



Shenzhen CTL Testing Technology Co., Ltd.

Unit 01A&B&C&D-1, Building A3, Guangming Sci-Tech Park, Guan Guang Road,
Fenghuang Subdistrict, Guangming District, Shenzhen, Guangdong, China
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

Annex for Bluetooth low energy

Test Report No.: CTL2604152051-WF02

Content

Annex for Bluetooth low energy	1
Test Report No.: CTL2604152051-WF02	1
1. Duty Cycle	4
1.1 Test Result	4
1.1.1 Ant1	4
1.2 Test Graph	5
1.2.1 Ant1	5
2. Bandwidth	8
2.1 Test Result	8
2.1.1 OBW	8
2.1.2 6dB BW	8
2.2 Test Graph	9
2.2.1 OBW	9
2.2.2 6dB BW	12
3. Maximum Conducted Output Power	15
3.1 Test Result	15
3.1.1 Power	15
3.2 Test Graph	16
3.2.1 Power	16
4. Maximum Power Spectral Density	19
4.1 Test Result	19
4.1.1 PSD	19
4.2 Test Graph	20
4.2.1 PSD	20

FCC ID: 2A94J-CP025

5. Unwanted Emissions In Non-restricted Frequency Bands	23
5.1 Test Result	23
5.1.1 Ref	23
5.1.2 CSE	23
5.2 Test Graph	24
5.2.1 Ref	24
5.2.2 CSE	27

FCC ID: 2A94J-CP025

1. Duty Cycle

1.1 Test Result

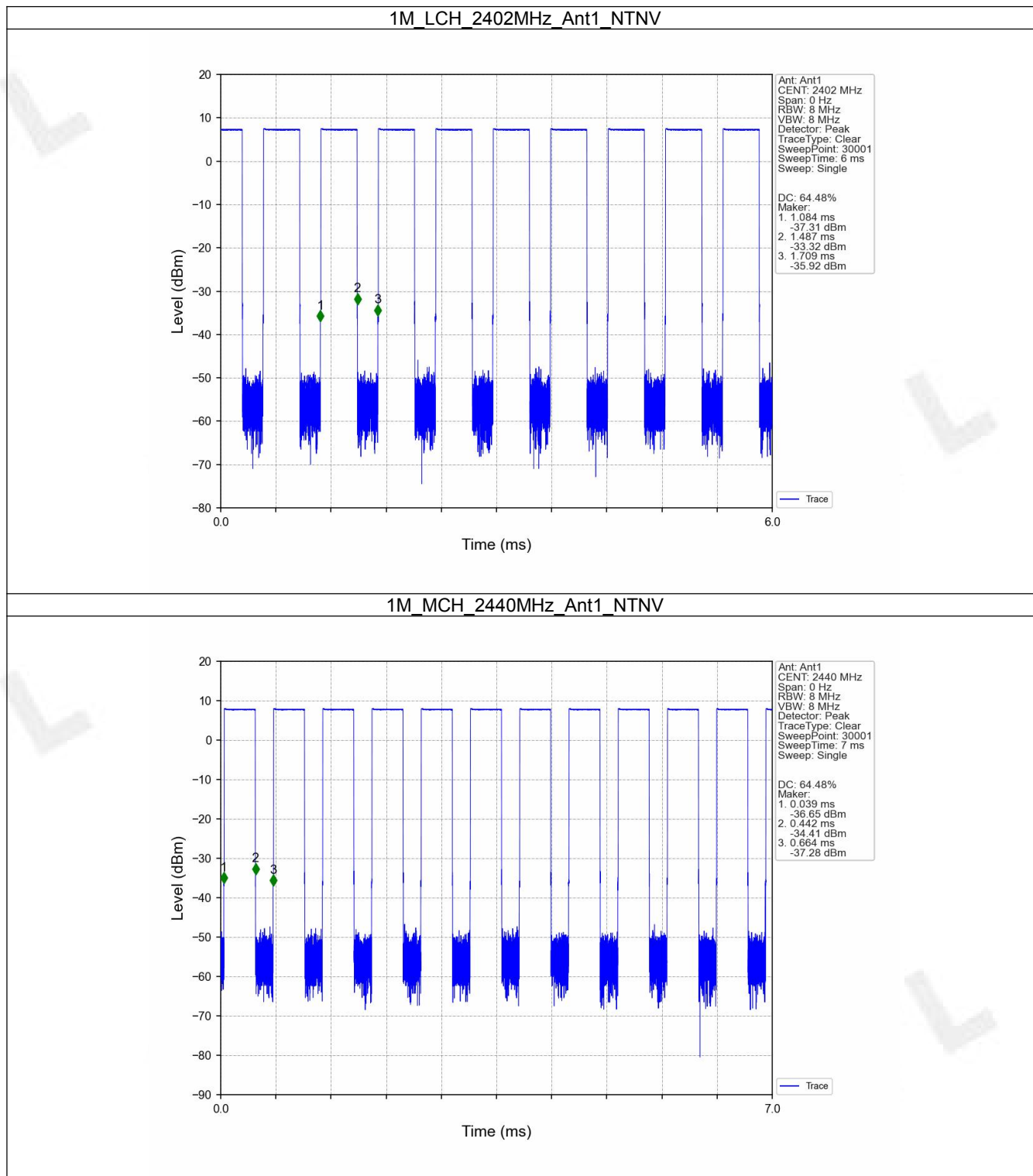
1.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1M	SISO	2402	0.403	0.625	64.48	1.91	0.03
		2440	0.403	0.625	64.48	1.91	0.05
		2480	0.403	0.625	64.48	1.91	0.00
2M	SISO	2402	1.154	2.500	46.16	3.36	0.03
		2440	1.155	2.500	46.20	3.35	0.03
		2480	1.154	2.499	46.18	3.36	0.03

