



Shenzhen CTL Testing Technology Co., Ltd.

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

Annex for 5G Wi-Fi Band 1

Test Report No.: CTL2509126021-WF02

TABLE OF CONTENTS

1. Duty Cycle	3
1.1 Test Result	3
1.1.1 Ant1	3
1.2 Test Graph.....	4
1.2.1 Ant1	4
2. Bandwidth.....	14
2.1 Test Result	14
2.1.1 OBW	14
2.1.2 26dB BW	14
2.2 Test Graph.....	16
2.2.1 OBW	16
2.2.2 26dB BW	26
3. Maximum Conducted Output Power	36
3.1 Test Result	36
3.1.1 Power	36
3.2 Test Graph.....	37
3.2.1 Power	37
4. Maximum Power Spectral Density	47



4.1 Test Result 47

 4.1.1 PSD 47

4.2 Test Graph..... 48

 4.2.1 PSD 48

5. Frequency Stability 58

 5.1 Test Result 58

 5.1.1 Ant1 58

FCC ID: SMQ-UWM1

1. Duty Cycle

1.1 Test Result

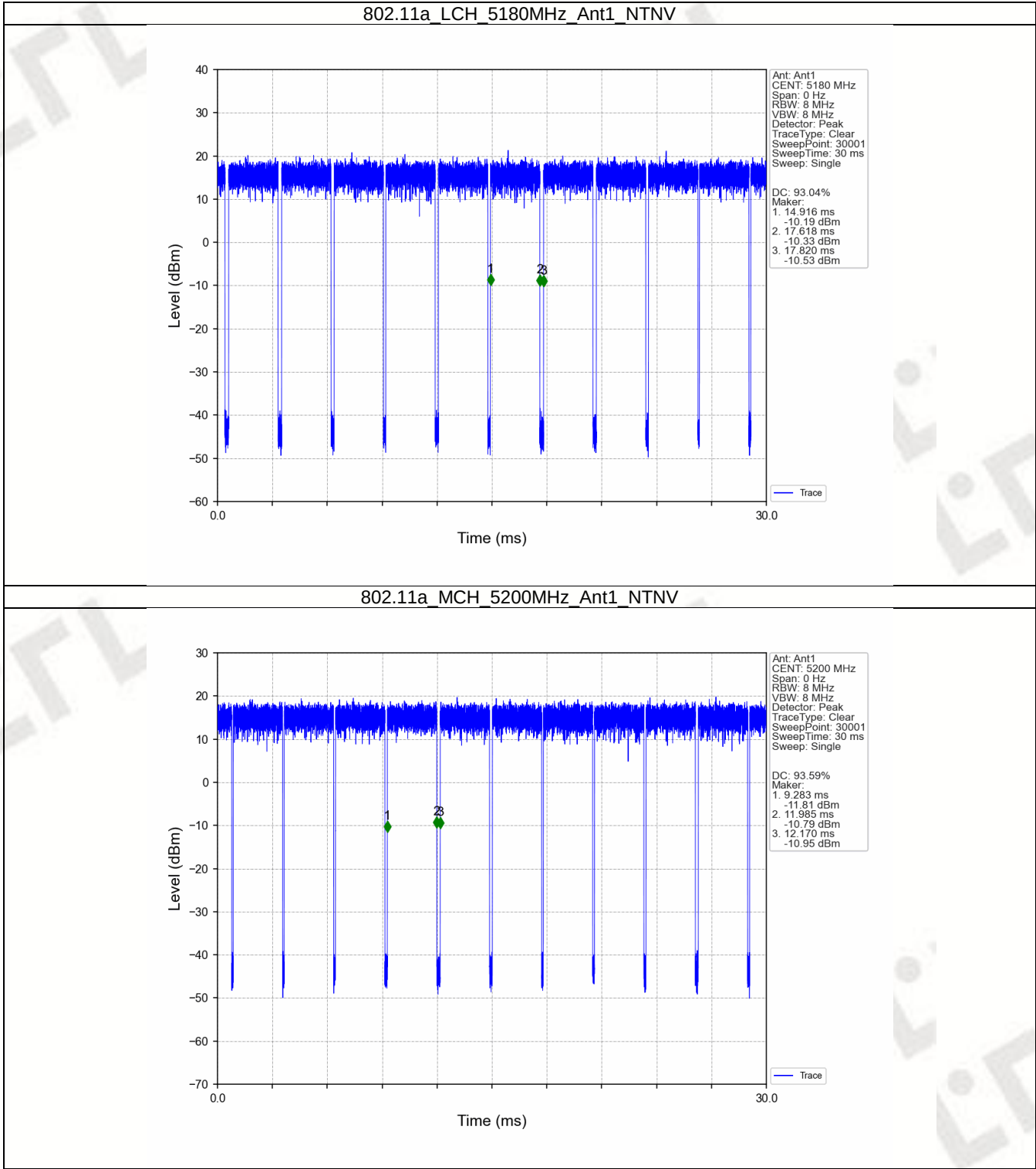
1.1.1 Ant1

Ant1									
Mode	TX Type	Frequency (MHz)	RU	RU Pos	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11a	SISO	5180	/	/	2.702	2.904	93.04	0.31	3.87
		5200	/	/	2.702	2.887	93.59	0.29	3.36
		5240	/	/	2.702	2.914	92.72	0.33	4.23
802.11n (HT20)	SISO	5180	/	/	2.514	2.725	92.26	0.35	4.44
		5200	/	/	2.515	2.717	92.57	0.34	2.85
		5240	/	/	2.514	2.784	90.30	0.44	4.28
802.11n (HT40)	SISO	5190	/	/	100.000	100.000	100.00	0.00	0.00
		5230	/	/	1.233	1.493	82.59	0.83	5.86
802.11ac (VHT20)	SISO	5180	/	/	2.521	2.725	92.51	0.34	4.17
		5200	/	/	2.522	2.802	90.01	0.46	6.39
		5240	/	/	2.516	2.733	92.06	0.36	4.14
802.11ac (VHT40)	SISO	5190	/	/	1.237	1.421	87.05	0.60	5.89
		5230	/	/	1.236	1.403	88.10	0.55	6.04
802.11ac (VHT80)	SISO	5210	/	/	0.595	0.761	78.19	1.07	8.16
802.11ax (HEW20)	SISO	5180	SU	/	1.917	2.126	90.17	0.45	3.59
		5200	SU	/	1.917	2.192	87.45	0.58	4.49
		5240	SU	/	1.917	2.134	89.83	0.47	5.23
802.11ax (HEW40)	SISO	5190	SU	/	0.979	1.186	82.55	0.83	9.11
		5230	SU	/	0.979	1.216	80.51	0.94	6.45
802.11ax (HEW80)	SISO	5210	SU	/	0.489	0.734	66.62	1.76	10.37

