



Appendix - BLE

BLE-L

1. Duty Cycle

1.1 Test Result

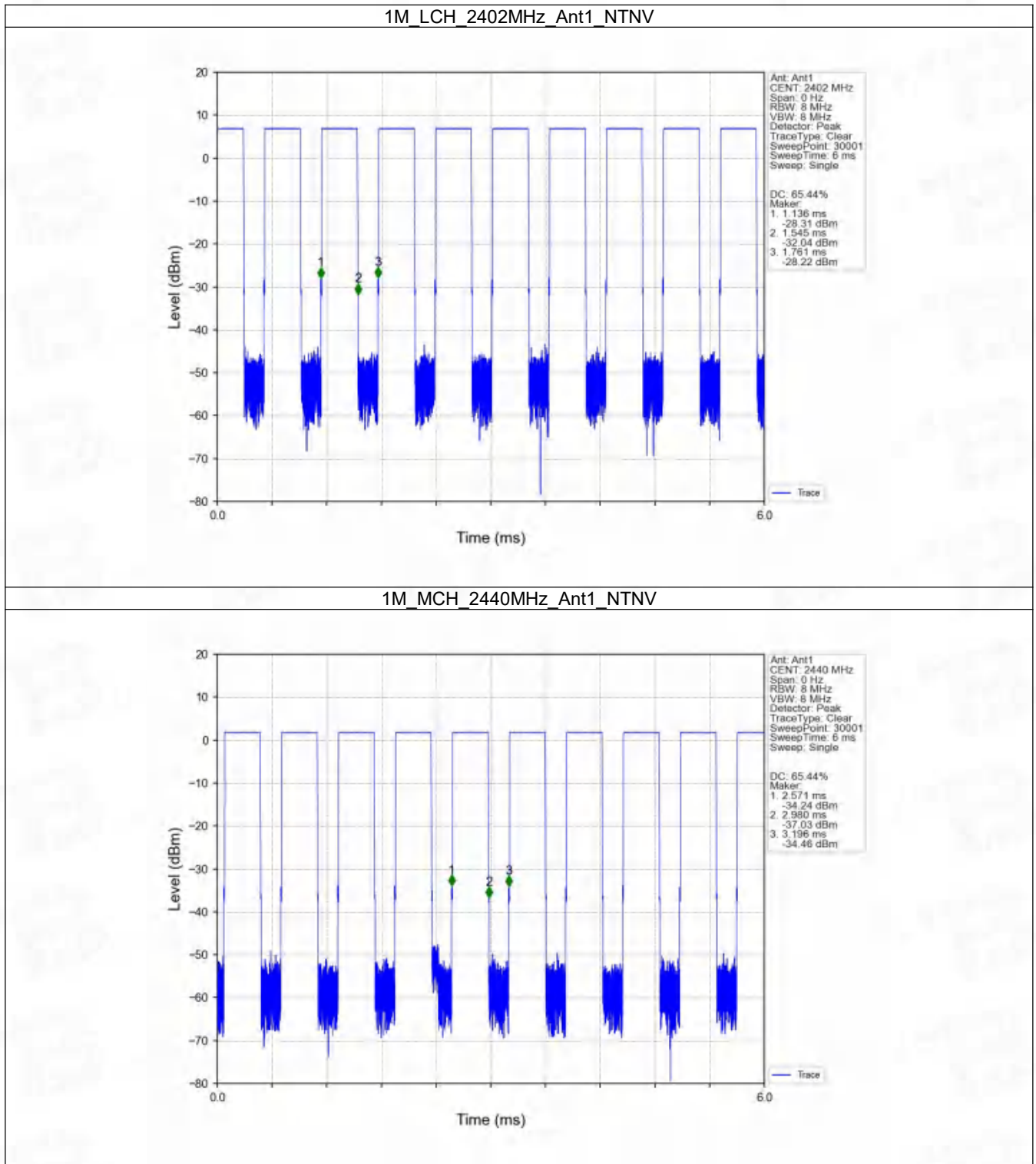
1.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1M	SISO	2402	0.409	0.625	65.44	1.84	0.03
		2440	0.409	0.625	65.44	1.84	0.03
		2480	0.410	0.625	65.60	1.83	0.03
2M	SISO	2402	0.225	0.625	36.00	4.44	0.00
		2440	0.225	0.625	36.00	4.44	0.00
		2480	0.226	0.625	36.16	4.42	0.03



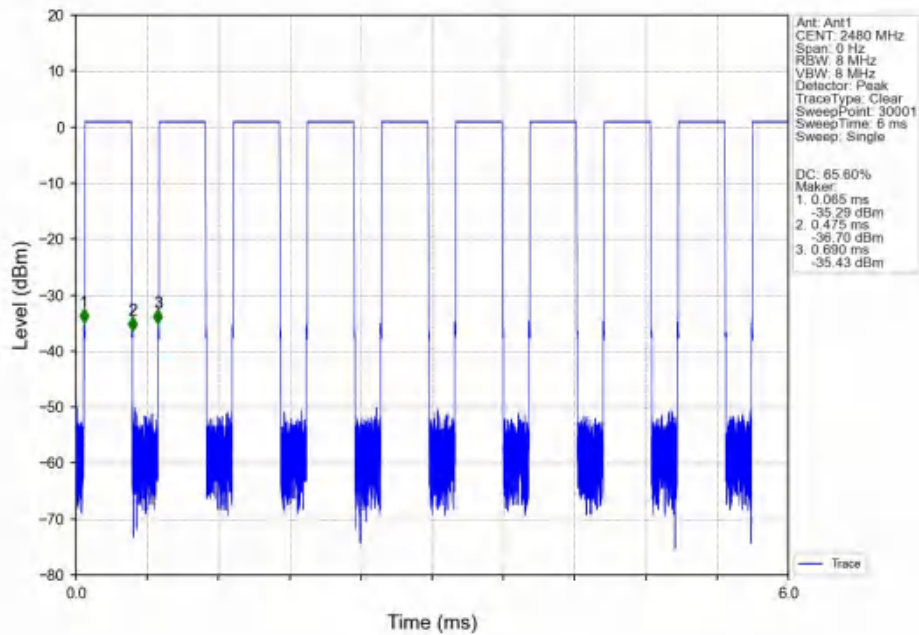
1.2 Test Graph

1.2.1 Ant1

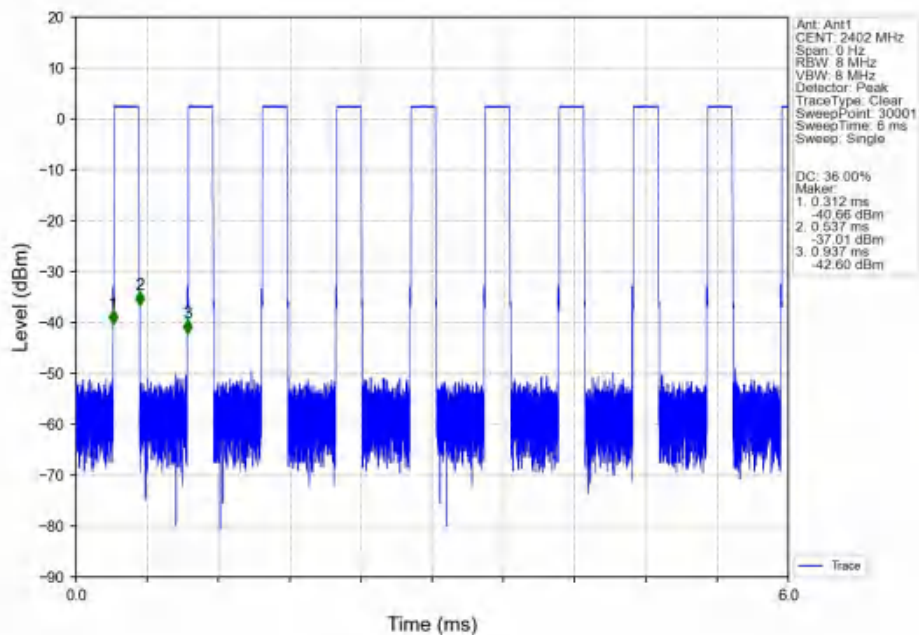




1M_HCH_2480MHz_Ant1_NTNV

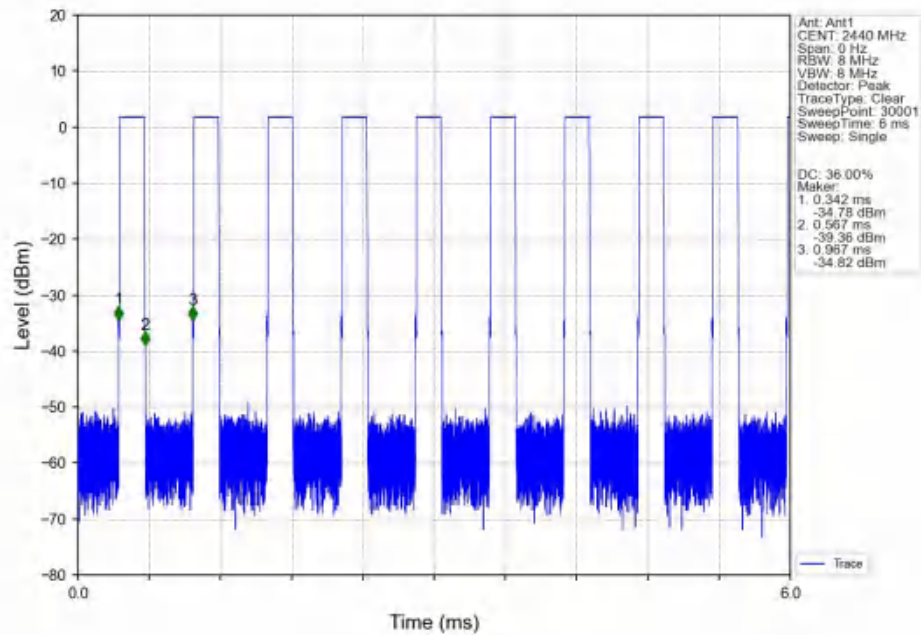


2M_LCH_2402MHz_Ant1_NTNV

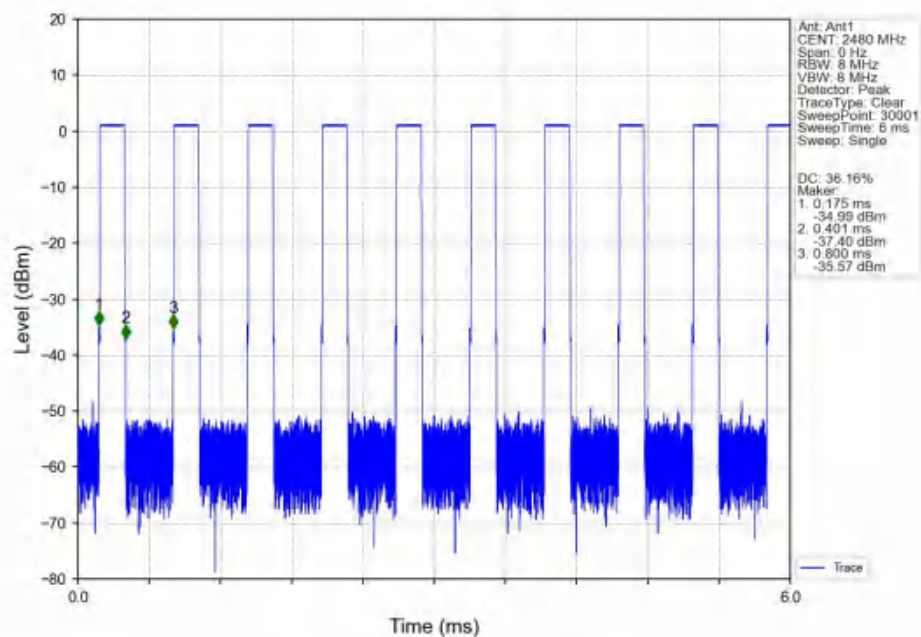




2M_MCH_2440MHz_Ant1_NTNV



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	1.042	/	Pass
		2440	1	1.043	/	Pass
		2480	1	1.041	/	Pass
2M	SISO	2402	1	2.054	/	Pass
		2440	1	2.056	/	Pass
		2480	1	2.053	/	Pass

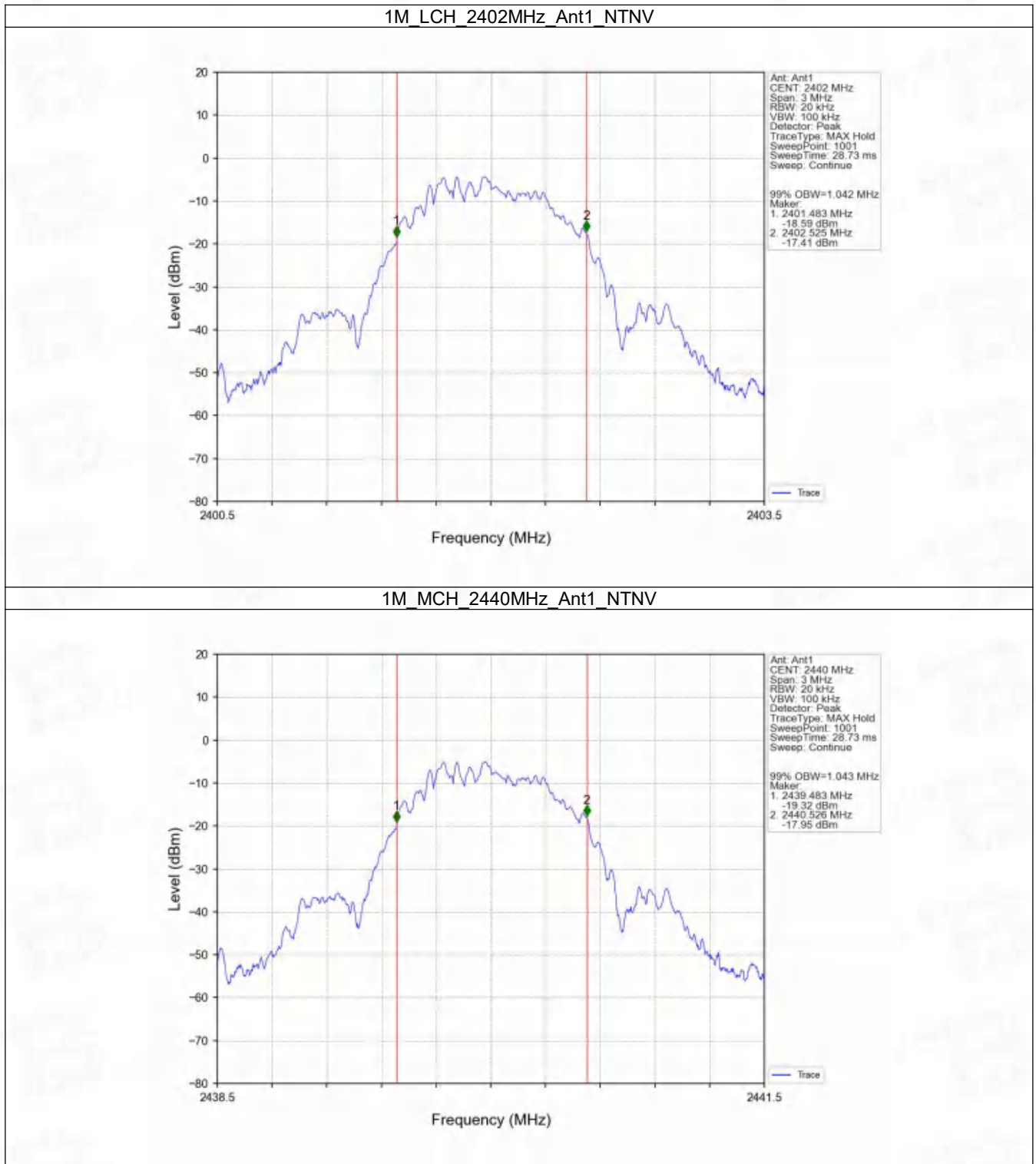
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.716	≥ 0.5	Pass
		2440	1	0.723	≥ 0.5	Pass
		2480	1	0.711	≥ 0.5	Pass
2M	SISO	2402	1	1.265	≥ 0.5	Pass
		2440	1	1.268	≥ 0.5	Pass
		2480	1	1.217	≥ 0.5	Pass



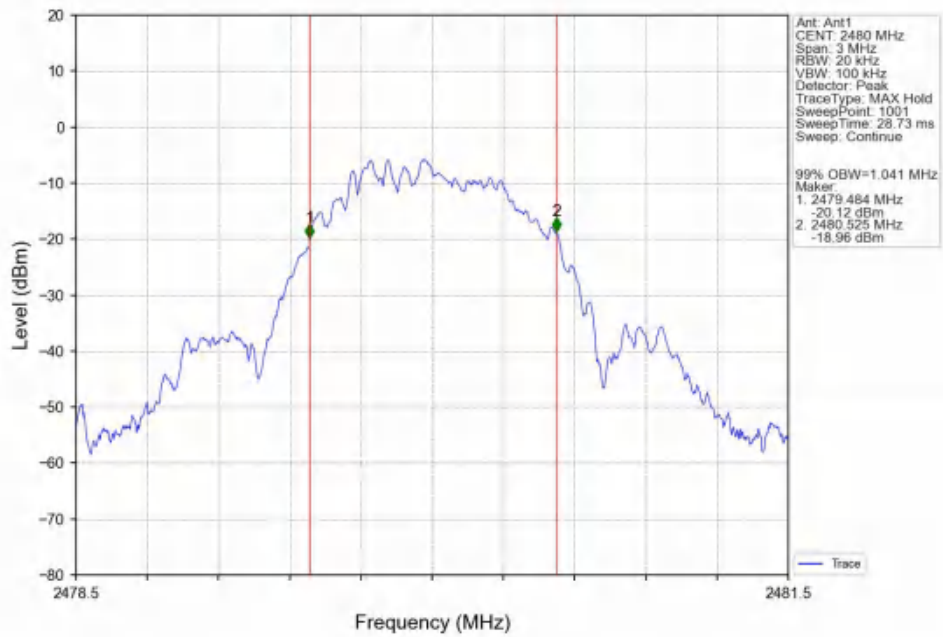
2.2 Test Graph

2.2.1 OBW

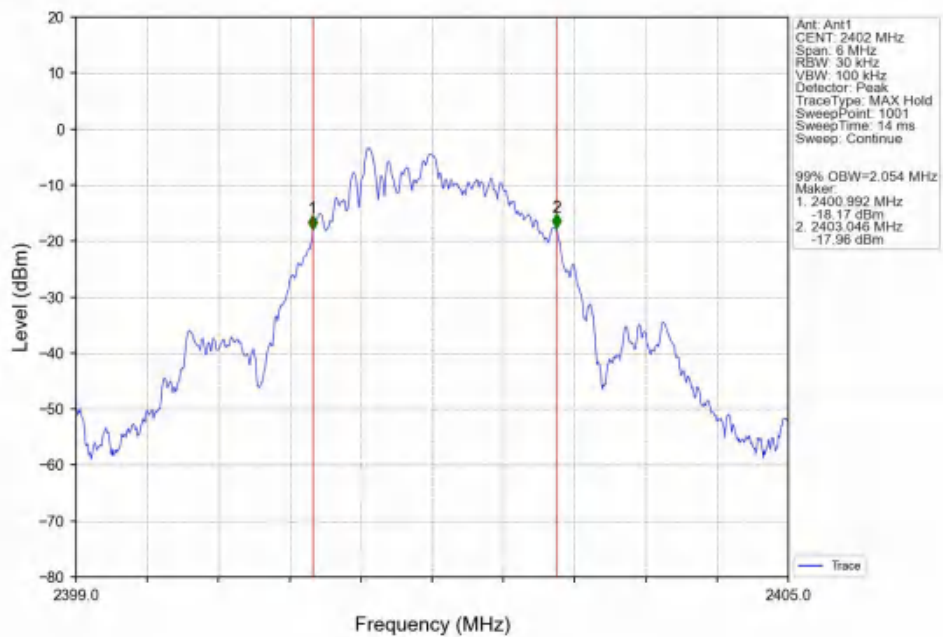




1M_HCH_2480MHz_Ant1_NTNV

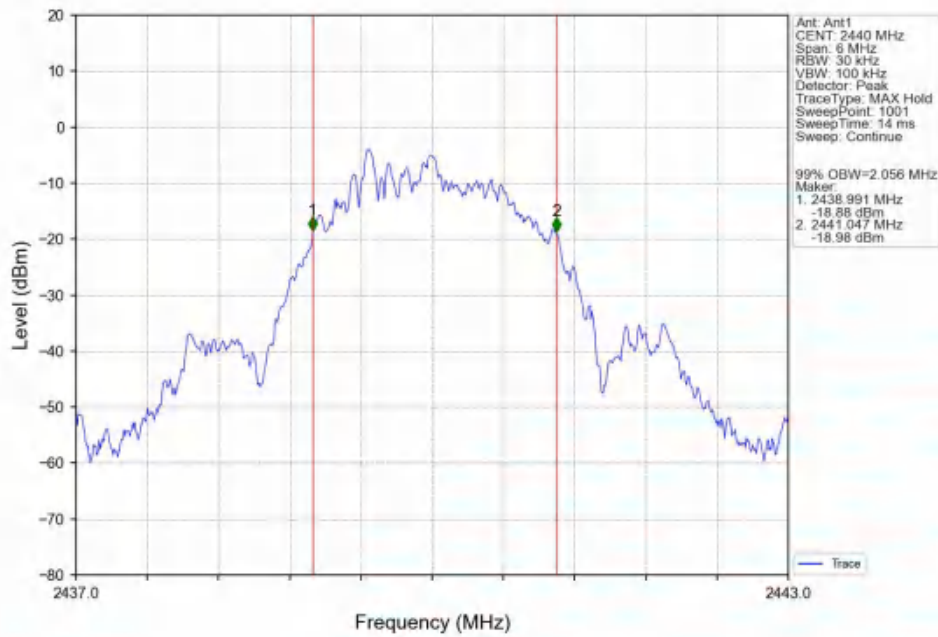


2M_LCH_2402MHz_Ant1_NTNV

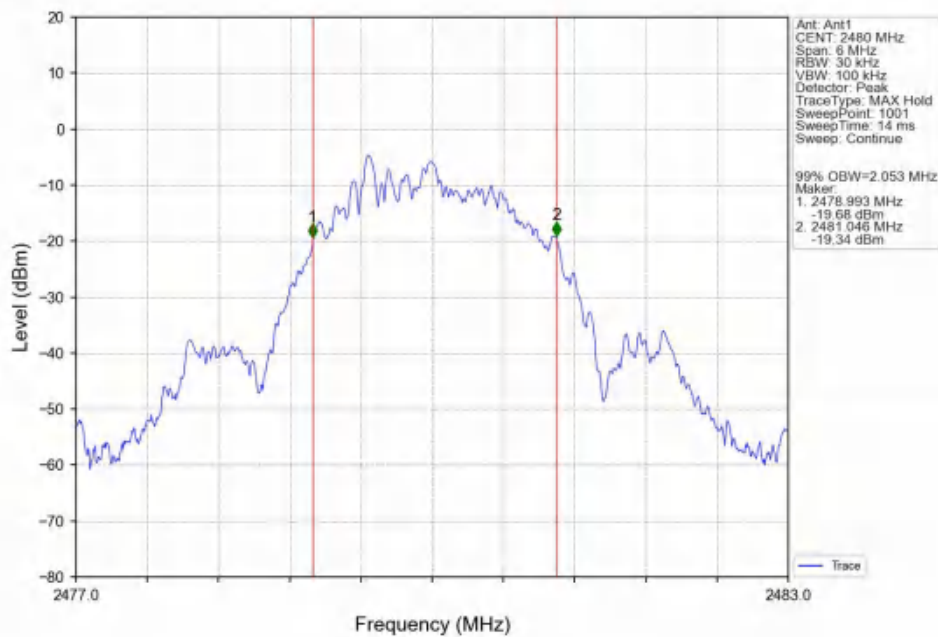




2M_MCH_2440MHz_Ant1_NTNV

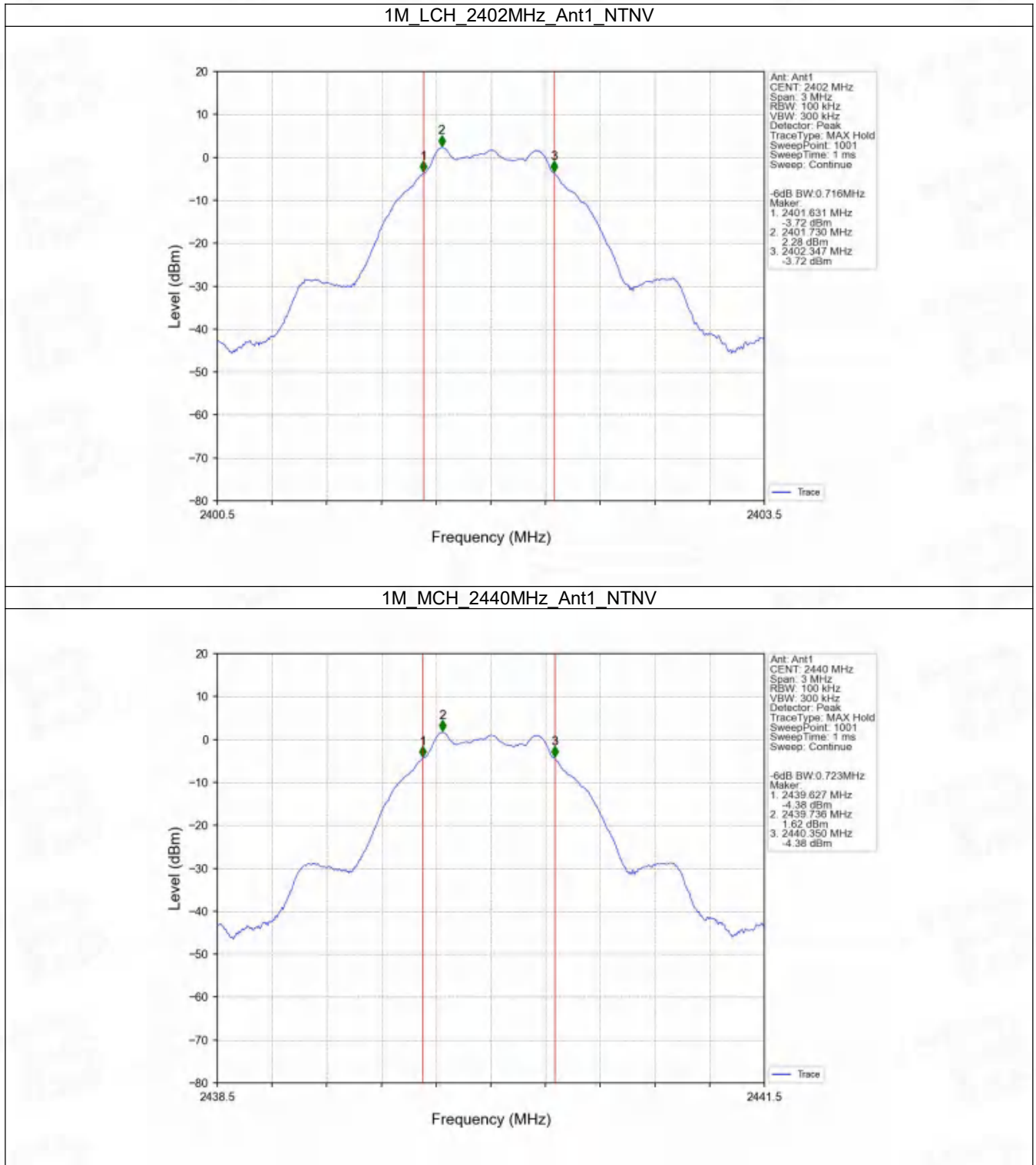


2M_HCH_2480MHz_Ant1_NTNV

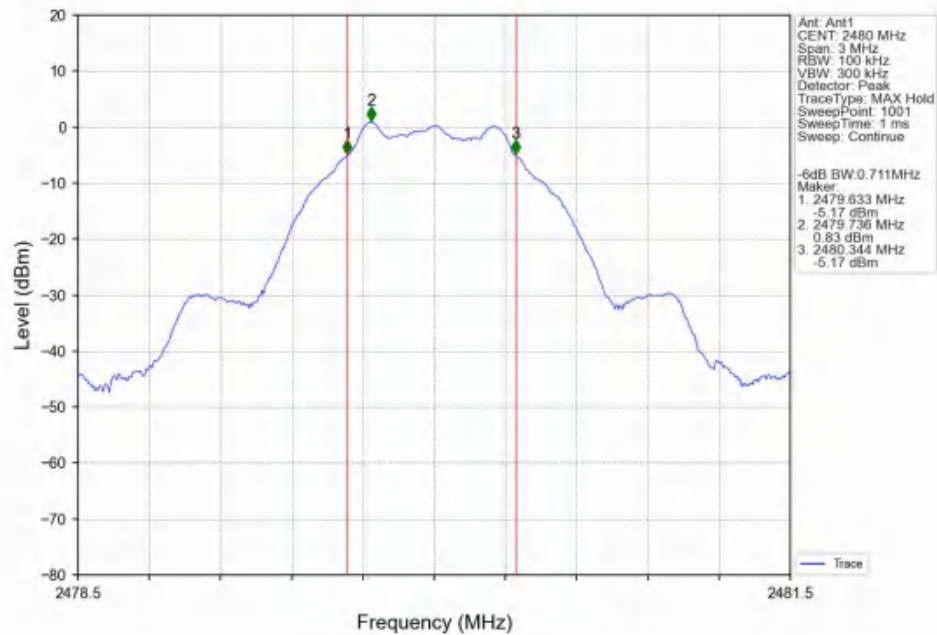




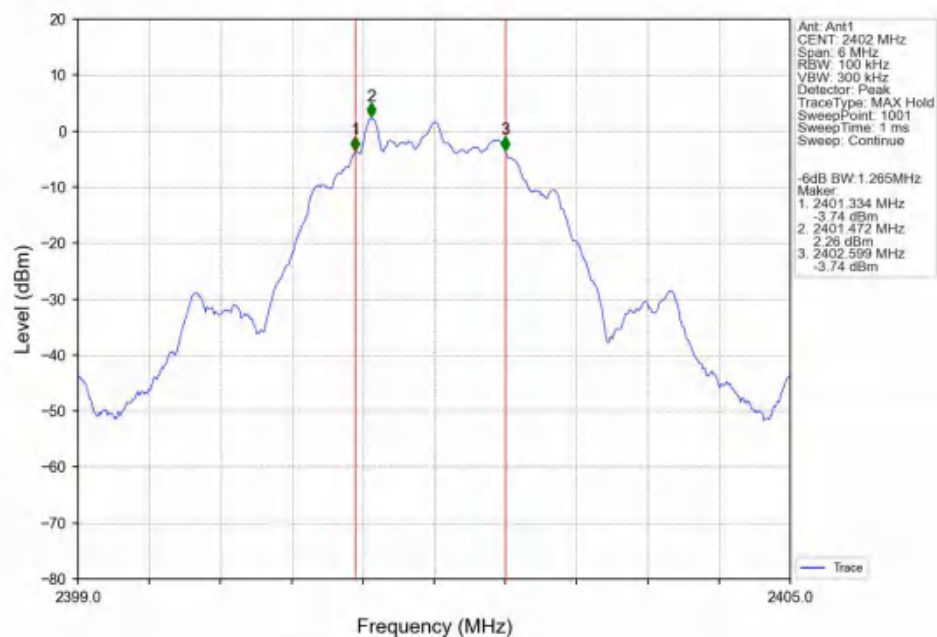
2.2.2 6dB BW



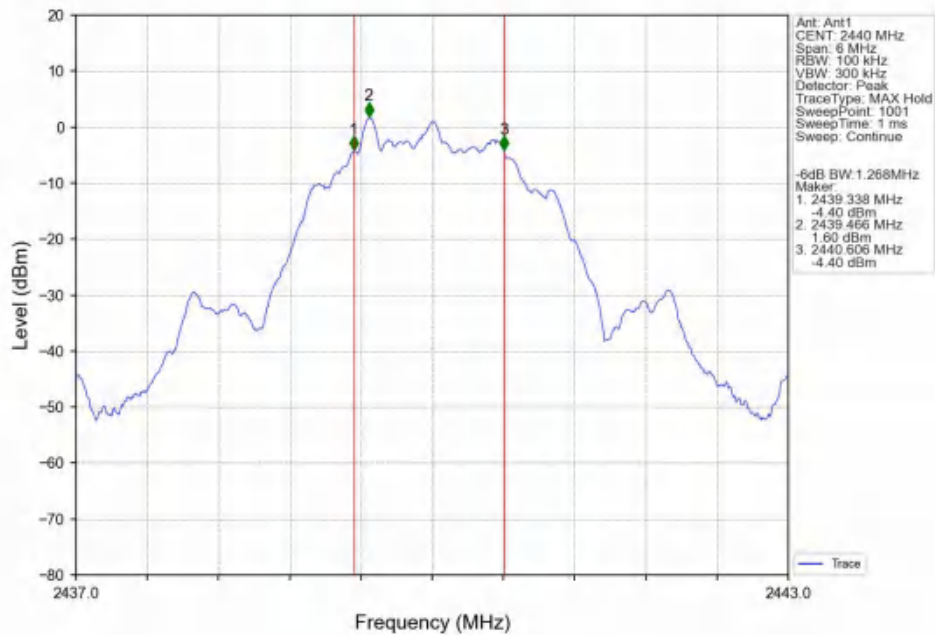
1M_HCH_2480MHz_Ant1_NTNV



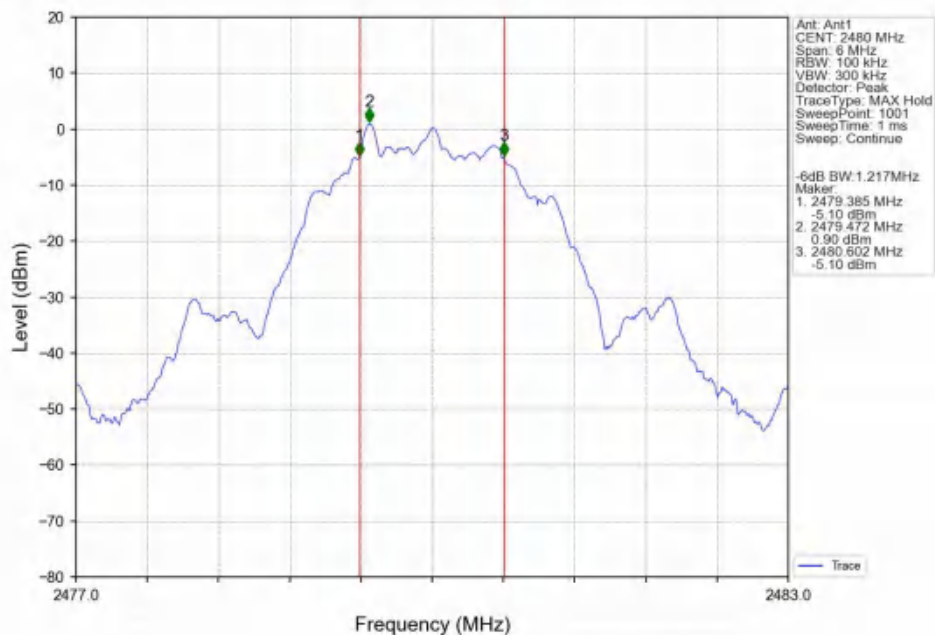
2M_LCH_2402MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV





3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

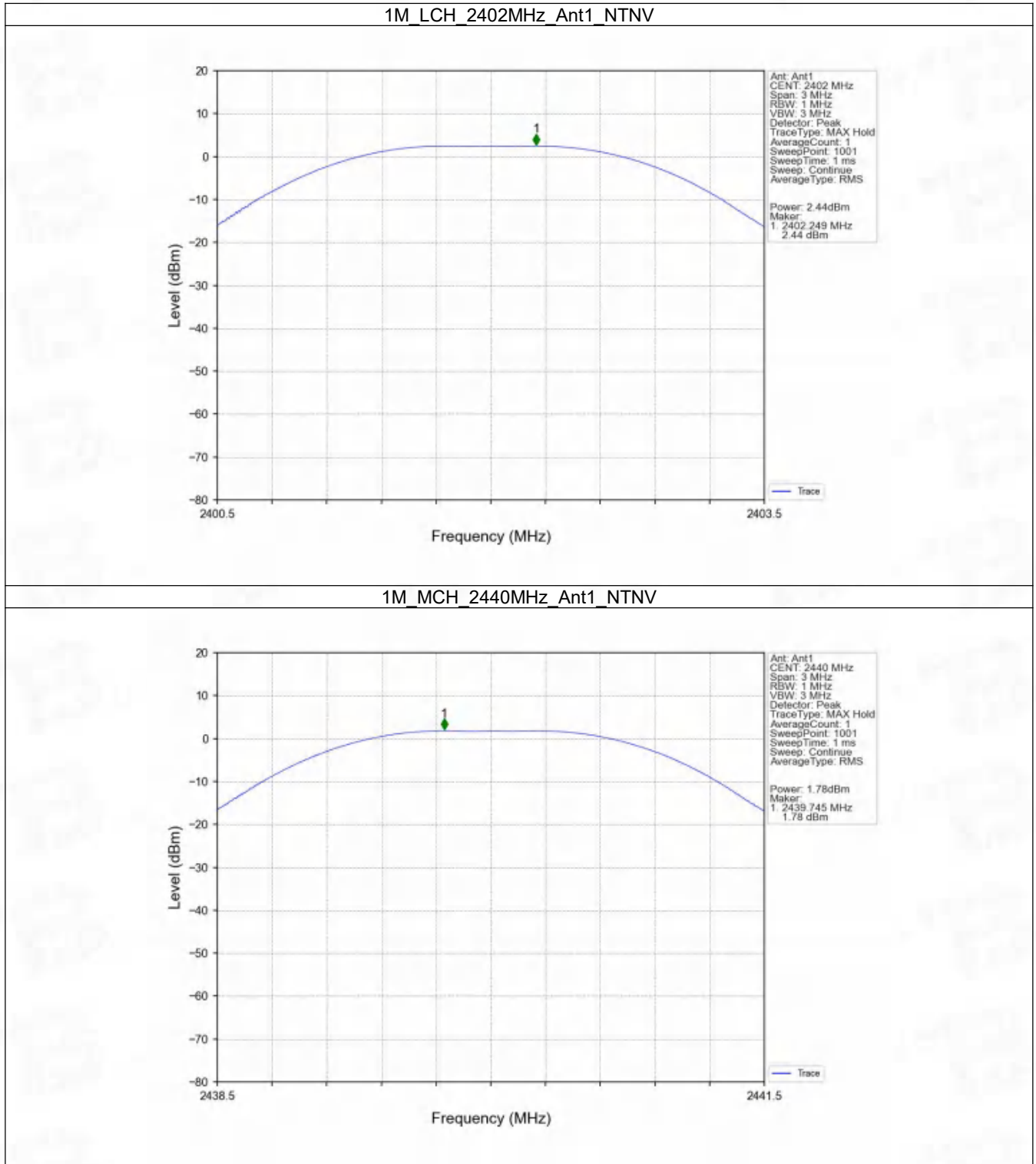
Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	2.44	<=30	Pass
		2440	1.78	<=30	Pass
		2480	0.99	<=30	Pass
2M	SISO	2402	2.50	<=30	Pass
		2440	1.87	<=30	Pass
		2480	1.08	<=30	Pass

Note1: Antenna Gain: Ant1: -0.25dBi;



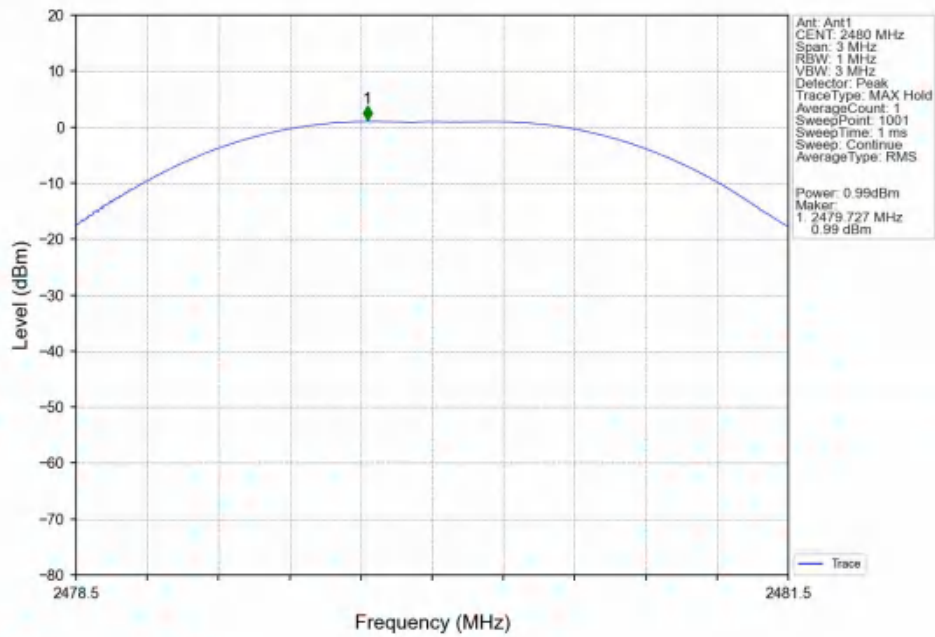
3.2 Test Graph

3.2.1 Power

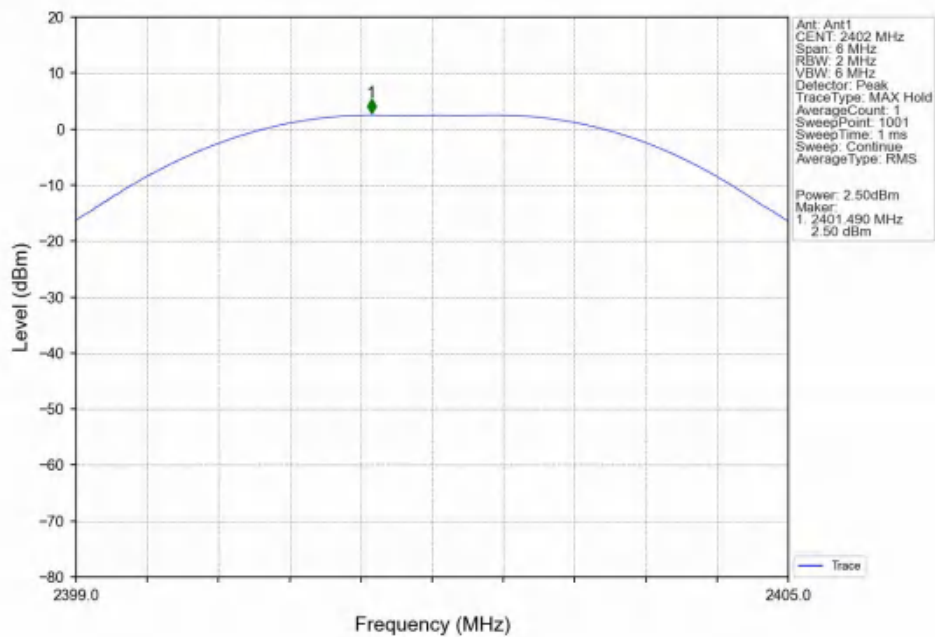




1M_HCH_2480MHz_Ant1_NTNV

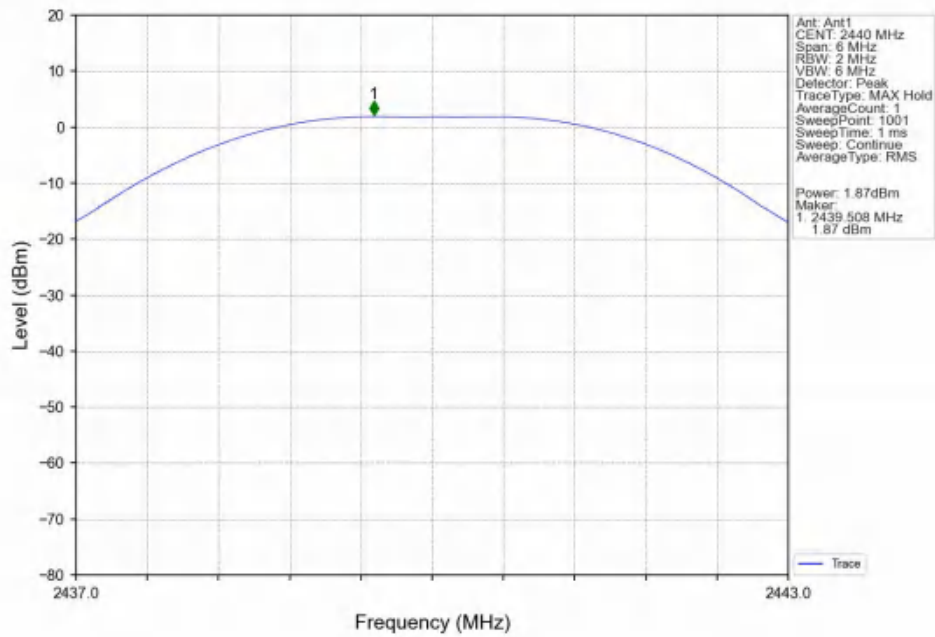


2M_LCH_2402MHz_Ant1_NTNV

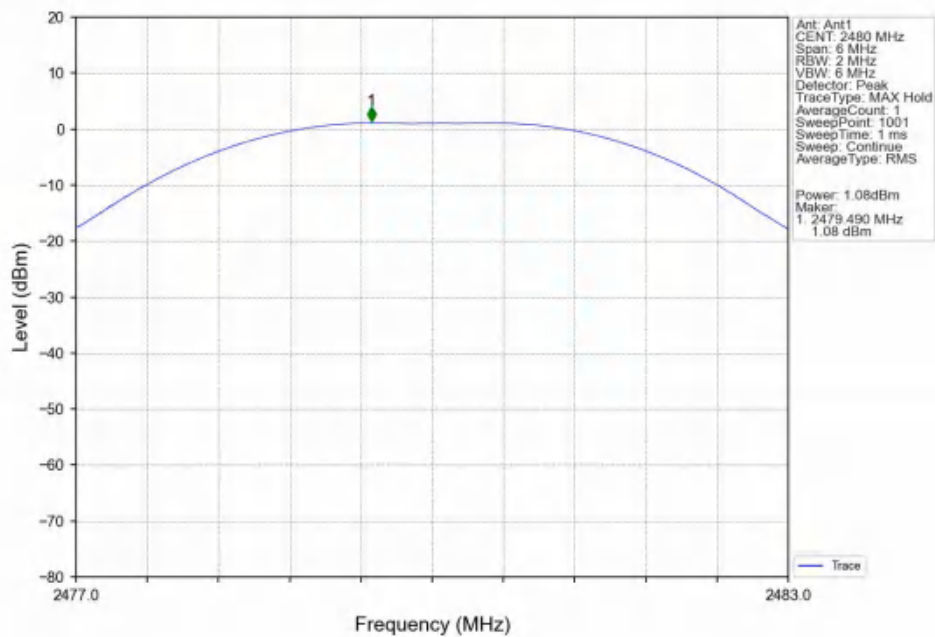




2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV





4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

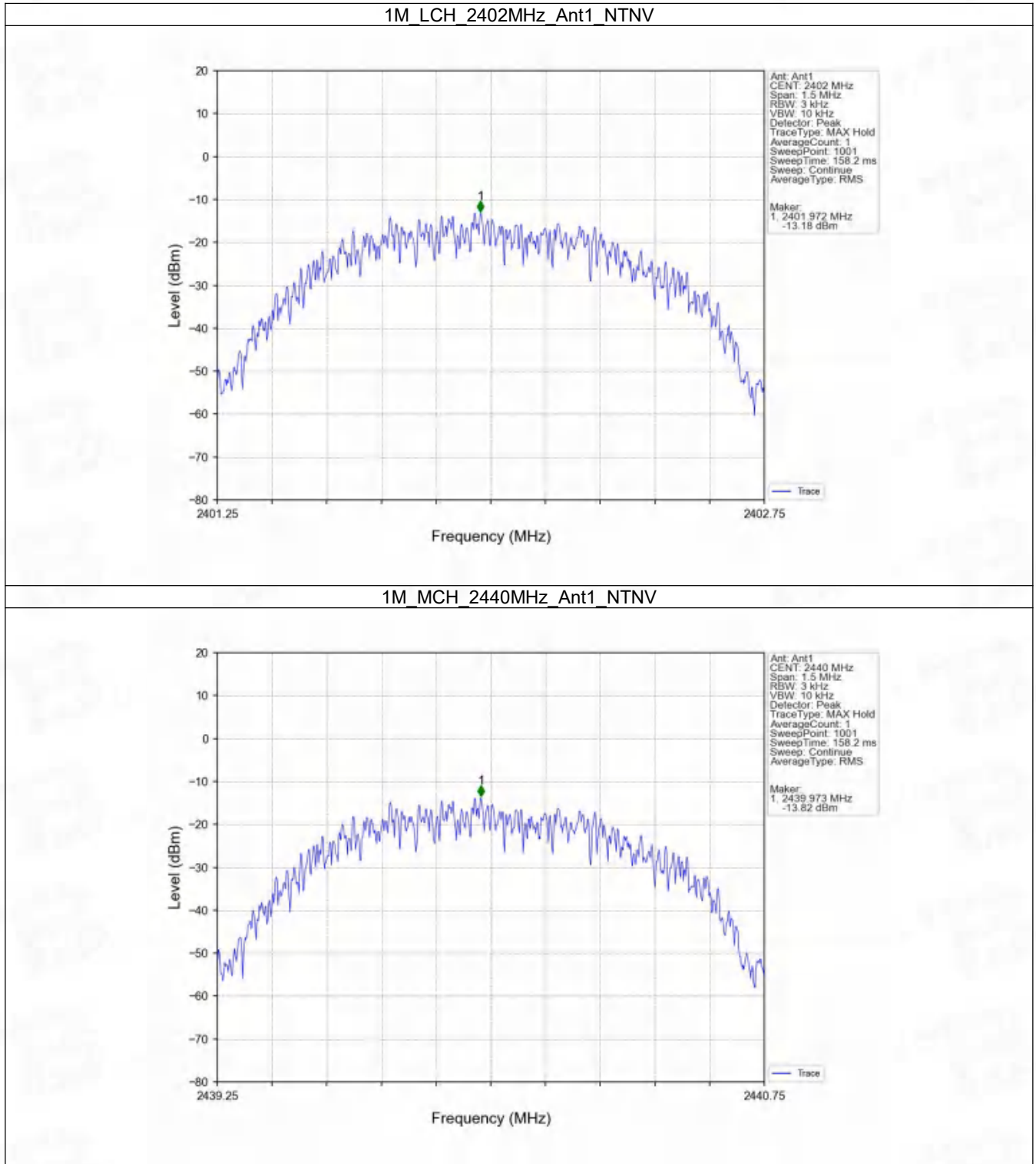
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm)		Verdict
			ANT1	Limit(dBm/3kHz)	
1M	SISO	2402	-13.18dBm/3kHz	<=8	Pass
		2440	-13.82dBm/3kHz	<=8	Pass
		2480	-14.57dBm/3kHz	<=8	Pass
2M	SISO	2402	-16.73dBm/3kHz	<=8	Pass
		2440	-17.32dBm/3kHz	<=8	Pass
		2480	-18.18dBm/3kHz	<=8	Pass

Note1: Antenna Gain: Ant1: -0.25dBi;



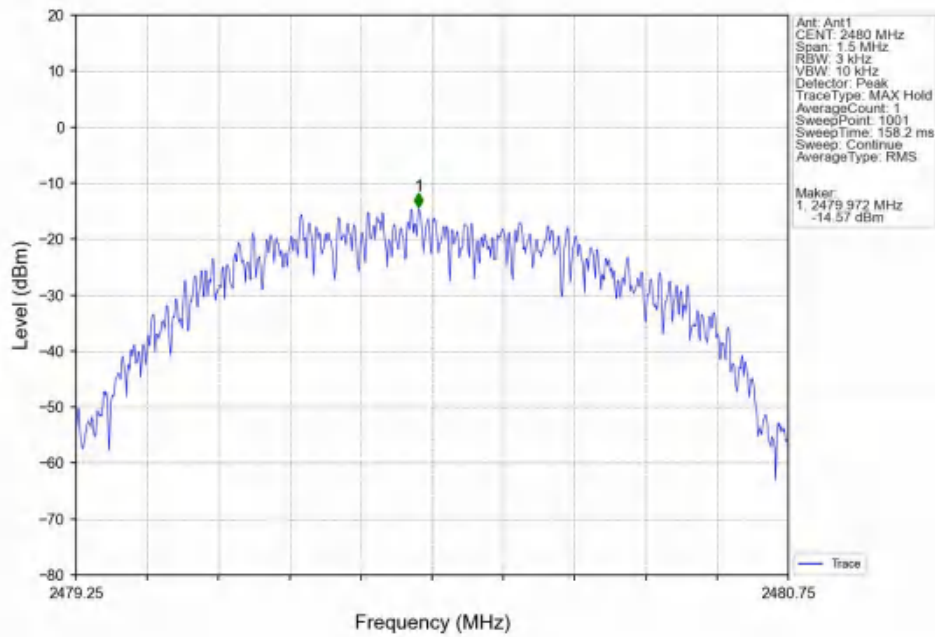
4.2 Test Graph

4.2.1 PSD

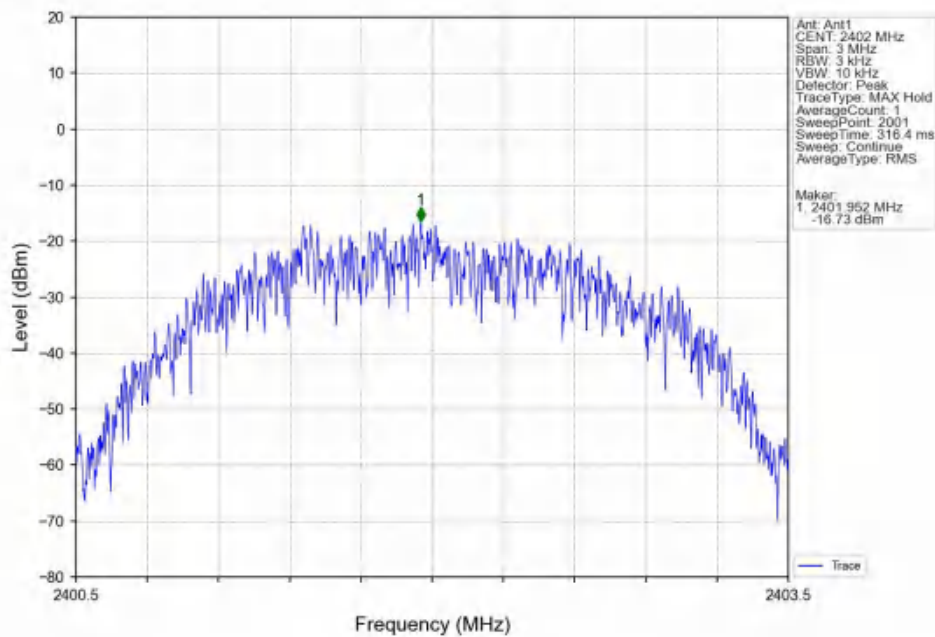




1M_HCH_2480MHz_Ant1_NTNV

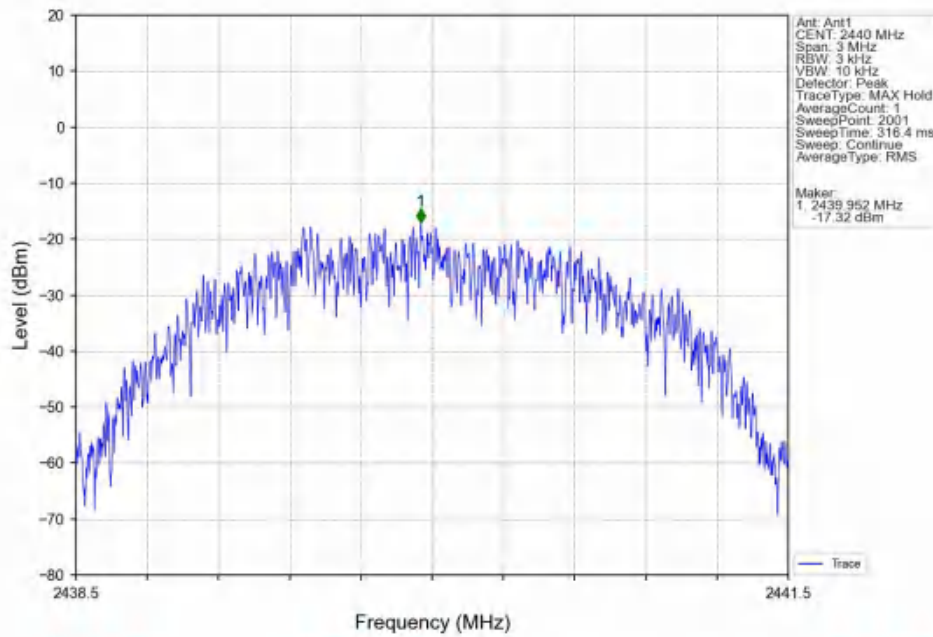


2M_LCH_2402MHz_Ant1_NTNV

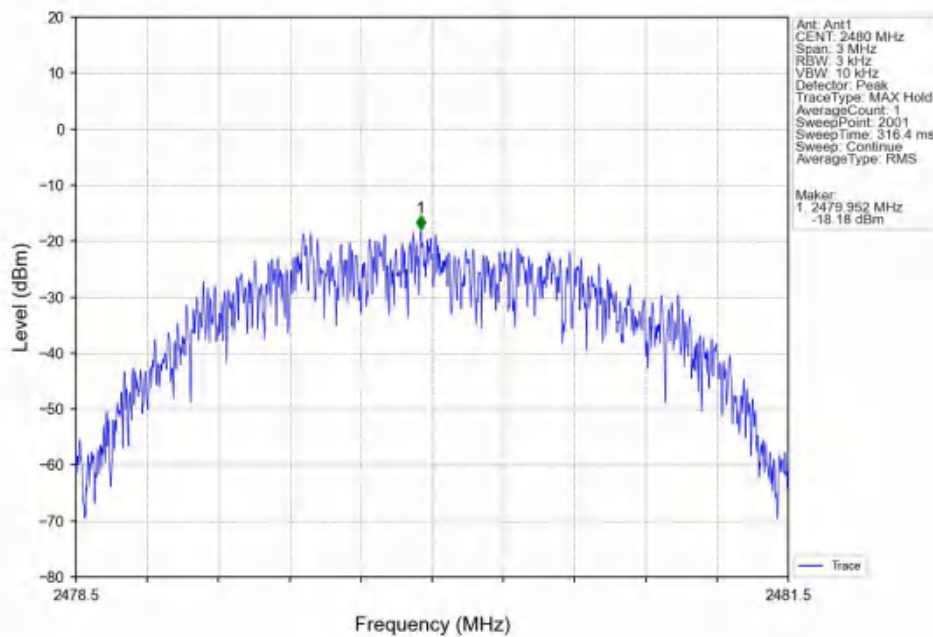




2M_MCH_2440MHz_Ant1_NTNV



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	2.28
		2440	1	1.63
		2480	1	0.84
2M	SISO	2402	1	2.24
		2440	1	1.66
		2480	1	0.87

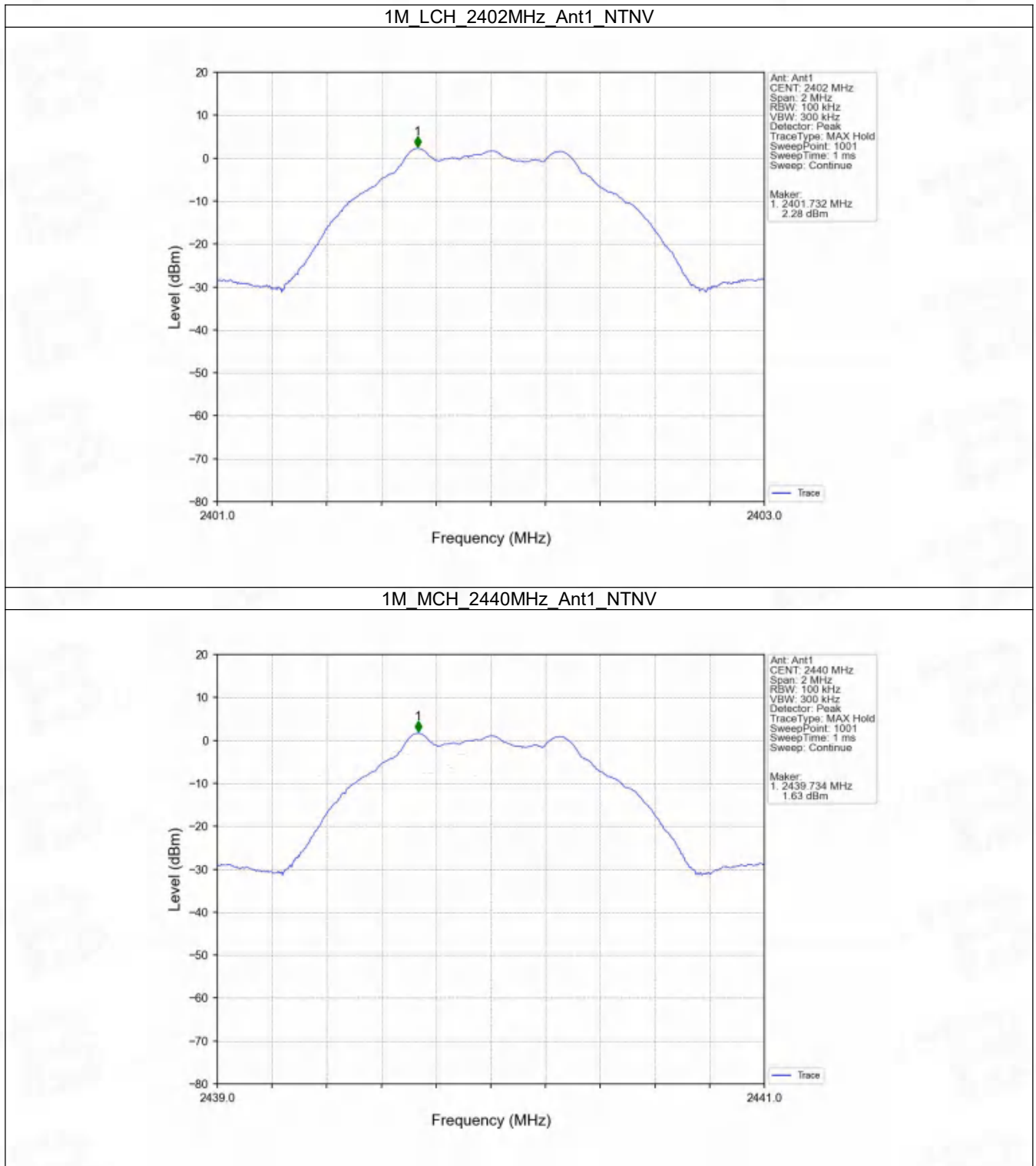
5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	2.28	-17.72	Pass
		2440	1	1.63	-18.37	Pass
		2480	1	0.84	-19.16	Pass
2M	SISO	2402	1	2.24	-17.76	Pass
		2440	1	1.66	-18.34	Pass
		2480	1	0.87	-19.13	Pass



