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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-OZT

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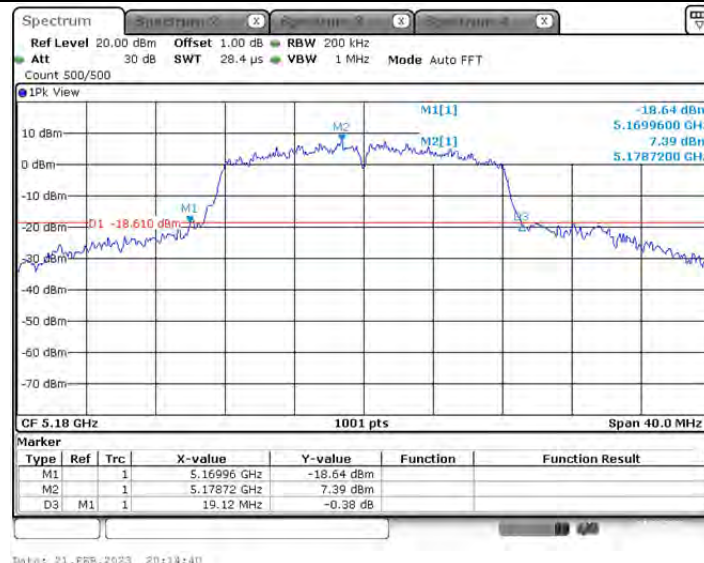
Appendix A1: Emission Bandwidth

Test Result

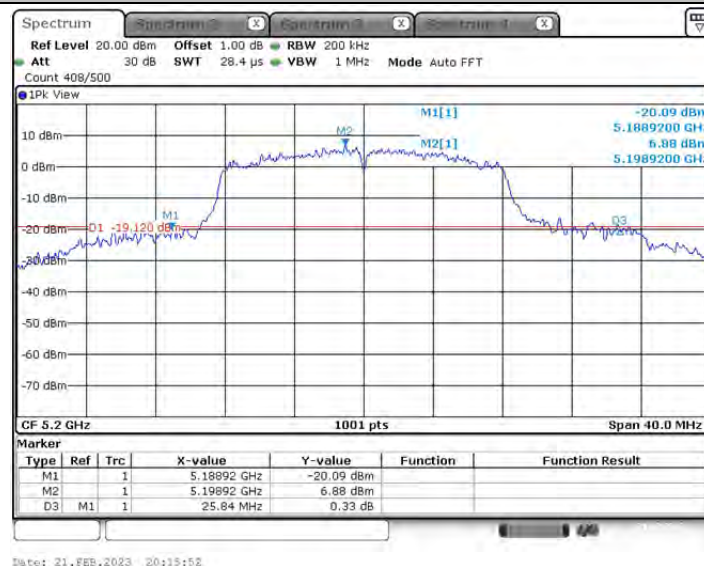
Test Mode	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Verdict
802.11a	5180	19.12	5169.96	5189.08	PASS
	5200	25.84	5188.92	5214.76	PASS
	5240	20.20	5230.40	5250.60	PASS
	5745	18.68	5735.60	5754.28	PASS
	5785	20.96	5775.20	5796.16	PASS
	5825	25.24	5813.92	5839.16	PASS
802.11n(HT20)	5180	21.36	5170.12	5191.48	PASS
	5200	21.48	5189.84	5211.32	PASS
	5240	21.08	5230.20	5251.28	PASS
	5745	20.04	5735.20	5755.24	PASS
	5785	19.72	5775.20	5794.92	PASS
	5825	25.44	5814.28	5839.72	PASS
802.11n(HT40)	5190	38.24	5170.96	5209.20	PASS
	5230	38.16	5210.88	5249.04	PASS
	5755	38.00	5735.88	5773.88	PASS
	5795	49.92	5775.88	5825.80	PASS
802.11ac(VHT20)	5180	24.48	5169.32	5193.80	PASS
	5200	23.48	5188.44	5211.92	PASS
	5240	27.40	5227.44	5254.84	PASS
	5745	19.84	5735.16	5755.00	PASS
	5785	19.32	5775.48	5794.80	PASS
	5825	25.96	5813.16	5839.12	PASS
802.11ac(VHT40)	5190	40.96	5169.20	5210.16	PASS
	5230	40.16	5209.36	5249.52	PASS
	5755	41.28	5735.00	5776.28	PASS
	5795	39.84	5775.32	5815.16	PASS

