



6.. 6DB&26DB&99% BANDWIDTH TEST

6.1. APPLIED PROCEDURES / LIMIT

The 26 dB bandwidth is used to determine the conducted power limits.

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

6.1.1. TEST PROCEDURE

6dB Bandwidth	
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

26dB Bandwidth	
Spectrum Parameters	Setting
RBW	approximately 1% of the emission bandwidth
VBW	>RBW
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

99% Occupied Bandwidth	
Spectrum Parameters	Setting
RBW	1% to 5% of the OBW
VBW	Approximately three times the RBW
Span	between 1.5 times and 5.0 times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

6.1.2. DEVIATION FROM STANDARD

No deviation.

6.1.3. TEST SETUP





6.1.4. 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.

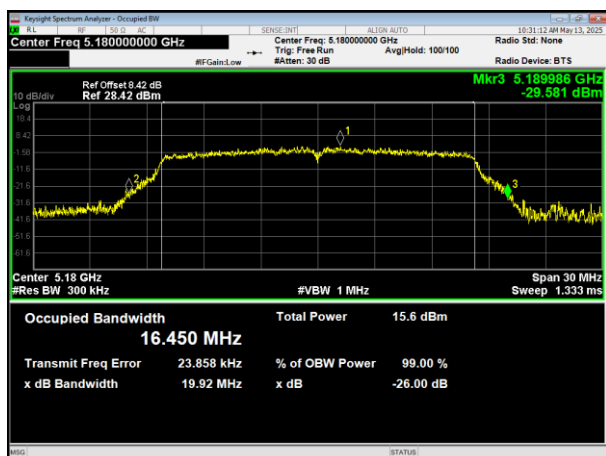
6.1.5. TEST RESULTS

		Test Channel	26dB Bandwidth (MHz)	Result
Band 1	802.11a	Low	19.92	Pass
		Middle	19.97	Pass
		High	19.37	Pass
	802.11ac HT20	Low	20.26	Pass
		Middle	21.44	Pass
		High	20.03	Pass
	802.11ac HT40	Low	39.68	Pass
		High	40.08	Pass
	802.11ac HT80	/	79.25	Pass
	802.11n HT20	Low	21.05	Pass
		Middle	20.87	Pass
		High	20.53	Pass
	802.11n HT40	Low	40.00	Pass
		High	40.49	Pass

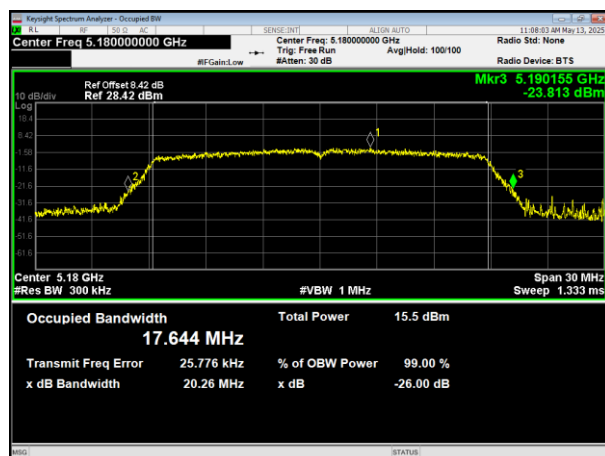
		Test Channel	6dB Bandwidth (MHz)	6dB Bandwidth Limit (MHz)	Result
Band 4	802.11a	Low	15.83	>0.5	Pass
		Middle	16.33	>0.5	Pass
		High	15.62	>0.5	Pass
	802.11ac HT20	Low	16.29	>0.5	Pass
		Middle	16.29	>0.5	Pass
		High	17.55	>0.5	Pass
	802.11ac HT40	Low	35.01	>0.5	Pass
		High	35.04	>0.5	Pass
	802.11ac HT80	/	73.87	>0.5	Pass
	802.11n HT20	Low	13.77	>0.5	Pass
		Middle	16.04	>0.5	Pass
		High	15.04	>0.5	Pass
	802.11n HT40	Low	33.76	>0.5	Pass
		High	30.00	>0.5	Pass



