Appendix D

Report No.:	CISRR24091917704
FCC ID:	2BK9F-V200
Product Name:	Intelligent Microprojector
Model No.:	V200
Test Engineer:	Lucas Huang
Supervised by:	Rory Huang

Frequency Stability

Measured all conditions and recorded worst case.

IEEE 802.11a Mode/5745MHz~5825MHz/ 5745 MHz

Enviroment Temperature(Dregree)	Voltage(v)	Center Frequency (MHz)	Calculated Value of Center Frequency(MHz)	Value(ppm)	State
20	HV	5745.0	5744.982955	-2.967	PASS
20	LV	5745.0	5744.982703	-3.011	PASS
50	NV	5745.0	5744.983583	-2.858	PASS
40	NV	5745.0	5744.983899	-2.803	PASS
30	NV	5745.0	5744.982755	-3.002	PASS
20	NV	5745.0	5744.982147	-3.108	PASS
10	NV	5745.0	5744.983028	-2.954	PASS
0	NV	5745.0	5744.983171	-2.929	PASS
-10	NV	5745.0	5744.983864	-2.809	PASS
-20	NV	5745.0	5744.983290	-2.909	PASS
-30	NV	5745.0	5744.982955	-2.967	PASS

IEEE 802.11a Mode/5745MHz~5825MHz/ 5825 MHz

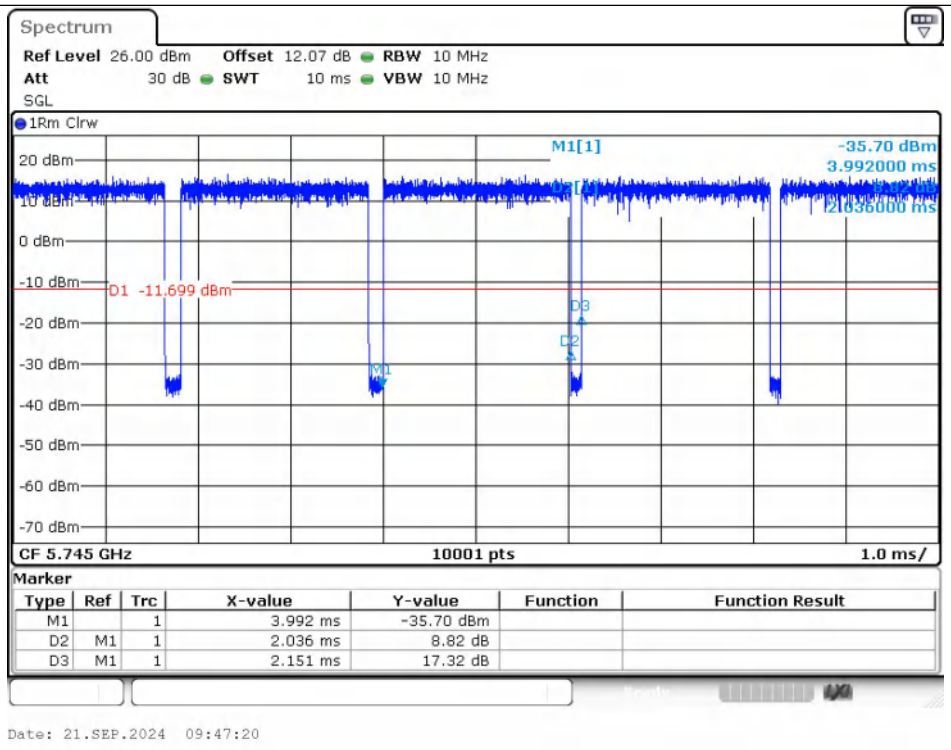
Enviroment Temperature(Dregree)	Voltage(v)	Center Frequency (MHz)	Calculated Value of Center Frequency(MHz)	Value(ppm)	State
20	HV	5825.0	5824.998219	-0.306	PASS
20	LV	5825.0	5824.997641	-0.405	PASS
50	NV	5825.0	5824.998597	-0.241	PASS
40	NV	5825.0	5824.998715	-0.221	PASS
30	NV	5825.0	5824.999879	-0.021	PASS
20	NV	5825.0	5824.999749	-0.043	PASS
10	NV	5825.0	5824.997621	-0.408	PASS
0	NV	5825.0	5824.999829	-0.029	PASS
-10	NV	5825.0	5824.997831	-0.372	PASS
-20	NV	5825.0	5824.998203	-0.308	PASS
-30	NV	5825.0	5824.998716	-0.220	PASS

Duty Cycle

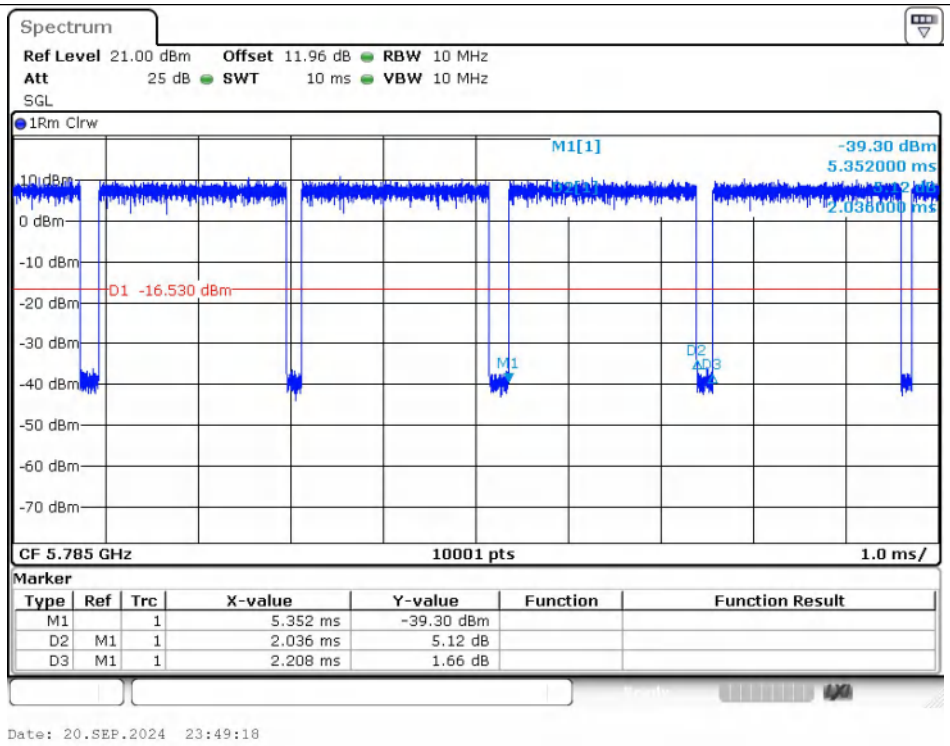
Test Result

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	149	1	2.036	2.151	94.65	0.9465	0.2388	0.49
		157		2.036	2.208	92.21	0.9221	0.3522	0.49
		165		2.036	2.208	92.21	0.9221	0.3522	0.49
IEEE 802.11n_20	MCS 0	149		1.304	1.337	97.53	0.9753	0.1086	0.77
		157		1.293	1.327	97.44	0.9744	0.1126	0.77
		165		1.304	1.338	97.46	0.9746	0.1117	0.77
IEEE 802.11n_40		151		0.650	0.684	95.00	0.9500	0.2228	1.54
		159		0.650	0.684	95.00	0.9500	0.2228	1.54
IEEE 802.11ac_20		149		1.316	1.350	97.48	0.9748	0.1108	0.76
		157		1.315	1.349	97.48	0.9748	0.1108	0.76
		165		1.316	1.349	97.55	0.9755	0.1077	0.76
IEEE 802.11ac_40		151		0.654	0.688	94.96	0.9496	0.2246	1.53
		159		0.654	0.688	95.03	0.9503	0.2214	1.53
IEEE 802.11ac_80		155		0.325	0.360	90.29	0.9029	0.4436	3.08