Test Graphs

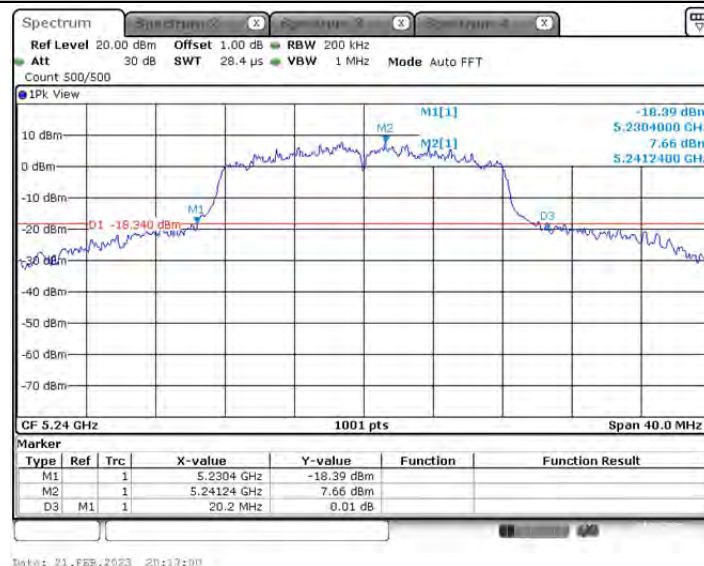
802.11a_5180



802.11a_5200



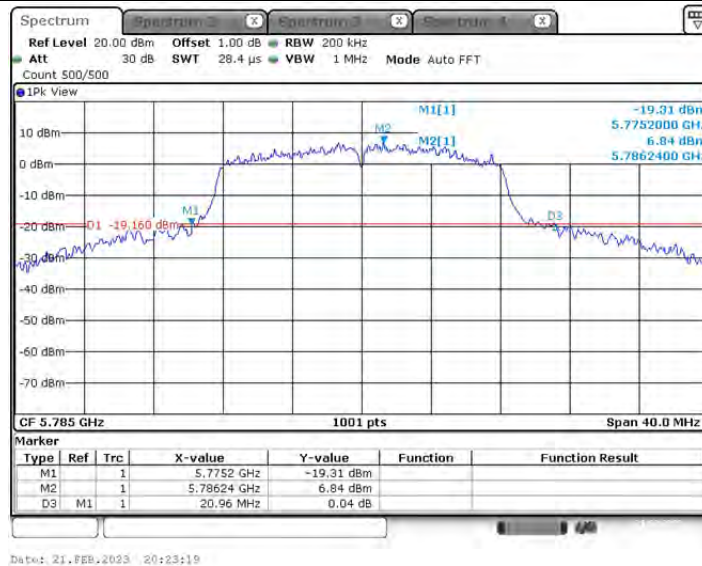
802.11a_5240



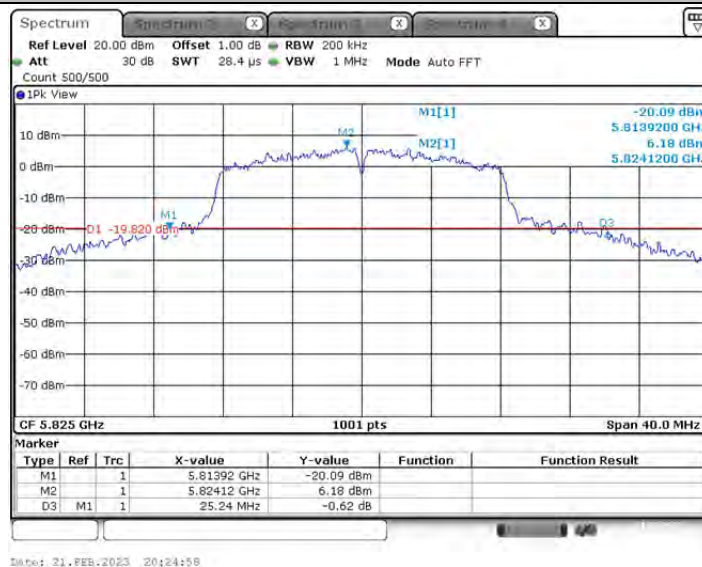
802.11a_5745



802.11a_5785



802.11a_5825



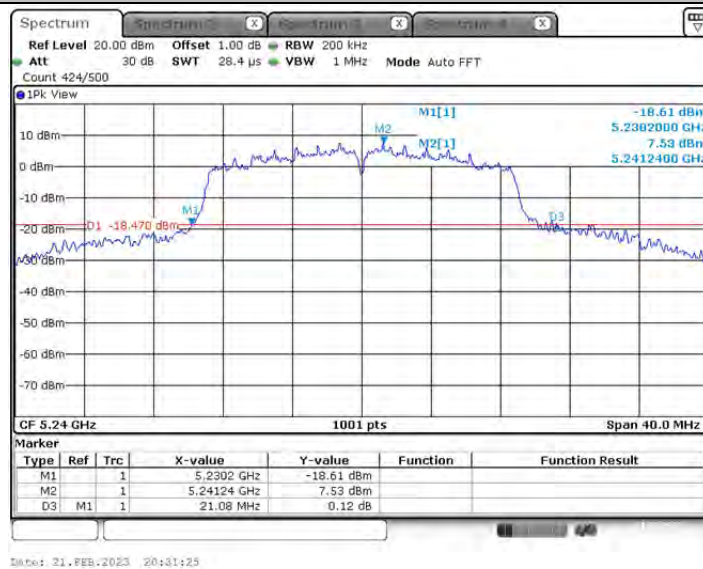
802.11n(HT20)_5180



802.11n(HT20)_5200



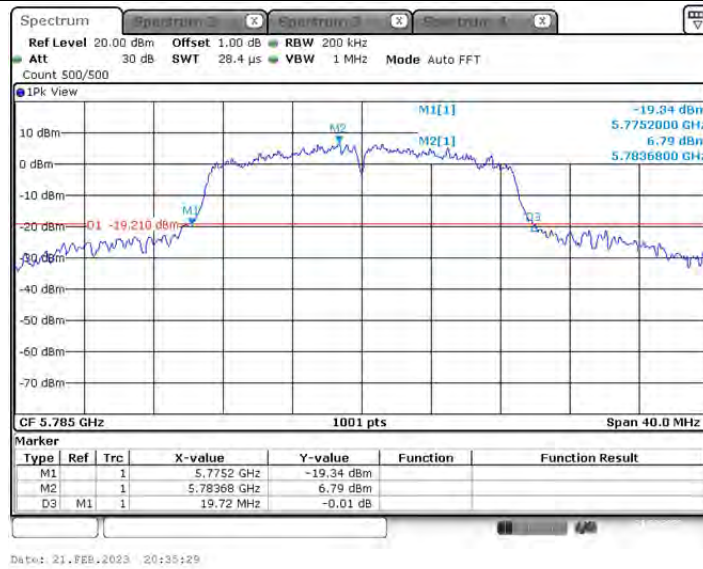
802.11n(HT20)_5240



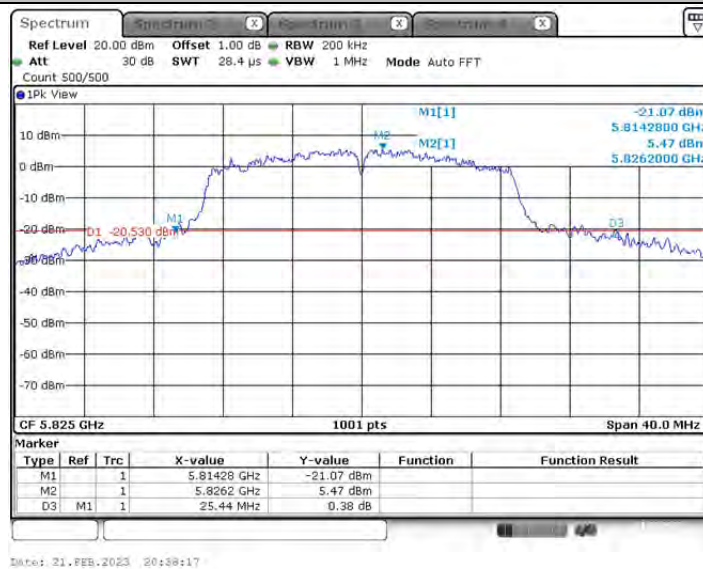
802.11n(HT20)_5745



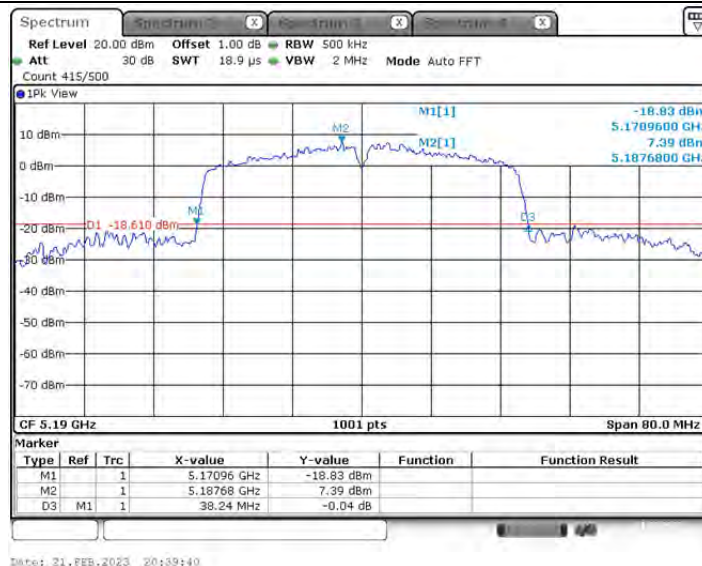
802.11n(HT20)_5785



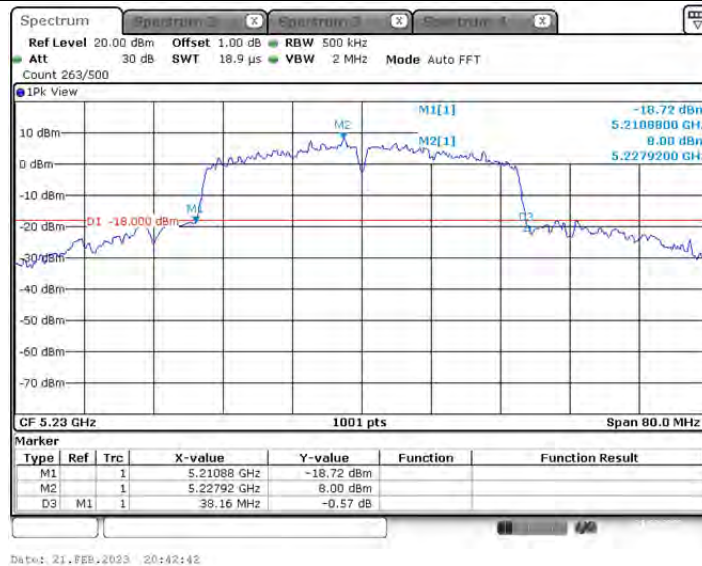
802.11n(HT20)_5825



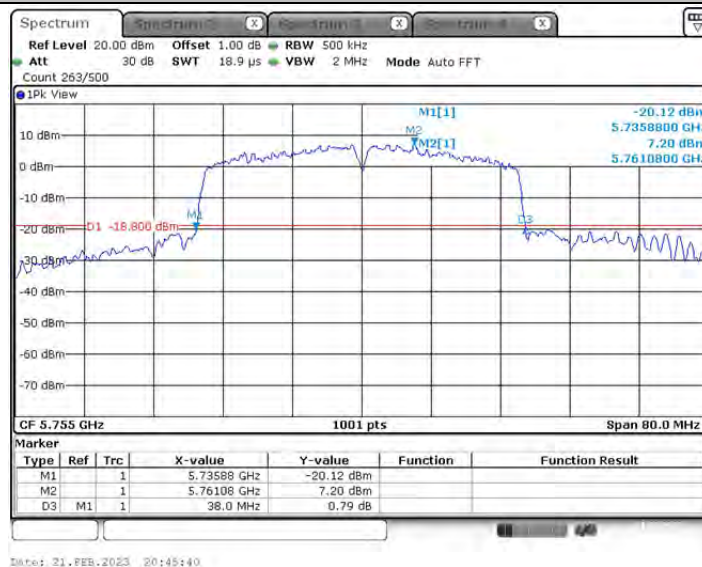
802.11n(HT40)_5190



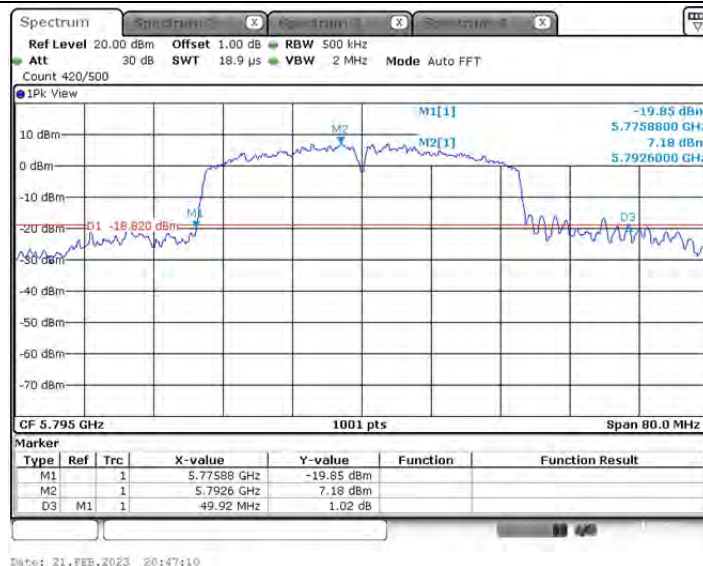
802.11n(HT40)_5230



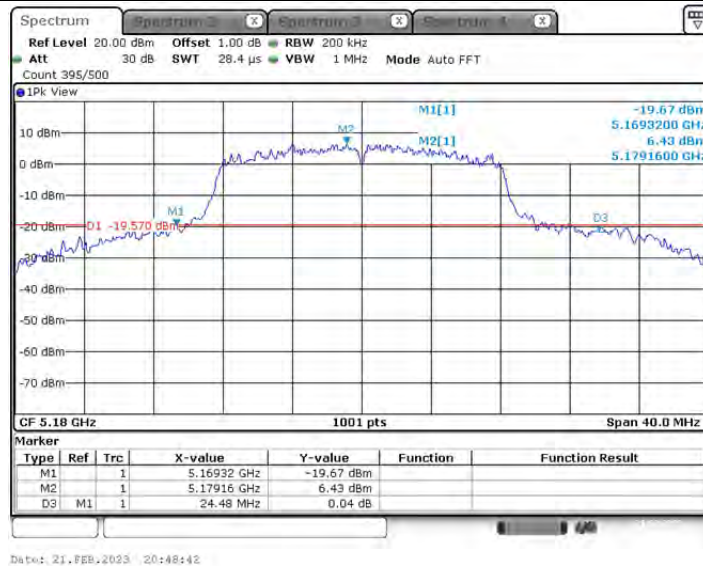
802.11n(HT40)_5755



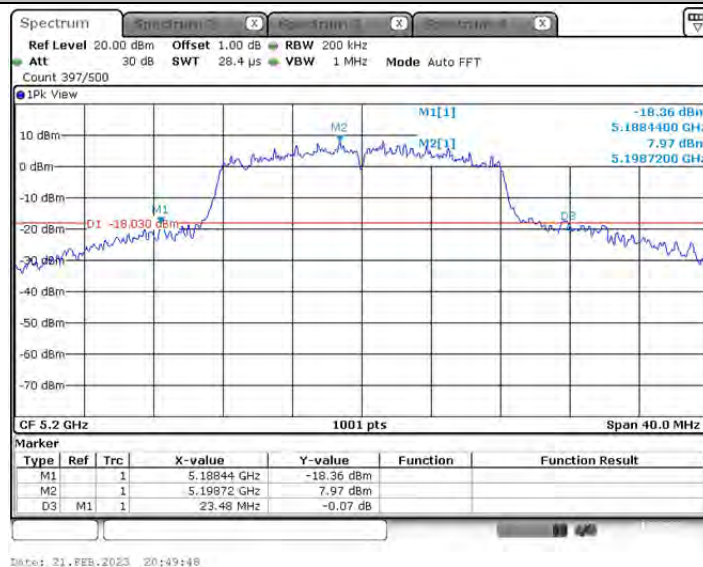
802.11n(HT40)_5795



802.11ac(VHT20)_5180



802.11ac(VHT20)_5200



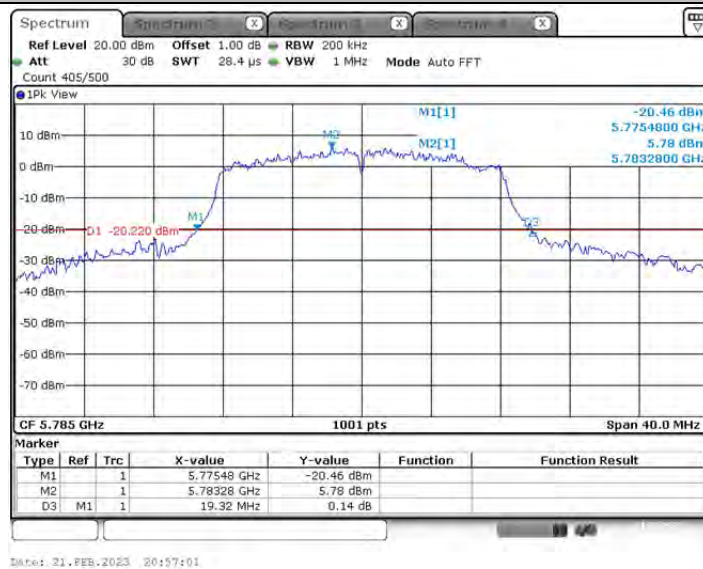
802.11ac(VHT20)_5240



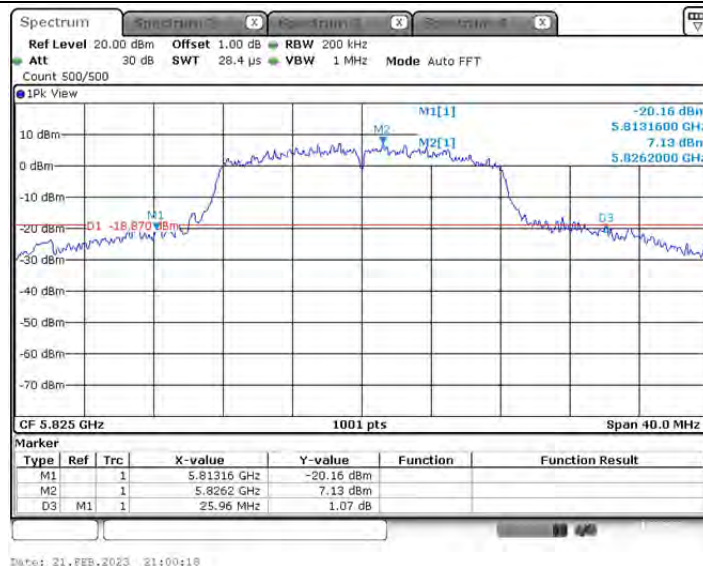
802.11ac(VHT20)_5745



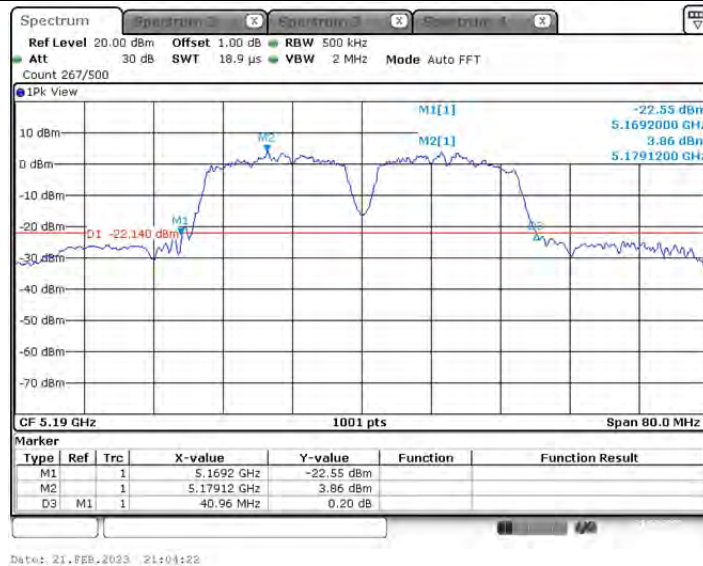
802.11ac(VHT20)_5785



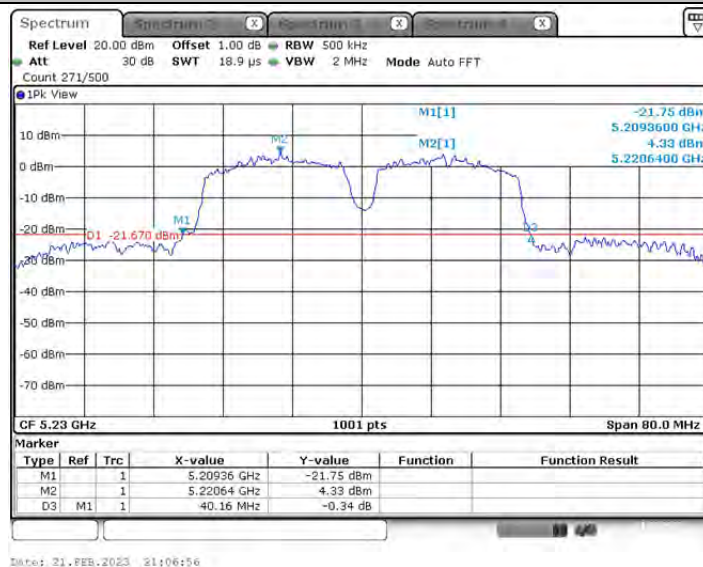
802.11ac(VHT20)_5825



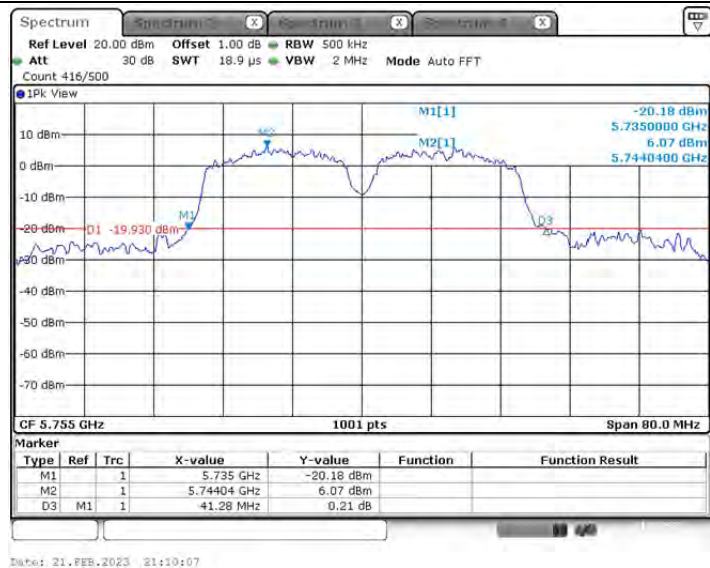
802.11ac(VHT40)_5190



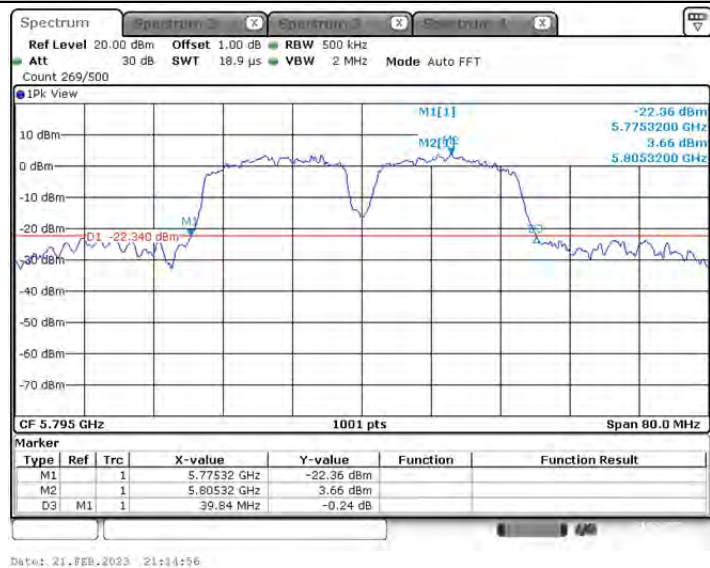
802.11ac(VHT40)_5230



802.11ac(VHT40)_5755



802.11ac(VHT40)_5795



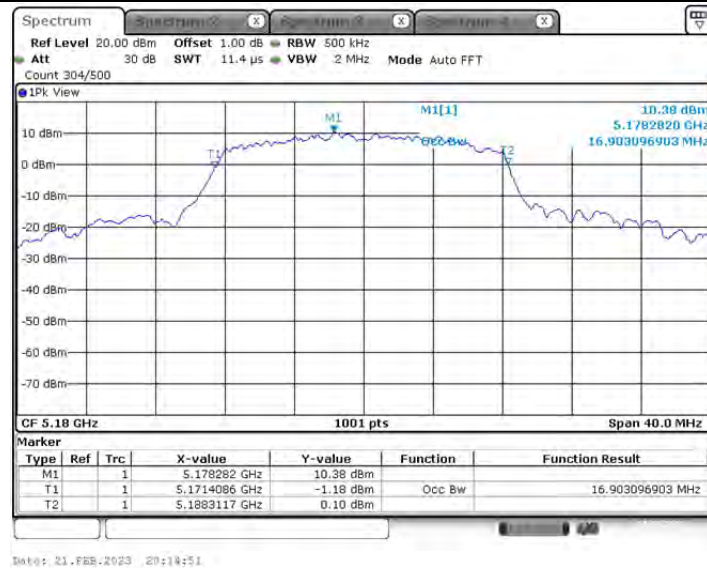
Appendix A2: Occupied channel bandwidth

Test Result

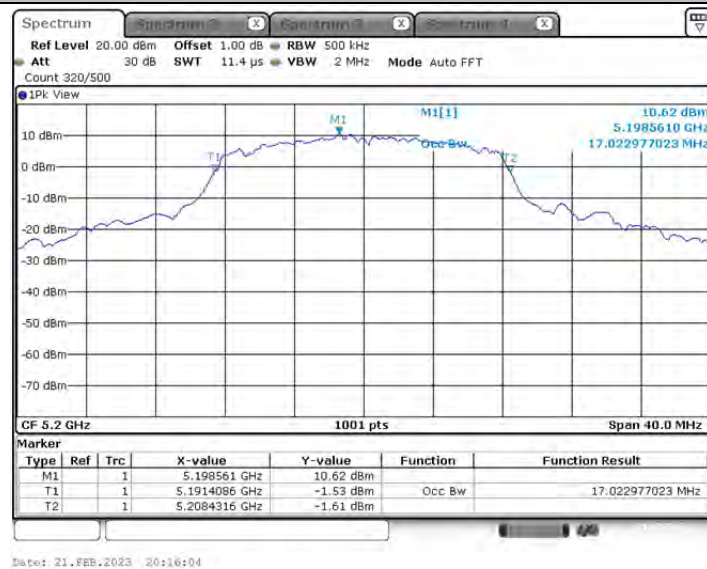
Test Mode	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
802.11a	5180	16.903	5171.409	5188.312	PASS
	5200	17.023	5191.409	5208.432	PASS
	5240	17.103	5231.528	5248.631	PASS
	5745	16.623	5736.608	5753.232	PASS
	5785	16.783	5776.568	5793.352	PASS
	5825	17.143	5816.409	5833.551	PASS
802.11n(HT20)	5180	18.022	5171.089	5189.111	PASS
	5200	17.982	5191.129	5209.111	PASS
	5240	18.182	5230.969	5249.151	PASS
	5745	17.542	5736.209	5753.751	PASS
	5785	17.942	5776.129	5794.071	PASS
	5825	17.822	5816.129	5833.951	PASS
802.11n(HT40)	5190	35.724	5172.098	5207.822	PASS
	5230	35.644	5212.258	5247.902	PASS
	5755	35.724	5737.098	5772.822	PASS
	5795	35.564	5777.258	5812.822	PASS
802.11ac(VHT20)	5180	16.943	5171.568	5188.511	PASS
	5200	17.103	5191.528	5208.631	PASS
	5240	17.263	5231.329	5248.591	PASS
	5745	16.663	5736.768	5753.432	PASS
	5785	17.023	5776.209	5793.232	PASS
	5825	17.023	5816.528	5833.551	PASS
802.11ac(VHT40)	5190	36.044	5171.938	5207.982	PASS
	5230	36.044	5211.938	5247.982	PASS
	5755	36.523	5736.538	5773.062	PASS
	5795	36.044	5776.938	5812.982	PASS

