CTC Laboratories, Inc.
1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China
Tel: +86-755- 27521059 Fax: +86-755- 27521011 Http://www.sz-ctc.org.cn

Appendix for 5GHz WIFI

Applicant: Fanvil Technology Co., LTD.

Address: 10/F Block A, Dualshine Global Science Innovation Center, Honglang North 2nd Road, Bao'an District, Shenzhen, China

Product Name: IP Phone

Model: X303W, X301W

FCC ID: 2APPZ-BL

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Appendix A1: Emission Bandwidth

Test Result

Test Mode	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Verdict
802.11a	5180	24.720	5169.080	5193.800	PASS
	5200	19.600	5190.240	5209.840	PASS
	5240	20.160	5230.320	5250.480	PASS
	5745	21.520	5735.040	5756.560	PASS
	5785	21.400	5774.960	5796.360	PASS
	5825	25.080	5813.760	5838.840	PASS
802.11n(HT20)	5180	23.880	5169.880	5193.760	PASS
	5200	20.960	5189.560	5210.520	PASS
	5240	23.840	5227.680	5251.520	PASS
	5745	23.080	5732.800	5755.880	PASS
	5785	26.360	5771.080	5797.440	PASS
	5825	28.960	5809.320	5838.280	PASS
802.11n(HT40)	5190	38.000	5171.040	5209.040	PASS
	5230	38.080	5210.880	5248.960	PASS
	5755	37.920	5736.040	5773.960	PASS
	5795	48.560	5765.480	5814.040	PASS
802.11ac(VHT20)	5180	20.280	5169.920	5190.200	PASS
	5200	21.080	5190.200	5211.280	PASS
	5240	19.760	5230.360	5250.120	PASS
	5745	24.400	5733.080	5757.480	PASS
	5785	24.360	5772.600	5796.960	PASS
	5825	26.320	5811.680	5838.000	PASS
802.11ac(VHT40)	5190	49.040	5169.440	5218.480	PASS
	5230	40.800	5209.920	5250.720	PASS
	5755	52.640	5728.600	5781.240	PASS
	5795	66.080	5762.600	5828.680	PASS

Test Graphs

802.11a_5180

802.11a_5200

802.11a_5240

802.11a_5745

802.11a_5785

802.11a_5825

802.11n(HT20)_5180

802.11n(HT20)_5200

802.11n(HT20)_5240

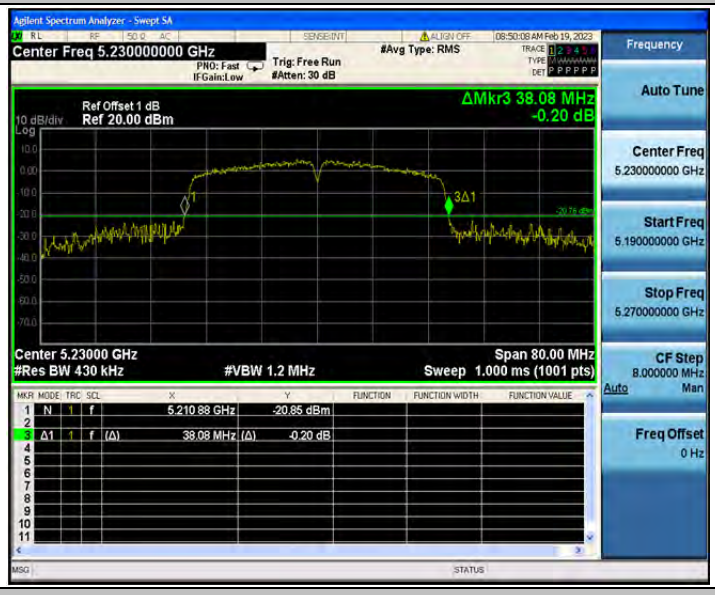
802.11n(HT20)_5745

802.11n(HT20)_5785

802.11n(HT20)_5825

802.11n(HT40)_5190

802.11n(HT40)_5230



802.11n(HT40)_5755

802.11n(HT40)_5795

802.11ac(VHT20)_5180

802.11ac(VHT20)_5200

802.11ac(VHT20)_5240

802.11ac(VHT20)_5745

802.11ac(VHT20)_5785

802.11ac(VHT20)_5825

802.11ac(VHT40)_5190

802.11ac(VHT40)_5230

802.11ac(VHT40)_5755

802.11ac(VHT40)_5795

Appendix A2: Occupied channel bandwidth

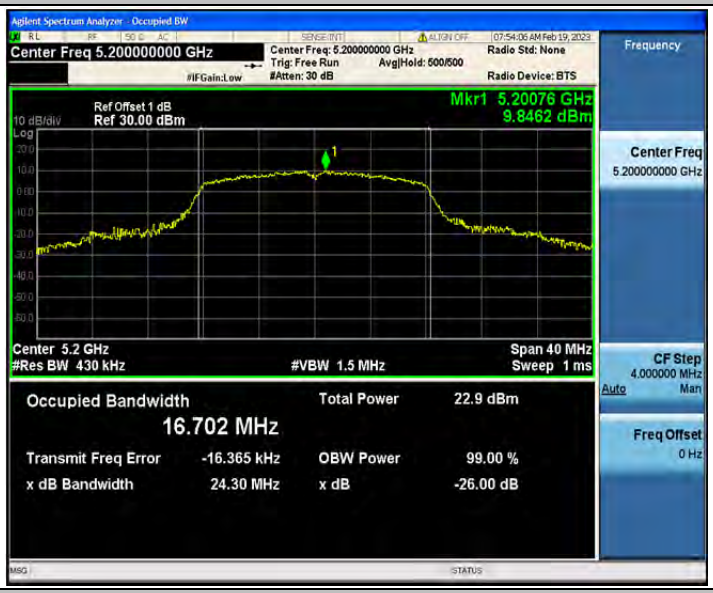
Test Result

Test Mode	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
802.11a	5180	16.970	5171.594	5188.564	PASS
	5200	16.702	5191.633	5208.335	PASS
	5240	16.721	5231.622	5248.343	PASS
	5745	16.754	5736.597	5753.351	PASS
	5785	16.720	5776.603	5793.323	PASS
	5825	16.907	5816.536	5833.443	PASS
802.11n(HT20)	5180	17.730	5171.175	5188.905	PASS
	5200	17.743	5191.154	5208.897	PASS
	5240	17.815	5231.054	5248.869	PASS
	5745	17.952	5735.985	5753.937	PASS
	5785	17.931	5776.053	5793.984	PASS
	5825	17.410	5816.244	5833.654	PASS
802.11n(HT40)	5190	35.379	5172.376	5207.755	PASS
	5230	35.360	5212.272	5247.632	PASS
	5755	35.509	5737.229	5772.738	PASS
	5795	35.622	5777.098	5812.720	PASS
802.11ac(VHT20)	5180	16.730	5171.698	5188.428	PASS
	5200	16.727	5191.641	5208.368	PASS
	5240	16.700	5231.660	5248.360	PASS
	5745	16.853	5736.480	5753.333	PASS
	5785	16.891	5776.506	5793.397	PASS
	5825	16.997	5816.502	5833.499	PASS
802.11ac(VHT40)	5190	36.345	5171.872	5208.217	PASS
	5230	36.200	5211.793	5247.993	PASS
	5755	36.541	5736.682	5773.223	PASS
	5795	36.612	5776.563	5813.175	PASS

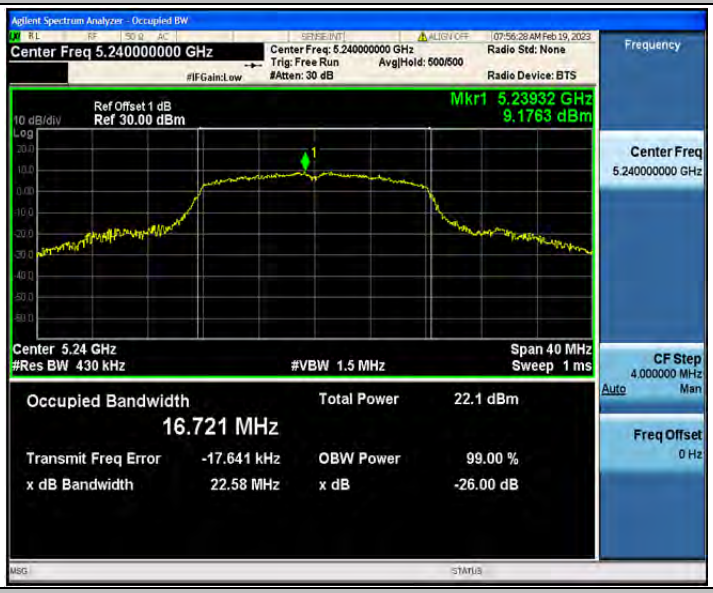
Test Graphs

802.11a_5180

802.11a_5200



802.11a_5240



802.11a_5745

802.11a_5785

802.11a_5825

802.11n(HT20)_5180

802.11n(HT20)_5200

802.11n(HT20)_5240

802.11n(HT20)_5745

802.11n(HT20)_5785

802.11n(HT20)_5825

802.11n(HT40)_5190

802.11n(HT40)_5230

802.11n(HT40)_5755

802.11n(HT40)_5795

802.11ac(VHT20)_5180

802.11ac(VHT20)_5200

802.11ac(VHT20)_5240

802.11ac(VHT20)_5745

802.11ac(VHT20)_5785

802.11ac(VHT20)_5825

802.11ac(VHT40)_5190

802.11ac(VHT40)_5230

802.11ac(VHT40)_5755

802.11ac(VHT40)_5795

Appendix A3: Min emission bandwidth

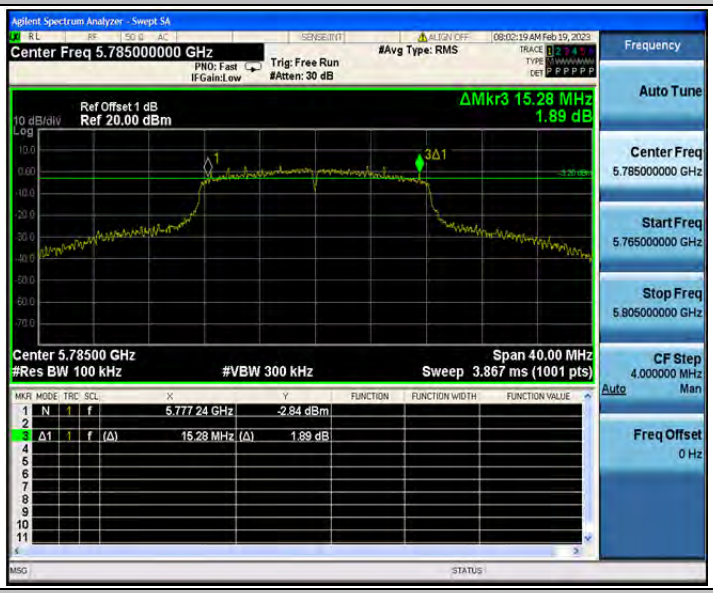
Test Result

Test Mode	Channel	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
802.11a	5745	13.440	5737.400	5750.840	>0.5	PASS
	5785	15.280	5777.240	5792.520	>0.5	PASS
	5825	15.080	5817.440	5832.520	>0.5	PASS
802.11n(HT20)	5745	13.840	5737.440	5751.280	>0.5	PASS
	5785	15.040	5777.480	5792.520	>0.5	PASS
	5825	15.080	5817.440	5832.520	>0.5	PASS
802.11n(HT40)	5755	31.360	5738.680	5770.040	>0.5	PASS
	5795	31.280	5778.680	5809.960	>0.5	PASS
802.11ac(VHT20)	5745	11.720	5739.600	5751.320	>0.5	PASS
	5785	15.000	5777.480	5792.480	>0.5	PASS
	5825	14.000	5818.480	5832.480	>0.5	PASS
802.11ac(VHT40)	5755	30.080	5739.960	5770.040	>0.5	PASS
	5795	30.640	5780.600	5811.240	>0.5	PASS
802.11ac(VHT80)	5775	13.440	5737.400	5750.840	>0.5	PASS

