



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.

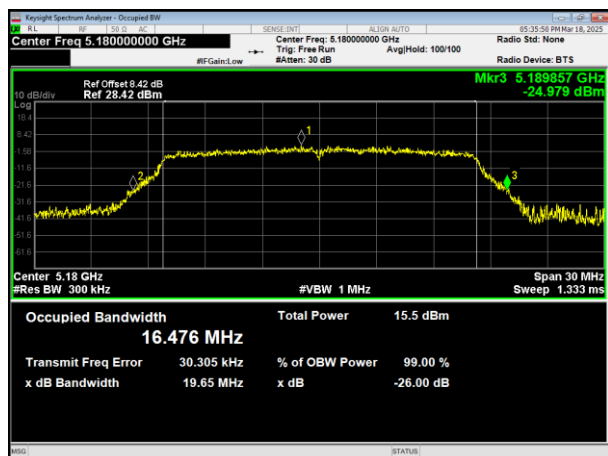
6.1.5 TEST RESULTS

		Test Channel	26dB Bandwidth (MHz)	Result
Band 1	802.11a	Low	19.653	Pass
		Middle	19.905	Pass
		High	19.529	Pass
	802.11ac HT20	Low	20.201	Pass
		Middle	20.313	Pass
		High	20.231	Pass
	802.11ac HT40	Low	39.718	Pass
		High	40.721	Pass
	802.11n HT20	Low	20.152	Pass
		Middle	21.373	Pass
		High	20.317	Pass
	802.11n HT40	Low	39.715	Pass
		High	40.455	Pass

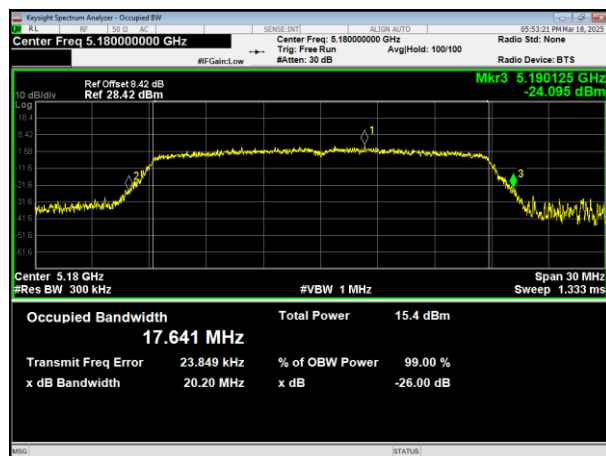
		Test Channel	6dB Bandwidth (MHz)	6dB Bandwidth Limit (MHz)	Result
Band 4	802.11a	Low	15.721	>0.5	Pass
		Middle	15.428	>0.5	Pass
		High	16.352	>0.5	Pass
	802.11ac HT20	Low	16.055	>0.5	Pass
		Middle	16.65	>0.5	Pass
		High	15.106	>0.5	Pass
	802.11ac HT40	Low	31.304	>0.5	Pass
		High	33.803	>0.5	Pass
	802.11n HT20	Low	16.31	>0.5	Pass
		Middle	15.929	>0.5	Pass
		High	16.122	>0.5	Pass
	802.11n HT40	Low	35.074	>0.5	Pass
		High	32.53	>0.5	Pass