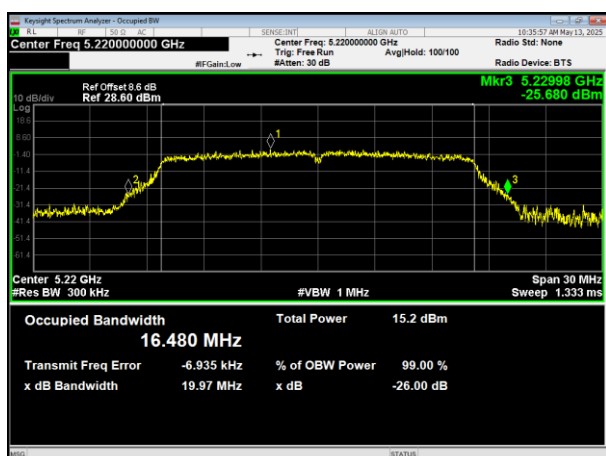
802.11a



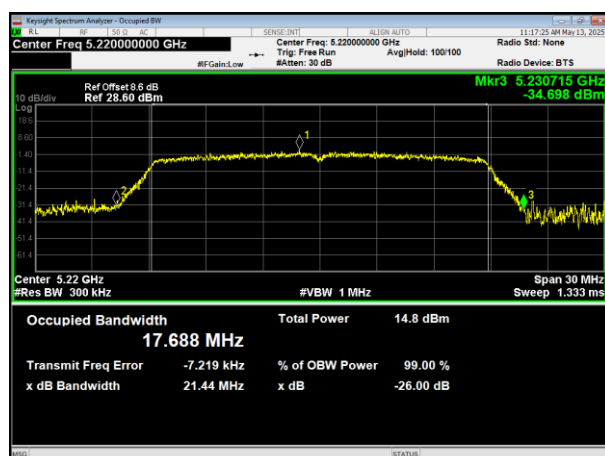
802.11ac HT20



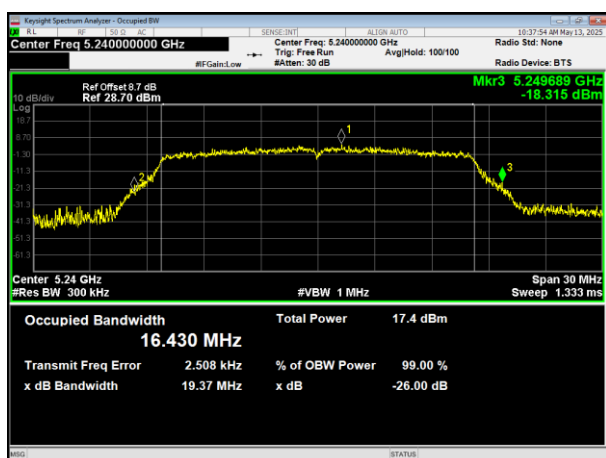
5180MHz



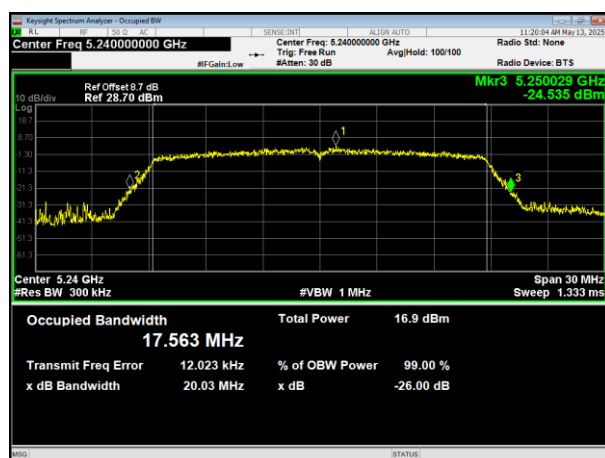
5180MHz



5200MHz



5200MHz

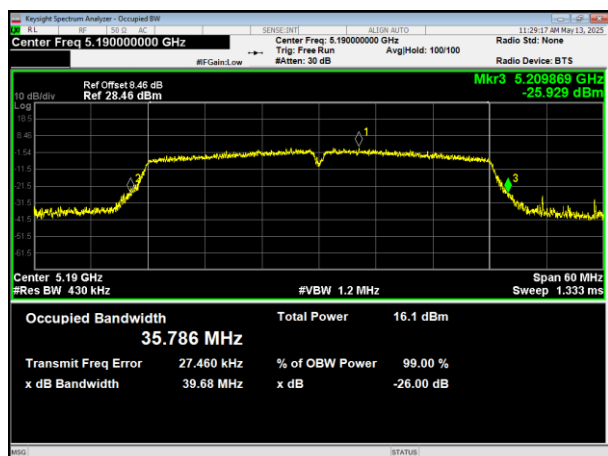


5240MHz

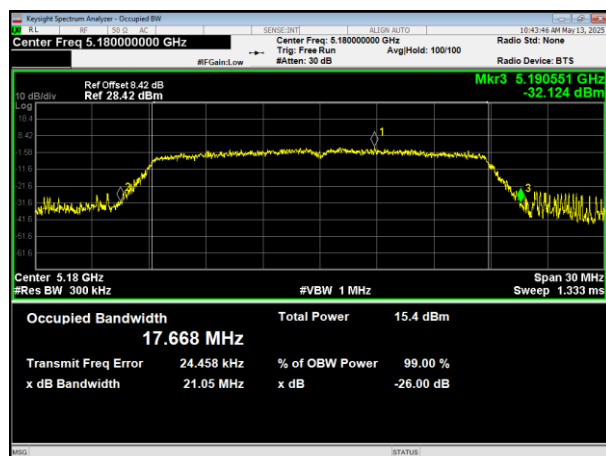
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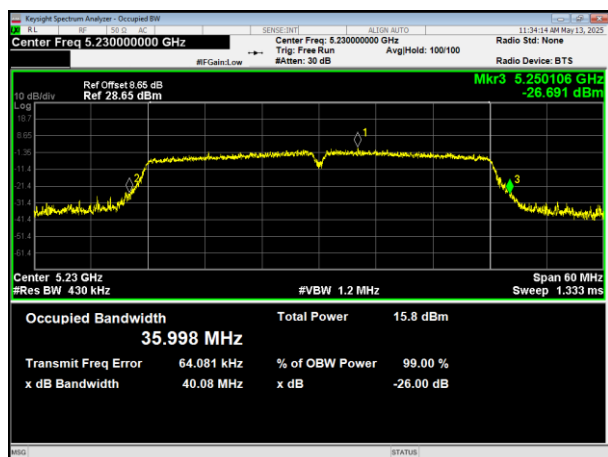
802.11ac HT40



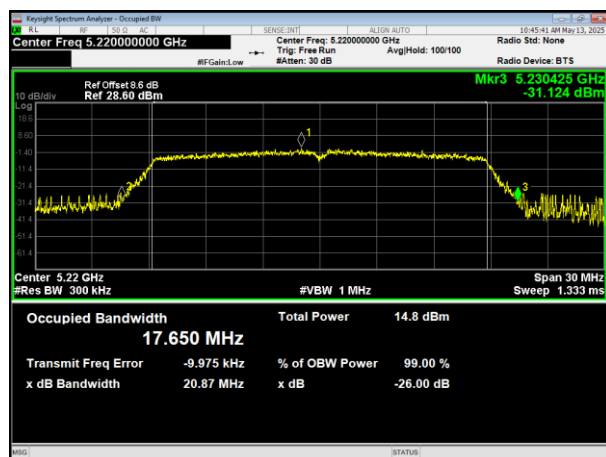
802.11n HT20



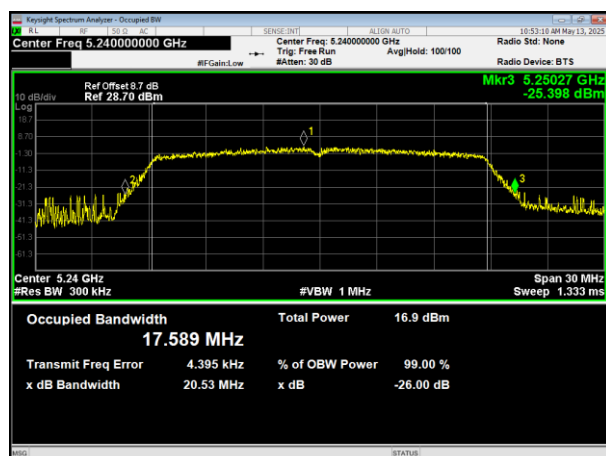
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5180MHz



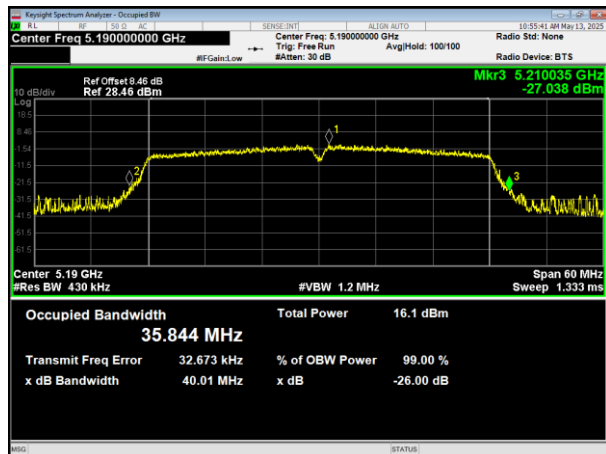
5230MHz



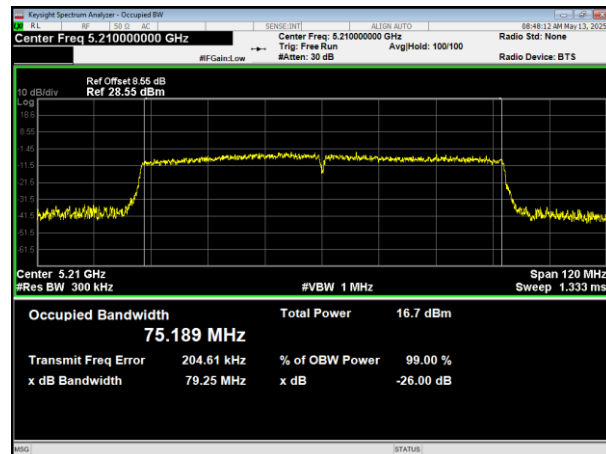
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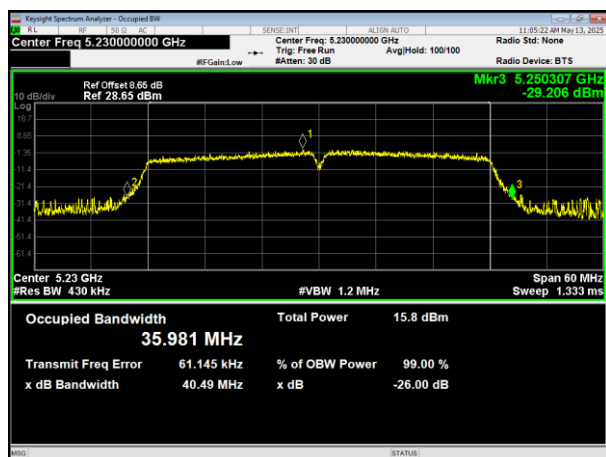
802.11n HT40



