

Appendix RF Test Data for 2.4G WIFI

Company: : Dongguan Chuyang Trading CO., Ltd

EUT : Mini pc case

FCC ID: : 2BT5Z-X2

Model Number : X2

Report No. : HTT202512771F01

Reviewed By : Heber He

1. Duty Cycle

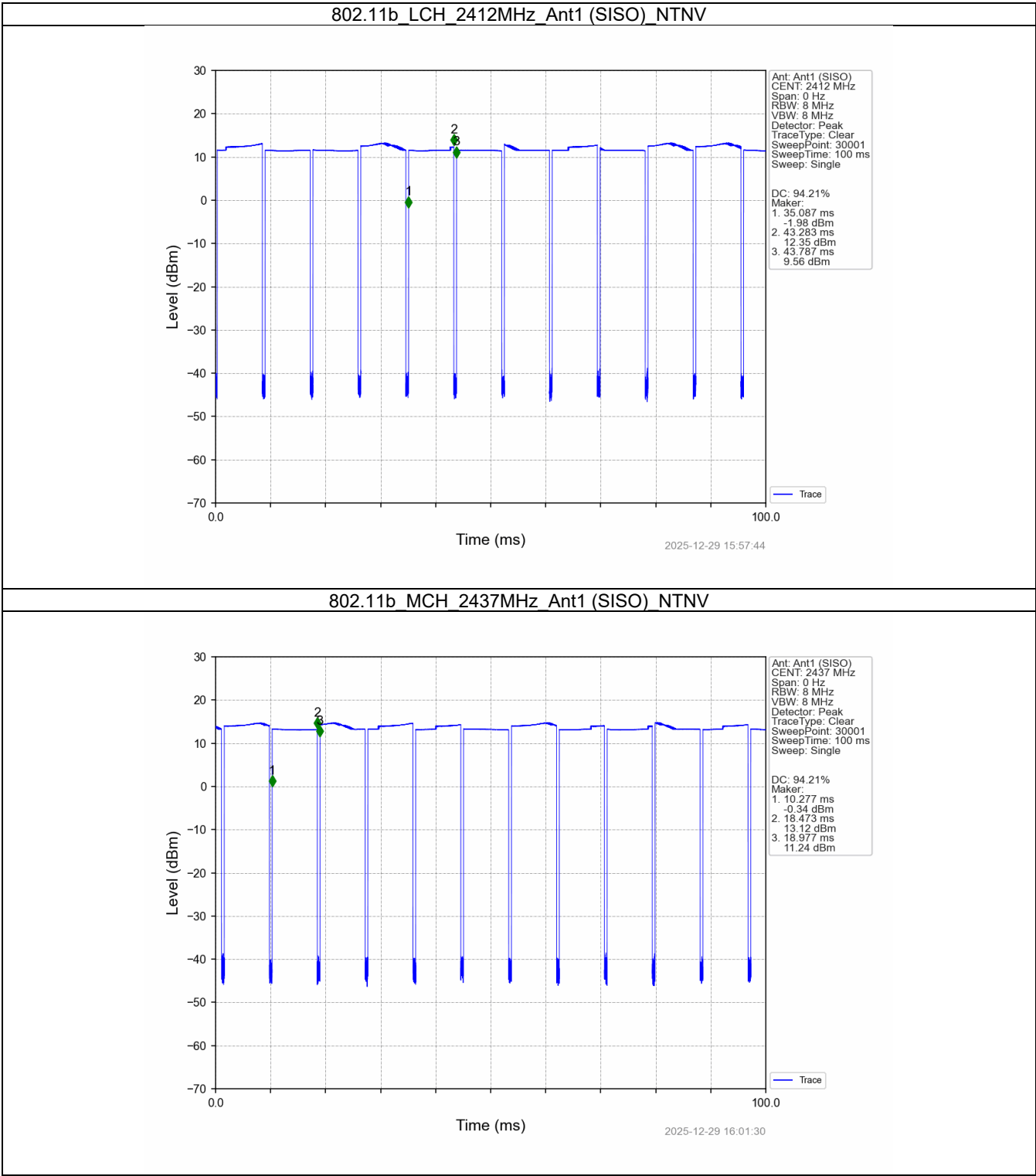
1.1 Test Result

1.1.1 Ant1

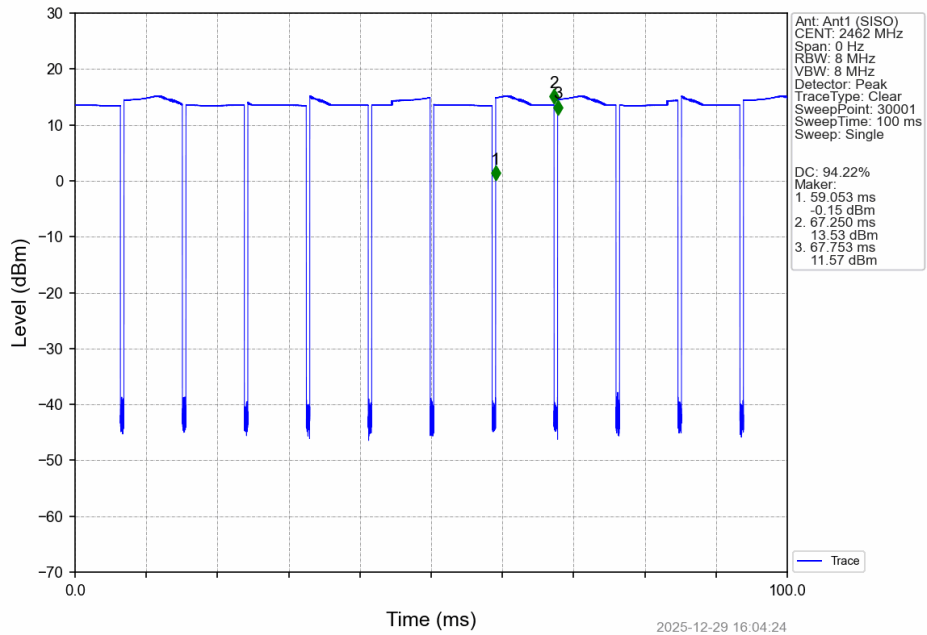
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	8.196	8.700	94.21	0.26	0.04
		2437	8.196	8.700	94.21	0.26	0.04
		2462	8.197	8.700	94.22	0.26	0.04
802.11g	SISO	2412	1.362	1.863	73.11	1.36	0.03
		2437	1.361	1.862	73.09	1.36	0.03
		2462	1.362	1.863	73.11	1.36	0.03
802.11n (HT20)	MIMO	2412	1.273	1.774	71.76	1.44	0.01
		2437	1.273	1.774	71.76	1.44	0.03
		2462	1.274	1.775	71.77	1.44	0.02
802.11n (HT40)	MIMO	2422	0.634	1.134	55.91	2.53	0.03
		2437	0.634	1.134	55.91	2.53	0.01
		2452	0.634	1.134	55.91	2.53	0.01

1.2 Test Graph

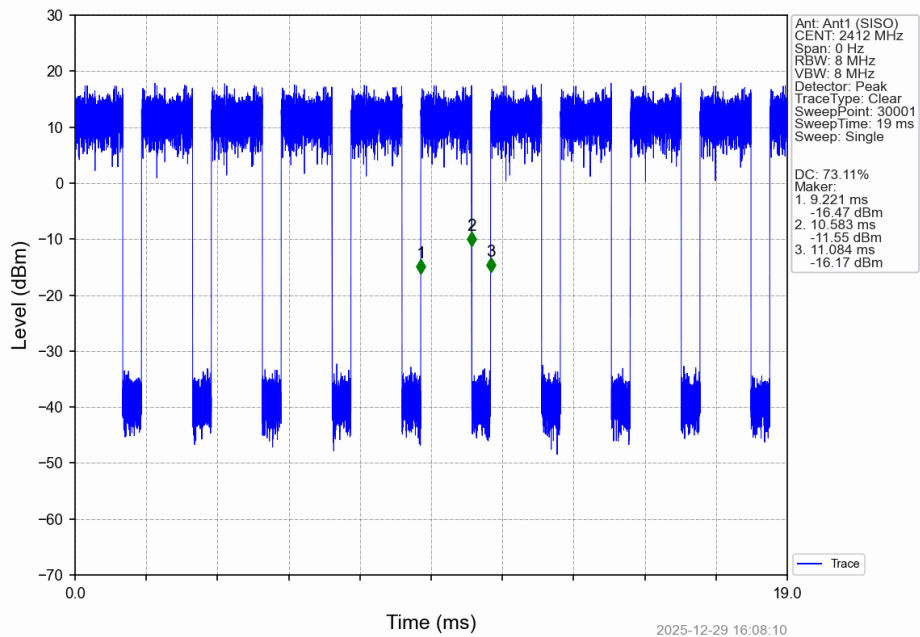
1.2.1 Ant1



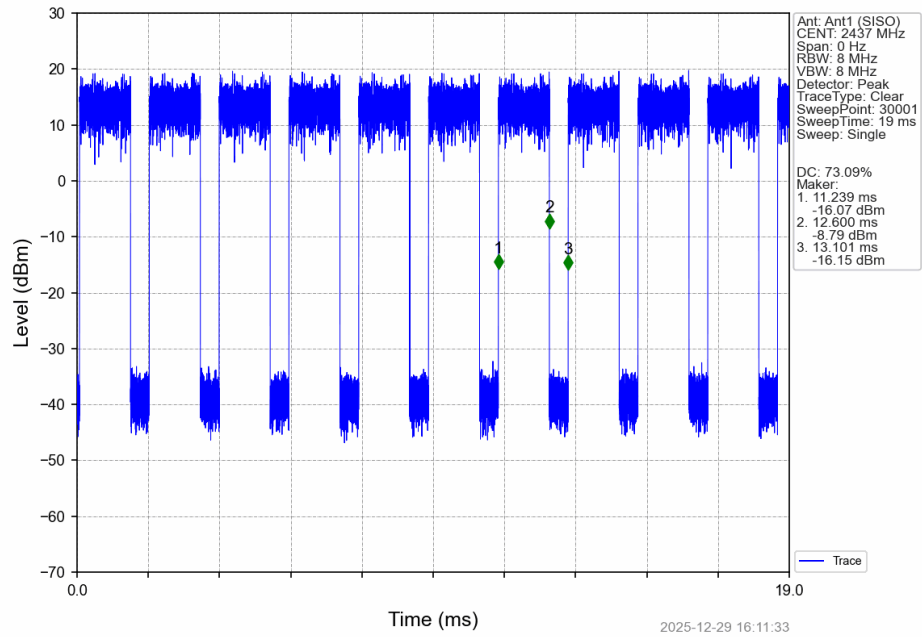
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



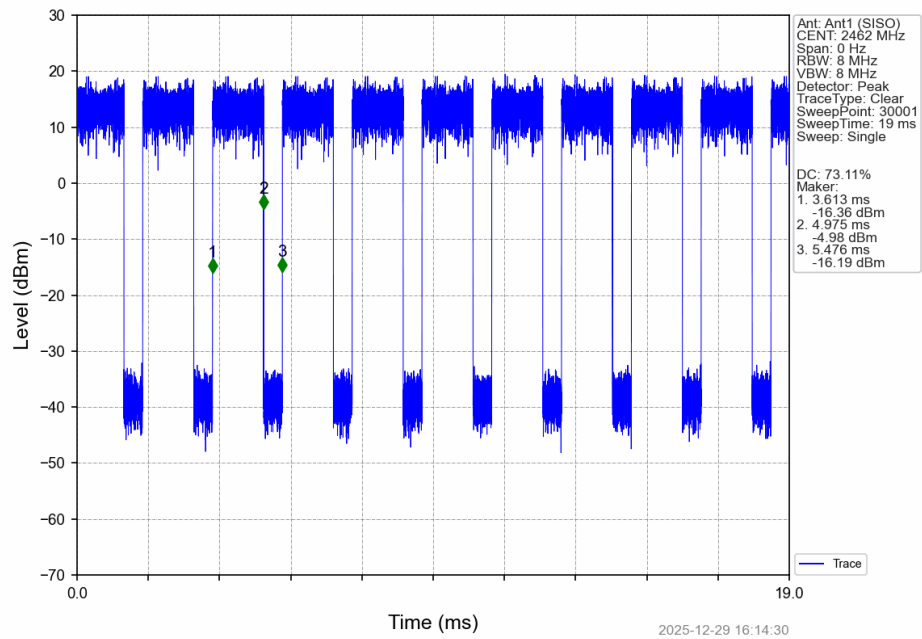
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



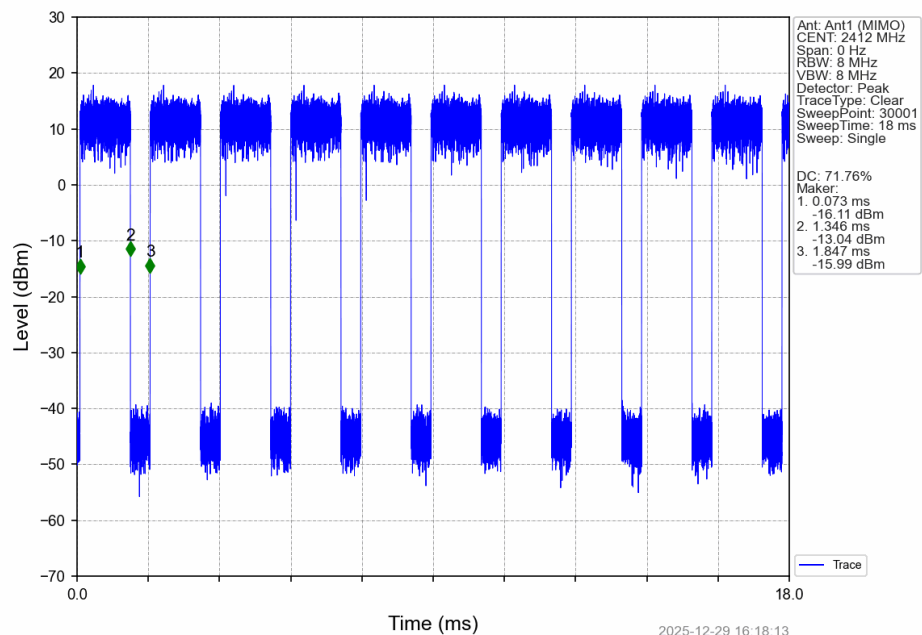
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



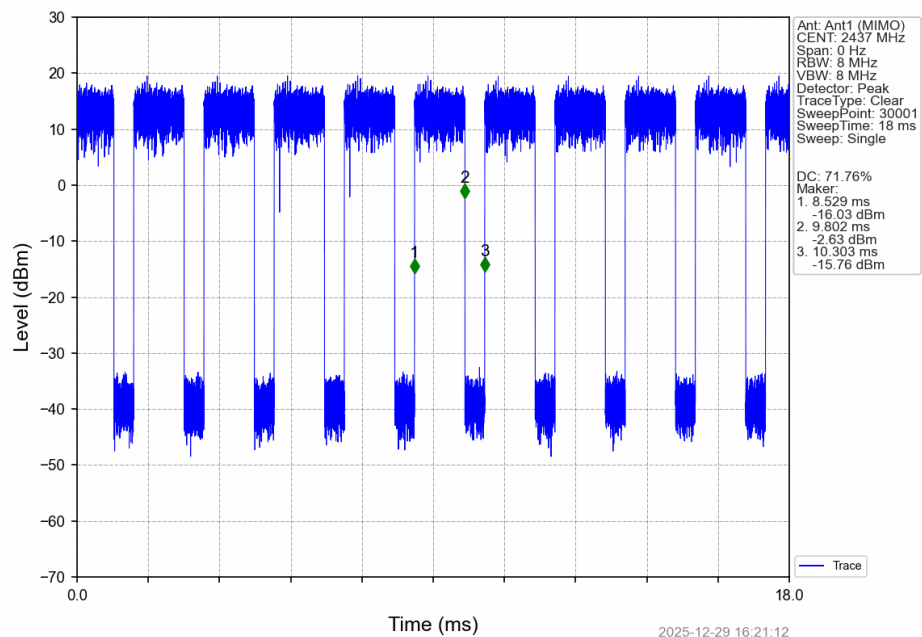
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



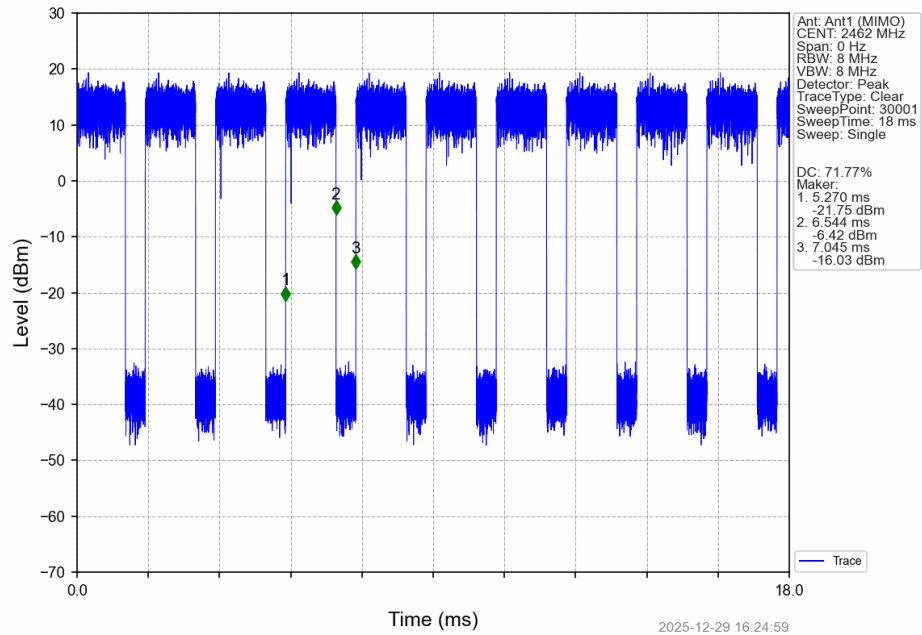
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



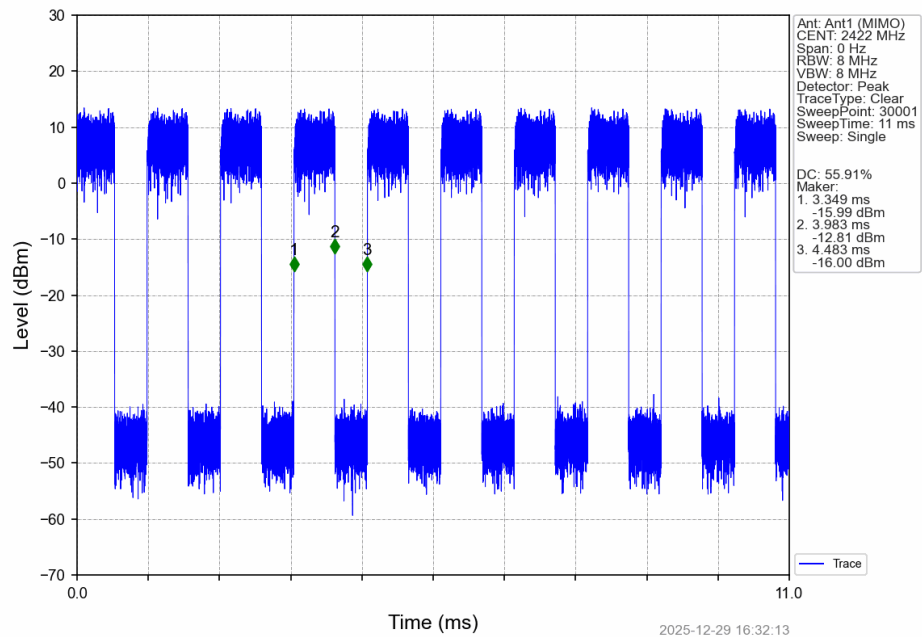
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



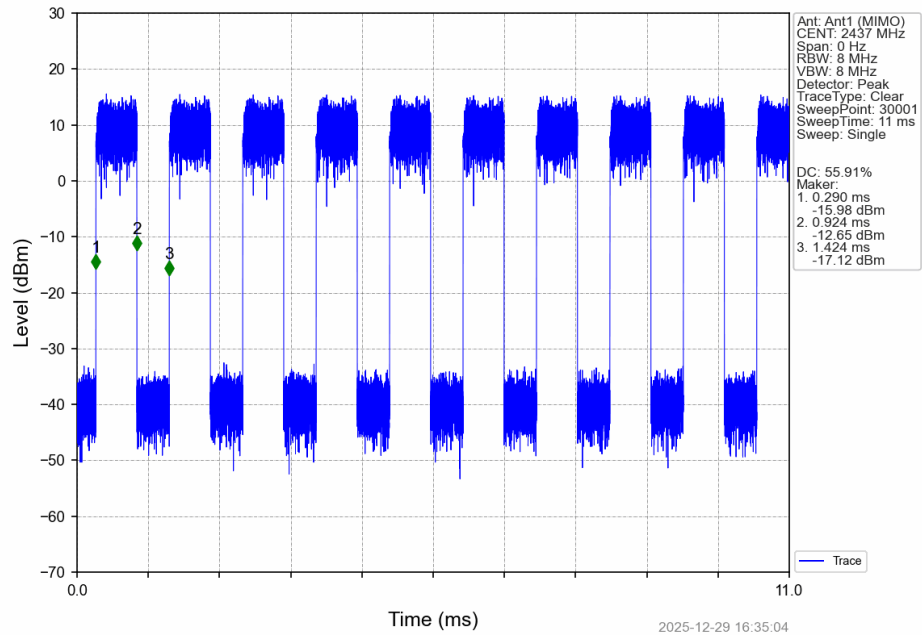
802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



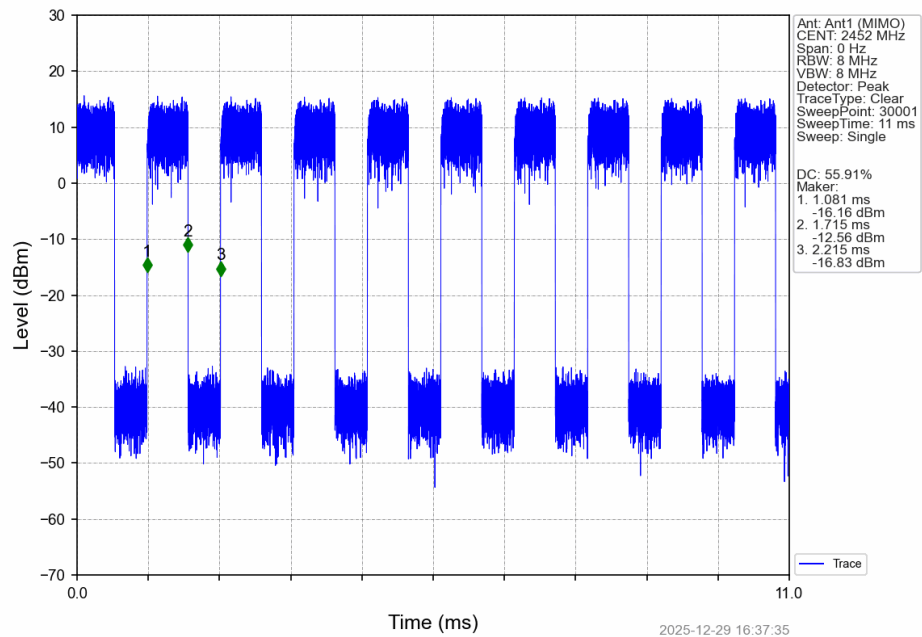
802.11n(HT40)_LCH_2422MHz_Ant1 (MIMO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (MIMO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (MIMO)_NTNV



2. Bandwidth

2.1 Test Result

2.1.1 OBW

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	14.644	/	Pass
			2	14.563	/	Pass
		2437	1	14.609	/	Pass
			2	14.608	/	Pass
		2462	1	14.684	/	Pass
			2	14.622	/	Pass
802.11g	SISO	2412	1	17.208	/	Pass
			2	16.858	/	Pass
		2437	1	17.158	/	Pass
			2	16.864	/	Pass
		2462	1	17.203	/	Pass
			2	16.852	/	Pass
802.11n (HT20)	MIMO	2412	1	18.344	/	Pass
			2	18.274	/	Pass
		2437	1	18.293	/	Pass
			2	18.309	/	Pass
		2462	1	18.310	/	Pass
			2	18.296	/	Pass
802.11n (HT40)	MIMO	2422	1	36.527	/	Pass
			2	36.475	/	Pass
		2437	1	36.478	/	Pass
			2	36.455	/	Pass
		2452	1	36.508	/	Pass
			2	36.412	/	Pass

