

## 6. 6dB & 26dB & 99% Bandwidth Test

### 6.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
2.	Attenuator	Agilent	8491B	MY39269201	Oct.13,19	1 Year
3.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	May.13,19	1 Year

### 6.2. Limit

6dB Bandwidth should be not less than 500kHz

### 6.3. Test Procedure

#### 26dB Bandwidth:

Use the test method described in ANSI C63.10 clause 12.4.1:

- (a) Set RBW = approximately 1% of the emission bandwidth.
- (b) Set the VBW > RBW.
- (c) Detector = Peak.
- (d) Trace mode = max hold.
- (e) 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%.

#### 6dB Bandwidth:

Use the test method described in 789033 D02 v02r01:

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725–5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- (a) Set RBW = 100 kHz.
- (b) Set the video bandwidth (VBW)  $\geq 3$  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 in this section. For devices that use channel aggregation refer to III.A and III.C for determining emission bandwidth.

**99% Occupied bandwidth:**

Use the test method described in ANSI C63.10 Section 6.9.2:

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

- a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than  $[10 \log (OBW/RBW)]$  below the reference level. Specific guidance is given in 4.1.5.2.
- d) Step a) through step c) might require iteration to adjust within the specified range.
- e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
- h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

## 6.4. Test Results

**U-NII-1 Band:**

EUT: WiFi +BT module		
M/N: WCT5GM2511		
Test date: 2020-03-07	Pressure: 102.3±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Lynn	Test site: RF site	Temperature:25.5±0.6 °C

**26dB bandwidth:**

Test Mode	Frequency ( MHz )	26dB Bandwidth (MHz)		Limit (KHz)
		ANT A	ANT B	
11a	5180	19.81	19.42	N/A
	5200	19.67	19.50	N/A
	5240	19.97	19.57	N/A
11n HT20	5180	20.11	20.07	N/A
	5200	20.17	19.93	N/A
	5240	20.10	20.02	N/A
11n HT40	5190	40.98	39.96	N/A
	5230	40.56	39.99	N/A
11ac VHT20	5180	19.96	19.93	N/A
	5200	20.07	20.02	N/A
	5240	20.06	20.05	N/A
11ac VHT40	5190	40.66	40.12	N/A
	5230	40.87	40.15	N/A
11ac VHT80	5210	80.81	80.19	N/A

Conclusion: PASS

**99% Occupied bandwidth:**

Test Mode	Frequency ( MHz )	99% bandwidth (MHz)		Limit (KHz)
		ANT A	ANT B	
11a	5180	16.528	16.362	N/A
	5200	16.496	16.356	N/A
	5240	16.519	16.354	N/A
11n HT20	5180	17.585	17.532	N/A
	5200	17.586	17.544	N/A
	5240	17.589	17.533	N/A
11n HT40	5190	36.284	36.147	N/A
	5230	36.194	36.182	N/A
11ac VHT20	5180	17.531	17.577	N/A
	5200	17.542	17.574	N/A
	5240	17.558	17.581	N/A
11ac VHT40	5190	36.233	36.082	N/A
	5230	36.211	36.062	N/A
11ac VHT80	5210	75.881	75.760	N/A

Conclusion: PASS

**U-NII-3 Band:**

EUT: WiFi +BT module		
M/N: WCT5GM2511		
Test date: 2020-03-07	Pressure: 102.3±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 25.5±0.6 °C

**6dB bandwidth:**

Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)		Limit (KHz)
		ANT A	ANT B	
11a	5745	15.14	15.01	≥ 500
	5785	15.18	15.13	≥ 500
	5825	15.16	15.16	≥ 500
11n HT20	5745	15.15	15.72	≥ 500
	5785	15.14	15.72	≥ 500
	5825	15.12	16.30	≥ 500
11n HT40	5755	35.24	36.25	≥ 500
	5795	35.24	35.89	≥ 500
11ac VHT20	5745	15.16	15.94	≥ 500
	5785	15.15	15.11	≥ 500
	5825	15.16	15.07	≥ 500
11ac VHT40	5755	35.23	35.17	≥ 500
	5795	35.23	35.22	≥ 500
11ac VHT80	5775	75.85	76.38	≥ 500

