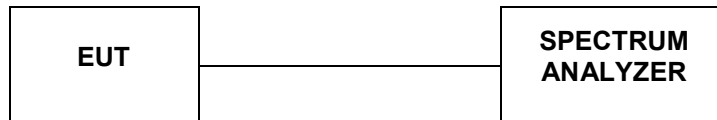


#### 4.6. 6dB Bandwidth

##### TEST CONFIGURATION



##### TEST PROCEDURE

According to KDB789033 D02 General U-NII Test Procedures New Rules v02r01 for one of the following procedures may be used for section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a. Set RBW = 100 kHz.
- b. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW
- c. Detector = Peak.
- d. Trace mode = max hold.
- e. Sweep = auto couple.
- f. Allow the trace to stabilize
- g. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

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

##### LIMIT

For Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz

##### 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) | 6dB Bandwidth (MHz) | Limit (KHz) | Result |
|-------------|---------|--------------------|---------------------|-------------|--------|
| 802.11a     | 149     | 16.682             | 15.200              | ≥500        | Pass   |
|             | 157     | 16.646             | 15.200              |             |        |
|             | 165     | 16.647             | 15.160              |             |        |
| 802.11nHT20 | 149     | 17.676             | 16.720              | ≥500        | Pass   |
|             | 157     | 17.654             | 15.760              |             |        |
|             | 165     | 17.608             | 15.800              |             |        |
| 802.11n40   | 151     | 36.590             | 35.920              | ≥500        | Pass   |
|             | 159     | 36.636             | 36.480              |             |        |
| 802.11ac20  | 149     | 17.727             | 15.800              | ≥500        | Pass   |
|             | 157     | 17.712             | 15.120              |             |        |
|             | 165     | 17.714             | 15.120              |             |        |
| 802.11ac40  | 151     | 36.381             | 35.280              | ≥500        | Pass   |
|             | 159     | 36.435             | 35.280              |             |        |
| 802.11ac80  | 155     | 75.955             | 76.000              | ≥500        | Pass   |

**Antenna 1:**

| Type        | Channel | 99%Bandwidth (MHz) | 6dB Bandwidth (MHz) | Limit (KHz) | Result |
|-------------|---------|--------------------|---------------------|-------------|--------|
| 802.11a     | 149     | 17.106             | 15.640              | ≥500        | Pass   |
|             | 157     | 17.045             | 15.120              |             |        |
|             | 165     | 17.052             | 15.160              |             |        |
| 802.11nHT20 | 149     | 18.026             | 15.160              | ≥500        | Pass   |
|             | 157     | 18.045             | 15.160              |             |        |
|             | 165     | 18.017             | 15.200              |             |        |
| 802.11n40   | 151     | 36.639             | 35.360              | ≥500        | Pass   |
|             | 159     | 36.692             | 35.360              |             |        |
| 802.11ac20  | 149     | 17.895             | 15.200              | ≥500        | Pass   |
|             | 157     | 17.850             | 15.760              |             |        |
|             | 165     | 17.845             | 15.160              |             |        |
| 802.11ac40  | 151     | 36.697             | 35.360              | ≥500        | Pass   |
|             | 159     | 36.665             | 35.440              |             |        |
| 802.11ac80  | 155     | 76.070             | 76.000              | ≥500        | Pass   |

