

ANNEX F TEST DATA

For

Project No.:	8229EU010601W
Client:	TZUMI Electronics,LLC
Product Name:	Projector
Model No.:	9520
FCC ID:	2AON7-9520
Technology:	WiFi 5G
Test Engineer:	<i>Mikoy zhu</i>
Test Date:	2024-05-13

Test Summary

Item	Result
Duty Cycle	Pass
Bandwidth	Pass
Maximum Conducted Output Power	Pass
Maximum Power Spectral Density	Pass
Unwanted Emissions In Restricted Frequency Bands	Pass
Frequency Stability	Pass

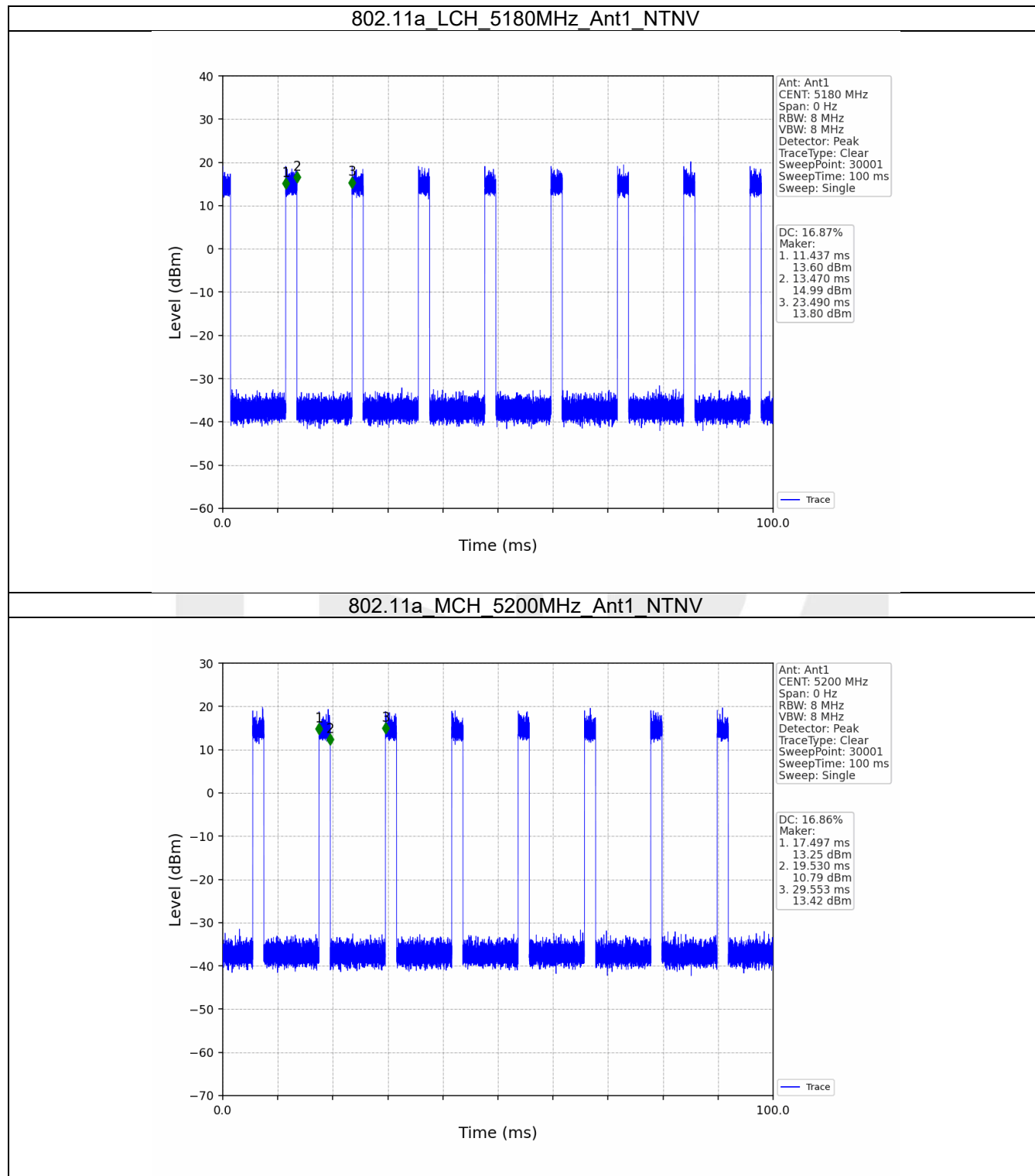
1. Duty Cycle

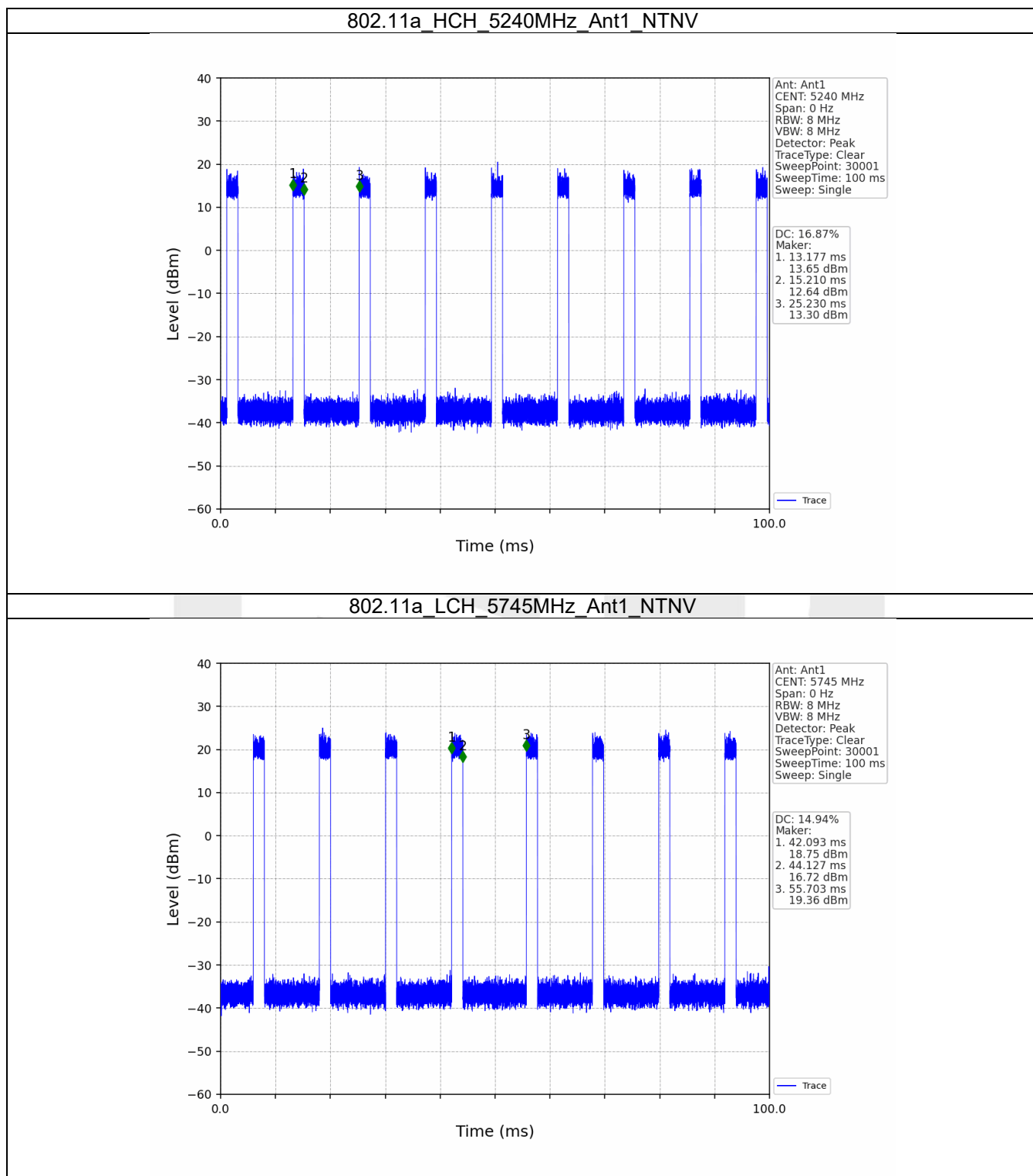
1.1 Ant1

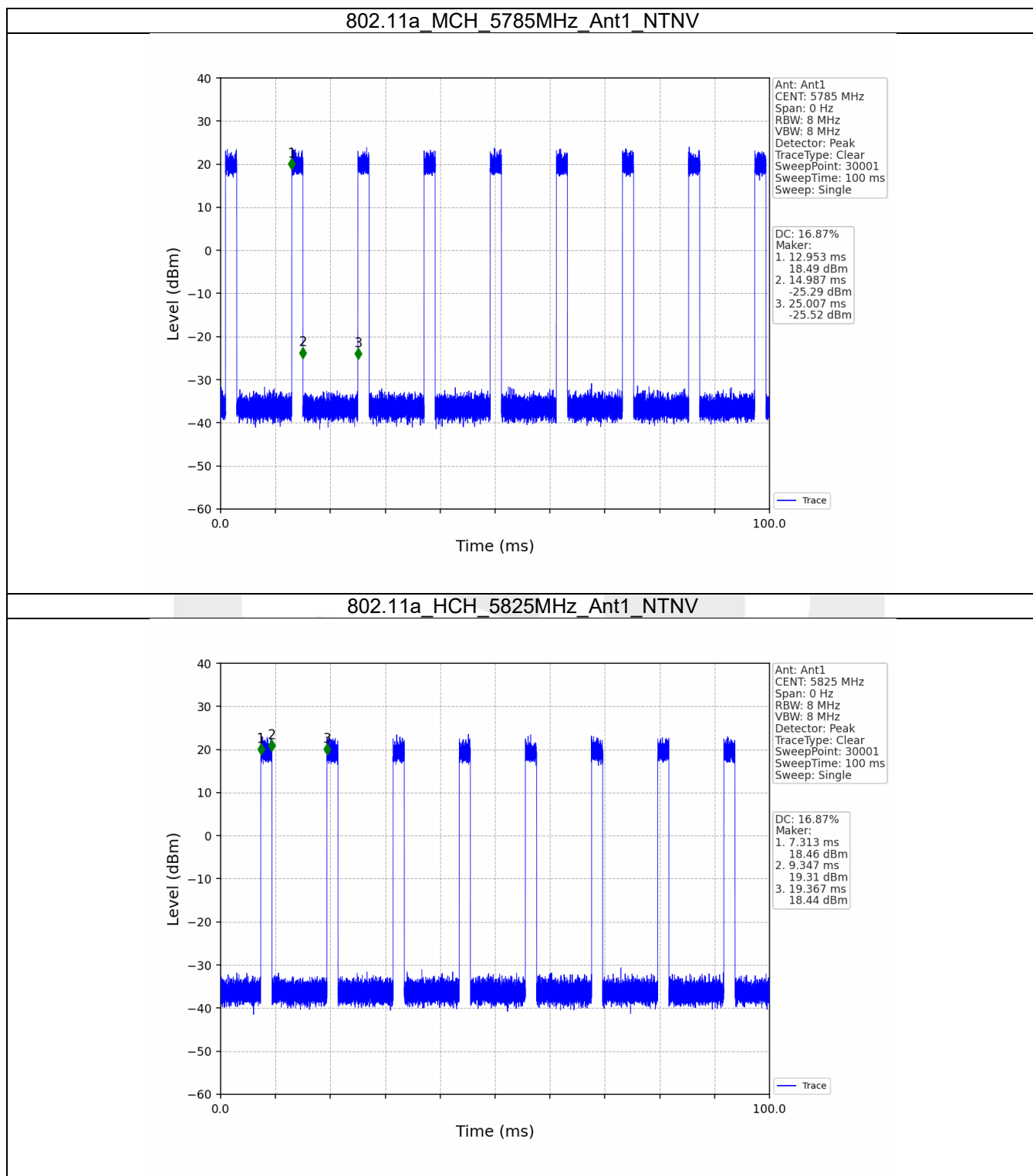
1.1.1 Test Result

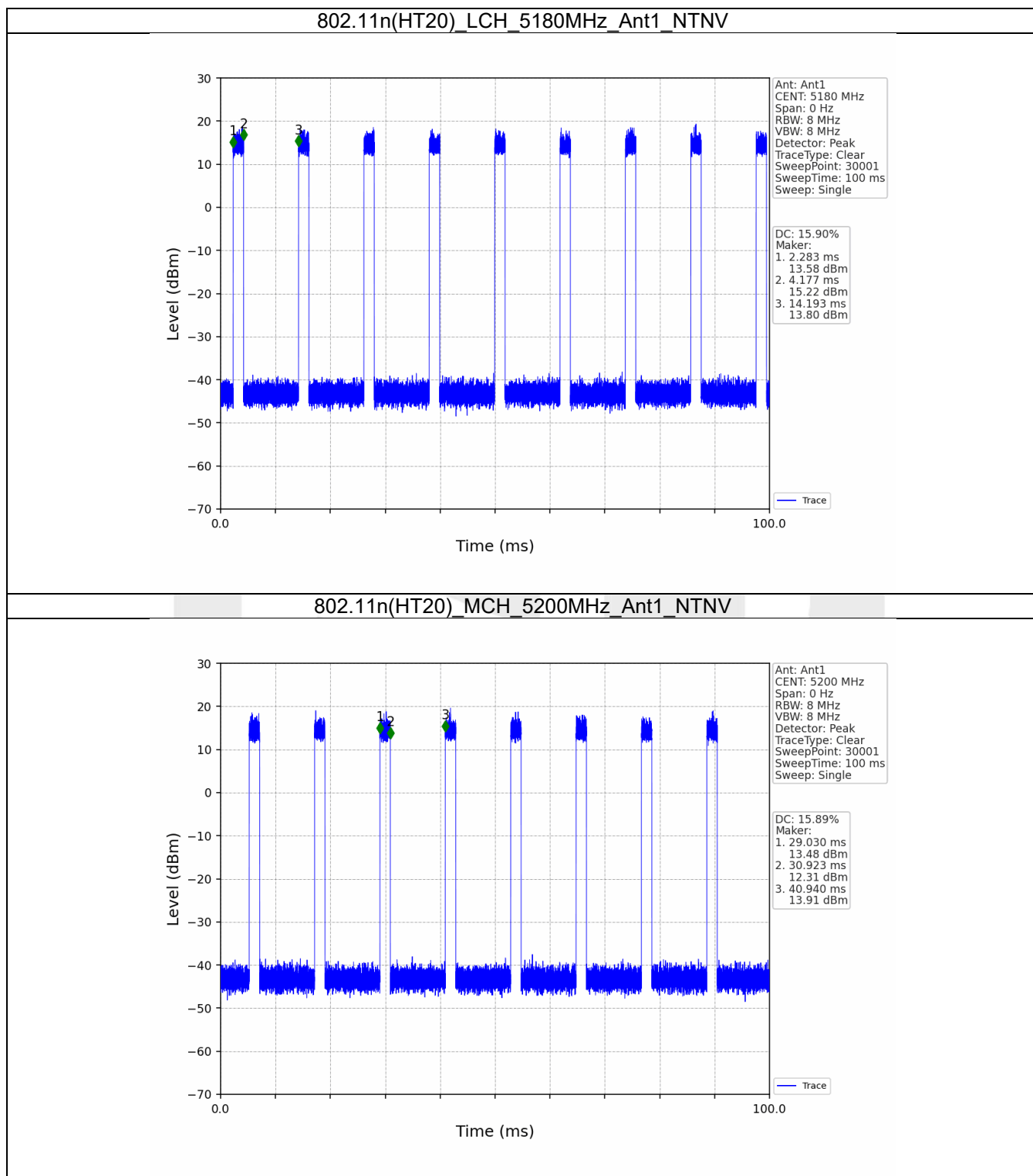
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11a	SISO	5180	2.033	12.053	16.87	7.73	0.00
		5200	2.033	12.056	16.86	7.73	0.03
		5240	2.033	12.053	16.87	7.73	0.03
		5745	2.034	13.610	14.94	8.26	1.96
		5785	2.034	12.054	16.87	7.73	0.03
		5825	2.034	12.054	16.87	7.73	0.00
802.11n (HT20)	SISO	5180	1.894	11.910	15.90	7.99	0.03
		5200	1.893	11.910	15.89	7.99	0.03
		5240	1.893	11.913	15.89	7.99	0.03
		5745	0.227	12.847	1.77	17.53	0.46
		5785	0.227	10.687	2.12	16.73	0.09
		5825	0.227	10.247	2.22	16.55	0.00
802.11n (HT40)	SISO	5190	0.933	10.950	8.52	10.70	0.03
		5230	0.934	10.950	8.53	10.69	0.03
		5755	0.933	10.956	8.52	10.70	0.01
		5795	0.934	10.954	8.53	10.69	0.03