Conclusion: PASS

**99% Occupied bandwidth:**

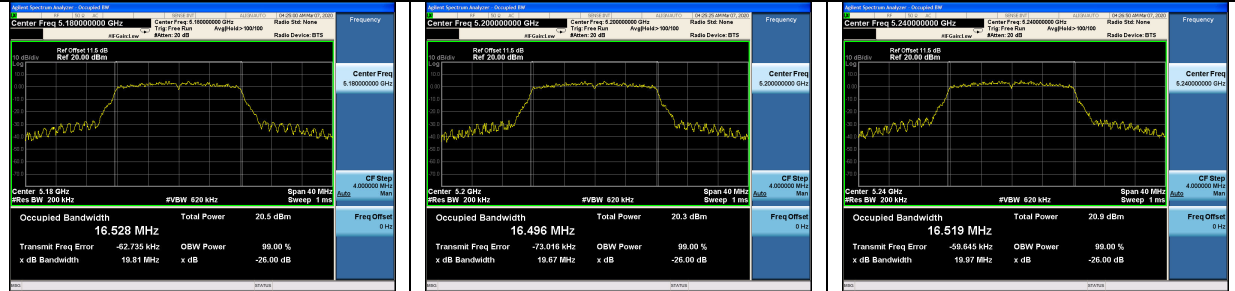
Test Mode	Frequency (MHz)	99% bandwidth (MHz)		Limit (KHz)
		ANT A	ANT B	
11a	5745	16.520	16.364	N/A
	5785	16.478	16.362	N/A
	5825	16.500	16.366	N/A
11n HT20	5745	17.642	17.580	N/A
	5785	17.613	17.565	N/A
	5825	17.612	17.544	N/A
11n HT40	5755	36.353	36.254	N/A
	5795	36.346	36.241	N/A
11ac VHT20	5745	17.572	17.586	N/A
	5785	17.577	17.592	N/A
	5825	17.559	17.592	N/A
11ac VHT40	5755	36.267	36.092	N/A
	5795	36.299	36.122	N/A
11ac VHT80	5775	75.940	75.807	N/A

Conclusion: PASS

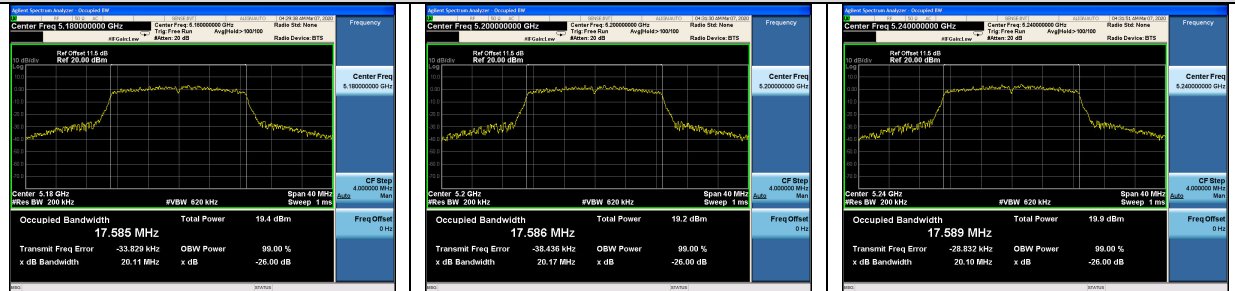
### 26dB bandwidth & 99% Occupied bandwidth

