Appendix Report

Report No.:	CISRR250228155
Test Engineer:	James Wang
Supervised by:	Rory Huang

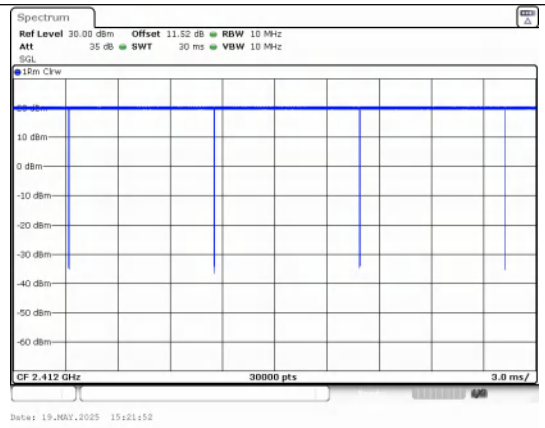
Duty Cycle

Ant0:

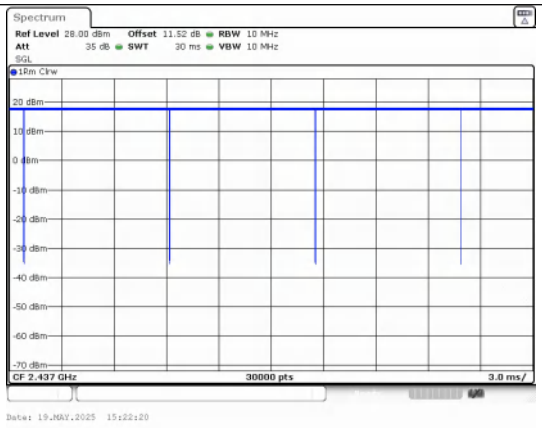
Test Result

Mode	Data rates	Channel	Antenna	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
IEEE 802.11b	1	1	0	30.000	30.000	100	1	0.0	0.0333
		6		30.000	30.000	100	1	0.0	0.0333
		11		30.000	30.000	100	1	0.0	0.0333
IEEE 802.11g		1		1.396	1.429	97.69	0.9769	0.1015	0.7163
		6		1.396	1.430	97.62	0.9762	0.1046	0.7163
		11		1.395	1.429	97.62	0.9762	0.1046	0.7168
IEEE 802.11n_20	MCS 0	1		1.293	1.326	97.49	0.9749	0.1104	0.7734
		6		1.293	1.327	97.44	0.9744	0.1126	0.7734
		11		1.293	1.327	97.44	0.9744	0.1126	0.7734
IEEE 802.11n_40		3		0.650	0.684	95.00	0.9500	0.2228	1.5385
		6		0.650	0.684	94.94	0.9494	0.2255	1.5385
		9		0.650	0.684	94.94	0.9494	0.2255	1.5385

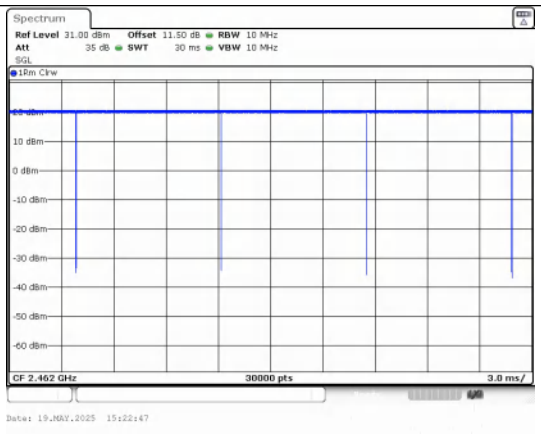
Test Graphs



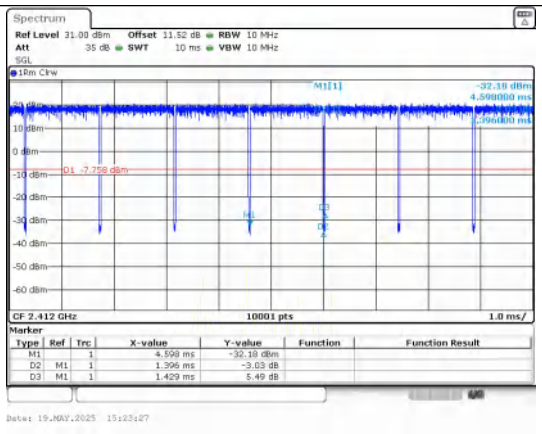
IEEE 802.11b_20MHz_Channel 1



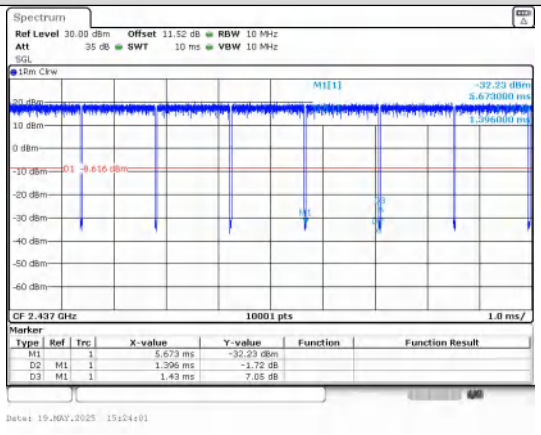
IEEE 802.11b_20MHz_Channel 6



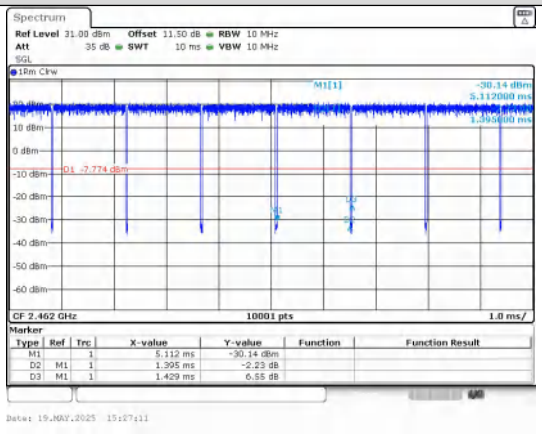
IEEE 802.11b_20MHz_Channel 11



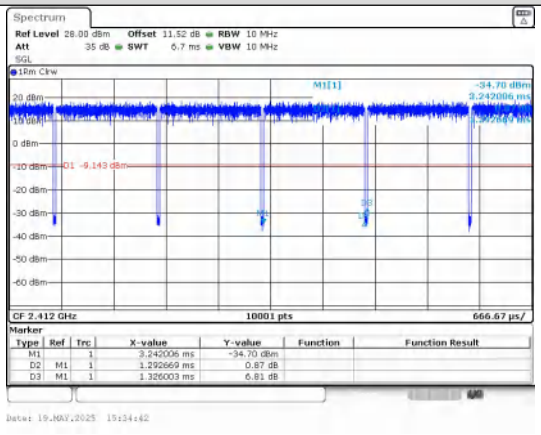
IEEE 802.11g_20MHz_Channel 1



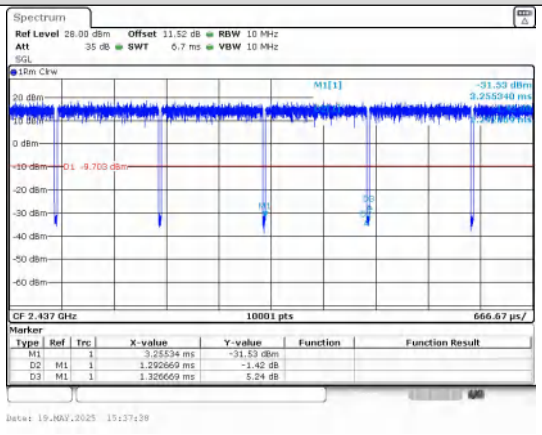
IEEE 802.11g_20MHz_Channel 6



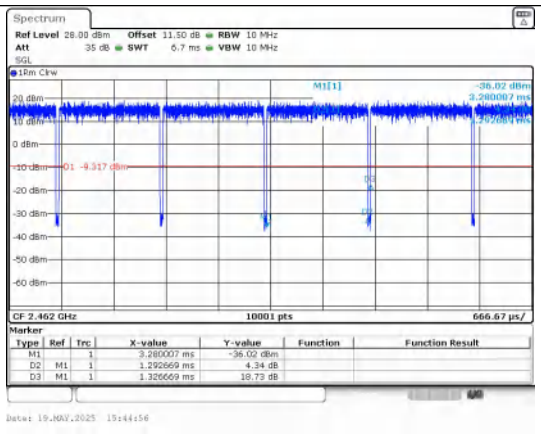
IEEE 802.11g_20MHz_Channel 11



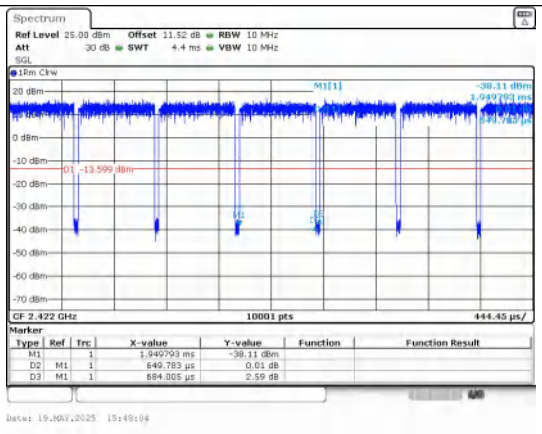
IEEE 802.11n_20MHz_Channel 1



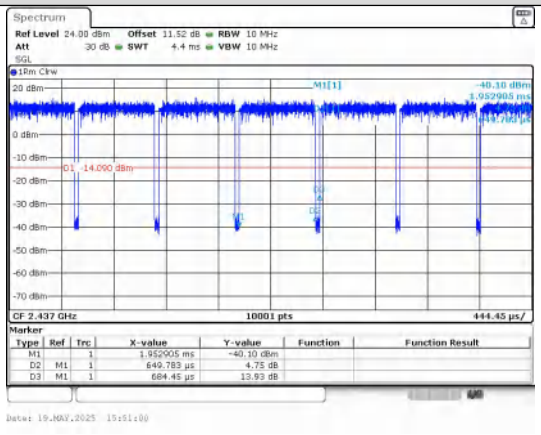
IEEE 802.11n_20MHz_Channel 6



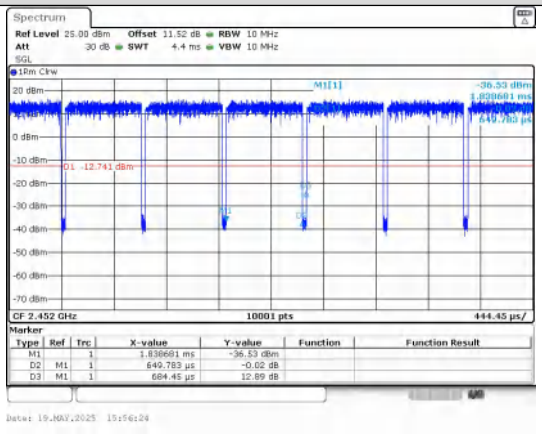
IEEE 802.11n_20MHz_Channel 11



IEEE 802.11n_40MHz_Channel 3



IEEE 802.11n_40MHz_Channel 6



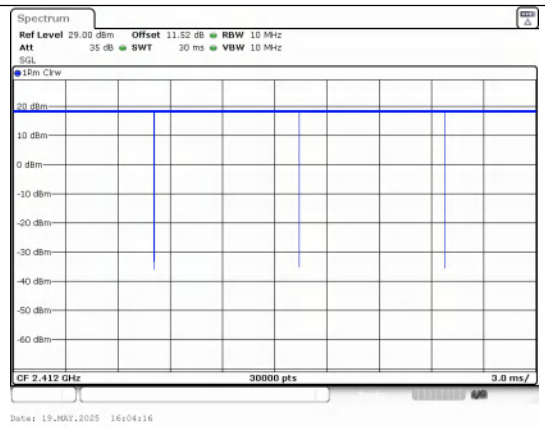
IEEE 802.11n_40MHz_Channel 9

Ant1:

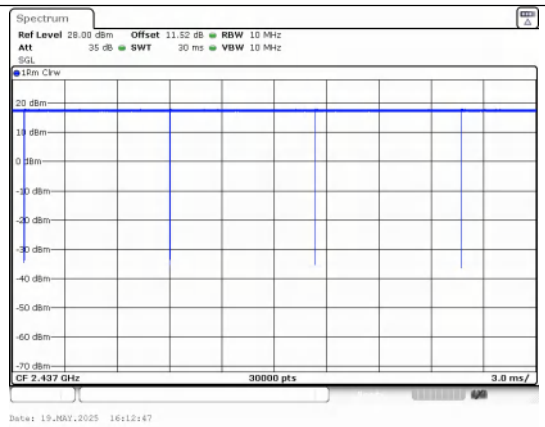
Test Result

Mode	Data rates	Channel	Antenna	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
IEEE 802.11b	1	1	1	30.000	30.000	100	1	0.0	0.0333
		6		30.000	30.000	100	1	0.0	0.0333
		11		30.000	30.000	100	1	0.0	0.0333
IEEE 802.11g		1		1.396	1.430	97.62	0.9762	0.1046	0.7163
		6		1.396	1.430	97.62	0.9762	0.1046	0.7163
		11		1.396	1.429	97.69	0.9769	0.1015	0.7163
IEEE 802.11n_20	MCS 0	1		1.304	1.337	97.53	0.9753	0.1086	0.7669
		6		1.293	1.327	97.44	0.9744	0.1126	0.7734
		11		1.304	1.337	97.53	0.9753	0.1086	0.7669
IEEE 802.11n_40		3		0.650	0.684	95.00	0.9500	0.2228	1.5385
		6		0.650	0.684	95.00	0.9500	0.2228	1.5385
		9		0.650	0.684	94.94	0.9494	0.2255	1.5385