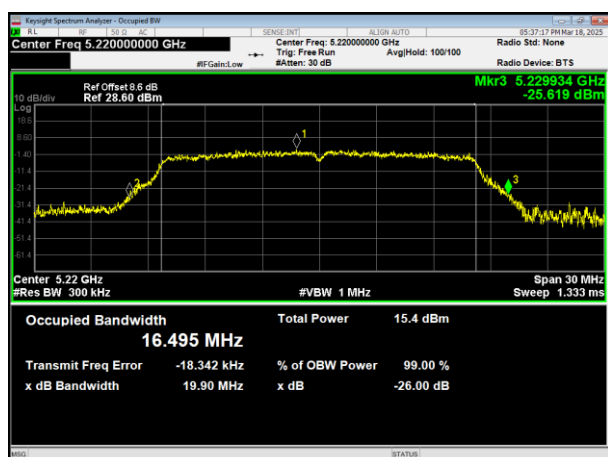
802.11a



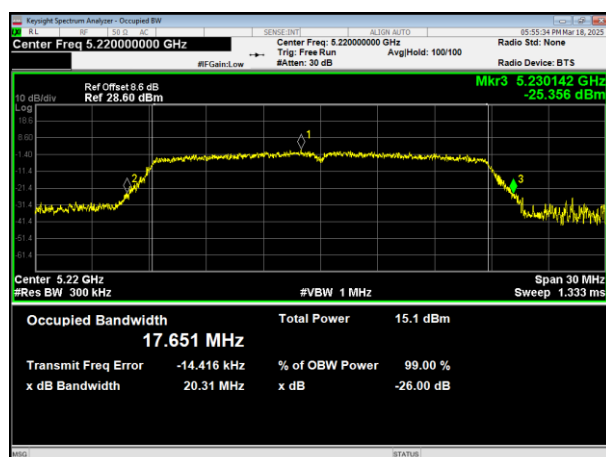
802.11ac HT20



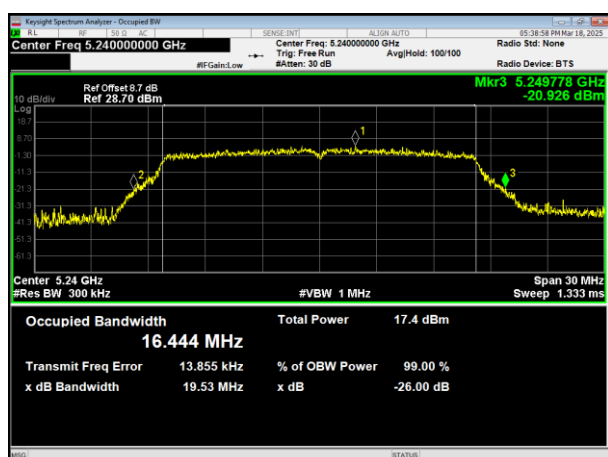
5180MHz



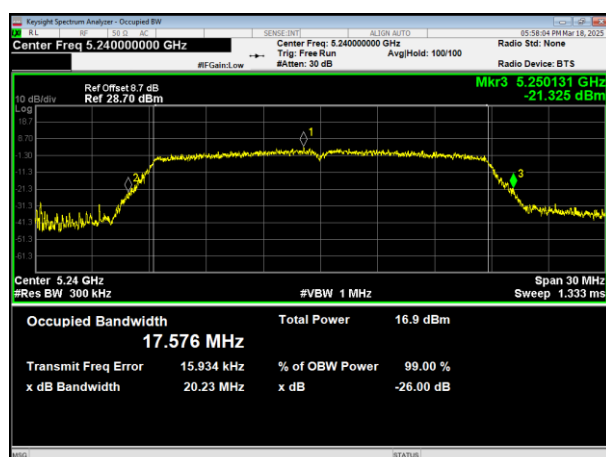
5180MHz



5200MHz



5200MHz

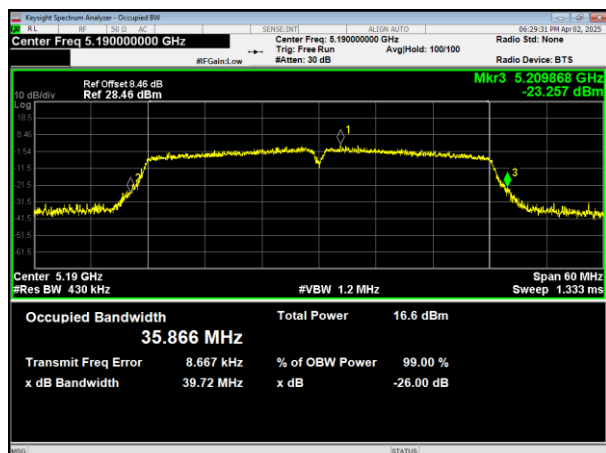


5240MHz

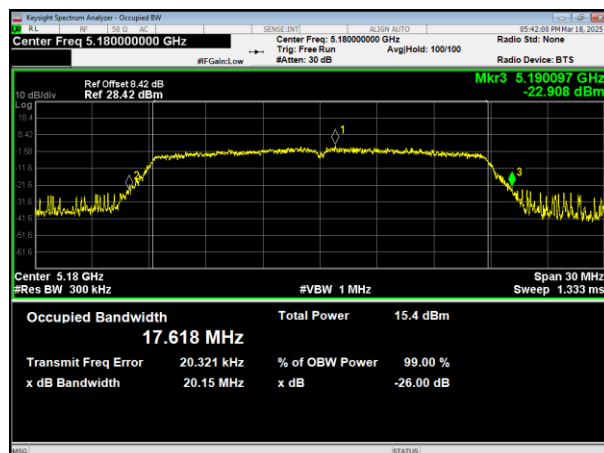
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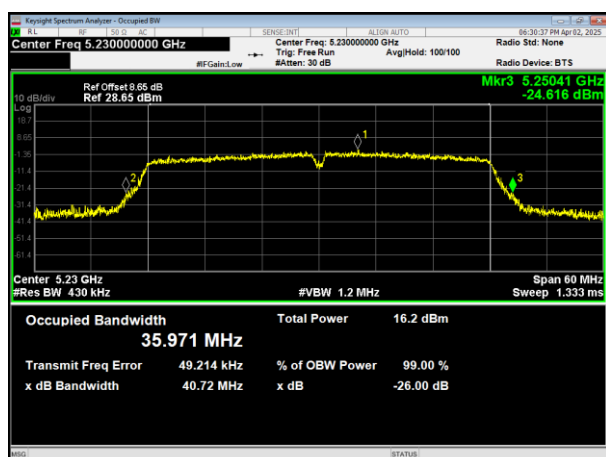
802.11ac HT40



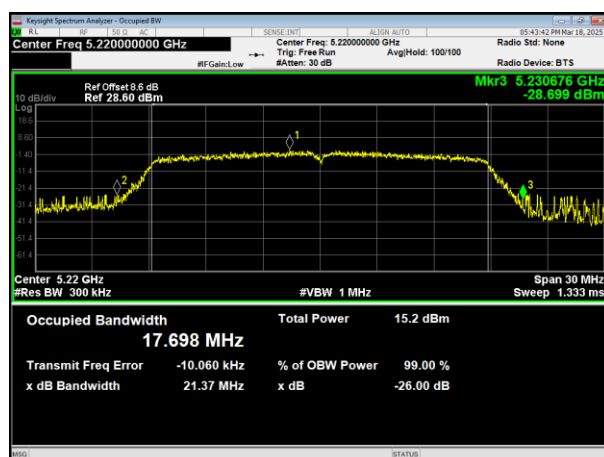
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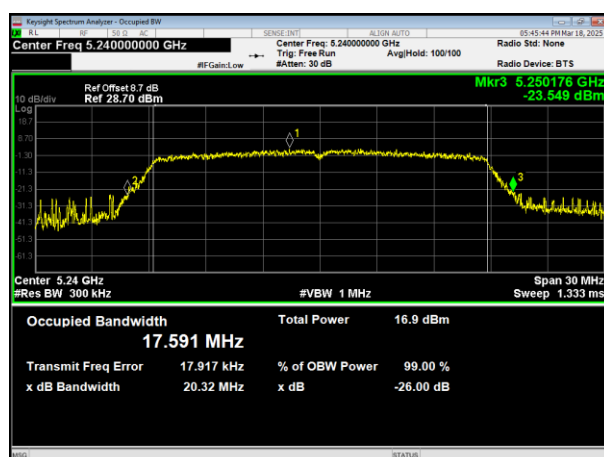
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5180MHz



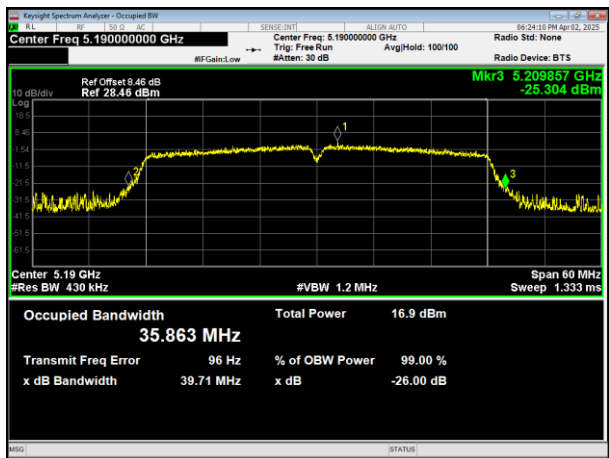
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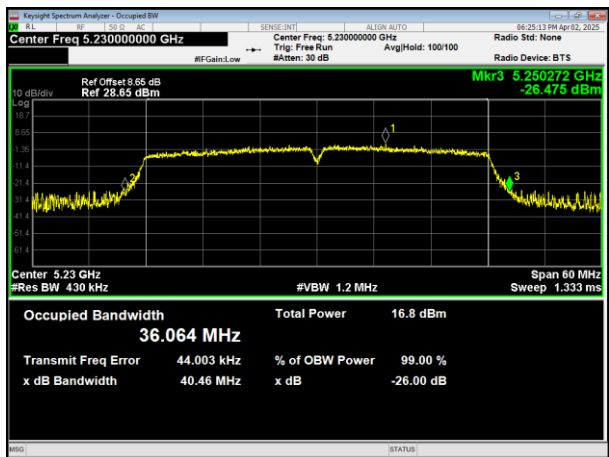
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802.11n HT40