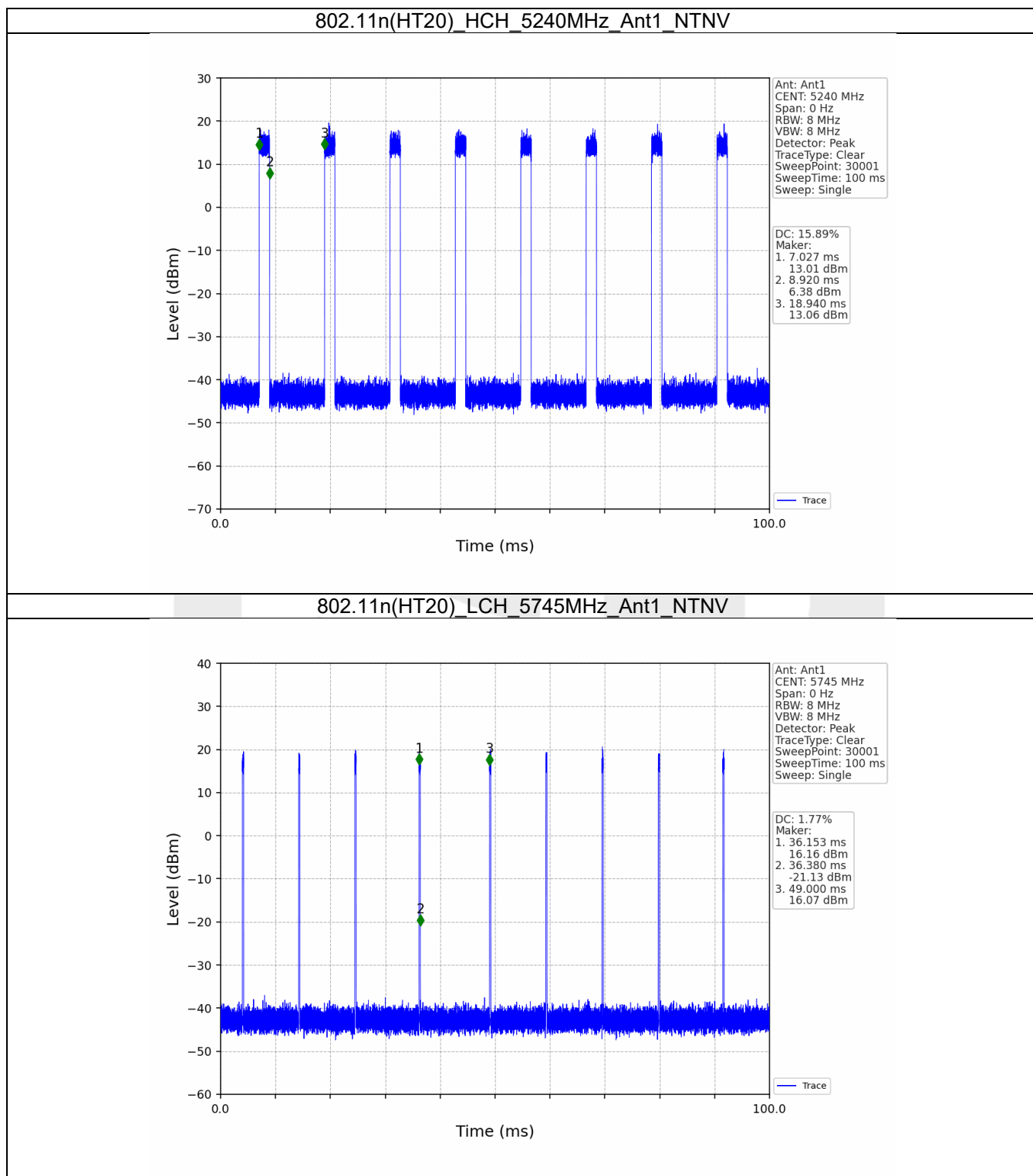
1.1.2 Test Graph

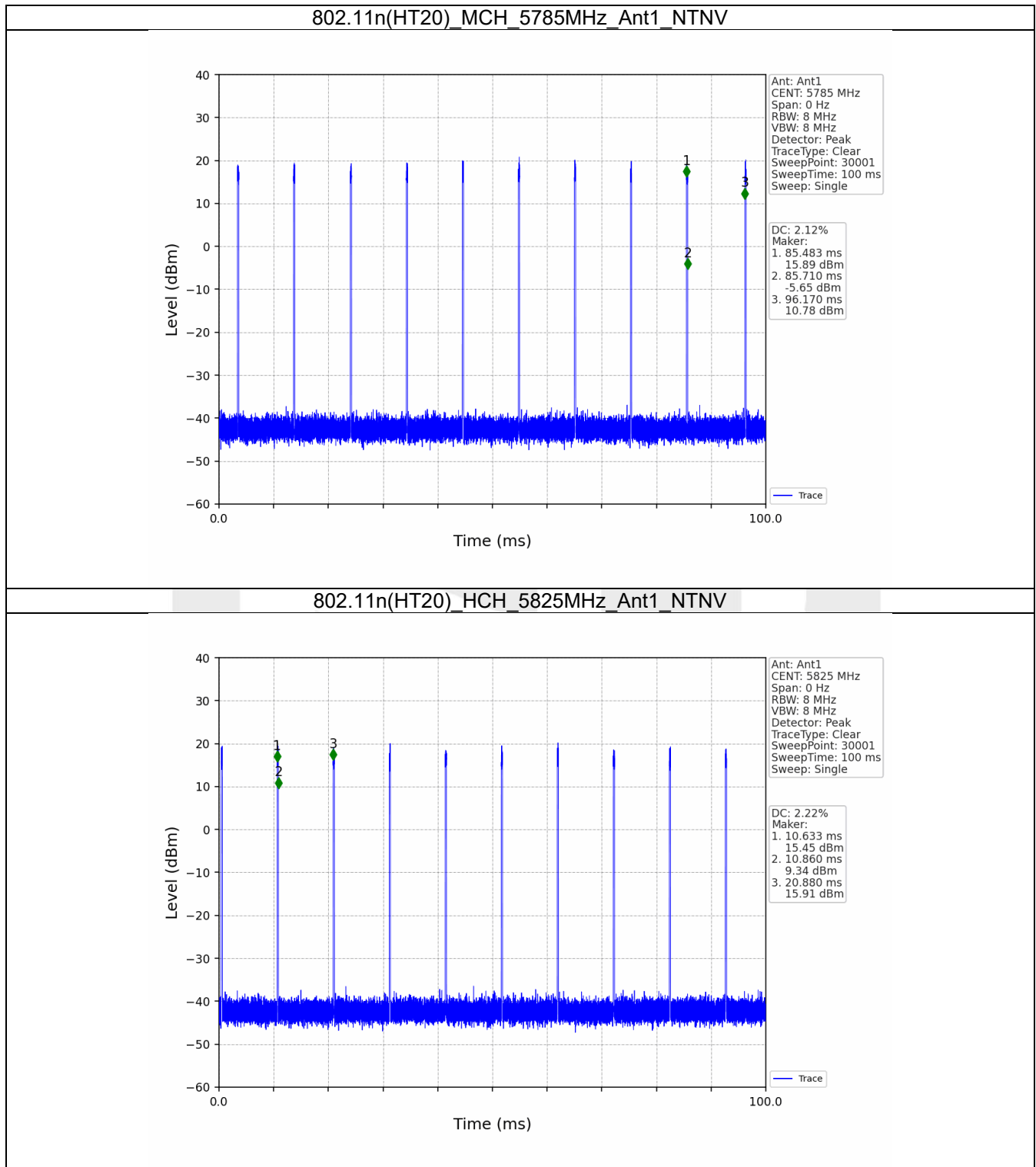


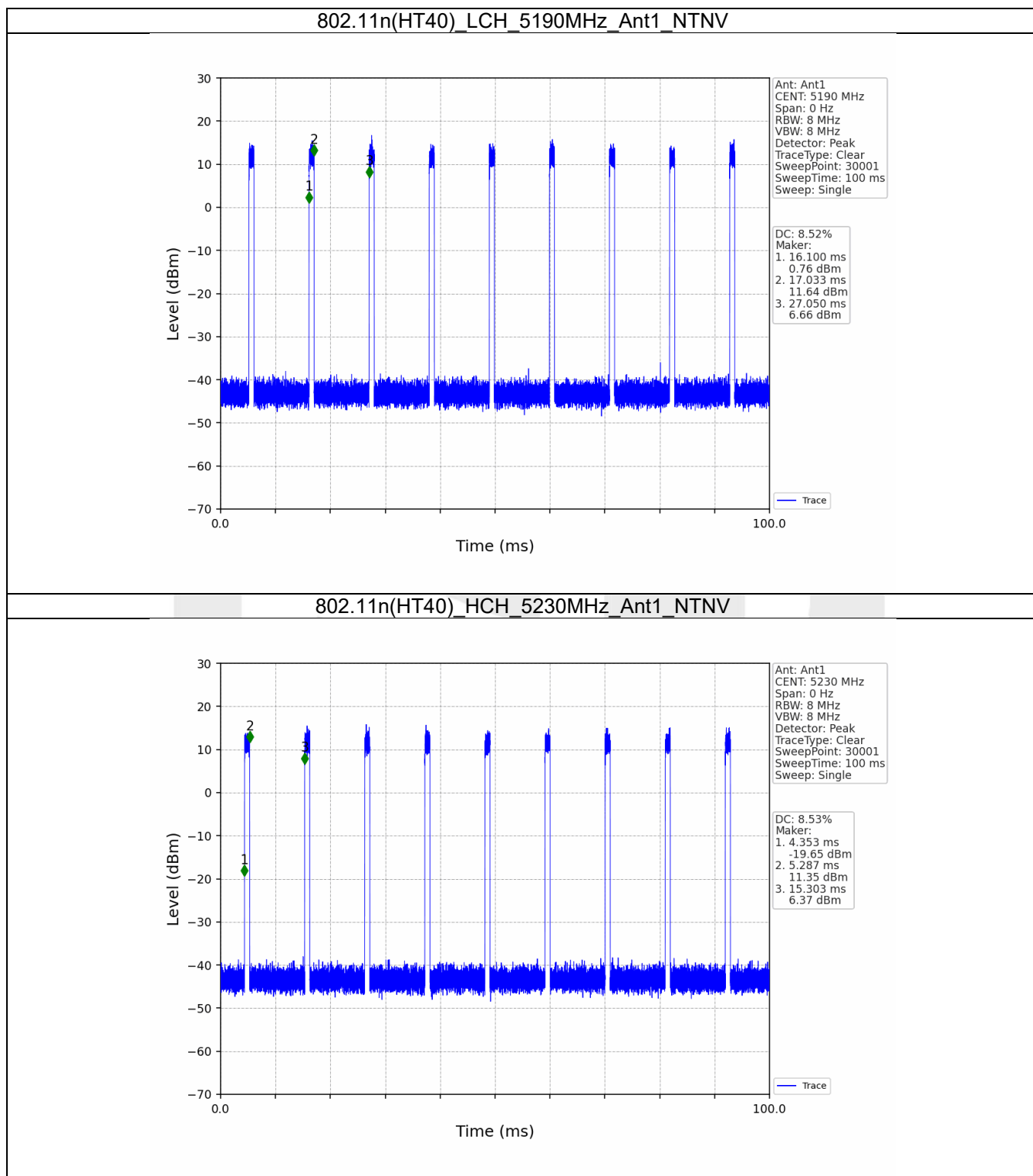


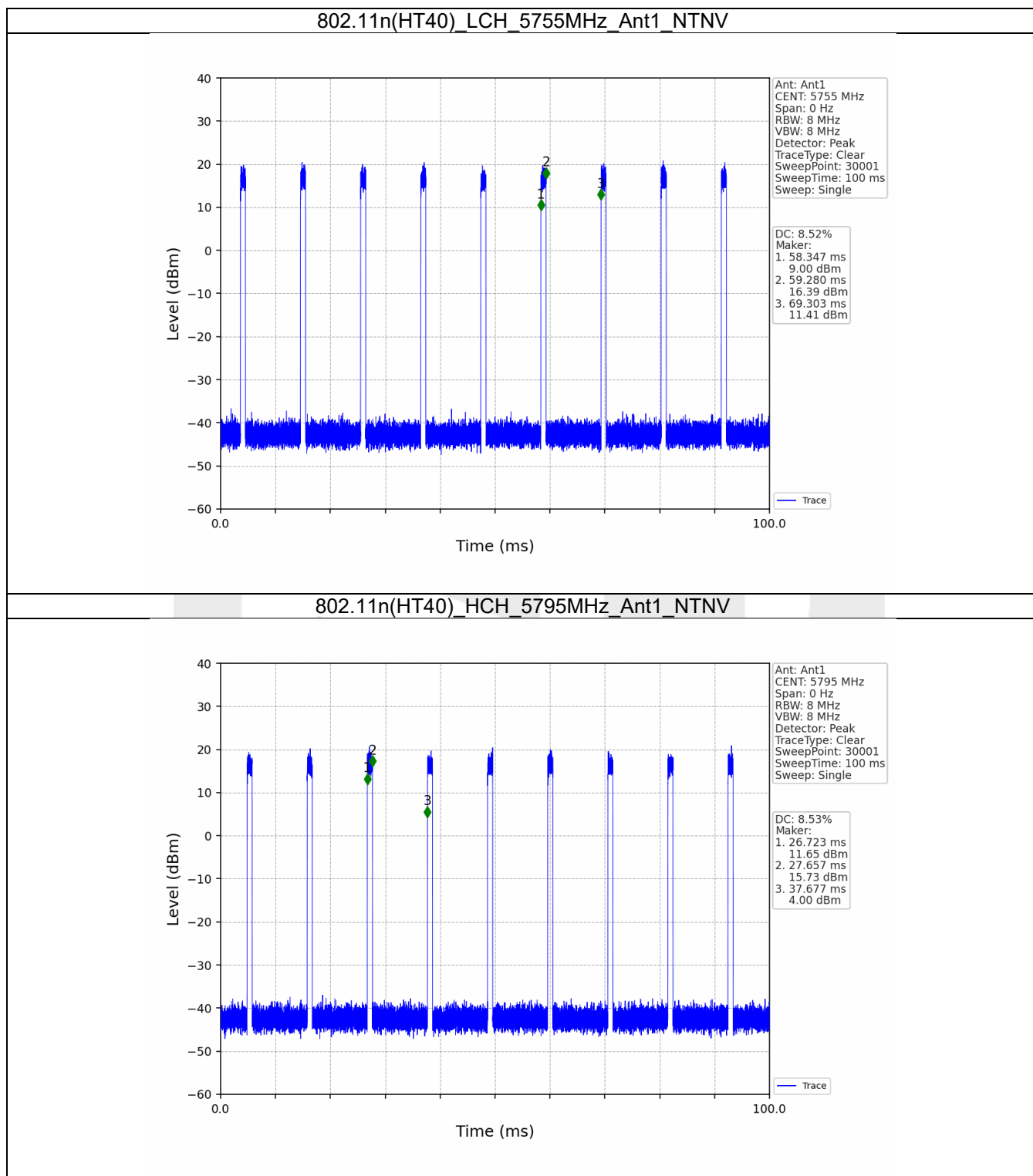












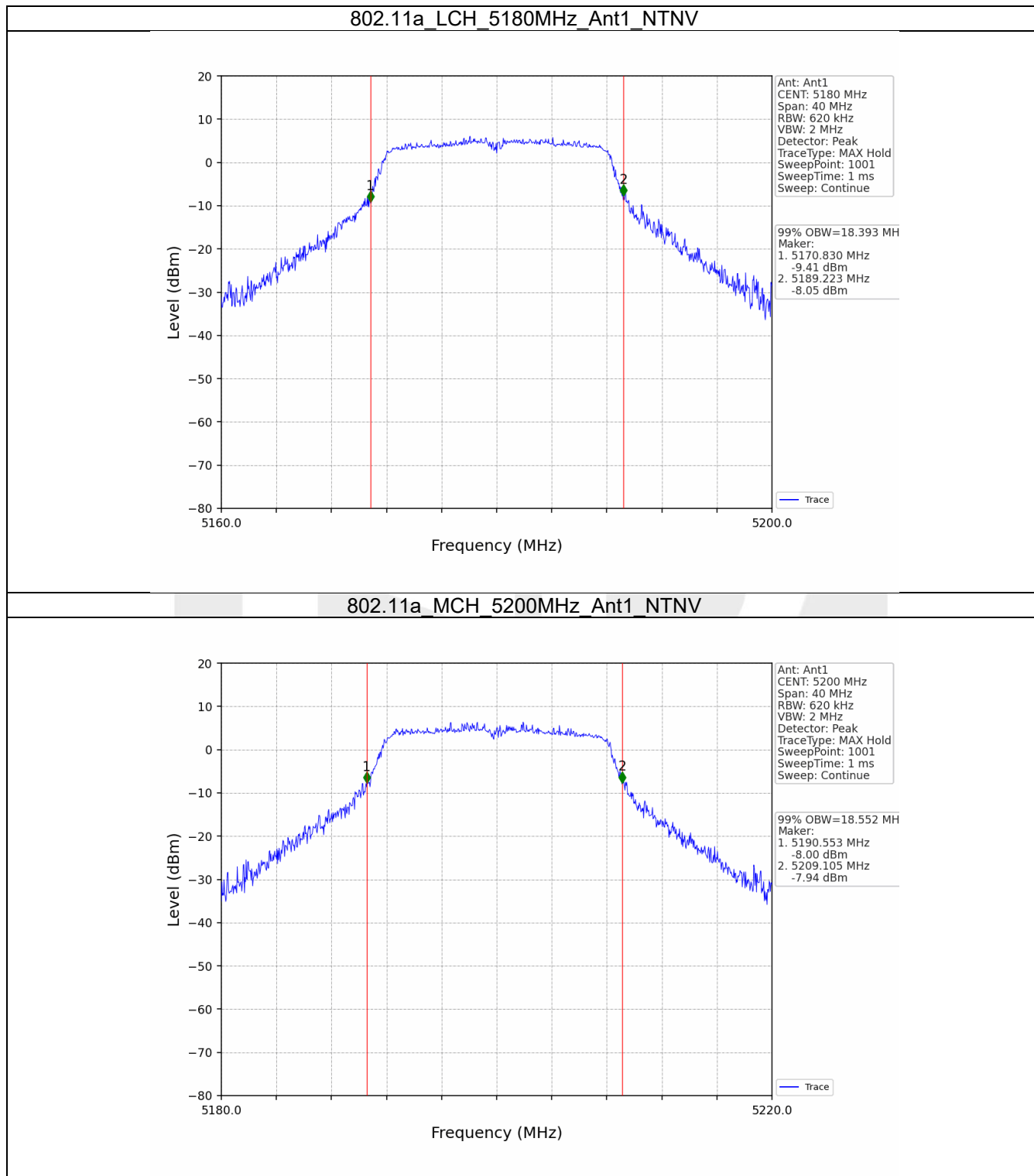
2. Bandwidth

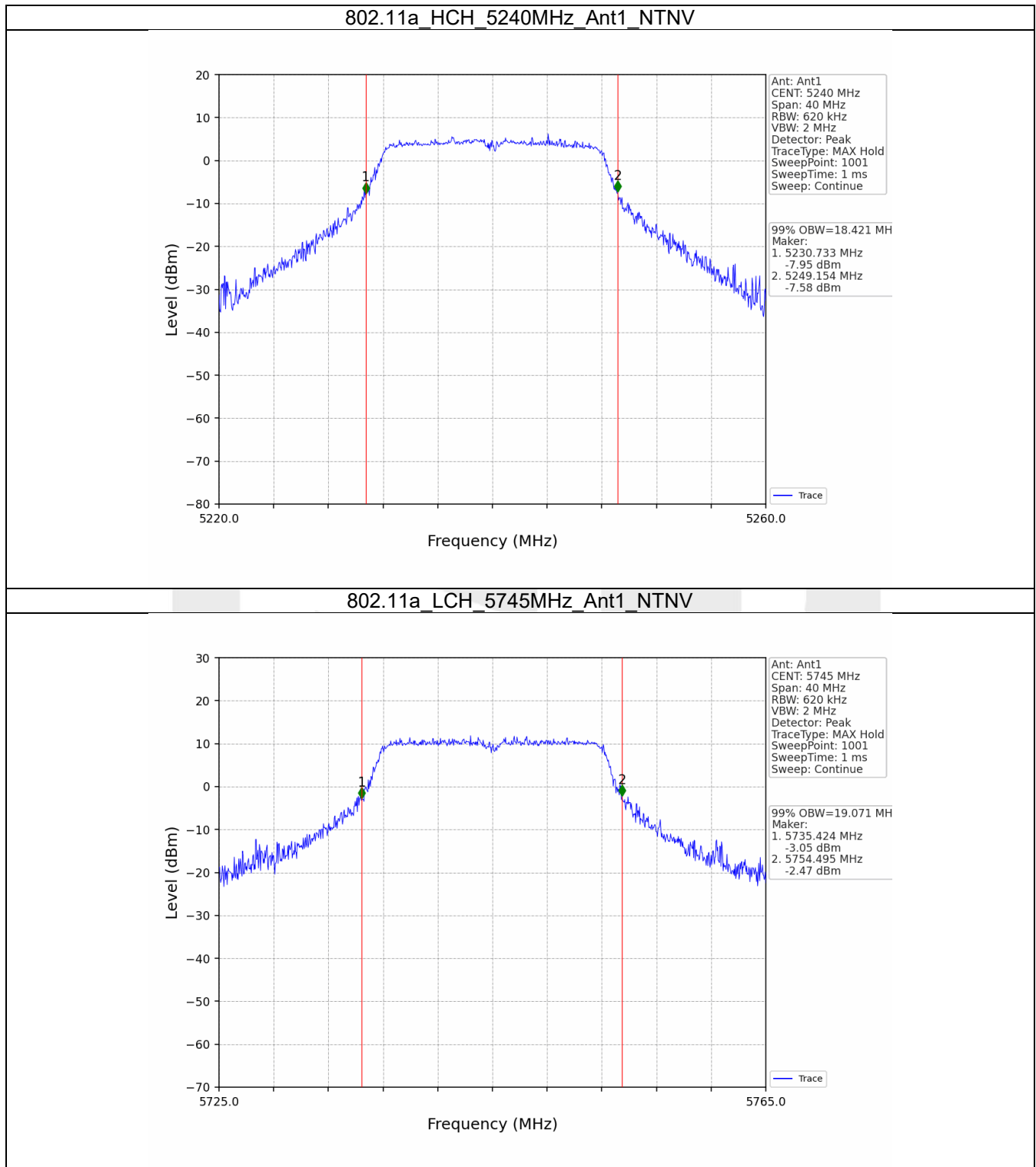
2.1 OBW

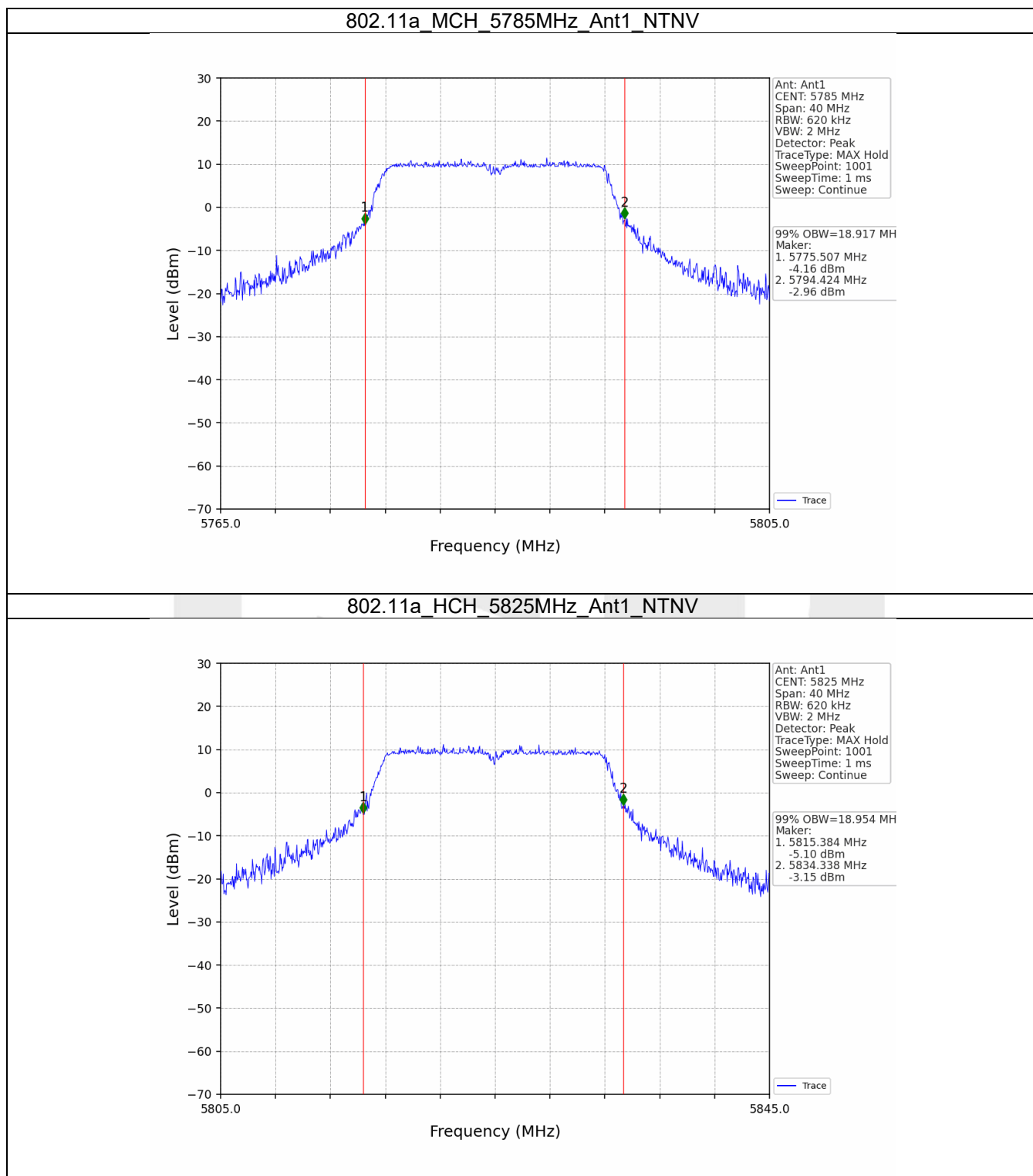
2.1.1 Test Result

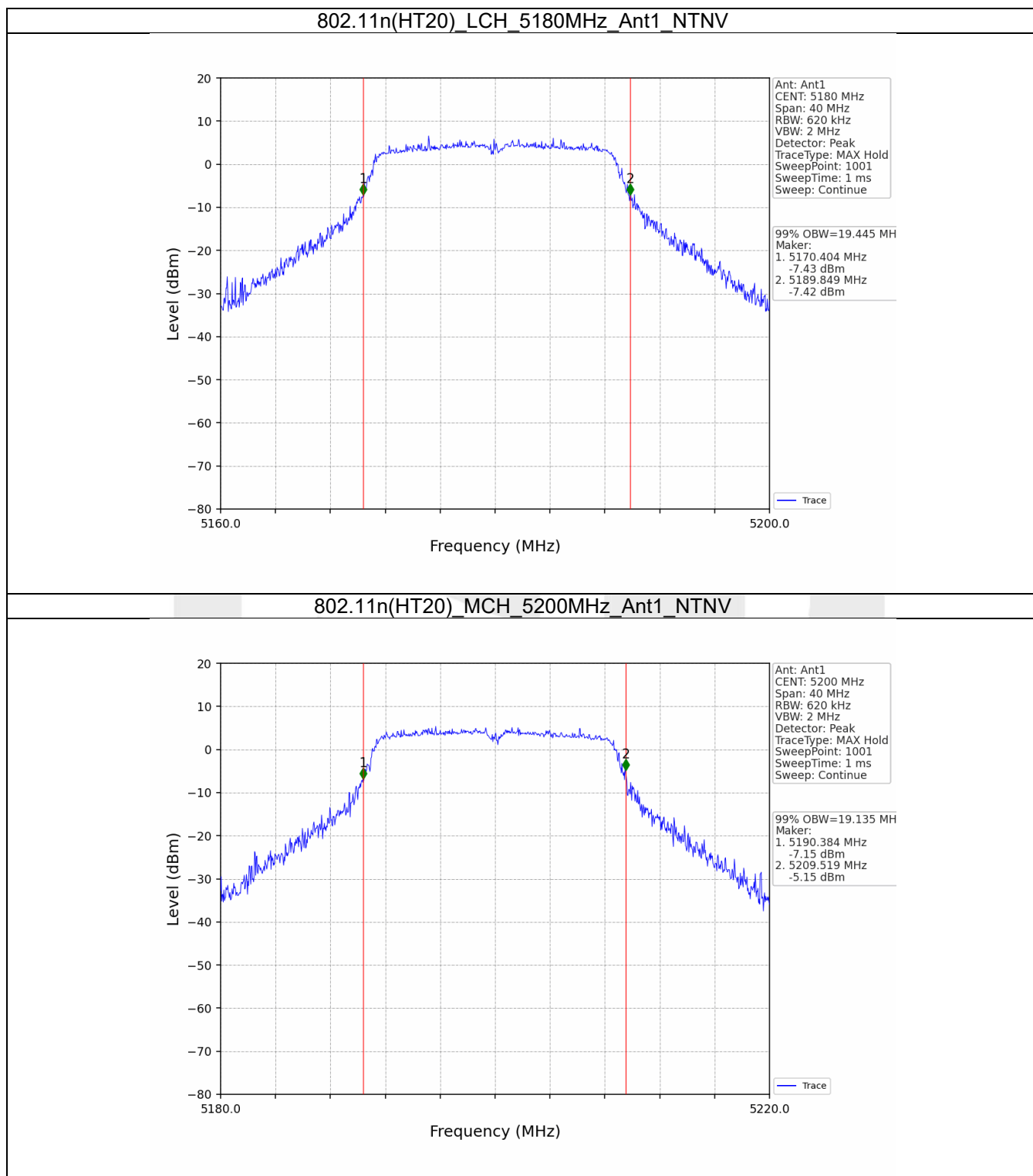
Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5180	1	18.393	/	Pass
		5200	1	18.552	/	Pass
		5240	1	18.421	/	Pass
		5745	1	19.071	/	Pass
		5785	1	18.917	/	Pass
		5825	1	18.954	/	Pass
802.11n (HT20)	SISO	5180	1	19.445	/	Pass
		5200	1	19.135	/	Pass
		5240	1	19.409	/	Pass
		5745	1	18.611	/	Pass
		5785	1	18.817	/	Pass
		5825	1	18.865	/	Pass
802.11n (HT40)	SISO	5190	1	37.411	/	Pass
		5230	1	37.338	/	Pass
		5755	1	38.237	/	Pass
		5795	1	38.094	/	Pass