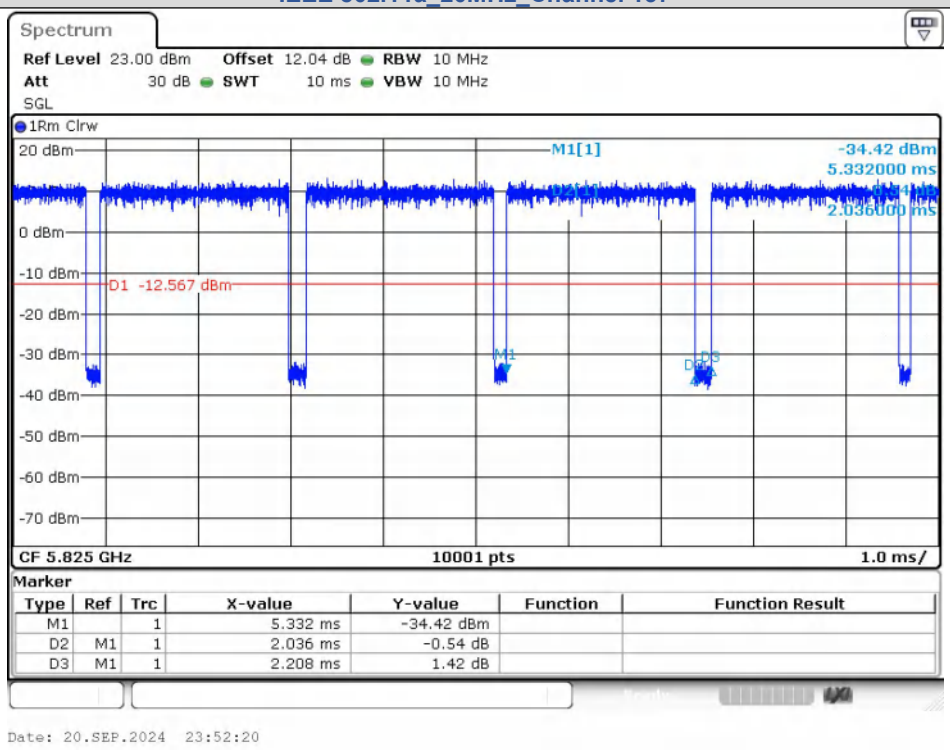
Test Graphs



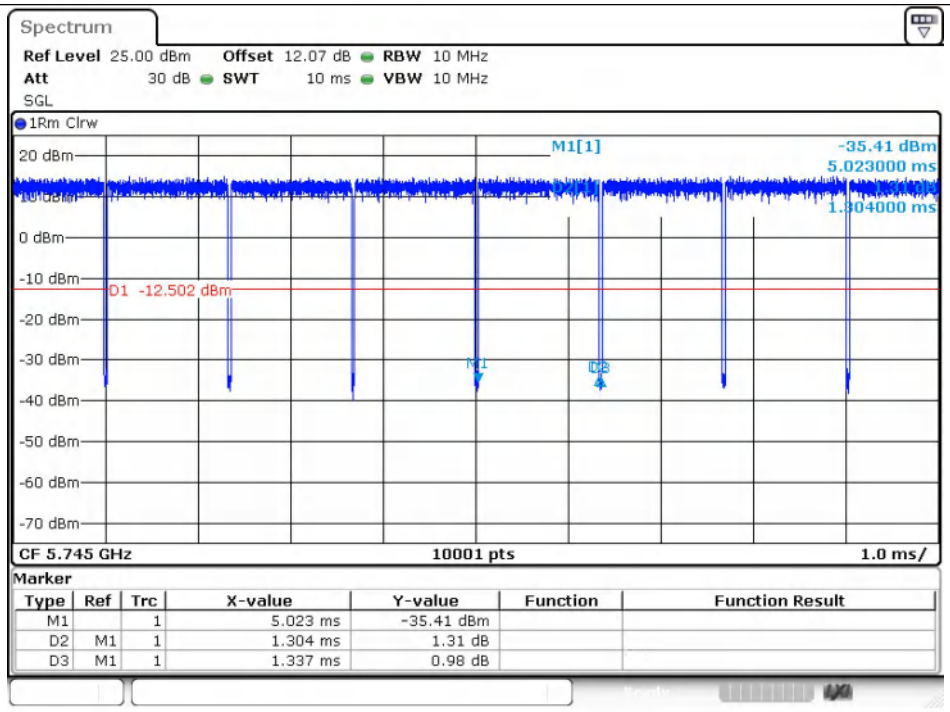
IEEE 802.11a_20MHz_Channel 149



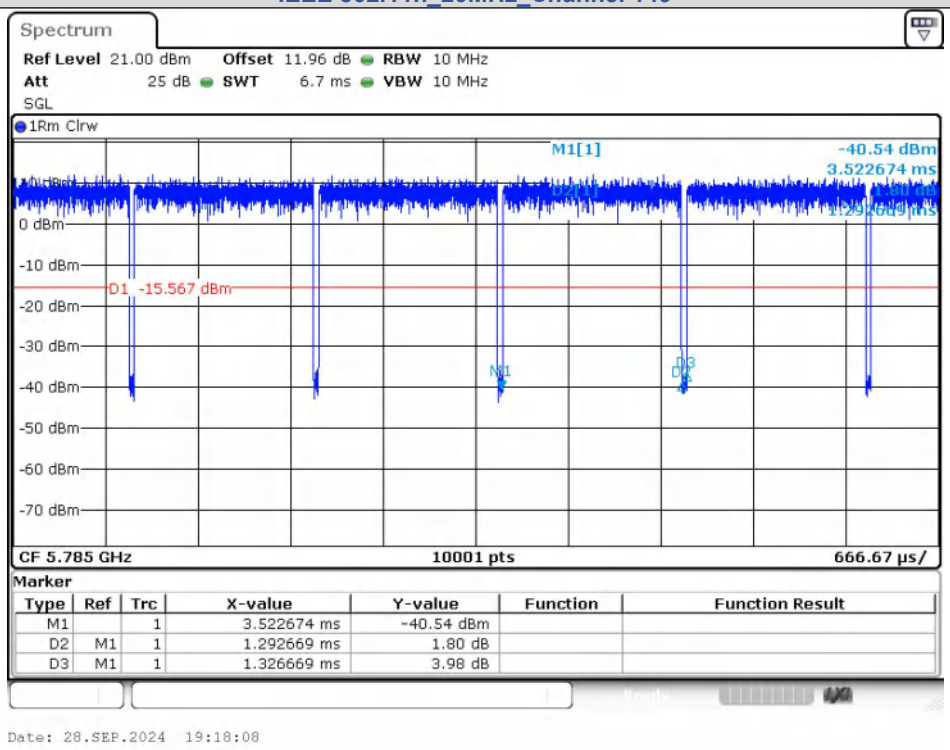
IEEE 802.11a_20MHz_Channel 157



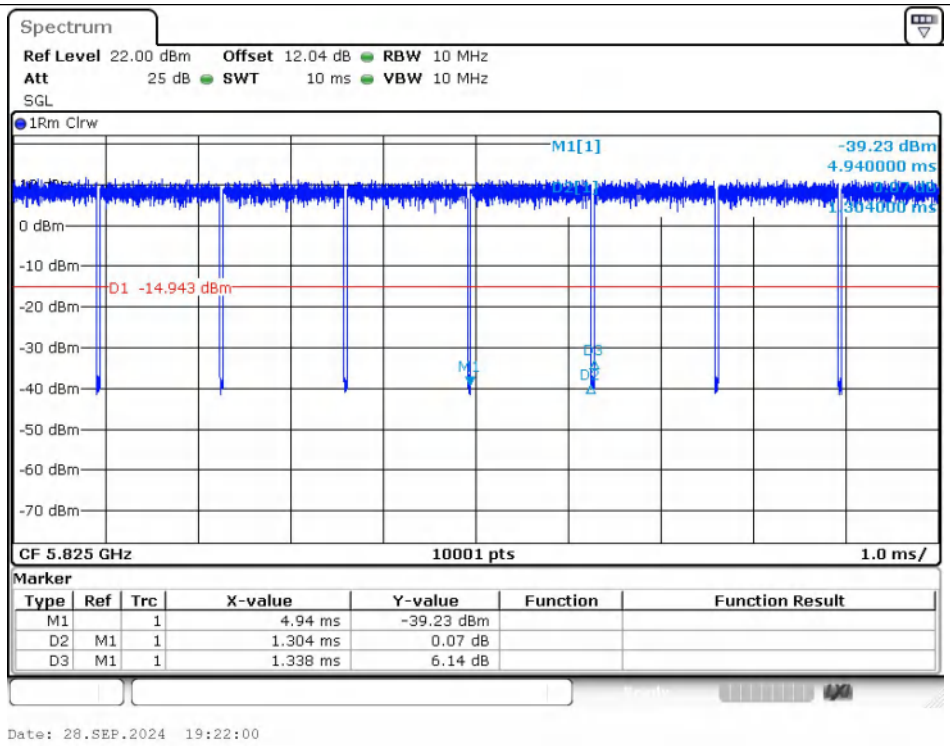
IEEE 802.11a_20MHz_Channel 165



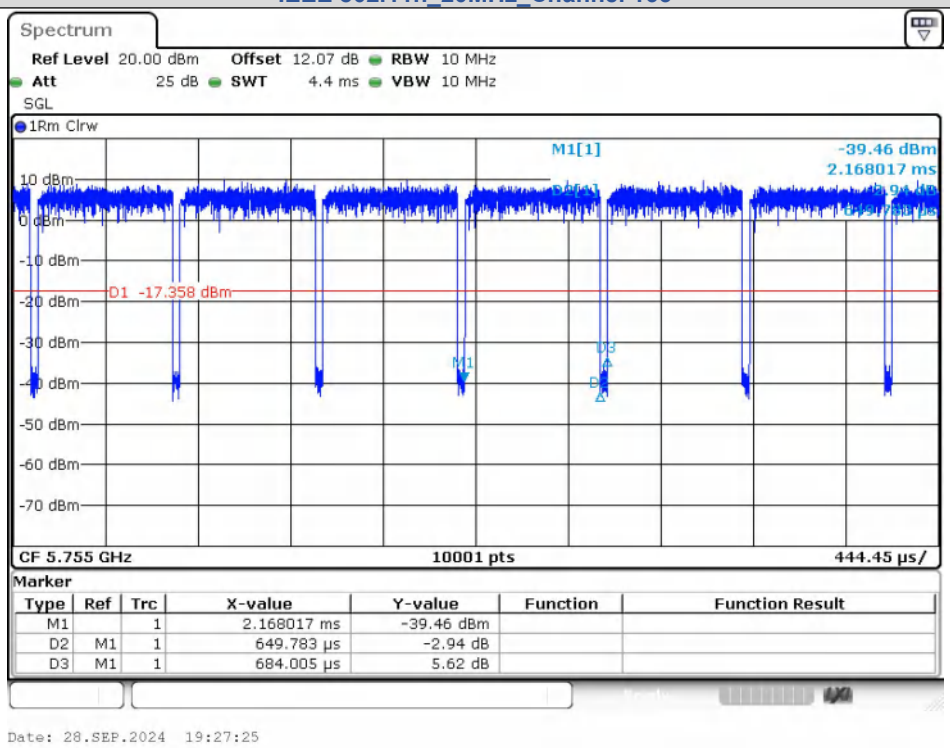
IEEE 802.11n_20MHz_Channel 149



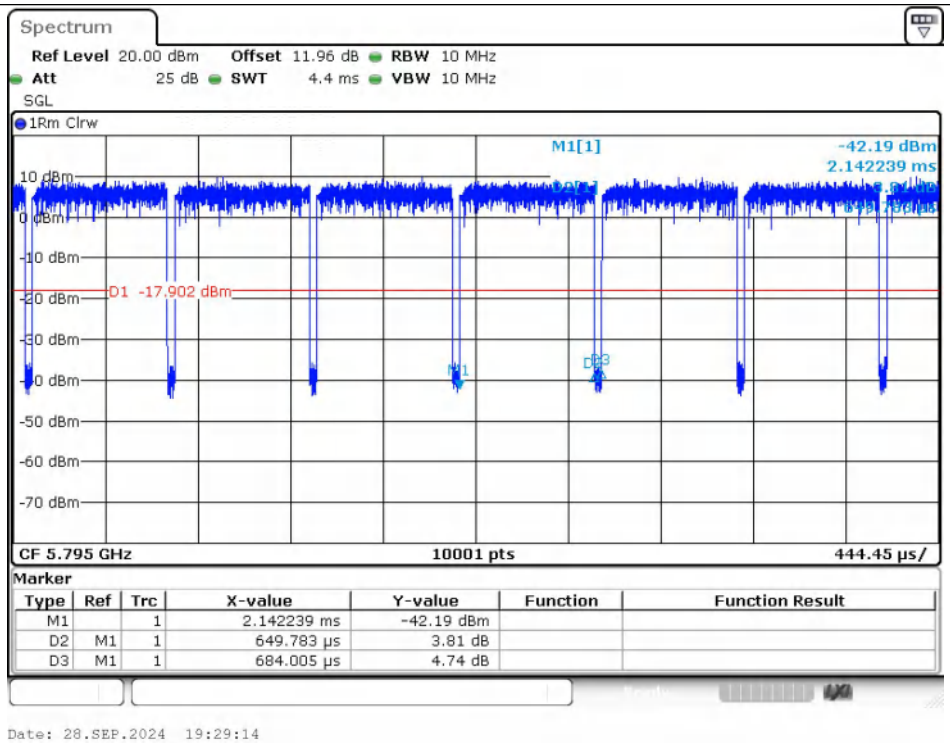
IEEE 802.11n_20MHz_Channel 157



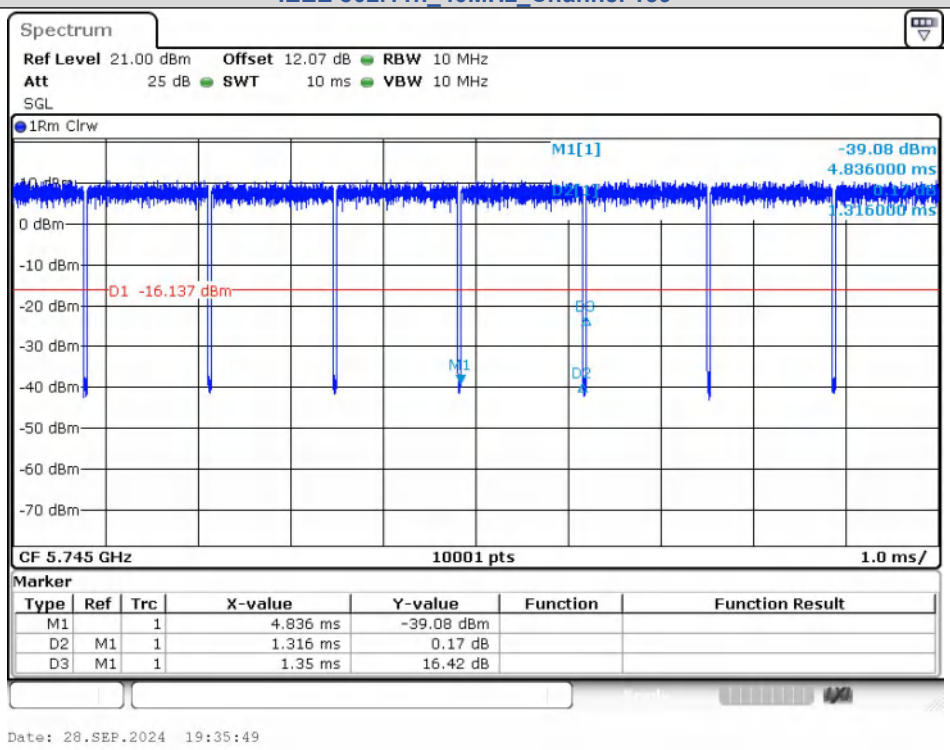
IEEE 802.11n_20MHz_Channel 165



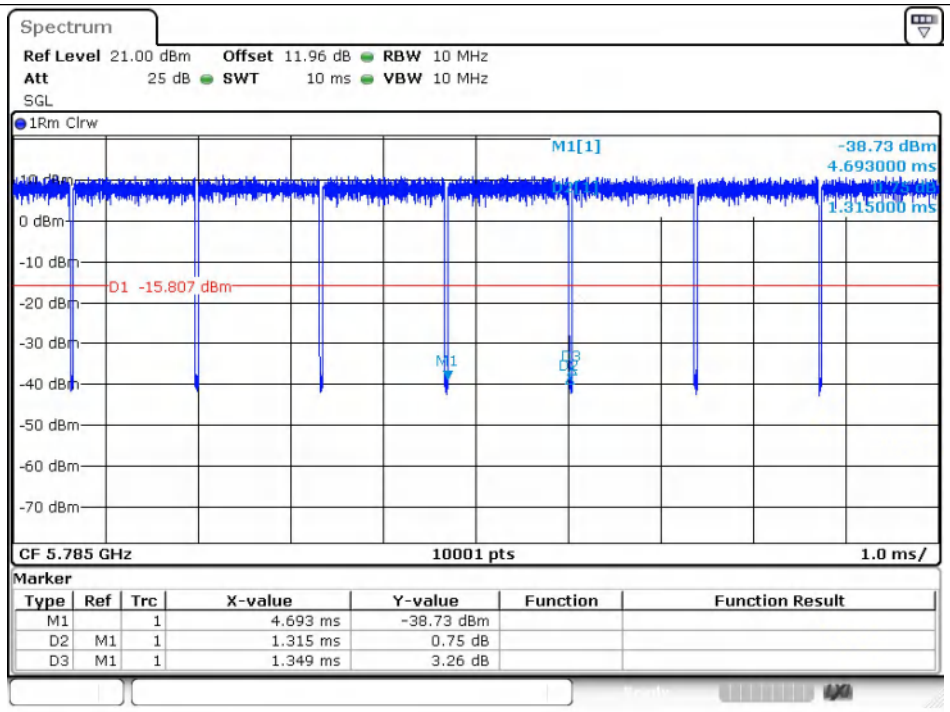
IEEE 802.11n_40MHz_Channel 151



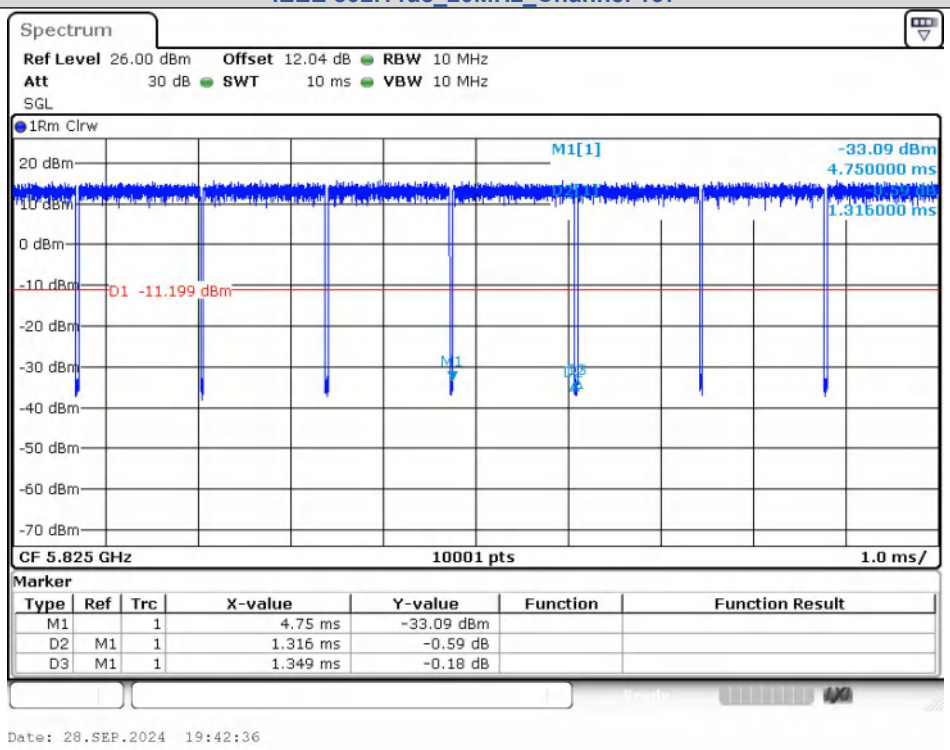
IEEE 802.11n_40MHz_Channel 159



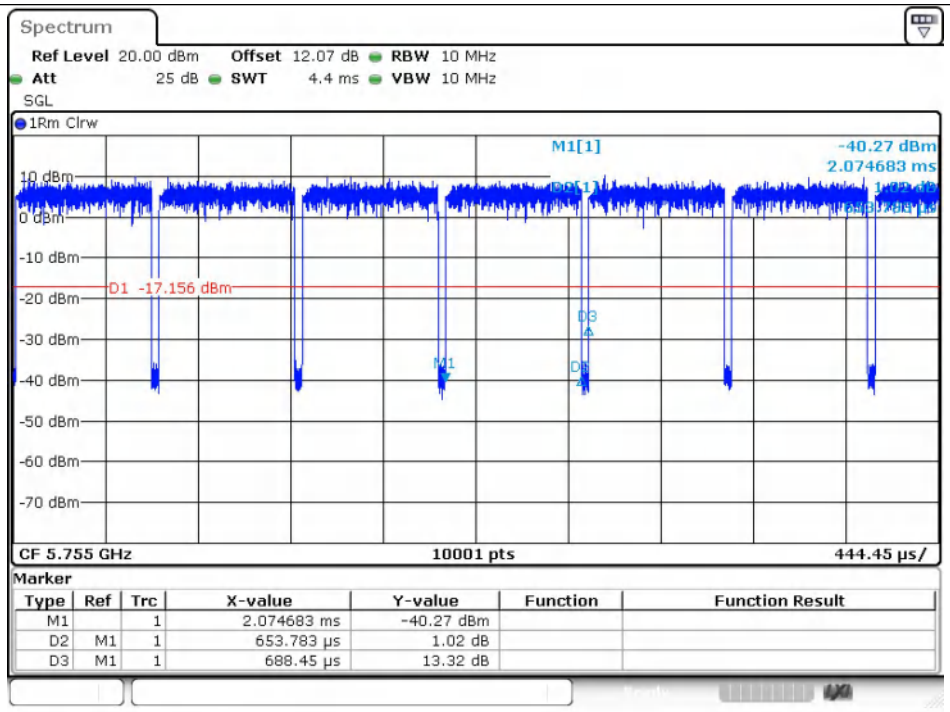
IEEE 802.11ac_20MHz_Channel 149



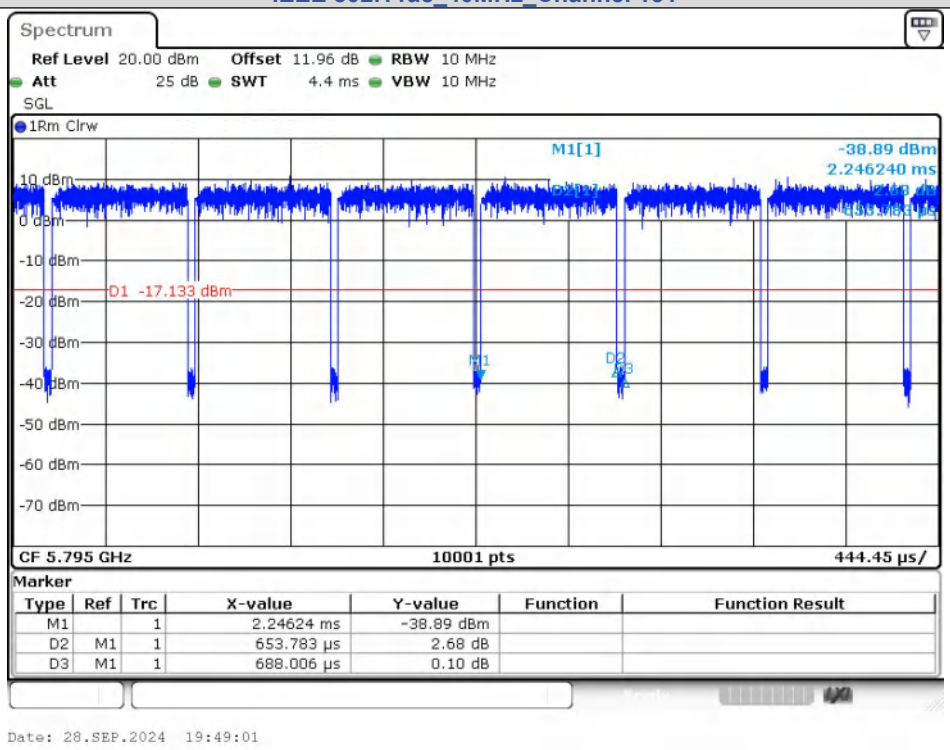
IEEE 802.11ac_20MHz_Channel 157



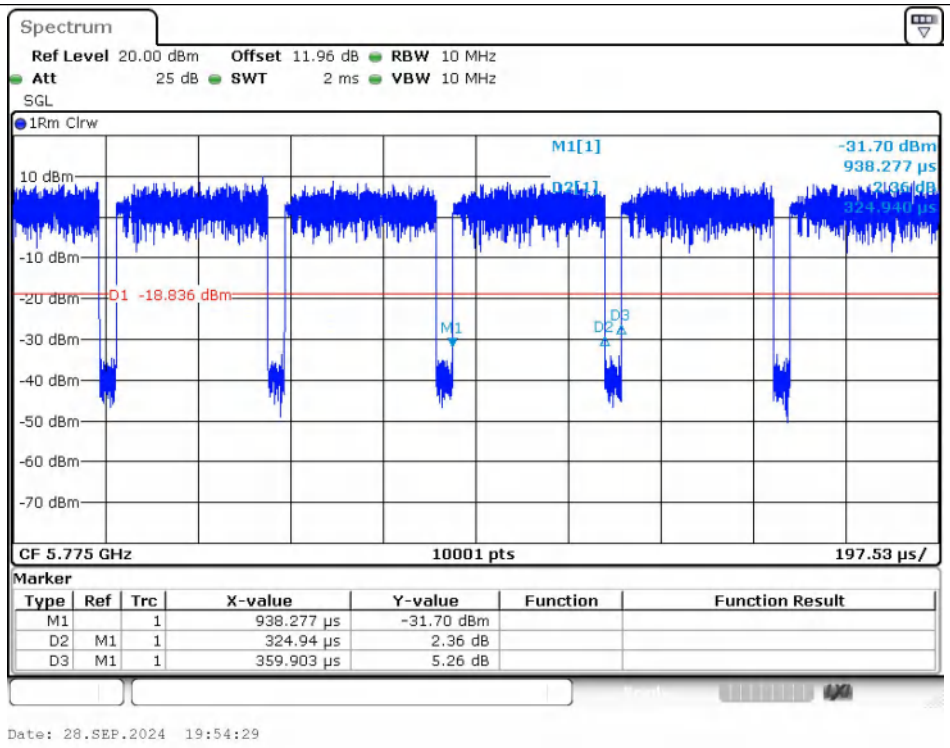
IEEE 802.11ac_20MHz_Channel 165



IEEE 802.11ac_40MHz_Channel 151



IEEE 802.11ac_40MHz_Channel 159



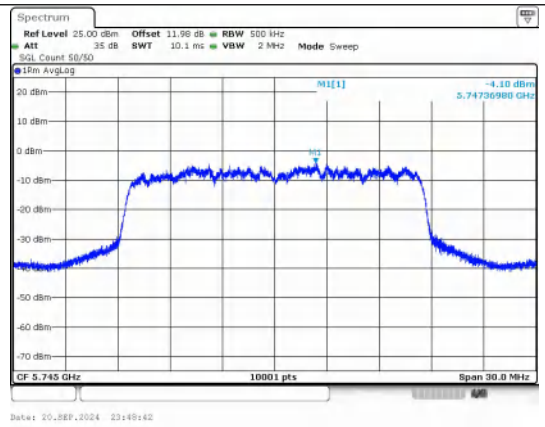
IEEE 802.11ac_80MHz_Channel 155

Peak Power Spectral Density

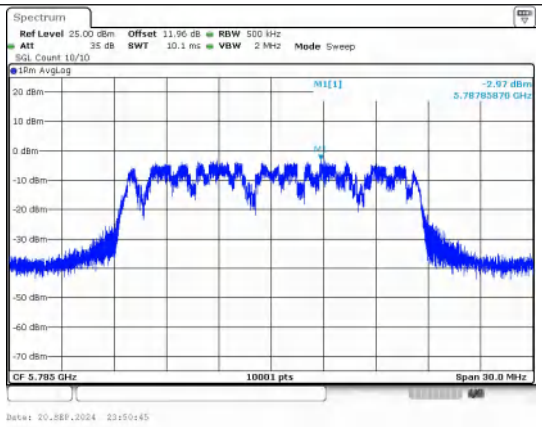
Test Result

Mode	Channel	Ant. 0 Meas PSD (dBm/MHz or dBm/0.5MHz)	Limit (dBm/MHz or dBm/0.5MHz)	Result
IEEE 802.11a	149	-4.10	30	PASS
	157	-2.97		PASS
	165	-3.51		PASS
IEEE 802.11n_20	149	0.10		PASS
	157	-4.01		PASS
	165	-4.01		PASS
IEEE 802.11n_40	151	-7.52		PASS
	159	-6.84		PASS
IEEE 802.11ac_20	149	-4.14		PASS
	157	-3.44		PASS
	165	0.69		PASS
IEEE 802.11ac_40	151	-6.60		PASS
	159	-6.71		PASS
IEEE 802.11ac_80	155	-10.85		PASS

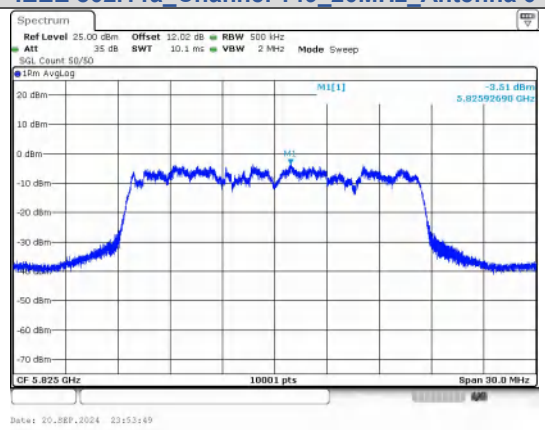
Test Graphs



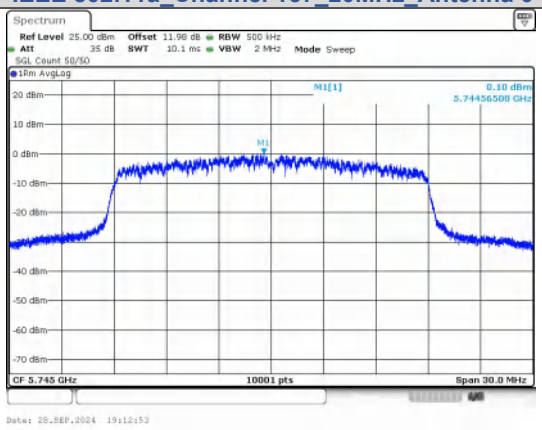
IEEE 802.11a_Channel 149_20MHz_Antenna 0



