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Annex for 2.4G Wi-Fi

Test Report No.: CTL2509126021-WF01

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FCC ID: SMQ-UWM1

1. Duty Cycle

1.1 Test Result

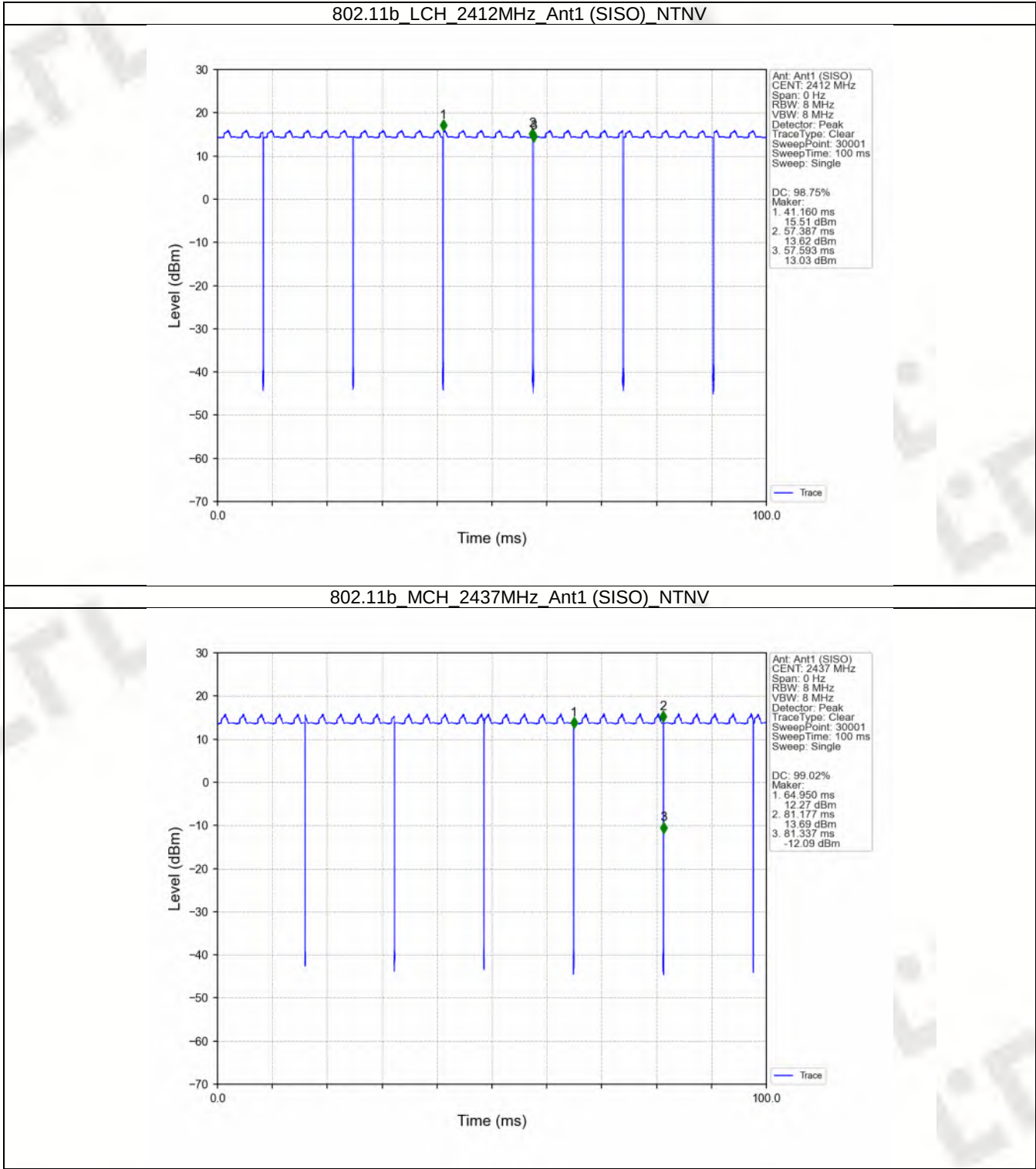
1.1.1 Ant1

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	/	/	16.227	16.433	98.75	0.05	0.44
		2437	/	/	16.227	16.387	99.02	0.04	0.49
		2462	/	/	16.230	16.747	96.91	0.14	0.62
802.11g	SISO	2412	/	/	2.702	2.914	92.72	0.33	3.57
		2437	/	/	2.702	2.905	93.01	0.31	4.25
		2462	/	/	2.702	2.913	92.76	0.33	3.88
802.11n (HT20)	SISO	2412	/	/	2.514	2.725	92.26	0.35	4.79
		2437	/	/	2.515	2.717	92.57	0.34	4.19
		2462	/	/	2.514	2.726	92.22	0.35	3.82
802.11n (HT40)	SISO	2422	/	/	1.232	1.435	85.85	0.66	6.39
		2437	/	/	1.233	1.426	86.47	0.63	5.83
		2452	/	/	1.232	1.444	85.32	0.69	3.32
802.11ax (HEW20)	SISO	2412	SU	/	0.986	1.489	66.22	1.79	0.03
		2437	SU	/	0.987	1.489	66.29	1.79	0.03
		2462	SU	/	0.987	1.489	66.29	1.79	0.03
802.11ax (HEW40)	SISO	2422	SU	/	0.520	1.022	50.88	2.93	0.02
		2437	SU	/	0.520	1.023	50.83	2.94	0.03
		2452	SU	/	0.521	1.023	50.93	2.93	0.03

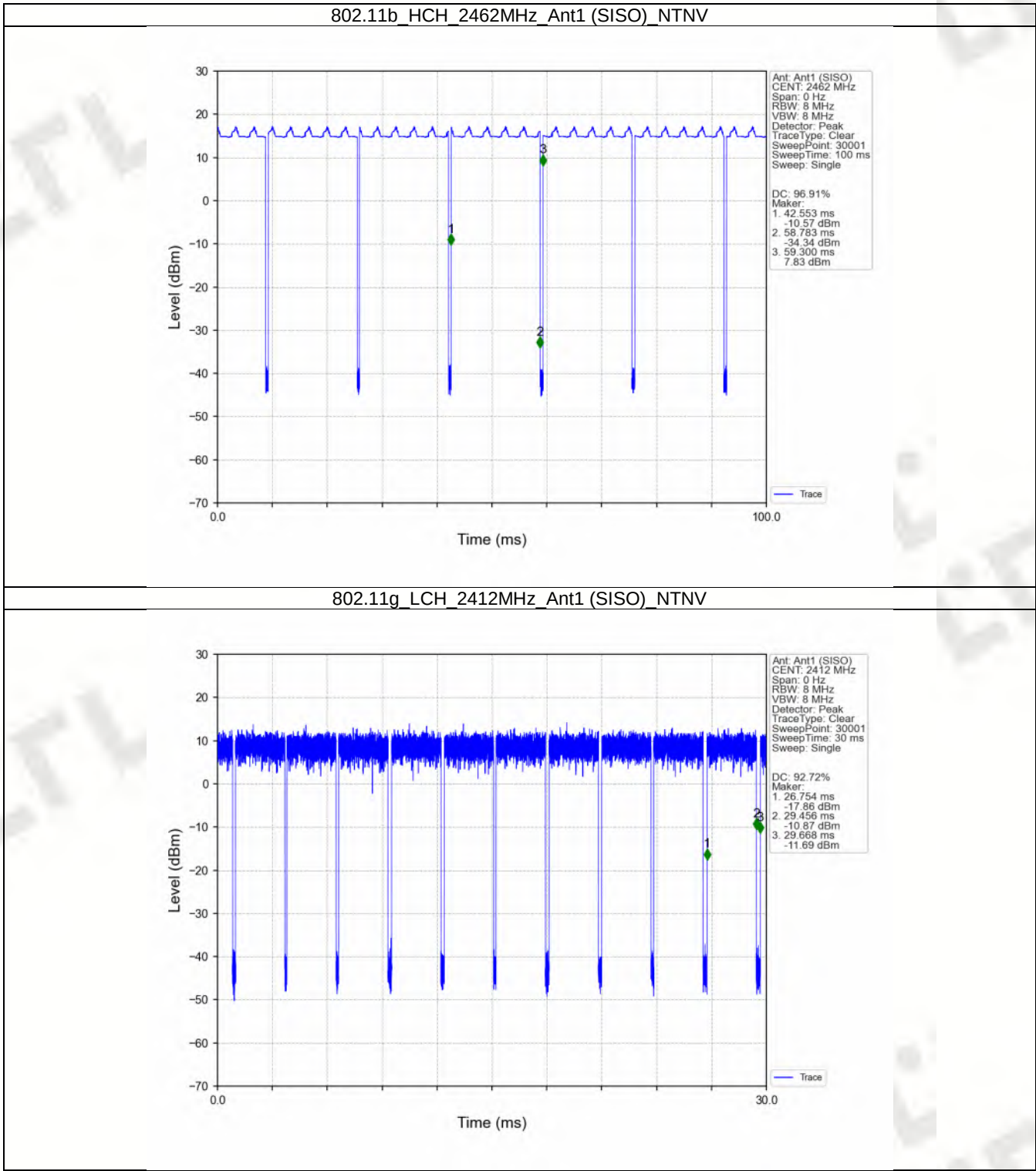
FCC ID: SMQ-UWM1

1.2 Test Graph

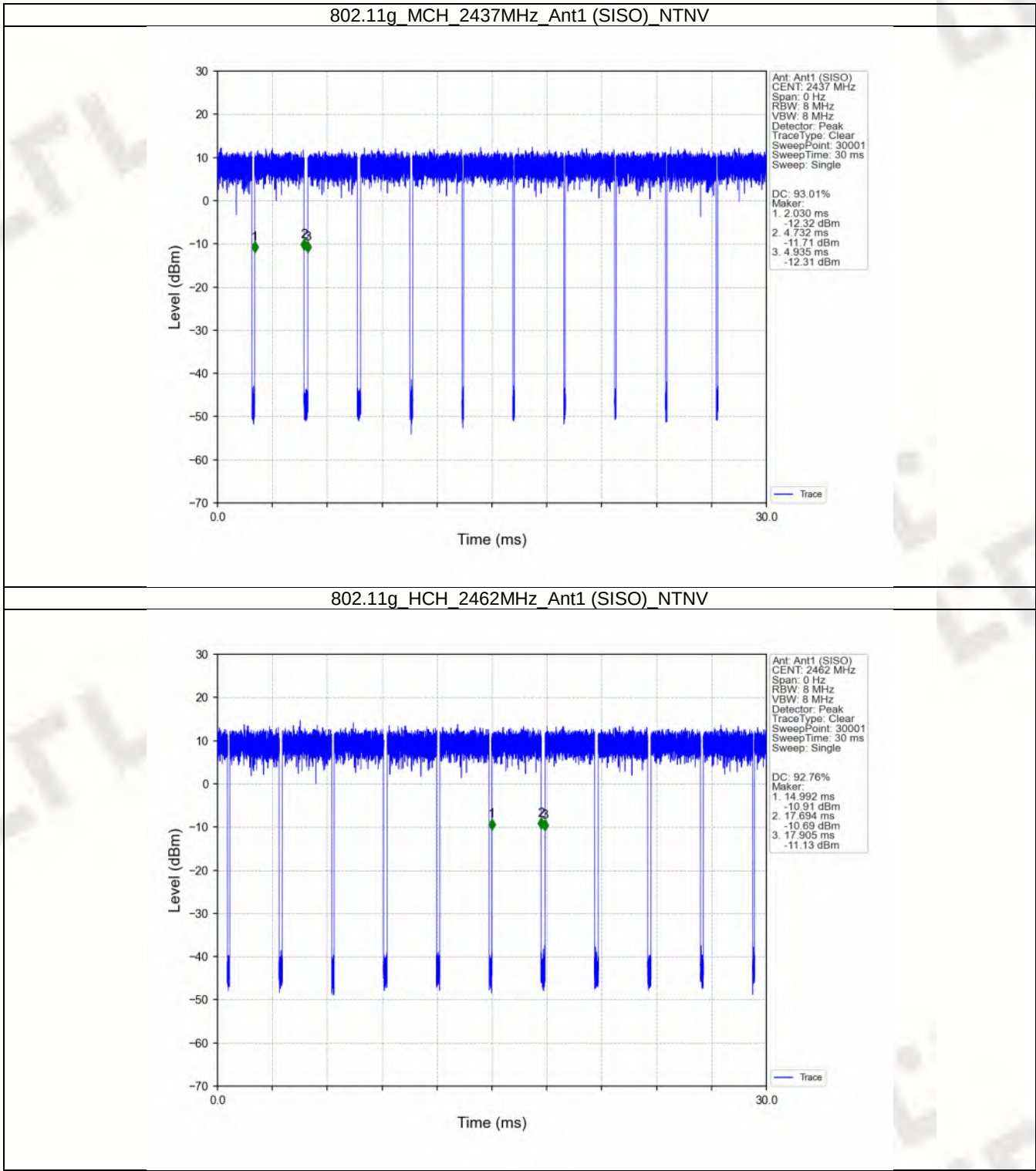
1.2.1 Ant1



FCC ID: SMQ-UWM1

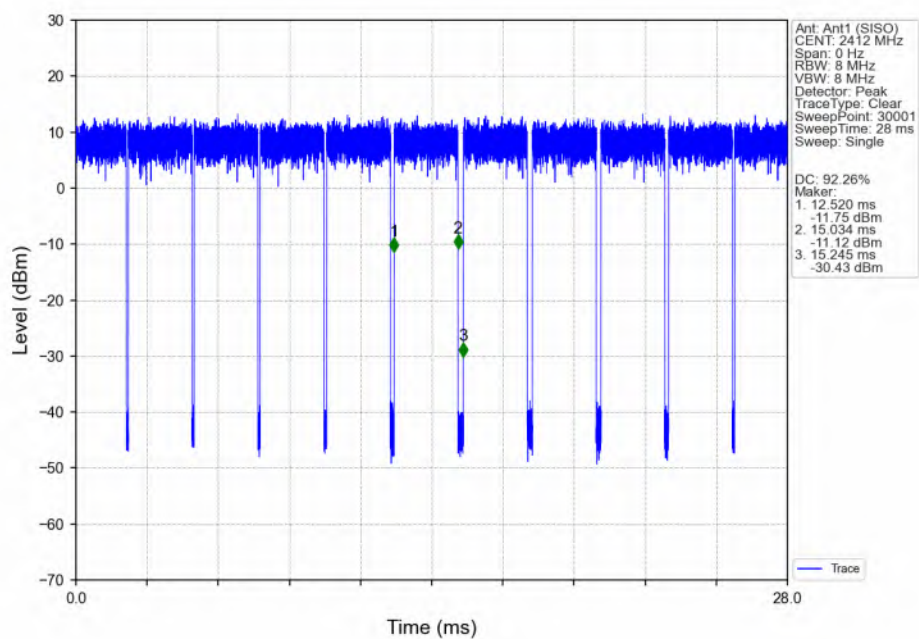


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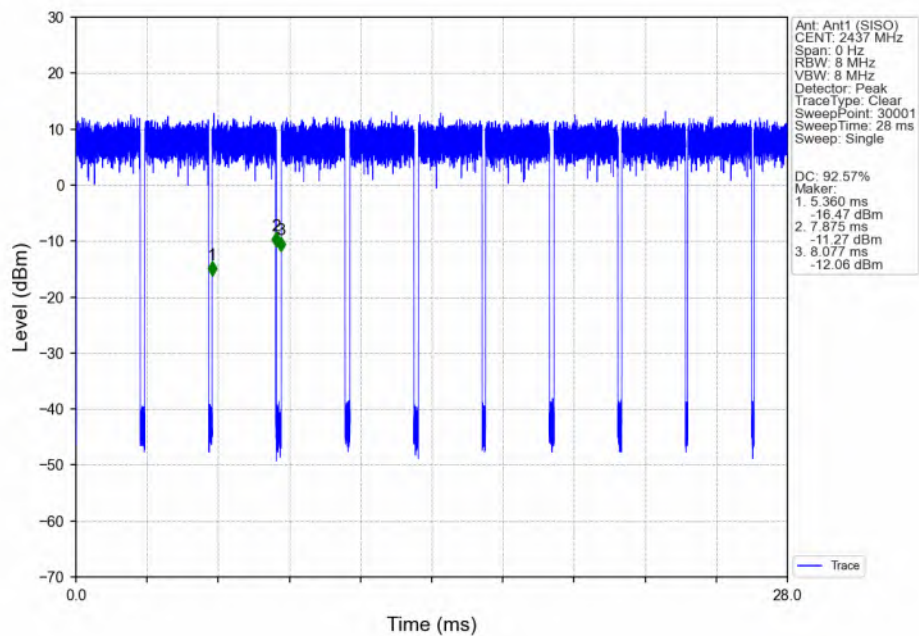


FCC ID: SMQ-UWM1

802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV

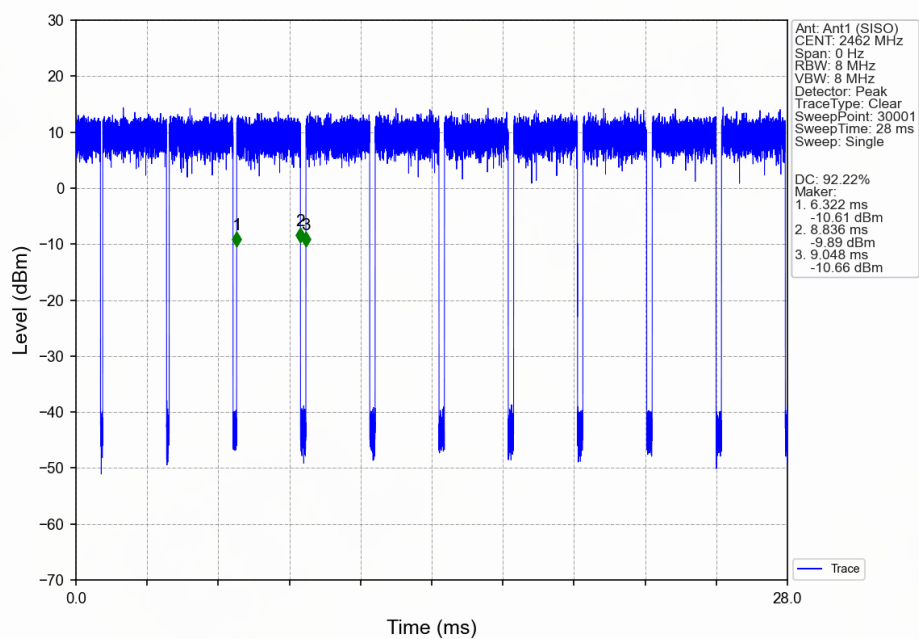


802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV

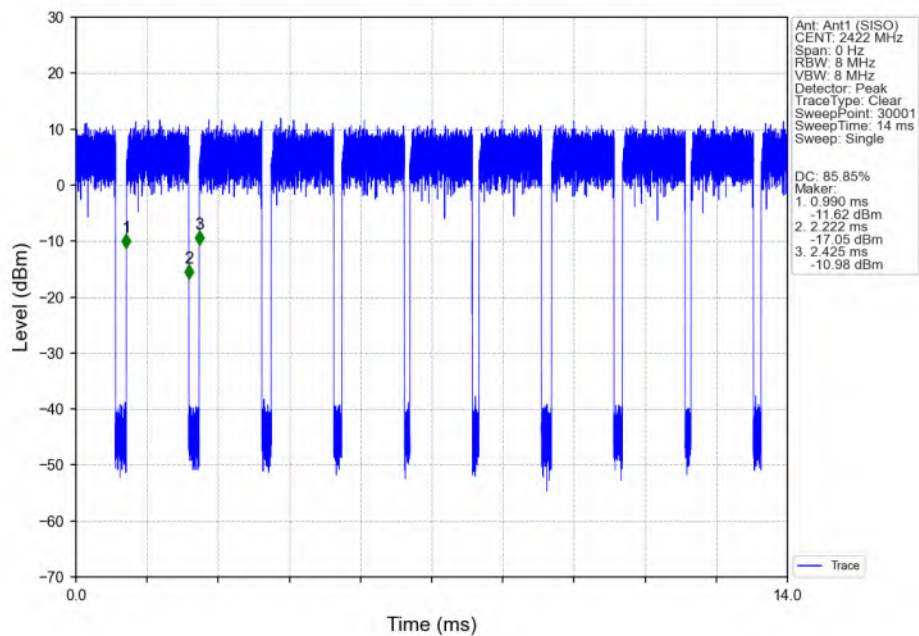


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802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV

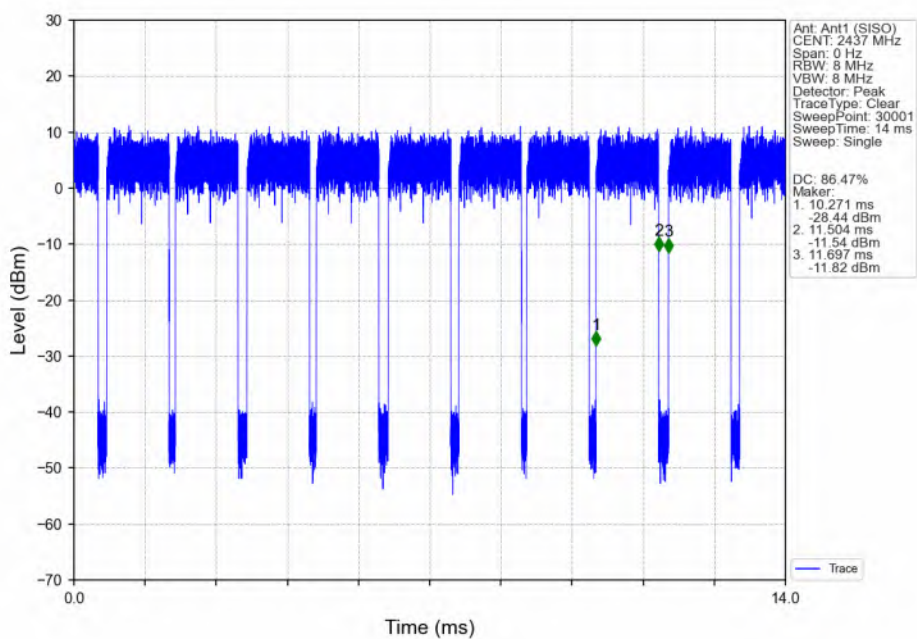


802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

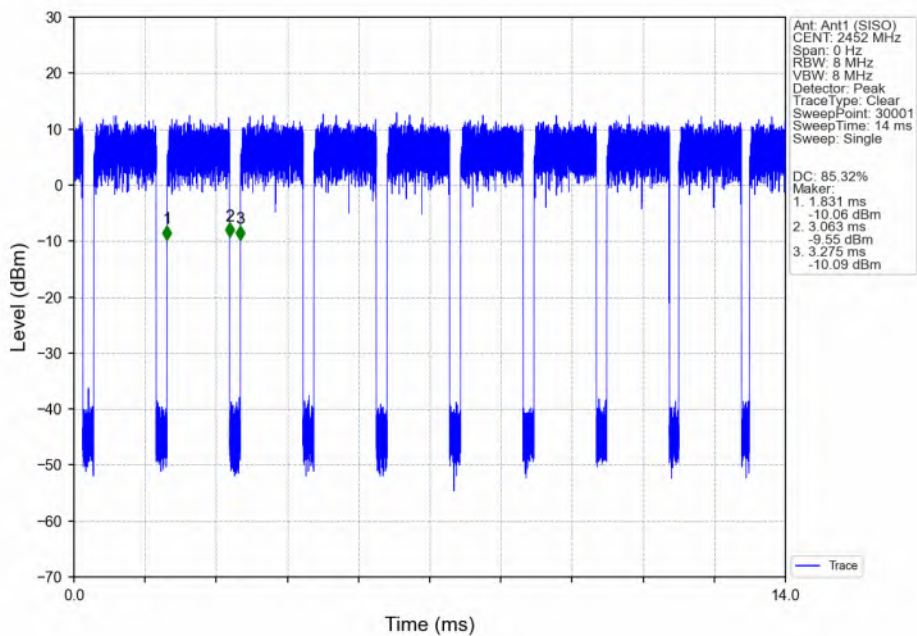


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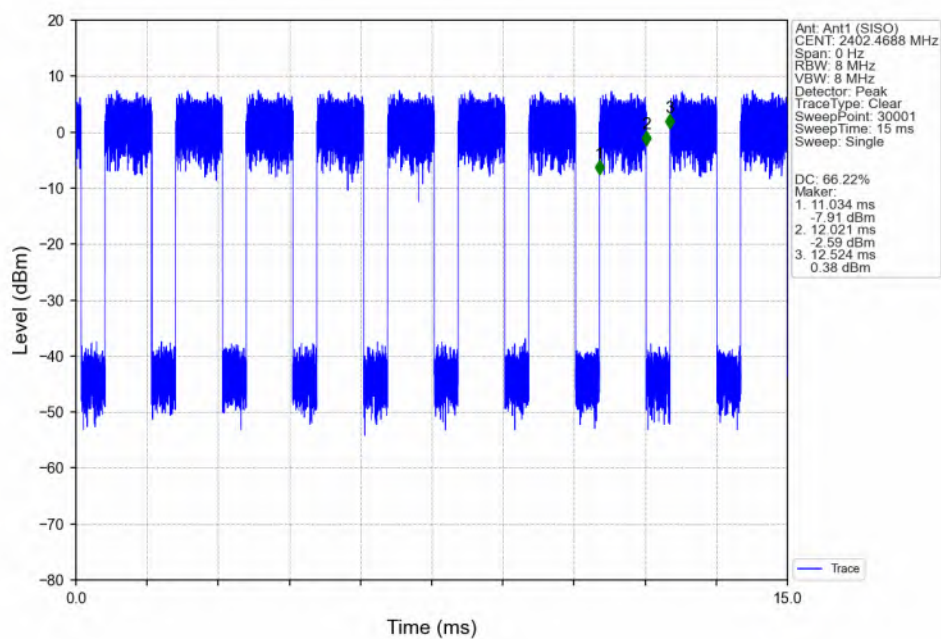


802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV

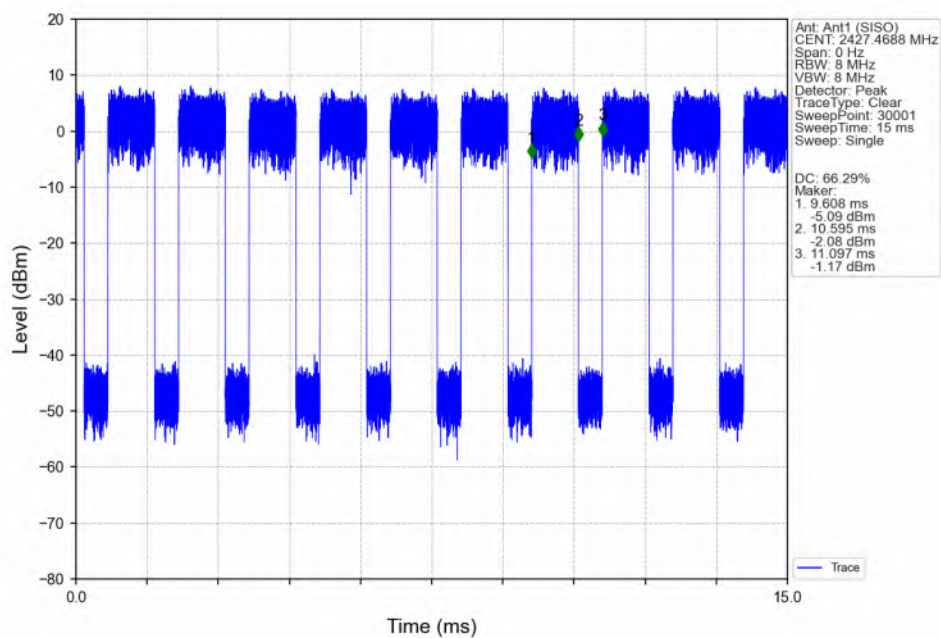


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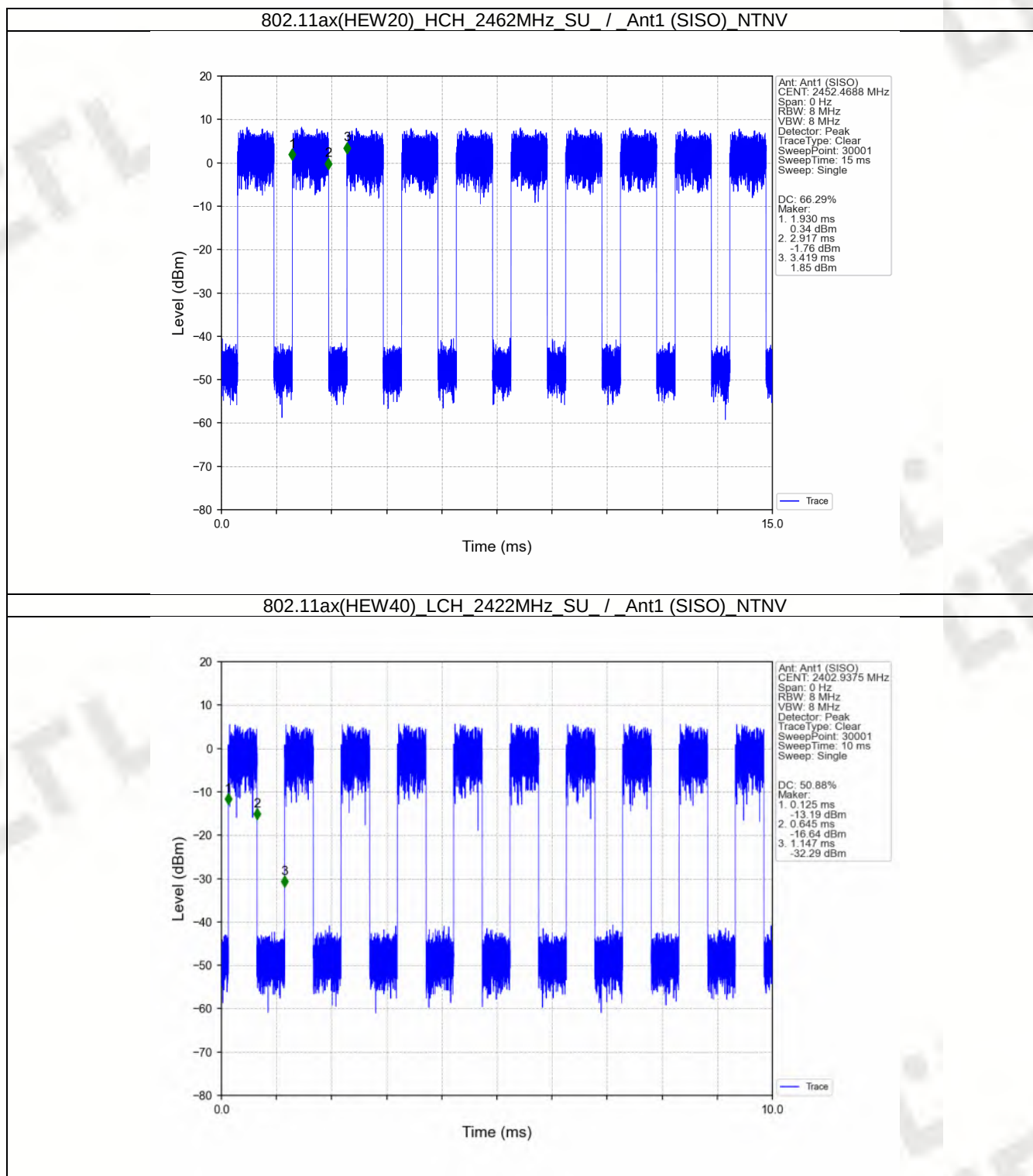
802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant1 (SISO)_NTNV



