | ≤ 23.98                      | Pass   |
| 11ax-HE40                          | MCS0              | 142         | 5710        | 17.03                           | 17.49                           | 17.40                           | 17.79                           | 23.46                           | ≤ 23.98                      | Pass   |
| 11ax-HE80                          | MCS0              | 58          | 5290        | 17.40                           | 17.28                           | 17.92                           | 17.65                           | 23.59                           | ≤ 23.98                      | Pass   |
| 11ax-HE80                          | MCS0              | 106         | 5530        | 17.85                           | 17.33                           | 17.56                           | 17.65                           | 23.62                           | ≤ 23.98                      | Pass   |
| 11ax-HE80                          | MCS0              | 122         | 5610        | 17.56                           | 17.59                           | 17.52                           | 18.03                           | 23.70                           | ≤ 23.98                      | Pass   |
| 11ax-HE80                          | MCS0              | 138         | 5690        | 17.04                           | 17.50                           | 17.49                           | 17.88                           | 23.51                           | ≤ 23.98                      | Pass   |

| Test Mode                         | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 Average Power (dBm) | Ant 1 Average Power (dBm) | Ant 2 Average Power (dBm) | Ant 3 Average Power (dBm) | Total Average Power (dBm) | Average Power Limit (dBm) | Result |
|-----------------------------------|-------------------|-------------|-------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------|
| Non Beam-Forming mode             |                   |             |             |                           |                           |                           |                           |                           |                           |        |
| 11ax-HE80+80<br>(Contiguous mode) | MCS0              | 42          | 5210        | 16.35                     | 16.80                     | --                        | --                        | 19.59                     | ≤ 30.00                   | Pass   |
|                                   | MCS0              | 58          | 5290        | --                        | --                        | 17.24                     | 16.96                     | 20.11                     | ≤ 23.98                   | Pass   |
| 11ax-HE80+80<br>(Contiguous mode) | MCS0              | 106         | 5530        | 16.32                     | 16.57                     | --                        | --                        | 22.53                     | ≤ 23.98                   | Pass   |
|                                   | MCS0              | 122         | 5610        | --                        | --                        | 16.81                     | 16.30                     |                           |                           |        |

Note 1: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ .

Note 2: For 802.11ac-VHT80+80/ax-HE80+80 Contiguous Mode

5210MHz fall within UNII-1: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)}\}$ .

5290MHz fall within UNII-2A: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ .

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ .

Note 3: Average Power Limit Calculation as below:

For 5150-5250MHz: Limit = 30.00dBm.

For 5250-5350MHz & 5470-5725MHz:

802.11a: Limit =  $11 + 10 \cdot \log(19.00) = 23.79\text{dBm} < 23.98\text{dBm}$ .

802.11n-HT20:  $11 + 10 \cdot \log(19.98) = 24.01\text{dBm} > 23.98\text{dBm}$ , Limit = 23.98dBm

802.11ac-VHT20: Limit =  $11 + 10 \cdot \log(19.86) = 23.98\text{dBm}$ .

802.11ax-HE20:  $11 + 10 \cdot \log(20.60) = 24.14\text{dBm} > 23.98\text{dBm}$ , Limit = 23.98dBm

802.11n-HT40/ac-VHT40/ac-VHT80/ac-VHT80+80/ax-HE40/ax-HE80/ ax-HE80+80: Limit = 23.98dBm.

For 5725-5825MHz: Limit = 30.00dBm.

| Test Mode                          | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0<br>Average Power (dBm) | Ant 1<br>Average Power (dBm) | Ant 2<br>Average Power (dBm) | Ant 3<br>Average Power (dBm) | Total<br>Average Power (dBm) | Average Power Limit (dBm) | Result |
|------------------------------------|-------------------|-------------|-------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|---------------------------|--------|
| Beam-Forming mode                  |                   |             |             |                              |                              |                              |                              |                              |                           |        |
| 11ac-VHT20                         | MCS0              | 52          | 5260        | 14.51                        | 15.28                        | 15.15                        | 15.35                        | 21.11                        | ≤ 23.08                   | Pass   |
| 11ac-VHT20                         | MCS0              | 60          | 5300        | 14.51                        | 15.01                        | 15.53                        | 15.51                        | 21.18                        | ≤ 23.08                   | Pass   |
| 11ac-VHT20                         | MCS0              | 64          | 5320        | 14.24                        | 15.02                        | 15.39                        | 15.03                        | 20.96                        | ≤ 23.08                   | Pass   |
| 11ac-VHT20                         | MCS0              | 100         | 5500        | 13.96                        | 14.56                        | 14.83                        | 14.79                        | 20.57                        | ≤ 22.54                   | Pass   |
| 11ac-VHT20                         | MCS0              | 120         | 5600        | 14.85                        | 14.51                        | 14.91                        | 15.04                        | 20.85                        | ≤ 22.54                   | Pass   |
| 11ac-VHT20                         | MCS0              | 140         | 5700        | 14.59                        | 14.31                        | 14.19                        | 14.46                        | 20.41                        | ≤ 22.54                   | Pass   |
| 11ac-VHT20                         | MCS0              | 144         | 5720        | 14.94                        | 14.39                        | 14.42                        | 14.59                        | 20.61                        | ≤ 22.54                   | Pass   |
| 11ac-VHT40                         | MCS0              | 54          | 5270        | 16.83                        | 16.43                        | 16.77                        | 16.36                        | 22.62                        | ≤ 23.08                   | Pass   |
| 11ac-VHT40                         | MCS0              | 62          | 5310        | 17.42                        | 16.98                        | 17.16                        | 16.45                        | 23.04                        | ≤ 23.08                   | Pass   |
| 11ac-VHT40                         | MCS0              | 102         | 5510        | 16.38                        | 16.11                        | 15.96                        | 15.36                        | 21.99                        | ≤ 22.54                   | Pass   |
| 11ac-VHT40                         | MCS0              | 118         | 5590        | 16.15                        | 15.84                        | 16.17                        | 16.09                        | 22.09                        | ≤ 22.54                   | Pass   |
| 11ac-VHT40                         | MCS0              | 134         | 5670        | 16.52                        | 15.99                        | 16.21                        | 16.26                        | 22.27                        | ≤ 22.54                   | Pass   |
| 11ac-VHT40                         | MCS0              | 142         | 5710        | 16.55                        | 15.99                        | 15.93                        | 16.12                        | 22.17                        | ≤ 22.54                   | Pass   |
| 11ac-VHT80                         | MCS0              | 58          | 5290        | 17.10                        | 16.73                        | 17.01                        | 16.53                        | 22.87                        | ≤ 23.08                   | Pass   |
| 11ac-VHT80                         | MCS0              | 106         | 5530        | 16.87                        | 16.32                        | 16.36                        | 16.06                        | 22.43                        | ≤ 22.54                   | Pass   |
| 11ac-VHT80                         | MCS0              | 122         | 5610        | 16.41                        | 15.95                        | 16.44                        | 16.28                        | 22.29                        | ≤ 22.54                   | Pass   |
| 11ac-VHT80                         | MCS0              | 138         | 5690        | 16.62                        | 16.09                        | 16.16                        | 16.53                        | 22.38                        | ≤ 22.54                   | Pass   |
| 11ac-VHT80+80<br>(Contiguous mode) | MCS0              | 42          | 5210        | 15.08                        | 14.75                        | --                           | --                           | 17.93                        | ≤ 29.10                   | Pass   |
|                                    | MCS0              | 58          | 5290        | --                           | --                           | 15.53                        | 15.33                        | 18.44                        | ≤ 23.08                   | Pass   |
| 11ac-VHT80+80<br>(Contiguous mode) | MCS0              | 106         | 5530        | 15.20                        | 14.72                        | --                           | --                           | 21.39                        | ≤ 22.54                   | Pass   |
|                                    | MCS0              | 122         | 5610        | --                           | --                           | 15.86                        | 15.63                        |                              |                           |        |
| 11ax-HE20                          | MCS0              | 52          | 5260        | 14.93                        | 15.56                        | 15.51                        | 15.81                        | 21.48                        | ≤ 23.08                   | Pass   |
| 11ax-HE20                          | MCS0              | 60          | 5300        | 15.52                        | 15.46                        | 15.62                        | 15.79                        | 21.62                        | ≤ 23.08                   | Pass   |
| 11ax-HE20                          | MCS0              | 64          | 5320        | 14.63                        | 15.43                        | 15.52                        | 15.52                        | 21.31                        | ≤ 23.08                   | Pass   |
| 11ax-HE20                          | MCS0              | 100         | 5500        | 14.42                        | 14.96                        | 15.33                        | 14.96                        | 20.95                        | ≤ 22.54                   | Pass   |
| 11ax-HE20                          | MCS0              | 120         | 5600        | 14.64                        | 14.28                        | 14.46                        | 14.84                        | 20.58                        | ≤ 22.54                   | Pass   |
| 11ax-HE20                          | MCS0              | 140         | 5700        | 14.87                        | 14.49                        | 14.46                        | 14.71                        | 20.66                        | ≤ 22.54                   | Pass   |
| 11ax-HE20                          | MCS0              | 144         | 5720        | 15.05                        | 14.61                        | 14.59                        | 14.78                        | 20.78                        | ≤ 22.54                   | Pass   |

| Test Mode                         | Data Rate/MCS | Channel No. | Freq. (MHz) | Ant 0 Average Power (dBm) | Ant 1 Average Power (dBm) | Ant 2 Average Power (dBm) | Ant 3 Average Power (dBm) | Total Average Power (dBm) | Average Power Limit (dBm) | Result |
|-----------------------------------|---------------|-------------|-------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------|
| Beam-Forming mode                 |               |             |             |                           |                           |                           |                           |                           |                           |        |
| 11ax-HE40                         | MCS0          | 54          | 5270        | 17.27                     | 16.84                     | 16.98                     | 16.53                     | 22.93                     | ≤ 23.08                   | Pass   |
| 11ax-HE40                         | MCS0          | 62          | 5310        | 17.24                     | 16.77                     | 16.96                     | 16.33                     | 22.86                     | ≤ 23.08                   | Pass   |
| 11ax-HE40                         | MCS0          | 102         | 5510        | 16.62                     | 16.35                     | 16.41                     | 15.83                     | 22.33                     | ≤ 22.54                   | Pass   |
| 11ax-HE40                         | MCS0          | 118         | 5590        | 16.31                     | 15.92                     | 16.21                     | 16.25                     | 22.20                     | ≤ 22.54                   | Pass   |
| 11ax-HE40                         | MCS0          | 134         | 5670        | 16.56                     | 16.17                     | 16.38                     | 16.39                     | 22.40                     | ≤ 22.54                   | Pass   |
| 11ax-HE40                         | MCS0          | 142         | 5710        | 16.62                     | 16.09                     | 16.09                     | 16.28                     | 22.30                     | ≤ 22.54                   | Pass   |
| 11ax-HE80                         | MCS0          | 58          | 5290        | 16.97                     | 17.18                     | 17.25                     | 16.56                     | 23.02                     | ≤ 23.08                   | Pass   |
| 11ax-HE80                         | MCS0          | 106         | 5530        | 16.20                     | 15.65                     | 16.01                     | 15.75                     | 21.93                     | ≤ 22.54                   | Pass   |
| 11ax-HE80                         | MCS0          | 122         | 5610        | 16.21                     | 15.66                     | 16.09                     | 16.12                     | 22.05                     | ≤ 22.54                   | Pass   |
| 11ax-HE80                         | MCS0          | 138         | 5690        | 16.42                     | 15.73                     | 15.88                     | 16.25                     | 22.10                     | ≤ 22.54                   | Pass   |
| 11ax-HE80+80<br>(Contiguous mode) | MCS0          | 42          | 5210        | 16.19                     | 15.97                     | --                        | --                        | 19.09                     | ≤ 29.10                   | Pass   |
|                                   | MCS0          | 58          | 5290        | --                        | --                        | 16.55                     | 16.32                     | 19.45                     | ≤ 23.08                   | Pass   |
| 11ax-HE80+80<br>(Contiguous mode) | MCS0          | 106         | 5530        | 16.51                     | 15.9                      | --                        | --                        | 22.64                     | ≤ 22.54                   | Pass   |
|                                   | MCS0          | 122         | 5610        | --                        | --                        | 16.80                     | 17.17                     |                           |                           |        |

Note 1: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ .

Note 2: For 802.11ac-VHT80+80/ax-HE80+80 Contiguous Mode

5210MHz fall within UNII-1: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)}\}$ .

5290MHz fall within UNII-2A: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ .

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)} + 10^{(\text{Ant 2 Average Power} / 10)} + 10^{(\text{Ant 3 Average Power} / 10)}\}$ .

Note 3: Average Power Limit Calculation as below:

For 5150-5250MHz: Limit = 30.00 - (6.90 - 6.00) = 29.10dBm.

For 5250-5350MHz: = 23.98 - (6.90 - 6.00) = 23.08dBm.

For 5470-5725MHz: = 23.98 - (7.44 - 6.00) = 22.54dBm.

For 5725-5825MHz: Limit = 30.00 - (6.34 - 6.00) = 29.66dBm.

