



Shenzhen CTL Testing Technology Co., Ltd.

Zone A, 1/ F, Warehouse 2, Baisha Logistics Company, No. 3011 Shahe West Road,
Nanshan District, Shenzhen, Guangdong, China
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

Annex for Bluetooth Low Energy Test Report No.: CTL2410232072-WF

TABLE OF CONTENTS

Annex for Bluetooth Low Energy Test Report No.: CTL2410232072-WF	1
1. Duty Cycle	2
2. Bandwidth	6
3. Maximum Conducted Output Power	13
4. Maximum Power Spectral Density	17
5. Unwanted Emissions In Non-restricted Frequency Bands	21

1. Duty Cycle

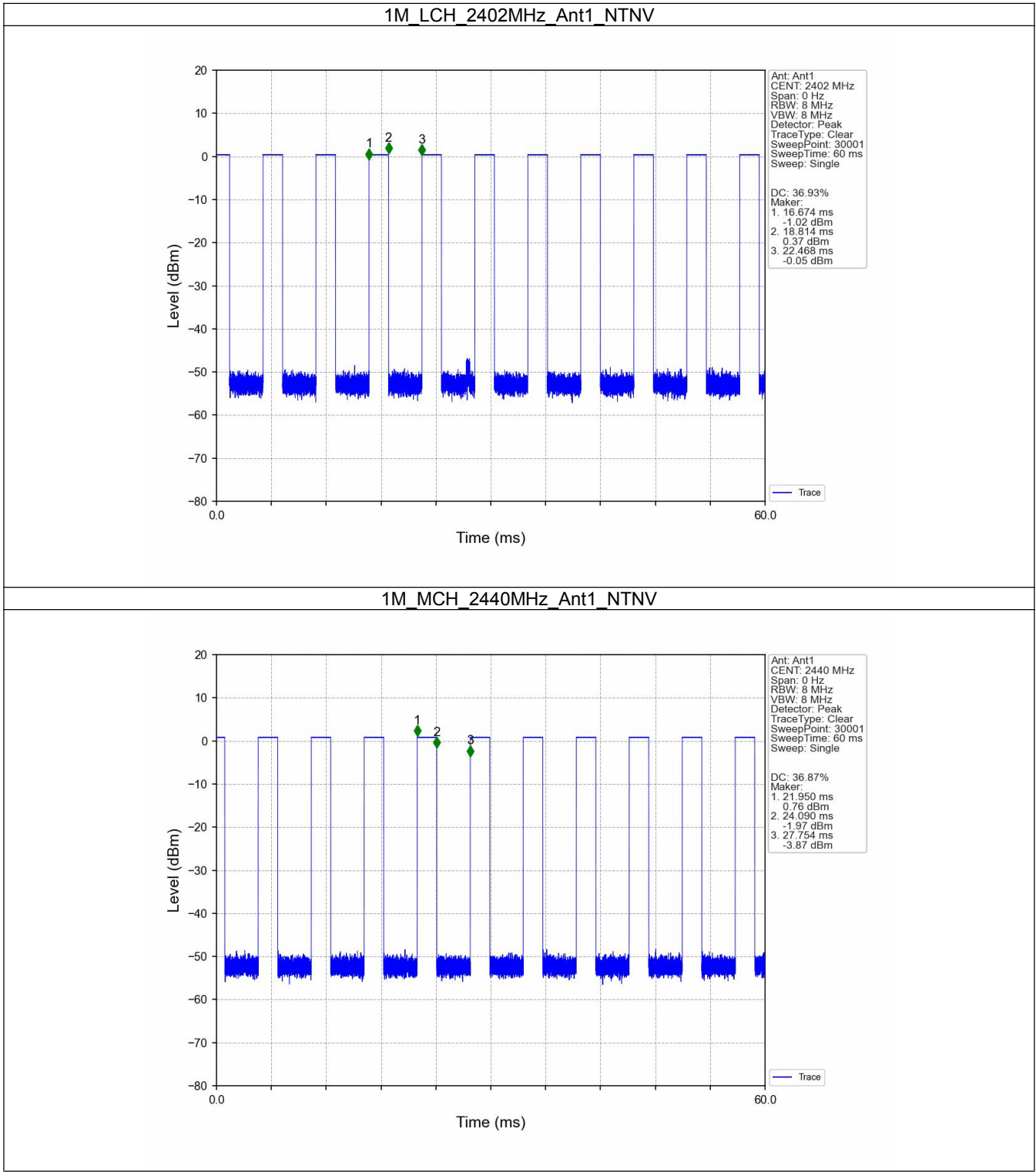
1.1 Test Result

1.1.1 Ant1

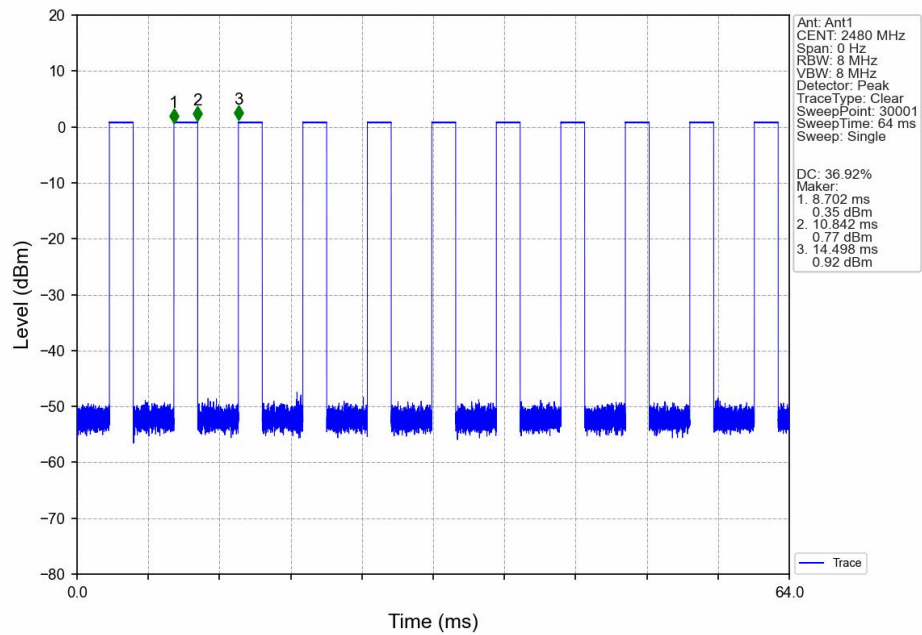
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1M	SISO	2402	2.140	5.794	36.93	4.33	0.03
		2440	2.140	5.804	36.87	4.33	0.06
		2480	2.140	5.796	36.92	4.33	0.04
2M	SISO	2402	1.083	4.735	22.87	6.41	0.03
		2440	1.085	4.748	22.85	6.41	0.06
		2480	1.085	4.746	22.86	6.41	0.05

