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.

D. 99% Occupied Bandwidth

The 99% 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. Measurement of the 99% occupied bandwidth is *required* only as a condition for using the optional band-edge measurement techniques described in II.G.3.d). Measurements of 99% occupied bandwidth may also optionally be used in lieu of the EBW to define the minimum frequency range over which the 789033 D02 General UNII Test Procedures New Rules v02r01 Page 4 spectrum is integrated when measuring maximum conducted output power as described in II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with Section 15.407(a).
The following procedure shall be used for measuring (99%) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

3. Set RBW = 1% to 5% of the OBW

4. Set VBW ≥ 3 * RBW

5. 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.

6. Use the 99% power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. 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% occupied bandwidth is the difference between these two frequencies.

10.4 Test Results

Test mode ANT 1	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	26.96
	5200	28.067
	5240	26.008
802.11ac20	5180	28.448
	5200	27.394
	5240	29.807
802.11ac40	5190	56.403
	5230	58.587
802.11ac80	5210	99.692
802.11n(HT20)	5180	29.926
	5200	28.322
	5240	29.925
802.11n(HT40)	5190	55.885
	5230	58.027

Test mode ANT 2	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	25.509
	5200	27.941
	5240	23.149
802.11ac20	5180	29.415
	5200	28.904
	5240	28.752
802.11ac40	5190	59.722
	5230	53.544
802.11ac80	5210	99.68
802.11n(HT20)	5180	29.618
	5200	29.666
	5240	29.077
802.11n(HT40)	5190	53.864
	5230	58.792

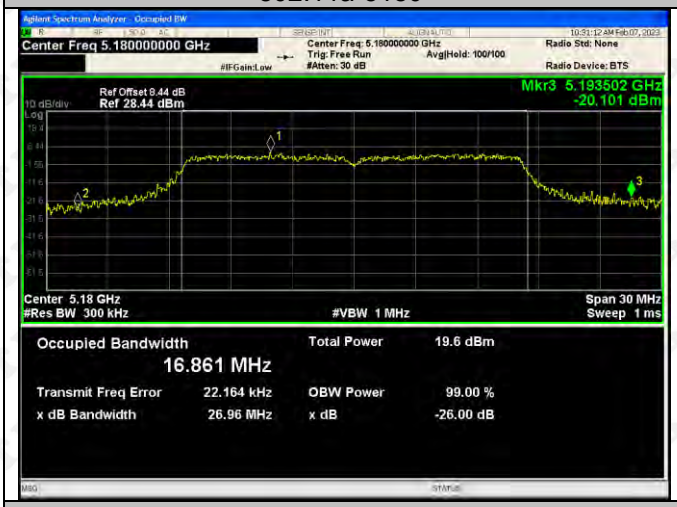
5725-5850 MHz

Test mode Ant 1	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.358	Pass
	5785	16.325	Pass
	5825	16.084	Pass
802.11ac(VH20)	5745	16.954	Pass
	5785	16.469	Pass
	5825	16.401	Pass
802.11ac(VH40)	5755	35.479	Pass
	5795	34.277	Pass
802.11ac(VH80)	5775	75.291	Pass
802.11n(VH20)	5745	16.919	Pass
	5785	17.563	Pass
	5825	17.16	Pass
802.11n(VH40)	5755	35.144	Pass
	5795	35.113	Pass

Test mode Ant 2	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.338	Pass
	5785	16.359	Pass
	5825	16.418	Pass
802.11ac(VH20)	5745	16.713	Pass
	5785	16.945	Pass
	5825	16.975	Pass
802.11ac(VH40)	5755	36.46	Pass
	5795	36.484	Pass
802.11ac(VH80)	5775	76.398	Pass
802.11n(VH20)	5745	16.903	Pass
	5785	16.891	Pass
	5825	17.233	Pass
802.11n(VH40)	5755	36.487	Pass
	5795	36.439	Pass

