

## 6dB Bandwidth

## 802.11a



## 802.11n HT20



## CH149



## CH149



## CH157



## CH157



## CH165



## CH165

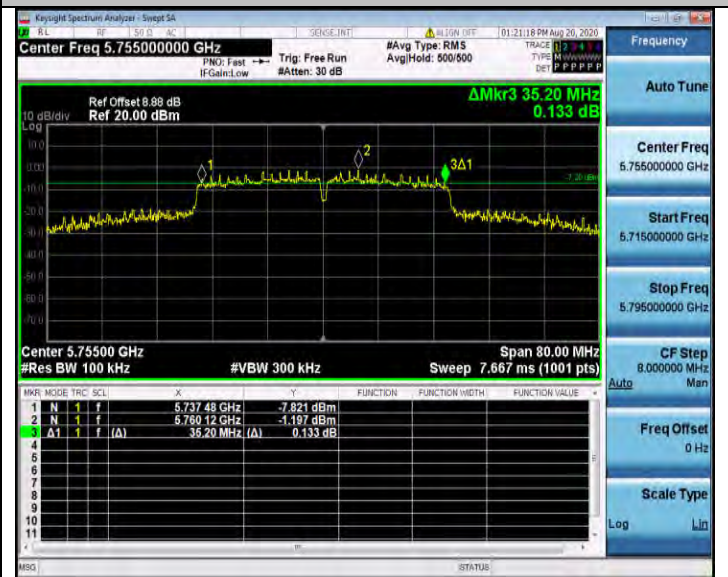


## 6dB Bandwidth

## 802.11ac20



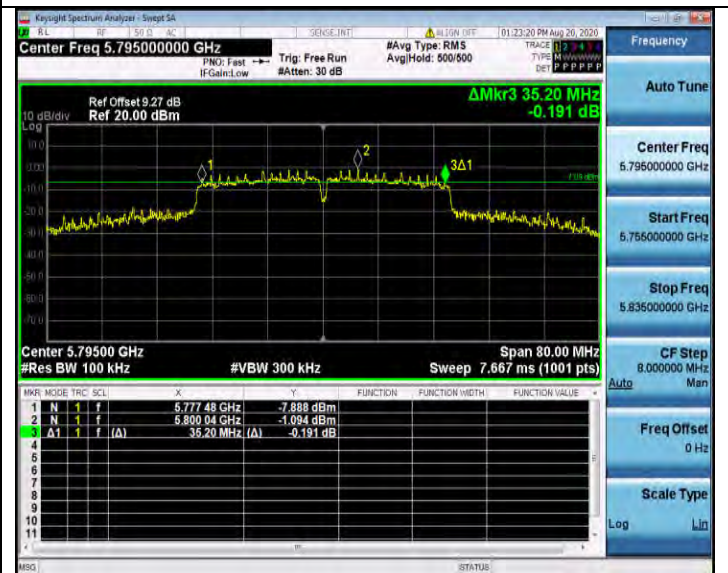
## 802.11n HT40



## CH149



## CH151



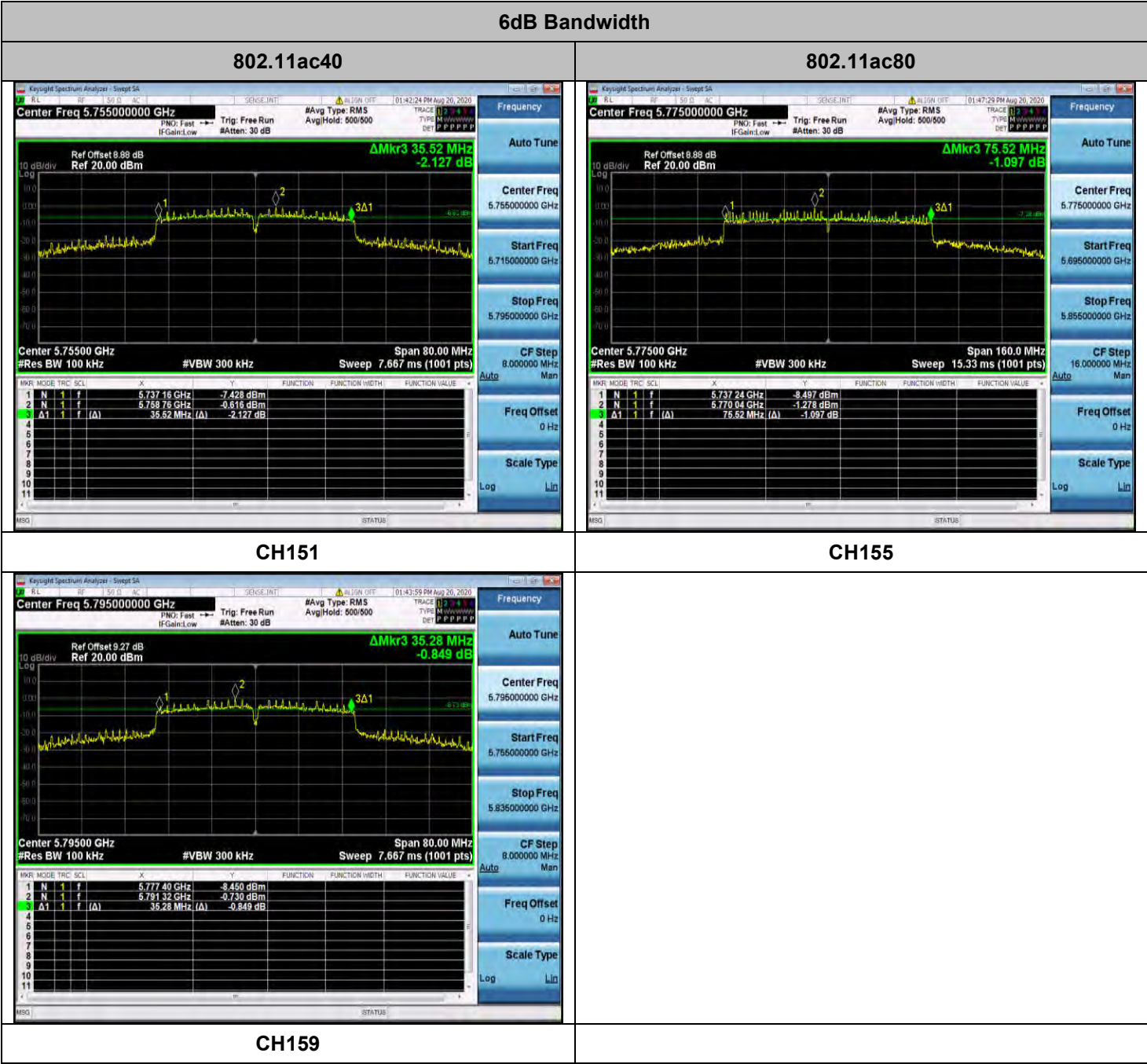
## CH157



## CH159

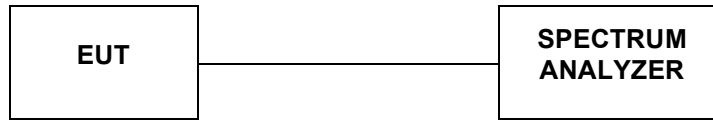


## CH165



#### 4.7. 26dBc Bandwidth

##### TEST CONFIGURATION



##### TEST PROCEDURE

According to KDB789033 D02 General UNII Test Procedures New Rules v01 for one of the following procedures may be used for Emission Bandwidth (EBW) measurement:

- Set RBW = 300 kHz (approximately 1% of the emission bandwidth).
- Set the video bandwidth (VBW) = 1000 KHz (VBW > RBW)
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize
- Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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

##### LIMIT

No Limits for 26dBc Bandwidth

##### TEST RESULTS

|               |          |                |                   |
|---------------|----------|----------------|-------------------|
| Temperature   | 23.6°C   | Humidity       | 55.7%             |
| Test Engineer | Moon Tan | Configurations | IEEE 802.11a/n/ac |

**Antenna 0:**

| Type        | Channel | 99%Bandwidth (MHz) | 26dB Bandwidth (MHz) | Limit (KHz) | Result |
|-------------|---------|--------------------|----------------------|-------------|--------|
| 802.11a     | 36      | 21.872             | 36.360               | -           | Pass   |
|             | 40      | 21.443             | 35.280               |             |        |
|             | 48      | 20.976             | 35.760               |             |        |
| 802.11nHT20 | 36      | 24.524             | 38.480               | -           | Pass   |
|             | 40      | 24.103             | 38.160               |             |        |
|             | 48      | 24.426             | 39.280               |             |        |
| 802.11ac20  | 36      | 21.990             | 37.120               | -           | Pass   |
|             | 40      | 22.505             | 37.600               |             |        |
|             | 48      | 23.527             | 37.720               |             |        |
| 802.11n40   | 38      | 47.090             | 79.600               | -           | Pass   |
|             | 46      | 47.283             | 80.000               |             |        |
| 802.11ac40  | 38      | 47.810             | 79.440               | -           | Pass   |
|             | 46      | 49.929             | 78.560               |             |        |
| 802.11ac80  | 42      | 92.239             | 159.840              | -           | Pass   |