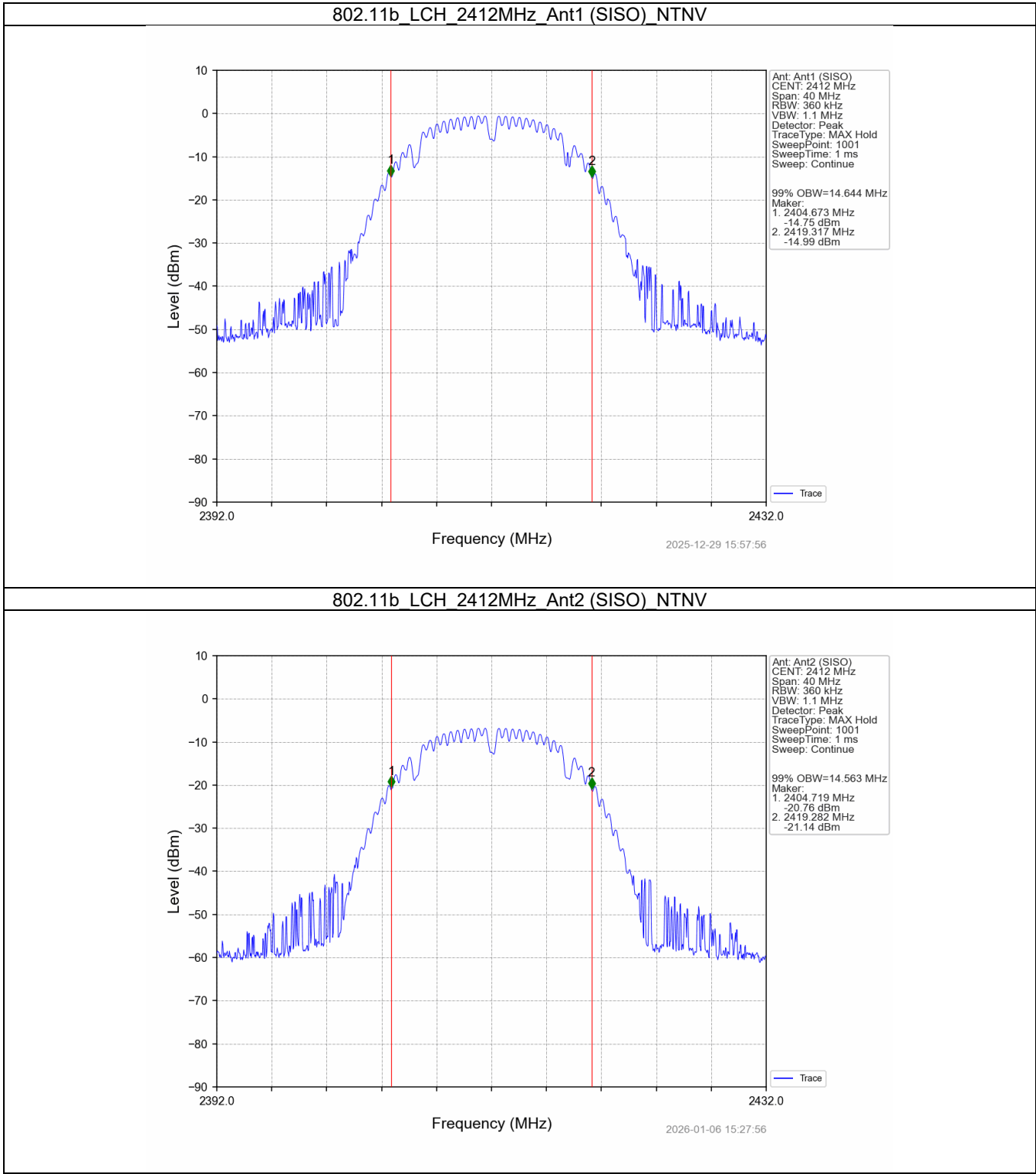
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	10.347	≥ 0.5	Pass
			2	10.342	≥ 0.5	Pass
		2437	1	10.341	≥ 0.5	Pass
			2	10.345	≥ 0.5	Pass
		2462	1	10.352	≥ 0.5	Pass
			2	10.346	≥ 0.5	Pass
802.11g	SISO	2412	1	16.375	≥ 0.5	Pass
			2	16.357	≥ 0.5	Pass
		2437	1	16.361	≥ 0.5	Pass
			2	16.415	≥ 0.5	Pass
		2462	1	16.416	≥ 0.5	Pass
			2	16.399	≥ 0.5	Pass
802.11n (HT20)	MIMO	2412	1	17.623	≥ 0.5	Pass
			2	17.622	≥ 0.5	Pass
		2437	1	17.589	≥ 0.5	Pass
			2	17.602	≥ 0.5	Pass
		2462	1	17.669	≥ 0.5	Pass
			1	17.669	≥ 0.5	Pass

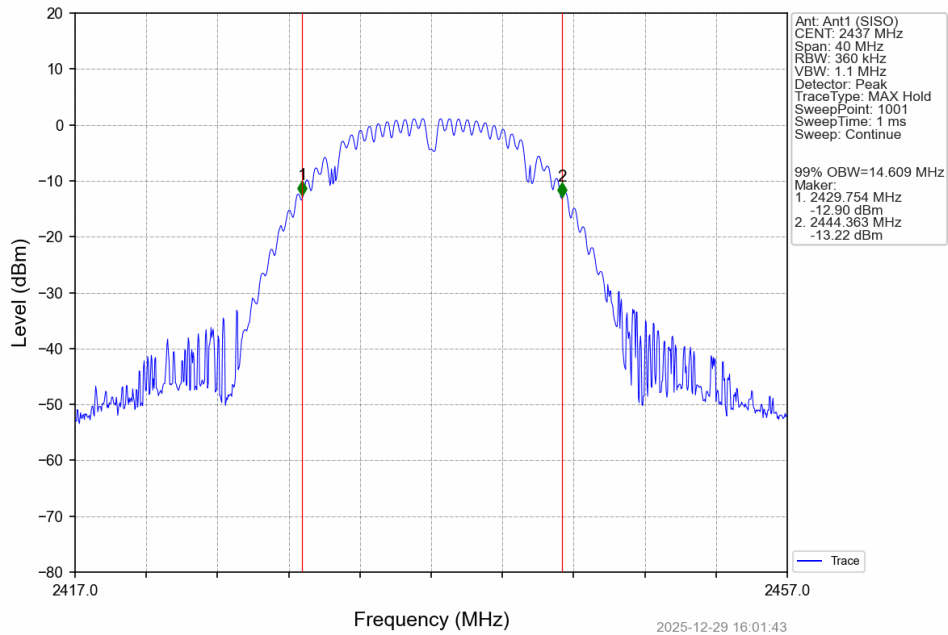
			2	17.543	≥ 0.5	Pass
802.11n (HT40)	MIMO	2422	1	36.241	≥ 0.5	Pass
			2	36.284	≥ 0.5	Pass
		2437	1	36.095	≥ 0.5	Pass
			2	36.049	≥ 0.5	Pass
		2452	1	36.336	≥ 0.5	Pass
			2	36.016	≥ 0.5	Pass

2.2 Test Graph

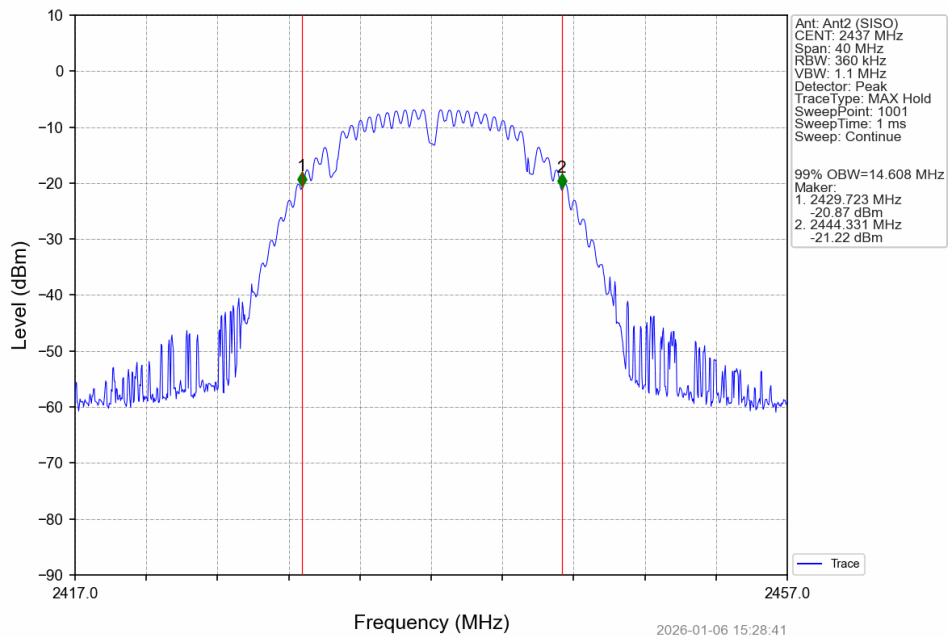
2.2.1 OBW



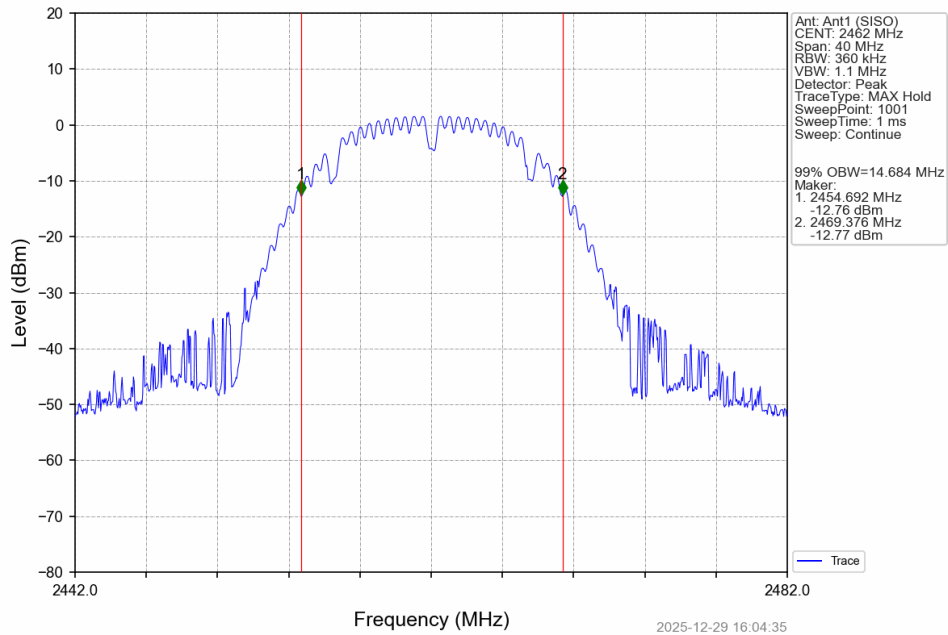
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



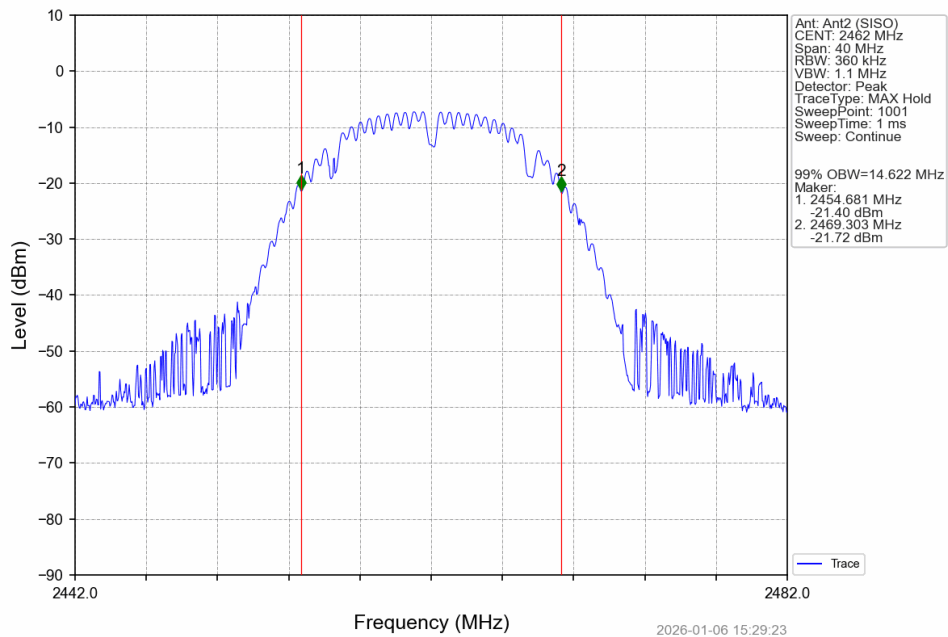
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



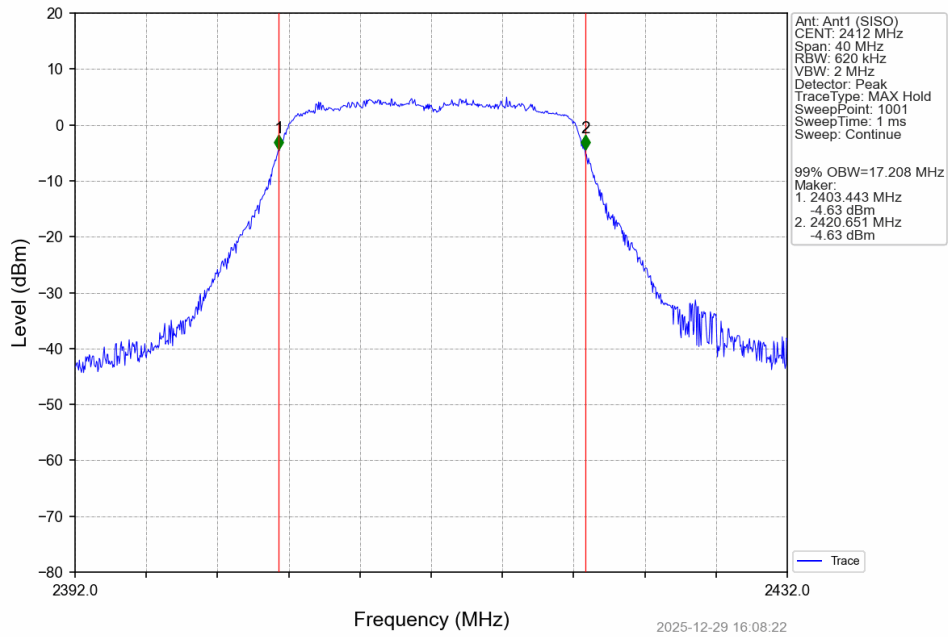
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



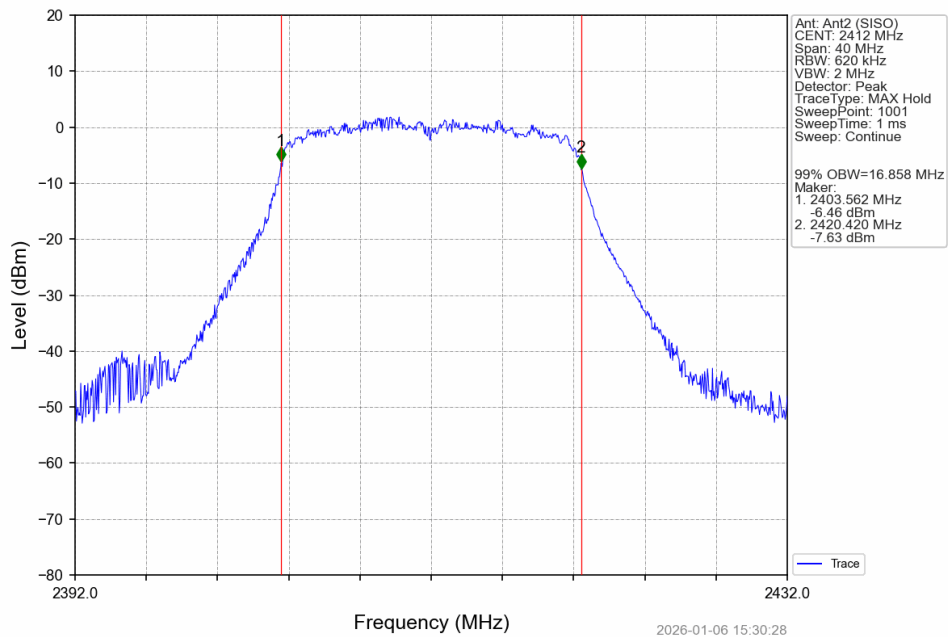
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



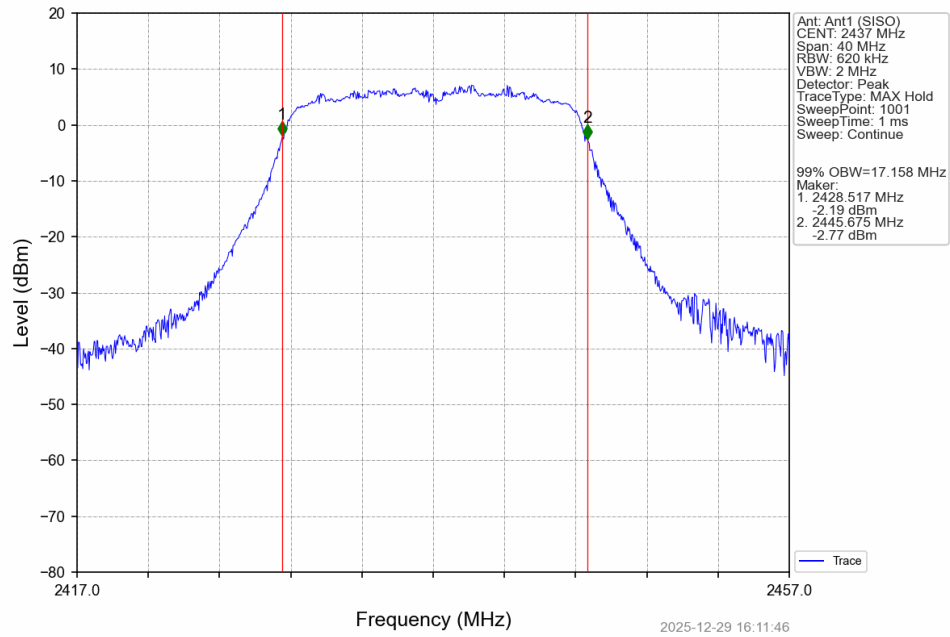
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



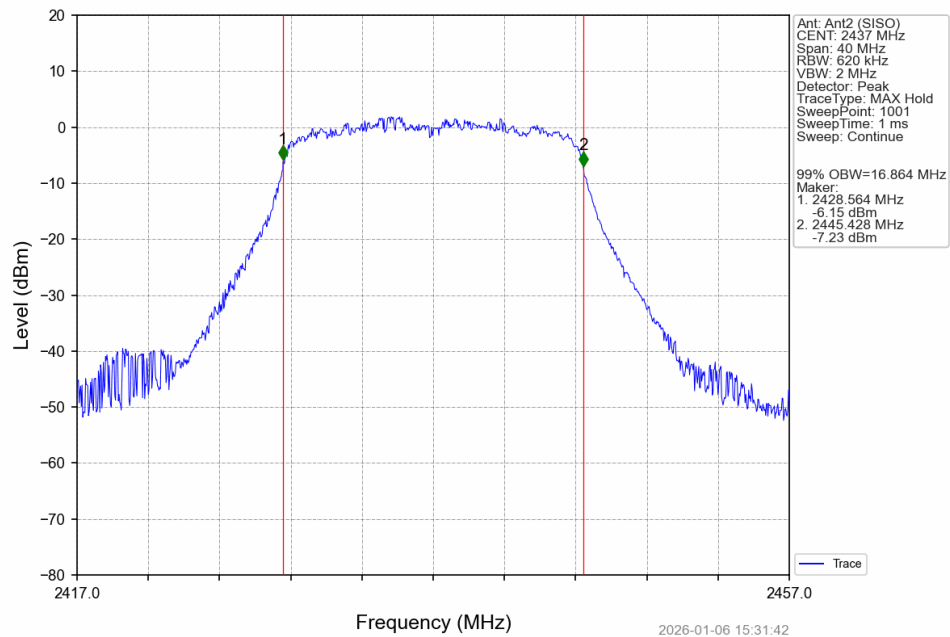
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



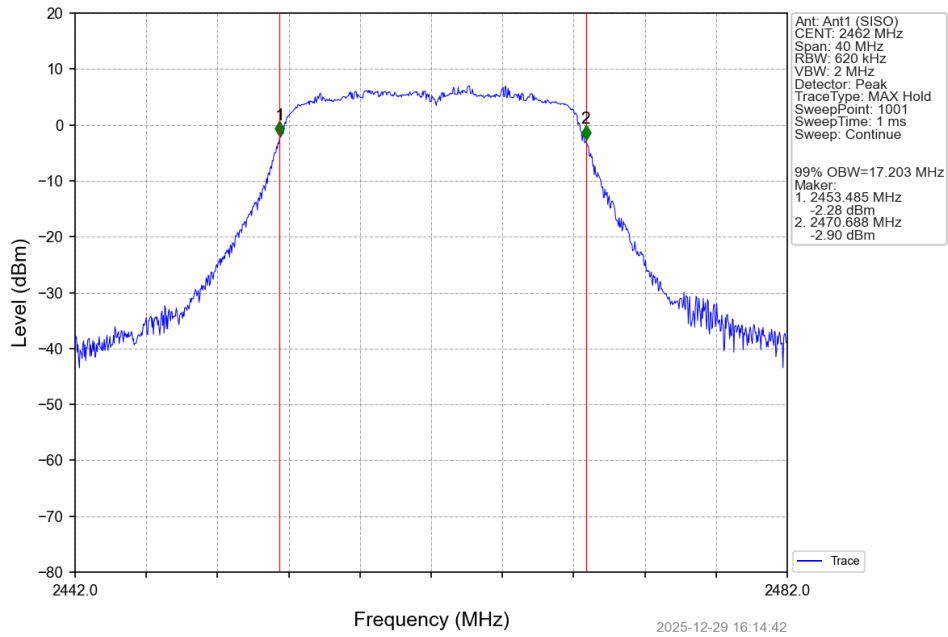
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



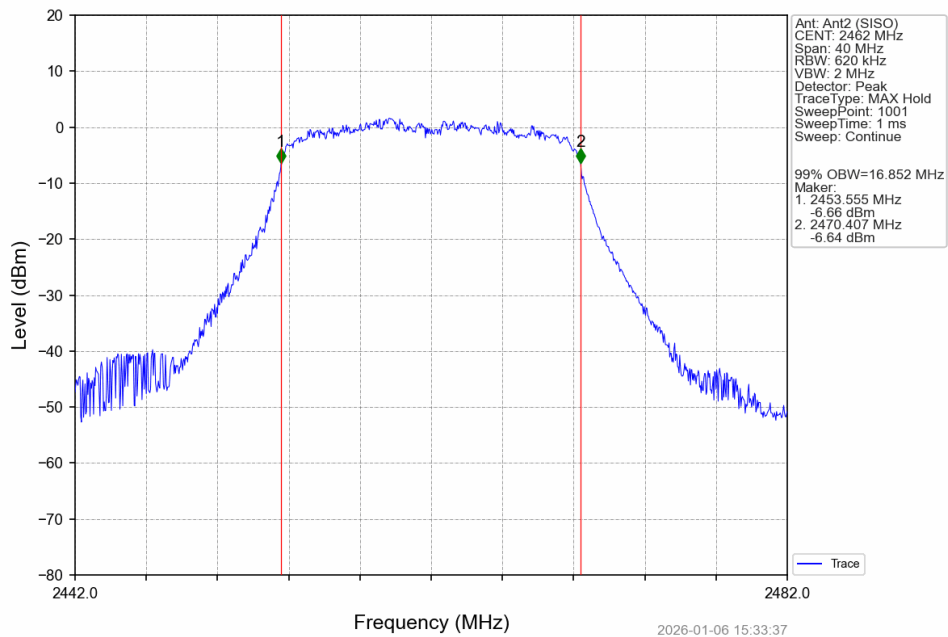
802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



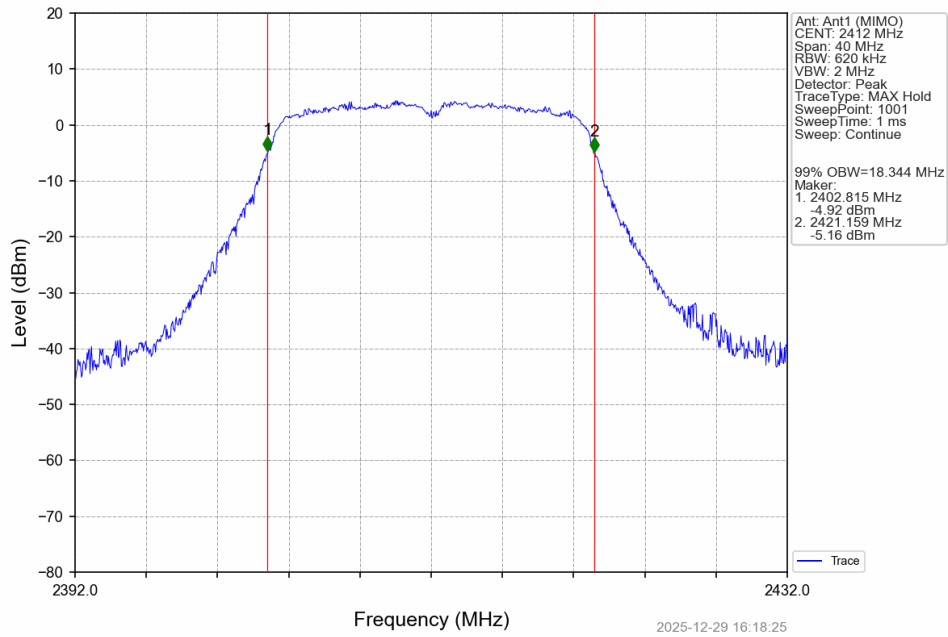
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