#### U-NII-1 Band: ANTA

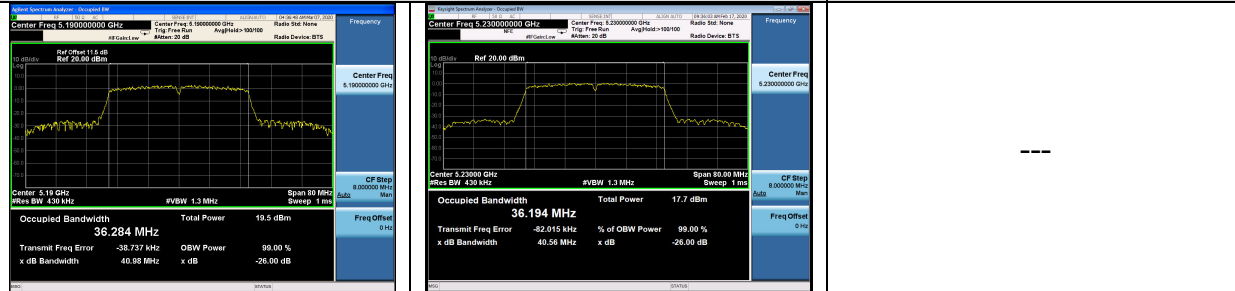
#### IEEE 802.11a



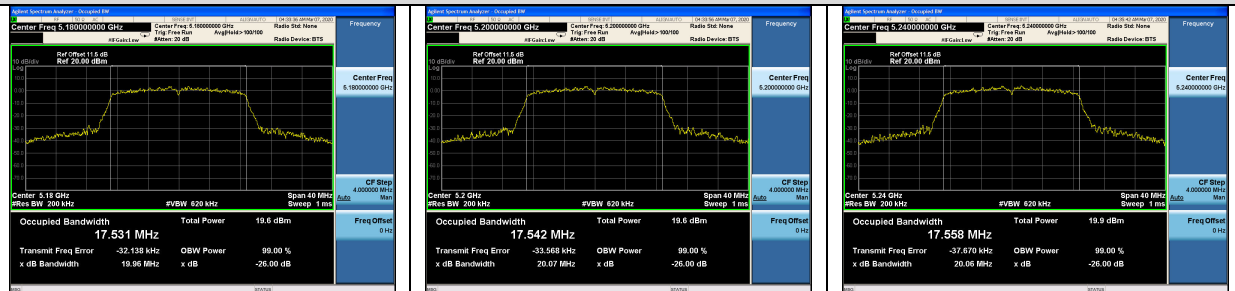
#### IEEE 802.11n HT20



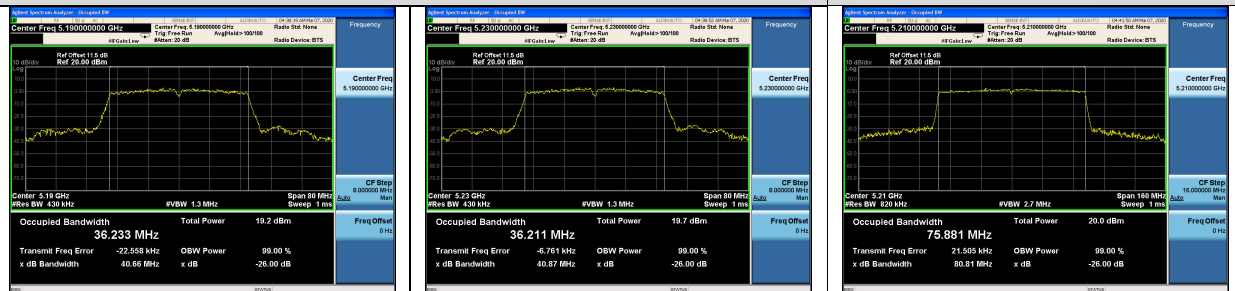
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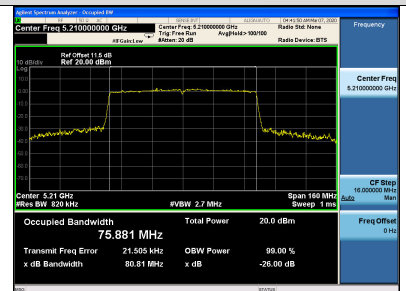
#### IEEE 802.11ac VHT20



#### IEEE 802.11ac VHT40



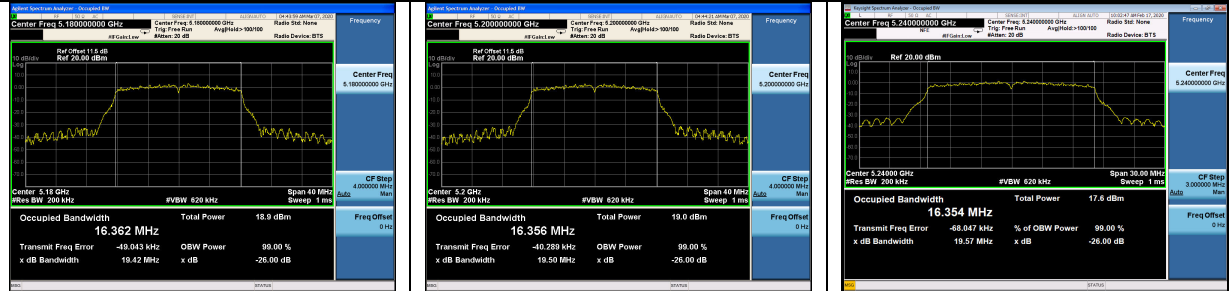
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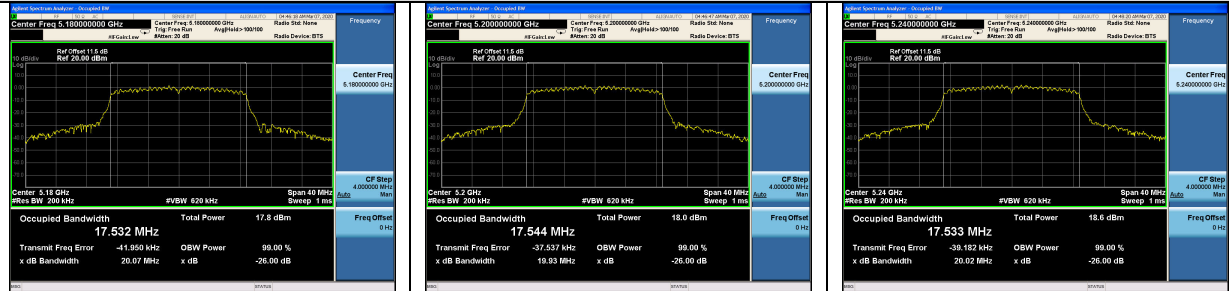
### 26dB bandwidth & 99% Occupied bandwidth

