

Appendix RF Test Data for 2.4G WIFI

Company: : ZHONGSHAN CAMAKT ELECTRONICS CO.,LTD

EUT : Smart lock

FCC ID: : 2BEHW-AF11

Model Number : AF11

Report No. : HTT202608309F02

Reviewed By : Heber He

1. Duty Cycle

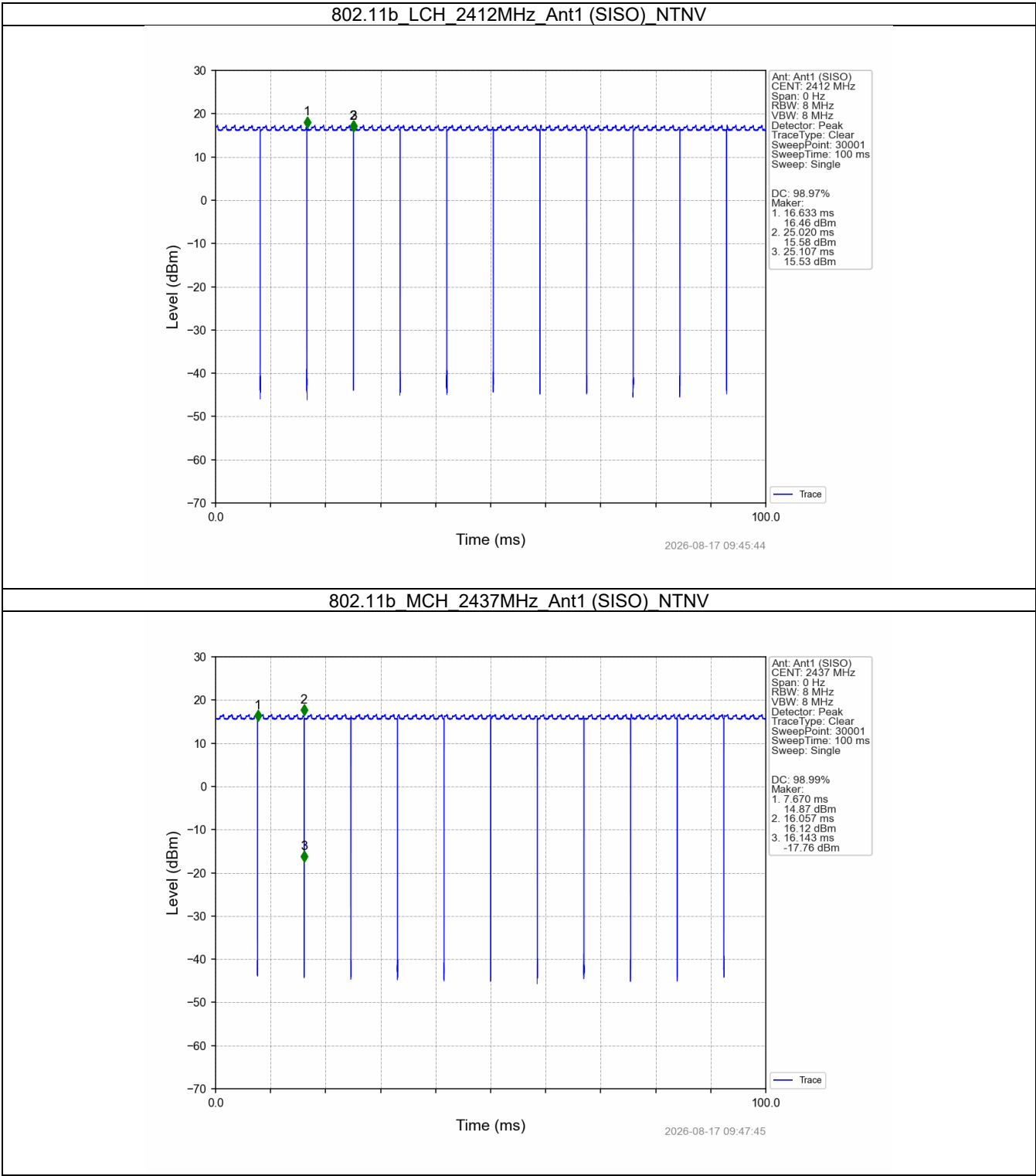
1.1 Test Result

1.1.1 Ant1

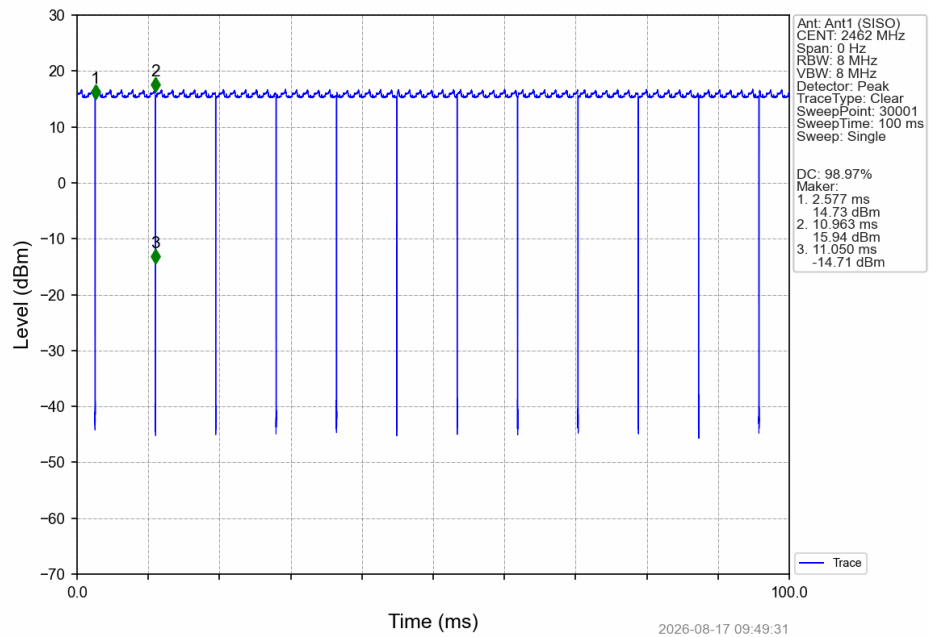
Ant1									
Mode	Tx Type	Frequency (MHz)	RU	RU Pos	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	/	/	8.387	8.474	98.97	0.04	0.04
		2437	/	/	8.387	8.473	98.99	0.04	0.04
		2462	/	/	8.386	8.473	98.97	0.04	0.04
802.11g	SISO	2412	/	/	1.392	1.410	98.72	0.06	0.03
		2437	/	/	1.392	1.410	98.72	0.06	0.03
		2462	/	/	1.392	1.410	98.72	0.06	0.03
802.11n (HT20)	SISO	2412	/	/	0.164	0.170	96.47	0.16	0.04
		2437	/	/	0.164	0.169	97.04	0.13	0.04
		2462	/	/	0.164	0.169	97.04	0.13	0.00
802.11n (HT40)	SISO	2422	/	/	0.100	0.104	96.15	0.17	0.06
		2437	/	/	0.100	0.104	96.15	0.17	0.03
		2452	/	/	0.100	0.105	95.24	0.21	0.09
802.11ax (HEW20)	SISO	2412	SU	/	0.159	0.168	94.64	0.24	0.04
		2437	SU	/	0.160	0.169	94.67	0.24	0.04
		2462	SU	/	0.160	0.169	94.67	0.24	0.04
802.11ax (HEW40)	SISO	2422	SU	/	0.102	0.111	91.89	0.37	0.06
		2437	SU	/	0.101	0.110	91.82	0.37	0.03
		2452	SU	/	0.102	0.111	91.89	0.37	0.06

1.2 Test Graph

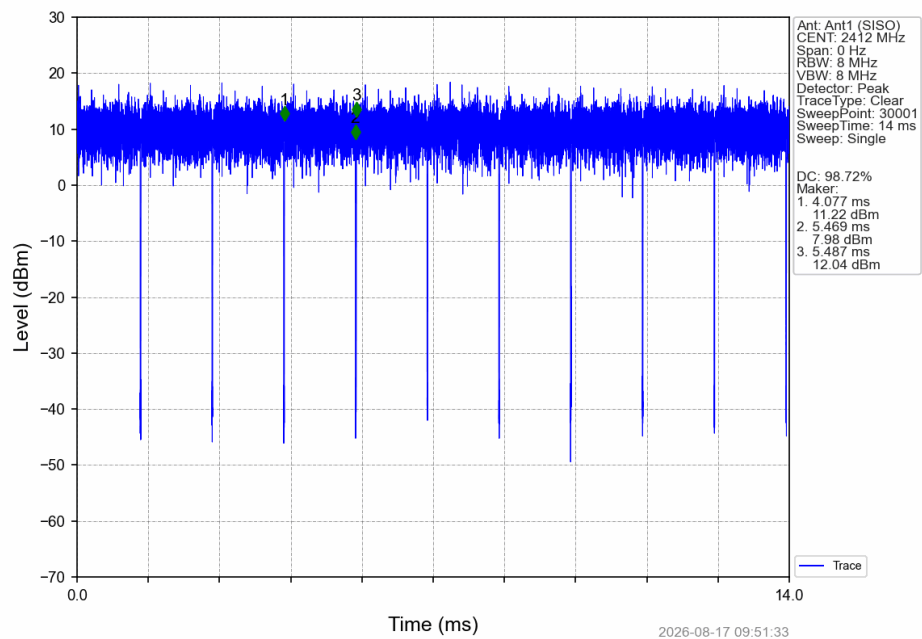
1.2.1 Ant1



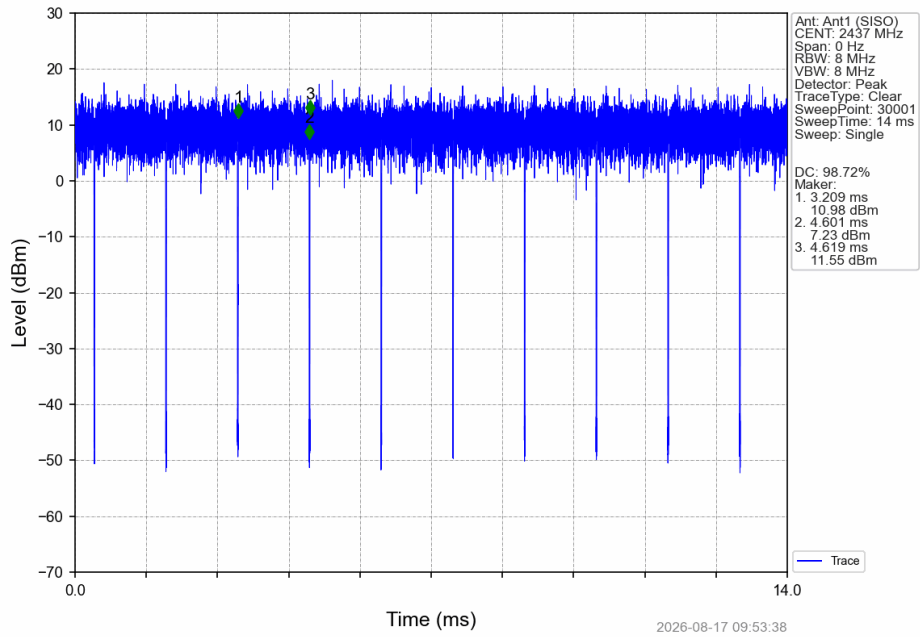
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



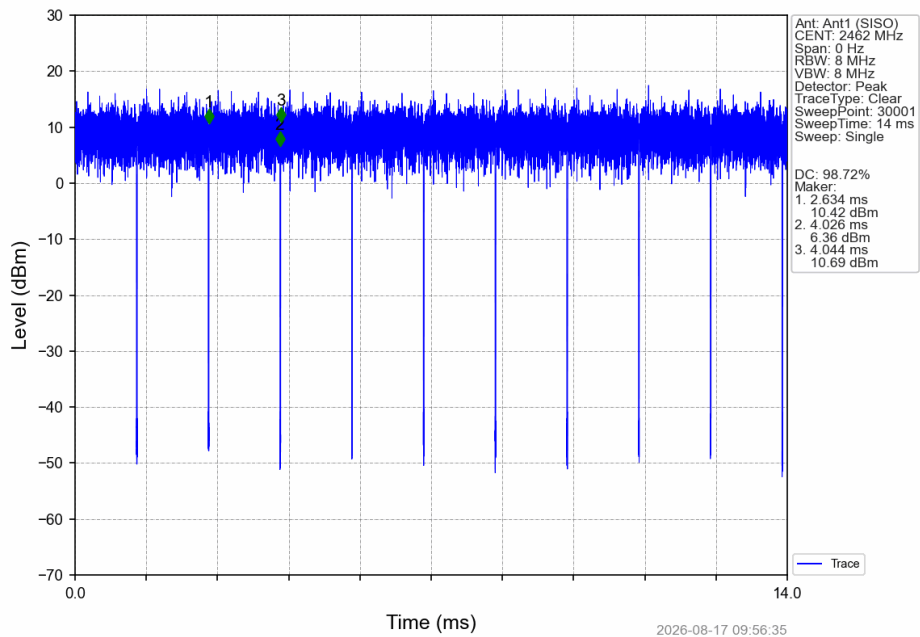
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



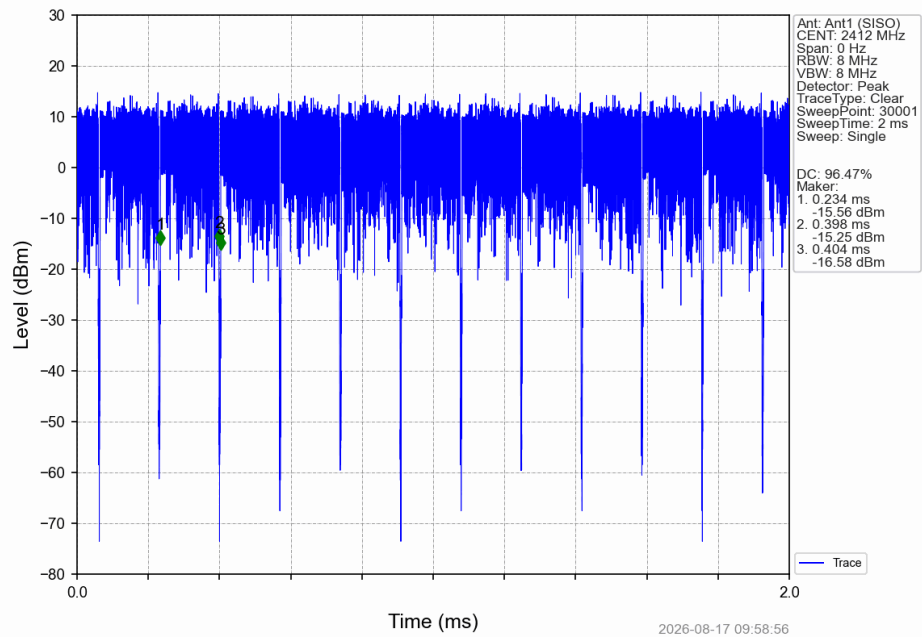
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



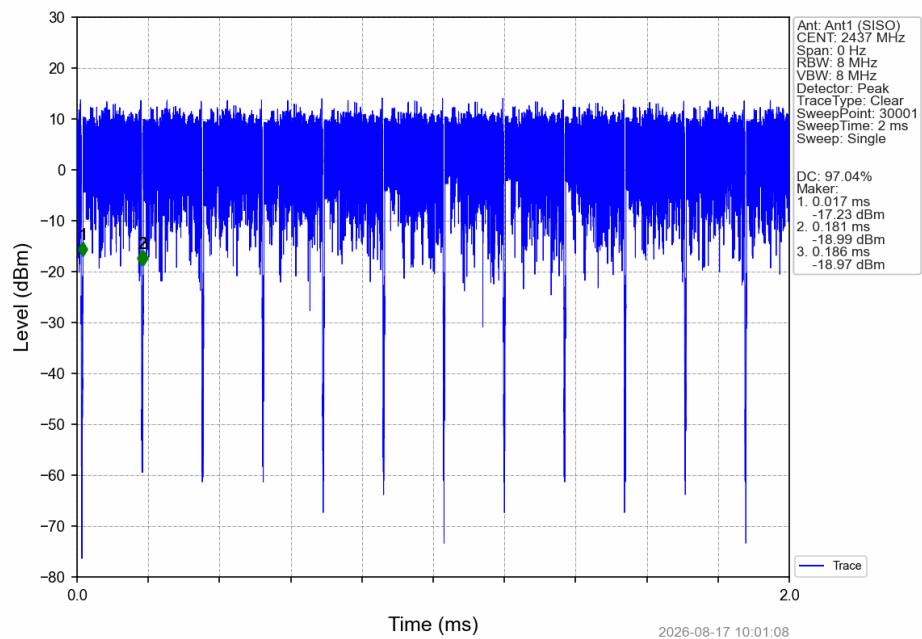
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



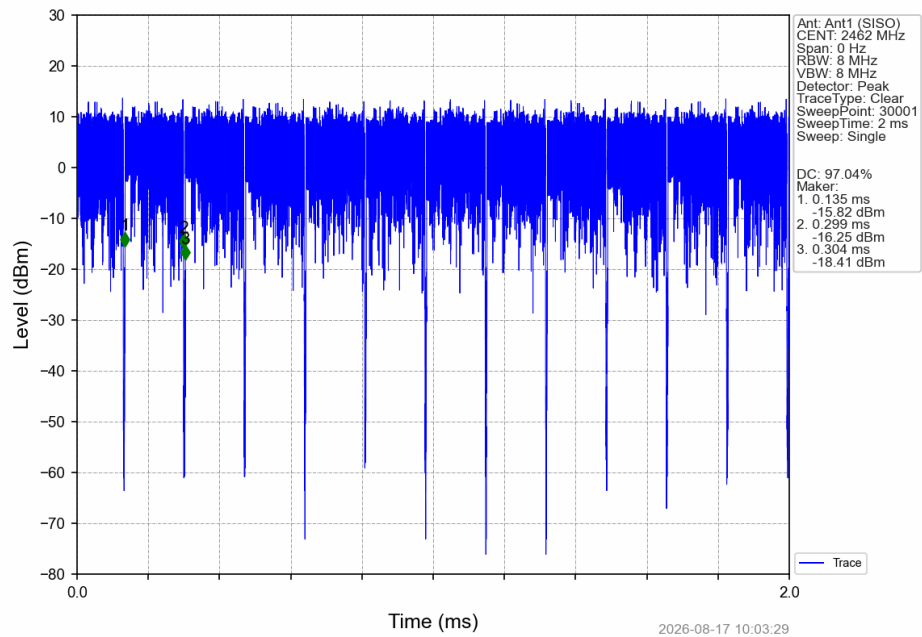
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



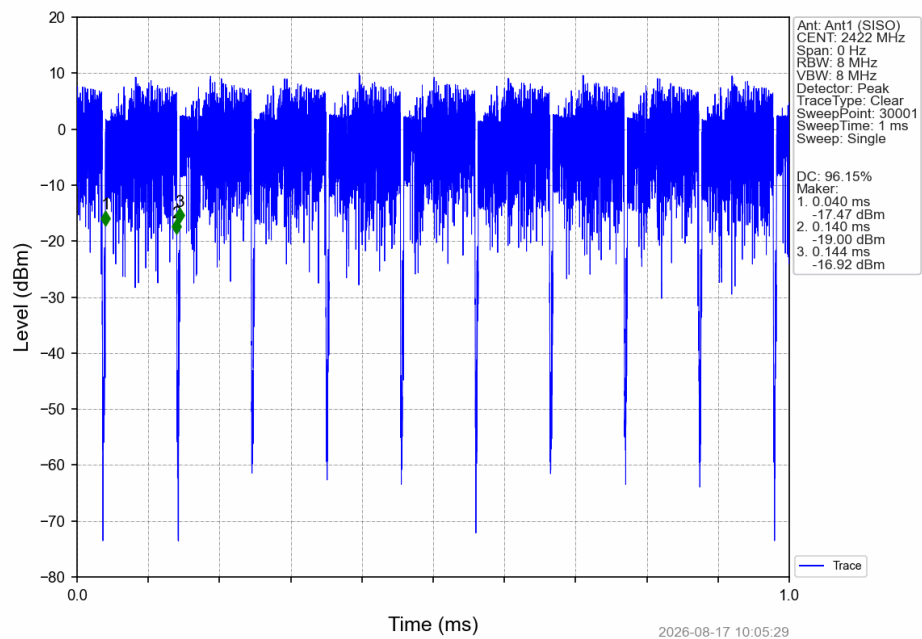
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



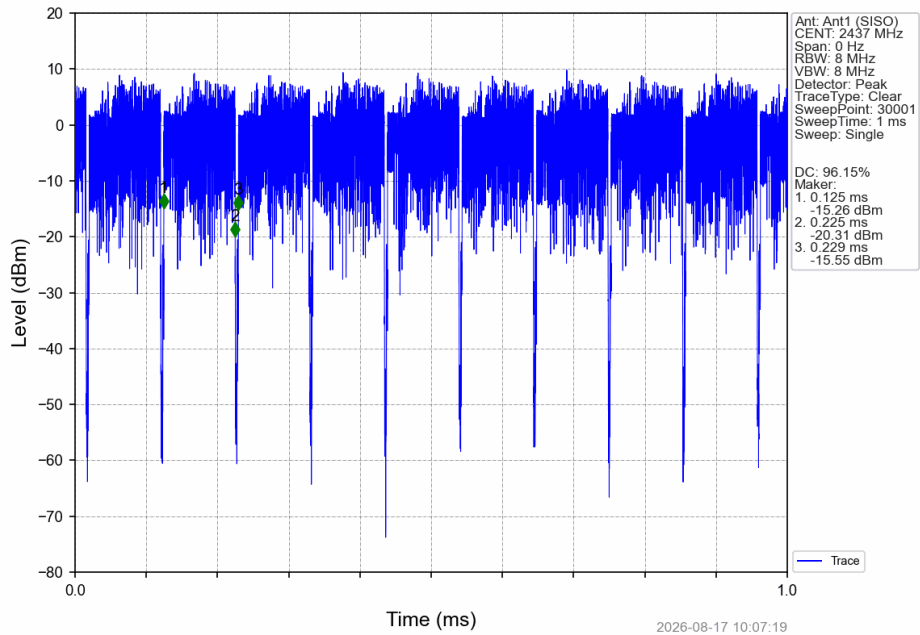
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