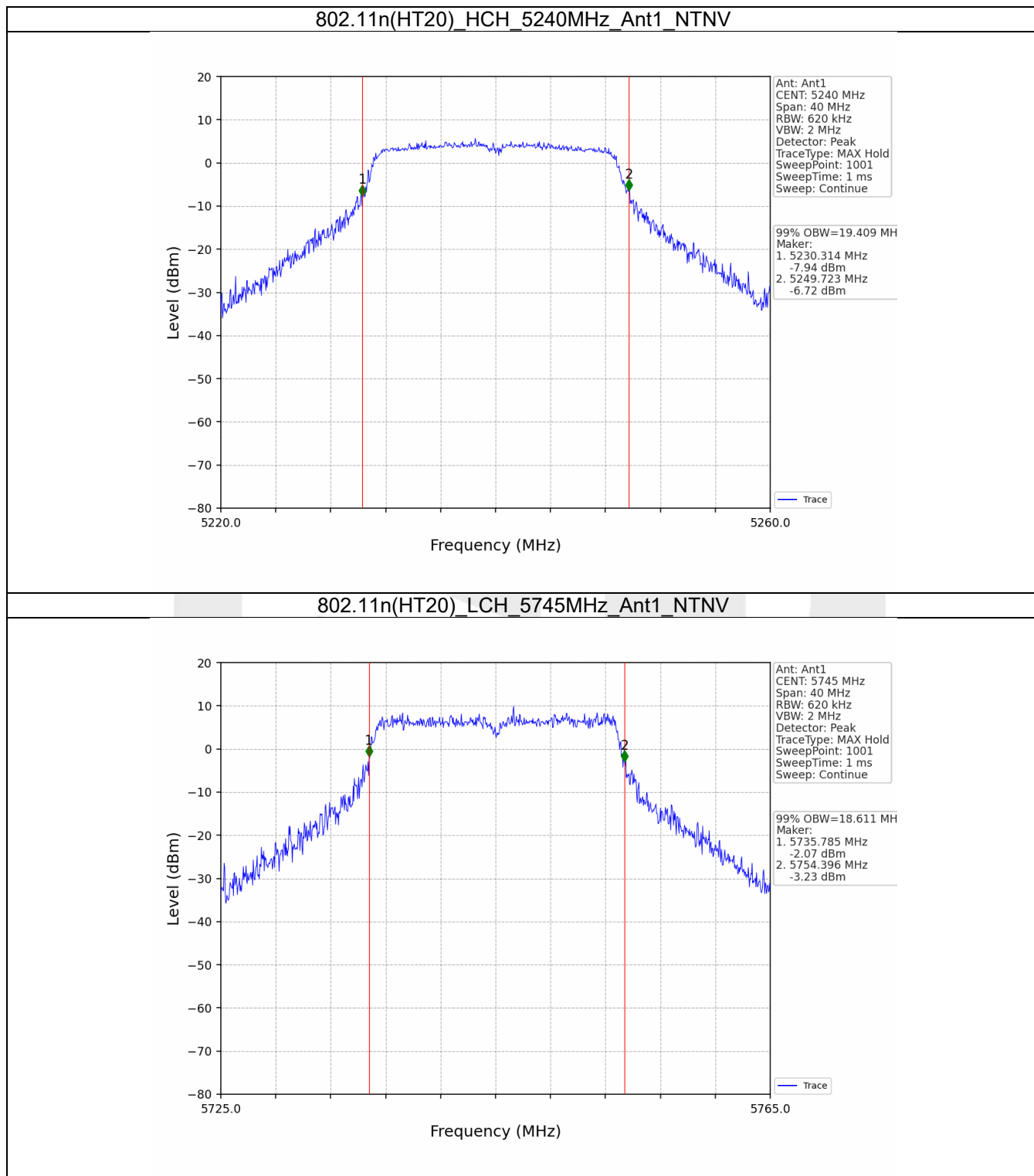
2.1.2 Test Graph

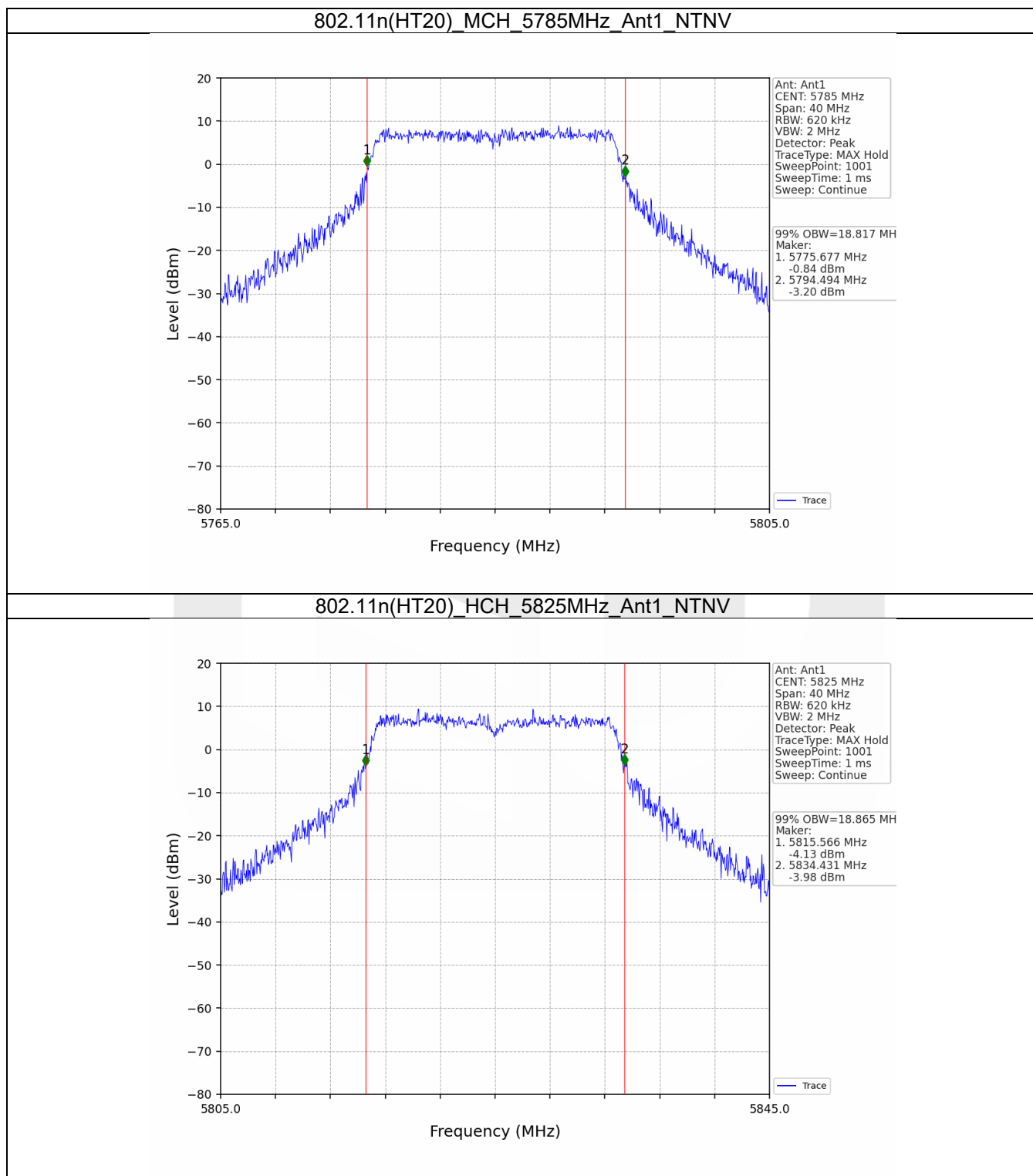


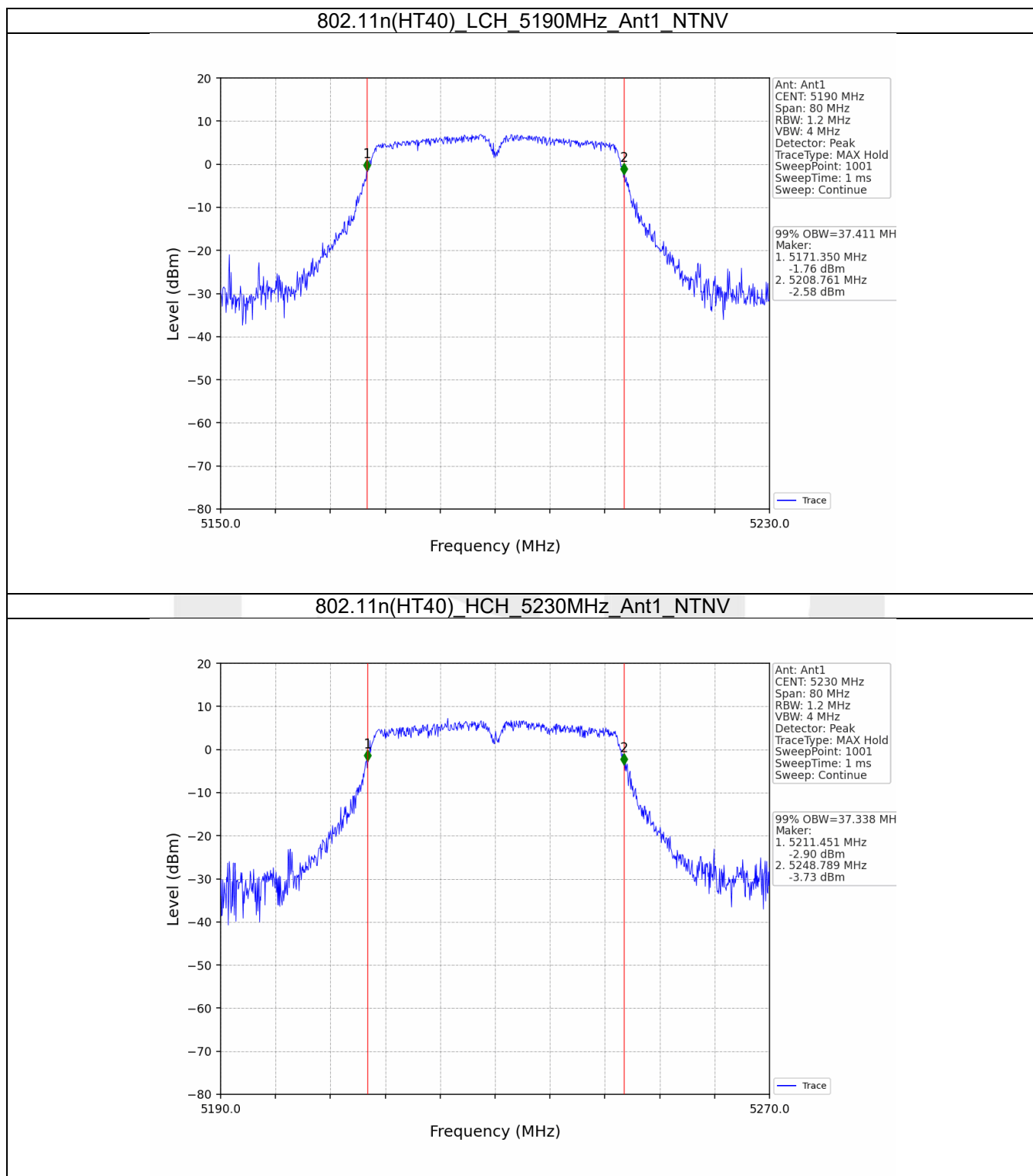


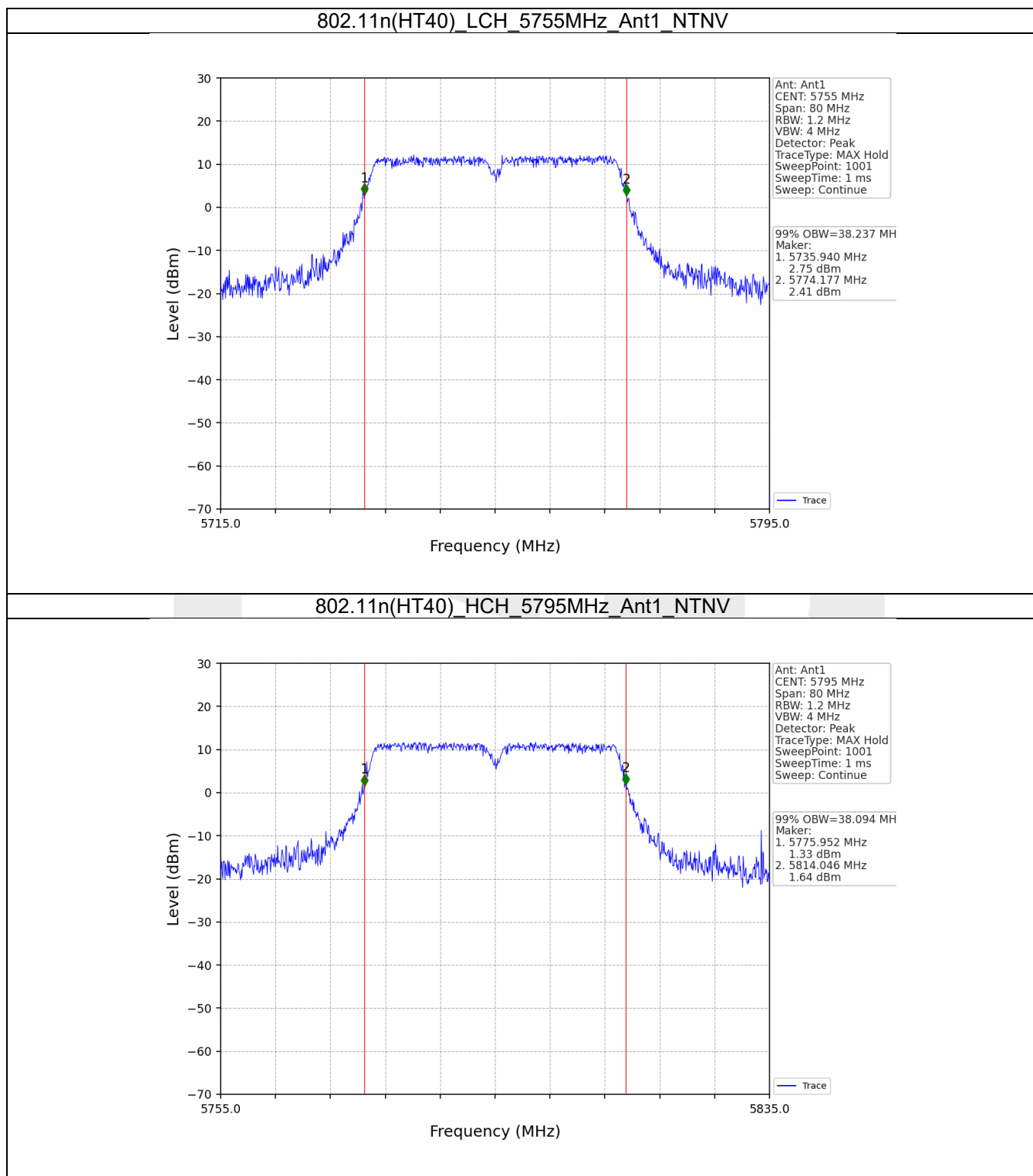










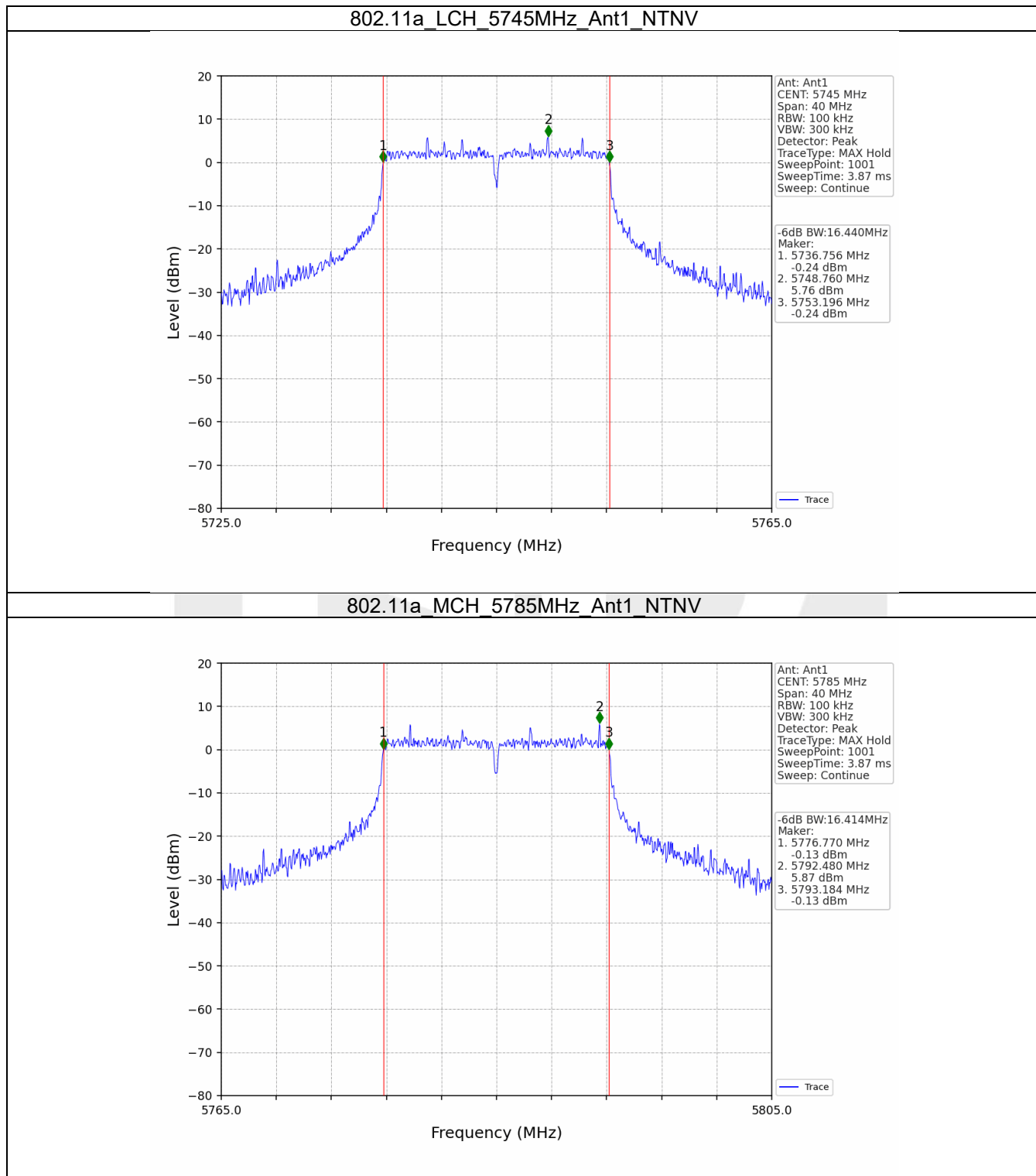


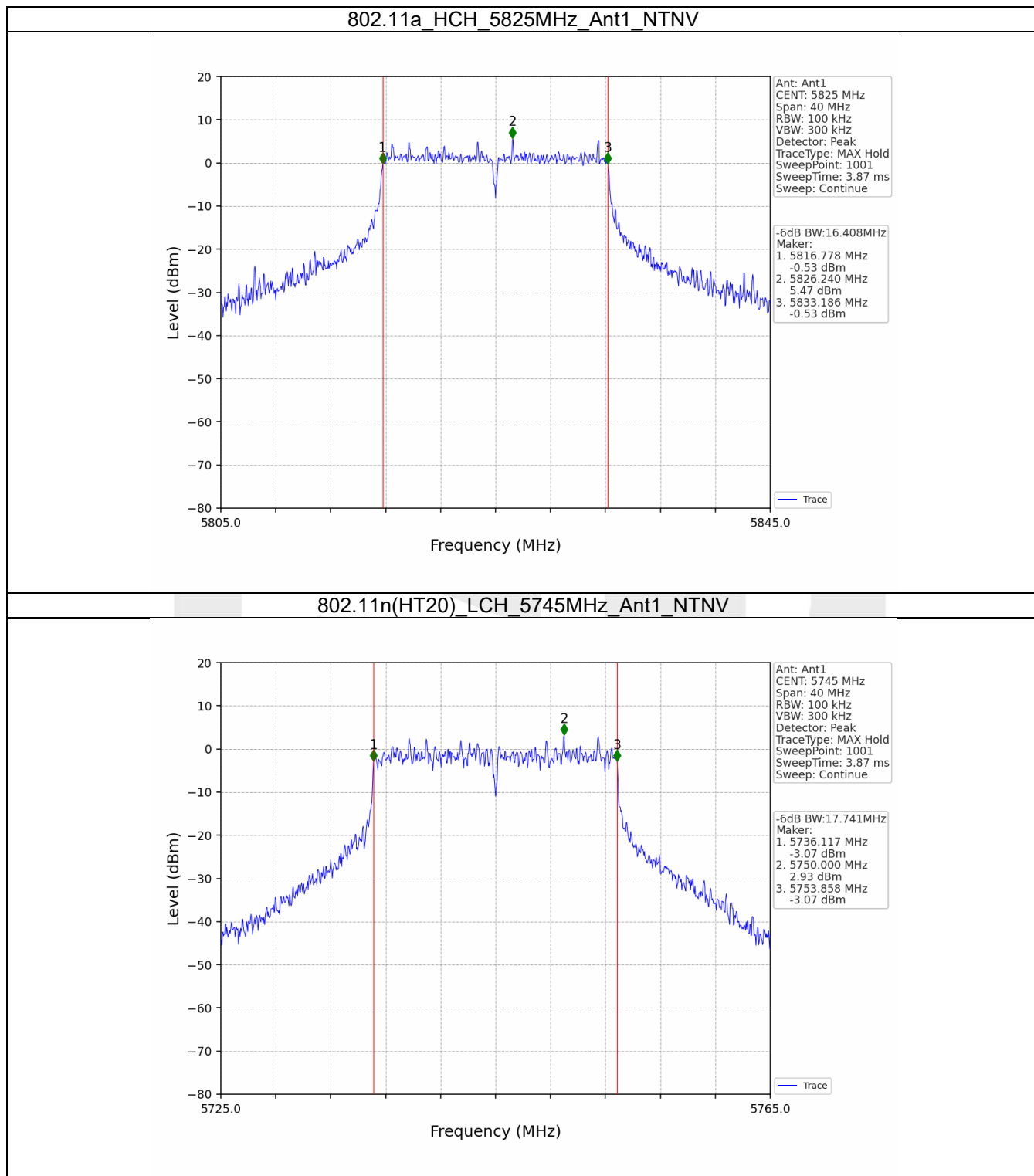
2.2 6dB BW

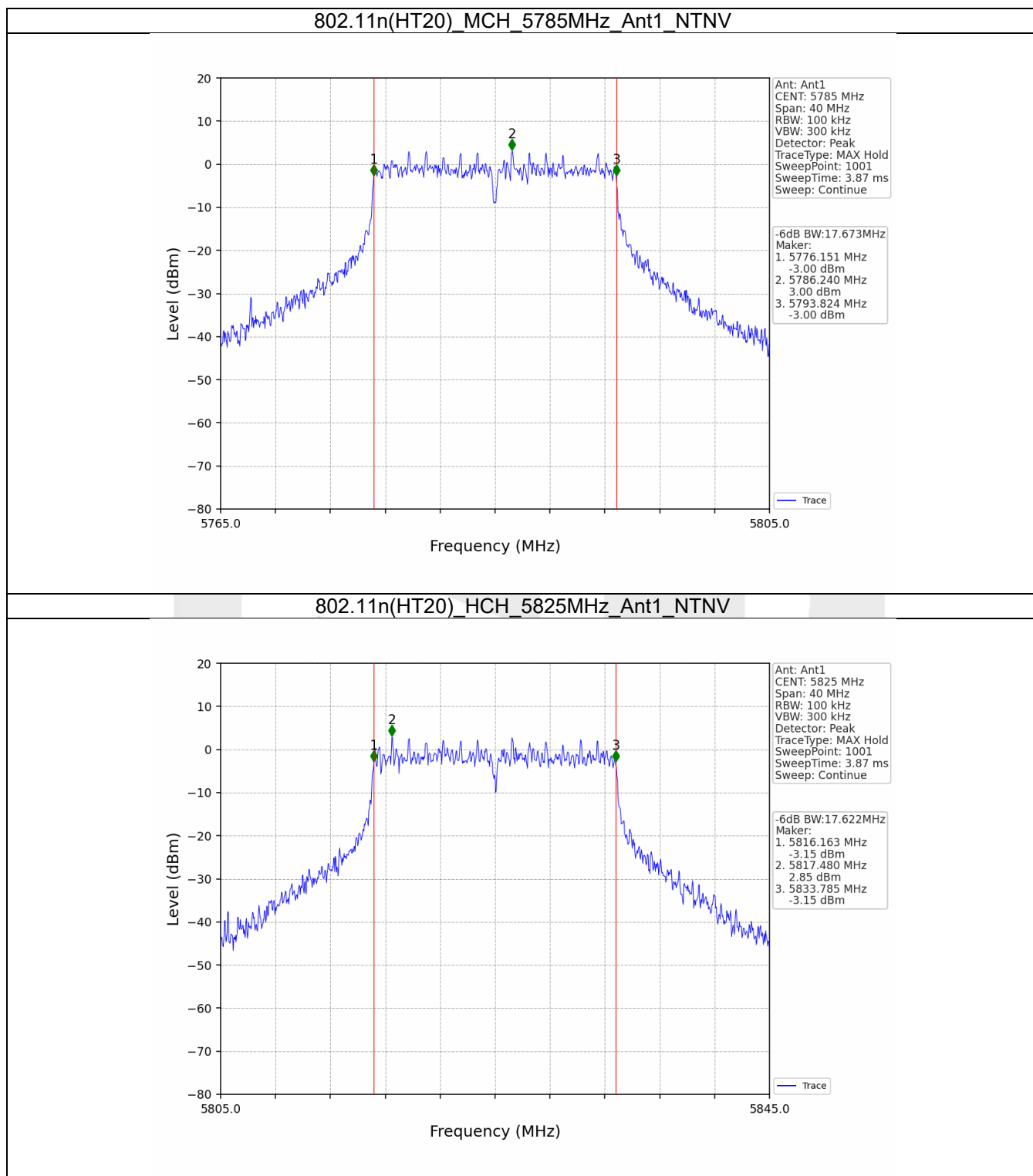
2.2.1 Test Result

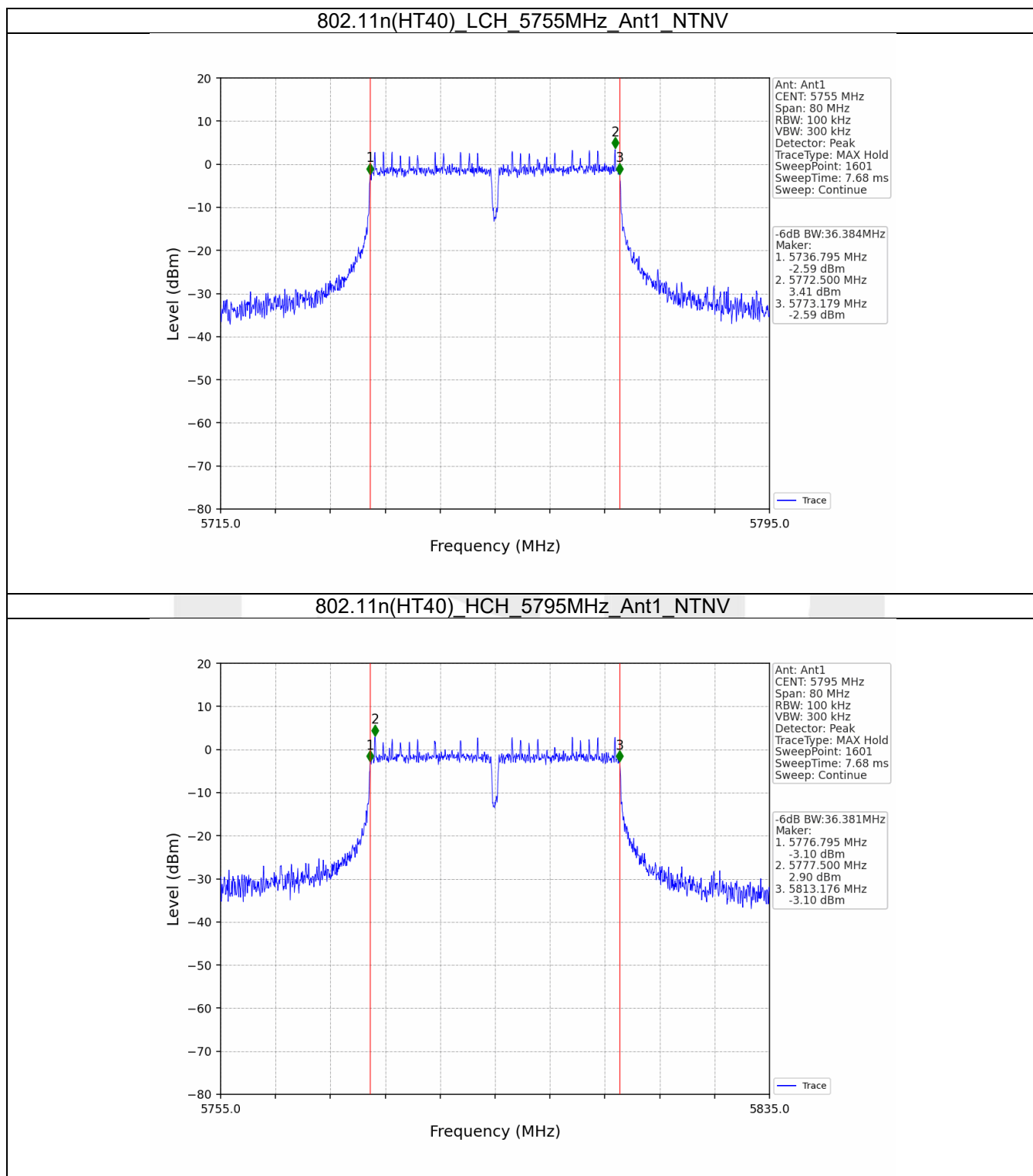
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5745	1	16.440	≥ 0.5	Pass
		5785	1	16.414	≥ 0.5	Pass
		5825	1	16.408	≥ 0.5	Pass
802.11n (HT20)	SISO	5745	1	17.741	≥ 0.5	Pass
		5785	1	17.673	≥ 0.5	Pass
		5825	1	17.622	≥ 0.5	Pass