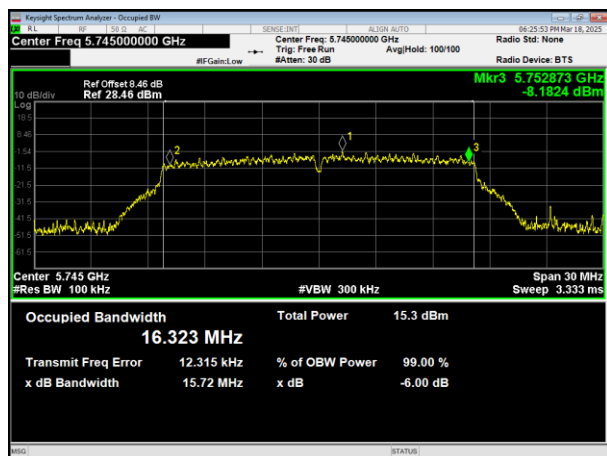
5190MHz



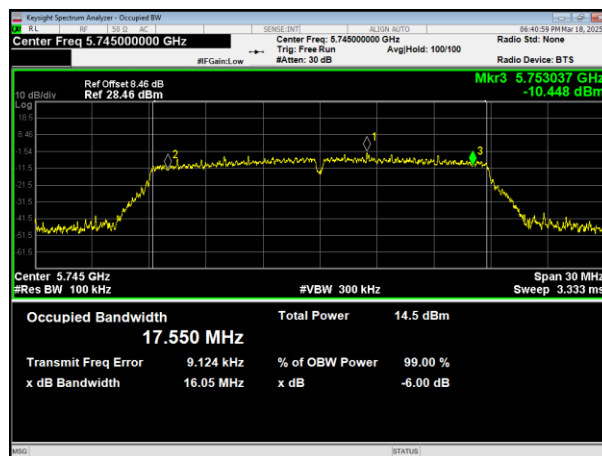
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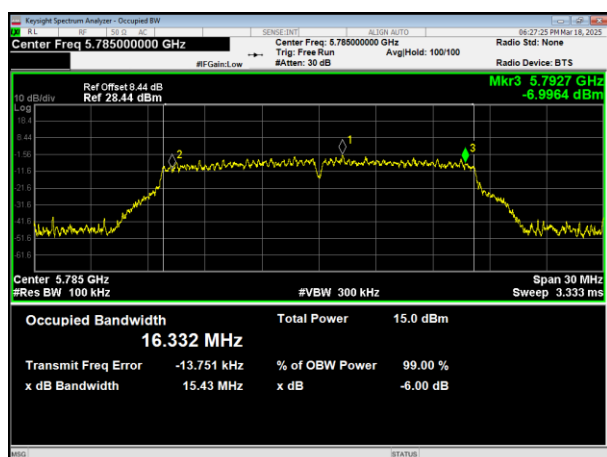
802.11a



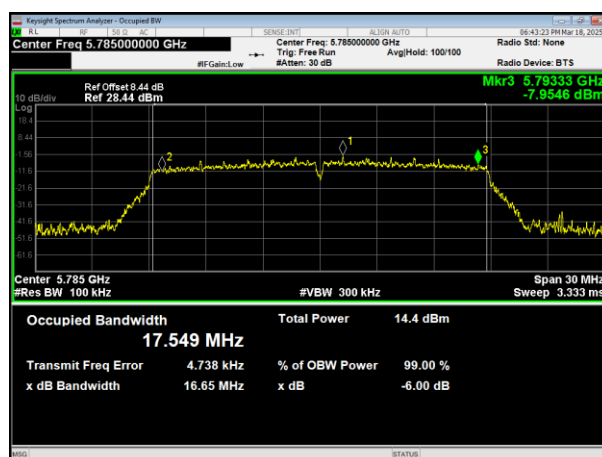
802.11ac HT20



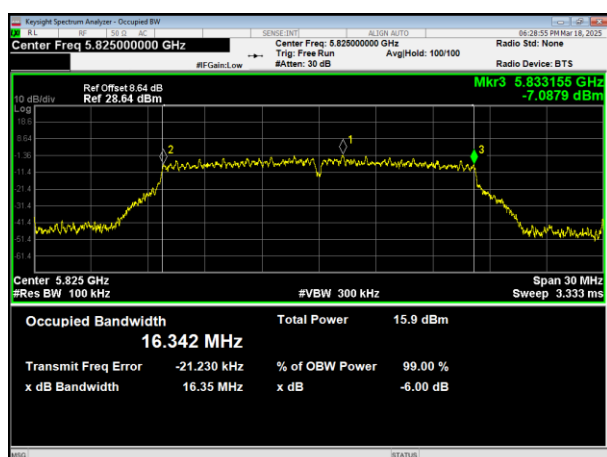
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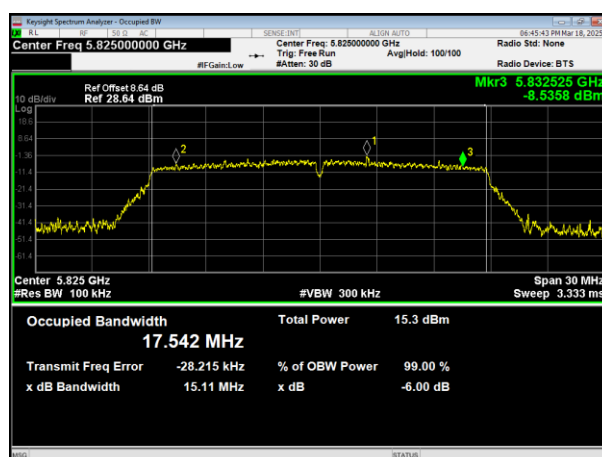
5745MHz



5785MHz



5785MHz

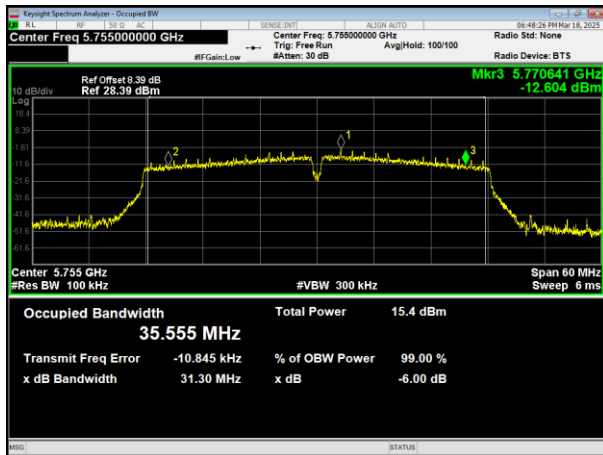


5825MHz

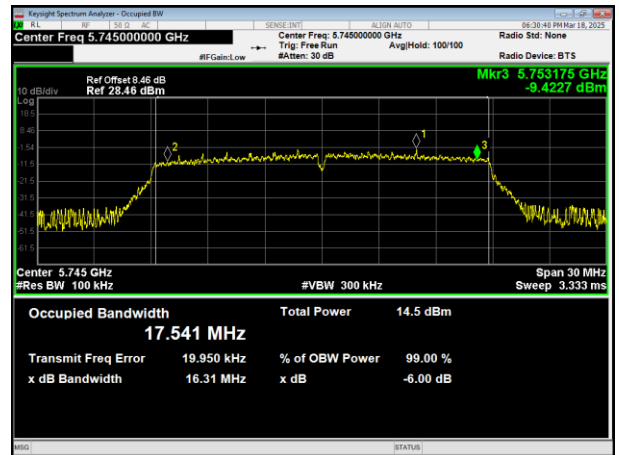
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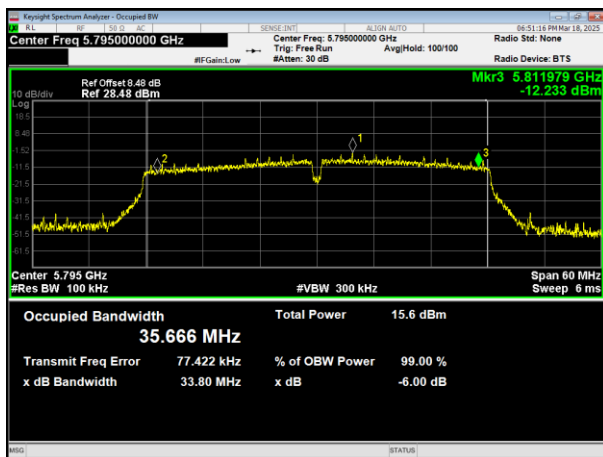
802.11ac HT40