1.2 Test Graph

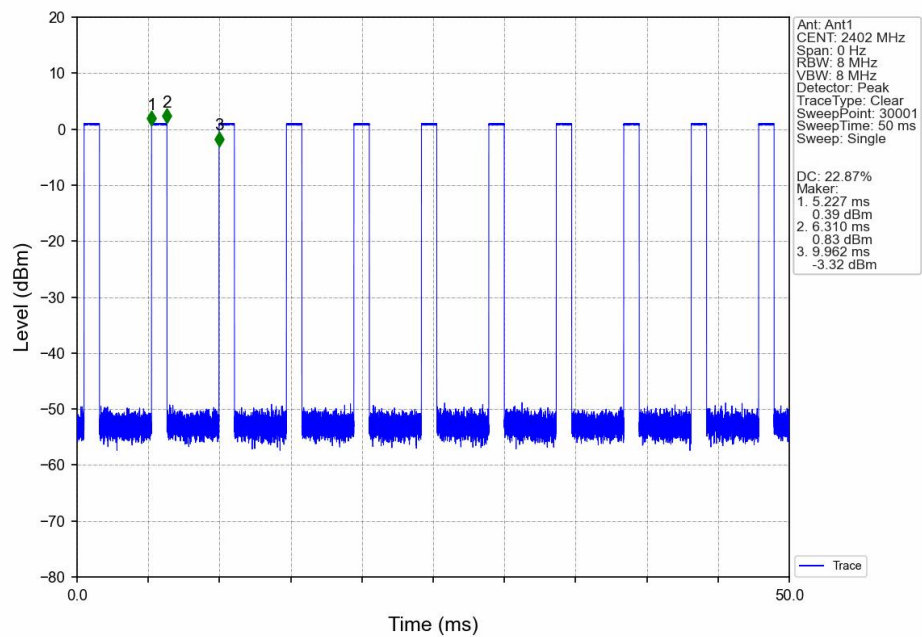
1.2.1 Ant1



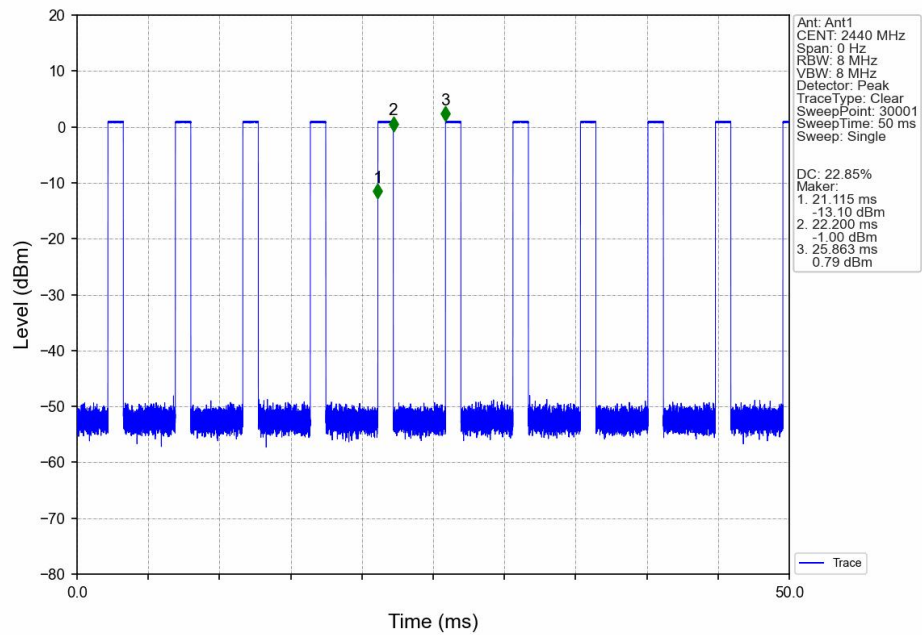
1M_HCH_2480MHz_Ant1_NTNV



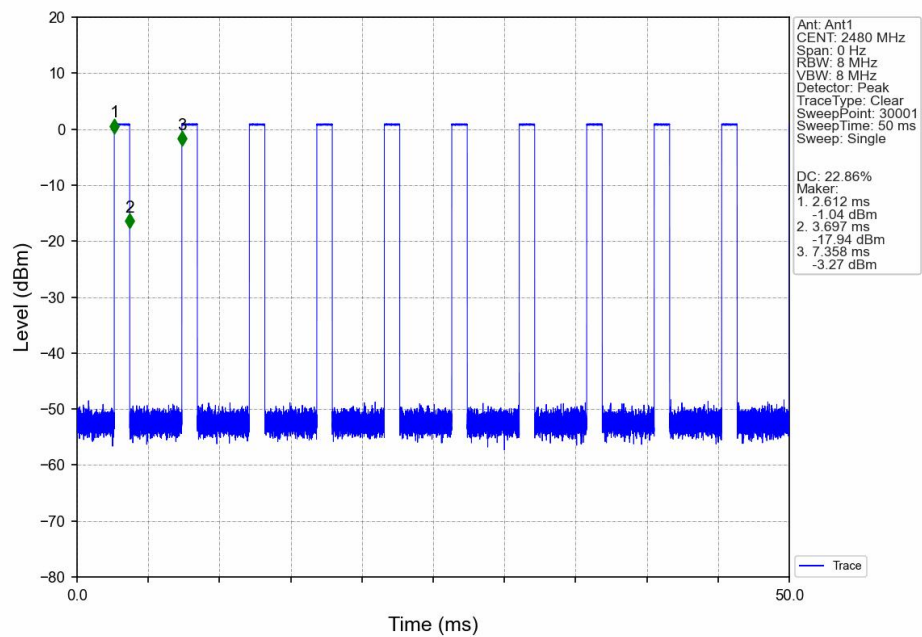
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



2. Bandwidth

2.1 Test Result

2.1.1 OBW

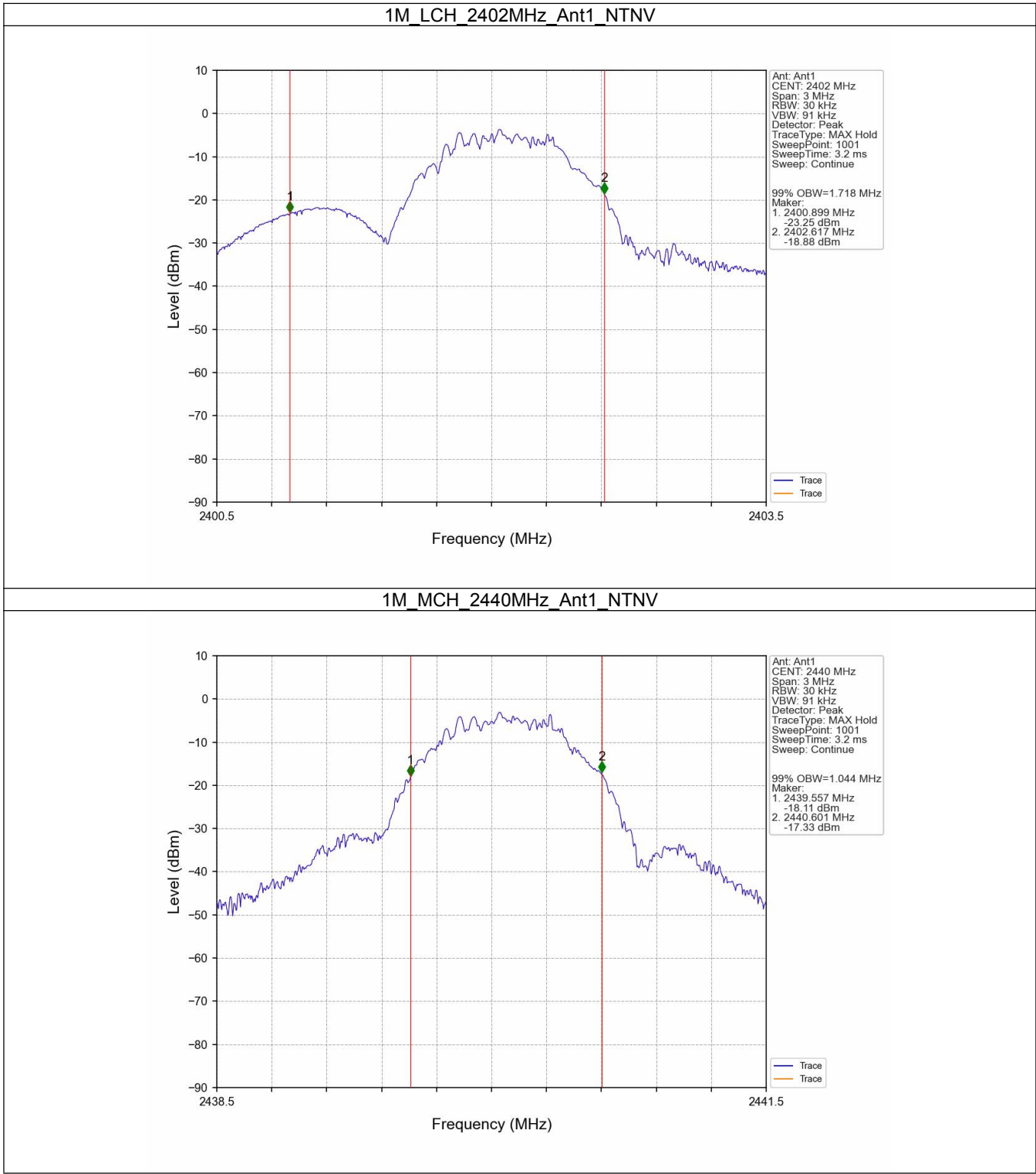
Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	1.718	/	Pass
		2440	1	1.044	/	Pass
		2480	1	1.304	/	Pass
2M	SISO	2402	1	2.484	/	Pass
		2440	1	2.059	/	Pass
		2480	1	2.103	/	Pass

2.1.2 6dB BW

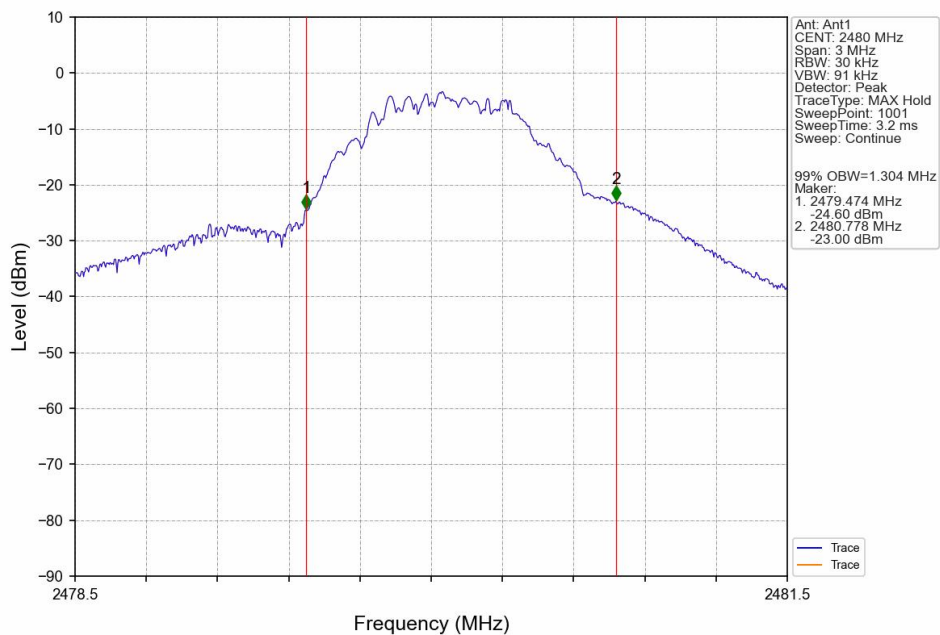
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.724	≥ 0.5	Pass
		2440	1	0.677	≥ 0.5	Pass
		2480	1	0.694	≥ 0.5	Pass
2M	SISO	2402	1	1.271	≥ 0.5	Pass
		2440	1	1.265	≥ 0.5	Pass
		2480	1	1.270	≥ 0.5	Pass