Test Graphs

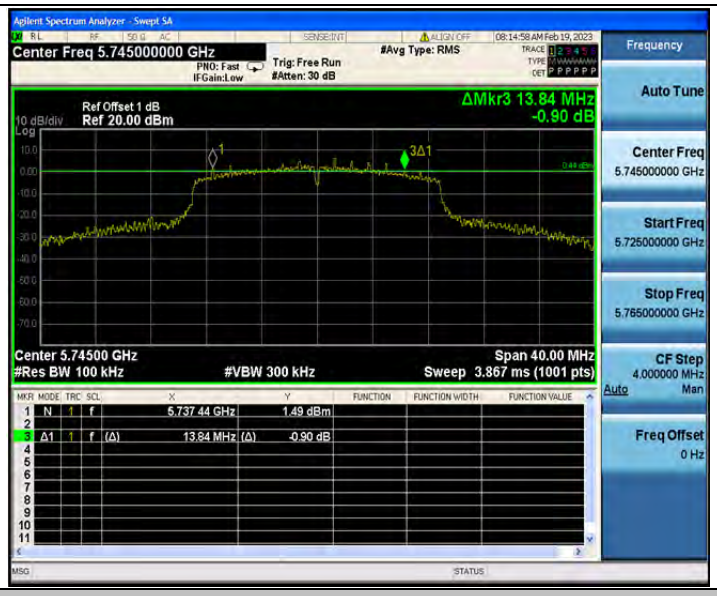
802.11a_5745

802.11a_5785



802.11a_5825

802.11n(HT20)_5745



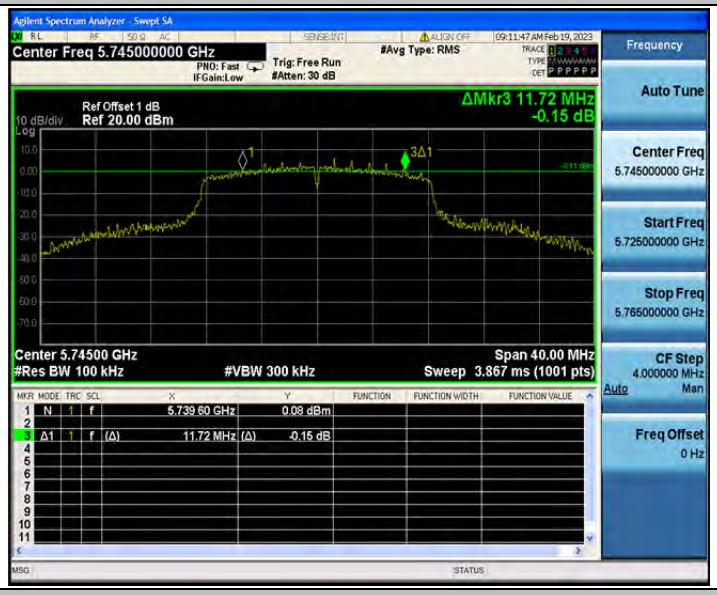
802.11n(HT20)_5785

802.11n(HT20)_5825

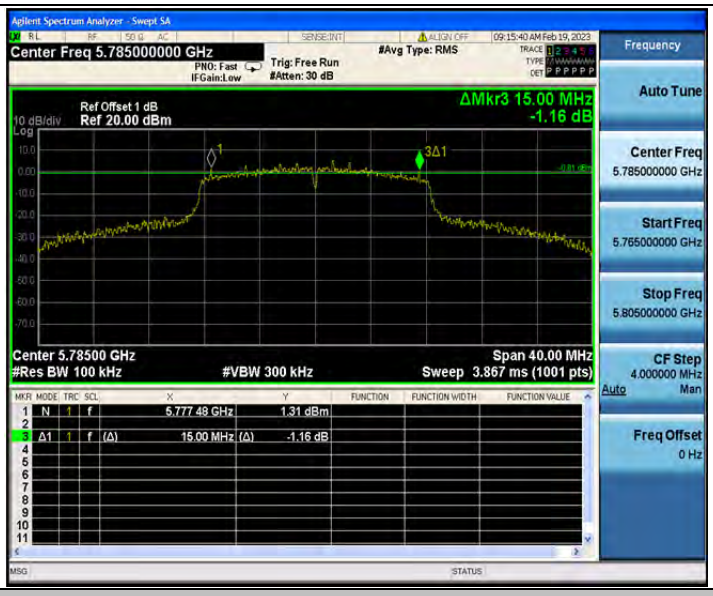
802.11n(HT40)_5755

802.11n(HT40)_5795

802.11ac(VHT20)_5745



802.11ac(VHT20)_5785



802.11ac(VHT20)_5825

802.11ac(VHT40)_5755

802.11ac(VHT40)_5795


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.795000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
09:35:34 AM Feb 19, 2023
Ref Offset 1 dB
10 dB/div Ref 20.00 dBm
ΔMkr3 30.64 MHz
0.10 dB
Center 5.79500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 80.00 MHz
Sweep 7.667 ms (1001 pts)
1 N 1 f 5.780 60 GHz -6.37 dBm
3 Δ1 1 f (Δ) 30.64 MHz (Δ) 0.10 dB
Frequency
Auto Tune
Center Freq
5.795000000 GHz
Start Freq
5.755000000 GHz
Stop Freq
5.835000000 GHz
CF Step
8.000000 MHz
Auto Man
Freq Offset
0 Hz

Appendix B: Maximum conducted output power

Test Result

Test Mode	Channel	Result Avg[dBm]	Limit[dBm]	Verdict
802.11a	5180	16.79	<=24	PASS
	5200	16.49	<=24	PASS
	5240	15.70	<=24	PASS
	5745	15.83	<=30	PASS
	5785	15.75	<=30	PASS
	5825	15.49	<=30	PASS
802.11n(HT20)	5180	16.04	<=24	PASS
	5200	16.02	<=24	PASS
	5240	16.23	<=24	PASS
	5745	16.08	<=30	PASS
	5785	15.27	<=30	PASS
	5825	16.07	<=30	PASS
802.11n(HT40)	5190	15.01	<=24	PASS
	5230	15.98	<=24	PASS
	5755	15.74	<=30	PASS
	5795	14.76	<=30	PASS
802.11ac(VHT20)	5180	16.42	<=24	PASS
	5200	16.27	<=24	PASS
	5240	15.81	<=24	PASS
	5745	15.91	<=30	PASS
	5785	15.44	<=30	PASS
	5825	15.06	<=30	PASS
802.11ac(VHT40)	5190	13.68	<=24	PASS
	5230	13.29	<=24	PASS
	5755	13.51	<=30	PASS
	5795	12.37	<=30	PASS

Note：1. Test results increased RF cable loss by 1dB.

2. Test results increased The Duty Cycle Factor.

Appendix C: Maximum power spectral density

Test Result

Test Mode	Channel	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
802.11a	5180	7.30	<=11	PASS
	5200	6.76	<=11	PASS
	5240	5.95	<=11	PASS
	5745	5.54	<=30	PASS
	5785	5.21	<=30	PASS
	5825	3.81	<=30	PASS
802.11n(HT20)	5180	6.49	<=11	PASS
	5200	6.38	<=11	PASS
	5240	6.31	<=11	PASS
	5745	4.65	<=30	PASS
	5785	4.45	<=30	PASS
	5825	4.39	<=30	PASS
802.11n(HT40)	5190	2.93	<=11	PASS
	5230	3.15	<=11	PASS
	5755	1.56	<=30	PASS
	5795	0.85	<=30	PASS
802.11ac(VHT20)	5180	7.27	<=11	PASS
	5200	7.09	<=11	PASS
	5240	5.87	<=11	PASS
	5745	4.59	<=30	PASS
	5785	4.29	<=30	PASS
	5825	4.80	<=30	PASS
802.11ac(VHT40)	5190	0.94	<=11	PASS
	5230	1.06	<=11	PASS
	5755	0.47	<=30	PASS
	5795	0.60	<=30	PASS

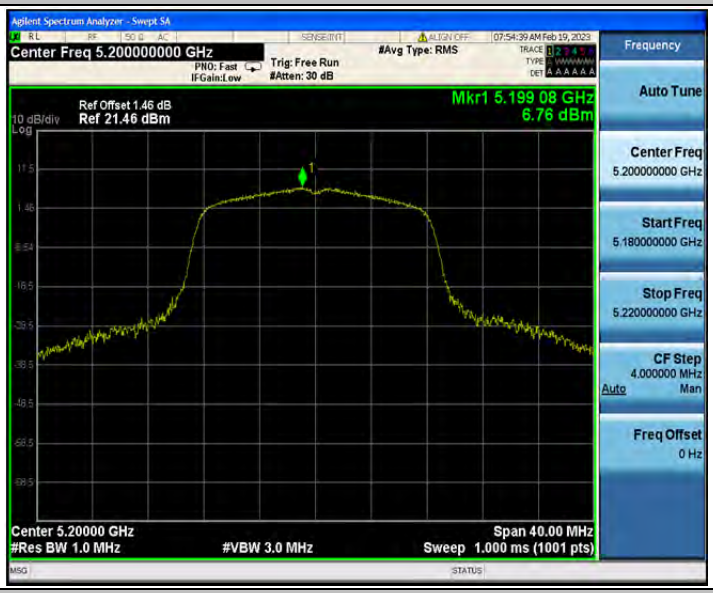
Note：1. The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.

