



Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

Annex for BLE

Test Report No.: CTL2410122024-WF

TABLE OF CONTENTS

Annex for BLE	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

FCCID: 2ASC7BD320

1. Duty Cycle

1.1 Test Result

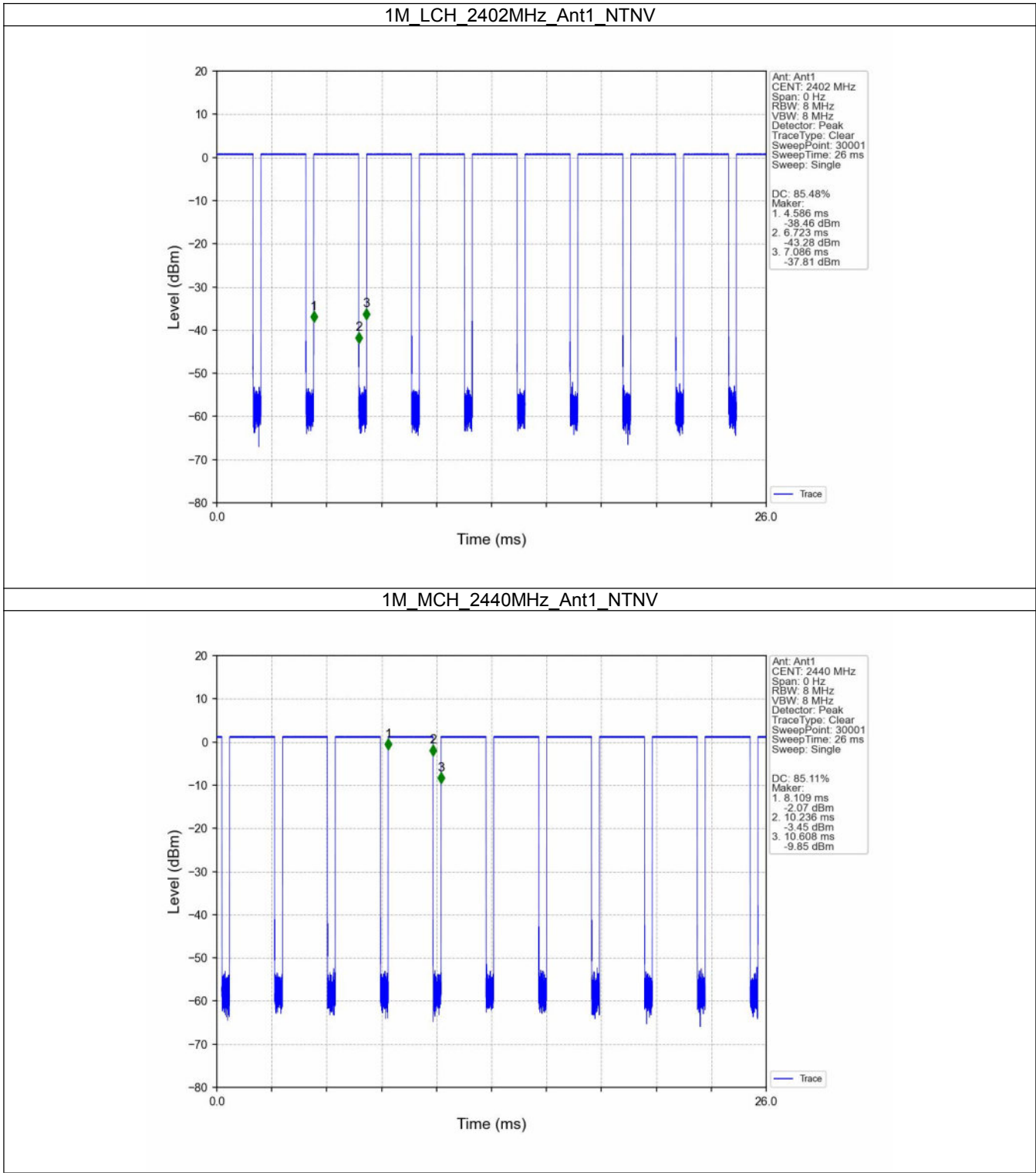
1.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1M	SISO	2402	2.137	2.500	85.48	0.68	0.01
		2440	2.127	2.499	85.11	0.70	0.03
		2480	2.129	2.500	85.16	0.70	0.03
2M	SISO	2402	1.075	2.499	43.02	3.66	0.03
		2440	1.076	2.500	43.04	3.66	0.03
		2480	1.085	2.501	43.38	3.63	0.02

FCCID: 2ASC7BD320

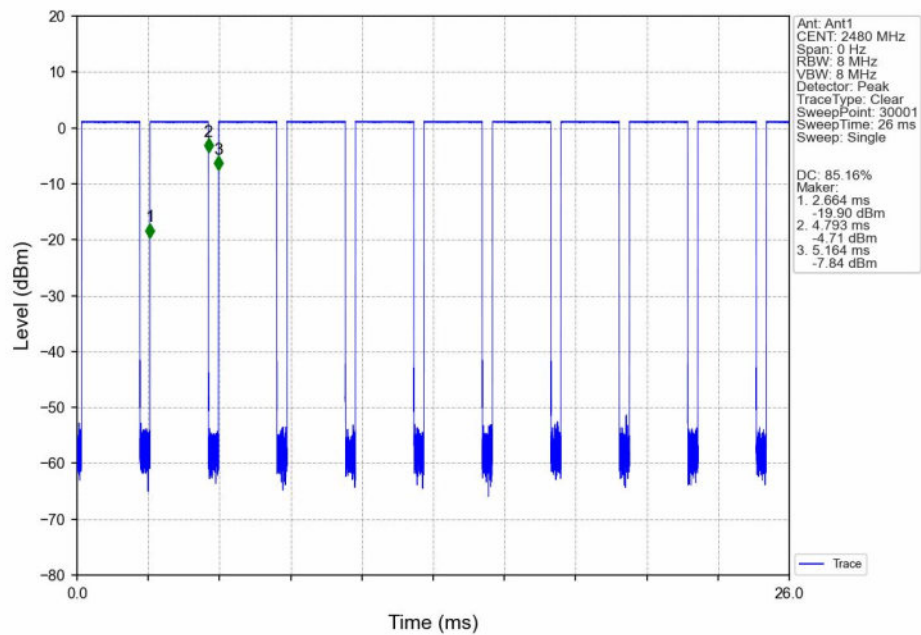
1.2 Test Graph

1.2.1 Ant1

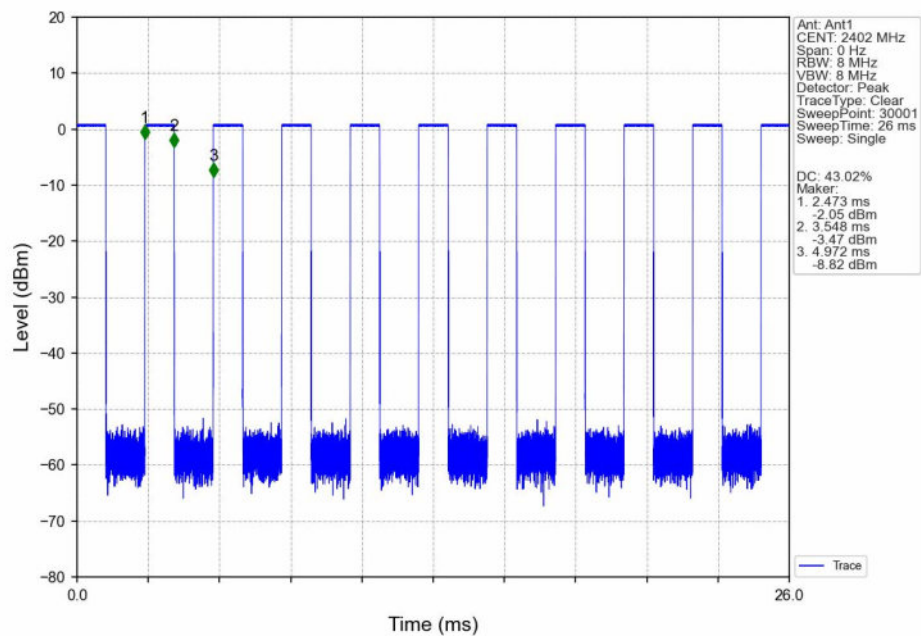


FCCID: 2ASC7BD320

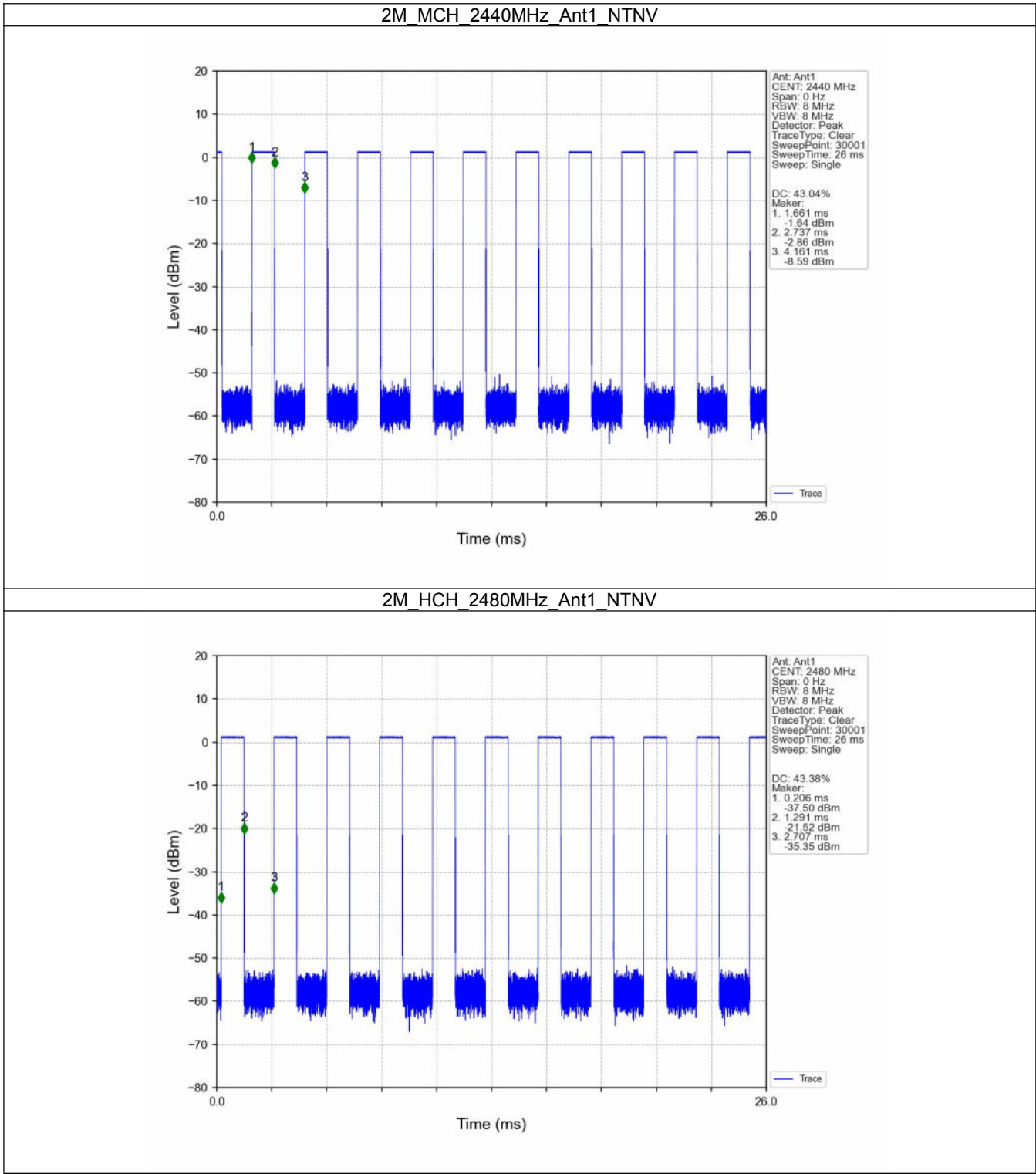
1M_HCH_2480MHz_Ant1_NTNV



2M_LCH_2402MHz_Ant1_NTNV



FCCID: 2ASC7BD320



FCCID: 2ASC7BD320

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	1.057	/	Pass
		2440	1	1.070	/	Pass
		2480	1	1.078	/	Pass
2M	SISO	2402	1	2.062	/	Pass
		2440	1	2.064	/	Pass
		2480	1	2.068	/	Pass

