Appendix A for SHEM210700794501

1. Duty Cycle

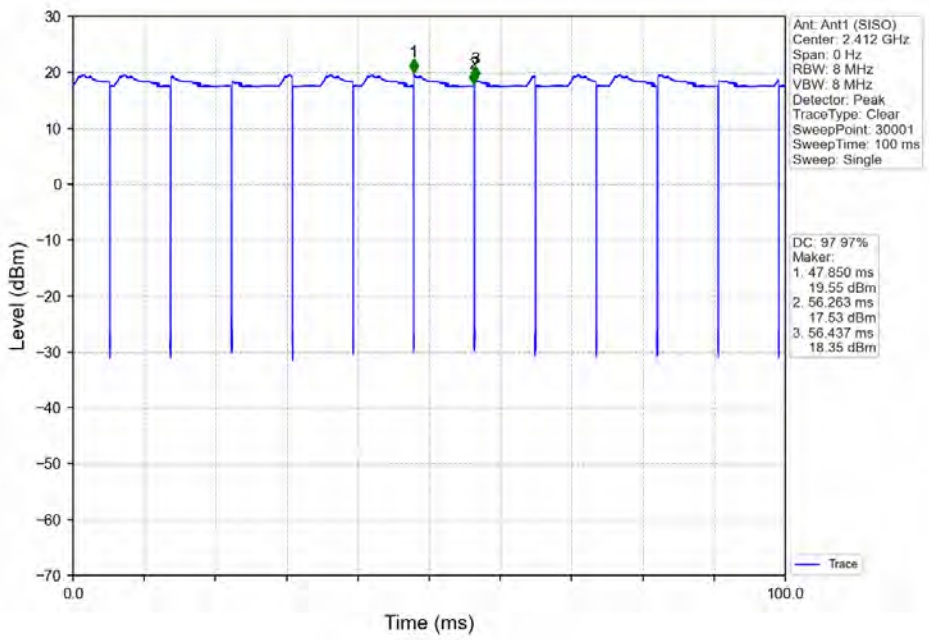
1.1 Ant1

1.1.1 Test Result

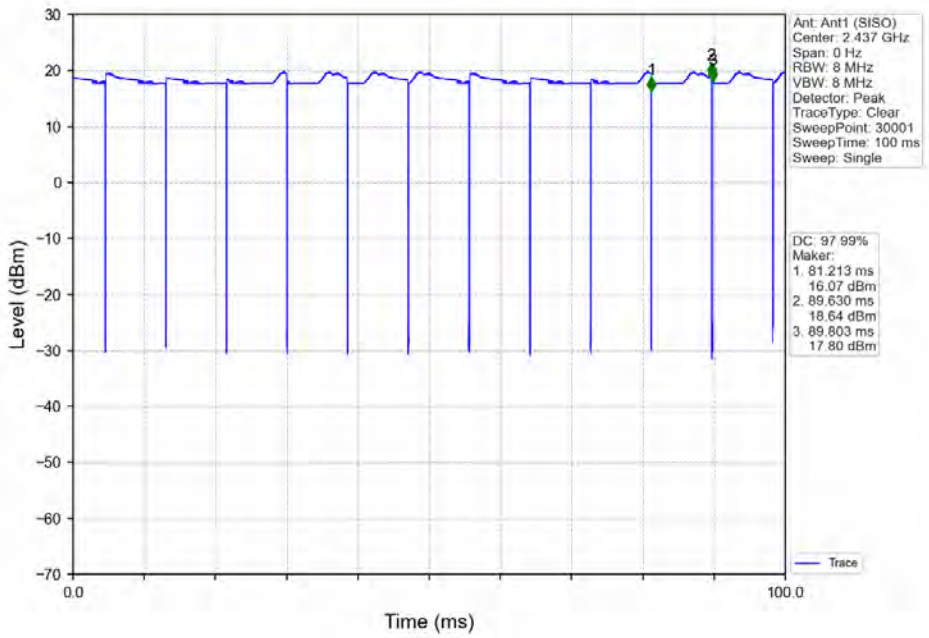
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	8.413	8.587	97.97	0.09	1.23
		2437	8.417	8.590	97.99	0.09	1.39
		2462	8.417	8.590	97.99	0.09	1.47
802.11g	SISO	2412	0.173	0.355	48.73	3.12	21.37
		2437	0.174	0.354	49.15	3.08	30.10
		2462	0.174	0.355	49.01	3.10	30.11
802.11n (HT20)	MIMO	2412	0.161	0.342	47.08	3.27	27.46
		2437	0.162	0.324	50.00	3.01	28.21
		2462	0.161	0.343	46.94	3.28	27.37

1.1.2 Test Graph

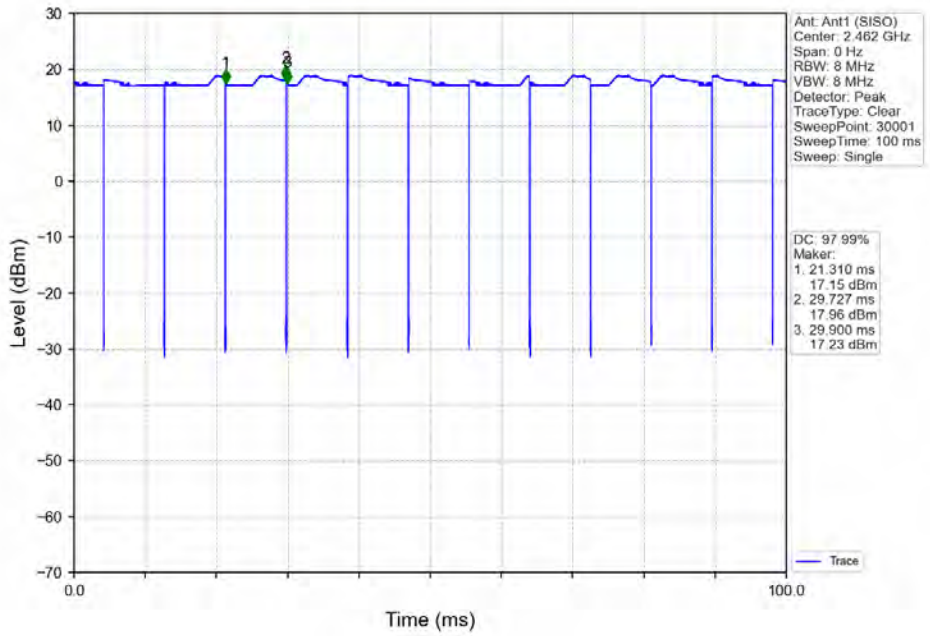
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



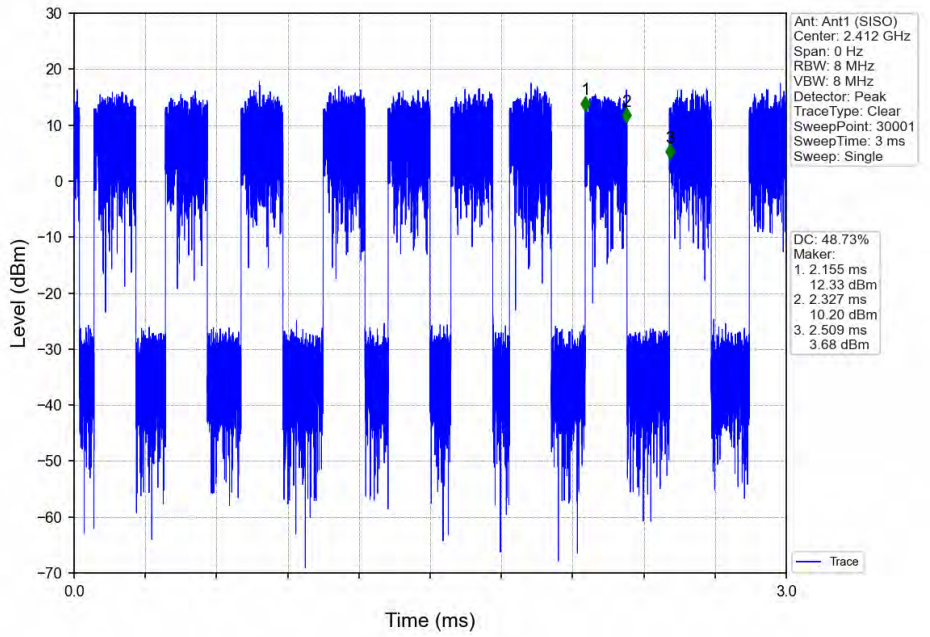
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



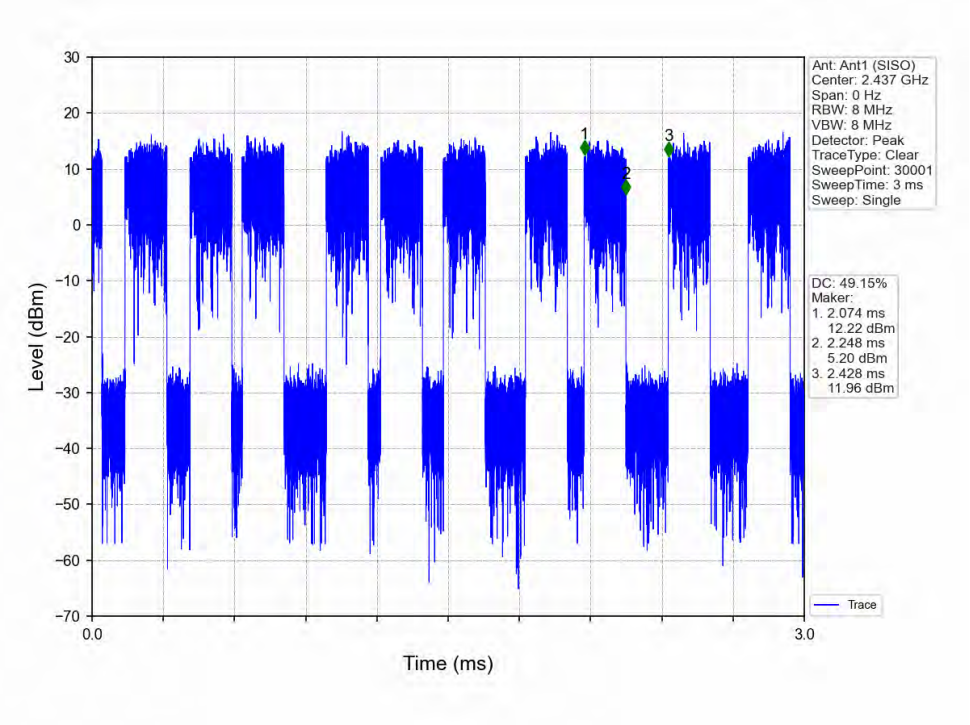
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



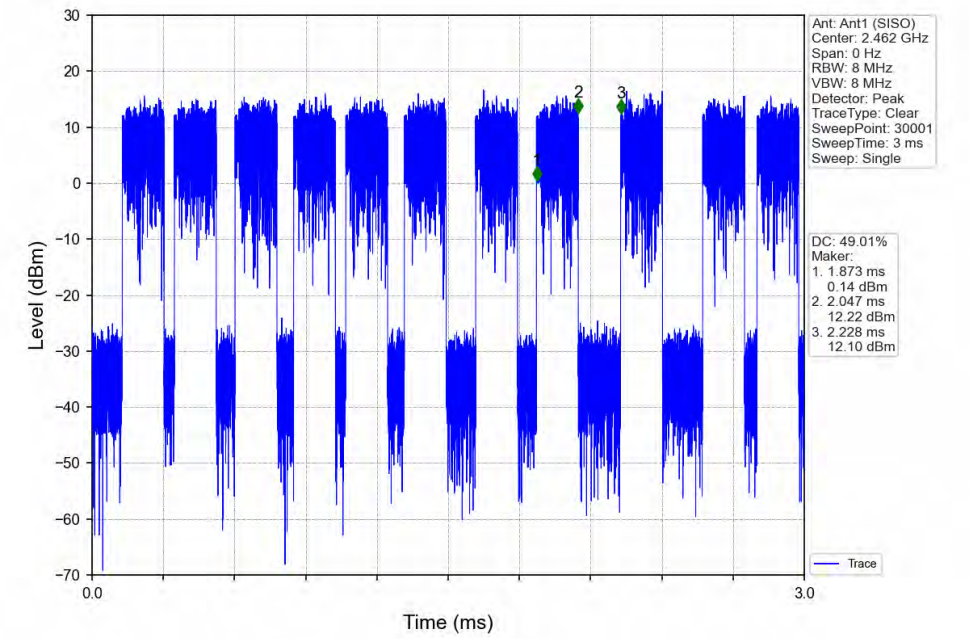
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



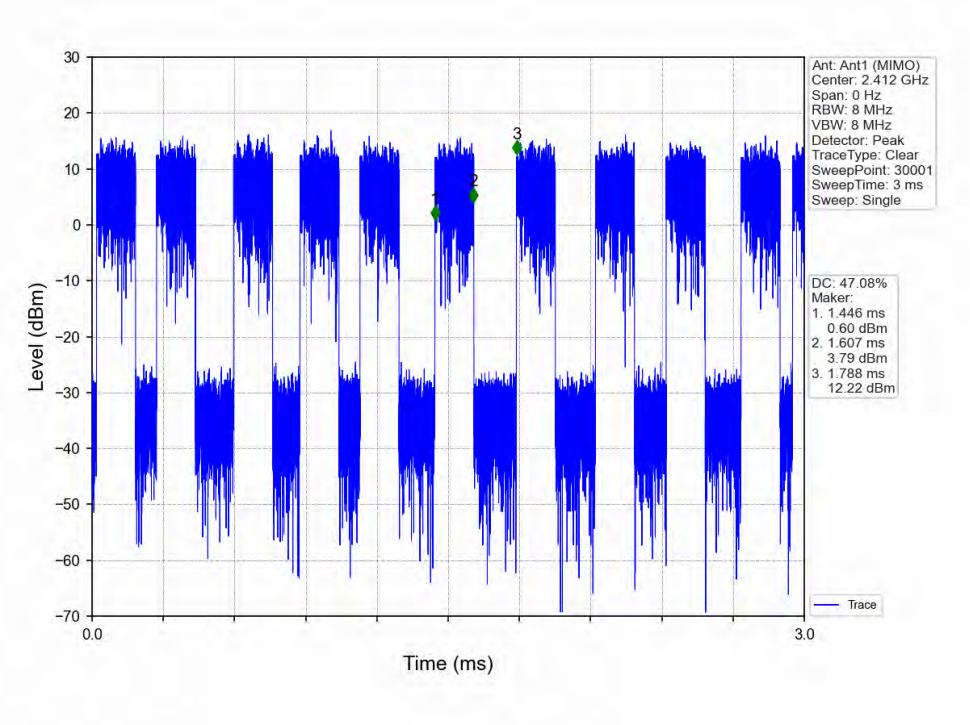
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



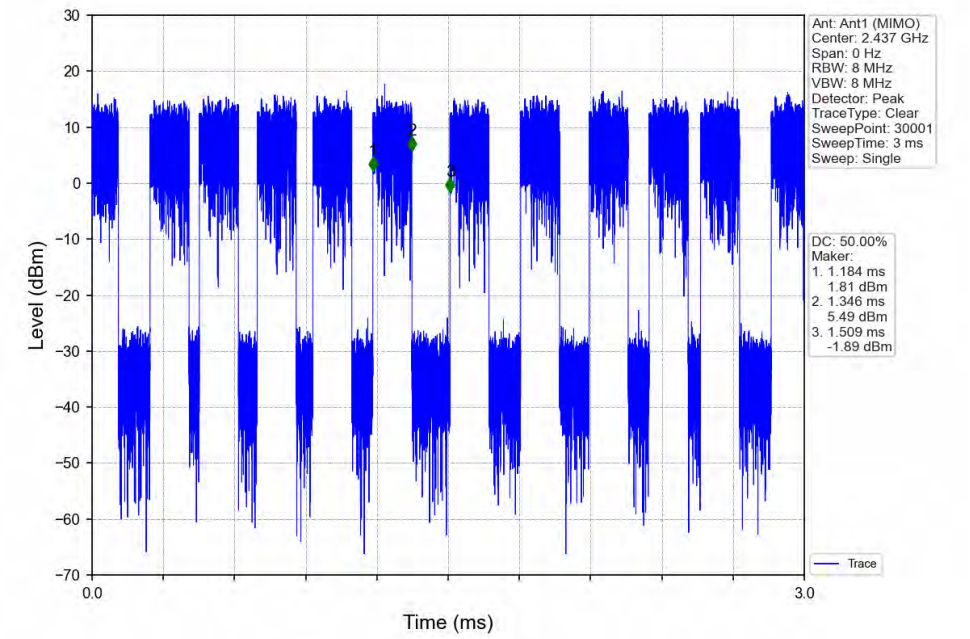
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



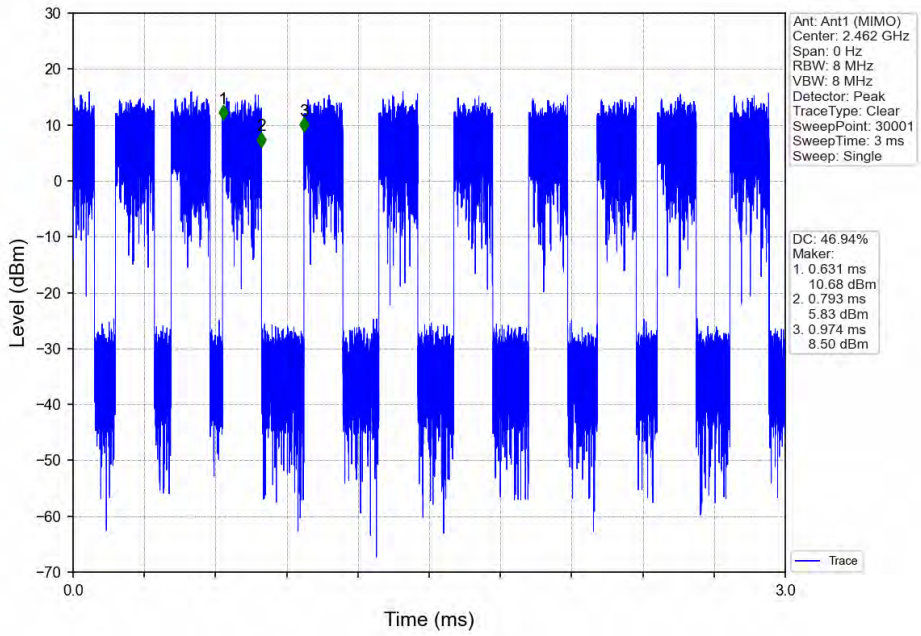
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



