

Appendix B

Report No.:	CISRR24082921502 CISRR24082921503
FCC ID:	2BE3U-X1
Product Name:	Bonding Encoder
Model No.:	X1
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

Frequency Stability

ANT1:

Test Result

Condition	Mode	Ch.	Antenna	Center Frequency (MHz)	Calculated Value of Center Frequency(MHz)	Result (ppm)	Limit (ppm)	State
NT/NV	IEEE 802.11a	36	1	5180.0	5180.108908	21.02	± 50ppm	PASS
		40		5200.0	5200.230125	44.25		PASS
		48		5240.0	5240.118975	22.71		PASS
	IEEE 802.11n_20	36		5180.0	5180.181592	35.06		PASS
		40		5200.0	5200.179058	34.43		PASS
		48		5240.0	5240.181342	34.61		PASS
	IEEE 802.11n_40	38		5190.0	5190.091025	17.54		PASS
		46		5230.0	5230.141992	27.15		PASS
		48		5180.0	5180.103692	20.02		PASS
	IEEE 802.11ac_20	36		5200.0	5200.109758	21.11		PASS
		40		5240.0	5240.230642	44.02		PASS
		48		5190.0	5190.105608	20.35		PASS
	IEEE 802.11ac_40	38		5230.0	5229.857158	-27.31		PASS
		46						PASS
		42		5210.0	5209.852992	-28.22		PASS

ANT2:

Condition	Mode	Ch.	Antenna	Center Frequency (MHz)	Calculated Value of Center Frequency(MHz)	Result (ppm)	Limit (ppm)	State
NT/NV	IEEE 802.11a	36	2	5180.0	5180.098692	19.05	± 50ppm	PASS
		40		5200.0	5200.229875	44.21		PASS
		48		5240.0	5240.223042	42.57		PASS
	IEEE 802.11n_20	36		5180.0	5180.173675	33.53		PASS
		40		5200.0	5200.181458	34.9		PASS
		48		5240.0	5240.179825	34.32		PASS
	IEEE 802.11n_40	38		5190.0	5189.853458	-28.24		PASS
		46		5230.0	5229.847942	-29.07		PASS
		48		5180.0	5180.221758	42.81		PASS
	IEEE 802.11ac_20	36		5200.0	5200.228692	43.98		PASS
		40		5240.0	5240.101575	19.38		PASS
		48		5190.0	5189.853642	-28.2		PASS
	IEEE 802.11ac_40	38		5230.0	5229.850342	-28.62		PASS
		46						PASS
		42		5210.0	5209.852792	-28.25		PASS

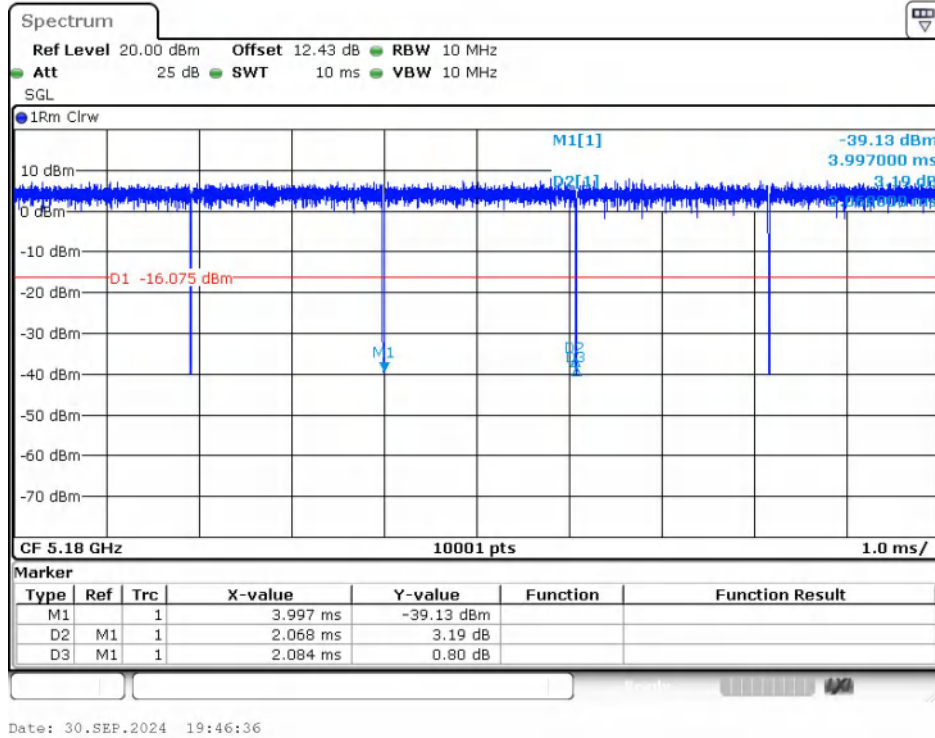
Duty Cycle

ANT1:

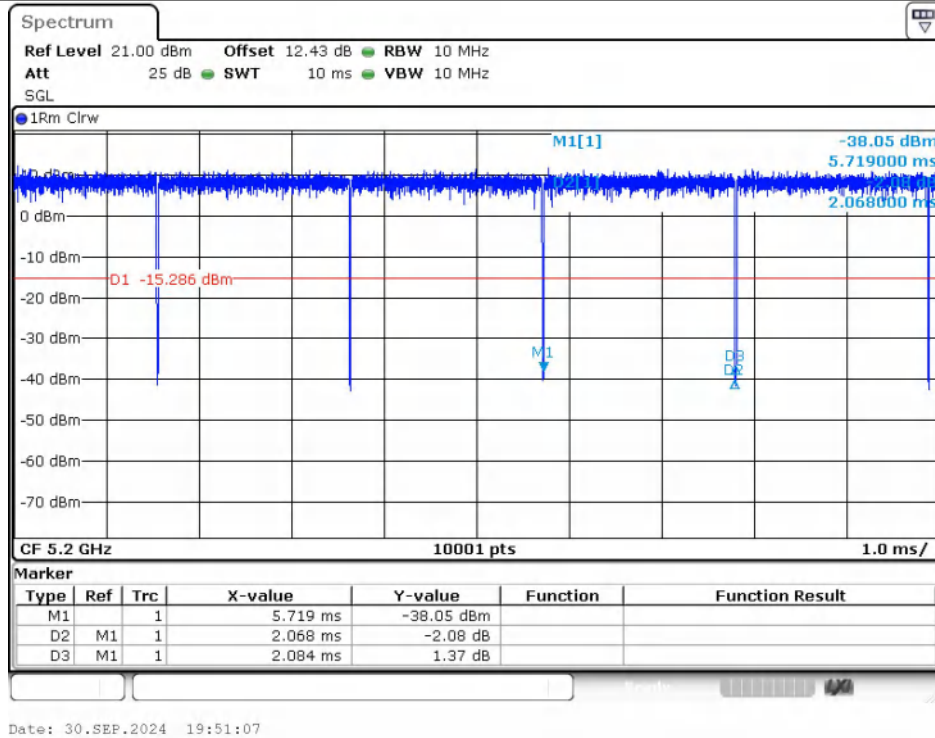
Test Result

Mode	Data rates	Channel	Antenna	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
IEEE 802.11a	6	36	1	2.068	2.084	99.23	0.9923	0.0336	0.48
		40		2.068	2.084	99.23	0.9923	0.0336	0.48
		48		2.068	2.084	99.23	0.9923	0.0336	0.48
		52		2.068	2.084	99.23	0.9923	0.0336	0.48
		60		2.068	2.084	99.23	0.9923	0.0336	0.48
		64		2.068	2.084	99.23	0.9923	0.0336	0.48
		100		2.068	2.084	99.23	0.9923	0.0336	0.48
		116		2.068	2.084	99.23	0.9923	0.0336	0.48
		140		2.068	2.084	99.23	0.9923	0.0336	0.48
IEEE 802.11n_20		36	1	0.229	0.247	92.49	0.9249	0.3391	4.37
		40		0.228	0.247	92.53	0.9253	0.3372	4.39
		48		0.228	0.247	92.48	0.9248	0.3395	4.39
		52		0.229	0.247	92.54	0.9254	0.3367	4.37
		60		0.228	0.247	92.48	0.9248	0.3395	4.39
		64		0.228	0.247	92.48	0.9248	0.3395	4.39
		100		0.228	0.247	92.48	0.9248	0.3395	4.39
		116		0.229	0.247	92.54	0.9254	0.3367	4.37
		140		0.230	0.247	92.96	0.9296	0.317	4.35
IEEE 802.11n_40		38	1	1.540	1.556	98.97	0.9897	0.045	0.65
		46		1.540	1.556	98.97	0.9897	0.045	0.65
		54		1.540	1.556	98.97	0.9897	0.045	0.65
		62		1.540	1.557	98.91	0.9891	0.0476	0.65
		110		1.540	1.556	98.97	0.9897	0.045	0.65
		134		1.540	1.556	98.97	0.9897	0.045	0.65
IEEE 802.11ac_20	MCS 0	36	1	1.936	1.952	99.18	0.9918	0.0358	0.52
		40		1.936	1.952	99.18	0.9918	0.0358	0.52
		48		1.936	1.952	99.18	0.9918	0.0358	0.52
		52		1.936	1.952	99.18	0.9918	0.0358	0.52
		60		1.936	1.952	99.18	0.9918	0.0358	0.52
		64		1.935	1.951	99.18	0.9918	0.0358	0.52
		100		1.936	1.952	99.18	0.9918	0.0358	0.52
		116		1.936	1.952	99.18	0.9918	0.0358	0.52
		140		1.936	1.952	99.18	0.9918	0.0358	0.52
IEEE 802.11ac_40		38	1	1.548	1.564	98.98	0.9898	0.0445	0.65
		46		1.548	1.564	98.98	0.9898	0.0445	0.65
		54		1.548	1.564	98.98	0.9898	0.0445	0.65
		62		1.548	1.564	98.98	0.9898	0.0445	0.65
		110		1.548	1.564	98.98	0.9898	0.0445	0.65
		134		1.548	1.564	98.98	0.9898	0.0445	0.65
IEEE 802.11ac_80		42	1	2.244	2.260	99.29	0.9929	0.0309	0.45
		58		2.244	2.260	99.29	0.9929	0.0309	0.45
		106		2.244	2.261	99.25	0.9925	0.0327	0.45
		122		2.244	2.260	99.29	0.9929	0.0309	0.45

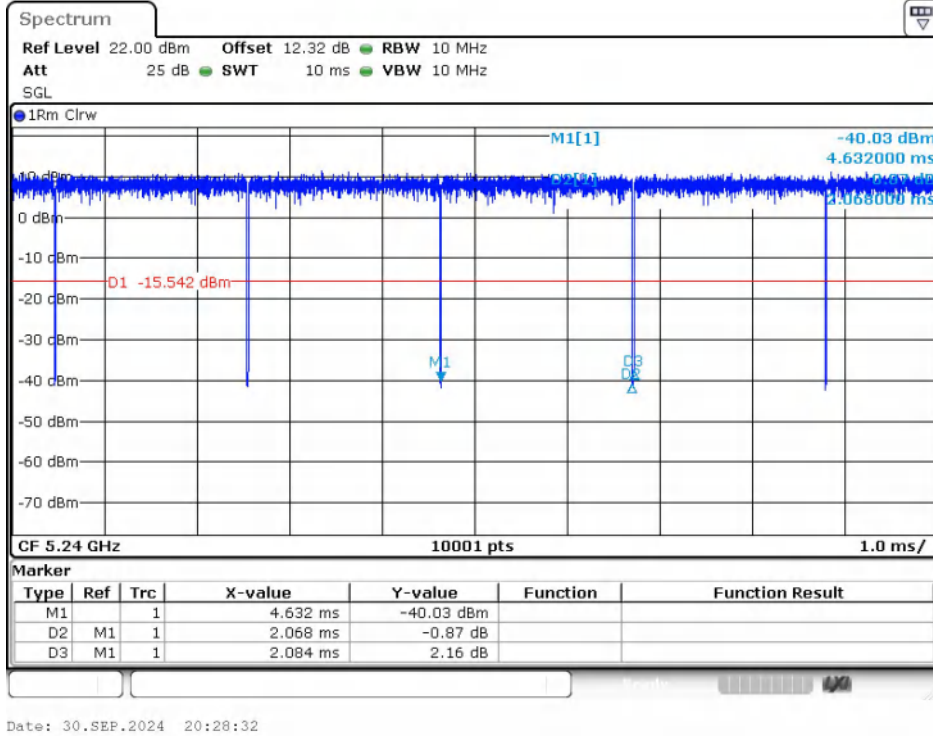
Test Graphs



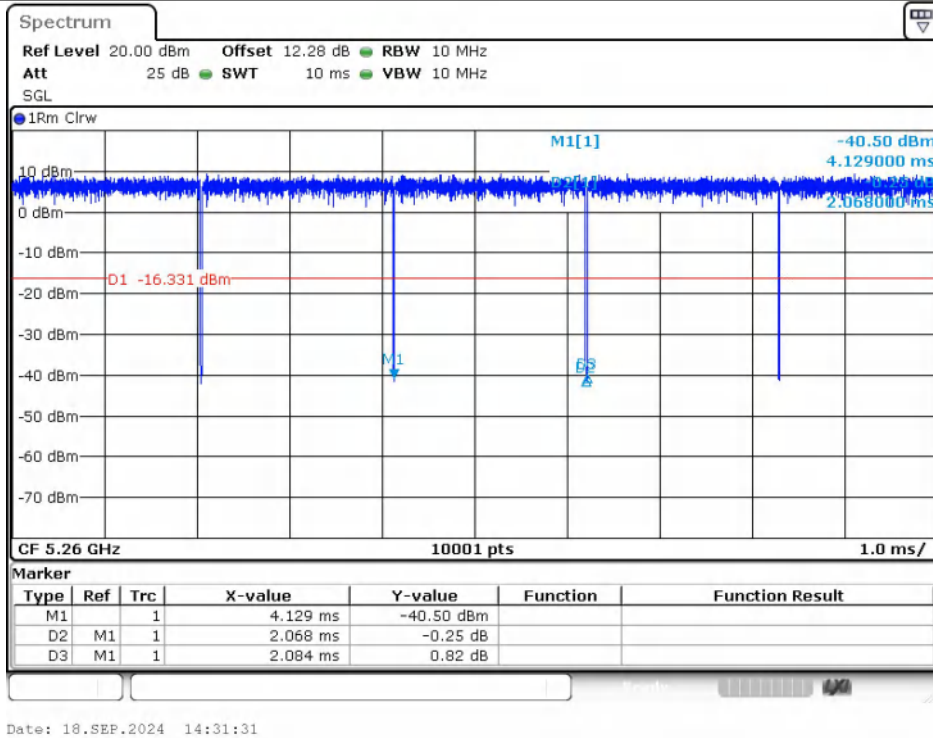
IEEE 802.11a_20MHz_Channel 36



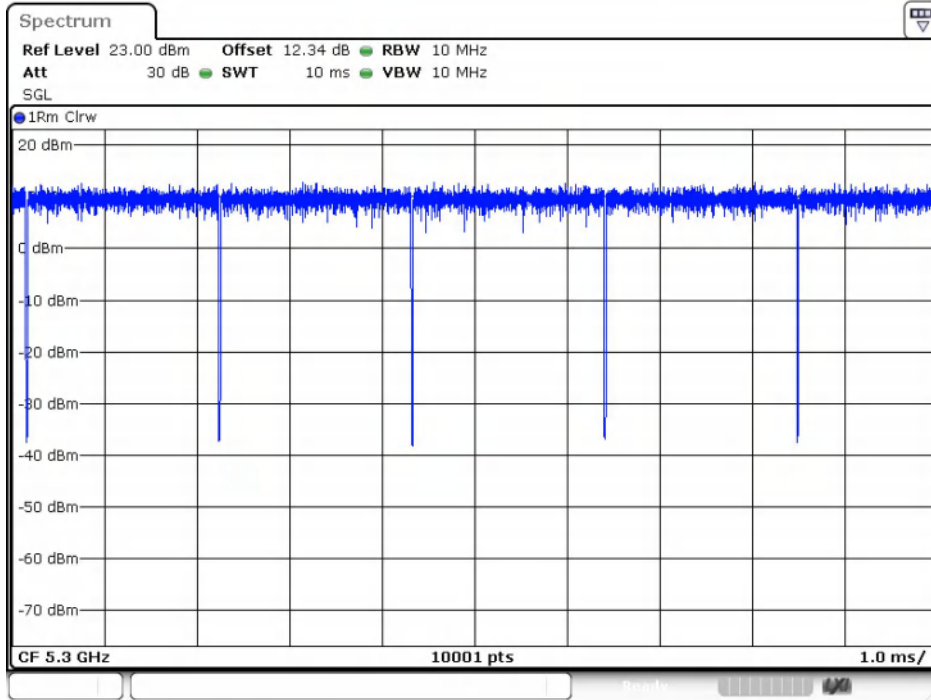
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IEEE 802.11a_20MHz_Channel 48

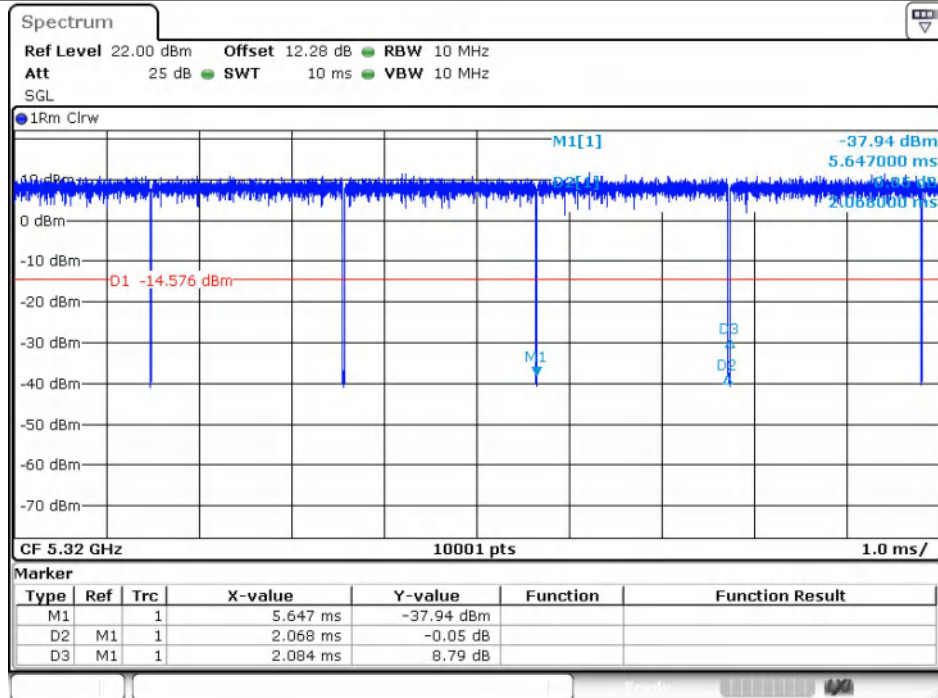


IEEE 802.11a_20MHz_Channel 52



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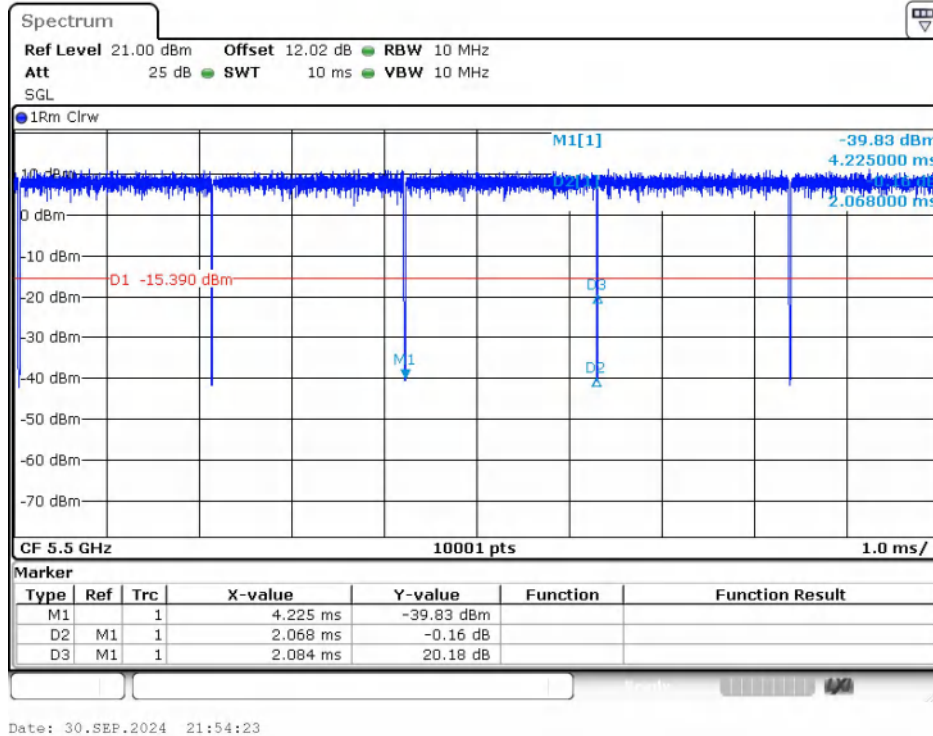
IEEE 802.11a_20MHz_Channel 60



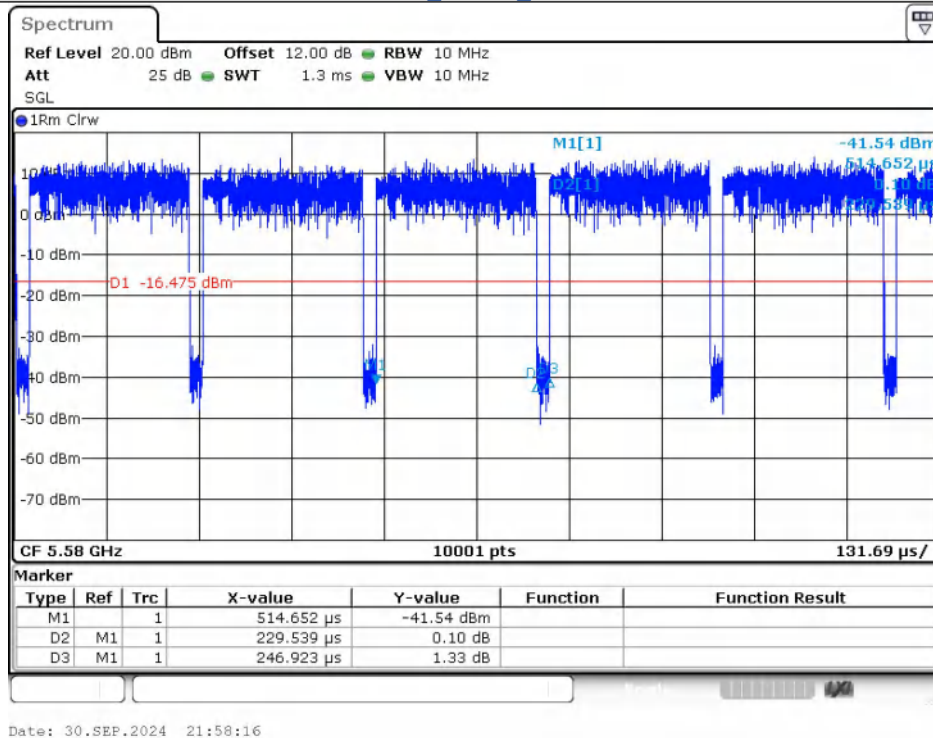
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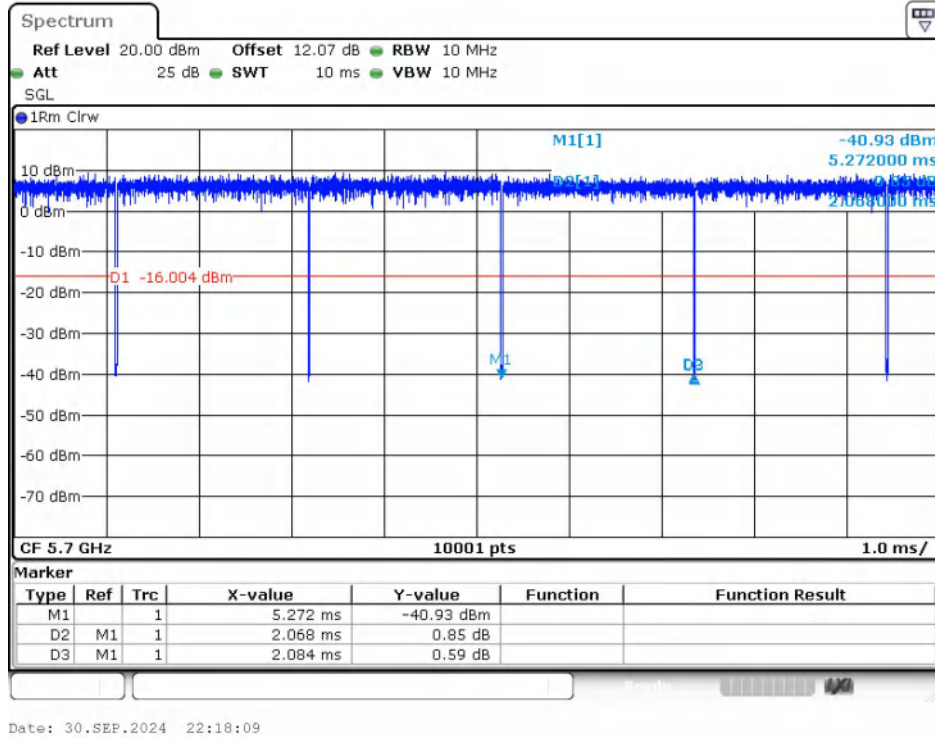
IEEE 802.11a_20MHz_Channel 64



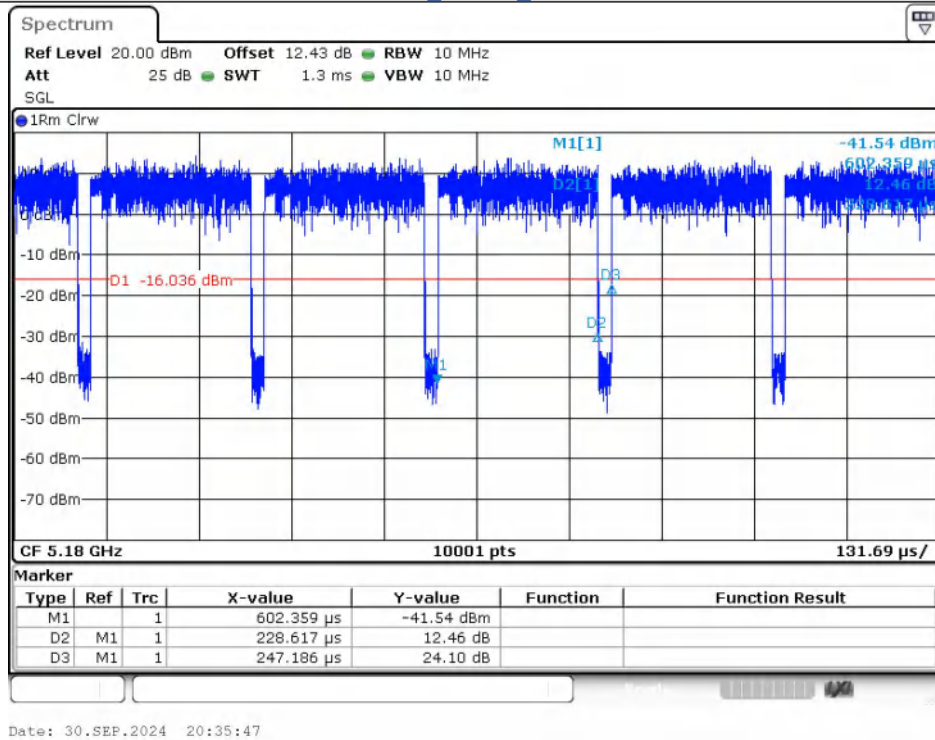
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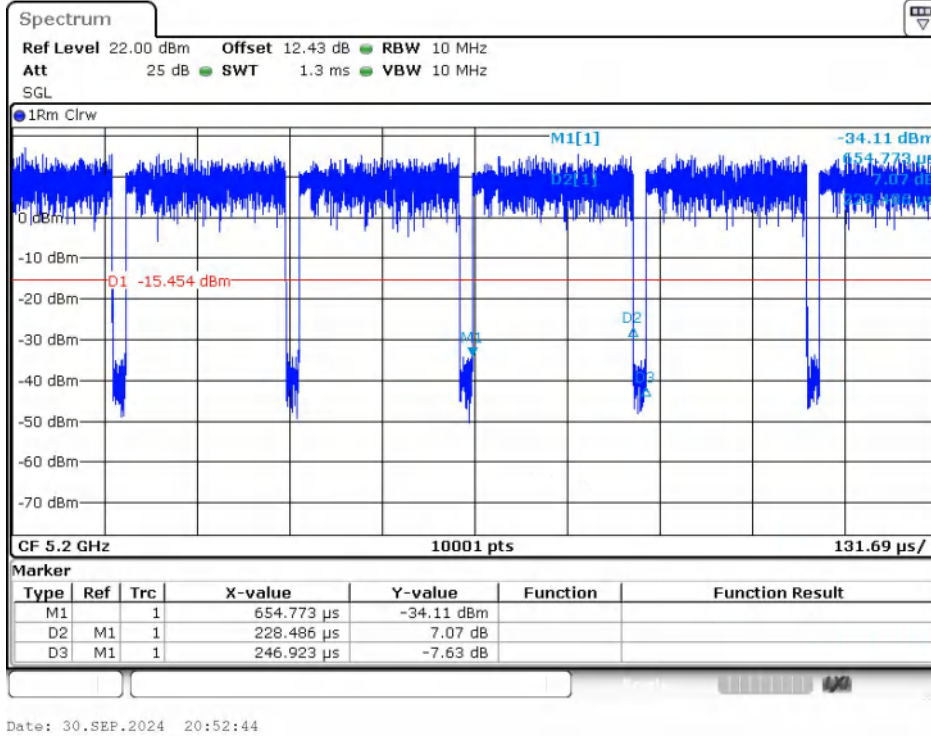
IEEE 802.11a_20MHz_Channel 116



