

Appendix Report

Project No.:	CISR250414121
Test Engineer:	James Wang
Supervised by:	Rory Huang

1) Frequency Stability

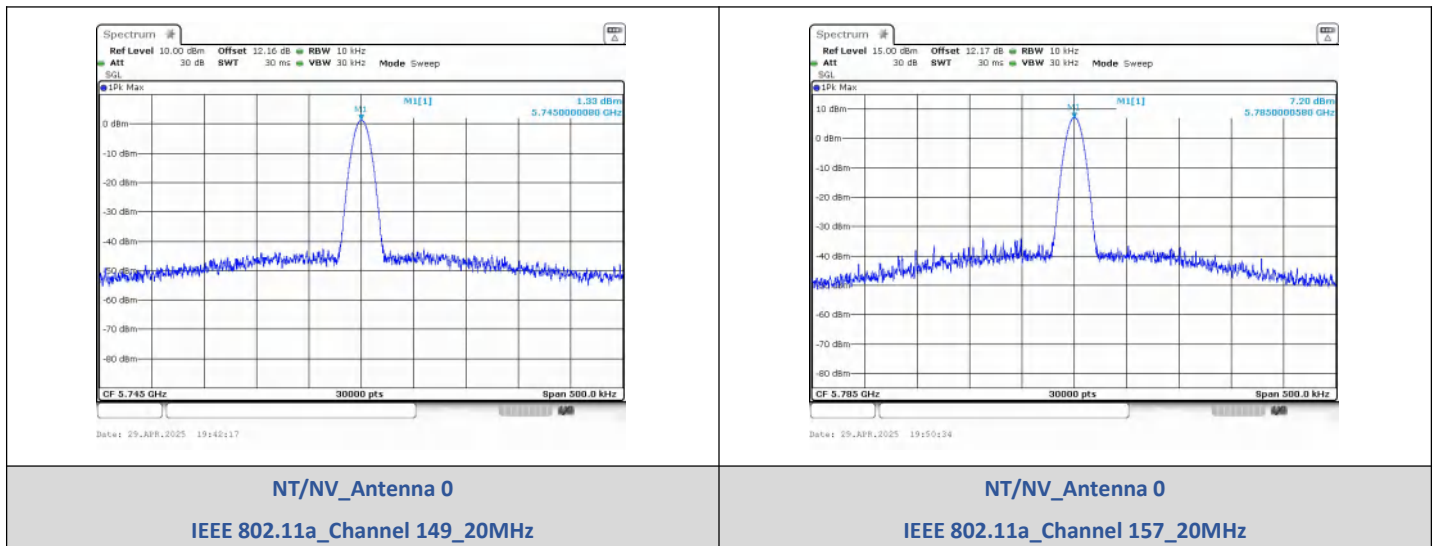
Test Result

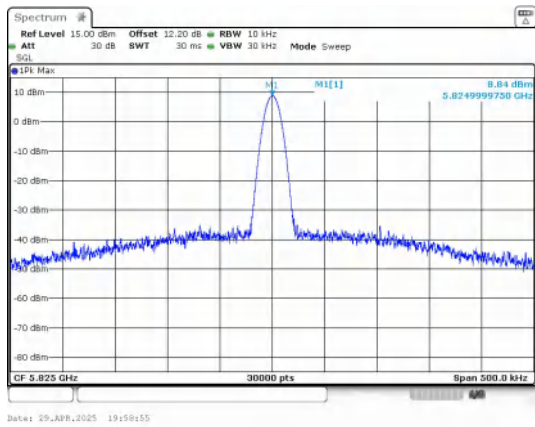
Condition	Mode	Ch.	Antenna	Center Frequency (MHz)	Calculated Value of Center Frequency(MHz)	Result (ppm)	Limit (ppm)	State
NT/NV	IEEE 802.11a	149	0	5745.0	5745.000008	0.0	Within authorized band	PASS
		157		5785.0	5785.000058	0.01		PASS
		165		5825.0	5824.999975	-0.0		PASS
	IEEE 802.11n_20	149		5745.0	5745.000092	0.02		PASS
		157		5785.0	5785.000042	0.01		PASS
		165		5825.0	5825.000008	0.0		PASS
	IEEE 802.11n_40	151		5755.0	5755.000058	0.01		PASS
		159		5795.0	5795.000042	0.01		PASS
	IEEE 802.11ac_20	149		5745.0	5745.000008	0.0		PASS
		157		5785.0	5785.000125	0.02		PASS
		165		5825.0	5825.000125	0.02		PASS
	IEEE 802.11ac_40	151		5755.0	5755.000125	0.02		PASS
		159		5795.0	5795.000125	0.02		PASS

