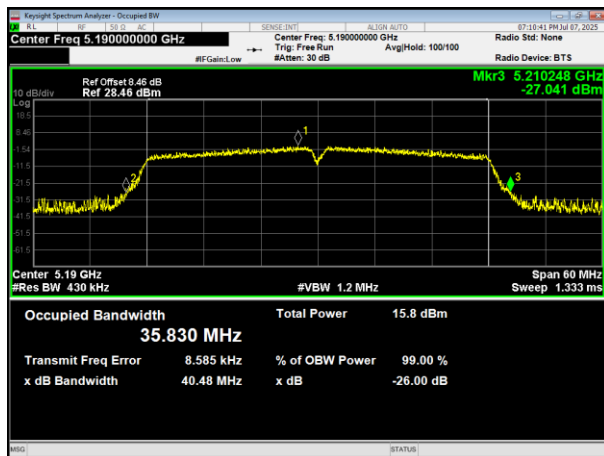
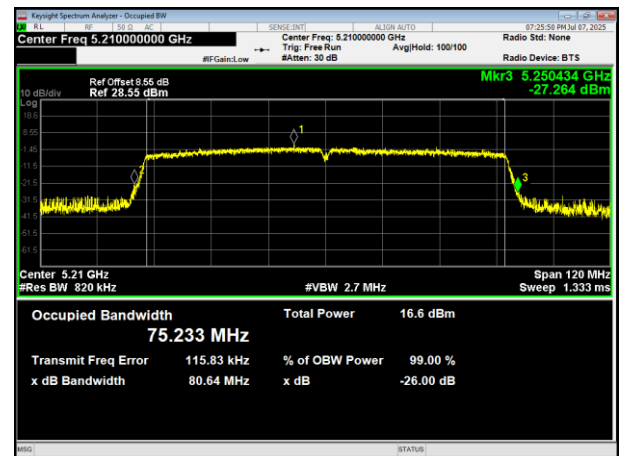




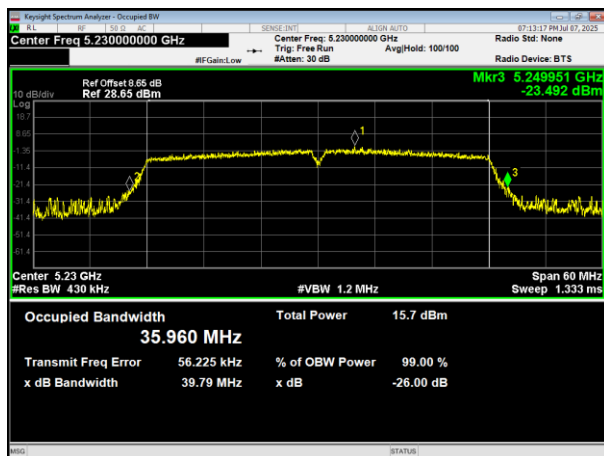
802.11n HT40



802.11ac HT80



5190MHz



5210MHz

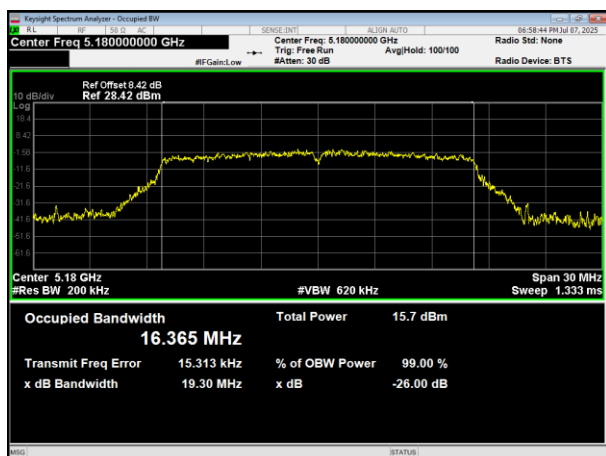


5230MHz

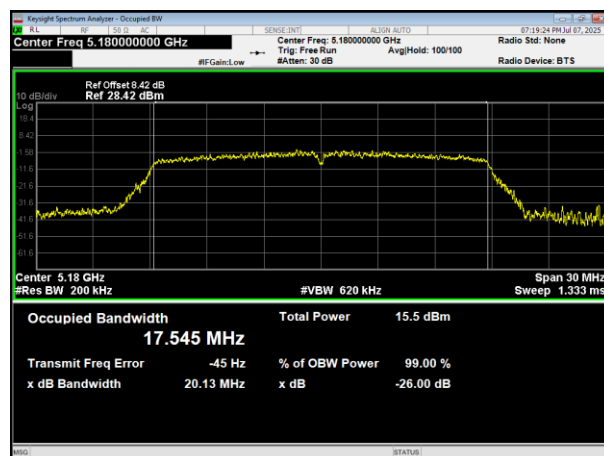


99% Bandwidth

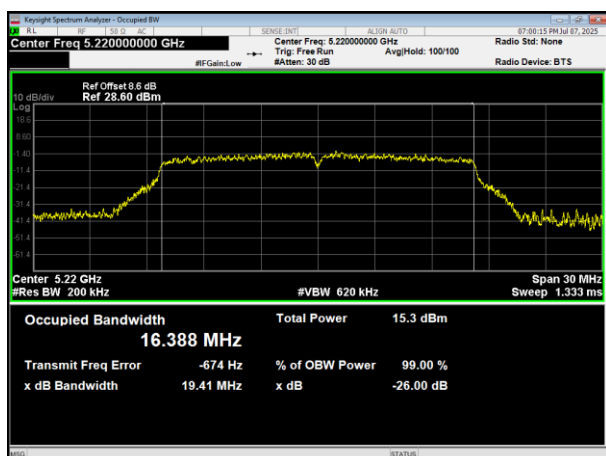
802.11a



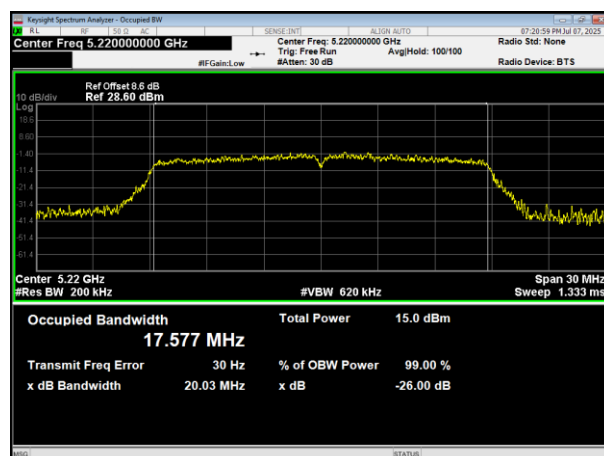
802.11ac HT20



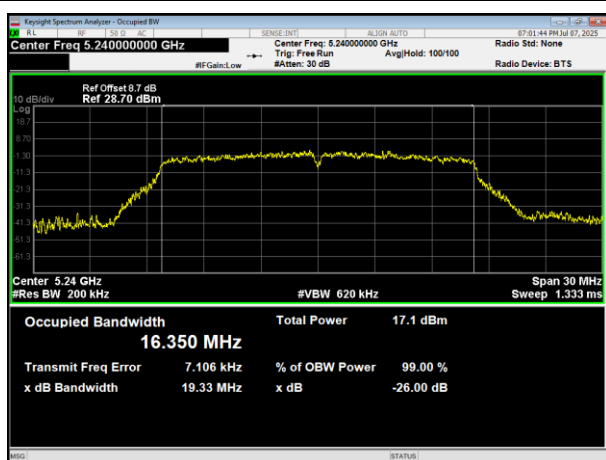
5180MHz



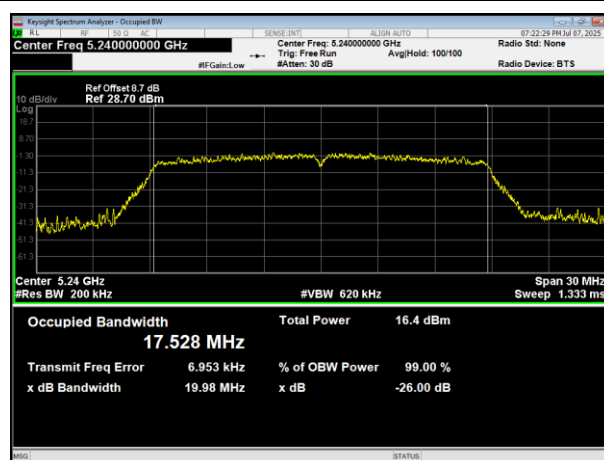
5180MHz



5200MHz



5200MHz

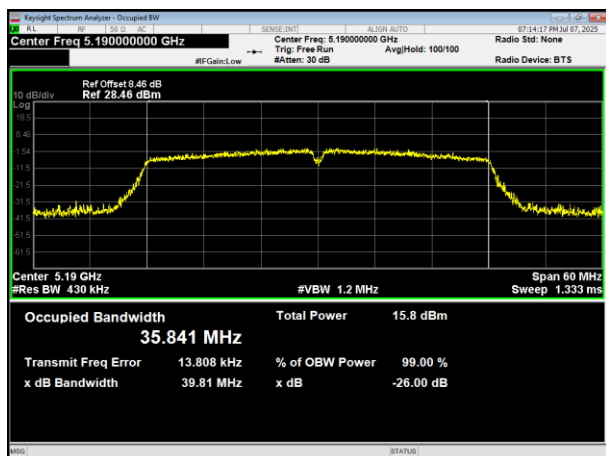


5240MHz

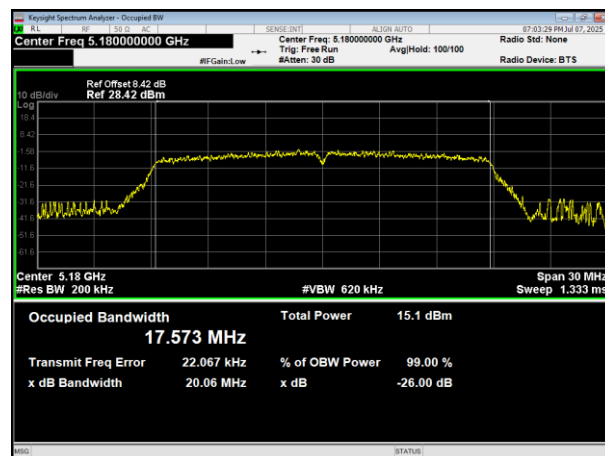
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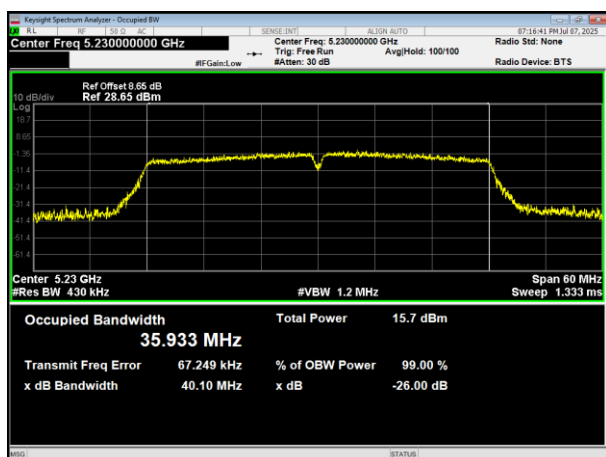
802.11ac HT40