## 7.5. Transmit Power Control

### 7.5.1. Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.

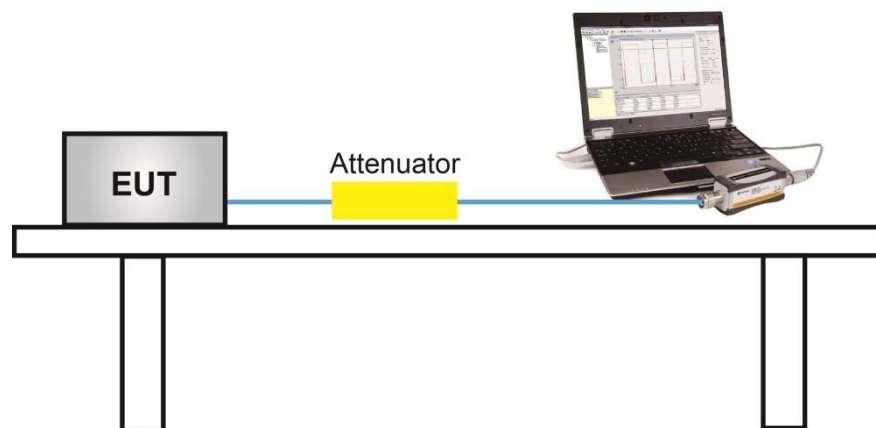
### 7.5.2. Test Procedure Used

KDB 789033 D02v01 - Section E) 3) b) Method PM-G

### 7.5.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

### 7.5.4. Test Setup



### 7.5.5. Test Result

|               |                        |                   |                         |
|---------------|------------------------|-------------------|-------------------------|
| Product       | GigaSpire              | Temperature       | 23 ~ 25°C               |
| Test Engineer | Bacon Dong             | Relative Humidity | 49 ~ 58%                |
| Test Site     | TR3                    | Test Date         | 2019/12/02 ~ 2019/12/17 |
| Test Item     | Transmit Power Control |                   |                         |

| Test Mode             | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 TPC Power (dBm) | Ant 1 TPC Power (dBm) | Ant 2 TPC Power (dBm) | Ant 3 TPC Power (dBm) | EIRP TPC Power (dBm) | TPC Limit (dBm) | Result |
|-----------------------|-------------------|-------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------|--------|
| Non Beam-Forming Mode |                   |             |             |                       |                       |                       |                       |                      |                 |        |
| 11a                   | 6Mbps             | 52          | 5260        | 15.63                 | 15.30                 | 15.22                 | 15.47                 | 23.32                | ≤ 24.00         | Pass   |
| 11a                   | 6Mbps             | 60          | 5300        | 15.63                 | 15.42                 | 15.53                 | 15.74                 | 23.49                | ≤ 24.00         | Pass   |
| 11a                   | 6Mbps             | 64          | 5320        | 15.56                 | 15.52                 | 15.54                 | 15.71                 | 23.49                | ≤ 24.00         | Pass   |
| 11a                   | 6Mbps             | 100         | 5500        | 15.72                 | 15.29                 | 15.76                 | 15.45                 | 23.61                | ≤ 24.00         | Pass   |
| 11a                   | 6Mbps             | 116         | 5580        | 15.29                 | 15.60                 | 15.29                 | 15.63                 | 23.51                | ≤ 24.00         | Pass   |
| 11a                   | 6Mbps             | 120         | 5600        | 15.25                 | 15.54                 | 15.72                 | 15.42                 | 23.54                | ≤ 24.00         | Pass   |
| 11a                   | 6Mbps             | 140         | 5700        | 15.72                 | 15.68                 | 15.18                 | 15.46                 | 23.57                | ≤ 24.00         | Pass   |
| 11a                   | 6Mbps             | 144         | 5720        | 15.20                 | 15.78                 | 15.29                 | 15.81                 | 23.58                | ≤ 24.00         | Pass   |
| 11n-HT20              | MCS0              | 52          | 5260        | 15.56                 | 15.57                 | 15.33                 | 15.58                 | 23.42                | ≤ 24.00         | Pass   |
| 11n-HT20              | MCS0              | 60          | 5300        | 15.62                 | 15.48                 | 15.41                 | 15.54                 | 23.42                | ≤ 24.00         | Pass   |
| 11n-HT20              | MCS0              | 64          | 5320        | 15.73                 | 15.58                 | 15.65                 | 15.25                 | 23.47                | ≤ 24.00         | Pass   |
| 11n-HT20              | MCS0              | 100         | 5500        | 15.40                 | 15.23                 | 15.69                 | 15.22                 | 23.44                | ≤ 24.00         | Pass   |
| 11n-HT20              | MCS0              | 116         | 5580        | 15.45                 | 15.72                 | 15.71                 | 15.24                 | 23.59                | ≤ 24.00         | Pass   |
| 11n-HT20              | MCS0              | 120         | 5600        | 15.34                 | 15.69                 | 15.51                 | 15.63                 | 23.60                | ≤ 24.00         | Pass   |
| 11n-HT20              | MCS0              | 140         | 5700        | 15.39                 | 15.67                 | 15.58                 | 15.68                 | 23.63                | ≤ 24.00         | Pass   |
| 11n-HT20              | MCS0              | 144         | 5720        | 15.47                 | 15.47                 | 15.39                 | 15.62                 | 23.54                | ≤ 24.00         | Pass   |
| 11n-HT40              | MCS0              | 54          | 5270        | 15.82                 | 15.58                 | 15.39                 | 15.63                 | 23.52                | ≤ 24.00         | Pass   |
| 11n-HT40              | MCS0              | 62          | 5310        | 15.35                 | 15.65                 | 15.28                 | 15.35                 | 23.32                | ≤ 24.00         | Pass   |
| 11n-HT40              | MCS0              | 102         | 5510        | 15.47                 | 15.26                 | 15.31                 | 15.58                 | 23.46                | ≤ 24.00         | Pass   |
| 11n-HT40              | MCS0              | 110         | 5550        | 15.44                 | 15.24                 | 15.39                 | 15.43                 | 23.43                | ≤ 24.00         | Pass   |
| 11n-HT40              | MCS0              | 118         | 5590        | 15.62                 | 15.32                 | 15.49                 | 15.66                 | 23.58                | ≤ 24.00         | Pass   |
| 11n-HT40              | MCS0              | 134         | 5670        | 15.74                 | 15.21                 | 15.69                 | 15.81                 | 23.67                | ≤ 24.00         | Pass   |
| 11n-HT40              | MCS0              | 142         | 5710        | 15.67                 | 15.80                 | 15.26                 | 15.66                 | 23.65                | ≤ 24.00         | Pass   |

| Test Mode                          | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 TPC Power (dBm) | Ant 1 TPC Power (dBm) | Ant 2 TPC Power (dBm) | Ant 3 TPC Power (dBm) | EIRP TPC Power (dBm) | TPC Limit (dBm) | Result |
|------------------------------------|-------------------|-------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------|--------|
| Non Beam-Forming Mode              |                   |             |             |                       |                       |                       |                       |                      |                 |        |
| 11ac-VHT20                         | MCS0              | 52          | 5260        | 15.46                 | 15.56                 | 15.37                 | 15.51                 | 23.39                | ≤ 24.00         | Pass   |
| 11ac-VHT20                         | MCS0              | 60          | 5300        | 15.60                 | 15.7                  | 15.44                 | 15.25                 | 23.41                | ≤ 24.00         | Pass   |
| 11ac-VHT20                         | MCS0              | 64          | 5320        | 15.32                 | 15.40                 | 15.50                 | 15.46                 | 23.33                | ≤ 24.00         | Pass   |
| 11ac-VHT20                         | MCS0              | 100         | 5500        | 15.70                 | 15.59                 | 15.64                 | 15.25                 | 23.60                | ≤ 24.00         | Pass   |
| 11ac-VHT20                         | MCS0              | 116         | 5580        | 15.55                 | 15.33                 | 15.20                 | 15.43                 | 23.43                | ≤ 24.00         | Pass   |
| 11ac-VHT20                         | MCS0              | 120         | 5600        | 15.65                 | 15.47                 | 15.80                 | 15.43                 | 23.64                | ≤ 24.00         | Pass   |
| 11ac-VHT20                         | MCS0              | 140         | 5700        | 15.29                 | 15.34                 | 15.34                 | 15.47                 | 23.41                | ≤ 24.00         | Pass   |
| 11ac-VHT20                         | MCS0              | 144         | 5720        | 15.78                 | 15.39                 | 15.77                 | 15.48                 | 23.66                | ≤ 24.00         | Pass   |
| 11ac-VHT40                         | MCS0              | 54          | 5270        | 15.72                 | 15.48                 | 15.36                 | 15.52                 | 23.43                | ≤ 24.00         | Pass   |
| 11ac-VHT40                         | MCS0              | 62          | 5310        | 15.82                 | 15.54                 | 15.64                 | 15.50                 | 23.54                | ≤ 24.00         | Pass   |
| 11ac-VHT40                         | MCS0              | 102         | 5510        | 15.71                 | 15.38                 | 15.75                 | 15.50                 | 23.64                | ≤ 24.00         | Pass   |
| 11ac-VHT40                         | MCS0              | 110         | 5550        | 15.77                 | 15.69                 | 15.79                 | 15.37                 | 23.71                | ≤ 24.00         | Pass   |
| 11ac-VHT40                         | MCS0              | 118         | 5590        | 15.20                 | 15.40                 | 15.67                 | 15.39                 | 23.47                | ≤ 24.00         | Pass   |
| 11ac-VHT40                         | MCS0              | 134         | 5670        | 15.45                 | 15.44                 | 15.27                 | 15.30                 | 23.42                | ≤ 24.00         | Pass   |
| 11ac-VHT40                         | MCS0              | 142         | 5710        | 15.76                 | 15.46                 | 15.79                 | 15.40                 | 23.66                | ≤ 24.00         | Pass   |
| 11ac-VHT80                         | MCS0              | 58          | 5290        | 15.25                 | 15.65                 | 15.82                 | 15.77                 | 23.54                | ≤ 24.00         | Pass   |
| 11ac-VHT80                         | MCS0              | 106         | 5530        | 15.35                 | 15.74                 | 15.30                 | 15.41                 | 23.50                | ≤ 24.00         | Pass   |
| 11ac-VHT80                         | MCS0              | 122         | 5610        | 15.60                 | 15.41                 | 15.71                 | 15.73                 | 23.66                | ≤ 24.00         | Pass   |
| 11ac-VHT80                         | MCS0              | 138         | 5690        | 15.58                 | 15.33                 | 15.22                 | 15.40                 | 23.44                | ≤ 24.00         | Pass   |
| 11ac-VHT80+80<br>(Contiguous mode) | MCS0              | 58          | 5290        | --                    | --                    | 12.76                 | 12.44                 | 17.50                | ≤ 24.00         | Pass   |
| 11ac-VHT80+80<br>(Contiguous mode) | MCS0              | 106         | 5530        | 15.57                 | 15.60                 | --                    | --                    | 23.67                | ≤ 22.54         | Pass   |
|                                    | MCS0              | 122         | 5610        | --                    | --                    | 15.61                 | 15.68                 |                      |                 |        |
| 11ax-HE20                          | MCS0              | 52          | 5260        | 15.43                 | 15.63                 | 15.62                 | 15.32                 | 23.41                | ≤ 24.00         | Pass   |
| 11ax-HE20                          | MCS0              | 60          | 5300        | 15.43                 | 15.65                 | 15.60                 | 15.77                 | 23.52                | ≤ 24.00         | Pass   |
| 11ax-HE20                          | MCS0              | 64          | 5320        | 15.56                 | 15.22                 | 15.51                 | 15.32                 | 23.32                | ≤ 24.00         | Pass   |
| 11ax-HE20                          | MCS0              | 100         | 5500        | 15.59                 | 15.67                 | 15.75                 | 15.38                 | 23.65                | ≤ 24.00         | Pass   |
| 11ax-HE20                          | MCS0              | 116         | 5580        | 15.34                 | 15.32                 | 15.26                 | 15.37                 | 23.37                | ≤ 24.00         | Pass   |
| 11ax-HE20                          | MCS0              | 120         | 5600        | 15.72                 | 15.39                 | 15.36                 | 15.69                 | 23.59                | ≤ 24.00         | Pass   |
| 11ax-HE20                          | MCS0              | 140         | 5700        | 15.35                 | 15.48                 | 15.27                 | 15.60                 | 23.48                | ≤ 24.00         | Pass   |
| 11ax-HE20                          | MCS0              | 144         | 5720        | 15.49                 | 15.81                 | 15.70                 | 15.40                 | 23.65                | ≤ 24.00         | Pass   |

| Test Mode                         | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 TPC Power (dBm) | Ant 1 TPC Power (dBm) | Ant 2 TPC Power (dBm) | Ant 3 TPC Power (dBm) | EIRP TPC Power (dBm) | TPC Limit (dBm) | Result |
|-----------------------------------|-------------------|-------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------|--------|
| Non Beam-Forming Mode             |                   |             |             |                       |                       |                       |                       |                      |                 |        |
| 11ax-HE40                         | MCS0              | 54          | 5270        | 15.35                 | 15.52                 | 15.25                 | 15.57                 | 23.34                | ≤ 24.00         | Pass   |
| 11ax-HE40                         | MCS0              | 62          | 5310        | 15.81                 | 15.53                 | 15.57                 | 15.29                 | 23.46                | ≤ 24.00         | Pass   |
| 11ax-HE40                         | MCS0              | 102         | 5510        | 15.33                 | 15.65                 | 15.25                 | 15.21                 | 23.41                | ≤ 24.00         | Pass   |
| 11ax-HE40                         | MCS0              | 110         | 5550        | 15.55                 | 15.23                 | 15.82                 | 15.38                 | 23.55                | ≤ 24.00         | Pass   |
| 11ax-HE40                         | MCS0              | 118         | 5590        | 15.69                 | 15.25                 | 15.75                 | 15.58                 | 23.62                | ≤ 24.00         | Pass   |
| 11ax-HE40                         | MCS0              | 134         | 5670        | 15.60                 | 15.80                 | 15.50                 | 15.45                 | 23.64                | ≤ 24.00         | Pass   |
| 11ax-HE40                         | MCS0              | 142         | 5710        | 15.35                 | 15.54                 | 15.61                 | 15.63                 | 23.58                | ≤ 24.00         | Pass   |
| 11ax-HE80                         | MCS0              | 58          | 5290        | 15.58                 | 15.69                 | 15.76                 | 15.58                 | 23.56                | ≤ 24.00         | Pass   |
| 11ax-HE80                         | MCS0              | 106         | 5530        | 15.74                 | 15.63                 | 15.52                 | 15.46                 | 23.64                | ≤ 24.00         | Pass   |
| 11ax-HE80                         | MCS0              | 122         | 5610        | 15.25                 | 15.26                 | 15.73                 | 15.47                 | 23.48                | ≤ 24.00         | Pass   |
| 11ax-HE80                         | MCS0              | 138         | 5690        | 15.24                 | 15.60                 | 15.64                 | 15.42                 | 23.53                | ≤ 24.00         | Pass   |
| 11ax-HE80+80<br>(Contiguous mode) | MCS0              | 58          | 5290        | --                    | --                    | 12.54                 | 12.78                 | 17.56                | ≤ 24.00         | Pass   |
| 11ax-HE80+80<br>(Contiguous mode) | MCS0              | 106         | 5530        | 15.22                 | 15.76                 | --                    | --                    | 23.59                | ≤ 22.54         | Pass   |
|                                   | MCS0              | 122         | 5610        | --                    | --                    | 15.72                 | 15.45                 |                      |                 |        |

Note 1: The EIRP TPC Power (dBm) =  $10 \cdot \log\{10^{(\text{Ant 0 TPC Power}/10)} + 10^{(\text{Ant 1 TPC Power}/10)} + 10^{(\text{Ant 2 TPC Power}/10)} + 10^{(\text{Ant 3 TPC Power}/10)}\} + \text{Direcional Gain (dBi)}$ .