Test Graphs

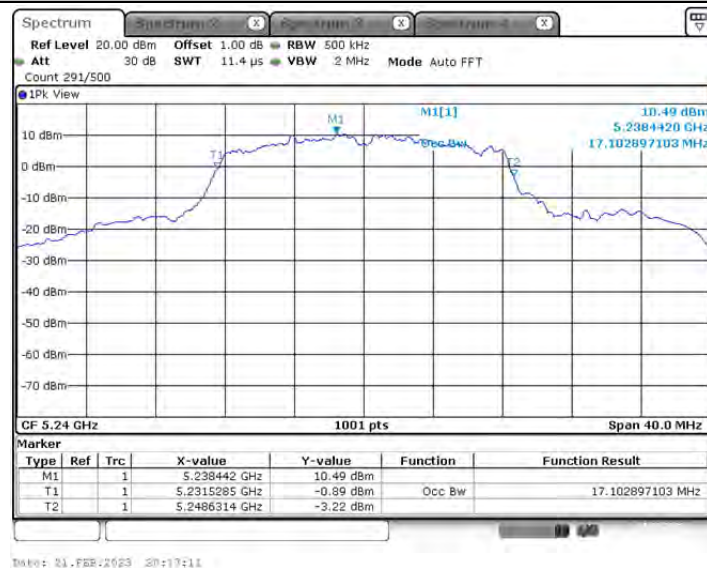
802.11a_5180



802.11a_5200



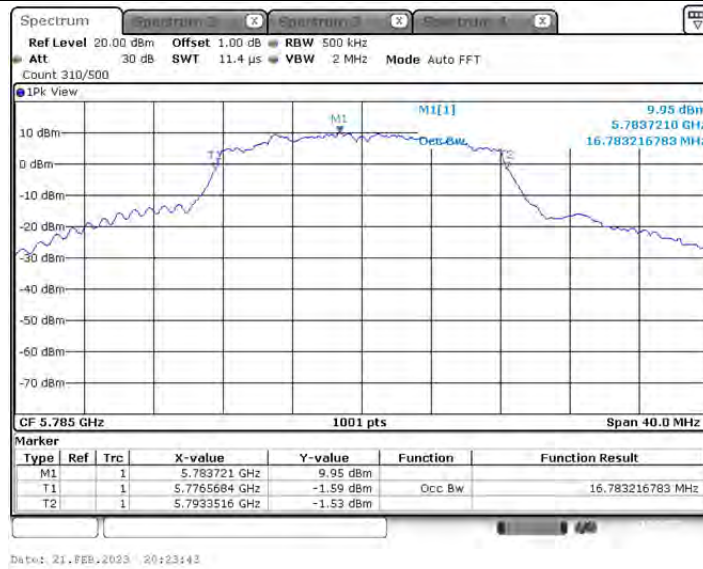
802.11a_5240



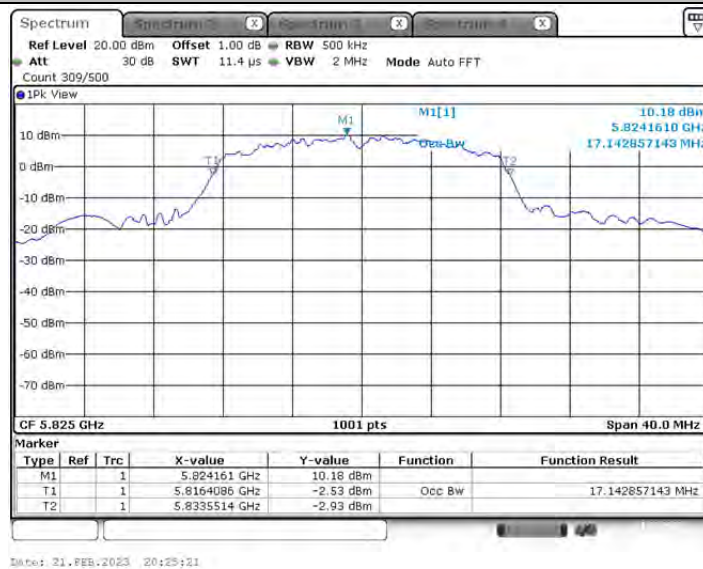
802.11a_5745



802.11a_5785



802.11a_5825



802.11n(HT20)_5180



802.11n(HT20)_5200



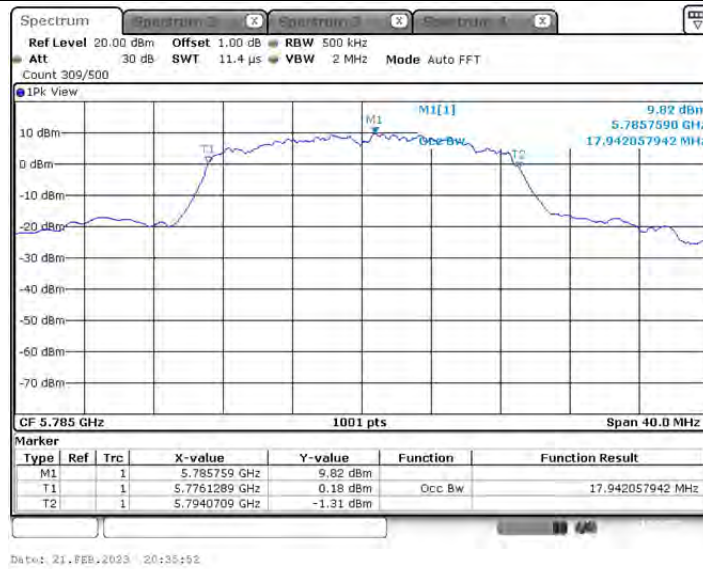
802.11n(HT20)_5240



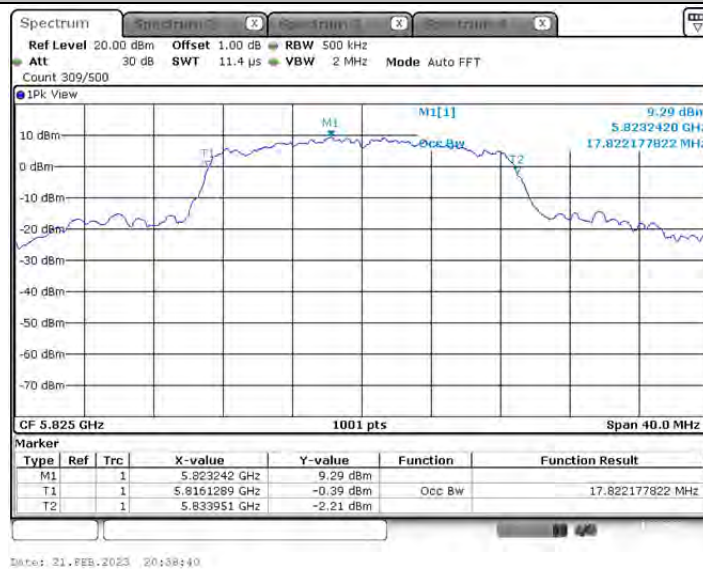
802.11n(HT20)_5745



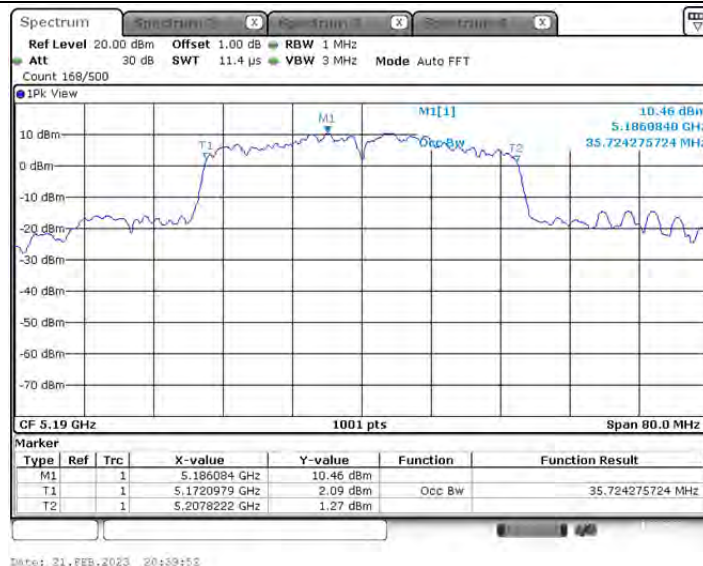
802.11n(HT20)_5785



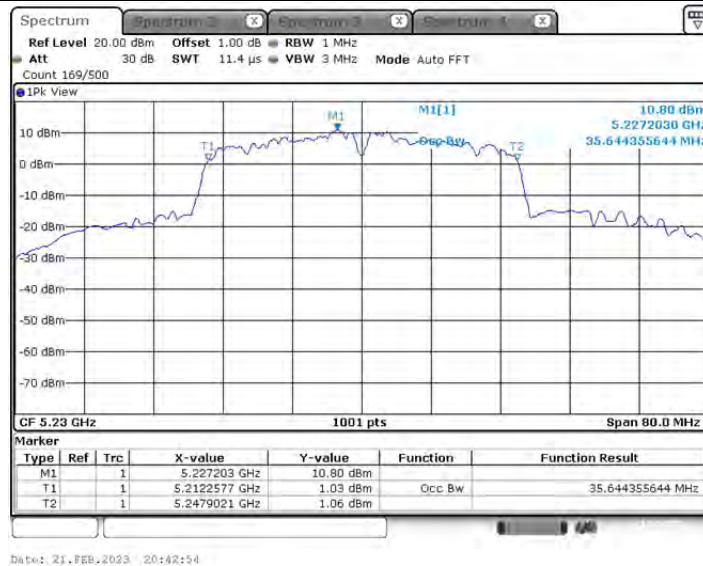
802.11n(HT20)_5825



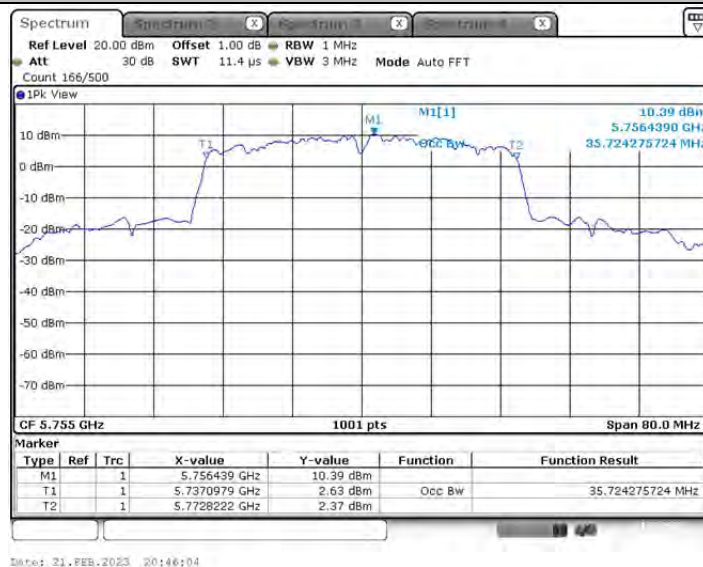
802.11n(HT40)_5190



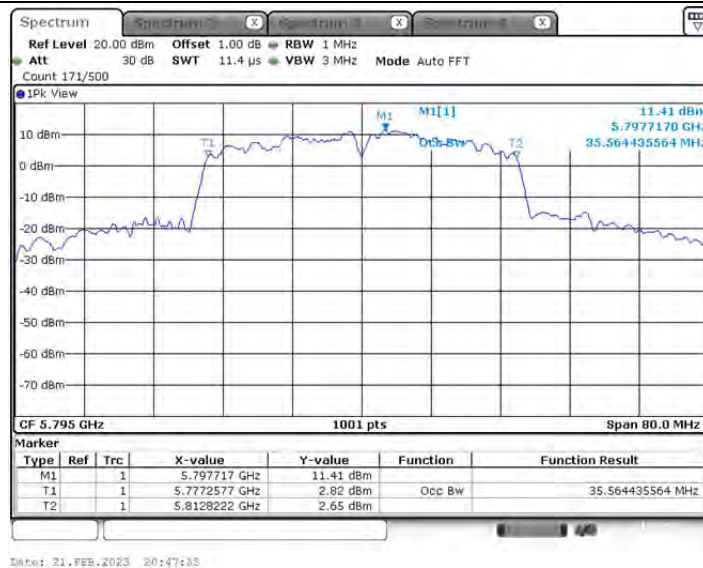
802.11n(HT40)_5230



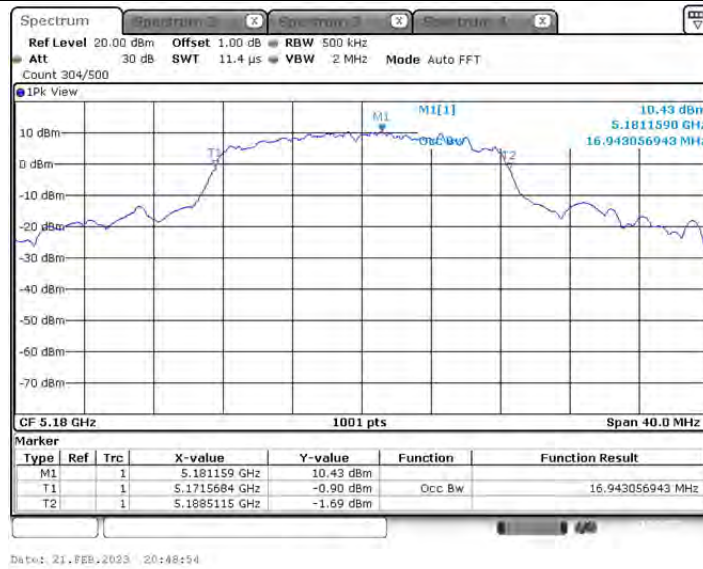
802.11n(HT40)_5755



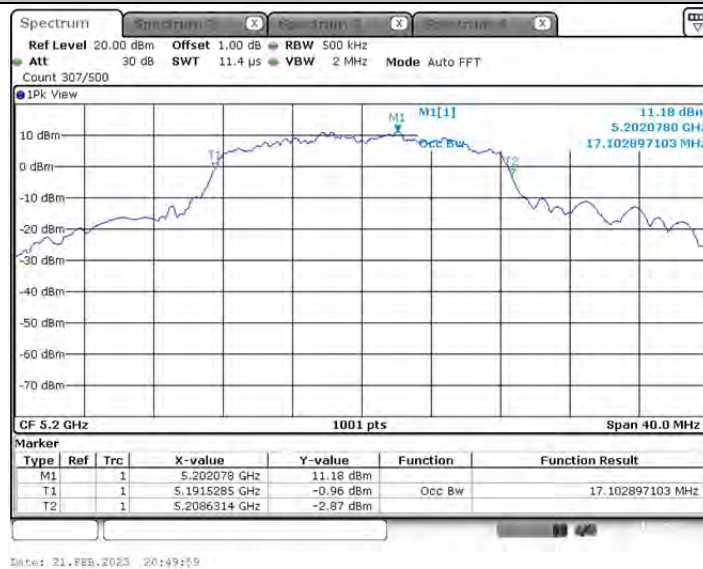
802.11n(HT40)_5795



802.11ac(VHT20)_5180



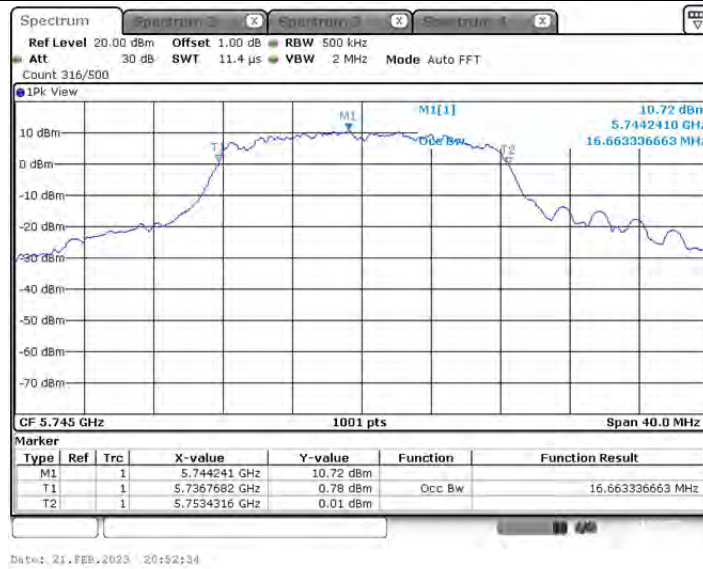
802.11ac(VHT20)_5200



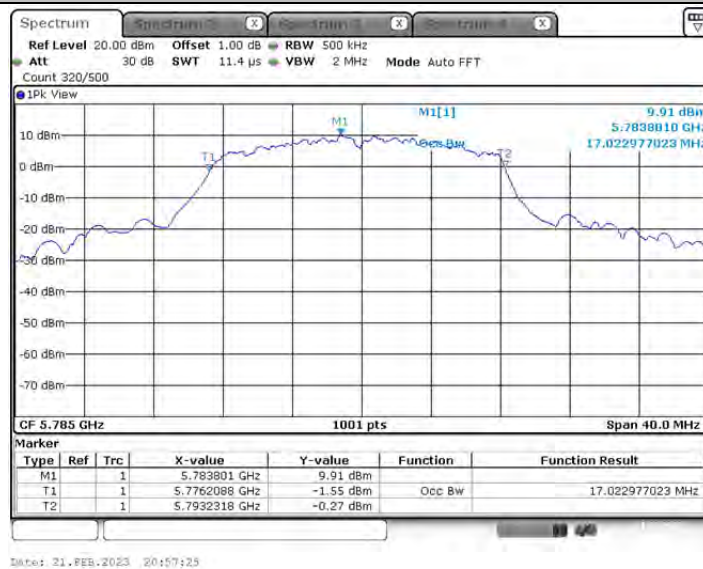
802.11ac(VHT20)_5240



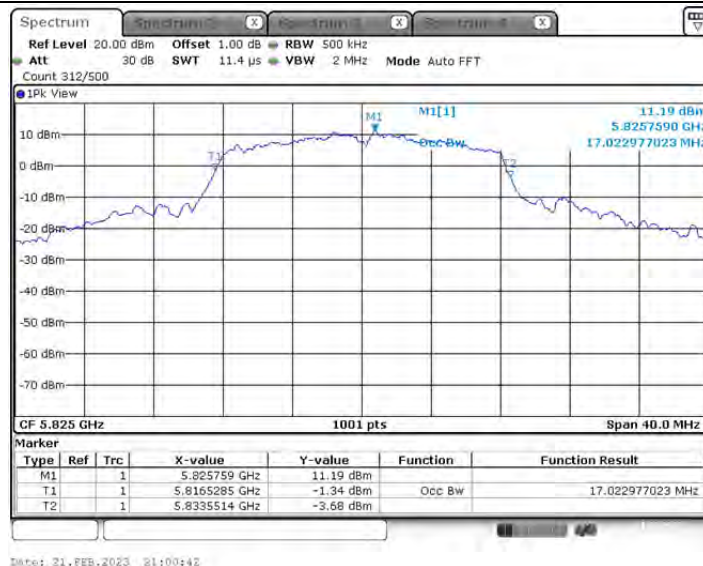
802.11ac(VHT20)_5745



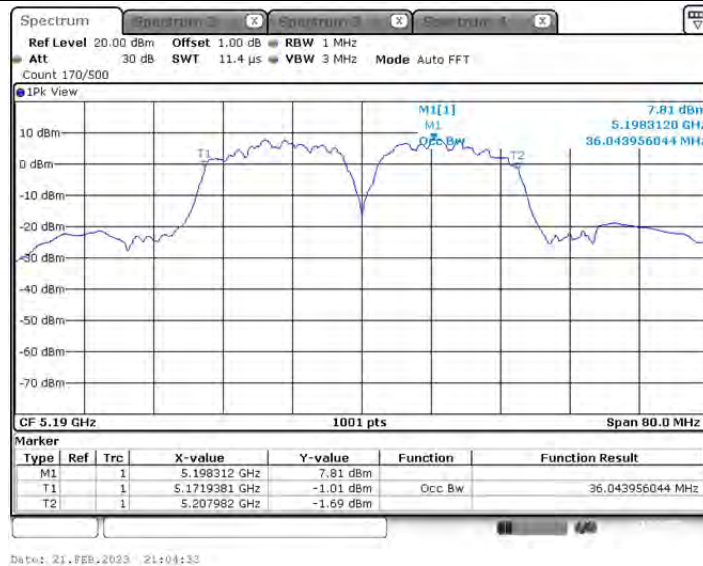
802.11ac(VHT20)_5785



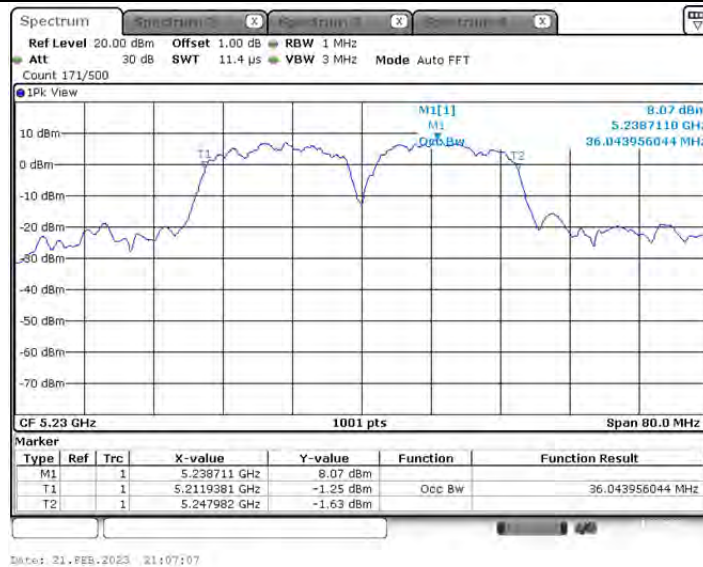
802.11ac(VHT20)_5825



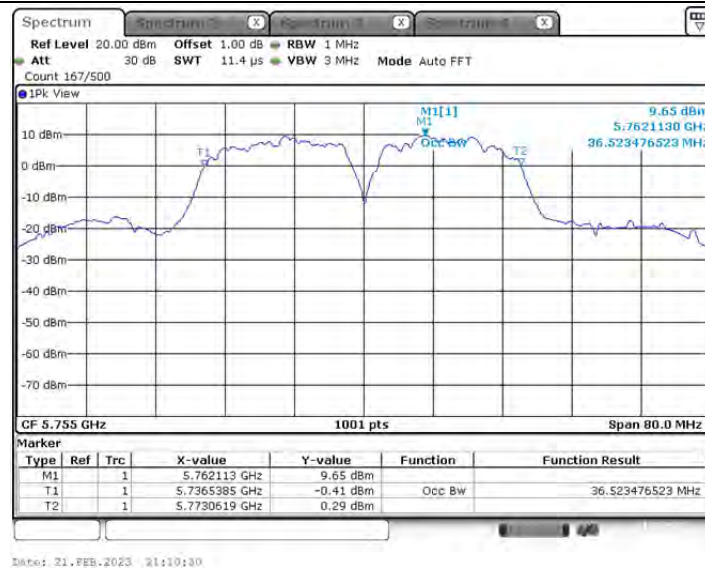
802.11ac(VHT40)_5190



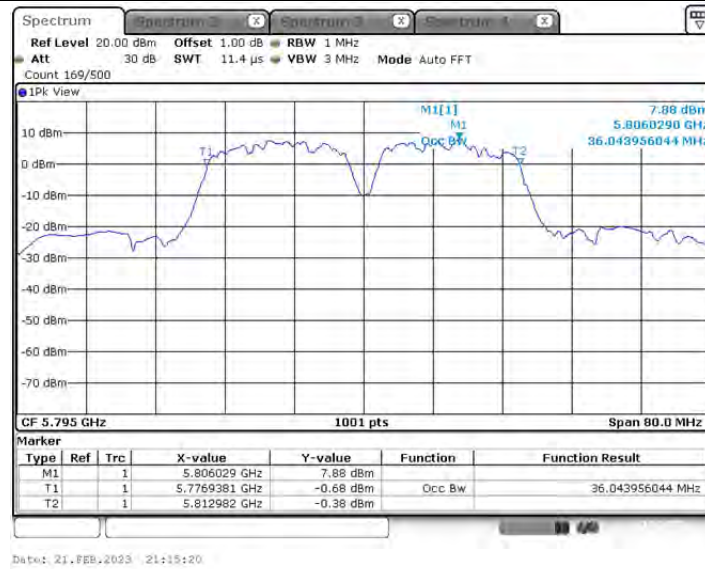
802.11ac(VHT40)_5230



802.11ac(VHT40)_5755



802.11ac(VHT40)_5795



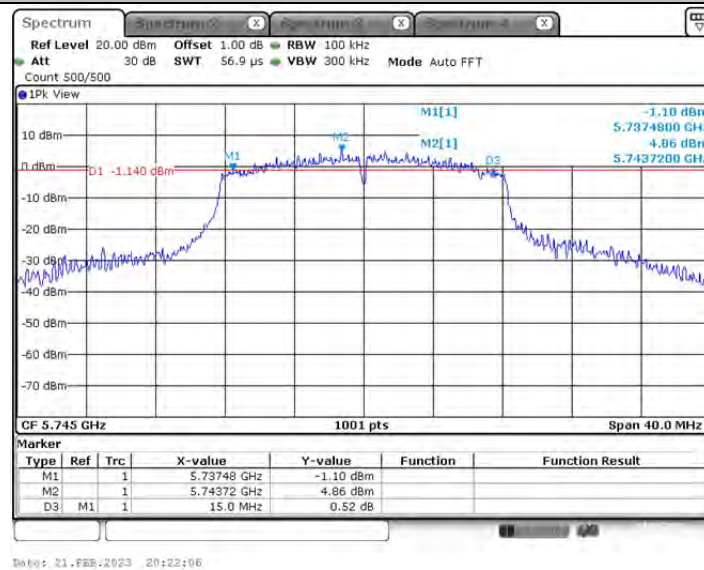
Appendix A3: Min emission bandwidth

Test Result

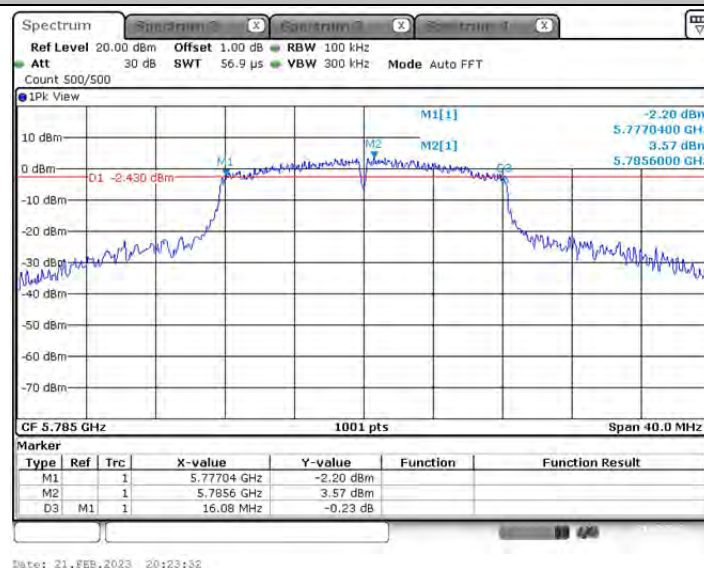
Test Mode	Channel	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
802.11a	5745	15.00	5737.48	5752.48	>0.5	PASS
	5785	16.08	5777.04	5793.12	>0.5	PASS
	5825	15.80	5817.04	5832.84	>0.5	PASS
802.11n(HT20)	5745	13.84	5738.64	5752.48	>0.5	PASS
	5785	16.32	5776.80	5793.12	>0.5	PASS
	5825	15.08	5817.40	5832.48	>0.5	PASS
802.11n(HT40)	5755	21.68	5742.44	5764.12	>0.5	PASS
	5795	35.04	5777.40	5812.44	>0.5	PASS
802.11ac(VHT20)	5745	15.32	5737.20	5752.52	>0.5	PASS
	5785	13.84	5778.68	5792.52	>0.5	PASS
	5825	15.68	5817.08	5832.76	>0.5	PASS
802.11ac(VHT40)	5755	34.72	5737.80	5772.52	>0.5	PASS
	5795	32.16	5779.08	5811.24	>0.5	PASS
802.11ac(VHT80)	5775	15.00	5737.48	5752.48	>0.5	PASS