Test Graph
ANT 1

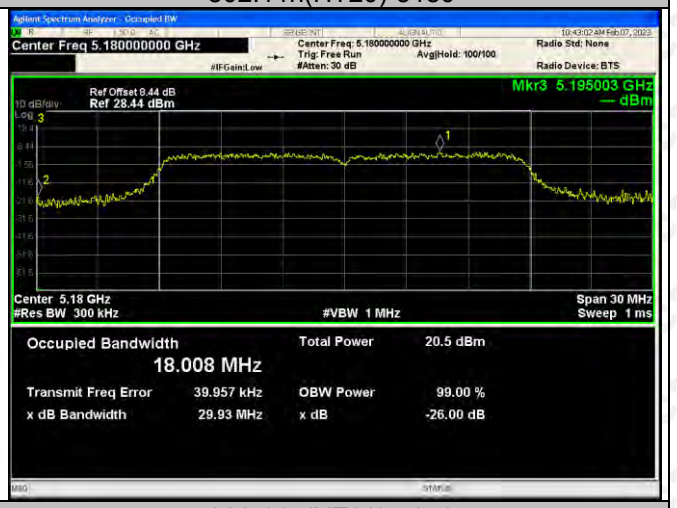
802.11a-5180



802.11a-5200

802.11a-5240

802.11n(HT20)-5180



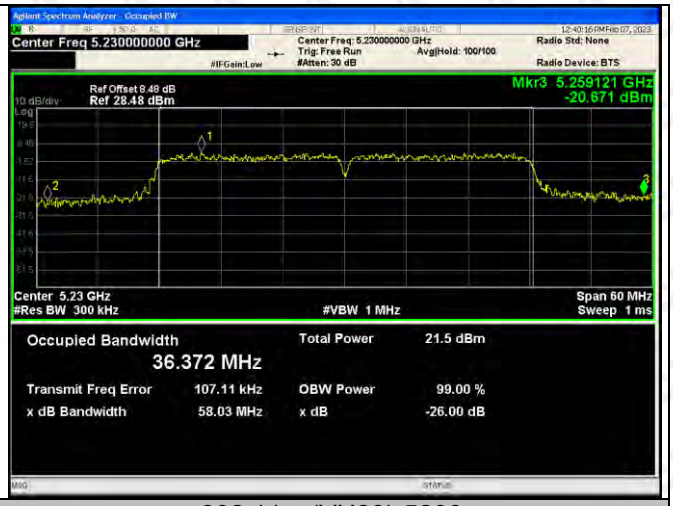
802.11n(HT20)-5200

802.11n(HT20)-5240

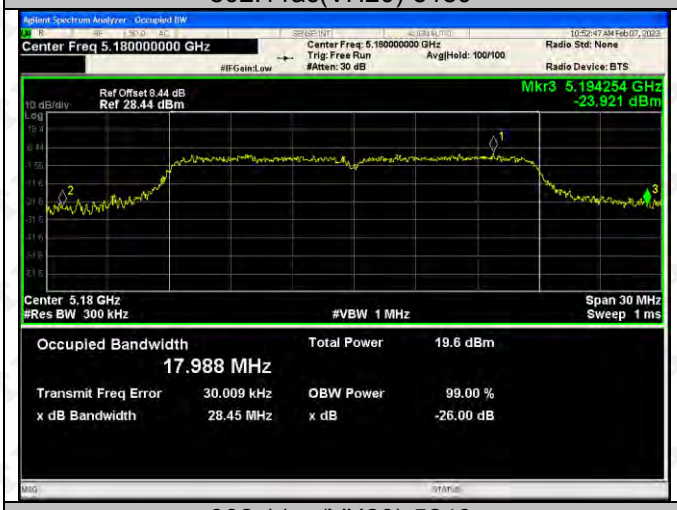
802.11n(HT40)-5190

802.11n(HT40)-5230

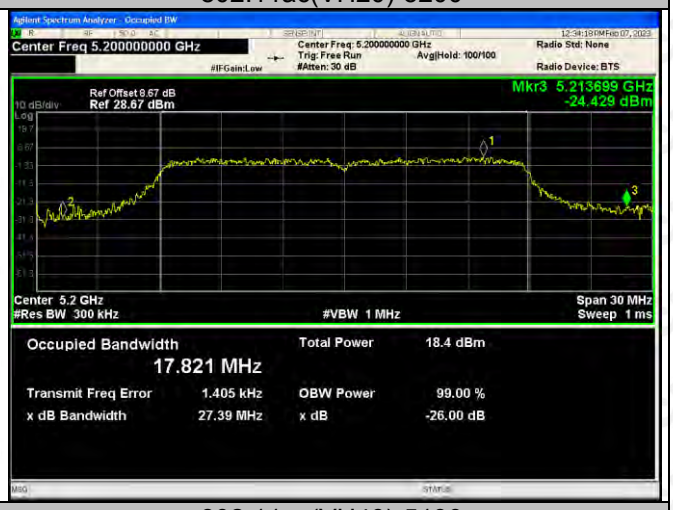
802.11ac(VH20)-5180



802.11ac(VH20)-5200

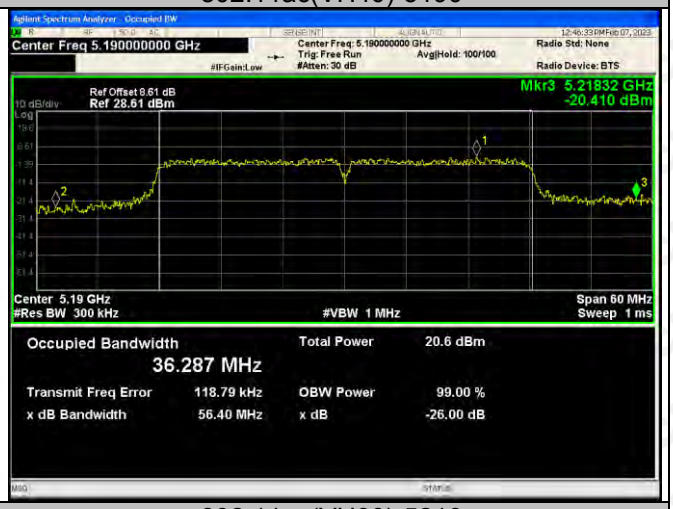


802.11ac(VH20)-5240

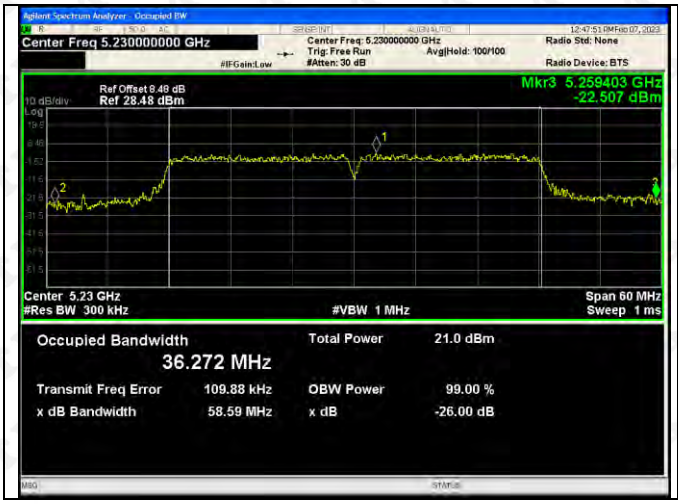


802.11ac(VH40)-5190

802.11ac(VH40)-5230

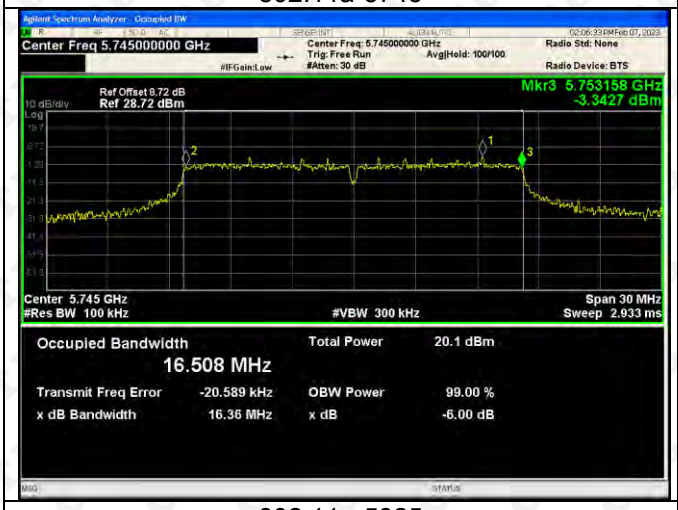


802.11ac(VH80)-5210

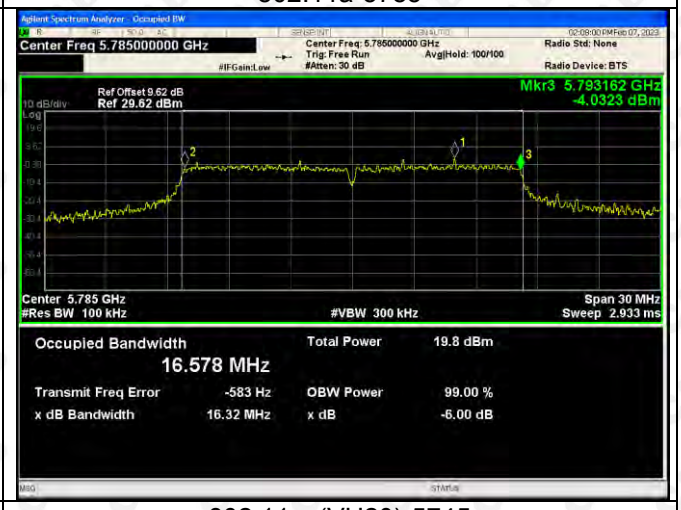


ANT1:
5725-5850MHz

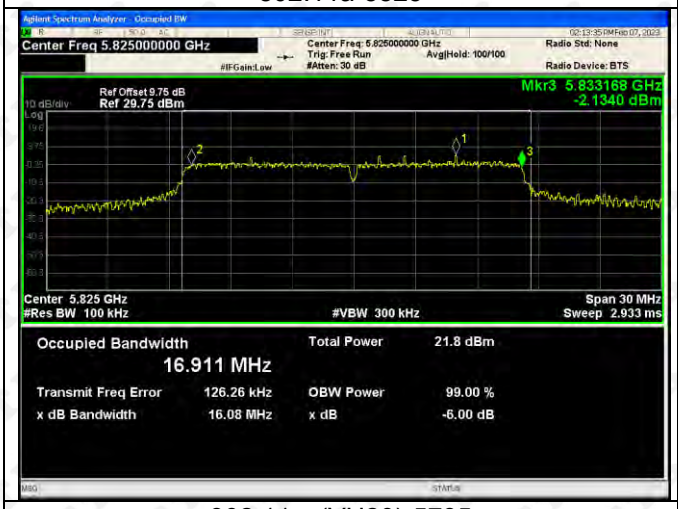
802.11a-5745



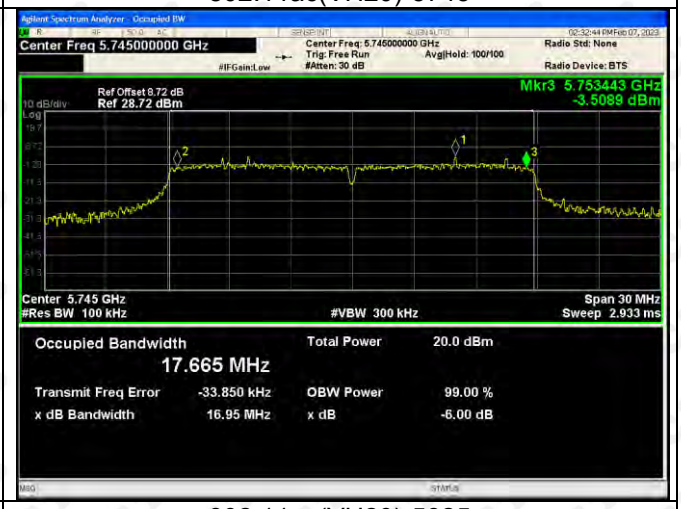
802.11a-5785



802.11a-5825



802.11ac(VH20)-5745