802.11ac HT80



5190MHz

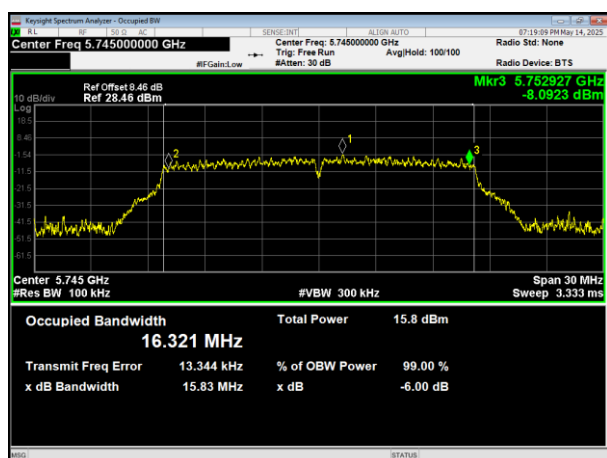


5210MHz

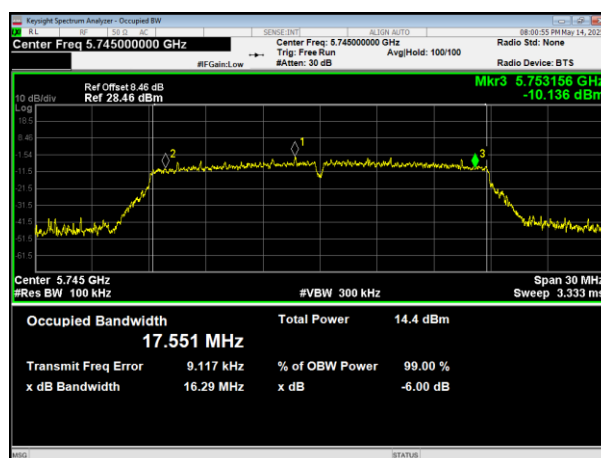
5230MHz



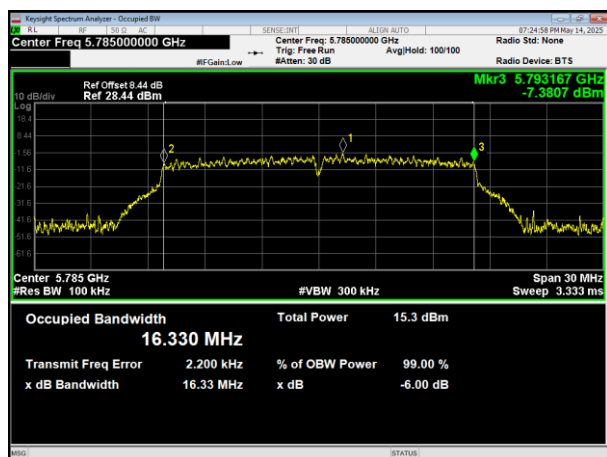
802.11a



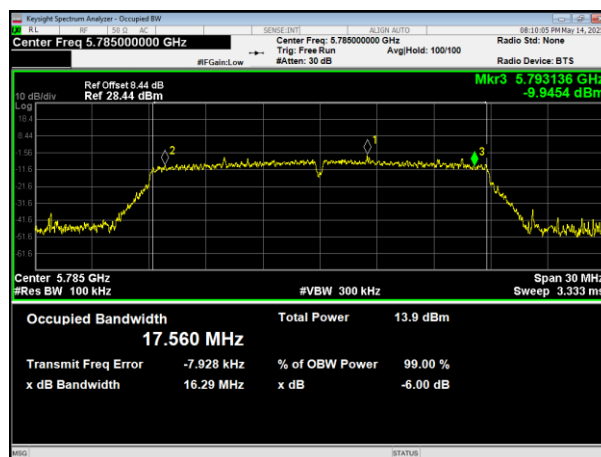
802.11ac HT20



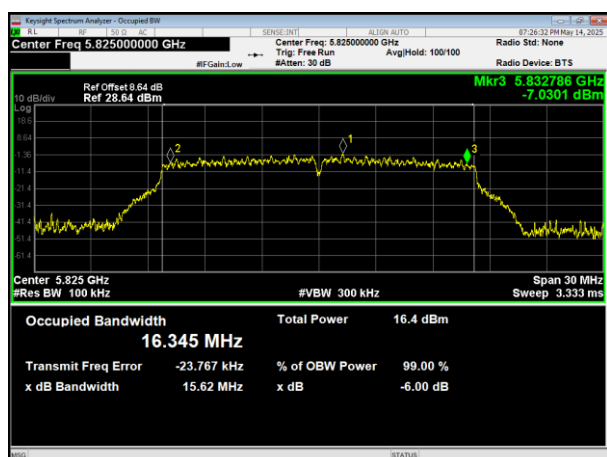
5745MHz



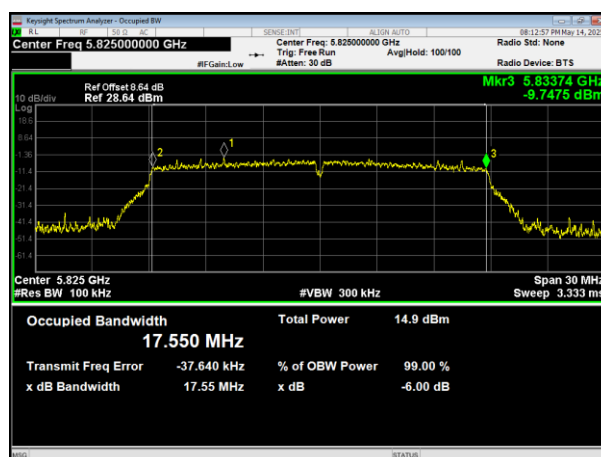
5745MHz



5785MHz



5785MHz

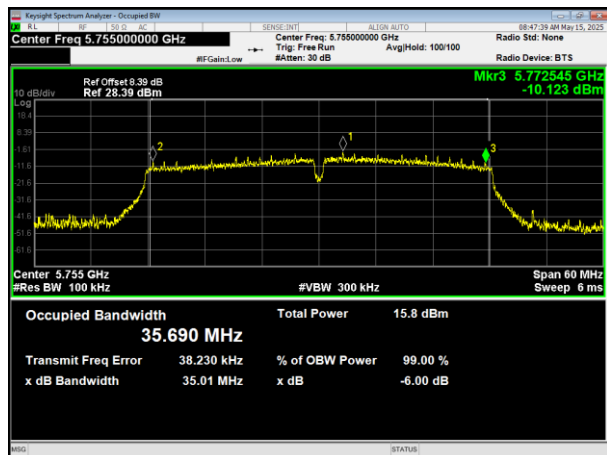


5825MHz

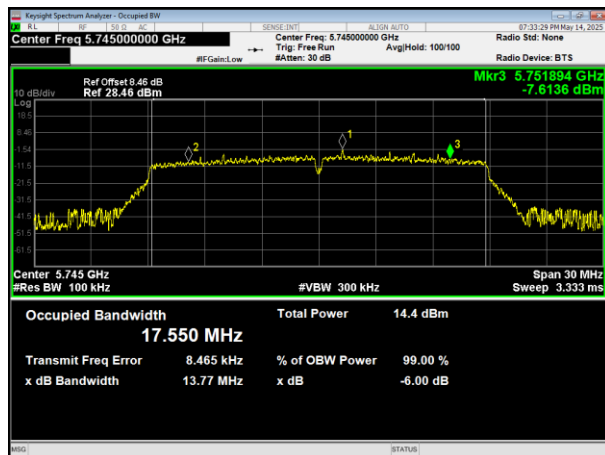
5825MHz



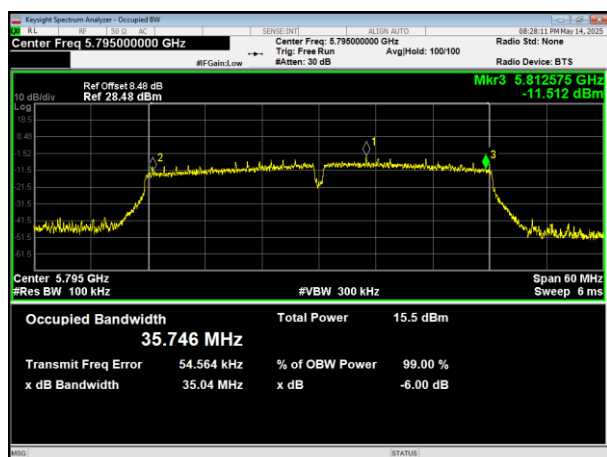
802.11ac HT40



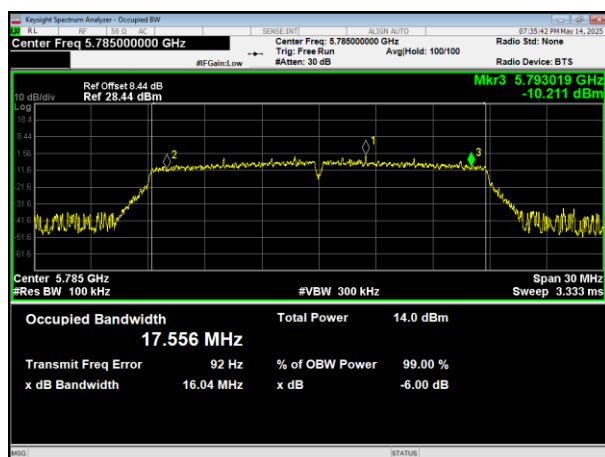
802.11n HT20



5755MHz



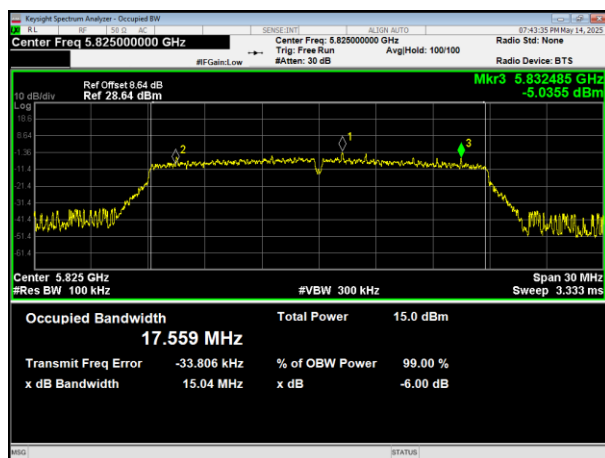
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5795MHz



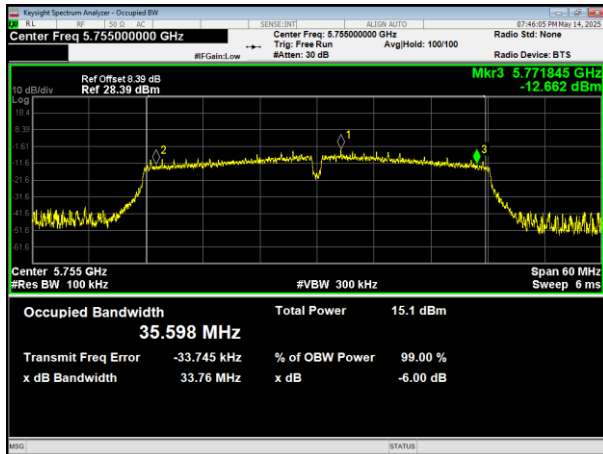
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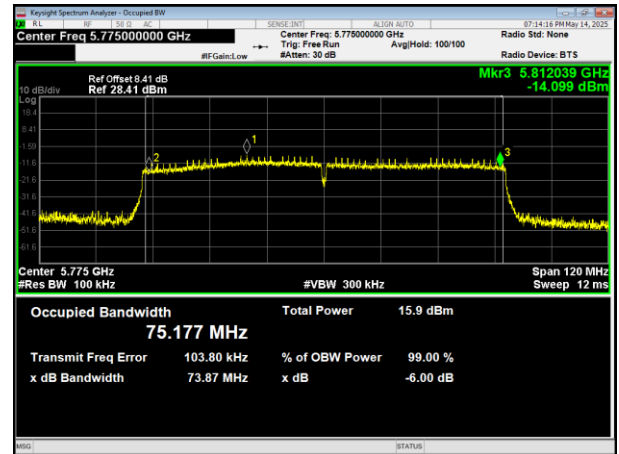
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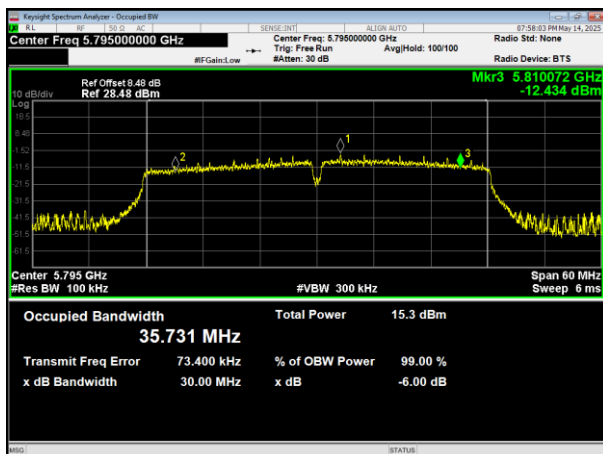
802.11n HT40



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.

