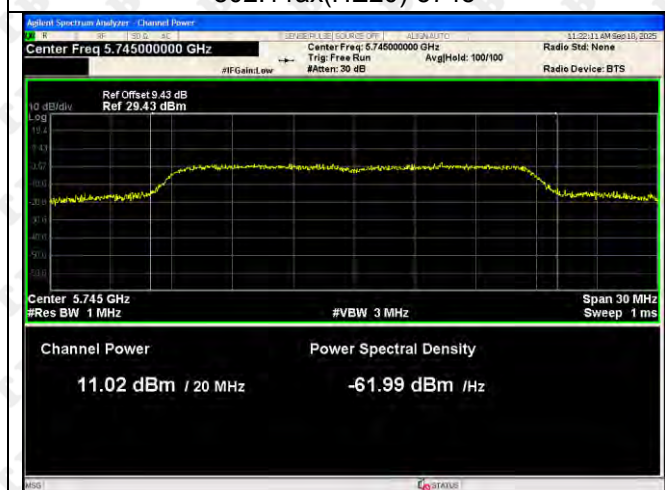




802.11ax(HE20)-5745



802.11ax(HE20)-5785



802.11ax(HE20)-5825



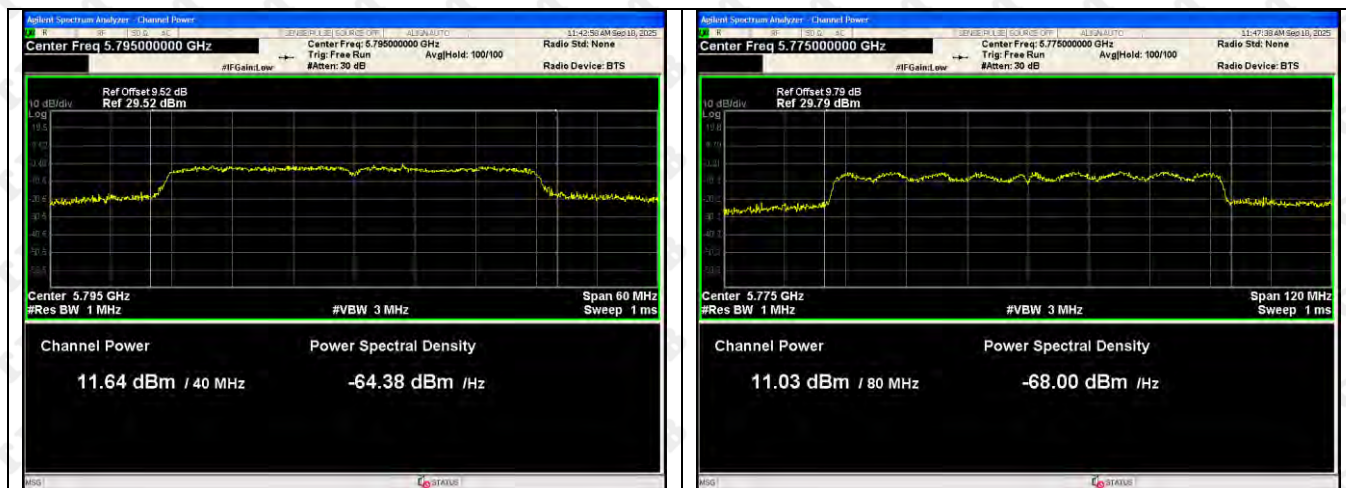
802.11ax(HE40)-5755



802.11ax(HE40)-5795

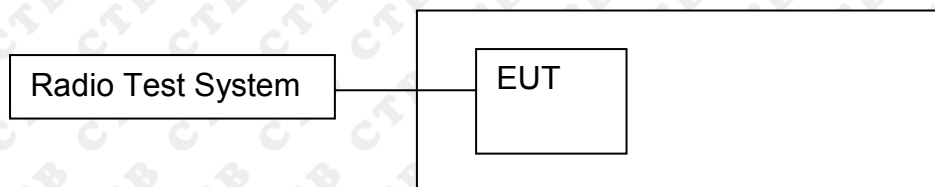


802.11ax(HE80)-5775



10. EMISSION BANDWIDTH& OCCUPIED BANDWIDTH

10.1 Block Diagram Of Test Setup



10.2 Limits

(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 $11 \text{ dBm} + 10 \log B$, 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.

(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

10.3 Test Procedure

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

1. Emission Bandwidth (EBW)

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- 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%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

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:

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 * \text{RBW}$.
- 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.

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 $\geq 3 * RBW$
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

5150-5250MHz

Test mode Ant 1	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	21.792
	5200	21.956
	5240	24.046
802.11ac(VHT20)	5180	21.763
	5200	22.125
	5240	25.773
802.11ac(VHT40)	5190	47.705
	5230	47.3
802.11ac(VHT80)	5210	81.44
802.11n(HT20)	5180	21.426
	5200	22.285
	5240	24.104
802.11n(HT40)	5190	47.716
	5230	47.193
802.11ax(HE20)	5180	22.007
	5200	22.396
	5240	23.786
802.11ax(HE40)	5190	41.942
	5230	47.444
802.11ax(HE80)	5210	81.48

Test mode Ant 2	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	22.409
	5200	22.186
	5240	24.076
802.11ac(VHT20)	5180	24.121
	5200	23.323
	5240	27.192
802.11ac(VHT40)	5190	41.544
	5230	41.842
802.11ac(VHT80)	5210	81.119
802.11n(HT20)	5180	25.259
	5200	23.55
	5240	28.976
802.11n(HT40)	5190	41.512
	5230	41.855
802.11ax(HE20)	5180	22.031
	5200	24.077
	5240	26.497
802.11ax(HE40)	5190	41.376
	5230	45.302
802.11ax(HE80)	5210	81.692

5725-5850 MHz

Test mode Ant 1	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.534	Pass
	5785	16.483	Pass
	5825	16.528	Pass
802.11ac(VHT20)	5745	17.741	Pass
	5785	17.739	Pass
	5825	17.736	Pass
802.11ac(VHT40)	5755	36.443	Pass
	5795	36.457	Pass
802.11ac(VHT80)	5775	75.604	Pass
802.11n(HT20)	5745	17.712	Pass
	5785	17.773	Pass
	5825	17.746	Pass
802.11n(HT40)	5755	36.477	Pass
	5795	36.481	Pass
802.11ax(HE20)	5745	17.744	Pass
	5785	17.719	Pass
	5825	17.779	Pass
802.11ax(HE40)	5755	36.427	Pass
	5795	36.413	Pass
802.11ax(HE80)	5775	75.65	Pass

Test mode Ant 2	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.498	Pass
	5785	16.528	Pass
	5825	16.504	Pass
802.11ac(VHT20)	5745	17.741	Pass
	5785	17.751	Pass
	5825	17.785	Pass
802.11ac(VHT40)	5755	36.507	Pass
	5795	36.489	Pass
802.11ac(VHT80)	5775	76.25	Pass
802.11n(HT20)	5745	17.711	Pass
	5785	17.751	Pass
	5825	17.761	Pass
802.11n(HT40)	5755	36.447	Pass
	5795	36.457	Pass
802.11ax(HE20)	5745	17.763	Pass
	5785	17.743	Pass
	5825	17.761	Pass
802.11ax(HE40)	5755	36.388	Pass
	5795	36.434	Pass
802.11ax(HE80)	5775	76.16	Pass

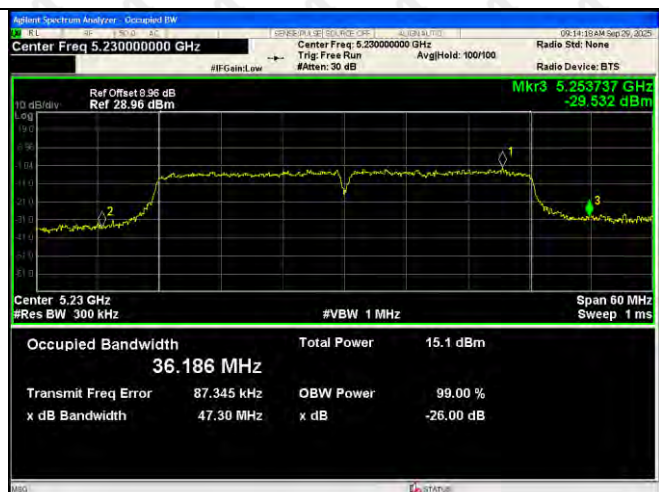
Test Graph 5150MHz ~5250MHz

ANT 1:





802.11ac(VHT80)-5210



802.11n(HT20)-5180



802.11n(HT20)-5200



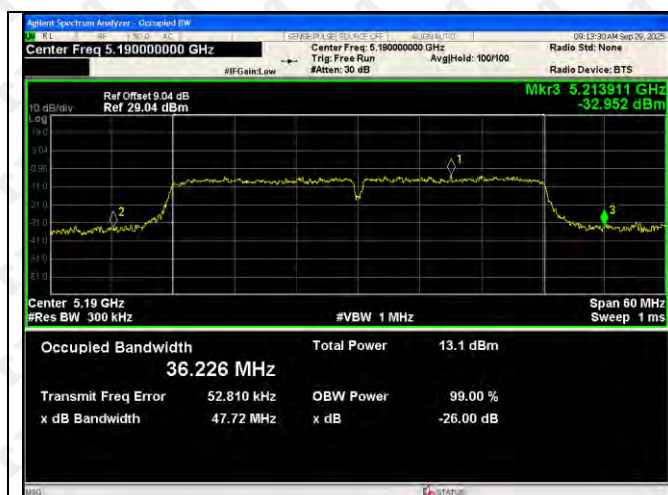
802.11n(HT20)-5240



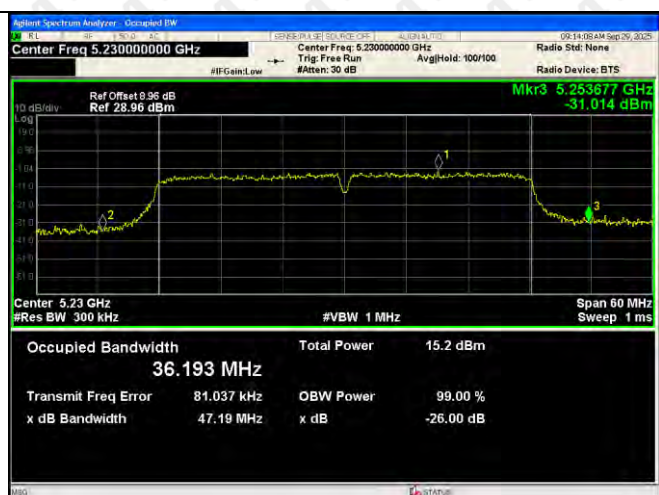
802.11n(HT40)-5190



802.11n(HT40)-5230



802.11ax(HE20)-5180



802.11ax(HE20)-5200



802.11ax(HE20)-5240



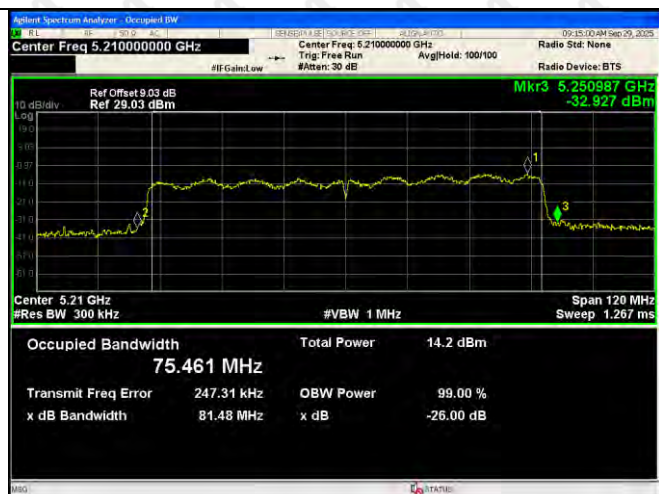
802.11ax(HE40)-5190



802.11ax(HE40)-5230



802.11ax(HE80)-5210



5150MHz ~5250MHz

ANT 2:

802.11a-5180



802.11a-5200



802.11a-5240

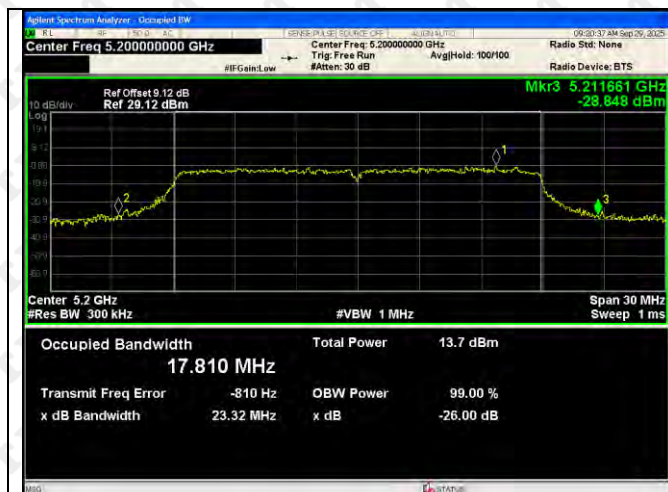


802.11ac(VHT20)-5180



802.11ac(VHT20)-5200

802.11ac(VHT20)-5240



802.11ac(VHT40)-5190



802.11ac(VHT40)-5230



802.11ac(VHT80)-5210



802.11ac(VHT80)-5230



802.11n(HT20)-5200



802.11n(HT20)-5240



802.11n(HT40)-5190



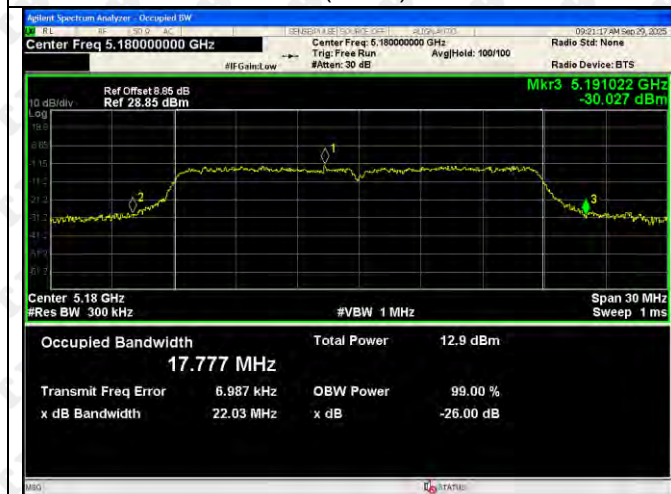
802.11n(HT40)-5230



802.11ax(HE20)-5180



802.11ax(HE20)-5200



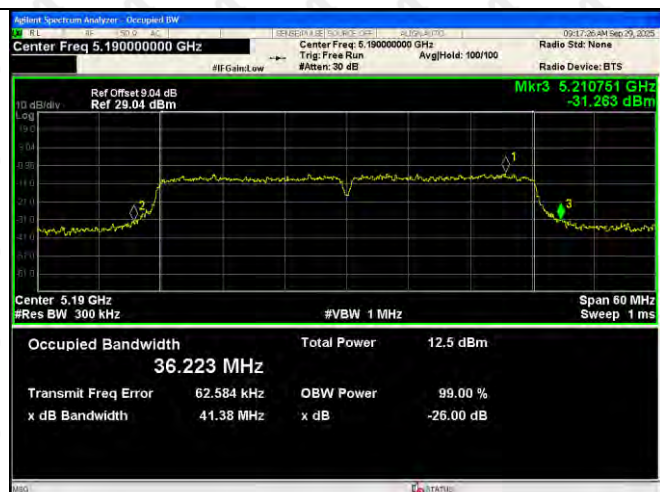
802.11ax(HE20)-5240



802.11ax(HE40)-5190



802.11ax(HE40)-5230



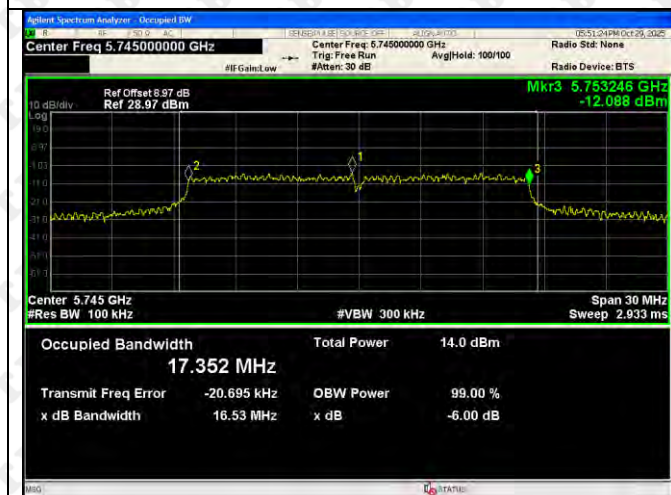
802.11ax(HE80)-5210



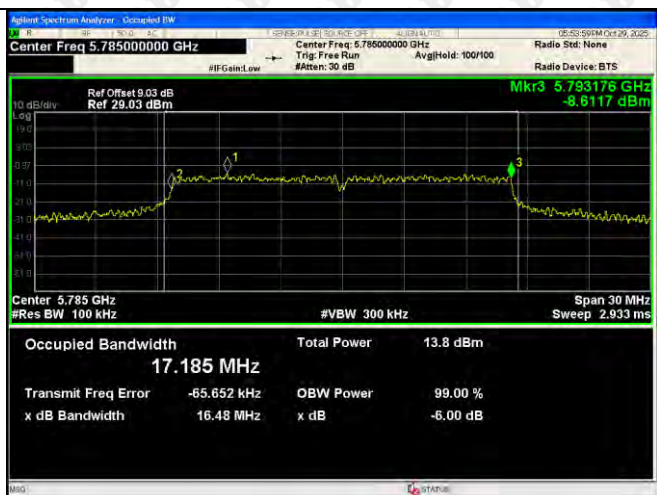
5725-5850MHz

ANT1:

802.11a-5745



802.11a-5785



802.11a-5825



802.11ac(VHT20)-5745



802.11ac(VHT20)-5785



802.11ac(VHT20)-5825

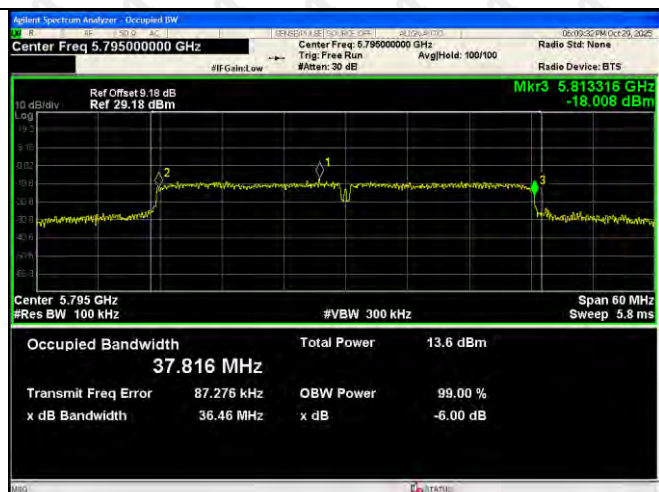


802.11ac(VHT40)-5755

802.11ac(VHT40)-5795



802.11ac(VHT80)-5775



802.11n(HT20)-5745



802.11n(HT20)-5785



802.11n(HT20)-5745



5802.11n(HT40)-5755



802.11n(HT40)-5795



802.11ax(HE20)-5745



802.11ax(HE20)-5785



802.11ax(HE20)-5825



802.11ax(HE40)-5755



802.11ax(HE40)-5795

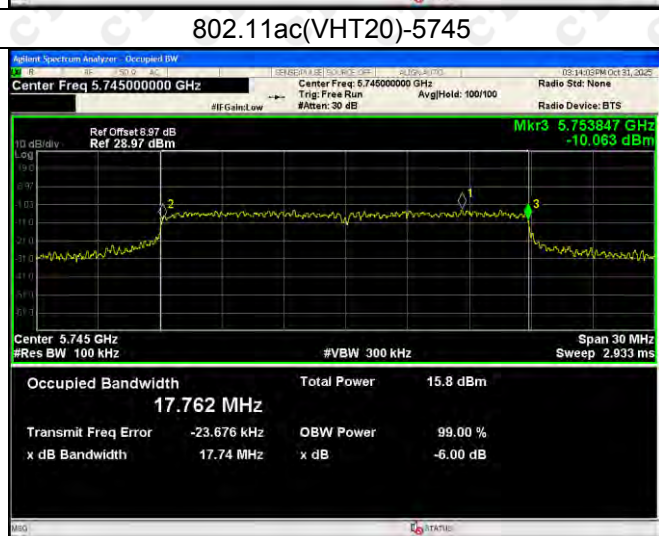
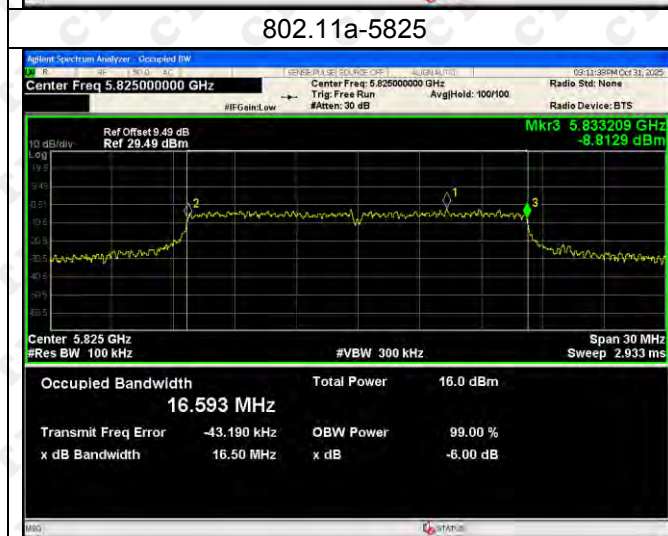
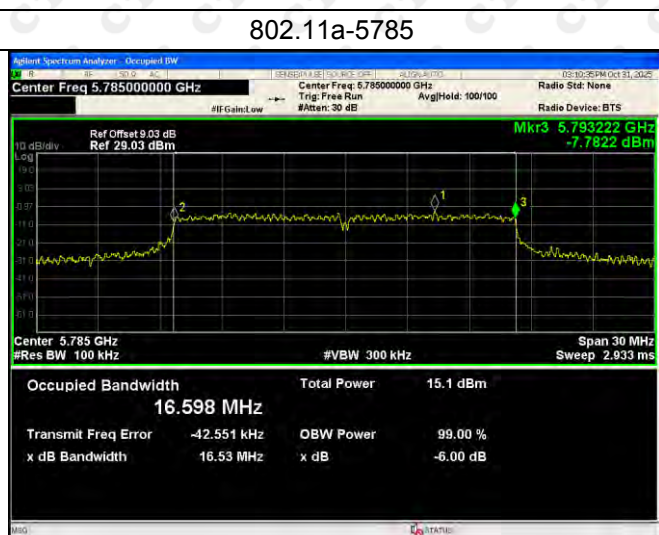
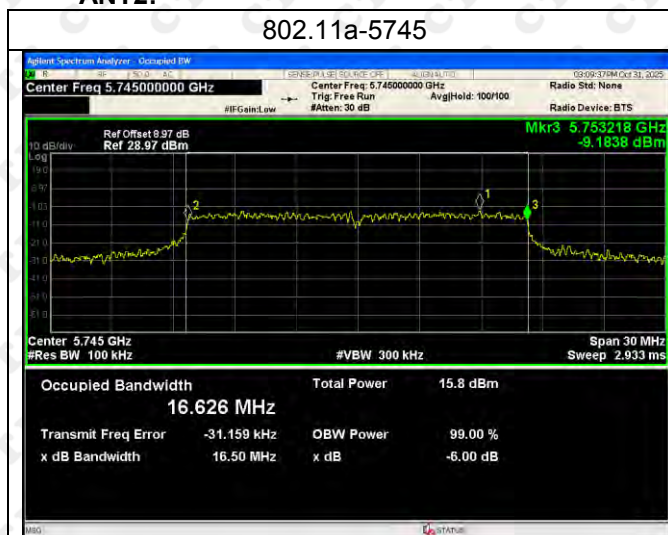