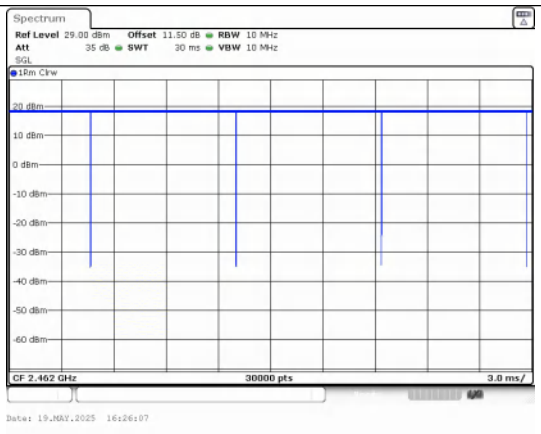
Test Graphs



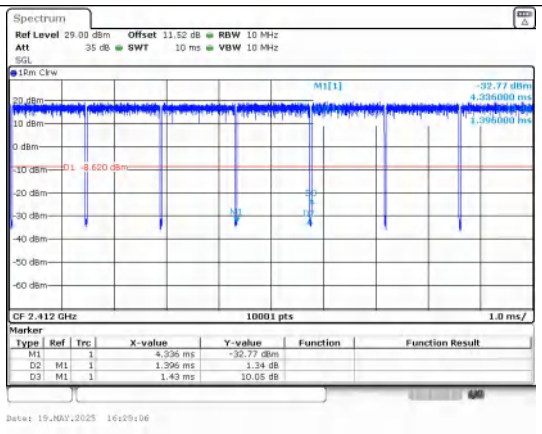
IEEE 802.11b_20MHz_Channel 1



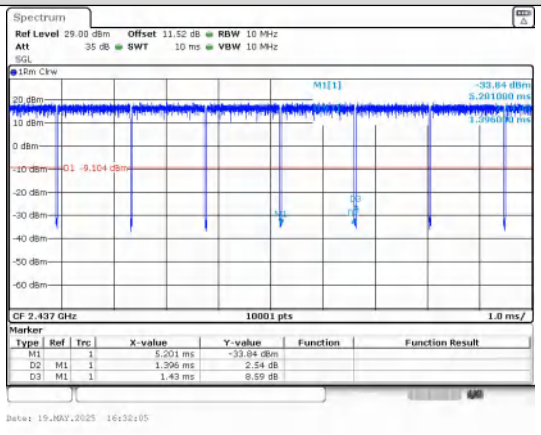
IEEE 802.11b_20MHz_Channel 6



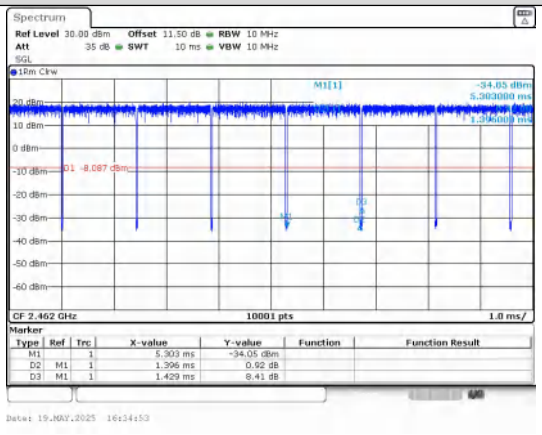
IEEE 802.11b_20MHz_Channel 11



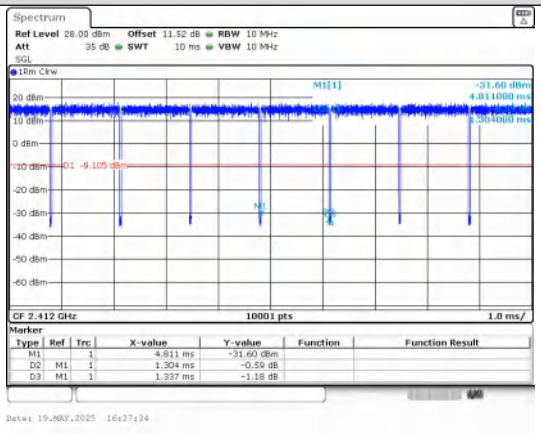
IEEE 802.11g_20MHz_Channel 1



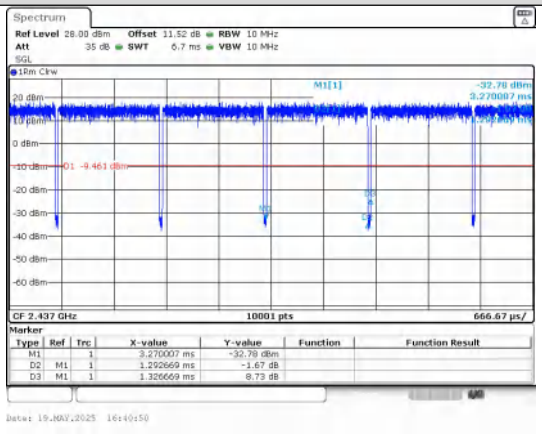
IEEE 802.11g_20MHz_Channel 6



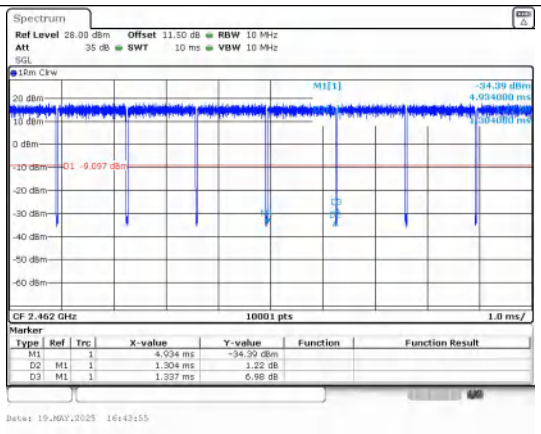
IEEE 802.11g_20MHz_Channel 11



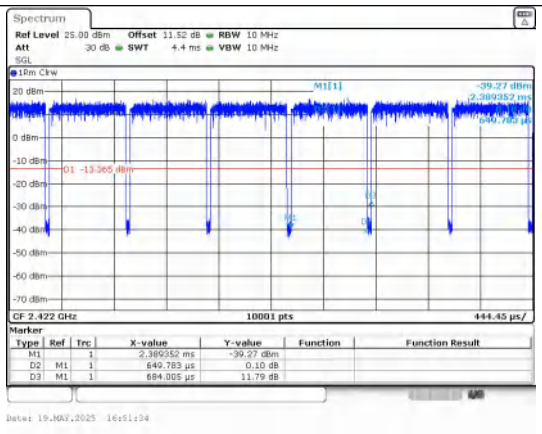
IEEE 802.11n_20MHz_Channel 1



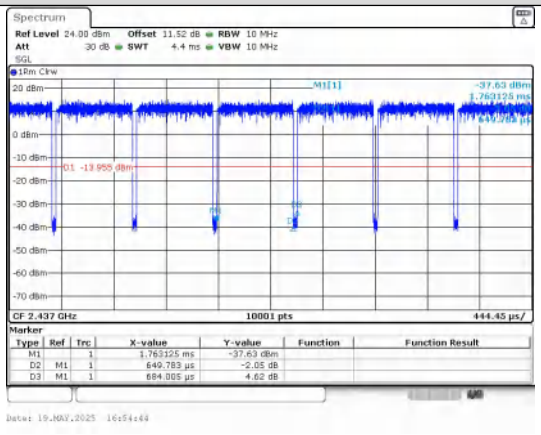
IEEE 802.11n_20MHz_Channel 6



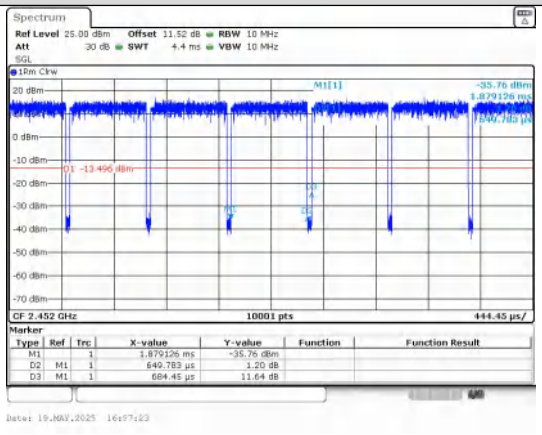
IEEE 802.11n_20MHz_Channel 11



IEEE 802.11n_40MHz_Channel 3



IEEE 802.11n_40MHz_Channel 6



IEEE 802.11n_40MHz_Channel 9

Power Spectral Density

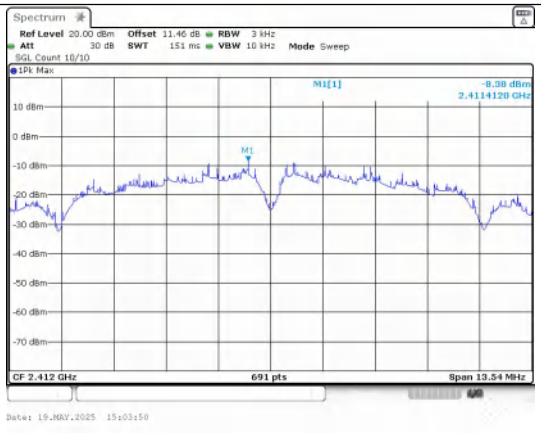
Test Result

Mode	Channel	PSD (dBm/3kHz) Ant. 0	PSD (dBm/3kHz) Ant. 1	Limit (dBm/3kHz)	Result
IEEE 802.11b	1	-5.38	-8.28	≤8	PASS
	6	-9.19	-9.97		PASS
	11	-5.26	-5.9		PASS
IEEE 802.11g	1	-8.09	-9.38		PASS
	6	-8.66	-9.29		PASS
	11	-6.75	-9.06		PASS
IEEE 802.11n_20	1	-12.1	-11.43		PASS
	6	-11.66	-12.84		PASS
	11	-11.56	-12.38		PASS
IEEE 802.11n_40	3	-13.24	-14.67		PASS
	6	-15.02	-13.84		PASS
	9	-13.46	-14.03		PASS

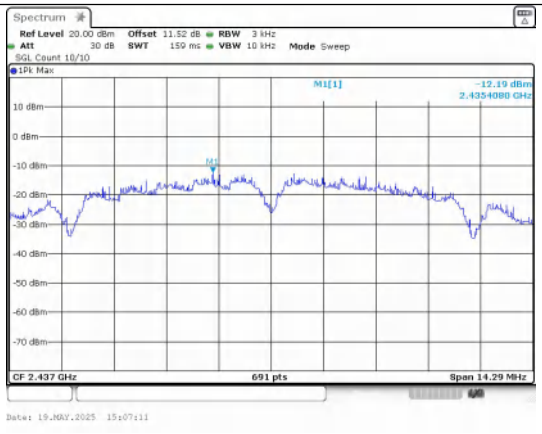
MIMO

Mode	Channel	PSD (dBm/3kHz) Ant. 0	PSD (dBm/3kHz) Ant. 1	PSD (dBm/3kHz) Ant. 1+Ant. 0	Limit (dBm/3kHz)	Result
IEEE 802.11n_20	1	-12.1	-11.43	-8.74	≤6.1	PASS
	6	-11.66	-12.84	-9.20		PASS
	11	-11.56	-12.38	-8.94		PASS
IEEE 802.11n_40	3	-13.24	-14.67	-10.89		PASS
	6	-15.02	-13.84	-11.38		PASS
	9	-13.46	-14.03	-10.73		PASS

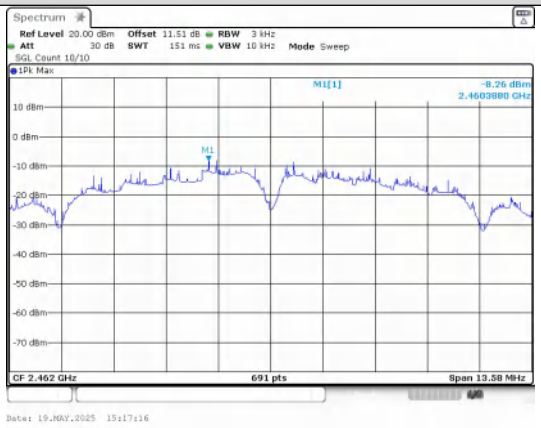
Test Graphs



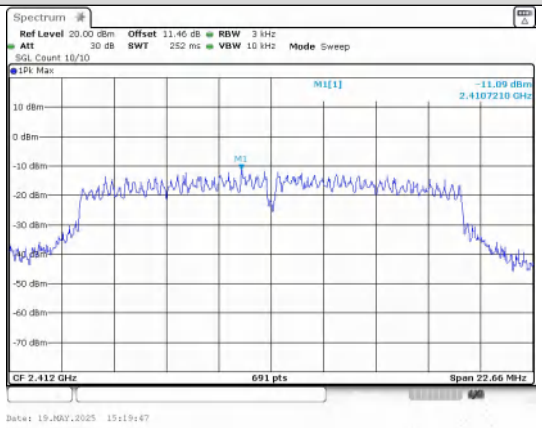
IEEE 802.11b_Channel 1_20MHz_Antenna 0



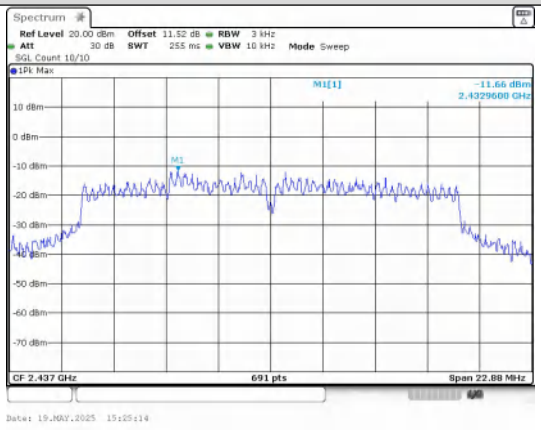
IEEE 802.11b_Channel 6_20MHz_Antenna 0



IEEE 802.11b_Channel 11_20MHz_Antenna 0



IEEE 802.11g_Channel 1_20MHz_Antenna 0



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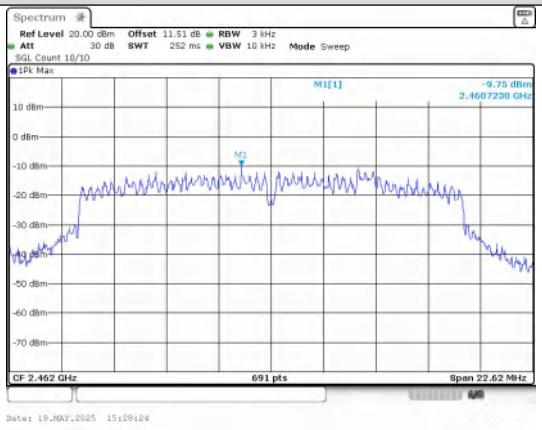
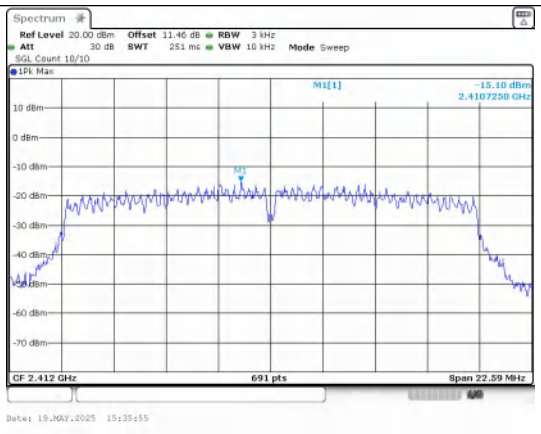
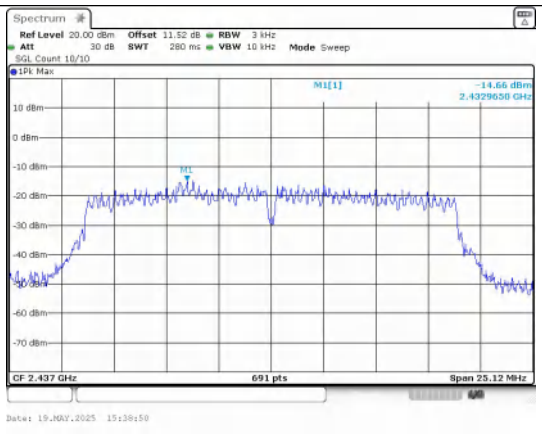