#### U-NII-1 Band: ANTB

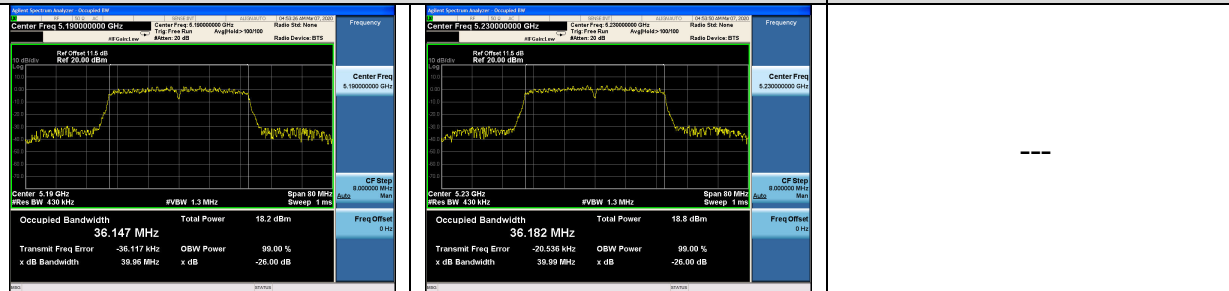
#### IEEE 802.11a



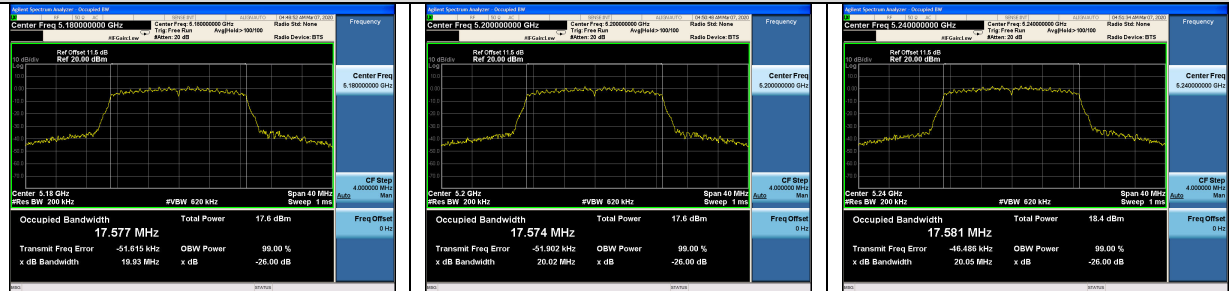
#### IEEE 802.11n HT20



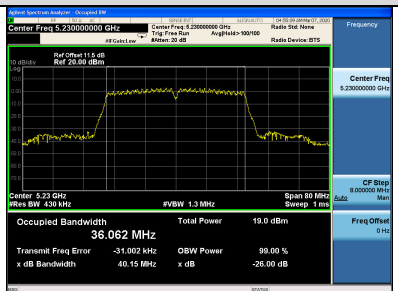
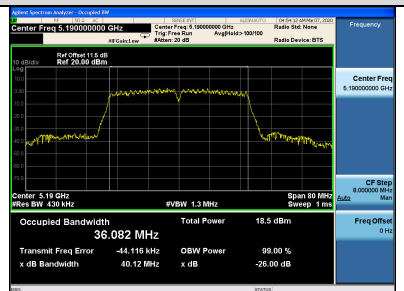
#### IEEE 802.11n HT40



#### IEEE 802.11ac VHT20



#### IEEE 802.11ac VHT40



#### IEEE 802.11ac VHT80