## Antenna 0:

## 99%Bandwidth

## 802.11a

## 802.11n HT20



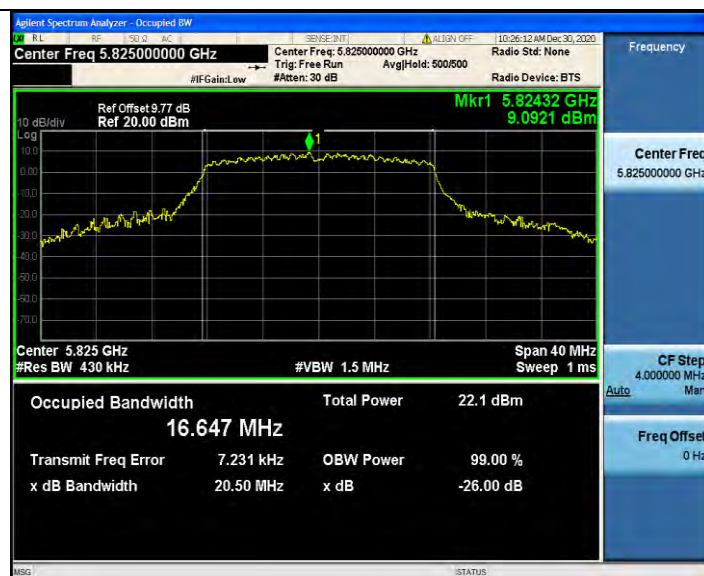
## CH149

## CH149



## CH157

## CH157



## CH165

## CH165

## 99%Bandwidth

## 802.11ac20



## 802.11n HT40



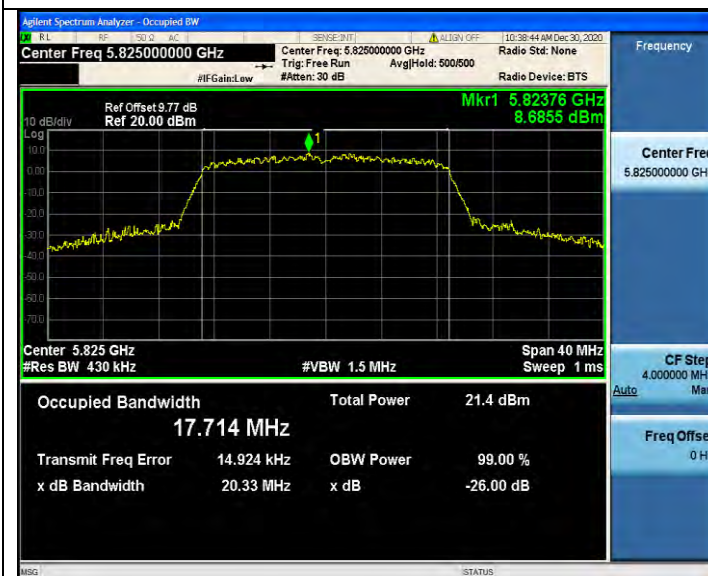
## CH149



## CH151



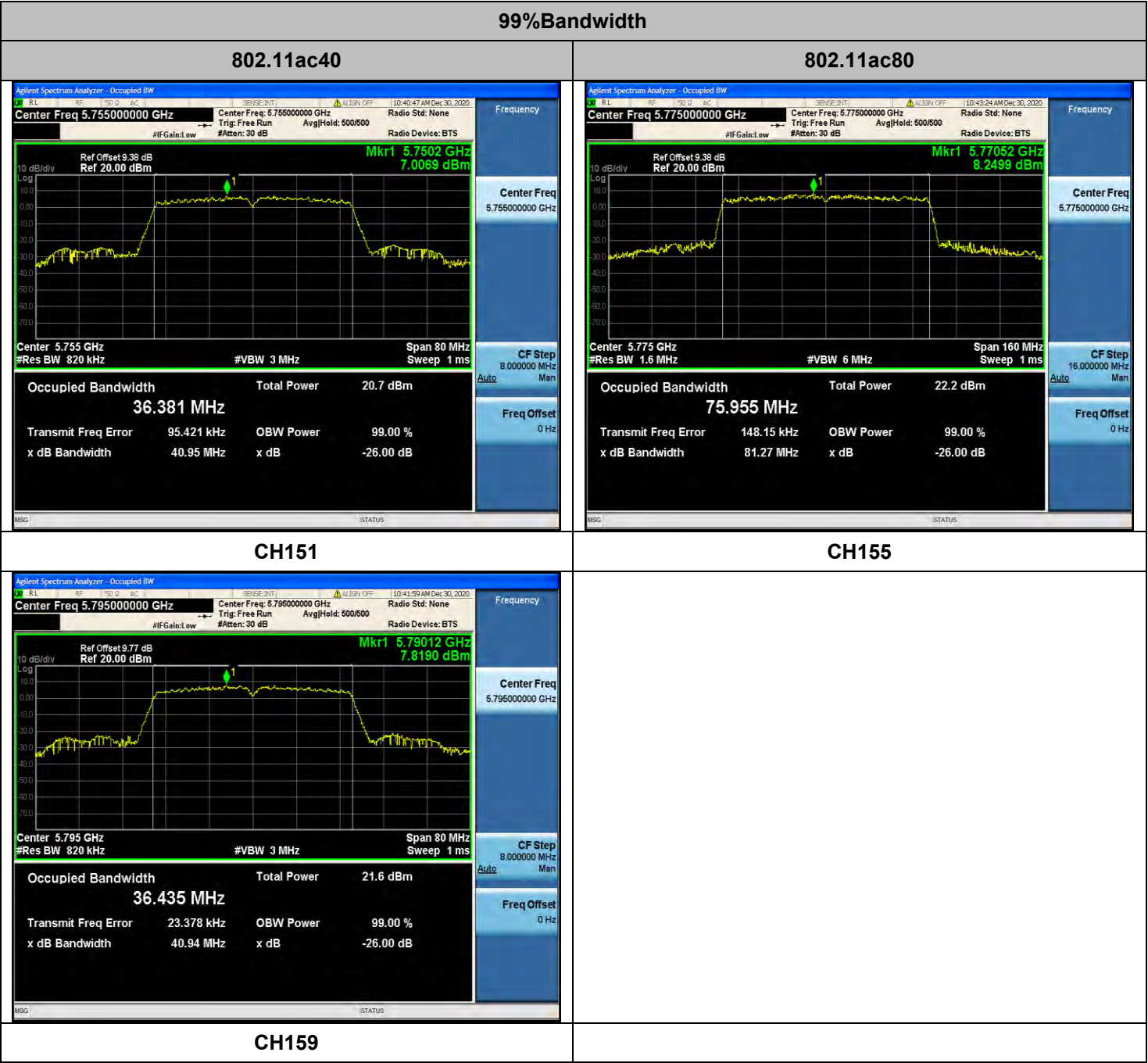
## CH157



## CH159



## CH165



6dB Bandwidth

802.11a

802.11n HT20



CH149

CH149



CH157

CH157



CH165

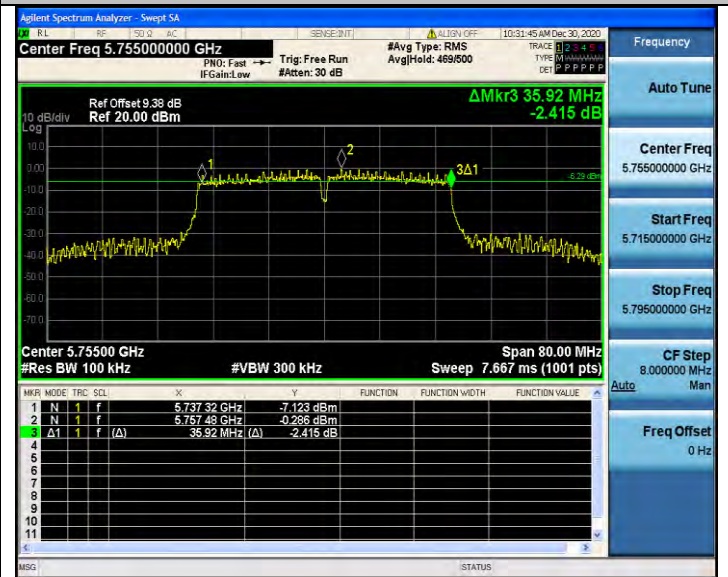
CH165

## 6dB Bandwidth

## 802.11ac20



## 802.11n HT40



## CH149



## CH151



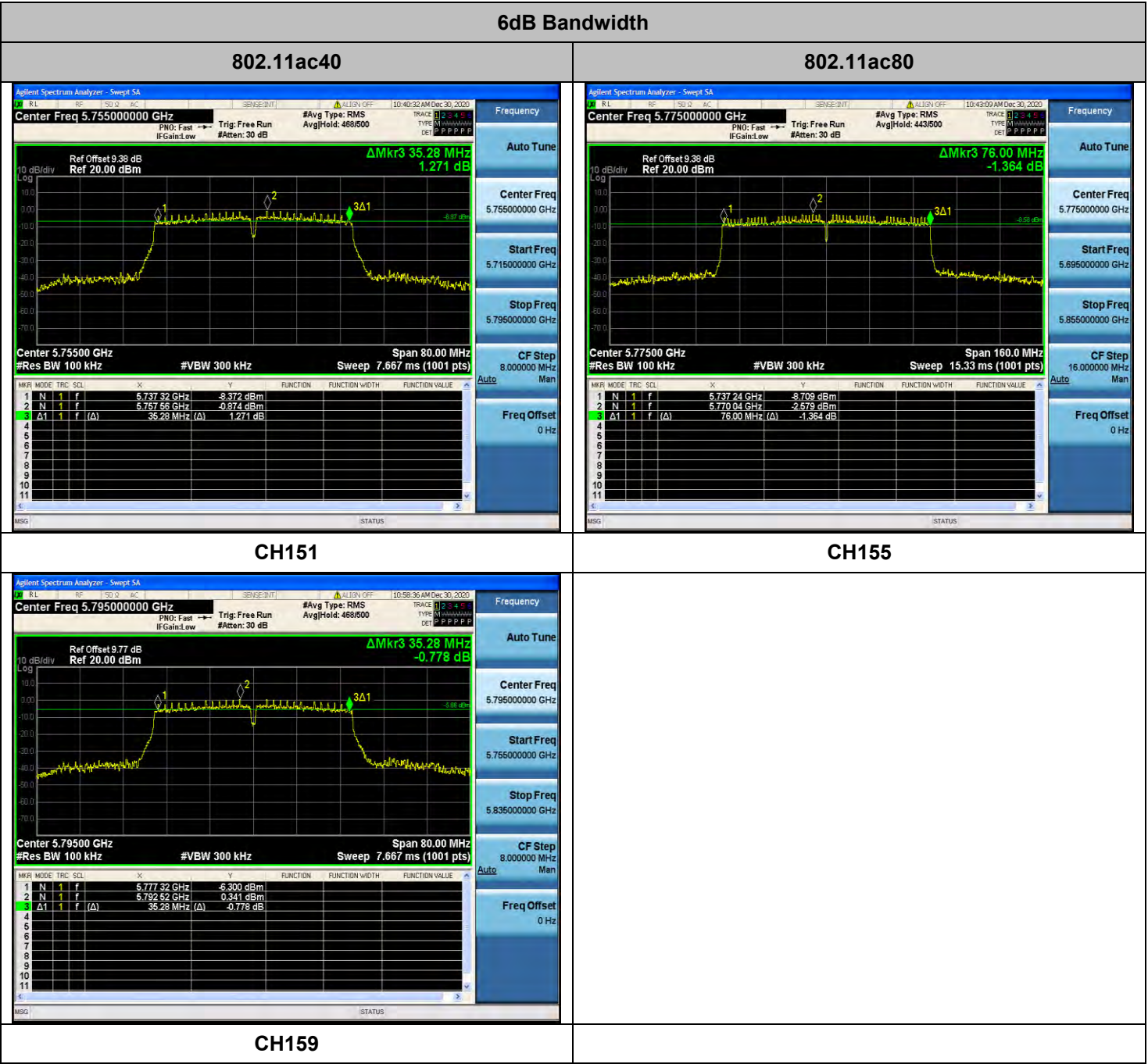