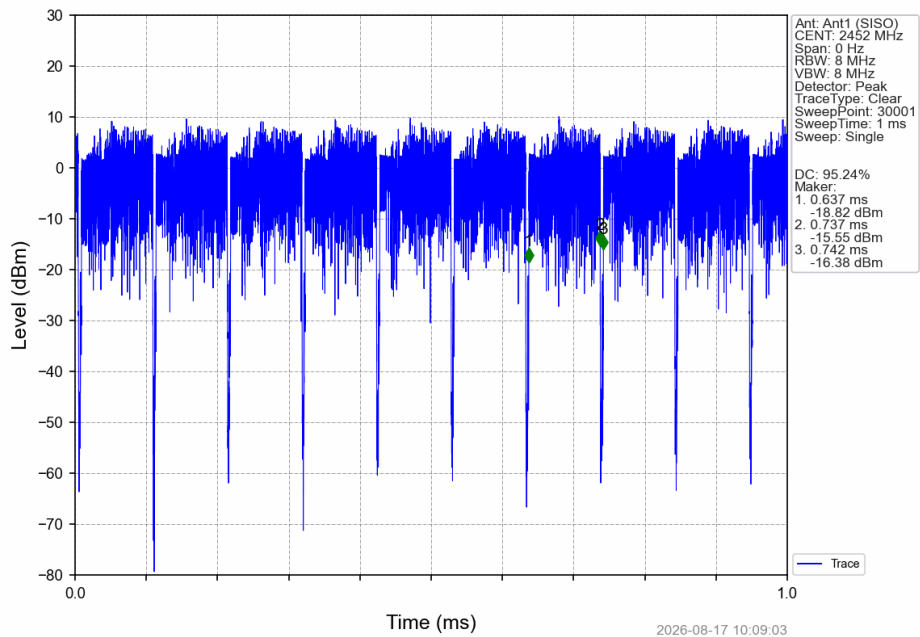
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



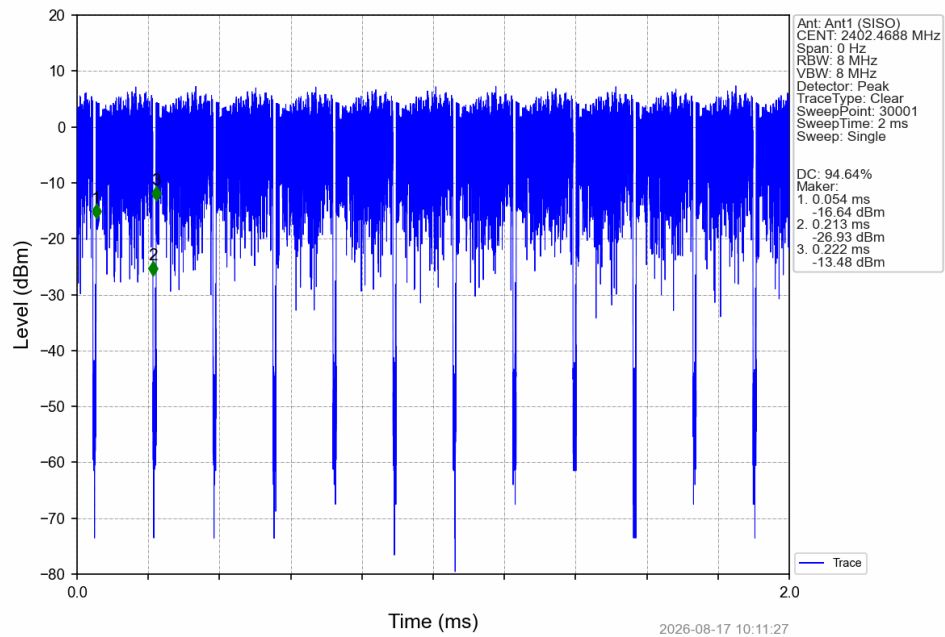
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



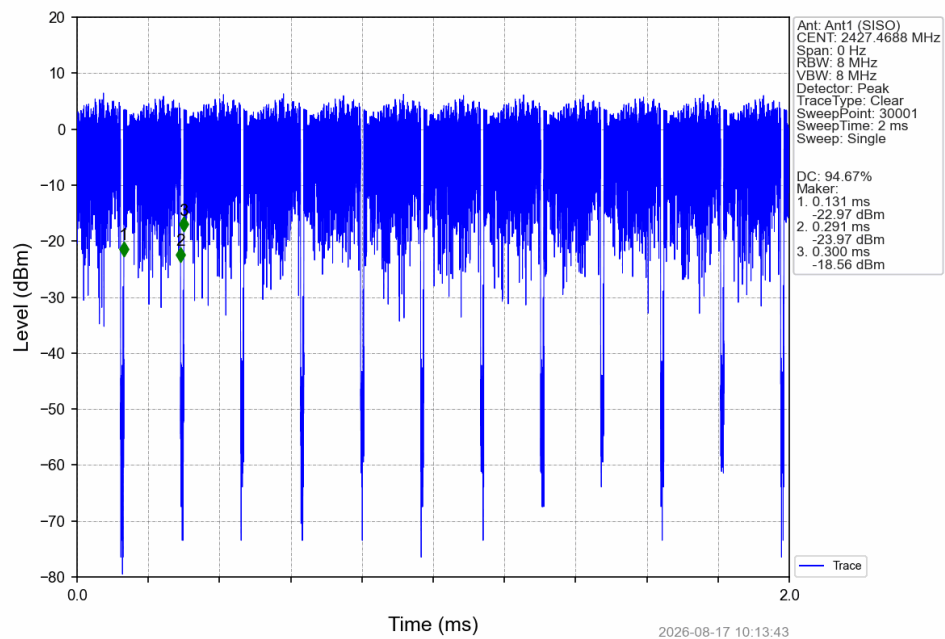
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



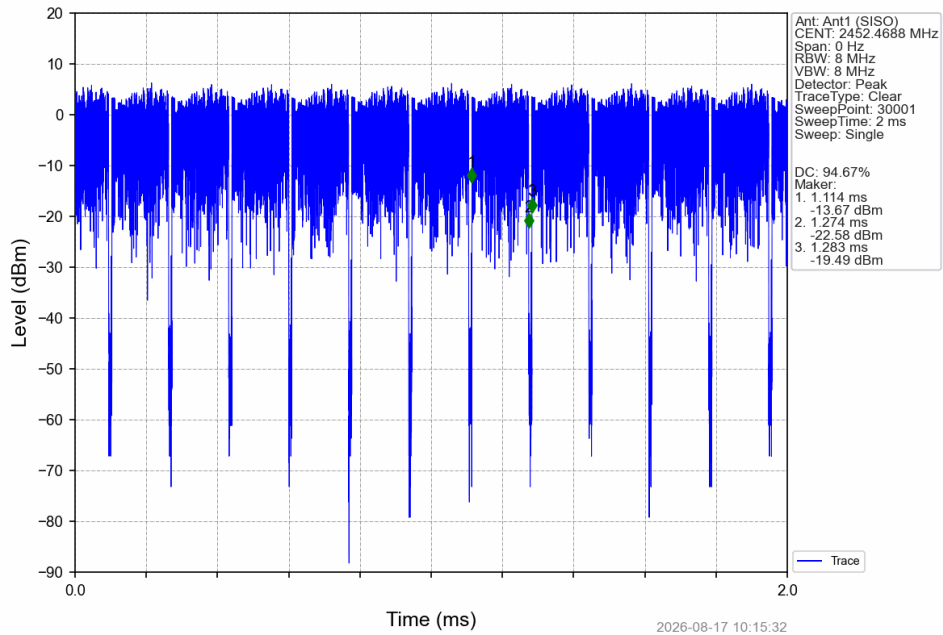
802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant1 (SISO)_NTNV



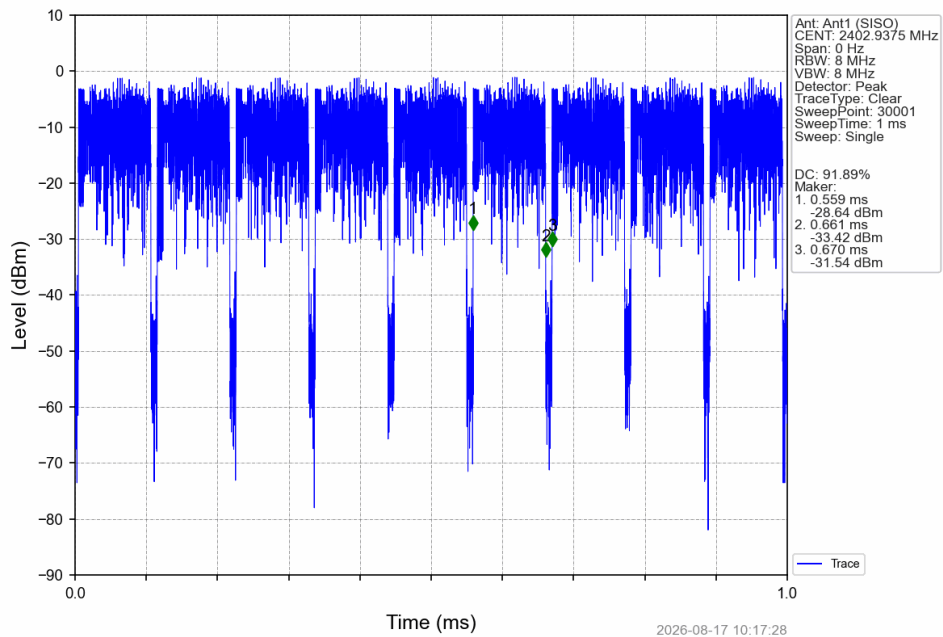
802.11ax(HEW20)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV



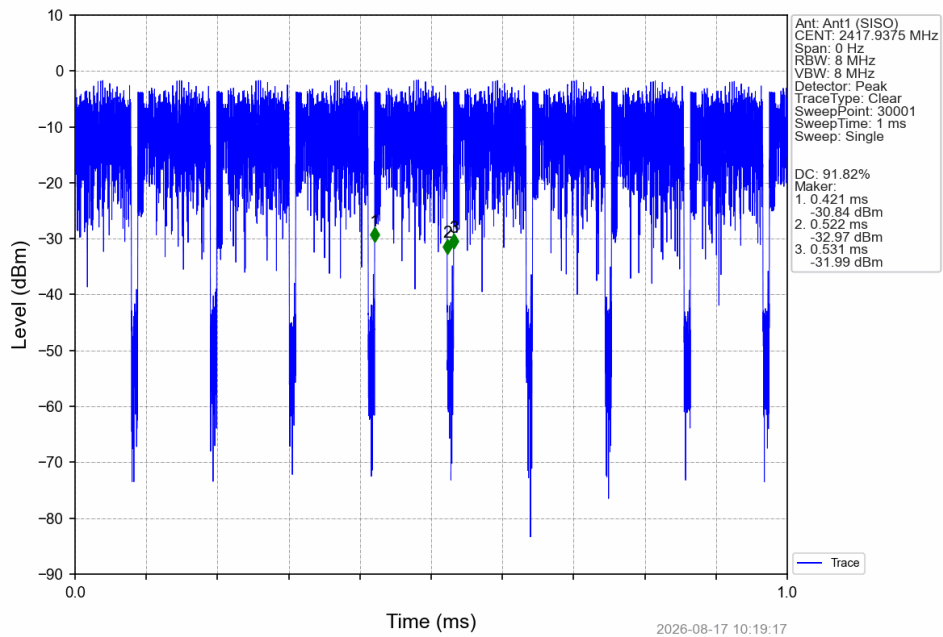
802.11ax(HEW20)_HCH_2462MHz_SU_/_Ant1 (SISO)_NTNV



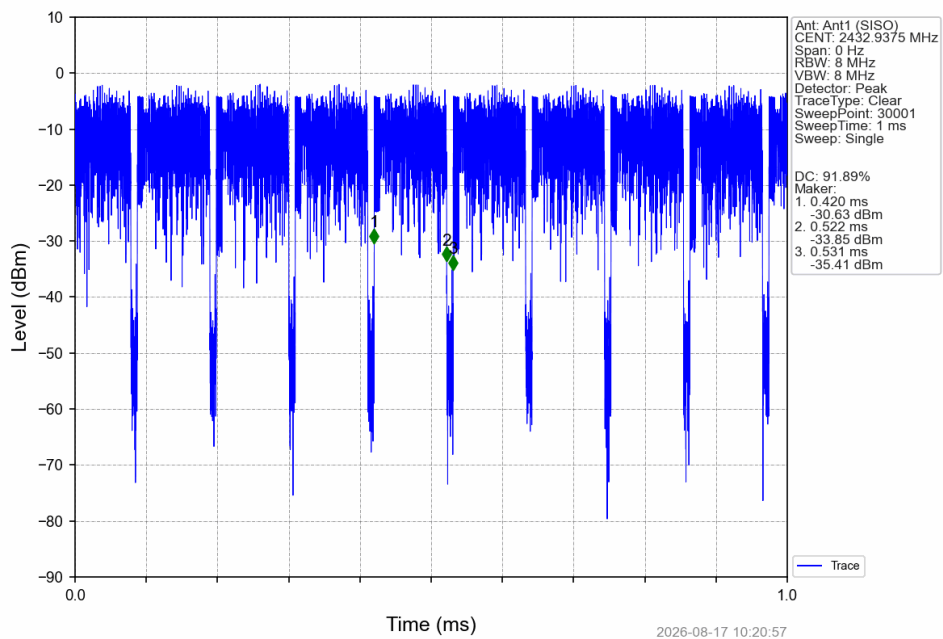
802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW40)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW40)_HCH_2452MHz_SU_/_Ant1 (SISO)_NTNV



2. Bandwidth

2.1 Test Result

2.1.1 OBW

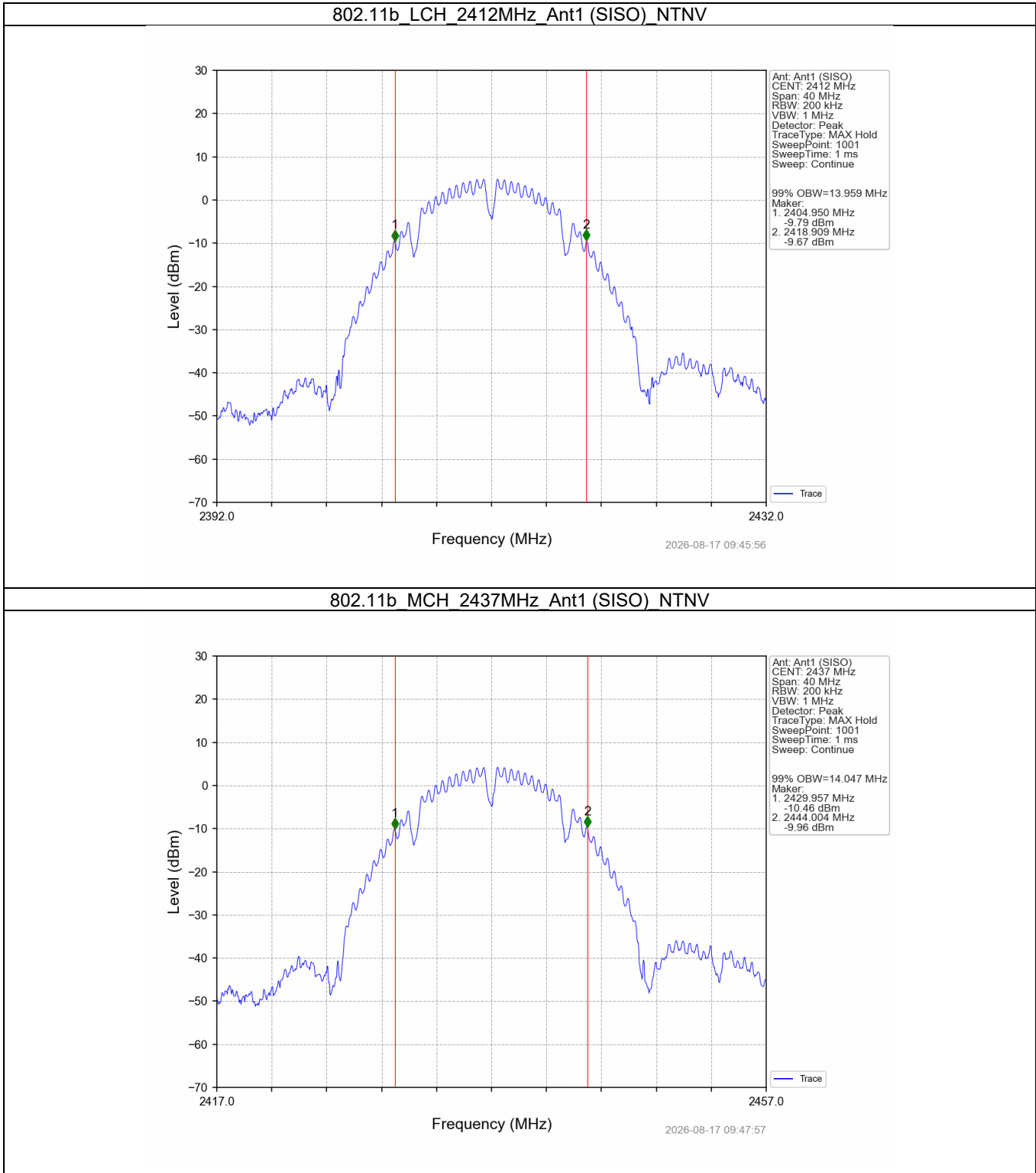
Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	99% Occupied Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	1	13.959	/	Pass
		2437	/	/	1	14.047	/	Pass
		2462	/	/	1	14.029	/	Pass
802.11g	SISO	2412	/	/	1	16.737	/	Pass
		2437	/	/	1	16.862	/	Pass
		2462	/	/	1	16.779	/	Pass
802.11n (HT20)	SISO	2412	/	/	1	17.771	/	Pass
		2437	/	/	1	17.827	/	Pass
		2462	/	/	1	17.806	/	Pass
802.11n (HT40)	SISO	2422	/	/	1	34.789	/	Pass
		2437	/	/	1	34.859	/	Pass
		2452	/	/	1	34.564	/	Pass
802.11ax (HEW20)	SISO	2412	SU	/	1	18.432	/	Pass
		2437	SU	/	1	18.488	/	Pass
		2462	SU	/	1	18.463	/	Pass
802.11ax (HEW40)	SISO	2422	SU	/	1	36.511	/	Pass
		2437	SU	/	1	36.585	/	Pass
		2452	SU	/	1	36.215	/	Pass

2.1.2 6dB BW

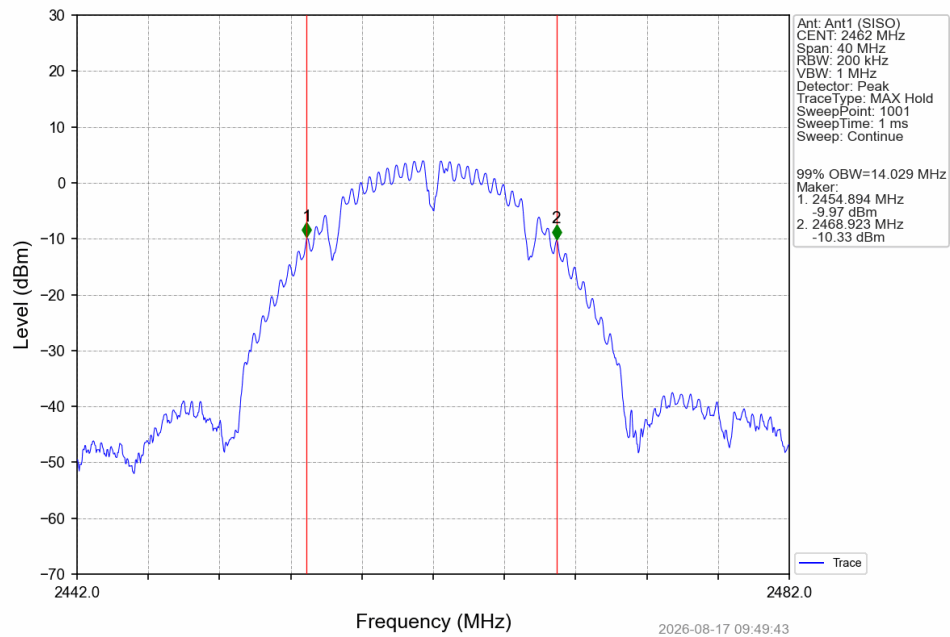
Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	6dB Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	1	9.158	>=0.5	Pass
		2437	/	/	1	9.175	>=0.5	Pass
		2462	/	/	1	9.175	>=0.5	Pass
802.11g	SISO	2412	/	/	1	15.125	>=0.5	Pass
		2437	/	/	1	15.164	>=0.5	Pass
		2462	/	/	1	15.160	>=0.5	Pass
802.11n (HT20)	SISO	2412	/	/	1	15.154	>=0.5	Pass
		2437	/	/	1	15.170	>=0.5	Pass
		2462	/	/	1	15.172	>=0.5	Pass
802.11n (HT40)	SISO	2422	/	/	1	27.086	>=0.5	Pass
		2437	/	/	1	28.815	>=0.5	Pass
		2452	/	/	1	26.532	>=0.5	Pass
802.11ax (HEW20)	SISO	2412	SU	/	1	15.063	>=0.5	Pass
		2437	SU	/	1	14.224	>=0.5	Pass
		2462	SU	/	1	15.109	>=0.5	Pass
802.11ax (HEW40)	SISO	2422	SU	/	1	26.650	>=0.5	Pass
		2437	SU	/	1	28.206	>=0.5	Pass
		2452	SU	/	1	25.347	>=0.5	Pass