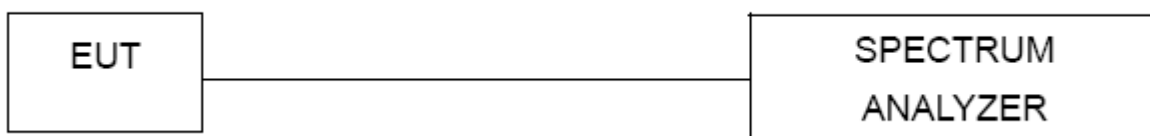
7.1.1. TEST PROCEDURE

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.



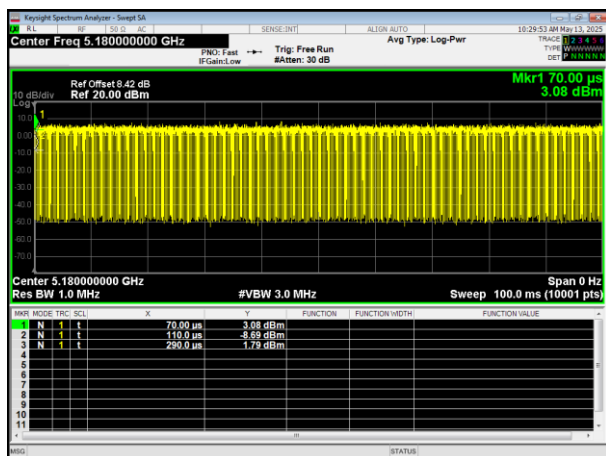
7.1.5. TEST RESULTS

		Test Channel	Duty Cycle(%)	Duty Fator (dB) 10 * log (1/ Duty cycle)
Band 1	802.11a	Low	81.82	0.87
		Middle	81.82	0.87
		High	81.82	0.87
	802.11ac HT20	Low	97.04	0.13
		Middle	97.06	0.13
		High	97.04	0.13
	802.11ac HT40	Low	94.29	0.26
		High	94.2	0.26
	802.11ac HT80	/	89.19	0.5
	802.11n HT20	Low	97.04	0.13
		Middle	97.01	0.13
		High	97.04	0.13
	802.11n HT40	Low	92.75	0.33
		High	94.2	0.26

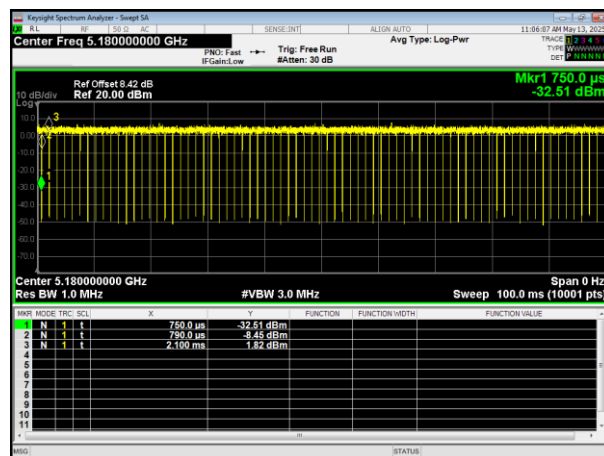
		Test Channel	Duty Cycle(%)	Duty Fator (dB) 10 * log (1/ Duty cycle)
Band 4	802.11a	Low	77.27	1.12
		Middle	81.82	0.87
		High	81.82	0.87
	802.11ac HT20	Low	97.06	0.13
		Middle	97.04	0.13
		High	97.06	0.13
	802.11ac HT40	Low	94.2	0.26
		High	92.86	0.32
	802.11ac HT80	/	88.89	0.51
	802.11n HT20	Low	97.01	0.13
		Middle	97.01	0.13
		High	97.01	0.13
	802.11n HT40	Low	94.2	0.26
		High	92.86	0.32