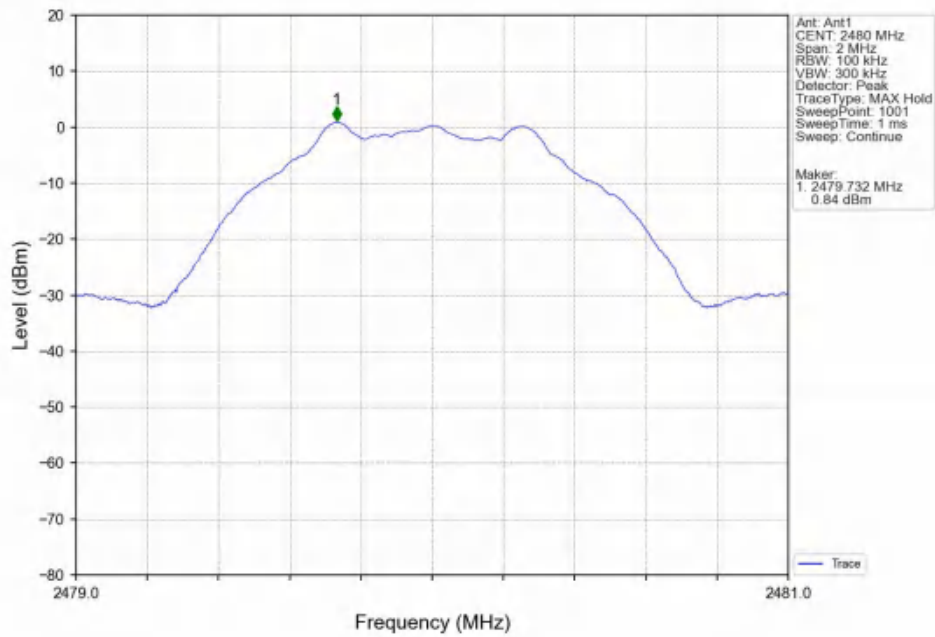
5.2 Test Graph

5.2.1 Ref

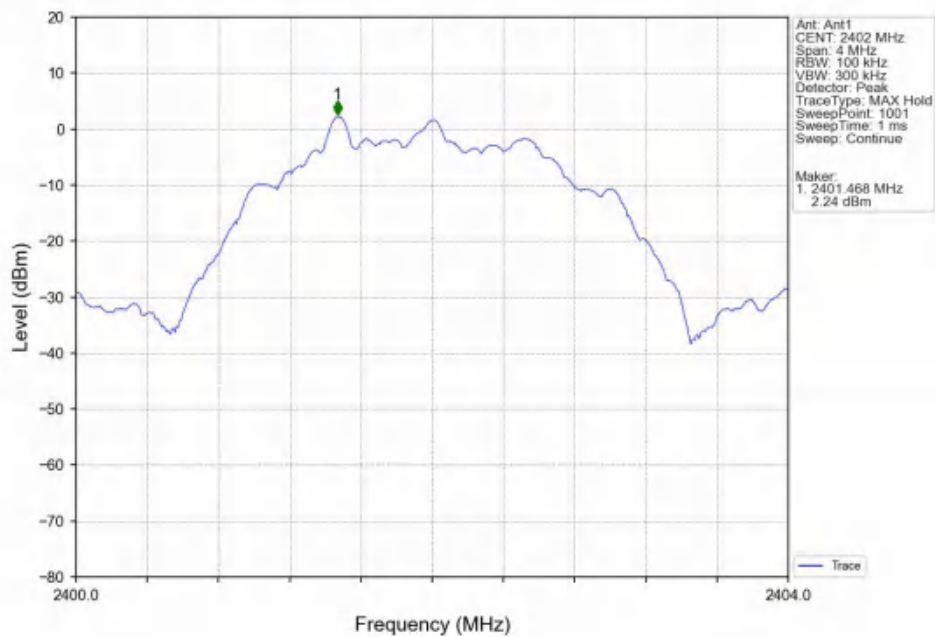




1M_HCH_2480MHz_Ant1_NTNV

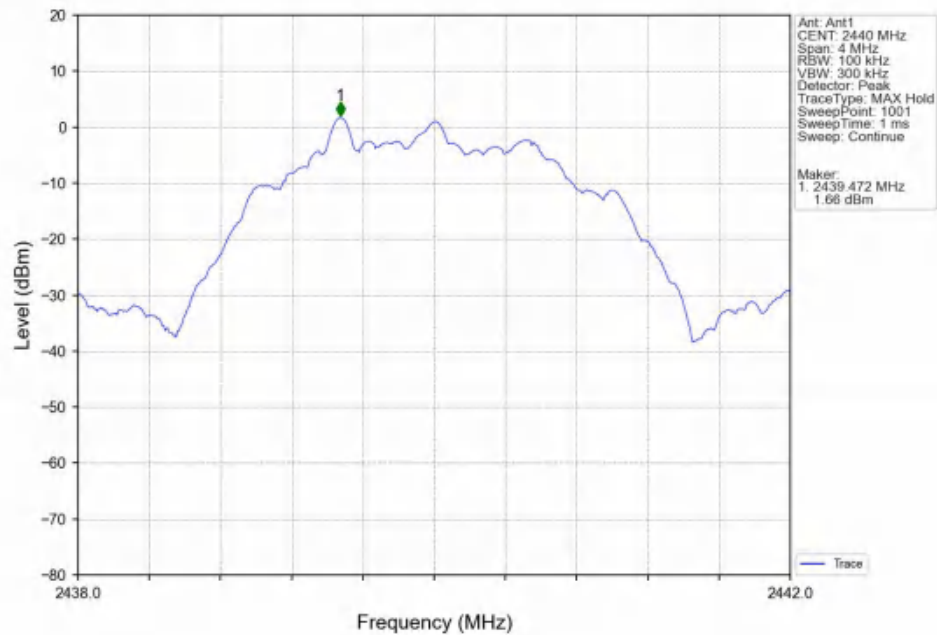


2M_LCH_2402MHz_Ant1_NTNV

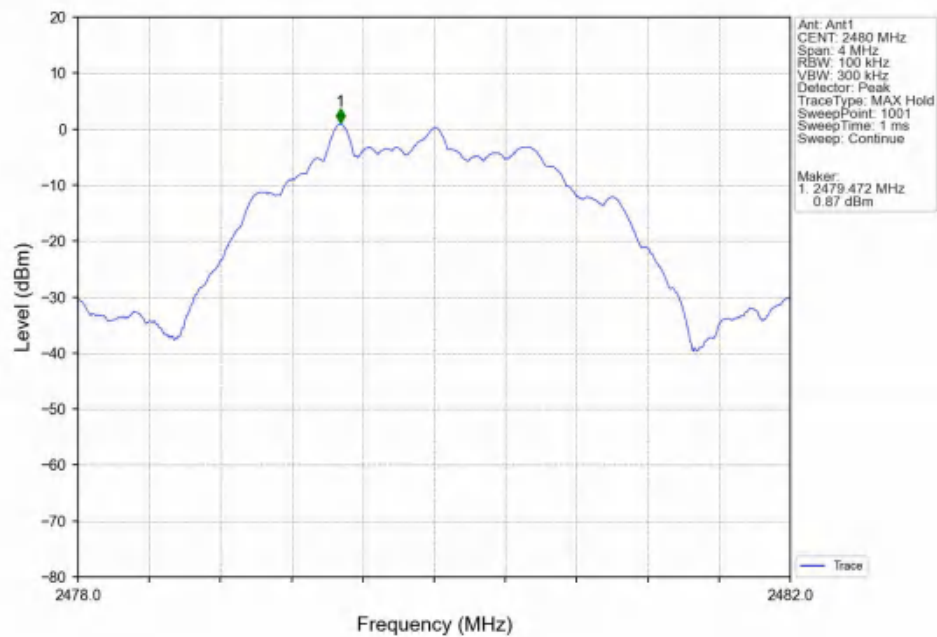




2M_MCH_2440MHz_Ant1_NTNV

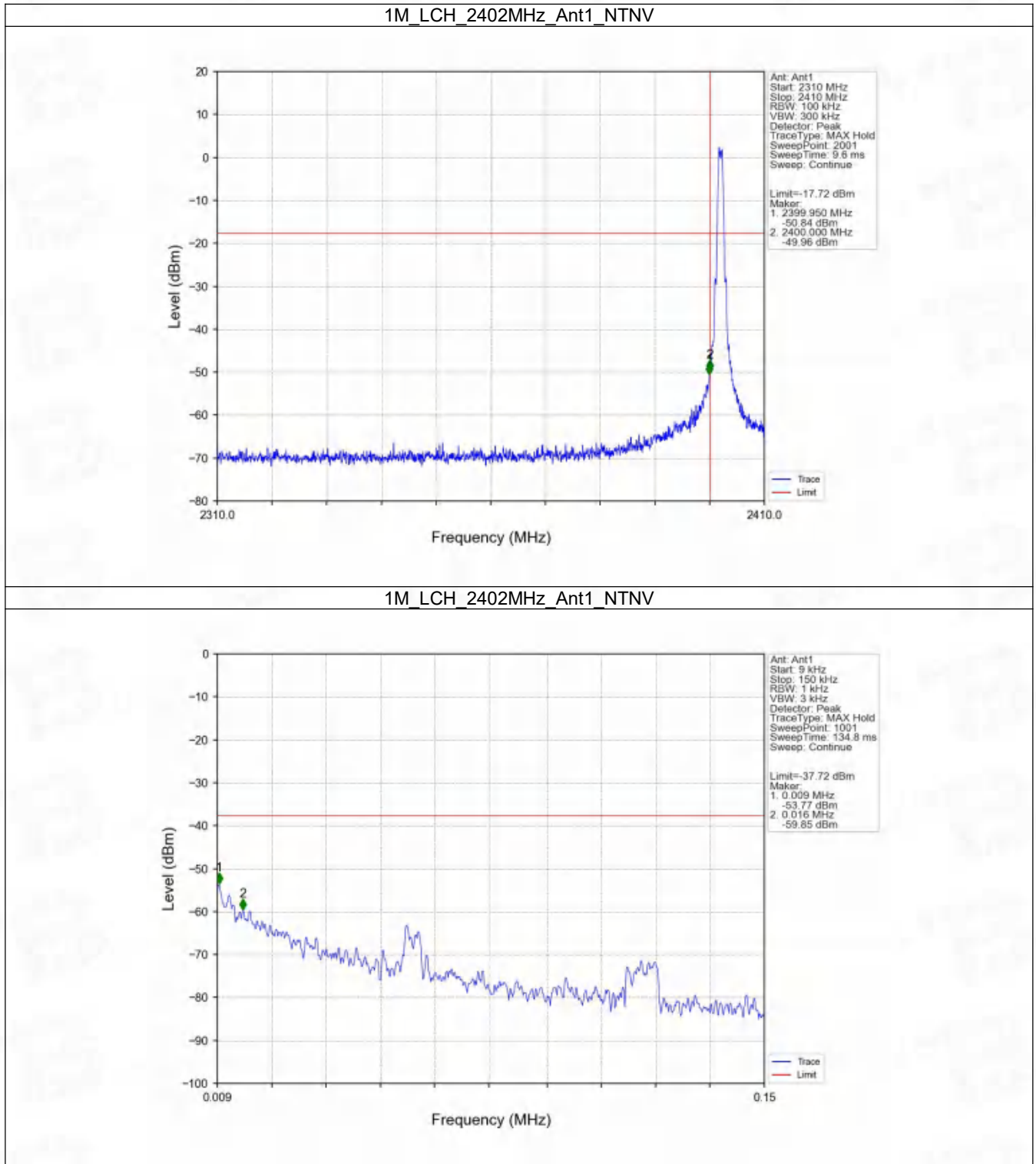


2M_HCH_2480MHz_Ant1_NTNV



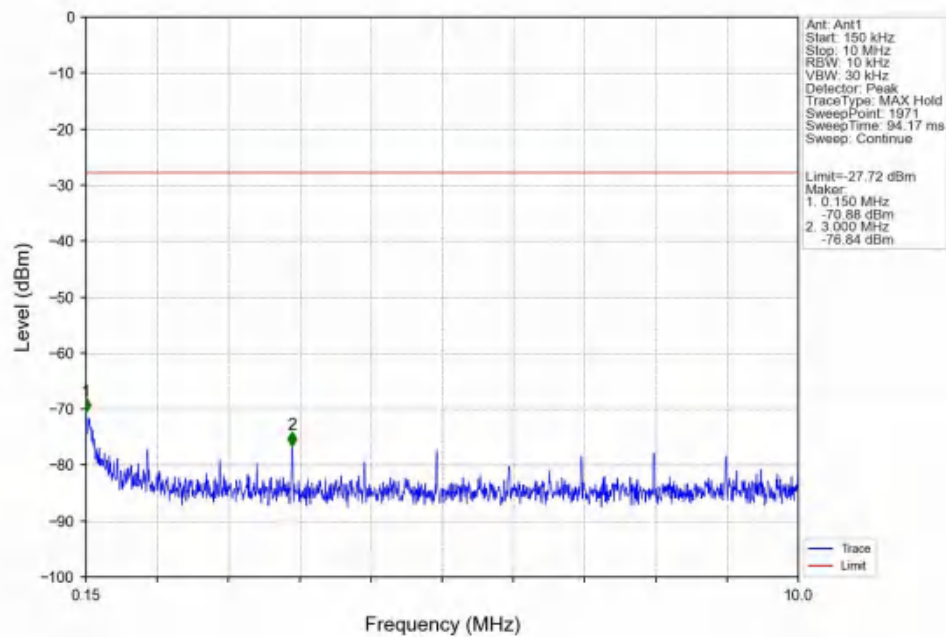


5.2.2 CSE

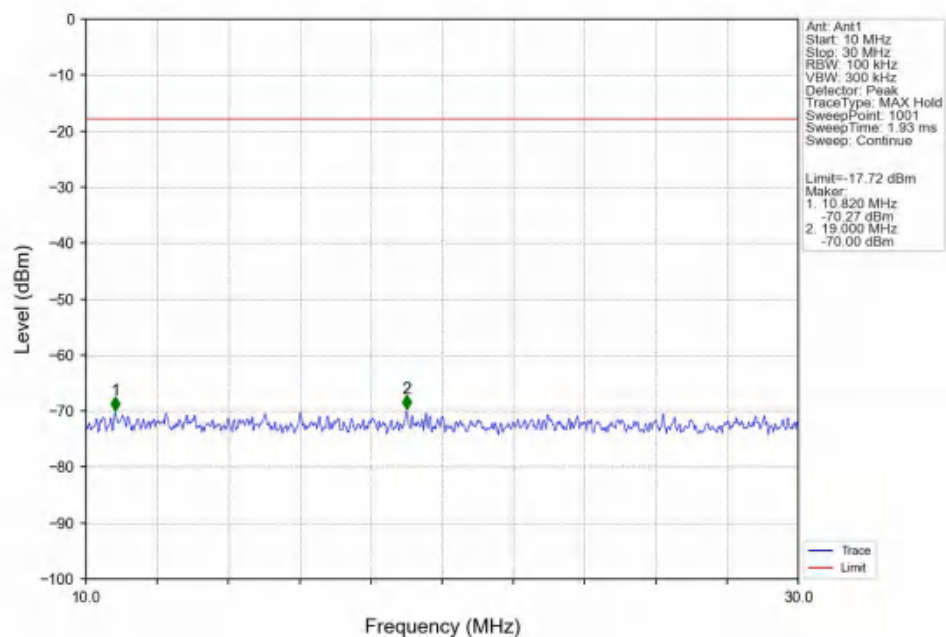




1M_LCH_2402MHz_Ant1_NTNV

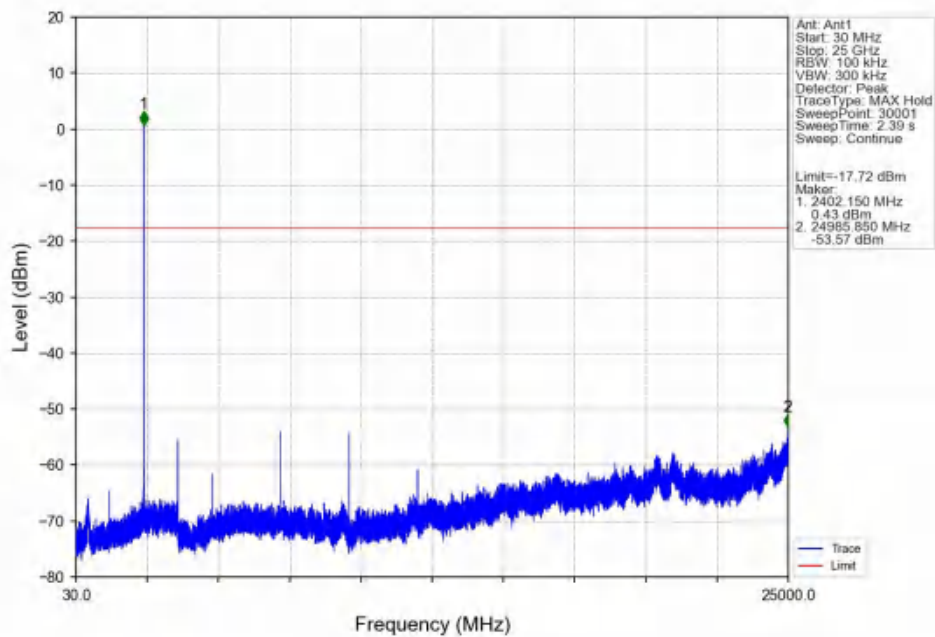


1M_LCH_2402MHz_Ant1_NTNV

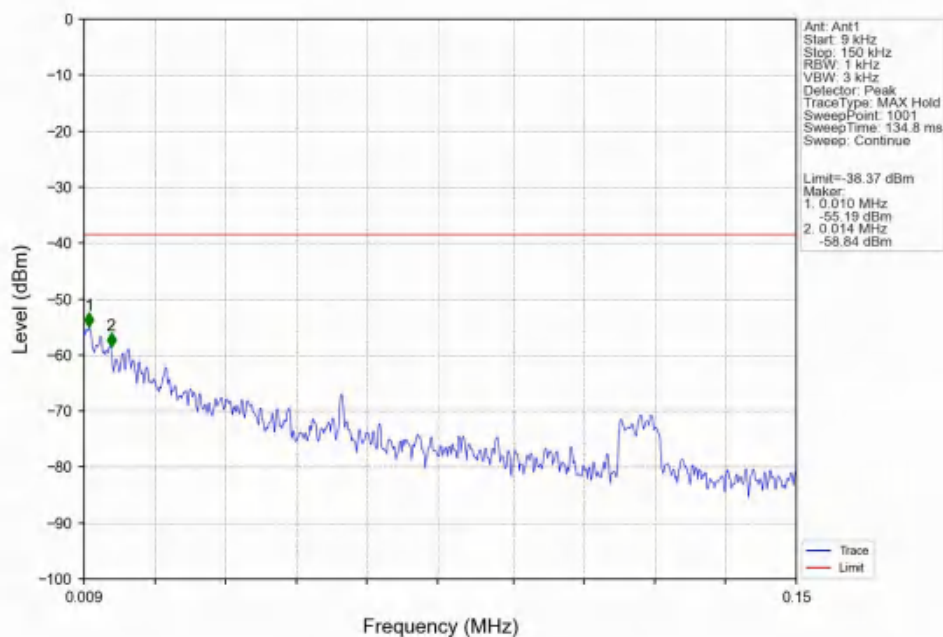




1M_LCH_2402MHz_Ant1_NTNV

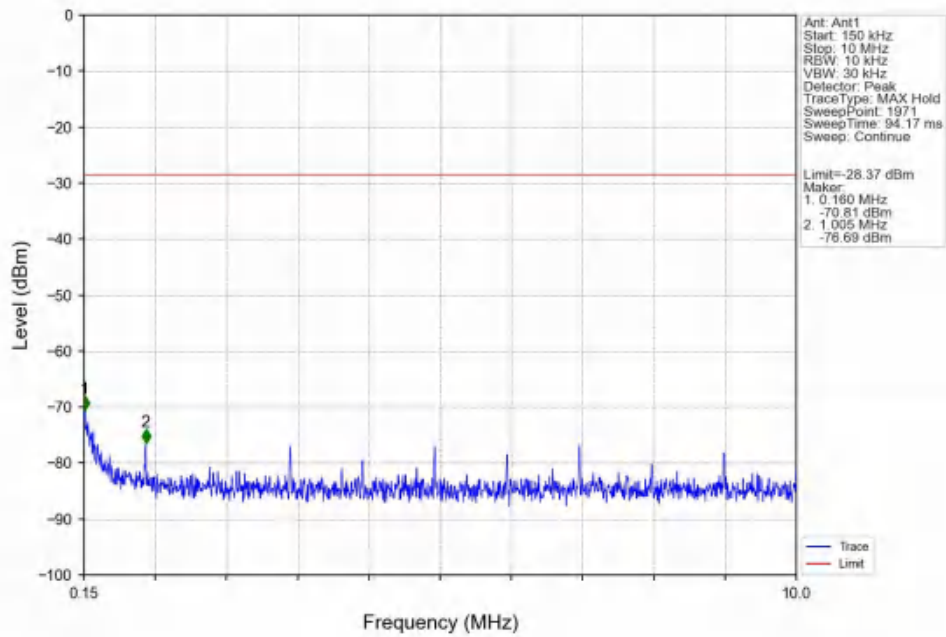


1M_MCH_2440MHz_Ant1_NTNV

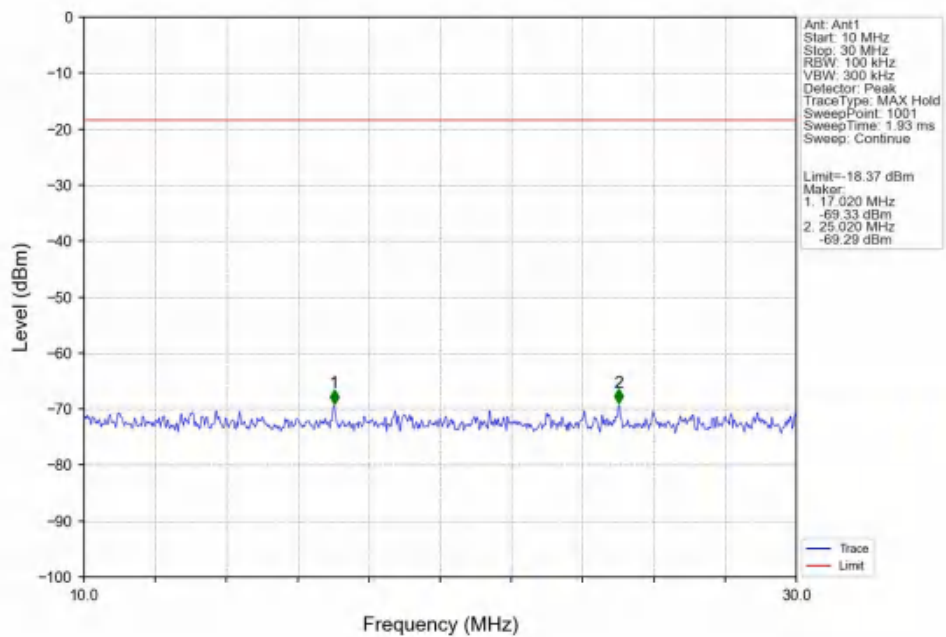




1M_MCH_2440MHz_Ant1_NTNV

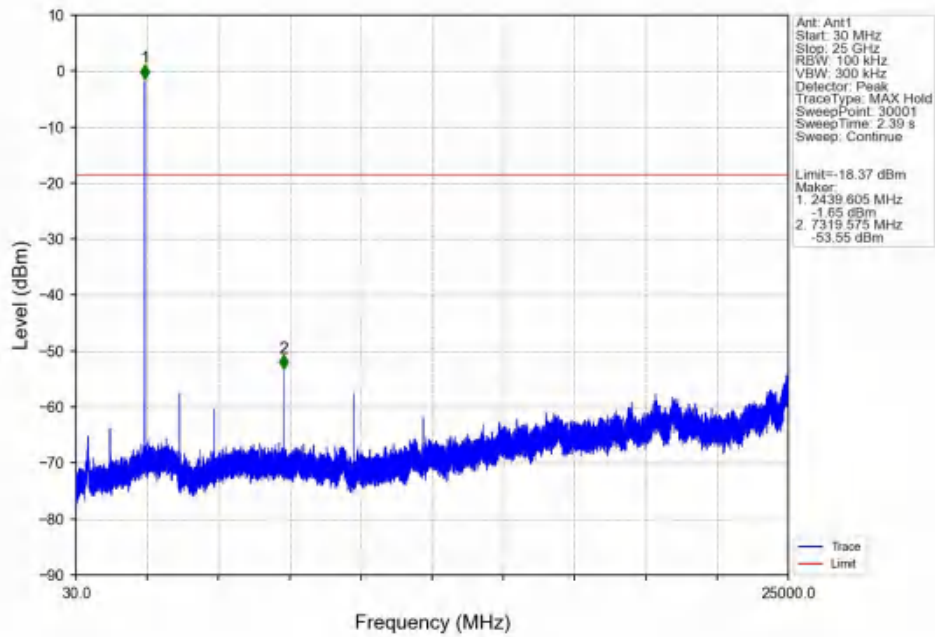


1M_MCH_2440MHz_Ant1_NTNV

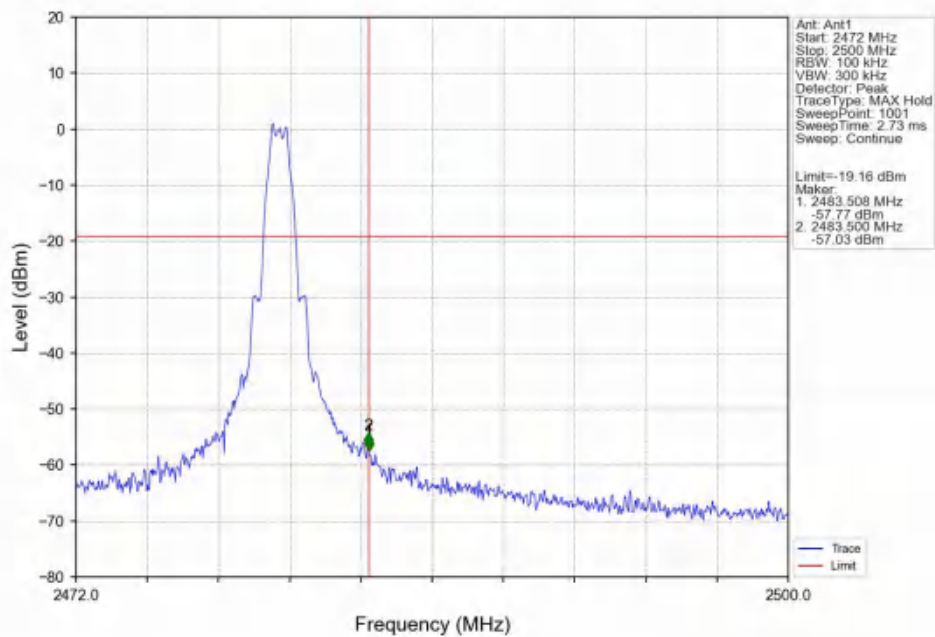




1M_MCH_2440MHz_Ant1_NTNV

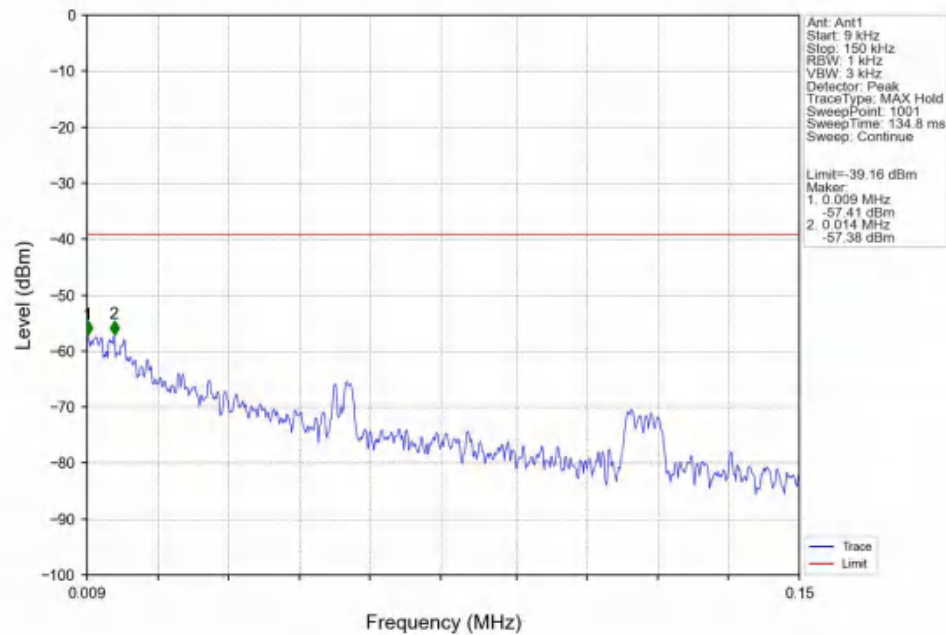


1M_HCH_2480MHz_Ant1_NTNV

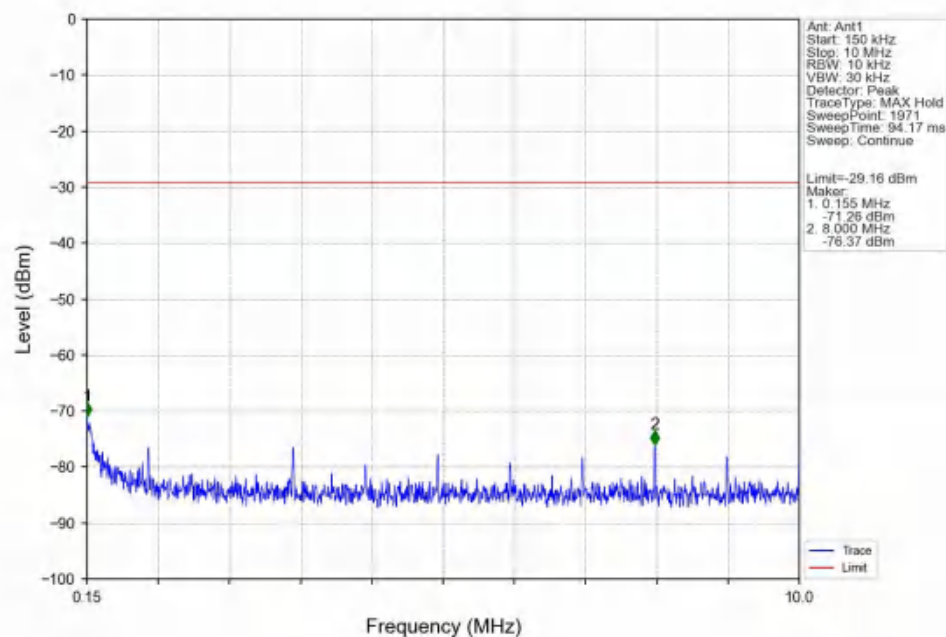




1M_HCH_2480MHz_Ant1_NTNV

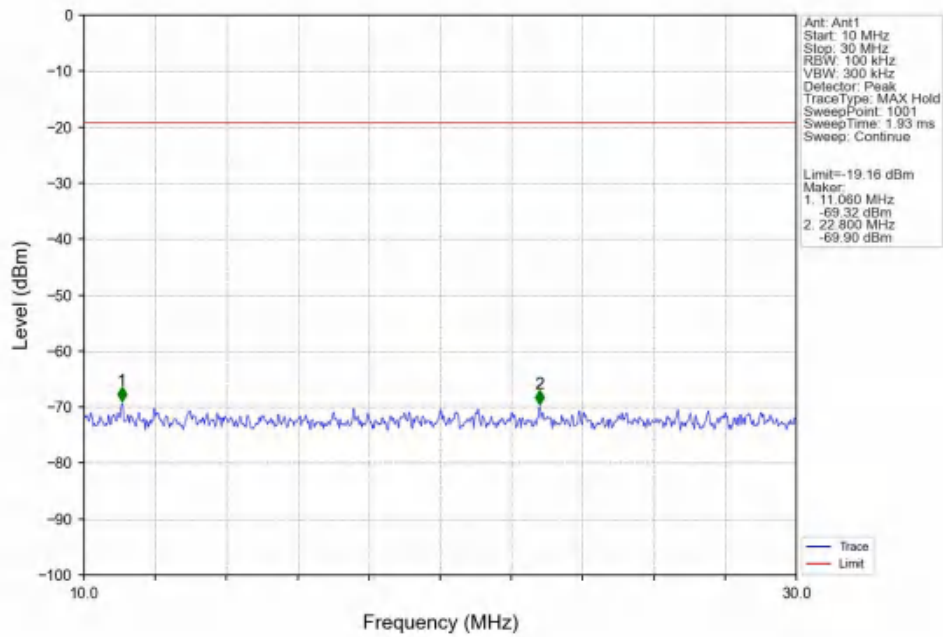


1M_HCH_2480MHz_Ant1_NTNV

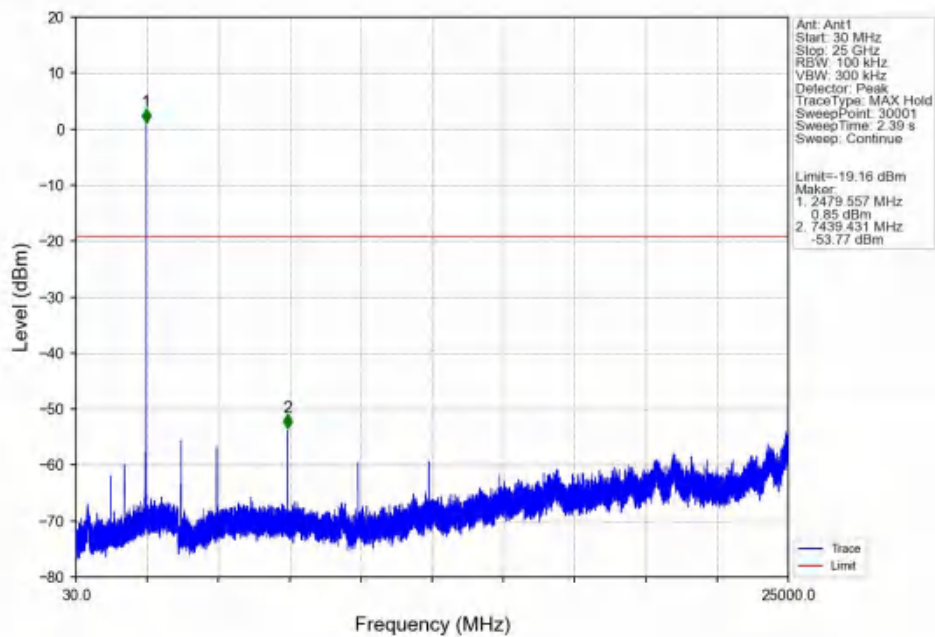




1M_HCH_2480MHz_Ant1_NTNV