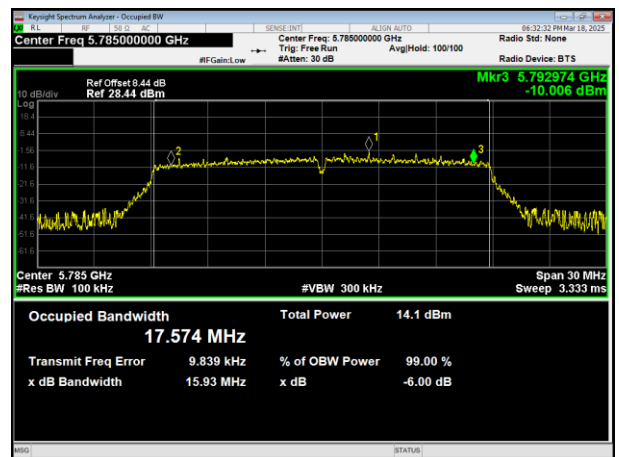
802.11n HT20



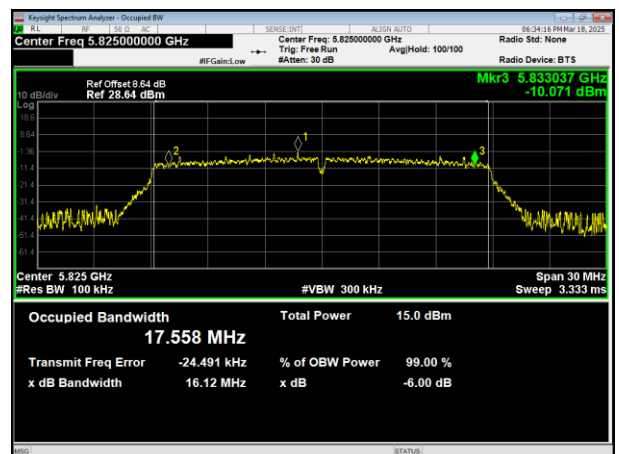
5755MHz



5745MHz



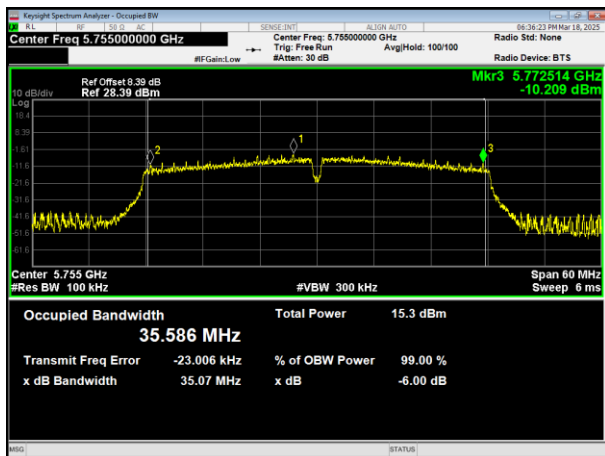
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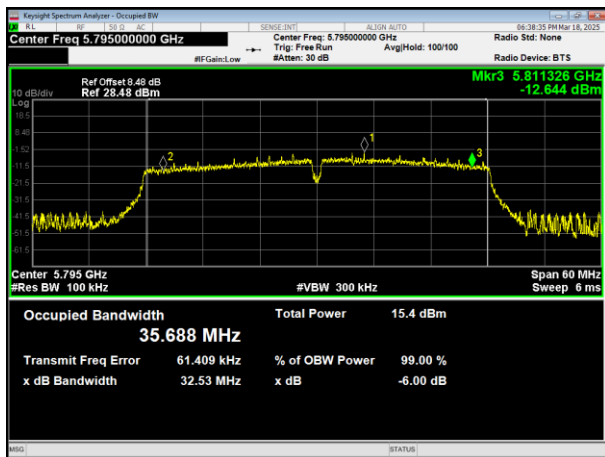
5825MHz



802.11n HT40



5755MHz



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.

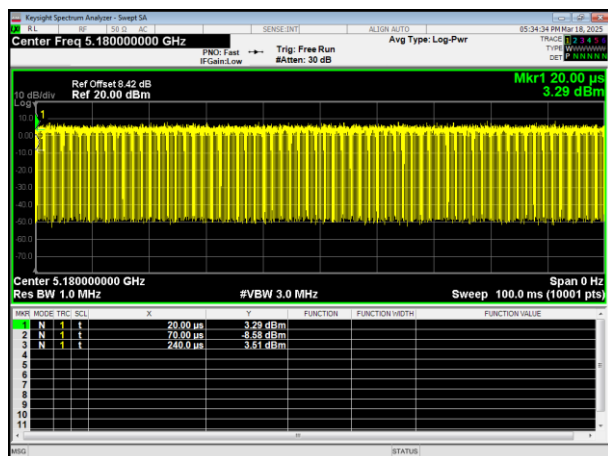
**7.1.5 TEST RESULTS**

		Test Channel	Duty Cycle(%)	Duty Fator (dB) 10 * log (1/ Duty cycle)
Band 1	802.11a	Low	77.27	1.12
		Middle	77.27	1.12
		High	81.82	0.87
	802.11ac HT20	Low	97.06	0.13
		Middle	96.32	0.16
		High	96.32	0.16
	802.11ac HT40	Low	92.86	0.32
		High	94.29	0.26
	802.11n HT20	Low	97.01	0.13
		Middle	97.01	0.13
		High	96.3	0.16
	802.11n HT40	Low	94.2	0.26
		High	94.2	0.26

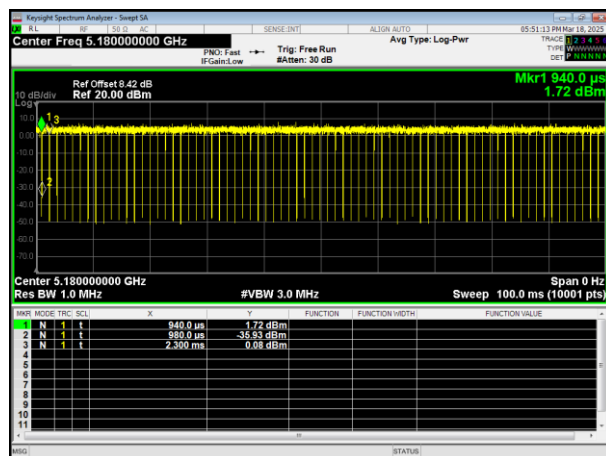
		Test Channel	Duty Cycle(%)	Duty Fator (dB) 10 * log (1/ Duty cycle)
Band 4	802.11a	Low	81.82	0.87
		Middle	81.82	0.87
		High	81.82	0.87
	802.11ac HT20	Low	96.32	0.16
		Middle	97.04	0.13
		High	97.06	0.13
	802.11ac HT40	Low	94.29	0.26
		High	94.29	0.26
	802.11n HT20	Low	96.3	0.16
		Middle	97.01	0.13
		High	97.01	0.13
	802.11n HT40	Low	94.2	0.26
		High	92.86	0.32



