

10 Appendix

For BLE

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 (%)
1M	SISO	2402	2.139	2.500	85.56	0.68	0.03
		2440	2.139	2.499	85.59	0.68	0.03
		2480	2.138	2.499	85.55	0.68	0.03
2M	SISO	2402	0.064	0.625	10.24	9.90	0.03
		2440	0.064	0.625	10.24	9.90	0.03
		2480	0.064	0.625	10.24	9.90	0.03



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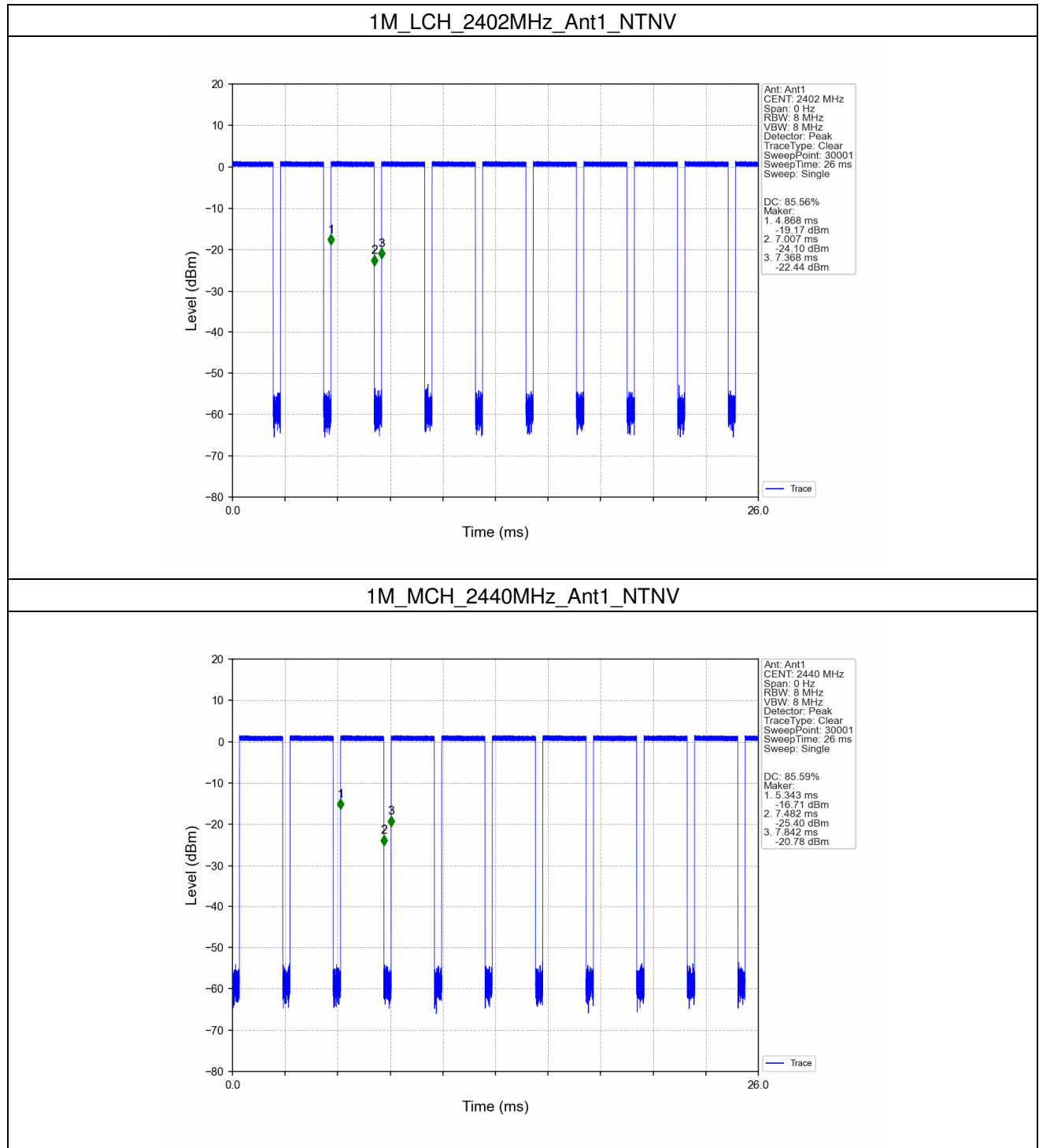
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中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663

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1.2 Test Graph

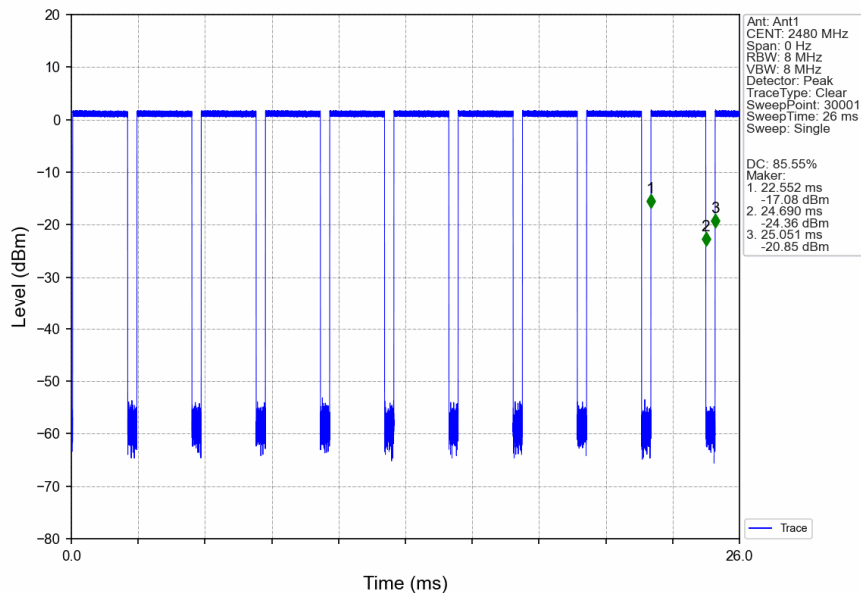
1.2.1 Ant1



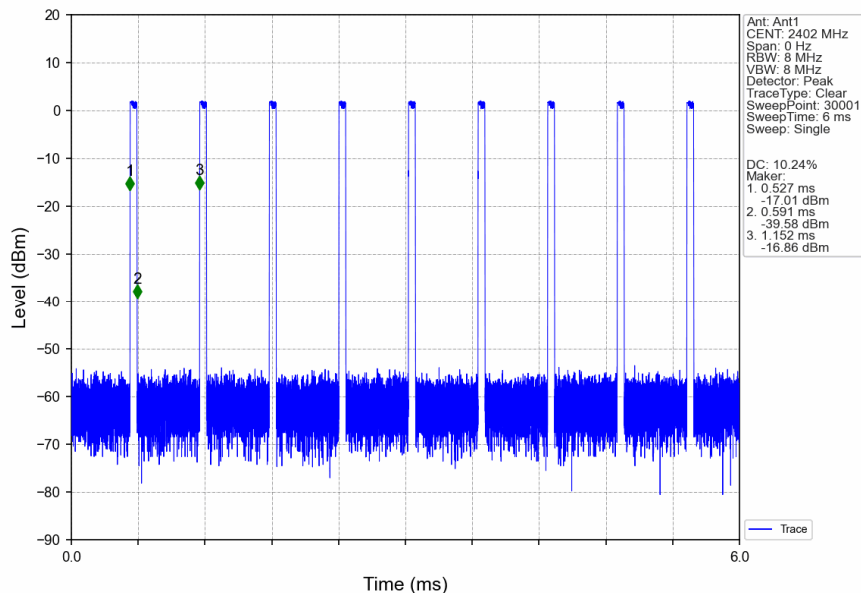
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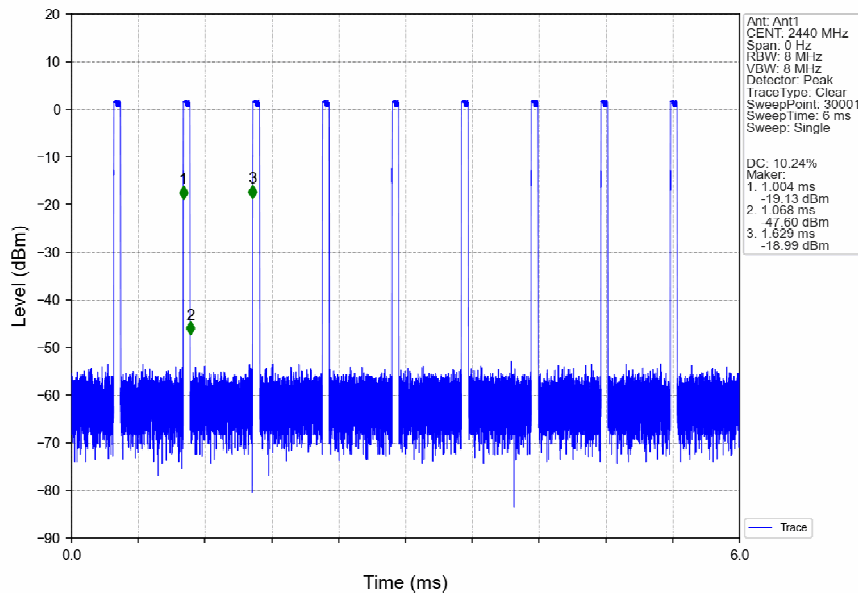
1M_HCH_2480MHz_Ant1_NTNV



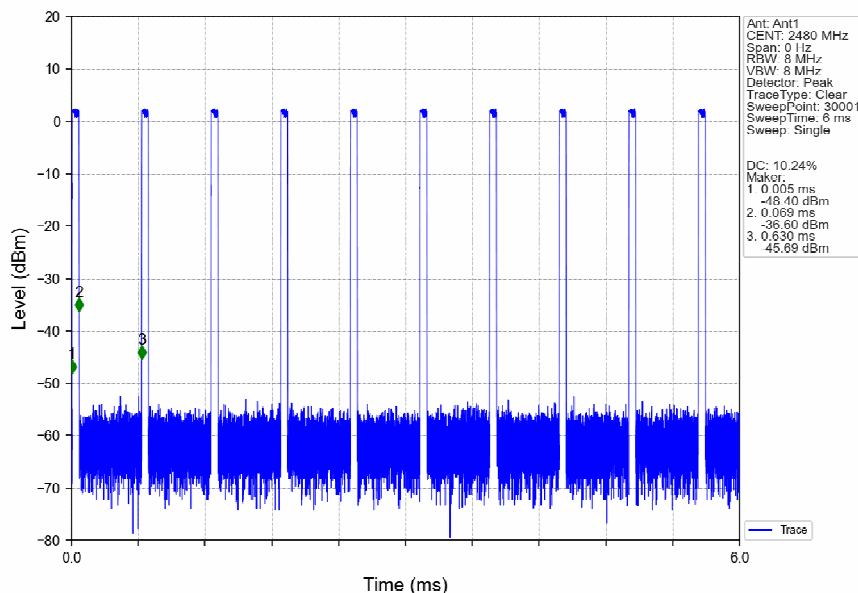
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



2. Bandwidth

2.1 Test Result

2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.642	≥ 0.5	Pass
		2440	1	0.641	≥ 0.5	Pass
		2480	1	0.642	≥ 0.5	Pass
2M	SISO	2402	1	0.673	≥ 0.5	Pass
		2440	1	0.674	≥ 0.5	Pass
		2480	1	0.673	≥ 0.5	Pass

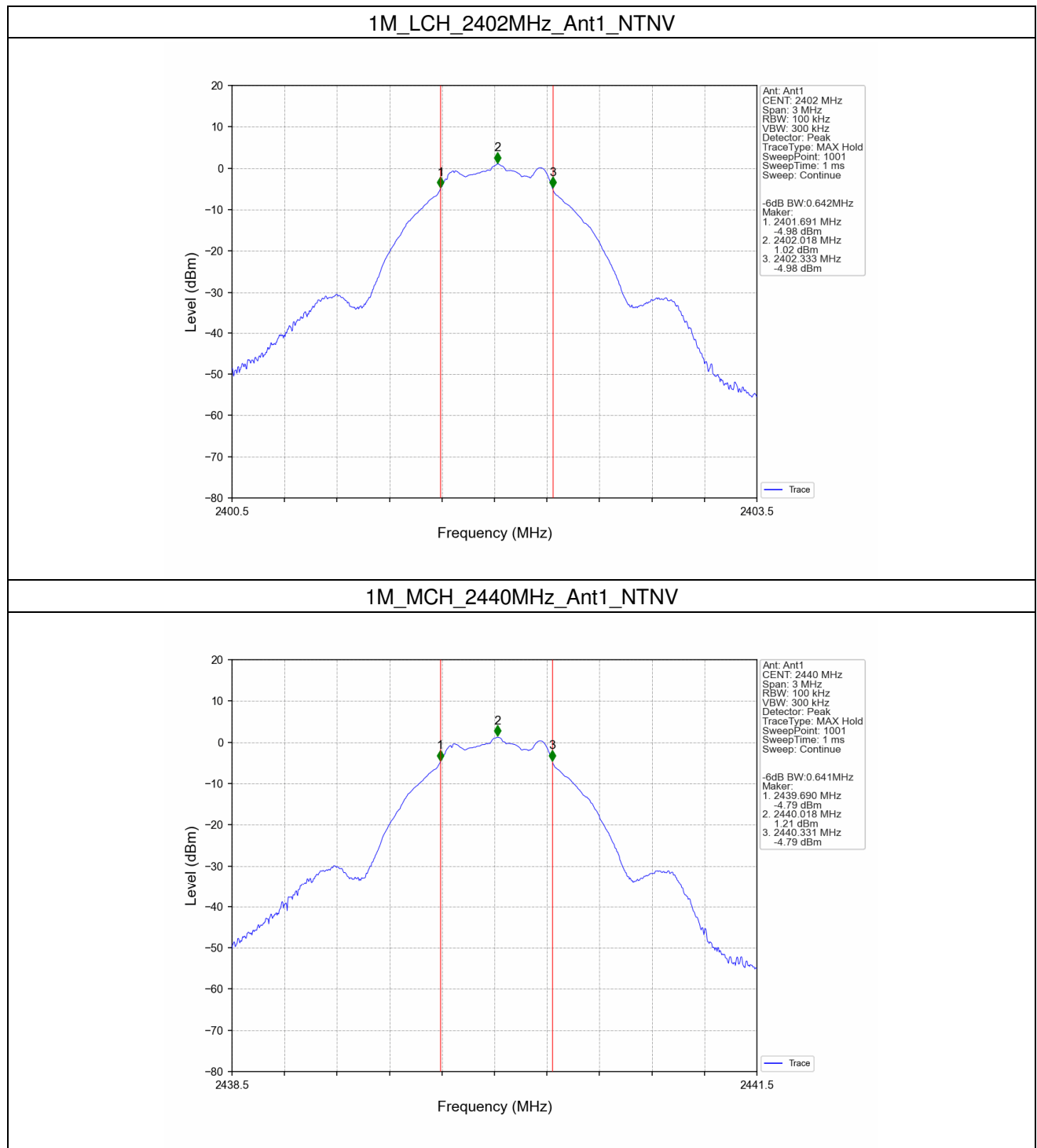


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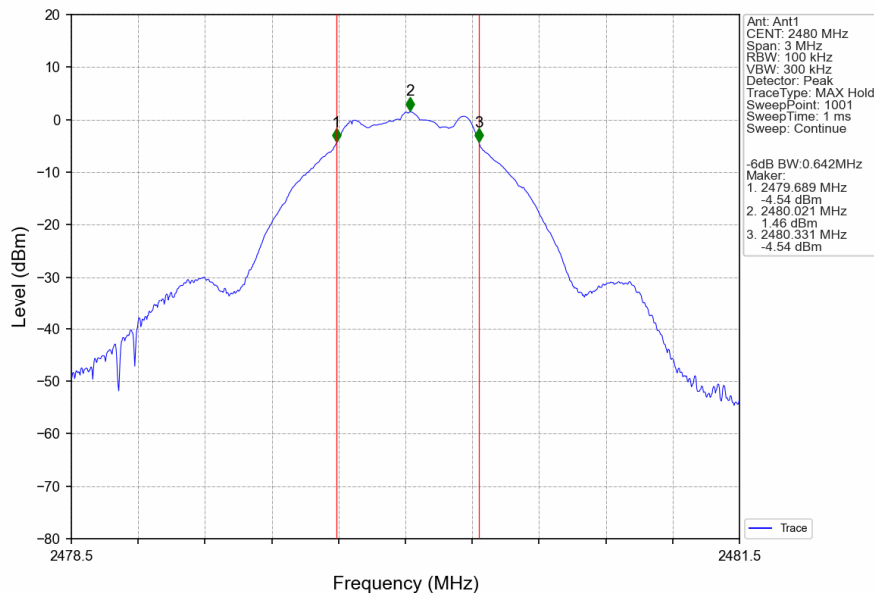
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2.2 Test Graph