Note 2: For 802.11ac-VHT80+80/ax-HE80+80 Contiguous Mode

5290MHz fall within UNII-2A: Total Average Power (dBm) =  $10 \cdot \log\{10^{(\text{Ant 2 Average Power}/10)} + 10^{(\text{Ant 3 Average Power}/10)}\}$ .

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) =  $10 \cdot \log\{10^{(\text{Ant 0 Average Power}/10)} + 10^{(\text{Ant 1 Average Power}/10)} + 10^{(\text{Ant 2 Average Power}/10)} + 10^{(\text{Ant 3 Average Power}/10)}\}$ .

| Test Mode                       | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 TPC Power (dBm) | Ant 1 TPC Power (dBm) | Ant 2 TPC Power (dBm) | Ant 3 TPC Power (dBm) | EIRP TPC Power (dBm) | TPC Limit (dBm) | Result |
|---------------------------------|-------------------|-------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------|--------|
| Beam-Forming Mode               |                   |             |             |                       |                       |                       |                       |                      |                 |        |
| 11ac-VHT20                      | MCS0              | 52          | 5260        | 10.42                 | 10.50                 | 10.19                 | 10.39                 | 23.30                | ≤ 24.00         | Pass   |
| 11ac-VHT20                      | MCS0              | 60          | 5300        | 10.55                 | 10.48                 | 10.22                 | 10.14                 | 23.27                | ≤ 24.00         | Pass   |
| 11ac-VHT20                      | MCS0              | 64          | 5320        | 10.12                 | 10.19                 | 10.32                 | 10.42                 | 23.18                | ≤ 24.00         | Pass   |
| 11ac-VHT20                      | MCS0              | 100         | 5500        | 10.15                 | 10.02                 | 10.13                 | 9.72                  | 23.47                | ≤ 24.00         | Pass   |
| 11ac-VHT20                      | MCS0              | 116         | 5580        | 9.95                  | 9.64                  | 9.54                  | 9.89                  | 23.22                | ≤ 24.00         | Pass   |
| 11ac-VHT20                      | MCS0              | 120         | 5600        | 10.12                 | 9.90                  | 10.28                 | 9.80                  | 23.49                | ≤ 24.00         | Pass   |
| 11ac-VHT20                      | MCS0              | 140         | 5700        | 9.71                  | 9.82                  | 9.73                  | 9.92                  | 23.26                | ≤ 24.00         | Pass   |
| 11ac-VHT20                      | MCS0              | 144         | 5720        | 10.21                 | 9.80                  | 10.10                 | 9.87                  | 23.46                | ≤ 24.00         | Pass   |
| 11ac-VHT40                      | MCS0              | 54          | 5270        | 10.57                 | 10.39                 | 10.24                 | 10.40                 | 23.32                | ≤ 24.00         | Pass   |
| 11ac-VHT40                      | MCS0              | 62          | 5310        | 10.80                 | 10.44                 | 10.56                 | 10.28                 | 23.44                | ≤ 24.00         | Pass   |
| 11ac-VHT40                      | MCS0              | 102         | 5510        | 10.02                 | 9.76                  | 10.16                 | 9.99                  | 23.45                | ≤ 24.00         | Pass   |
| 11ac-VHT40                      | MCS0              | 110         | 5550        | 10.12                 | 9.97                  | 10.25                 | 9.84                  | 23.51                | ≤ 24.00         | Pass   |
| 11ac-VHT40                      | MCS0              | 118         | 5590        | 9.64                  | 9.87                  | 10.09                 | 9.74                  | 23.30                | ≤ 24.00         | Pass   |
| 11ac-VHT40                      | MCS0              | 134         | 5670        | 9.81                  | 9.80                  | 9.71                  | 9.61                  | 23.19                | ≤ 24.00         | Pass   |
| 11ac-VHT40                      | MCS0              | 142         | 5710        | 10.23                 | 9.83                  | 10.13                 | 9.79                  | 23.46                | ≤ 24.00         | Pass   |
| 11ac-VHT80                      | MCS0              | 58          | 5290        | 10.23                 | 10.52                 | 10.77                 | 10.55                 | 23.44                | ≤ 24.00         | Pass   |
| 11ac-VHT80                      | MCS0              | 106         | 5530        | 9.70                  | 10.14                 | 9.61                  | 9.79                  | 23.28                | ≤ 24.00         | Pass   |
| 11ac-VHT80                      | MCS0              | 122         | 5610        | 9.87                  | 9.87                  | 10.07                 | 10.00                 | 23.41                | ≤ 24.00         | Pass   |
| 11ac-VHT80                      | MCS0              | 138         | 5690        | 10.03                 | 9.82                  | 9.64                  | 9.80                  | 23.29                | ≤ 24.00         | Pass   |
| 11ac-VHT80+80 (Contiguous mode) | MCS0              | 58          | 5290        | --                    | --                    | 7.10                  | 6.77                  | 16.85                | ≤ 24.00         | Pass   |
| 11ac-VHT80+80 (Contiguous mode) | MCS0              | 106         | 5530        | 9.87                  | 10.07                 | --                    | --                    | 23.47                | ≤ 22.54         | Pass   |
|                                 | MCS0              | 122         | 5610        | --                    | --                    | 9.98                  | 10.10                 |                      |                 |        |
| 11ax-HE20                       | MCS0              | 52          | 5260        | 10.21                 | 10.45                 | 10.53                 | 10.26                 | 23.29                | ≤ 24.00         | Pass   |
| 11ax-HE20                       | MCS0              | 60          | 5300        | 10.32                 | 10.54                 | 10.39                 | 10.69                 | 23.41                | ≤ 24.00         | Pass   |
| 11ax-HE20                       | MCS0              | 64          | 5320        | 10.49                 | 10.14                 | 10.50                 | 10.17                 | 23.25                | ≤ 24.00         | Pass   |
| 11ax-HE20                       | MCS0              | 100         | 5500        | 10.00                 | 9.97                  | 10.11                 | 9.71                  | 23.41                | ≤ 24.00         | Pass   |
| 11ax-HE20                       | MCS0              | 116         | 5580        | 9.70                  | 9.69                  | 9.59                  | 9.8                   | 23.16                | ≤ 24.00         | Pass   |
| 11ax-HE20                       | MCS0              | 120         | 5600        | 10.22                 | 9.74                  | 9.72                  | 10.02                 | 23.39                | ≤ 24.00         | Pass   |
| 11ax-HE20                       | MCS0              | 140         | 5700        | 9.66                  | 9.76                  | 9.66                  | 10.01                 | 23.24                | ≤ 24.00         | Pass   |
| 11ax-HE20                       | MCS0              | 144         | 5720        | 9.83                  | 10.29                 | 10.02                 | 9.78                  | 23.45                | ≤ 24.00         | Pass   |

| Test Mode                      | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 TPC Power (dBm) | Ant 1 TPC Power (dBm) | Ant 2 TPC Power (dBm) | Ant 3 TPC Power (dBm) | EIRP TPC Power (dBm) | TPC Limit (dBm) | Result |
|--------------------------------|-------------------|-------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------|--------|
| Beam-Forming Mode              |                   |             |             |                       |                       |                       |                       |                      |                 |        |
| 11ax-HE40                      | MCS0              | 54          | 5270        | 10.16                 | 10.31                 | 10.10                 | 10.50                 | 23.19                | ≤ 24.00         | Pass   |
| 11ax-HE40                      | MCS0              | 62          | 5310        | 10.60                 | 10.37                 | 10.42                 | 10.13                 | 23.30                | ≤ 24.00         | Pass   |
| 11ax-HE40                      | MCS0              | 102         | 5510        | 9.67                  | 10.08                 | 9.63                  | 9.65                  | 23.22                | ≤ 24.00         | Pass   |
| 11ax-HE40                      | MCS0              | 110         | 5550        | 10.04                 | 9.56                  | 10.16                 | 9.79                  | 23.35                | ≤ 24.00         | Pass   |
| 11ax-HE40                      | MCS0              | 118         | 5590        | 10.13                 | 9.68                  | 10.05                 | 10.08                 | 23.45                | ≤ 24.00         | Pass   |
| 11ax-HE40                      | MCS0              | 134         | 5670        | 10.06                 | 10.25                 | 9.86                  | 9.92                  | 23.49                | ≤ 24.00         | Pass   |
| 11ax-HE40                      | MCS0              | 142         | 5710        | 9.63                  | 9.84                  | 10.01                 | 9.94                  | 23.32                | ≤ 24.00         | Pass   |
| 11ax-HE80                      | MCS0              | 58          | 5290        | 10.46                 | 10.53                 | 10.55                 | 10.35                 | 23.39                | ≤ 24.00         | Pass   |
| 11ax-HE80                      | MCS0              | 106         | 5530        | 10.16                 | 9.92                  | 9.89                  | 9.81                  | 23.41                | ≤ 24.00         | Pass   |
| 11ax-HE80                      | MCS0              | 122         | 5610        | 9.74                  | 9.75                  | 10.05                 | 9.91                  | 23.32                | ≤ 24.00         | Pass   |
| 11ax-HE80                      | MCS0              | 138         | 5690        | 9.54                  | 9.98                  | 9.92                  | 9.87                  | 23.29                | ≤ 24.00         | Pass   |
| 11ax-HE80+80 (Contiguous mode) | MCS0              | 58          | 5290        | --                    | --                    | 6.86                  | 7.13                  | 16.91                | ≤ 24.00         | Pass   |
| 11ax-HE80+80 (Contiguous mode) | MCS0              | 106         | 5530        | 9.56                  | 10.15                 | --                    | --                    | 23.38                | ≤ 22.54         | Pass   |
|                                | MCS0              | 122         | 5610        | --                    | --                    | 10.06                 | 9.90                  |                      |                 |        |

Note 1: The EIRP TPC Power (dBm) =  $10 \cdot \log\{10^{(\text{Ant 0 TPC Power}/10)} + 10^{(\text{Ant 1 TPC Power}/10)} + 10^{(\text{Ant 2 TPC Power}/10)} + 10^{(\text{Ant 3 TPC Power}/10)}\} + \text{Direcional Gain (dBi)}$ .

Note 2: For 802.11ac-VHT80+80/ax-HE80+80 Contiguous Mode

5290MHz fall within UNII-2A: Total Average Power (dBm) =  $10 \cdot \log\{10^{(\text{Ant 2 Average Power}/10)} + 10^{(\text{Ant 3 Average Power}/10)}\}$ .

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) =  $10 \cdot \log\{10^{(\text{Ant 0 Average Power}/10)} + 10^{(\text{Ant 1 Average Power}/10)} + 10^{(\text{Ant 2 Average Power}/10)} + 10^{(\text{Ant 3 Average Power}/10)}\}$ .

## **7.6. Power Spectral Density Measurement**

### **7.6.1. Test Limit**

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 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

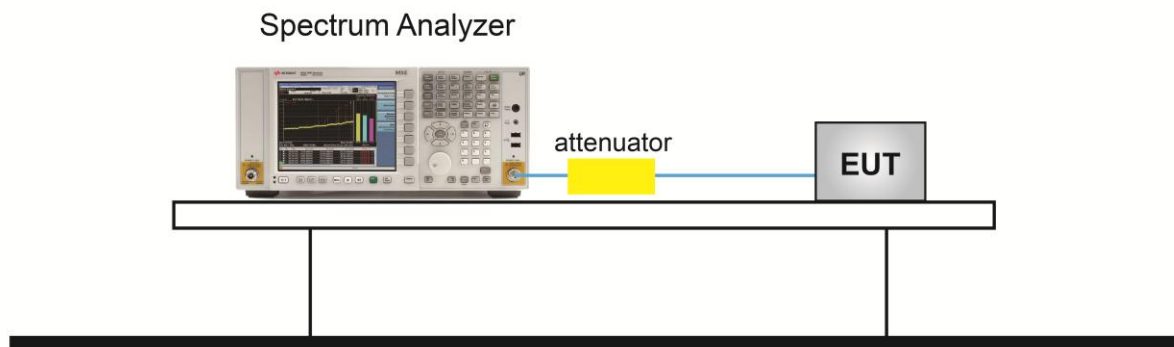
### **7.6.2. Test Procedure Used**

KDB 789033 D02v02r01 - Section F

### **7.6.3. Test Setting**

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz,  
RBW = 100 kHz
4. VBW = 3MHz
5. Number of sweep points  $\geq 2 \times (\text{span} / \text{RBW})$
6. Detector = power averaging (Average)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add  $10 \cdot \log(1/x)$ , where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add  $10 \cdot \log(1/0.25) = 6$  dB if the duty cycle is 25 percent.
11. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor  $10 \cdot \log(500\text{kHz}/100\text{kHz}) = 6.99$  dB to the measured result.