Test Graphs

NT/NV

IEEE 802.11a

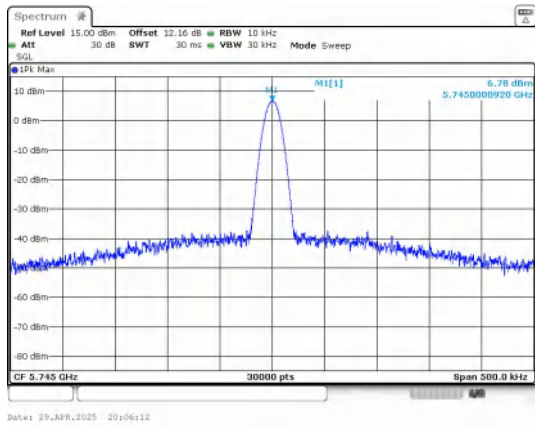




NT/NV_Antenna 0

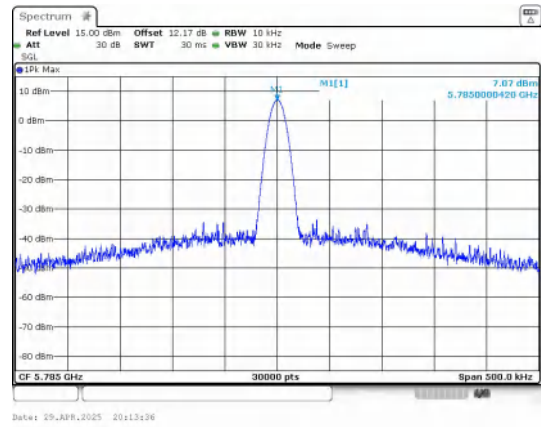
IEEE 802.11a_Channel 165_20MHz

IEEE 802.11n_20



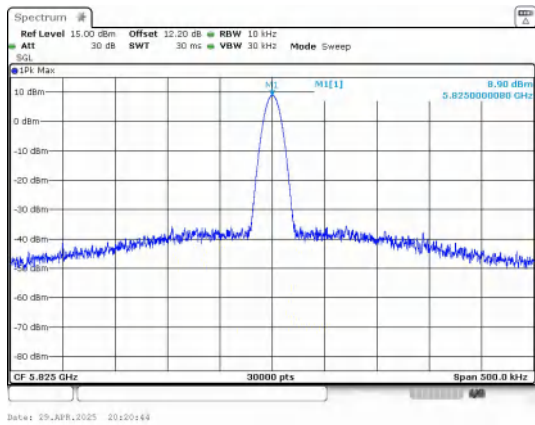
NT/NV_Antenna 0

IEEE 802.11n_Channel 149_20MHz



NT/NV_Antenna 0

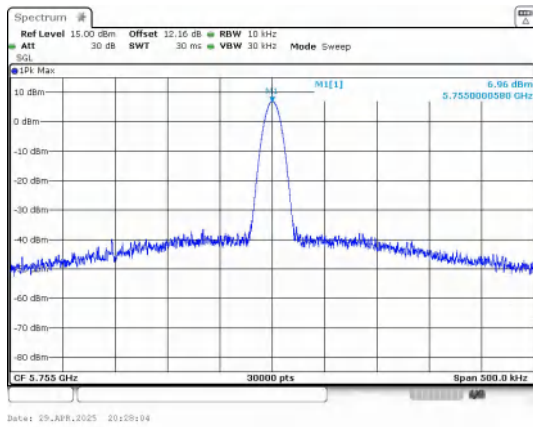
IEEE 802.11n_Channel 157_20MHz



NT/NV_Antenna 0

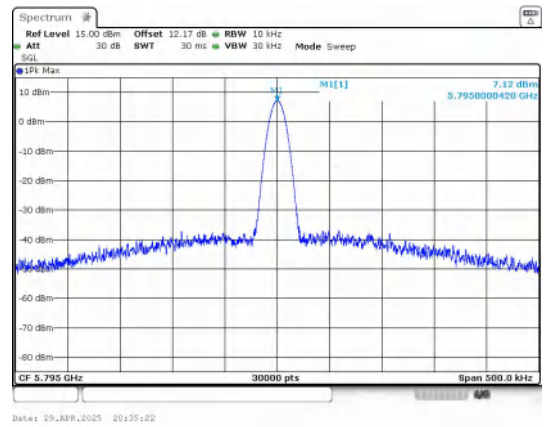
IEEE 802.11n_Channel 165_20MHz

IEEE 802.11n_40



NT/NV_Antenna 0

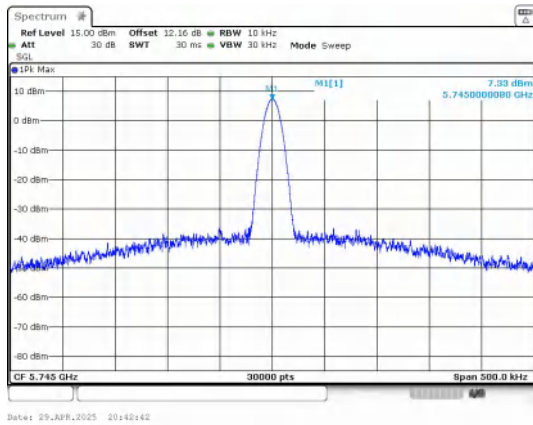
IEEE 802.11n_Channel 151_40MHz



NT/NV_Antenna 0

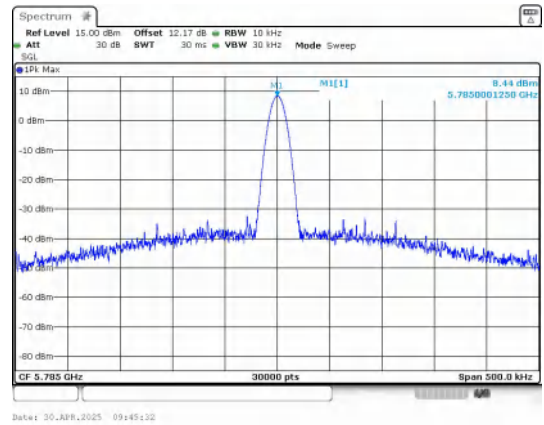
IEEE 802.11n_Channel 159_40MHz

IEEE 802.11ac_20



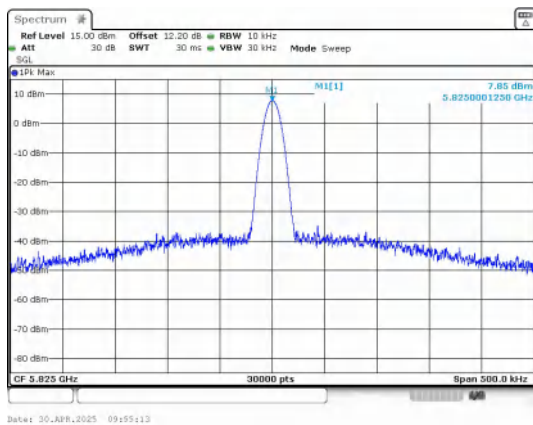
NT/NV_Antenna 0

IEEE 802.11ac_Channel 149_20MHz



NT/NV_Antenna 0

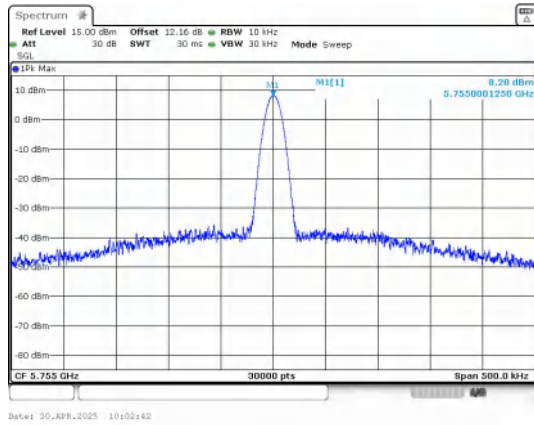
IEEE 802.11ac_Channel 157_20MHz



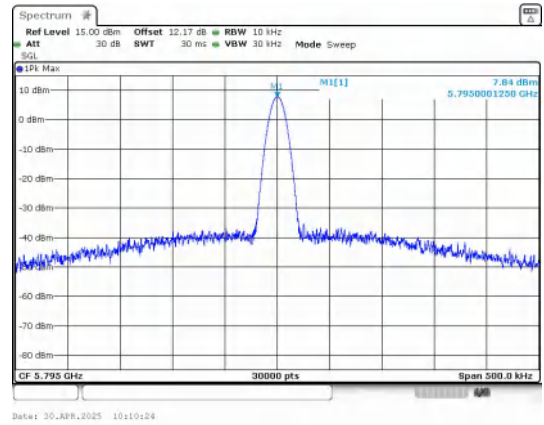
NT/NV_Antenna 0

IEEE 802.11ac_Channel 165_20MHz

IEEE 802.11ac_40



NT/NV_Antenna 0
IEEE 802.11ac_Channel 151_40MHz



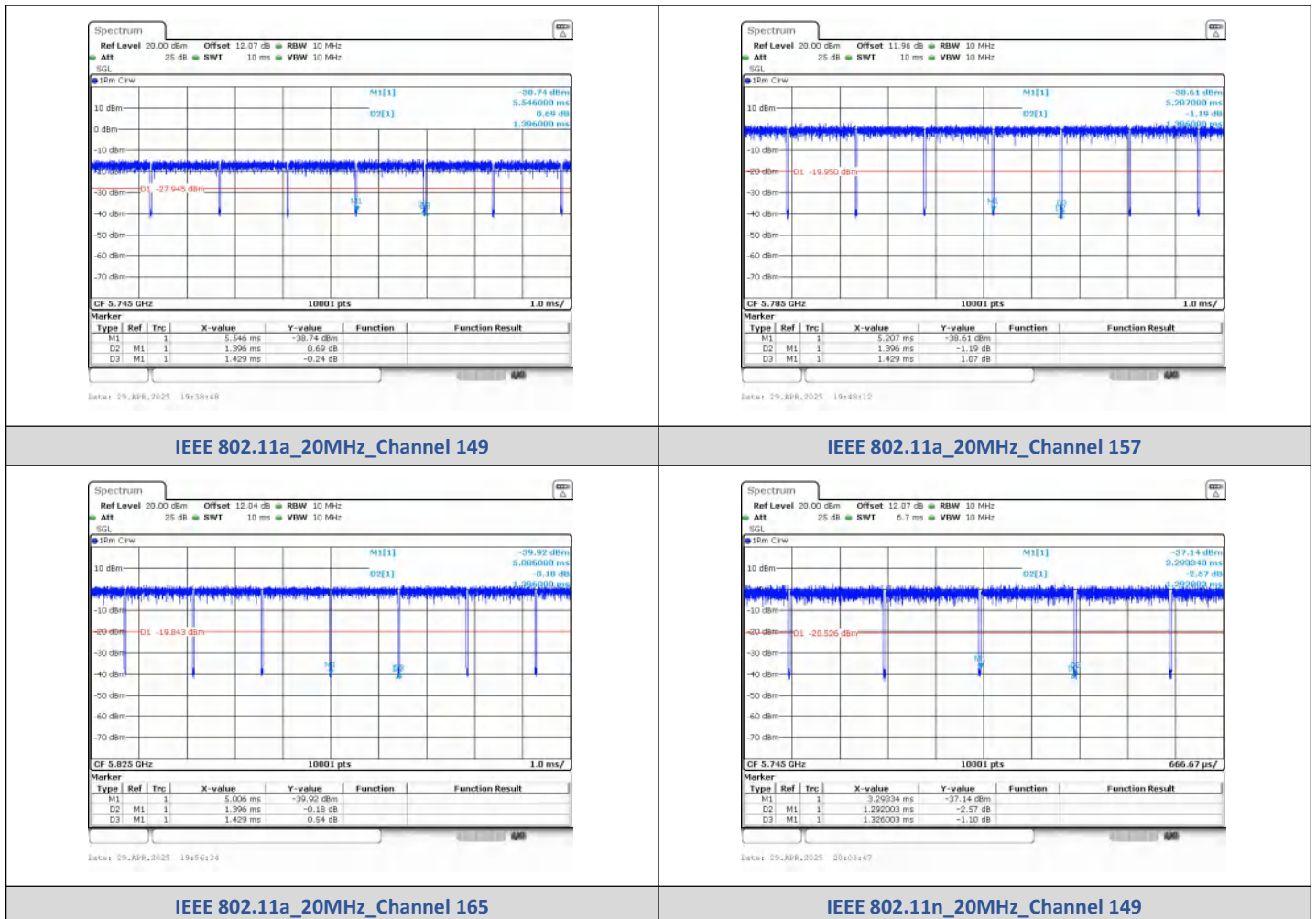
NT/NV_Antenna 0
IEEE 802.11ac_Channel 159_40MHz

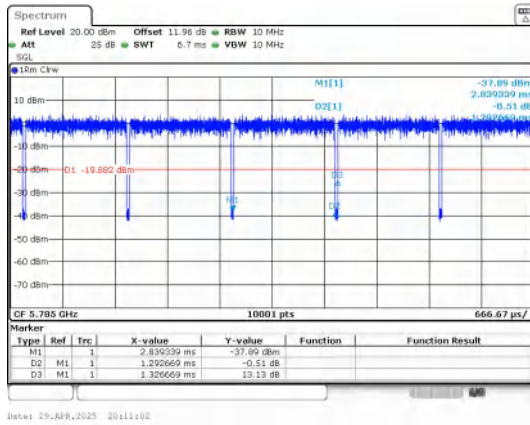
2) Duty Cycle

Test Result

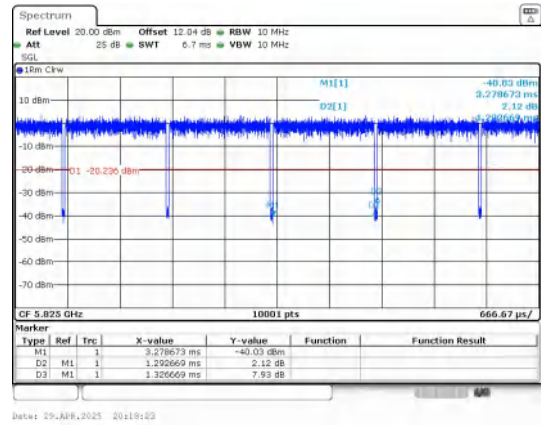
Mode	Data rates	Channel	Antenna	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)	1/T
IEEE 802.11a	6	149	1	1.396	1.429	97.69	0.9769	0.1015	0.7163
		157		1.396	1.429	97.69	0.9769	0.1015	0.7163
		165		1.396	1.429	97.69	0.9769	0.1015	0.7163
IEEE 802.11n_20	MCS 0	149		1.292	1.326	97.44	0.9744	0.1126	0.7740
		157		1.293	1.327	97.44	0.9744	0.1126	0.7734
		165		1.293	1.327	97.44	0.9744	0.1126	0.7734
IEEE 802.11n_40		151		0.650	0.684	94.94	0.9494	0.2255	1.5385
		159		0.650	0.684	94.94	0.9494	0.2255	1.5385
IEEE 802.11ac_20		149		1.316	1.349	97.55	0.9755	0.1077	0.7599
		157		1.316	1.349	97.55	0.9755	0.1077	0.7599
		165		1.305	1.339	97.46	0.9746	0.1117	0.7663
IEEE 802.11ac_40		151		0.654	0.688	95.03	0.9503	0.2214	1.5291
		159		0.654	0.688	94.96	0.9496	0.2246	1.5291