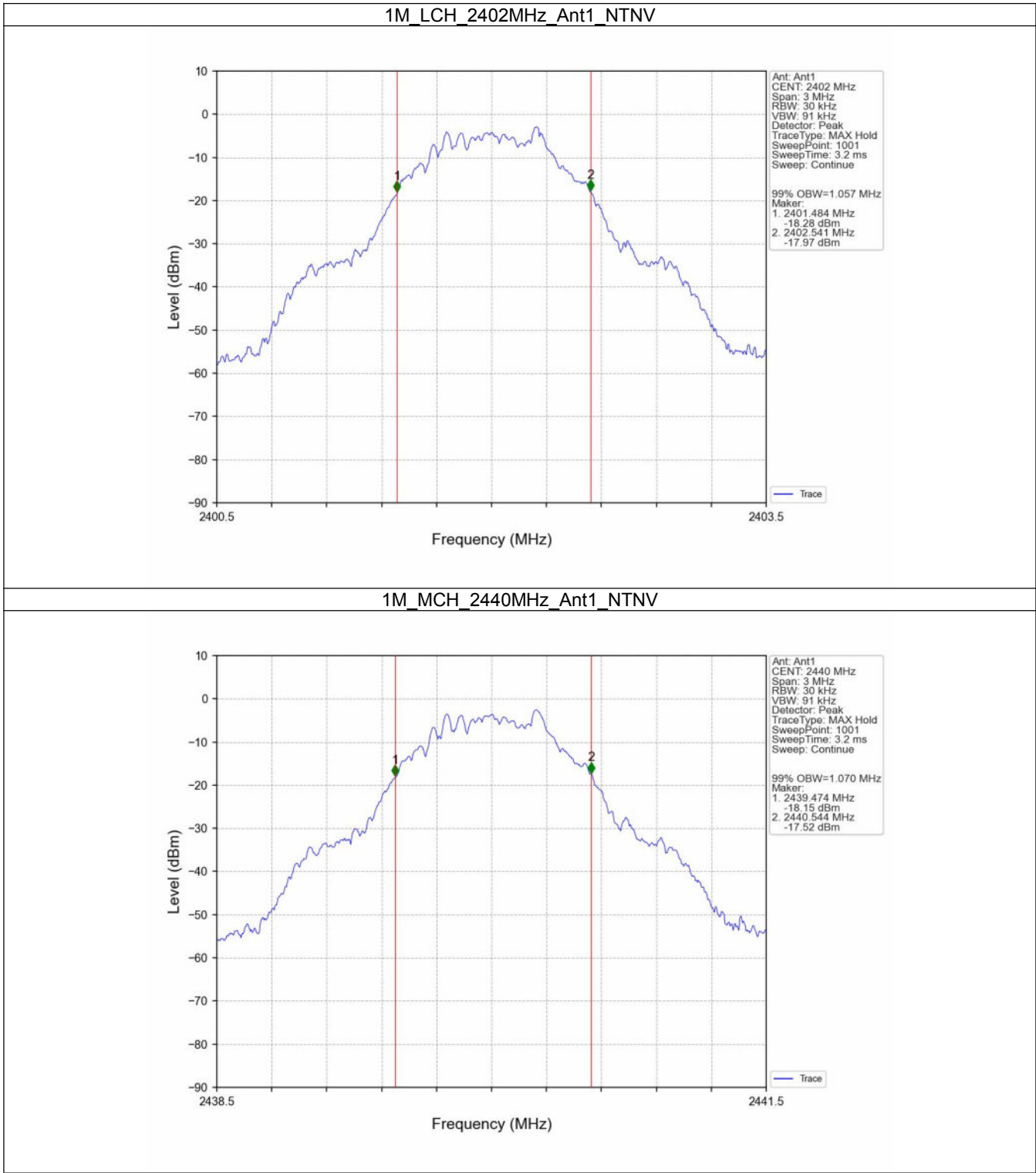
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.688	≥ 0.5	Pass
		2440	1	0.699	≥ 0.5	Pass
		2480	1	0.696	≥ 0.5	Pass
2M	SISO	2402	1	1.198	≥ 0.5	Pass
		2440	1	1.201	≥ 0.5	Pass
		2480	1	1.262	≥ 0.5	Pass