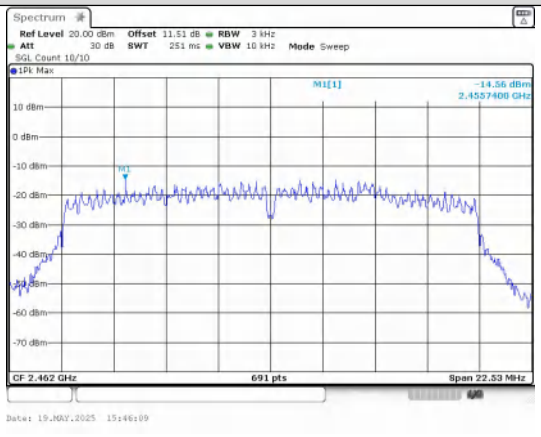
IEEE 802.11g_Channel 11_20MHz_Antenna 0



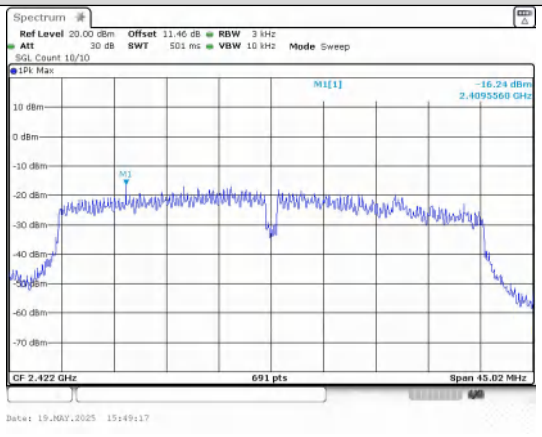
IEEE 802.11n_Channel 1_20MHz_Antenna 0



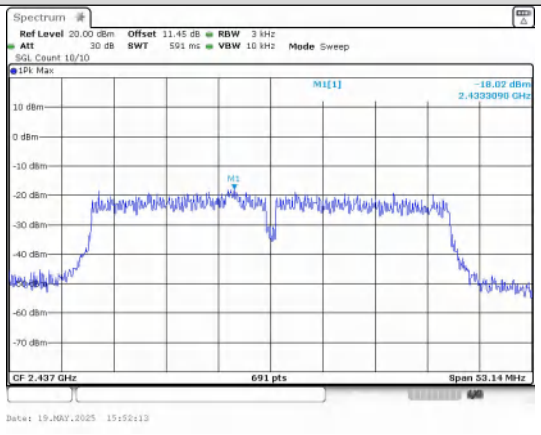
IEEE 802.11n_Channel 6_20MHz_Antenna 0



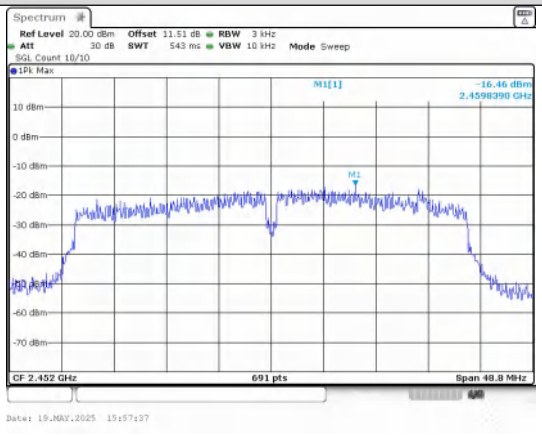
IEEE 802.11n_Channel 11_20MHz_Antenna 0



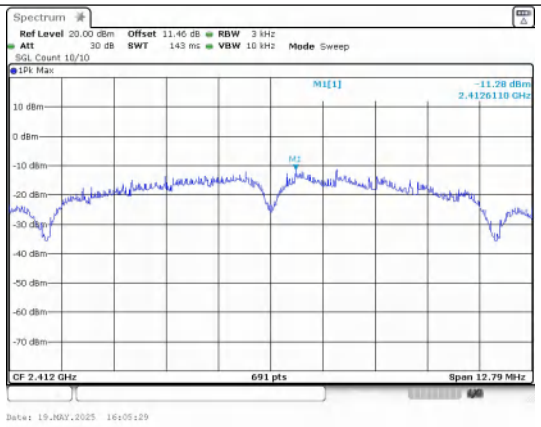
IEEE 802.11n_Channel 3_40MHz_Antenna 0



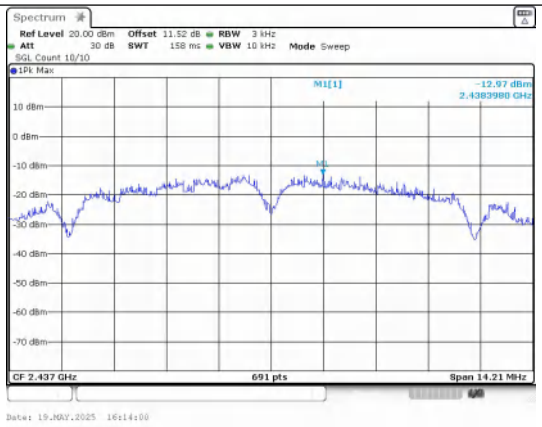
IEEE 802.11n_Channel 6_40MHz_Antenna 0



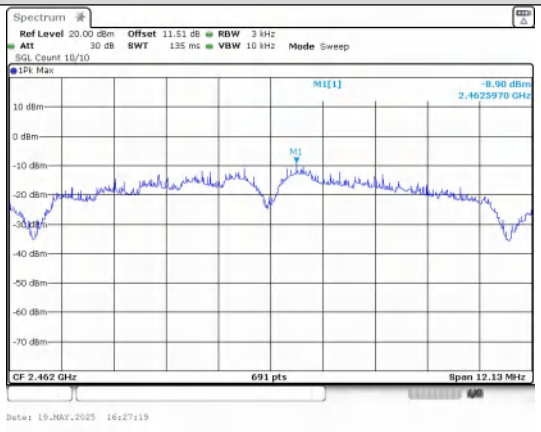
IEEE 802.11n_Channel 9_40MHz_Antenna 0



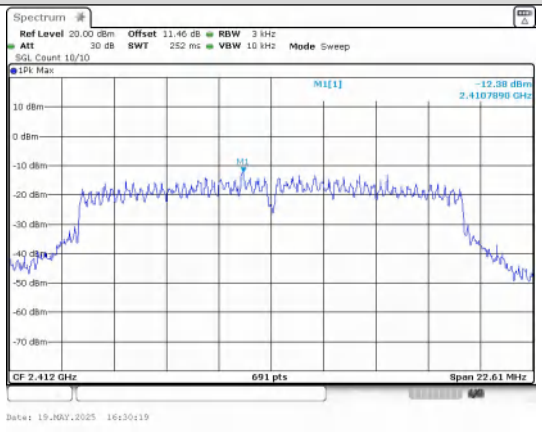
IEEE 802.11b_Channel 1_20MHz_Antenna 1



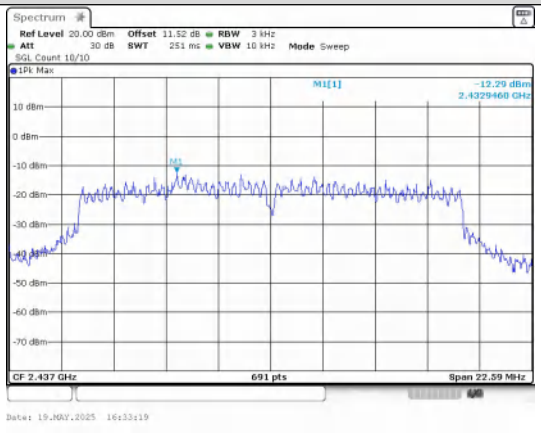
IEEE 802.11b_Channel 6_20MHz_Antenna 1



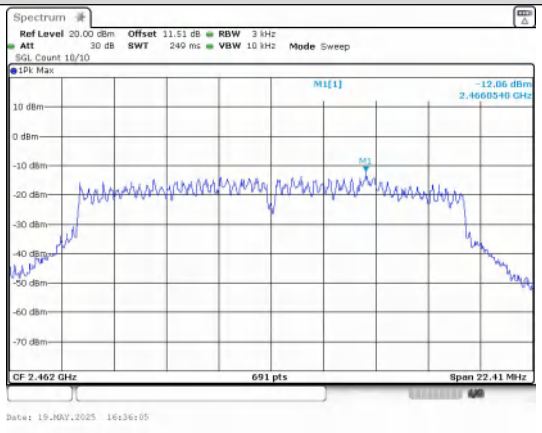
IEEE 802.11b_Channel 11_20MHz_Antenna 1



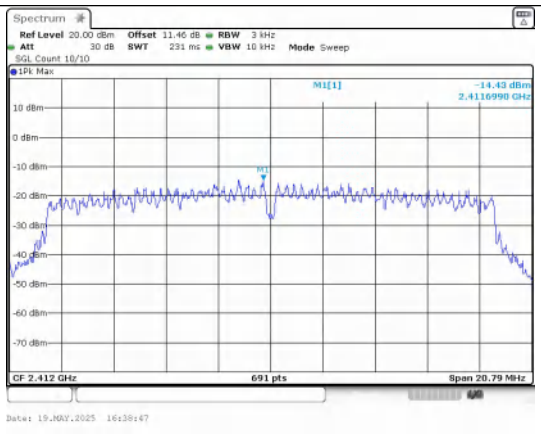
IEEE 802.11g_Channel 1_20MHz_Antenna 1



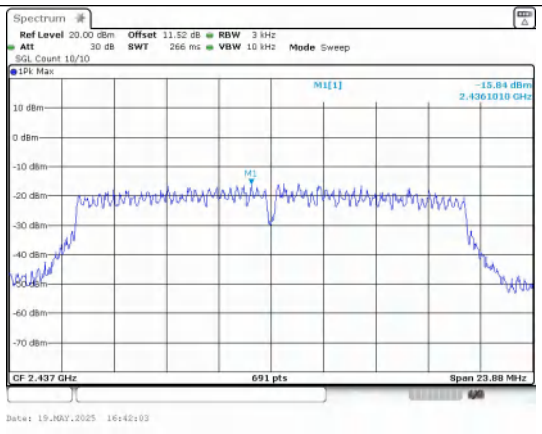
IEEE 802.11g_Channel 6_20MHz_Antenna 1



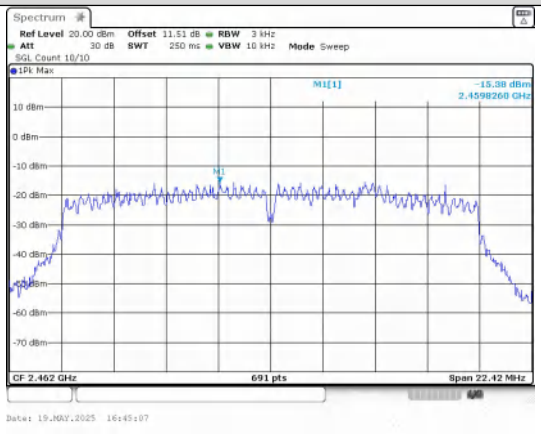
IEEE 802.11g_Channel 11_20MHz_Antenna 1



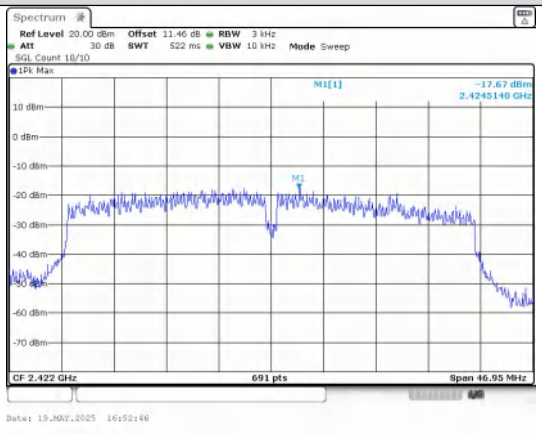
IEEE 802.11n_Channel 1_20MHz_Antenna 1



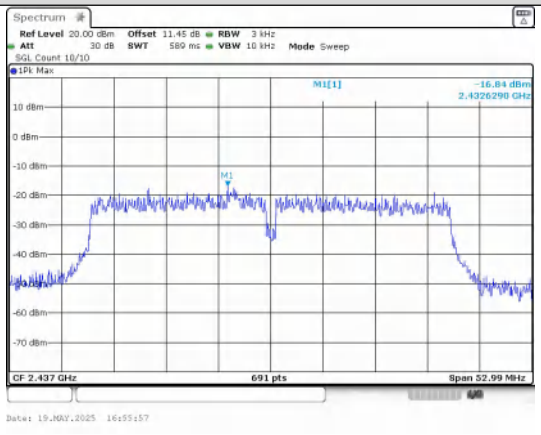
IEEE 802.11n_Channel 6_20MHz_Antenna 1



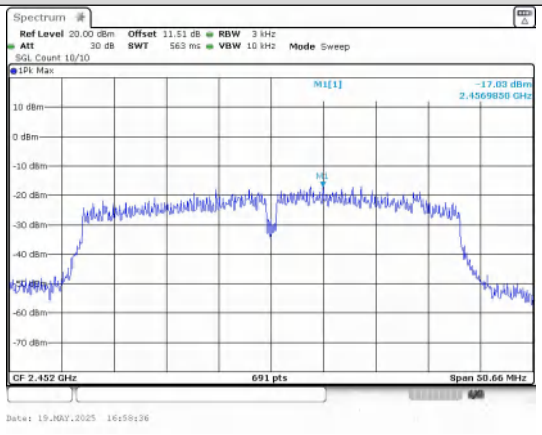
IEEE 802.11n_Channel 11_20MHz_Antenna 1



IEEE 802.11n_Channel 3_40MHz_Antenna 1



IEEE 802.11n_Channel 6_40MHz_Antenna 1



IEEE 802.11n_Channel 9_40MHz_Antenna 1

Conducted Output Power

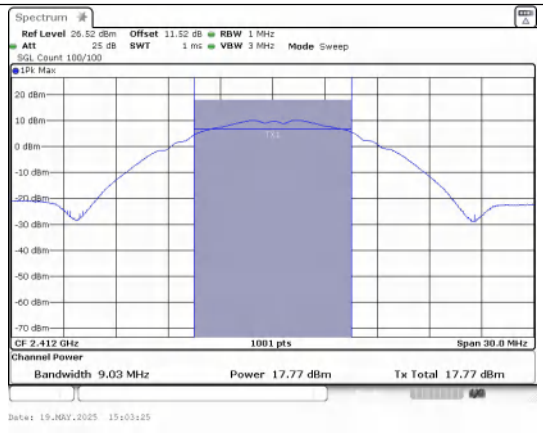
Test Result

Mode	Channel	Ant0 (dBm)	Ant1 (dBm)	Limit (dBm)	Result
IEEE 802.11b	1	17.77	15.82	≤30	PASS
	6	15.52	15.31	≤30	PASS
	11	17.86	15.76	≤30	PASS
IEEE 802.11g	1	21.92	20.51	≤30	PASS
	6	21.06	20.06	≤30	PASS
	11	22.11	20.69	≤30	PASS
IEEE 802.11n_20	1	18.35	18.06	≤30	PASS
	6	18.39	18.25	≤30	PASS
	11	18.55	18.70	≤30	PASS
IEEE 802.11n_40	3	18.49	18.59	≤30	PASS
	6	18.63	18.66	≤30	PASS
	9	18.65	18.73	≤30	PASS

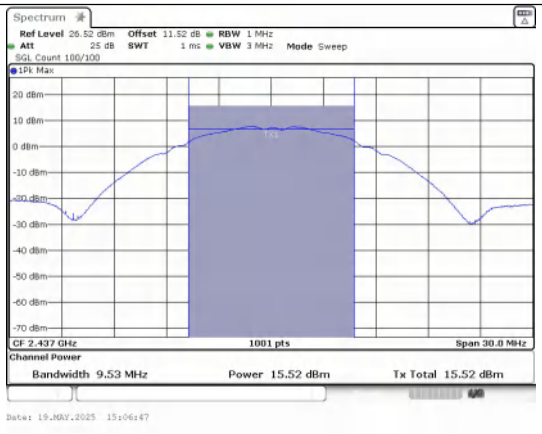
MIMO

Mode	Channel	Ant0 (dBm)	Ant1 (dBm)	Ant. 1+Ant. 0 (dBm)	Limit (dBm)	Result
IEEE 802.11n_20	1	18.35	18.06	21.22	≤28.1	PASS
	6	18.39	18.25	21.33		PASS
	11	18.55	18.70	21.64		PASS
IEEE 802.11n_40	3	18.49	18.59	21.55		PASS
	6	18.63	18.66	21.66		PASS
	9	18.65	18.73	21.70		PASS

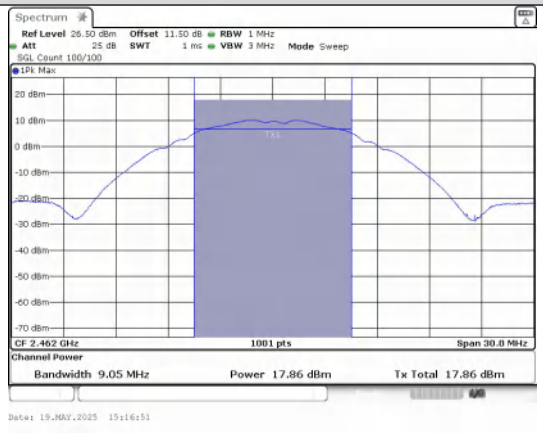
Test Graphs



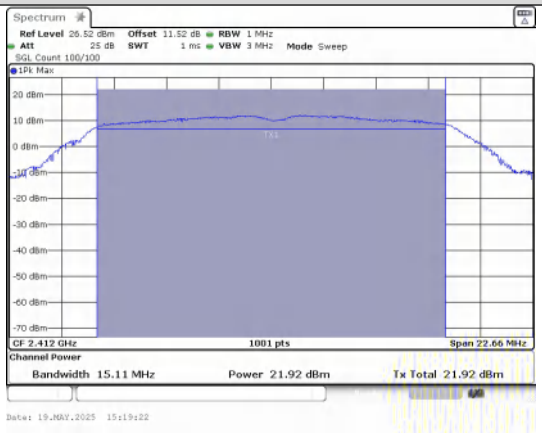
Conducted Output Power
IEEE 802.11b_Channel 1_Antenna 0



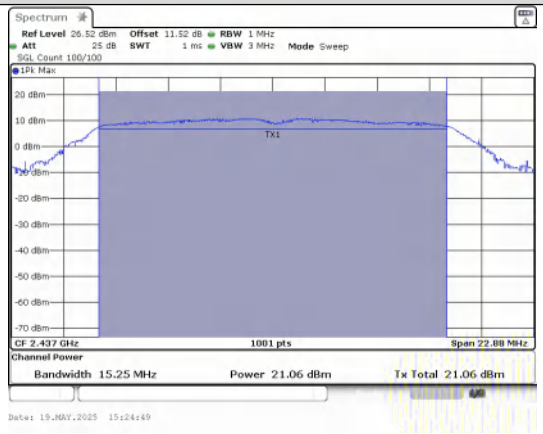
Conducted Output Power
IEEE 802.11b_Channel 6_Antenna 0



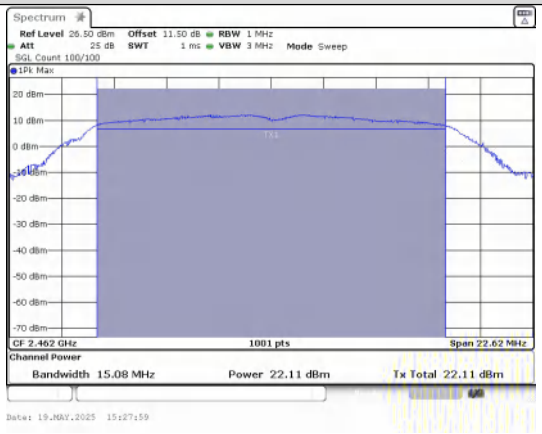
Conducted Output Power
IEEE 802.11b_Channel 11_Antenna 0



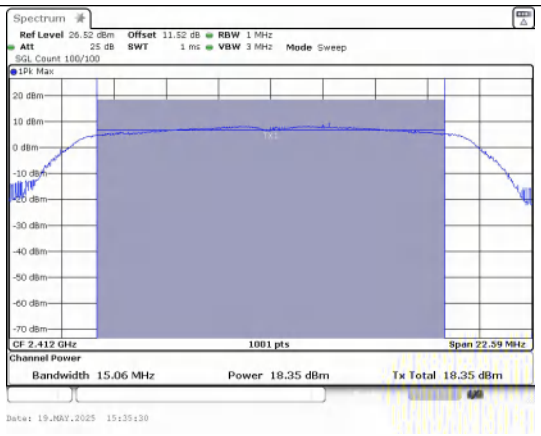
Conducted Output Power
IEEE 802.11g_Channel 1_Antenna 0



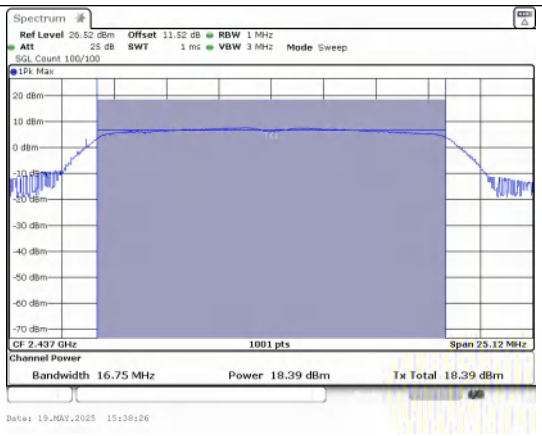
Conducted Output Power
IEEE 802.11g_Channel 6_Antenna 0



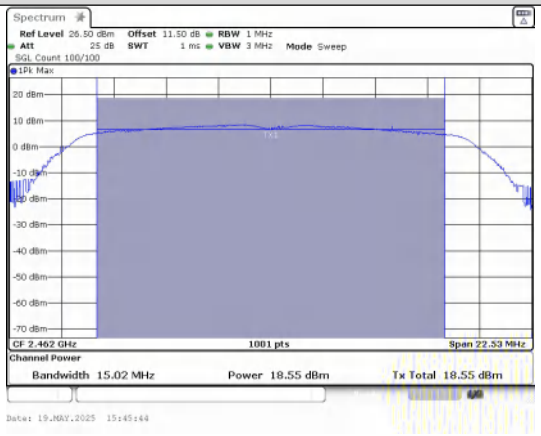
Conducted Output Power
IEEE 802.11g_Channel 11_Antenna 0



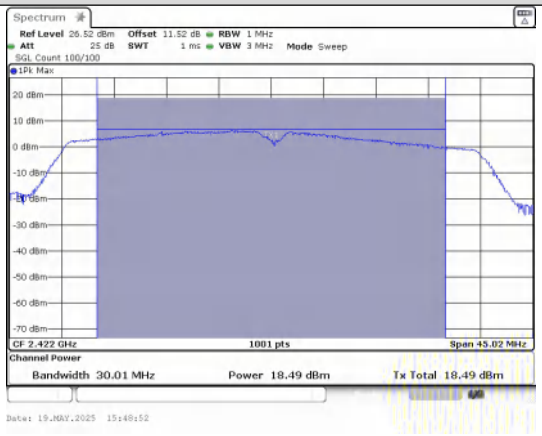
Conducted Output Power
IEEE 802.11n_20_Channel 1_Antenna 0



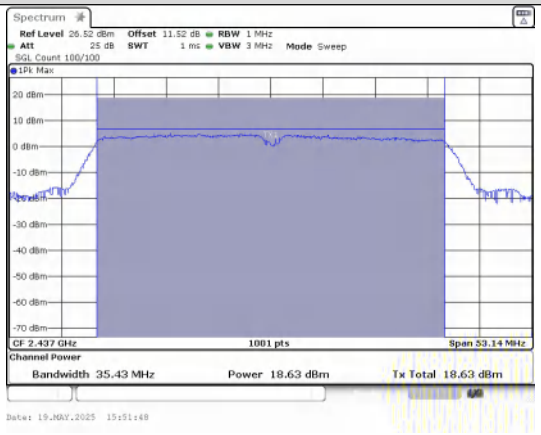
Conducted Output Power
IEEE 802.11n_20_Channel 6_Antenna 0



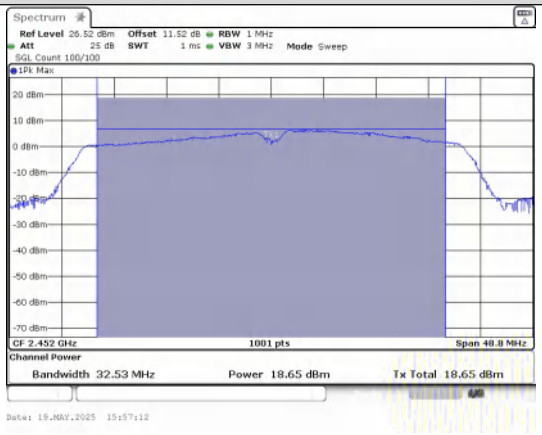
Conducted Output Power
IEEE 802.11n_20_Channel 11_Antenna 0