802.11n (HT40)	SISO	5755	1	36.384	≥ 0.5	Pass
		5795	1	36.381	≥ 0.5	Pass

2.2.2 Test Graph







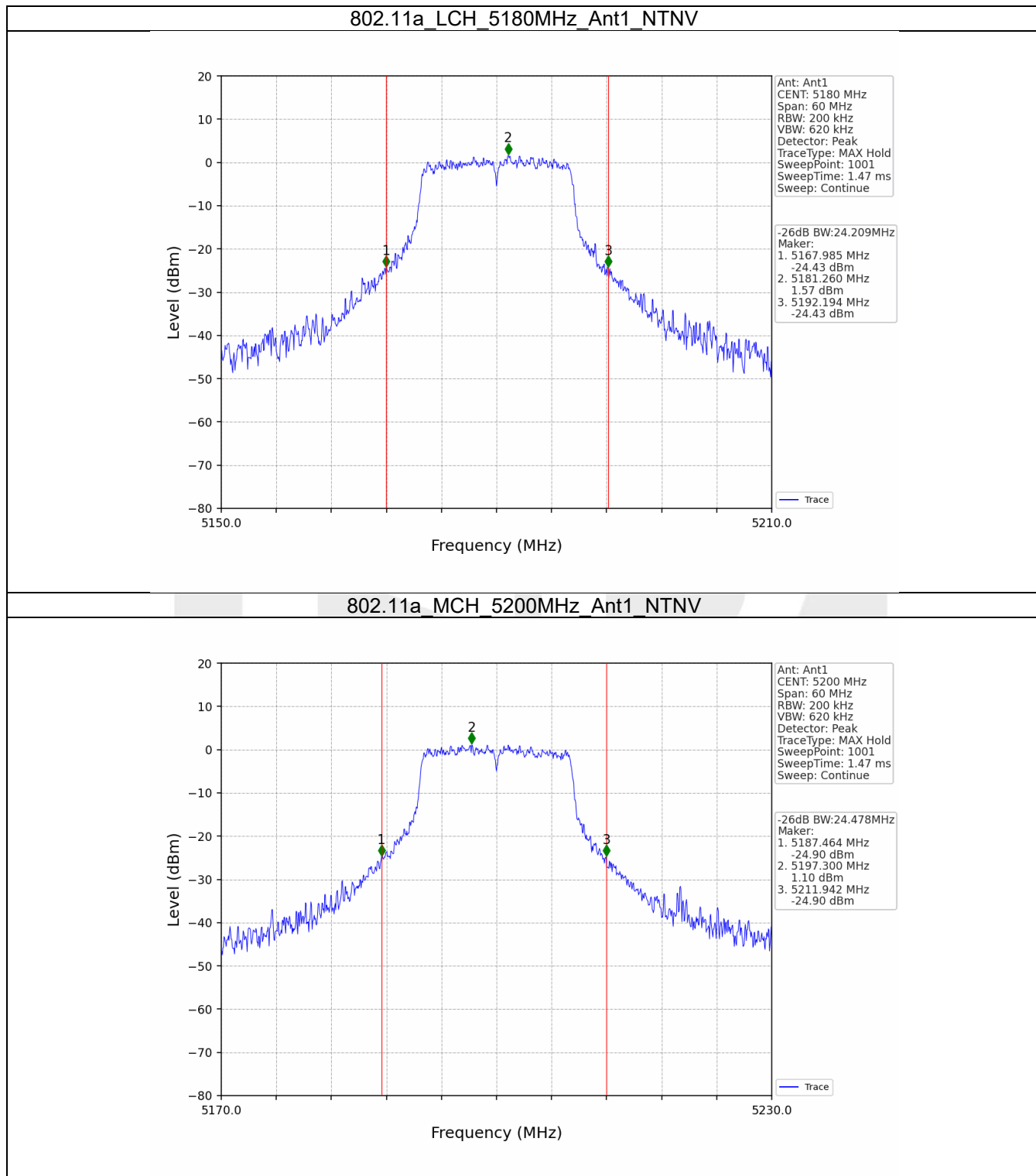


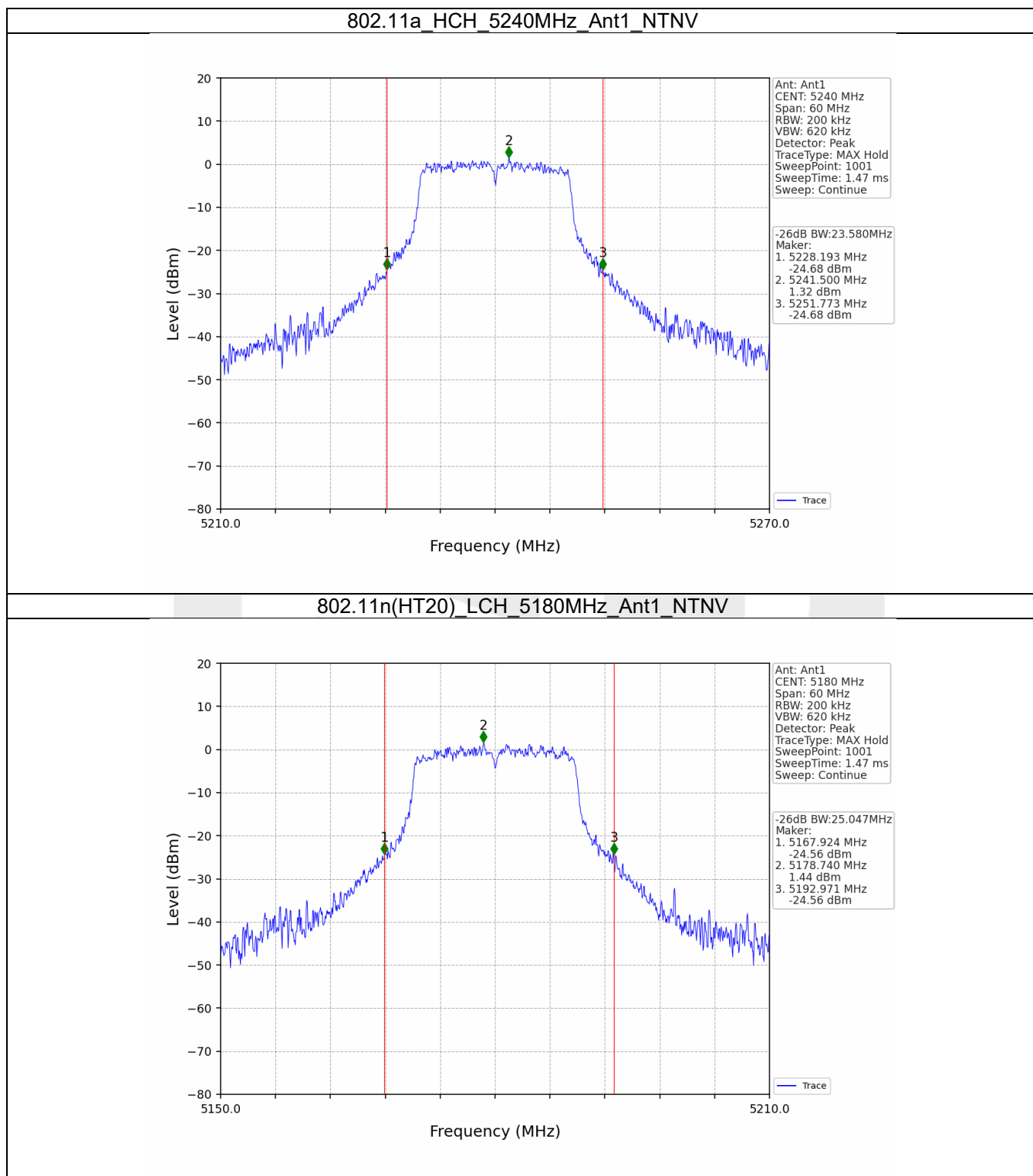
2.3 26dB BW

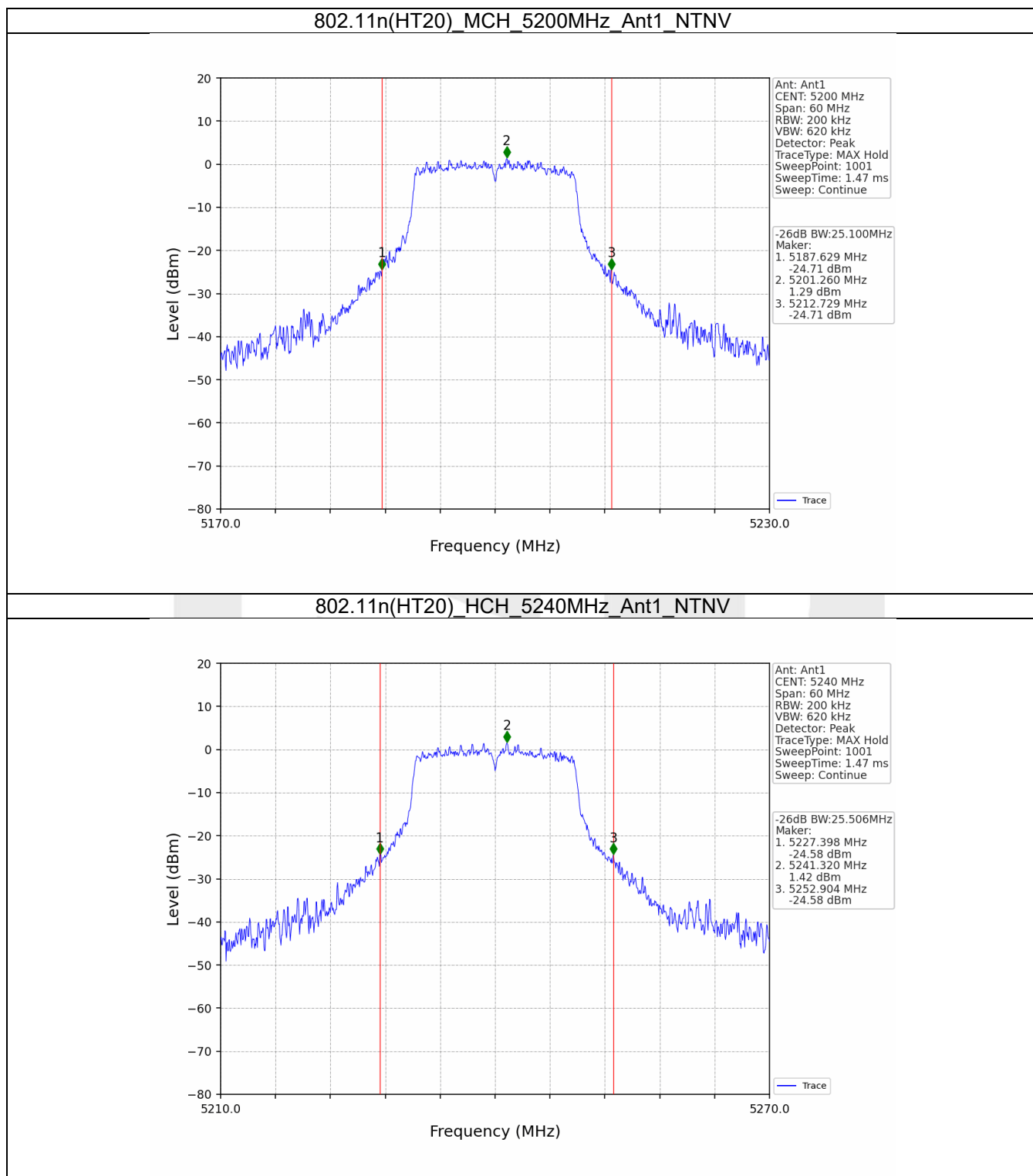
2.3.1 Test Result

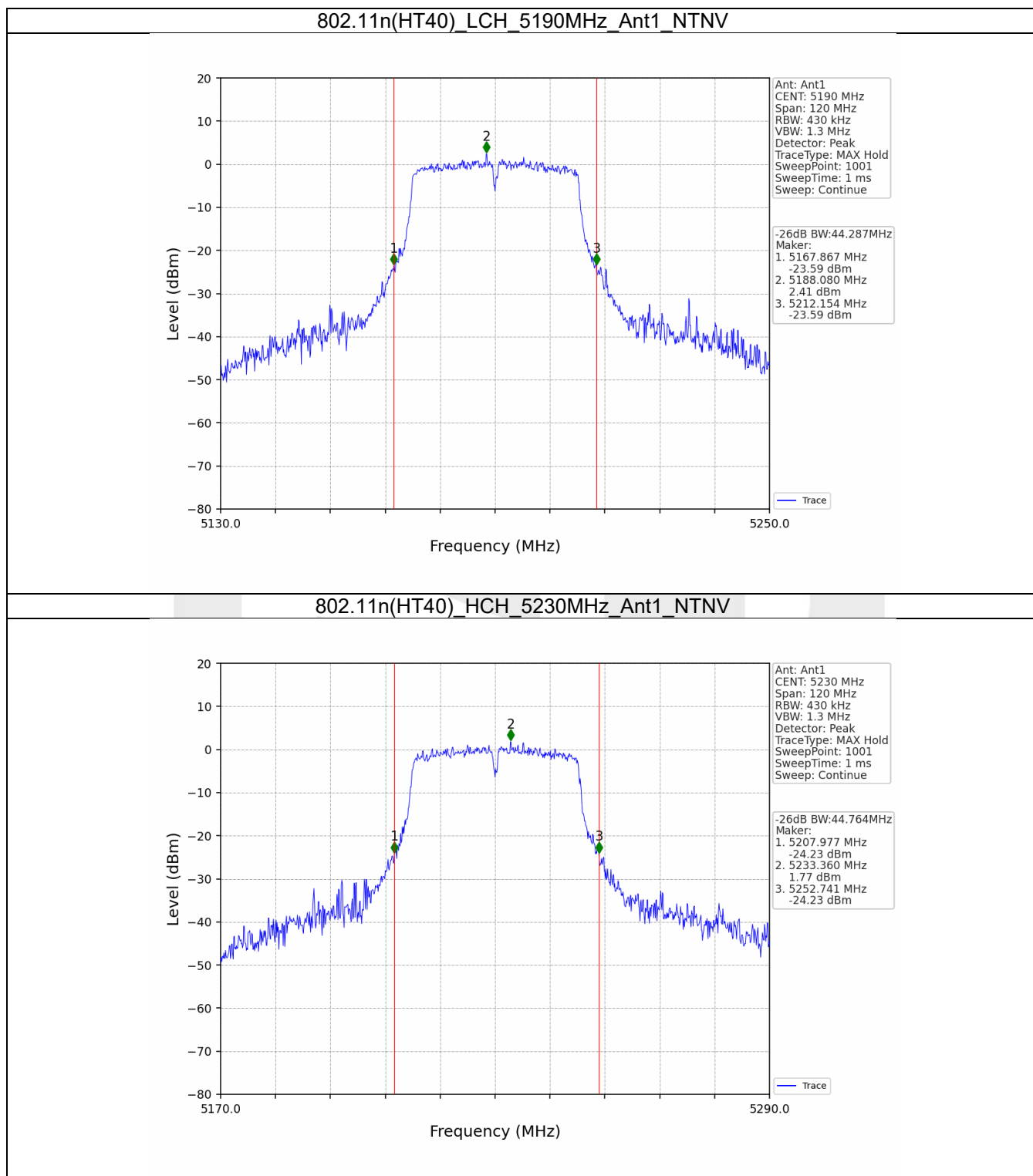
Mode	TX Type	Frequency (MHz)	ANT	26dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11a	SISO	5180	1	24.209	/	Pass
		5200	1	24.478	/	Pass
		5240	1	23.580	/	Pass
802.11n (HT20)	SISO	5180	1	25.047	/	Pass
		5200	1	25.100	/	Pass
		5240	1	25.506	/	Pass
802.11n (HT40)	SISO	5190	1	44.287	/	Pass
		5230	1	44.764	/	Pass