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

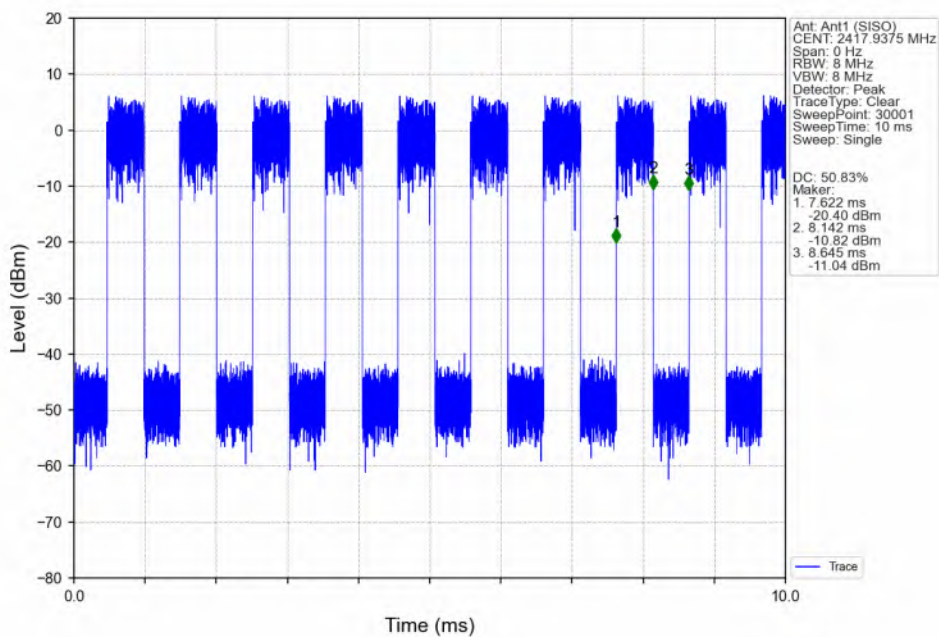


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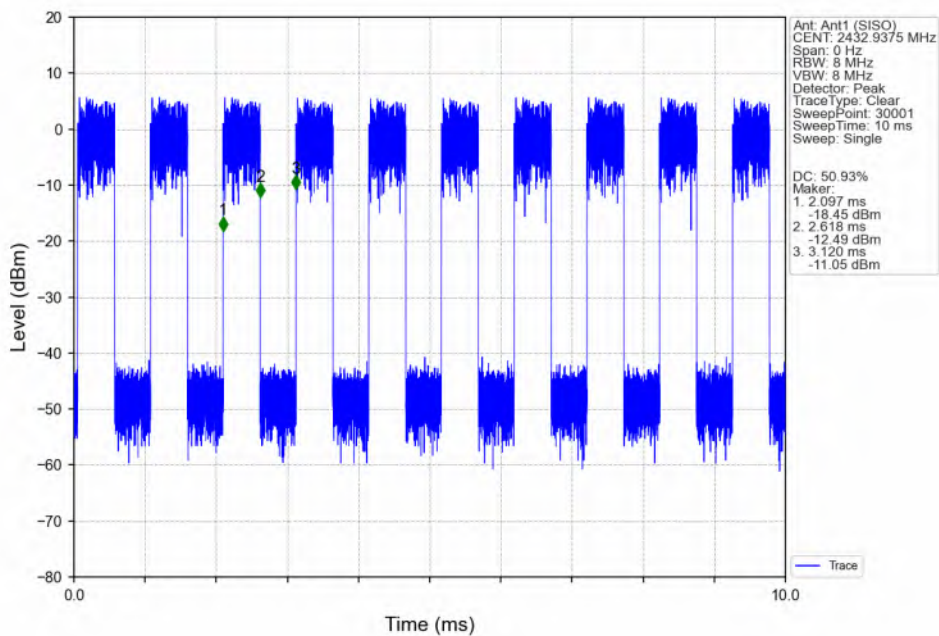


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802.11ax(HEW40) MCH 2437MHz_SU / _Ant1 (SISO)_NTNV



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	14.656	/	Pass
		2437	/	/	1	14.917	/	Pass
		2462	/	/	1	14.778	/	Pass
802.11g	SISO	2412	/	/	1	17.246	/	Pass
		2437	/	/	1	17.476	/	Pass
		2462	/	/	1	17.347	/	Pass
802.11n (HT20)	SISO	2412	/	/	1	18.062	/	Pass
		2437	/	/	1	18.276	/	Pass
		2462	/	/	1	18.192	/	Pass
802.11n (HT40)	SISO	2422	/	/	1	36.924	/	Pass
		2437	/	/	1	37.201	/	Pass
		2452	/	/	1	36.927	/	Pass
802.11ax (HEW20)	SISO	2412	SU	/	1	19.050	/	Pass
		2437	SU	/	1	19.103	/	Pass
		2462	SU	/	1	19.068	/	Pass
802.11ax (HEW40)	SISO	2422	SU	/	1	37.879	/	Pass
		2437	SU	/	1	38.097	/	Pass
		2452	SU	/	1	37.930	/	Pass

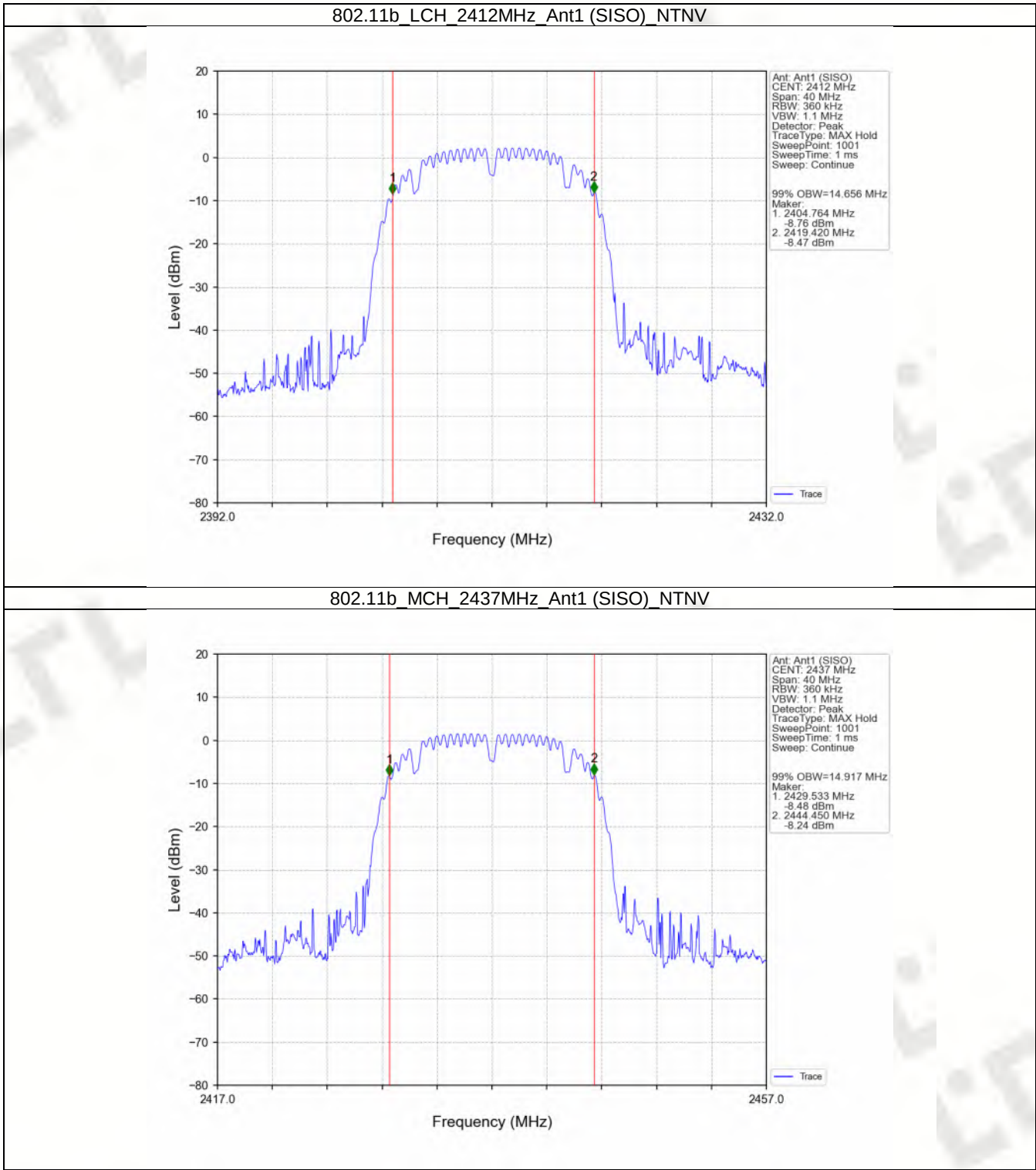
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	6dB Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	1	12.737	>=0.5	Pass
		2437	/	/	1	13.276	>=0.5	Pass
		2462	/	/	1	13.200	>=0.5	Pass
802.11g	SISO	2412	/	/	1	16.808	>=0.5	Pass
		2437	/	/	1	16.964	>=0.5	Pass
		2462	/	/	1	16.778	>=0.5	Pass
802.11n (HT20)	SISO	2412	/	/	1	17.535	>=0.5	Pass
		2437	/	/	1	17.717	>=0.5	Pass
		2462	/	/	1	17.612	>=0.5	Pass
802.11n (HT40)	SISO	2422	/	/	1	36.516	>=0.5	Pass
		2437	/	/	1	36.985	>=0.5	Pass
		2452	/	/	1	36.677	>=0.5	Pass
802.11ax (HEW20)	SISO	2412	SU	/	1	19.030	>=0.5	Pass
		2437	SU	/	1	19.028	>=0.5	Pass
		2462	SU	/	1	19.064	>=0.5	Pass
802.11ax (HEW40)	SISO	2422	SU	/	1	37.915	>=0.5	Pass
		2437	SU	/	1	38.229	>=0.5	Pass
		2452	SU	/	1	38.015	>=0.5	Pass

FCC ID: SMQ-UWM1

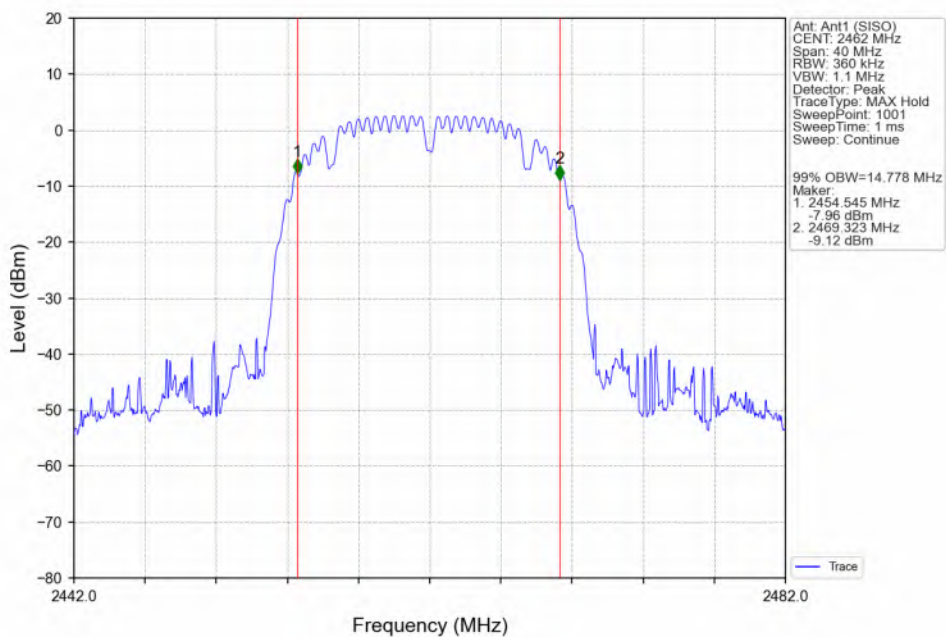
2.2 Test Graph

2.2.1 OBW

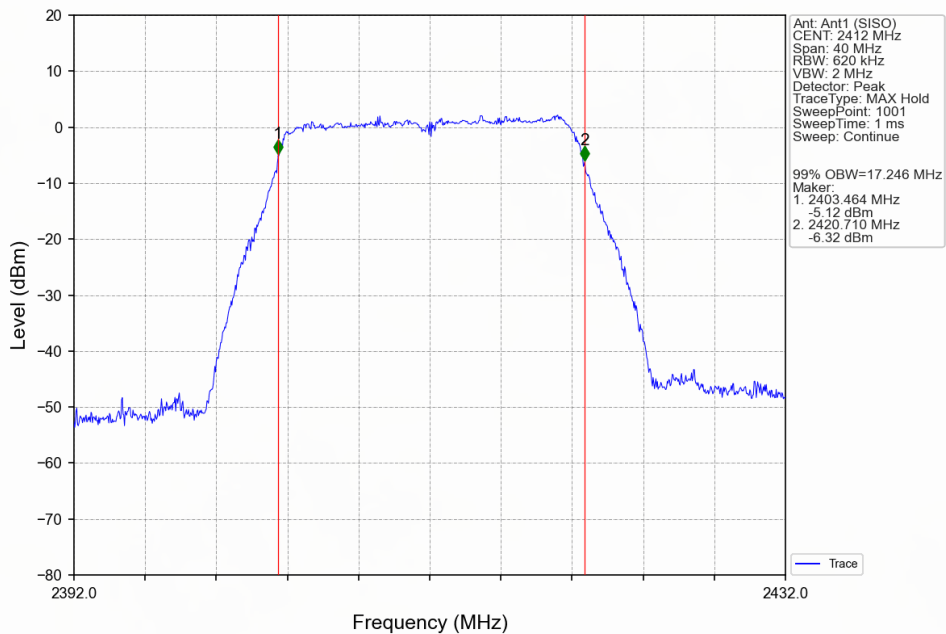


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802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV

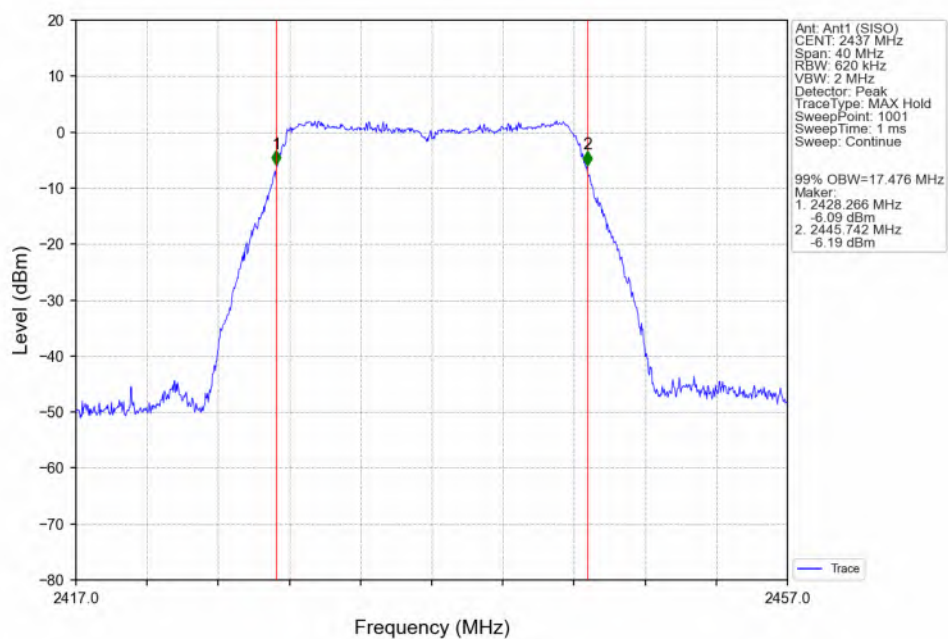


802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

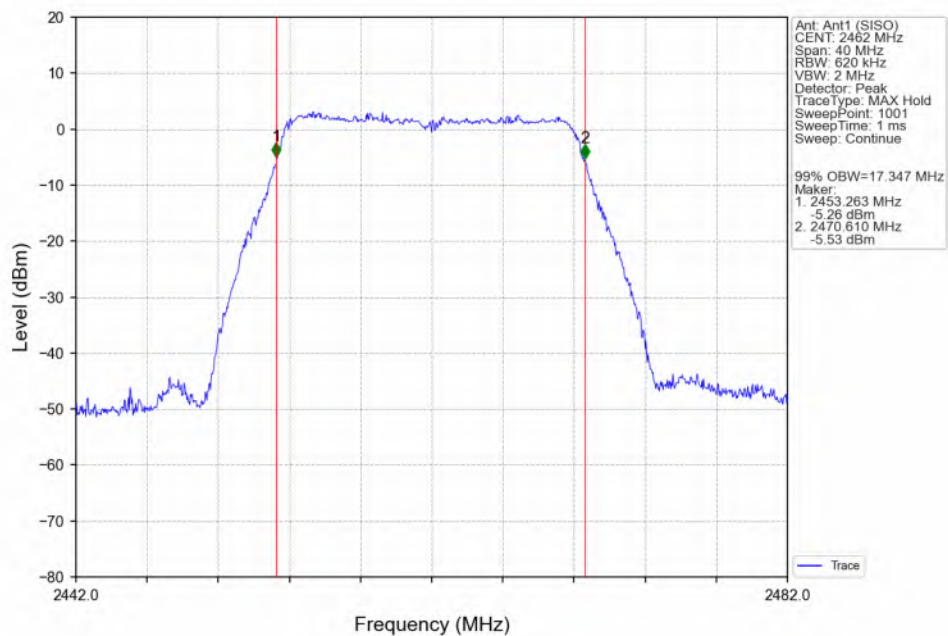


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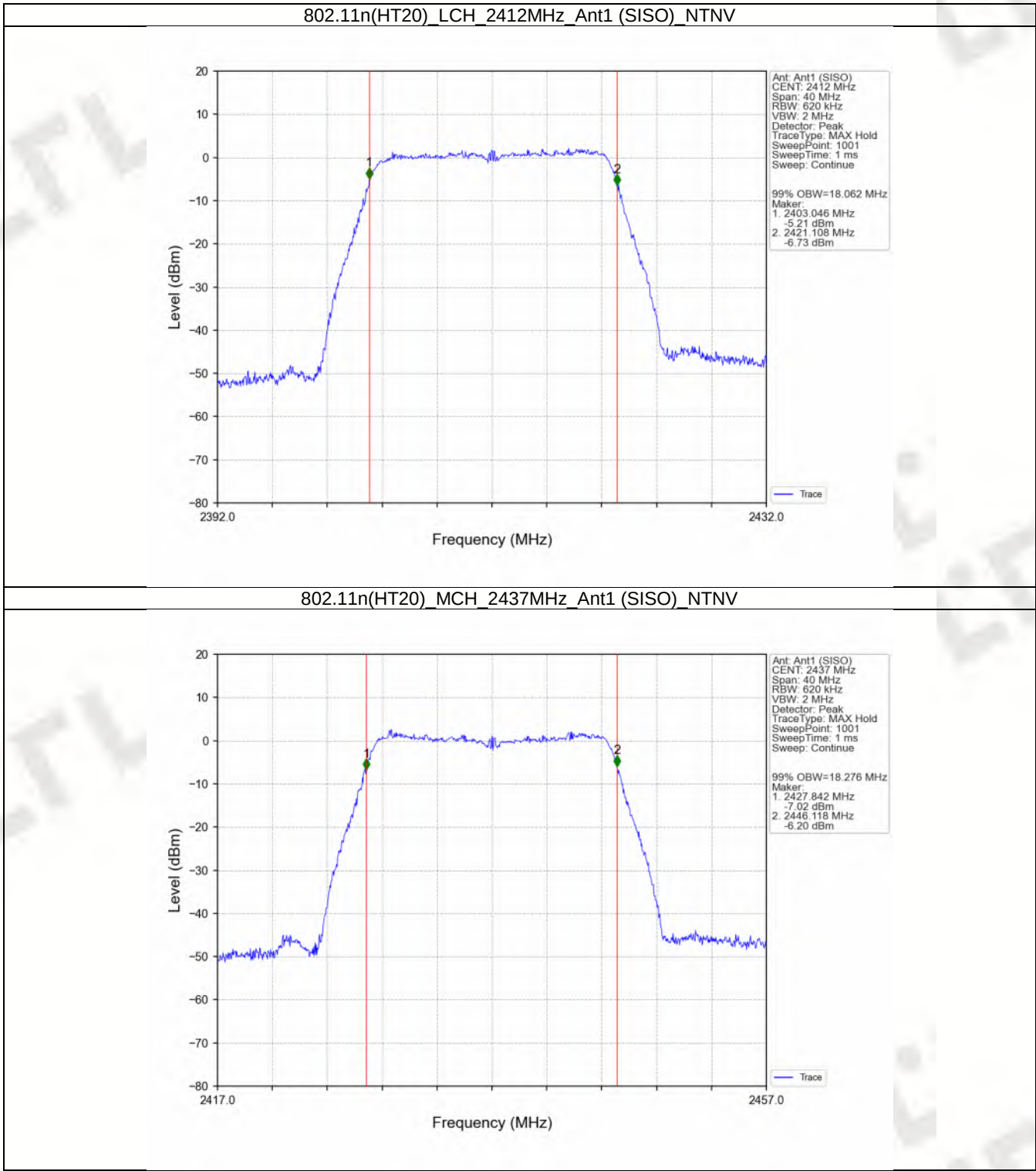
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



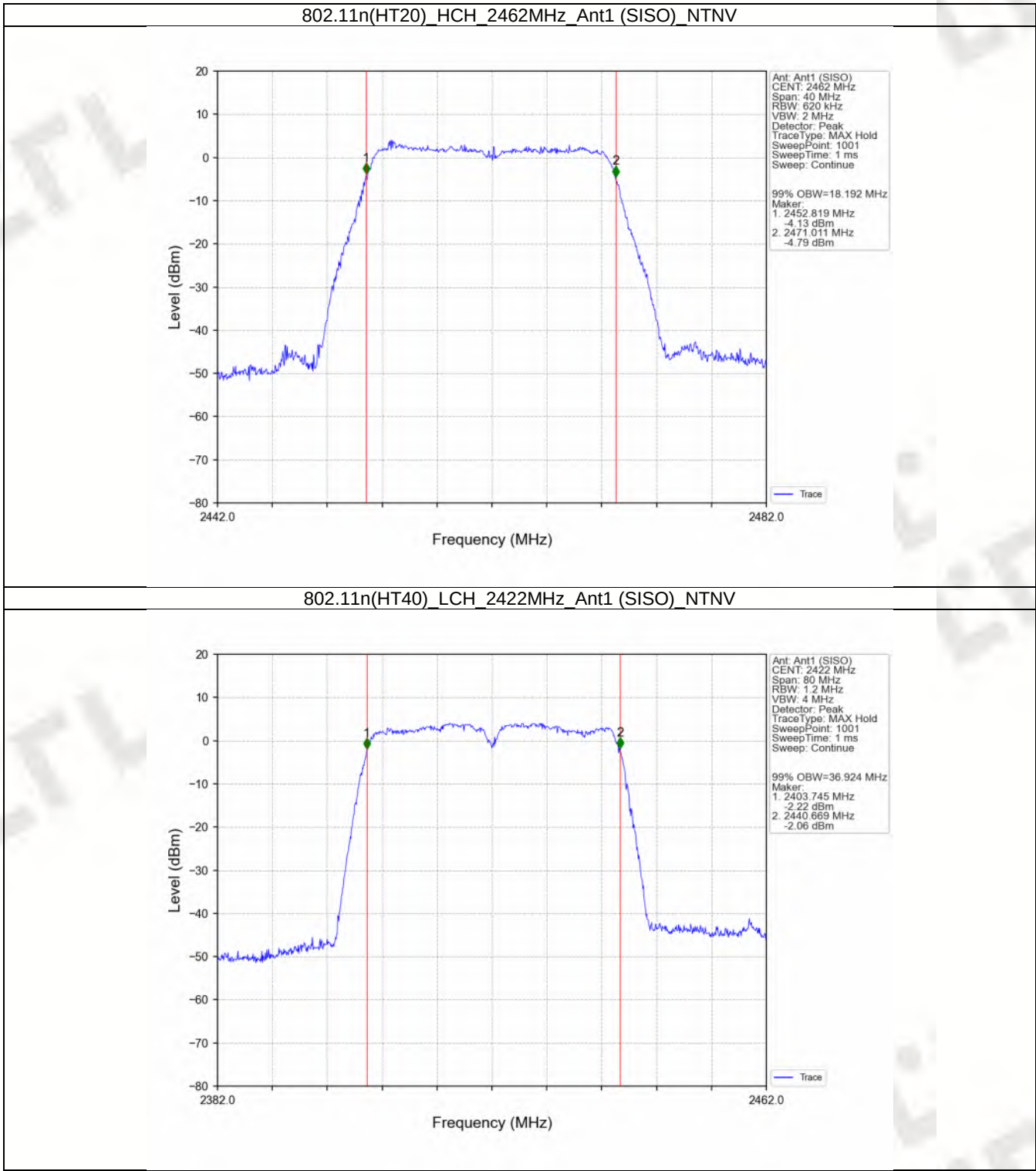
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