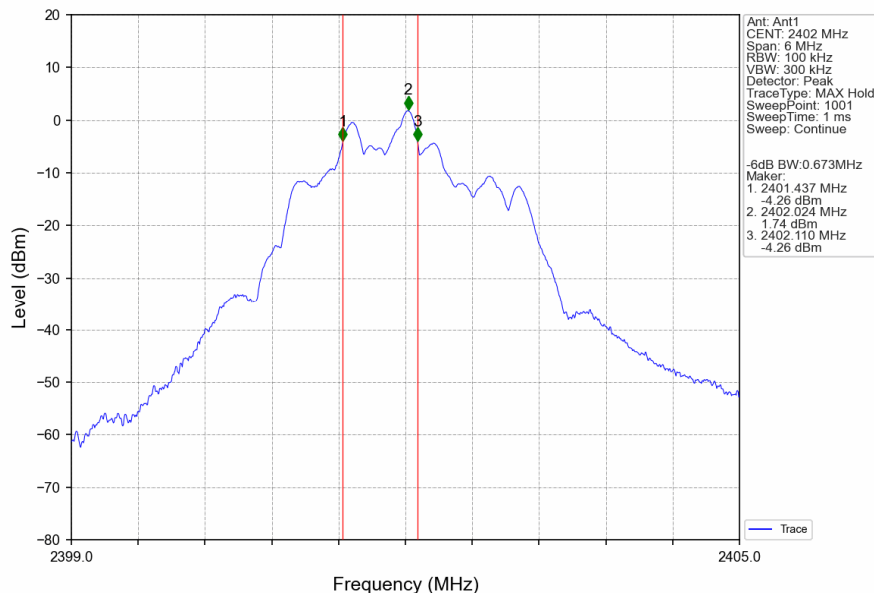
2.2.2 6dB BW



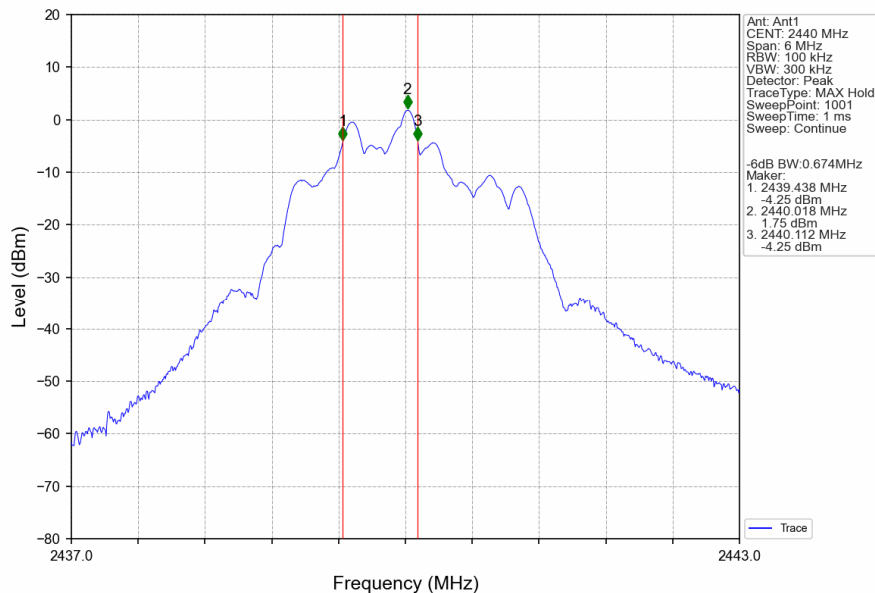
1M_HCH_2480MHz_Ant1_NTNV



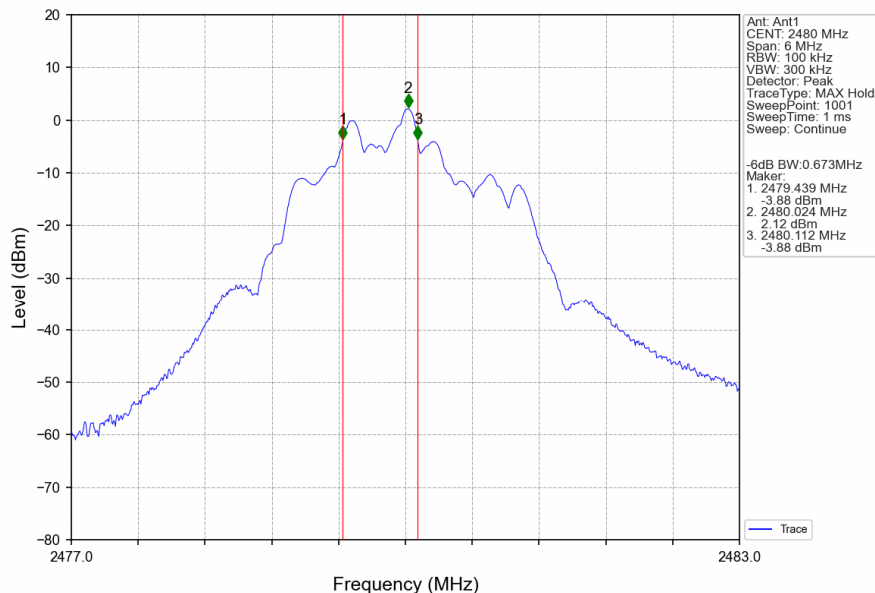
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_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	
1M	SISO	2402	1.01	<=30	Pass
		2440	1.32	<=30	Pass
		2480	1.67	<=30	Pass
2M	SISO	2402	1.63	<=30	Pass
		2440	1.84	<=30	Pass
		2480	2.20	<=30	Pass

Note1: Antenna Gain: Ant1: 4.40dBi;



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4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
1M	SISO	2402	-15.04	<=8	Pass
		2440	-14.72	<=8	Pass
		2480	-14.47	<=8	Pass
2M	SISO	2402	-16.76	<=8	Pass
		2440	-16.70	<=8	Pass
		2480	-16.24	<=8	Pass

Note1: Antenna Gain: Ant1: 4.40dBi;



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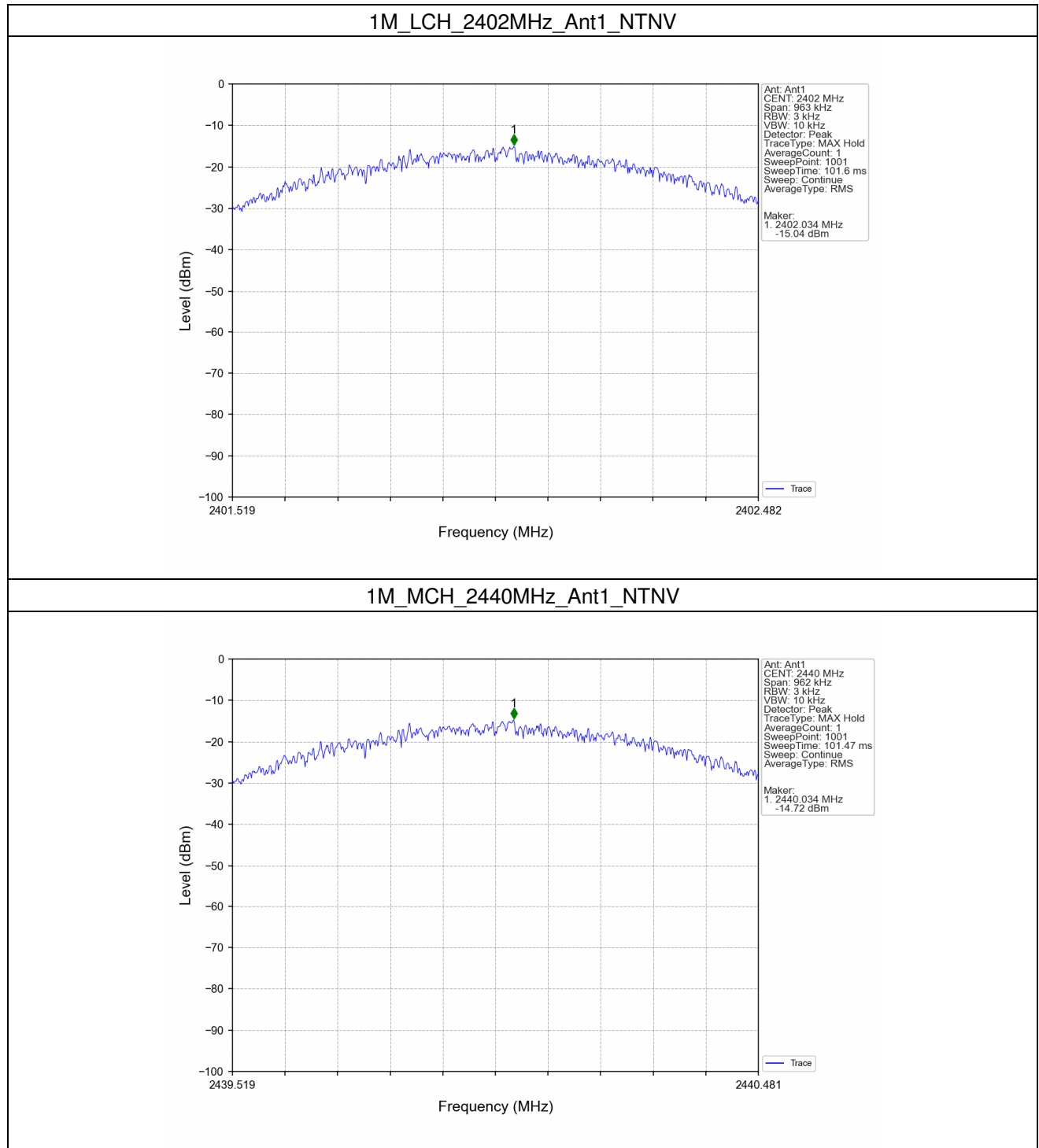
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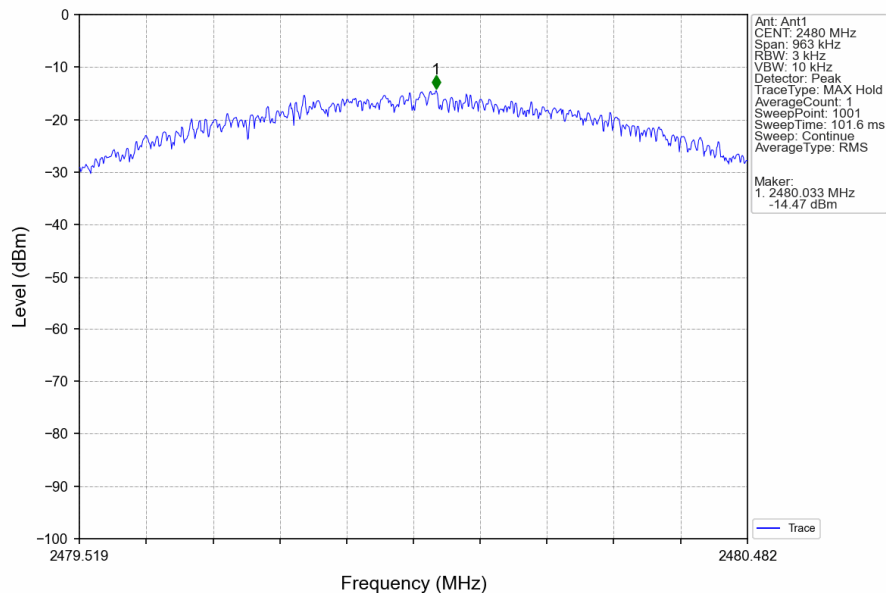
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t (86-20) 82155555 sgs.china@sgs.com

4.2 Test Graph

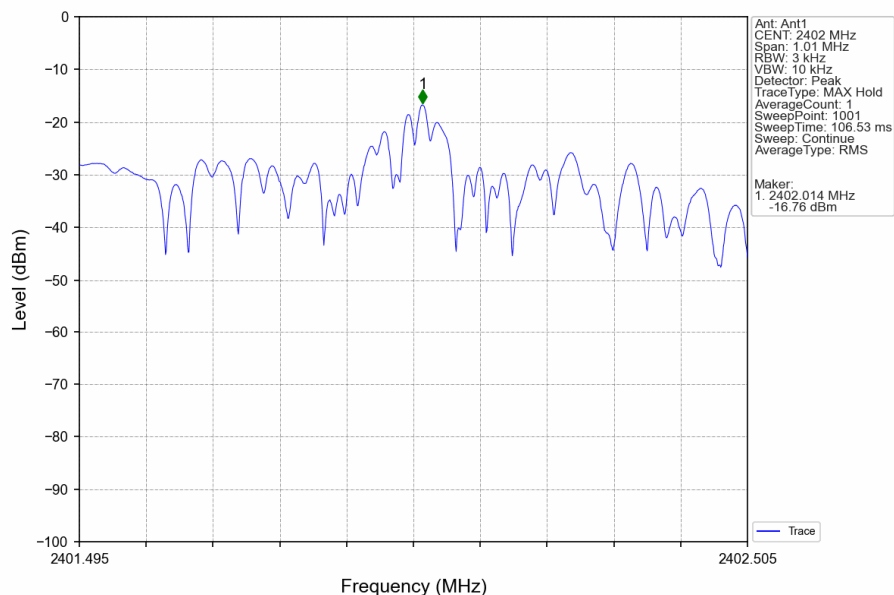
4.2.1 PSD



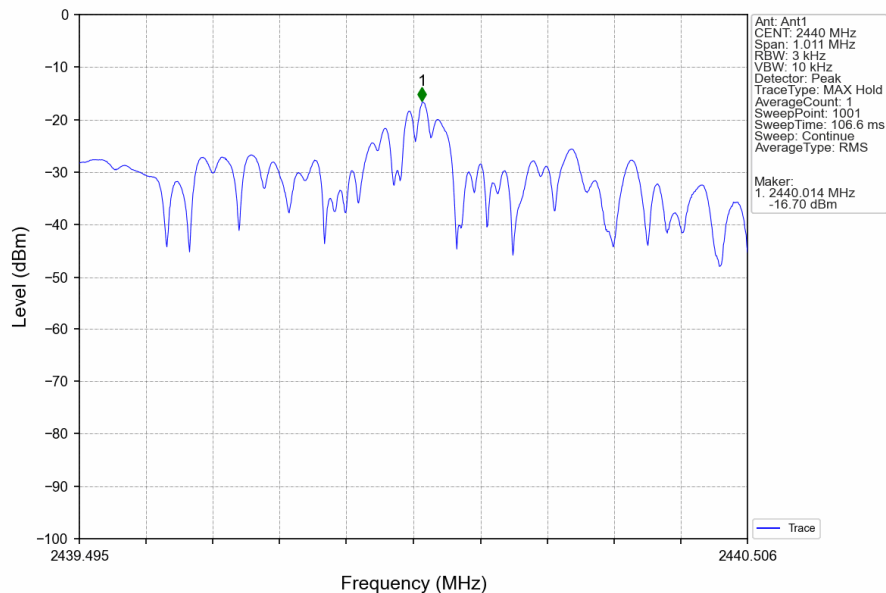
1M_HCH_2480MHz_Ant1_NTNV



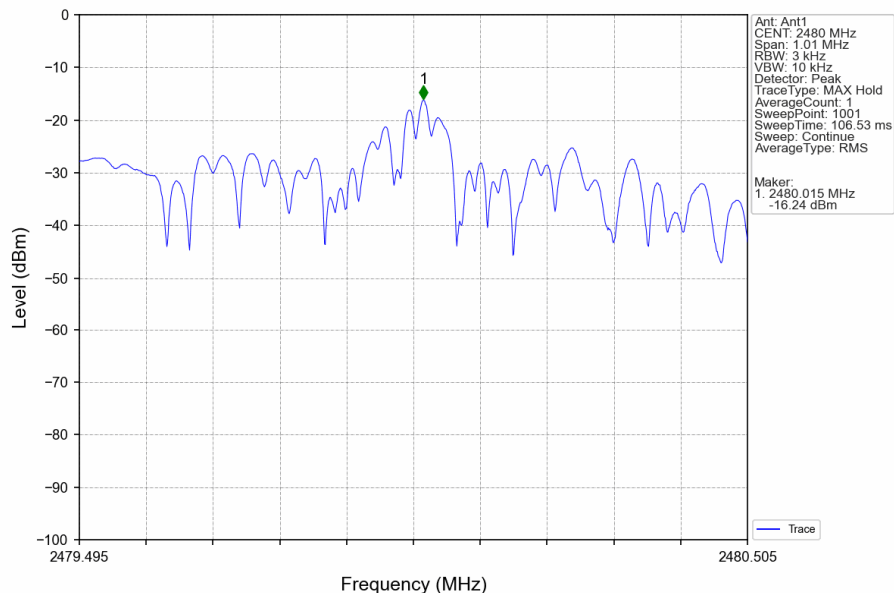
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_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)
1M	SISO	2402	1	0.92
		2440	1	1.19
		2480	1	1.52
2M	SISO	2402	1	1.54
		2440	1	1.65
		2480	1	2.07

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

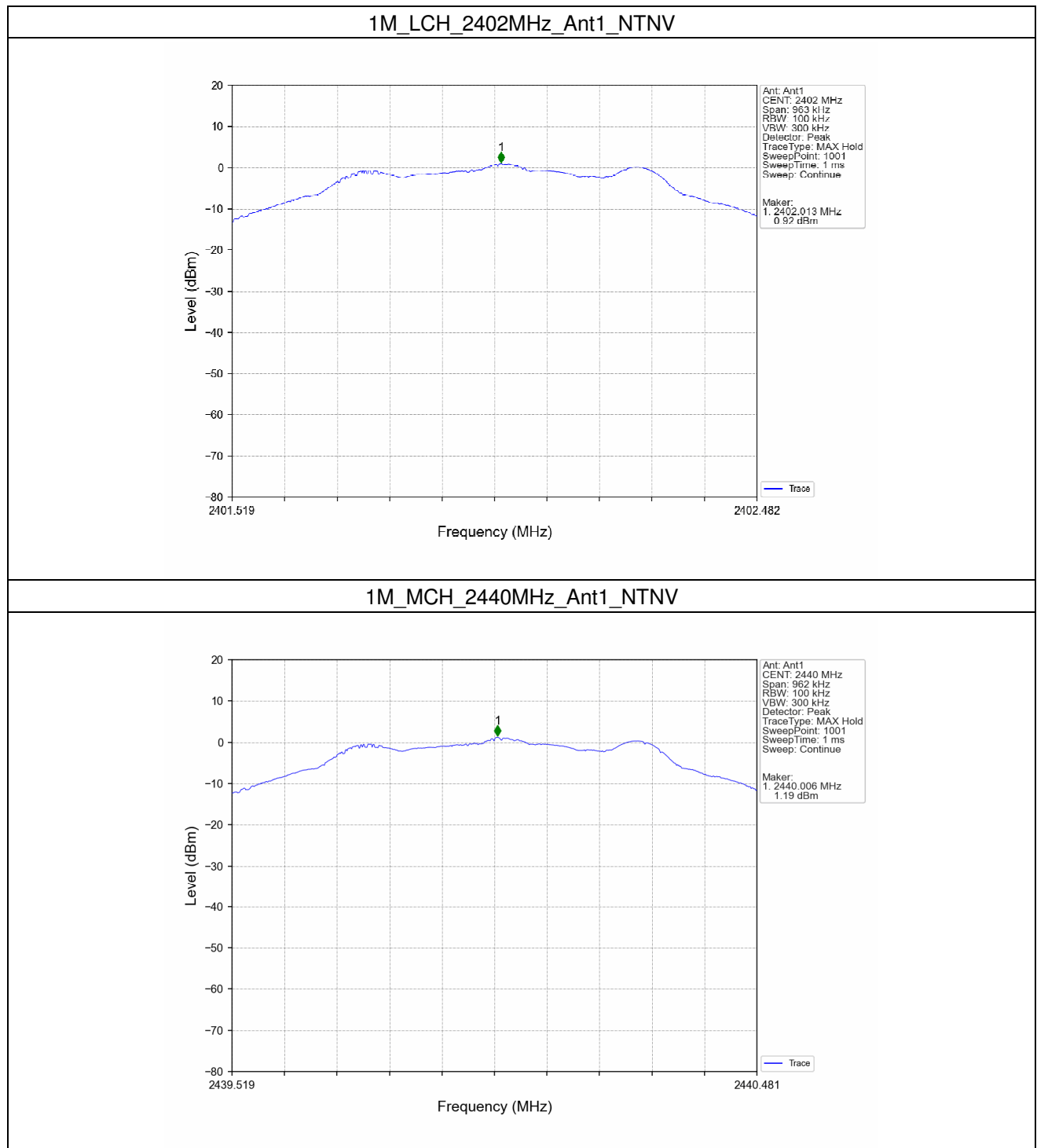
5.1.2 CSE and Band Edges

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	1.52	-18.48	Pass
		2440	1	1.52	-18.48	Pass
		2480	1	1.52	-18.48	Pass
2M	SISO	2402	1	2.07	-17.93	Pass
		2440	1	2.07	-17.93	Pass
		2480	1	2.07	-17.93	Pass