802.11ax(HE80)-5775



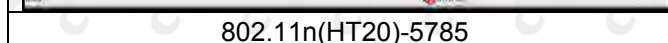
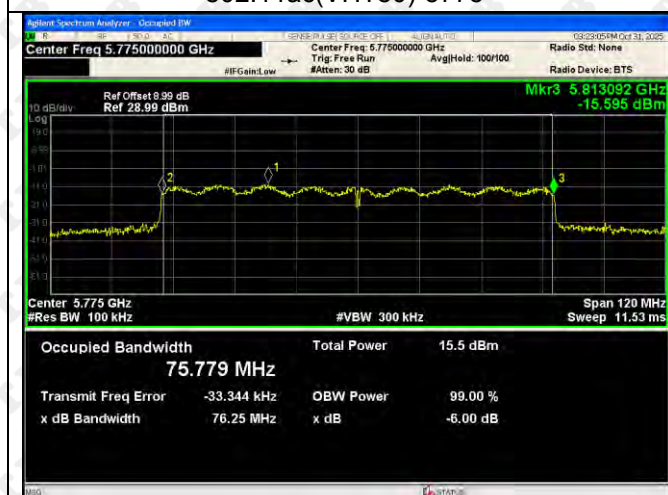
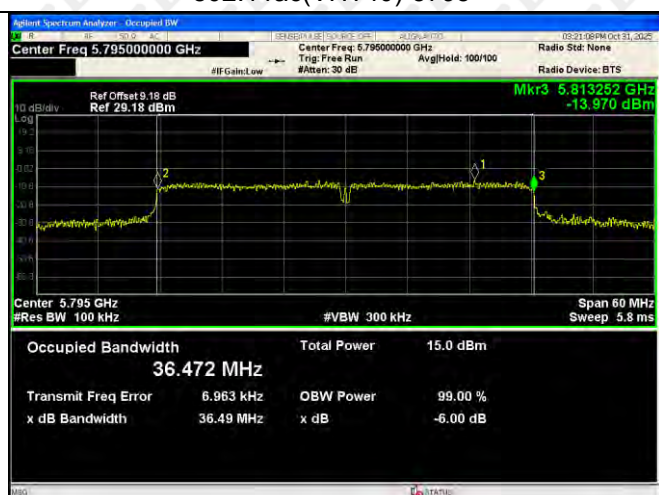
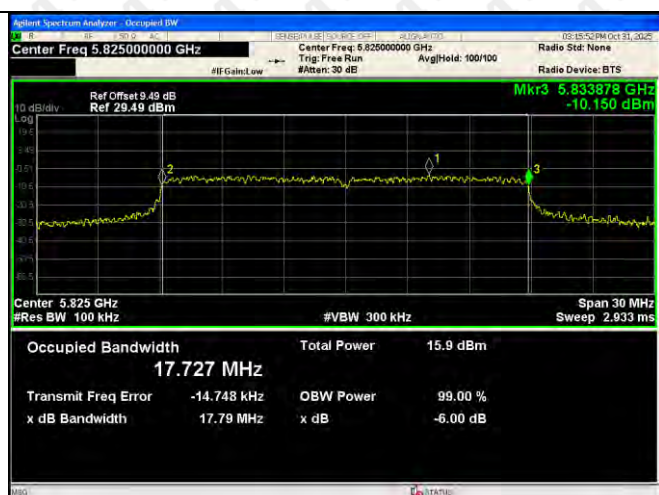
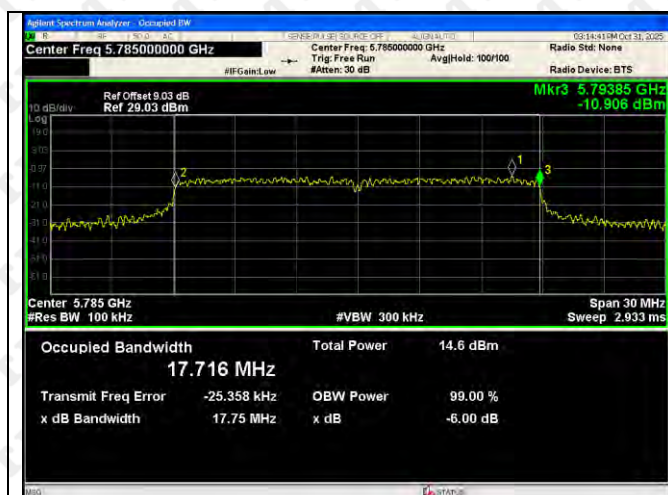
5725-5850MHz

ANT2:



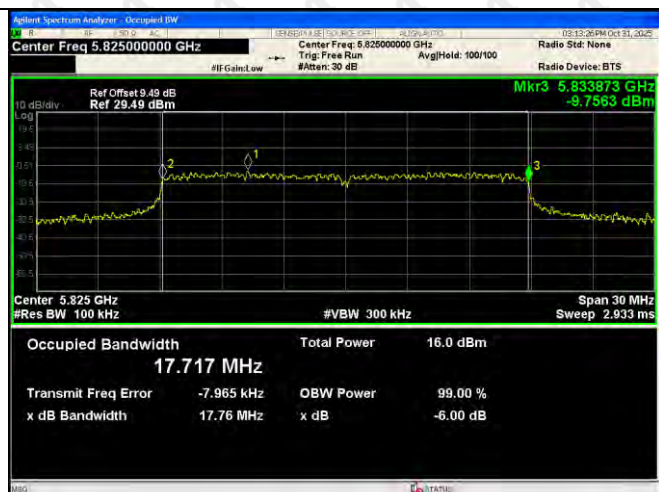
802.11ac(VHT20)-5785

802.11ac(VHT20)-5825





5802.11n(HT40)-5755



802.11n(HT40)-5795



802.11ax(HE20)-5745



802.11ax(HE20)-5785



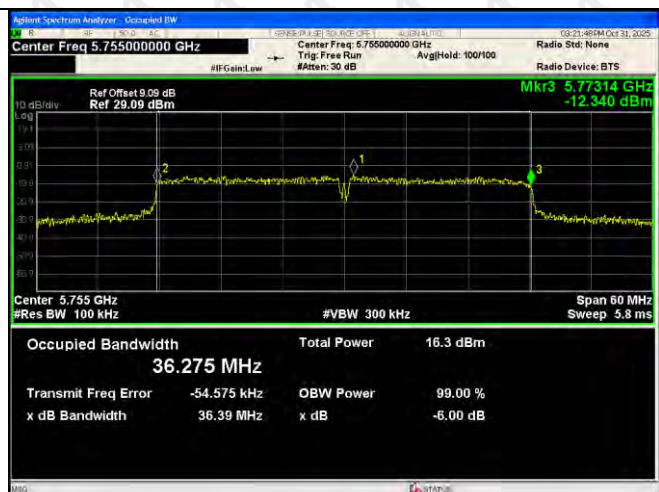
802.11ax(HE20)-5825



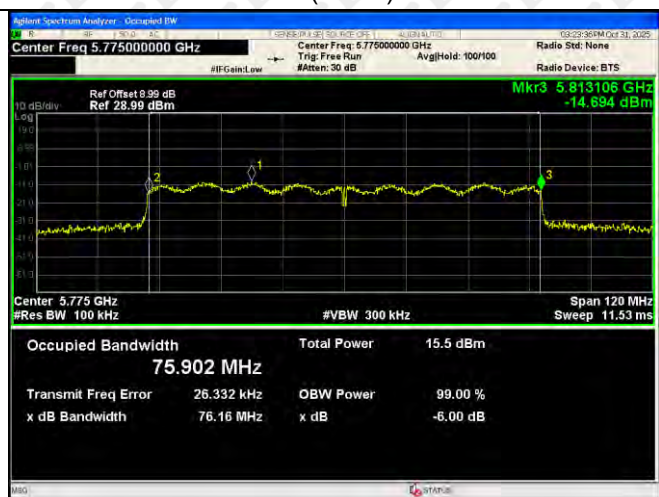
802.11ax(HE40)-5755



802.11ax(HE40)-5795

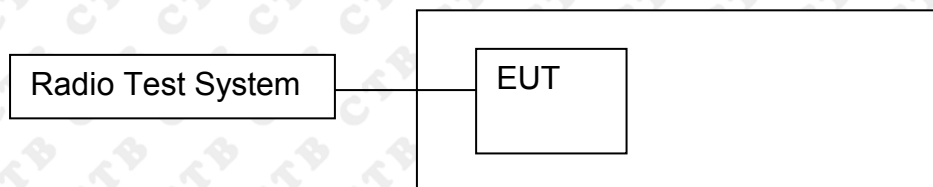


802.11ax(HE80)-5775



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 $RBW \geq 1/T$, where T is defined in II.B.I.a).