#### 7.6.4. Test Setup



### 7.6.5. Test Result

|               |                                                           |                   |                         |
|---------------|-----------------------------------------------------------|-------------------|-------------------------|
| Product       | GigaSpire                                                 | Temperature       | 22 ~ 25°C               |
| Test Engineer | David Lv                                                  | Relative Humidity | 46 ~ 59%                |
| Test Site     | TR3                                                       | Test Date         | 2019/12/03 ~ 2020/01/06 |
| Test Item     | Power Spectral Dencity (Bands UNII-1 & UNII-2A & UNII-2C) |                   |                         |

| Test Mode             | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 PSD (dBm/MHz) | Ant 1 PSD (dBm/MHz) | Ant 2 PSD (dBm/MHz) | Ant 3 PSD (dBm/MHz) | Duty Cycle (%) | Total PSD (dBm/MHz) | PSD Limit (dBm/MHz) | Result |
|-----------------------|-------------------|-------------|-------------|---------------------|---------------------|---------------------|---------------------|----------------|---------------------|---------------------|--------|
| Non Beam-Forming mode |                   |             |             |                     |                     |                     |                     |                |                     |                     |        |
| 11a                   | 6Mbps             | 52          | 5260        | 4.26                | 4.02                | 4.16                | 4.42                | 94.03          | 10.51               | ≤ 11.00             | Pass   |
| 11a                   | 6Mbps             | 60          | 5300        | 4.31                | 4.19                | 4.76                | 4.75                | 94.03          | 10.80               | ≤ 11.00             | Pass   |
| 11a                   | 6Mbps             | 64          | 5320        | 4.02                | 3.99                | 4.78                | 4.66                | 94.03          | 10.67               | ≤ 11.00             | Pass   |
| 11a                   | 6Mbps             | 100         | 5500        | 4.59                | 3.98                | 4.43                | 4.63                | 94.03          | 10.70               | ≤ 11.00             | Pass   |
| 11a                   | 6Mbps             | 120         | 5600        | 4.42                | 4.57                | 4.58                | 4.78                | 94.03          | 10.88               | ≤ 11.00             | Pass   |
| 11a                   | 6Mbps             | 140         | 5700        | 4.35                | 4.71                | 4.67                | 4.70                | 94.03          | 10.90               | ≤ 11.00             | Pass   |
| 11a                   | 6Mbps             | 144         | 5720        | 3.96                | 4.36                | 4.42                | 4.37                | 94.03          | 10.57               | ≤ 11.00             | Pass   |
| 11n-HT20              | MCS0              | 52          | 5260        | 4.41                | 3.83                | 4.42                | 4.48                | 93.78          | 10.59               | ≤ 11.00             | Pass   |
| 11n-HT20              | MCS0              | 60          | 5300        | 4.38                | 4.16                | 4.67                | 4.56                | 93.78          | 10.75               | ≤ 11.00             | Pass   |
| 11n-HT20              | MCS0              | 64          | 5320        | 3.98                | 3.95                | 4.58                | 4.56                | 93.78          | 10.58               | ≤ 11.00             | Pass   |
| 11n-HT20              | MCS0              | 100         | 5500        | 4.40                | 4.08                | 4.28                | 4.28                | 93.78          | 10.56               | ≤ 11.00             | Pass   |
| 11n-HT20              | MCS0              | 120         | 5600        | 4.48                | 4.29                | 4.55                | 4.71                | 93.78          | 10.81               | ≤ 11.00             | Pass   |
| 11n-HT20              | MCS0              | 140         | 5700        | 3.86                | 4.38                | 4.40                | 4.57                | 93.78          | 10.61               | ≤ 11.00             | Pass   |
| 11n-HT20              | MCS0              | 144         | 5720        | 3.84                | 4.11                | 4.61                | 4.55                | 93.78          | 10.59               | ≤ 11.00             | Pass   |
| 11n-HT40              | MCS0              | 54          | 5270        | 4.30                | 4.12                | 4.60                | 4.51                | 90.18          | 10.86               | ≤ 11.00             | Pass   |
| 11n-HT40              | MCS0              | 62          | 5310        | 3.80                | 3.91                | 4.23                | 3.94                | 90.18          | 10.44               | ≤ 11.00             | Pass   |
| 11n-HT40              | MCS0              | 102         | 5510        | 3.10                | 4.19                | 4.26                | 4.19                | 90.18          | 10.43               | ≤ 11.00             | Pass   |
| 11n-HT40              | MCS0              | 118         | 5590        | 3.64                | 3.38                | 3.23                | 3.79                | 90.18          | 9.98                | ≤ 11.00             | Pass   |
| 11n-HT40              | MCS0              | 134         | 5670        | 3.20                | 3.58                | 3.37                | 3.88                | 90.18          | 9.98                | ≤ 11.00             | Pass   |
| 11n-HT40              | MCS0              | 142         | 5710        | 3.64                | 4.09                | 3.94                | 4.30                | 90.18          | 10.47               | ≤ 11.00             | Pass   |

| Test Mode             | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 PSD (dBm/MHz) | Ant 1 PSD (dBm/MHz) | Ant 2 PSD (dBm/MHz) | Ant 3 PSD (dBm/MHz) | Duty Cycle (%) | Total PSD (dBm/MHz) | PSD Limit (dBm/MHz) | Result |
|-----------------------|-------------------|-------------|-------------|---------------------|---------------------|---------------------|---------------------|----------------|---------------------|---------------------|--------|
| Non Beam-Forming mode |                   |             |             |                     |                     |                     |                     |                |                     |                     |        |
| 11ac-VHT20            | MCS0              | 52          | 5260        | 4.01                | 3.78                | 4.06                | 4.36                | 90.50          | 10.51               | ≤ 11.00             | Pass   |
| 11ac-VHT20            | MCS0              | 60          | 5300        | 4.38                | 3.93                | 4.67                | 4.60                | 90.50          | 10.86               | ≤ 11.00             | Pass   |
| 11ac-VHT20            | MCS0              | 64          | 5320        | 3.37                | 3.60                | 4.01                | 4.30                | 90.50          | 10.29               | ≤ 11.00             | Pass   |
| 11ac-VHT20            | MCS0              | 100         | 5500        | 4.15                | 3.56                | 3.76                | 4.00                | 90.50          | 10.33               | ≤ 11.00             | Pass   |
| 11ac-VHT20            | MCS0              | 120         | 5600        | 3.78                | 3.87                | 4.07                | 4.30                | 90.50          | 10.46               | ≤ 11.00             | Pass   |
| 11ac-VHT20            | MCS0              | 140         | 5700        | 3.89                | 4.26                | 4.31                | 4.71                | 90.50          | 10.76               | ≤ 11.00             | Pass   |
| 11ac-VHT20            | MCS0              | 144         | 5720        | 3.61                | 3.85                | 4.42                | 4.22                | 90.50          | 10.49               | ≤ 11.00             | Pass   |
| 11ac-VHT40            | MCS0              | 54          | 5270        | 4.02                | 3.76                | 4.29                | 4.23                | 90.00          | 10.56               | ≤ 11.00             | Pass   |
| 11ac-VHT40            | MCS0              | 62          | 5310        | 3.71                | 3.99                | 4.32                | 4.34                | 90.00          | 10.58               | ≤ 11.00             | Pass   |
| 11ac-VHT40            | MCS0              | 102         | 5510        | 4.15                | 3.45                | 4.11                | 4.12                | 90.00          | 10.45               | ≤ 11.00             | Pass   |
| 11ac-VHT40            | MCS0              | 118         | 5590        | 4.23                | 4.38                | 4.21                | 4.70                | 90.00          | 10.86               | ≤ 11.00             | Pass   |
| 11ac-VHT40            | MCS0              | 134         | 5670        | 3.39                | 3.58                | 3.62                | 3.59                | 90.00          | 10.02               | ≤ 11.00             | Pass   |
| 11ac-VHT40            | MCS0              | 142         | 5710        | 3.33                | 3.52                | 3.27                | 4.03                | 90.00          | 10.03               | ≤ 11.00             | Pass   |
| 11ac-VHT80            | MCS0              | 58          | 5290        | 0.78                | 0.57                | 1.26                | 0.94                | 90.50          | 7.35                | ≤ 11.00             | Pass   |
| 11ac-VHT80            | MCS0              | 106         | 5530        | 1.50                | 1.03                | 0.84                | 1.26                | 90.50          | 7.62                | ≤ 11.00             | Pass   |
| 11ac-VHT80            | MCS0              | 122         | 5610        | 1.69                | 1.56                | 1.72                | 1.75                | 90.50          | 8.13                | ≤ 11.00             | Pass   |
| 11ac-VHT80            | MCS0              | 138         | 5690        | 1.51                | 1.75                | 1.85                | 2.38                | 90.50          | 8.34                | ≤ 11.00             | Pass   |
| 11ac-VHT80+80         | MCS0              | 42          | 5210        | -3.11               | -3.35               | --                  | --                  | 90.50          | 0.22                | ≤ 17.00             | Pass   |
| Contiguous Mode       | MCS0              | 58          | 5290        | --                  | --                  | -0.83               | -2.83               | 90.50          | 1.73                | ≤ 11.00             | Pass   |
| 11ac-VHT80+80         | MCS0              | 106         | 5530        | -3.49               | -3.19               | --                  | --                  | 90.50          | 0.11                | ≤ 11.00             | Pass   |
| Contiguous Mode       | MCS0              | 122         | 5610        | --                  | --                  | 1.00                | -2.64               | 90.50          | 2.99                | ≤ 11.00             | Pass   |

| Test Mode                       | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 PSD (dBm/MHz) | Ant 1 PSD (dBm/MHz) | Ant 2 PSD (dBm/MHz) | Ant 3 PSD (dBm/MHz) | Duty Cycle (%) | Total PSD (dBm/MHz) | PSD Limit (dBm/MHz) | Result |
|---------------------------------|-------------------|-------------|-------------|---------------------|---------------------|---------------------|---------------------|----------------|---------------------|---------------------|--------|
| Non Beam-Forming mode           |                   |             |             |                     |                     |                     |                     |                |                     |                     |        |
| 11ax-HE20                       | MCS0              | 52          | 5260        | 4.12                | 3.88                | 4.23                | 4.32                | 95.03          | 10.38               | ≤ 11.00             | Pass   |
| 11ax-HE20                       | MCS0              | 60          | 5300        | 4.05                | 3.90                | 4.11                | 4.17                | 95.03          | 10.30               | ≤ 11.00             | Pass   |
| 11ax-HE20                       | MCS0              | 64          | 5320        | 4.11                | 3.90                | 4.45                | 4.25                | 95.03          | 10.42               | ≤ 11.00             | Pass   |
| 11ax-HE20                       | MCS0              | 100         | 5500        | 4.28                | 4.27                | 4.28                | 4.38                | 95.03          | 10.54               | ≤ 11.00             | Pass   |
| 11ax-HE20                       | MCS0              | 120         | 5600        | 4.10                | 4.25                | 3.88                | 4.66                | 95.03          | 10.47               | ≤ 11.00             | Pass   |
| 11ax-HE20                       | MCS0              | 140         | 5700        | 4.34                | 4.51                | 4.75                | 4.72                | 95.03          | 10.83               | ≤ 11.00             | Pass   |
| 11ax-HE20                       | MCS0              | 144         | 5720        | 3.97                | 4.41                | 4.23                | 4.55                | 95.03          | 10.54               | ≤ 11.00             | Pass   |
| 11ax-HE40                       | MCS0              | 54          | 5270        | 4.22                | 4.43                | 4.53                | 4.33                | 94.28          | 10.66               | ≤ 11.00             | Pass   |
| 11ax-HE40                       | MCS0              | 62          | 5310        | 3.94                | 4.12                | 4.45                | 4.30                | 94.28          | 10.48               | ≤ 11.00             | Pass   |
| 11ax-HE40                       | MCS0              | 102         | 5510        | 4.27                | 4.11                | 4.44                | 4.34                | 94.28          | 10.57               | ≤ 11.00             | Pass   |
| 11ax-HE40                       | MCS0              | 118         | 5590        | 3.22                | 3.64                | 3.40                | 4.04                | 94.28          | 9.86                | ≤ 11.00             | Pass   |
| 11ax-HE40                       | MCS0              | 134         | 5670        | 3.53                | 3.61                | 3.70                | 4.05                | 94.28          | 10.00               | ≤ 11.00             | Pass   |
| 11ax-HE40                       | MCS0              | 142         | 5710        | 3.32                | 3.72                | 3.68                | 4.30                | 94.28          | 10.05               | ≤ 11.00             | Pass   |
| 11ax-HE80                       | MCS0              | 58          | 5290        | 1.28                | 1.07                | 1.65                | 1.76                | 95.61          | 7.66                | ≤ 11.00             | Pass   |
| 11ax-HE80                       | MCS0              | 106         | 5530        | 1.32                | 1.15                | 1.31                | 1.29                | 95.61          | 7.48                | ≤ 11.00             | Pass   |
| 11ax-HE80                       | MCS0              | 122         | 5610        | 1.39                | 2.08                | 1.80                | 1.96                | 95.61          | 8.03                | ≤ 11.00             | Pass   |
| 11ax-HE80                       | MCS0              | 138         | 5690        | 1.16                | 1.76                | 1.56                | 2.00                | 95.61          | 7.85                | ≤ 11.00             | Pass   |
| 11ax-HE80+80<br>Contiguous Mode | MCS0              | 42          | 5210        | -2.61               | -3.42               | --                  | --                  | 95.61          | 0.21                | ≤ 17.00             | Pass   |
|                                 | MCS0              | 58          | 5290        | --                  | --                  | 0.14                | -2.07               | 95.61          | 2.38                | ≤ 11.00             | Pass   |
| 11ax-HE80+80<br>Contiguous Mode | MCS0              | 106         | 5530        | -2.89               | -3.25               | --                  | --                  | 95.61          | 0.14                | ≤ 11.00             | Pass   |
|                                 | MCS0              | 122         | 5610        | --                  | --                  | 1.86                | -1.34               | 95.61          | 3.75                | ≤ 11.00             | Pass   |

Note 1: When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) =  $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\}$  (dBm/MHz).