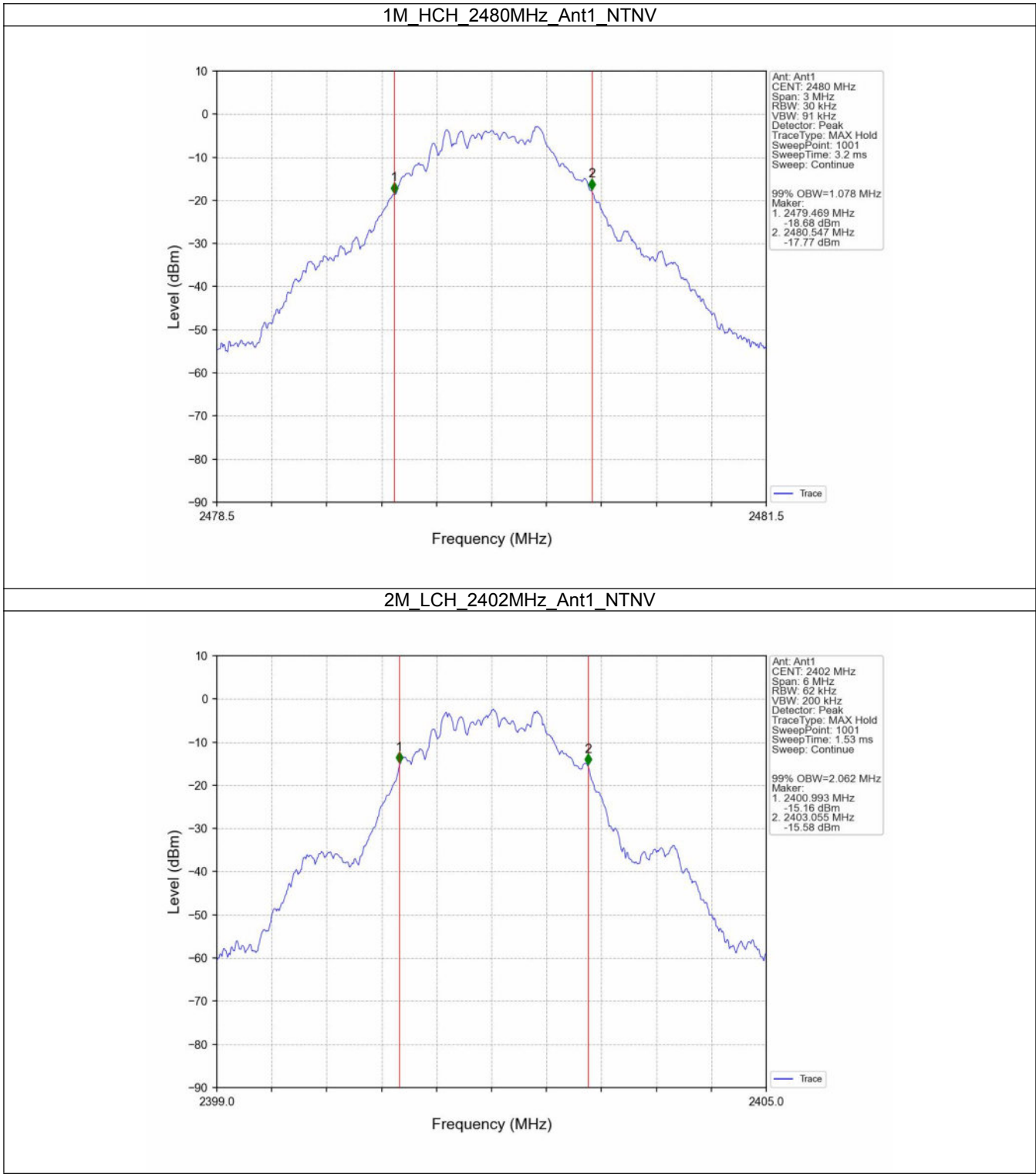
FCCID: 2ASC7BD320

2.2 Test Graph

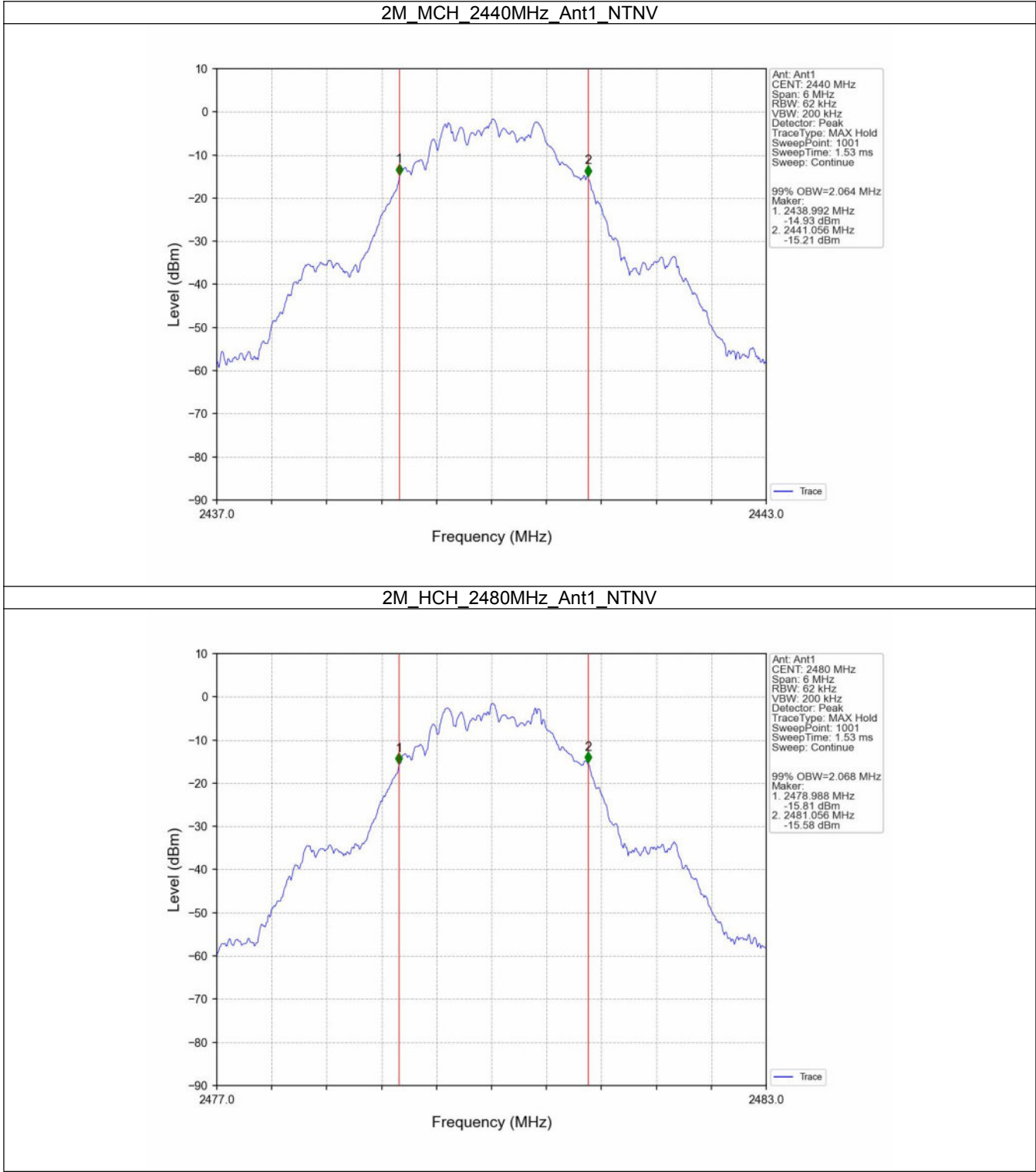
2.2.1 OBW



FCCID: 2ASC7BD320

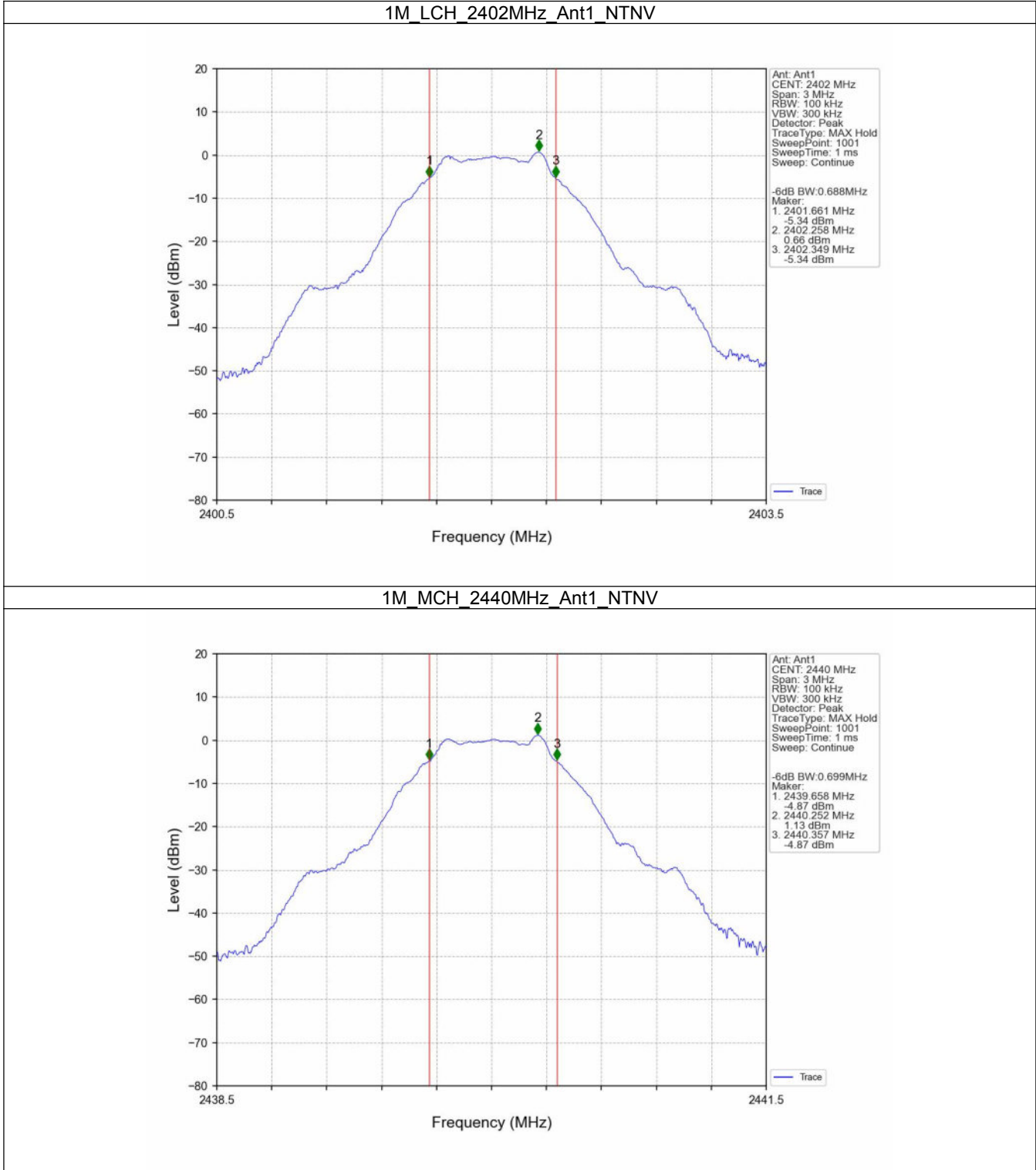


FCCID: 2ASC7BD320

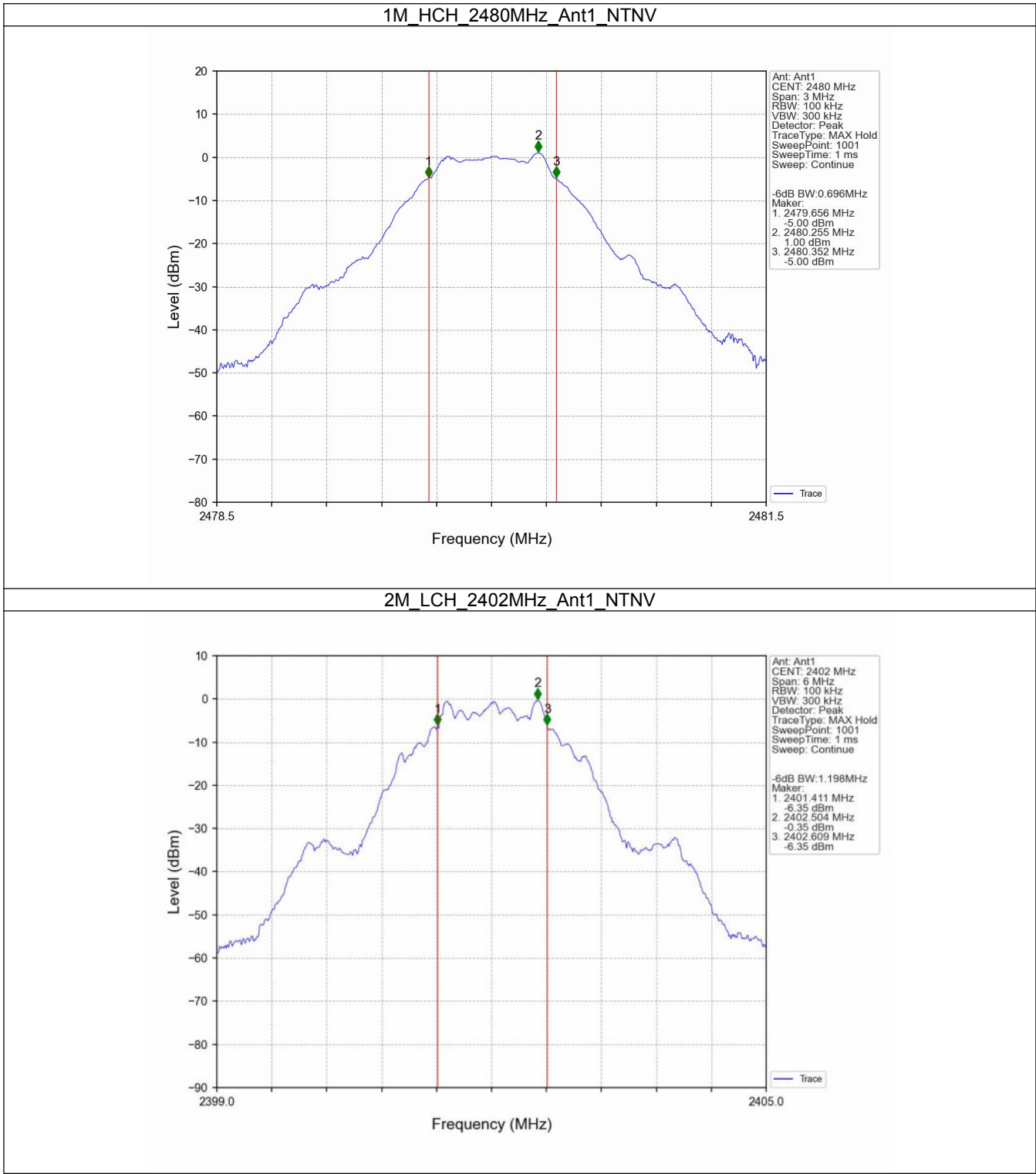


FCCID: 2ASC7BD320

2.2.2 6dB BW

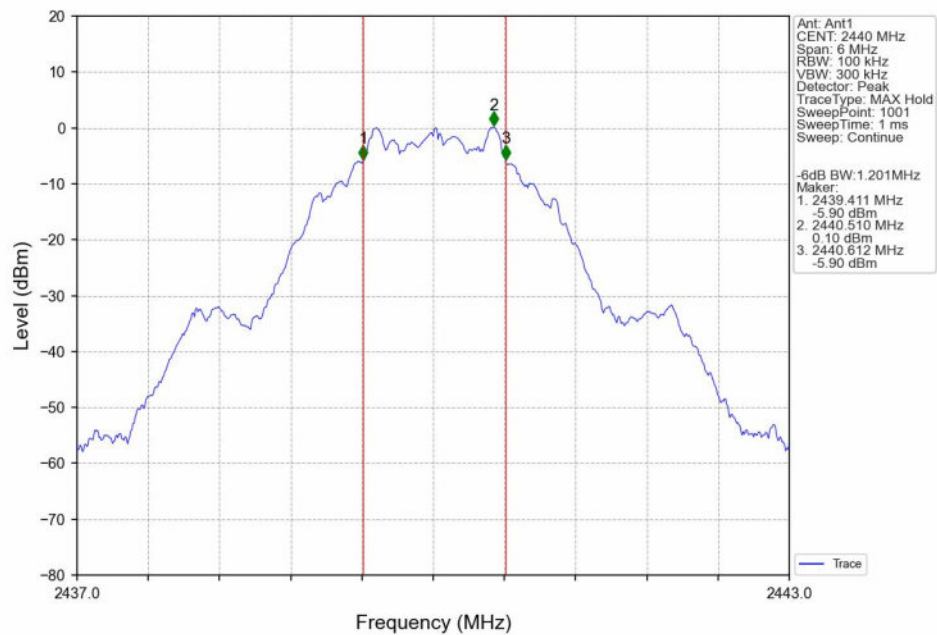


FCCID: 2ASC7BD320

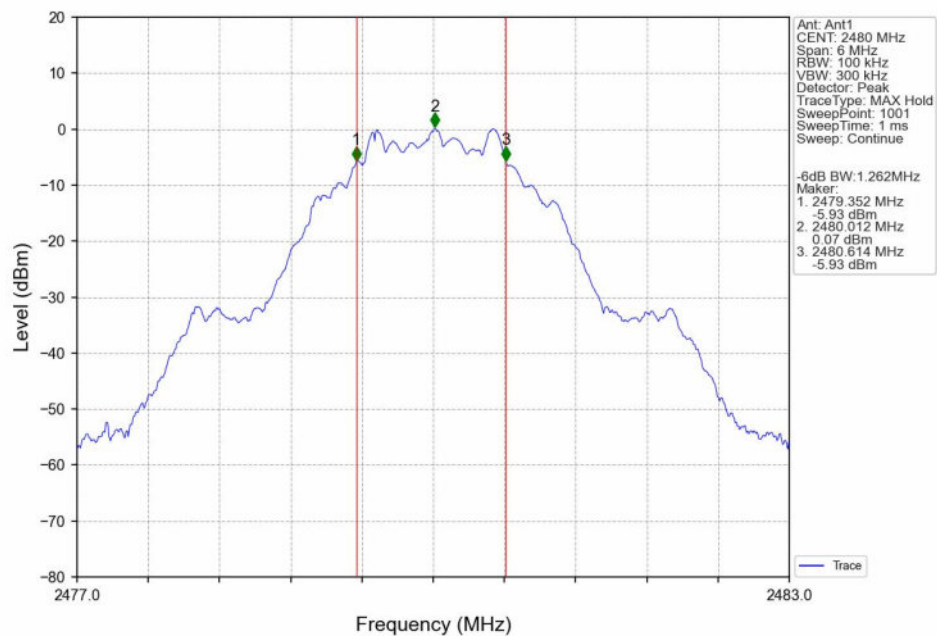


FCCID: 2ASC7BD320