2. The Duty Cycle Factor and RBW Factor is compensated in the graph.

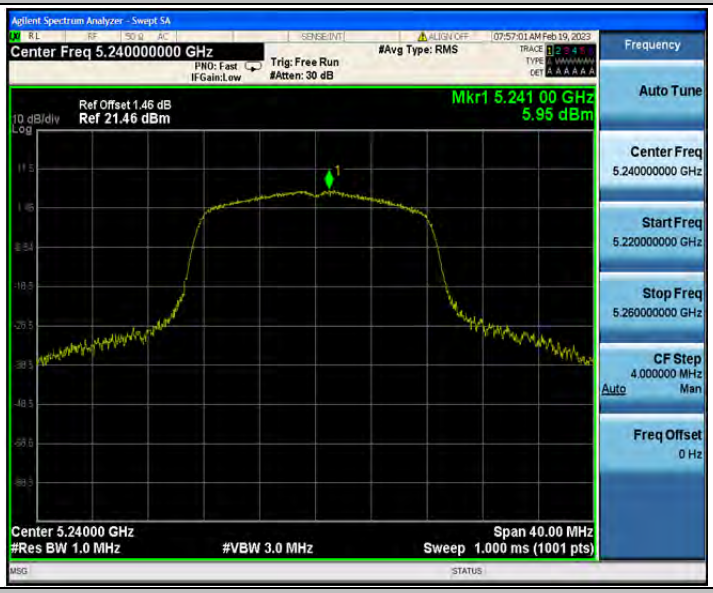
Test Graphs

802.11a_5180

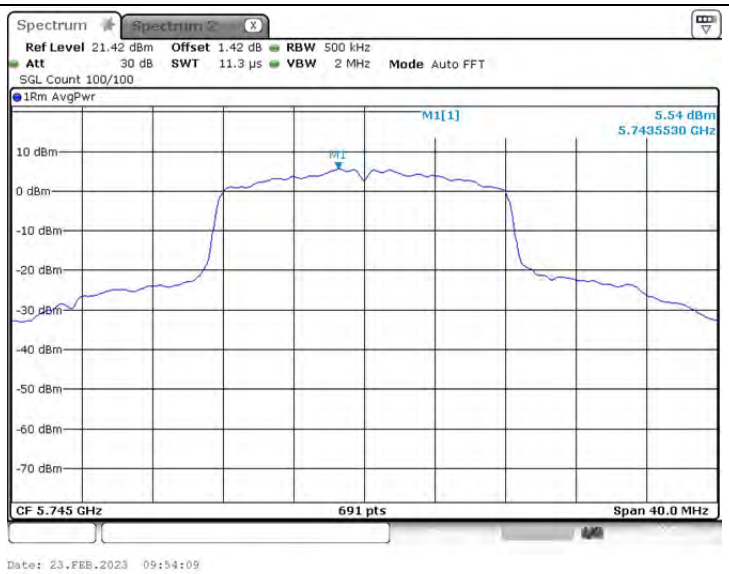
802.11a_5200



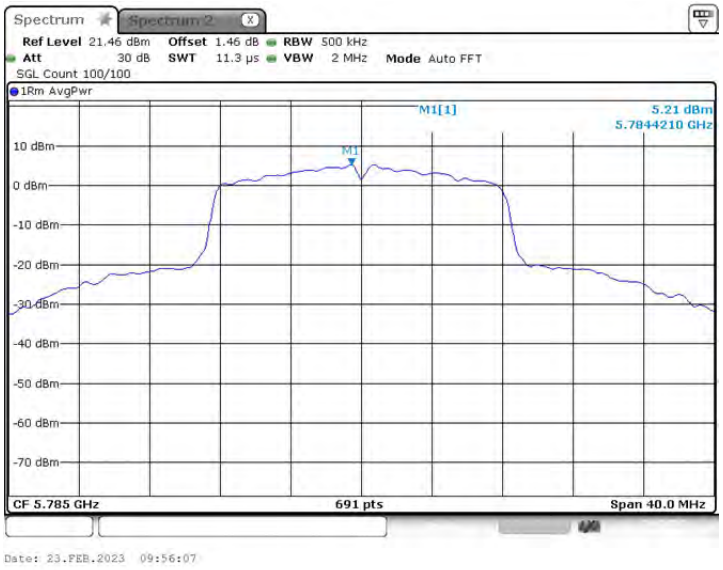
802.11a_5240



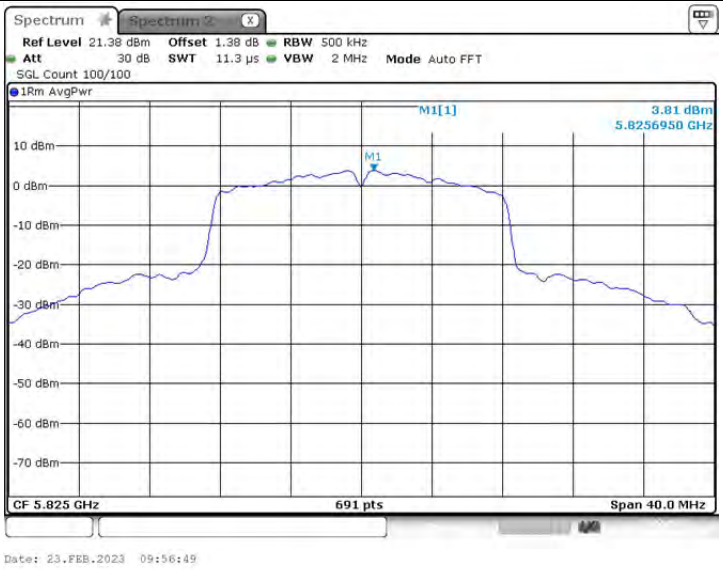
802.11a_5745



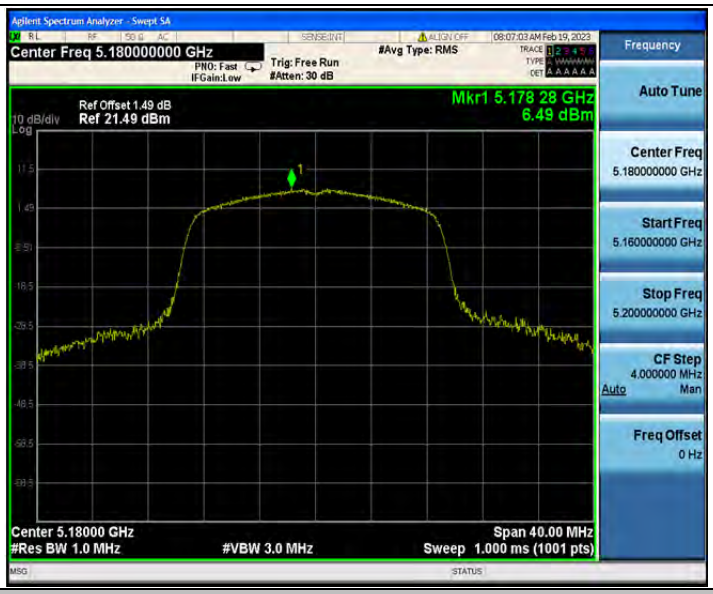
802.11a_5785



802.11a_5825

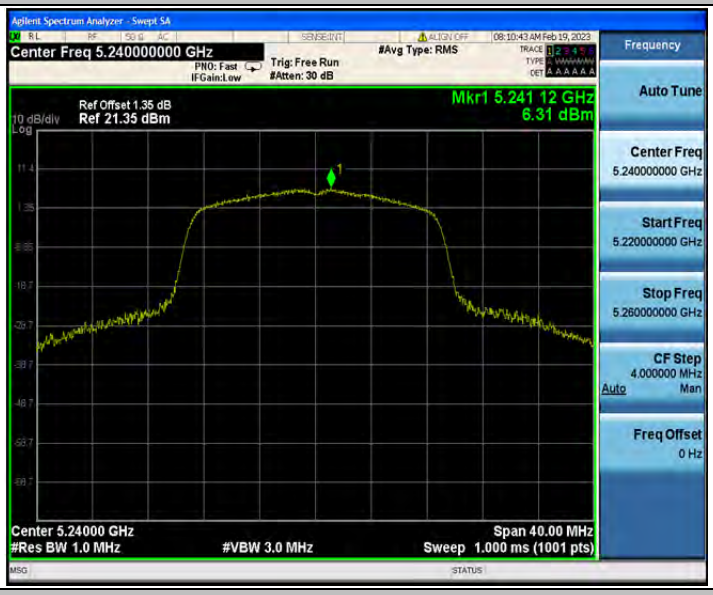


802.11n(HT20)_5180

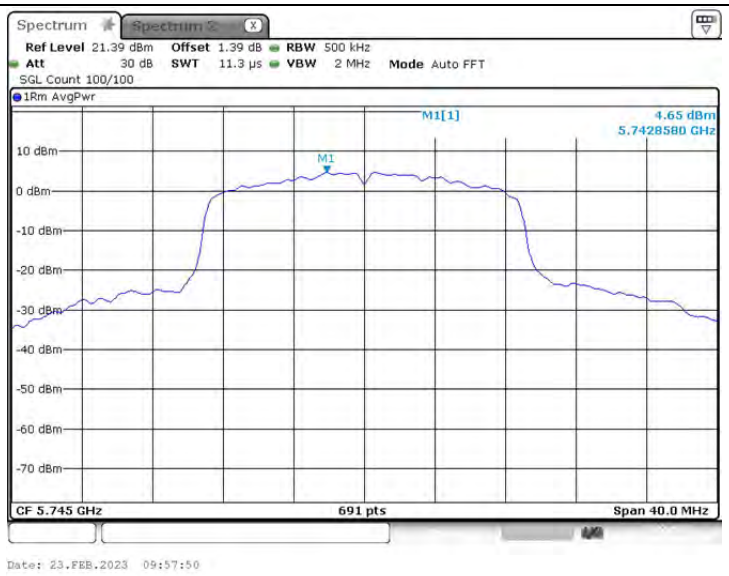


802.11n(HT20)_5200

802.11n(HT20)_5240



802.11n(HT20)_5745



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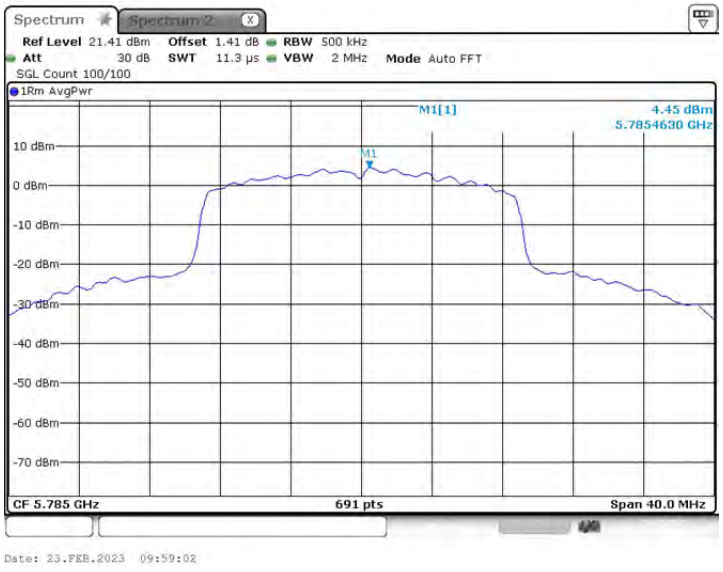
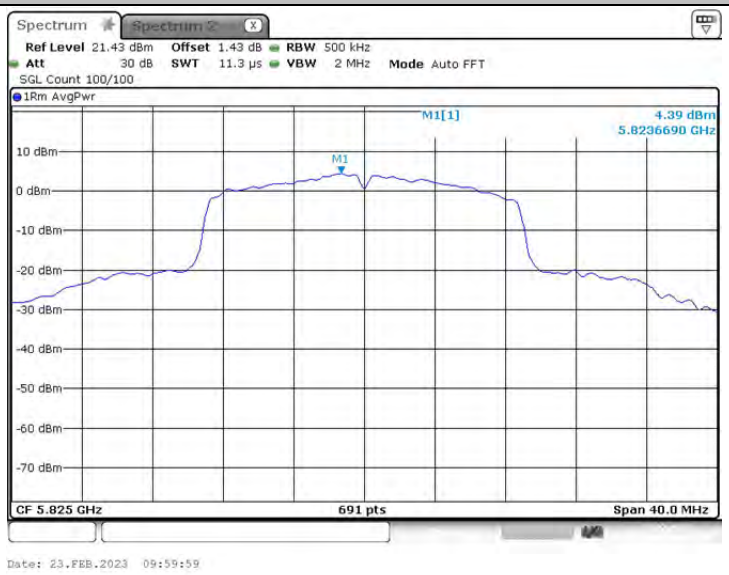
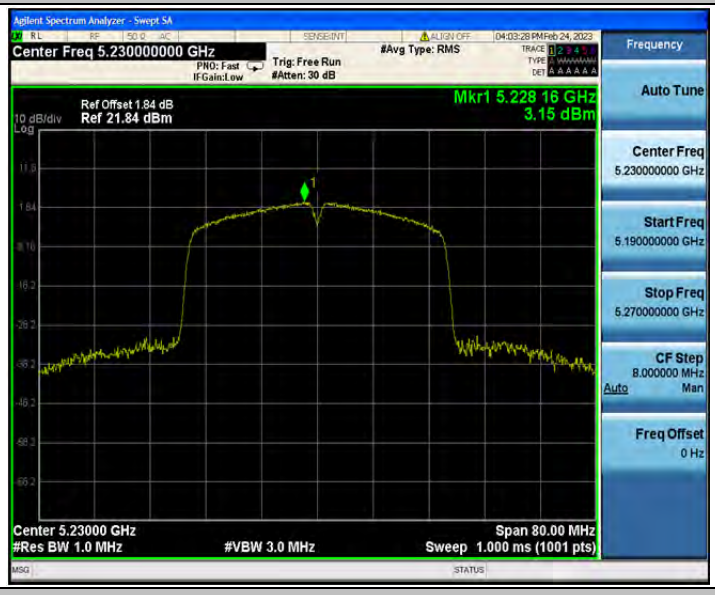