Test Graphs

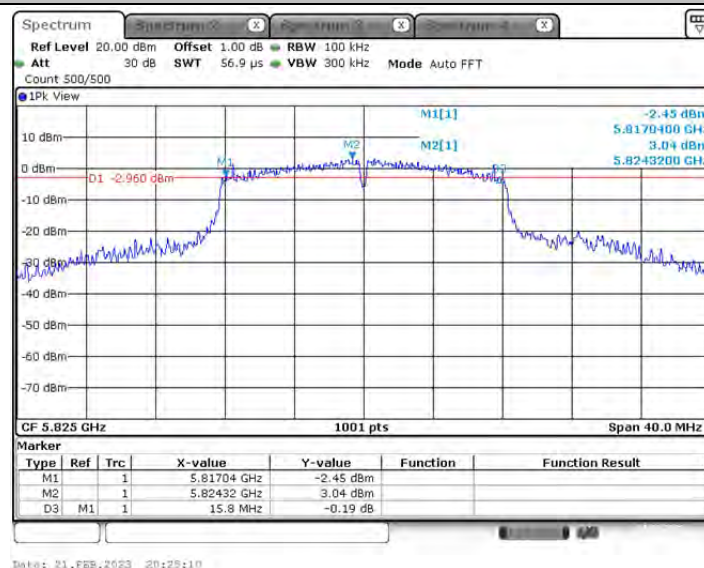
802.11a_5745



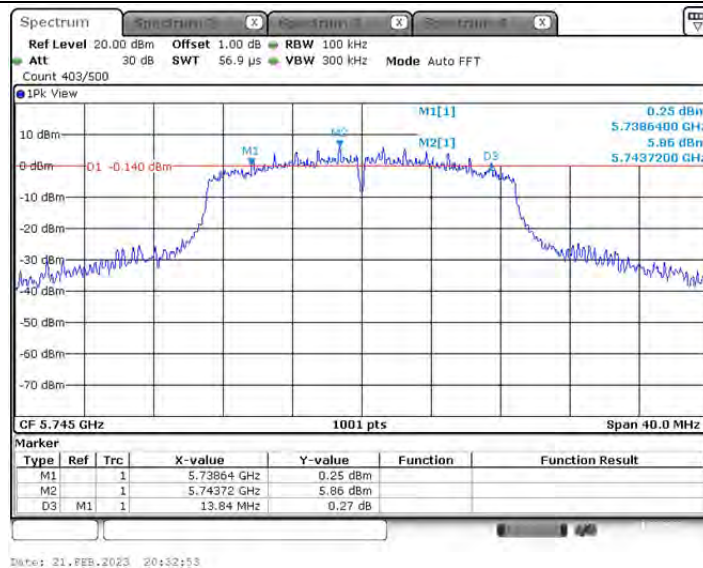
802.11a_5785



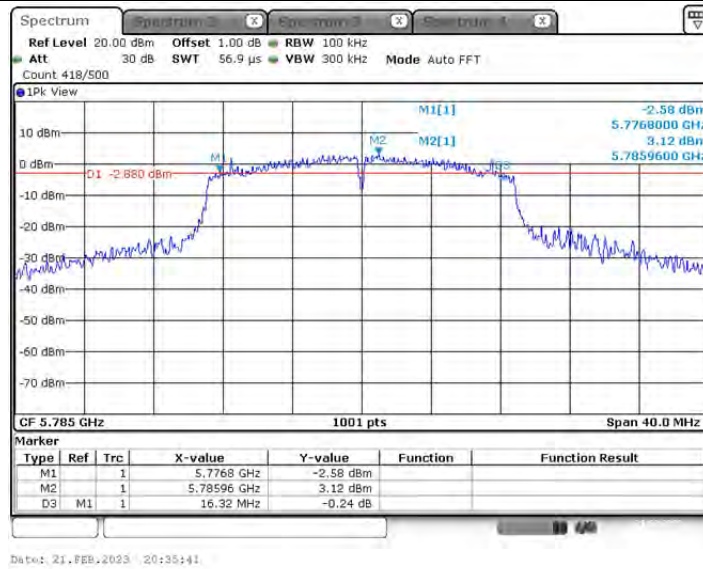
802.11a_5825



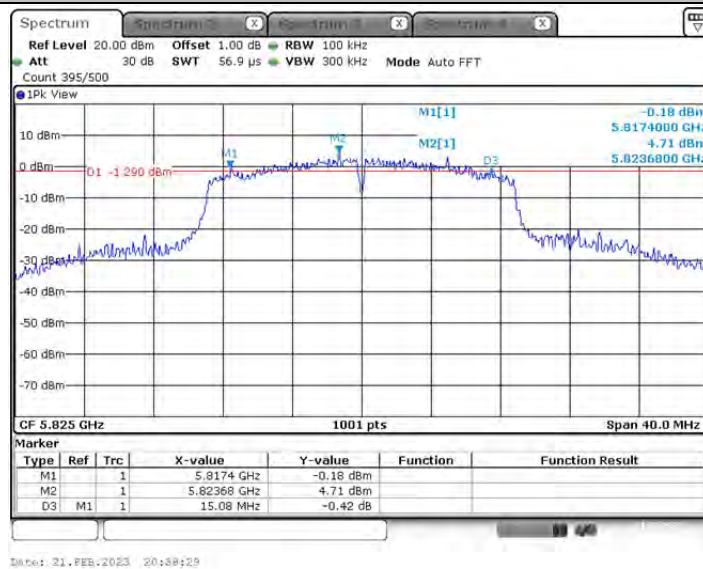
802.11n(HT20)_5745



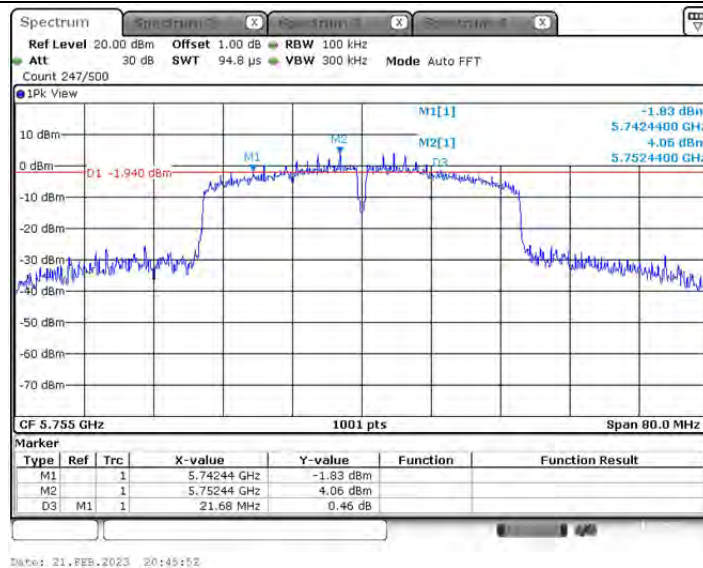
802.11n(HT20)_5785



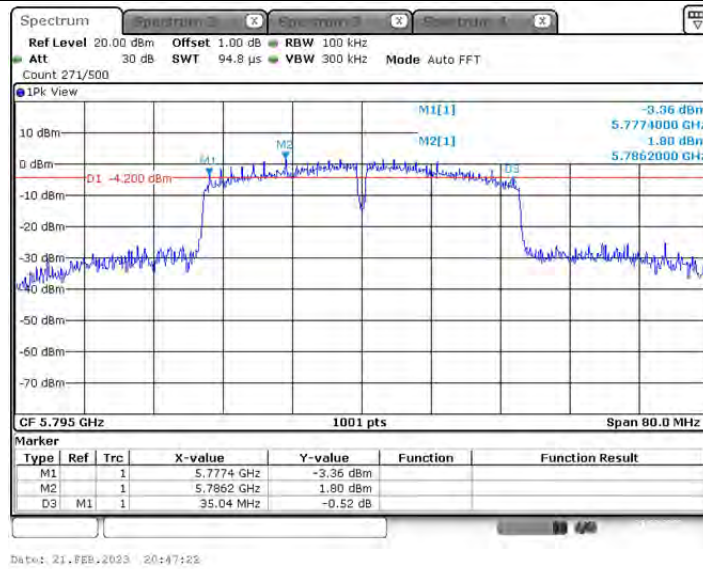
802.11n(HT20)_5825



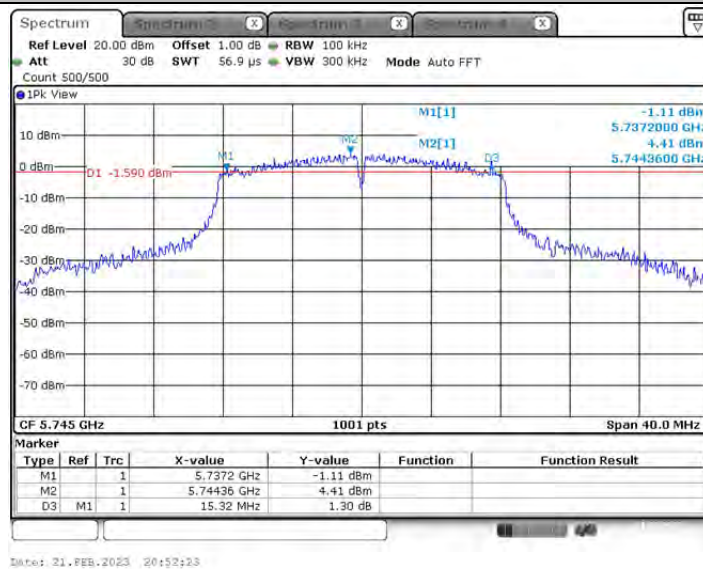
802.11n(HT40)_5755



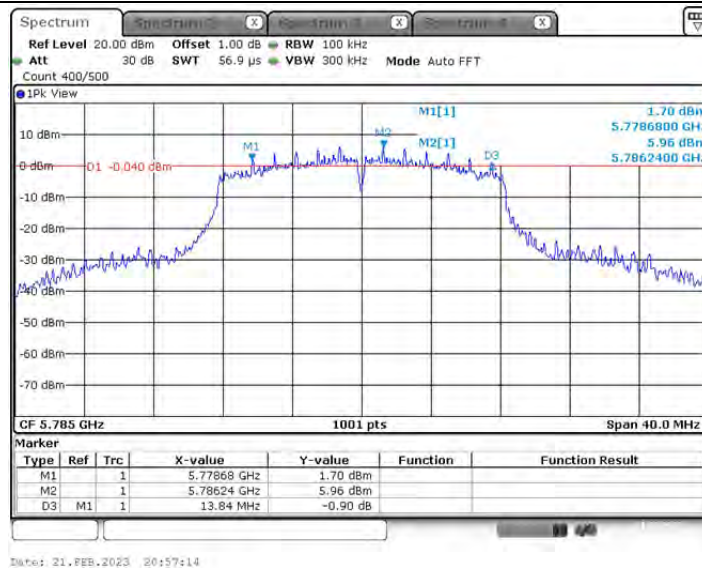
802.11n(HT40)_5795



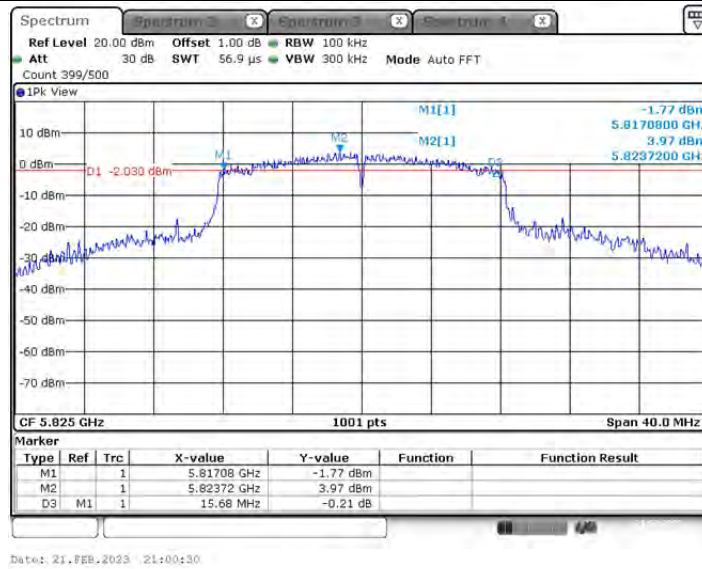
802.11ac(VHT20)_5745



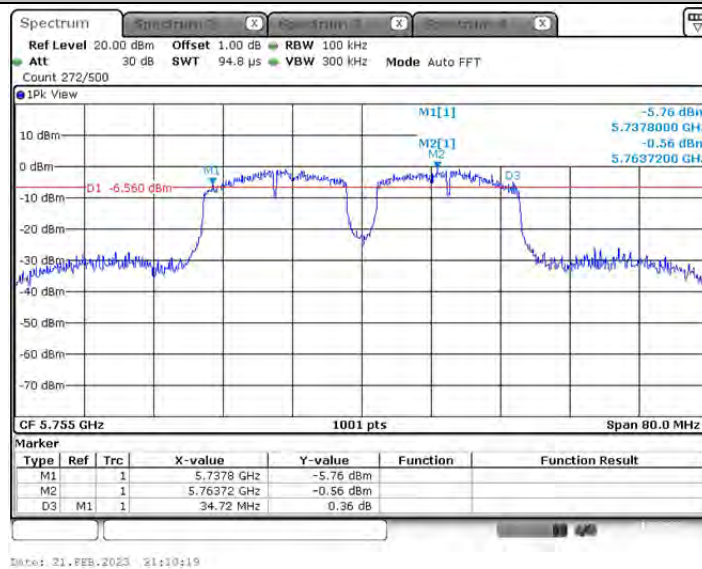
802.11ac(VHT20)_5785



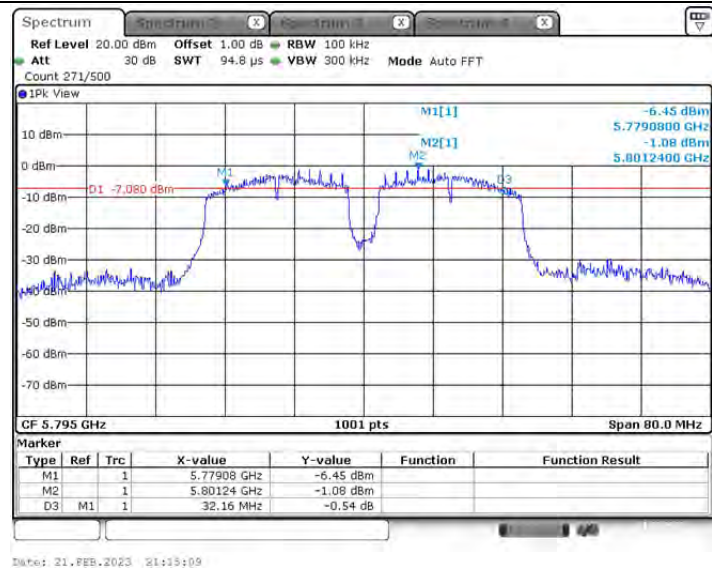
802.11ac(VHT20)_5825



802.11ac(VHT40)_5755



802.11ac(VHT40)_5795



Appendix B: Maximum conducted output power

Test Result

Test Mode	Channel	Result Avg[dBm]	Limit[dBm]	Verdict
802.11a	5180	16.34	<=24	PASS
	5200	16.20	<=24	PASS
	5240	16.22	<=24	PASS
	5745	16.54	<=30	PASS
	5785	16.30	<=30	PASS
	5825	15.82	<=30	PASS
802.11n(HT20)	5180	16.02	<=24	PASS
	5200	15.87	<=24	PASS
	5240	16.01	<=24	PASS
	5745	16.24	<=30	PASS
	5785	15.98	<=30	PASS
	5825	15.71	<=30	PASS
802.11n(HT40)	5190	16.10	<=24	PASS
	5230	15.73	<=24	PASS
	5755	16.48	<=30	PASS
	5795	16.36	<=30	PASS
802.11ac(VHT20)	5180	16.37	<=24	PASS
	5200	16.33	<=24	PASS
	5240	16.35	<=24	PASS
	5745	16.68	<=30	PASS
	5785	15.85	<=30	PASS
	5825	16.39	<=30	PASS
802.11ac(VHT40)	5190	13.06	<=24	PASS
	5230	12.90	<=24	PASS
	5755	14.94	<=30	PASS
	5795	13.27	<=30	PASS

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

2. Test results increased Duty Cycle Factor.

Appendix C: Maximum power spectral density

Test Result

Test Mode	Channel	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
802.11a	5180	6.82	≤ 11	PASS
	5200	7.01	≤ 11	PASS
	5240	7.02	≤ 11	PASS
	5745	3.64	≤ 30	PASS
	5785	4.37	≤ 30	PASS
	5825	5.25	≤ 30	PASS
802.11n(HT20)	5180	6.26	≤ 11	PASS
	5200	5.86	≤ 11	PASS
	5240	6.17	≤ 11	PASS
	5745	4.22	≤ 30	PASS
	5785	4.28	≤ 30	PASS
	5825	6.50	≤ 30	PASS
802.11n(HT40)	5190	6.17	≤ 11	PASS
	5230	3.81	≤ 11	PASS
	5755	0.68	≤ 30	PASS
	5795	0.55	≤ 30	PASS
802.11ac(VHT20)	5180	6.87	≤ 11	PASS
	5200	7.15	≤ 11	PASS
	5240	7.22	≤ 11	PASS
	5745	3.41	≤ 30	PASS
	5785	4.19	≤ 30	PASS
	5825	5.87	≤ 30	PASS
802.11ac(VHT40)	5190	1.02	≤ 11	PASS
	5230	0.91	≤ 11	PASS
	5755	0.94	≤ 30	PASS
	5795	0.59	≤ 30	PASS

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

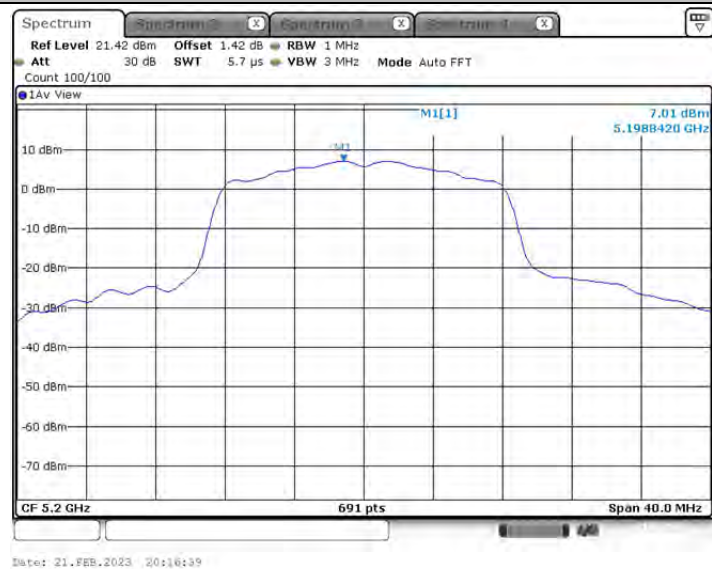
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.