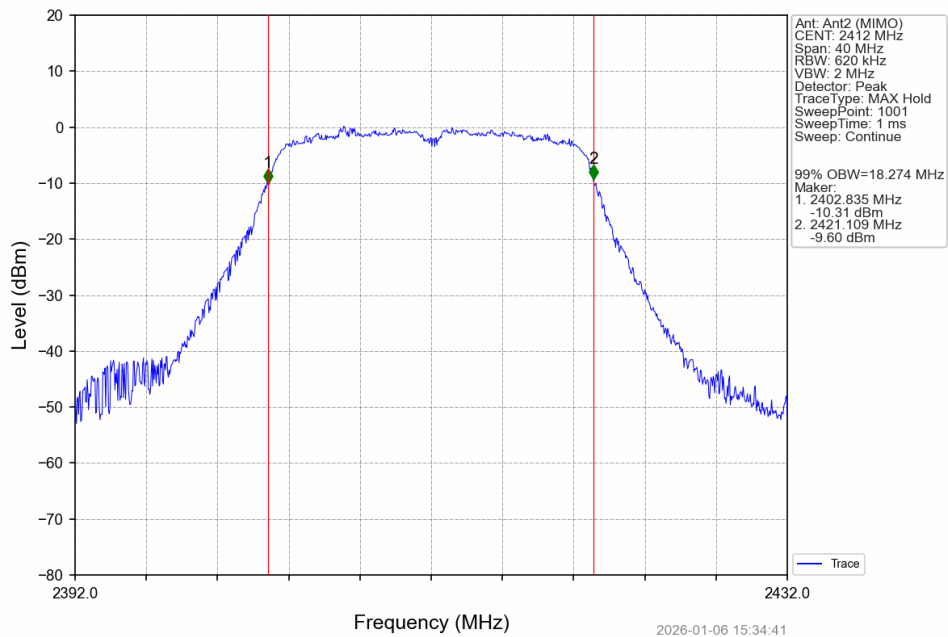
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



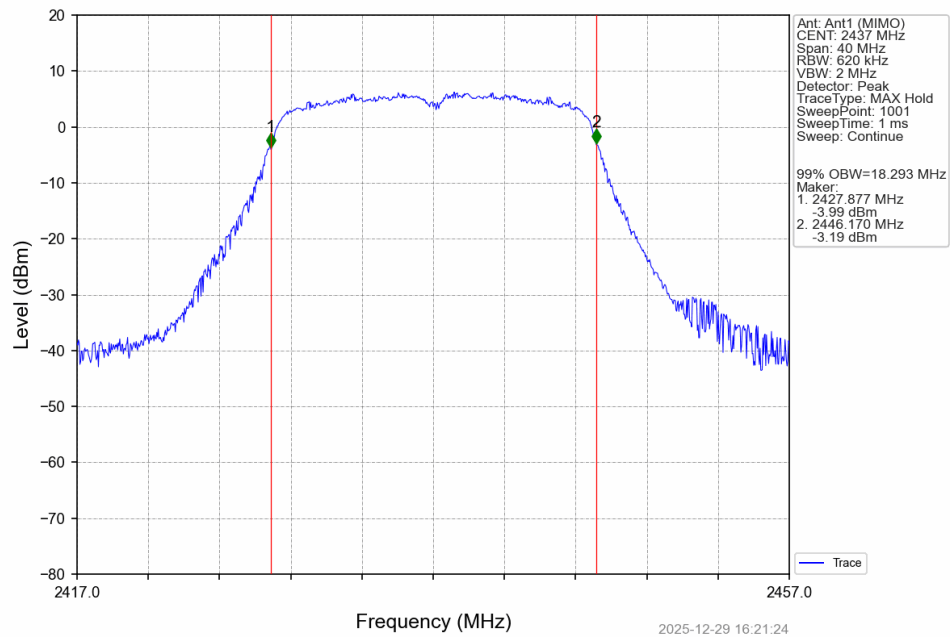
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



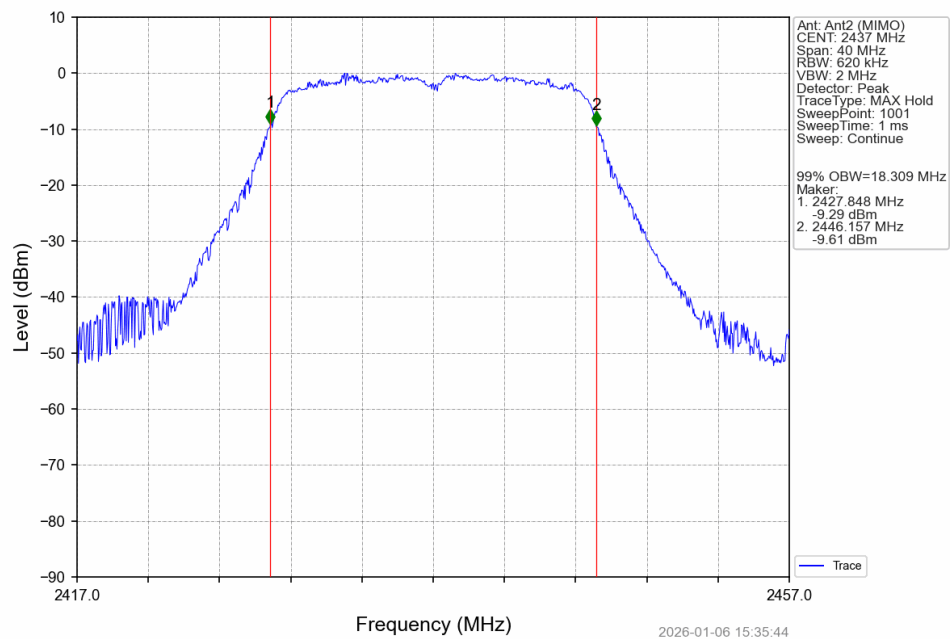
802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



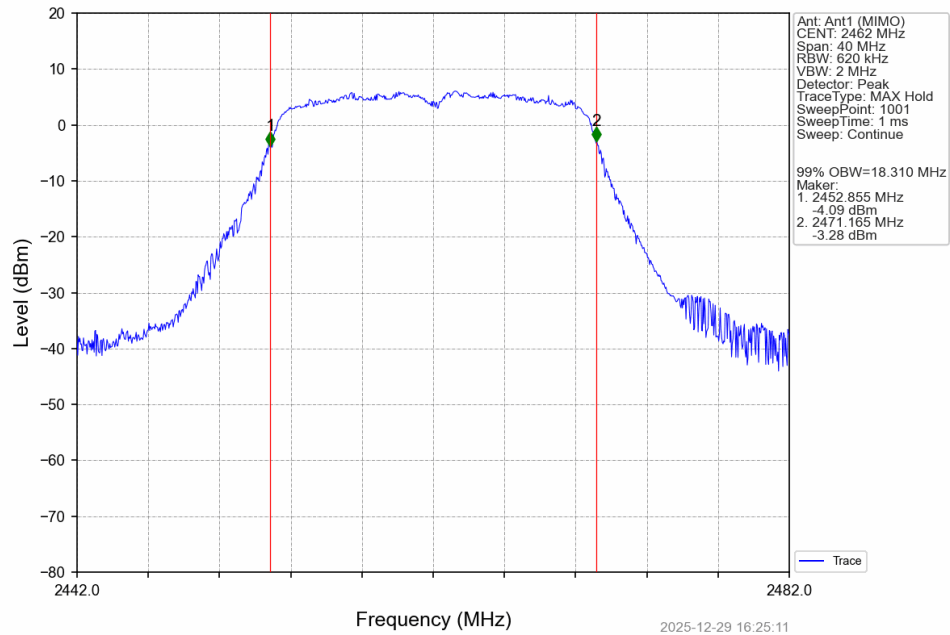
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



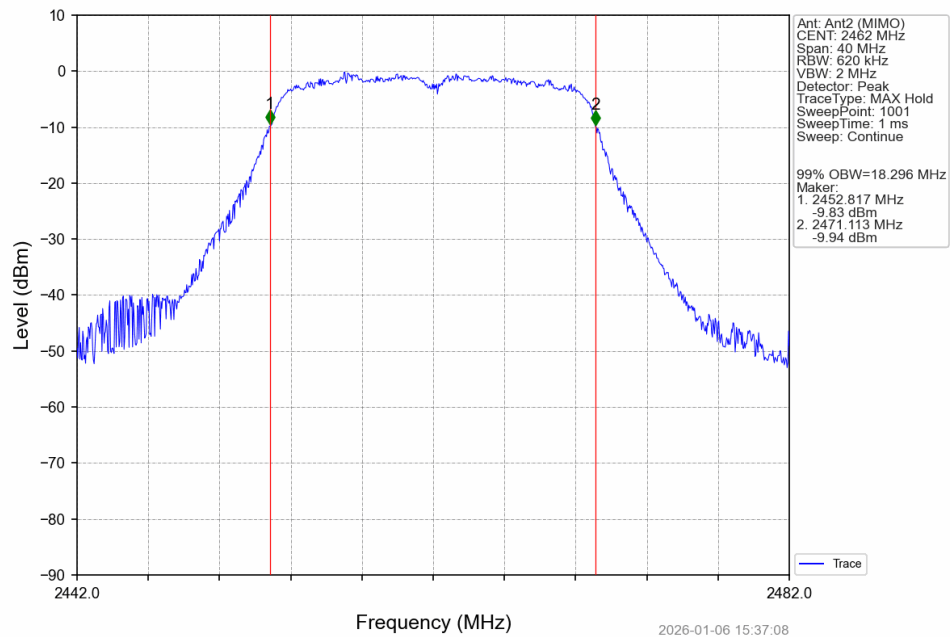
802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



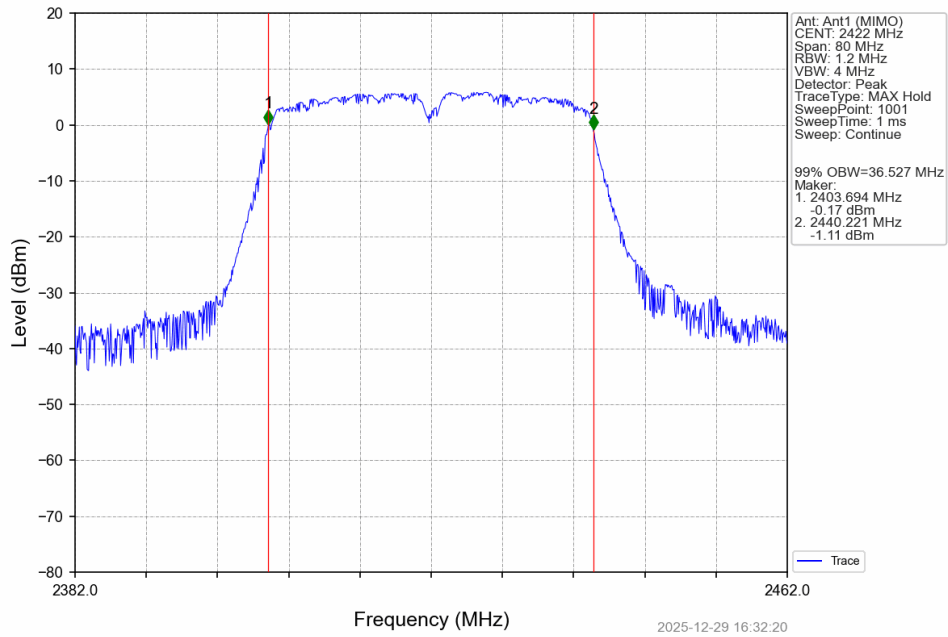
802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



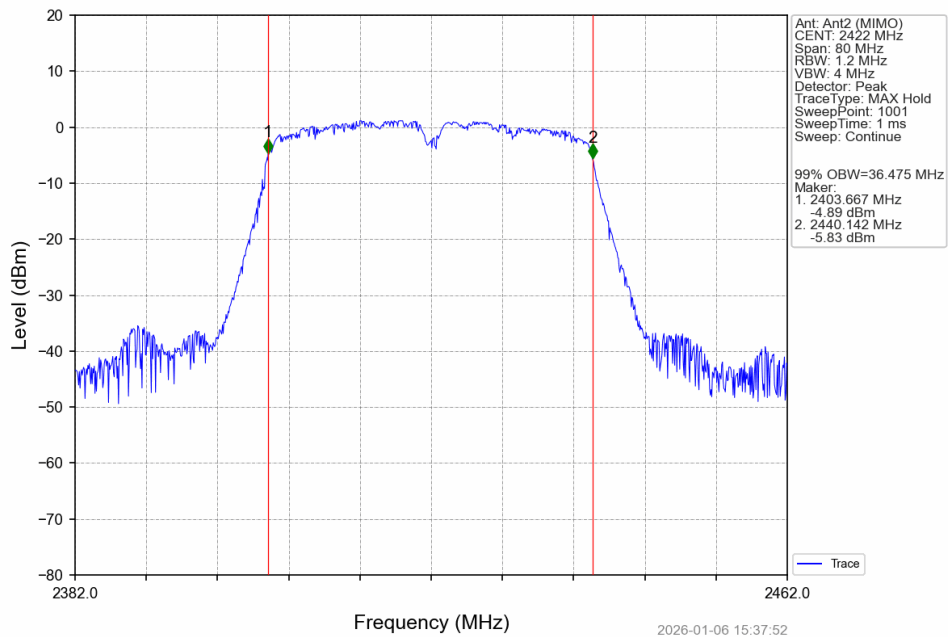
802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



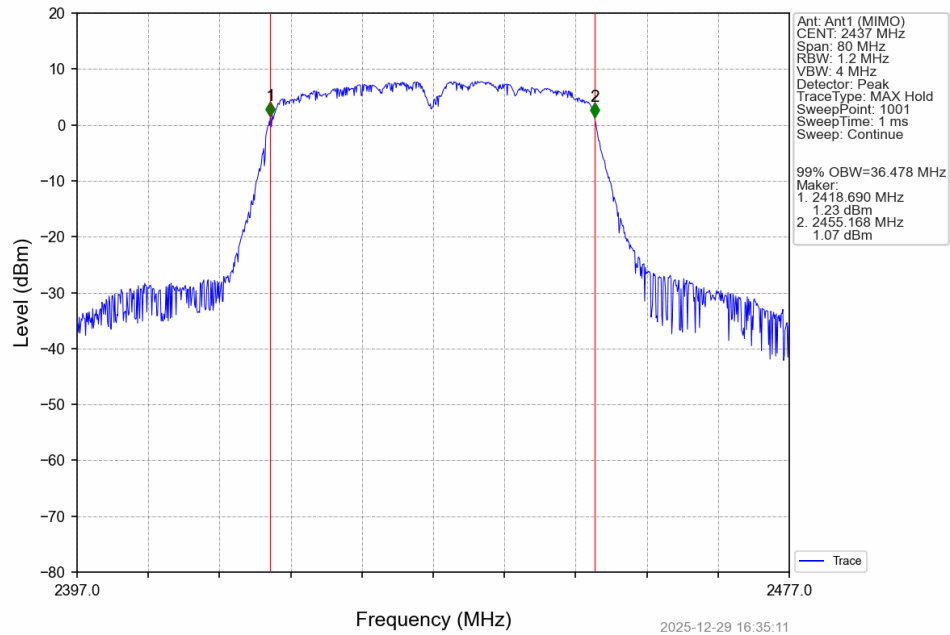
802.11n(HT40)_LCH_2422MHz_Ant1 (MIMO)_NTNV



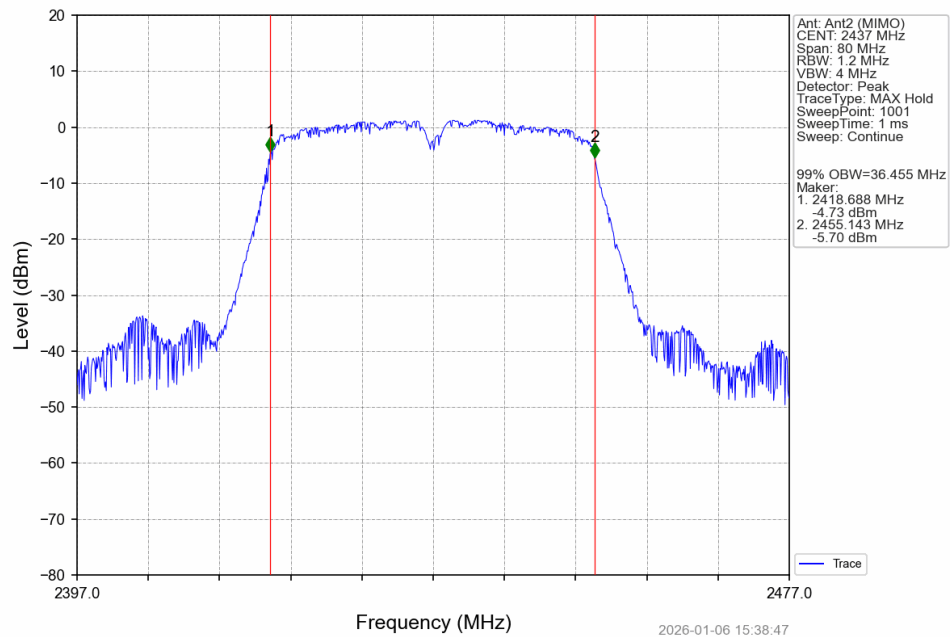
802.11n(HT40)_LCH_2422MHz_Ant2 (MIMO)_NTNV



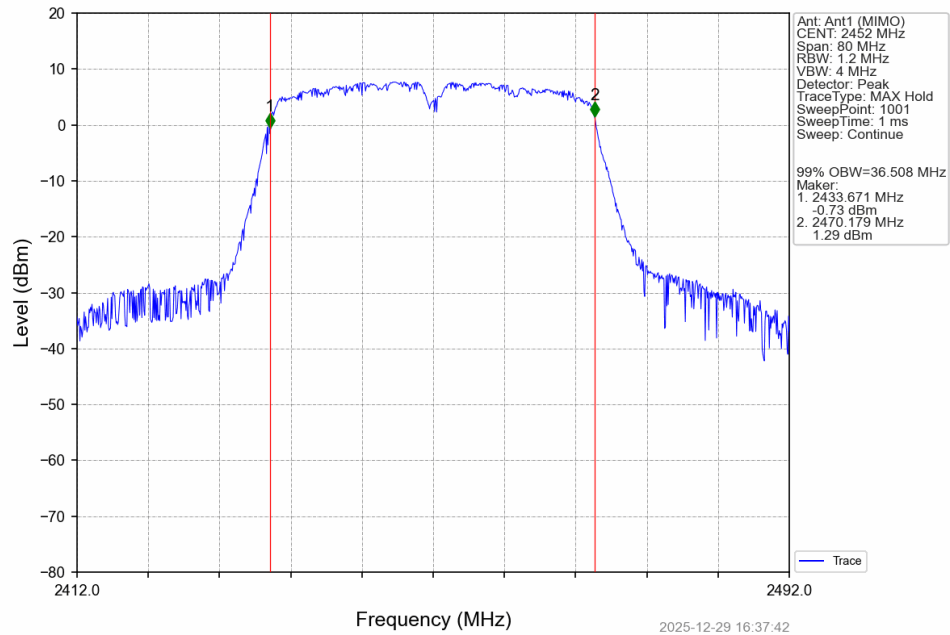
802.11n(HT40)_MCH_2437MHz_Ant1 (MIMO)_NTNV



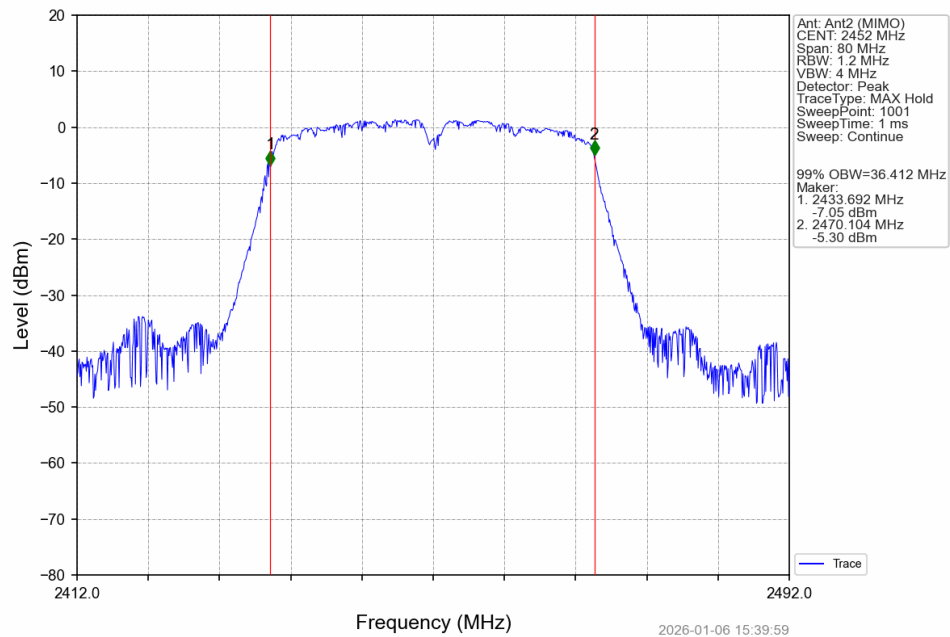
802.11n(HT40)_MCH_2437MHz_Ant2 (MIMO)_NTNV



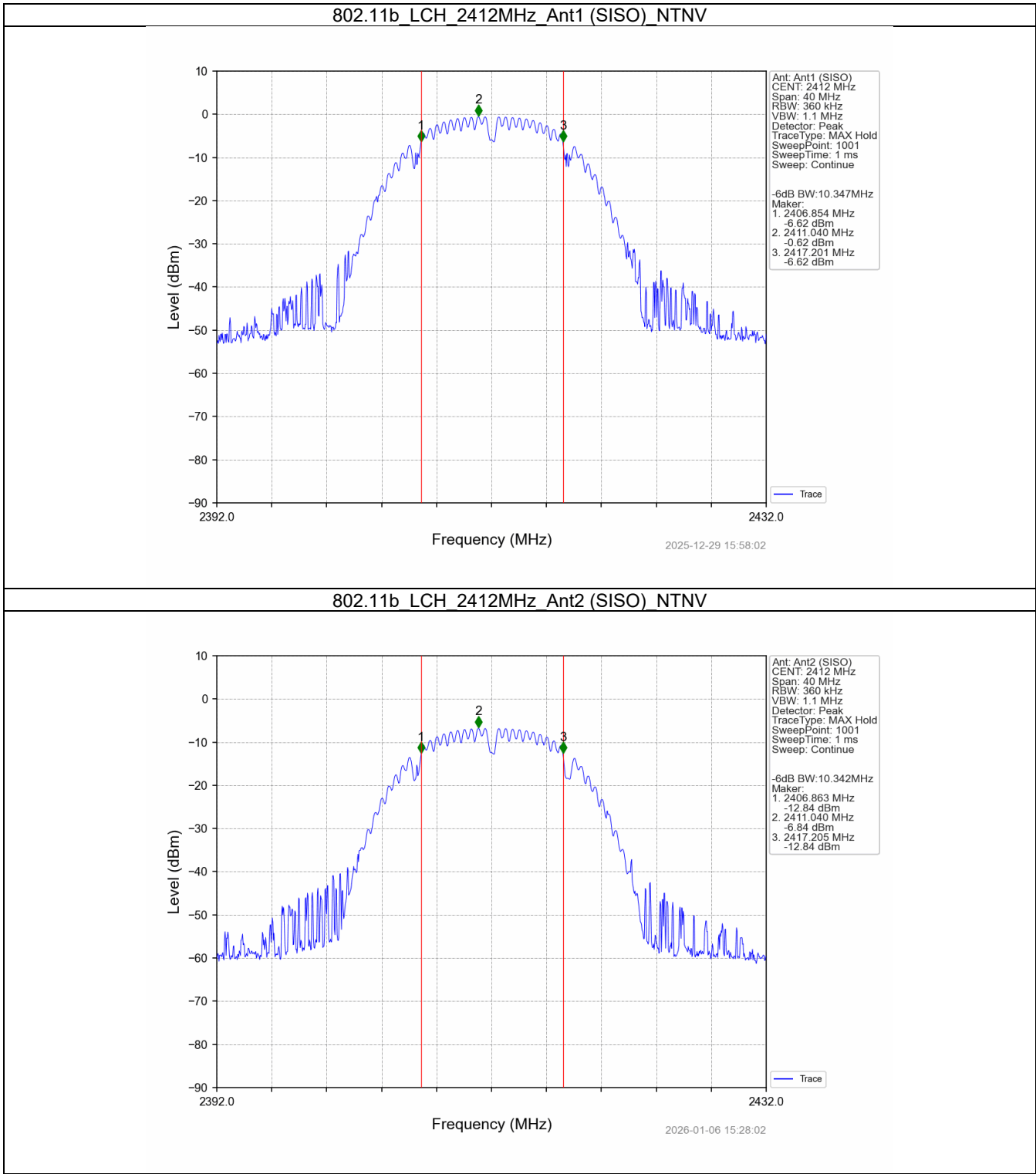
802.11n(HT40)_HCH_2452MHz_Ant1 (MIMO)_NTNV