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

5.2 Test Graph

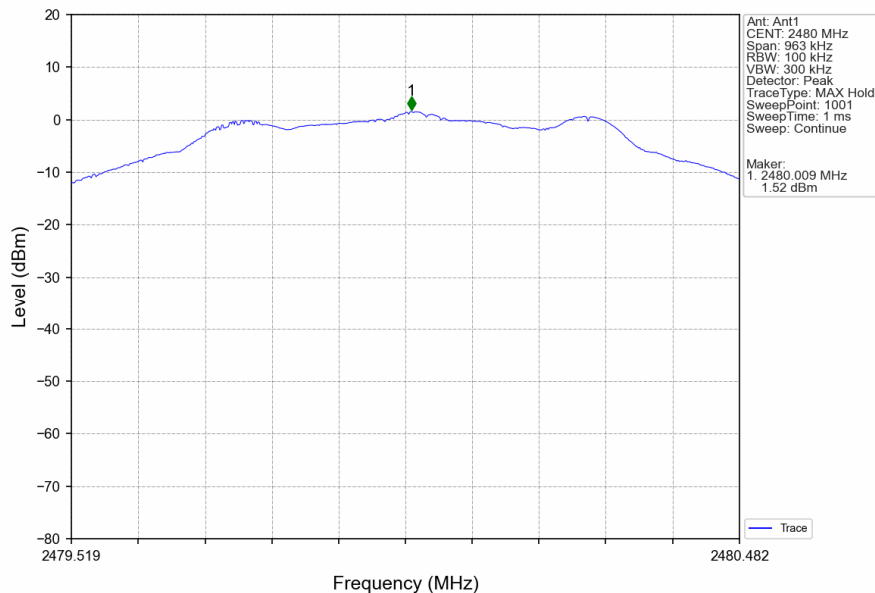
5.2.1 Ref



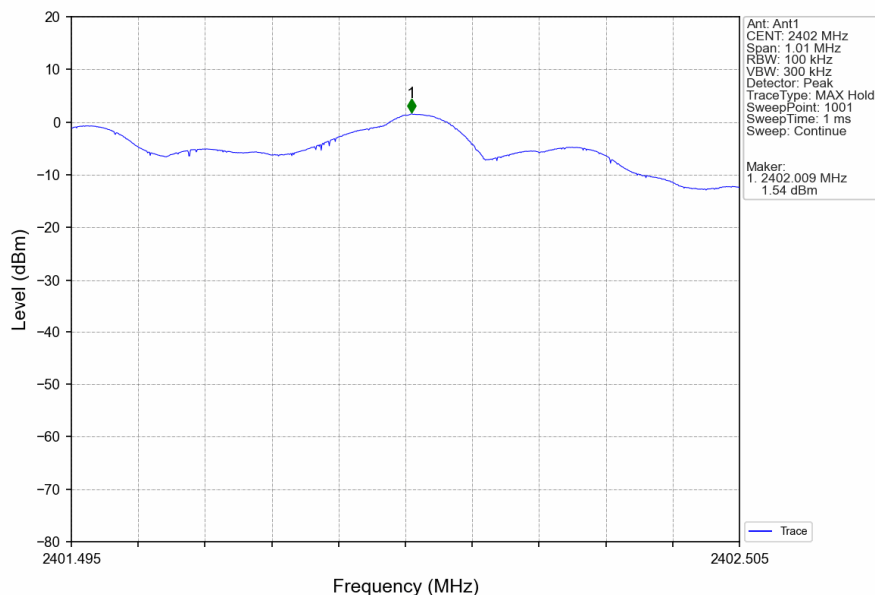
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1M_HCH_2480MHz_Ant1_NTNV



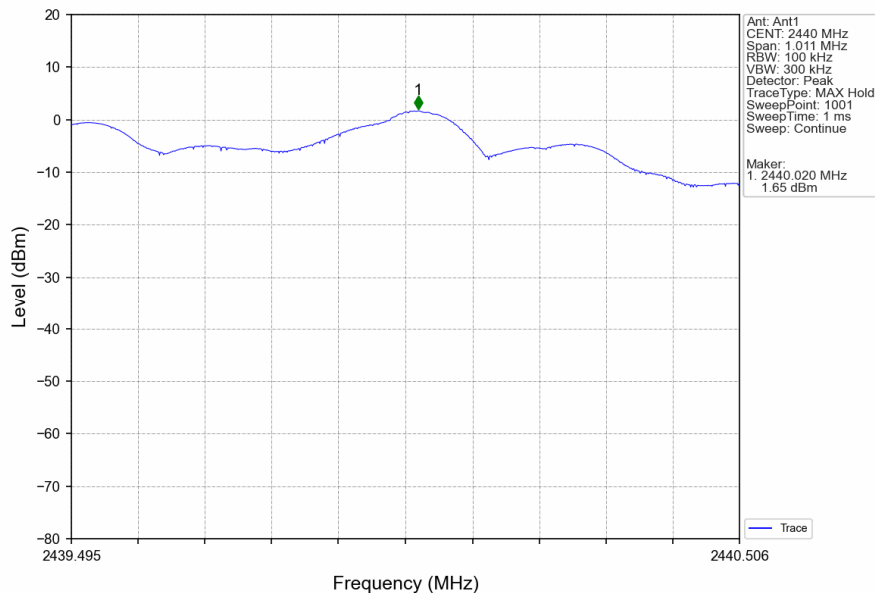
2M_LCH_2402MHz_Ant1_NTNV



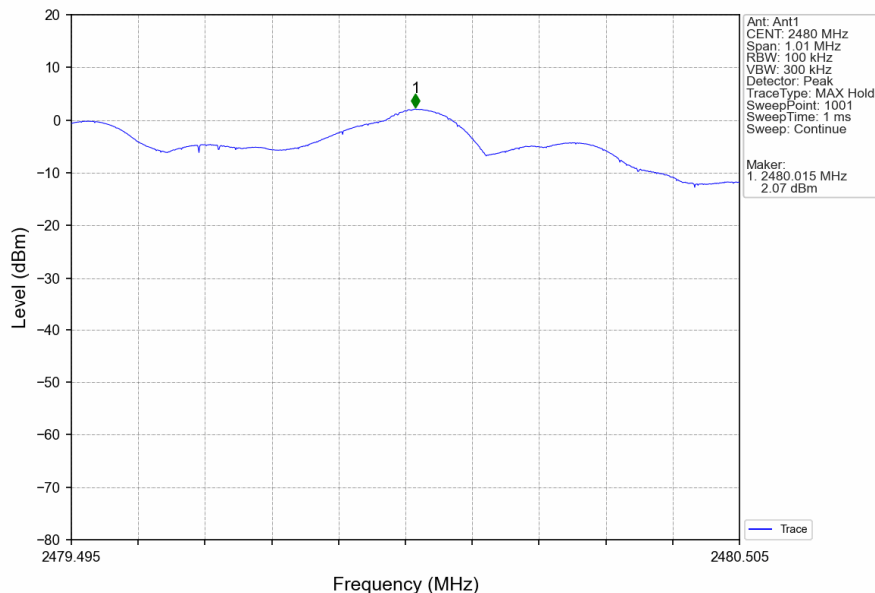
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2M_MCH_2440MHz_Ant1_NTNV



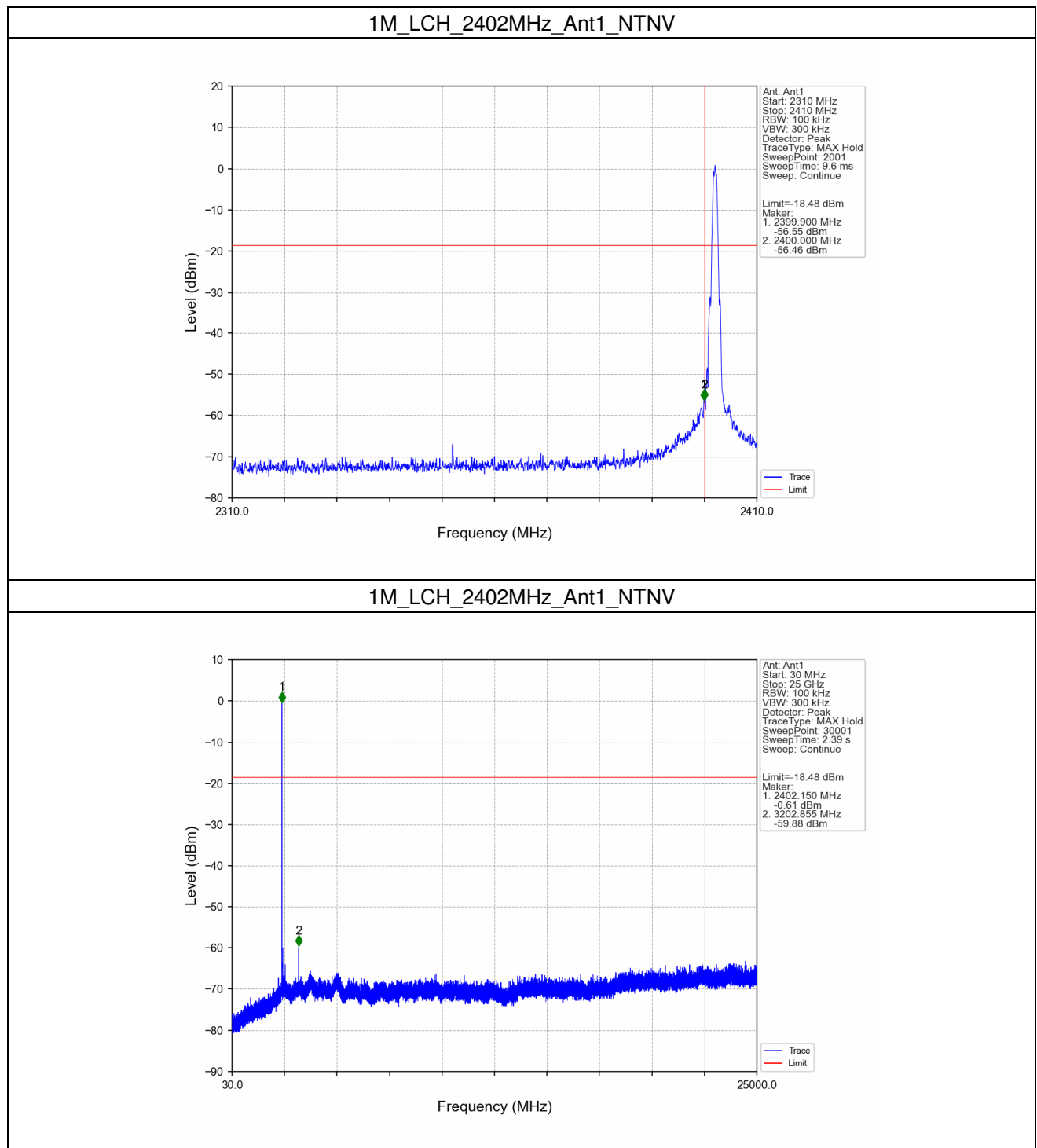
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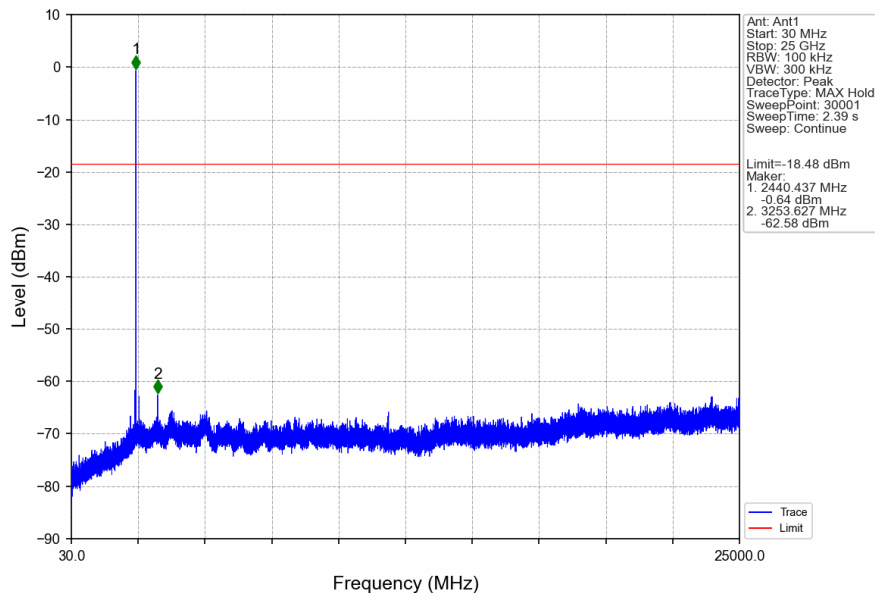
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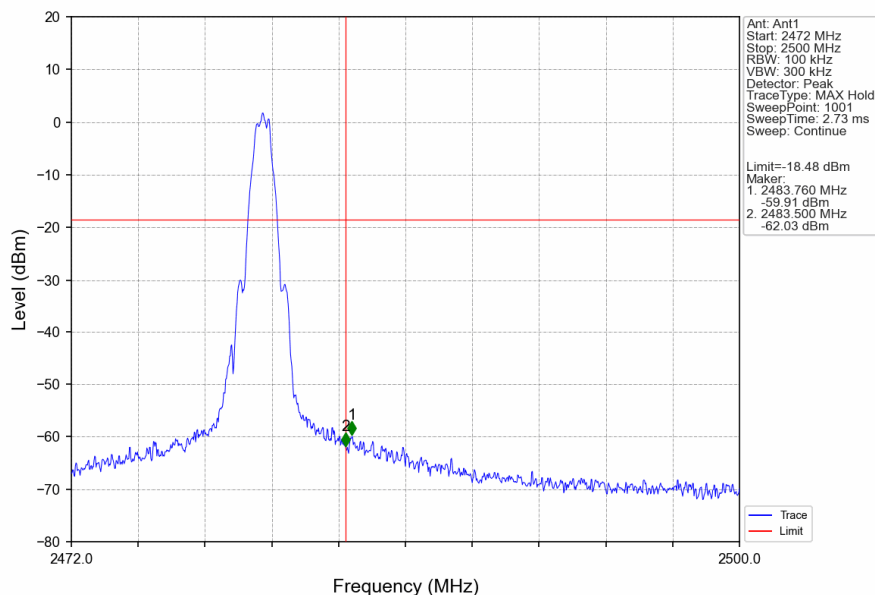
5.2.2 CSE and Band Edges



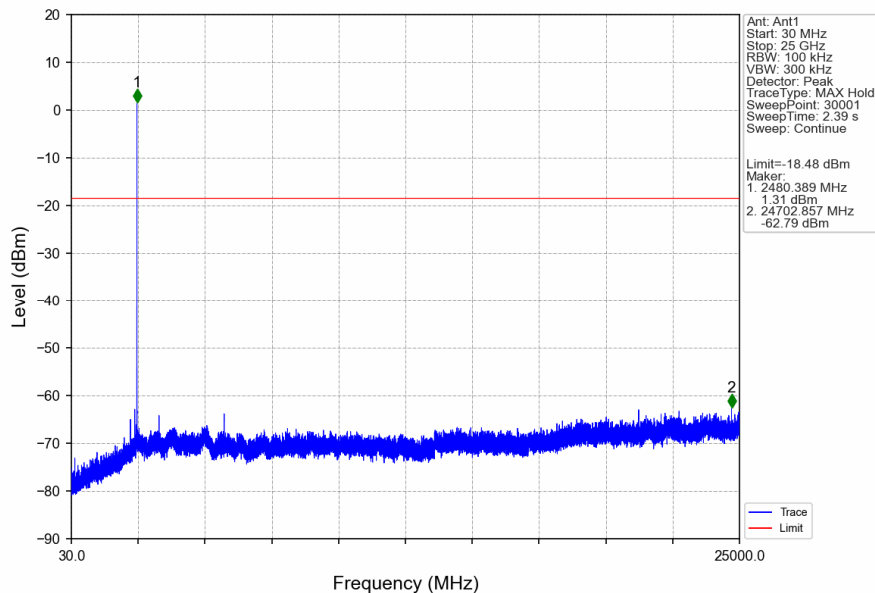
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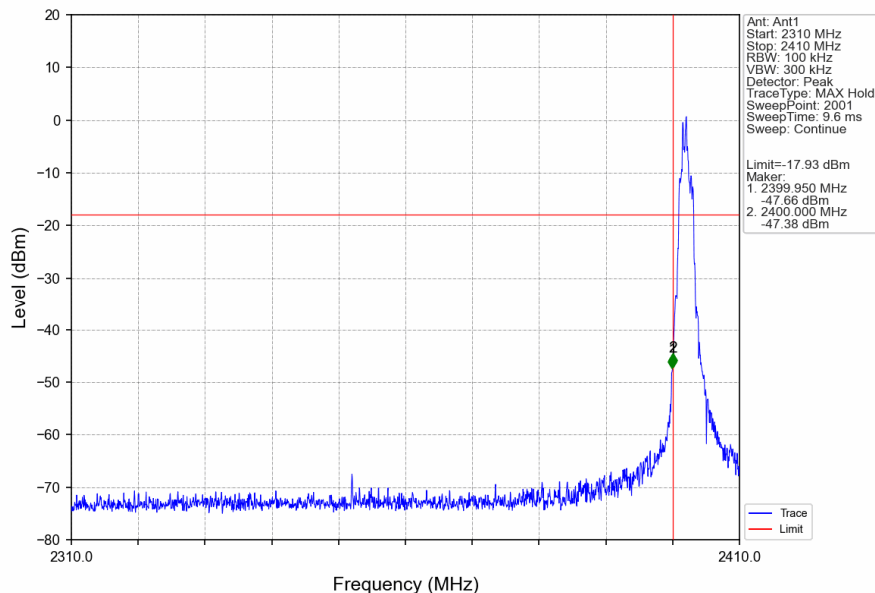
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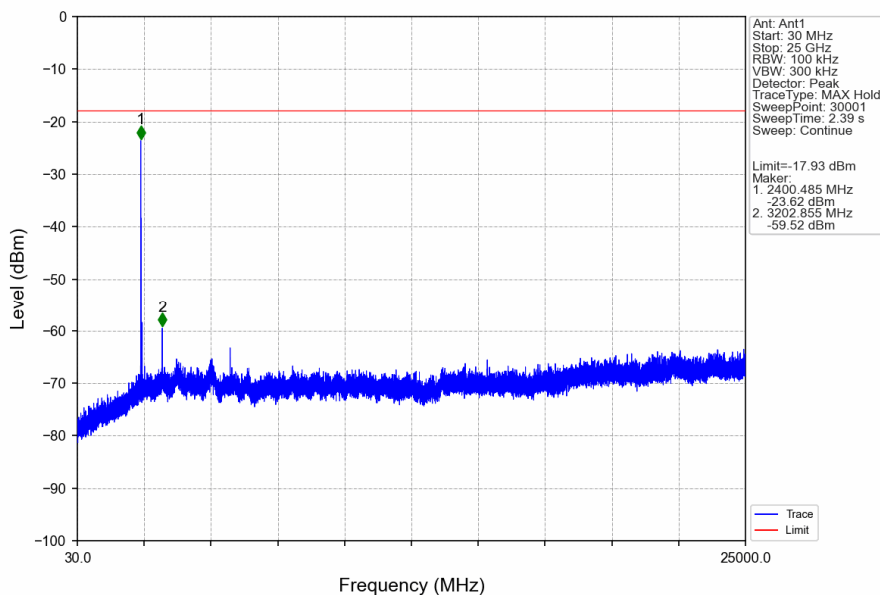
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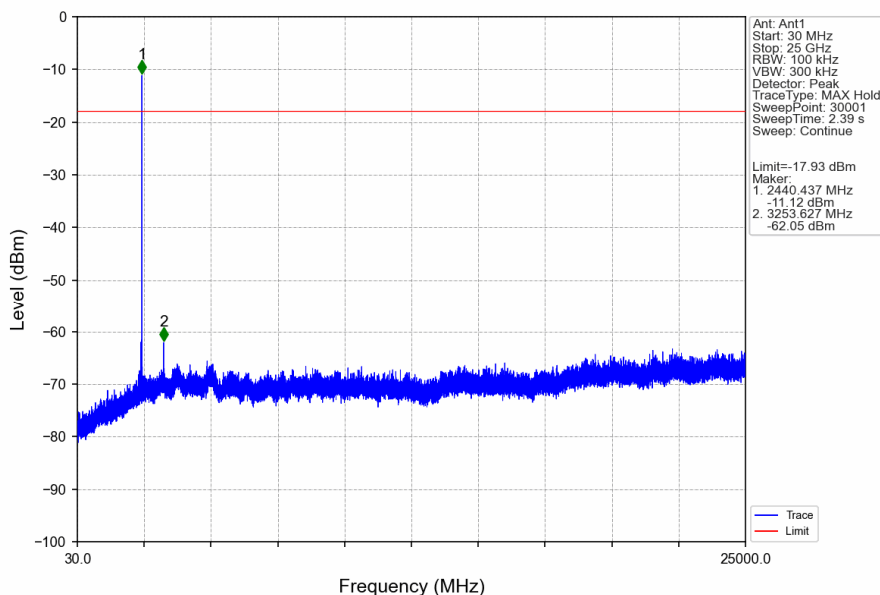
2M_LCH_2402MHz_Ant1_NTNV