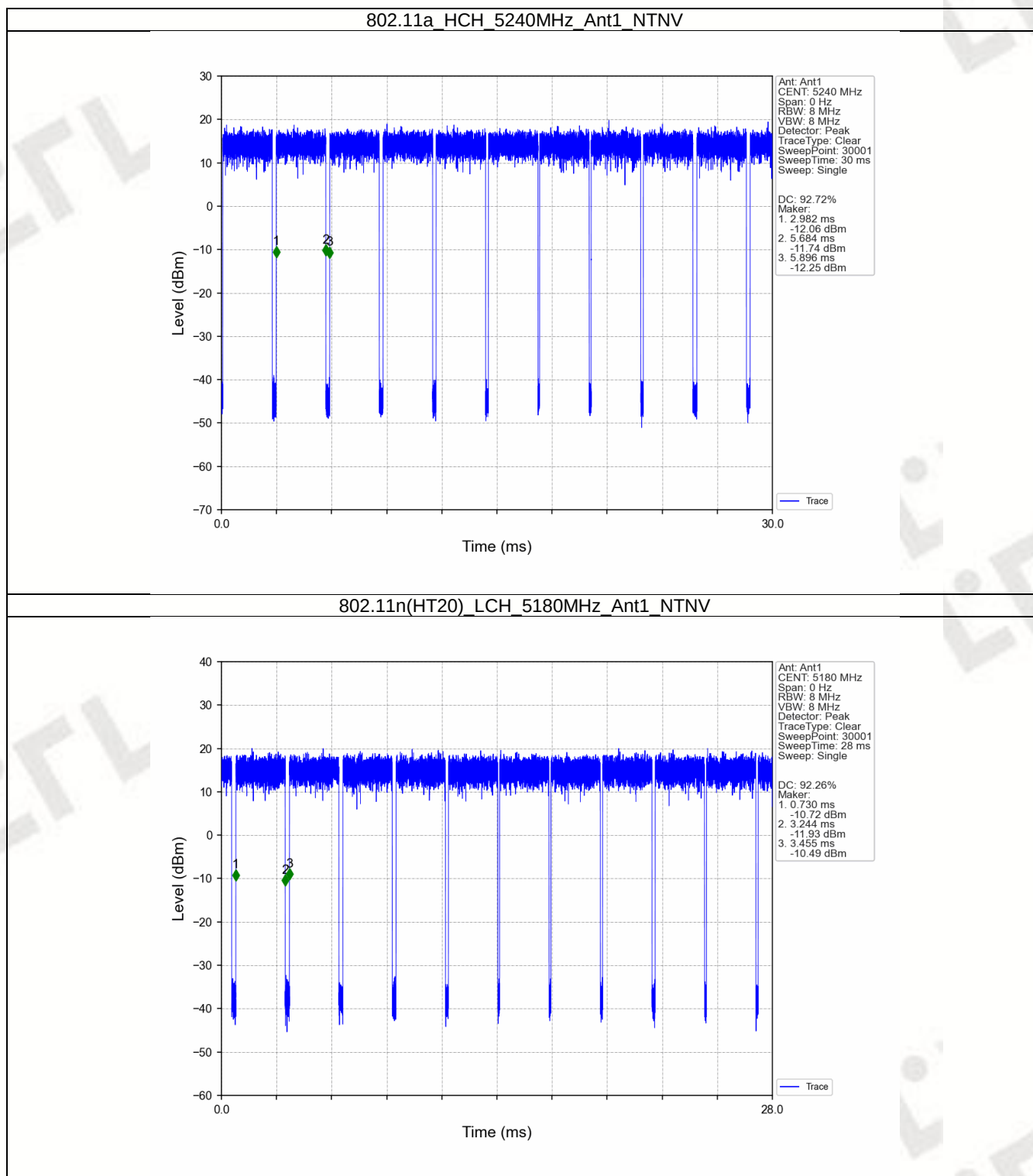
FCC ID: SMQ-UWM1

1.2 Test Graph

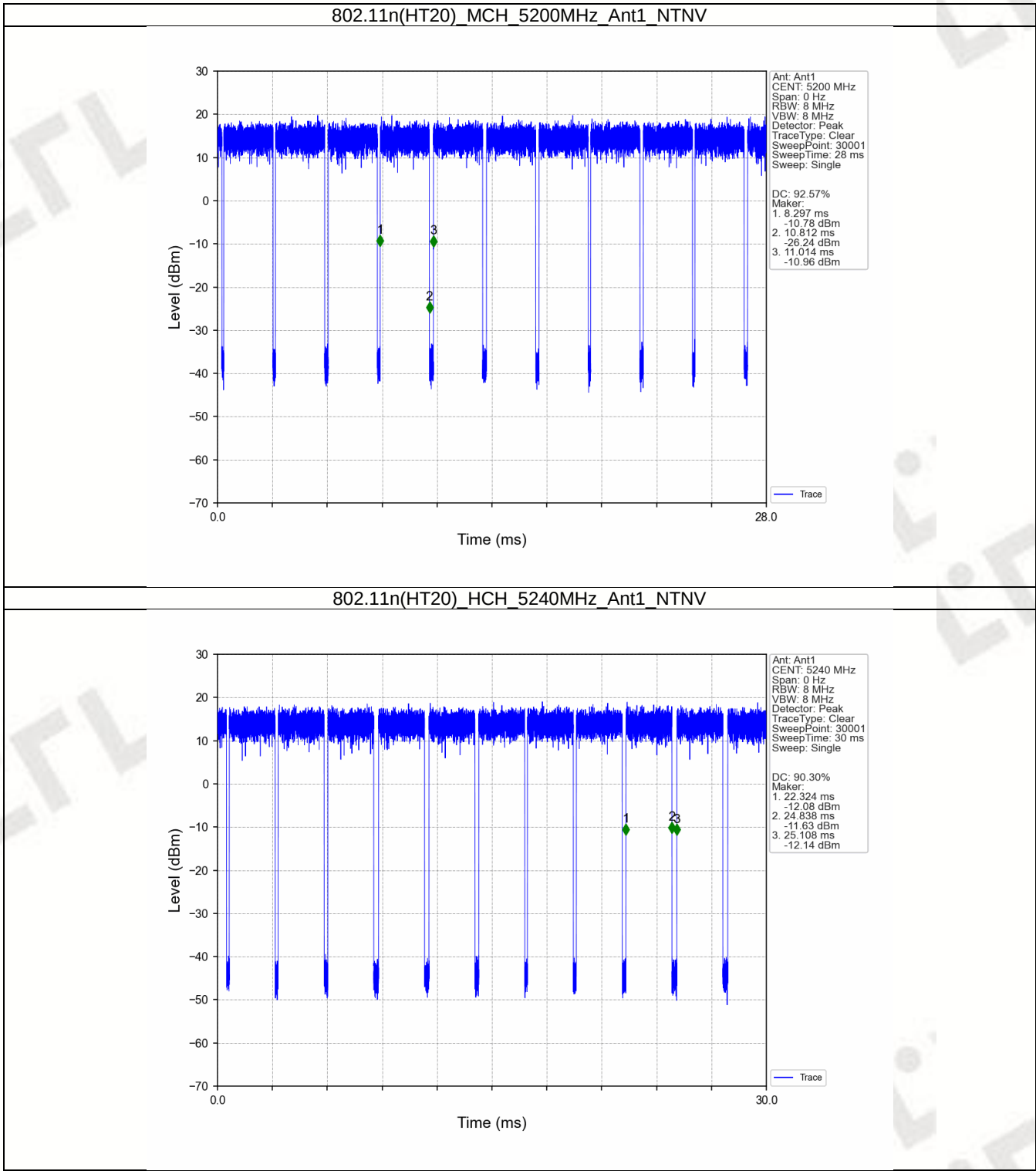
1.2.1 Ant1



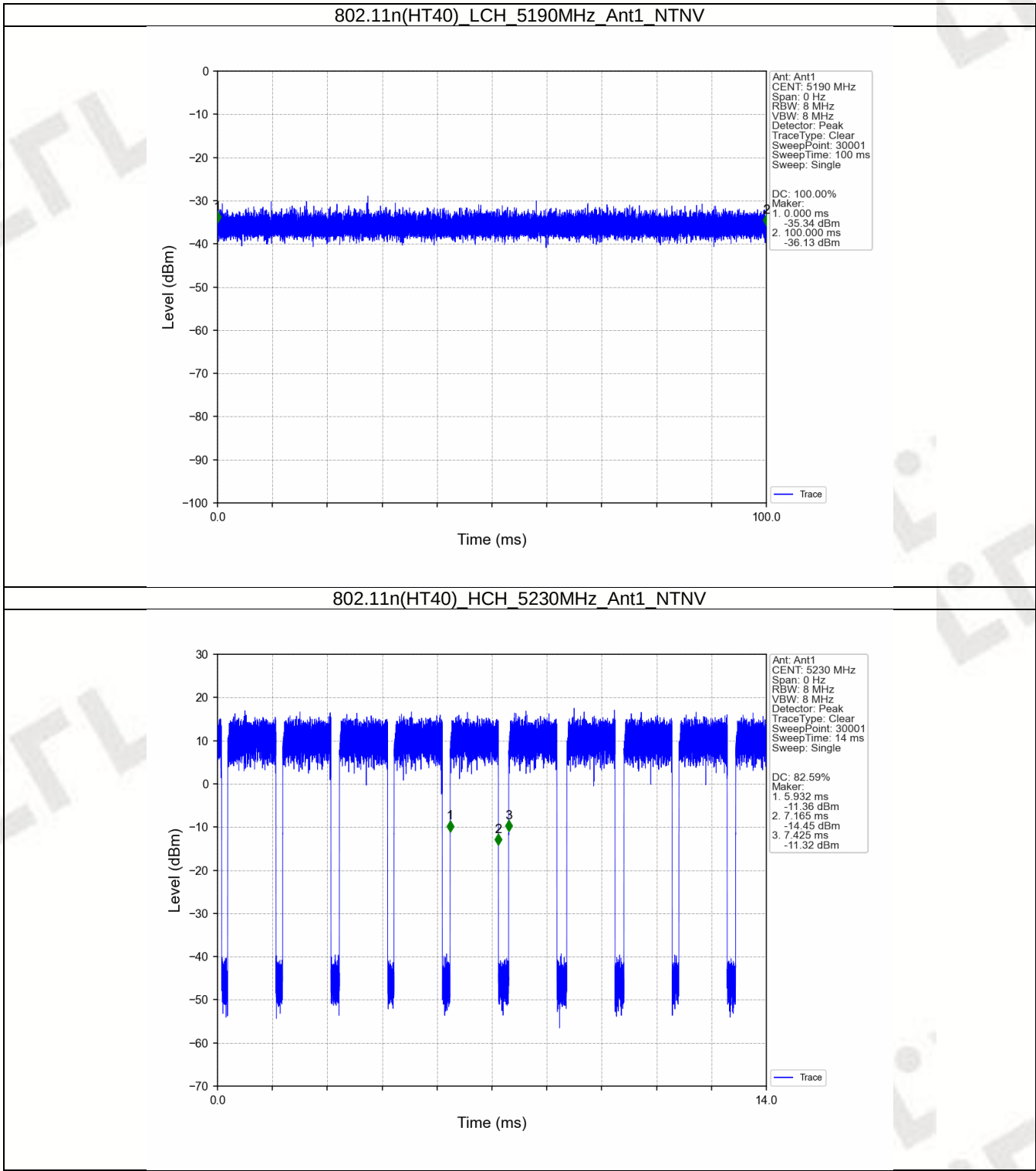
FCC ID: SMQ-UWM1



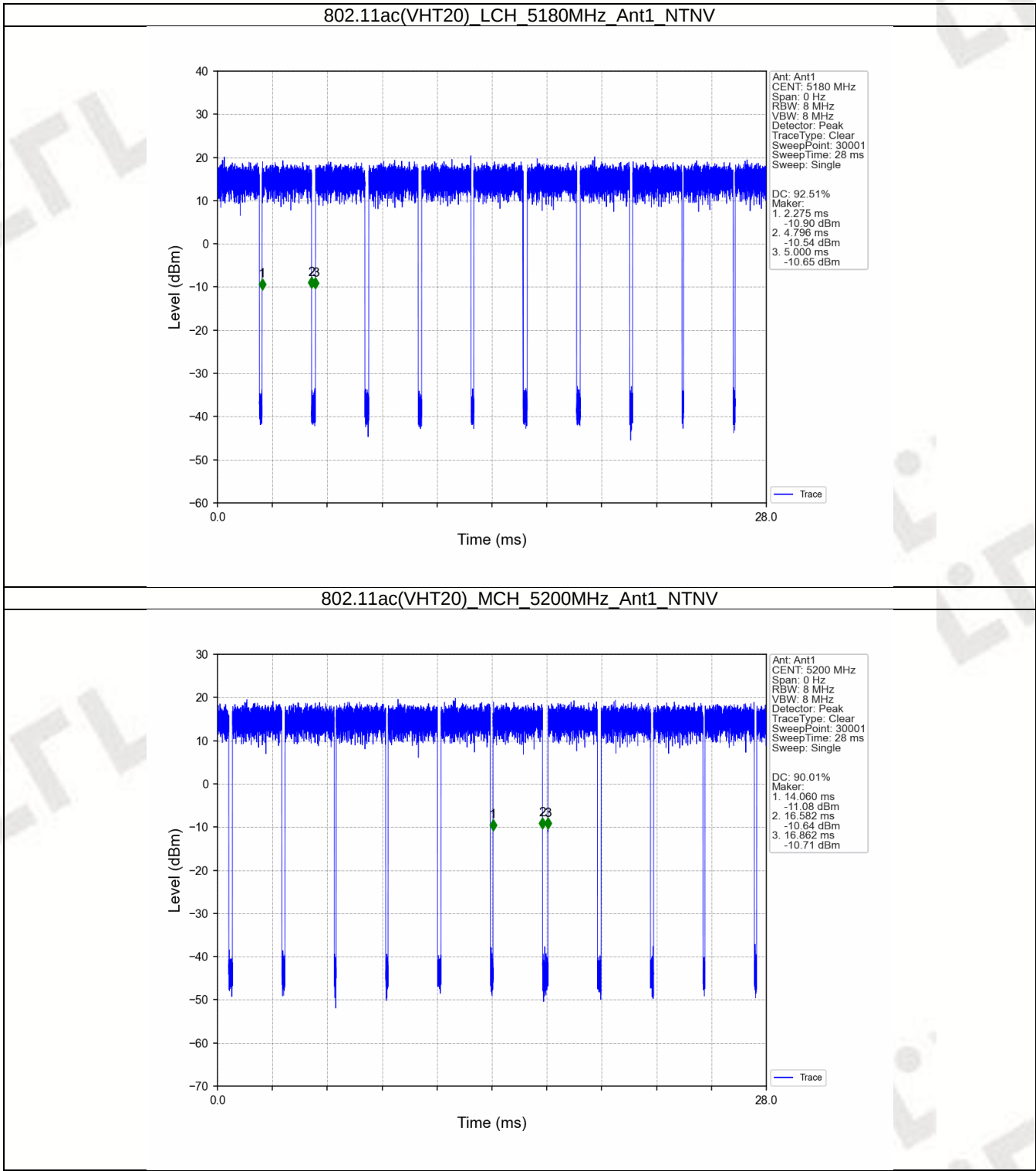
FCC ID: SMQ-UWM1



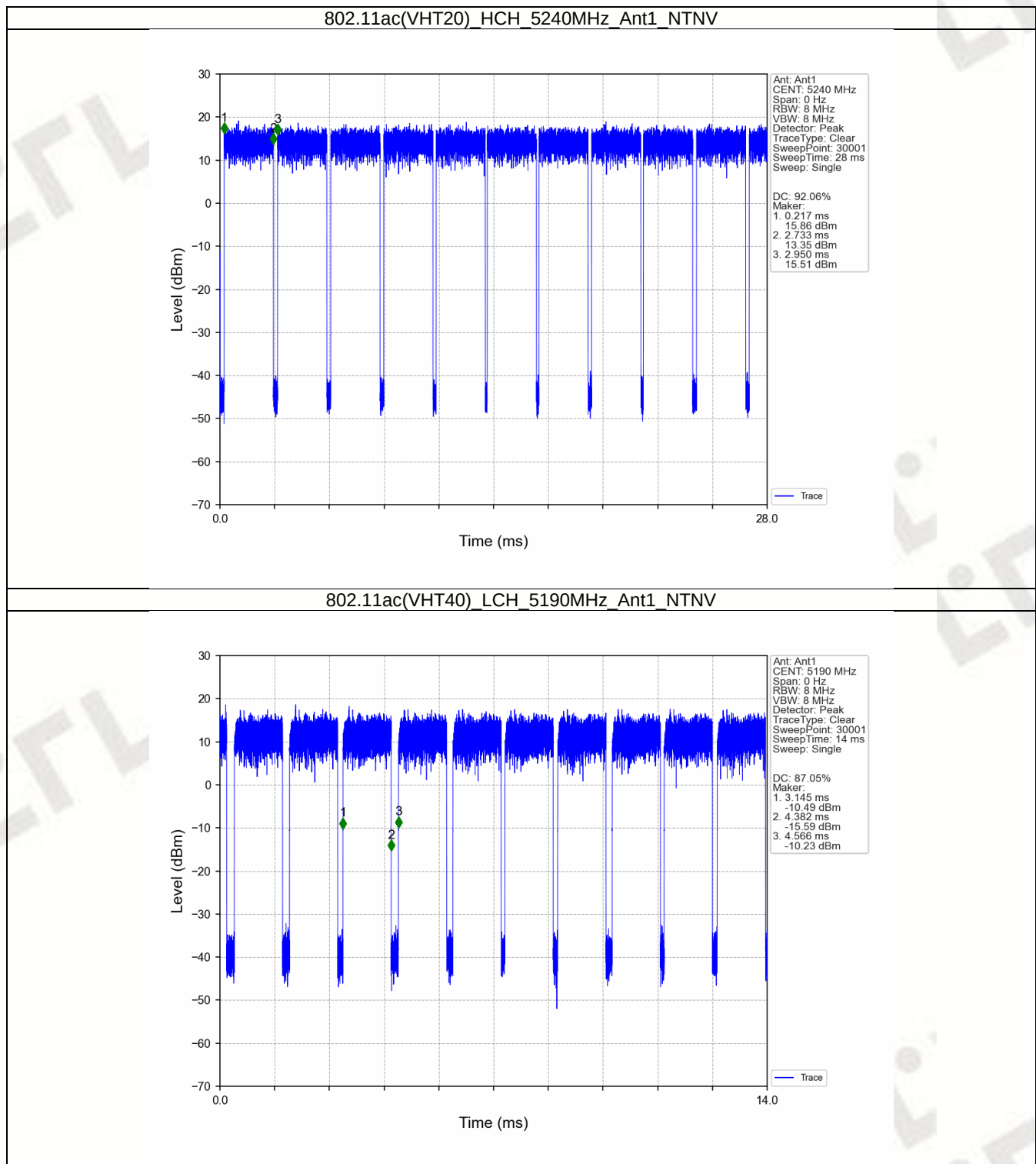
FCC ID: SMQ-UWM1



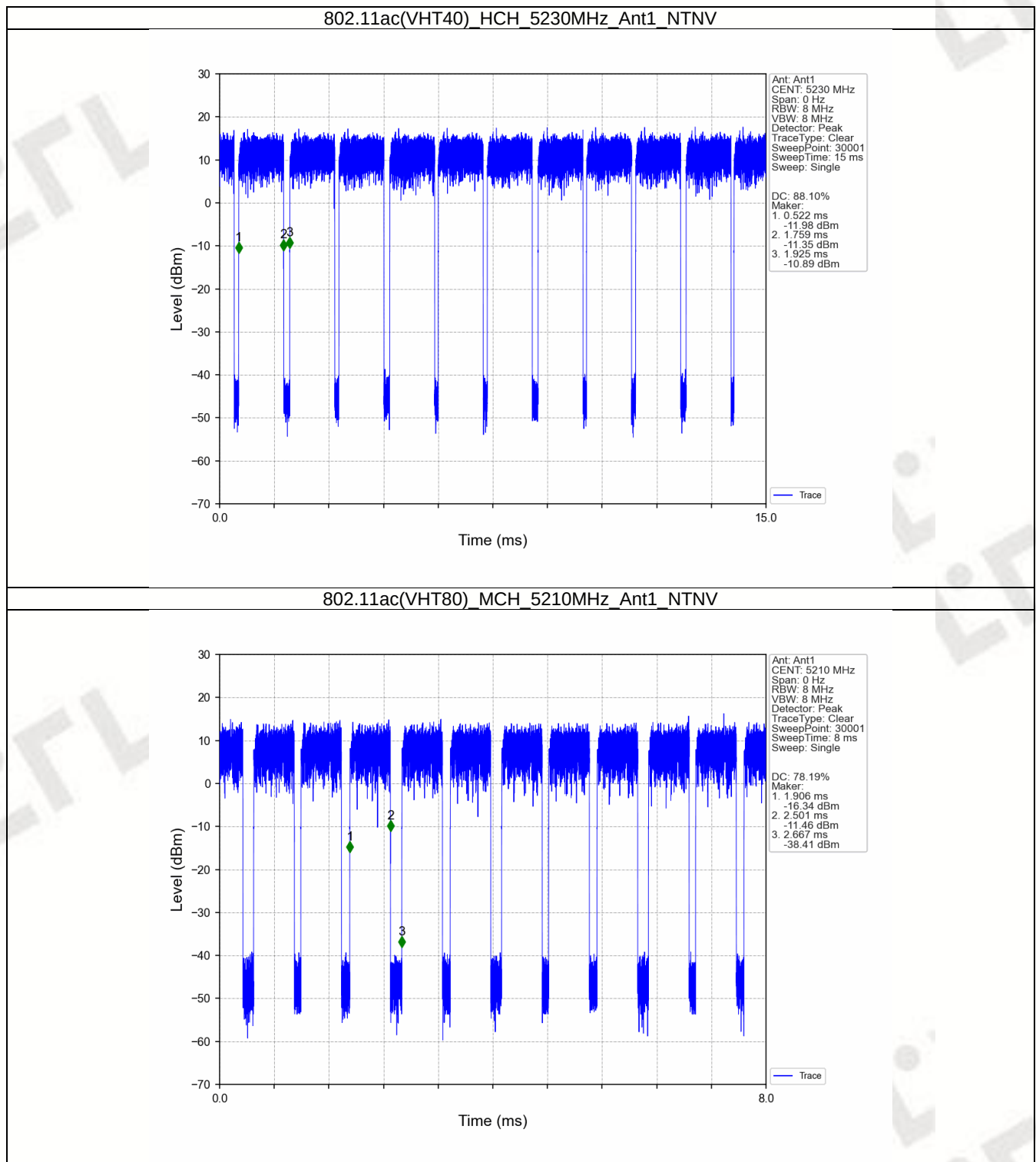
FCC ID: SMQ-UWM1



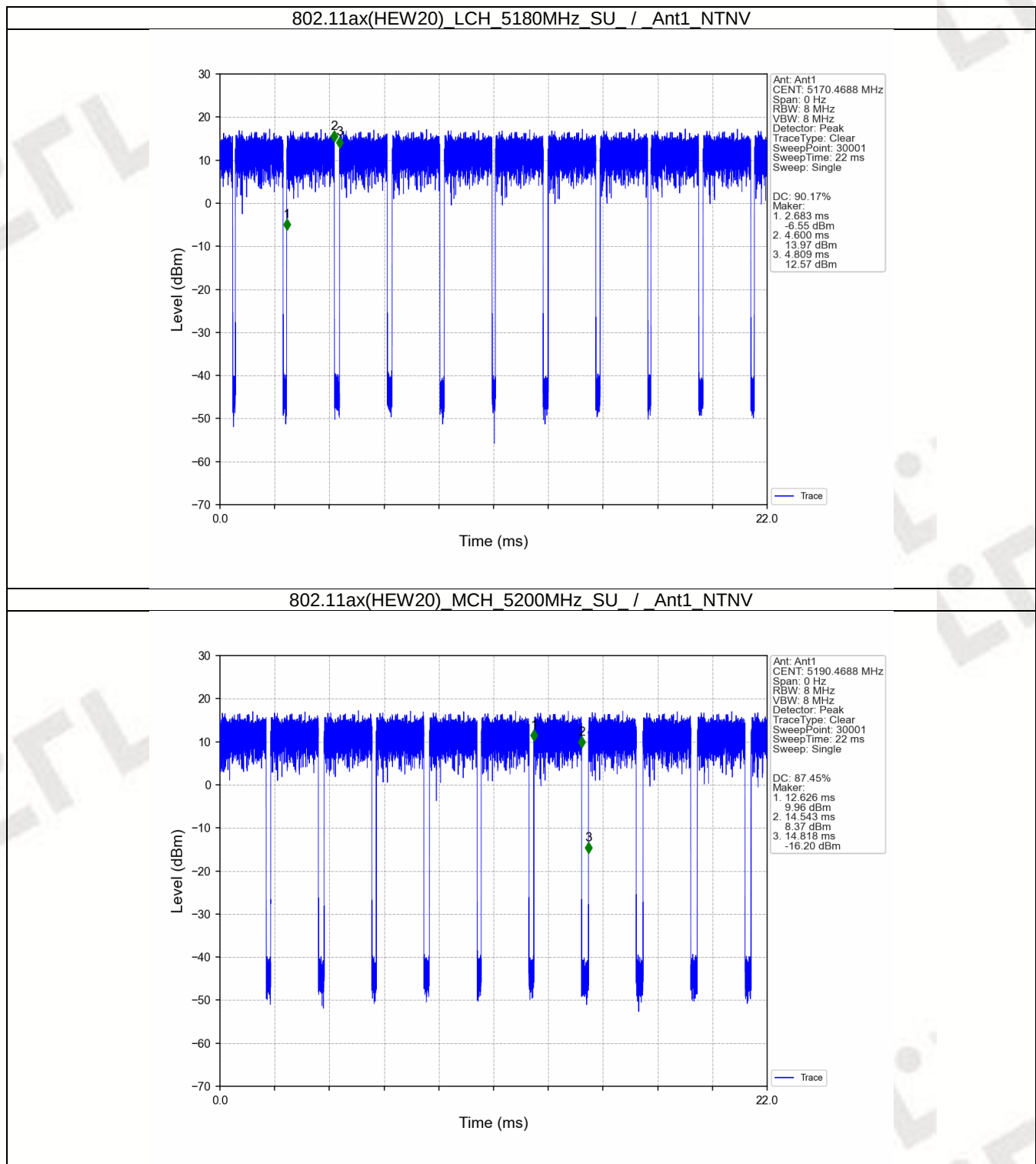
FCC ID: SMQ-UWM1



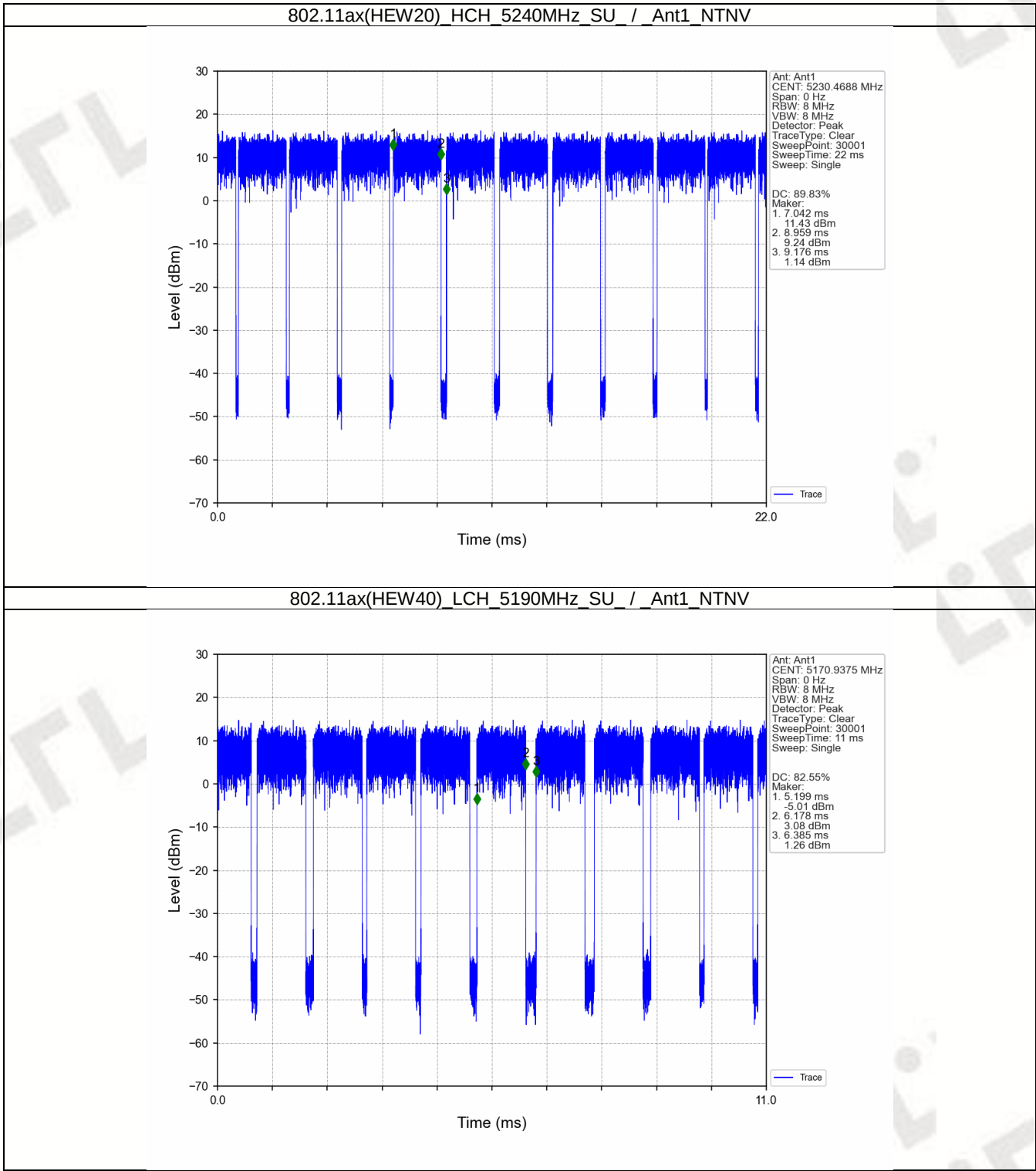
FCC ID: SMQ-UWM1



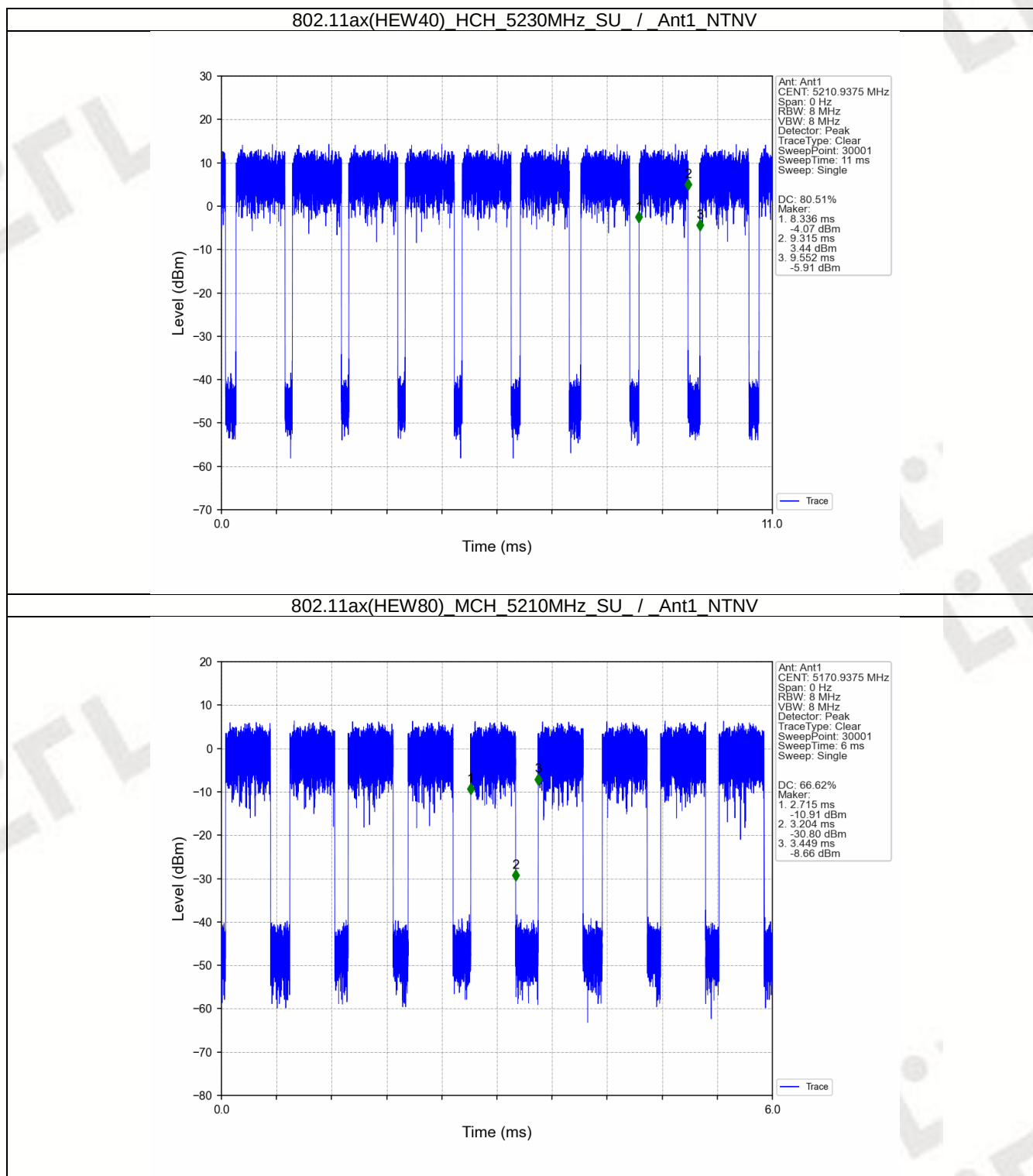
FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1

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	
802.11a	SISO	5180	/	/	1	17.643	/	Pass
		5200	/	/	1	17.680	/	Pass
		5240	/	/	1	17.711	/	Pass
802.11n (HT20)	SISO	5180	/	/	1	18.488	/	Pass
		5200	/	/	1	18.499	/	Pass
		5240	/	/	1	18.565	/	Pass
802.11n (HT40)	SISO	5190	/	/	1	37.292	/	Pass
		5230	/	/	1	37.338	/	Pass
802.11ac (VHT20)	SISO	5180	/	/	1	18.488	/	Pass
		5200	/	/	1	18.589	/	Pass
		5240	/	/	1	18.572	/	Pass
802.11ac (VHT40)	SISO	5190	/	/	1	37.313	/	Pass
		5230	/	/	1	37.294	/	Pass
802.11ac (VHT80)	SISO	5210	/	/	1	75.291	/	Pass