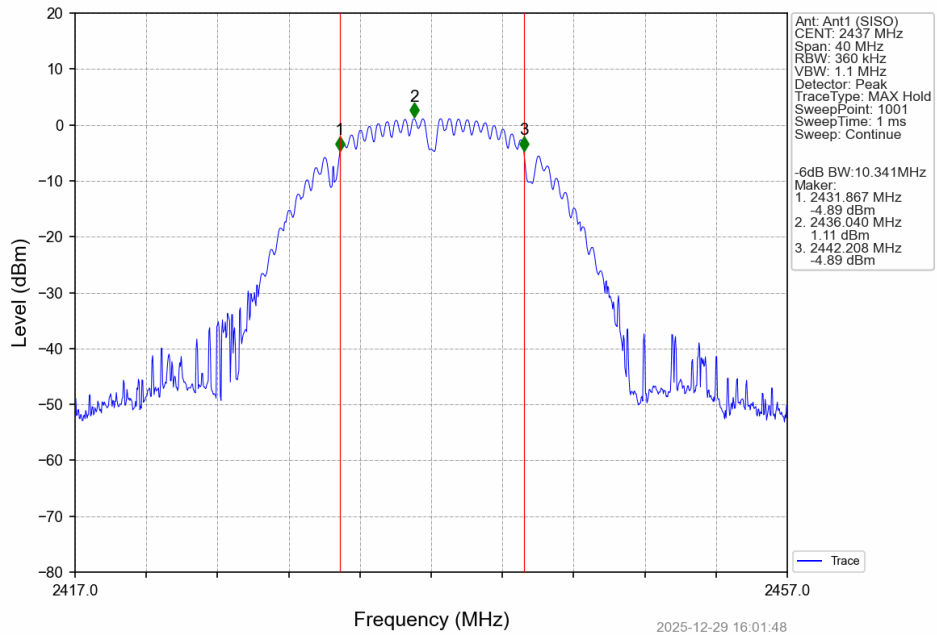
802.11n(HT40)_HCH_2452MHz_Ant2 (MIMO)_NTNV



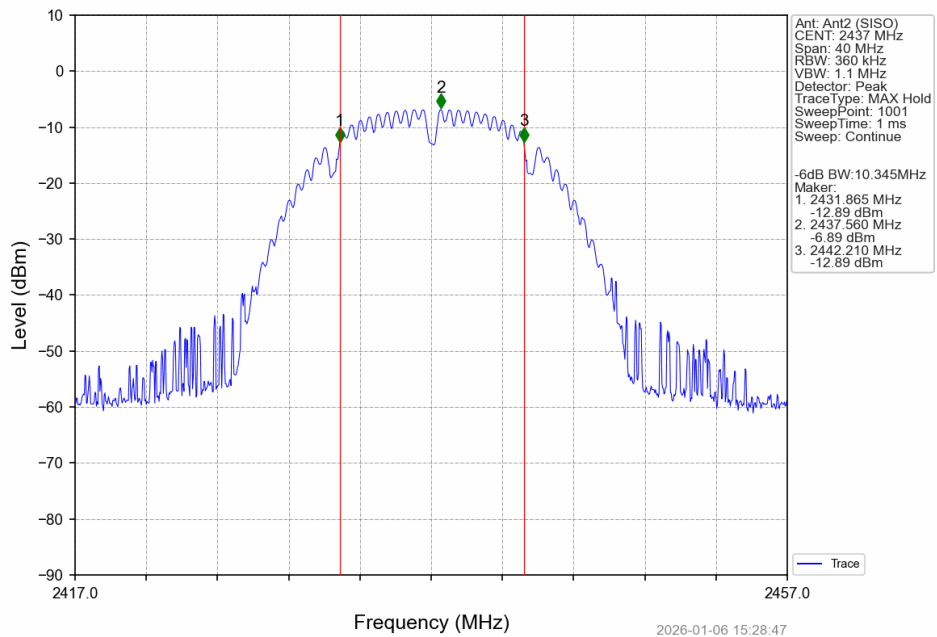
2.2.2 6dB BW



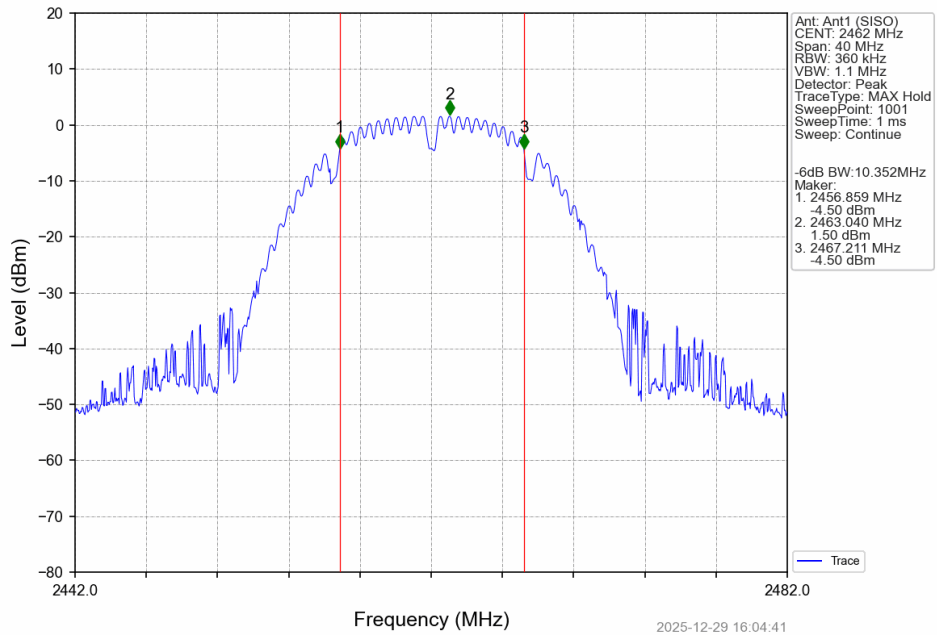
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



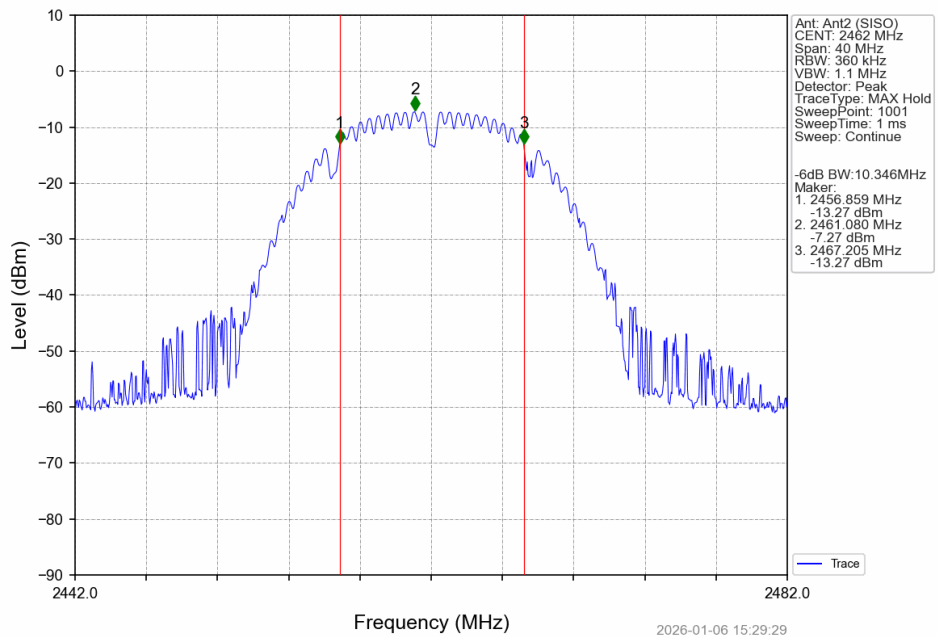
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



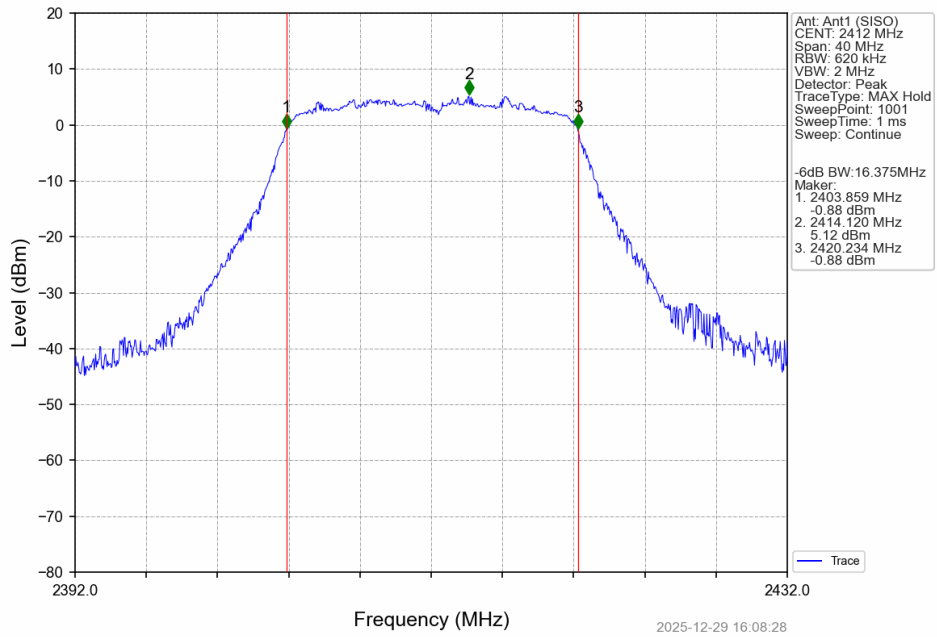
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



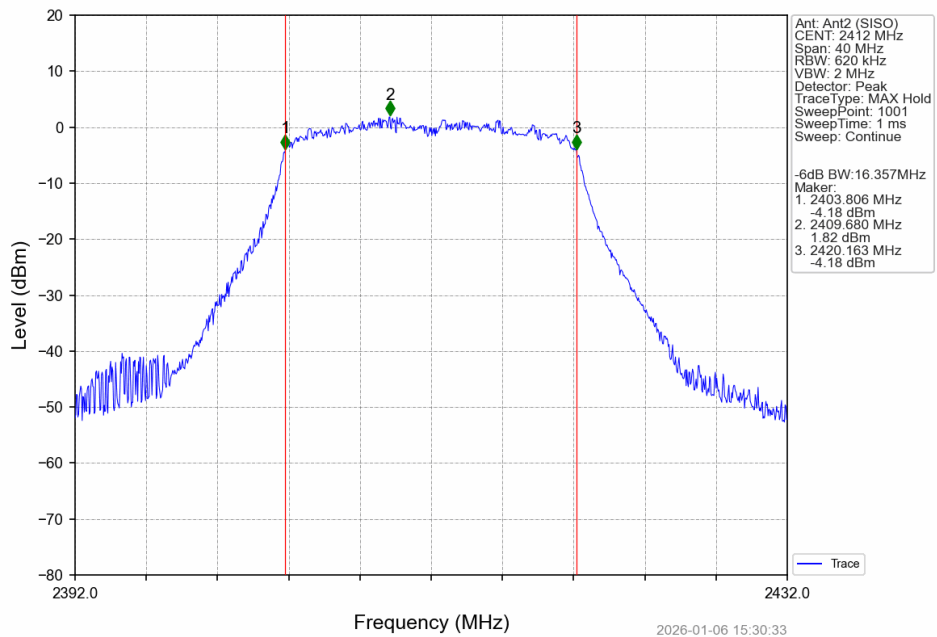
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



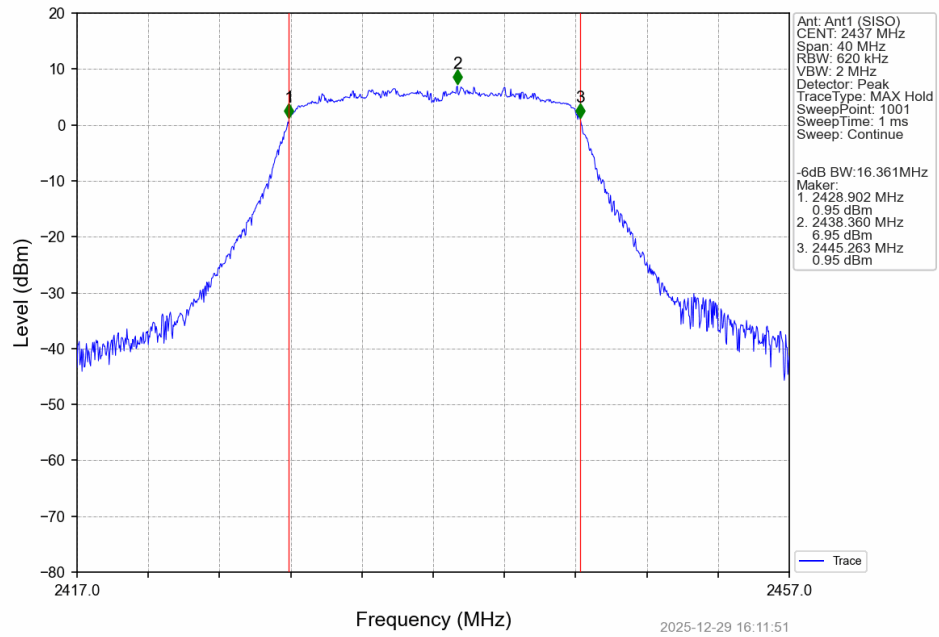
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



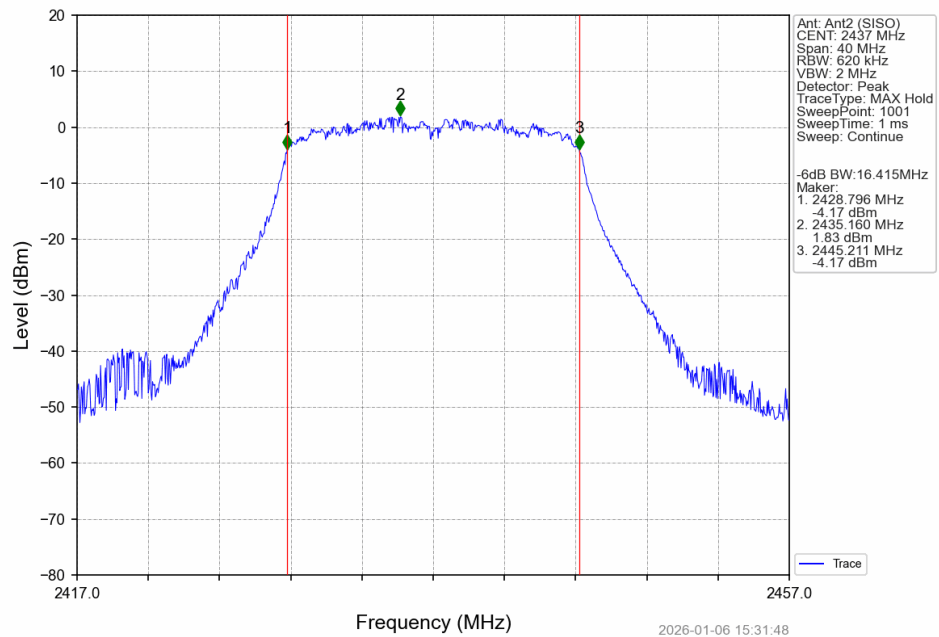
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



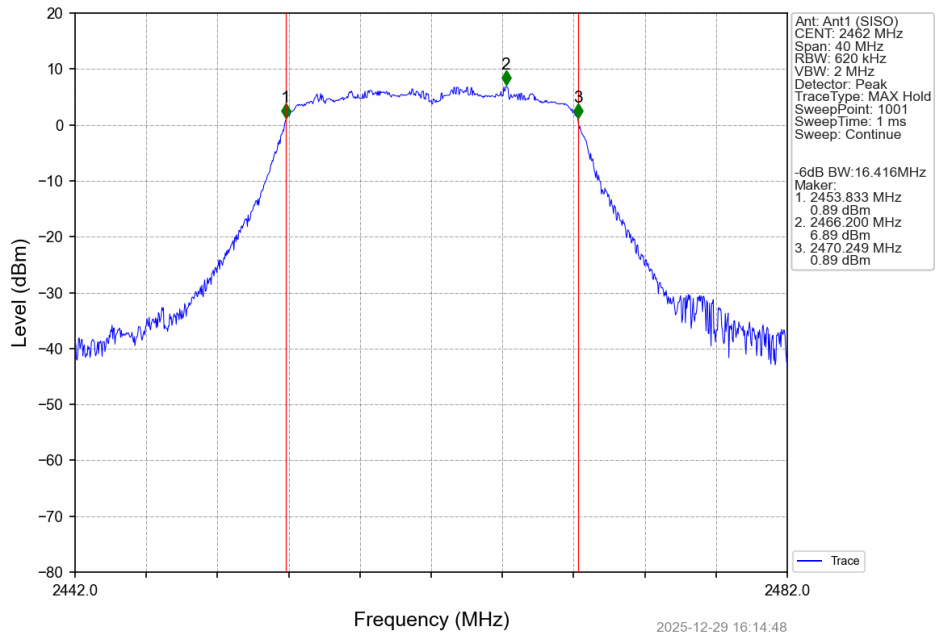
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



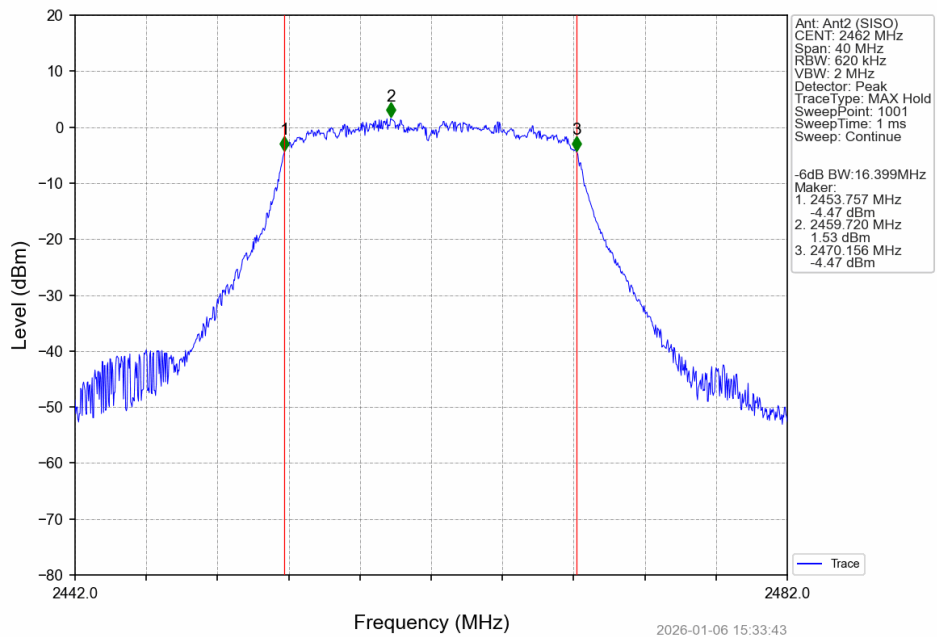
802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



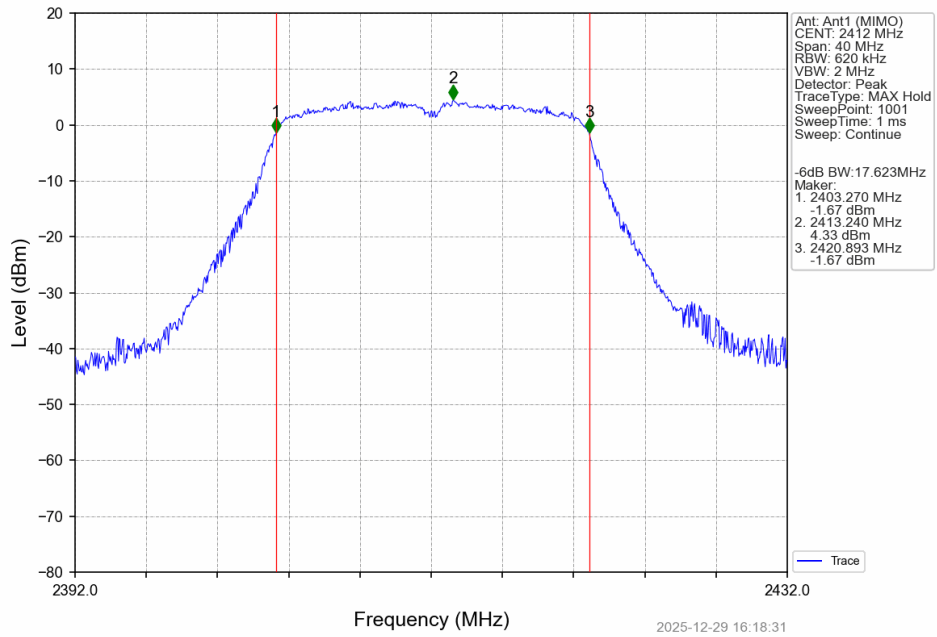
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



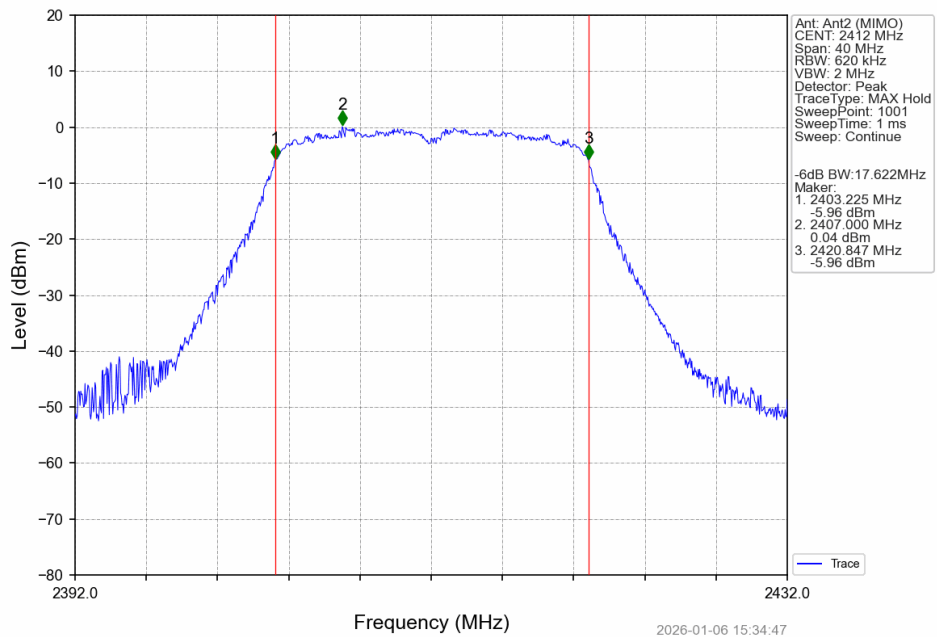
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



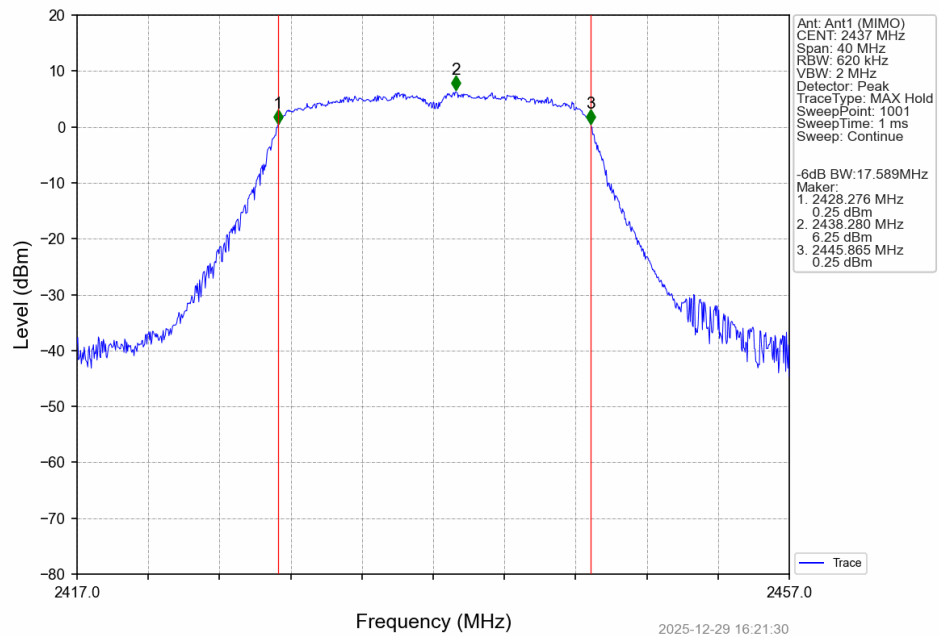
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