b) Set $VBW \geq 3 RBW$.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz}/RBW)$ 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 $10 \log (1\text{MHz}/\text{RBW})$ 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

ANT1+ANT2

5150MHz ~5250MHz:

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	-4.007	-3.293	/	11	Pass
	5200	-5.163	-2.503	/	11	Pass
	5240	-4.127	-1.506	/	11	Pass
802.11ac(VHT20)	5180	-4.730	-3.604	-1.120	11	Pass
	5200	-4.920	-3.223	-0.979	11	Pass
	5240	-4.761	-2.828	-0.678	11	Pass
802.11ac(VHT40)	5190	-7.974	-6.210	-3.993	11	Pass
	5230	-7.736	-5.423	-3.417	11	Pass
802.11ac(VHT80)	5230	-10.111	-7.477	-5.587	11	Pass
802.11n(HT20)	5180	-4.159	-3.672	-0.898	11	Pass
	5200	-4.335	-3.152	-0.693	11	Pass
	5240	-4.411	-1.894	0.038	11	Pass
802.11n(HT40)	5190	-7.397	-6.829	-4.093	11	Pass
	5230	-7.800	-6.434	-4.053	11	Pass
802.11ax(HE20)	5180	-4.616	-3.926	-1.247	11	Pass
	5200	-4.579	-3.230	-0.842	11	Pass
	5240	-4.718	-1.800	-0.008	11	Pass
802.11ax(HE40)	5190	-7.606	-5.821	-3.612	11	Pass
	5230	-8.384	-5.169	-3.475	11	Pass
802.11ax(HE80)	5210	-10.622	-7.654	-5.879	11	Pass

5725-5850MHz:

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	-5.481	-7.487	/	30	Pass
	5785	-6.365	-6.520	/	30	Pass
	5825	-6.058	-6.134	/	30	Pass
802.11ac(VHT20)	5745	-6.957	-7.833	-4.363	30	Pass
	5785	-6.056	-6.625	-3.321	30	Pass
	5825	-5.648	-6.004	-2.812	30	Pass
802.11ac(VHT40)	5755	-10.187	-10.747	-7.448	30	Pass
	5795	-10.351	-10.15	-7.239	30	Pass
802.11ac(VHT80)	5795	-12.418	-12.878	-9.632	30	Pass
802.11n(HT20)	5745	-7.707	-7.928	-4.806	30	Pass
	5785	-6.467	-6.757	-3.599	30	Pass
	5825	-6.326	-6.433	-3.369	30	Pass
802.11n(HT40)	5755	-9.885	-10.884	-7.346	30	Pass
	5795	-10.192	-10.478	-7.322	30	Pass
802.11ax(HE20)	5745	-7.448	-7.802	-4.611	30	Pass
	5785	-6.519	-6.571	-3.535	30	Pass
	5825	-6.039	-6.226	-3.121	30	Pass
802.11ax(HE40)	5755	-9.554	-10.793	-7.119	30	Pass
	5795	-9.812	-10.330	-7.053	30	Pass
802.11ax(HE80)	5775	-12.229	-12.765	-9.478	30	Pass

ANT 1:

802.11a-5180



802.11a-5200



802.11a-5240



802.11ac(VHT20)-5180



802.11ac(VHT20)-5200



802.11ac(VHT20)-5240



802.11ac(VHT40)-5190



802.11ac(VHT40)-5230





802.11ac(VHT80)-5210



802.11n(HT20)-5180



802.11n(HT20)-5200



802.11n(HT20)-5240



802.11n(HT40)-5190



802.11n(HT40)-5230



802.11ax(HE20)-5180



802.11ax(HE20)-5200



802.11ax(HE20)-5240



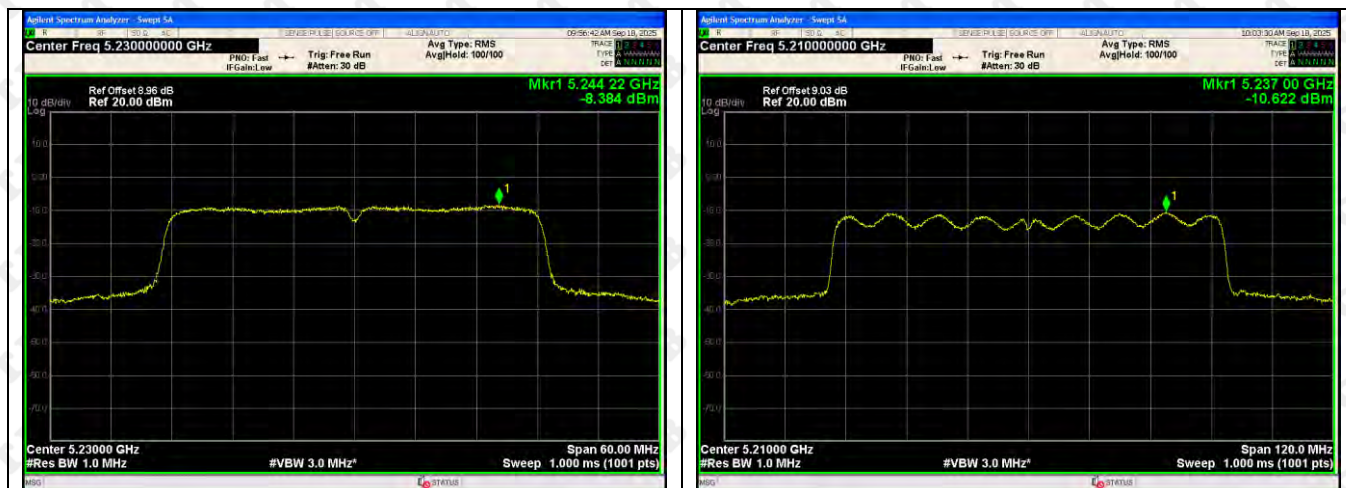
802.11ax(HE40)-5190



802.11ax(HE40)-5230



802.11ax(HE80)-5210



ANT 2:

802.11a-5180



802.11a-5200



802.11a-5240



802.11ac(VHT20)-5180



802.11ac(VHT20)-5200

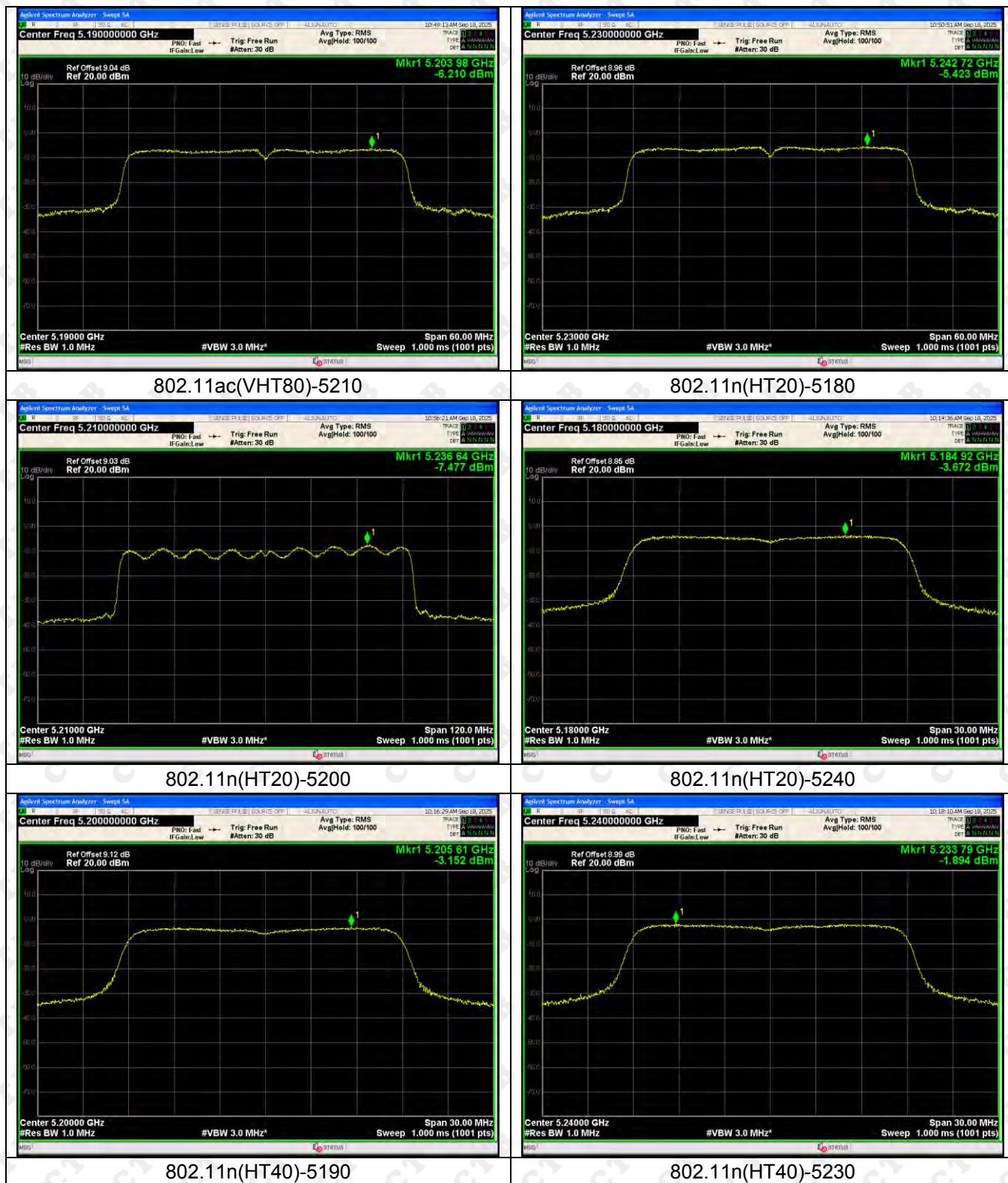


802.11ac(VHT20)-5240



802.11ac(VHT40)-5190

802.11ac(VHT40)-5230





802.11ax(HE20)-5180



802.11ax(HE20)-5200



802.11ax(HE20)-5240



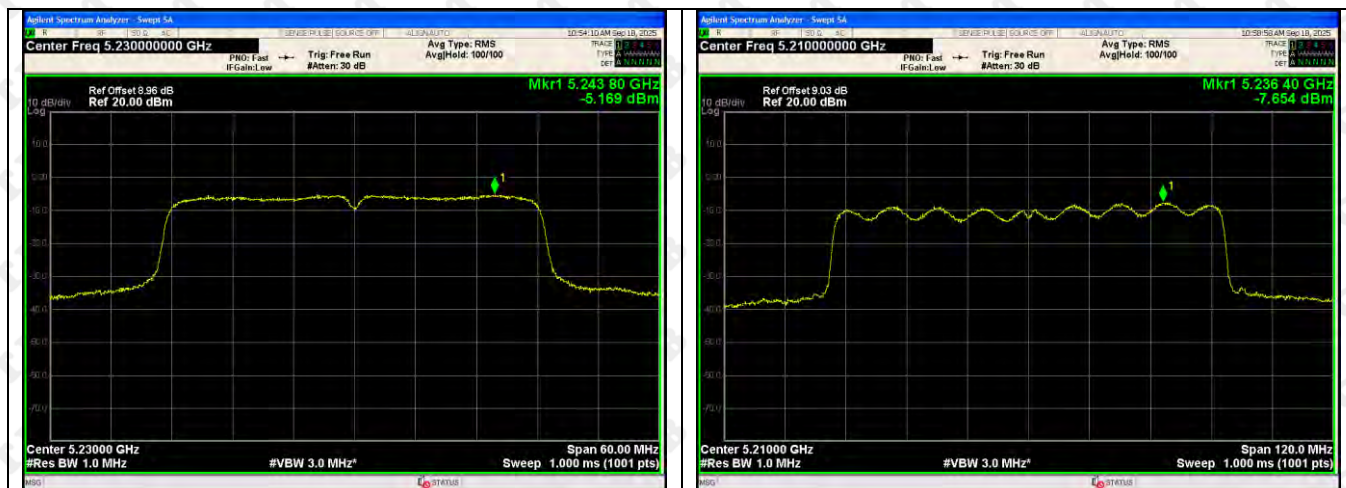
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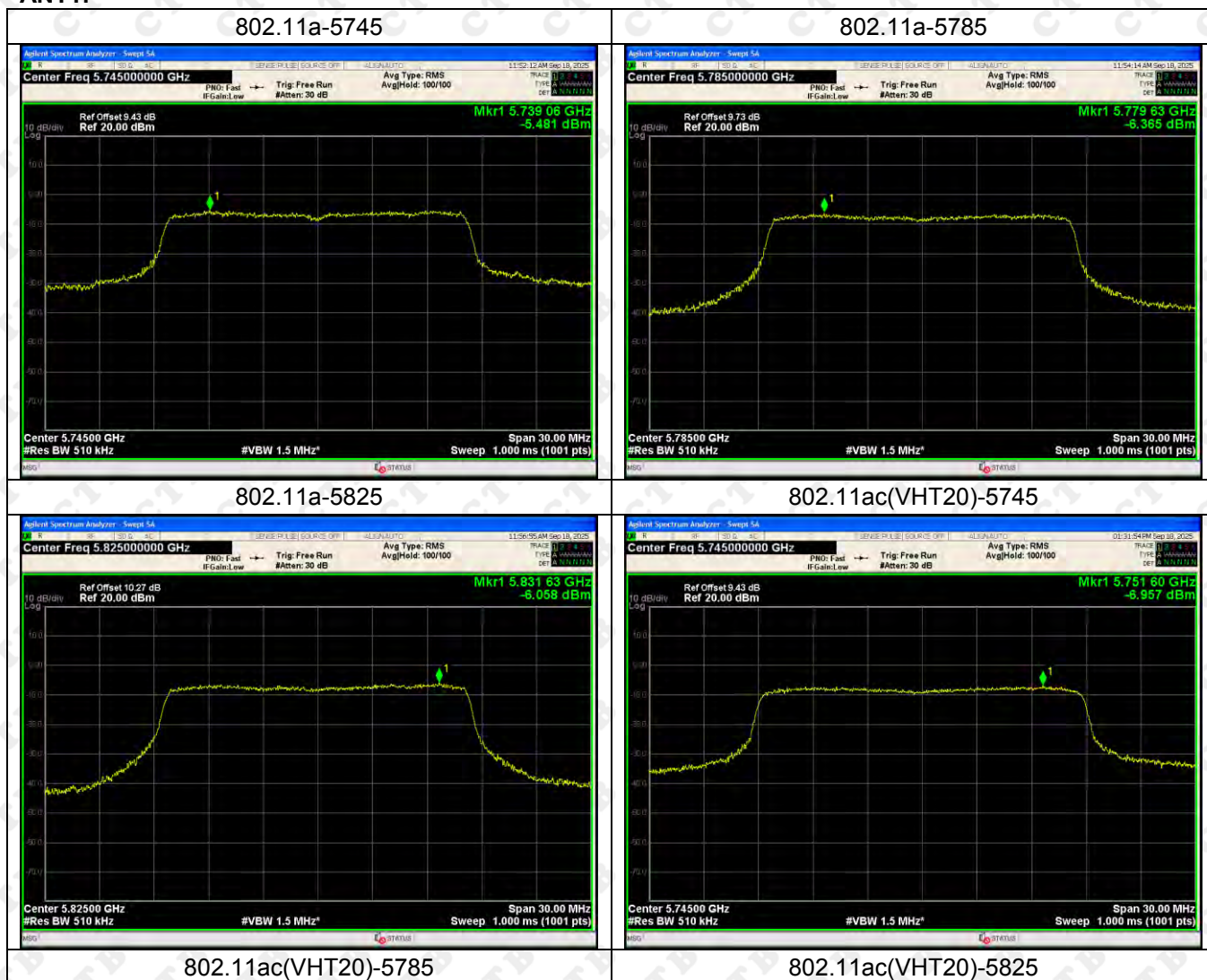