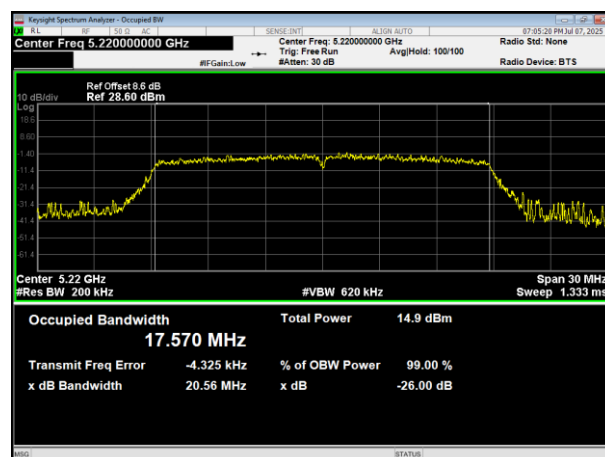
802.11n HT20



5190MHz



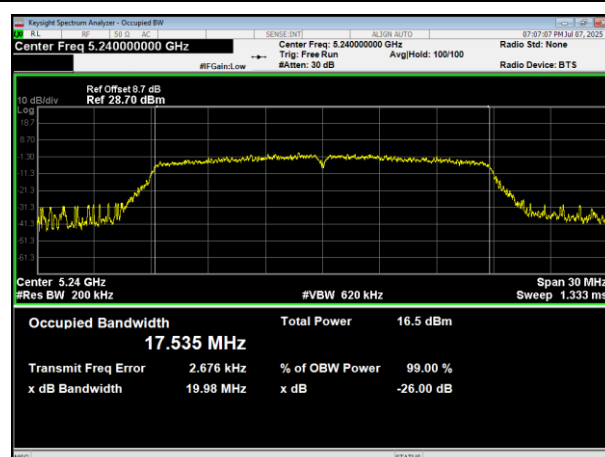
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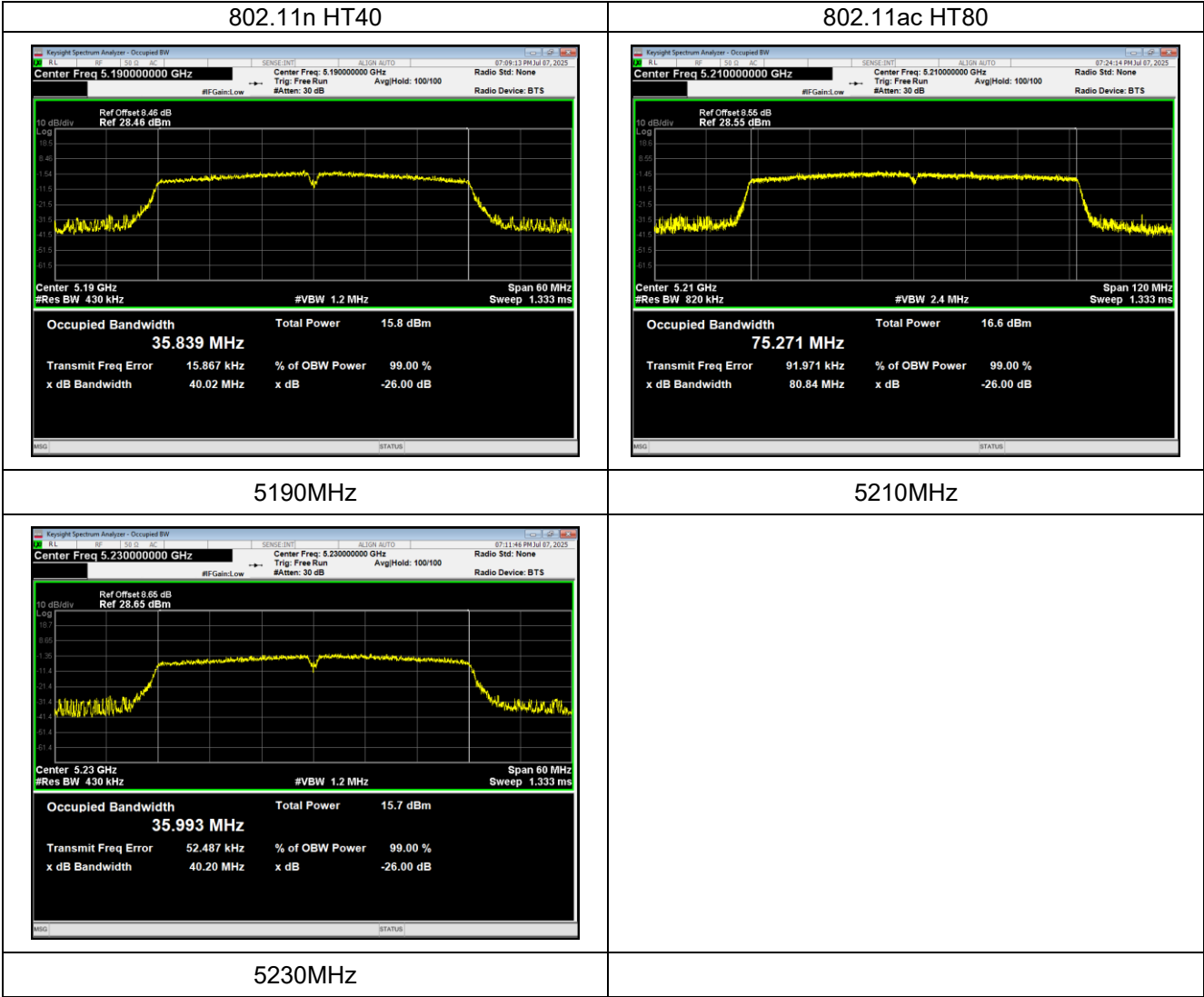
5230MHz



5200MHz



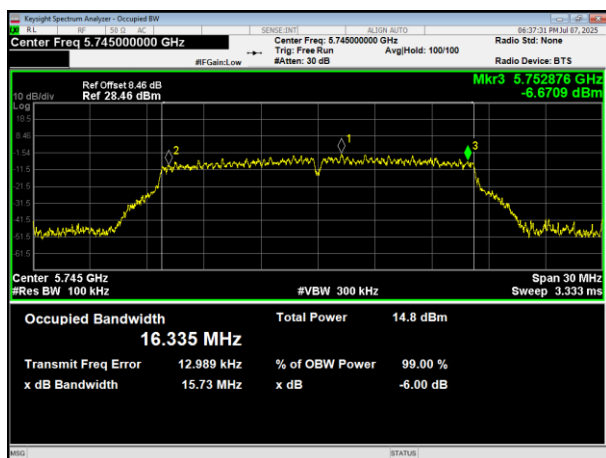
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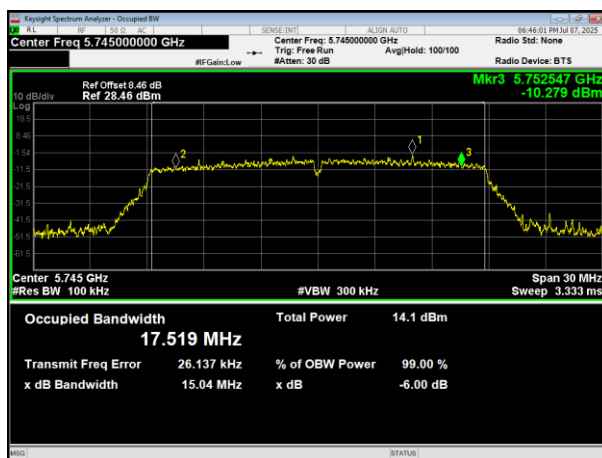