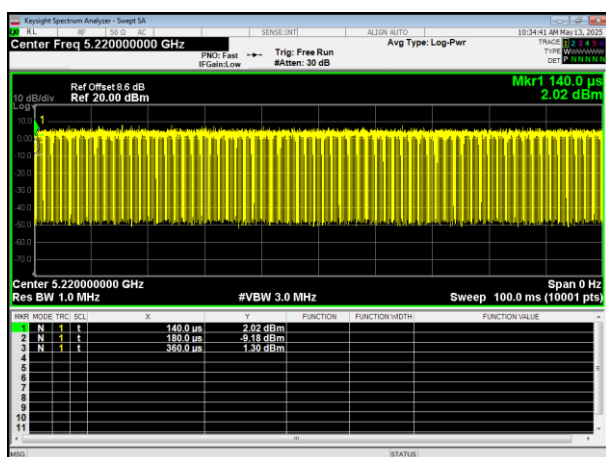
802.11a



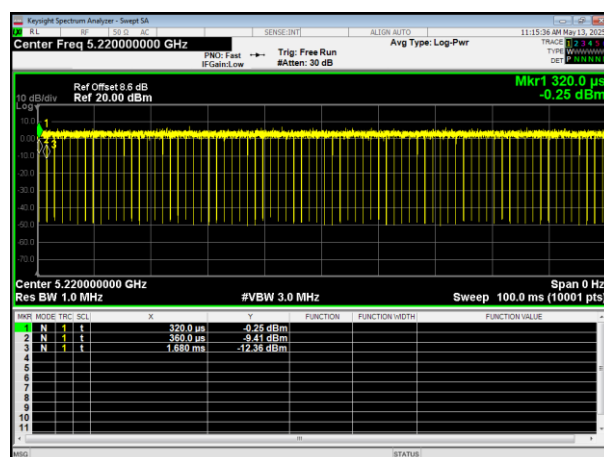
802.11ac HT20



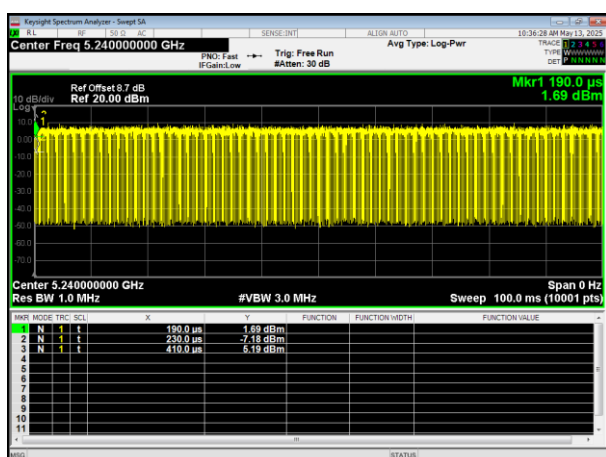
5180MHz



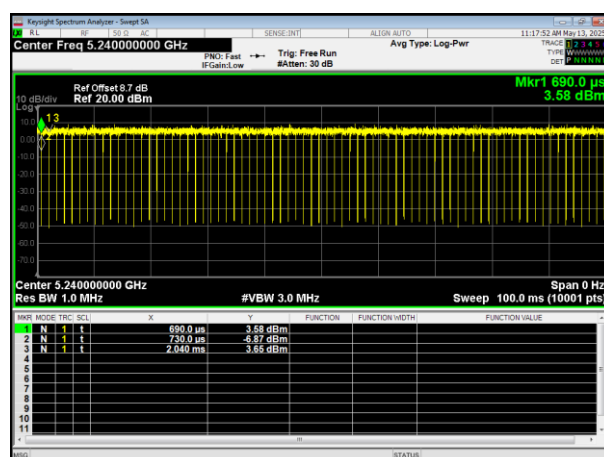
5180MHz



5200MHz



5200MHz

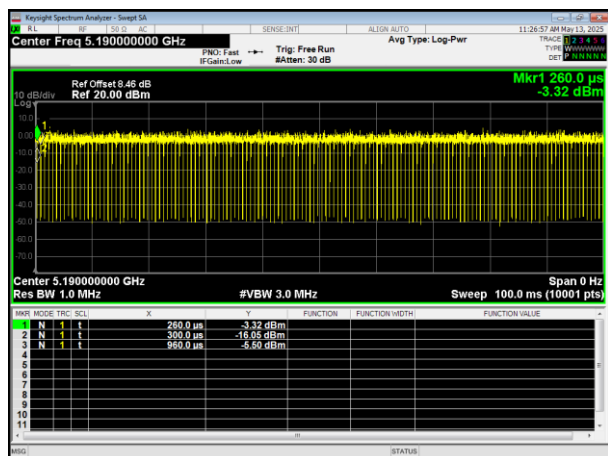


5240MHz

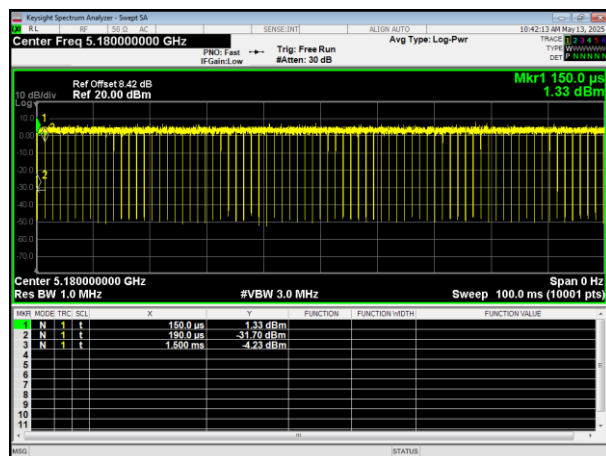
5240MHz



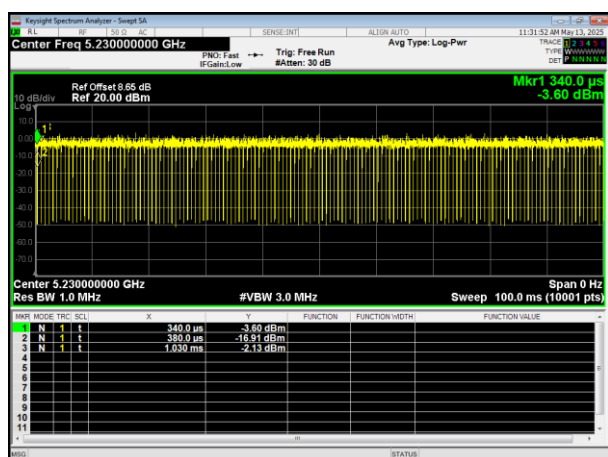
802.11ac HT40



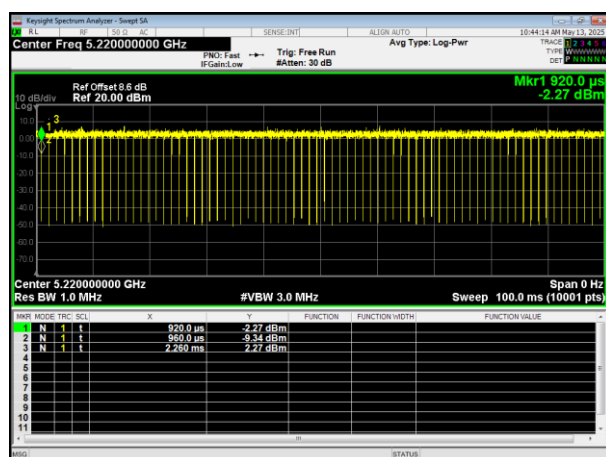
802.11n HT20



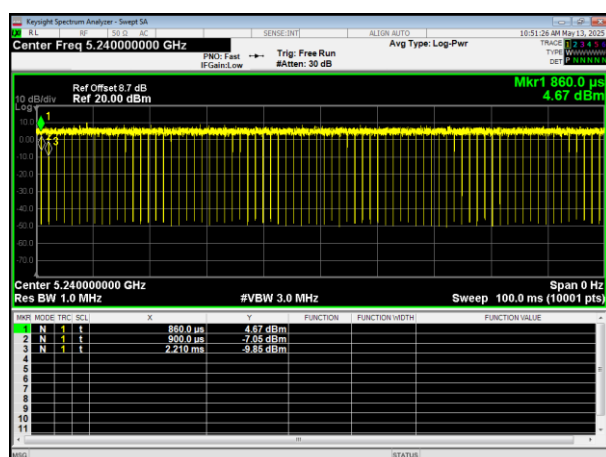
5190MHz



5180MHz



5230MHz