802.11ax(HE80)-5210



5725-5850MHz

ANT1:





802.11ac(VHT40)-5755



802.11ac(VHT40)-5795



802.11ac(VHT80)-5775



802.11n(HT20)-5745



802.11n(HT20)-5785



802.11n(HT20)-5825



5802.11n(HT40)-5755



802.11n(HT40)-5795



802.11ax(HE20)-5745



802.11ax(HE20)-5785



802.11ax(HE20)-5825



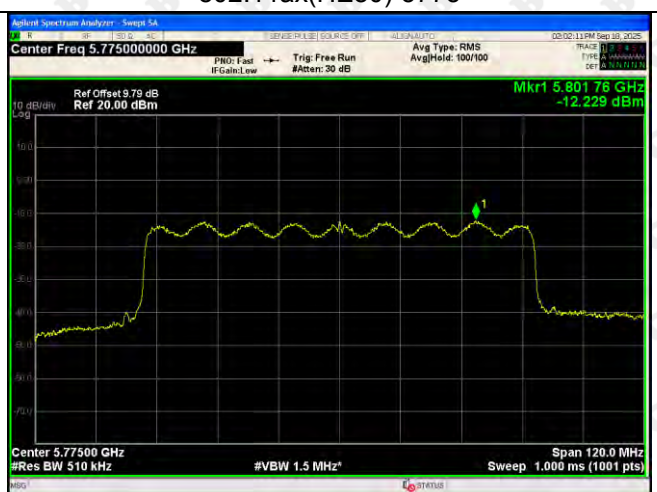
802.11ax(HE40)-5755



802.11ax(HE40)-5795



802.11ax(HE80)-5775



ANT2:



802.11a-5825



802.11ac(VHT20)-5745



802.11ac(VHT20)-5785



802.11ac(VHT20)-5825



802.11ac(VHT40)-5755



802.11ac(VHT40)-5795



802.11ac(VHT80)-5775



802.11n(HT20)-5745



802.11n(HT20)-5785



802.11n(HT20)-5825



5802.11n(HT40)-5755



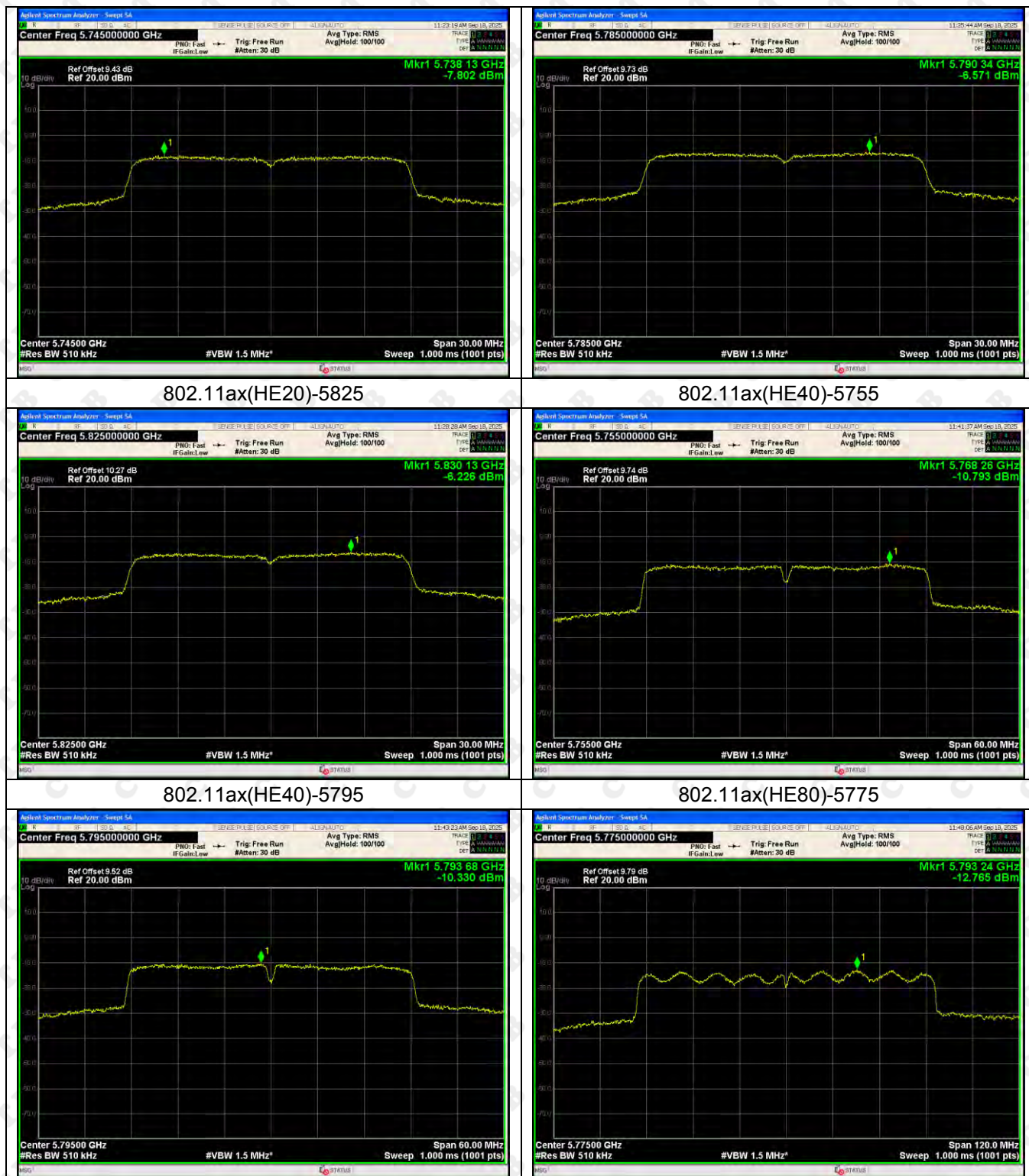
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802.11ax(HE20)-5745