2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV



FCCID: 2ASC7BD320

3. Maximum Conducted Output Power

3.1 Test Result

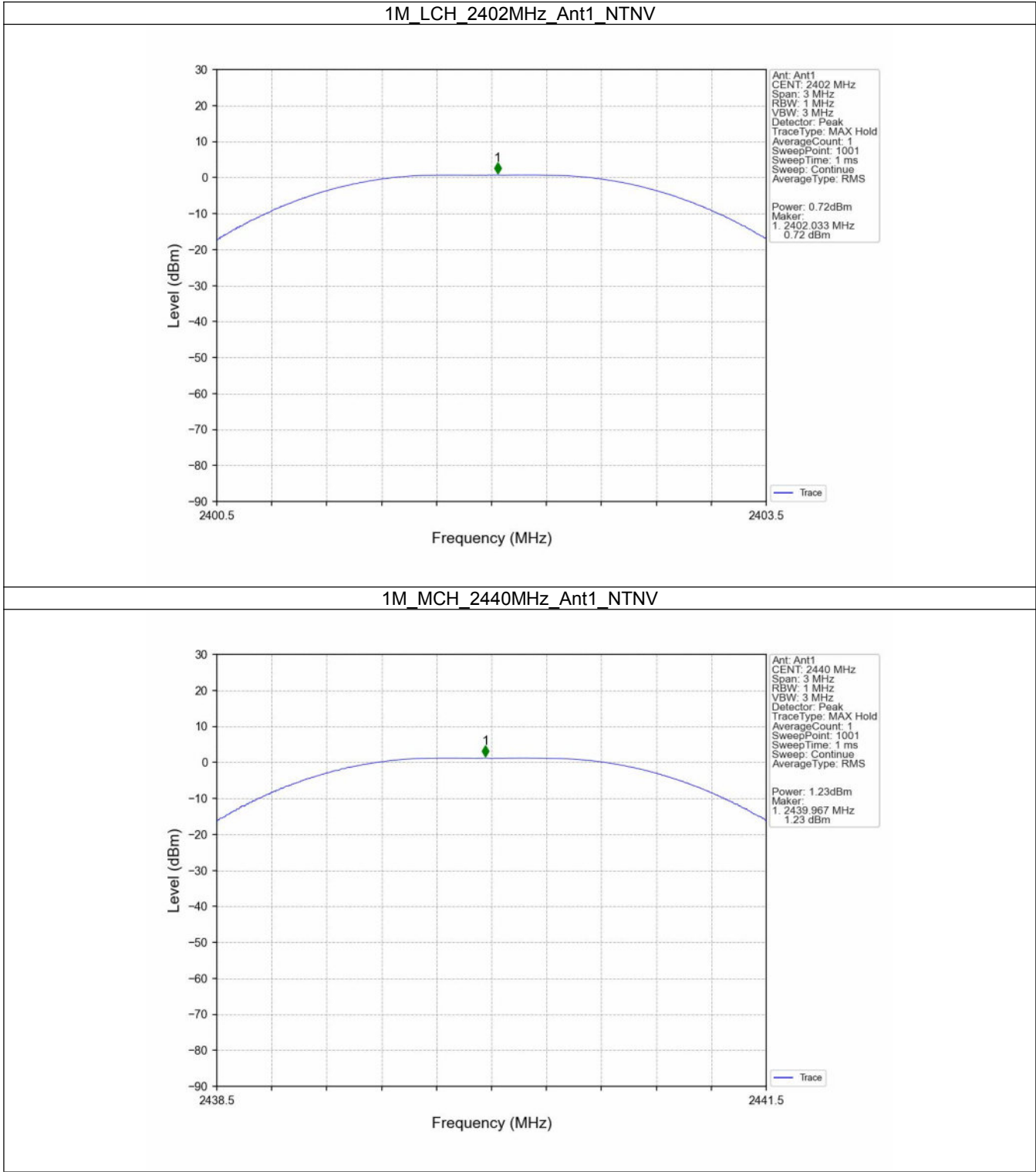
3.1.1 Power

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	0.72	<=30	Pass
		2440	1.23	<=30	Pass
		2480	1.13	<=30	Pass
2M	SISO	2402	0.73	<=30	Pass
		2440	1.27	<=30	Pass
		2480	1.18	<=30	Pass
Note1: Antenna Gain: Ant1: 1.74dBi;					