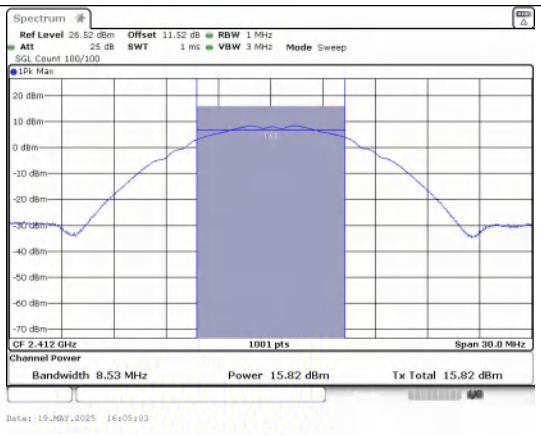
Conducted Output Power
IEEE 802.11n_40_Channel 3_Antenna 0



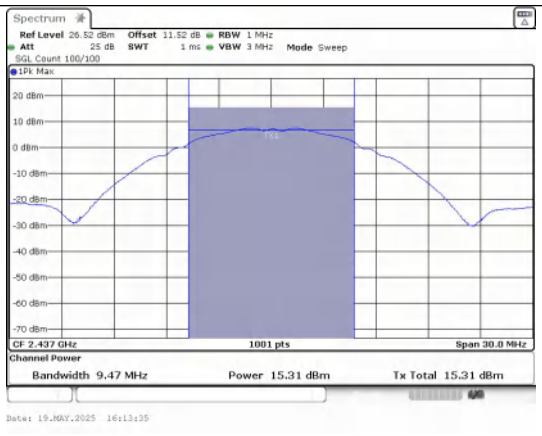
Conducted Output Power
IEEE 802.11n_40_Channel 6_Antenna 0



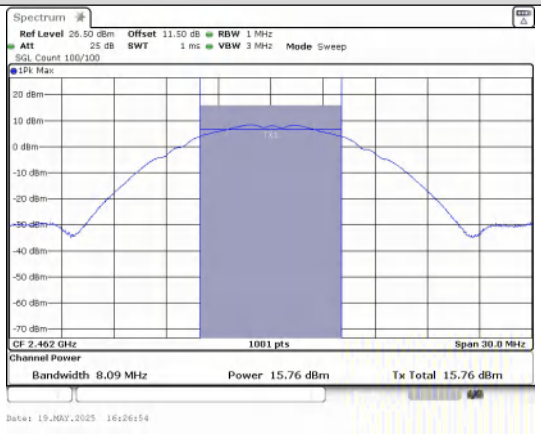
Conducted Output Power
IEEE 802.11n_40_Channel 9_Antenna 0



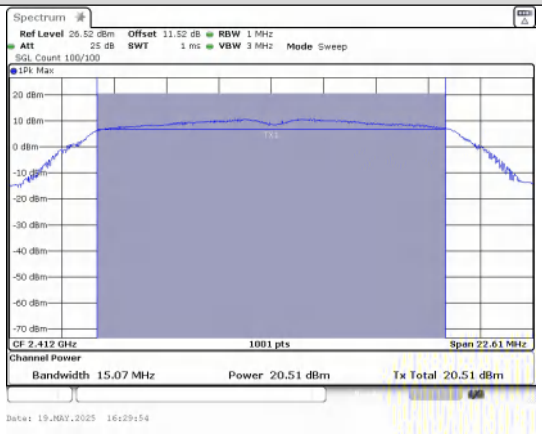
Conducted Output Power
IEEE 802.11b_Channel 1_Antenna 1



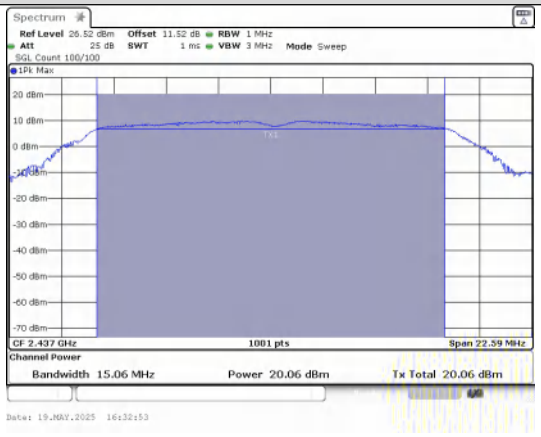
Conducted Output Power
IEEE 802.11b_Channel 6_Antenna 1



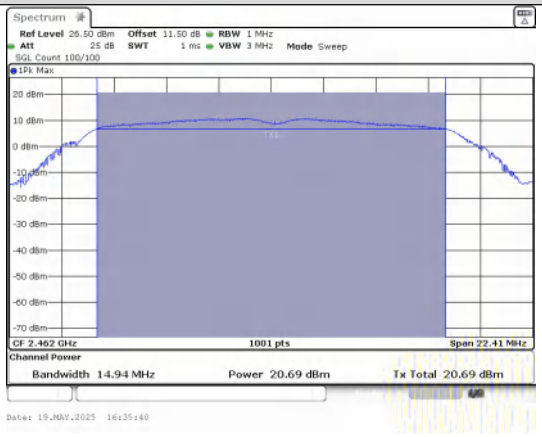
Conducted Output Power
IEEE 802.11b_Channel 11_Antenna 1



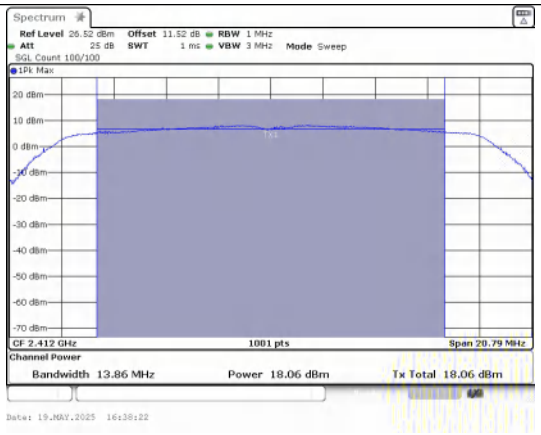
Conducted Output Power
IEEE 802.11g_Channel 1_Antenna 1



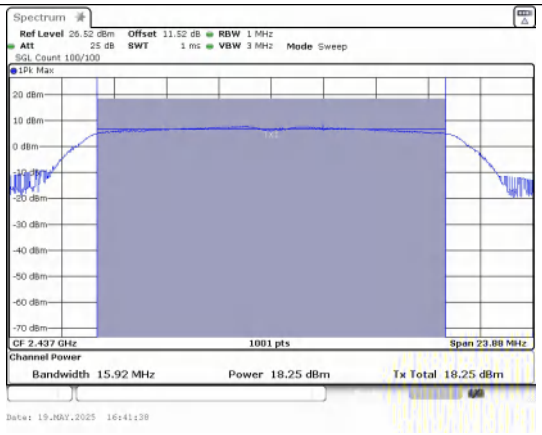
Conducted Output Power
IEEE 802.11g_Channel 6_Antenna 1



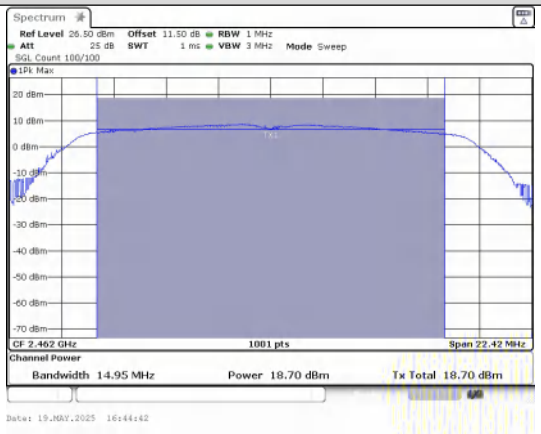
Conducted Output Power
IEEE 802.11g_Channel 11_Antenna 1



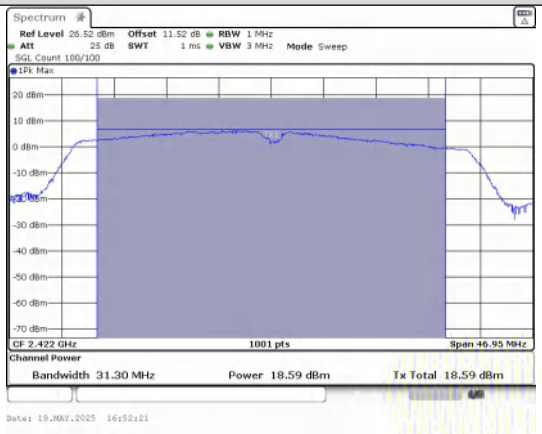
Conducted Output Power
IEEE 802.11n_20_Channel 1_Antenna 1



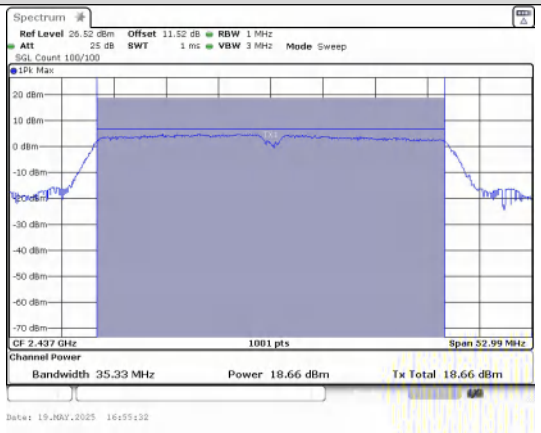
Conducted Output Power
IEEE 802.11n_20_Channel 6_Antenna 1



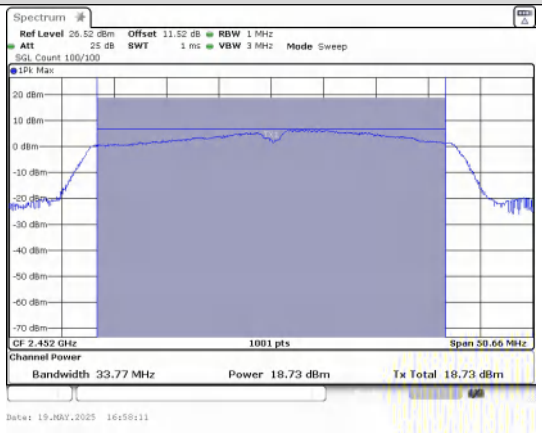
Conducted Output Power
IEEE 802.11n_20_Channel 11_Antenna 1



Conducted Output Power
IEEE 802.11n_40_Channel 3_Antenna 1



Conducted Output Power
IEEE 802.11n_40_Channel 6_Antenna 1



Conducted Output Power
IEEE 802.11n_40_Channel 9_Antenna 1

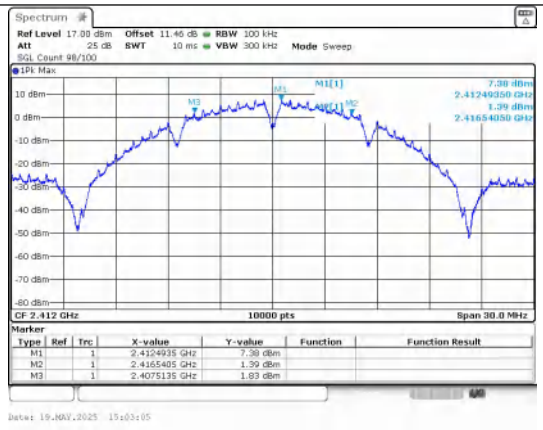
6dB Bandwidth

Ant0:

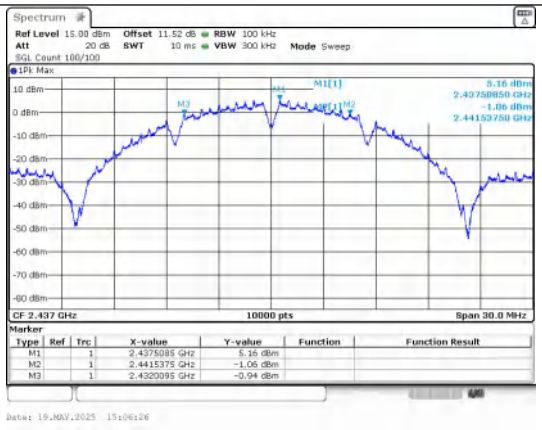
Test Result

Mode	Channel	Ant.	Center Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11b	1	0	2412	9.030	≥0.5	PASS
	6		2437	9.530		PASS
	11		2462	9.050		PASS
IEEE 802.11g	1		2412	15.11		PASS
	6		2437	15.25		PASS
	11		2462	15.08		PASS
IEEE 802.11n_20	1		2412	15.06		PASS
	6		2437	16.75		PASS
	11		2462	15.02		PASS
IEEE 802.11n_40	3		2422	30.01		PASS
	6		2437	35.43		PASS
	9		2452	32.53		PASS