802.11ax (HEW20)	SISO	5180	SU	/	1	19.354	/	Pass
		5200	SU	/	1	19.305	/	Pass
		5240	SU	/	1	19.311	/	Pass
802.11ax (HEW40)	SISO	5190	SU	/	1	38.261	/	Pass
		5230	SU	/	1	38.284	/	Pass
802.11ax (HEW80)	SISO	5210	SU	/	1	76.982	/	Pass

2.1.2 26dB BW

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	26dB Bandwidth (MHz)		Verdict
						Result	Limit	
802.11a	SISO	5180	/	/	1	22.959	/	Pass
		5200	/	/	1	22.683	/	Pass
		5240	/	/	1	23.123	/	Pass
802.11n (HT20)	SISO	5180	/	/	1	23.399	/	Pass
		5200	/	/	1	22.822	/	Pass
		5240	/	/	1	23.365	/	Pass
802.11n (HT40)	SISO	5190	/	/	1	43.082	/	Pass
		5230	/	/	1	43.034	/	Pass
802.11ac (VHT20)	SISO	5180	/	/	1	23.182	/	Pass
		5200	/	/	1	23.354	/	Pass
		5240	/	/	1	22.855	/	Pass
802.11ac (VHT40)	SISO	5190	/	/	1	43.308	/	Pass
		5230	/	/	1	43.094	/	Pass
802.11ac (VHT80)	SISO	5210	/	/	1	81.511	/	Pass
802.11ax (HEW20)	SISO	5180	SU	/	1	22.807	/	Pass
		5200	SU	/	1	22.847	/	Pass

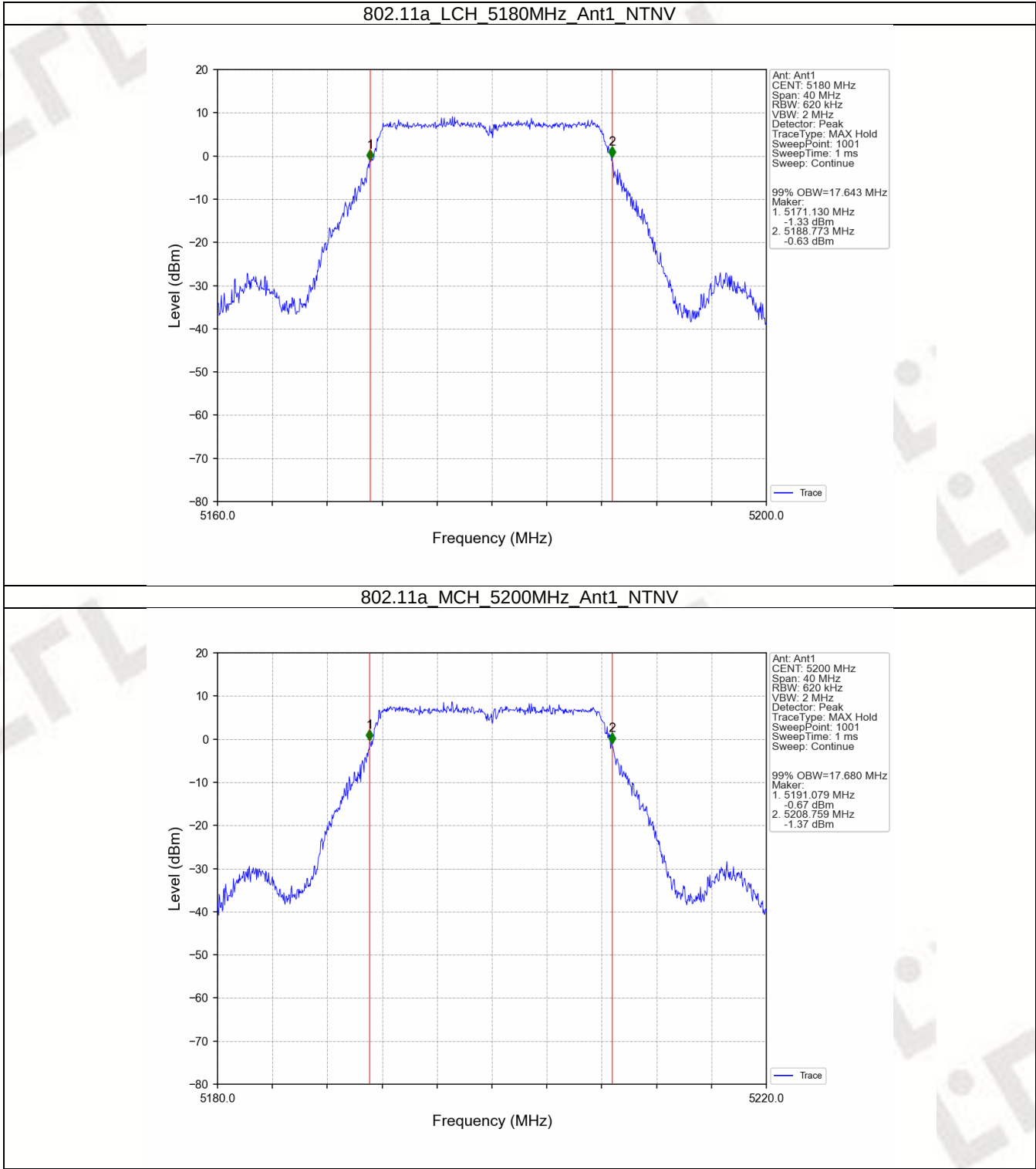
FCC ID: SMQ-UWM1

		5240	SU	/	1	22.790	/	Pass
802.11ax (HEW40)	SISO	5190	SU	/	1	42.368	/	Pass
		5230	SU	/	1	42.532	/	Pass
802.11ax (HEW80)	SISO	5210	SU	/	1	82.007	/	Pass