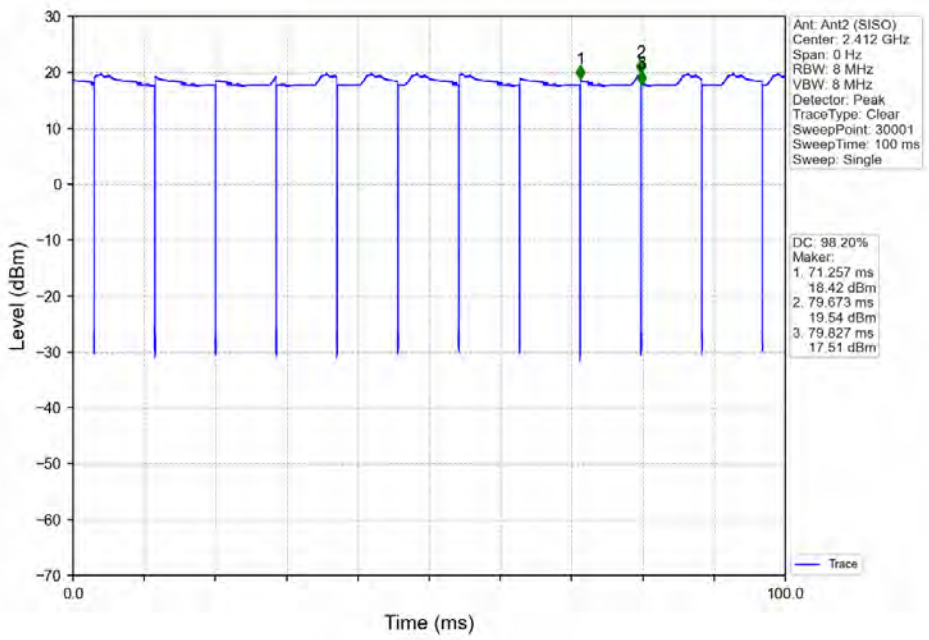
1.2 Ant2

1.2.1 Test Result

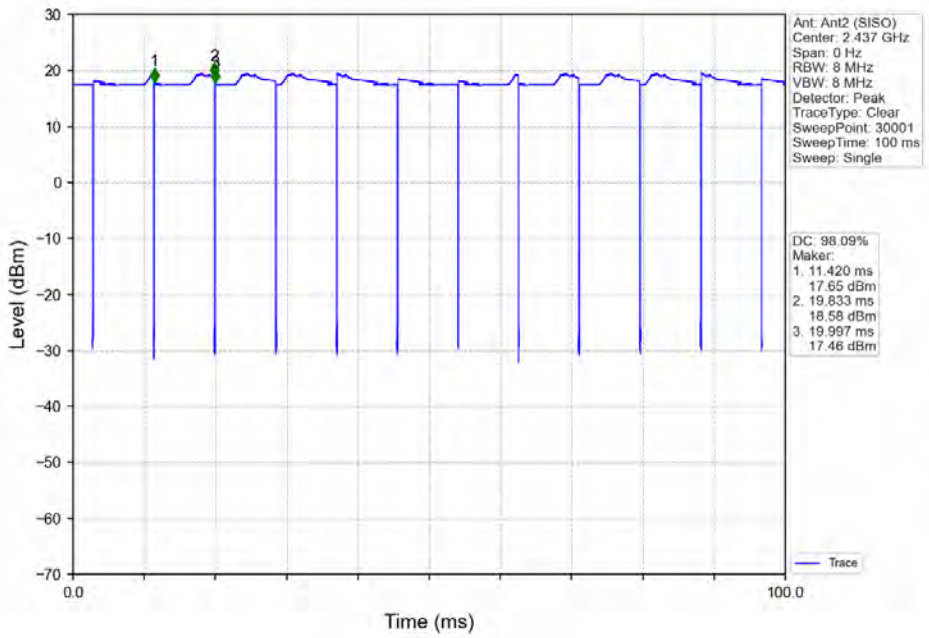
Ant2							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	8.416	8.570	98.20	0.08	1.12
		2437	8.413	8.577	98.09	0.08	1.47
		2462	8.413	8.570	98.17	0.08	1.39
802.11g	SISO	2412	0.174	0.327	53.21	2.74	26.26
		2437	0.173	0.336	51.49	2.88	24.35
		2462	0.173	0.327	52.91	2.77	22.91
802.11n (HT20)	MIMO	2412	0.162	0.343	47.23	3.26	30.79
		2437	0.160	0.343	46.65	3.31	16.61
		2462	0.161	0.289	55.71	2.54	18.62

1.2.2 Test Graph

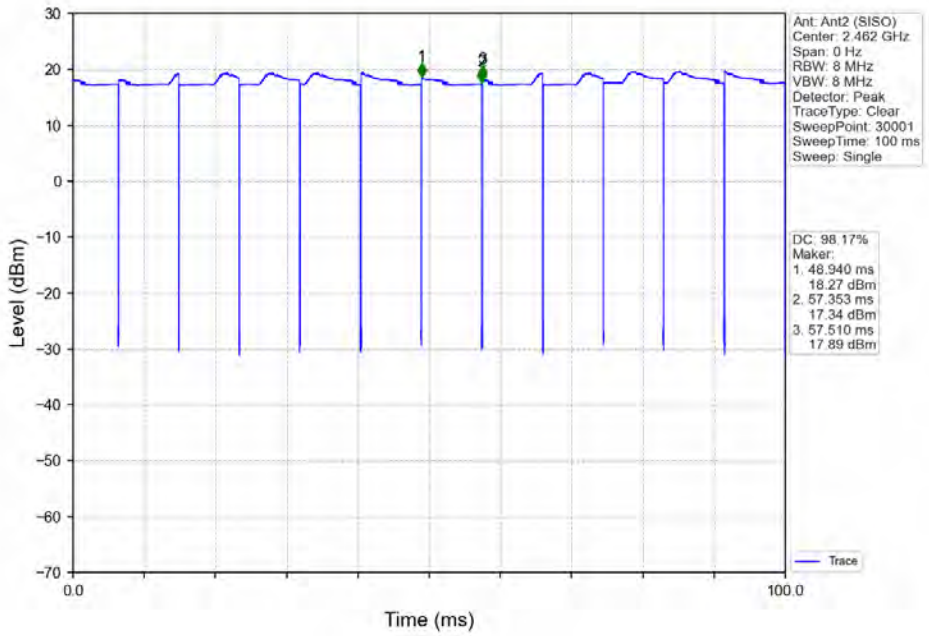
802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



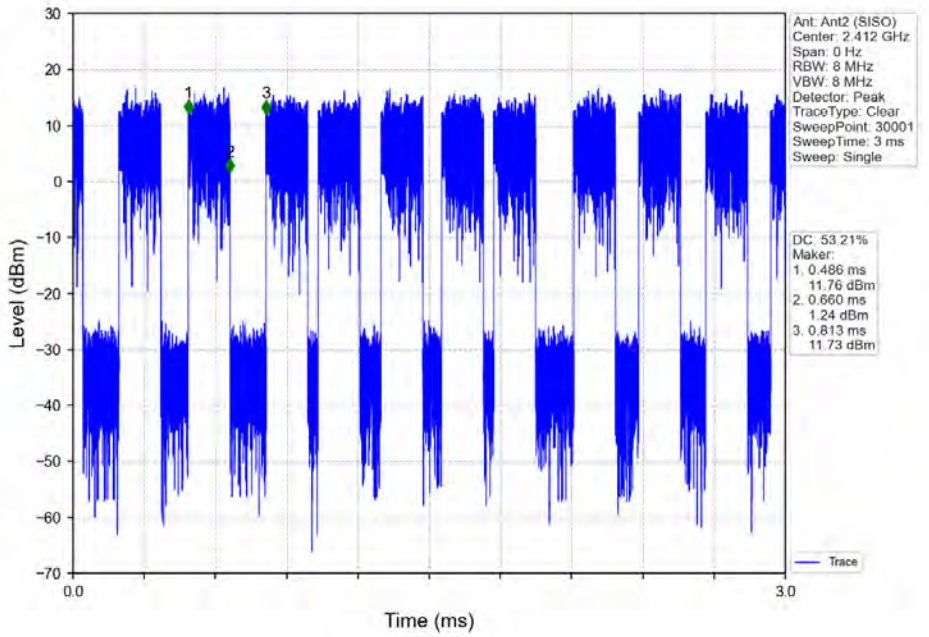
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



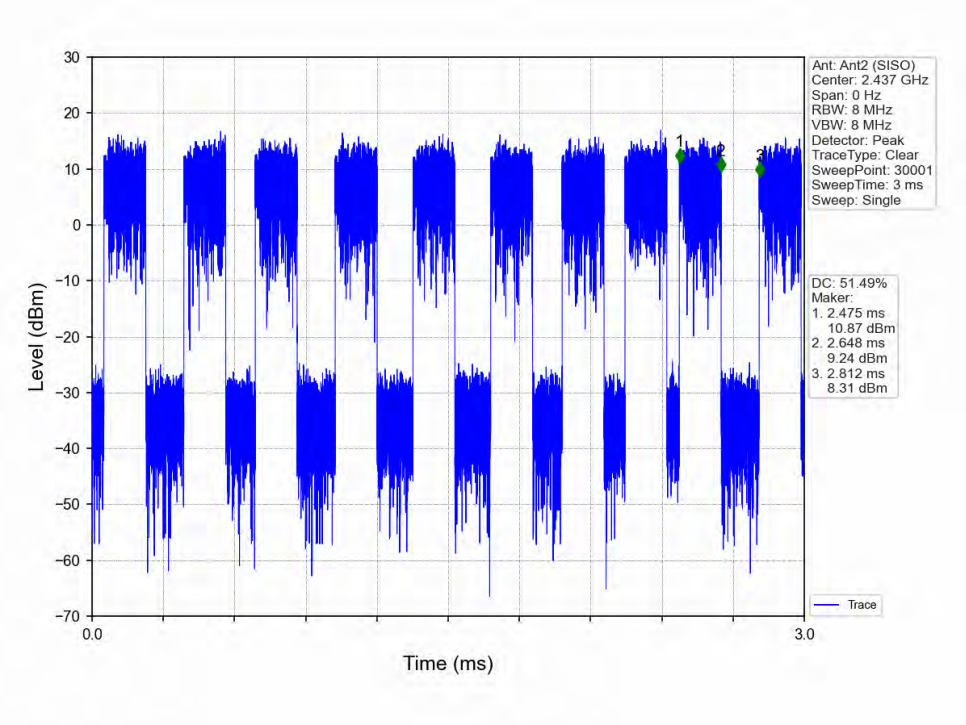
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



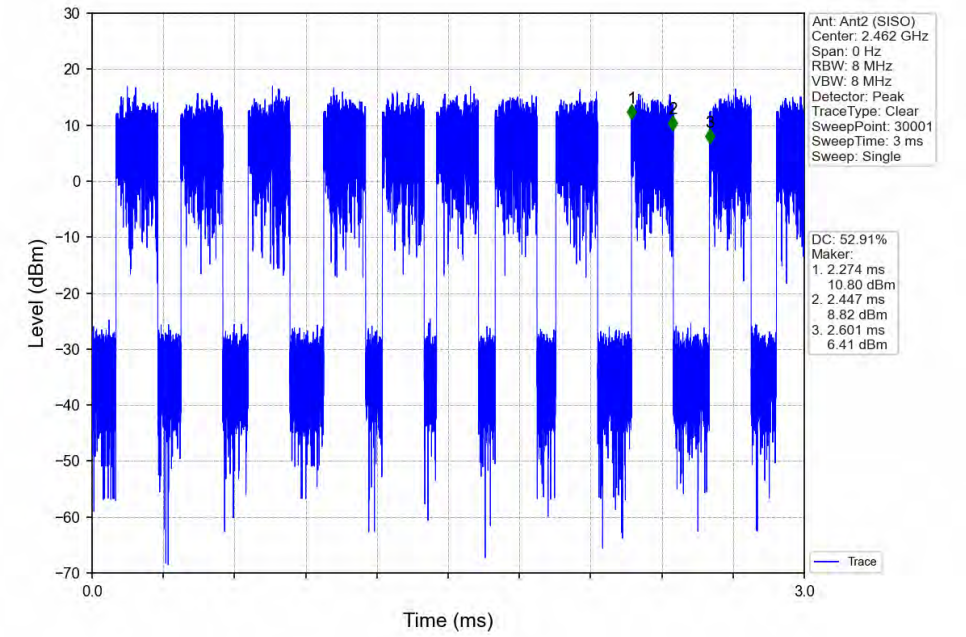
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



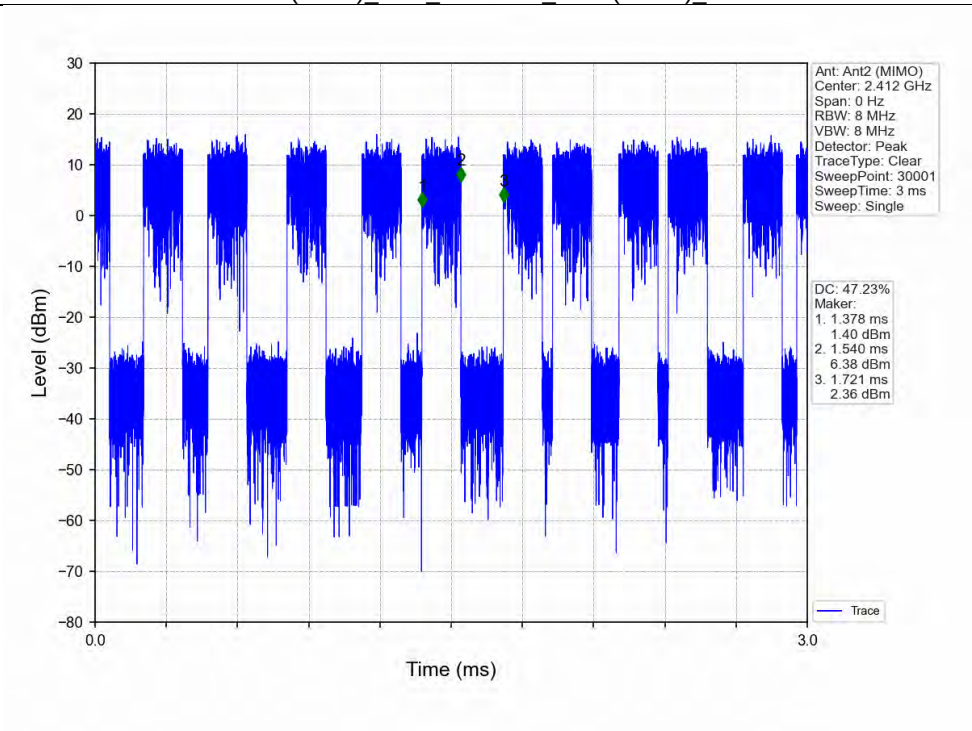
802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



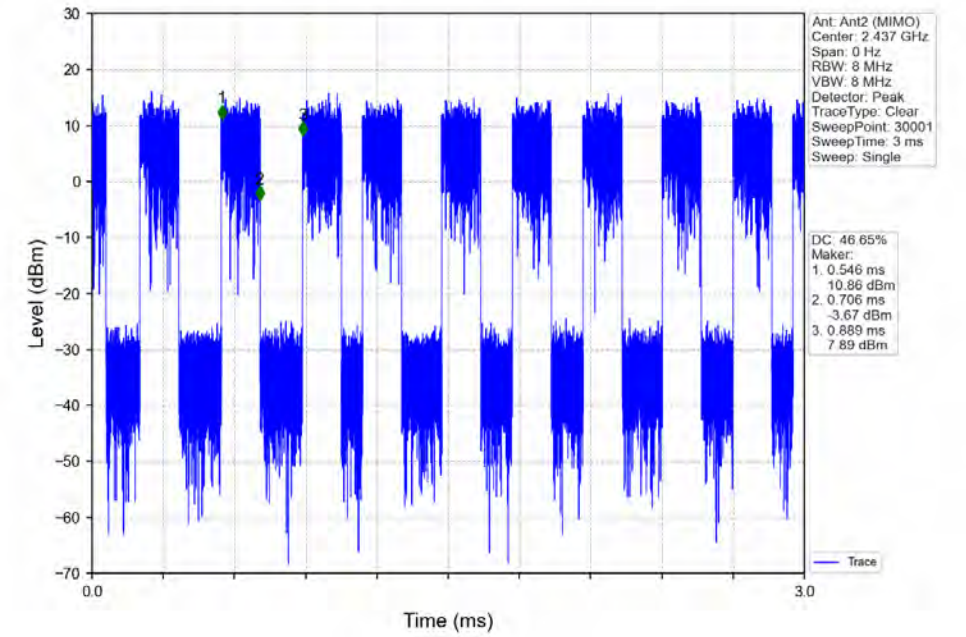
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



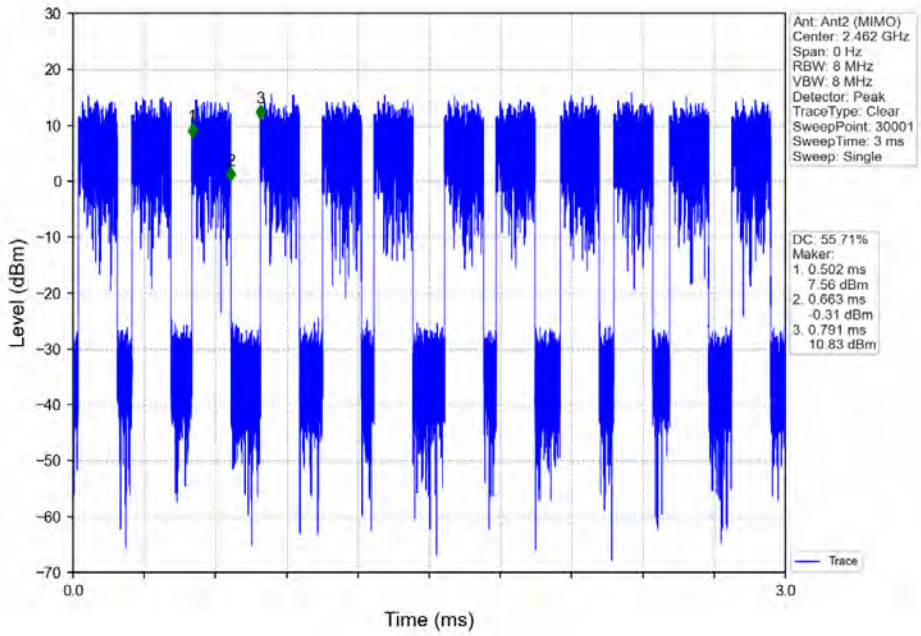
802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