2M_LCH_2402MHz_Ant1_NTNV



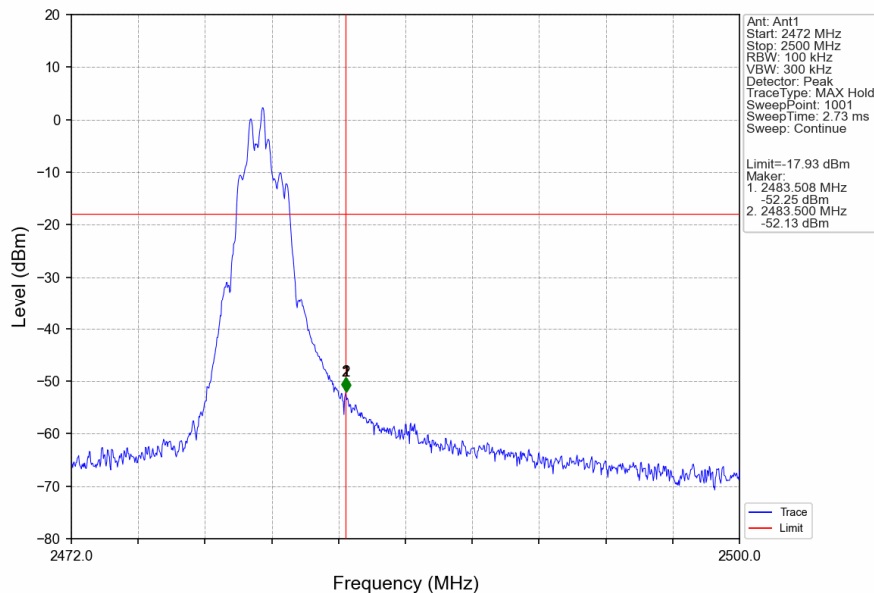
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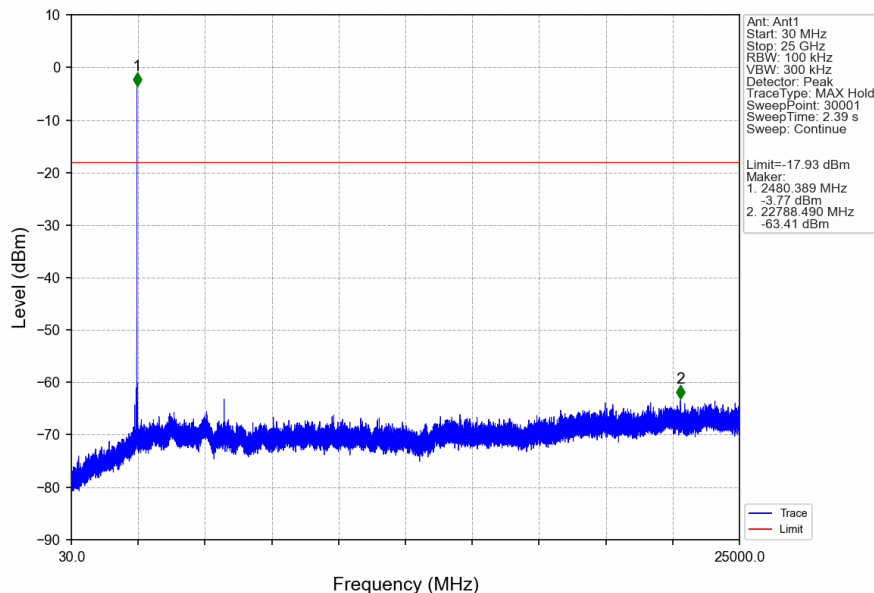
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2M_HCH_2480MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



For 2.4GHz Wi-Fi

1. Duty Cycle

1.1 Test Result

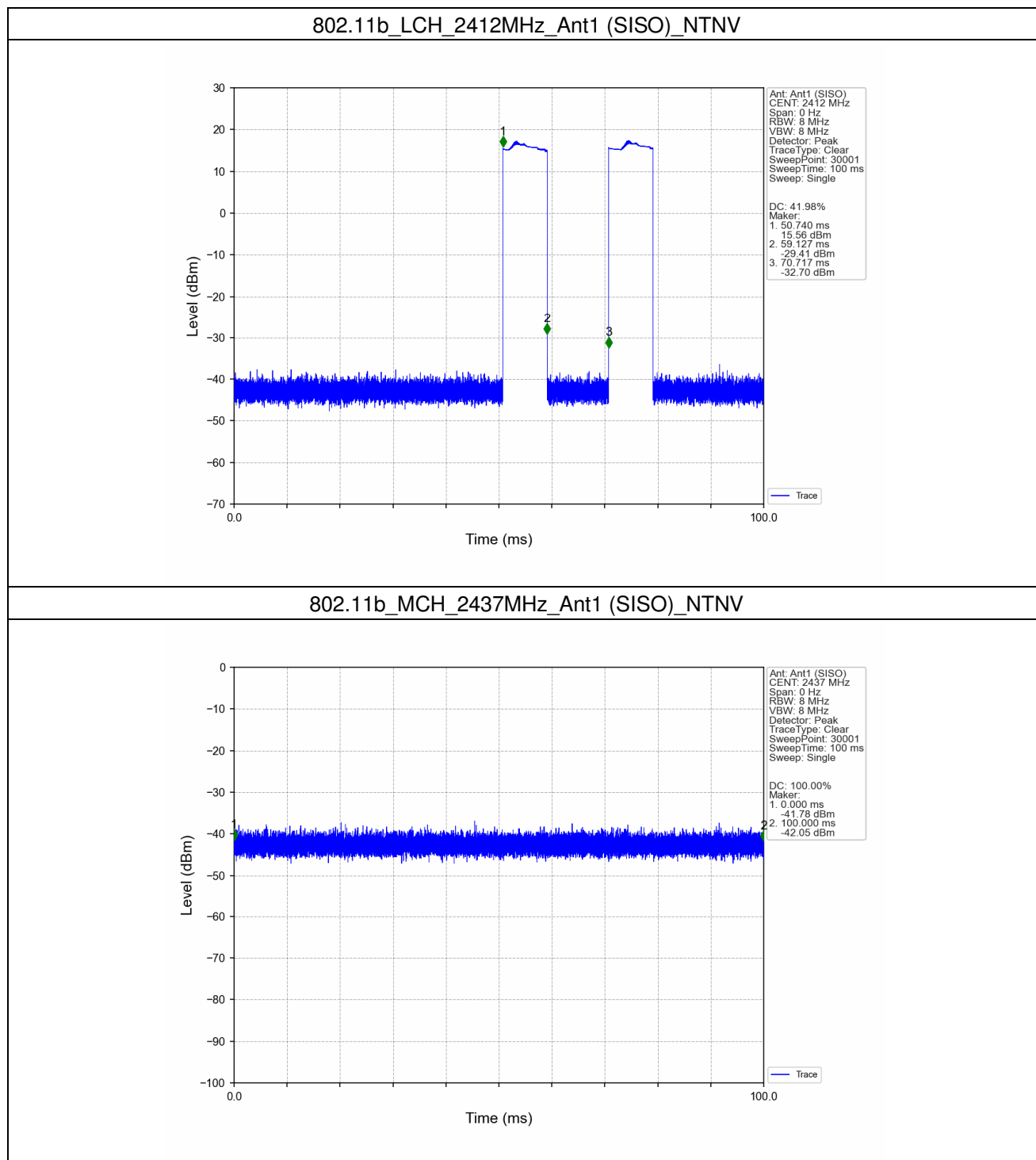
1.1.1 Ant1

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	8.387	19.977	41.98	3.77	0.00
		2437	100.000	100.000	100.00	0.00	0.00
		2462	100.000	100.000	100.00	0.00	0.00
802.11g	SISO	2412	1.393	9.920	14.04	8.53	0.00
		2437	1.393	23.743	5.87	12.32	84.03
		2462	1.390	20.367	6.82	11.66	7.64
802.11n (HT40)	SISO	2422	0.650	50.130	1.30	18.87	0.00
		2437	0.647	40.024	1.62	17.91	4.89
		2452	0.650	20.006	3.25	14.88	3.27

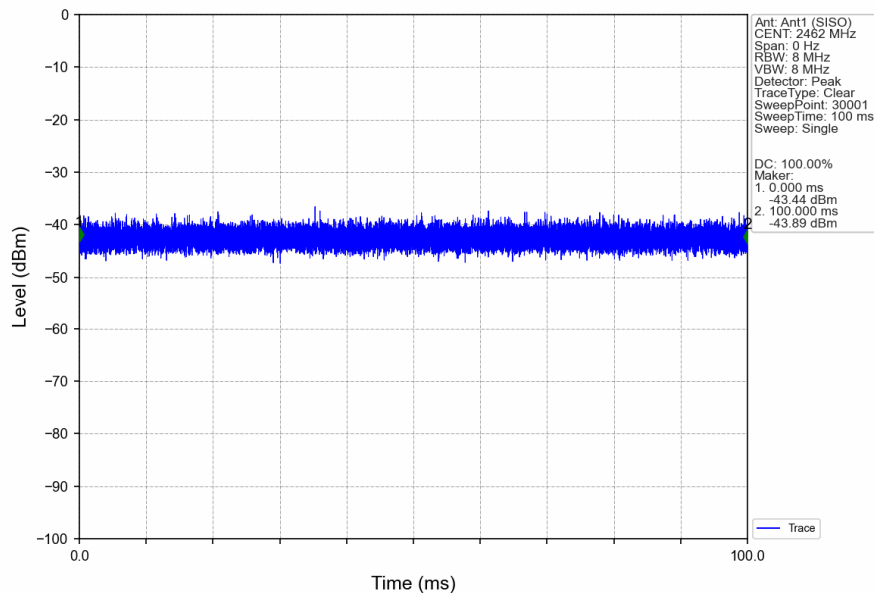


1.2 Test Graph

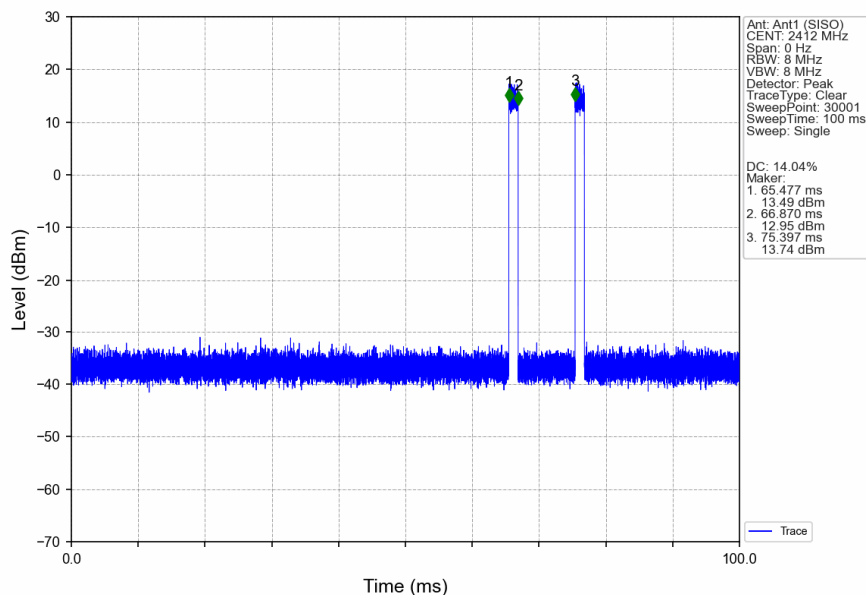
1.2.1 Ant1



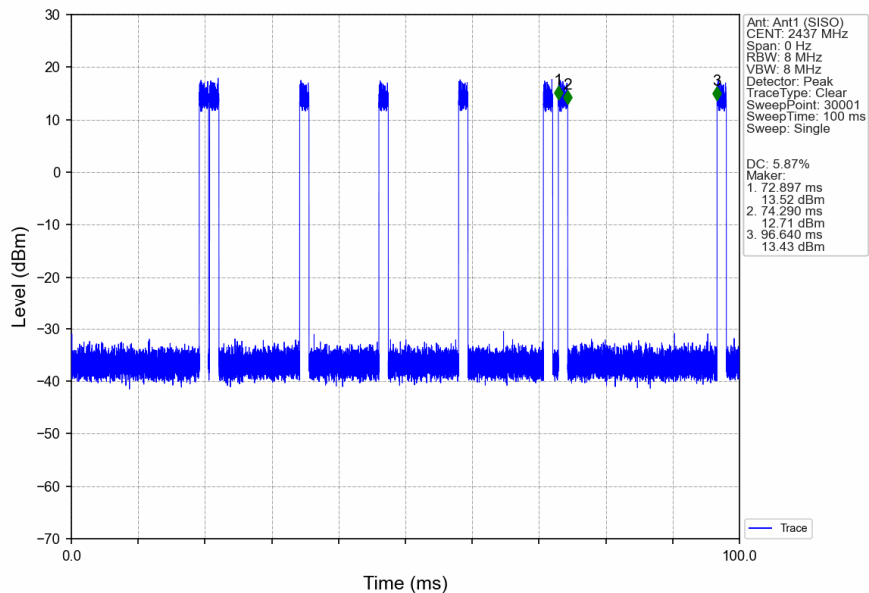
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



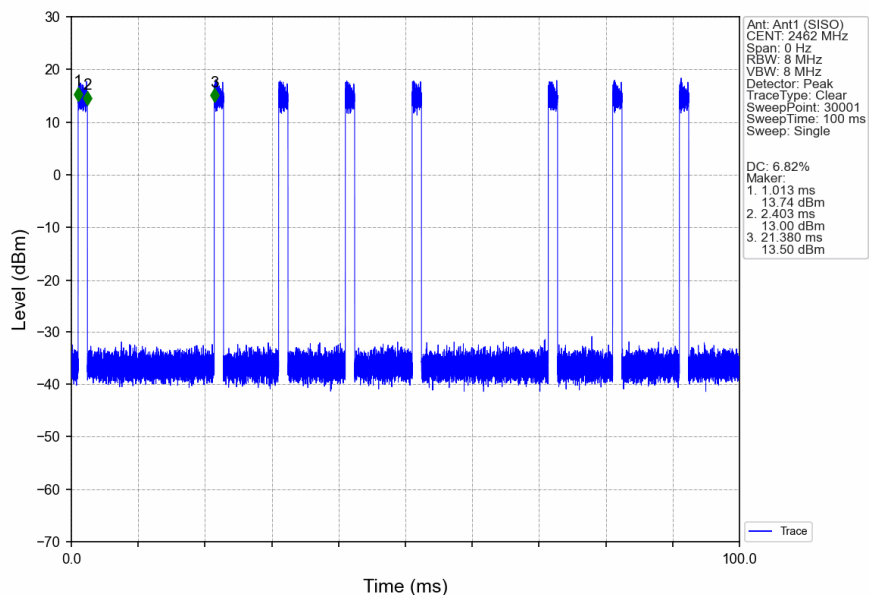
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



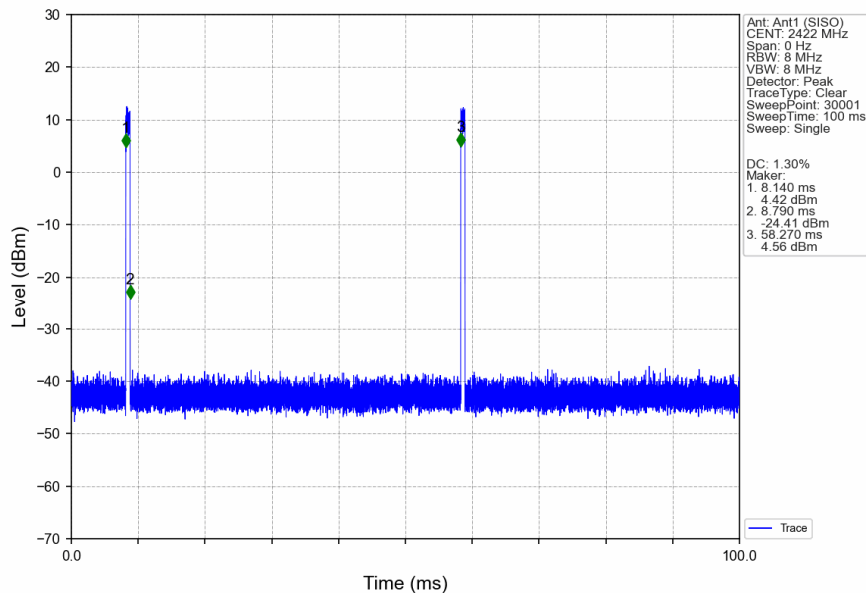
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



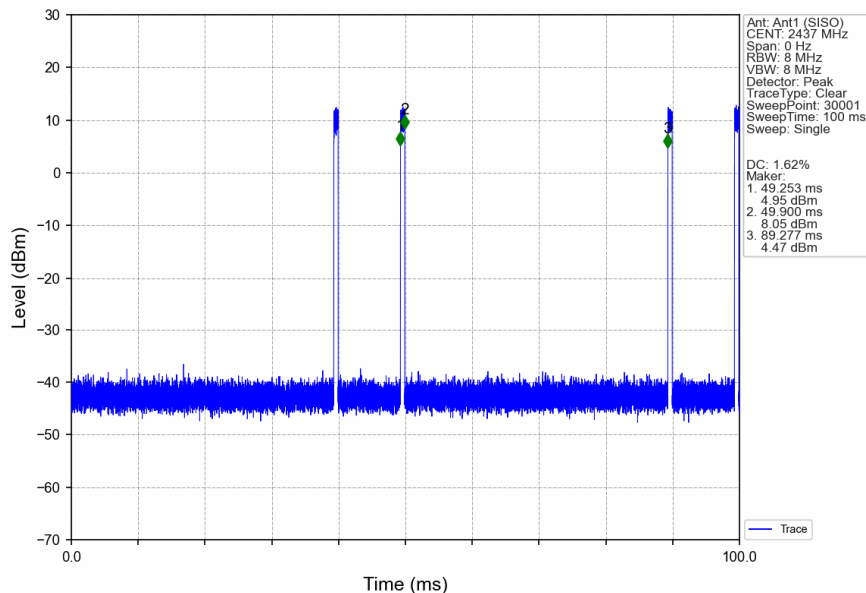
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