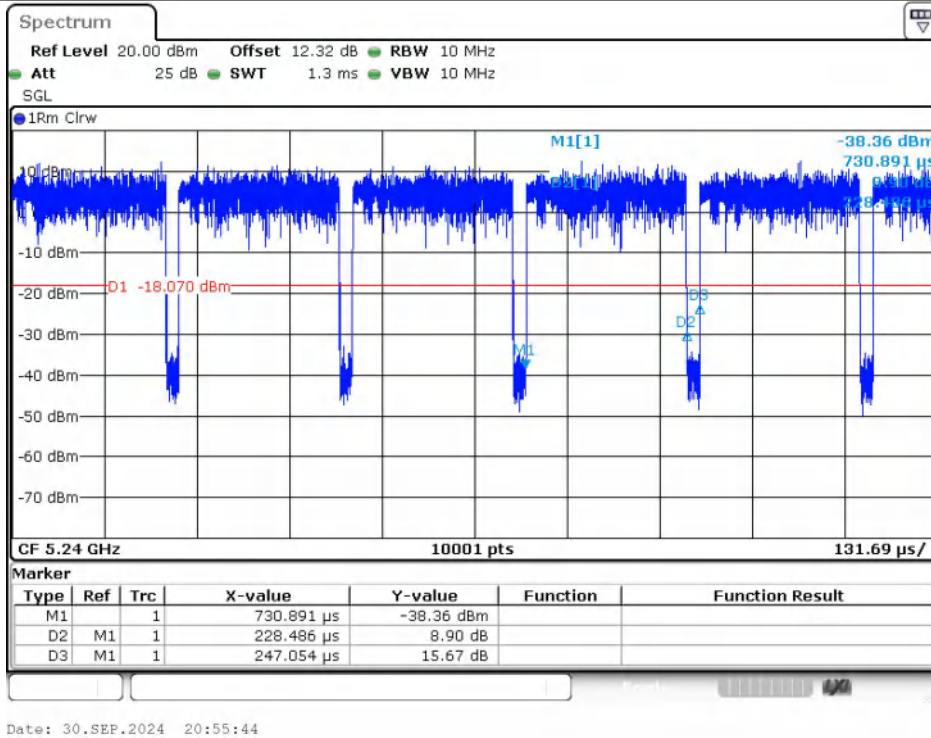
IEEE 802.11a_20MHz_Channel 140



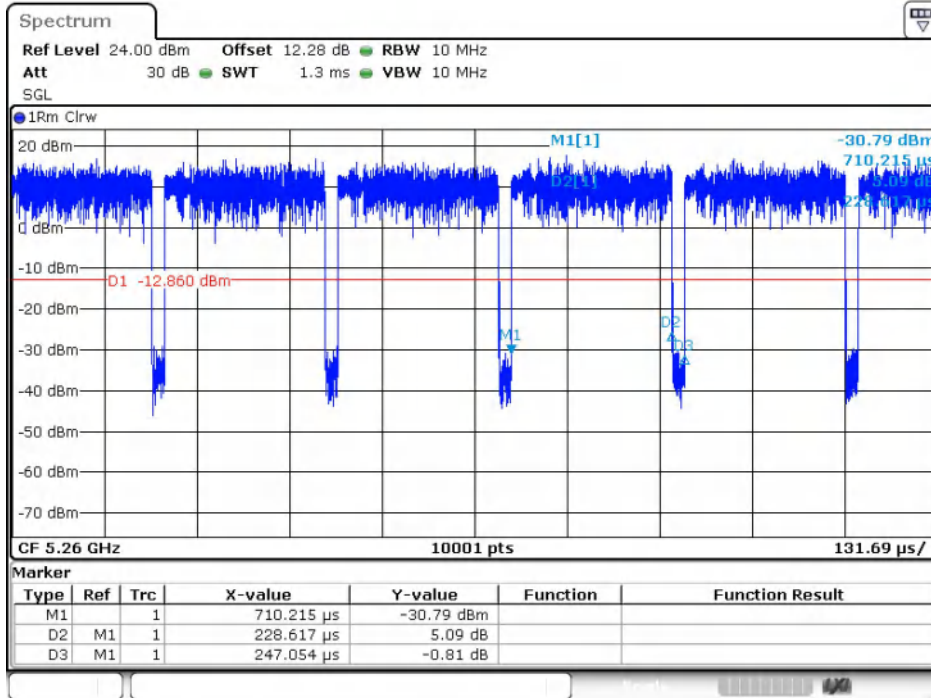
IEEE 802.11n_20MHz_Channel 36



IEEE 802.11n_20MHz_Channel 40

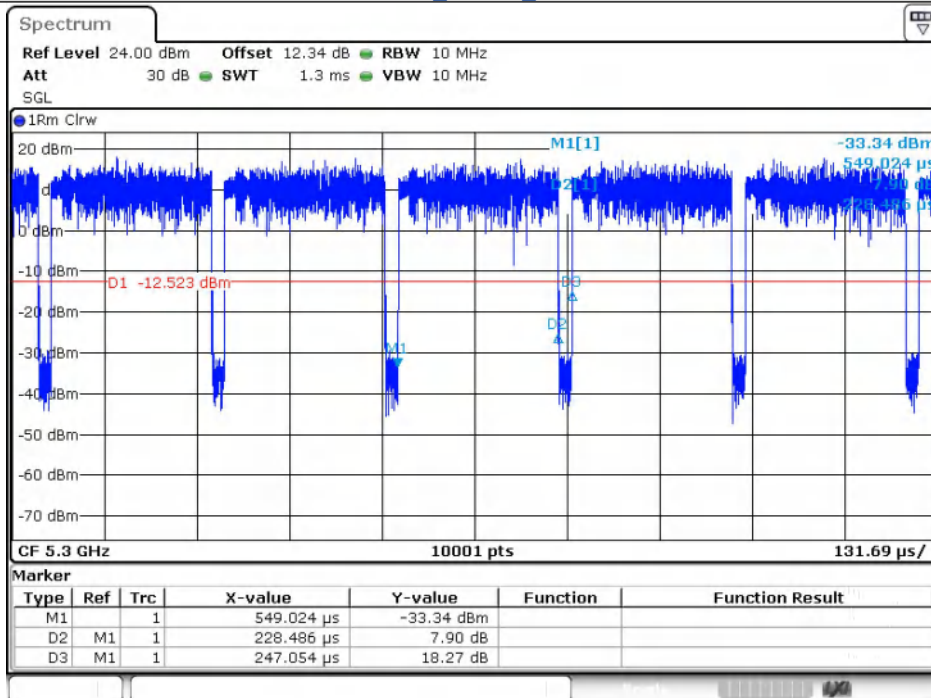


IEEE 802.11n_20MHz_Channel 48



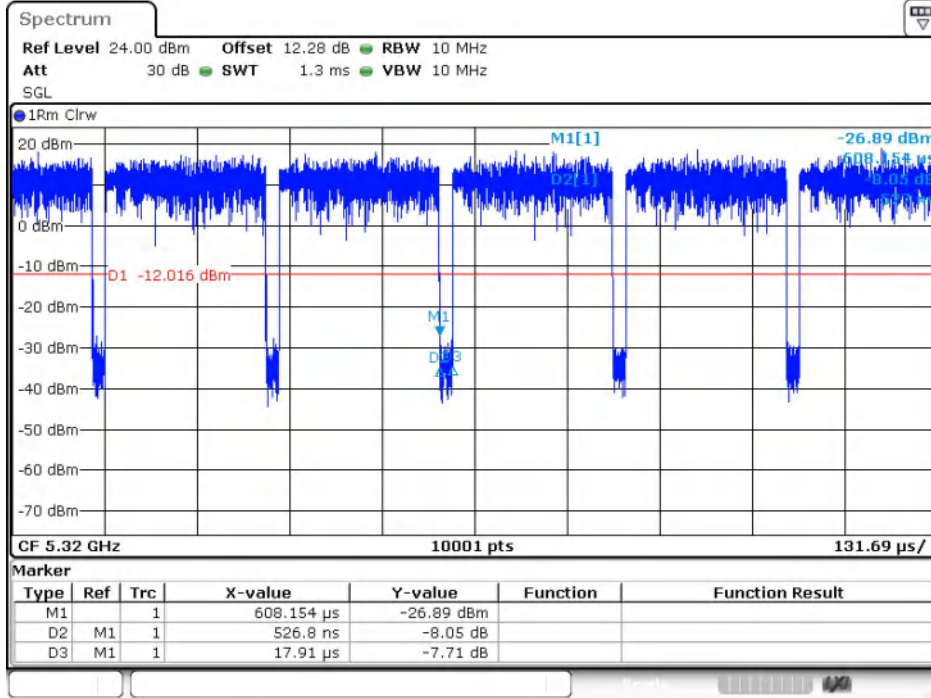
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IEEE 802.11n_20MHz_Channel 52



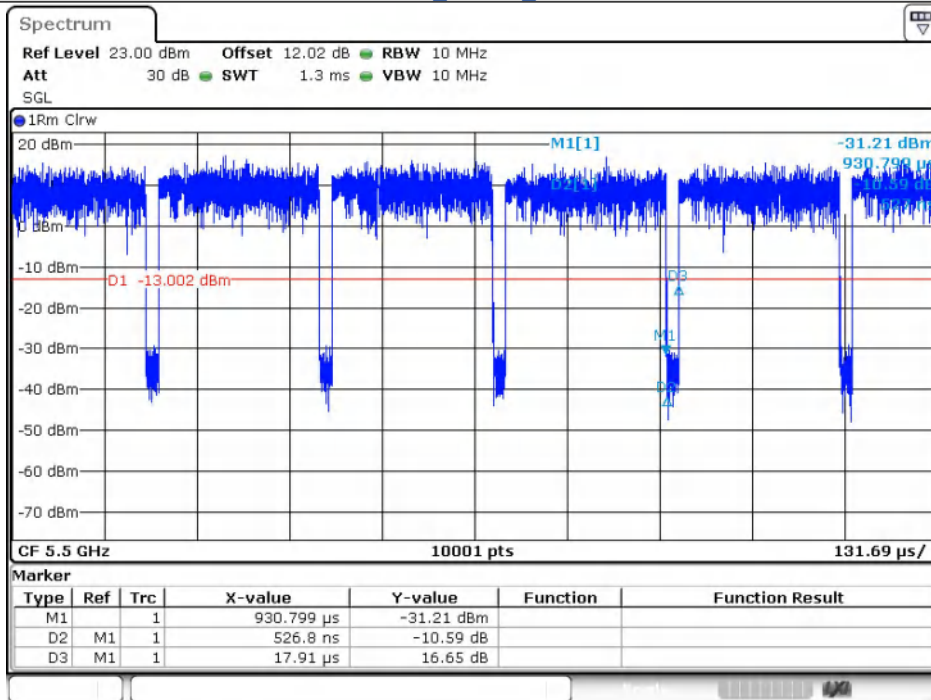
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IEEE 802.11n_20MHz_Channel 60



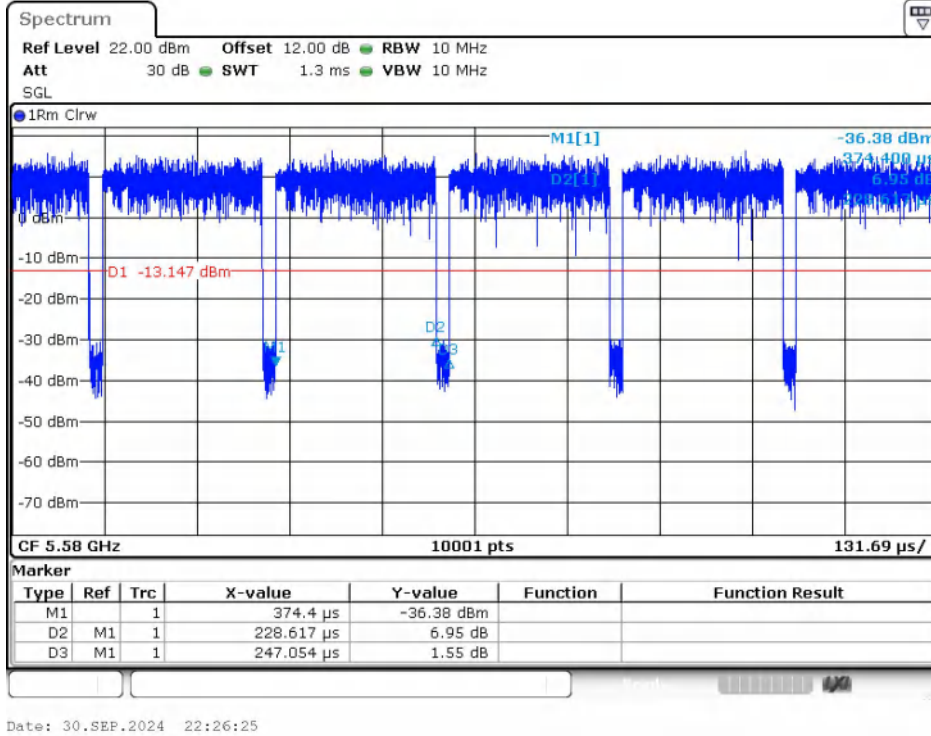
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IEEE 802.11n_20MHz_Channel 64

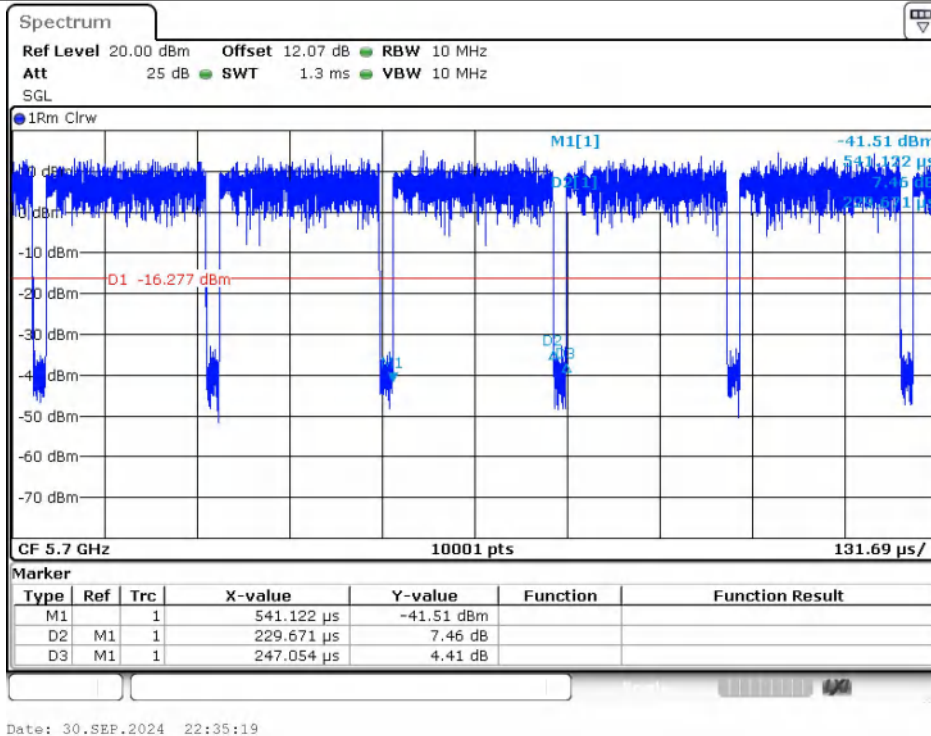


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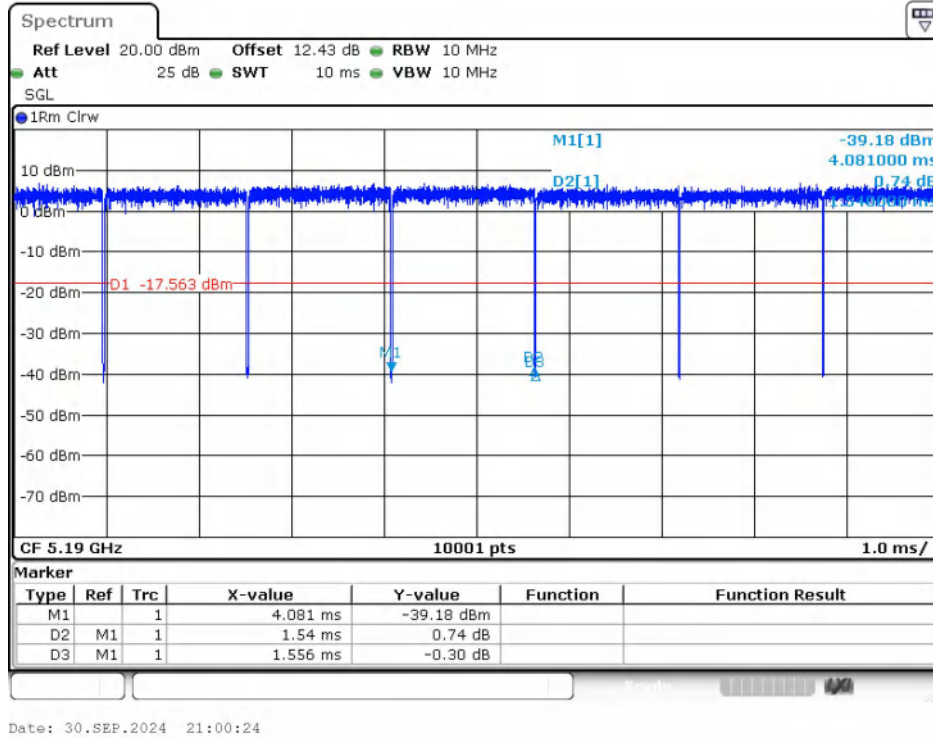
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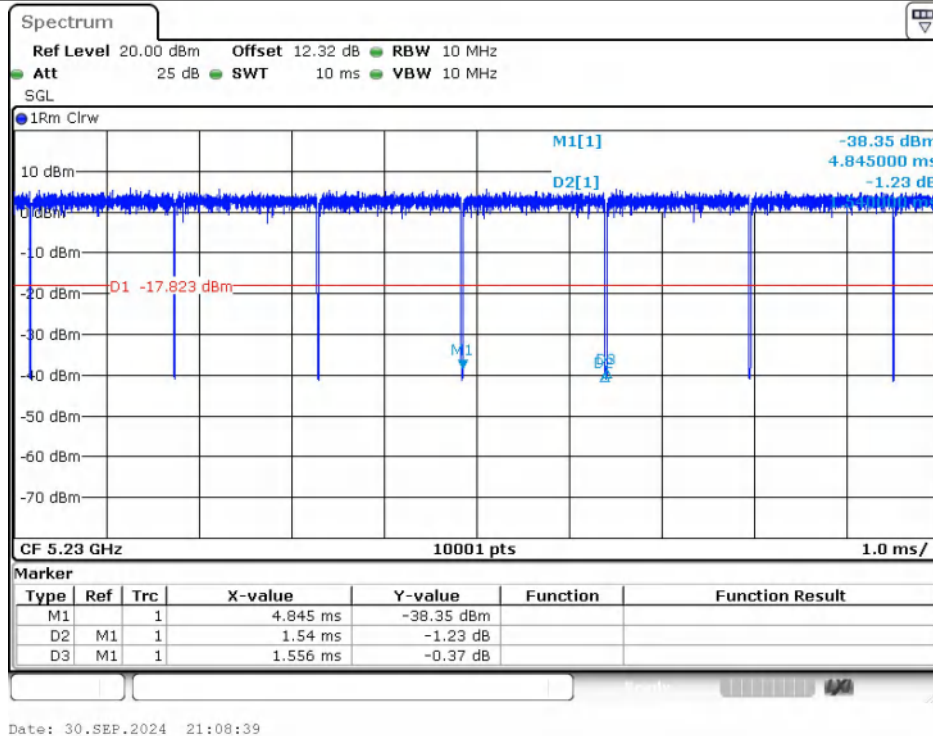
IEEE 802.11n_20MHz_Channel 116