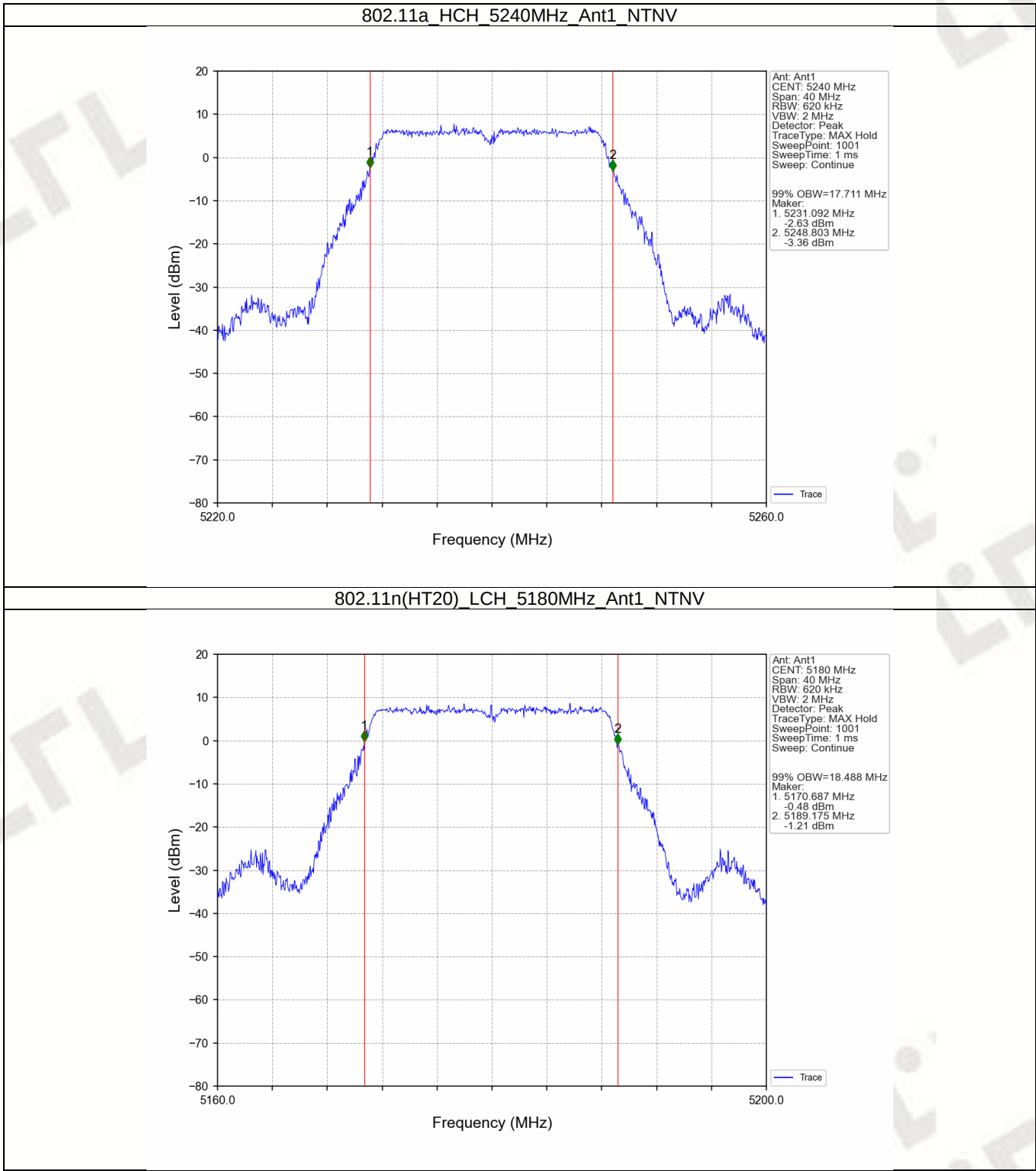
FCC ID: SMQ-UWM1

2.2 Test Graph

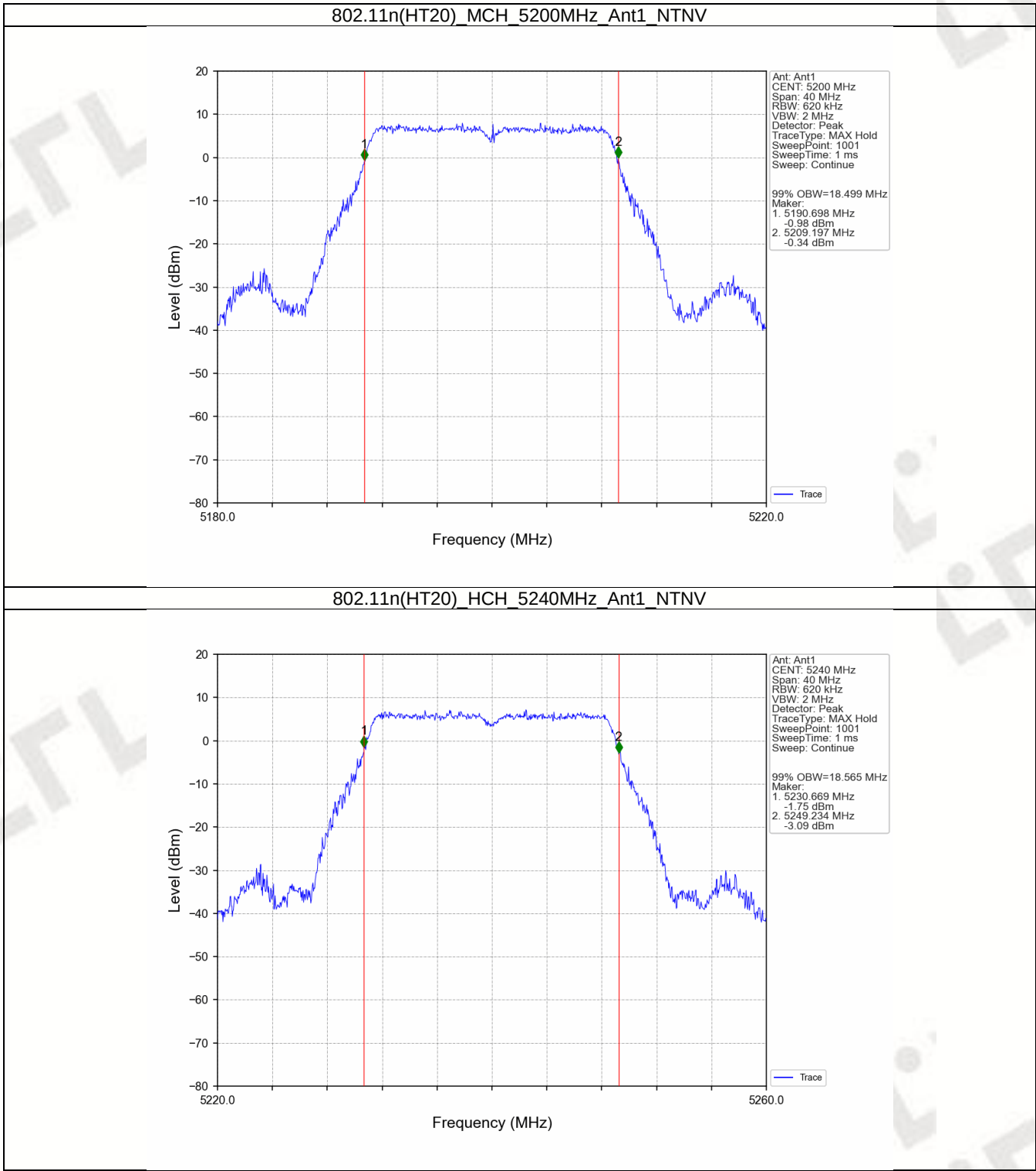
2.2.1 OBW



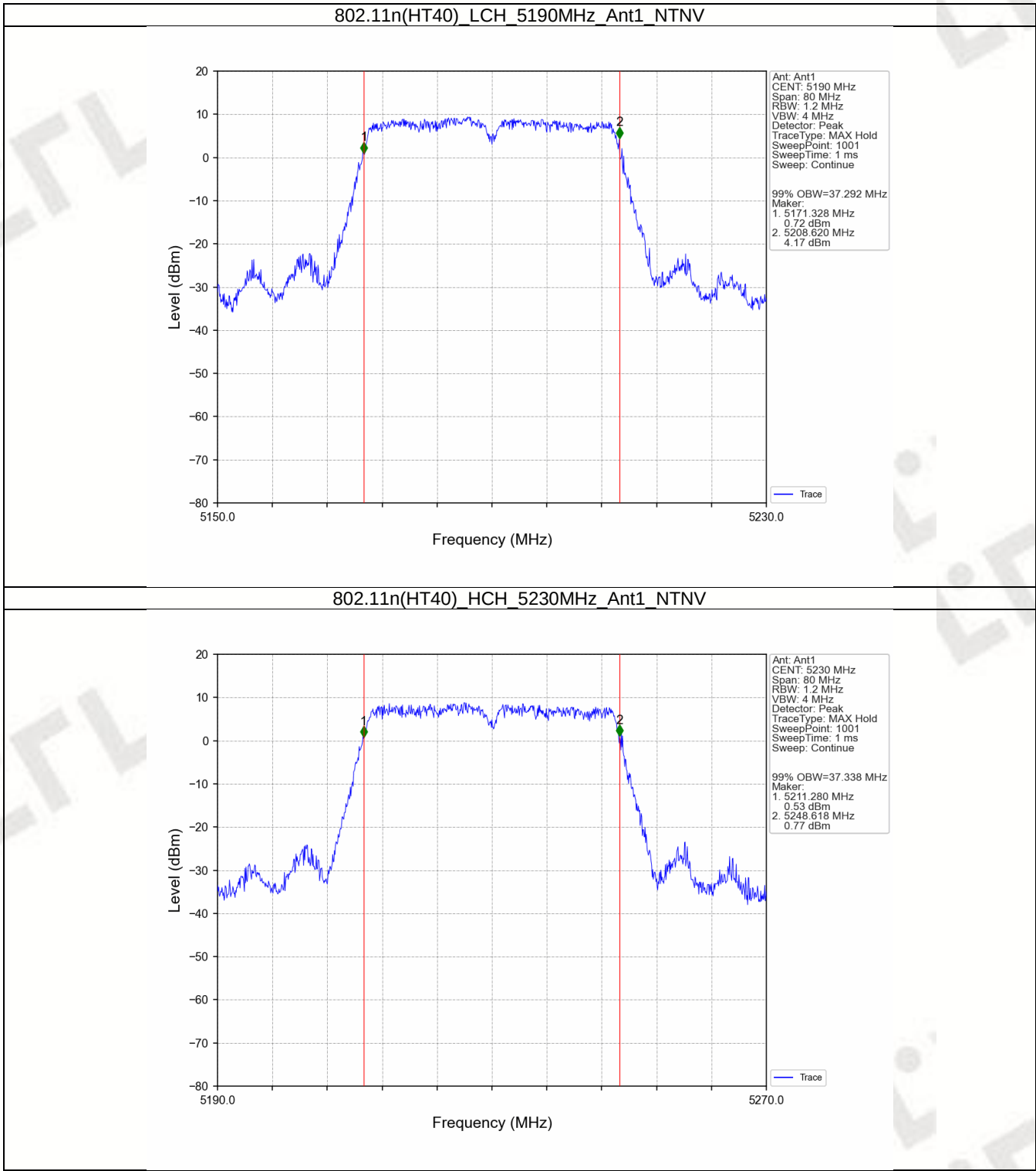
FCC ID: SMQ-UWM1



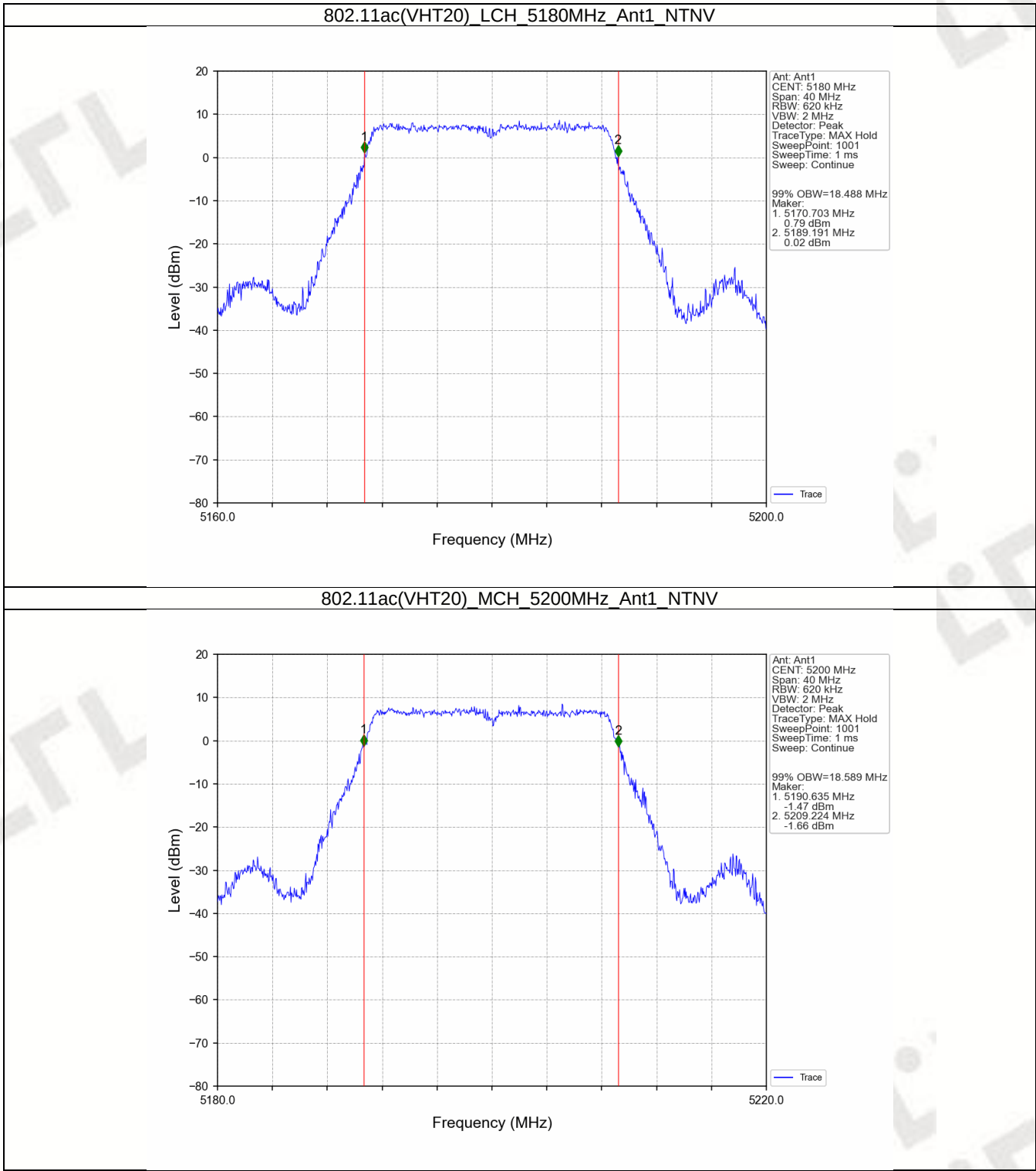
FCC ID: SMQ-UWM1



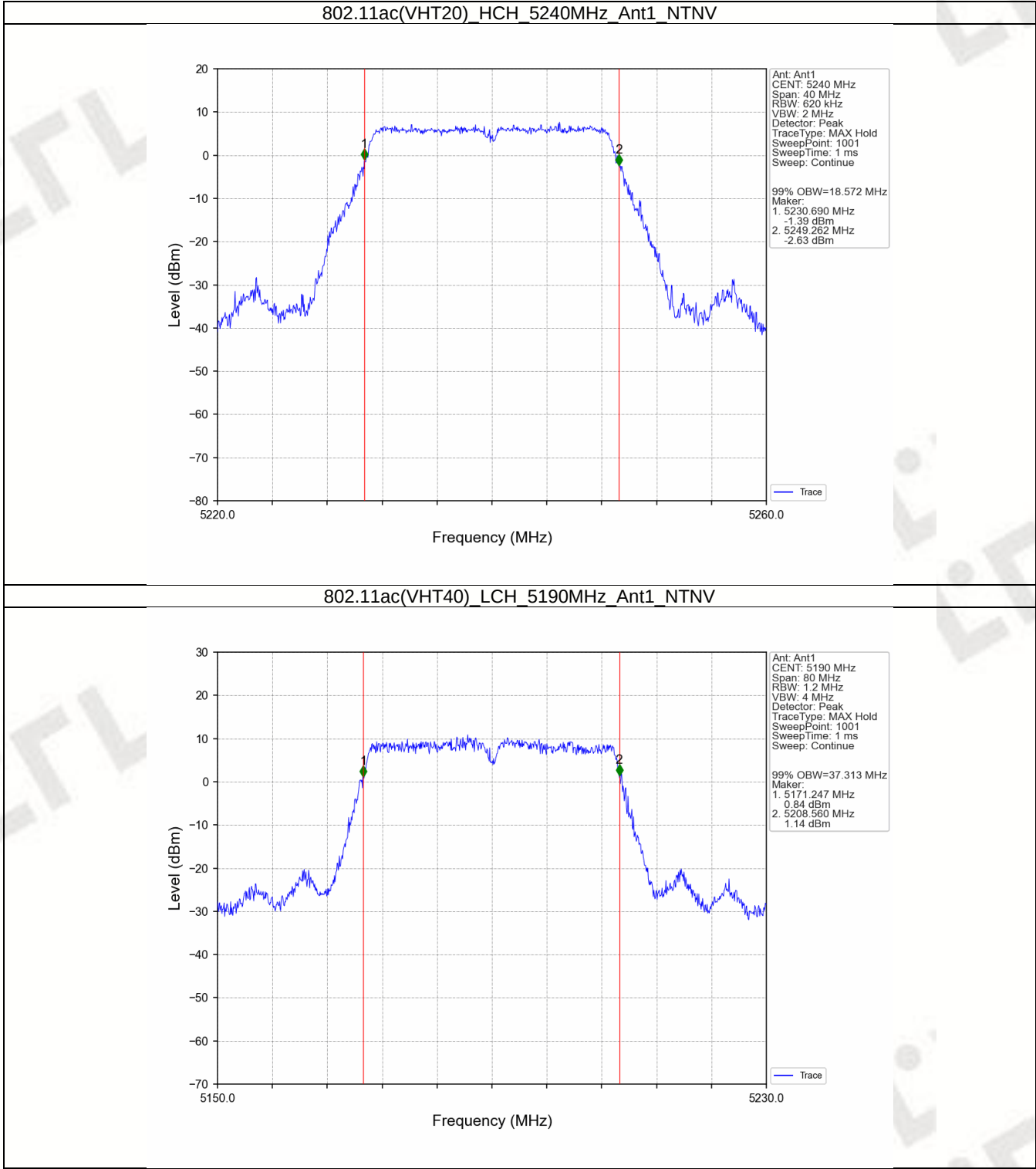
FCC ID: SMQ-UWM1



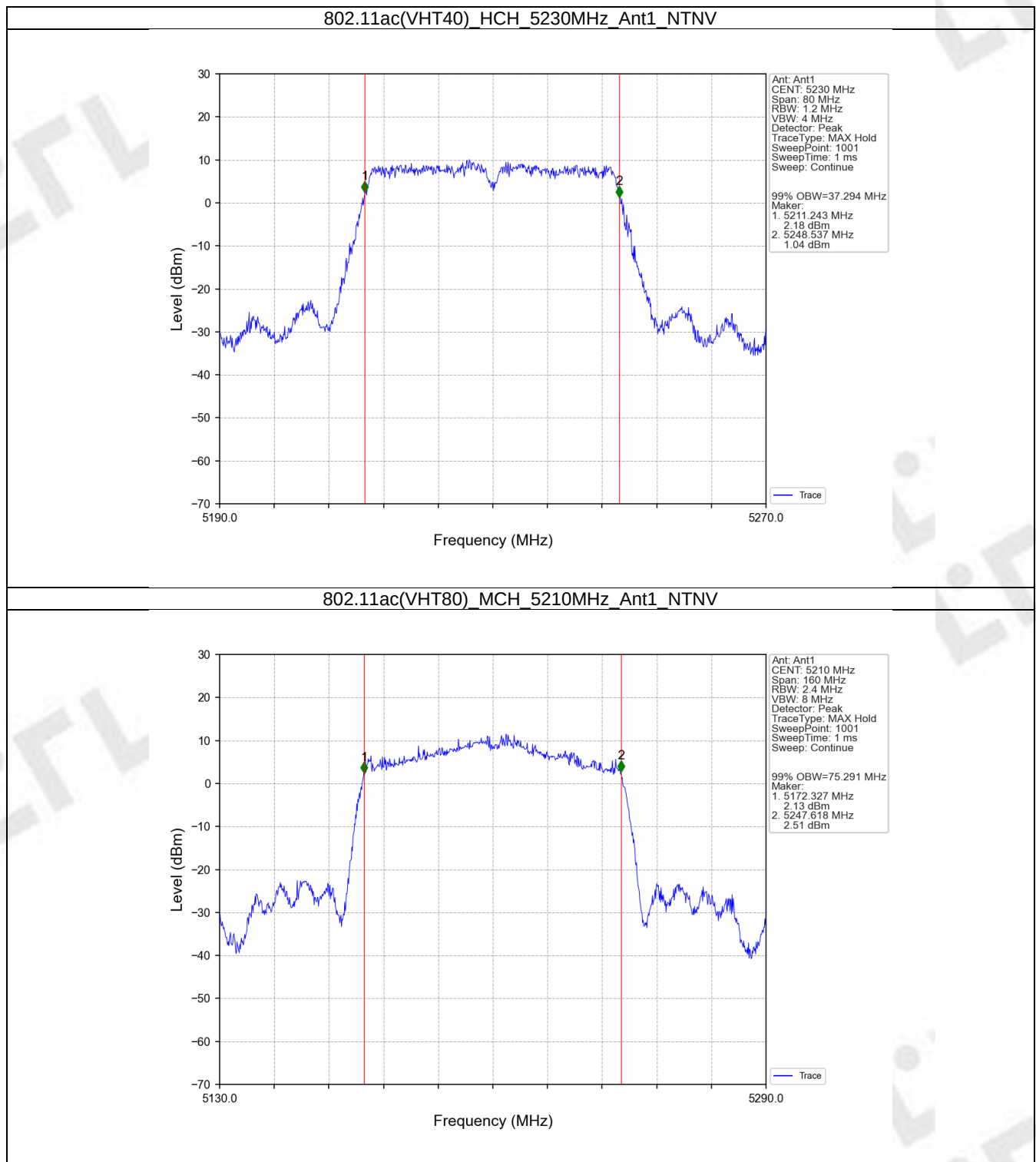
FCC ID: SMQ-UWM1



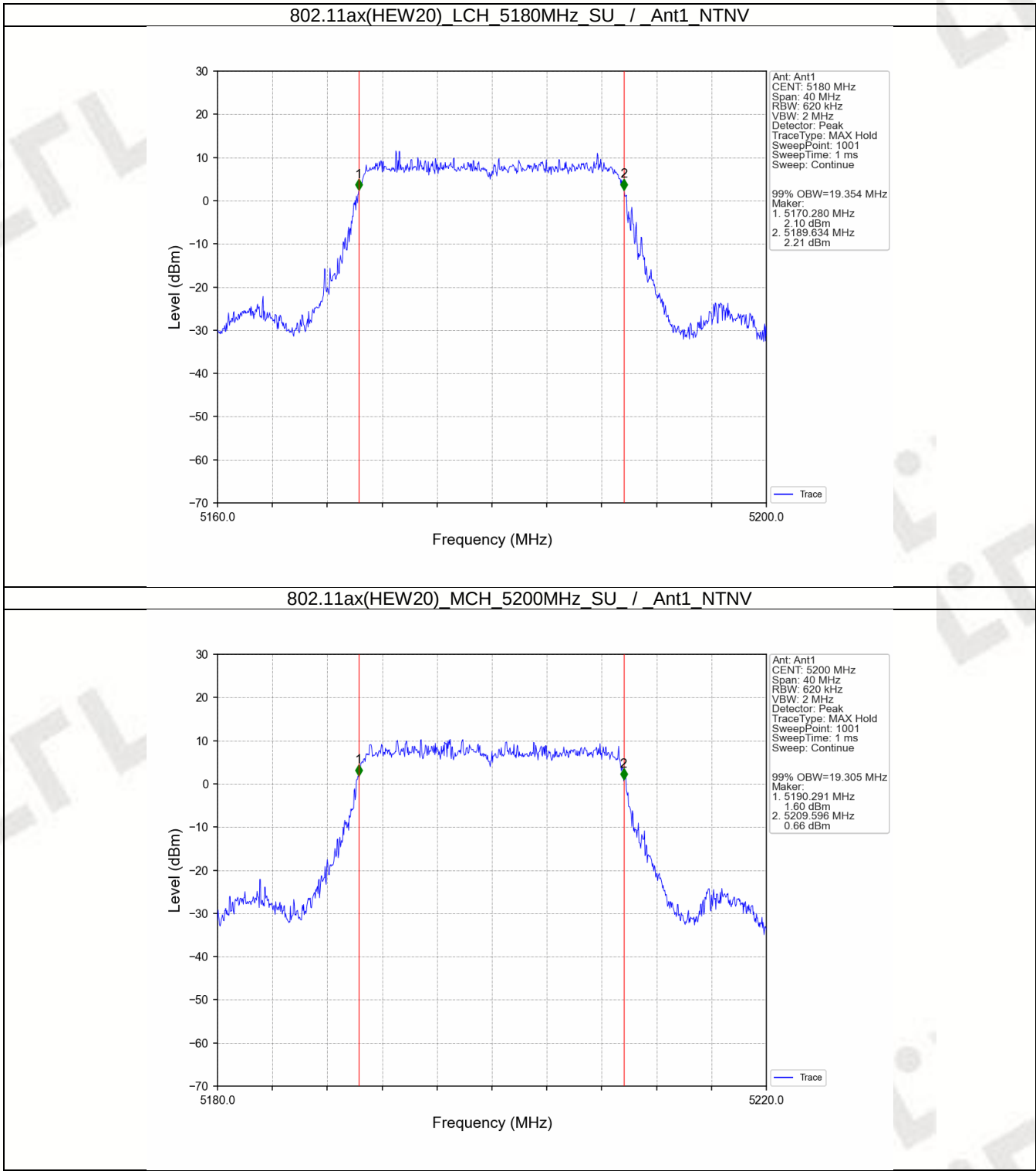
FCC ID: SMQ-UWM1



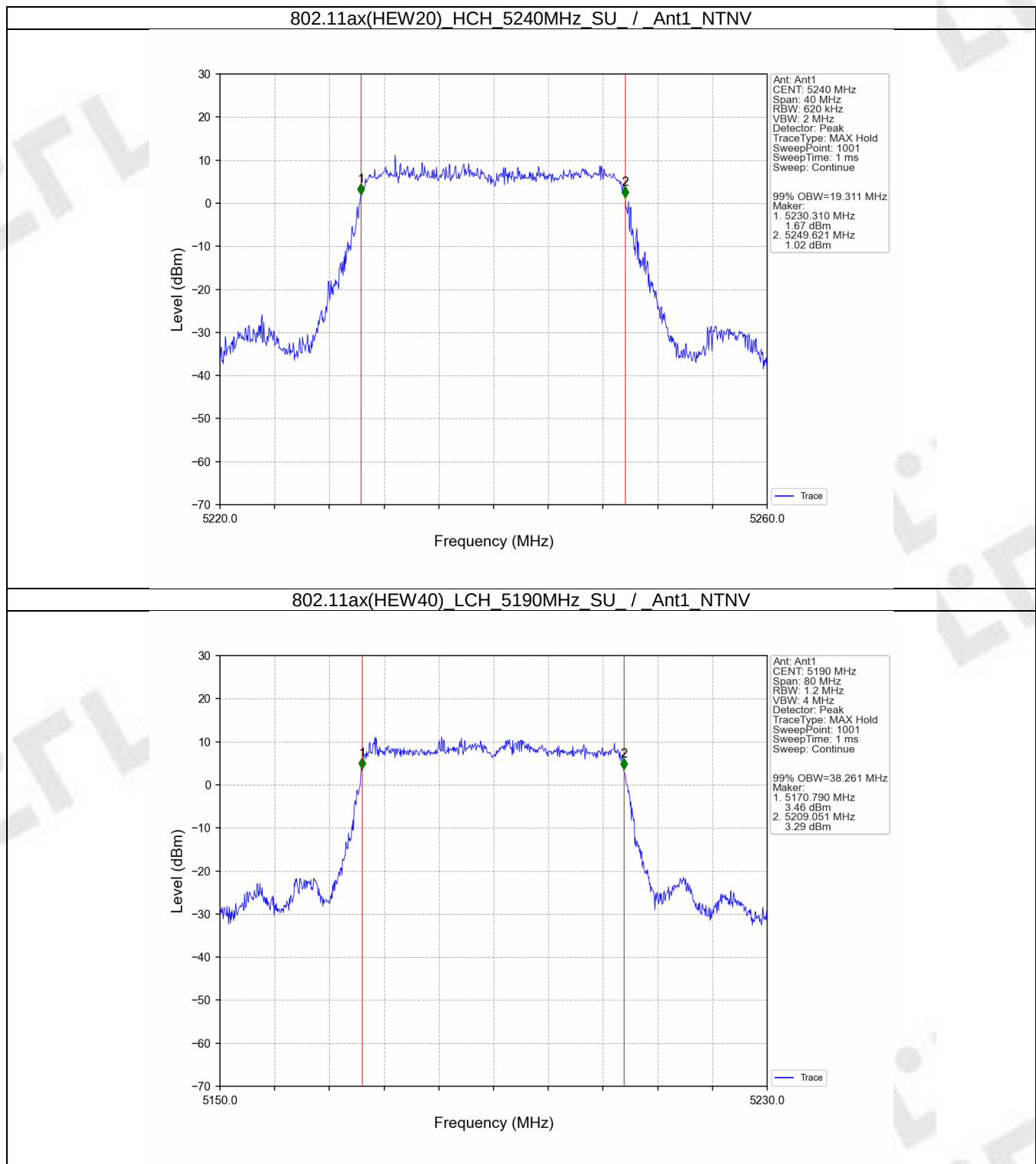
FCC ID: SMQ-UWM1



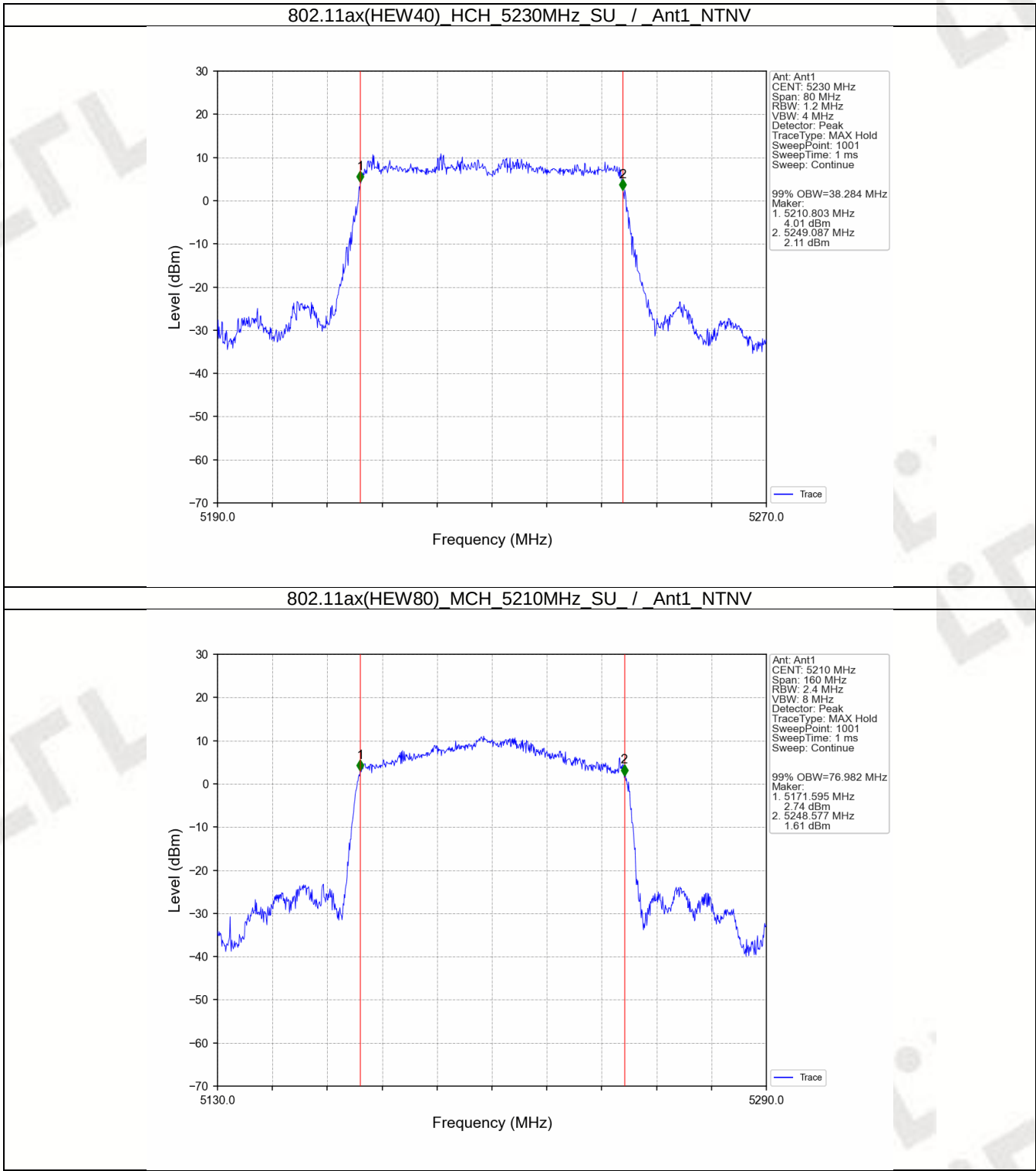
FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1