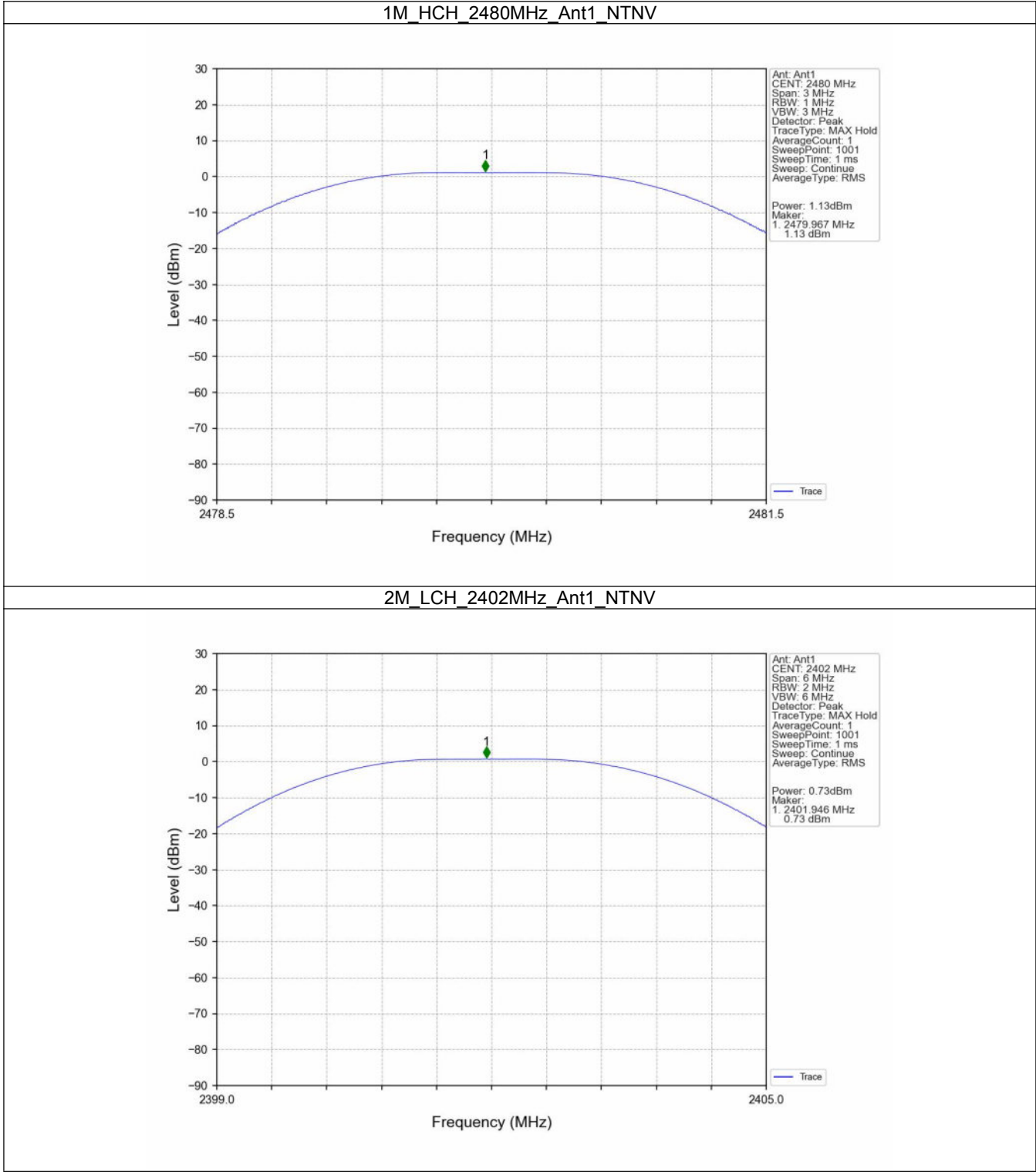
FCCID: 2ASC7BD320

3.2 Test Graph

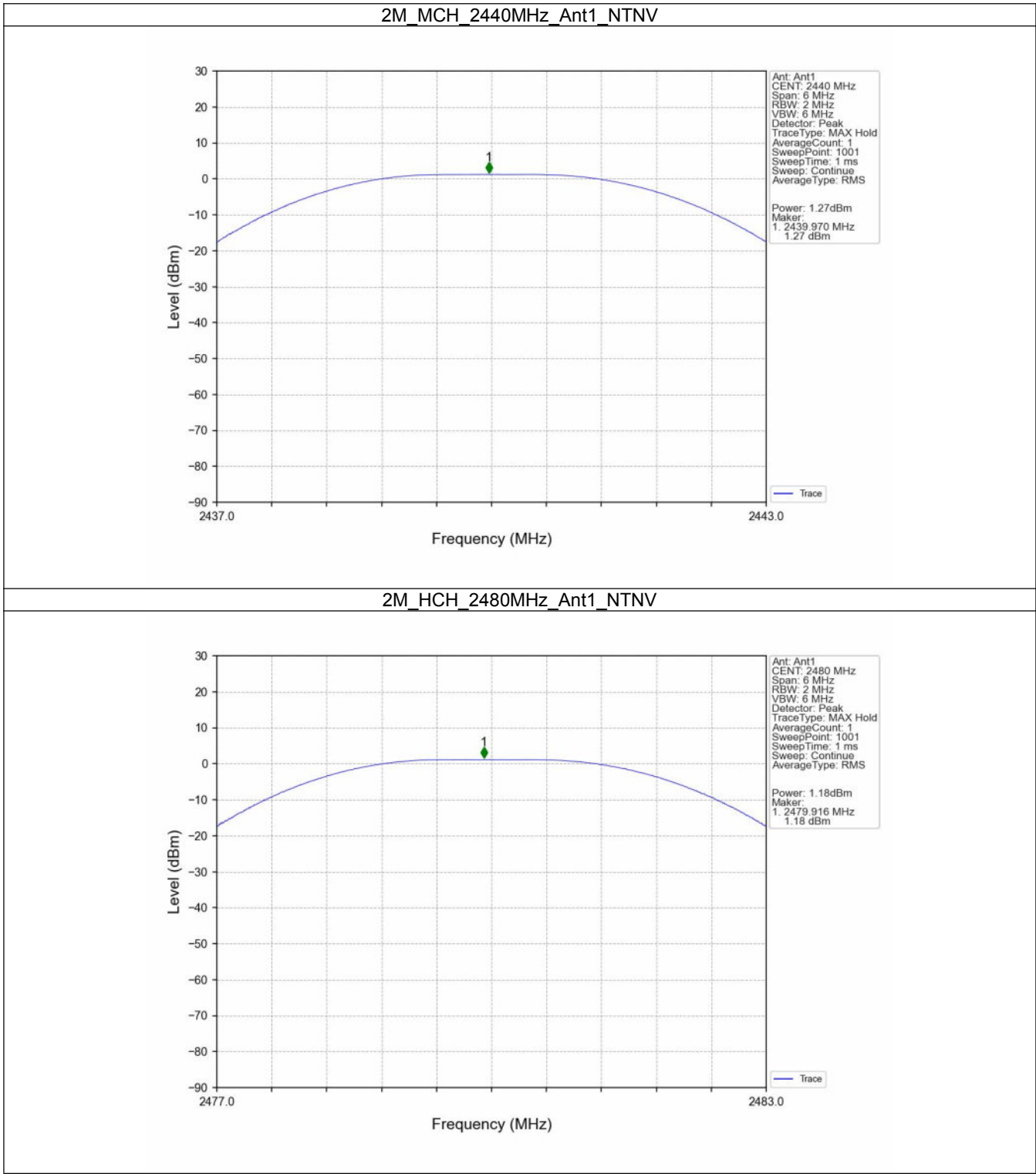
3.2.1 Power



FCCID: 2ASC7BD320



FCCID: 2ASC7BD320



FCCID: 2ASC7BD320

4. Maximum Power Spectral Density

4.1 Test Result

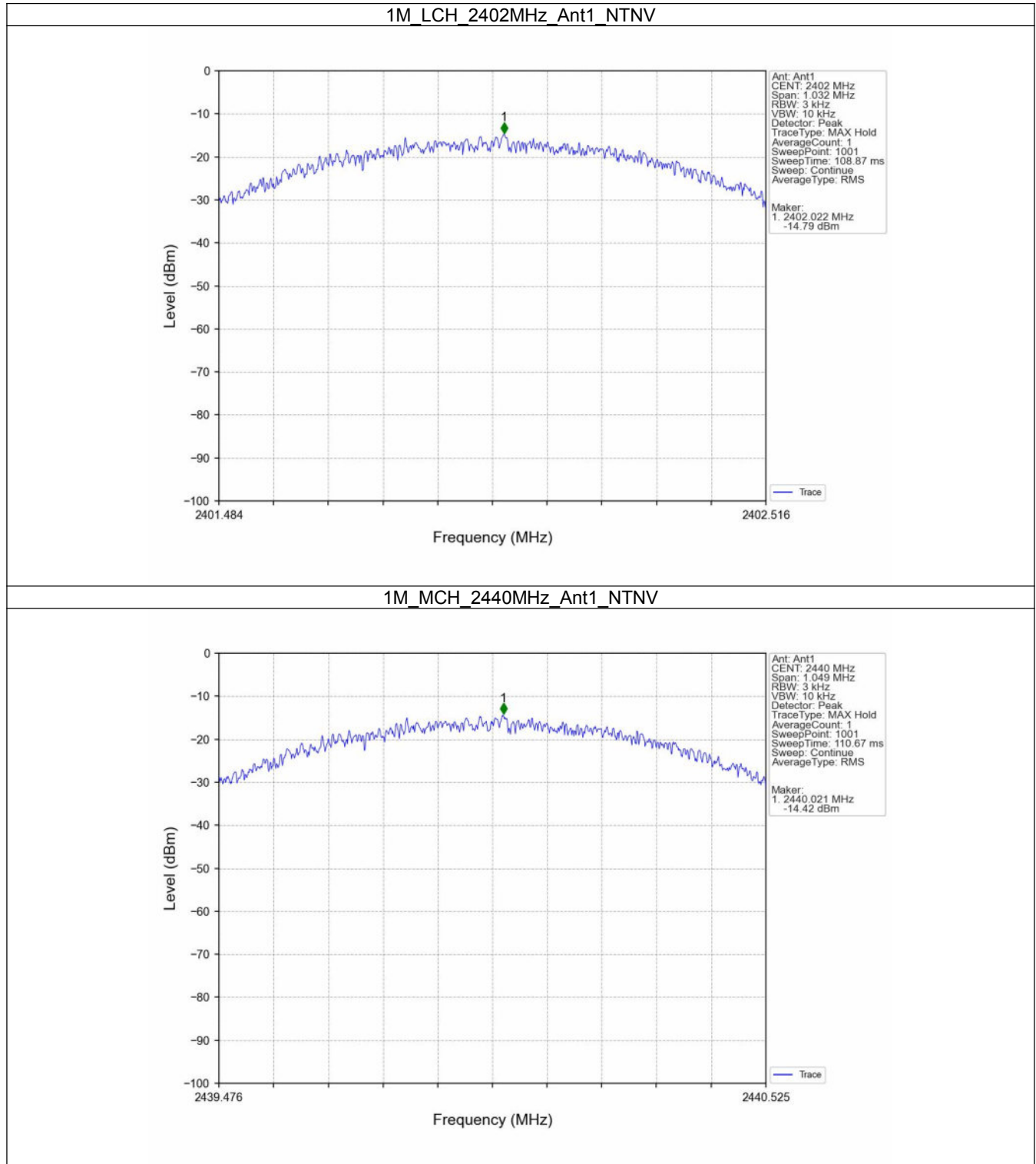
4.1.1 PSD

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
1M	SISO	2402	-14.79	<=8	Pass
		2440	-14.42	<=8	Pass
		2480	-14.58	<=8	Pass
2M	SISO	2402	-19.06	<=8	Pass
		2440	-18.56	<=8	Pass
		2480	-18.61	<=8	Pass
Note1: Antenna Gain: Ant1: 1.74dBi;					