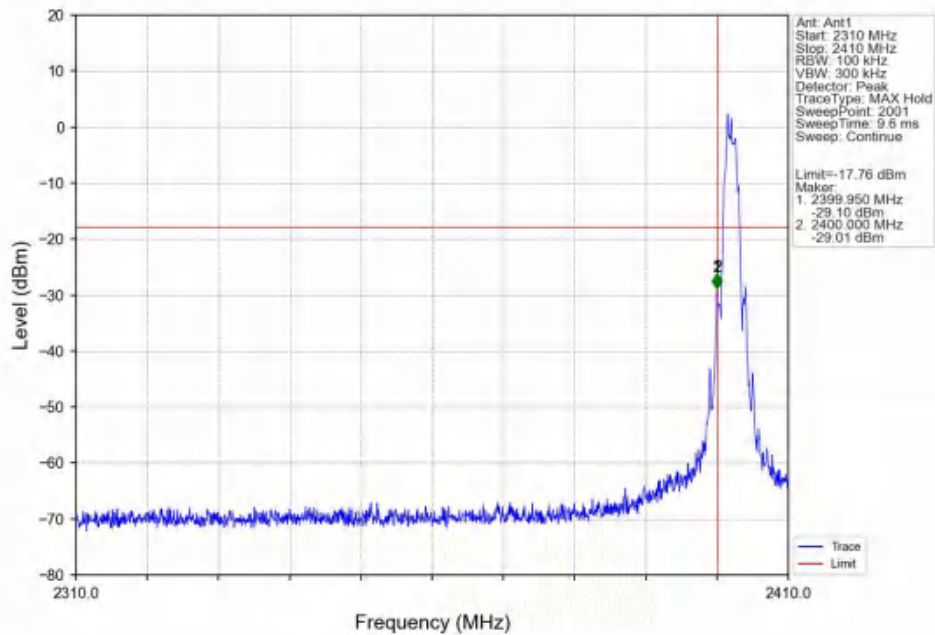


1M_HCH_2480MHz_Ant1_NTNV

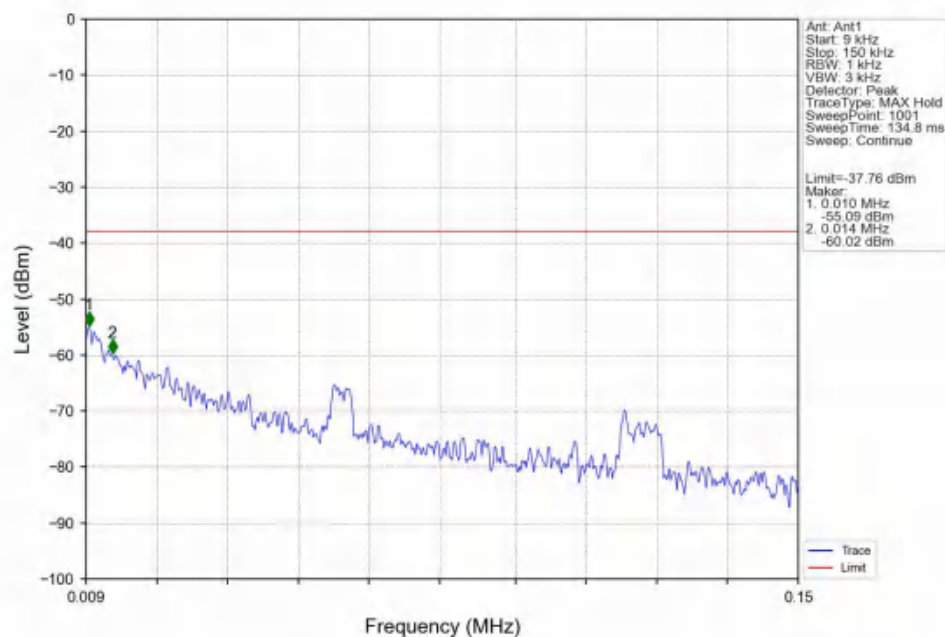




2M_LCH_2402MHz_Ant1_NTNV

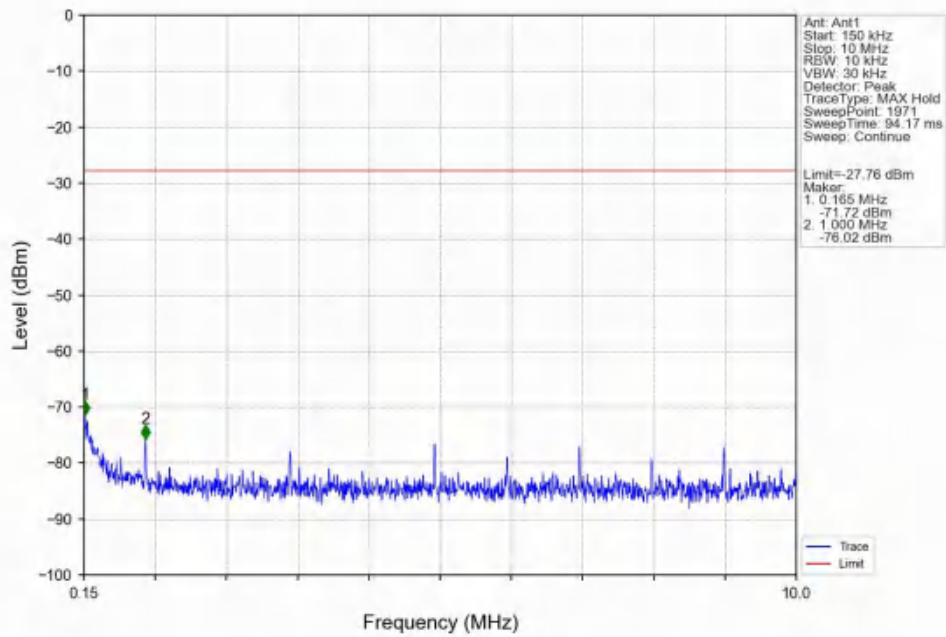


2M_LCH_2402MHz_Ant1_NTNV

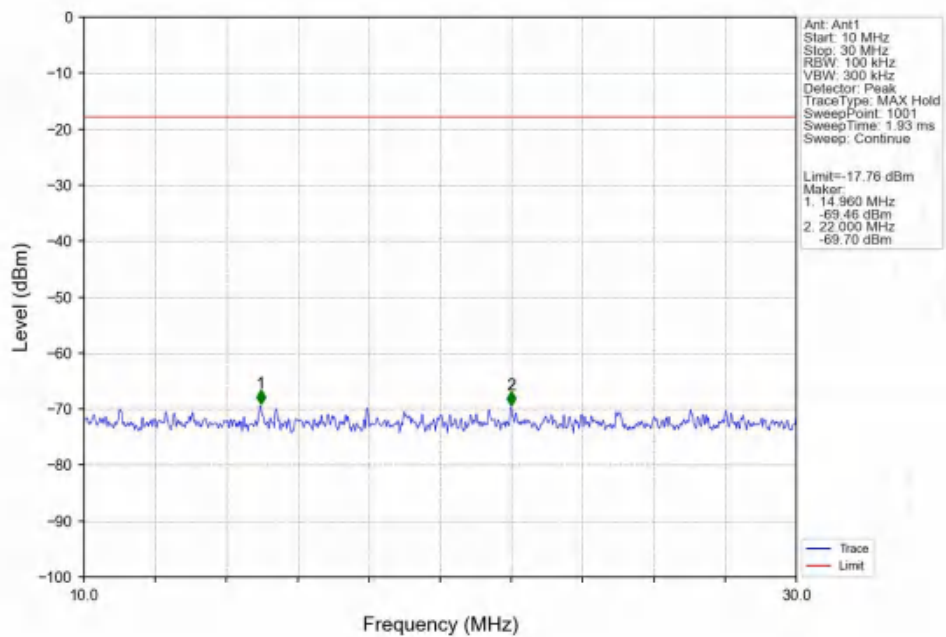




2M_LCH_2402MHz_Ant1_NTNV

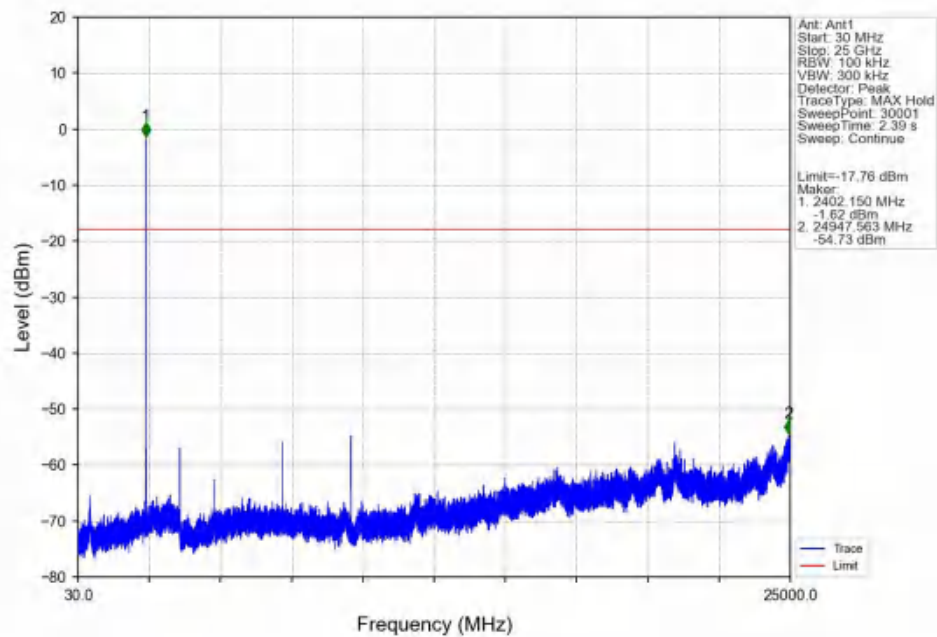


2M_LCH_2402MHz_Ant1_NTNV

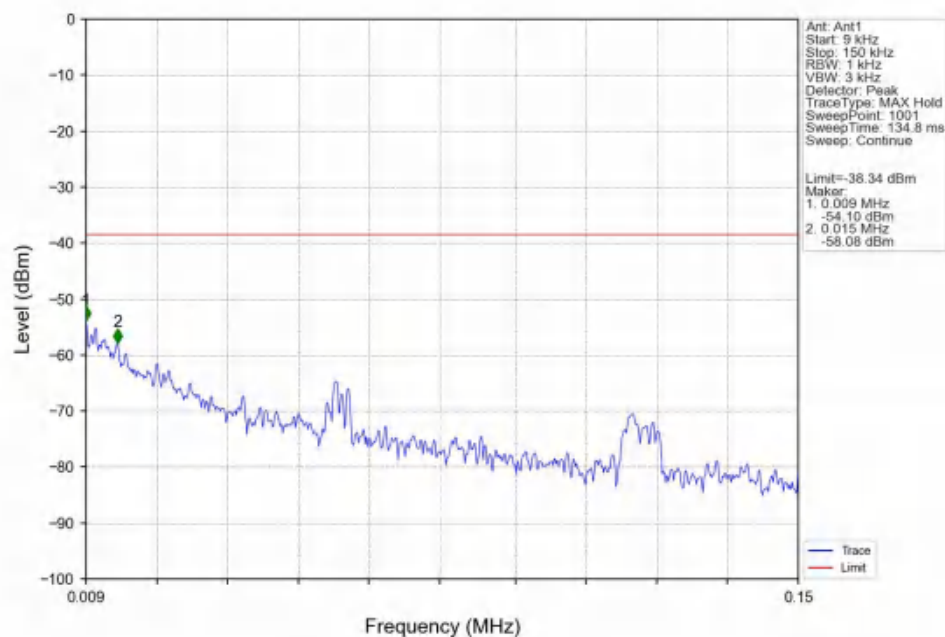




2M_LCH_2402MHz_Ant1_NTNV

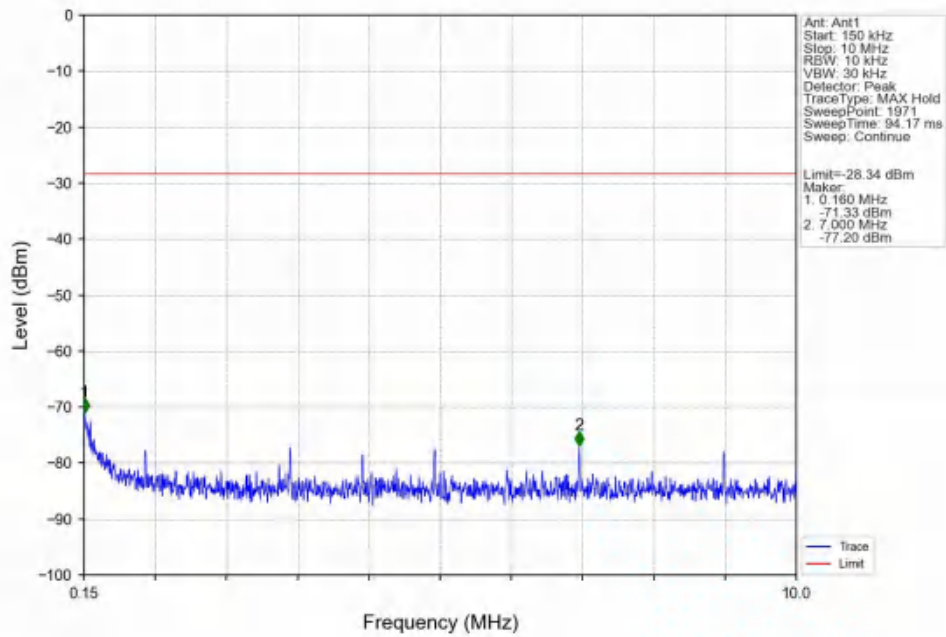


2M_MCH_2440MHz_Ant1_NTNV

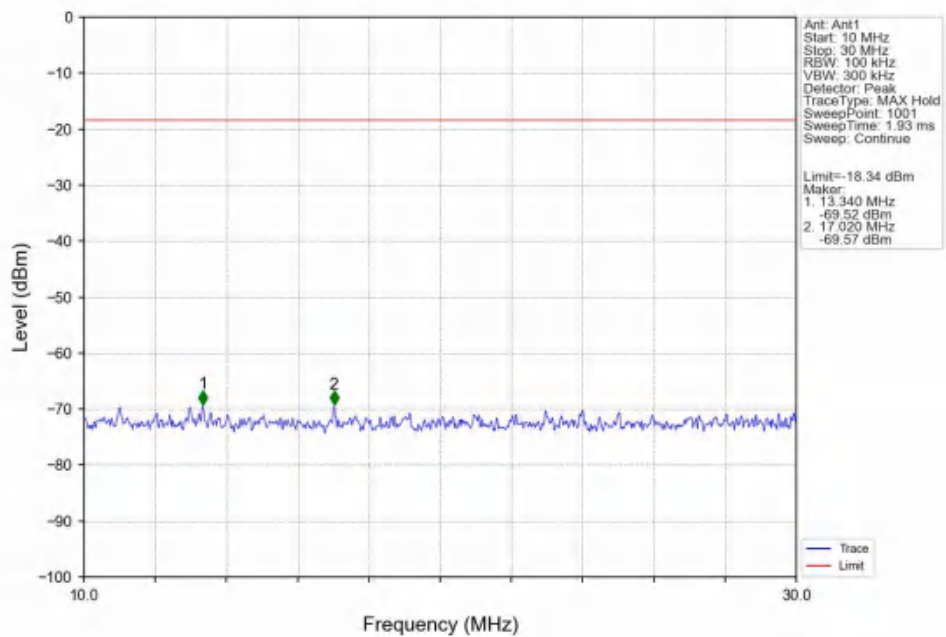




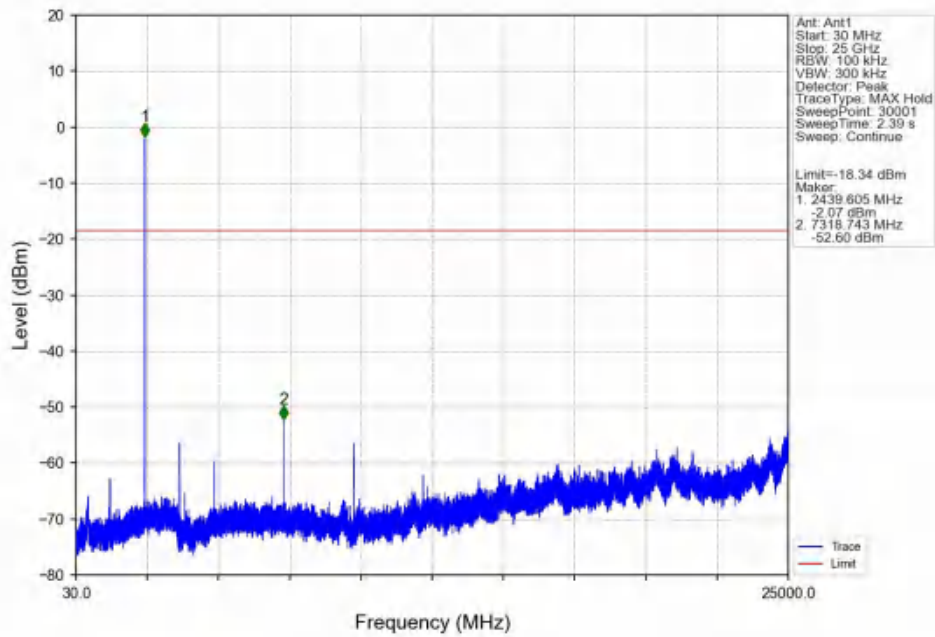
2M_MCH_2440MHz_Ant1_NTNV



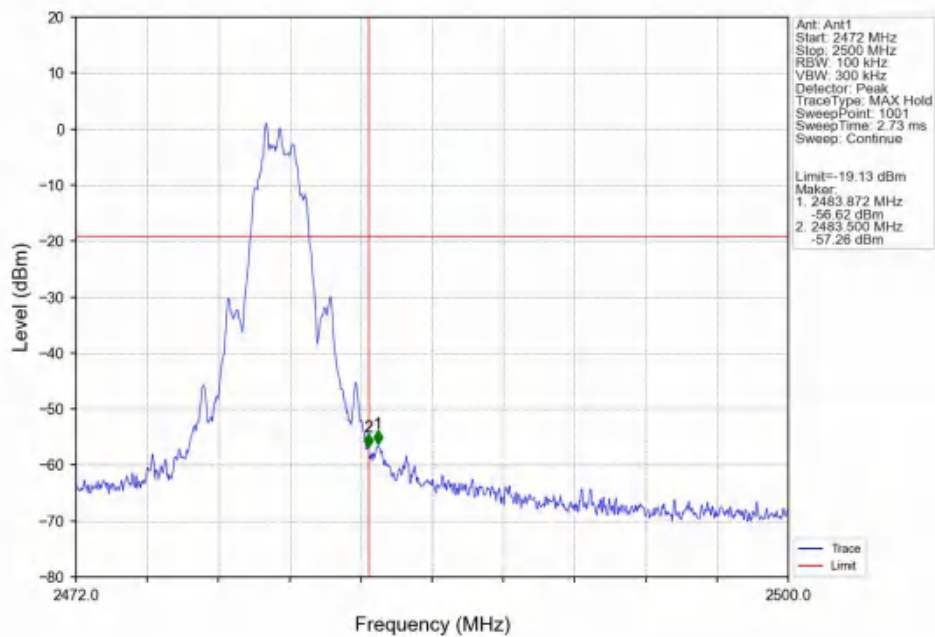
2M_MCH_2440MHz_Ant1_NTNV



2M_MCH_2440MHz_Ant1_NTNV

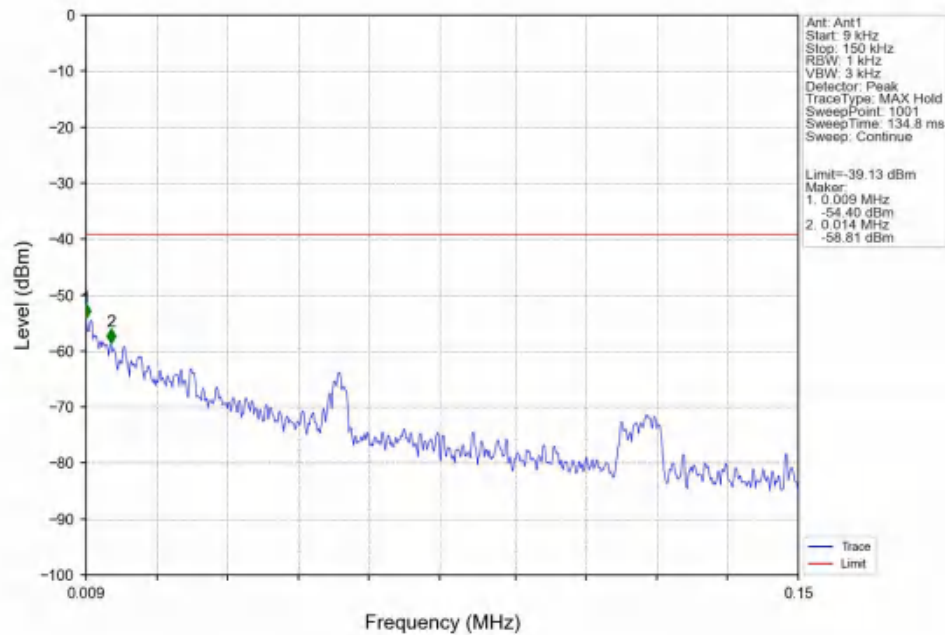


2M_HCH_2480MHz_Ant1_NTNV

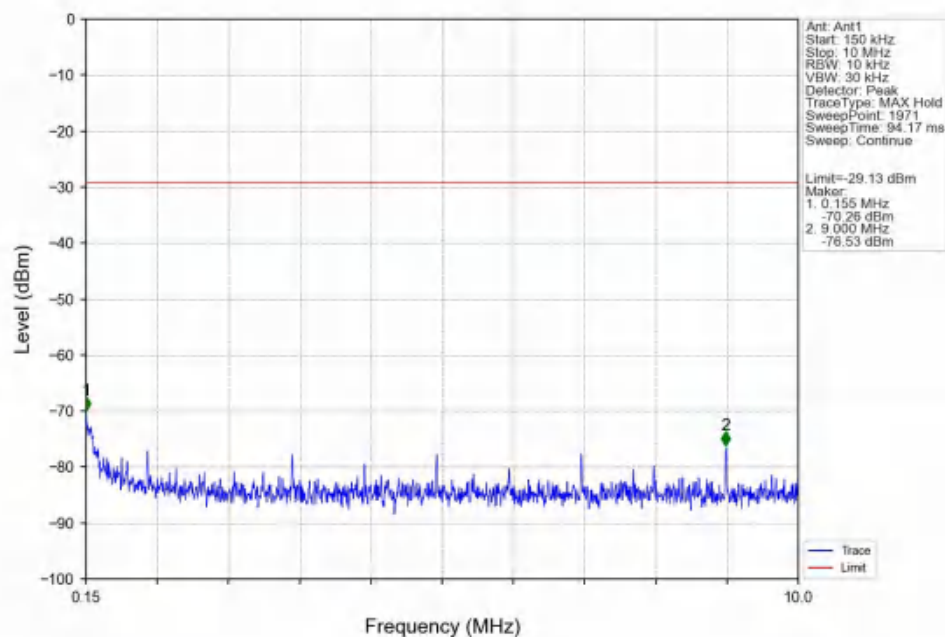




2M_HCH_2480MHz_Ant1_NTNV

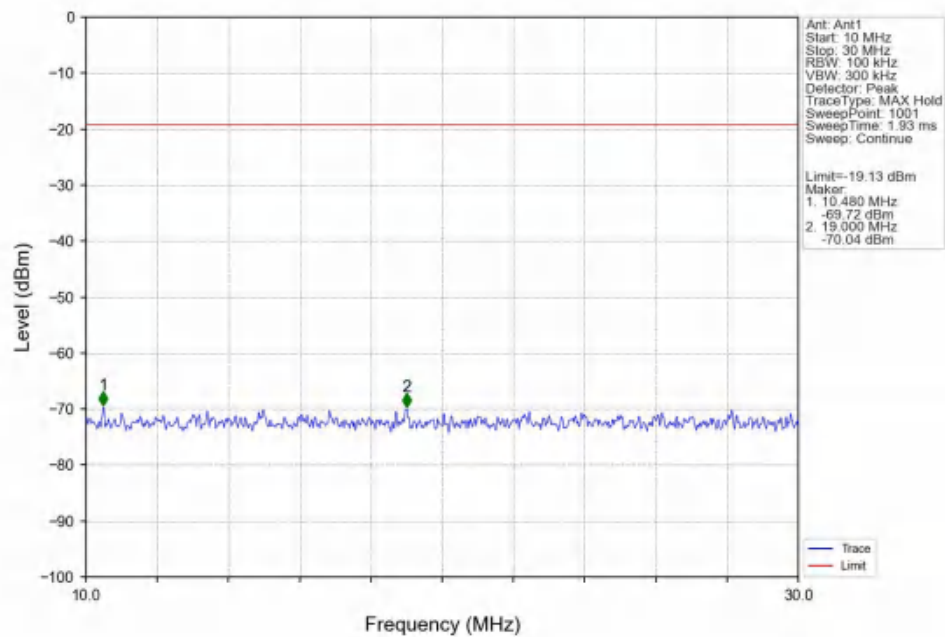


2M_HCH_2480MHz_Ant1_NTNV

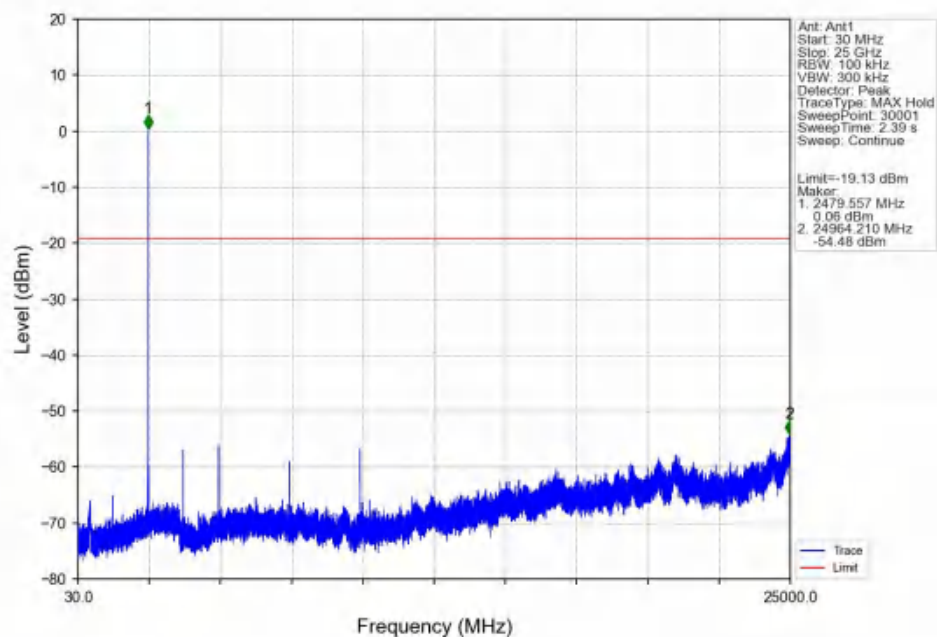




2M_HCH_2480MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV





6. Form731

6.1 Test Result

6.1.1 Form731

Lower Freq (MHz)	High Freq (MHz)	MAX Power (W)	MAX Power (dBm)
2402	2480	0.0018	2.50