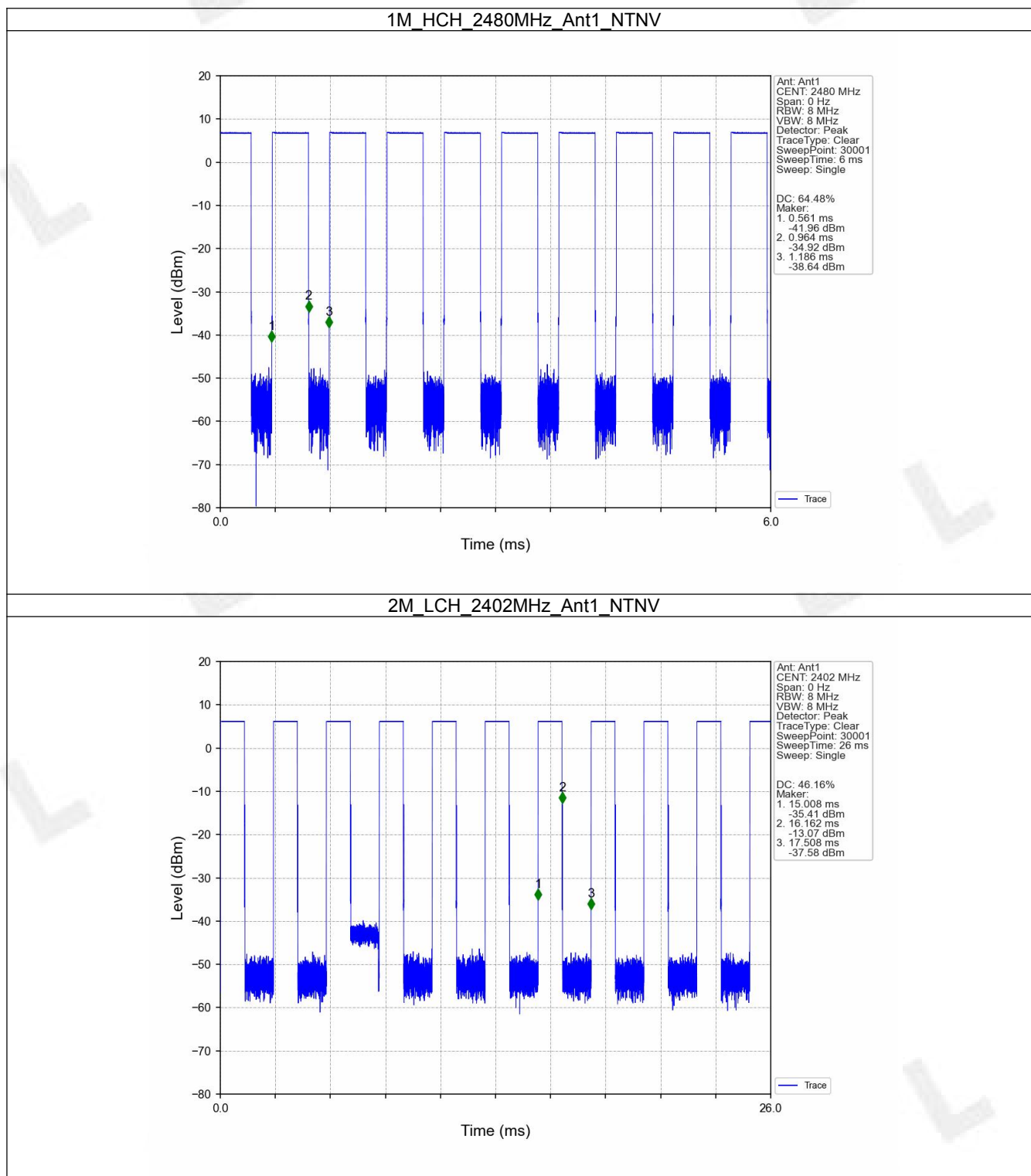
FCC ID: 2A94J-CP025

1.2 Test Graph

1.2.1 Ant1

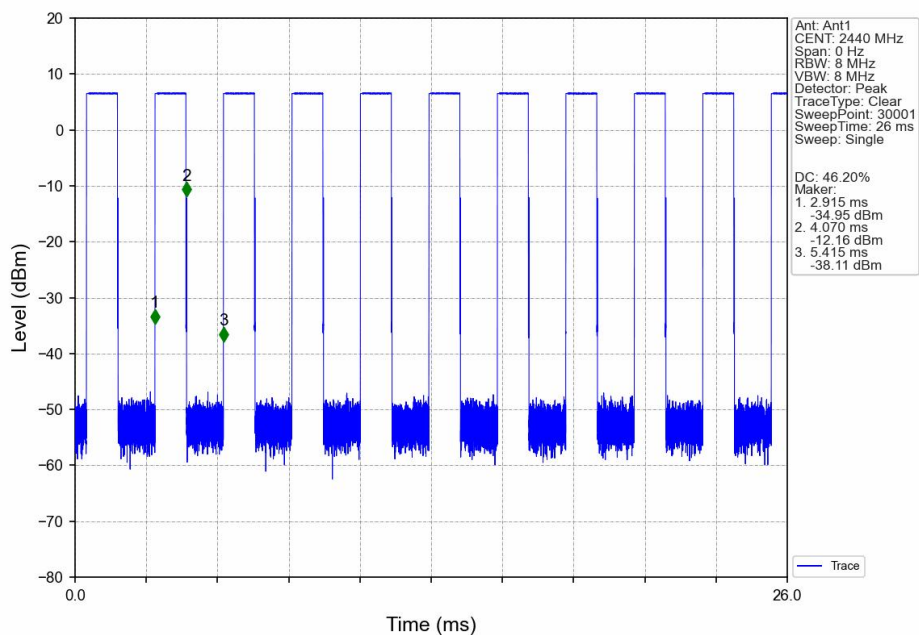


FCC ID: 2A94J-CP025

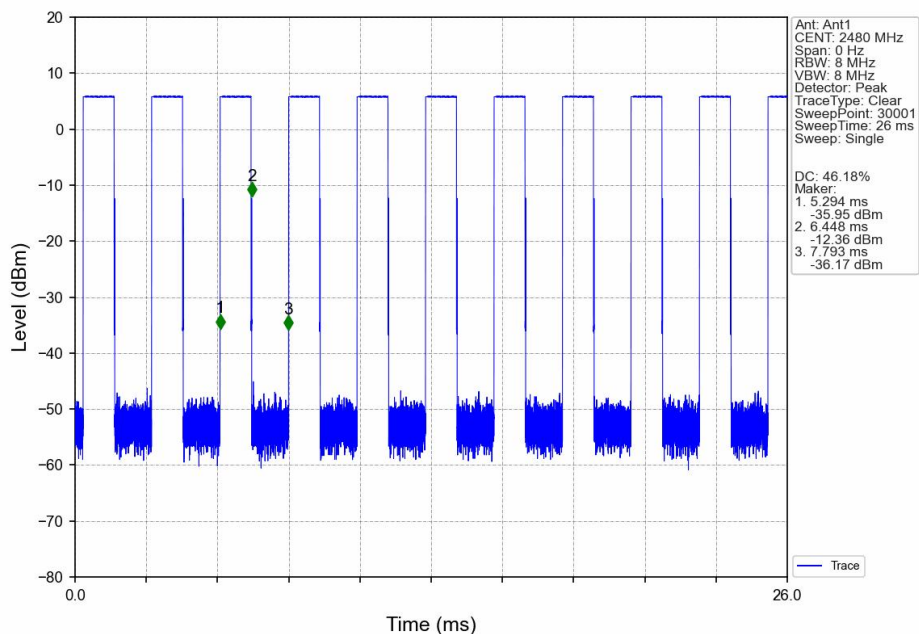


FCC ID: 2A94J-CP025

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	1.025	/	Pass
		2440	1	1.036	/	Pass
		2480	1	1.025	/	Pass
2M	SISO	2402	1	2.000	/	Pass
		2440	1	2.008	/	Pass
		2480	1	1.996	/	Pass

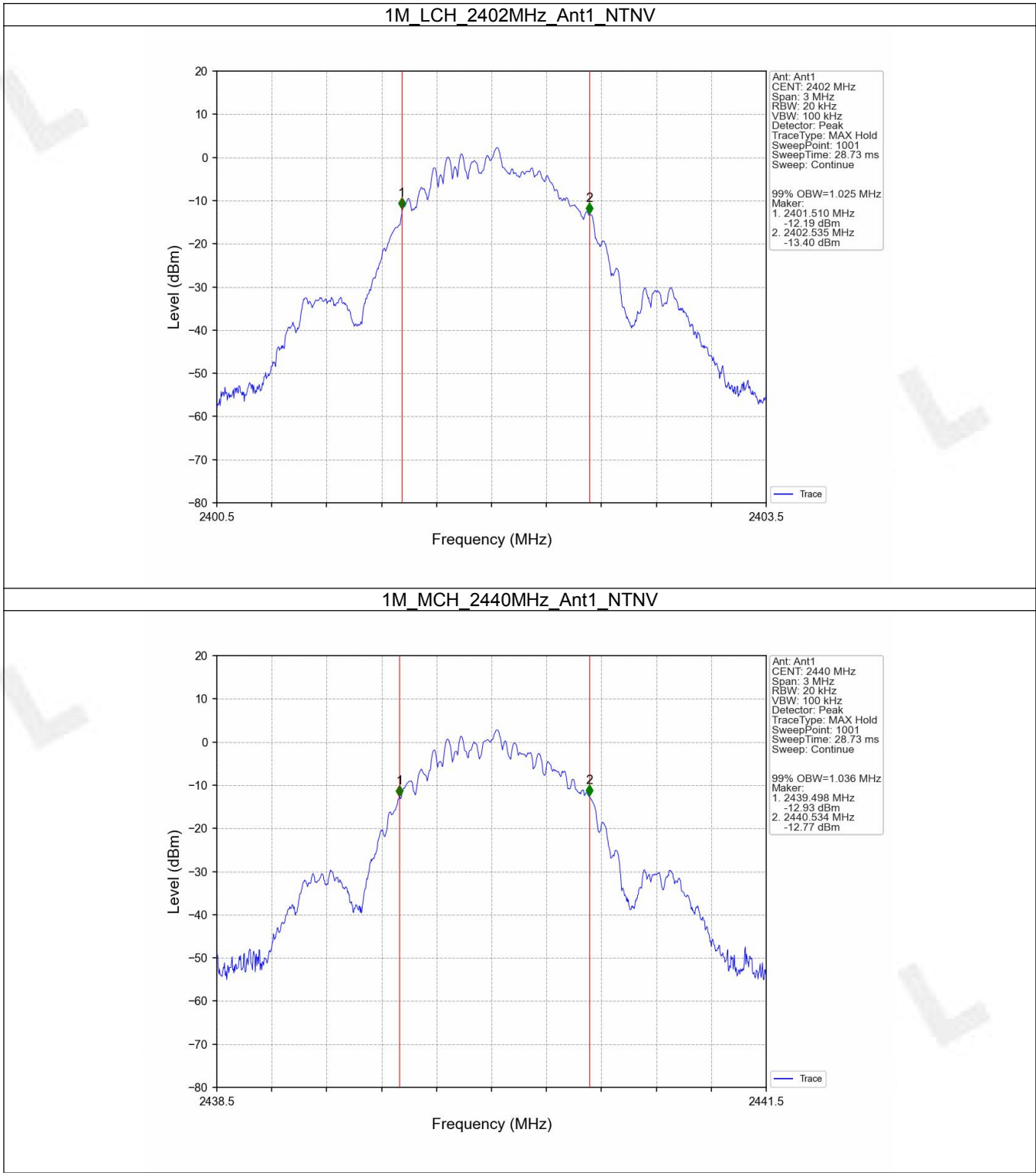
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.663	≥ 0.5	Pass
		2440	1	0.668	≥ 0.5	Pass
		2480	1	0.663	≥ 0.5	Pass
2M	SISO	2402	1	1.153	≥ 0.5	Pass
		2440	1	1.136	≥ 0.5	Pass
		2480	1	1.158	≥ 0.5	Pass