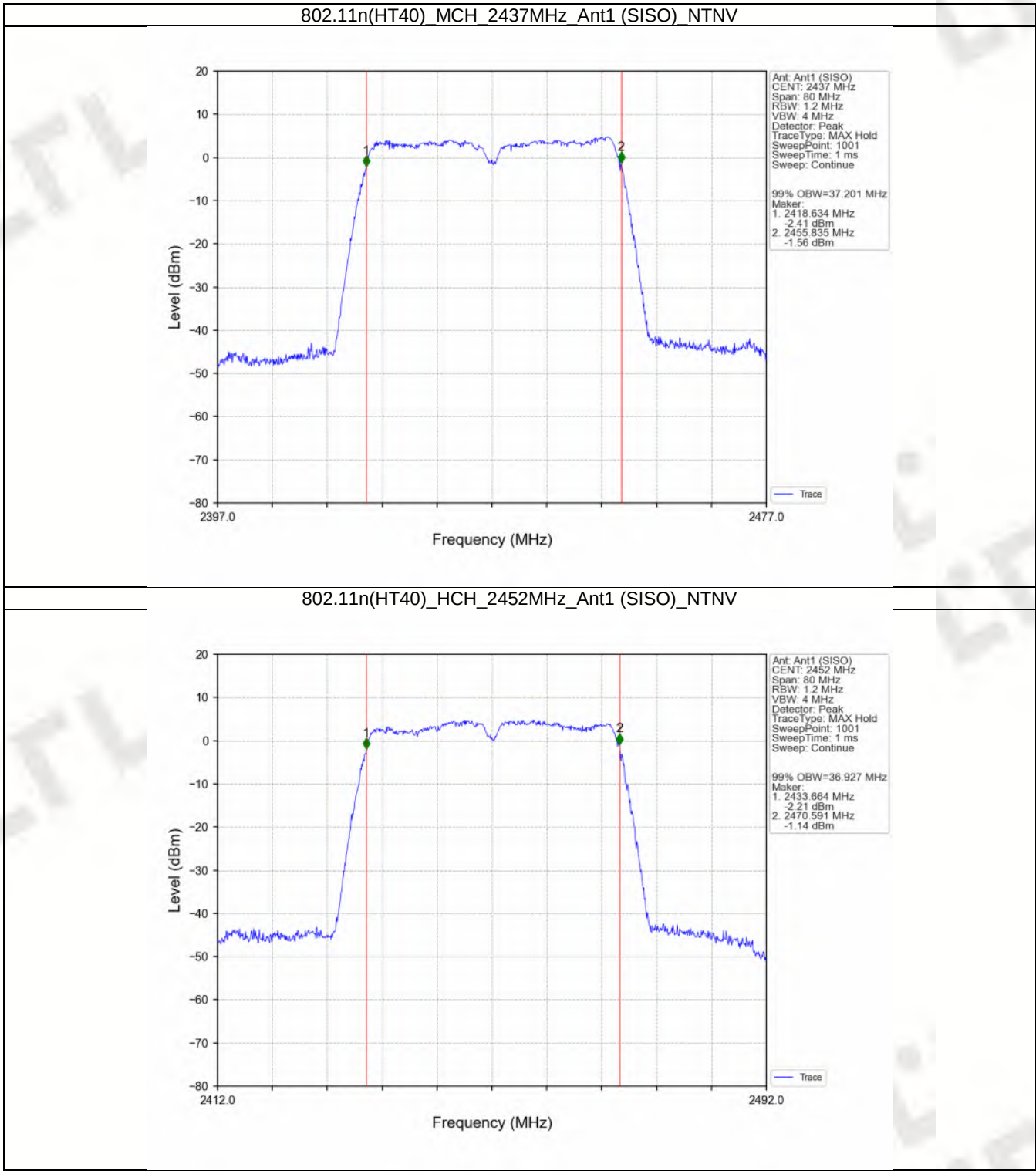
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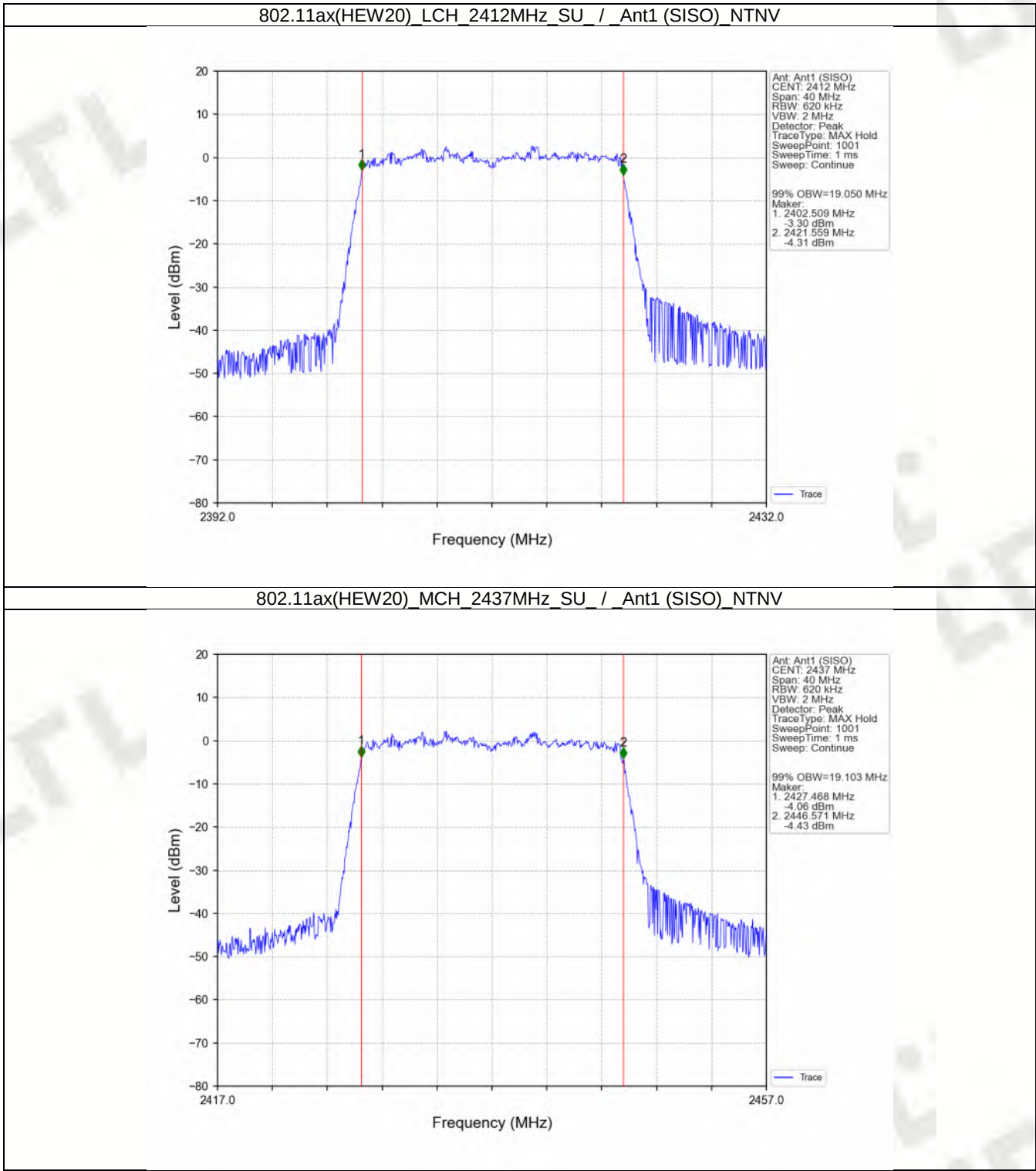
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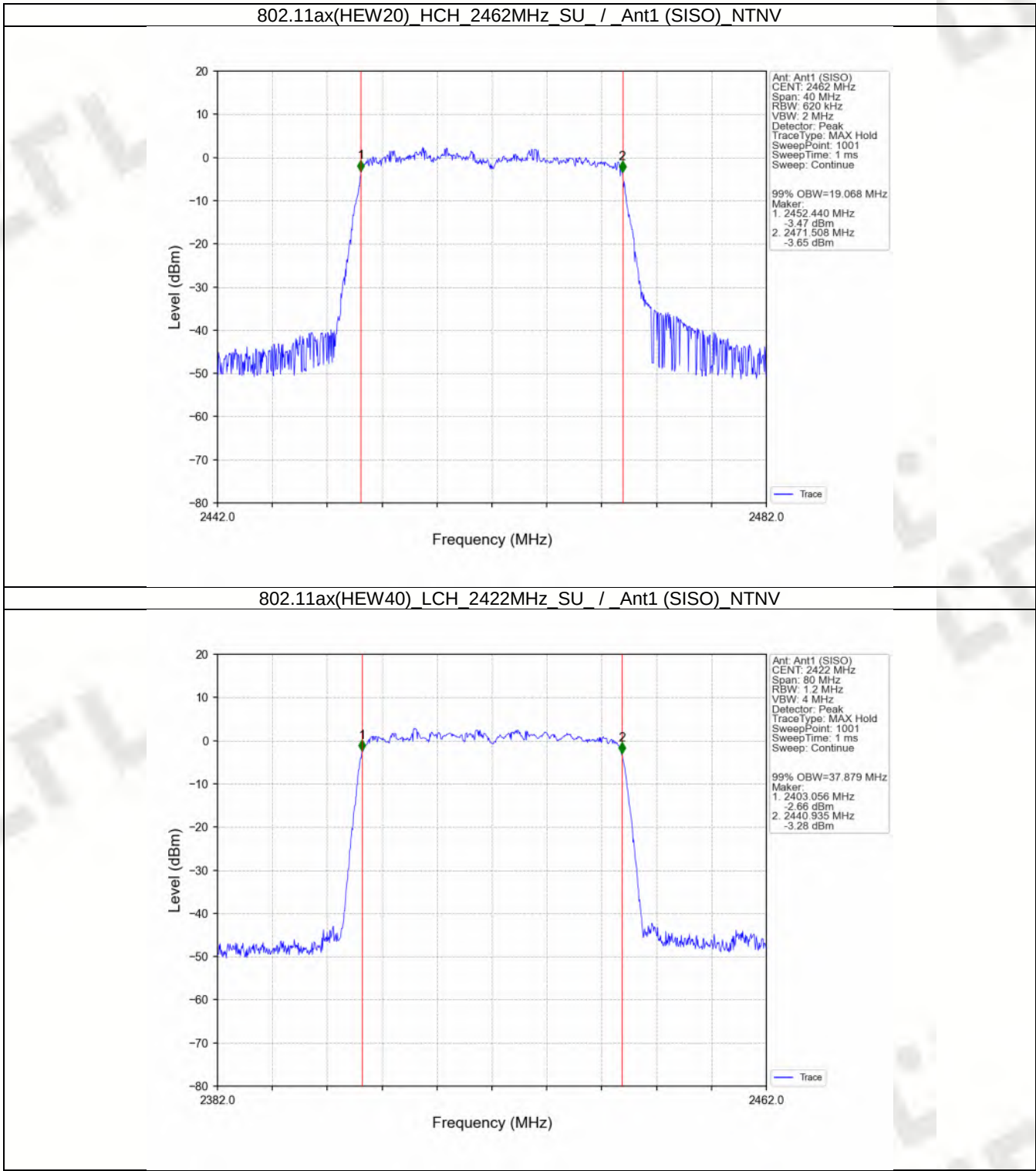
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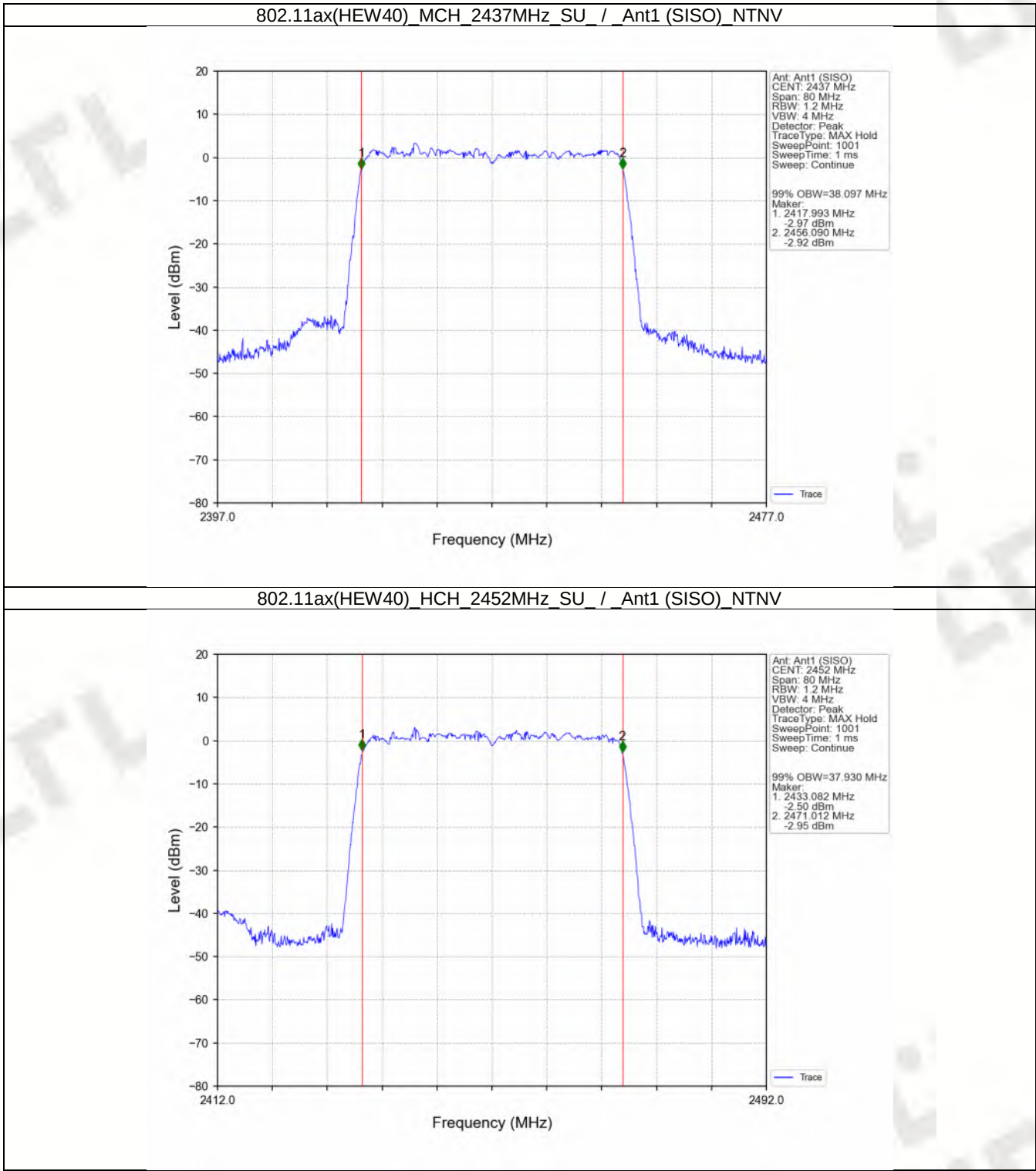
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FCC ID: SMQ-UWM1

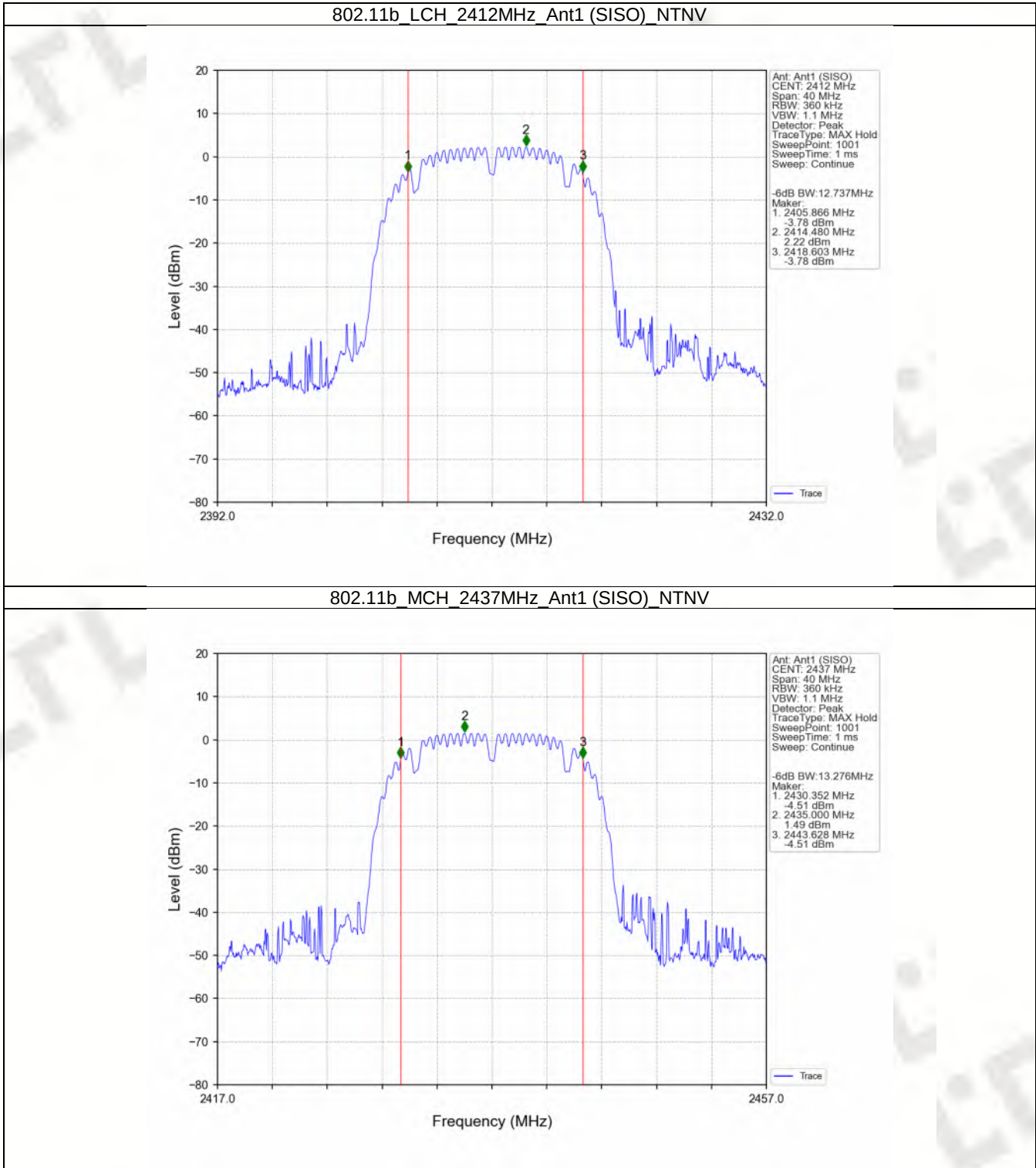


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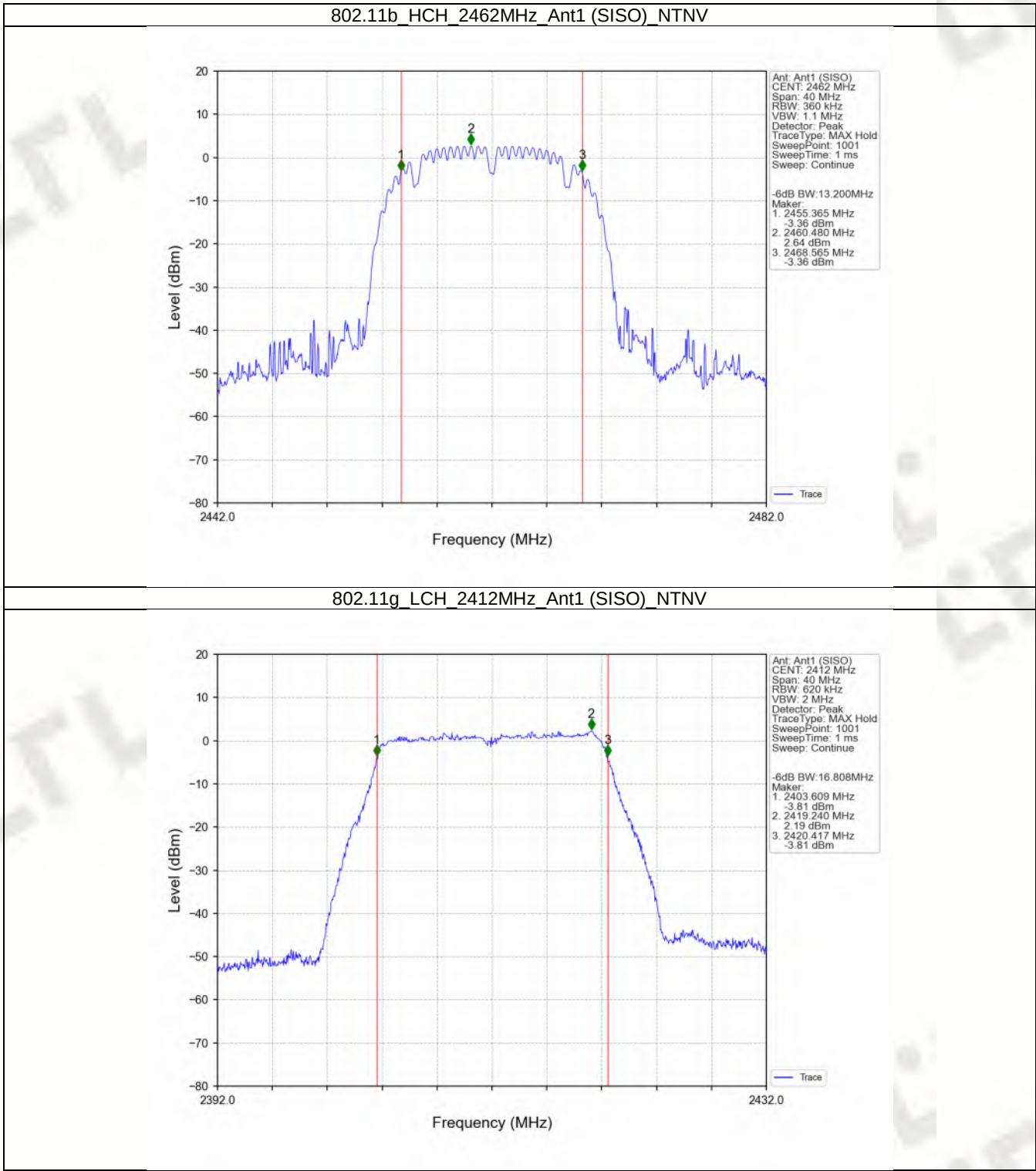


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2.2.2 6dB BW

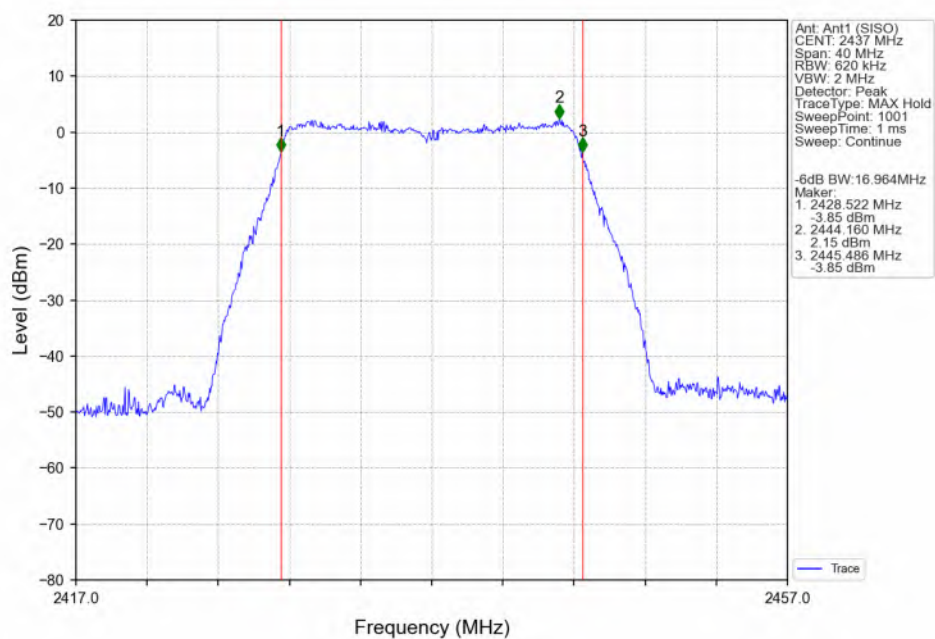


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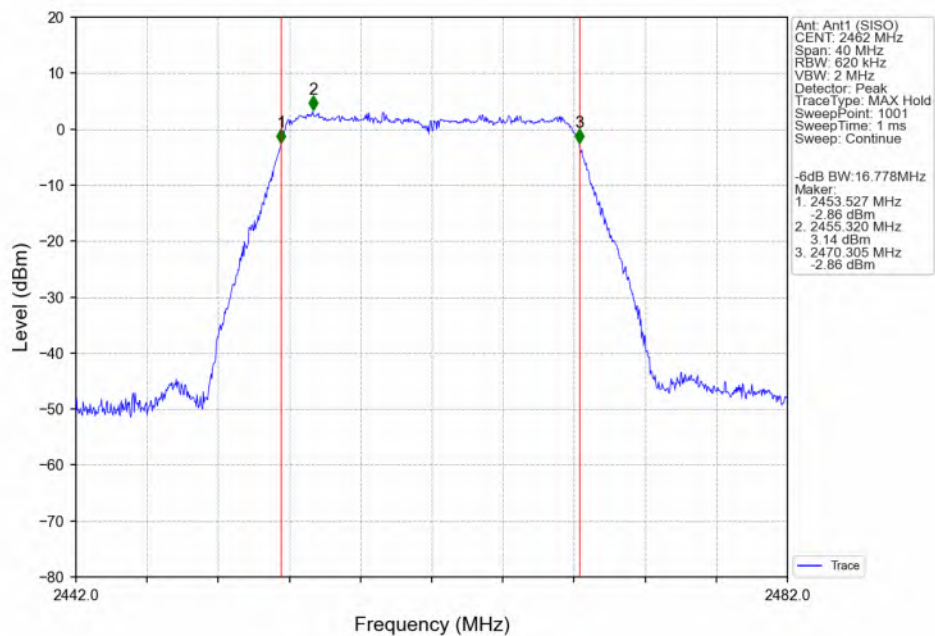


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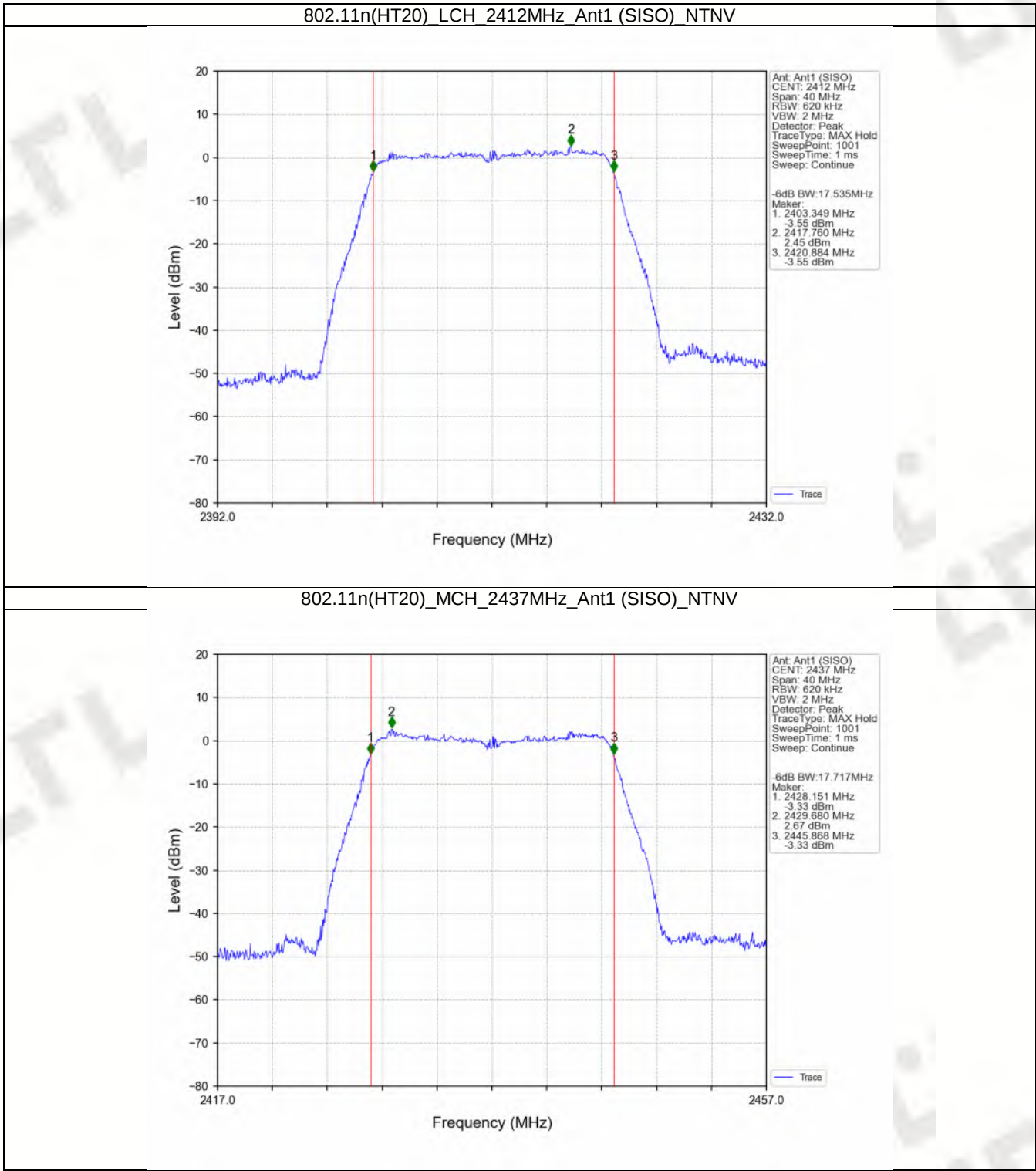
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV

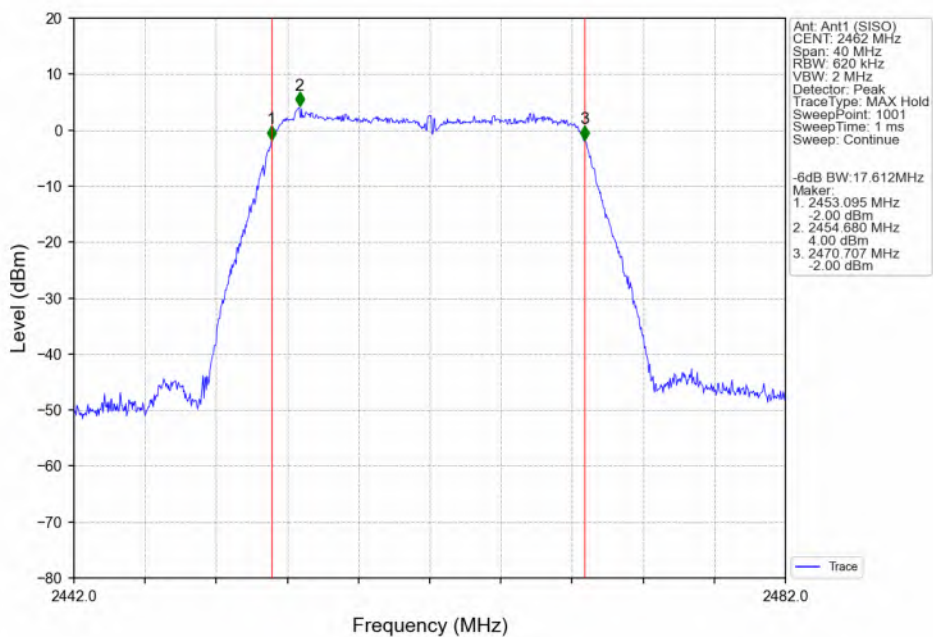


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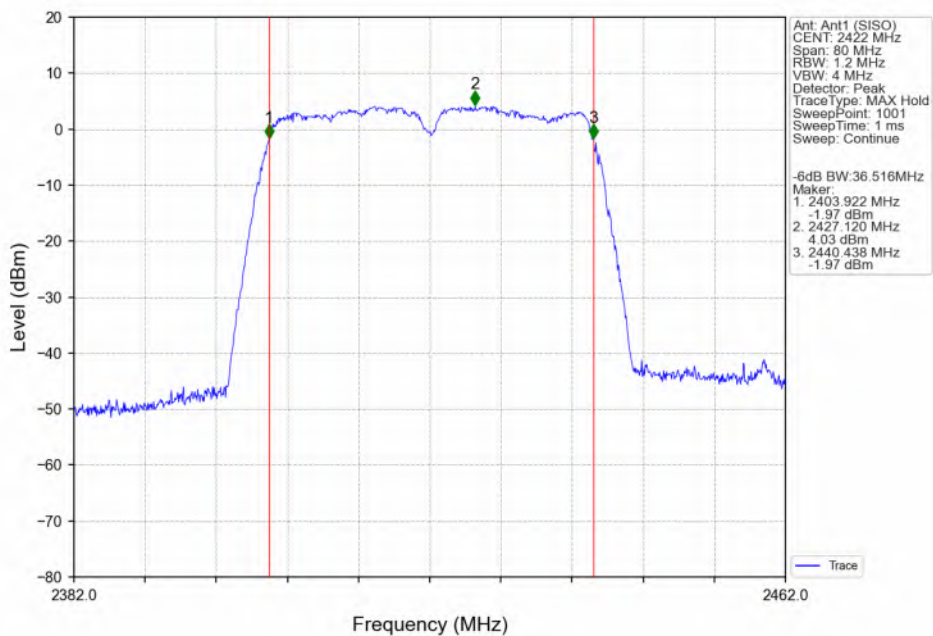


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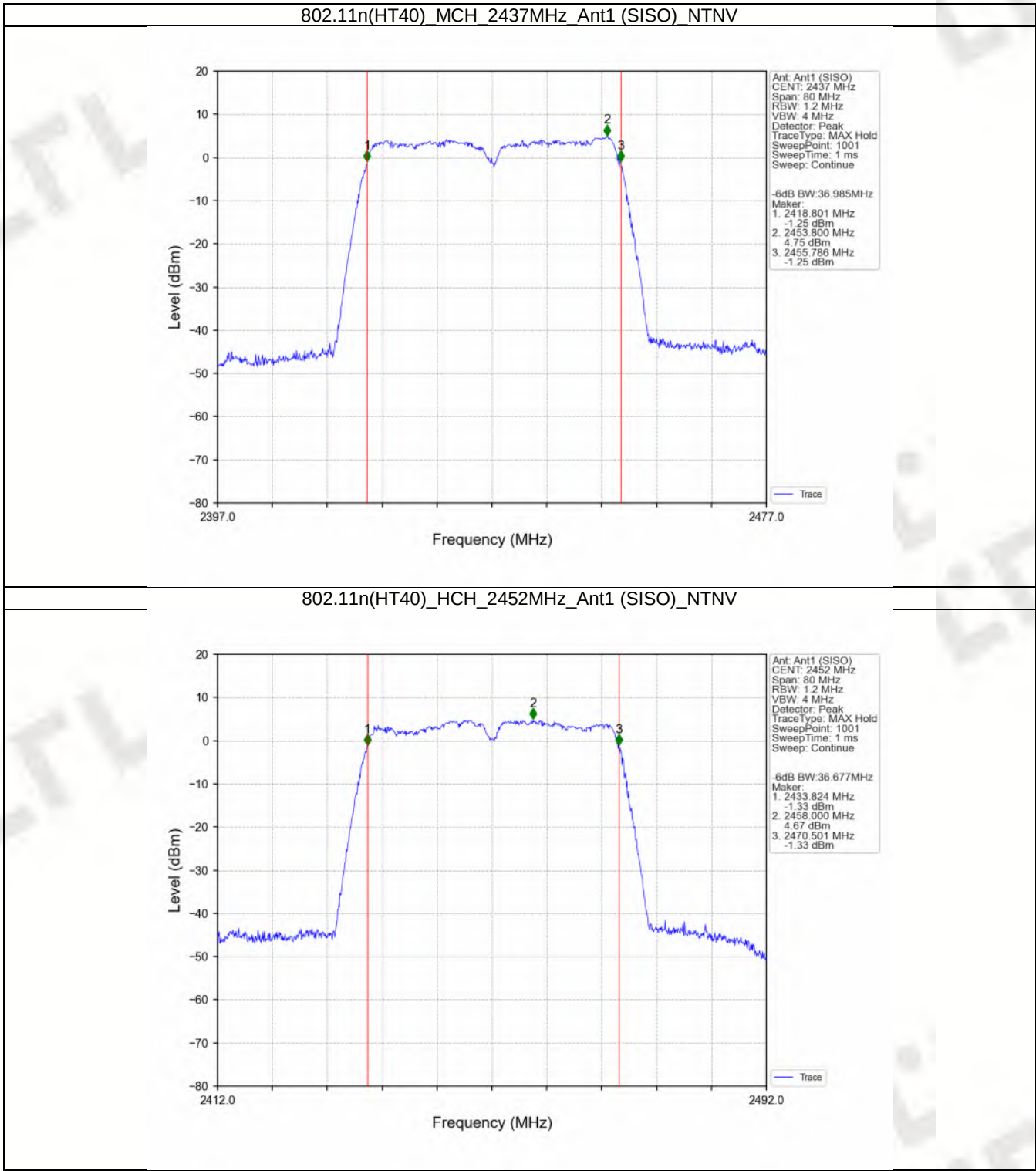
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

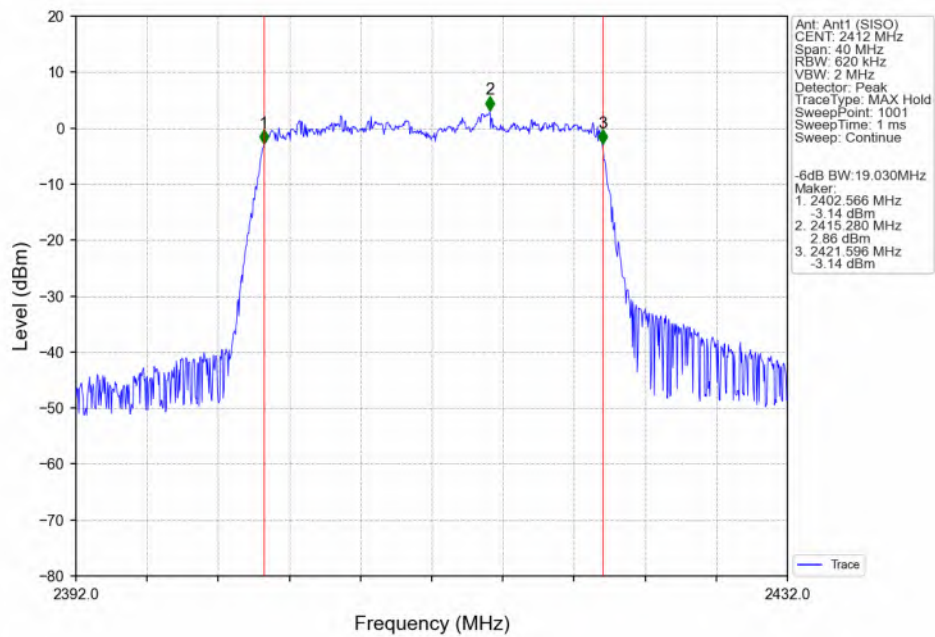


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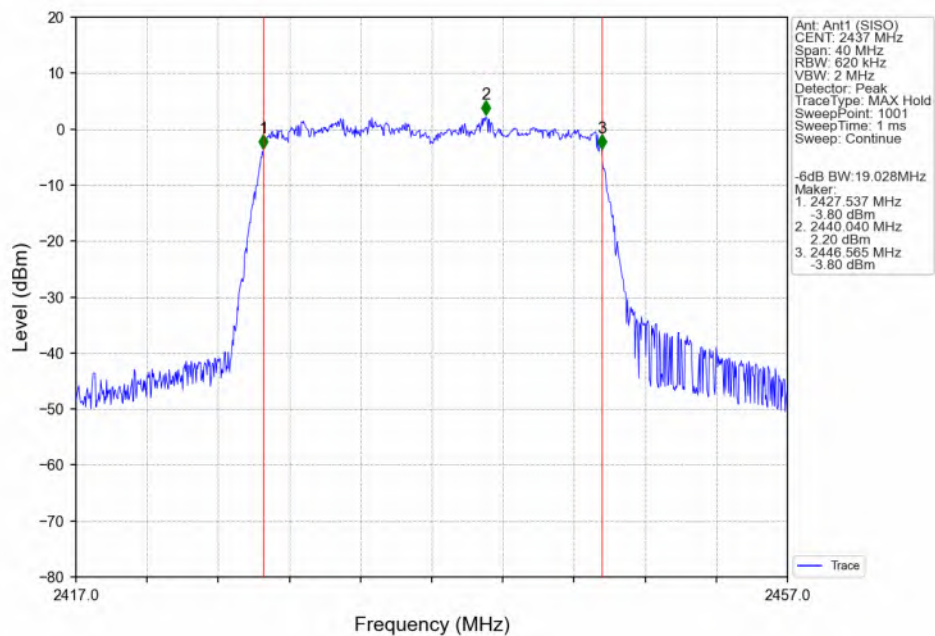


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802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant1 (SISO)_NTNV

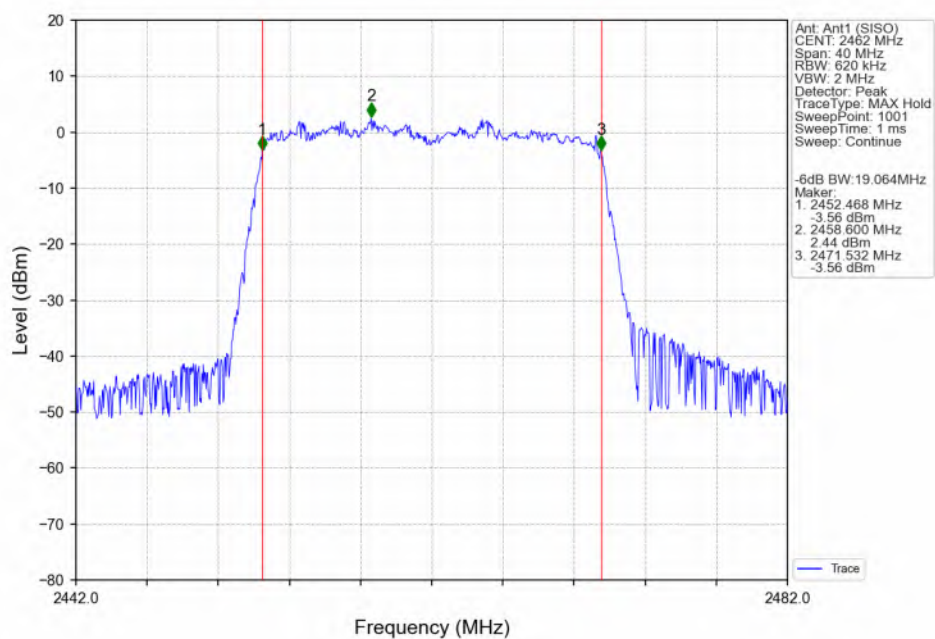


802.11ax(HEW20)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV

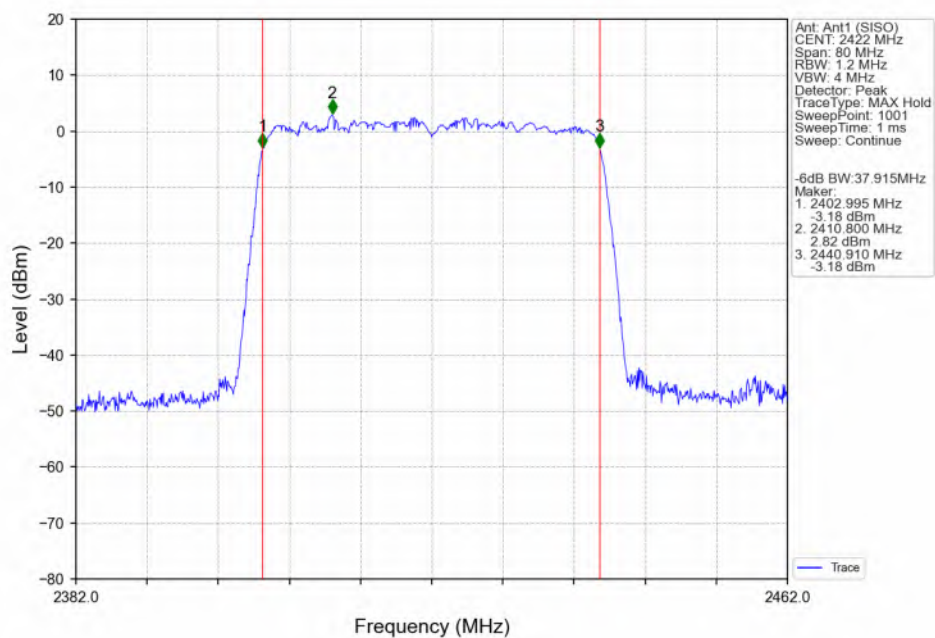


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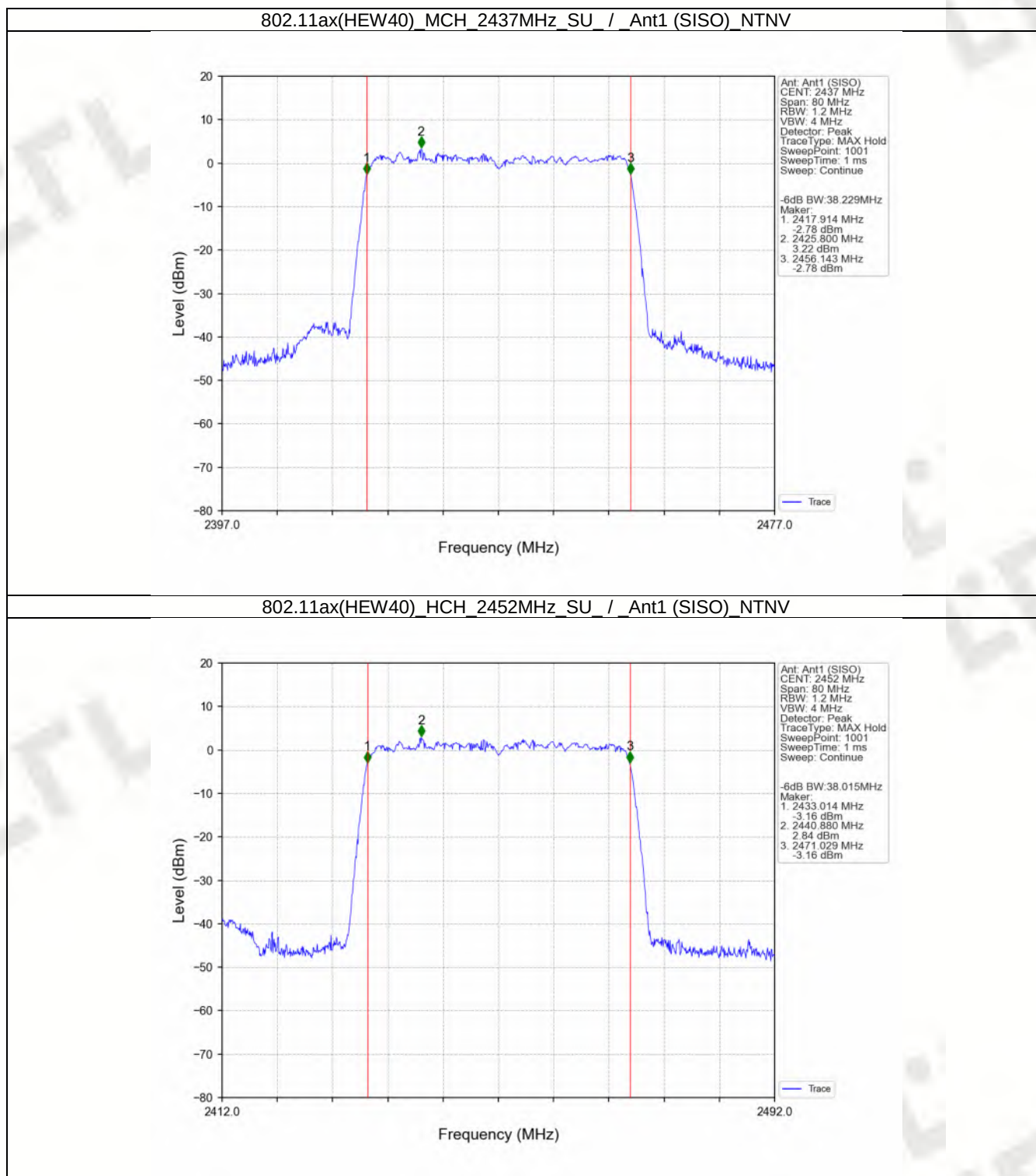
802.11ax(HEW20)_HCH_2462MHz_SU_/_Ant1 (SISO)_NTNV



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



FCC ID: SMQ-UWM1



3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum Peak Conducted Output Power (dBm)		Verdict
					ANT1	Limit	
802.11b	SISO	2412	/	/	14.58	<=30	Pass
		2437	/	/	14.18	<=30	Pass
		2462	/	/	15.15	<=30	Pass
802.11g	SISO	2412	/	/	15.52	<=30	Pass
		2437	/	/	15.51	<=30	Pass
		2462	/	/	16.39	<=30	Pass
802.11n (HT20)	SISO	2412	/	/	15.55	<=30	Pass
		2437	/	/	15.52	<=30	Pass
		2462	/	/	16.78	<=30	Pass
802.11n (HT40)	SISO	2422	/	/	16.75	<=30	Pass
		2437	/	/	17.18	<=30	Pass
		2452	/	/	17.34	<=30	Pass
802.11ax (HEW20)	SISO	2412	SU	/	14.85	<=30	Pass
		2437	SU	/	14.49	<=30	Pass
		2462	SU	/	14.55	<=30	Pass
802.11ax (HEW40)	SISO	2422	SU	/	15.34	<=30	Pass
		2437	SU	/	15.51	<=30	Pass
		2452	SU	/	15.37	<=30	Pass
Note1: Antenna Gain: Ant1: 2.51dBi;							

FCC ID: SMQ-UWM1

4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

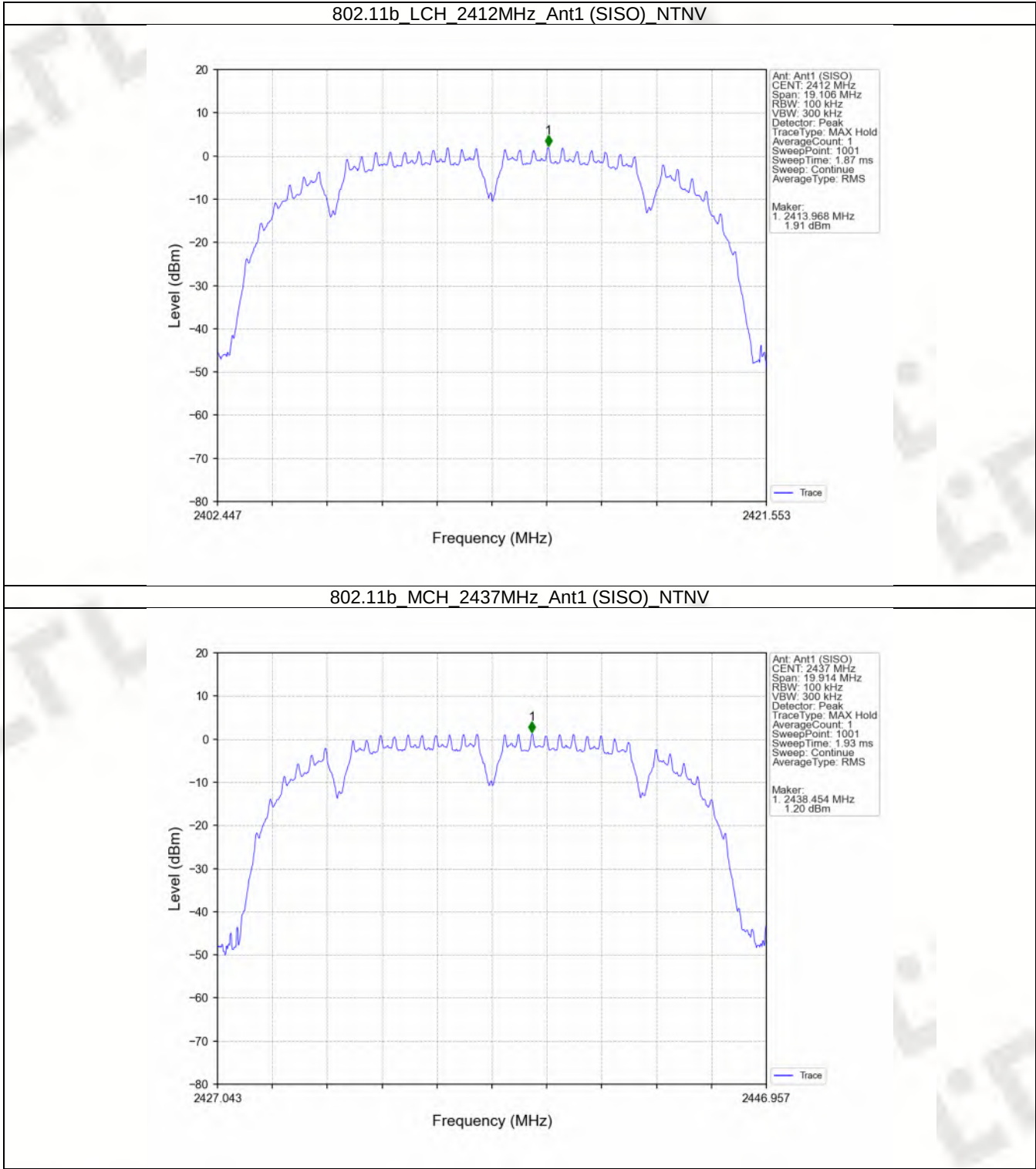
Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum PSD (dBm)		Verdict
					ANT1	Limit	
802.11b	SISO	2412	/	/	1.91	<=8	Pass
		2437	/	/	1.20	<=8	Pass
		2462	/	/	2.25	<=8	Pass
802.11g	SISO	2412	/	/	-2.61	<=8	Pass
		2437	/	/	-2.48	<=8	Pass
		2462	/	/	-1.50	<=8	Pass
802.11n (HT20)	SISO	2412	/	/	-2.60	<=8	Pass
		2437	/	/	-2.46	<=8	Pass
		2462	/	/	-1.15	<=8	Pass
802.11n (HT40)	SISO	2422	/	/	-4.20	<=8	Pass
		2437	/	/	-3.95	<=8	Pass
		2452	/	/	-3.63	<=8	Pass
802.11ax (HEW20)	SISO	2412	SU	/	-4.91	<=8	Pass
		2437	SU	/	-5.75	<=8	Pass
		2462	SU	/	-5.55	<=8	Pass
802.11ax (HEW40)	SISO	2422	SU	/	-7.29	<=8	Pass
		2437	SU	/	-7.23	<=8	Pass
		2452	SU	/	-7.44	<=8	Pass

Note1: Antenna Gain: Ant1: 2.51dBi;