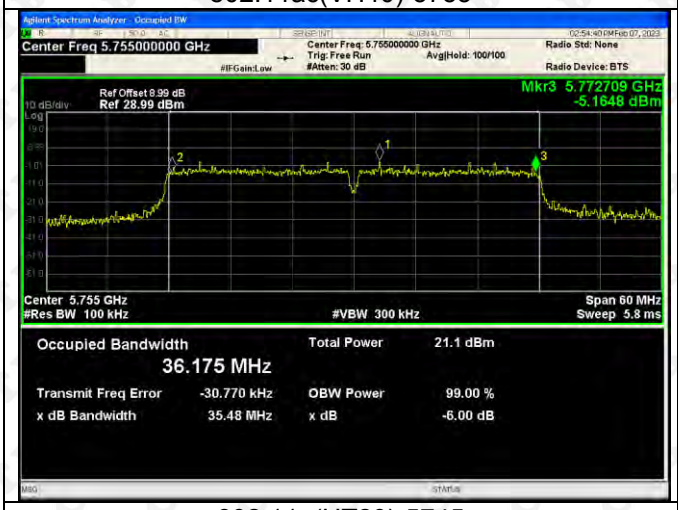


802.11ac(VH20)-5785

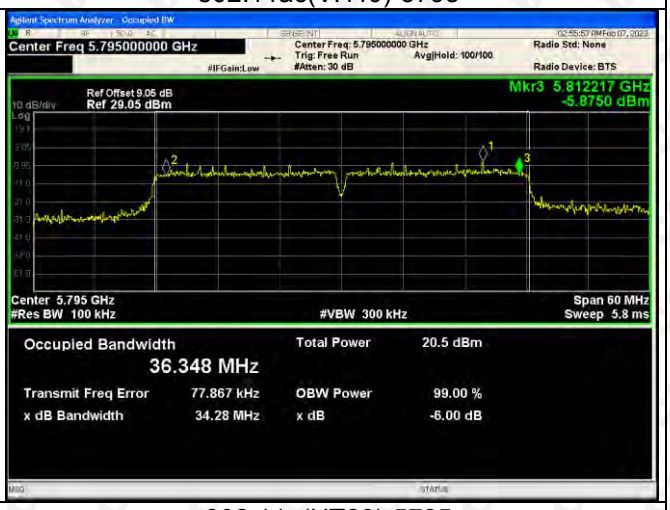
802.11ac(VH20)-5825

802.11ac(VH40)-5755

802.11ac(VH40)-5795

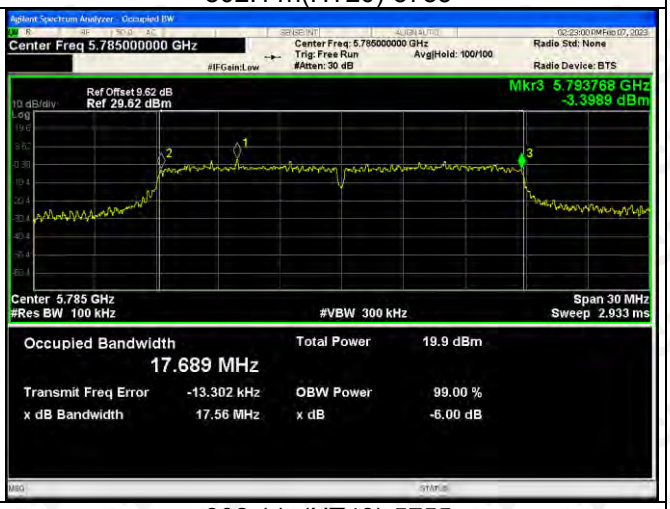


802.11n(HT20)-5745



802.11n(HT20)-5785

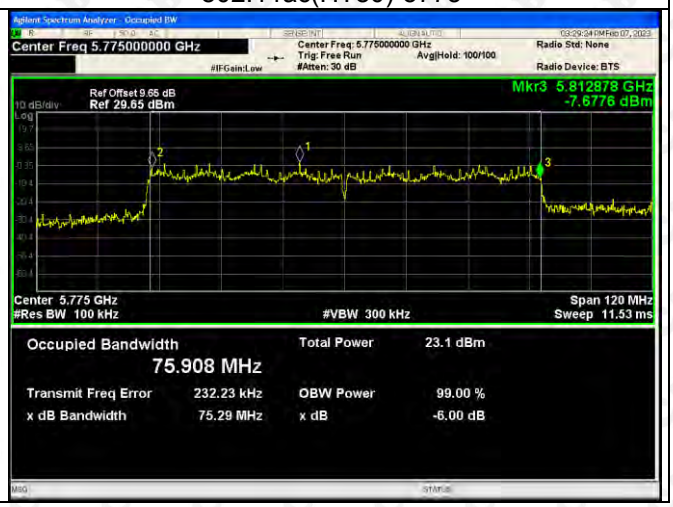
802.11n(HT20)-5825



802.11n(HT40)-5755

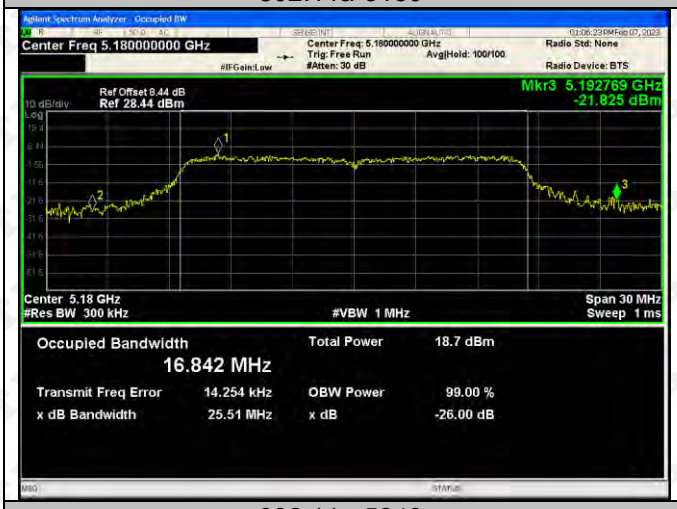
802.11n(HT40)-5795

802.11ac(HT80)-5775

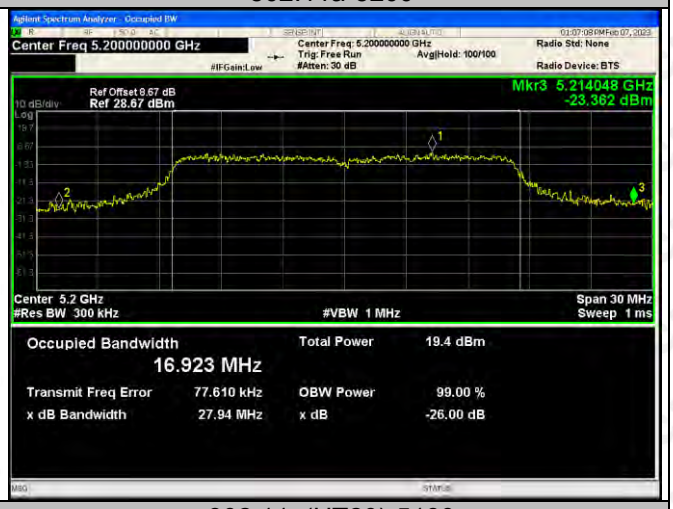


Test Graph
ANT 2

802.11a-5180



802.11a-5200

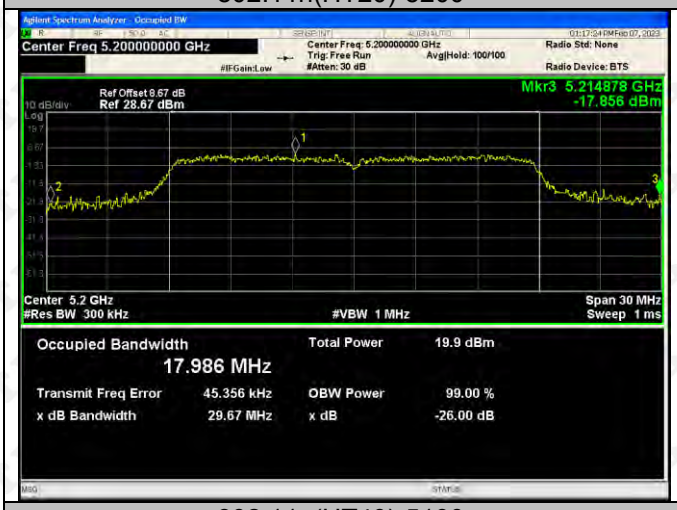


802.11a-5240

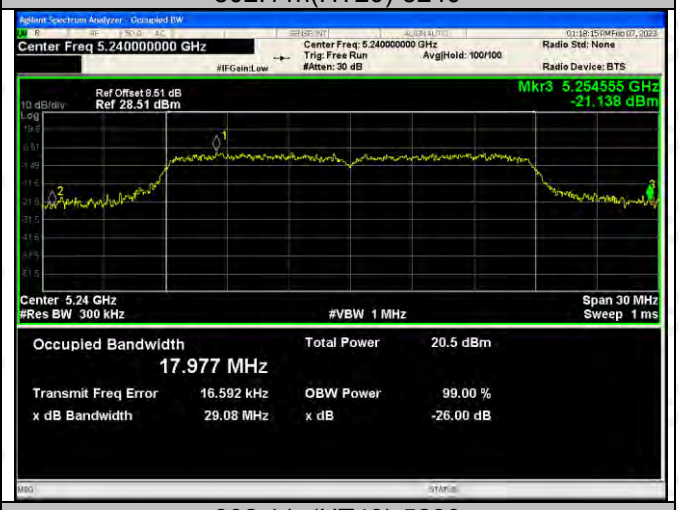
802.11n(HT20)-5180

802.11n(HT20)-5200

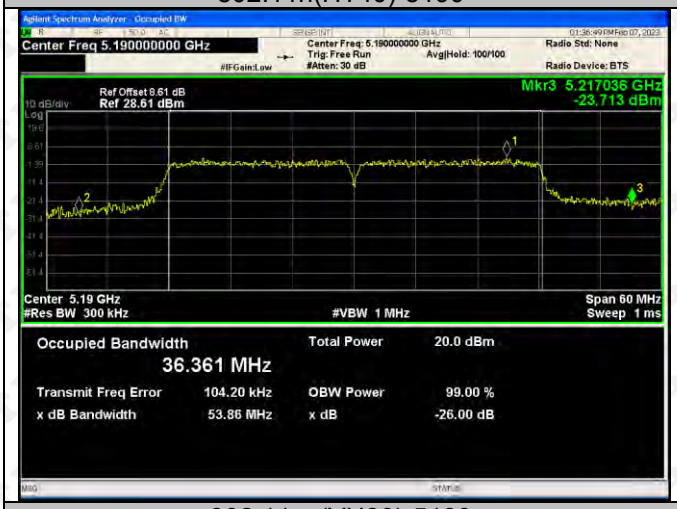
802.11n(HT20)-5240



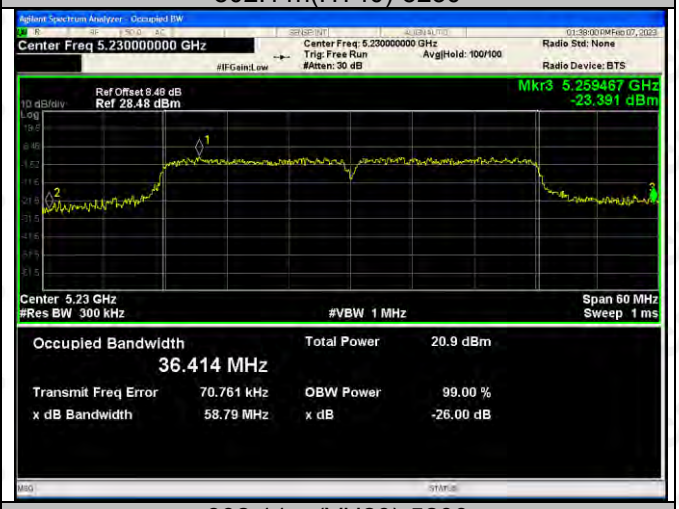
802.11n(HT40)-5190