**Antenna 1:**

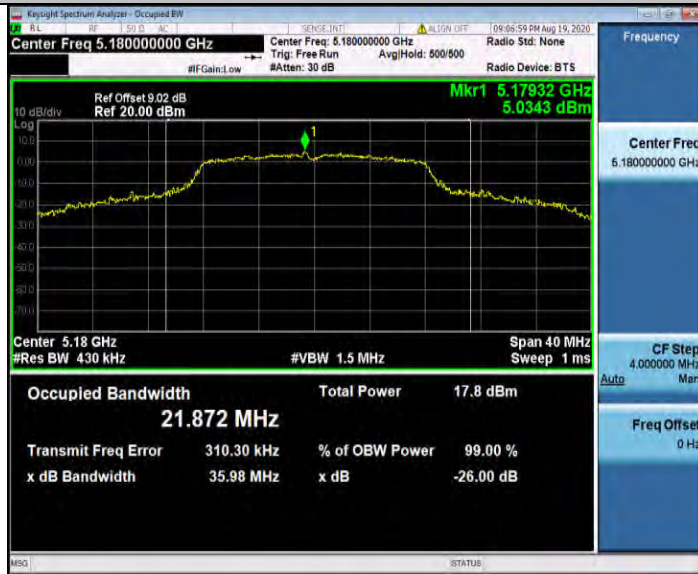
| Type        | Channel | 99%Bandwidth (MHz) | 26dB Bandwidth (MHz) | Limit (KHz) | Result |
|-------------|---------|--------------------|----------------------|-------------|--------|
| 802.11a     | 36      | 22.444             | 36.480               | -           | Pass   |
|             | 40      | 22.879             | 37.400               |             |        |
|             | 48      | 23.536             | 36.800               |             |        |
| 802.11nHT20 | 36      | 25.566             | 39.480               | -           | Pass   |
|             | 40      | 26.246             | 39.720               |             |        |
|             | 48      | 27.122             | 39.840               |             |        |
| 802.11ac20  | 36      | 23.161             | 37.600               | -           | Pass   |
|             | 40      | 23.553             | 38.480               |             |        |
|             | 48      | 24.072             | 38.680               |             |        |
| 802.11n40   | 38      | 50.760             | 79.840               | -           | Pass   |
|             | 46      | 53.198             | 80.000               |             |        |
| 802.11ac40  | 38      | 48.440             | 79.840               | -           | Pass   |
|             | 46      | 50.937             | 79.760               |             |        |
| 802.11ac80  | 42      | 119.64             | 160.000              | -           | Pass   |