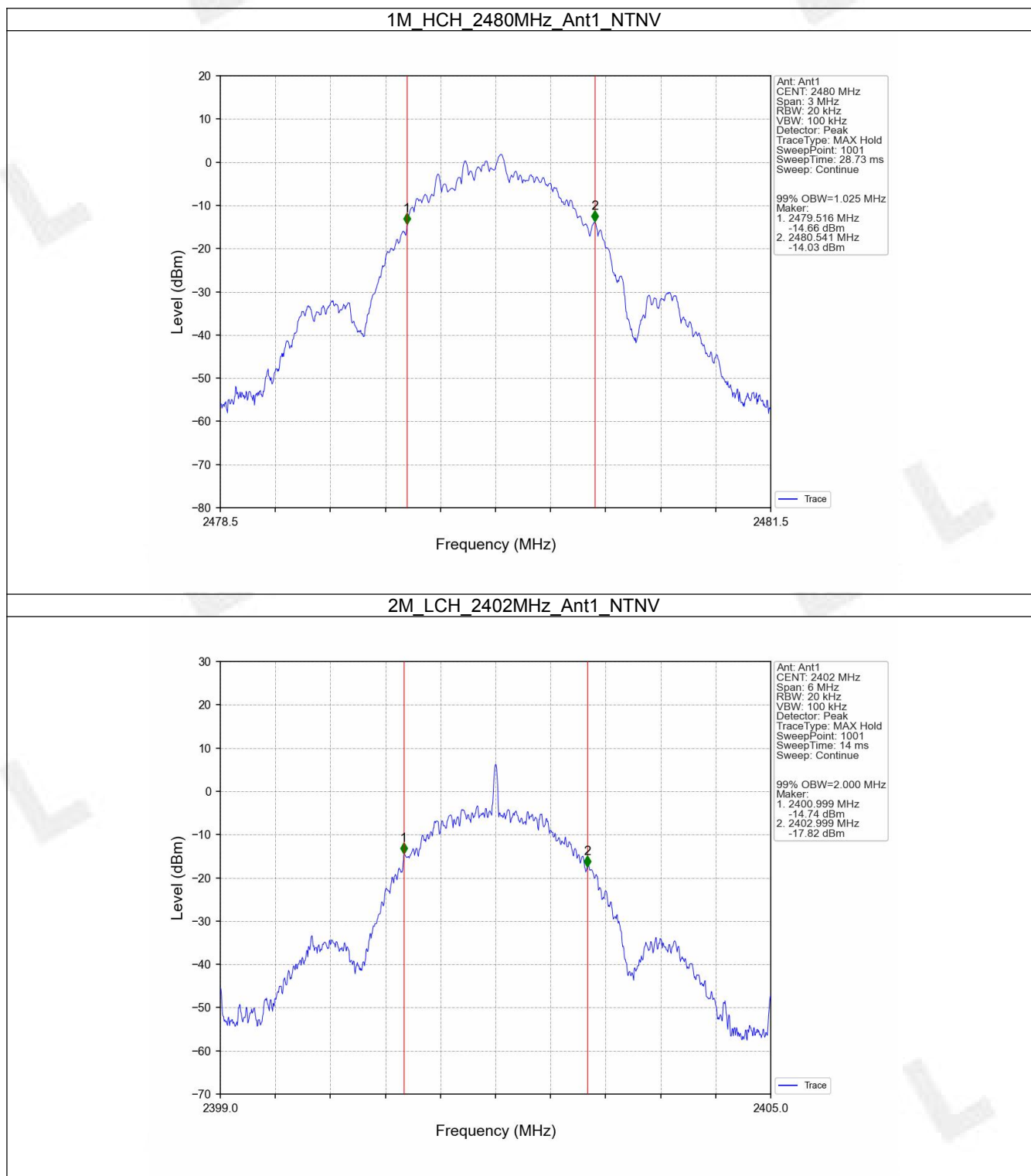
FCC ID: 2A94J-CP025

2.2 Test Graph

2.2.1 OBW

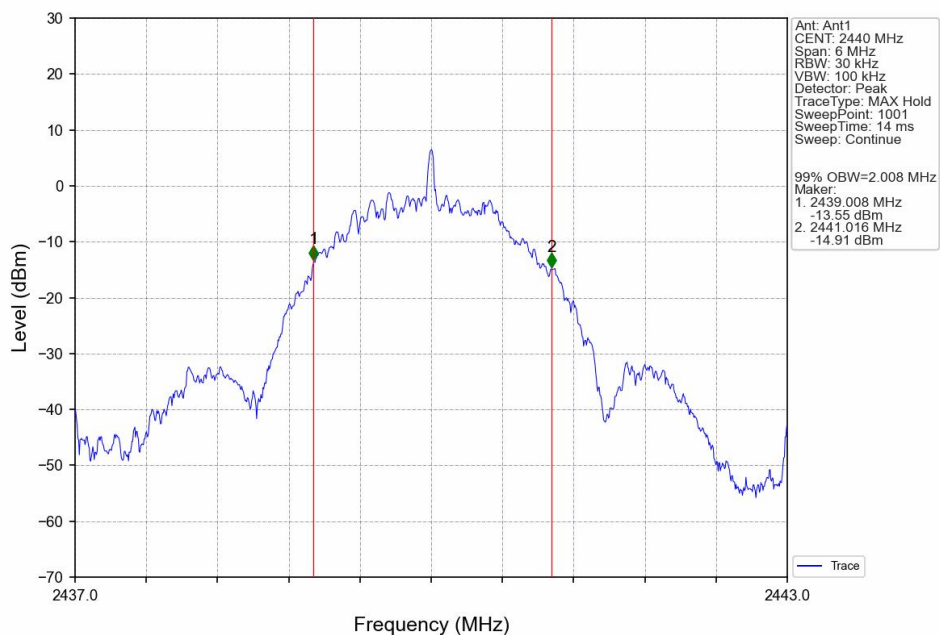


FCC ID: 2A94J-CP025

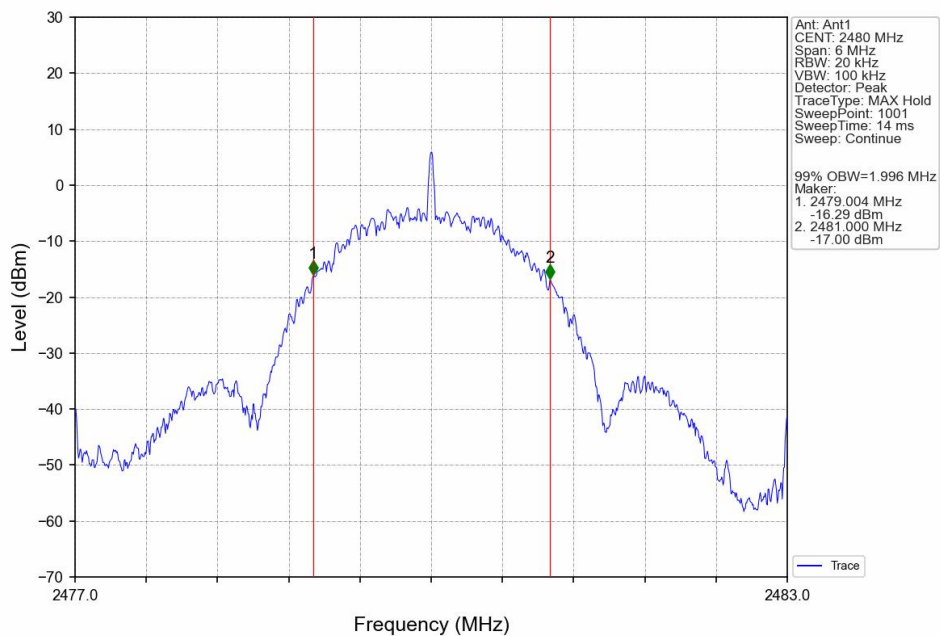


FCC ID: 2A94J-CP025

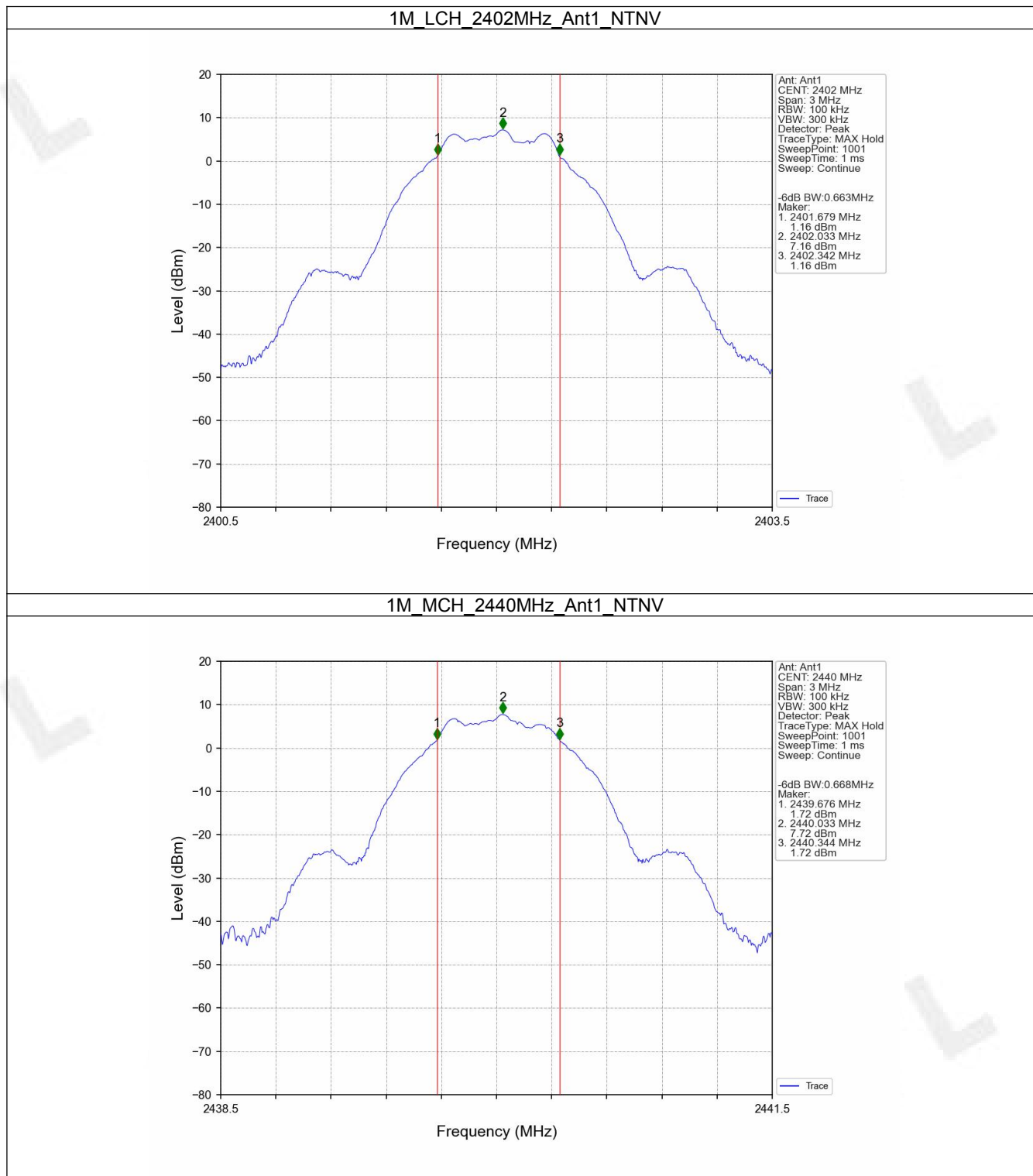
2M_MCH_2440MHz_Ant1_NTNV



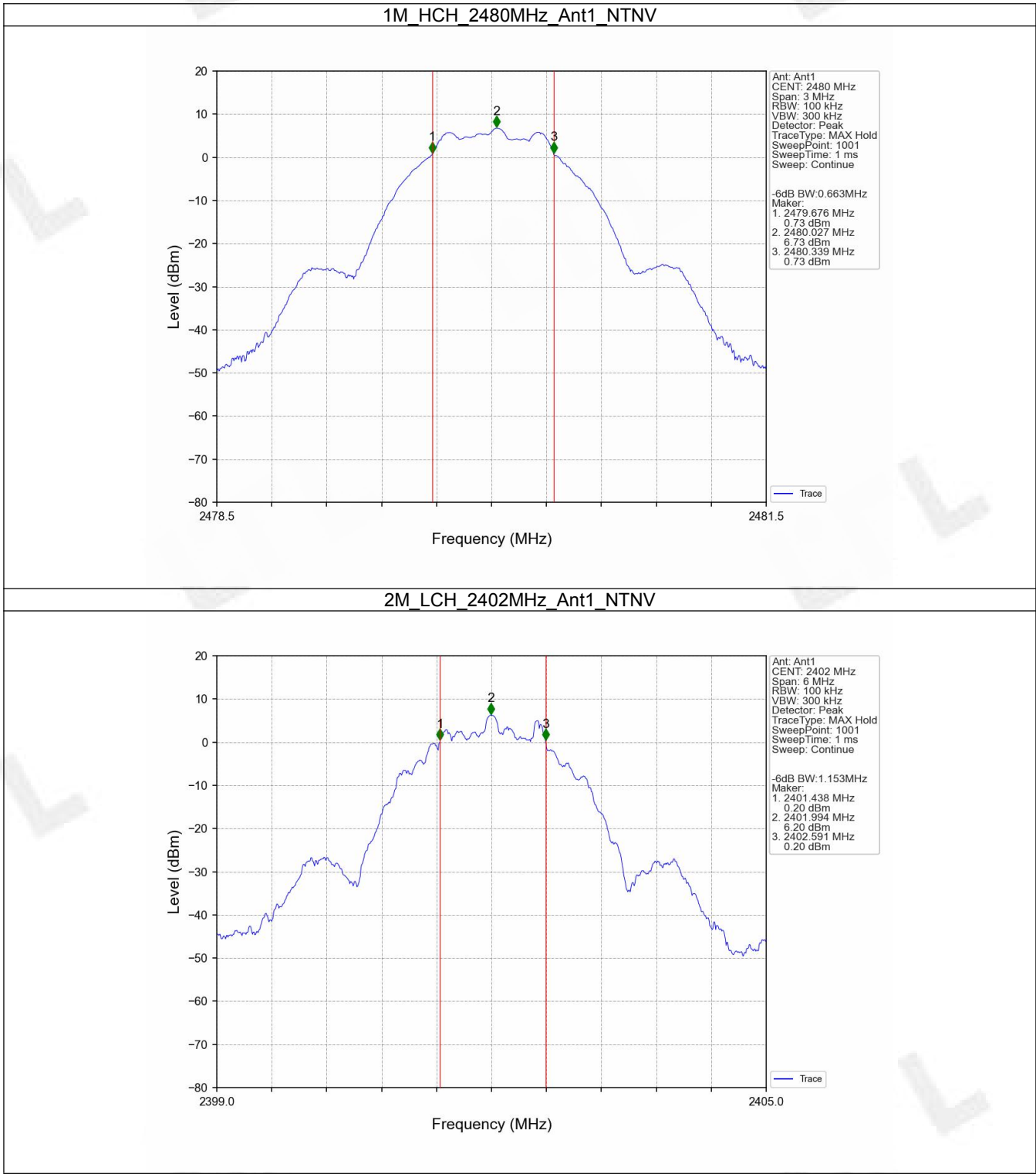
2M_HCH_2480MHz_Ant1_NTNV



FCC ID: 2A94J-CP025

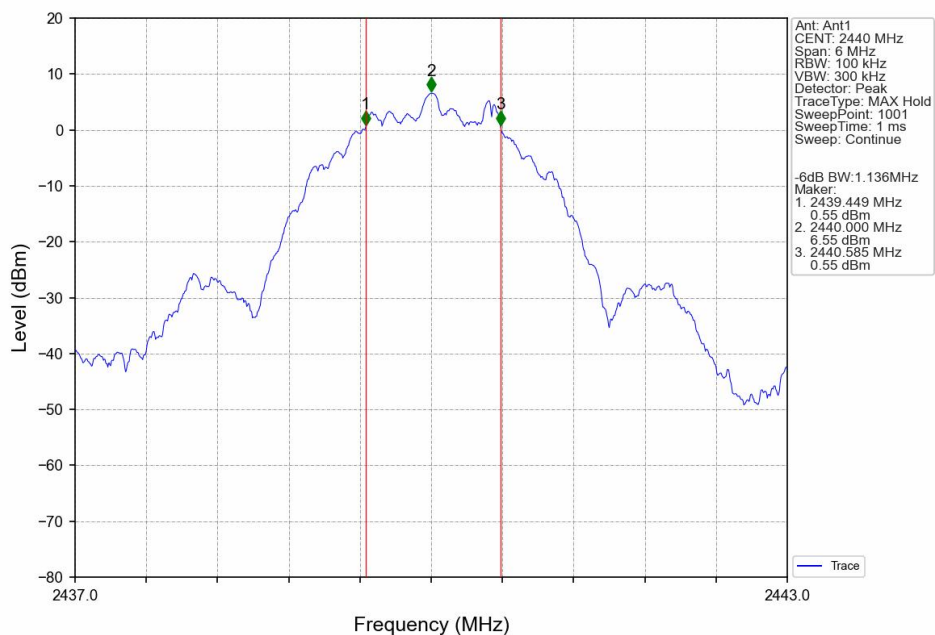
2.2.2 6dB BW

FCC ID: 2A94J-CP025

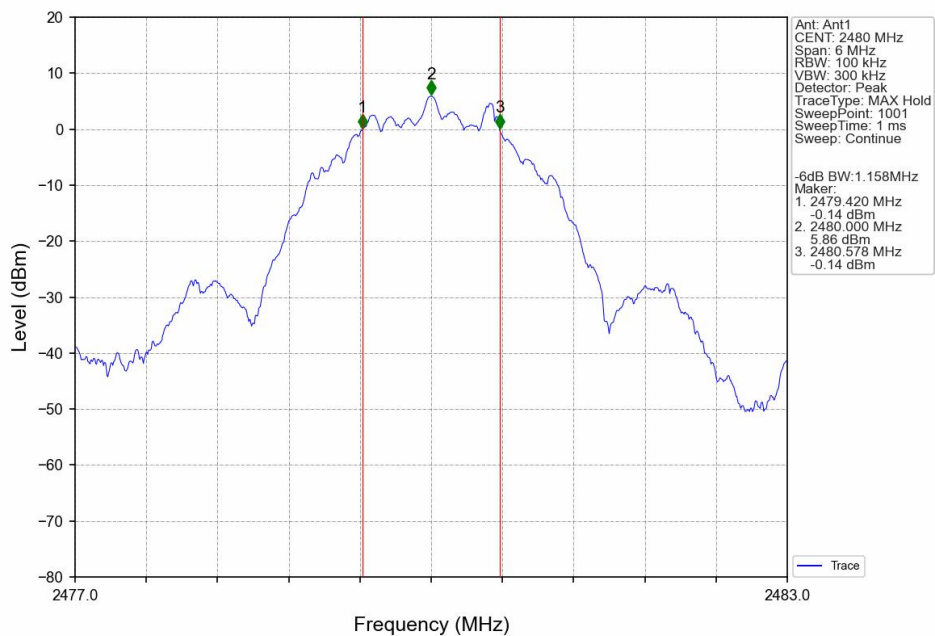