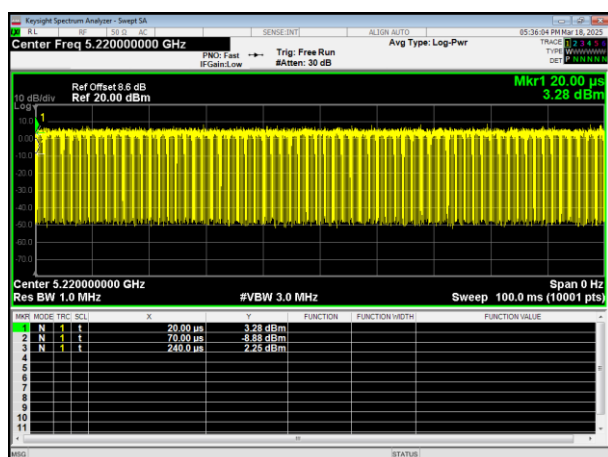
802.11a



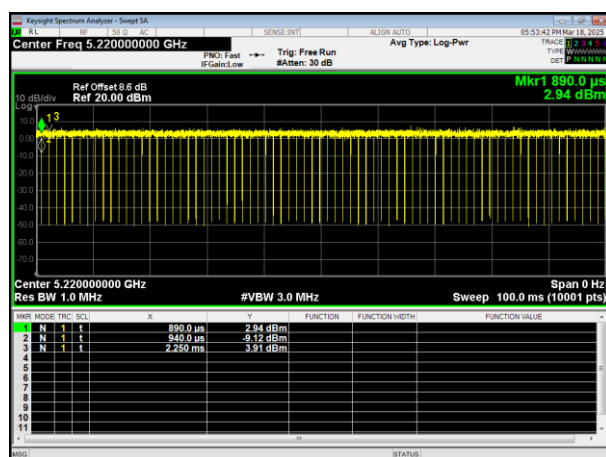
802.11ac HT20



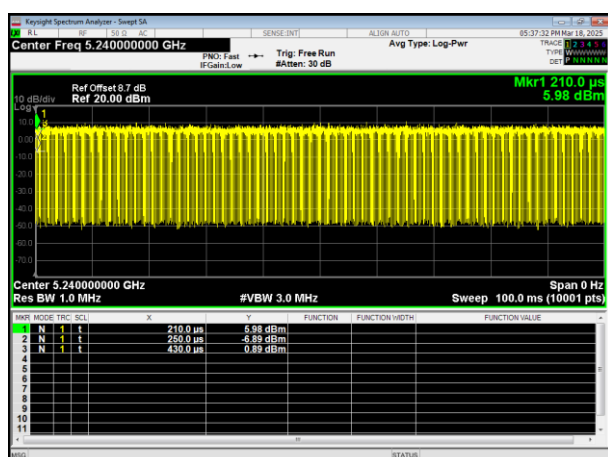
5180MHz



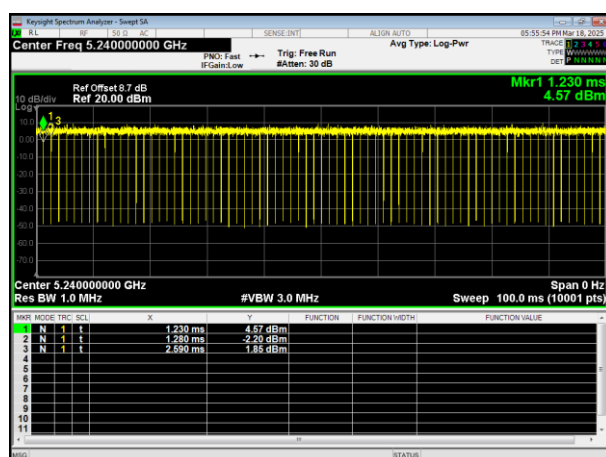
5180MHz



5200MHz



5200MHz

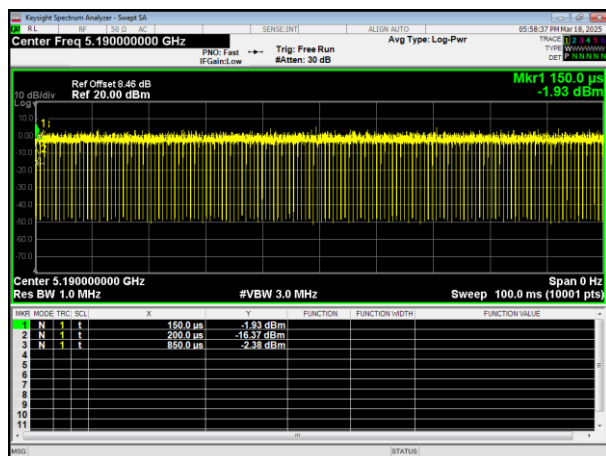


5240MHz

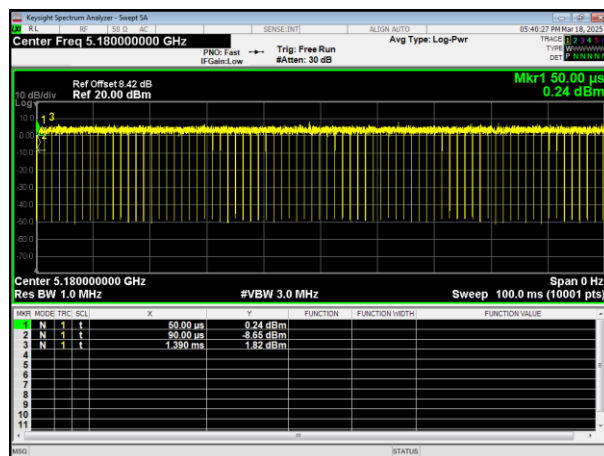
5240MHz



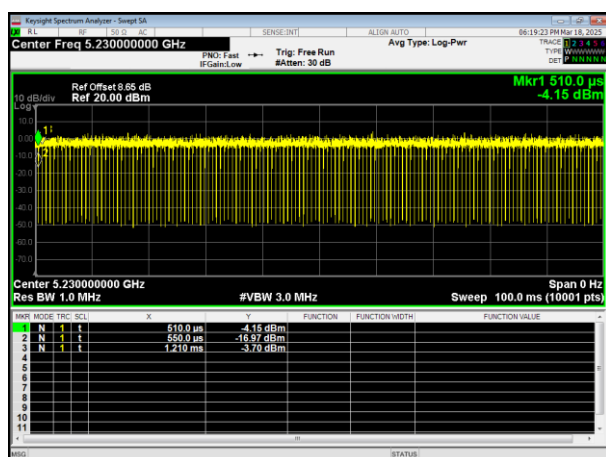
802.11ac HT40