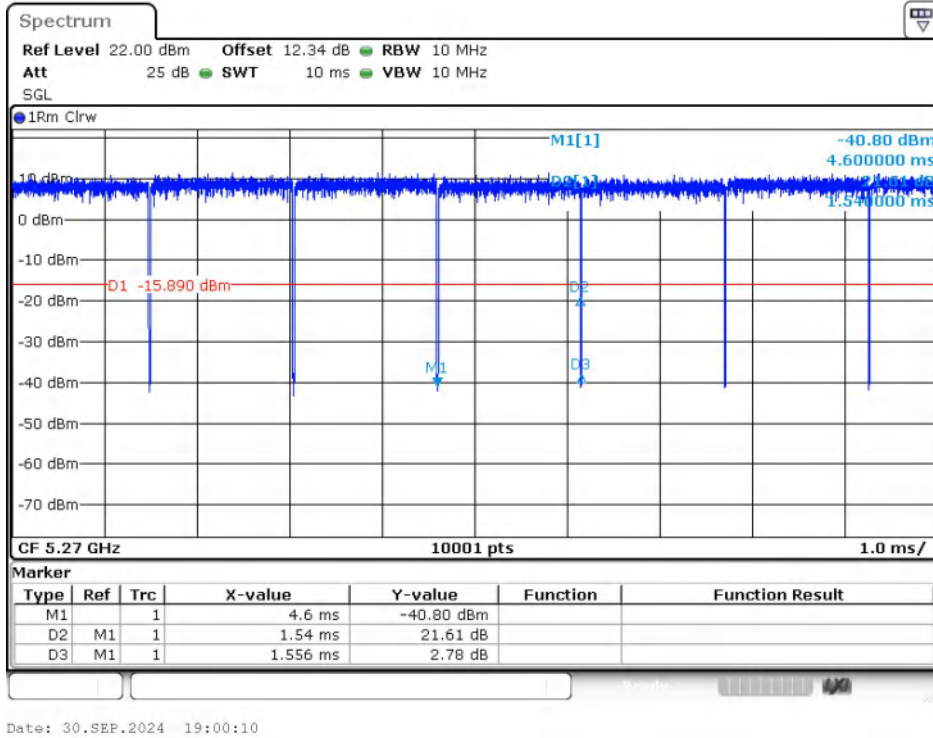
IEEE 802.11n_20MHz_Channel 140



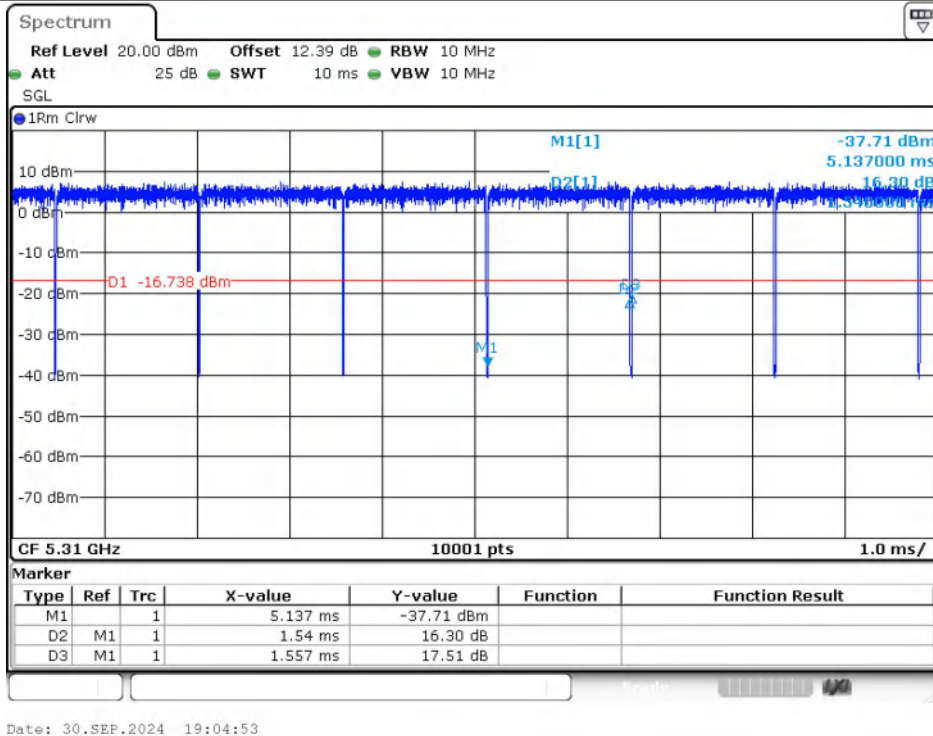
IEEE 802.11n_40MHz_Channel 38



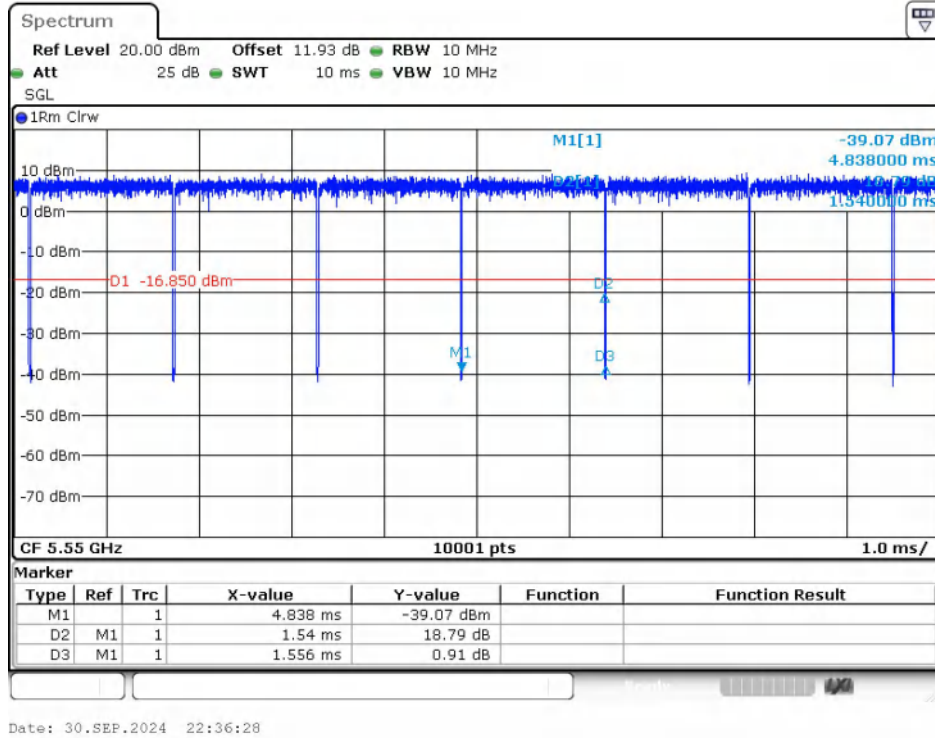
IEEE 802.11n_40MHz_Channel 46



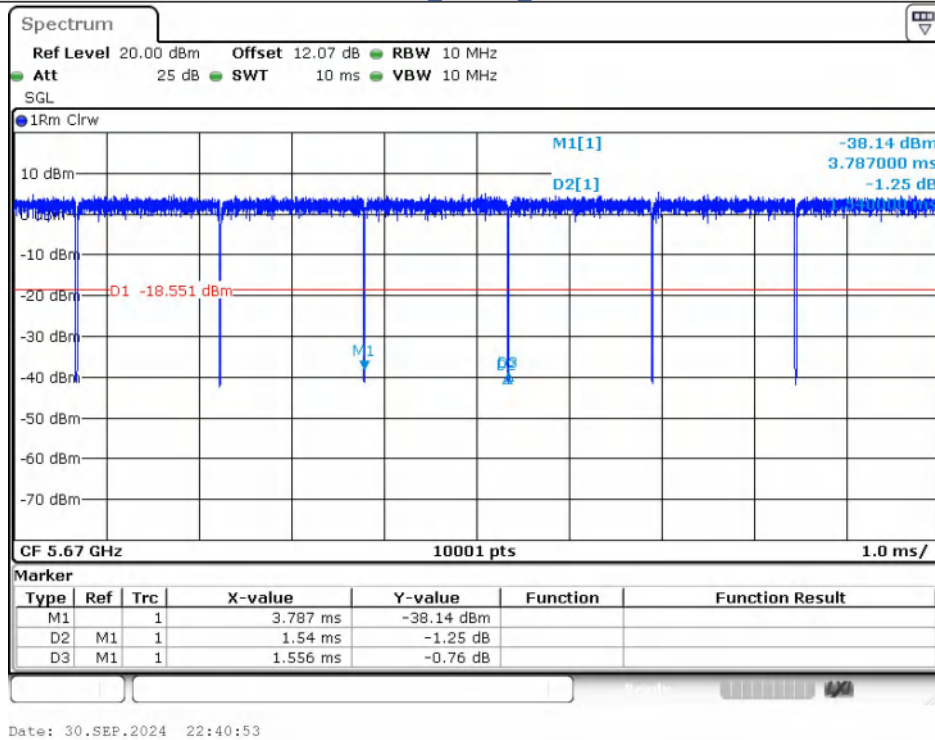
IEEE 802.11n_40MHz_Channel 54



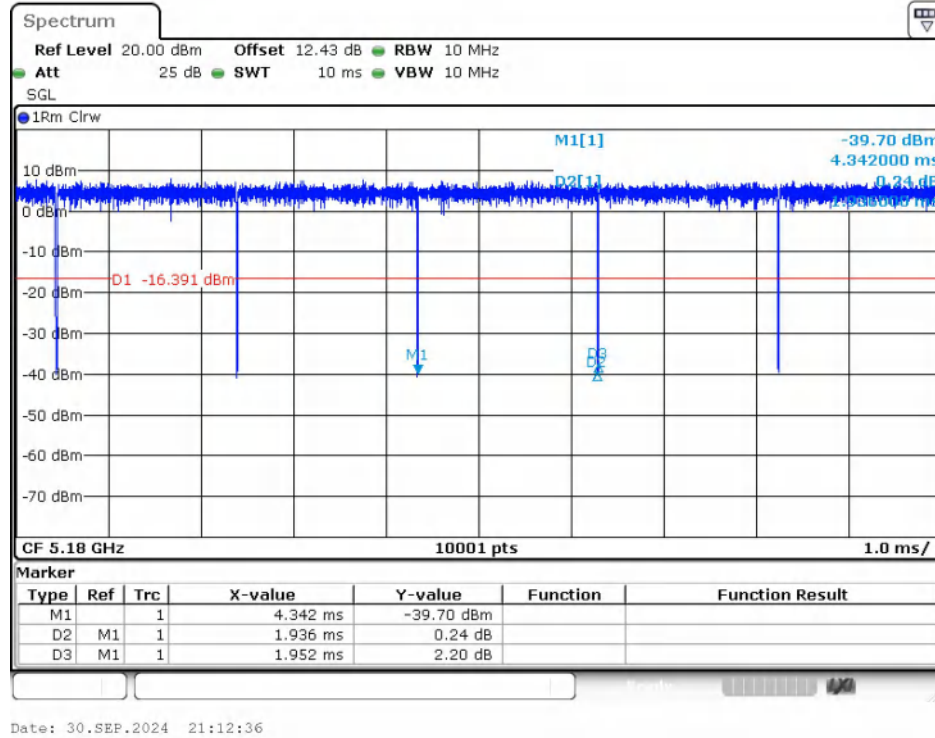
IEEE 802.11n_40MHz_Channel 62



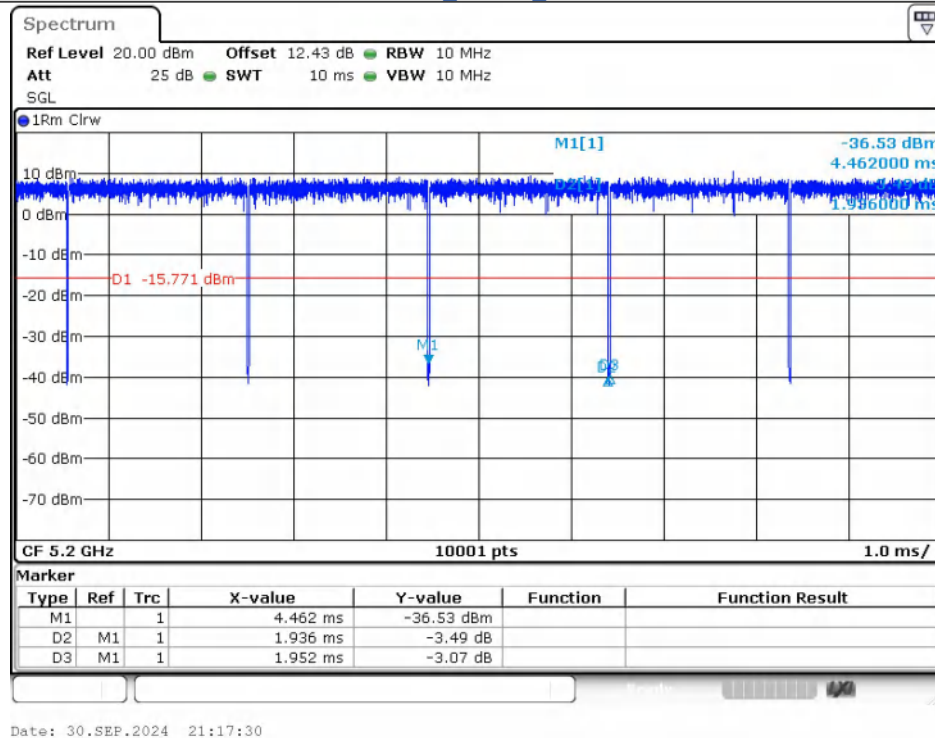
IEEE 802.11n_40MHz_Channel 110



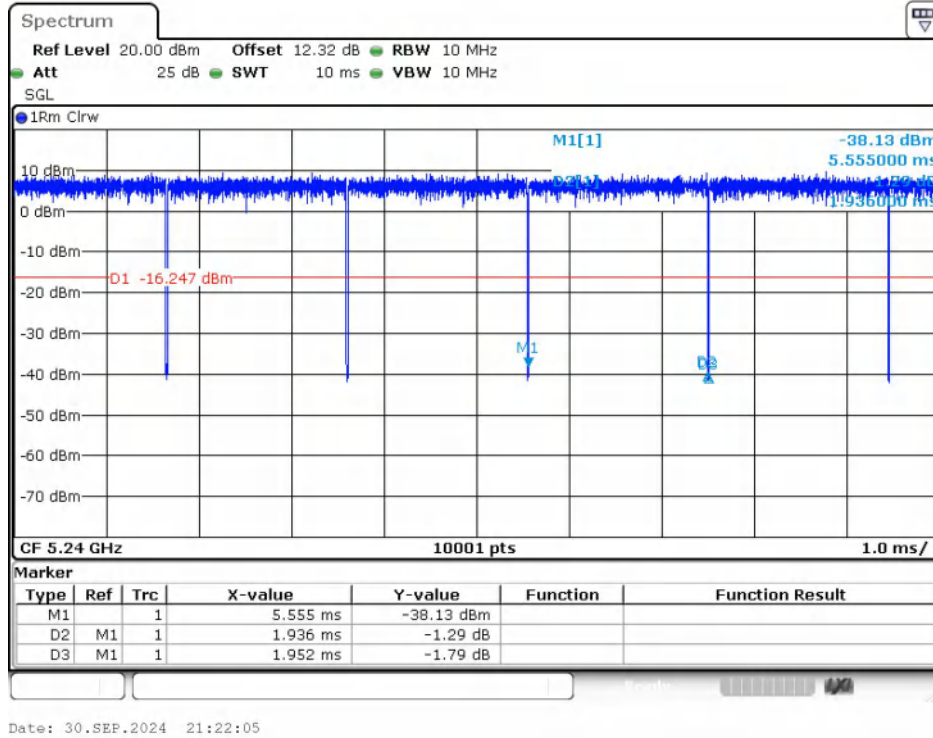
IEEE 802.11n_40MHz_Channel 134



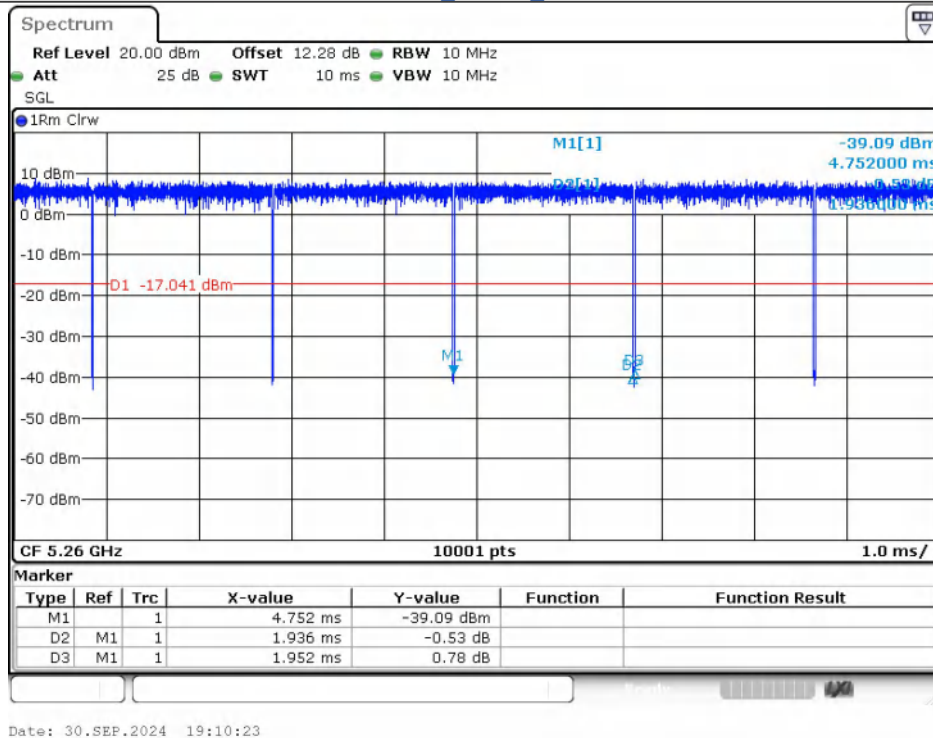
IEEE 802.11ac_20MHz_Channel 36



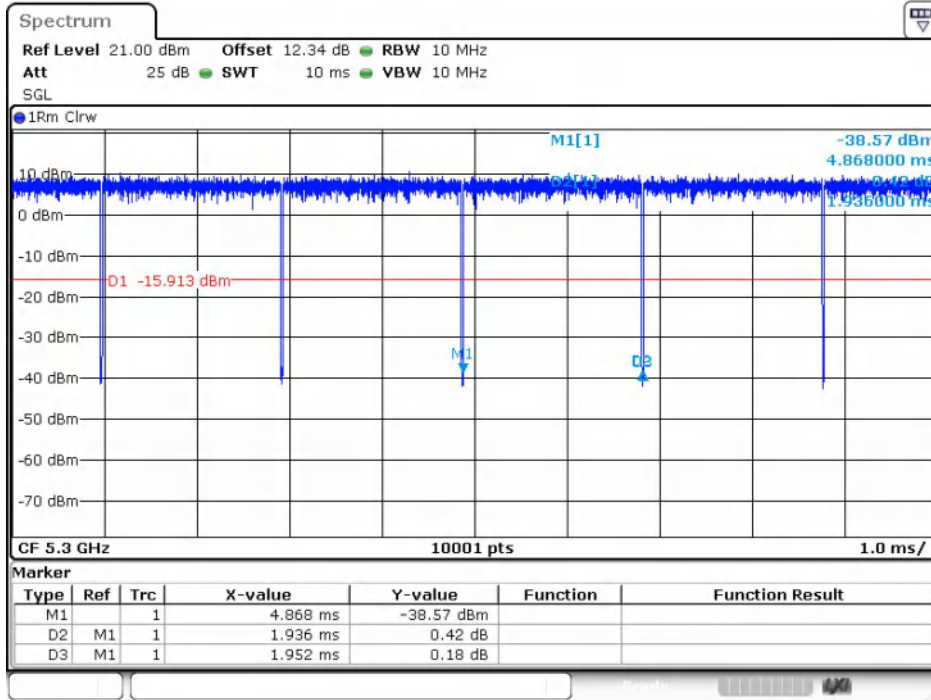
IEEE 802.11ac_20MHz_Channel 40



IEEE 802.11ac_20MHz_Channel 48

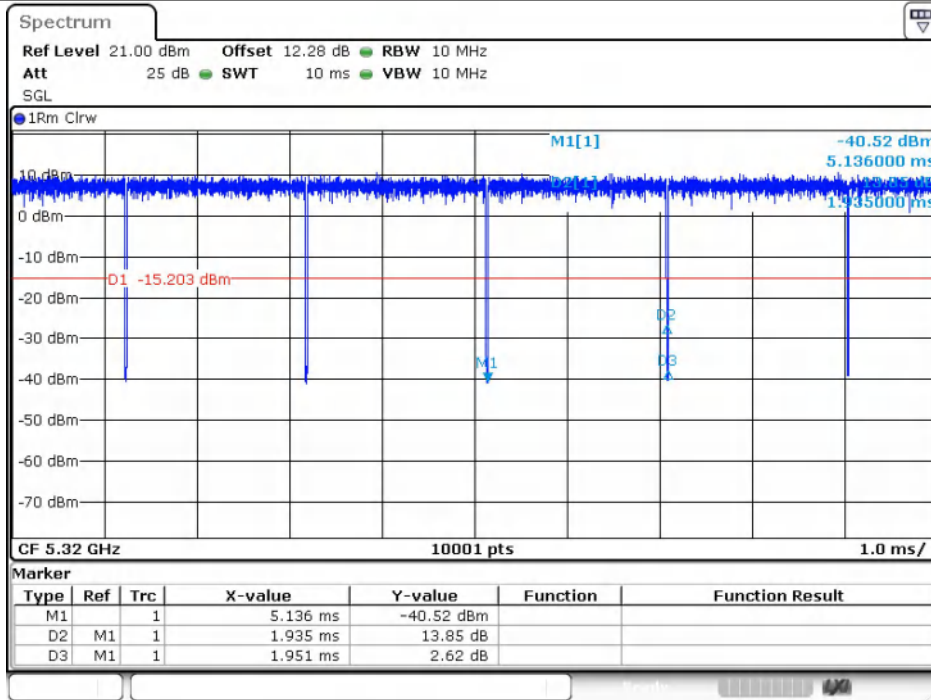


IEEE 802.11ac_20MHz_Channel 52



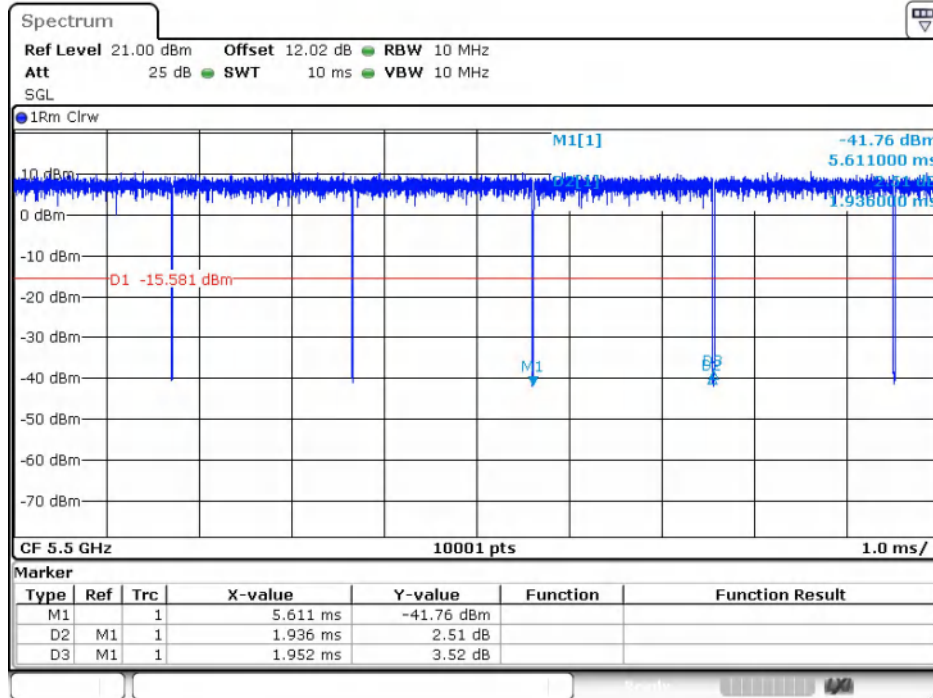
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IEEE 802.11ac_20MHz_Channel 60



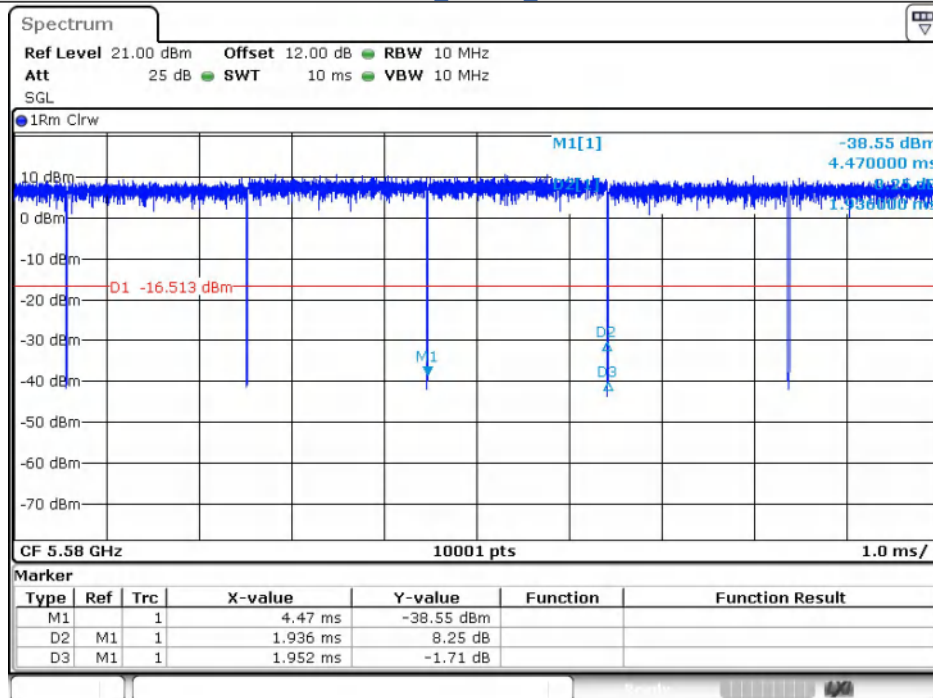
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IEEE 802.11ac_20MHz_Channel 64



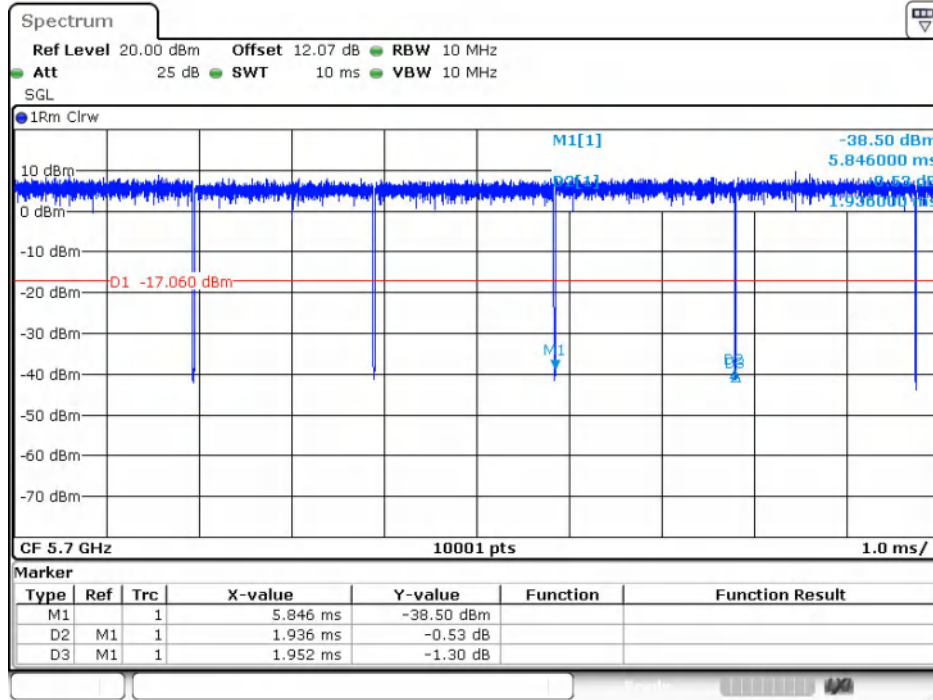
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IEEE 802.11ac_20MHz_Channel 100



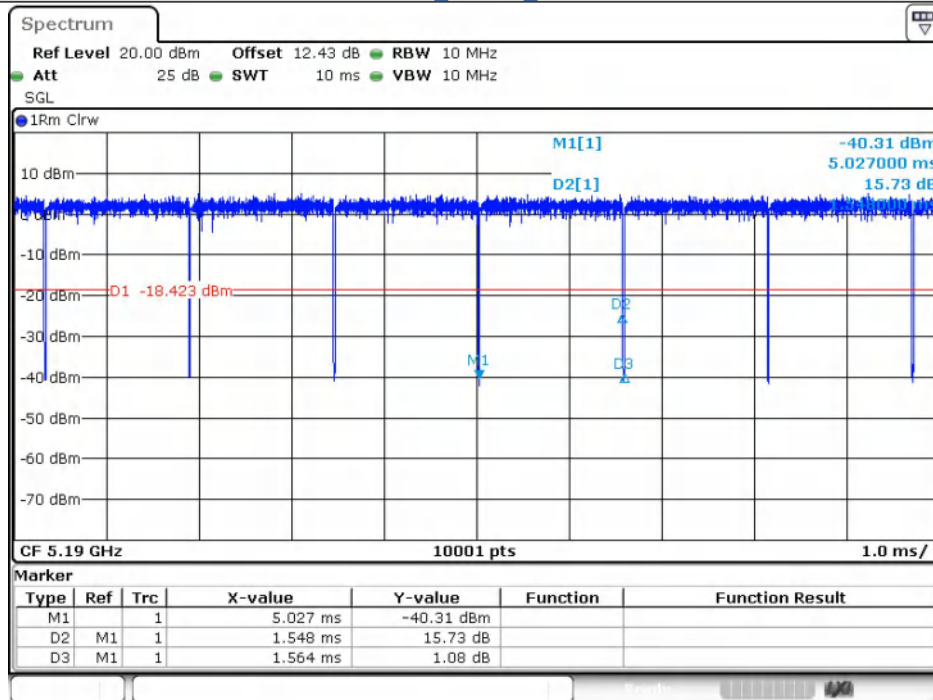
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IEEE 802.11ac_20MHz_Channel 116



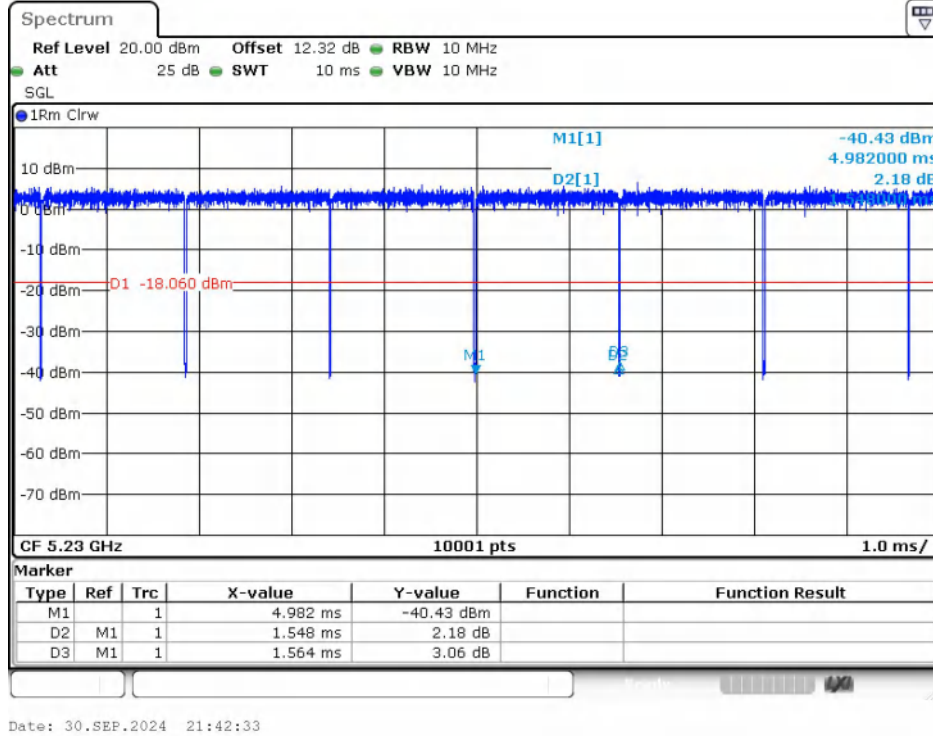
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IEEE 802.11ac_20MHz_Channel 140

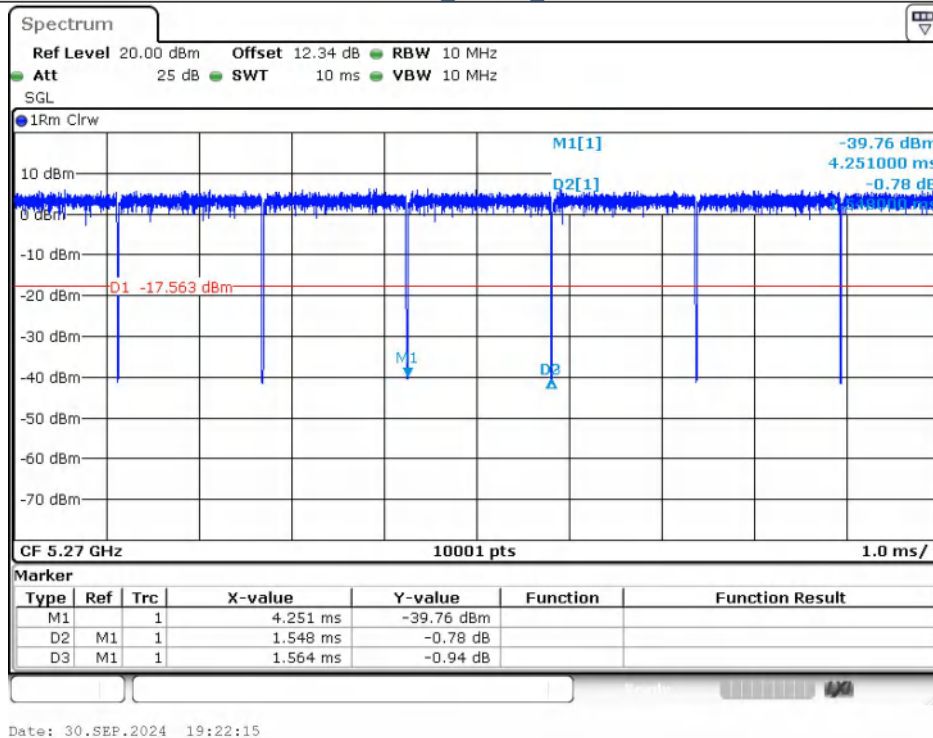


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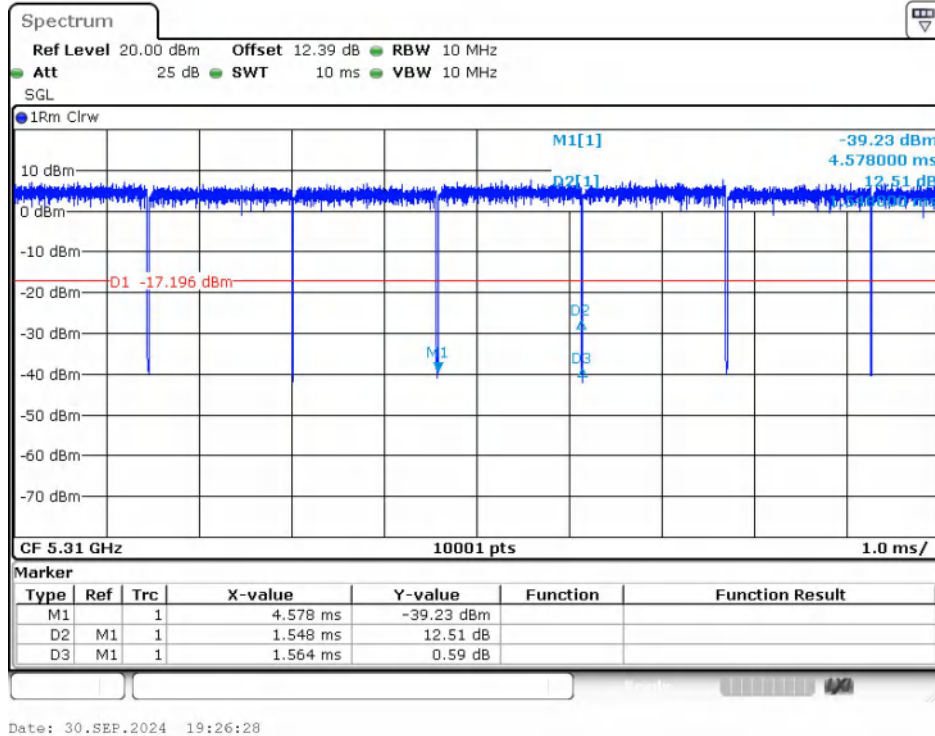
IEEE 802.11ac_40MHz_Channel 38



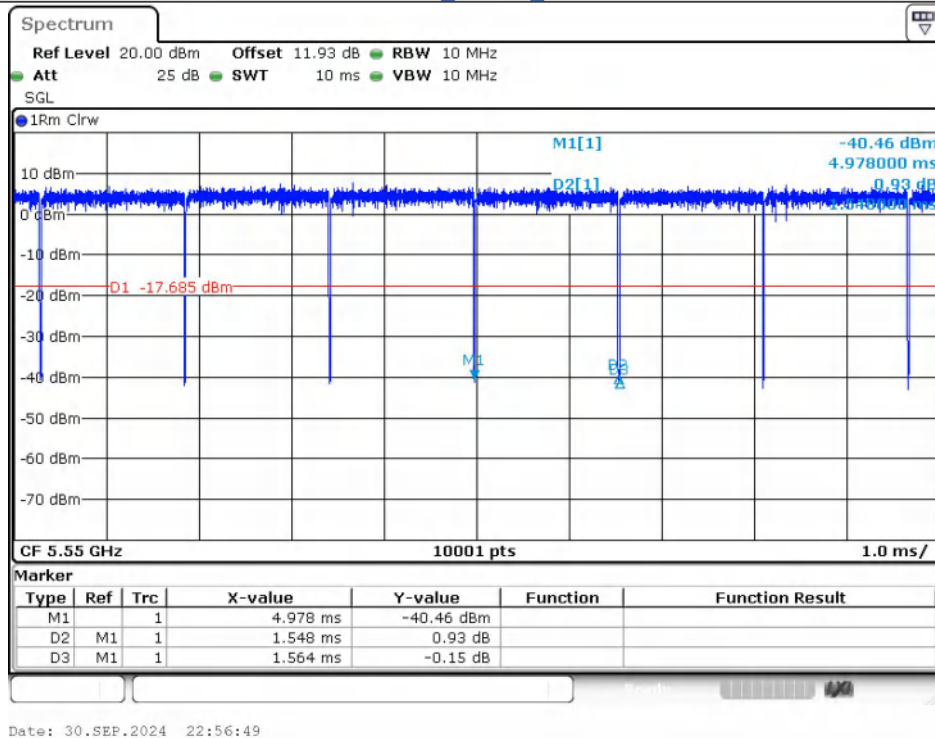
IEEE 802.11ac_40MHz_Channel 46



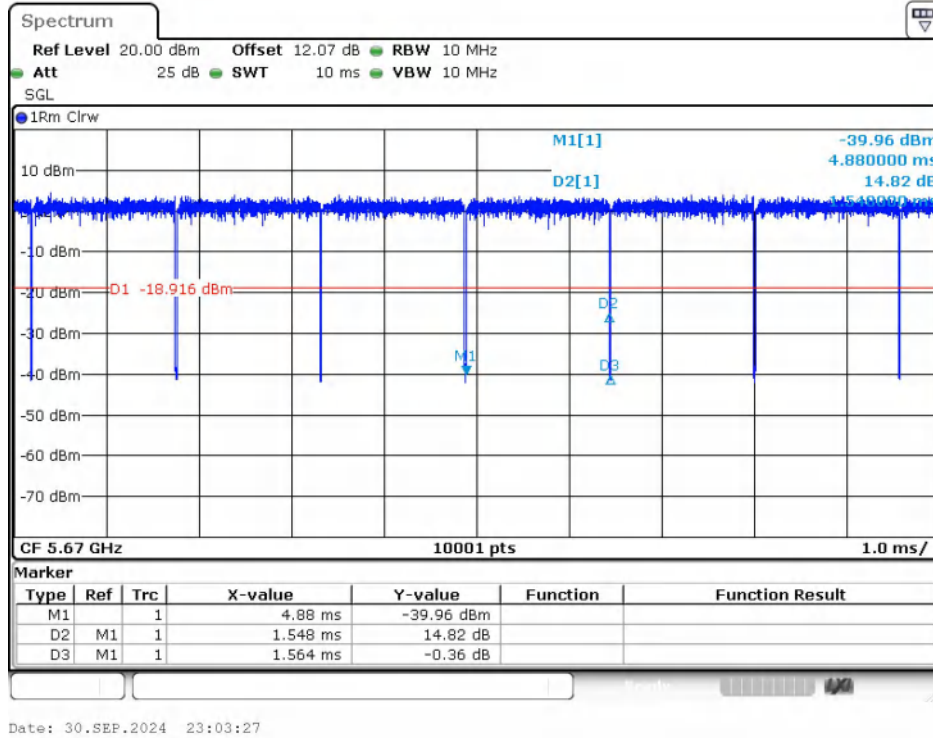
IEEE 802.11ac_40MHz_Channel 54



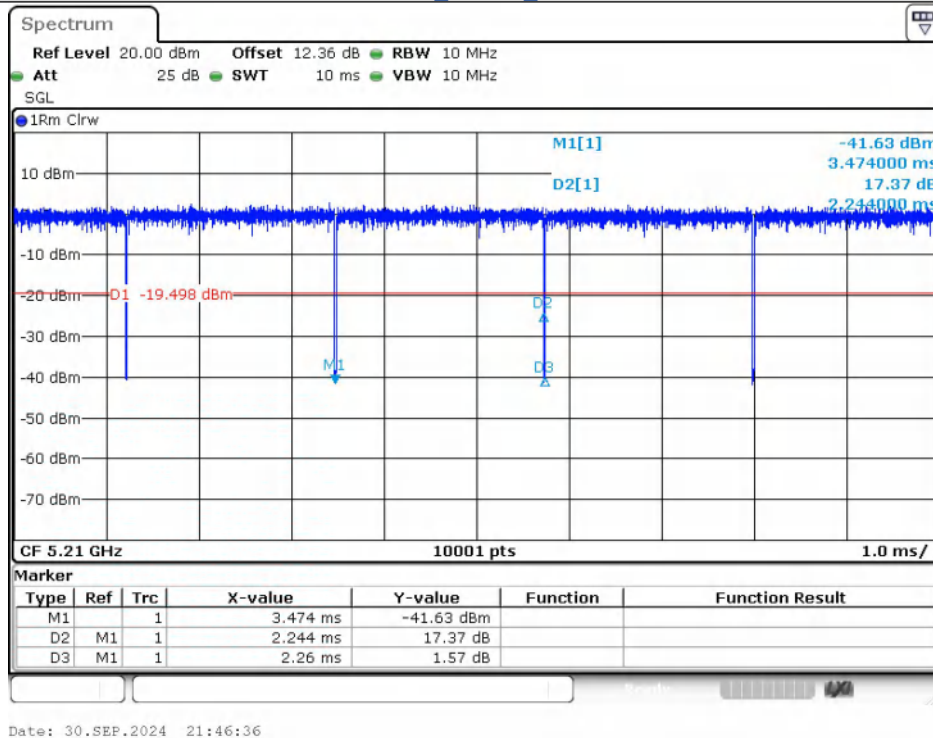
IEEE 802.11ac_40MHz_Channel 62



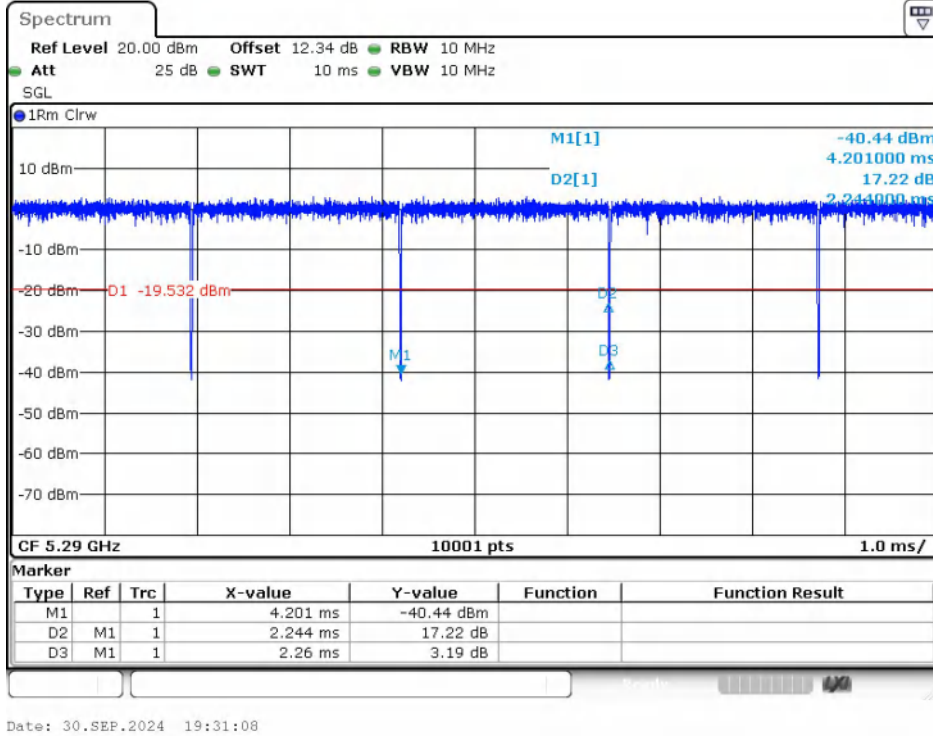
IEEE 802.11ac_40MHz_Channel 110



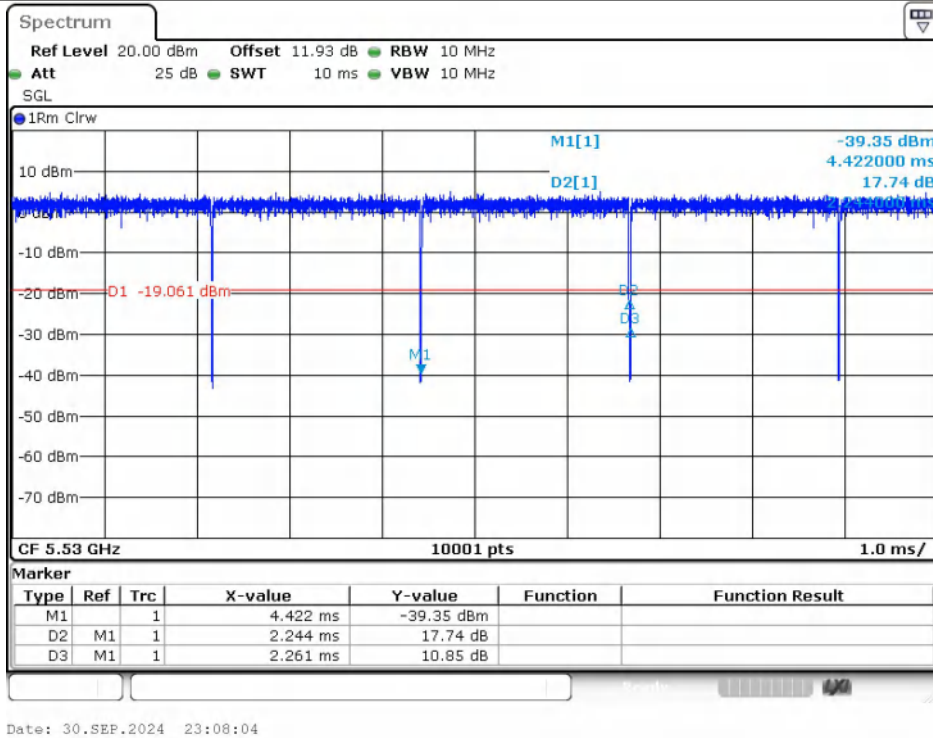
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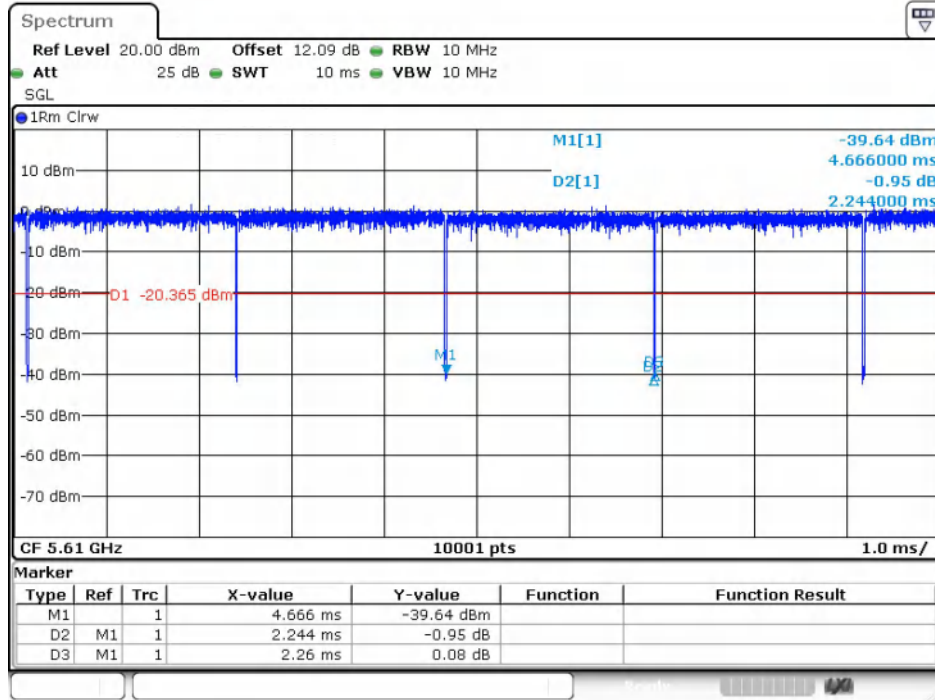
IEEE 802.11ac_80MHz_Channel 42