2.2 Test Graph

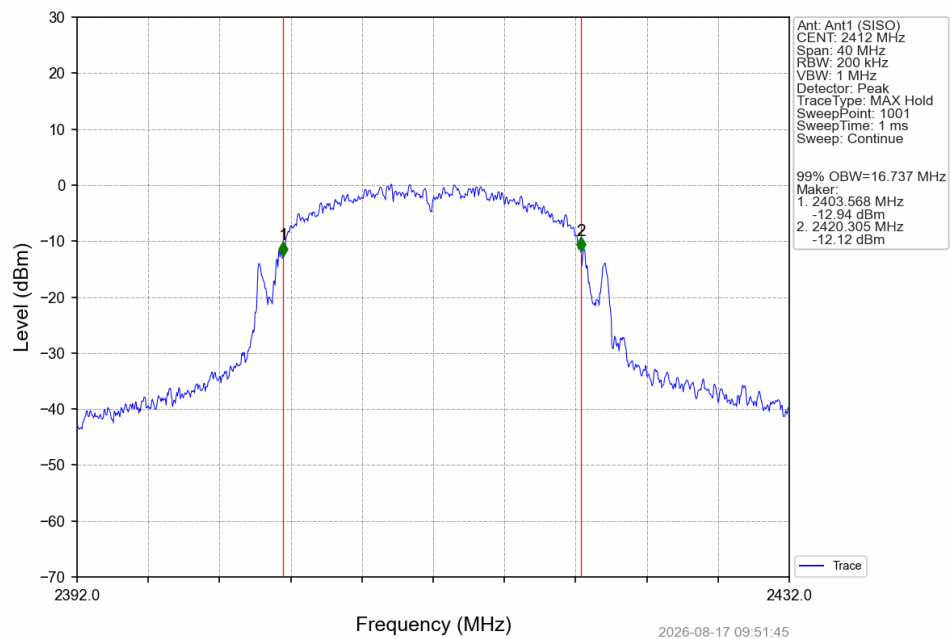
2.2.1 OBW



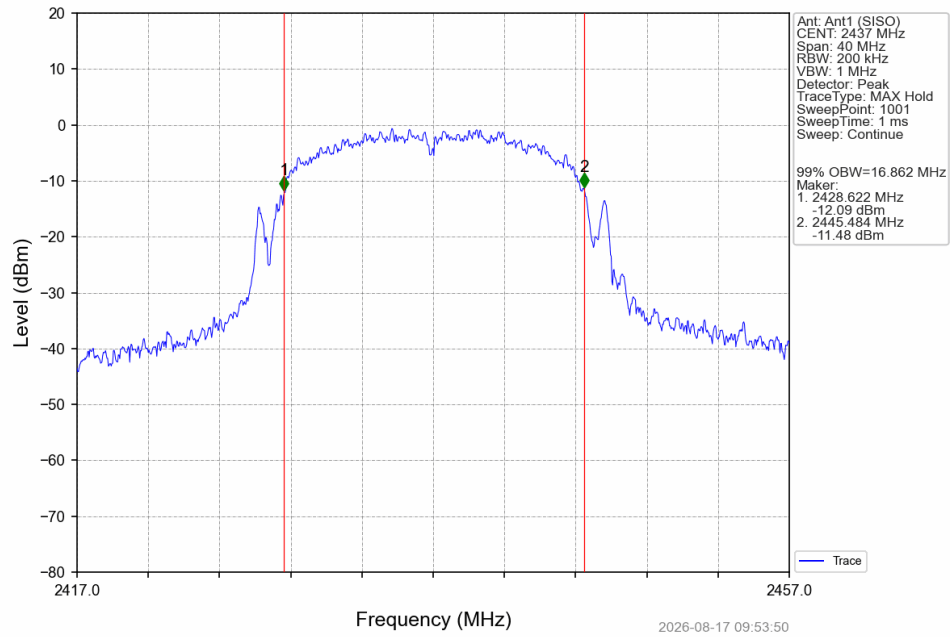
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



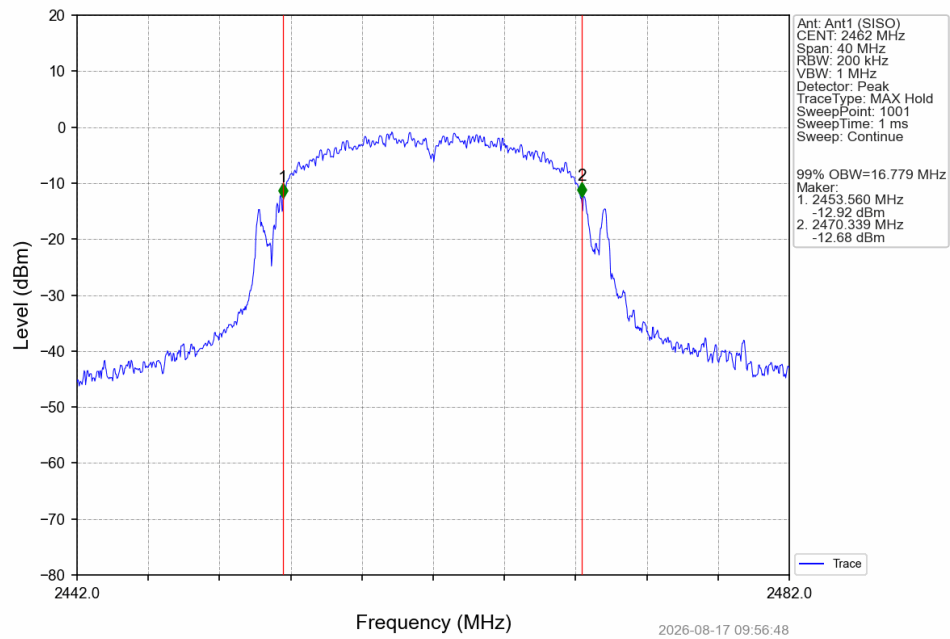
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



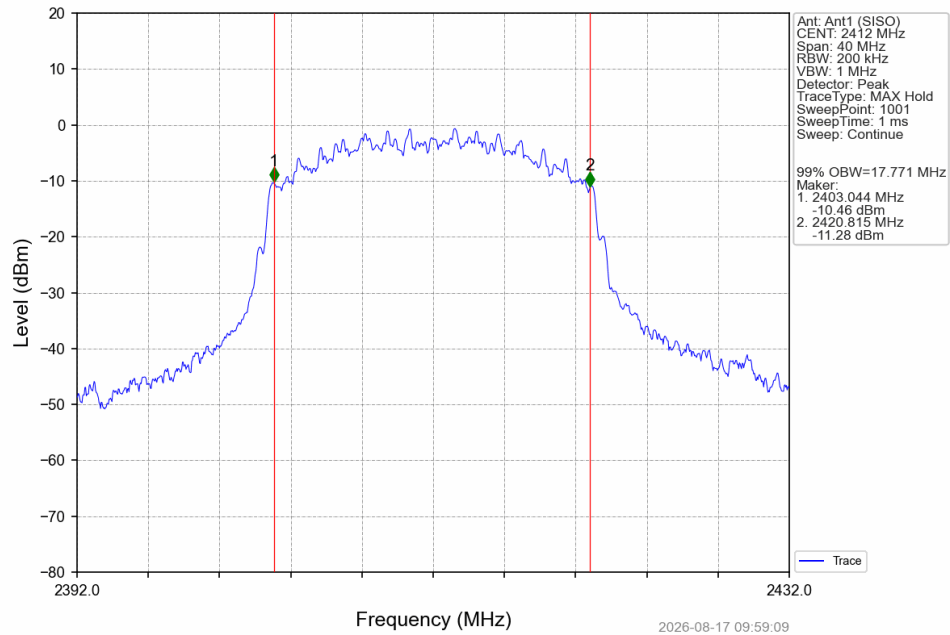
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



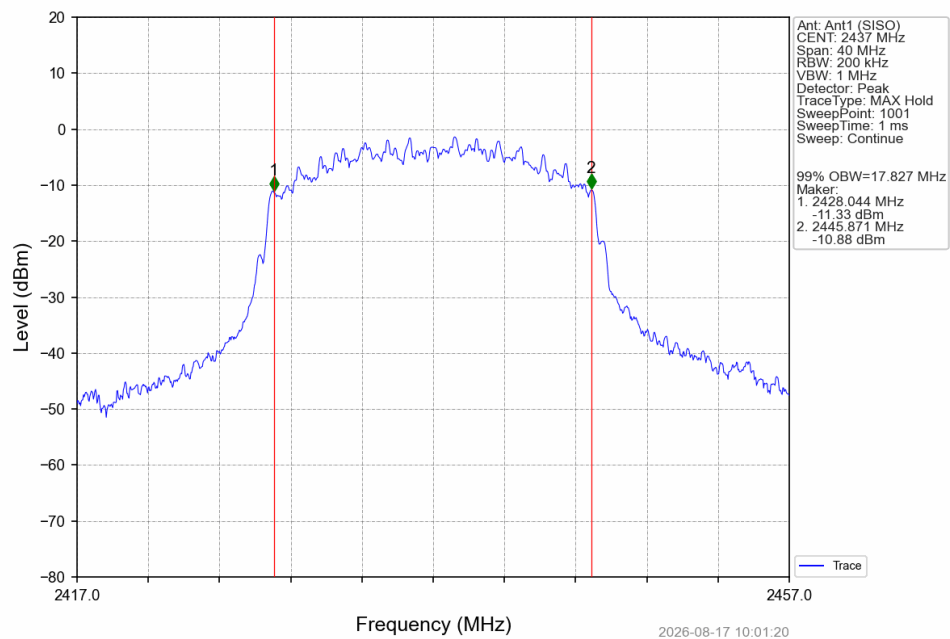
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



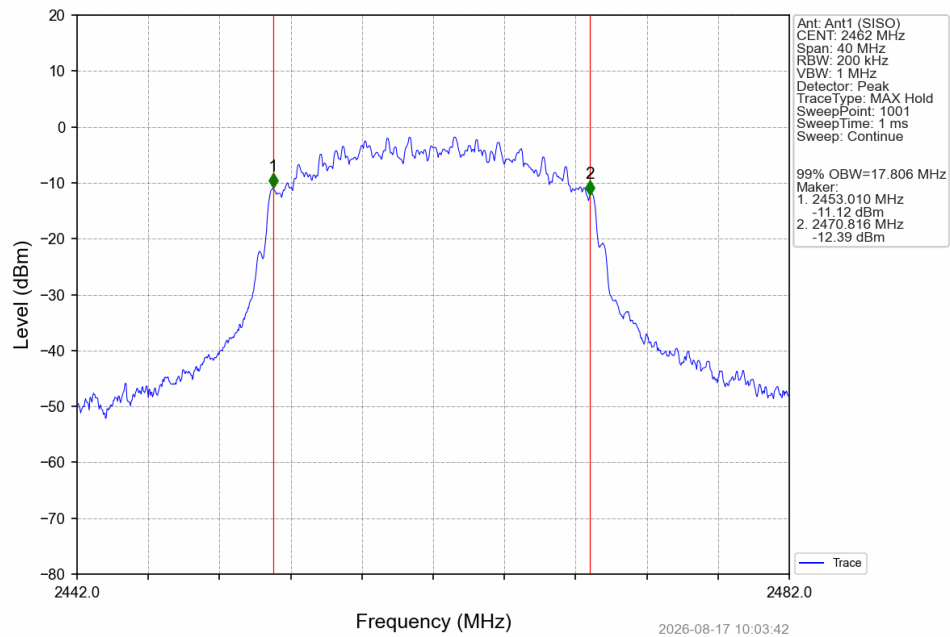
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



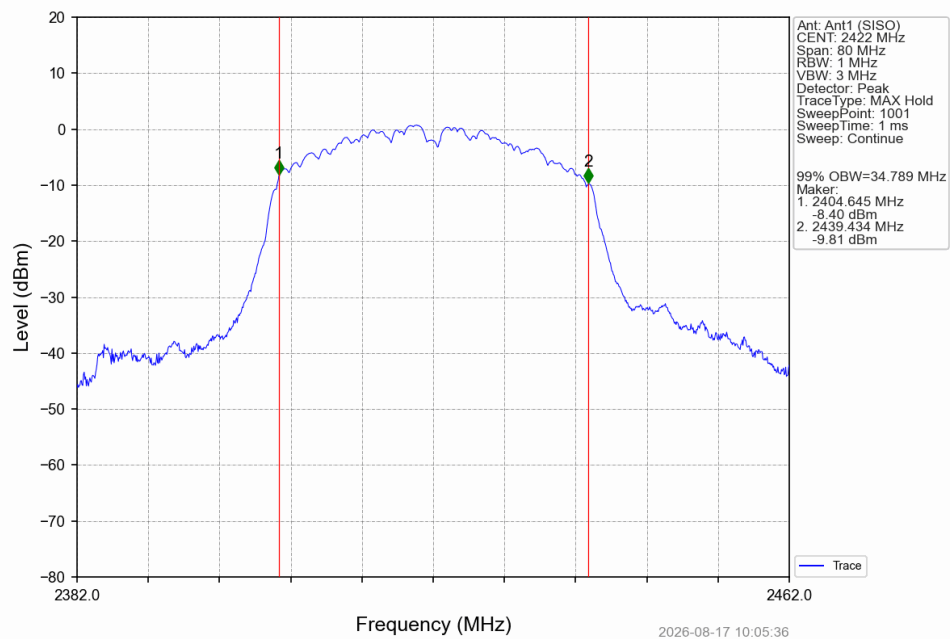
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



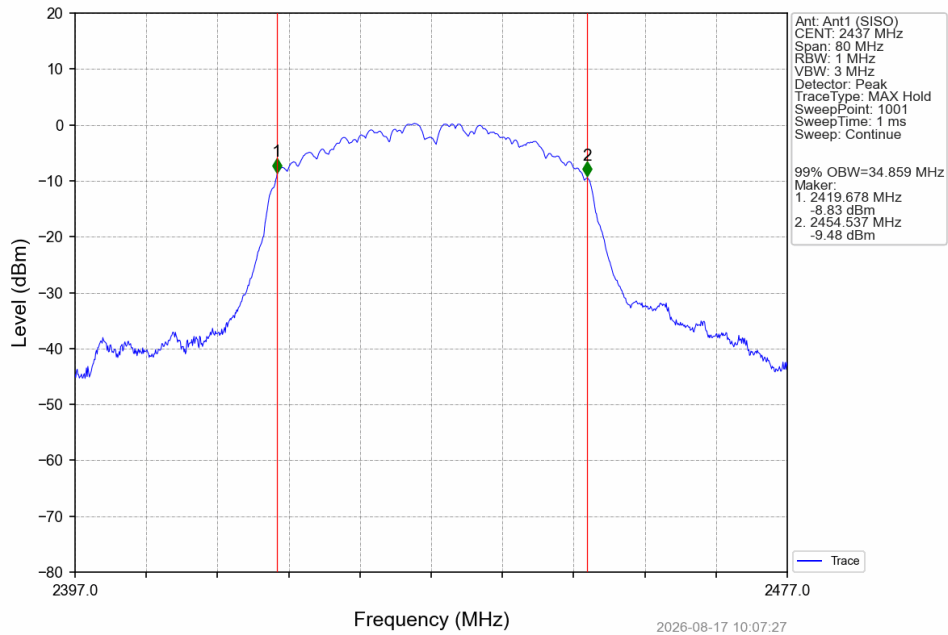
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



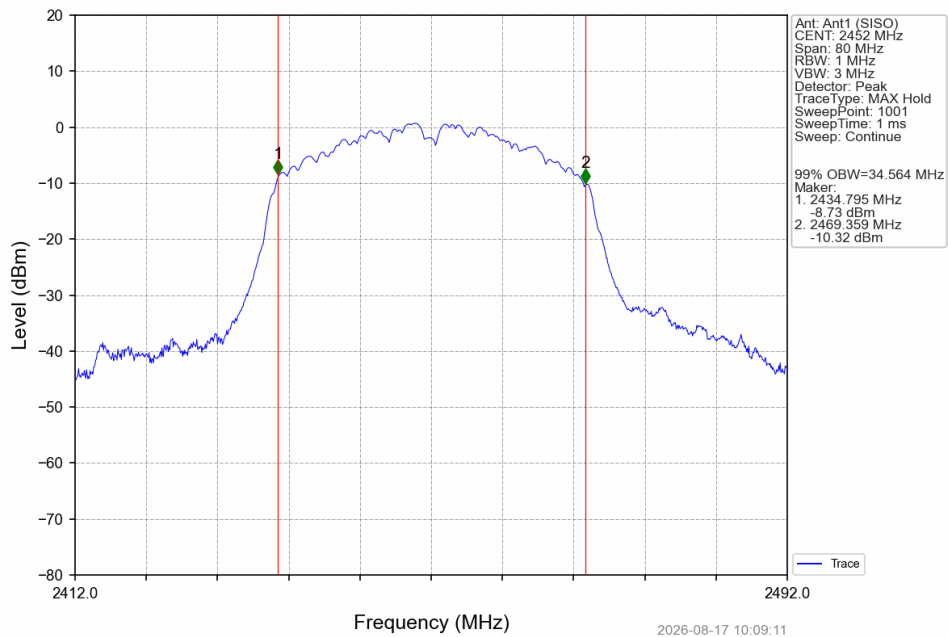
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



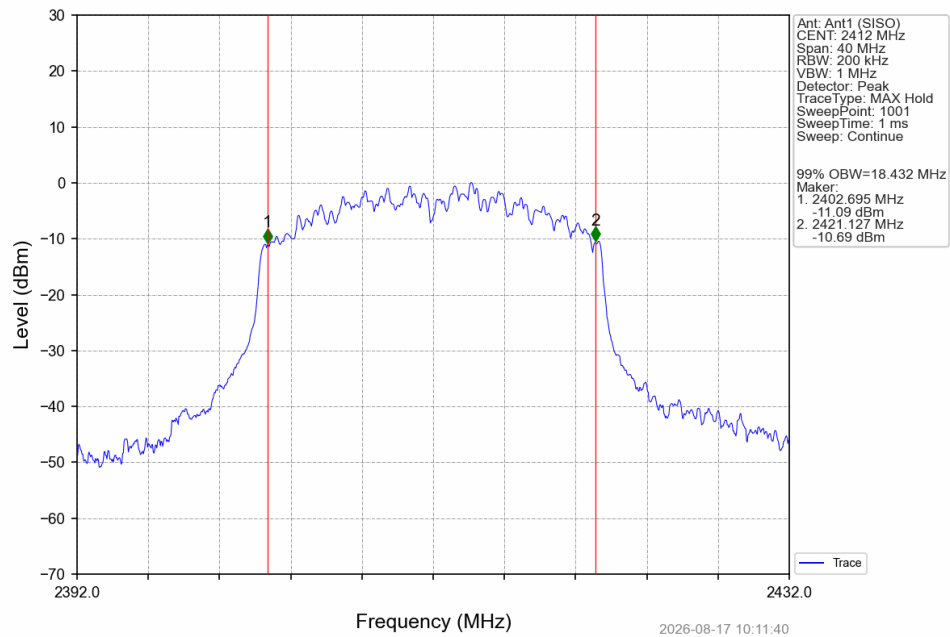
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



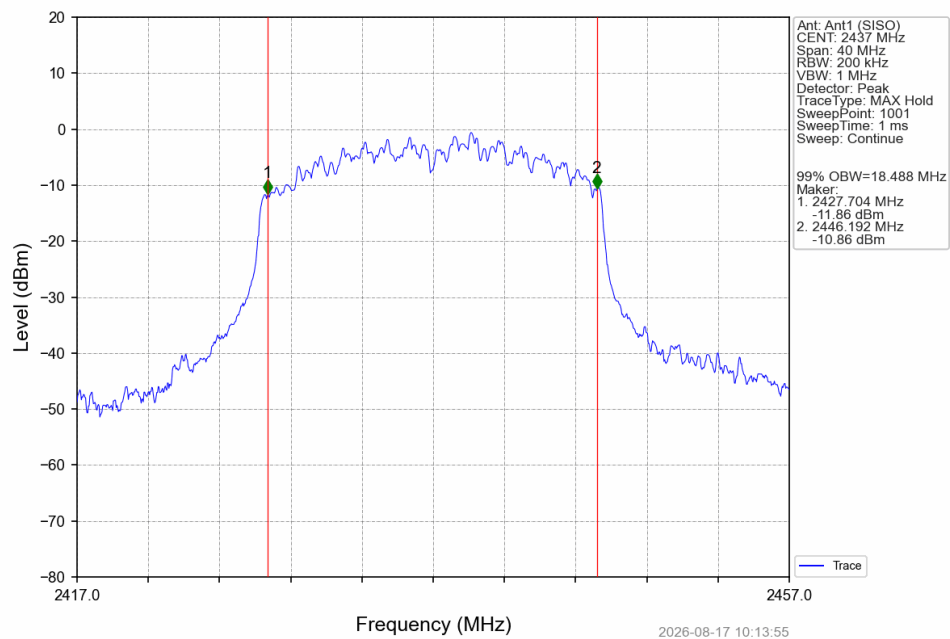
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