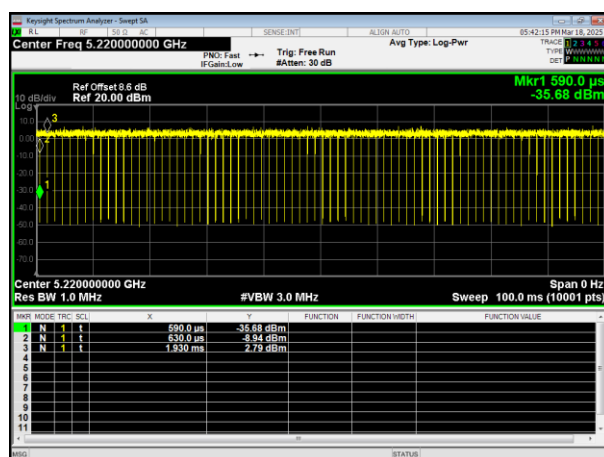
802.11n HT20



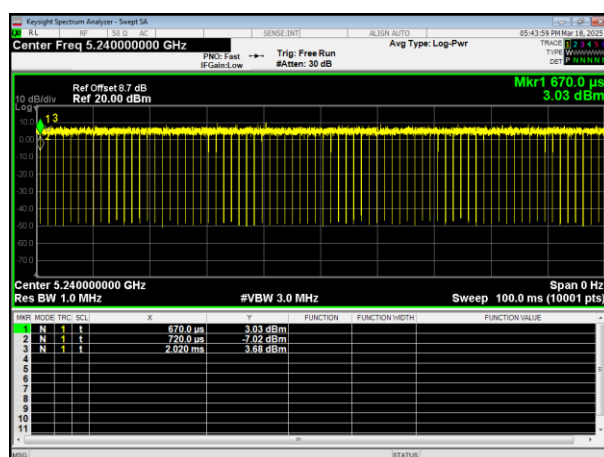
5190MHz



5180MHz



5230MHz

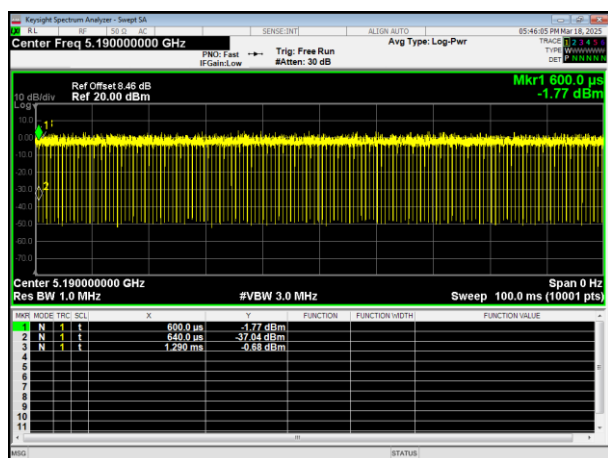


5200MHz

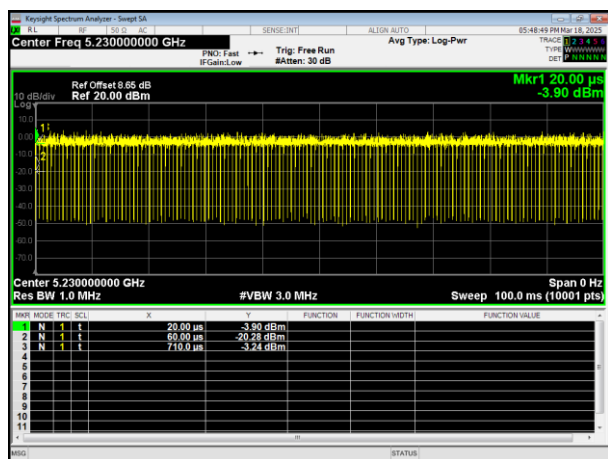
5240MHz



802.11n HT40



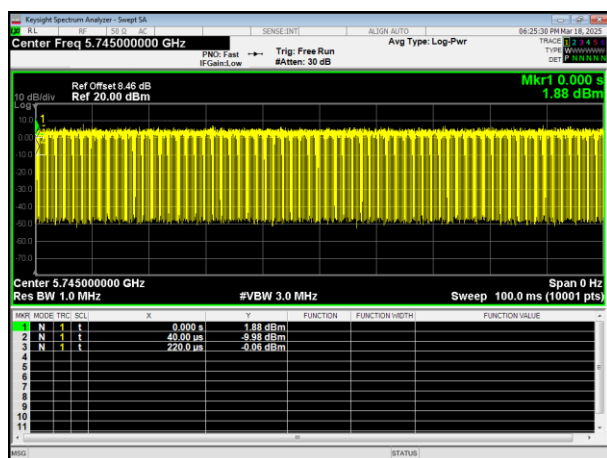
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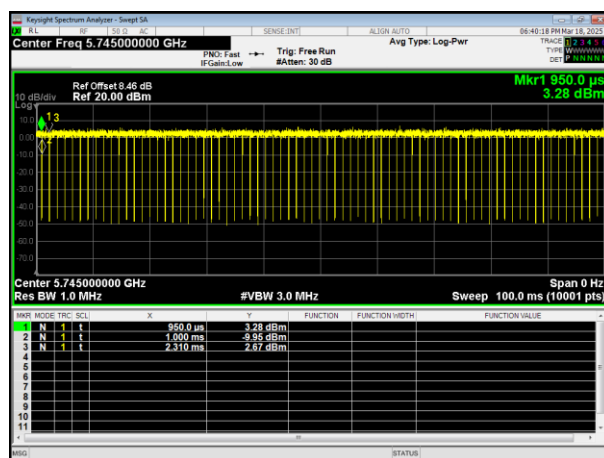
5230MHz