IEEE 802.11ac_80MHz_Channel 58



IEEE 802.11ac_80MHz_Channel 106



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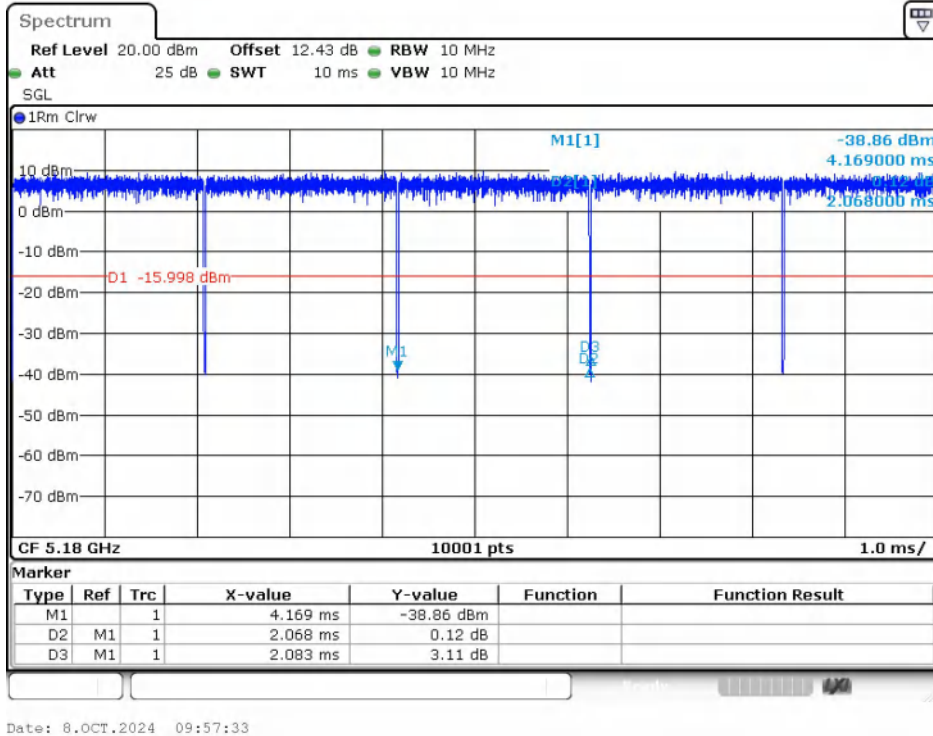
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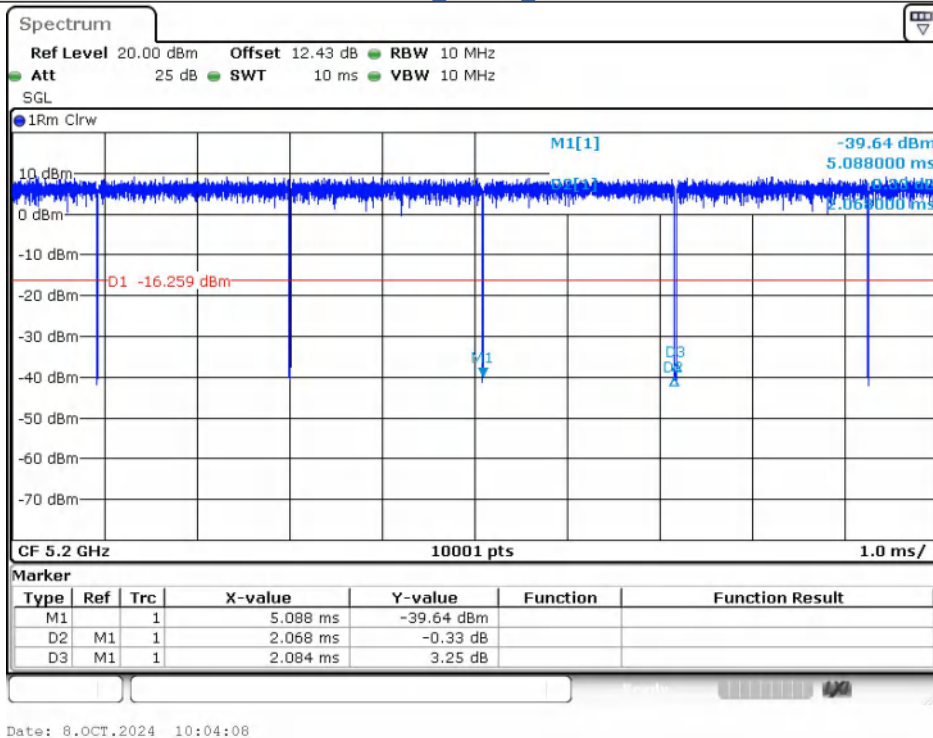
Test Result

Mode	Data rates	Channel	Antenna	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
IEEE 802.11a	6	36	2	2.068	2.083	99.28	0.9928	0.0314	0.48
		40		2.068	2.084	99.23	0.9923	0.0336	0.48
		48		2.068	2.084	99.23	0.9923	0.0336	0.48
		52		2.068	2.083	99.28	0.9928	0.0314	0.48
		60		2.068	2.084	99.23	0.9923	0.0336	0.48
		64		2.068	2.084	99.23	0.9923	0.0336	0.48
		100		2.068	2.083	99.28	0.9928	0.0314	0.48
		116		2.068	2.084	99.23	0.9923	0.0336	0.48
		140		2.068	2.083	99.28	0.9928	0.0314	0.48
IEEE 802.11n_20		36	2	0.229	0.247	92.54	0.9254	0.3367	4.37
		40		0.228	0.247	92.53	0.9253	0.3372	4.39
		48		0.229	0.247	92.59	0.9259	0.3344	4.37
		52		0.229	0.247	92.54	0.9254	0.3367	4.37
		60		0.229	0.247	92.54	0.9254	0.3367	4.37
		64		0.229	0.247	92.54	0.9254	0.3367	4.37
		100		0.228	0.247	92.53	0.9253	0.3372	4.39
		116		0.229	0.247	92.49	0.9249	0.3391	4.37
		140		0.229	0.247	92.59	0.9259	0.3344	4.37
IEEE 802.11n_40		38	2	1.540	1.555	99.04	0.9904	0.0419	0.65
		46		1.540	1.556	98.97	0.9897	0.045	0.65
		54		1.540	1.556	98.97	0.9897	0.045	0.65
		62		1.540	1.557	98.91	0.9891	0.0476	0.65
		110		1.540	1.557	98.91	0.9891	0.0476	0.65
IEEE 802.11ac_20	MCS 0	134	2	1.540	1.556	98.97	0.9897	0.045	0.65
		36		1.936	1.952	99.18	0.9918	0.0358	0.52
		40		1.936	1.952	99.18	0.9918	0.0358	0.52
		48		1.936	1.952	99.18	0.9918	0.0358	0.52
		52		1.936	1.952	99.18	0.9918	0.0358	0.52
		60		1.936	1.952	99.18	0.9918	0.0358	0.52
		64		1.936	1.952	99.18	0.9918	0.0358	0.52
		100		1.936	1.952	99.18	0.9918	0.0358	0.52
		116		1.936	1.952	99.18	0.9918	0.0358	0.52
IEEE 802.11ac_40		140	2	1.936	1.952	99.18	0.9918	0.0358	0.52
		38		1.548	1.564	98.98	0.9898	0.0445	0.65
		46		1.548	1.564	98.98	0.9898	0.0445	0.65
		54		1.548	1.564	98.98	0.9898	0.0445	0.65
		62		1.548	1.564	98.98	0.9898	0.0445	0.65
IEEE 802.11ac_80		110	2	1.548	1.564	98.98	0.9898	0.0445	0.65
		134		1.548	1.564	98.98	0.9898	0.0445	0.65
		42		2.244	2.261	99.25	0.9925	0.0327	0.45
		58		2.244	2.260	99.29	0.9929	0.0309	0.45
		106		2.244	2.260	99.29	0.9929	0.0309	0.45
		122		2.244	2.260	99.29	0.9929	0.0309	0.65