## Antenna 0:

## 99%Bandwidth

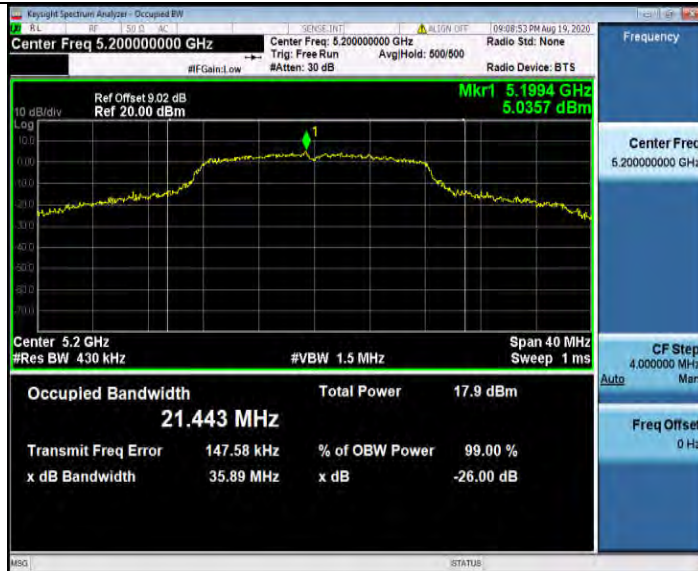
## 802.11a

## 802.11n HT20



## CH36

## CH36



## CH40

## CH40

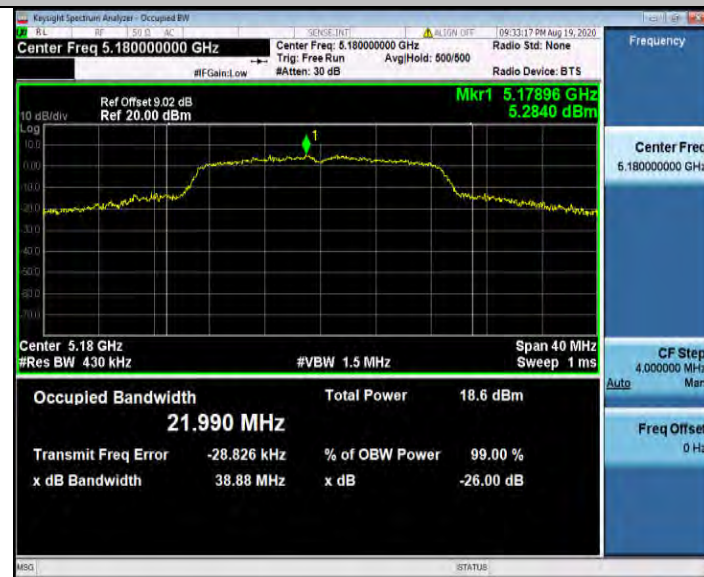


## CH48

## CH48

## 99%Bandwidth

## 802.11ac20



## 802.11n HT40



## CH36



## CH38



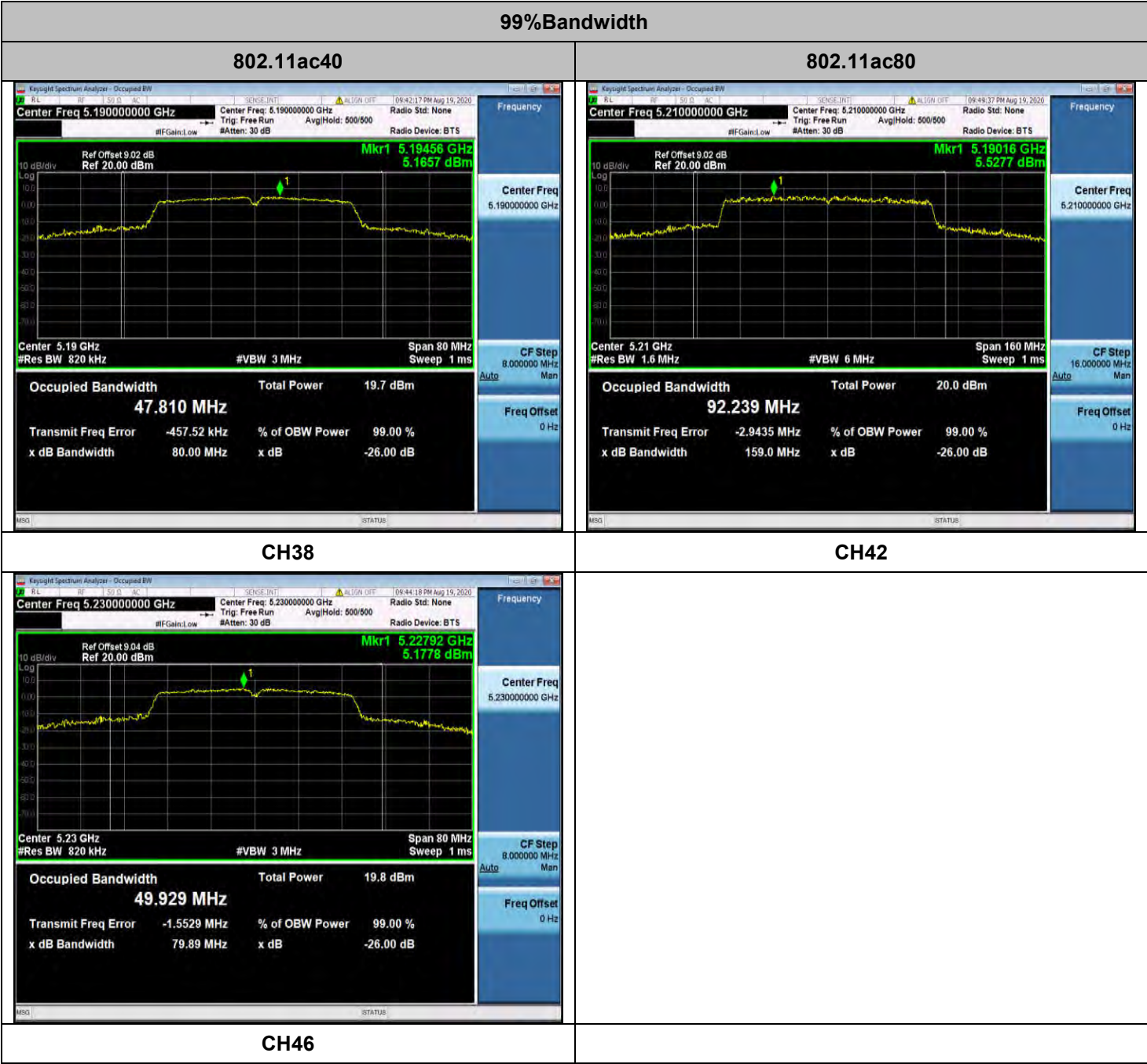
## CH40



## CH46



## CH48



CH46

Keyight Spectrum Analyzer - Occupied BW

Center Freq 5.26000000 GHz

Center Freq: 5.26000000 GHz

Trig: Free Run

Avg/Hold: 500/500

Radio Std: None

#FGain: Low

#Atten: 30 dB

Radio Device: BTS

Frequency

10 dB/div

Log

Ref Offset 9.04 dB

Ref 20.00 dBm

Mkr1 5.25792 GHz

5.1778 dBm

Center Freq 5.26000000 GHz

Center 5.26 GHz

#Res BW 820 kHz

#VBW 3 MHz

Span 80 MHz

Sweep 1 ms

CF Step 8.000000 MHz

Auto

Man

Freq Offset 0 Hz

Occupied Bandwidth 49.929 MHz

Total Power 19.8 dBm

Transmit Freq Error -1.5529 MHz

% of OBW Power 99.00 %

x dB Bandwidth 79.89 MHz

x dB -26.00 dB

MSG

STATUS

26dB Bandwidth

802.11a



802.11n HT20



CH36



CH36



CH40



CH40



CH48



CH48



## 26dB Bandwidth

## 802.11ac20



## 802.11n HT40



## CH36



## CH38



## CH40



## CH46



## CH48

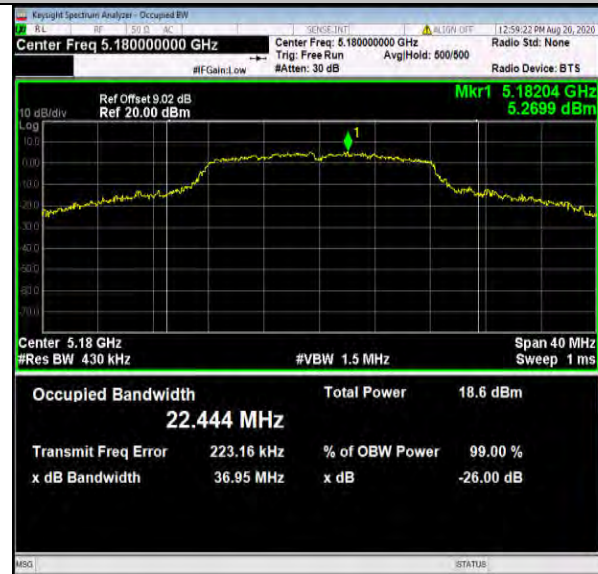


## Antenna 1:

## 99%Bandwidth

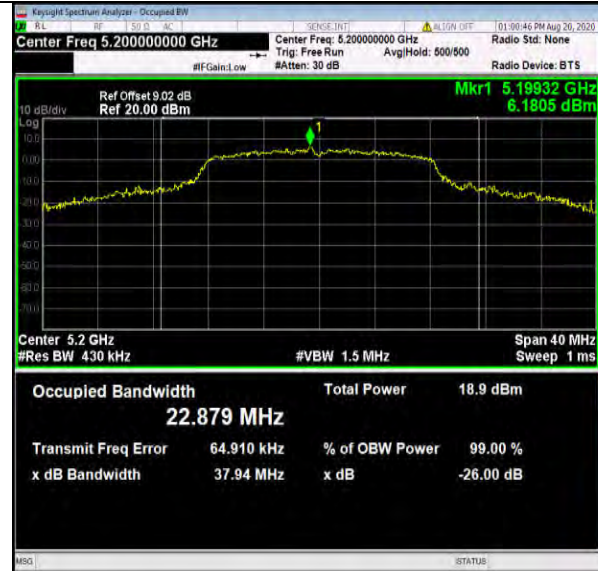
## 802.11a

## 802.11n HT20



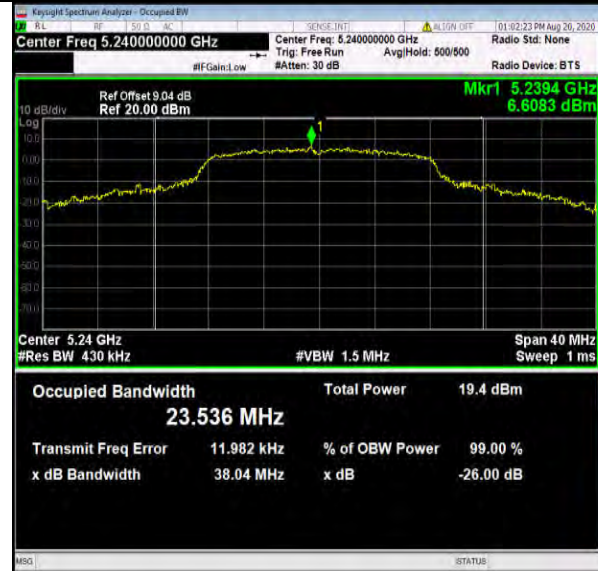
## CH36

## CH36



## CH40

## CH40



## CH48

## CH48

## 99%Bandwidth

## 802.11ac20



## 802.11n HT40



## CH36



## CH38



## CH40



## CH46



## CH48

## 99%Bandwidth

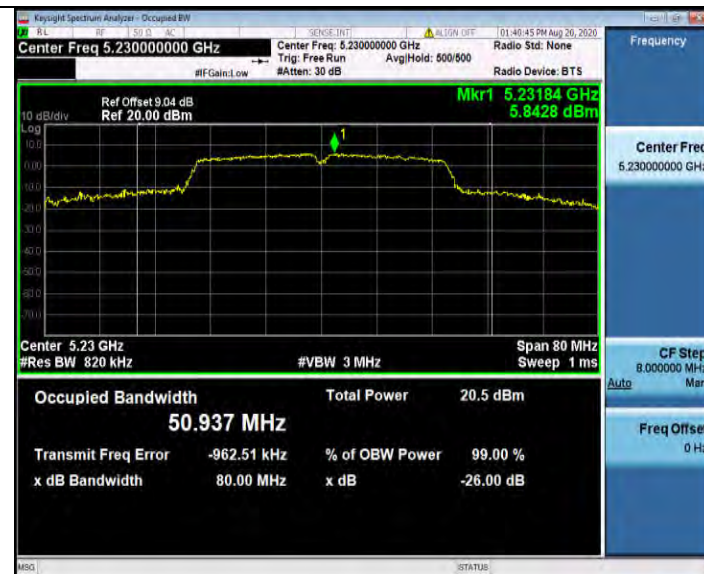
## 802.11ac40



## 802.11ac80



## CH38



## CH42



## CH46



## 26dB Bandwidth

802.11a



802.11n HT20



CH36



CH36



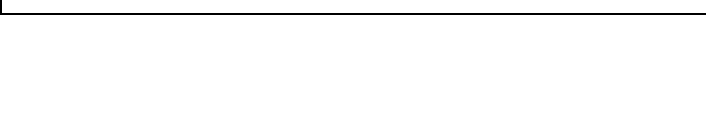
CH40



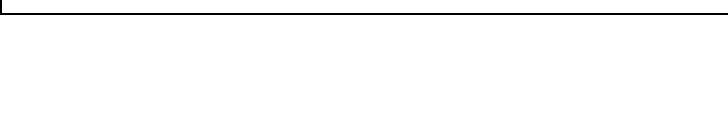
CH40



CH48



CH48



## 26dB Bandwidth

## 802.11ac20



## 802.11n HT40



## CH36



## CH38



## CH40



## CH46

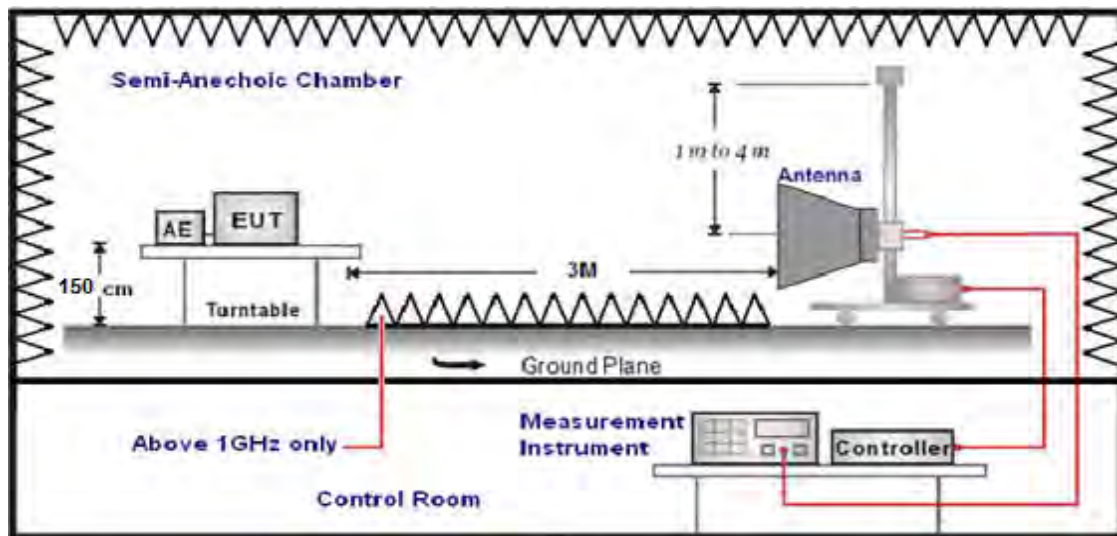


## CH48



## 4.8. Band Edge Compliance

### TEST CONFIGURATION



### LIMIT

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m)                            | Radiated (μV/m)       |
|-----------------|-------------------|----------------------------------------------|-----------------------|
| 0.009-0.49      | 3                 | $20\log(2400/F(\text{KHz})) + 40\log(300/3)$ | $2400/F(\text{KHz})$  |
| 0.49-1.705      | 3                 | $20\log(24000/F(\text{KHz})) + 40\log(30/3)$ | $24000/F(\text{KHz})$ |
| 1.705-30        | 3                 | $20\log(30) + 40\log(30/3)$                  | 30                    |
| 30-88           | 3                 | 40.0                                         | 100                   |
| 88-216          | 3                 | 43.5                                         | 150                   |
| 216-960         | 3                 | 46.0                                         | 200                   |
| Above 960       | 3                 | 54.0                                         | 500                   |

According to §15.407 (b): Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits

| Frequency (MHz) | EIRP Limit (dBm)                   | Equivalent Field Strength at 3m (dBμV/m) |
|-----------------|------------------------------------|------------------------------------------|
| 5150-5250       | -27                                | 68.2                                     |
| 5250-5350       | -27                                | 68.2                                     |
| 5470-5725       | -27                                | 68.2                                     |
| 5725-5850       | -27 (beyond 10MHz of the bandedge) | 68.2                                     |
|                 | -17 (within 10 MHz of band edge)   | 78.2                                     |

### TEST PROCEDURE

1. The EUT was placed on a turn table which is 1.5m above 1GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed..
5. The distance between test antenna and EUT as following table states:

| Test Frequency range | Test Antenna Type          | Test Distance |
|----------------------|----------------------------|---------------|
| 1GHz-18GHz           | Double Ridged Horn Antenna | 3             |

6. Setting test receiver/spectrum as following table states:

| Test Frequency range | Test Receiver/Spectrum Setting                                                                            | Detector |
|----------------------|-----------------------------------------------------------------------------------------------------------|----------|
| 1GHz-18GHz           | Peak Value: RBW=1MHz/VBW=3MHz,<br>Sweep time=Auto<br>Average Value: RBW=1MHz/VBW=10Hz,<br>Sweep time=Auto | Peak     |

### **Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

|                           |                                            |
|---------------------------|--------------------------------------------|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude    | AG = Amplifier Gain                        |
| AF = Antenna Factor       |                                            |

### **TEST RESULTS**

Remark: For radiated band edge We measured at both mode, recorded worst case in antenna 0's 802.11 ac20 mode;

**For Radiated Bandedge Measurement**

|               |          |                |                   |
|---------------|----------|----------------|-------------------|
| Temperature   | 23.4°C   | Humidity       | 54.5%             |
| Test Engineer | Moon Tan | Configurations | IEEE 802.11a/n/ac |