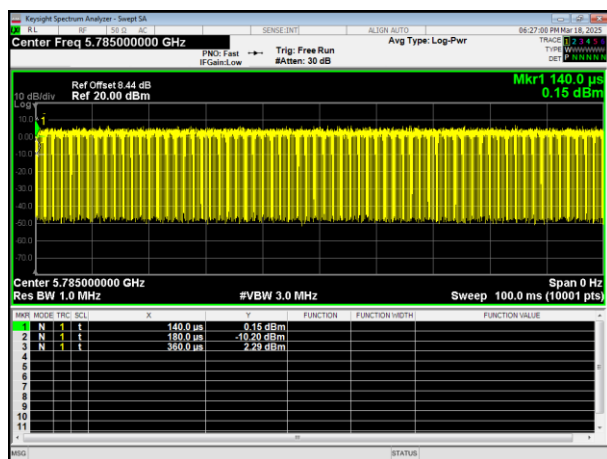
802.11a



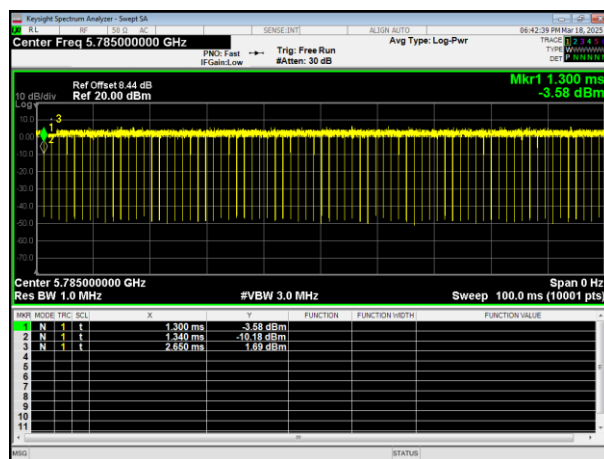
802.11ac HT20



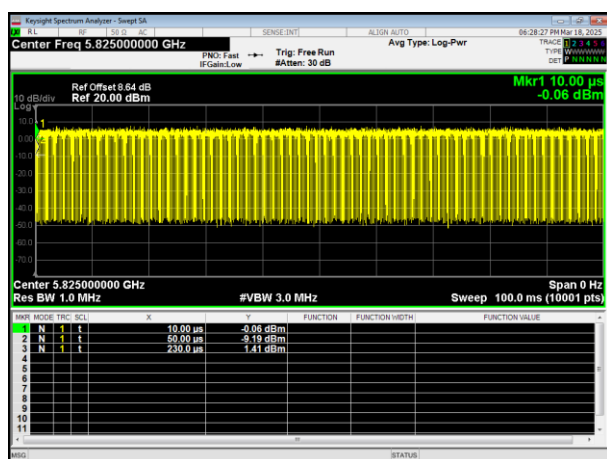
5745MHz



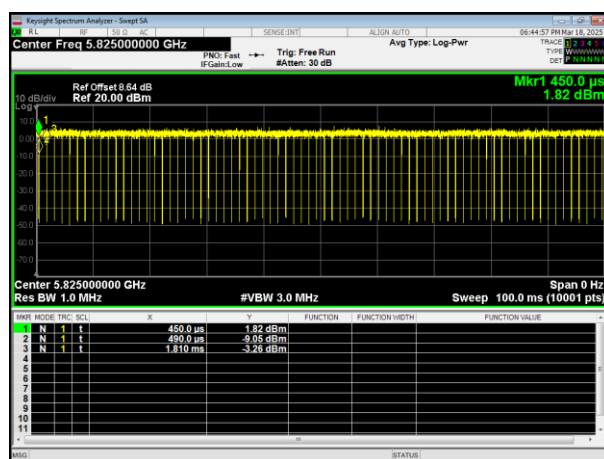
5745MHz



5785MHz



5785MHz

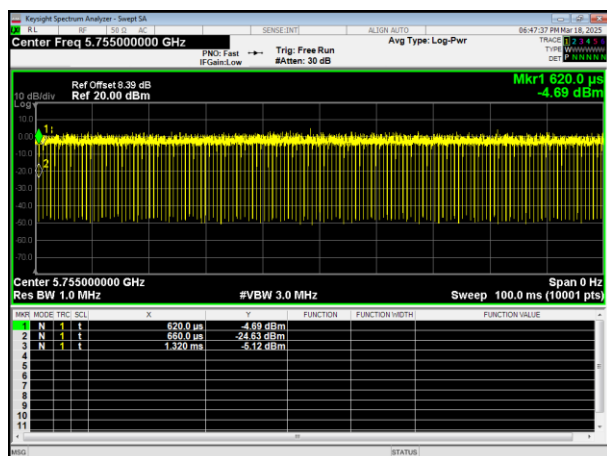


5825MHz

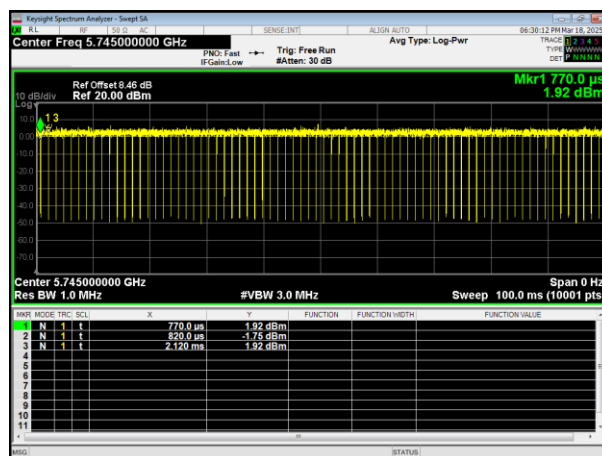
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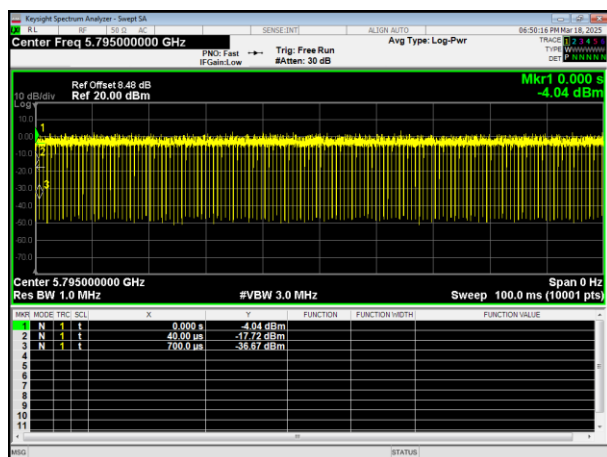
802.11ac HT40