FCC ID: SMQ-UWM1

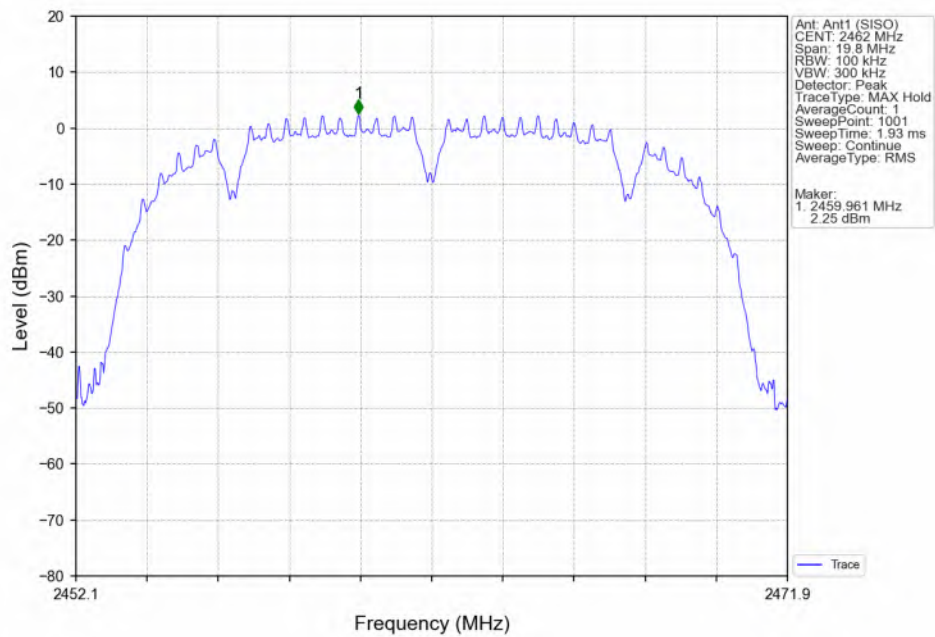
4.2 Test Graph

4.2.1 PSD

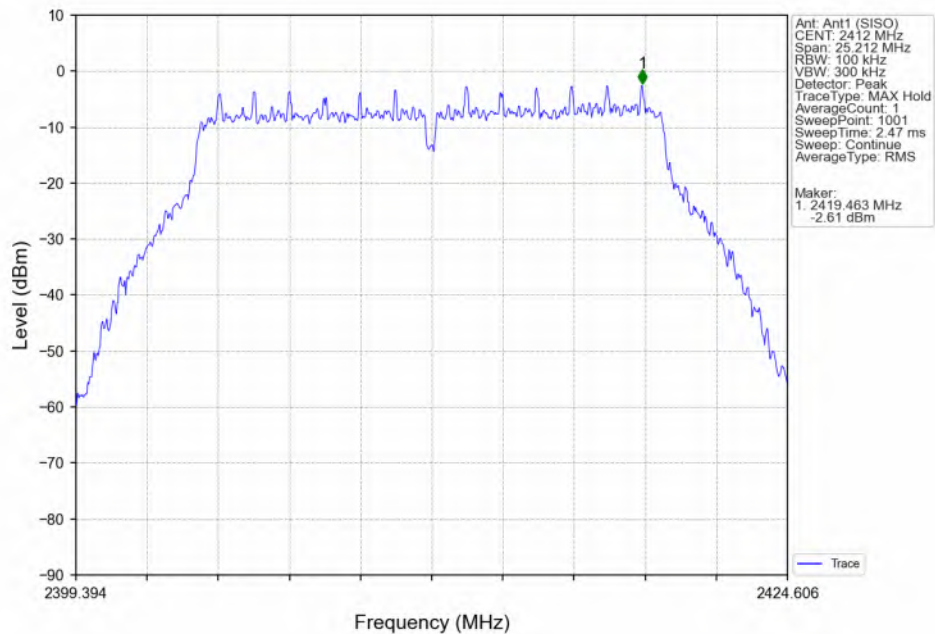


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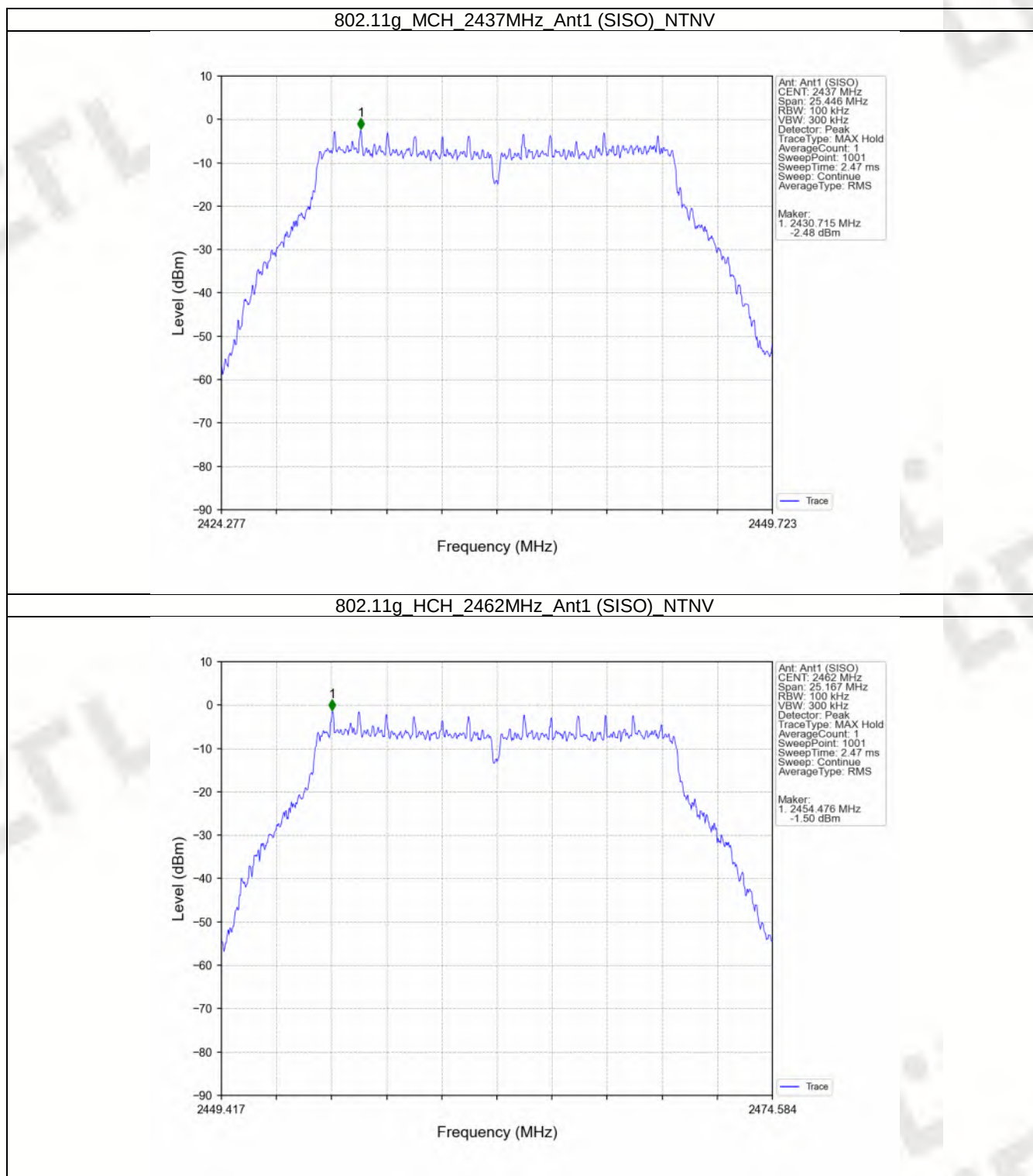
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



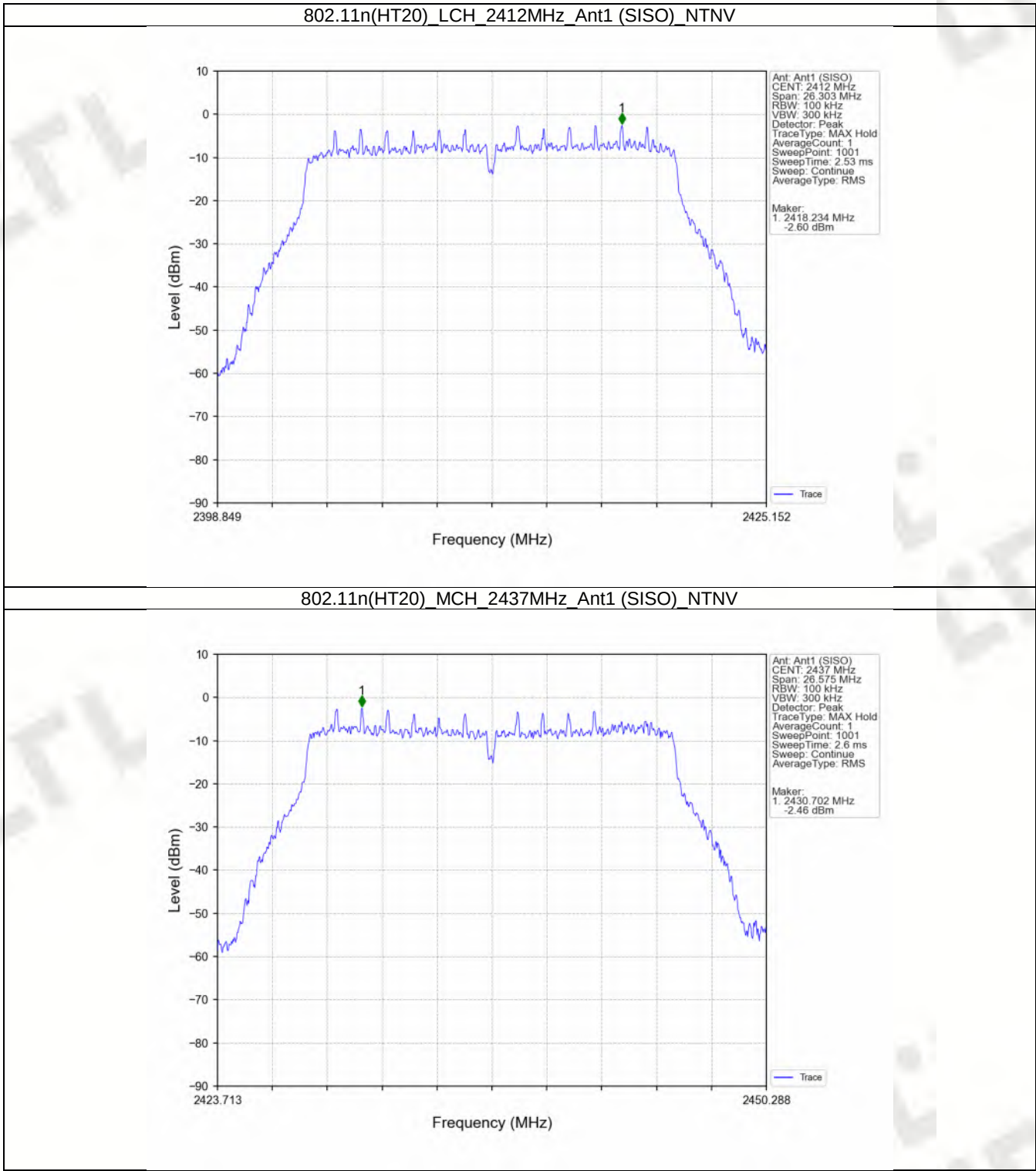
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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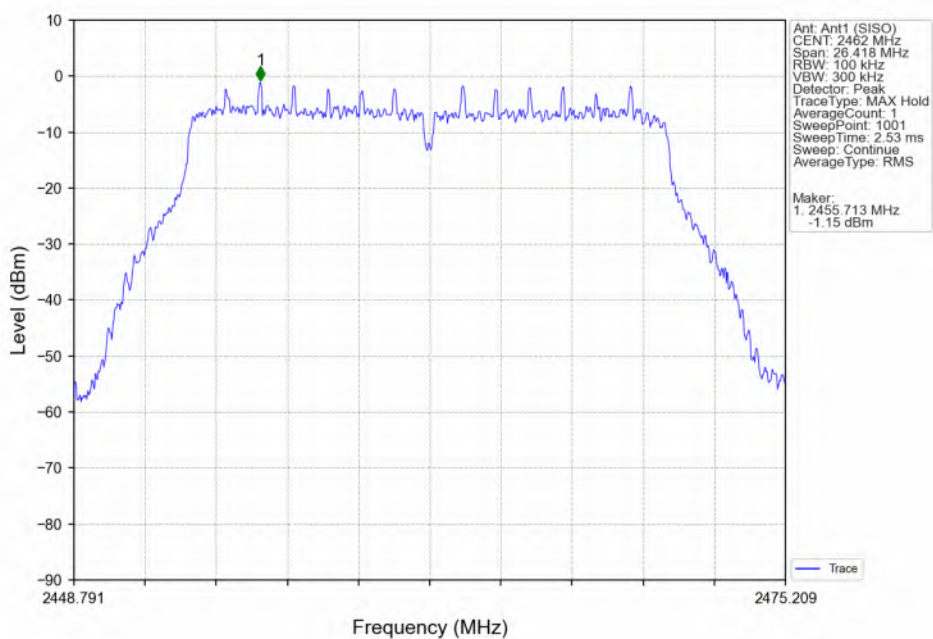


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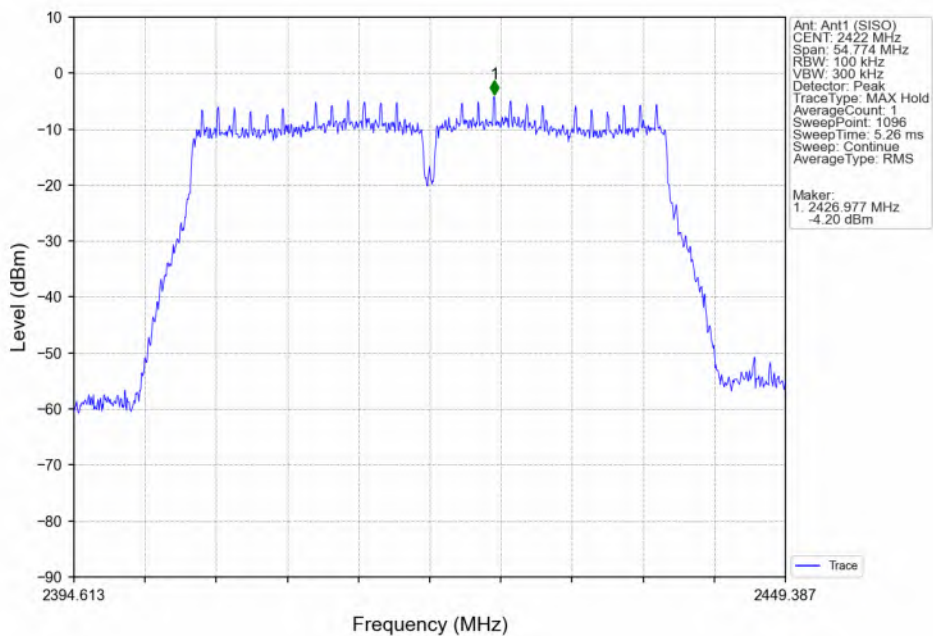


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802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV

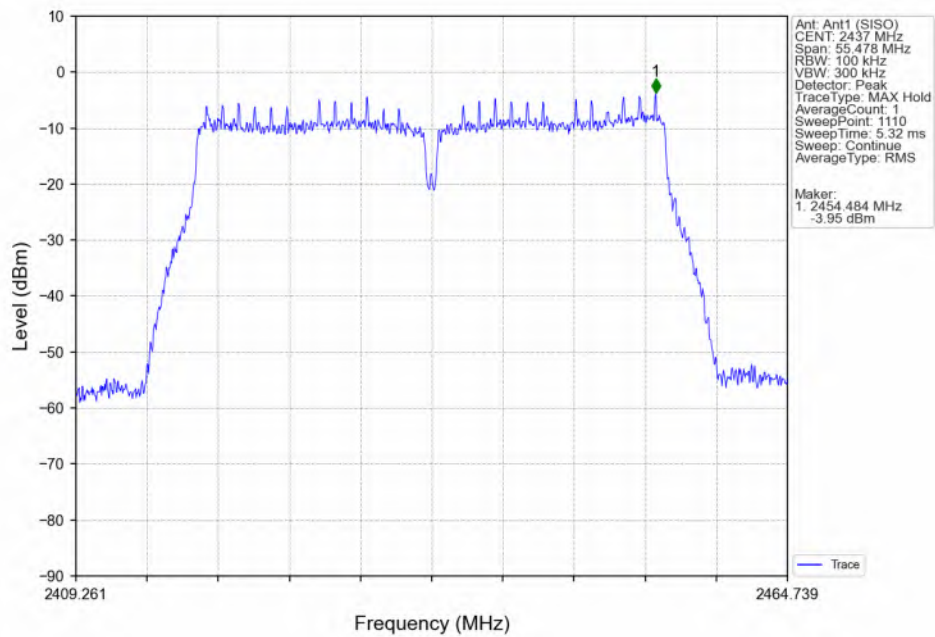


802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

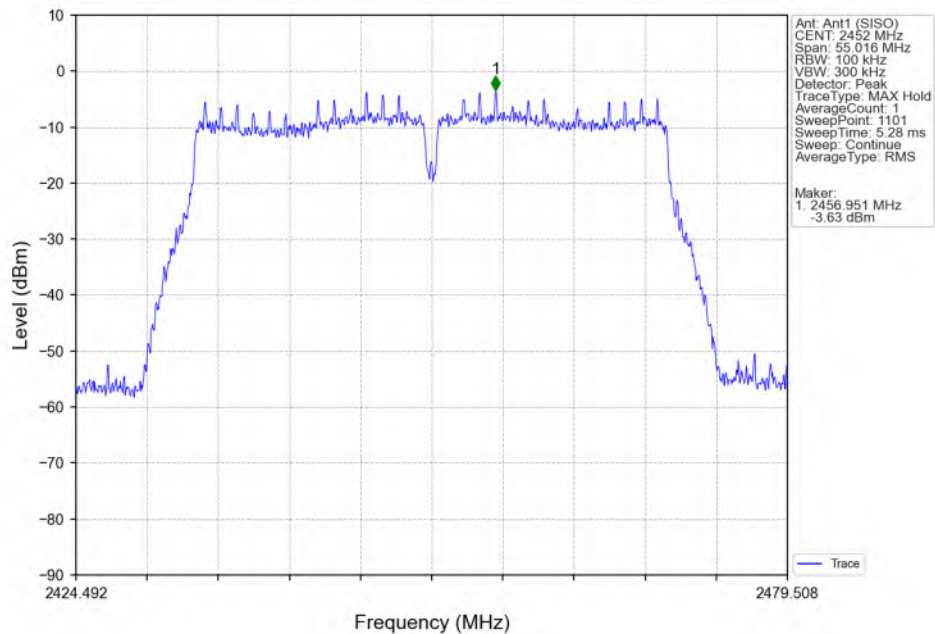


FCC ID: SMQ-UWM1

802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV

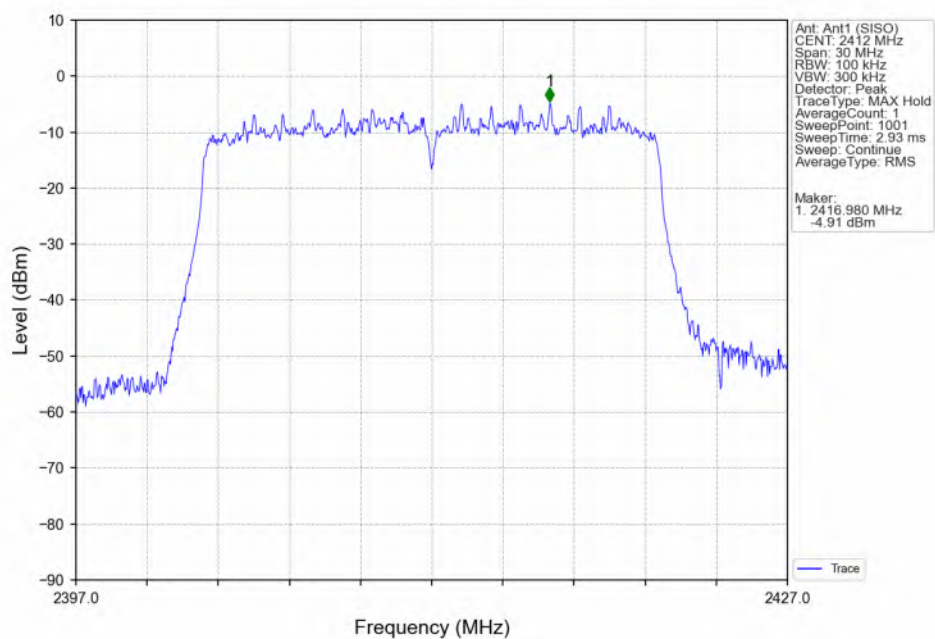


802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV

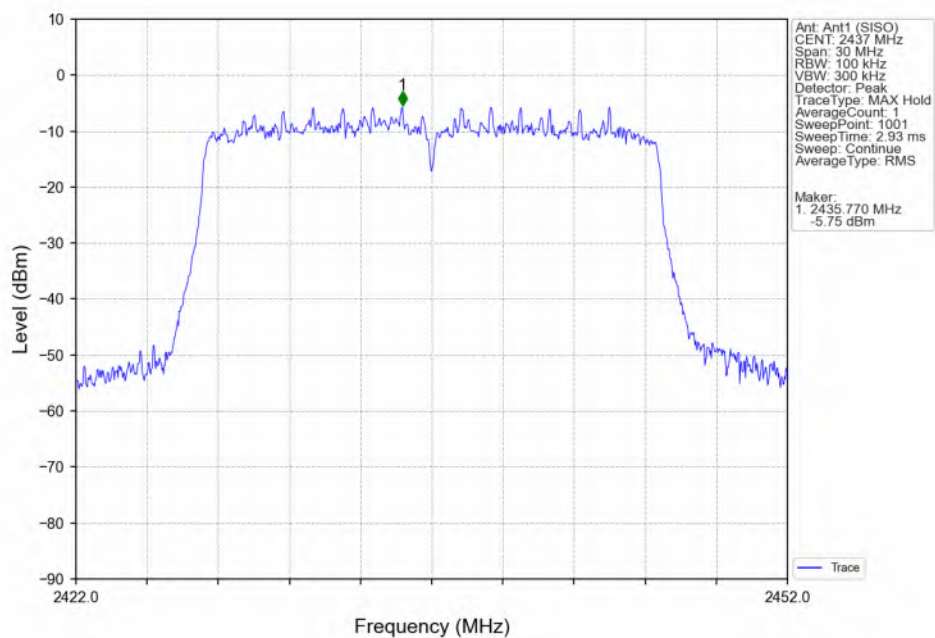


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802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant1 (SISO)_NTNV

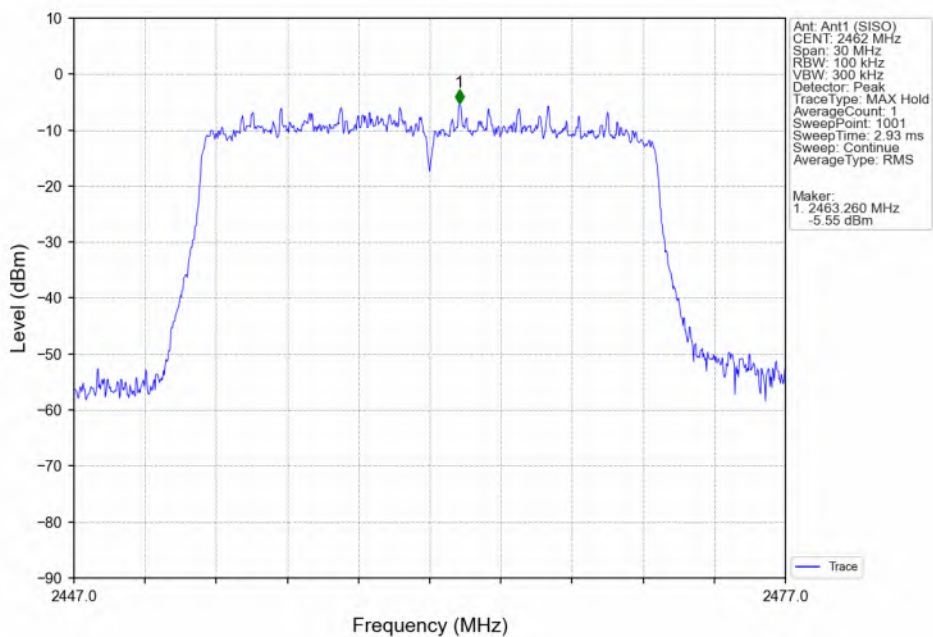


802.11ax(HEW20)_MCH_2437MHz_SU_/_Ant1 (SISO)_NTNV

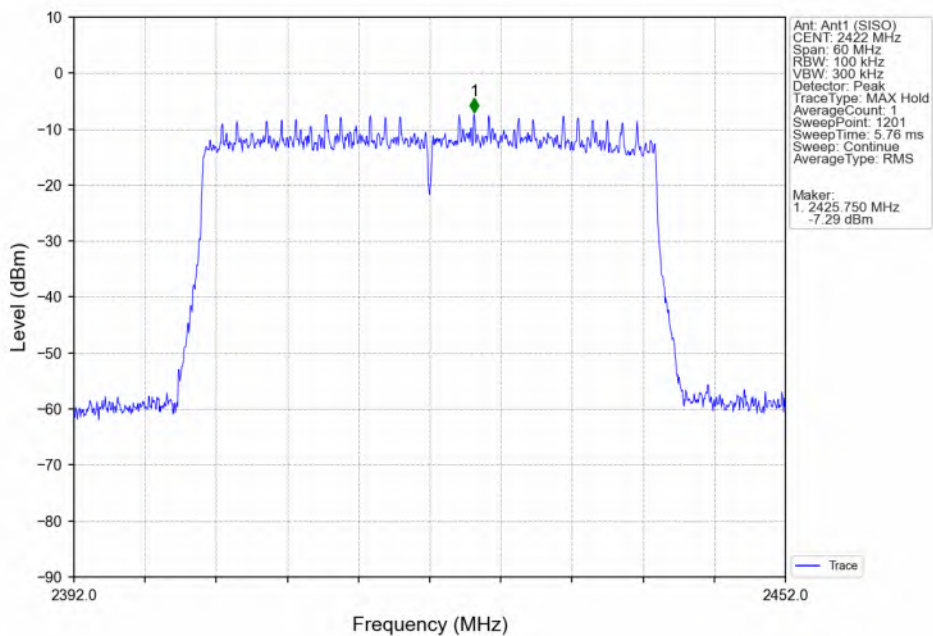


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802.11ax(HEW20)_HCH_2462MHz_SU_/_Ant1 (SISO)_NTNV

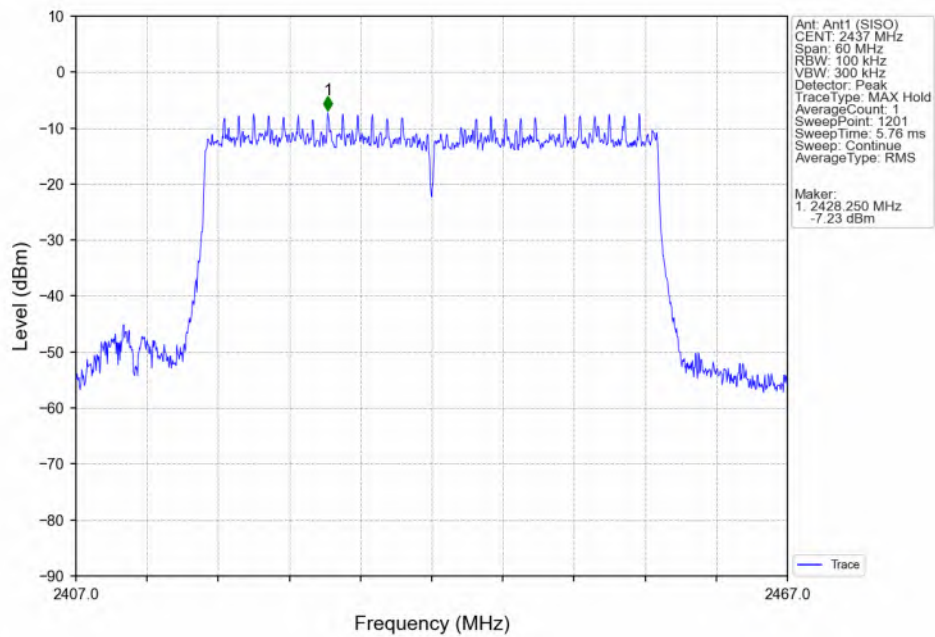


802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant1 (SISO)_NTNV

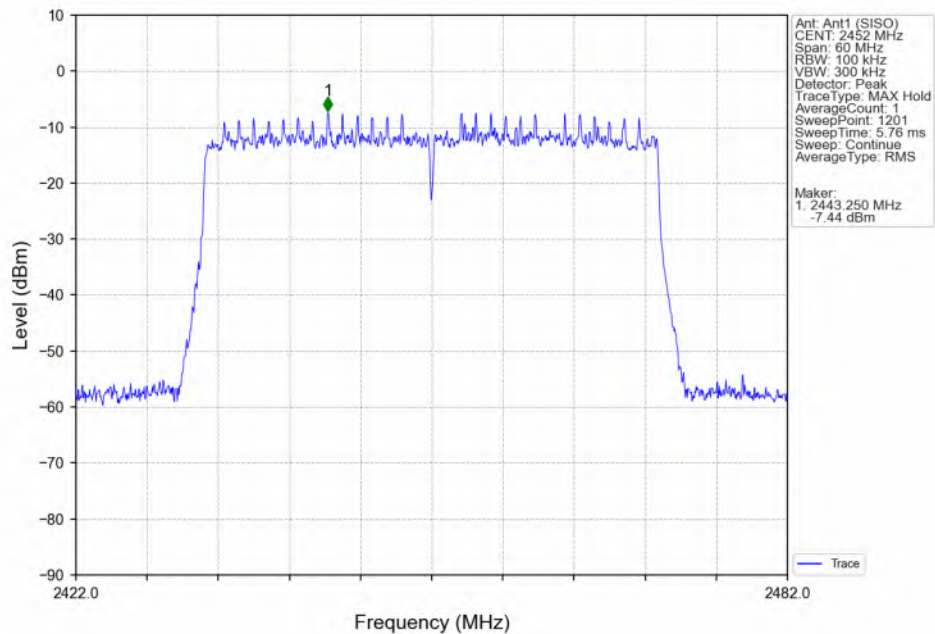


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802.11ax(HEW40) MCH 2437MHz_SU / _Ant1 (SISO)_NTNV



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	1.93
		2437	/	/	1	1.18
		2462	/	/	1	2.31
802.11g	SISO	2412	/	/	1	-2.39
		2437	/	/	1	-2.38
		2462	/	/	1	-1.51
802.11n (HT20)	SISO	2412	/	/	1	-2.56
		2437	/	/	1	-2.31
		2462	/	/	1	-1.07
802.11n (HT40)	SISO	2422	/	/	1	-4.34
		2437	/	/	1	-4.03
		2452	/	/	1	-3.64
802.11ax (HEW20)	SISO	2412	SU	/	1	-4.88
		2437	SU	/	1	-5.25
		2462	SU	/	1	-5.19
802.11ax (HEW40)	SISO	2422	SU	/	1	-7.29
		2437	SU	/	1	-7.10
		2452	SU	/	1	-7.29

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)	RU	RU Pos	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	/	/	1	2.31	-17.69	Pass
		2437	/	/	1	2.31	-17.69	Pass
		2462	/	/	1	2.31	-17.69	Pass
802.11g	SISO	2412	/	/	1	-1.51	-21.51	Pass
		2437	/	/	1	-1.51	-21.51	Pass
		2462	/	/	1	-1.51	-21.51	Pass
802.11n (HT20)	SISO	2412	/	/	1	-1.07	-21.07	Pass
		2437	/	/	1	-1.07	-21.07	Pass
		2462	/	/	1	-1.07	-21.07	Pass
802.11n (HT40)	SISO	2422	/	/	1	-3.64	-23.64	Pass
		2437	/	/	1	-3.64	-23.64	Pass
		2452	/	/	1	-3.64	-23.64	Pass
802.11ax (HEW20)	SISO	2412	SU	/	1	-4.88	-24.88	Pass
		2437	SU	/	1	-4.88	-24.88	Pass
		2462	SU	/	1	-4.88	-24.88	Pass
802.11ax (HEW40)	SISO	2422	SU	/	1	-7.10	-27.10	Pass
		2437	SU	/	1	-7.10	-27.10	Pass
		2452	SU	/	1	-7.10	-27.10	Pass

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

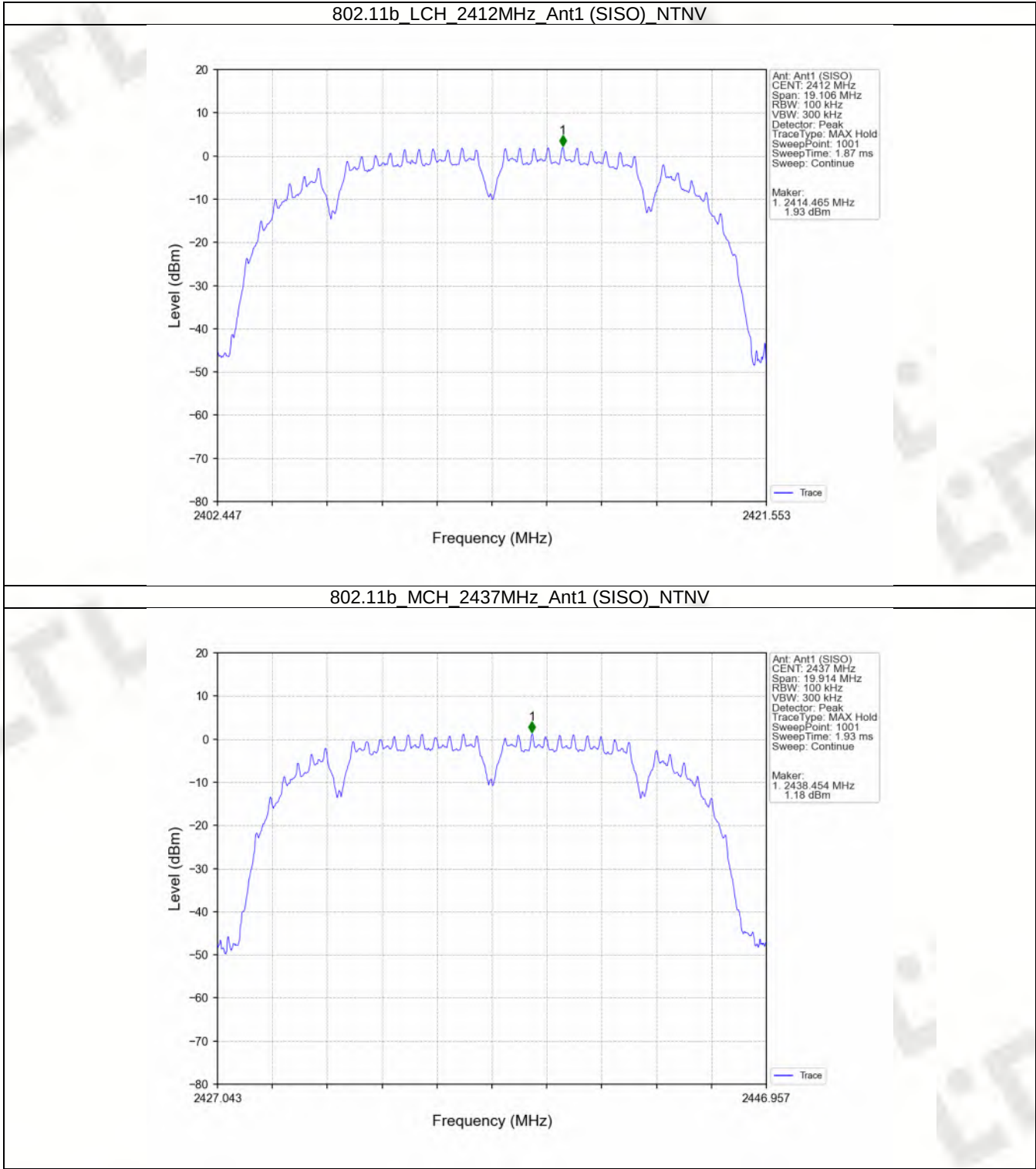
FCC ID: SMQ-UWM1

establish the reference level.