2.3.2 Test Graph









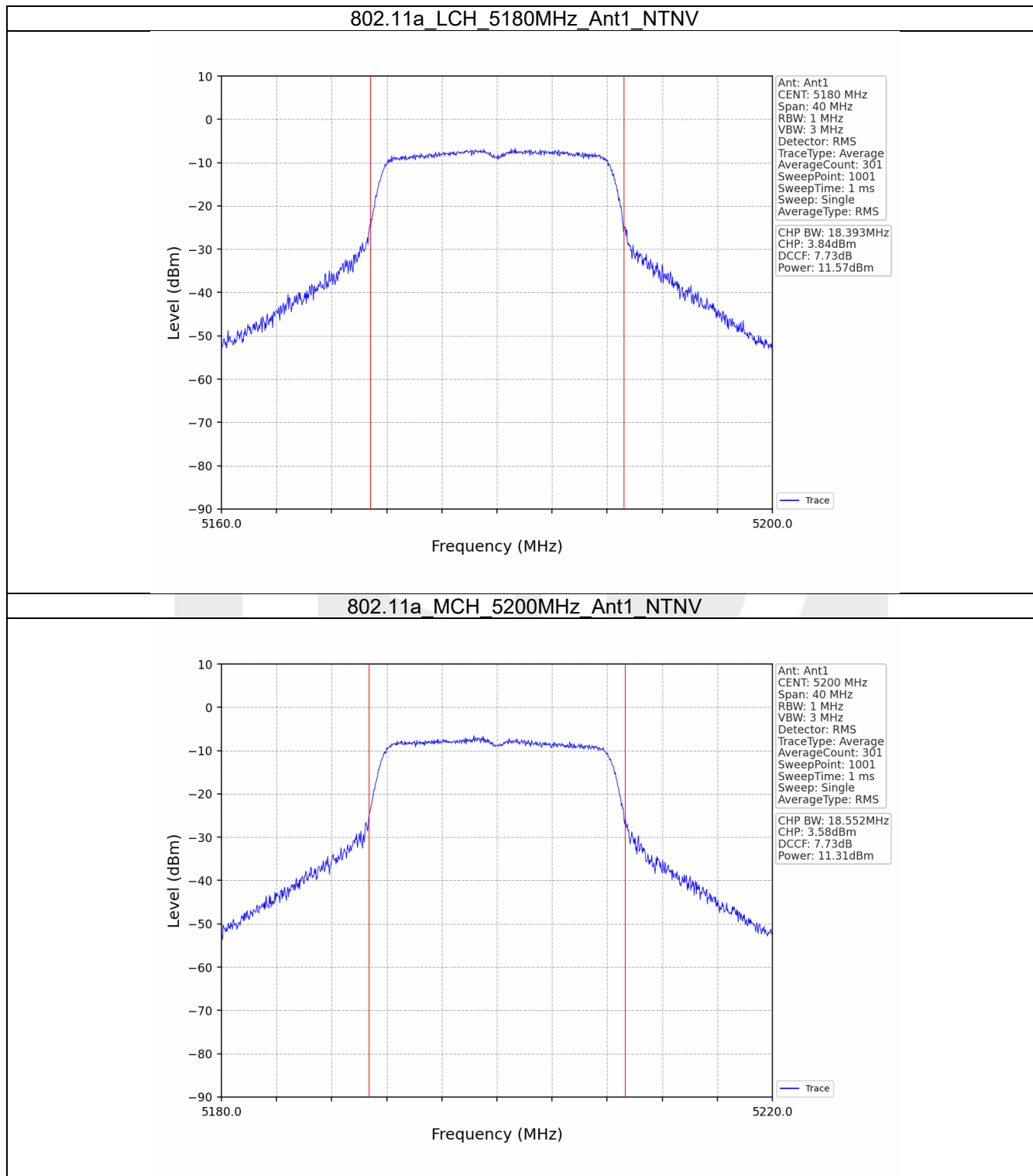
3. Maximum Conducted Output Power

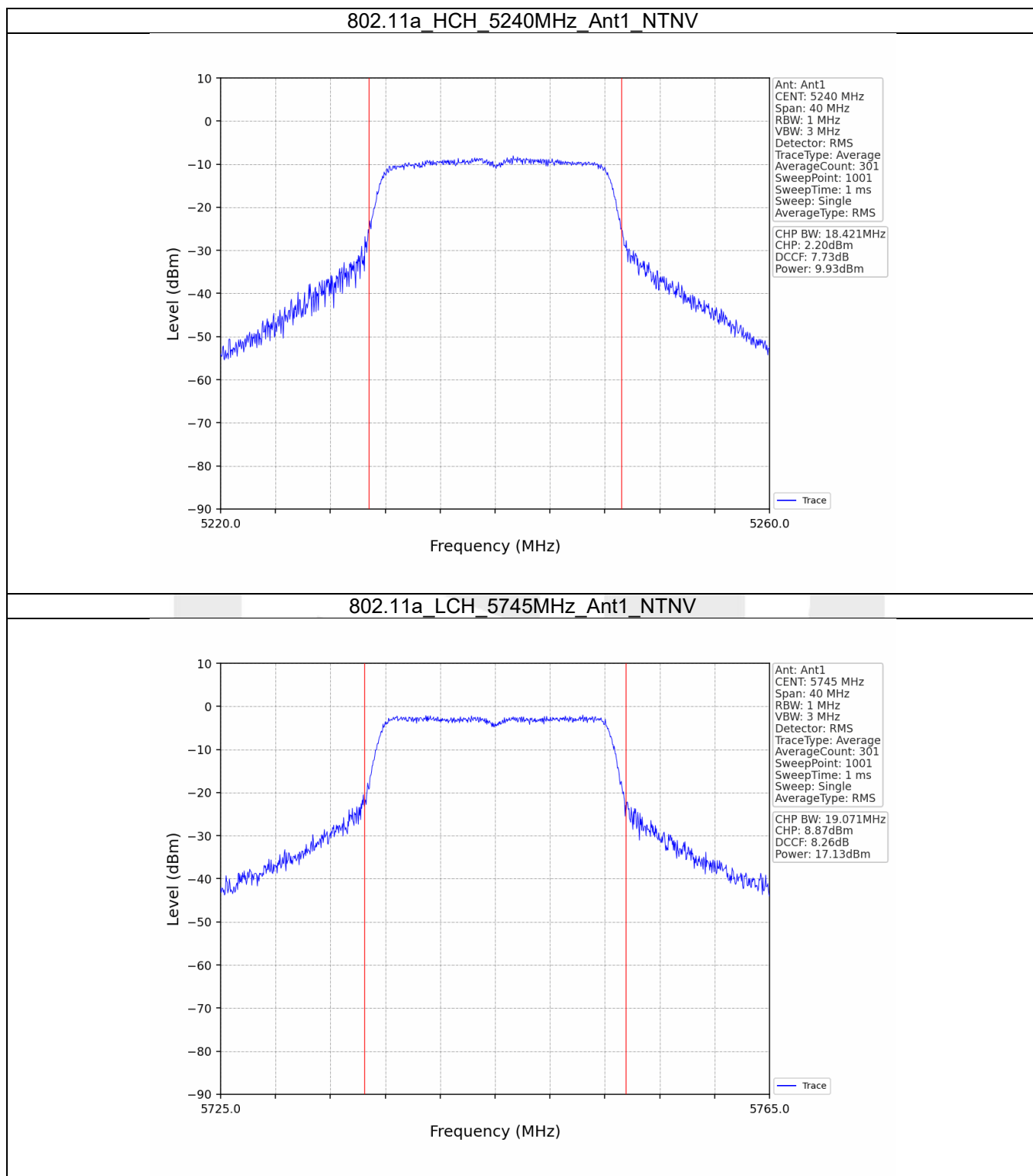
3.1 Power

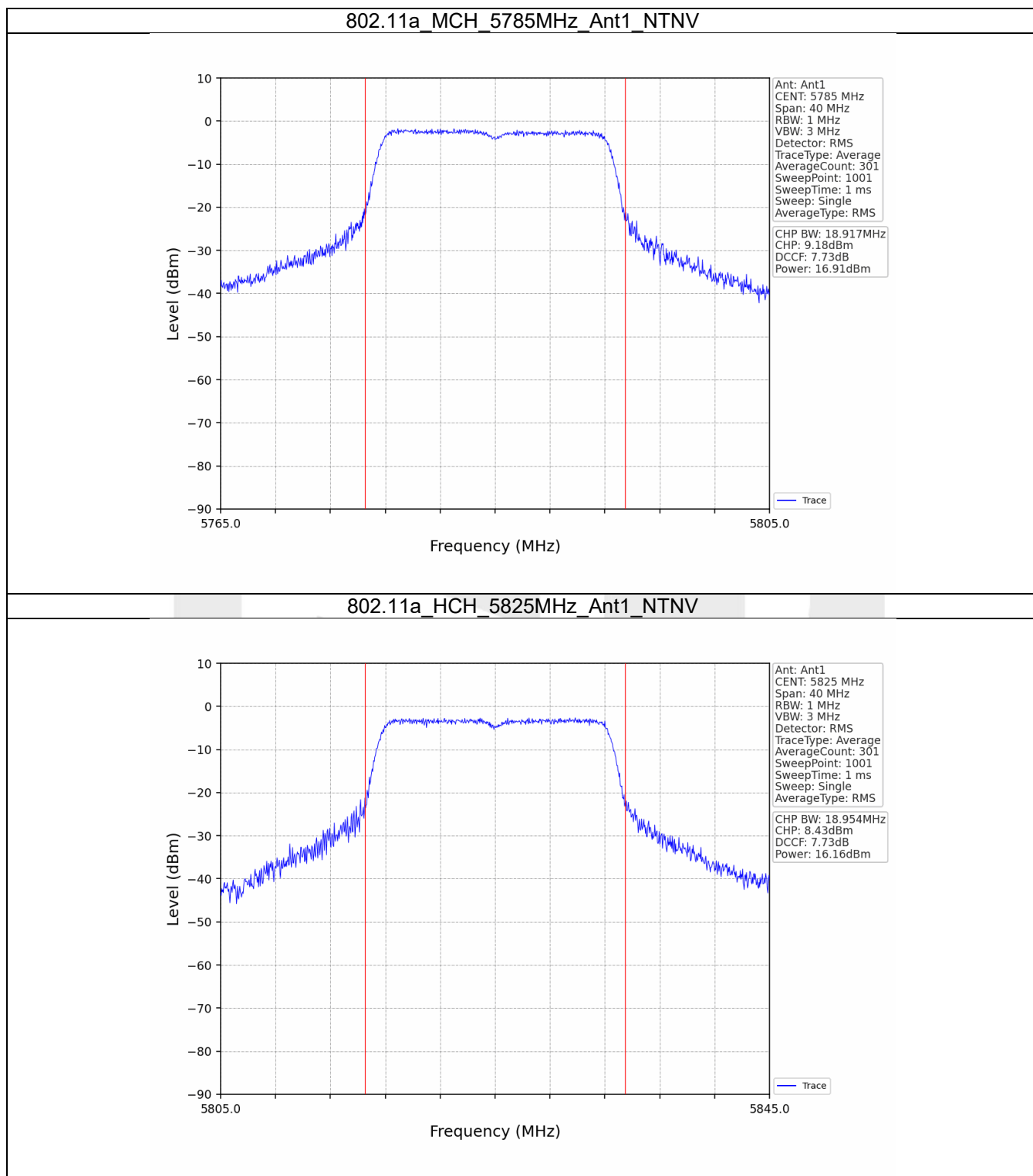
3.1.1 Test Result

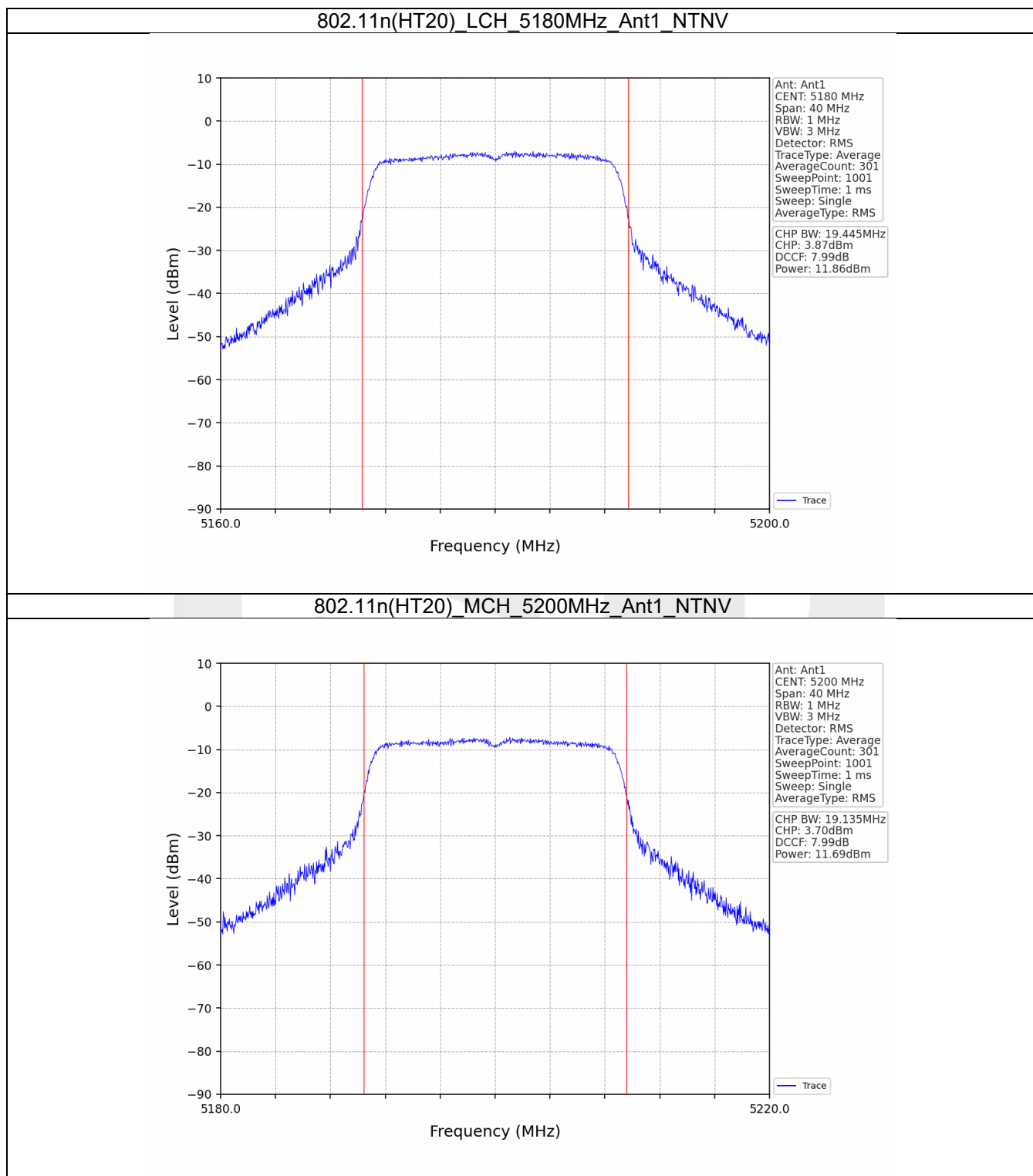
Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11a	SISO	5180	11.57	≤ 23.98	Pass
		5200	11.31	≤ 23.98	Pass
		5240	9.93	≤ 23.98	Pass
		5745	17.13	≤ 30	Pass
		5785	16.91	≤ 30	Pass
		5825	16.16	≤ 30	Pass
802.11n (HT20)	SISO	5180	11.86	≤ 23.98	Pass
		5200	11.69	≤ 23.98	Pass
		5240	12.37	≤ 23.98	Pass
		5745	14.23	≤ 30	Pass
		5785	12.71	≤ 30	Pass
		5825	12.13	≤ 30	Pass
802.11n (HT40)	SISO	5190	11.16	≤ 23.98	Pass
		5230	11.60	≤ 23.98	Pass
		5755	18.18	≤ 30	Pass
		5795	16.43	≤ 30	Pass