6dB Bandwidth

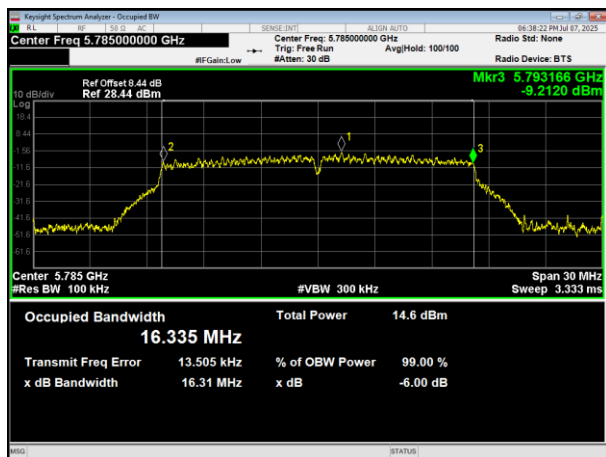
802.11a



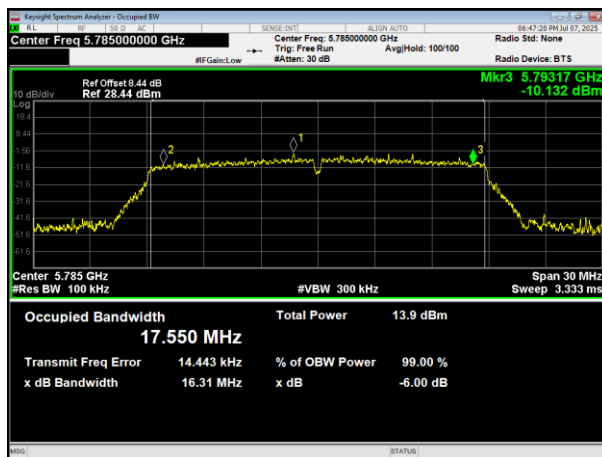
802.11ac HT20



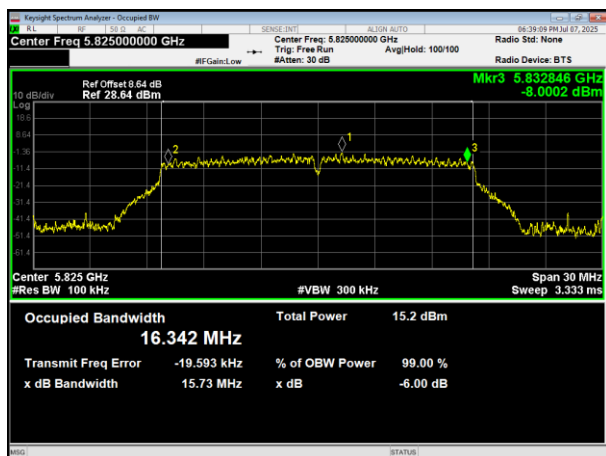
5745MHz



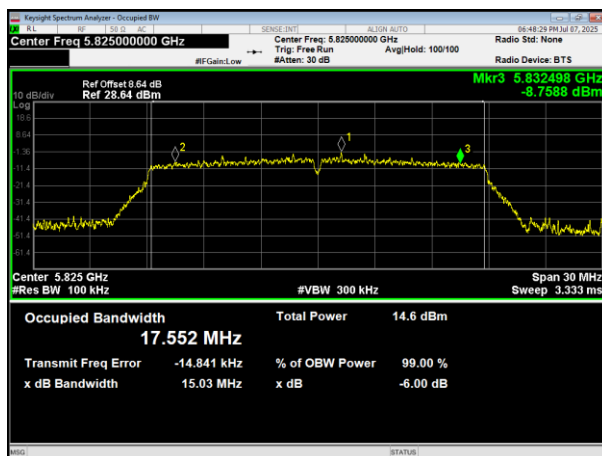
5745MHz



5785MHz



5785MHz

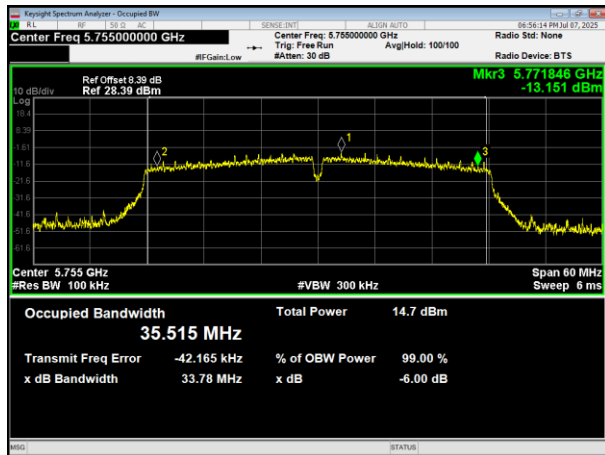


5825MHz

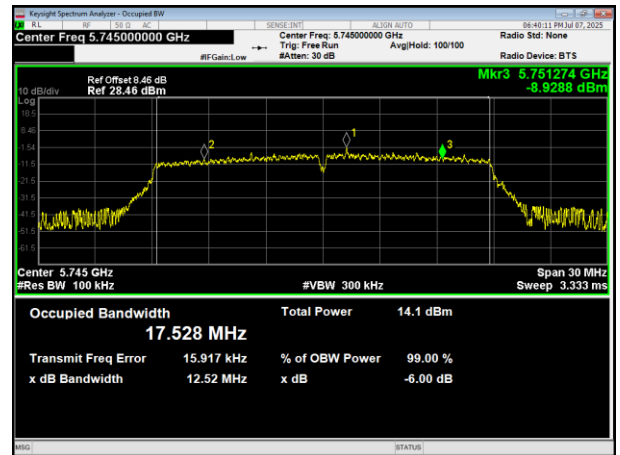
5825MHz



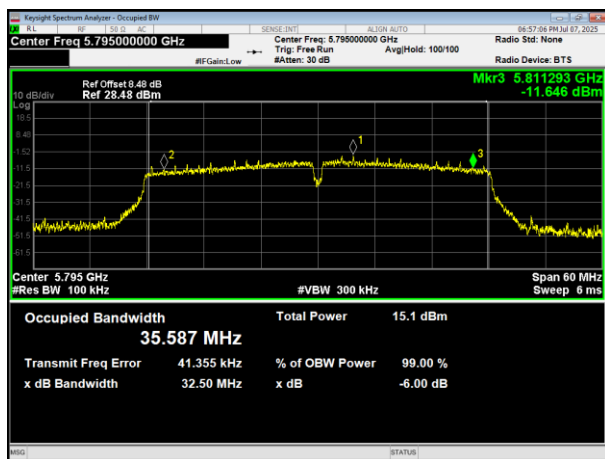
802.11ac HT40



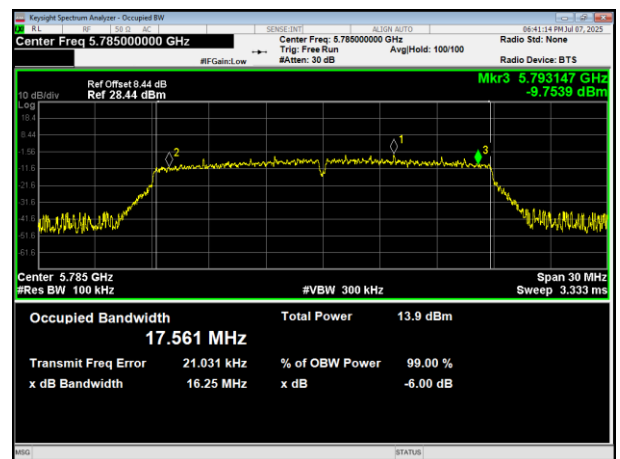
802.11n HT20



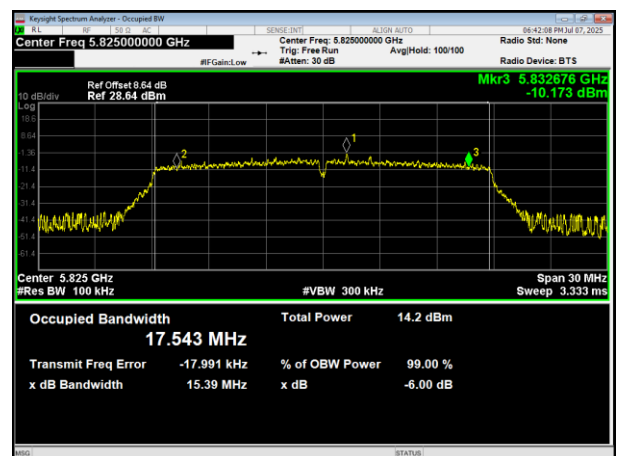
5755MHz



5745MHz



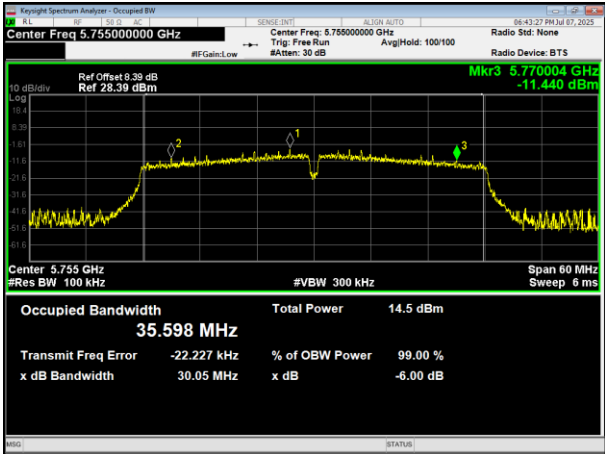
5795MHz



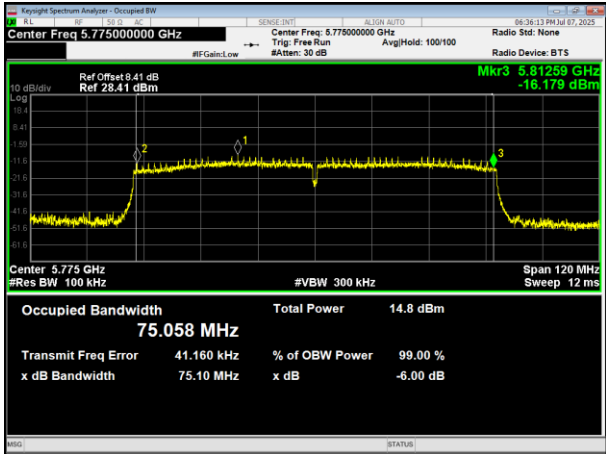
5825MHz



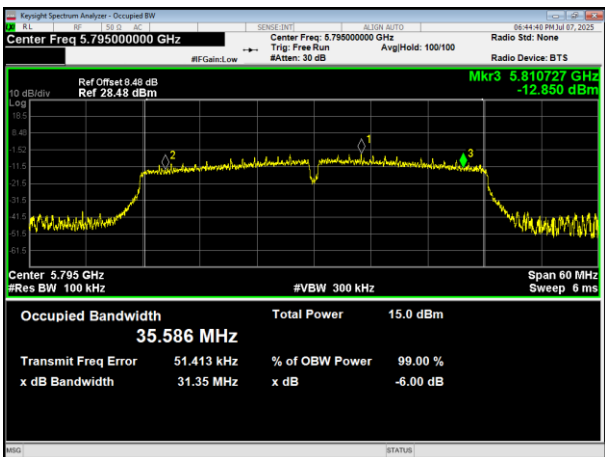
802.11n HT40



802.11ac HT80



5755MHz



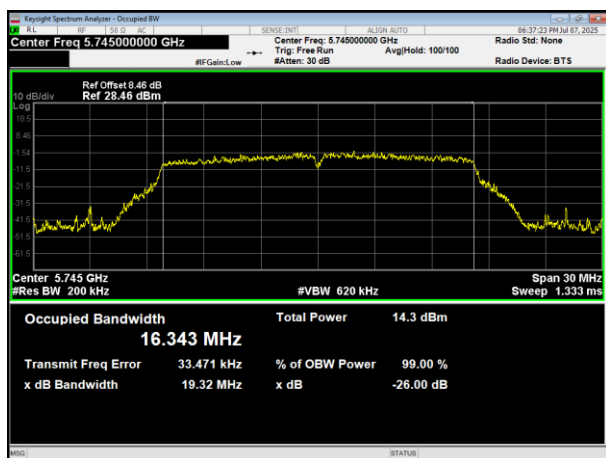
5775MHz

5795MHz

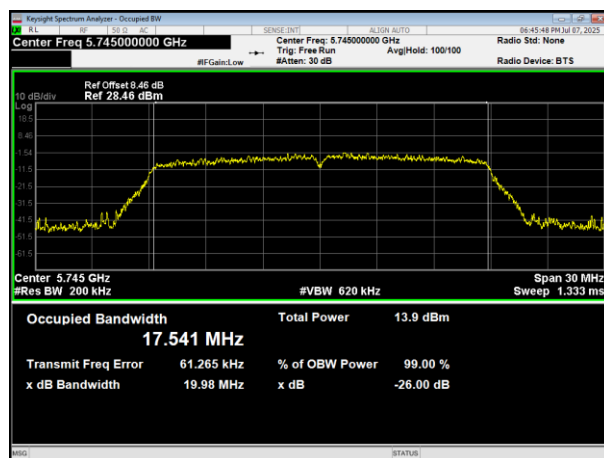


99% Bandwidth

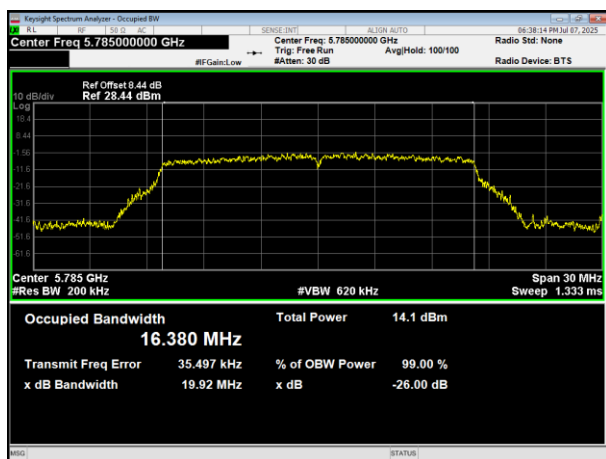
802.11a



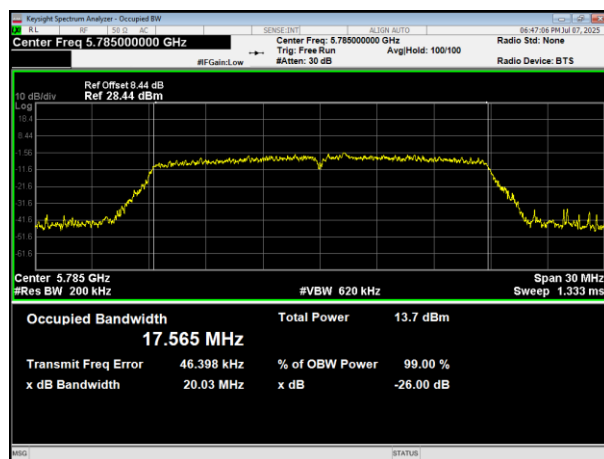