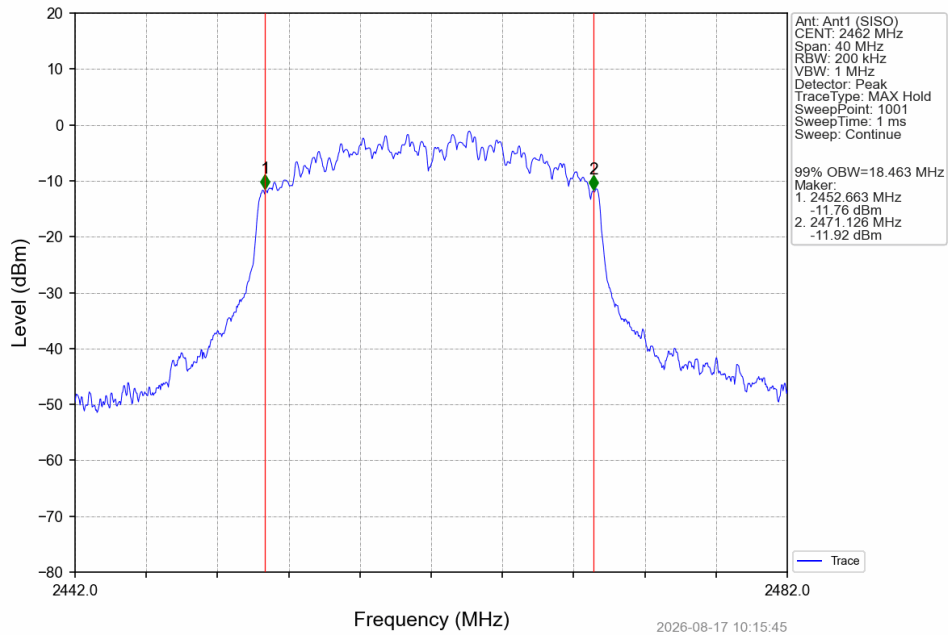
802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant1 (SISO)_NTNV



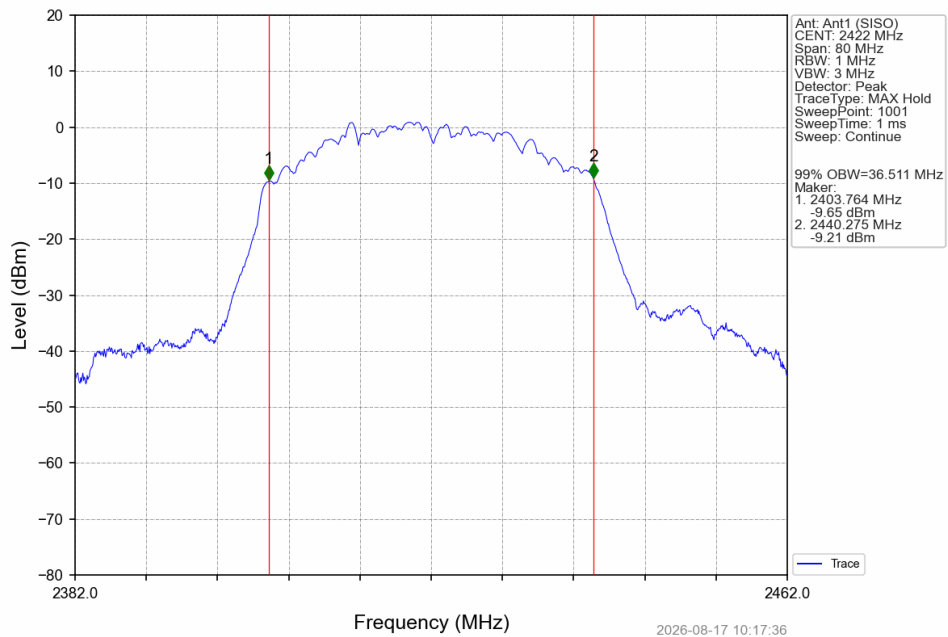
802.11ax(HEW20)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV



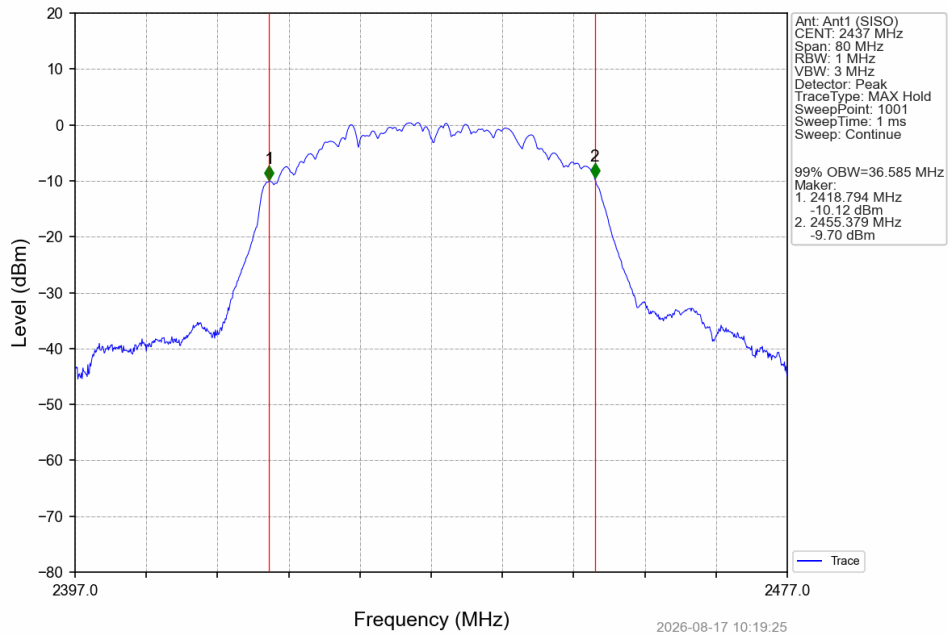
802.11ax(HEW20)_HCH_2462MHz_SU_/_Ant1 (SISO)_NTNV



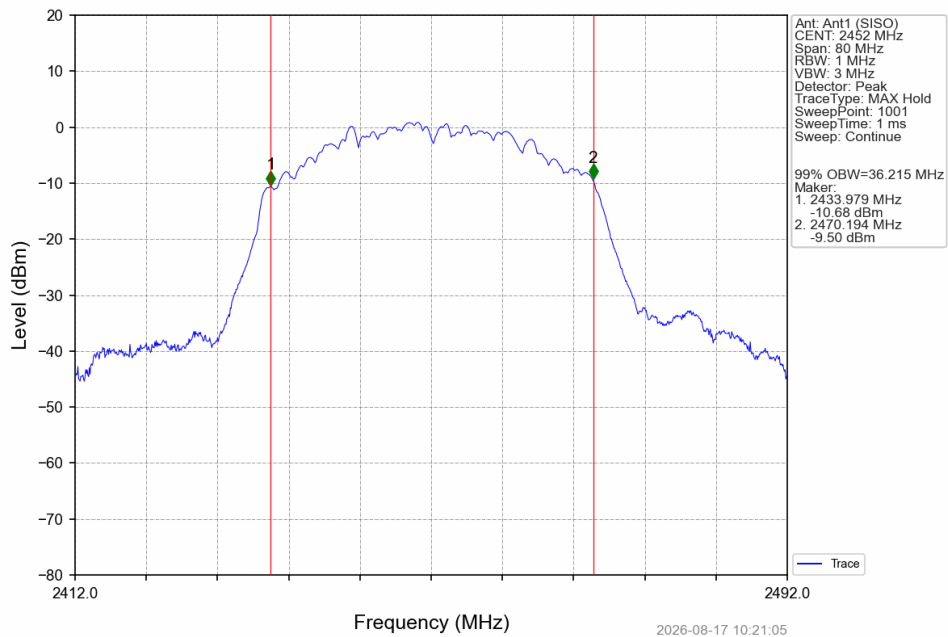
802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant1 (SISO)_NTNV



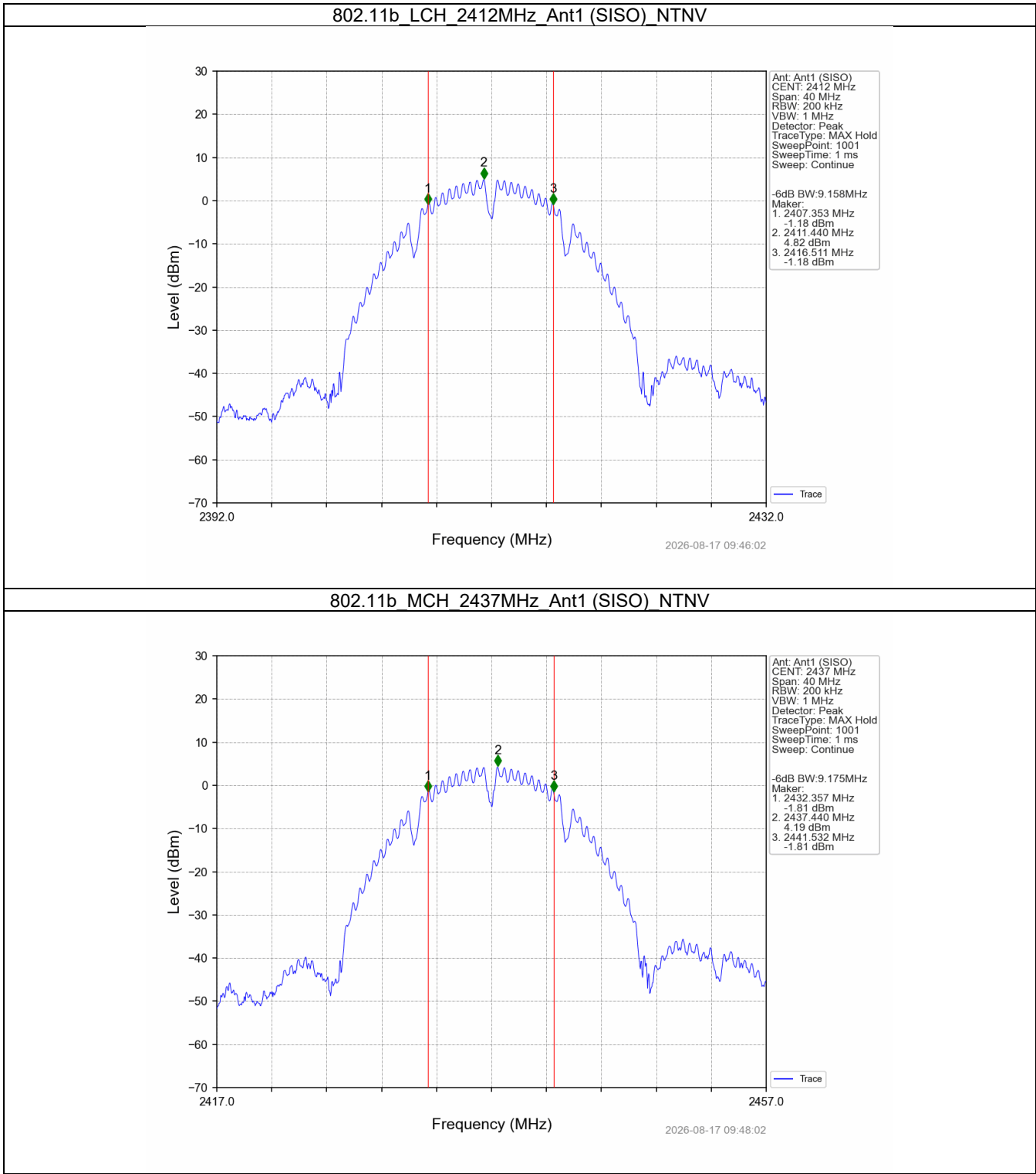
802.11ax(HEW40)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV



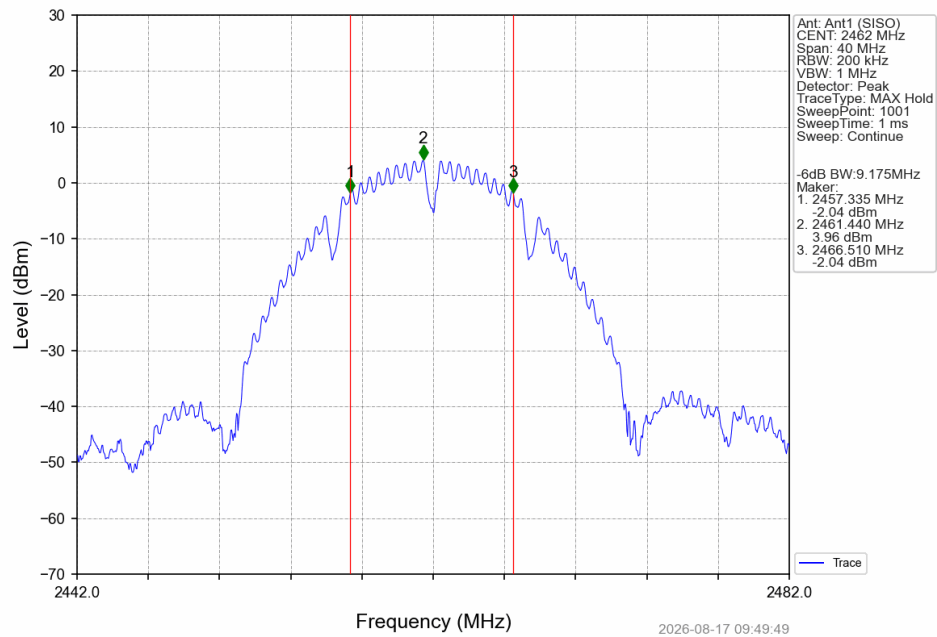
802.11ax(HEW40)_HCH_2452MHz_SU_/_Ant1 (SISO)_NTNV



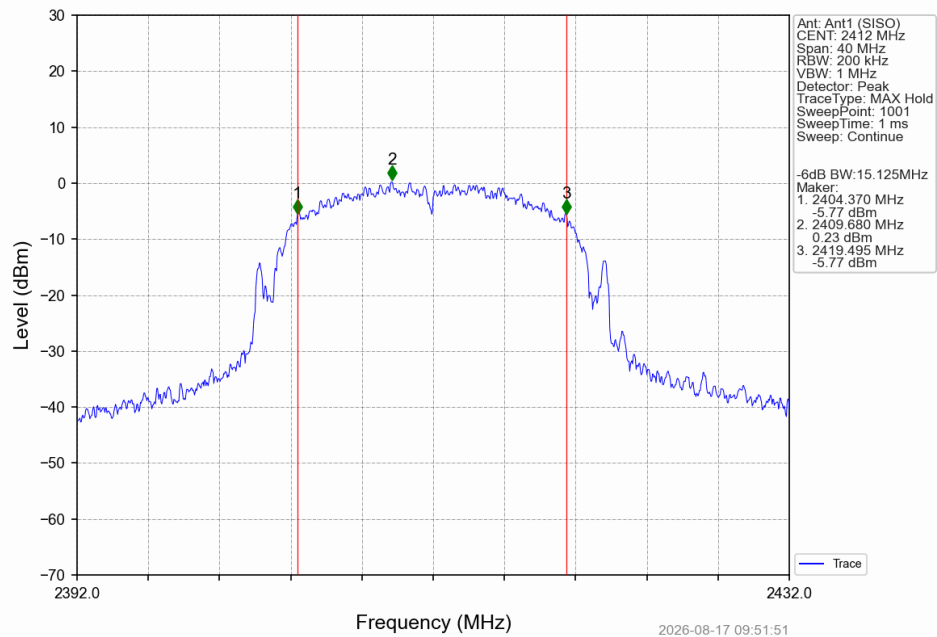
2.2.2 6dB BW



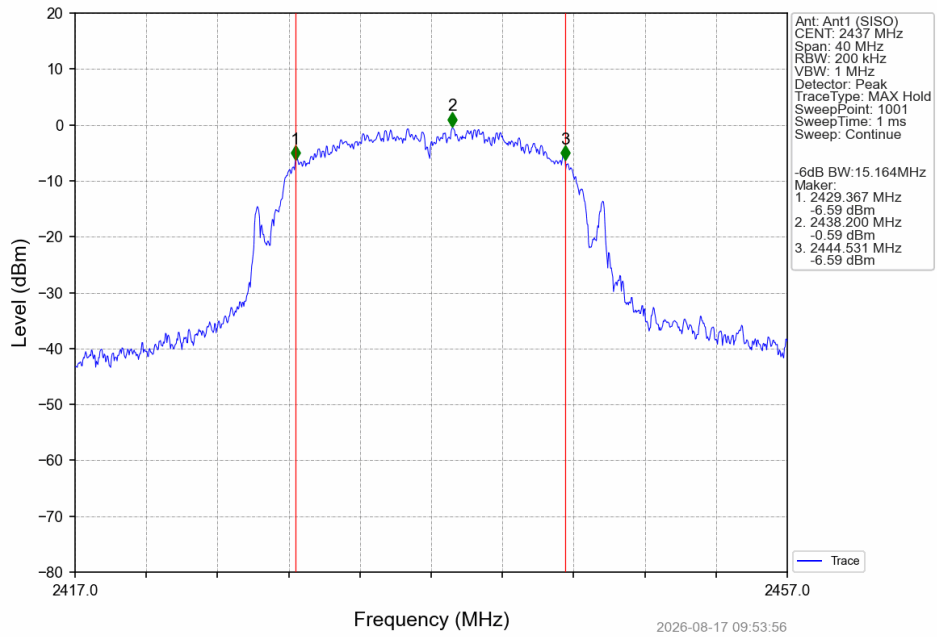
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



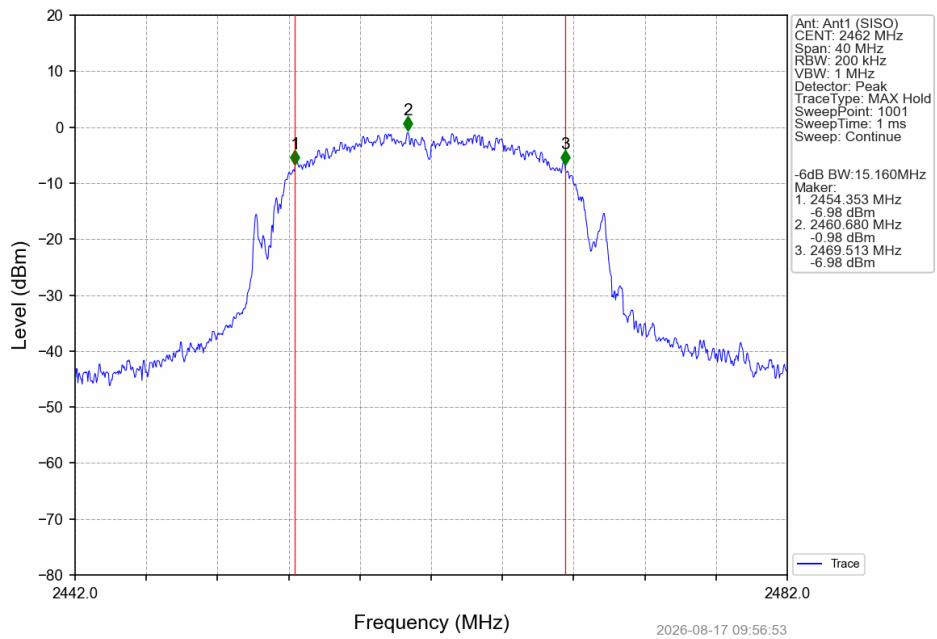
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



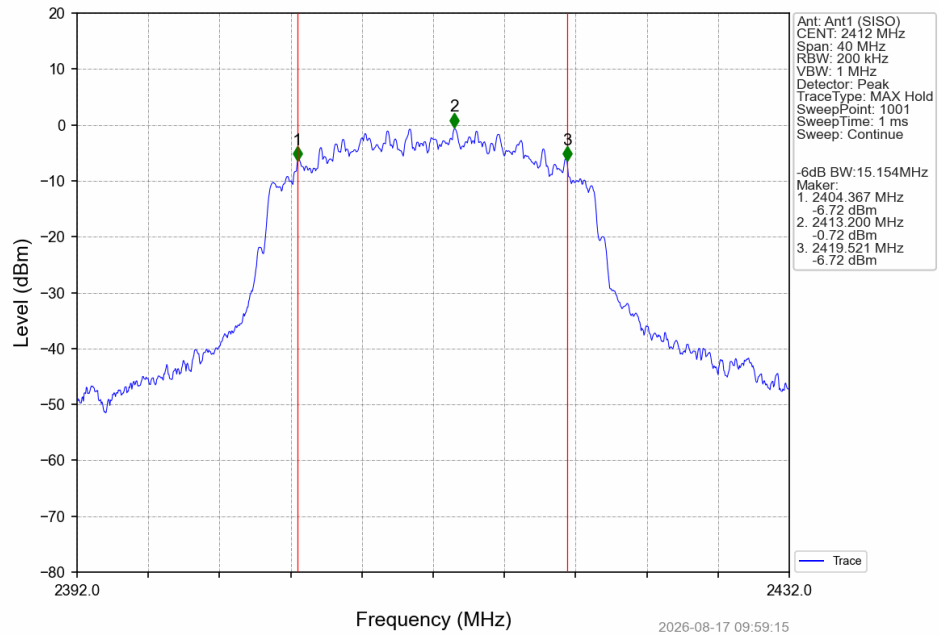
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



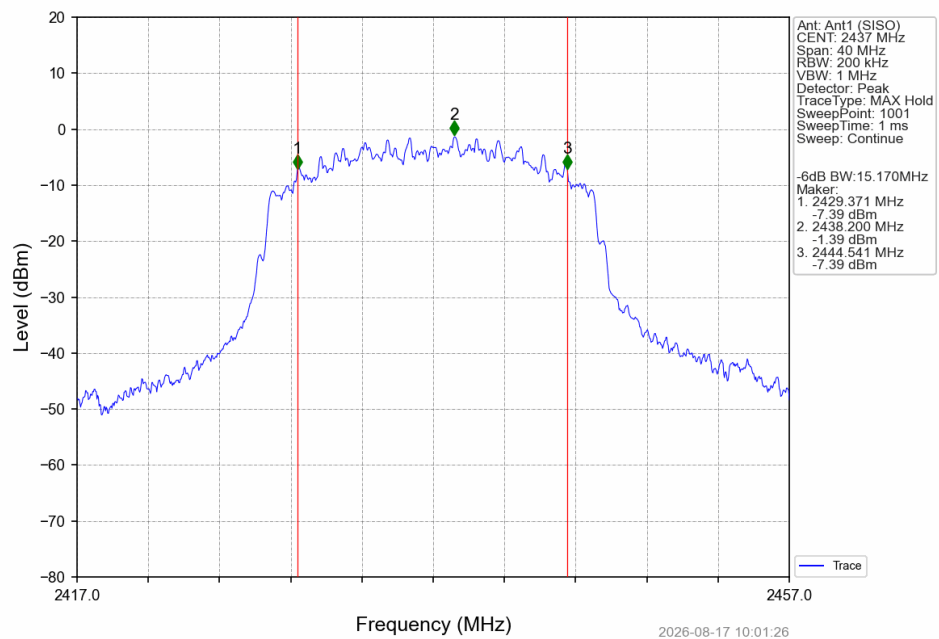
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



