

ANNEX TEST DATA WIFI2.4G

FCC ID: 2A54Y-HA116

Applicant: Shenzhen TFIRETEK Technology Co., Ltd.

Address: 204, Building 2, Stech Park, Taoyuan Community, Dalang Street, LongHua District, ShenZhen

Manufacturer: Shenzhen TFIRETEK Technology Co., Ltd.

Address: 204, Building 2, Stech Park, Taoyuan Community, Dalang Street, LongHua District, ShenZhen

Product Name: Projector

Trade Mark: N/A

Model Number: HA116, HA116-A, HA116-B, HA116-C, HA116-D, HA116-PRO, HA116-PLUS, HA116-Ultra

Date of Receipt: Jul. 21, 2026

Test Date: Jul. 21, 2026 – Aug. 07, 2026

Date of Report: Aug. 07, 2026

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory Area, No.1 Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China

Applicable Standards: FCC PART 15 C 15.247
ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024

Test Result: Pass

Report Number: DLE-260721007R

1. Duty Cycle

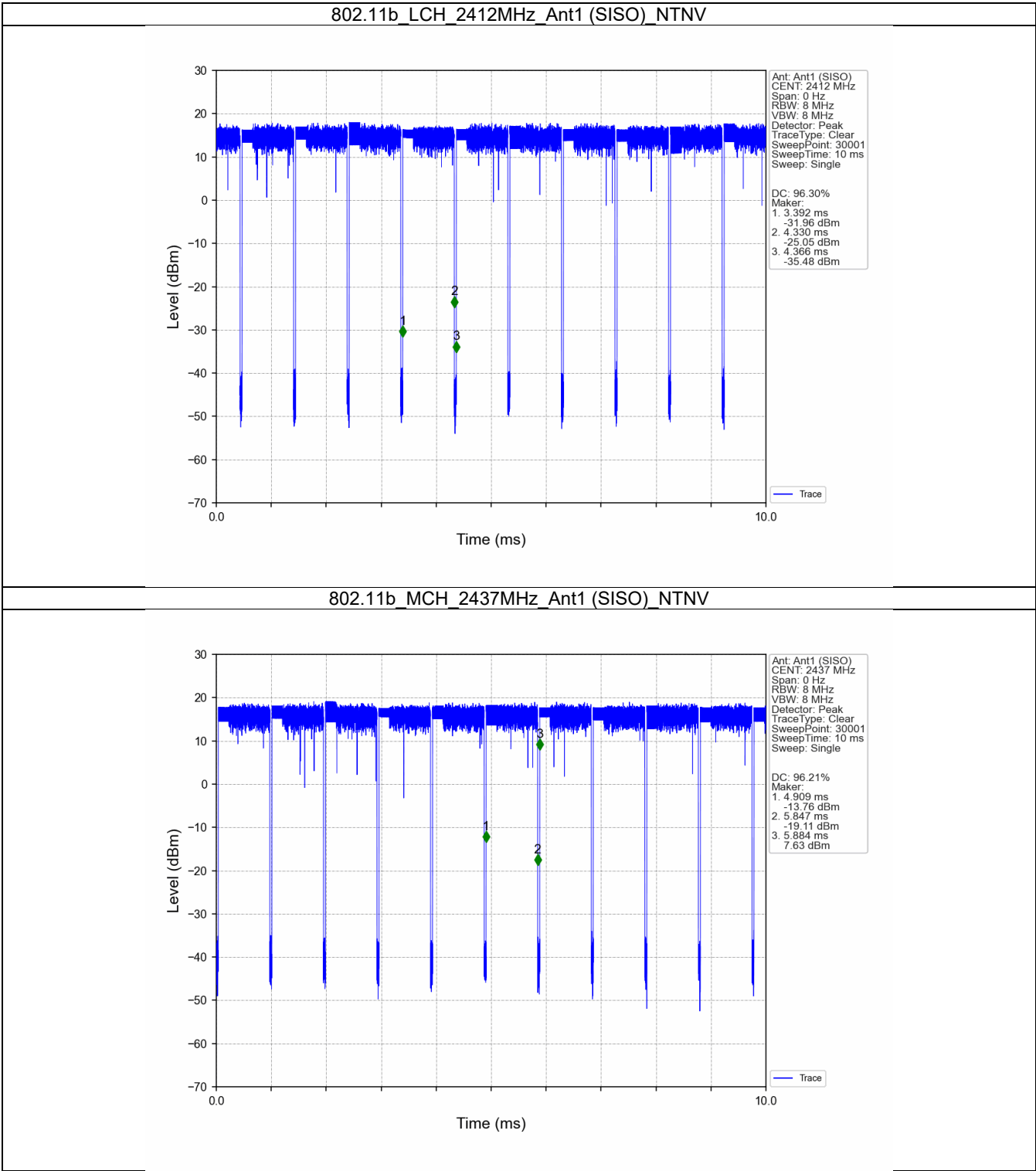
1.1 Test Result

1.1.1 Ant1

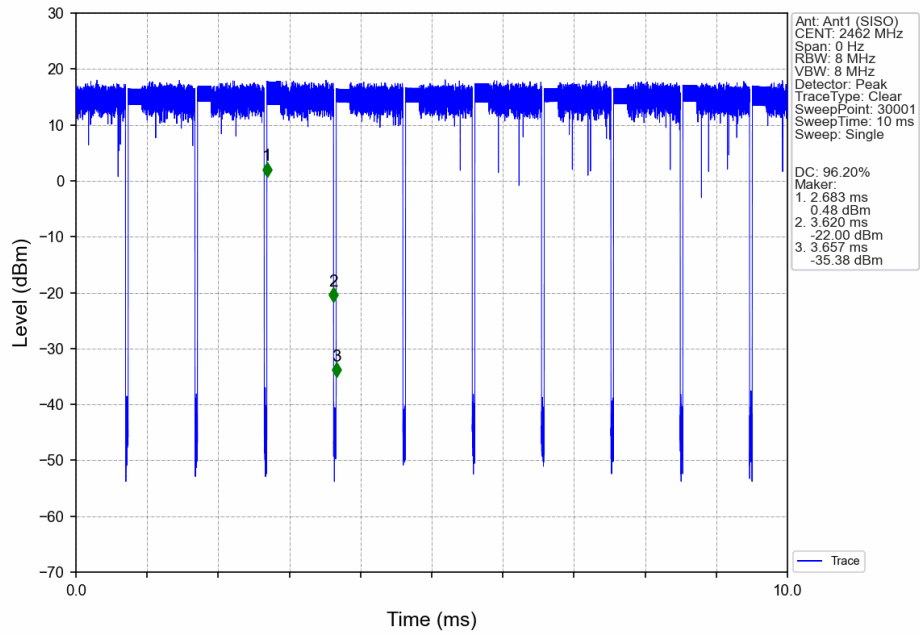
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	0.938	0.974	96.30	0.16	0.03
		2437	0.938	0.975	96.21	0.17	0.07
		2462	0.937	0.974	96.20	0.17	0.03
802.11g	SISO	2412	0.178	0.220	80.91	0.92	0.10
		2437	0.177	0.221	80.09	0.96	0.08
		2462	0.177	0.220	80.45	0.94	0.15
802.11n (HT20)	SISO	2412	0.165	0.208	79.33	1.01	0.07
		2437	0.167	0.208	80.29	0.95	0.12
		2462	0.167	0.209	79.90	0.97	0.10
802.11n (HT40)	SISO	2422	0.100	0.198	50.51	2.97	19.09
		2437	0.101	0.144	70.14	1.54	0.10
		2452	0.101	0.144	70.14	1.54	0.12

1.2 Test Graph

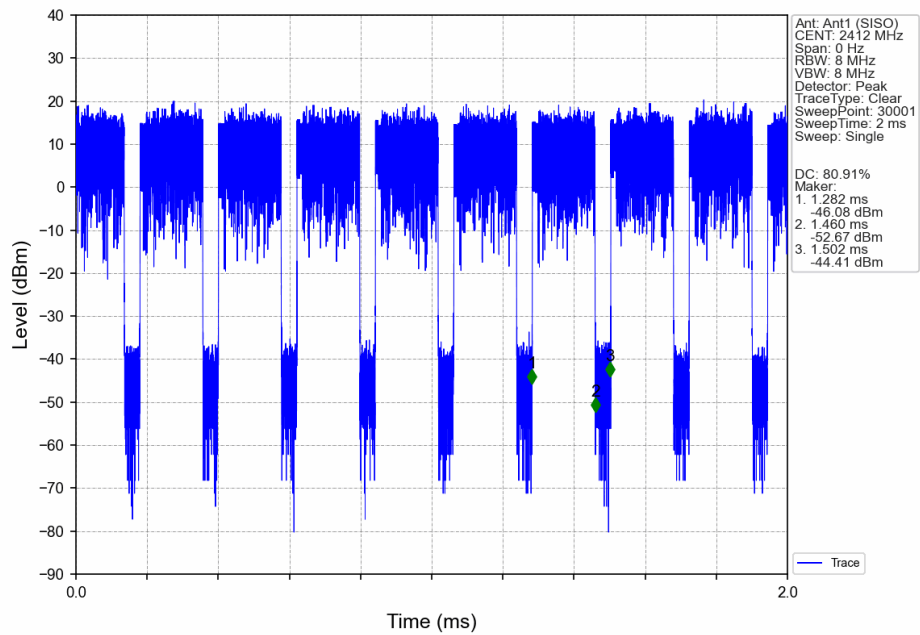
1.2.1 Ant1



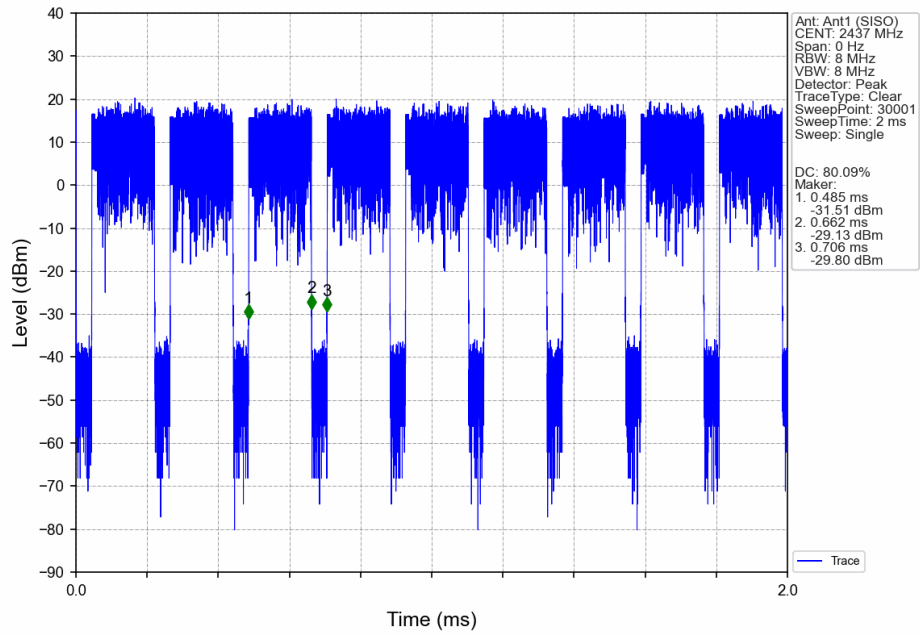
802.11b HCH 2462MHz Ant1 (SISO) NTN



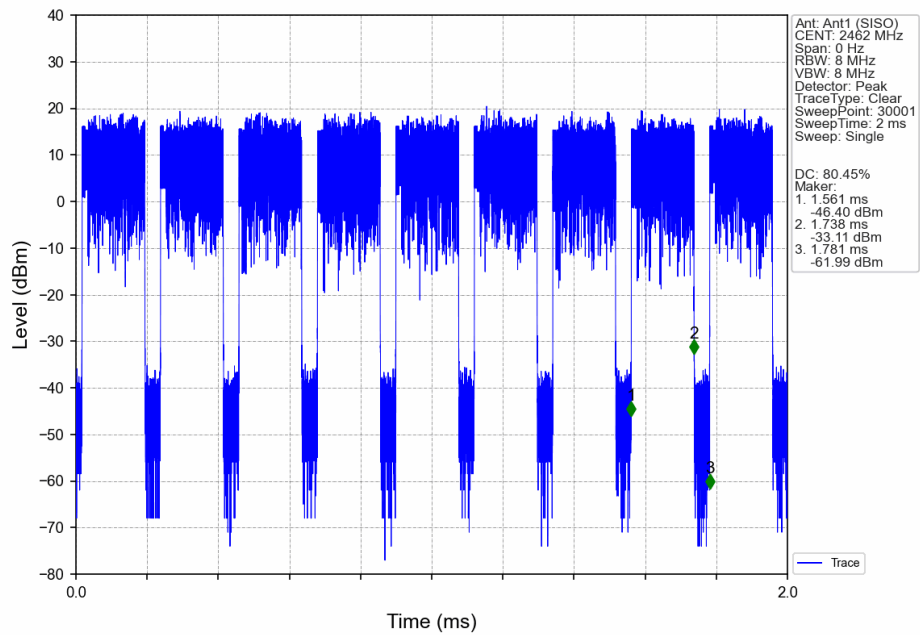
802.11g LCH 2412MHz Ant1 (SISO) NTN



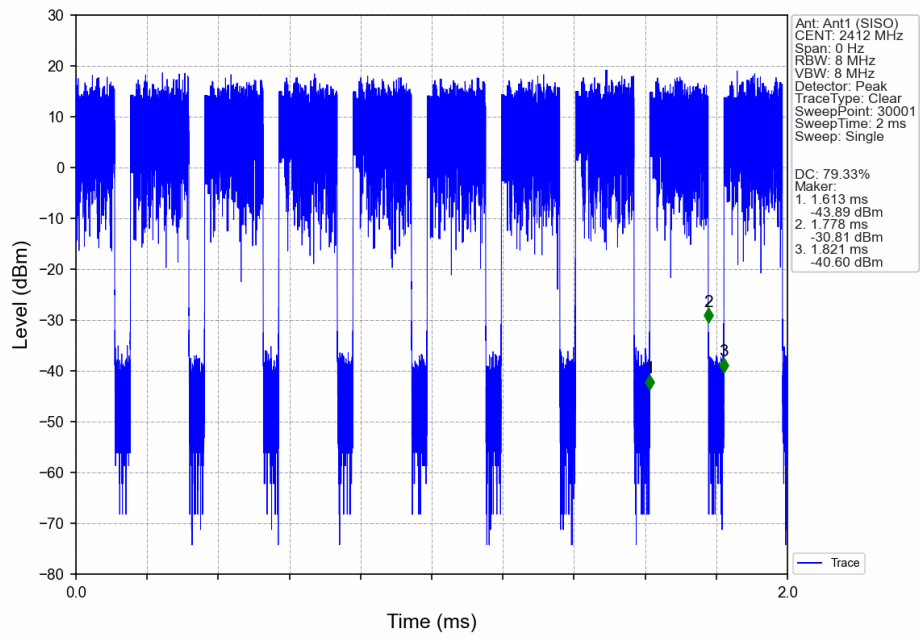
802.11g MCH 2437MHz Ant1 (SISO) NTN



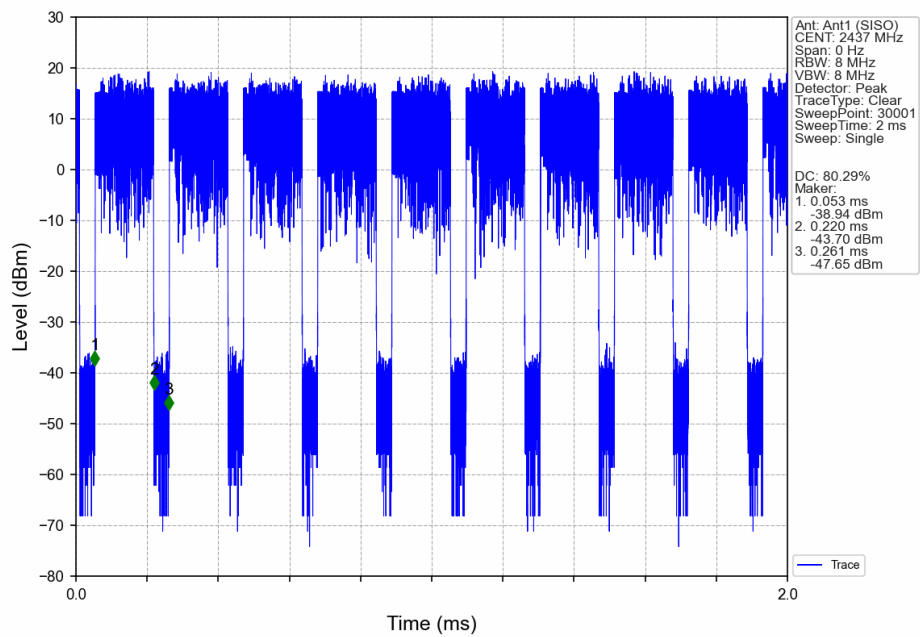
802.11g HCH 2462MHz Ant1 (SISO) NTN



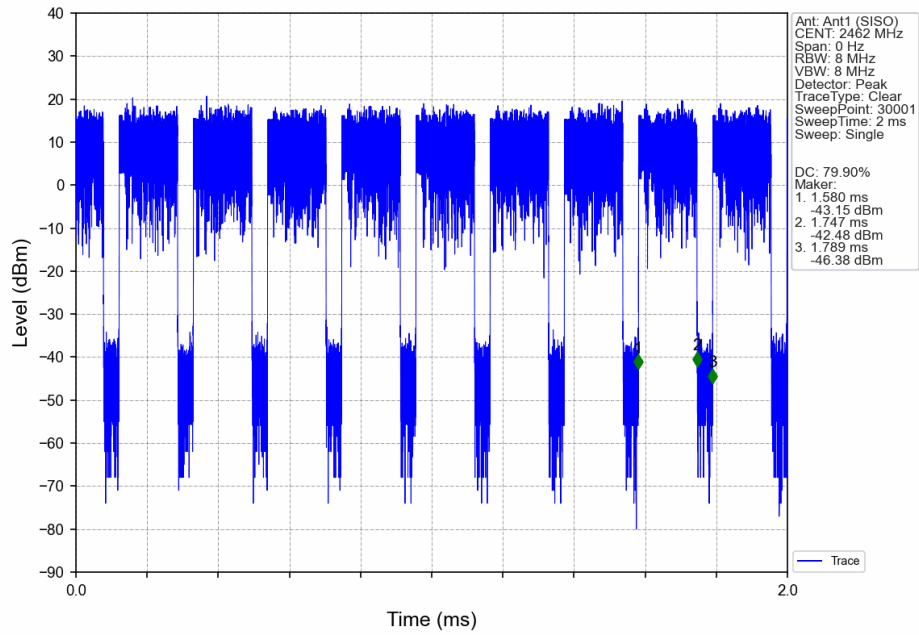
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTN



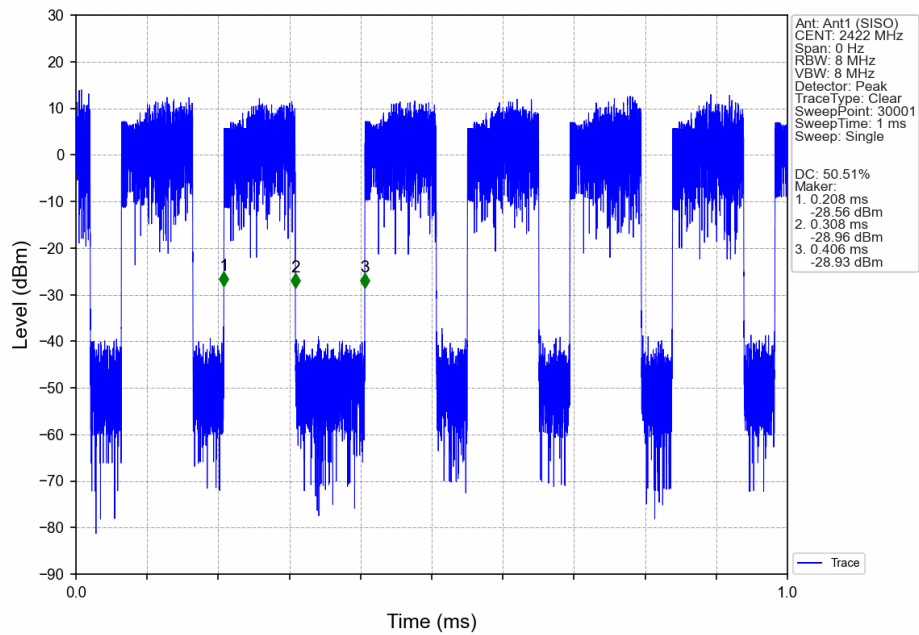
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTN



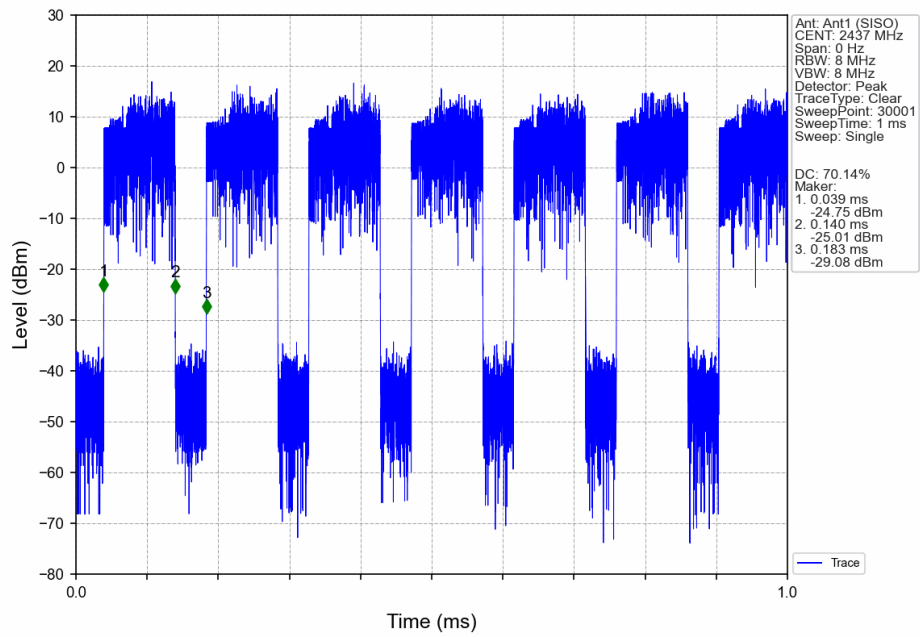
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTNV



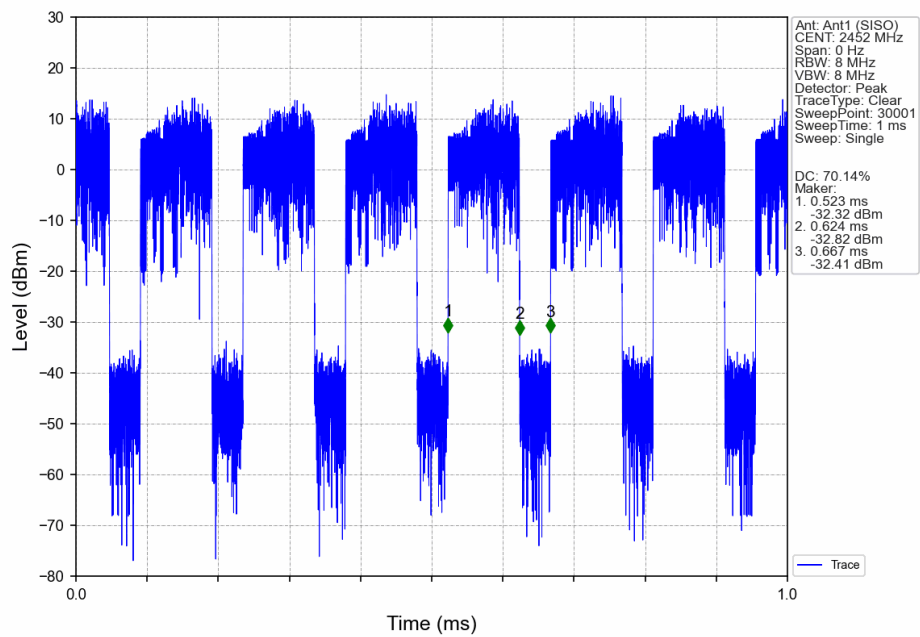
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTNV



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTN



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTN



2. Bandwidth

2.1 Test Result

2.1.1 OBW

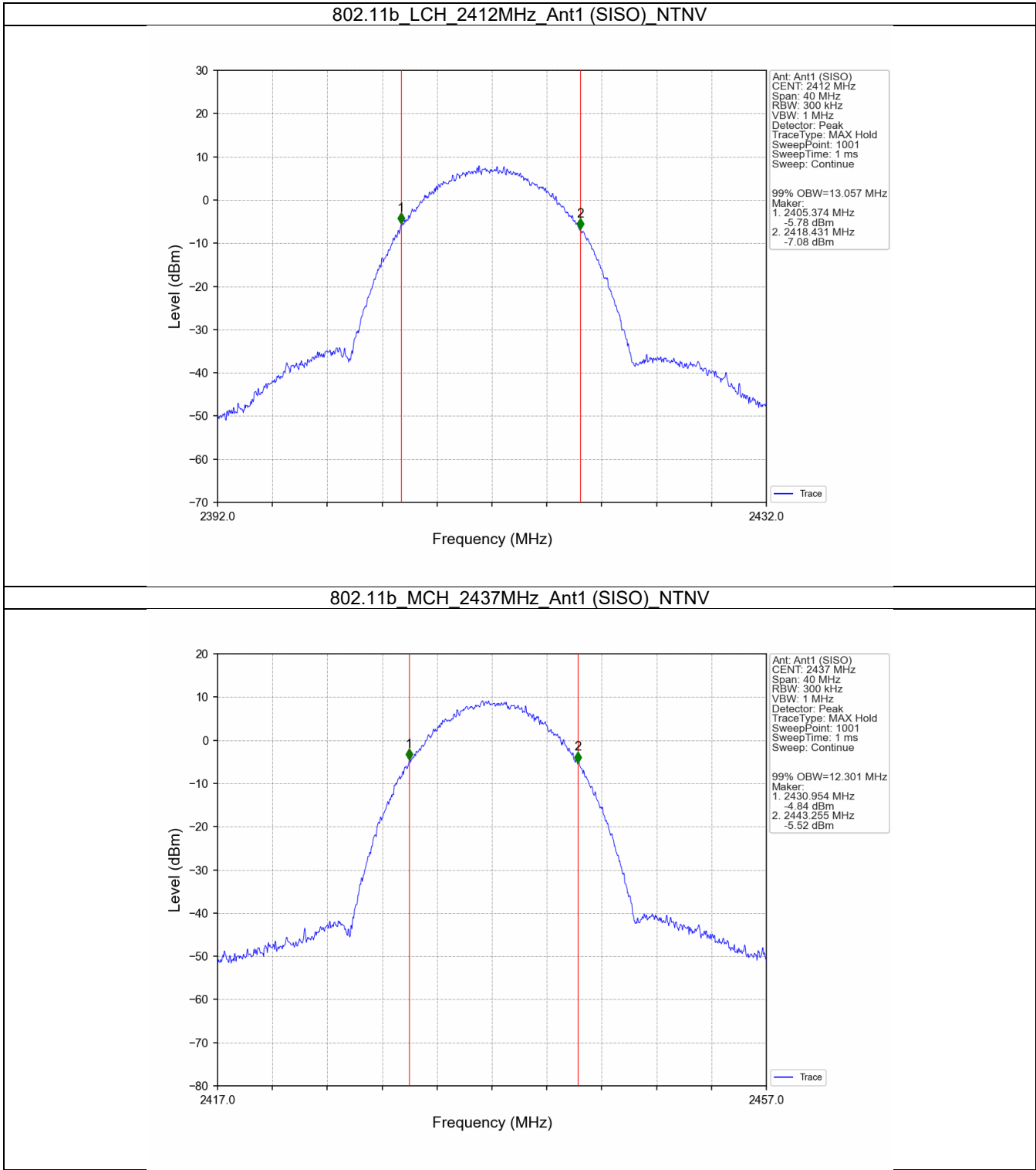
Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	13.057	/	Pass
		2437	1	12.301	/	Pass
		2462	1	12.807	/	Pass
802.11g	SISO	2412	1	16.928	/	Pass
		2437	1	16.502	/	Pass
		2462	1	16.656	/	Pass
802.11n (HT20)	SISO	2412	1	17.921	/	Pass
		2437	1	17.556	/	Pass
		2462	1	17.777	/	Pass
802.11n (HT40)	SISO	2422	1	36.844	/	Pass
		2437	1	35.717	/	Pass
		2452	1	36.382	/	Pass

2.1.2 6dB BW

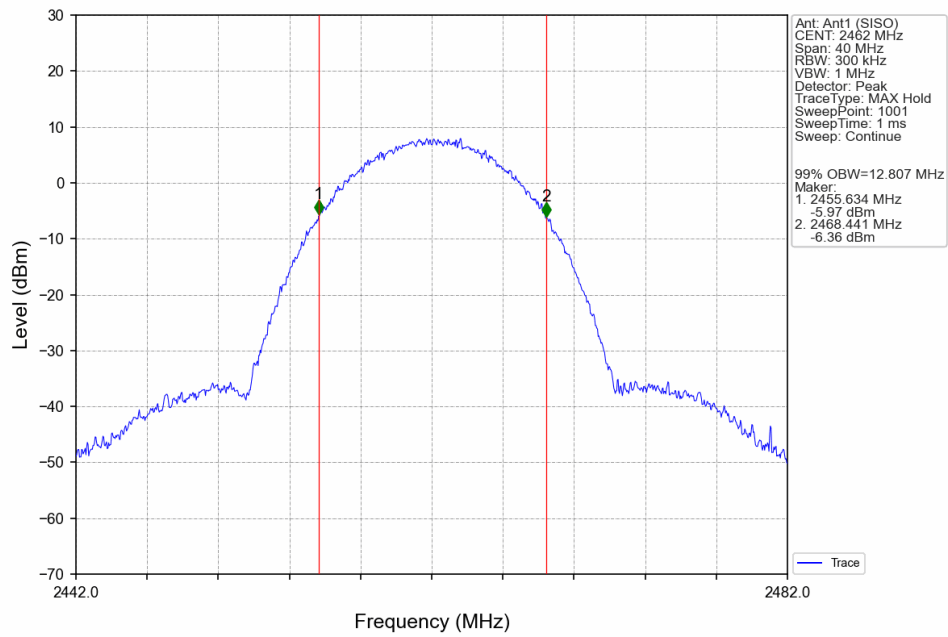
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	8.454	≥ 0.5	Pass
		2437	1	7.400	≥ 0.5	Pass
		2462	1	8.521	≥ 0.5	Pass
802.11g	SISO	2412	1	16.562	≥ 0.5	Pass
		2437	1	16.044	≥ 0.5	Pass
		2462	1	15.968	≥ 0.5	Pass
802.11n (HT20)	SISO	2412	1	17.631	≥ 0.5	Pass
		2437	1	16.523	≥ 0.5	Pass
		2462	1	17.774	≥ 0.5	Pass
802.11n (HT40)	SISO	2422	1	36.502	≥ 0.5	Pass
		2437	1	28.023	≥ 0.5	Pass
		2452	1	35.553	≥ 0.5	Pass

2.2 Test Graph

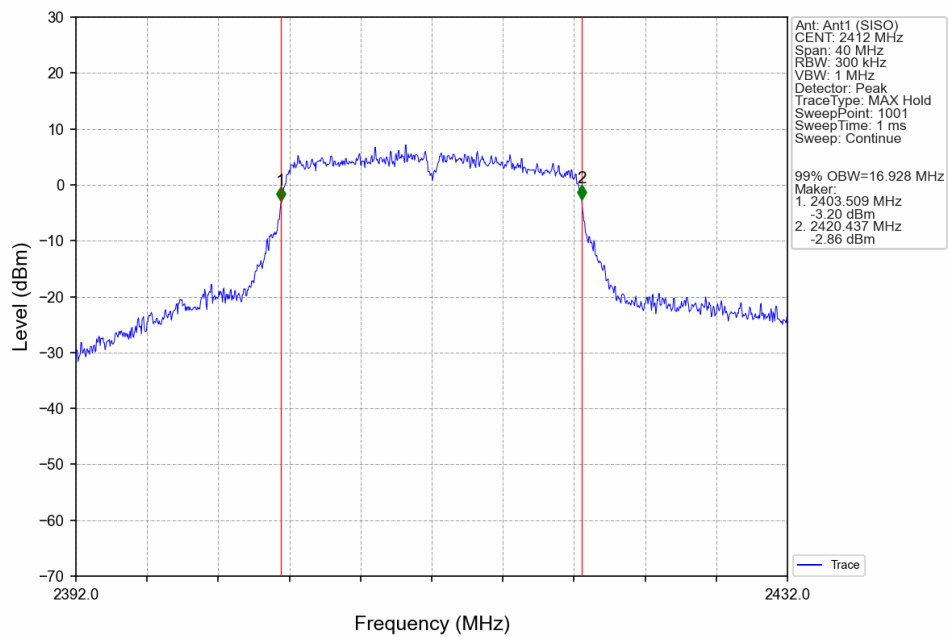
2.2.1 OBW



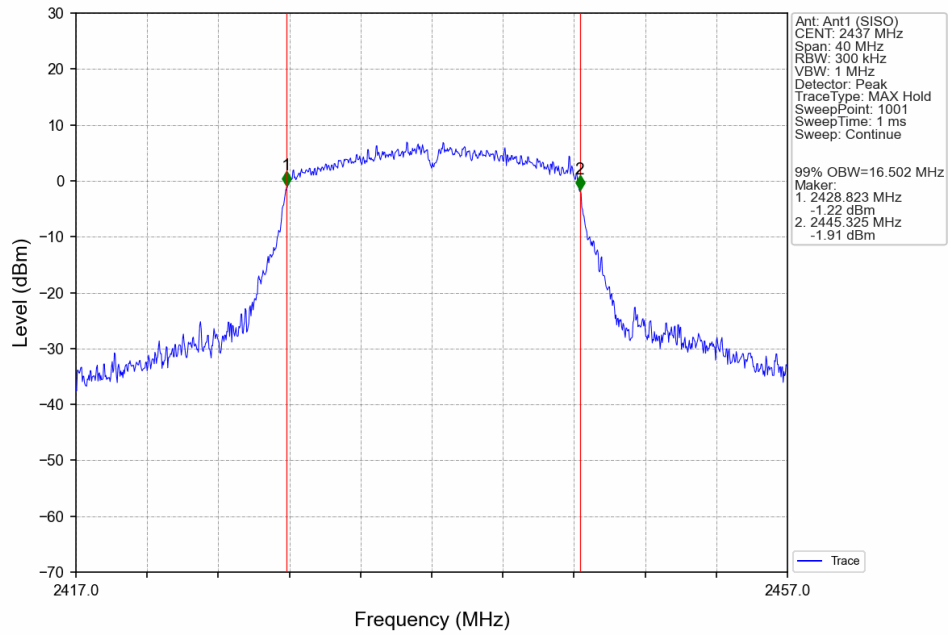
802.11b HCH 2462MHz Ant1 (SISO) NTN



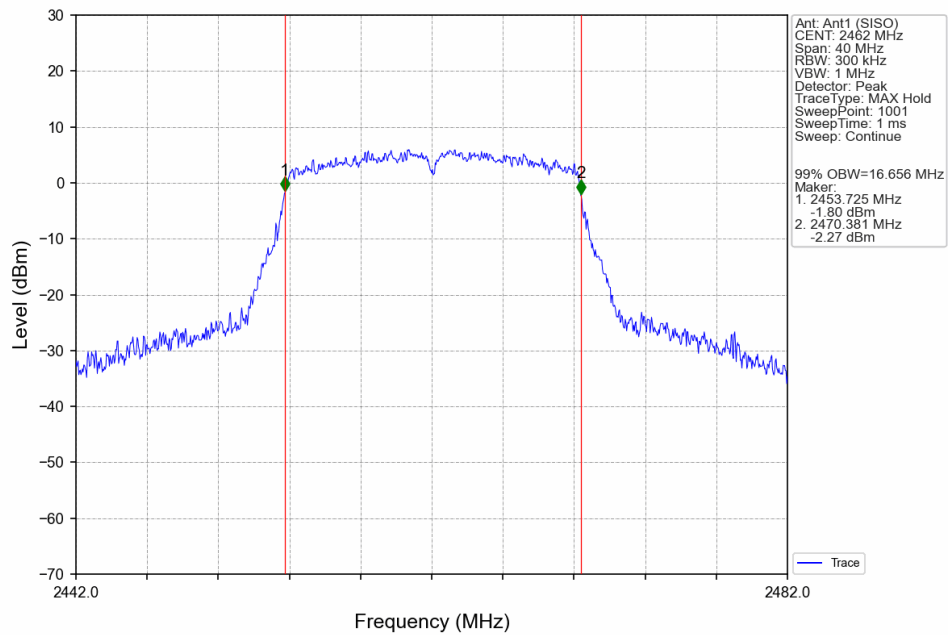
802.11g LCH 2412MHz Ant1 (SISO) NTN



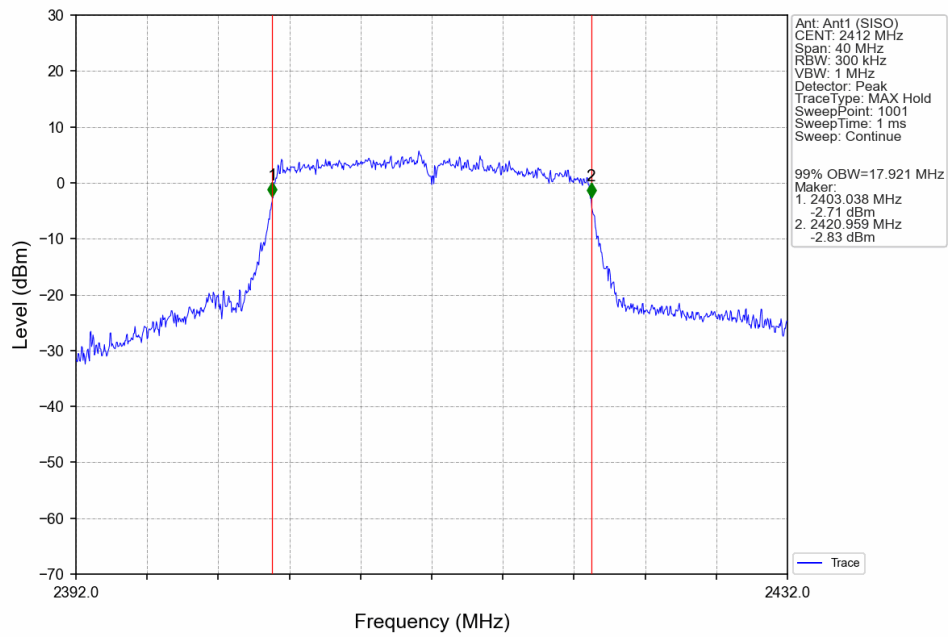
802.11g MCH 2437MHz Ant1 (SISO) NTN



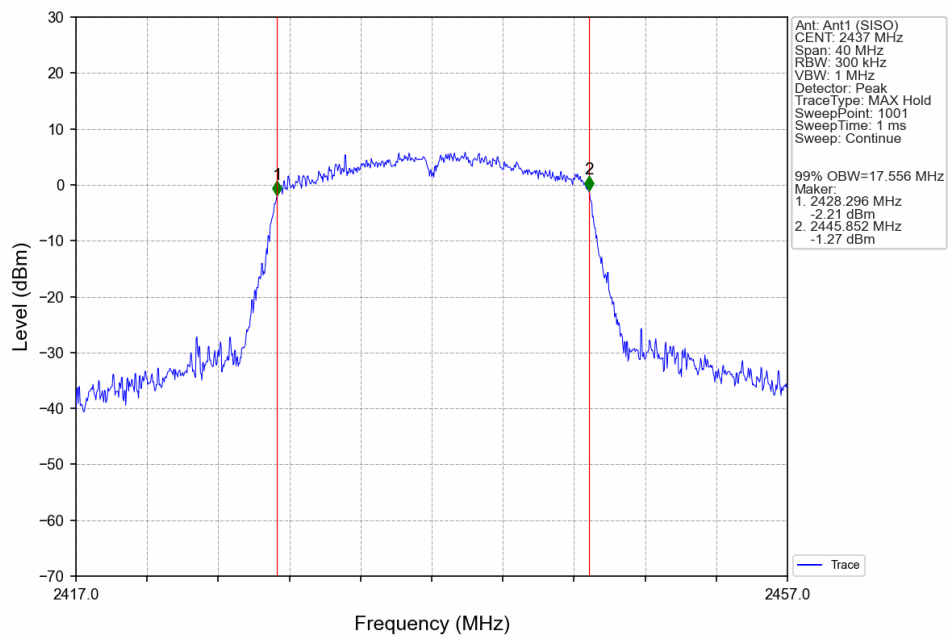
802.11g HCH 2462MHz Ant1 (SISO) NTN



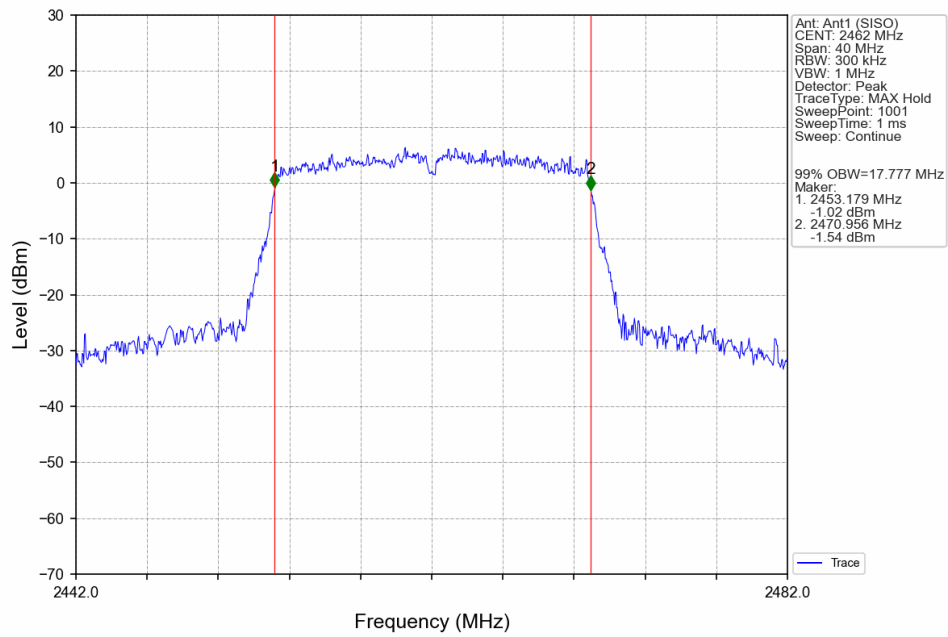
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTNV



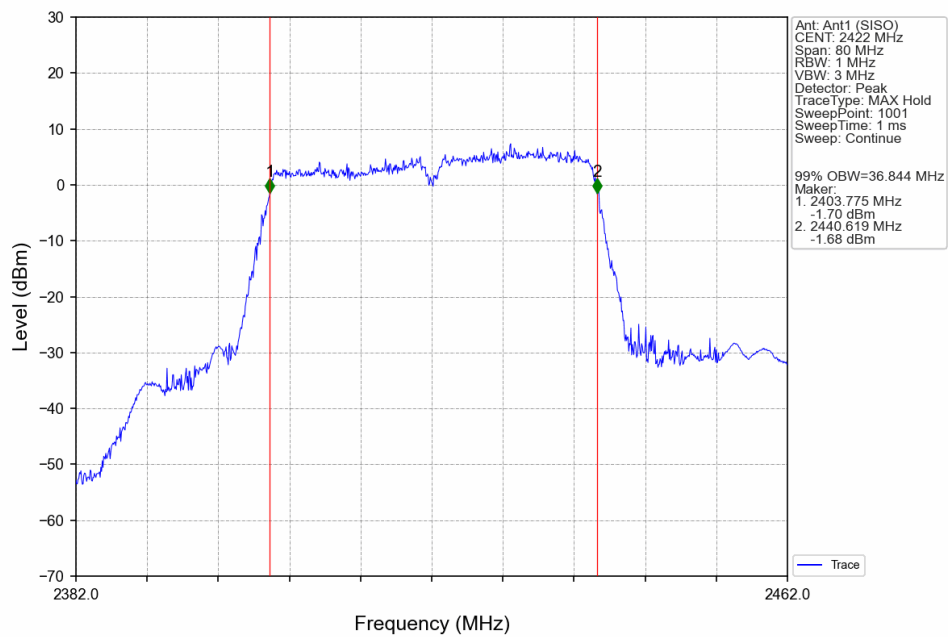
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTNV



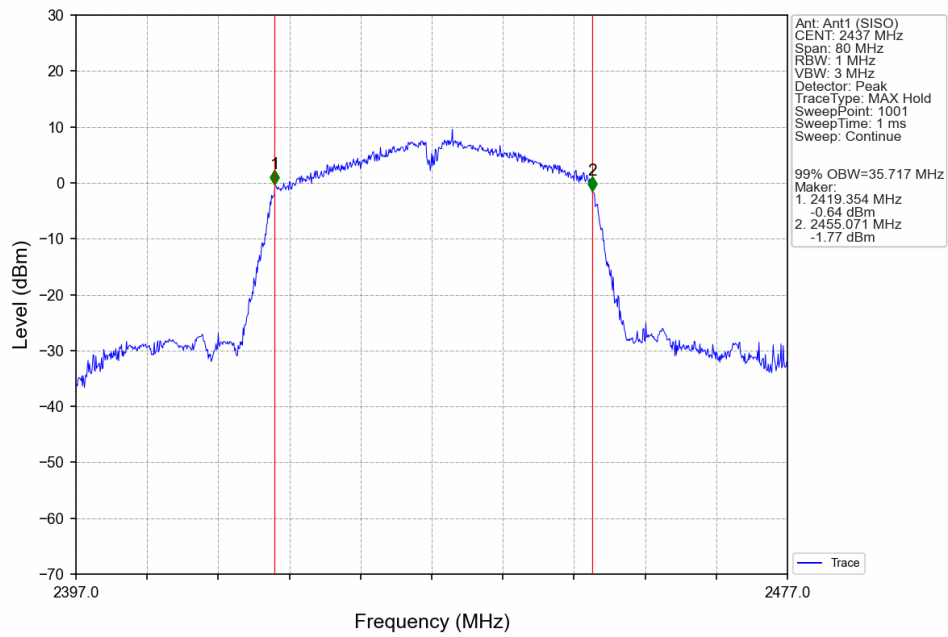
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTNV



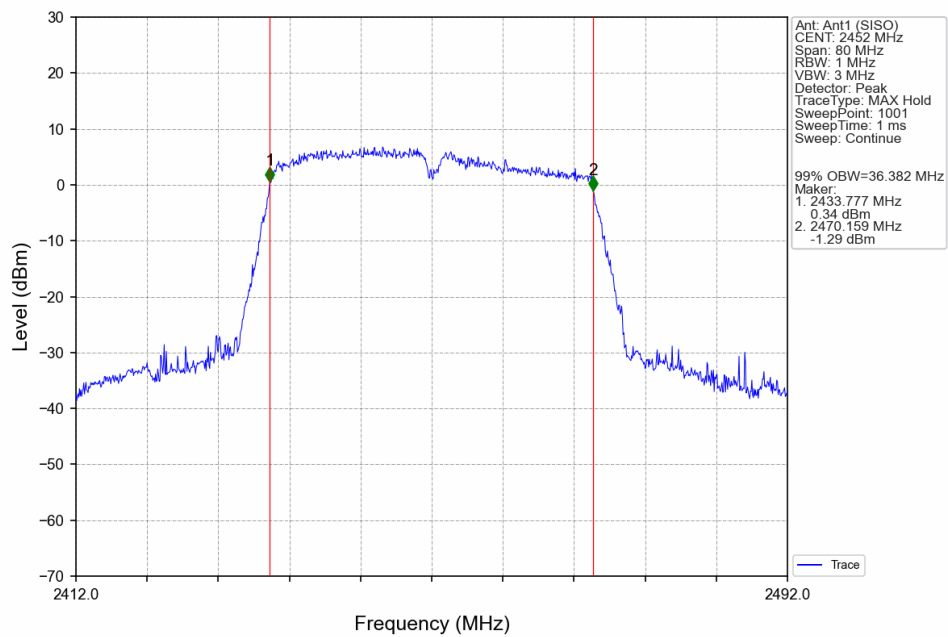
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTNV



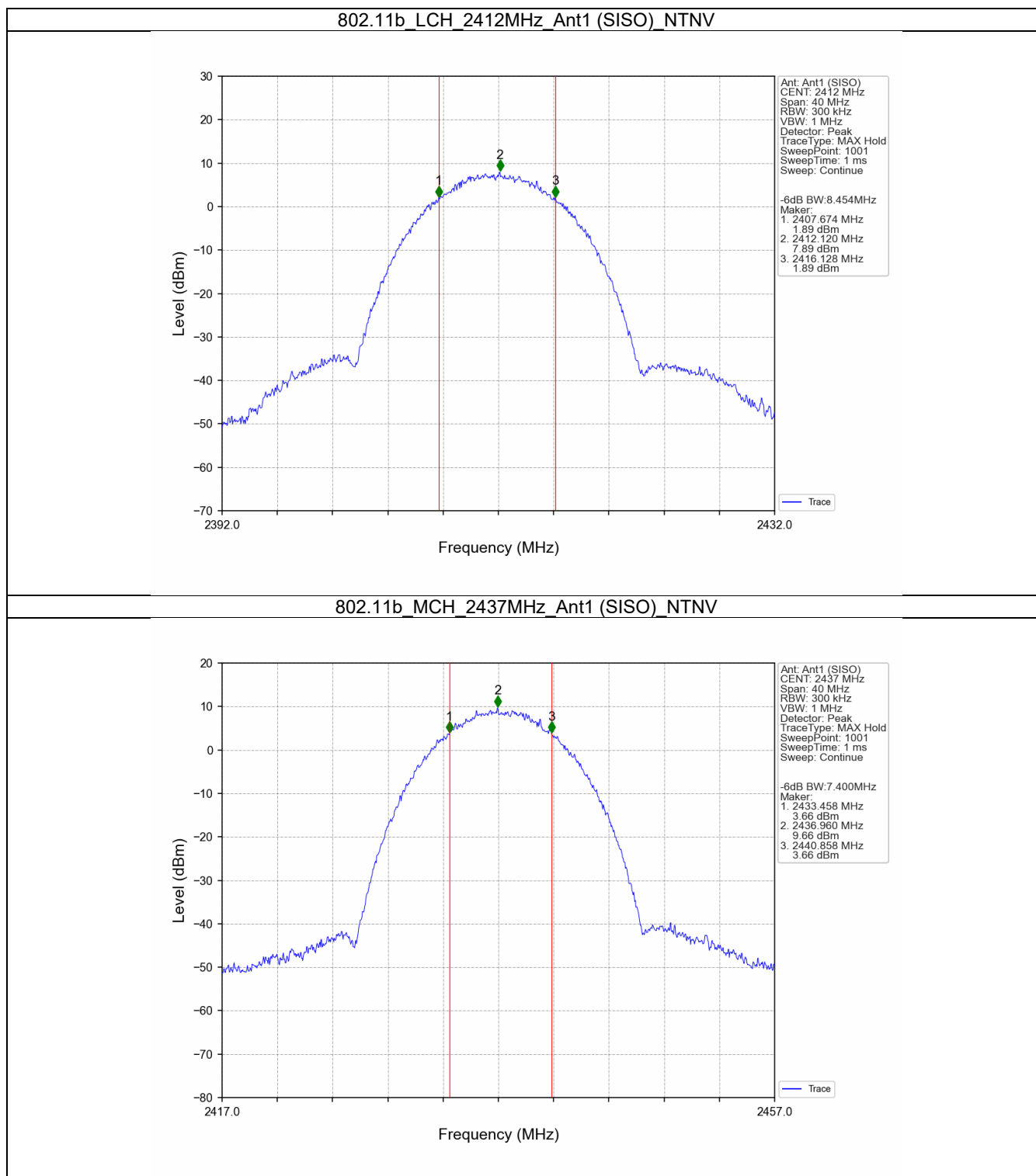
802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTNV



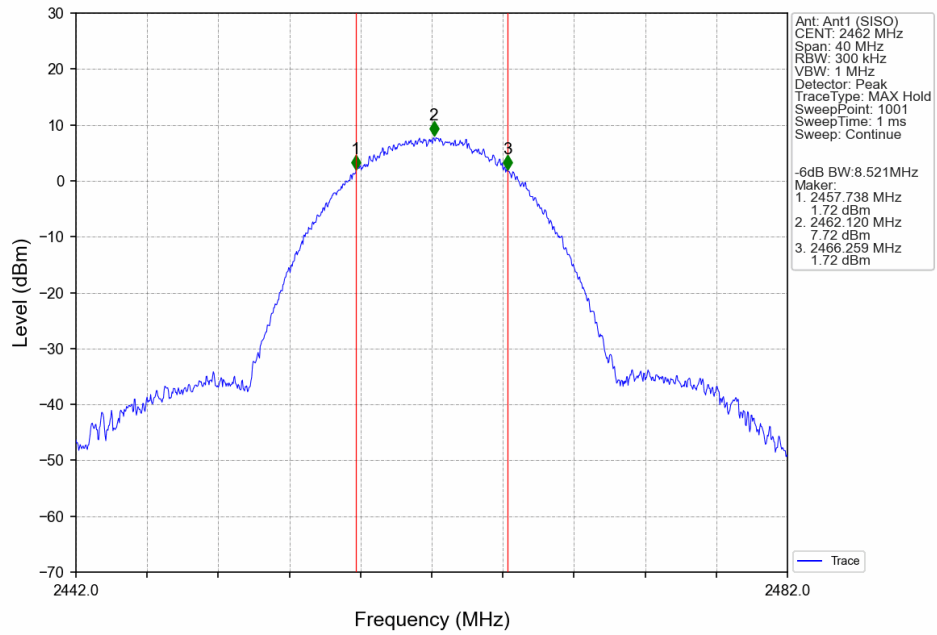
802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTNV



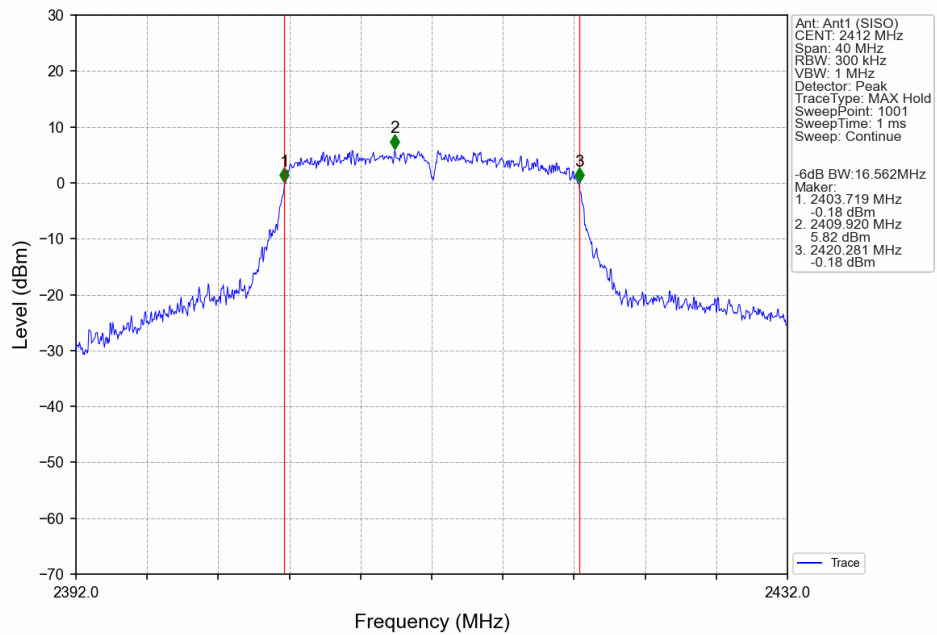
2.2.2 6dB BW



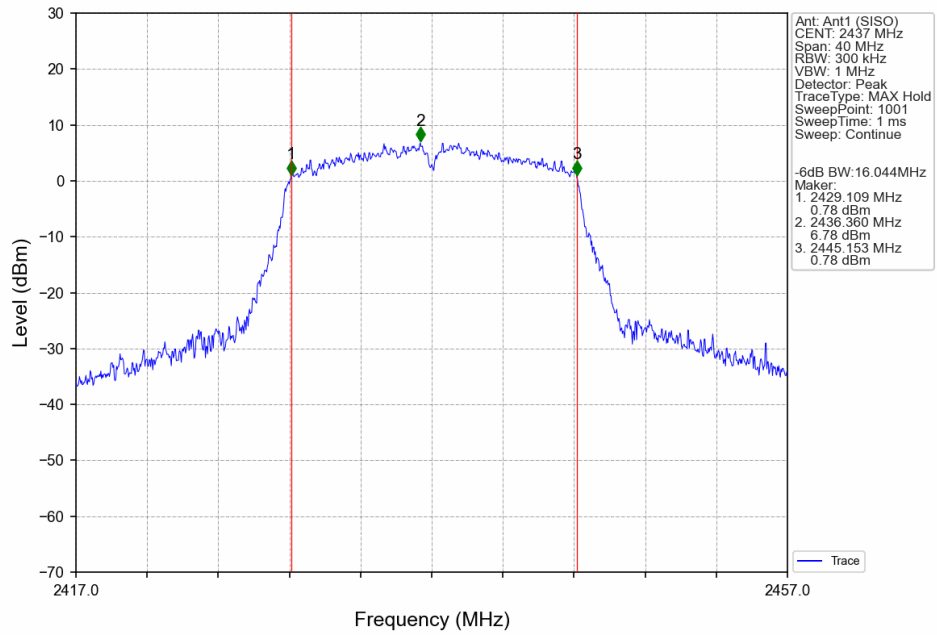
802.11b HCH 2462MHz Ant1 (SISO) NTN



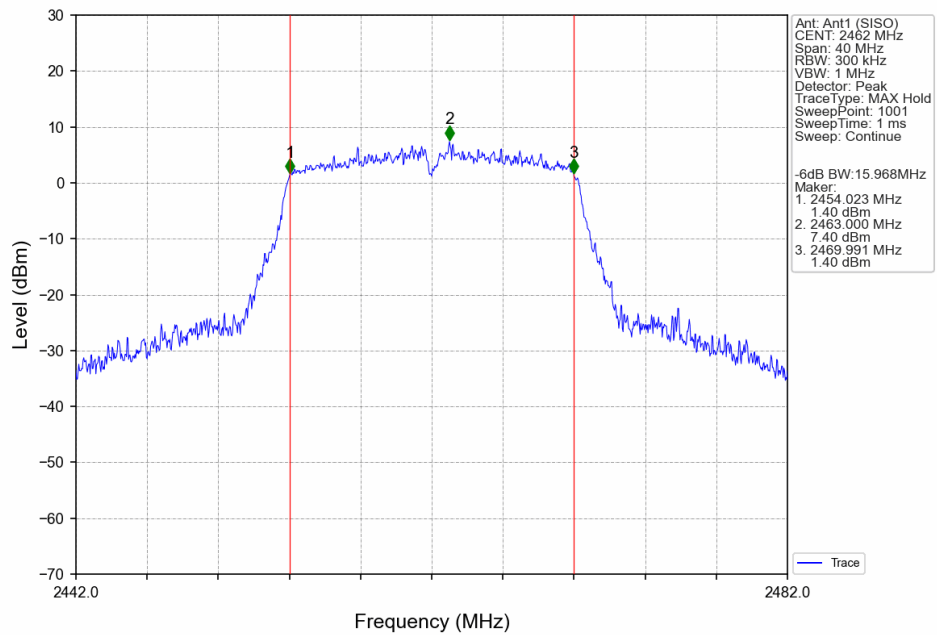
802.11g LCH 2412MHz Ant1 (SISO) NTN



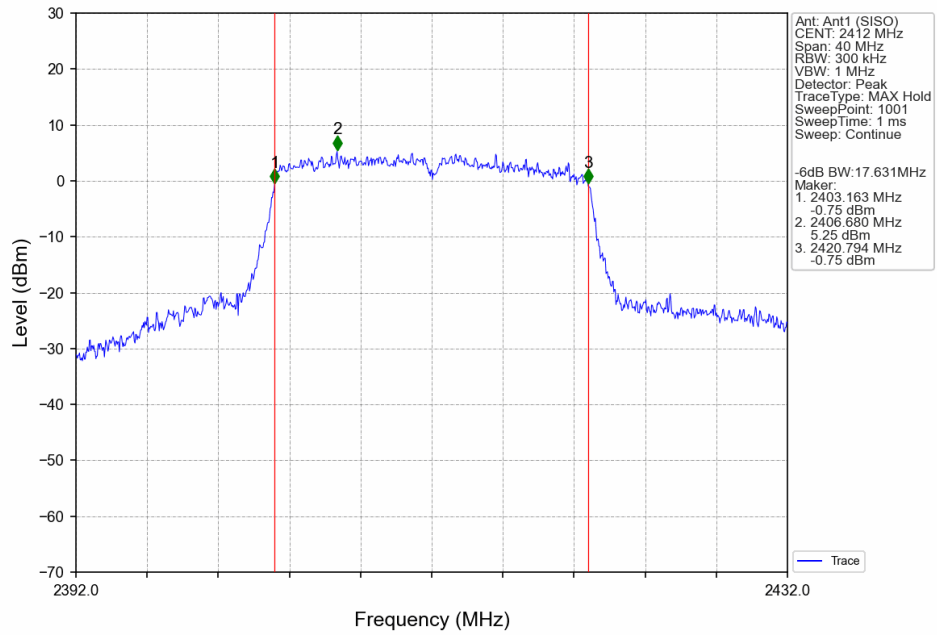
802.11g MCH 2437MHz Ant1 (SISO) NTN



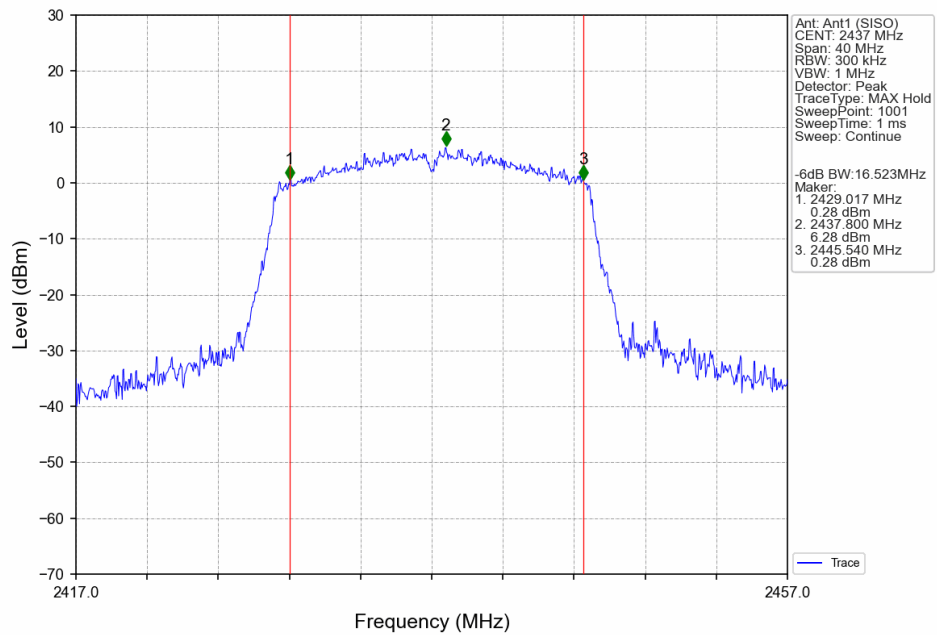
802.11g HCH 2462MHz Ant1 (SISO) NTN



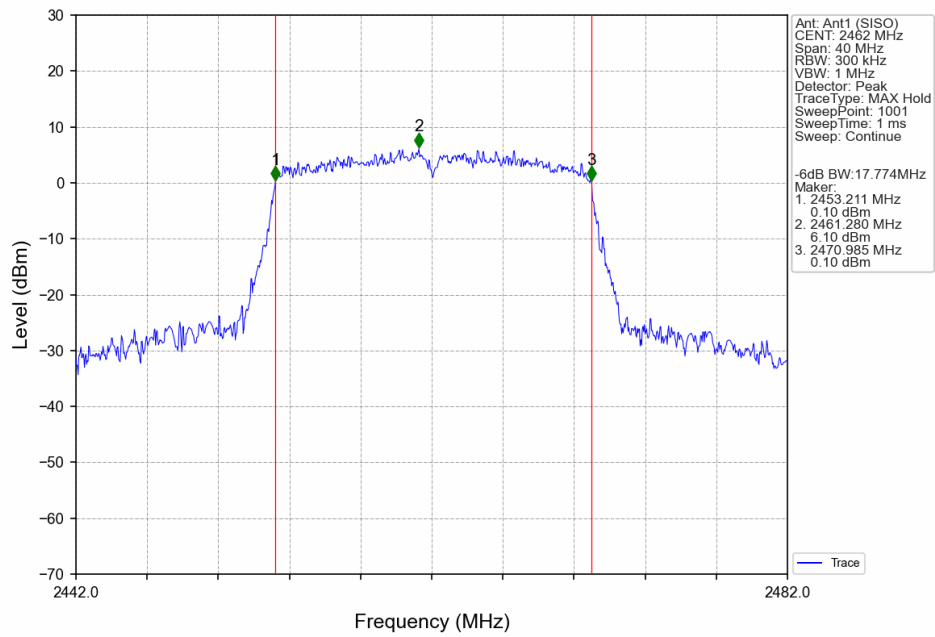
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTNV



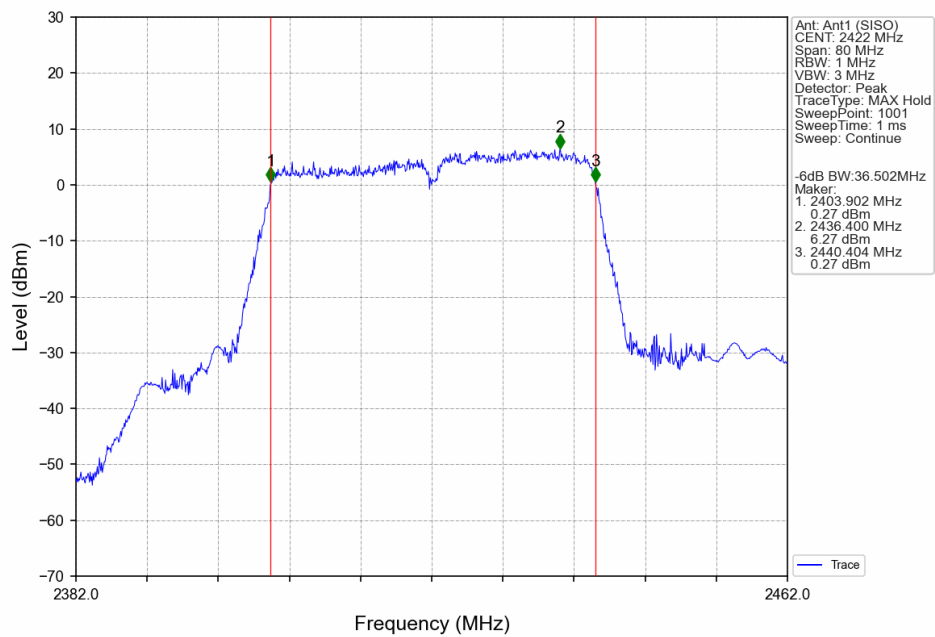
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTNV



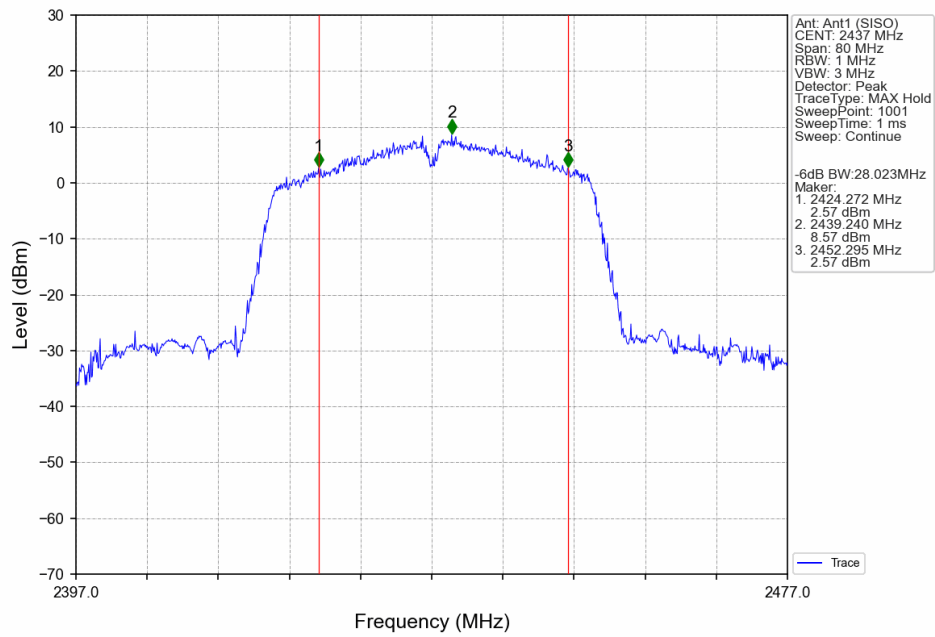
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTNV



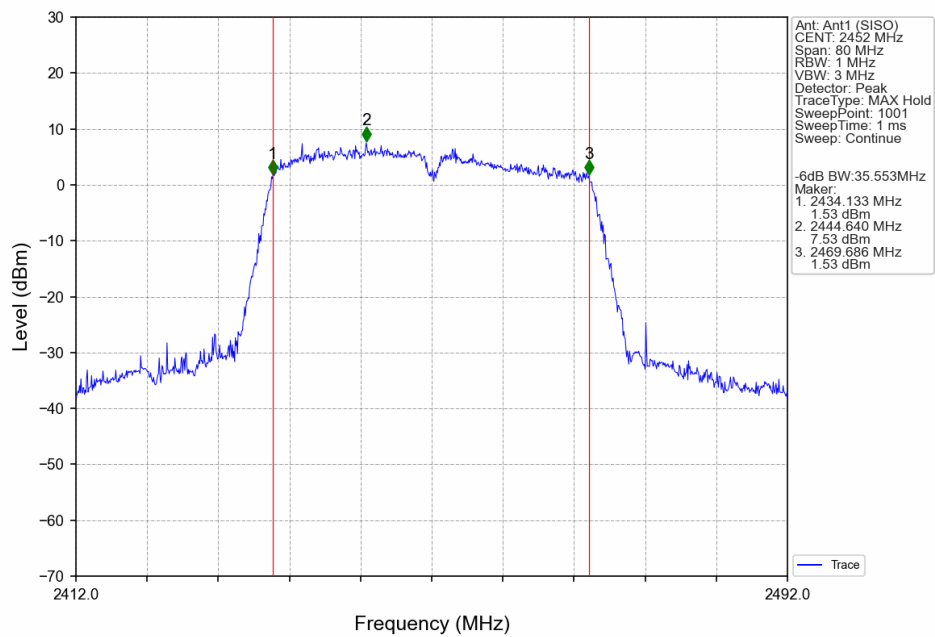
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTNV



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTNV



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTNV



3. Maximum Conducted Output Power

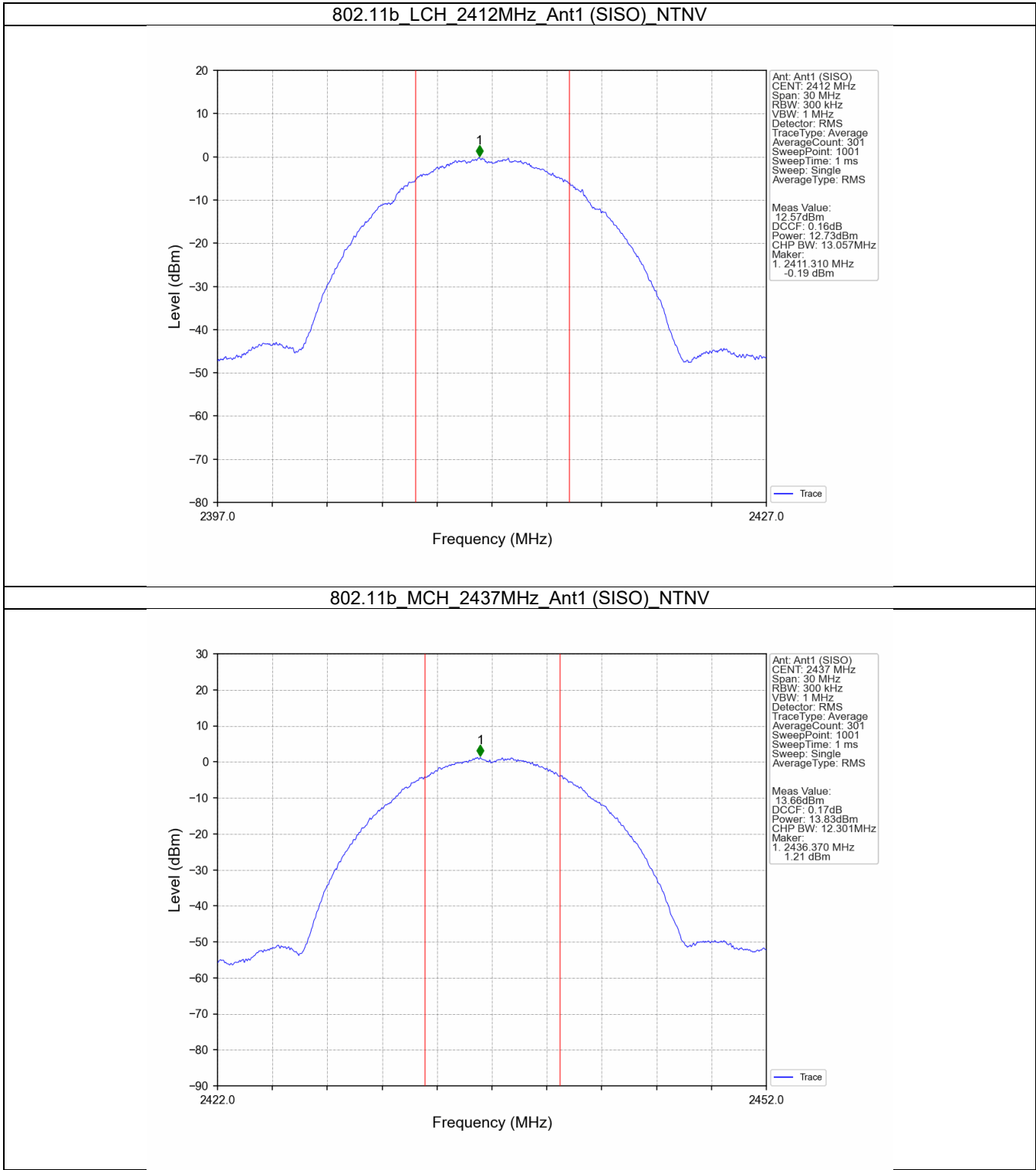
3.1 Test Result

3.1.1 Power

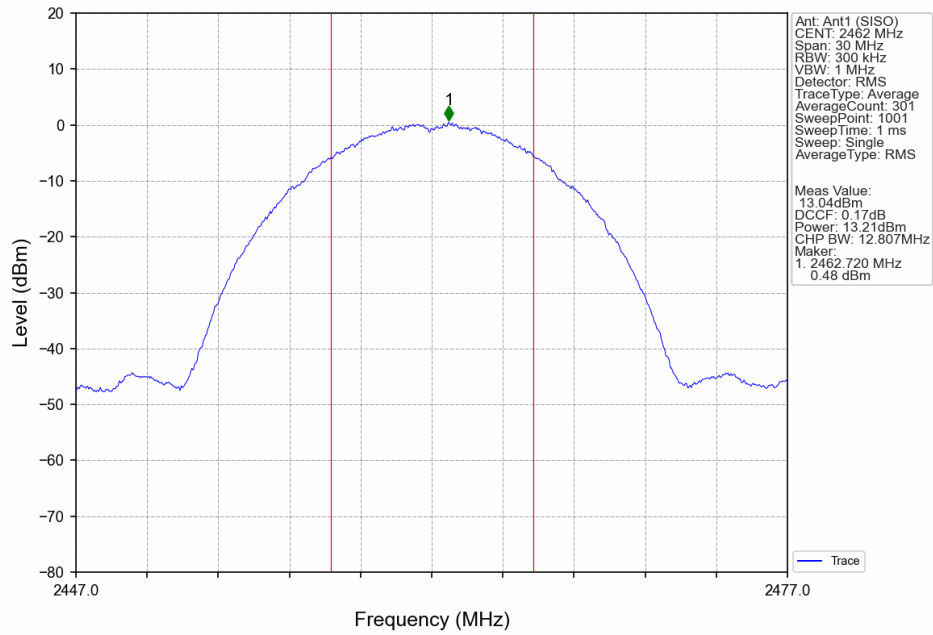
Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	12.73	<=30	Pass
		2437	13.83	<=30	Pass
		2462	13.21	<=30	Pass
802.11g	SISO	2412	13.39	<=30	Pass
		2437	13.62	<=30	Pass
		2462	13.46	<=30	Pass
802.11n (HT20)	SISO	2412	12.69	<=30	Pass
		2437	13.01	<=30	Pass
		2462	13.45	<=30	Pass
802.11n (HT40)	SISO	2422	11.42	<=30	Pass
		2437	11.19	<=30	Pass
		2452	11.09	<=30	Pass

3.2 Test Graph

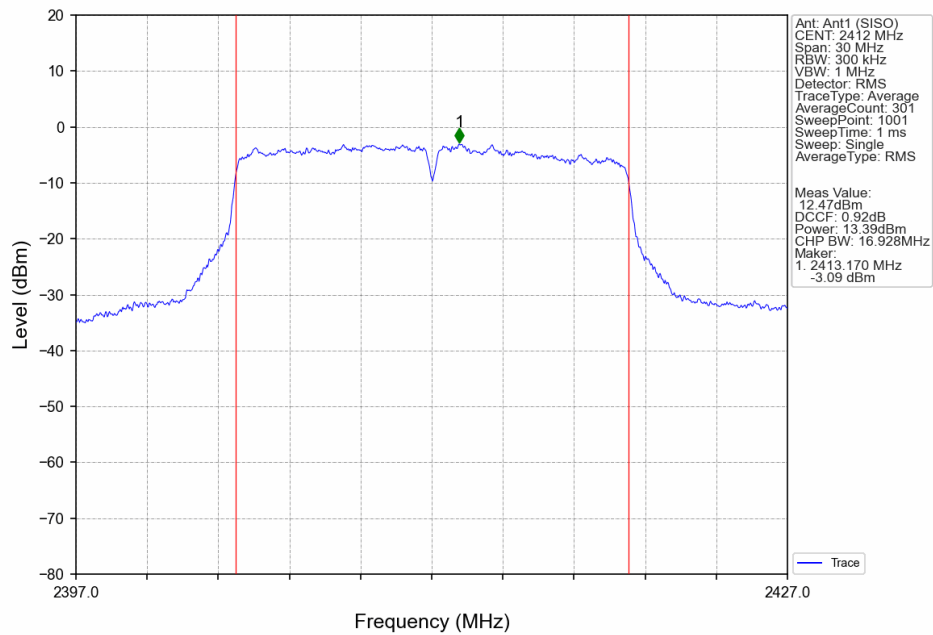
3.2.1 Power



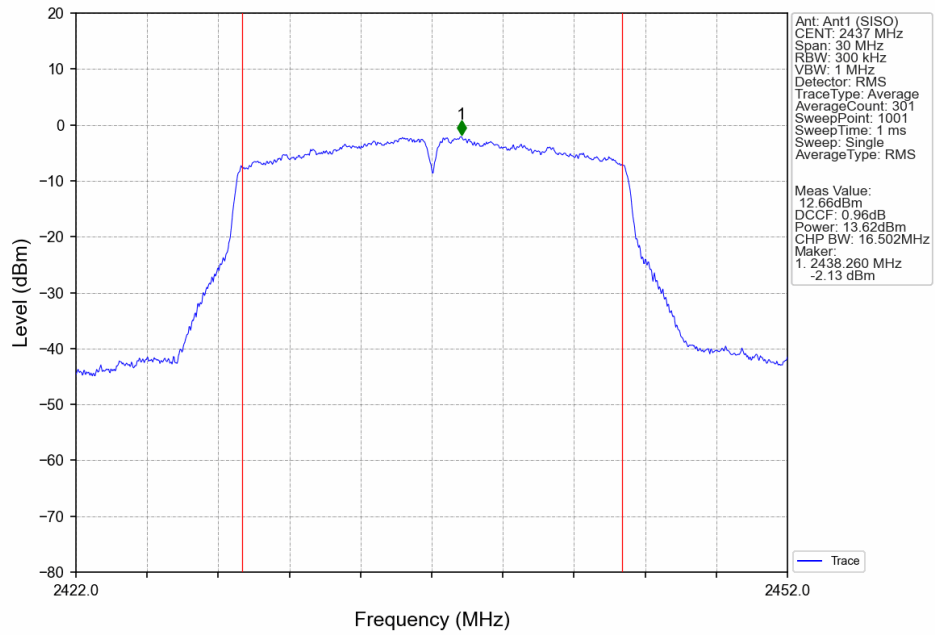
802.11b HCH 2462MHz Ant1 (SISO) NTN



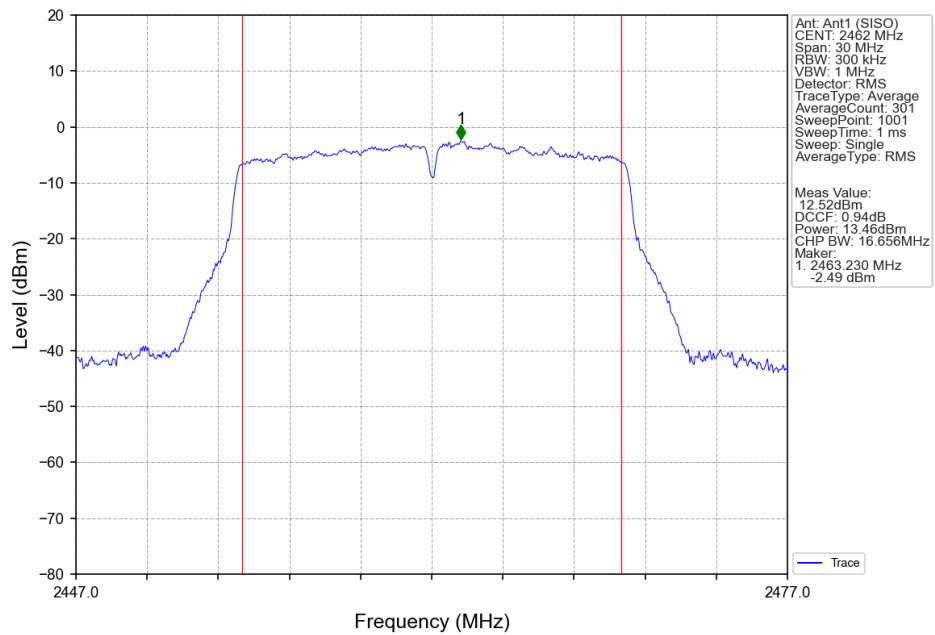
802.11g LCH 2412MHz Ant1 (SISO) NTN



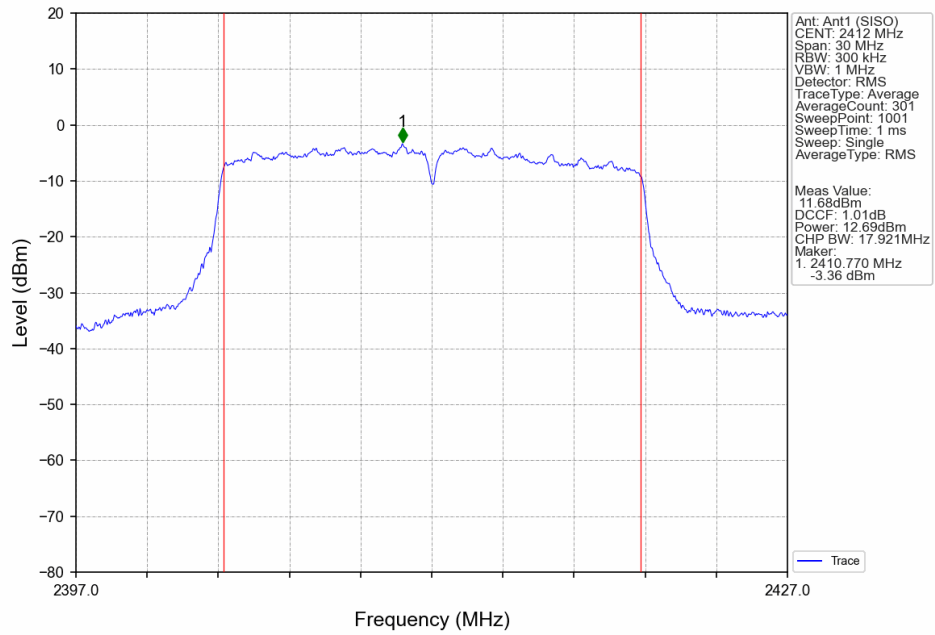
802.11g MCH 2437MHz Ant1 (SISO) NTN



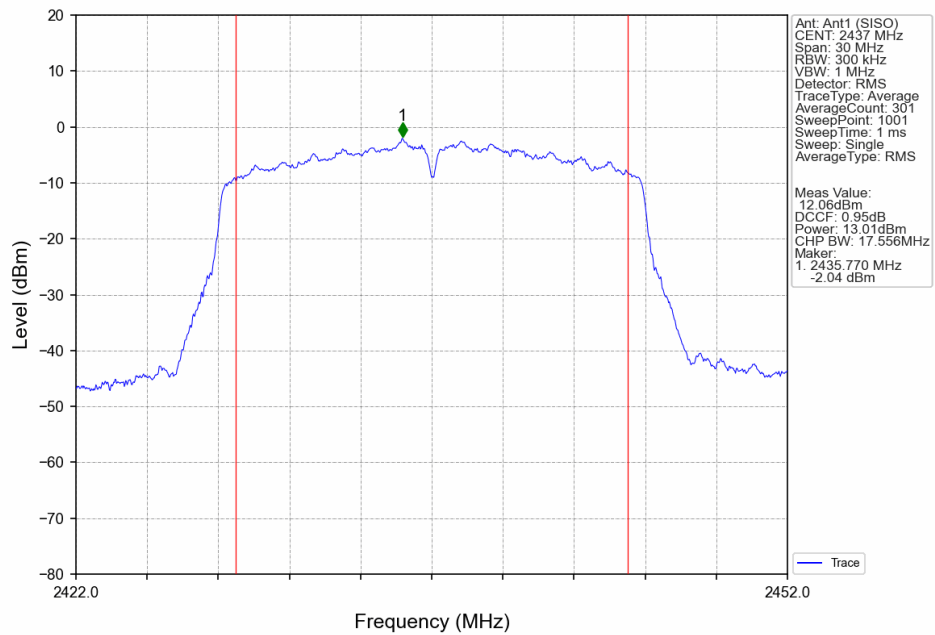
802.11g HCH 2462MHz Ant1 (SISO) NTN



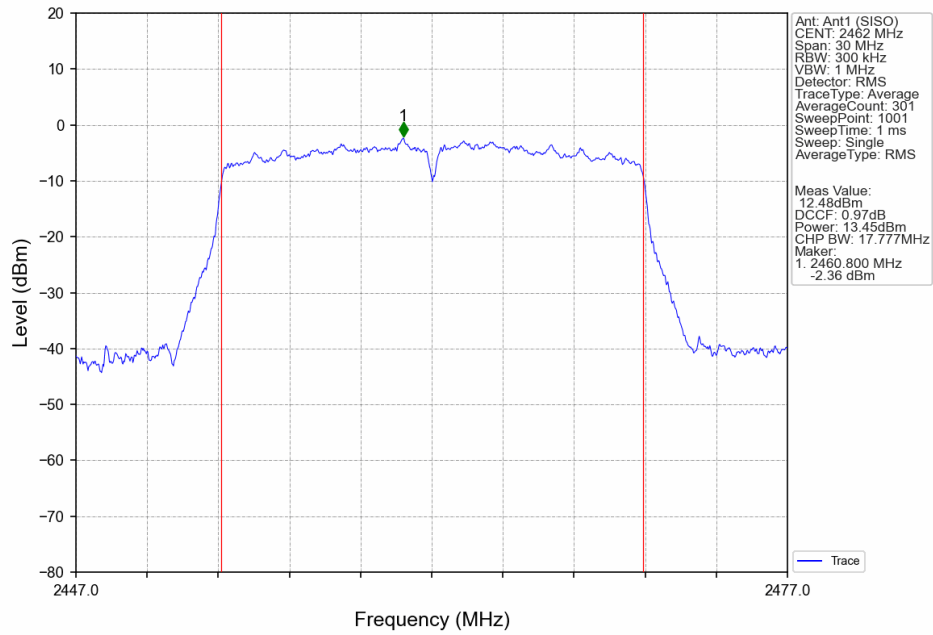
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTNV



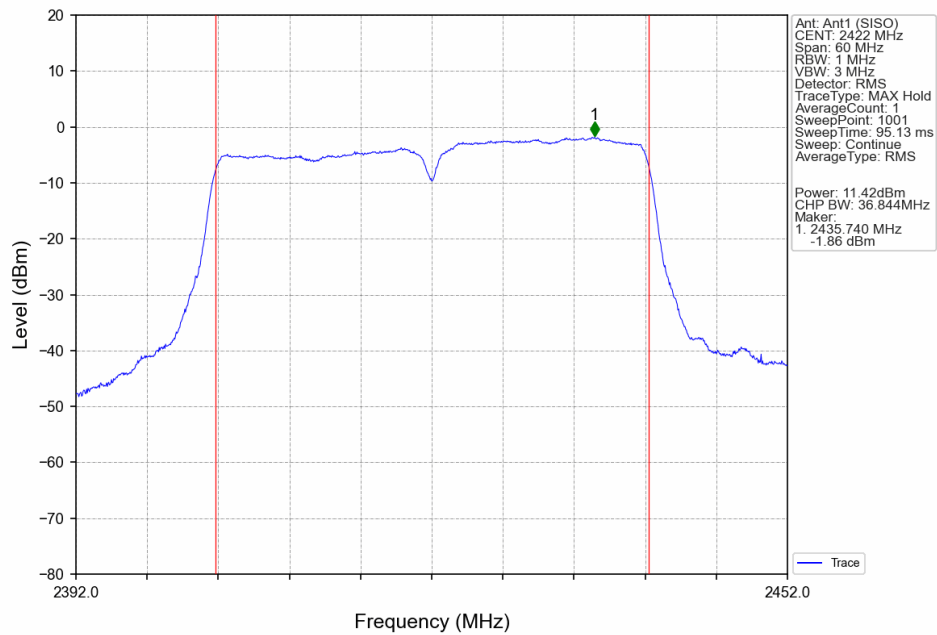
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTNV



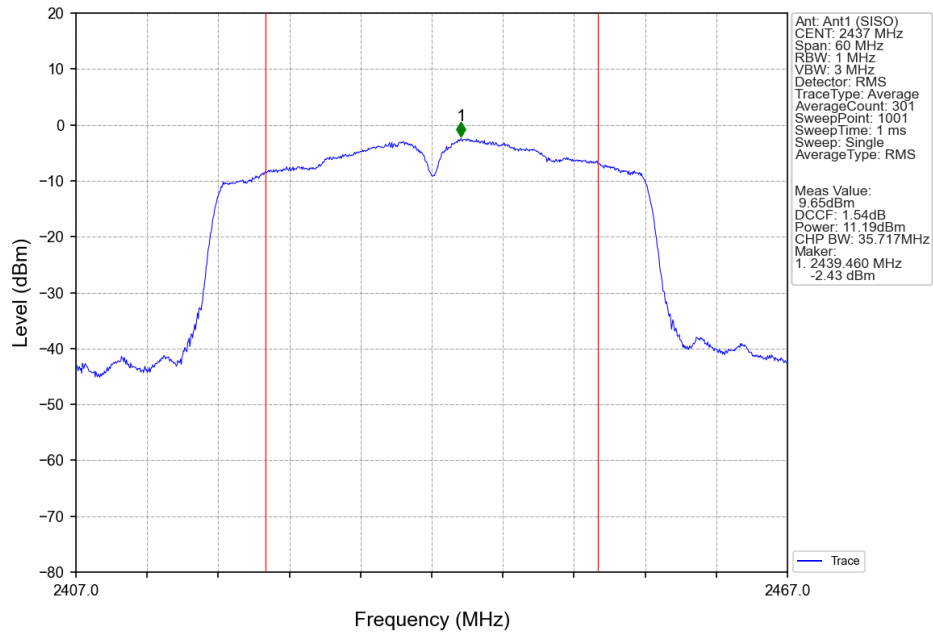
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN



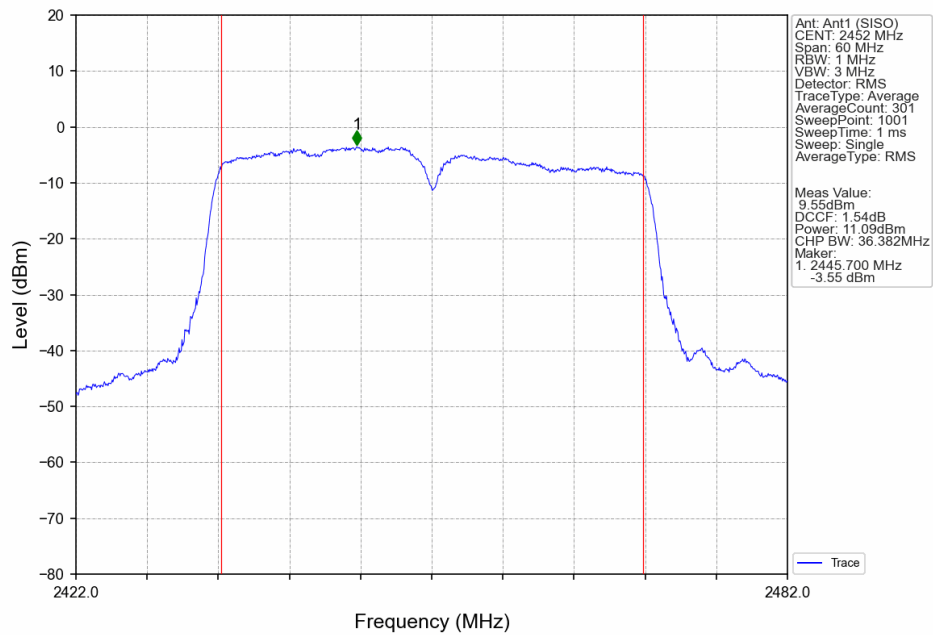
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTN



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTNV



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTNV



4. Maximum Power Spectral Density

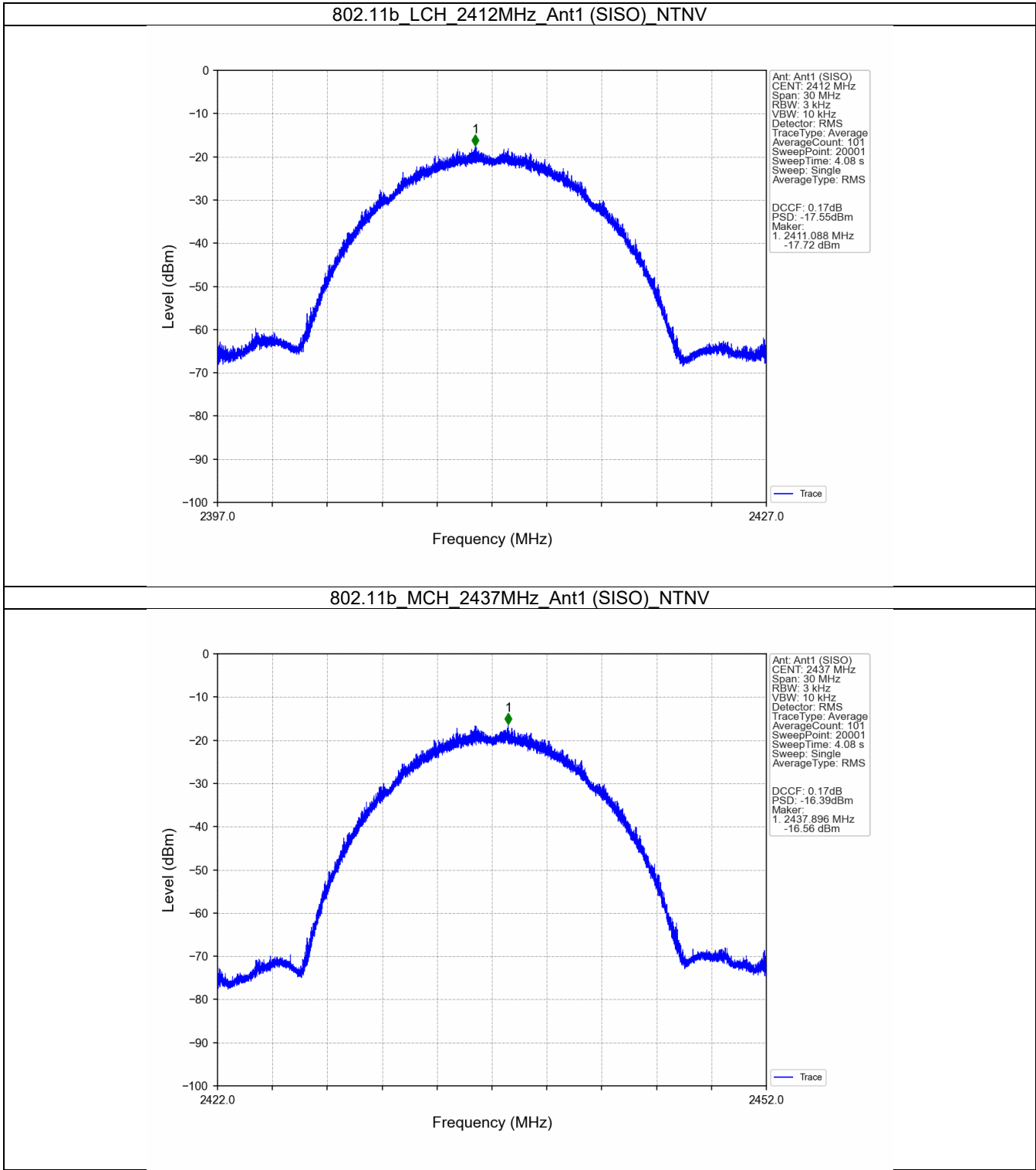
4.1 Test Result

4.1.1 PSD

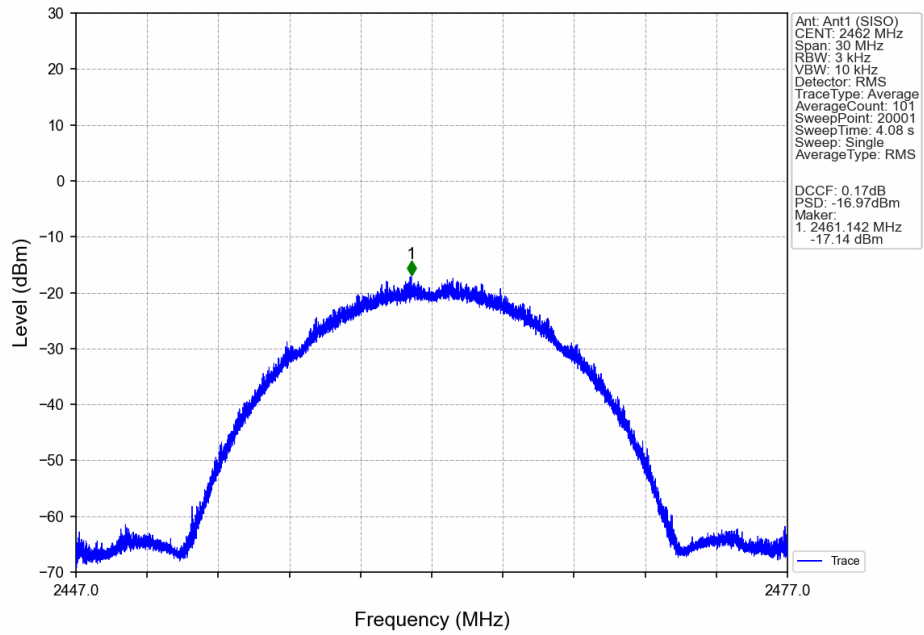
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm)		Verdict
			ANT1	Limit(dBm/3kHz)	
802.11b	SISO	2412	-17.55	<=8	Pass
		2437	-16.39	<=8	Pass
		2462	-16.97dBm/3kHz	<=8	Pass
802.11g	SISO	2412	-16.76dBm/3kHz	<=8	Pass
		2437	-15.93dBm/3kHz	<=8	Pass
		2462	-16.33dBm/3kHz	<=8	Pass
802.11n (HT20)	SISO	2412	-15.89dBm/3kHz	<=8	Pass
		2437	-15.65dBm/3kHz	<=8	Pass
		2462	-16.01dBm/3kHz	<=8	Pass
802.11n (HT40)	SISO	2422	-16.78dBm/3kHz	<=8	Pass
		2437	-17.37dBm/3kHz	<=8	Pass
		2452	-18.03dBm/3kHz	<=8	Pass

4.2 Test Graph

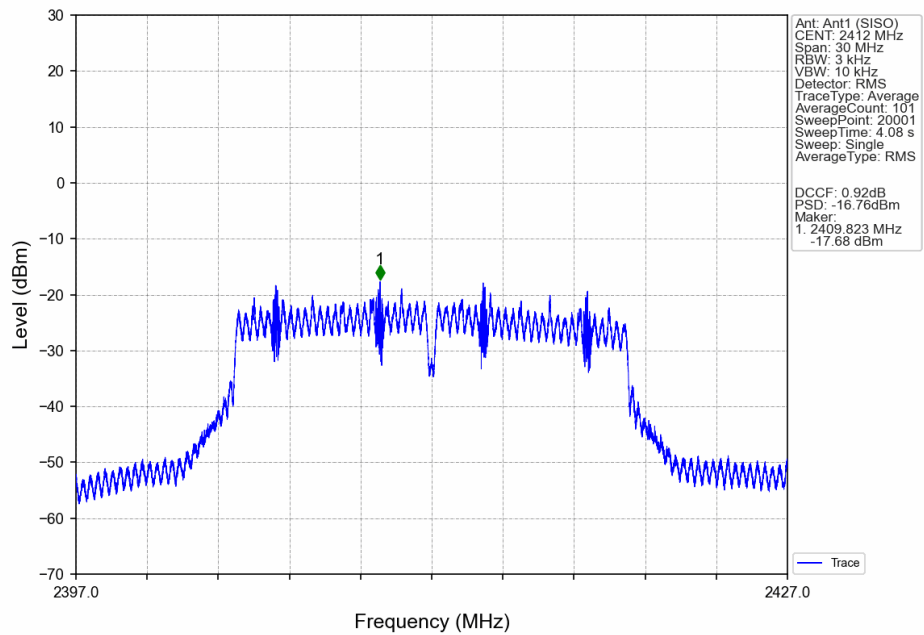
4.2.1 PSD



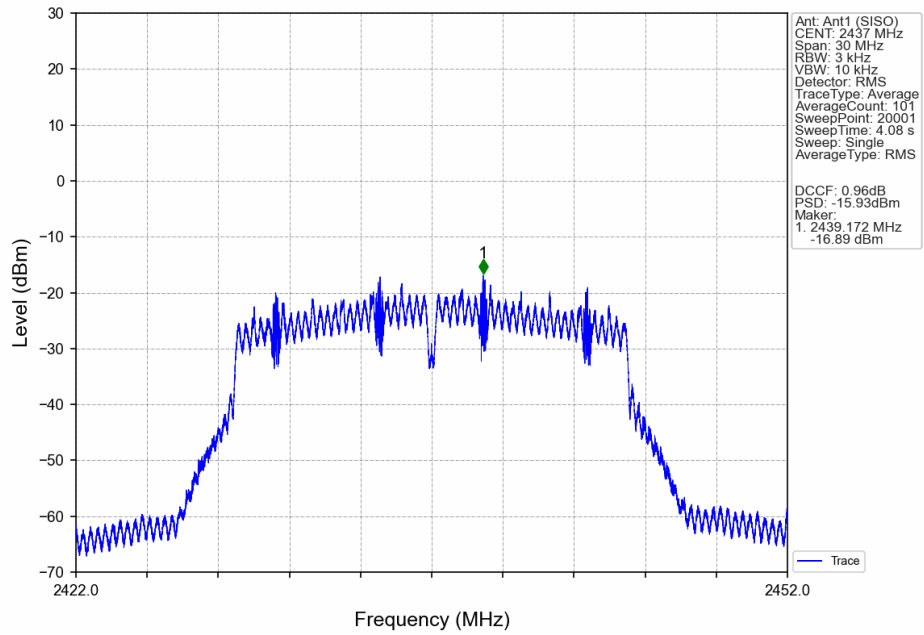
802.11b HCH 2462MHz Ant1 (SISO) NTN



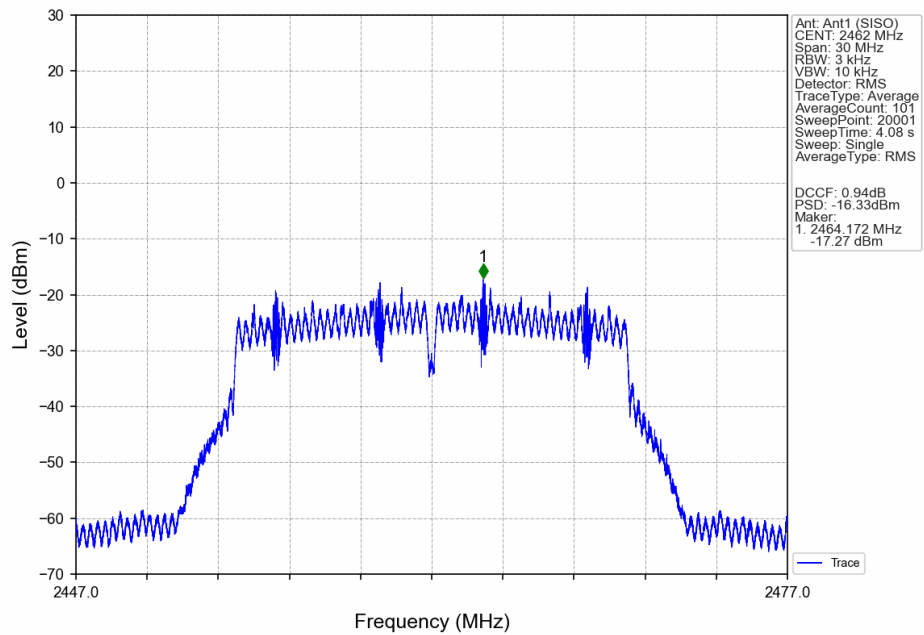
802.11g LCH 2412MHz Ant1 (SISO) NTN



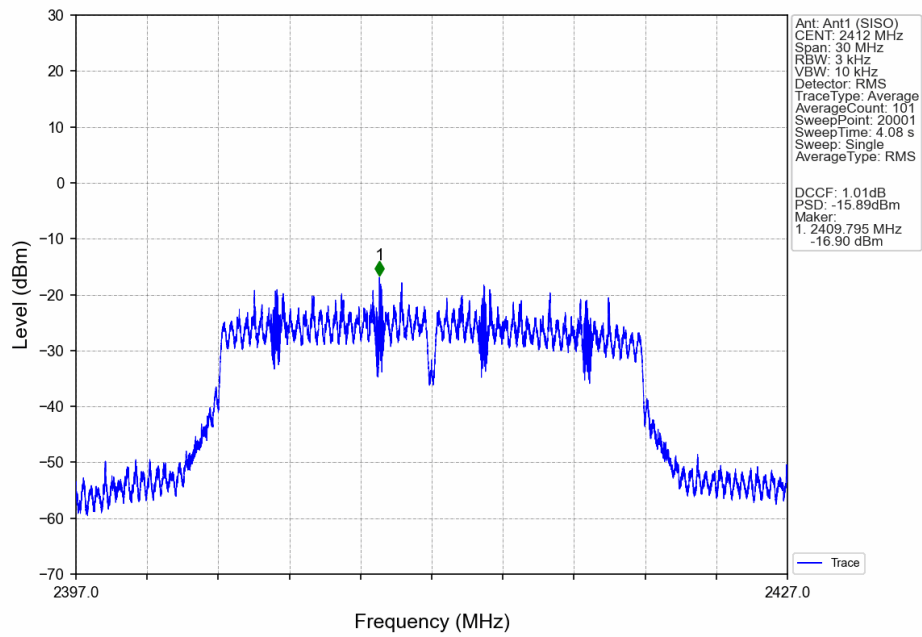
802.11g MCH 2437MHz Ant1 (SISO) NTN



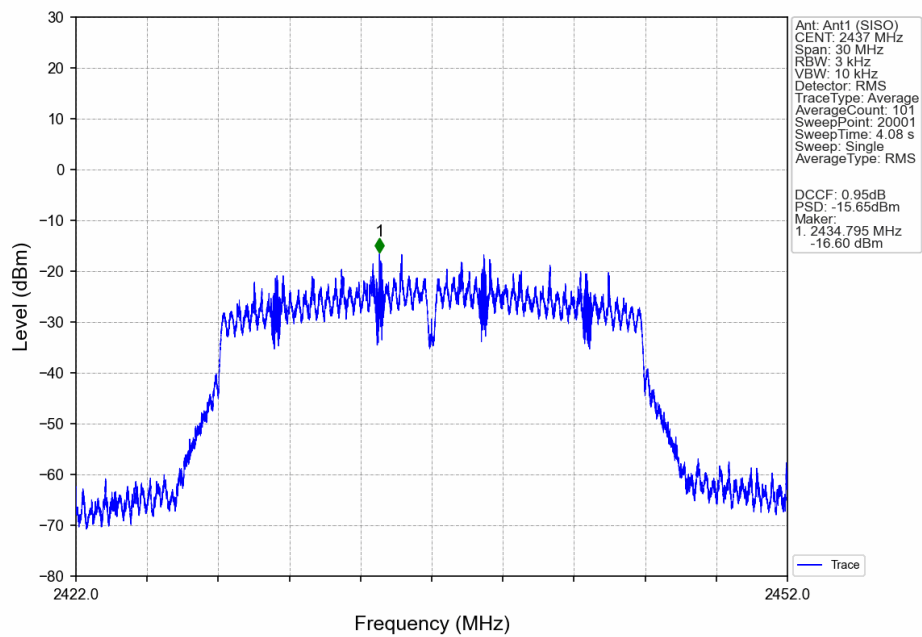
802.11g HCH 2462MHz Ant1 (SISO) NTN



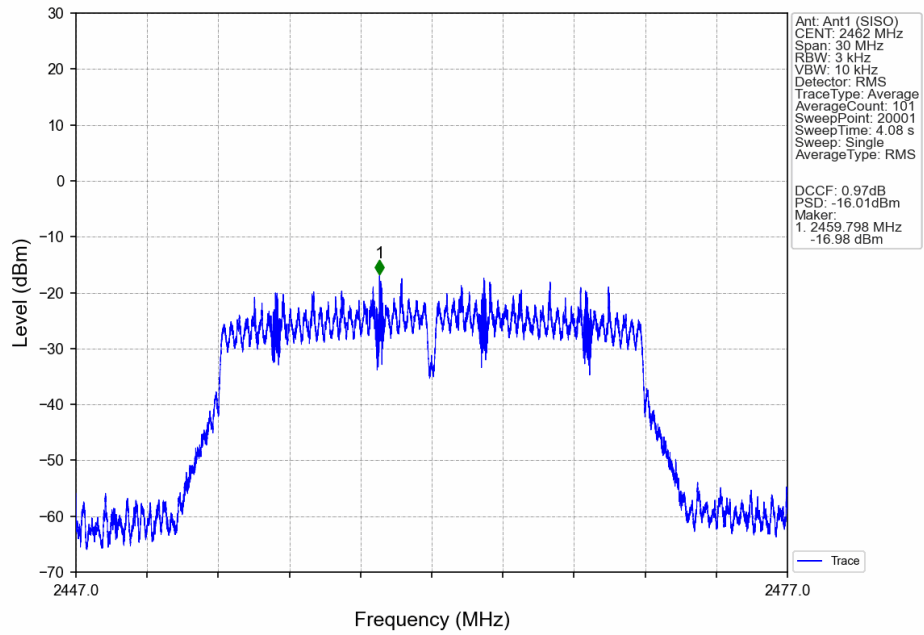
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTNV



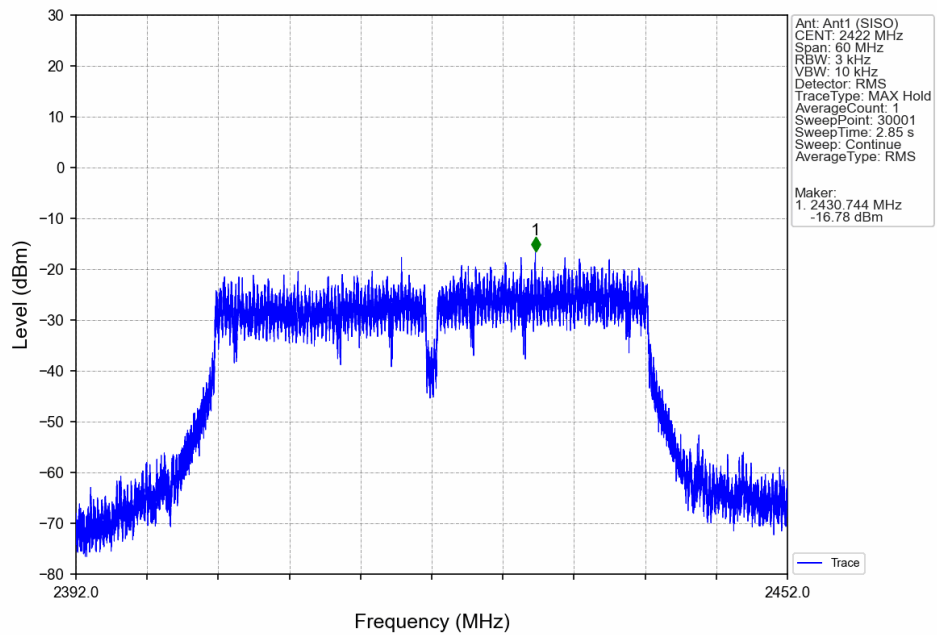
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTNV



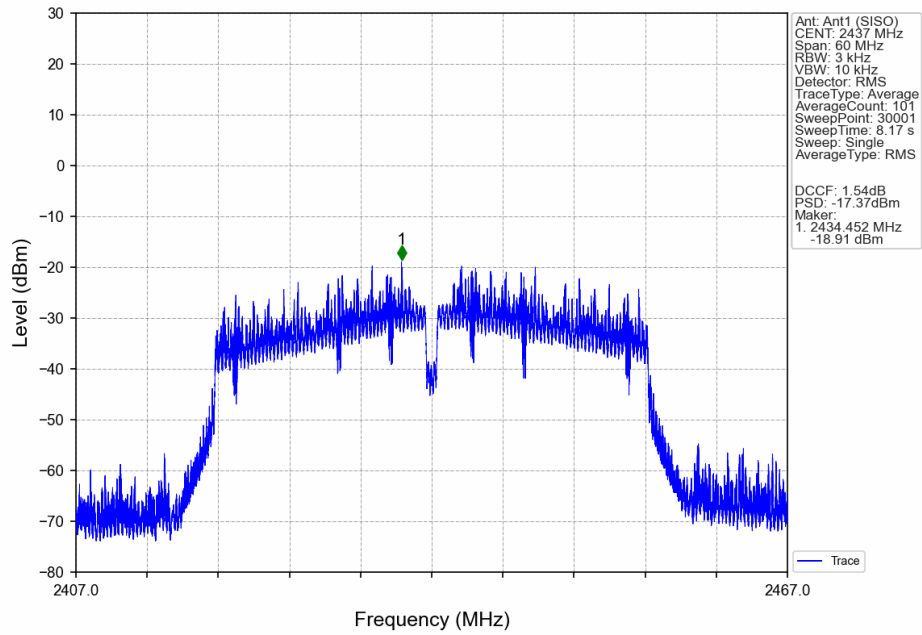
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN



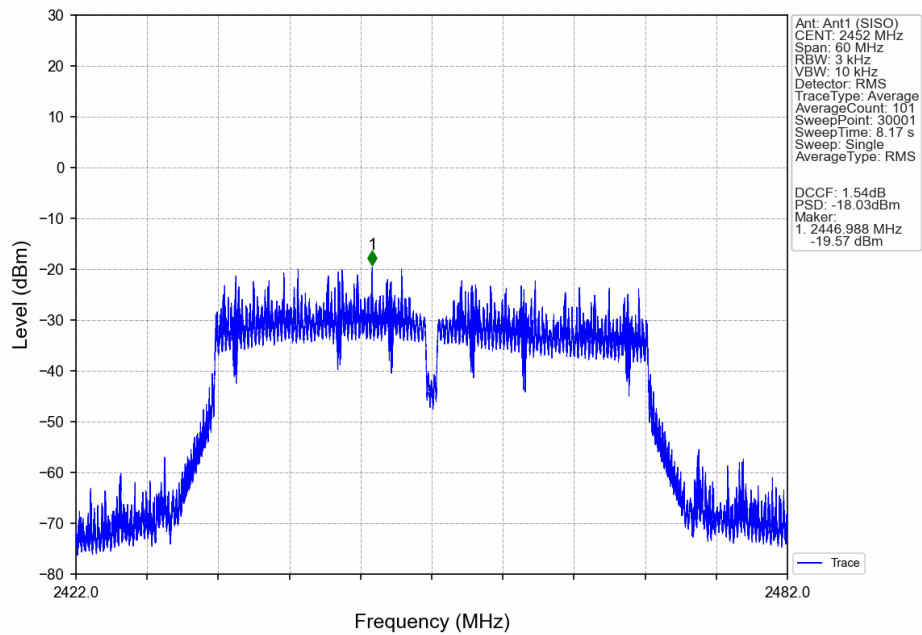
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTN



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTN



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTN



5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Test Result

5.1.1 Ref

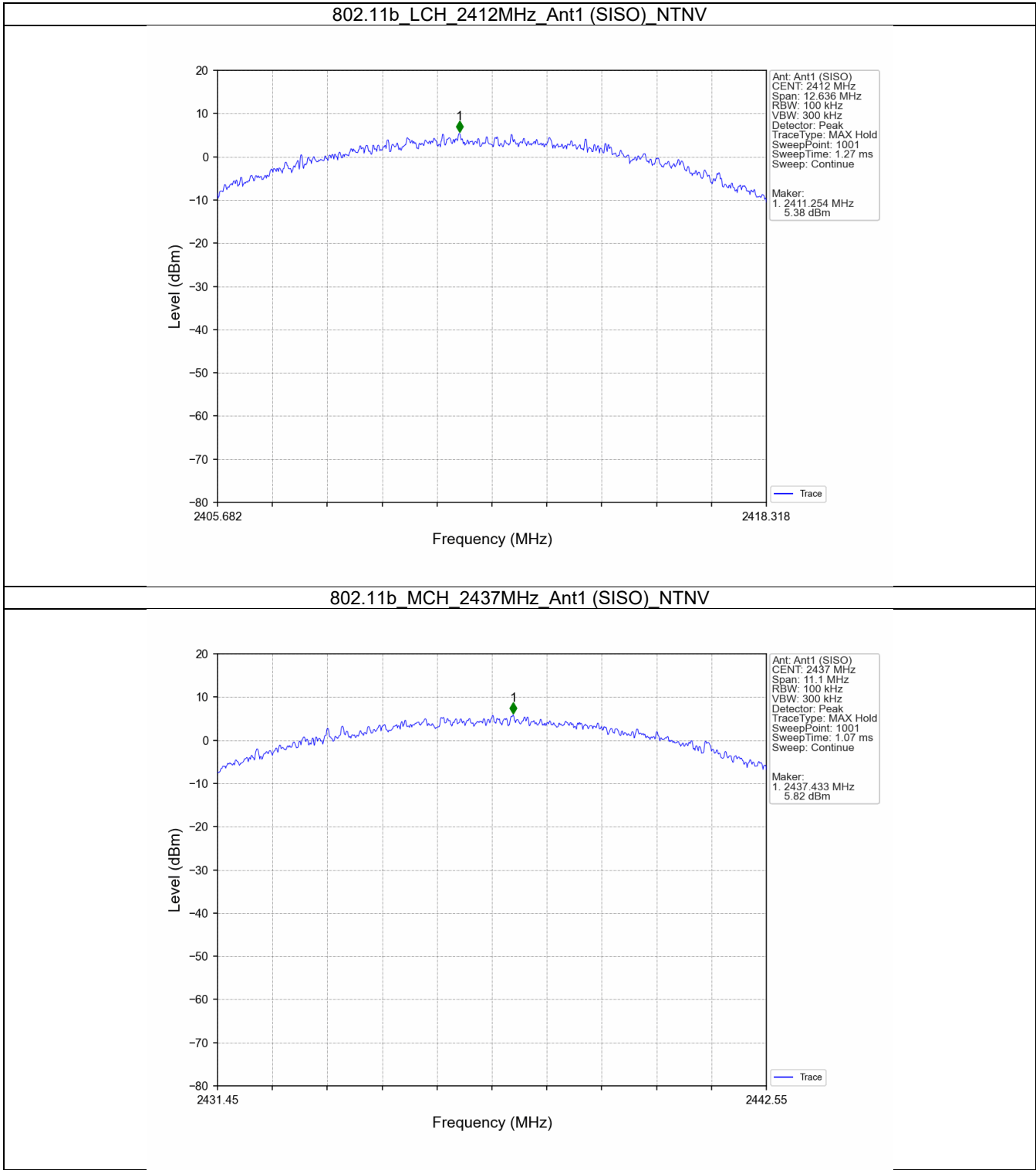
Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	1	5.38
		2437	1	5.82
		2462	1	6.62
802.11g	SISO	2412	1	0.86
		2437	1	4.07
		2462	1	3.54
802.11n (HT20)	SISO	2412	1	0.80
		2437	1	3.28
		2462	1	3.42
802.11n (HT40)	SISO	2422	1	-2.10
		2437	1	-0.05
		2452	1	-1.61

5.1.2 CSE

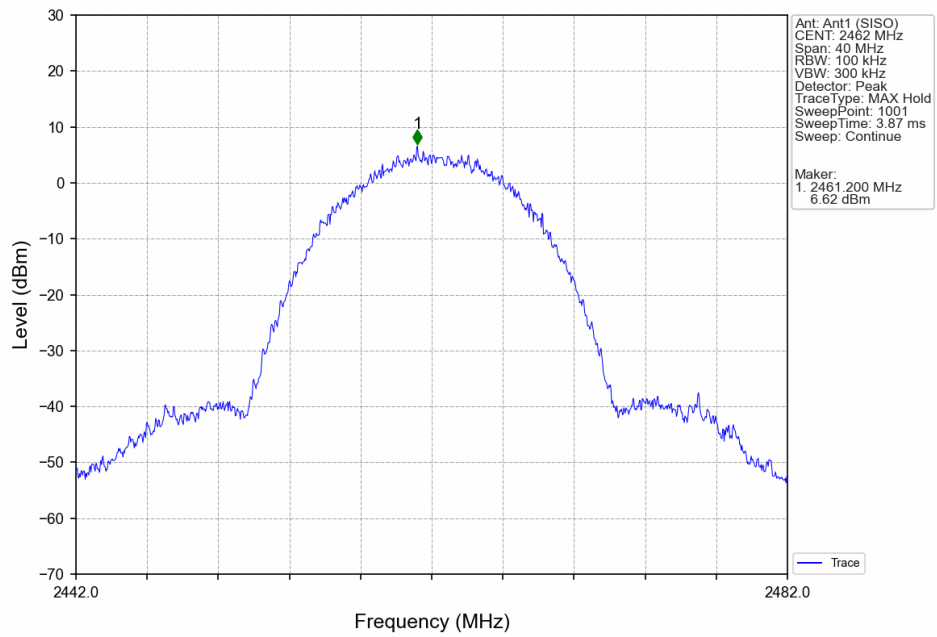
Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	5.38	-24.62	Pass
		2437	1	5.82	-24.18	Pass
		2462	1	6.62	-23.38	Pass
802.11g	SISO	2412	1	0.86	-29.14	Pass
		2437	1	4.07	-25.93	Pass
		2462	1	3.54	-26.46	Pass
802.11n (HT20)	SISO	2412	1	0.80	-29.20	Pass
		2437	1	3.28	-26.72	Pass
		2462	1	3.42	-26.58	Pass
802.11n (HT40)	SISO	2422	1	-2.10	-32.10	Pass
		2437	1	-0.05	-30.05	Pass
		2452	1	-1.61	-31.61	Pass

5.2 Test Graph

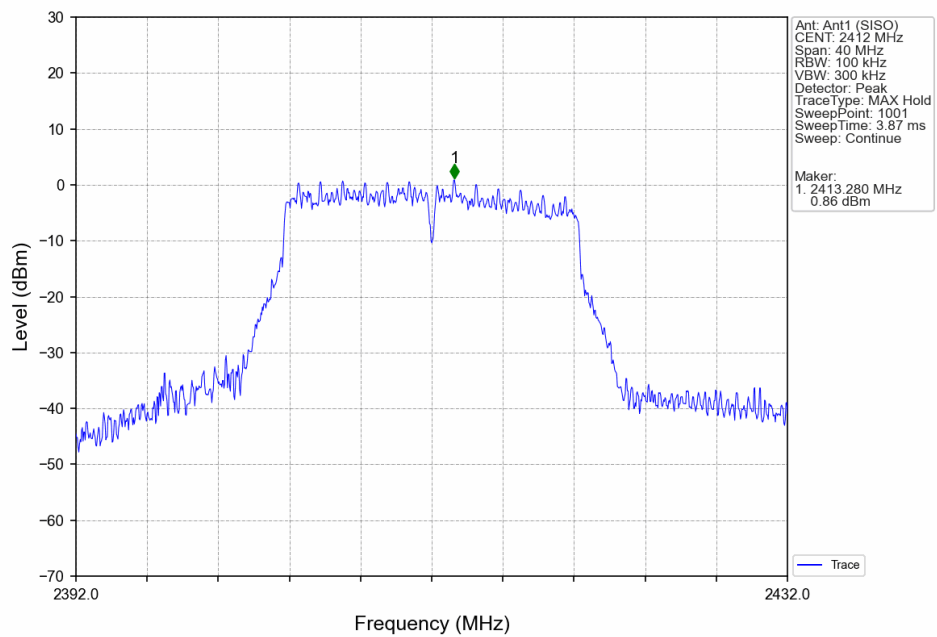
5.2.1 Ref



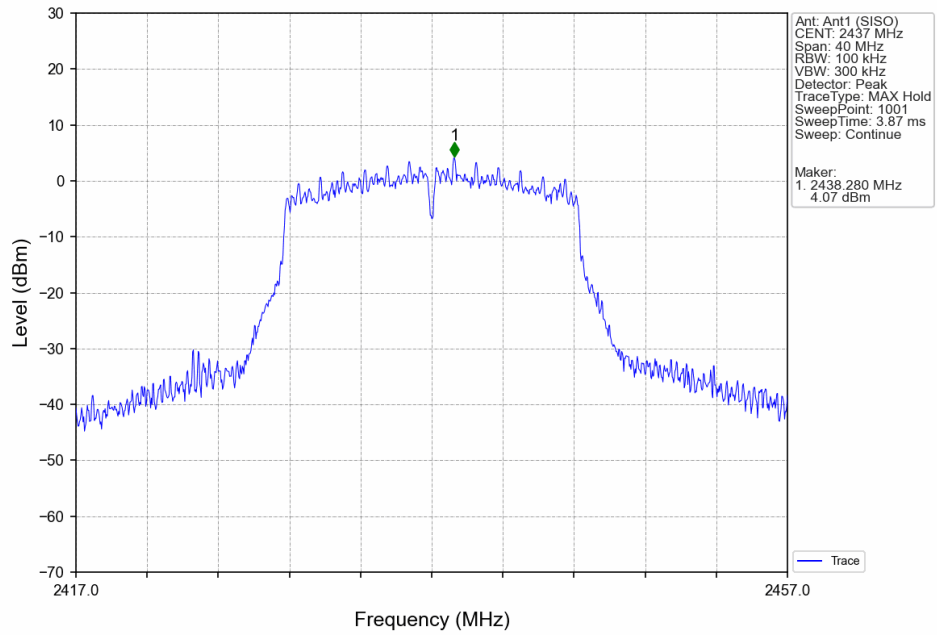
802.11b HCH 2462MHz Ant1 (SISO) NTN



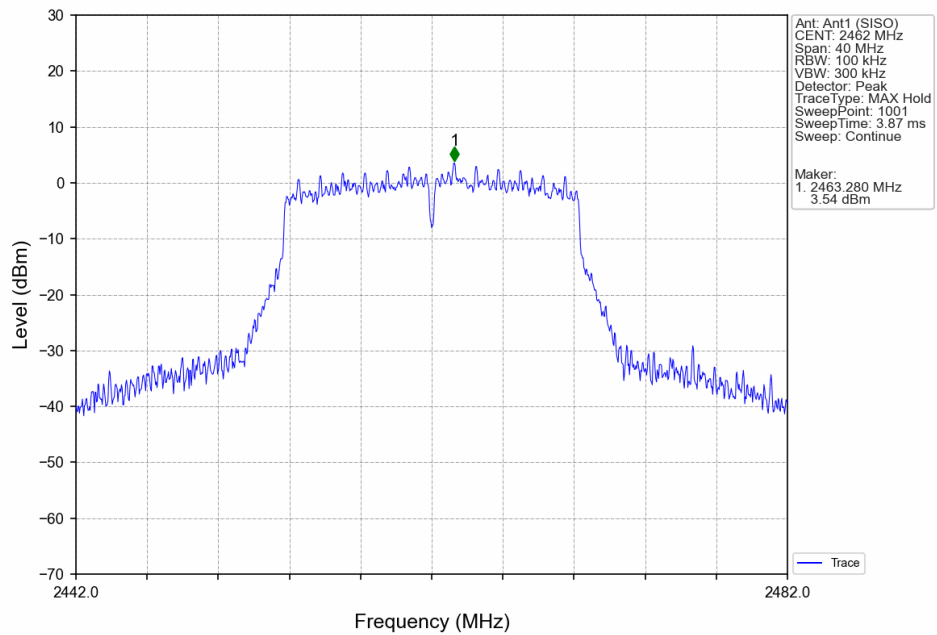
802.11g LCH 2412MHz Ant1 (SISO) NTN



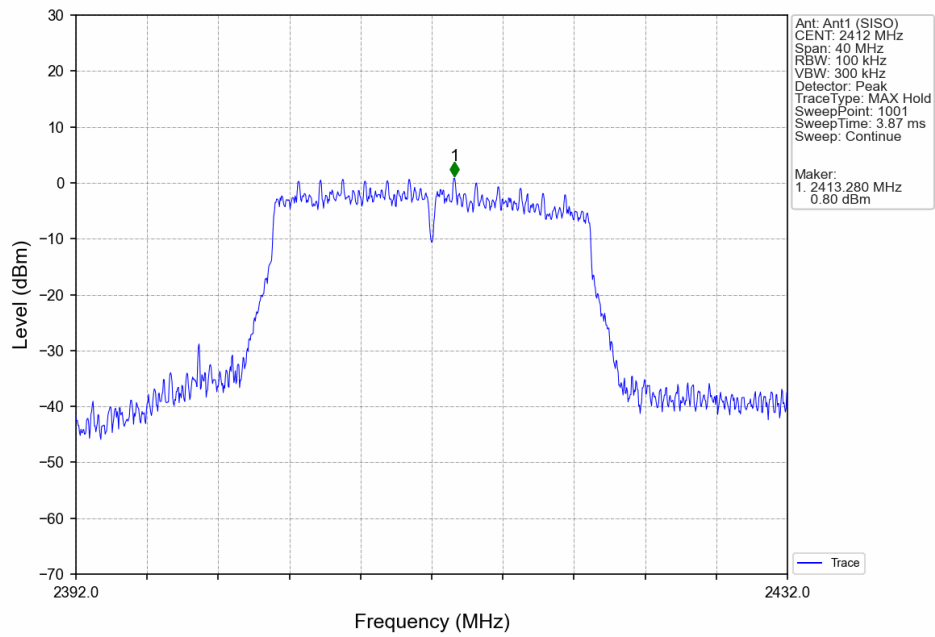
802.11g MCH 2437MHz Ant1 (SISO) NTN



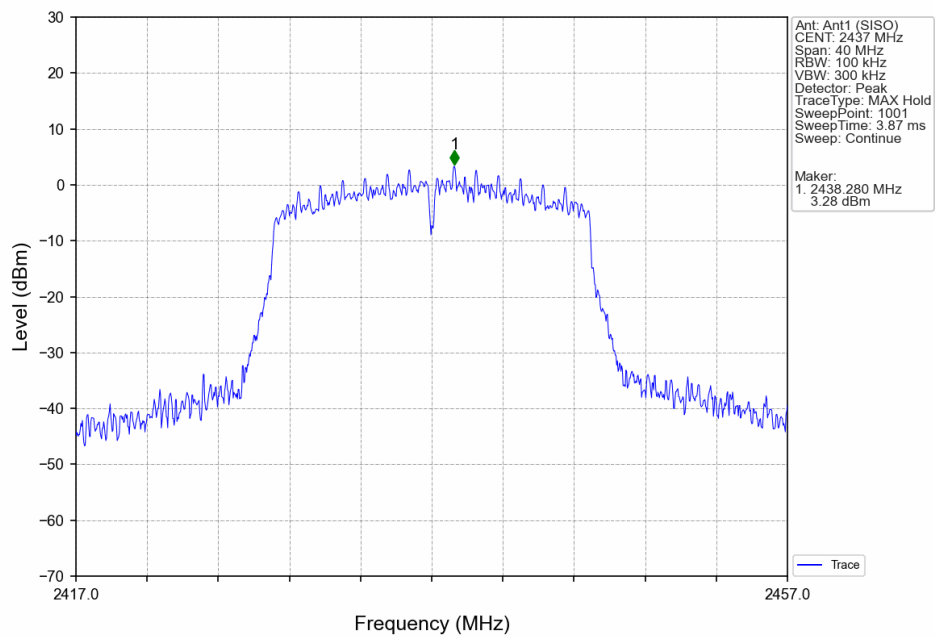
802.11g HCH 2462MHz Ant1 (SISO) NTN



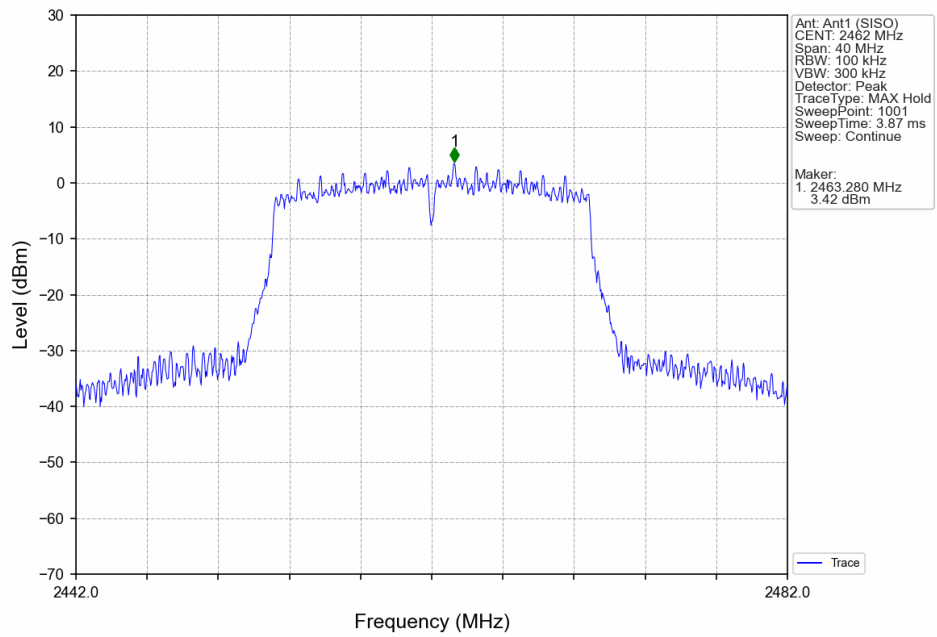
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTN



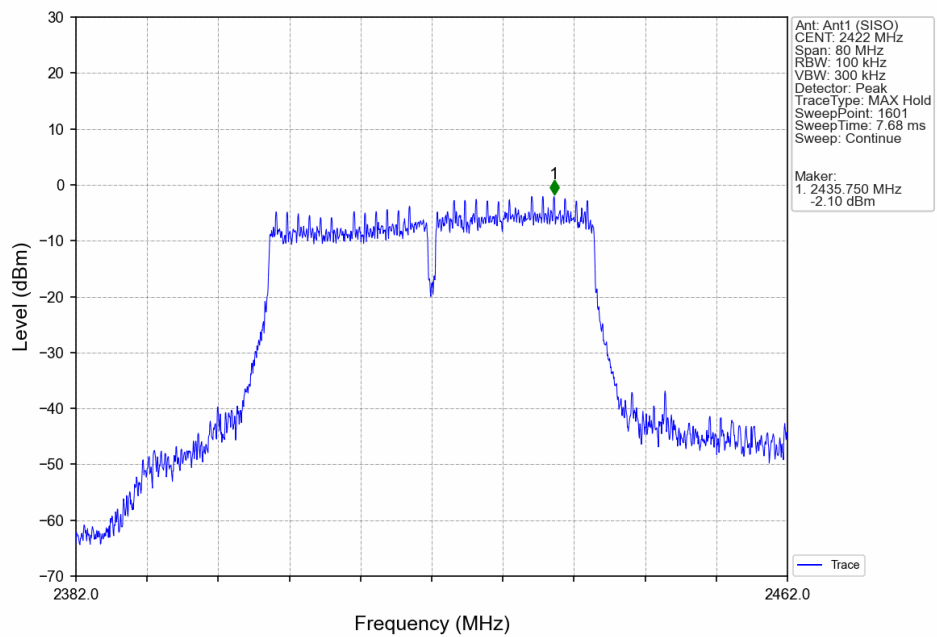
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTN



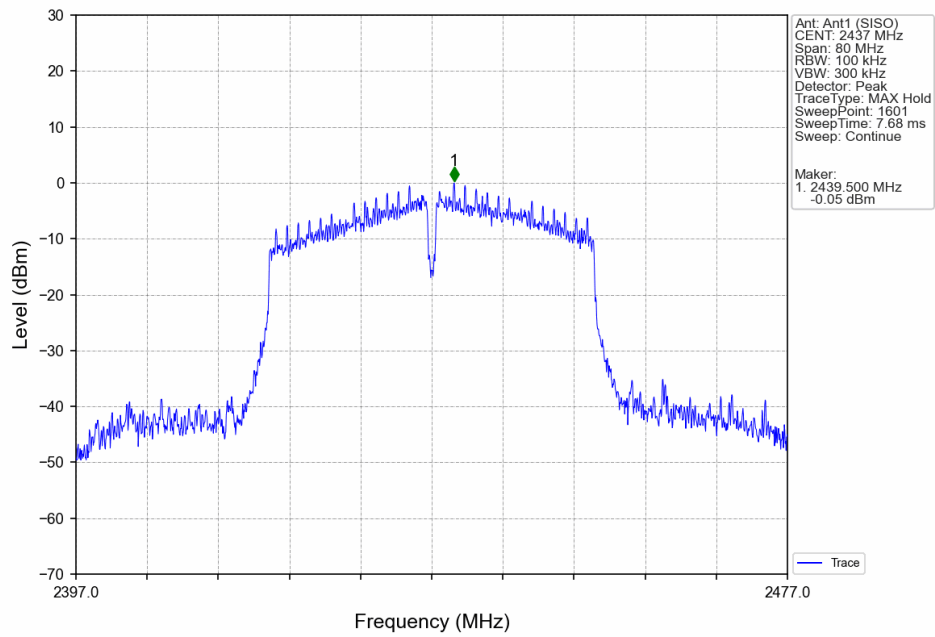
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTNV



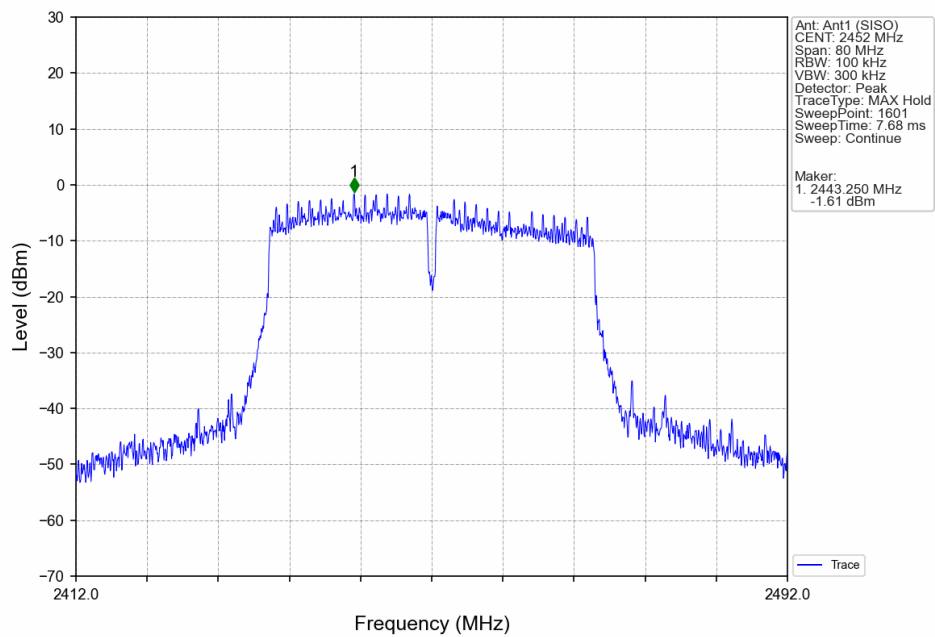
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTNV



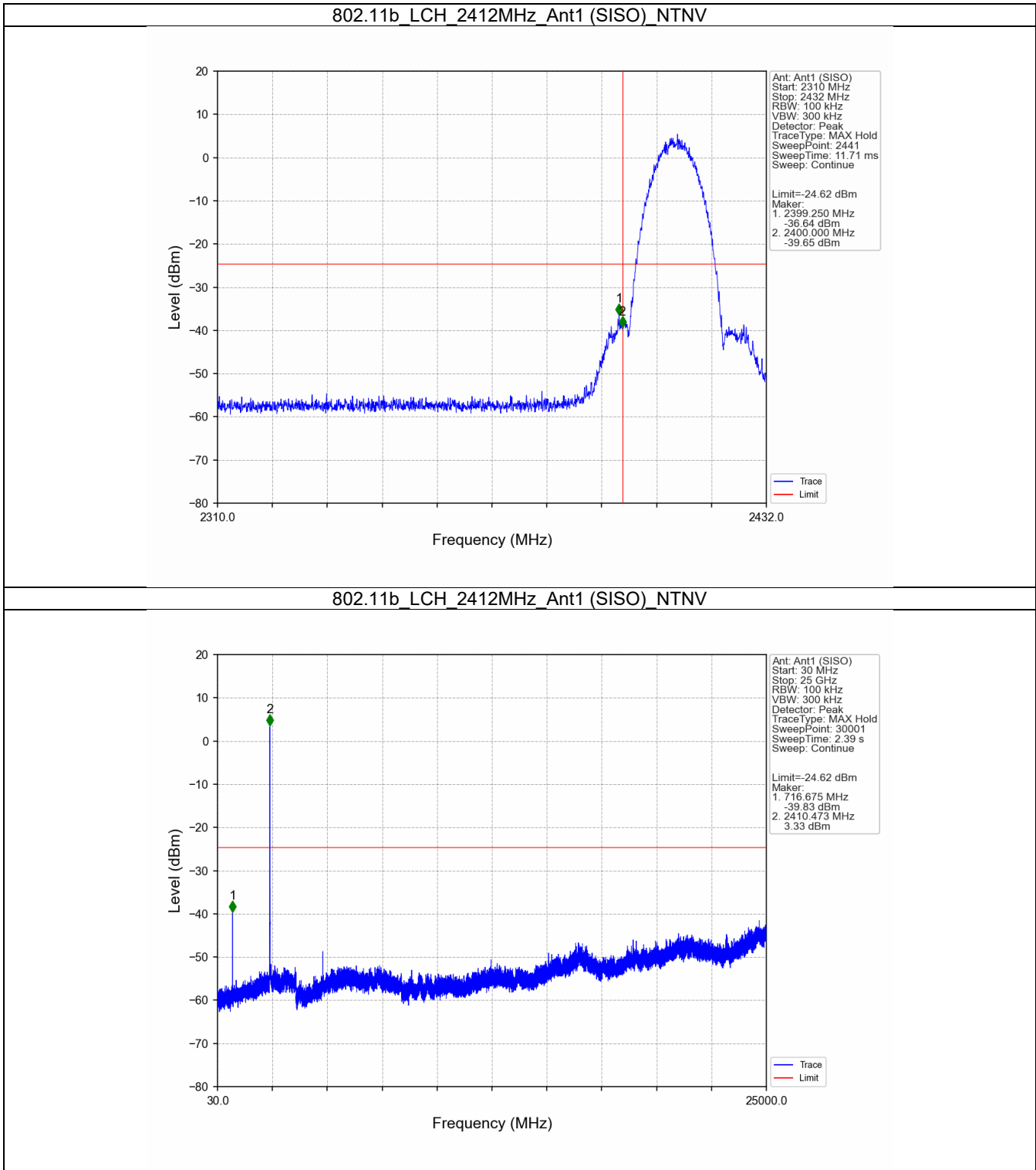
802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTNV



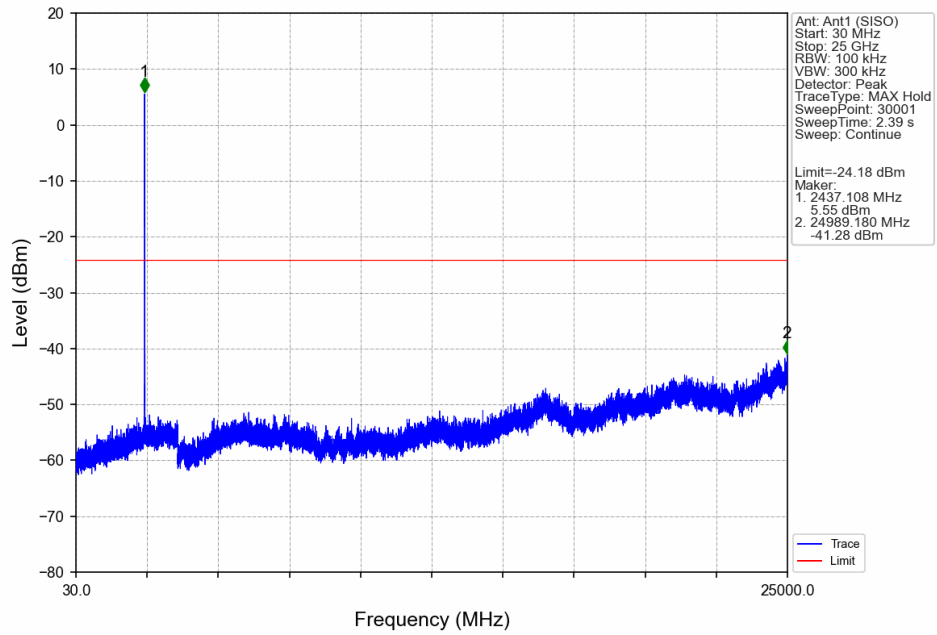
802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTNV



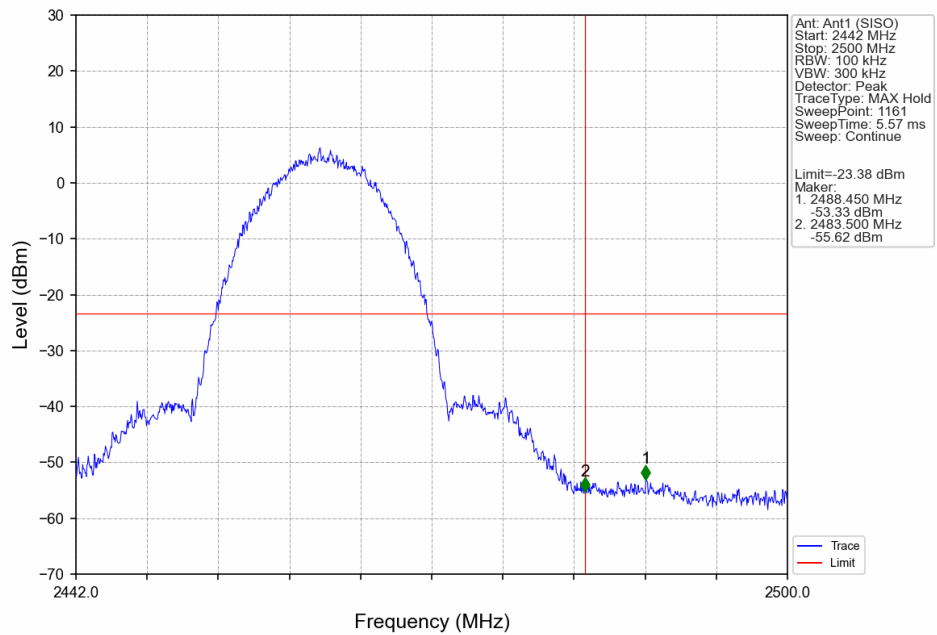
5.2.2 CSE



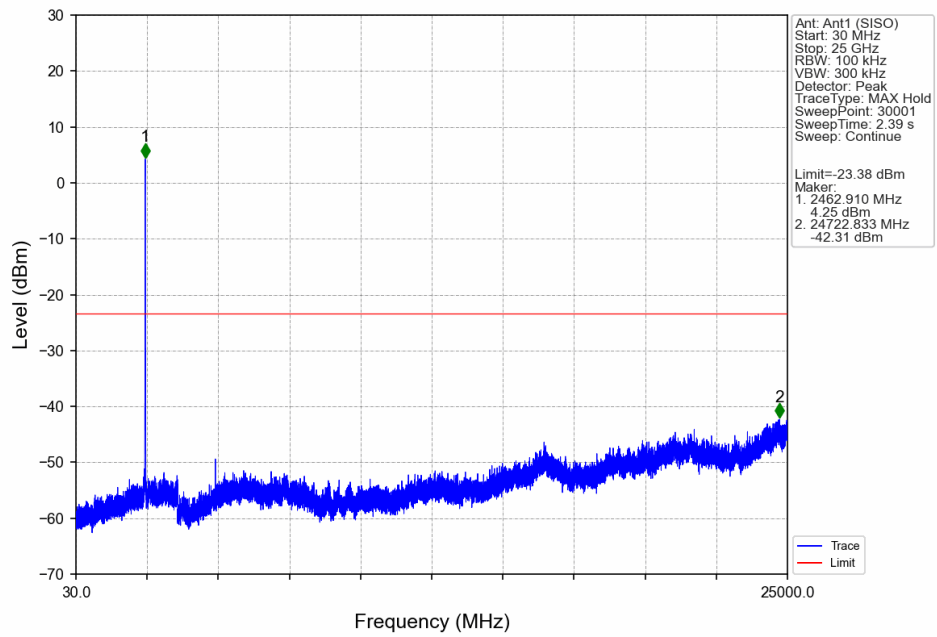
802.11b MCH 2437MHz Ant1 (SISO) NTN



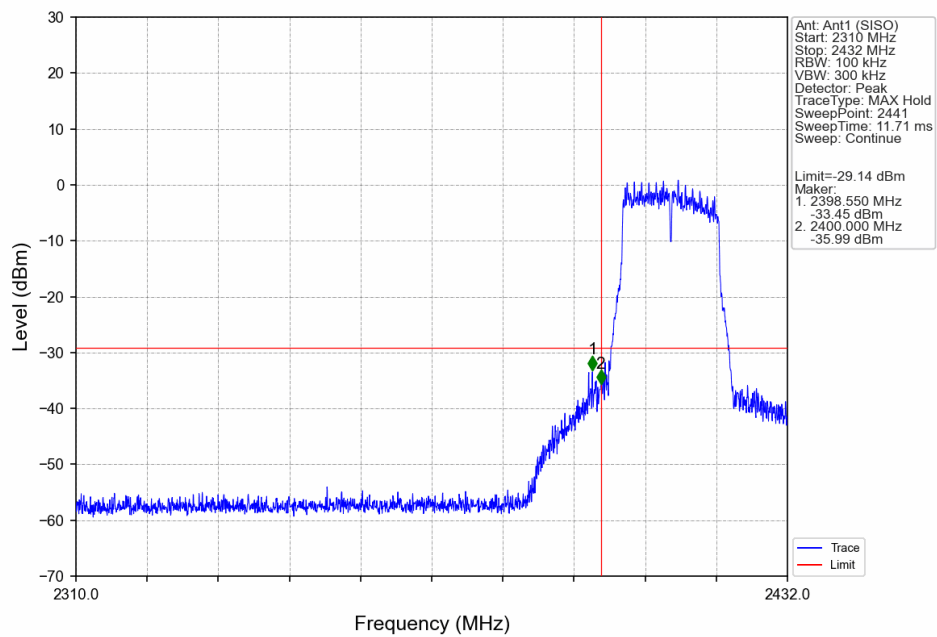
802.11b HCH 2462MHz Ant1 (SISO) NTN



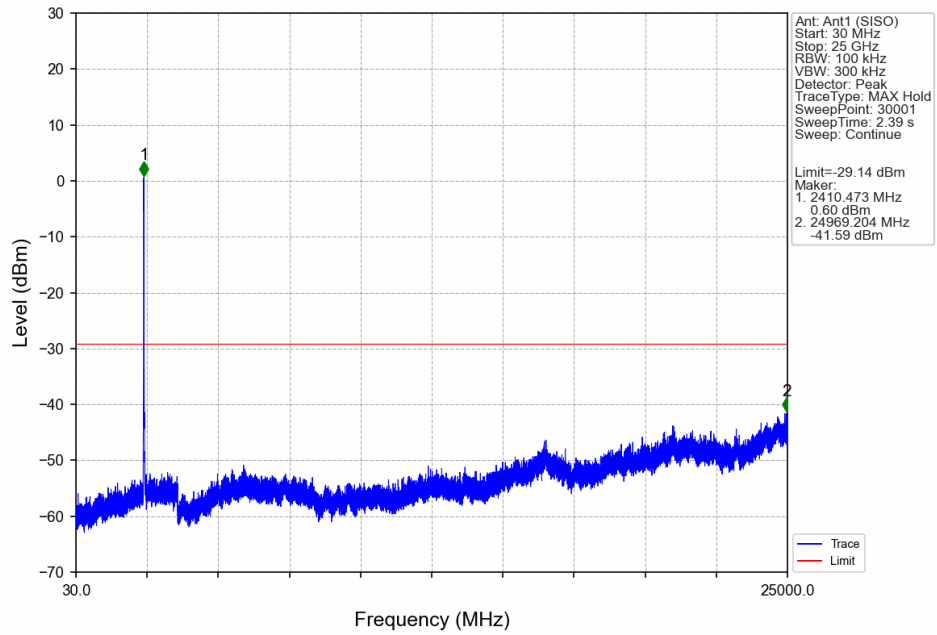
802.11b HCH 2462MHz Ant1 (SISO) NTN



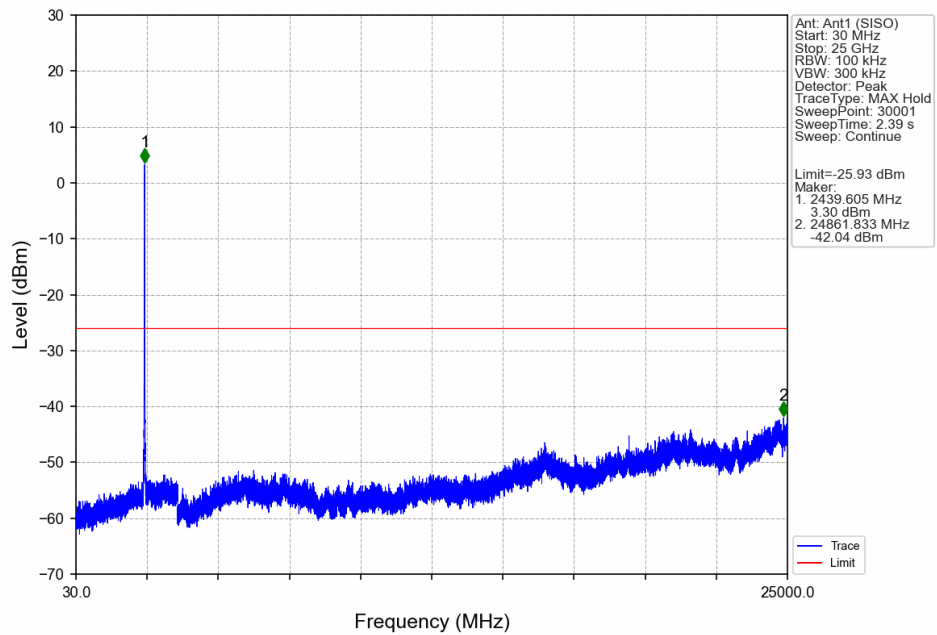
802.11g LCH 2412MHz Ant1 (SISO) NTN



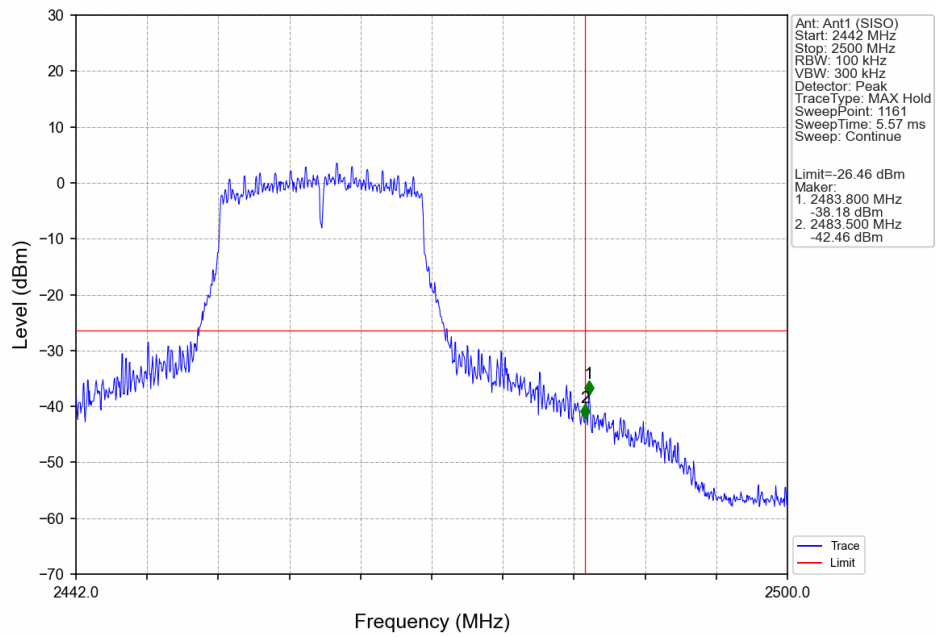
802.11g LCH 2412MHz Ant1 (SISO) NTN



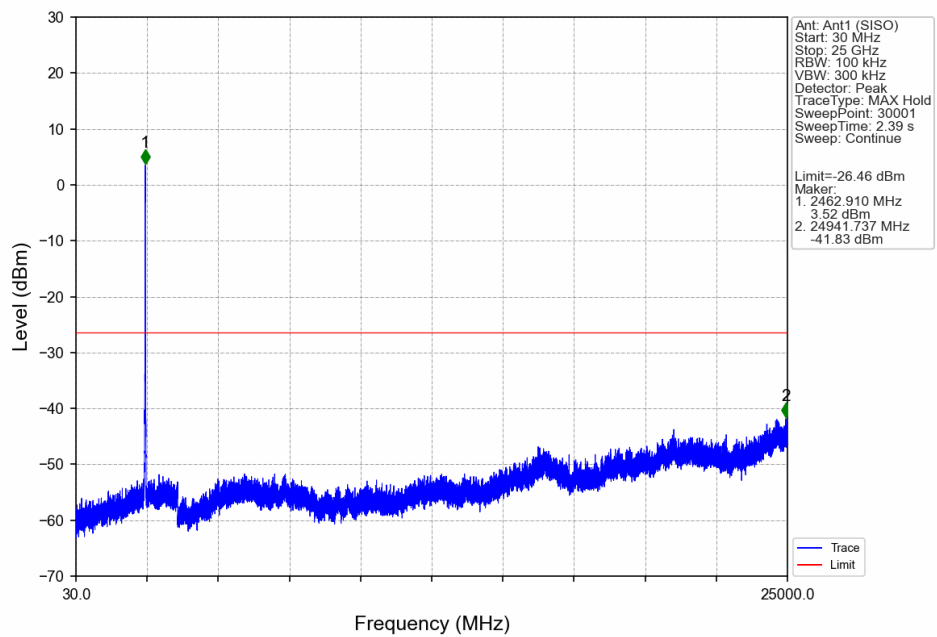
802.11g MCH 2437MHz Ant1 (SISO) NTN



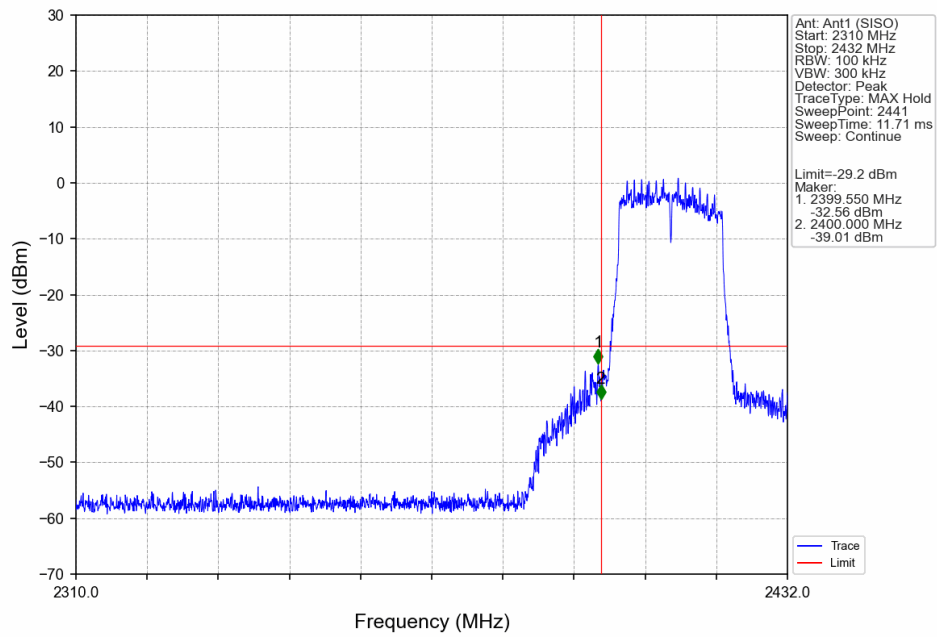
802.11g HCH 2462MHz Ant1 (SISO) NTN



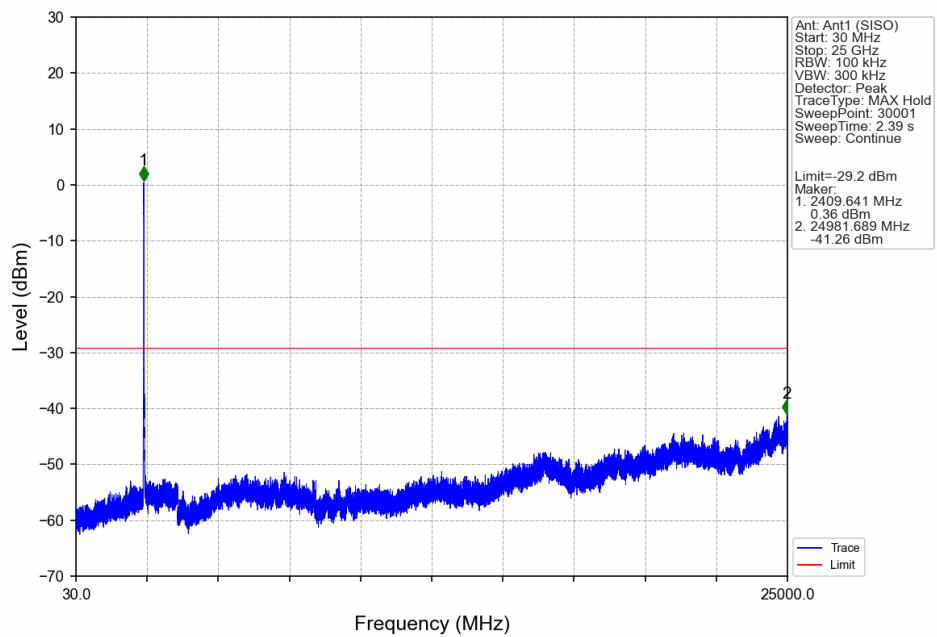
802.11g HCH 2462MHz Ant1 (SISO) NTN



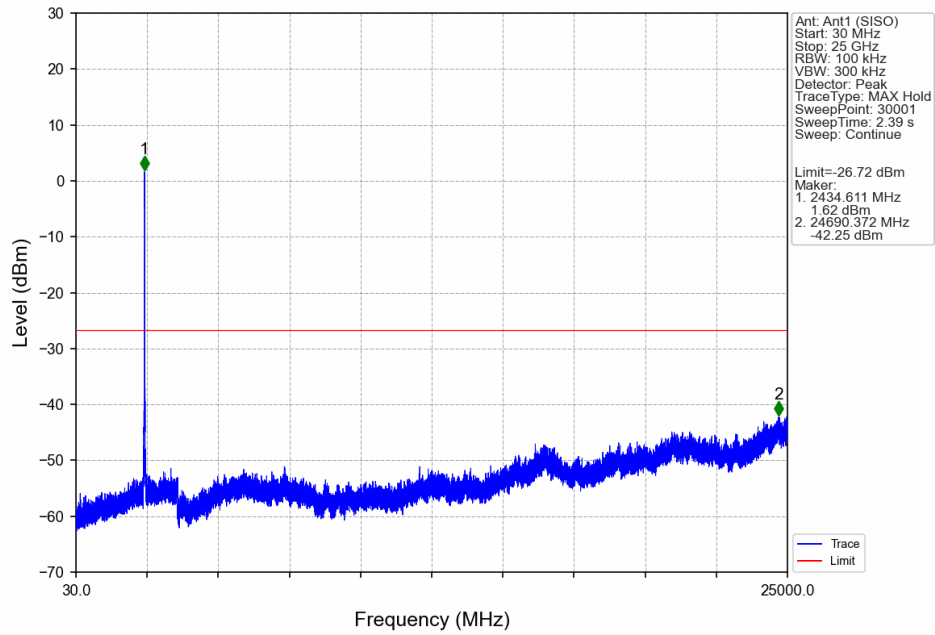
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTNV



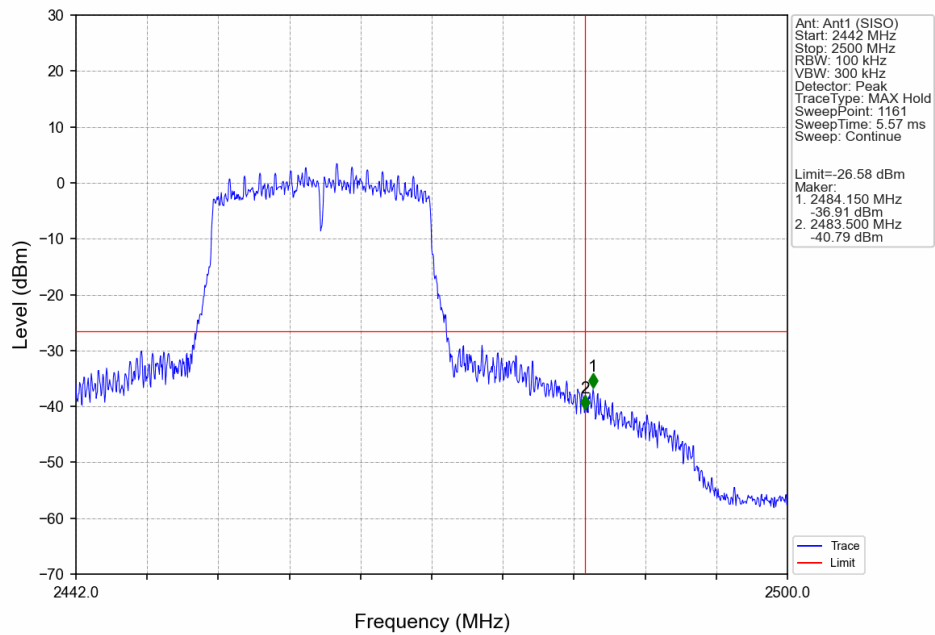
802.11n(HT20) LCH 2412MHz Ant1 (SISO) NTNV



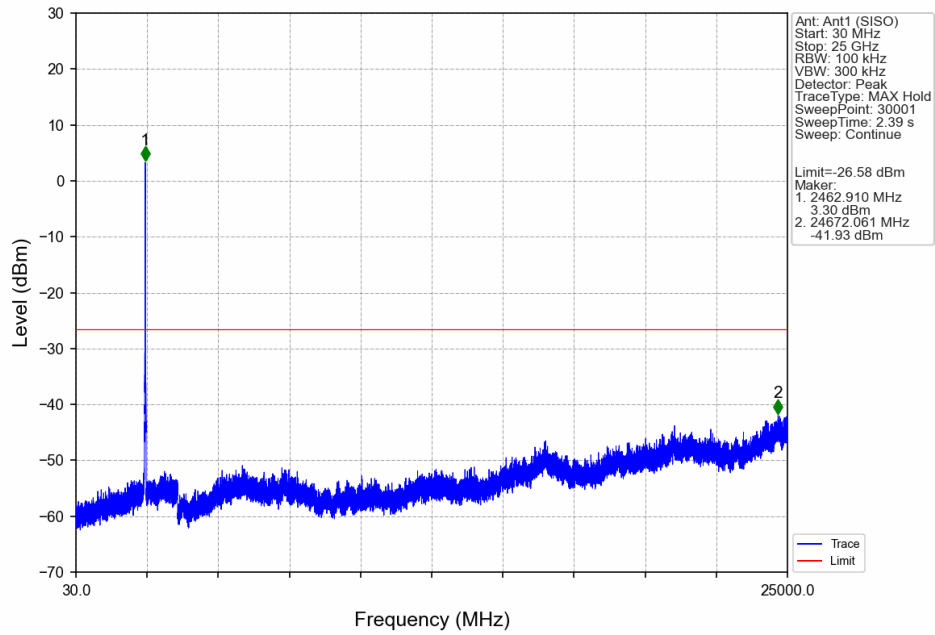
802.11n(HT20) MCH 2437MHz Ant1 (SISO) NTNV



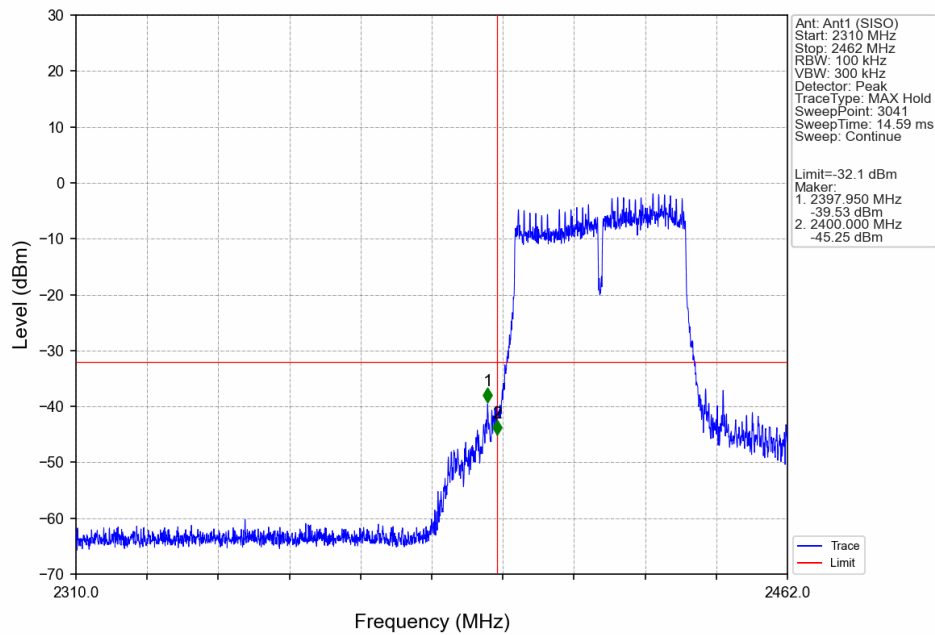
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTNV



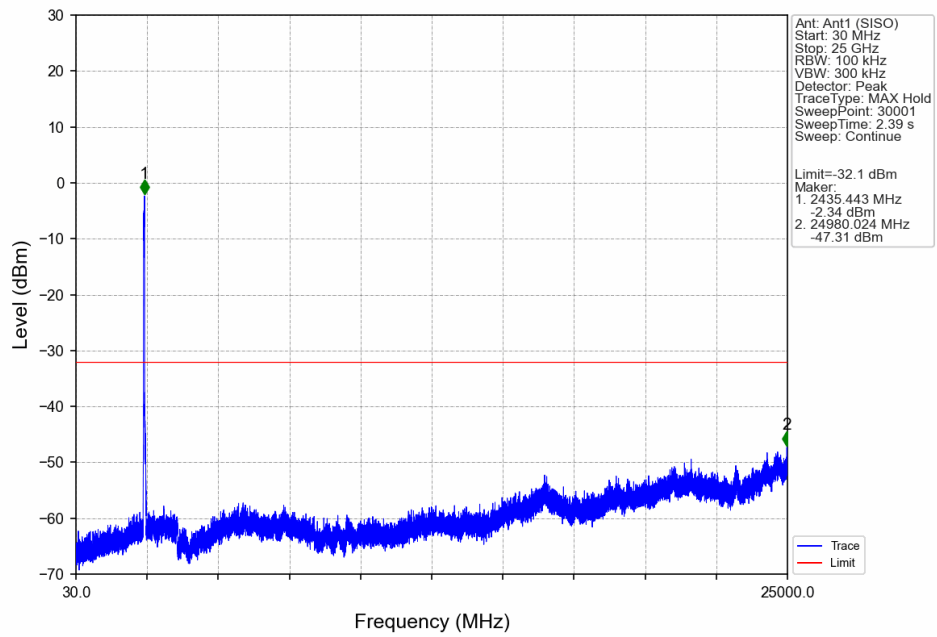
802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTNV



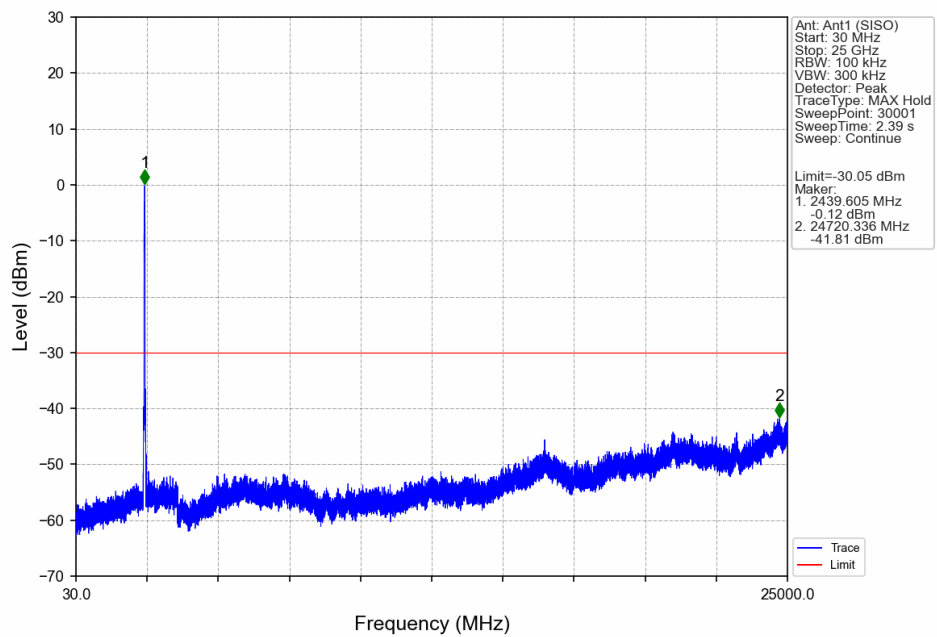
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTNV



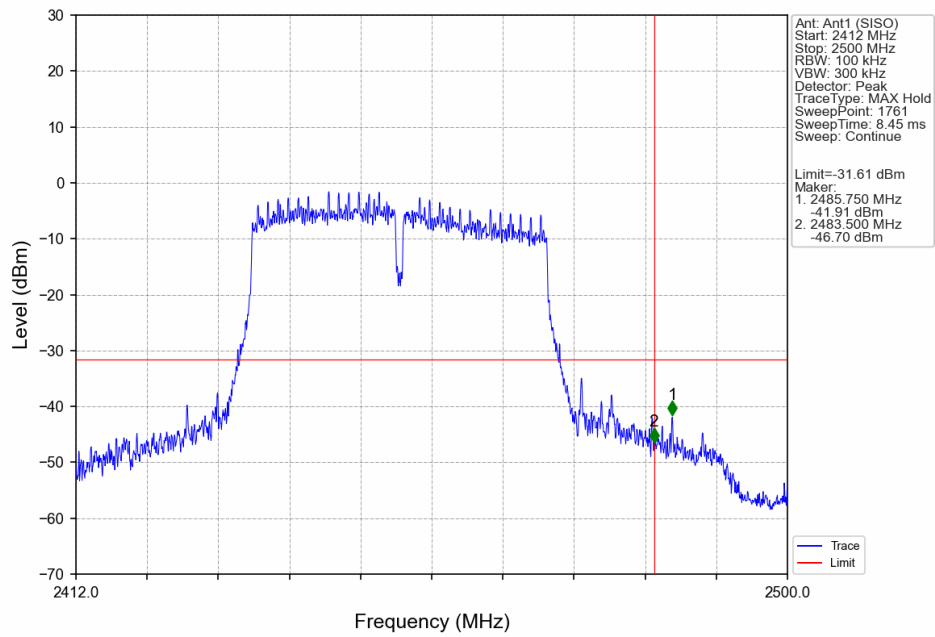
802.11n(HT40) LCH 2422MHz Ant1 (SISO) NTNV



802.11n(HT40) MCH 2437MHz Ant1 (SISO) NTNV



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTNV



802.11n(HT40) HCH 2452MHz Ant1 (SISO) NTNV