802.11ac HT20



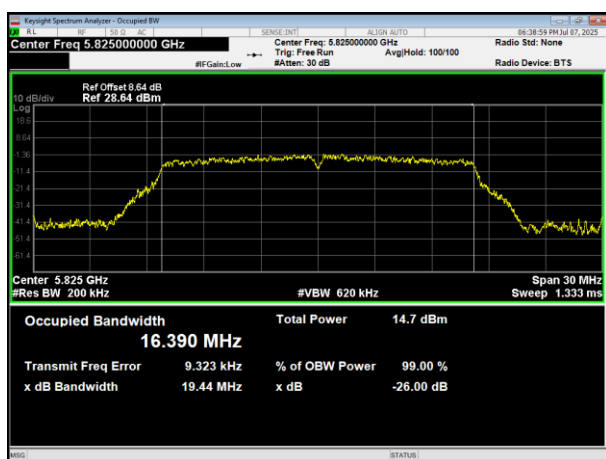
5745MHz



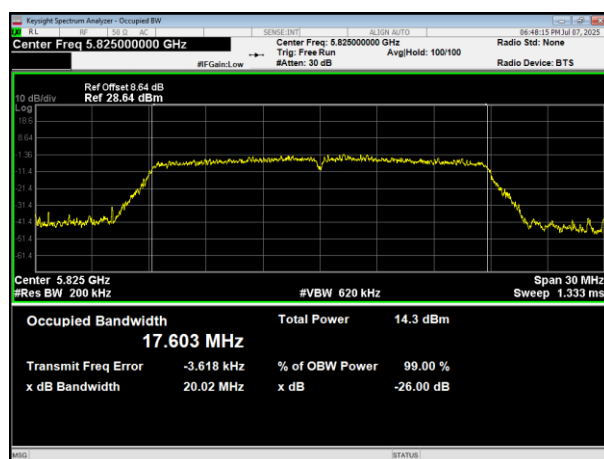
5745MHz



5785MHz



5785MHz

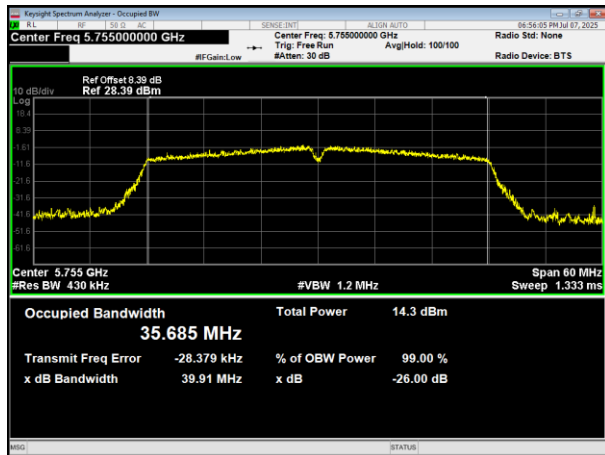


5825MHz

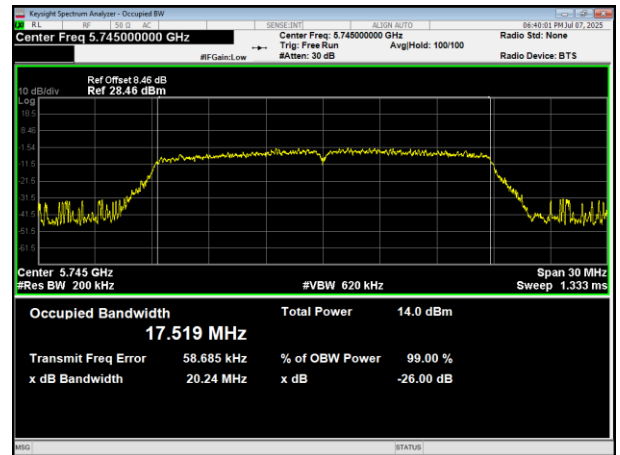
5825MHz



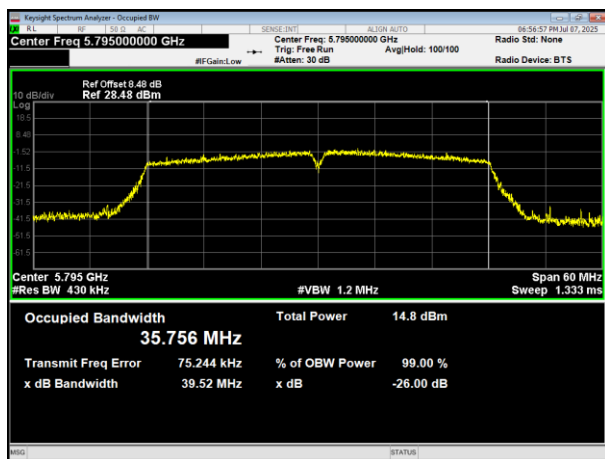
802.11ac HT40



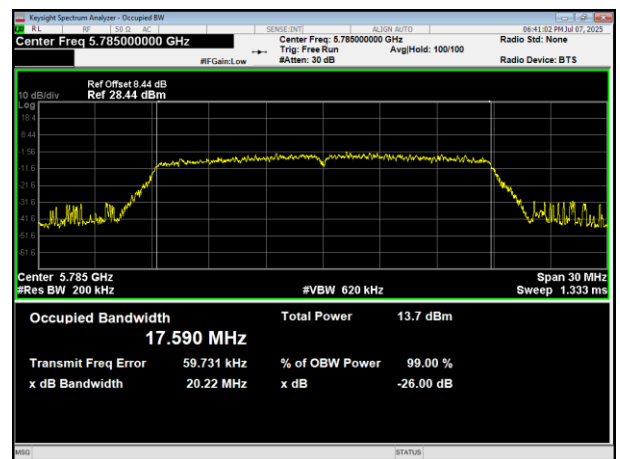
802.11n HT20



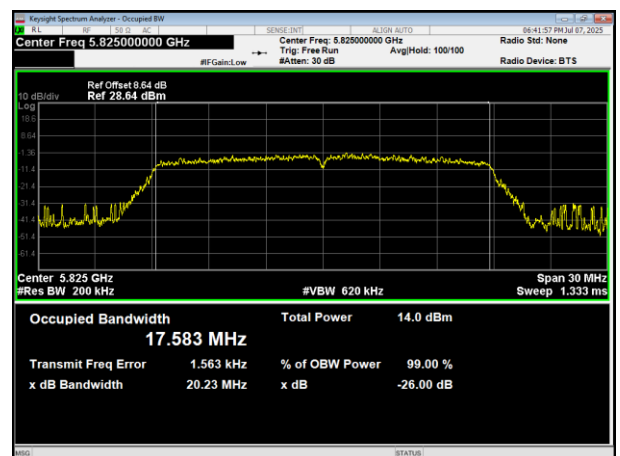
5755MHz



5745MHz



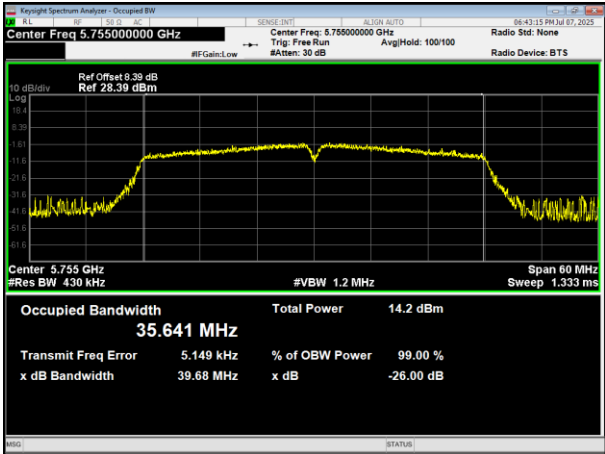
5795MHz



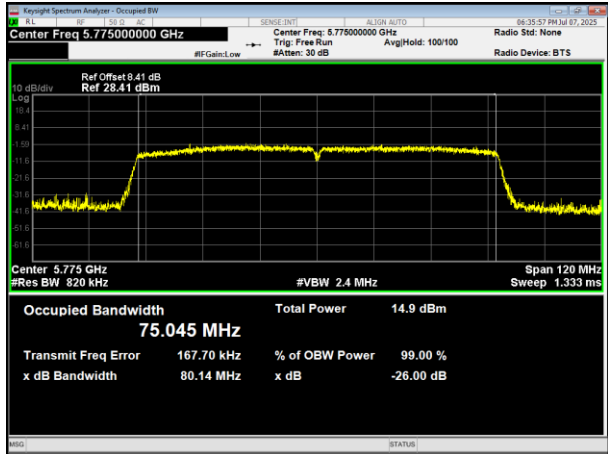
5825MHz



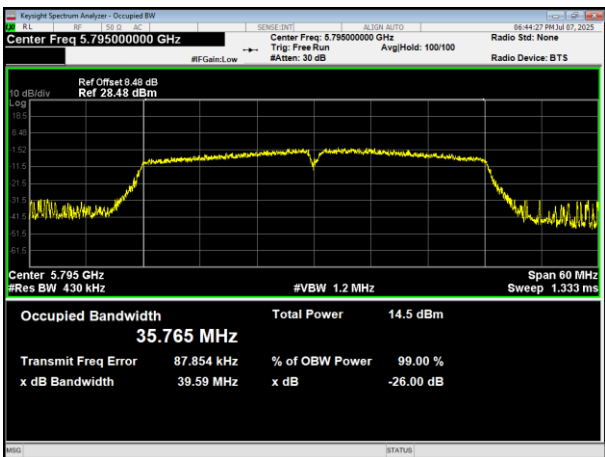
802.11n HT40



802.11ac HT80



5755MHz



5775MHz

5795MHz



7. DUTY CYCLE TEST SIGNAL

7.1 APPLIED PROCEDURES / LIMIT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

7.1.1 TEST PROCEDURE

1. Set RBW = 1 MHz.
2. Set the video bandwidth (VBW) $\geq$ RBW.
3. Detector = Peak.
4. Sweep = auto couple.
5. Allow the trace to stabilize.
6. Span=0