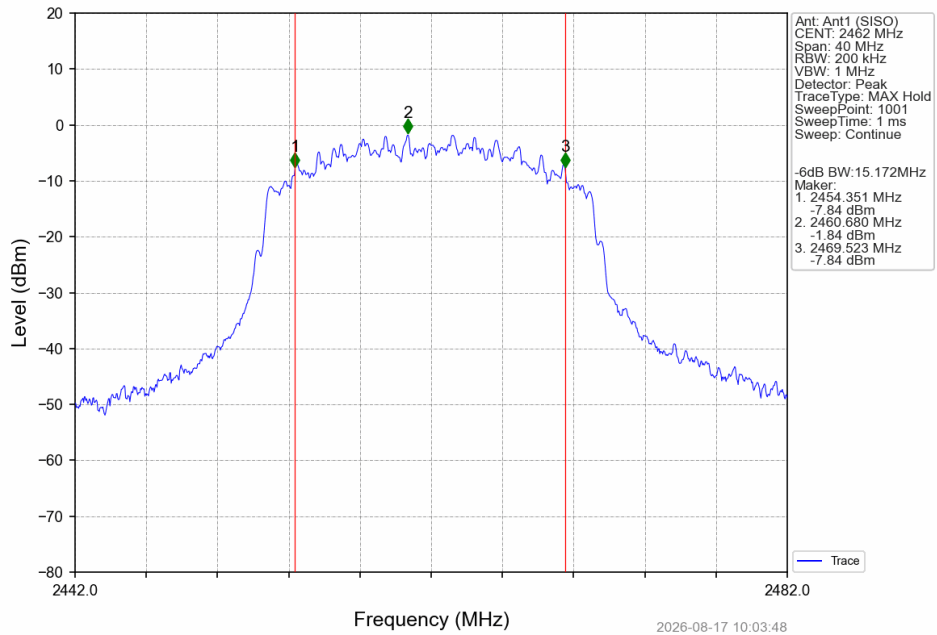
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



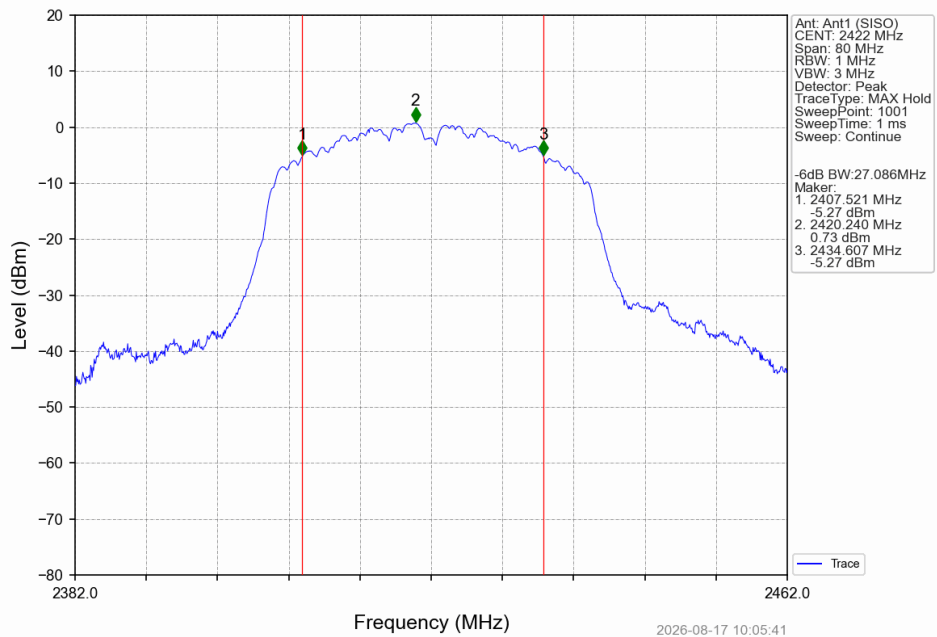
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



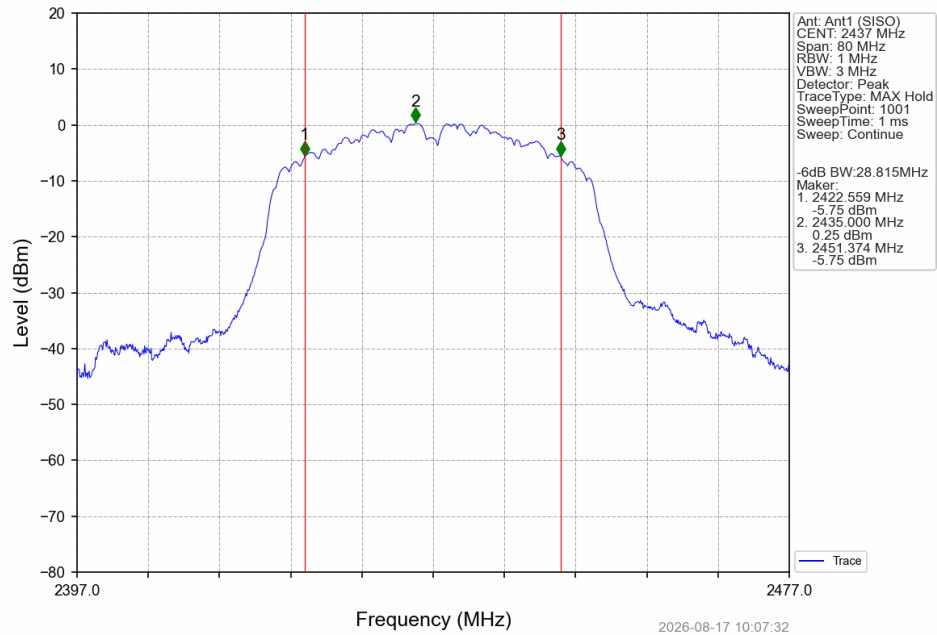
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



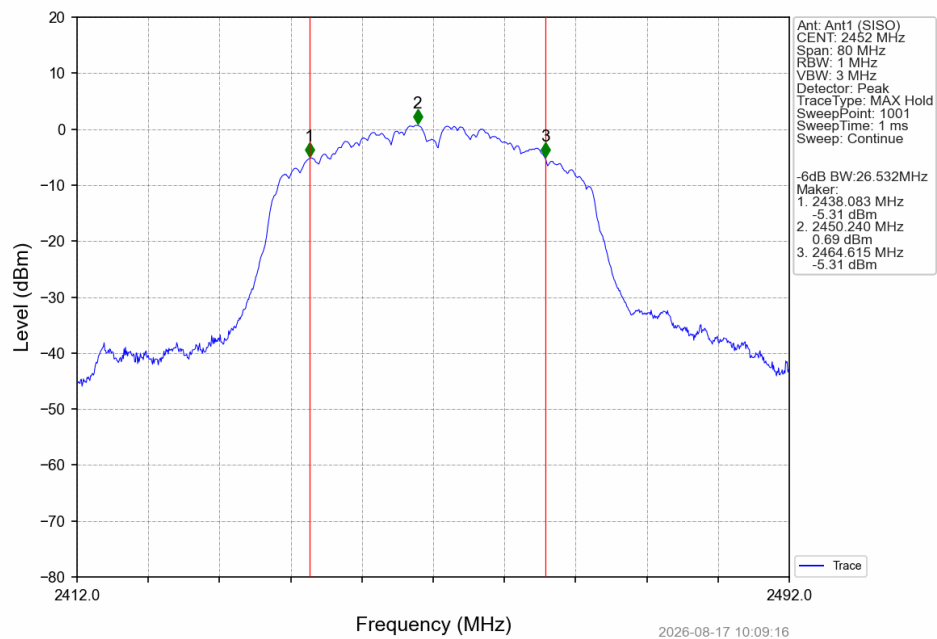
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



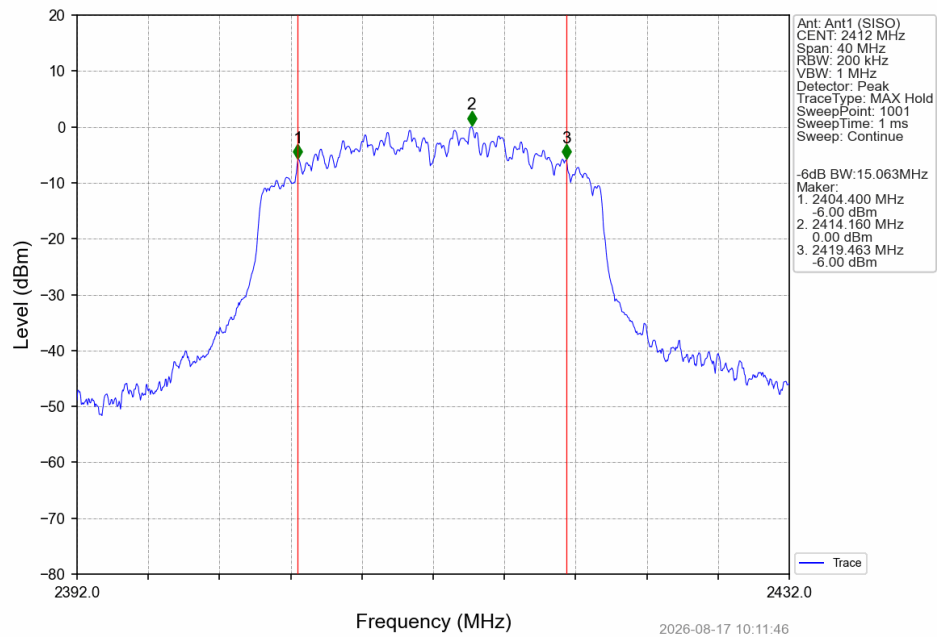
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



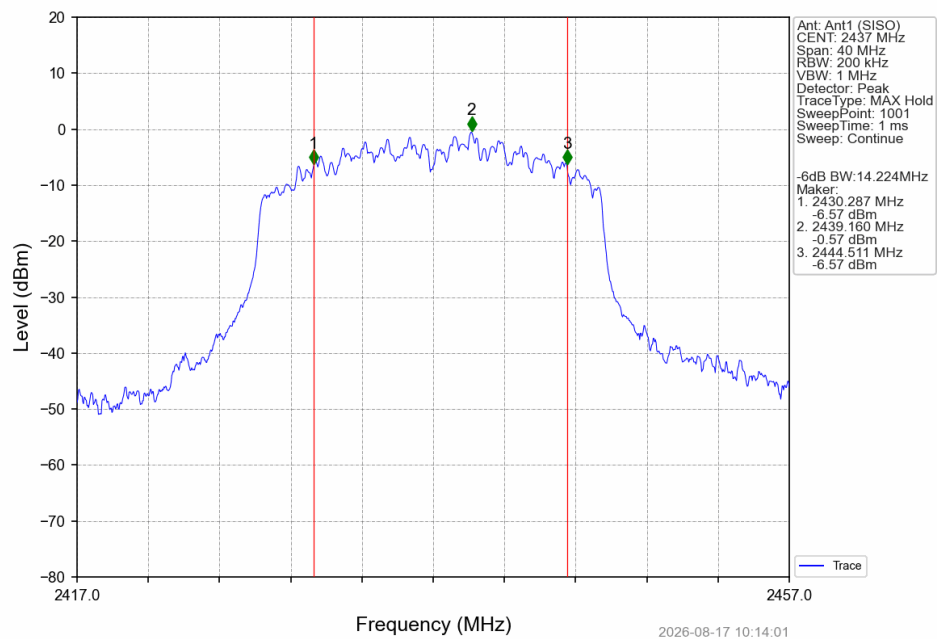
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



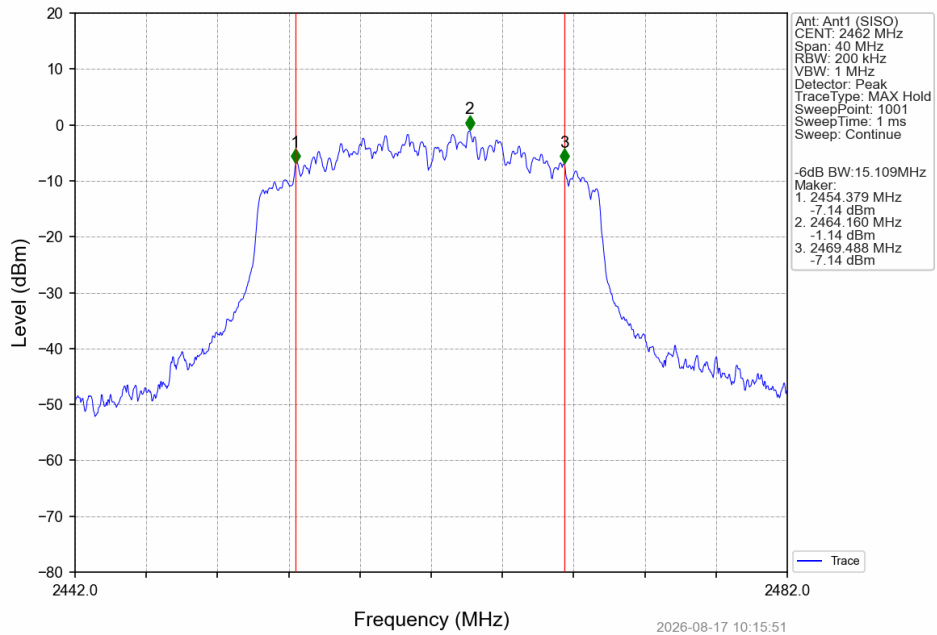
802.11ax(HEW20)_LCH_2412MHz_SU / _Ant1 (SISO)_NTNV



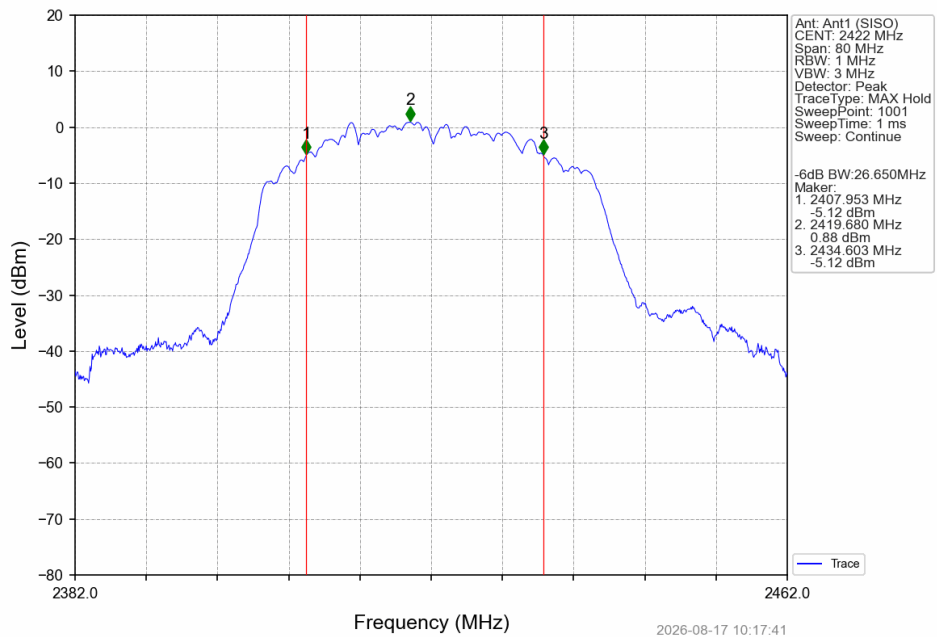
802.11ax(HEW20)_MCH_2437MHz_SU / _Ant1 (SISO)_NTNV



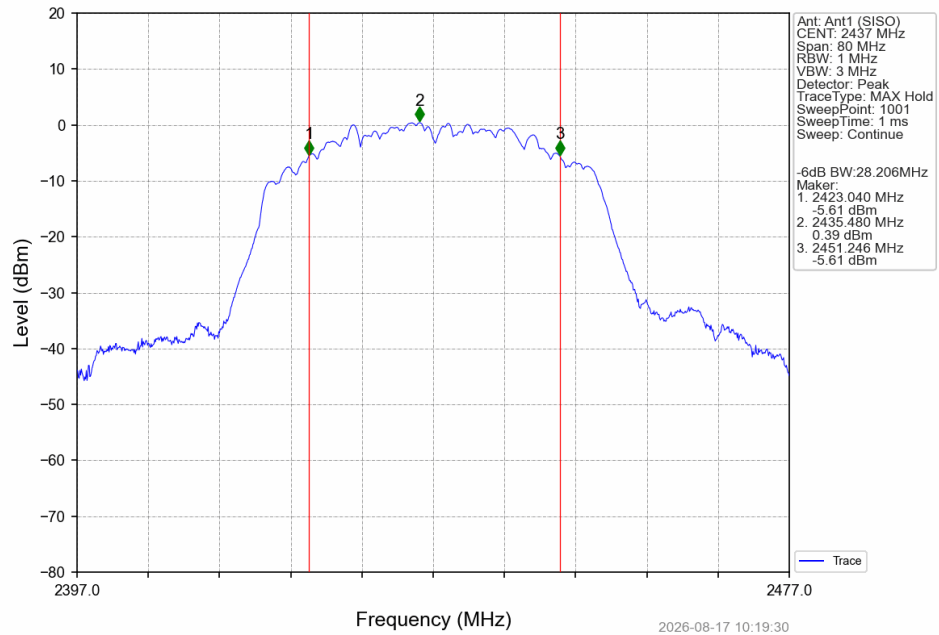
802.11ax(HEW20)_HCH_2462MHz_SU_/_Ant1 (SISO)_NTNV



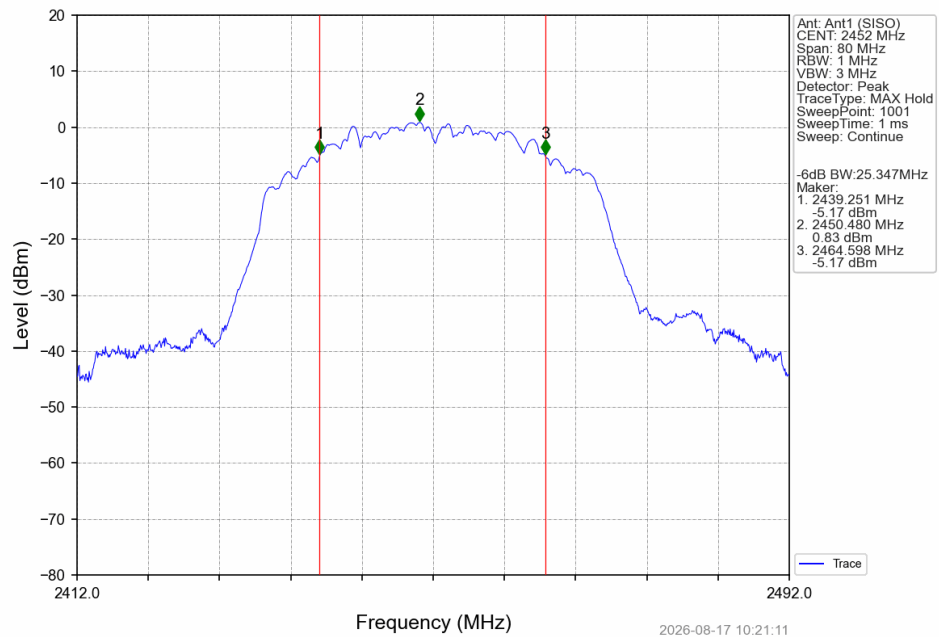
802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW40)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW40)_HCH_2452MHz_SU_/_Ant1 (SISO)_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	Limit	
802.11b	SISO	2412	15.63	<=30	Pass
		2437	15.07	<=30	Pass
		2462	14.69	<=30	Pass
802.11g	SISO	2412	16.88	<=30	Pass
		2437	16.22	<=30	Pass
		2462	15.77	<=30	Pass
802.11n (HT20)	SISO	2412	15.37	<=30	Pass
		2437	14.70	<=30	Pass
		2462	14.30	<=30	Pass
802.11n (HT40)	SISO	2422	12.35	<=30	Pass
		2437	12.22	<=30	Pass
		2452	12.21	<=30	Pass
802.11ax (HEW20)	SISO	2412	15.27	<=30	Pass
		2437	14.50	<=30	Pass
		2462	14.24	<=30	Pass
802.11ax (HEW40)	SISO	2422	12.67	<=30	Pass
		2437	12.51	<=30	Pass
		2452	12.46	<=30	Pass