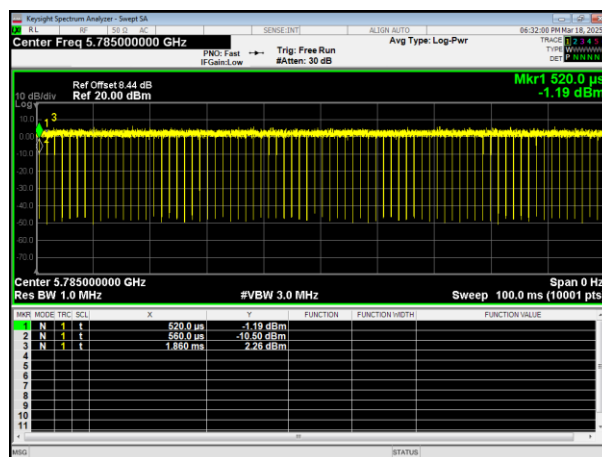
802.11n HT20



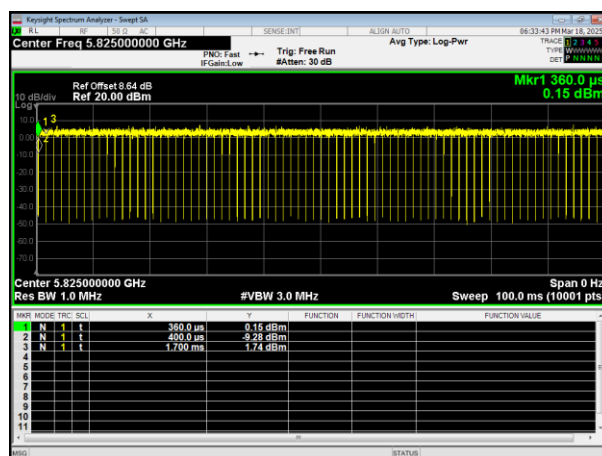
5755MHz



5745MHz



5795MHz

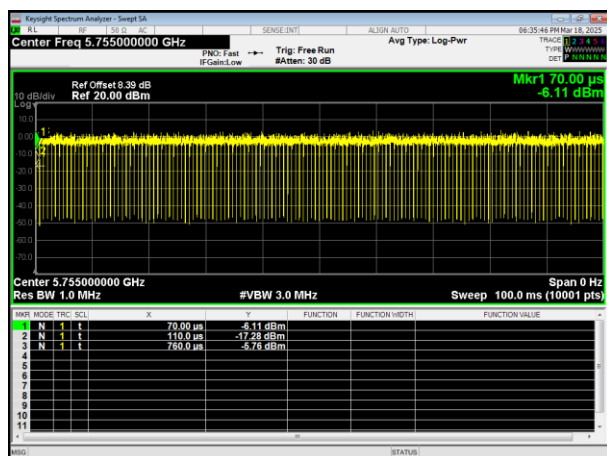


5785MHz

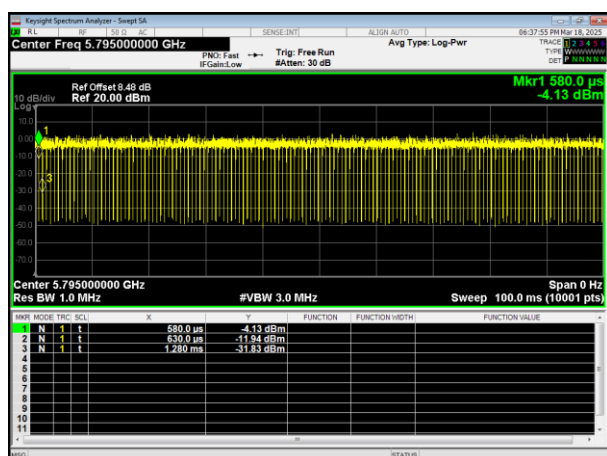
5825MHz



802.11n HT40



5755MHz



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.

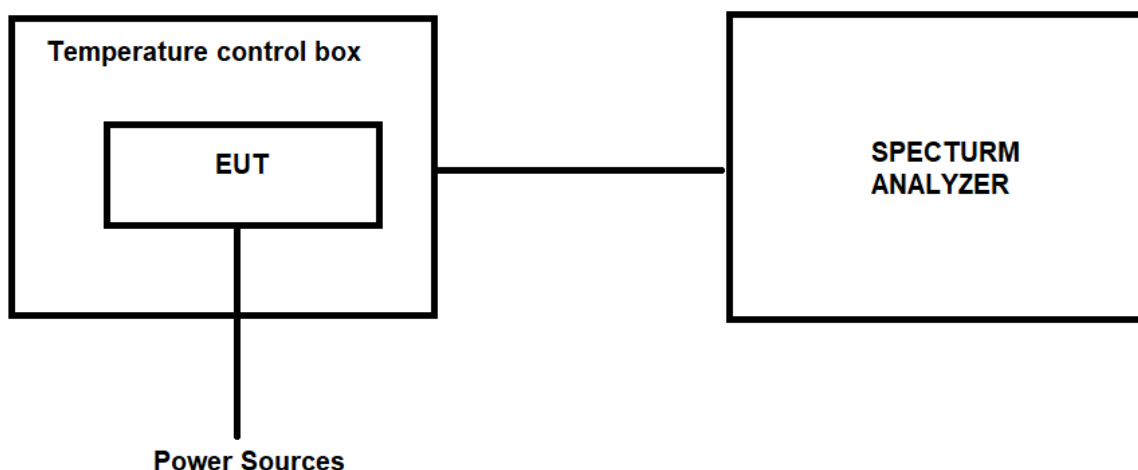
8.1.1 TEST PROCEDURE

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 (MHz)		
		(MHz)	802.11a	802.11n HT20	802.11ac HT20	802.11a	802.11n HT20	802.11ac HT20
132V	-20℃	5180	5180.0379	5180.0443	5180.0361	7.3166	8.5521	6.9691
		5220	5220.0413	5220.0371	5220.0383	7.9119	7.1073	7.3372
		5240	5240.0294	5240.0269	5240.0261	5.6107	5.1336	4.9809
		5745	5745.0449	5745.0449	5745.0380	7.8155	7.8155	6.6144
		5785	5785.0373	5785.0366	5785.0408	6.4477	6.3267	7.0527
		5825	5825.0385	5825.0405	5825.0418	6.6094	6.9528	7.1760
108V		5180	5180.0258	5180.0291	5180.0301	4.9807	5.6178	5.8108
		5220	5220.0416	5220.0410	5220.0399	7.9693	7.8544	7.6437
		5240	5240.0280	5240.0292	5240.0274	5.3435	5.5725	5.2290
		5745	5745.0342	5745.0278	5745.0316	5.9530	4.8390	5.5004
		5785	5785.0403	5785.0415	5785.0407	6.9663	7.1737	7.0354
		5825	5825.0535	5825.0494	5825.0465	9.1845	8.4807	7.9828
120V	25℃	5180	5180.0636	5180.0560	5180.0610	12.2780	10.8108	11.7761
		5220	5220.0283	5220.0286	5220.0291	5.4215	5.4789	5.5747
		5240	5240.0425	5240.0361	5240.0414	8.1107	6.8893	7.9008
		5745	5745.0374	5745.0375	5745.0378	6.5100	6.5274	6.5796
		5785	5785.0474	5785.0488	5785.0518	8.1936	8.4356	8.9542
		5825	5825.0342	5825.0276	5825.0277	5.8712	4.7382	4.7554
132V	50℃	5180	5180.0368	5180.0361	5180.0414	7.1042	6.9691	7.9923
		5220	5220.0250	5220.0291	5220.0319	4.7893	5.5747	6.1111
		5240	5240.0436	5240.0399	5240.0400	8.3206	7.6145	7.6336
		5745	5745.0674	5745.0711	5745.0694	11.7319	12.3760	12.0801
		5785	5785.0483	5785.0478	5785.0495	8.3492	8.2627	8.5566
		5825	5825.0655	5825.0678	5825.0720	11.2446	11.6395	12.3605
108V	50℃	5180	5180.0364	5180.0369	5180.0391	7.0270	7.1236	7.5483
		5220	5220.0309	5220.0314	5220.0300	5.9195	6.0153	5.7471
		5240	5240.0368	5240.0400	5240.0371	7.0229	7.6336	7.0802
		5745	5745.0474	5745.0477	5745.0515	8.2507	8.3029	8.9643
		5785	5785.0351	5785.0309	5785.0300	6.0674	5.3414	5.1858
		5825	5825.0814	5825.0789	5825.0816	13.9742	13.5451	14.0086



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
132V	-20℃	5190	5190.0261	5190.0324	5.0289	6.2428
		5230	5230.0410	5230.0392	7.8394	7.4952
		5755	5755.0555	5755.0569	9.6438	9.8871
		5795	5795.0670	5795.0667	11.5617	11.5099
108V		5190	5190.0251	5190.0309	4.8362	5.9538
		5230	5230.0403	5230.0362	7.7055	6.9216
		5755	5755.0285	5755.0721	4.9522	12.5282
		5795	5795.0514	5795.0530	8.8697	9.1458
120V	25℃	5190	5190.0261	5190.0251	5.0289	4.8362
		5230	5230.0729	5230.0696	13.9388	13.3078
		5755	5755.0258	5755.0322	4.4831	5.5951
		5795	5795.0641	5795.0578	11.0613	9.9741
132V	50℃	5190	5190.0668	5190.0687	12.8709	13.2370
		5230	5230.0555	5230.0562	10.6119	10.7457
		5755	5755.0543	5755.0466	9.4353	8.0973
		5795	5795.0366	5795.0434	6.3158	7.4892
108V	50℃	5190	5190.0627	5190.0561	12.0809	10.8092
		5230	5230.0430	5230.0418	8.2218	7.9924
		5755	5755.0421	5755.0425	7.3154	7.3849
		5795	5795.0503	5795.0494	8.6799	8.5246



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 *******