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

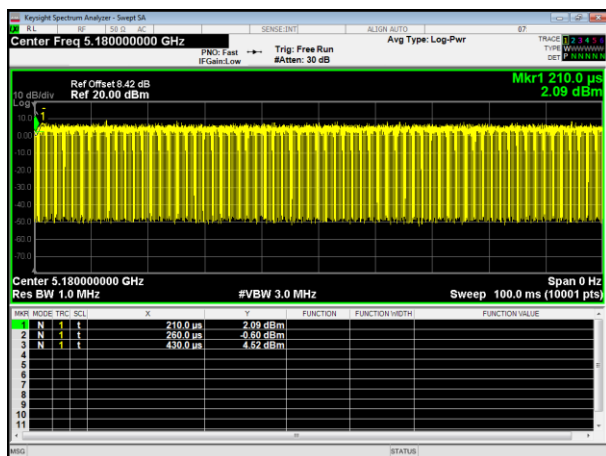
**7.1.5 TEST RESULTS**

		Test Channel	Duty Cycle(%)	Duty Fator (dB) 10 * log (1/ Duty cycle)
Band 1	802.11a	Low	77.27	1.12
		Middle	81.82	0.87
		High	81.82	0.87
	802.11ac HT20	Low	97.04	0.13
		Middle	97.04	0.13
		High	97.06	0.13
	802.11ac HT40	Low	92.86	0.32
		High	94.2	0.26
	802.11ac HT80	/	88.89	0.51
	802.11n HT20	Low	97.04	0.13
		Middle	96.3	0.16
		High	97.01	0.13
	802.11n HT40	Low	94.2	0.26
		High	94.2	0.26

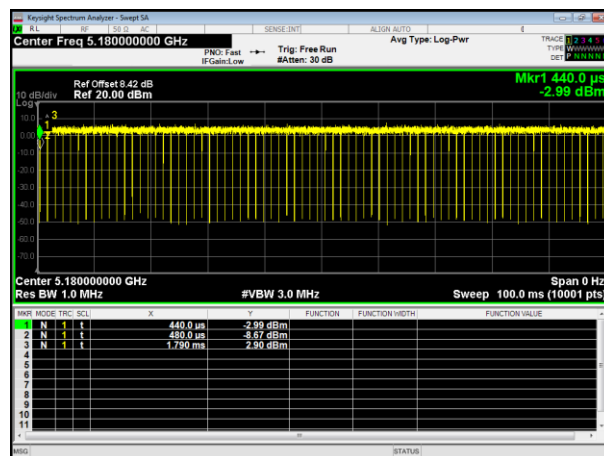
		Test Channel	Duty Cycle(%)	Duty Fator (dB) 10 * log (1/ Duty cycle)
Band 4	802.11a	Low	77.27	1.12
		Middle	81.82	0.87
		High	81.82	0.87
	802.11ac HT20	Low	97.04	0.13
		Middle	97.04	0.13
		High	97.06	0.13
	802.11ac HT40	Low	94.29	0.26
		High	94.29	0.26
	802.11ac HT80	/	89.19	0.5
	802.11n HT20	Low	96.3	0.16
		Middle	97.01	0.13
		High	96.3	0.16
	802.11n HT40	Low	92.86	0.32
		High	94.2	0.26