Note 2: When EUT duty cycle < 98%, the total PSD (dBm/MHz) =  $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 3: For 802.11ac-VHT80+80/ax-HE80+80 Contiguous Mode

5210MHz Fall within UNII-1: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ .

5290MHz Fall within UNII-2A: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\}$ .

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\}$ .

Note 4: PSD Limit Calculation as below:

For 5150-5250MHz: 17dBm/MHz.

For 5250-5350MHz & 5470-5725MHz

802.11a/n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80/802.11ac-VHT80+80/ax-HE20/ax-HE40

/ax-HE80/802.11ax-HE80+80:

Limit = 11.00 dBm/MHz.

| Test Mode         | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 PSD (dBm/MHz) | Ant 1 PSD (dBm/MHz) | Ant 2 PSD (dBm/MHz) | Ant 3 PSD (dBm/MHz) | Duty Cycle (%) | Total PSD (dBm/MHz) | PSD Limit (dBm/MHz) | Result |
|-------------------|-------------------|-------------|-------------|---------------------|---------------------|---------------------|---------------------|----------------|---------------------|---------------------|--------|
| Beam-Forming mode |                   |             |             |                     |                     |                     |                     |                |                     |                     |        |
| 11ac-VHT20        | MCS0              | 52          | 5260        | 3.29                | 3.60                | 3.10                | 3.48                | 90.50          | 9.83                | ≤ 10.10             | Pass   |
| 11ac-VHT20        | MCS0              | 60          | 5300        | 3.70                | 3.47                | 3.37                | 3.68                | 90.50          | 10.01               | ≤ 10.10             | Pass   |
| 11ac-VHT20        | MCS0              | 64          | 5320        | 3.37                | 3.66                | 3.85                | 3.24                | 90.50          | 9.99                | ≤ 10.10             | Pass   |
| 11ac-VHT20        | MCS0              | 100         | 5500        | 2.69                | 3.05                | 2.56                | 3.04                | 90.50          | 9.29                | ≤ 9.56              | Pass   |
| 11ac-VHT20        | MCS0              | 120         | 5600        | 3.11                | 3.08                | 2.81                | 2.95                | 90.50          | 9.44                | ≤ 9.56              | Pass   |
| 11ac-VHT20        | MCS0              | 140         | 5700        | 2.90                | 2.55                | 2.50                | 2.85                | 90.50          | 9.16                | ≤ 9.56              | Pass   |
| 11ac-VHT20        | MCS0              | 144         | 5720        | 3.03                | 2.77                | 2.75                | 2.96                | 90.50          | 9.33                | ≤ 9.56              | Pass   |
| 11ac-VHT40        | MCS0              | 54          | 5270        | 2.56                | 1.96                | 0.25                | 2.30                | 90.00          | 8.33                | ≤ 10.10             | Pass   |
| 11ac-VHT40        | MCS0              | 62          | 5310        | 3.01                | 3.06                | 2.71                | 2.73                | 90.00          | 9.36                | ≤ 10.10             | Pass   |
| 11ac-VHT40        | MCS0              | 102         | 5510        | 0.10                | 1.45                | 1.50                | 1.41                | 90.00          | 7.63                | ≤ 9.56              | Pass   |
| 11ac-VHT40        | MCS0              | 118         | 5590        | 2.51                | 2.72                | 2.05                | 2.46                | 90.00          | 8.92                | ≤ 9.56              | Pass   |
| 11ac-VHT40        | MCS0              | 134         | 5670        | 2.51                | 3.13                | 1.76                | 3.35                | 90.00          | 9.21                | ≤ 9.56              | Pass   |
| 11ac-VHT40        | MCS0              | 142         | 5710        | 2.90                | 3.65                | 2.38                | 2.99                | 90.00          | 9.48                | ≤ 9.56              | Pass   |
| 11ac-VHT80        | MCS0              | 58          | 5290        | -0.64               | -0.76               | -2.50               | -0.70               | 90.50          | 5.37                | ≤ 10.10             | Pass   |
| 11ac-VHT80        | MCS0              | 106         | 5530        | -0.62               | -1.09               | -1.18               | -1.00               | 90.50          | 5.49                | ≤ 9.56              | Pass   |
| 11ac-VHT80        | MCS0              | 122         | 5610        | -0.57               | -0.18               | -1.35               | -0.64               | 90.50          | 5.79                | ≤ 9.56              | Pass   |
| 11ac-VHT80        | MCS0              | 138         | 5690        | -1.36               | -0.38               | -1.21               | -0.62               | 90.50          | 5.58                | ≤ 9.56              | Pass   |
| 11ac-VHT80+80     | MCS0              | 42          | 5210        | -5.19               | -5.66               | --                  | --                  | 90.50          | -1.97               | ≤ 16.10             | Pass   |
| Contiguous Mode   | MCS0              | 58          | 5290        | --                  | --                  | -3.95               | -2.64               | 90.50          | 0.20                | ≤ 10.10             | Pass   |
| 11ac-VHT80+80     | MCS0              | 106         | 5530        | -4.86               | -5.36               | --                  | --                  | 90.50          | -1.66               | ≤ 9.56              | Pass   |
| Contiguous Mode   | MCS0              | 122         | 5610        | --                  | --                  | -3.82               | -1.25               | 90.50          | 1.10                | ≤ 9.56              | Pass   |

| Test Mode                       | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 PSD (dBm/MHz) | Ant 1 PSD (dBm/MHz) | Ant 2 PSD (dBm/MHz) | Ant 3 PSD (dBm/MHz) | Duty Cycle (%) | Total PSD (dBm/MHz) | PSD Limit (dBm/MHz) | Result |
|---------------------------------|-------------------|-------------|-------------|---------------------|---------------------|---------------------|---------------------|----------------|---------------------|---------------------|--------|
| Beam-Forming mode               |                   |             |             |                     |                     |                     |                     |                |                     |                     |        |
| 11ax-HE20                       | MCS0              | 52          | 5260        | 3.55                | 3.80                | 3.21                | 3.74                | 95.03          | 9.82                | ≤ 10.10             | Pass   |
| 11ax-HE20                       | MCS0              | 60          | 5300        | 3.38                | 3.38                | 2.55                | 3.86                | 95.03          | 9.56                | ≤ 10.10             | Pass   |
| 11ax-HE20                       | MCS0              | 64          | 5320        | 3.10                | 3.64                | 3.61                | 3.63                | 95.03          | 9.74                | ≤ 10.10             | Pass   |
| 11ax-HE20                       | MCS0              | 100         | 5500        | 2.68                | 3.35                | 3.58                | 2.85                | 95.03          | 9.37                | ≤ 9.56              | Pass   |
| 11ax-HE20                       | MCS0              | 120         | 5600        | 3.02                | 2.69                | 2.82                | 2.77                | 95.03          | 9.07                | ≤ 9.56              | Pass   |
| 11ax-HE20                       | MCS0              | 140         | 5700        | 3.08                | 2.66                | 2.88                | 2.70                | 95.03          | 9.08                | ≤ 9.56              | Pass   |
| 11ax-HE20                       | MCS0              | 144         | 5720        | 3.31                | 3.01                | 3.08                | 3.15                | 95.03          | 9.38                | ≤ 9.56              | Pass   |
| 11ax-HE40                       | MCS0              | 54          | 5270        | 1.82                | 2.08                | 0.25                | 2.04                | 94.28          | 7.89                | ≤ 10.10             | Pass   |
| 11ax-HE40                       | MCS0              | 62          | 5310        | 1.87                | 1.94                | 1.51                | 1.82                | 94.28          | 8.06                | ≤ 10.10             | Pass   |
| 11ax-HE40                       | MCS0              | 102         | 5510        | 1.34                | 1.52                | 0.35                | 1.10                | 94.28          | 7.38                | ≤ 9.56              | Pass   |
| 11ax-HE40                       | MCS0              | 118         | 5590        | 2.00                | 2.64                | 1.60                | 2.25                | 94.28          | 8.42                | ≤ 9.56              | Pass   |
| 11ax-HE40                       | MCS0              | 134         | 5670        | 1.91                | 2.93                | 0.47                | 2.45                | 94.28          | 8.31                | ≤ 9.56              | Pass   |
| 11ax-HE40                       | MCS0              | 142         | 5710        | 2.26                | 3.04                | 1.66                | 3.12                | 94.28          | 8.84                | ≤ 9.56              | Pass   |
| 11ax-HE80                       | MCS0              | 58          | 5290        | -0.70               | -0.41               | -1.59               | -0.55               | 95.61          | 5.43                | ≤ 10.10             | Pass   |
| 11ax-HE80                       | MCS0              | 106         | 5530        | -1.88               | -1.61               | -2.50               | -1.89               | 95.61          | 4.26                | ≤ 9.56              | Pass   |
| 11ax-HE80                       | MCS0              | 122         | 5610        | -0.15               | 0.35                | -0.69               | 0.11                | 95.61          | 6.14                | ≤ 9.56              | Pass   |
| 11ax-HE80                       | MCS0              | 138         | 5690        | -0.45               | 0.51                | -1.64               | -0.15               | 95.61          | 5.85                | ≤ 9.56              | Pass   |
| 11ax-HE80+80<br>Contiguous Mode | MCS0              | 42          | 5210        | -3.31               | -3.59               | --                  | --                  | 95.61          | -0.24               | ≤ 16.10             | Pass   |
|                                 | MCS0              | 58          | 5290        | --                  | --                  | -2.04               | -1.04               | 95.61          | 1.69                | ≤ 10.10             | Pass   |
| 11ax-HE80+80<br>Contiguous Mode | MCS0              | 106         | 5530        | -2.67               | -3.42               | --                  | --                  | 95.61          | 0.18                | ≤ 9.56              | Pass   |
|                                 | MCS0              | 122         | 5610        | --                  | --                  | -2.07               | -0.69               | 95.61          | 1.88                | ≤ 9.56              | Pass   |

Note 1: When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) =  $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\}$  (dBm/MHz).

Note 2: When EUT duty cycle < 98%, the total PSD (dBm/MHz) =  $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\}$  (dBm/MHz) +  $10 \cdot \log (1/\text{Duty Cycle})$ .

Note 3: For 802.11ac-VHT80+80/ax-HE80+80 Contiguous Mode

5210MHz Fall within UNII-1: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ .

5290MHz Fall within UNII-2A: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\}$ .

5530MHz & 5610MHz Fall within UNII-2C: Total Average Power (dBm) =  $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)} + 10^{(\text{Ant 2 PSD}/10)} + 10^{(\text{Ant 3 PSD}/10)}\}$ .

Note 4: PSD Limit Calculation as below:

For 5150-5250MHz:

Limit = 17.00 - (6.90 - 6.00) = 16.10dBm/MHz.

For 5250-5350MHz & 5470-5725MHz

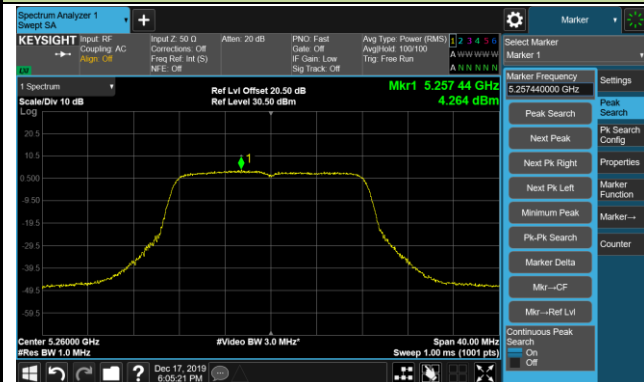
802.11a/n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80/802.11ac-VHT80+80/ax-HE20/ax-HE40

/ax-HE80/802.11ax-HE80+80:

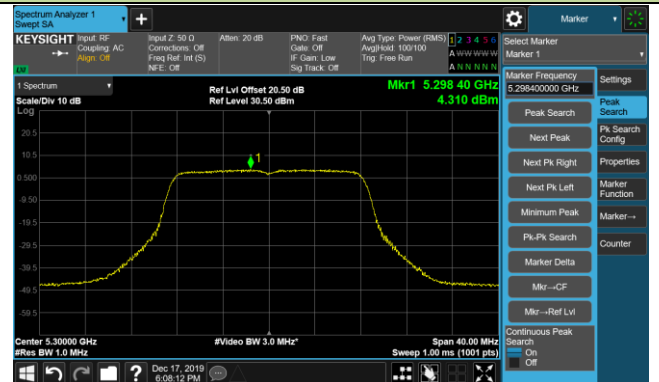
Limit =  $11 - (7.44 - 6.00) = 9.56\text{dBm/MHz}$ .