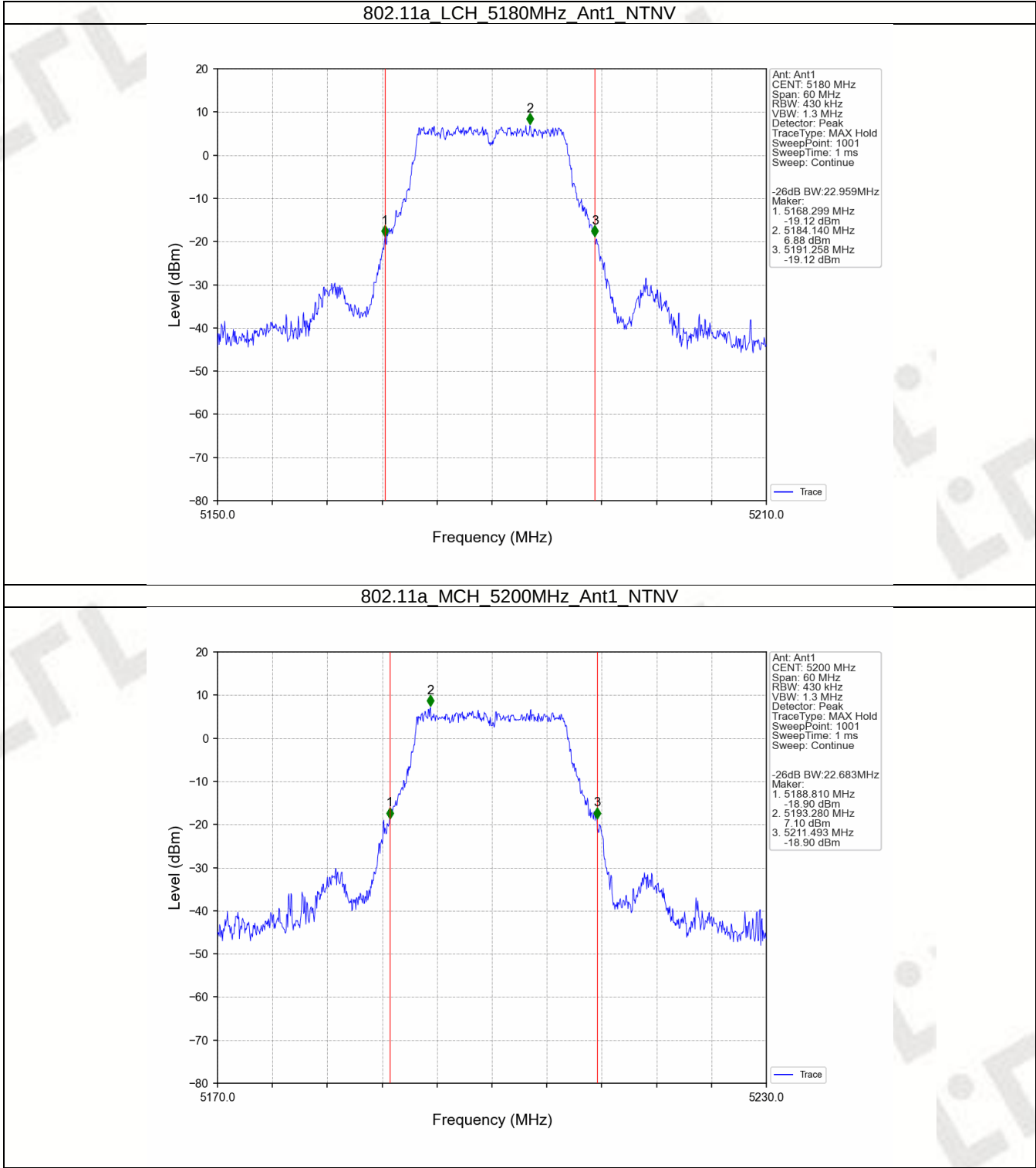


FCC ID: SMQ-UWM1

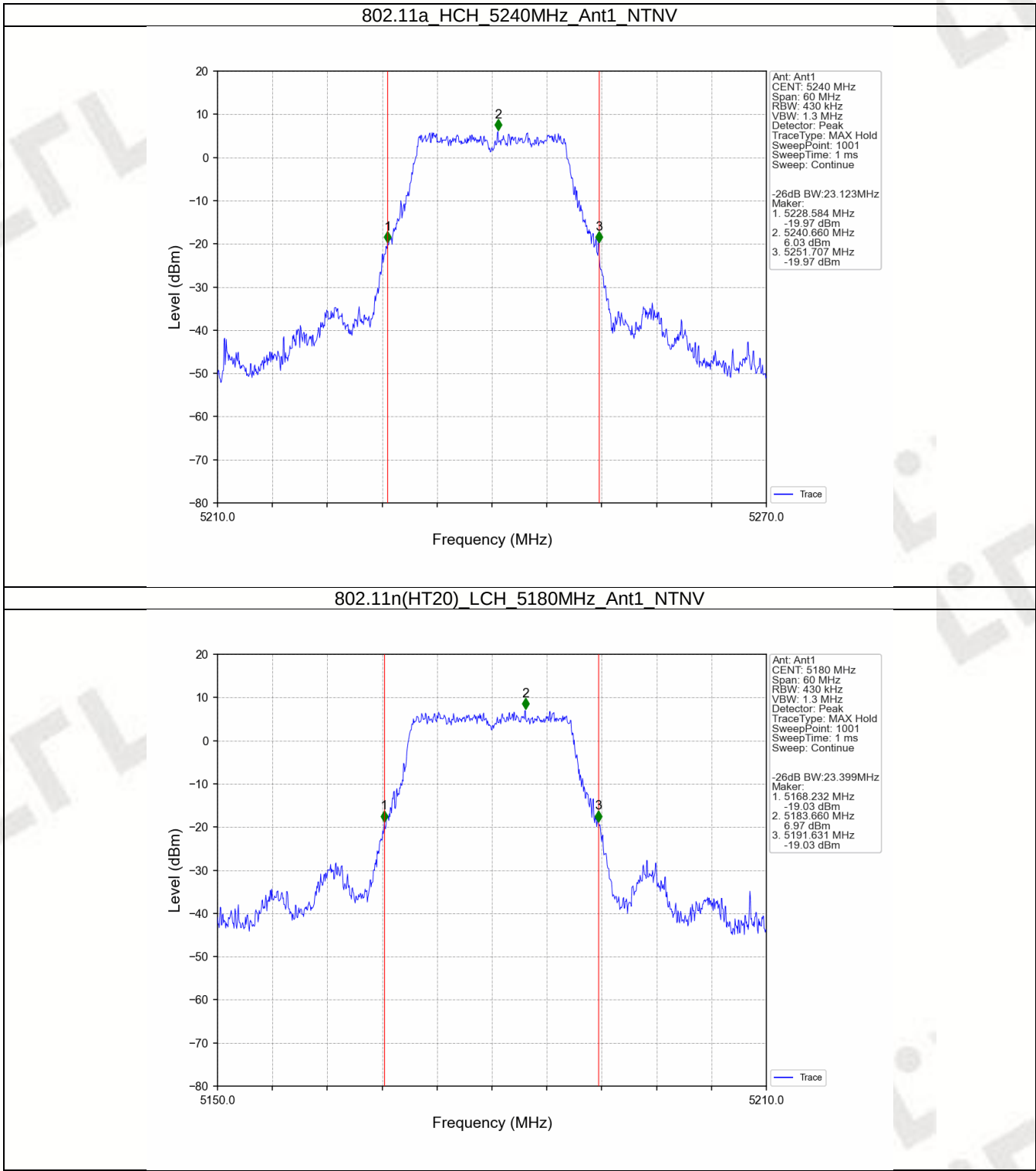


FCC ID: SMQ-UWM1

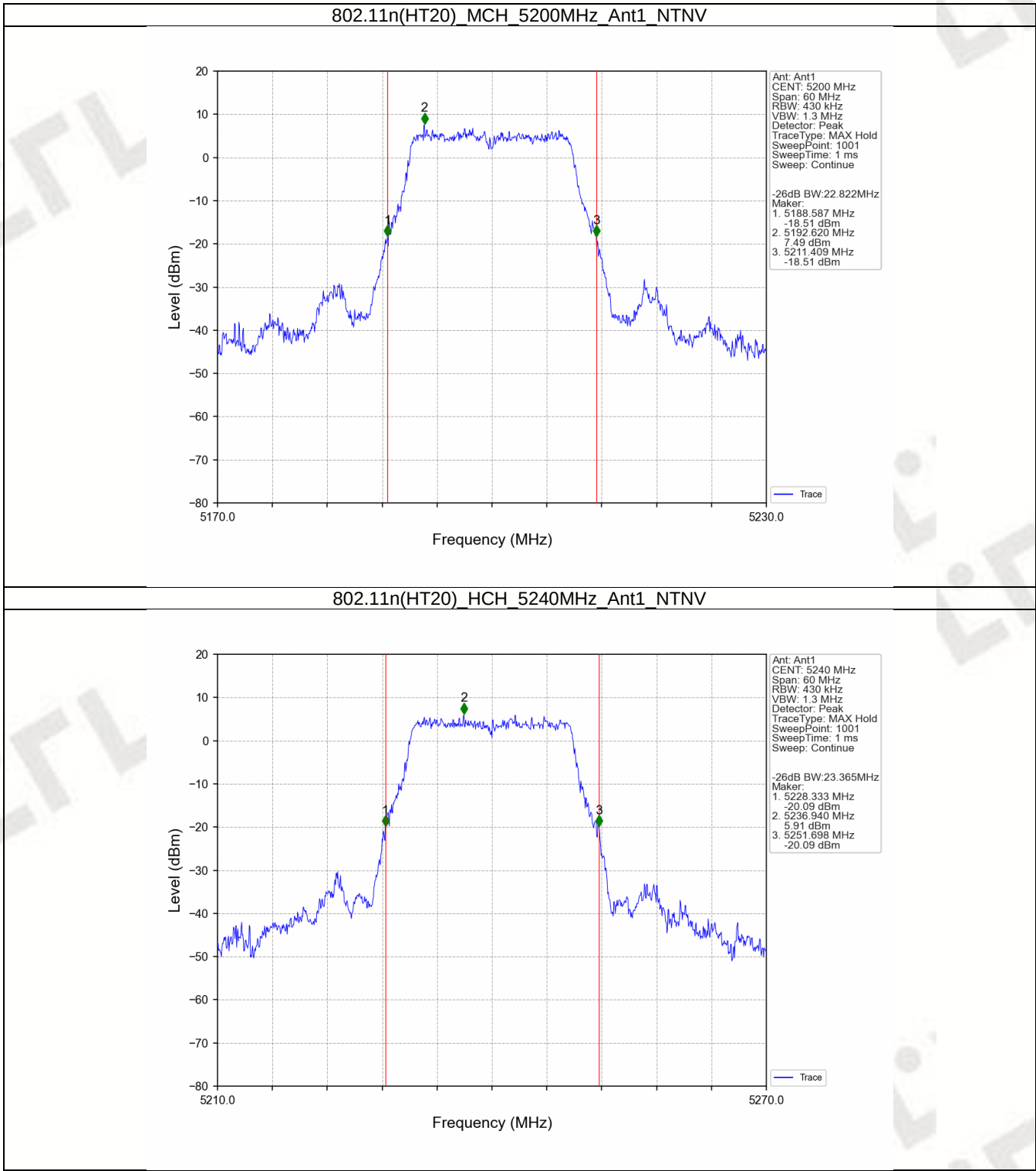
2.2.2 26dB BW



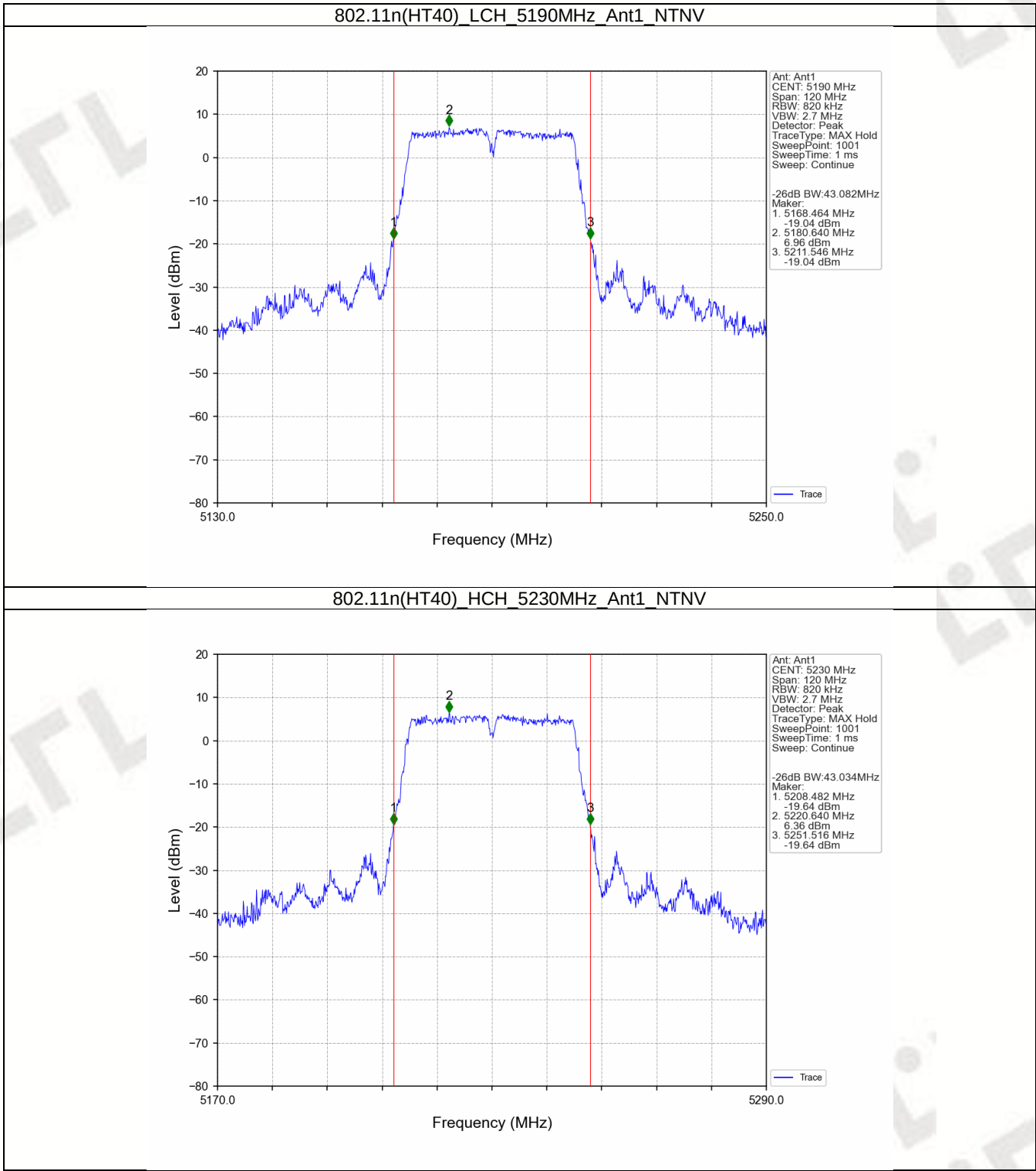
FCC ID: SMQ-UWM1



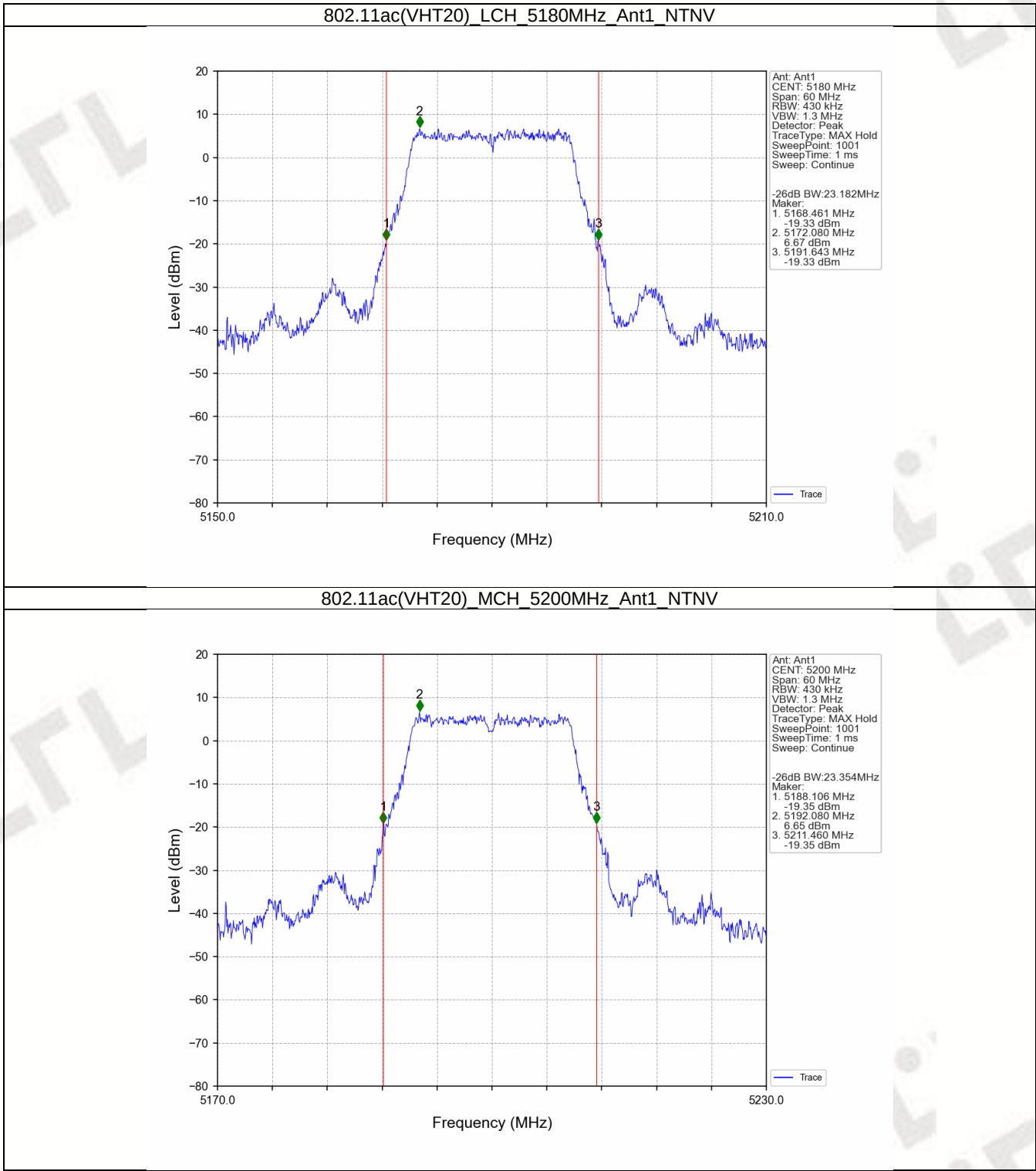
FCC ID: SMQ-UWM1



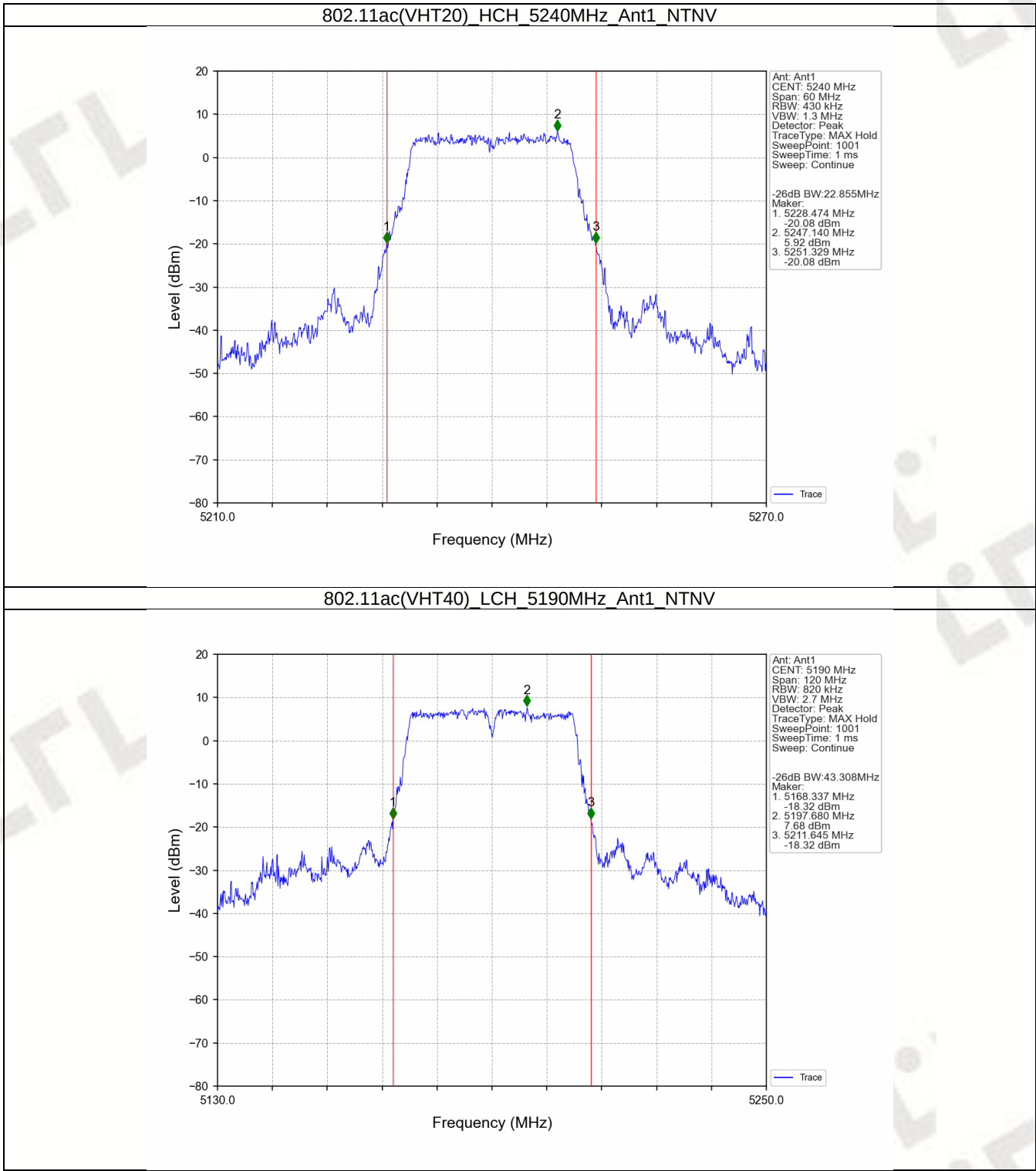
FCC ID: SMQ-UWM1



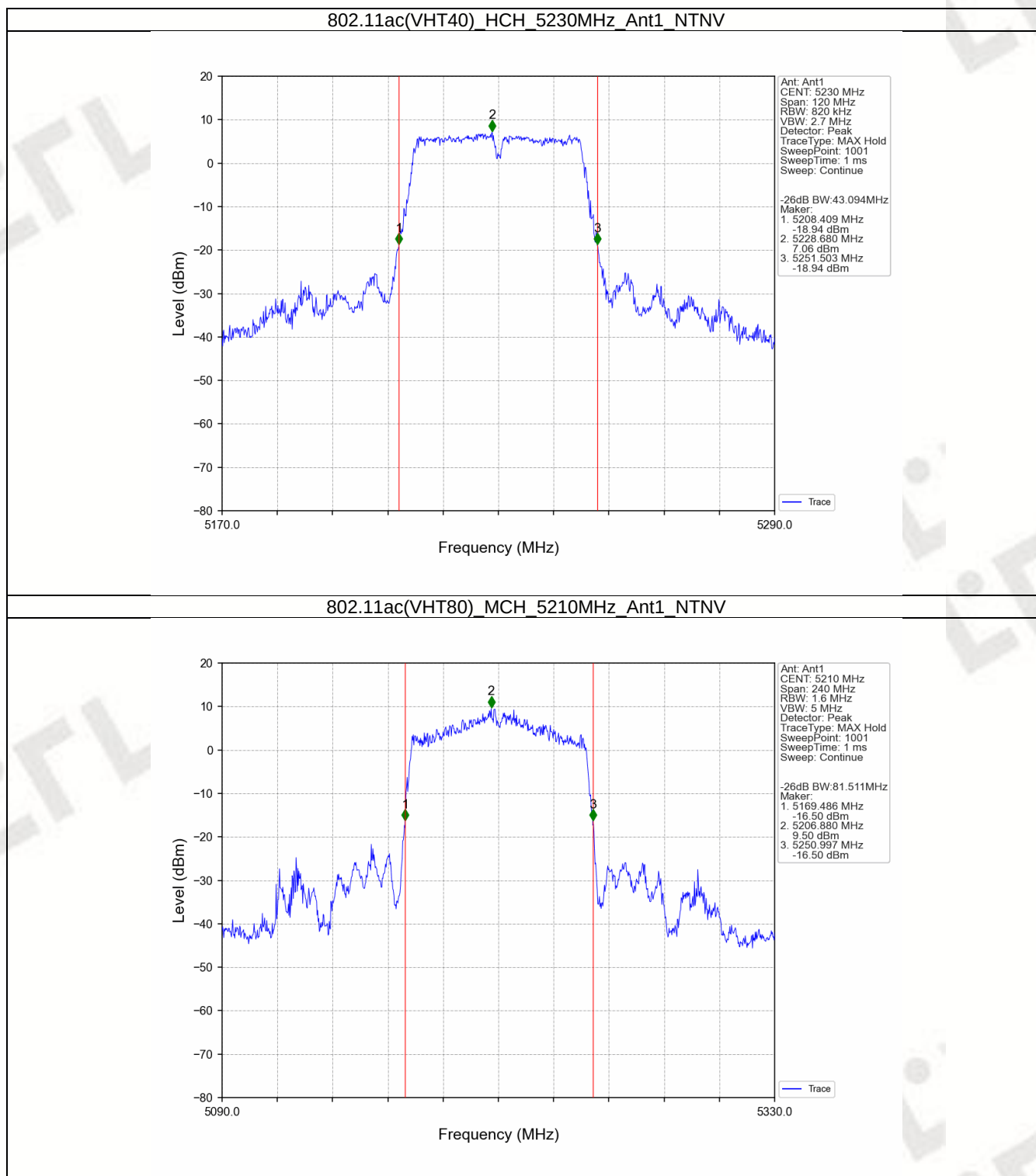
FCC ID: SMQ-UWM1



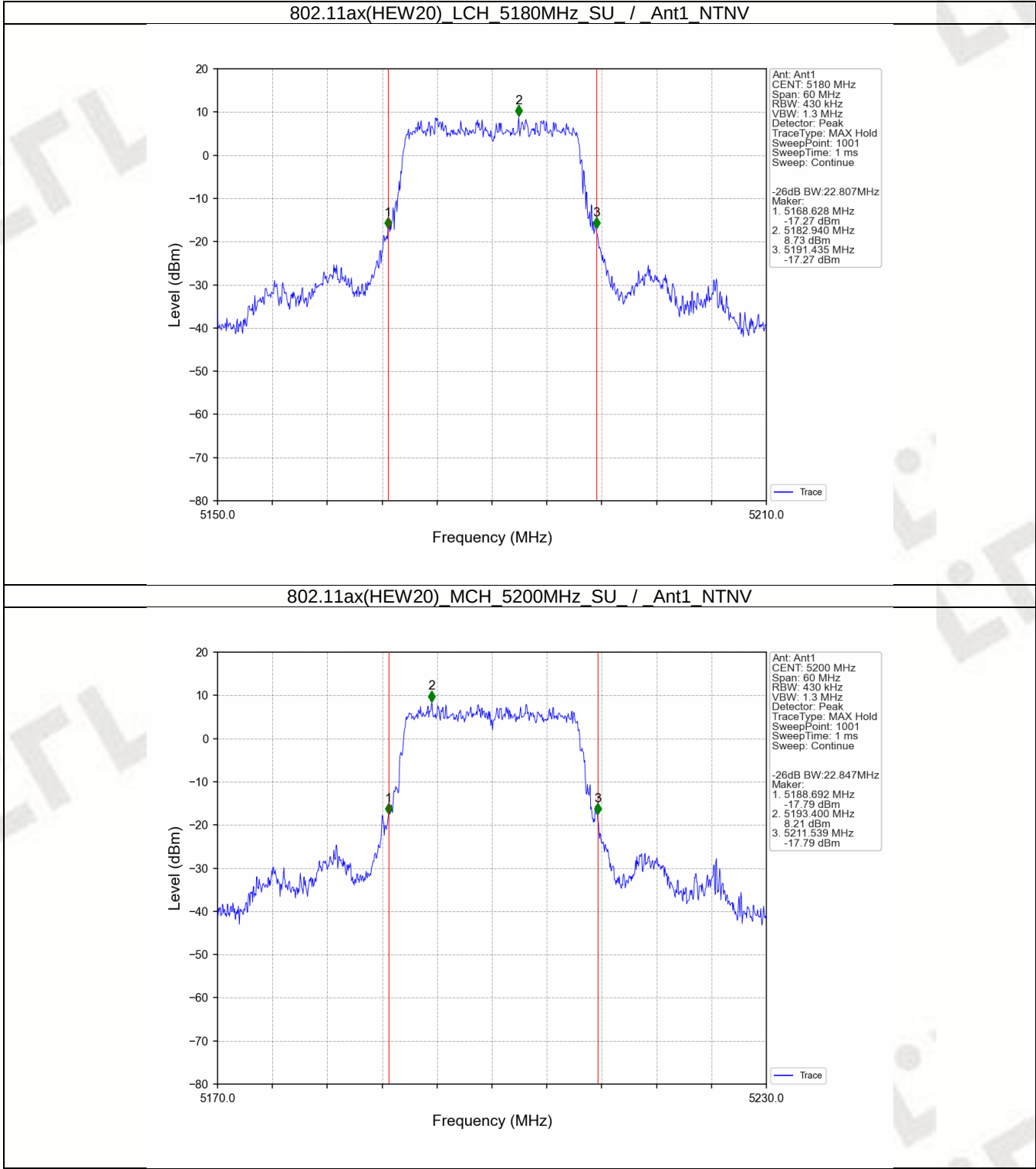
FCC ID: SMQ-UWM1



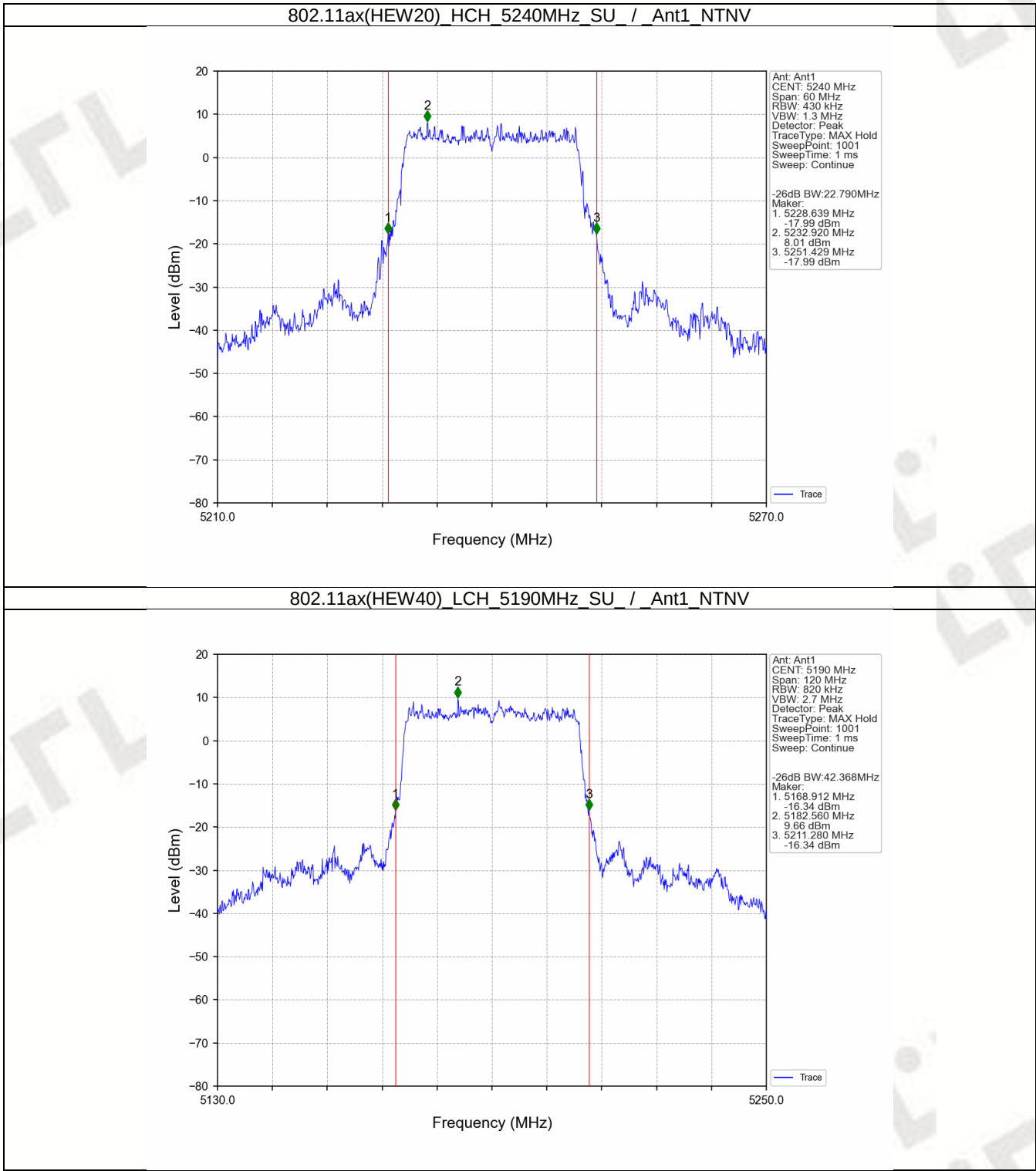
FCC ID: SMQ-UWM1



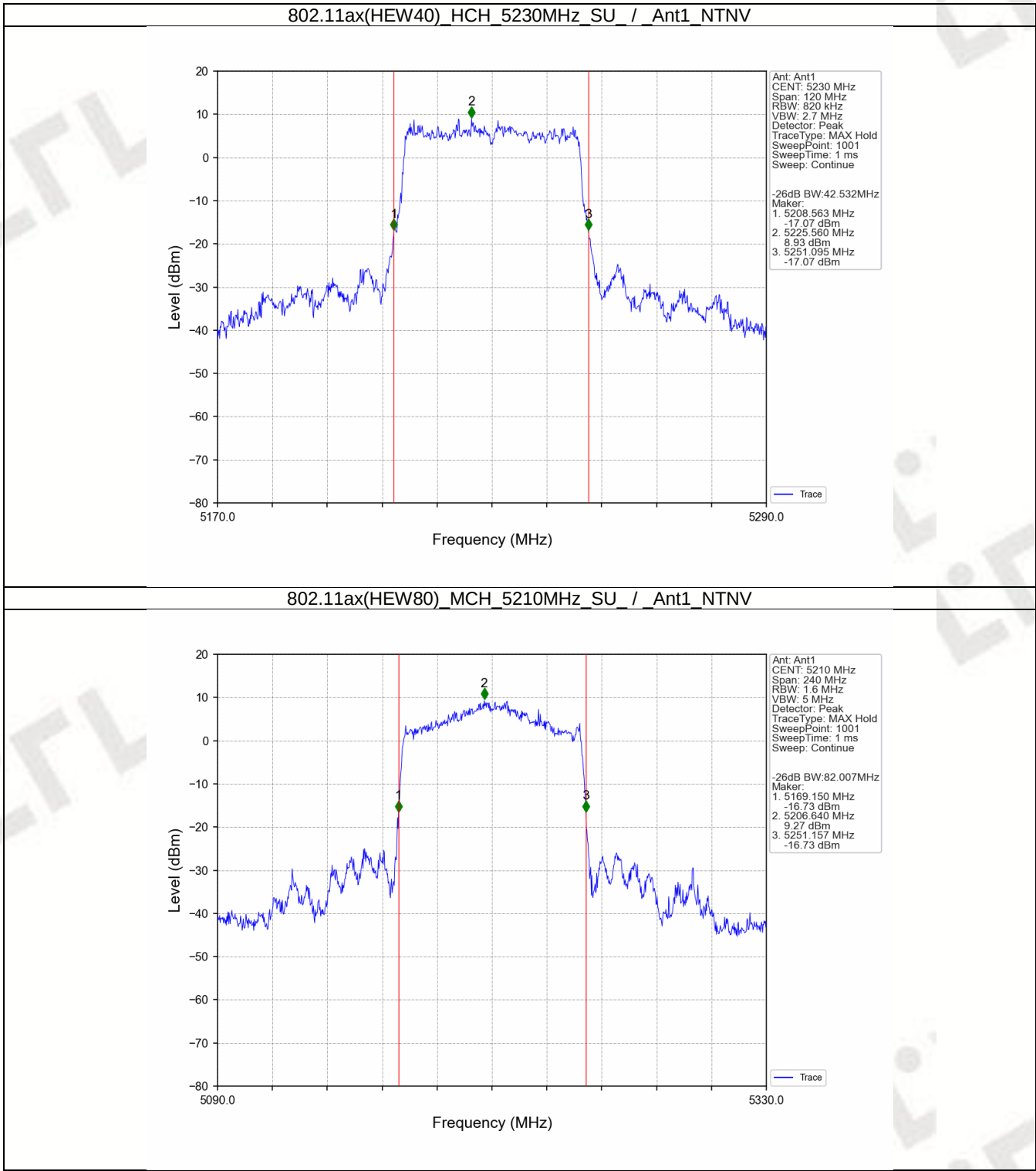
FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1



3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

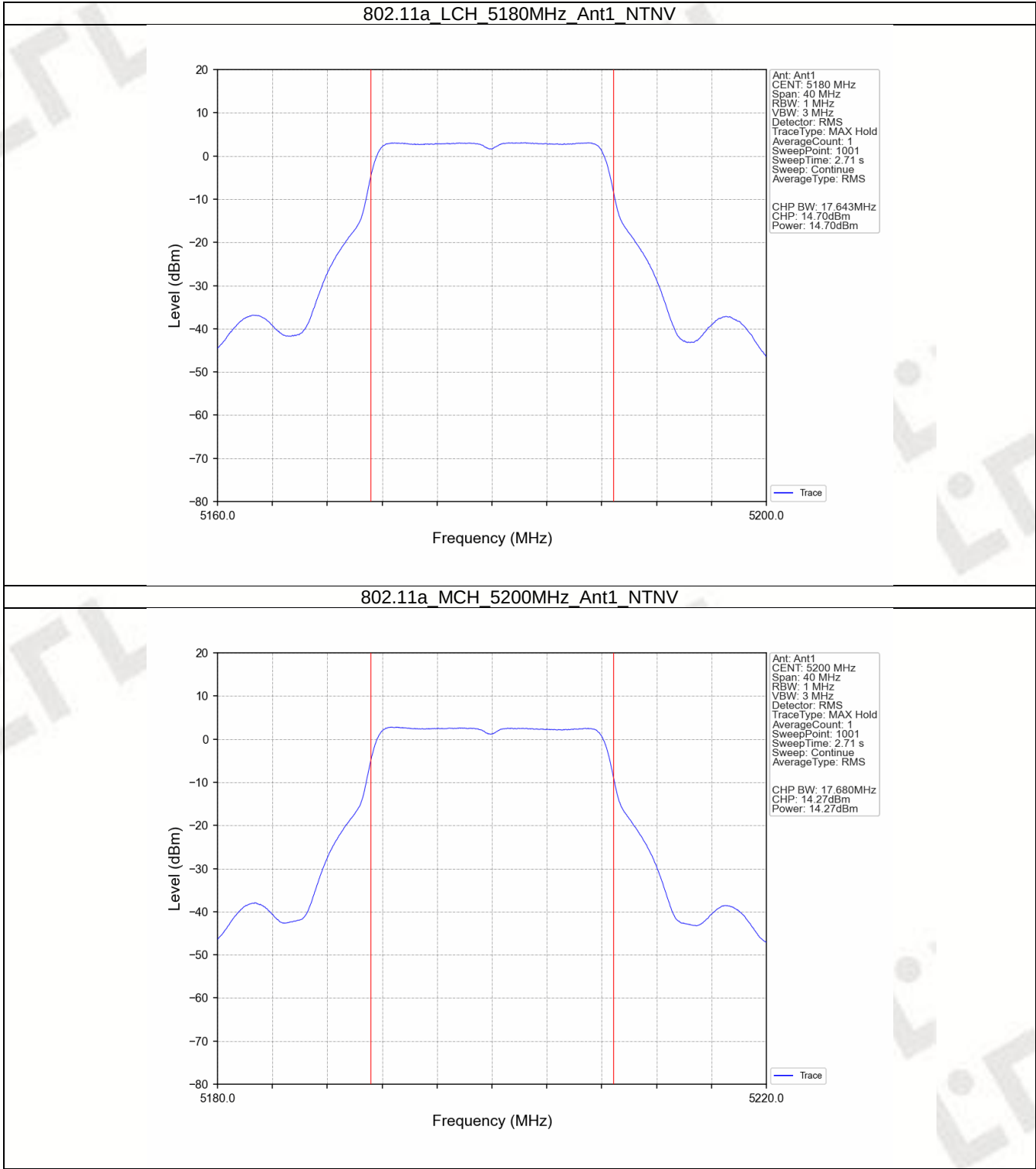
Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum Average Conducted Output Power (dBm)		Verdict