**NOTE: We measured Radiated Emission at Antenna 0 & Antenna 1 mode from 1GHz to 25GHz and the worst case was recorded(Antenna 0).**

| <b>802.11 ac20/ Channel 36 :5180 MHz</b> |                   |                       |                 |                 |                       |                     |             |          |              |
|------------------------------------------|-------------------|-----------------------|-----------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| Freq (MHz)                               | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor (dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
| 4500.0                                   | 35.09             | 35.58                 | 29.04           | 8.28            | 49.91                 | 68.20               | -18.29      | Peak     | Horizontal   |
| 4500.0                                   | 30.05             | 35.58                 | 29.04           | 8.28            | 44.87                 | 54.00               | -9.13       | AV       | Horizontal   |
| 5150.0                                   | 39.15             | 35.58                 | 29.04           | 8.28            | 53.97                 | 68.20               | -14.23      | Peak     | Horizontal   |
| 5150.0                                   | 30.56             | 35.58                 | 29.04           | 8.28            | 45.38                 | 54.00               | -8.62       | AV       | Horizontal   |

| <b>802.11 ac20/ Channel 48 :5240 MHz</b> |                   |                       |                 |                 |                       |                     |             |          |              |
|------------------------------------------|-------------------|-----------------------|-----------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| Freq (MHz)                               | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor (dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
| 5350.0                                   | 35.28             | 35.42                 | 29.06           | 8.39            | 50.03                 | 68.20               | -18.17      | Peak     | Horizontal   |
| 5350.0                                   | 30.30             | 35.42                 | 29.06           | 8.39            | 45.05                 | 54.00               | -8.95       | AV       | Horizontal   |
| 5460.0                                   | 39.11             | 35.42                 | 29.06           | 8.39            | 53.86                 | 68.20               | -14.34      | Peak     | Horizontal   |
| 5460.0                                   | 30.69             | 35.42                 | 29.06           | 8.39            | 45.44                 | 54.00               | -8.56       | AV       | Horizontal   |

| <b>802.11 ac20/ Channel 149 :5745 MHz</b> |                   |                       |                 |                 |                       |                     |             |          |              |
|-------------------------------------------|-------------------|-----------------------|-----------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| Freq (MHz)                                | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor (dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
| 5650.0                                    | 30.10             | 35.35                 | 29.07           | 8.43            | 44.81                 | 68.20               | -23.39      | Peak     | Horizontal   |
| 5700.0                                    | 30.27             | 35.35                 | 29.07           | 8.43            | 44.98                 | 68.20               | -23.22      | Peak     | Horizontal   |
| 5720.0                                    | 32.18             | 35.35                 | 29.07           | 8.43            | 46.89                 | 68.20               | -21.31      | Peak     | Horizontal   |
| 5725.0                                    | 30.67             | 35.35                 | 29.07           | 8.43            | 45.38                 | 68.20               | -22.82      | Peak     | Horizontal   |

| <b>802.11 ac20/ Channel 165 :5825 MHz</b> |                   |                       |                 |                 |                       |                     |             |          |              |
|-------------------------------------------|-------------------|-----------------------|-----------------|-----------------|-----------------------|---------------------|-------------|----------|--------------|
| Freq (MHz)                                | Read Level (dBμV) | Antenna Factor (dB/m) | PRM Factor (dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector | Polarization |
| 5850.0                                    | 30.05             | 35.3                  | 29.11           | 8.51            | 44.75                 | 68.20               | -23.45      | Peak     | Horizontal   |
| 5855.0                                    | 30.38             | 35.3                  | 29.11           | 8.51            | 45.08                 | 68.20               | -23.12      | Peak     | Horizontal   |
| 5875.0                                    | 32.02             | 35.3                  | 29.11           | 8.51            | 46.72                 | 68.20               | -21.48      | Peak     | Horizontal   |
| 5925.0                                    | 30.67             | 35.3                  | 29.11           | 8.51            | 45.37                 | 68.20               | -22.83      | Peak     | Horizontal   |

**REMARKS:**

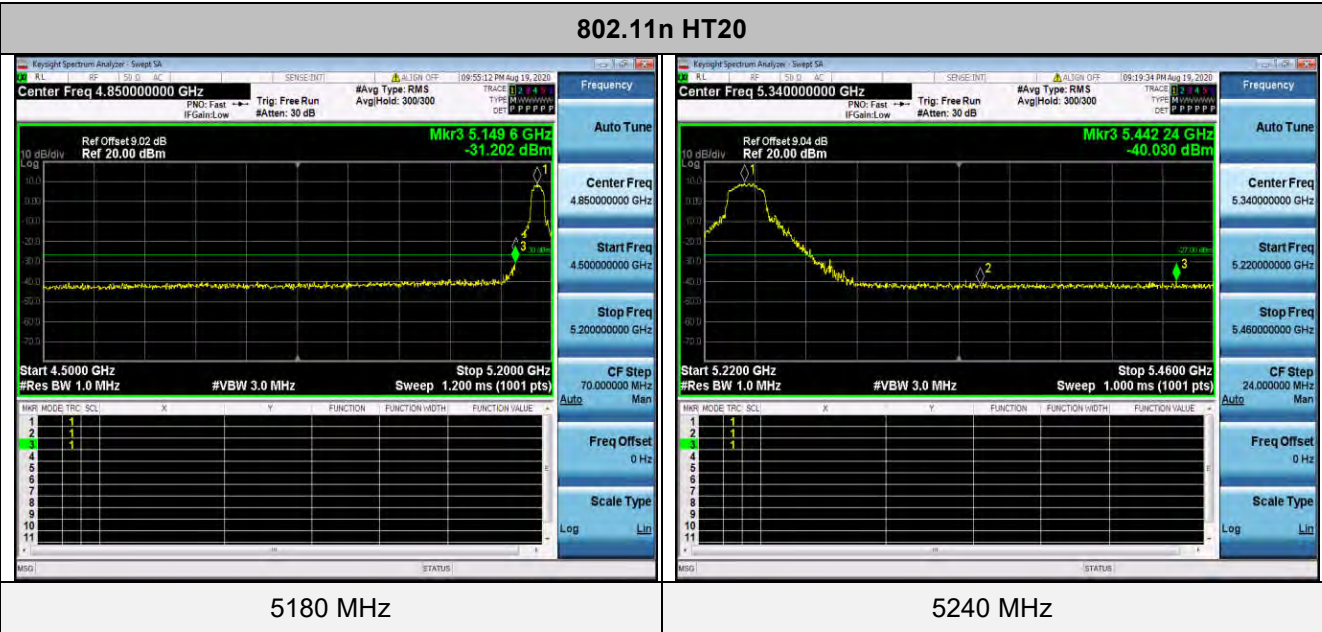
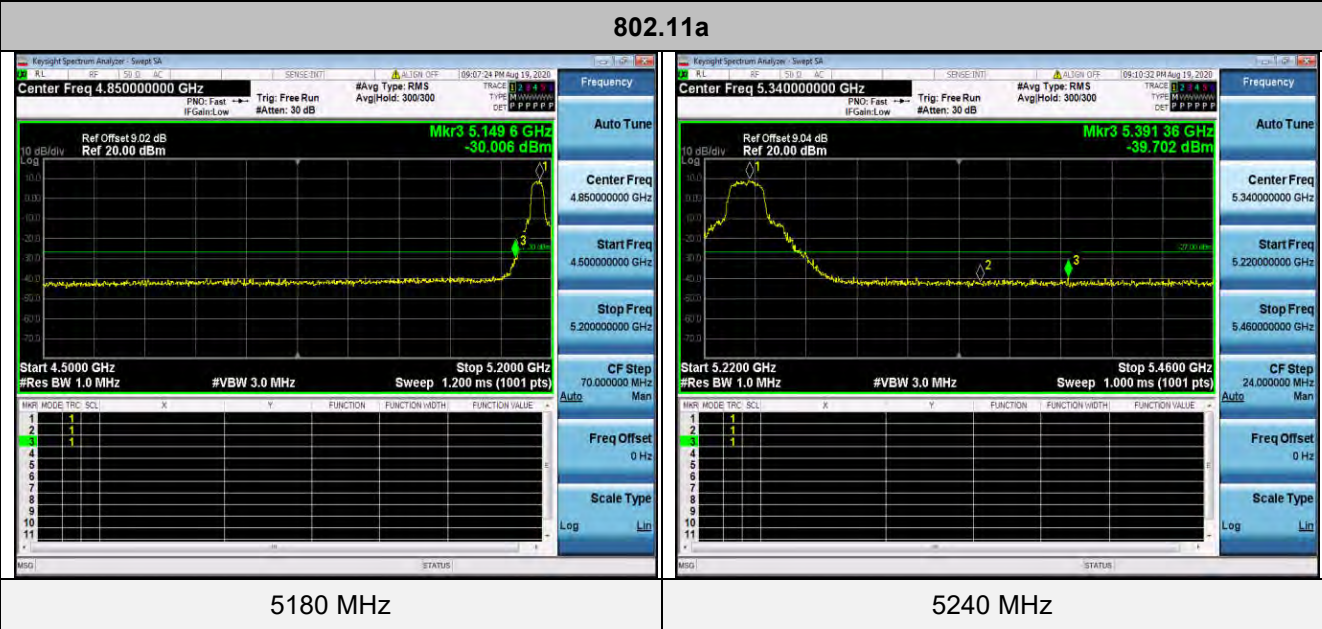
1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.
2. Margin value = Result Level-Limit value.
2. The other emission levels were very low against the limit.
3. The average measurement was not performed when the peak measured data under the limit of average detection.
4. Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=10Hz/Sweep time=Auto/Detector=Peak;

For Conducted Band edge Measurement

|               |          |                |                   |
|---------------|----------|----------------|-------------------|
| Temperature   | 23.6°C   | Humidity       | 55.7%             |
| Test Engineer | Moon Tan | Configurations | IEEE 802.11a/n/ac |