2.2 Test Graph

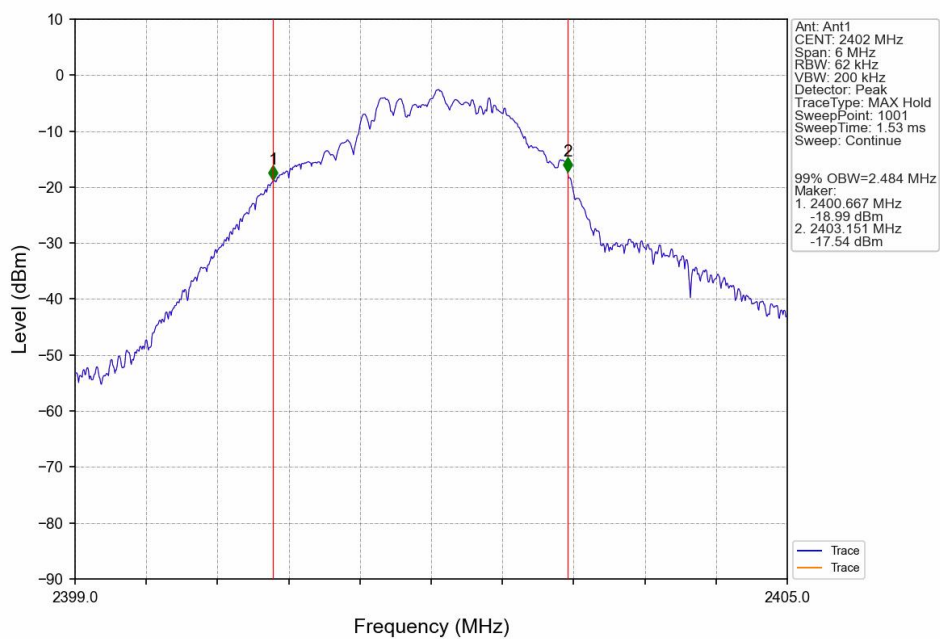
2.2.1 OBW



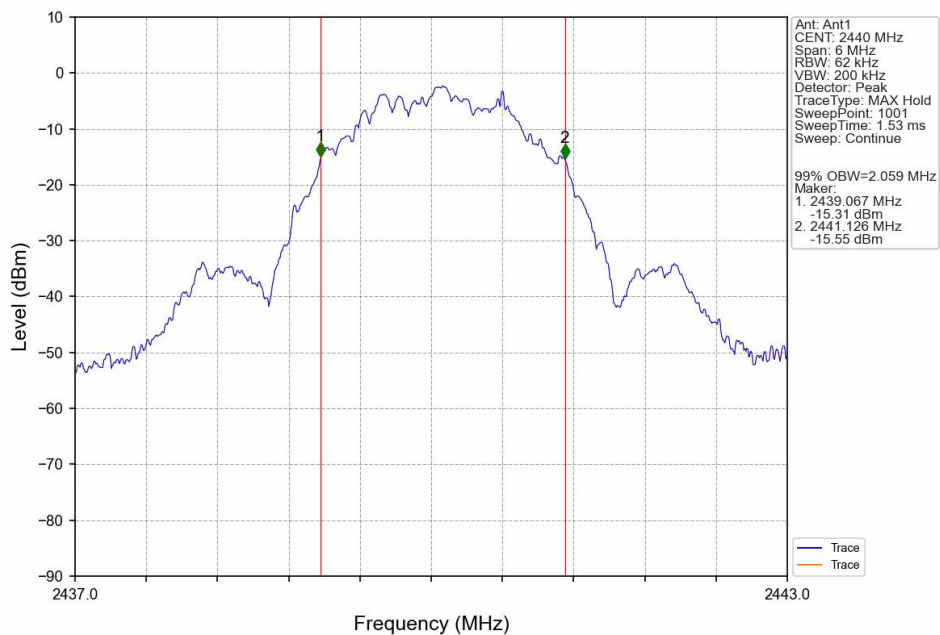
1M_HCH_2480MHz_Ant1_NTNV



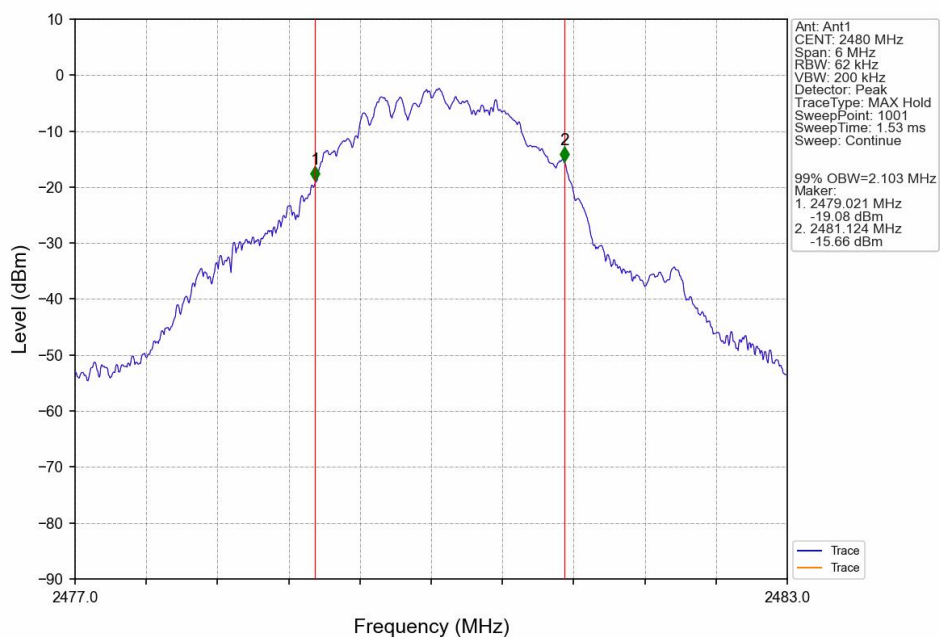
2M_LCH_2402MHz_Ant1_NTNV



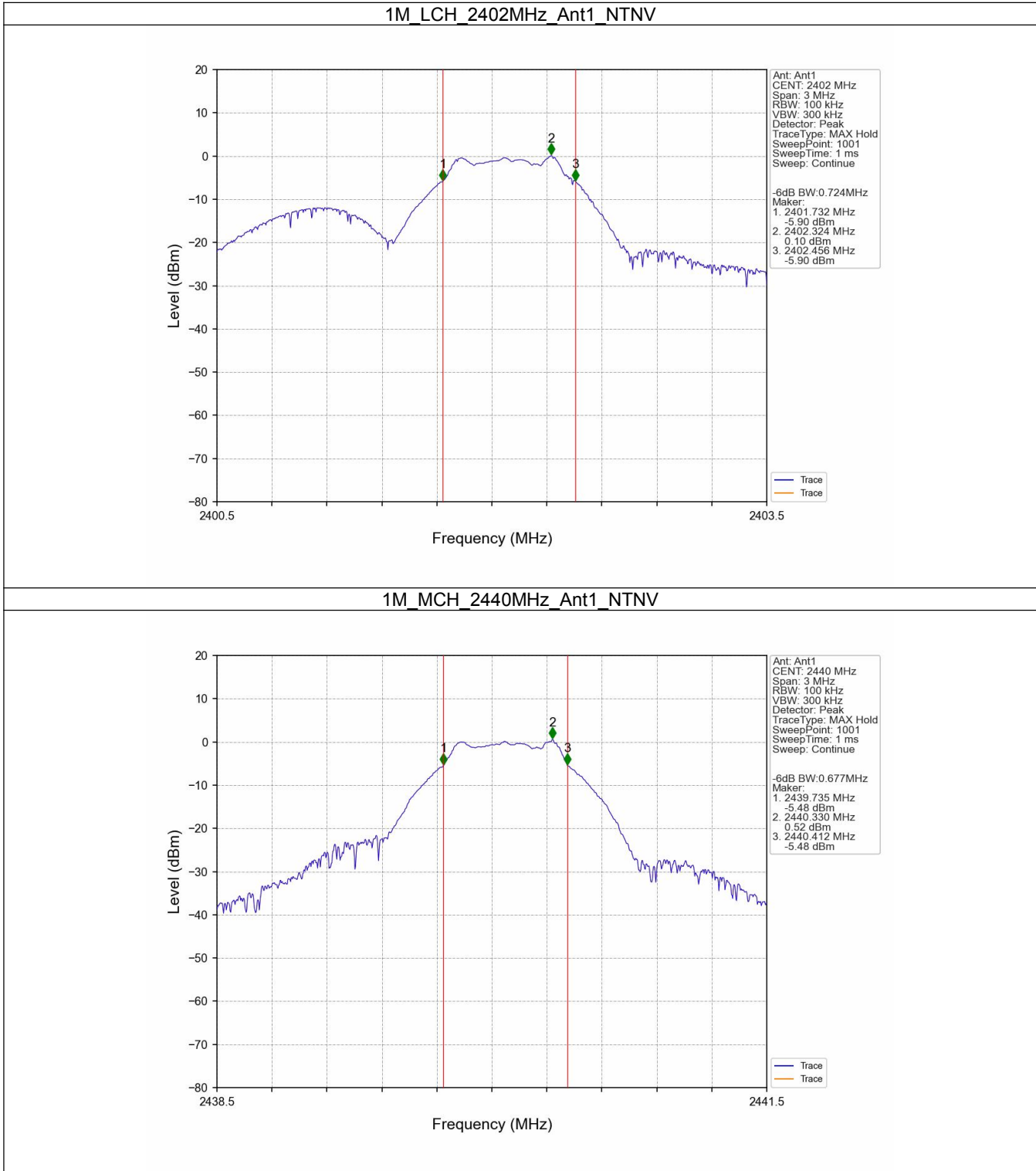
2M_MCH_2440MHz_Ant1_NTNV

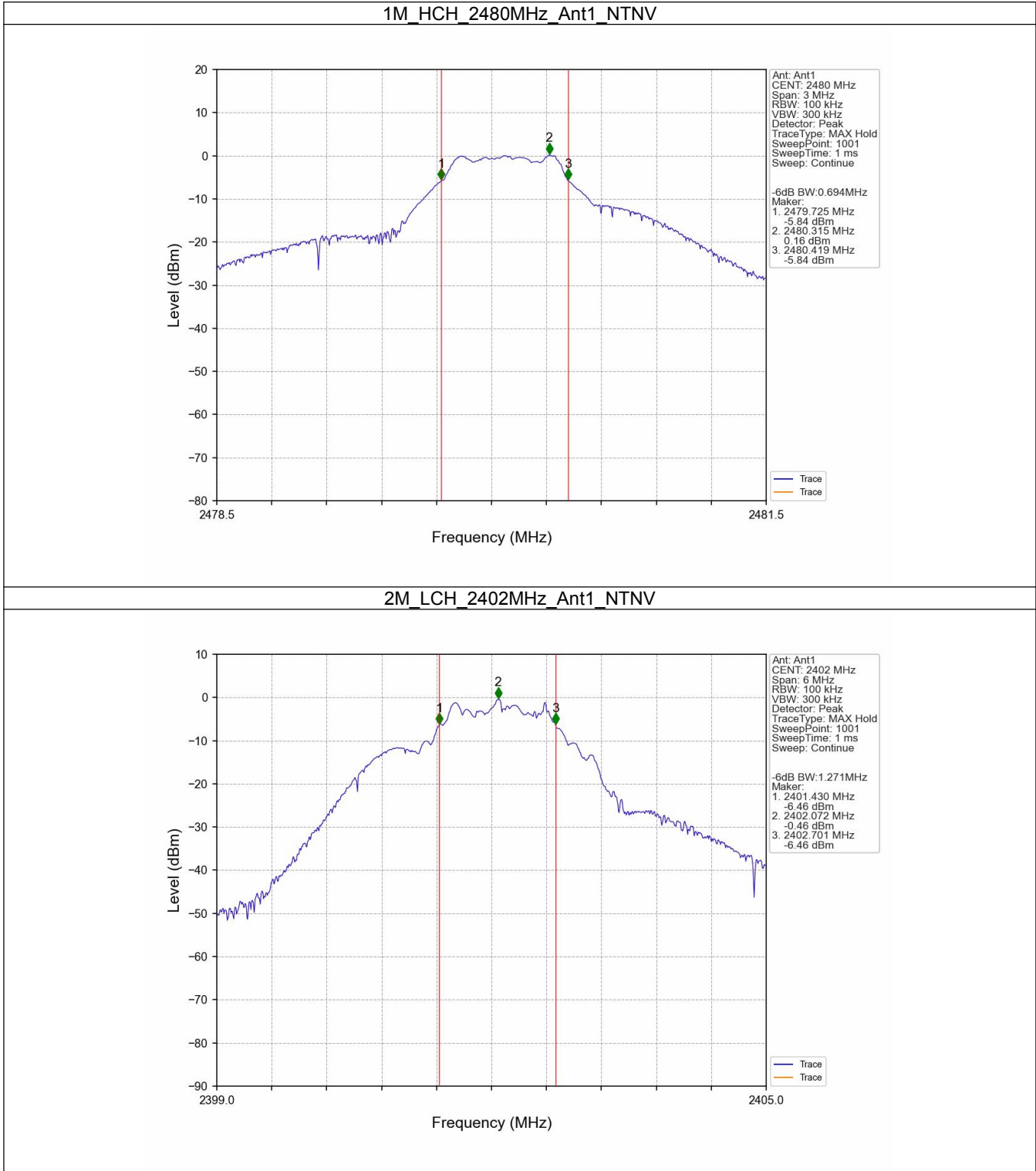


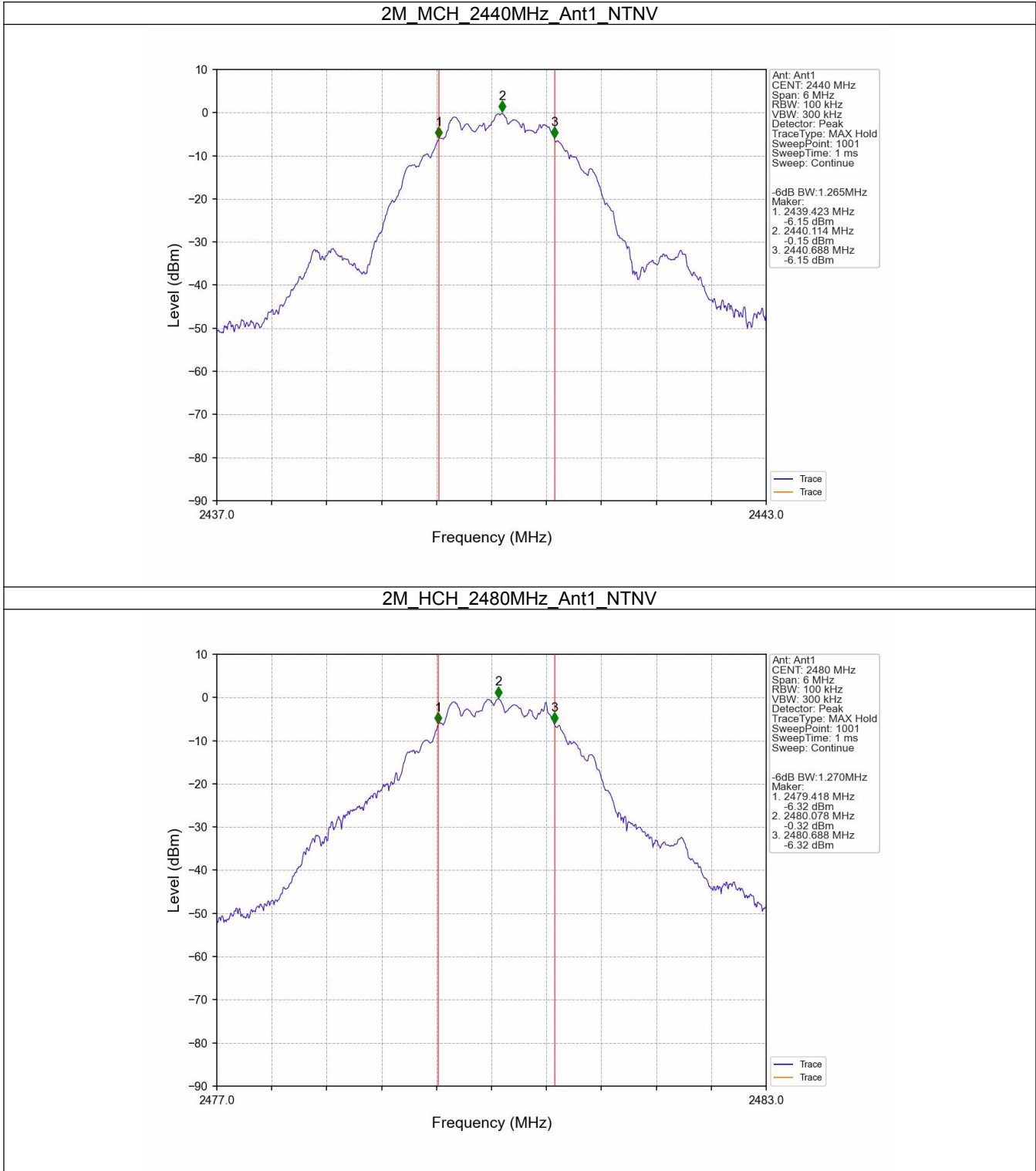
2M_HCH_2480MHz_Ant1_NTNV