802.11n(HT40)-5230



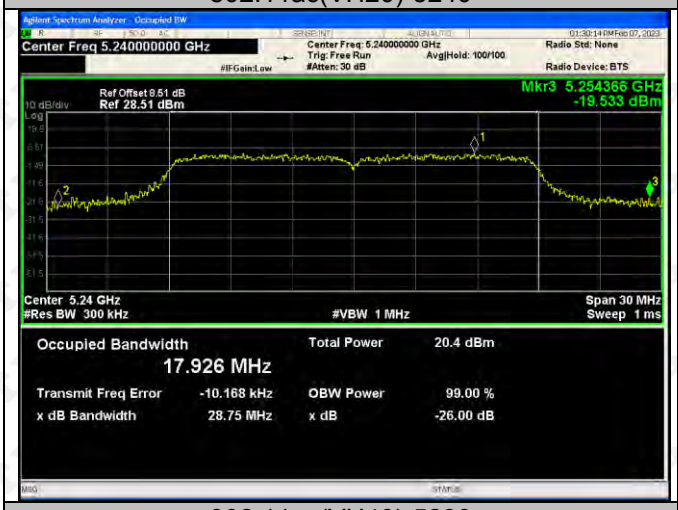
802.11ac(VH20)-5180



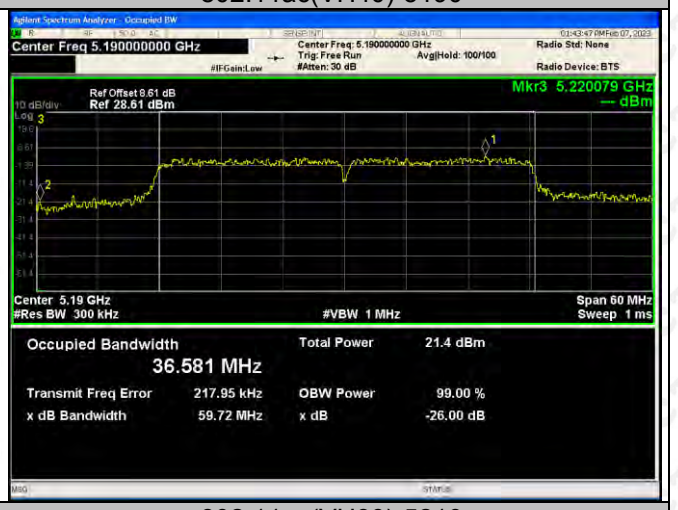
802.11ac(VH20)-5200

802.11ac(VH20)-5240

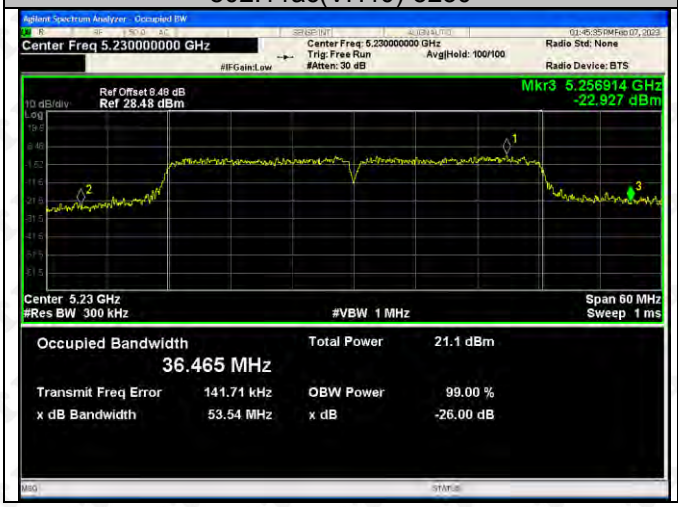
802.11ac(VH40)-5190

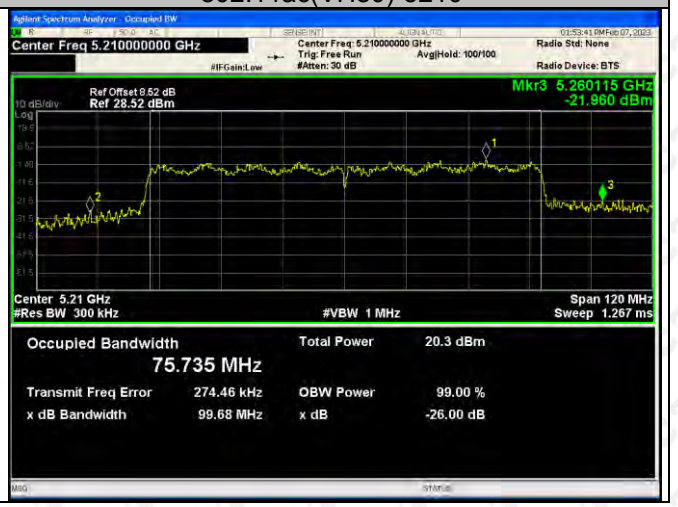


802.11ac(VH40)-5230



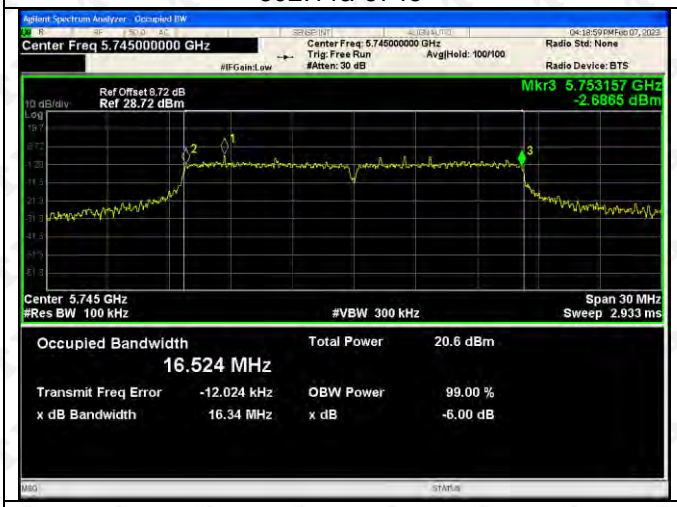
802.11ac(VH80)-5210



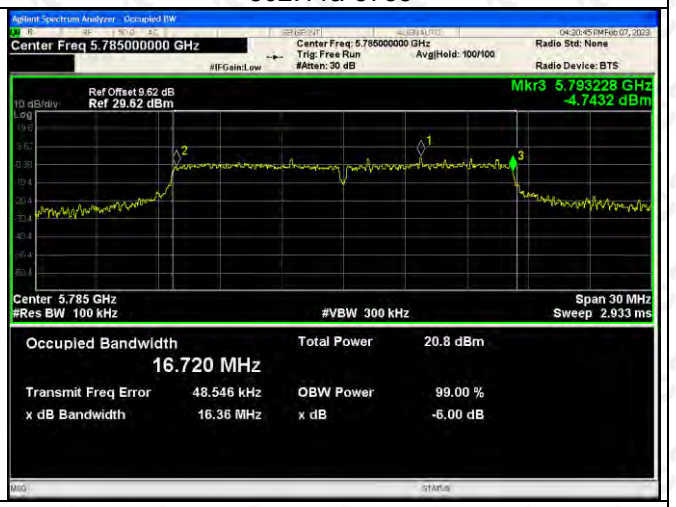


ANT2:
5725-5850MHz

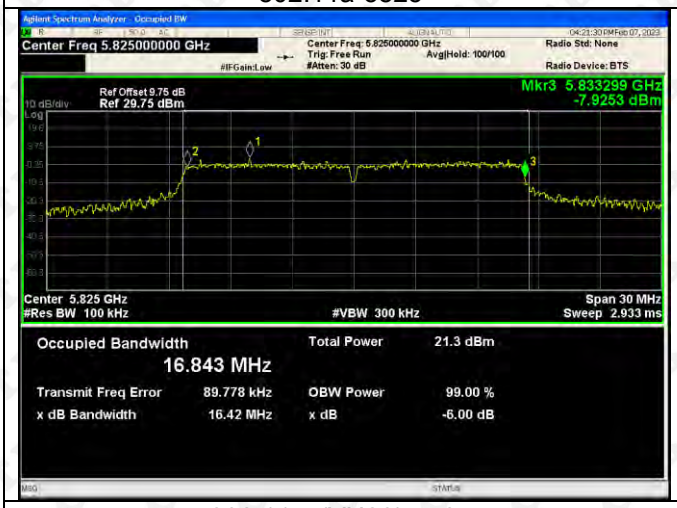
802.11a-5745



802.11a-5785

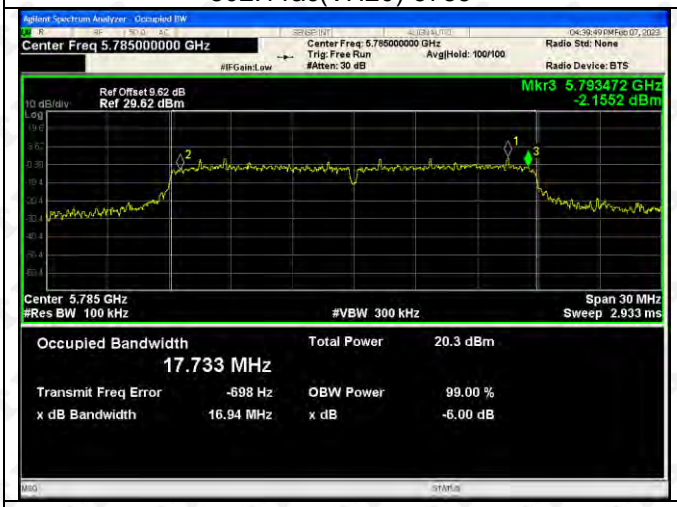


802.11a-5825

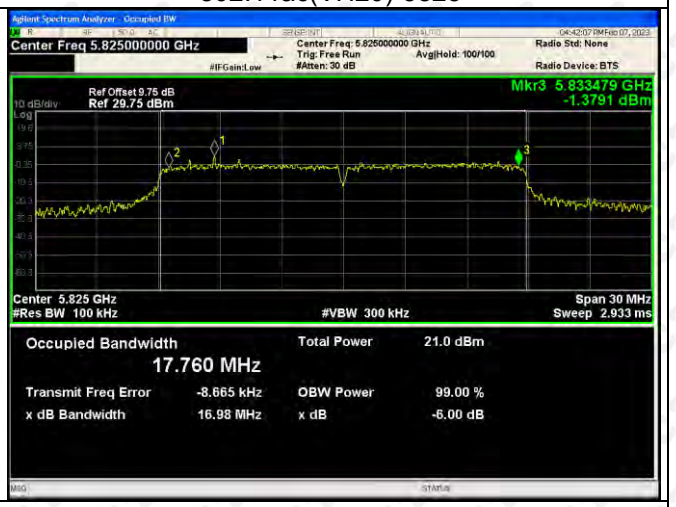


802.11ac(VH20)-5745

802.11ac(VH20)-5785

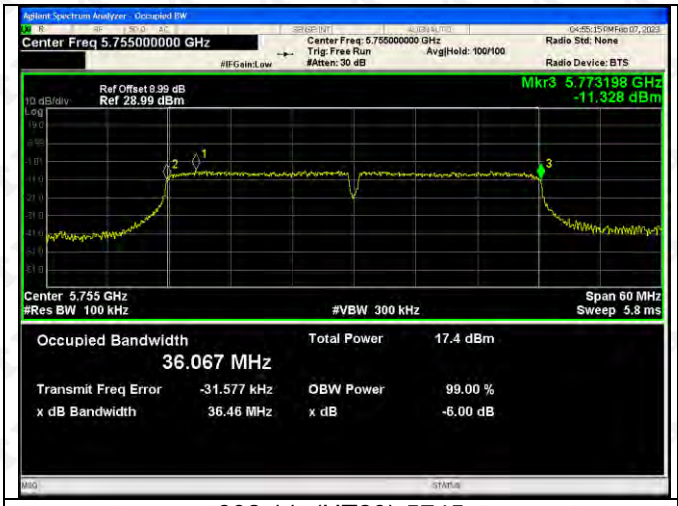


802.11ac(VH20)-5825



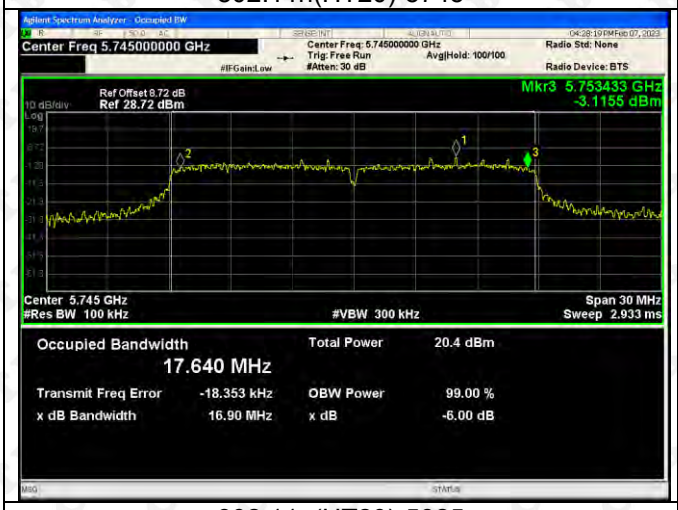
802.11ac(VH40)-5755

802.11ac(VH40)-5795