Test Graphs

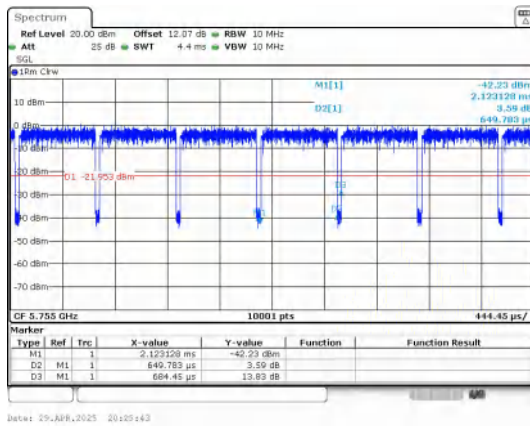




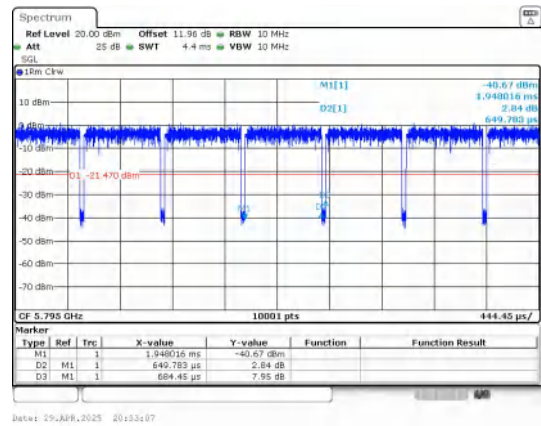
IEEE 802.11n_20MHz_Channel 157



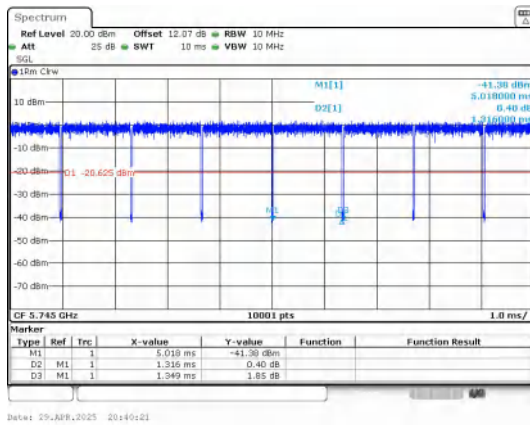
IEEE 802.11n_20MHz_Channel 165



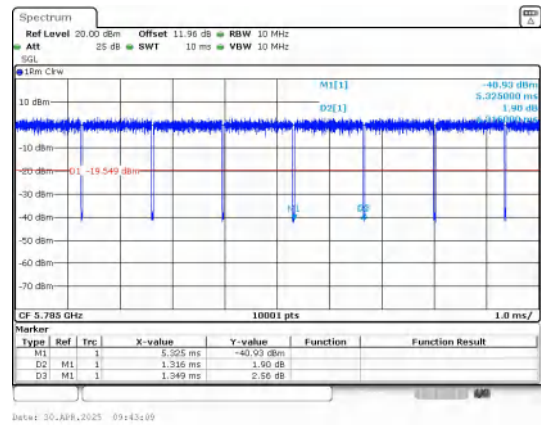
IEEE 802.11n_40MHz_Channel 151



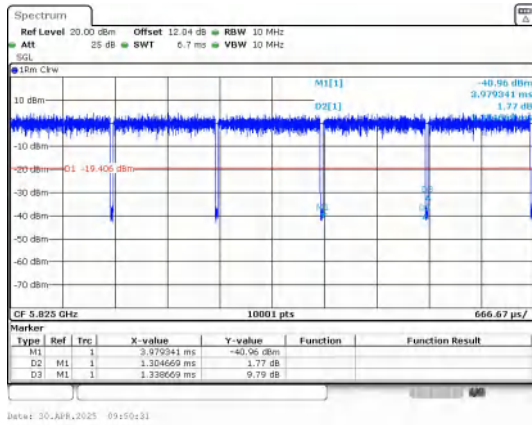
IEEE 802.11n_40MHz_Channel 159



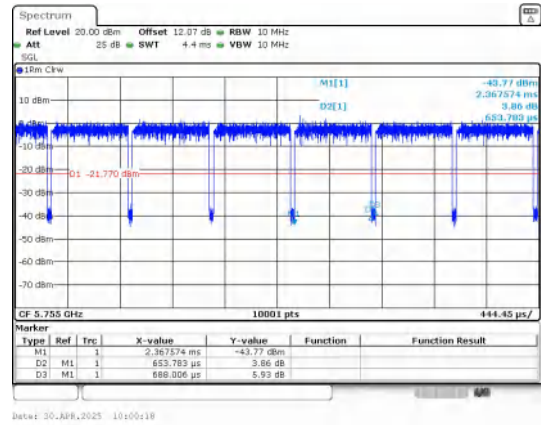
IEEE 802.11ac_20MHz_Channel 149



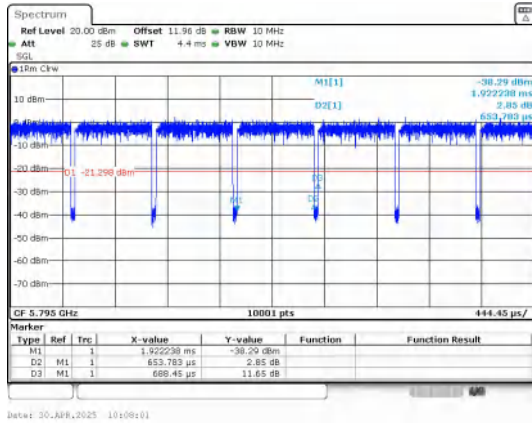
IEEE 802.11ac_20MHz_Channel 157



IEEE 802.11ac_20MHz_Channel 165



IEEE 802.11ac_40MHz_Channel 151



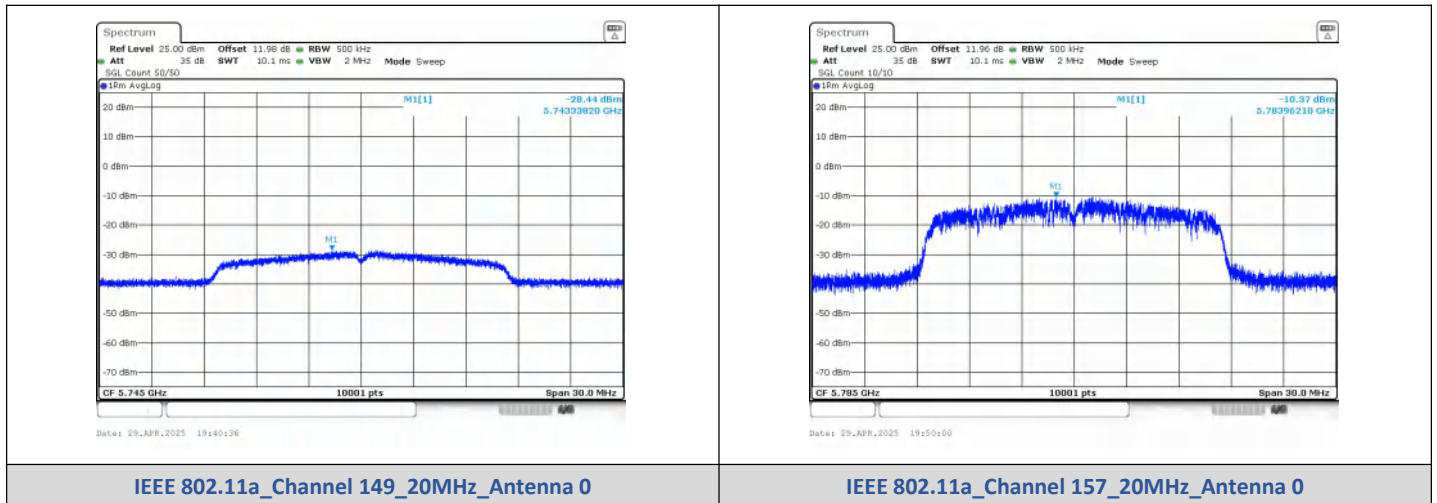
IEEE 802.11ac_40MHz_Channel 159

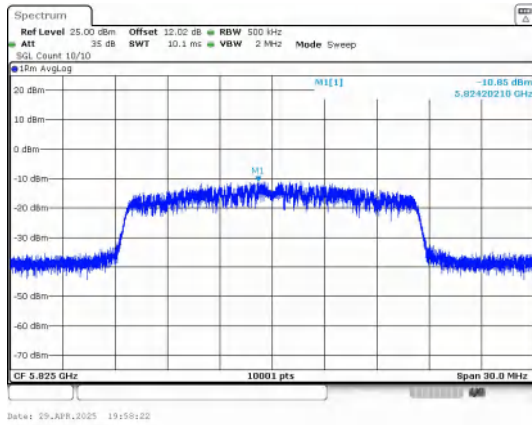
3) Peak Power Spectral Density

Test Result

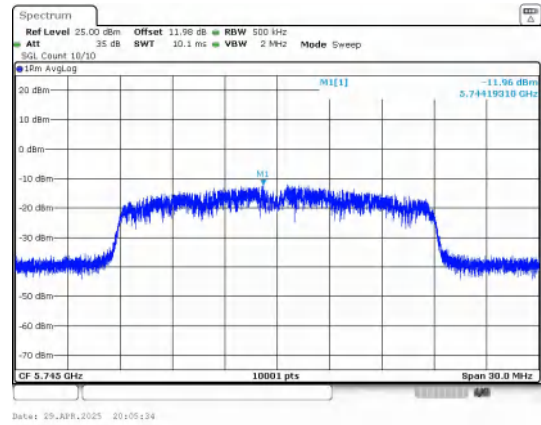
Mode	Channel	Ant. 0 Meas PSD (dBm/MHz or dBm/0.5MHz)	Ant. 0 Corr'd PSD (dBm/MHz or dBm/0.5MHz)	Limit (dBm/MHz or dBm/0.5MHz)	Result
IEEE 802.11a	149	-28.440	-28.338	30	PASS
	157	-10.370	-10.268		PASS
	165	-10.850	-10.748		PASS
IEEE 802.11n_20	149	-11.960	-11.847		PASS
	157	-10.880	-10.767		PASS
	165	-10.620	-10.507		PASS
IEEE 802.11n_40	151	-14.580	-14.354		PASS
	159	-13.500	-13.274		PASS
IEEE 802.11ac_20	149	-12.050	-11.938		PASS
	157	-9.590	-9.478		PASS
	165	-9.730	-9.618		PASS
IEEE 802.11ac_40	151	-13.290	-13.065		PASS
	159	-13.200	-12.975		PASS

Test Graphs

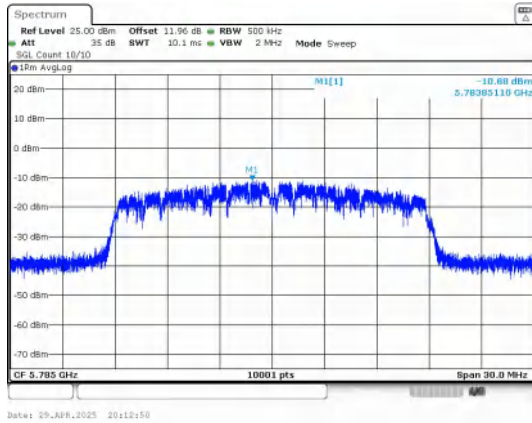




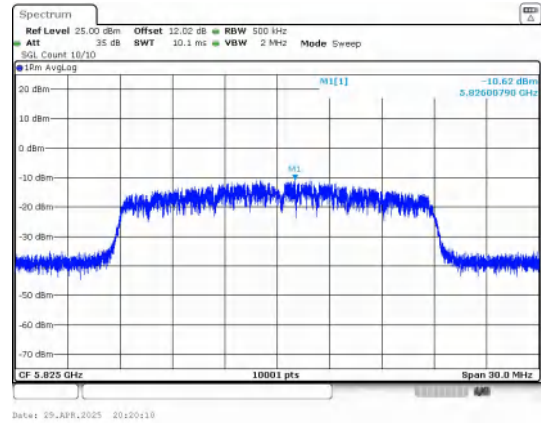
IEEE 802.11a_Channel 165_20MHz_Antenna 0



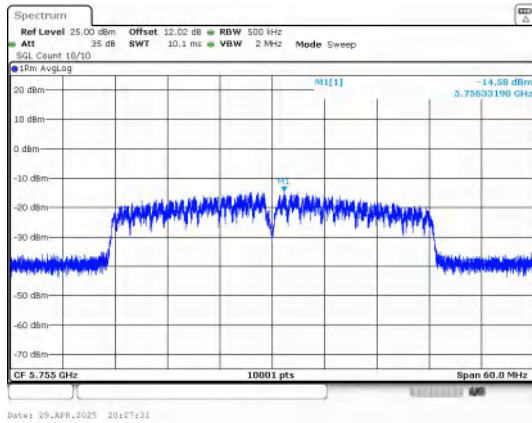
IEEE 802.11n_Channel 149_20MHz_Antenna 0



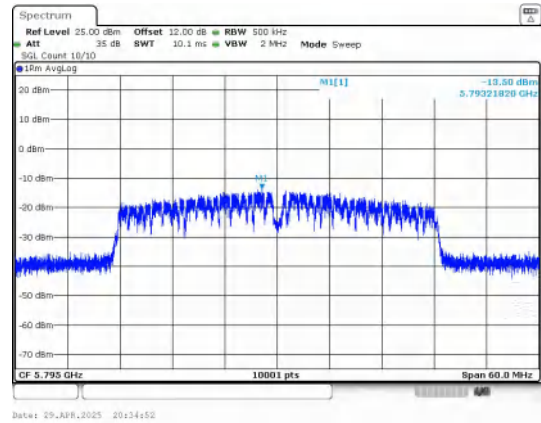
IEEE 802.11n_Channel 157_20MHz_Antenna 0



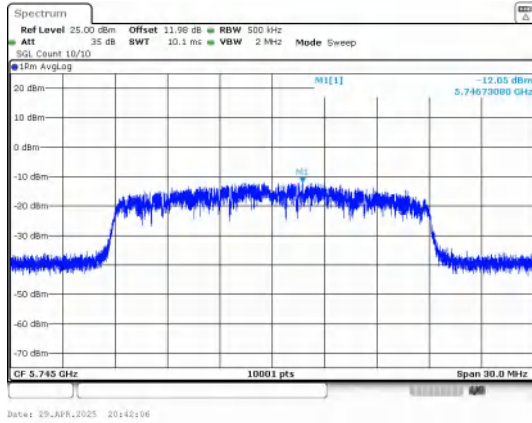
IEEE 802.11n_Channel 165_20MHz_Antenna 0



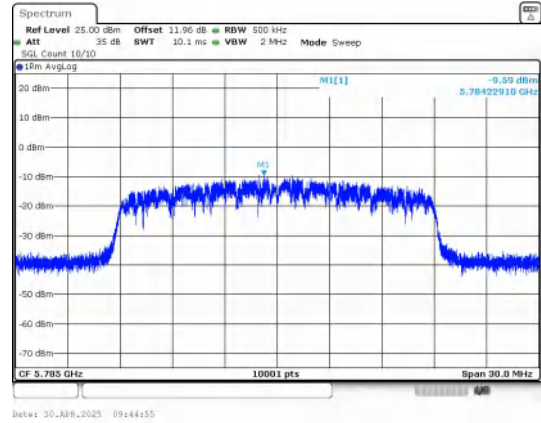
IEEE 802.11n_Channel 151_40MHz_Antenna 0



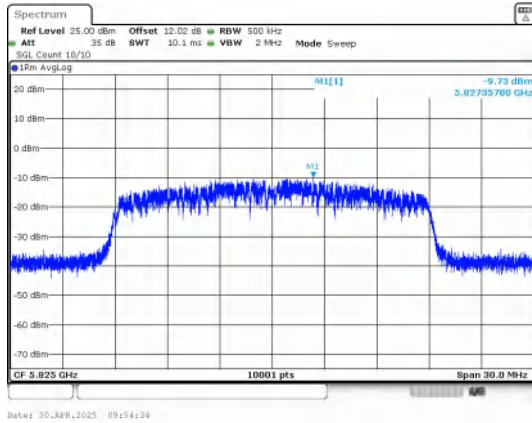
IEEE 802.11n_Channel 159_40MHz_Antenna 0



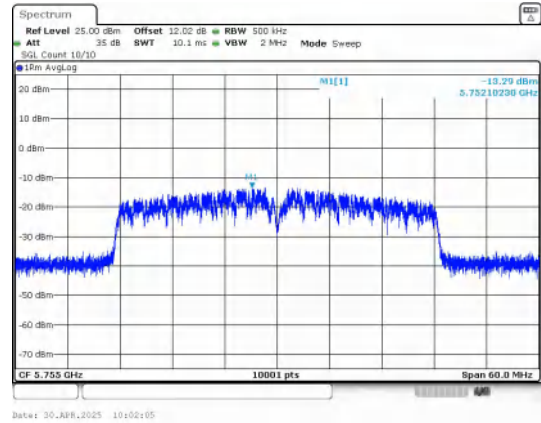
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



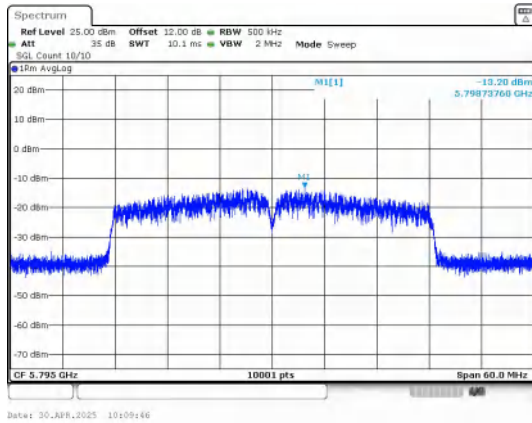
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



IEEE 802.11ac_Channel 165_20MHz_Antenna 0



IEEE 802.11ac_Channel 151_40MHz_Antenna 0

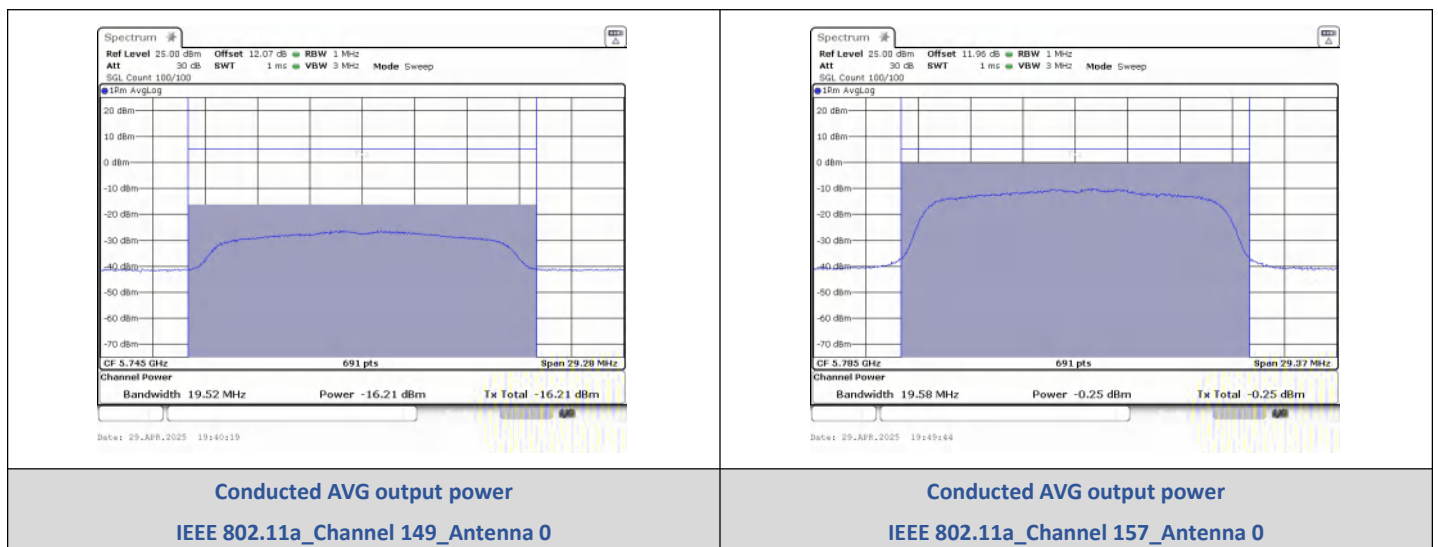


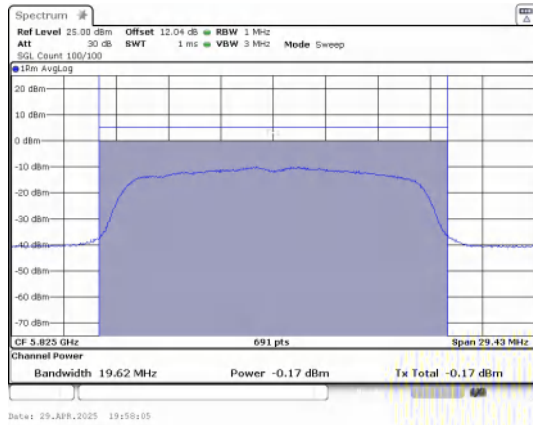
IEEE 802.11ac_Channel 159_40MHz_Antenna 0