Test Graphs

802.11a_5180



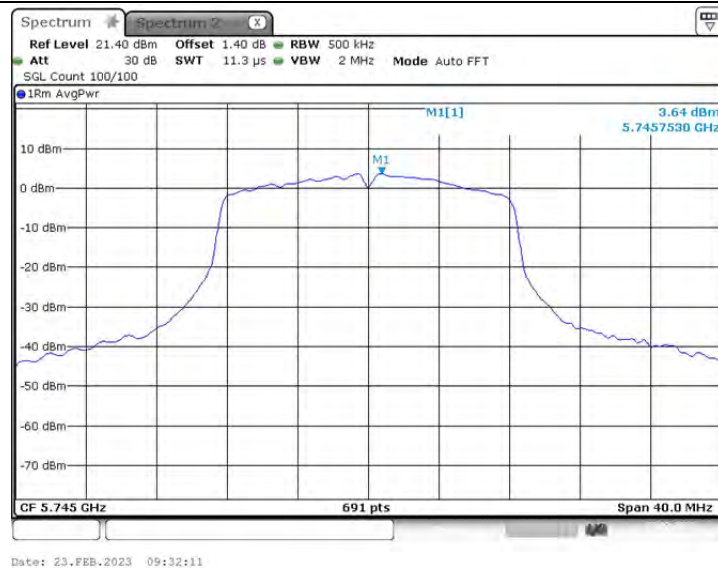
802.11a_5200



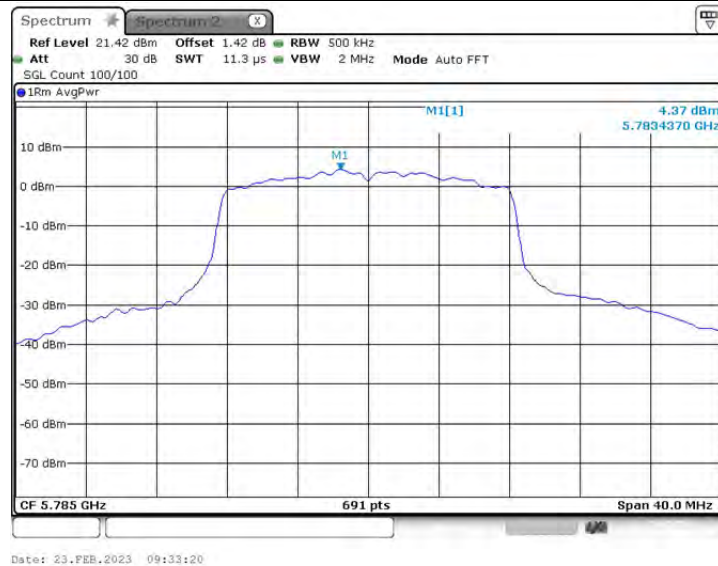
802.11a_5240



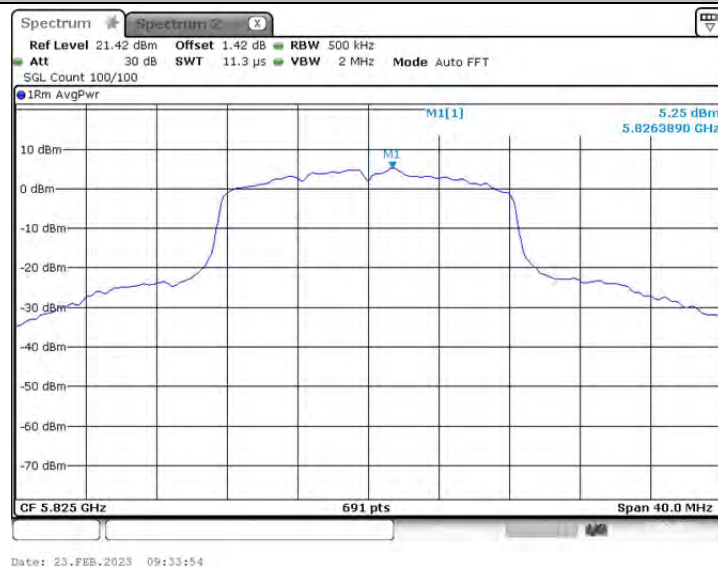
802.11a_5745



802.11a_5785



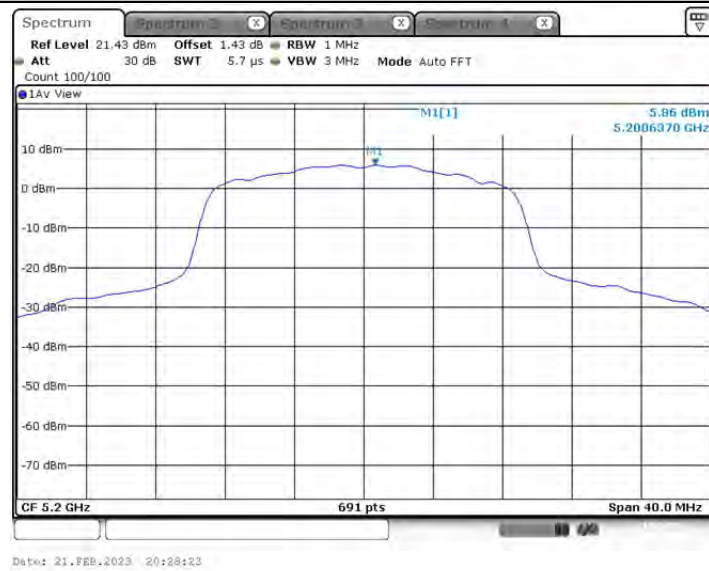
802.11a_5825



802.11n(HT20)_5180



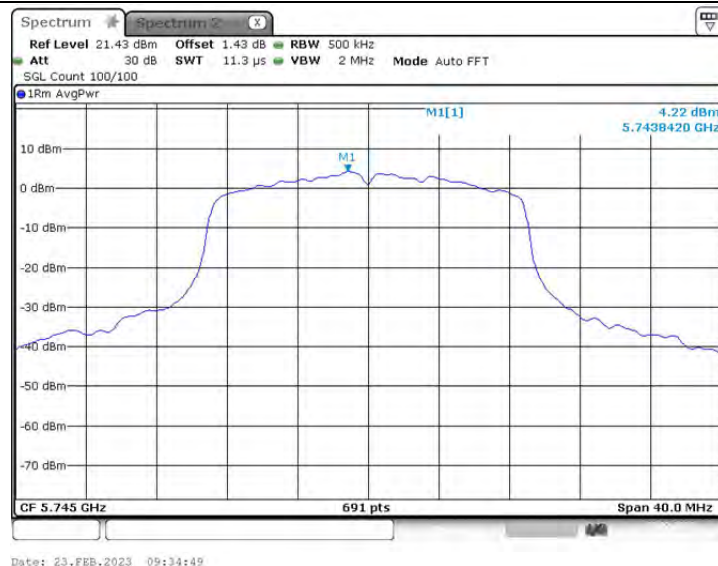
802.11n(HT20)_5200



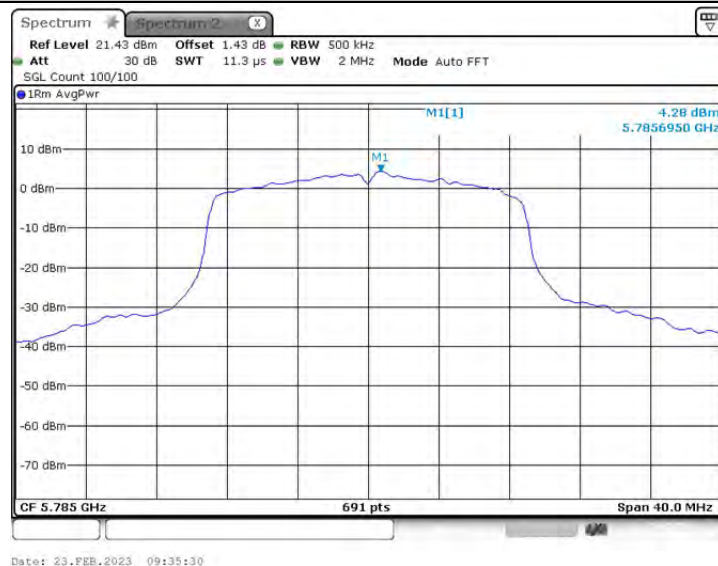
802.11n(HT20)_5240



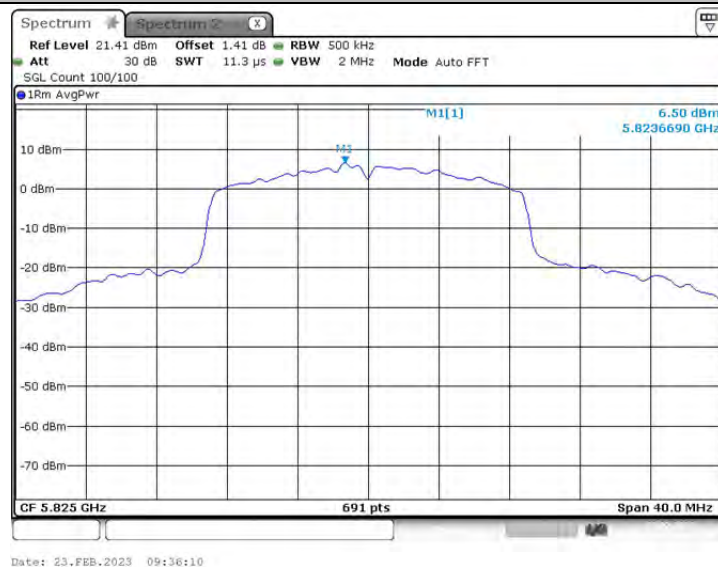
802.11n(HT20)_5745



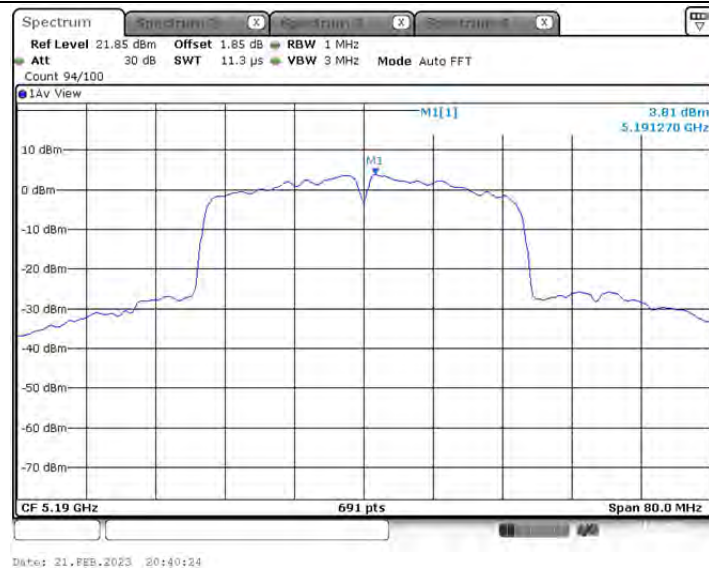
802.11n(HT20)_5785



802.11n(HT20)_5825



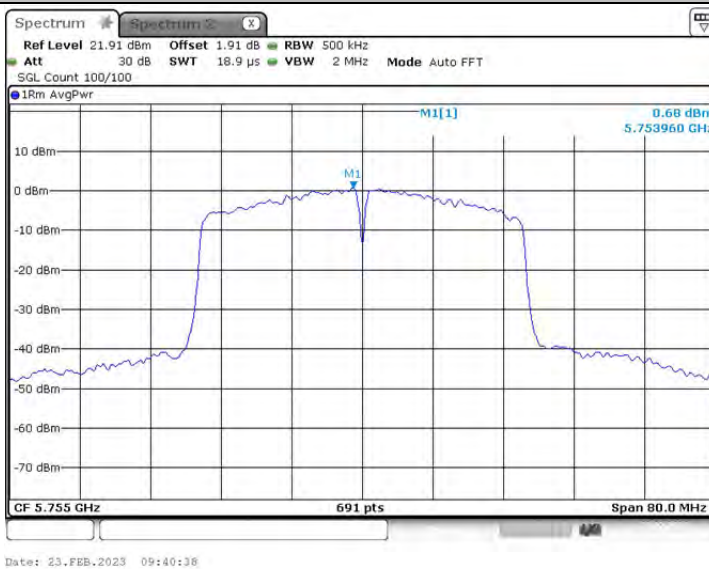
802.11n(HT40)_5190



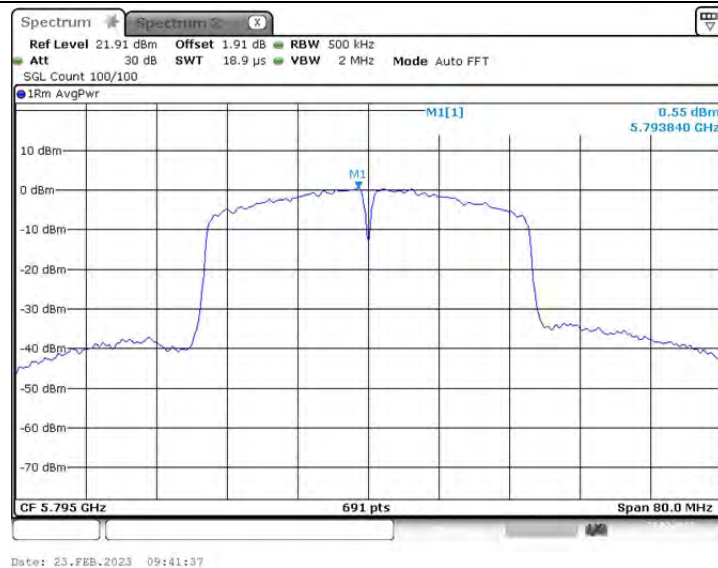
802.11n(HT40)_5230



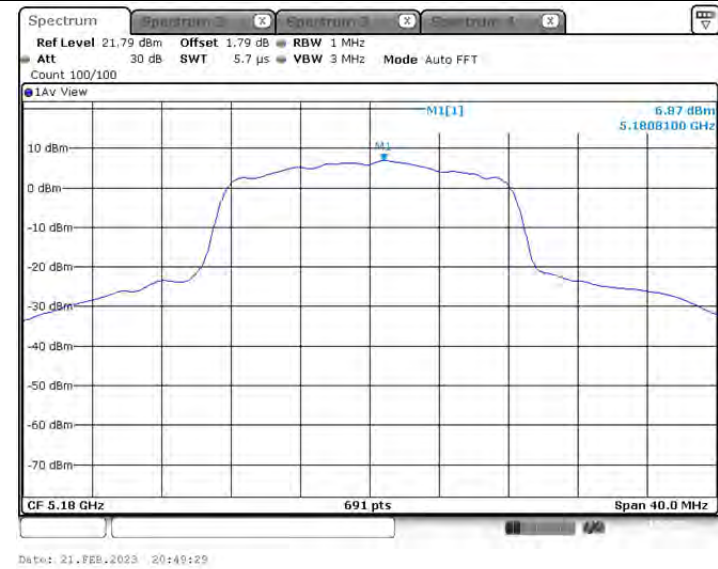
802.11n(HT40)_5755



802.11n(HT40)_5795



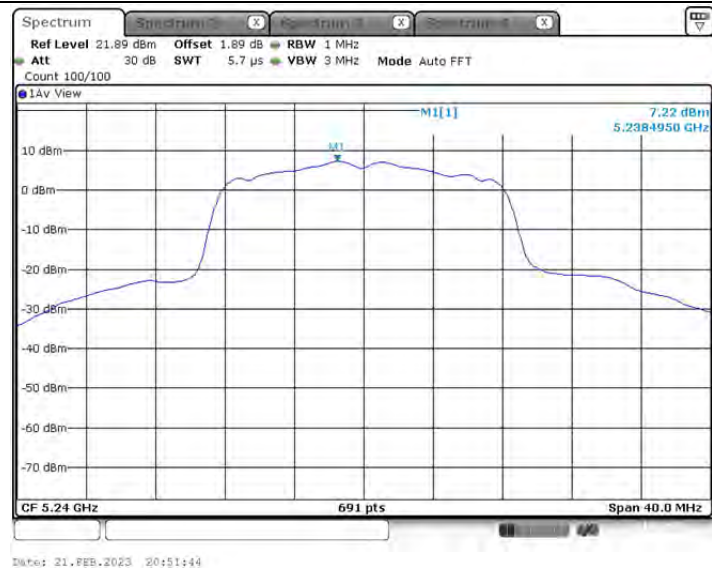
802.11ac(VHT20)_5180



802.11ac(VHT20)_5200



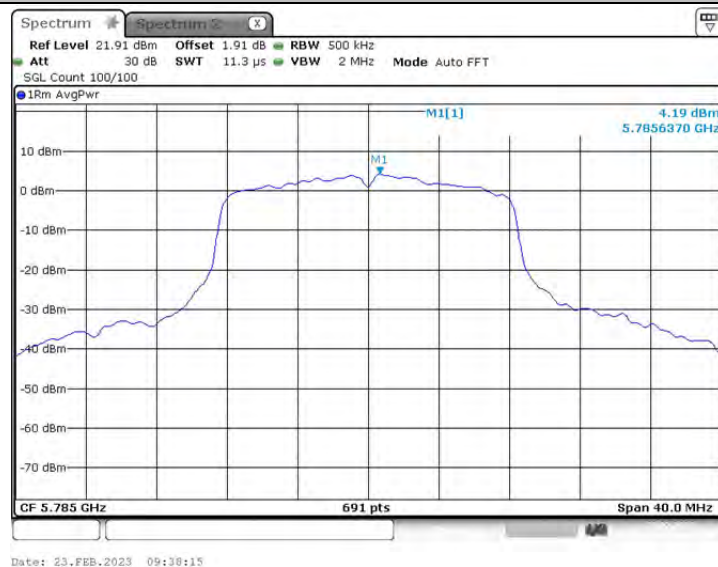
802.11ac(VHT20)_5240



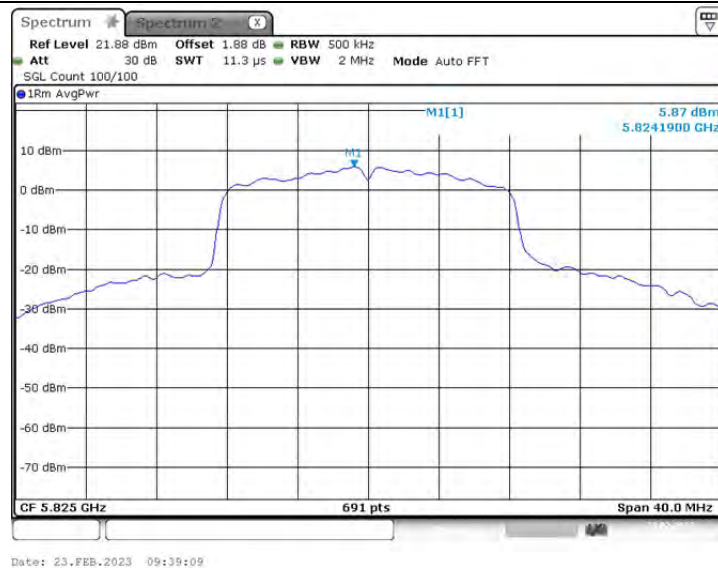
802.11ac(VHT20)_5745



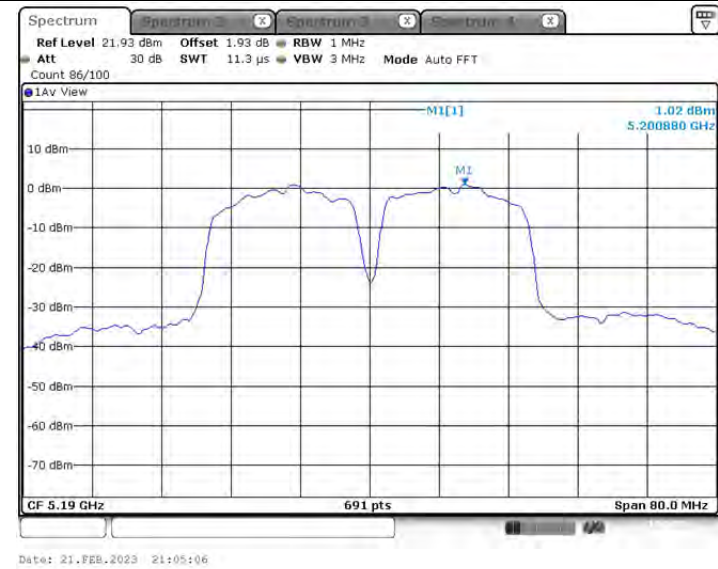
802.11ac(VHT20)_5785



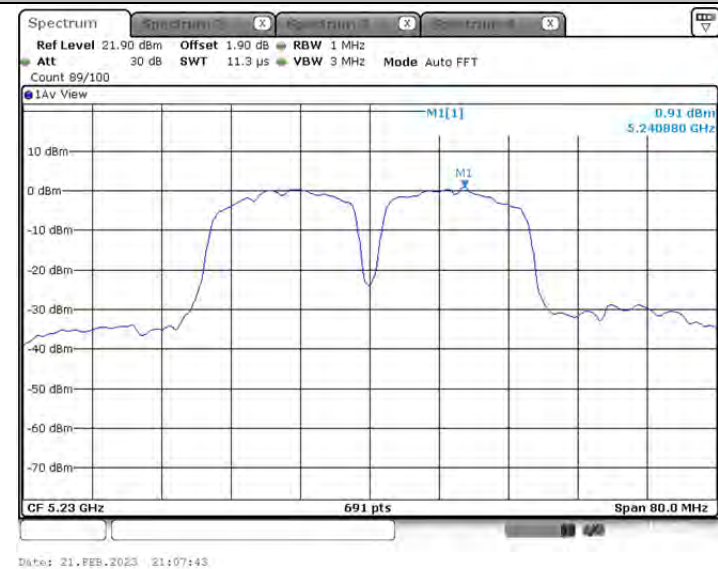
802.11ac(VHT20)_5825



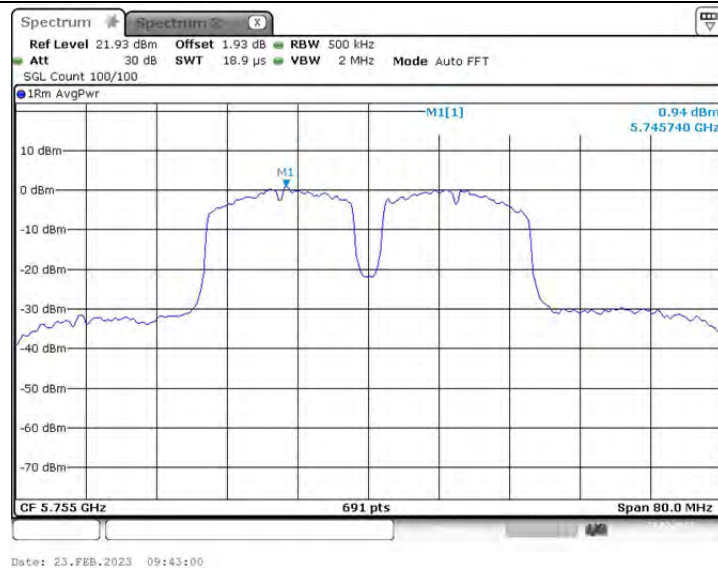
802.11ac(VHT40)_5190



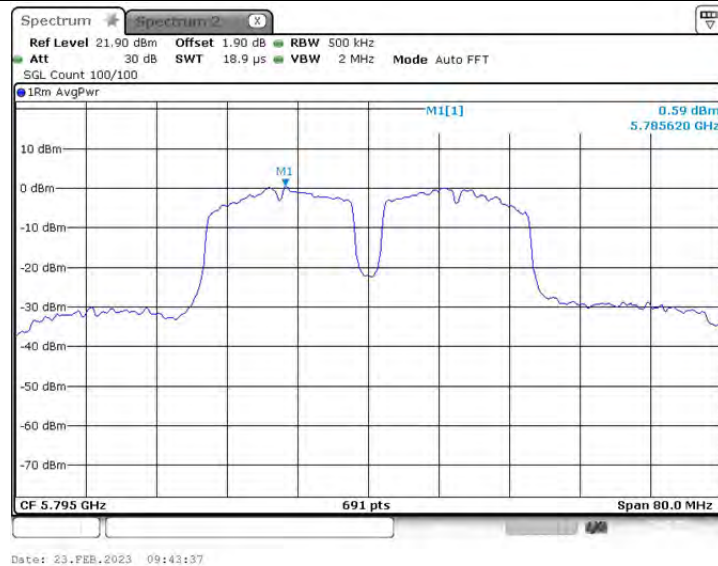
802.11ac(VHT40)_5230



802.11ac(VHT40)_5755



802.11ac(VHT40)_5795



Appendix D: Frequency Stability

Test Result

Voltage							
Test Mode	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20MHz	5180	NV	NT	-27000	-5.212355	±20	PASS
		LV	NT	-28000	-5.405405	±20	PASS
		HV	NT	-28000	-5.405405	±20	PASS
	5200	NV	NT	-28000	-5.384615	±20	PASS
		LV	NT	-28000	-5.384615	±20	PASS
		HV	NT	-28000	-5.384615	±20	PASS
	5240	NV	NT	-28000	-5.343511	±20	PASS
		LV	NT	-28000	-5.343511	±20	PASS
		HV	NT	-28000	-5.343511	±20	PASS
	5745	NV	NT	-30000	-5.221932	±20	PASS
		LV	NT	-31000	-5.395997	±20	PASS
		HV	NT	-31000	-5.395997	±20	PASS
	5785	NV	NT	-31000	-5.358686	±20	PASS
		LV	NT	-32000	-5.531547	±20	PASS
		HV	NT	-32000	-5.531547	±20	PASS
	5825	NV	NT	-32000	-5.493562	±20	PASS
		LV	NT	-32000	-5.493562	±20	PASS
		HV	NT	-32000	-5.493562	±20	PASS
40MHz	5190	NV	NT	-29000	-5.587669	±20	PASS
		LV	NT	-28000	-5.394990	±20	PASS
		HV	NT	-28000	-5.394990	±20	PASS
	5230	NV	NT	-28000	-5.353728	±20	PASS
		LV	NT	-28000	-5.353728	±20	PASS
		HV	NT	-28000	-5.353728	±20	PASS
	5755	NV	NT	-31000	-5.386620	±20	PASS