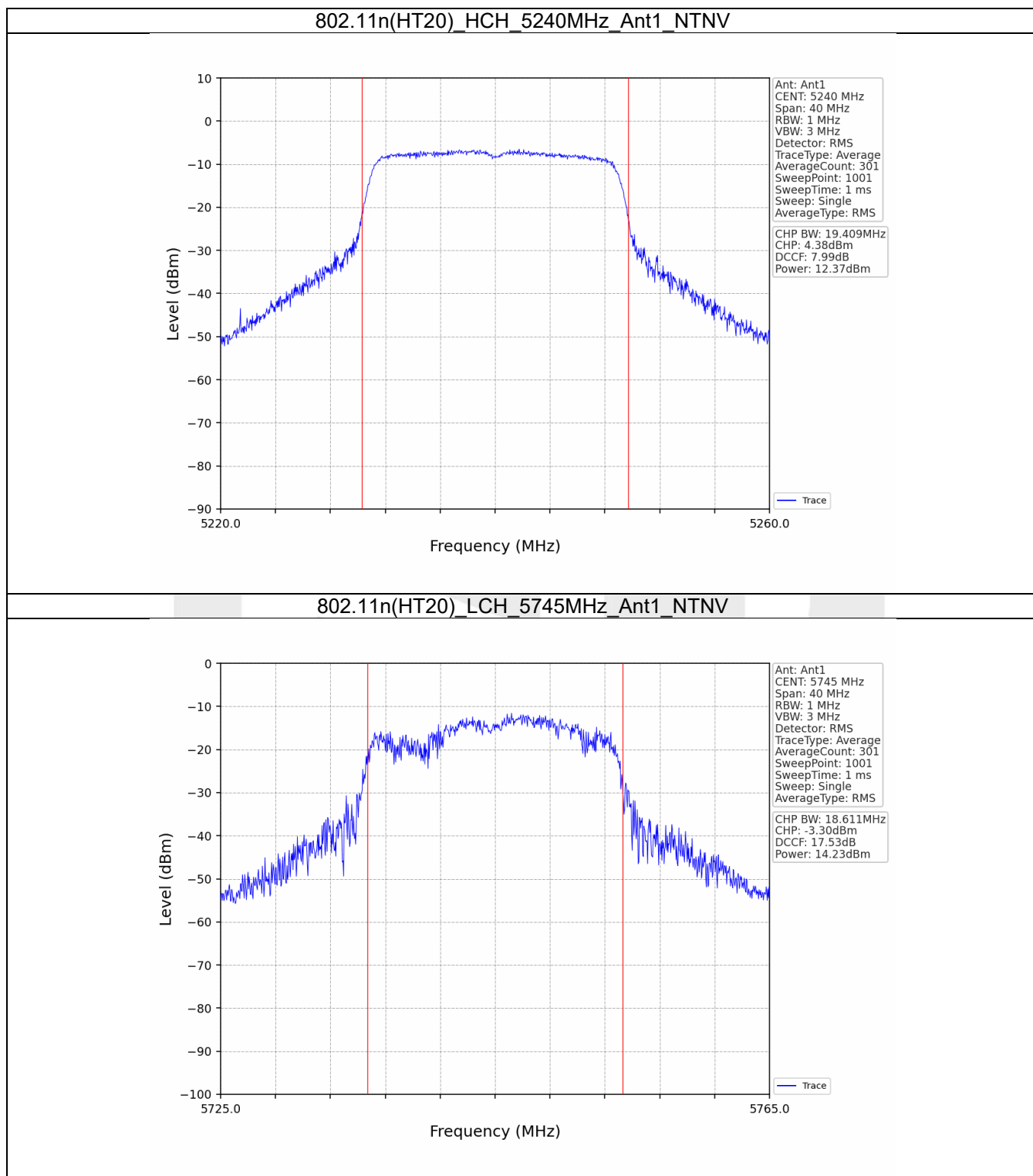
3.1.2 Test Graph

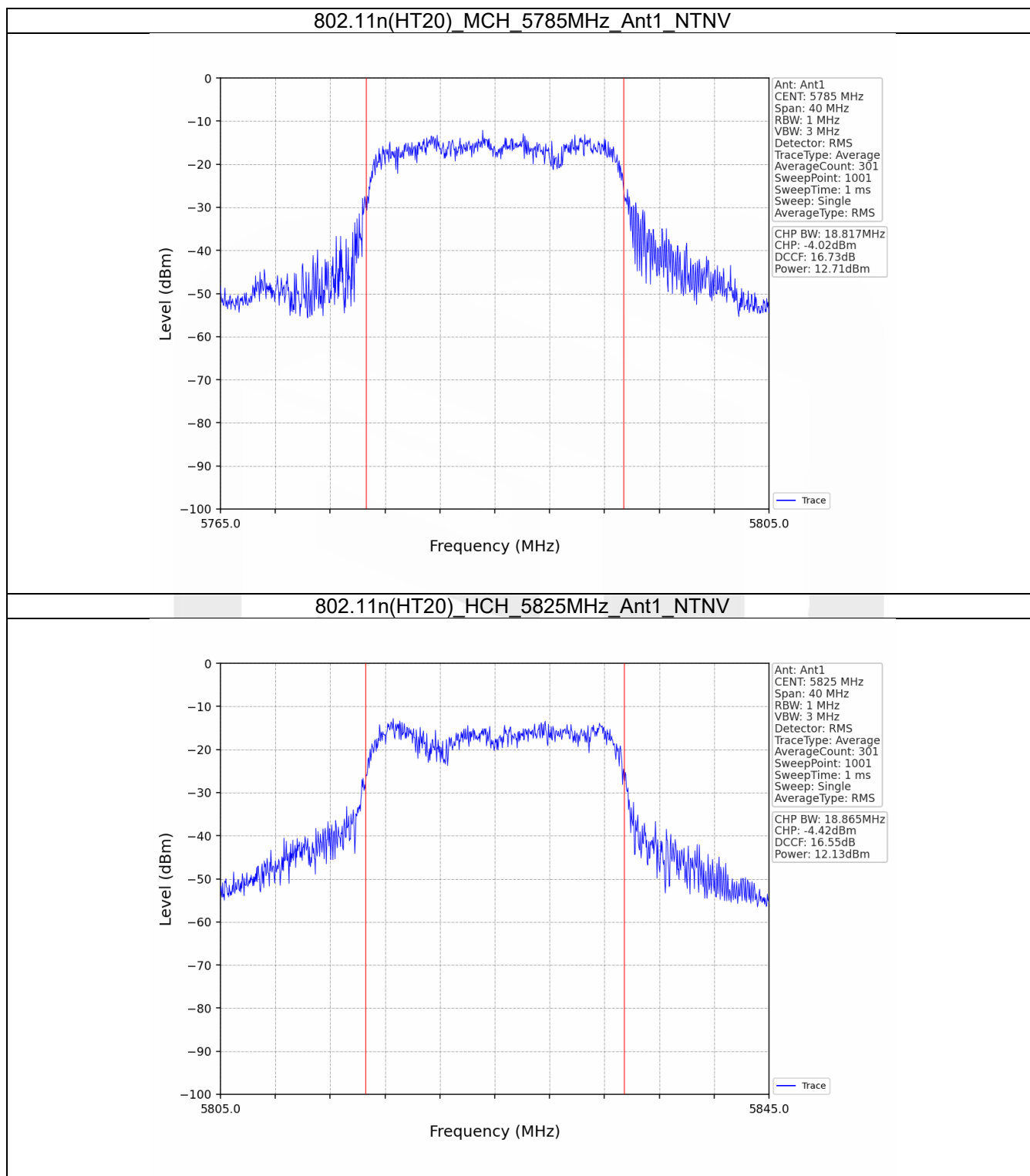


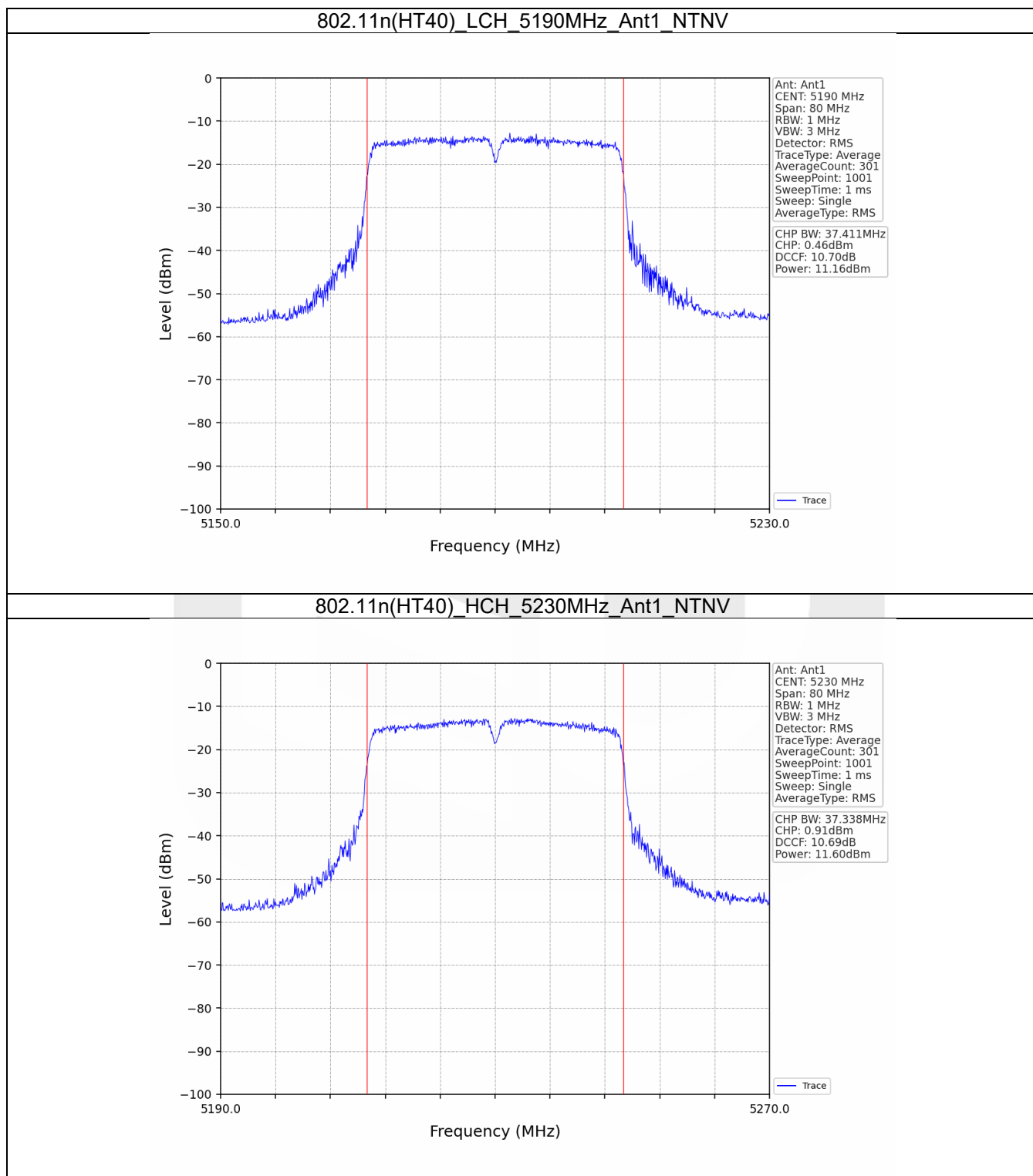


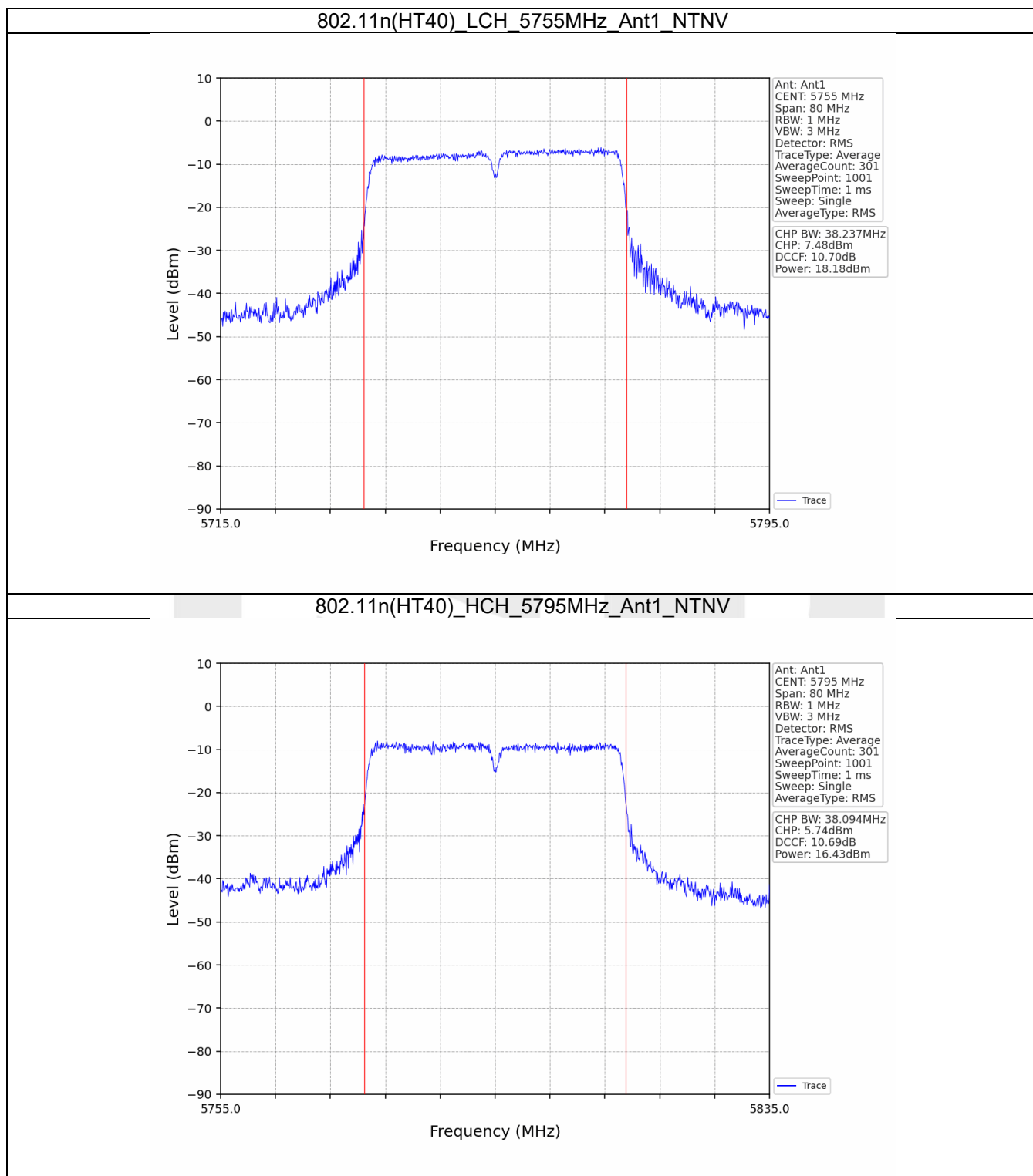












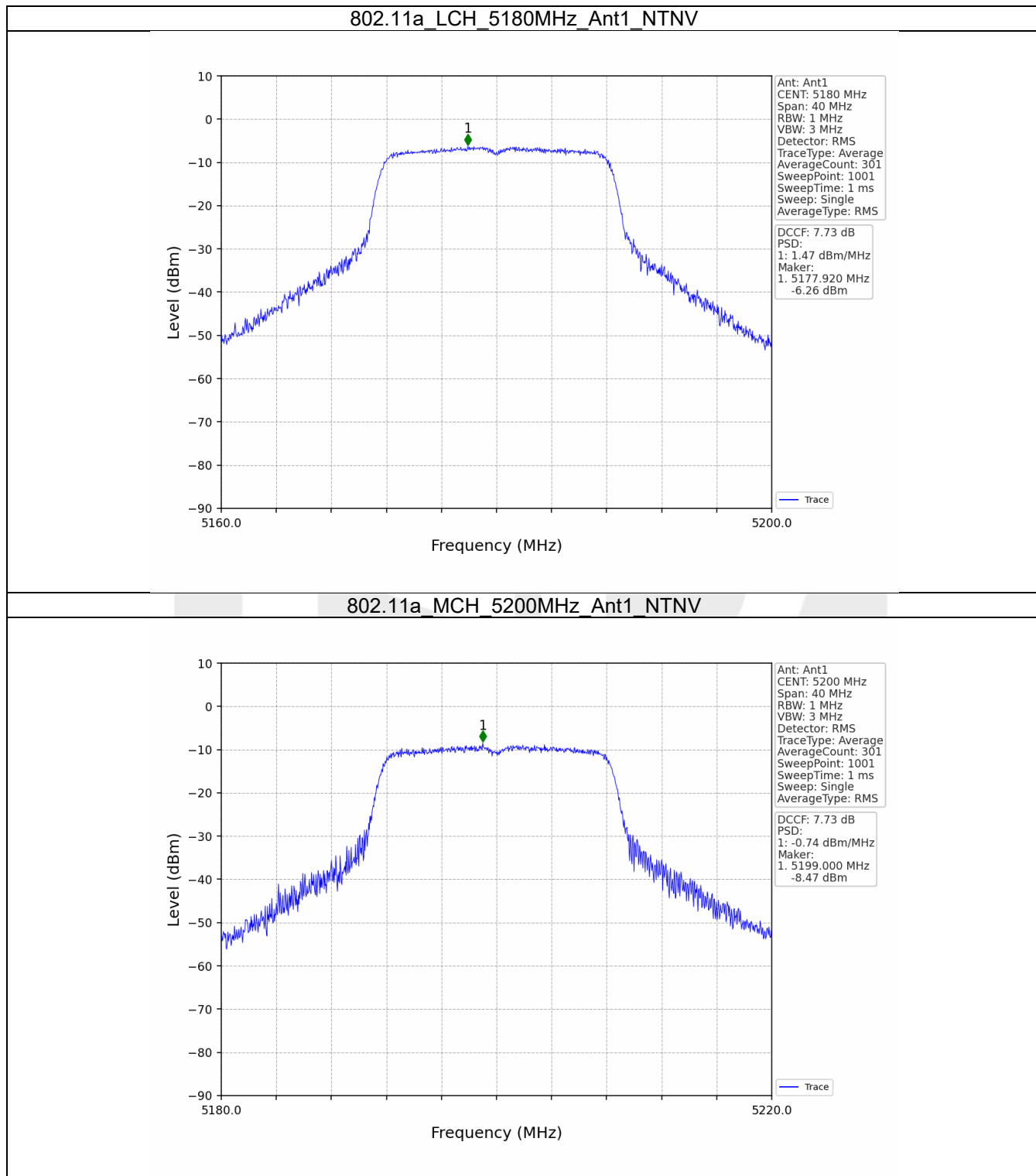
4. Maximum Power Spectral Density

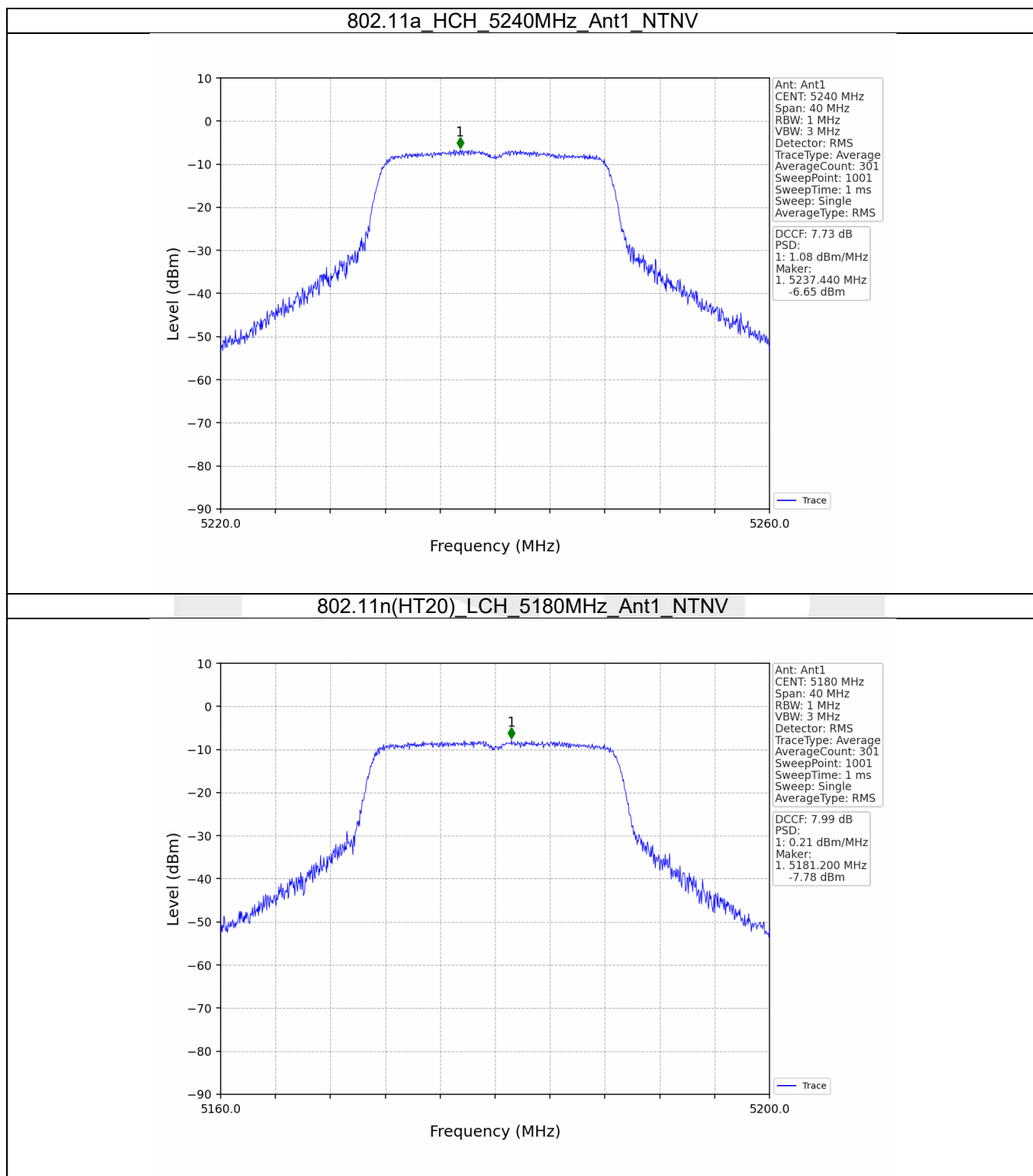
4.1 PSD

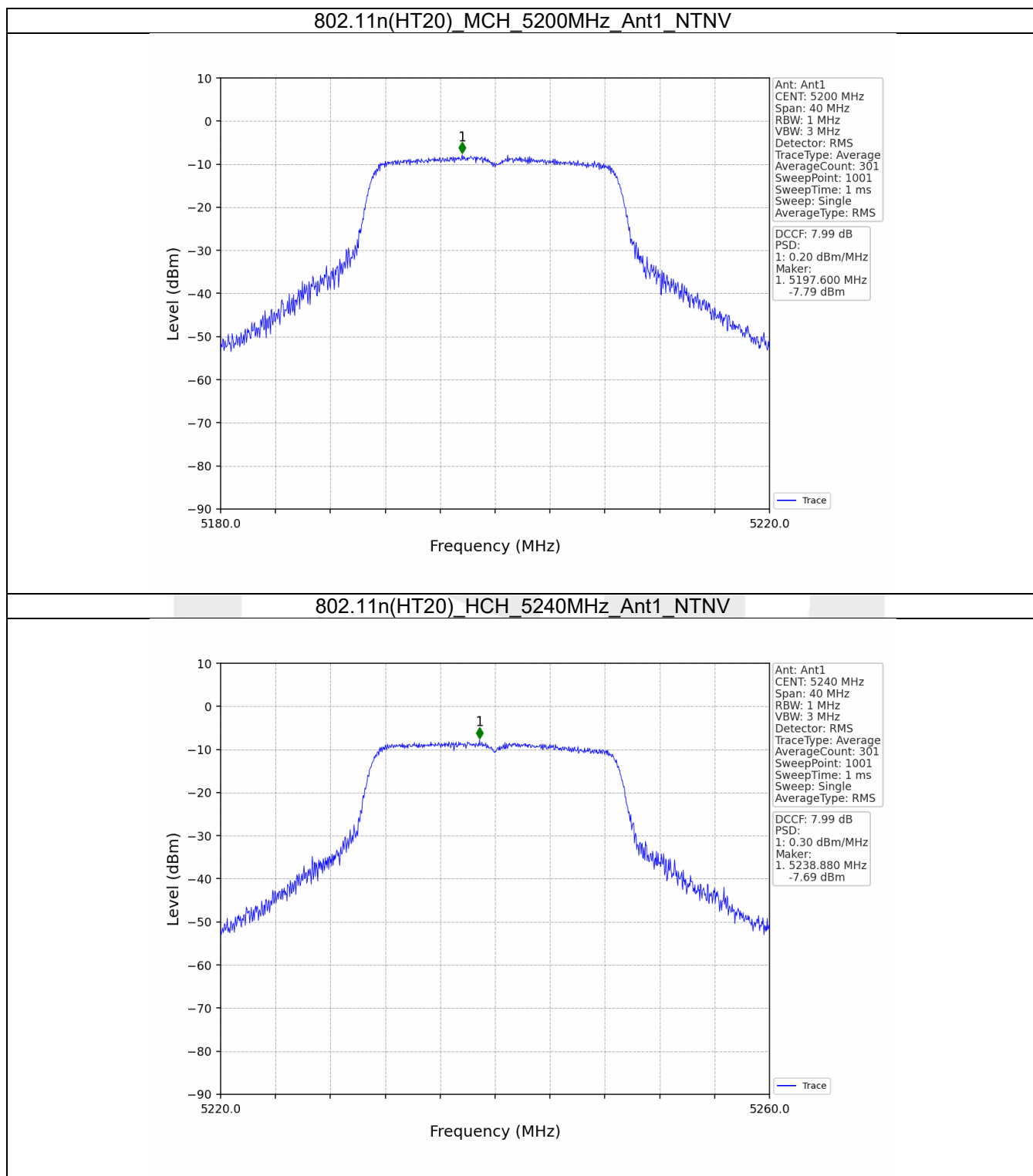
4.1.1 Test Result

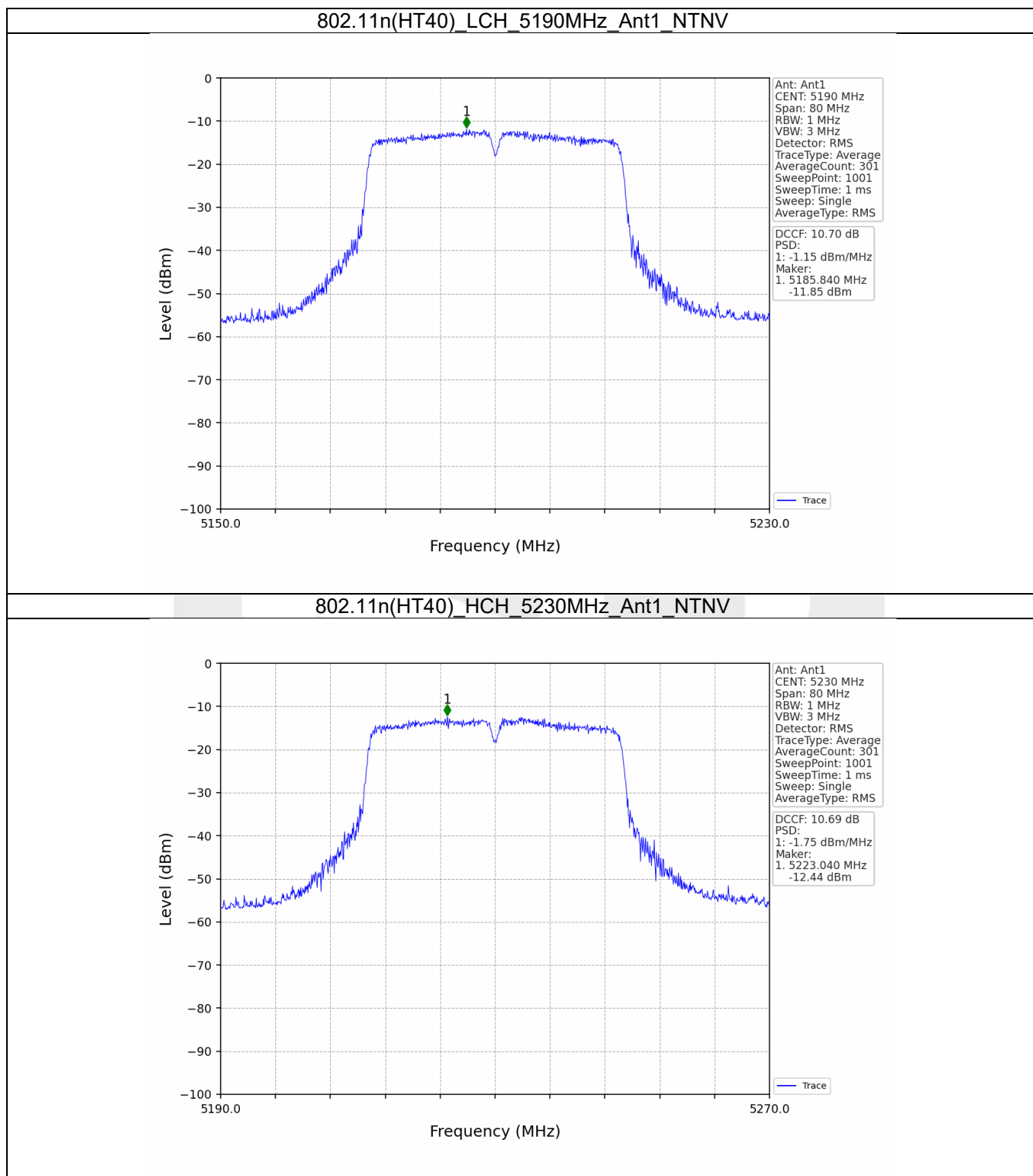
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/MHz)		Verdict
			ANT1	Limit	
802.11a	SISO	5180	1.47	<=11	Pass
		5200	-0.74	<=11	Pass
		5240	1.08	<=11	Pass
802.11n (HT20)	SISO	5180	0.21	<=11	Pass
		5200	0.20	<=11	Pass
		5240	0.30	<=11	Pass
802.11n (HT40)	SISO	5190	-1.15	<=11	Pass
		5230	-1.75	<=11	Pass