802.11n(HT20)_5825

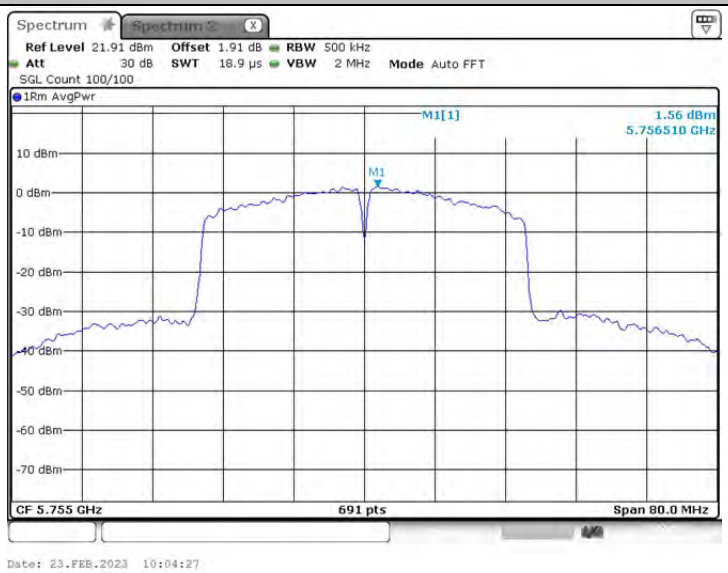


802.11n(HT40)_5190

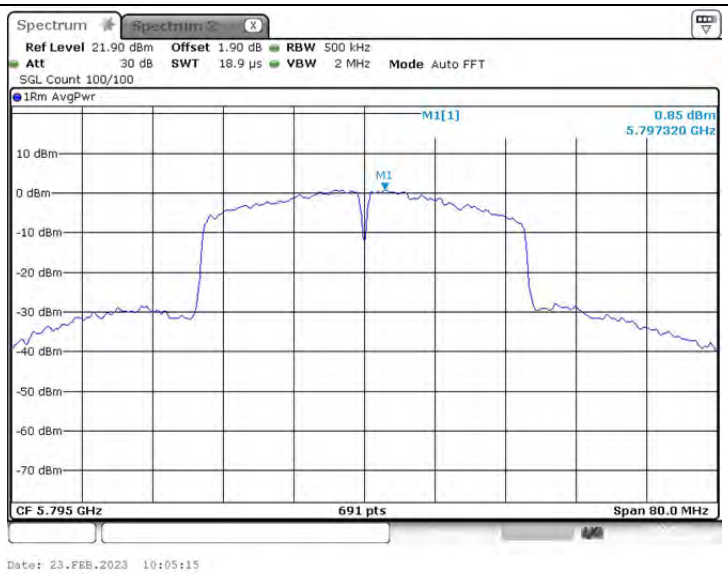
802.11n(HT40)_5230



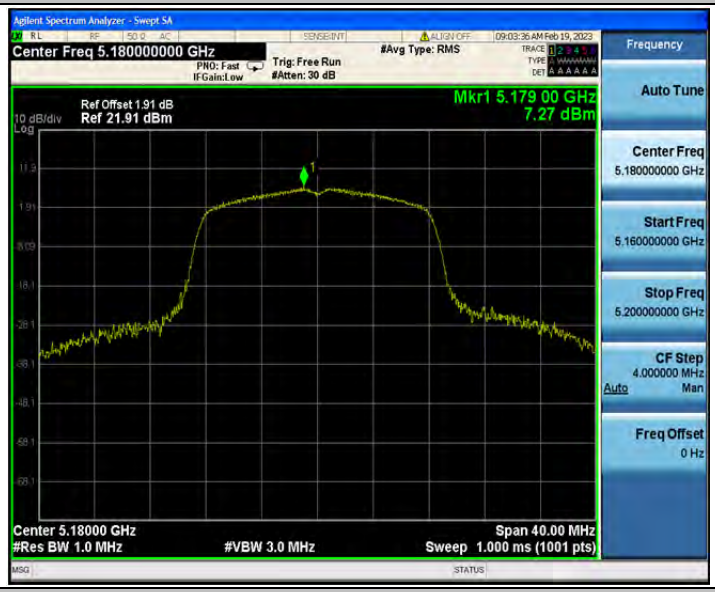
802.11n(HT40)_5755



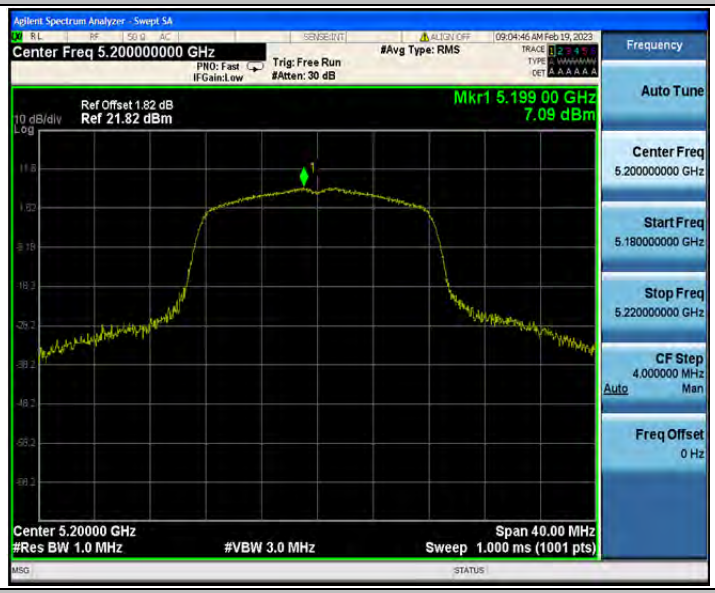
802.11n(HT40)_5795



802.11ac(VHT20)_5180

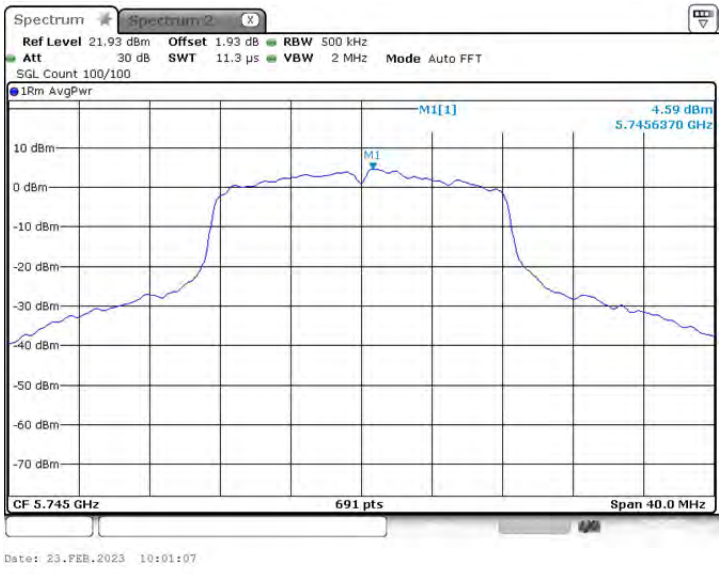


802.11ac(VHT20)_5200

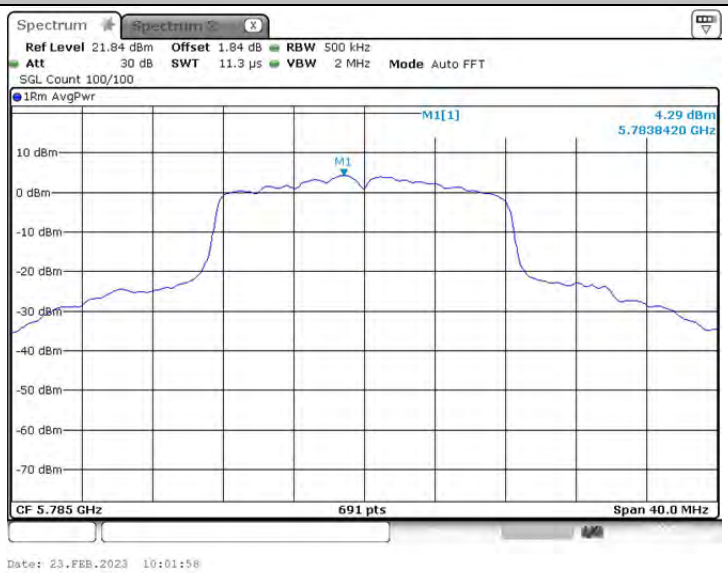


802.11ac(VHT20)_5240

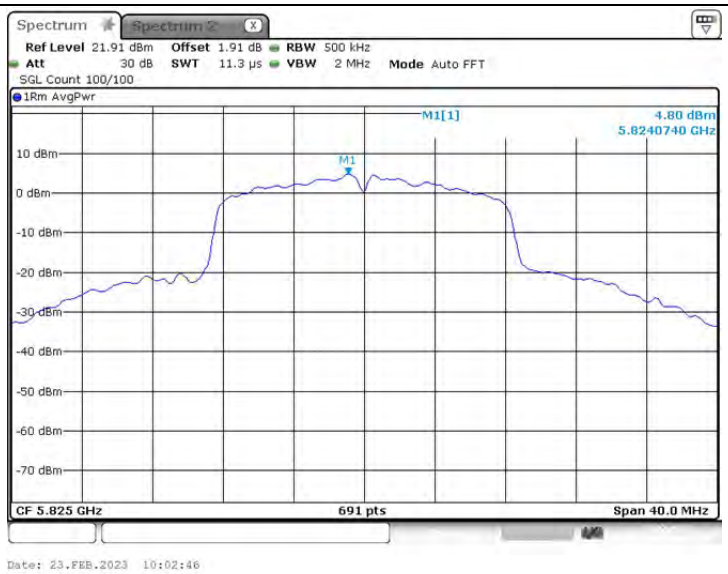
802.11ac(VHT20)_5745



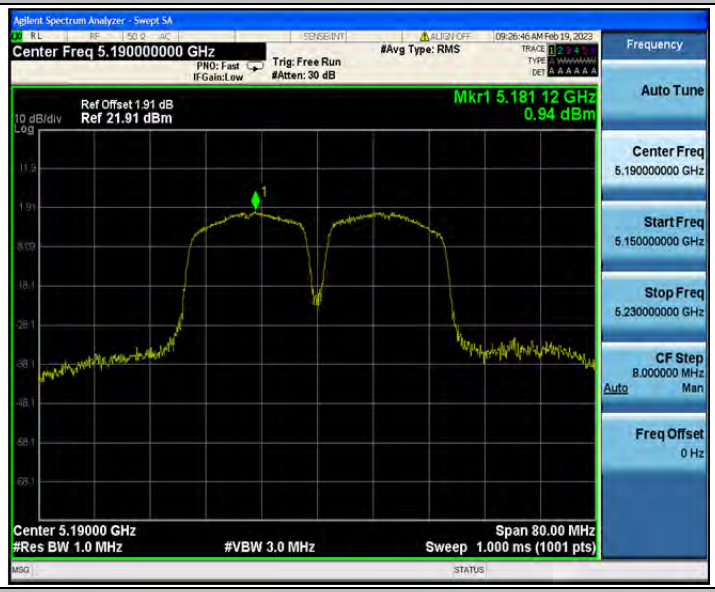
802.11ac(VHT20)_5785



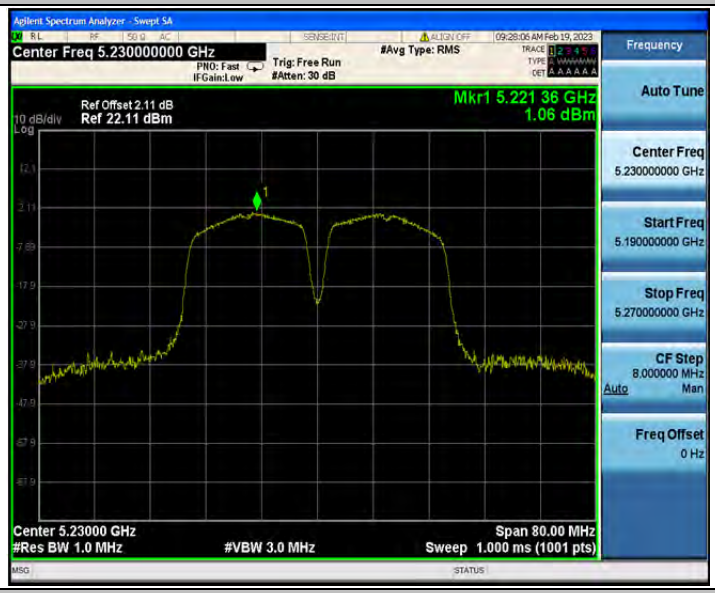
802.11ac(VHT20)_5825



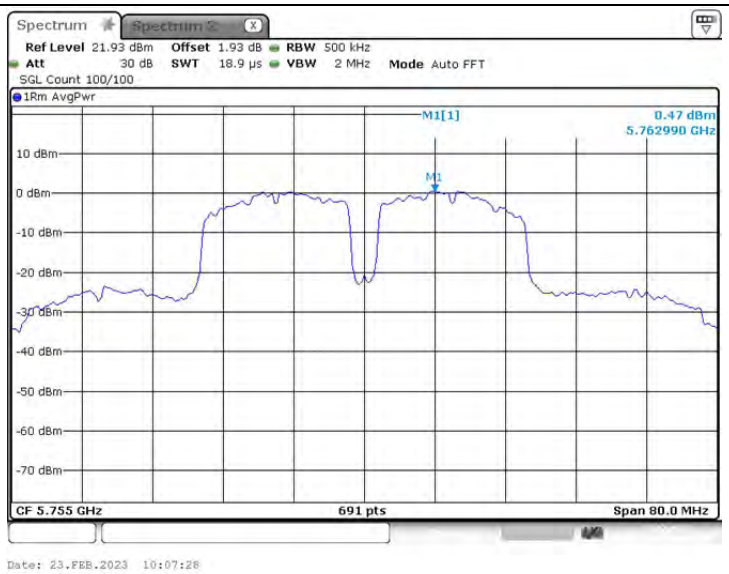
802.11ac(VHT40)_5190



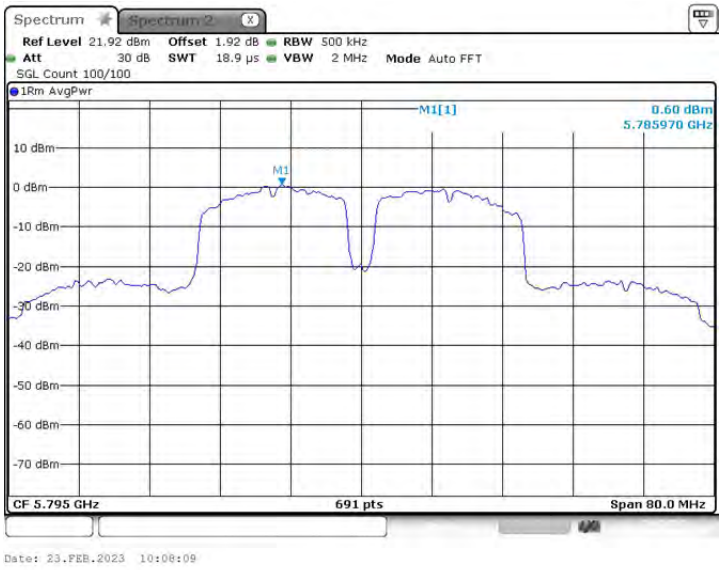
802.11ac(VHT40)_5230



802.11ac(VHT40)_5755



802.11ac(VHT40)_5795



Appendix D: Frequency Stability

Test Result

Voltage							
Test Mode	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20MHz	5180	NV	NT	-22000	-4.247104	±20	PASS
		LV	NT	-22000	-4.247104	±20	PASS
		HV	NT	-22000	-4.247104	±20	PASS
	5200	NV	NT	-21000	-4.038462	±20	PASS
		LV	NT	-21000	-4.038462	±20	PASS
		HV	NT	-21000	-4.038462	±20	PASS
	5240	NV	NT	-22000	-4.198473	±20	PASS
		LV	NT	-22000	-4.198473	±20	PASS
		HV	NT	-21000	-4.007634	±20	PASS
	5745	NV	NT	-23000	-4.003481	±20	PASS
		LV	NT	-23000	-4.003481	±20	PASS
		HV	NT	-22000	-3.829417	±20	PASS
	5785	NV	NT	-22000	-3.802939	±20	PASS
		LV	NT	-22000	-3.802939	±20	PASS
		HV	NT	-22000	-3.802939	±20	PASS
	5825	NV	NT	-23000	-3.948498	±20	PASS
		LV	NT	-22000	-3.776824	±20	PASS
		HV	NT	-21000	-3.605150	±20	PASS
40MHz	5190	NV	NT	-21000	-4.046243	±20	PASS
		LV	NT	-21000	-4.046243	±20	PASS
		HV	NT	-21000	-4.046243	±20	PASS
	5230	NV	NT	-23000	-4.397706	±20	PASS
		LV	NT	-22000	-4.206501	±20	PASS
		HV	NT	-22000	-4.206501	±20	PASS
	5755	NV	NT	-24000	-4.170287	±20	PASS
		LV	NT	-22000	-3.822763	±20	PASS
		HV	NT	-22000	-3.822763	±20	PASS
	5795	NV	NT	-22000	-3.796376	±20	PASS
		LV	NT	-21000	-3.623814	±20	PASS
		HV	NT	-21000	-3.623814	±20	PASS

Temperature							
TestMode	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20MHz	5180	NV	0	-22000	-4.247104	±20	PASS
		NV	10	-21000	-4.054054	±20	PASS
		NV	20	-21000	-4.054054	±20	PASS
		NV	30	-21000	-4.054054	±20	PASS
		NV	40	-21000	-4.054054	±20	PASS
		NV	45	-21000	-4.054054	±20	PASS
	5200	NV	0	-21000	-4.038462	±20	PASS
		NV	10	-21000	-4.038462	±20	PASS
		NV	20	-21000	-4.038462	±20	PASS
		NV	30	-21000	-4.038462	±20	PASS
		NV	40	-21000	-4.038462	±20	PASS
		NV	45	-21000	-4.038462	±20	PASS
	5240	NV	0	-21000	-4.007634	±20	PASS
		NV	10	-21000	-4.007634	±20	PASS
		NV	20	-21000	-4.007634	±20	PASS
		NV	30	-21000	-4.007634	±20	PASS