FCC ID: 2A94J-CP025

2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



3. Maximum Conducted Output Power

3.1 Test Result

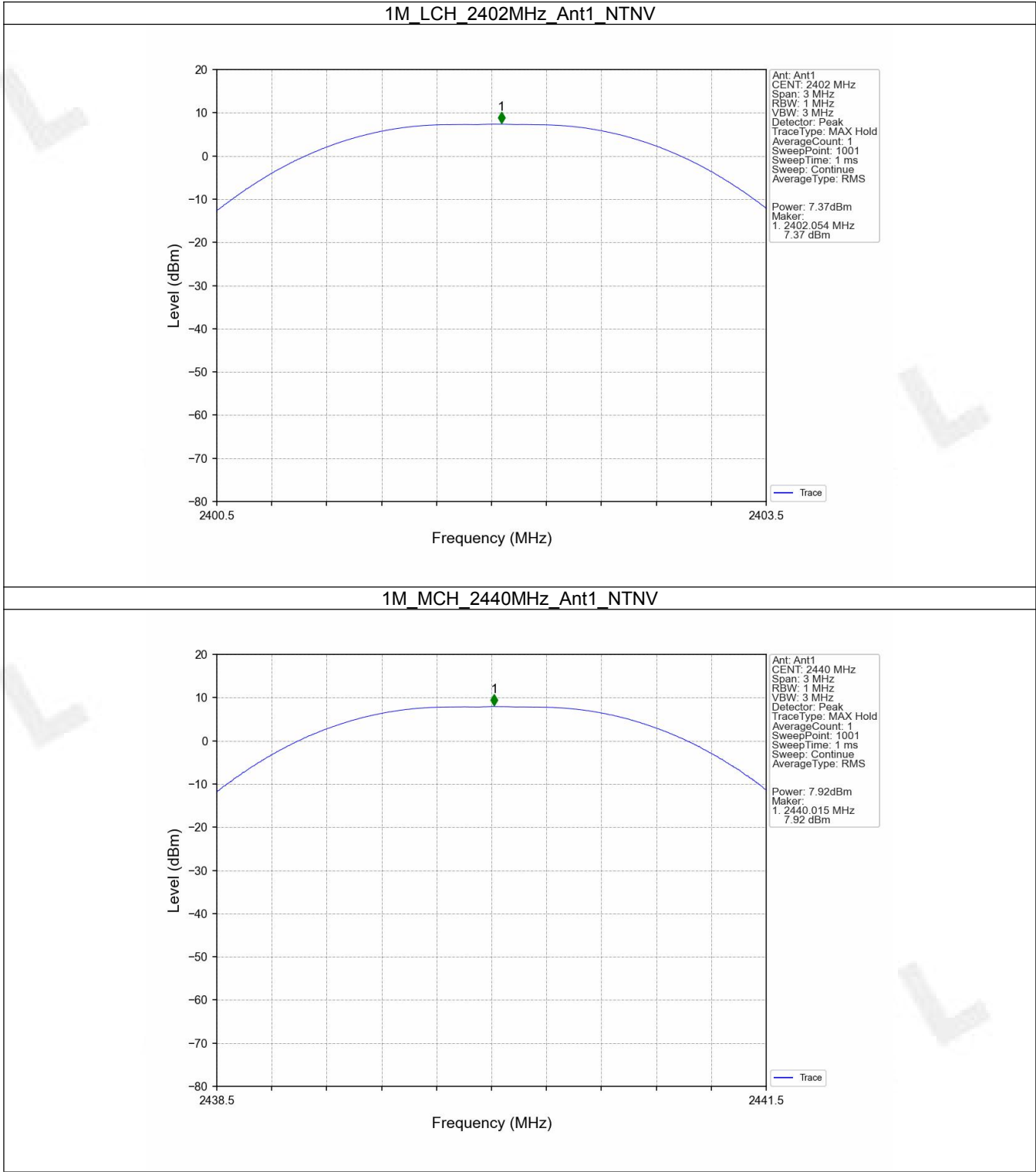
3.1.1 Power

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	7.37	<=30	Pass
		2440	7.92	<=30	Pass
		2480	6.92	<=30	Pass
2M	SISO	2402	6.24	<=30	Pass
		2440	6.59	<=30	Pass
		2480	5.88	<=30	Pass
Note1: Antenna Gain: Ant1: -3.68dBi; Note2: RF Cable loss=0.5dB Note3: The test results include RF Cable loss.					