4) Conducted Peak Output Power

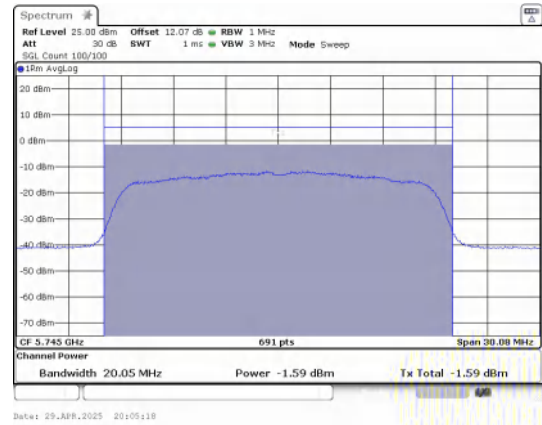
Conducted output power

Mode	Channel	Ant. 0 (dBm)	Corr'd Value Ant. 0 (dBm)	Limit (dBm)	Result
IEEE 802.11a	149	-16.21	-16.11	≤30	PASS
	157	-0.25	-0.15	≤30	PASS
	165	-0.17	-0.07	≤30	PASS
IEEE 802.11n_20	149	-1.59	-1.48	≤30	PASS
	157	-0.37	-0.25	≤30	PASS
	165	-0.27	-0.16	≤30	PASS
IEEE 802.11n_40	151	-1.35	-1.12	≤30	PASS
	159	-0.88	-0.66	≤30	PASS
IEEE 802.11ac_20	149	-1.01	-0.9	≤30	PASS
	157	0.40	0.51	≤30	PASS
	165	0.42	0.53	≤30	PASS
IEEE 802.11ac_40	151	-0.12	0.1	≤30	PASS
	159	-0.15	0.07	≤30	PASS

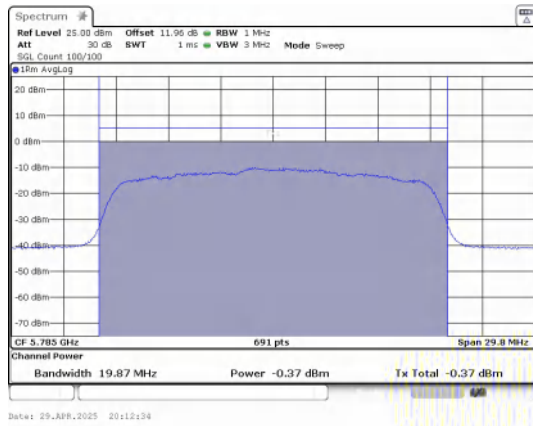




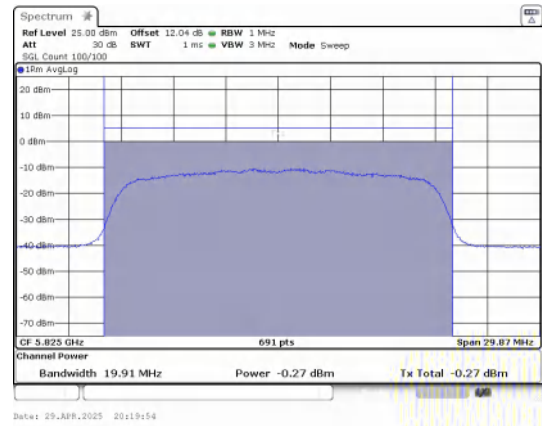
Conducted AVG output power
IEEE 802.11a_Channel 165_Antenna 0



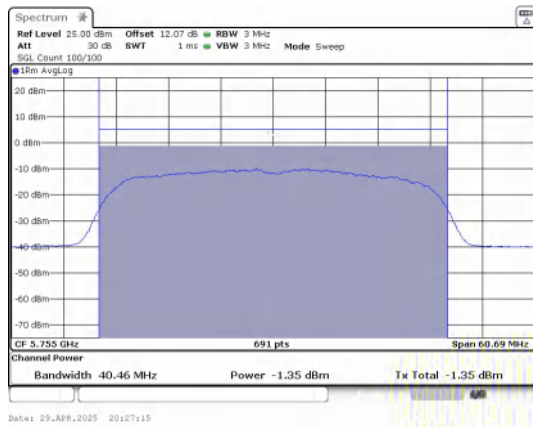
Conducted AVG output power
IEEE 802.11n_20_Channel 149_Antenna 0



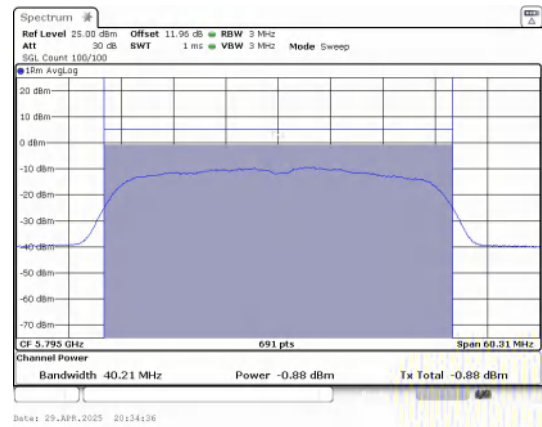
Conducted AVG output power
IEEE 802.11n_20_Channel 157_Antenna 0



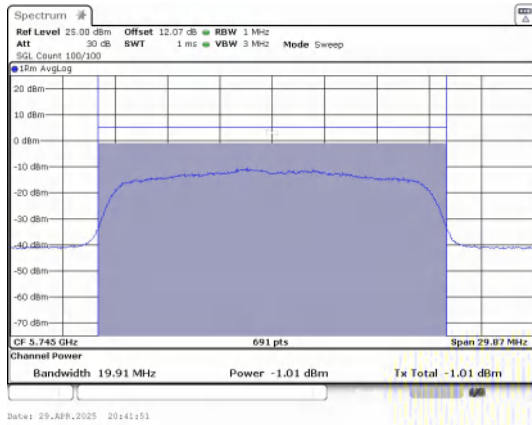
Conducted AVG output power
IEEE 802.11n_20_Channel 165_Antenna 0



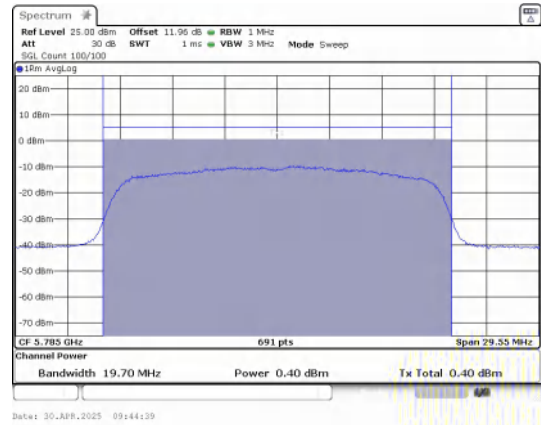
Conducted AVG output power
IEEE 802.11n_40_Channel 151_Antenna 0



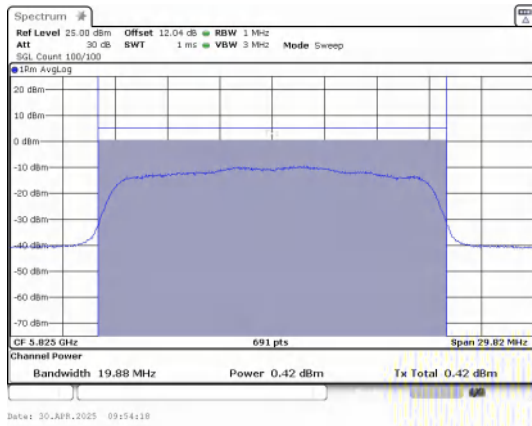
Conducted AVG output power
IEEE 802.11n_40_Channel 159_Antenna 0



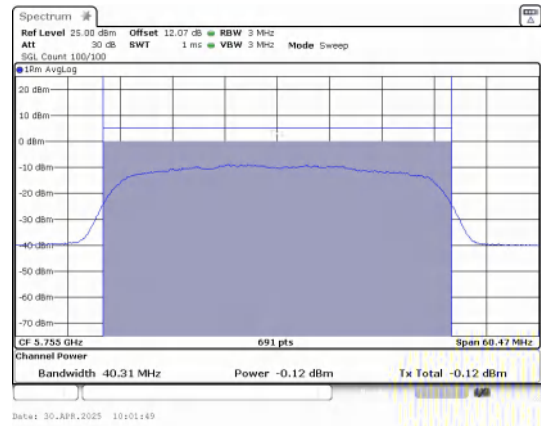
Conducted AVG output power
IEEE 802.11ac_20_Channel 149_Antenna 0



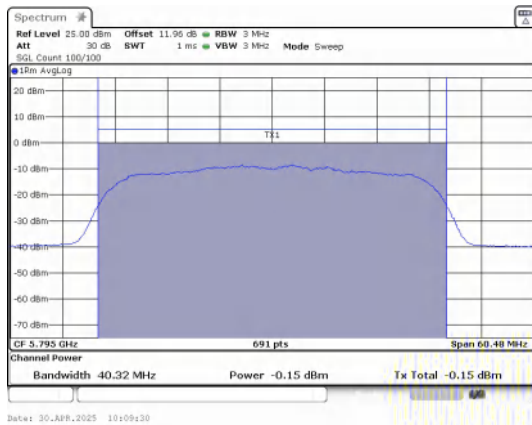
Conducted AVG output power
IEEE 802.11ac_20_Channel 157_Antenna 0



Conducted AVG output power
IEEE 802.11ac_20_Channel 165_Antenna 0



Conducted AVG output power
IEEE 802.11ac_40_Channel 151_Antenna 0



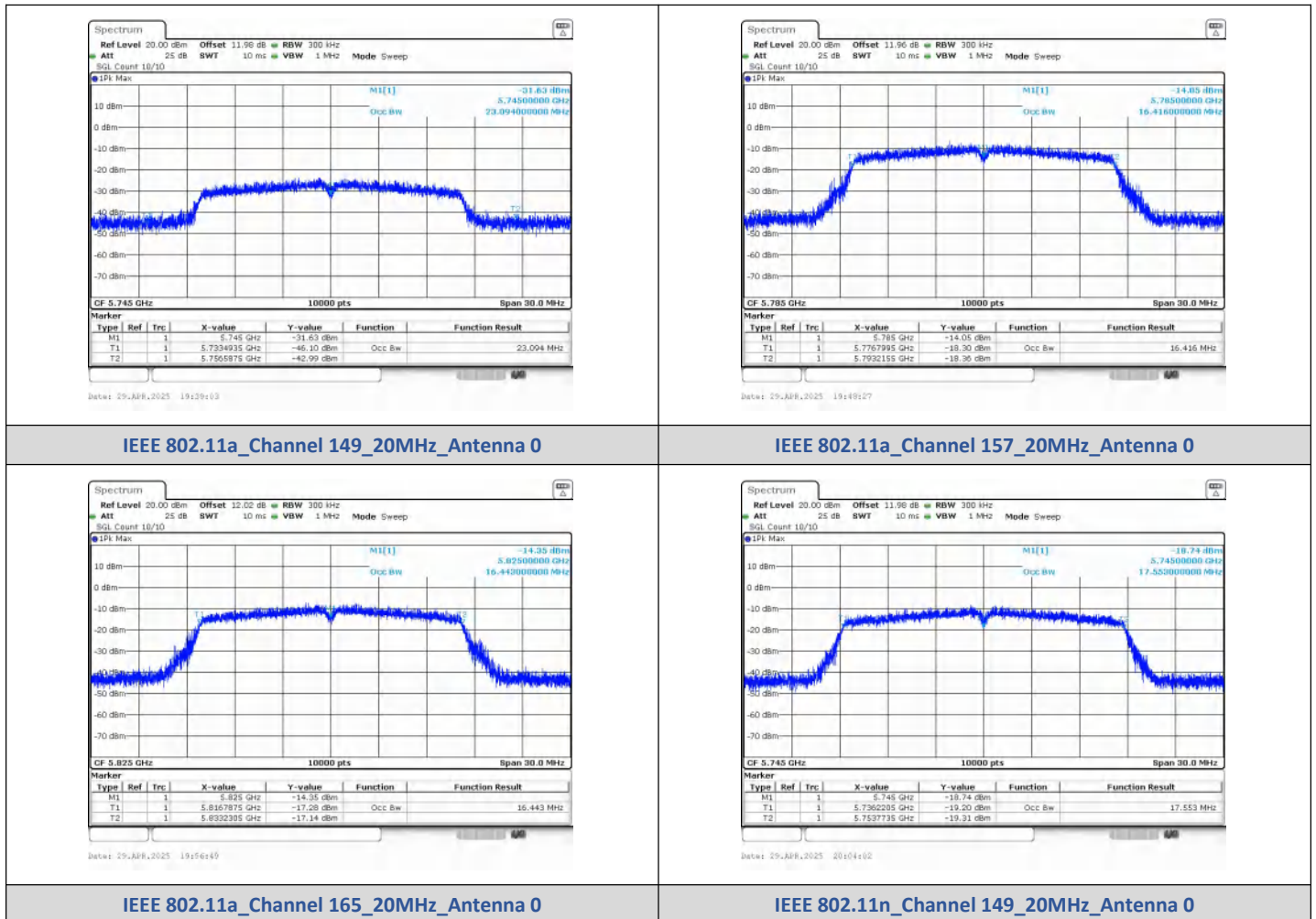
Conducted AVG output power
IEEE 802.11ac_40_Channel 159_Antenna 0