		NV	40	-21000	-4.007634	±20	PASS
		NV	45	-21000	-4.007634	±20	PASS
	5745	NV	0	-22000	-3.829417	±20	PASS
		NV	10	-22000	-3.829417	±20	PASS
		NV	20	-22000	-3.829417	±20	PASS
		NV	30	-22000	-3.829417	±20	PASS
		NV	40	-22000	-3.829417	±20	PASS
		NV	45	-22000	-3.829417	±20	PASS
	5785	NV	0	-22000	-3.802939	±20	PASS
		NV	10	-22000	-3.802939	±20	PASS
		NV	20	-22000	-3.802939	±20	PASS
		NV	30	-22000	-3.802939	±20	PASS
		NV	40	-22000	-3.802939	±20	PASS
		NV	45	-21000	-3.630078	±20	PASS
	5825	NV	0	-21000	-3.605150	±20	PASS
		NV	10	-21000	-3.605150	±20	PASS
		NV	20	-21000	-3.605150	±20	PASS
		NV	30	-21000	-3.605150	±20	PASS
		NV	40	-21000	-3.605150	±20	PASS
		NV	45	-21000	-3.605150	±20	PASS
40MHz	5190	NV	0	-22000	-4.238921	±20	PASS
		NV	10	-22000	-4.238921	±20	PASS
		NV	20	-22000	-4.238921	±20	PASS
		NV	30	-22000	-4.238921	±20	PASS
		NV	40	-22000	-4.238921	±20	PASS
		NV	45	-22000	-4.238921	±20	PASS
	5230	NV	0	-22000	-4.206501	±20	PASS

		NV	10	-22000	-4.206501	±20	PASS
		NV	20	-22000	-4.206501	±20	PASS
		NV	30	-22000	-4.206501	±20	PASS
		NV	40	-22000	-4.206501	±20	PASS
		NV	45	-22000	-4.206501	±20	PASS
	5755	NV	0	-21000	-3.649001	±20	PASS
		NV	10	-21000	-3.649001	±20	PASS
		NV	20	-21000	-3.649001	±20	PASS
		NV	30	-21000	-3.649001	±20	PASS
		NV	40	-21000	-3.649001	±20	PASS
		NV	45	-21000	-3.649001	±20	PASS
	5795	NV	0	-21000	-3.623814	±20	PASS
		NV	10	-21000	-3.623814	±20	PASS
		NV	20	-20000	-3.451251	±20	PASS
		NV	30	-21000	-3.623814	±20	PASS
		NV	40	-20000	-3.451251	±20	PASS
		NV	45	-20000	-3.451251	±20	PASS

Appendix E: Duty Cycle

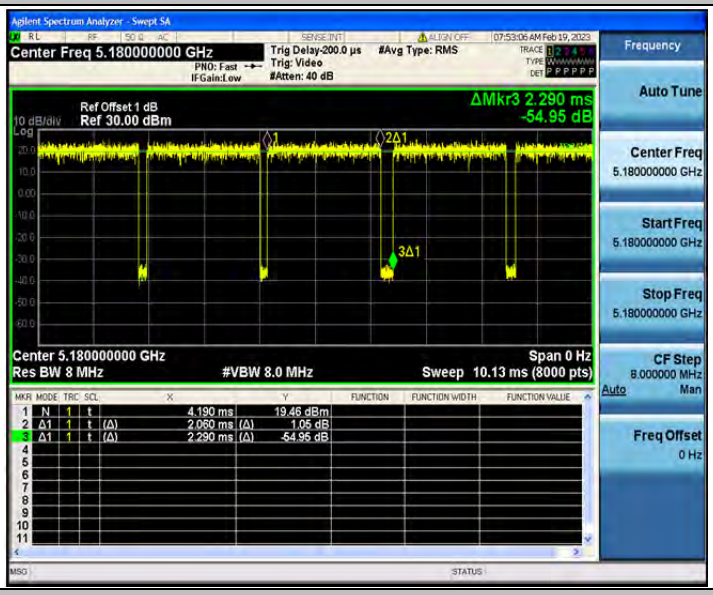
Test Result

Test Mode	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)	Duty factor (dB)
802.11a	5180	2.06	2.29	89.96	0.49	1	0.46
	5200	2.07	2.30	90.00	0.48	1	0.46
	5240	2.06	2.29	89.96	0.49	1	0.46
	5745	2.06	2.27	90.75	0.49	1	0.42
	5785	2.07	2.30	90.00	0.48	1	0.46
	5825	2.07	2.26	91.59	0.48	1	0.38
802.11n(HT20)	5180	1.92	2.15	89.30	0.52	1	0.49
	5200	1.92	2.15	89.30	0.52	1	0.49
	5240	1.92	2.08	92.31	0.52	1	0.35
	5745	1.92	2.10	91.43	0.52	1	0.39
	5785	1.92	2.11	91.00	0.52	1	0.41
	5825	1.92	2.12	90.57	0.52	1	0.43
802.11n(HT40)	5190	0.95	1.18	80.51	1.05	2	0.94
	5230	0.94	1.14	82.46	1.06	2	0.84
	5755	0.94	1.16	81.03	1.06	2	0.91
	5795	0.95	1.17	81.20	1.05	2	0.90
802.11ac(VHT20)	5180	2.06	2.54	81.10	0.49	1	0.91
	5200	2.06	2.49	82.73	0.49	1	0.82
	5240	2.06	2.44	84.43	0.49	1	0.74
	5745	2.06	2.55	80.78	0.49	1	0.93
	5785	2.06	2.50	82.40	0.49	1	0.84
	5825	2.06	2.54	81.10	0.49	1	0.91
802.11ac(VHT40)	5190	2.06	2.54	81.10	0.49	1	0.91
	5230	2.06	2.66	77.44	0.49	1	1.11
	5755	2.06	2.55	80.78	0.49	1	0.93
	5795	2.07	2.56	80.86	0.48	1	0.92