2. Bandwidth

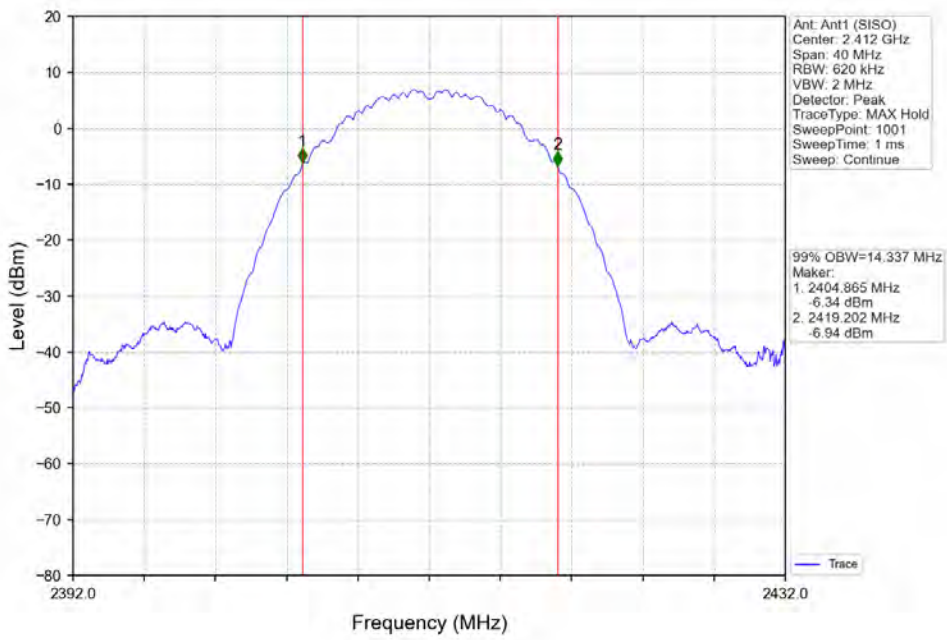
2.1 OBW

2.1.1 Test Result

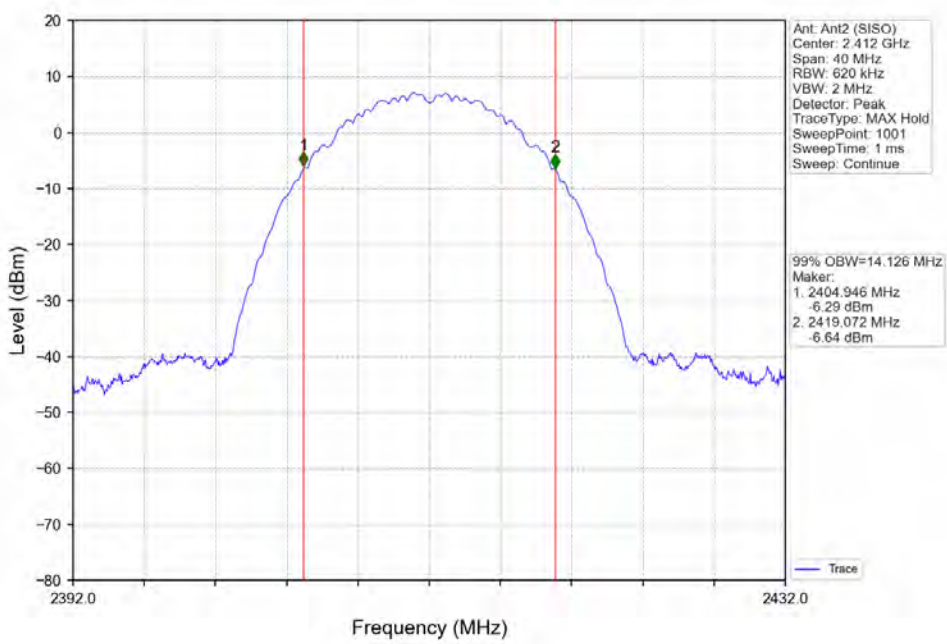
Mode	TX Type	Frequency (MHz)	Ant	99% Occupied Bandwidth (MHz)	Limit (MHz)	Verdict
802.11b	SISO	2412	1	14.337	/	Pass
			2	14.126	/	Pass
		2437	1	14.270	/	Pass
			2	14.202	/	Pass
		2462	1	14.352	/	Pass
			2	14.130	/	Pass
802.11g	SISO	2412	1	16.885	/	Pass
			2	16.889	/	Pass
		2437	1	16.873	/	Pass
			2	16.937	/	Pass
		2462	1	16.865	/	Pass
			2	16.915	/	Pass
802.11n (HT20)	MIMO	2412	1	17.727	/	Pass
			2	17.728	/	Pass
		2437	1	17.740	/	Pass
			2	17.785	/	Pass
		2462	1	17.778	/	Pass
			2	17.736	/	Pass

2.1.2 Test Graph

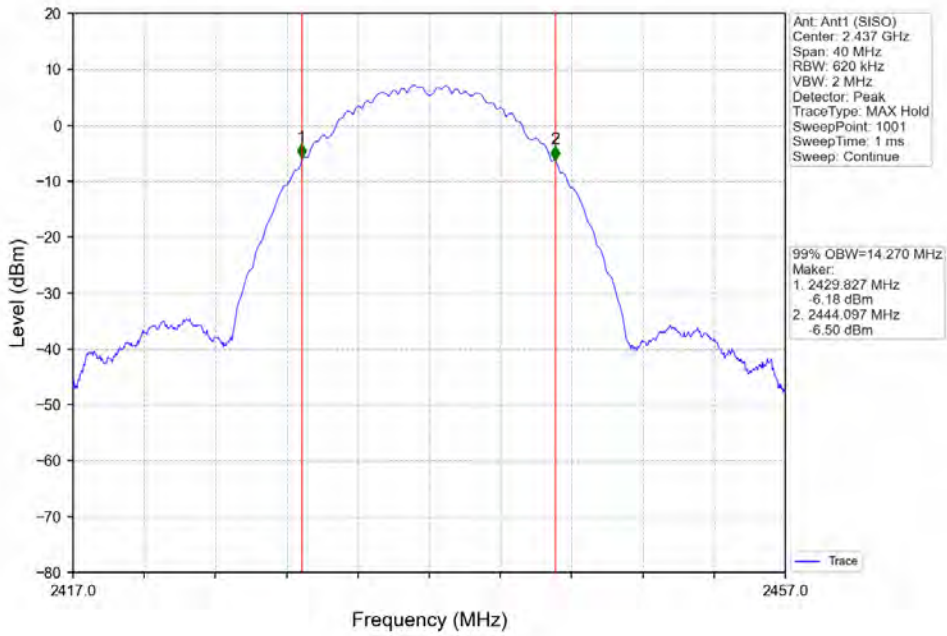
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



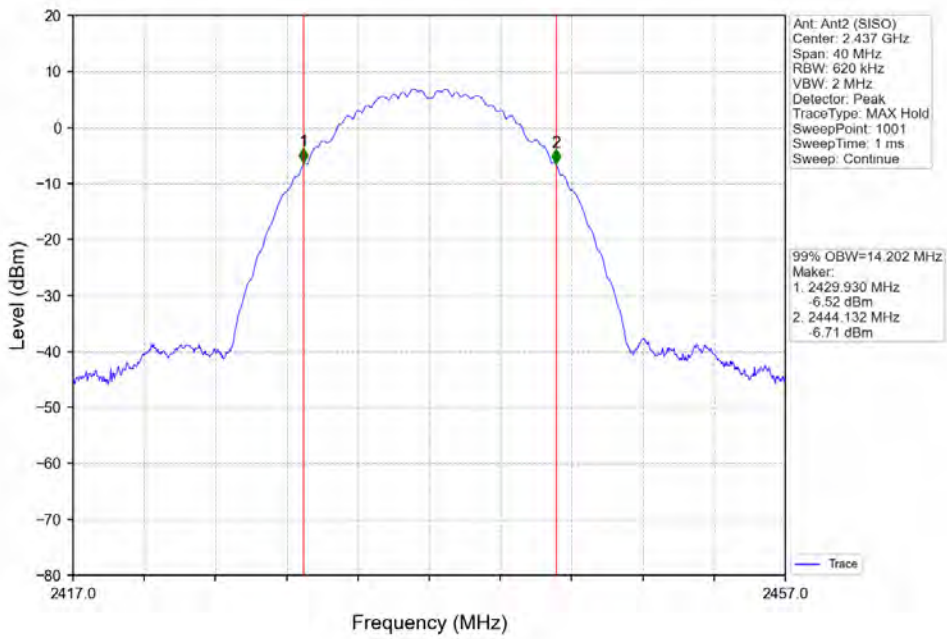
802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



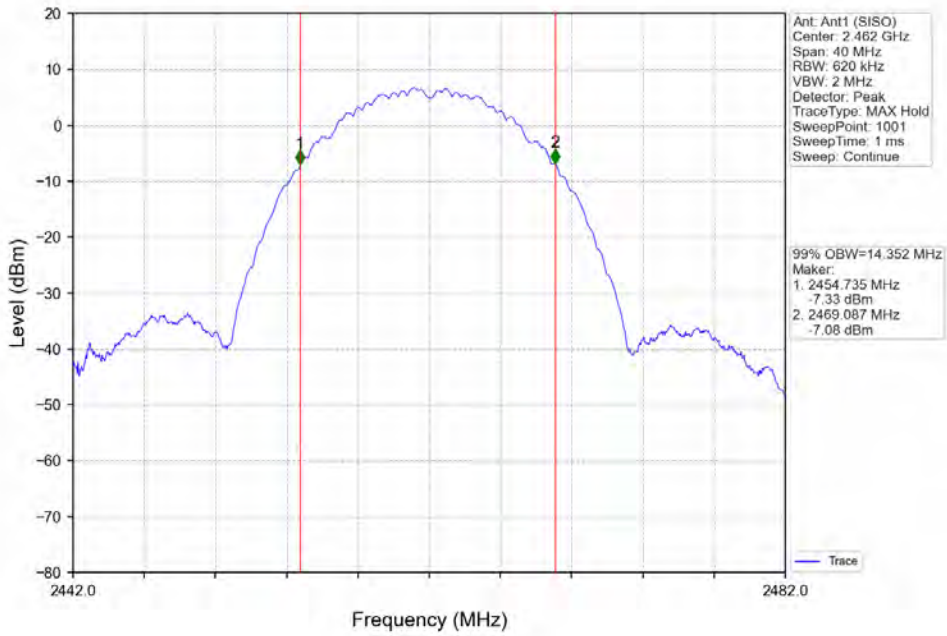
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



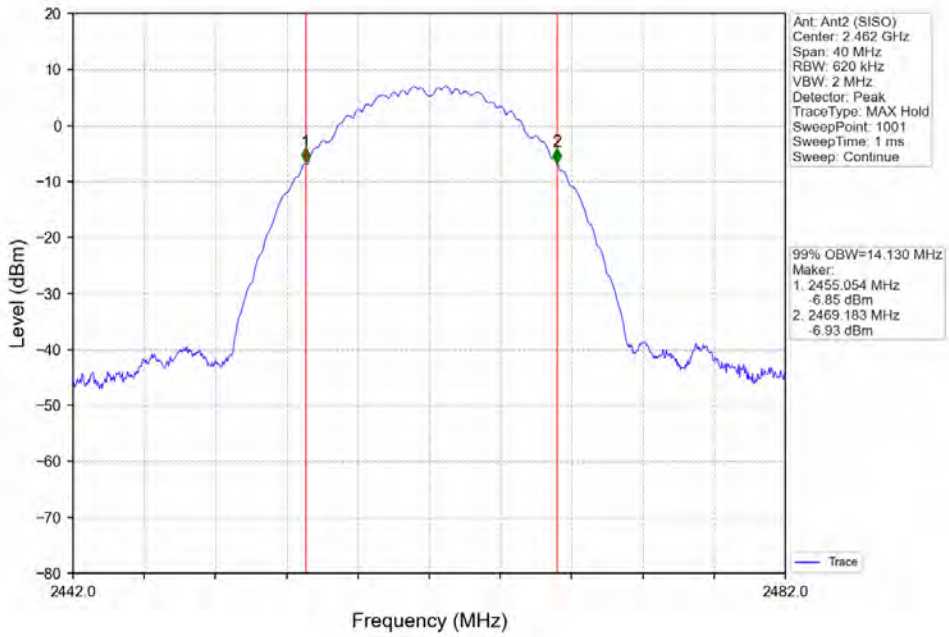
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



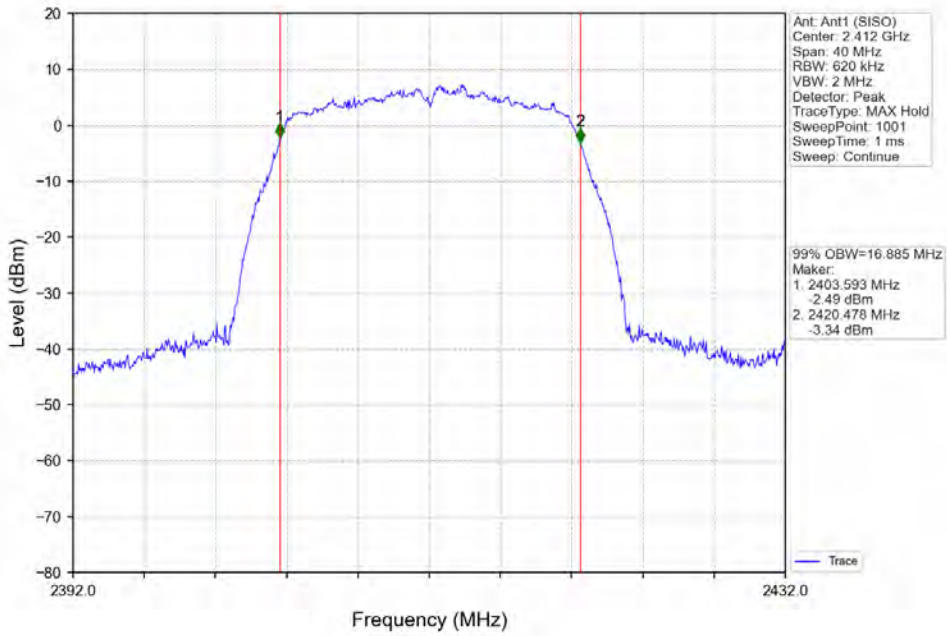
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



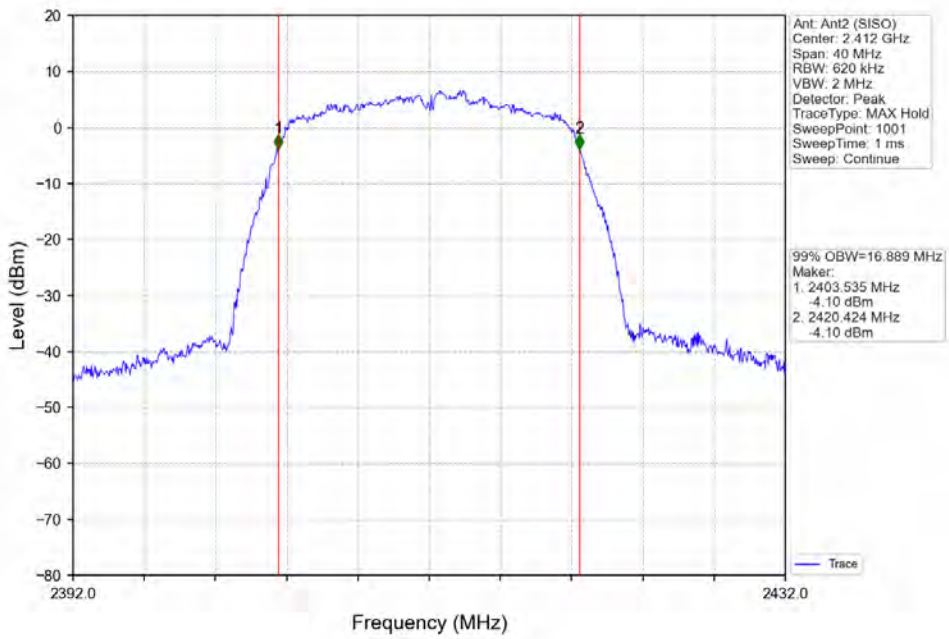
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



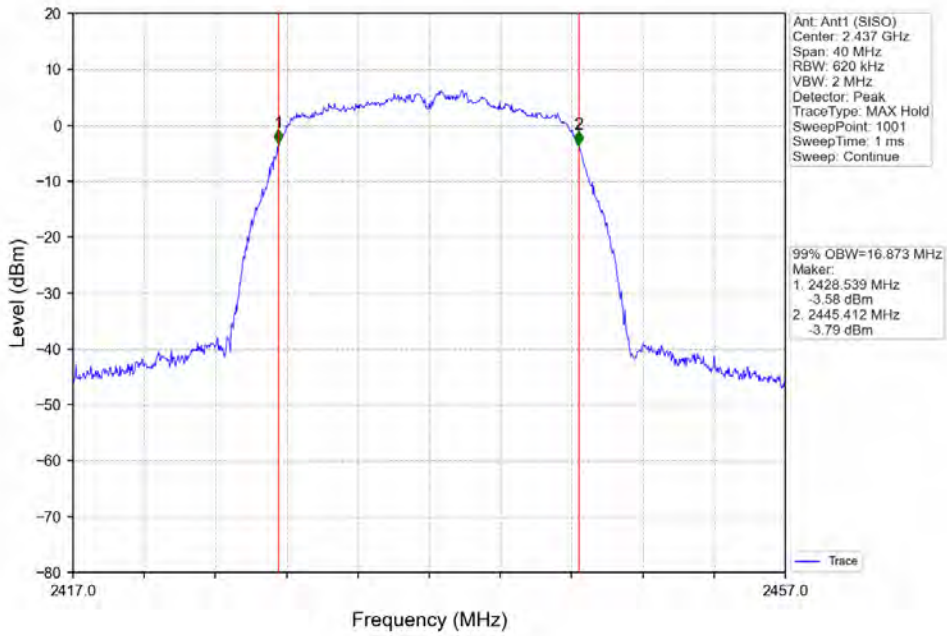
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



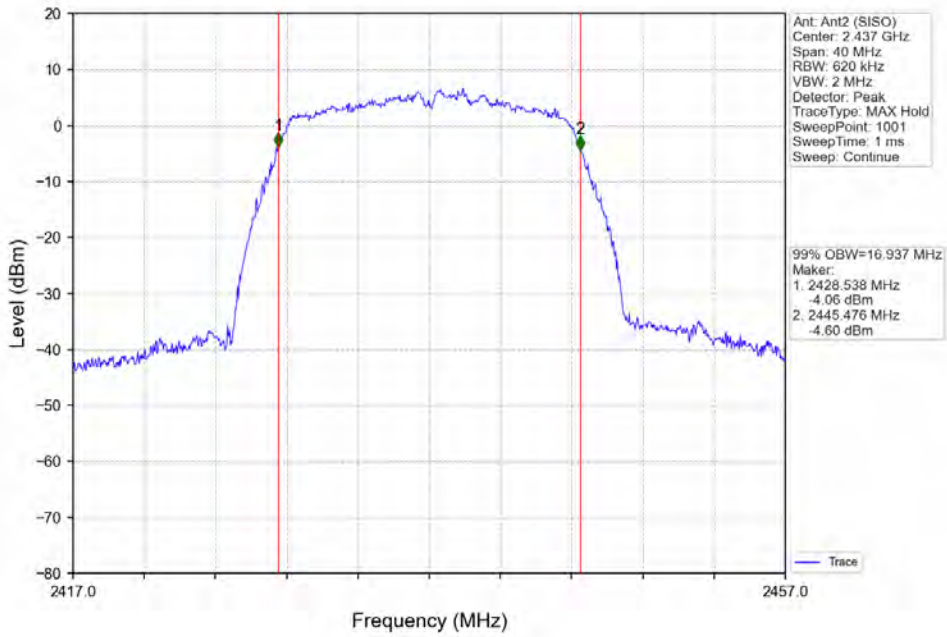
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



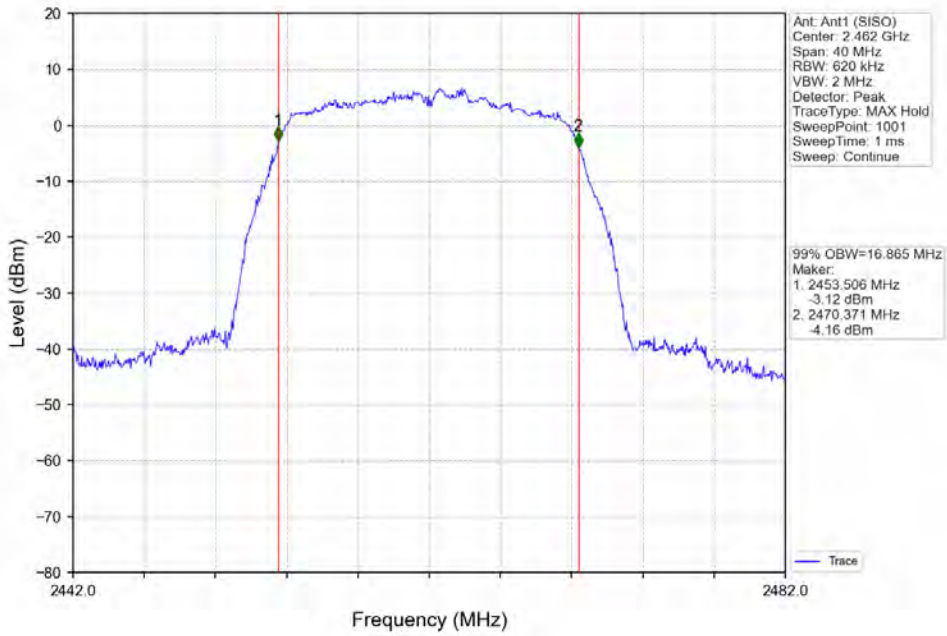
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