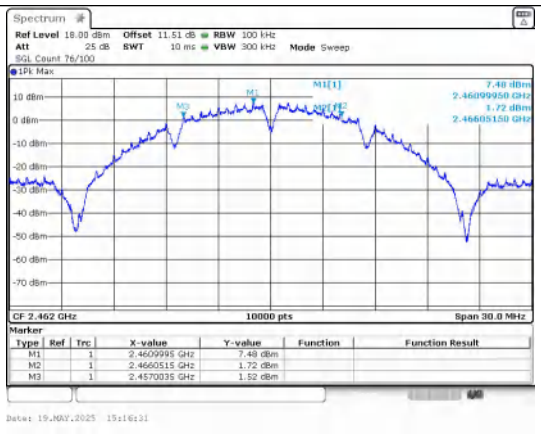
Test Graphs



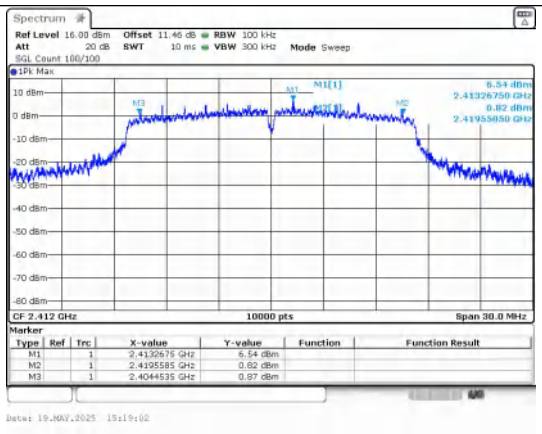
IEEE 802.11b_Channel 1_20MHz_Antenna 0



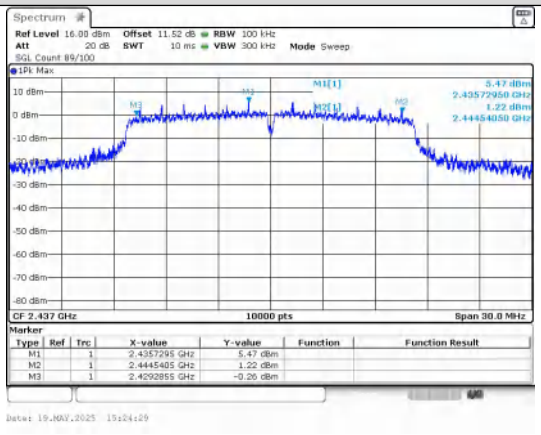
IEEE 802.11b_Channel 6_20MHz_Antenna 0



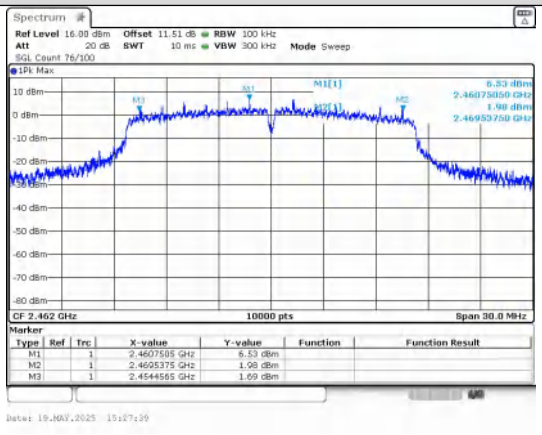
IEEE 802.11b_Channel 11_20MHz_Antenna 0



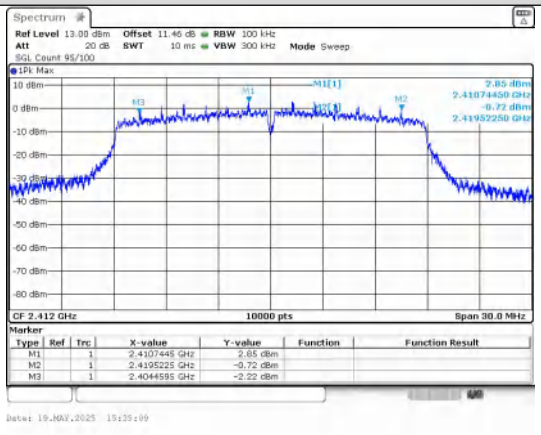
IEEE 802.11g_Channel 1_20MHz_Antenna 0



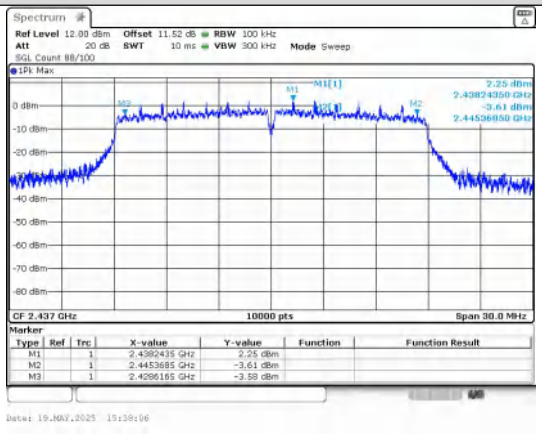
IEEE 802.11g_Channel 6_20MHz_Antenna 0



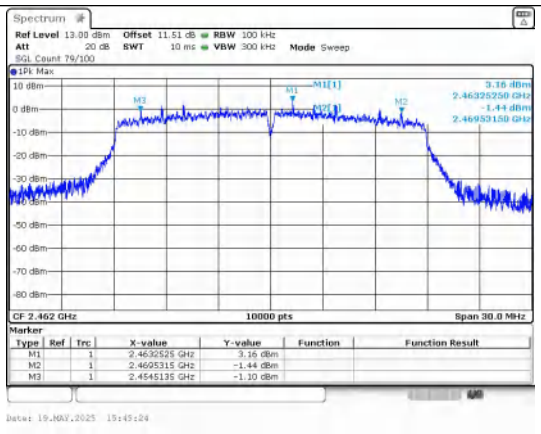
IEEE 802.11g_Channel 11_20MHz_Antenna 0



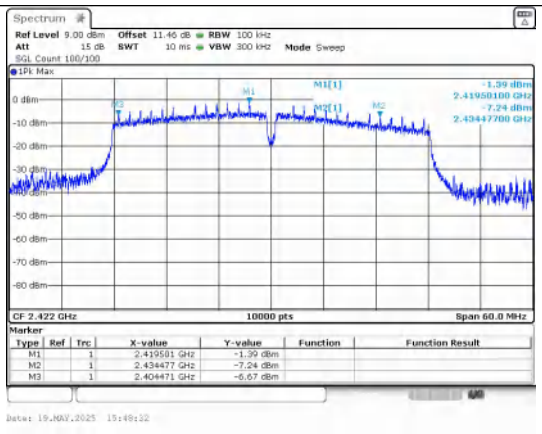
IEEE 802.11n_Channel 1_20MHz_Antenna 0



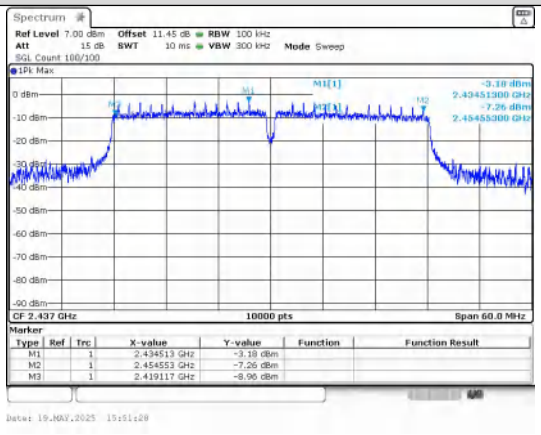
IEEE 802.11n_Channel 6_20MHz_Antenna 0



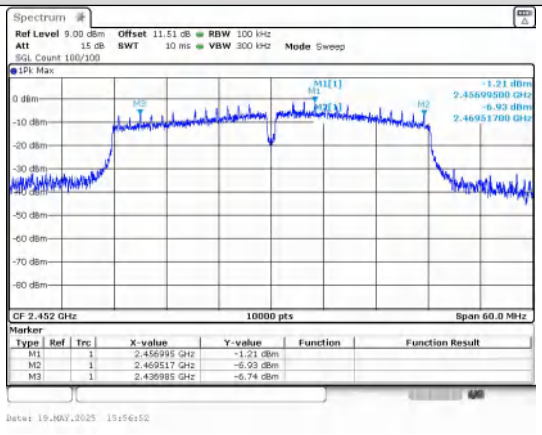
IEEE 802.11n_Channel 11_20MHz_Antenna 0



IEEE 802.11n_Channel 3_40MHz_Antenna 0



IEEE 802.11n_Channel 6_40MHz_Antenna 0



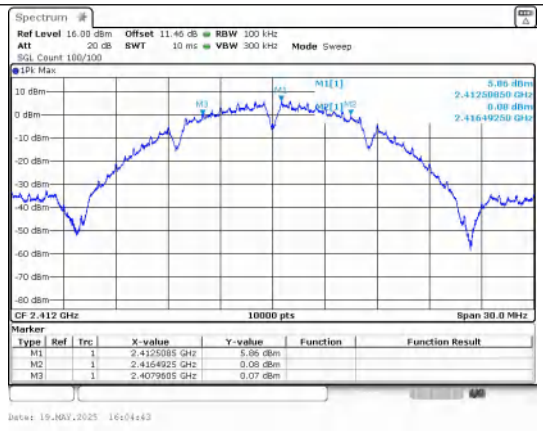
IEEE 802.11n_Channel 9_40MHz_Antenna 0

Ant1:

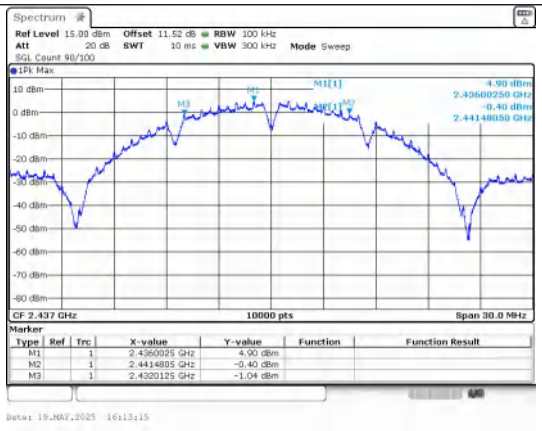
Test Result

Mode	Channel	Ant.	Center Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11b	1	1	2412	8.530	≥0.5	PASS
	6		2437	9.470		PASS
	11		2462	8.090		PASS
IEEE 802.11g	1		2412	15.07		PASS
	6		2437	15.06		PASS
	11		2462	14.94		PASS
IEEE 802.11n_20	1		2412	13.86		PASS
	6		2437	15.92		PASS
	11		2462	14.95		PASS
IEEE 802.11n_40	3		2422	31.30		PASS
	6		2437	35.33		PASS
	9		2452	33.77		PASS

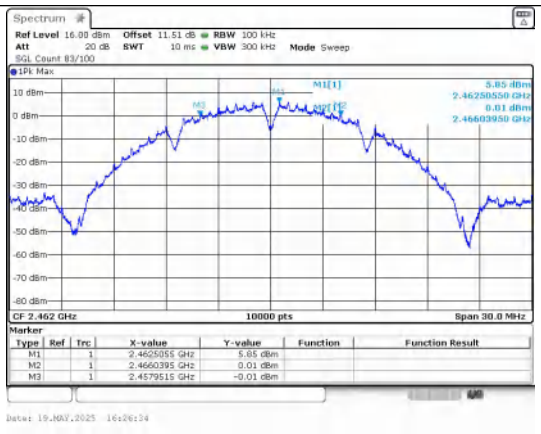
Test Graphs



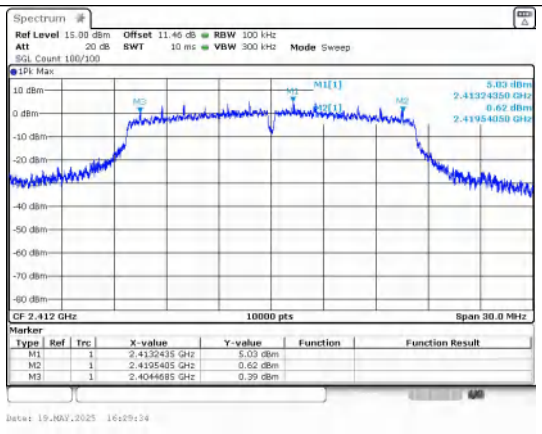
IEEE 802.11b_Channel 1_20MHz_Antenna 1



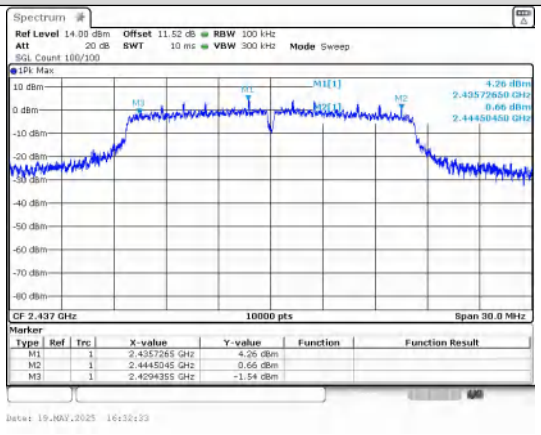
IEEE 802.11b_Channel 6_20MHz_Antenna 1



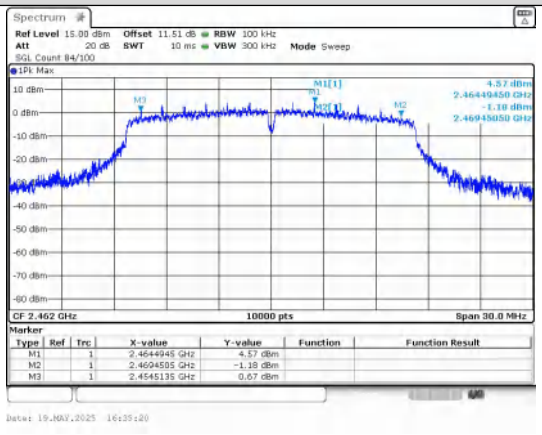
IEEE 802.11b_Channel 11_20MHz_Antenna 1



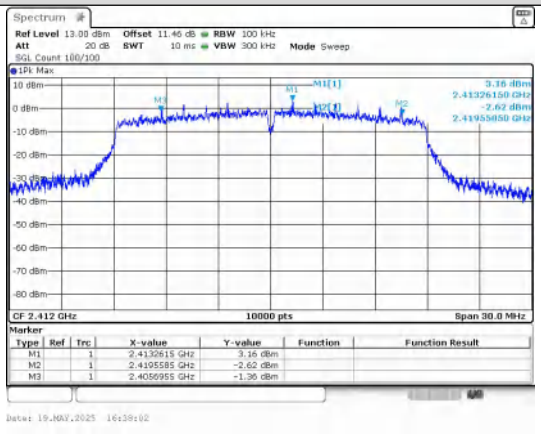
IEEE 802.11g_Channel 1_20MHz_Antenna 1



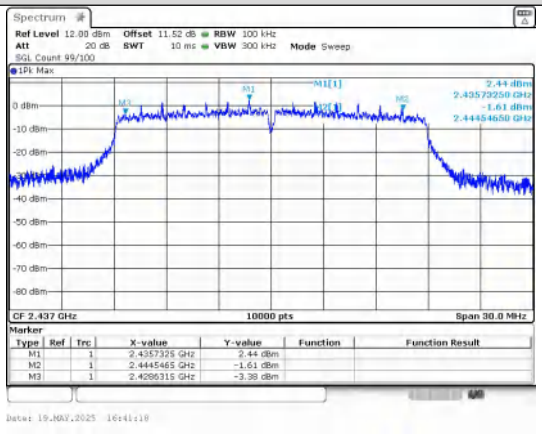
IEEE 802.11g_Channel 6_20MHz_Antenna 1



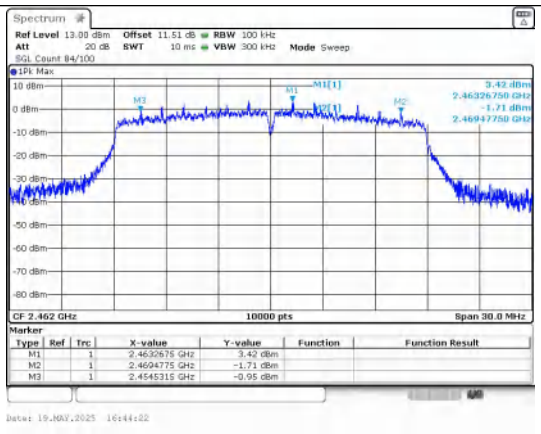
IEEE 802.11g_Channel 11_20MHz_Antenna 1



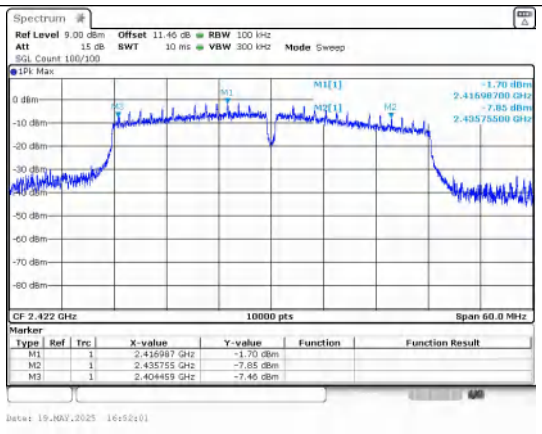
IEEE 802.11n_Channel 1_20MHz_Antenna 1



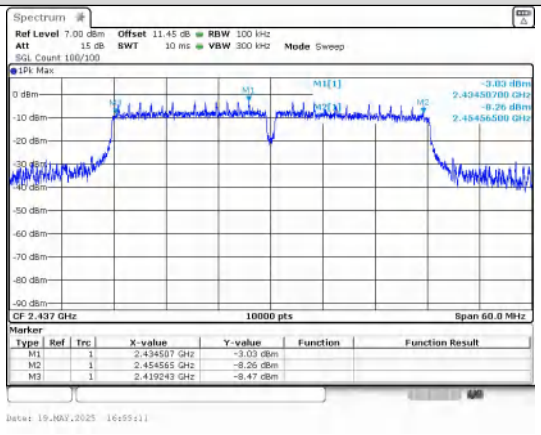
IEEE 802.11n_Channel 6_20MHz_Antenna 1



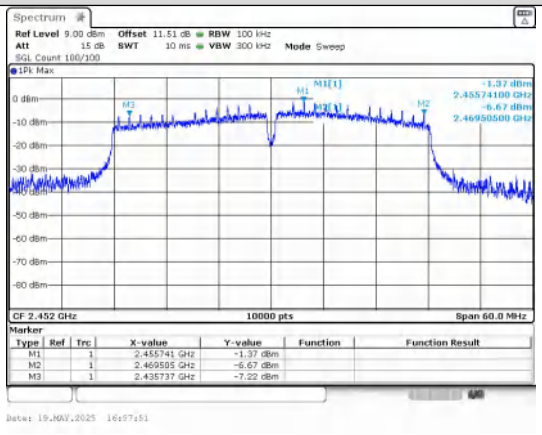
IEEE 802.11n_Channel 11_20MHz_Antenna 1



IEEE 802.11n_Channel 3_40MHz_Antenna 1



IEEE 802.11n_Channel 6_40MHz_Antenna 1



IEEE 802.11n_Channel 9_40MHz_Antenna 1

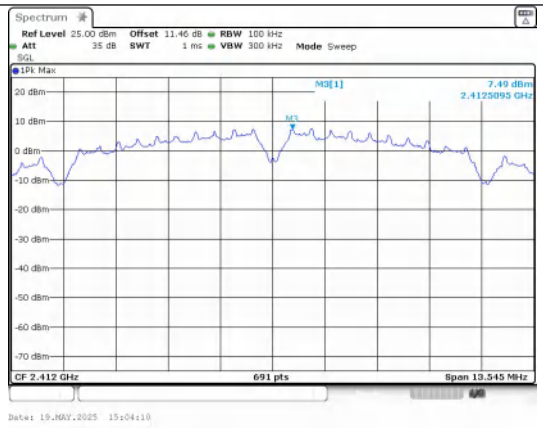
Conducted Out Of Band Emission

Ant0:

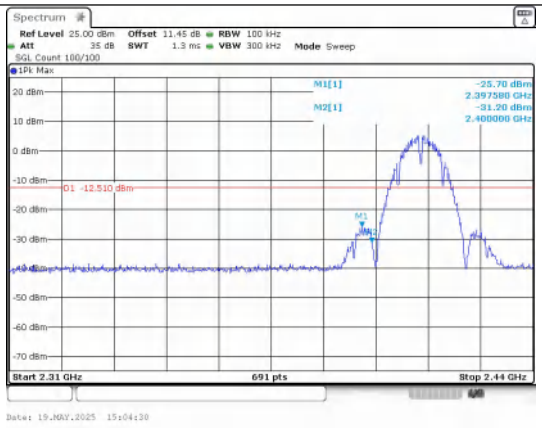
Test Result

Mode	Channel	Ant.	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
IEEE 802.11b	1	0	2397.58	-25.698	-12.51	-13.188	PASS
			2400.00	-31.200	-12.51	-18.690	PASS
			6996.20	-44.890	-12.51	-32.380	PASS
	6		6897.17	-44.277	-14.84	-29.437	PASS
	11		2483.50	-39.430	-12.43	-27.000	PASS
			6940.45	-44.043	-12.43	-31.613	PASS
IEEE 802.11g	1		2398.52	-23.627	-14.14	-9.487	PASS
			2400.00	-24.160	-14.14	-10.020	PASS
			23698.6	-44.522	-14.14	-30.382	PASS
	6		6997.05	-44.332	-14.48	-29.852	PASS
	11		2483.50	-36.160	-14.0	-22.160	PASS
			6949.60	-44.315	-14.0	-30.315	PASS
IEEE 802.11n_20	1		2400.00	-30.630	-17.17	-13.460	PASS
			5465.55	-44.557	-17.17	-27.387	PASS
	6		6922.14	-43.014	-17.72	-25.294	PASS
	11		2483.50	-39.480	-17.03	-22.450	PASS
			6918.81	-44.345	-17.03	-27.315	PASS
IEEE 802.11n_40	3		2396.26	-29.550	-18.91	-10.640	PASS
			2400.00	-32.090	-18.91	-13.180	PASS
			22063.9	-44.220	-18.91	-25.310	PASS
	6		23292.5	-43.979	-22.78	-21.199	PASS
	9		2483.50	-36.530	-19.02	-17.510	PASS
			6915.48	-44.010	-19.02	-24.990	PASS

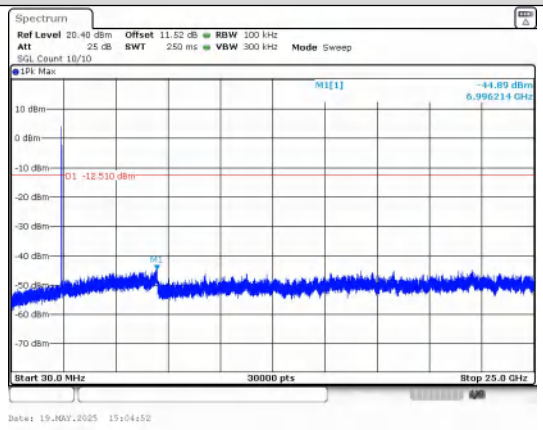
Test Graphs



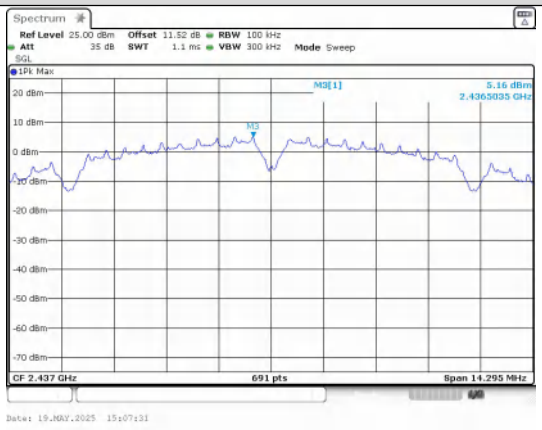
In-Band Reference Level
IEEE 802.11b_Channel 1_20MHz_Antenna 0