## CH157



## CH159



## CH165



## Antenna 1:

## 99%Bandwidth

## 802.11a

## 802.11n HT20



## CH149

## CH149



## CH157

## CH157



## CH165

## CH165

## 99%Bandwidth

## 802.11ac20



## 802.11n HT40



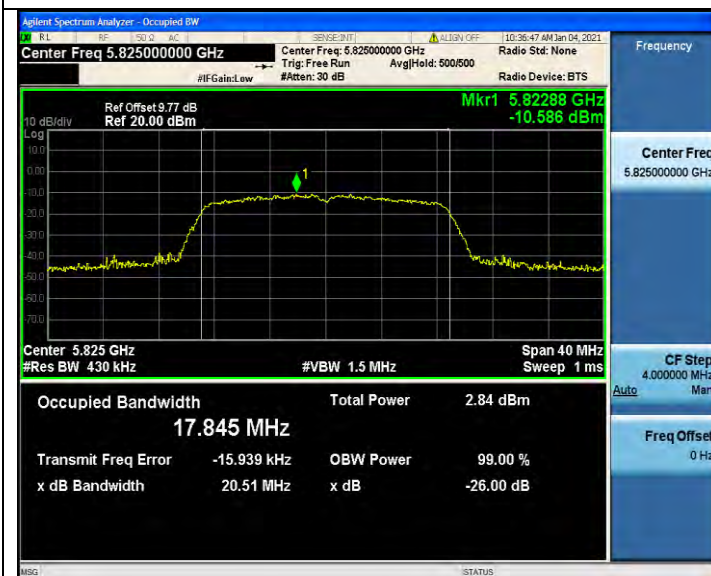
## CH149



## CH151



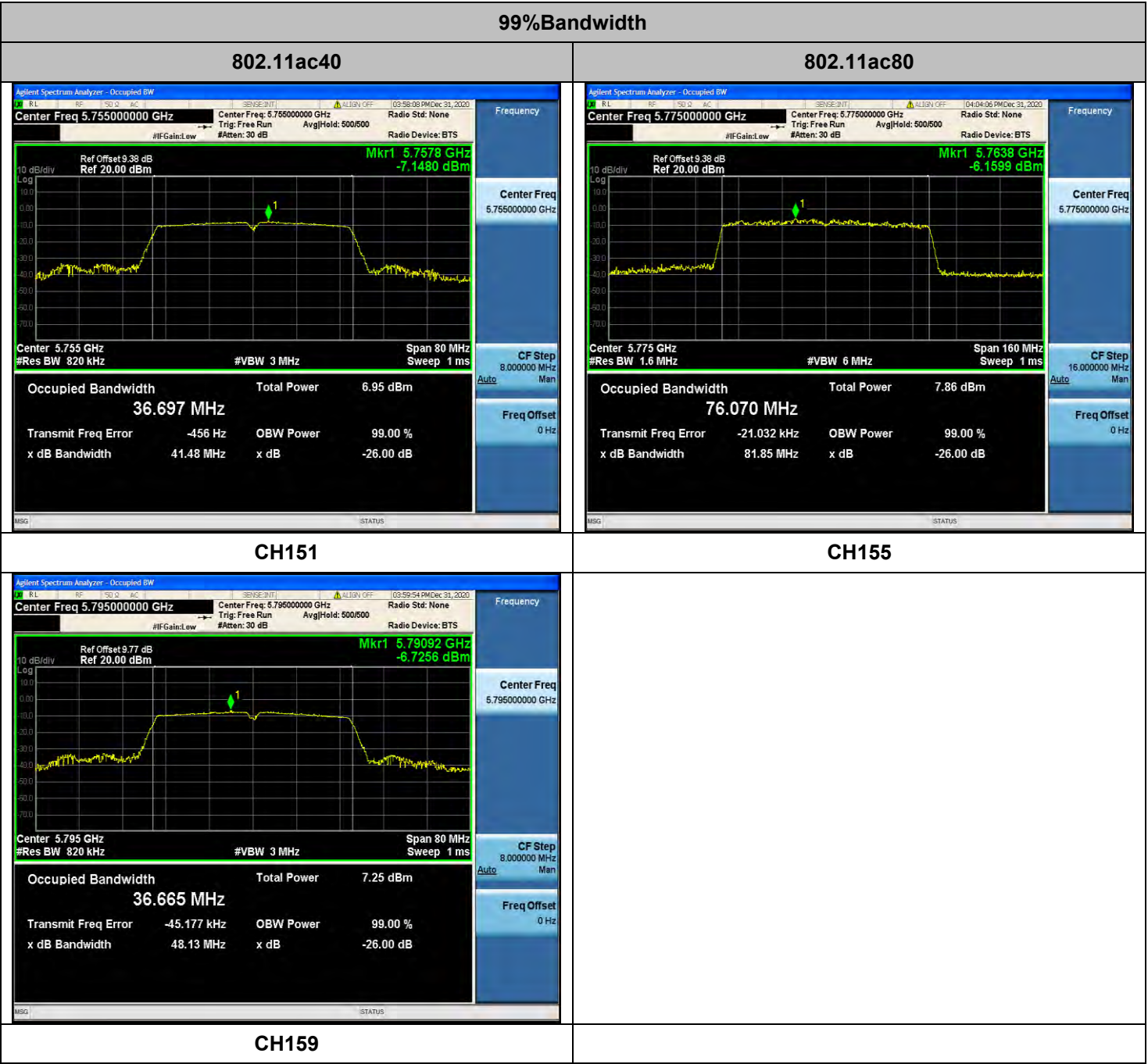
## CH157



## CH159



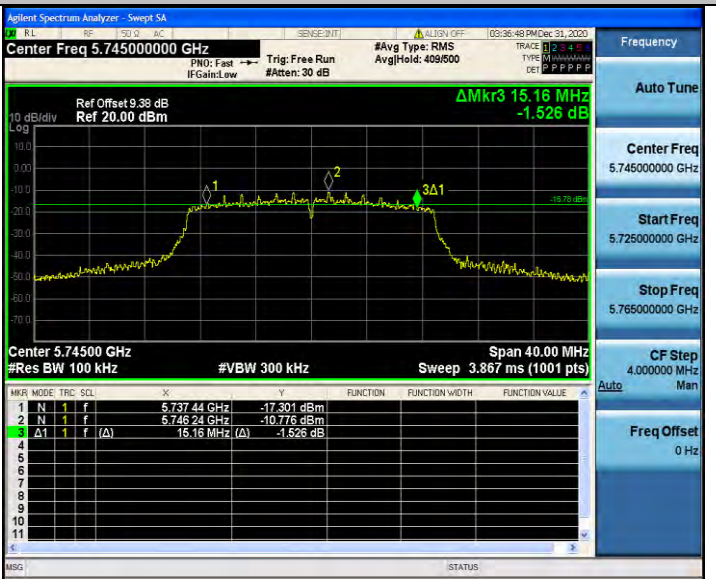
## CH165



6dB Bandwidth

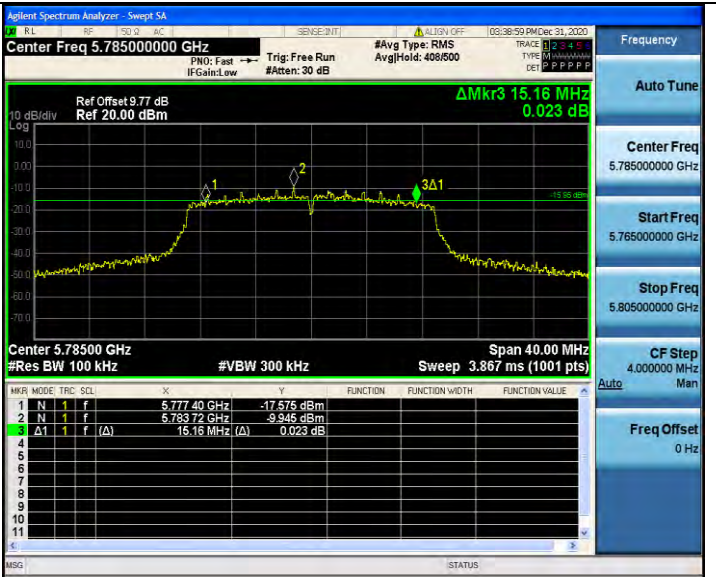
802.11a

802.11n HT20



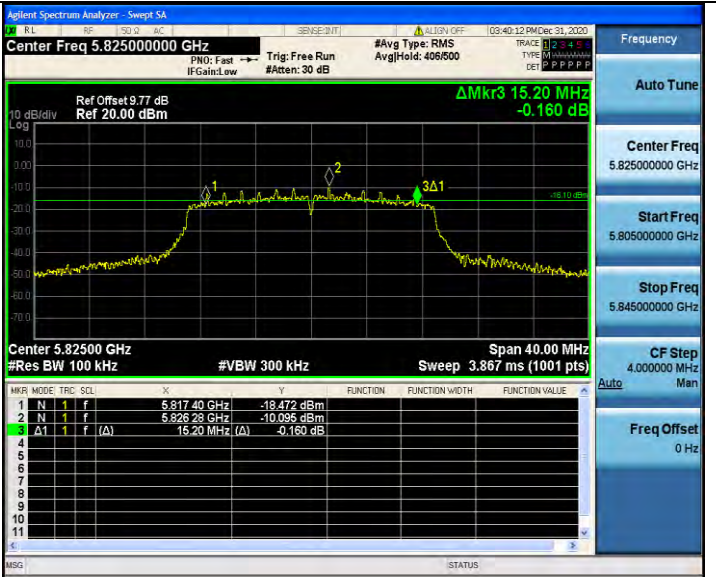
CH149

CH149



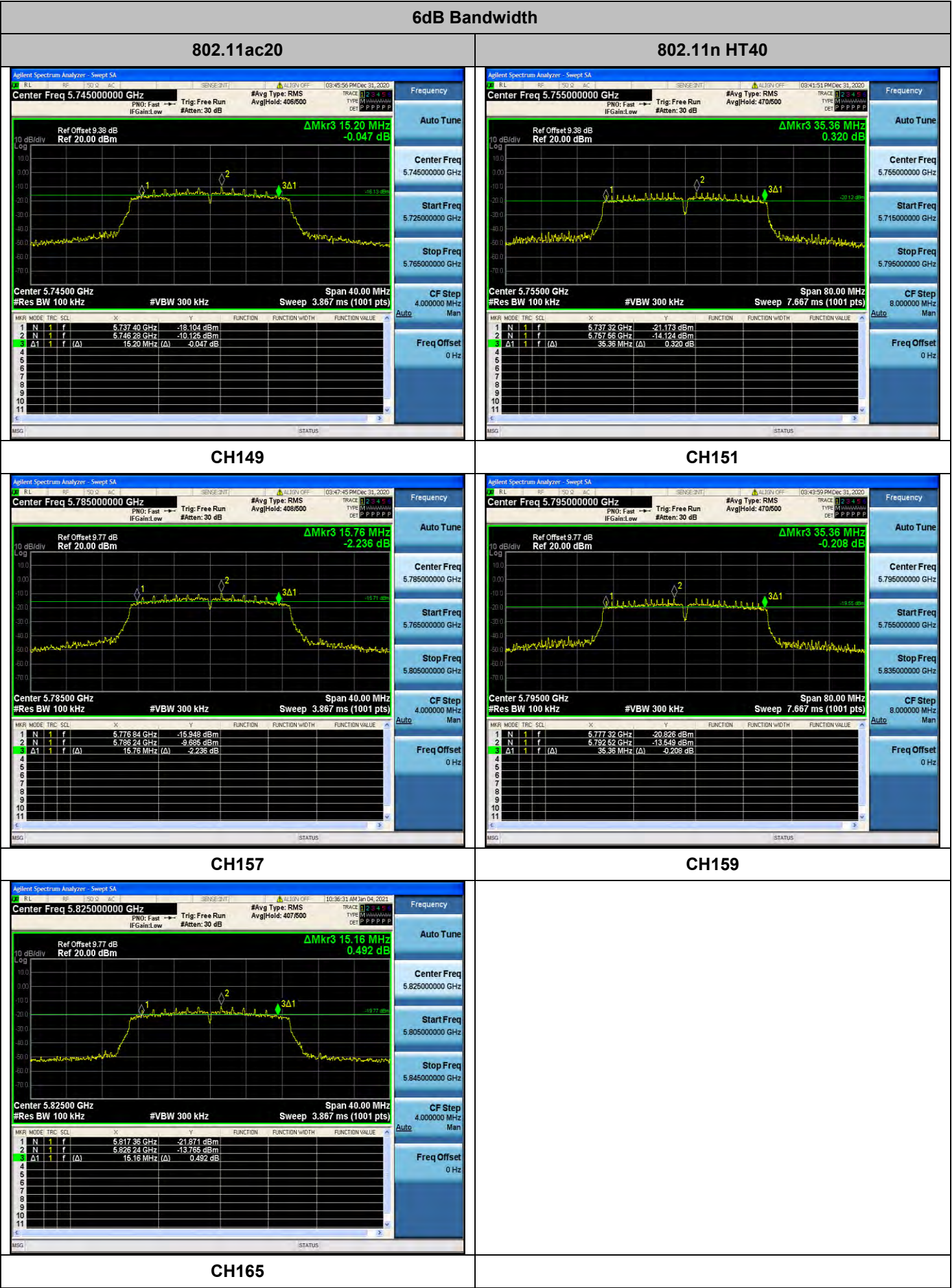
CH157

CH157



CH165

CH165



CH157

Agilent Spectrum Analyzer - Sweep SA

Center Freq 5.825000000 GHz

Ref Offset 9.77 dB  
Ref 20.00 dBm

ΔMkr3 15.16 MHz  