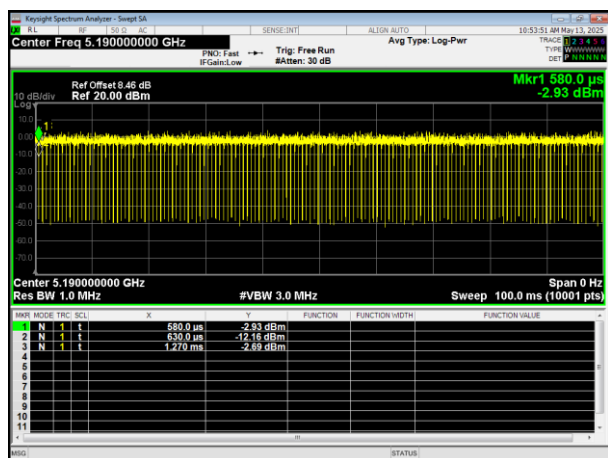


5200MHz

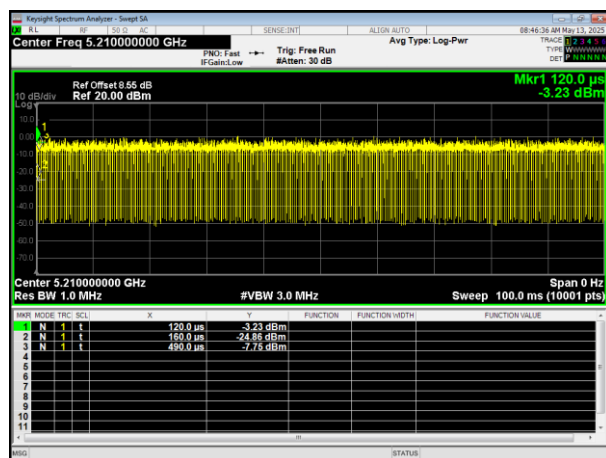
5240MHz



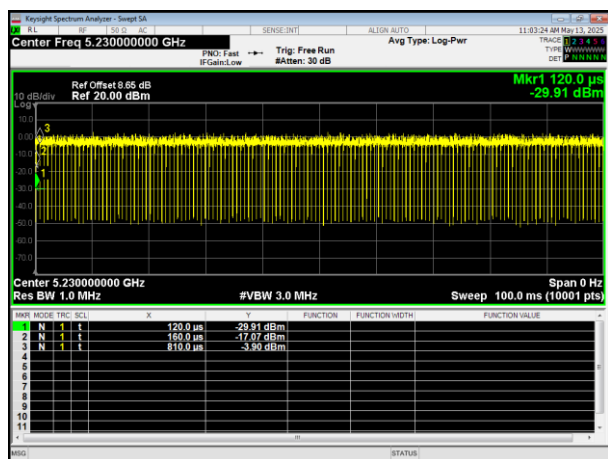
802.11n HT40



802.11ac HT80



5190MHz



5210MHz

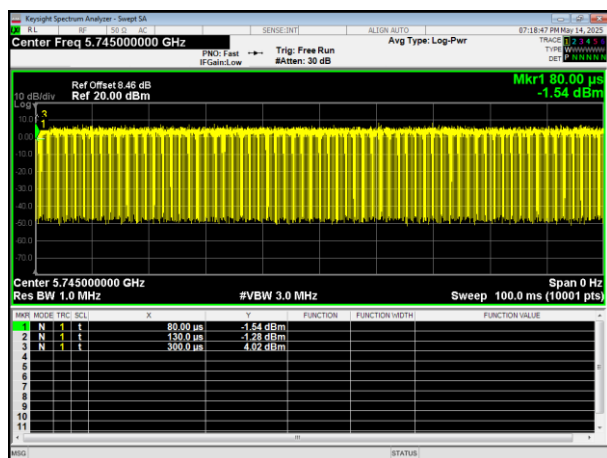


5230MHz

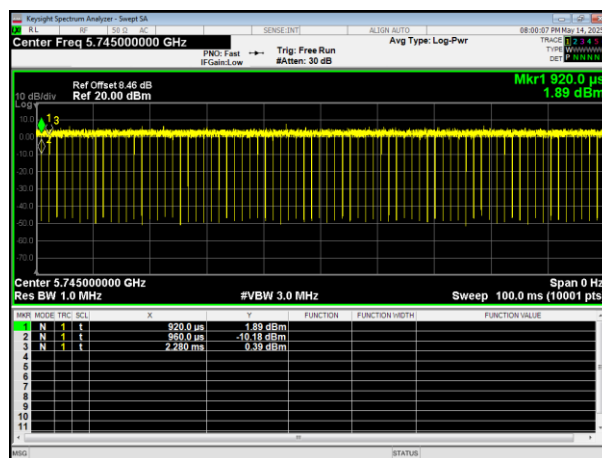




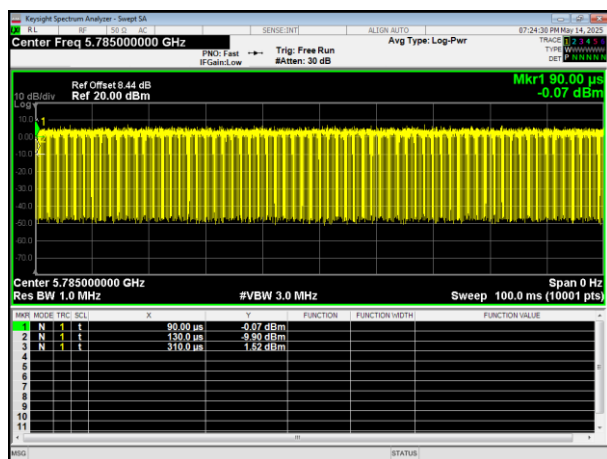
802.11a



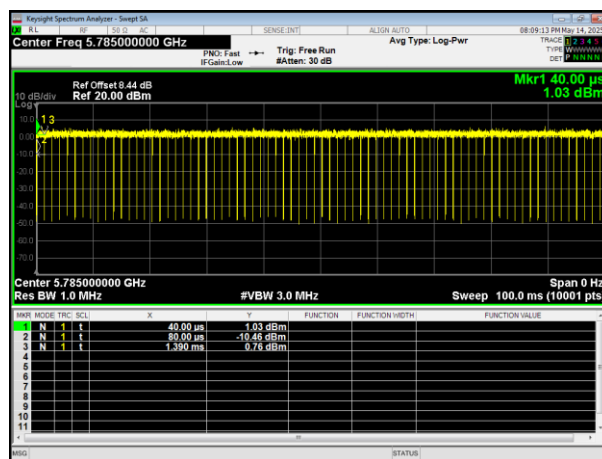
802.11ac HT20



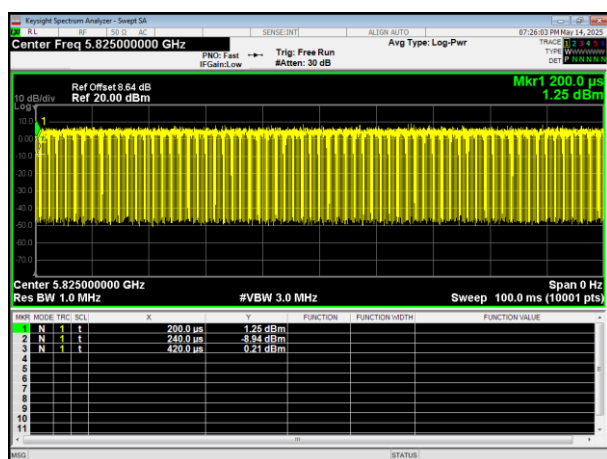
5745MHz



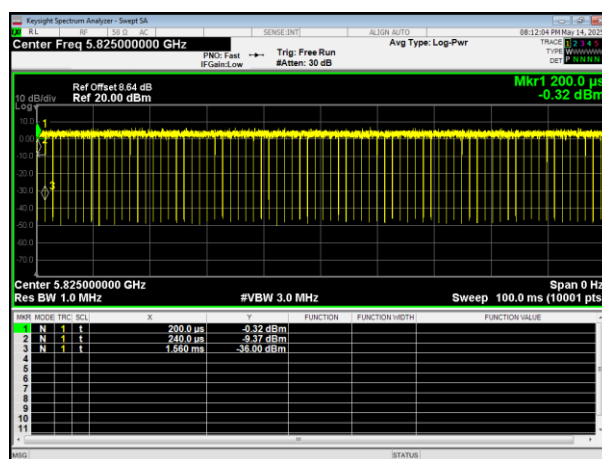
5745MHz



5785MHz