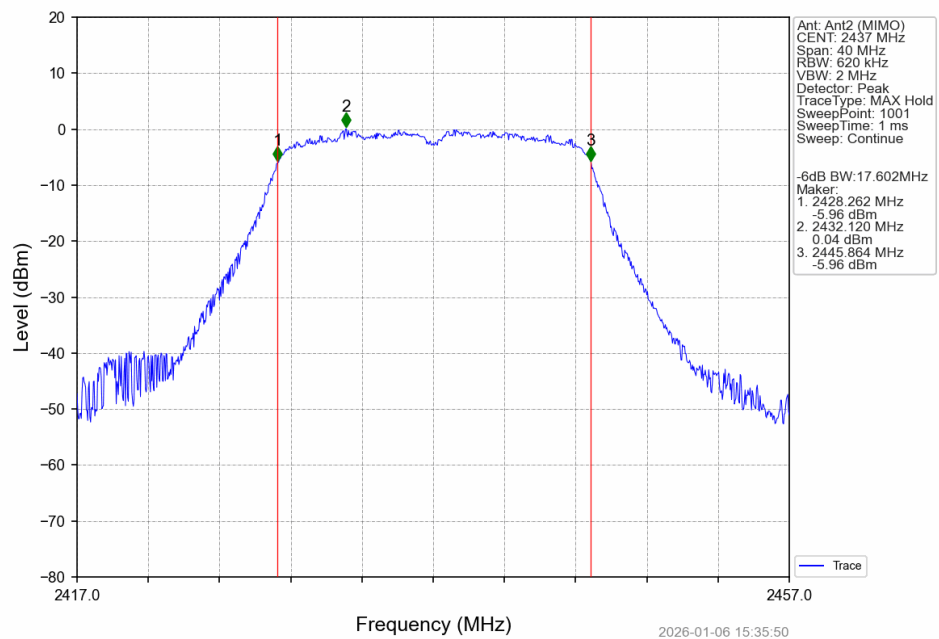
802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



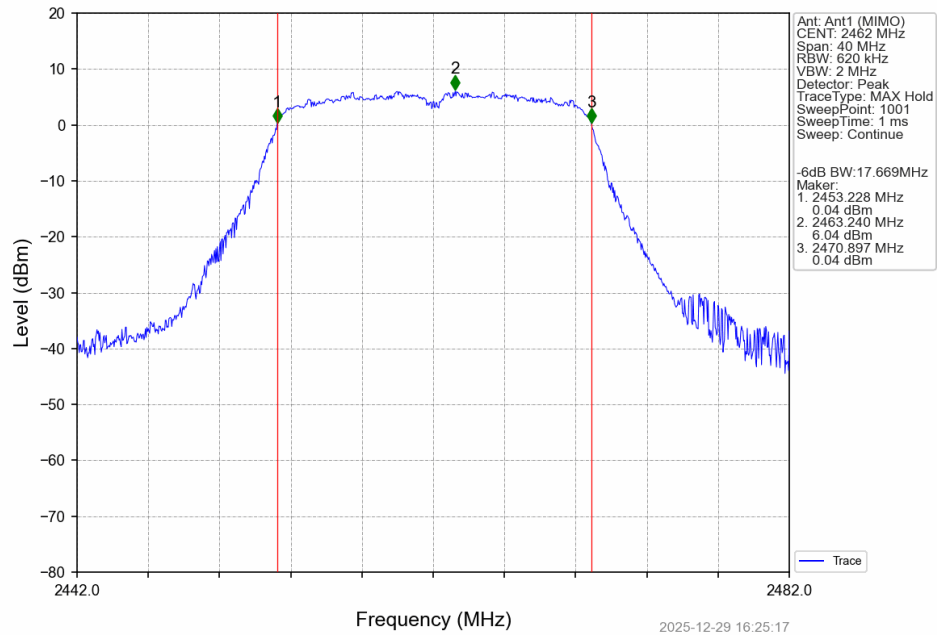
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



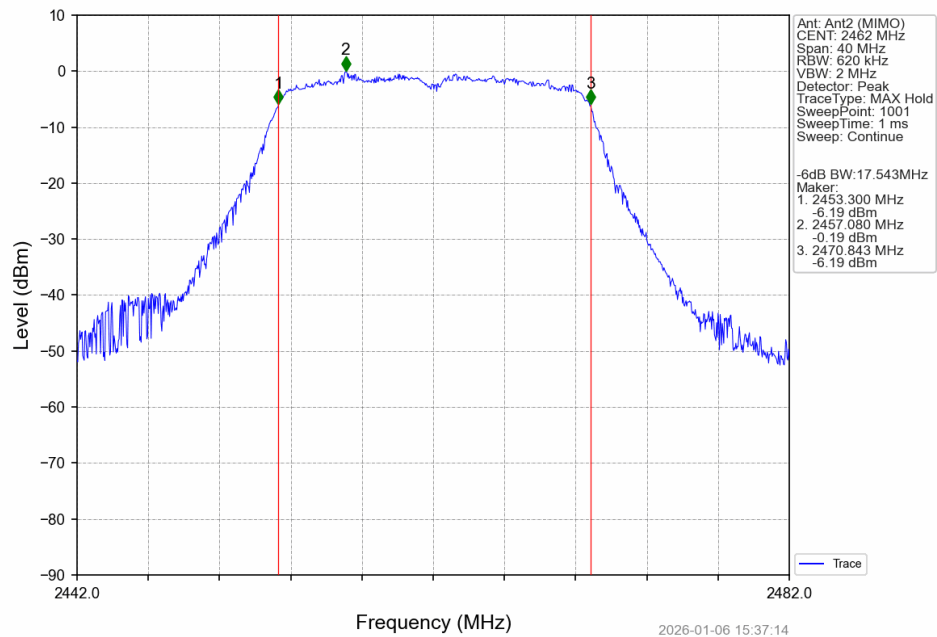
802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



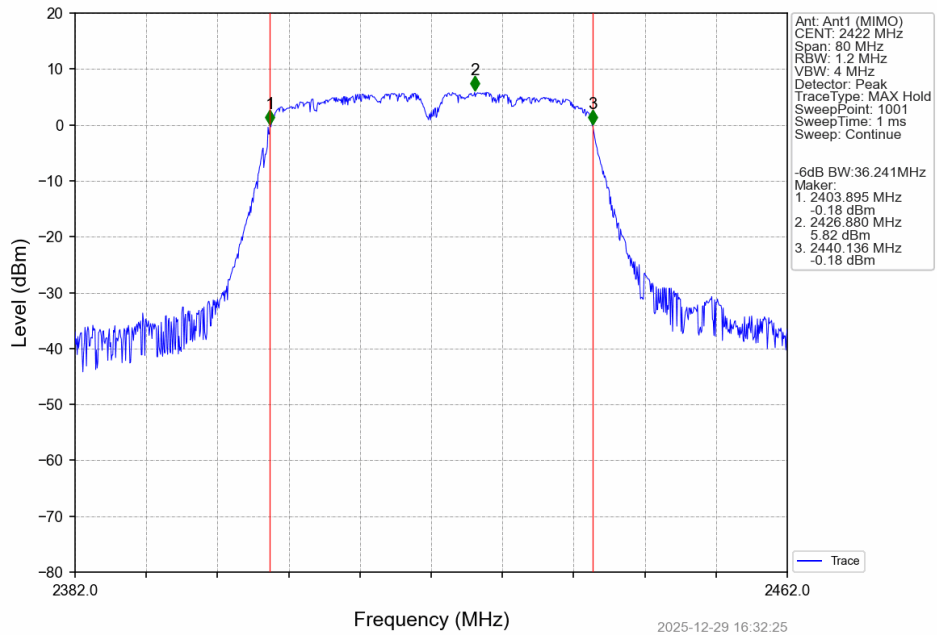
802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



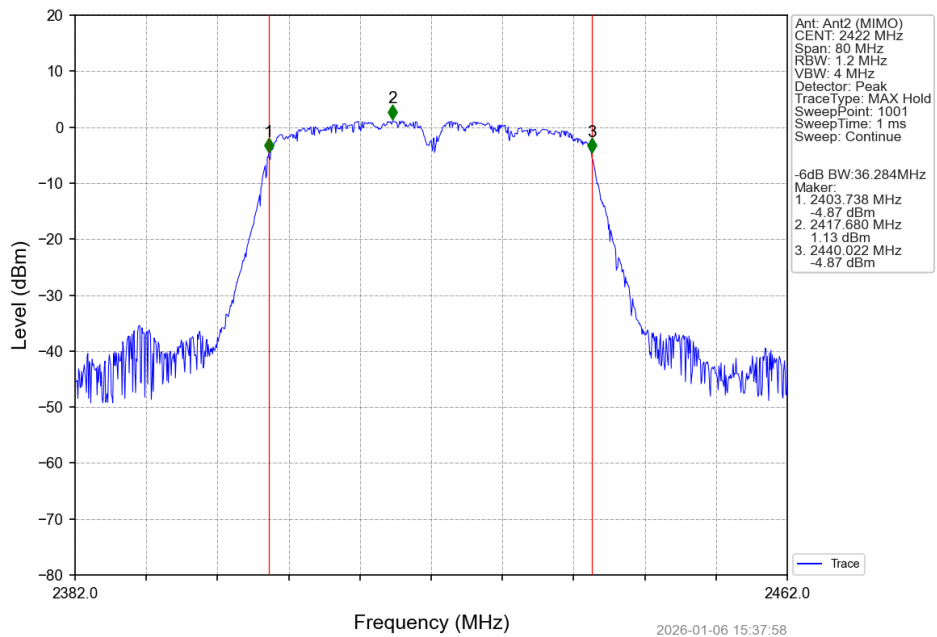
802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



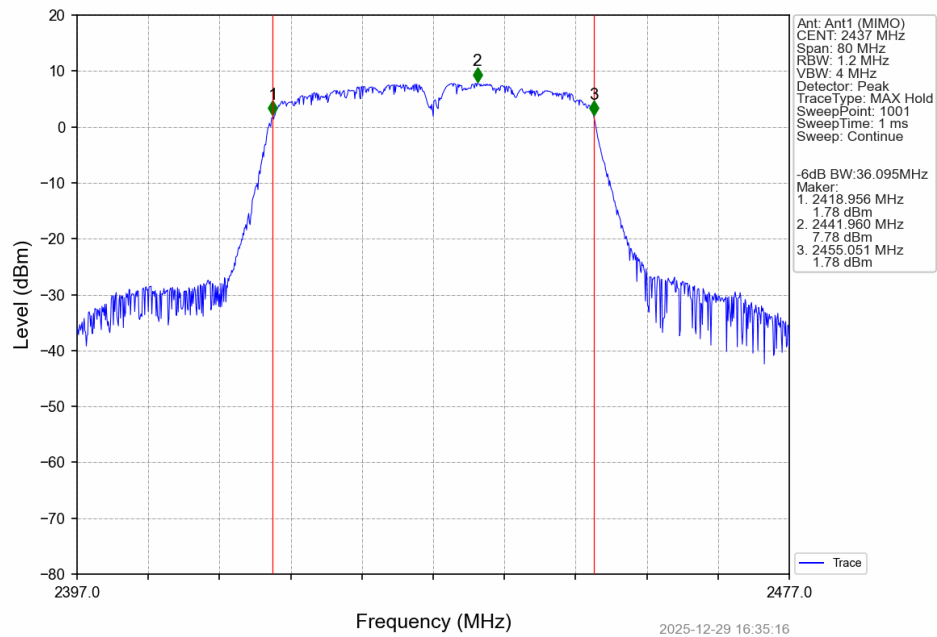
802.11n(HT40)_LCH_2422MHz_Ant1 (MIMO)_NTNV



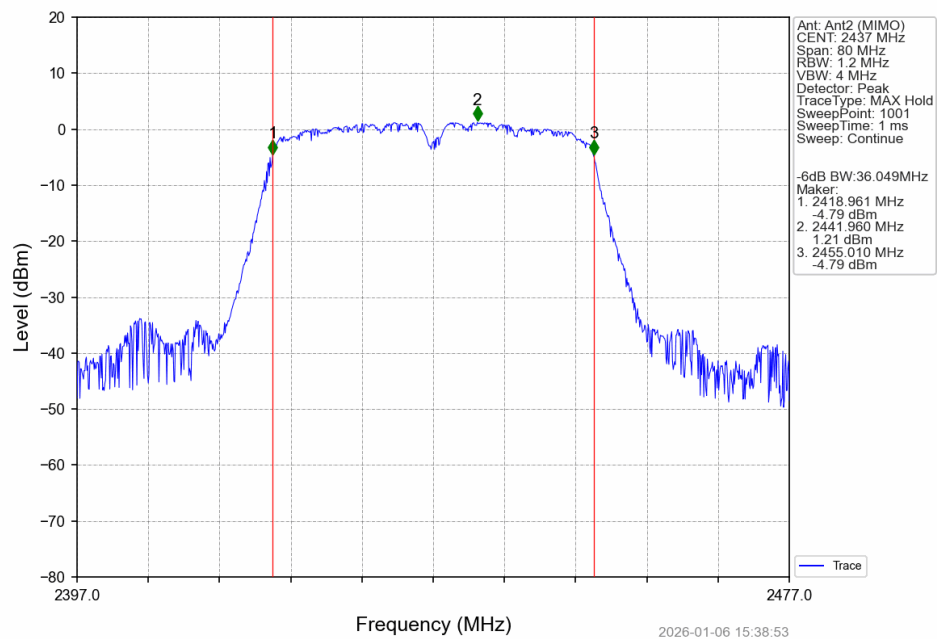
802.11n(HT40)_LCH_2422MHz_Ant2 (MIMO)_NTNV



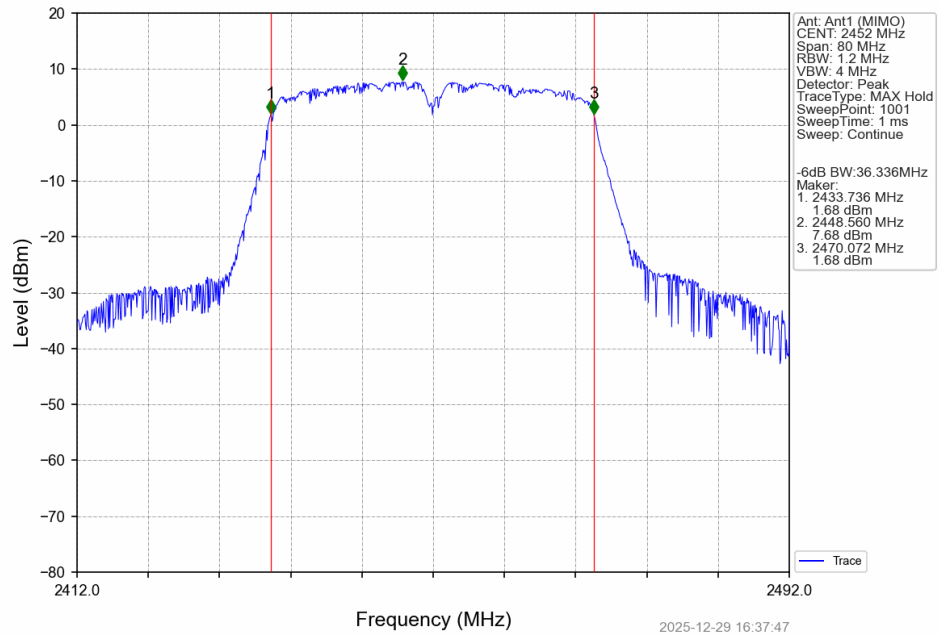
802.11n(HT40)_MCH_2437MHz_Ant1 (MIMO)_NTNV



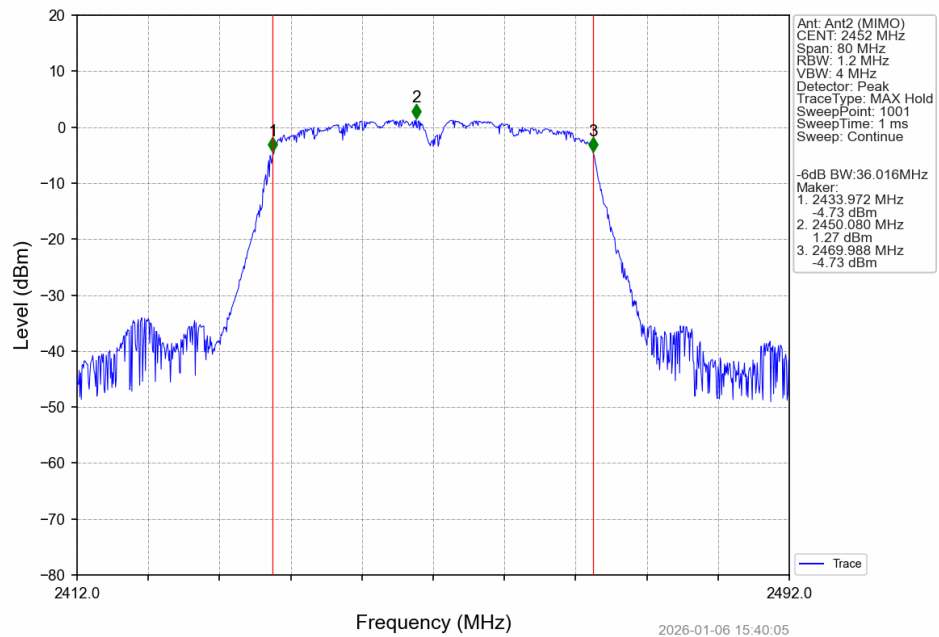
802.11n(HT40)_MCH_2437MHz_Ant2 (MIMO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (MIMO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant2 (MIMO)_NTNV



3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)				Verdict
			ANT1	ANT2	MIMO	Limit	
802.11b	SISO	2412	11.09	10.69	/	<=30	Pass
		2437	12.78	11.15	/	<=30	Pass
		2462	13.22	9.01	/	<=30	Pass
802.11g	SISO	2412	18.25	19.89	/	<=30	Pass
		2437	20.03	20.29	/	<=30	Pass
		2462	19.95	18.10	/	<=30	Pass
802.11n (HT20)	MIMO	2412	18.12	19.43	21.83	<=30	Pass
		2437	19.93	19.83	22.89	<=30	Pass
		2462	19.83	17.53	21.84	<=30	Pass
802.11n (HT40)	MIMO	2422	18.45	19.72	22.14	<=30	Pass
		2437	20.20	20.26	23.24	<=30	Pass
		2452	20.26	20.09	23.19	<=30	Pass

4. Maximum Power Spectral Density

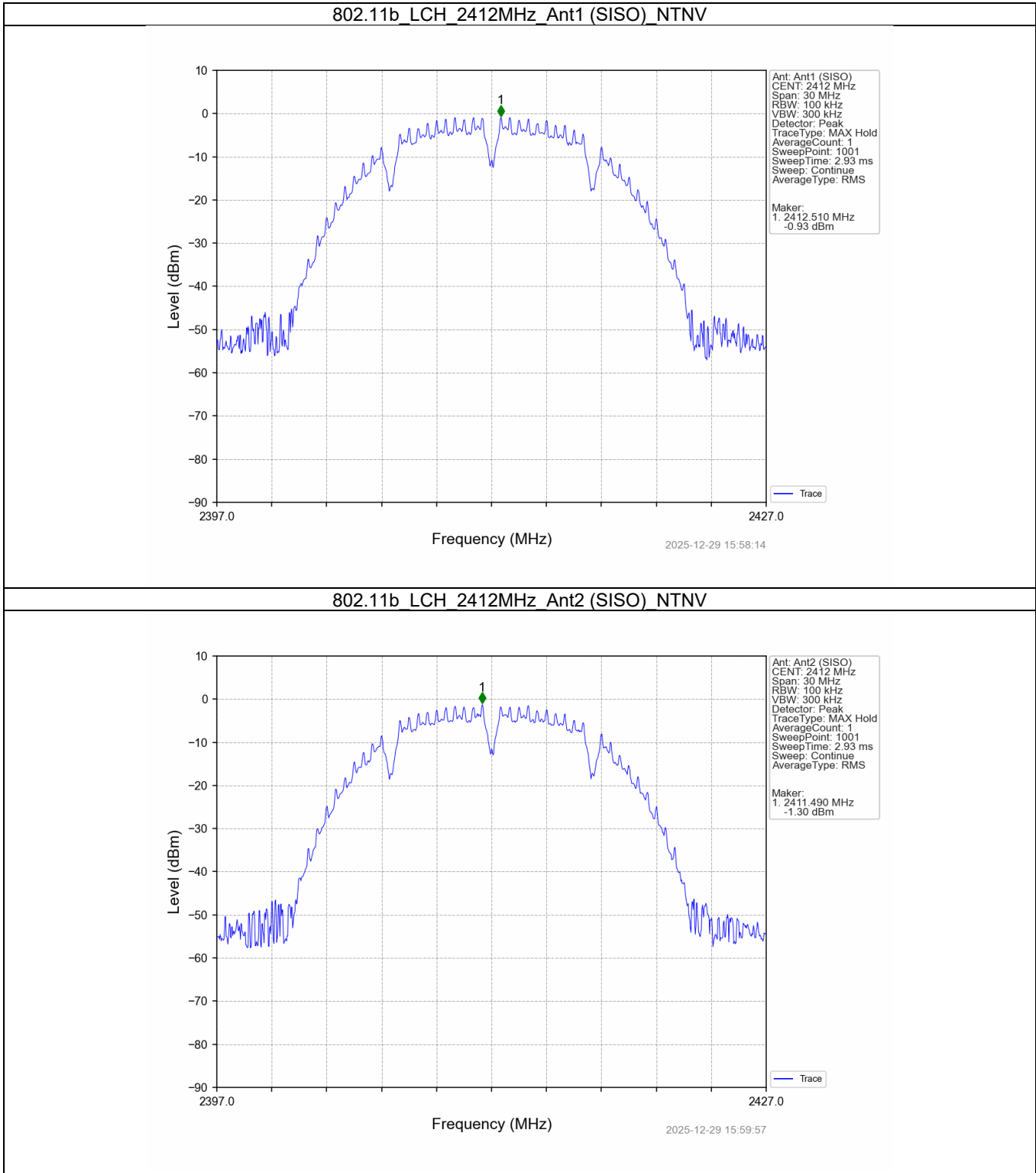
4.1 Test Result

4.1.1 PSD

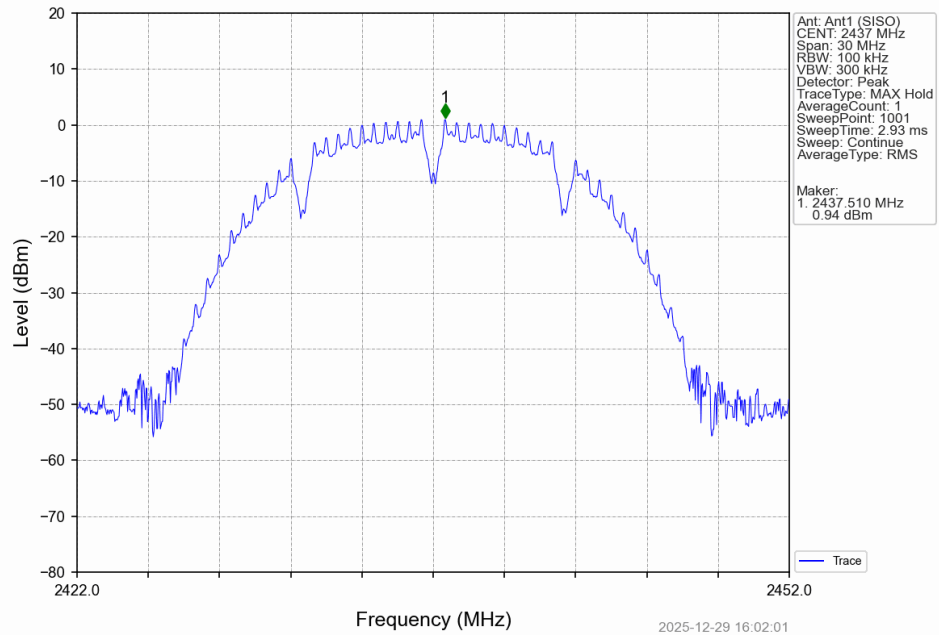
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm)				Verdict
			ANT1	ANT2	MIMO	Limit	
802.11b	SISO	2412	-0.93	-1.30	/	<=8	Pass
		2437	0.94	-0.77	/	<=8	Pass
		2462	1.30	-2.97	/	<=8	Pass
802.11g	SISO	2412	-0.10	0.70	/	<=8	Pass
		2437	1.29	1.38	/	<=8	Pass
		2462	1.61	-0.96	/	<=8	Pass
802.11n (HT20)	MIMO	2412	-0.34	0.85	3.10	<=8	Pass
		2437	1.74	1.25	4.34	<=8	Pass
		2462	1.72	-0.82	3.64	<=8	Pass
802.11n (HT40)	MIMO	2422	-3.00	-1.73	0.68	<=8	Pass
		2437	-1.10	-1.06	1.81	<=8	Pass
		2452	-1.22	-1.02	1.74	<=8	Pass