0.492 dB

Center Freq 5.82500000 GHz

Start Freq 5.805000000 GHz

Stop Freq 5.845000000 GHz

CF Step 4.0000000 MHz

Freq Offset 0 Hz

Span 40.00 MHz

Sweep 3.867 ms (1001 pts)

#Res BW 100 kHz

#VBW 300 kHz

Auto

MAN

1 N 1 f 5.817 36 GHz -21.871 dBm

2 N 1 f 5.826 24 GHz -13.766 dBm

3 Δ1 1 f (Δ) 15.16 MHz (Δ) 0.492 dB

4

5

6

7

8

9

10

11

MSG

STATUS

CH159

Agilent Spectrum Analyzer - Sweep SA

Center Freq 5.825000000 GHz

Ref Offset 9.77 dB  
Ref 20.00 dBm

ΔMkr3 15.16 MHz  
0.492 dB

Center Freq 5.82500000 GHz

Start Freq 5.805000000 GHz

Stop Freq 5.845000000 GHz

CF Step 4.0000000 MHz

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11

MSG

STATUS

CH165

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Center Freq 5.825000000 GHz

Ref Offset 9.77 dB  
Ref 20.00 dBm

ΔMkr3 15.16 MHz  
0.492 dB

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Stop Freq 5.845000000 GHz

CF Step 4.0000000 MHz

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4

5

6

7

8

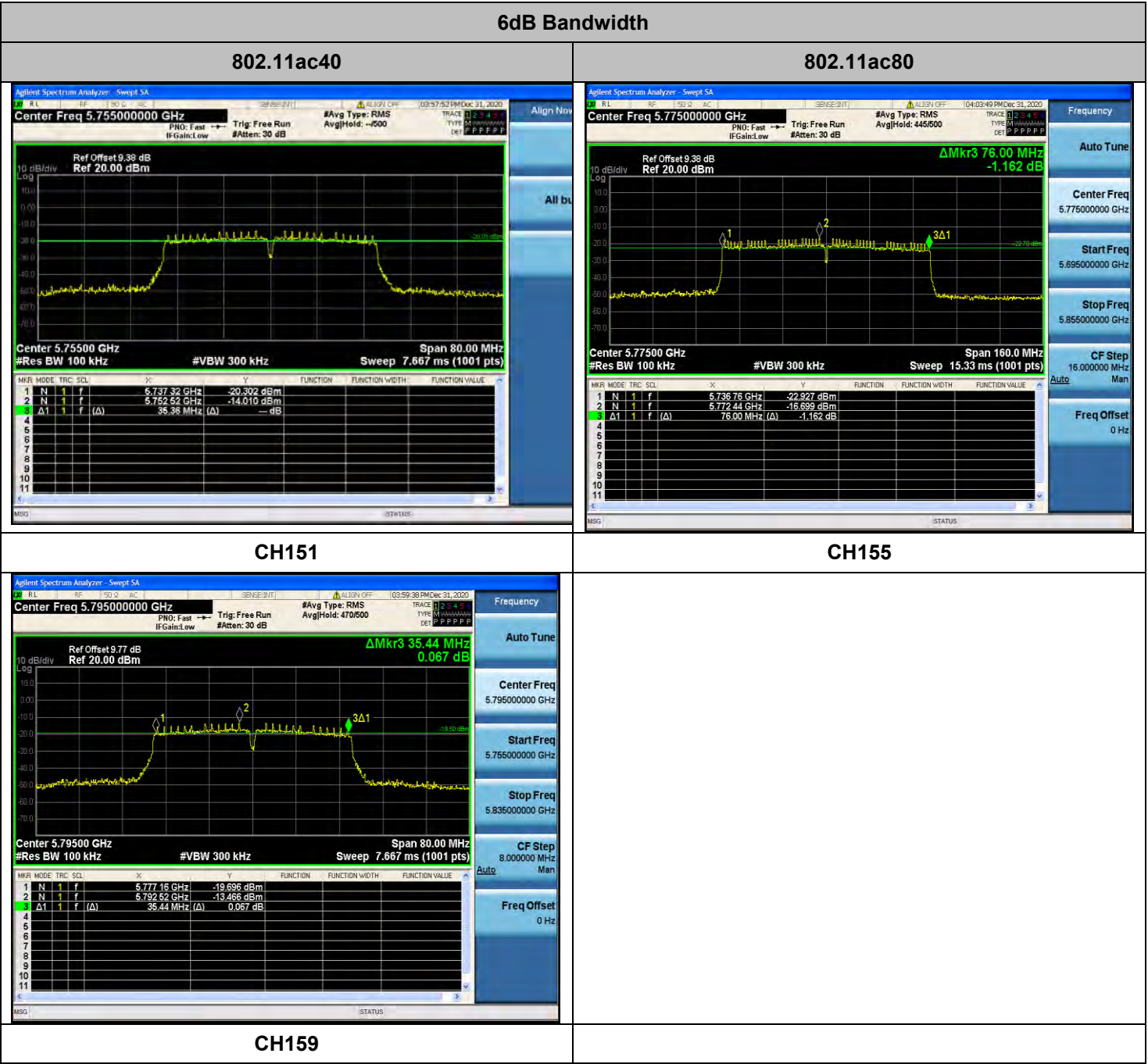
9

10

11

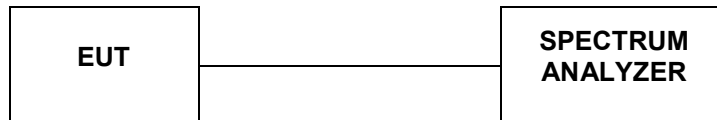
MSG

STATUS



#### 4.7. 26dBc Bandwidth

##### TEST CONFIGURATION



##### TEST PROCEDURE

According to KDB789033 D02 General U-NII Test Procedures New Rules v02r01 for one of the following procedures may be used for Emission Bandwidth (EBW) measurement:

- Set RBW = 220 kHz/430 kHz /820 kHz (approximately 1% of the emission bandwidth).
- Set the video bandwidth (VBW) = 3\* 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      | 16.608             | 19.800               | -           | Pass   |
|             | 40      | 16.597             | 19.520               |             |        |
|             | 48      | 16.593             | 19.680               |             |        |
| 802.11nHT20 | 36      | 17.684             | 21.320               | -           | Pass   |
|             | 40      | 17.685             | 21.240               |             |        |
|             | 48      | 17.682             | 20.600               |             |        |
| 802.11n40   | 38      | 36.720             | 40.160               | -           | Pass   |
|             | 46      | 36.688             | 40.160               |             |        |
| 802.11ac20  | 36      | 17.767             | 20.240               | -           | Pass   |
|             | 40      | 17.753             | 20.240               |             |        |
|             | 48      | 17.732             | 20.240               |             |        |
| 802.11ac40  | 38      | 36.567             | 40.320               | -           | Pass   |
|             | 46      | 36.451             | 40.400               |             |        |
| 802.11ac80  | 42      | 75.993             | 80.320               | -           | Pass   |

**Antenna 1:**

| Type        | Channel | 99%Bandwidth (MHz) | 26dB Bandwidth (MHz) | Limit (KHz) | Result |
|-------------|---------|--------------------|----------------------|-------------|--------|
| 802.11a     | 36      | 17.038             | 20.080               | -           | Pass   |
|             | 40      | 17.071             | 20.120               |             |        |
|             | 48      | 17.100             | 20.440               |             |        |
| 802.11nHT20 | 36      | 17.940             | 20.600               | -           | Pass   |
|             | 40      | 17.945             | 20.160               |             |        |
|             | 48      | 17.922             | 20.160               |             |        |
| 802.11n40   | 38      | 37.079             | 40.800               | -           | Pass   |
|             | 46      | 36.879             | 40.560               |             |        |
| 802.11ac20  | 36      | 17.925             | 20.280               | -           | Pass   |
|             | 40      | 17.914             | 20.360               |             |        |
|             | 48      | 17.844             | 20.280               |             |        |
| 802.11ac40  | 38      | 36.870             | 46.160               | -           | Pass   |
|             | 46      | 36.711             | 40.880               |             |        |
| 802.11ac80  | 42      | 76.033             | 81.280               | -           | Pass   |