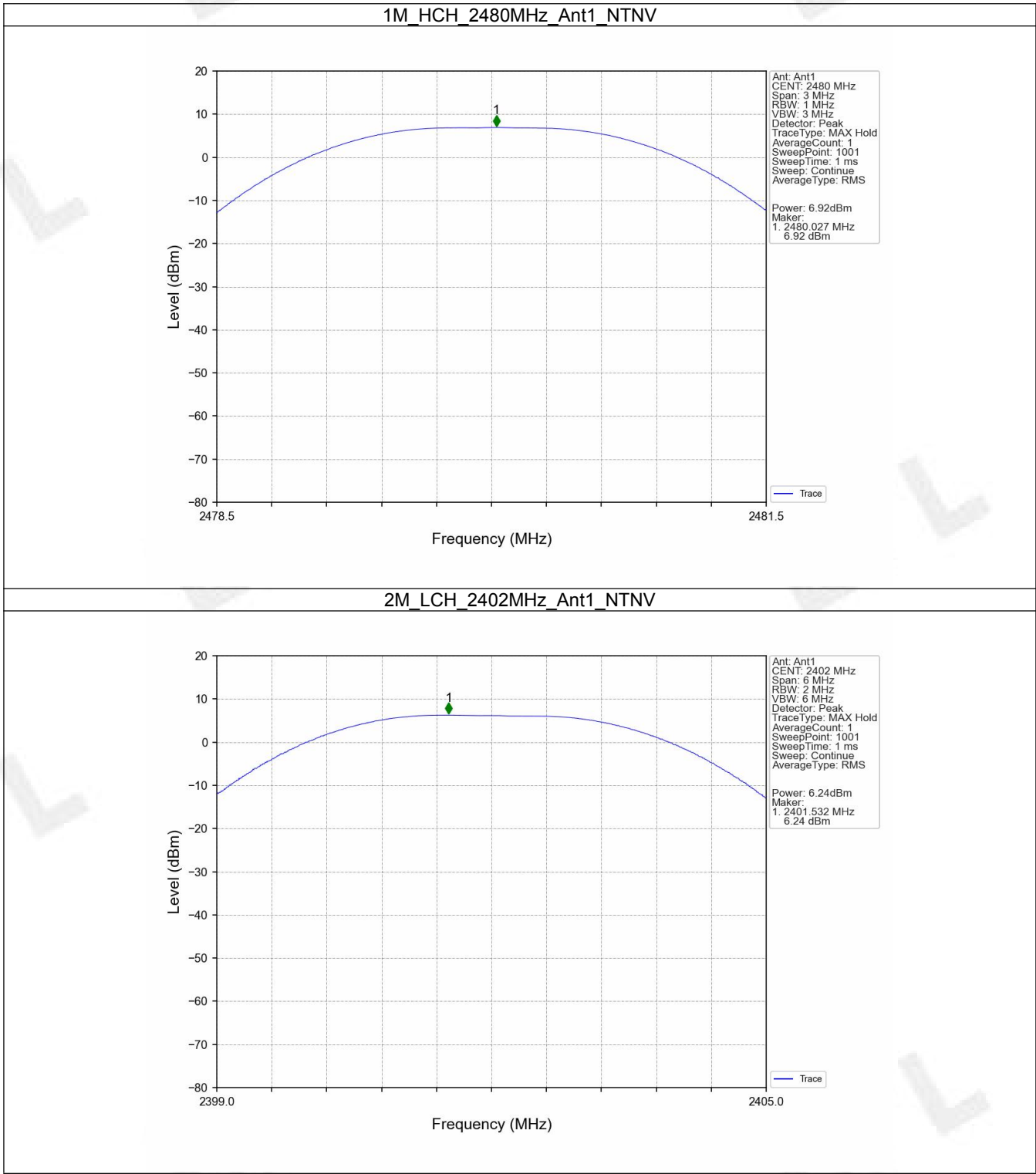
FCC ID: 2A94J-CP025

3.2 Test Graph

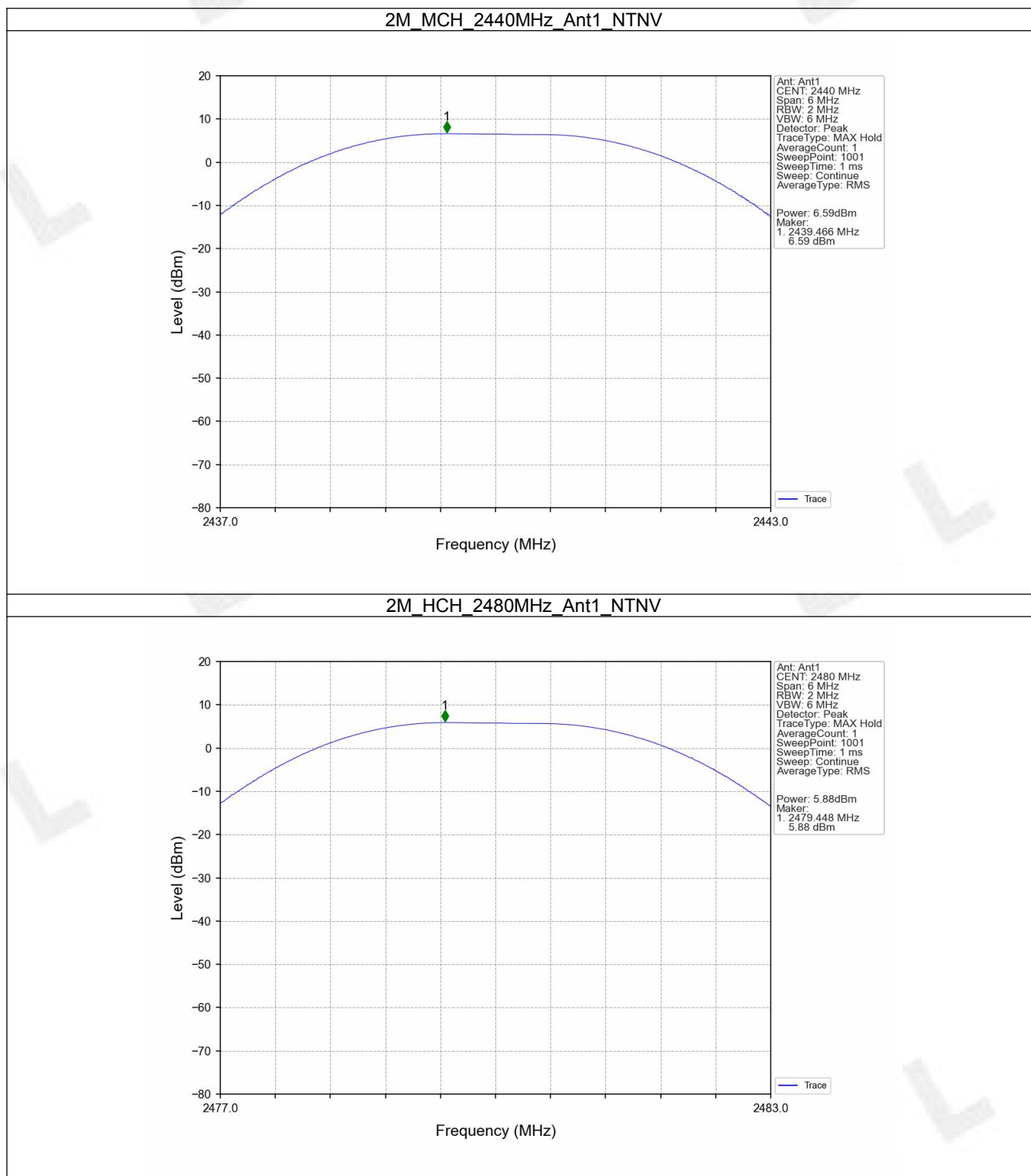
3.2.1 Power



FCC ID: 2A94J-CP025



FCC ID: 2A94J-CP025



4. Maximum Power Spectral Density

4.1 Test Result

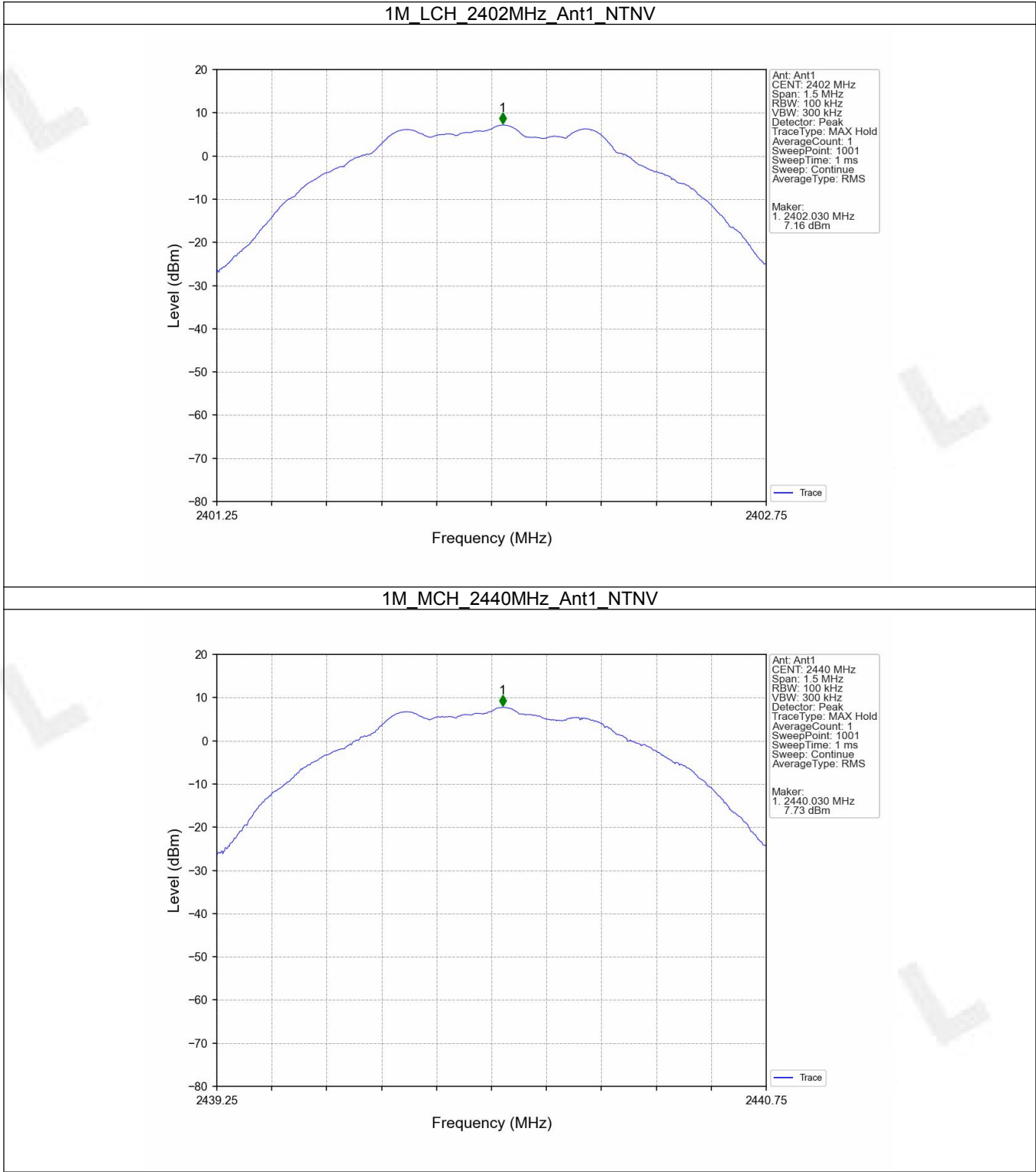
4.1.1 PSD

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm)		Verdict
			ANT1	Limit(dBm/3kHz)	
1M	SISO	2402	7.16dBm/100kHz	<=8	Pass
		2440	7.73dBm/100kHz	<=8	Pass
		2480	6.73dBm/100kHz	<=8	Pass
2M	SISO	2402	6.14dBm/100kHz	<=8	Pass
		2440	6.48dBm/100kHz	<=8	Pass
		2480	5.77dBm/100kHz	<=8	Pass
Note1: Antenna Gain: Ant1: -3.68dBi; Note2: RF Cable loss=0.5dB Note3: The test results include RF Cable loss.					