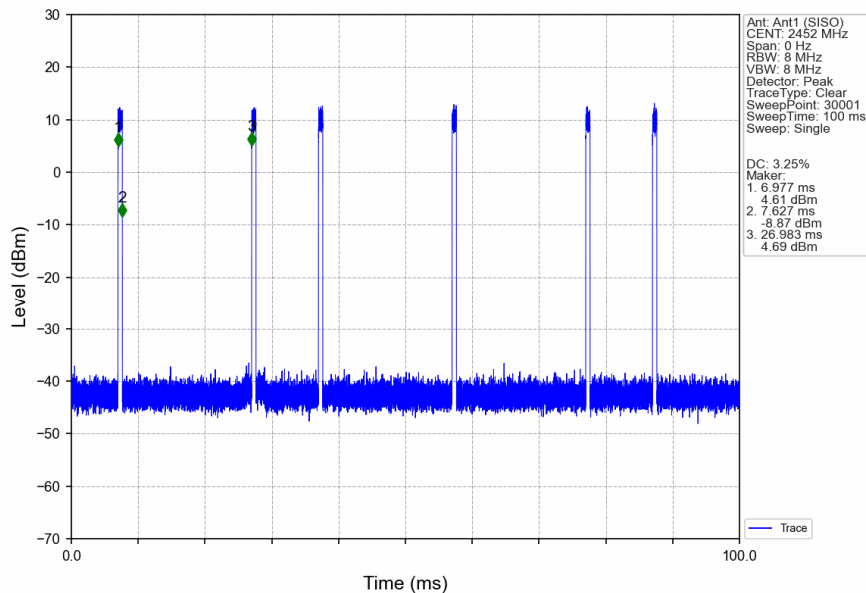
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



2. Bandwidth

2.1 Test Result

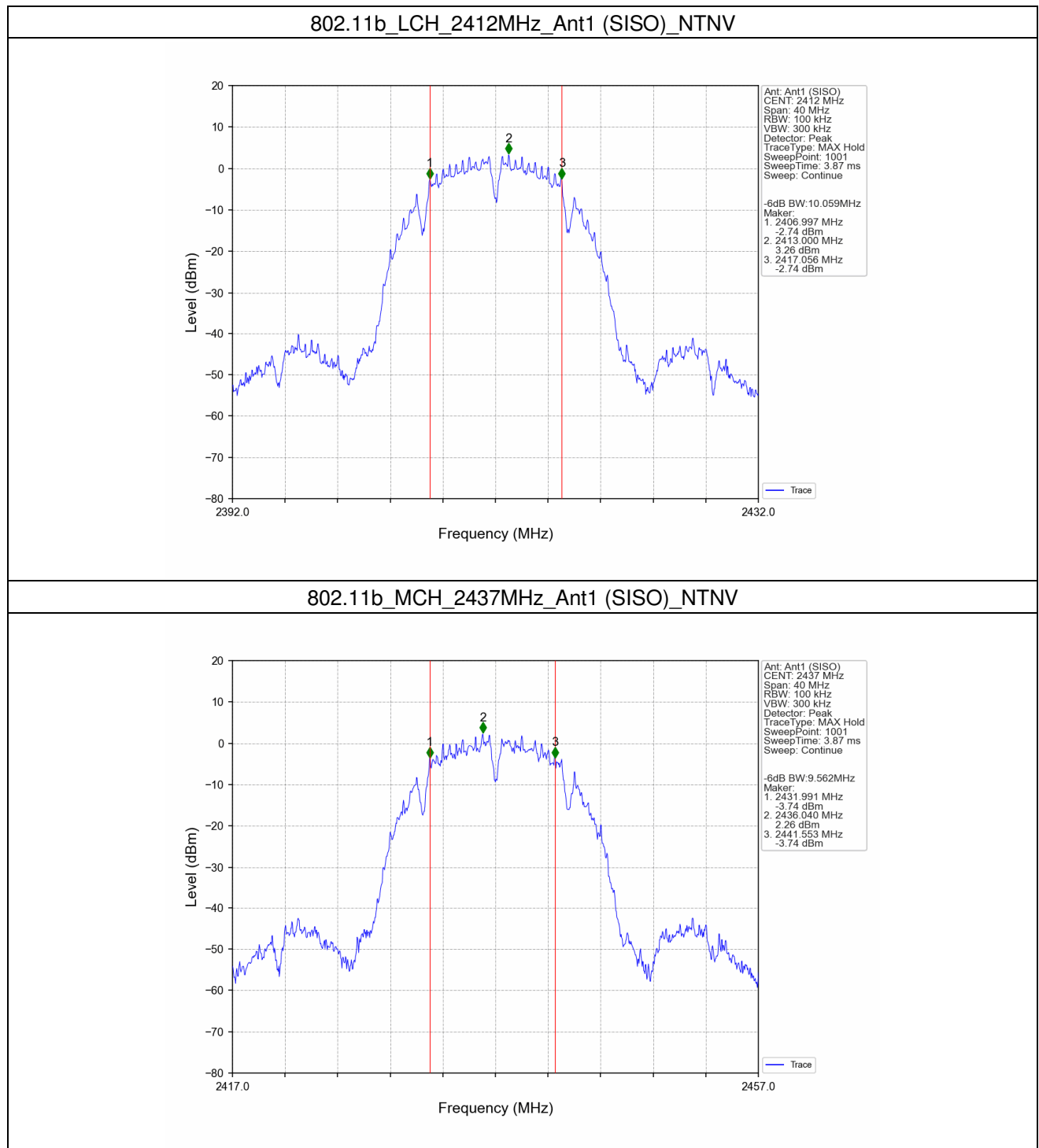
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	10.059	≥ 0.5	Pass
		2437	1	9.562	≥ 0.5	Pass
		2462	1	8.131	≥ 0.5	Pass
802.11g	SISO	2412	1	16.033	≥ 0.5	Pass
		2437	1	16.333	≥ 0.5	Pass
		2462	1	16.291	≥ 0.5	Pass
802.11n (HT40)	SISO	2422	1	35.112	≥ 0.5	Pass
		2437	1	35.045	≥ 0.5	Pass
		2452	1	35.112	≥ 0.5	Pass

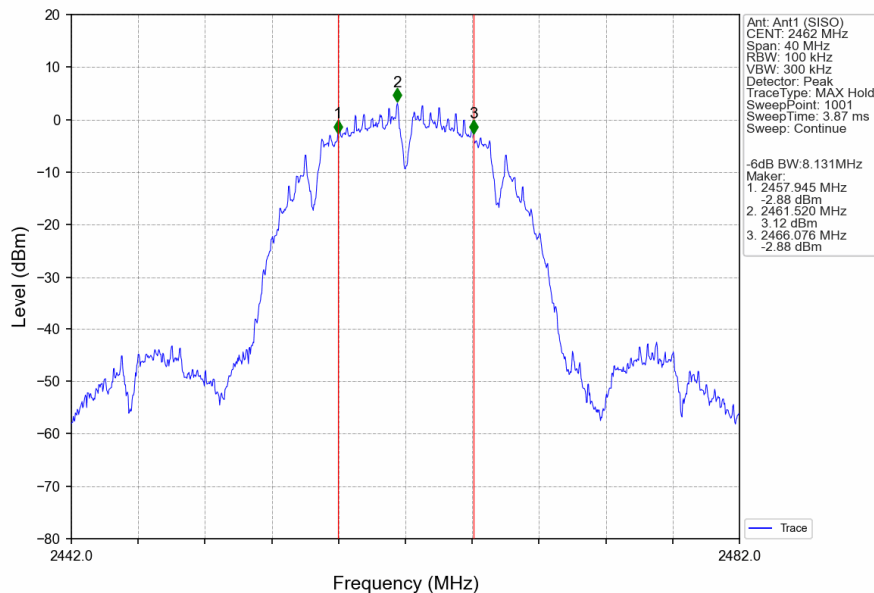


2.2 Test Graph

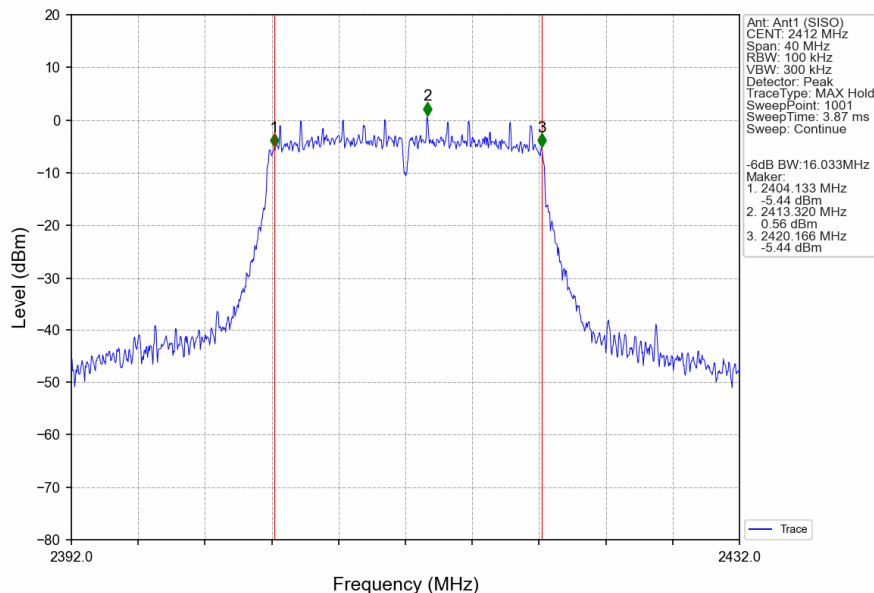
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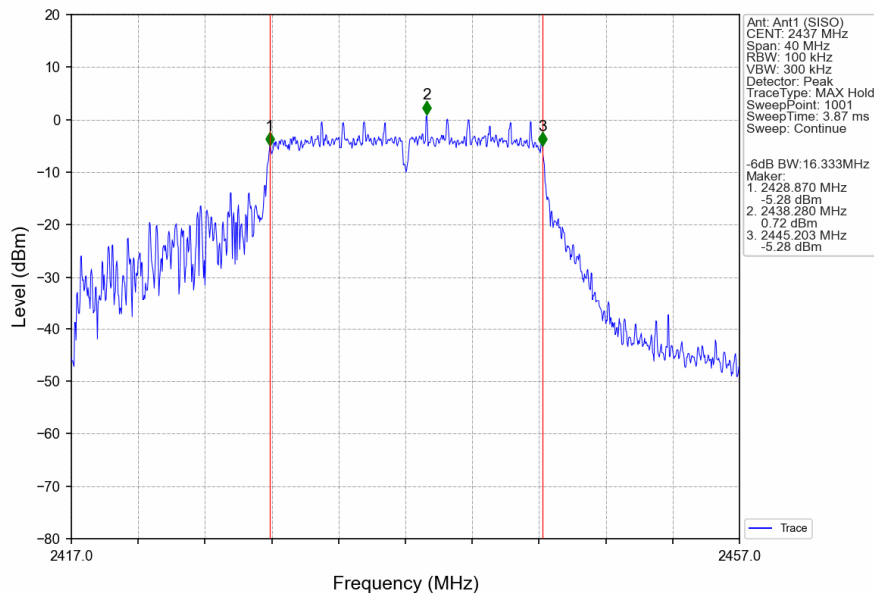
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



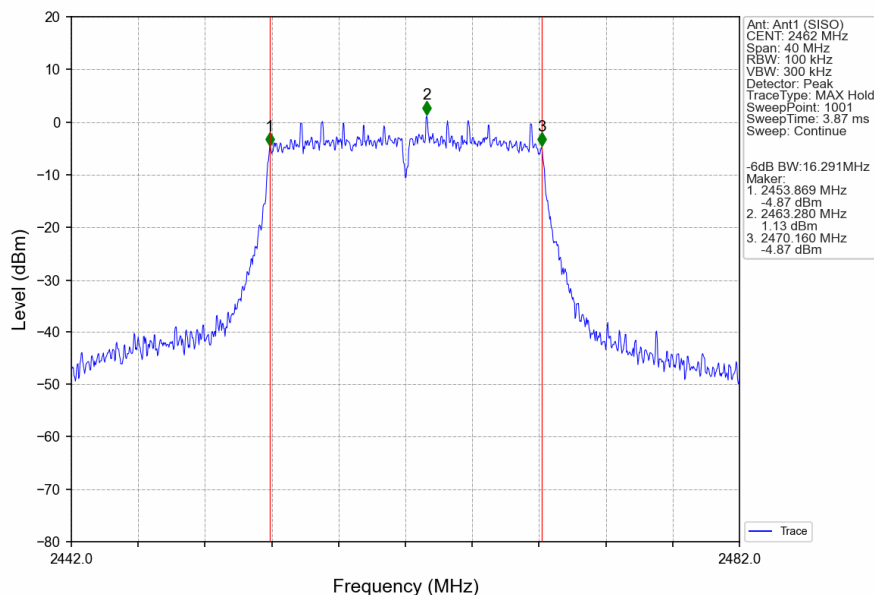
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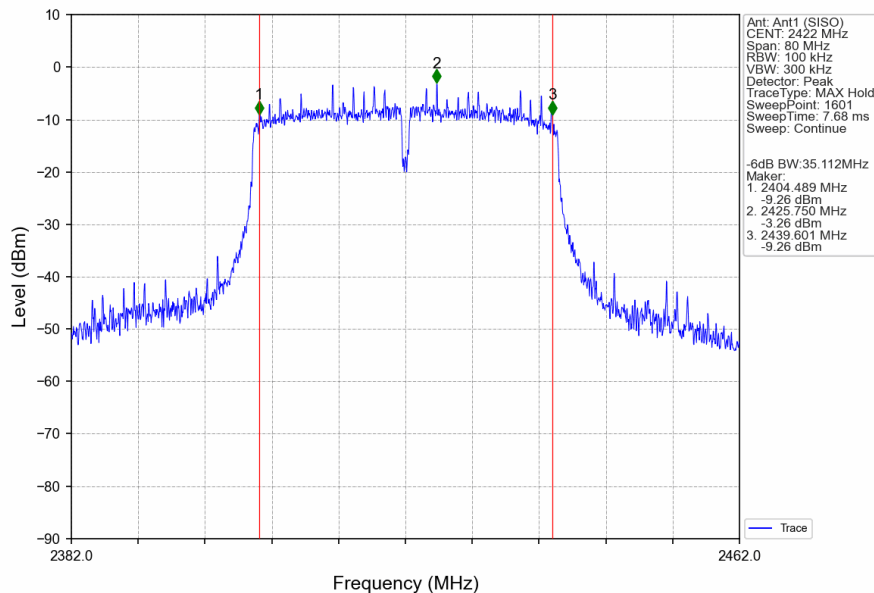
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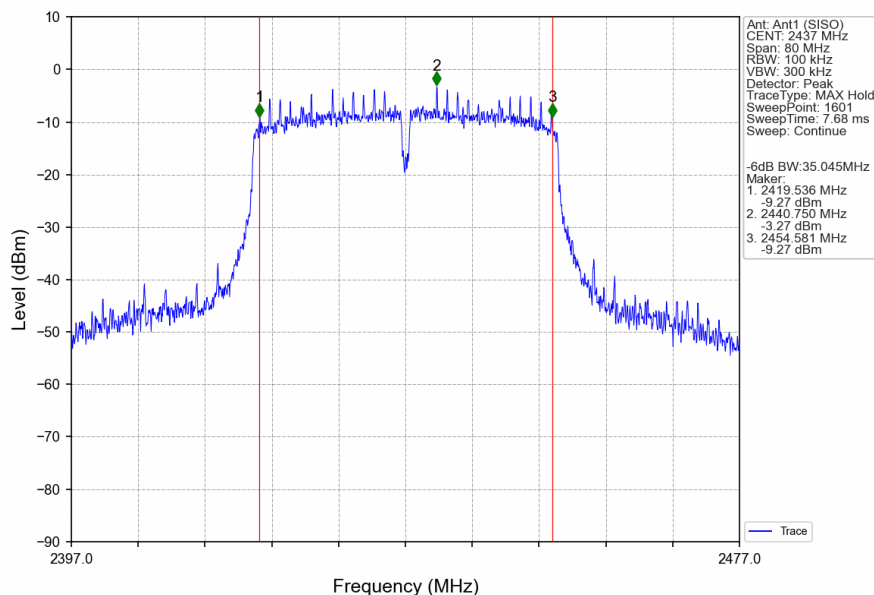
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



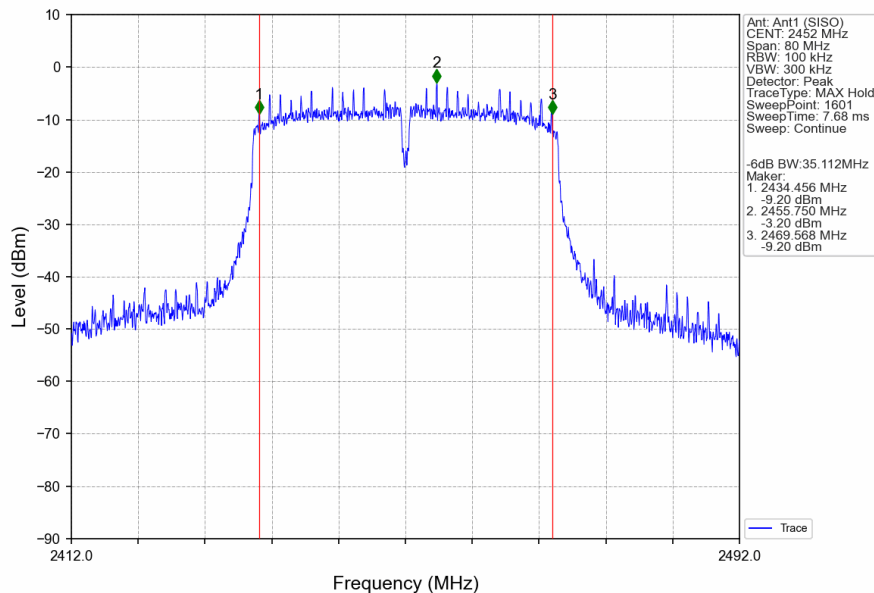
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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 Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	15.20	<=30	Pass
		2437	14.52	<=30	Pass
		2462	14.20	<=30	Pass
802.11g	SISO	2412	18.44	<=30	Pass
		2437	18.97	<=30	Pass
		2462	18.91	<=30	Pass
802.11n (HT40)	SISO	2422	16.82	<=30	Pass
		2437	16.84	<=30	Pass
		2452	17.07	<=30	Pass

Note1: Antenna Gain: Ant1: 4.40dBi;



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4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-10.11	<=8	Pass
		2437	-9.63	<=8	Pass
		2462	-11.58	<=8	Pass
802.11g	SISO	2412	-14.06	<=8	Pass
		2437	-14.16	<=8	Pass
		2462	-13.90	<=8	Pass
802.11n (HT40)	SISO	2422	-18.90	<=8	Pass
		2437	-18.47	<=8	Pass
		2452	-18.40	<=8	Pass

Note1: Antenna Gain: Ant1: 4.40dBi;