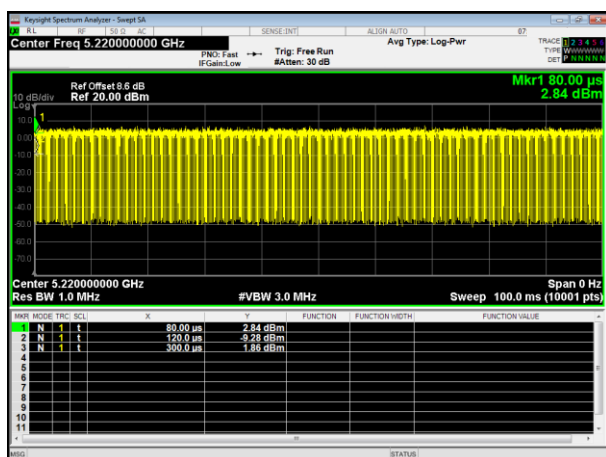
802.11a



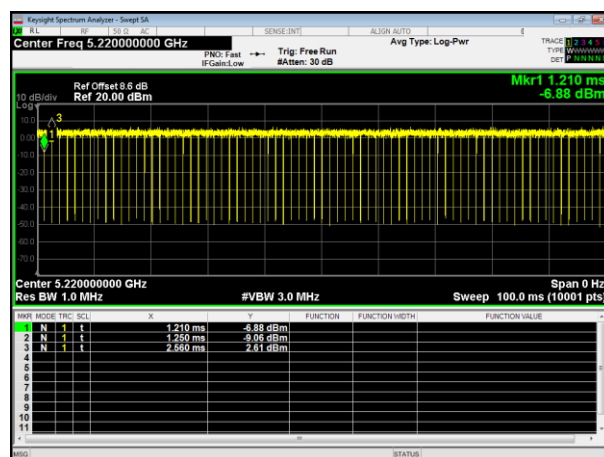
802.11ac HT20



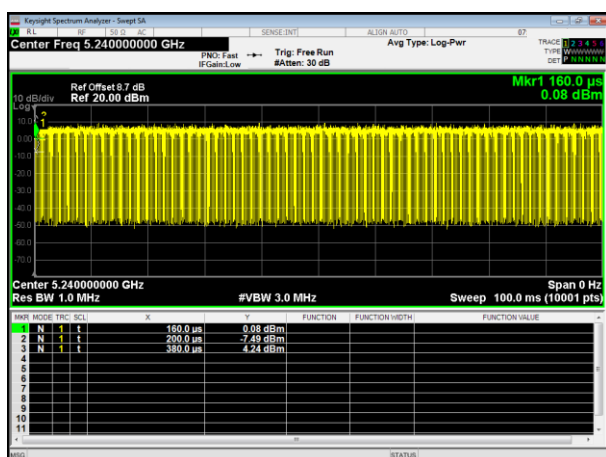
5180MHz



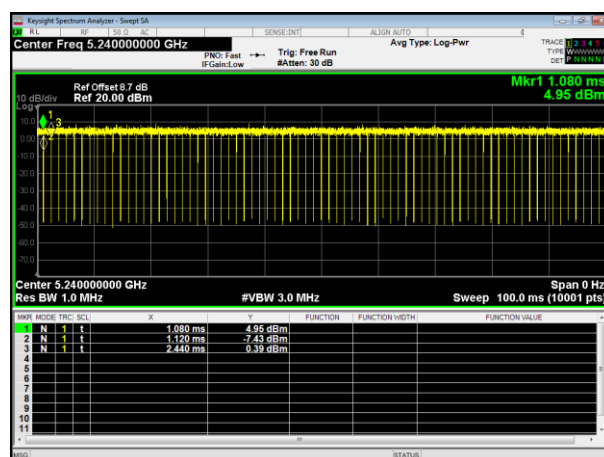
5180MHz



5200MHz



5200MHz

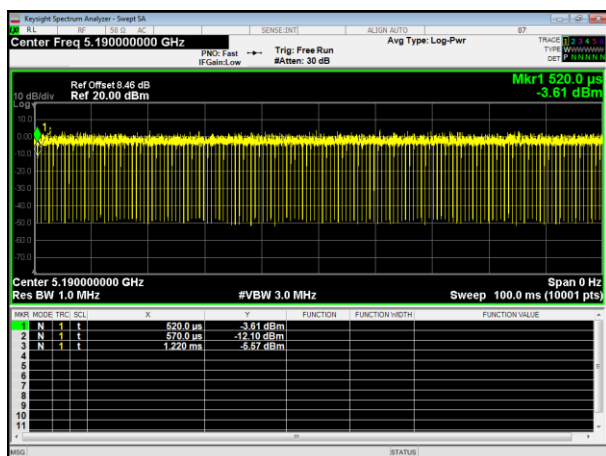


5240MHz

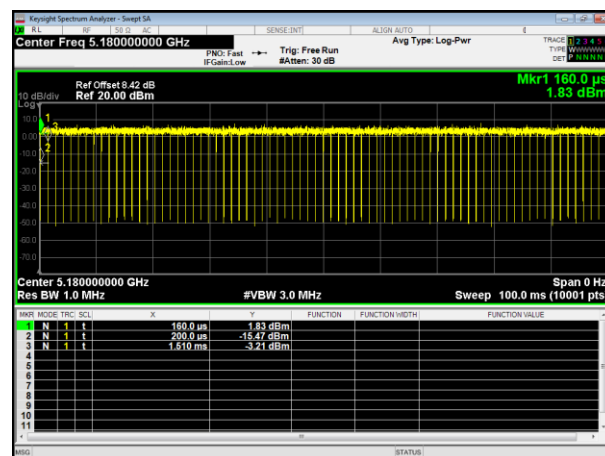
5240MHz



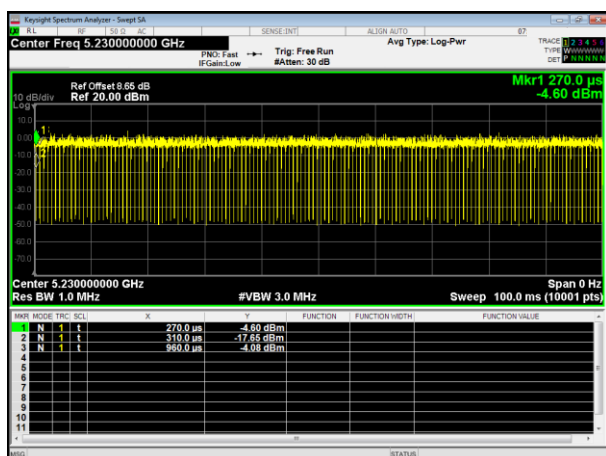
802.11ac HT40



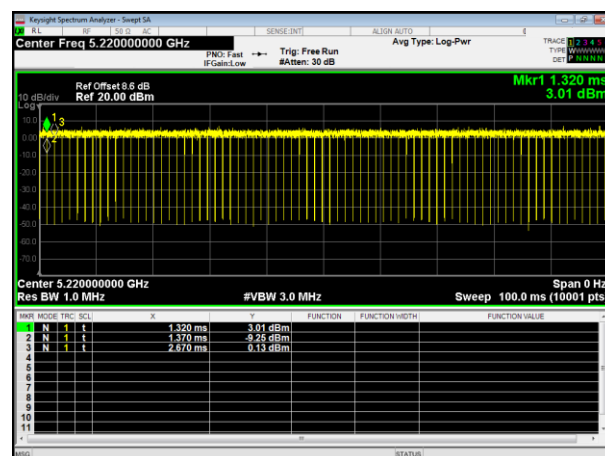
802.11n HT20



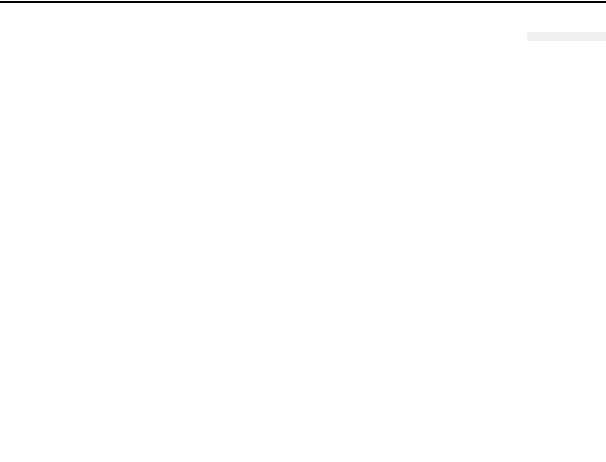
5190MHz



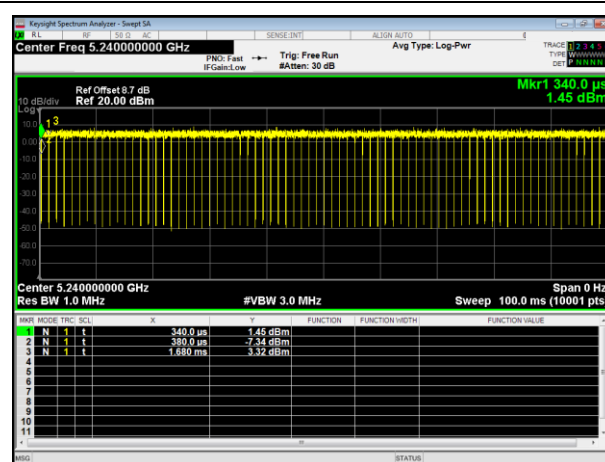
5180MHz



5230MHz



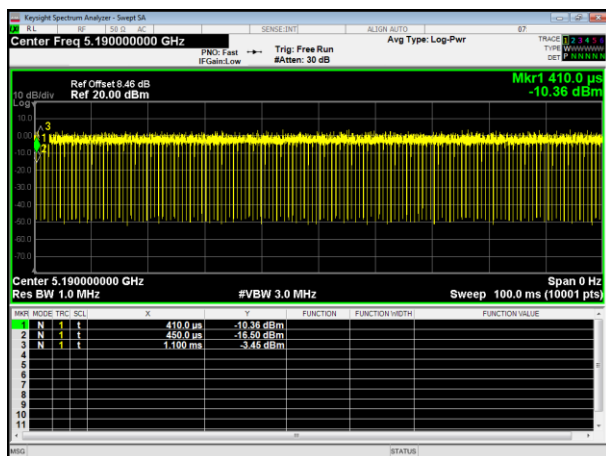
5200MHz



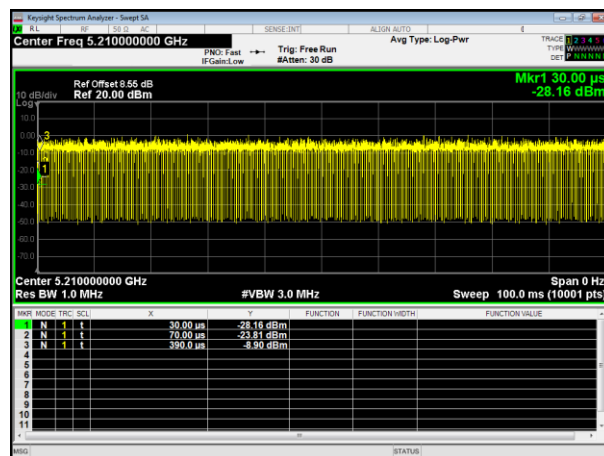
5240MHz



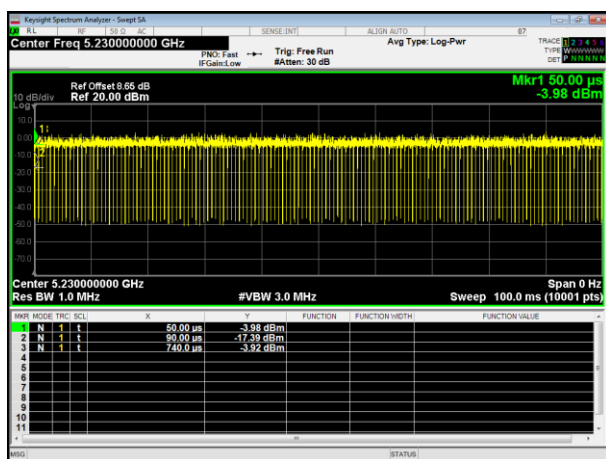
802.11n HT40



802.11ac HT80



5190MHz

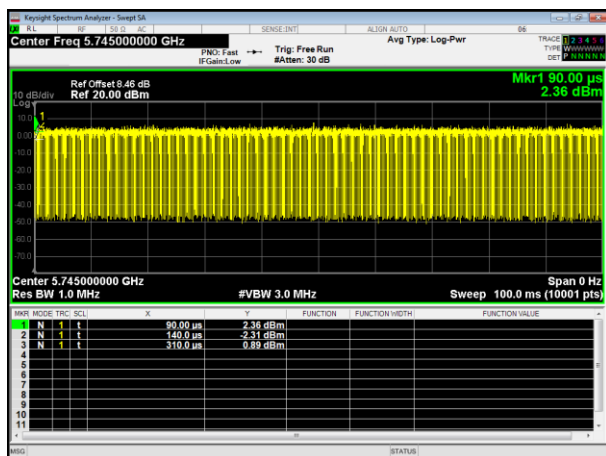


5210MHz

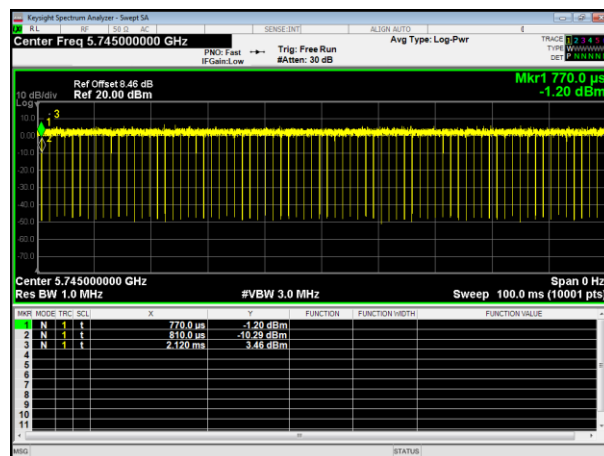
5230MHz



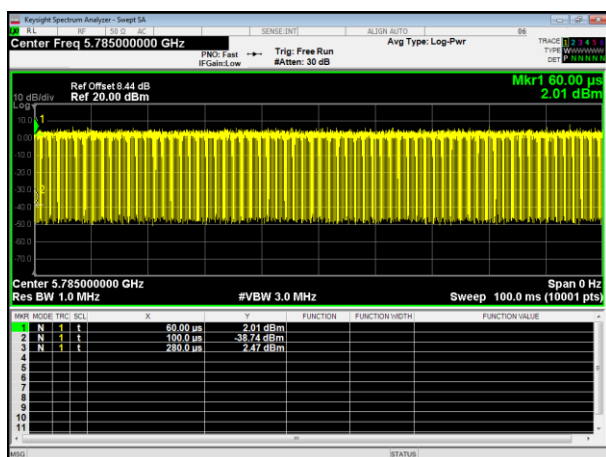
802.11a



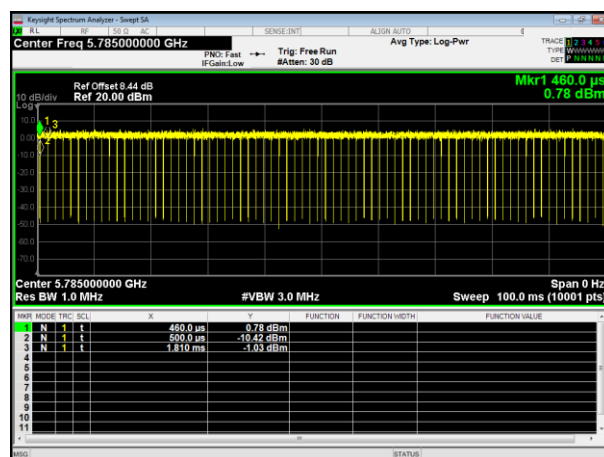
802.11ac HT20



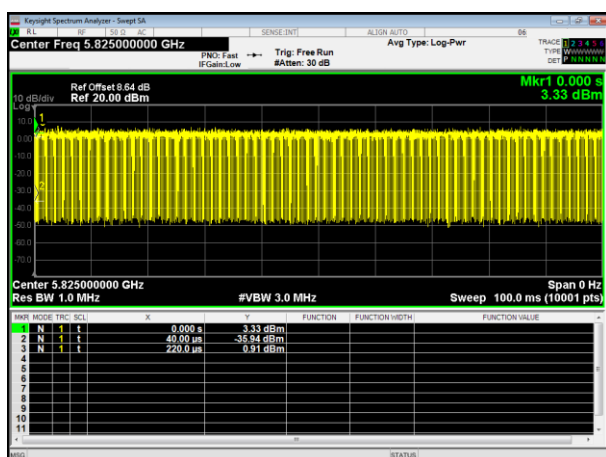
5745MHz



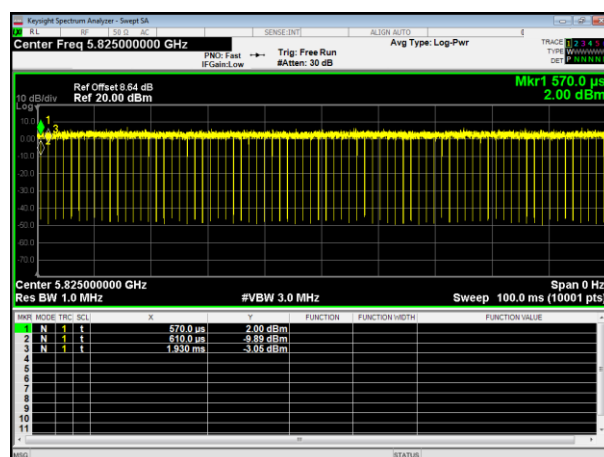
5745MHz



5785MHz

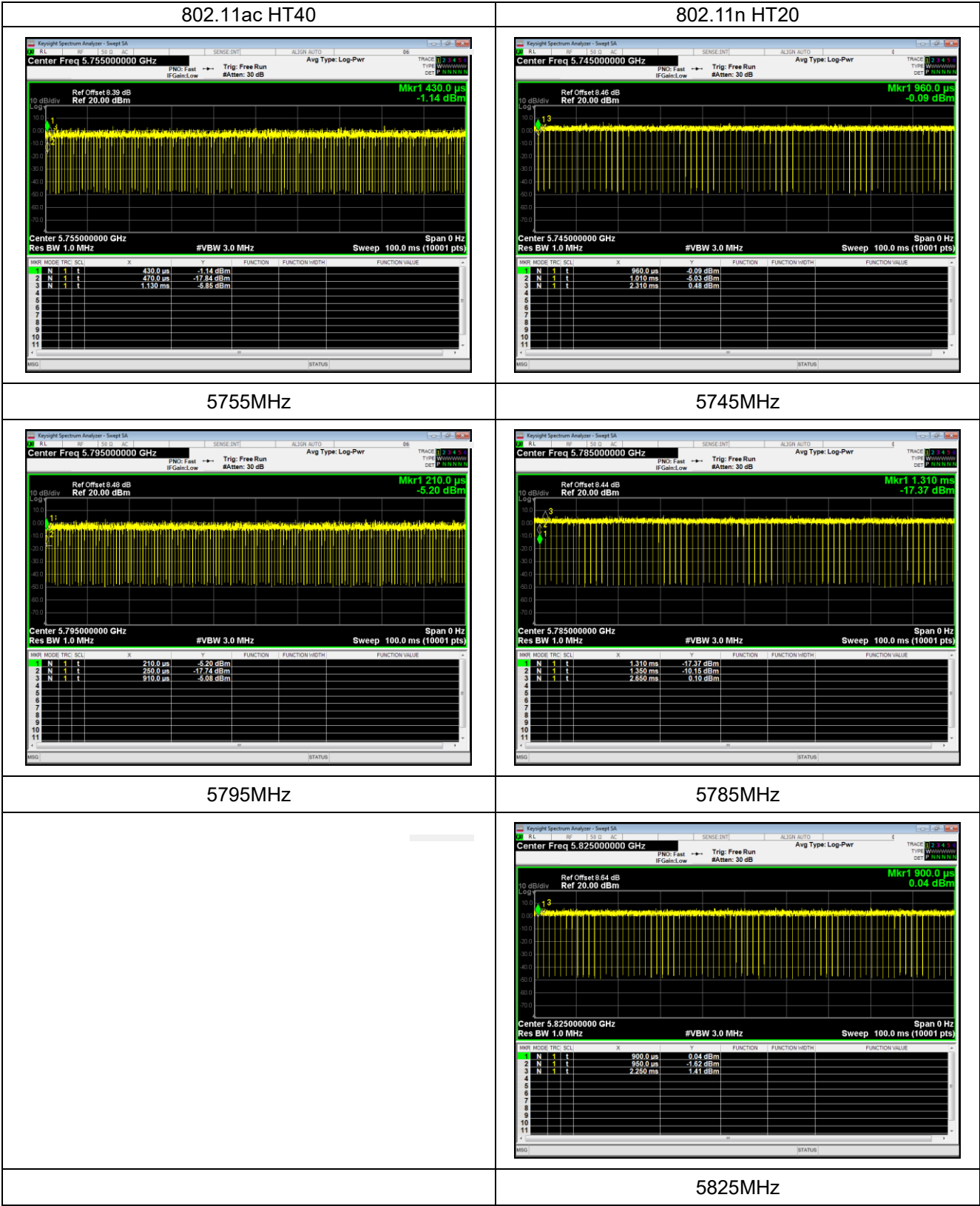


5785MHz



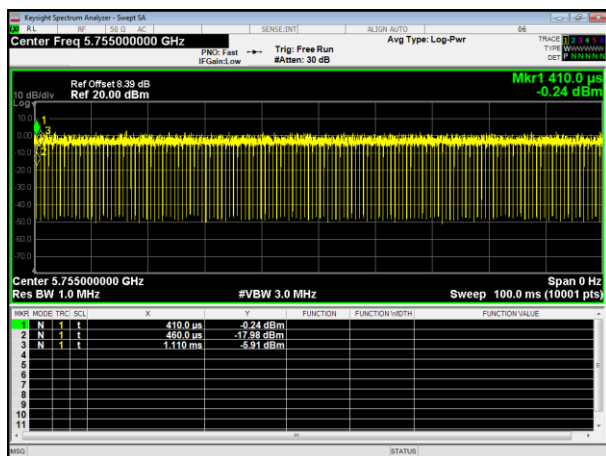
5825MHz

5825MHz

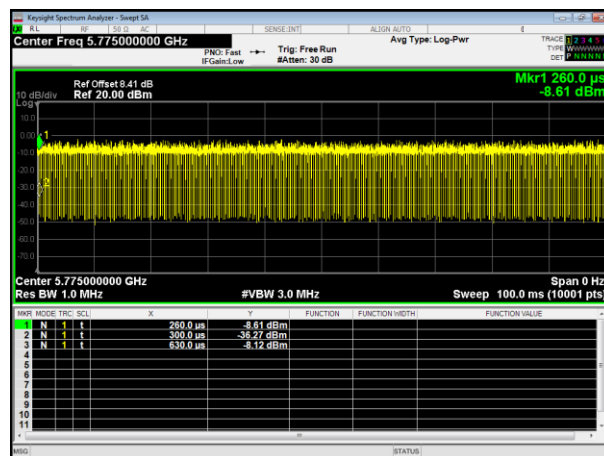




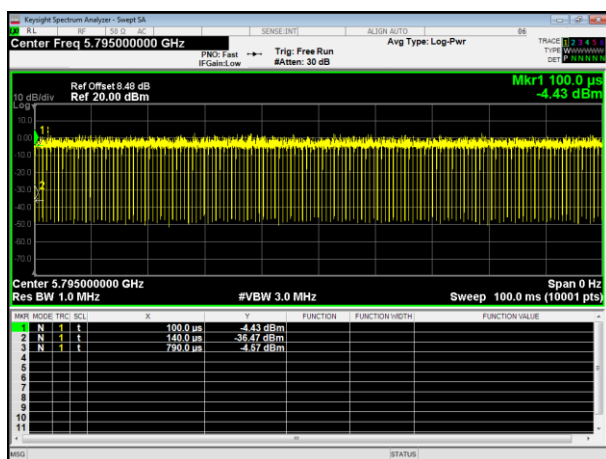
802.11n HT40



802.11ac HT80



5755MHz



5775MHz

5795MHz



8. FREQUENCY STABILITY

8.1 APPLIED PROCEDURES / 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.

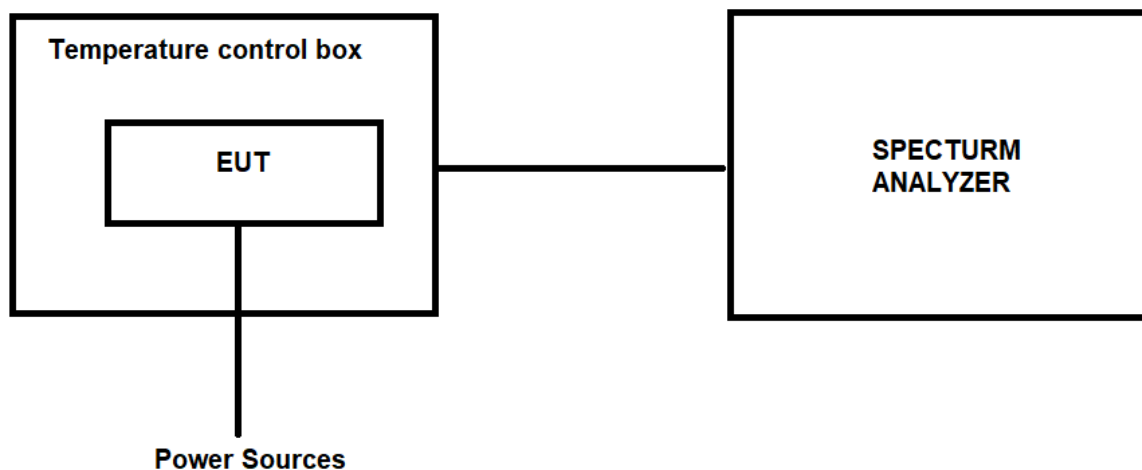
8.1.1 TEST PROCEDURE

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.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



8.1.5 TEST RESULTS

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)			Δ Frequency (MHz)		
			802.11a	802.11n HT20	802.11ac HT20	802.11a	802.11n HT20	802.11ac HT20
13.2V	-20℃	5180	5180.0349	5180.0335	5180.0375	0.0349	0.0335	0.0375
		5220	5220.0361	5220.0372	5220.0351	0.0361	0.0372	0.0351
		5240	5240.0223	5240.0221	5240.0233	0.0223	0.0221	0.0233
		5745	5745.0376	5745.0362	5745.0402	0.0376	0.0362	0.0402
		5785	5785.0366	5785.0346	5785.0389	0.0366	0.0346	0.0389
		5825	5825.0389	5825.0369	5825.0331	0.0389	0.0369	0.0331
10.8V		5180	5180.0276	5180.0256	5180.0230	0.0276	0.0256	0.023
		5220	5220.0335	5220.0384	5220.0322	0.0335	0.0384	0.0322