5785MHz

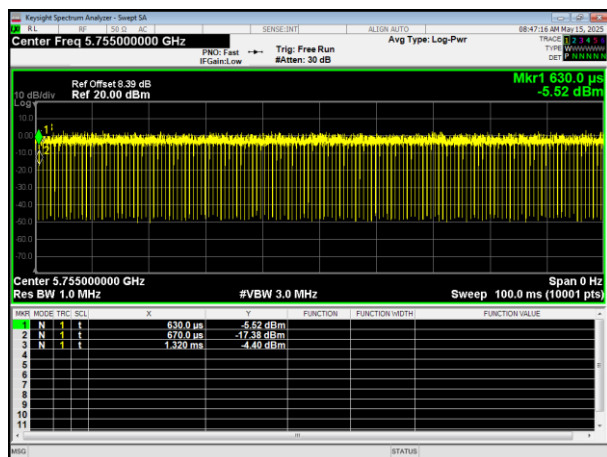


5825MHz

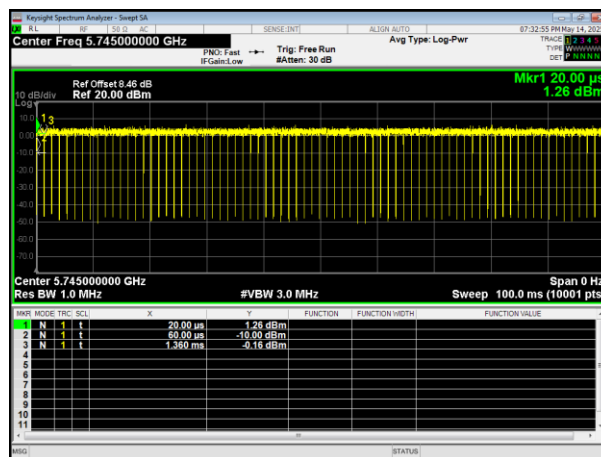
5825MHz



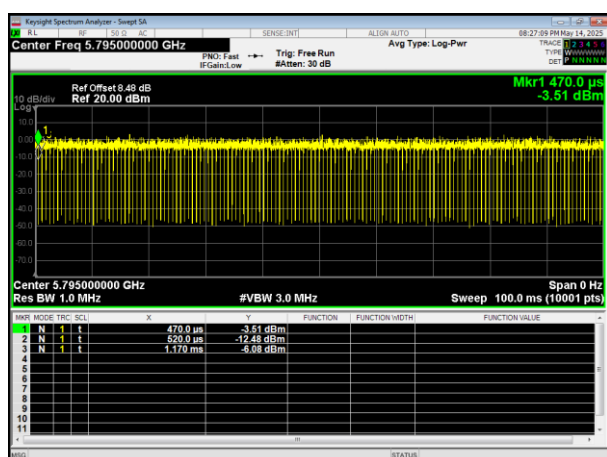
802.11ac HT40



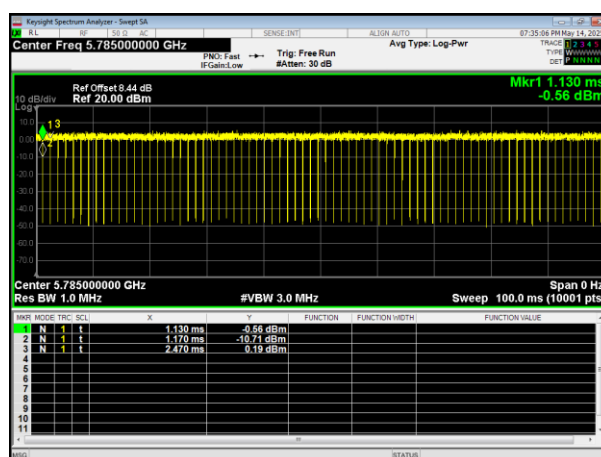
802.11n HT20



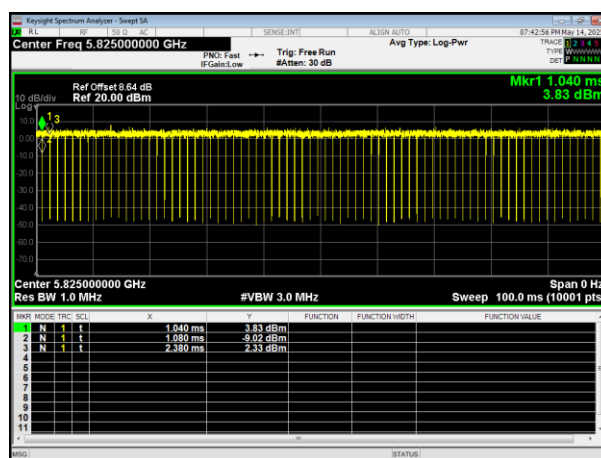
5755MHz



5745MHz



5795MHz

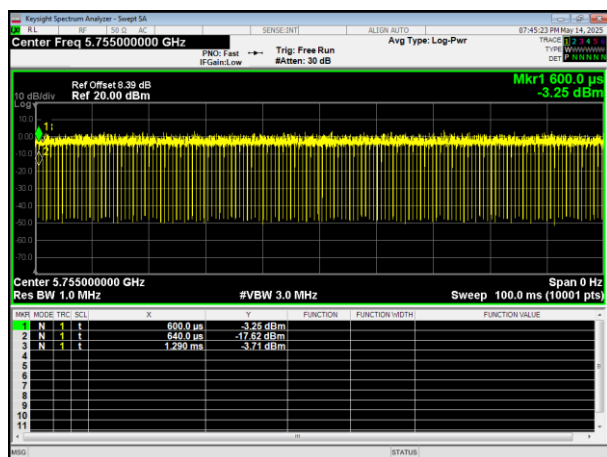


5785MHz

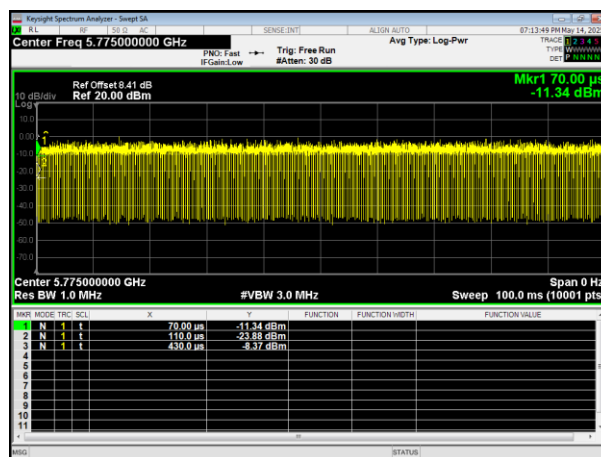
5825MHz



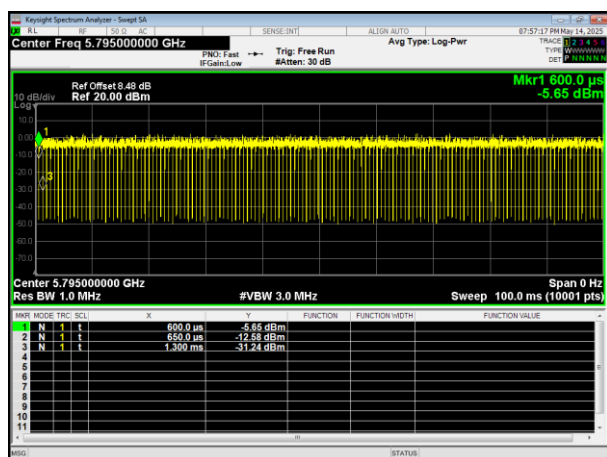
802.11n HT40



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.