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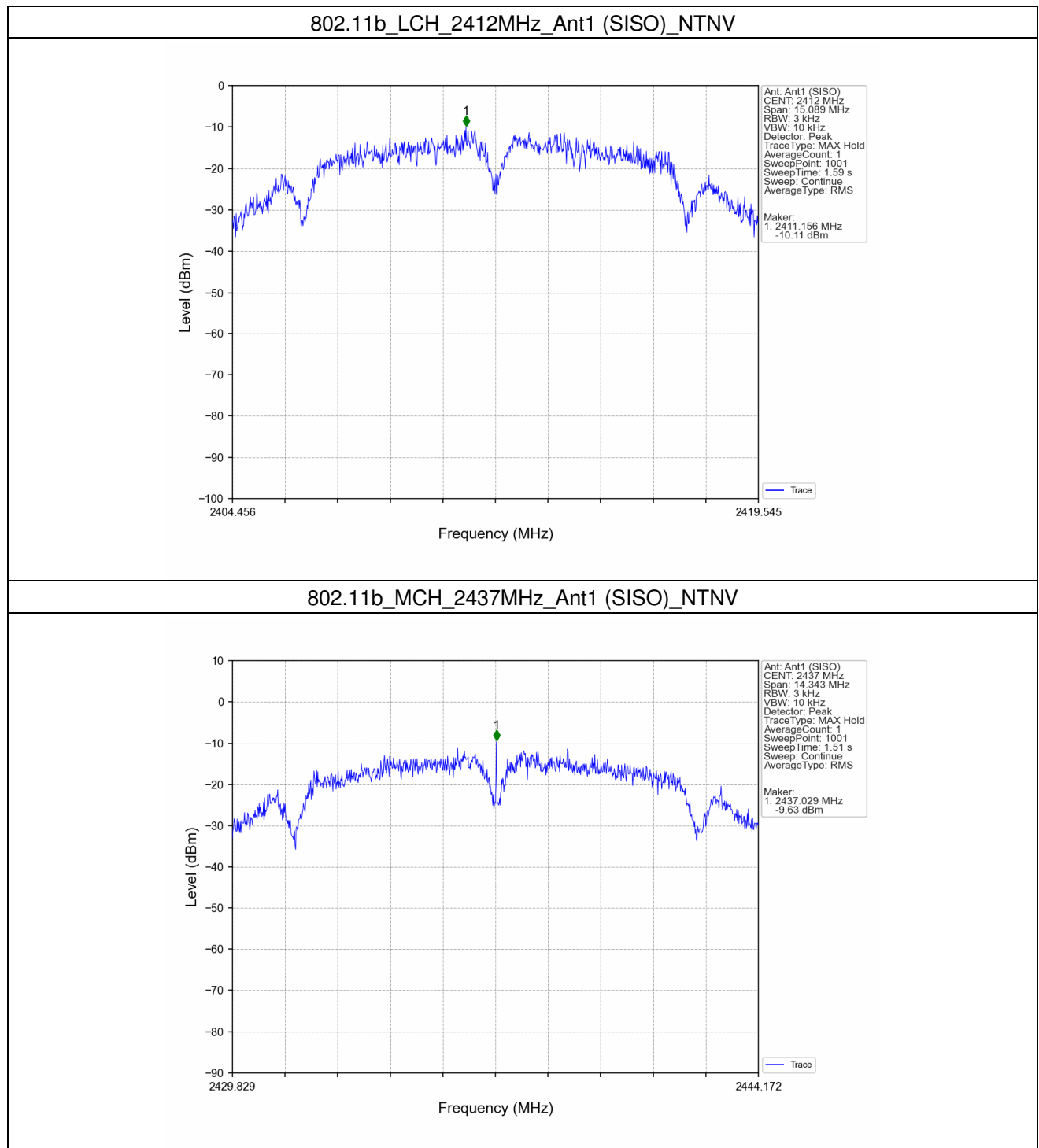
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4.2 Test Graph

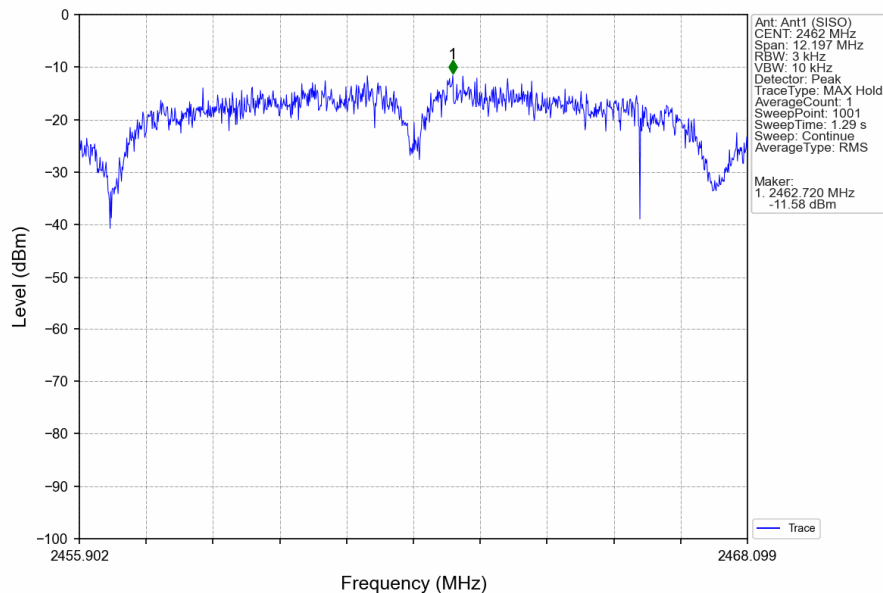
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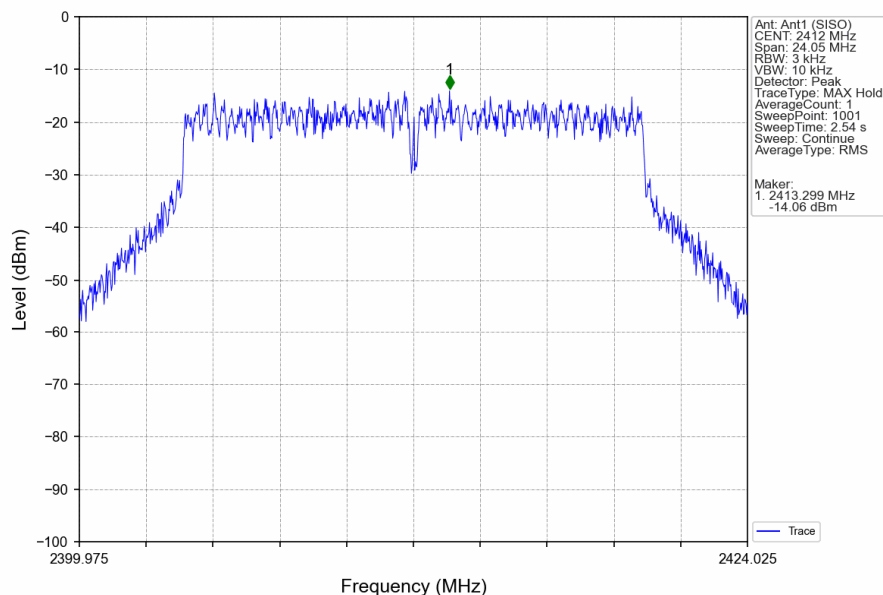
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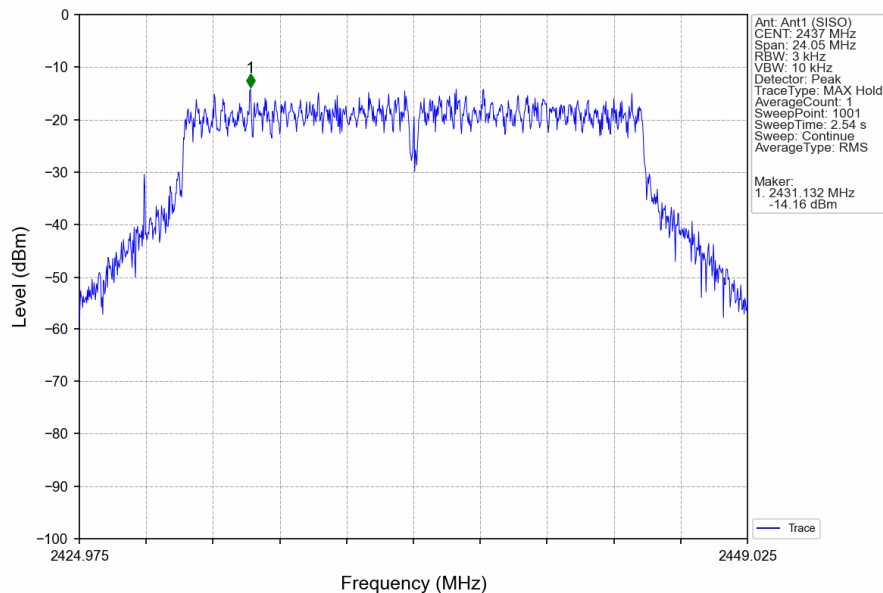
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



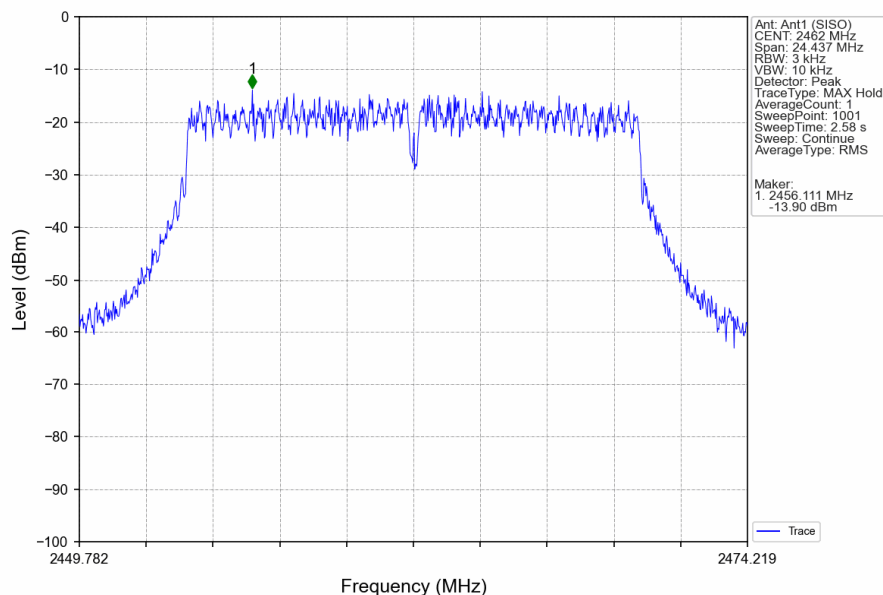
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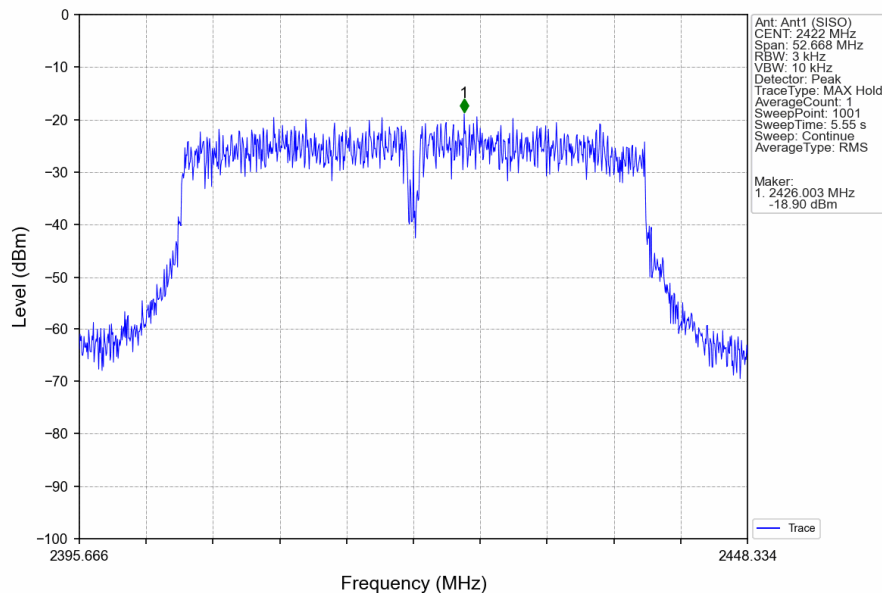
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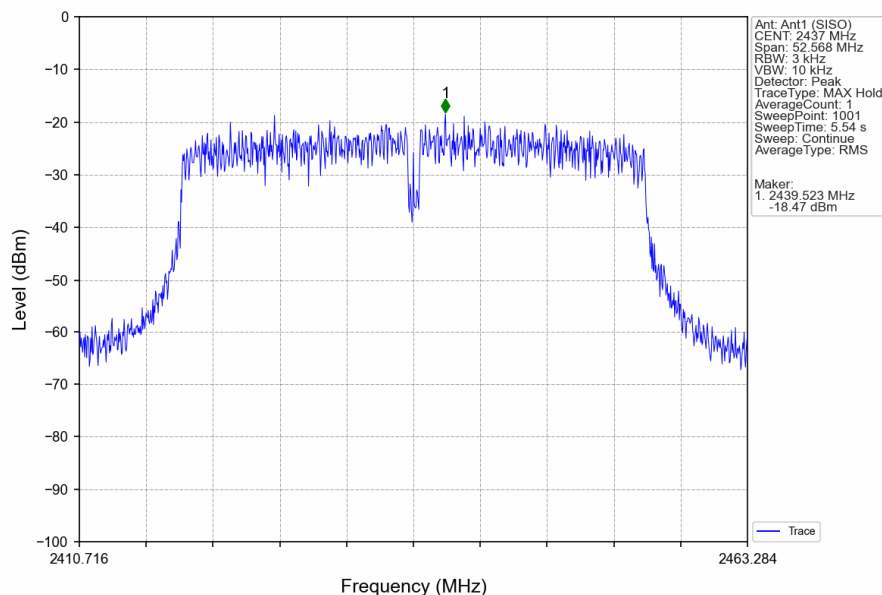
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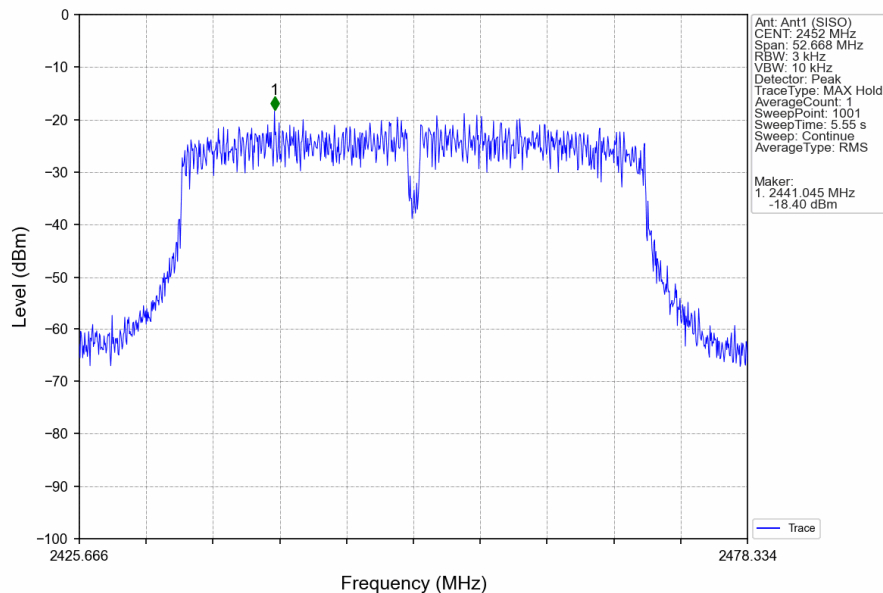
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_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	3.24
		2437	1	2.13
		2462	1	1.95
802.11g	SISO	2412	1	-0.30
		2437	1	0.00
		2462	1	0.51
802.11n (HT40)	SISO	2422	1	-6.34
		2437	1	-3.36
		2452	1	-4.06

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, 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	3.24	-16.76	Pass
		2437	1	3.24	-16.76	Pass
		2462	1	3.24	-16.76	Pass
802.11g	SISO	2412	1	0.51	-19.49	Pass
		2437	1	0.51	-19.49	Pass
		2462	1	0.51	-19.49	Pass
802.11n (HT40)	SISO	2422	1	-3.36	-23.36	Pass
		2437	1	-3.36	-23.36	Pass
		2452	1	-3.36	-23.36	Pass

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.



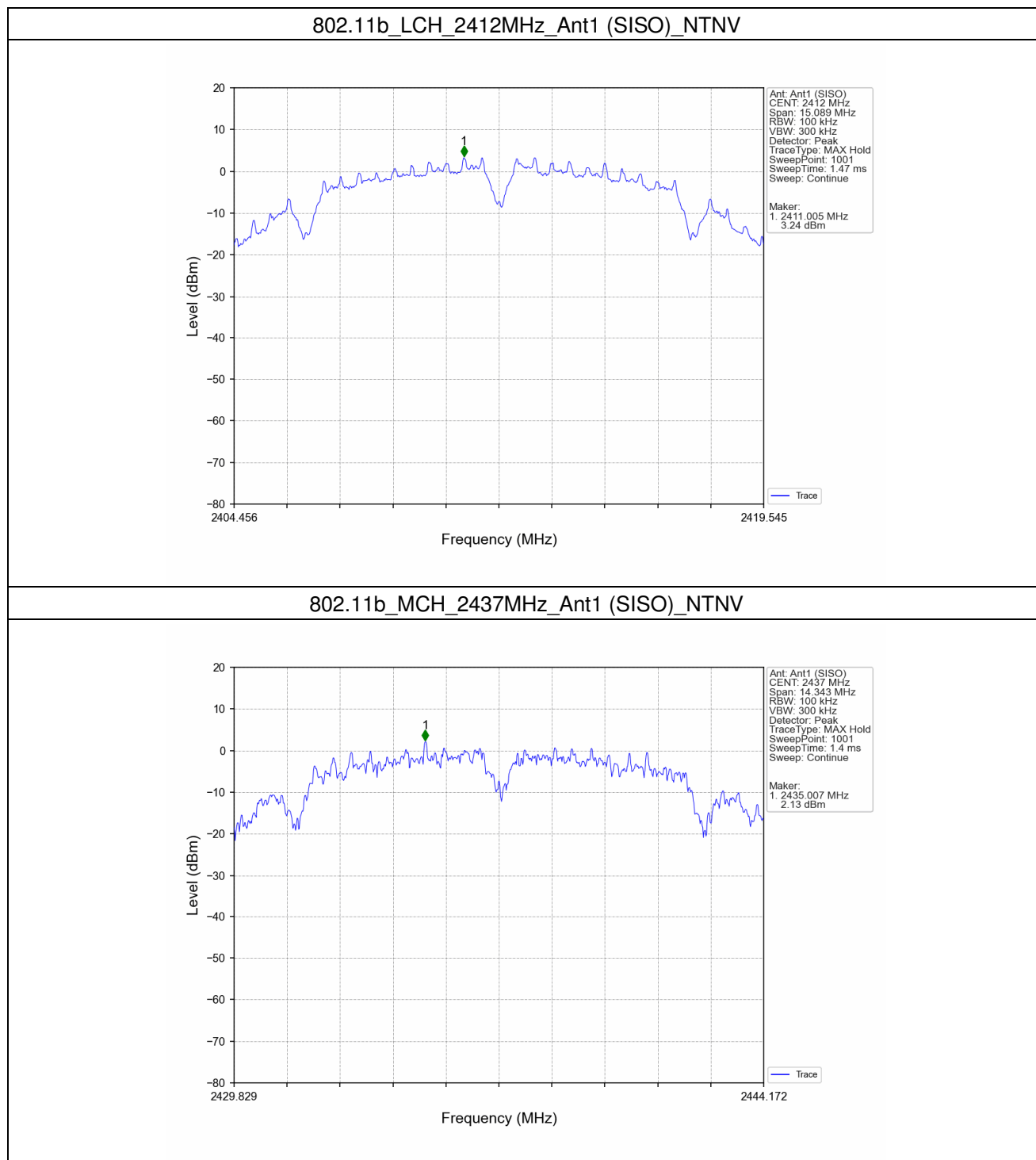
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5.2 Test Graph