4. Maximum Power Spectral Density

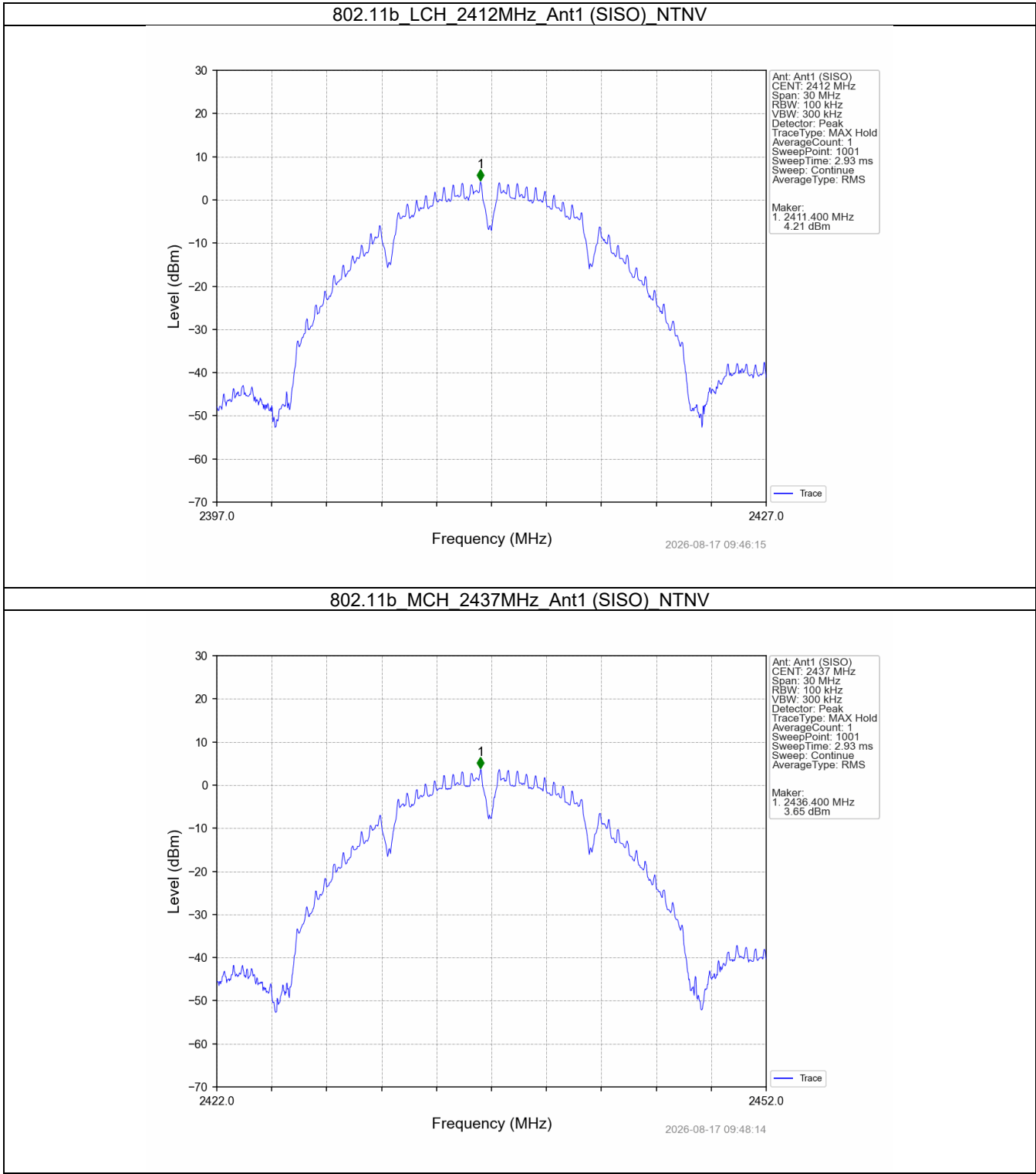
4.1 Test Result

4.1.1 PSD

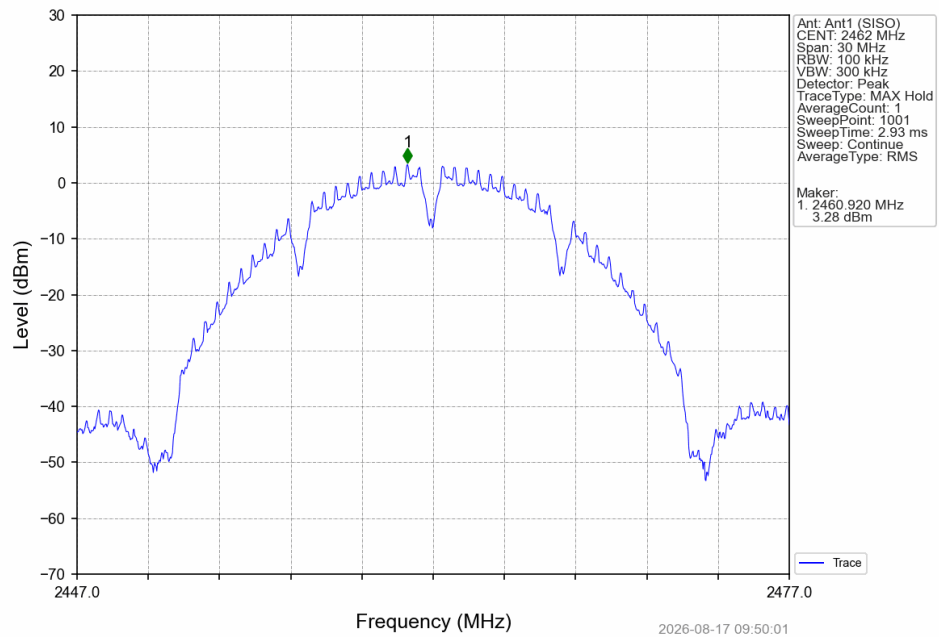
Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum PSD (dBm)		Verdict
					ANT1	Limit(dBm/3kHz)	
802.11b	SISO	2412	/	/	4.21dBm/100kHz	<=8	Pass
		2437	/	/	3.65dBm/100kHz	<=8	Pass
		2462	/	/	3.28dBm/100kHz	<=8	Pass
802.11g	SISO	2412	/	/	-0.71dBm/100kHz	<=8	Pass
		2437	/	/	-1.94dBm/100kHz	<=8	Pass
		2462	/	/	-1.81dBm/100kHz	<=8	Pass
802.11n (HT20)	SISO	2412	/	/	-1.55dBm/100kHz	<=8	Pass
		2437	/	/	-2.26dBm/100kHz	<=8	Pass
		2462	/	/	-2.77dBm/100kHz	<=8	Pass
802.11n (HT40)	SISO	2422	/	/	-6.52dBm/100kHz	<=8	Pass
		2437	/	/	-6.92dBm/100kHz	<=8	Pass
		2452	/	/	-6.59dBm/100kHz	<=8	Pass
802.11ax (HEW20)	SISO	2412	SU	/	-1.48dBm/100kHz	<=8	Pass
		2437	SU	/	-2.18dBm/100kHz	<=8	Pass
		2462	SU	/	-2.57dBm/100kHz	<=8	Pass
802.11ax (HEW40)	SISO	2422	SU	/	-6.37dBm/100kHz	<=8	Pass
		2437	SU	/	-6.78dBm/100kHz	<=8	Pass
		2452	SU	/	-6.45dBm/100kHz	<=8	Pass

4.2 Test Graph

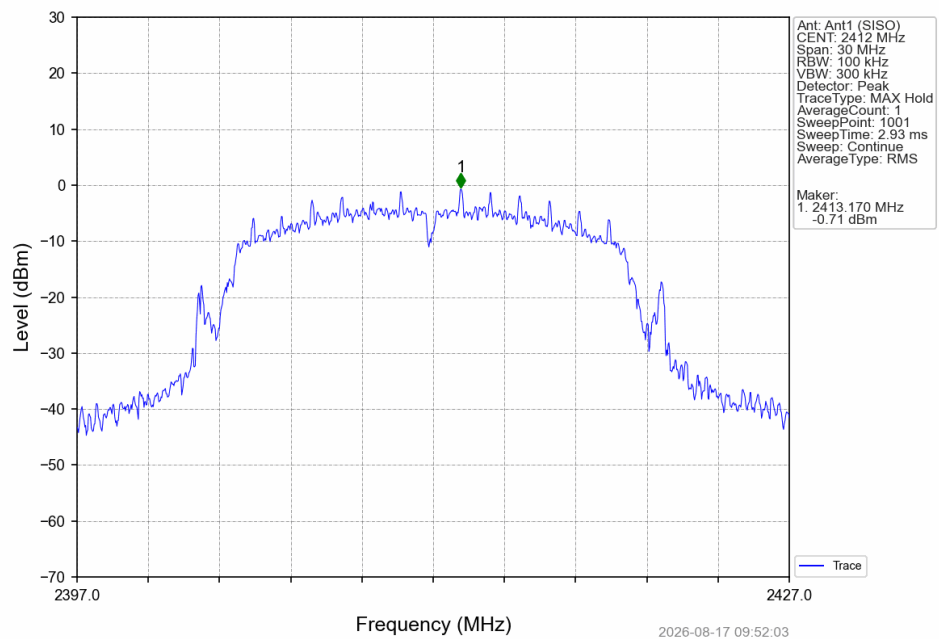
4.2.1 PSD



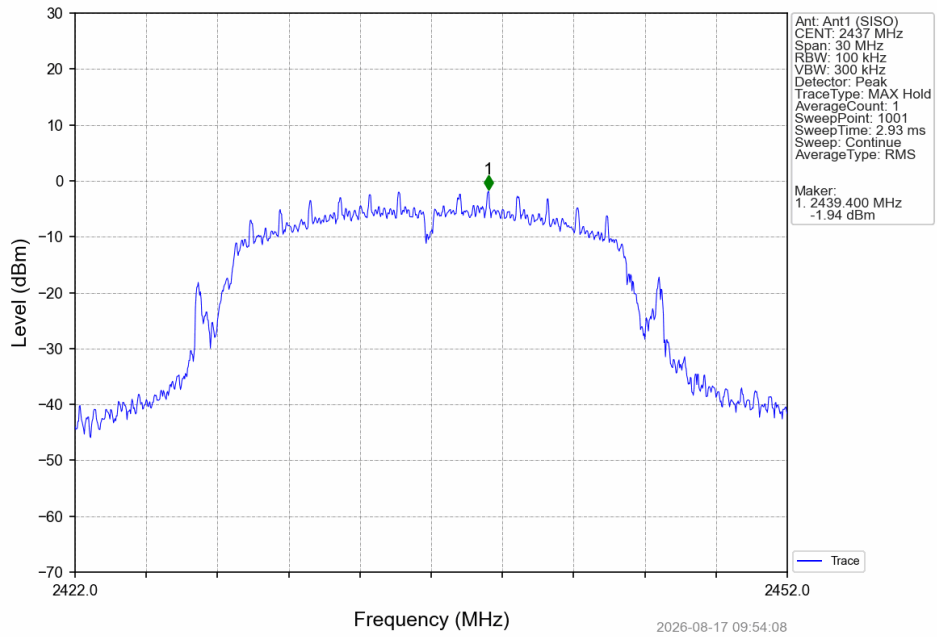
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



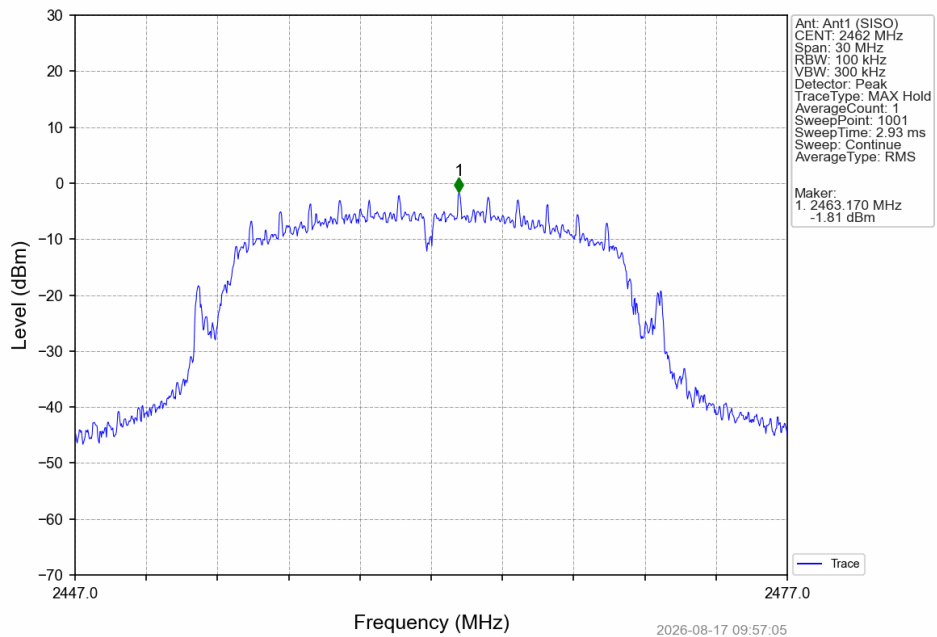
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



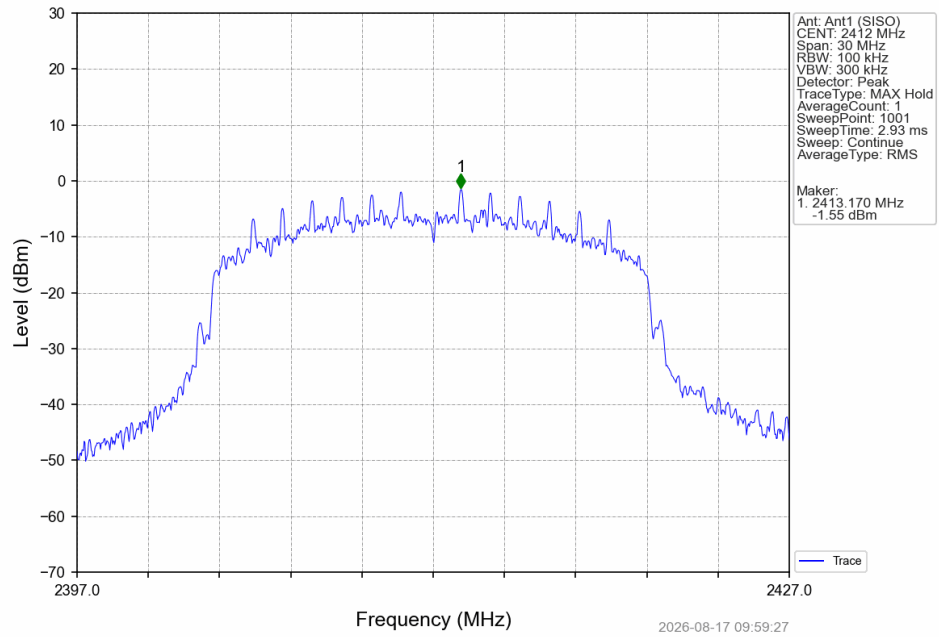
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



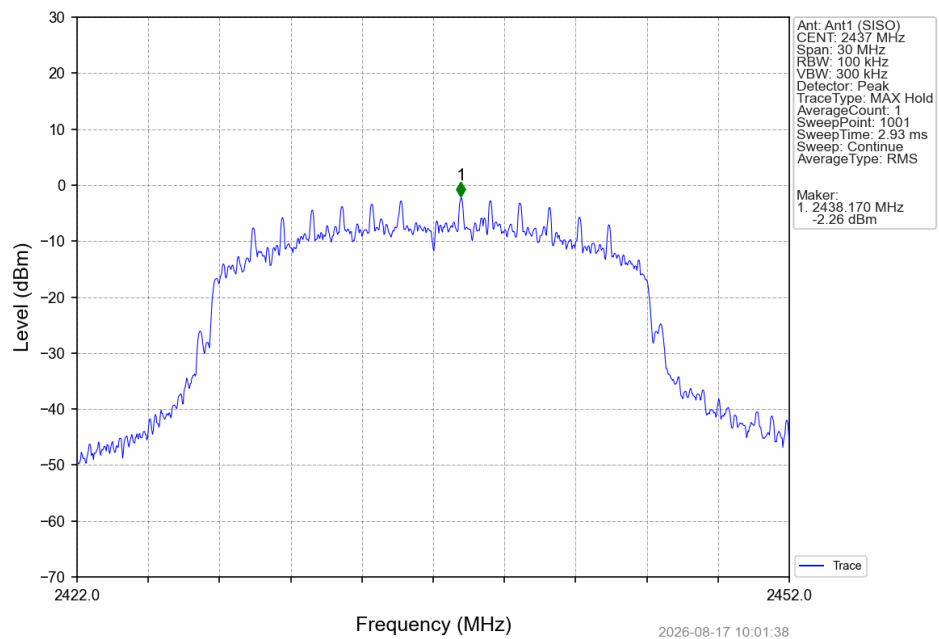
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



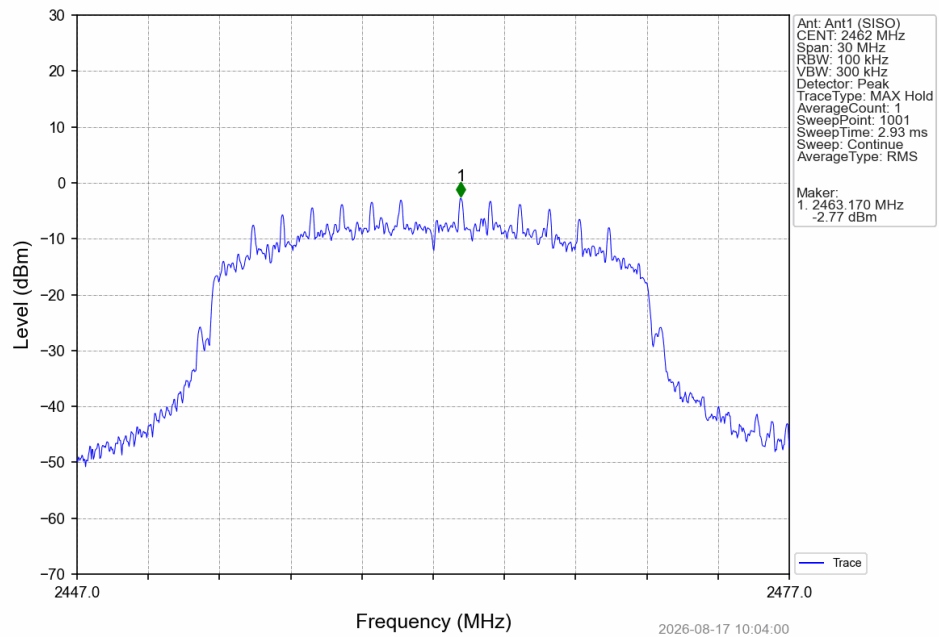
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



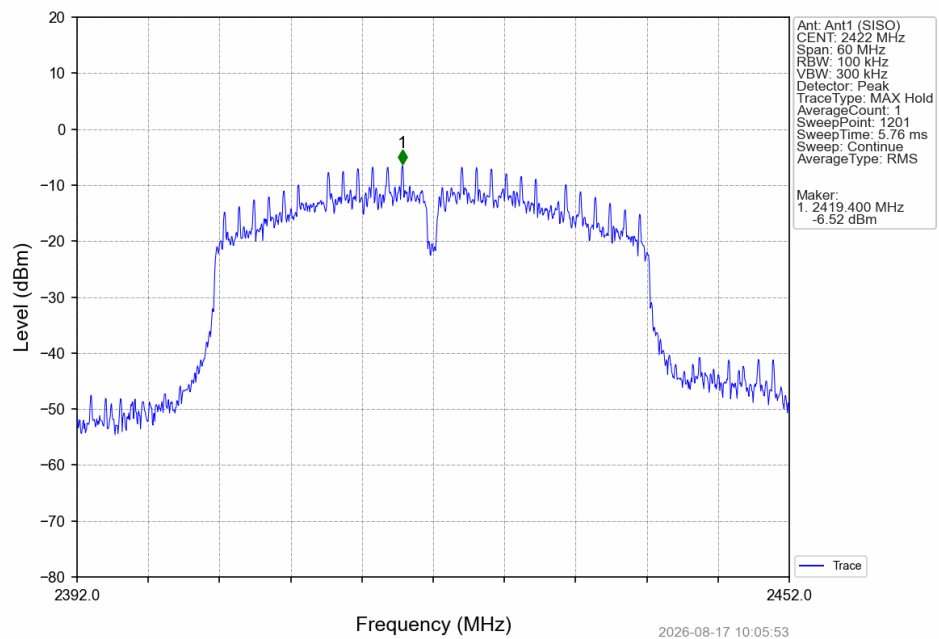
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



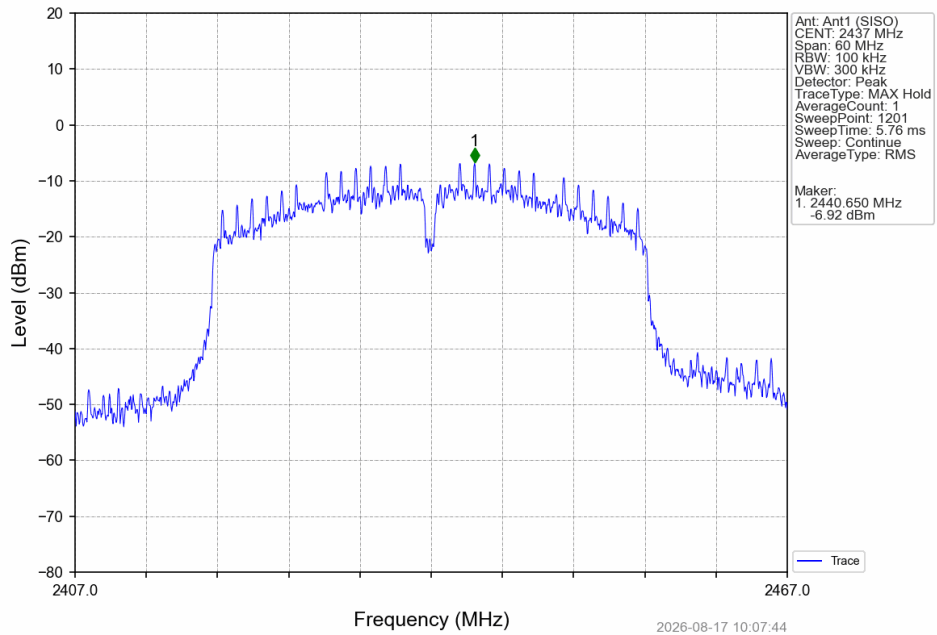
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