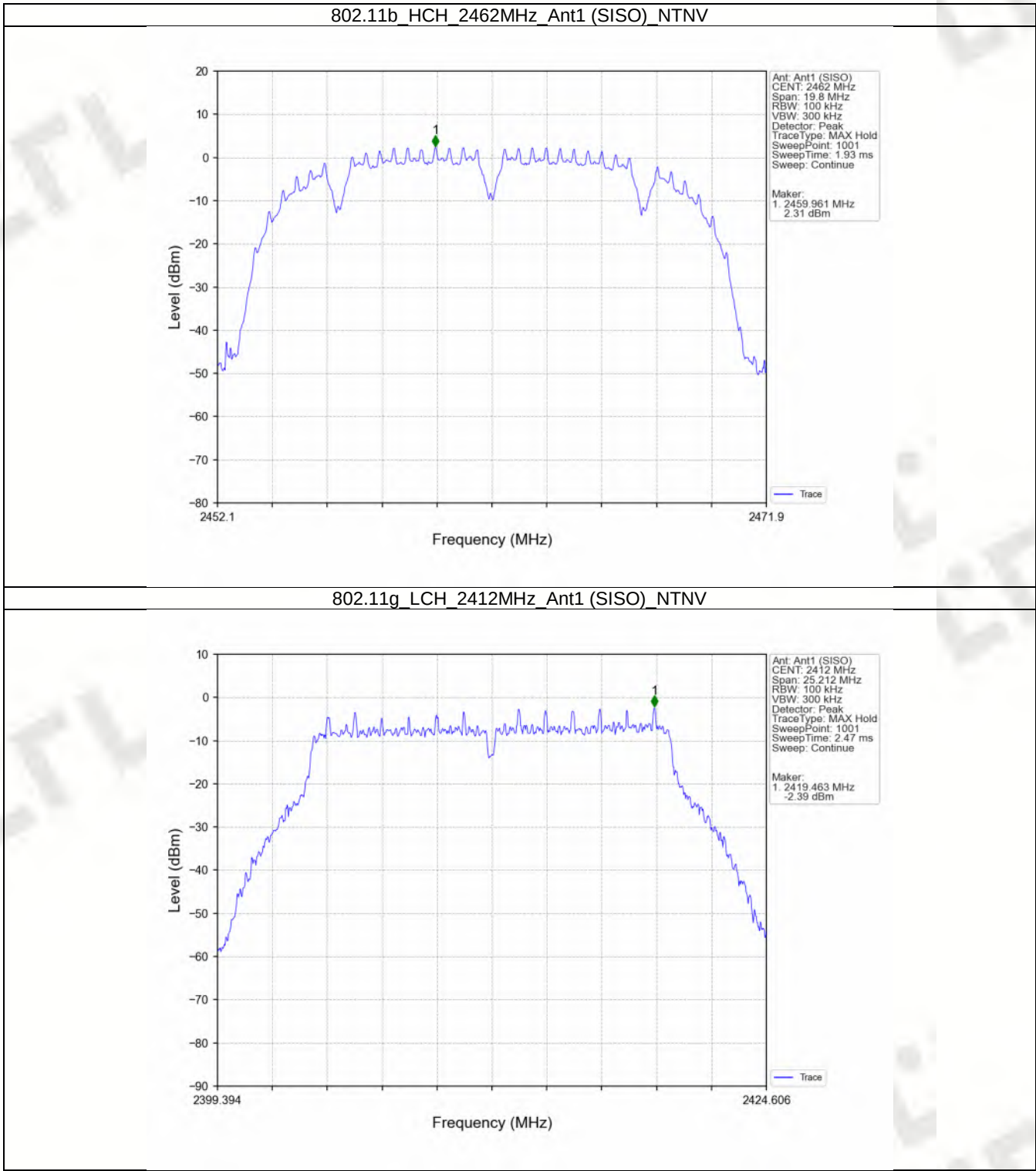
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5.2 Test Graph

5.2.1 Ref

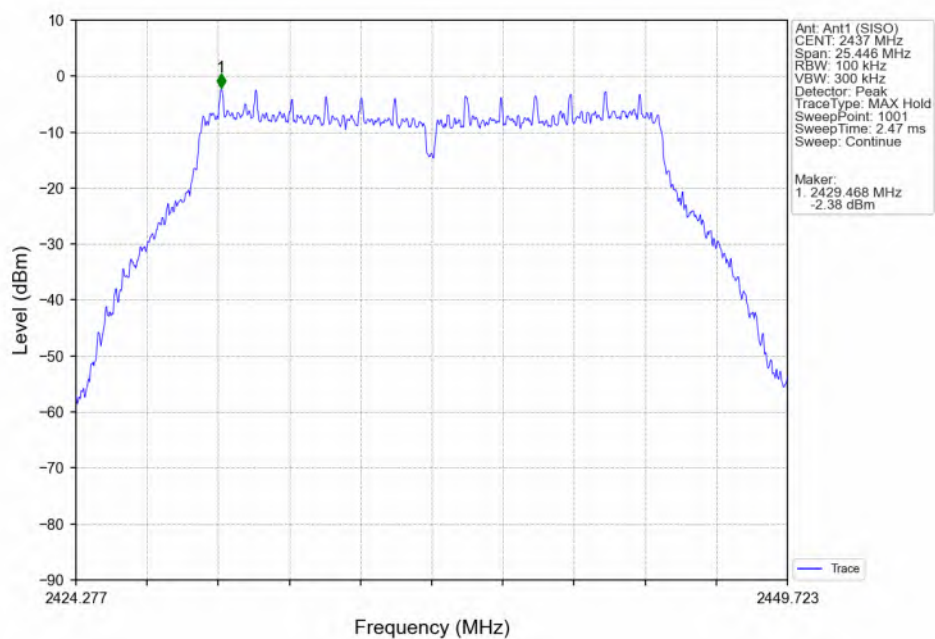


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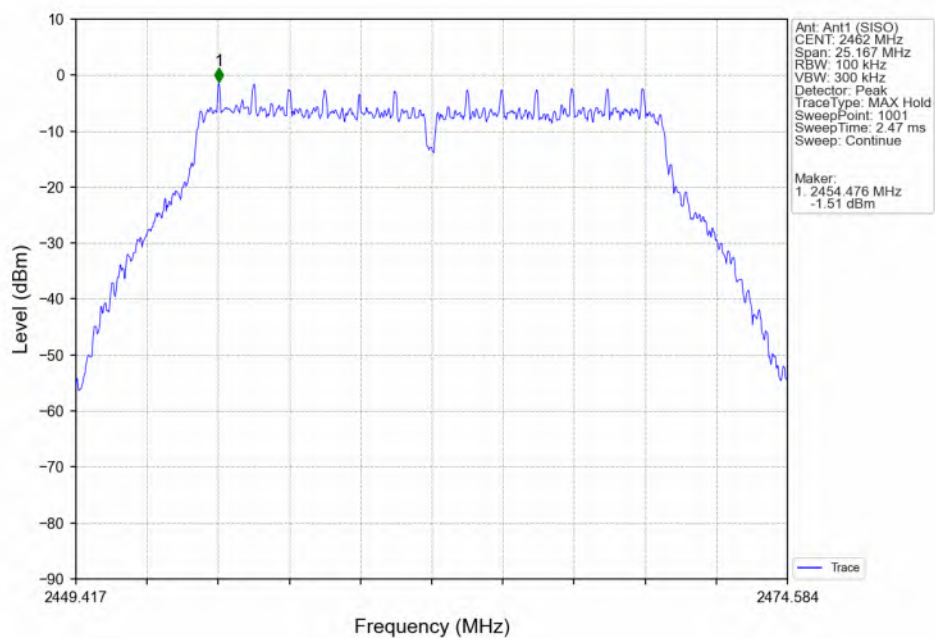


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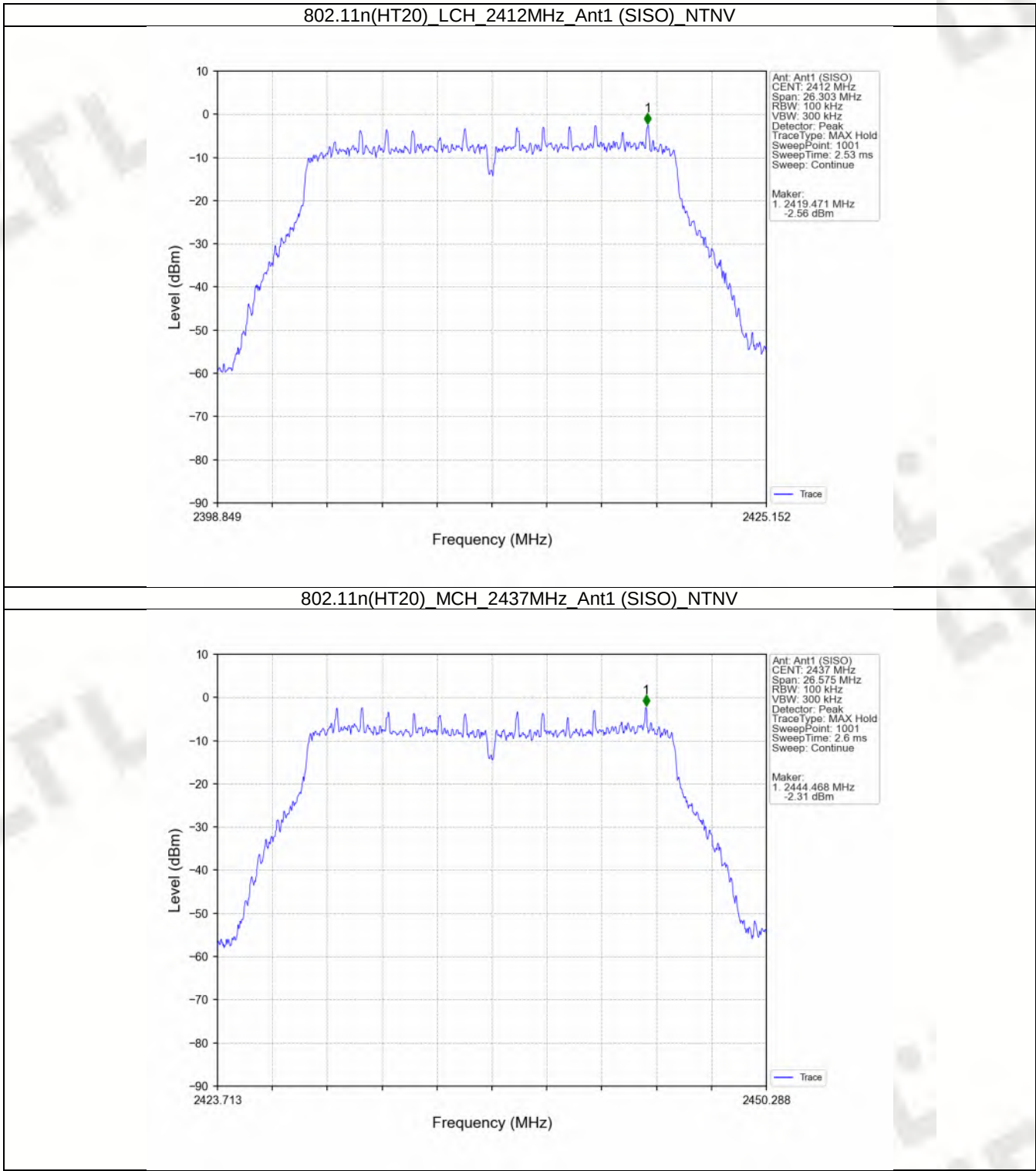
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV

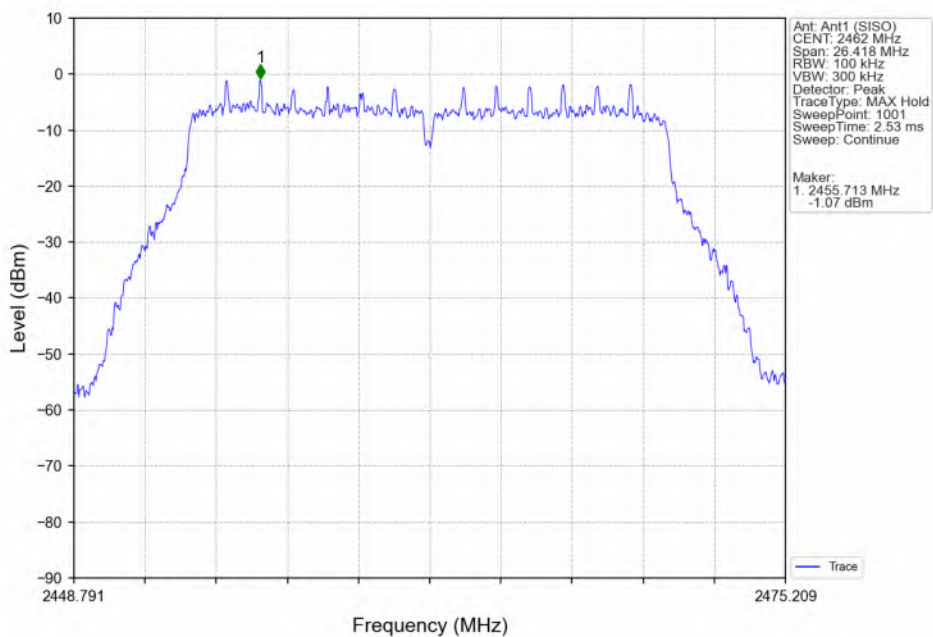


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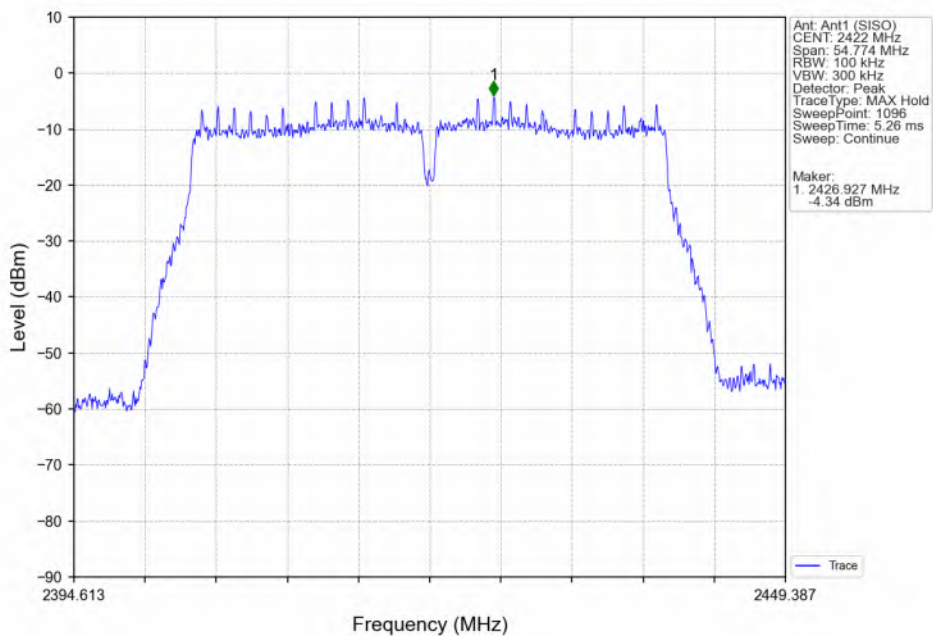


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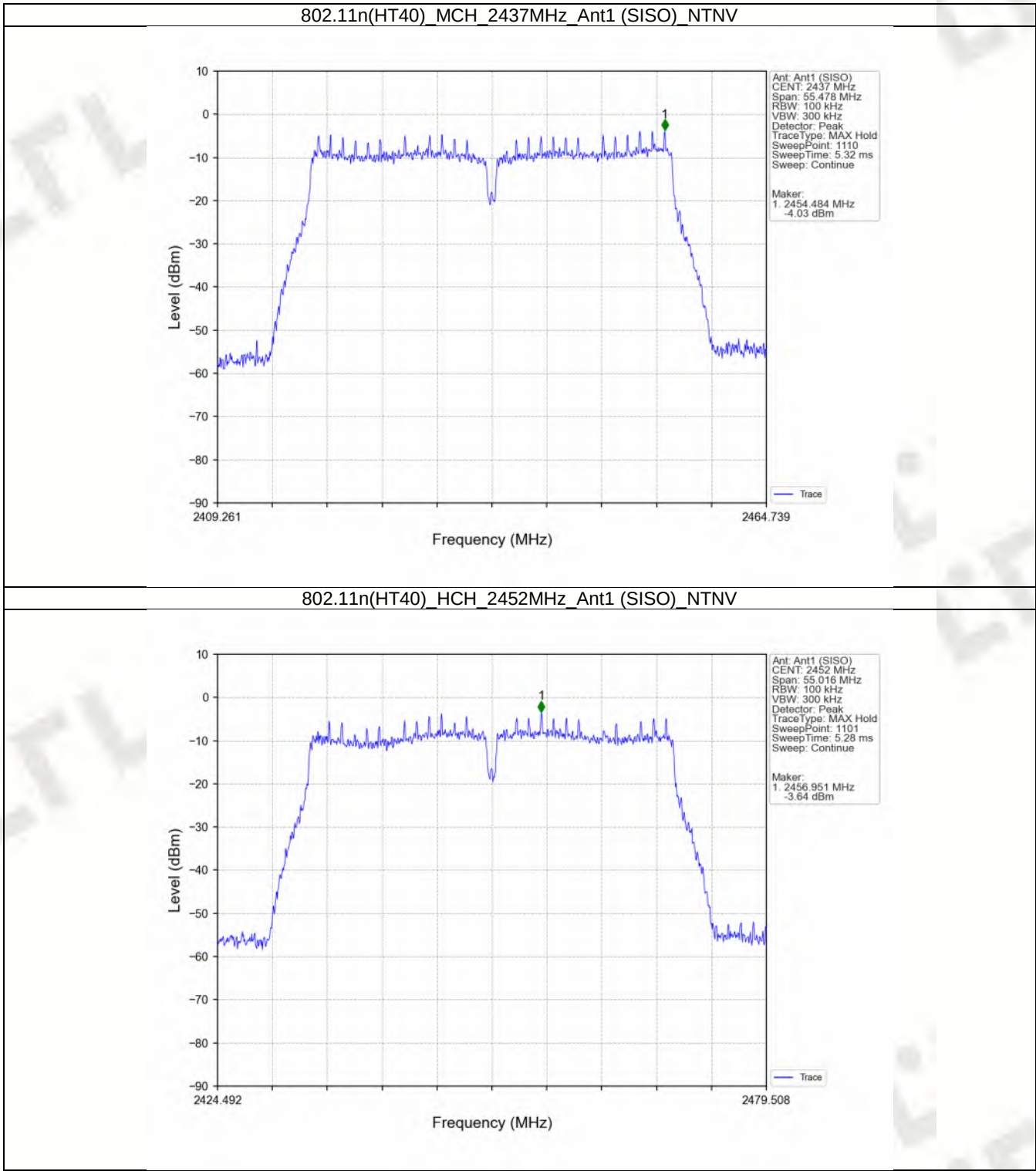
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



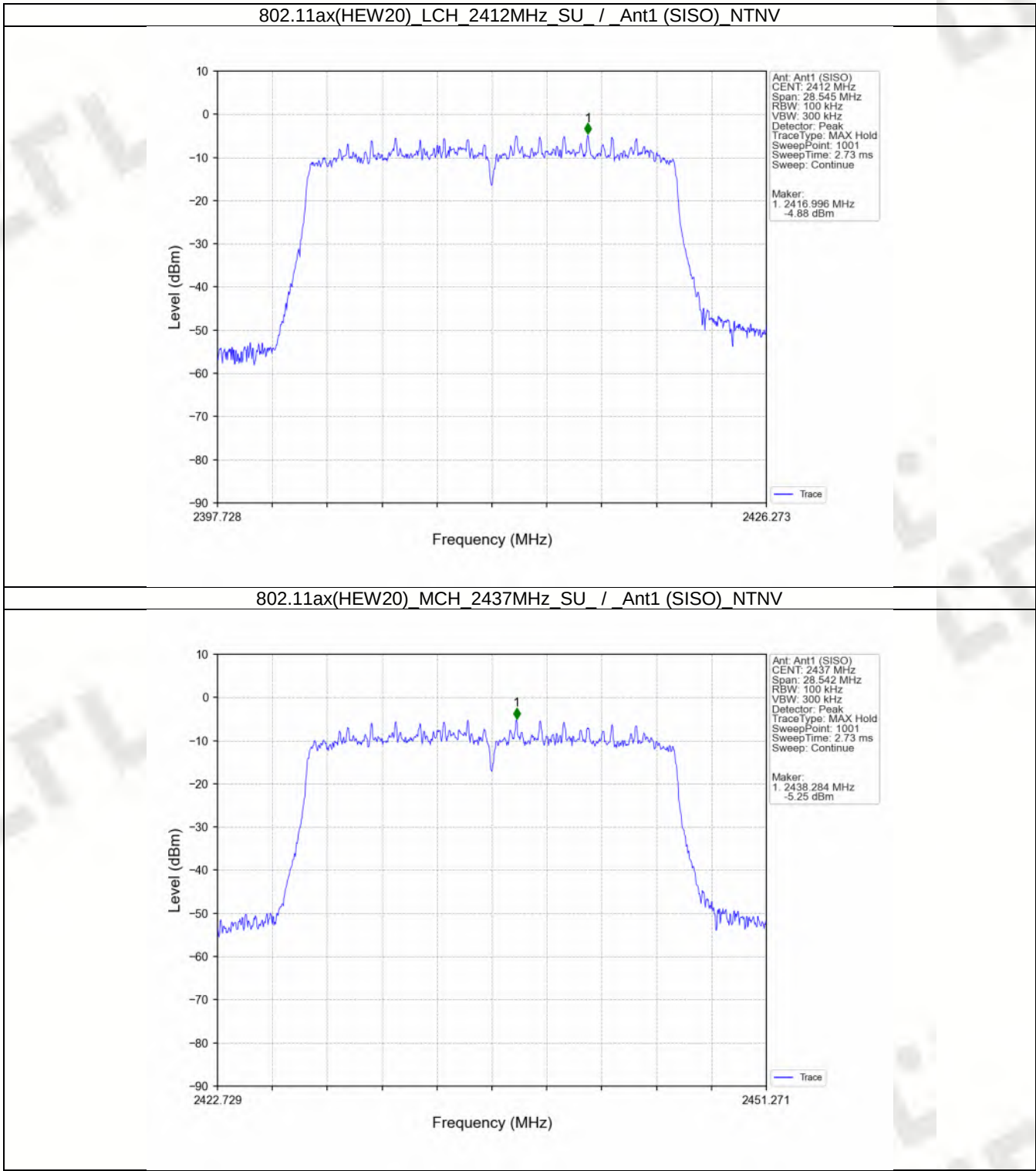
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