4.1.2 Test Graph







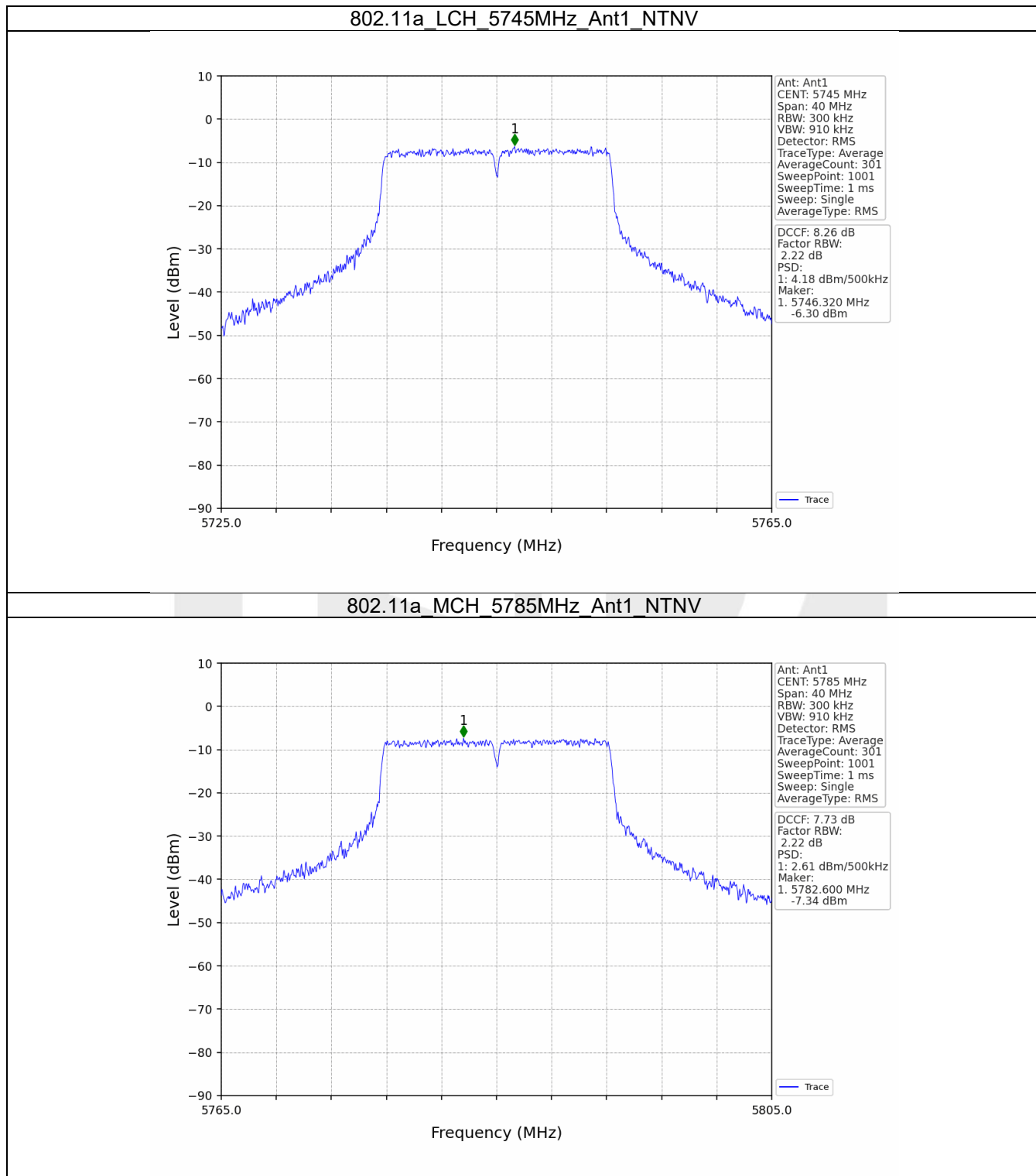


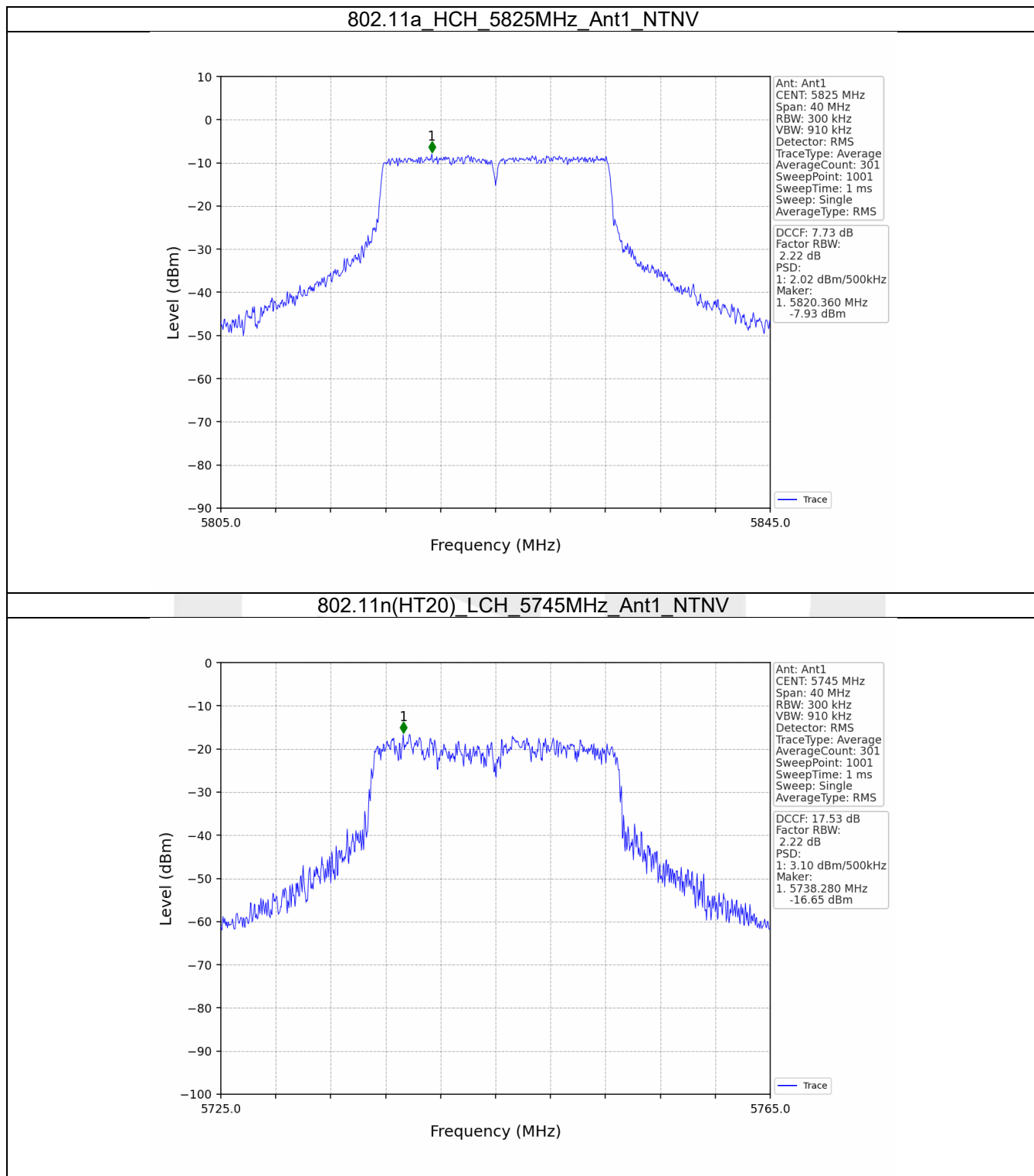
4.2 PSD-Band3

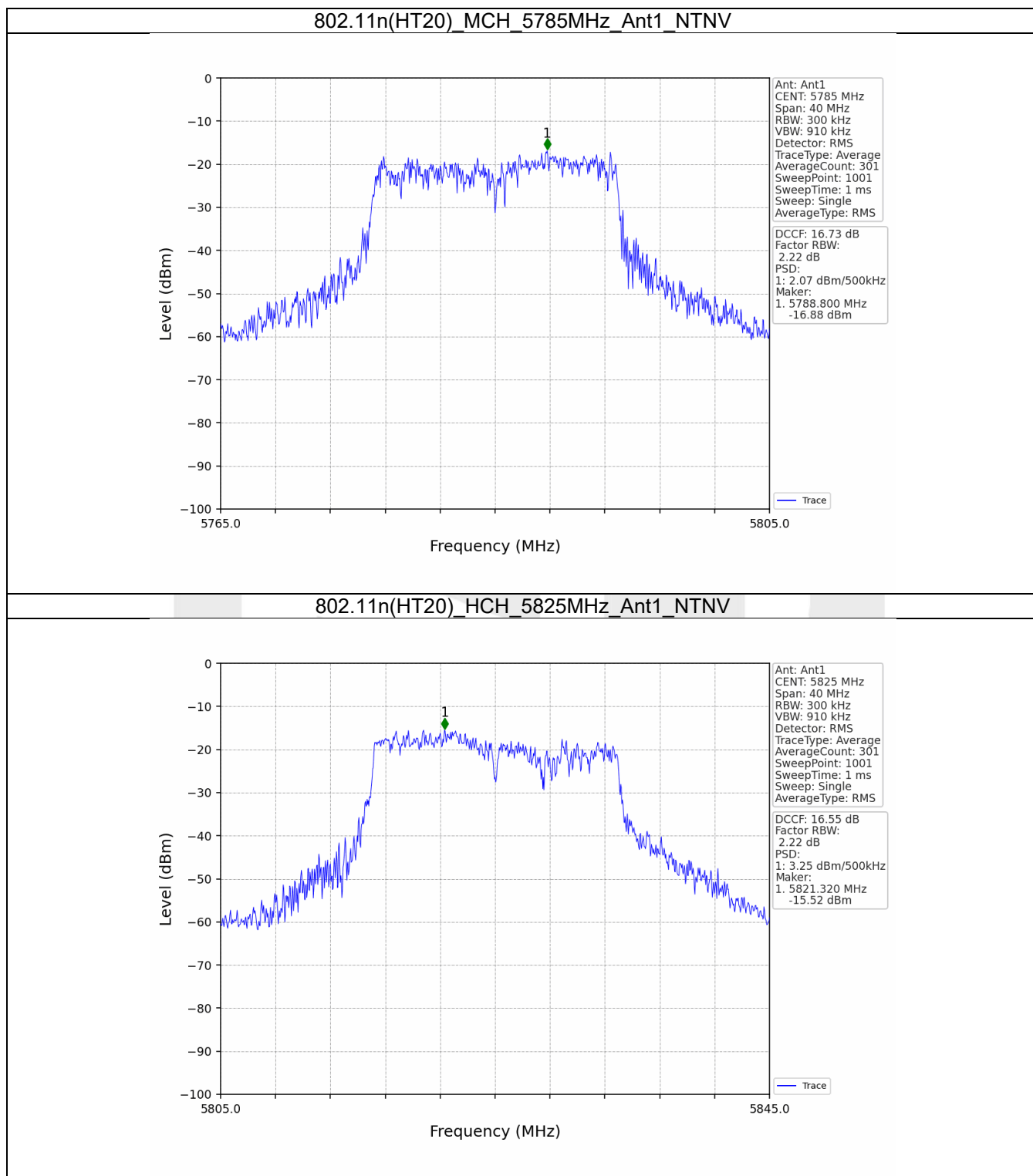
4.2.1 Test Result

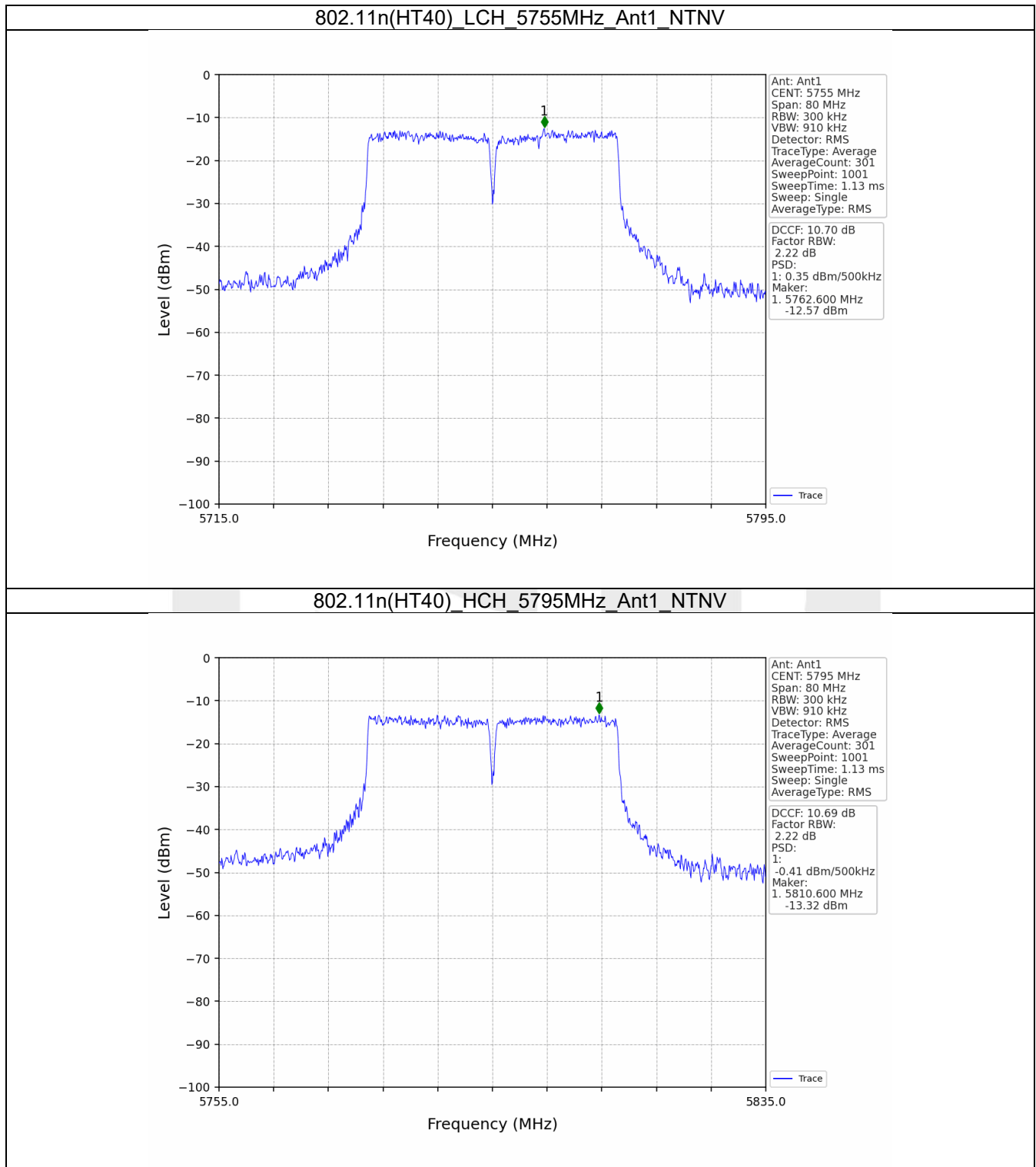
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/500kHz)		Verdict
			ANT1	Limit	
802.11a	SISO	5745	4.18	<=30	Pass
		5785	2.61	<=30	Pass
		5825	2.02	<=30	Pass
802.11n (HT20)	SISO	5745	3.10	<=30	Pass
		5785	2.07	<=30	Pass
		5825	3.25	<=30	Pass
802.11n (HT40)	SISO	5755	0.35	<=30	Pass
		5795	-0.41	<=30	Pass

4.2.2 Test Graph









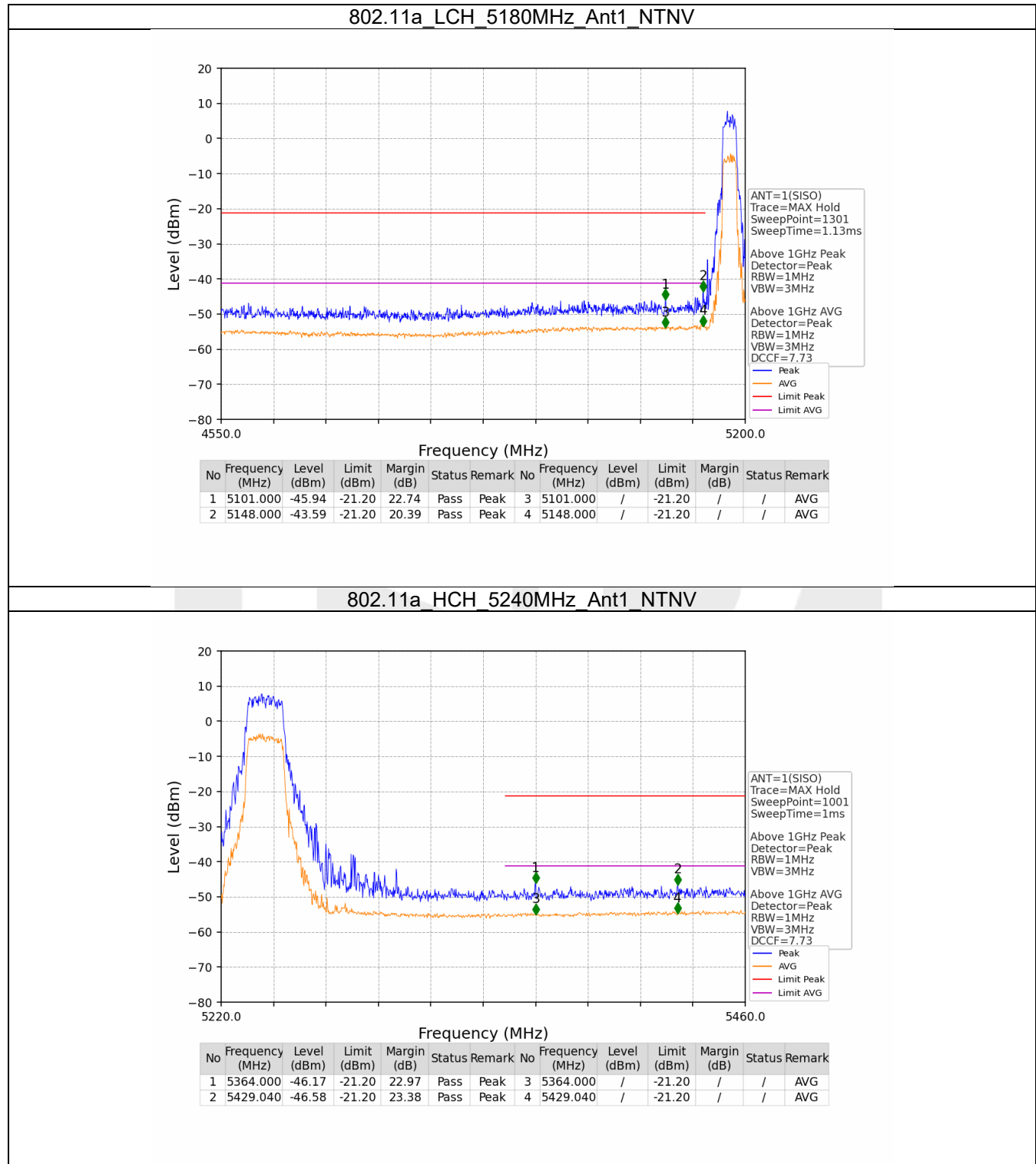
5. Unwanted Emissions In Restricted Frequency Bands

5.1 RSE

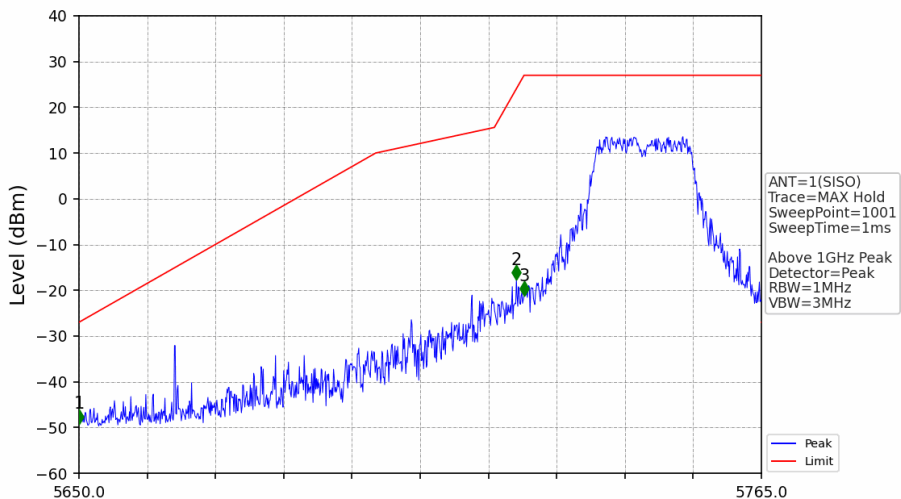
5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Unwanted Emissions (dBm)		Verdict
				Result	Limit	
802.11a	SISO	5180	1	Refer To Test Graph		Pass
		5240	1	Refer To Test Graph		Pass
		5745	1	Refer To Test Graph		Pass
		5825	1	Refer To Test Graph		Pass
802.11n (HT20)	SISO	5180	1	Refer To Test Graph		Pass
		5240	1	Refer To Test Graph		Pass
		5745	1	Refer To Test Graph		Pass
		5825	1	Refer To Test Graph		Pass
802.11n (HT40)	SISO	5190	1	Refer To Test Graph		Pass
		5230	1	Refer To Test Graph		Pass
		5755	1	Refer To Test Graph		Pass
		5795	1	Refer To Test Graph		Pass

5.1.2 Test Graph

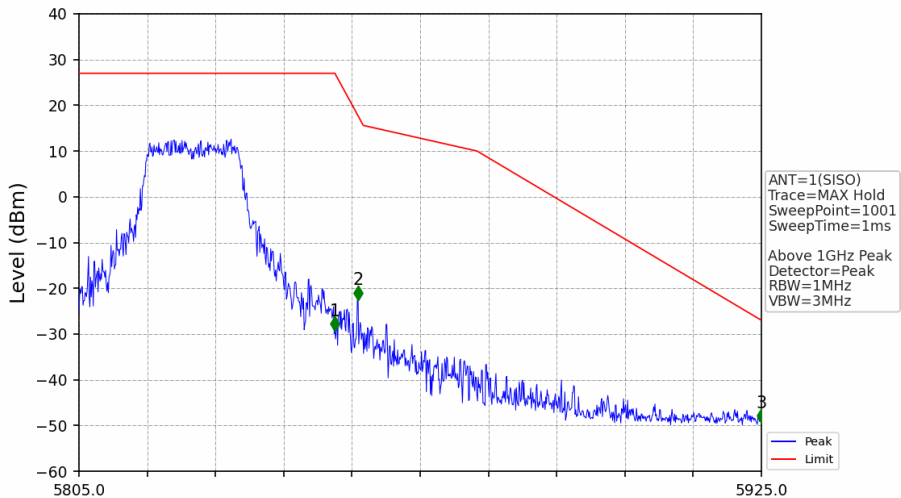


802.11a_LCH_5745MHz_Ant1_NTNV



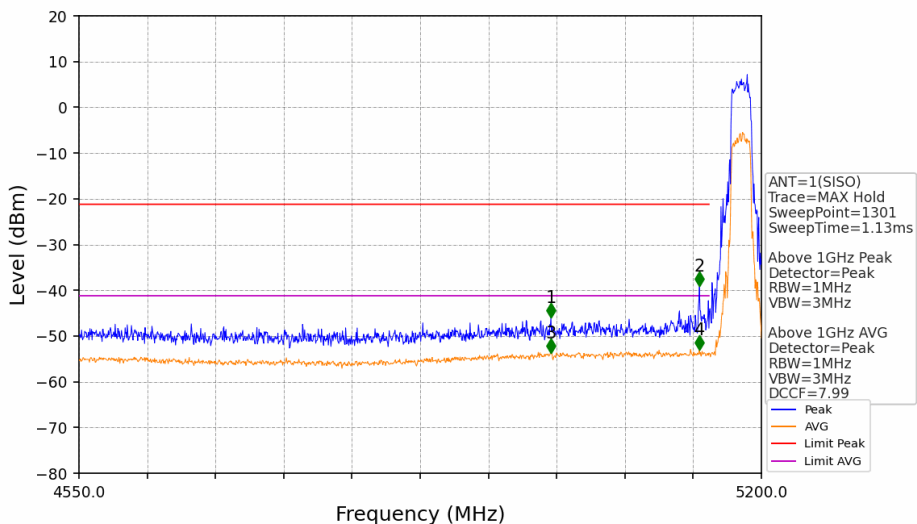
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5650.000	-49.16	-27.00	20.16	Pass	Peak	3	5725.000	-21.21	27.00	46.21	Pass	Peak
2	5723.715	-17.75	24.07	39.81	Pass	Peak							