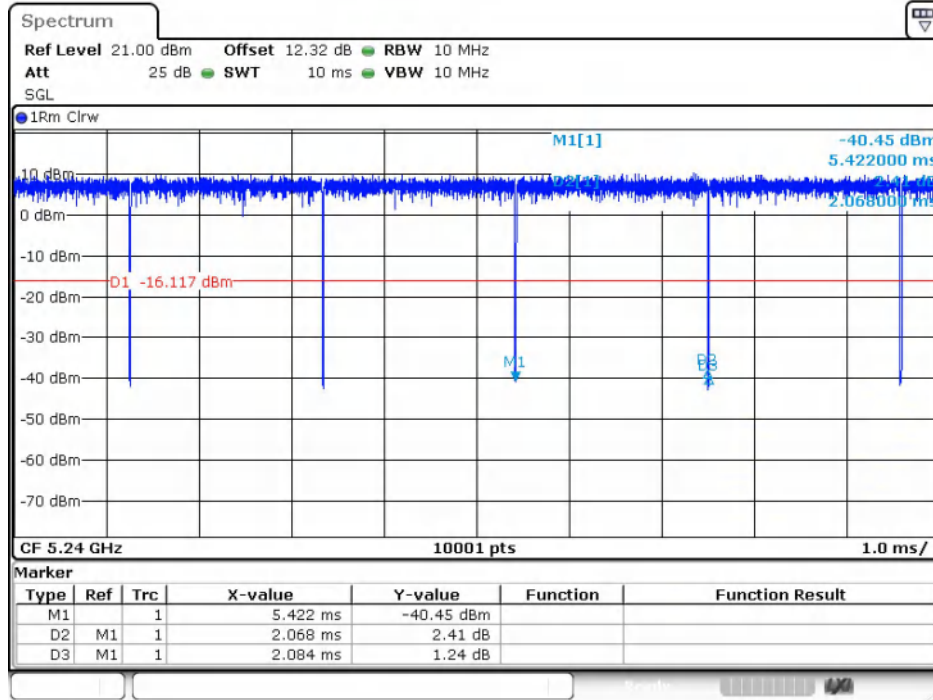
Test Graphs



IEEE 802.11a_20MHz_Channel 36

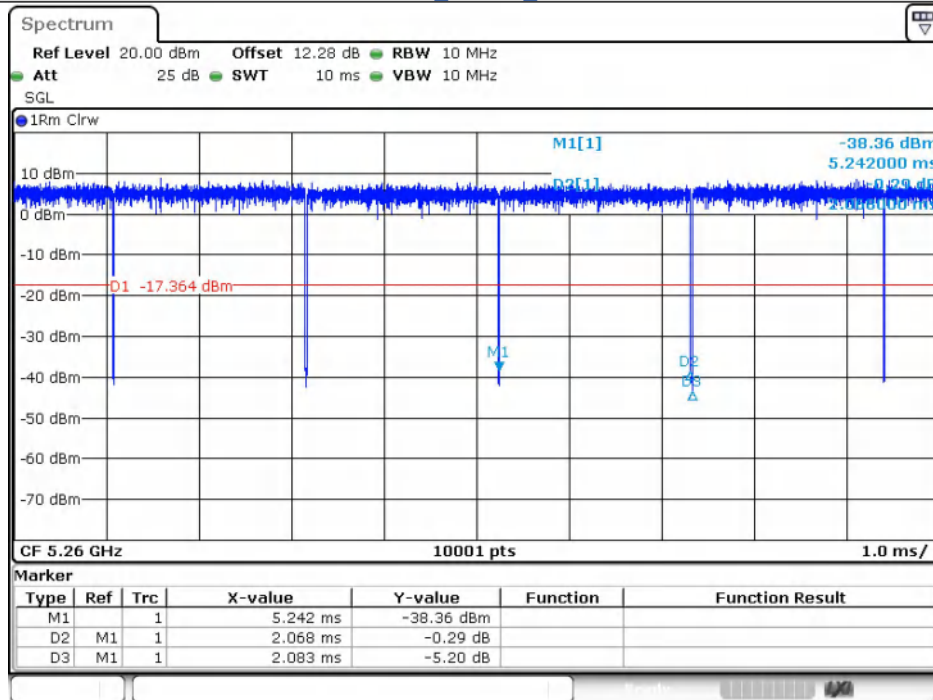


IEEE 802.11a_20MHz_Channel 40



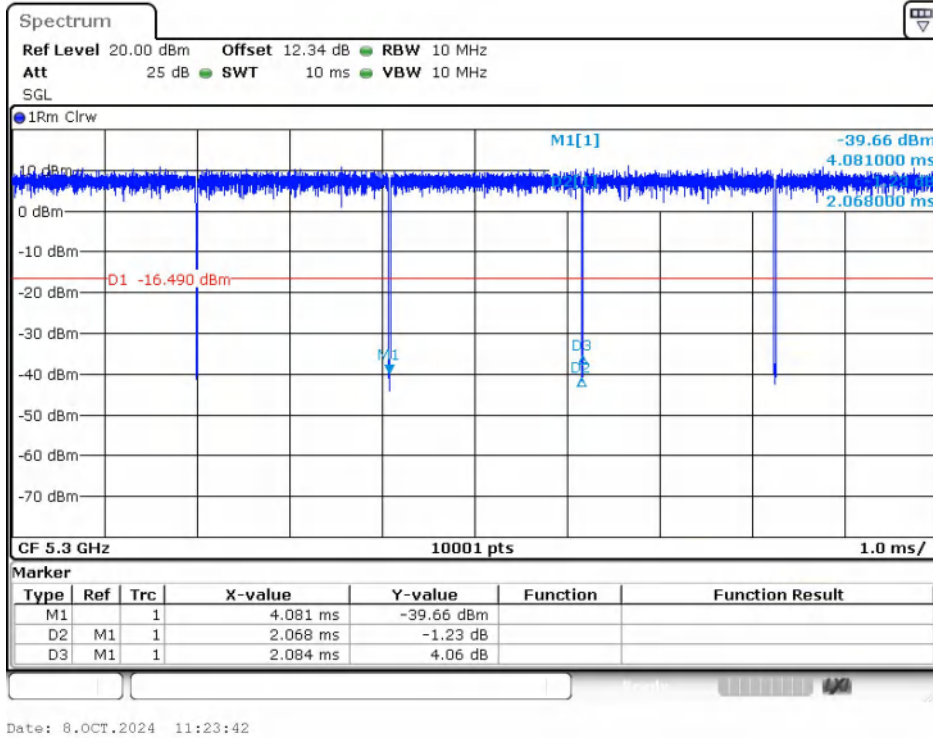
Date: 8.OCT.2024 10:07:57

IEEE 802.11a_20MHz_Channel 48

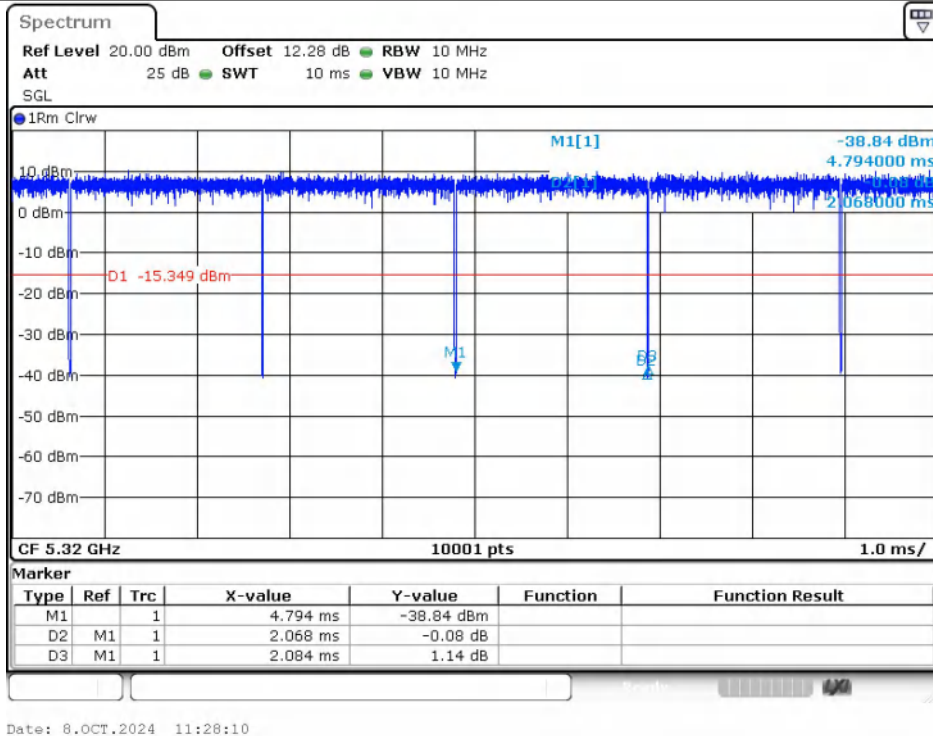


Date: 8.OCT.2024 11:19:16

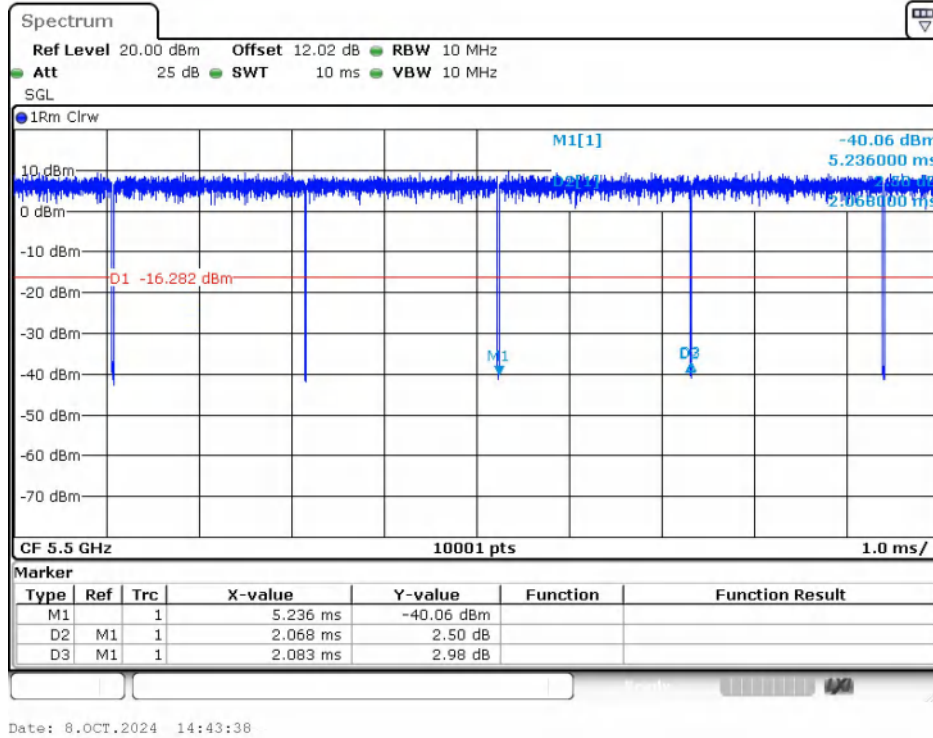
IEEE 802.11a_20MHz_Channel 52



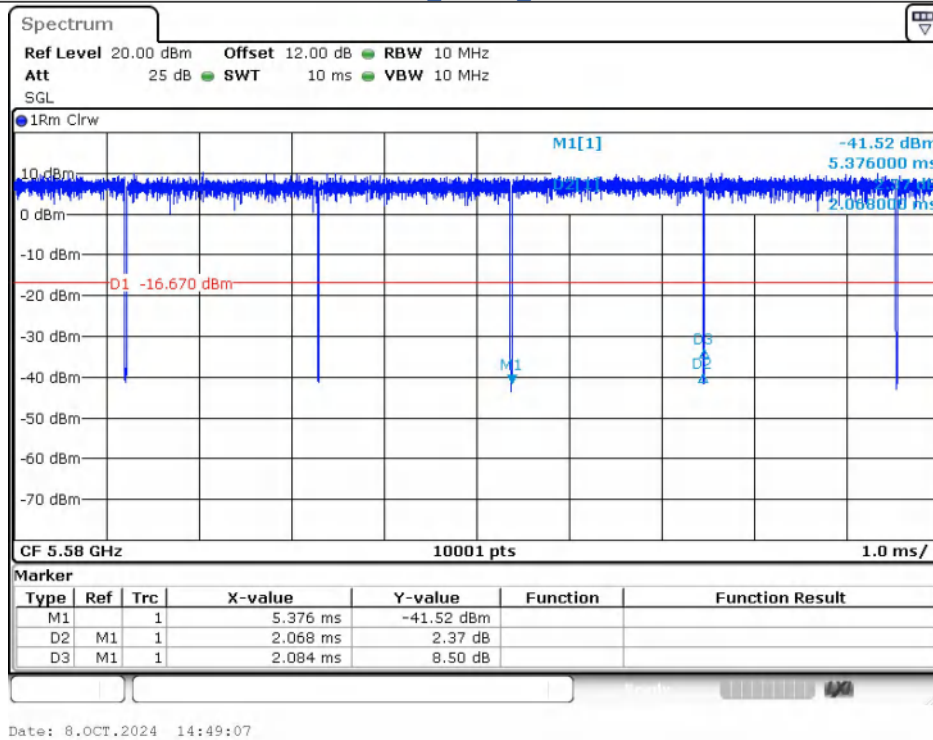
IEEE 802.11a_20MHz_Channel 60



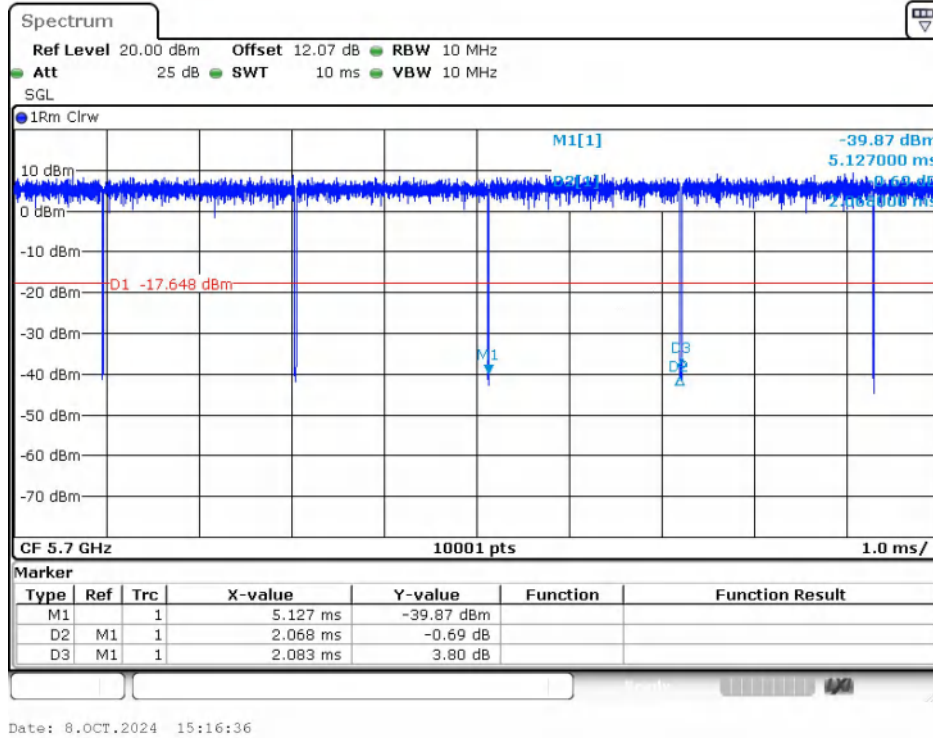
IEEE 802.11a_20MHz_Channel 64



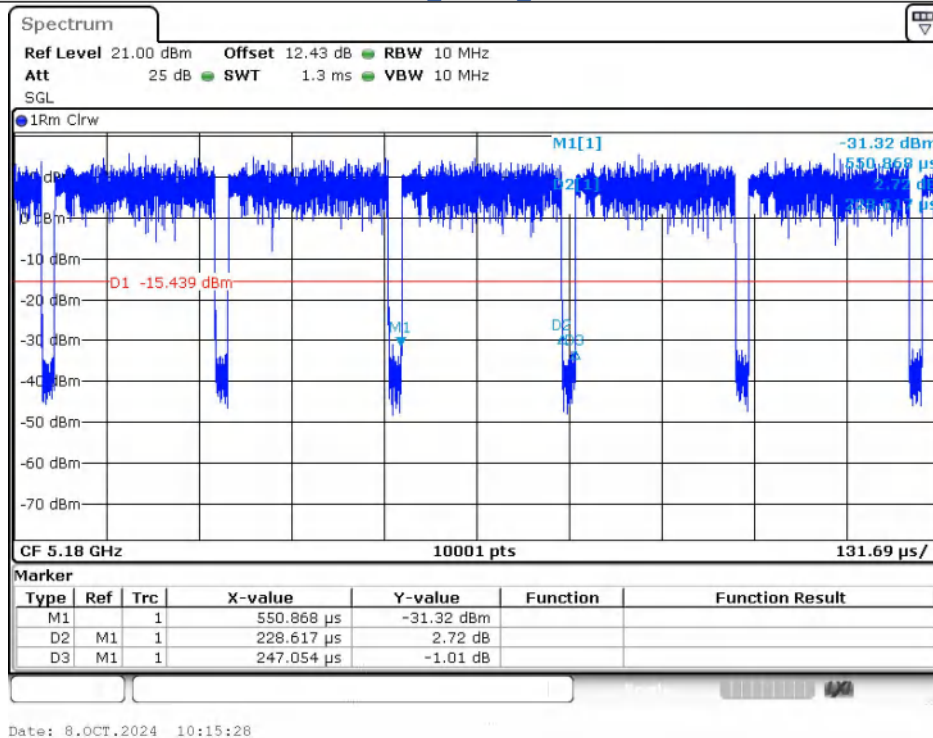
IEEE 802.11a_20MHz_Channel 100



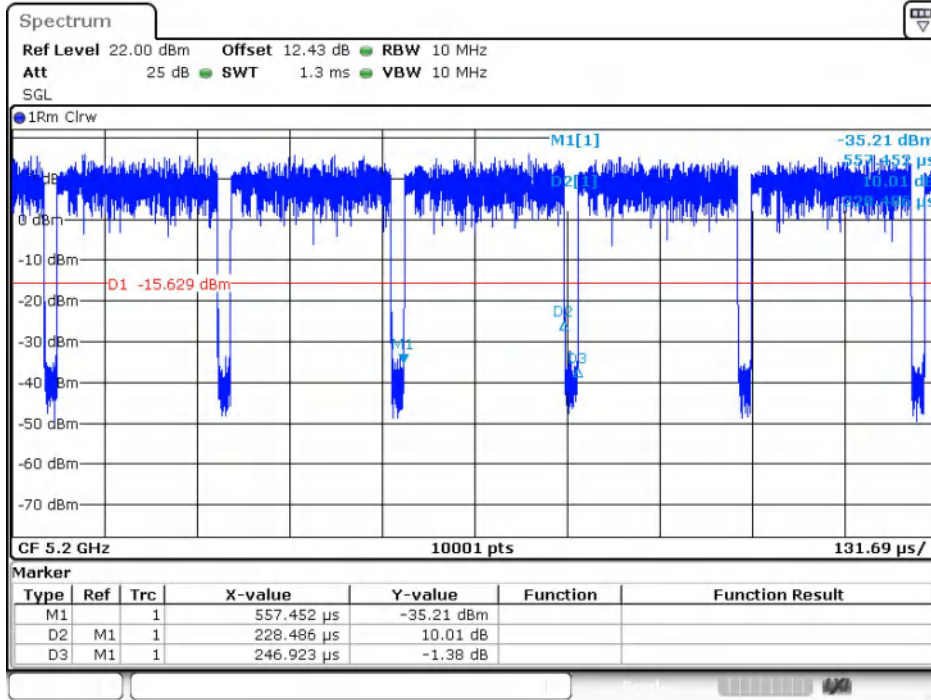
IEEE 802.11a_20MHz_Channel 116



IEEE 802.11a_20MHz_Channel 140

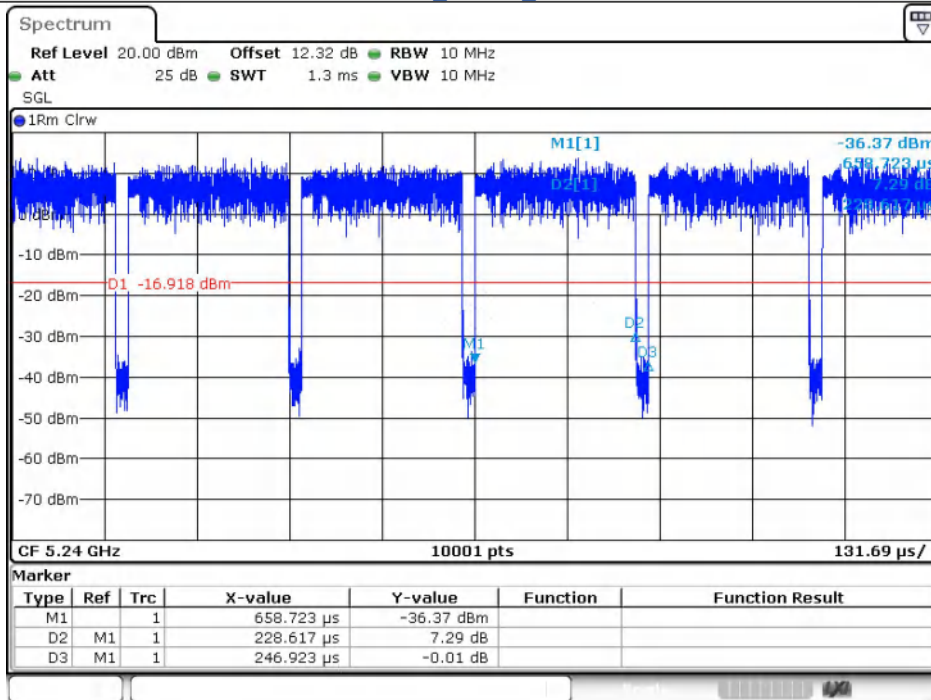


IEEE 802.11n_20MHz_Channel 36



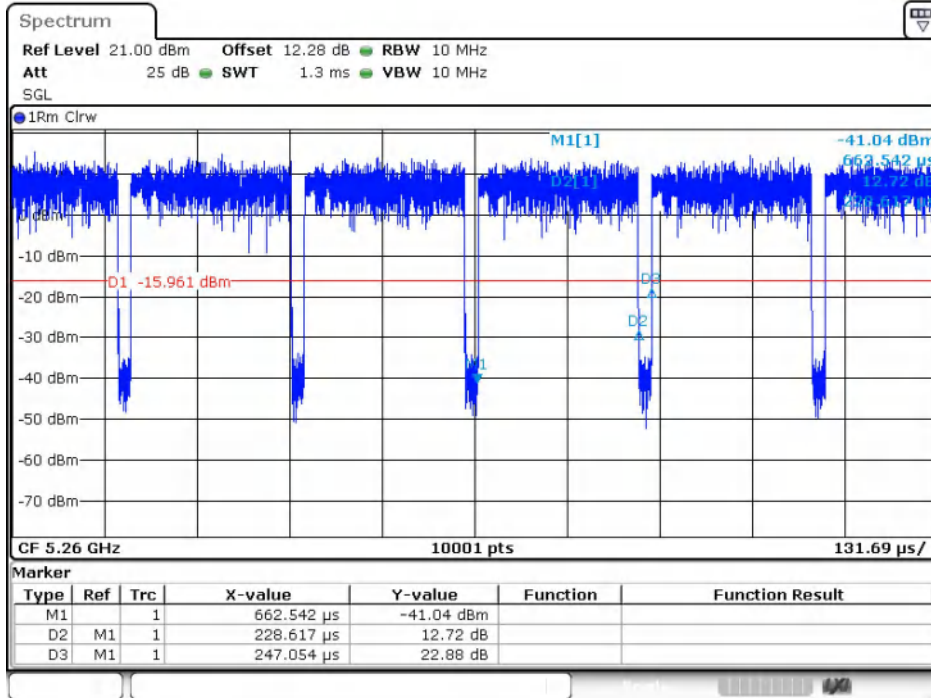
Date: 8.OCT.2024 10:22:35

IEEE 802.11n_20MHz_Channel 40



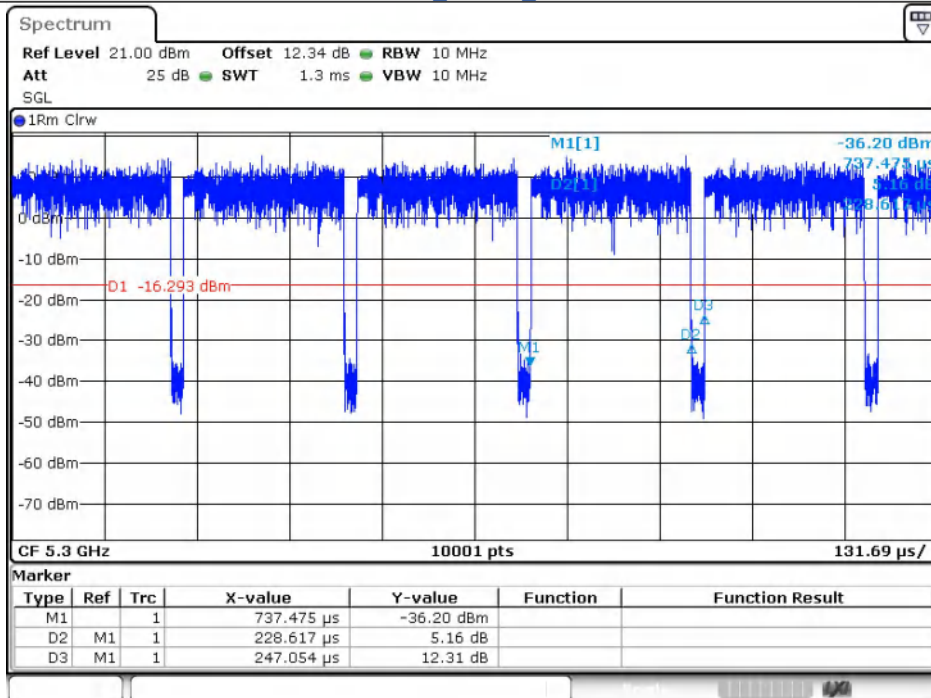
Date: 8.OCT.2024 10:26:38

IEEE 802.11n_20MHz_Channel 48



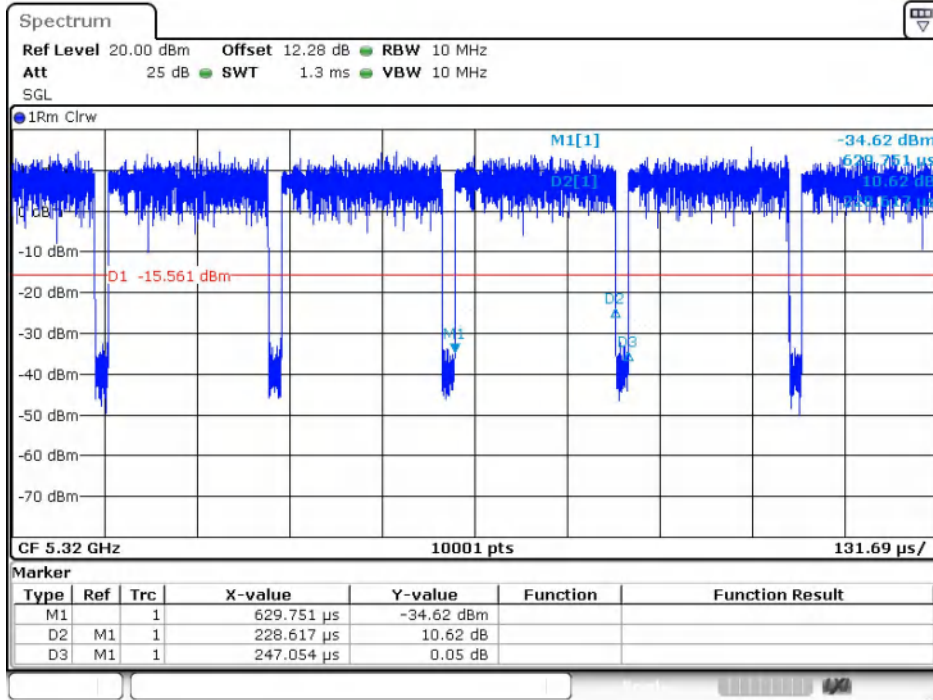
Date: 8.OCT.2024 11:33:00

IEEE 802.11n_20MHz_Channel 52



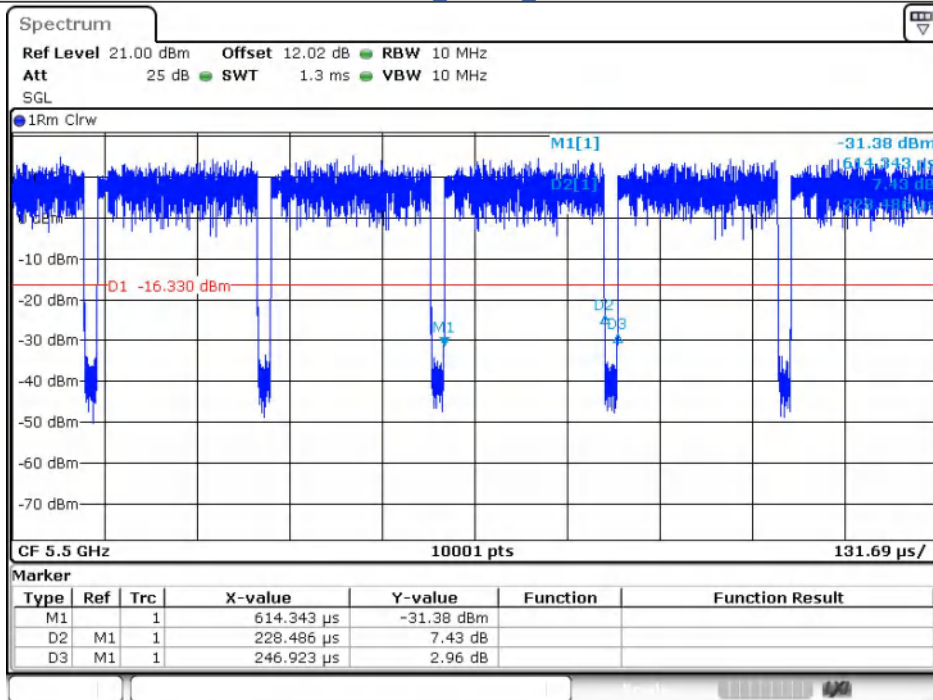
Date: 8.OCT.2024 11:36:28

IEEE 802.11n_20MHz_Channel 60



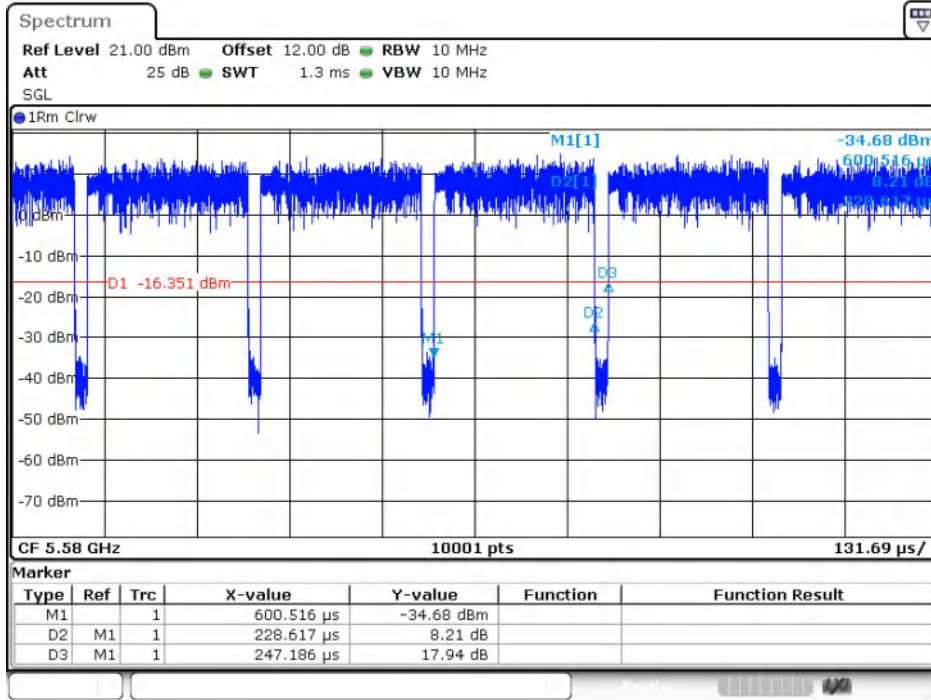
Date: 8.OCT.2024 11:43:32

IEEE 802.11n_20MHz_Channel 64



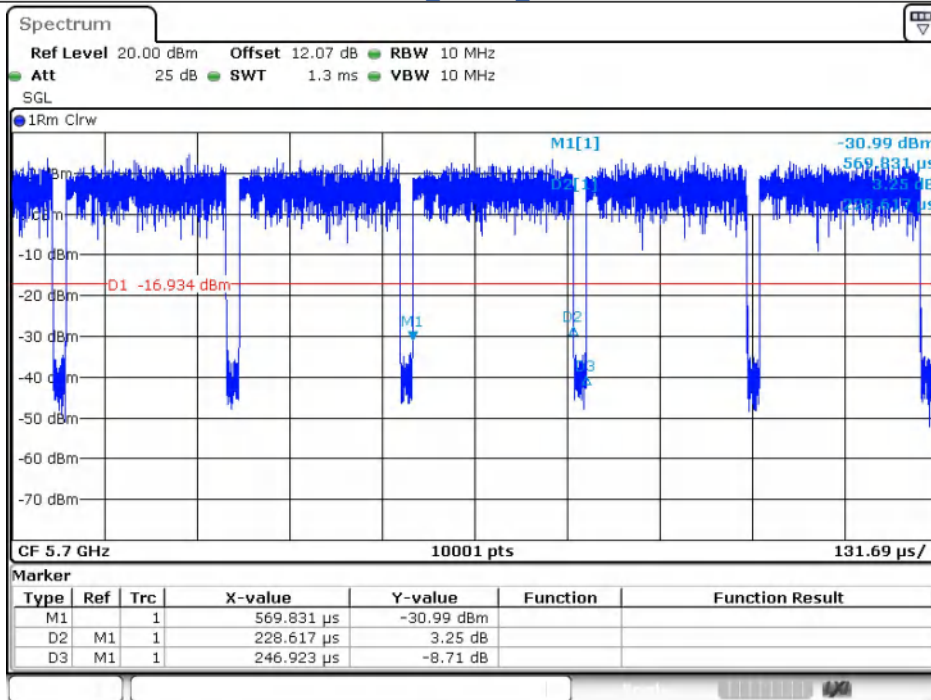
Date: 8.OCT.2024 14:58:07

IEEE 802.11n_20MHz_Channel 100



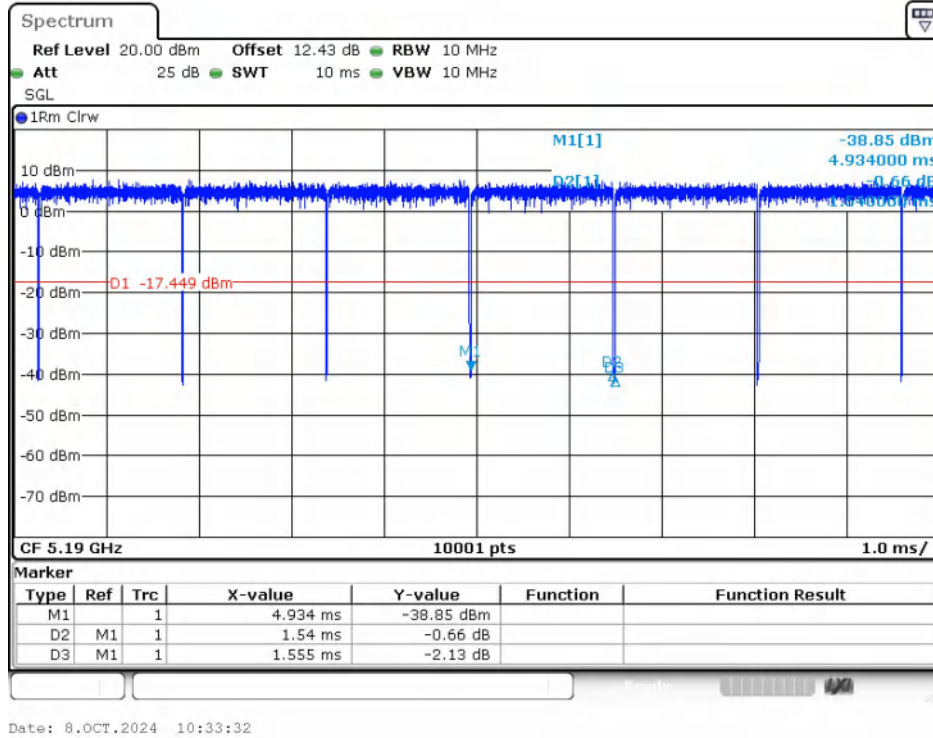
Date: 8.OCT.2024 15:01:38

IEEE 802.11n_20MHz_Channel 116

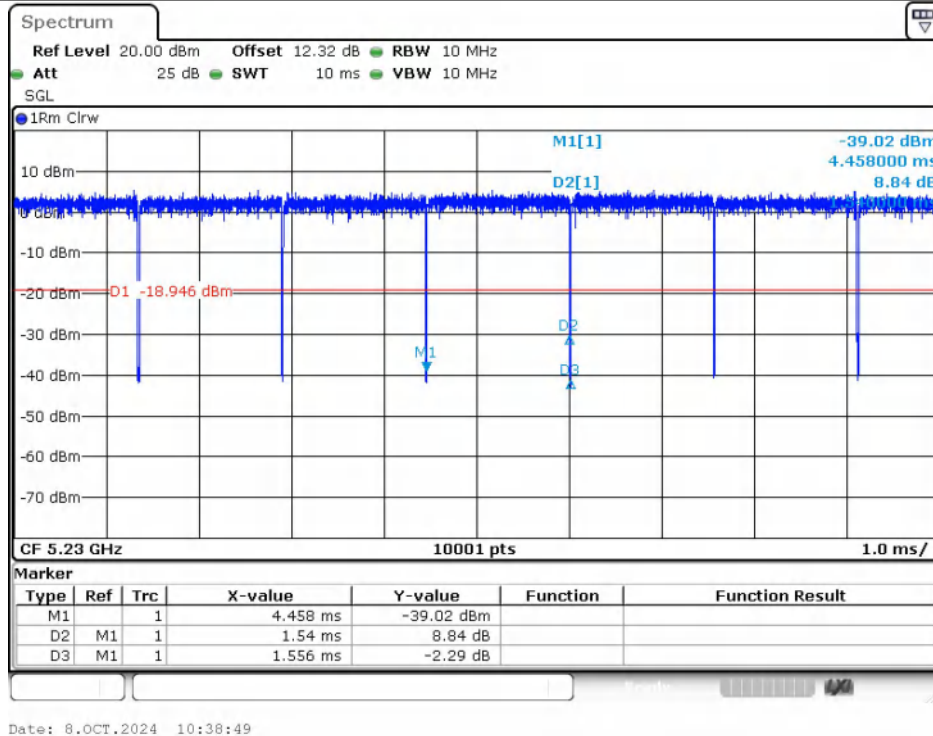


Date: 8.OCT.2024 15:20:41

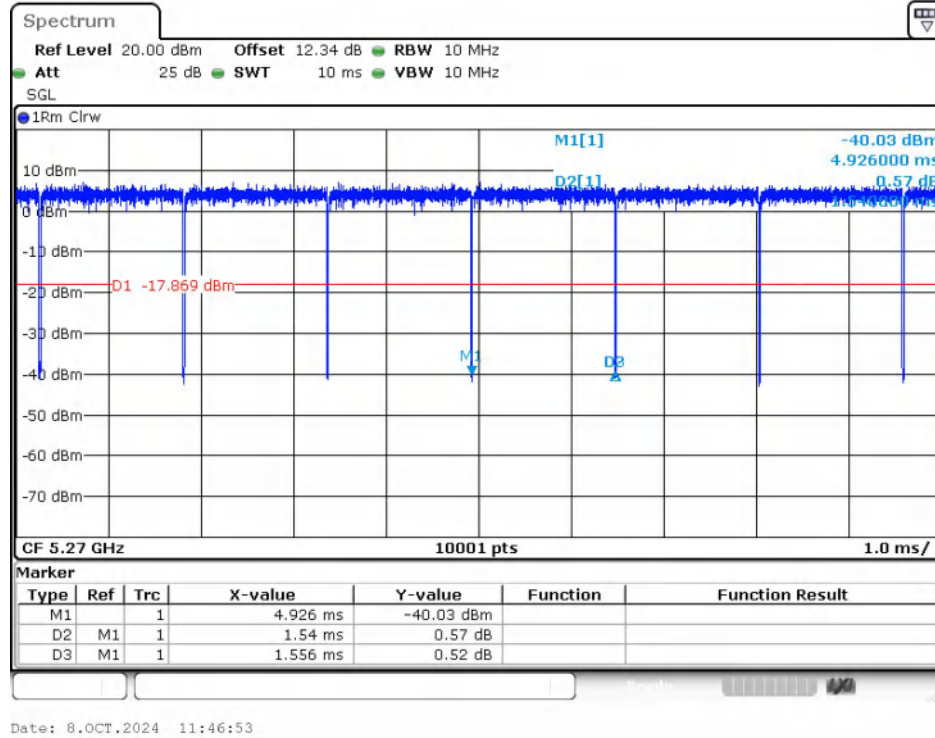
IEEE 802.11n_20MHz_Channel 140