2.2.2 6dB BW







3. Maximum Conducted Output Power

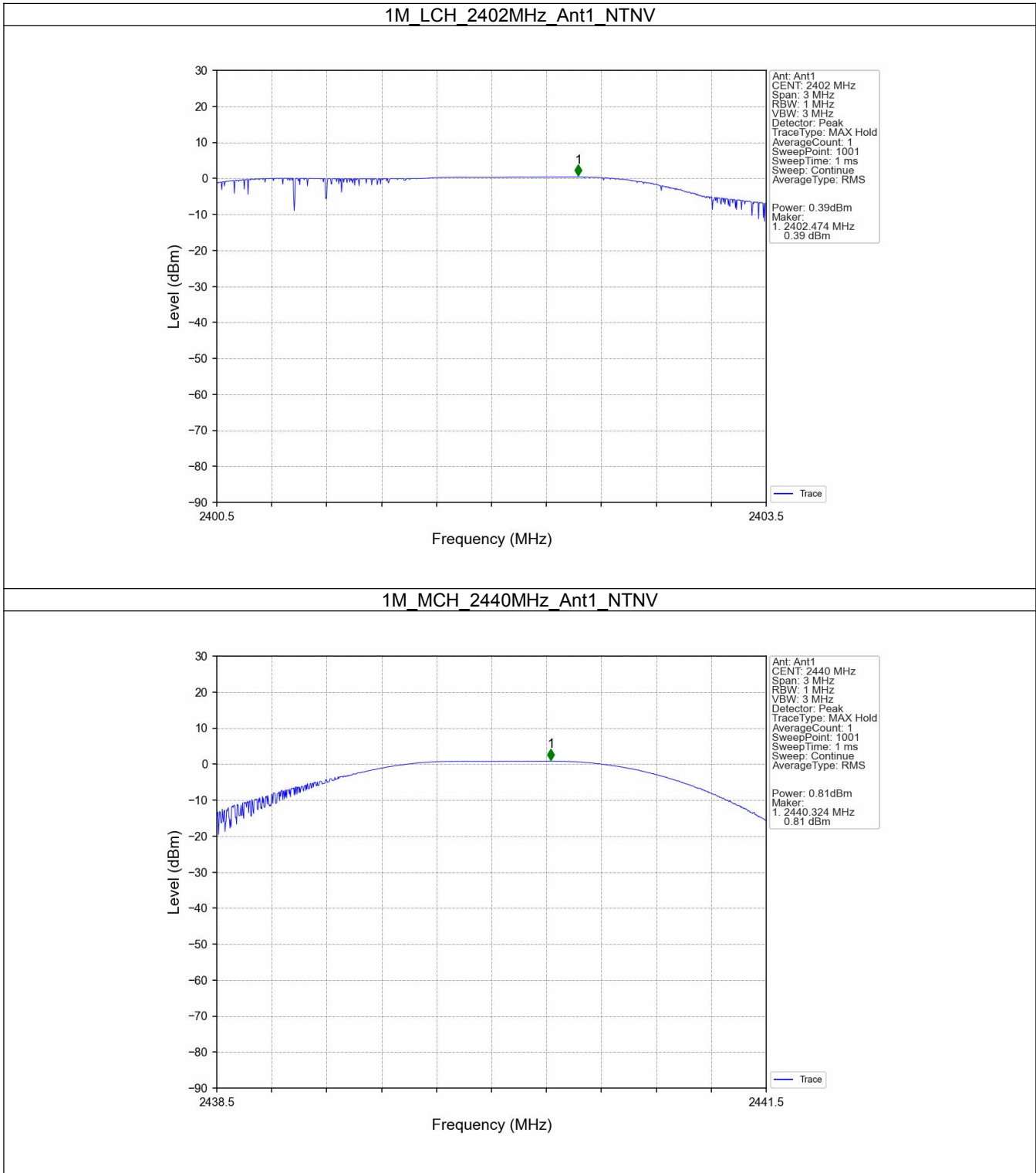
3.1 Test Result

3.1.1 Power

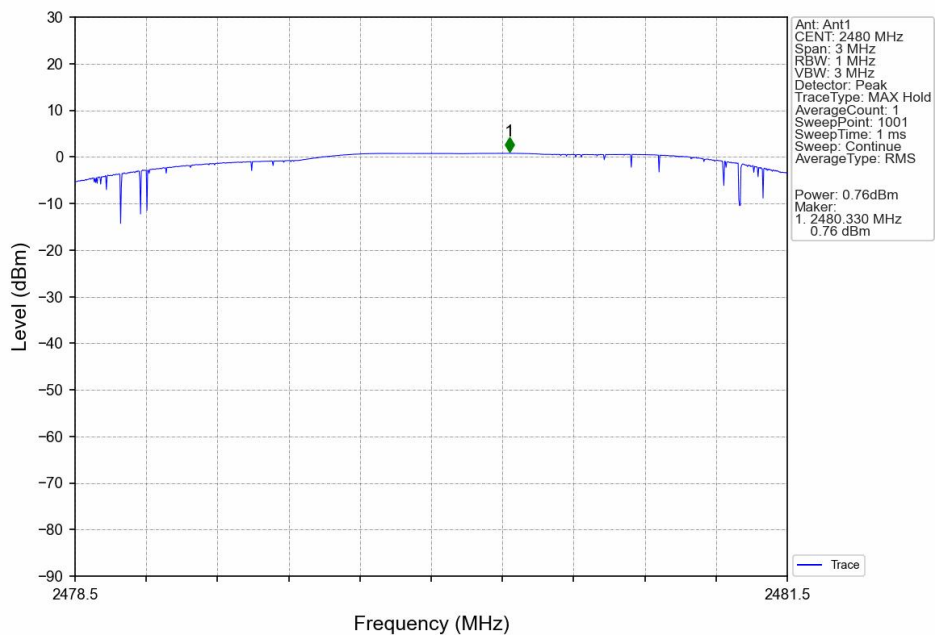
Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	0.39	<=30	Pass
		2440	0.81	<=30	Pass
		2480	0.76	<=30	Pass
2M	SISO	2402	0.89	<=30	Pass
		2440	0.87	<=30	Pass
		2480	0.81	<=30	Pass
Note1: Antenna Gain: Ant1: 2.10dBi;					