4.2 Test Graph

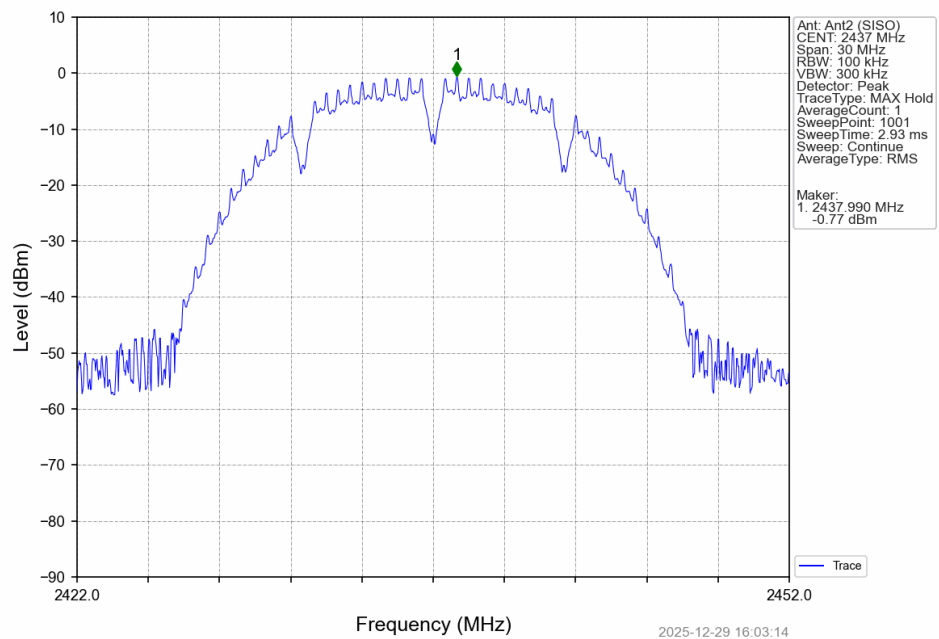
4.2.1 PSD



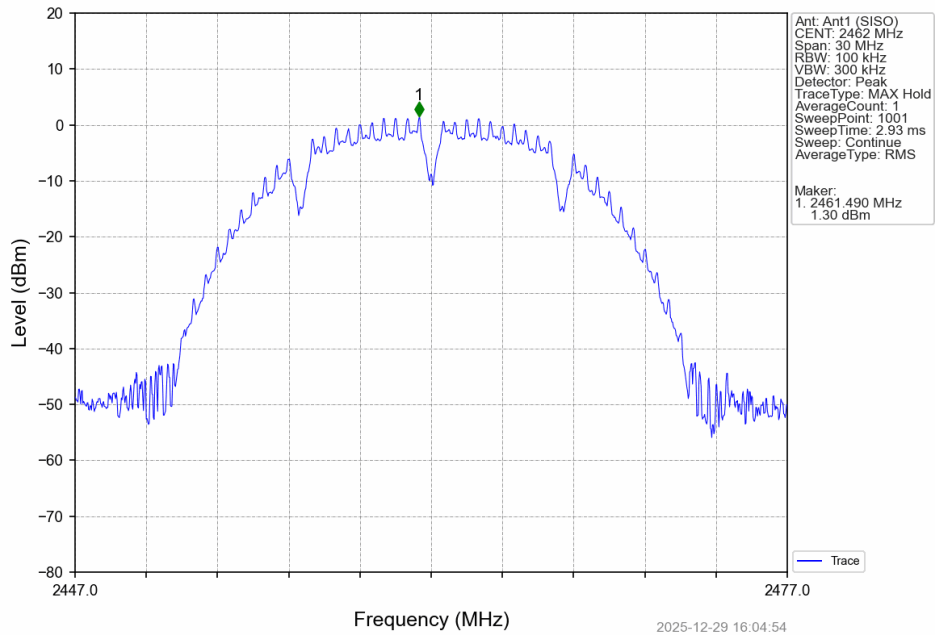
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



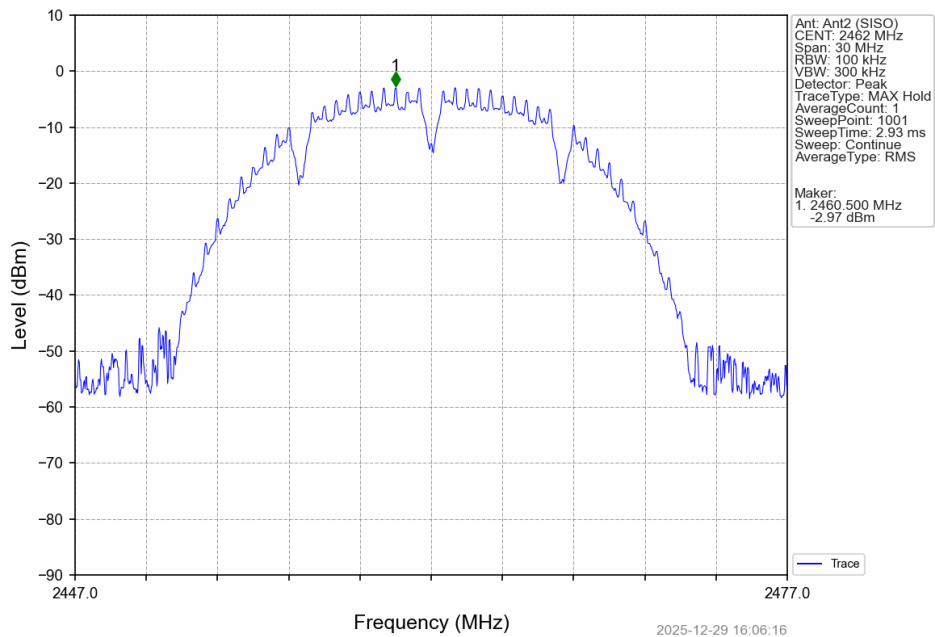
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



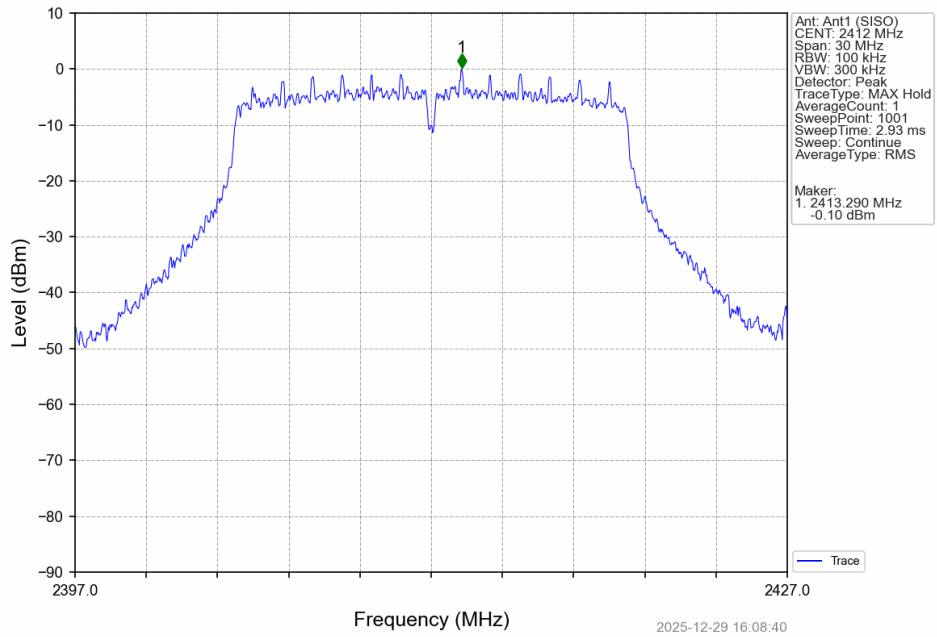
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



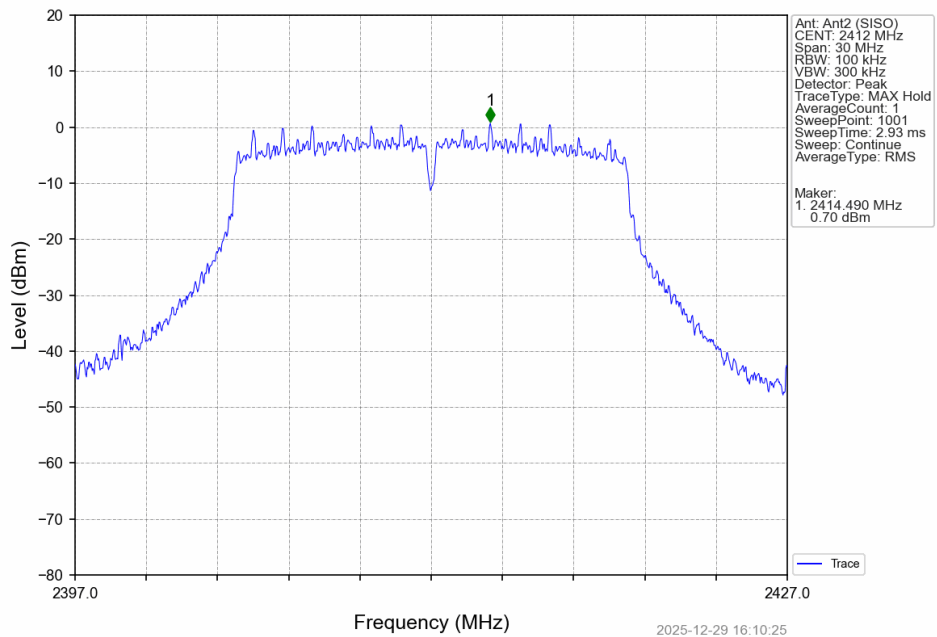
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



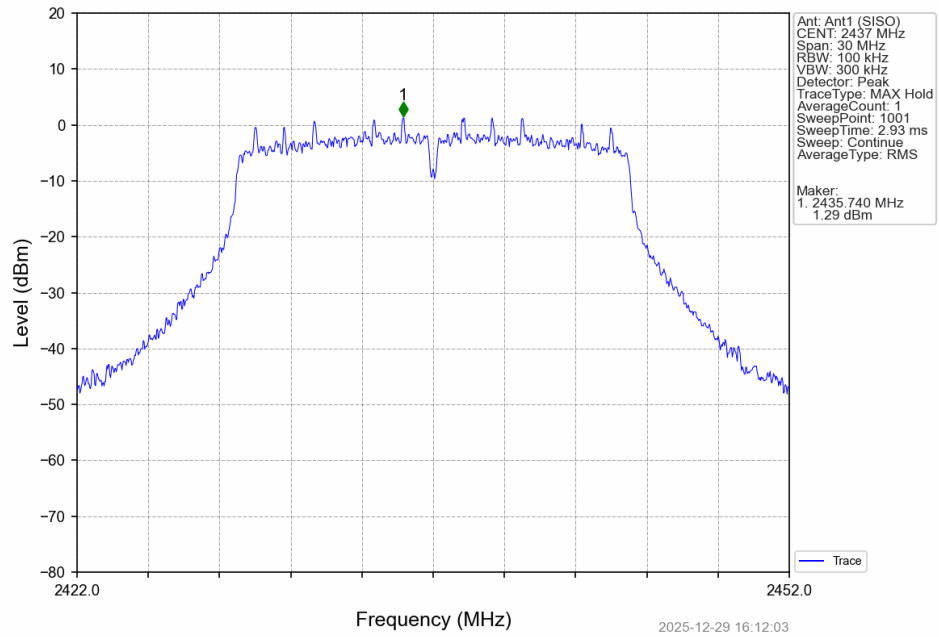
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



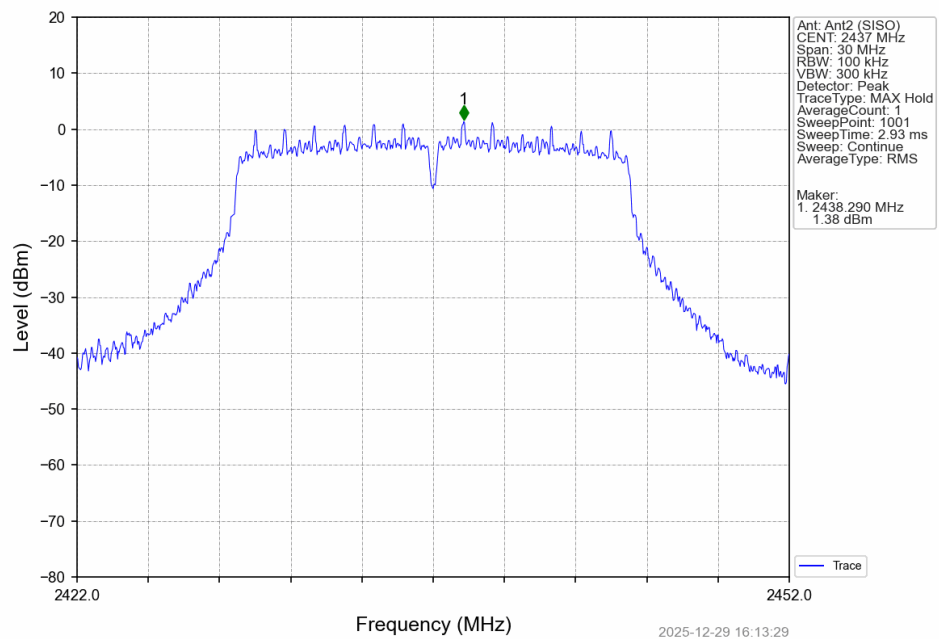
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



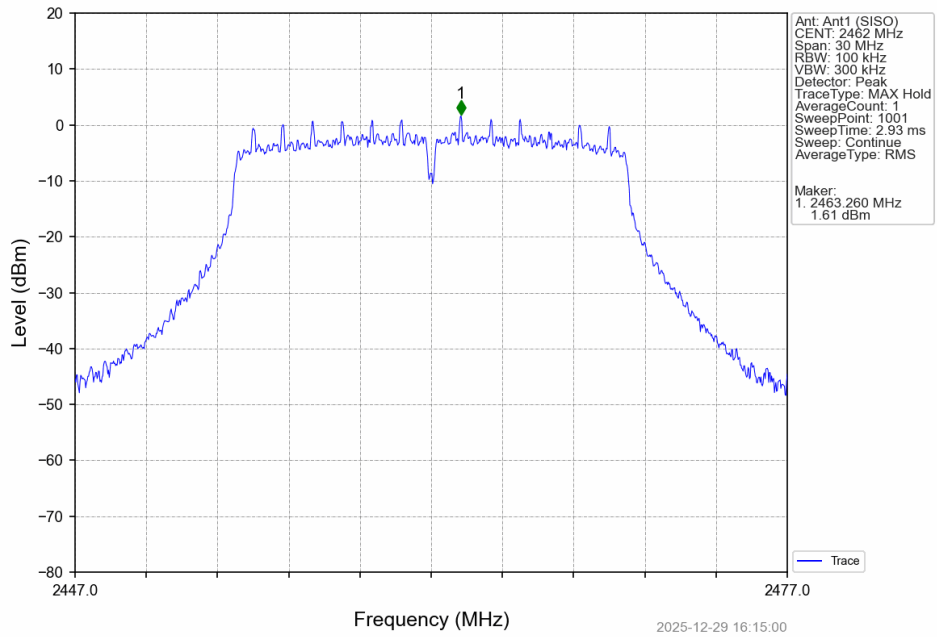
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



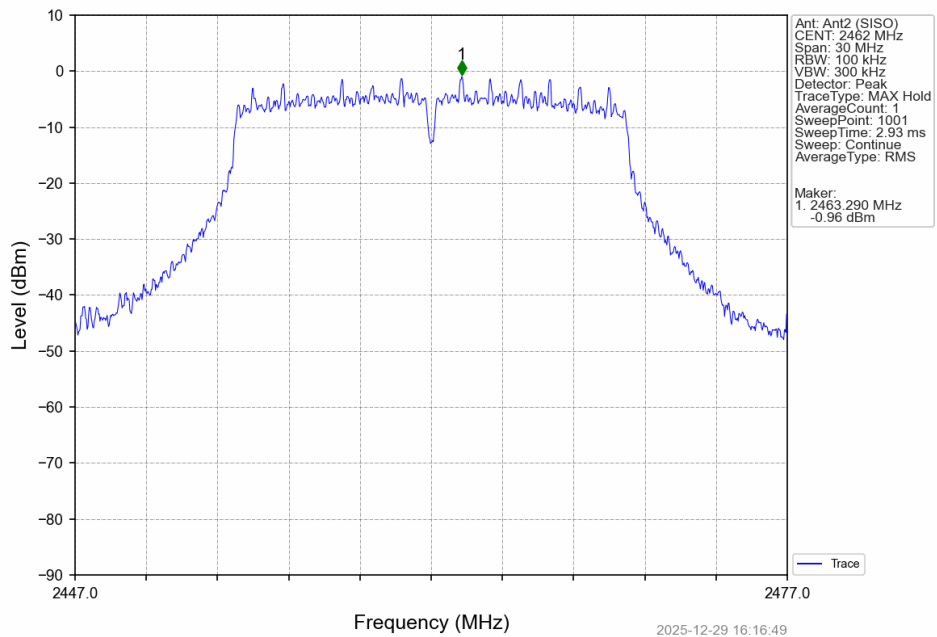
802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



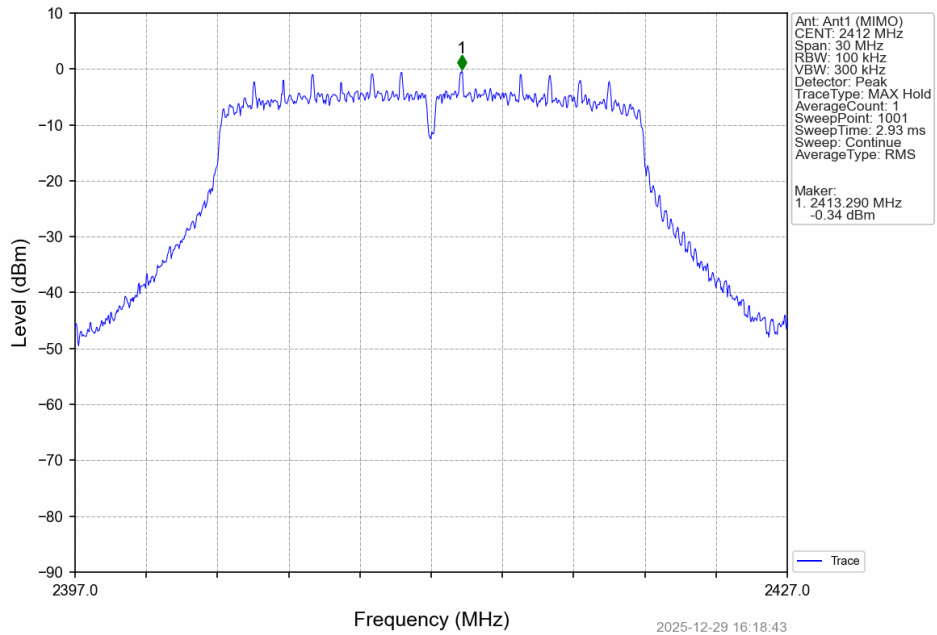
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



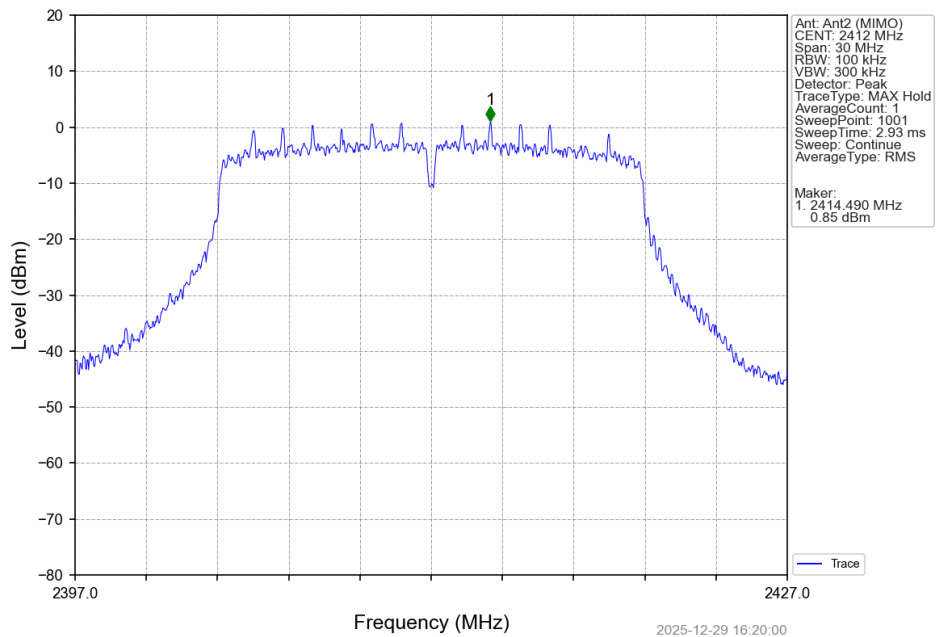
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



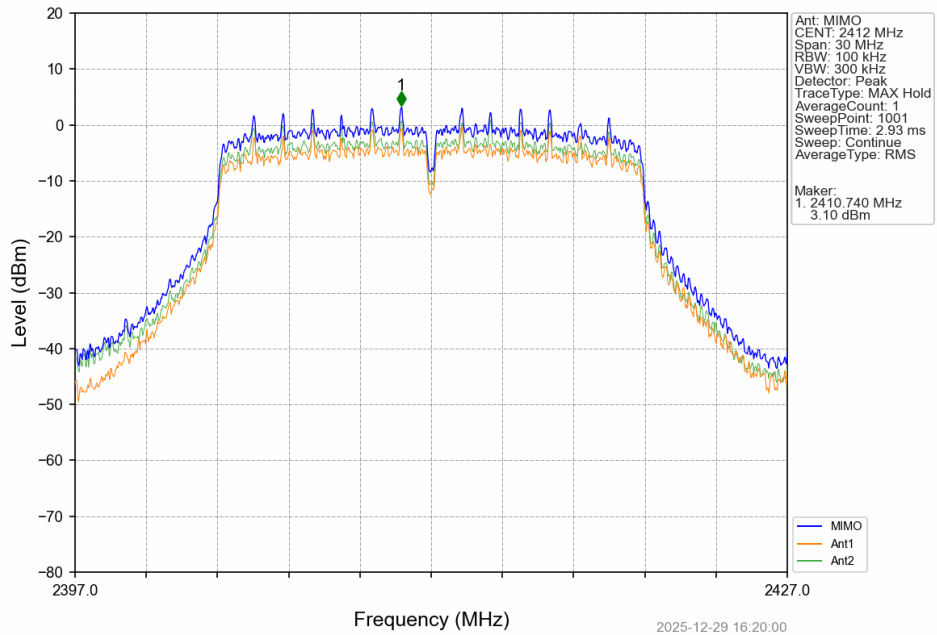
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



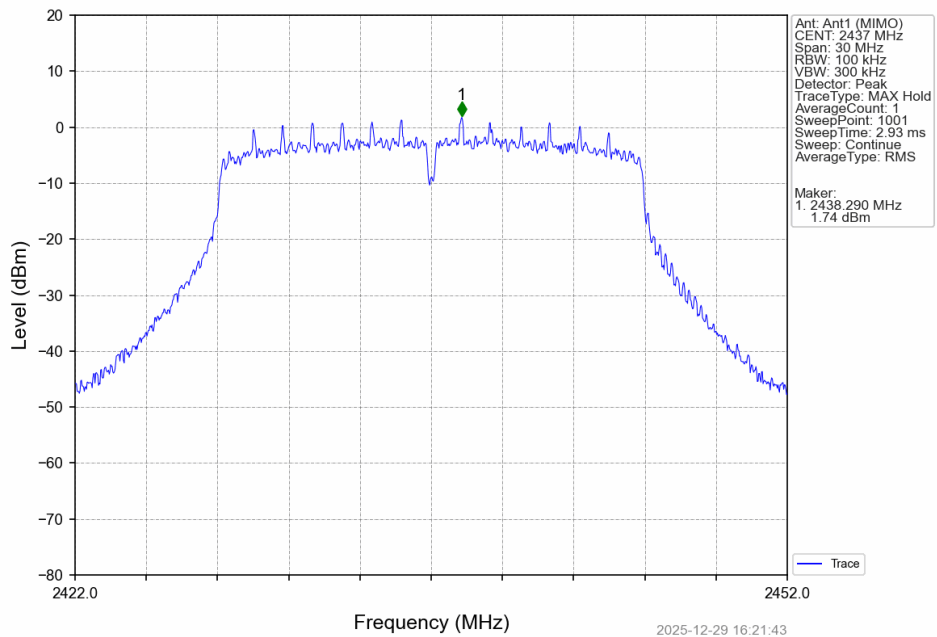
802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