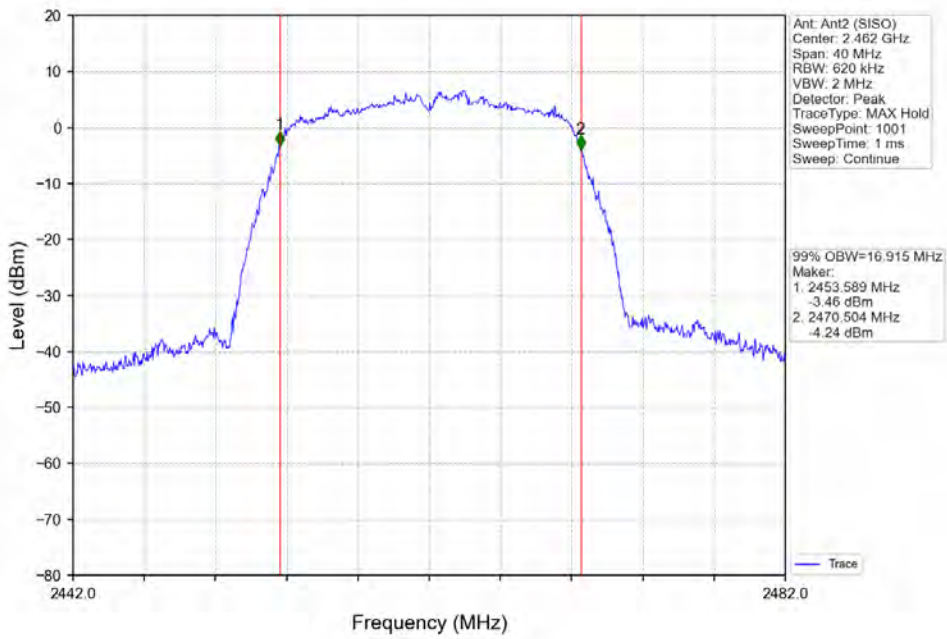
802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



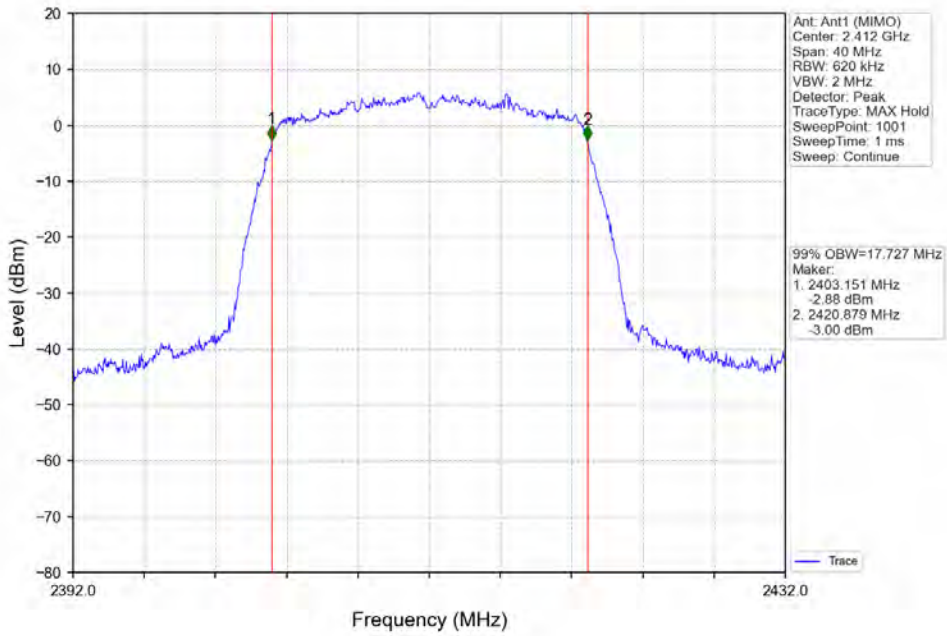
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



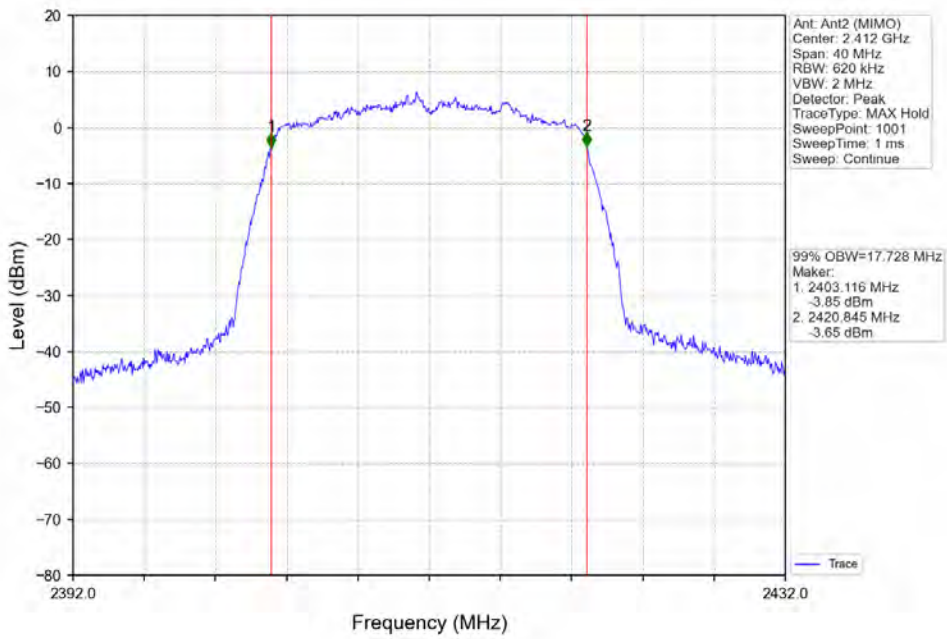
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



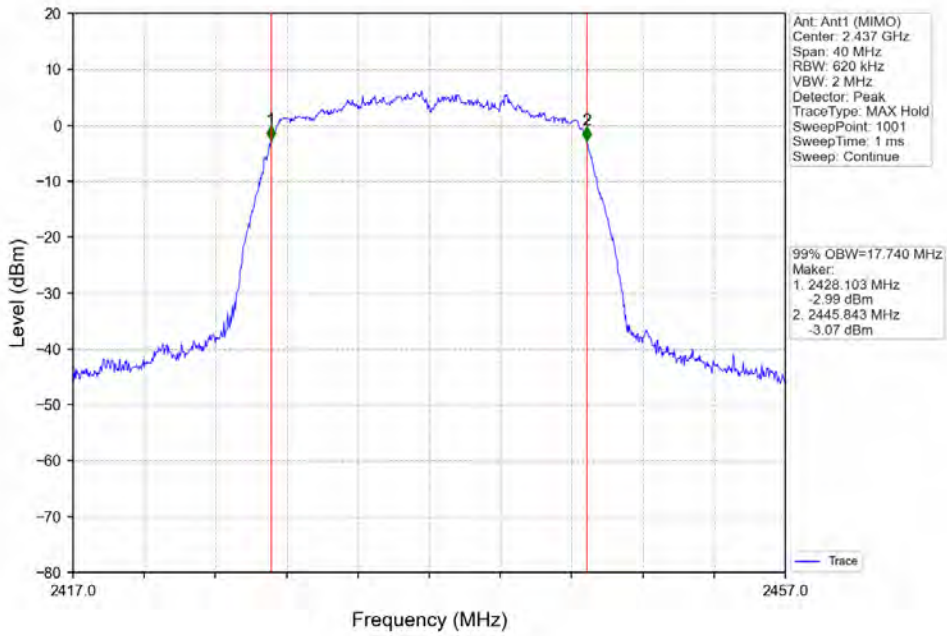
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



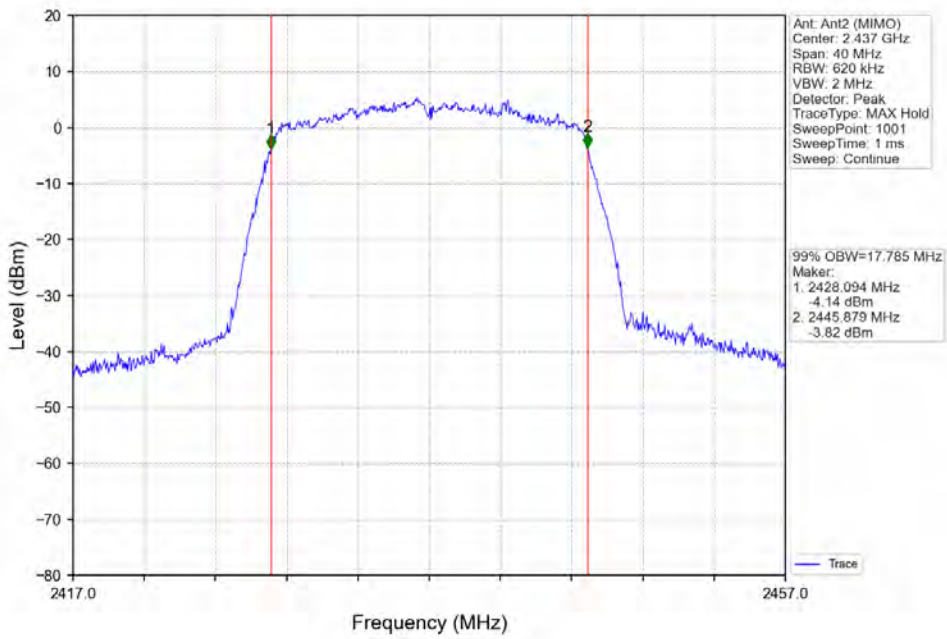
802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



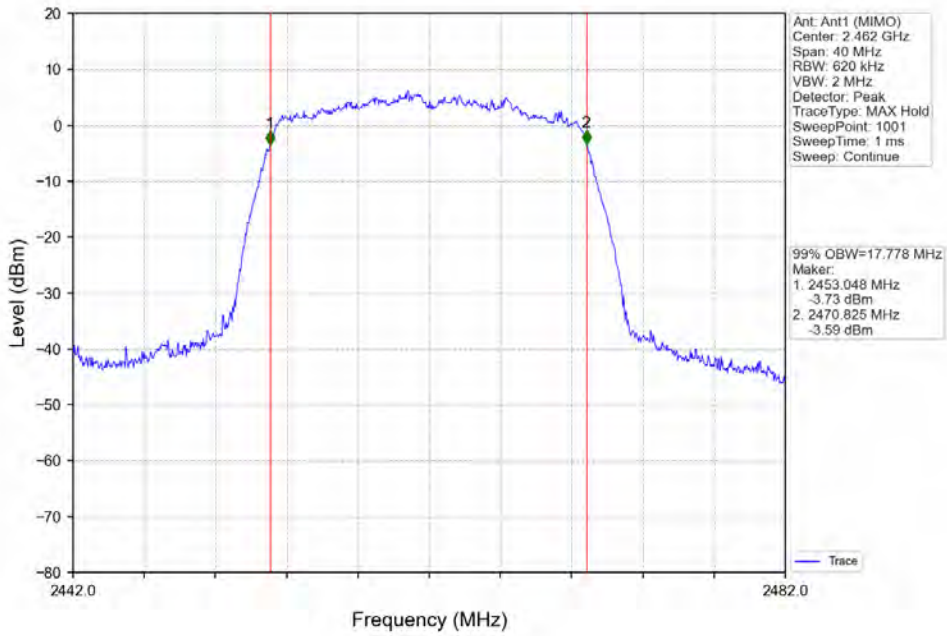
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



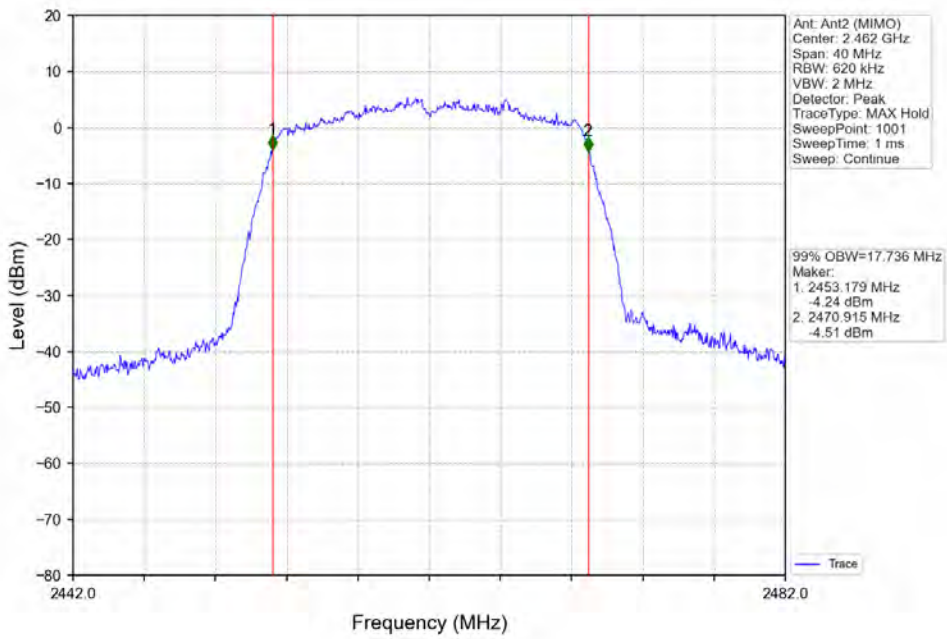
802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



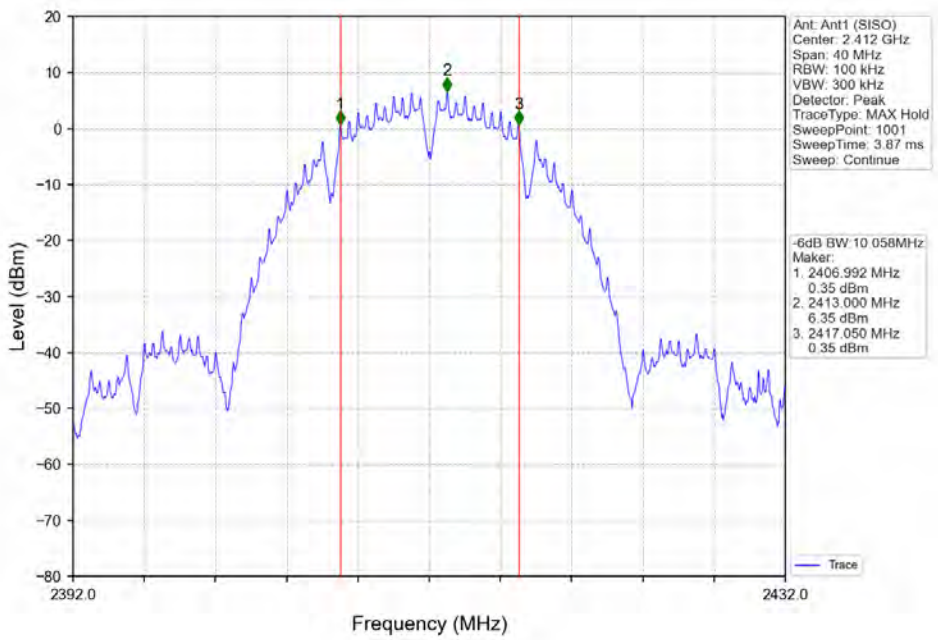
2.2 6dB BW

2.2.1 Test Result

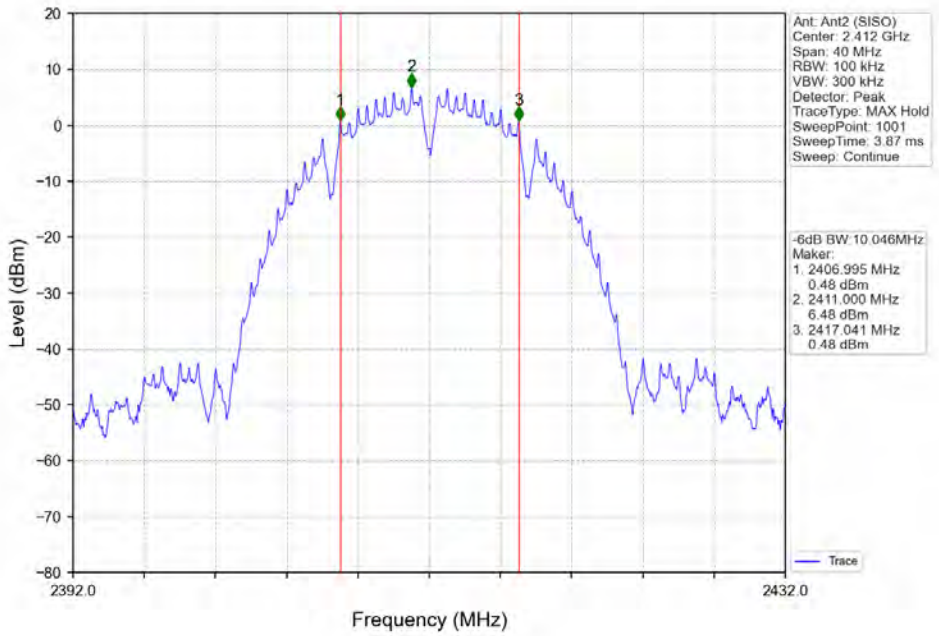
Mode	TX Type	Frequency (MHz)	Ant	6dB Bandwidth (MHz)	Limit (MHz)	Verdict
802.11b	SISO	2412	1	10.058	>=0.5	Pass
			2	10.046	>=0.5	Pass
		2437	1	9.108	>=0.5	Pass
			2	10.055	>=0.5	Pass
		2462	1	9.111	>=0.5	Pass
			2	9.104	>=0.5	Pass
802.11g	SISO	2412	1	15.144	>=0.5	Pass
			2	15.141	>=0.5	Pass
		2437	1	15.145	>=0.5	Pass
			2	15.141	>=0.5	Pass
		2462	1	15.706	>=0.5	Pass
			2	15.137	>=0.5	Pass
802.11n (HT20)	MIMO	2412	1	15.142	>=0.5	Pass
			2	15.142	>=0.5	Pass
		2437	1	15.145	>=0.5	Pass
			2	15.142	>=0.5	Pass
		2462	1	15.746	>=0.5	Pass
			2	15.443	>=0.5	Pass