3.2 Test Graph

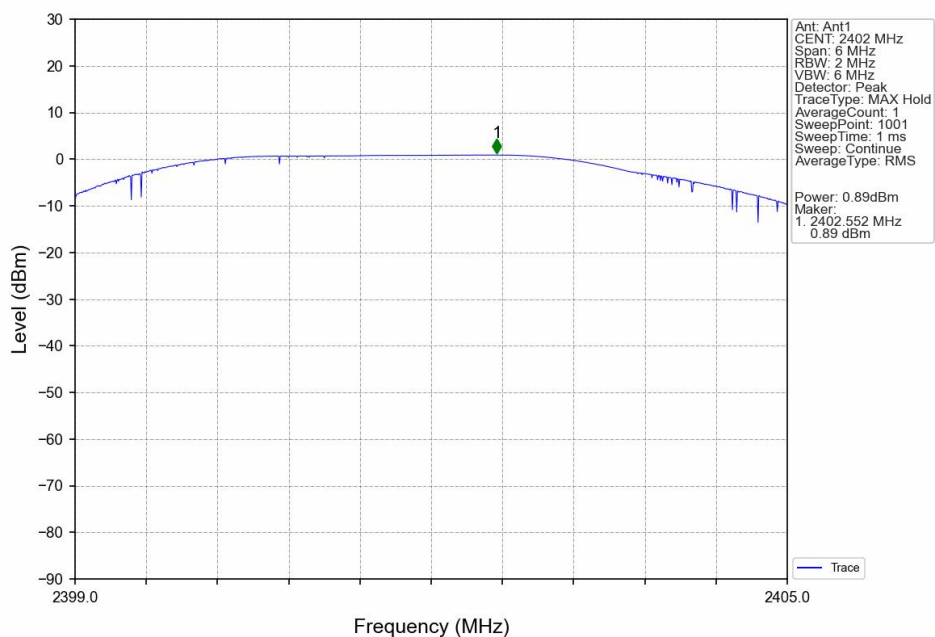
3.2.1 Power

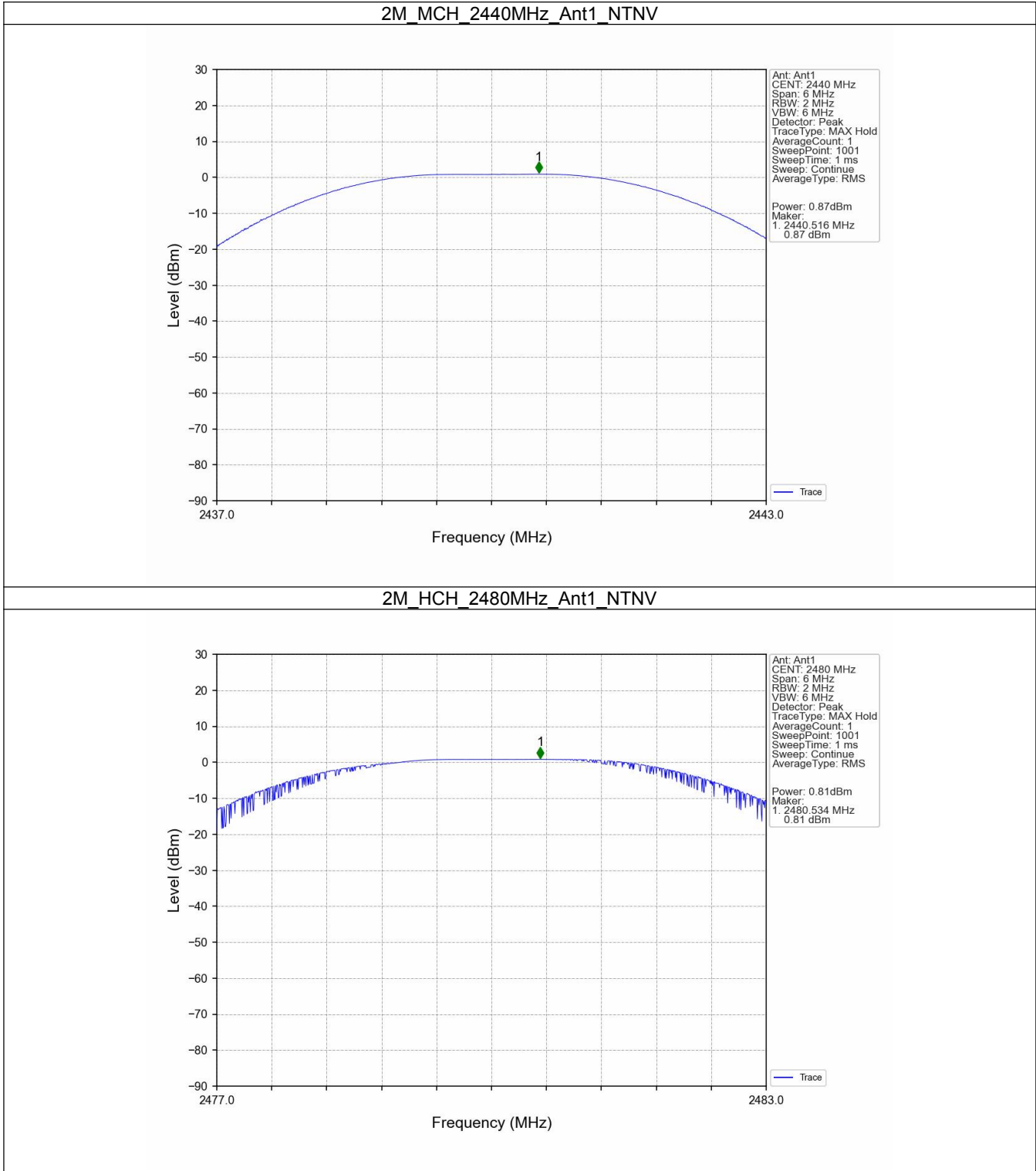


1M_HCH_2480MHz_Ant1_NTNV



2M_LCH_2402MHz_Ant1_NTNV





4. Maximum Power Spectral Density

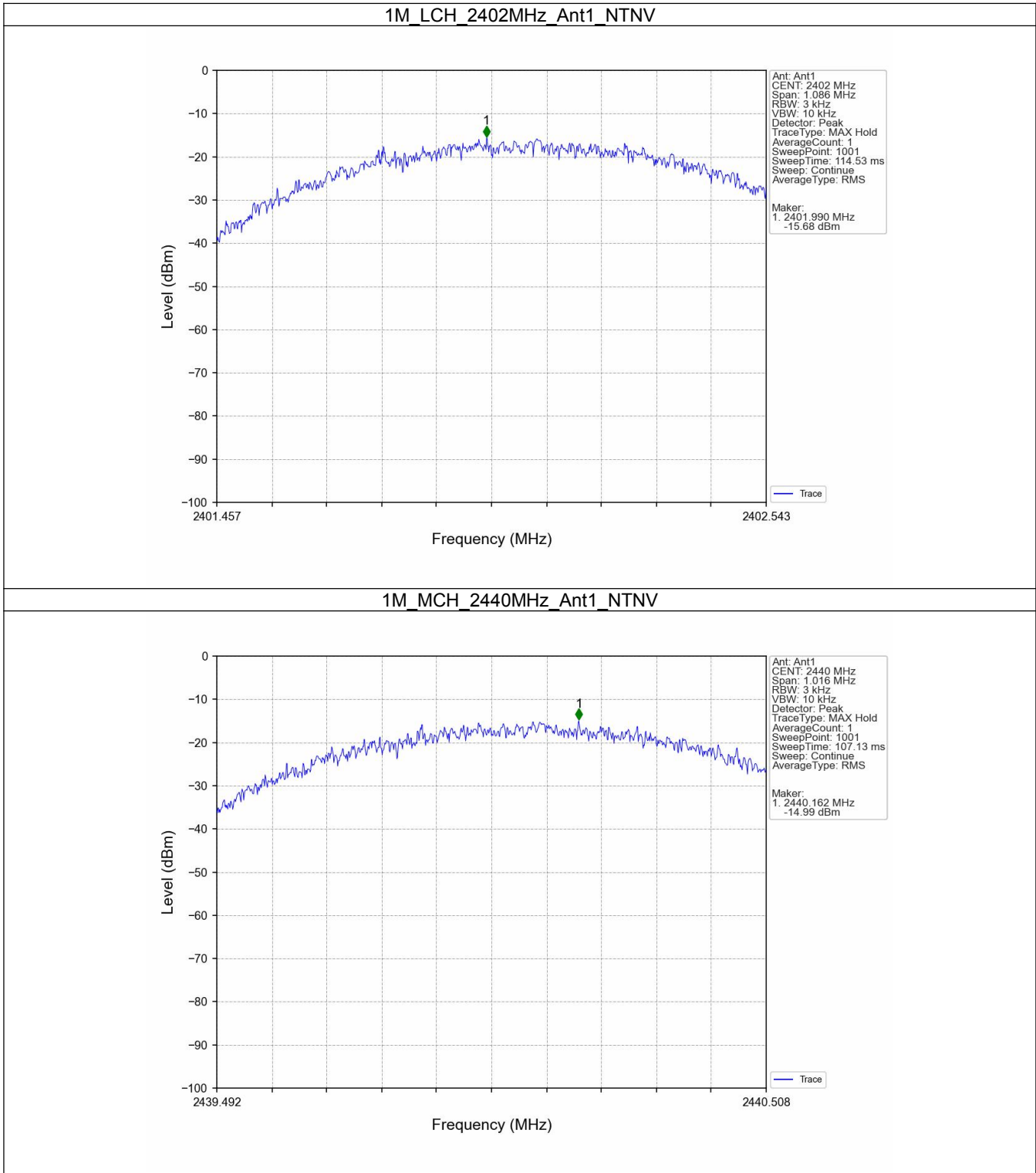
4.1 Test Result

4.1.1 PSD

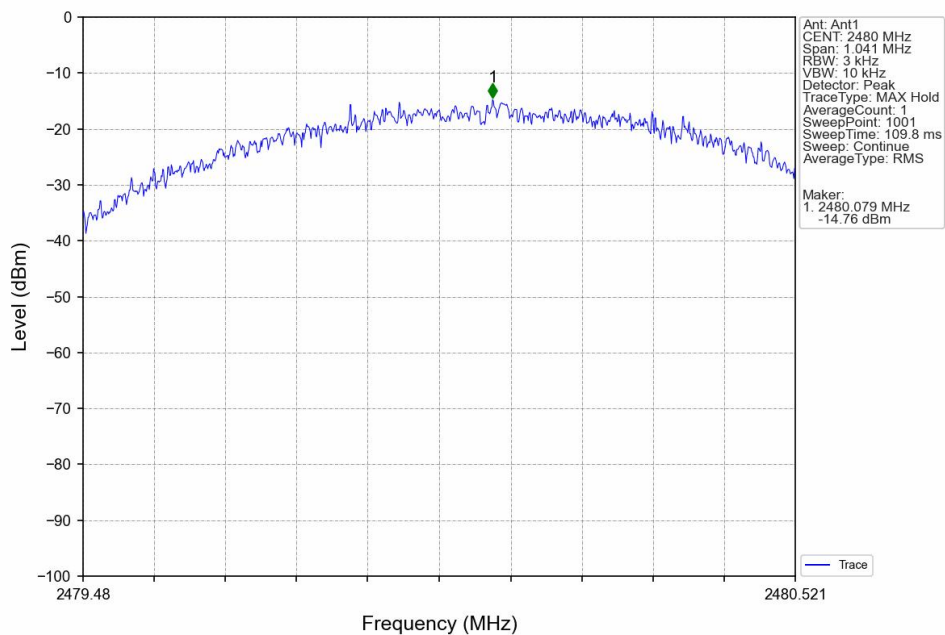
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
1M	SISO	2402	-15.68	<=8	Pass
		2440	-14.99	<=8	Pass
		2480	-14.76	<=8	Pass
2M	SISO	2402	-18.87	<=8	Pass
		2440	-16.83	<=8	Pass
		2480	-17.51	<=8	Pass
Note1: Antenna Gain: Ant1: 2.10dBi;					