## 802.11a Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

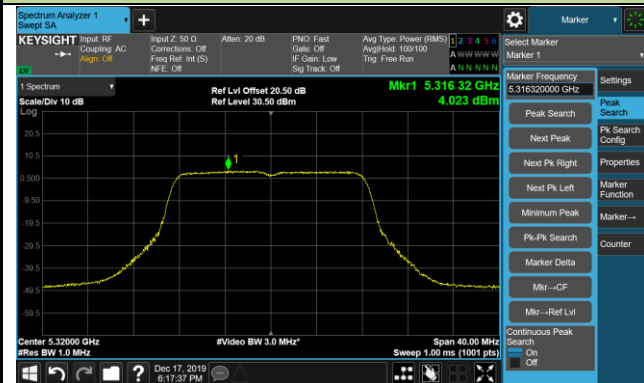
### Channel 52 (5260MHz)



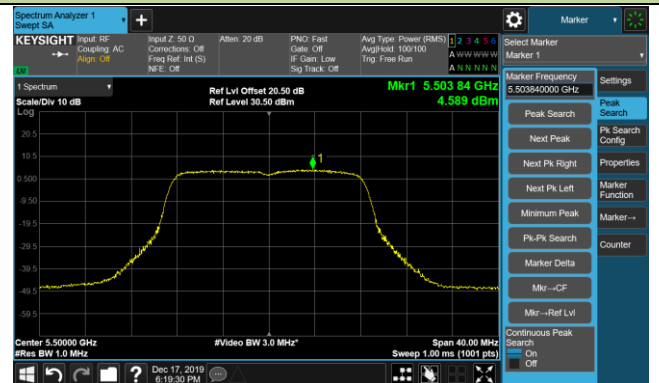
### Channel 60 (5300MHz)



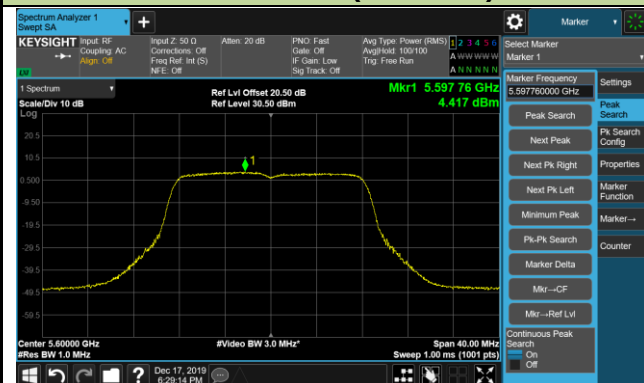
### Channel 64 (5320MHz)



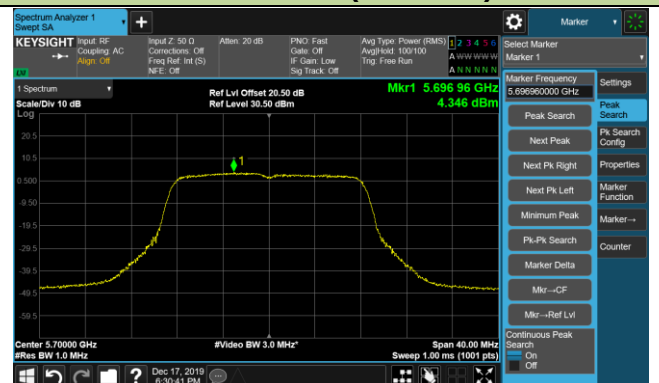
### Channel 100 (5500MHz)



### Channel 120 (5600MHz)

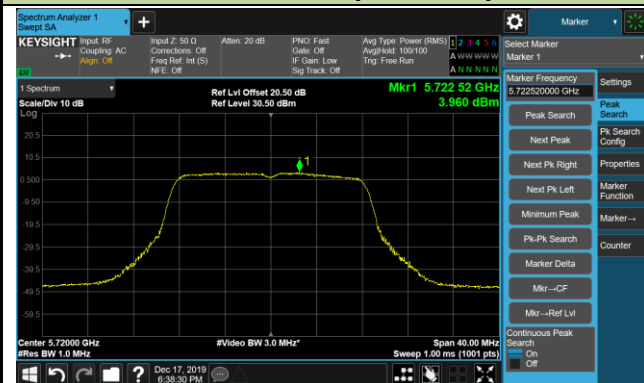


### Channel 140 (5700MHz)



## 802.11a Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

### Channel 144 (5720MHz)

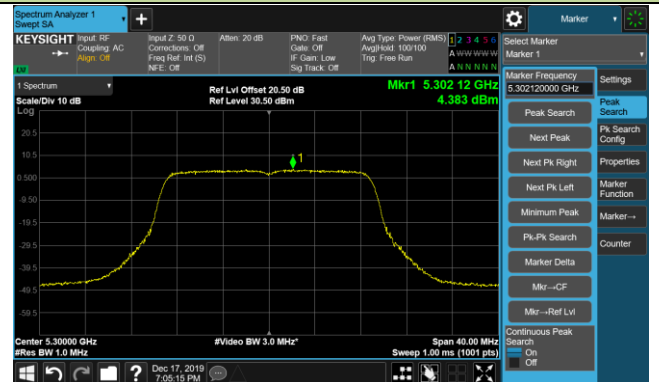


## 802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

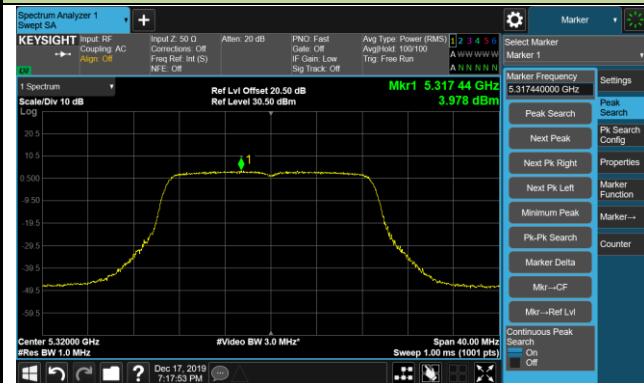
### Channel 52 (5260MHz)



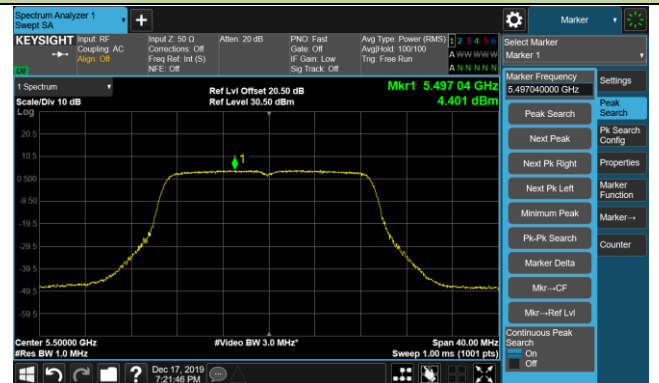
### Channel 60 (5300MHz)



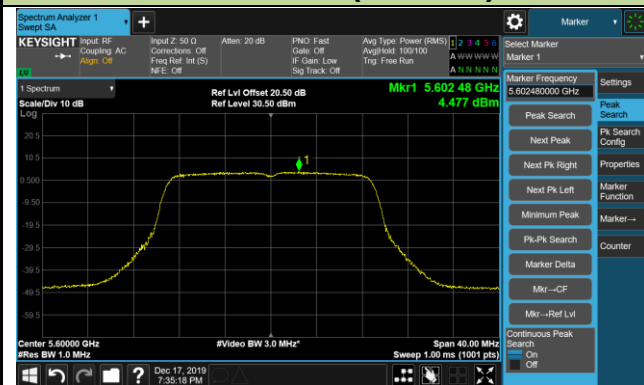
### Channel 64 (5320MHz)



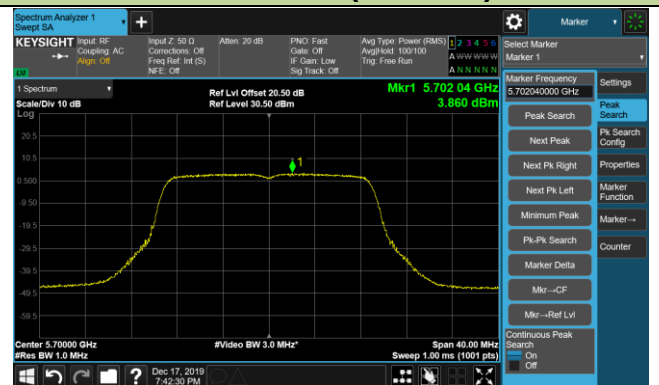
### Channel 100 (5500MHz)



### Channel 120 (5600MHz)

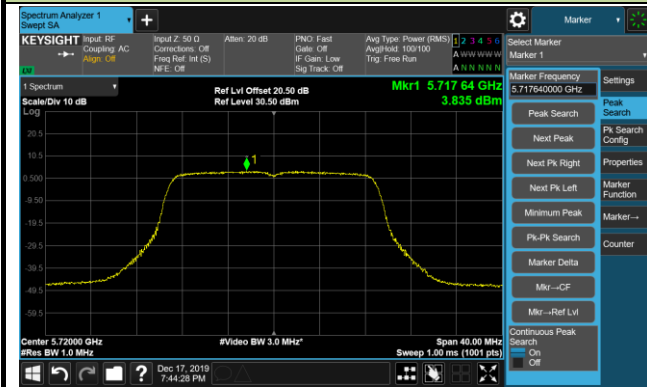


### Channel 140 (5700MHz)



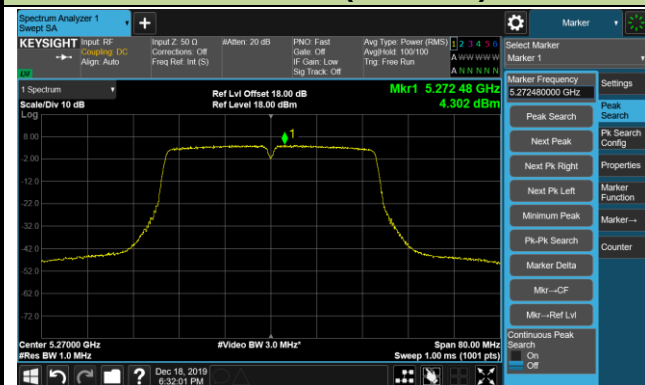
## 802.11n-HT20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

### Channel 144 (5720MHz)

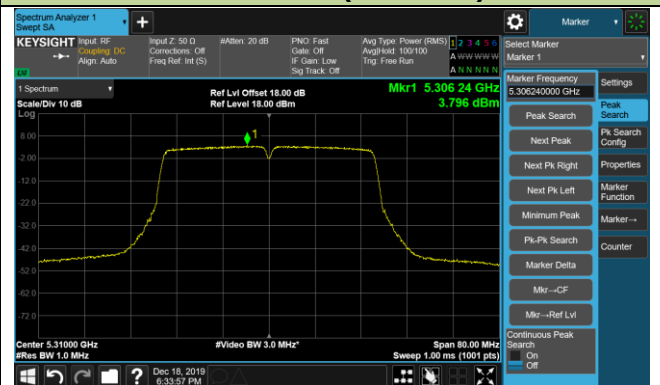


# 802.11n-HT40 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

Channel 54 (5270MHz)



Channel 62 (5310MHz)



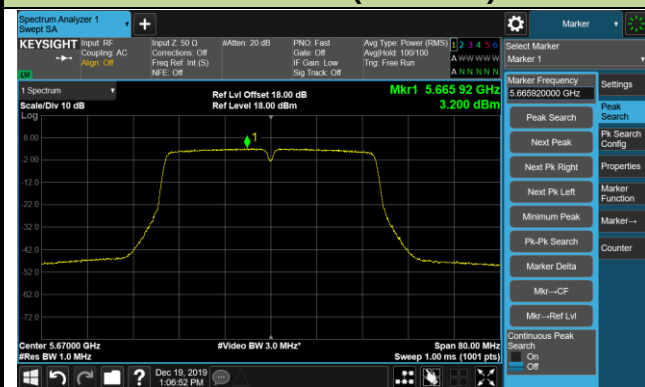
Channel 102 (5510MHz)



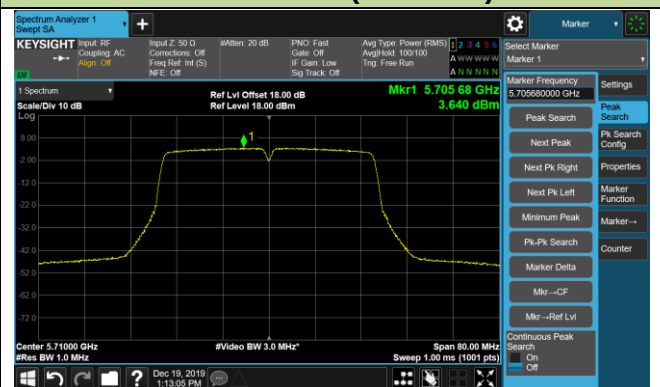
Channel 118 (5590MHz)



Channel 134 (5670MHz)

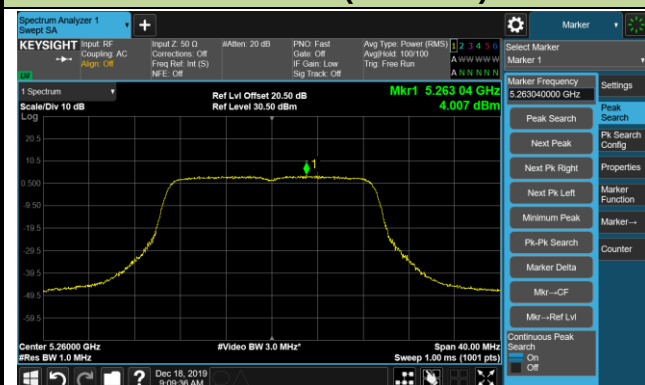


Channel 142 (5710MHz)

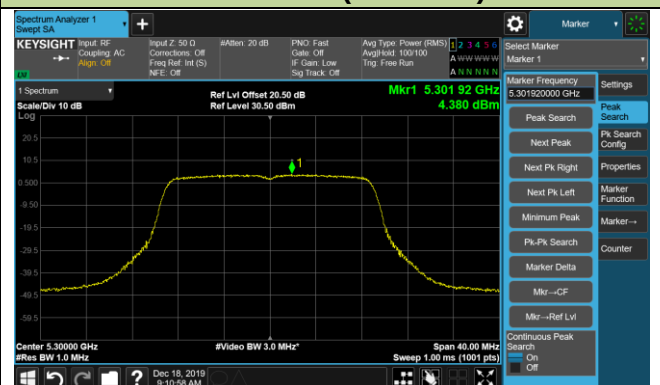


# 802.11ac-VHT20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

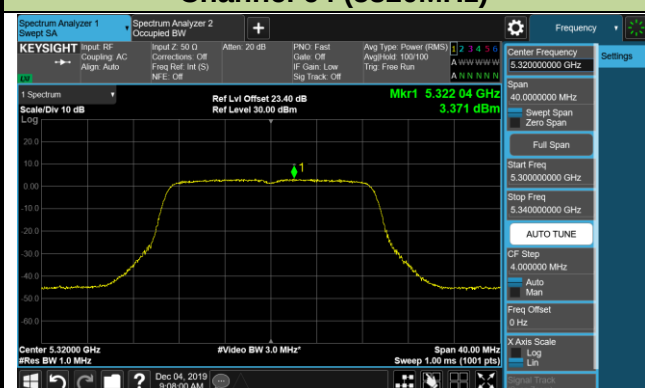
## Channel 52 (5260MHz)