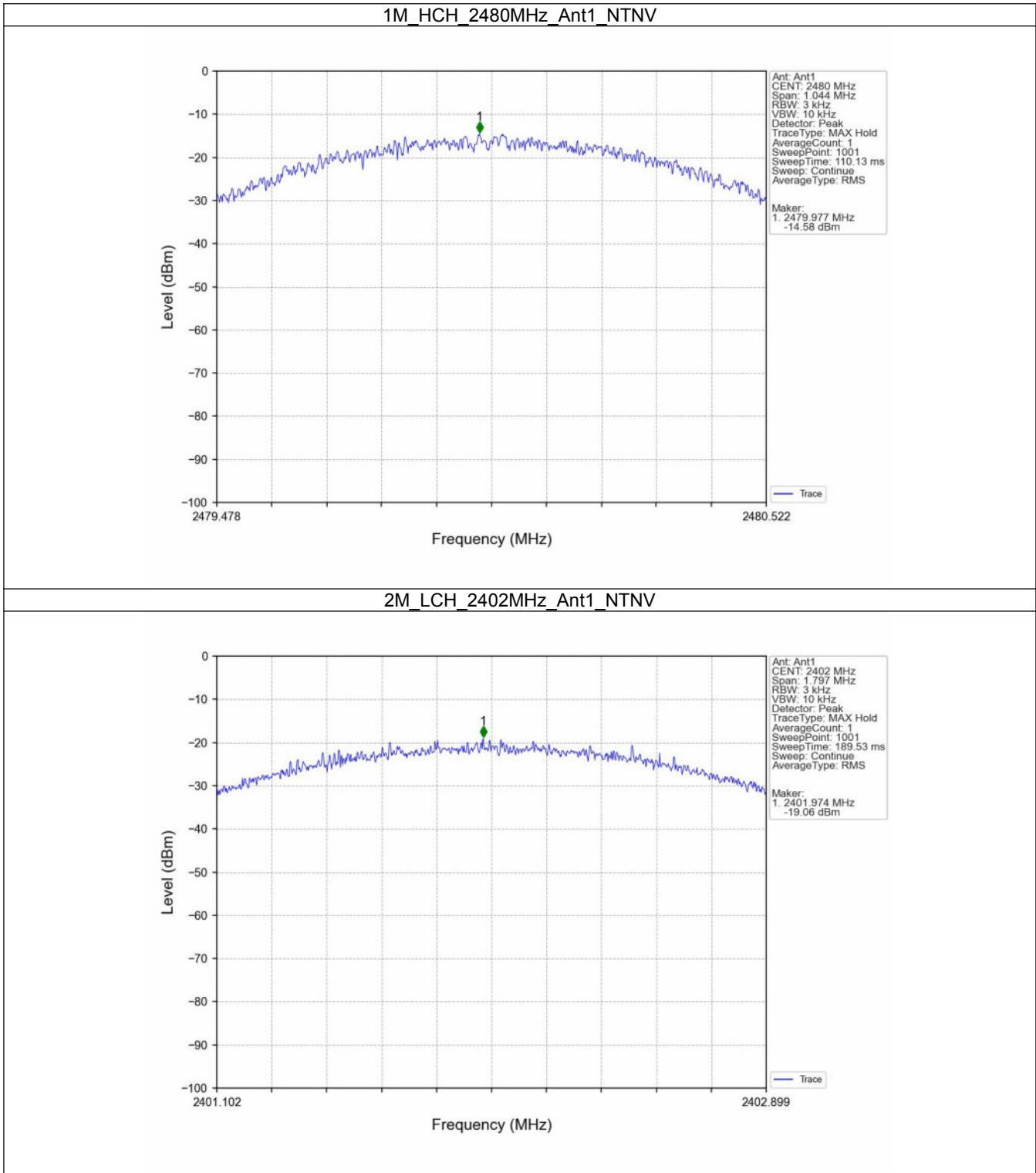
FCCID: 2ASC7BD320

4.2 Test Graph

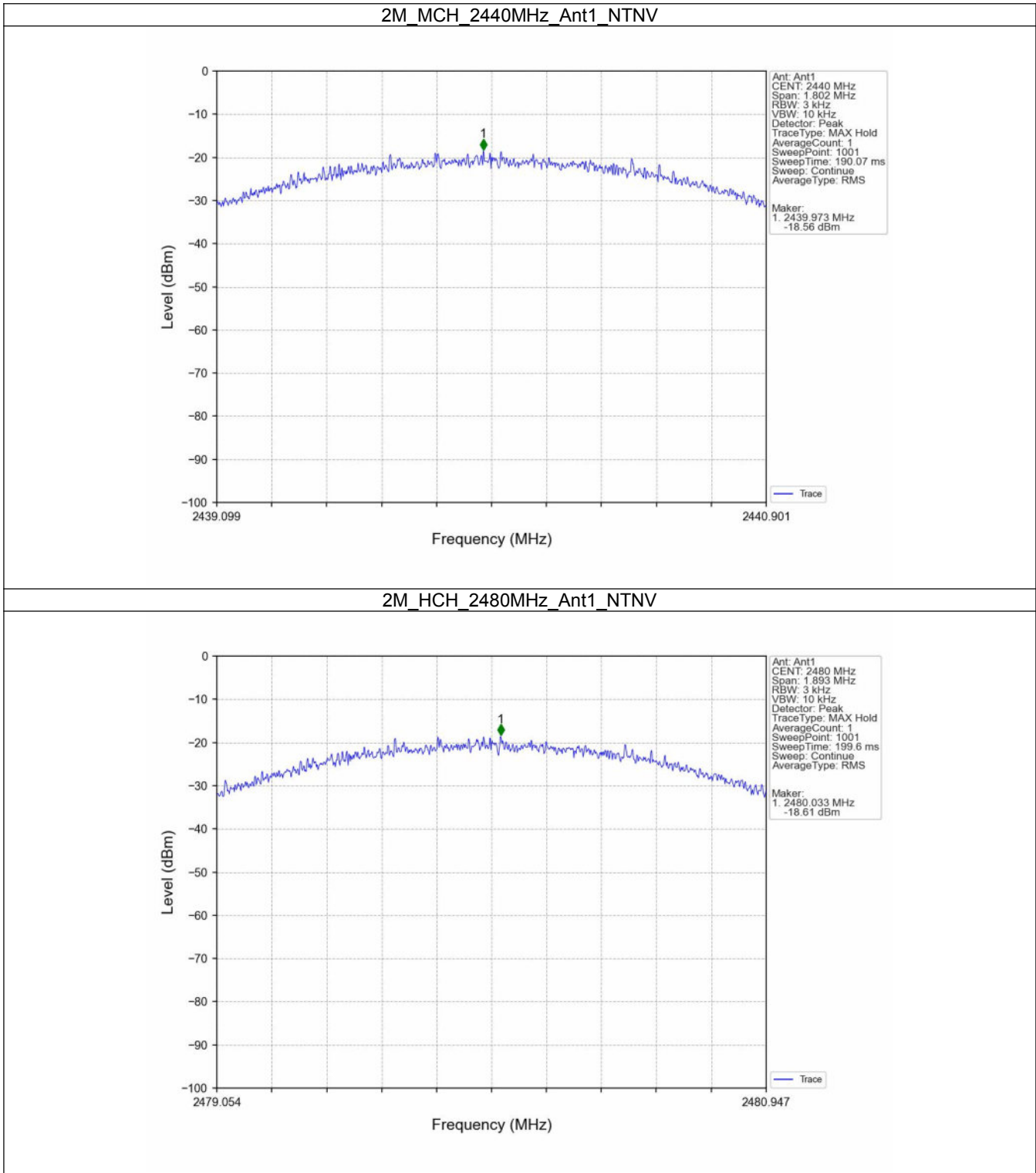
4.2.1 PSD



FCCID: 2ASC7BD320



FCCID: 2ASC7BD320



FCCID: 2ASC7BD320

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	0.67
		2440	1	1.12
		2480	1	1.01
2M	SISO	2402	1	-0.42
		2440	1	0.15
		2480	1	0.15

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

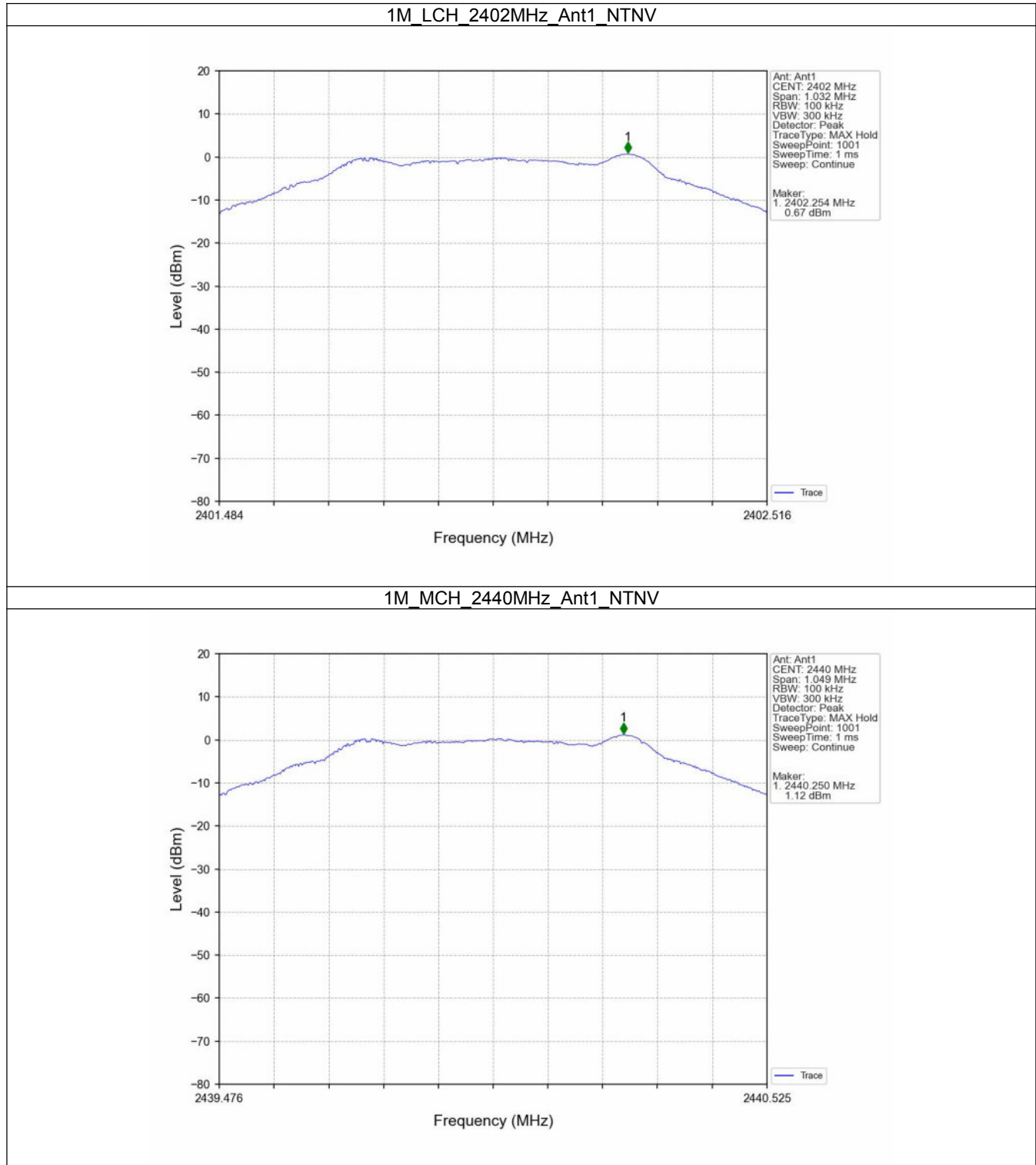
Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	1.12	-18.88	Pass
		2440	1	1.12	-18.88	Pass
		2480	1	1.12	-18.88	Pass
2M	SISO	2402	1	0.15	-19.85	Pass
		2440	1	0.15	-19.85	Pass
		2480	1	0.15	-19.85	Pass

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.