4.2 Test Graph

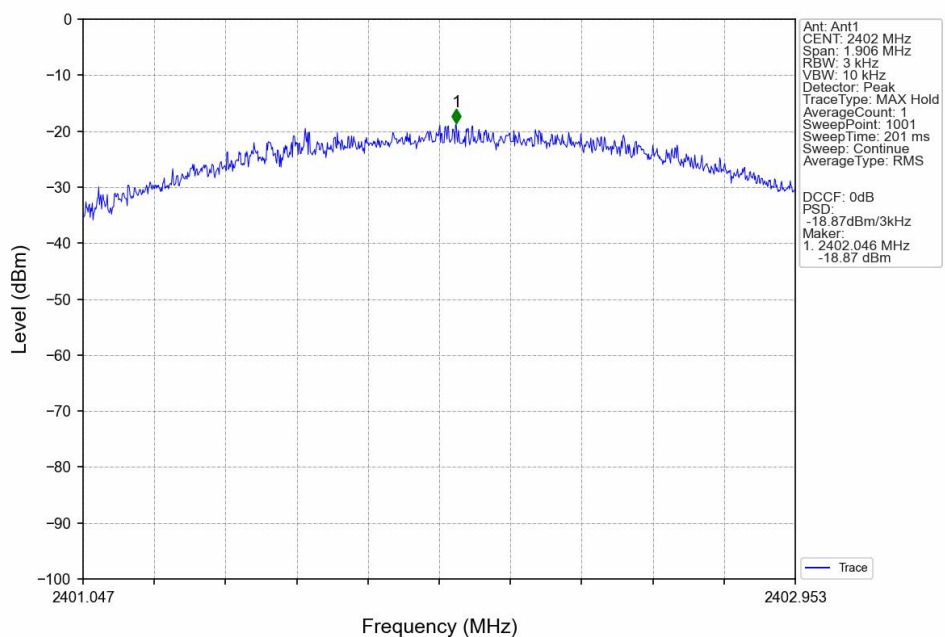
4.2.1 PSD

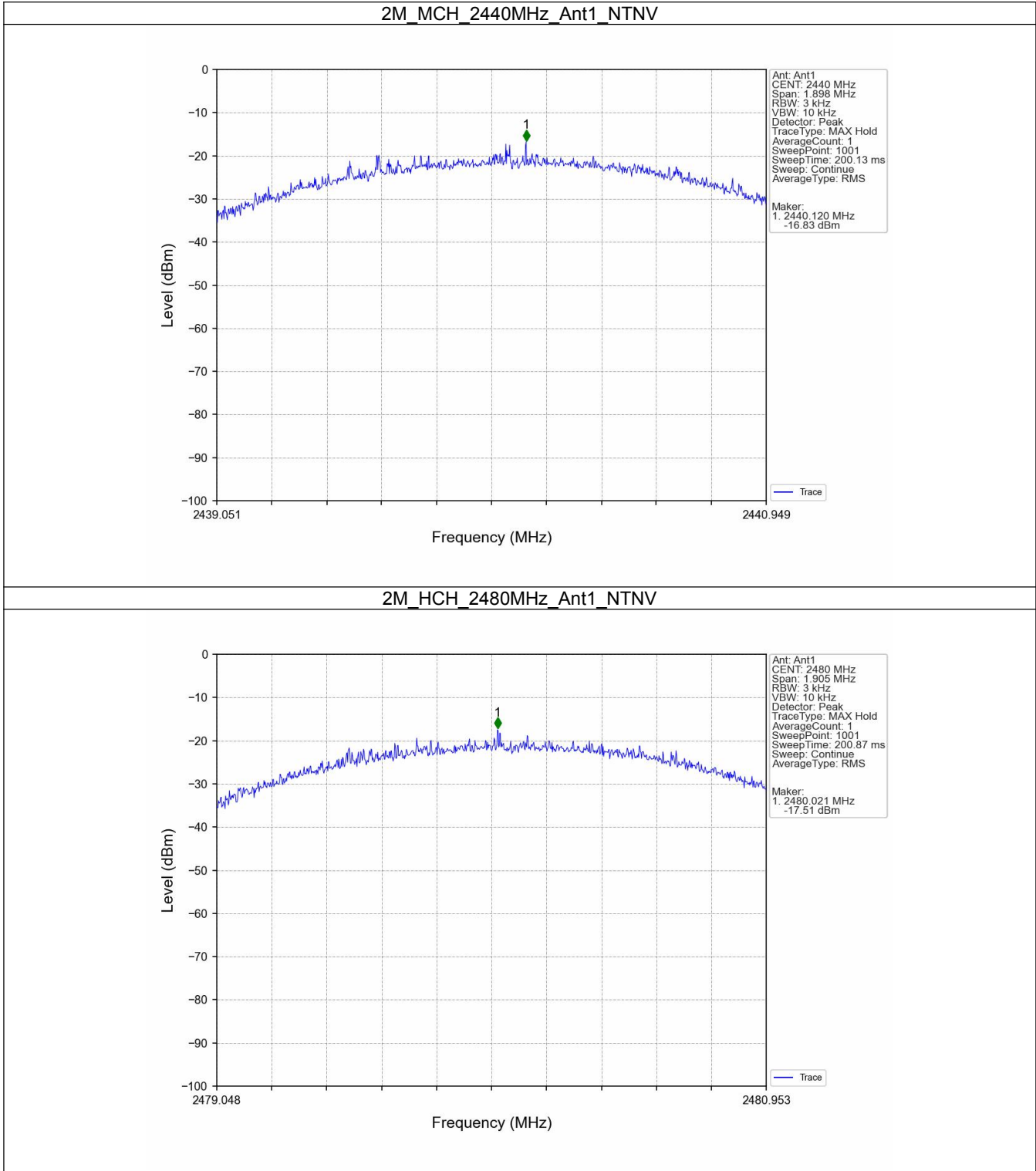


1M_HCH_2480MHz_Ant1_NTNV



2M_LCH_2402MHz_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	-0.17
		2440	1	0.13
		2480	1	0.18
2M	SISO	2402	1	-0.38
		2440	1	-0.28
		2480	1	-0.34

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.

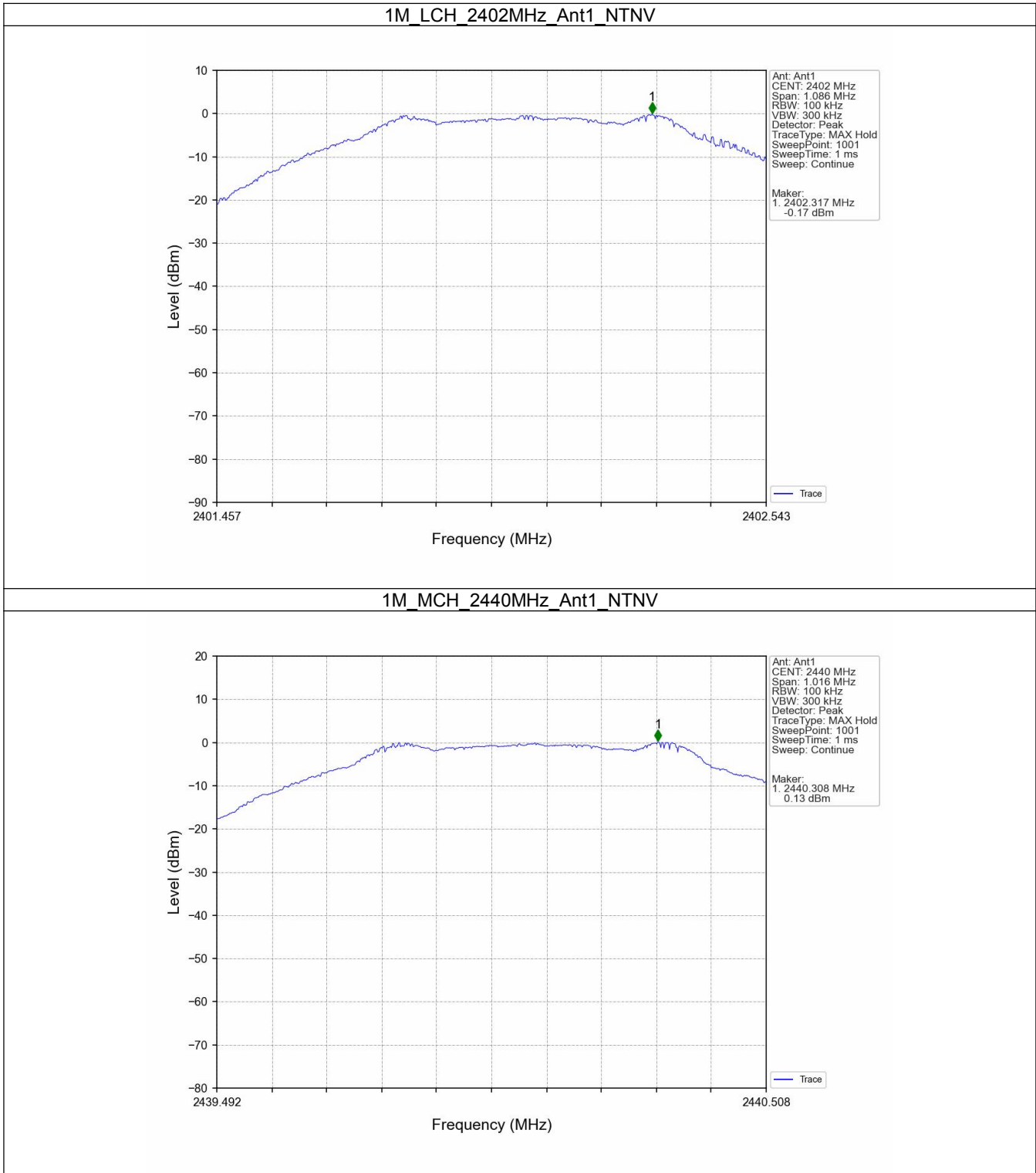
5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	0.18	-19.82	Pass
		2440	1	0.18	-19.82	Pass
		2480	1	0.18	-19.82	Pass
2M	SISO	2402	1	-0.28	-20.28	Pass
		2440	1	-0.28	-20.28	Pass
		2480	1	-0.28	-20.28	Pass