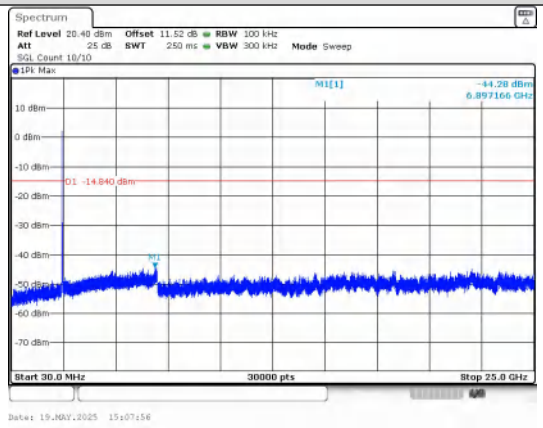
Out Of Band Emission
IEEE 802.11b_Channel 1_20MHz_Antenna 0

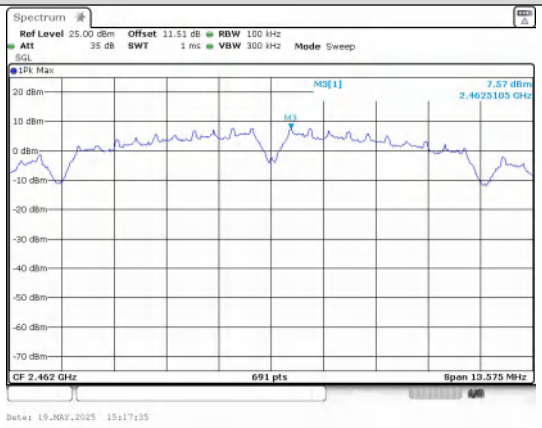


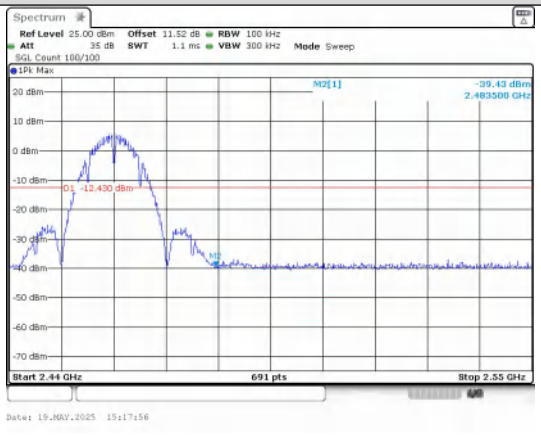
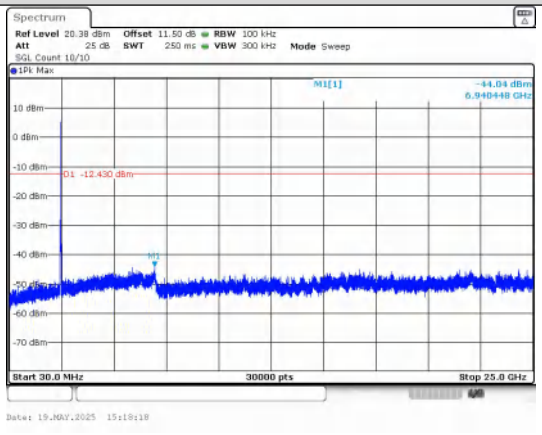
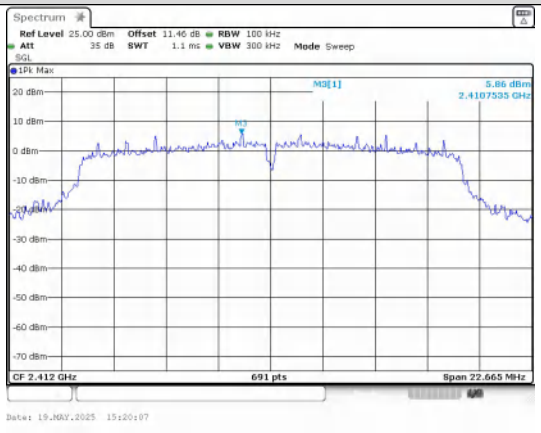
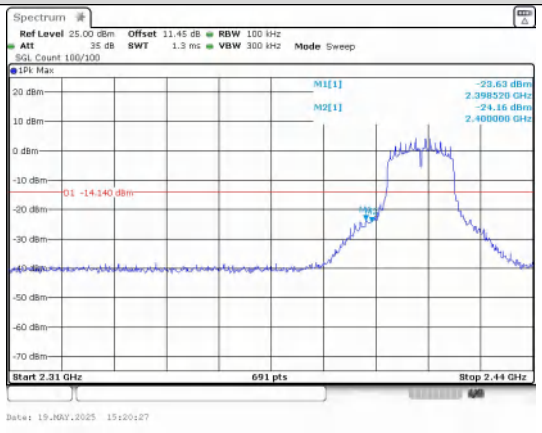
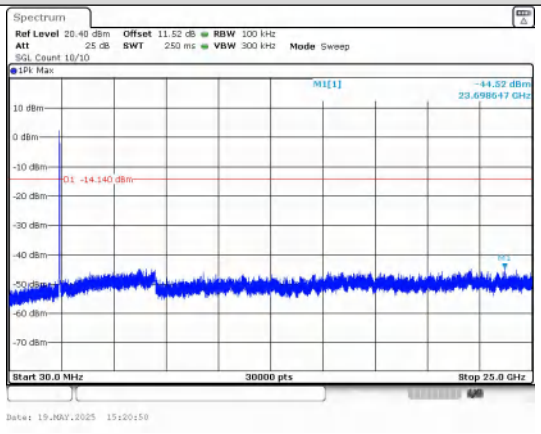
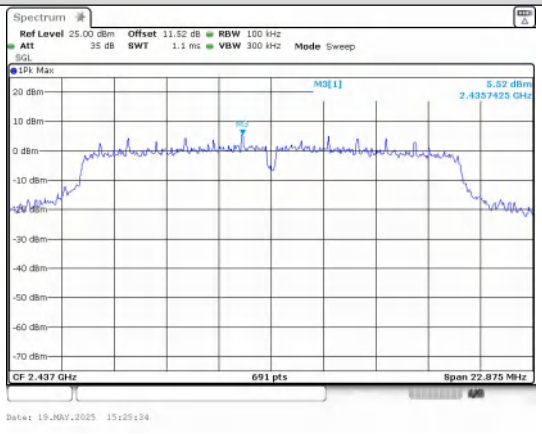
30.0 MHz - 25000.0 MHz
IEEE 802.11b_Channel 1_20MHz_Antenna 0

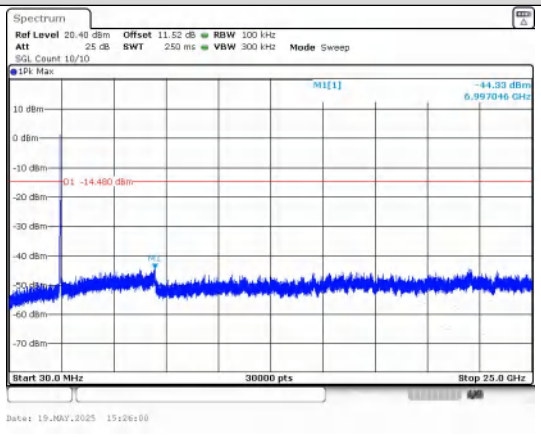
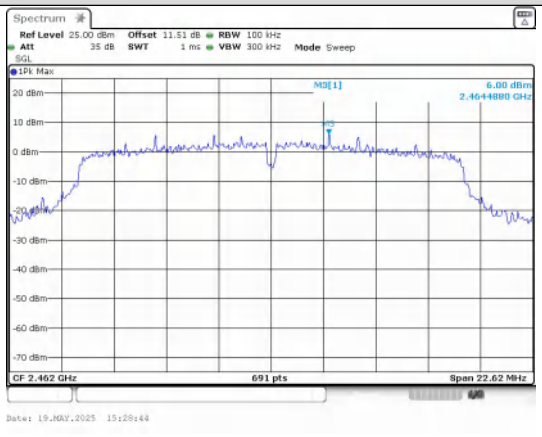
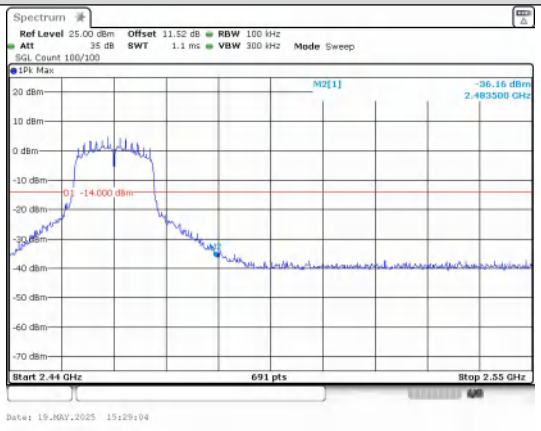
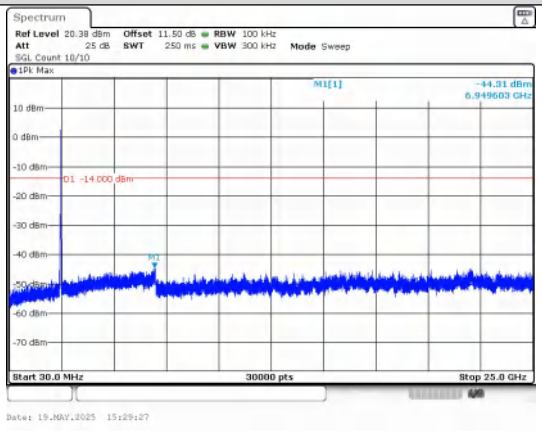
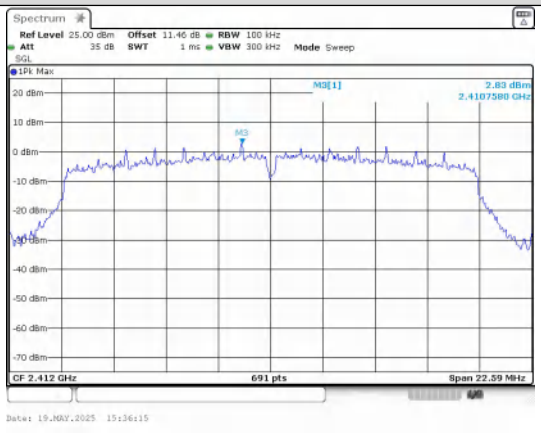
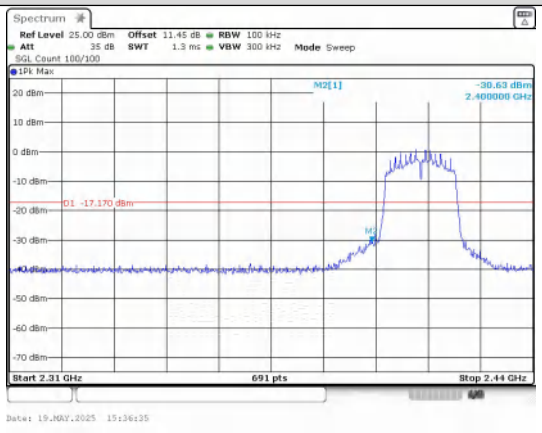


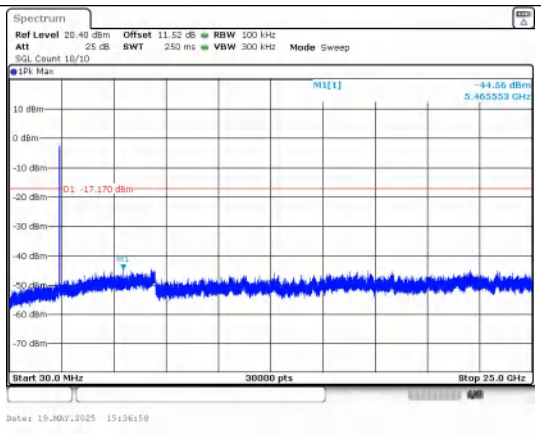
In-Band Reference Level
IEEE 802.11b_Channel 6_20MHz_Antenna 0



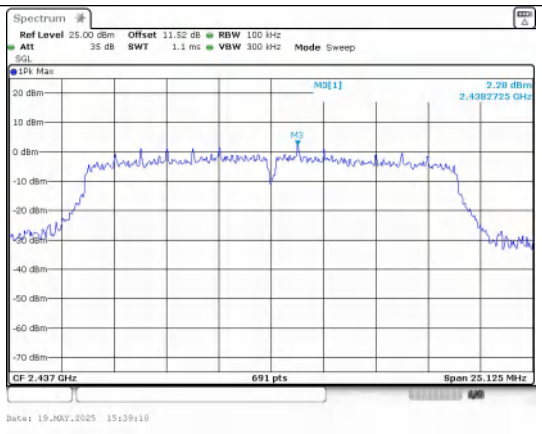


30.0 MHz - 25000.0 MHz IEEE 802.11b_Channel 6_20MHz_Antenna 0	In-Band Reference Level IEEE 802.11b_Channel 11_20MHz_Antenna 0
	
Out Of Band Emission **IEEE 802.11b_Channel 11_20MHz_Antenna 0**	**30.0 MHz - 25000.0 MHz** **IEEE 802.11b_Channel 11_20MHz_Antenna 0**
	
In-Band Reference Level **IEEE 802.11g_Channel 1_20MHz_Antenna 0**	**Out Of Band Emission** **IEEE 802.11g_Channel 1_20MHz_Antenna 0**
	
30.0 MHz - 25000.0 MHz	**In-Band Reference Level**

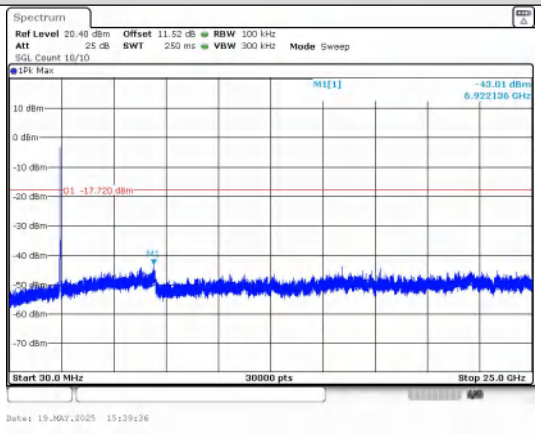
IEEE 802.11g_Channel 1_20MHz_Antenna 0	IEEE 802.11g_Channel 6_20MHz_Antenna 0
	
30.0 MHz - 25000.0 MHz **IEEE 802.11g_Channel 6_20MHz_Antenna 0**	**In-Band Reference Level** **IEEE 802.11g_Channel 11_20MHz_Antenna 0**
	
Out Of Band Emission **IEEE 802.11g_Channel 11_20MHz_Antenna 0**	**30.0 MHz - 25000.0 MHz** **IEEE 802.11g_Channel 11_20MHz_Antenna 0**
	
In-Band Reference Level **IEEE 802.11n_Channel 1_20MHz_Antenna 0**	**Out Of Band Emission** **IEEE 802.11n_Channel 1_20MHz_Antenna 0**



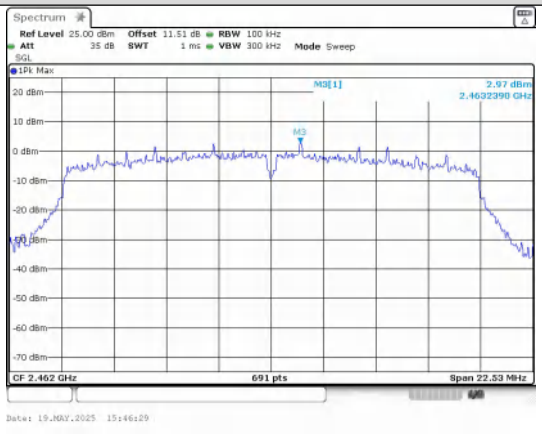
30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 1_20MHz_Antenna 0



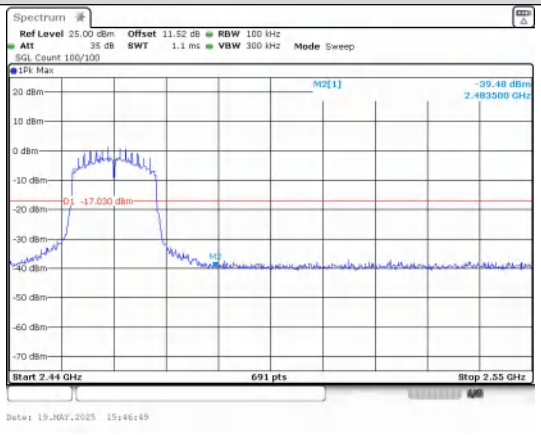
In-Band Reference Level
IEEE 802.11n_Channel 6_20MHz_Antenna 0



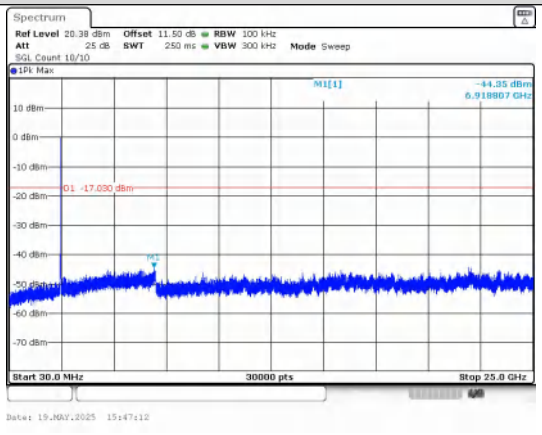
30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 6_20MHz_Antenna 0