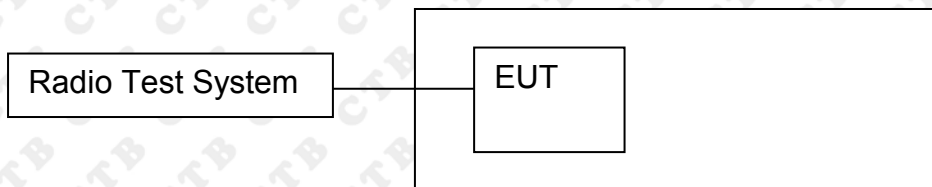


802.11ax(HE20)-5785



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)	19.0	5180.0117	5180	0.0117	2.2538
		V max (V)	20.9	5180.0185	5180	0.0185	3.5763
		V min (V)	17.1	5180.0239	5180	0.0239	4.6102
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5180.0534	5180	0.0534	10.3165
		T (°C)	10	5180.0145	5180	0.0145	2.7994
		T (°C)	20	5180.0514	5180	0.0514	9.9246
		T (°C)	30	5180.0070	5180	0.0070	1.3419
		T (°C)	40	5180.0035	5180	0.0035	0.6734
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)	19.0	5200.0191	5200	0.0191	3.6744
		V max (V)	20.9	5200.0527	5200	0.0527	10.1375
		V min (V)	17.1	5200.0003	5200	0.0003	0.0616
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5200.0266	5200	0.0266	5.1172
		T (°C)	10	5200.0143	5200	0.0143	2.7464
		T (°C)	20	5200.0296	5200	0.0296	5.6952
		T (°C)	30	5200.0332	5200	0.0332	6.3871
		T (°C)	40	5200.0053	5200	0.0053	1.0163
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)	19.0	5240.0372	5240	0.0372	7.1062
		V max (V)	20.9	5240.0349	5240	0.0349	6.6626
		V min (V)	17.1	5240.0158	5240	0.0158	3.0171
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5240.0149	5240	0.0149	2.8430
		T (°C)	10	5240.0172	5240	0.0172	3.2842
		T (°C)	20	5240.0196	5240	0.0196	3.7491
		T (°C)	30	5240.0480	5240	0.0480	9.1684
		T (°C)	40	5240.0162	5240	0.0162	3.0944
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)	19.0	5745.0587	5745	0.0587	10.2212
		V max (V)	20.9	5745.0054	5745	0.0054	0.9476
		V min (V)	17.1	5745.0587	5745	0.0587	10.2212
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5745.0277	5745	0.0277	4.8144
		T (°C)	10	5745.0592	5745	0.0592	10.2997
		T (°C)	20	5745.0843	5745	0.0843	14.6788
		T (°C)	30	5745.0856	5745	0.0856	14.8950
		T (°C)	40	5745.0168	5745	0.0168	2.9234
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)	19.0	5785.0679	5785	0.0679	11.7372
		V max (V)	20.9	5785.0578	5785	0.0578	9.9869
		V min (V)	17.1	5785.0694	5785	0.0694	11.9890
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5785.0501	5785	0.0501	8.6616
		T (°C)	10	5785.0908	5785	0.0908	15.7009
		T (°C)	20	5785.0772	5785	0.0772	13.3512
		T (°C)	30	5785.0463	5785	0.0463	8.0084
		T (°C)	40	5785.0656	5785	0.0656	11.3318
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)	19.0	5825.0875	5825	0.0875	15.0255
		V max (V)	20.9	5825.0259	5825	0.0259	4.4474
		V min (V)	17.1	5825.0361	5825	0.0361	6.1985
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5825.0093	5825	0.0093	1.5898
		T (°C)	10	5825.0582	5825	0.0582	9.9917
		T (°C)	20	5825.0319	5825	0.0319	5.4689
		T (°C)	30	5825.0628	5825	0.0628	10.7803
		T (°C)	40	5825.0207	5825	0.0207	3.5567
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)	19.0	5180.0864	5180	0.0864	16.6831
		V max (V)	20.9	5180.0197	5180	0.0197	3.7995
		V min (V)	17.1	5180.0917	5180	0.0917	17.6959
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5180.0723	5180	0.0723	13.9638
		T (°C)	10	5180.0546	5180	0.0546	10.5456
		T (°C)	20	5180.0209	5180	0.0209	4.0383
		T (°C)	30	5180.0040	5180	0.0040	0.7669
		T (°C)	40	5180.0585	5180	0.0585	11.2853
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)	19.0	5200.0066	5200	0.0066	1.2611
		V max (V)	20.9	5200.0388	5200	0.0388	7.4566
		V min (V)	17.1	5200.0768	5200	0.0768	14.7650
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5200.0787	5200	0.0787	15.1261
		T (°C)	10	5200.0823	5200	0.0823	15.8348
		T (°C)	20	5200.0905	5200	0.0905	17.4002
		T (°C)	30	5200.0228	5200	0.0228	4.3801
		T (°C)	40	5200.0564	5200	0.0564	10.8478
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)	19.0	5240.0822	5240	0.0822	15.6842
		V max (V)	20.9	5240.0554	5240	0.0554	10.5743
		V min (V)	17.1	5240.0614	5240	0.0614	11.7130
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5240.0386	5240	0.0386	7.3629
		T (°C)	10	5240.0599	5240	0.0599	11.4222
		T (°C)	20	5240.0211	5240	0.0211	4.0211
		T (°C)	30	5240.0797	5240	0.0797	15.2090
		T (°C)	40	5240.0460	5240	0.0460	8.7745
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)	19.0	5745.0159	5745	0.0159	2.7606
		V max (V)	20.9	5745.0474	5745	0.0474	8.2428
		V min (V)	17.1	5745.0820	5745	0.0820	14.2723
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5745.0852	5745	0.0852	14.8252
		T (°C)	10	5745.0287	5745	0.0287	4.9943
		T (°C)	20	5745.0698	5745	0.0698	12.1417
		T (°C)	30	5745.0155	5745	0.0155	2.6999
		T (°C)	40	5745.0864	5745	0.0864	15.0427
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)	19.0	5785.0110	5785	0.0110	1.9012
		V max (V)	20.9	5785.0710	5785	0.0710	12.2652
		V min (V)	17.1	5785.0252	5785	0.0252	4.3635
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5785.0911	5785	0.0911	15.7534
		T (°C)	10	5785.0514	5785	0.0514	8.8765
		T (°C)	20	5785.0721	5785	0.0721	12.4709
		T (°C)	30	5785.0386	5785	0.0386	6.6653
		T (°C)	40	5785.0923	5785	0.0923	15.9494
		T (°C)	50	5785.0341	5785	0.0341	5.8971
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)	19.0	5825.0698	5825	0.0698	11.9843
		V max (V)	20.9	5825.0077	5825	0.0077	1.3206
		V min (V)	17.1	5825.0593	5825	0.0593	10.1760
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	19	T (°C)	0	5825.0751	5825	0.0751	12.8900
		T (°C)	10	5825.0058	5825	0.0058	1.0004
		T (°C)	20	5825.0303	5825	0.0303	5.2042
		T (°C)	30	5825.0307	5825	0.0307	5.2715
		T (°C)	40	5825.0620	5825	0.0620	10.6519
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.

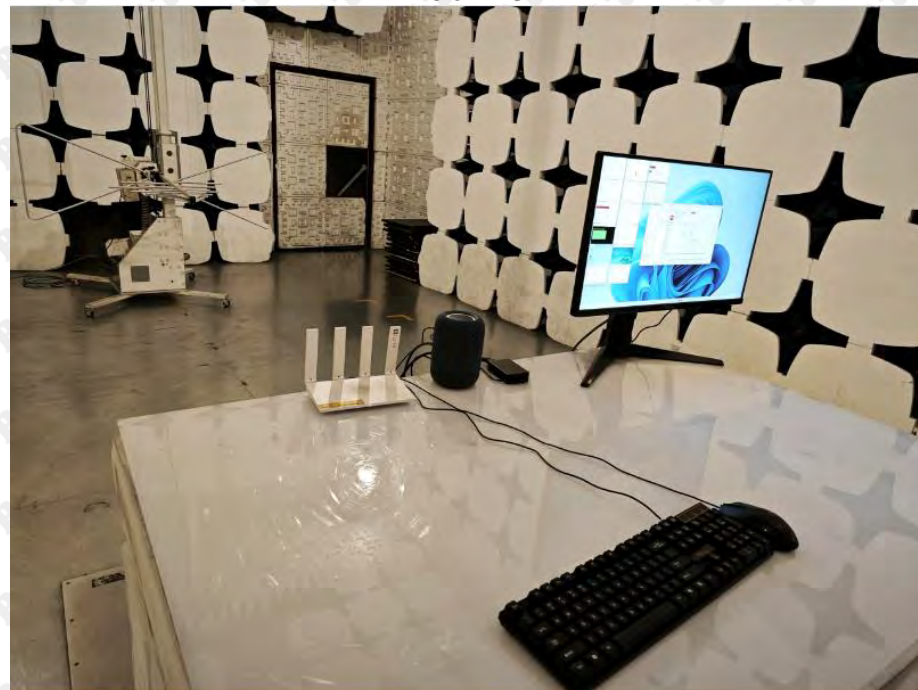
EUT Antenna:

The antenna is FPC antenna and no consideration of replacement. The best case gain of the WiFi (5.2G): Ant1: 3.03dBi, Ant2: 0.69dBi, WiFi (5.8G): Ant1: 3.73dBi, Ant2: 0.82dBi

15. EUT TEST SETUP PHOTOGRAPHS

Radiated Emissions

Below 1G



Above 1G



Conducted emission



***** END OF REPORT *****