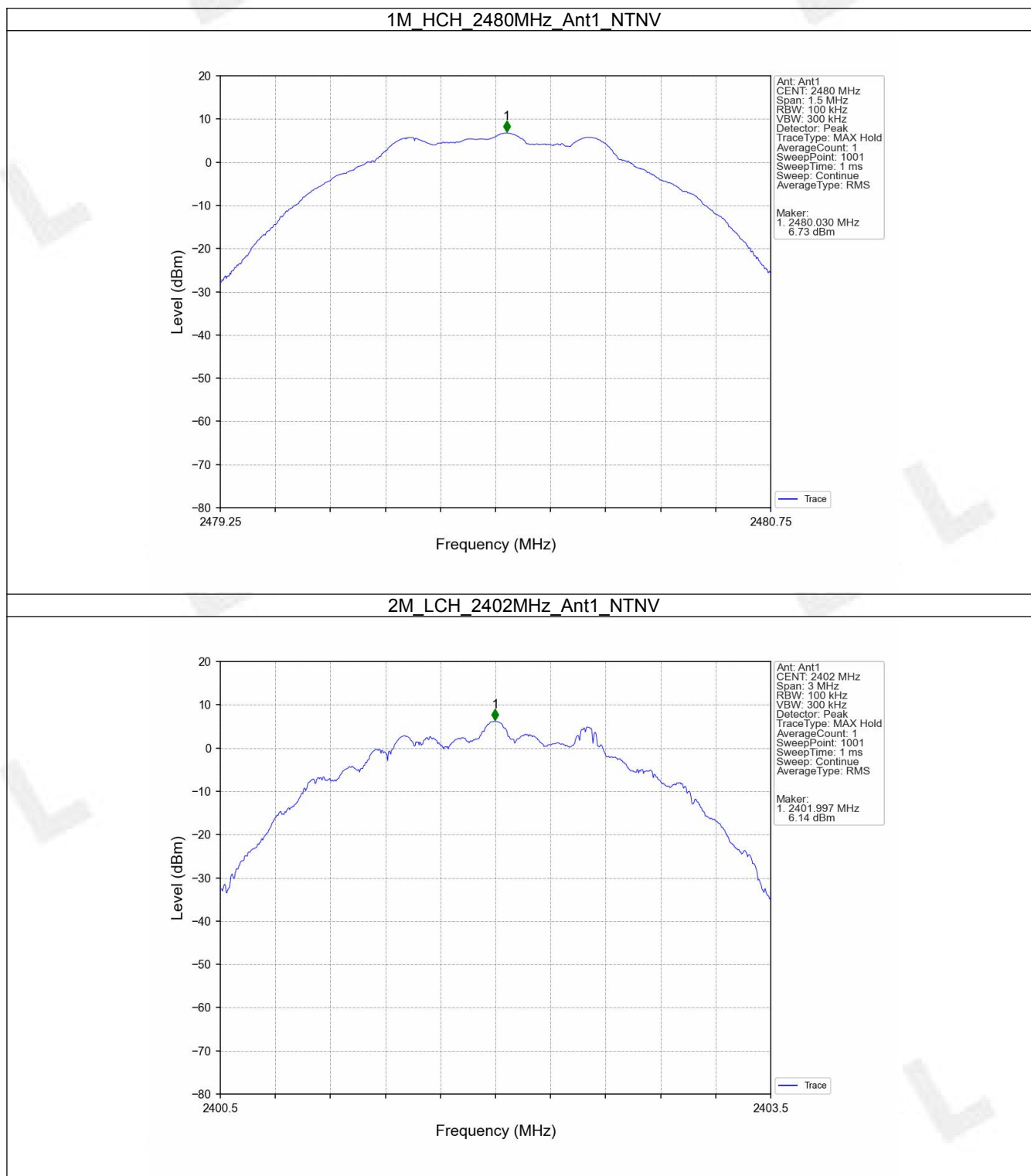
FCC ID: 2A94J-CP025

4.2 Test Graph

4.2.1 PSD

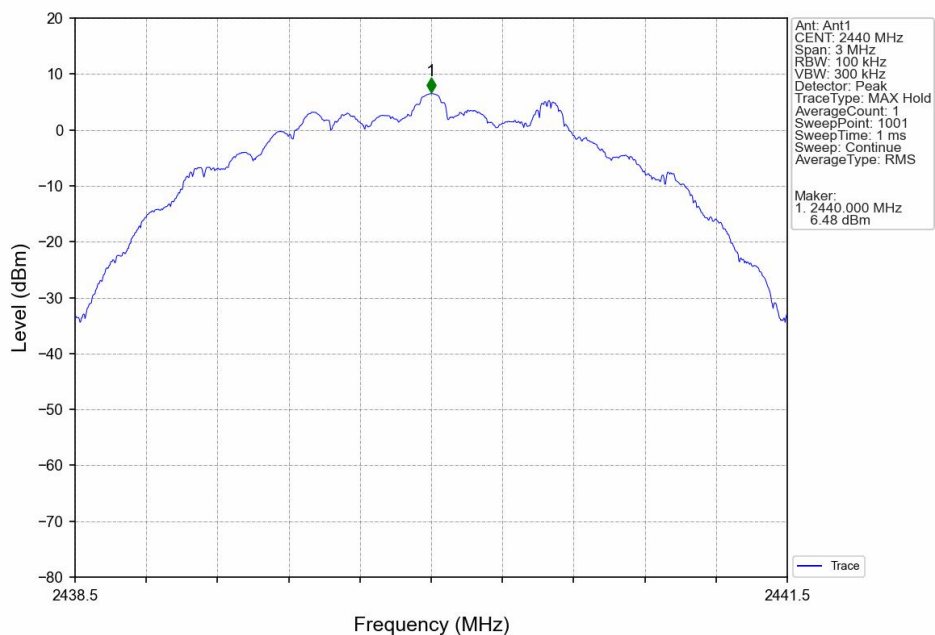


FCC ID: 2A94J-CP025

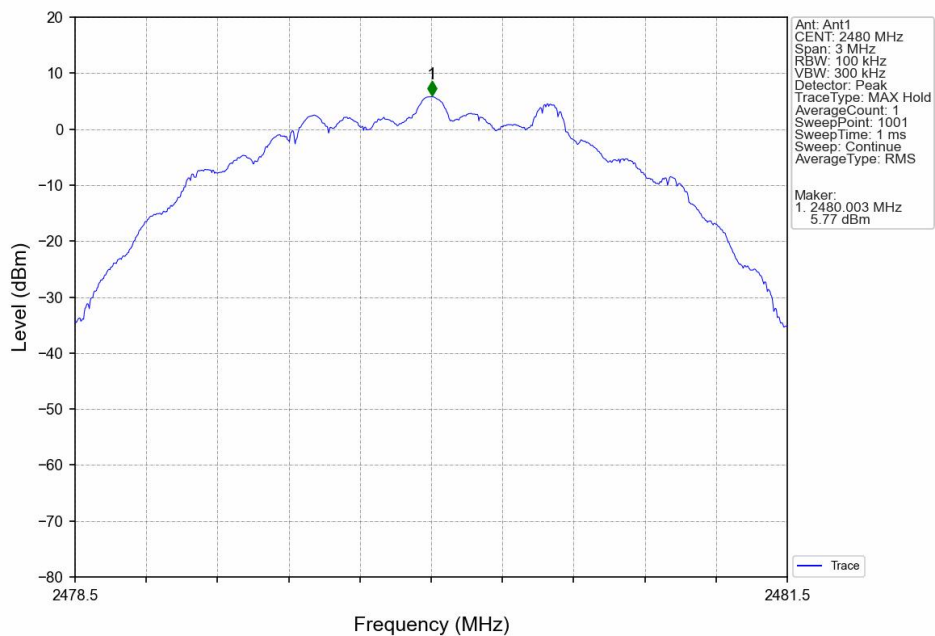


FCC ID: 2A94J-CP025

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	7.13
		2440	1	7.71
		2480	1	6.72
2M	SISO	2402	1	6.17
		2440	1	6.51
		2480	1	5.79

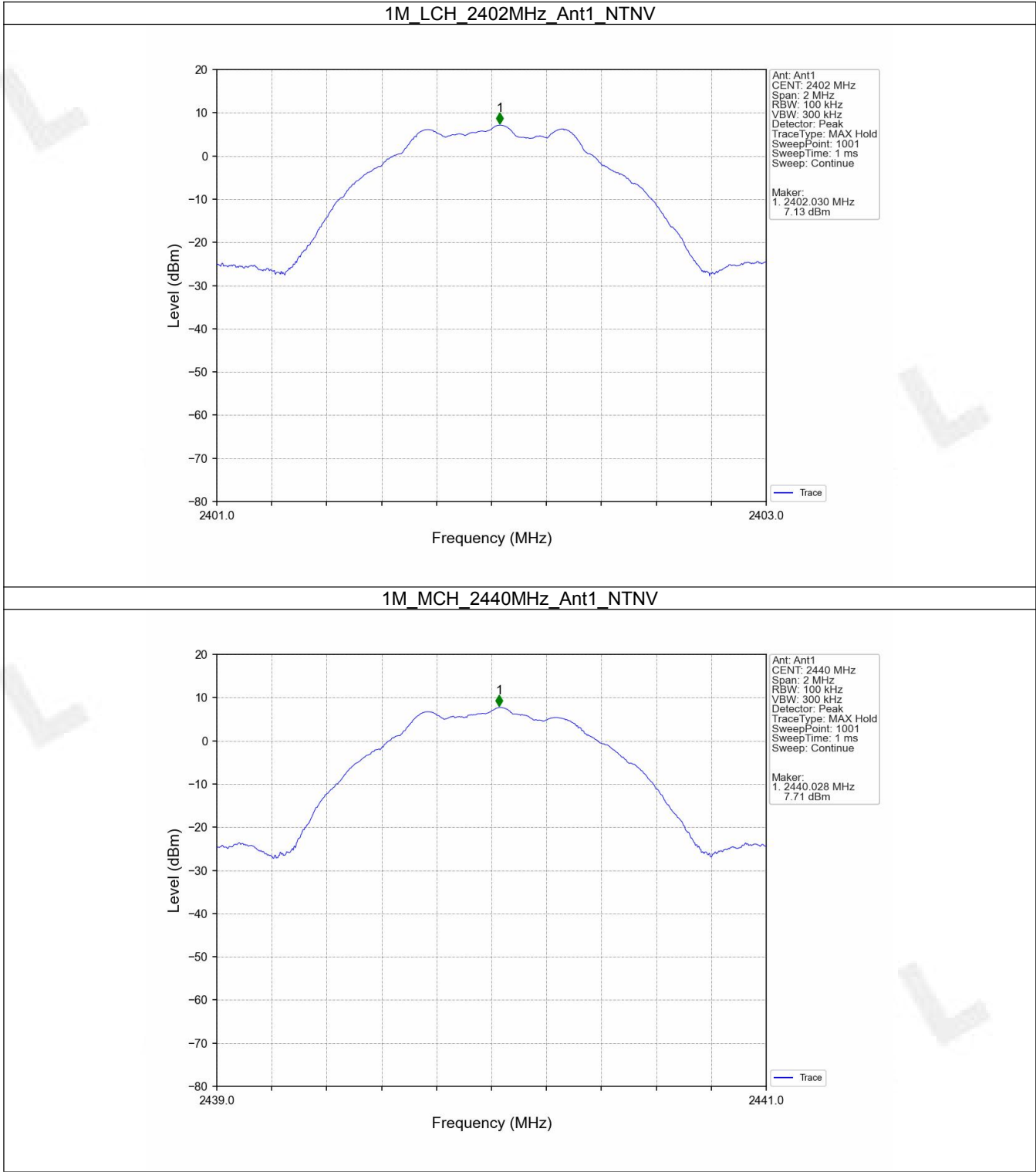
5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	7.71	-12.29	Pass
		2440	1	7.71	-12.29	Pass
		2480	1	7.71	-12.29	Pass
2M	SISO	2402	1	6.51	-13.49	Pass
		2440	1	6.51	-13.49	Pass
		2480	1	6.51	-13.49	Pass

FCC ID: 2A94J-CP025

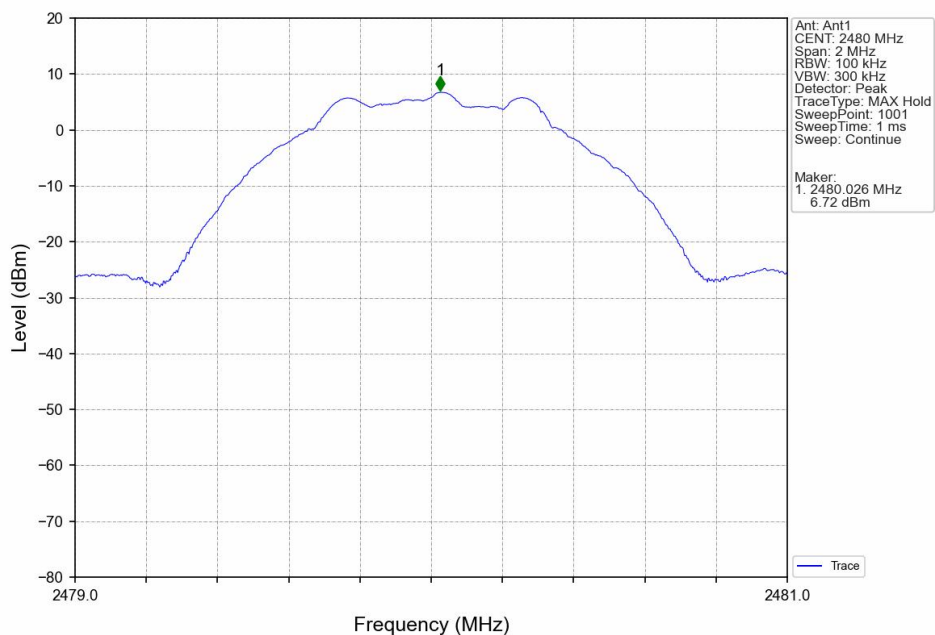
5.2 Test Graph

5.2.1 Ref

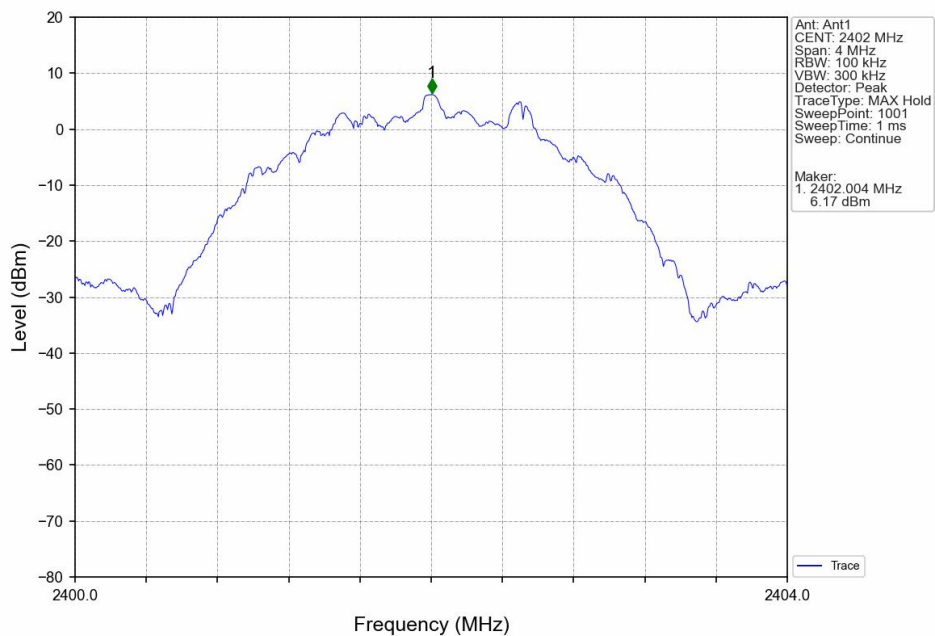


FCC ID: 2A94J-CP025

1M_HCH_2480MHz_Ant1_NTNV

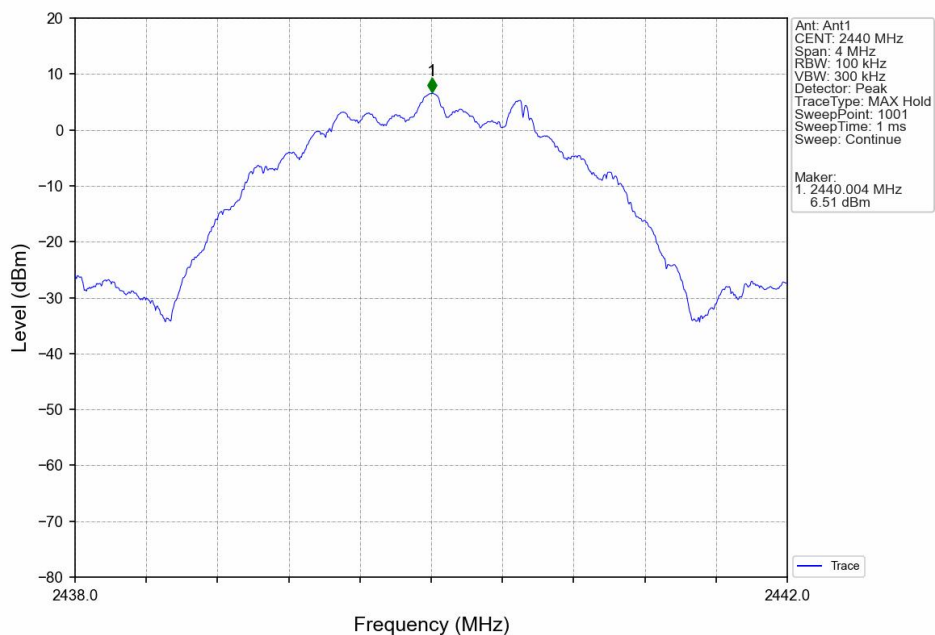


2M_LCH_2402MHz_Ant1_NTNV

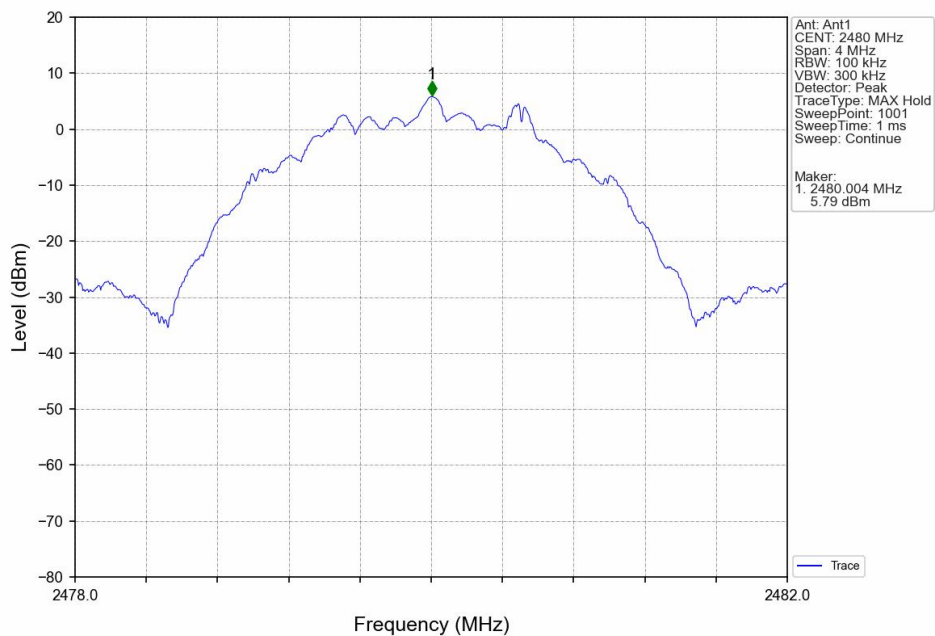


FCC ID: 2A94J-CP025

2M_MCH_2440MHz_Ant1_NTNV

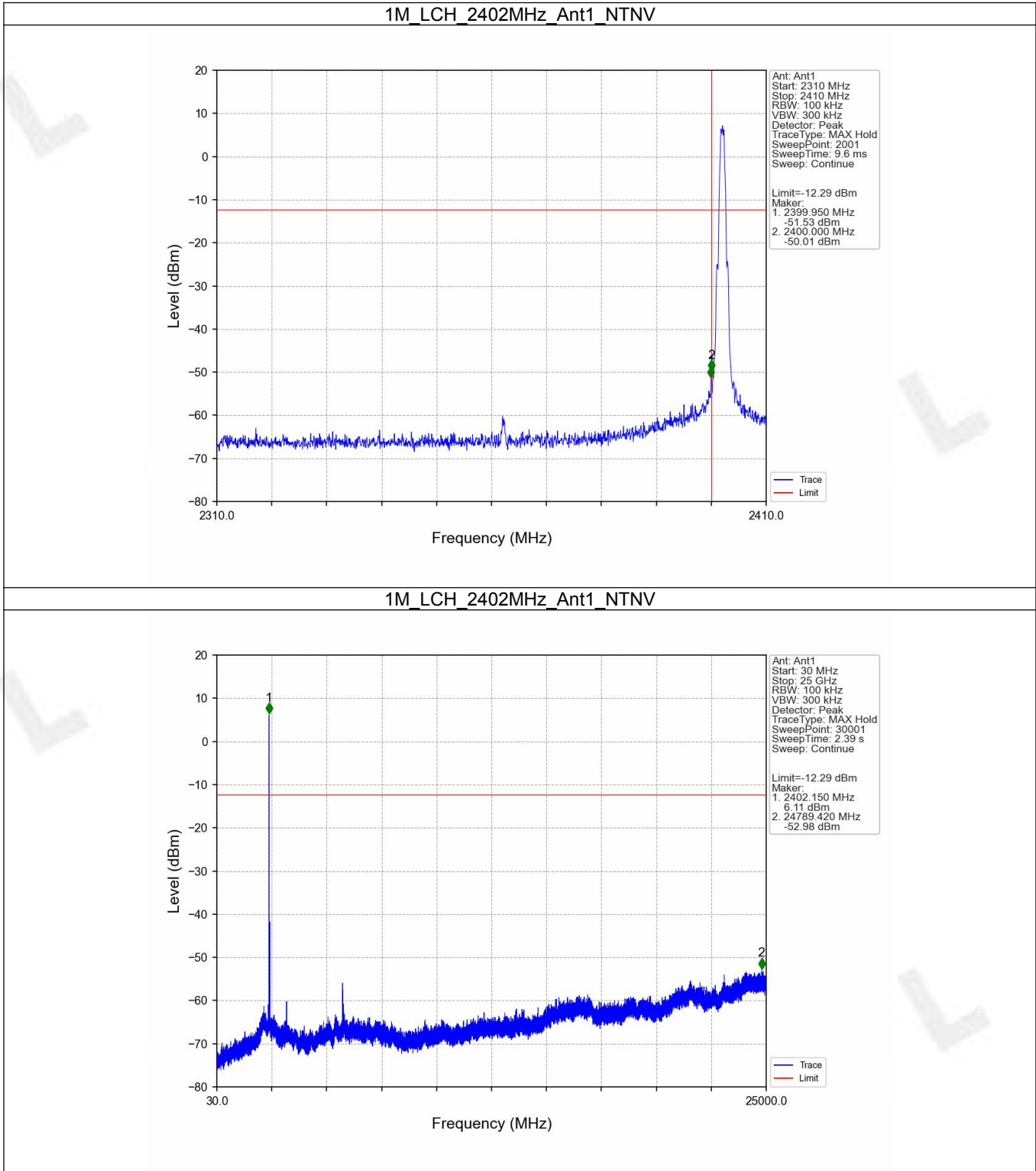


2M_HCH_2480MHz_Ant1_NTNV

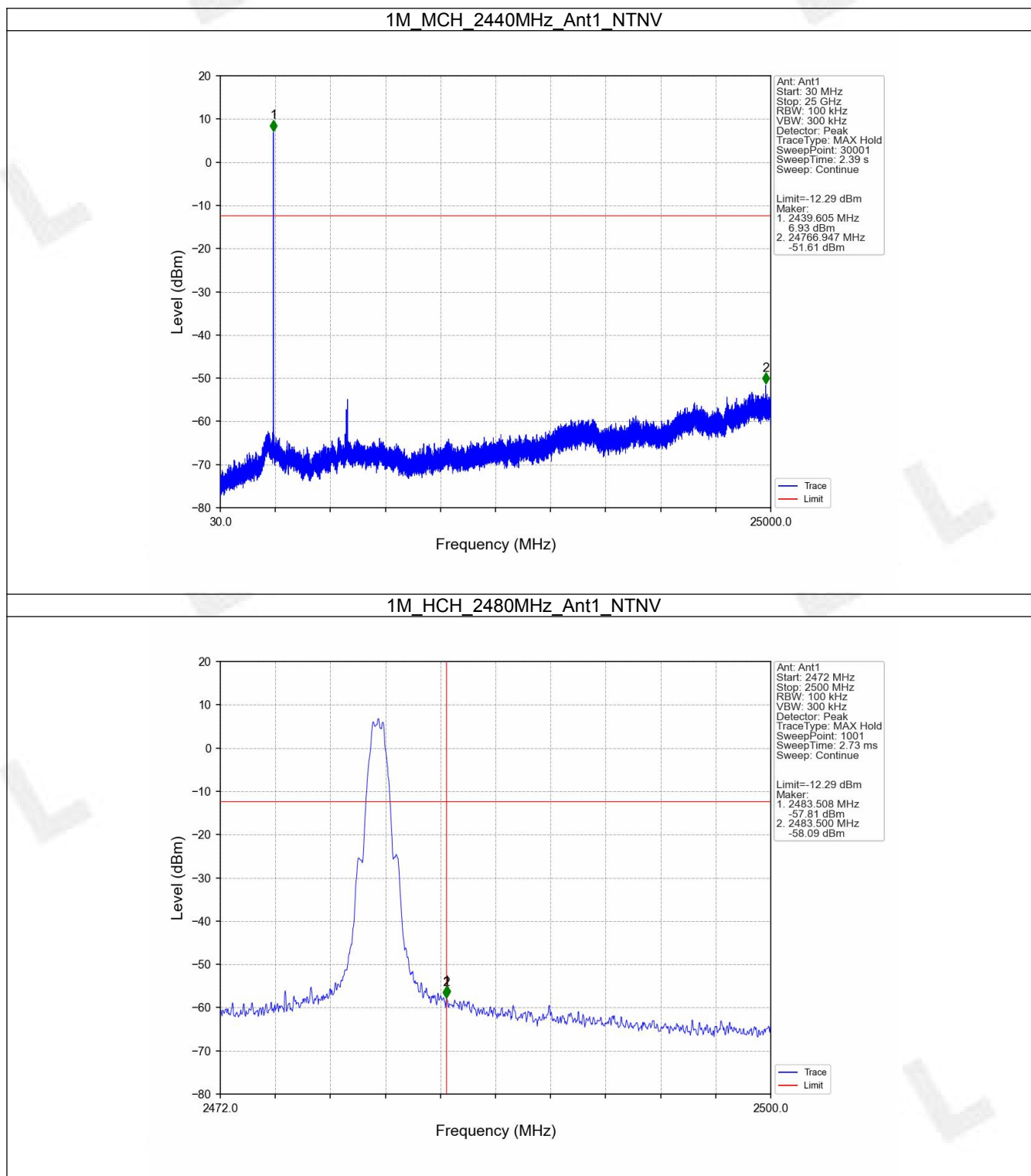


FCC ID: 2A94J-CP025

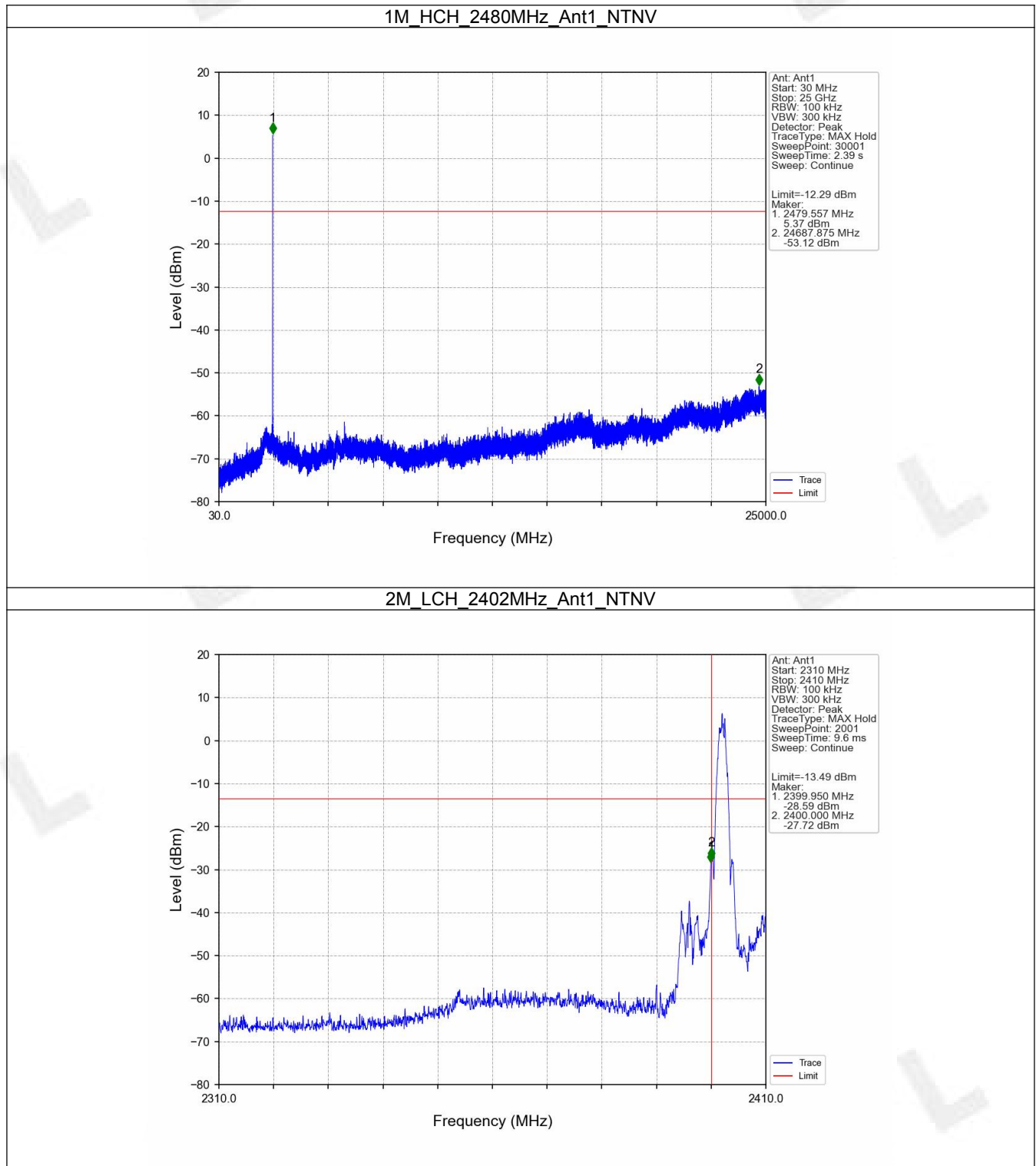
5.2.2 CSE



FCC ID: 2A94J-CP025

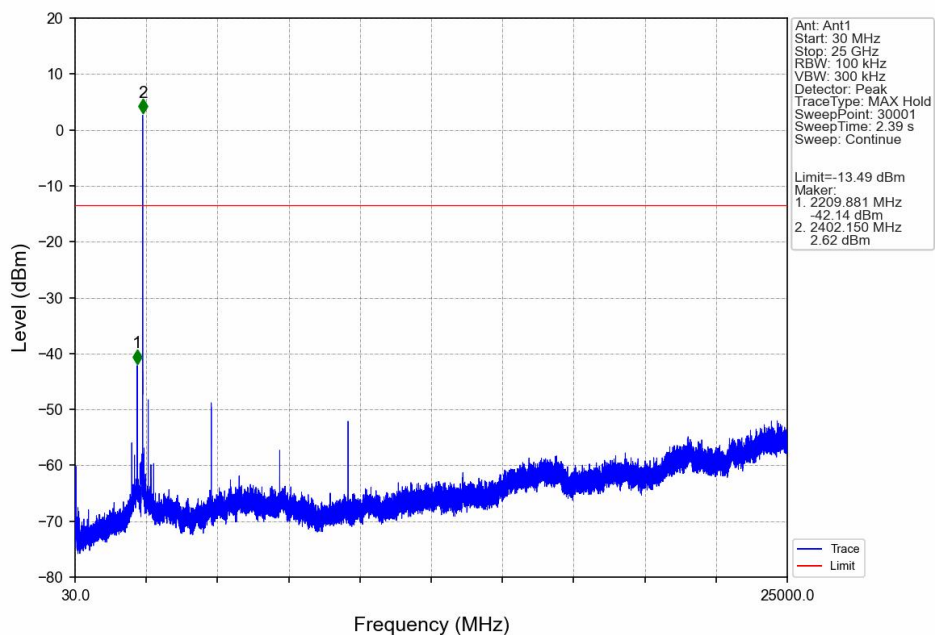


FCC ID: 2A94J-CP025

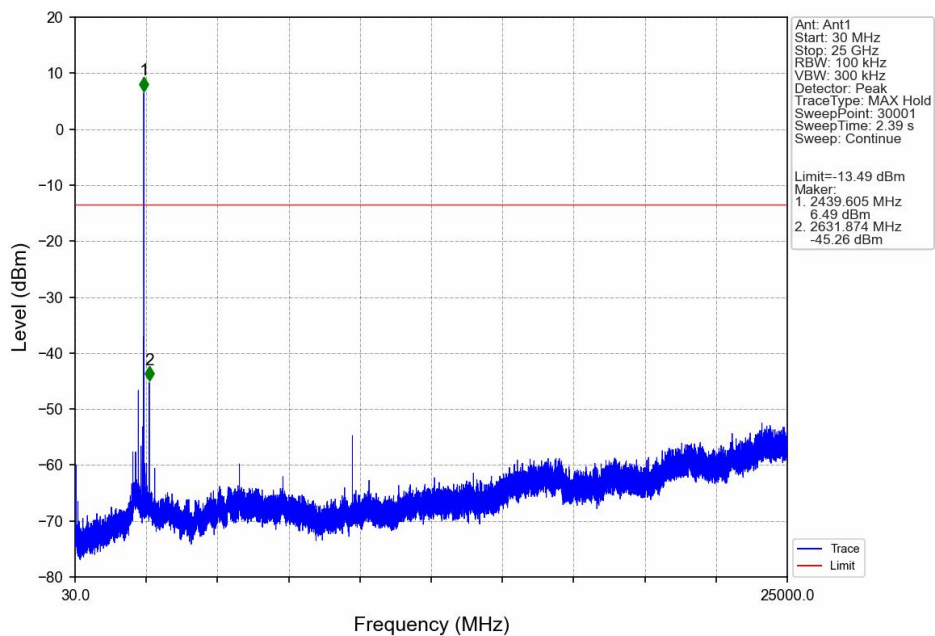


FCC ID: 2A94J-CP025

2M_LCH_2402MHz_Ant1_NTNV

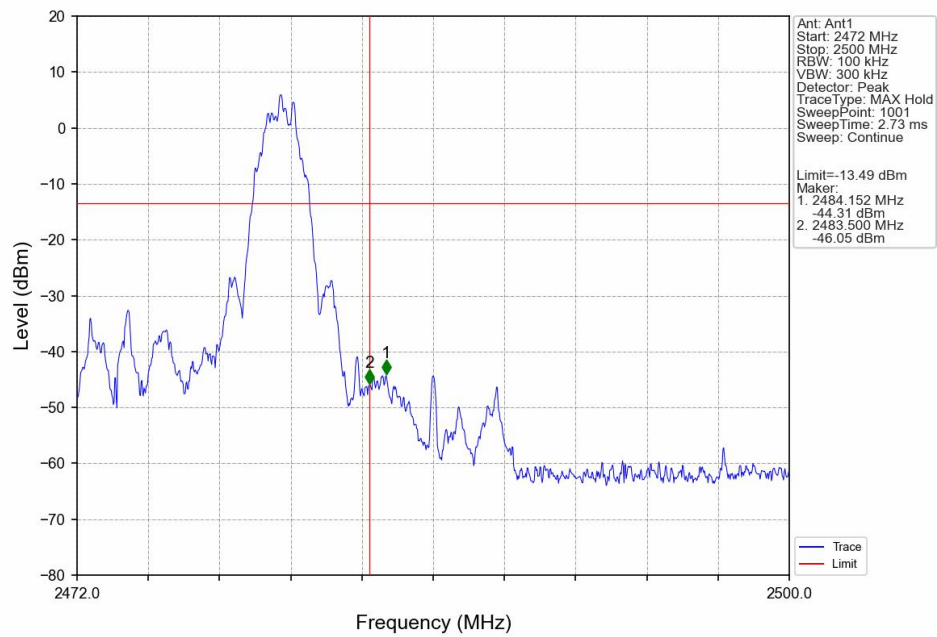


2M_MCH_2440MHz_Ant1_NTNV



FCC ID: 2A94J-CP025

2M_HCH_2480MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV