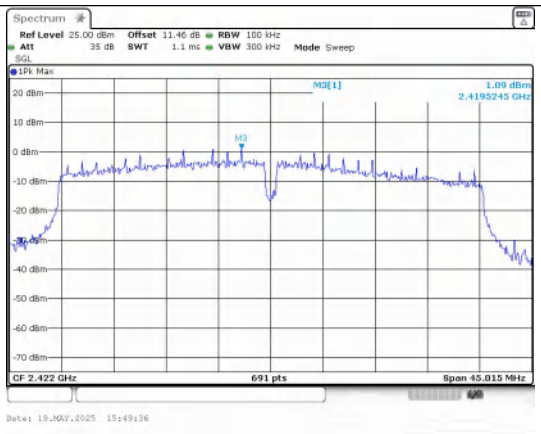
In-Band Reference Level
IEEE 802.11n_Channel 11_20MHz_Antenna 0



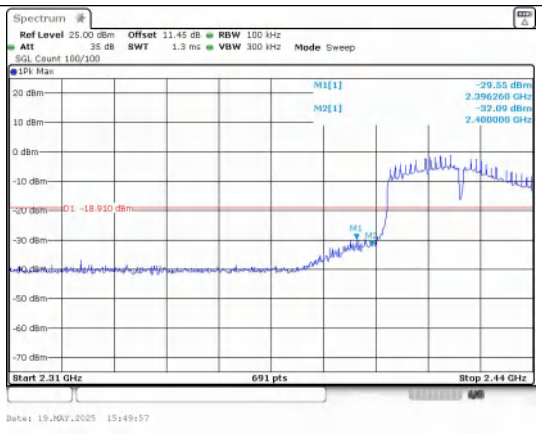
Out Of Band Emission
IEEE 802.11n_Channel 11_20MHz_Antenna 0



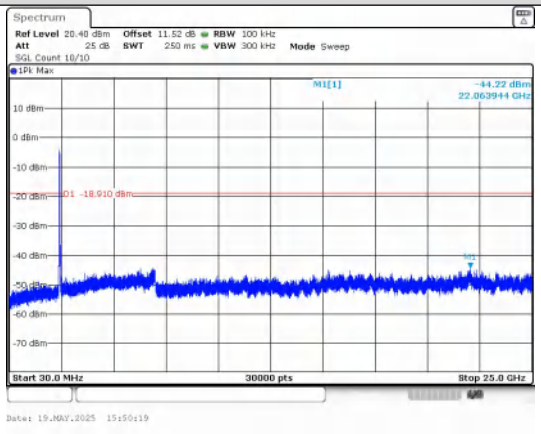
30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 11_20MHz_Antenna 0



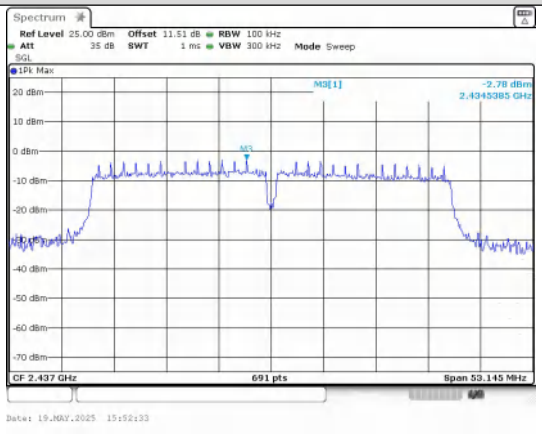
In-Band Reference Level
IEEE 802.11n_Channel 3_40MHz_Antenna 0



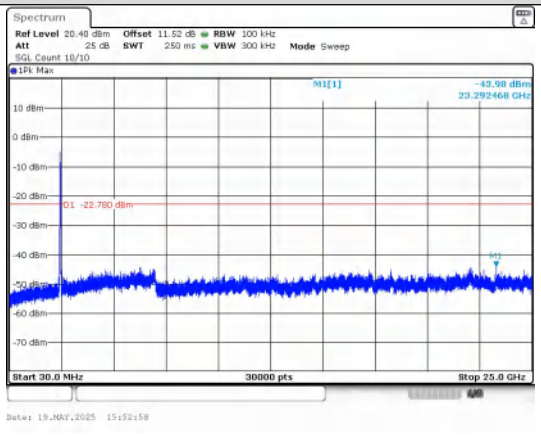
Out Of Band Emission
IEEE 802.11n_Channel 3_40MHz_Antenna 0



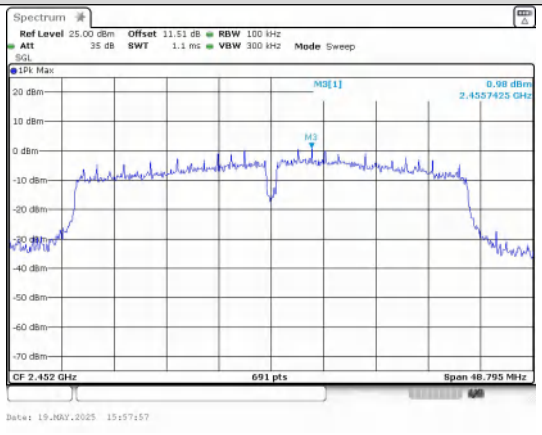
30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 3_40MHz_Antenna 0



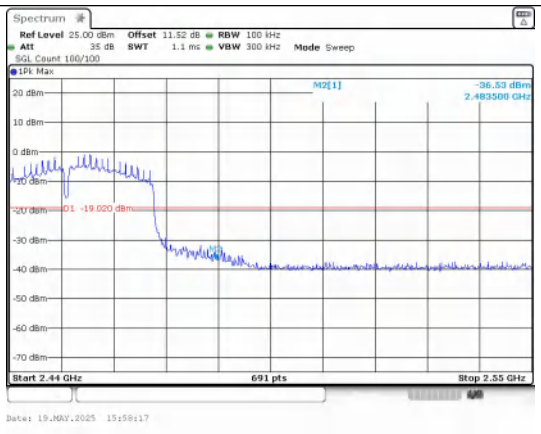
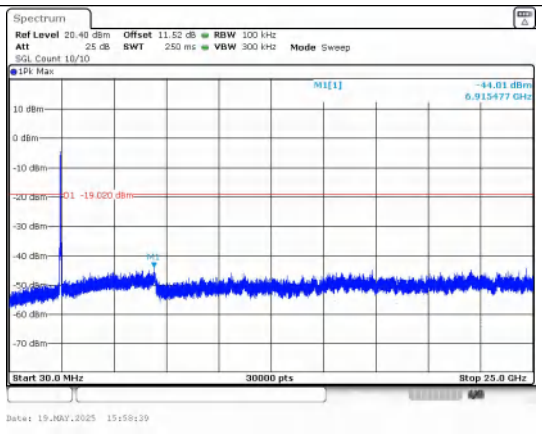
In-Band Reference Level
IEEE 802.11n_Channel 6_40MHz_Antenna 0



30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 6_40MHz_Antenna 0



In-Band Reference Level
IEEE 802.11n_Channel 9_40MHz_Antenna 0

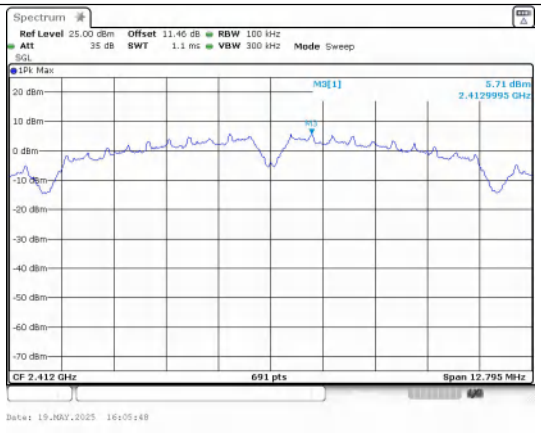
	
Out Of Band Emission IEEE 802.11n_Channel 9_40MHz_Antenna 0	**30.0 MHz - 25000.0 MHz IEEE 802.11n_Channel 9_40MHz_Antenna 0**

Ant1:

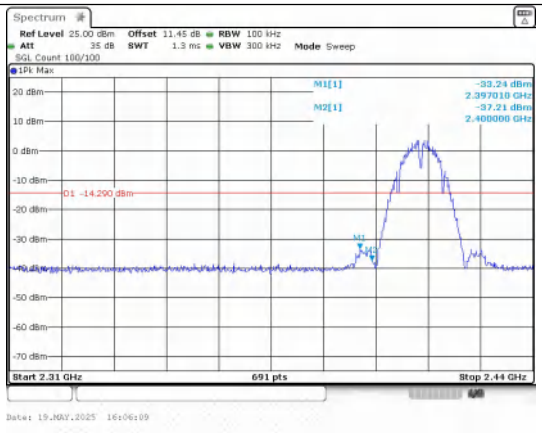
Test Result

Mode	Channel	Ant.	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
IEEE 802.11b	1	1	2397.01	-33.244	-14.29	-18.954	PASS
			2400.00	-37.210	-14.29	-22.920	PASS
			22106.4	-44.360	-14.29	-30.070	PASS
	6		6859.71	-43.440	-15.1	-28.340	PASS
	11		2483.50	-39.090	-14.23	-24.860	PASS
			22047.3	-44.708	-14.23	-30.478	PASS
IEEE 802.11g	1		2398.89	-26.194	-15.01	-11.184	PASS
			2400.00	-28.110	-15.01	-13.100	PASS
			22057.3	-43.264	-15.01	-28.254	PASS
	6		6907.15	-44.172	-15.64	-28.532	PASS
	11		2483.50	-36.390	-15.28	-21.110	PASS
			6896.33	-43.897	-15.28	-28.617	PASS
IEEE 802.11n_20	1		2400.00	-30.890	-17.63	-13.260	PASS
			22040.6	-44.353	-17.63	-26.723	PASS
	6		22042.3	-43.534	-17.76	-25.774	PASS
	11		2483.50	-39.270	-17.43	-21.840	PASS
			6883.02	-44.232	-17.43	-26.802	PASS
IEEE 802.11n_40	3		2398.52	-30.047	-19.65	-10.397	PASS
			2400.00	-31.150	-19.65	-11.500	PASS
			6959.60	-44.367	-19.65	-24.717	PASS
	6		6274.58	-44.253	-22.72	-21.533	PASS
	9		2483.50	-36.790	-21.06	-15.730	PASS
			6906.32	-43.943	-21.06	-22.883	PASS

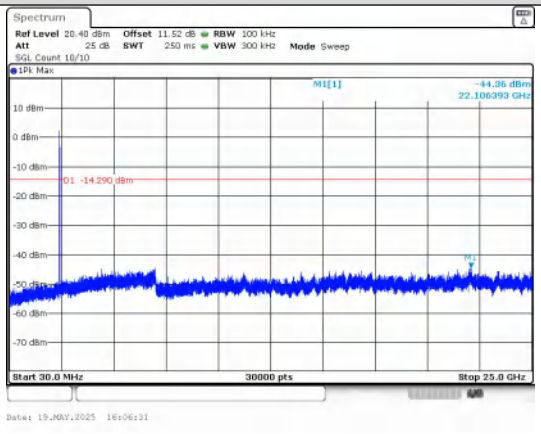
Test Graphs



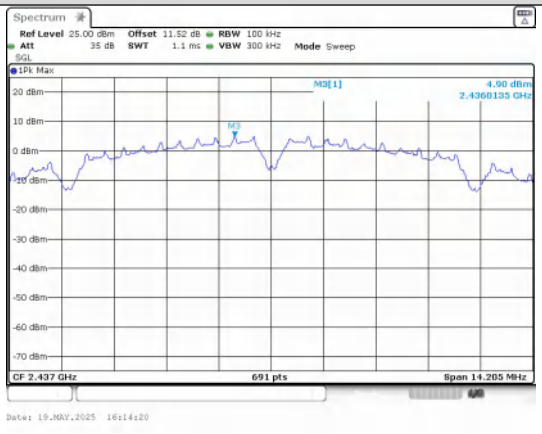
In-Band Reference Level
IEEE 802.11b_Channel 1_20MHz_Antenna 1



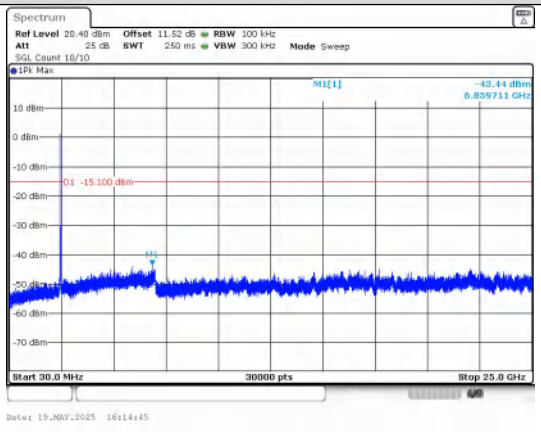
Out Of Band Emission
IEEE 802.11b_Channel 1_20MHz_Antenna 1



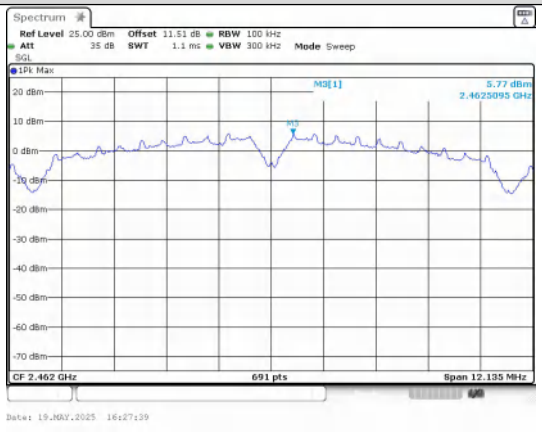
30.0 MHz - 25000.0 MHz
IEEE 802.11b_Channel 1_20MHz_Antenna 1



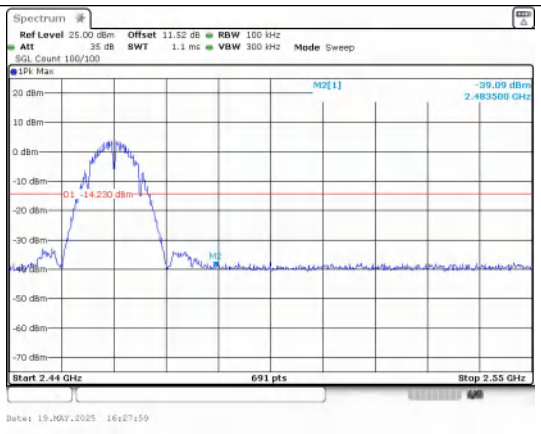
In-Band Reference Level
IEEE 802.11b_Channel 6_20MHz_Antenna 1



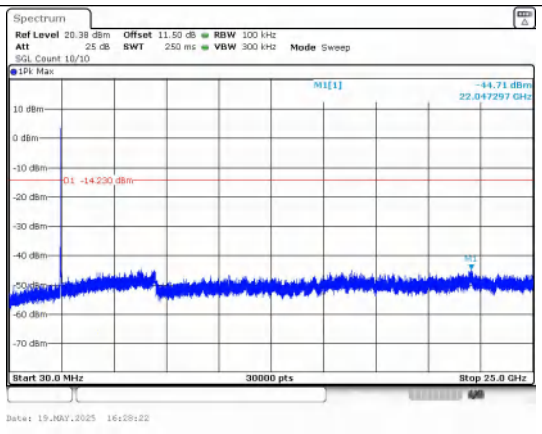
30.0 MHz - 25000.0 MHz
IEEE 802.11b_Channel 6_20MHz_Antenna 1



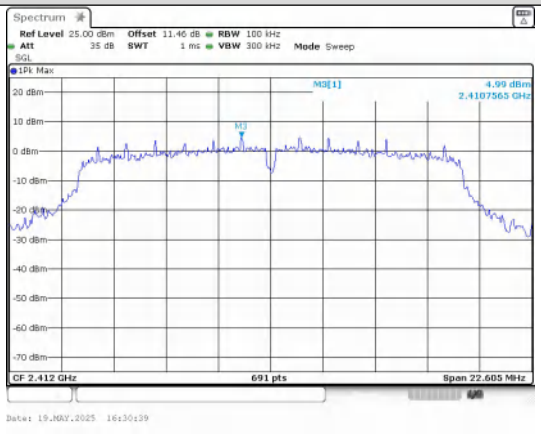
In-Band Reference Level
IEEE 802.11b_Channel 11_20MHz_Antenna 1



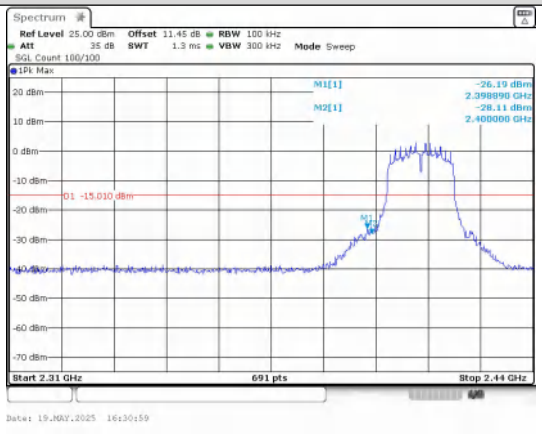
Out Of Band Emission
IEEE 802.11b_Channel 11_20MHz_Antenna 1



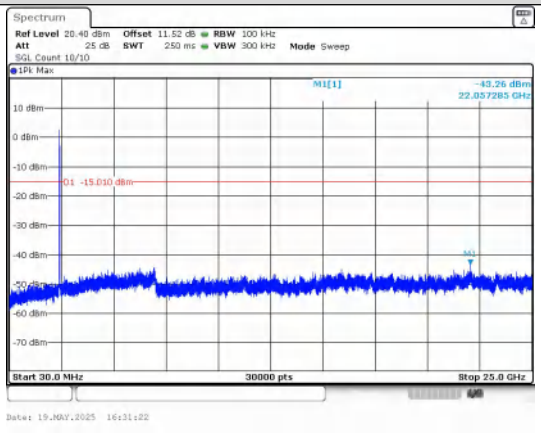
30.0 MHz - 25000.0 MHz
IEEE 802.11b_Channel 11_20MHz_Antenna 1