		LV	NT	-31000	-5.386620	±20	PASS
		HV	NT	-31000	-5.386620	±20	PASS
	5795	NV	NT	-31000	-5.349439	±20	PASS
		LV	NT	-31000	-5.349439	±20	PASS
		HV	NT	-31000	-5.349439	±20	PASS

Temperature							
TestMode	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20MHz	5180	NV	0	-27000	-5.212355	±20	PASS
		NV	10	-28000	-5.405405	±20	PASS
		NV	20	-28000	-5.405405	±20	PASS
		NV	30	-28000	-5.405405	±20	PASS
		NV	40	-28000	-5.405405	±20	PASS
		NV	45	-27000	-5.212355	±20	PASS
	5200	NV	0	-28000	-5.384615	±20	PASS
		NV	10	-28000	-5.384615	±20	PASS
		NV	20	-28000	-5.384615	±20	PASS
		NV	30	-28000	-5.384615	±20	PASS
		NV	40	-28000	-5.384615	±20	PASS
		NV	45	-28000	-5.384615	±20	PASS
	5240	NV	0	-28000	-5.343511	±20	PASS
		NV	10	-28000	-5.343511	±20	PASS
		NV	20	-28000	-5.343511	±20	PASS
		NV	30	-28000	-5.343511	±20	PASS
		NV	40	-28000	-5.343511	±20	PASS
		NV	45	-28000	-5.343511	±20	PASS
	5745	NV	0	-31000	-5.395997	±20	PASS
		NV	10	-31000	-5.395997	±20	PASS
		NV	20	-31000	-5.395997	±20	PASS
		NV	30	-31000	-5.395997	±20	PASS
		NV	40	-32000	-5.570061	±20	PASS
		NV	45	-31000	-5.395997	±20	PASS
	5785	NV	0	-32000	-5.531547	±20	PASS
		NV	10	-32000	-5.531547	±20	PASS
		NV	20	-32000	-5.531547	±20	PASS
		NV	30	-32000	-5.531547	±20	PASS
		NV	40	-32000	-5.531547	±20	PASS
		NV	45	-32000	-5.531547	±20	PASS
	5825	NV	0	-32000	-5.493562	±20	PASS
		NV	10	-32000	-5.493562	±20	PASS
		NV	20	-32000	-5.493562	±20	PASS
		NV	30	-32000	-5.493562	±20	PASS
		NV	40	-32000	-5.493562	±20	PASS
		NV	45	-32000	-5.493562	±20	PASS
40MHz	5190	NV	0	-28000	-5.39499	±20	PASS
		NV	10	-28000	-5.39499	±20	PASS
		NV	20	-28000	-5.39499	±20	PASS
		NV	30	-28000	-5.39499	±20	PASS
		NV	40	-28000	-5.39499	±20	PASS
		NV	45	-28000	-5.39499	±20	PASS
	5230	NV	0	-28000	-5.353728	±20	PASS

		NV	10	-28000	-5.353728	±20	PASS
		NV	20	-28000	-5.353728	±20	PASS
		NV	30	-28000	-5.353728	±20	PASS
		NV	40	-28000	-5.353728	±20	PASS
		NV	45	-28000	-5.353728	±20	PASS
	5755	NV	0	-32000	-5.560382	±20	PASS
		NV	10	-32000	-5.560382	±20	PASS
		NV	20	-32000	-5.560382	±20	PASS
		NV	30	-32000	-5.560382	±20	PASS
		NV	40	-32000	-5.560382	±20	PASS
		NV	45	-32000	-5.560382	±20	PASS
	5795	NV	0	-32000	-5.522001	±20	PASS
		NV	10	-32000	-5.522001	±20	PASS
		NV	20	-32000	-5.522001	±20	PASS
		NV	30	-32000	-5.522001	±20	PASS
		NV	40	-32000	-5.522001	±20	PASS
		NV	45	-32000	-5.522001	±20	PASS