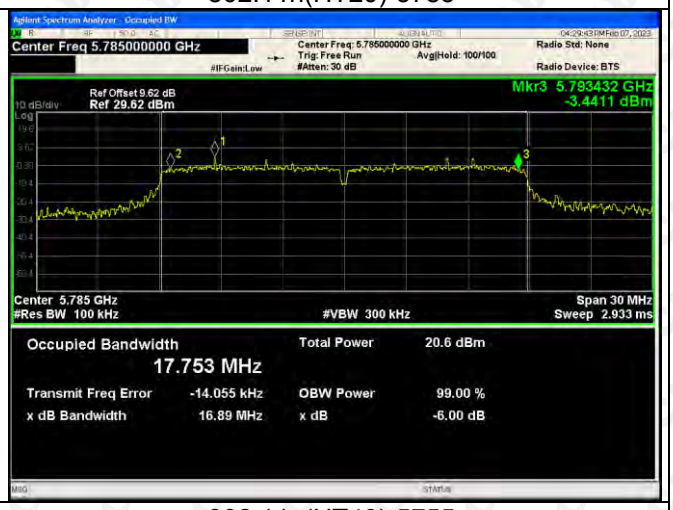


802.11n(HT20)-5745

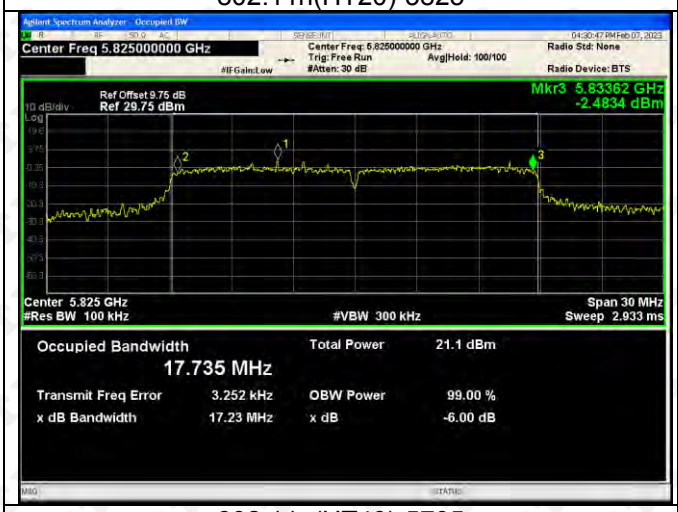
802.11n(HT20)-5785



802.11n(HT20)-5825

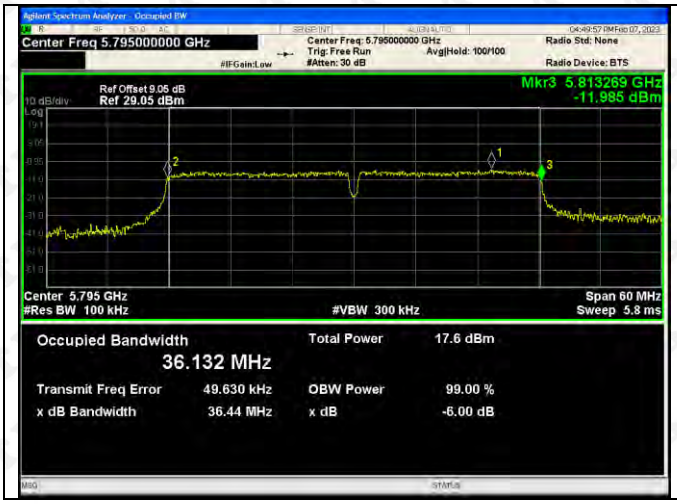


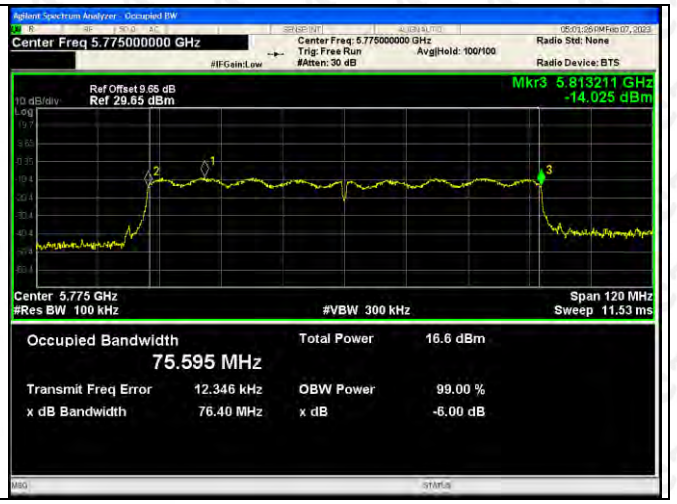
802.11n(HT40)-5755



802.11n(HT40)-5795

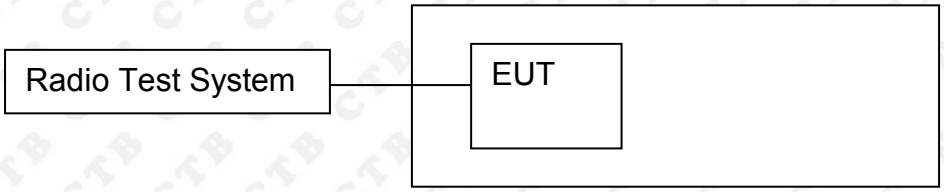
802.11ac(HT80)-5775


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.795000000 GHz
Center Freq: 5.795000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 9.05 dB
10 dB/div
Ref 29.05 dBm
Mkr3 5.813269 GHz
-11.985 dBm
Center 5.795 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60 MHz
Sweep 5.8 ms
Occupied Bandwidth
36.132 MHz
Total Power 17.6 dBm
Transmit Freq Error 49.630 kHz
OBW Power 99.00 %
x dB Bandwidth 36.44 MHz
x dB -6.00 dB


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.775000000 GHz
Center Freq: 5.775000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 9.65 dB
10 dB/div
Ref 29.65 dBm
Mkr3 5.813211 GHz
-14.025 dBm
Center 5.775 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 120 MHz
Sweep 11.53 ms
Occupied Bandwidth
75.595 MHz
Total Power 16.6 dBm
Transmit Freq Error 12.346 kHz
OBW Power 99.00 %
x dB Bandwidth 76.40 MHz
x dB -6.00 dB

11. POWER SPECTRAL DENSITY

11.1 Block Diagram Of Test Setup



11.2 Limit

(1) For the band 5.15-5.25 GHz.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
(2) 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 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

11.3 Test procedure

According to KDB789033 D02v02r01 sectionE, the following is the measurement procedure.