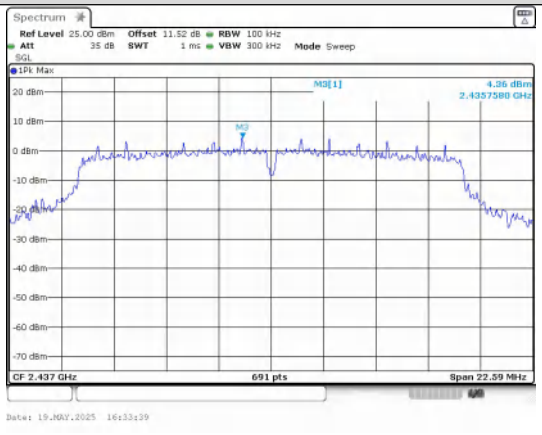
In-Band Reference Level
IEEE 802.11g_Channel 1_20MHz_Antenna 1



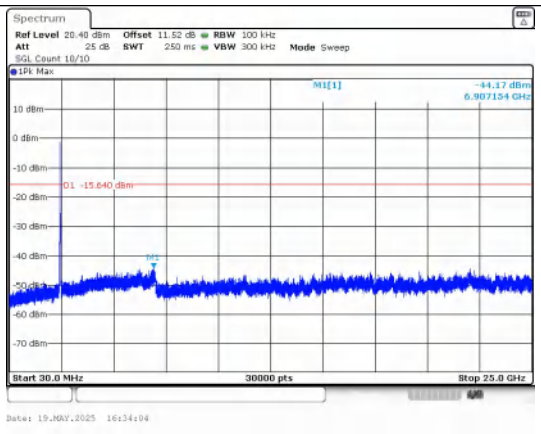
Out Of Band Emission
IEEE 802.11g_Channel 1_20MHz_Antenna 1



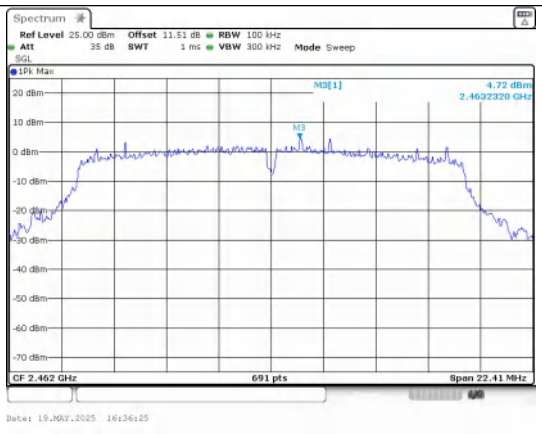
30.0 MHz - 25000.0 MHz
IEEE 802.11g_Channel 1_20MHz_Antenna 1



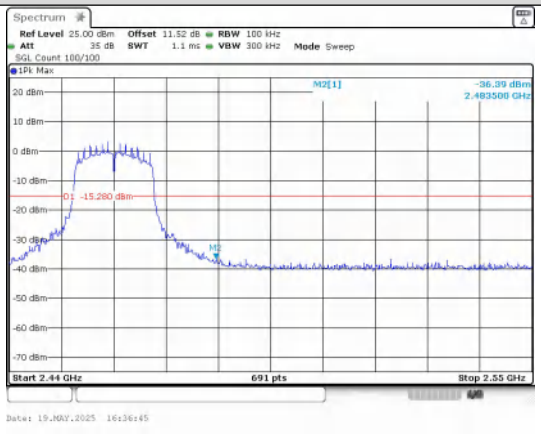
In-Band Reference Level
IEEE 802.11g_Channel 6_20MHz_Antenna 1



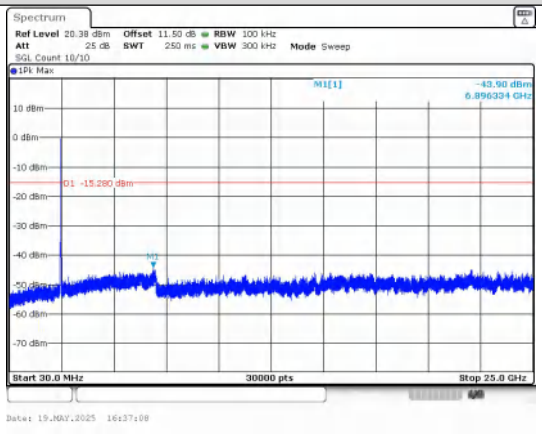
30.0 MHz - 25000.0 MHz
IEEE 802.11g_Channel 6_20MHz_Antenna 0



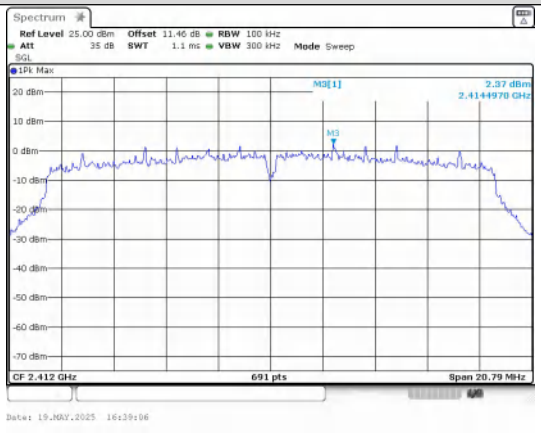
In-Band Reference Level
IEEE 802.11g_Channel 11_20MHz_Antenna 0



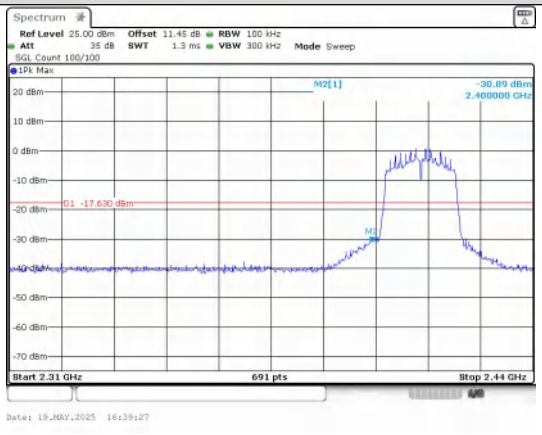
Out Of Band Emission
IEEE 802.11g_Channel 11_20MHz_Antenna 1



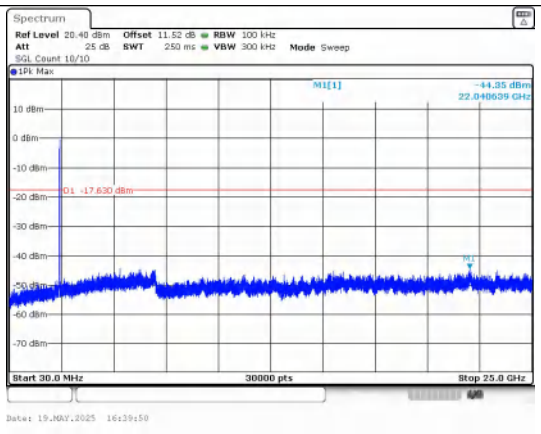
30.0 MHz - 25000.0 MHz
IEEE 802.11g_Channel 11_20MHz_Antenna 1



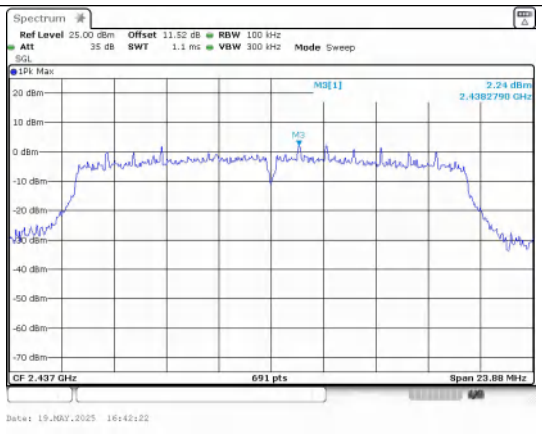
In-Band Reference Level
IEEE 802.11n_Channel 1_20MHz_Antenna 1



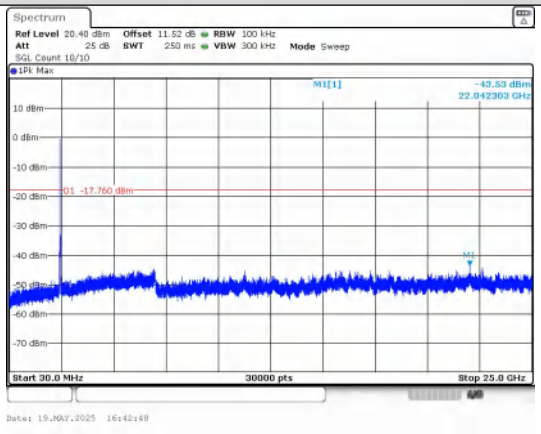
Out Of Band Emission
IEEE 802.11n_Channel 1_20MHz_Antenna 1



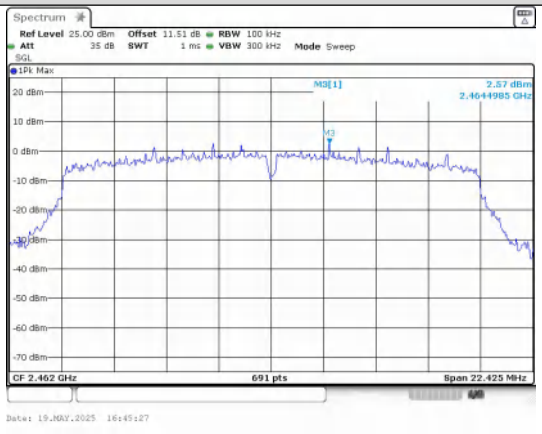
30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 1_20MHz_Antenna 1



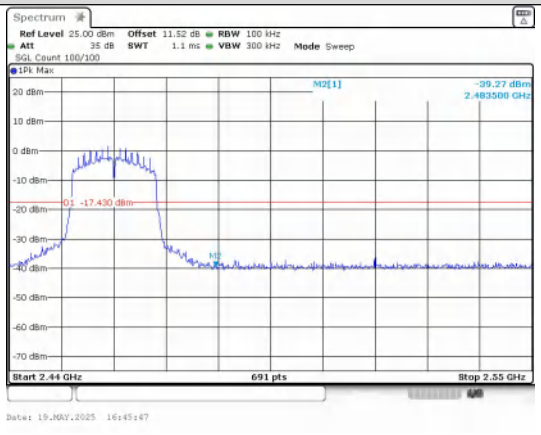
In-Band Reference Level
IEEE 802.11n_Channel 6_20MHz_Antenna 1



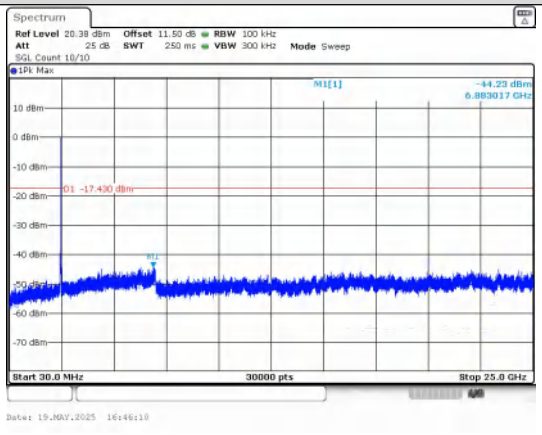
30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 6_20MHz_Antenna 0



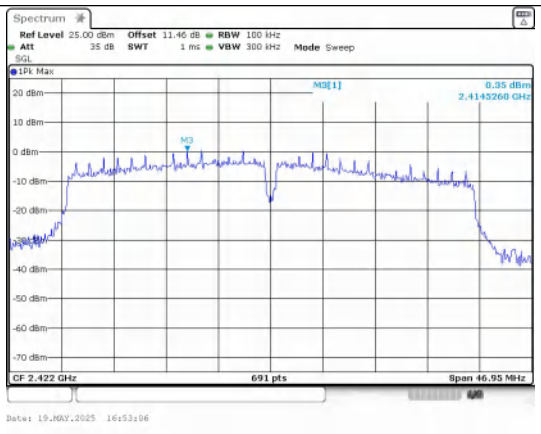
In-Band Reference Level
IEEE 802.11n_Channel 11_20MHz_Antenna 0



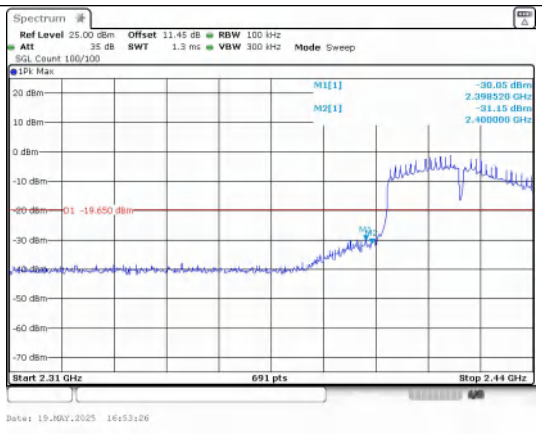
Out Of Band Emission
IEEE 802.11n_Channel 11_20MHz_Antenna 1



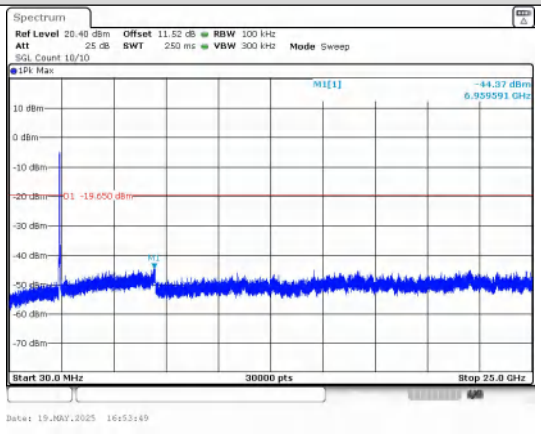
30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 11_20MHz_Antenna 1



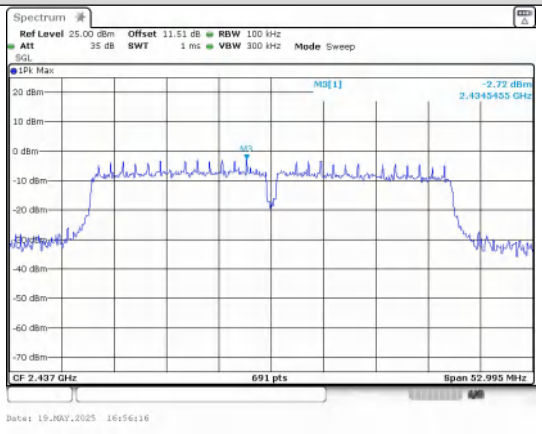
In-Band Reference Level
IEEE 802.11n_Channel 3_40MHz_Antenna 1



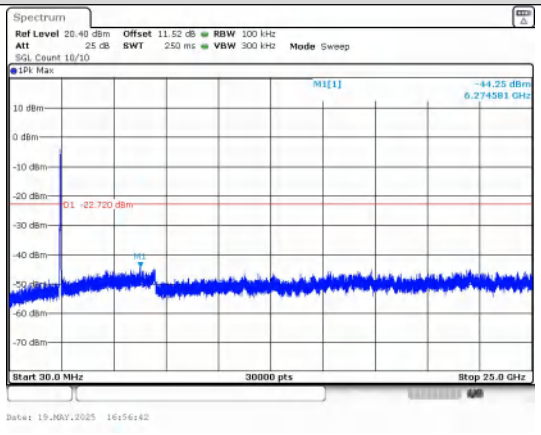
Out Of Band Emission
IEEE 802.11n_Channel 3_40MHz_Antenna 1



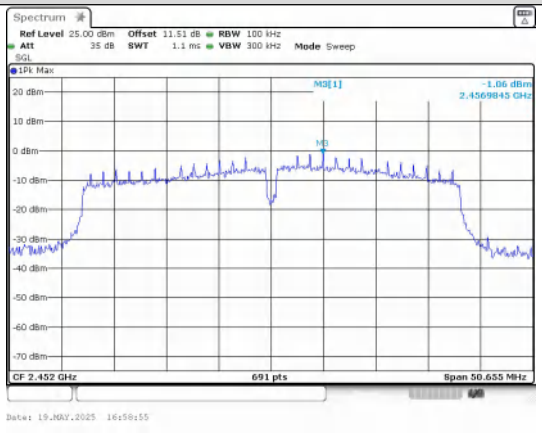
30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 3_40MHz_Antenna 1



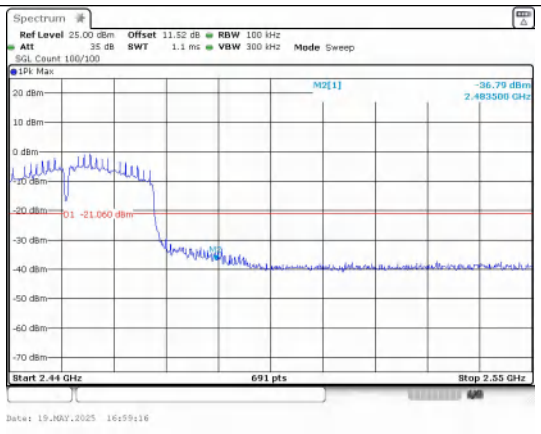
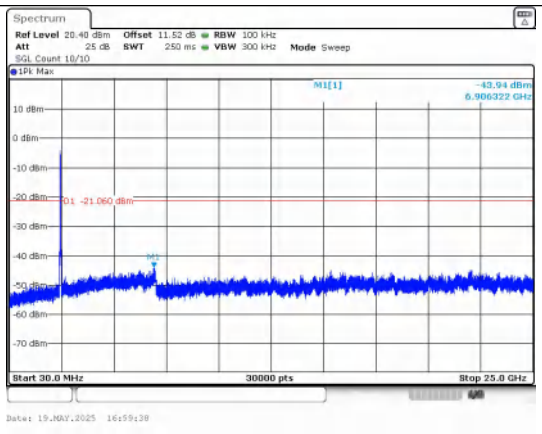
In-Band Reference Level
IEEE 802.11n_Channel 6_40MHz_Antenna 1



30.0 MHz - 25000.0 MHz
IEEE 802.11n_Channel 6_40MHz_Antenna 1



In-Band Reference Level
IEEE 802.11n_Channel 9_40MHz_Antenna 1

	
Out Of Band Emission **IEEE 802.11n_Channel 9_40MHz_Antenna 1**	**30.0 MHz - 25000.0 MHz** **IEEE 802.11n_Channel 9_40MHz_Antenna 1**

------End of the report-----