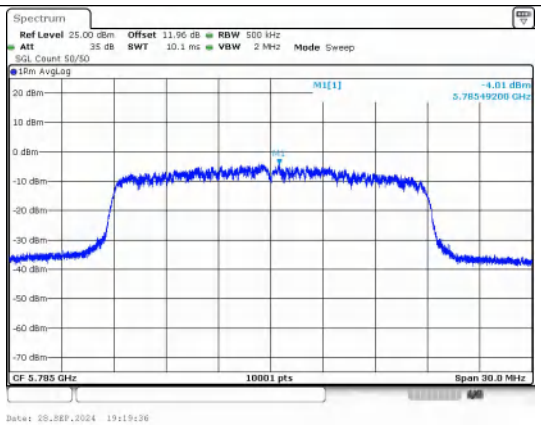
IEEE 802.11a_Channel 157_20MHz_Antenna 0



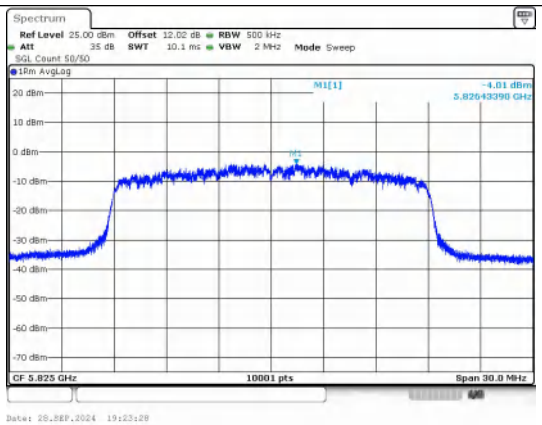
IEEE 802.11a_Channel 165_20MHz_Antenna 0



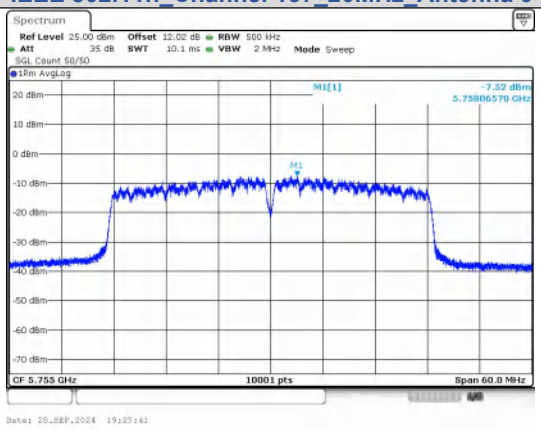
IEEE 802.11n_Channel 149_20MHz_Antenna 0



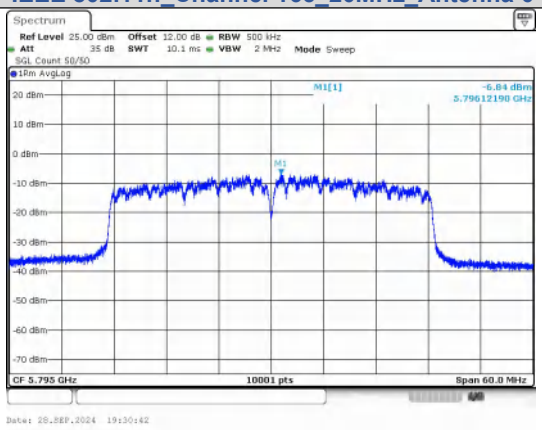
IEEE 802.11n_Channel 157_20MHz_Antenna 0



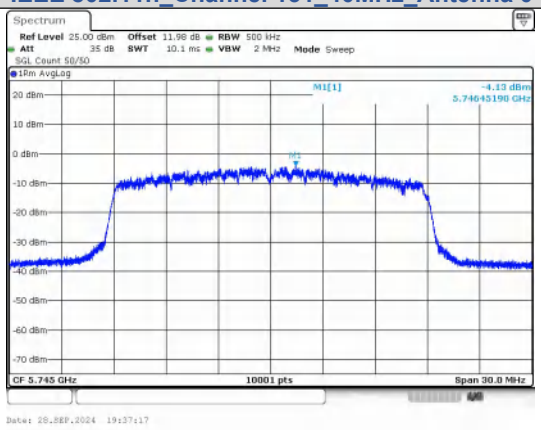
IEEE 802.11n_Channel 165_20MHz_Antenna 0



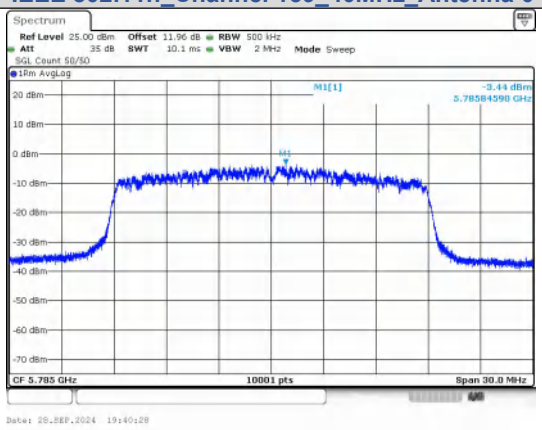
IEEE 802.11n_Channel 151_40MHz_Antenna 0



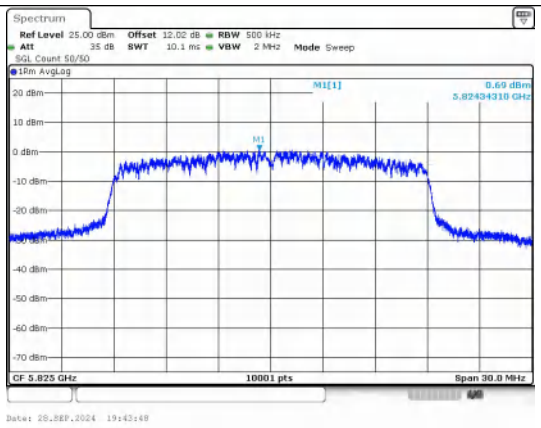
IEEE 802.11n_Channel 159_40MHz_Antenna 0



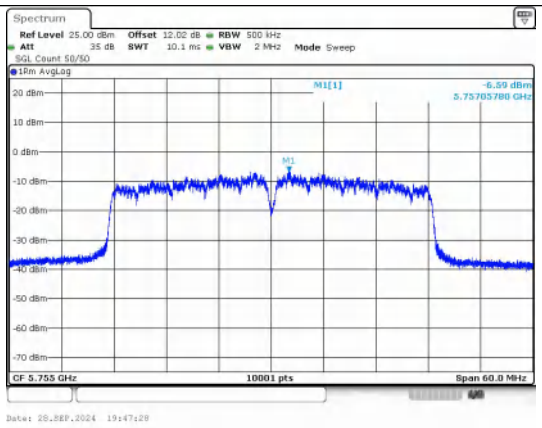
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



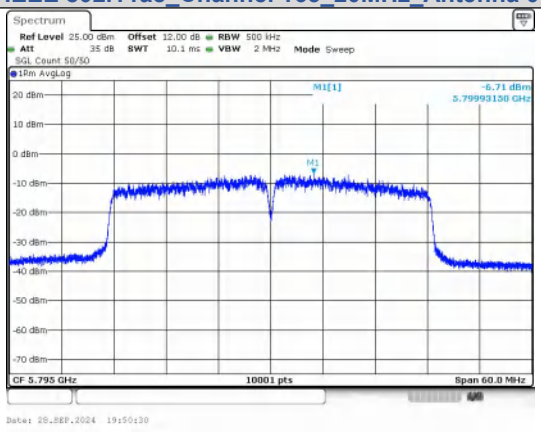
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



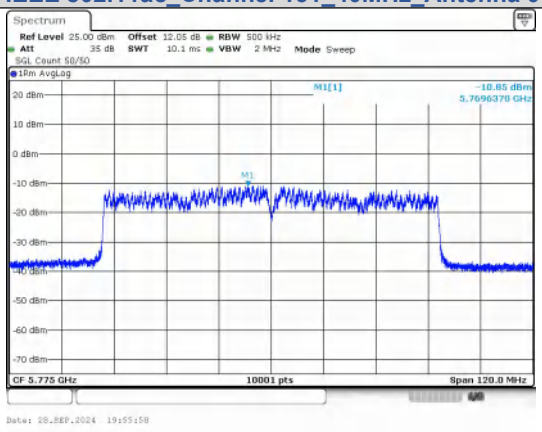
IEEE 802.11ac_Channel 165_20MHz_Antenna 0



IEEE 802.11ac_Channel 151_40MHz_Antenna 0



IEEE 802.11ac_Channel 159_40MHz_Antenna 0

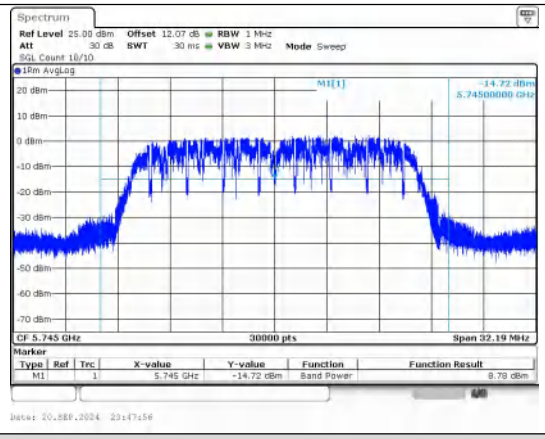


IEEE 802.11ac_Channel 155_80MHz_Antenna 0

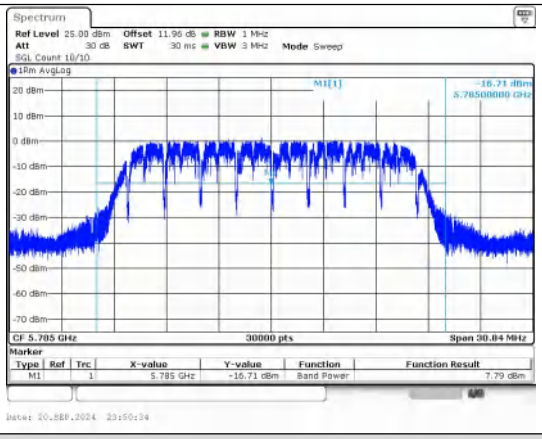
Conducted AVG Output Power

Conducted output power

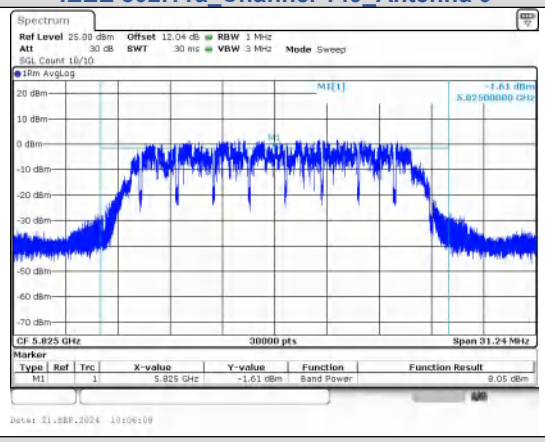
Mode	Channel	Ant. 0 (dBm)	Limit (dBm)	Result
IEEE 802.11a	149	8.78	≤30	PASS
	157	7.79	≤30	PASS
	165	8.05	≤30	PASS
IEEE 802.11n_20	149	8.31	≤30	PASS
	157	8.44	≤30	PASS
	165	8.76	≤30	PASS
IEEE 802.11n_40	151	8.49	≤30	PASS
	159	8.51	≤30	PASS
IEEE 802.11ac_20	149	8.47	≤30	PASS
	157	8.61	≤30	PASS
	165	8.07	≤30	PASS
IEEE 802.11ac_40	151	8.36	≤30	PASS
	159	8.54	≤30	PASS
IEEE 802.11ac_80	155	7.57	≤30	PASS



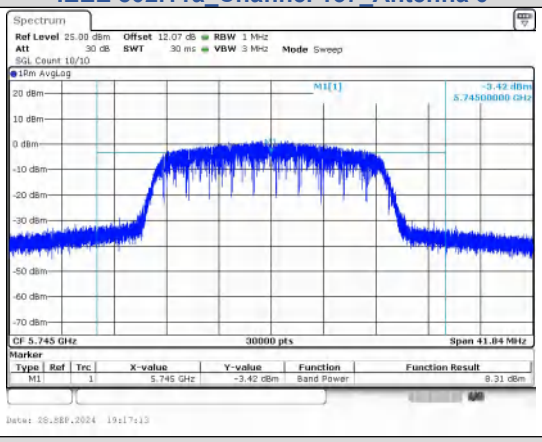
Conducted AVG output power
IEEE 802.11a_Channel 149_Antenna 0