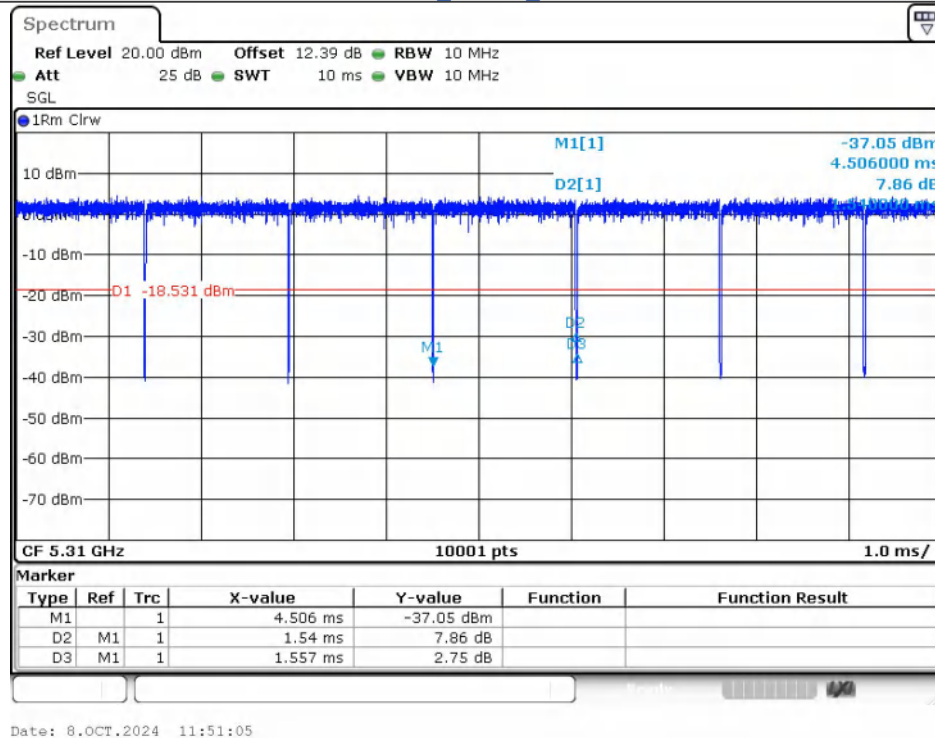
IEEE 802.11n_40MHz_Channel 38



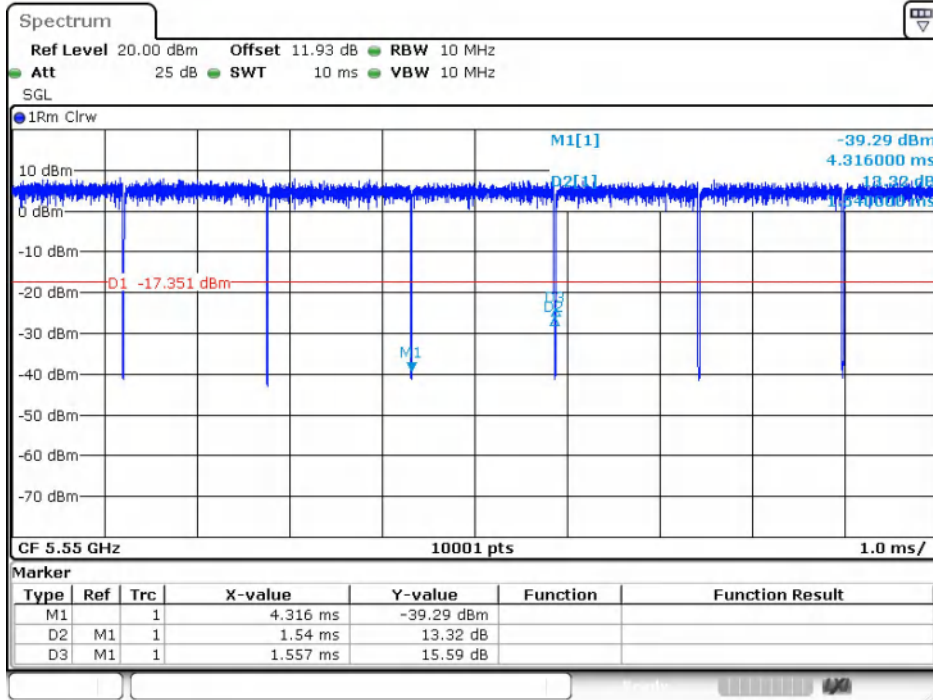
IEEE 802.11n_40MHz_Channel 46



IEEE 802.11n_40MHz_Channel 54

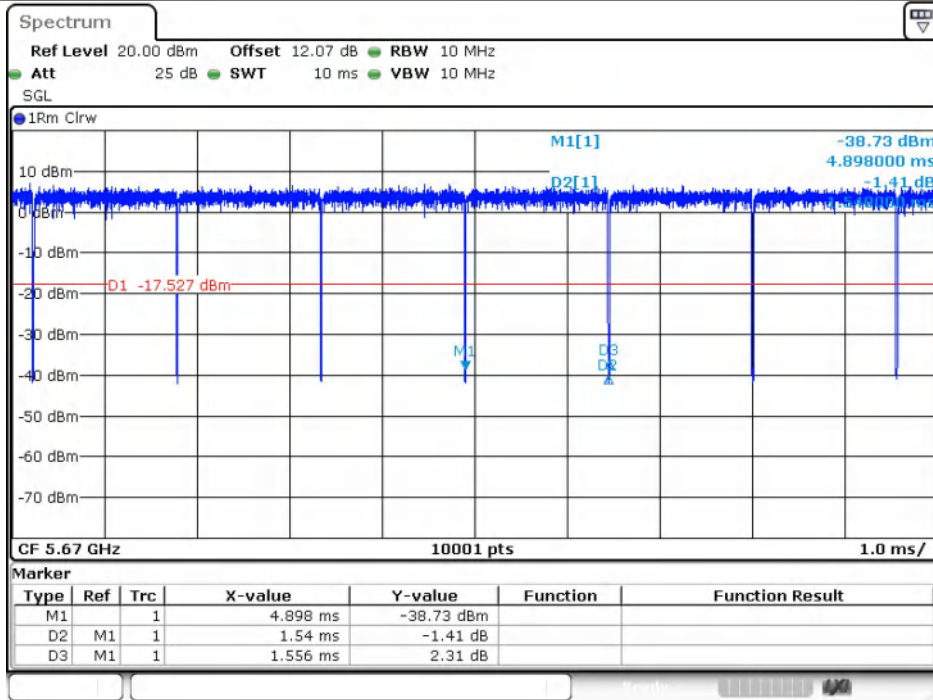


IEEE 802.11n_40MHz_Channel 62



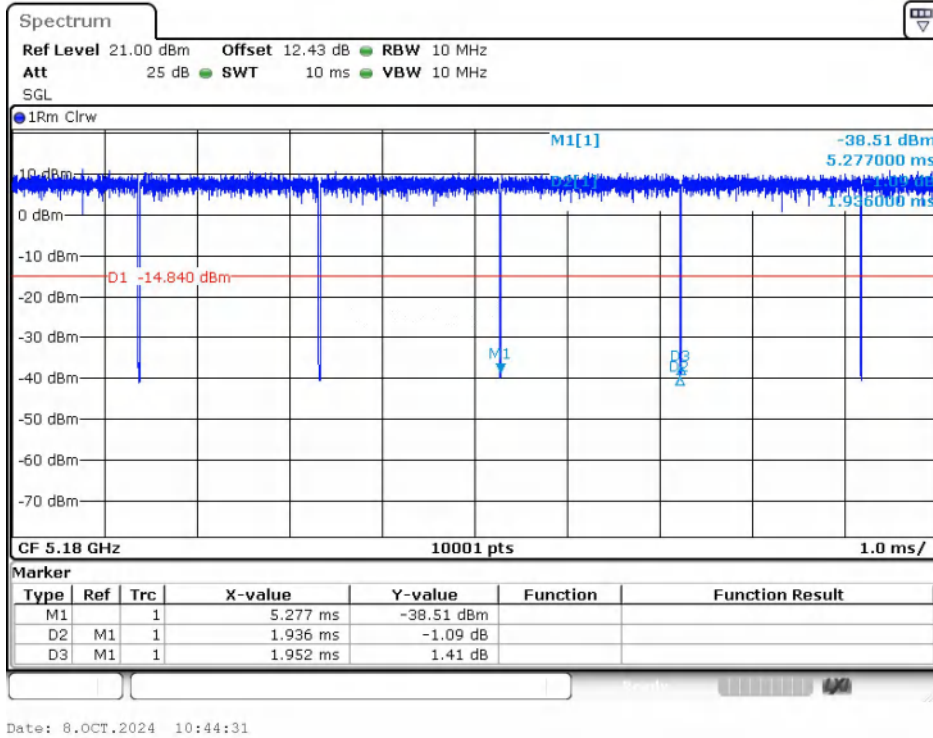
Date: 8.OCT.2024 15:09:22

IEEE 802.11n_40MHz_Channel 110

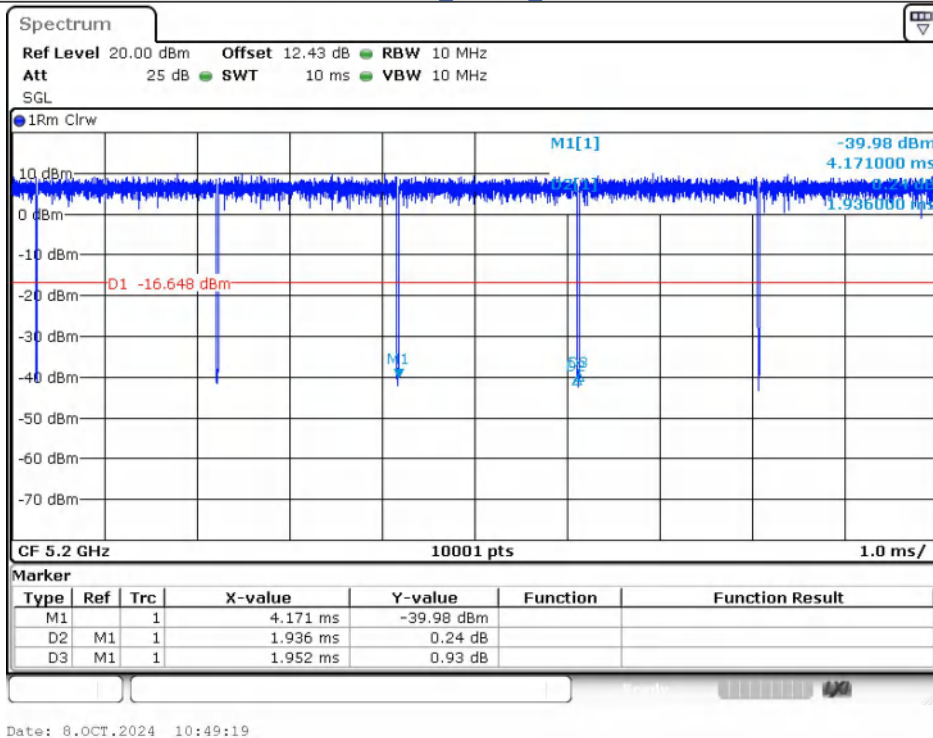


Date: 8.OCT.2024 15:24:14

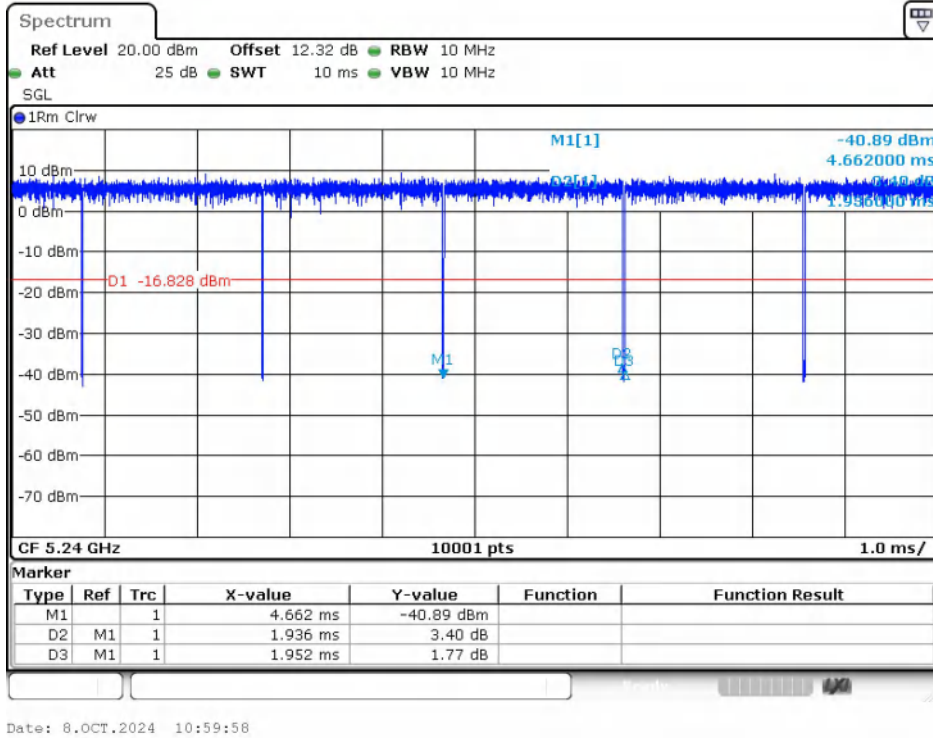
IEEE 802.11n_40MHz_Channel 134



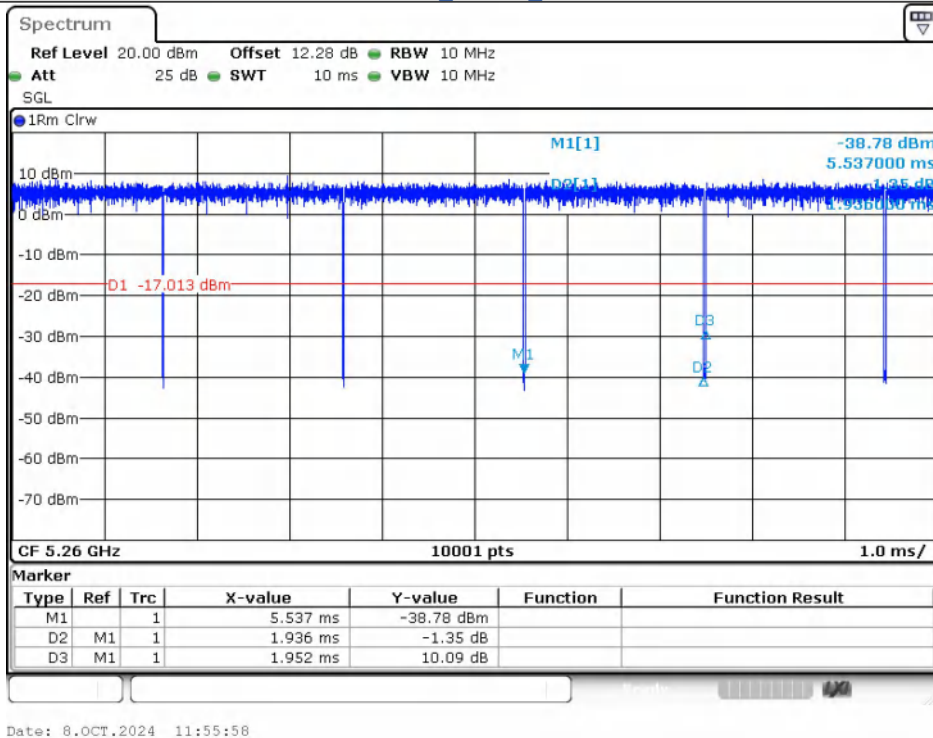
IEEE 802.11ac_20MHz_Channel 36



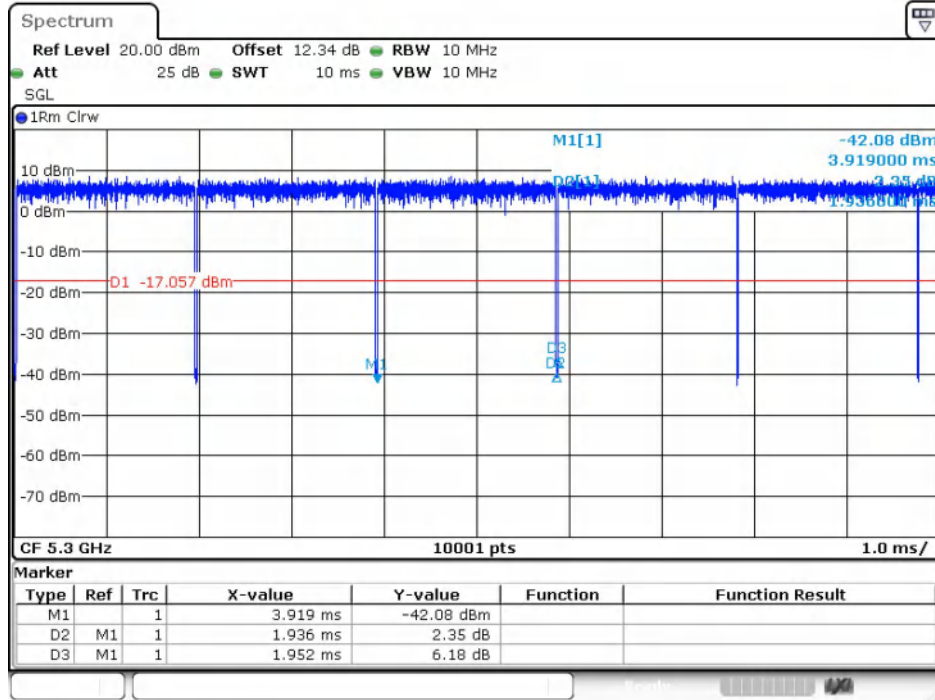
IEEE 802.11ac_20MHz_Channel 40



IEEE 802.11ac_20MHz_Channel 48

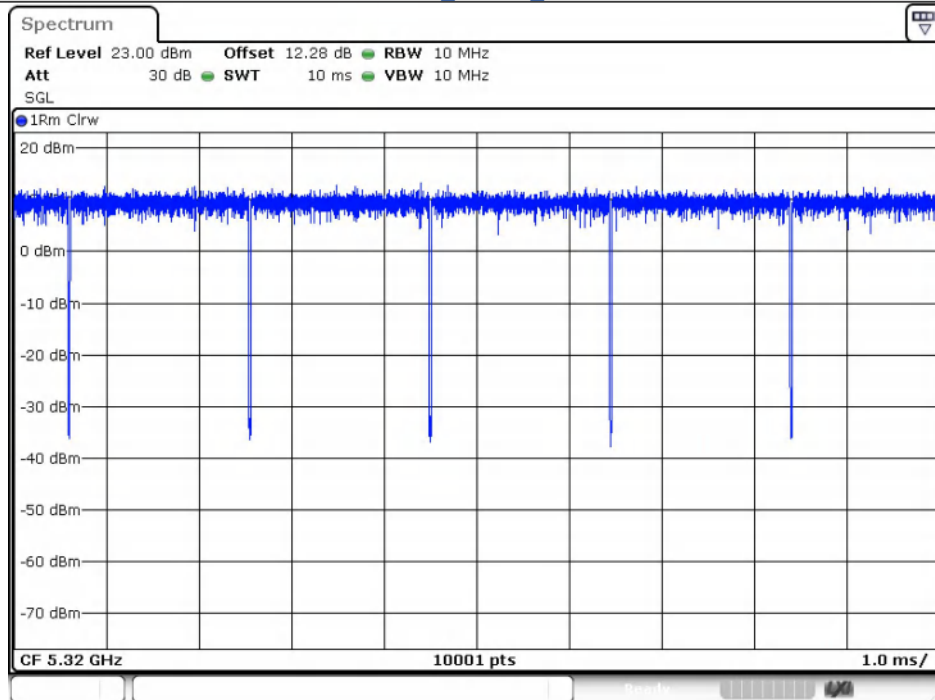


IEEE 802.11ac_20MHz_Channel 52



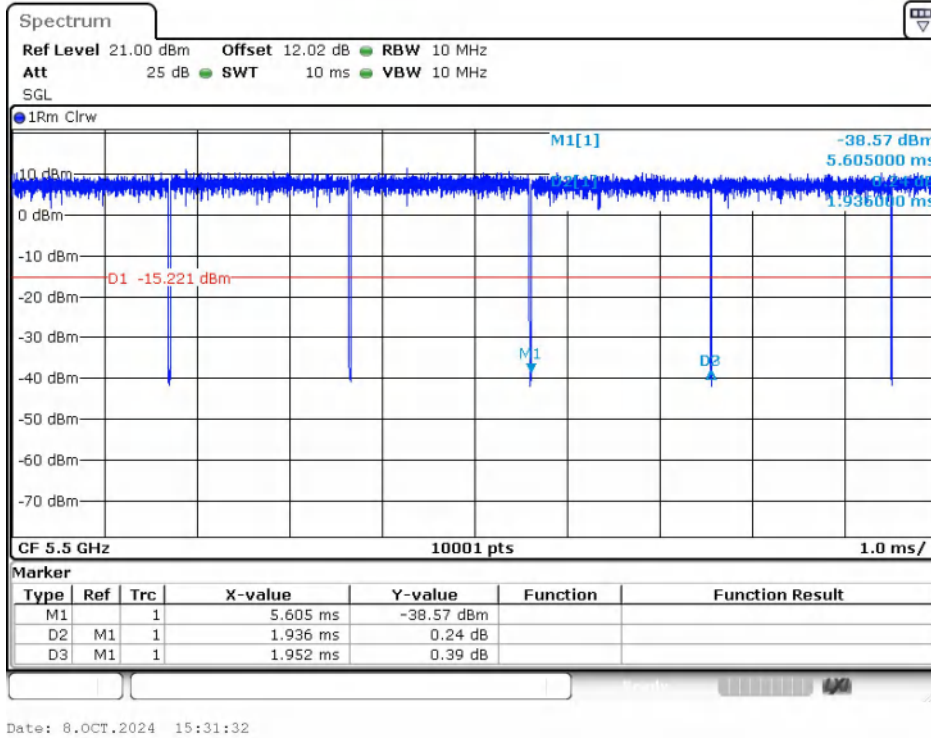
Date: 8.OCT.2024 14:16:24

IEEE 802.11ac_20MHz_Channel 60

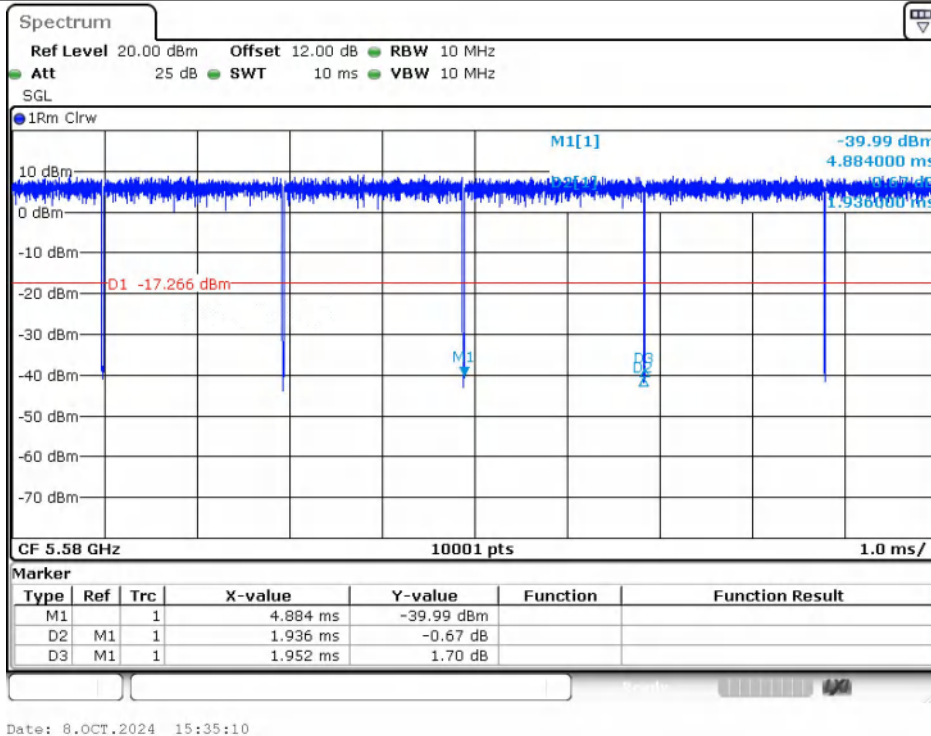


Date: 8.OCT.2024 14:24:28

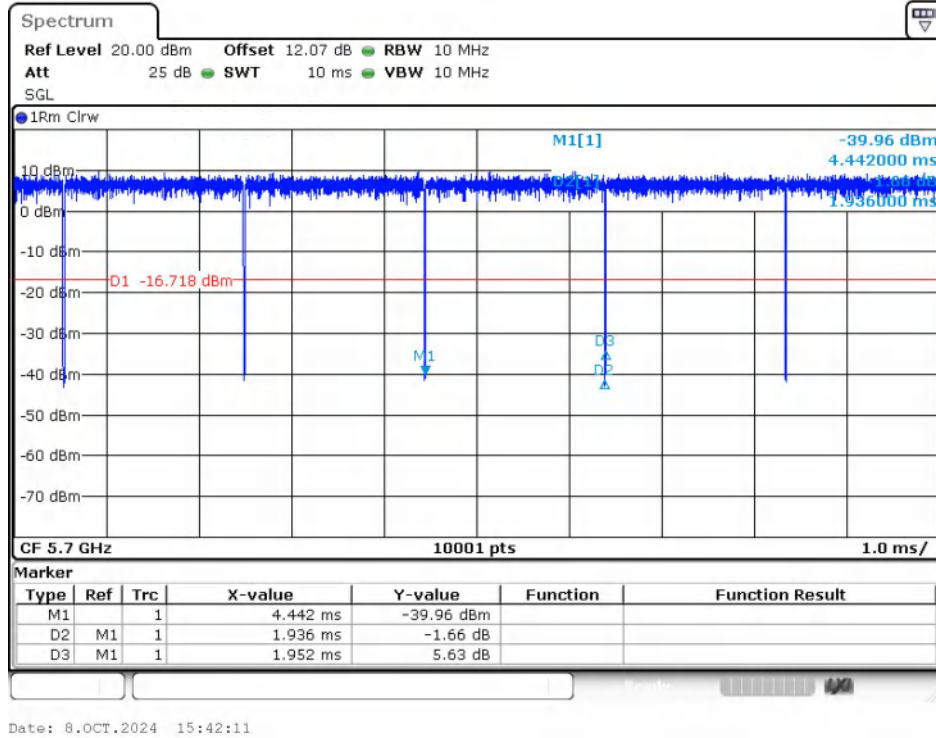
IEEE 802.11ac_20MHz_Channel 64



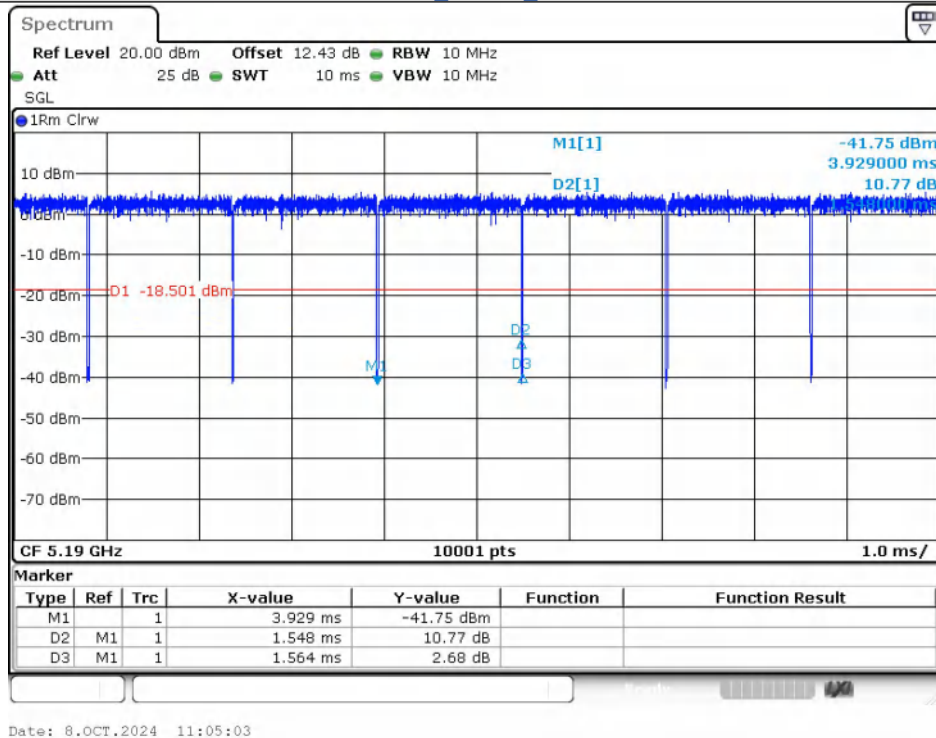
IEEE 802.11ac_20MHz_Channel 100



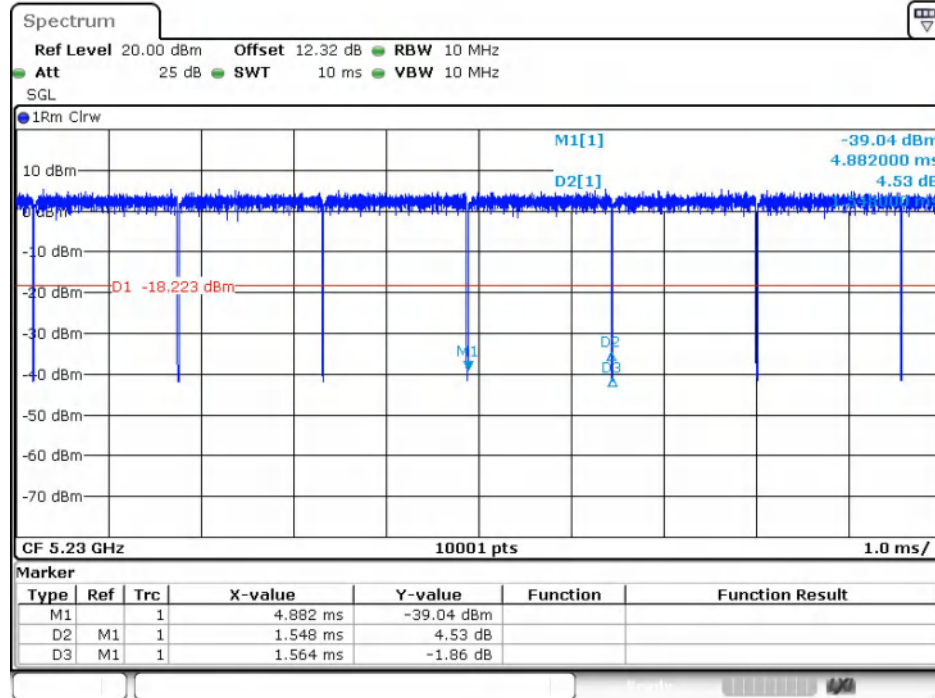
IEEE 802.11ac_20MHz_Channel 116



IEEE 802.11ac_20MHz_Channel 140

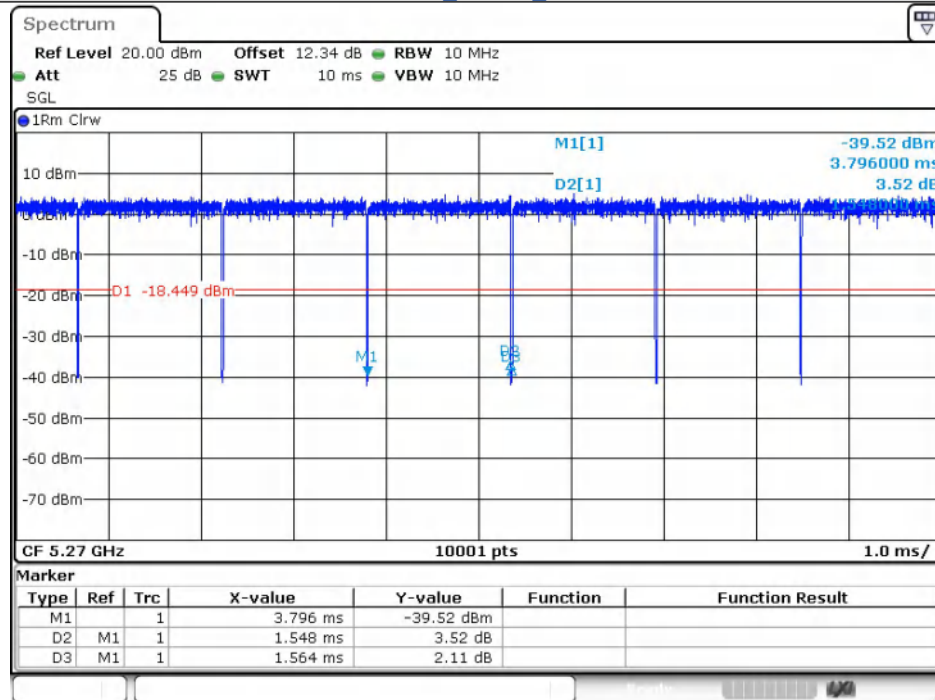


IEEE 802.11ac_40MHz_Channel 38



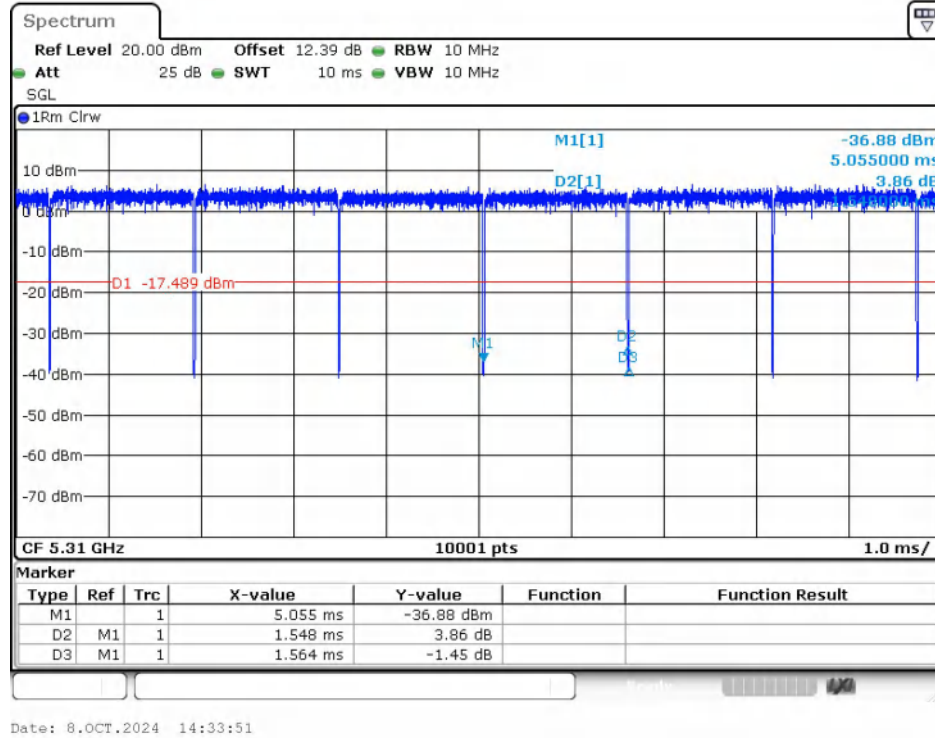
Date: 8.OCT.2024 11:10:22

IEEE 802.11ac_40MHz_Channel 46

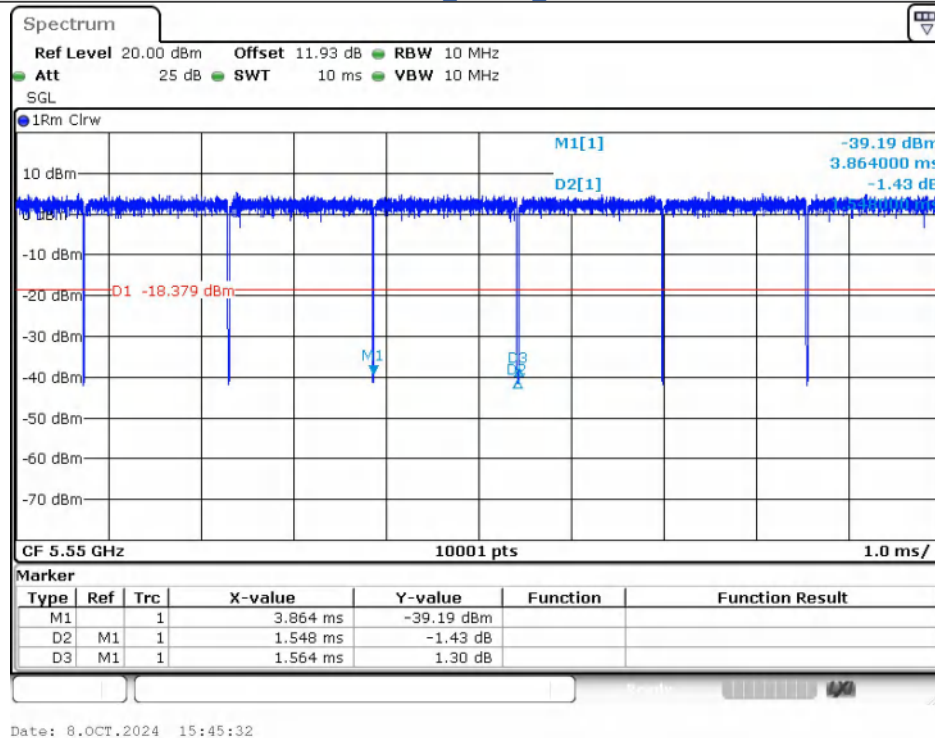


Date: 8.OCT.2024 14:28:02

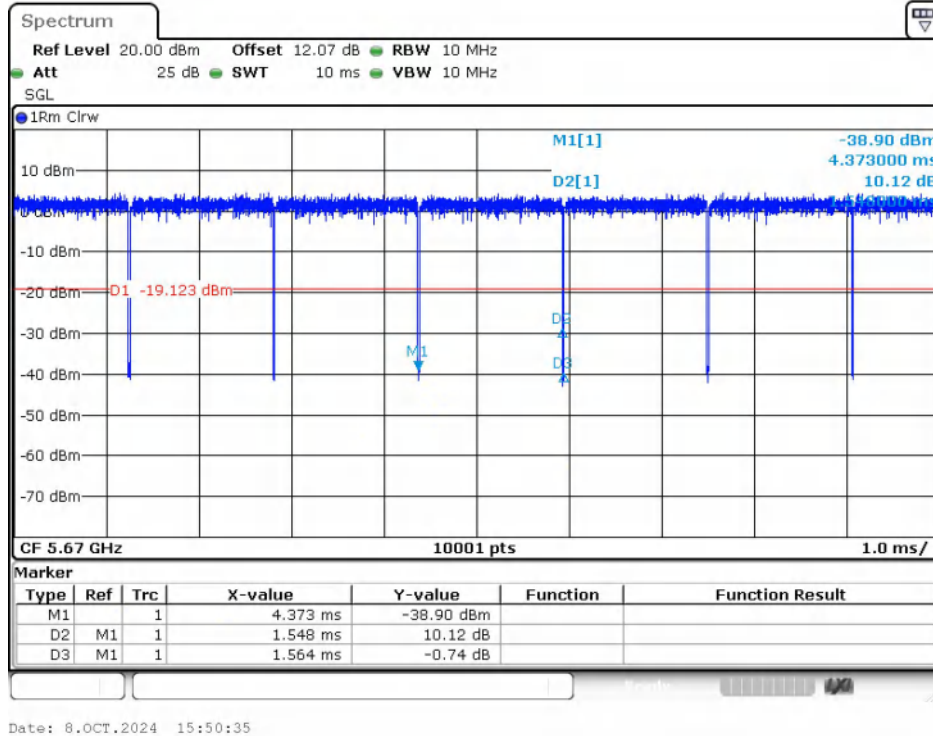
IEEE 802.11ac_40MHz_Channel 54



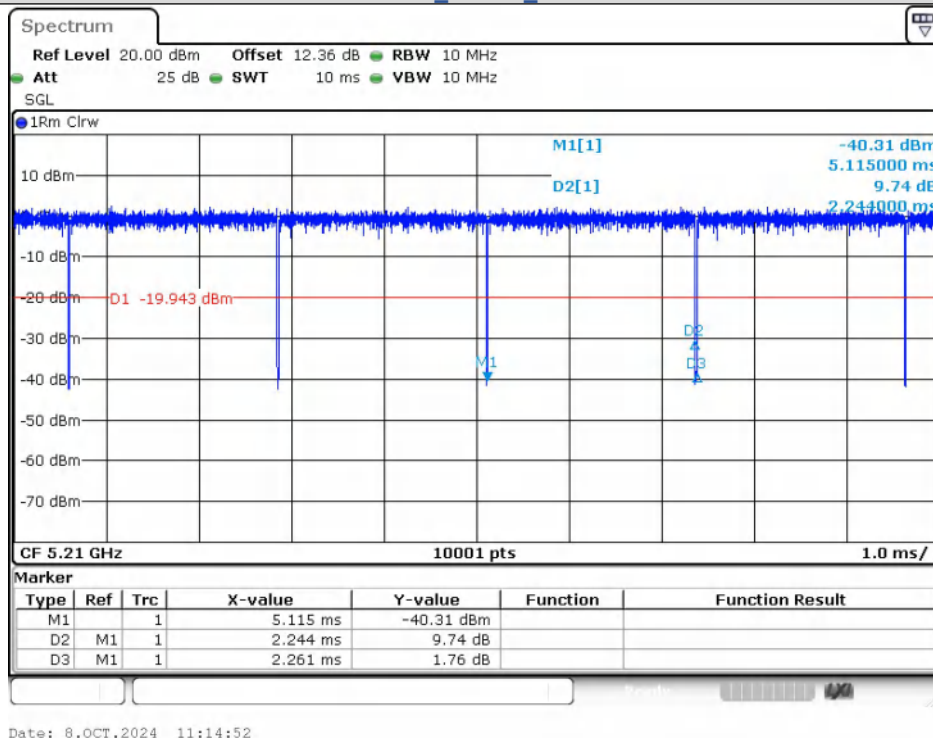
IEEE 802.11ac_40MHz_Channel 62



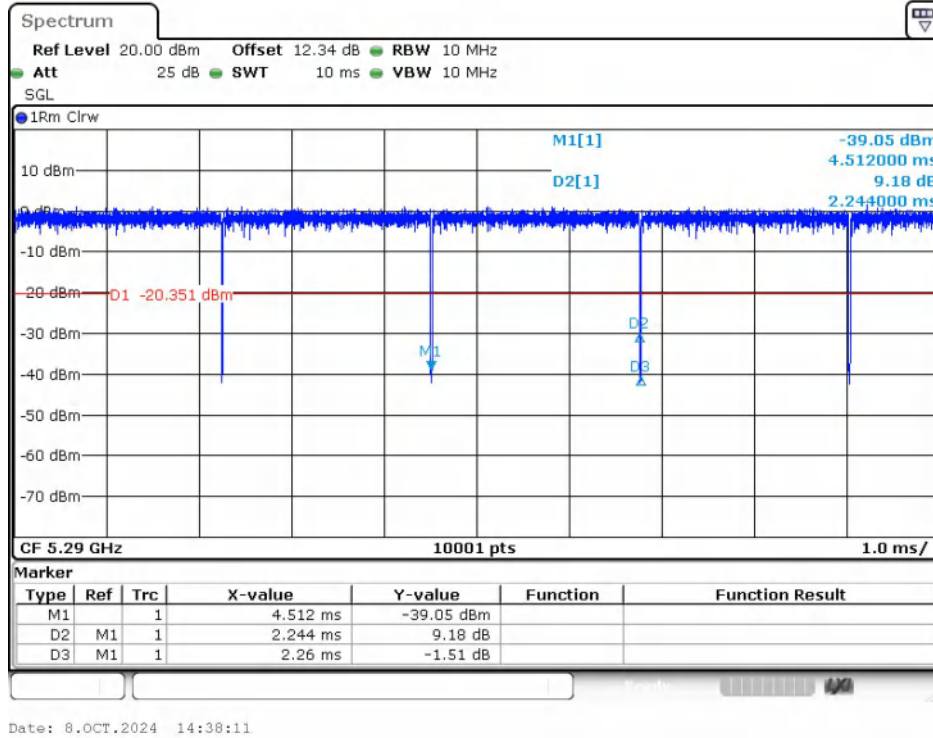
IEEE 802.11ac_40MHz_Channel 110