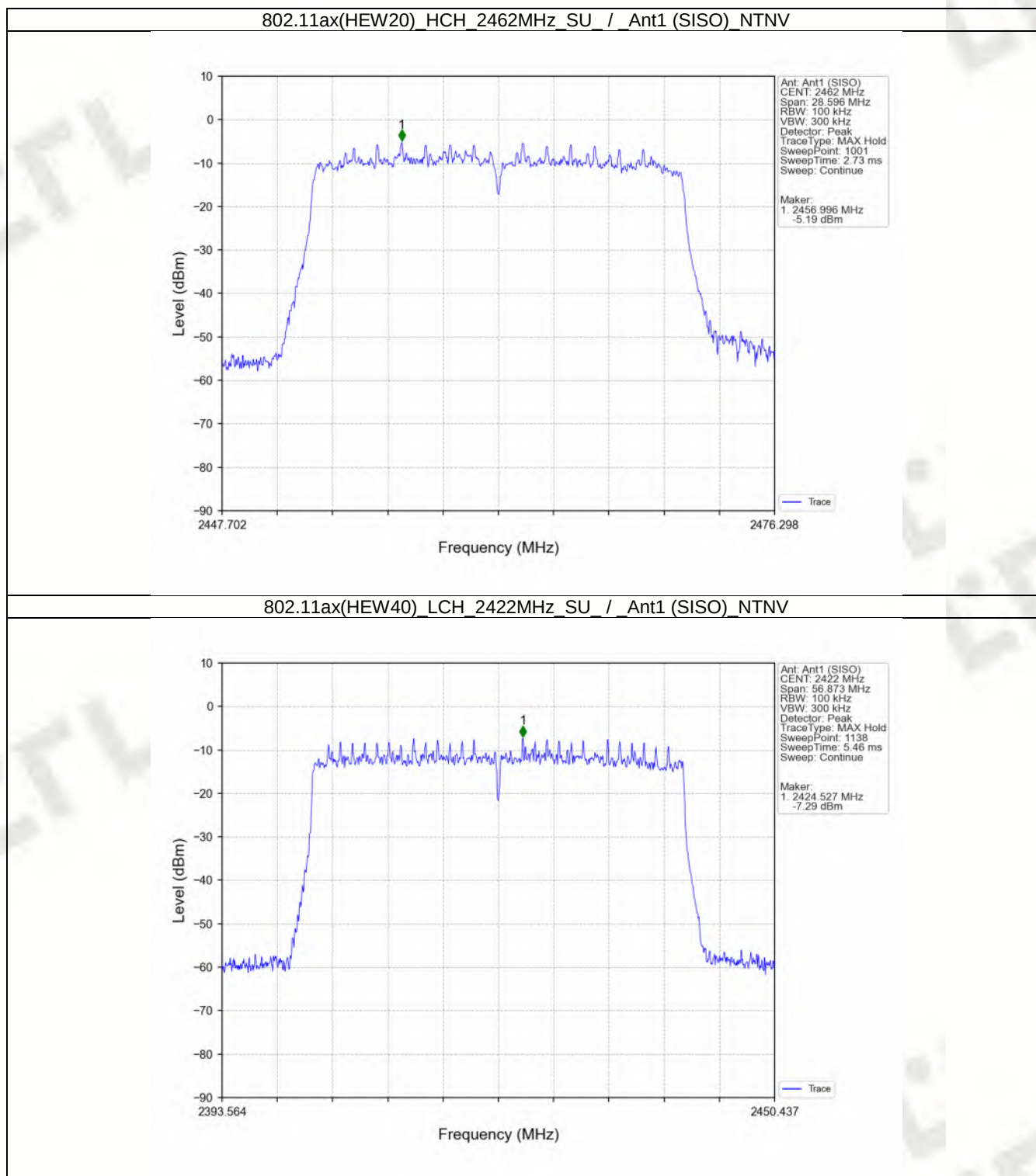
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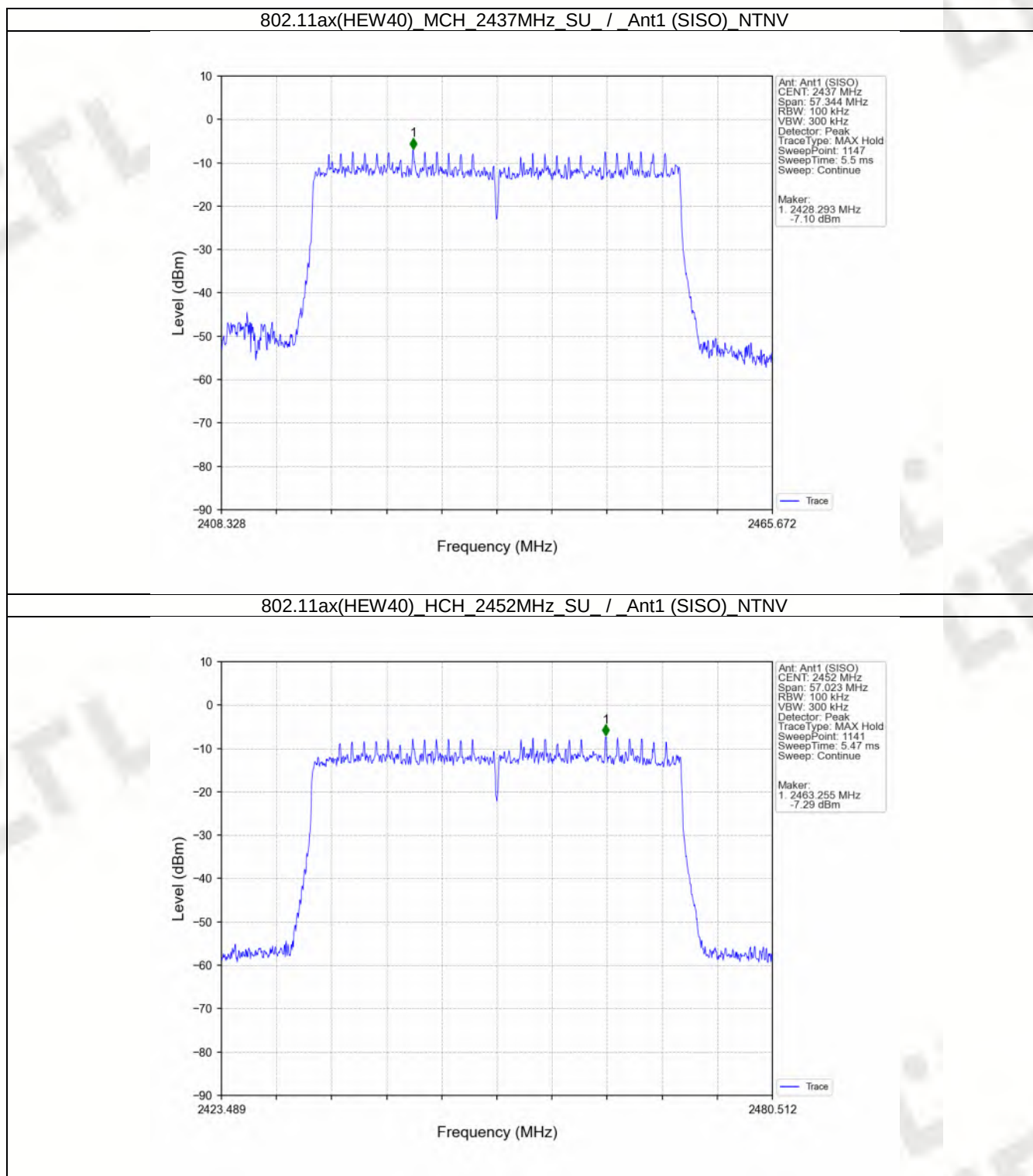
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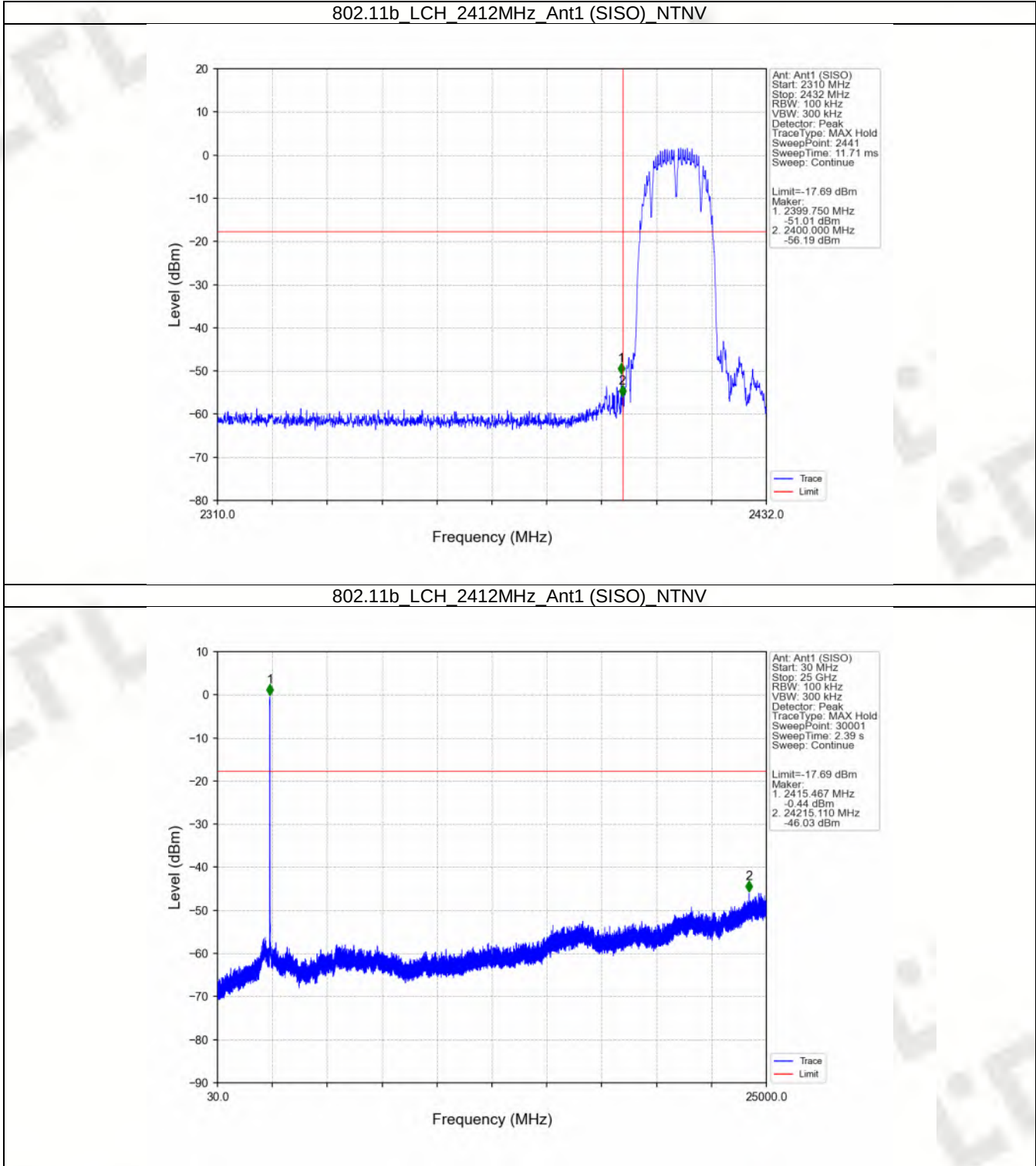


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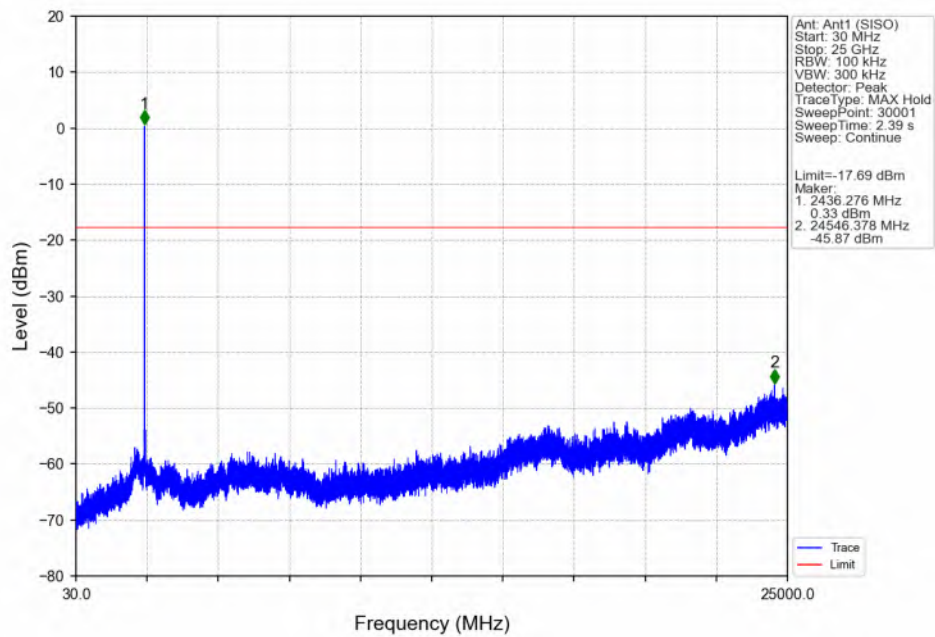
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5.2.2 CSE

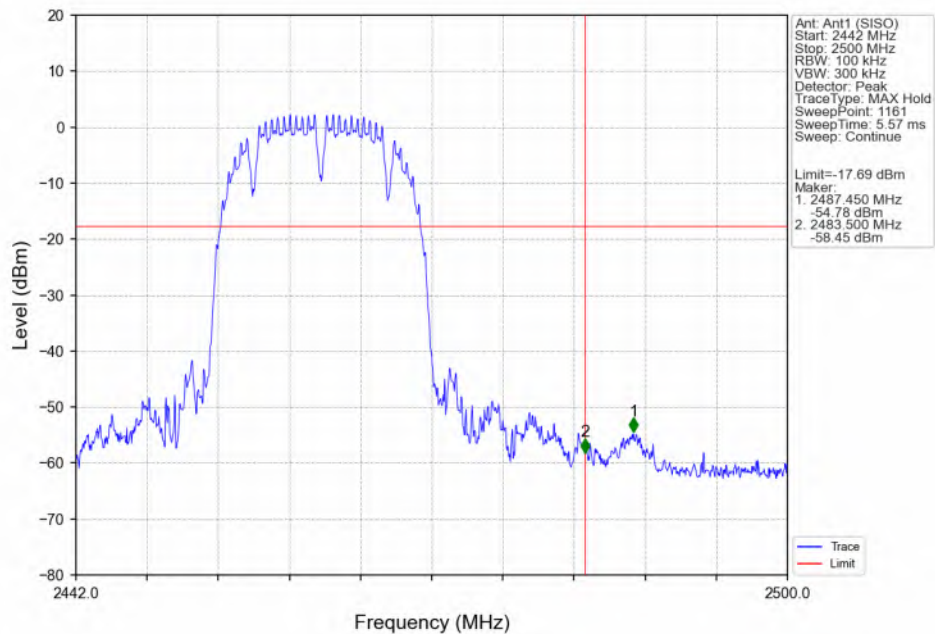


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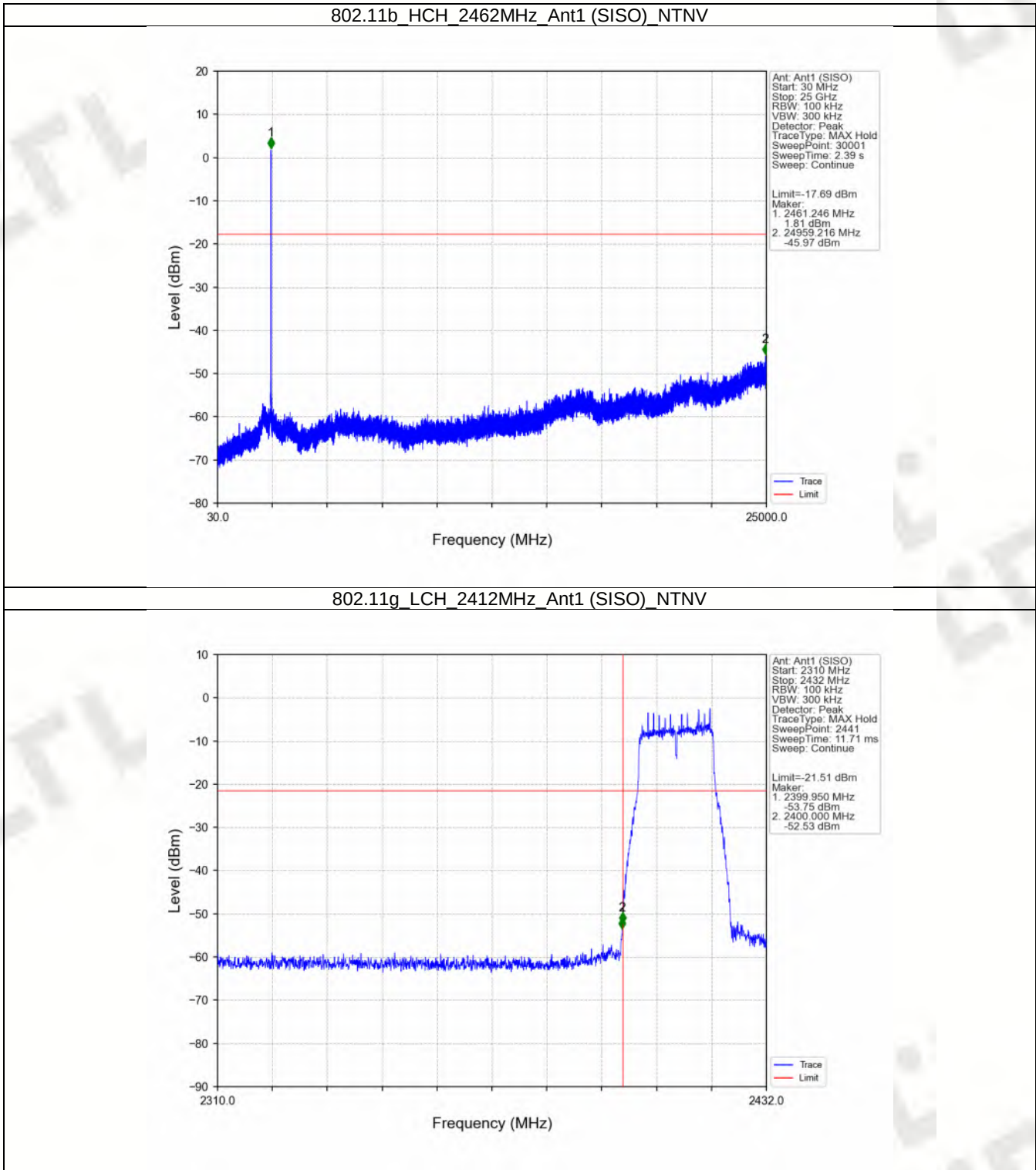
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV

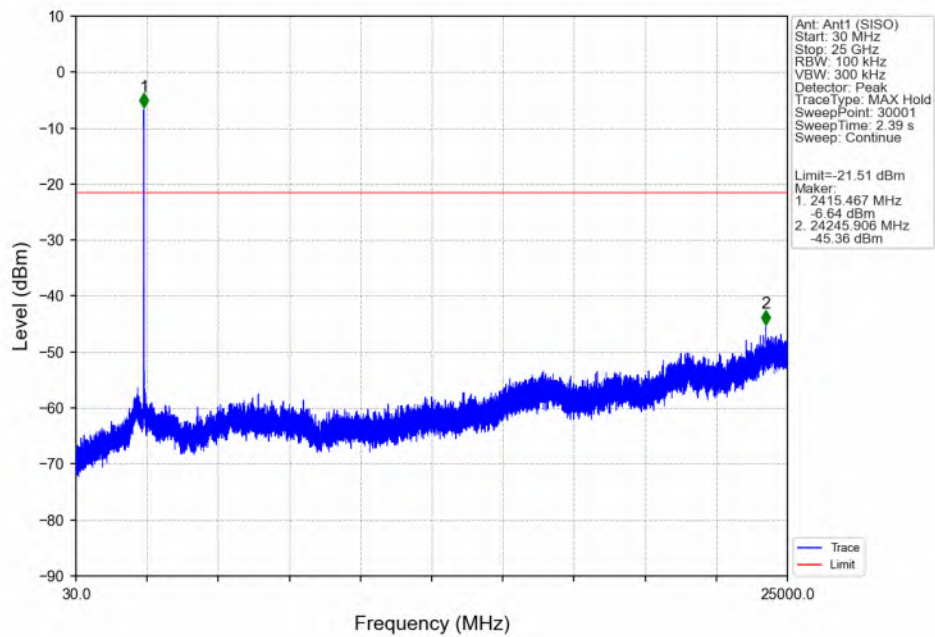


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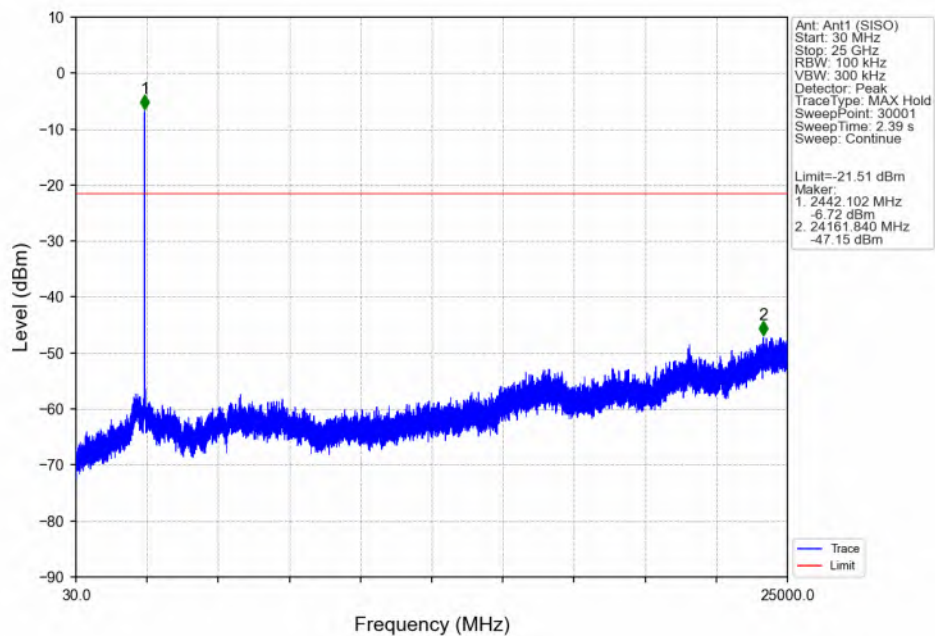


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802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

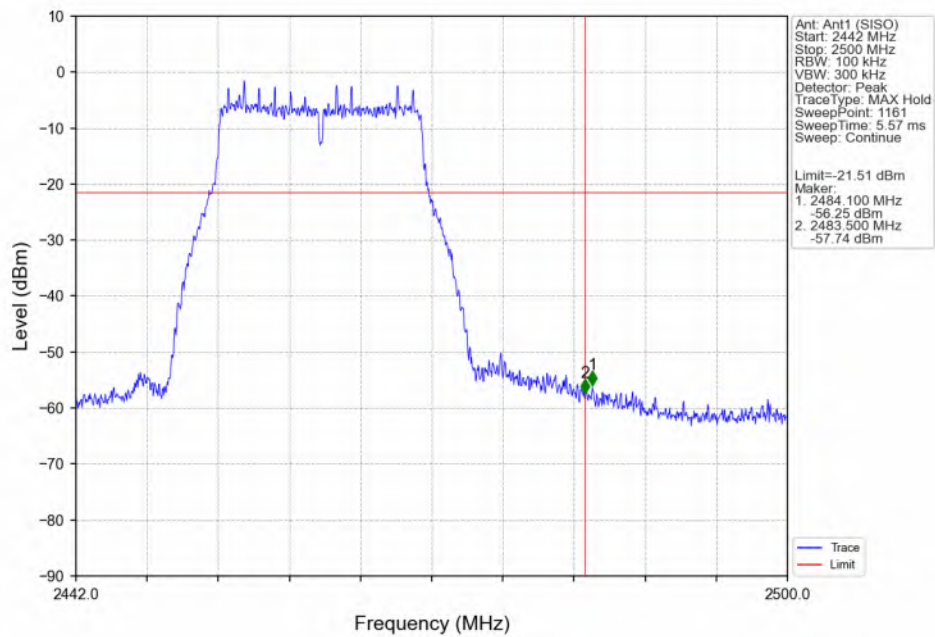


802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV

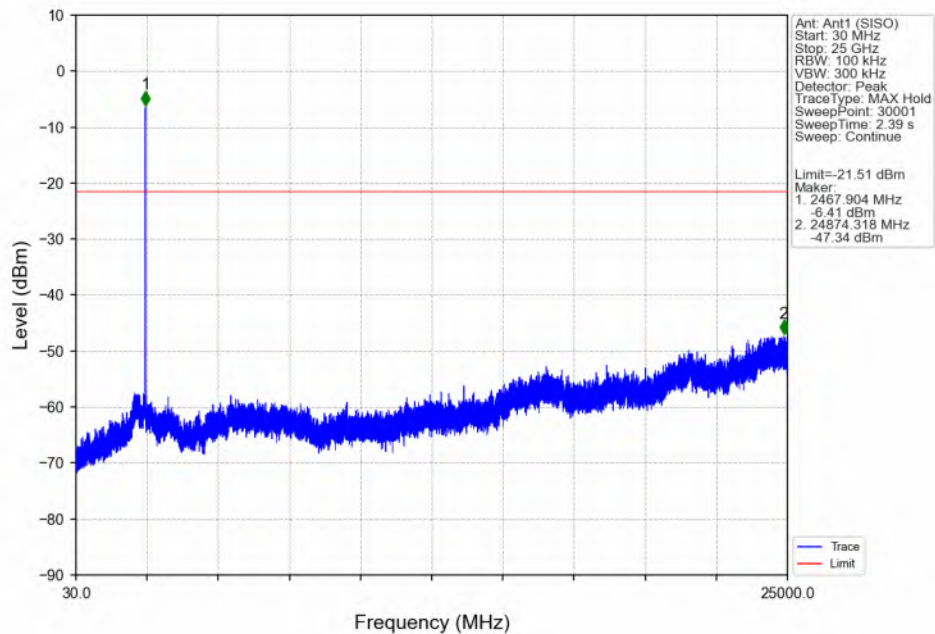


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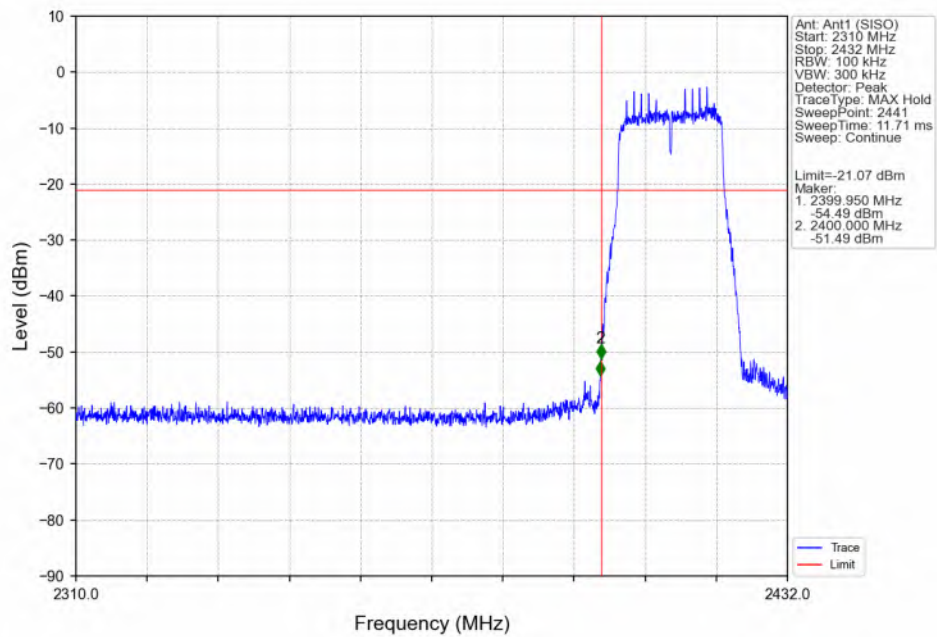


802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV

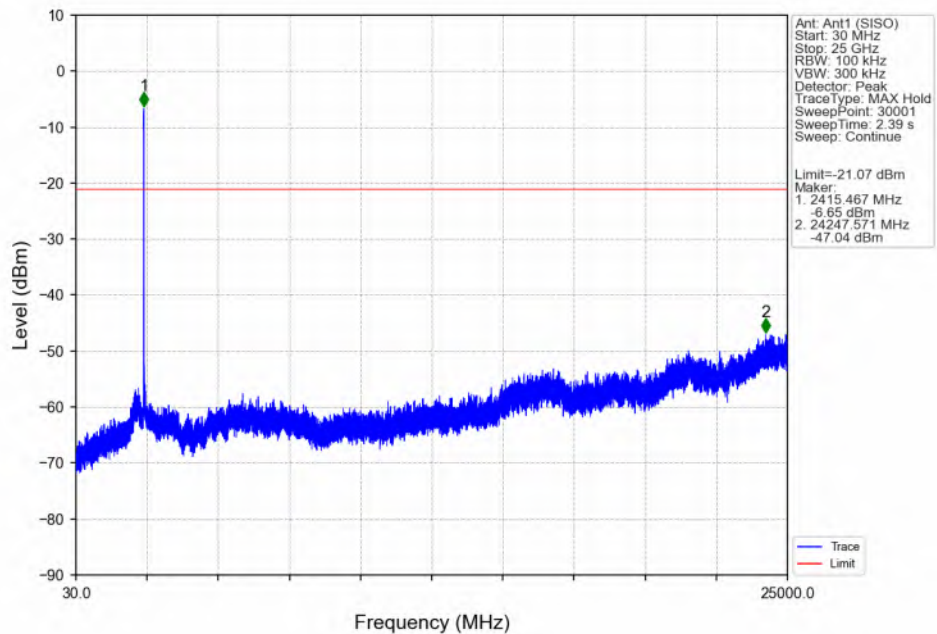


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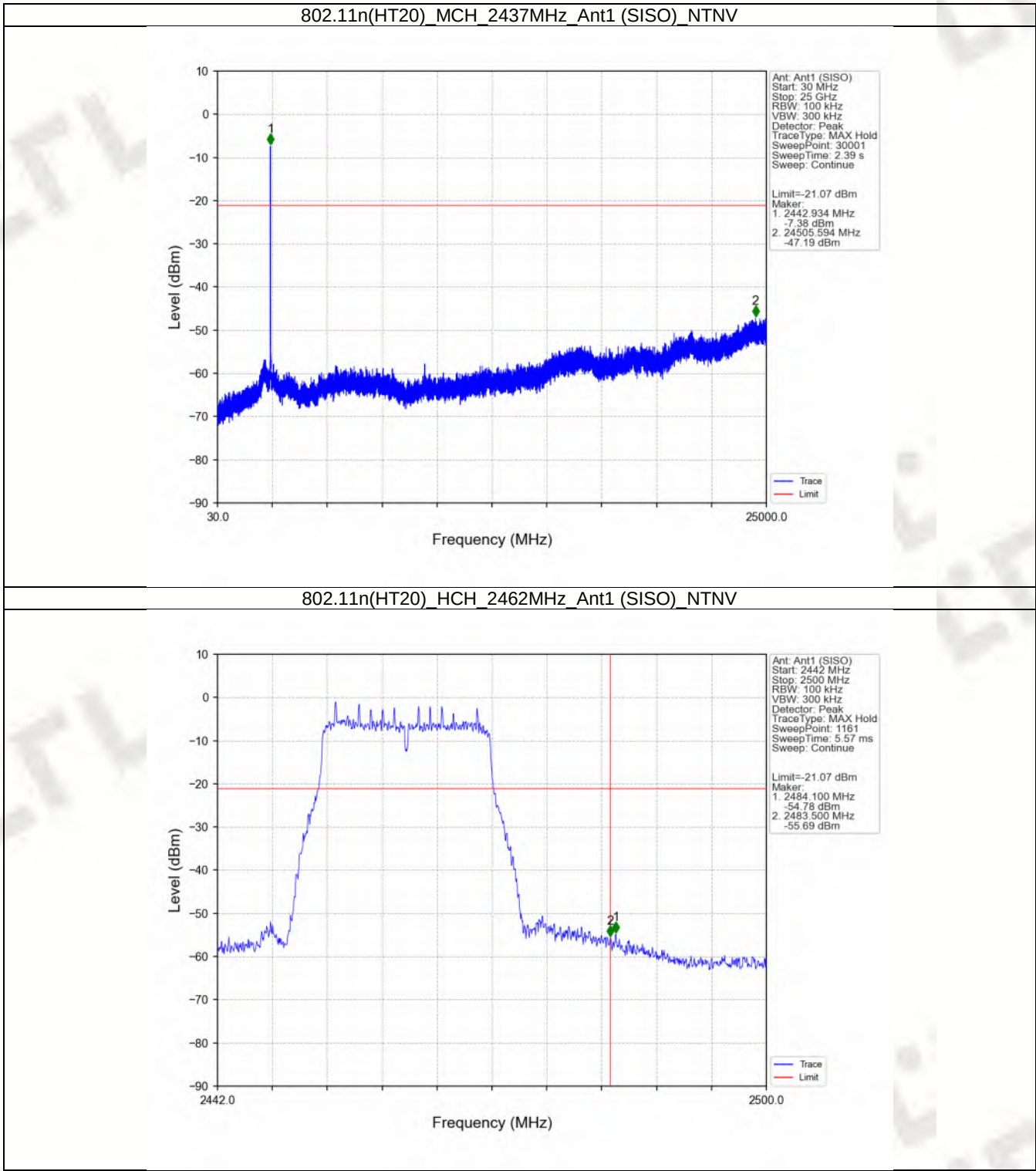
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