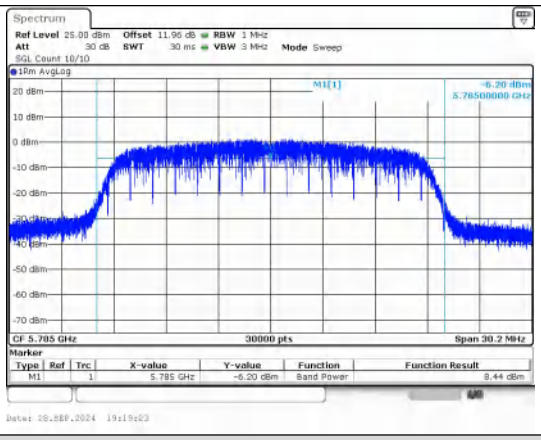
Conducted AVG output power
IEEE 802.11a_Channel 157_Antenna 0



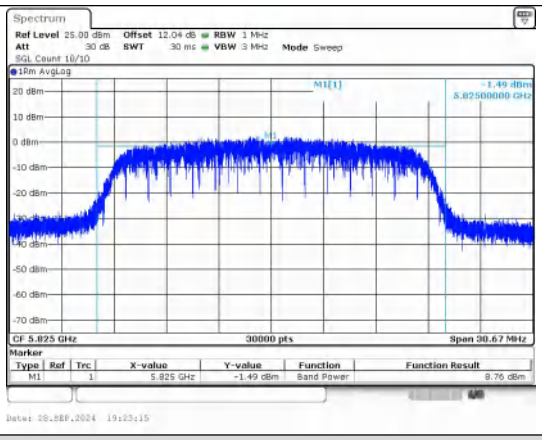
Conducted AVG output power
IEEE 802.11a_Channel 165_Antenna 0



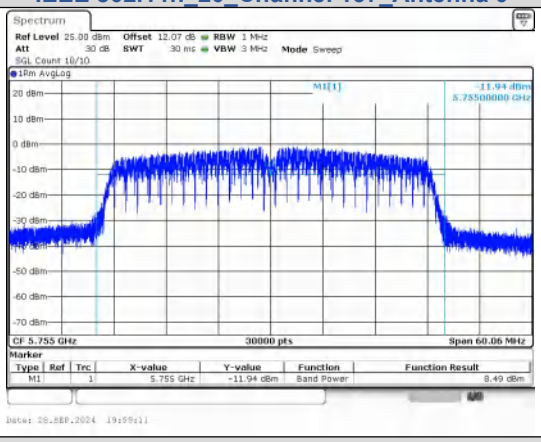
Conducted AVG output power
IEEE 802.11n_20_Channel 149_Antenna 0



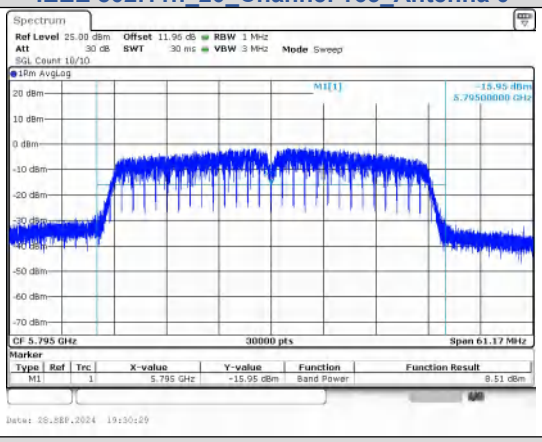
Conducted AVG output power
IEEE 802.11n_20_Channel 157_Antenna 0



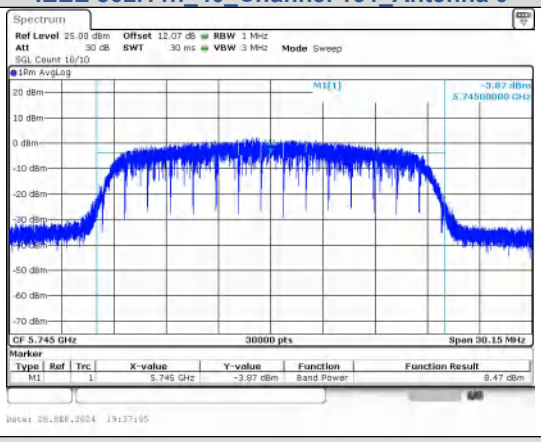
Conducted AVG output power
IEEE 802.11n_20_Channel 165_Antenna 0



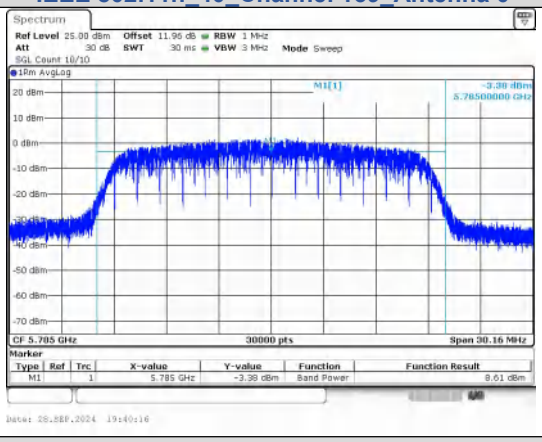
Conducted AVG output power
IEEE 802.11n_40_Channel 151_Antenna 0



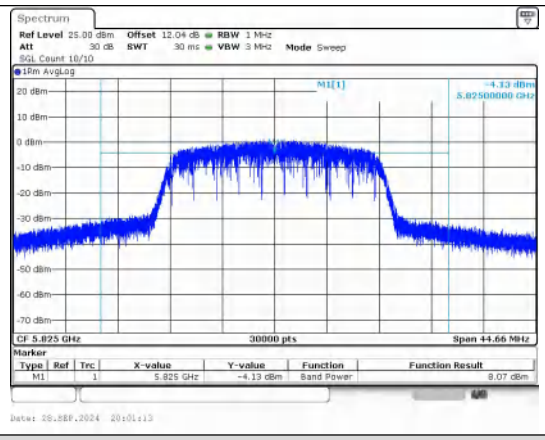
Conducted AVG output power
IEEE 802.11n_40_Channel 159_Antenna 0



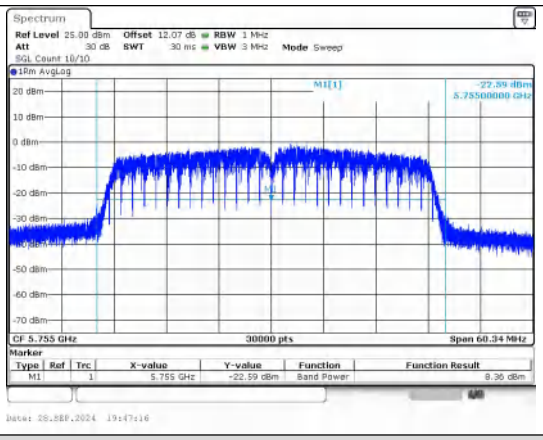
Conducted AVG output power
IEEE 802.11ac_20_Channel 149_Antenna 0



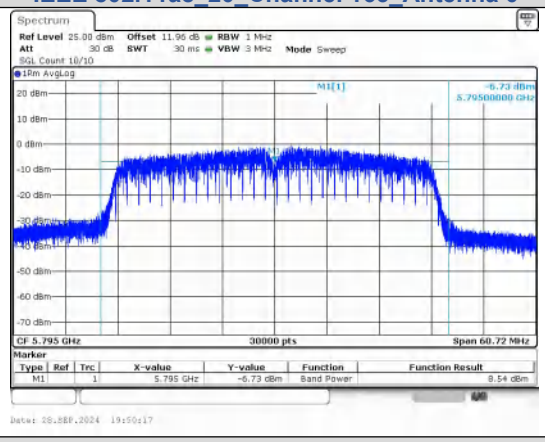
Conducted AVG output power
IEEE 802.11ac_20_Channel 157_Antenna 0



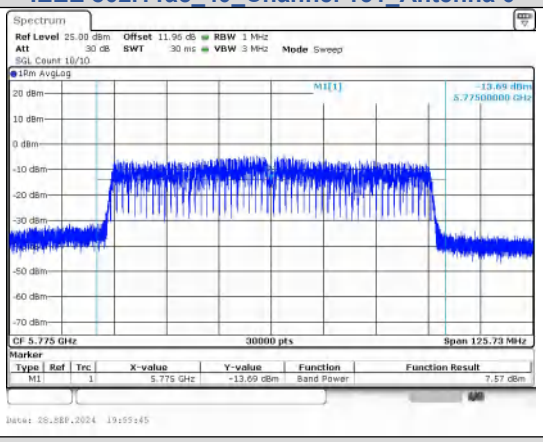
Conducted AVG output power
IEEE 802.11ac_20_Channel 165_Antenna 0



Conducted AVG output power
IEEE 802.11ac_40_Channel 151_Antenna 0



Conducted AVG output power
IEEE 802.11ac_40_Channel 159_Antenna 0



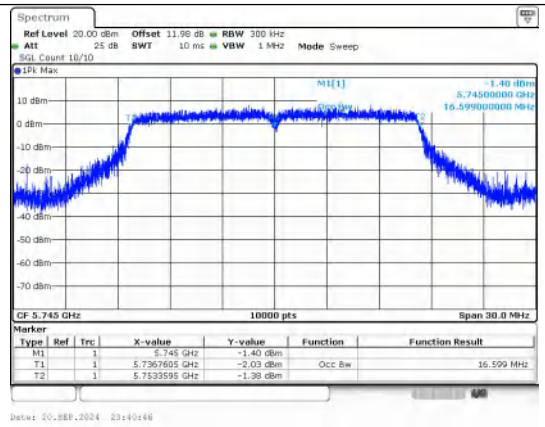
Conducted AVG output power
IEEE 802.11ac_80_Channel 155_Antenna 0

99% Bandwidth

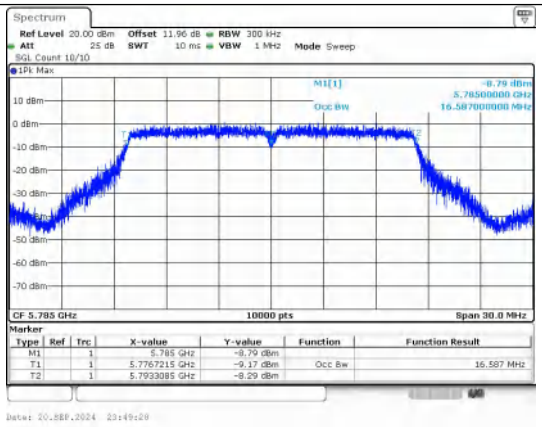
Test Result

Mode	Channel	Ant.	Center Frequency (MHz)	99% BW (MHz)
IEEE 802.11a	149	0	5745	16.599
	157		5785	16.587
	165		5825	16.575
IEEE 802.11n_20	149		5745	17.703
	157		5785	17.616
	165		5825	17.607
IEEE 802.11n_40	151		5755	35.928
	159		5795	35.946
IEEE 802.11ac_20	149		5745	17.580
	157		5785	17.583
	165		5825	17.742
IEEE 802.11ac_40	151		5755	35.934
	159		5795	35.916
IEEE 802.11ac_80	155		5775	75.756

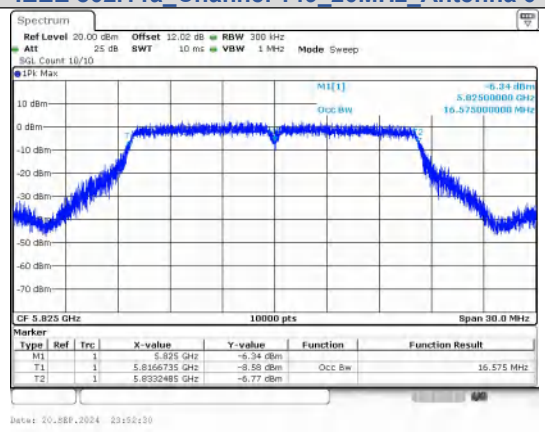
Test Graphs



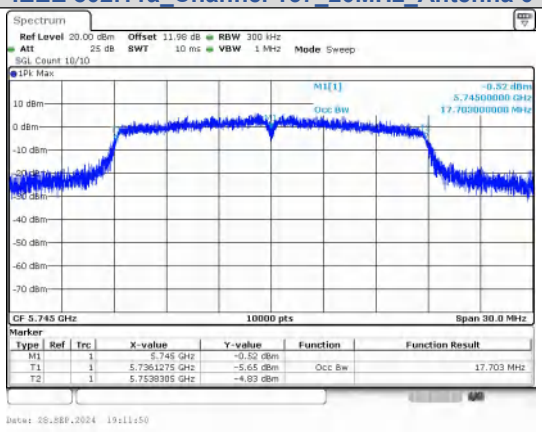
IEEE 802.11a_Channel 149_20MHz_Antenna 0



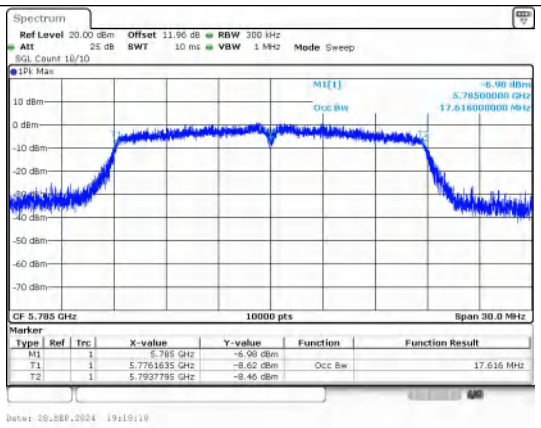
IEEE 802.11a_Channel 157_20MHz_Antenna 0



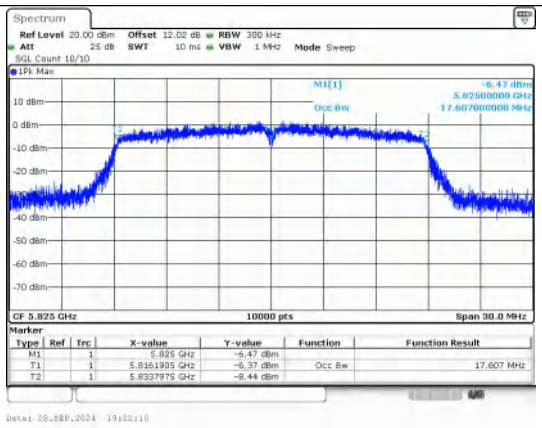
IEEE 802.11a_Channel 165_20MHz_Antenna 0



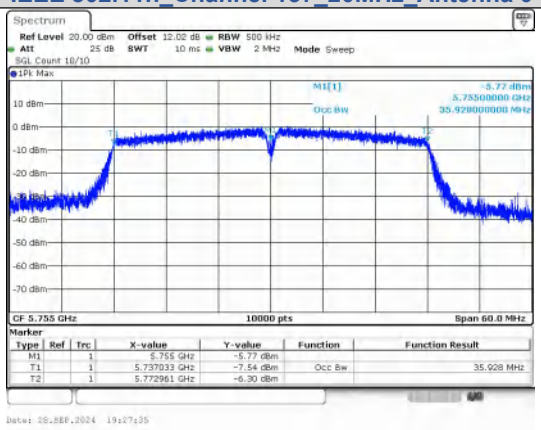
IEEE 802.11n_Channel 149_20MHz_Antenna 0



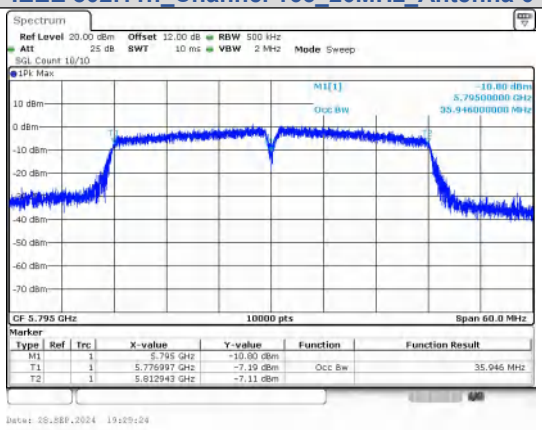
IEEE 802.11n_Channel 157_20MHz_Antenna 0



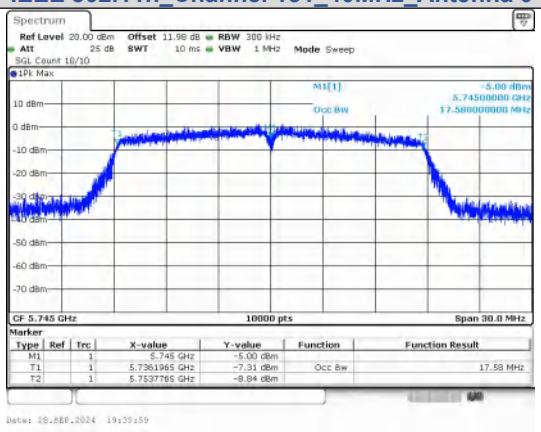
IEEE 802.11n_Channel 165_20MHz_Antenna 0