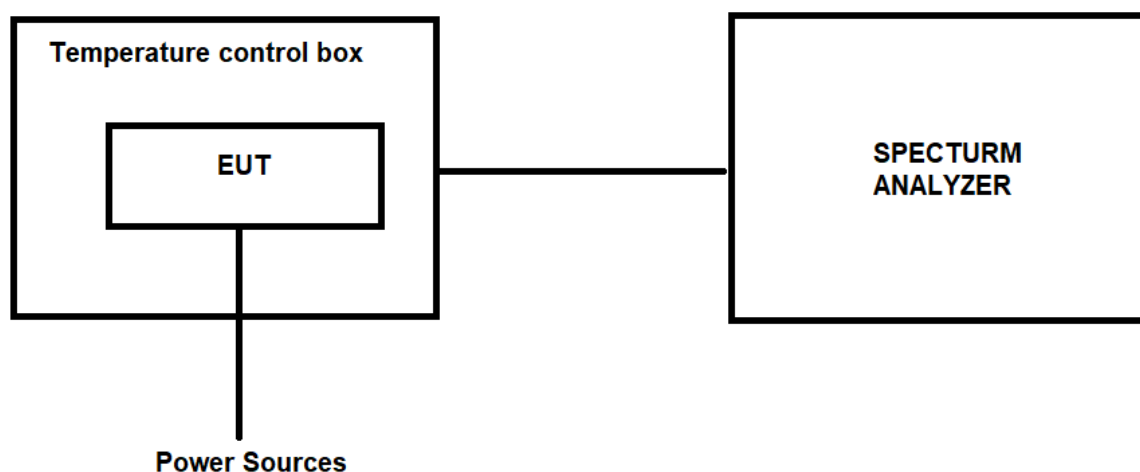
8.1.1. TEST PROCEDURE

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	Spectrum Frequency (MHz)			Δ Frequency (PPM)		
		(MHz)	802.11a	802.11n HT20	802.11ac HT20	802.11a	802.11n HT20	802.11ac HT20
5.5V	-20°C	5180	5180.0036	5180.0052	5180.0063	0.6950	1.0039	1.2162
		5220	5220.0058	5220.0013	5220.0021	1.1111	0.2490	0.4023
		5240	5240.0041	5240.0028	5240.0018	0.7824	0.5344	0.3435
		5745	5745.0019	5745.0014	5745.0023	0.3307	0.2437	0.4003
		5785	5785.0025	5785.0026	5785.0025	0.4322	0.4494	0.4322
		5825	5825.0018	5825.0017	5825.0018	0.3090	0.2918	0.3090
4.5V	-20°C	5180	5180.0054	5180.0016	5180.0026	1.0425	0.3089	0.5019
		5220	5220.0017	5220.0024	5220.0041	0.3257	0.4598	0.7854
		5240	5240.0026	5240.0021	5240.0063	0.4962	0.4008	1.2023
		5745	5745.0015	5745.0016	5745.0015	0.2611	0.2785	0.2611
		5785	5785.0044	5785.0018	5785.0022	0.7606	0.3111	0.3803
		5825	5825.0096	5825.0023	5825.0016	1.6481	0.3948	0.2747
5V	25°C	5180	5180.0025	5180.0017	5180.0024	0.4826	0.3282	0.4633
		5220	5220.0014	5220.0035	5220.0013	0.2682	0.6705	0.2490
		5240	5240.0059	5240.0011	5240.0027	1.1260	0.2099	0.5153
		5745	5745.0055	5745.0063	5745.0046	0.9574	1.0966	0.8007
		5785	5785.0021	5785.0018	5785.0022	0.3630	0.3111	0.3803
		5825	5825.0063	5825.0016	5825.0046	1.0815	0.2747	0.7897
5.5V	50°C	5180	5180.0052	5180.0036	5180.0028	1.0039	0.6950	0.5405
		5220	5220.0036	5220.0047	5220.0024	0.6897	0.9004	0.4598
		5240	5240.0058	5240.0021	5240.0022	1.1069	0.4008	0.4198
		5745	5745.0025	5745.0046	5745.0063	0.4352	0.8007	1.0966
		5785	5785.0024	5785.0085	5785.0021	0.4149	1.4693	0.3630
		5825	5825.0046	5825.0043	5825.0052	0.7897	0.7382	0.8927
4.5V	50°C	5180	5180.0085	5180.0028	5180.0021	1.6409	0.5405	0.4054
		5220	5220.0063	5220.0014	5220.0026	1.2069	0.2682	0.4981
		5240	5240.0015	5240.0063	5240.0044	0.2863	1.2023	0.8397
		5745	5745.0014	5745.0021	5745.0021	0.2437	0.3655	0.3655
		5785	5785.0058	5785.0074	5785.0085	1.0026	1.2792	1.4693
		5825	5825.0036	5825.0037	5825.0036	0.6180	0.6352	0.6180



Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)		Δ Frequency (PPM)	
			802.11n HT40	802.11ac HT40	802.11n HT40	802.11ac HT40
5.5V	-20℃	5190	5190.0063	5190.0022	1.2139	0.4239
		5230	5230.0038	5230.0033	0.7266	0.6310
		5755	5755.0025	5755.0012	0.4344	0.2085
		5795	5795.0053	5795.0023	0.9146	0.3969
4.5V		5190	5190.0052	5190.0021	1.0019	0.4046
		5230	5230.0066	5230.0043	1.2620	0.8222
		5755	5755.0037	5755.0022	0.6429	0.3823
		5795	5795.0064	5795.0043	1.1044	0.7420
5V	25℃	5190	5190.0022	5190.0021	0.4239	0.4046
		5230	5230.0046	5230.0052	0.8795	0.9943
		5755	5755.0023	5755.0016	0.3997	0.2780
		5795	5795.0015	5795.0038	0.2588	0.6557
5.5V	50℃	5190	5190.0016	5190.0026	0.3083	0.5010
		5230	5230.0012	5230.0014	0.2294	0.2677
		5755	5755.0036	5755.0026	0.6255	0.4518
		5795	5795.0021	5795.0032	0.3624	0.5522
4.5V	50℃	5190	5190.0023	5190.0011	0.4432	0.2119
		5230	5230.0012	5230.0013	0.2294	0.2486
		5755	5755.0023	5755.0012	0.3997	0.2085
		5795	5795.0014	5795.0013	0.2416	0.2243



Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)	Δ Frequency (PPM)
			802.11ac HT80	802.11ac HT80
5.5V	-20°C	5210	5210.0041	0.7869
		5775	5775.0018	0.3117
4.5V		5210	5210.0026	0.4990
		5775	5775.0052	0.9004
5V	25°C	5210	5210.0015	0.2879
		5775	5775.0038	0.6580
5.5V	50°C	5210	5210.0063	1.2092
		5775	5775.0014	0.2424
4.5V	50°C	5210	5210.0037	0.7102
		5775	5775.0063	1.0909



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.

9.2. TEST RESULT

No non-compliance noted:
Refer to the theory of operation.

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.

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 *******