2.2.2 Test Graph

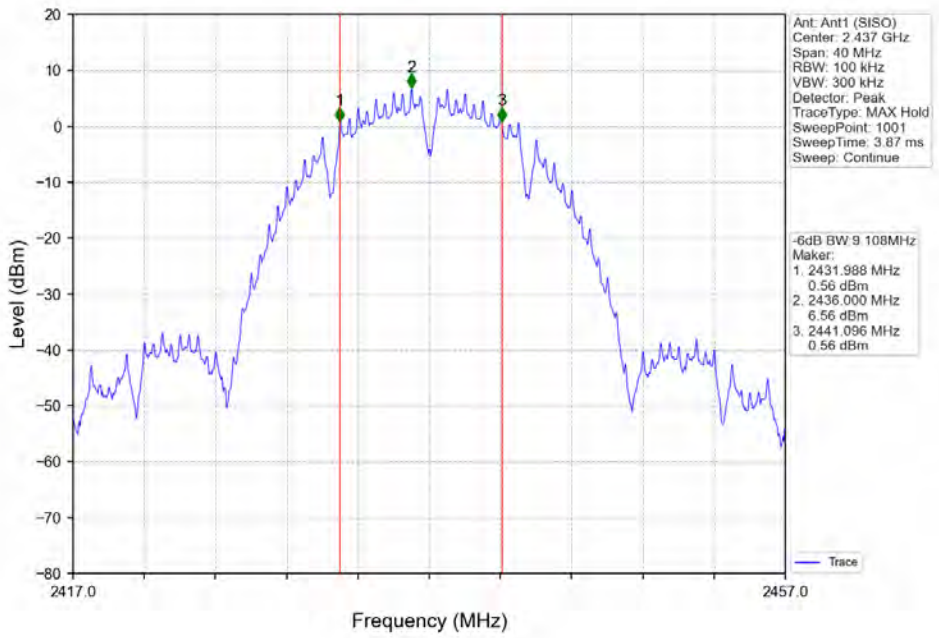
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



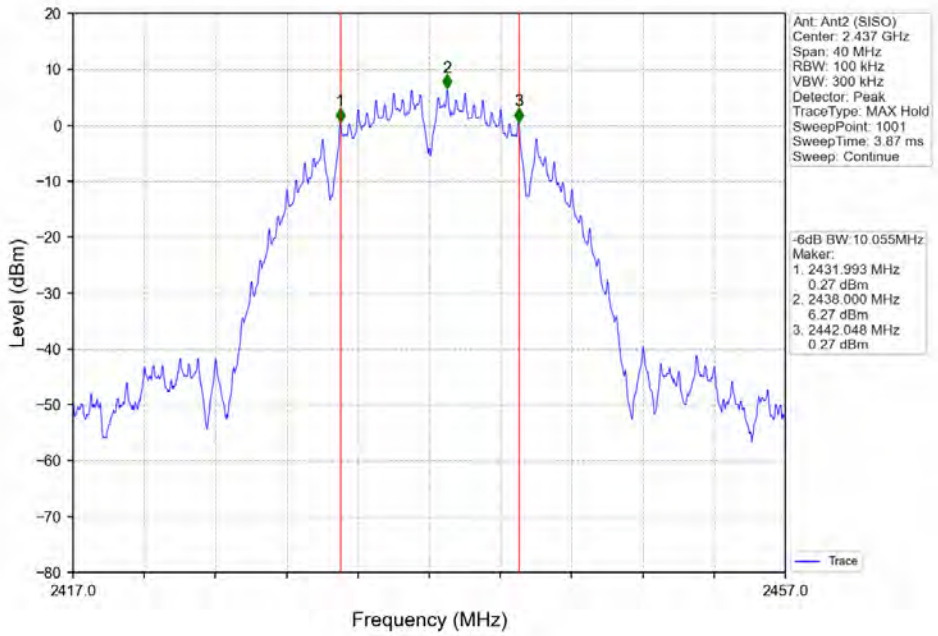
802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



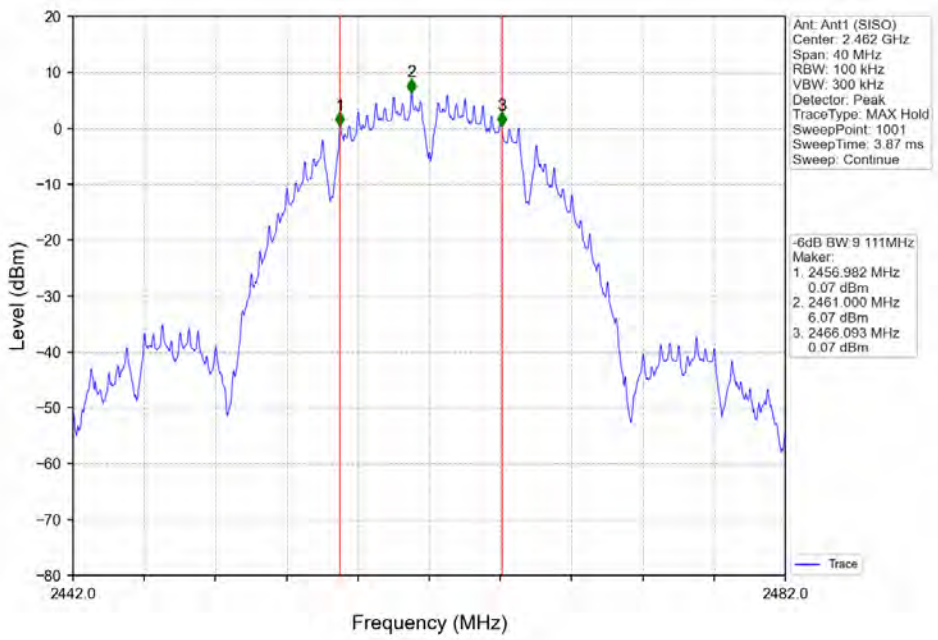
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



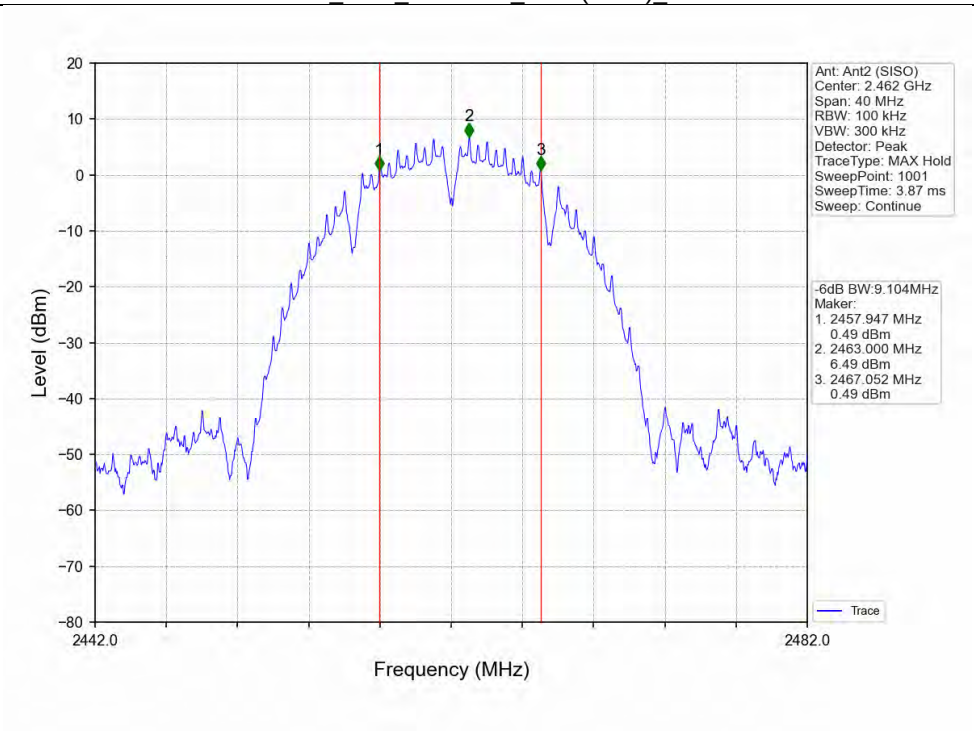
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



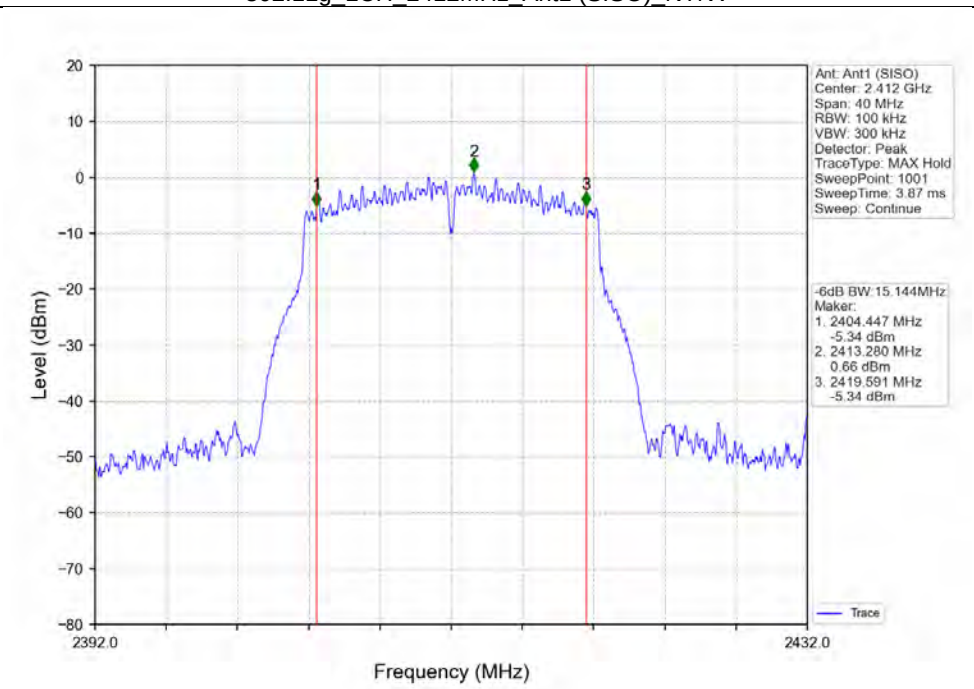
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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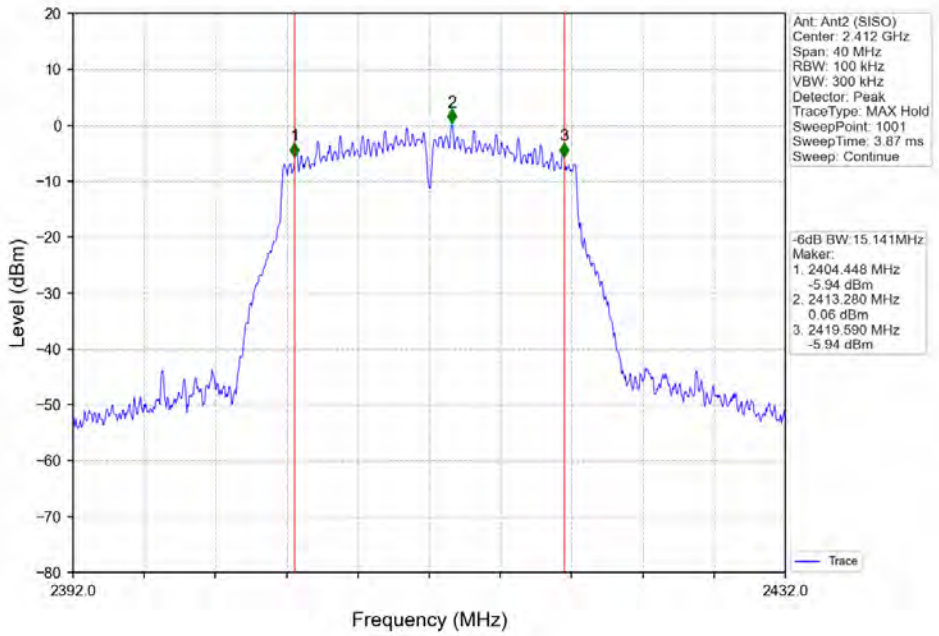
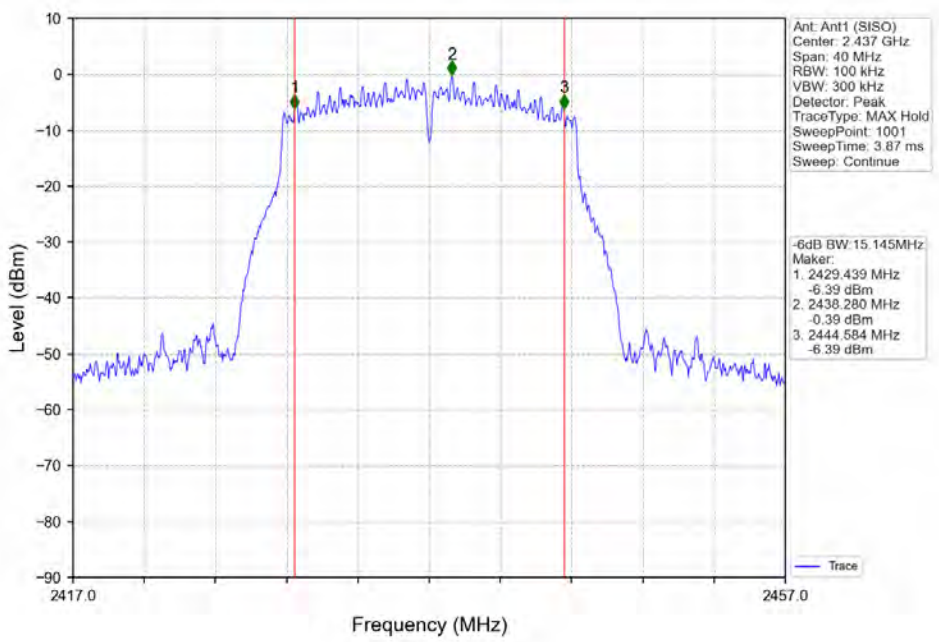


802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



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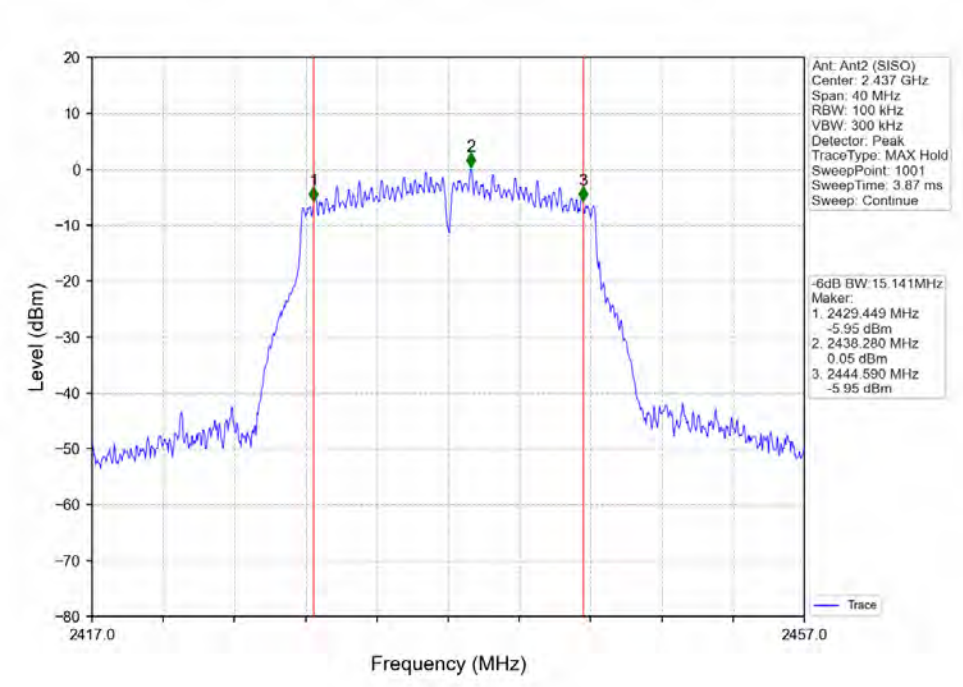

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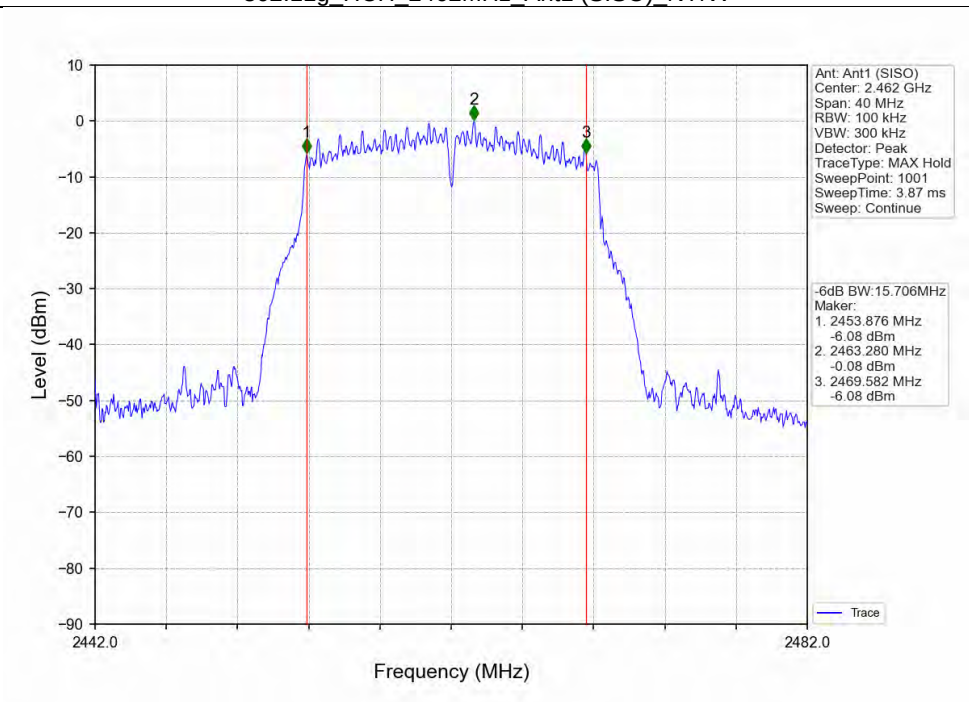
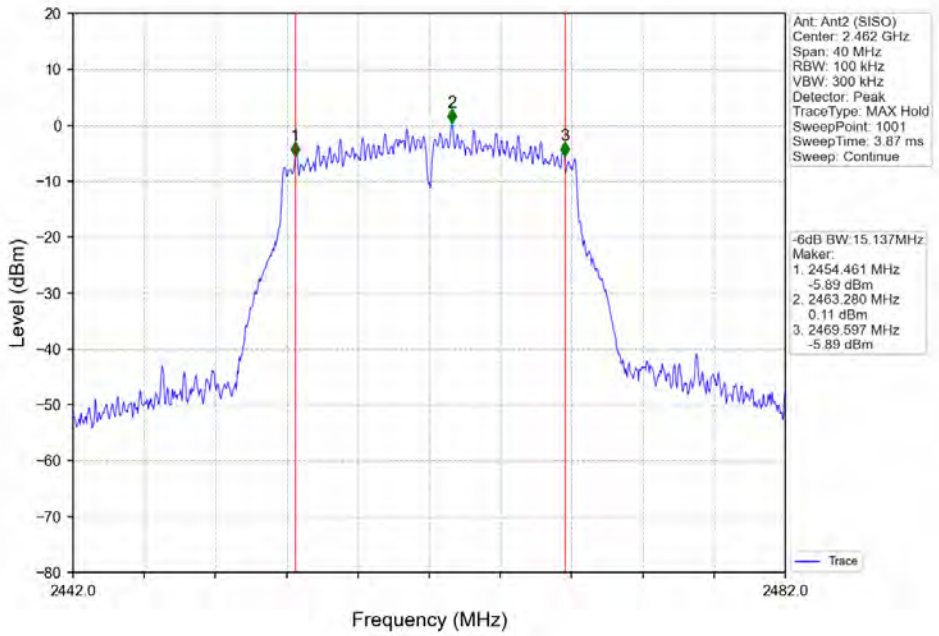
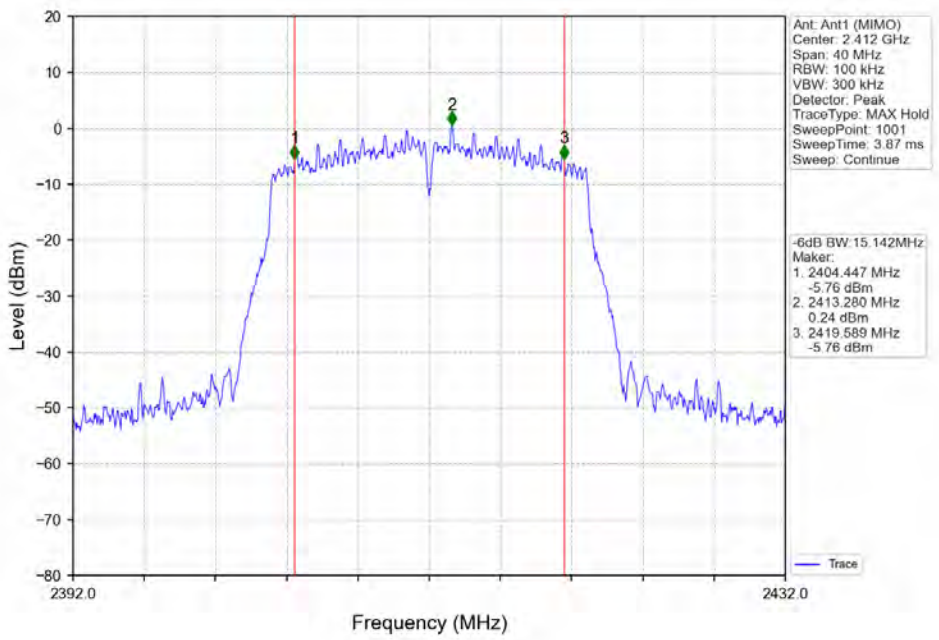