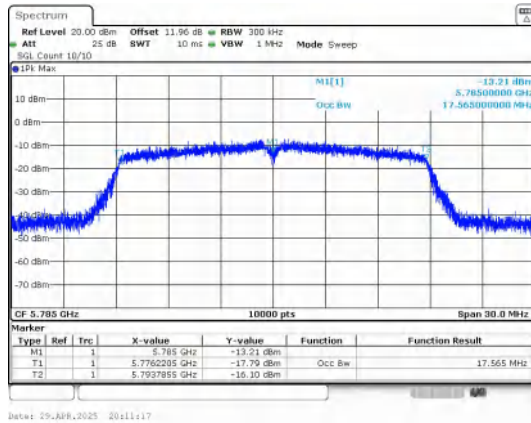
5) 99% Bandwidth

Test Result

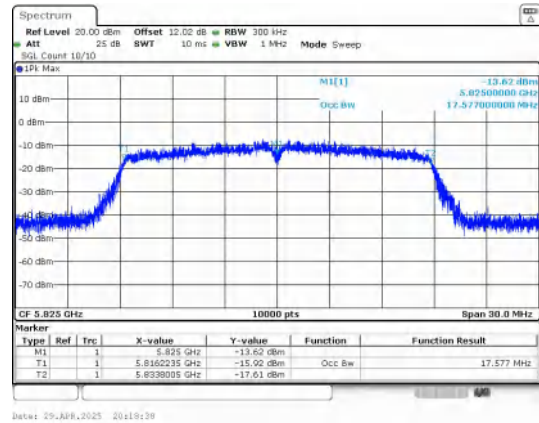
Mode	Channel	Ant.	Center Frequency (MHz)	99% BW (MHz)
IEEE 802.11a	149	0	5745	23.094
	157		5785	16.416
	165		5825	16.443
IEEE 802.11n_20	149		5745	17.553
	157		5785	17.565
	165		5825	17.577
IEEE 802.11n_40	151		5755	35.916
	159		5795	35.874
IEEE 802.11ac_20	149		5745	17.544
	157		5785	17.556
	165		5825	17.583
IEEE 802.11ac_40	151		5755	35.898
	159		5795	35.862

Test Graphs

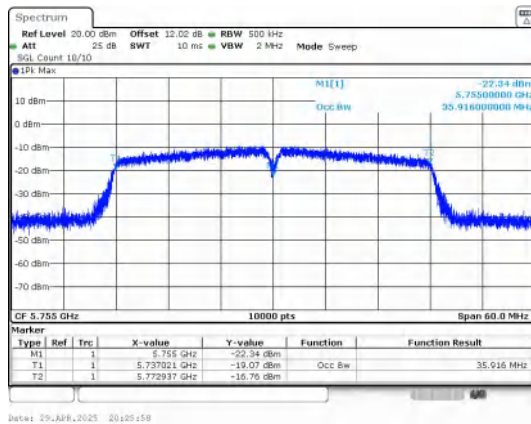




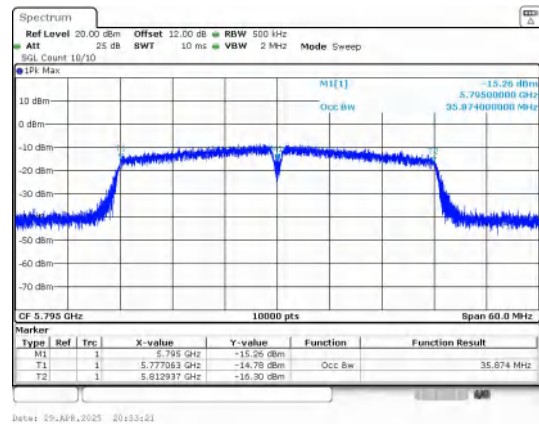
IEEE 802.11n_Channel 157_20MHz_Antenna 0



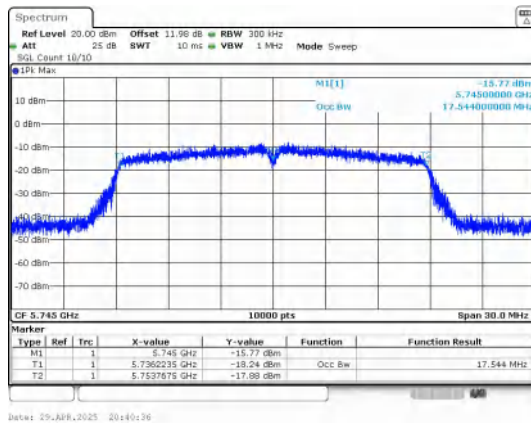
IEEE 802.11n_Channel 165_20MHz_Antenna 0



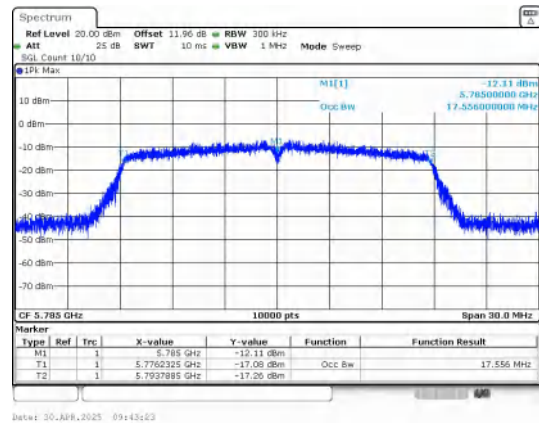
IEEE 802.11n_Channel 151_40MHz_Antenna 0



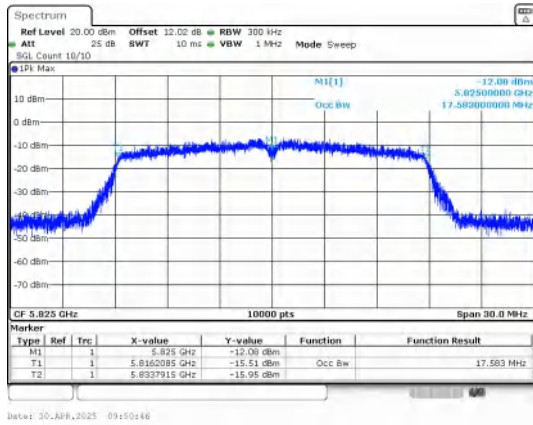
IEEE 802.11n_Channel 159_40MHz_Antenna 0



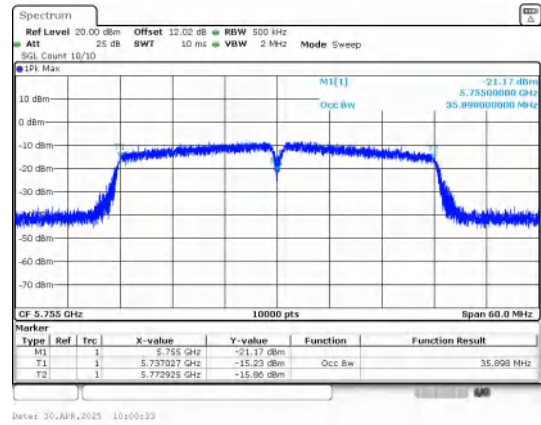
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



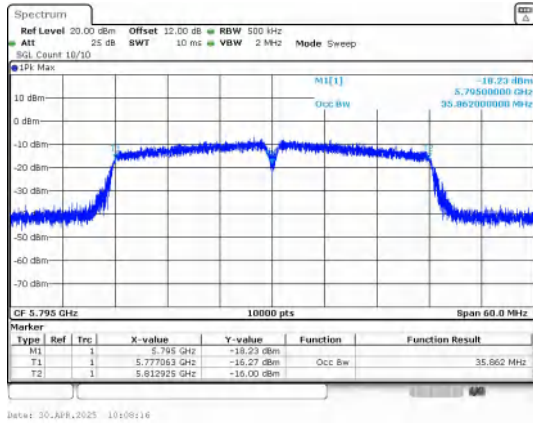
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



IEEE 802.11ac_Channel 165_20MHz_Antenna 0



IEEE 802.11ac_Channel 151_40MHz_Antenna 0



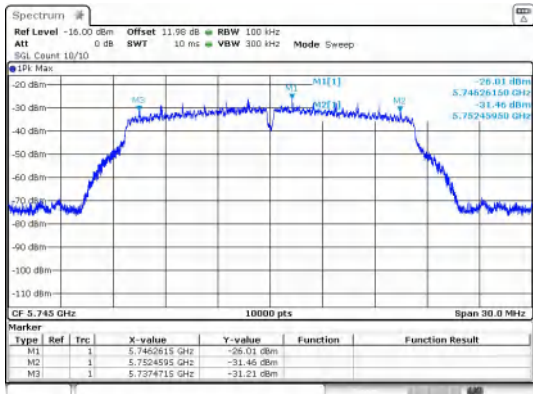
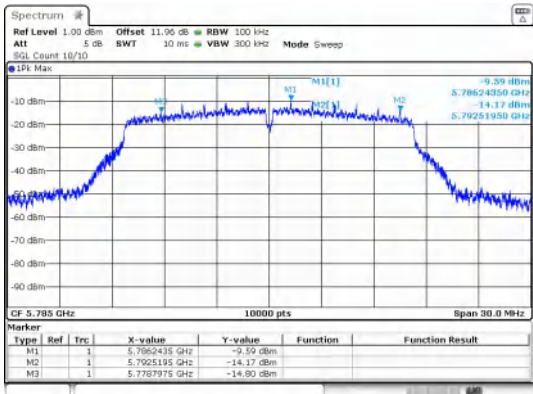
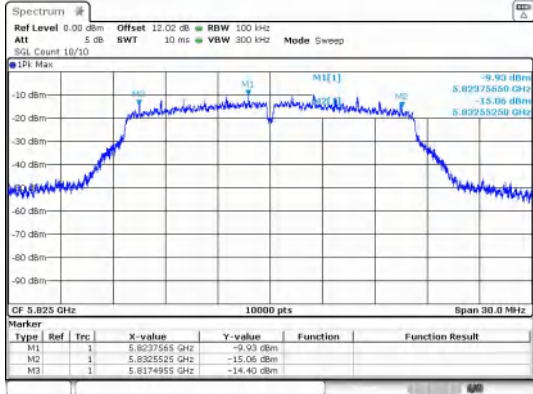
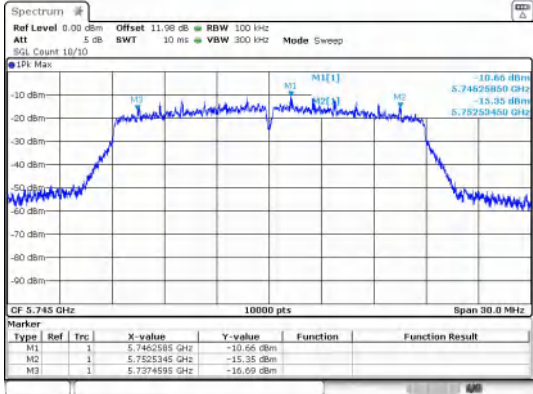
IEEE 802.11ac_Channel 159_40MHz_Antenna 0

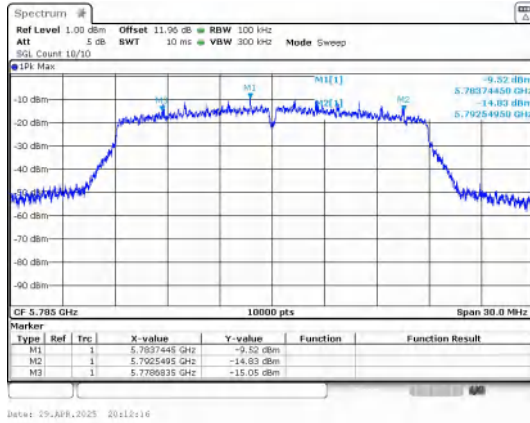
6) 6dB Bandwidth

Test Result

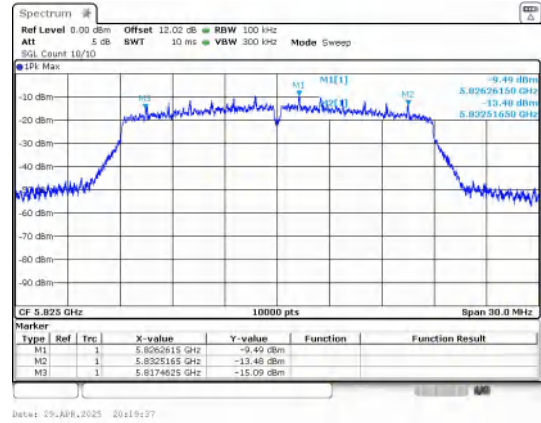
Mode	Channel	Ant.	Center Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a	149	0	5745	14.99	≥0.5	PASS
	157		5785	13.72		PASS
	165		5825	15.05		PASS
IEEE 802.11n_20	149		5745	15.07		PASS
	157		5785	13.87		PASS
	165		5825	15.06		PASS
IEEE 802.11n_40	151		5755	33.82		PASS
	159		5795	35.04		PASS
IEEE 802.11ac_20	149		5745	15.08		PASS
	157		5785	15.08		PASS
	165		5825	15.08		PASS
IEEE 802.11ac_40	151		5755	35.00		PASS
	159		5795	35.01		PASS