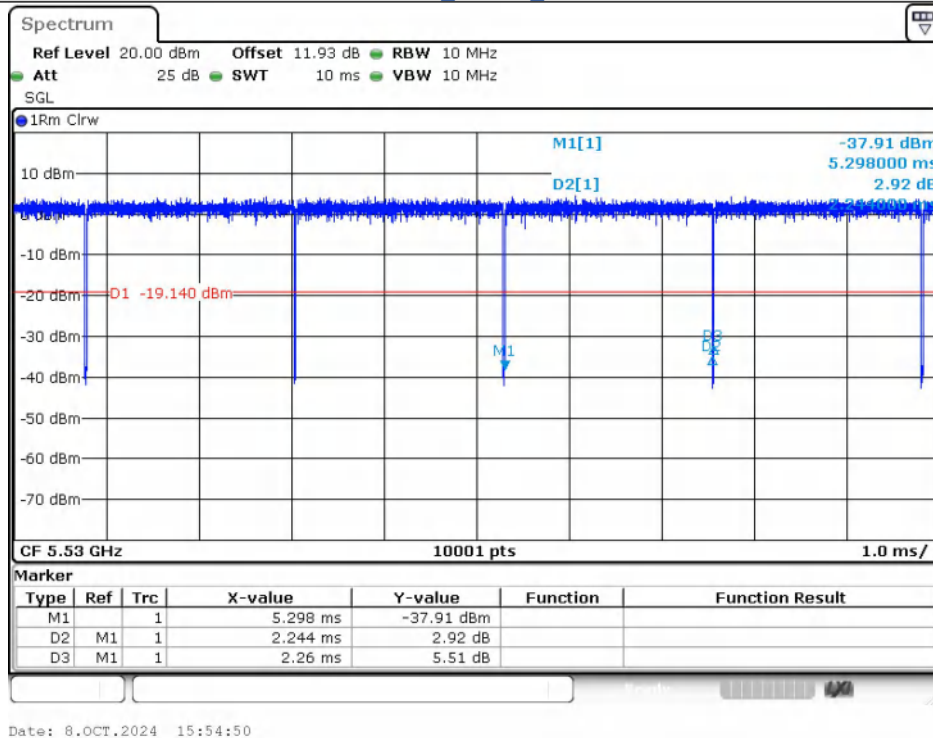
IEEE 802.11ac_40MHz_Channel 134



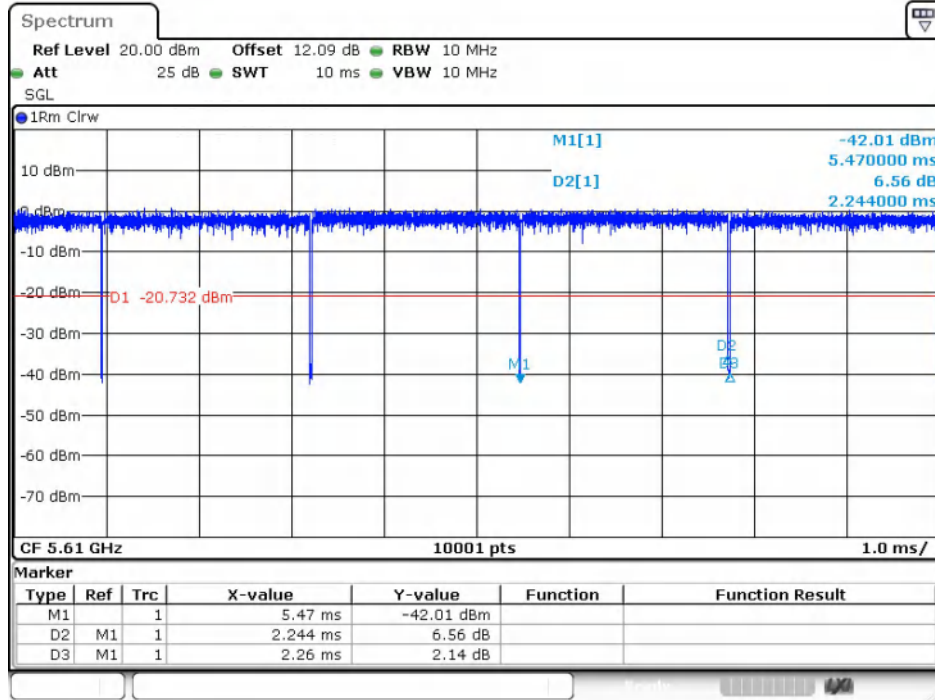
IEEE 802.11ac_80MHz_Channel 42



IEEE 802.11ac_80MHz_Channel 58



IEEE 802.11ac_80MHz_Channel 106



Date: 8.OCT.2024 16:06:11

IEEE 802.11ac_80MHz_Channel 122

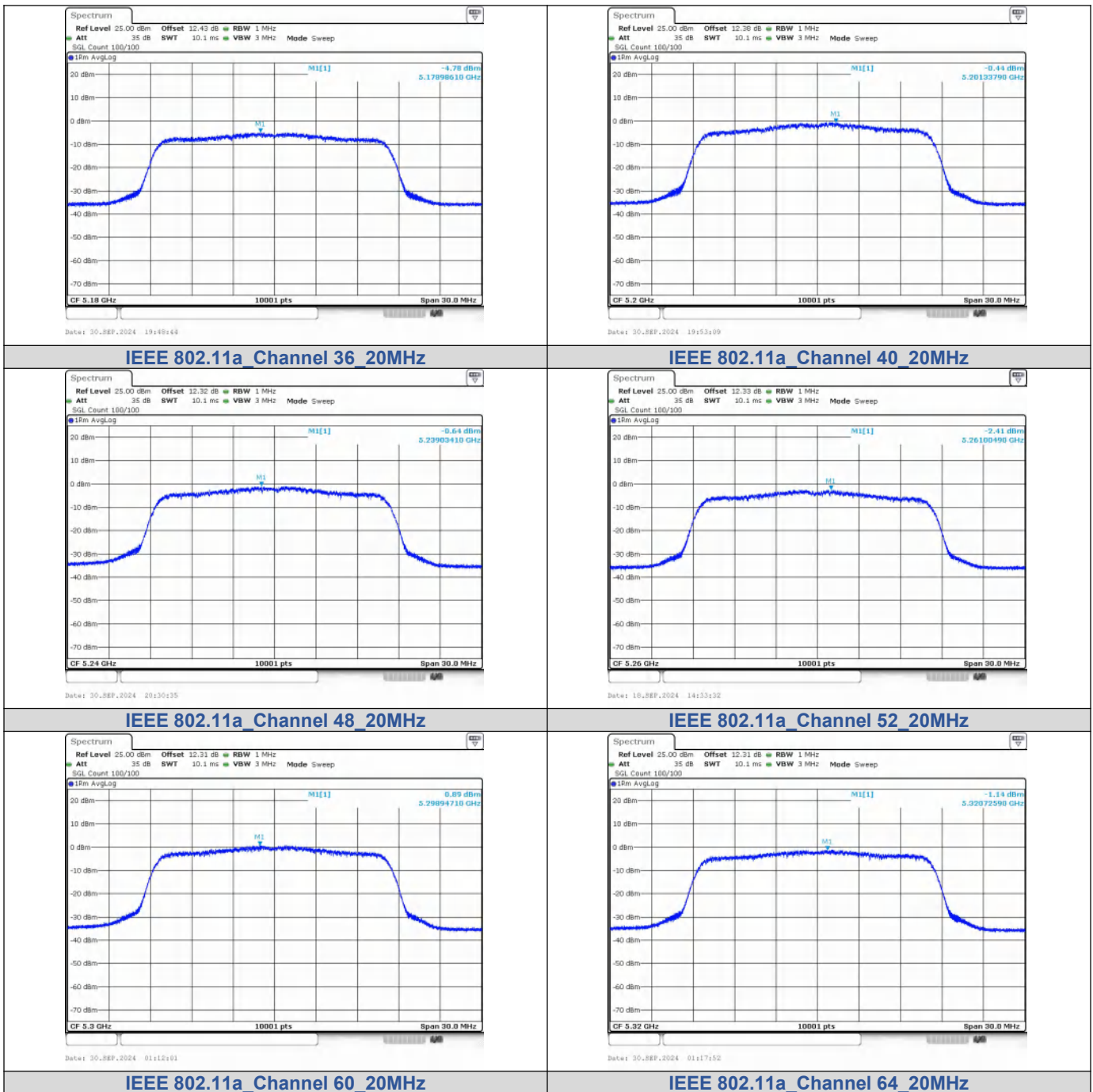
Peak Power Spectral Density

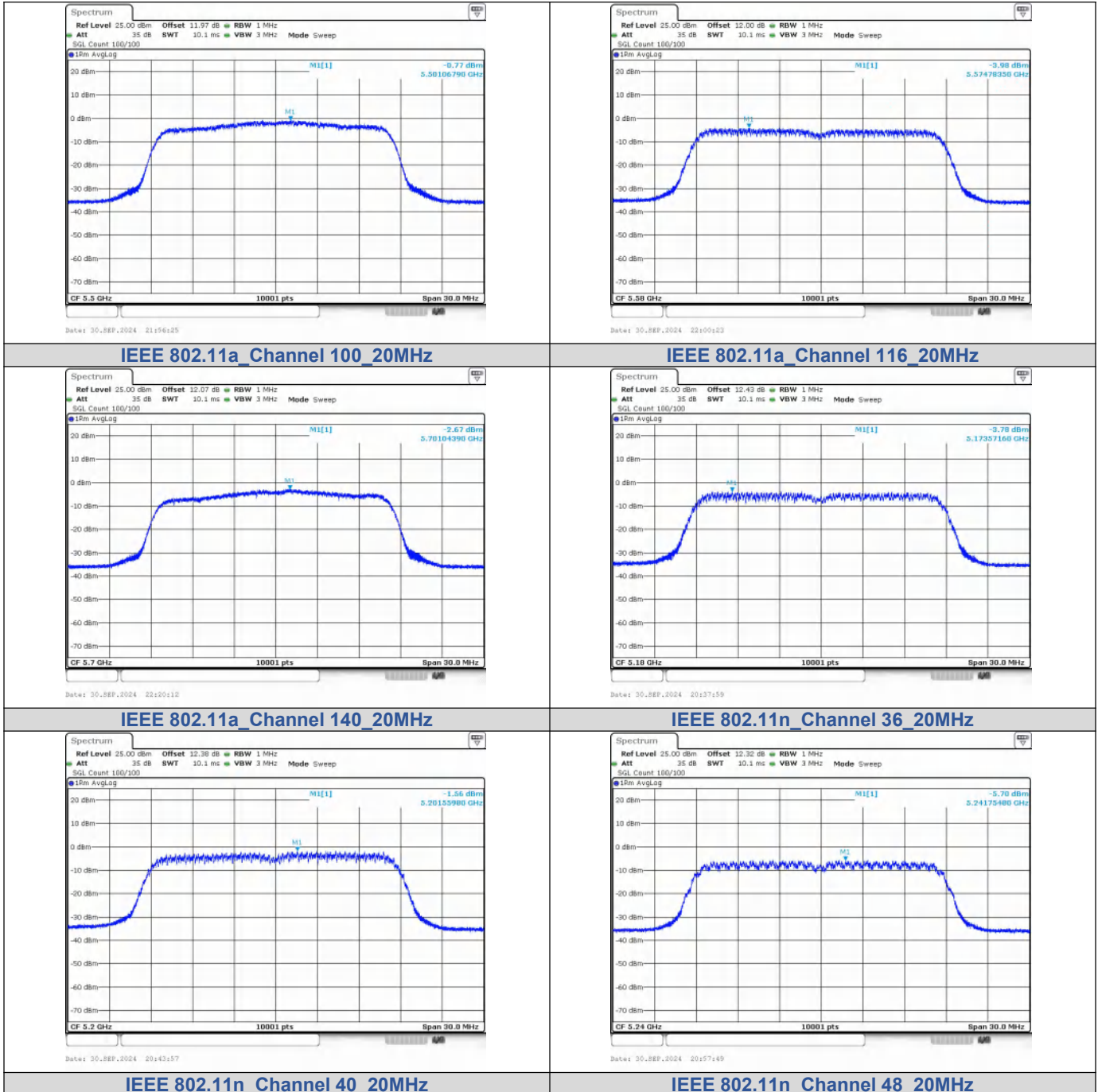
ANT1:

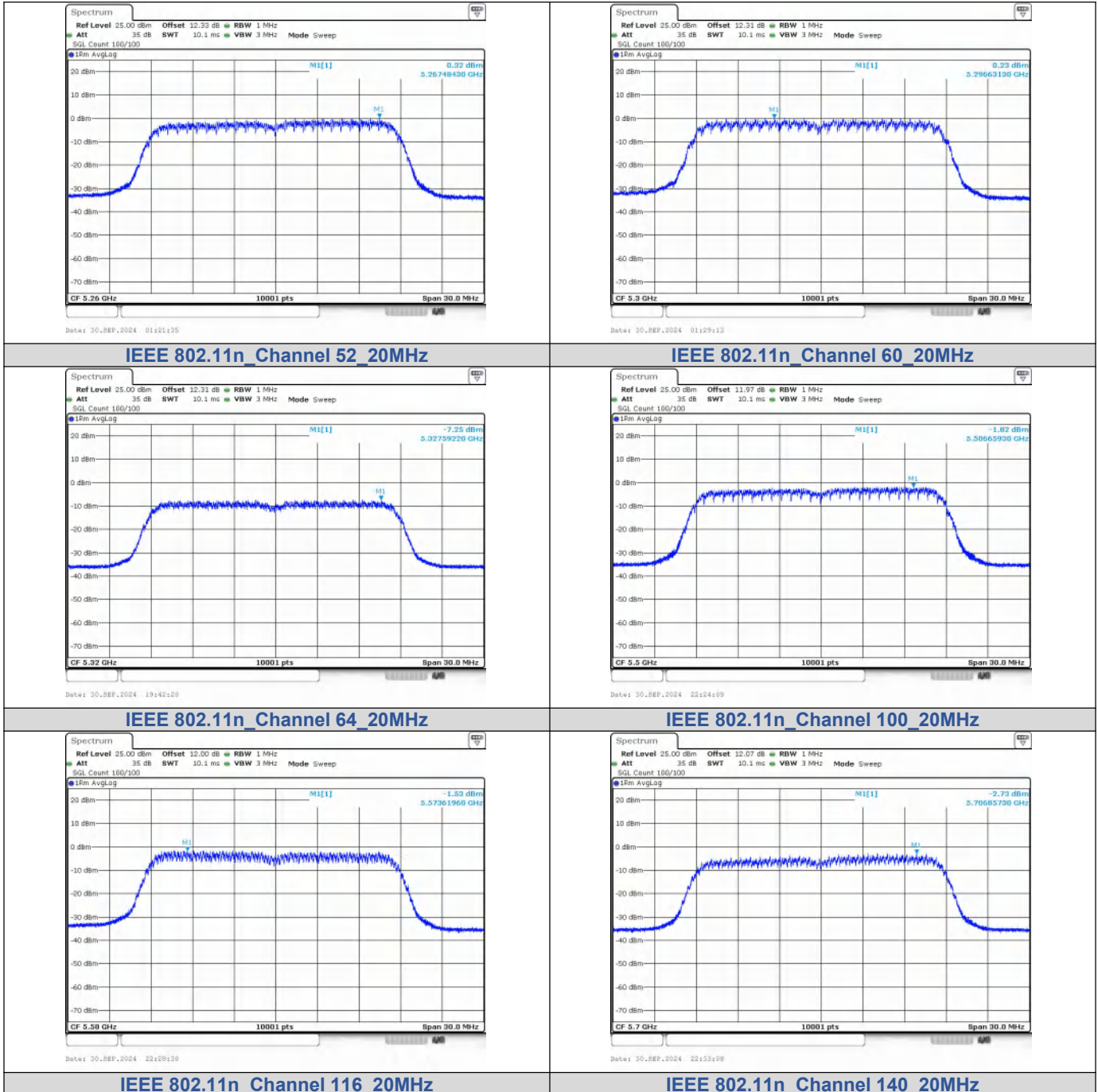
Test Result

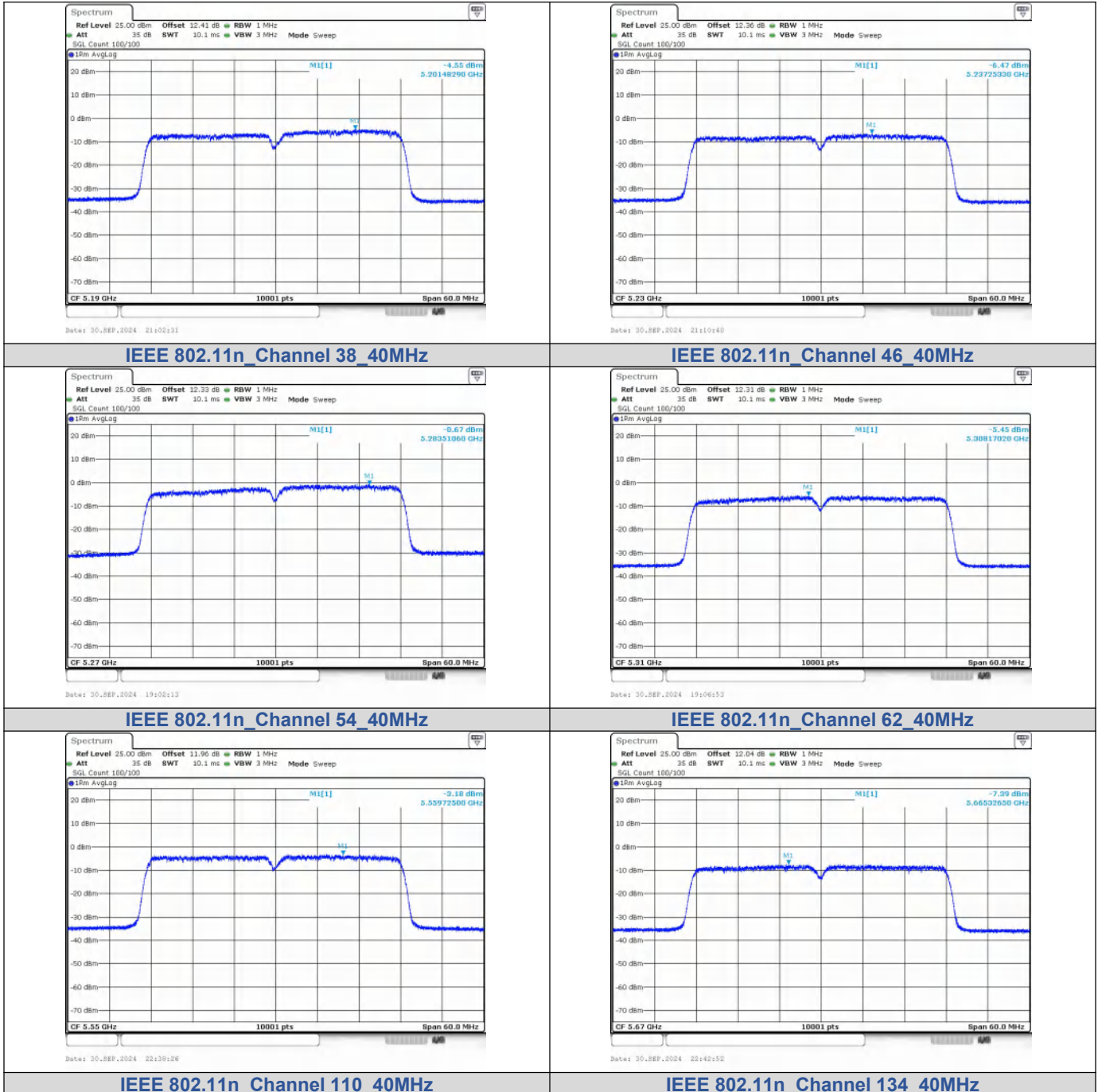
Mode	Channel	Ant. 1 Meas PSD (dBm/MHz or dBm/0.5MHz)	Limit (dBm/MHz or dBm/0.5MHz)	Result
IEEE 802.11a	36	-4.78	11	PASS
	40	-0.44		PASS
	48	-0.64		PASS
	52	-2.42		PASS
	60	0.89		PASS
	64	-1.14		PASS
	100	-0.77		PASS
	116	-3.98		PASS
IEEE 802.11n_20	140	-2.67		PASS
	36	-3.78		PASS
	40	-1.56		PASS
	48	-5.70		PASS
	52	0.32		PASS
	60	0.23		PASS
	64	-7.25		PASS
	100	-1.82		PASS
IEEE 802.11n_40	116	-1.53		PASS
	140	-2.73		PASS
	38	-4.55		PASS
	46	-6.48		PASS
	54	-0.67		PASS
	62	-5.45		PASS
IEEE 802.11ac_20	110	-3.18		PASS
	134	-7.39		PASS
	36	-4.53		PASS
	40	-2.61		PASS
	48	-2.63		PASS
	52	-3.44		PASS
	60	-1.75		PASS
	64	-1.18		PASS
IEEE 802.11ac_40	100	-1.40		PASS
	116	-1.75		PASS
	140	-3.39		PASS
	38	-6.66		PASS
	46	-6.29		PASS
	54	-5.52		PASS
IEEE 802.11ac_80	62	-5.46		PASS
	110	-4.91		PASS
	134	-8.61		PASS
	42	-9.27		PASS
	58	-8.41		PASS
	106	-7.36		PASS
	122	-9.49		PASS

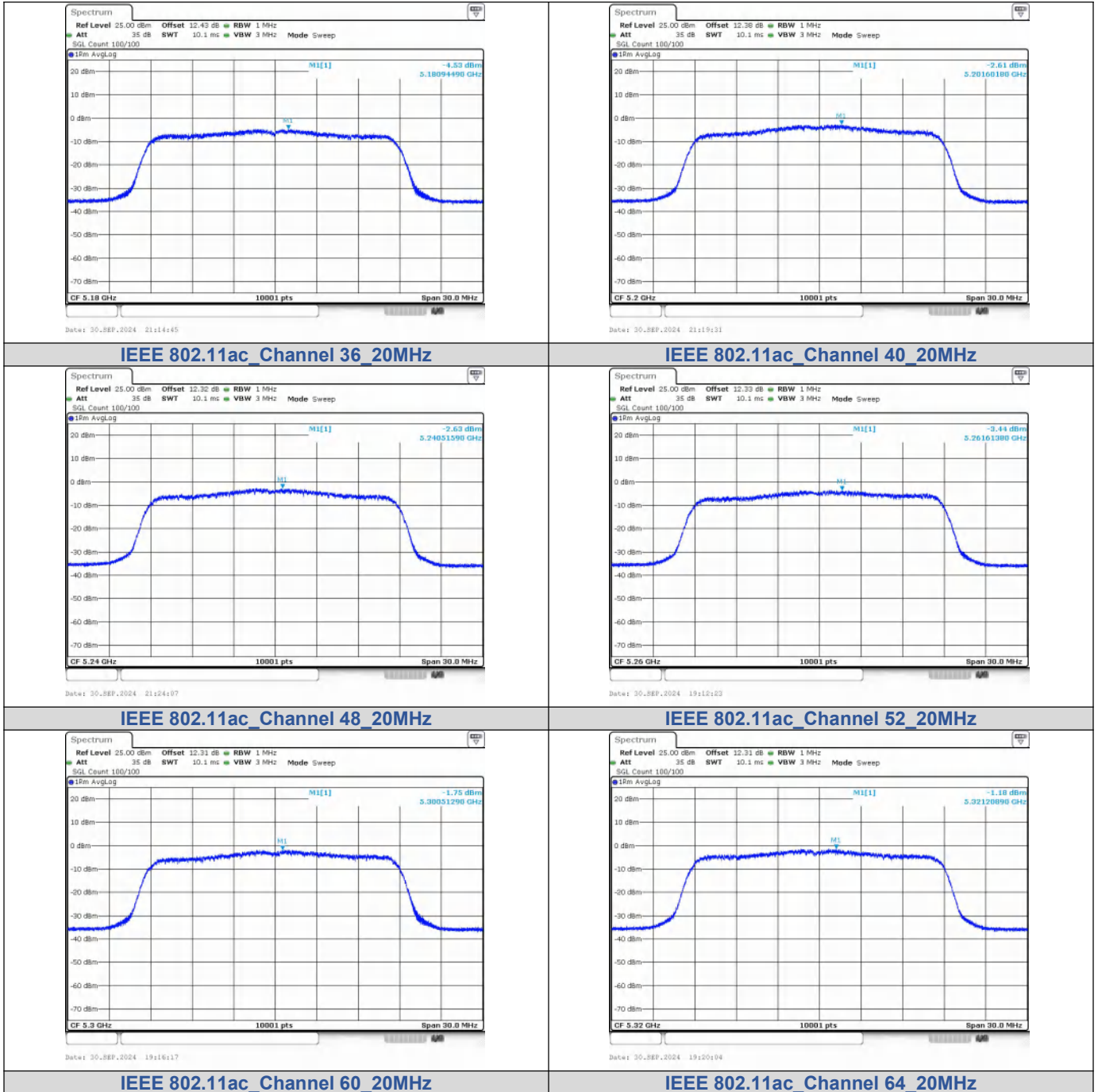
Test Graphs

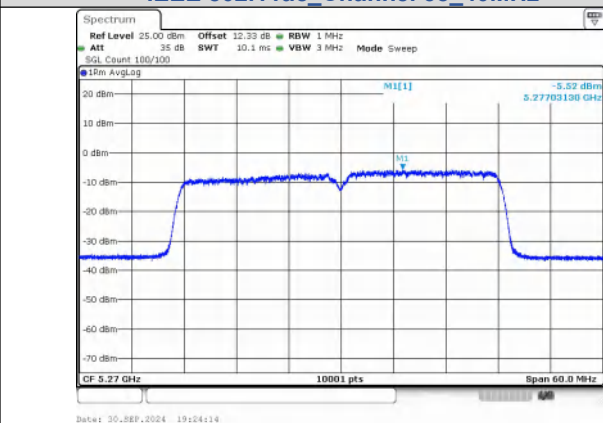
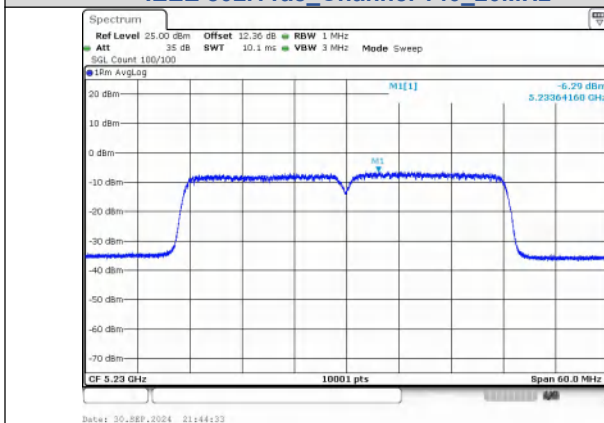
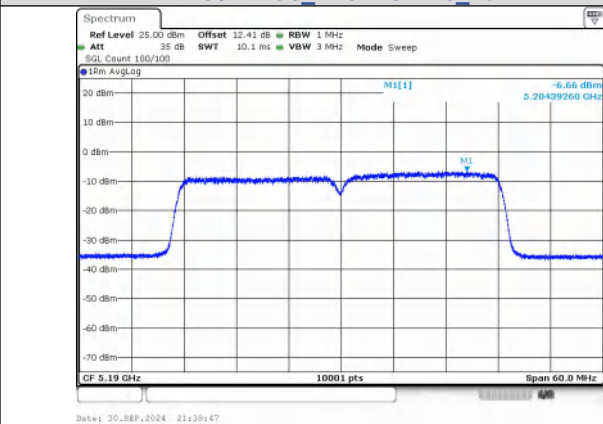
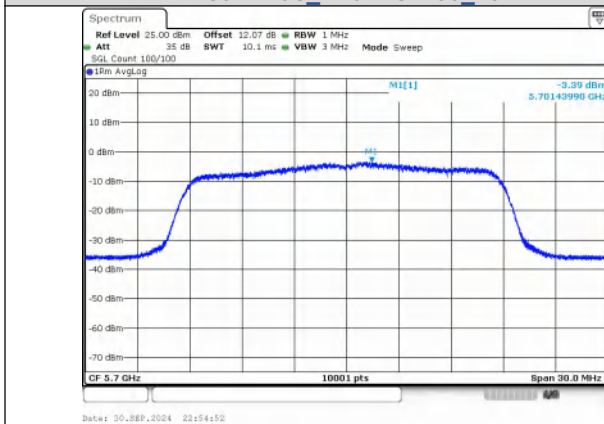
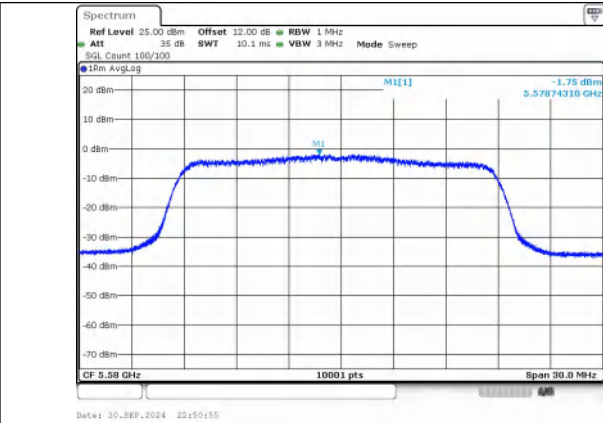
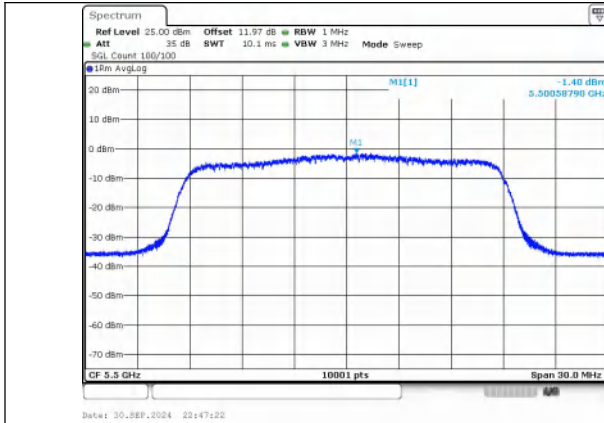