The test results have included the antenna gain

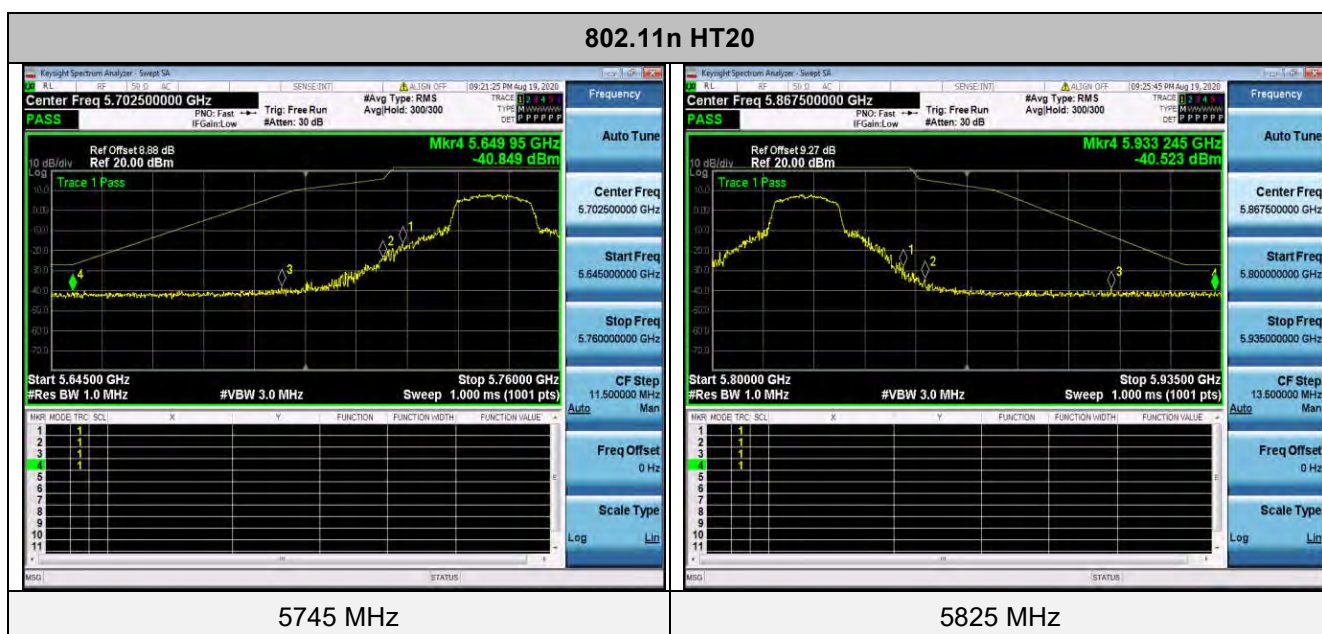
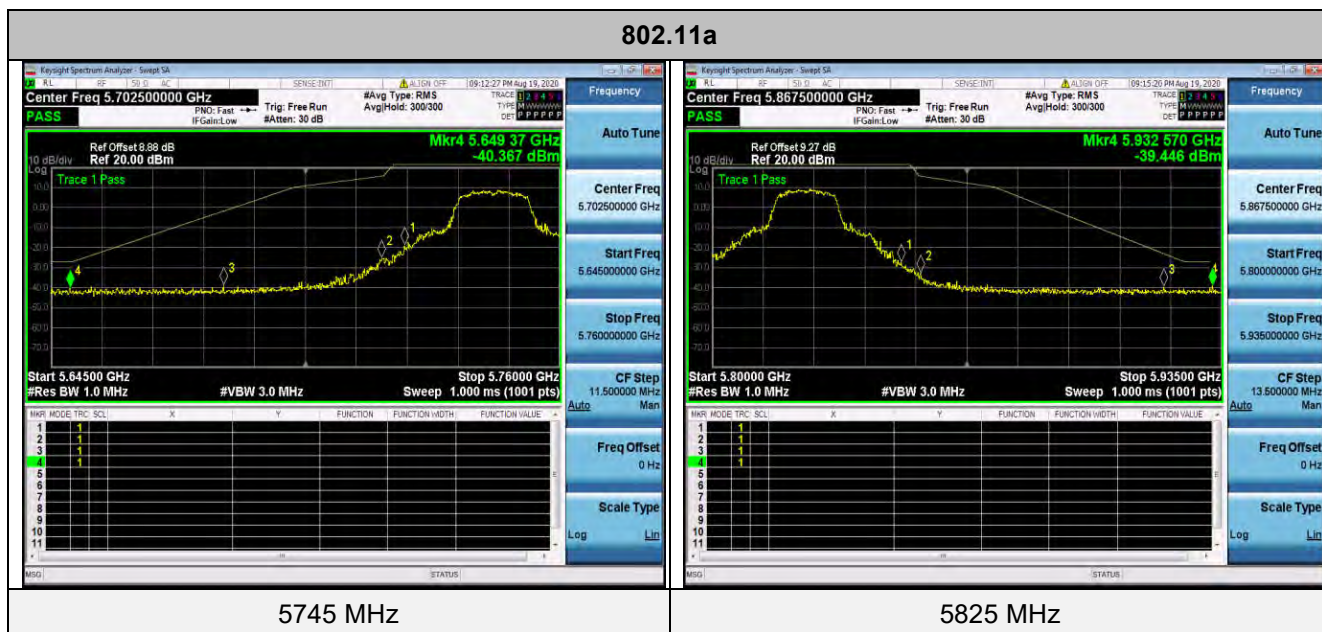
Antenna 0:  
5150-5250MHz:

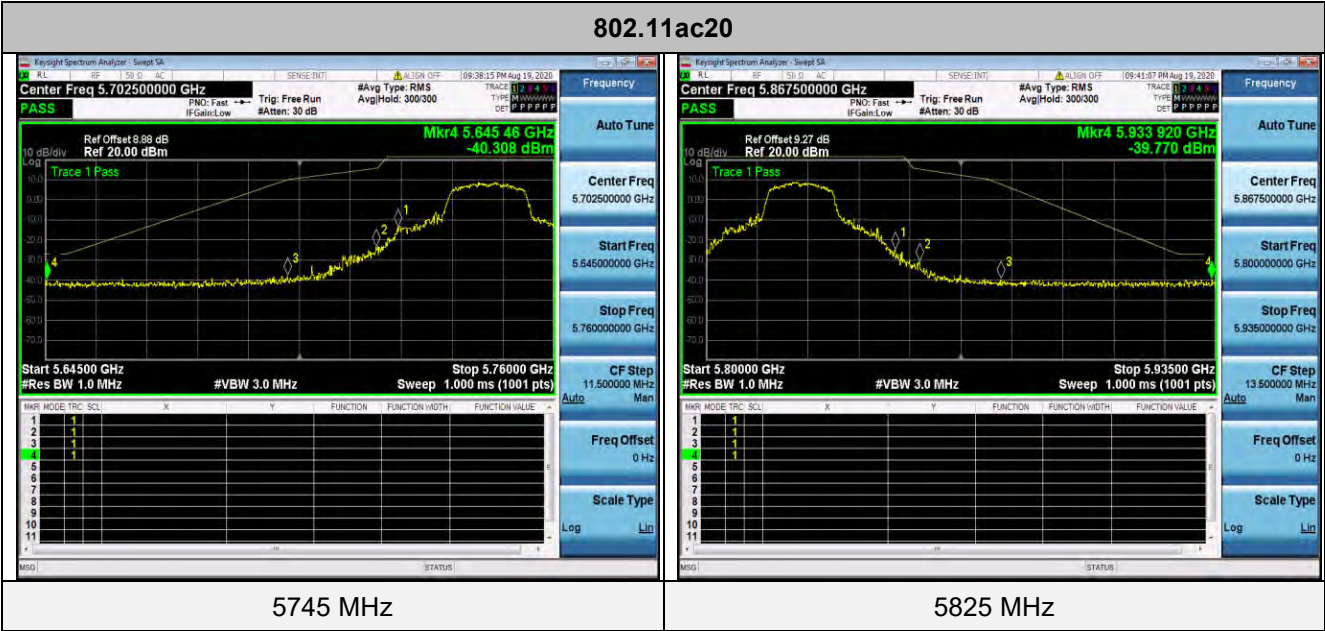






**5725-5850MHz:**





802.11ac40

Keysight Spectrum Analyzer - Sweep SA

**Center Freq 5.712500000 GHz**

PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB

**PASS**

Ref Offset 8.99 dB Ref 20.00 dBm

Mkr4 5.646 350 GHz -39.104 dBm

Trace 1 Pass

Start 5.645000 GHz Stop 5.780000 GHz

#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (1001 pts)

| MR MODE | TRC | SCN | X | Y | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|---------|-----|-----|---|---|----------|----------------|----------------|
| 1       | 1   | 1   |   |   |          |                |                |
| 2       | 1   | 1   |   |   |          |                |                |
| 3       | 1   | 1   |   |   |          |                |                |
| 4       | 1   | 1   |   |   |          |                |                |
| 5       | 1   | 1   |   |   |          |                |                |
| 6       | 1   | 1   |   |   |          |                |                |
| 7       | 1   | 1   |   |   |          |                |                |
| 8       | 1   | 1   |   |   |          |                |                |
| 9       | 1   | 1   |   |   |          |                |                |
| 10      | 1   | 1   |   |   |          |                |                |
| 11      | 1   | 1   |   |   |          |                |                |

Auto

Frequency

Center Freq 5.712500000 GHz

Start Freq 5.645000000 GHz

Stop Freq 5.780000000 GHz

CF Step 13.500000 MHz

Auto

Freq Offset 0 Hz

Scale Type Log

Keysight Spectrum Analyzer - Sweep SA

**Center Freq 5.852500000 GHz**

PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB

**PASS**

Ref Offset 9.27 dB Ref 20.00 dBm

Mkr4 5.925 100 GHz -39.410 dBm

Trace 1 Pass

Start 5.770000 GHz Stop 5.935000 GHz

#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (1001 pts)

| MR MODE | TRC | SCN | X | Y | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|---------|-----|-----|---|---|----------|----------------|----------------|
| 1       | 1   | 1   |   |   |          |                |                |
| 2       | 1   | 1   |   |   |          |                |                |
| 3       | 1   | 1   |   |   |          |                |                |
| 4       | 1   | 1   |   |   |          |                |                |
| 5       | 1   | 1   |   |   |          |                |                |
| 6       | 1   | 1   |   |   |          |                |                |
| 7       | 1   | 1   |   |   |          |                |                |
| 8       | 1   | 1   |   |   |          |                |                |
| 9       | 1   | 1   |   |   |          |                |                |
| 10      | 1   | 1   |   |   |          |                |                |
| 11      | 1   | 1   |   |   |          |                |                |

Auto

Frequency

Center Freq 5.852500000 GHz

Start Freq 5.770000000 GHz

Stop Freq 5.935000000 GHz

CF Step 16.500000 MHz

Auto

Freq Offset 0 Hz

Scale Type Log

5755 MHz

5795 MHz

5755 MHz

5795 MHz

**802.11ac80**

**Left Screenshot:**

- Center Freq: 5.722500000 GHz
- Start Freq: 5.645000000 GHz
- Stop Freq: 5.800000000 GHz
- Center Freq: 5.647945 GHz
- Power: -30.858 dBm
- Resolution Bandwidth (Res BW): 1.0 MHz
- Sweep: 1.000 ms (1001 pts)

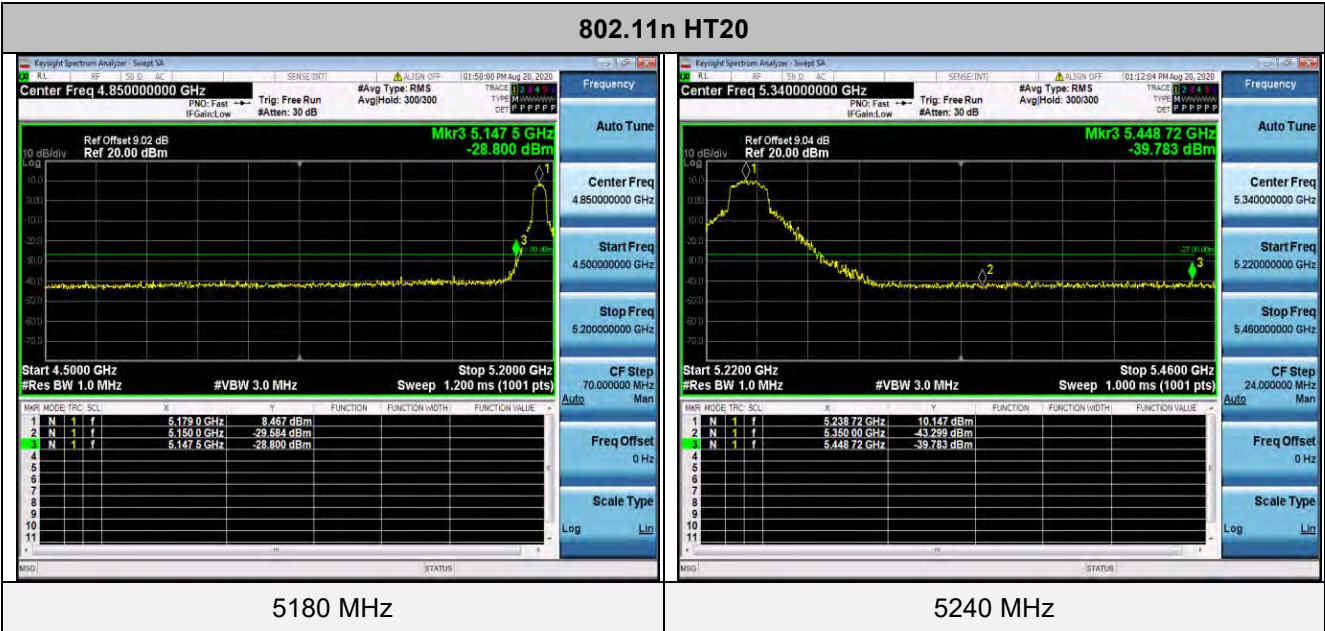
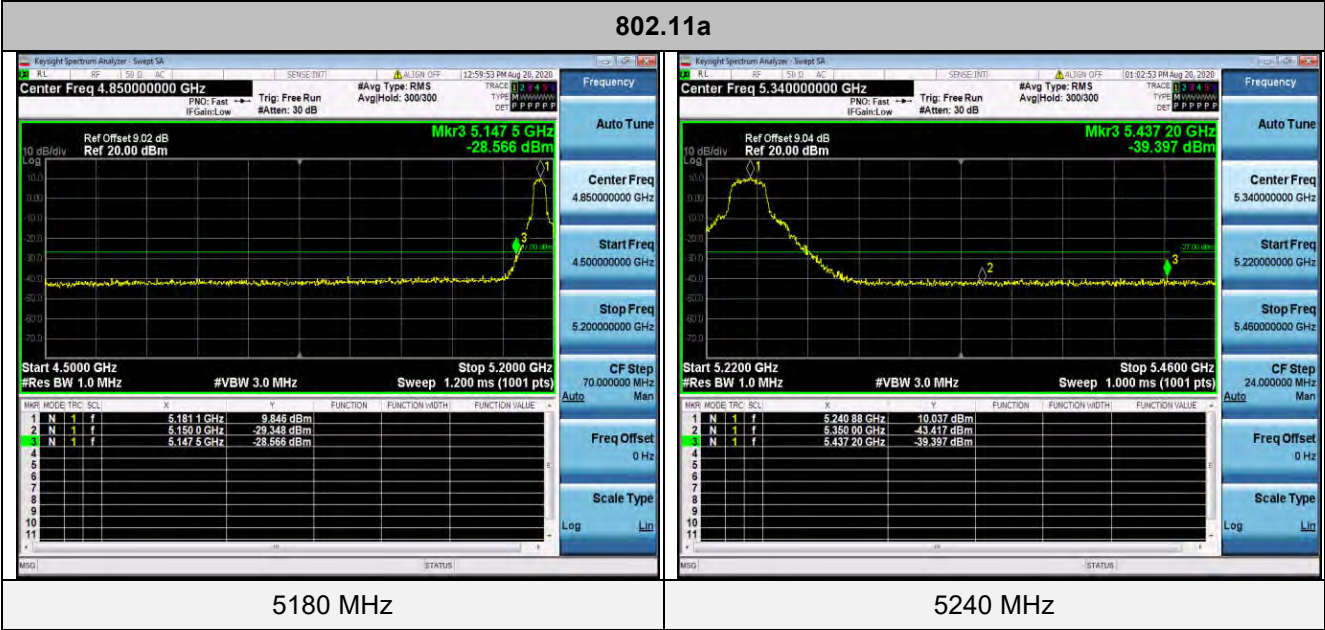
**Right Screenshot:**

- Center Freq: 5.842500000 GHz
- Start Freq: 5.842500000 GHz
- Stop Freq: 5.935000000 GHz
- Center Freq: 5.932780 GHz
- Power: -38.150 dBm
- Resolution Bandwidth (Res BW): 1.0 MHz
- Sweep: 1.000 ms (1001 pts)

5775 MHz

5775 MHz

Antenna 1:  
5150-5250MHz:



802.11ac20



5180 MHz



5240 MHz

802.11n HT40



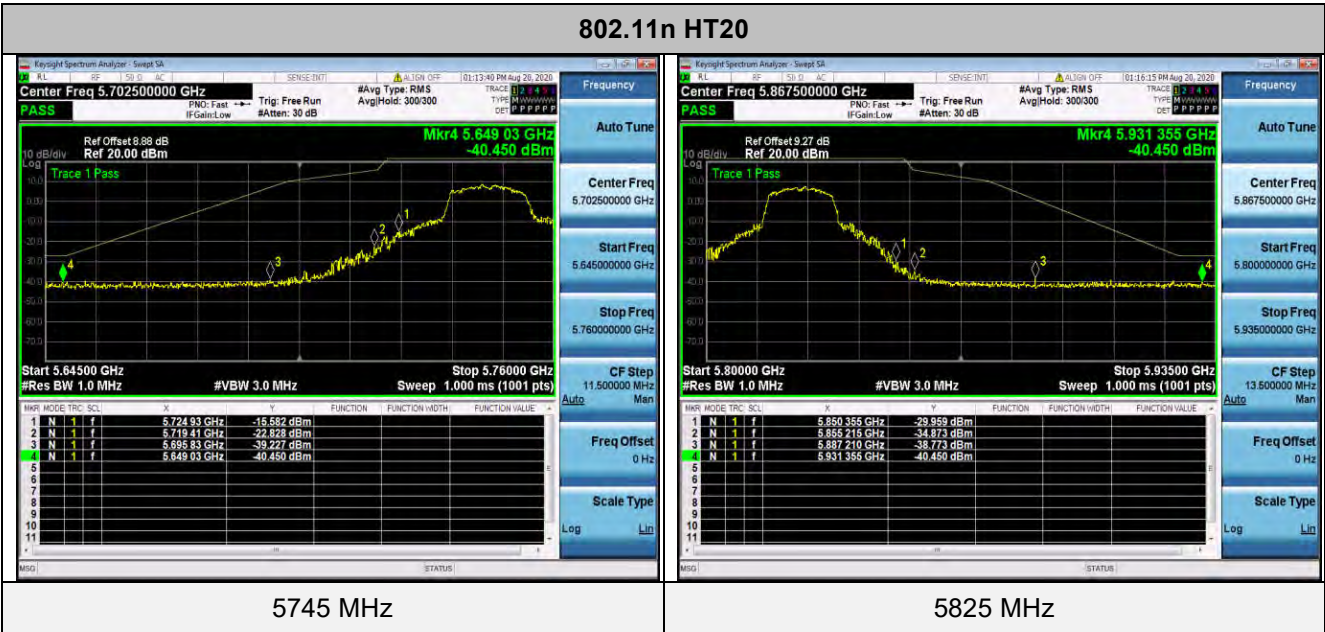
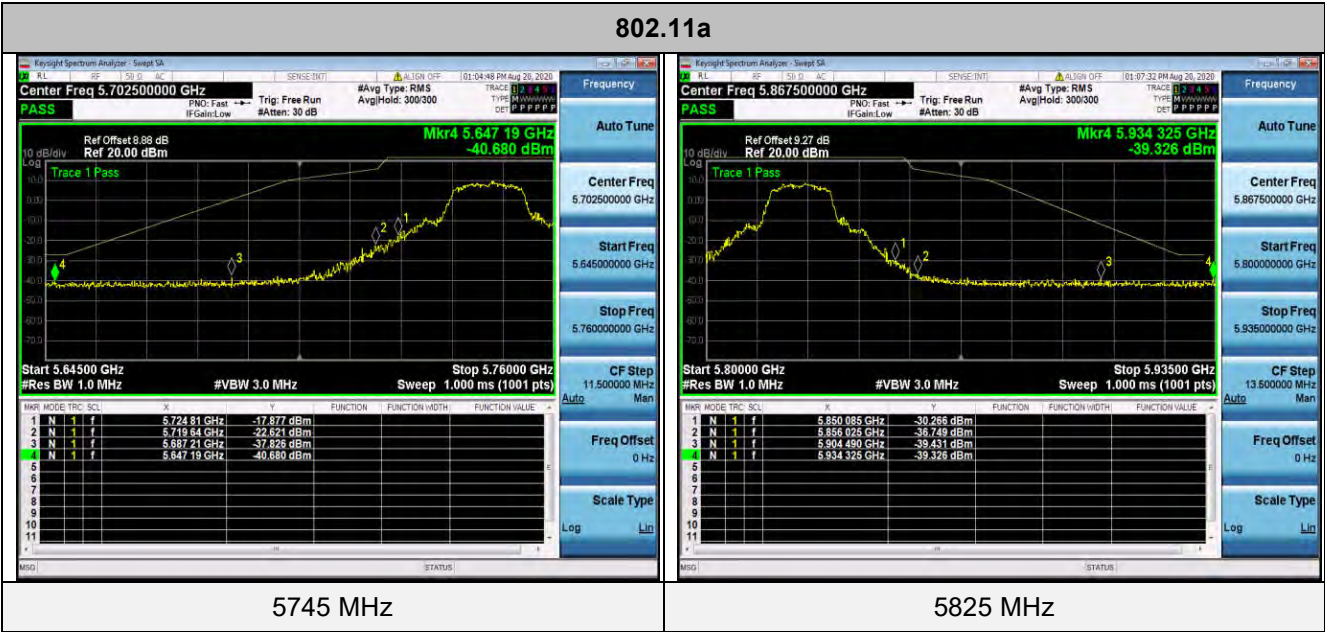
5190 MHz