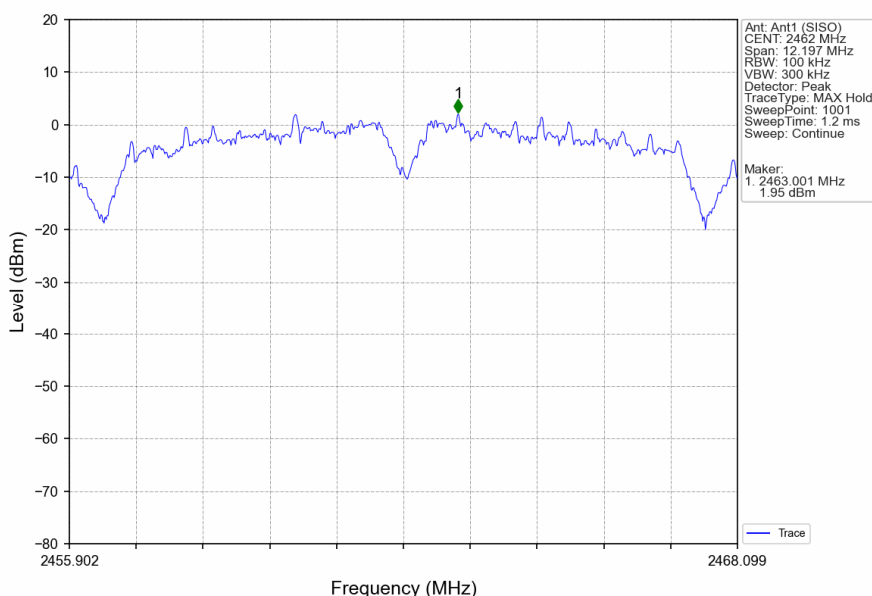
5.2.1 Ref



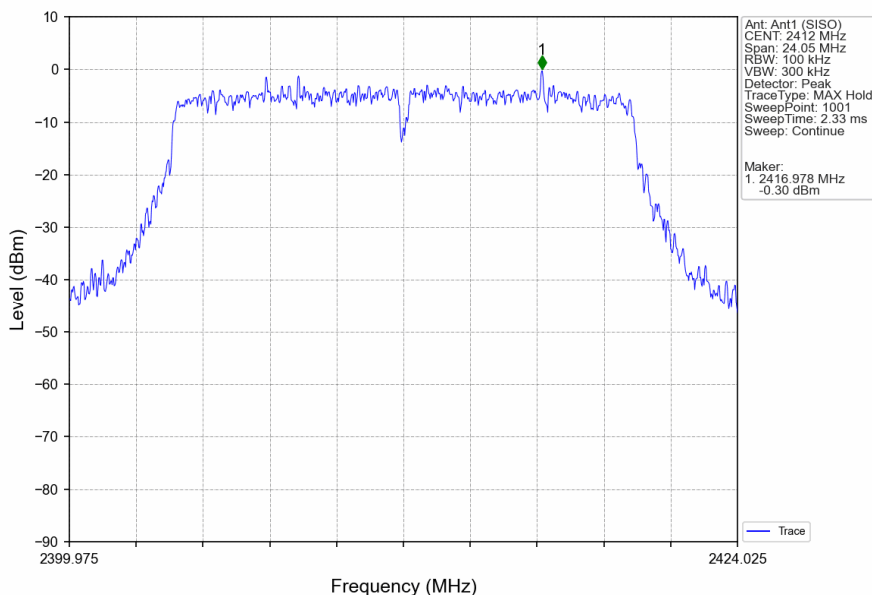
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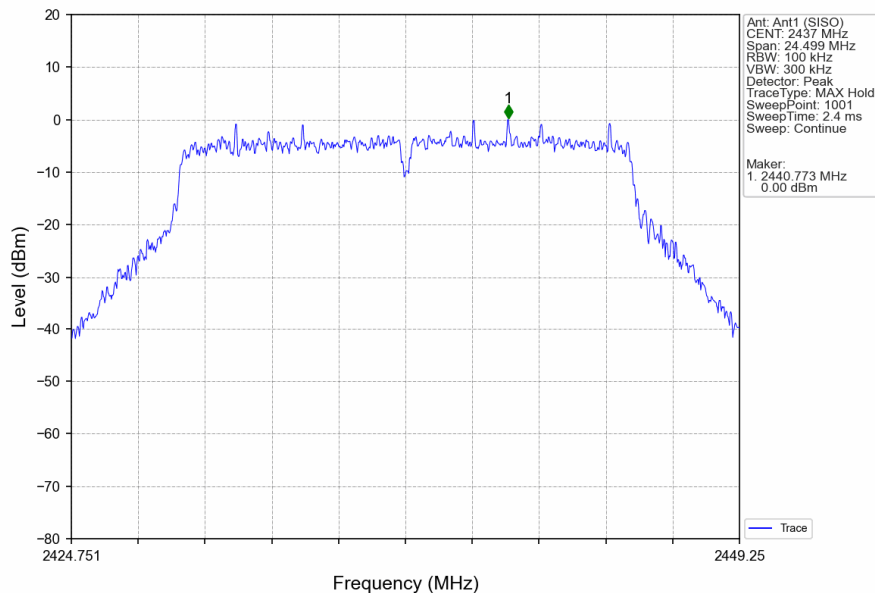
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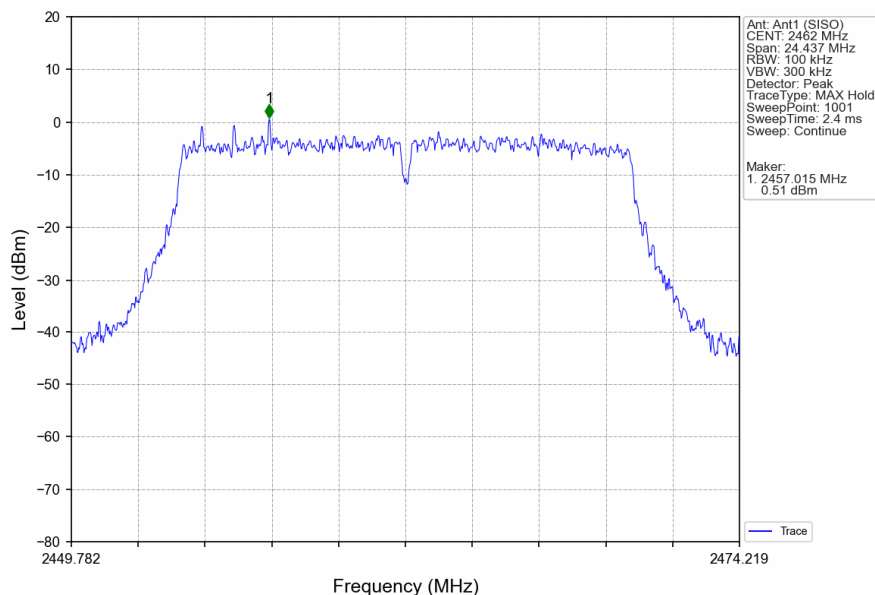
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



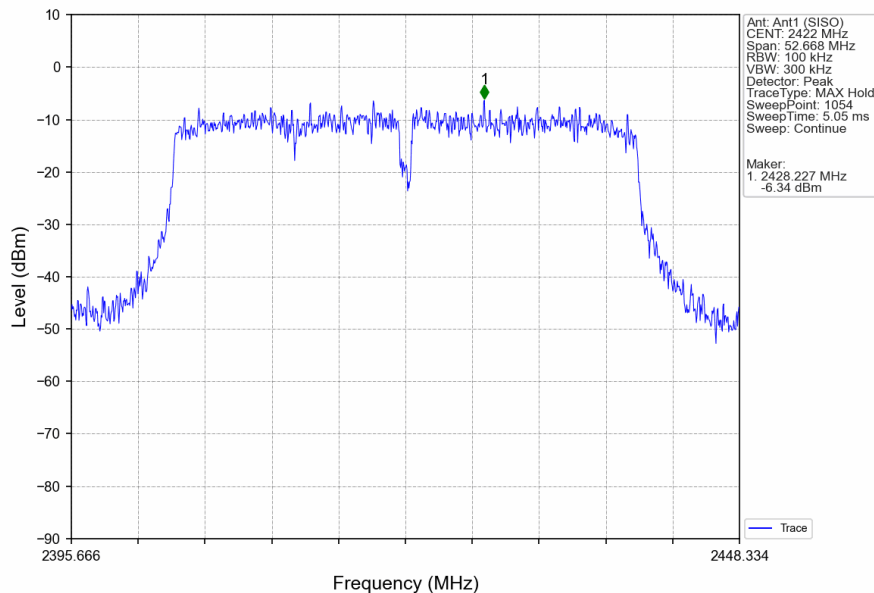
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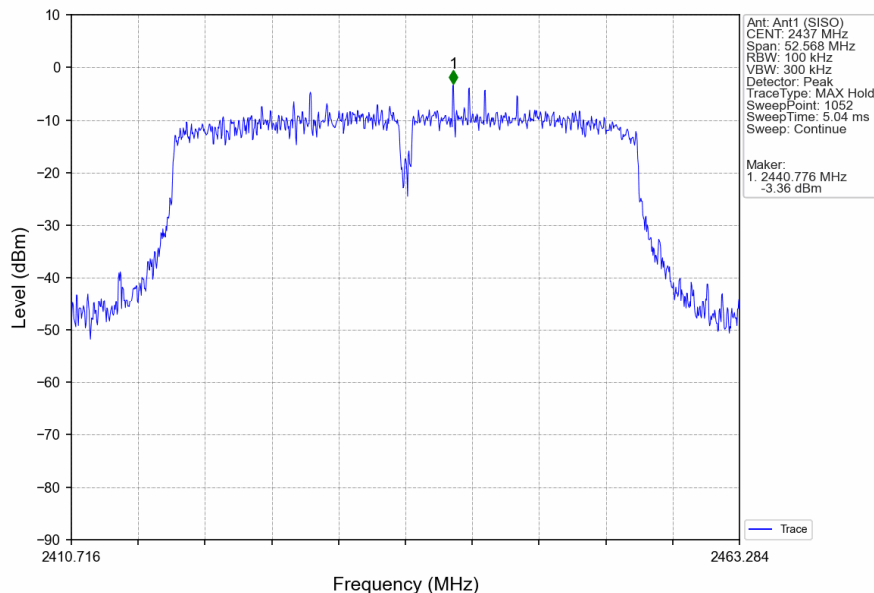
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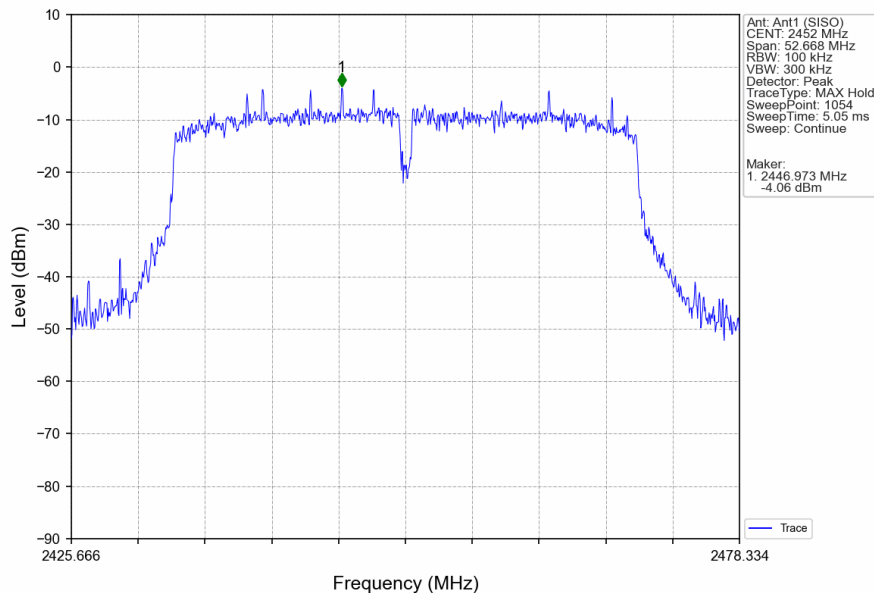
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



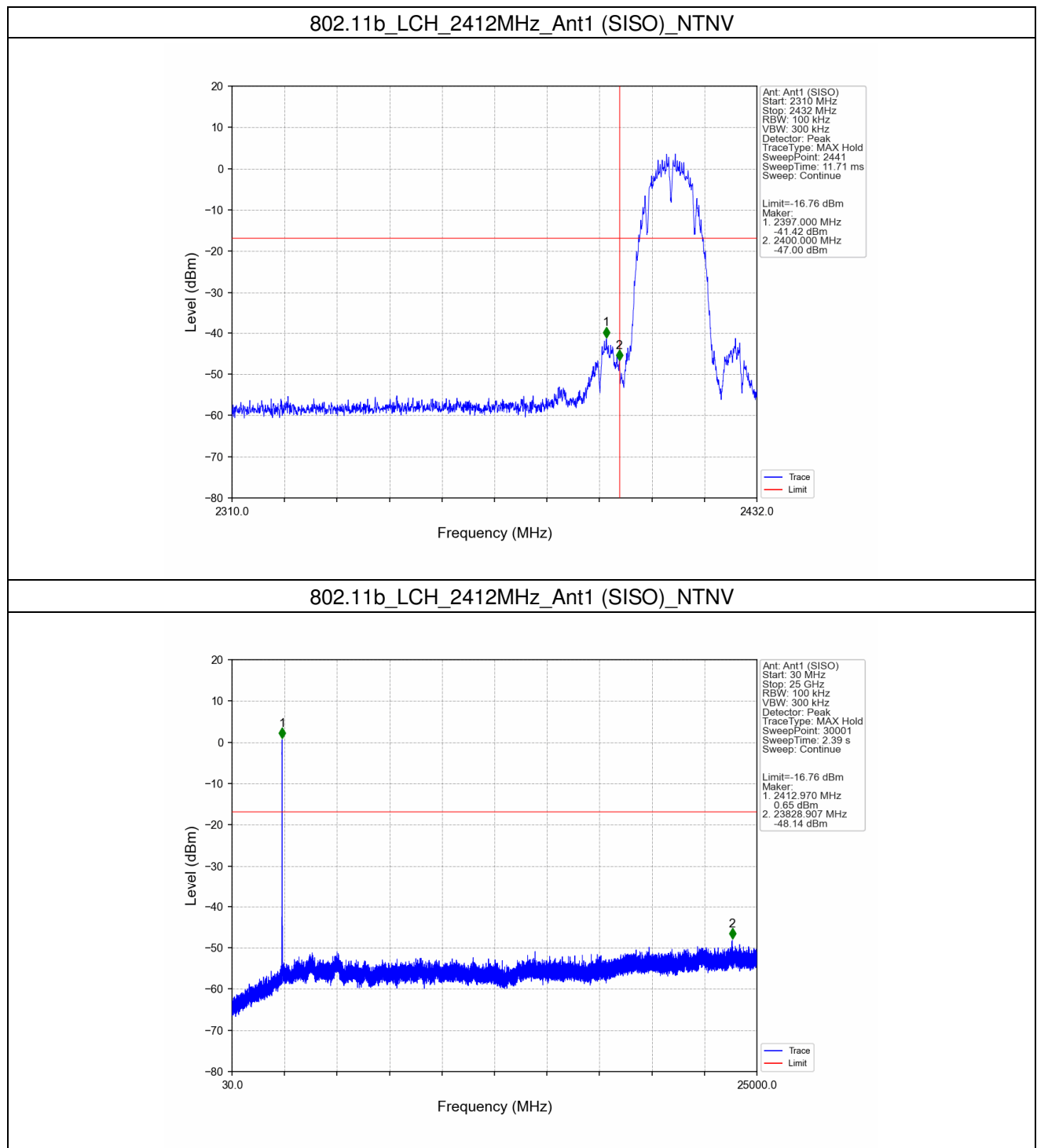
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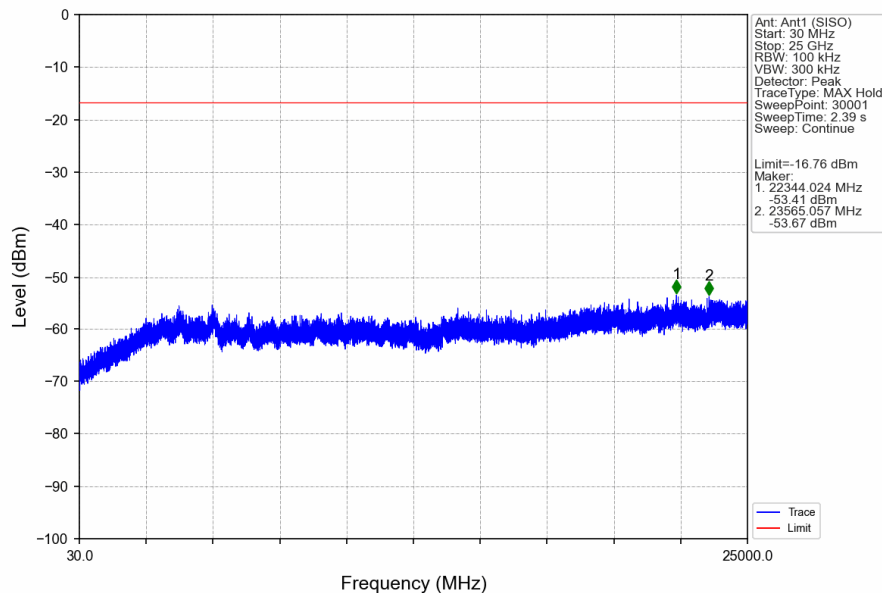
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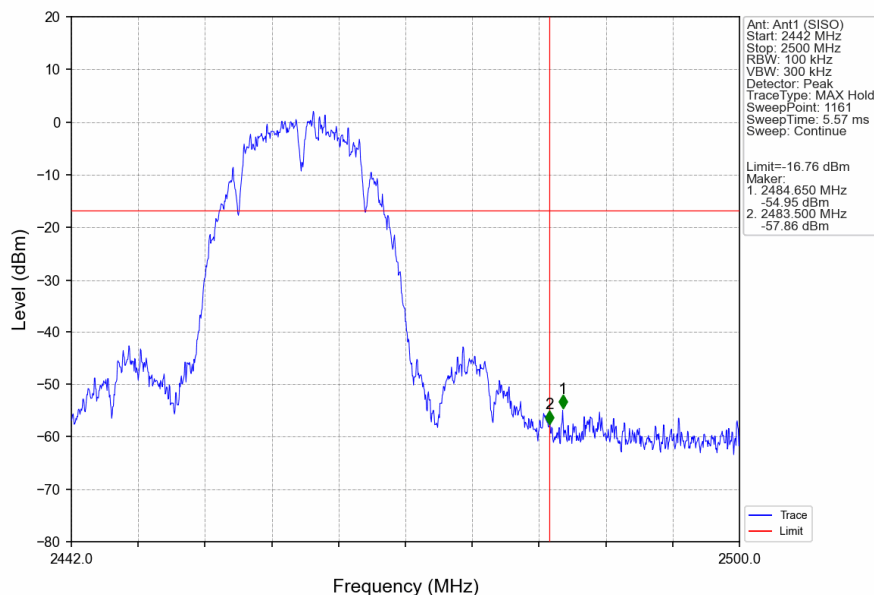
5.2.2 CSE and Band Edges