802.11a_HCH_5825MHz_Ant1_NTNV



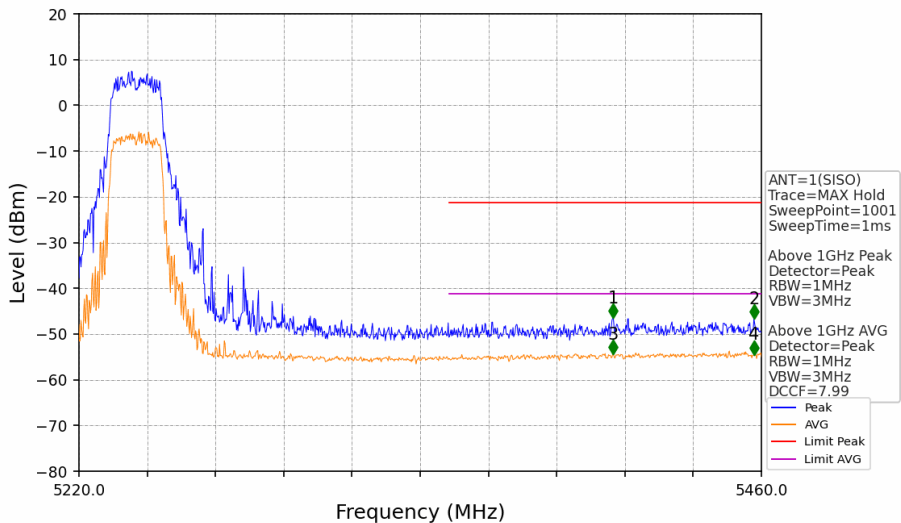
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5850.000	-29.37	27.00	54.37	Pass	Peak	3	5925.000	-49.42	-27.00	20.42	Pass	Peak
2	5854.080	-22.54	17.70	38.24	Pass	Peak							

802.11n(HT20)_LCH_5180MHz_Ant1_NTNV



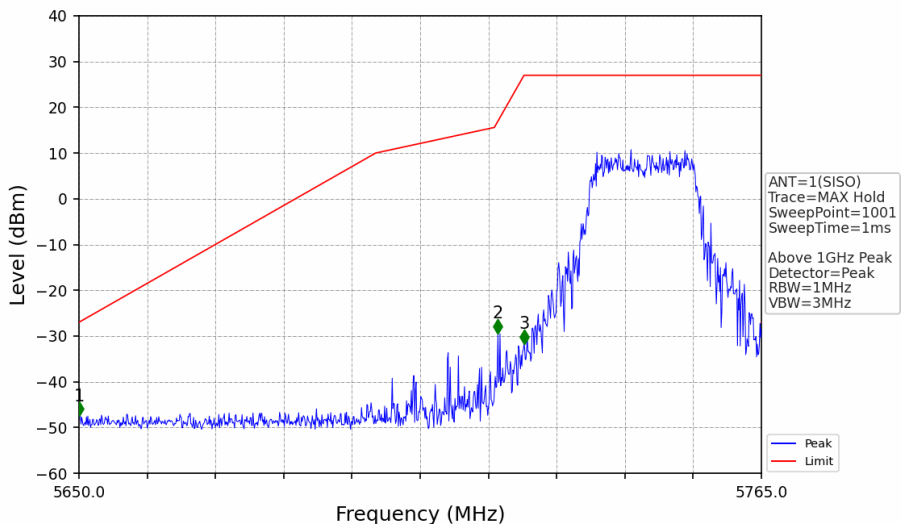
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	4999.500	-45.98	-21.20	22.78	Pass	Peak	3	4999.500	/	-21.20	/	/	AVG
2	5141.000	-39.16	-21.20	15.96	Pass	Peak	4	5141.000	/	-21.20	/	/	AVG

802.11n(HT20)_HCH_5240MHz_Ant1_NTNV



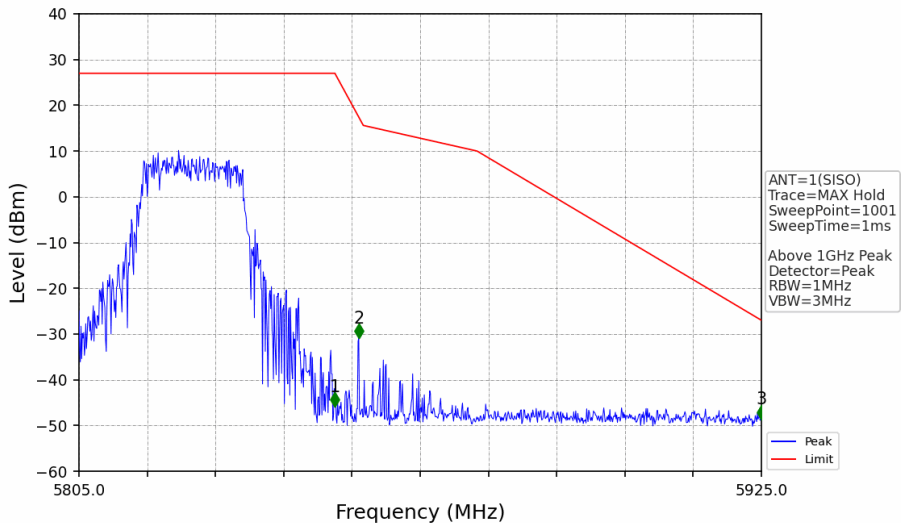
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5407.920	-46.49	-21.20	23.29	Pass	Peak	3	5407.920	/	-21.20	/	/	AVG
2	5457.360	-46.71	-21.20	23.51	Pass	Peak	4	5457.360	/	-21.20	/	/	AVG

802.11n(HT20)_LCH_5745MHz_Ant1_NTNV



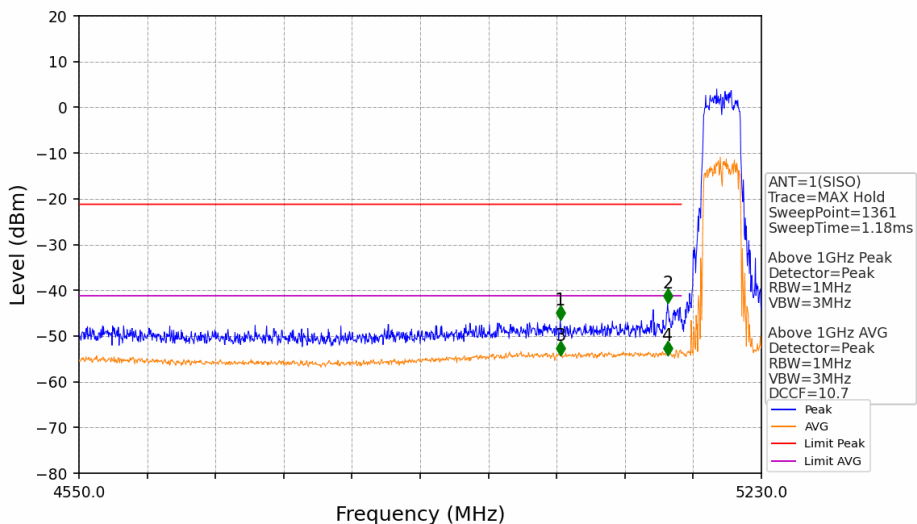
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5650.000	-47.51	-27.00	18.51	Pass	Peak	3	5725.000	-31.72	27.00	56.72	Pass	Peak
2	5720.610	-29.41	16.99	44.40	Pass	Peak							

802.11n(HT20)_HCH_5825MHz_Ant1_NTNV



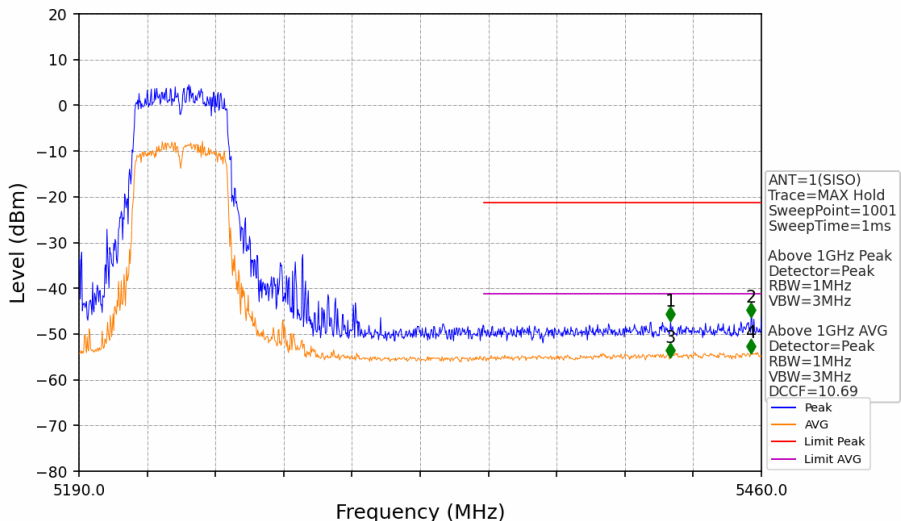
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5850.000	-45.92	27.00	70.92	Pass	Peak	3	5925.000	-48.64	-27.00	19.64	Pass	Peak
2	5854.200	-30.86	17.42	46.29	Pass	Peak							

802.11n(HT40)_LCH_5190MHz_Ant1_NTNV



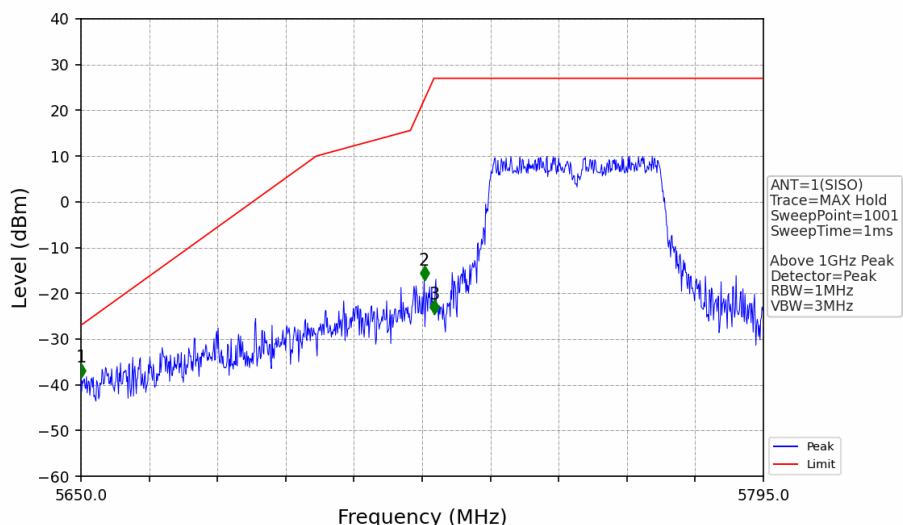
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5029.500	-46.56	-21.20	23.36	Pass	Peak	3	5029.500	/	-21.20	/	/	AVG
2	5136.500	-42.78	-21.20	19.58	Pass	Peak	4	5136.500	/	-21.20	/	/	AVG

802.11n(HT40)_HCH_5230MHz_Ant1_NTNV



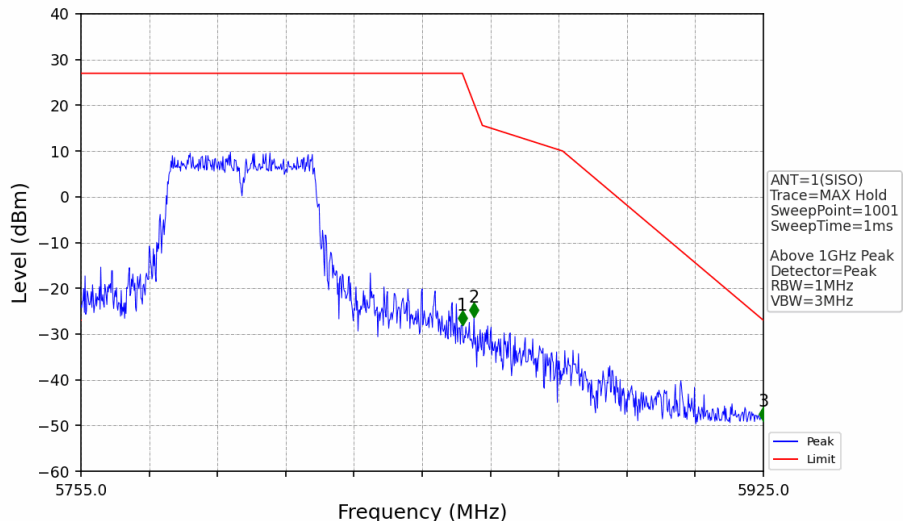
No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5424.090	-47.27	-21.20	24.07	Pass	Peak	3	5424.090	/	-21.20	/	/	AVG
2	5455.950	-46.28	-21.20	23.08	Pass	Peak	4	5455.950	/	-21.20	/	/	AVG

802.11n(HT40)_LCH_5755MHz_Ant1_NTNV



No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5650.000	-38.40	-27.00	9.40	Pass	Peak	3	5725.000	-24.54	27.00	49.54	Pass	Peak
2	5722.935	-17.09	22.29	37.38	Pass	Peak							

802.11n(HT40)_HCH_5795MHz_Ant1_NTNV



No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark	No	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Status	Remark
1	5850.000	-28.02	27.00	53.02	Pass	Peak	3	5925.000	-49.14	-27.00	20.14	Pass	Peak
2	5852.920	-26.26	20.34	44.60	Pass	Peak							

6. Frequency Stability

6.1 Ant1

6.1.1 Test Result

Ant1							
Mode	Tx Type	Frequency (MHz)	Temperature (°C)	Voltage (VAC)	Measured Frequency (MHz)	Limit (MHz)	Verdict
802.11a	SISO	5180	20	102	5180.080	5150 to 5250	Pass
				120	5180.020	5150 to 5250	Pass
				138	5180.040	5150 to 5250	Pass
			-30	120	5180.060	5150 to 5250	Pass
			-20	120	5180.040	5150 to 5250	Pass
			-10	120	5180.040	5150 to 5250	Pass
			0	120	5180.020	5150 to 5250	Pass
			10	120	5180.060	5150 to 5250	Pass
			30	120	5180.040	5150 to 5250	Pass
			40	120	5180.040	5150 to 5250	Pass
			50	120	5180.000	5150 to 5250	Pass
		5200	20	102	5200.020	5150 to 5250	Pass
				120	5199.940	5150 to 5250	Pass
				138	5199.960	5150 to 5250	Pass
			-30	120	5200.000	5150 to 5250	Pass
			-20	120	5200.060	5150 to 5250	Pass
			-10	120	5199.980	5150 to 5250	Pass
			0	120	5199.980	5150 to 5250	Pass
			10	120	5199.960	5150 to 5250	Pass
			30	120	5200.000	5150 to 5250	Pass
			40	120	5200.060	5150 to 5250	Pass
			50	120	5199.980	5150 to 5250	Pass
		5240	20	102	5239.980	5150 to 5250	Pass
				120	5239.980	5150 to 5250	Pass
				138	5239.980	5150 to 5250	Pass
			-30	120	5239.940	5150 to 5250	Pass
			-20	120	5239.980	5150 to 5250	Pass
			-10	120	5240.020	5150 to 5250	Pass
			0	120	5239.980	5150 to 5250	Pass
			10	120	5240.000	5150 to 5250	Pass
			30	120	5240.000	5150 to 5250	Pass
			40	120	5239.960	5150 to 5250	Pass
			50	120	5239.960	5150 to 5250	Pass
		5745	20	102	5745.000	5725 to 5850	Pass
				120	5745.000	5725 to 5850	Pass
				138	5745.040	5725 to 5850	Pass
			-30	120	5745.000	5725 to 5850	Pass
			-20	120	5744.940	5725 to 5850	Pass
			-10	120	5744.980	5725 to 5850	Pass
			0	120	5745.020	5725 to 5850	Pass
			10	120	5745.100	5725 to 5850	Pass

			30	120	5745.000	5725 to 5850	Pass
			40	120	5745.060	5725 to 5850	Pass
			50	120	5745.020	5725 to 5850	Pass
		5785	20	102	5785.000	5725 to 5850	Pass
				120	5785.020	5725 to 5850	Pass
				138	5784.980	5725 to 5850	Pass
			-30	120	5785.000	5725 to 5850	Pass
			-20	120	5784.960	5725 to 5850	Pass
			-10	120	5784.900	5725 to 5850	Pass
			0	120	5784.940	5725 to 5850	Pass
			10	120	5784.960	5725 to 5850	Pass
			30	120	5784.980	5725 to 5850	Pass
			40	120	5785.060	5725 to 5850	Pass
			50	120	5784.980	5725 to 5850	Pass
		5825	20	102	5825.040	5725 to 5850	Pass
				120	5825.100	5725 to 5850	Pass
				138	5825.000	5725 to 5850	Pass
			-30	120	5825.060	5725 to 5850	Pass
			-20	120	5824.980	5725 to 5850	Pass
			-10	120	5824.960	5725 to 5850	Pass
			0	120	5824.940	5725 to 5850	Pass
			10	120	5825.000	5725 to 5850	Pass
			30	120	5825.000	5725 to 5850	Pass
			40	120	5825.020	5725 to 5850	Pass
			50	120	5825.000	5725 to 5850	Pass
802.11n (HT20)	SISO	5180	20	102	5180.040	5150 to 5250	Pass
				120	5179.980	5150 to 5250	Pass
				138	5179.940	5150 to 5250	Pass
			-30	120	5179.960	5150 to 5250	Pass
			-20	120	5180.020	5150 to 5250	Pass
			-10	120	5180.020	5150 to 5250	Pass
			0	120	5179.980	5150 to 5250	Pass
			10	120	5180.040	5150 to 5250	Pass
			30	120	5180.020	5150 to 5250	Pass
			40	120	5180.000	5150 to 5250	Pass
			50	120	5180.040	5150 to 5250	Pass
		5200	20	102	5199.980	5150 to 5250	Pass
				120	5199.980	5150 to 5250	Pass
				138	5199.960	5150 to 5250	Pass
			-30	120	5199.980	5150 to 5250	Pass
			-20	120	5200.100	5150 to 5250	Pass
			-10	120	5200.040	5150 to 5250	Pass
			0	120	5199.940	5150 to 5250	Pass
			10	120	5199.920	5150 to 5250	Pass
			30	120	5200.000	5150 to 5250	Pass
			40	120	5200.000	5150 to 5250	Pass
			50	120	5200.040	5150 to 5250	Pass
		5240	20	102	5239.980	5150 to 5250	Pass
				120	5240.040	5150 to 5250	Pass
				138	5240.040	5150 to 5250	Pass
			-30	120	5240.080	5150 to 5250	Pass
			-20	120	5240.020	5150 to 5250	Pass

			-10	120	5240.040	5150 to 5250	Pass
			0	120	5240.020	5150 to 5250	Pass
			10	120	5240.000	5150 to 5250	Pass
			30	120	5240.000	5150 to 5250	Pass
			40	120	5240.020	5150 to 5250	Pass
			50	120	5240.040	5150 to 5250	Pass
		5745	20	102	5744.980	5725 to 5850	Pass
				120	5745.060	5725 to 5850	Pass
				138	5745.080	5725 to 5850	Pass
			-30	120	5745.020	5725 to 5850	Pass
			-20	120	5745.060	5725 to 5850	Pass
			-10	120	5745.060	5725 to 5850	Pass
			0	120	5744.960	5725 to 5850	Pass
			10	120	5745.120	5725 to 5850	Pass
			30	120	5744.980	5725 to 5850	Pass
			40	120	5744.980	5725 to 5850	Pass
			50	120	5745.000	5725 to 5850	Pass
		5785	20	102	5785.040	5725 to 5850	Pass
				120	5785.000	5725 to 5850	Pass
				138	5785.000	5725 to 5850	Pass
			-30	120	5785.180	5725 to 5850	Pass
			-20	120	5784.960	5725 to 5850	Pass
			-10	120	5785.080	5725 to 5850	Pass
			0	120	5785.060	5725 to 5850	Pass
			10	120	5785.000	5725 to 5850	Pass
			30	120	5784.960	5725 to 5850	Pass
			40	120	5784.980	5725 to 5850	Pass
			50	120	5785.040	5725 to 5850	Pass
		5825	20	102	5824.980	5725 to 5850	Pass
				120	5825.060	5725 to 5850	Pass
				138	5825.080	5725 to 5850	Pass
			-30	120	5824.980	5725 to 5850	Pass
			-20	120	5824.940	5725 to 5850	Pass
			-10	120	5825.080	5725 to 5850	Pass
			0	120	5825.020	5725 to 5850	Pass
			10	120	5824.960	5725 to 5850	Pass
			30	120	5824.980	5725 to 5850	Pass
			40	120	5825.020	5725 to 5850	Pass
			50	120	5825.000	5725 to 5850	Pass
802.11n (HT40)	SISO	5190	20	102	5190.160	5150 to 5250	Pass
				120	5190.000	5150 to 5250	Pass
				138	5190.160	5150 to 5250	Pass
			-30	120	5190.040	5150 to 5250	Pass
			-20	120	5190.080	5150 to 5250	Pass
			-10	120	5190.040	5150 to 5250	Pass
			0	120	5190.000	5150 to 5250	Pass
			10	120	5190.040	5150 to 5250	Pass
			30	120	5190.040	5150 to 5250	Pass
			40	120	5190.040	5150 to 5250	Pass
			50	120	5190.080	5150 to 5250	Pass
		5230	20	102	5230.080	5150 to 5250	Pass
				120	5230.080	5150 to 5250	Pass

				138	5230.000	5150 to 5250	Pass
			-30	120	5230.040	5150 to 5250	Pass
			-20	120	5230.040	5150 to 5250	Pass
			-10	120	5230.080	5150 to 5250	Pass
			0	120	5230.160	5150 to 5250	Pass
			10	120	5230.080	5150 to 5250	Pass
			30	120	5230.000	5150 to 5250	Pass
			40	120	5230.000	5150 to 5250	Pass
			50	120	5230.080	5150 to 5250	Pass
		5755	20	102	5755.040	5725 to 5850	Pass
				120	5755.040	5725 to 5850	Pass
				138	5755.000	5725 to 5850	Pass
			-30	120	5755.040	5725 to 5850	Pass
			-20	120	5755.120	5725 to 5850	Pass
			-10	120	5755.000	5725 to 5850	Pass
			0	120	5755.040	5725 to 5850	Pass
			10	120	5755.080	5725 to 5850	Pass
			30	120	5755.160	5725 to 5850	Pass
			40	120	5755.080	5725 to 5850	Pass
			50	120	5755.120	5725 to 5850	Pass
		5795	20	102	5795.040	5725 to 5850	Pass
				120	5795.000	5725 to 5850	Pass
				138	5795.000	5725 to 5850	Pass
			-30	120	5795.040	5725 to 5850	Pass
			-20	120	5795.040	5725 to 5850	Pass
			-10	120	5795.000	5725 to 5850	Pass
			0	120	5795.040	5725 to 5850	Pass
			10	120	5795.040	5725 to 5850	Pass
			30	120	5795.120	5725 to 5850	Pass
			40	120	5794.920	5725 to 5850	Pass
			50	120	5795.080	5725 to 5850	Pass

----- End of Report -----