		5240	5240.0262	5240.0229	5240.0256	0.0262	0.0229	0.0256
		5745	5745.0254	5745.0292	5745.0262	0.0254	0.0292	0.0262
		5785	5785.0391	5785.0353	5785.0344	0.0391	0.0353	0.0344
		5825	5825.0452	5825.0476	5825.0483	0.0452	0.0476	0.0483
12V	25℃	5180	5180.0555	5180.0564	5180.0567	0.0555	0.0564	0.0567
		5220	5220.0270	5220.0242	5220.0243	0.027	0.0242	0.0243
		5240	5240.0373	5240.0354	5240.0354	0.0373	0.0354	0.0354
		5745	5745.0349	5745.0340	5745.0376	0.0349	0.034	0.0376
		5785	5785.0496	5785.0442	5785.0482	0.0496	0.0442	0.0482
		5825	5825.0232	5825.0262	5825.0301	0.0232	0.0262	0.0301
13.2V	50℃	5180	5180.0354	5180.0383	5180.0353	0.0354	0.0383	0.0353
		5220	5220.0216	5220.0234	5220.0234	0.0216	0.0234	0.0234
		5240	5240.0343	5240.0341	5240.0335	0.0343	0.0341	0.0335
		5745	5745.0635	5745.0653	5745.0622	0.0635	0.0653	0.0622
		5785	5785.0437	5785.0422	5785.0456	0.0437	0.0422	0.0456
		5825	5825.0669	5825.0671	5825.0673	0.0669	0.0671	0.0673
10.8V	50℃	5180	5180.0321	5180.0354	5180.0354	0.0321	0.0354	0.0354
		5220	5220.0243	5220.0263	5220.0292	0.0243	0.0263	0.0292
		5240	5240.0364	5240.0319	5240.0321	0.0364	0.0319	0.0321
		5745	5745.0469	5745.0456	5745.0443	0.0469	0.0456	0.0443
		5785	5785.0236	5785.0263	5785.0250	0.0236	0.0263	0.025
		5825	5825.0741	5825.0754	5825.0765	0.0741	0.0754	0.0765



Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)		Δ Frequency (MHz)	
			802.11n HT40	802.11ac HT40	802.11n HT40	802.11ac HT40
13.2V	-20℃	5190	5190.0244	5190.0235	0.0244	0.0235
		5230	5230.0362	5230.0374	0.0362	0.0374
		5755	5755.0596	5755.0565	0.0596	0.0565
		5795	5795.0623	5795.0622	0.0623	0.0622
10.8V		5190	5190.0270	5190.0243	0.027	0.0243
		5230	5230.0335	5230.0354	0.0335	0.0354
		5755	5755.0253	5755.0661	0.0253	0.0661
		5795	5795.0442	5795.0492	0.0442	0.0492
12V	25℃	5190	5190.0253	5190.0289	0.0253	0.0289
		5230	5230.0672	5230.0664	0.0672	0.0664
		5755	5755.0224	5755.0273	0.0224	0.0273
		5795	5795.0576	5795.0535	0.0576	0.0535
13.2V	50℃	5190	5190.0635	5190.0654	0.0635	0.0654
		5230	5230.0566	5230.0592	0.0566	0.0592
		5755	5755.0469	5755.0456	0.0469	0.0456
		5795	5795.0323	5795.0343	0.0323	0.0343
10.8V	50℃	5190	5190.0552	5190.0564	0.0552	0.0564
		5230	5230.0360	5230.0356	0.036	0.0356
		5755	5755.0321	5755.0343	0.0321	0.0343
		5795	5795.0472	5795.0449	0.0472	0.0449