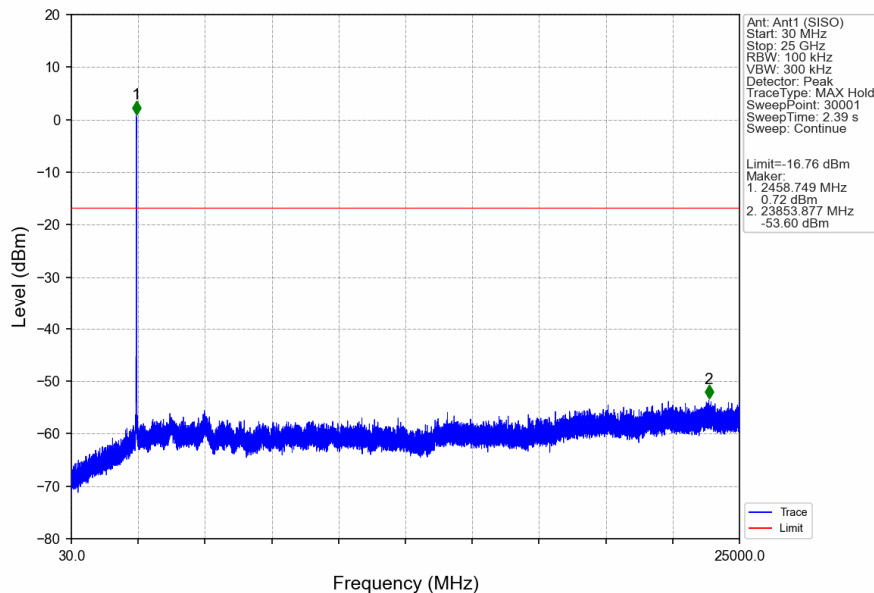
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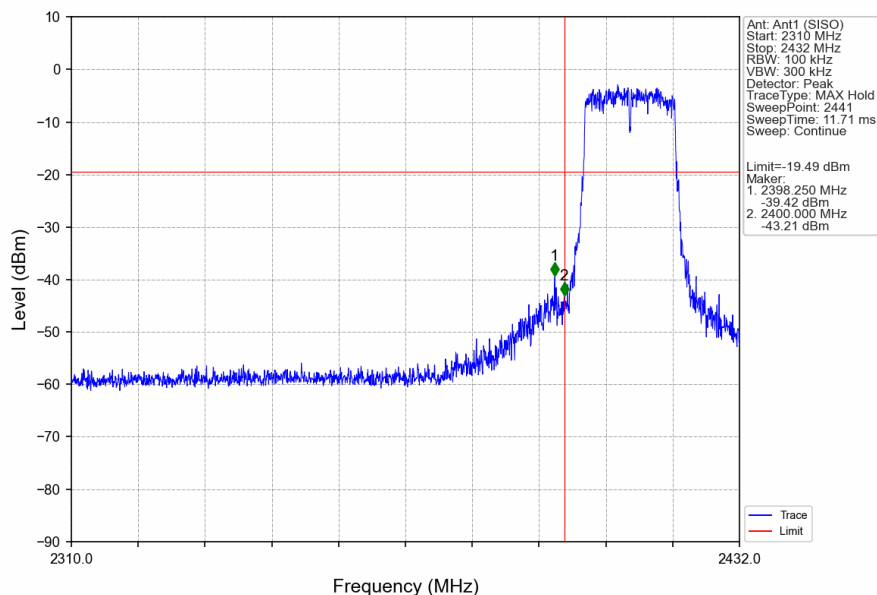
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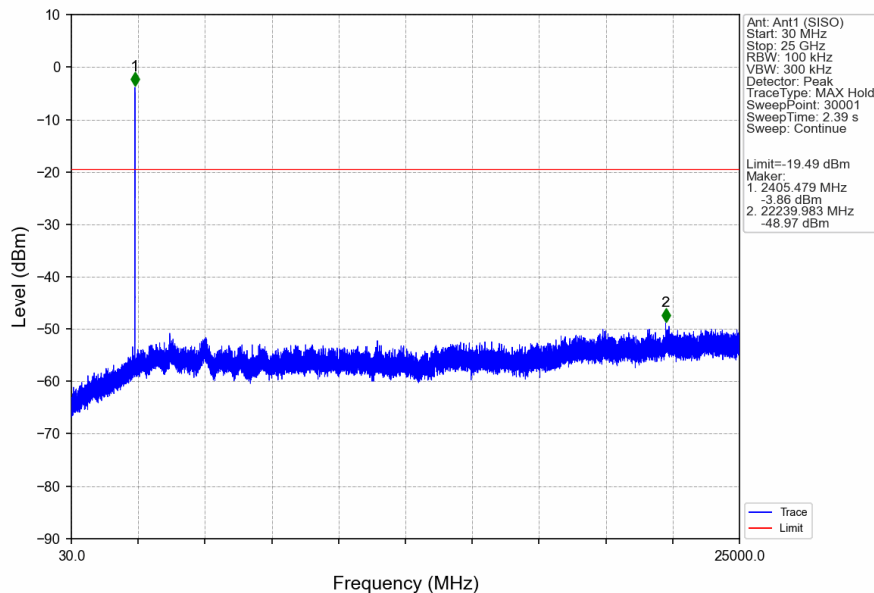
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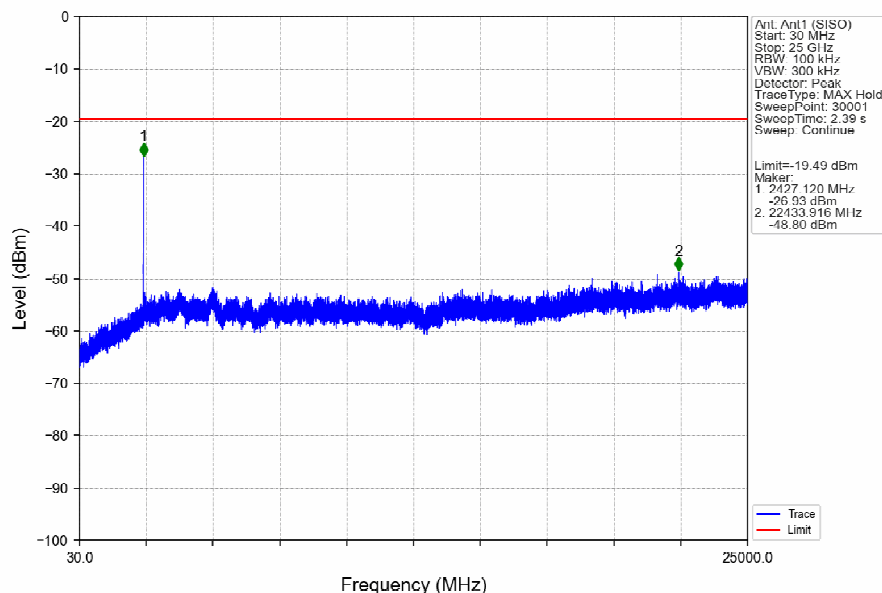
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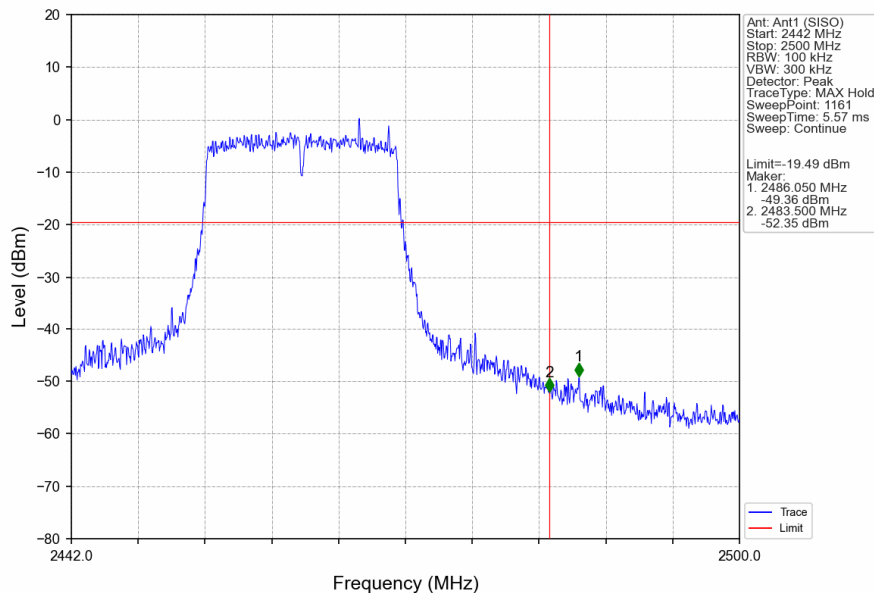
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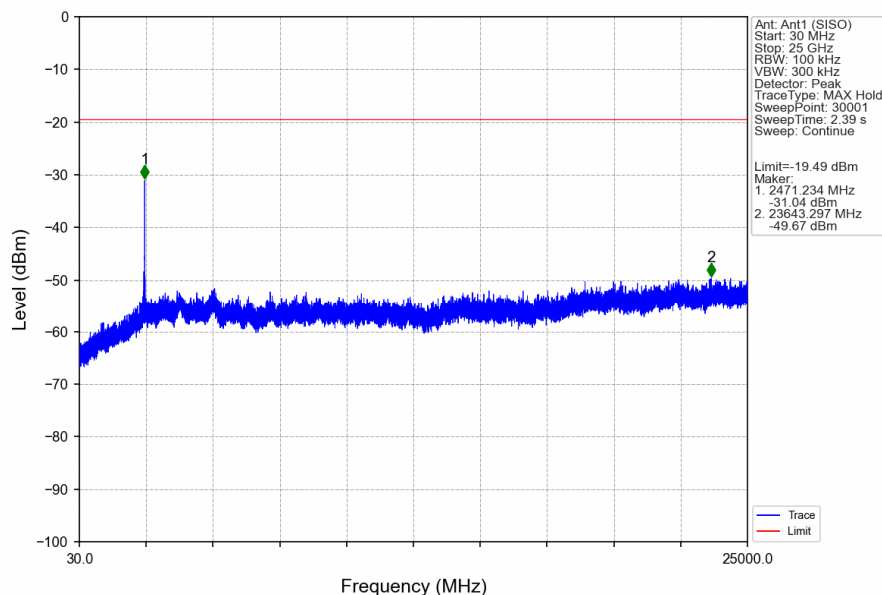
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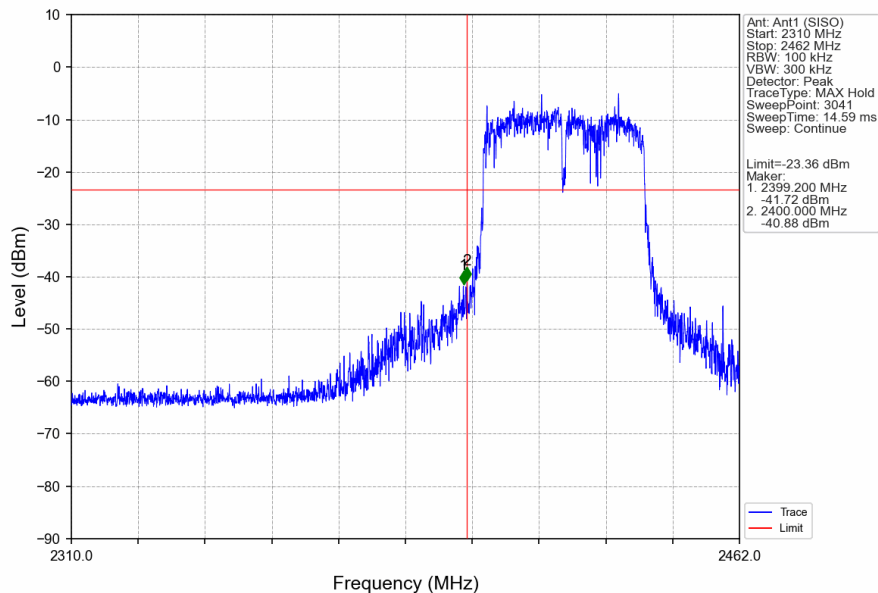
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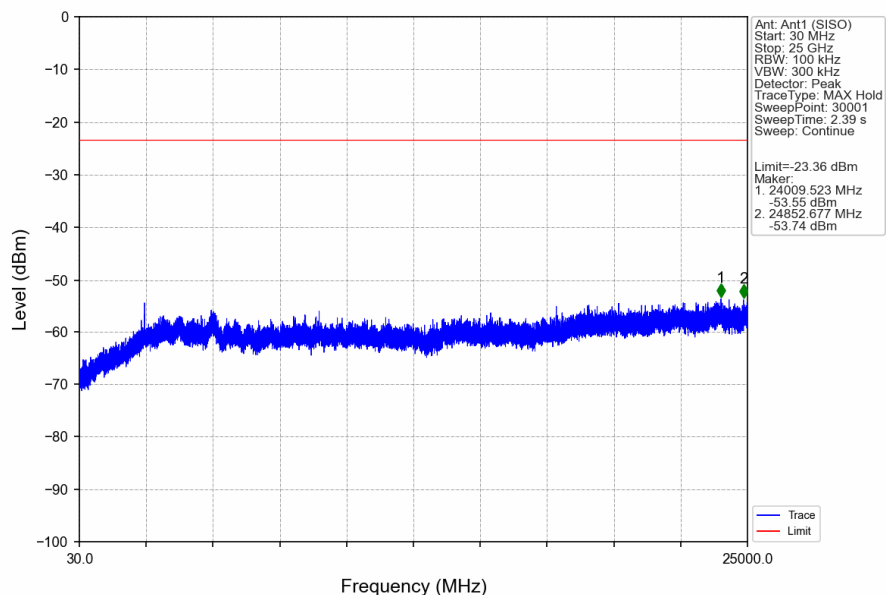
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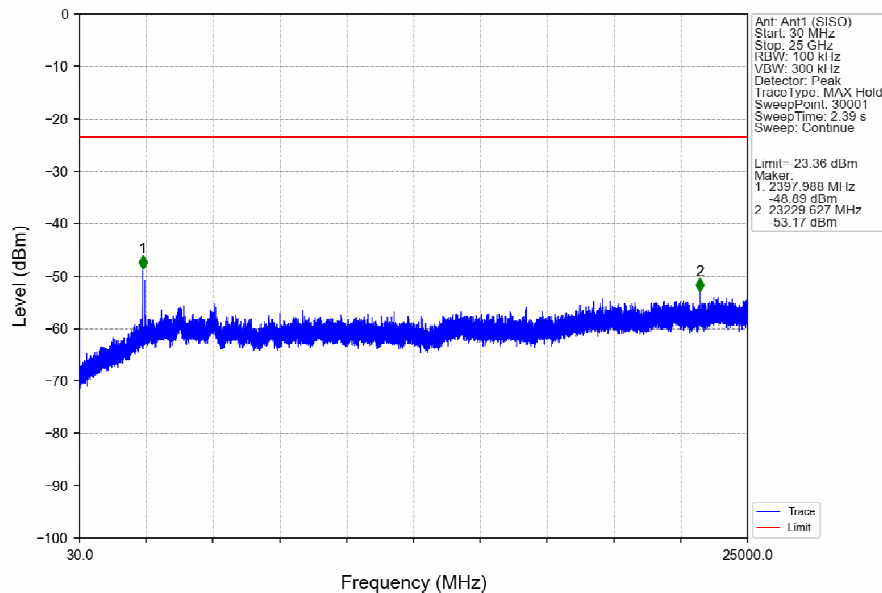
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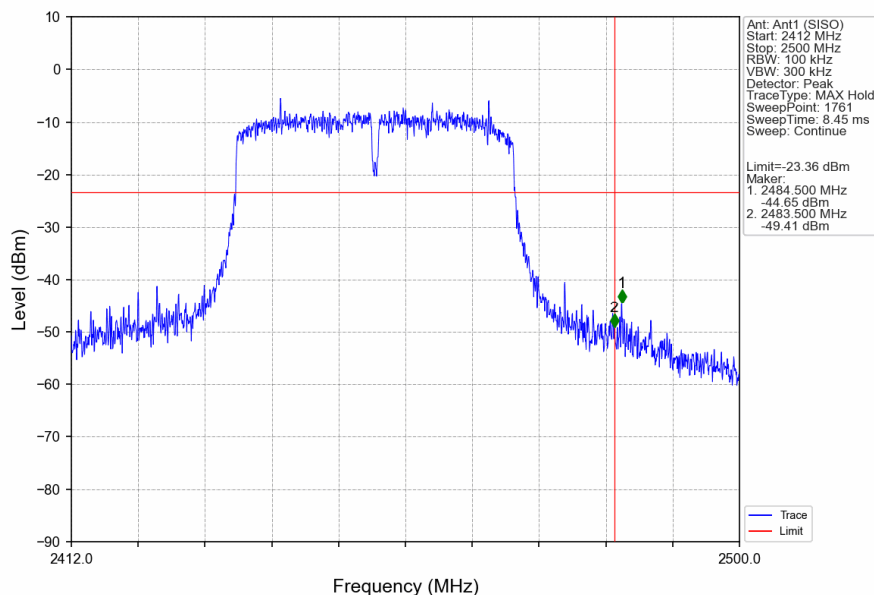
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802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



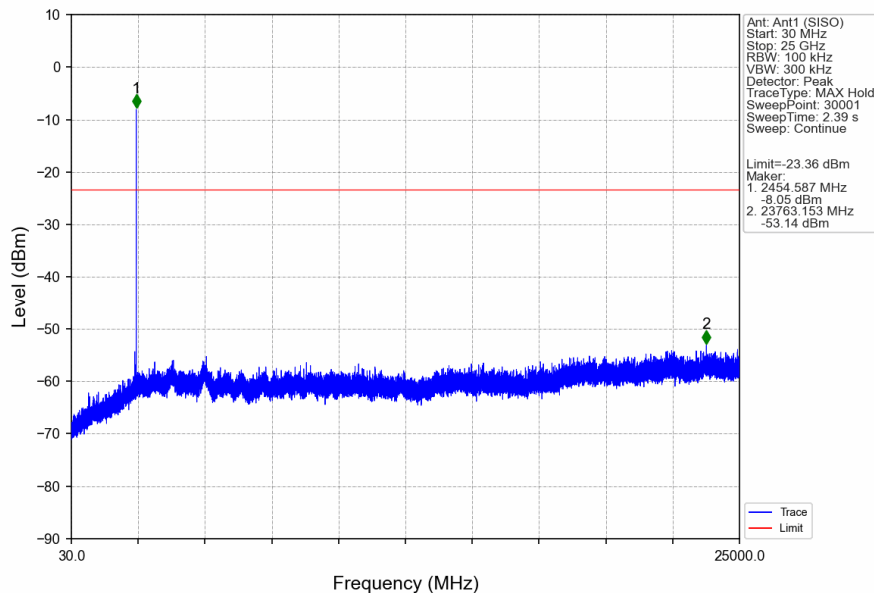
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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