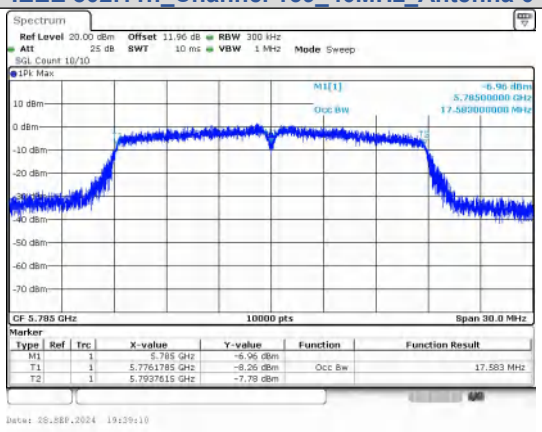
IEEE 802.11n_Channel 151_40MHz_Antenna 0



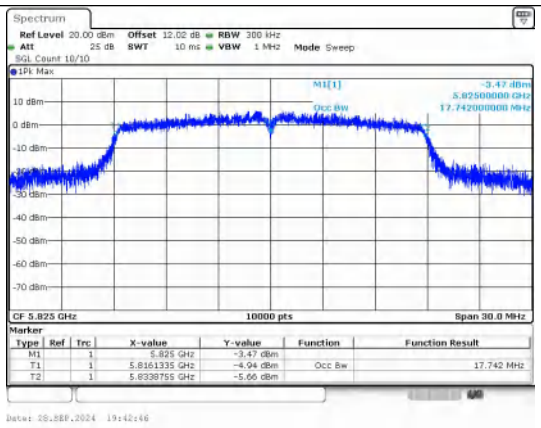
IEEE 802.11n_Channel 159_40MHz_Antenna 0



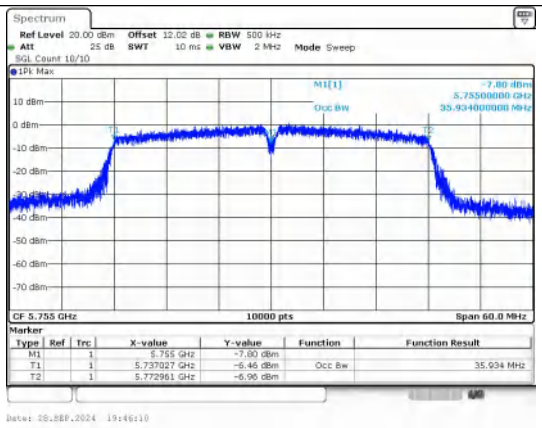
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



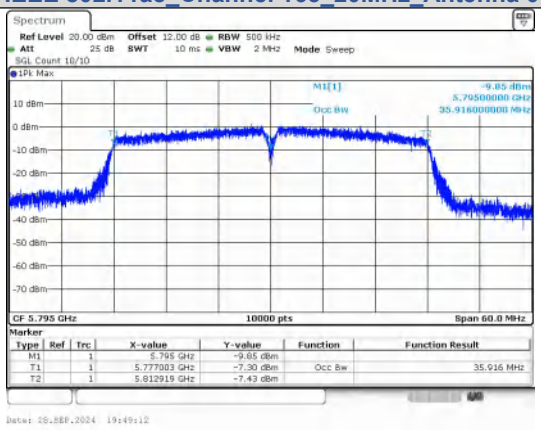
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



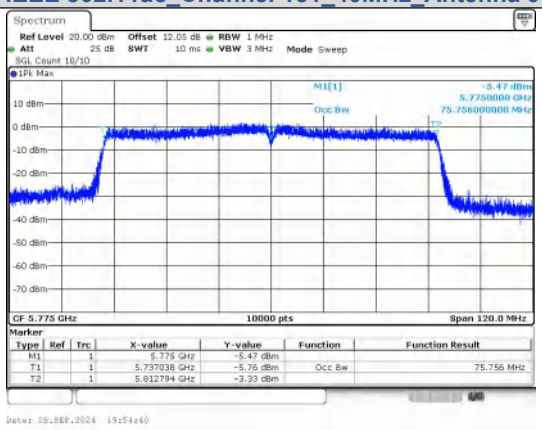
IEEE 802.11ac_Channel 165_20MHz_Antenna 0



IEEE 802.11ac_Channel 151_40MHz_Antenna 0



IEEE 802.11ac_Channel 159_40MHz_Antenna 0



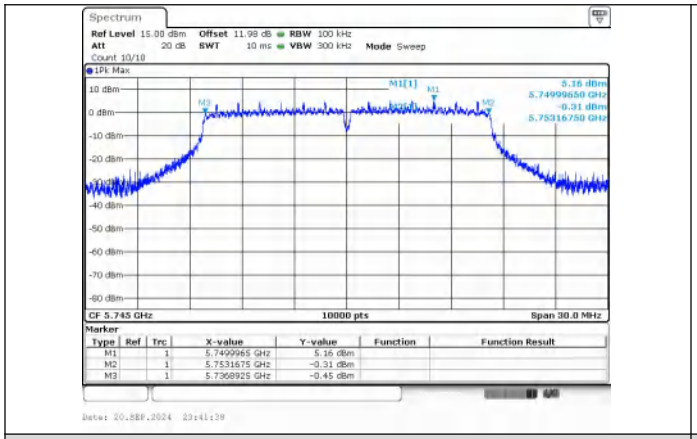
IEEE 802.11ac_Channel 155_80MHz_Antenna 0

6dB Bandwidth

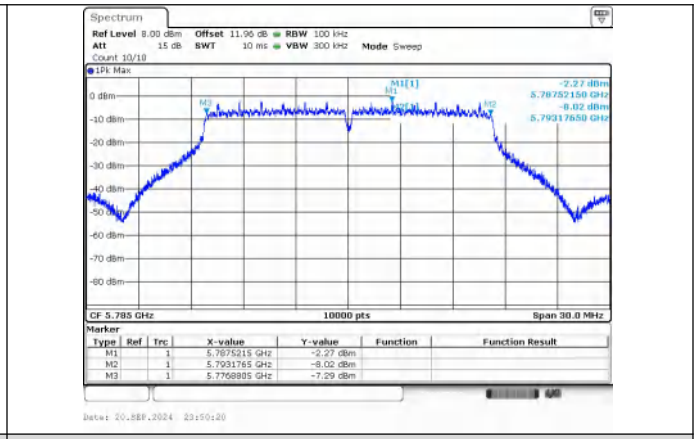
Test Result

Mode	Channel	Ant.	Center Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a	149	0	5745	16.28	≥0.5	PASS
	157		5785	16.30		PASS
	165		5825	16.29		PASS
IEEE 802.11n_20	149		5745	15.07		PASS
	157		5785	14.04		PASS
	165		5825	15.10		PASS
IEEE 802.11n_40	151		5755	35.08		PASS
	159		5795	35.05		PASS
IEEE 802.11ac_20	149		5745	15.05		PASS
	157		5785	15.10		PASS
	165		5825	15.05		PASS
IEEE 802.11ac_40	151		5755	35.07		PASS
	159		5795	35.04		PASS
IEEE 802.11ac_80	155		5775	75.09		PASS

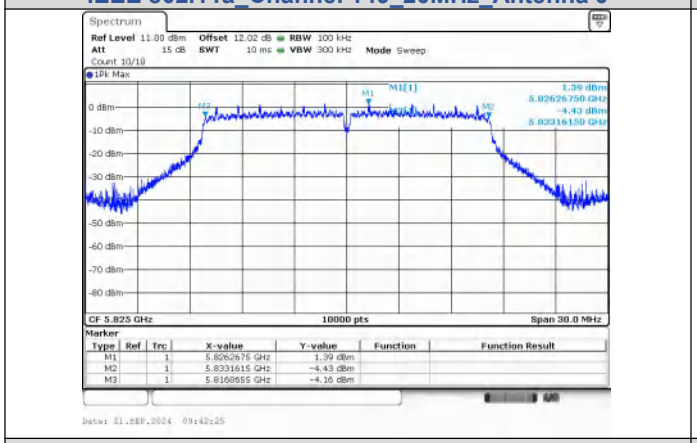
Test Graphs



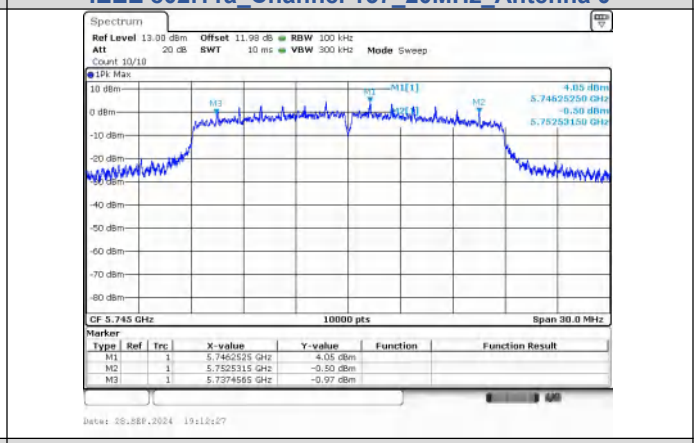
IEEE 802.11a_Channel 149_20MHz_Antenna 0



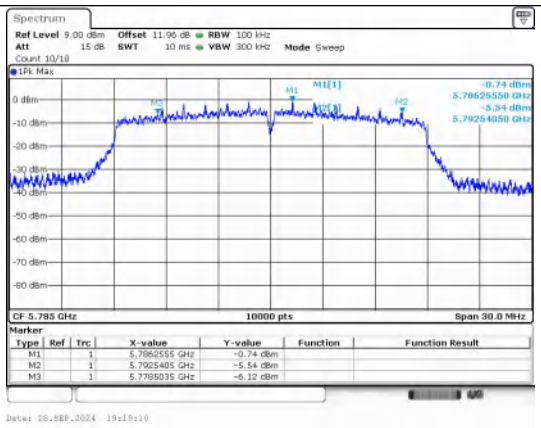
IEEE 802.11a_Channel 157_20MHz_Antenna 0



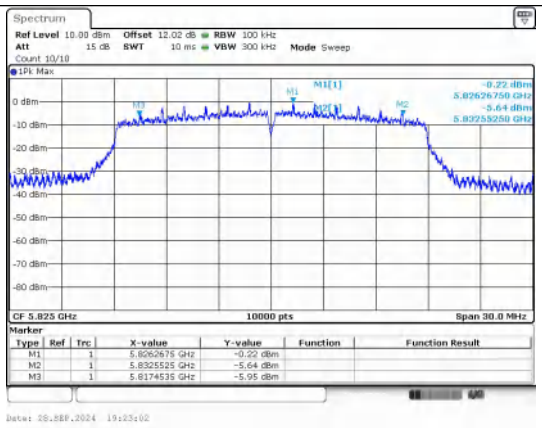
IEEE 802.11a_Channel 165_20MHz_Antenna 0



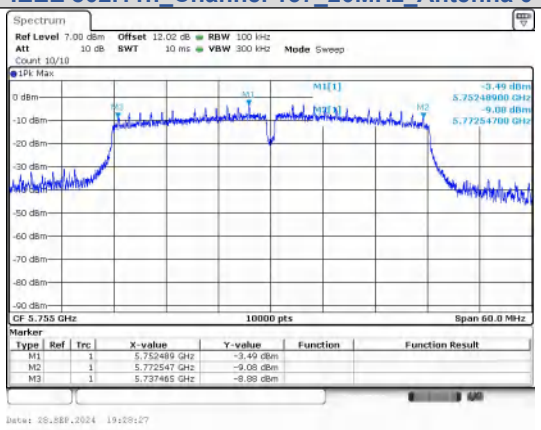
IEEE 802.11n_Channel 149_20MHz_Antenna 0



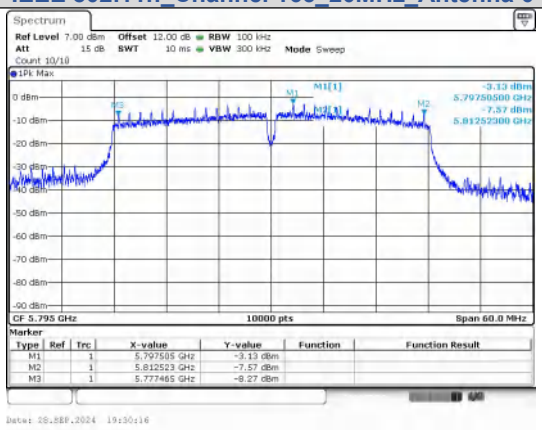
IEEE 802.11n_Channel 157_20MHz_Antenna 0



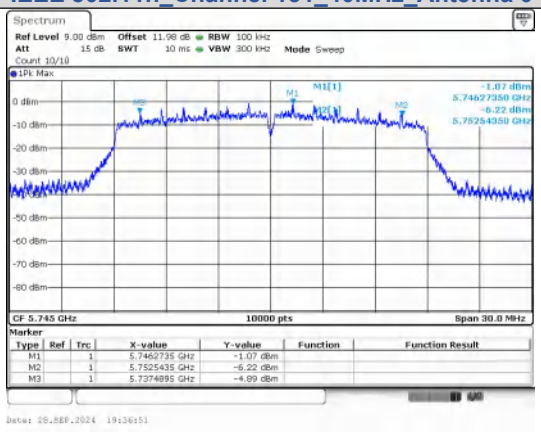
IEEE 802.11n_Channel 165_20MHz_Antenna 0



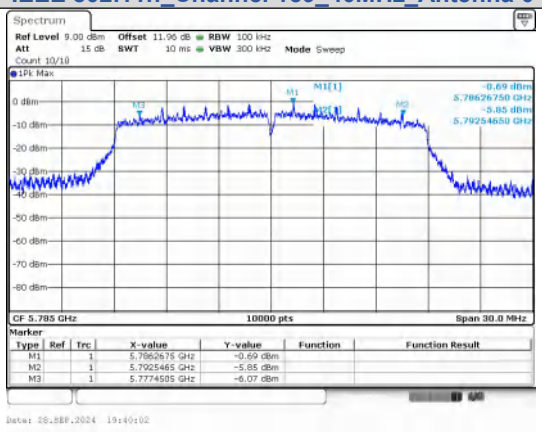
IEEE 802.11n_Channel 151_40MHz_Antenna 0



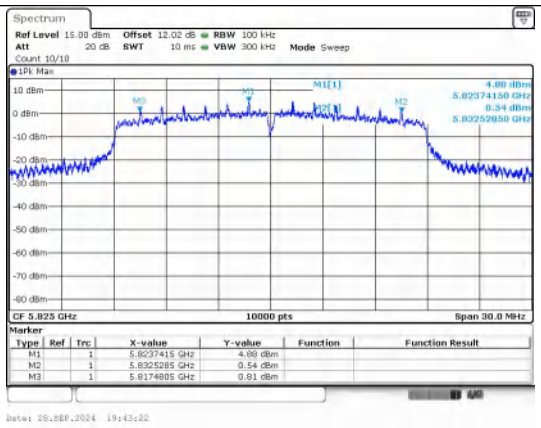
IEEE 802.11n_Channel 159_40MHz_Antenna 0



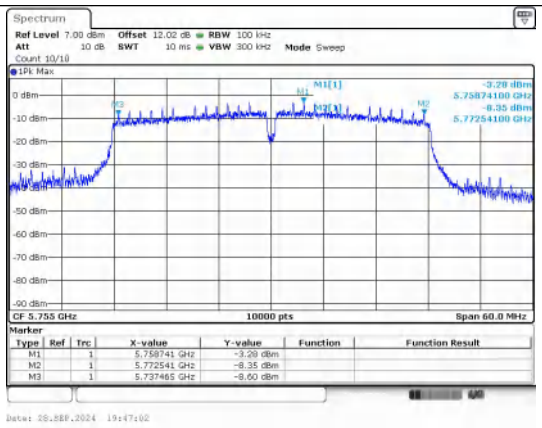
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



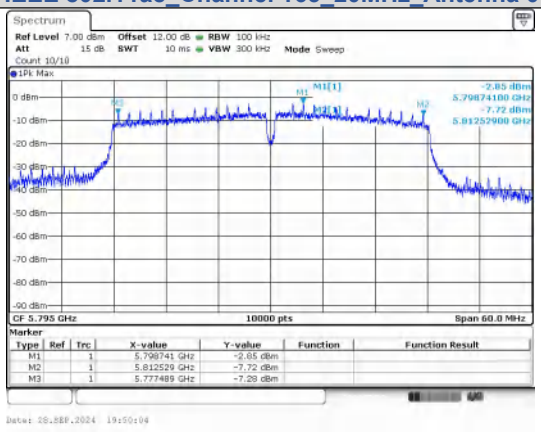
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



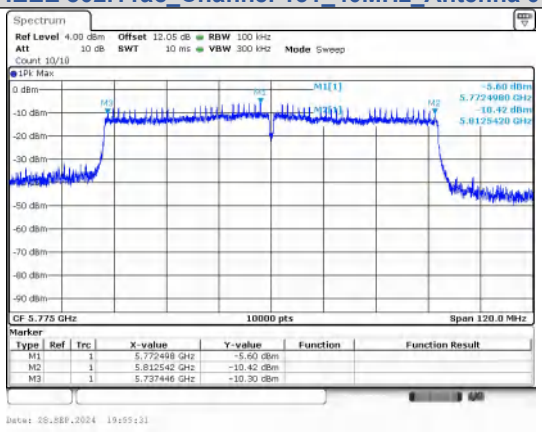
IEEE 802.11ac_Channel 165_20MHz_Antenna 0