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)	Δ Frequency (MHz)
			802.11ac HT80	802.11ac HT80
13.2V	-20℃	5210	5210.0131	0.0131
		5775	5775.0153	0.0153
10.8V		5210	5210.0282	0.0282
		5775	5775.0351	0.0351
12V	25℃	5210	5210.0503	0.0503
		5775	5775.0459	0.0459
13.2V	50℃	5210	5210.0342	0.0342
		5775	5775.0281	0.0281
10.8V	50℃	5210	5210.0337	0.0337
		5775	5775.0563	0.0563



9. TRANSMISSION IN THE ABSENCE OF DATA

9.1 STANDARD REQUIREMENT

According to §15.407(c)

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 signaling 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.

The following requirements shall apply:

a) The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signalling information or the use of repetitive codes where required by the technology.

b) All LE-LAN devices must contain security features to protect against modification of software by unauthorized parties.

Manufacturers must implement security features in any digitally modulated devices capable of operating in any of the frequency ranges within the 5 GHz band, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers may use various means, including the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment certification.

Manufacturers must take steps to ensure that DFS functionality cannot be disabled by the operator of the LE-LAN device.

9.2 TEST RESULT

Pass.

Note:

- ☒ Antenna use a permanently attached antenna which is not replaceable.
 - ☐ Not using a standard antenna jack or electrical connector for antenna replacement
 - ☐ The antenna has to be professionally installed (please provide method of installation)
- Please refer to the attached document Internal Photos to show the antenna connector.



10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

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

RSS-Gen Section 6.8 requirement: The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level.

However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

10.2 EUT ANTENNA

The EUT antenna is internal antenna, It comply with the standard requirement.

11. TEST SEUUP PHOTO

Reference to the appendix I for details.

12. EUT PHOTO

Reference to the appendix II for details.

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