Appendix E: Duty Cycle

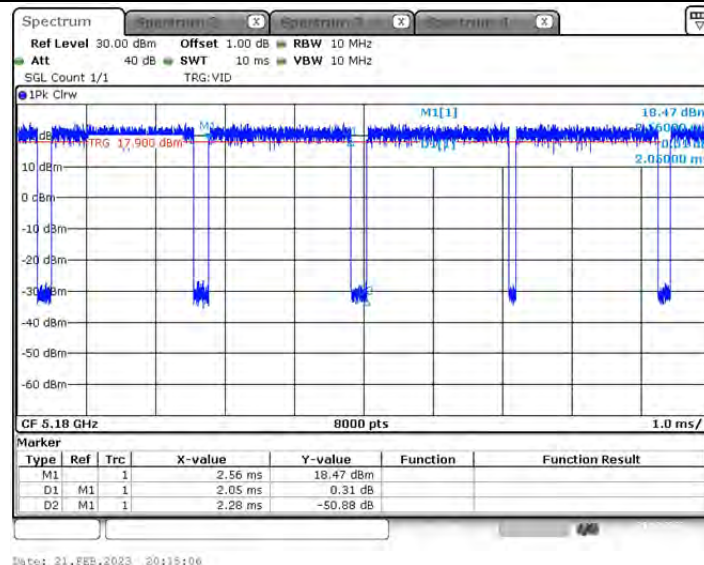
Test Result

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	2.05	2.28	89.91	0.49	1	0.46
	5200	2.05	2.26	90.71	0.49	1	0.42
	5240	2.05	2.26	90.71	0.49	1	0.42
	5745	2.05	2.25	91.11	0.49	1	0.40
	5785	2.05	2.26	90.71	0.49	1	0.42
	5825	2.05	2.26	90.71	0.49	1	0.42
802.11n(HT20)	5180	1.91	2.13	89.67	0.52	1	0.47
	5200	1.91	2.11	90.52	0.52	1	0.43
	5240	1.91	2.11	90.52	0.52	1	0.43
	5745	1.91	2.11	90.52	0.52	1	0.43
	5785	1.91	2.11	90.52	0.52	1	0.43
	5825	1.91	2.10	90.95	0.52	1	0.41
802.11n(HT40)	5190	0.93	1.13	82.30	1.08	2	0.85
	5230	0.94	1.16	81.03	1.06	2	0.91
	5755	0.94	1.16	81.03	1.06	2	0.91
	5795	0.94	1.16	81.03	1.06	2	0.91
802.11ac(VHT20)	5180	2.05	2.46	83.33	0.49	1	0.79
	5200	2.05	2.44	84.02	0.49	1	0.76
	5240	2.06	2.53	81.42	0.49	1	0.89
	5745	2.05	2.49	82.33	0.49	1	0.84
	5785	2.05	2.53	81.03	0.49	1	0.91
	5825	2.05	2.51	81.67	0.49	1	0.88
802.11ac(VHT40)	5190	2.05	2.54	80.71	0.49	1	0.93
	5230	2.05	2.52	81.35	0.49	1	0.90
	5755	2.05	2.54	80.71	0.49	1	0.93
	5795	2.05	2.52	81.35	0.49	1	0.90

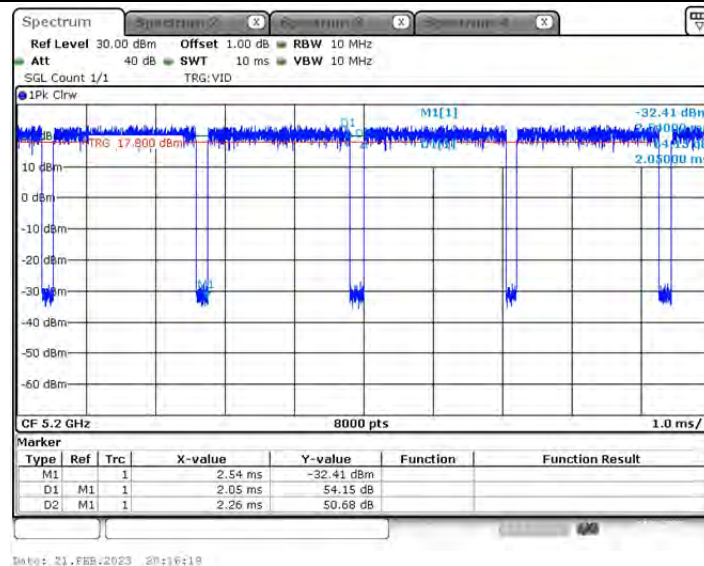
Note: Duty Cycle Factor = $10 \cdot \log_{10}(1 / \text{Duty Cycle})$

Test Graphs

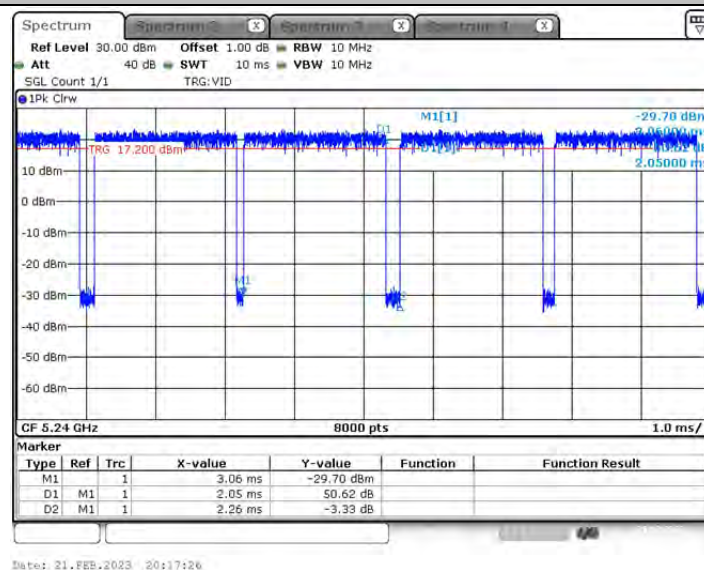
802.11a_5180



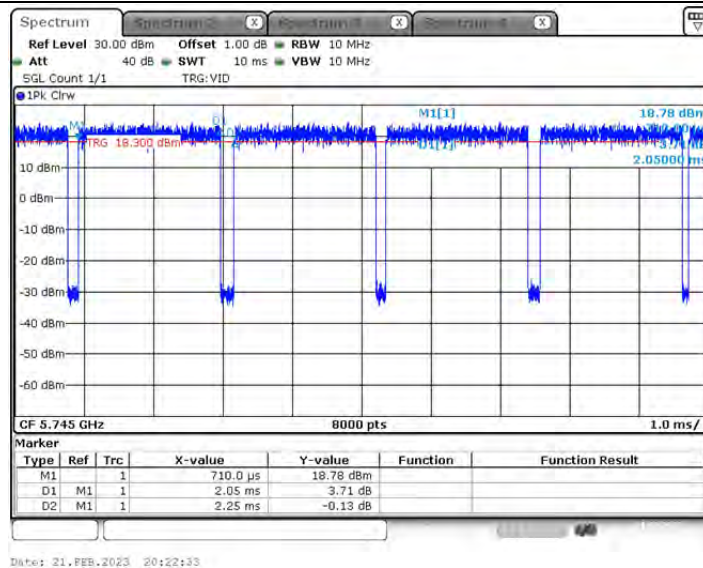
802.11a_5200



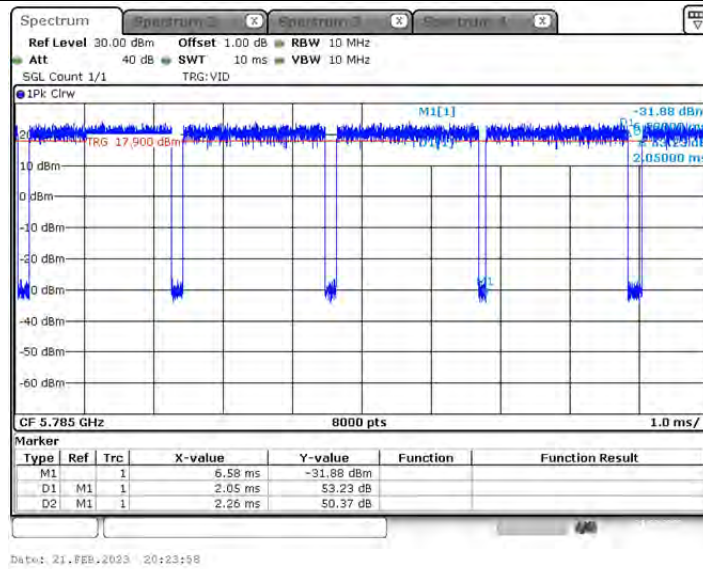
802.11a_5240



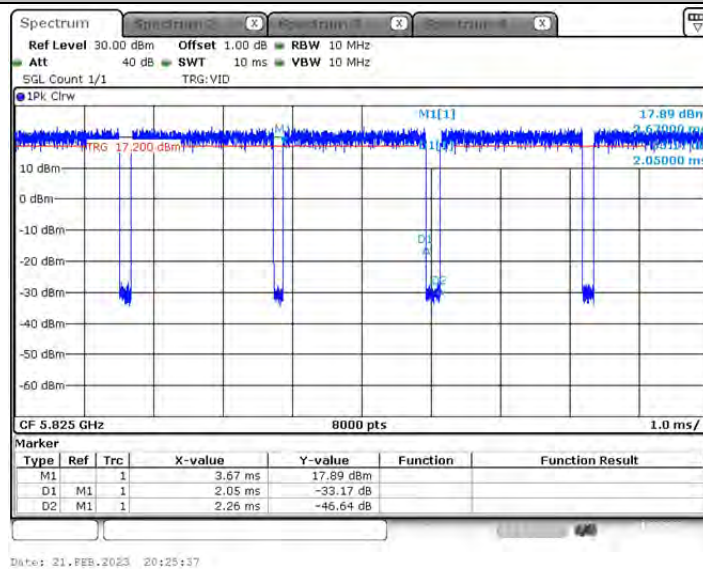
802.11a_5745



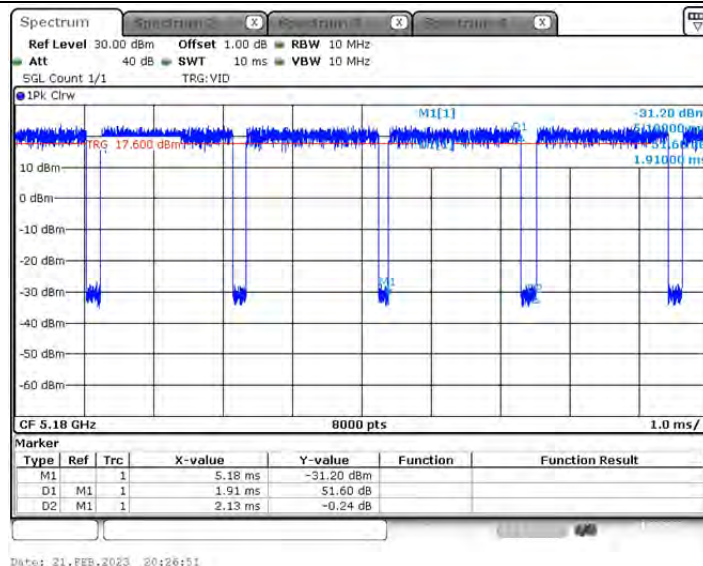
802.11a_5785



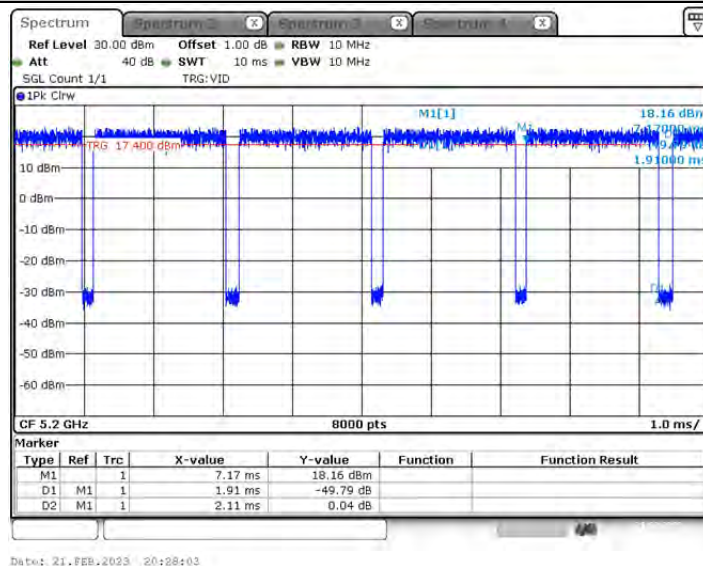
802.11a_5825



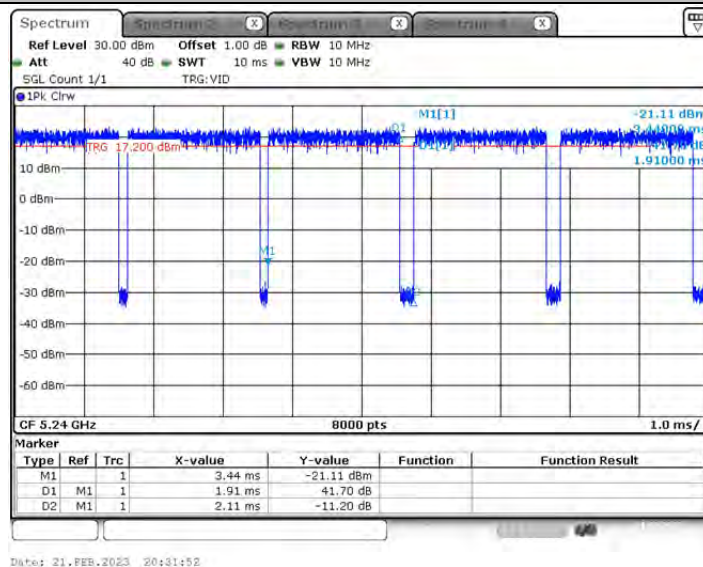
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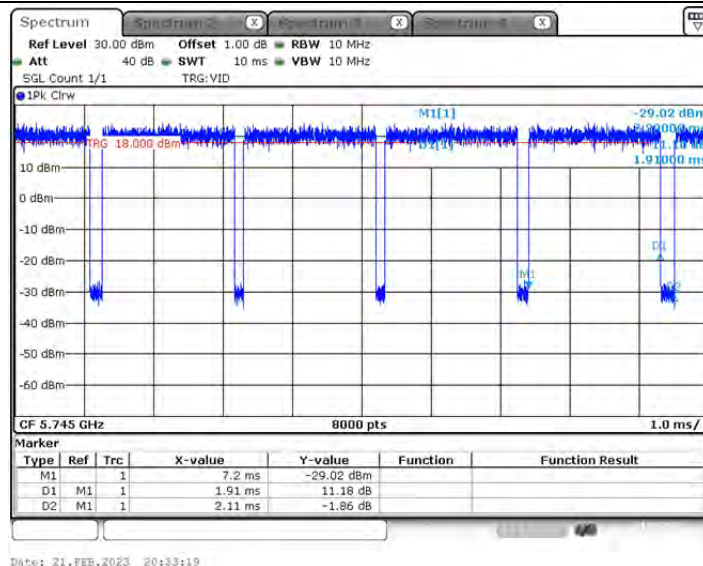
802.11n(HT20)_5200