IEEE 802.11ac_Channel 151_40MHz_Antenna 0



IEEE 802.11ac_Channel 159_40MHz_Antenna 0



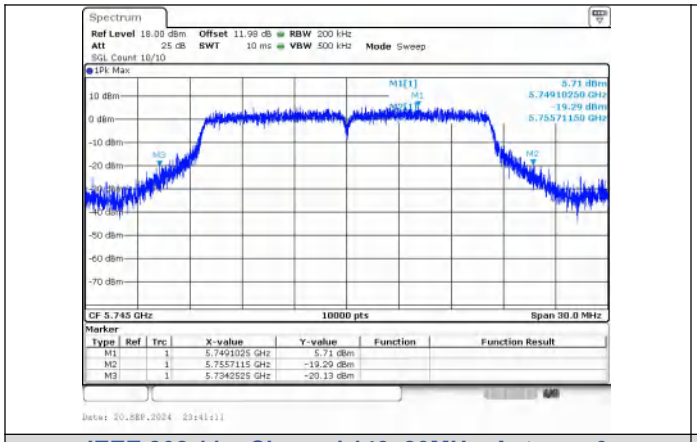
IEEE 802.11ac_Channel 155_80MHz_Antenna 0

26dB Bandwidth

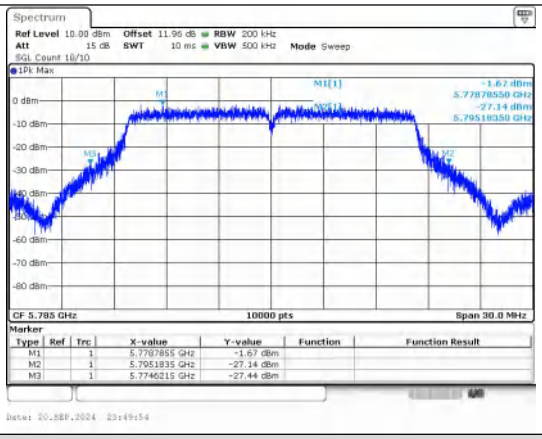
Test Result

Mode	Channel	Ant.	Center Frequency (MHz)	26 dB Bandwidth (MHz)
IEEE 802.11a	149	0	5745	21.46
	157		5785	20.56
	165		5825	20.83
IEEE 802.11n_20	149		5745	27.89
	157		5785	20.13
	165		5825	20.45
IEEE 802.11n_40	151		5755	40.04
	159		5795	40.78
IEEE 802.11ac_20	149		5745	20.10
	157		5785	20.11
	165		5825	29.77
IEEE 802.11ac_40	151		5755	40.23
	159		5795	40.48
IEEE 802.11ac_80	155		5775	83.82

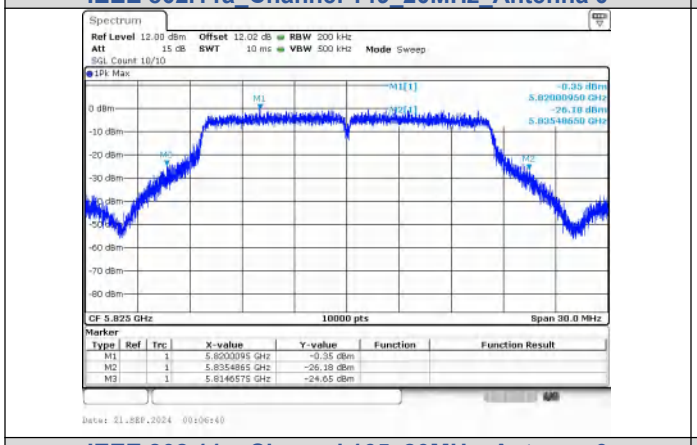
Test Graphs



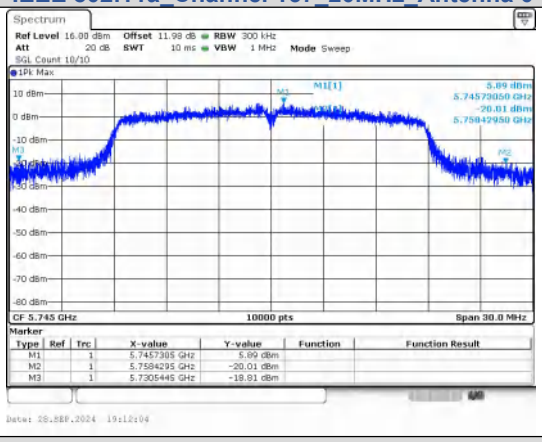
IEEE 802.11a_Channel 149_20MHz_Antenna 0



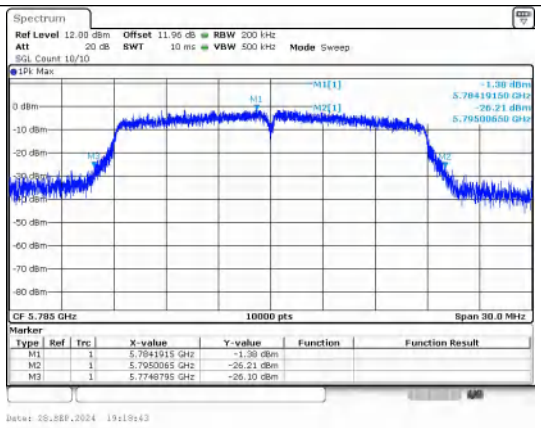
IEEE 802.11a_Channel 157_20MHz_Antenna 0



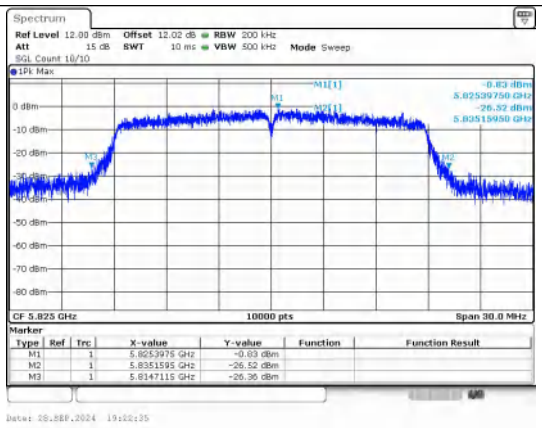
IEEE 802.11a_Channel 165_20MHz_Antenna 0



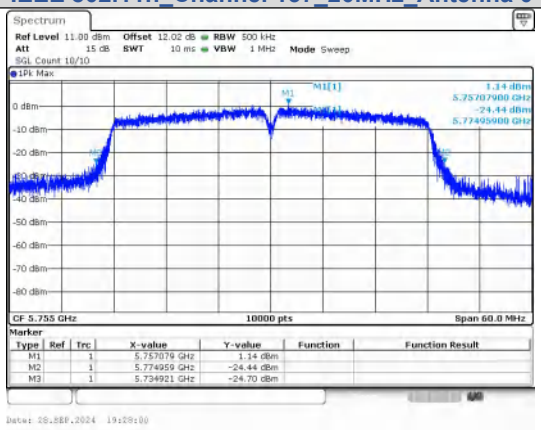
IEEE 802.11n_Channel 149_20MHz_Antenna 0



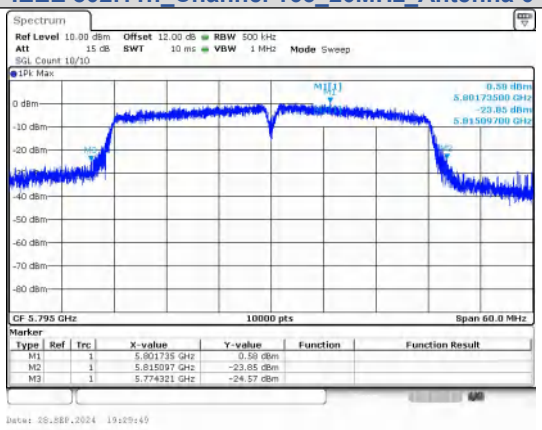
IEEE 802.11n_Channel 157_20MHz_Antenna 0



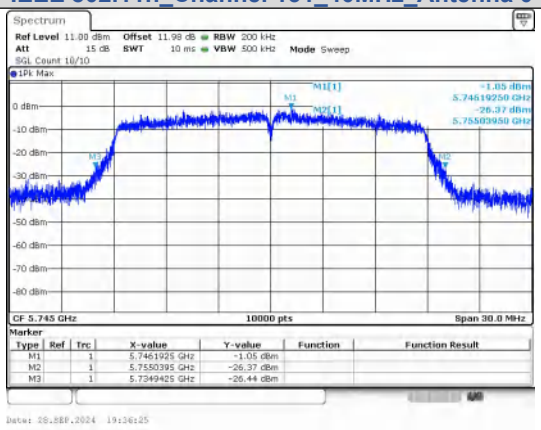
IEEE 802.11n_Channel 165_20MHz_Antenna 0



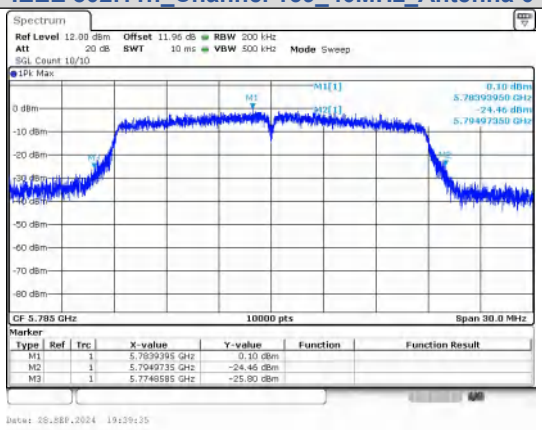
IEEE 802.11n_Channel 151_40MHz_Antenna 0



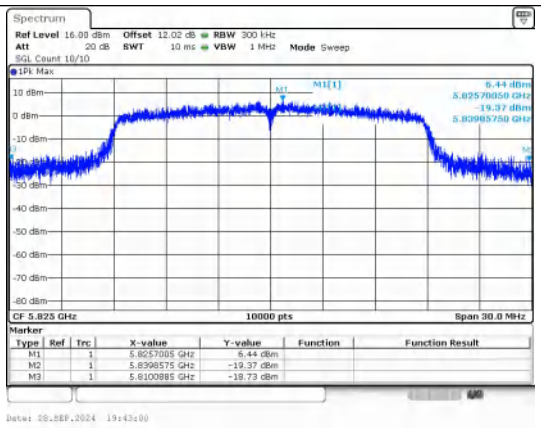
IEEE 802.11n_Channel 159_40MHz_Antenna 0



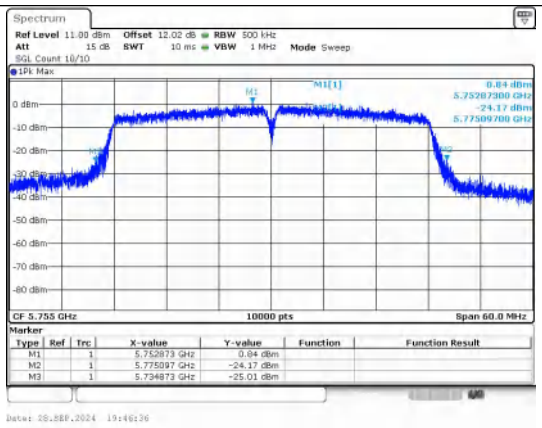
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



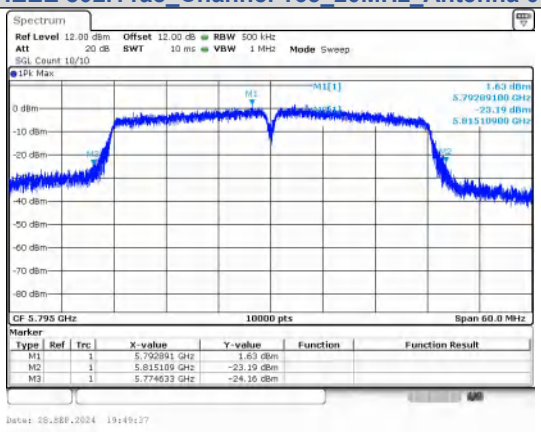
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



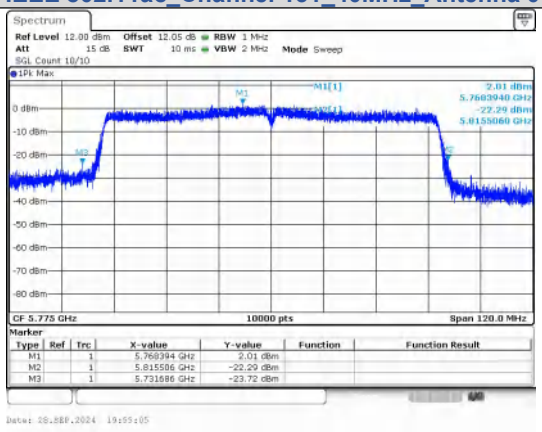
IEEE 802.11ac_Channel 165_20MHz_Antenna 0



IEEE 802.11ac_Channel 151_40MHz_Antenna 0



IEEE 802.11ac_Channel 159_40MHz_Antenna 0



IEEE 802.11ac_Channel 155_80MHz_Antenna 0

Conducted Out Of Band Emission

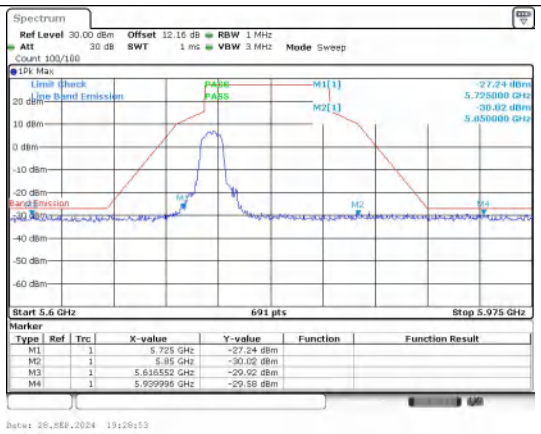
Test Result

Mode	Channel	Ant.	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
IEEE 802.11a	149	0	5555.12	-44.030	-27	-17.030	PASS
			5616.55	-29.919	-27	-2.919	PASS
			5725.00	-27.240	15.6	-54.240	PASS
			5850.00	-30.020	10	-57.020	PASS
			5940.00	-29.579	-27	-2.579	PASS
			21926.7	-43.710	-27	-16.710	PASS
	157		5622.93	-44.710	-27	-17.710	PASS
			16277.3	-42.440	-27	-15.440	PASS
	165		3494.26	-44.910	-27	-17.910	PASS
			5602.44	-30.343	-27	-3.343	PASS
			5725.00	-32.200	15.6	-59.200	PASS
			5850.00	-30.700	10	-57.700	PASS
			5934.57	-29.338	-27	-2.338	PASS
			16734.5	-42.540	-27	-15.540	PASS
IEEE 802.11n_20	149		5574.97	-44.300	-27	-17.300	PASS
			5634.46	-29.515	-27	-2.515	PASS
			5725.00	-22.090	15.6	-49.090	PASS
			5850.00	-30.730	10	-57.730	PASS
			5925.89	-28.736	-27	-1.736	PASS
			17234.9	-42.840	-27	-15.840	PASS
	157		5403.38	-44.270	-27	-17.270	PASS
			16590.8	-43.030	-27	-16.030	PASS
	165		1621.49	-43.470	-27	-16.470	PASS
			5629.03	-30.572	-27	-3.572	PASS

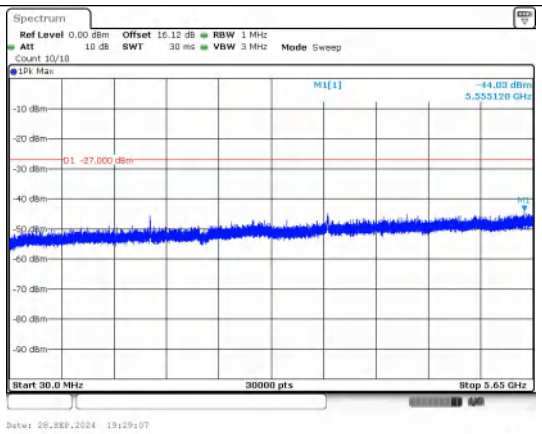
			5725.00	-32.420	15.6	-59.420	PASS
			5850.00	-26.640	10	-53.640	PASS
			5961.70	-29.783	-27	-2.783	PASS
			22067.2	-42.020	-27	-15.020	PASS
IEEE 802.11n_40	151		5602.44	-29.913	-27	-2.913	PASS
			5631.92	-41.380	-27	-14.380	PASS
			5725.00	-19.120	15.6	-46.120	PASS
			5850.00	-31.670	10	-58.670	PASS
			5929.14	-30.264	-27	-3.264	PASS
			22066.0	-43.000	-27	-16.000	PASS
	159		4635.50	-44.380	-27	-17.380	PASS
			5633.92	-29.848	-27	-2.848	PASS
			5725.00	-31.400	15.6	-58.400	PASS
			5850.00	-30.360	10	-57.360	PASS
			5945.42	-29.937	-27	-2.937	PASS
			22095.2	-43.120	-27	-16.120	PASS
IEEE 802.11ac_20	149		3447.24	-44.060	-27	-17.060	PASS
			5631.20	-29.241	-27	-2.241	PASS
			5725.00	-21.840	15.6	-48.840	PASS
			5850.00	-29.590	10	-56.590	PASS
			5951.39	-29.172	-27	-2.172	PASS
			17234.9	-42.620	-27	-15.620	PASS
	157		5618.43	-43.660	-27	-16.660	PASS
			16286.9	-42.320	-27	-15.320	PASS
	165		3491.64	-44.090	-27	-17.090	PASS
			5645.86	-29.697	-27	-2.697	PASS
			5725.00	-30.740	15.6	-57.740	PASS
			5850.00	-29.270	10	-56.270	PASS