## Channel 60 (5300MHz)



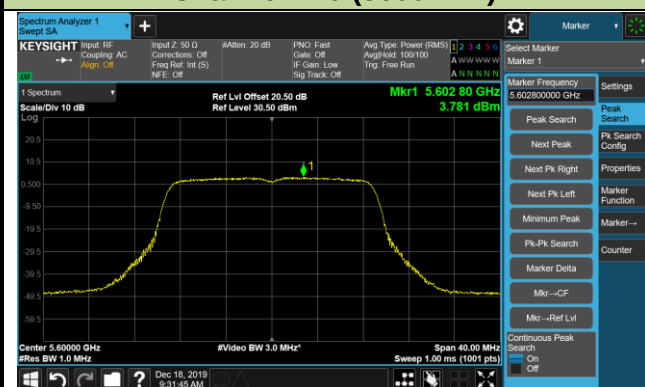
## Channel 64 (5320MHz)



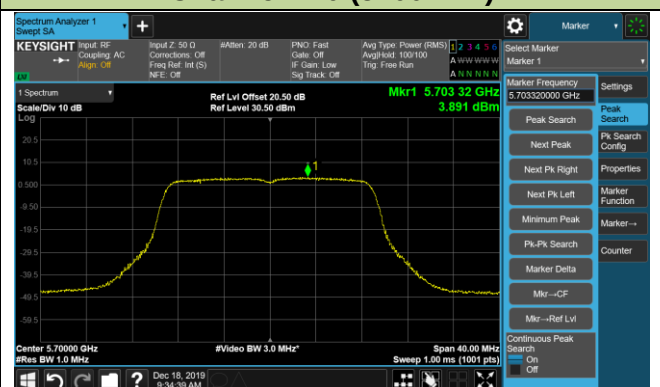
## Channel 100 (5500MHz)



## Channel 120 (5600MHz)

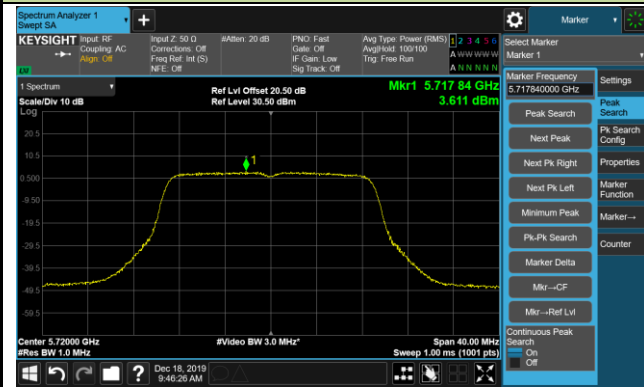


## Channel 140 (5700MHz)



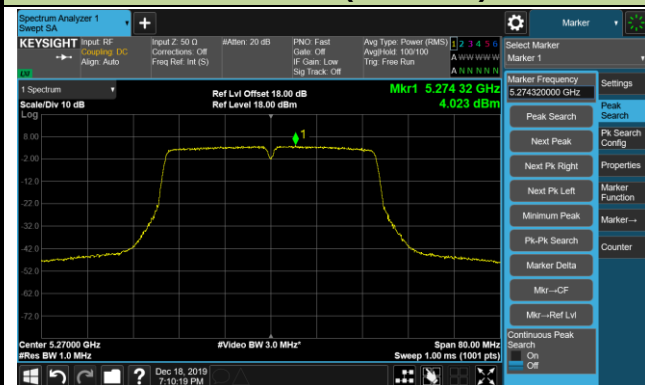
# 802.11ac-VHT20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

## Channel 144 (5720MHz)

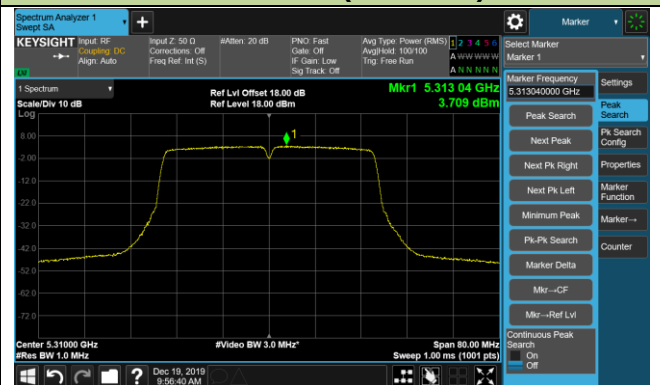


# 802.11ac-VHT40 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

Channel 54 (5270MHz)



Channel 62 (5310MHz)



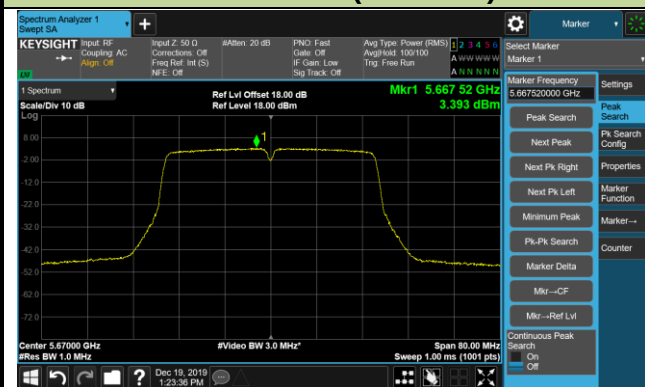
Channel 102 (5510MHz)



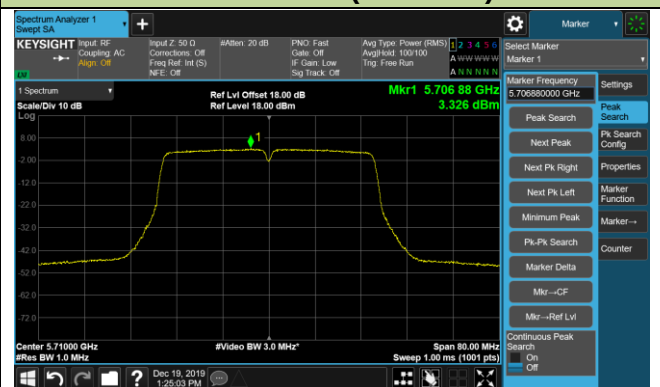
Channel 118 (5590MHz)



Channel 134 (5670MHz)

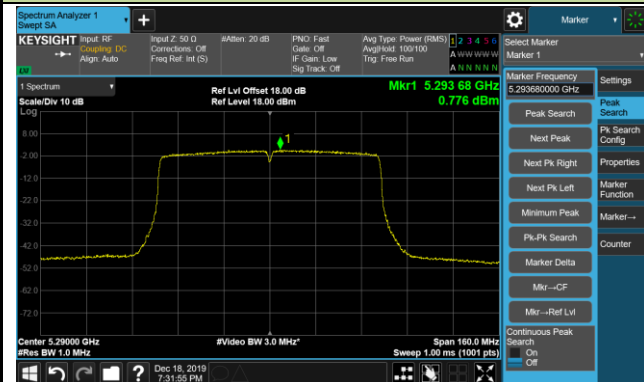


Channel 142 (5710MHz)

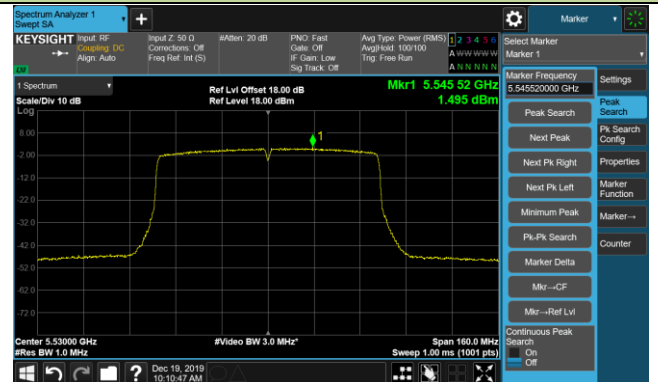


# 802.11ac-VHT80 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

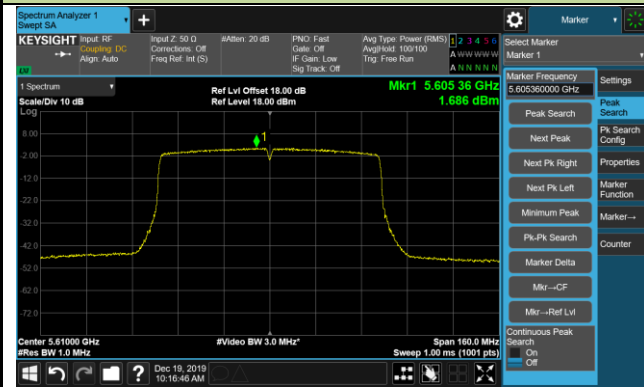
## Channel 58 (5290MHz)



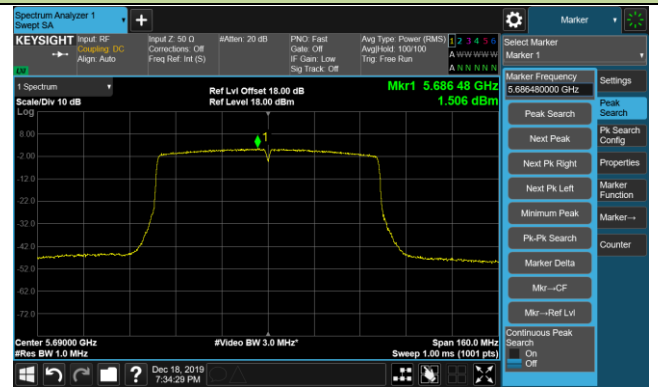
## Channel 106 (5530MHz)



## Channel 122 (5610MHz)

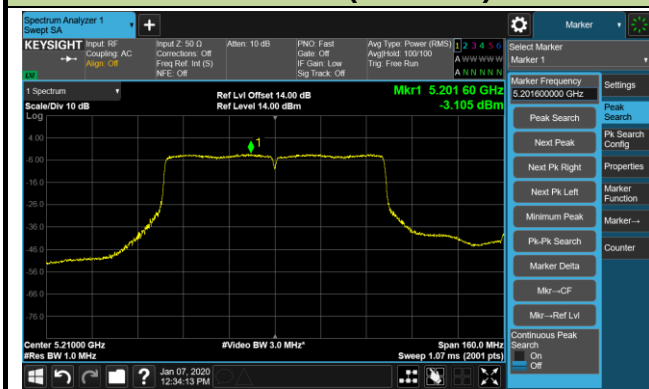


## Channel 138 (5690MHz)

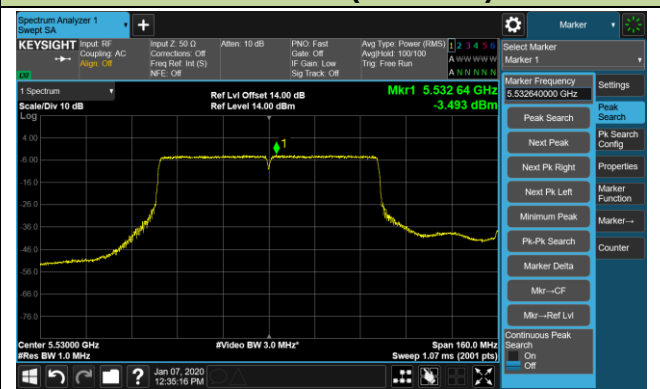


## 802.11ac-VHT80+80 Contiguous Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

### Channel 42 (5210MHz)

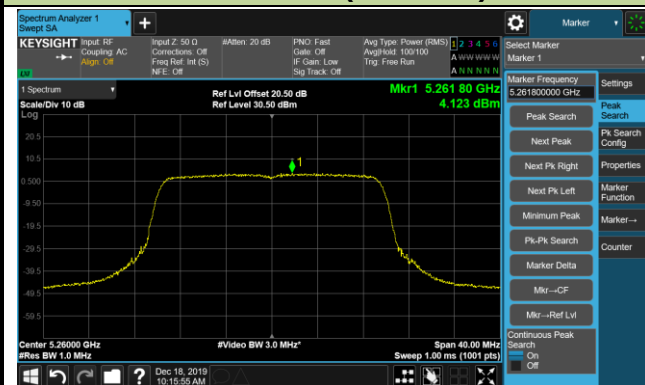


### Channel 106 (5530MHz)

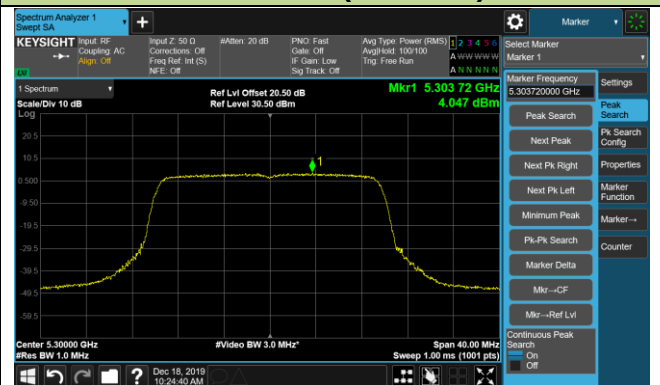


## 802.11ax-HE20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

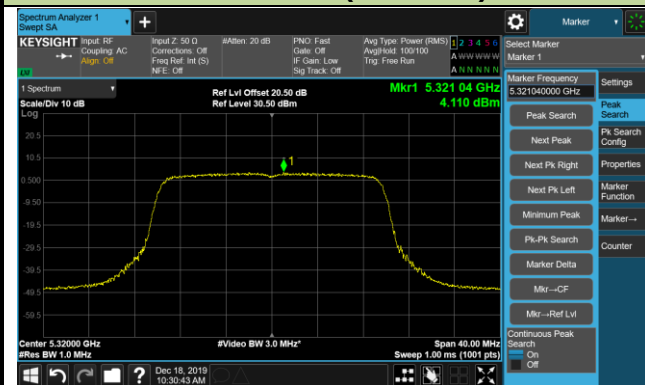
### Channel 52 (5260MHz)