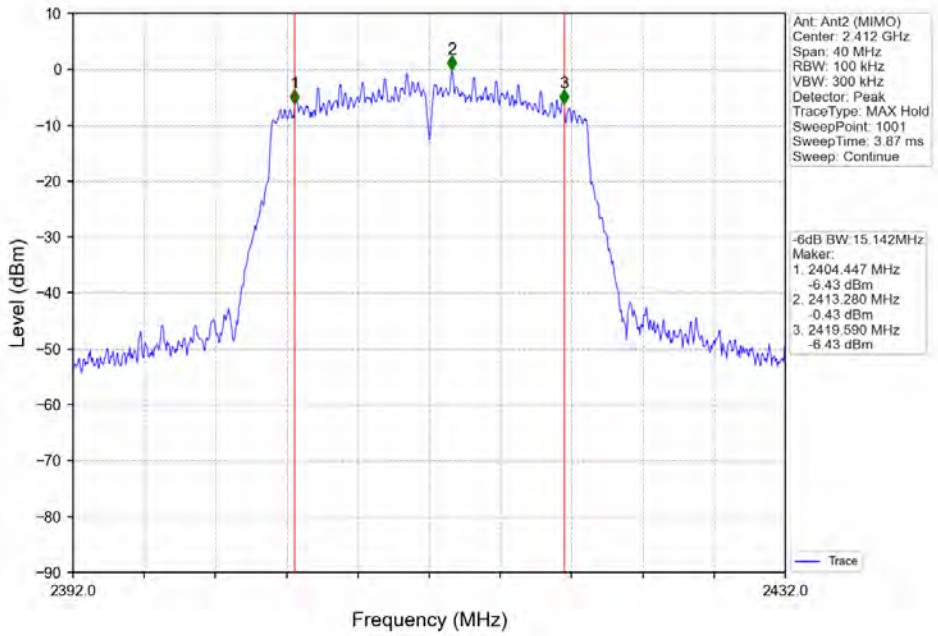
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



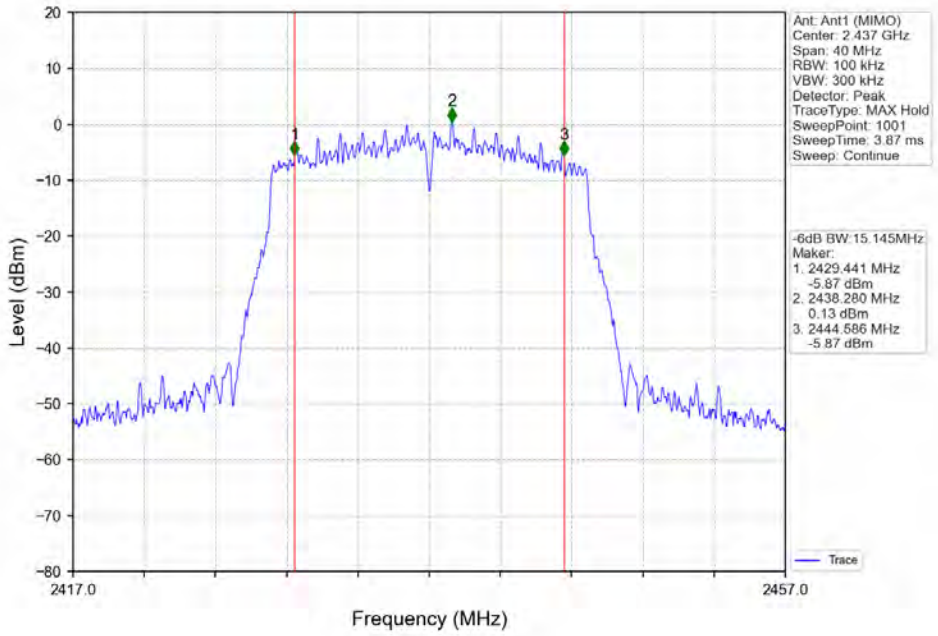
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



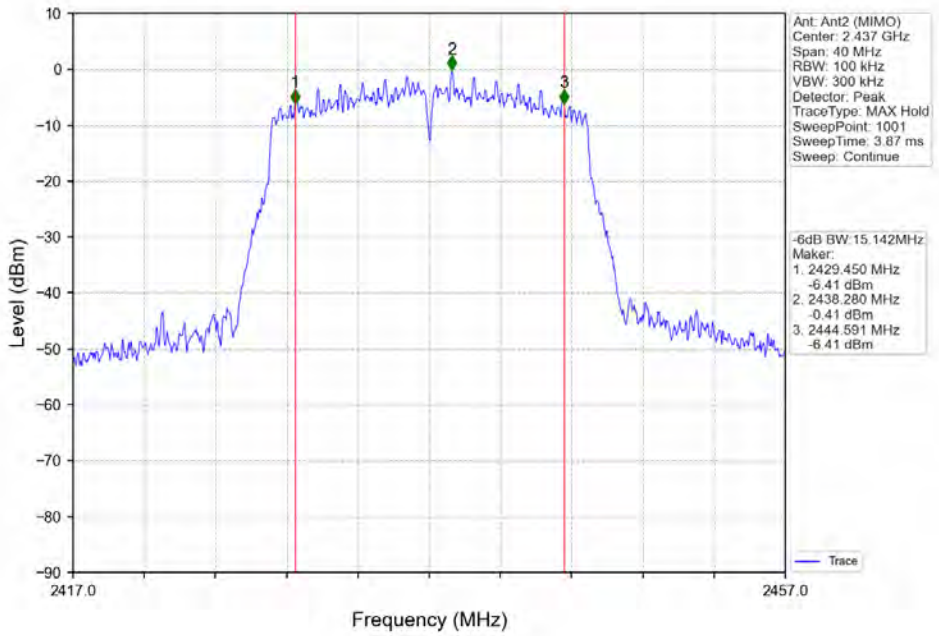
802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



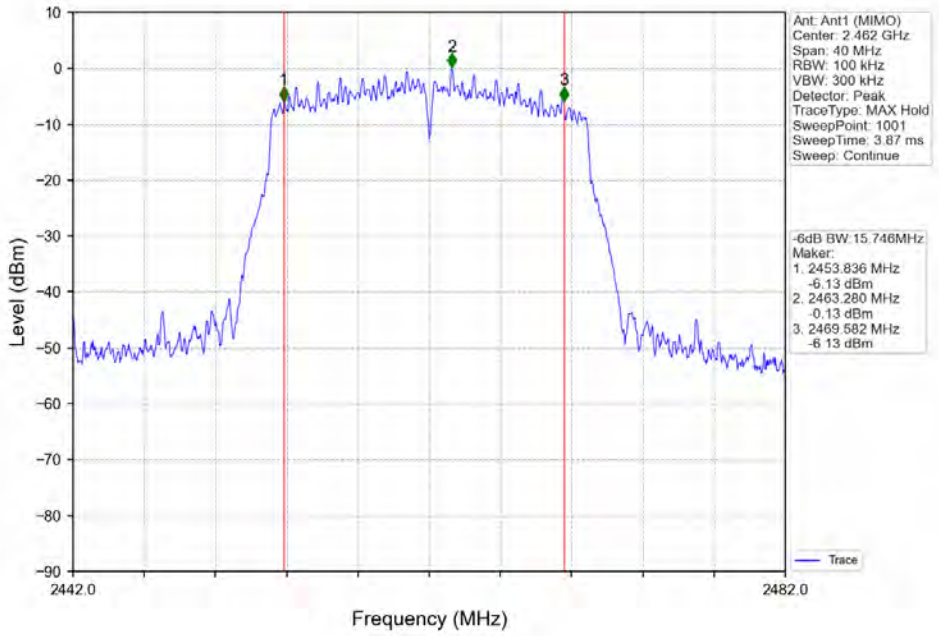
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



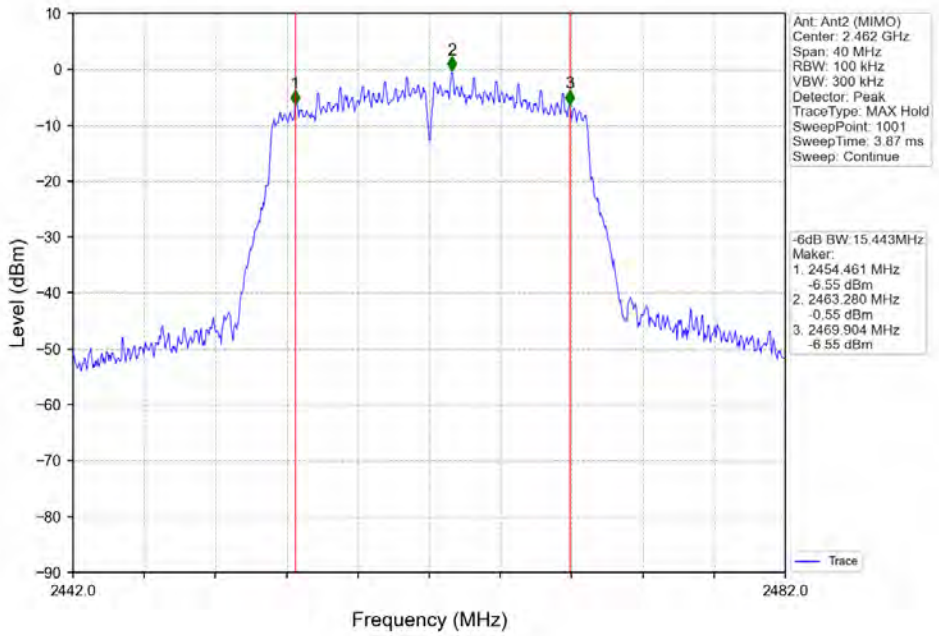
802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Measured Peak Output Power (dBm)				Verdict
			Ant1	Ant2	Sum	Limit	
802.11b	SISO	2412	17.49	17.53	/	<=30	Pass
		2437	17.45	17.38	/	<=30	Pass
		2462	17.14	17.31	/	<=30	Pass
802.11g	SISO	2412	18.59	17.94	/	<=30	Pass
		2437	17.55	17.85	/	<=30	Pass
		2462	17.91	17.82	/	<=30	Pass
802.11n (HT20)	MIMO	2412	17.48	16.85	20.19	<=29.99	Pass
		2437	17.42	16.72	20.09	<=29.99	Pass
		2462	17.25	16.63	19.96	<=29.99	Pass
Note1: Antenna Gain: Ant1: 3.00dBi; Ant2: 3.00dBi; Note2: Directional Gain: Uncorrelated(Directional Gain = Ant Gain)							

4. Maximum Power Spectral Density

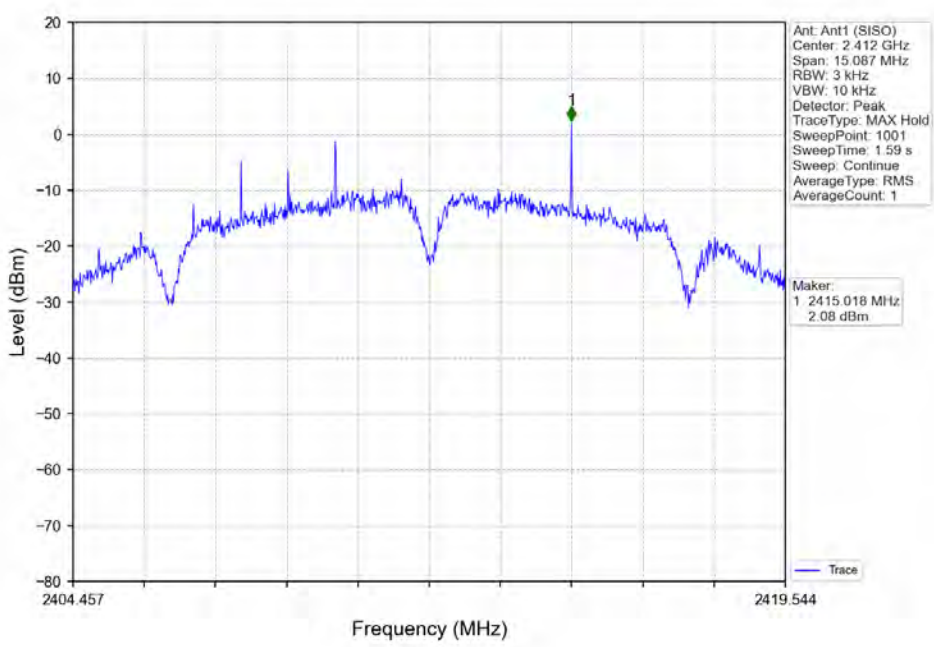
4.1 PSD

4.1.1 Test Result

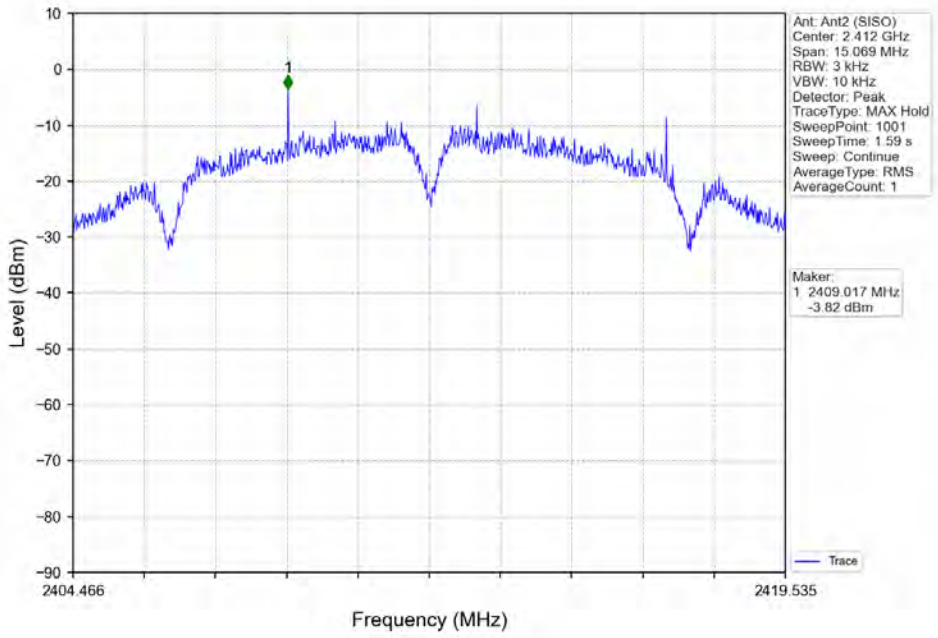
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)				Verdict
			Ant1	Ant2	Sum	Limit	
802.11b	SISO	2412	2.08	-3.82	/	<=8	Pass
		2437	6.01	0.51	/	<=8	Pass
		2462	-4.45	-8.06	/	<=8	Pass
802.11g	SISO	2412	-15.56	-16.24	/	<=8	Pass
		2437	-16.65	-15.37	/	<=8	Pass
		2462	-15.81	-16.24	/	<=8	Pass
802.11n (HT20)	MIMO	2412	-15.79	-16.69	-13.89	<=7.99	Pass
		2437	-16.32	-17.13	-14.14	<=7.99	Pass
		2462	-17.13	-15.83	-14.16	<=7.99	Pass
Note1: Antenna Gain: Ant1: 3.00dBi; Ant2: 3.00dBi;							

4.1.2 Test Graph

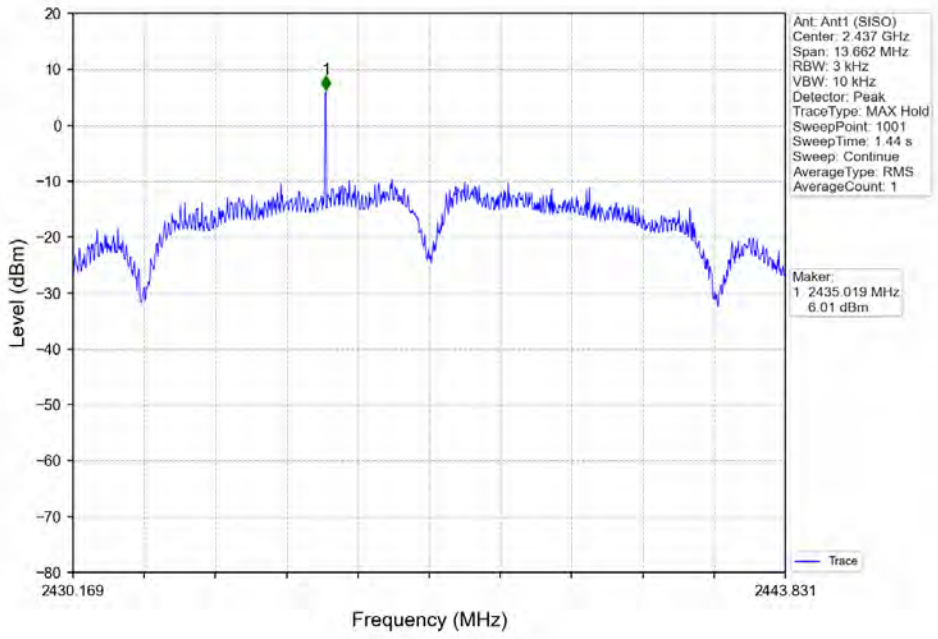
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