			5932.94	-29.604	-27	-2.604	PASS
			16881.4	-43.030	-27	-16.030	PASS
IEEE 802.11ac_40	151		5613.84	-30.021	-27	-3.021	PASS
			5643.16	-44.290	-27	-17.290	PASS
			5725.00	-22.840	15.6	-49.840	PASS
			5850.00	-31.560	10	-58.560	PASS
			5932.94	-30.236	-27	-3.236	PASS
			16234.1	-42.580	-27	-15.580	PASS
	159		4950.59	-45.170	-27	-18.170	PASS
			5630.66	-28.841	-27	-1.841	PASS
			5725.00	-31.540	15.6	-58.540	PASS
			5850.00	-28.980	10	-55.980	PASS
			5926.97	-29.255	-27	-2.255	PASS
			16794.9	-42.870	-27	-15.870	PASS
IEEE 802.11ac_80	155		5632.83	-28.823	-27	-1.823	PASS
			5636.23	-31.780	-27	-4.780	PASS
			5725.00	-20.440	15.6	-47.440	PASS
			5850.00	-22.190	10	-49.190	PASS
			5925.32	-35.360	-27	-8.360	PASS
			5940.00	-29.684	-27	-2.684	PASS

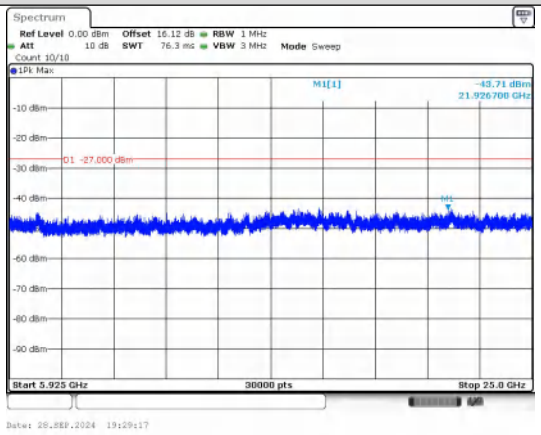
Test Graphs



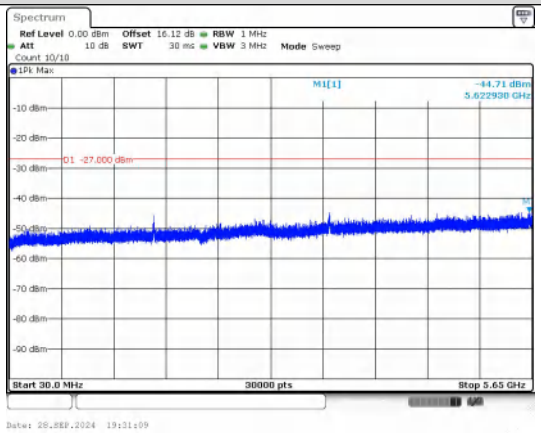
Out Of Band Emission
IEEE 802.11a_Channel 149_20MHz_Antenna 0



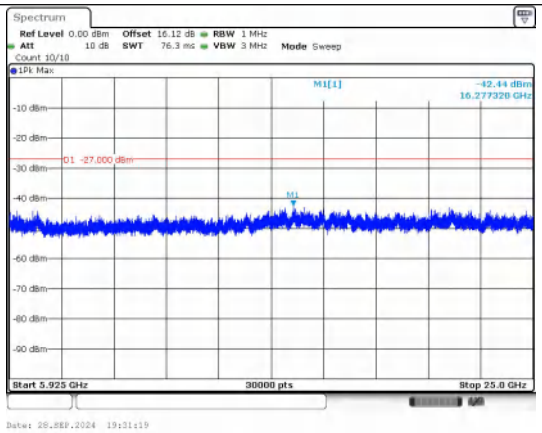
Spurious Emission:30.0~5650 MHz
IEEE 802.11a_Channel 149_20MHz_Antenna 0



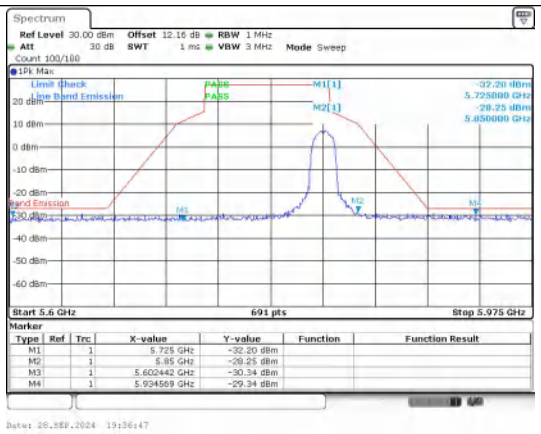
Spurious Emission:5925~25000.0 MHz
IEEE 802.11a_Channel 149_20MHz_Antenna 0



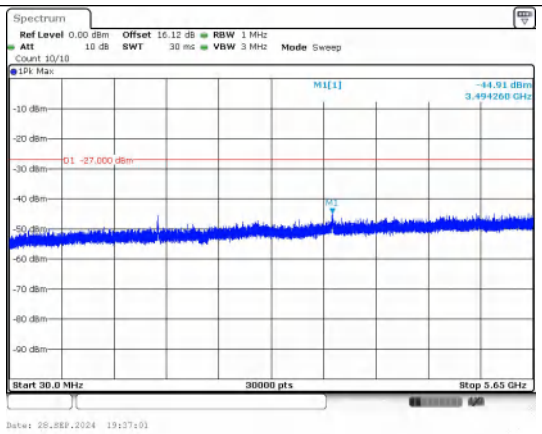
Spurious Emission:30.0~5650 MHz
IEEE 802.11a_Channel 157_20MHz_Antenna 0



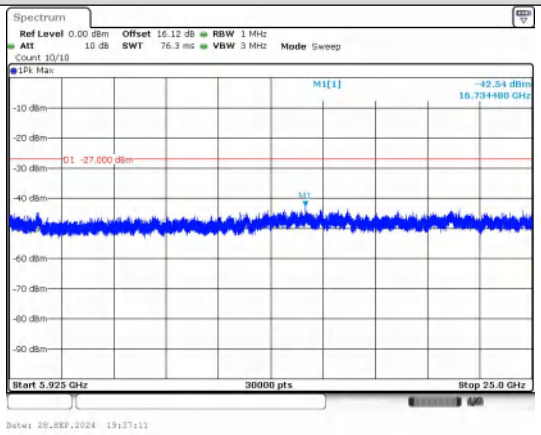
Spurious Emission:5925~25000.0 MHz
IEEE 802.11a_Channel 157_20MHz_Antenna 0



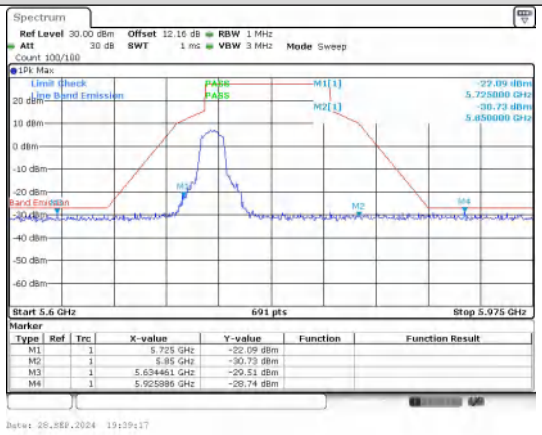
Out Of Band Emission
IEEE 802.11a_Channel 165_20MHz_Antenna 0



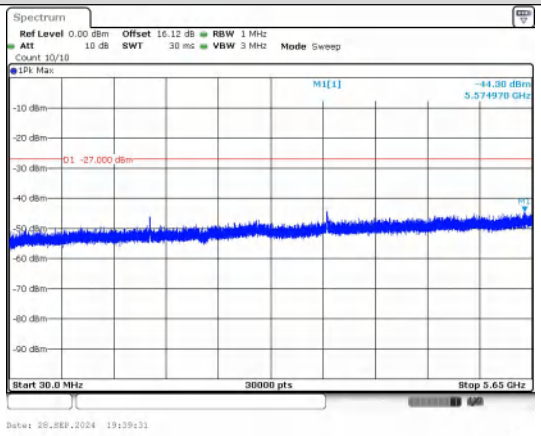
Spurious Emission:30.0~5650 MHz
IEEE 802.11a_Channel 165_20MHz_Antenna 0



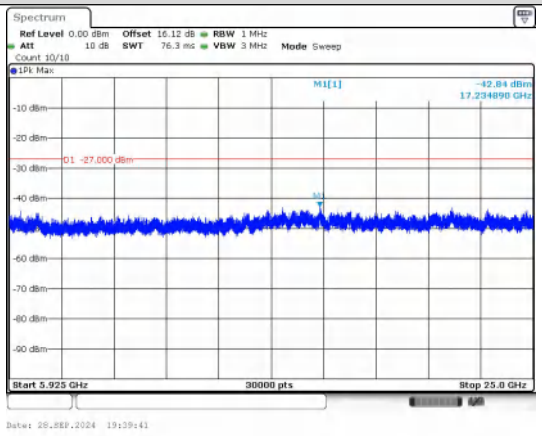
Spurious Emission:5925~25000.0 MHz
IEEE 802.11a_Channel 165_20MHz_Antenna 0



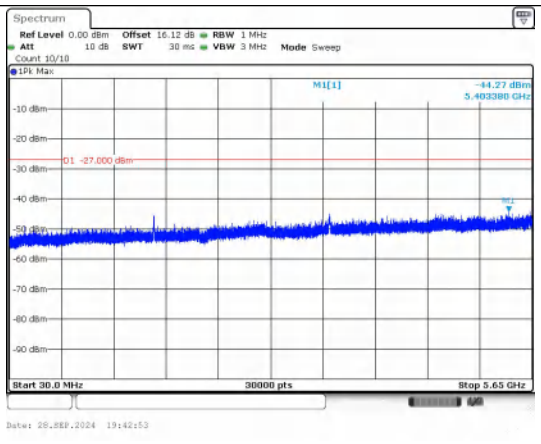
Out Of Band Emission
IEEE 802.11n_Channel 149_20MHz_Antenna 0



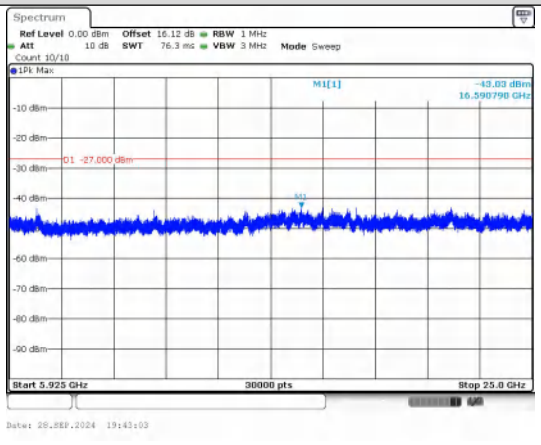
Spurious Emission:30.0~5650 MHz
IEEE 802.11n_Channel 149_20MHz_Antenna 0



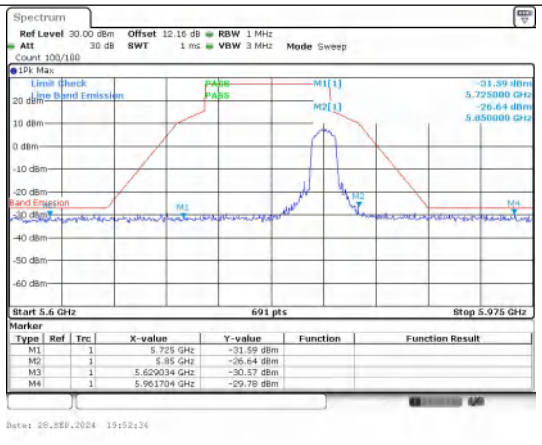
Spurious Emission:5925~25000.0 MHz
IEEE 802.11n_Channel 149_20MHz_Antenna 0



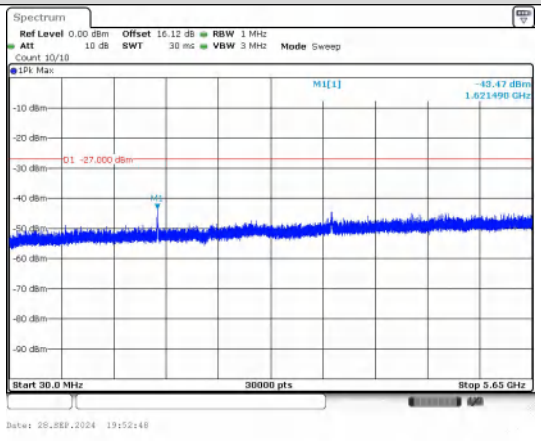
Spurious Emission:30.0~5650 MHz
IEEE 802.11n_Channel 157_20MHz_Antenna 0



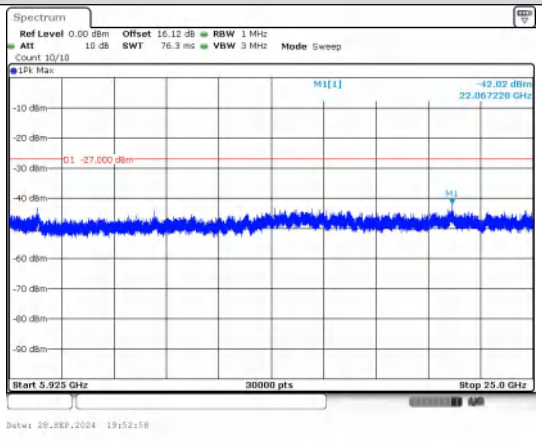
Spurious Emission:5925~25000.0 MHz
IEEE 802.11n_Channel 157_20MHz_Antenna 0



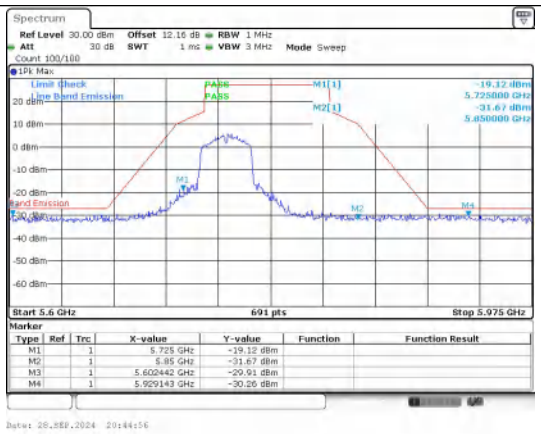
Out Of Band Emission
IEEE 802.11n_Channel 165_20MHz_Antenna 0



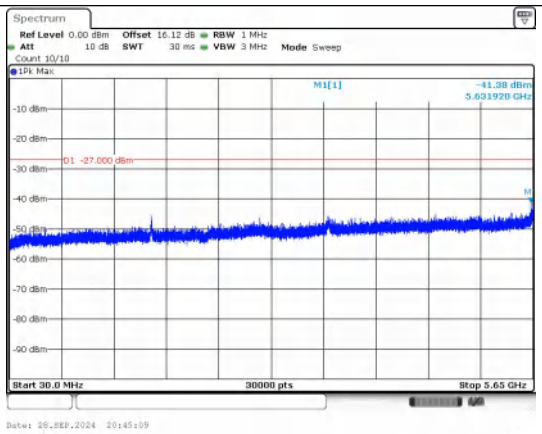
Spurious Emission:30.0~5650 MHz
IEEE 802.11n_Channel 165_20MHz_Antenna 0



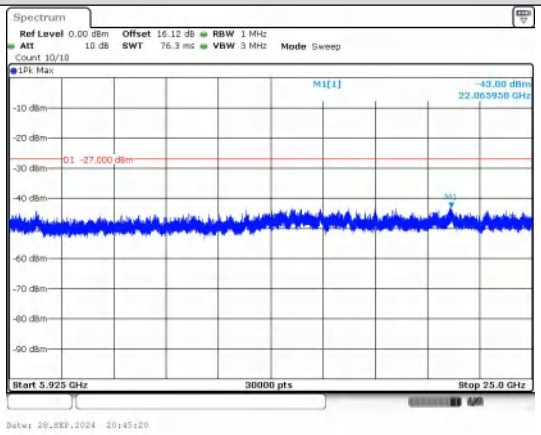
Spurious Emission:5925~25000.0 MHz
IEEE 802.11n_Channel 165_20MHz_Antenna 0



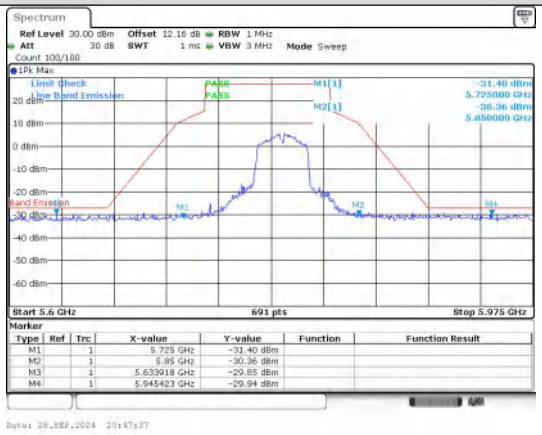
Out Of Band Emission
IEEE 802.11n_Channel 151_40MHz_Antenna 0