5230 MHz



5725-5850MHz:



KeySight Spectrum Analyzer - Sweep SA

Center Freq 5.867500000 GHz

PASS

Ref Offset 9.27 dB  
Ref 20.00 dBm

Mkr4 5.931 355 GHz  
-40.450 dBm

Trace 1 Pass

Start 5.80000 GHz  
#Res BW 1.0 MHz

#VBW 3.0 MHz

Sweep 1.000 ms (1001 pts)

CF Step 13.500000 MHz

Auto

Man

Log

Lin

Frequency

Auto Tune

Center Freq 5.867500000 GHz

Start Freq 5.800000000 GHz

Stop Freq 5.935000000 GHz

Freq Offset 0 Hz

Scale Type

Log

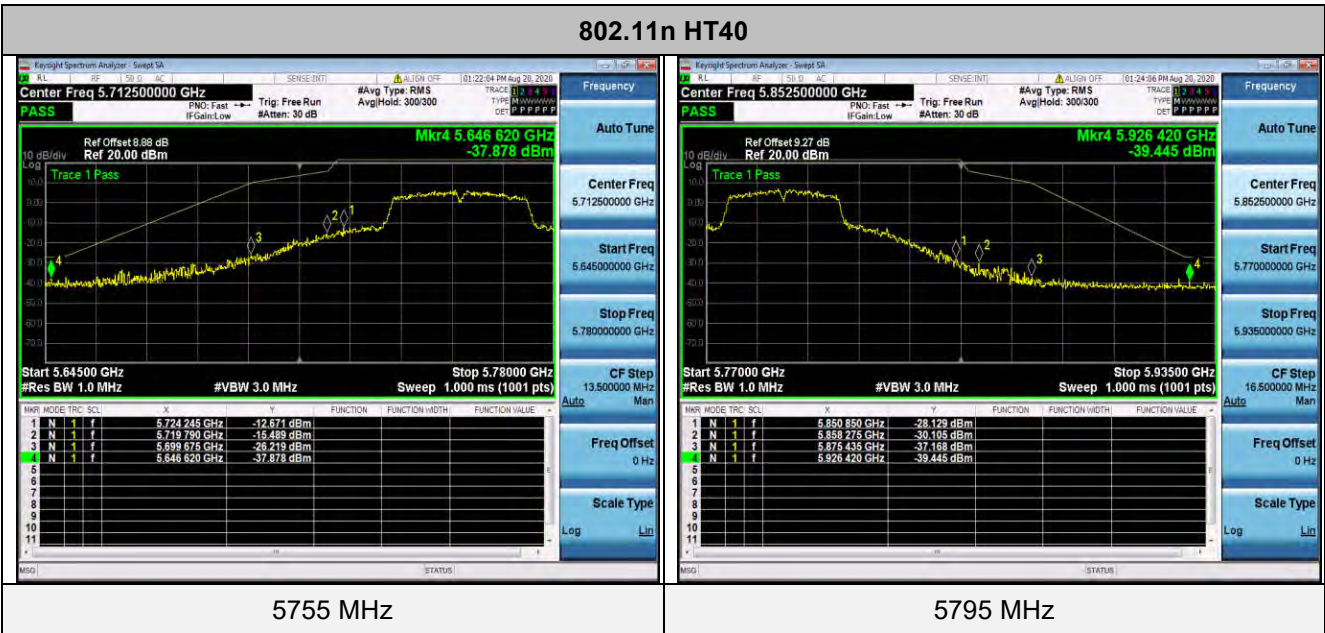
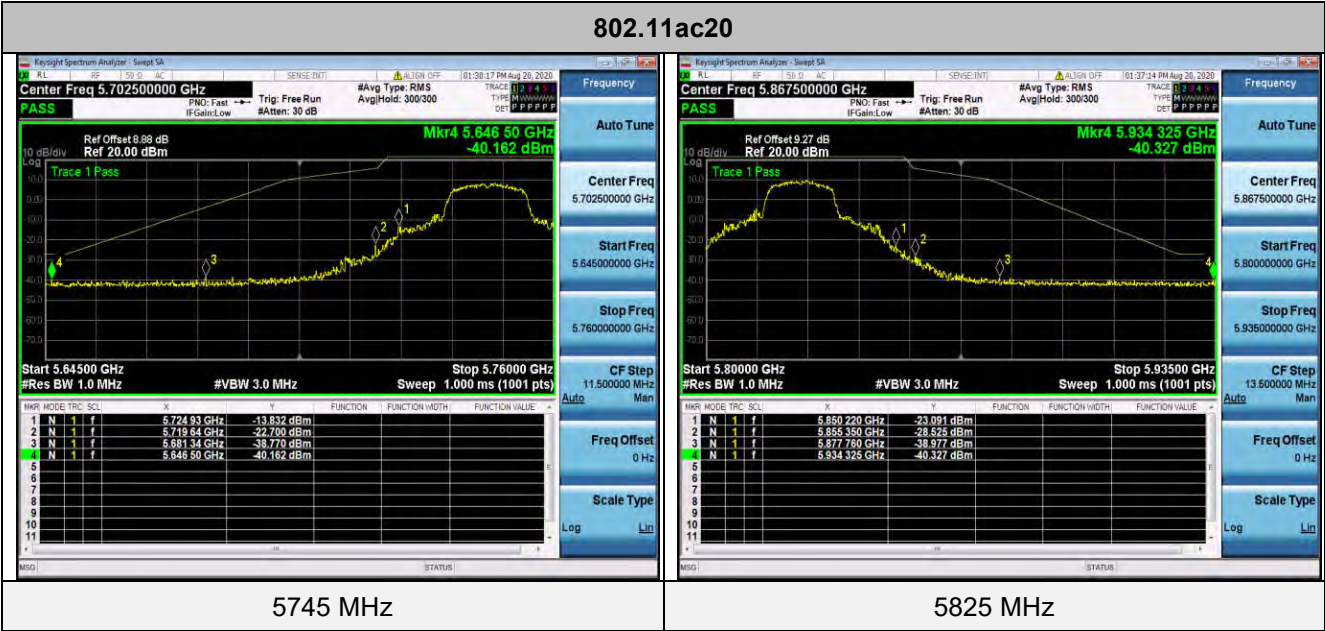
Lin

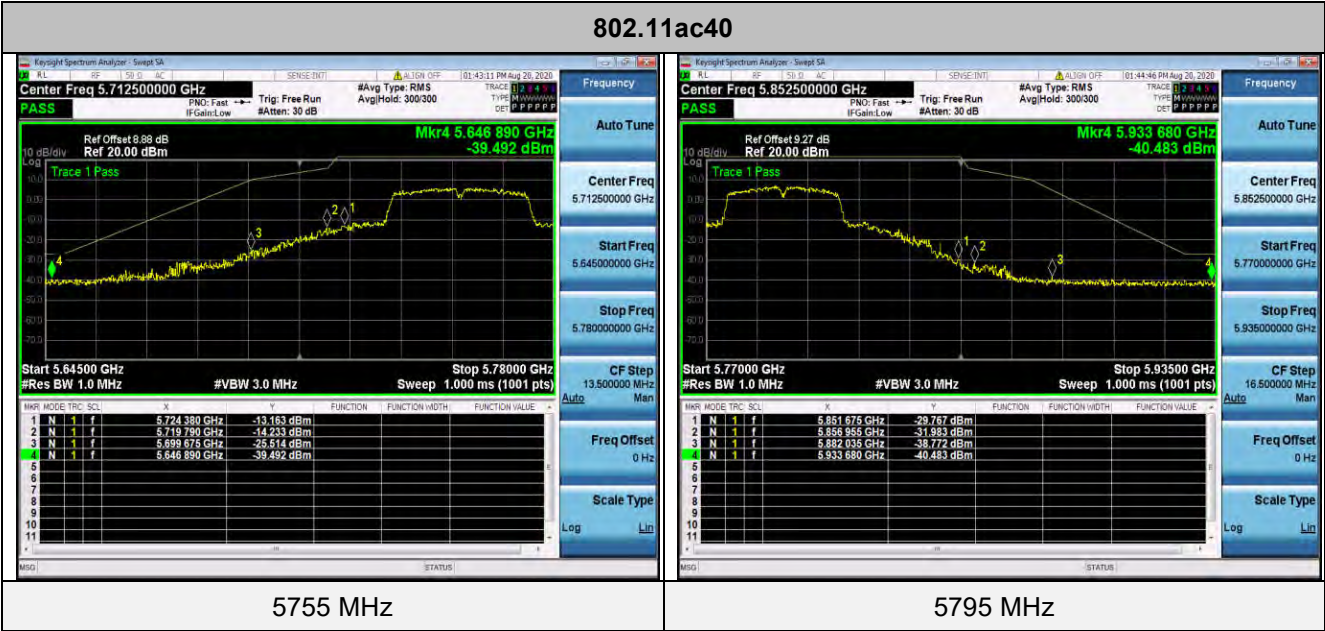
MSO

STATUS

| NR | MODE | TRC | SCL | X             | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|----|------|-----|-----|---------------|-------------|----------|----------------|----------------|
| 1  | N    | 1   | f   | 5.850 355 GHz | -29.959 dBm |          |                |                |
| 2  | N    | 1   | f   | 5.855 215 GHz | -34.873 dBm |          |                |                |
| 3  | N    | 1   | f   | 5.897 210 GHz | -38.773 dBm |          |                |                |
| 4  | N    | 1   | f   | 5.931 355 GHz | -40.450 dBm |          |                |                |

5825 MHz





## 4.9. Frequency Stability

### Standard Applicable

According to FCC §15.407(g) “Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.”