Note: Duty Cycle Factor = 10*Log10(1/ Duty Cycle)

Test Graphs

802.11a_5180



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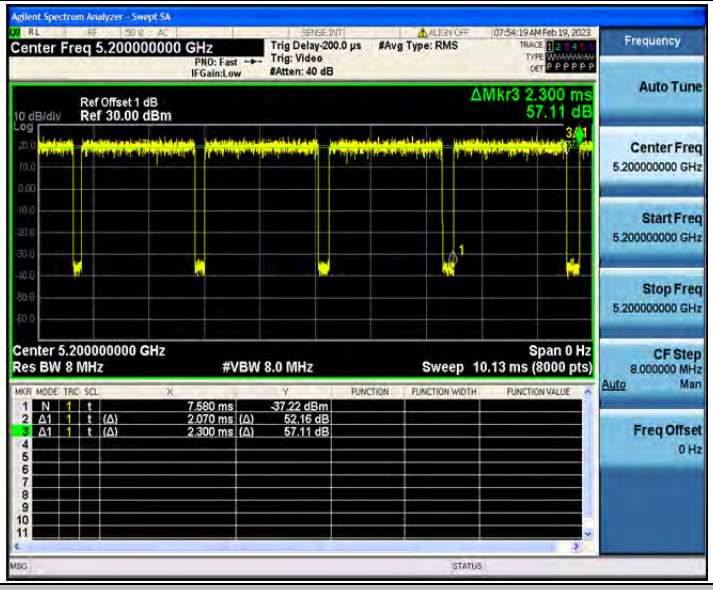

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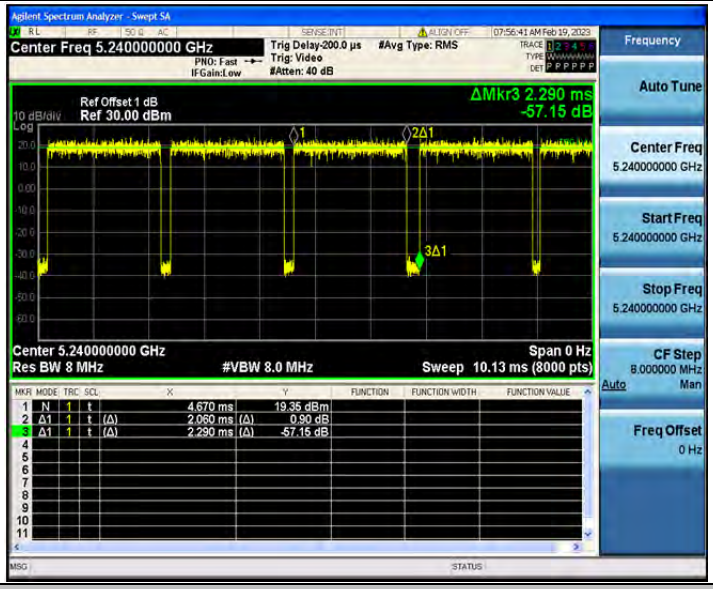

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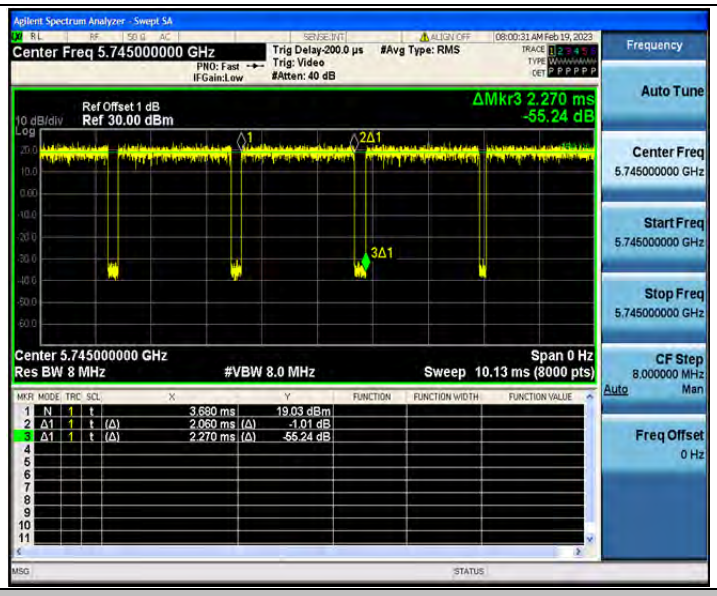

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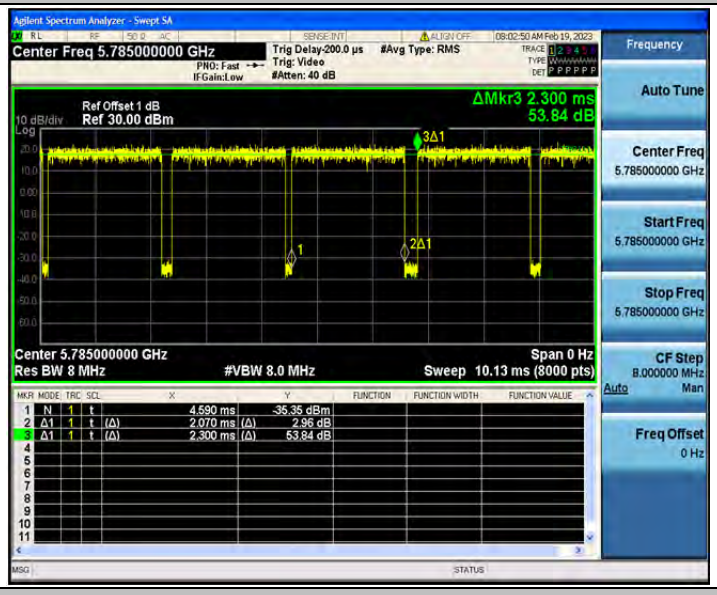

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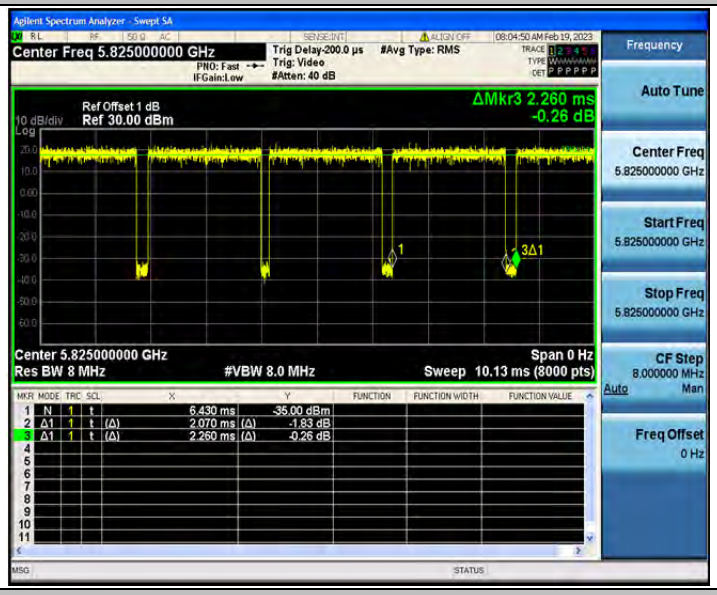

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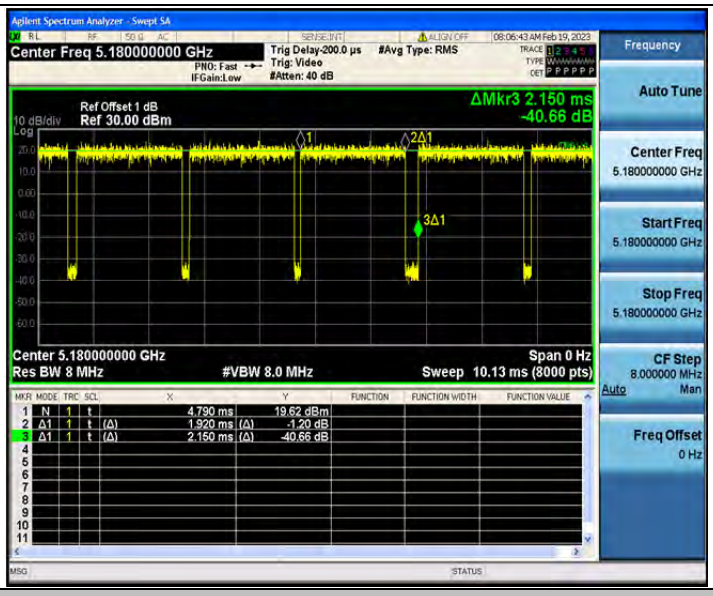

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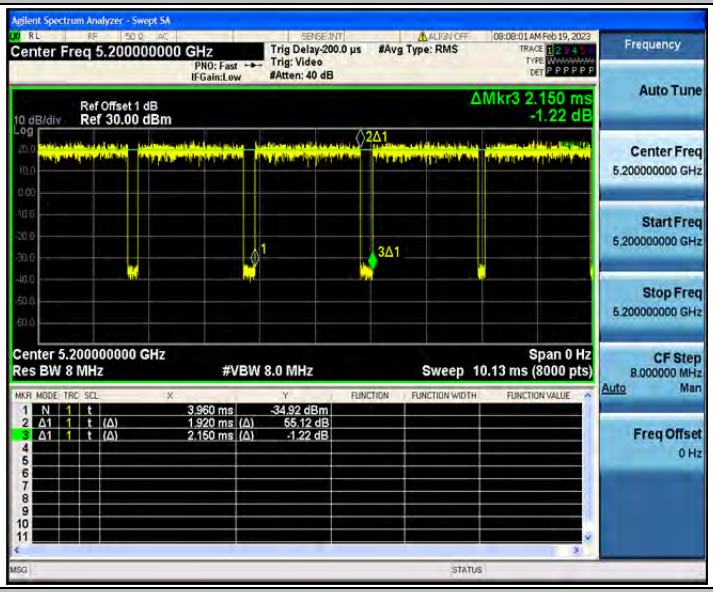

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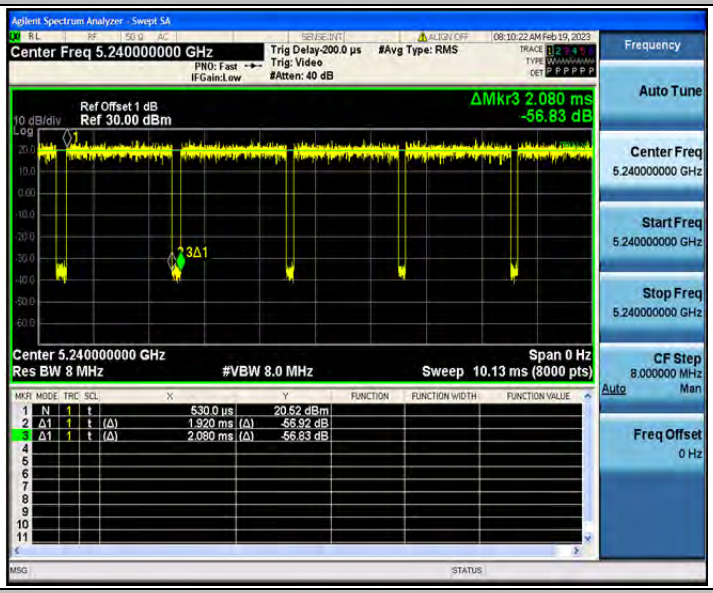