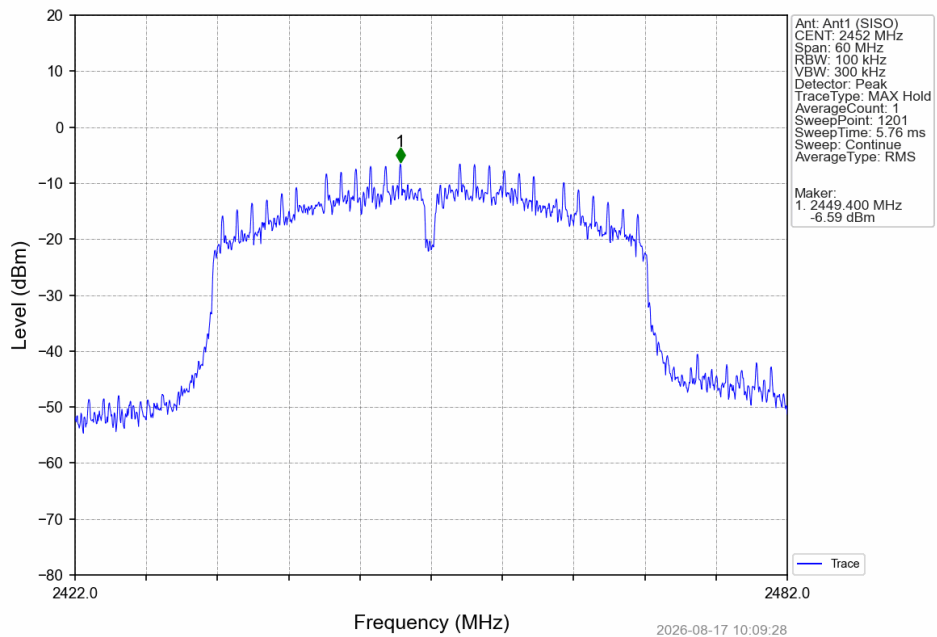
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



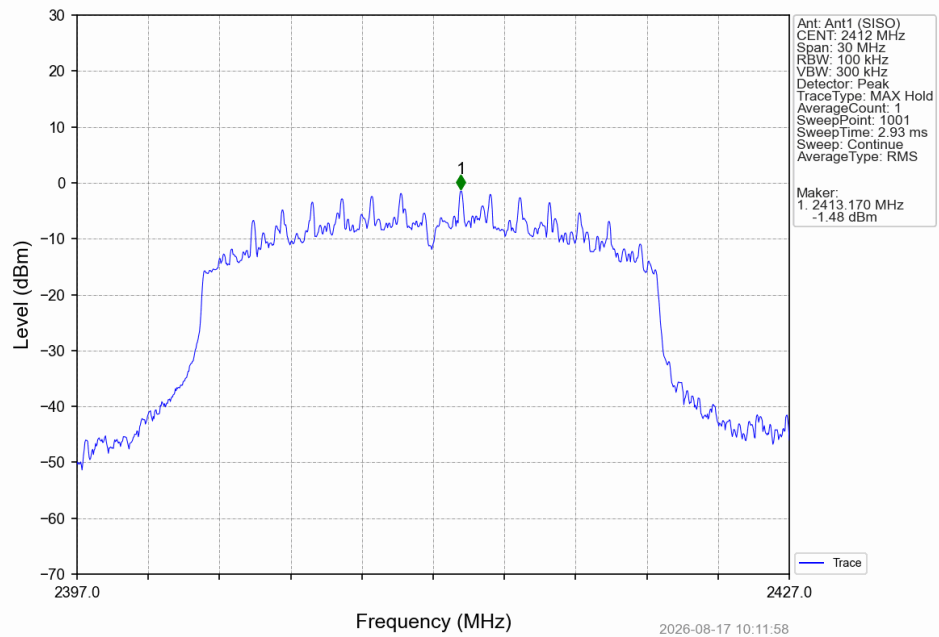
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



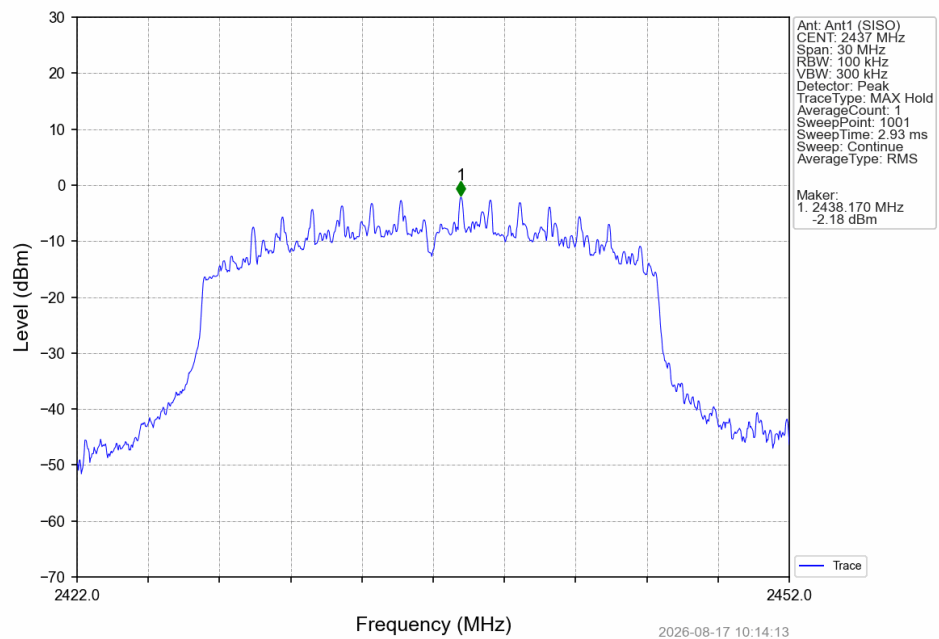
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



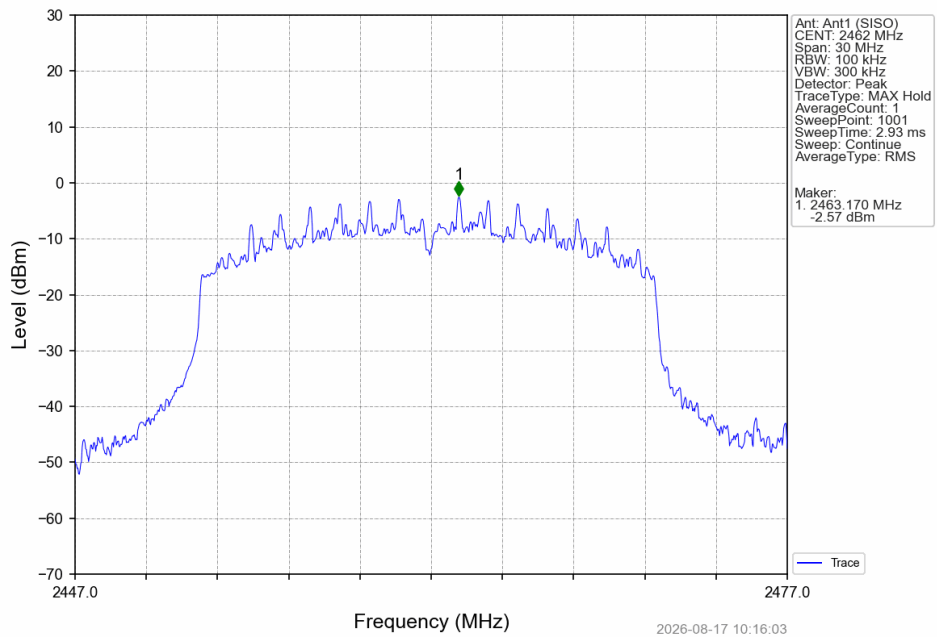
802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant1 (SISO)_NTNV



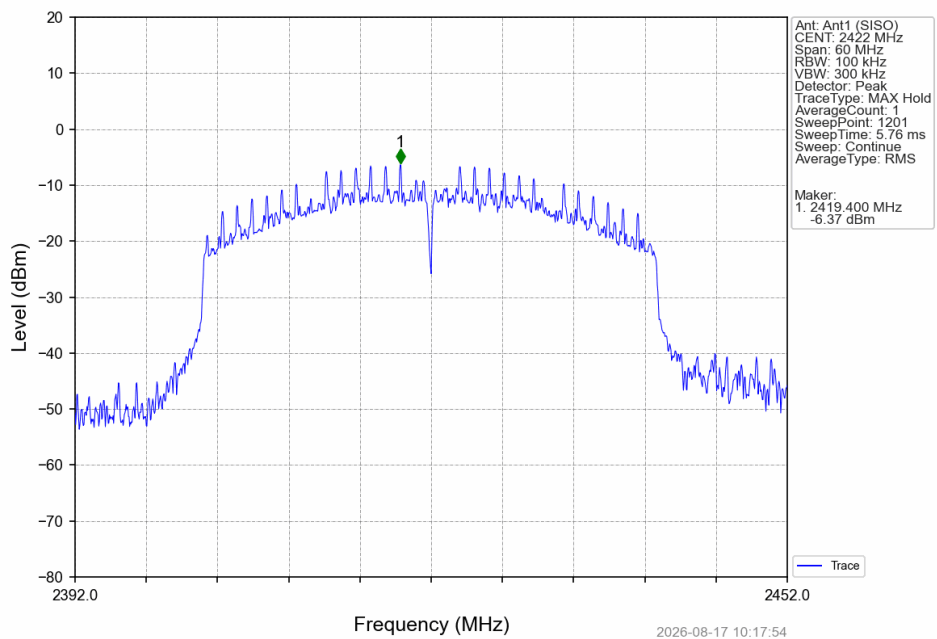
802.11ax(HEW20)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV



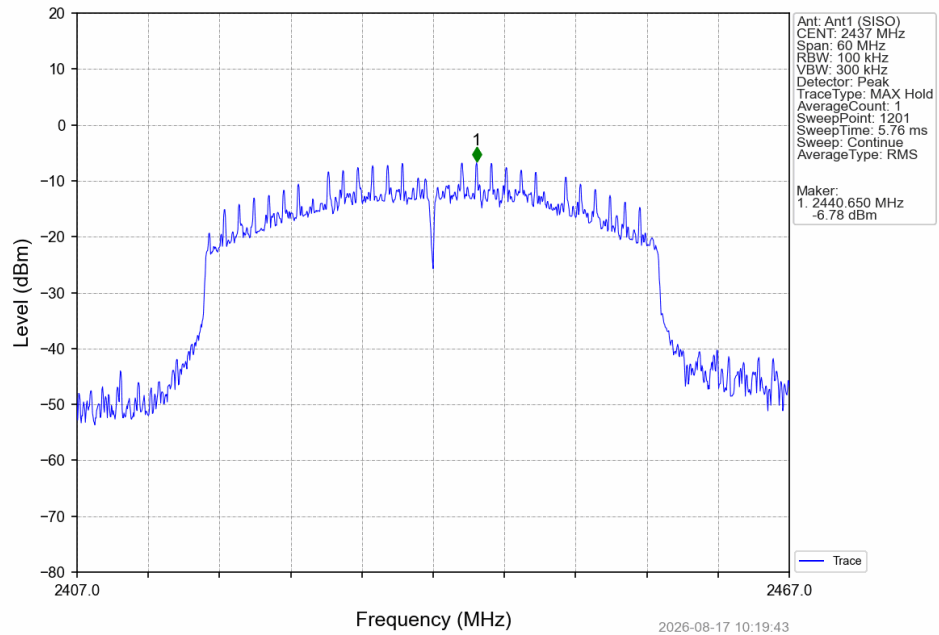
802.11ax(HEW20)_HCH_2462MHz_SU_/_Ant1 (SISO)_NTNV



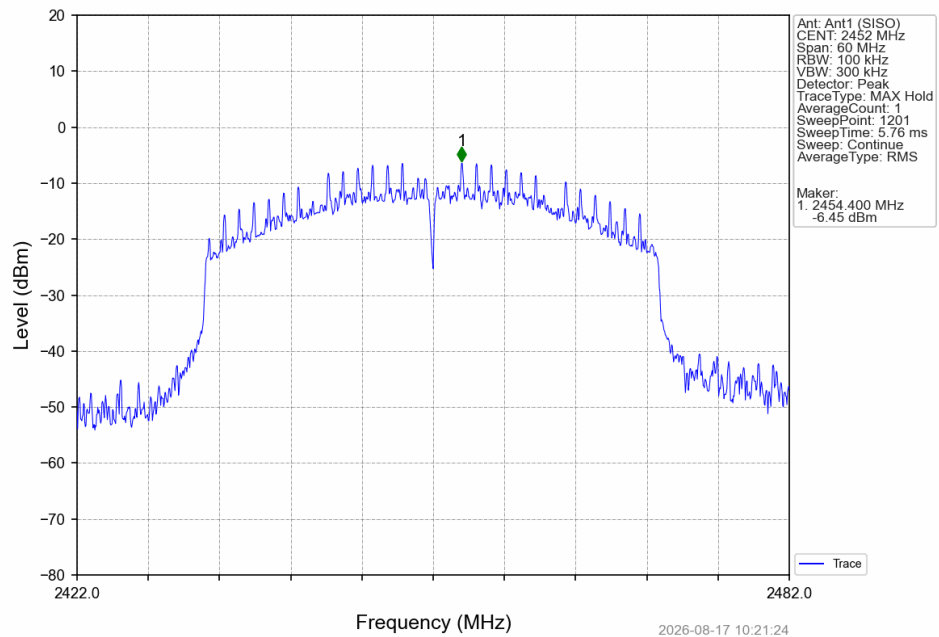
802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW40)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW40)_HCH_2452MHz_SU_/_Ant1 (SISO)_NTNV



5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Test Result

5.1.1 Ref

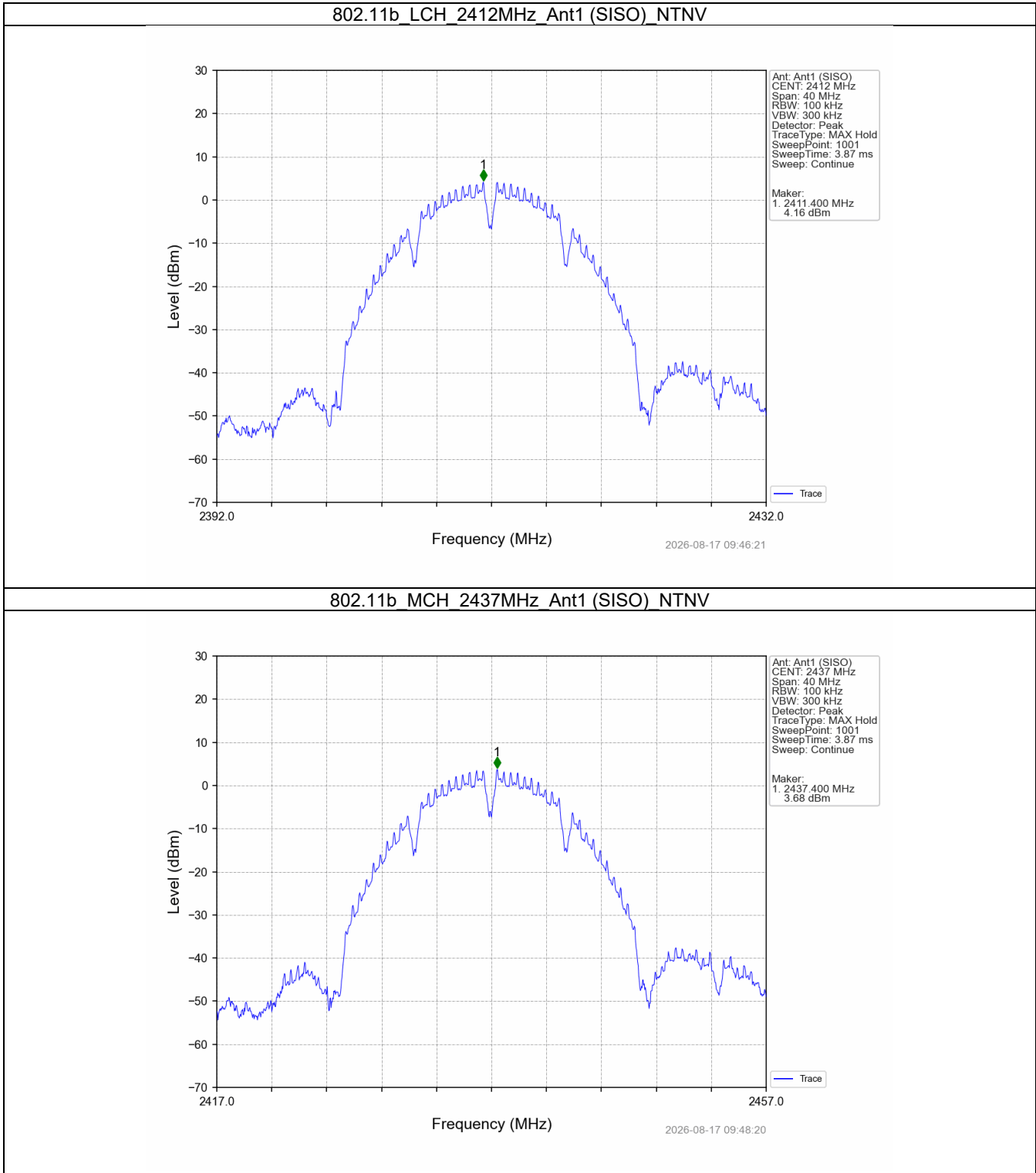
Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	Level of Reference (dBm)
802.11b	SISO	2412	/	/	1	4.16
		2437	/	/	1	3.68
		2462	/	/	1	3.38
802.11g	SISO	2412	/	/	1	-1.01
		2437	/	/	1	-2.01
		2462	/	/	1	-1.80
802.11n (HT20)	SISO	2412	/	/	1	-1.55
		2437	/	/	1	-2.24
		2462	/	/	1	-2.67
802.11n (HT40)	SISO	2422	/	/	1	-6.52
		2437	/	/	1	-6.92
		2452	/	/	1	-6.56
802.11ax (HEW20)	SISO	2412	SU	/	1	-1.42
		2437	SU	/	1	-2.12
		2462	SU	/	1	-2.54
802.11ax (HEW40)	SISO	2422	SU	/	1	-6.39
		2437	SU	/	1	-6.78
		2452	SU	/	1	-6.42

5.1.2 CSE

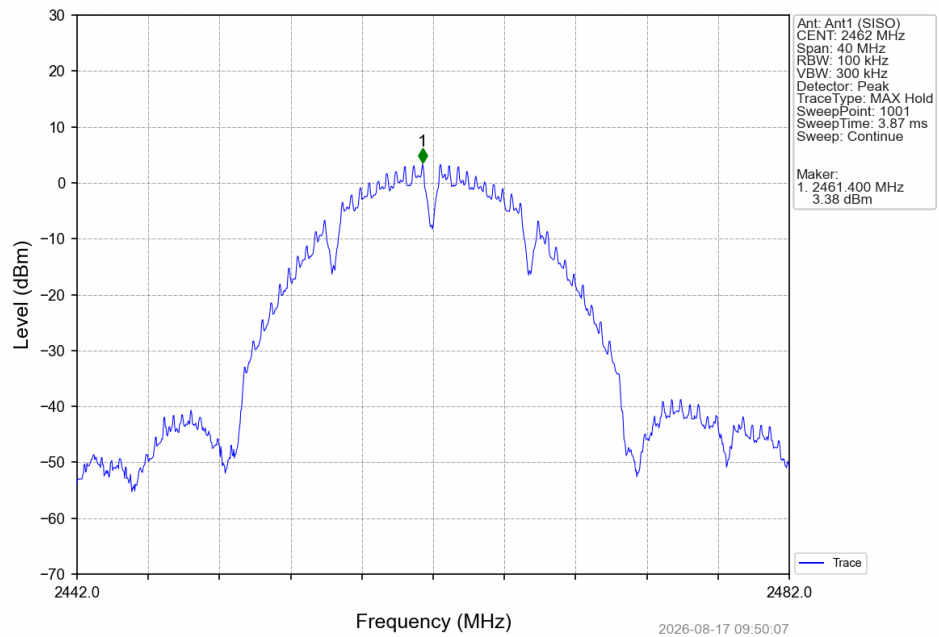
Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	/	/	1	4.16	-15.84	Pass
		2437	/	/	1	3.68	-16.32	Pass
		2462	/	/	1	3.38	-16.62	Pass
802.11g	SISO	2412	/	/	1	-1.01	-21.01	Pass
		2437	/	/	1	-2.01	-22.01	Pass
		2462	/	/	1	-1.80	-21.80	Pass
802.11n (HT20)	SISO	2412	/	/	1	-1.55	-21.55	Pass
		2437	/	/	1	-2.24	-22.24	Pass
		2462	/	/	1	-2.67	-22.67	Pass
802.11n (HT40)	SISO	2422	/	/	1	-6.52	-26.52	Pass
		2437	/	/	1	-6.92	-26.92	Pass
		2452	/	/	1	-6.56	-26.56	Pass
802.11ax (HEW20)	SISO	2412	SU	/	1	-1.42	-21.42	Pass
		2437	SU	/	1	-2.12	-22.12	Pass
		2462	SU	/	1	-2.54	-22.54	Pass
802.11ax (HEW40)	SISO	2422	SU	/	1	-6.39	-26.39	Pass
		2437	SU	/	1	-6.78	-26.78	Pass
		2452	SU	/	1	-6.42	-26.42	Pass