For devices operating in the bands 5.15−5.25 GHz, 5.25−5.35 GHz, and 5.47−5.725 GHz, the preceding procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 15.407(a)(5). For devices operating in the band 5.725−5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
a) Set RBW ≥ 1/*T*, where *T* is defined in II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the II.F.5.c) and II.F.5.d), since RBW=100 kHz is available on nearly all spectrum analyzers.

11.4 Test Result

ANT 1+ANT2

Test mode	Test Channel (MHz)	PSD [dBm/MHz] ANT 1	PSD [dBm/MHz] ANT 2	PSD [dBm/MHz] Total	Limit (dBm/MHz)	Result
802.11a	5180	5.099	4.558	/	10.52	Pass
	5200	4.27	4.922	/	10.52	Pass
	5240	5.138	6.065	/	10.52	Pass
802.11ac(VH20)	5180	5.092	5.884	8.516	10.52	Pass
	5200	6.148	4.999	8.622	10.52	Pass
	5240	6.663	5.89	9.304	10.52	Pass
802.11ac(VH40)	5190	2.635	2.502	5.579	10.52	Pass
	5230	3.533	3.233	6.396	10.52	Pass
802.11n(VH20)	5180	1.392	1.444	4.428	10.52	Pass
	5200	4.073	4.898	7.515	10.52	Pass
	5240	5.557	5.26	8.421	10.52	Pass
802.11n(VH40)	5190	5.759	6.598	9.209	10.52	Pass
	5230	2.92	3.056	5.999	10.52	Pass
802.11ac(VH80)	5230	3.882	3.092	6.515	10.52	Pass

Test mode	Test Channel (MHz)	PSD [dBm/MHz] ANT 1	PSD [dBm/MHz] ANT 2	PSD [dBm/MHz] Total	Limit (dBm)	Result
802.11a	5745	2.632	2.638	/	28.20	Pass
	5785	3.061	3.15	/	28.20	Pass
	5825	4.226	4.72	/	28.20	Pass
802.11ac(VH20)	5745	1.79	1.824	4.817	28.20	Pass
	5785	2.574	1.942	5.280	28.20	Pass
	5825	4.029	3.993	7.021	28.20	Pass
802.11ac(VH40)	5755	-0.11	0.628	3.285	28.20	Pass
	5795	1.765	0.299	4.104	28.20	Pass
802.11n(VH20)	5775	0.182	-3.319	1.785	28.20	Pass
	5745	2.832	3.181	6.020	28.20	Pass
	5785	2.85	2.75	5.811	28.20	Pass
802.11n(VH40)	5825	6.233	4.703	8.545	28.20	Pass
	5755	0.07	-1.35	2.428	28.20	Pass
802.11ac(VH80)	5795	-0.498	-0.986	2.275	28.20	Pass

ANT 1

802.11a-5180

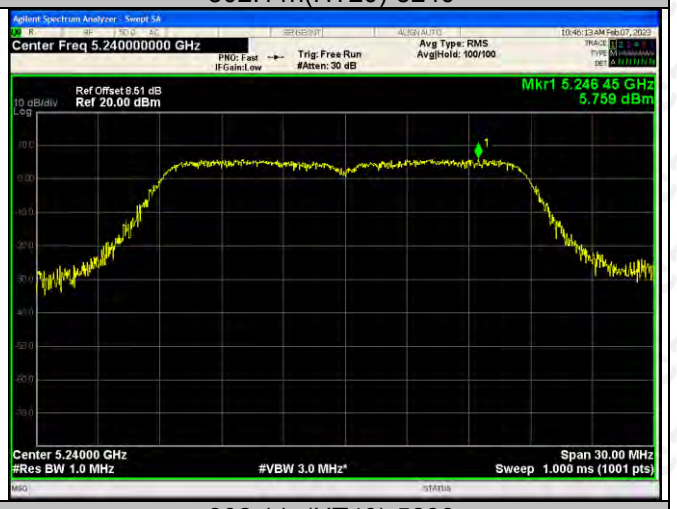
802.11a-5200

802.11a-5240

802.11n(HT20)-5180

802.11n(HT20)-5200

802.11n(HT20)-5240



802.11n(HT40)-5190

802.11n(HT40)-5230

802.11ac(VH20)-5180

802.11ac(VH20)-5200

802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

ANT1:

802.11a-5745	802.11a-5785
	
802.11a-5825	802.11ac(VH20)-5745
	
802.11ac(VH20)-5785	802.11ac(VH20)-5825

802.11ac(VH40)-5755

802.11ac(VH40)-5795

802.11n(HT20)-5745

802.11n(HT20)-5785

802.11n(HT20)-5825

802.11n(HT40)-5755

802.11n(HT40)-5795

802.11ac(HT80)-5775

ANT 2

802.11a-5180

802.11a-5200

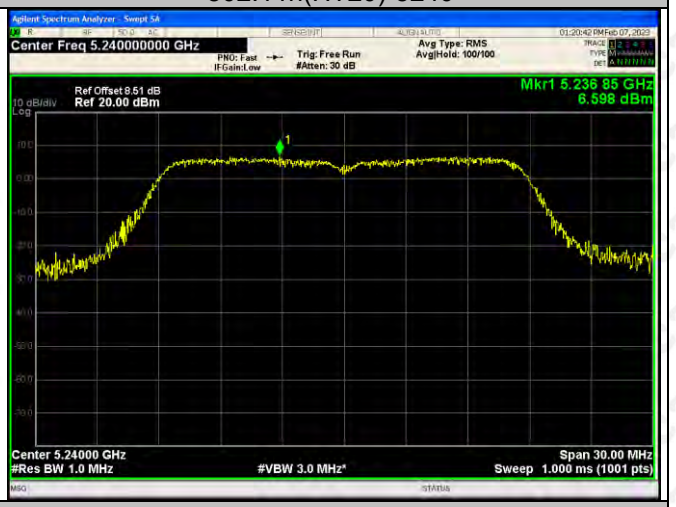
802.11a-5240

802.11n(HT20)-5180

802.11n(HT20)-5200

802.11n(HT20)-5240

802.11n(HT40)-5190



802.11n(HT40)-5230

802.11ac(VH20)-5180

802.11ac(VH20)-5200

802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

ANT2:

802.11a-5745	802.11a-5785
	
802.11a-5825	802.11ac(VH20)-5745
	
802.11ac(VH20)-5785	802.11ac(VH20)-5825

802.11ac(VH40)-5755

802.11ac(VH40)-5795

802.11n(HT20)-5745

802.11n(HT20)-5785

802.11n(HT20)-5825

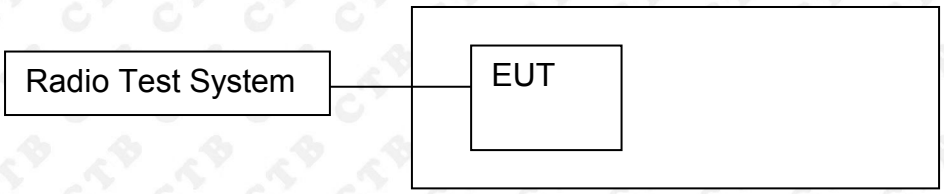
802.11n(HT40)-575

802.11n(HT40)-5795

802.11ac(HT80)-5775

12. FREQUENCY STABILITY

12.1 Block Diagram Of Test Setup



12.2 Limit

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's manual.