Test Graphs

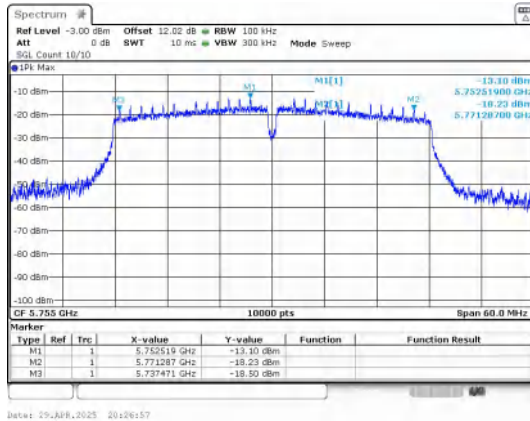
 IEEE 802.11a_Channel 149_20MHz_Antenna 0	 IEEE 802.11a_Channel 157_20MHz_Antenna 0
 IEEE 802.11a_Channel 165_20MHz_Antenna 0	 IEEE 802.11n_Channel 149_20MHz_Antenna 0



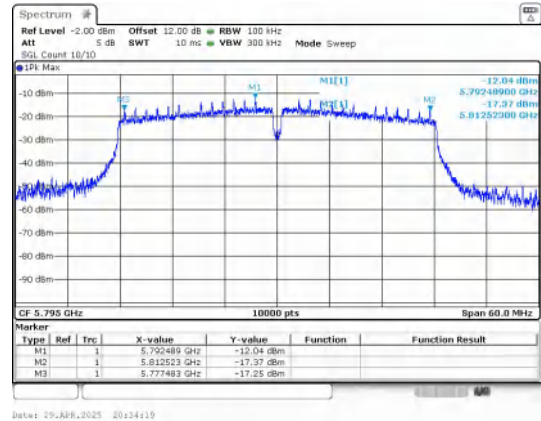
IEEE 802.11n_Channel 157_20MHz_Antenna 0



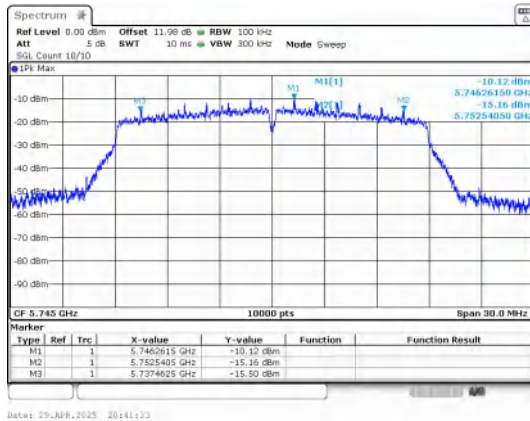
IEEE 802.11n_Channel 165_20MHz_Antenna 0



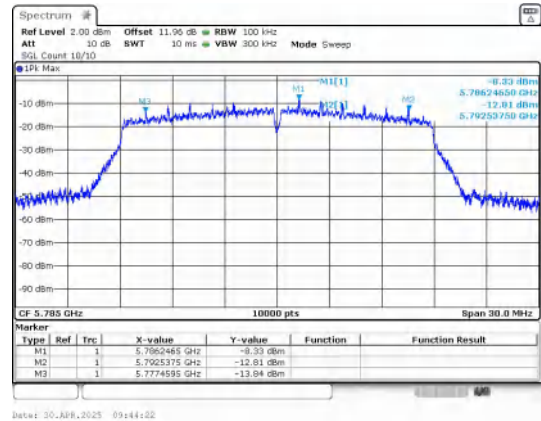
IEEE 802.11n_Channel 151_40MHz_Antenna 0



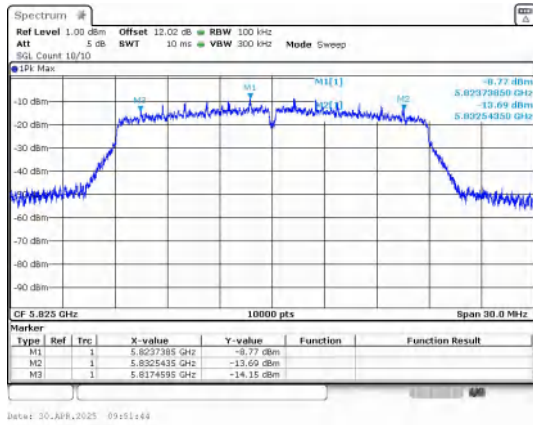
IEEE 802.11n_Channel 159_40MHz_Antenna 0



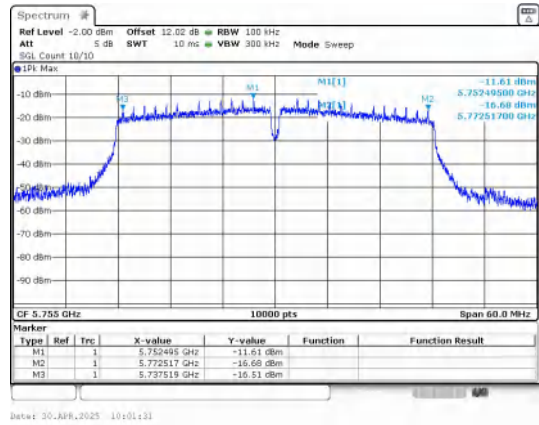
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



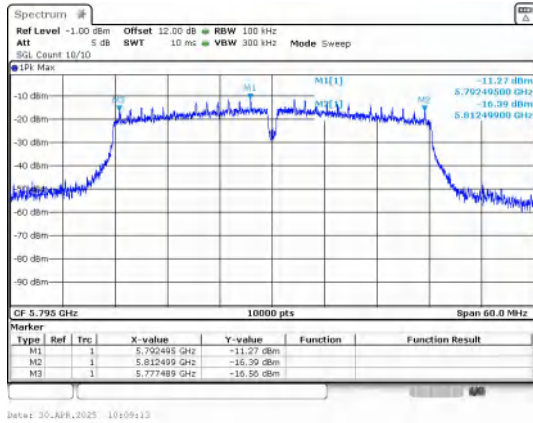
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



IEEE 802.11ac_Channel 165_20MHz_Antenna 0



IEEE 802.11ac_Channel 151_40MHz_Antenna 0



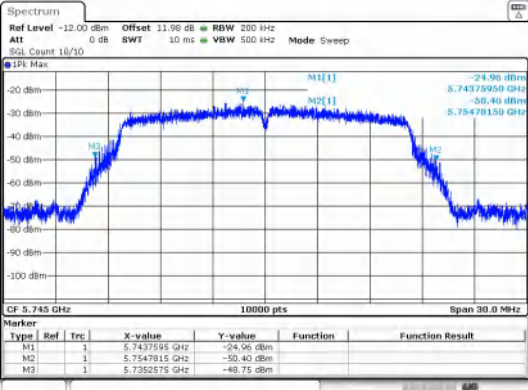
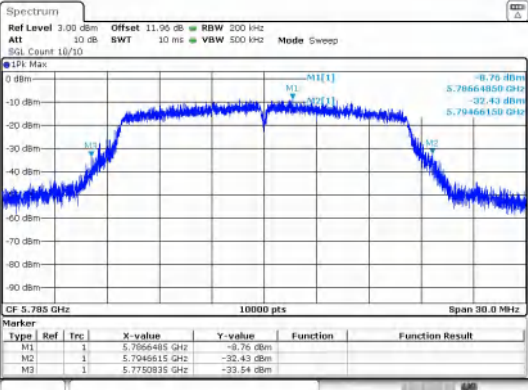
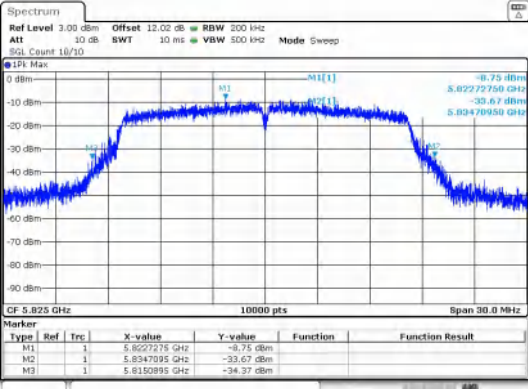
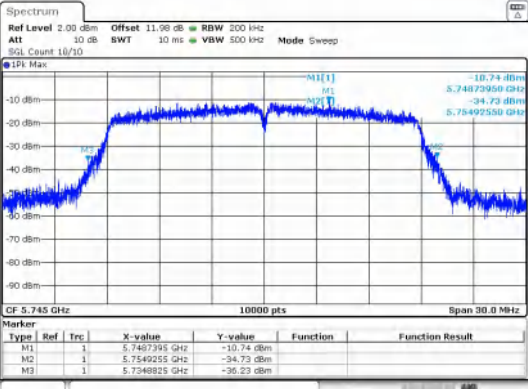
IEEE 802.11ac_Channel 159_40MHz_Antenna 0

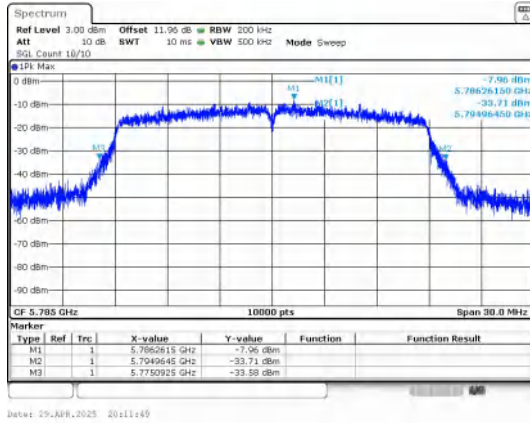
7) 26dB Bandwidth

Test Result

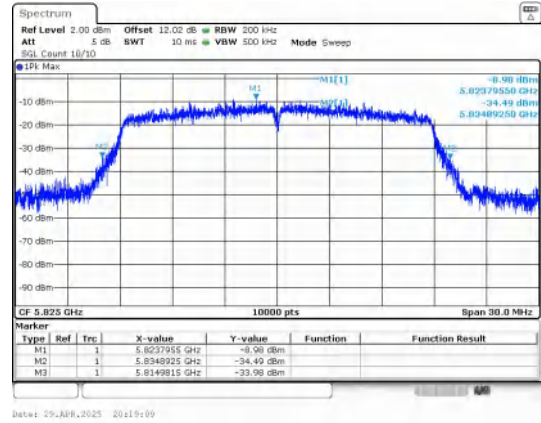
Mode	Channel	Ant.	Center Frequency (MHz)	26 dB Bandwidth (MHz)	RBW/EBW
IEEE 802.11a	149	0	5745	19.52	1.12
	157		5785	19.58	1.13
	165		5825	19.62	1.12
IEEE 802.11n_20	149		5745	20.05	1.1
	157		5785	19.87	1.12
	165		5825	19.91	1.11
IEEE 802.11n_40	151		5755	40.46	1.04
	159		5795	40.21	1.04
IEEE 802.11ac_20	149		5745	19.91	1.11
	157		5785	19.70	1.13
	165		5825	19.88	1.12
IEEE 802.11ac_40	151		5755	40.31	1.06
	159		5795	40.32	1.06

Test Graphs

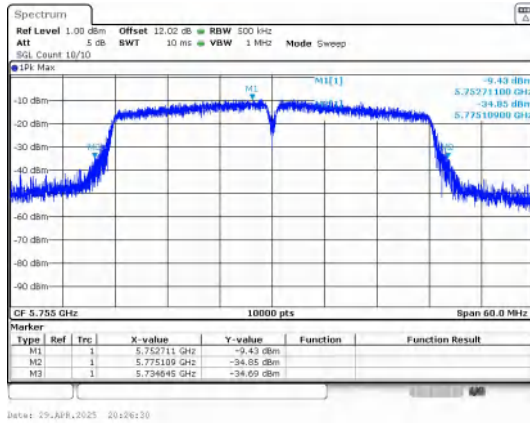
 IEEE 802.11a_Channel 149_20MHz_Antenna 0	 IEEE 802.11a_Channel 157_20MHz_Antenna 0
 IEEE 802.11a_Channel 165_20MHz_Antenna 0	 IEEE 802.11n_Channel 149_20MHz_Antenna 0



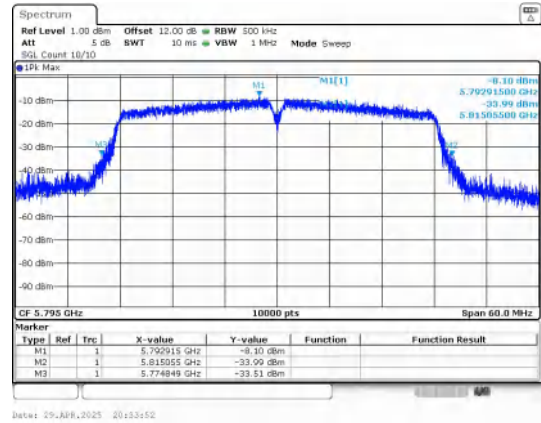
IEEE 802.11n_Channel 157_20MHz_Antenna 0



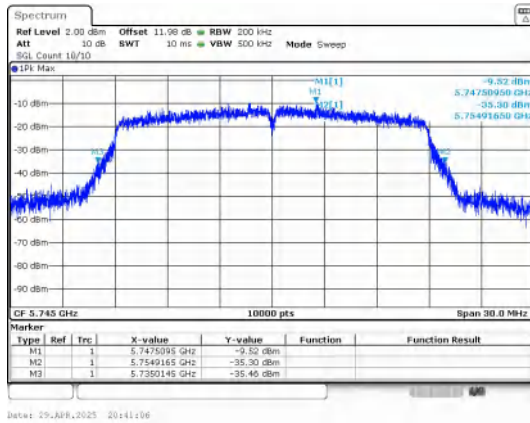
IEEE 802.11n_Channel 165_20MHz_Antenna 0