5.2 Test Graph

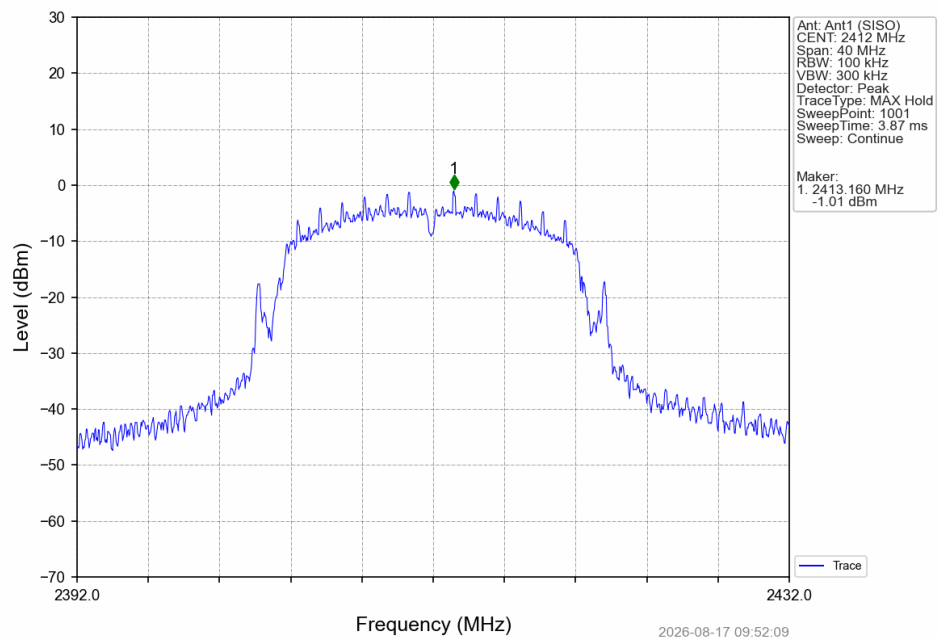
5.2.1 Ref



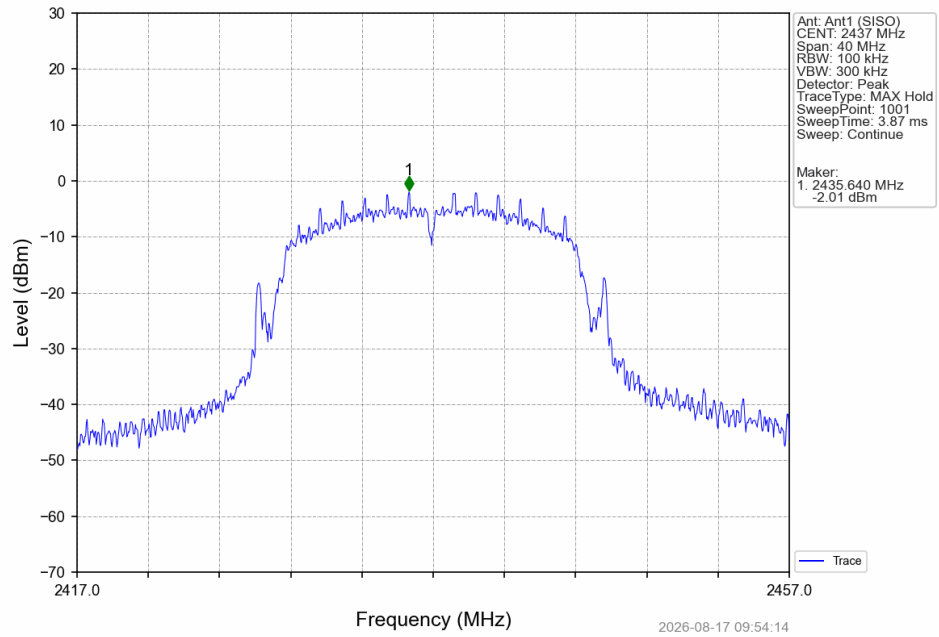
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



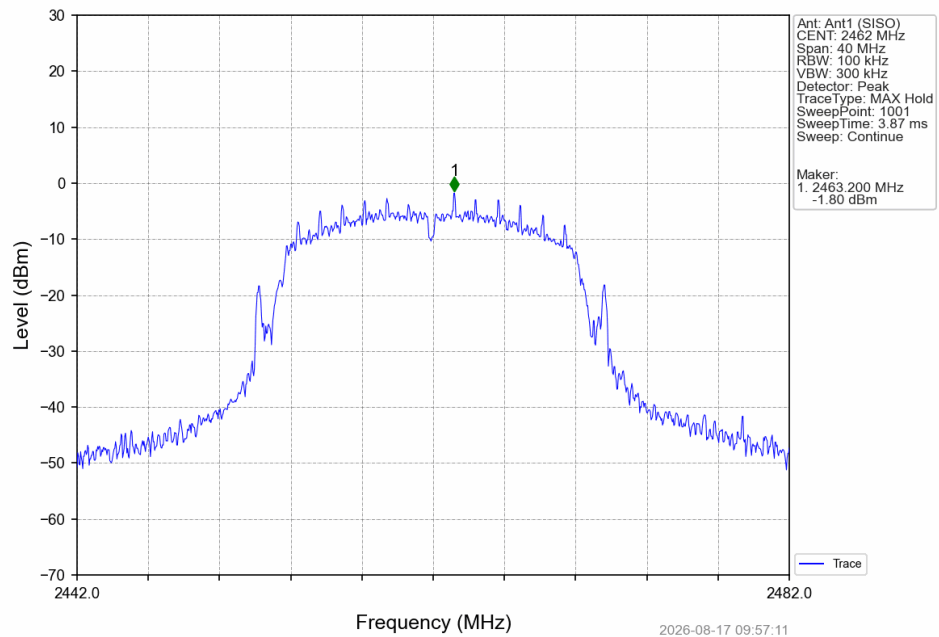
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



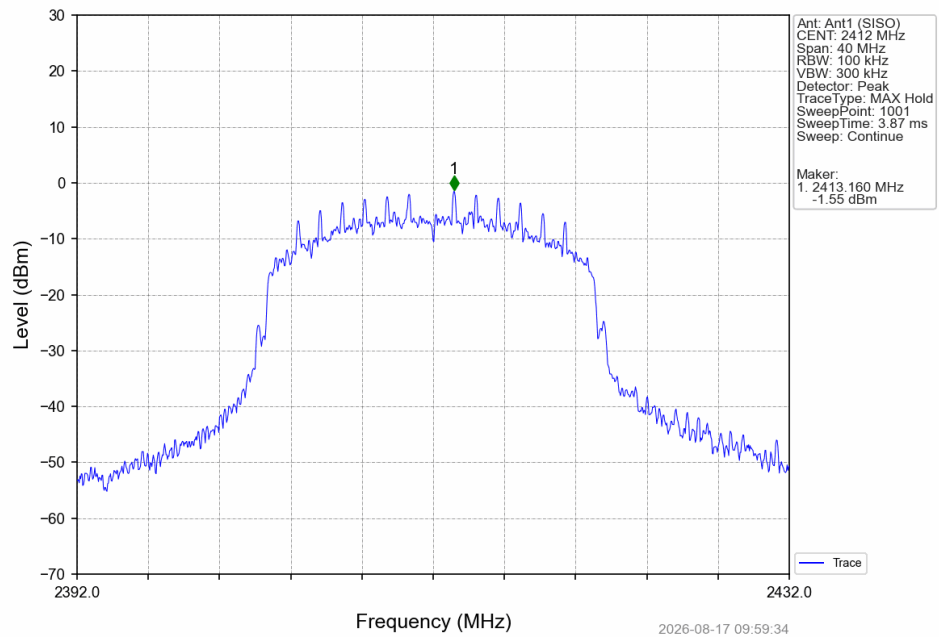
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



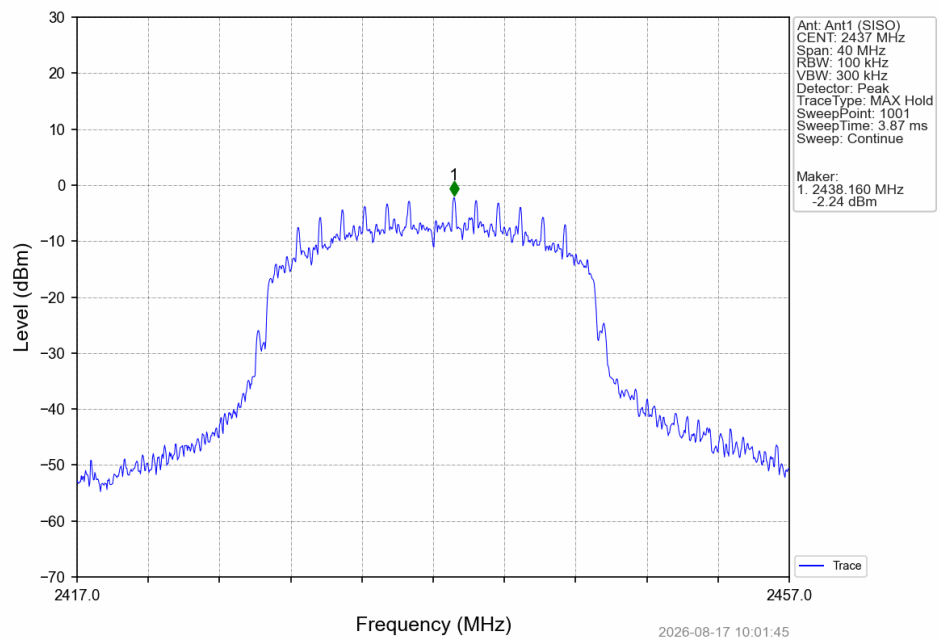
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



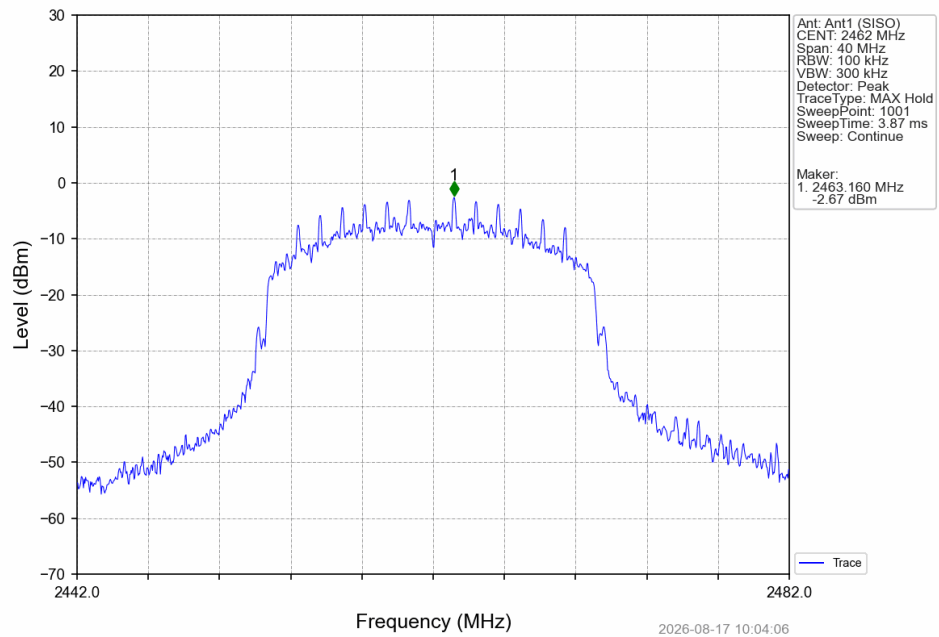
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



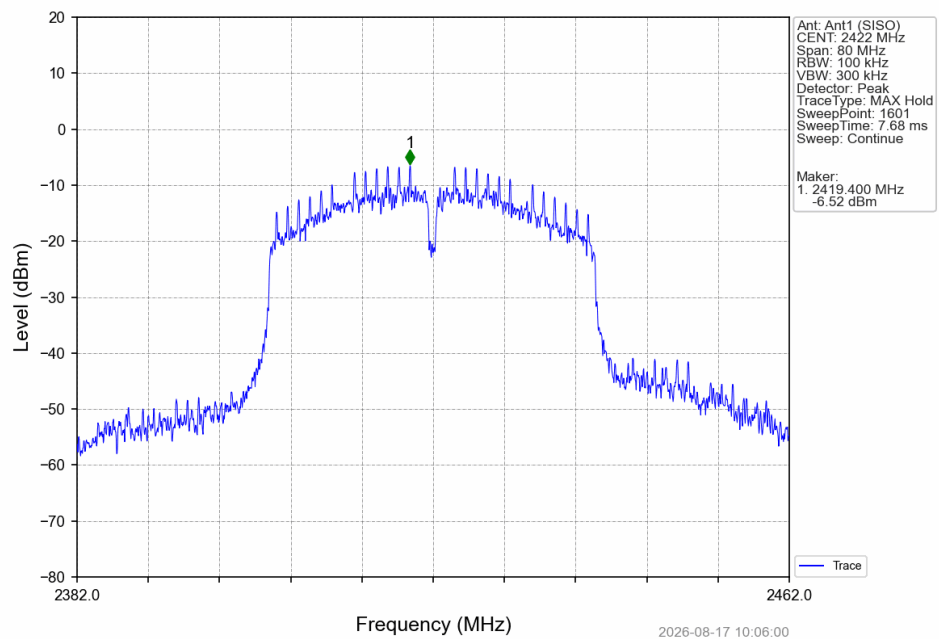
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



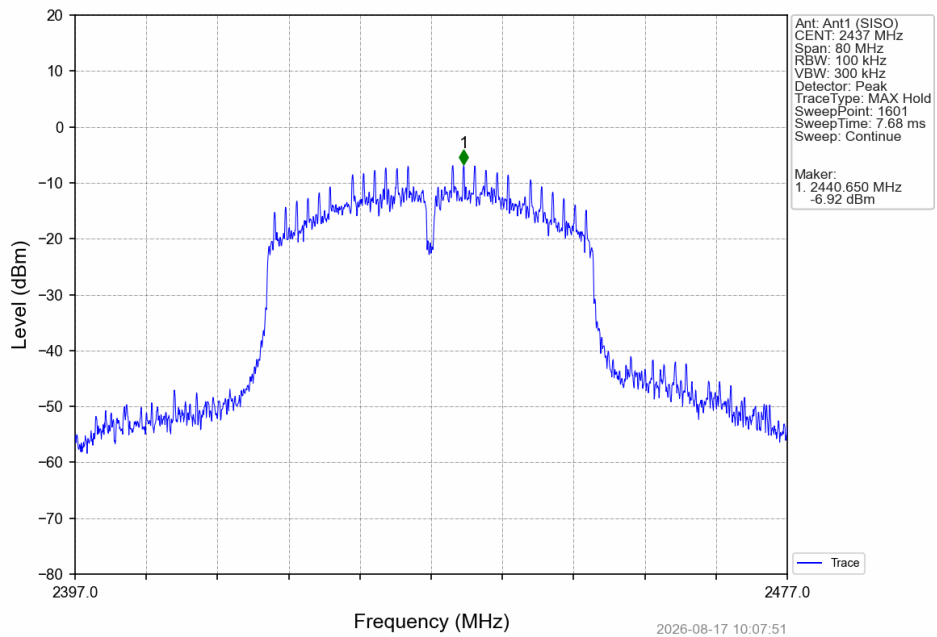
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



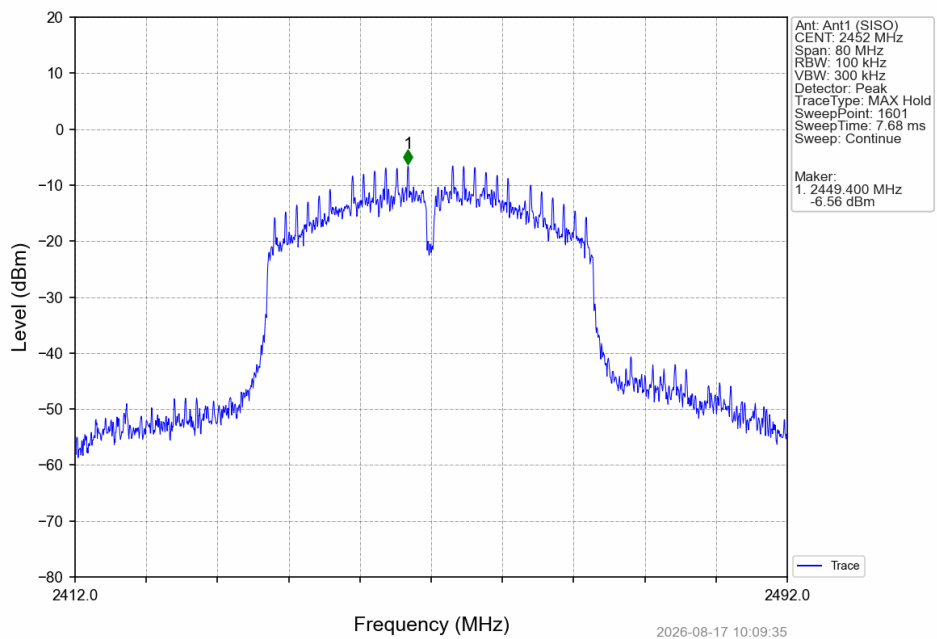
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



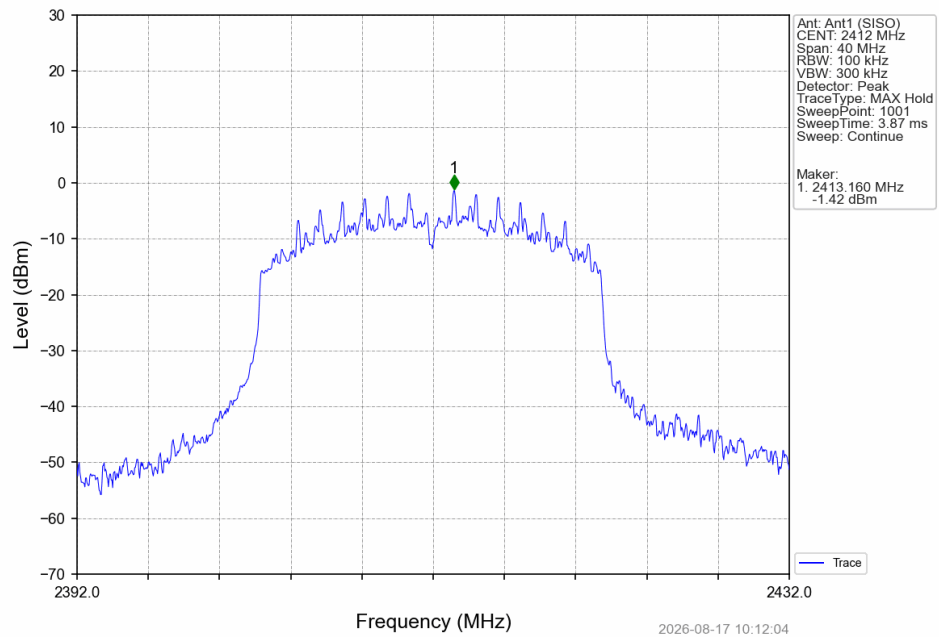
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



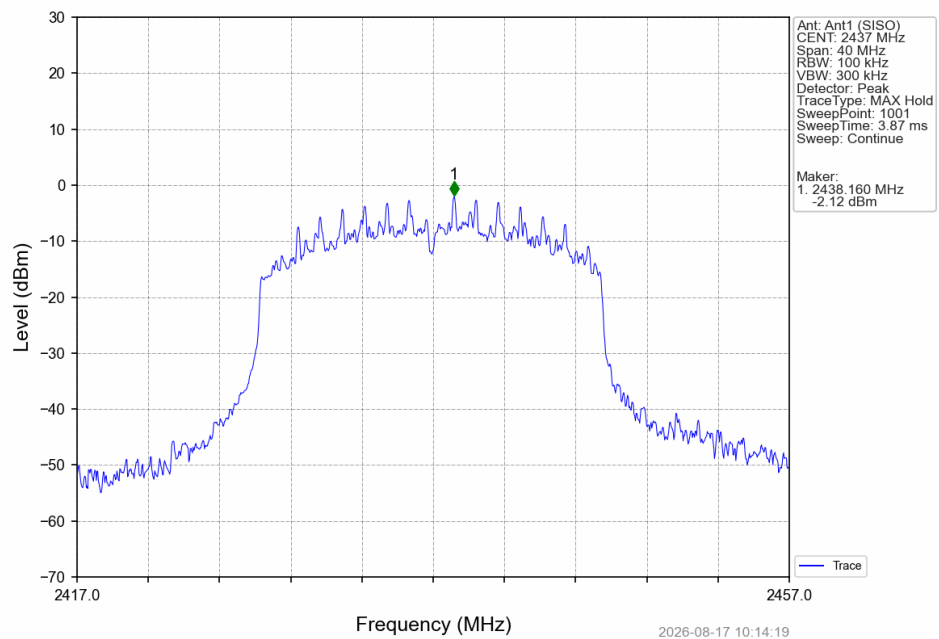
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



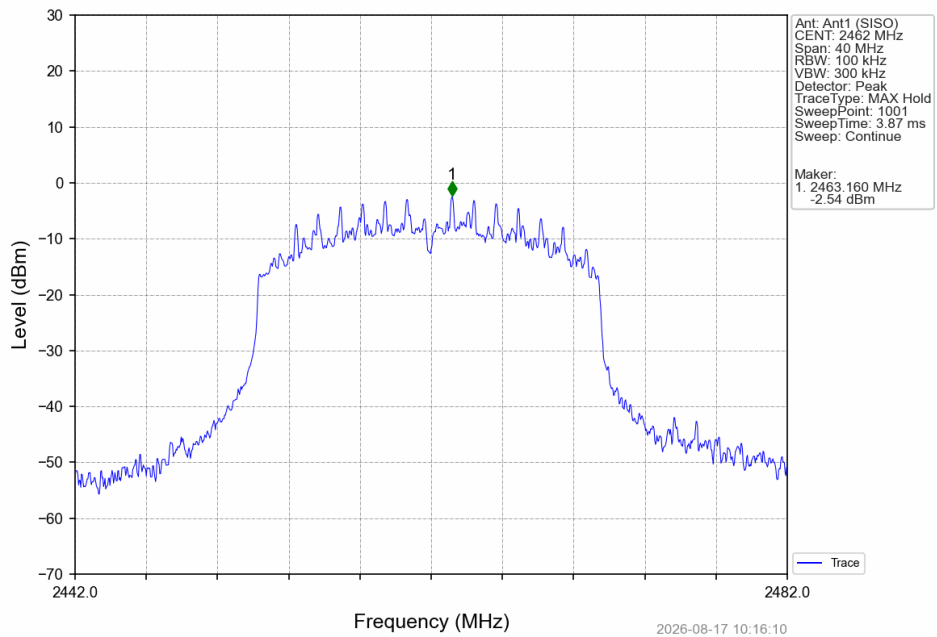
802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW20)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW20)_HCH_2462MHz_SU_/_Ant1 (SISO)_NTNV



802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant1 (SISO)_NTNV