## Antenna 0:

## 99%Bandwidth

## 802.11a

## 802.11n HT20



## CH36

## CH36



## CH40

## CH40

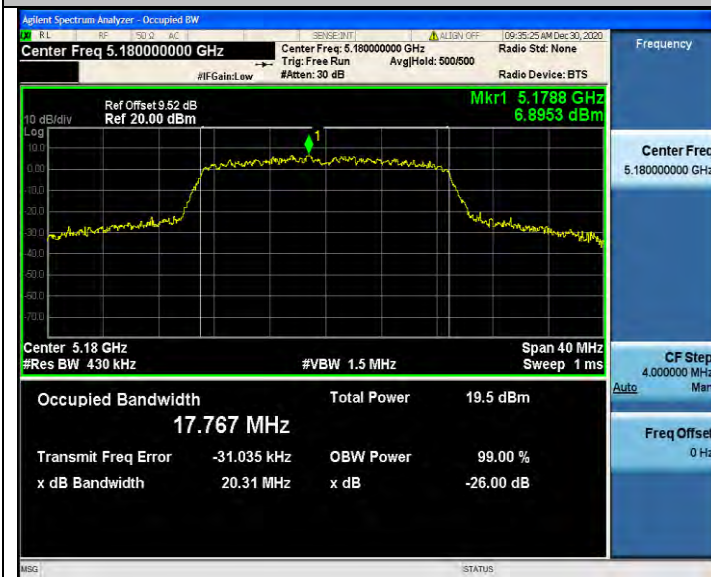


## CH48

## CH48

## 99%Bandwidth

## 802.11ac20



## 802.11n HT40



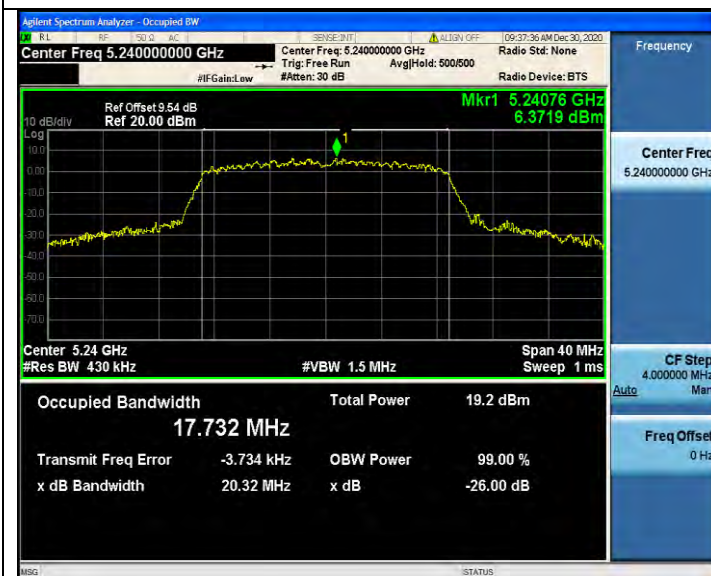
## CH36



## CH38



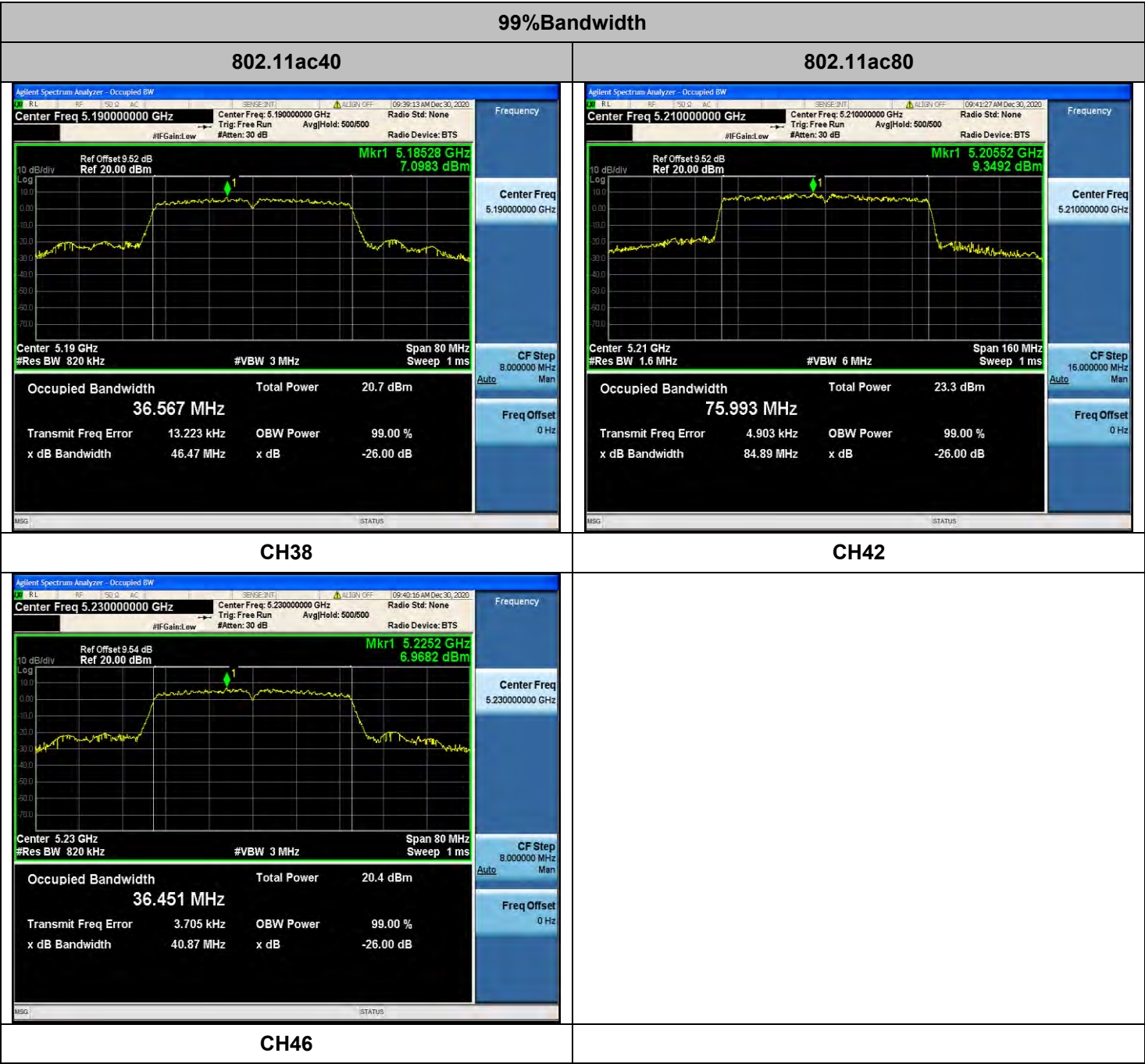
## CH40



## CH46



## CH48



## 26dB Bandwidth

## 802.11a



## 802.11n HT20



## CH36



## CH36



## CH40

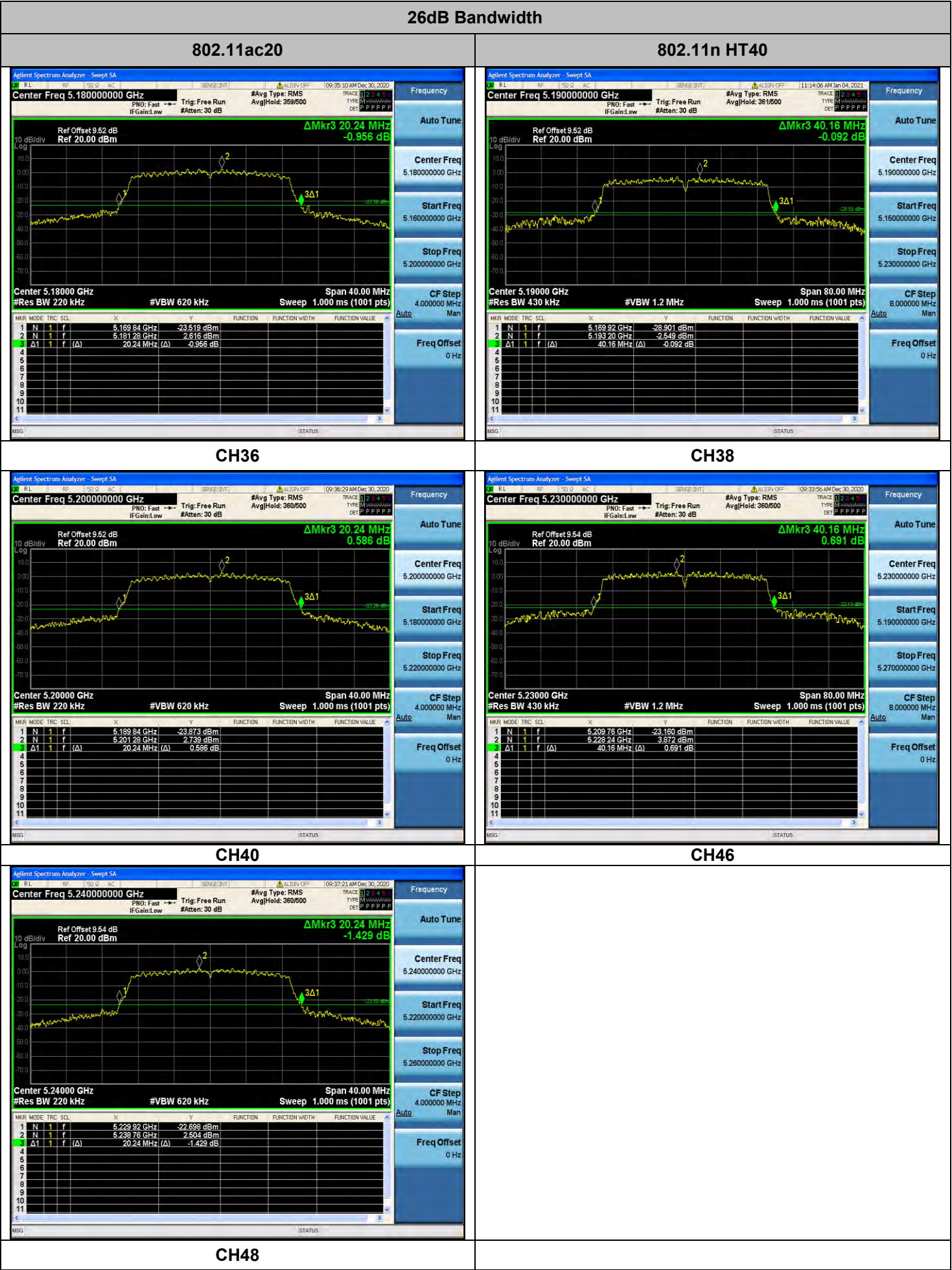