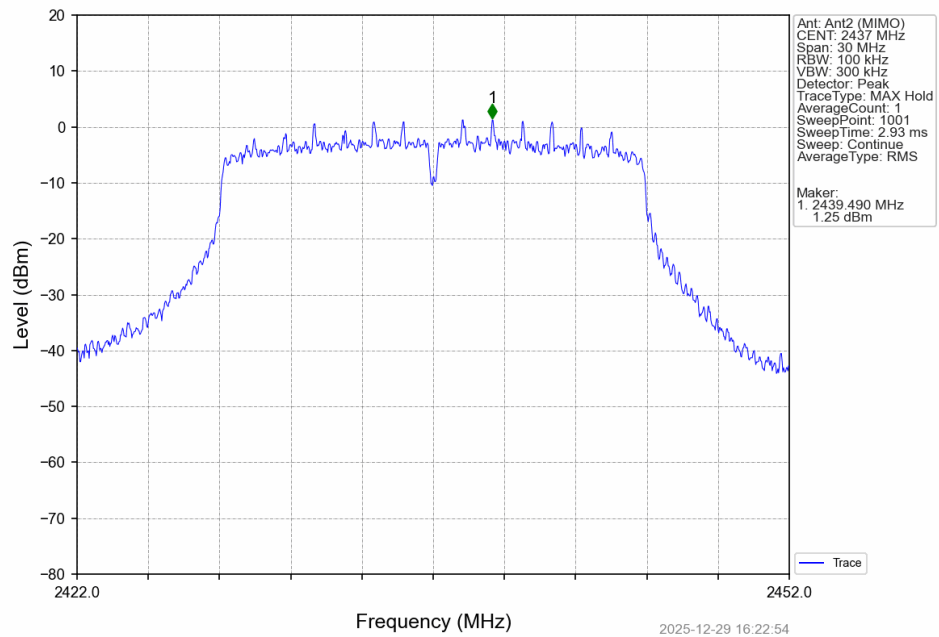
802.11n(HT20)_LCH_2412MHz_MIMO_NTNV



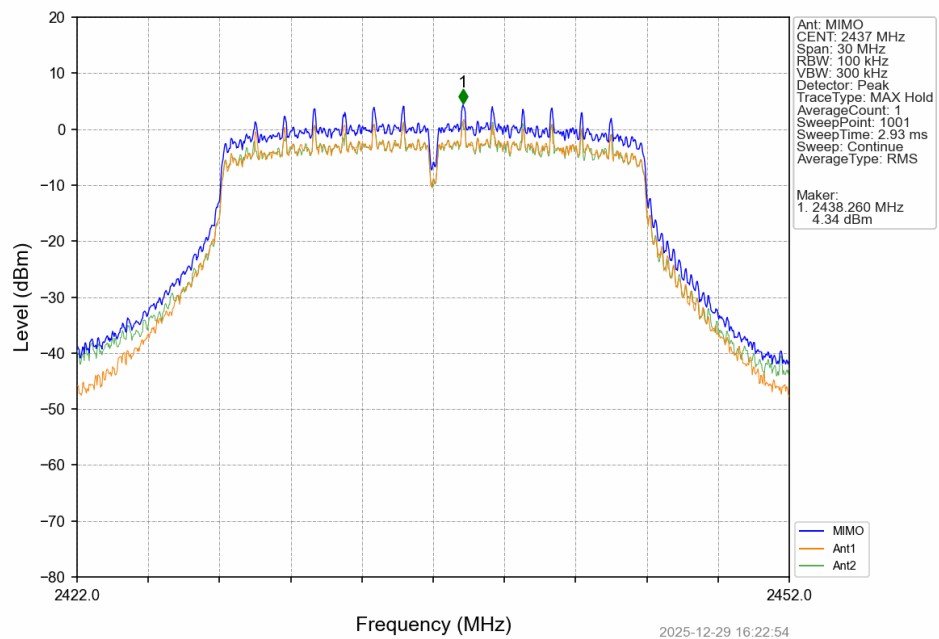
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



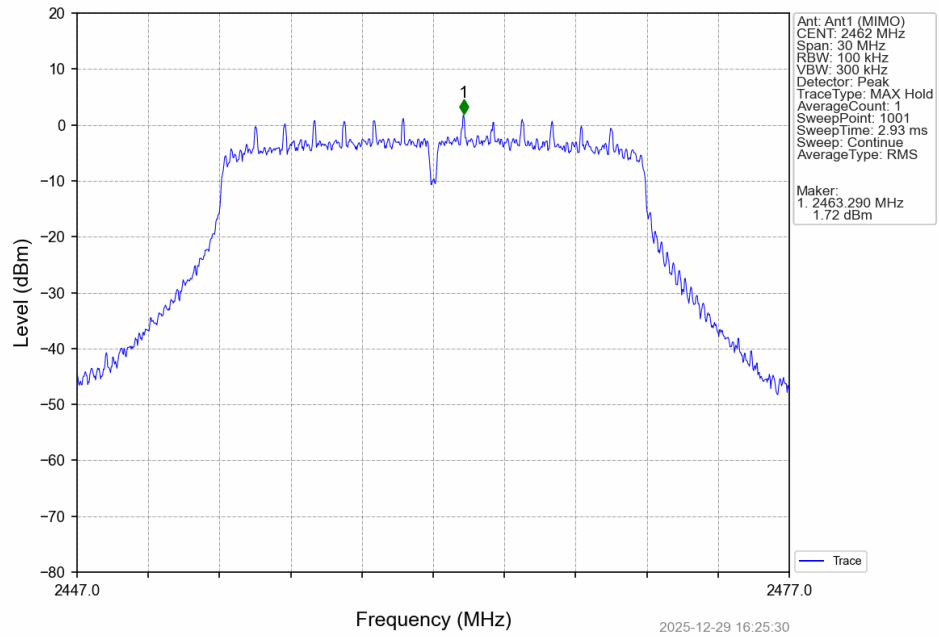
802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



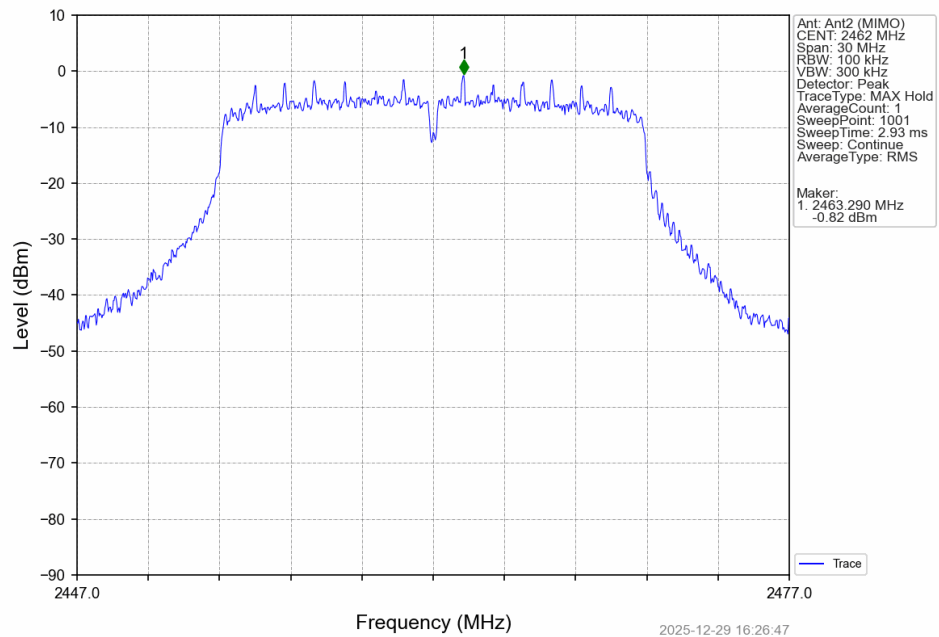
802.11n(HT20)_MCH_2437MHz_MIMO_NTNV



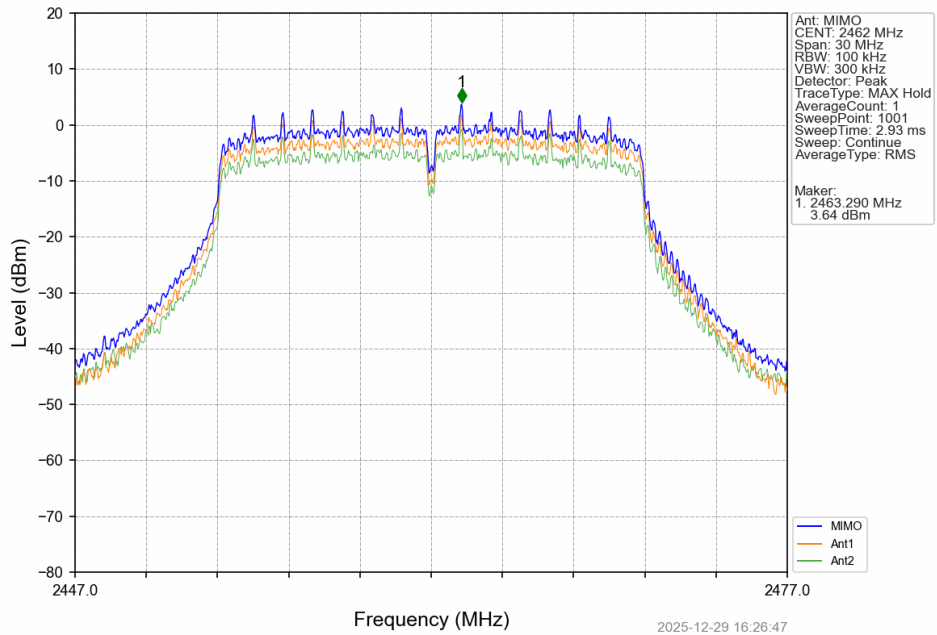
802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



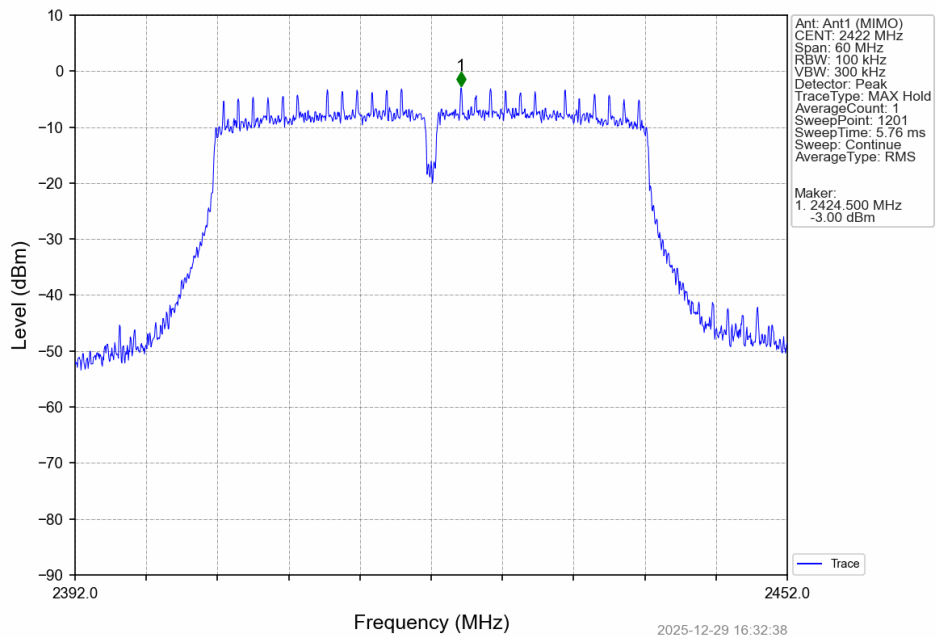
802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



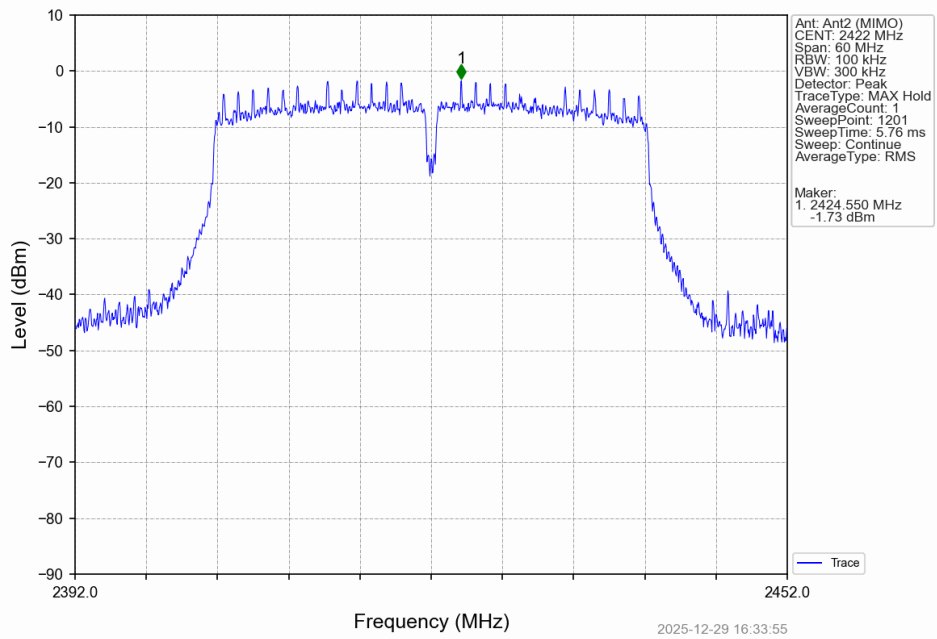
802.11n(HT20)_HCH_2462MHz_MIMO_NTNV



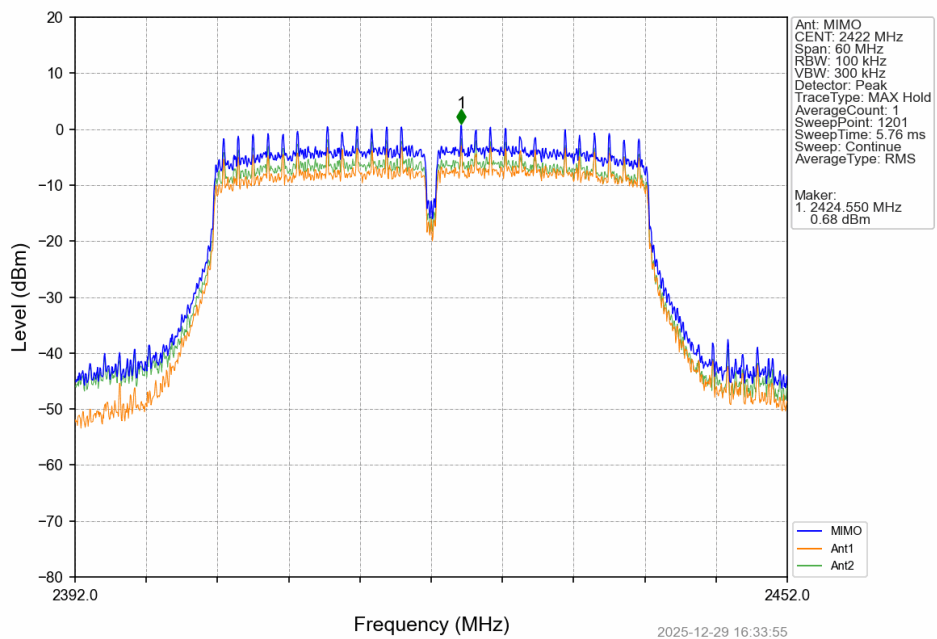
802.11n(HT40)_LCH_2422MHz_Ant1 (MIMO)_NTNV



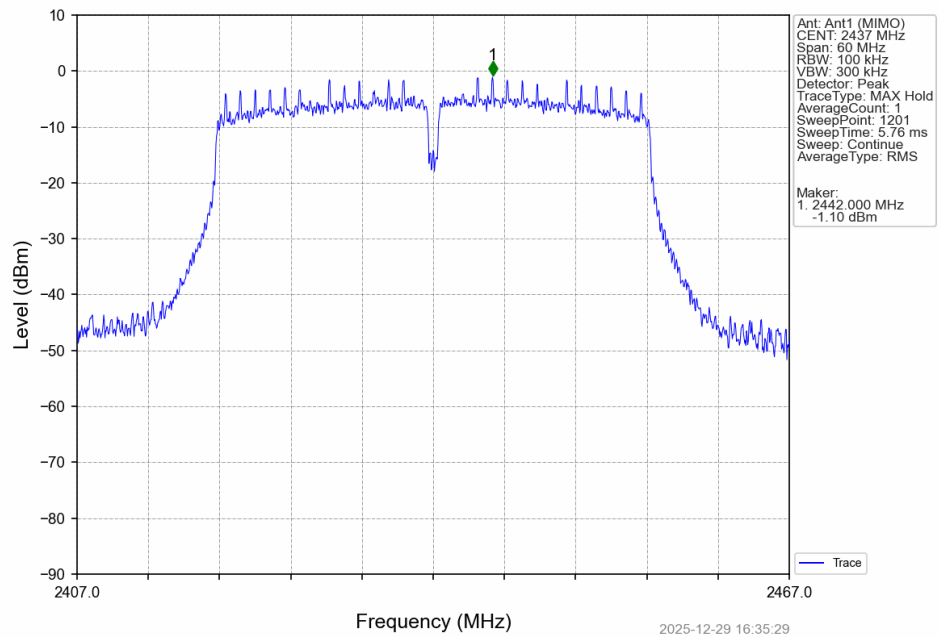
802.11n(HT40)_LCH_2422MHz_Ant2 (MIMO)_NTNV



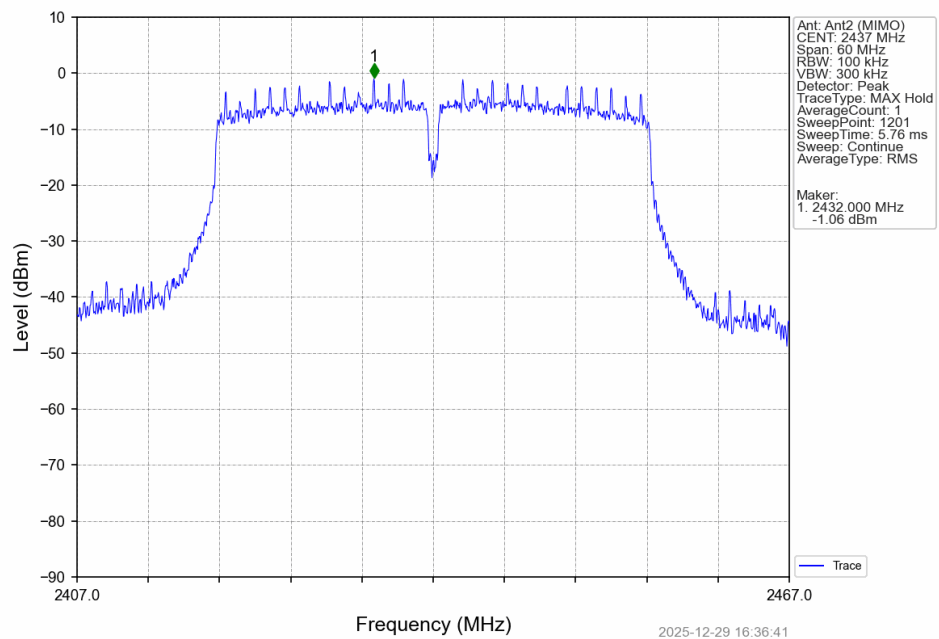
802.11n(HT40)_LCH_2422MHz_MIMO_NTNV



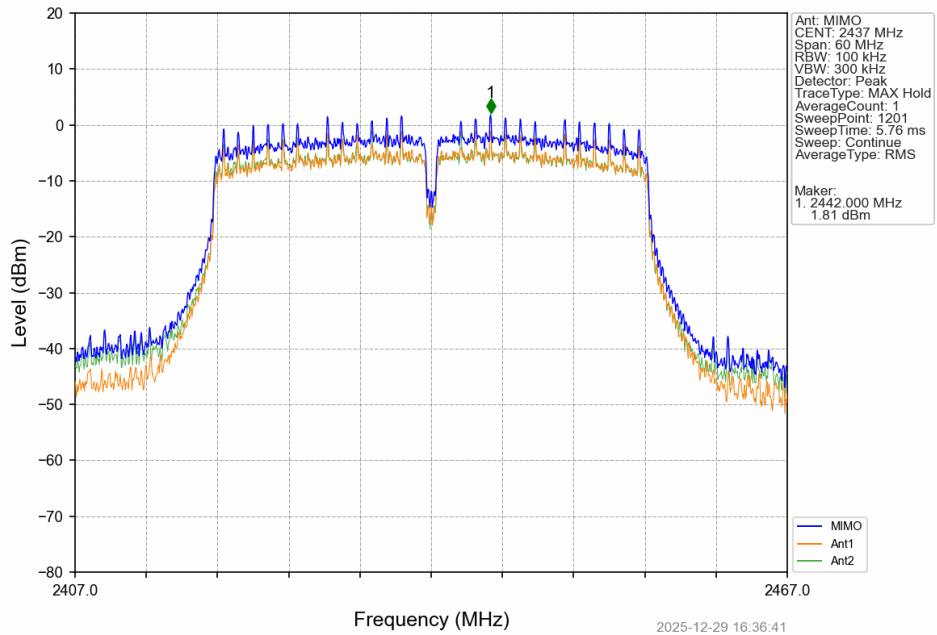
802.11n(HT40)_MCH_2437MHz_Ant1 (MIMO)_NTNV



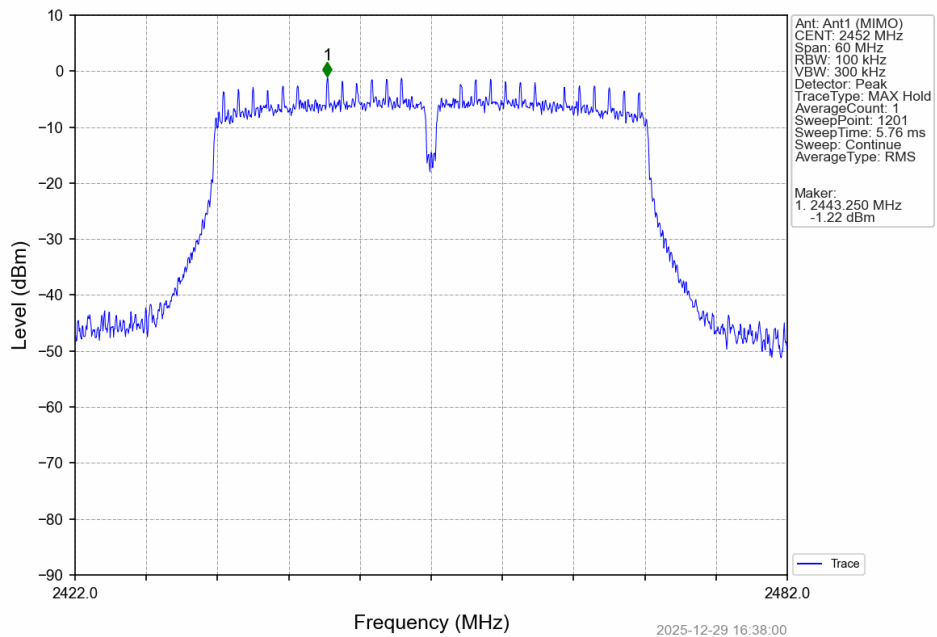
802.11n(HT40)_MCH_2437MHz_Ant2 (MIMO)_NTNV