					ANT1	Limit	
802.11a	SISO	5180	/	/	14.70	<=23.98	Pass
		5200	/	/	14.27	<=23.98	Pass
		5240	/	/	13.37	<=23.98	Pass
802.11n (HT20)	SISO	5180	/	/	14.68	<=23.98	Pass
		5200	/	/	14.28	<=23.98	Pass
		5240	/	/	13.40	<=23.98	Pass
802.11n (HT40)	SISO	5190	/	/	14.00	<=23.98	Pass
		5230	/	/	13.94	<=23.98	Pass
802.11ac (VHT20)	SISO	5180	/	/	14.57	<=23.98	Pass
		5200	/	/	14.33	<=23.98	Pass
		5240	/	/	13.65	<=23.98	Pass
802.11ac (VHT40)	SISO	5190	/	/	15.17	<=23.98	Pass
		5230	/	/	14.51	<=23.98	Pass
802.11ac (VHT80)	SISO	5210	/	/	13.60	<=23.98	Pass
802.11ax (HEW20)	SISO	5180	SU	/	14.79	<=23.98	Pass
		5200	SU	/	14.52	<=23.98	Pass
		5240	SU	/	13.65	<=23.98	Pass
802.11ax (HEW40)	SISO	5190	SU	/	14.86	<=23.98	Pass
		5230	SU	/	14.26	<=23.98	Pass
802.11ax (HEW80)	SISO	5210	SU	/	13.62	<=23.98	Pass

Note1: Antenna Gain: Ant1: 2.89dBi;