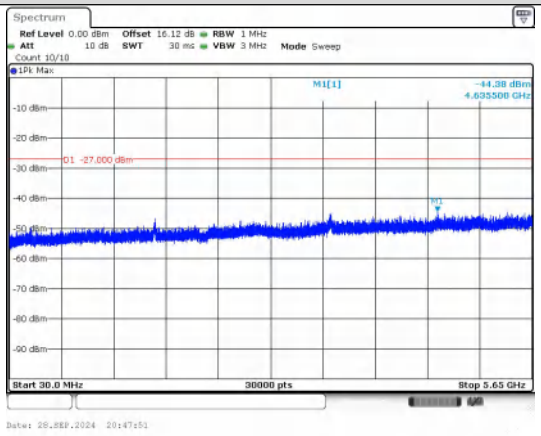
Spurious Emission:30.0~5650 MHz
IEEE 802.11n_Channel 151_40MHz_Antenna 0



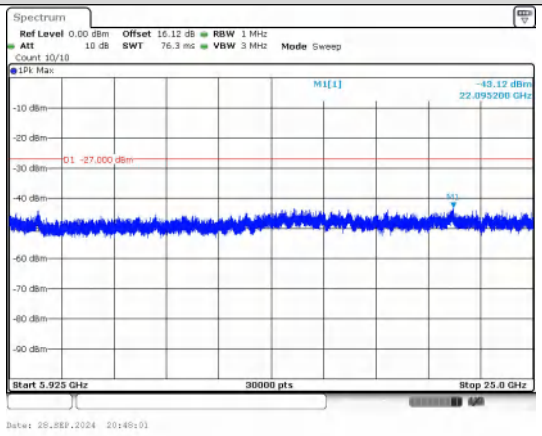
Spurious Emission:5925~25000.0 MHz
IEEE 802.11n_Channel 151_40MHz_Antenna 0



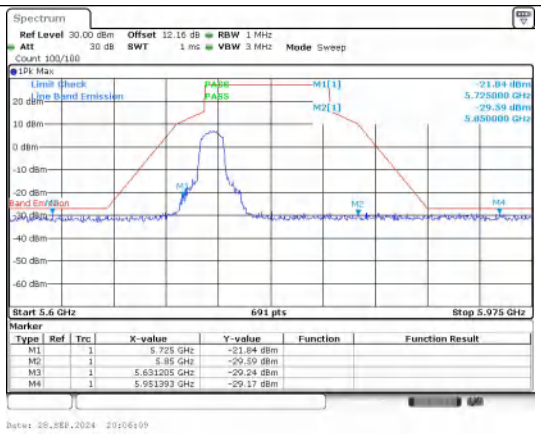
Out Of Band Emission
IEEE 802.11n_Channel 159_40MHz_Antenna 0



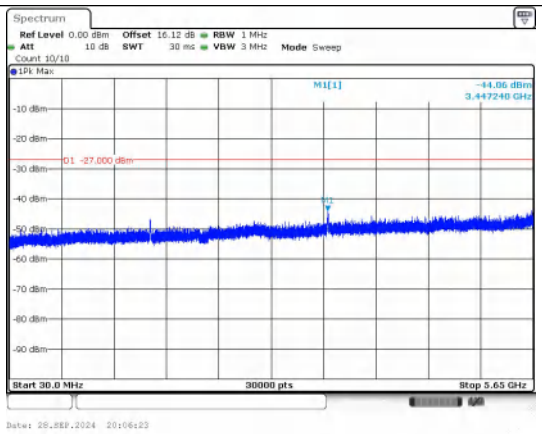
Spurious Emission:30.0~5650 MHz
IEEE 802.11n_Channel 159_40MHz_Antenna 0



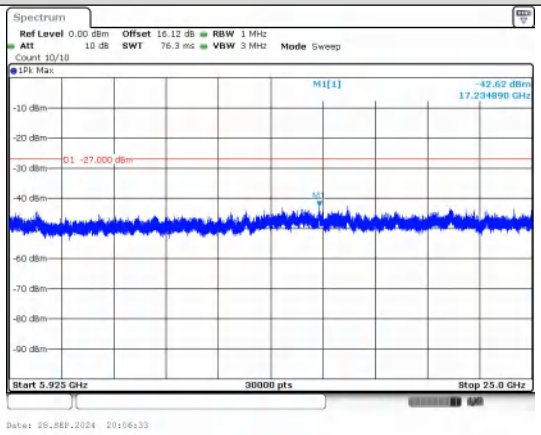
Spurious Emission:5925~25000.0 MHz
IEEE 802.11n_Channel 159_40MHz_Antenna 0



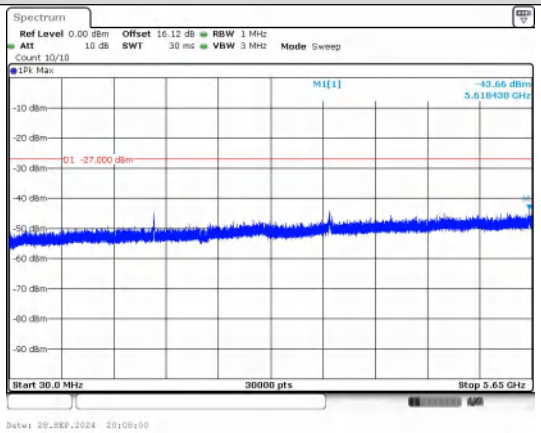
Out Of Band Emission
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



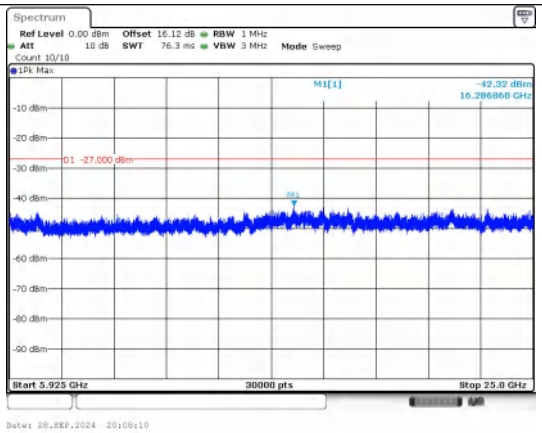
Spurious Emission:30.0~5650 MHz
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



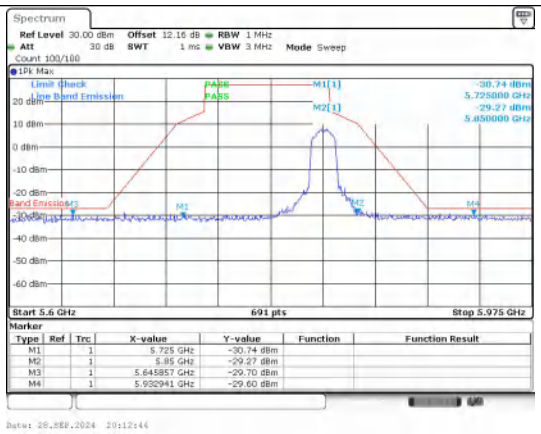
Spurious Emission:5925~25000.0 MHz
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



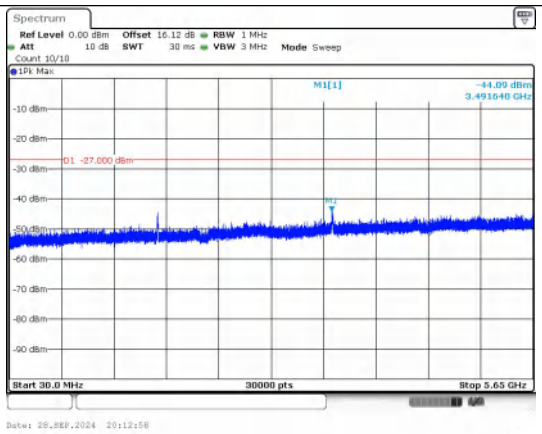
Spurious Emission:30.0~5650 MHz
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



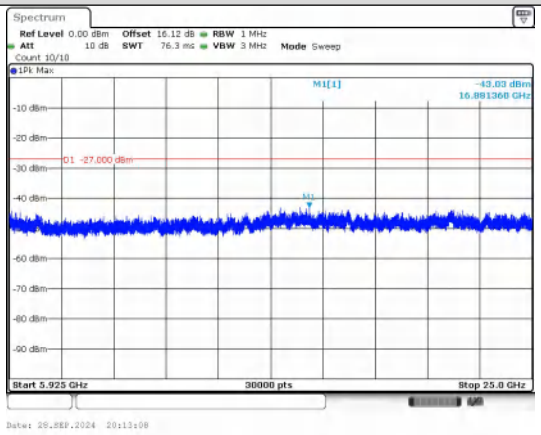
Spurious Emission:5925~25000.0 MHz
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



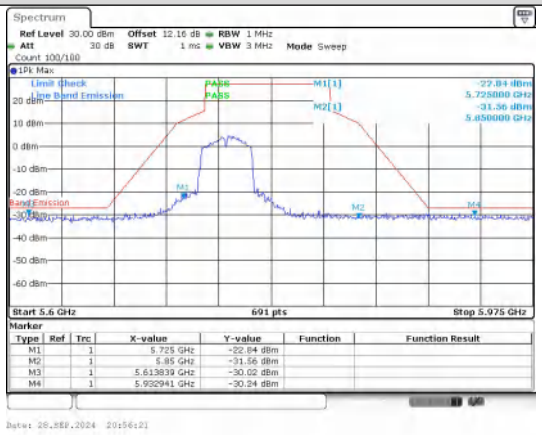
Out Of Band Emission
IEEE 802.11ac_Channel 165_20MHz_Antenna 0



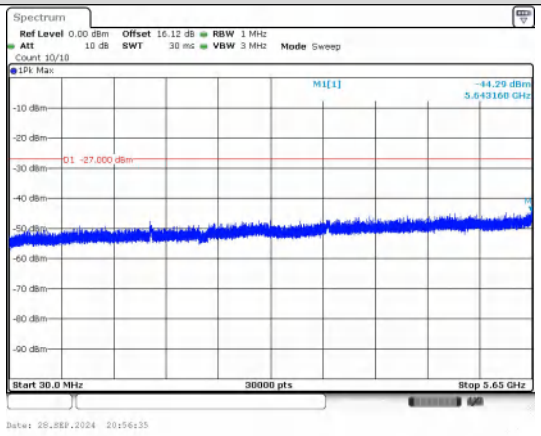
Spurious Emission:30.0~5650 MHz
IEEE 802.11ac_Channel 165_20MHz_Antenna 0



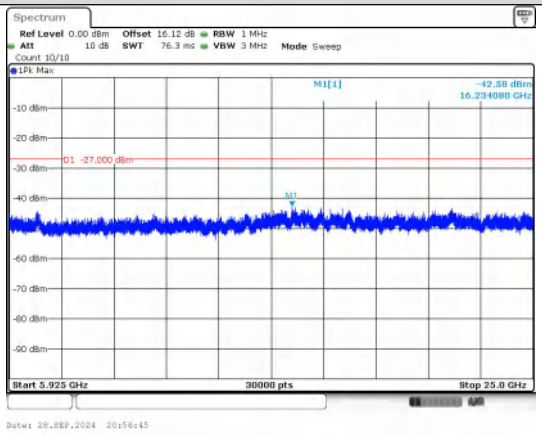
Spurious Emission:5925~25000.0 MHz
IEEE 802.11ac_Channel 165_20MHz_Antenna 0



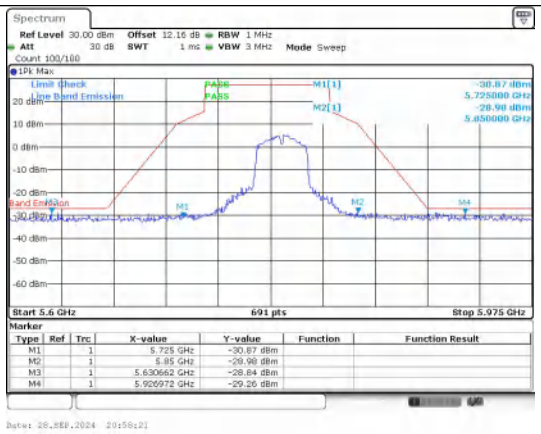
Out Of Band Emission
IEEE 802.11ac_Channel 151_40MHz_Antenna 0



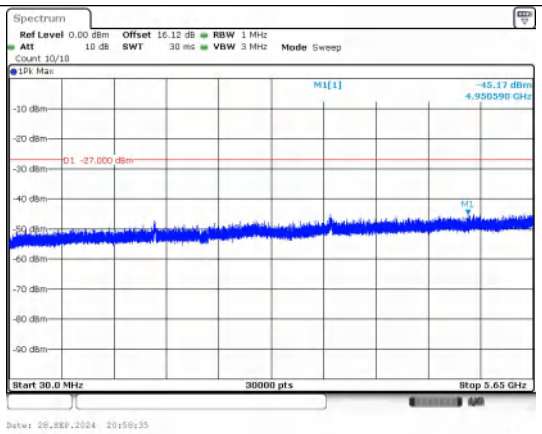
Spurious Emission:30.0~5650 MHz
IEEE 802.11ac_Channel 151_40MHz_Antenna 0



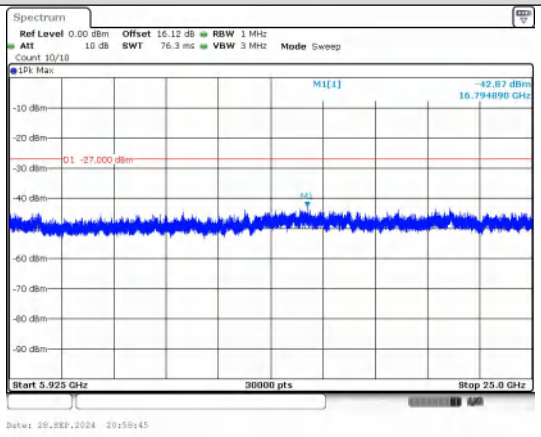
Spurious Emission:5925~25000.0 MHz
IEEE 802.11ac_Channel 151_40MHz_Antenna 0



Out Of Band Emission
IEEE 802.11ac_Channel 159_40MHz_Antenna 0



Spurious Emission:30.0~5650 MHz
IEEE 802.11ac_Channel 159_40MHz_Antenna 0



Spurious Emission:5925~25000.0 MHz
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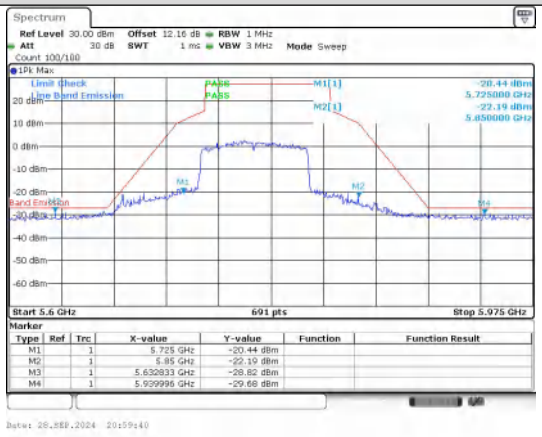
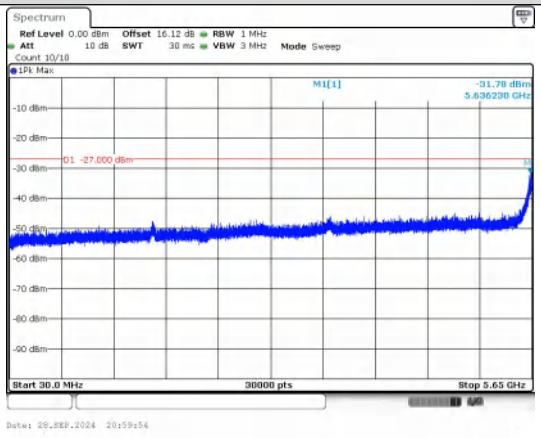
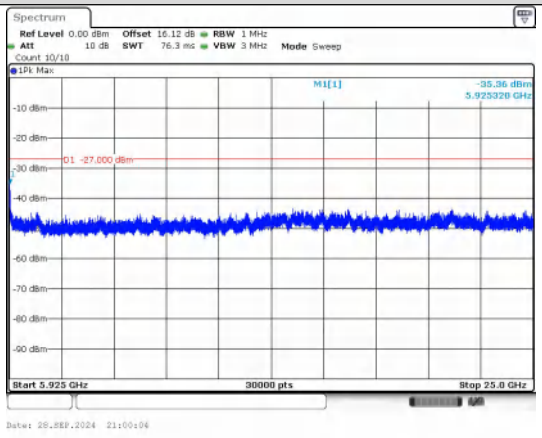


Out Of Band Emission
IEEE 802.11ac_Channel 155_80MHz_Antenna 0



Spurious Emission:30.0~5650 MHz
IEEE 802.11ac_Channel 155_80MHz_Antenna 0



Spurious Emission:5925~25000.0 MHz
IEEE 802.11ac_Channel 155_80MHz_Antenna 0