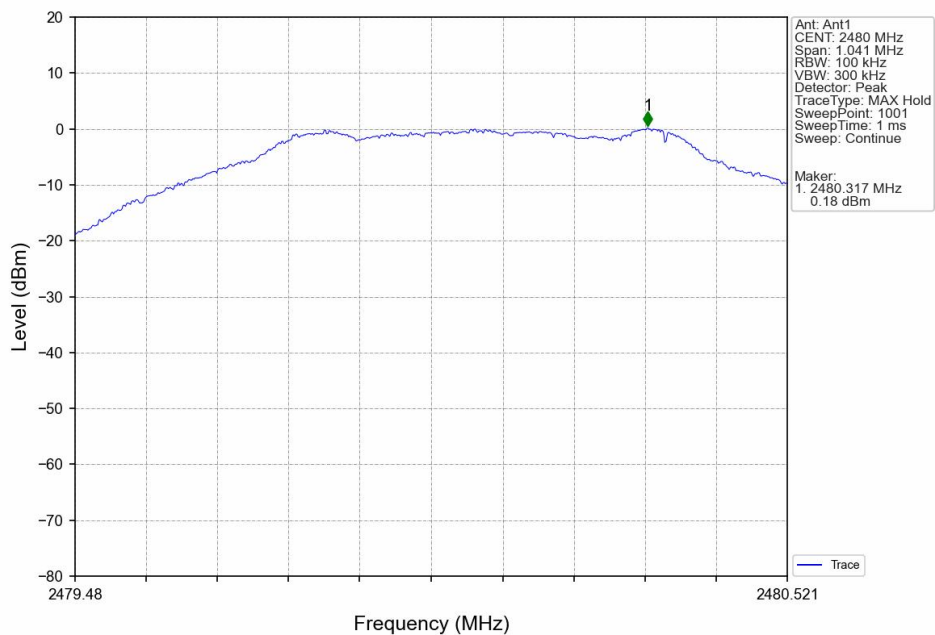
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