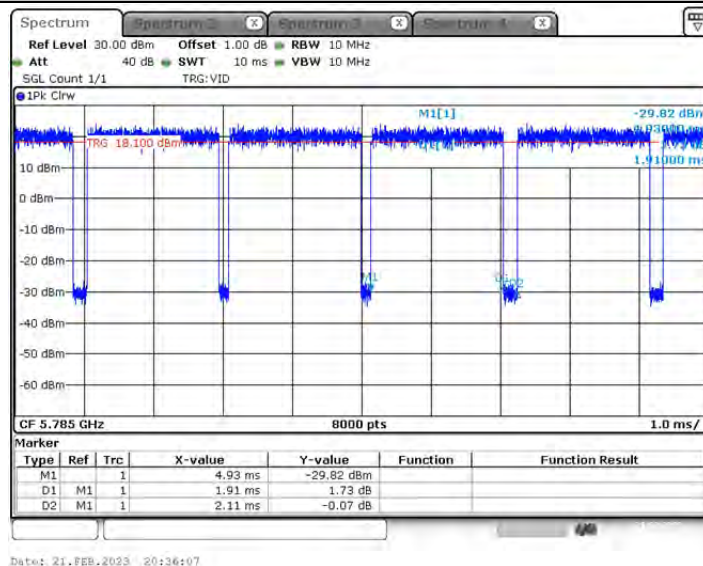
802.11n(HT20)_5240



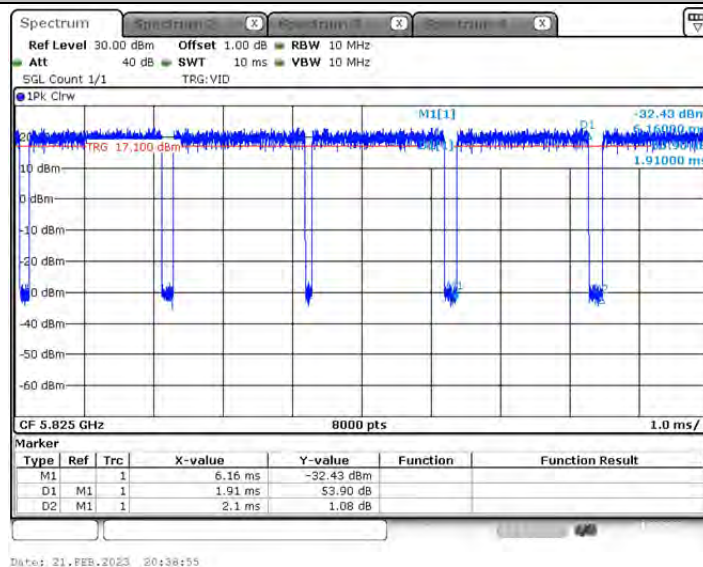
802.11n(HT20)_5745



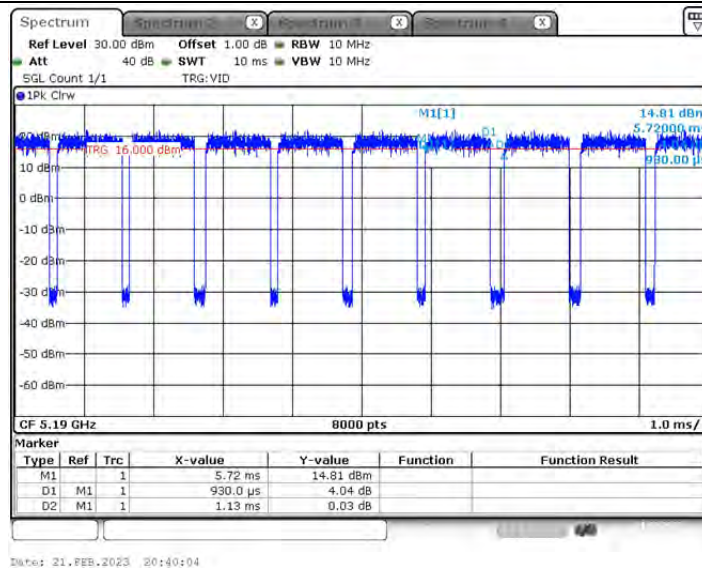
802.11n(HT20)_5785



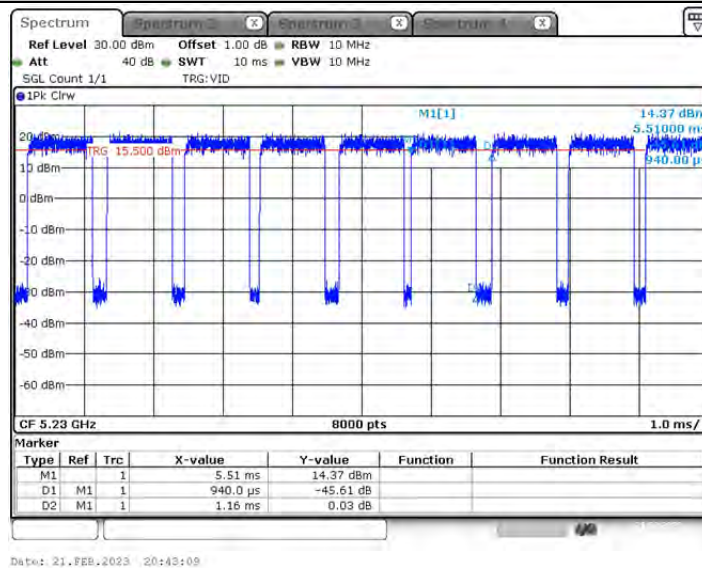
802.11n(HT20)_5825



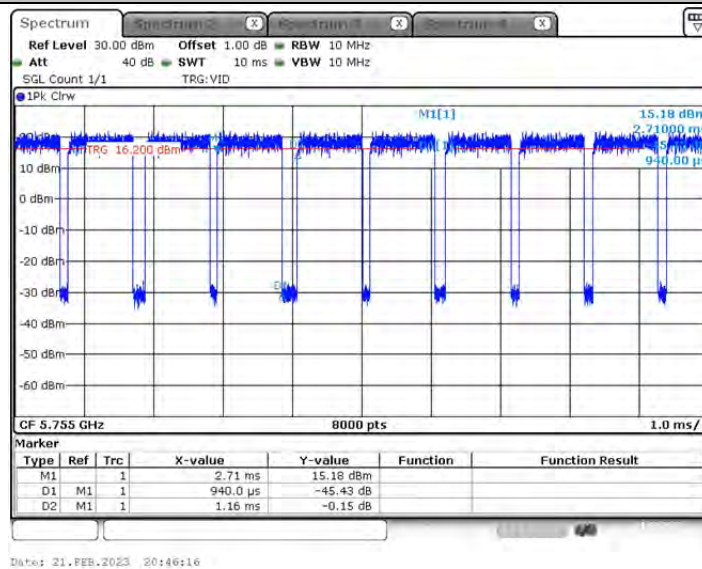
802.11n(HT40)_5190



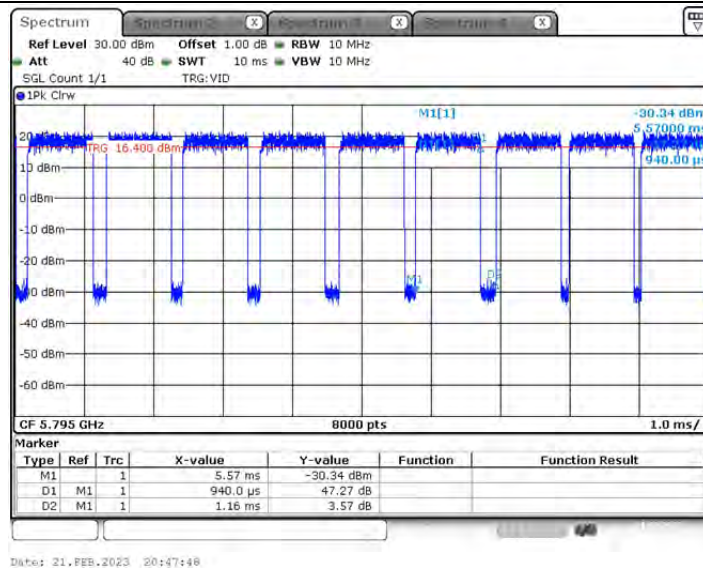
802.11n(HT40)_5230



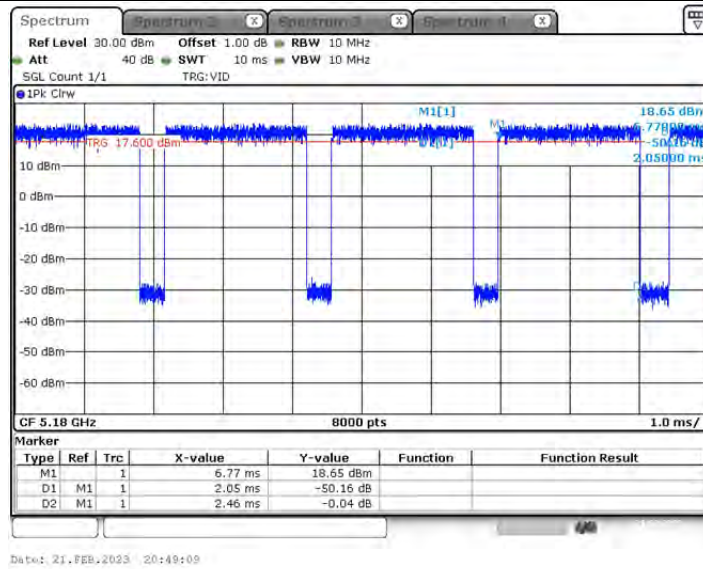
802.11n(HT40)_5755



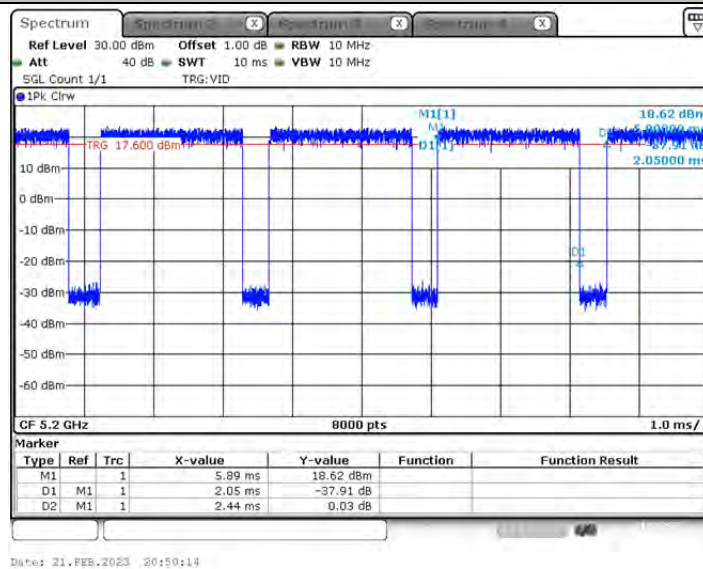
802.11n(HT40)_5795



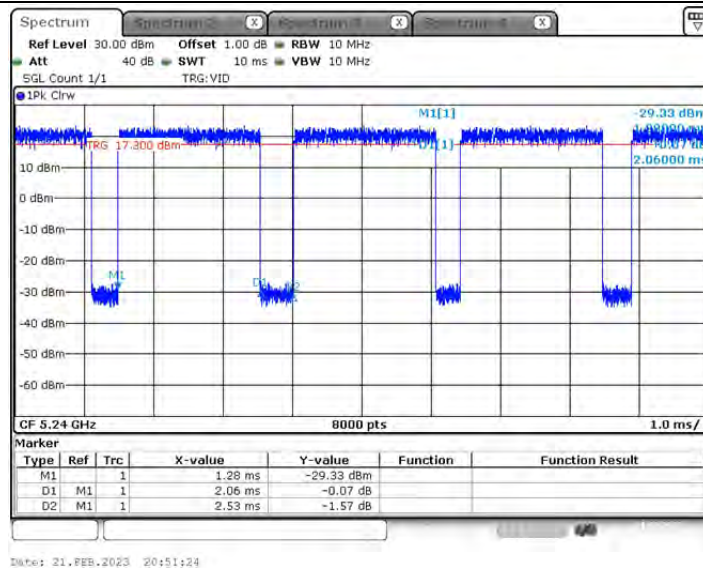
802.11ac(VHT20)_5180



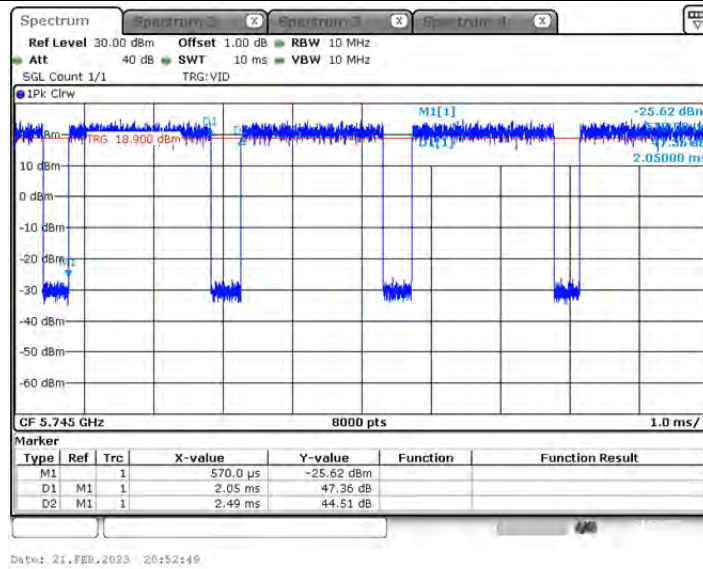
802.11ac(VHT20)_5200



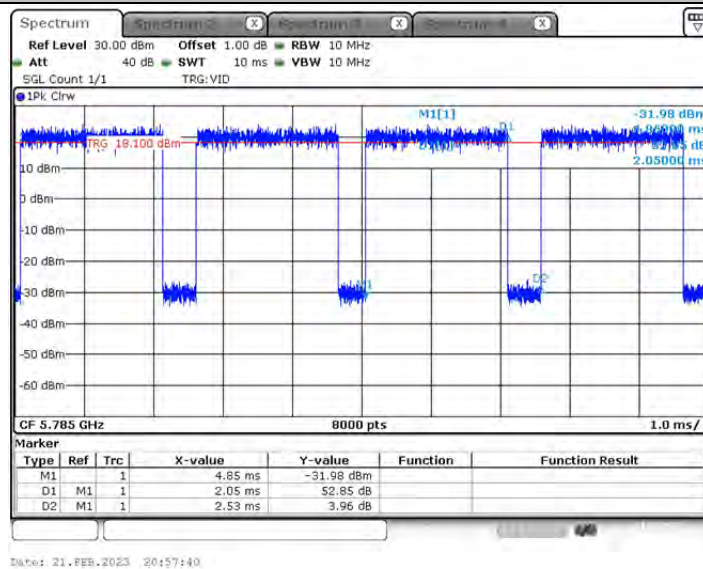
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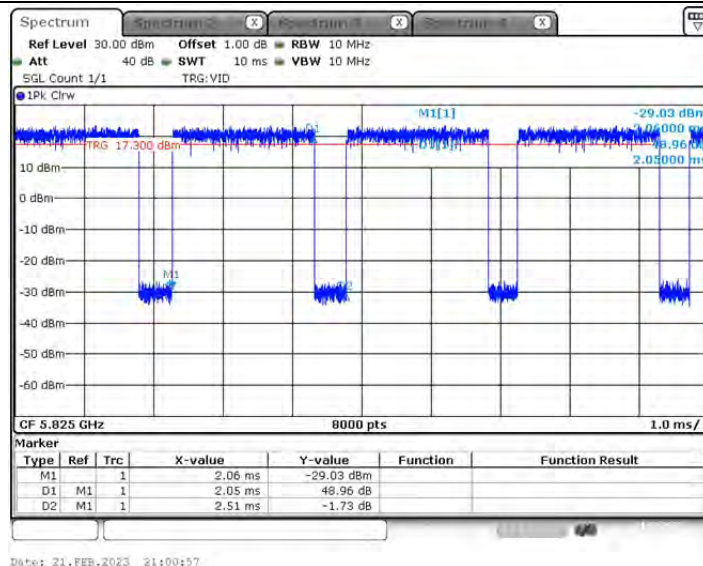
802.11ac(VHT20)_5745



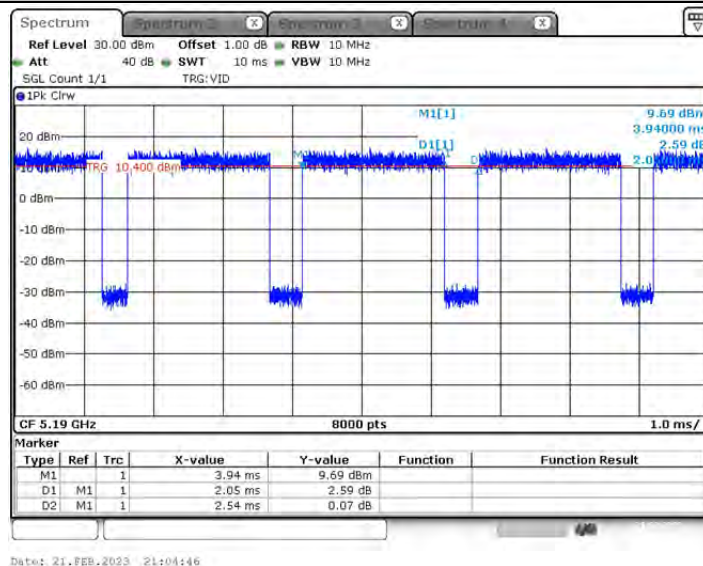
802.11ac(VHT20)_5785



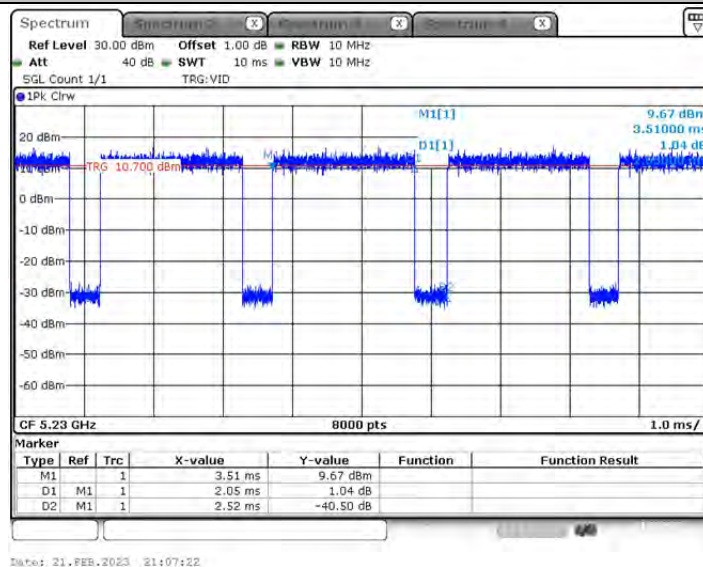
802.11ac(VHT20)_5825



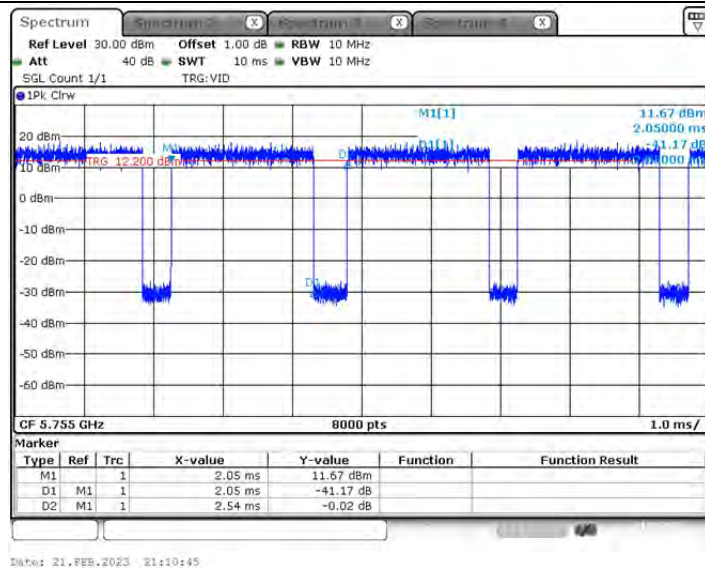
802.11ac(VHT40)_5190



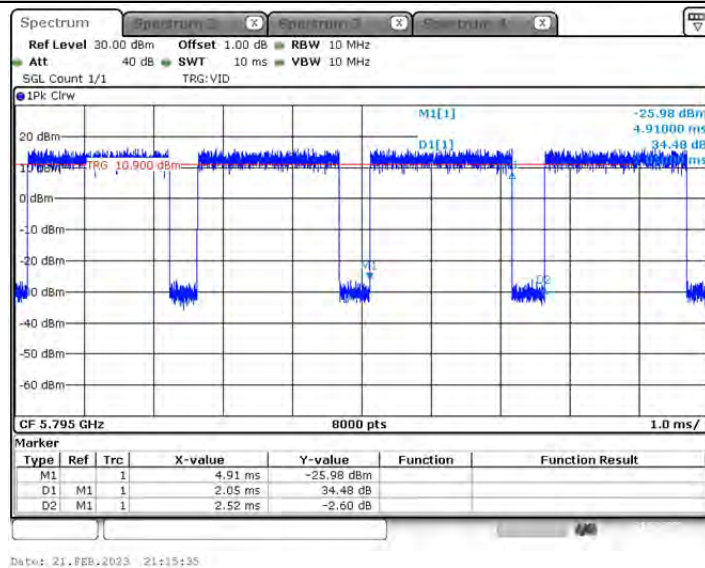
802.11ac(VHT40)_5230



802.11ac(VHT40)_5755



802.11ac(VHT40)_5795



-----End-----