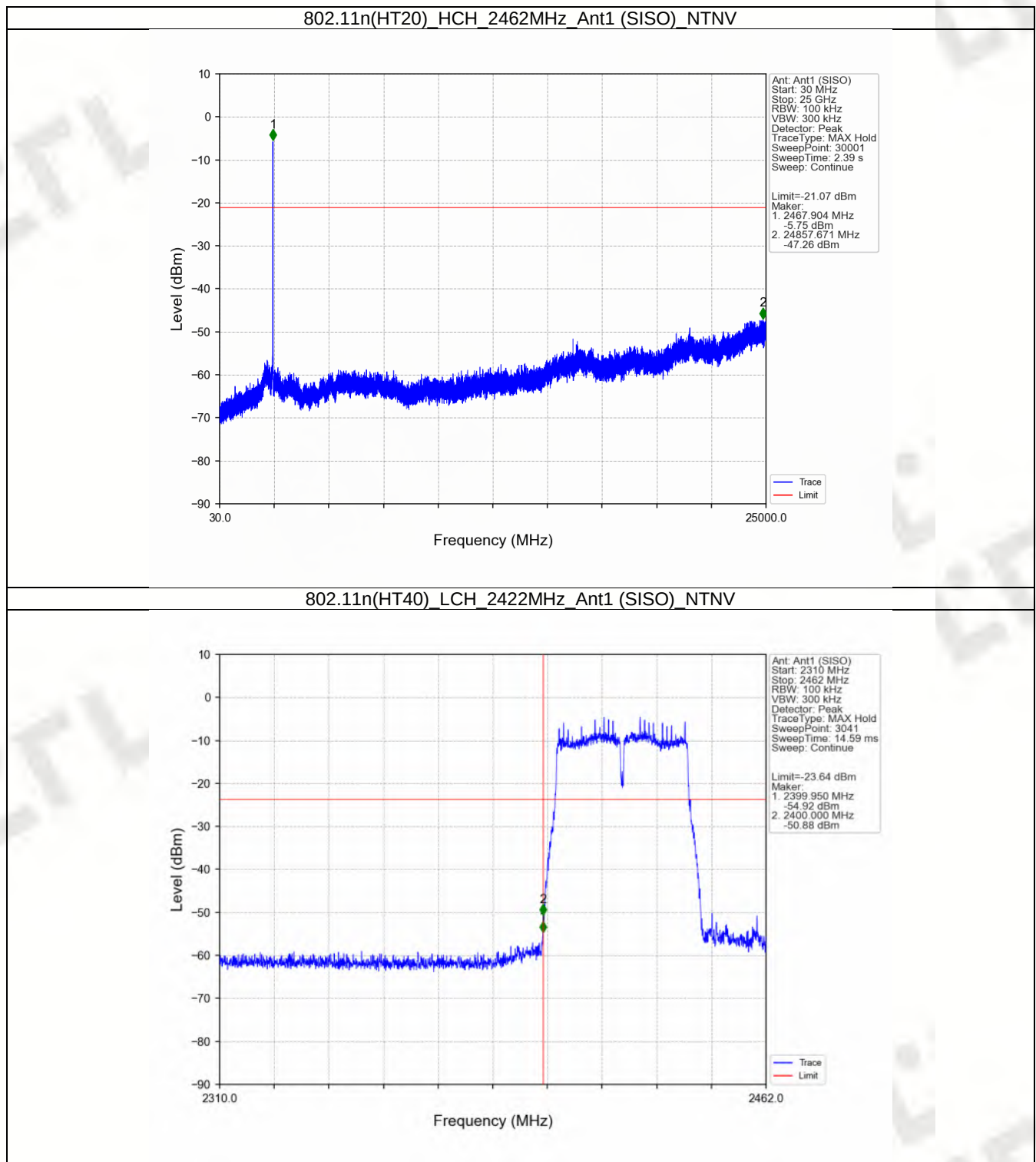
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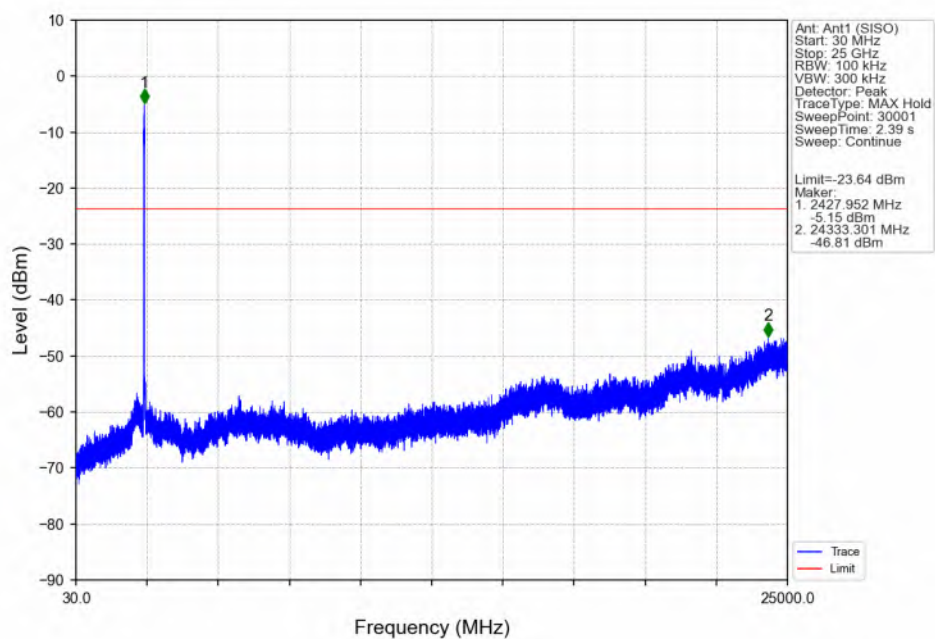


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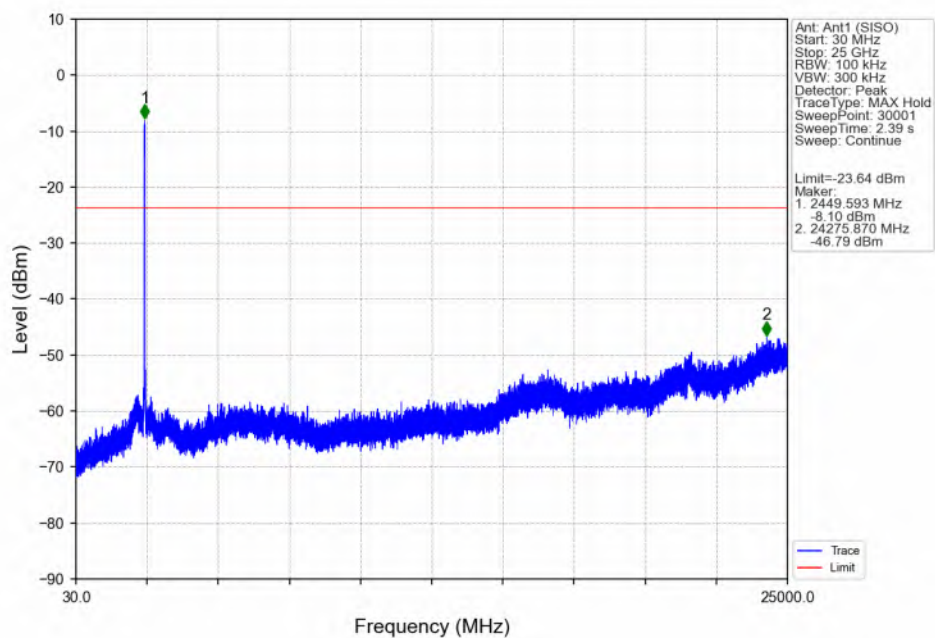


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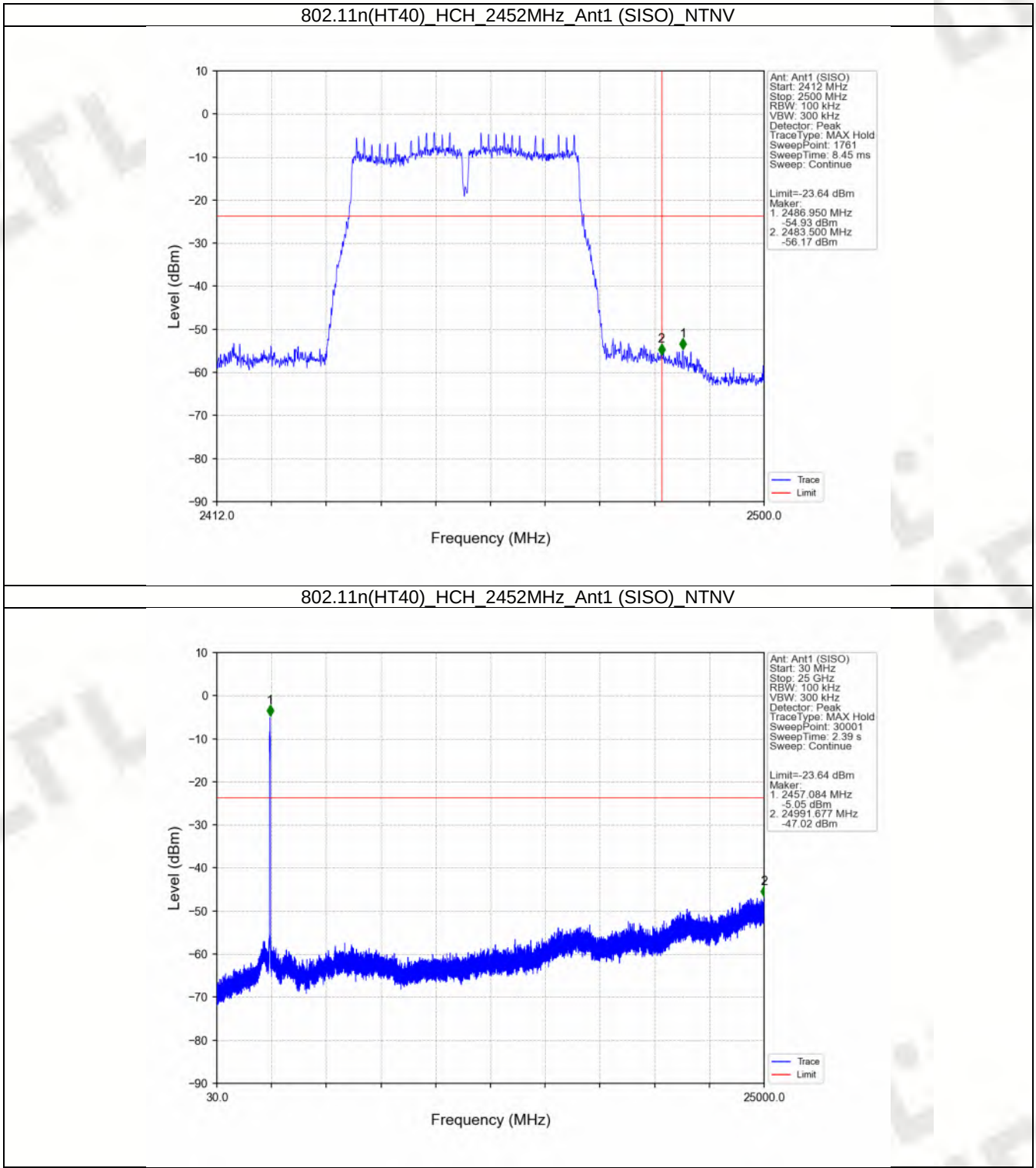
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



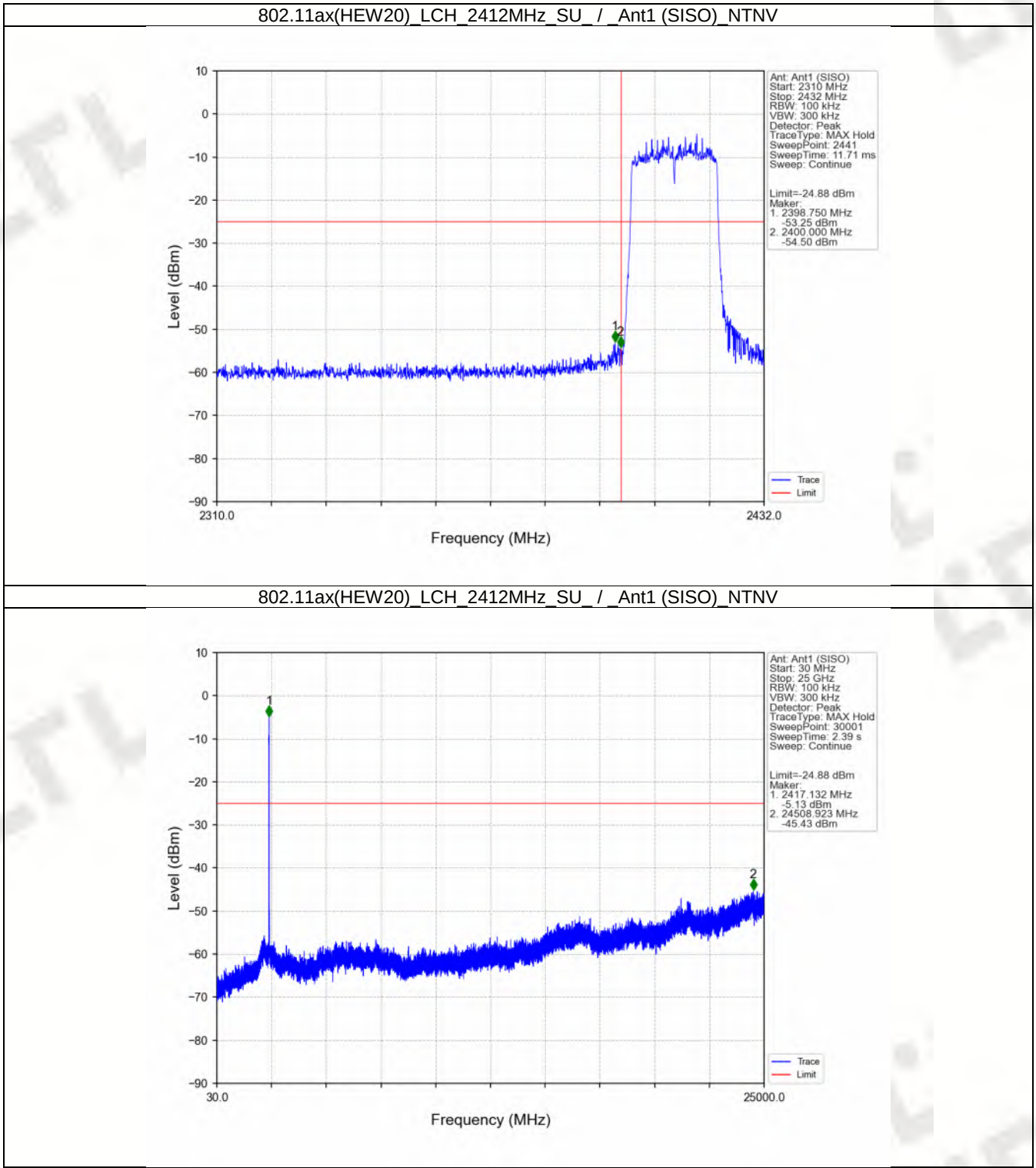
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



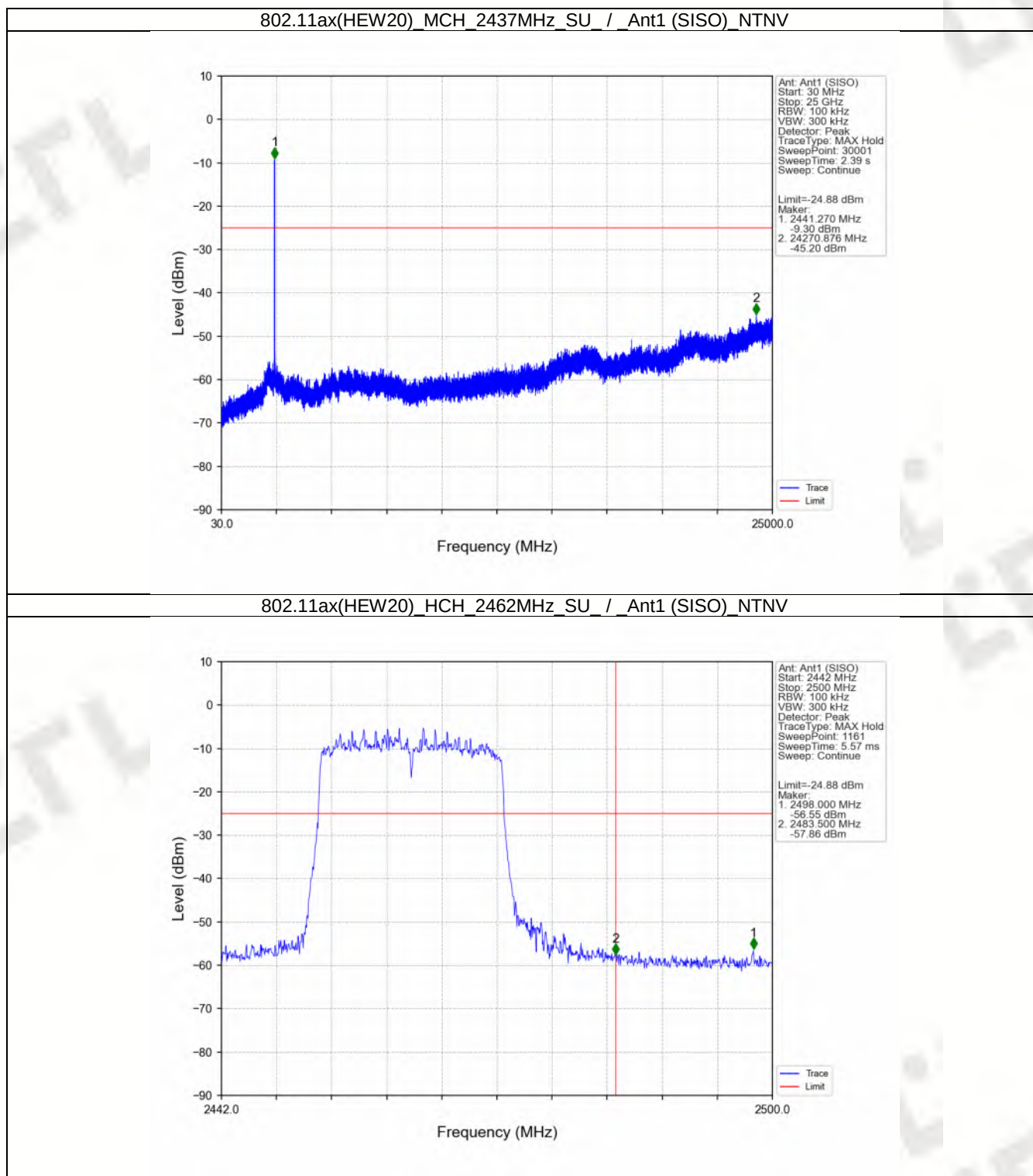
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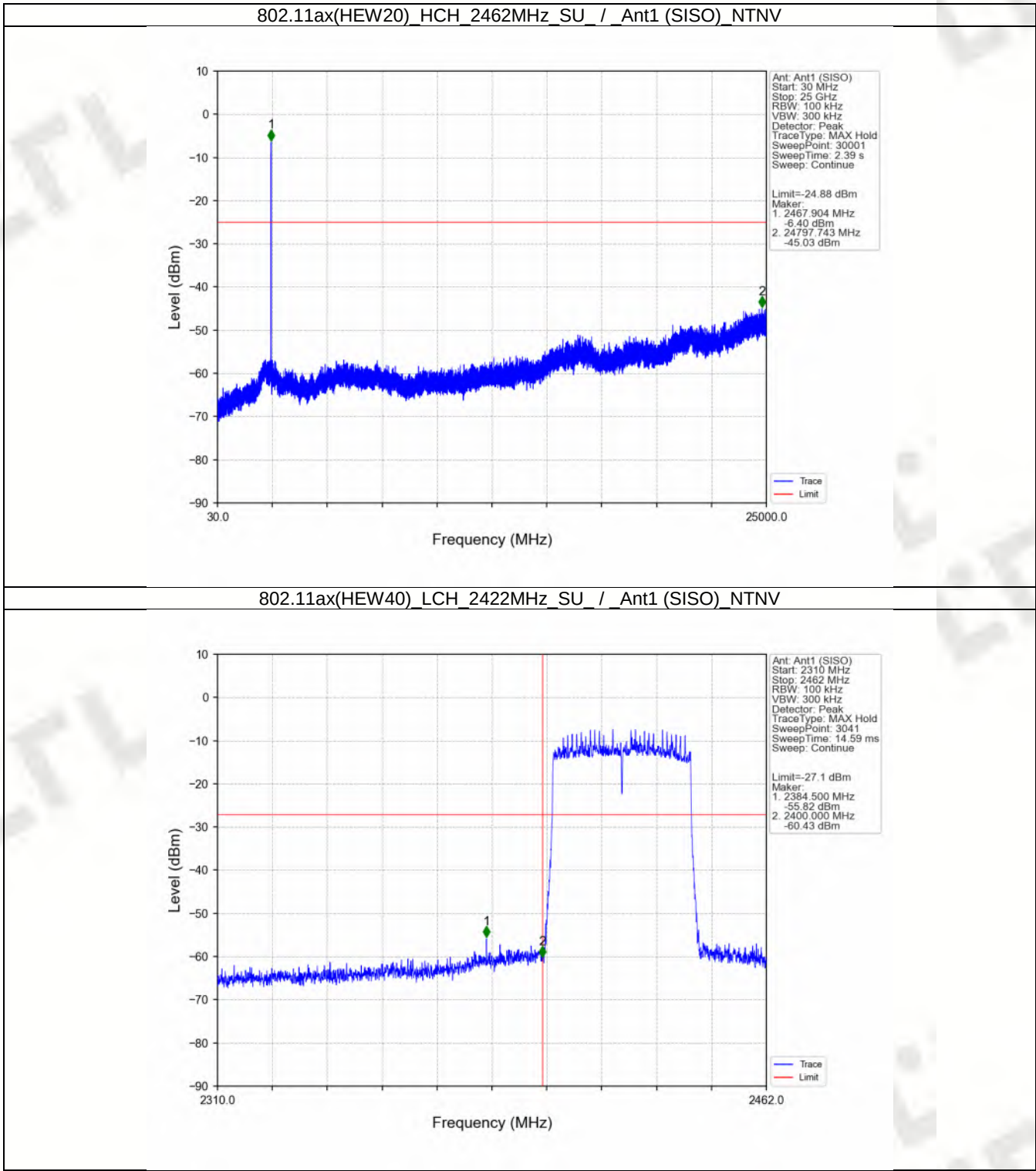
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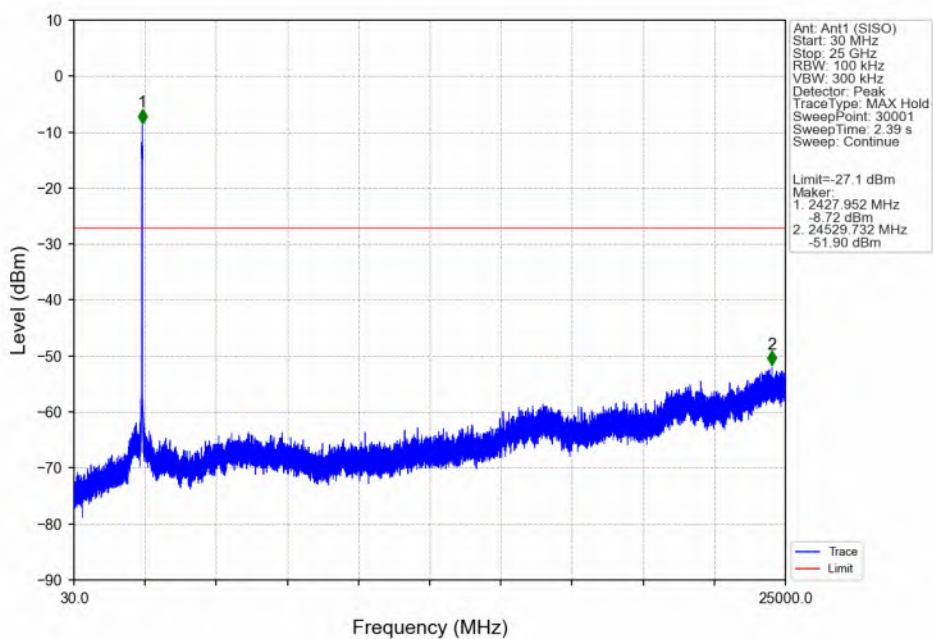


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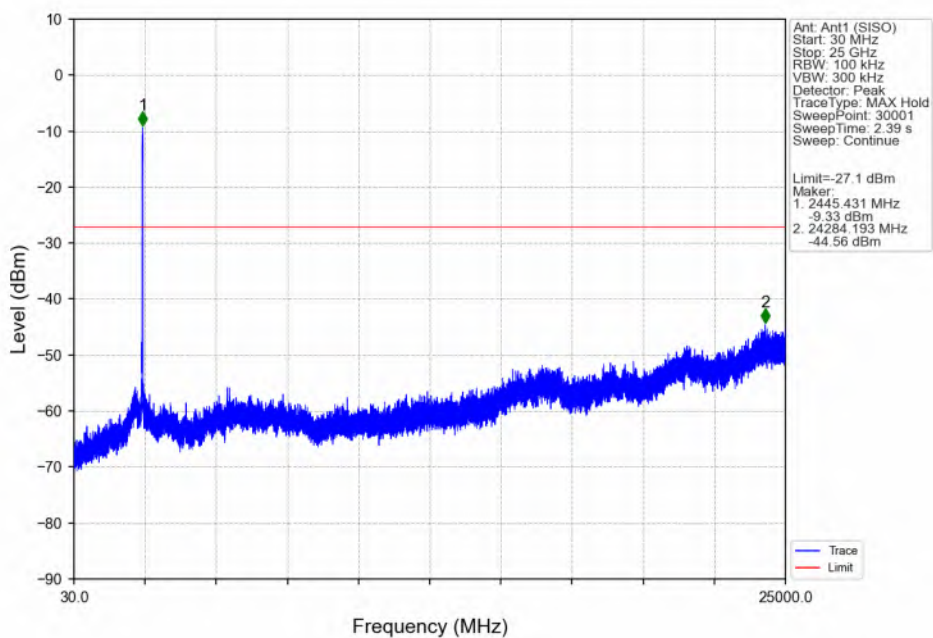


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802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant1 (SISO)_NTNV



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



FCC ID: SMQ-UWM1