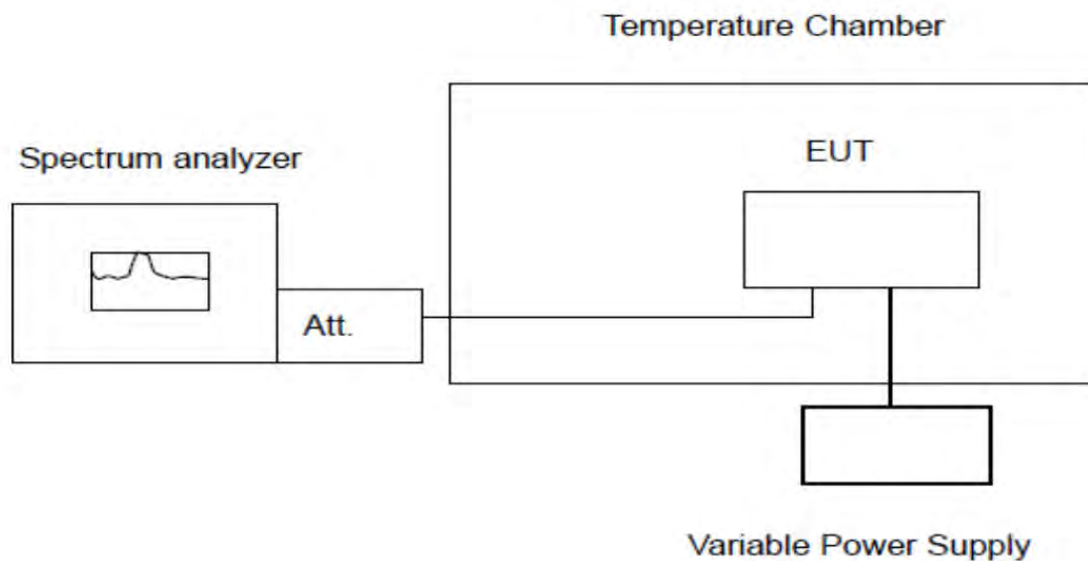
According to FCC §2.1055(a) “The frequency stability shall be measured with variation of ambient temperature as follows:”

(1) From -30° to + 50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

(2) From -20° to + 50° centigrade for equipment to be licensed for use in the Maritime Services under part 80 of this chapter, except for Class A, B, and S Emergency Position Indicating Radiobeacons (EPIRBS), and equipment to be licensed for use above 952 MHz at operational fixed stations in all services, stations in the Local Television Transmission Service and Point-to-Point Microwave Radio Service under part 21 of this chapter, equipment licensed for use aboard aircraft in the Aviation Services under part 87 of this chapter, and equipment authorized for use in the Family Radio Service under part 95 of this chapter.

(3) From 0° to + 50° centigrade for equipment to be licensed for use in the Radio Broadcast Services under part 73 of this chapter.

### Test Configuration



### Test Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20 degree operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30 degree. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10 degree increased per stage until the highest temperature of +50 degree reached.

### Test Results

PASS

Remark:

1. Measured all conditions and recorded worst case.

IEEE 802.11a Mode / 5180 – 5240 MHz / 5180 MHz

| Enviroment Temperature (Dregree) | Voltage (V) | Measured Frequency (MHz) | Limit Range (MHz) | Test Results |
|----------------------------------|-------------|--------------------------|-------------------|--------------|
| 20                               | DC 5.5V     | 5180.121                 | 5150 – 5250       | PASS         |
| 20                               | DC 4.5V     | 5180.138                 | 5150 – 5250       | PASS         |
| 50                               | DC 5V       | 5180.167                 | 5150 – 5250       | PASS         |
| 40                               | DC 5V       | 5180.123                 | 5150 – 5250       | PASS         |
| 30                               | DC 5V       | 5180.126                 | 5150 – 5250       | PASS         |
| 20                               | DC 5V       | 5180.146                 | 5150 – 5250       | PASS         |
| 10                               | DC 5V       | 5180.138                 | 5150 – 5250       | PASS         |
| 0                                | DC 5V       | 5180.119                 | 5150 – 5250       | PASS         |
| -10                              | DC 5V       | 5180.125                 | 5150 – 5250       | PASS         |
| -20                              | DC 5V       | 5180.139                 | 5150 – 5250       | PASS         |
| -30                              | DC 5V       | 5180.115                 | 5150 – 5250       | PASS         |

IEEE 802.11a Mode / 5180 – 5240 MHz / 5240 MHz

| Enviroment Temperature (Dregree) | Voltage (V) | Measured Frequency (MHz) | Limit Range (MHz) | Test Results |
|----------------------------------|-------------|--------------------------|-------------------|--------------|
| 20                               | DC 5.5V     | 5240.131                 | 5150 – 5250       | PASS         |
| 20                               | DC 4.5V     | 5240.125                 | 5150 – 5250       | PASS         |
| 50                               | DC 5V       | 5240.128                 | 5150 – 5250       | PASS         |
| 40                               | DC 5V       | 5240.111                 | 5150 – 5250       | PASS         |
| 30                               | DC 5V       | 5240.162                 | 5150 – 5250       | PASS         |
| 20                               | DC 5V       | 5240.133                 | 5150 – 5250       | PASS         |
| 10                               | DC 5V       | 5240.115                 | 5150 – 5250       | PASS         |
| 0                                | DC 5V       | 5240.185                 | 5150 – 5250       | PASS         |
| -10                              | DC 5V       | 5240.112                 | 5150 – 5250       | PASS         |
| -20                              | DC 5V       | 5240.141                 | 5150 – 5250       | PASS         |
| -30                              | DC 5V       | 5240.128                 | 5150 – 5250       | PASS         |

IEEE 802.11a Mode / 5745 – 5825 MHz / 5745 MHz

| Enviroment Temperature (Degree) | Voltage (V) | Measured Frequency (MHz) | Limit Range (MHz) | Test Results |
|---------------------------------|-------------|--------------------------|-------------------|--------------|
| 20                              | DC 5.5V     | 5475.127                 | 5725 – 5850       | PASS         |
| 20                              | DC 4.5V     | 5475.112                 | 5725 – 5850       | PASS         |
| 50                              | DC 5V       | 5475.138                 | 5725 – 5850       | PASS         |
| 40                              | DC 5V       | 5475.144                 | 5725 – 5850       | PASS         |
| 30                              | DC 5V       | 5475.148                 | 5725 – 5850       | PASS         |
| 20                              | DC 5V       | 5475.139                 | 5725 – 5850       | PASS         |
| 10                              | DC 5V       | 5475.177                 | 5725 – 5850       | PASS         |
| 0                               | DC 5V       | 5475.122                 | 5725 – 5850       | PASS         |
| -10                             | DC 5V       | 5475.147                 | 5725 – 5850       | PASS         |
| -20                             | DC 5V       | 5475.136                 | 5725 – 5850       | PASS         |
| -30                             | DC 5V       | 5475.142                 | 5725 – 5850       | PASS         |

IEEE 802.11a Mode / 5745 – 5825 MHz / 5825 MHz

| Enviroment Temperature (Degree) | Voltage (V) | Measured Frequency (MHz) | Limit Range (MHz) | Test Results |
|---------------------------------|-------------|--------------------------|-------------------|--------------|
| 20                              | DC 5.5V     | 5825.155                 | 5725 – 5850       | PASS         |
| 20                              | DC 4.5V     | 5825.136                 | 5725 – 5850       | PASS         |
| 50                              | DC 5V       | 5825.125                 | 5725 – 5850       | PASS         |
| 40                              | DC 5V       | 5825.169                 | 5725 – 5850       | PASS         |
| 30                              | DC 5V       | 5825.151                 | 5725 – 5850       | PASS         |
| 20                              | DC 5V       | 5825.132                 | 5725 – 5850       | PASS         |
| 10                              | DC 5V       | 5825.143                 | 5725 – 5850       | PASS         |
| 0                               | DC 5V       | 5825.142                 | 5725 – 5850       | PASS         |
| -10                             | DC 5V       | 5825.159                 | 5725 – 5850       | PASS         |
| -20                             | DC 5V       | 5825.141                 | 5725 – 5850       | PASS         |
| -30                             | DC 5V       | 5825.139                 | 5725 – 5850       | PASS         |

#### **4.10. Antenna Requirement**

##### **Standard Applicable**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

##### **Antenna Information**

The antenna is FPC antenna, through the buckle stretched out, The directional gains of antenna used for transmitting is 2dBi.

Reference to the Test Report: **GTS20200812009-1-15.**

## **5. TEST SETUP PHOTOS OF THE EUT**

Reference to the test report No. **GTS20200812009-1-15.**

## **6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT**

Reference to the test report No. **GTS20200812009-1-15.**

**.....End of Report.....**