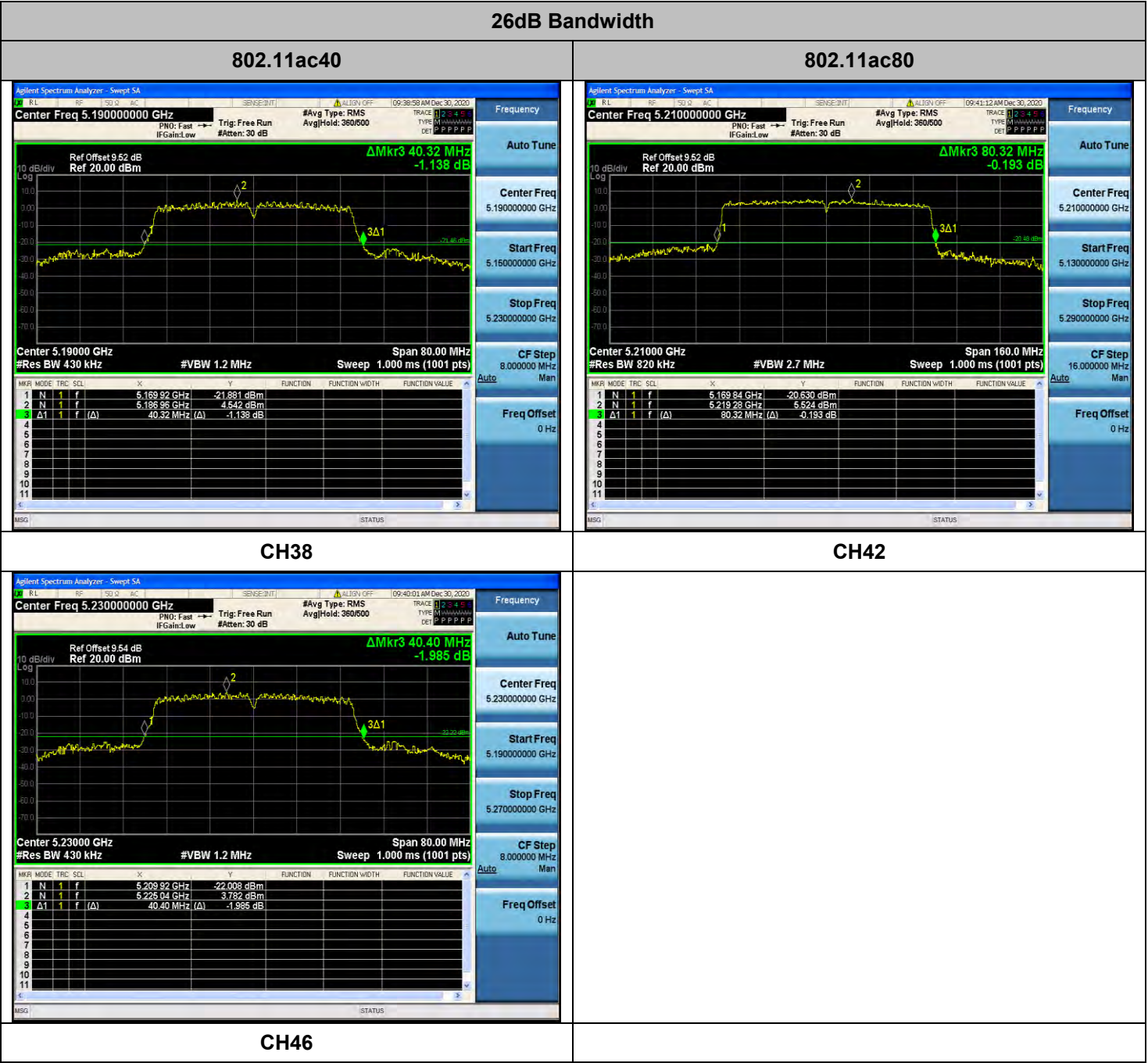
## CH40



## CH48

## CH48





## Antenna 1:

## 99%Bandwidth

## 802.11a

## 802.11n HT20



## CH36

## CH36



## CH40

## CH40

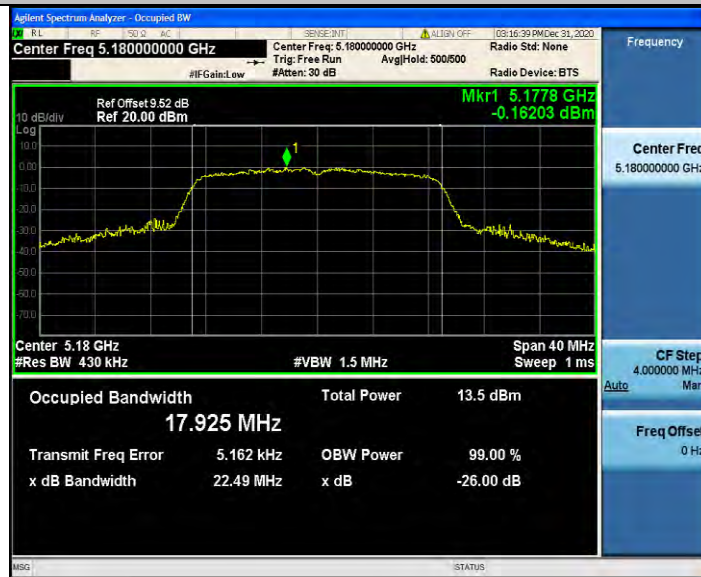


## CH48

## CH48

## 99%Bandwidth

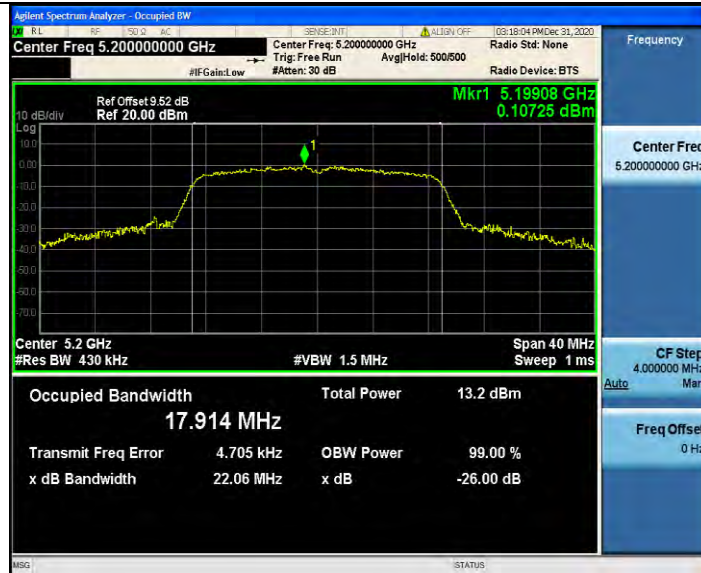
## 802.11ac20



## 802.11n HT40



## CH36



## CH38



## CH40



## CH46



## CH48