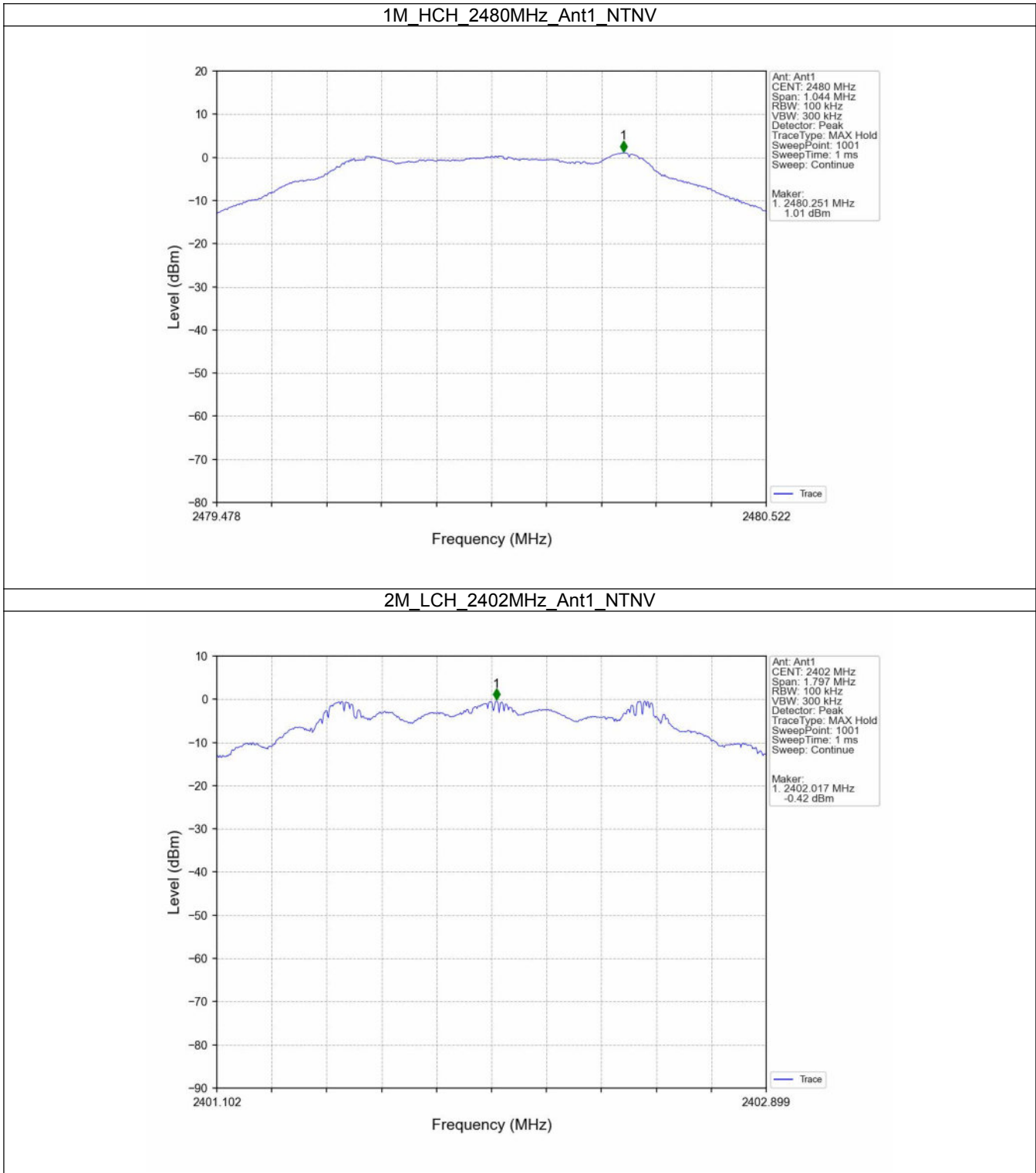
FCCID: 2ASC7BD320

5.2 Test Graph

5.2.1 Ref

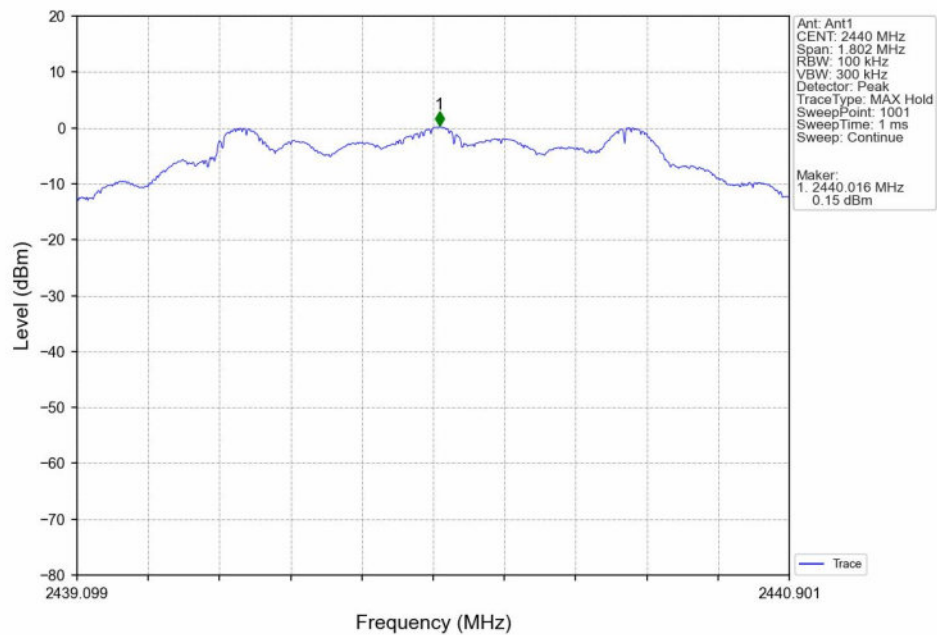


FCCID: 2ASC7BD320

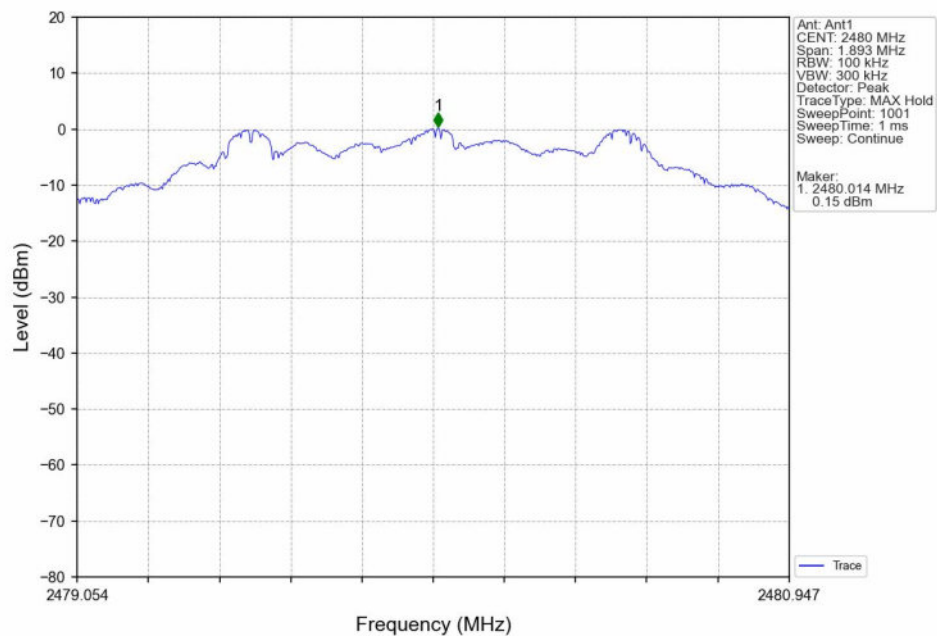


FCCID: 2ASC7BD320

2M_MCH_2440MHz_Ant1_NTNV

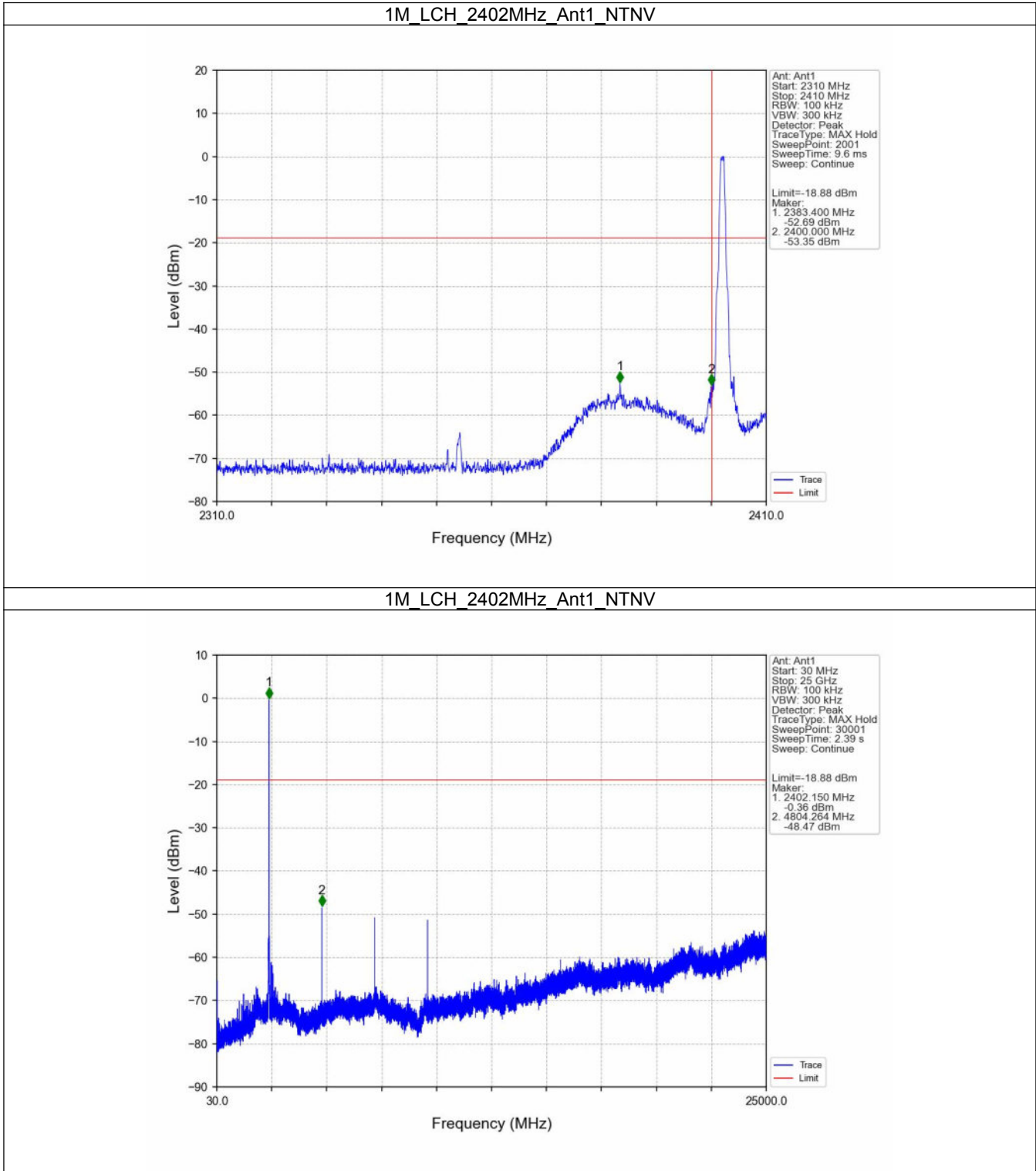


2M_HCH_2480MHz_Ant1_NTNV

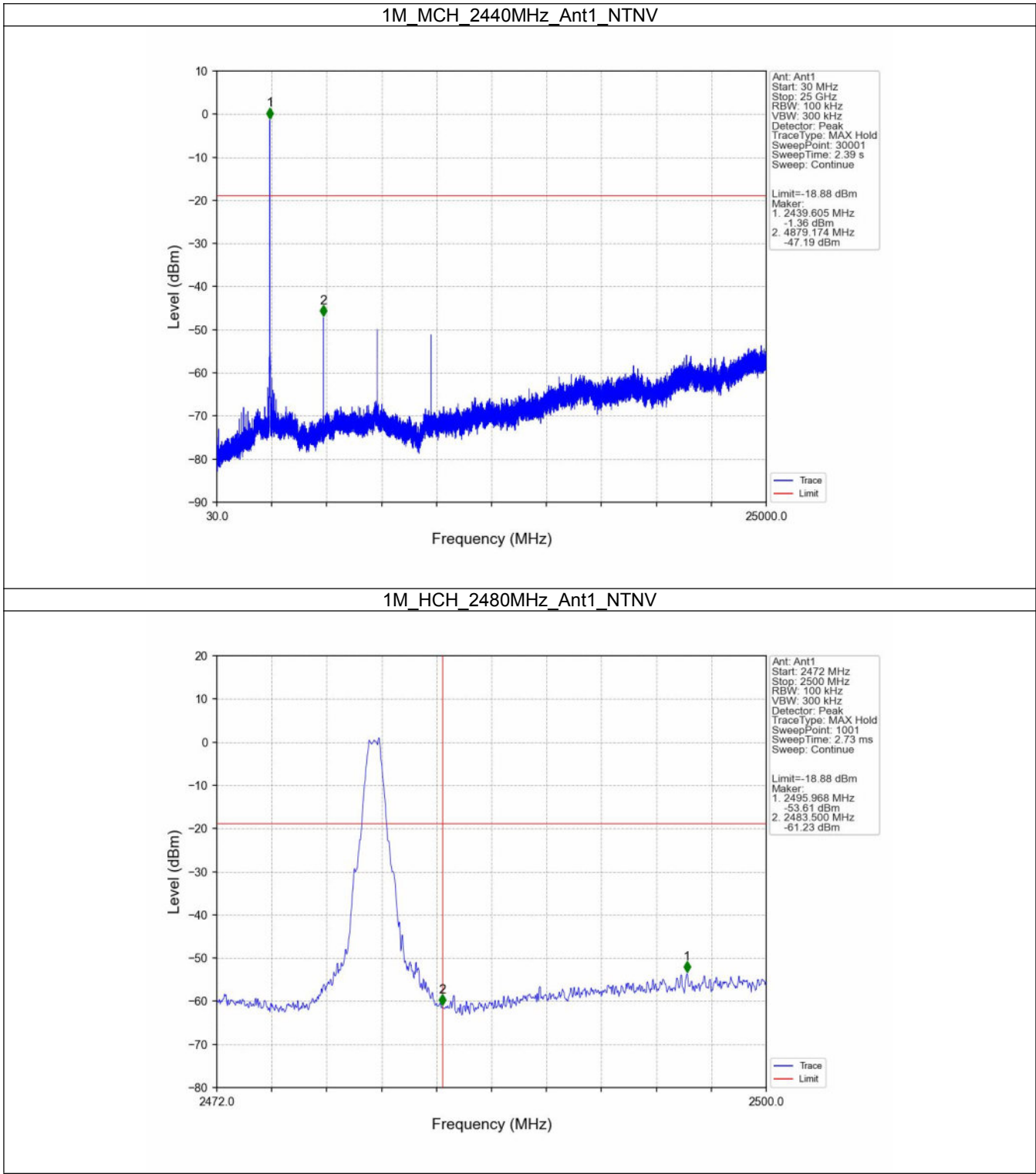


FCCID: 2ASC7BD320

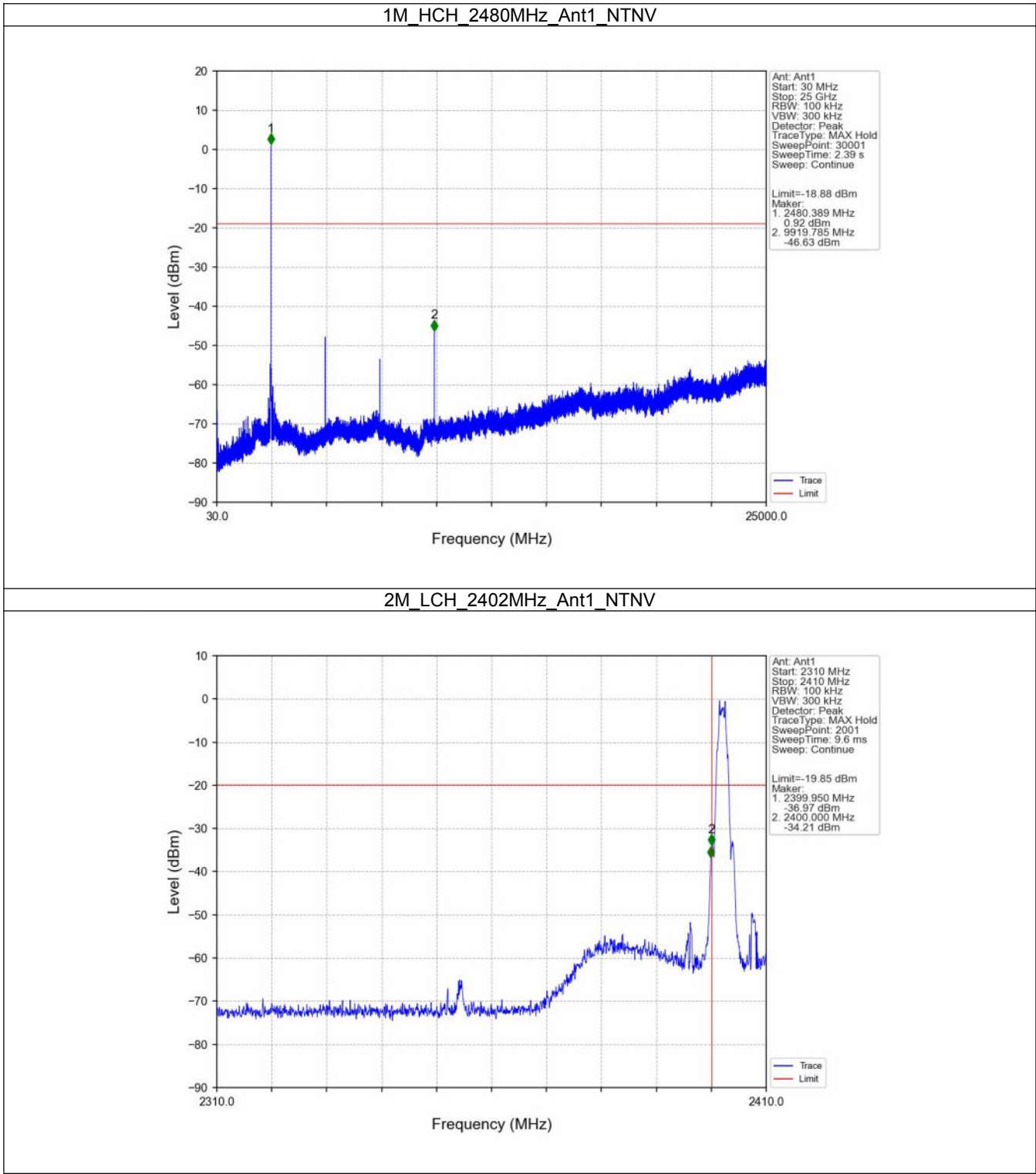
5.2.2 CSE



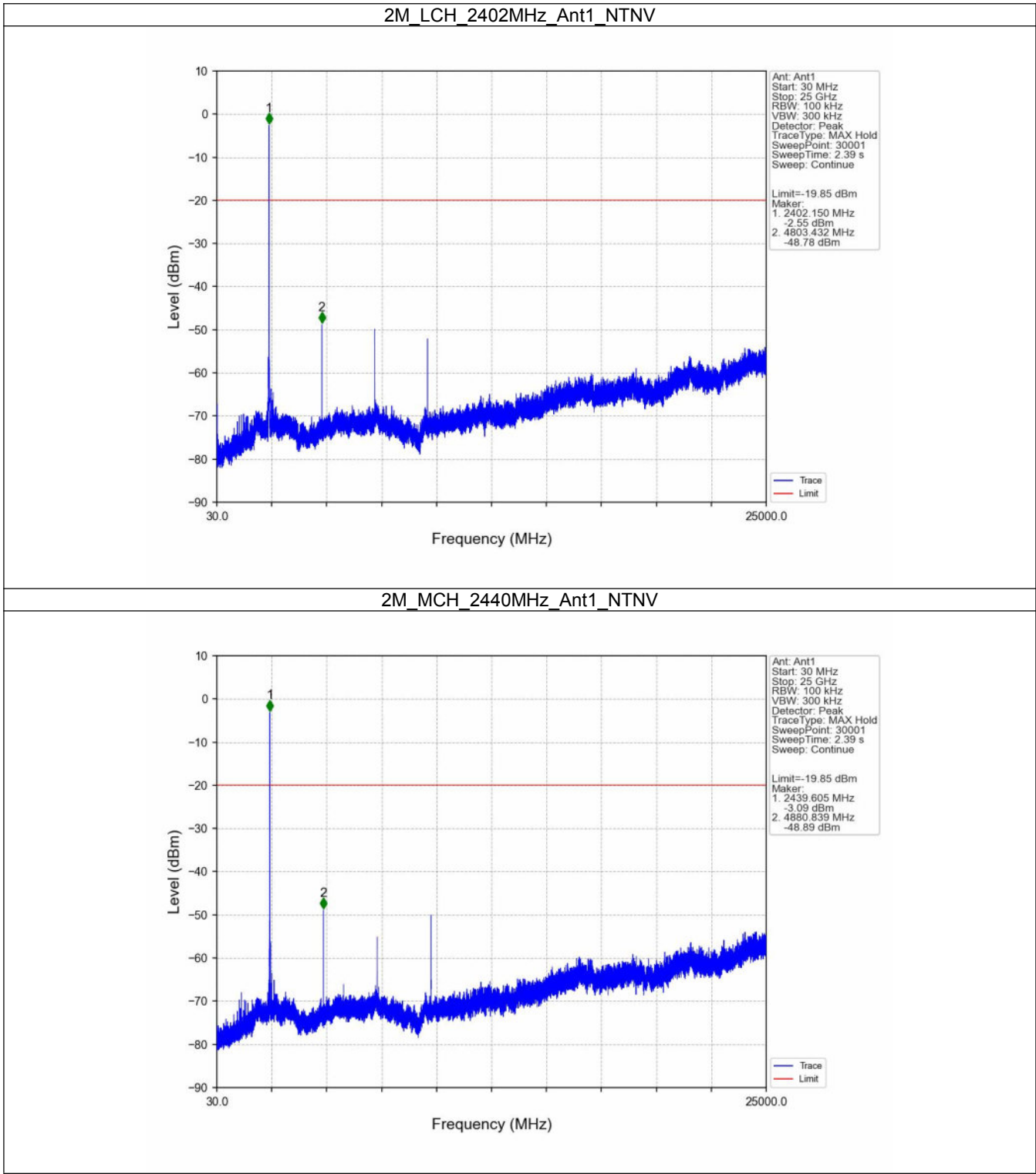
FCCID: 2ASC7BD320



FCCID: 2ASC7BD320



FCCID: 2ASC7BD320



FCCID: 2ASC7BD320