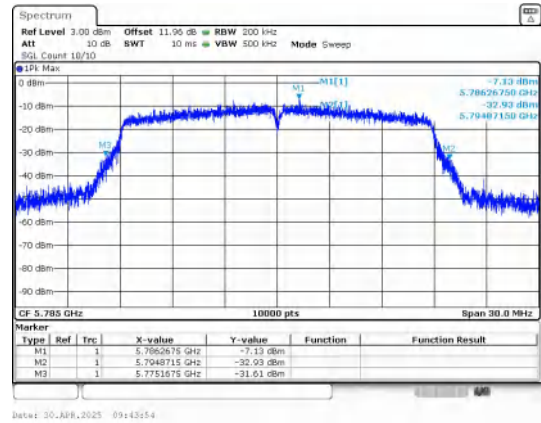
IEEE 802.11n_Channel 151_40MHz_Antenna 0



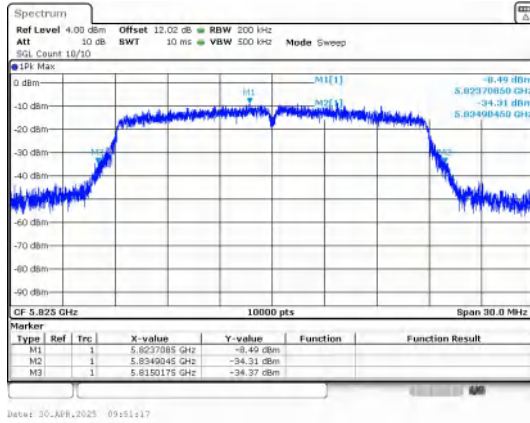
IEEE 802.11n_Channel 159_40MHz_Antenna 0



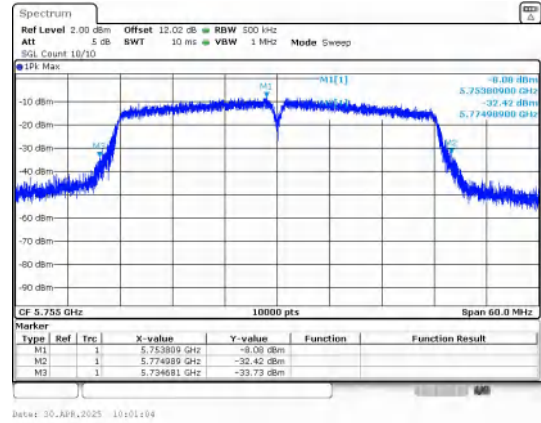
IEEE 802.11ac_Channel 149_20MHz_Antenna 0



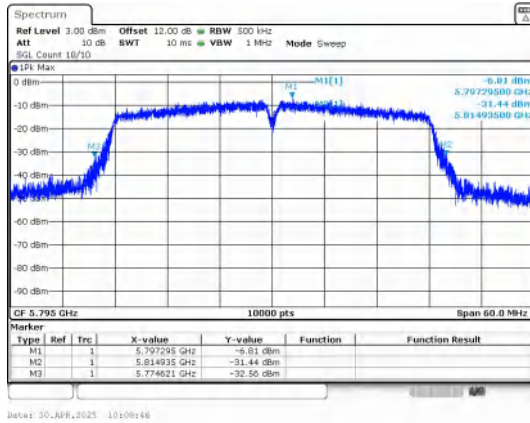
IEEE 802.11ac_Channel 157_20MHz_Antenna 0



IEEE 802.11ac_Channel 165_20MHz_Antenna 0



IEEE 802.11ac_Channel 151_40MHz_Antenna 0



IEEE 802.11ac_Channel 159_40MHz_Antenna 0

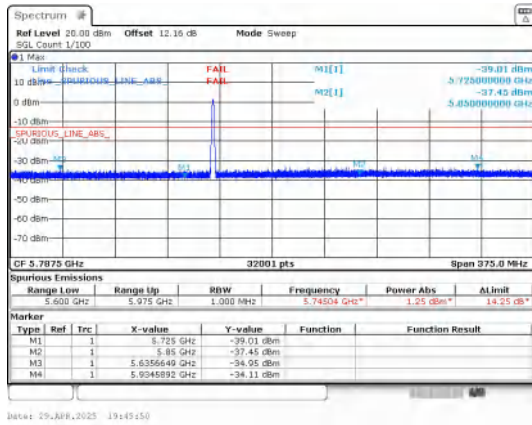
8) Conducted Out Of Band Emission

Test Result

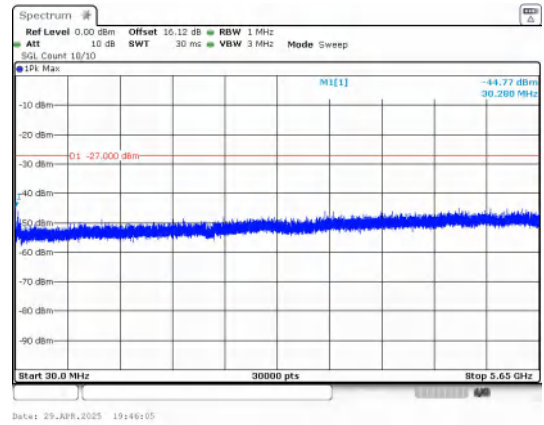
Mode	Channel	Ant.	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
IEEE 802.11a	149	0	30.28	-44.770	-27	-17.770	PASS
			5635.66	-34.955	-27	-7.955	PASS
			5725.00	-39.010	27	-66.010	PASS
			5850.00	-37.450	27	-64.450	PASS
			5934.59	-34.107	-27	-7.107	PASS
			22087.6	-43.170	-27	-16.170	PASS
	157		30.09	-43.640	-27	-16.640	PASS
			5613.14	-34.862	-27	-7.862	PASS
			5725.00	-38.440	27	-65.440	PASS
			5850.00	-36.990	27	-63.990	PASS
			5971.27	-34.038	-27	-7.038	PASS
			22004.9	-43.090	-27	-16.090	PASS
	165		3495.20	-43.410	-27	-16.410	PASS
			5642.45	-34.757	-27	-7.757	PASS
			5725.00	-35.930	27	-62.930	PASS
			5850.00	-37.760	27	-64.760	PASS
			5960.55	-34.356	-27	-7.356	PASS
			22084.4	-43.060	-27	-16.060	PASS
IEEE 802.11n_20	149		3447.24	-44.360	-27	-17.360	PASS
			5602.42	-35.113	-27	-8.113	PASS
			5725.00	-38.520	27	-65.520	PASS
			5850.00	-37.510	27	-64.510	PASS
			5927.41	-34.010	-27	-7.010	PASS
			18267.5	-43.160	-27	-16.160	PASS
	157	5480.74	-44.190	-27	-17.190	PASS	
		5643.23	-34.672	-27	-7.672	PASS	
		5725.00	-37.920	27	-64.920	PASS	
		5850.00	-37.430	27	-64.430	PASS	
		5950.24	-33.878	-27	-6.878	PASS	
		15384.6	-43.860	-27	-16.860	PASS	
	165	3495.01	-43.300	-27	-16.300	PASS	
		5627.30	-34.547	-27	-7.547	PASS	
		5725.00	-36.340	27	-63.340	PASS	
		5850.00	-36.640	27	-63.640	PASS	
		5931.94	-34.054	-27	-7.054	PASS	
		22046.9	-42.950	-27	-15.950	PASS	
IEEE	151	5590.90	-44.870	-27	-17.870	PASS	

802.11n_40		5622.92	-34.965	-27	-7.965	PASS
		5725.00	-37.440	27	-64.440	PASS
		5850.00	-37.860	27	-64.860	PASS
		5932.85	-34.234	-27	-7.234	PASS
		21989.7	-43.690	-27	-16.690	PASS
	159	5448.34	-44.890	-27	-17.890	PASS
		5649.33	-34.966	-27	-7.966	PASS
		5725.00	-36.530	27	-63.530	PASS
		5850.00	-37.130	27	-64.130	PASS
		5956.32	-33.990	-27	-6.990	PASS
		17352.5	-43.160	-27	-16.160	PASS
		5580.97	-44.350	-27	-17.350	PASS
IEEE 802.11ac_20	149	5609.23	-34.716	-27	-7.716	PASS
		5725.00	-38.060	27	-65.060	PASS
		5850.00	-37.830	27	-64.830	PASS
		5954.97	-34.188	-27	-7.188	PASS
		22071.0	-42.800	-27	-15.800	PASS
		3470.85	-45.120	-27	-18.120	PASS
	157	5628.82	-34.586	-27	-7.586	PASS
		5725.00	-38.160	27	-65.160	PASS
		5850.00	-37.270	27	-64.270	PASS
		5969.28	-34.050	-27	-7.050	PASS
		22017.0	-43.270	-27	-16.270	PASS
		5575.16	-45.050	-27	-18.050	PASS
	165	5604.48	-35.139	-27	-8.139	PASS
		5725.00	-37.540	27	-64.540	PASS
		5850.00	-37.550	27	-64.550	PASS
		5948.52	-33.983	-27	-6.983	PASS
		22090.7	-43.620	-27	-16.620	PASS
		4987.12	-44.250	-27	-17.250	PASS
IEEE 802.11ac_40	151	5626.91	-34.746	-27	-7.746	PASS
		5725.00	-37.990	27	-64.990	PASS
		5850.00	-36.860	27	-63.860	PASS
		5936.82	-34.228	-27	-7.228	PASS
		16336.5	-43.400	-27	-16.400	PASS
		30.09	-42.800	-27	-15.800	PASS
	159	5612.65	-34.702	-27	-7.702	PASS
		5725.00	-38.080	27	-65.080	PASS
		5850.00	-37.250	27	-64.250	PASS
		5945.02	-34.018	-27	-7.018	PASS
		16203.6	-43.000	-27	-16.000	PASS

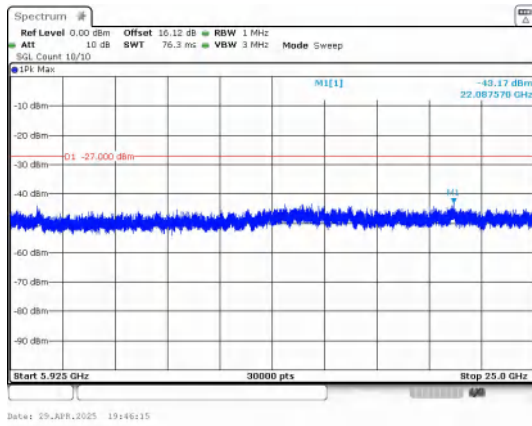
Test Graphs



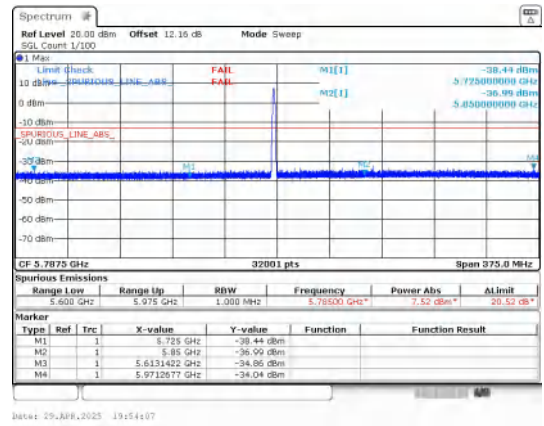
Out Of Band Emission
IEEE 802.11a_Channel 149_20MHz_Antenna 0



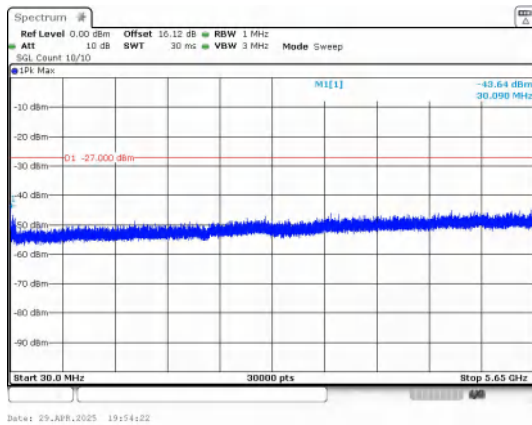
Spurious Emission:30.0~5650 MHz
IEEE 802.11a_Channel 149_20MHz_Antenna 0



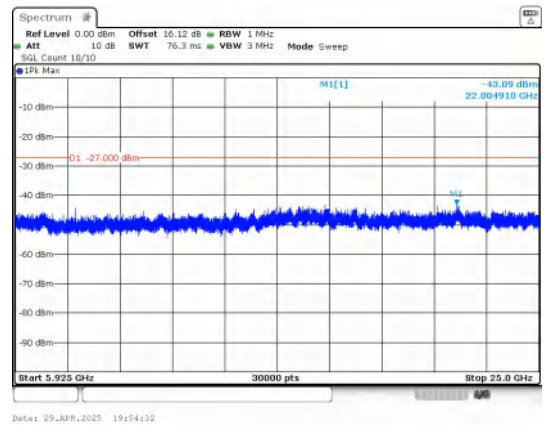
Spurious Emission:5925~25000.0 MHz
IEEE 802.11a_Channel 149_20MHz_Antenna 0