BLE-R

1. Duty Cycle

1.1 Test Result

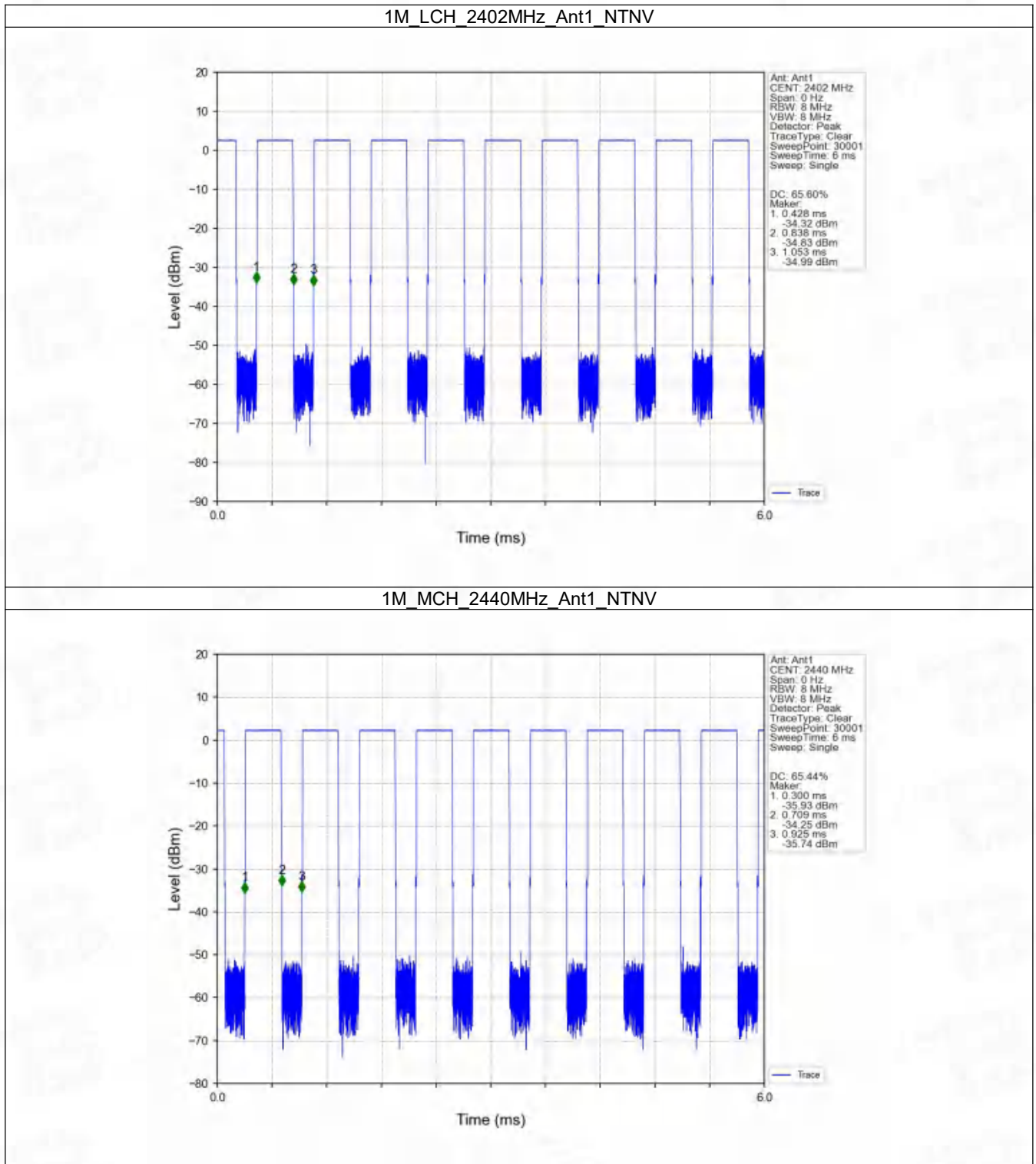
1.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1M	SISO	2402	0.410	0.625	65.60	1.83	0.00
		2440	0.409	0.625	65.44	1.84	0.00
		2480	0.410	0.625	65.60	1.83	0.03
2M	SISO	2402	0.225	0.625	36.00	4.44	0.00
		2440	0.226	0.625	36.16	4.42	0.00
		2480	0.225	0.625	36.00	4.44	0.00



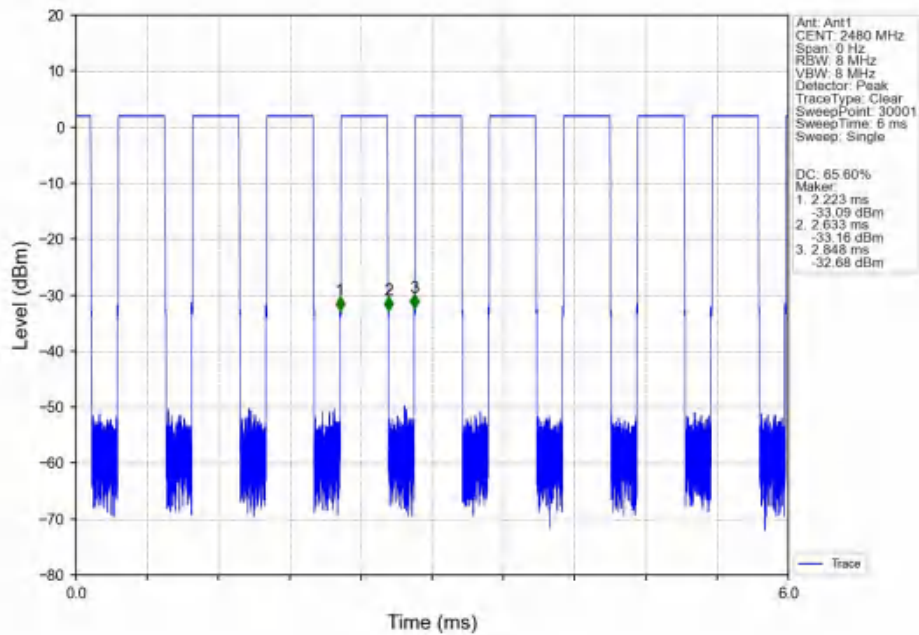
1.2 Test Graph

1.2.1 Ant1

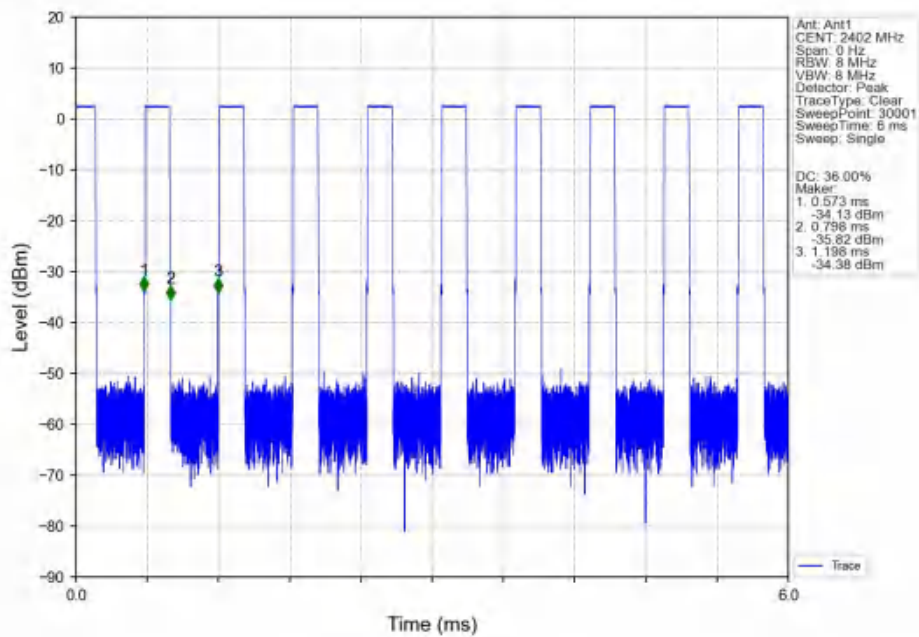




1M_HCH_2480MHz_Ant1_NTNV

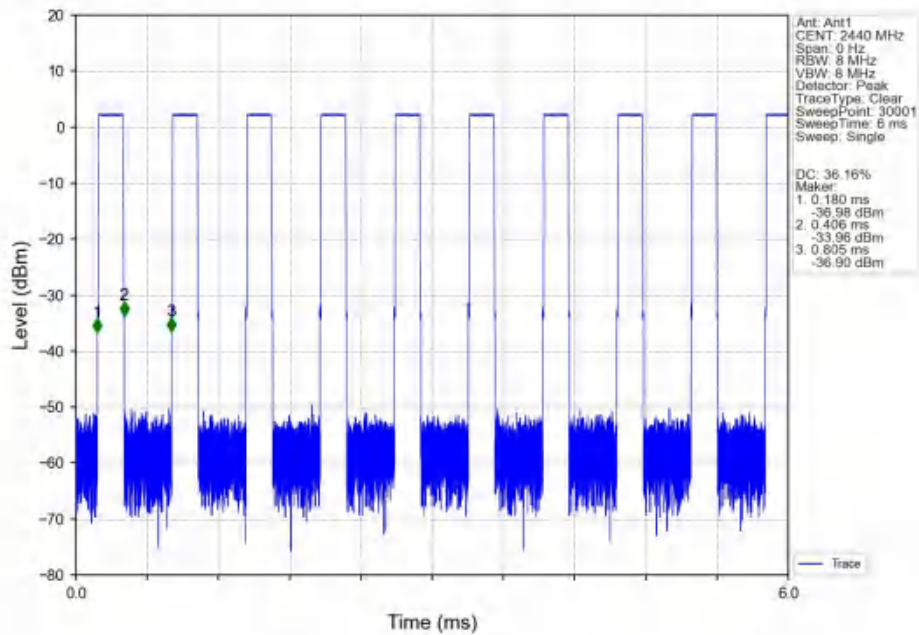


2M_LCH_2402MHz_Ant1_NTNV

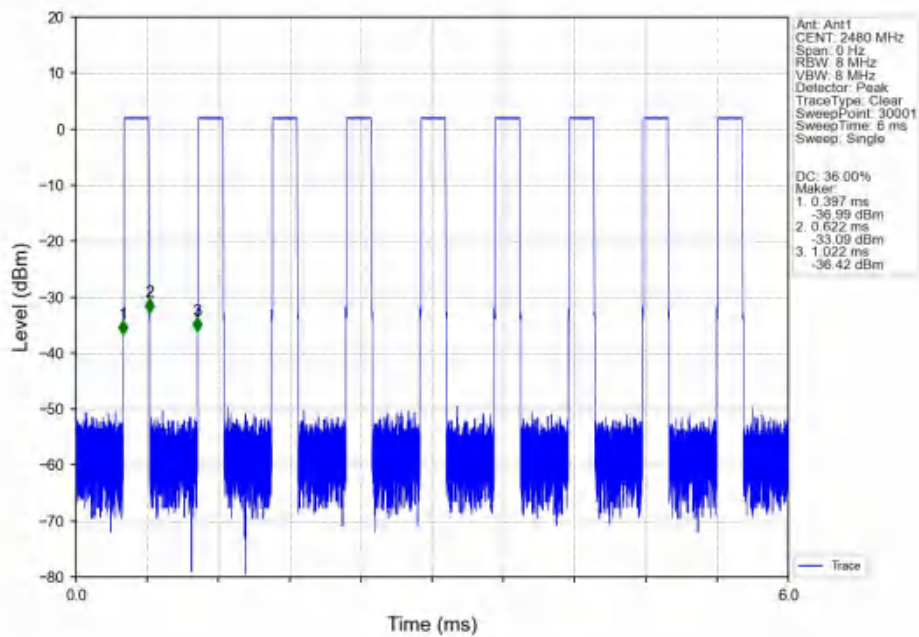




2M_MCH_2440MHz_Ant1_NTNV



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	1.041	/	Pass
		2440	1	1.041	/	Pass
		2480	1	1.041	/	Pass
2M	SISO	2402	1	2.054	/	Pass
		2440	1	2.053	/	Pass
		2480	1	2.052	/	Pass

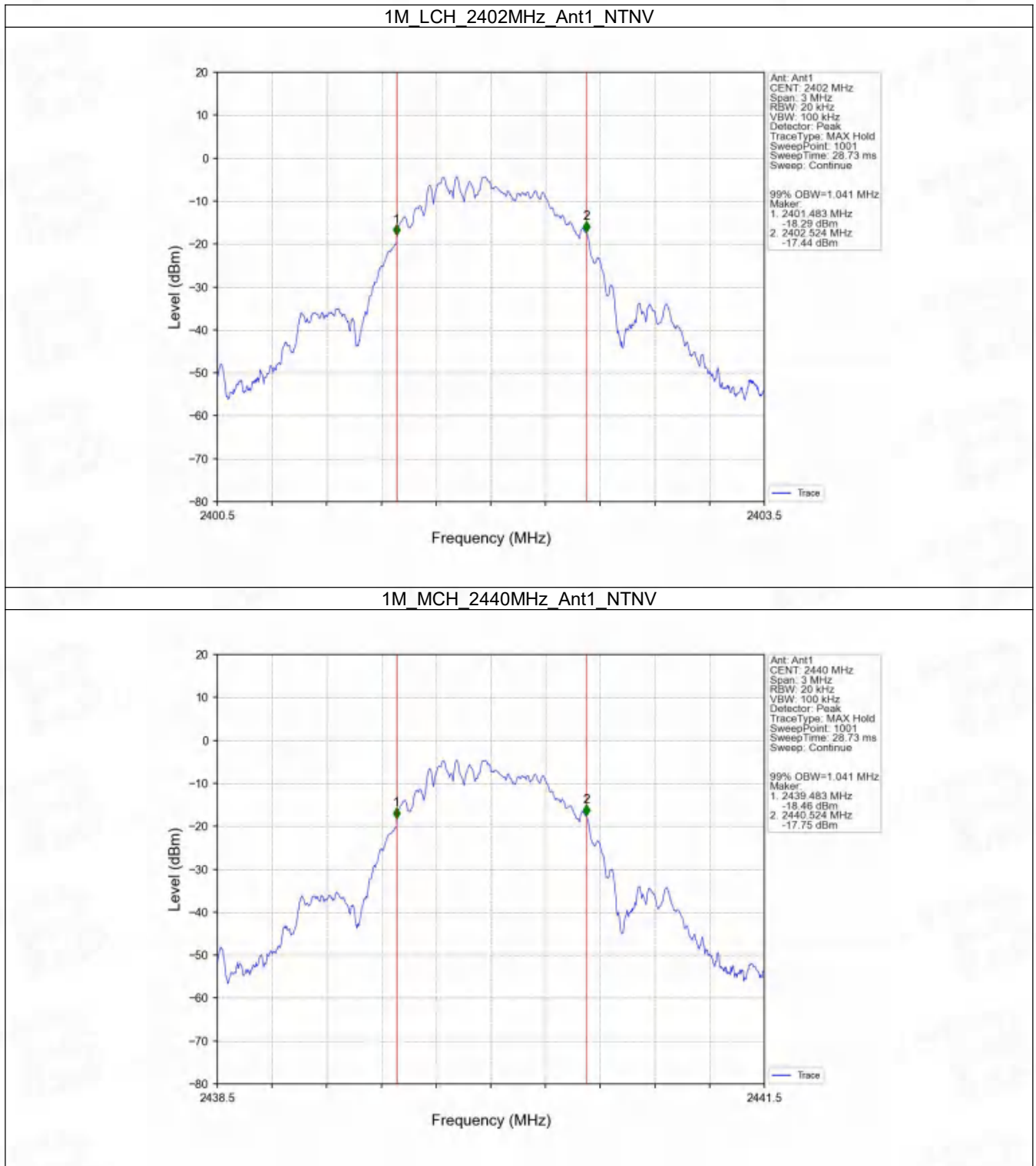
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.712	≥ 0.5	Pass
		2440	1	0.720	≥ 0.5	Pass
		2480	1	0.716	≥ 0.5	Pass
2M	SISO	2402	1	1.219	≥ 0.5	Pass
		2440	1	1.217	≥ 0.5	Pass
		2480	1	1.263	≥ 0.5	Pass