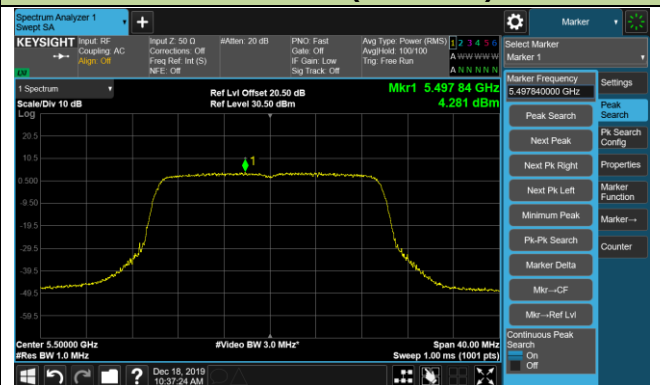
### Channel 60 (5300MHz)



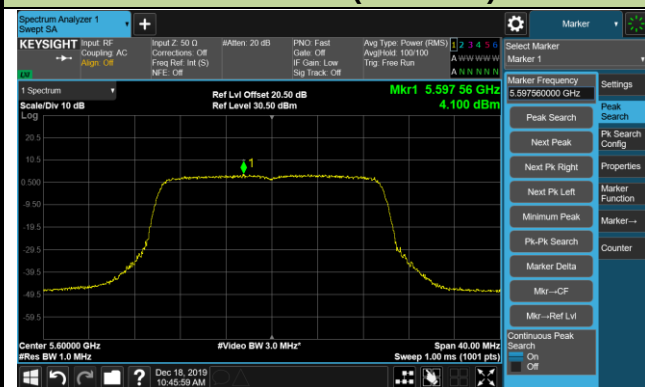
### Channel 64 (5320MHz)



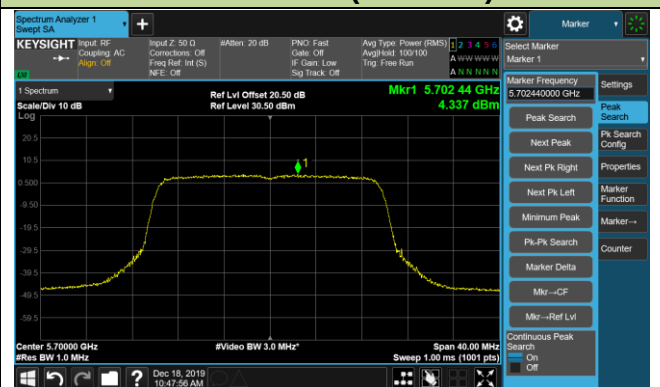
### Channel 100 (5500MHz)



### Channel 120 (5600MHz)

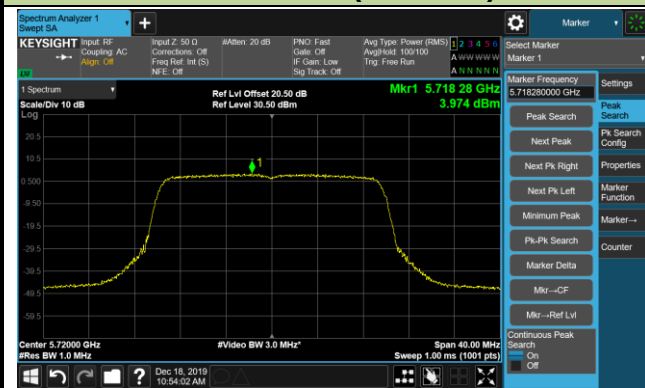


### Channel 140 (5700MHz)



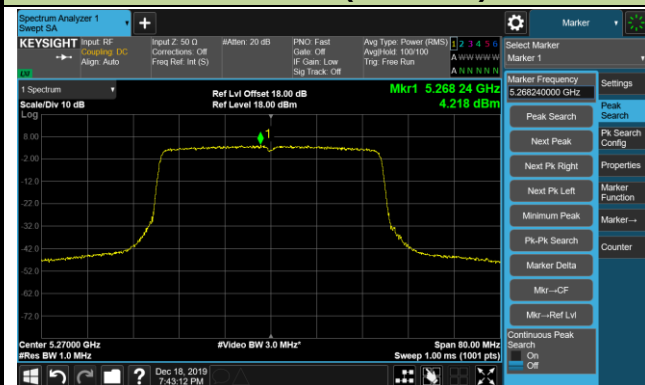
# 802.11ax-HE20 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

## Channel 144 (5720MHz)

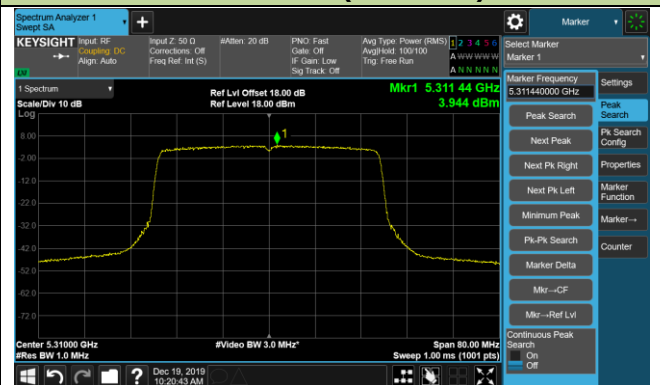


# 802.11ax-HE40 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

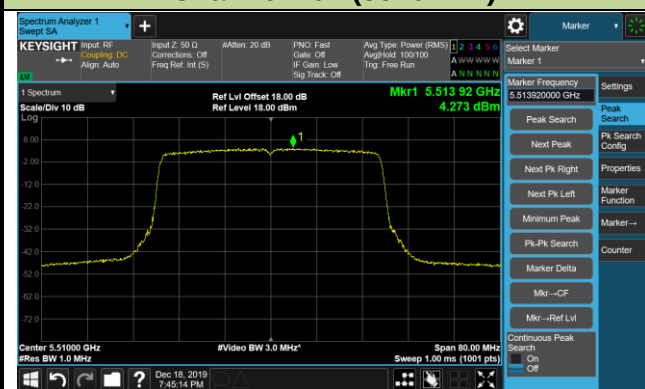
Channel 54 (5270MHz)



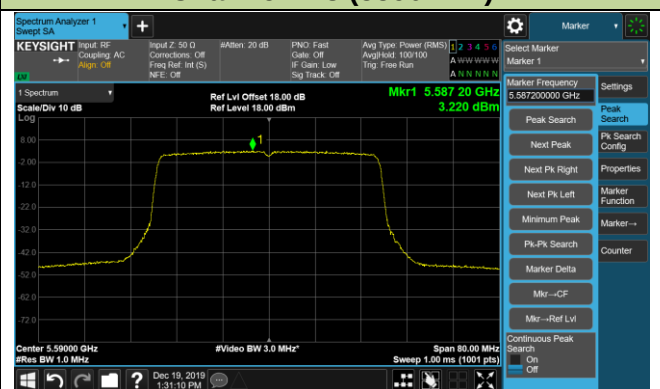
Channel 62 (5310MHz)



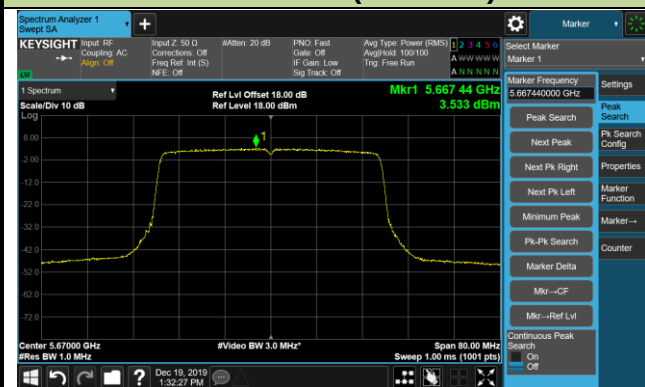
Channel 102 (5510MHz)



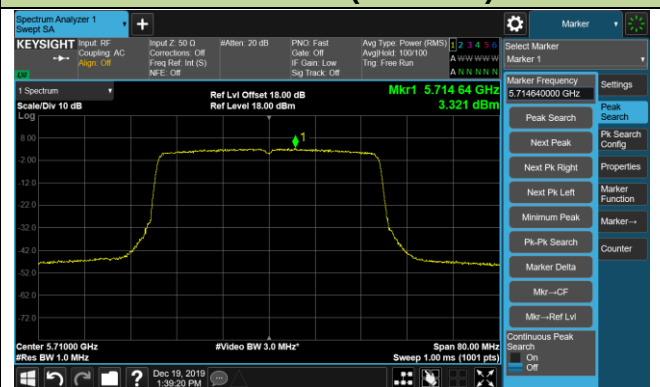
Channel 118 (5590MHz)



Channel 134 (5670MHz)

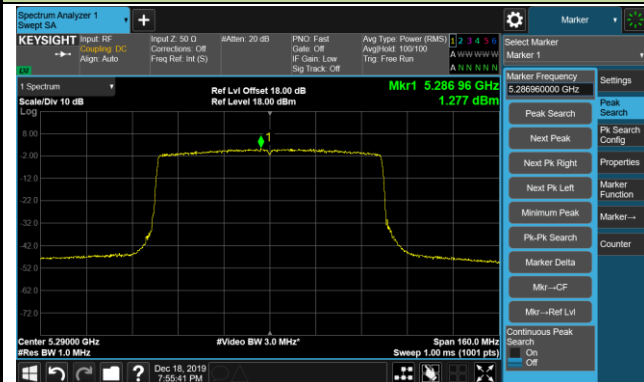


Channel 142 (5710MHz)

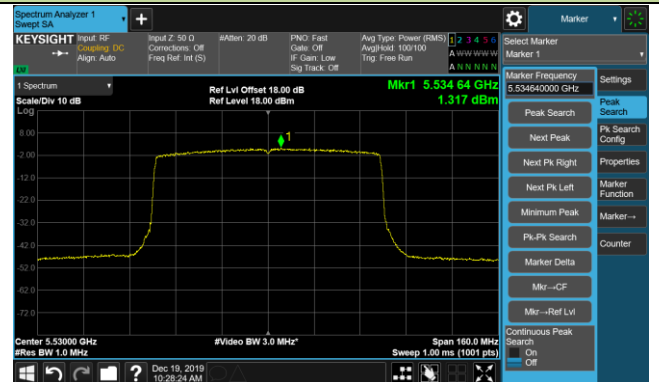


# 802.11ax-HE80 Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

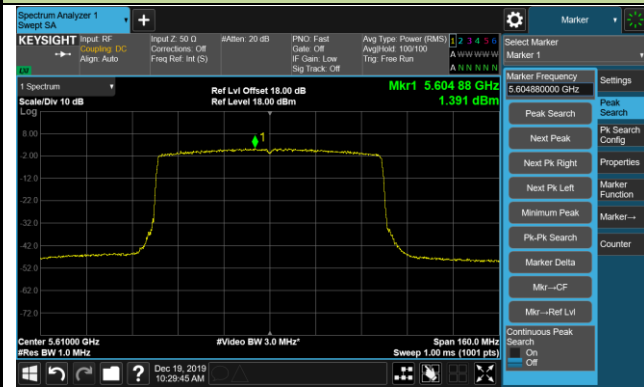
## Channel 58 (5290MHz)



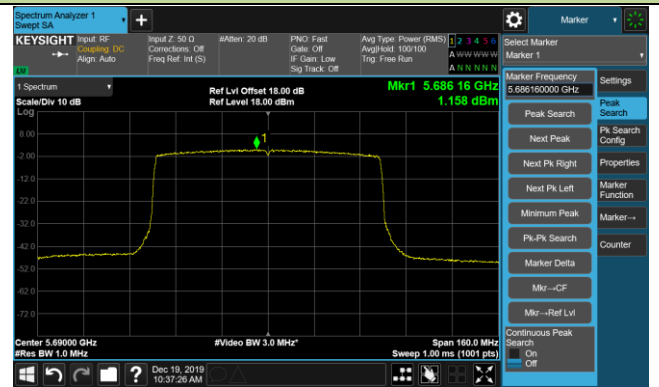
## Channel 106 (5530MHz)



## Channel 122 (5610MHz)

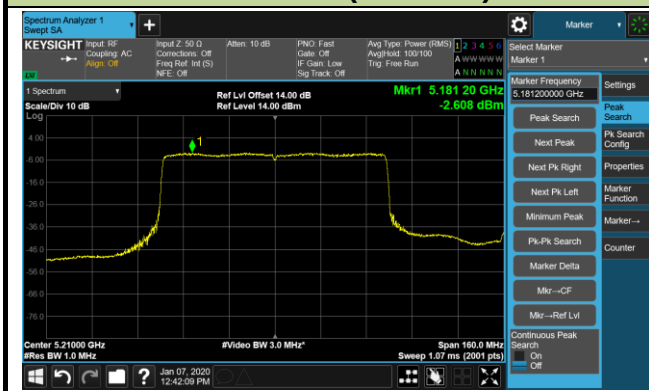


## Channel 138 (5690MHz)



## 802.11ax-HE80+80 Contiguous Power Spectral Density - Ant 0 / Ant 0 + 1 + 2 + 3 (Non Beam-Forming Mode)

### Channel 42 (5210MHz)



### Channel 106 (5530MHz)