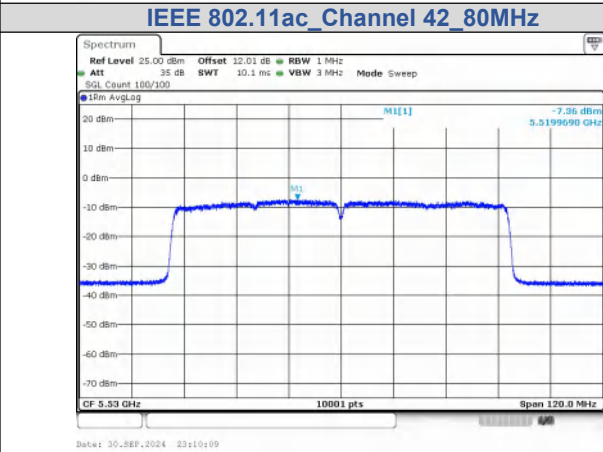
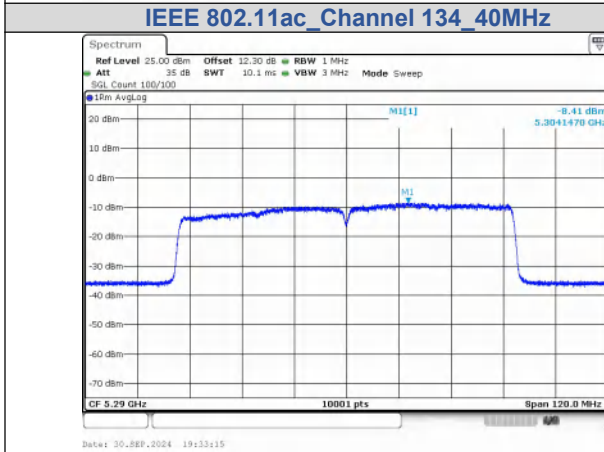
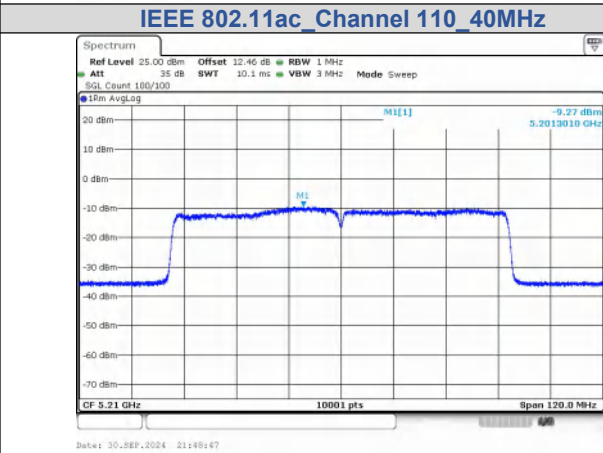
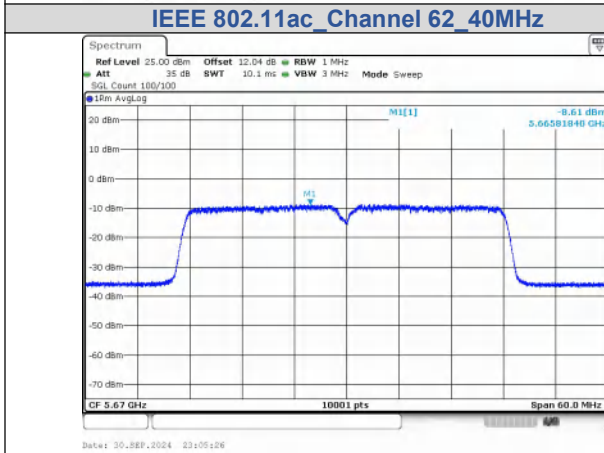
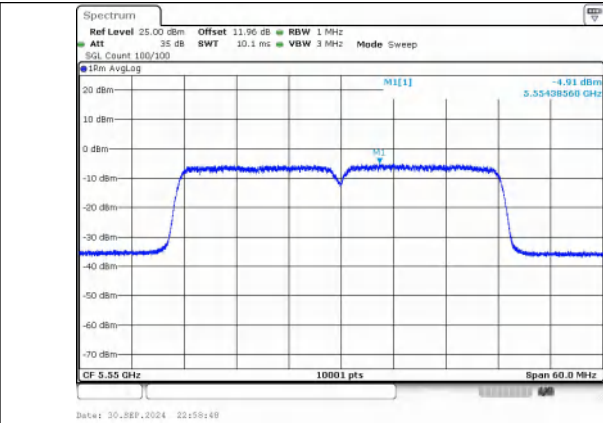
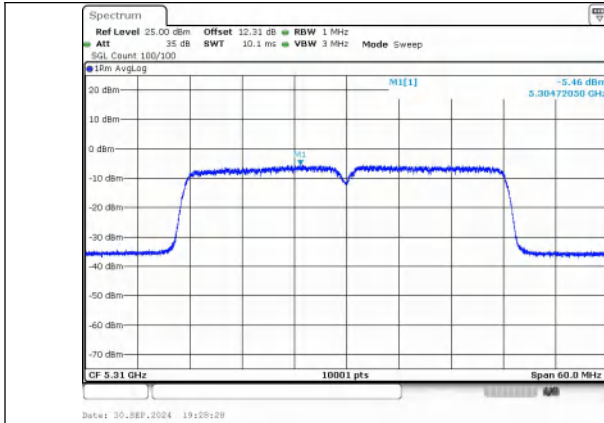


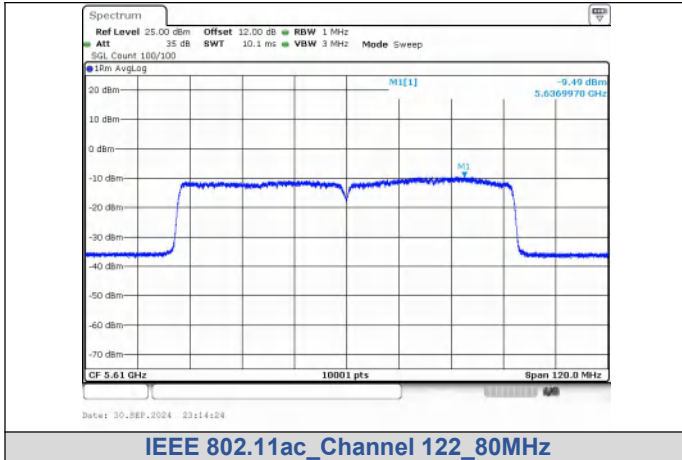










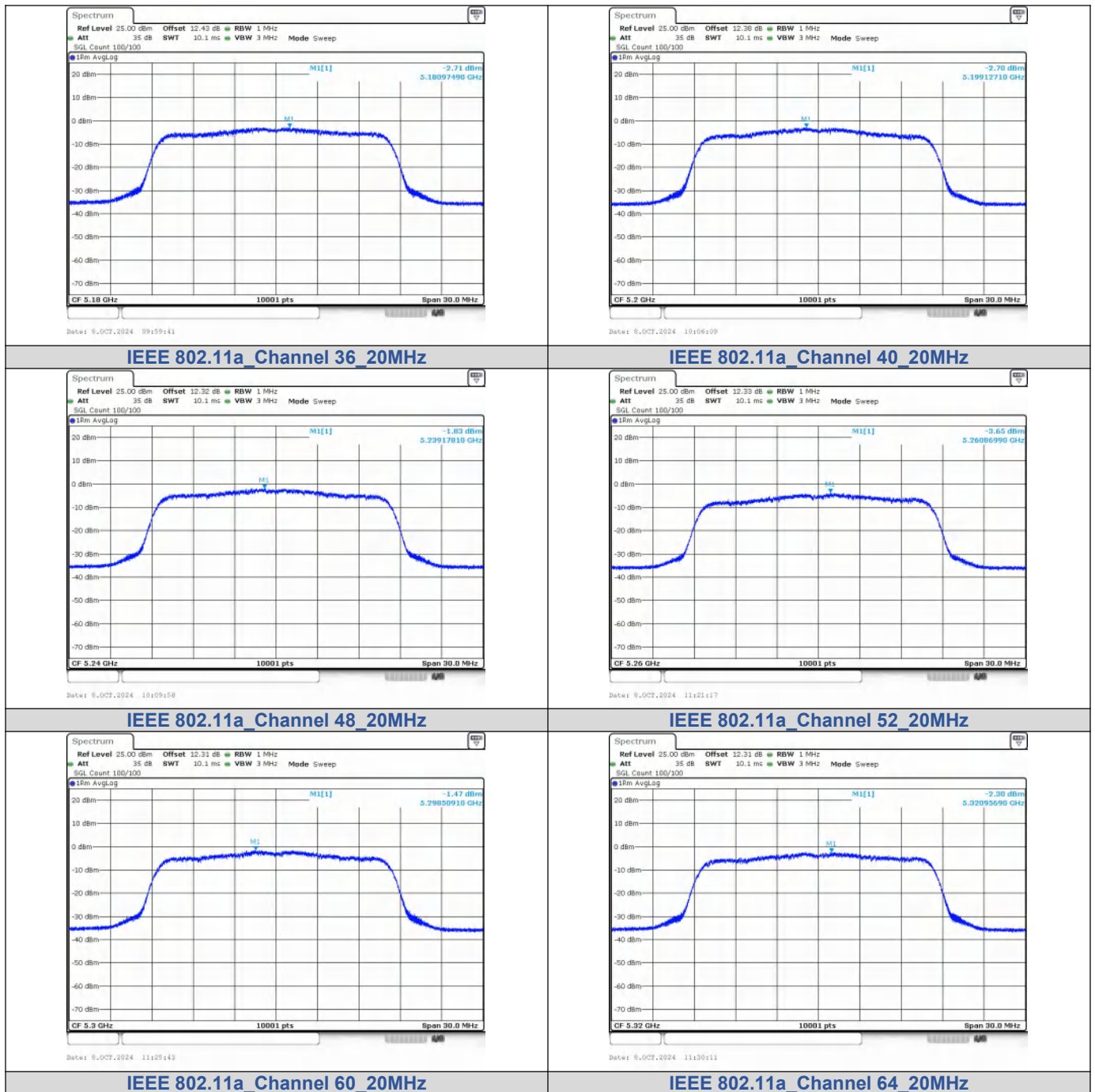


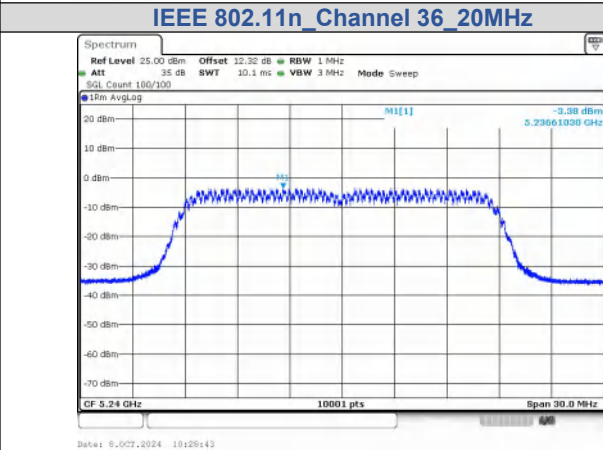
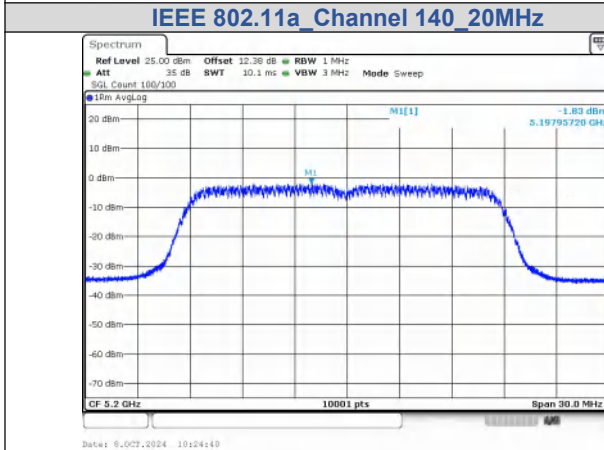
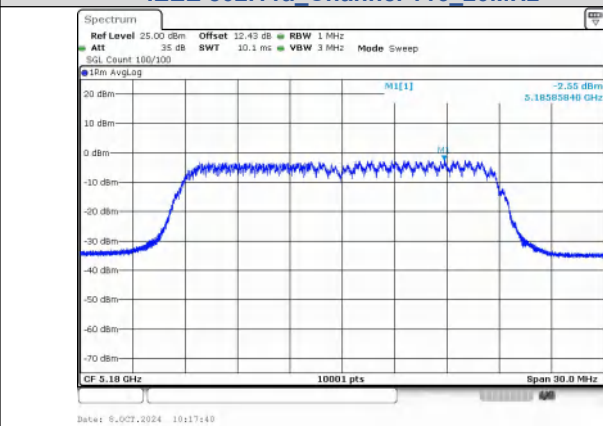
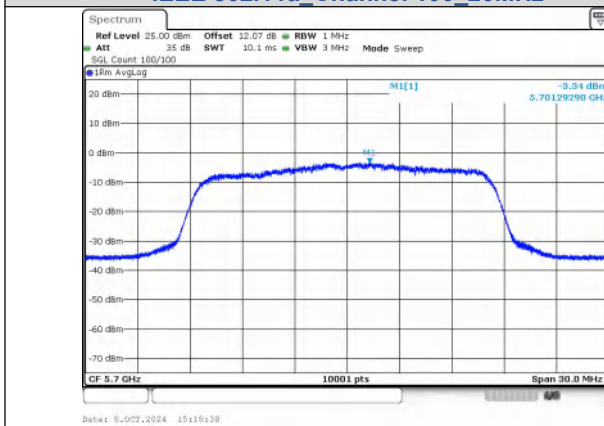
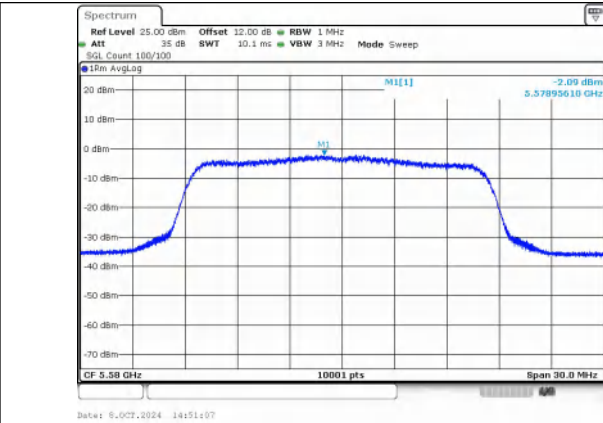
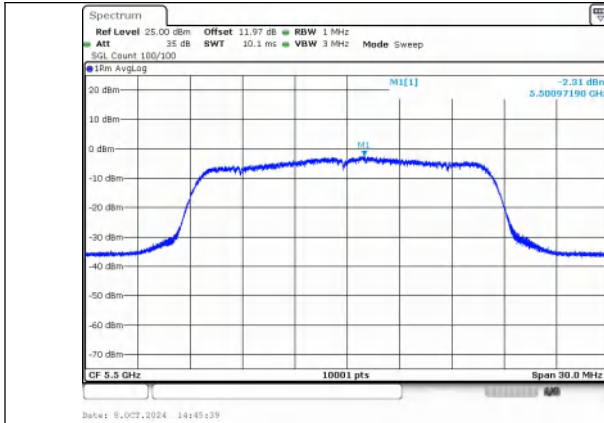
ANT2:

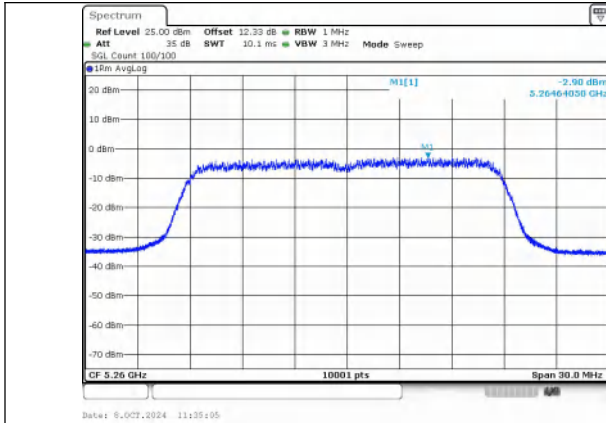
Test Result

Mode	Channel	Ant. 2 Meas PSD (dBm/MHz or dBm/0.5MHz)	Limit (dBm/MHz or dBm/0.5MHz)	Result
IEEE 802.11a	36	-2.71	11	PASS
	40	-2.70		PASS
	48	-1.83		PASS
	52	-3.65		PASS
	60	-1.47		PASS
	64	-2.30		PASS
	100	-2.31		PASS
	116	-2.09		PASS
	140	-3.34		PASS
IEEE 802.11n_20	36	-2.55		PASS
	40	-1.84		PASS
	48	-3.38		PASS
	52	-2.90		PASS
	60	-2.49		PASS
	64	-2.25		PASS
	100	-1.61		PASS
	116	-2.05		PASS
	140	-4.14		PASS
IEEE 802.11n_40	38	-4.29		PASS
	46	-7.41		PASS
	54	-5.58		PASS
	62	-7.92		PASS
	110	-5.75		PASS
	134	-6.02		PASS
IEEE 802.11ac_20	36	-1.57		PASS
	40	-2.52		PASS
	48	-3.39		PASS
	52	-3.40		PASS
	60	-3.33		PASS
	64	0.45		PASS
	100	-1.01		PASS
	116	-3.00		PASS
	140	-2.32		PASS
IEEE 802.11ac_40	38	-6.44		PASS
	46	-7.15		PASS
	54	-6.23		PASS
	62	-5.57		PASS
	110	-7.06		PASS
	134	-8.04		PASS
	42	-9.32		PASS
IEEE 802.11ac_80	58	-8.19		PASS
	106	-7.68		PASS
	122	-9.61		PASS

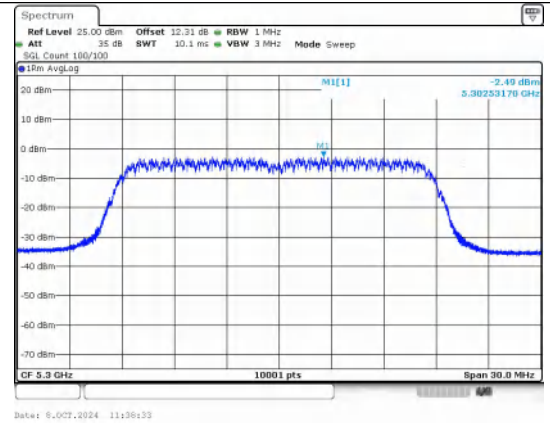
Test Graphs



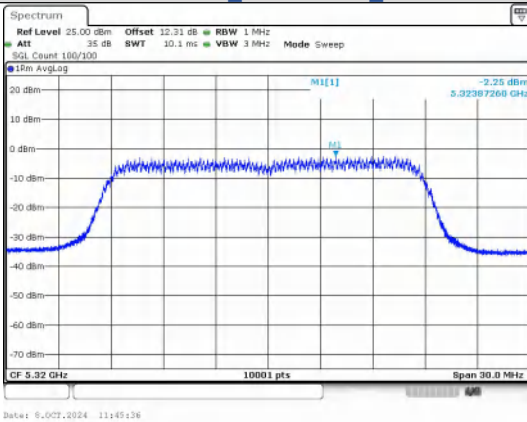




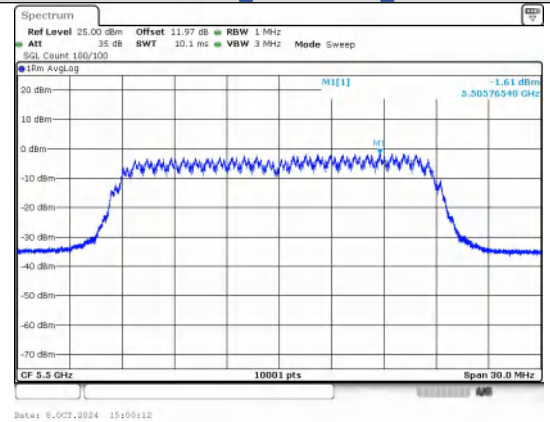
IEEE 802.11n_Channel 52_20MHz



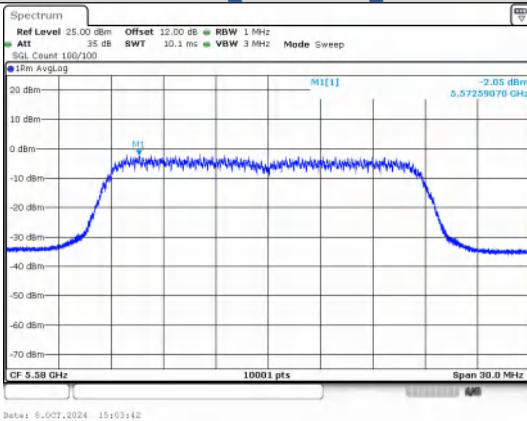
IEEE 802.11n_Channel 60_20MHz



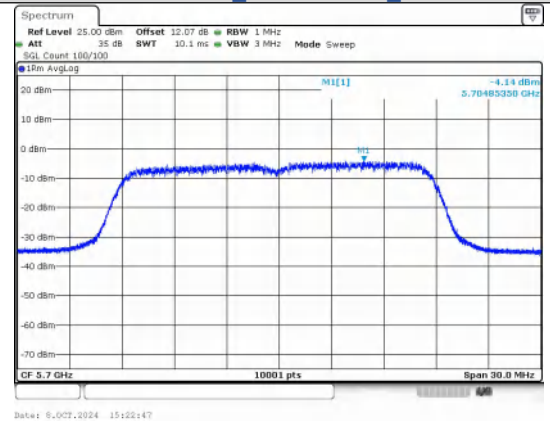
IEEE 802.11n_Channel 64_20MHz



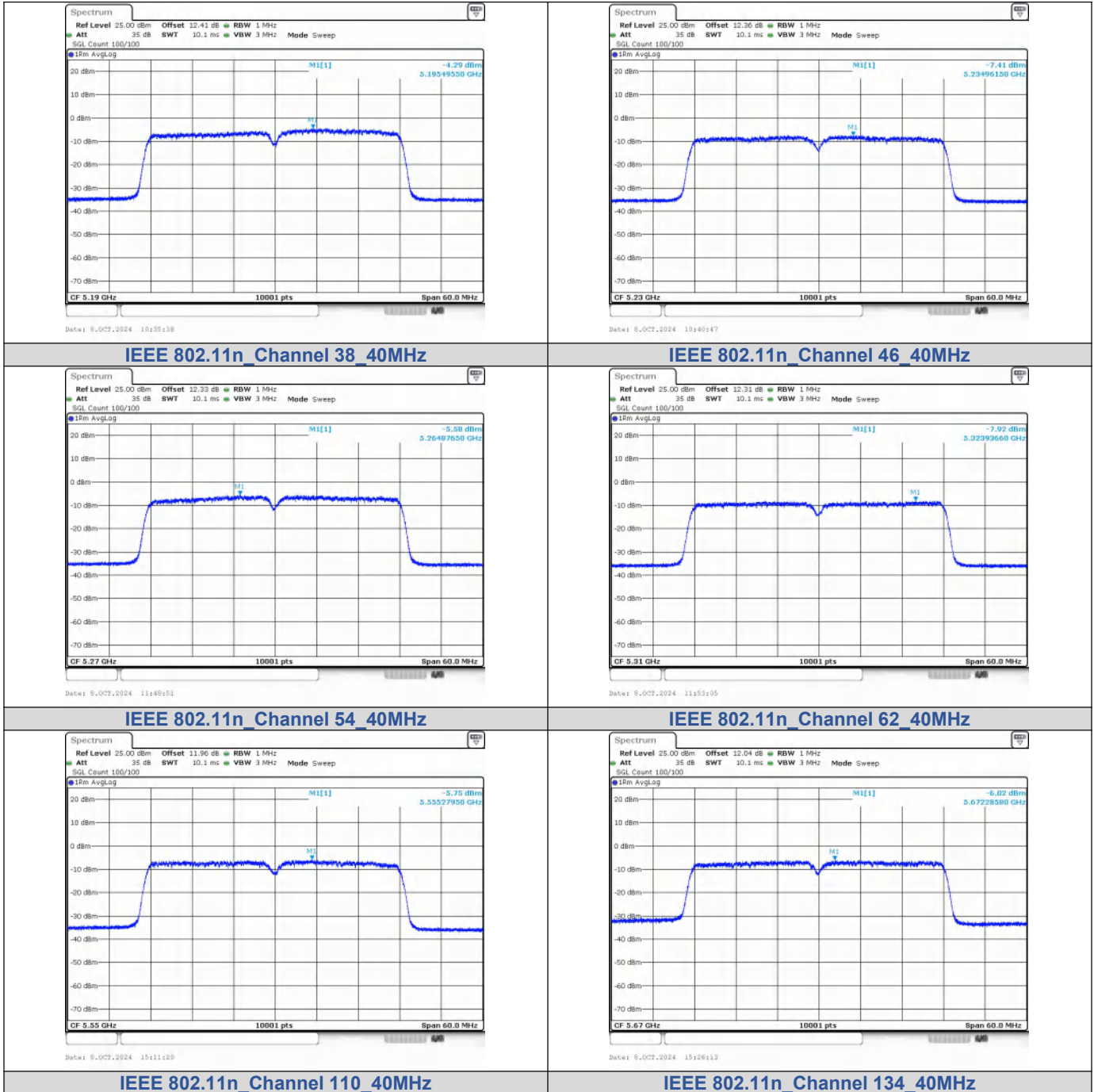
IEEE 802.11n_Channel 100_20MHz

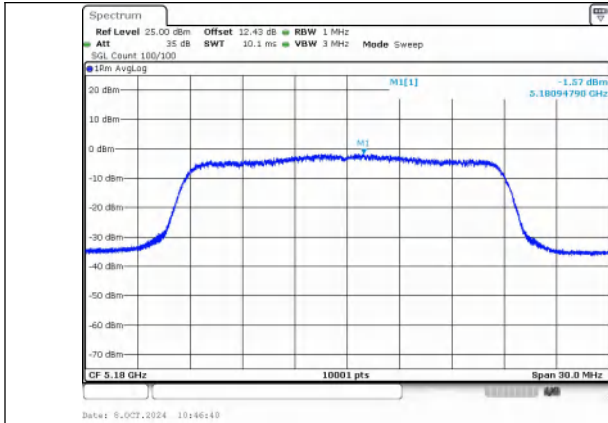


IEEE 802.11n_Channel 116_20MHz

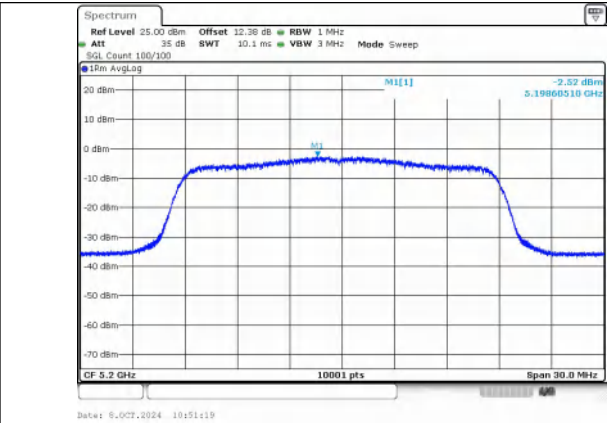


IEEE 802.11n_Channel 140_20MHz

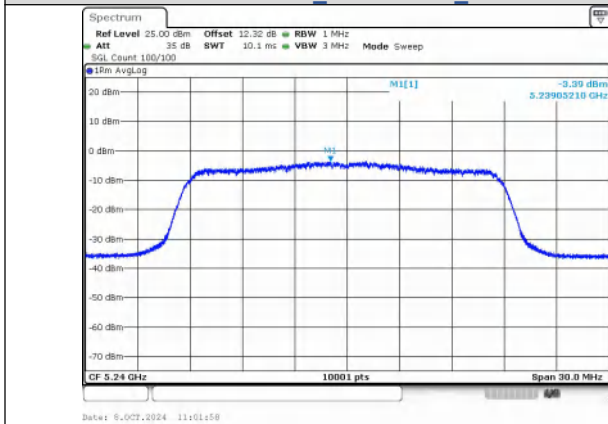




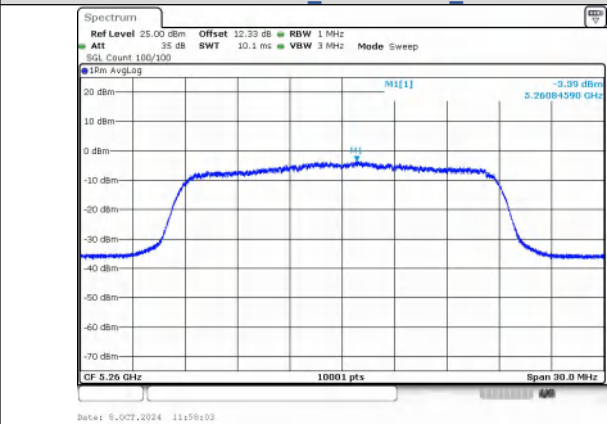
IEEE 802.11ac_Channel 36_20MHz



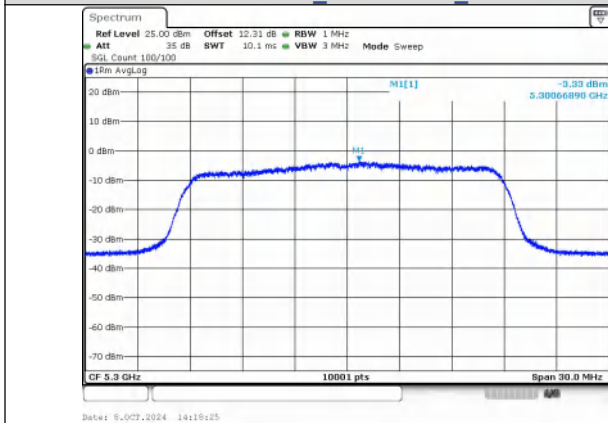
IEEE 802.11ac_Channel 40_20MHz



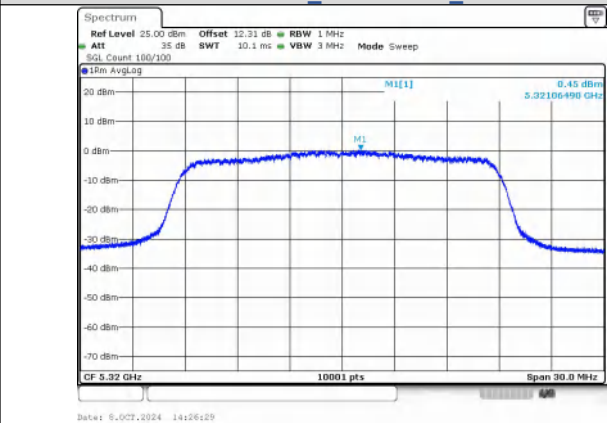
IEEE 802.11ac_Channel 48_20MHz



IEEE 802.11ac_Channel 52_20MHz



IEEE 802.11ac_Channel 60_20MHz



IEEE 802.11ac_Channel 64_20MHz