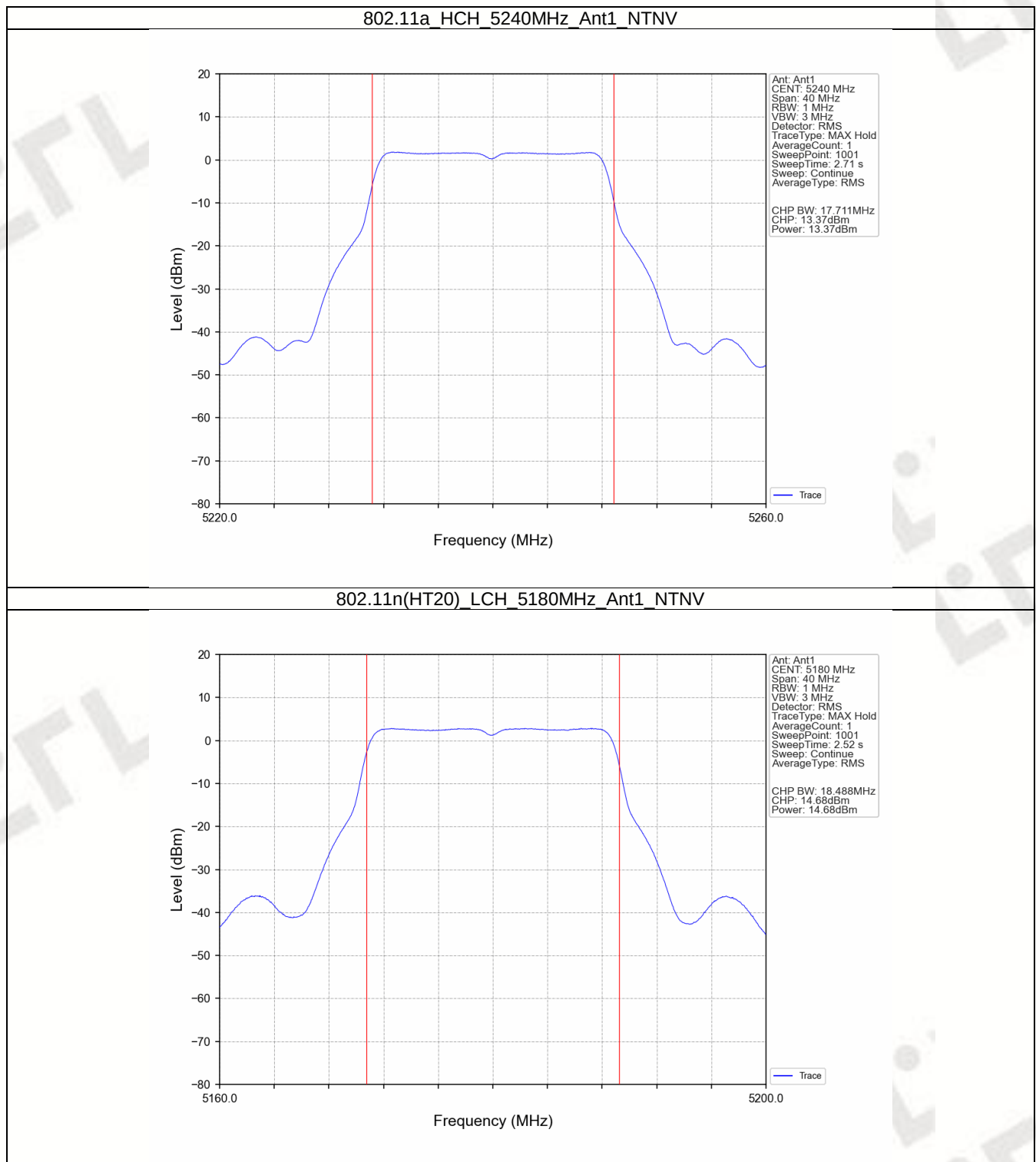
FCC ID: SMQ-UWM1

3.2 Test Graph

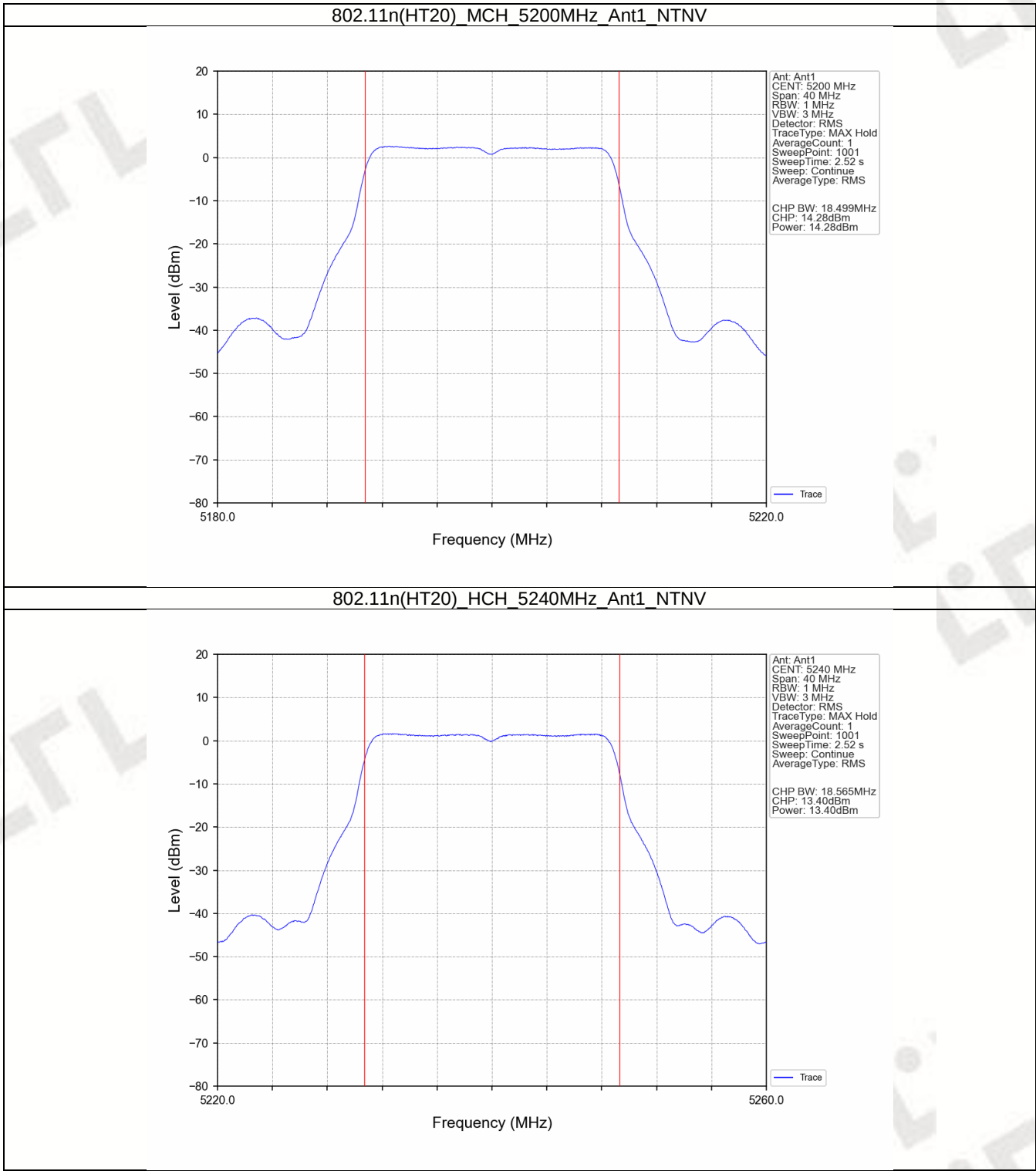
3.2.1 Power



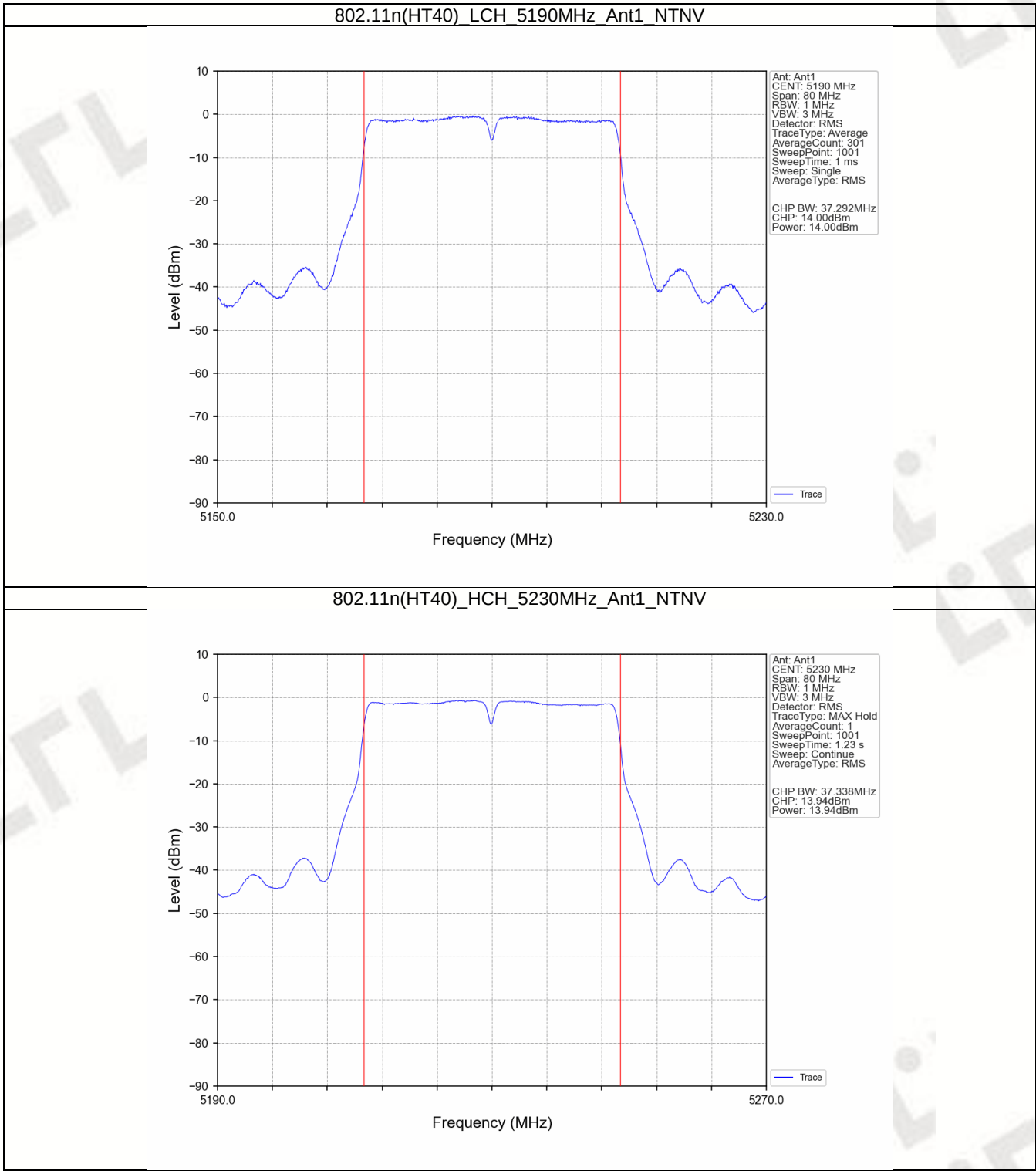
FCC ID: SMQ-UWM1



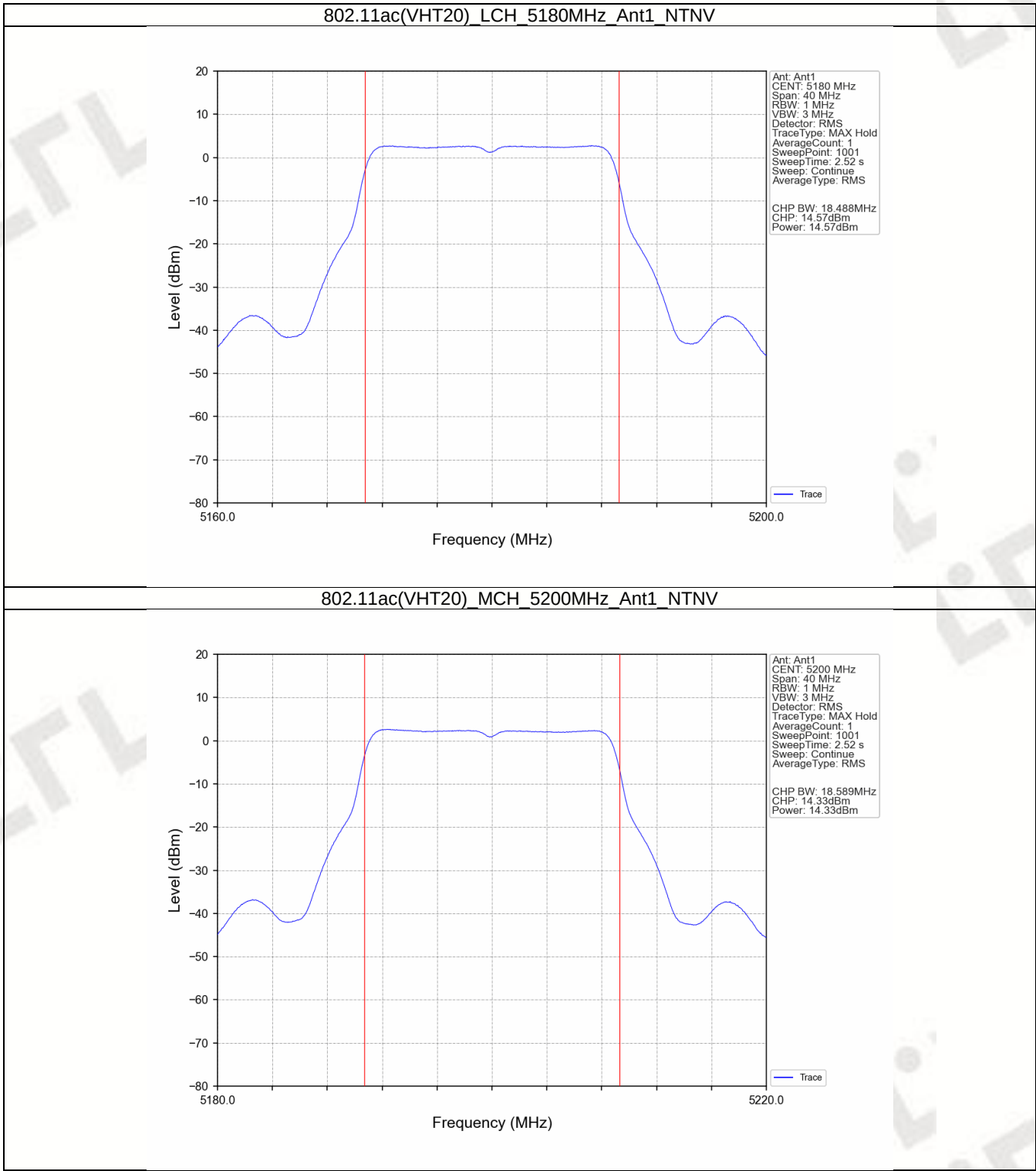
FCC ID: SMQ-UWM1



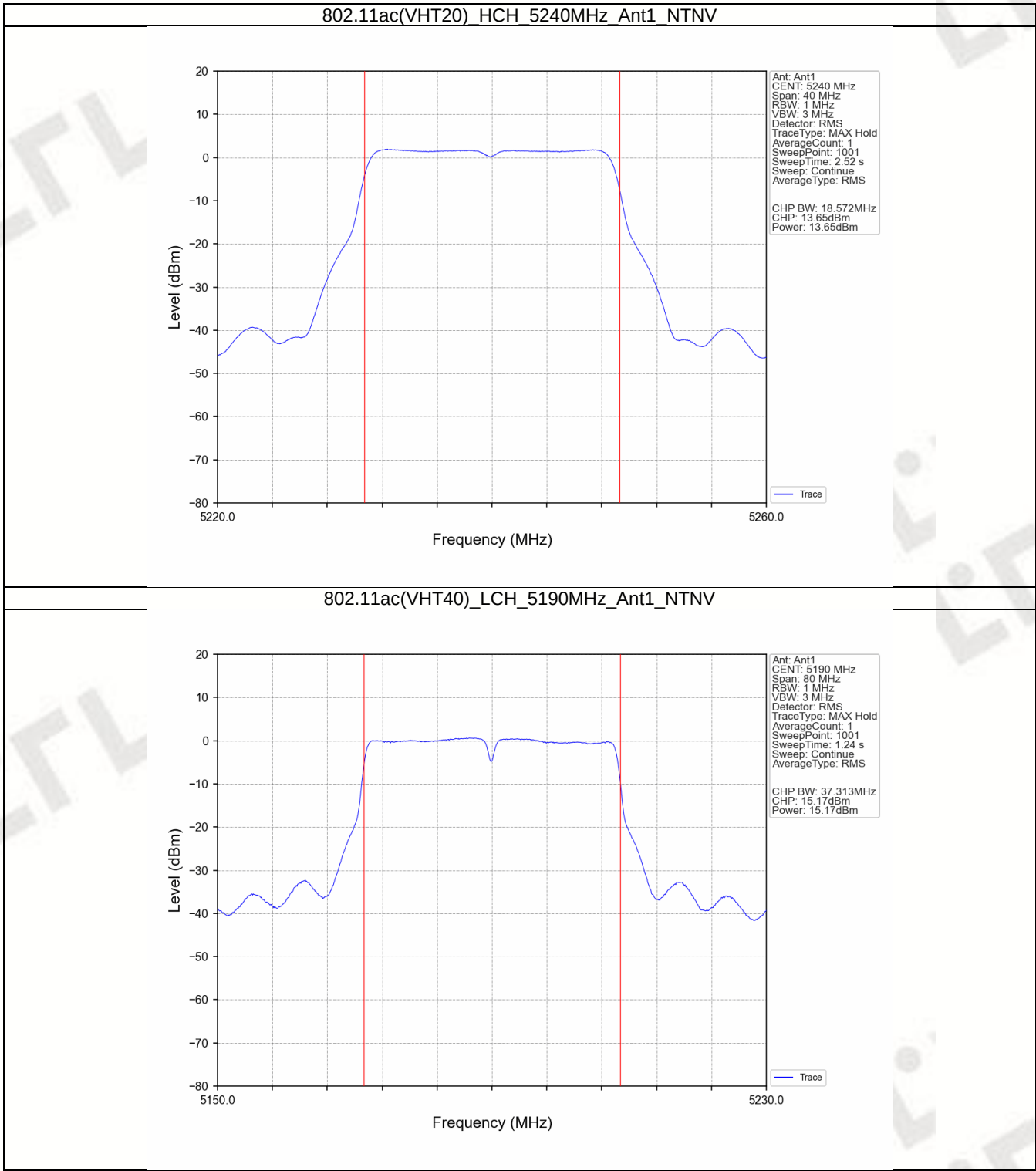
FCC ID: SMQ-UWM1



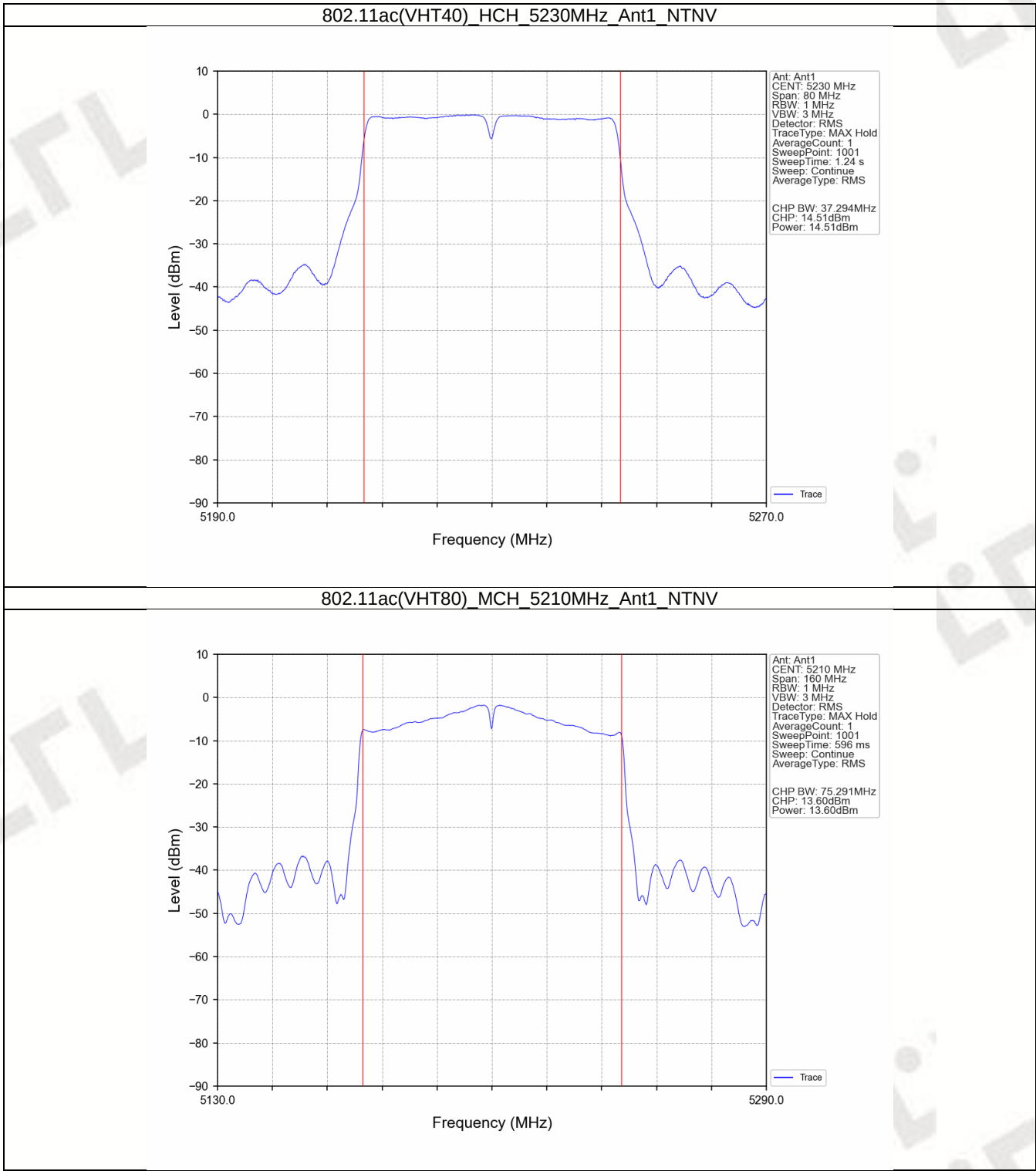
FCC ID: SMQ-UWM1



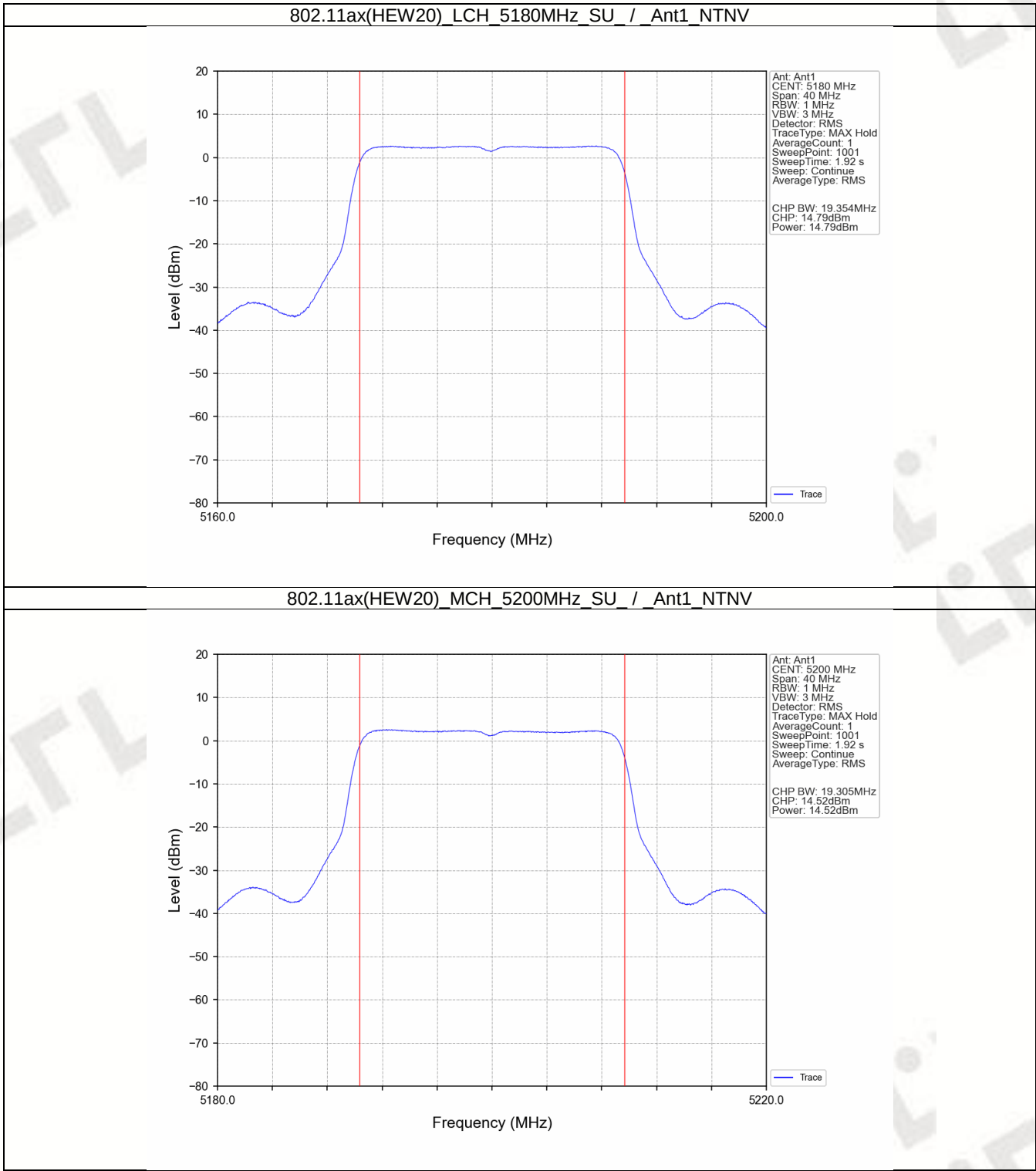
FCC ID: SMQ-UWM1



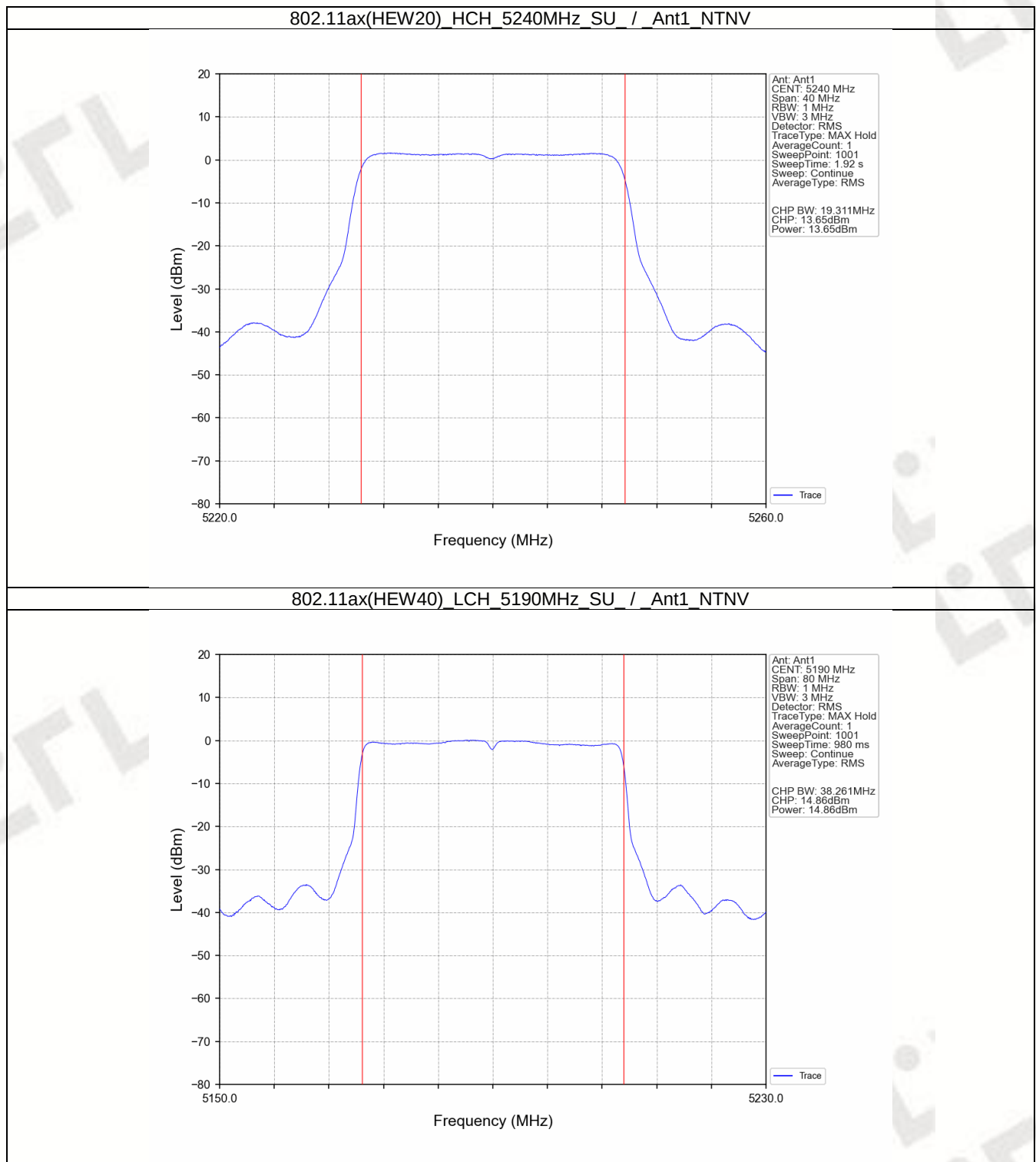
FCC ID: SMQ-UWM1



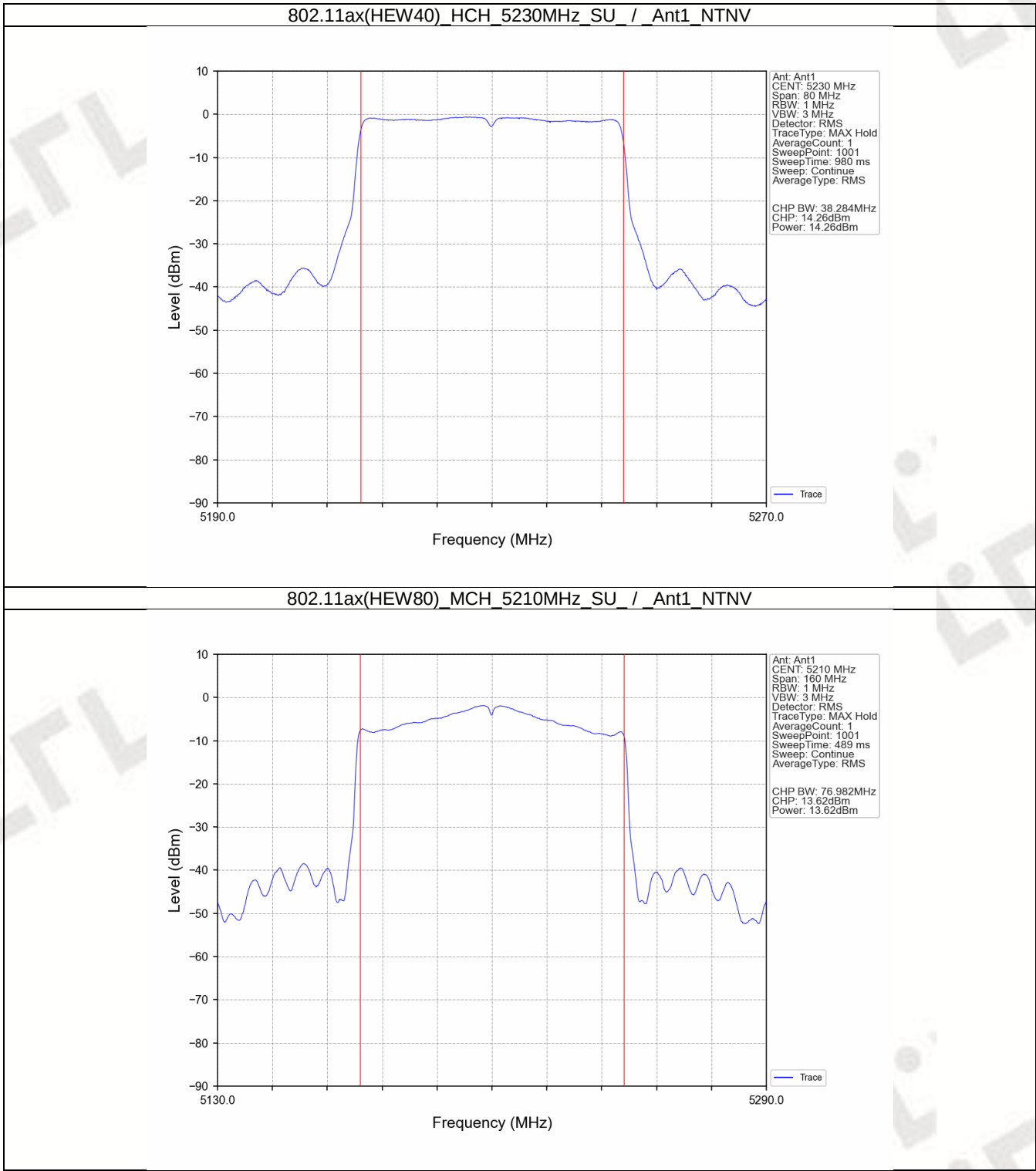
FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1



4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

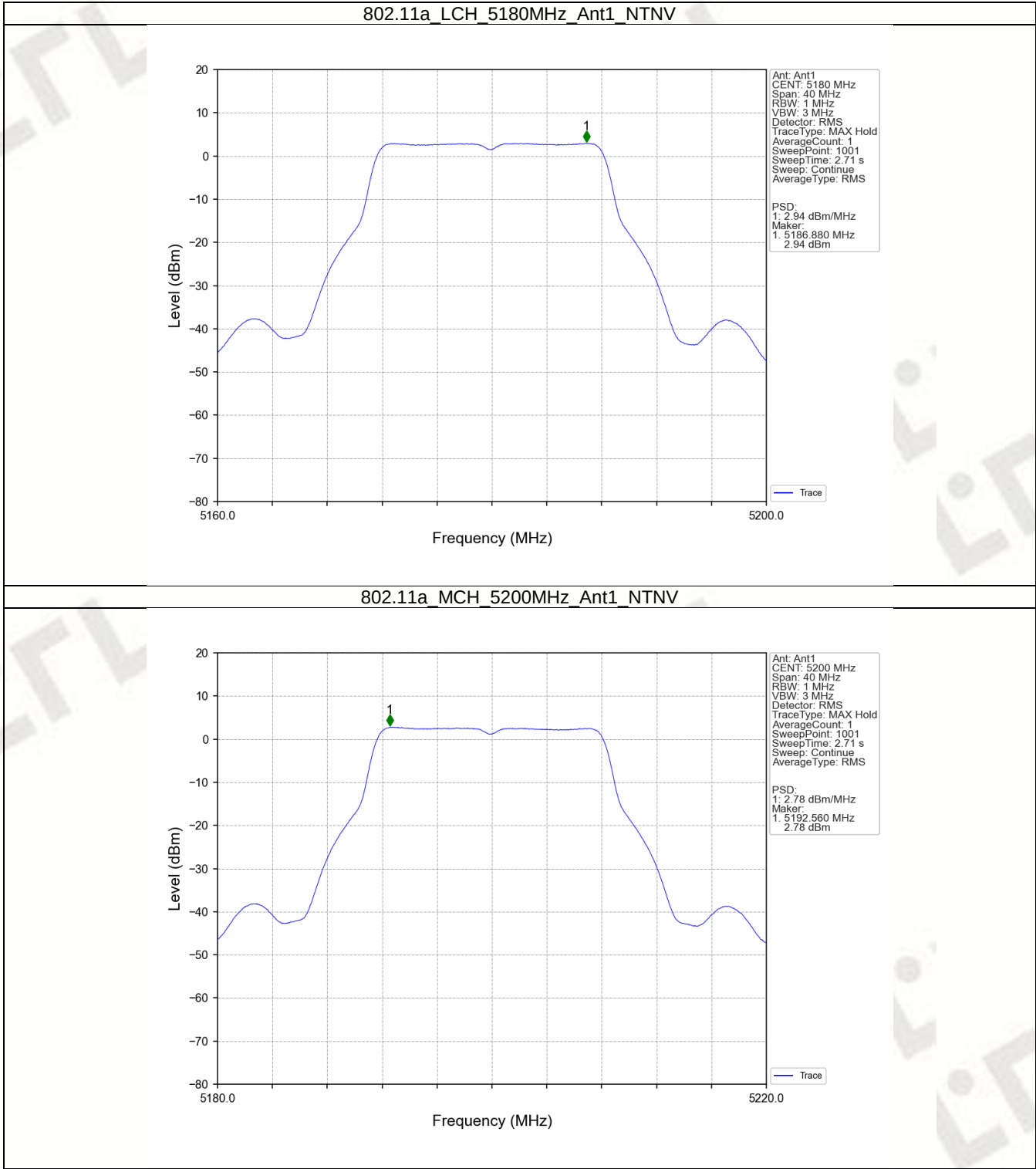
Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum PSD (dBm/MHz)		Verdict
					ANT1	Limit	
802.11a	SISO	5180	/	/	2.94	<=11	Pass
		5200	/	/	2.78	<=11	Pass
		5240	/	/	1.81	<=11	Pass
802.11n (HT20)	SISO	5180	/	/	2.66	<=11	Pass
		5200	/	/	2.51	<=11	Pass
		5240	/	/	1.61	<=11	Pass
802.11n (HT40)	SISO	5190	/	/	-0.34	<=11	Pass
		5230	/	/	-0.71	<=11	Pass
802.11ac (VHT20)	SISO	5180	/	/	2.67	<=11	Pass
		5200	/	/	2.69	<=11	Pass
		5240	/	/	1.93	<=11	Pass
802.11ac (VHT40)	SISO	5190	/	/	0.53	<=11	Pass
		5230	/	/	-0.17	<=11	Pass
802.11ac (VHT80)	SISO	5210	/	/	-1.75	<=11	Pass
802.11ax (HEW20)	SISO	5180	SU	/	2.62	<=11	Pass
		5200	SU	/	2.51	<=11	Pass
		5240	SU	/	1.60	<=11	Pass
802.11ax (HEW40)	SISO	5190	SU	/	0.07	<=11	Pass
		5230	SU	/	-0.64	<=11	Pass
802.11ax (HEW80)	SISO	5210	SU	/	-1.86	<=11	Pass

Note1: Antenna Gain: Ant1: 2.89dBi;