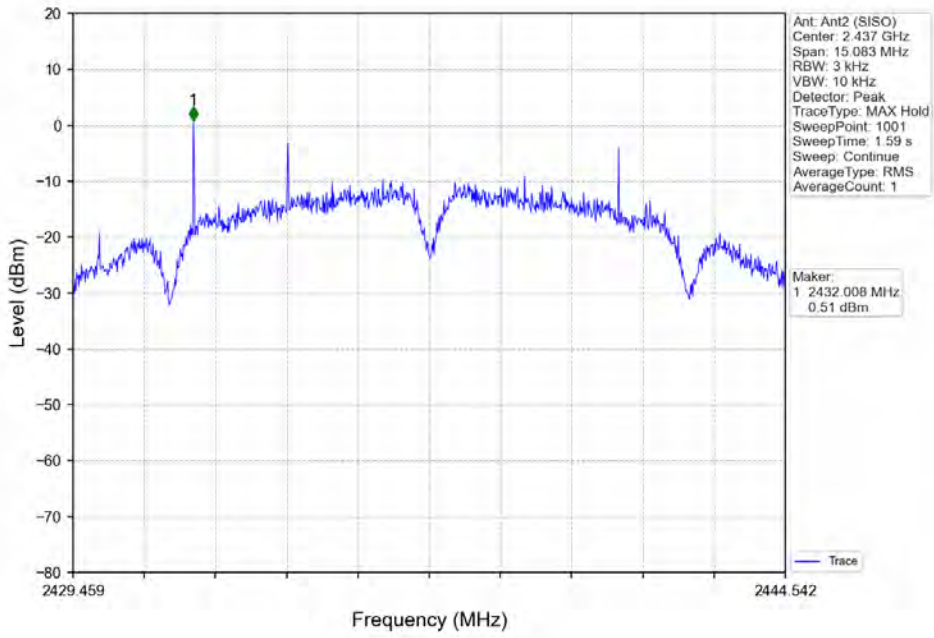
802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



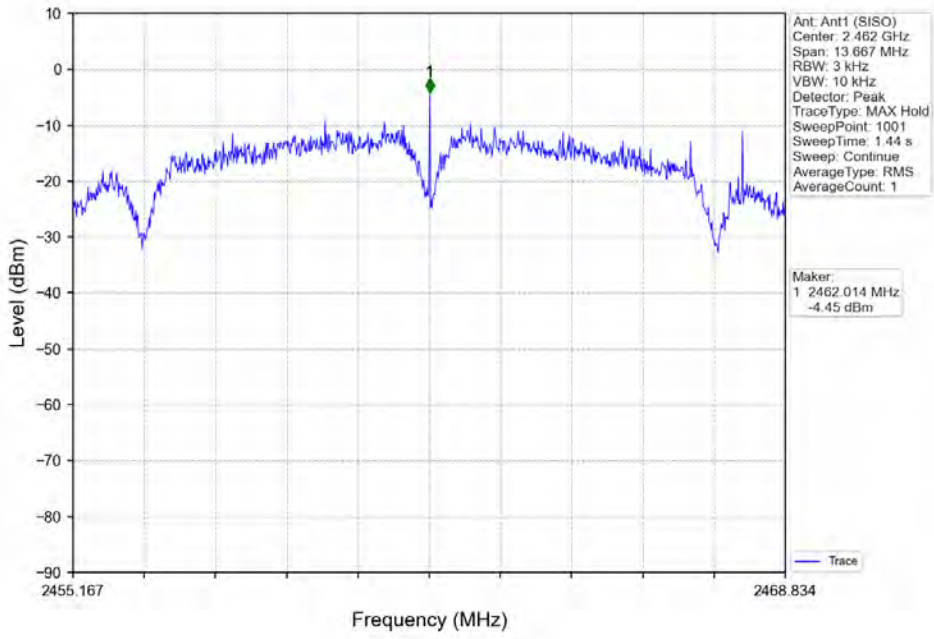
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



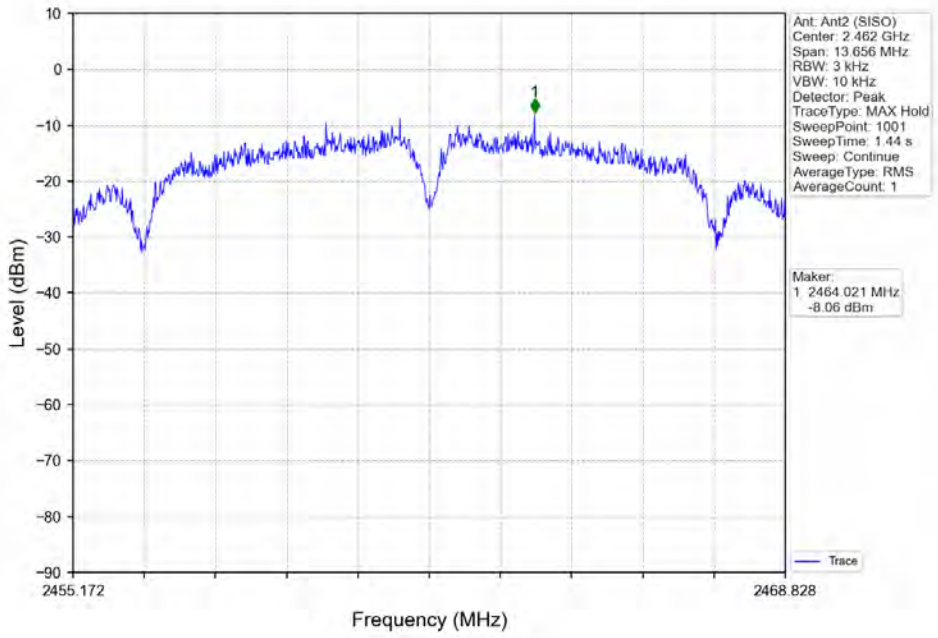
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



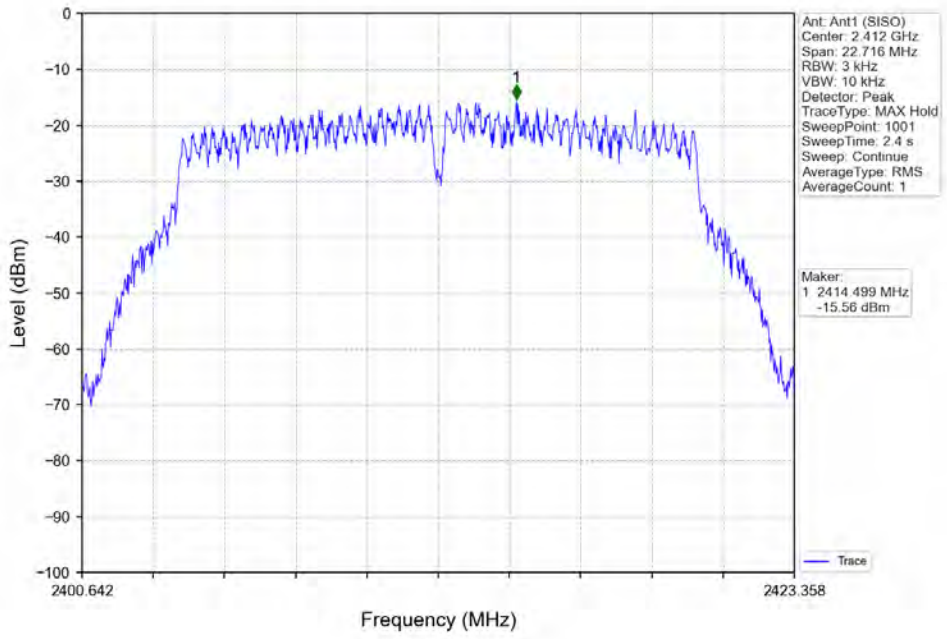
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



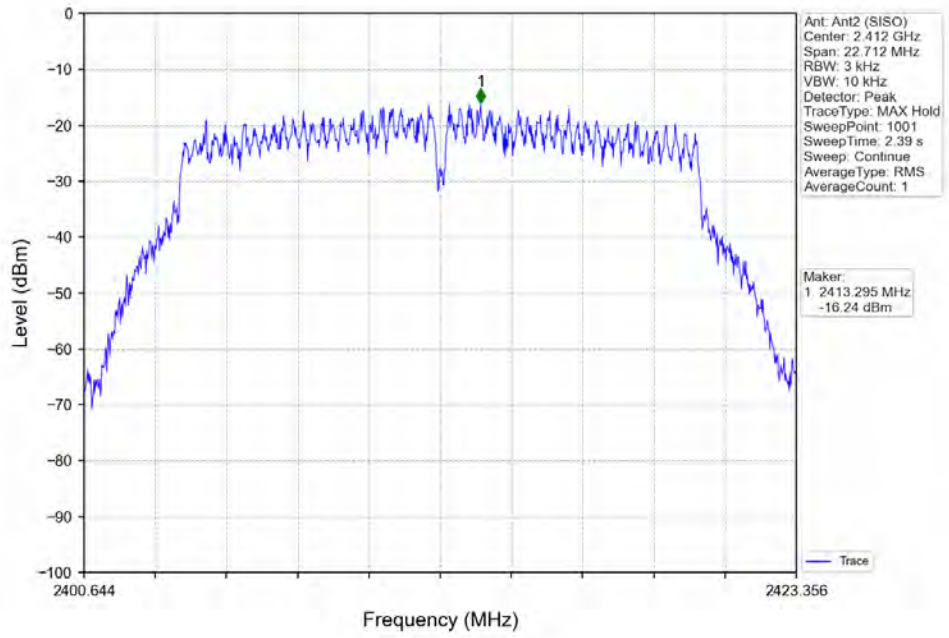
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



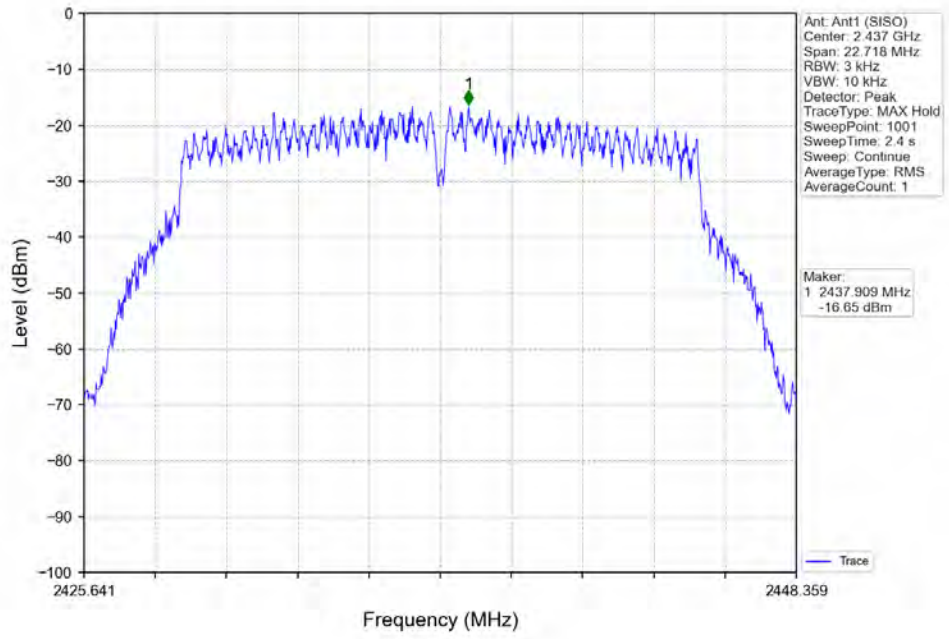
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



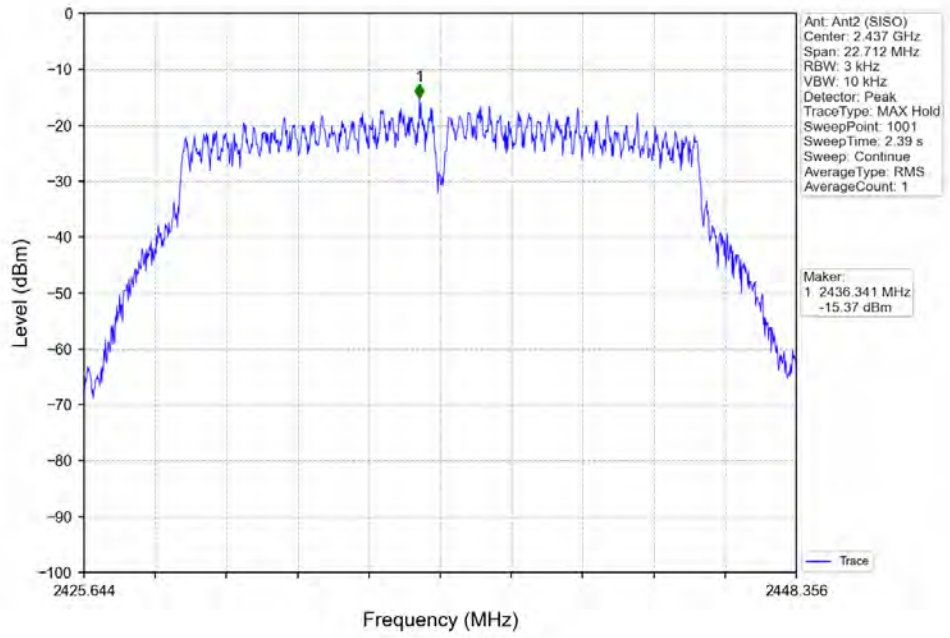
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



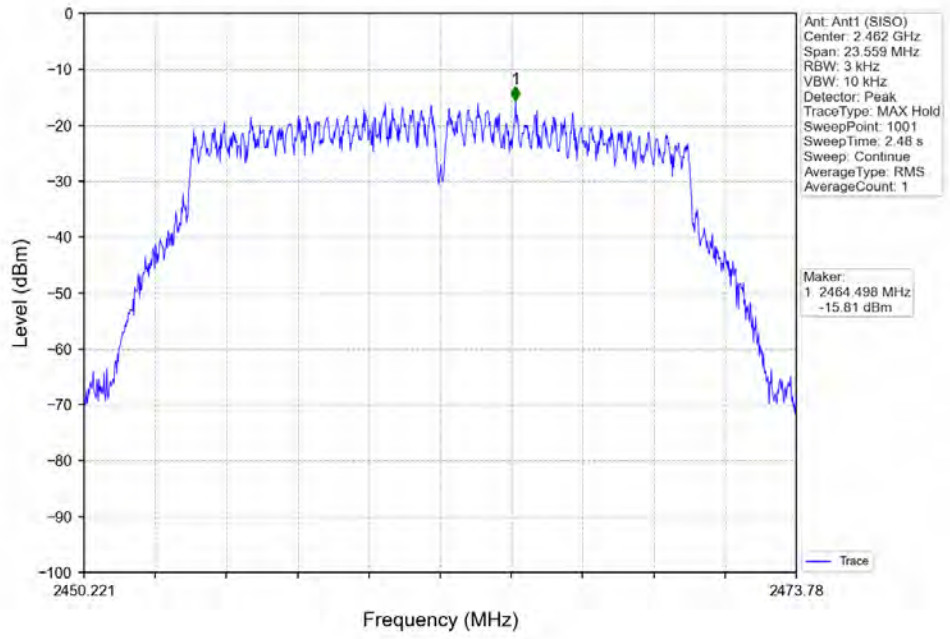
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



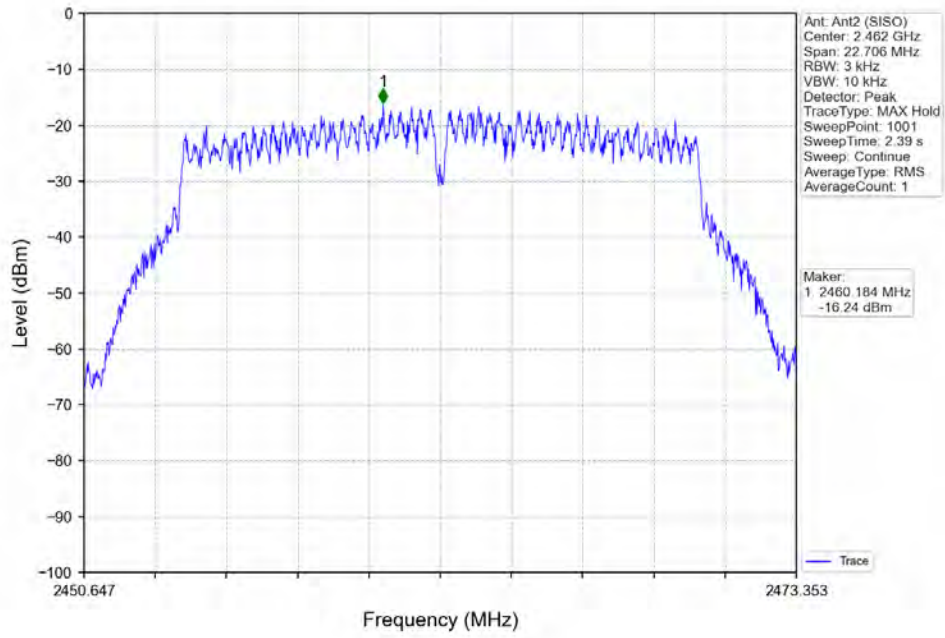
802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



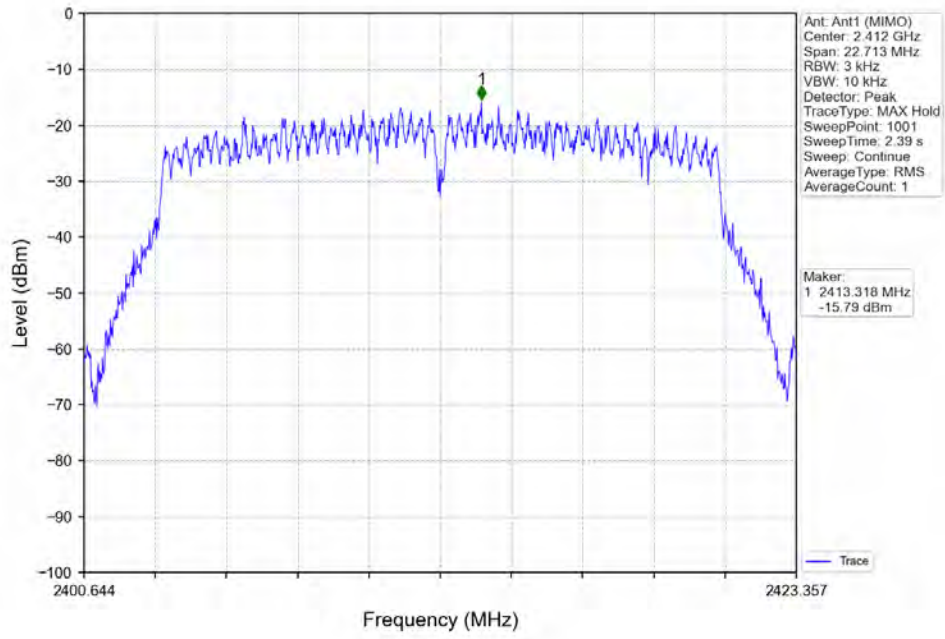
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