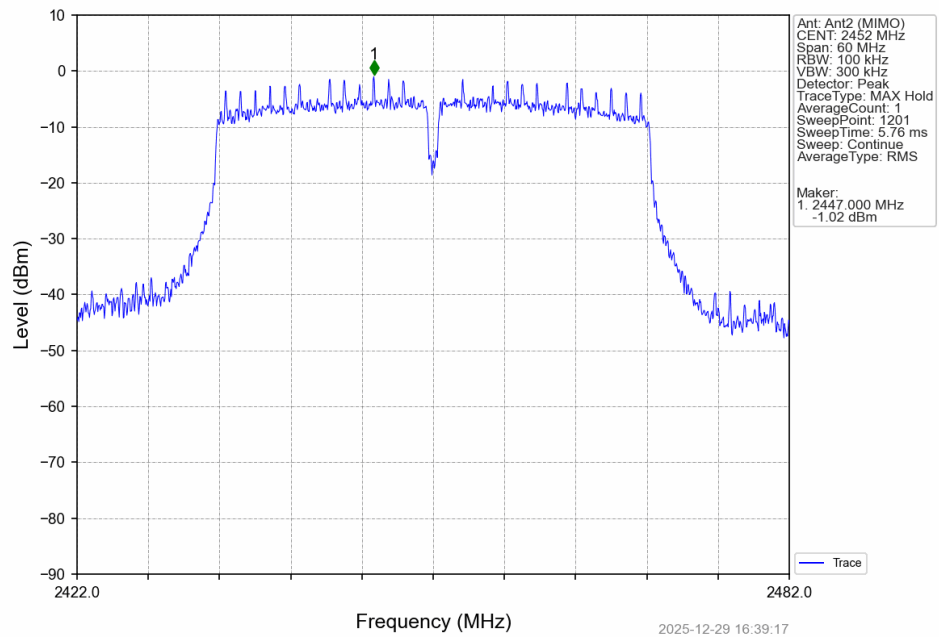
802.11n(HT40)_MCH_2437MHz_MIMO_NTNV



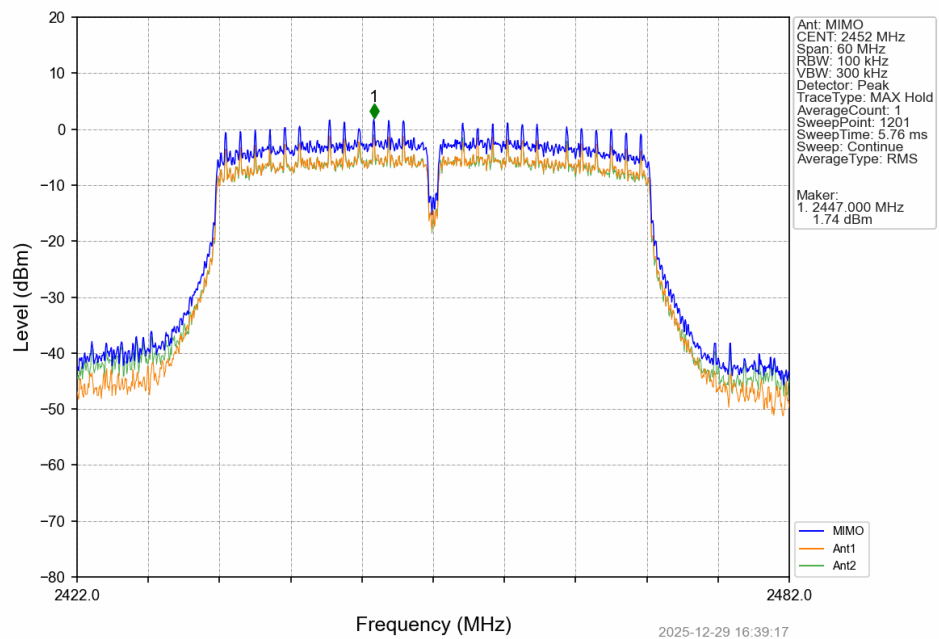
802.11n(HT40)_HCH_2452MHz_Ant1 (MIMO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant2 (MIMO)_NTNV



802.11n(HT40)_HCH_2452MHz_MIMO_NTNV



5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Test Result

5.1.1 Ref

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	1	-0.88
			2	-1.26
		2437	1	0.84
			2	-0.69
		2462	1	1.35
			2	-2.93
802.11g	SISO	2412	1	-0.09
			2	1.17
		2437	1	1.41
			2	1.61
		2462	1	1.76
			2	-1.18
802.11n (HT20)	MIMO	2412	1	0.01
			2	1.23
		2437	1	1.88
			2	0.92
		2462	1	1.67
			2	-0.75
802.11n (HT40)	MIMO	2422	1	-3.01
			2	-1.49
		2437	1	-1.20
			2	-1.02
		2452	1	-1.17
			2	-1.19

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

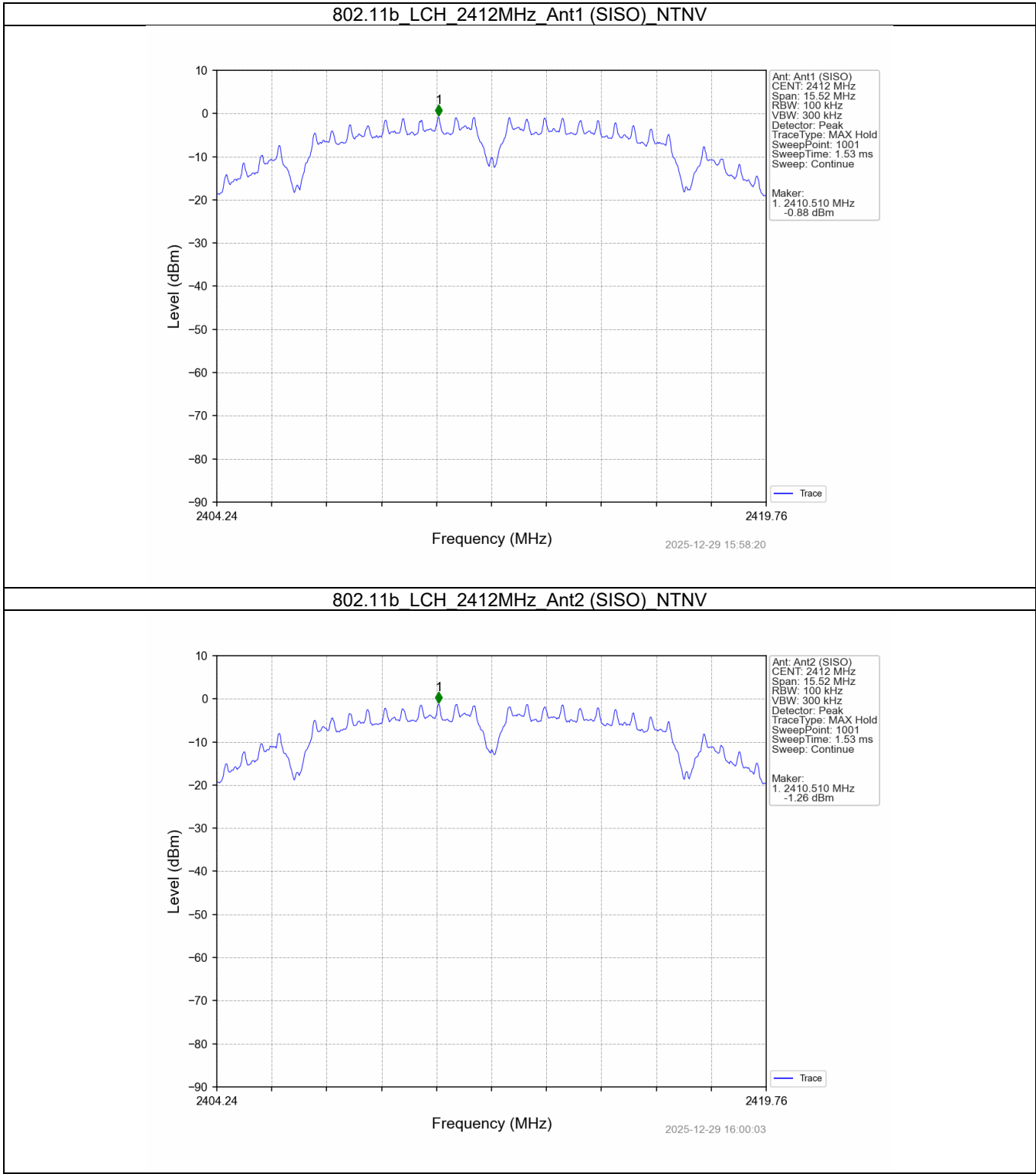
5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	-0.88	-20.88	Pass
			2	-1.26	-21.26	Pass
		2437	1	0.84	-19.16	Pass
			2	-0.69	-20.69	Pass
		2462	1	1.35	-18.65	Pass
			2	-2.93	-22.93	Pass
802.11g	SISO	2412	1	-0.09	-20.09	Pass
			2	1.17	-18.83	Pass
		2437	1	1.41	-18.59	Pass
			2	1.61	-18.39	Pass
		2462	1	1.76	-18.24	Pass
			2	-1.18	-21.18	Pass
802.11n (HT20)	MIMO	2412	1	0.01	-19.99	Pass
			2	1.23	-18.77	Pass
		2437	1	1.88	-18.12	Pass

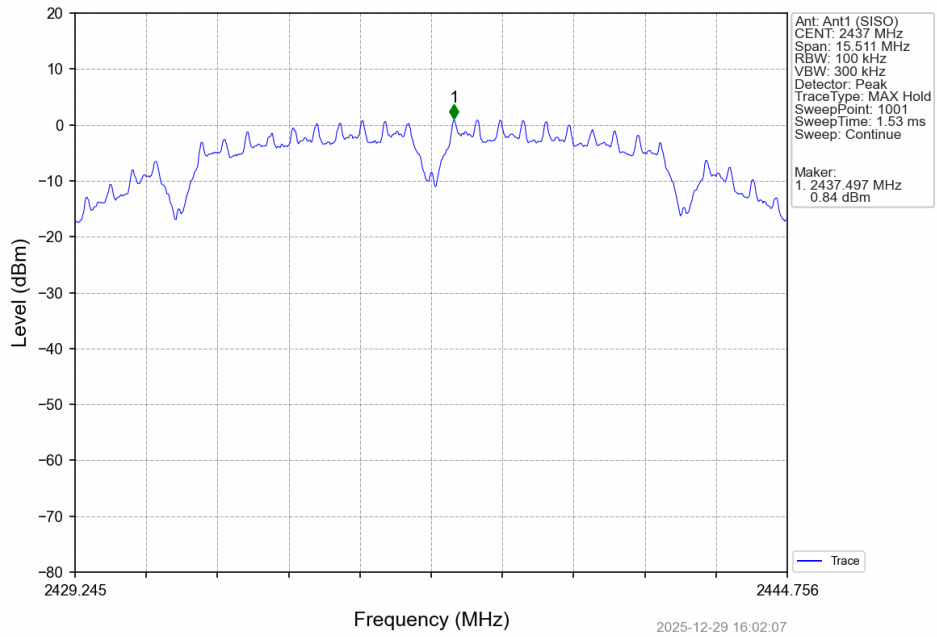
			2	0.92	-19.08	Pass
		2462	1	1.67	-18.33	Pass
			2	-0.75	-20.75	Pass
802.11n (HT40)	MIMO	2422	1	-3.01	-23.01	Pass
			2	-1.49	-21.49	Pass
		2437	1	-1.20	-21.20	Pass
			2	-1.02	-21.02	Pass
		2452	1	-1.17	-21.17	Pass
			2	-1.19	-21.19	Pass
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.						

5.2 Test Graph

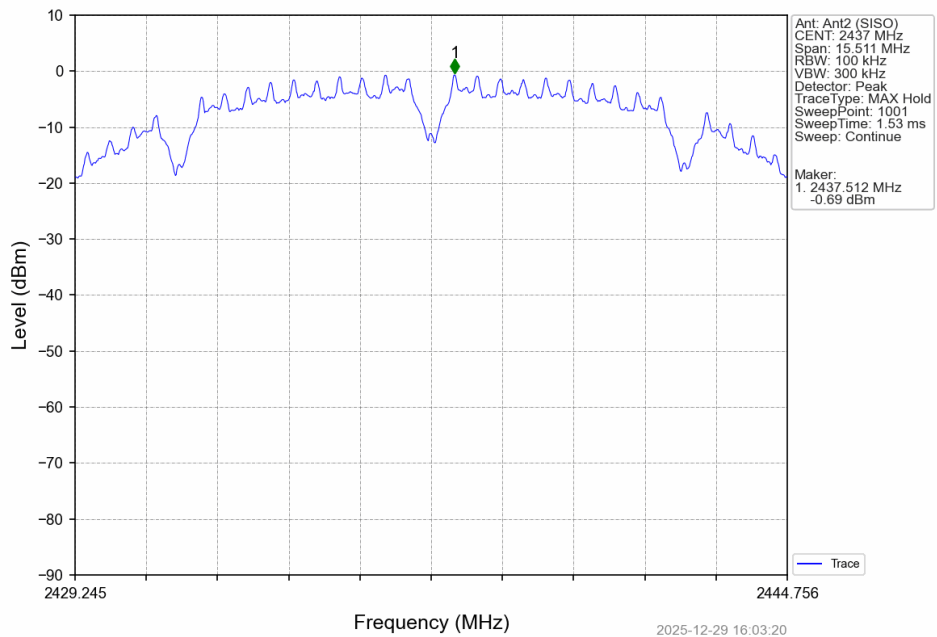
5.2.1 Ref



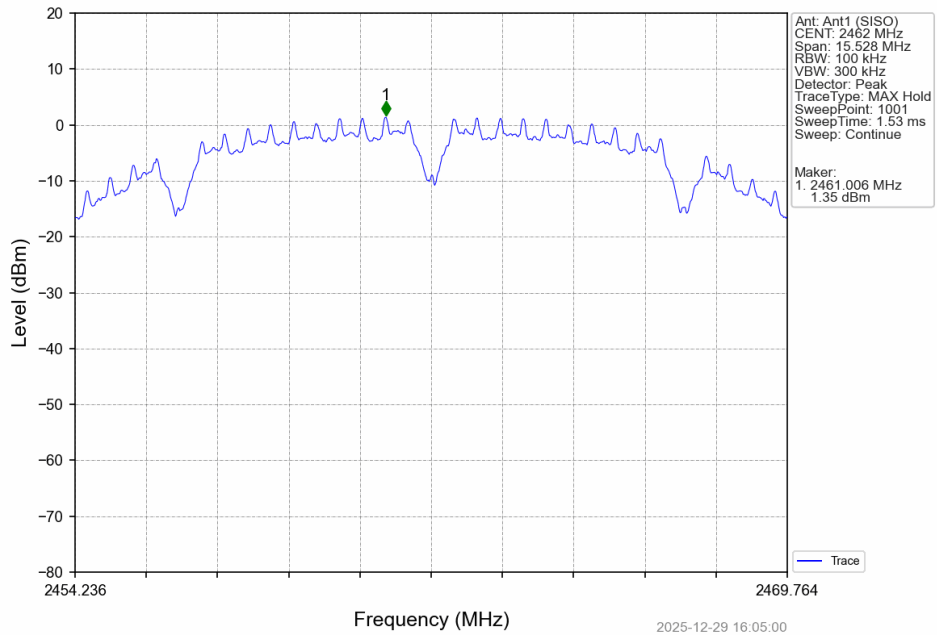
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



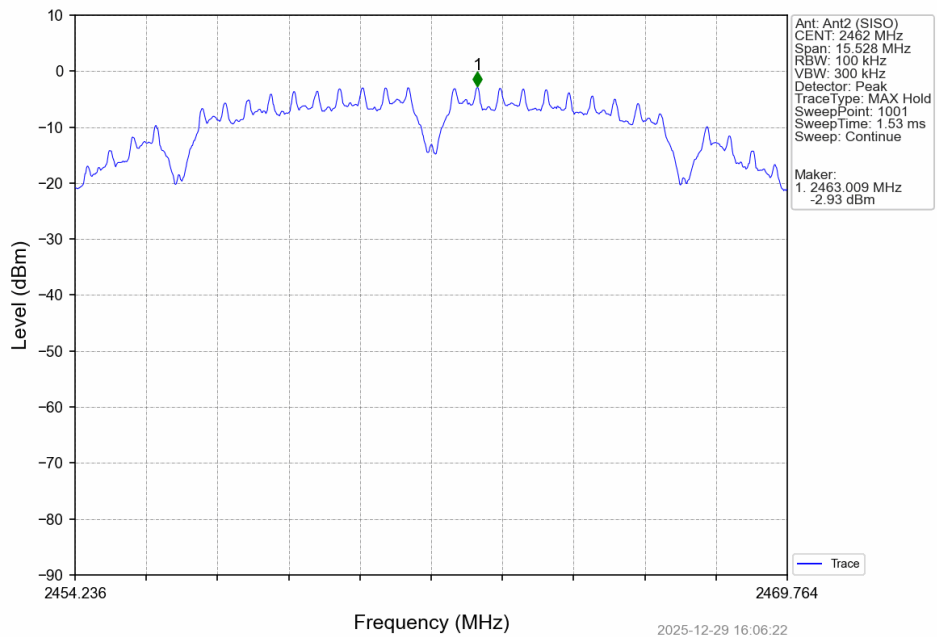
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



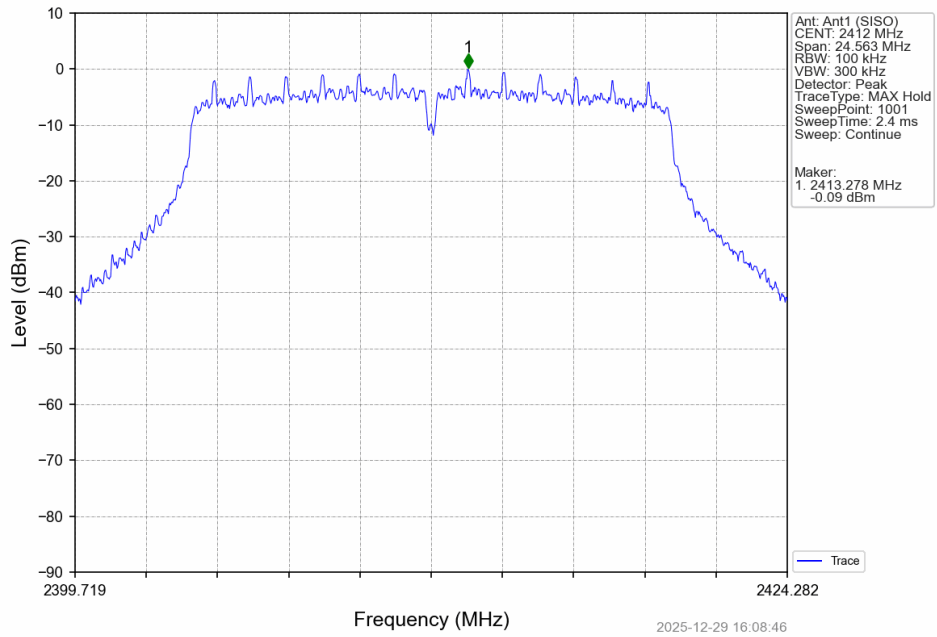
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



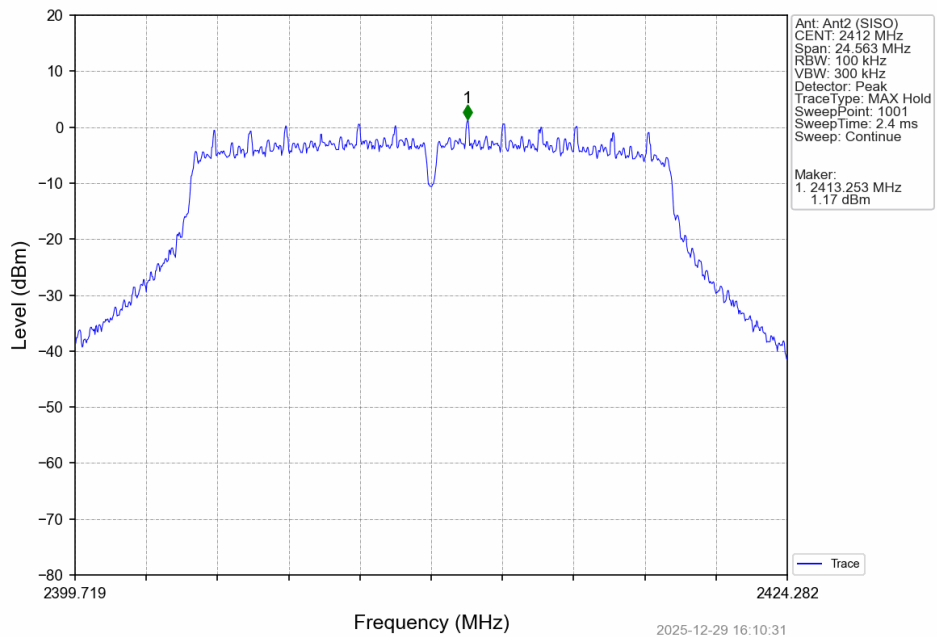
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



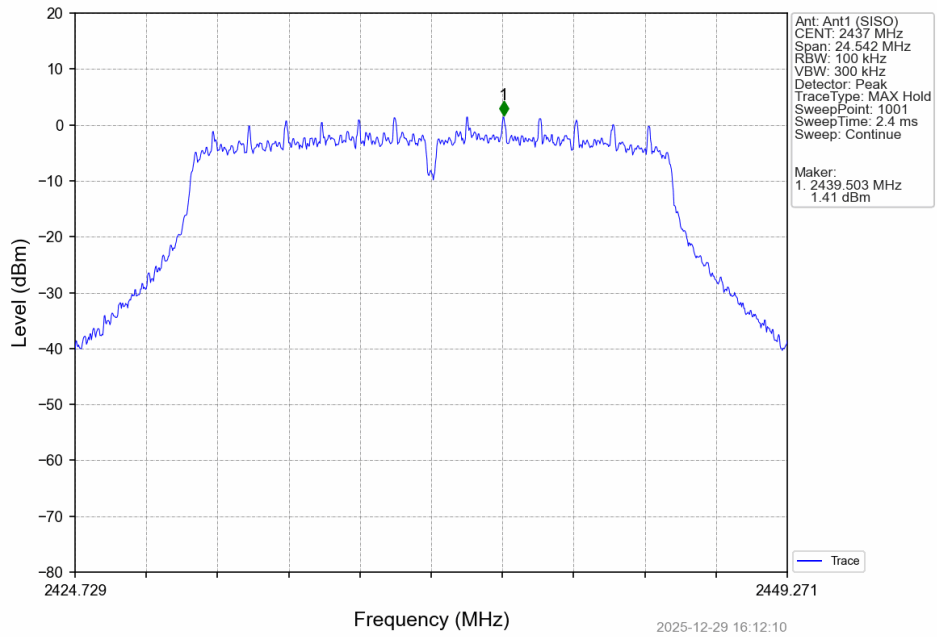
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



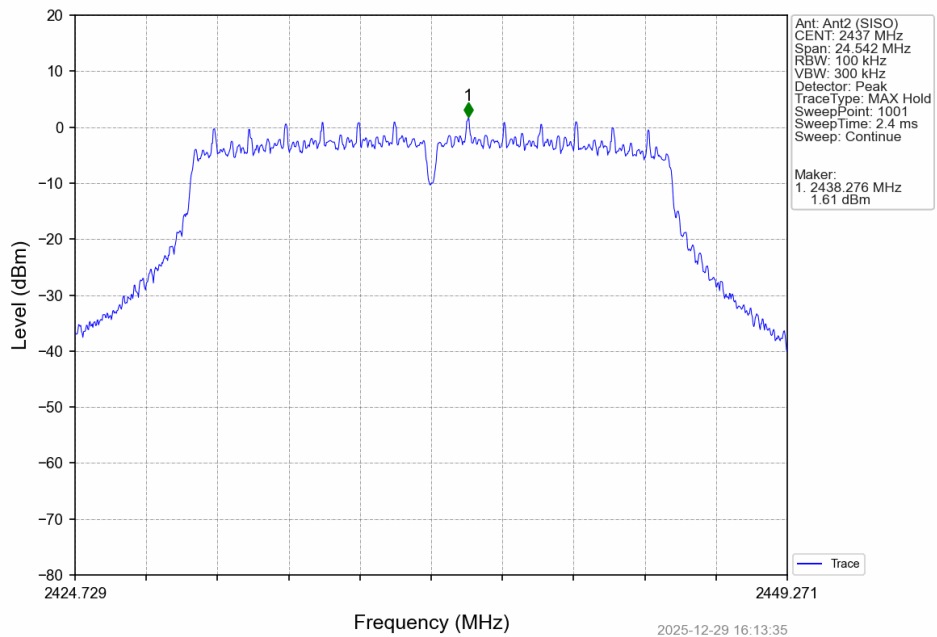
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



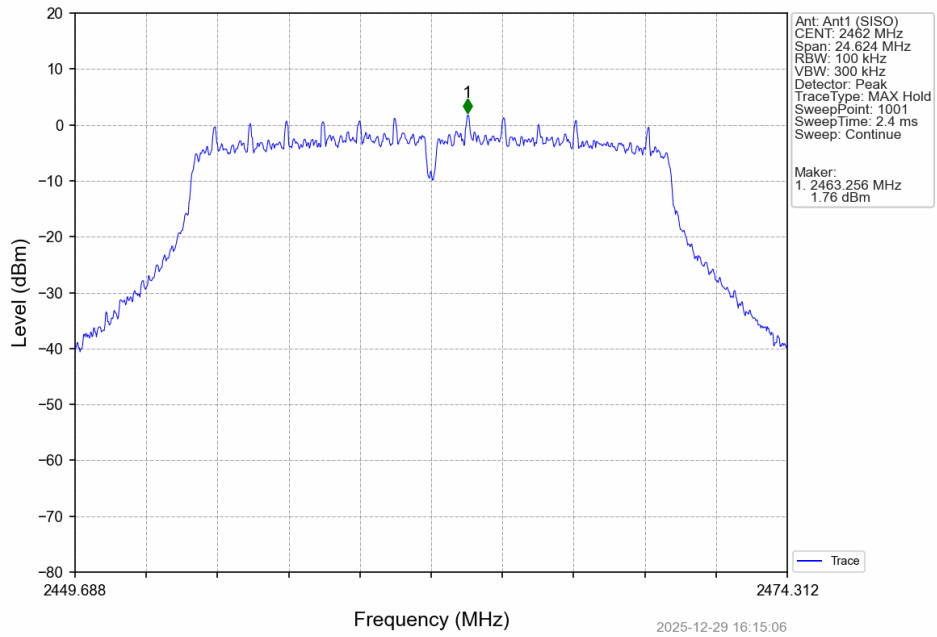
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV