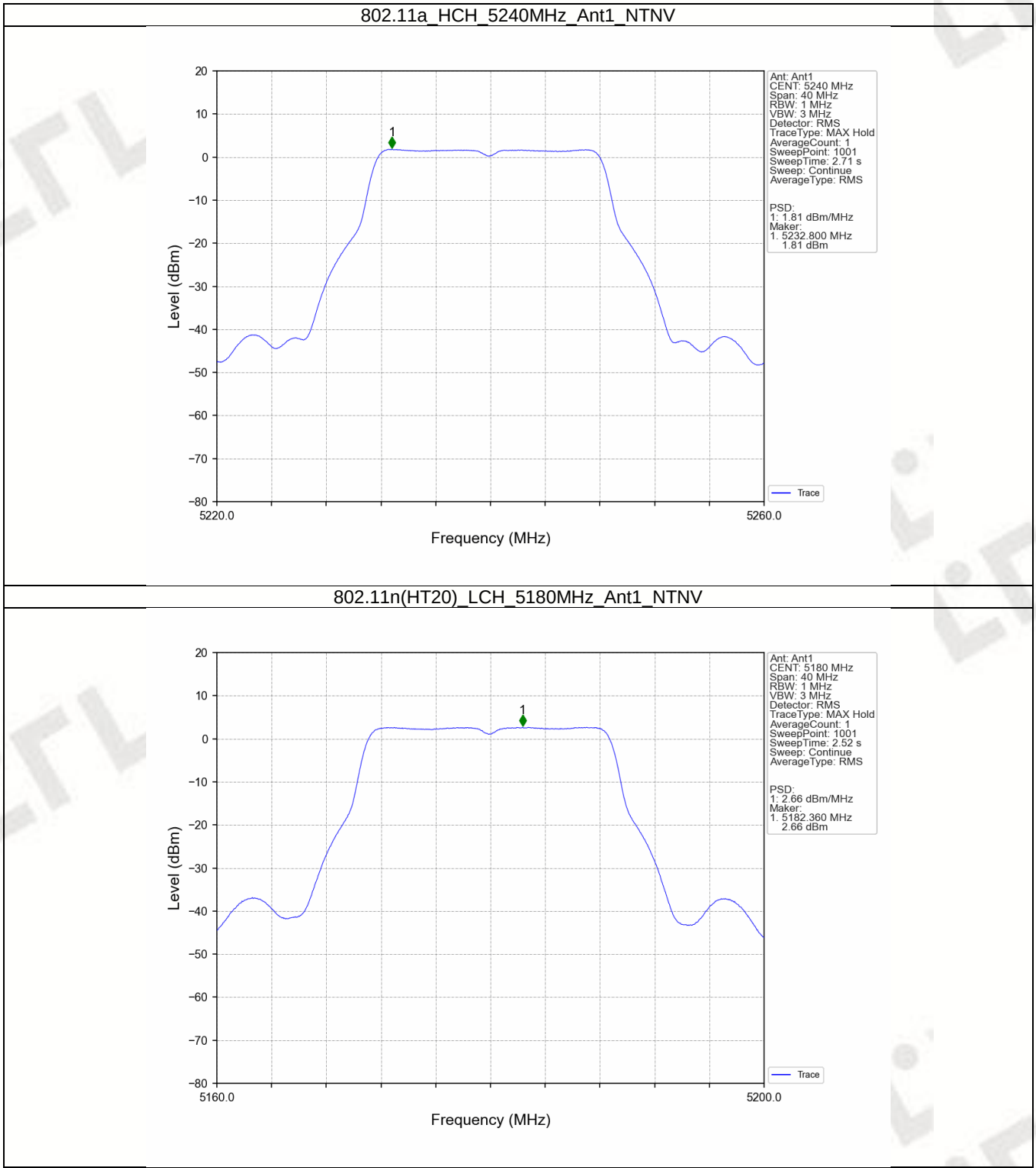
FCC ID: SMQ-UWM1

4.2 Test Graph

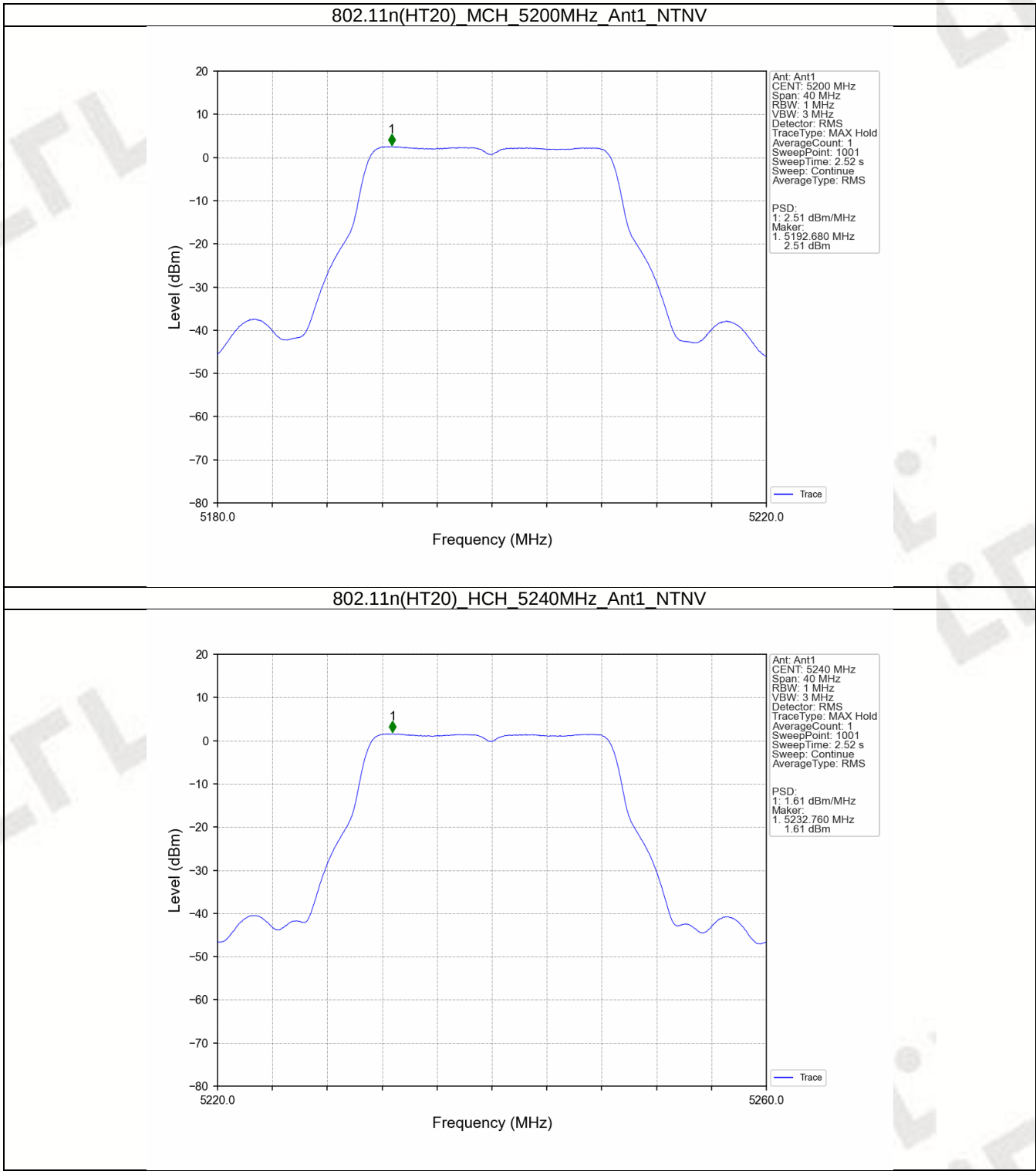
4.2.1 PSD



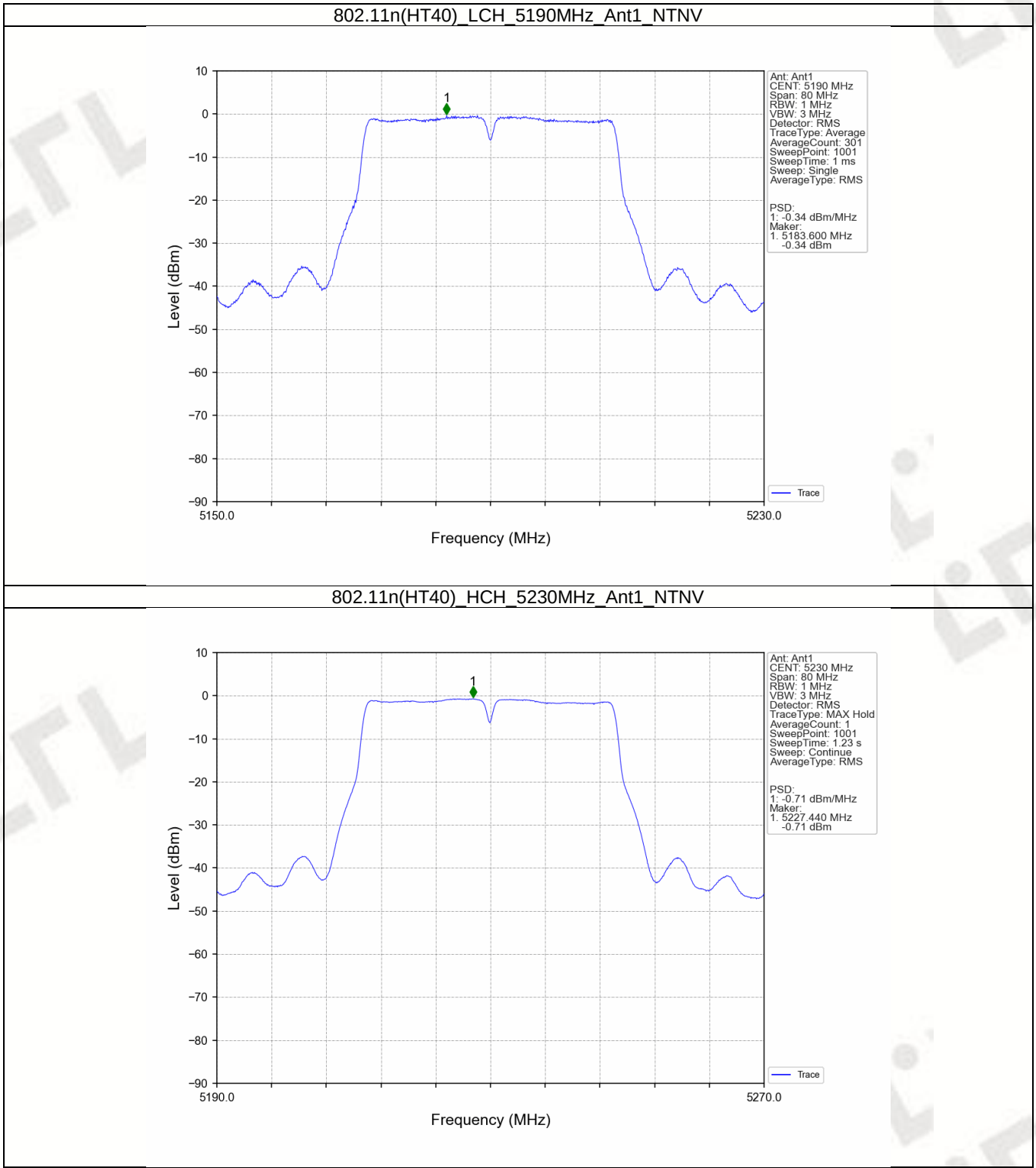
FCC ID: SMQ-UWM1



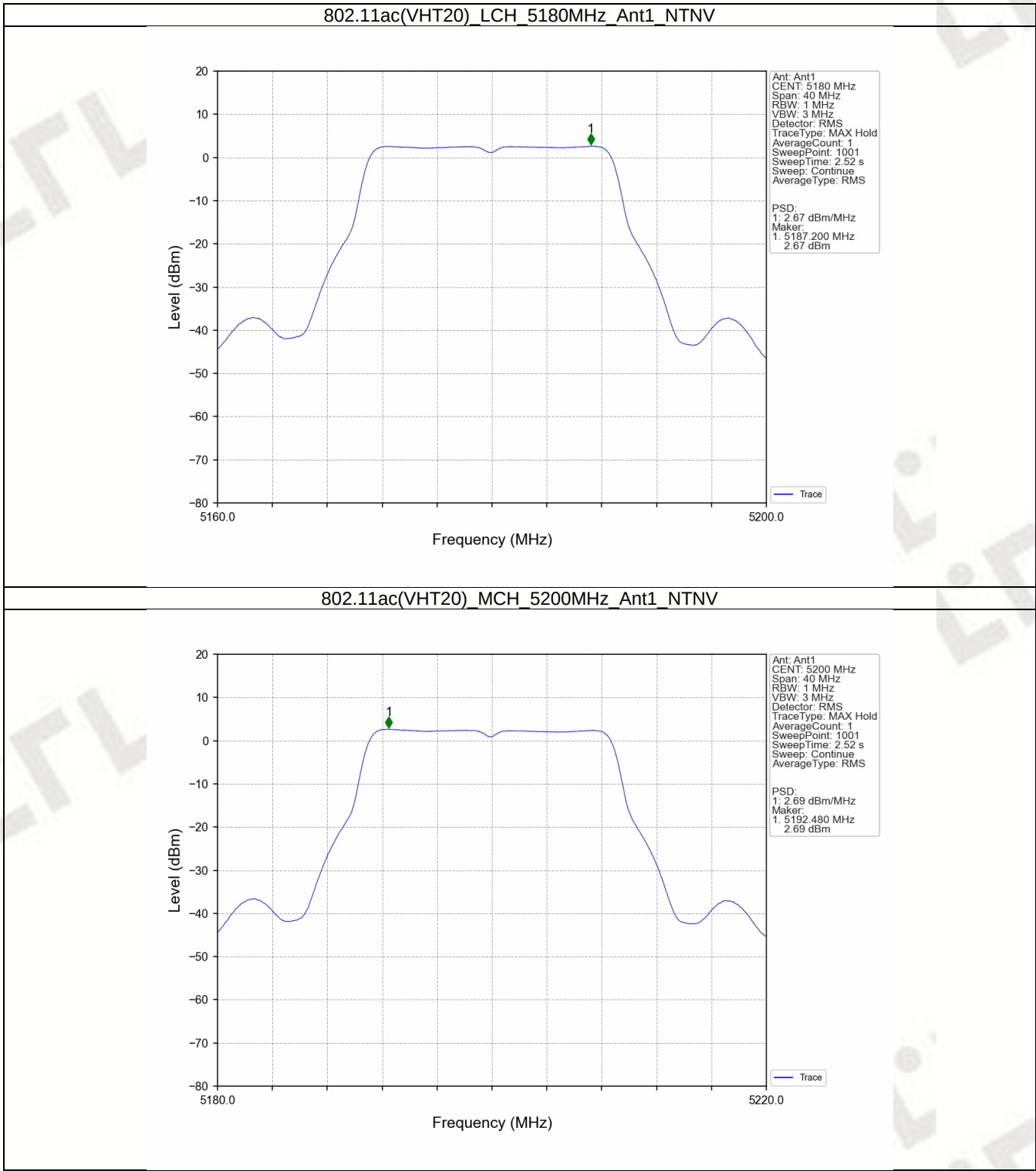
FCC ID: SMQ-UWM1



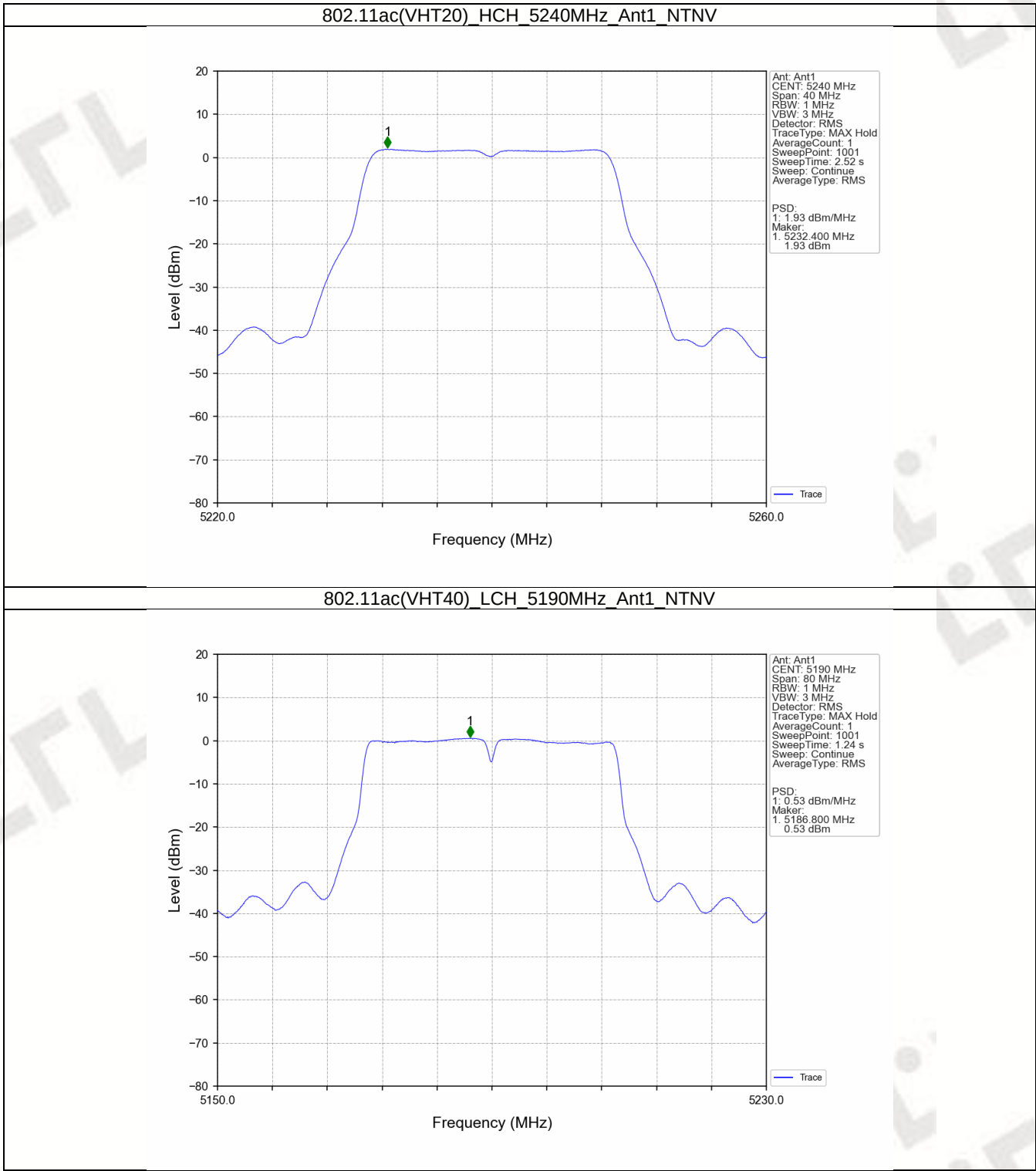
FCC ID: SMQ-UWM1



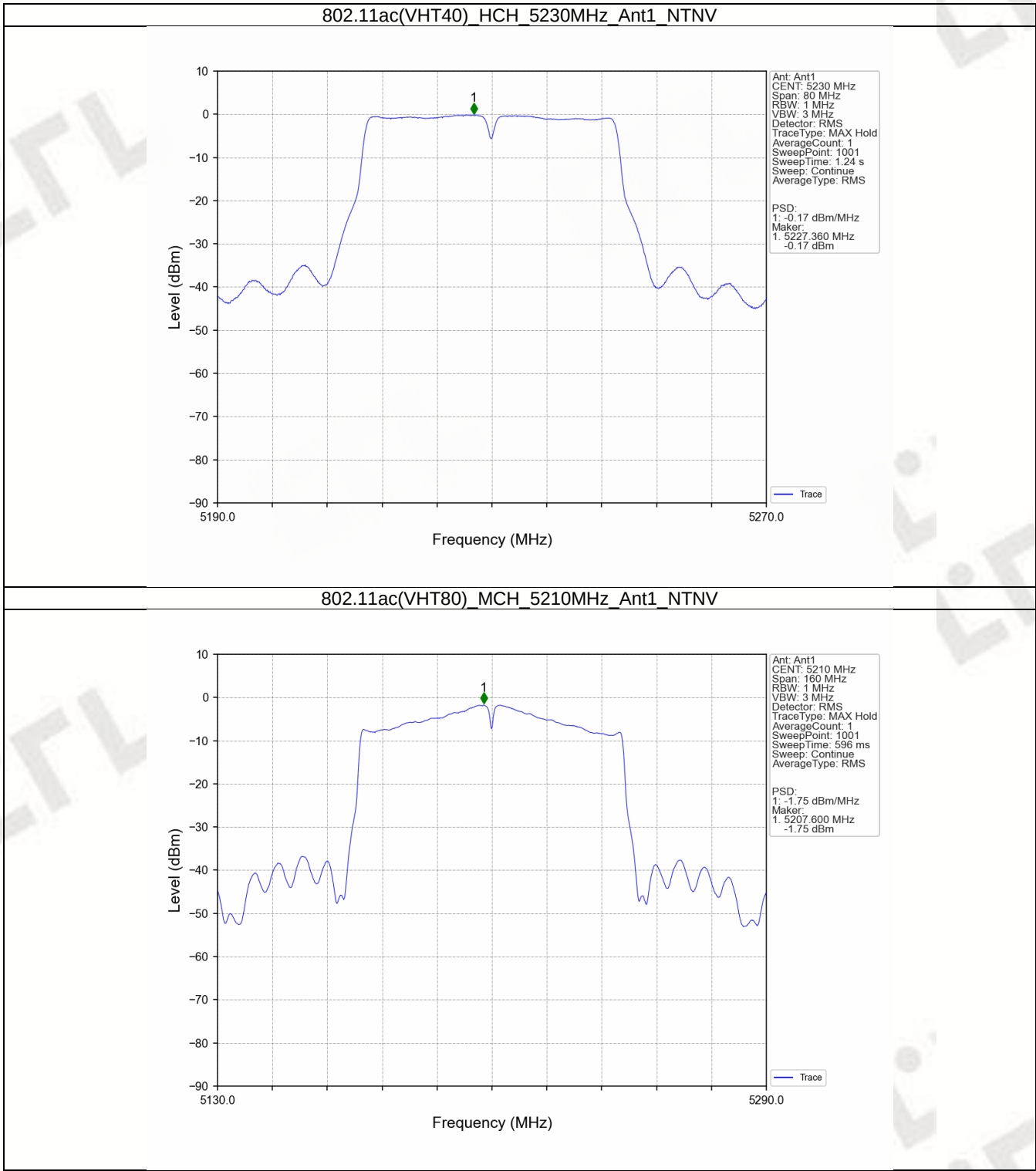
FCC ID: SMQ-UWM1



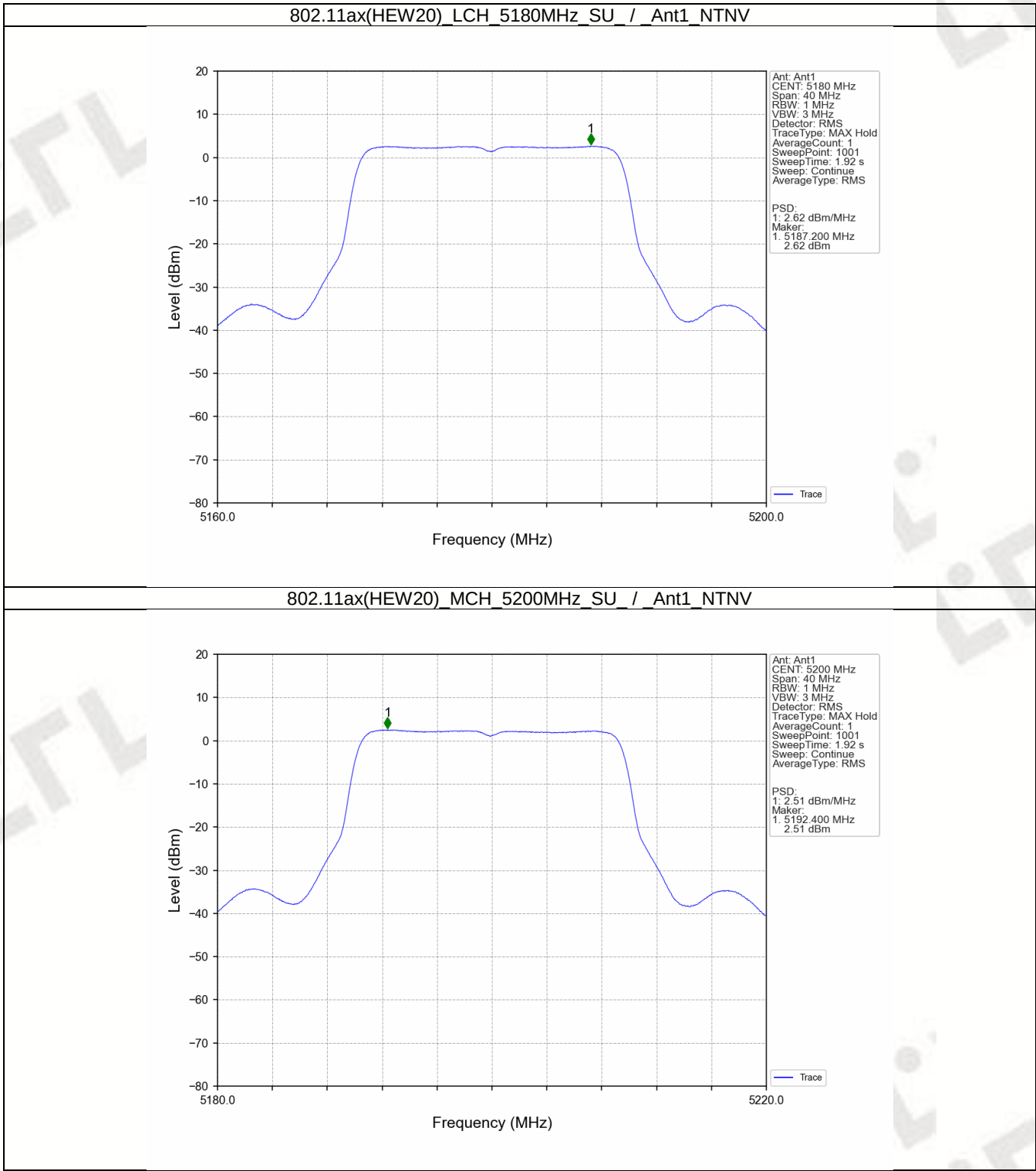
FCC ID: SMQ-UWM1



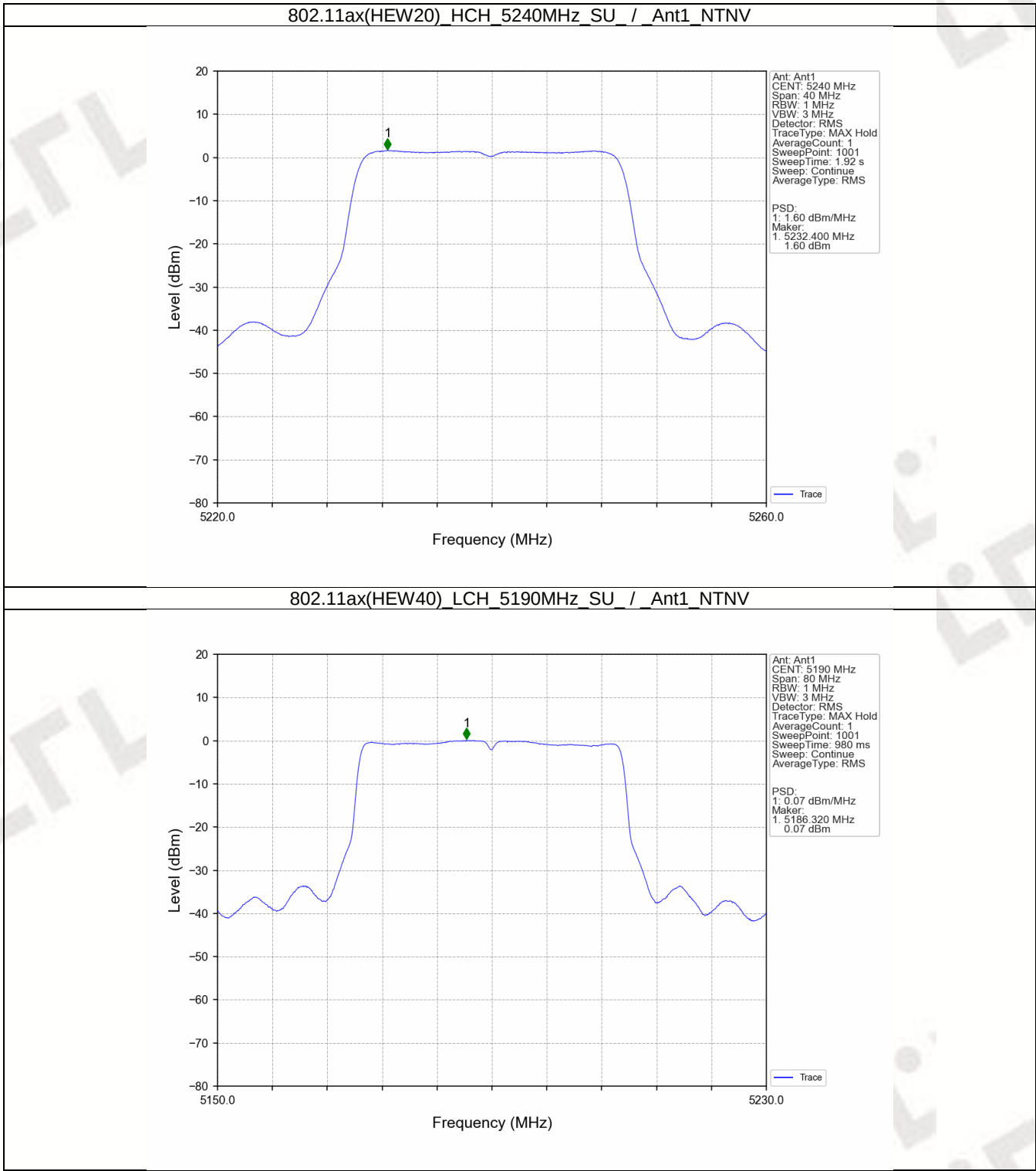
FCC ID: SMQ-UWM1



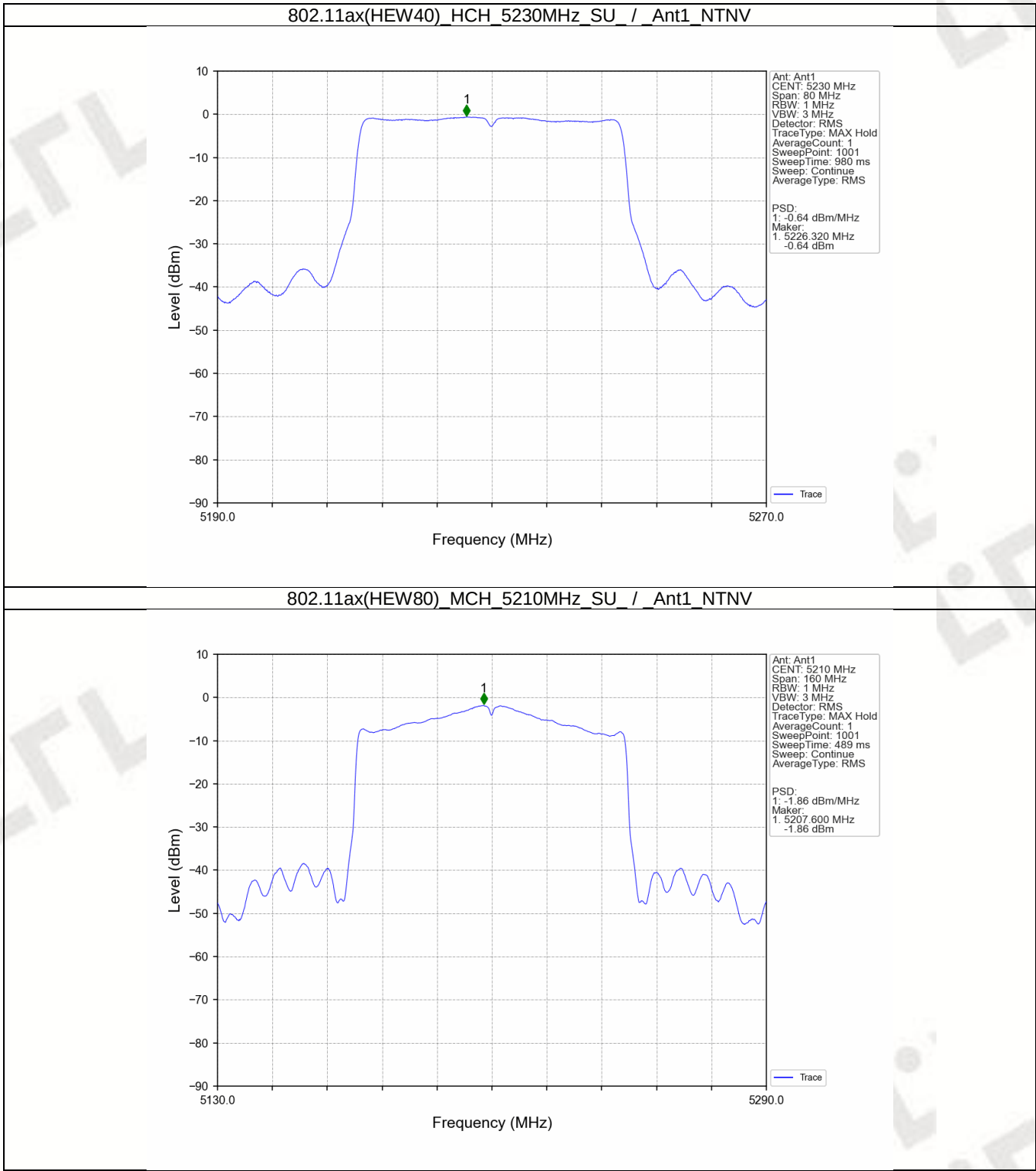
FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1



FCC ID: SMQ-UWM1

5. Frequency Stability

5.1 Test Result

5.1.1 Ant1

Ant1							
Mode	Tx Type	Frequency (MHz)	Temperature (°C)	Voltage (VDC)	Measured Frequency (MHz)	Limit (MHz)	Verdict
Carrier Wave	SISO	5180	20	2.805	5179.900	5150 to 5250	Pass
				3.300	5179.900	5150 to 5250	Pass
				3.795	5179.900	5150 to 5250	Pass
			-30	3.300	5179.900	5150 to 5250	Pass
			-20	3.300	5179.900	5150 to 5250	Pass
			-10	3.300	5179.900	5150 to 5250	Pass
			0	3.300	5179.900	5150 to 5250	Pass
			10	3.300	5179.900	5150 to 5250	Pass
			30	3.300	5179.900	5150 to 5250	Pass
			40	3.300	5179.900	5150 to 5250	Pass
			50	3.300	5179.900	5150 to 5250	Pass
		5200	20	2.805	5199.900	5150 to 5250	Pass
				3.300	5199.899	5150 to 5250	Pass
				3.795	5199.899	5150 to 5250	Pass
			-30	3.300	5199.899	5150 to 5250	Pass
			-20	3.300	5199.900	5150 to 5250	Pass
			-10	3.300	5199.900	5150 to 5250	Pass
			0	3.300	5199.900	5150 to 5250	Pass
			10	3.300	5199.900	5150 to 5250	Pass
			30	3.300	5199.900	5150 to 5250	Pass
			40	3.300	5199.900	5150 to 5250	Pass
			50	3.300	5199.900	5150 to 5250	Pass
		5240	20	2.805	5239.898	5150 to 5250	Pass
				3.300	5239.899	5150 to 5250	Pass
				3.795	5239.899	5150 to 5250	Pass
			-30	3.300	5239.899	5150 to 5250	Pass
			-20	3.300	5239.899	5150 to 5250	Pass
			-10	3.300	5239.899	5150 to 5250	Pass
			0	3.300	5239.899	5150 to 5250	Pass
			10	3.300	5239.899	5150 to 5250	Pass
			30	3.300	5239.899	5150 to 5250	Pass
			40	3.300	5239.899	5150 to 5250	Pass
			50	3.300	5239.899	5150 to 5250	Pass
		5190	20	2.805	5189.899	5150 to 5250	Pass
				3.300	5189.899	5150 to 5250	Pass
				3.795	5189.899	5150 to 5250	Pass
			-30	3.300	5189.900	5150 to 5250	Pass
			-20	3.300	5189.900	5150 to 5250	Pass
			-10	3.300	5189.900	5150 to 5250	Pass
			0	3.300	5189.900	5150 to 5250	Pass
			10	3.300	5189.900	5150 to 5250	Pass
			30	3.300	5189.900	5150 to 5250	Pass
			40	3.300	5189.900	5150 to 5250	Pass
			50	3.300	5189.900	5150 to 5250	Pass
		5230	20	2.805	5229.899	5150 to 5250	Pass
				3.300	5229.899	5150 to 5250	Pass
				3.795	5229.899	5150 to 5250	Pass

FCC ID: SMQ-UWM1

			-30	3.300	5229.899	5150 to 5250	Pass
			-20	3.300	5229.899	5150 to 5250	Pass
			-10	3.300	5229.899	5150 to 5250	Pass
			0	3.300	5229.899	5150 to 5250	Pass
			10	3.300	5229.899	5150 to 5250	Pass
			30	3.300	5229.899	5150 to 5250	Pass
			40	3.300	5229.899	5150 to 5250	Pass
			50	3.300	5229.899	5150 to 5250	Pass
		5210	20	2.805	5209.899	5150 to 5250	Pass
				3.300	5209.899	5150 to 5250	Pass
				3.795	5209.899	5150 to 5250	Pass
			-30	3.300	5209.899	5150 to 5250	Pass
			-20	3.300	5209.899	5150 to 5250	Pass
			-10	3.300	5209.899	5150 to 5250	Pass
			0	3.300	5209.899	5150 to 5250	Pass
			10	3.300	5209.900	5150 to 5250	Pass
			30	3.300	5209.900	5150 to 5250	Pass
			40	3.300	5209.900	5150 to 5250	Pass
			50	3.300	5209.900	5150 to 5250	Pass