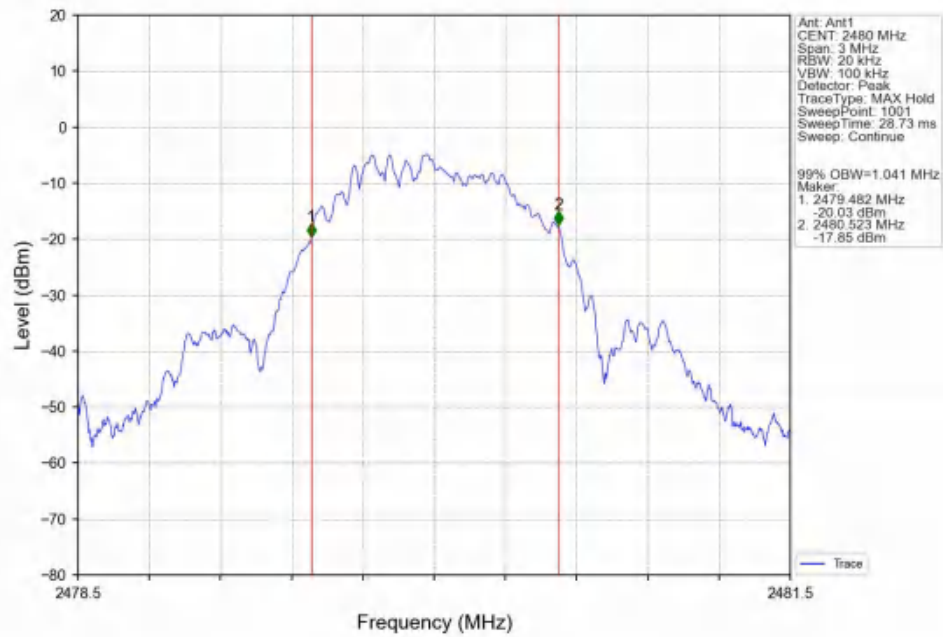
2.2 Test Graph

2.2.1 OBW

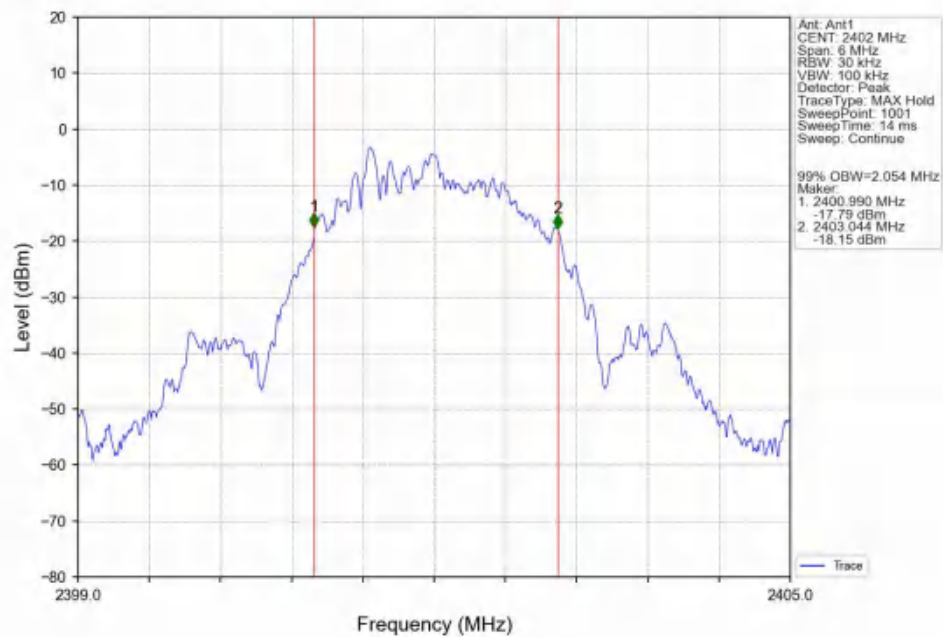




1M_HCH_2480MHz_Ant1_NTNV

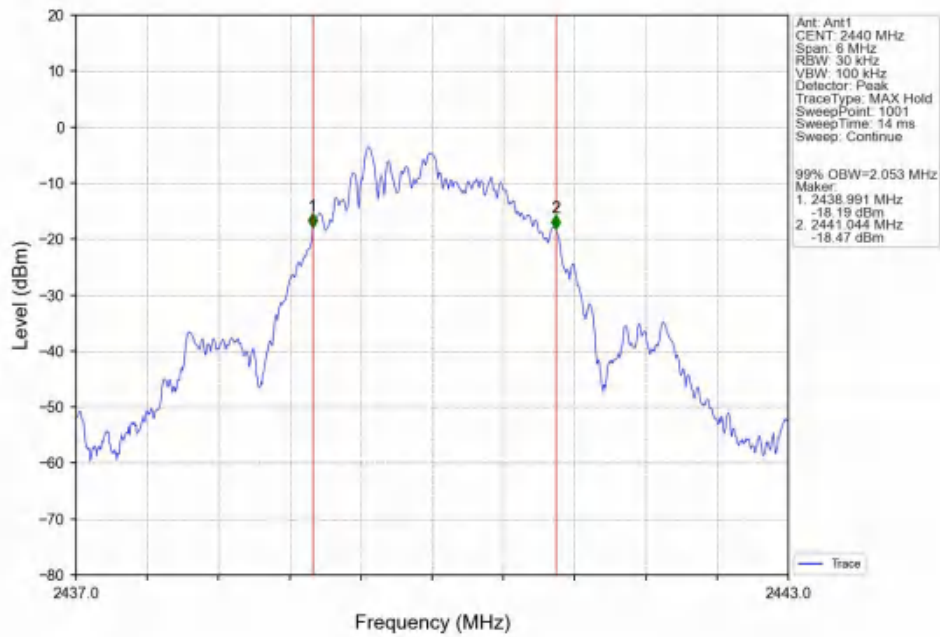


2M_LCH_2402MHz_Ant1_NTNV

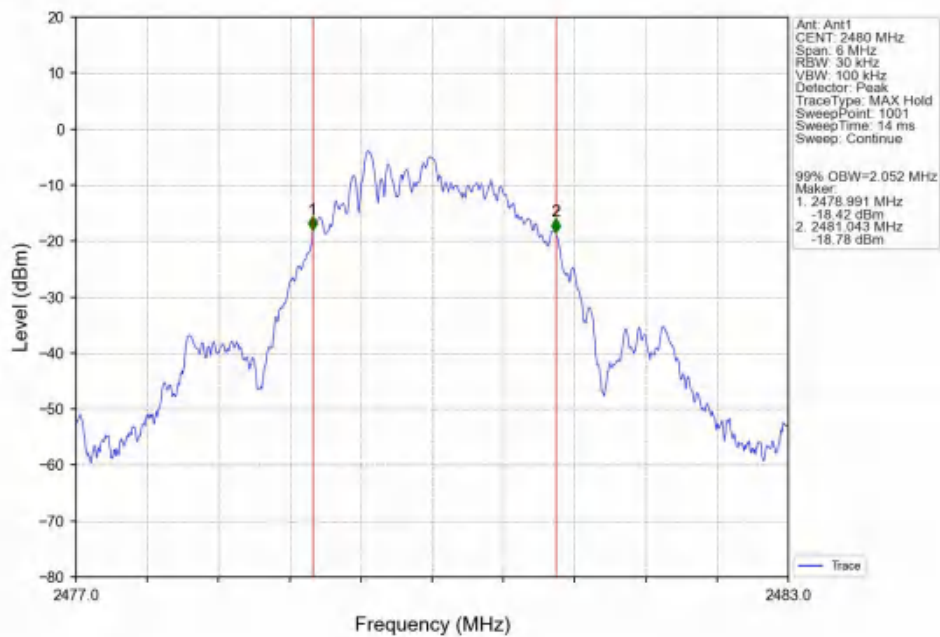




2M_MCH_2440MHz_Ant1_NTNV

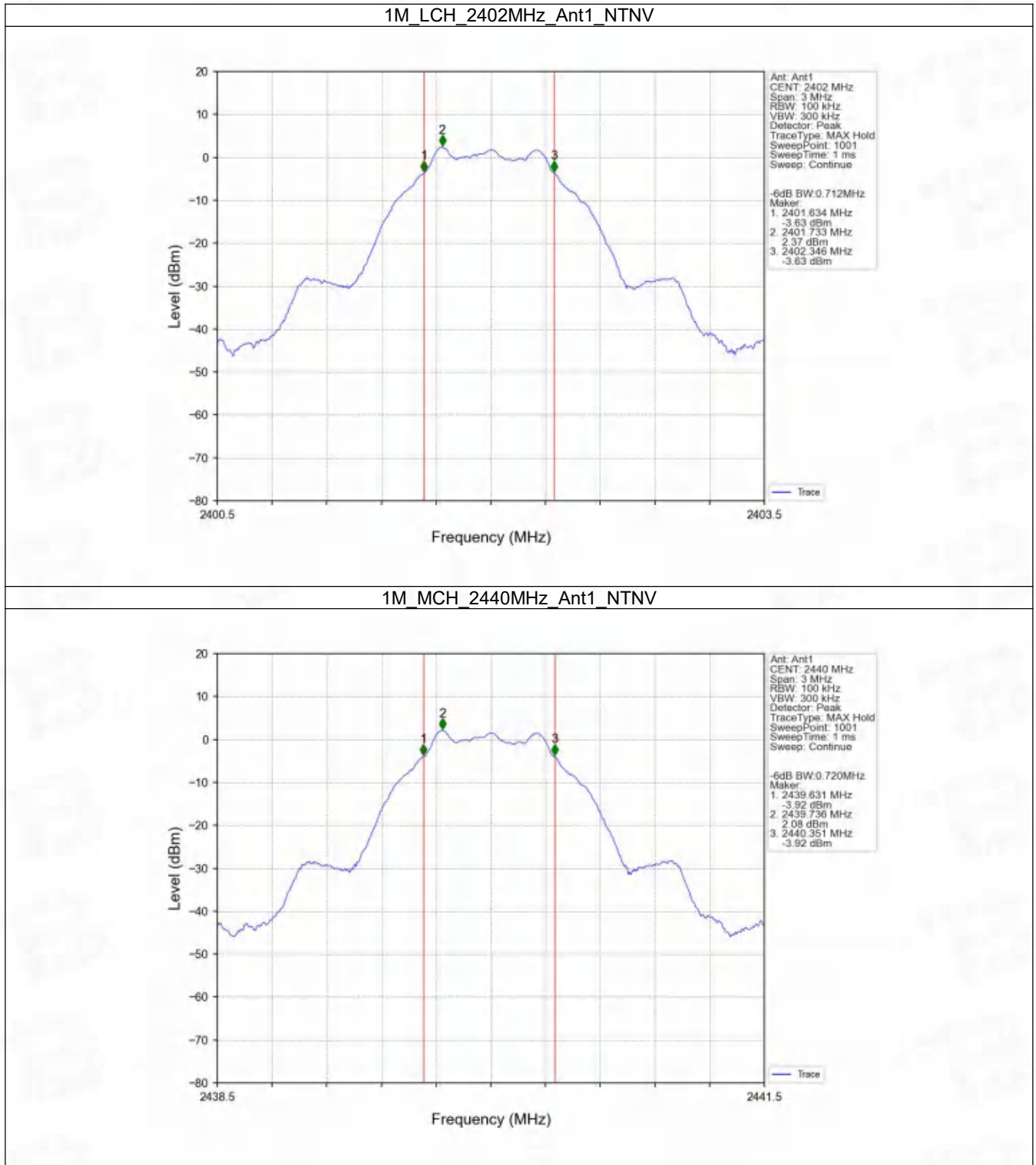


2M_HCH_2480MHz_Ant1_NTNV



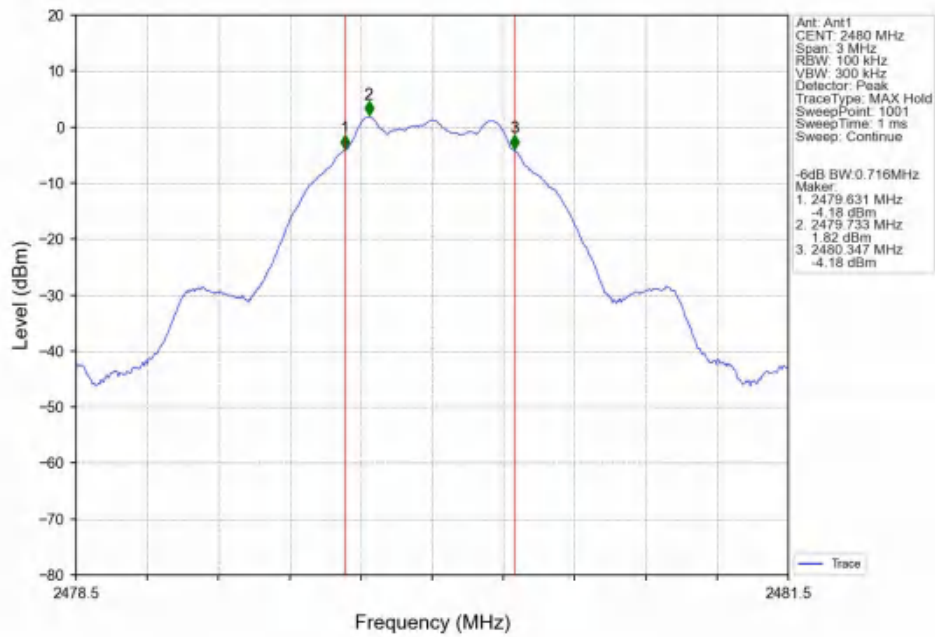


2.2.2 6dB BW

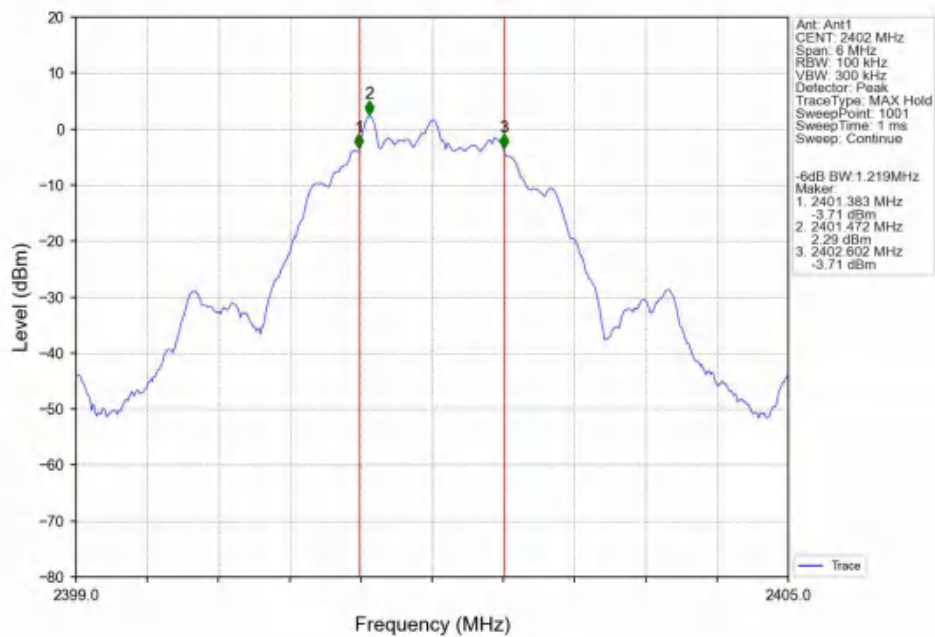




1M_HCH_2480MHz_Ant1_NTNV

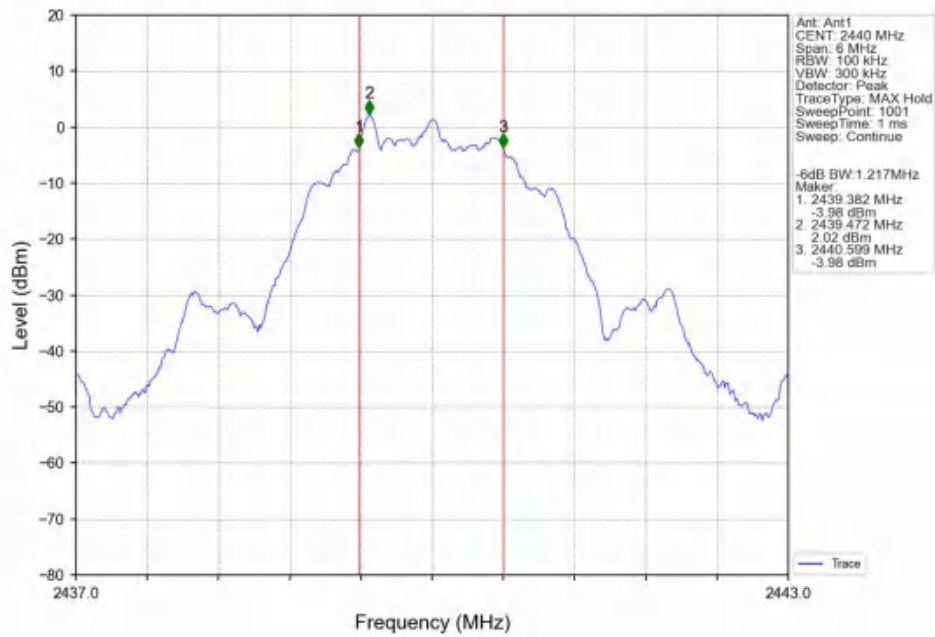


2M_LCH_2402MHz_Ant1_NTNV

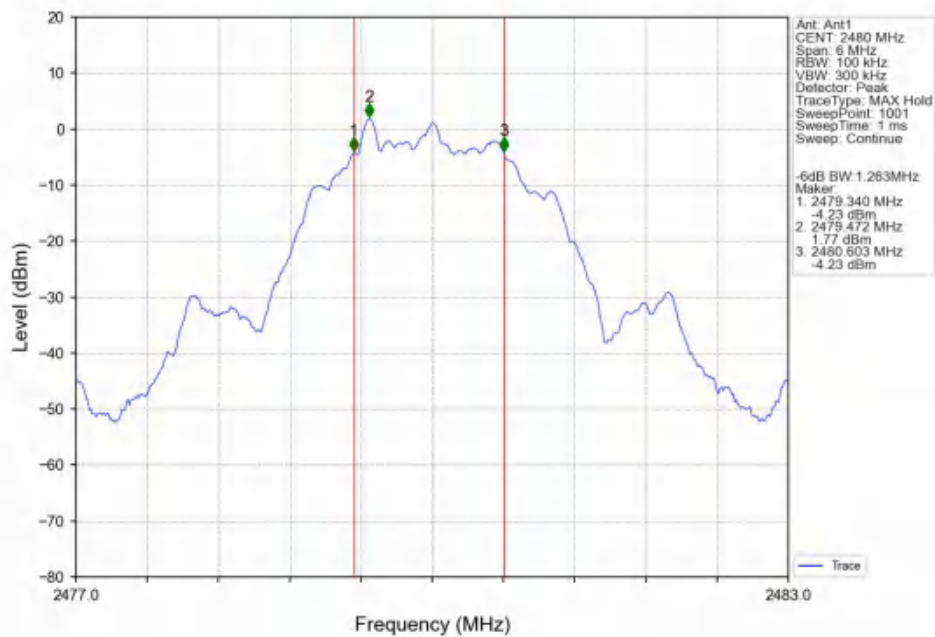




2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV





3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

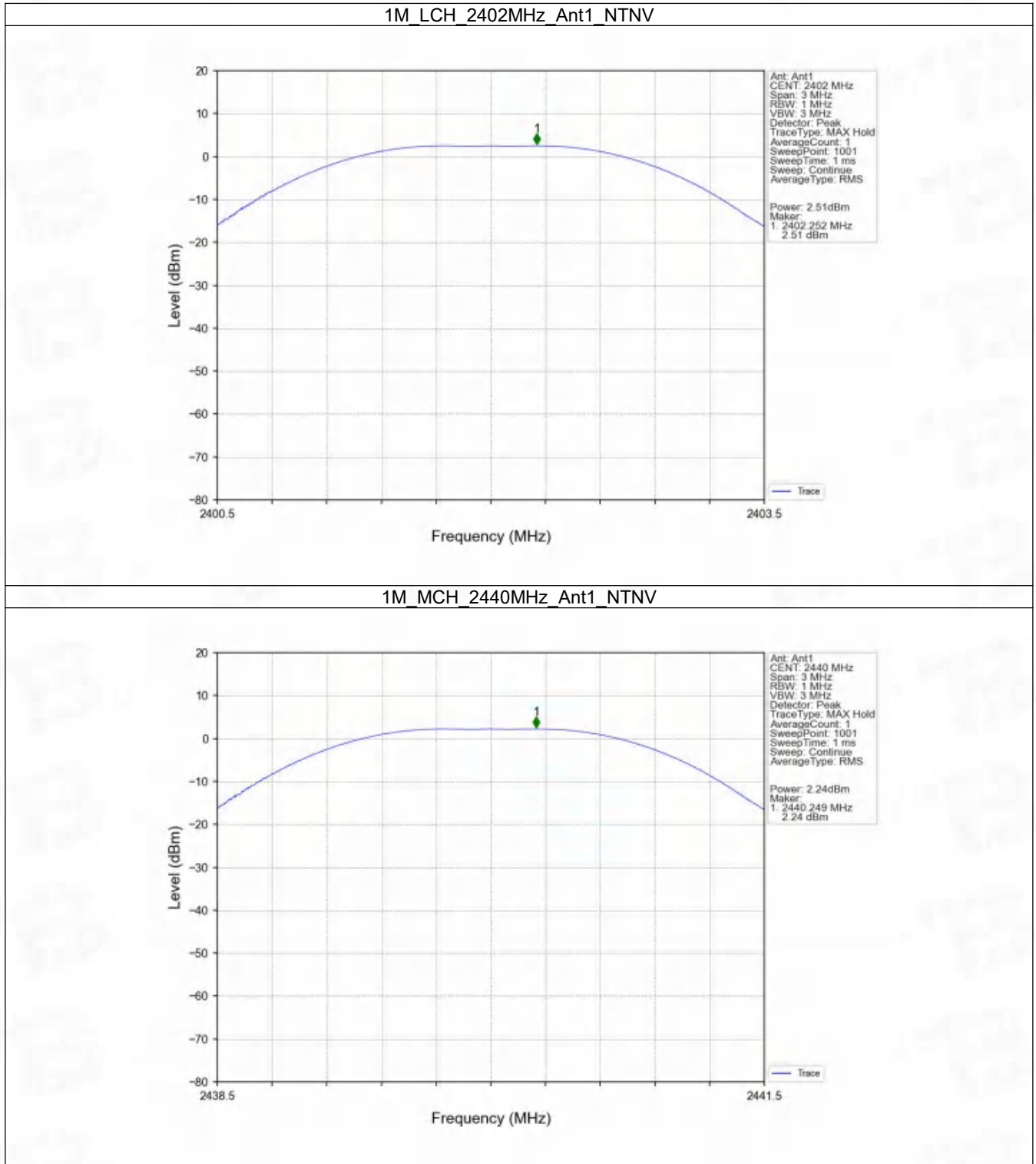
Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	2.51	<=30	Pass
		2440	2.24	<=30	Pass
		2480	1.98	<=30	Pass
2M	SISO	2402	2.50	<=30	Pass
		2440	2.23	<=30	Pass
		2480	1.97	<=30	Pass

Note1: Antenna Gain: Ant1: -2.23dBi;



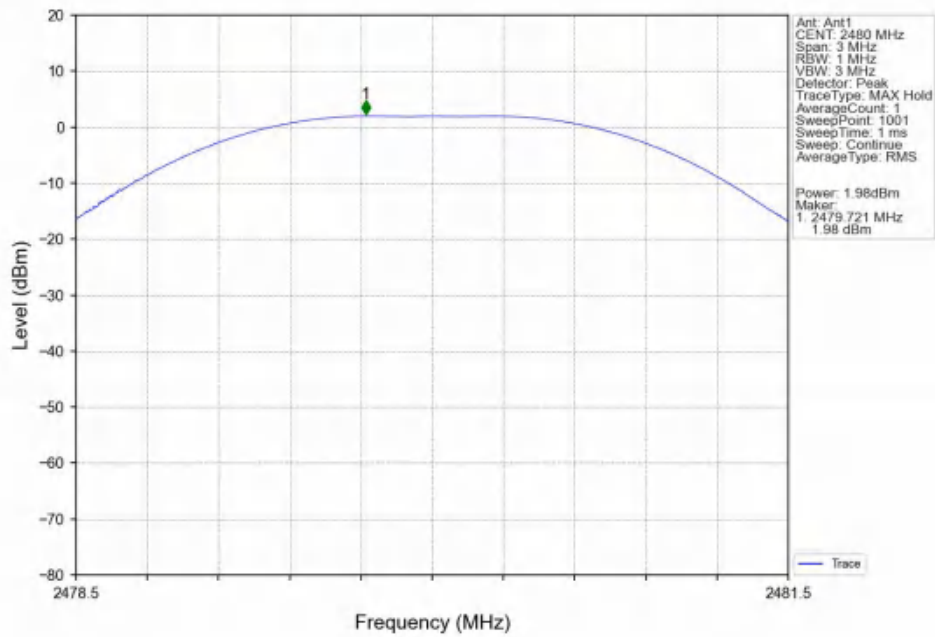
3.2 Test Graph

3.2.1 Power

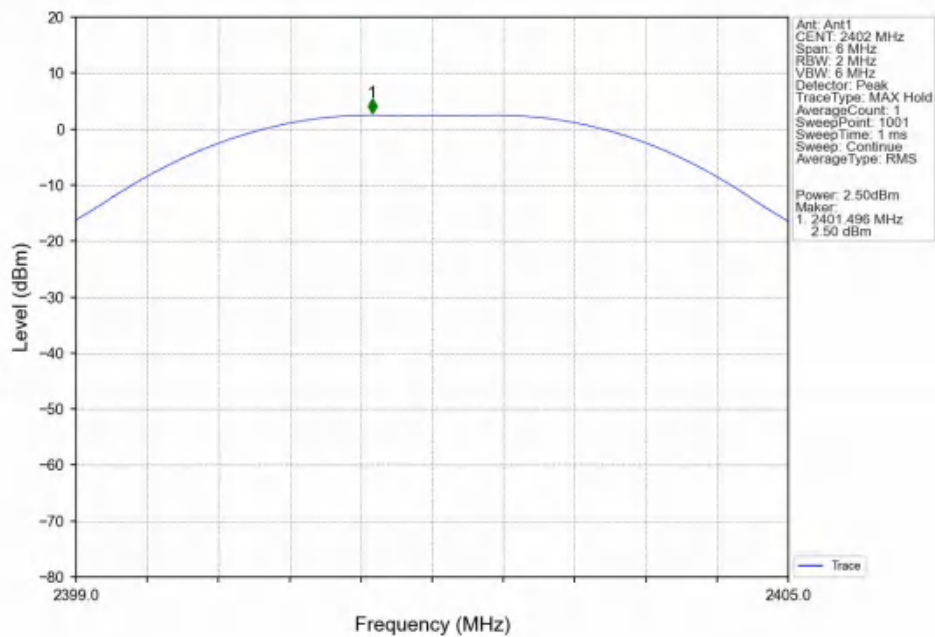




1M_HCH_2480MHz_Ant1_NTNV

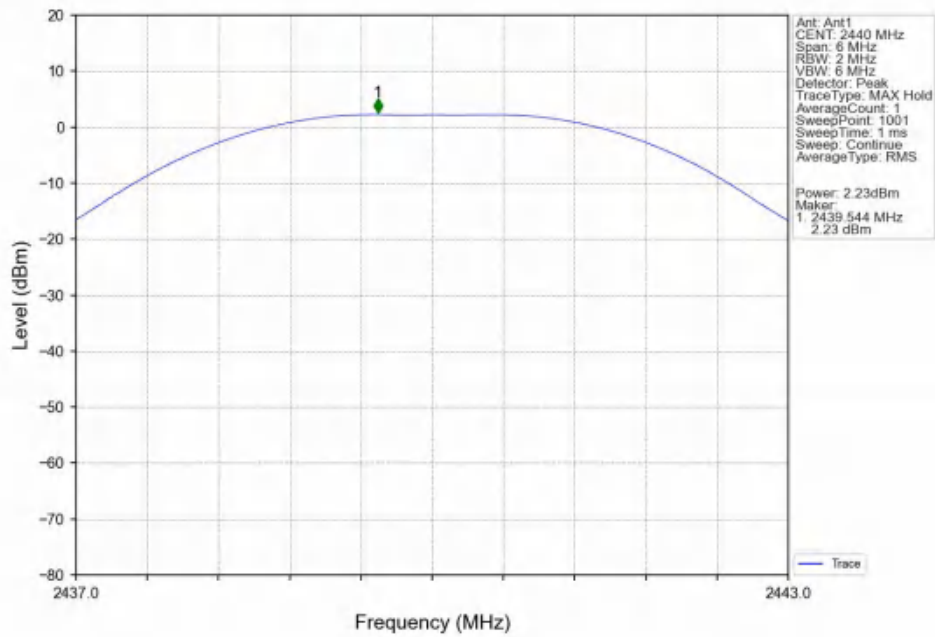


2M_LCH_2402MHz_Ant1_NTNV

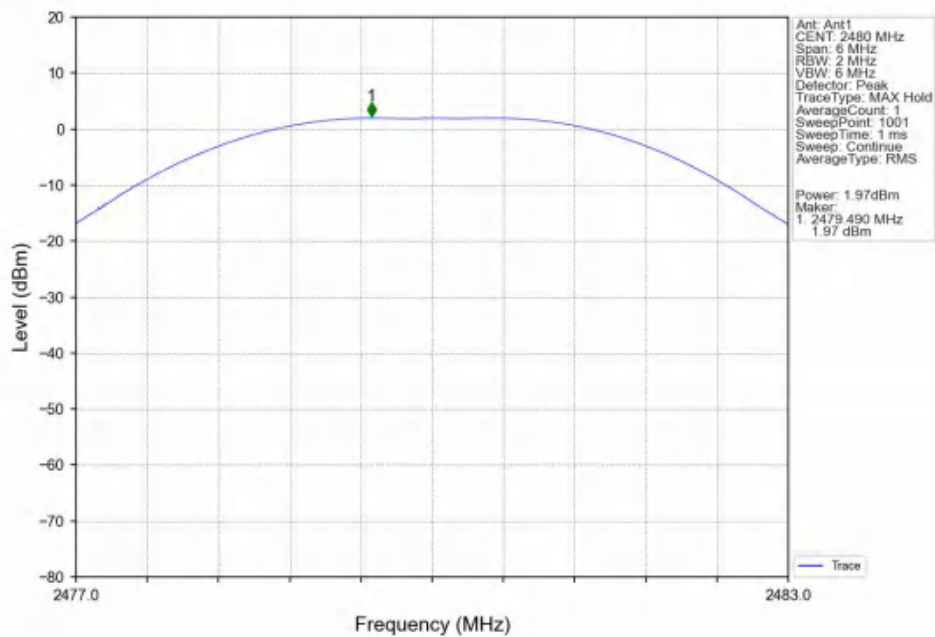




2M_MCH_2440MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV





4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

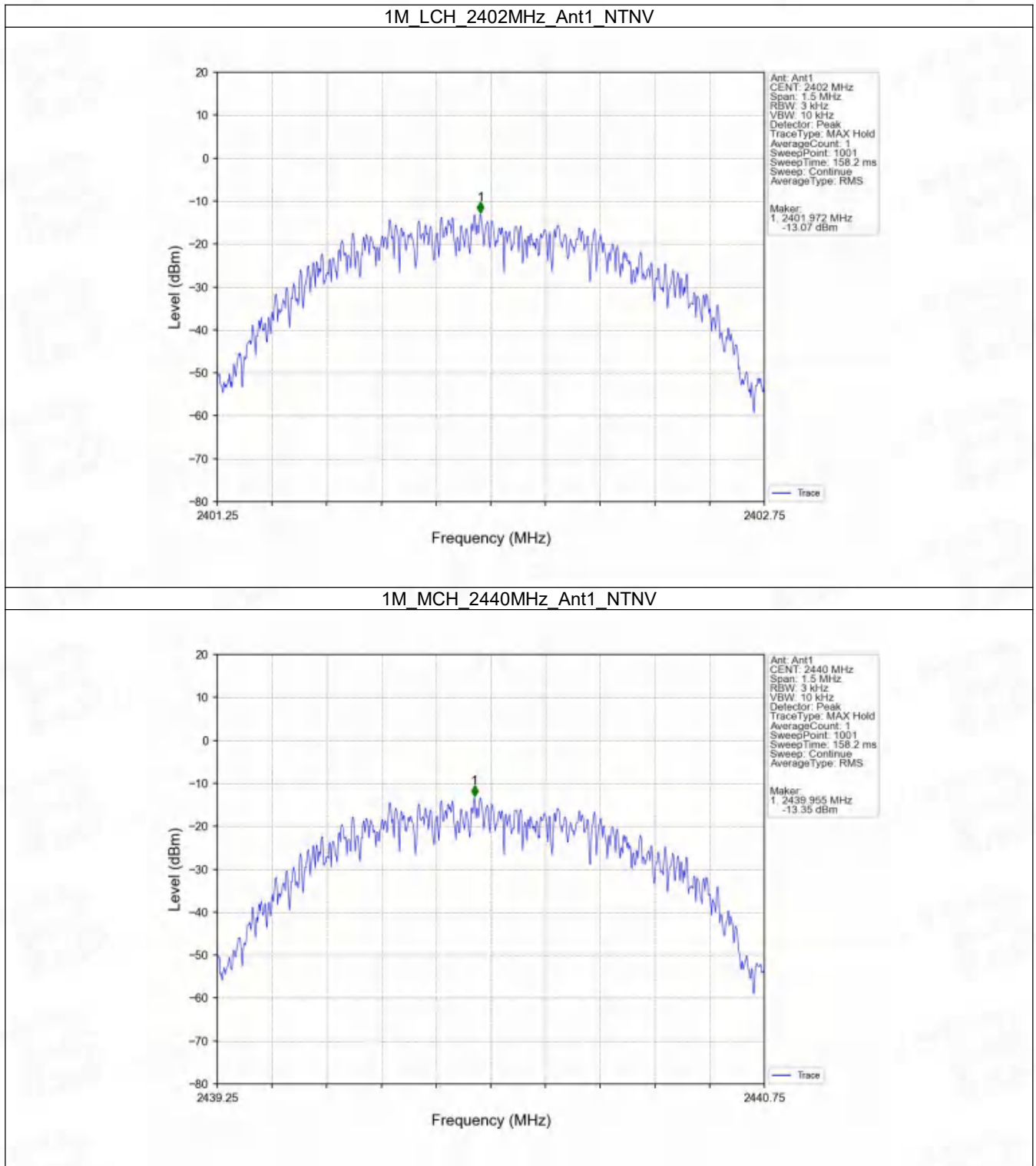
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm)		Verdict
			ANT1	Limit(dBm/3kHz)	
1M	SISO	2402	-13.07dBm/3kHz	<=8	Pass
		2440	-13.35dBm/3kHz	<=8	Pass
		2480	-13.60dBm/3kHz	<=8	Pass
2M	SISO	2402	-16.70dBm/3kHz	<=8	Pass
		2440	-16.94dBm/3kHz	<=8	Pass
		2480	-17.30dBm/3kHz	<=8	Pass

Note1: Antenna Gain: Ant1: -2.23dBi;



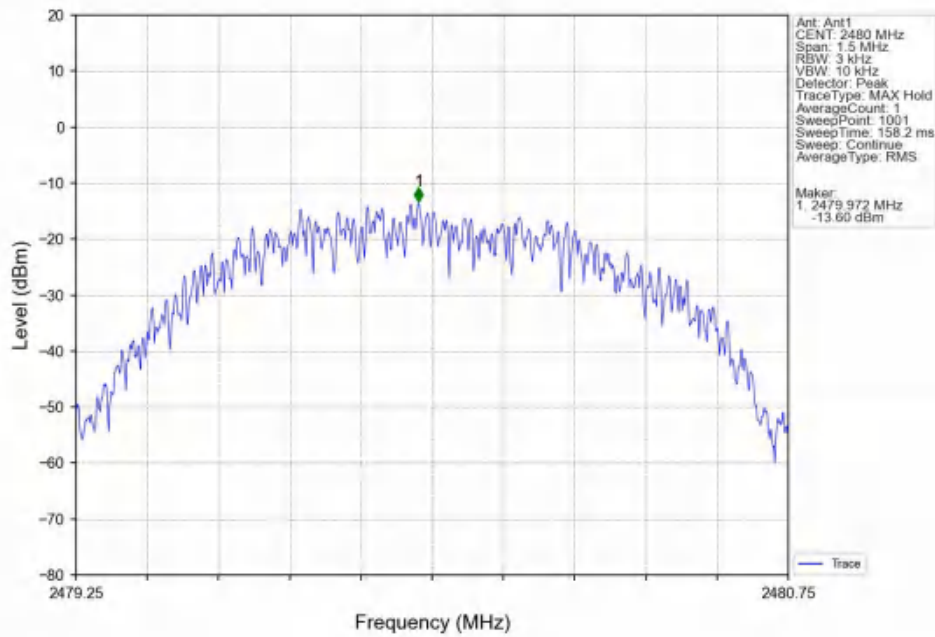
4.2 Test Graph

4.2.1 PSD

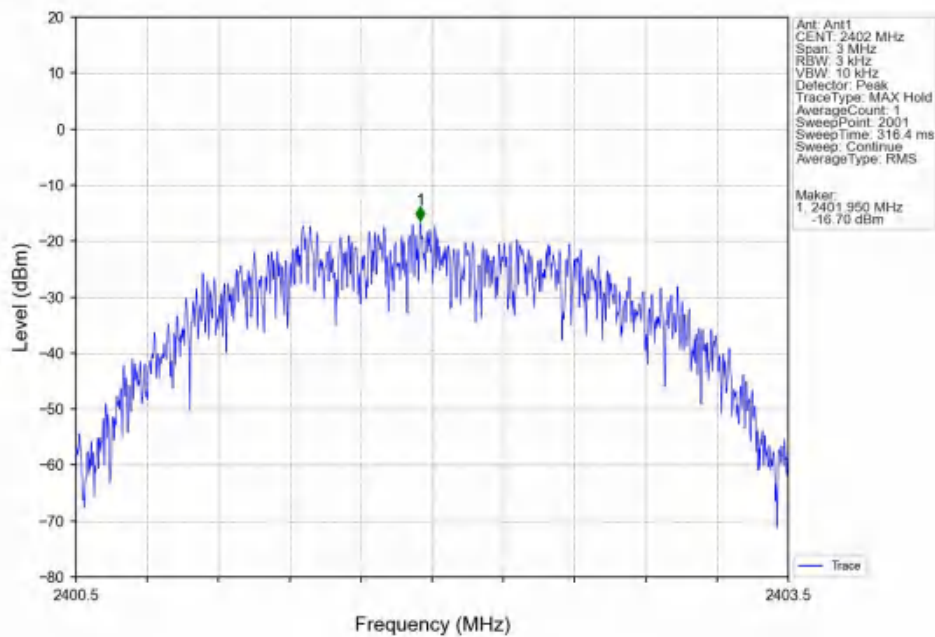




1M_HCH_2480MHz_Ant1_NTNV

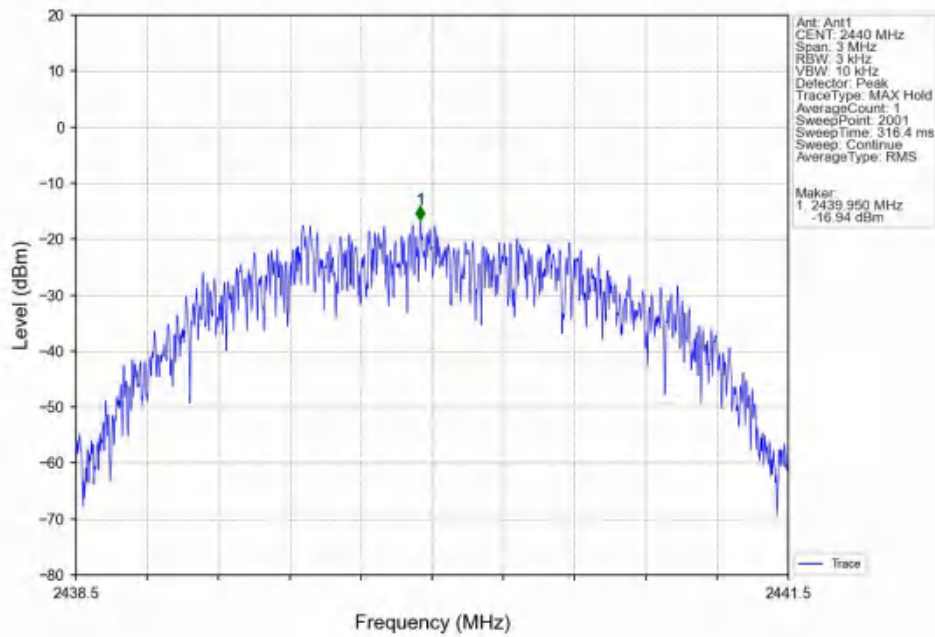


2M_LCH_2402MHz_Ant1_NTNV

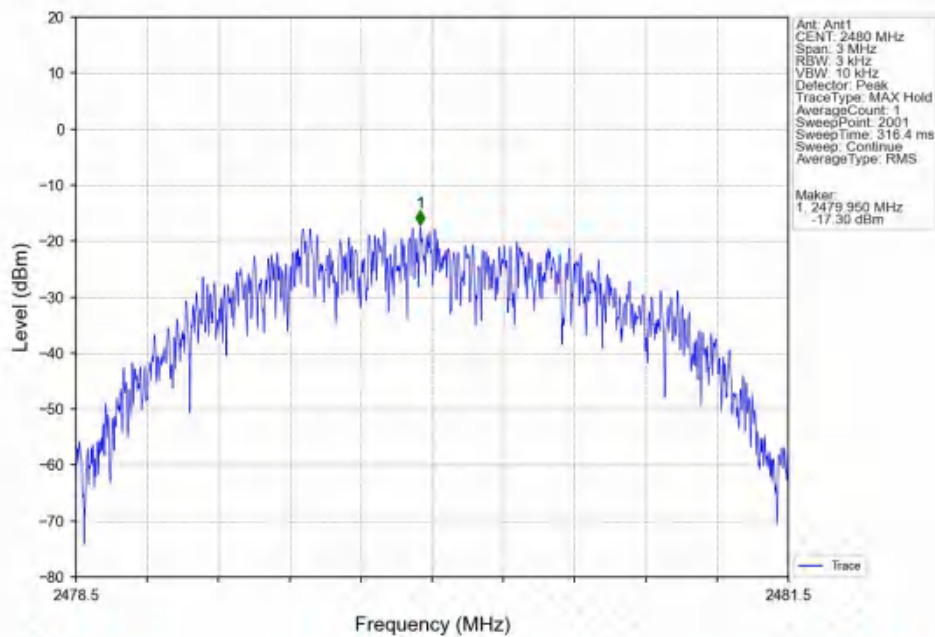




2M_MCH_2440MHz_Ant1_NTNV



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	2.36
		2440	1	2.08
		2480	1	1.79
2M	SISO	2402	1	2.27
		2440	1	2.01
		2480	1	1.75

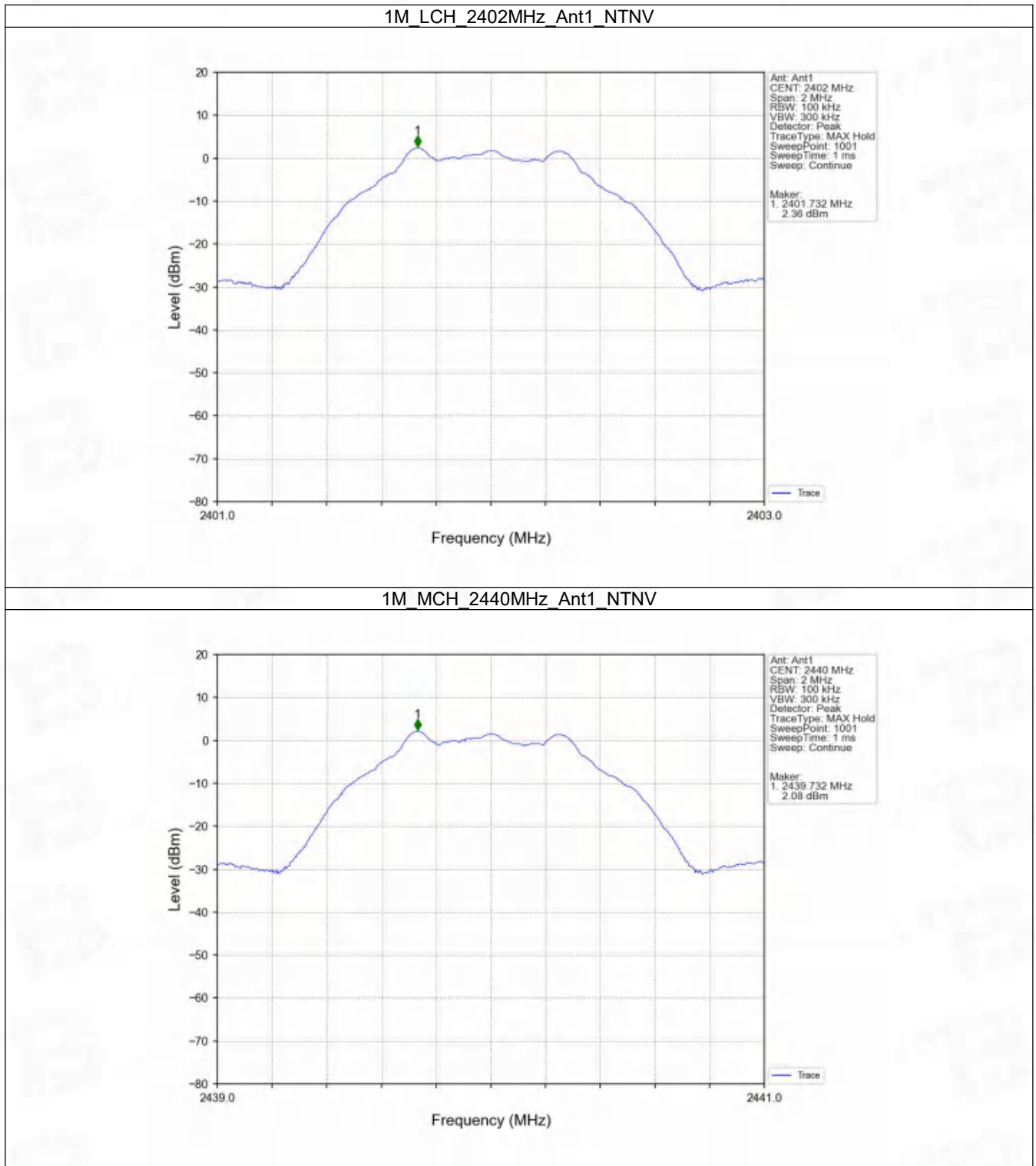
5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	2.36	-17.64	Pass
		2440	1	2.08	-17.92	Pass
		2480	1	1.79	-18.21	Pass
2M	SISO	2402	1	2.27	-17.73	Pass
		2440	1	2.01	-17.99	Pass
		2480	1	1.75	-18.25	Pass