12.3 Test procedure

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.

2. Set EUT as normal operation.

3. Turn the EUT on and couple its output to spectrum.

4. Turn the EUT off and set the chamber to the highest temperature specified.

5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.

6. Repeat step with the temperature chamber set to the lowest temperature.

12.4 Test Result

TX Frequency (5150-5250MHz)

ANT1

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5180.0196	5180	0.0196	3.7847
		V max (V)	132	5180.0672	5180	0.0672	12.9653
		V min (V)	108	5180.0917	5180	0.0917	17.7013
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5180.0380	5180	0.0380	7.3358
		T (°C)	10	5180.0180	5180	0.0180	3.4810
		T (°C)	20	5180.0310	5180	0.0310	5.9770
		T (°C)	30	5180.0479	5180	0.0479	9.2432
		T (°C)	40	5180.0298	5180	0.0298	5.7552
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5200.0407	5200	0.0407	7.8278
		V max (V)	132	5200.0249	5200	0.0249	4.7895
		V min (V)	108	5200.0527	5200	0.0527	10.1257
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5200.0009	5200	0.0009	0.1673
		T (°C)	10	5200.0422	5200	0.0422	8.1116
		T (°C)	20	5200.0156	5200	0.0156	3.0025
		T (°C)	30	5200.0121	5200	0.0121	2.3337
		T (°C)	40	5200.0057	5200	0.0057	1.1047
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5240.0530	5240	0.0530	10.1052
		V max (V)	132	5240.0241	5240	0.0241	4.5996
		V min (V)	108	5240.0332	5240	0.0332	6.3333
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5240.0330	5240	0.0330	6.2994
		T (°C)	10	5240.0320	5240	0.0320	6.1080
		T (°C)	20	5240.0149	5240	0.0149	2.8461
		T (°C)	30	5240.0462	5240	0.0462	8.8144
		T (°C)	40	5240.0292	5240	0.0292	5.5641
Limits				±20ppm			
Result				Complies			

TX Frequency (5725-5850MHz)

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5745.0256	5745	0.0256	4.4561
		V max (V)	132	5745.0886	5745	0.0886	15.4243
		V min (V)	108	5745.0256	5745	0.0256	4.4561
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5745.0756	5745	0.0756	13.1601
		T (°C)	10	5745.0442	5745	0.0442	7.6877
		T (°C)	20	5745.0697	5745	0.0697	12.1279
		T (°C)	30	5745.0883	5745	0.0883	15.3636
		T (°C)	40	5745.0791	5745	0.0791	13.7606
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5785.0495	5785	0.0495	8.5564
		V max (V)	132	5785.0630	5785	0.0630	10.8916
		V min (V)	108	5785.0154	5785	0.0154	2.6579
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5785.0492	5785	0.0492	8.5087
		T (°C)	10	5785.0540	5785	0.0540	9.3382
		T (°C)	20	5785.0128	5785	0.0128	2.2053
		T (°C)	30	5785.0595	5785	0.0595	10.2825
		T (°C)	40	5785.0612	5785	0.0612	10.5823
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5825.0168	5825	0.0168	2.8839
		V max (V)	132	5825.0761	5825	0.0761	13.0595
		V min (V)	108	5825.0930	5825	0.0930	15.9663
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5825.0328	5825	0.0328	5.6233
		T (°C)	10	5825.0427	5825	0.0427	7.3294
		T (°C)	20	5825.0759	5825	0.0759	13.0309
		T (°C)	30	5825.0174	5825	0.0174	2.9926
		T (°C)	40	5825.0639	5825	0.0639	10.9659
Limits				±20ppm			
Result				Complies			

ANT2:

TX Frequency (5150-5250MHz)

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5180.0701	5180	0.0701	13.5410
		V max (V)	132	5180.0053	5180	0.0053	1.0141
		V min (V)	108	5180.0930	5180	0.0930	17.9539
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5180.0285	5180	0.0285	5.4963
		T (°C)	10	5180.0182	5180	0.0182	3.5148
		T (°C)	20	5180.0881	5180	0.0881	17.0063
		T (°C)	30	5180.0578	5180	0.0578	11.1643
		T (°C)	40	5180.0015	5180	0.0015	0.2885
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5200.0040	5200	0.0040	0.7762
		V max (V)	132	5200.0838	5200	0.0838	16.1184
		V min (V)	108	5200.0926	5200	0.0926	17.8111
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5200.0559	5200	0.0559	10.7442
		T (°C)	10	5200.0702	5200	0.0702	13.5034
		T (°C)	20	5200.0466	5200	0.0466	8.9599
		T (°C)	30	5200.0250	5200	0.0250	4.8165
		T (°C)	40	5200.0623	5200	0.0623	11.9746
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5240.0769	5240	0.0769	14.6684
		V max (V)	132	5240.0436	5240	0.0436	8.3214
		V min (V)	108	5240.0869	5240	0.0869	16.5802
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5240.0814	5240	0.0814	15.5396
		T (°C)	10	5240.0084	5240	0.0084	1.6058
		T (°C)	20	5240.0667	5240	0.0667	12.7228
		T (°C)	30	5240.0846	5240	0.0846	16.1395
		T (°C)	40	5240.0591	5240	0.0591	11.2706
Limits				±20ppm			
Result				Complies			

TX Frequency (5725-5850MHz)

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5745.0255	5745	0.0255	4.4321
		V max (V)	132	5745.0380	5745	0.0380	6.6073
		V min (V)	108	5745.0729	5745	0.0729	12.6907
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5745.0933	5745	0.0933	16.2332
		T (°C)	10	5745.0174	5745	0.0174	3.0239
		T (°C)	20	5745.0758	5745	0.0758	13.1882
		T (°C)	30	5745.0543	5745	0.0543	9.4582
		T (°C)	40	5745.0711	5745	0.0711	12.3772
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5785.0813	5785	0.0813	14.0477
		V max (V)	132	5785.0908	5785	0.0908	15.6979
		V min (V)	108	5785.0040	5785	0.0040	0.6938
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5785.0871	5785	0.0871	15.0479
		T (°C)	10	5785.0503	5785	0.0503	8.7007
		T (°C)	20	5785.0918	5785	0.0918	15.8678
		T (°C)	30	5785.0351	5785	0.0351	6.0667
		T (°C)	40	5785.0405	5785	0.0405	6.9948
		T (°C)	50	5785.0225	5785	0.0225	3.8932
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5825.0433	5825	0.0433	7.4364
		V max (V)	132	5825.0510	5825	0.0510	8.7477
		V min (V)	108	5825.0394	5825	0.0394	6.7701
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5825.0388	5825	0.0388	6.6569
		T (°C)	10	5825.0440	5825	0.0440	7.5540
		T (°C)	20	5825.0265	5825	0.0265	4.5538
		T (°C)	30	5825.0302	5825	0.0302	5.1824
		T (°C)	40	5825.0564	5825	0.0564	9.6862
Limits				±20ppm			
Result				Complies			

13. OPERATION IN THE ABSENCE OF INFORMATION TO THE TRANSMIT

13.1 Requirement

15.407(c) requirement:
The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signal ling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

13.2 Test Results

Operation in the absence of information to the transmit:

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling
signal of ASK message transmitting from remote device and verify whether it shall resend or
discontinue transmission. (manufacturer declare)

14. ANTENNA REQUIREMENT

15.203 requirement:
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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirement:
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is FPC antenna and no consideration of replacement. The best case gain of the antenna is WiFi (5.2G):Ant1:4.63dBi, Ant2:1.91dBi, WiFi (5.8G):Ant1: 3.51dBi, Ant2: 4.96dBi.

15. EUT PHOTOGRAPHS

EUT Photo 1

EUT Photo 2

16. EUT TEST SETUP PHOTOGRAPHS

Spurious emissions

Below 1GHz

Above 1GHz

Conducted Emission

※※※※※ **END OF REPORT** ※※※※※