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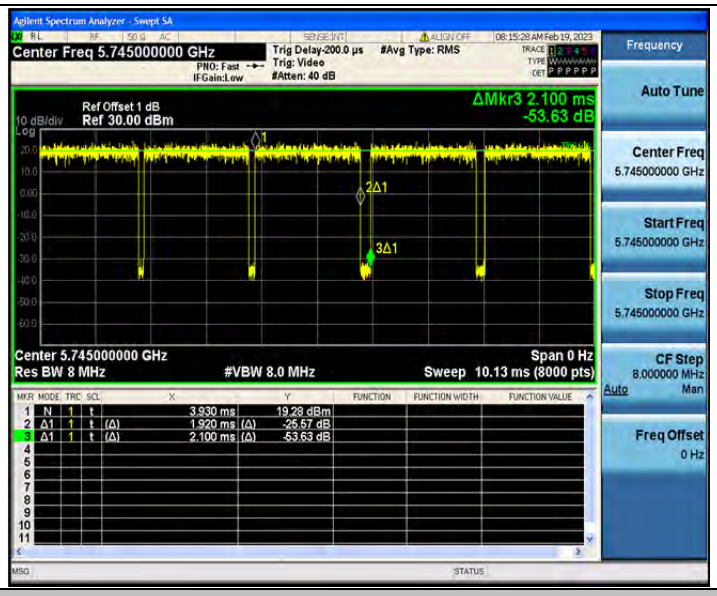

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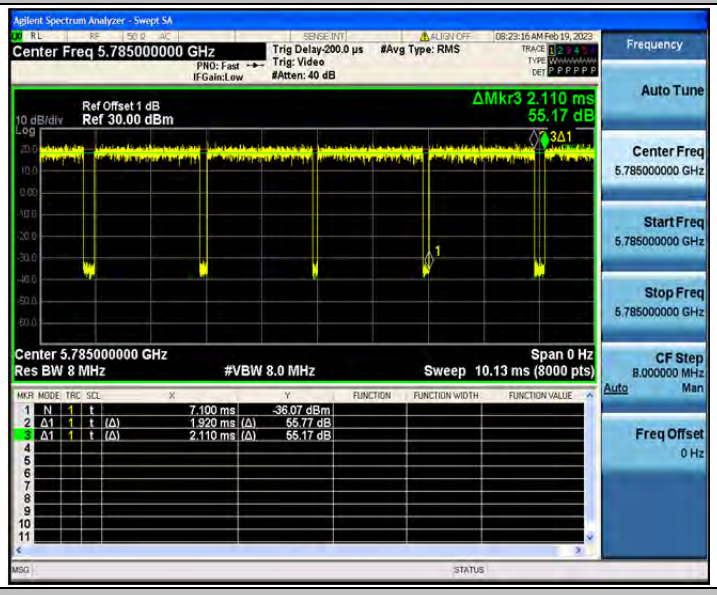

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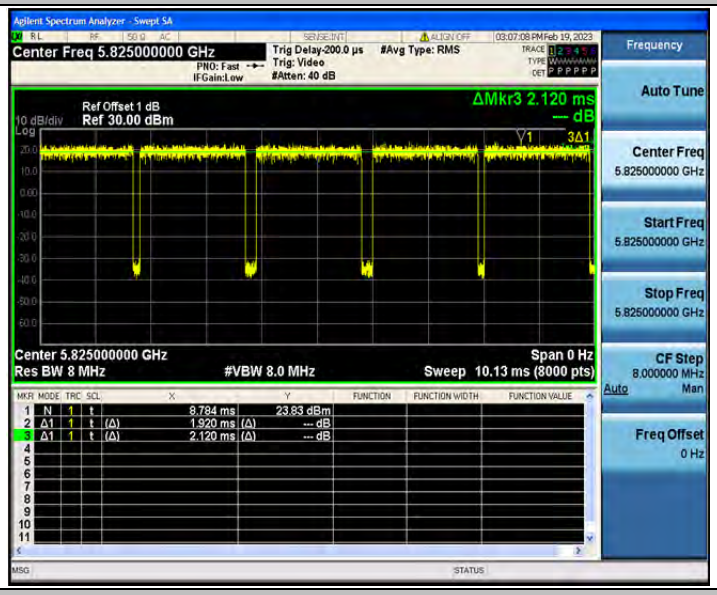

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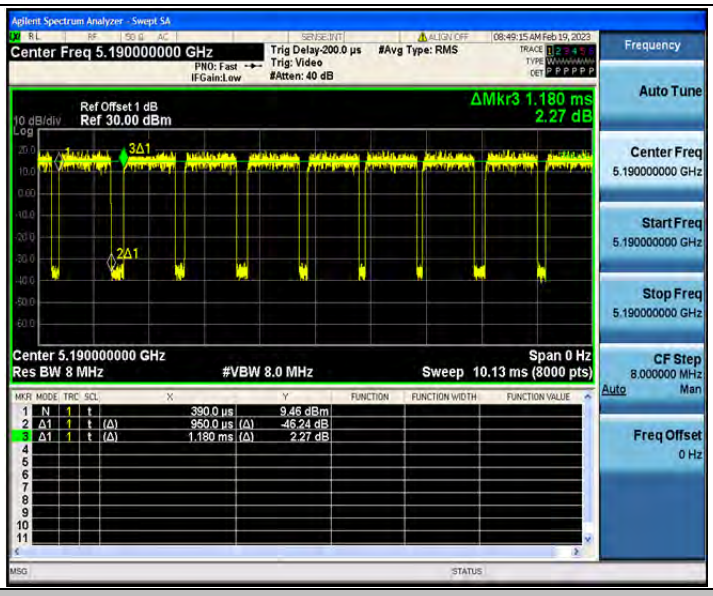

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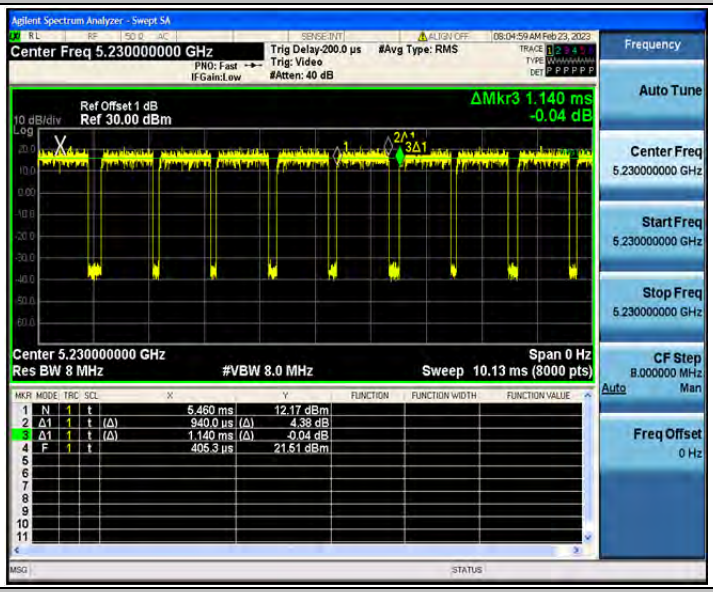

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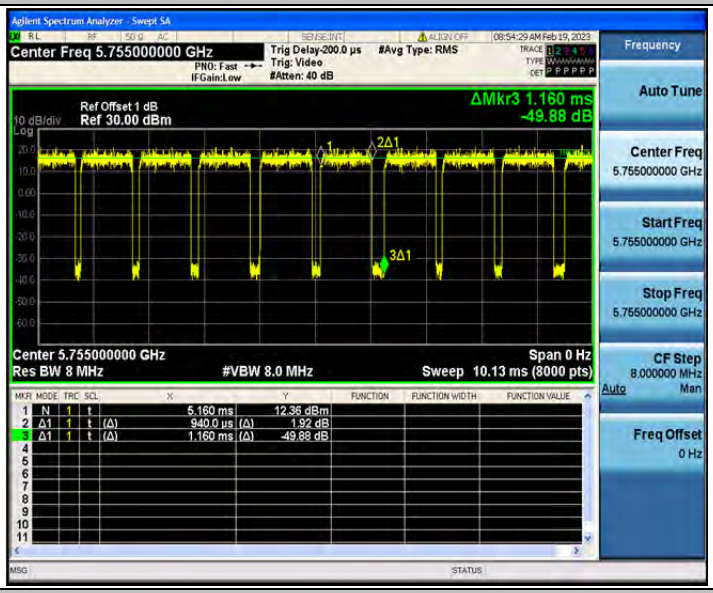

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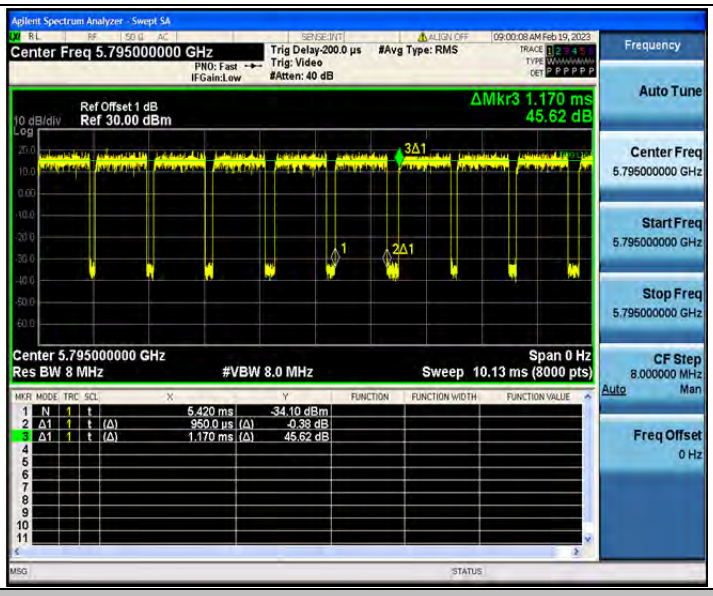

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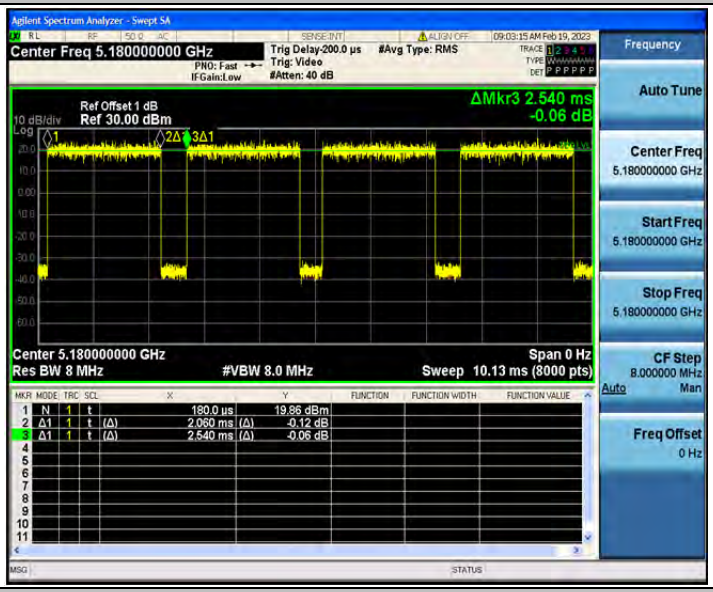

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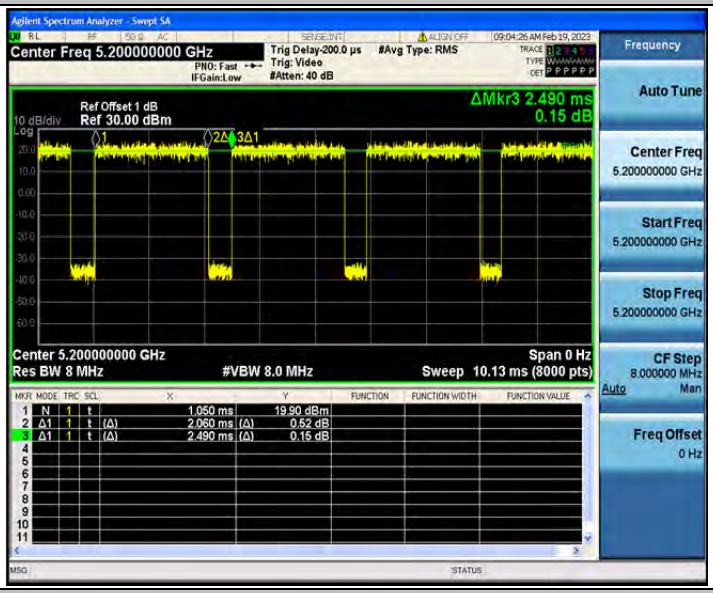