5.2 Test Graph

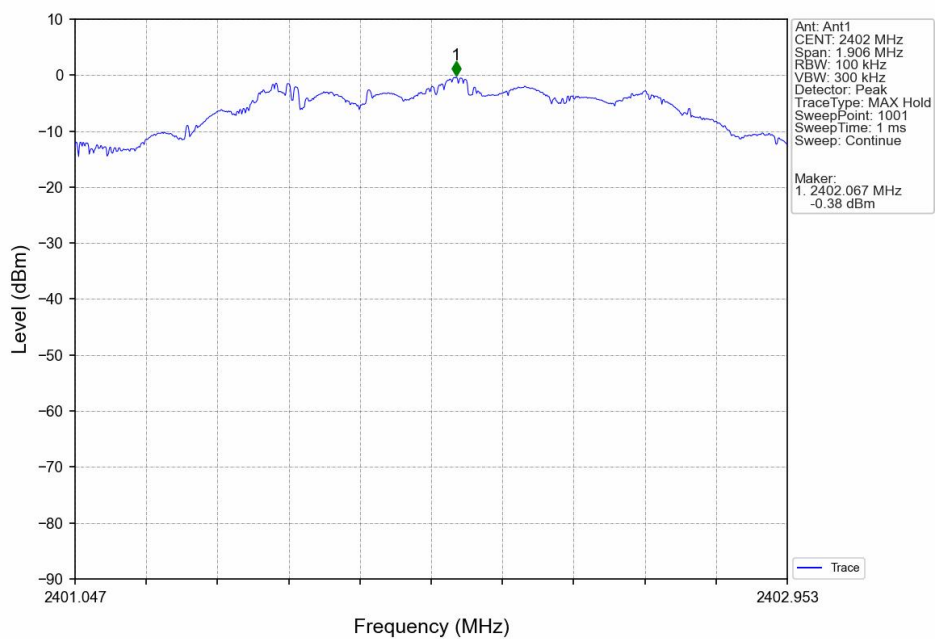
5.2.1 Ref

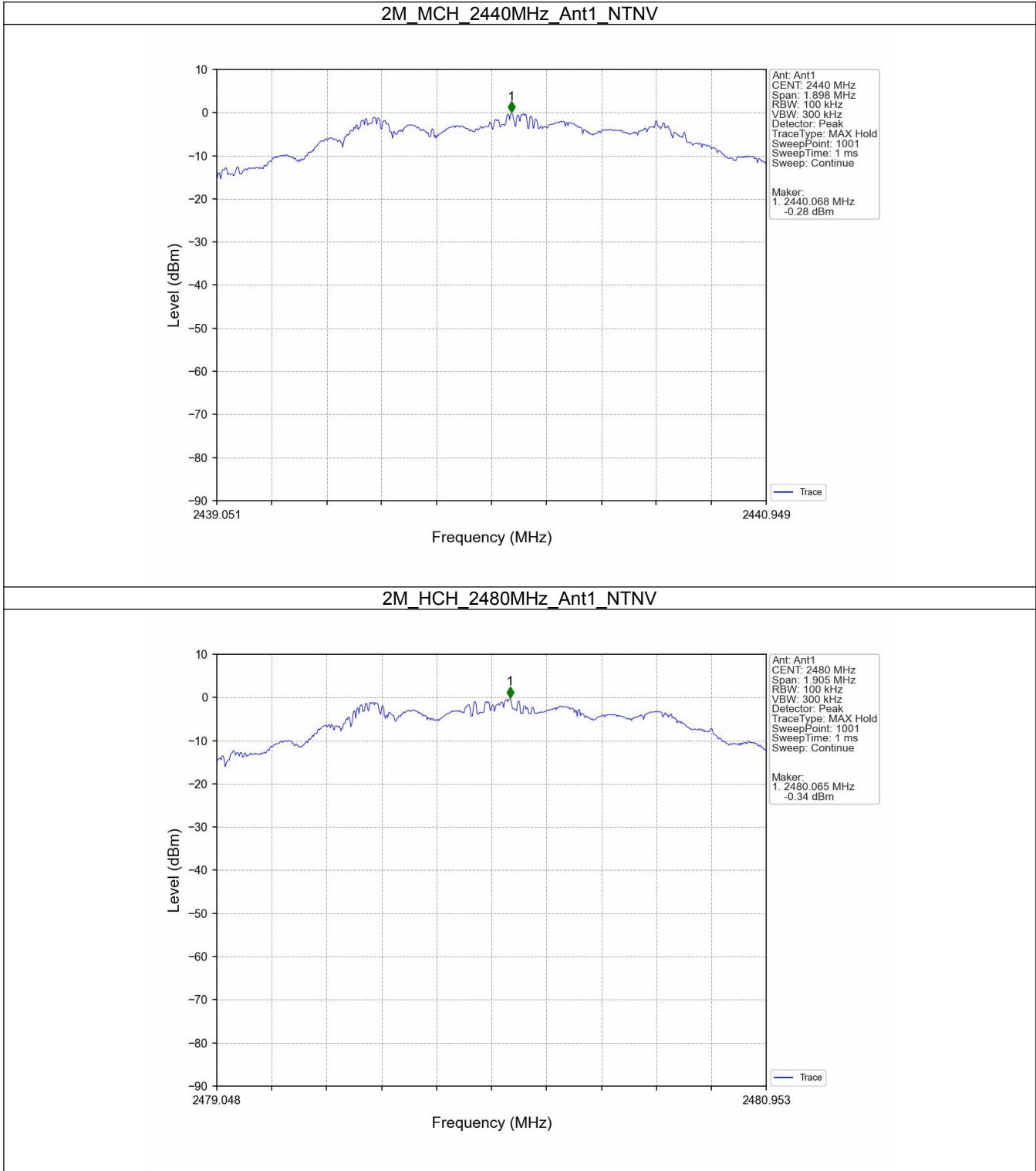


1M_HCH_2480MHz_Ant1_NTNV

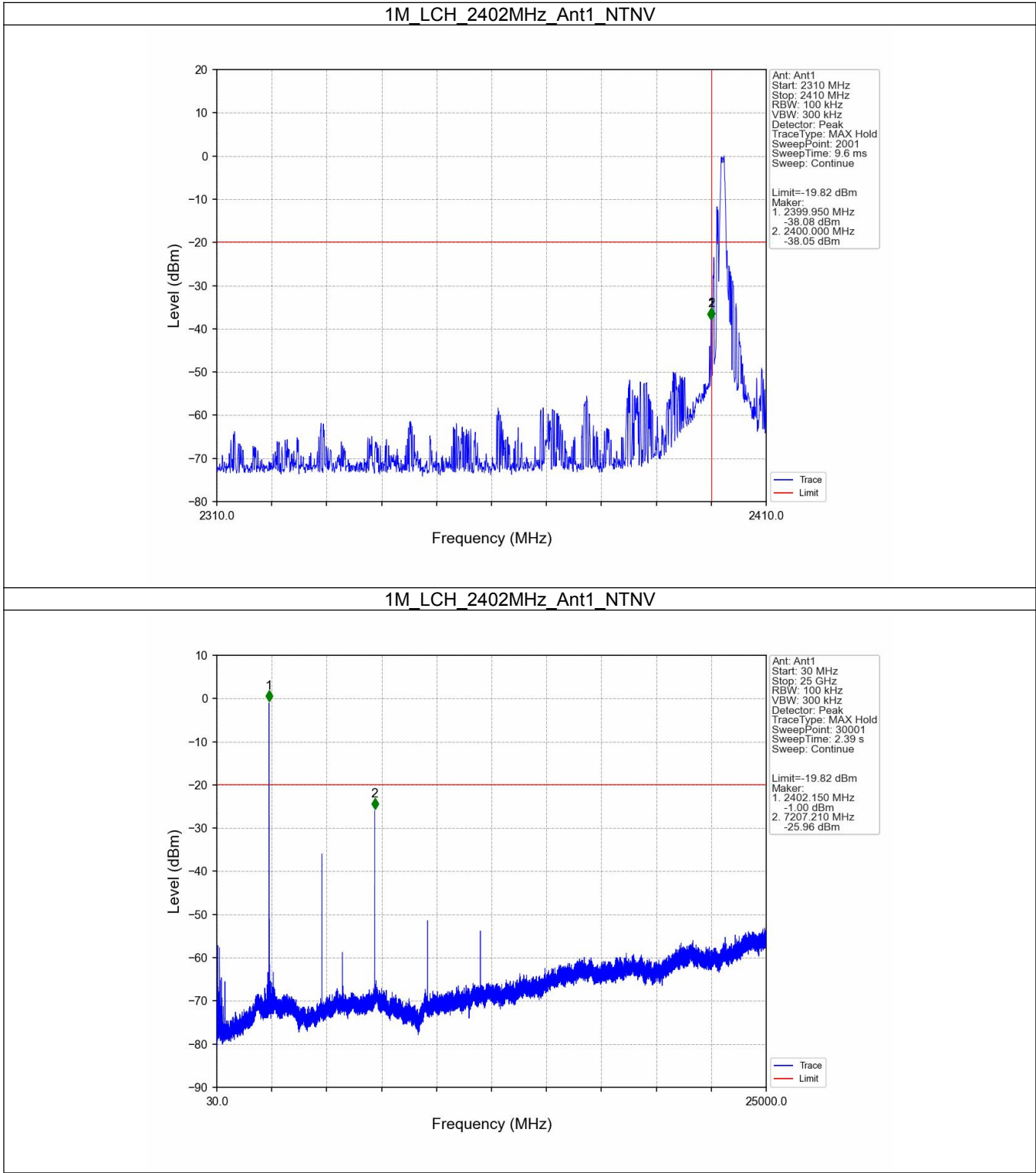


2M_LCH_2402MHz_Ant1_NTNV

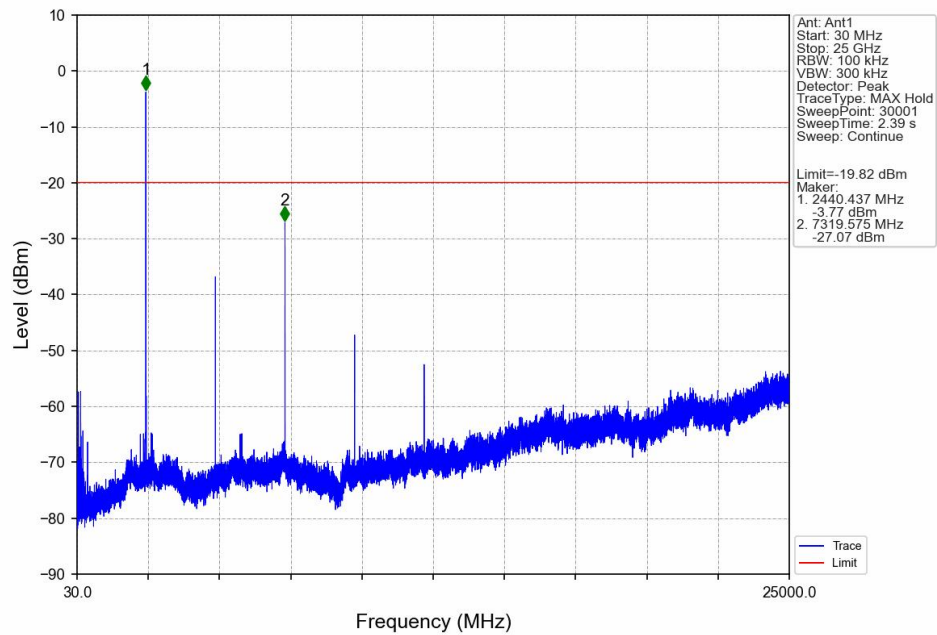




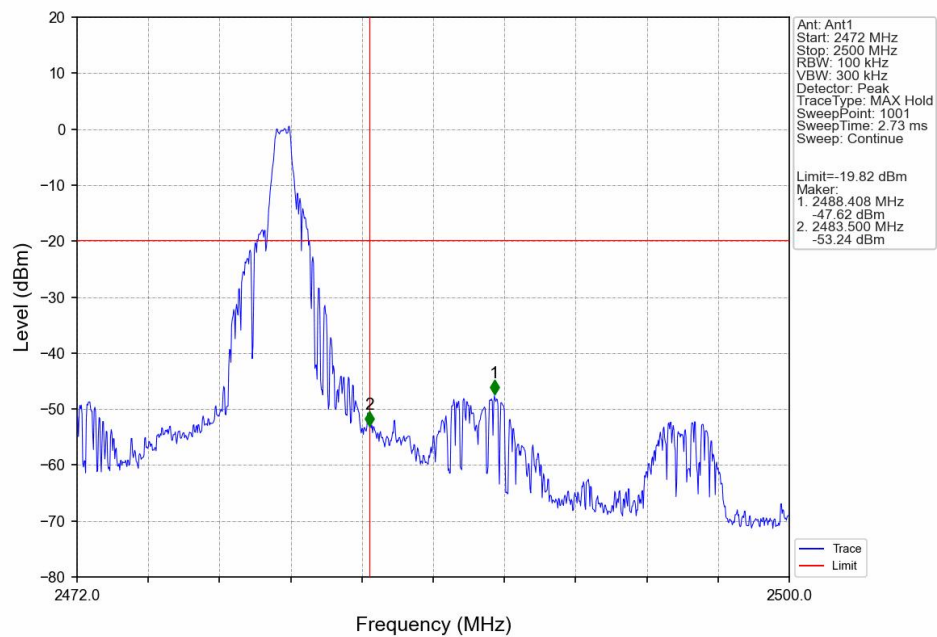
5.2.2 CSE

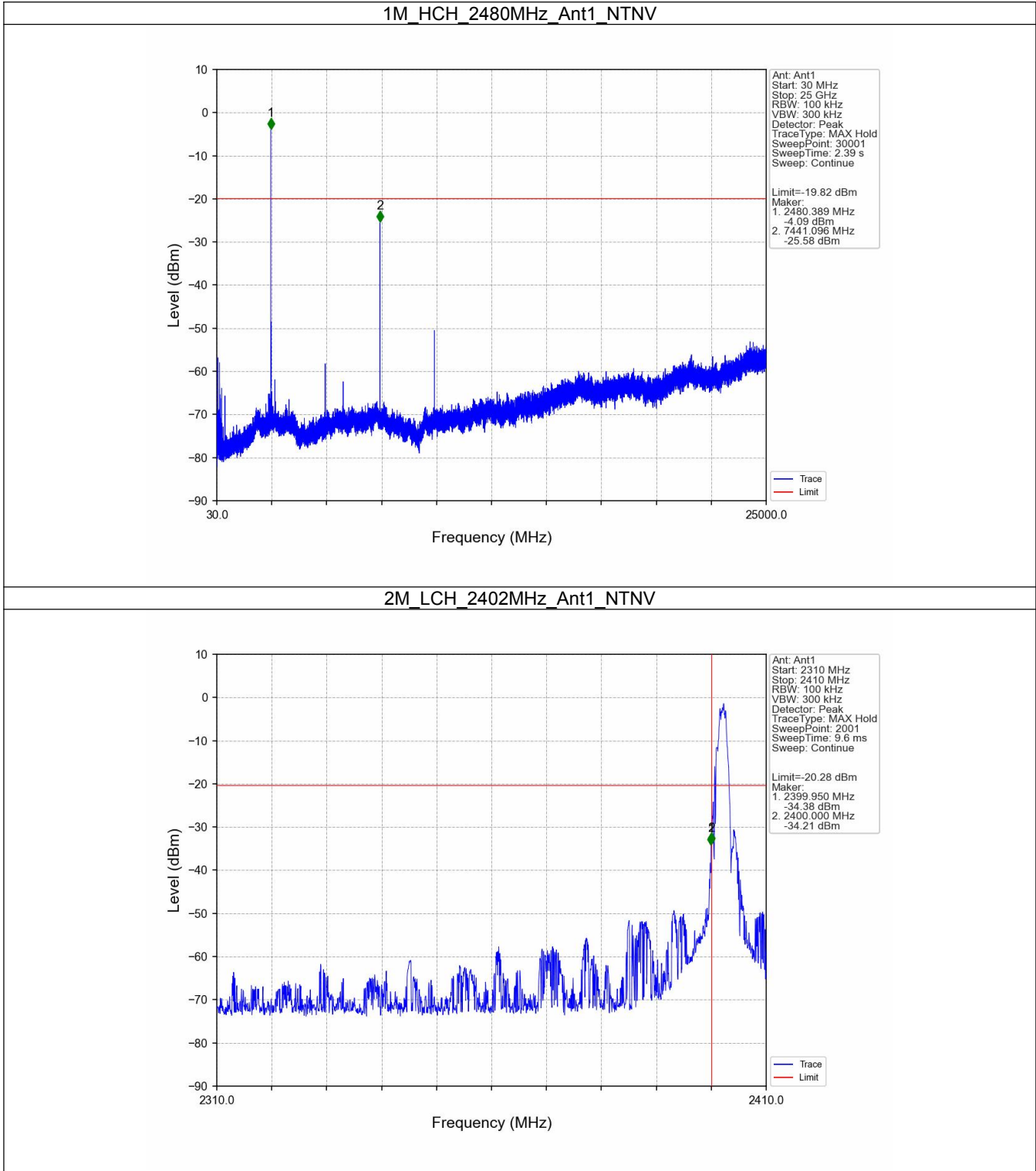


1M_MCH_2440MHz_Ant1_NTNV

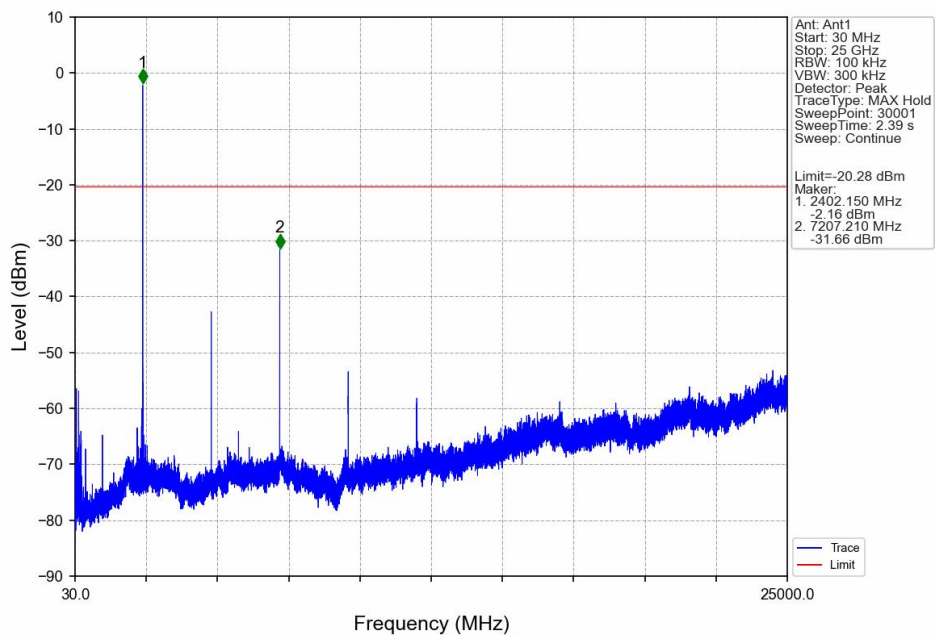


1M_HCH_2480MHz_Ant1_NTNV





2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV