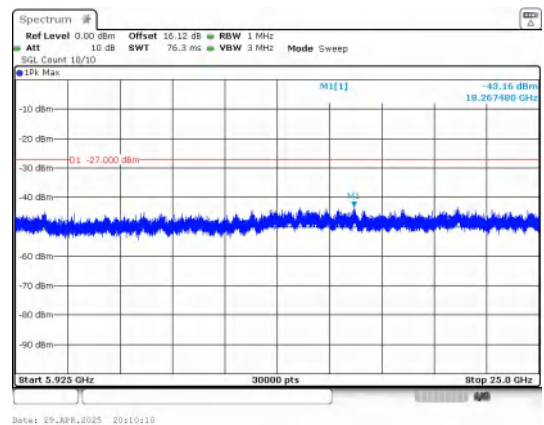
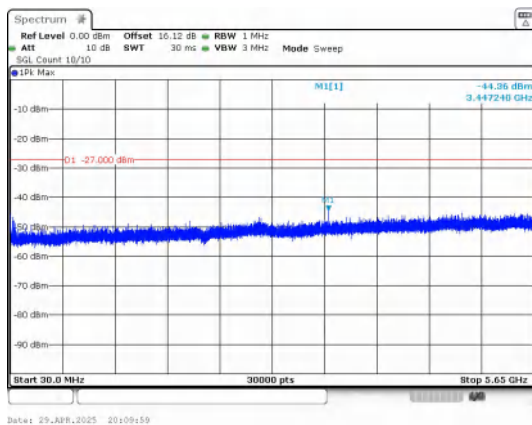
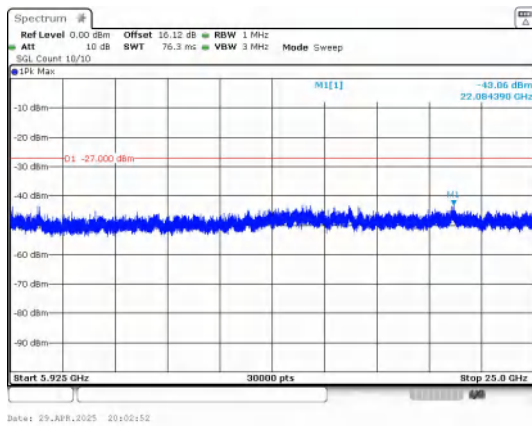
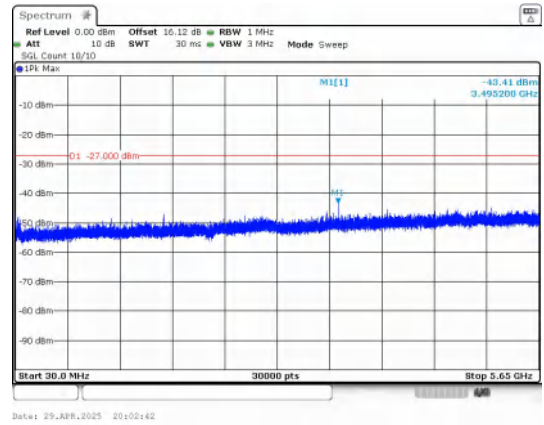
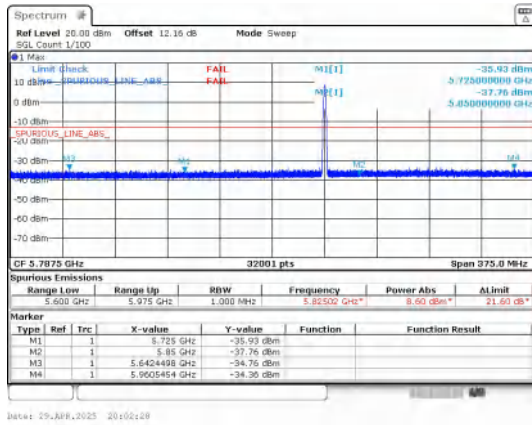
Out Of Band Emission
IEEE 802.11a_Channel 157_20MHz_Antenna 0

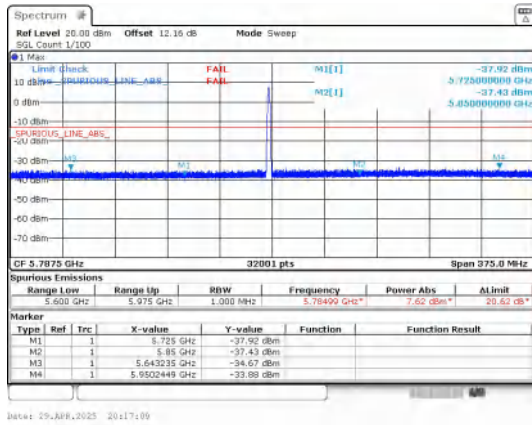


Spurious Emission:30.0~5650 MHz
IEEE 802.11a_Channel 157_20MHz_Antenna 0

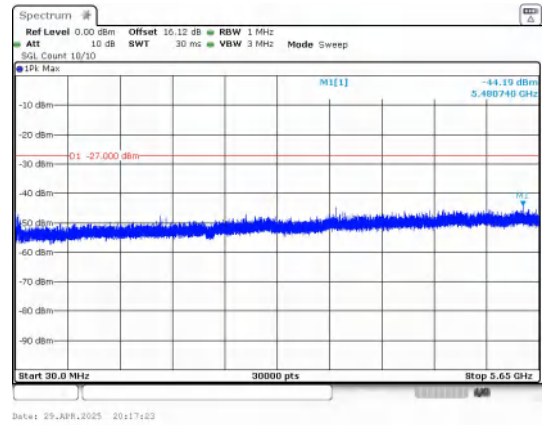


Spurious Emission:5925~25000.0 MHz
IEEE 802.11a_Channel 157_20MHz_Antenna 0

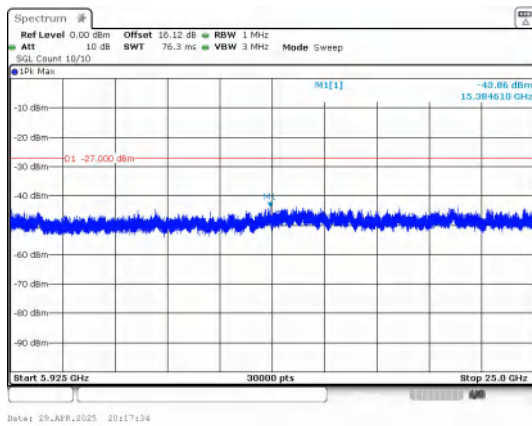




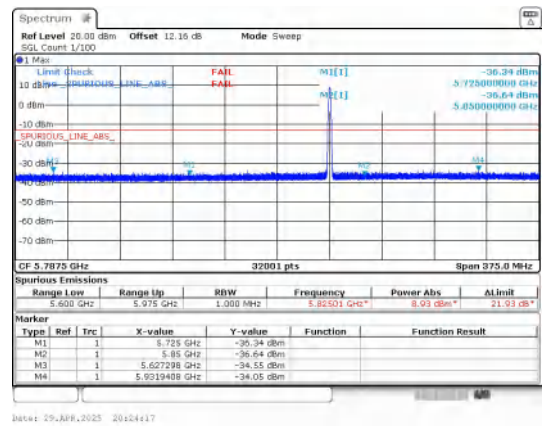
Out Of Band Emission
IEEE 802.11n_Channel 157_20MHz_Antenna 0



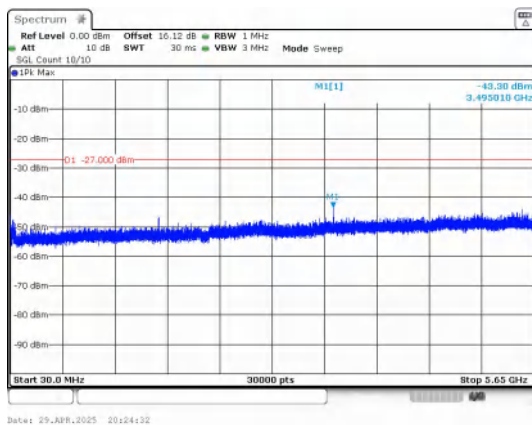
Spurious Emission:30.0~5650 MHz
IEEE 802.11n_Channel 157_20MHz_Antenna 0



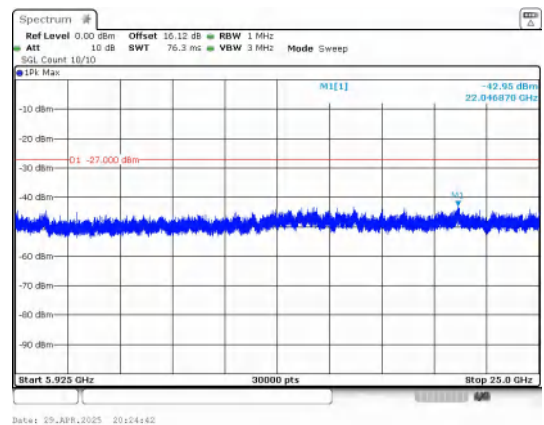
Spurious Emission:5925~25000.0 MHz
IEEE 802.11n_Channel 157_20MHz_Antenna 0



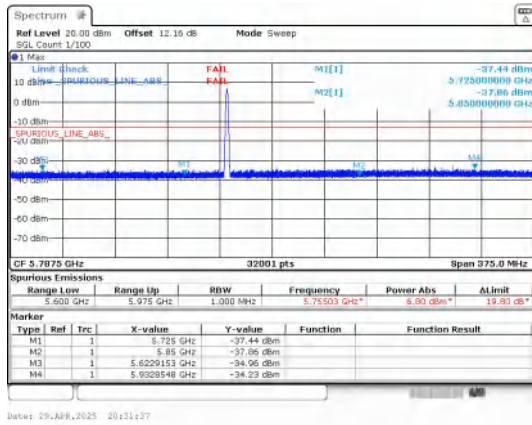
Out Of Band Emission
IEEE 802.11n_Channel 165_20MHz_Antenna 0



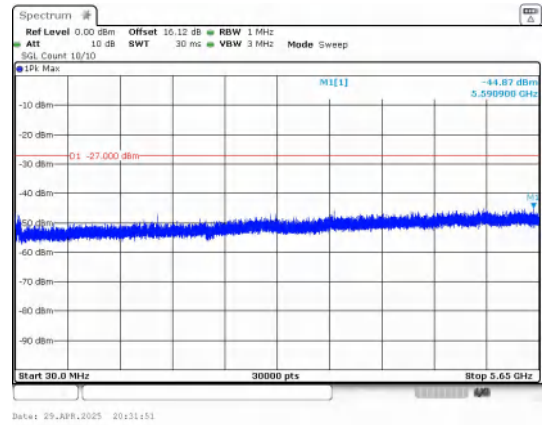
Spurious Emission:30.0~5650 MHz
IEEE 802.11n_Channel 165_20MHz_Antenna 0



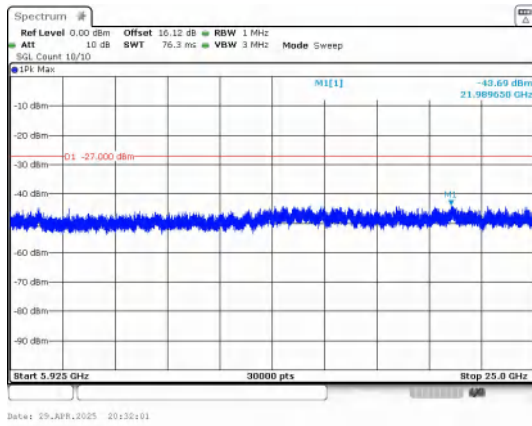
Spurious Emission:5925~25000.0 MHz
IEEE 802.11n_Channel 165_20MHz_Antenna 0



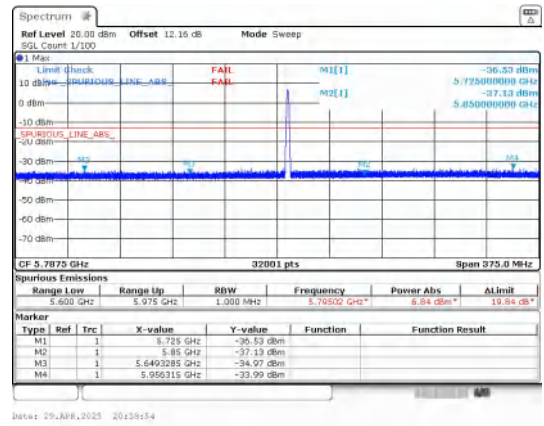
Out Of Band Emission
IEEE 802.11n_Channel 151_40MHz_Antenna 0



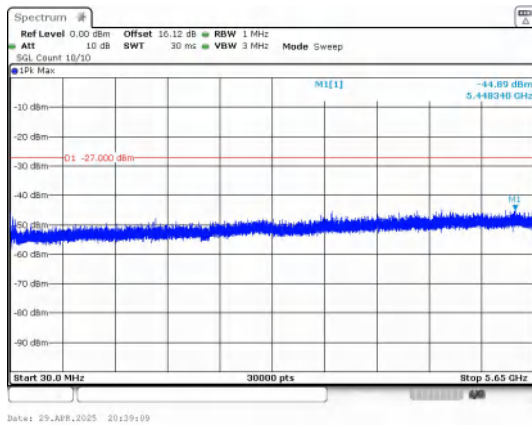
Spurious Emission:30.0~5650 MHz
IEEE 802.11n_Channel 151_40MHz_Antenna 0



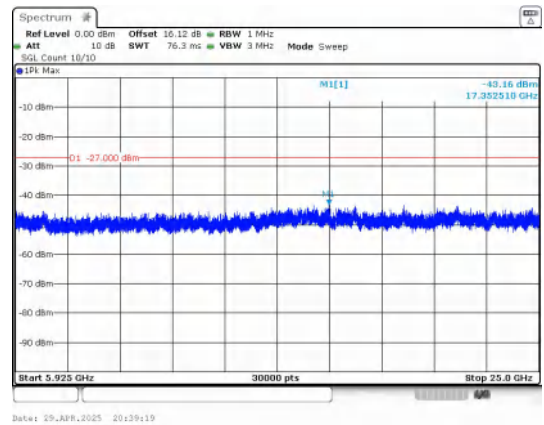
Spurious Emission:5925~25000.0 MHz
IEEE 802.11n_Channel 151_40MHz_Antenna 0



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