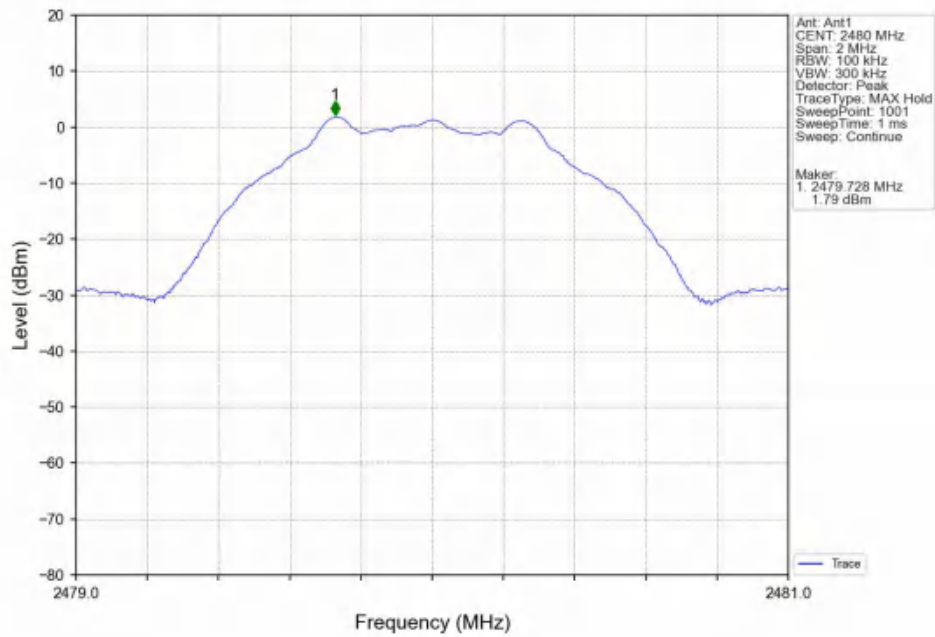
5.2 Test Graph

5.2.1 Ref

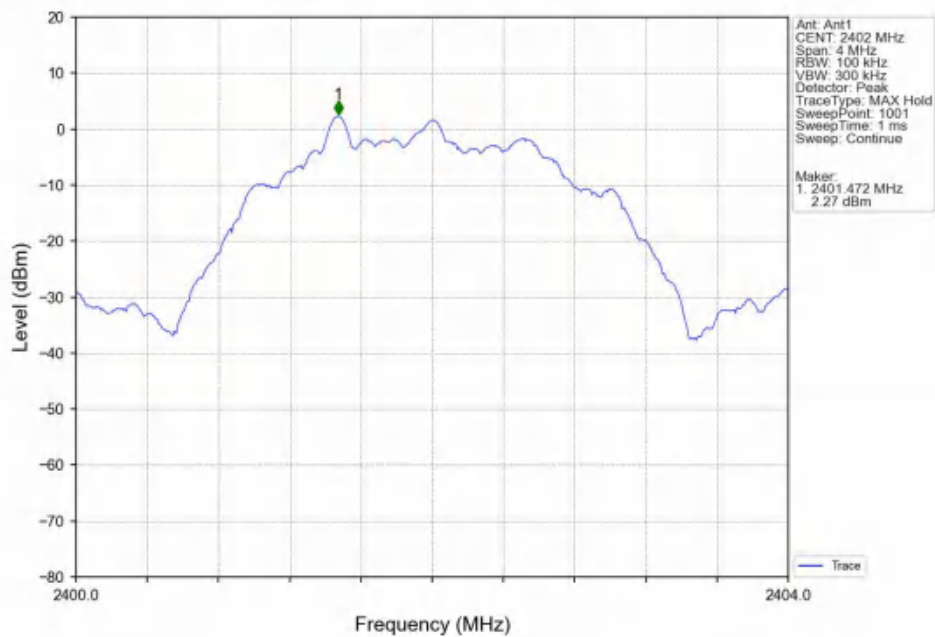




1M_HCH_2480MHz_Ant1_NTNV

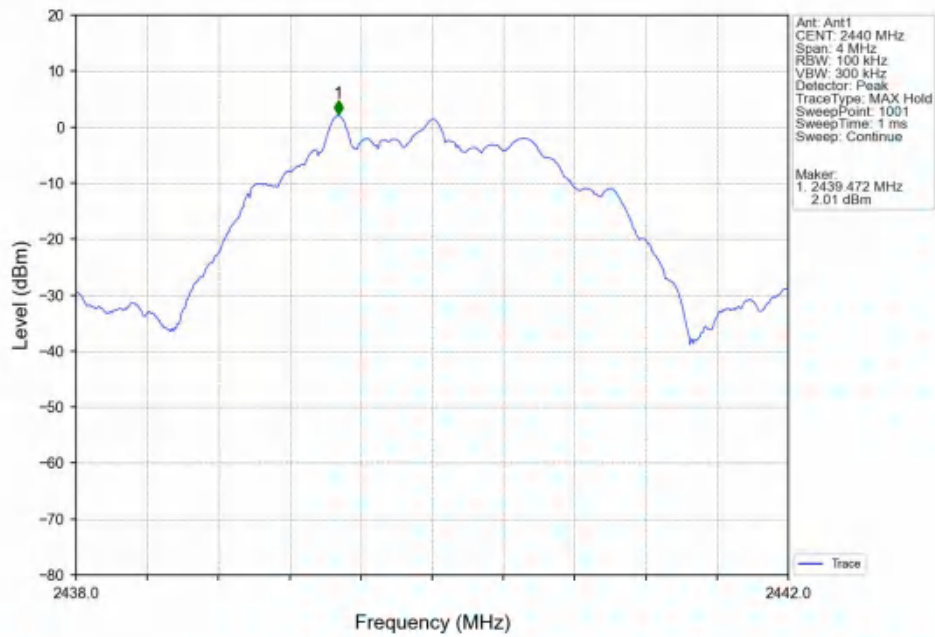


2M_LCH_2402MHz_Ant1_NTNV

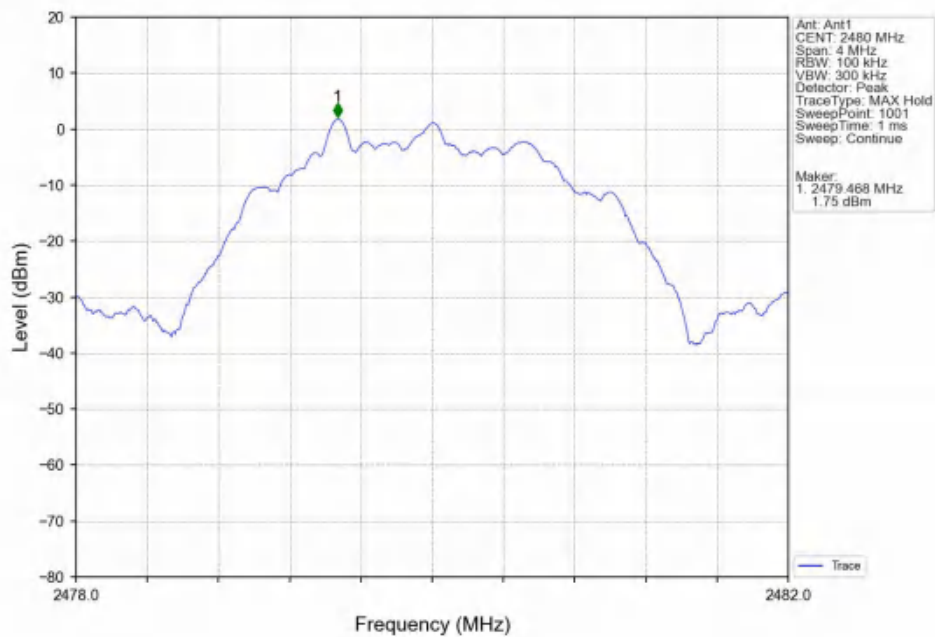




2M_MCH_2440MHz_Ant1_NTNV

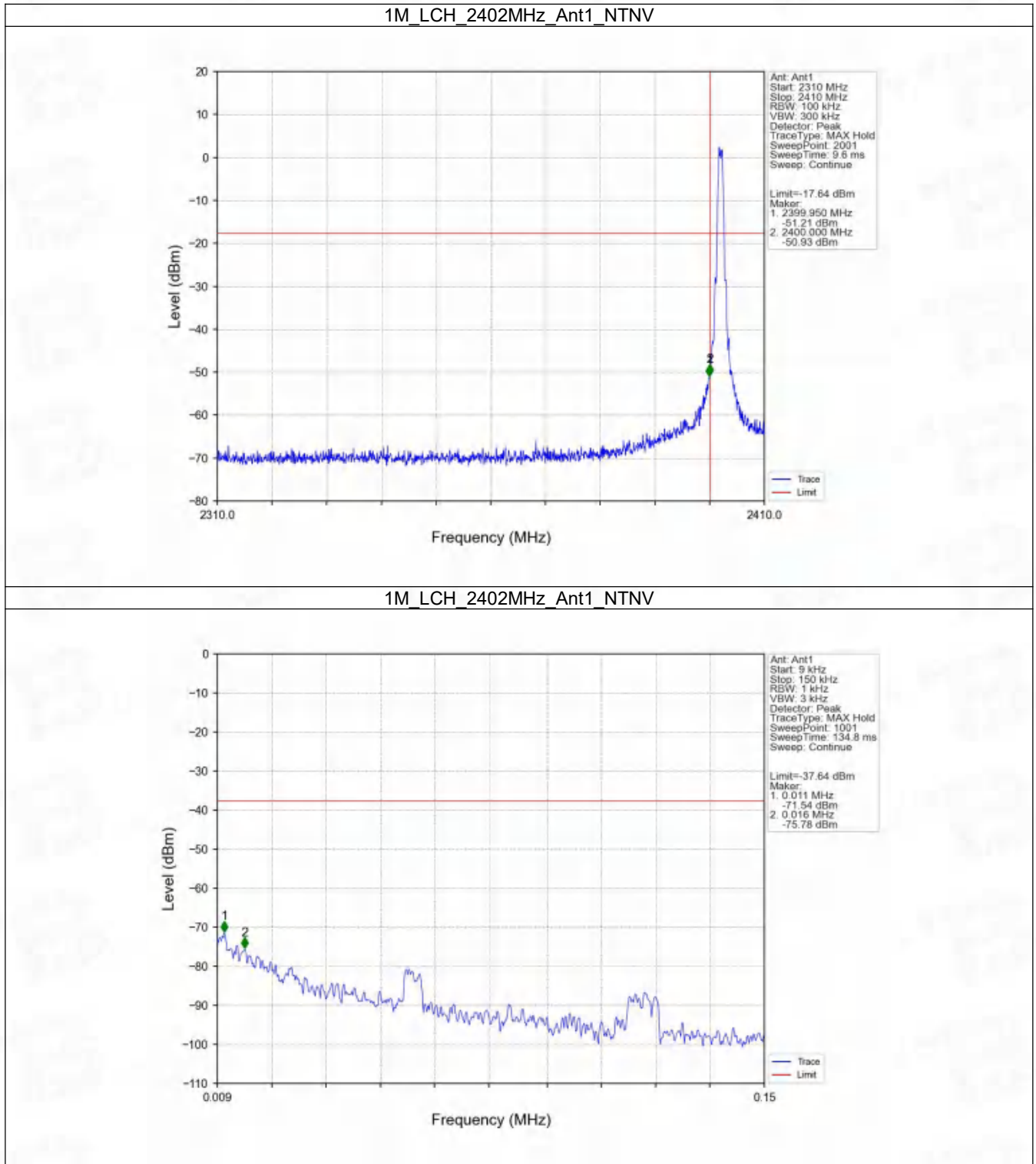


2M_HCH_2480MHz_Ant1_NTNV



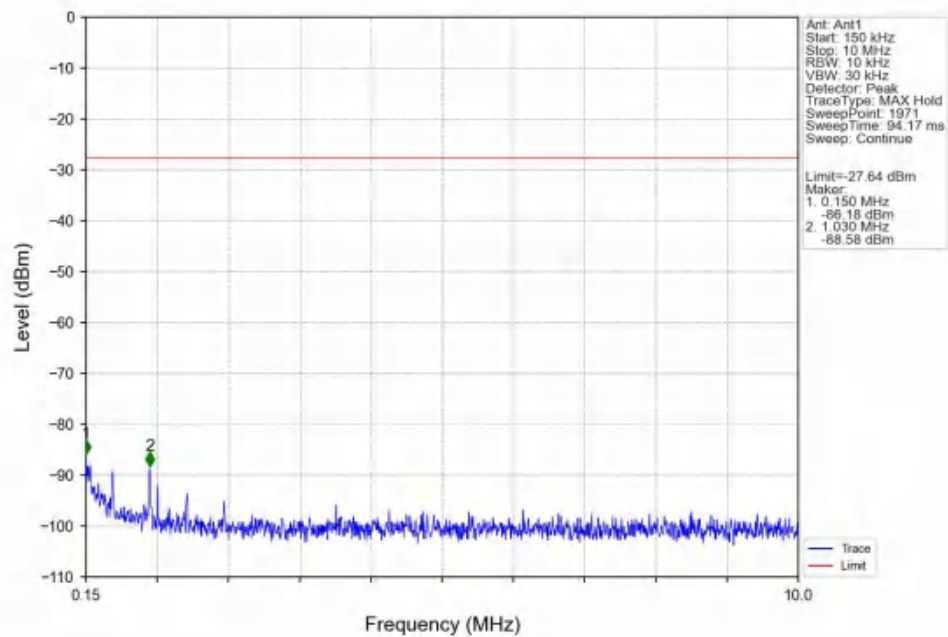


5.2.2 CSE

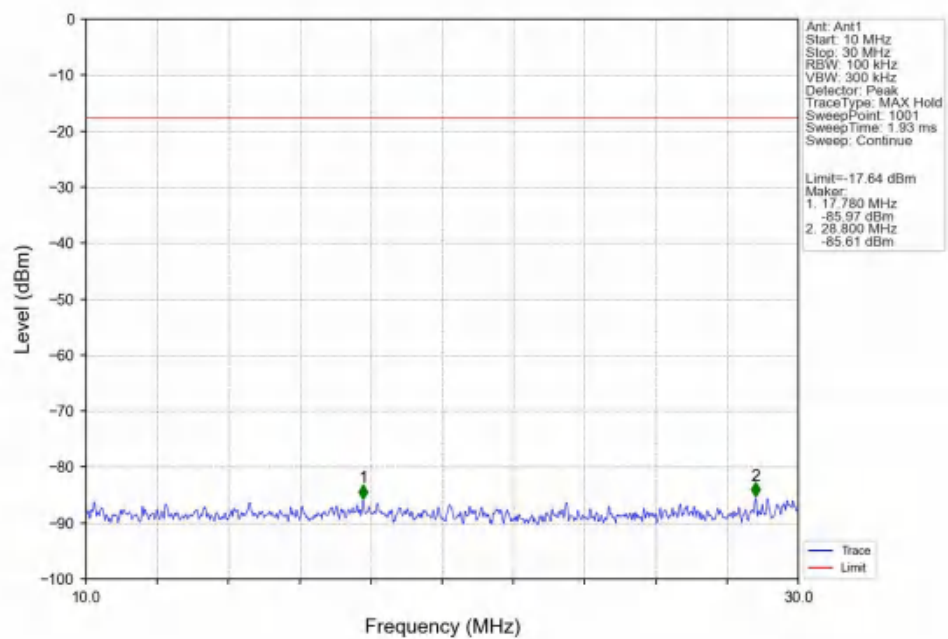




1M_LCH_2402MHz_Ant1_NTNV

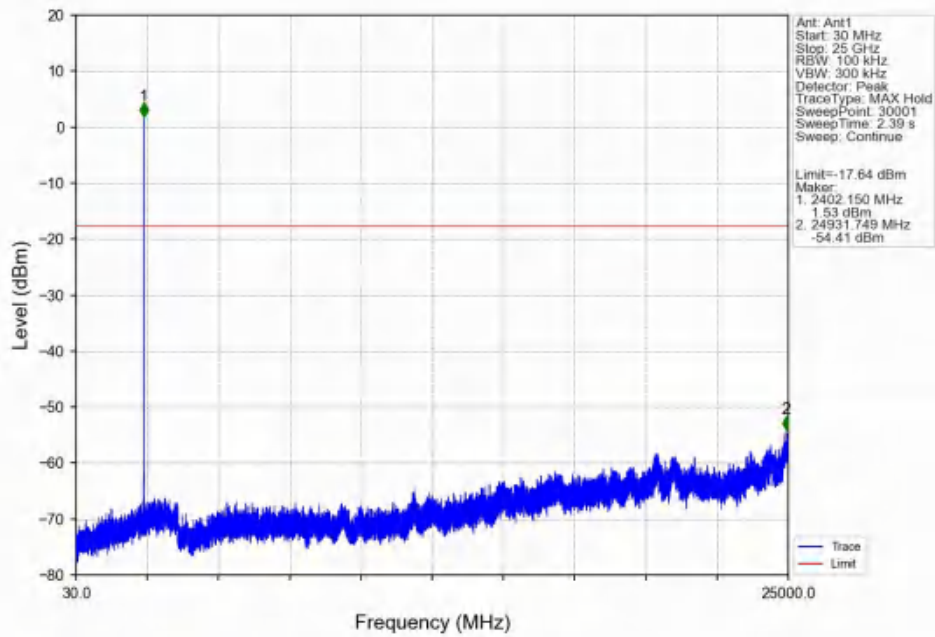


1M_LCH_2402MHz_Ant1_NTNV

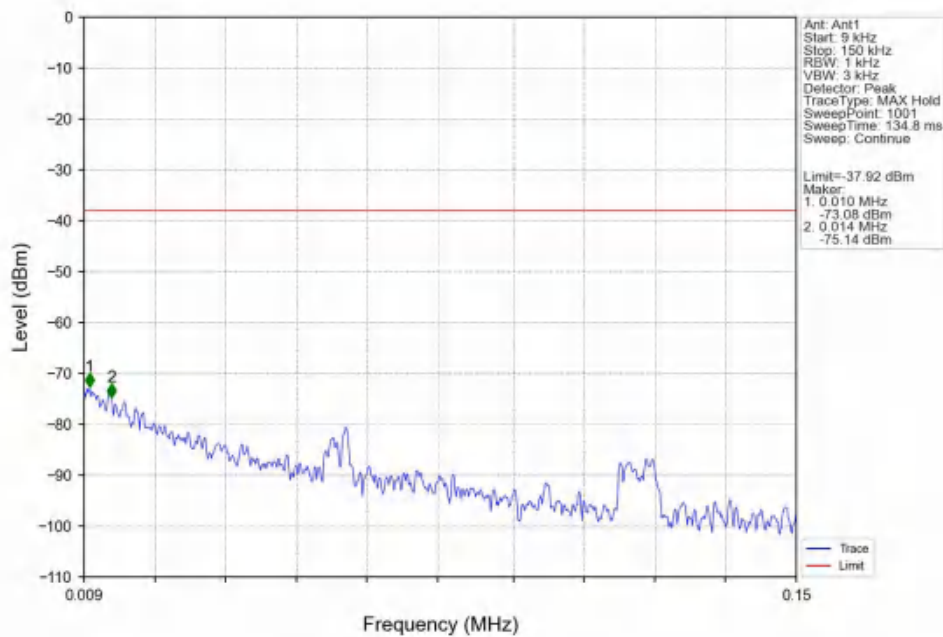




1M_LCH_2402MHz_Ant1_NTNV

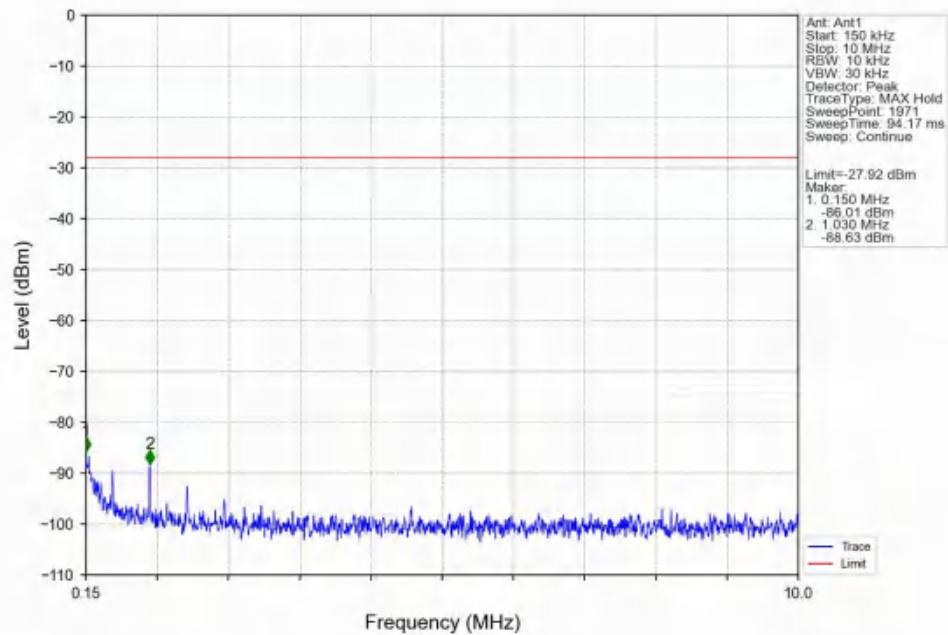


1M_MCH_2440MHz_Ant1_NTNV

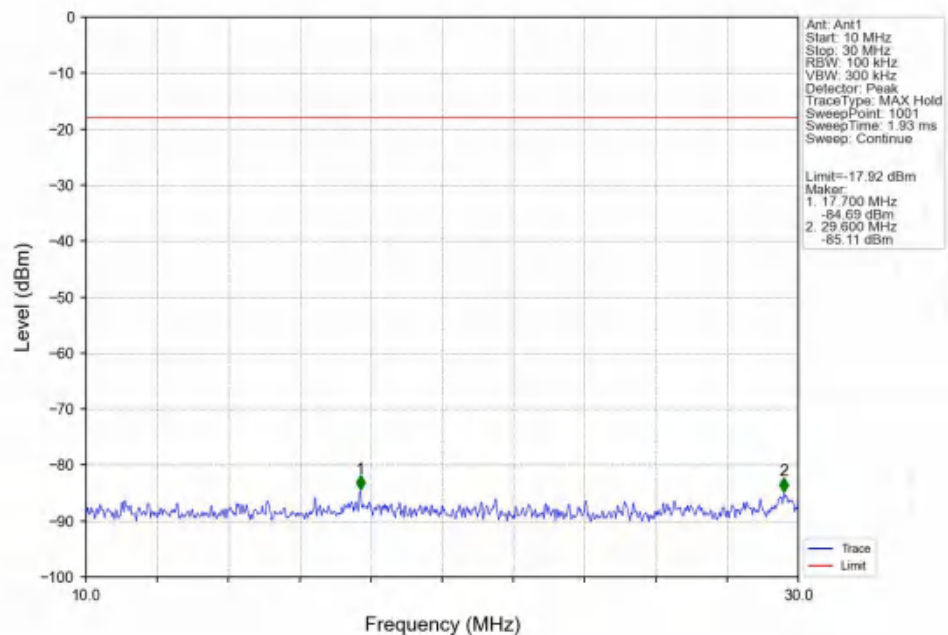




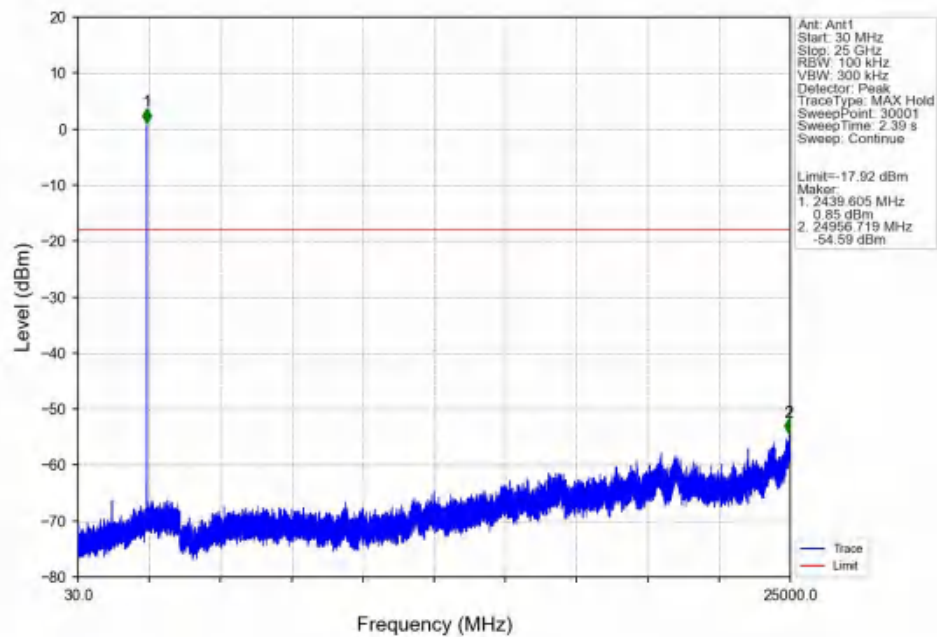
1M_MCH_2440MHz_Ant1_NTNV



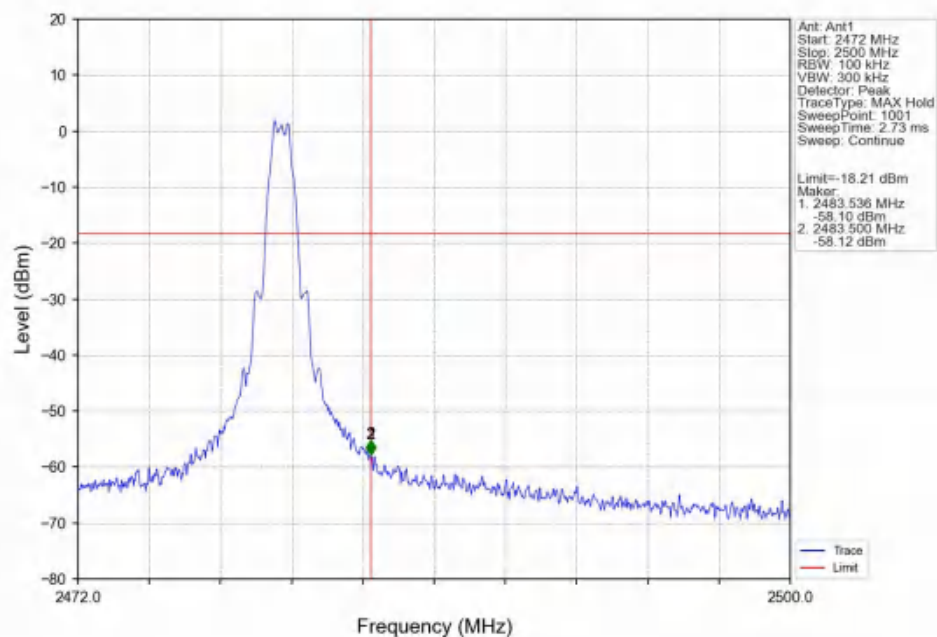
1M_MCH_2440MHz_Ant1_NTNV



1M_MCH_2440MHz_Ant1_NTNV

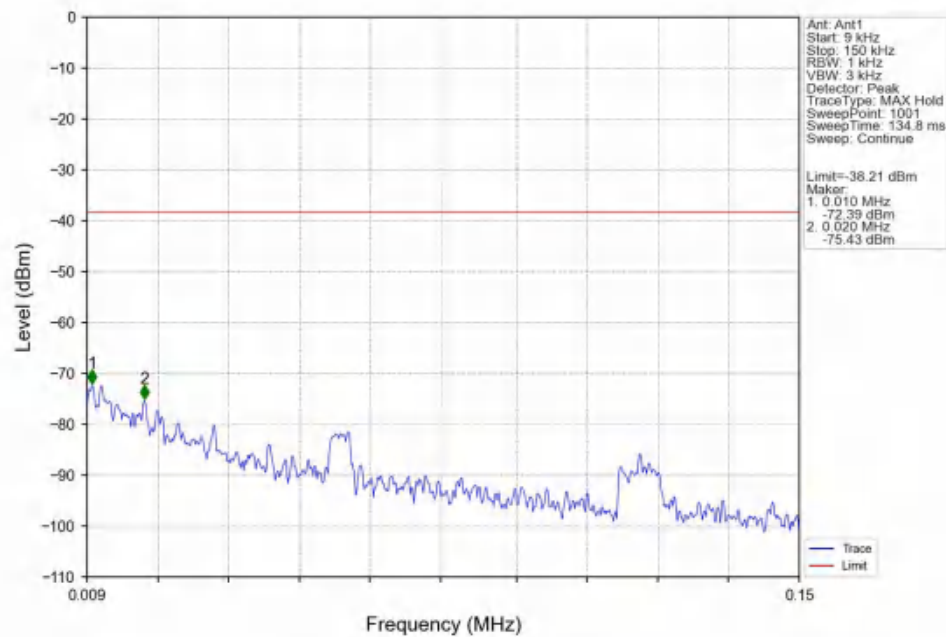


1M_HCH_2480MHz_Ant1_NTNV

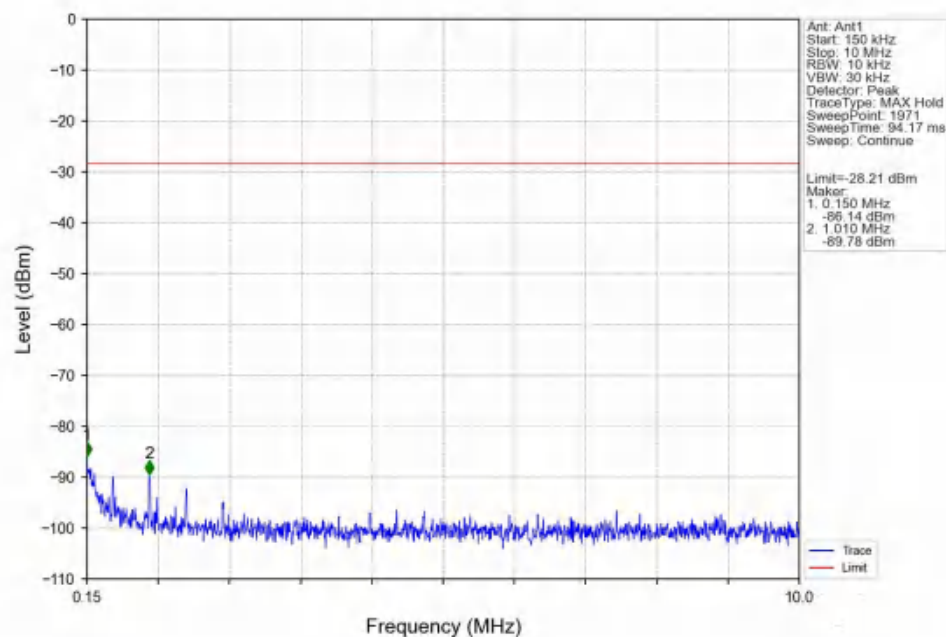




1M_HCH_2480MHz_Ant1_NTNV

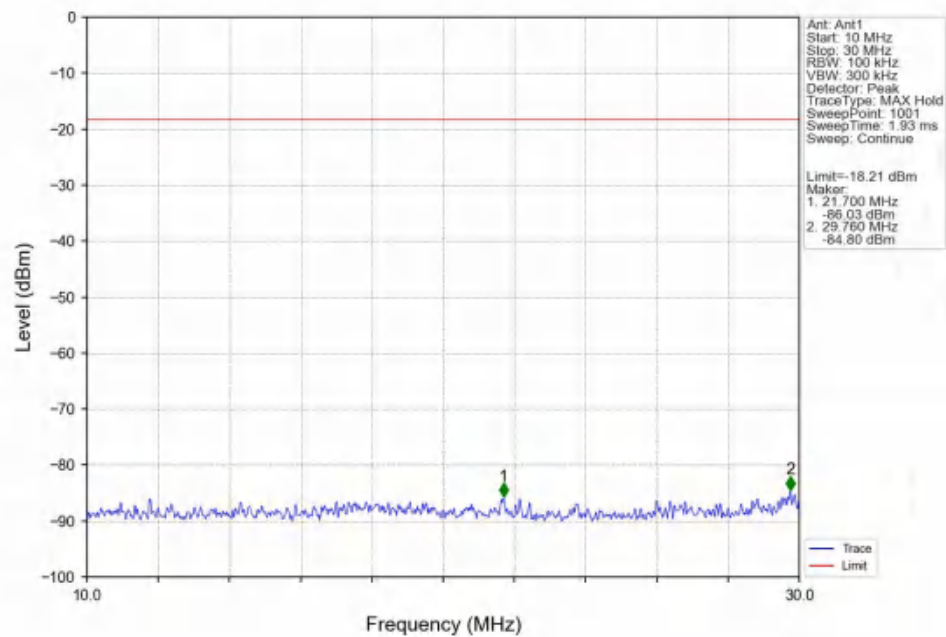


1M_HCH_2480MHz_Ant1_NTNV

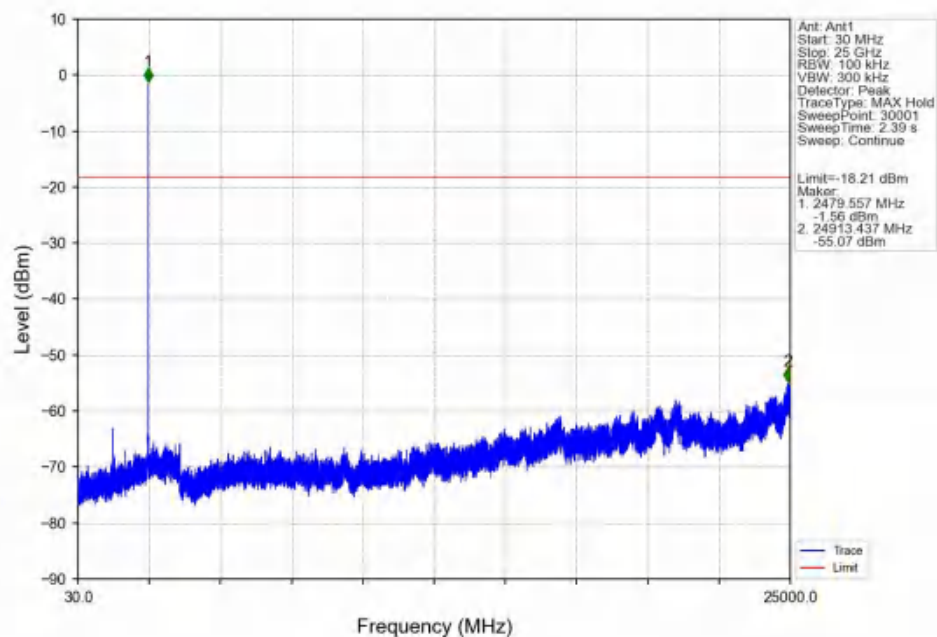