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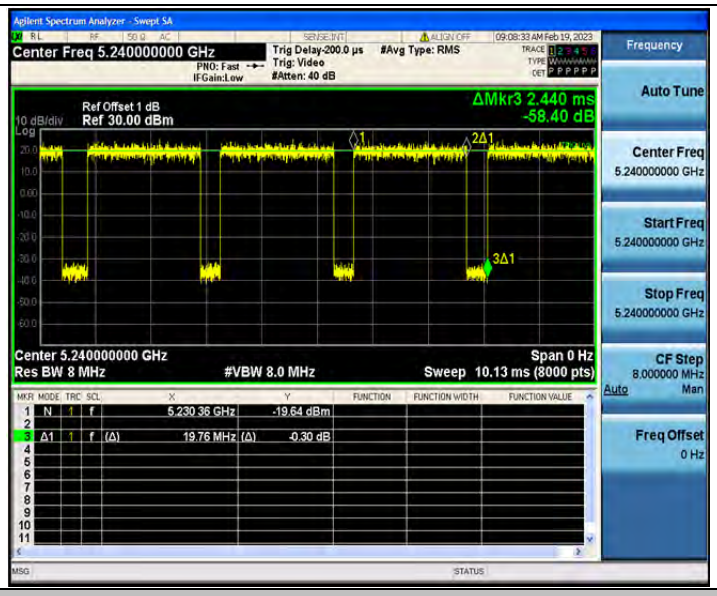

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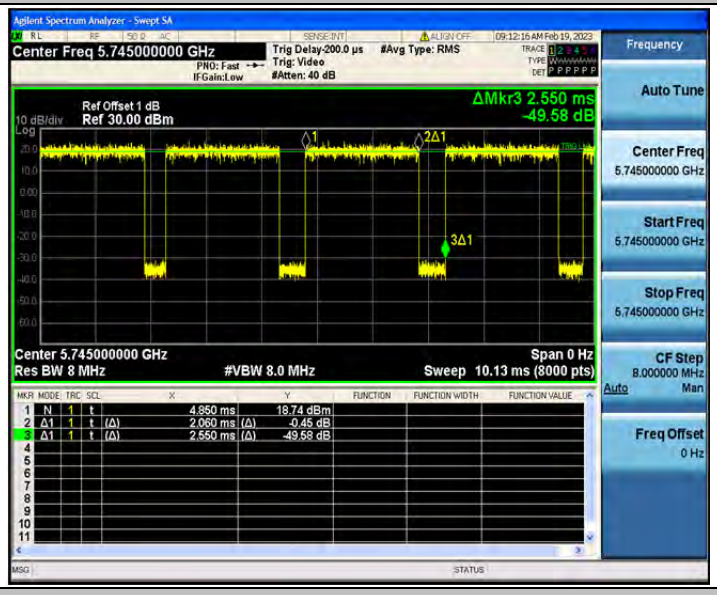

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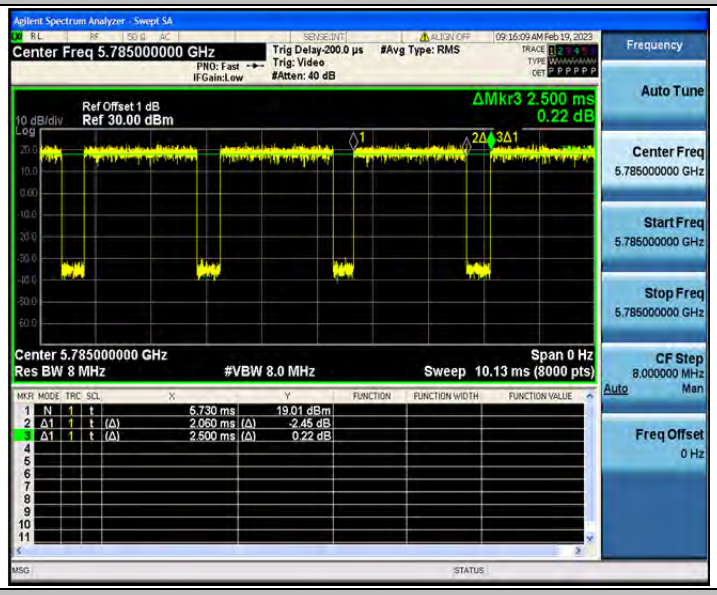

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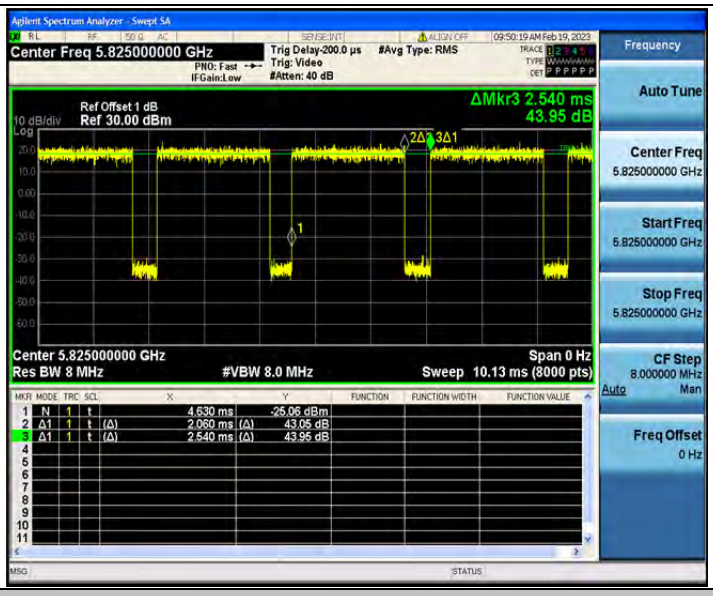

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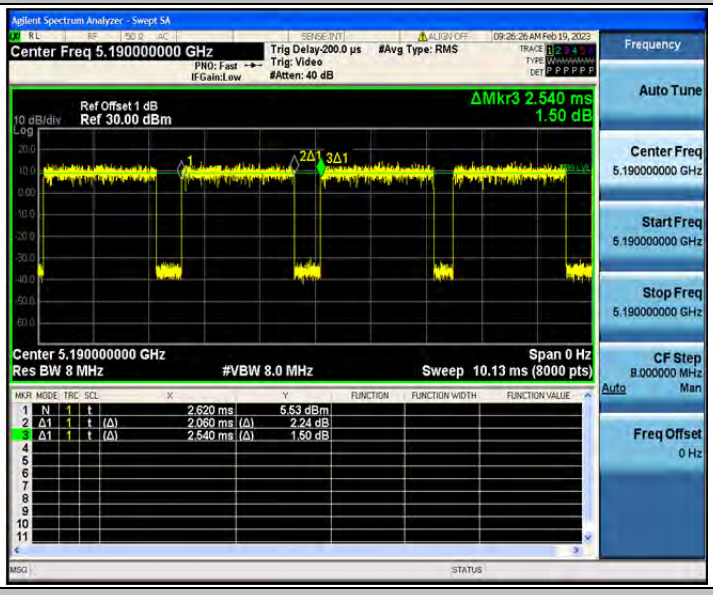

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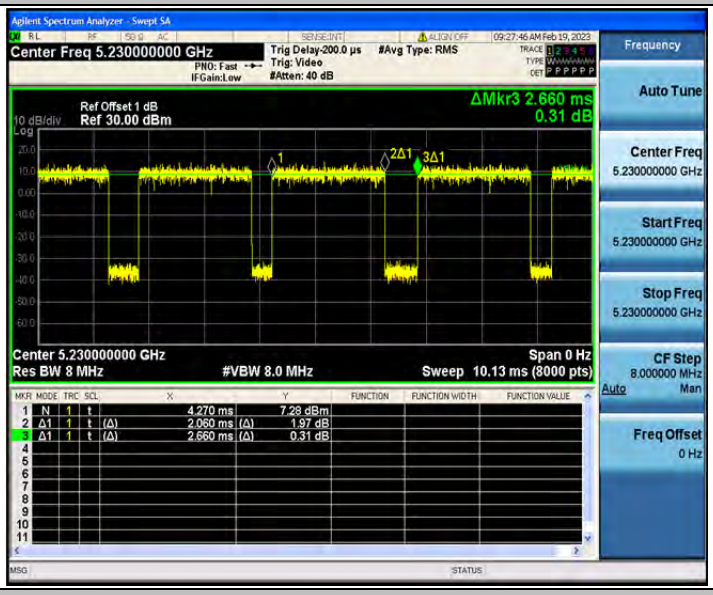

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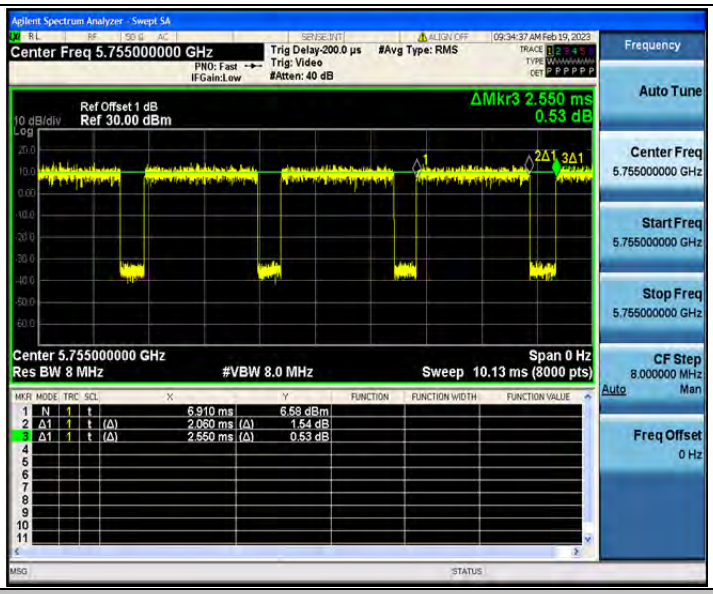

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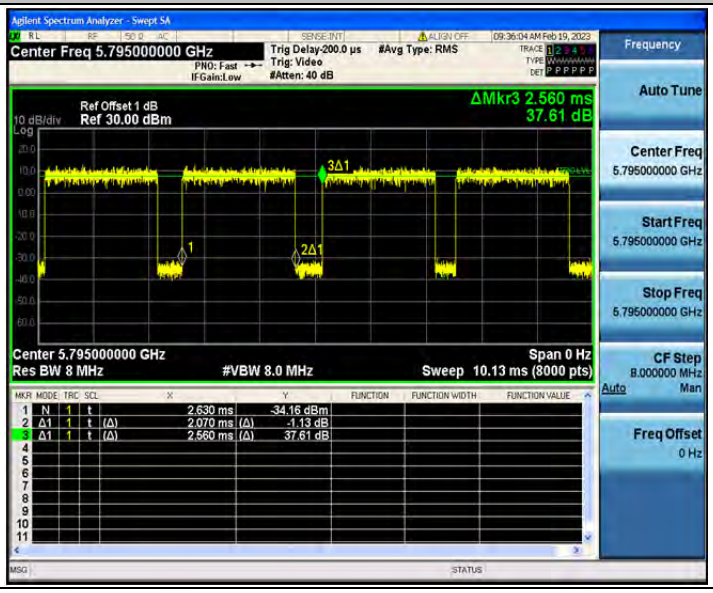

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