1M_HCH_2480MHz_Ant1_NTNV

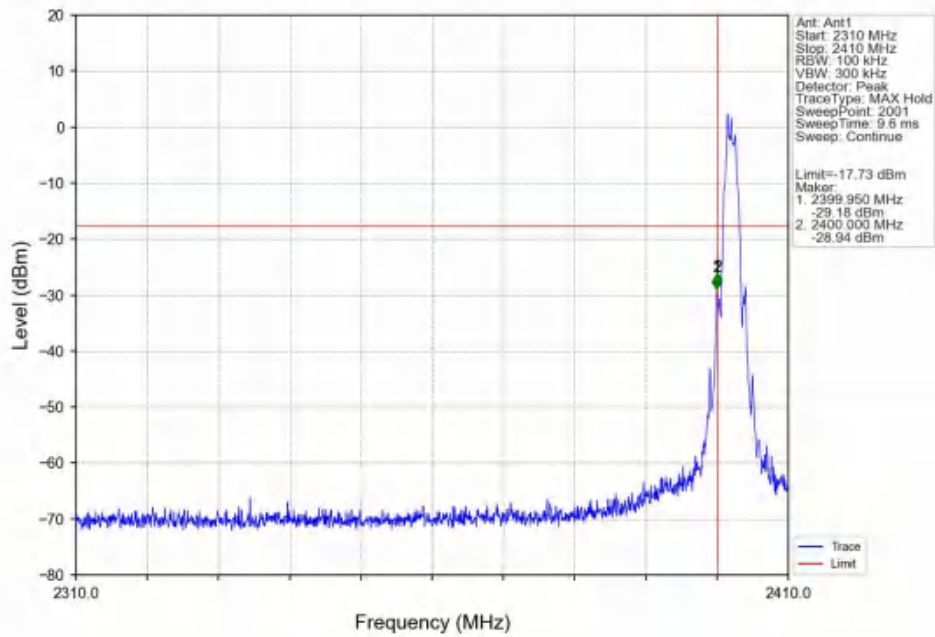


1M_HCH_2480MHz_Ant1_NTNV

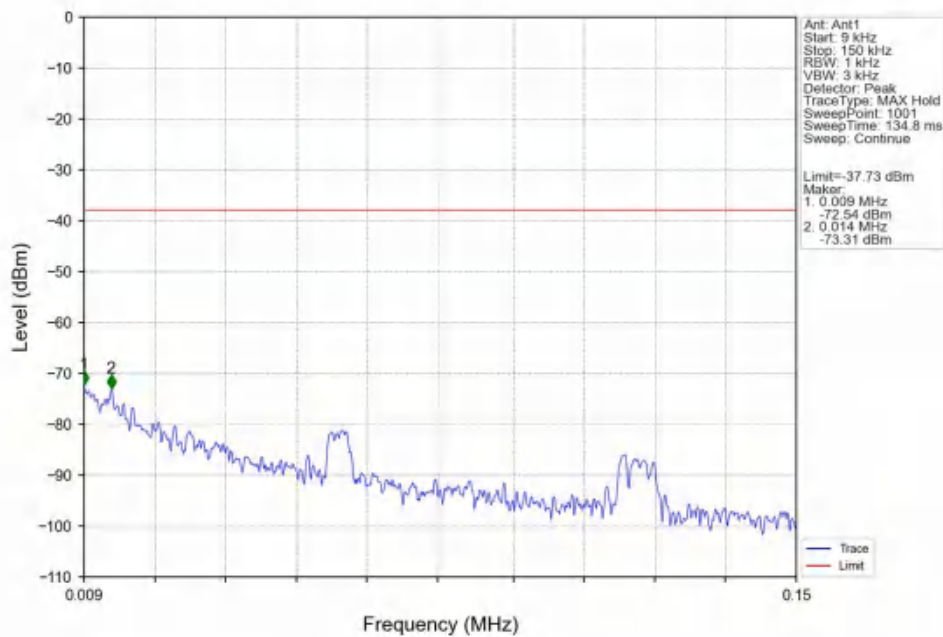




2M_LCH_2402MHz_Ant1_NTNV

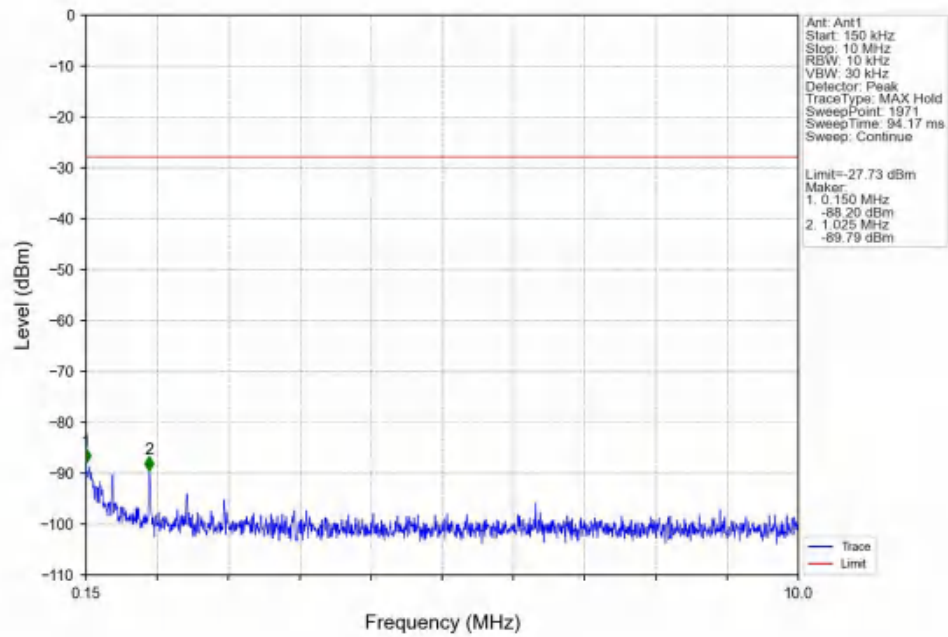


2M_LCH_2402MHz_Ant1_NTNV

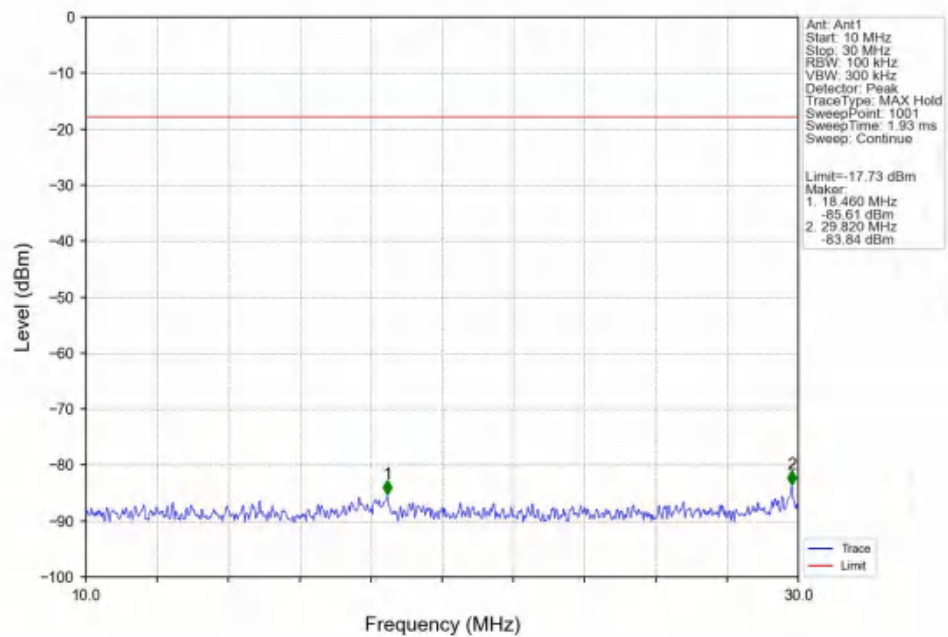




2M_LCH_2402MHz_Ant1_NTNV

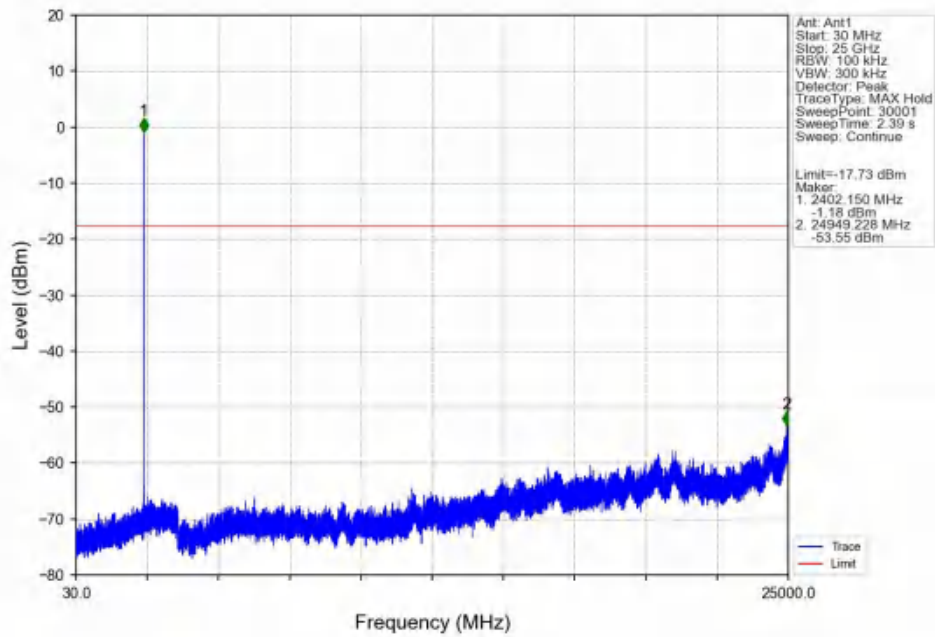


2M_LCH_2402MHz_Ant1_NTNV

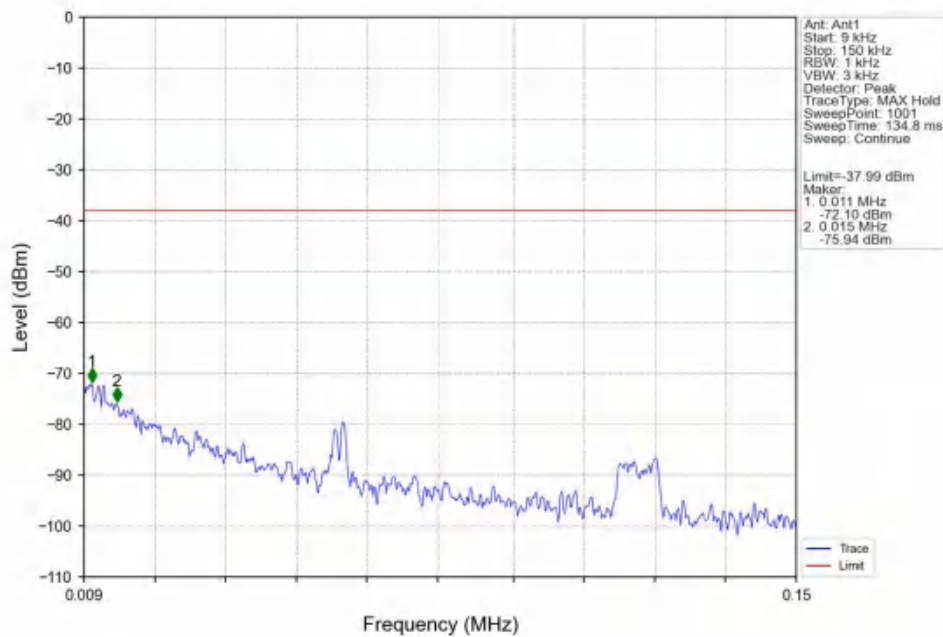




2M_LCH_2402MHz_Ant1_NTNV

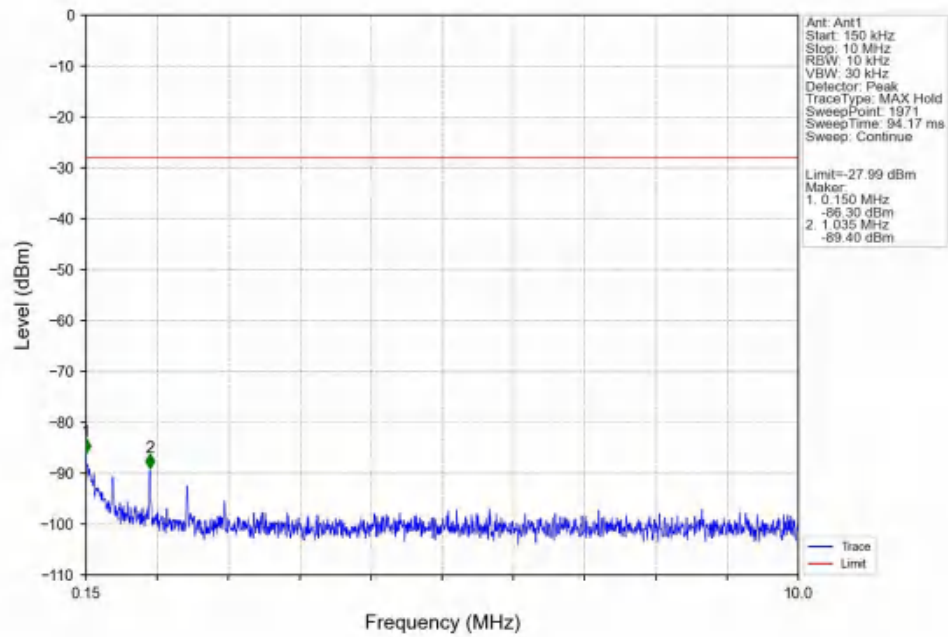


2M_MCH_2440MHz_Ant1_NTNV

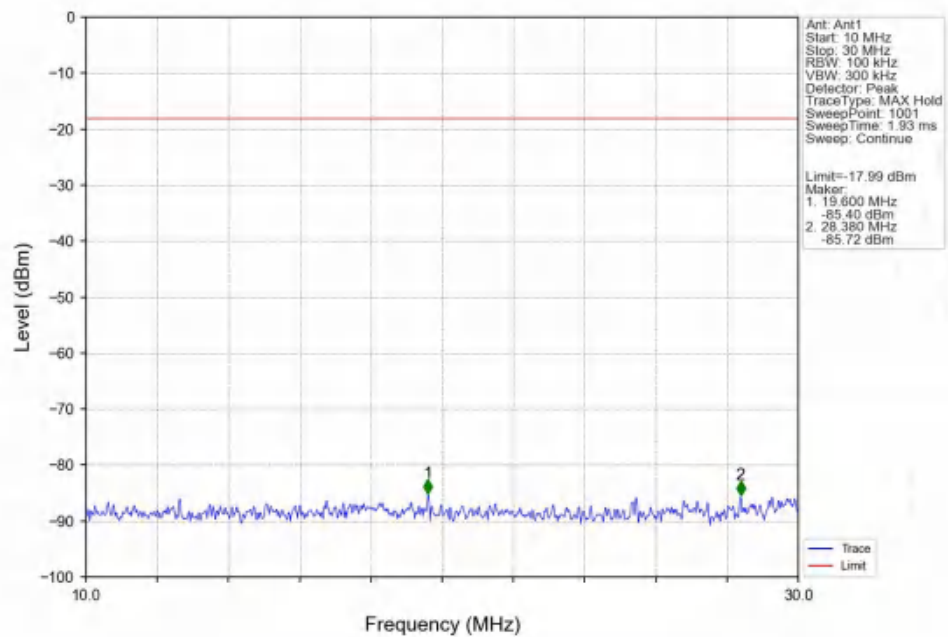




2M_MCH_2440MHz_Ant1_NTNV

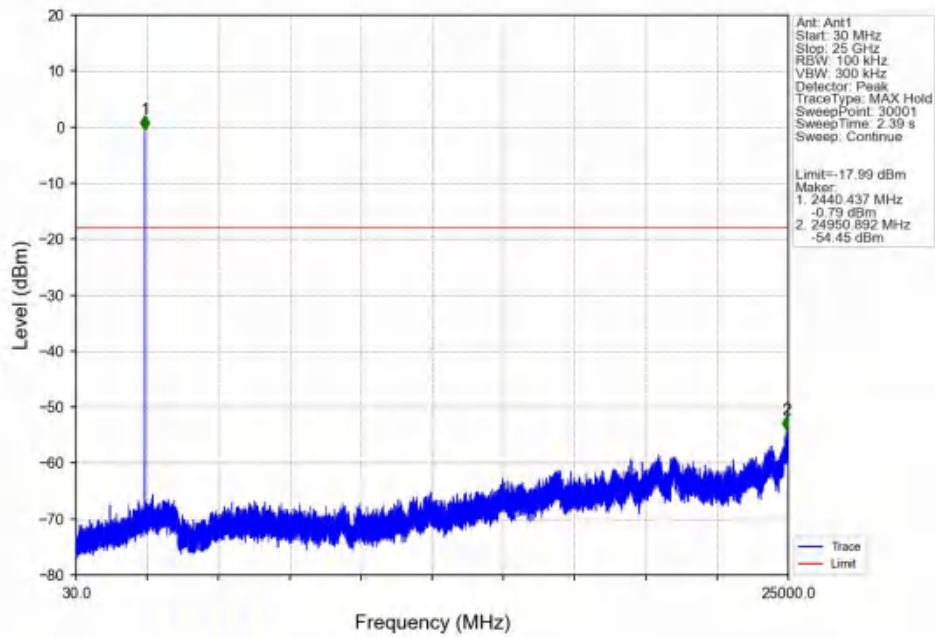


2M_MCH_2440MHz_Ant1_NTNV

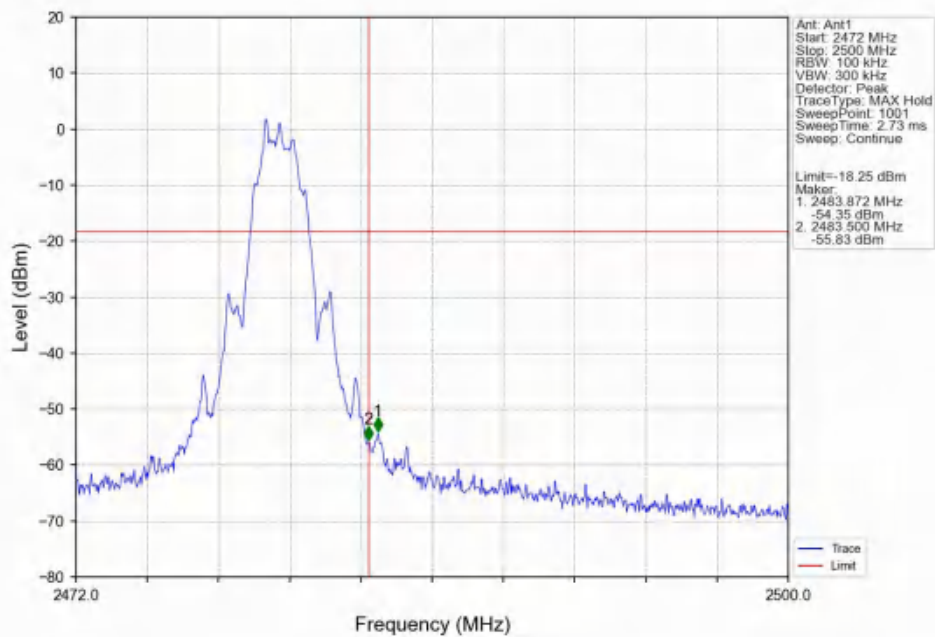




2M_MCH_2440MHz_Ant1_NTNV

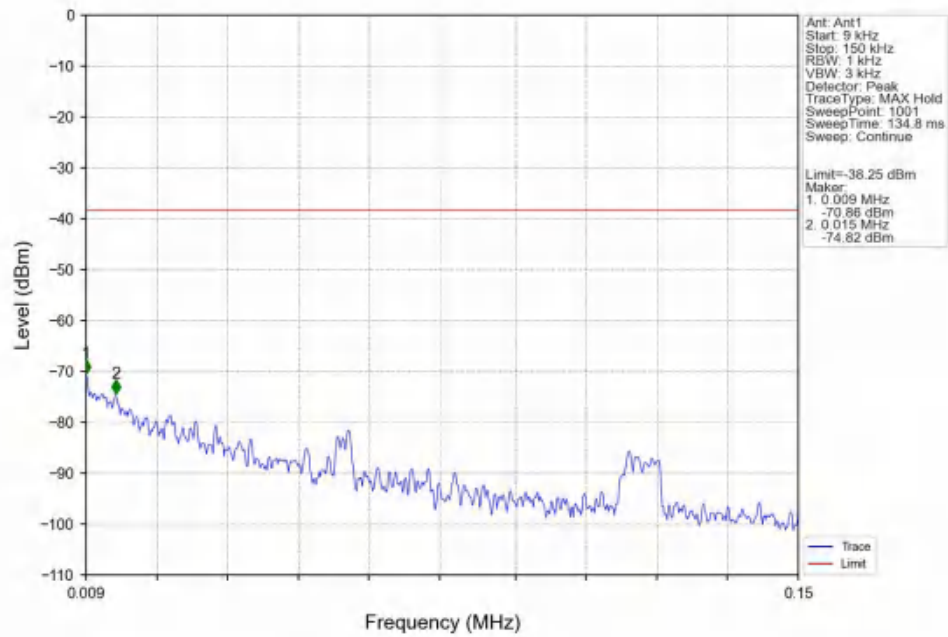


2M_HCH_2480MHz_Ant1_NTNV

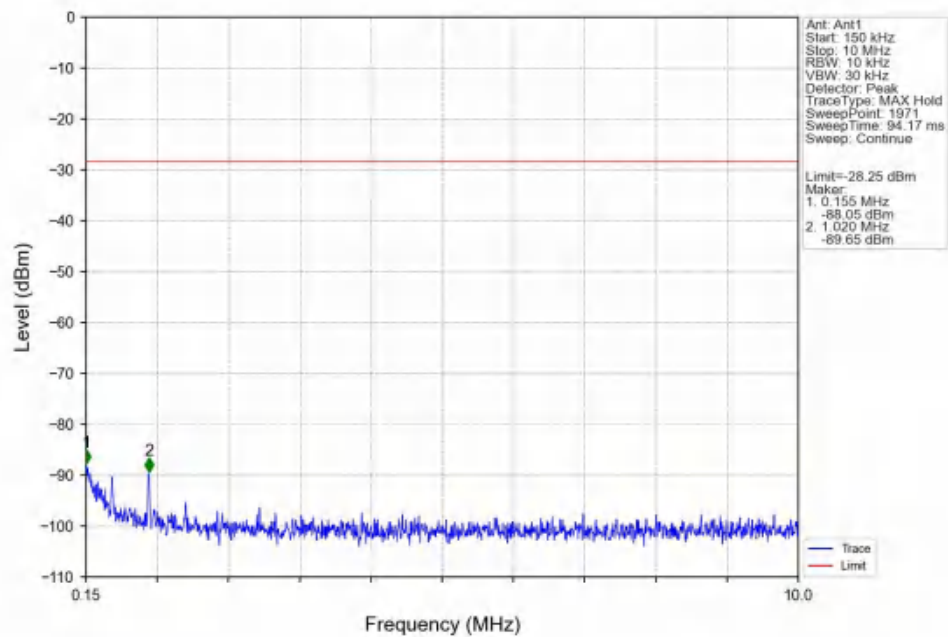




2M_HCH_2480MHz_Ant1_NTNV

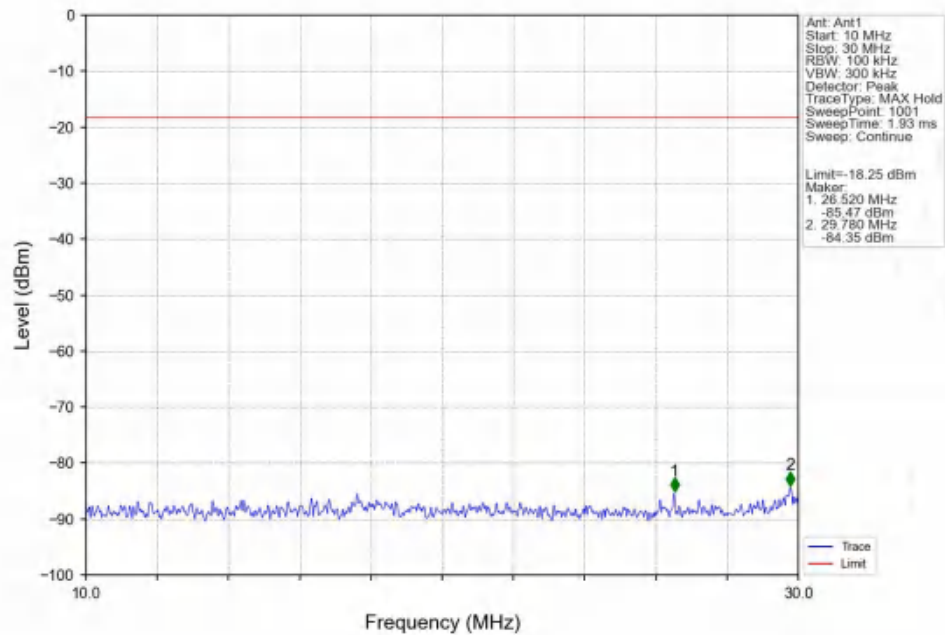


2M_HCH_2480MHz_Ant1_NTNV

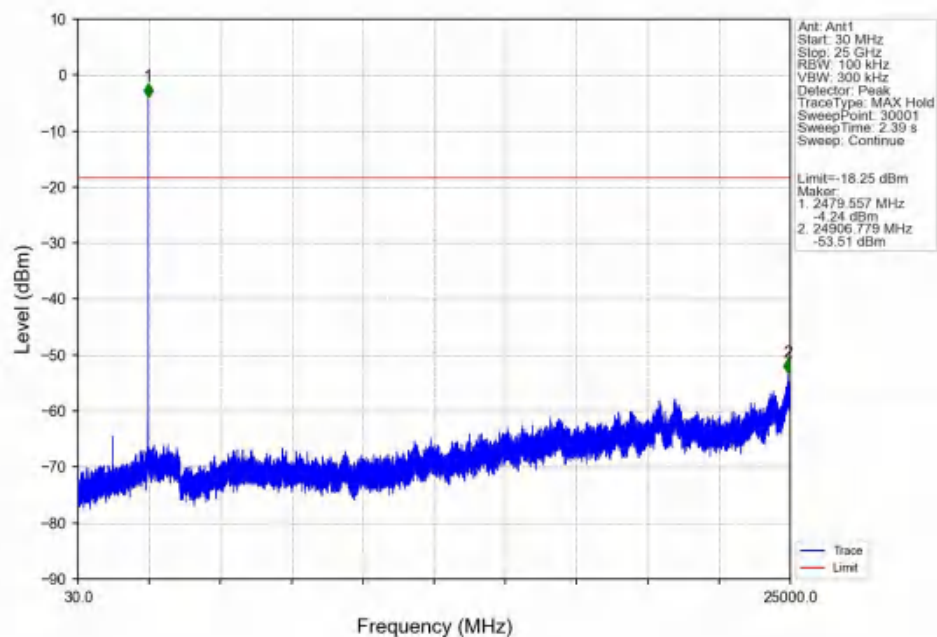




2M_HCH_2480MHz_Ant1_NTNV



2M_HCH_2480MHz_Ant1_NTNV





6. Form731

6.1 Test Result

6.1.1 Form731

Lower Freq (MHz)	High Freq (MHz)	MAX Power (W)	MAX Power (dBm)
2402	2480	0.0018	2.51