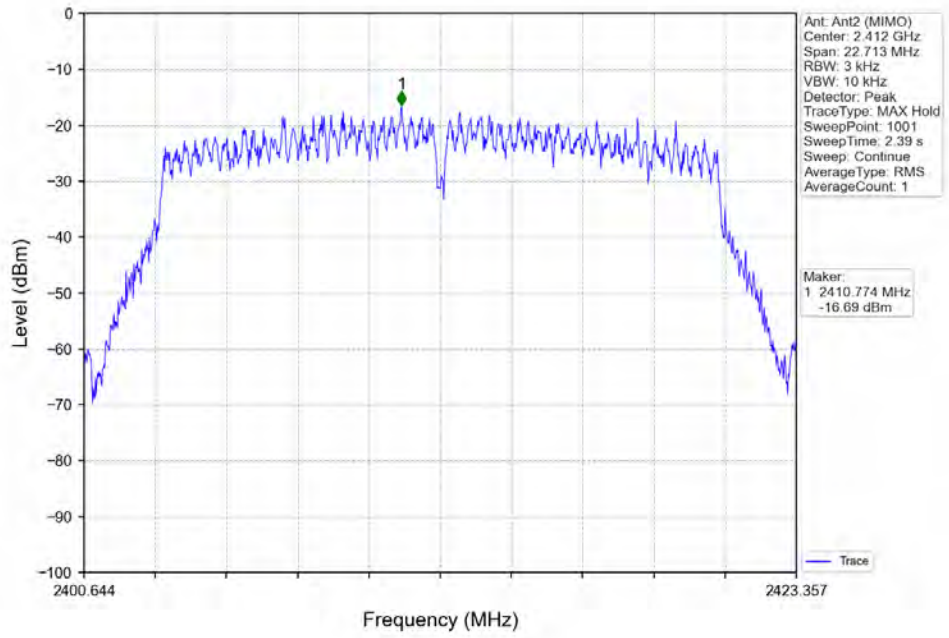
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



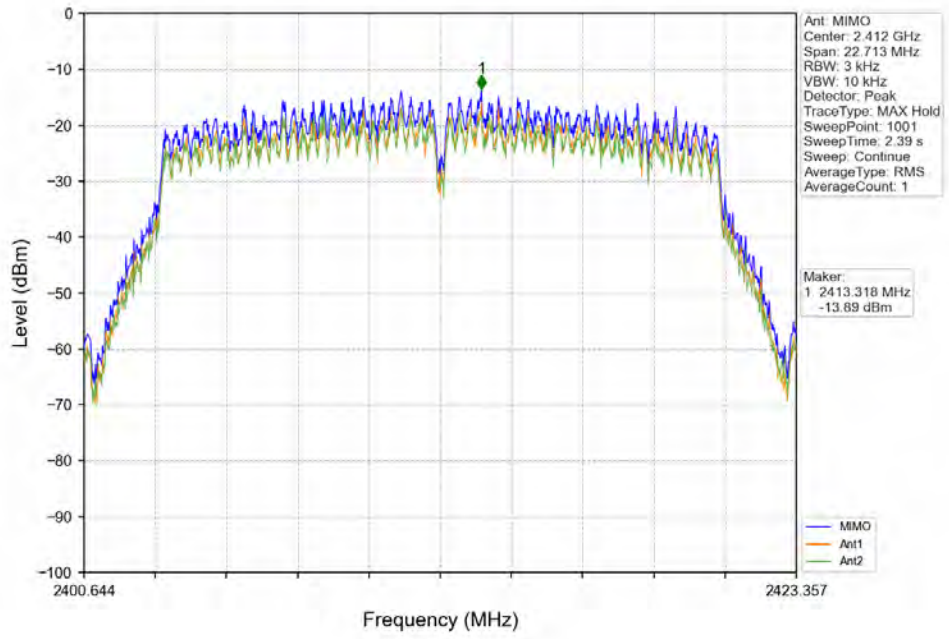
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



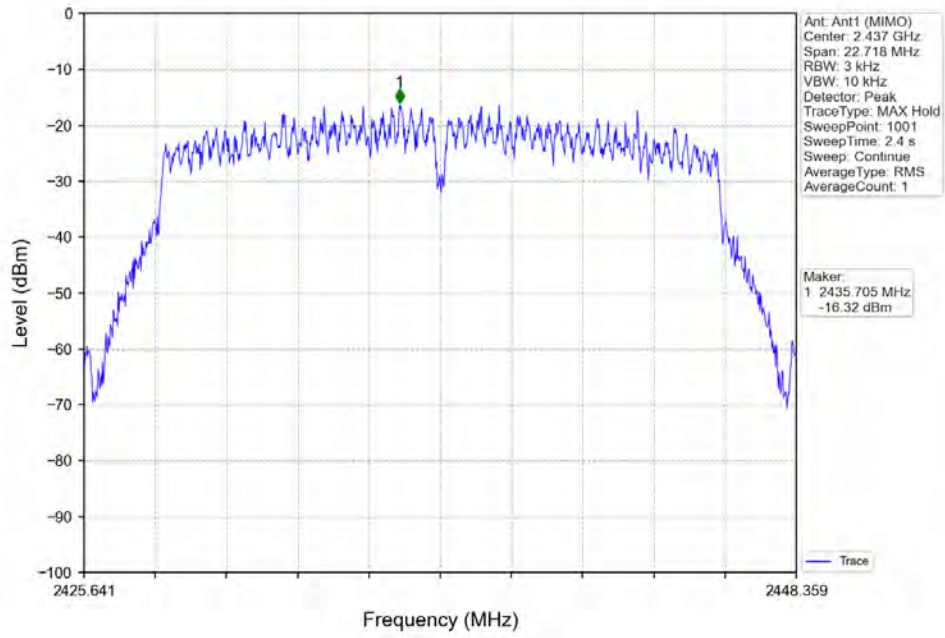
802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



802.11n(HT20)_LCH_2412MHz_MIMO_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



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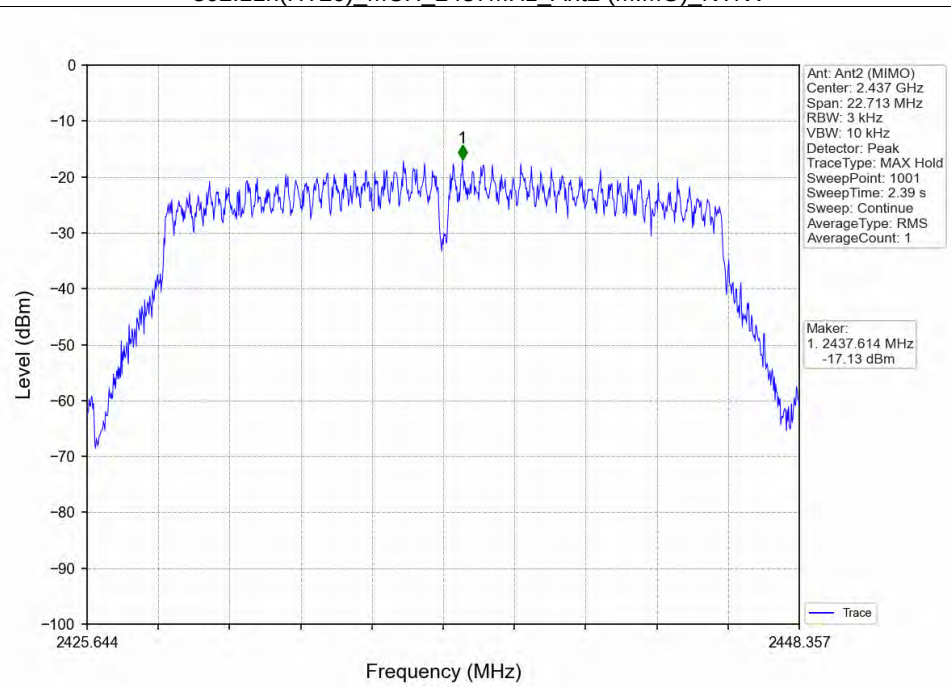
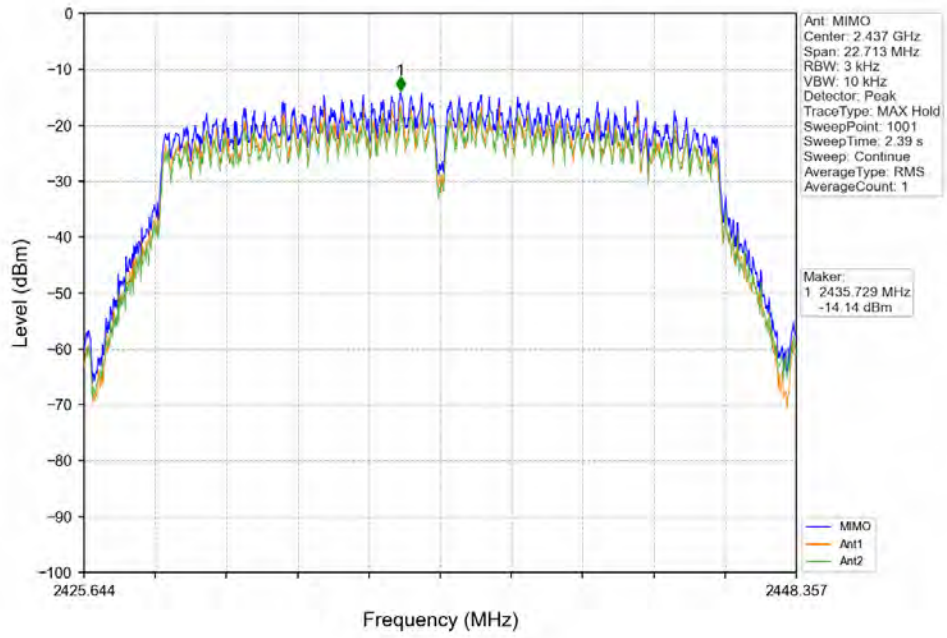
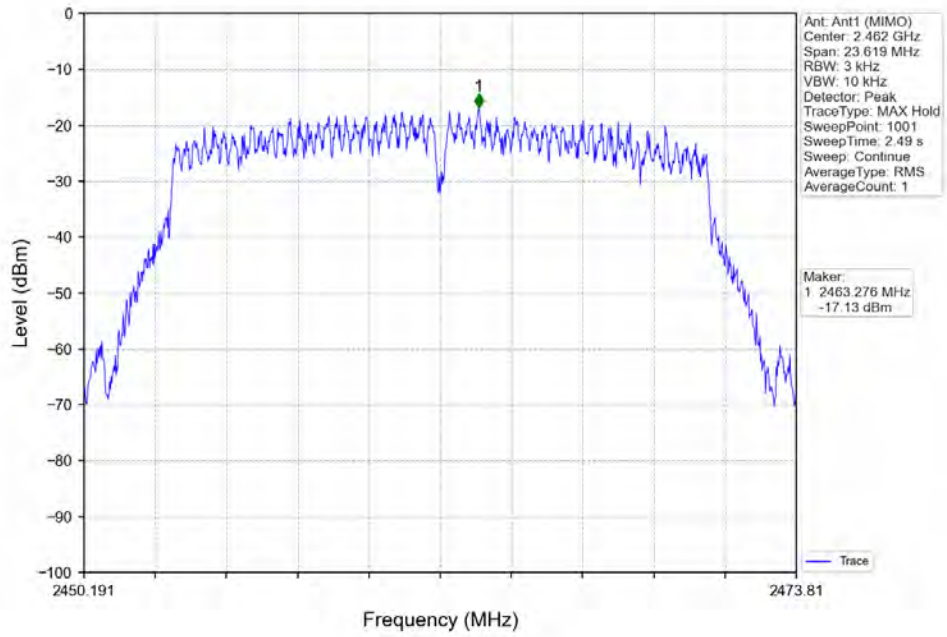


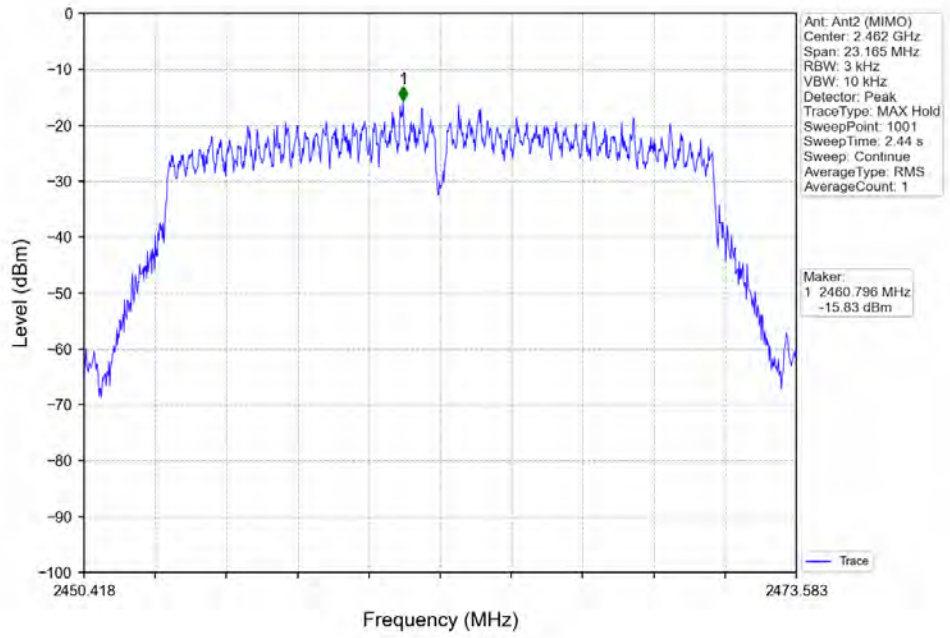
802.11n(HT20)_MCH_2437MHz_MIMO_NTNV



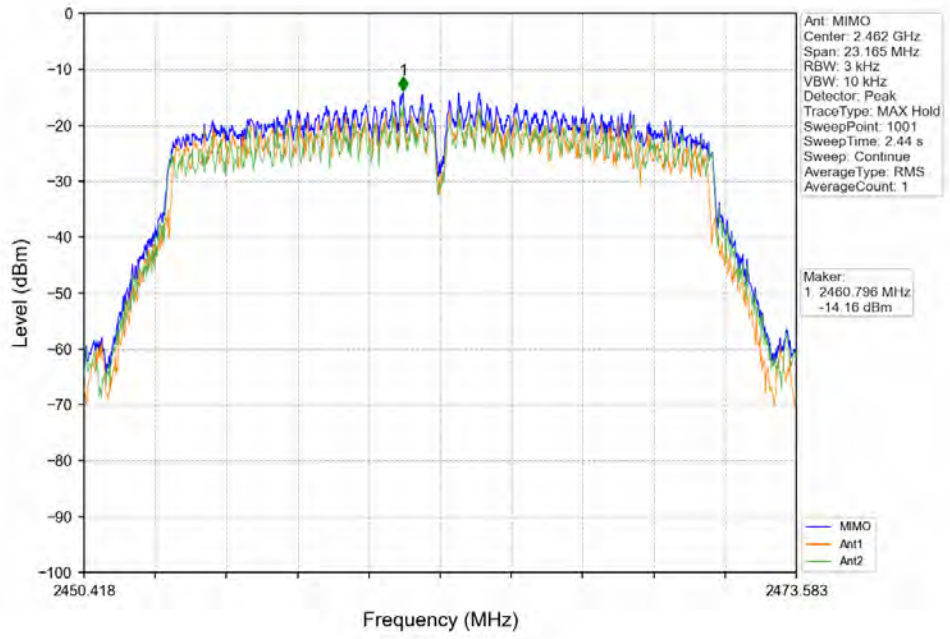
802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_MIMO_NTNV



5. Unwanted Emissions In Non-restricted Frequency Bands

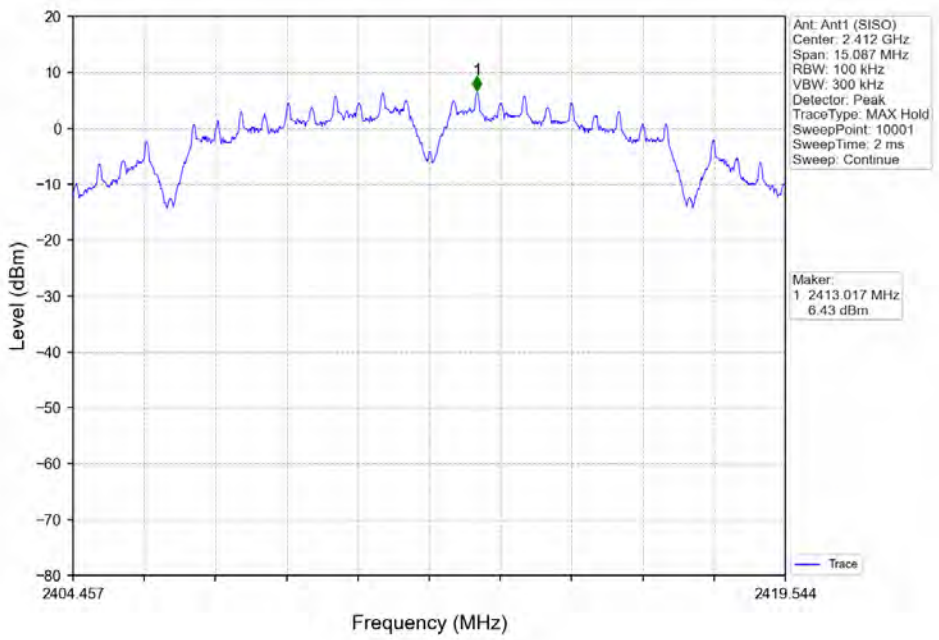
5.1 Ref

5.1.1 Test Result

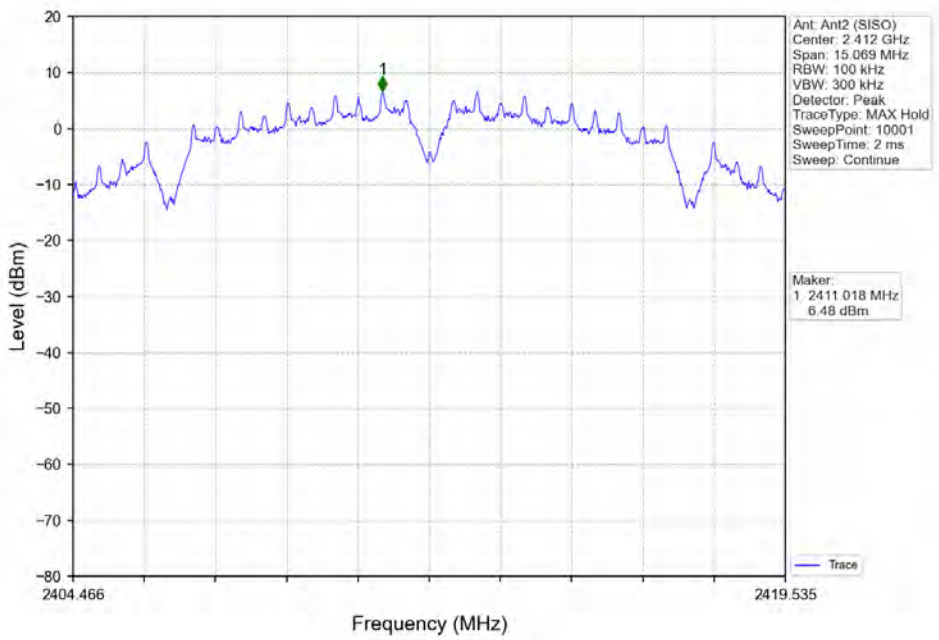
Mode	TX Type	Frequency (MHz)	Ant	Level of Reference (dBm)
802.11b	SISO	2412	1	6.43
			2	6.48
		2437	1	6.55
			2	6.28
		2462	1	6.09
			2	6.50
802.11g	SISO	2412	1	0.52
			2	-0.05
		2437	1	-0.53
			2	-0.11
		2462	1	-0.17
			2	-0.06
802.11n (HT20)	MIMO	2412	1	0.11
			2	-0.62
		2437	1	0.10
			2	-0.61
		2462	1	-0.29
			2	-0.69
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 Test Graph

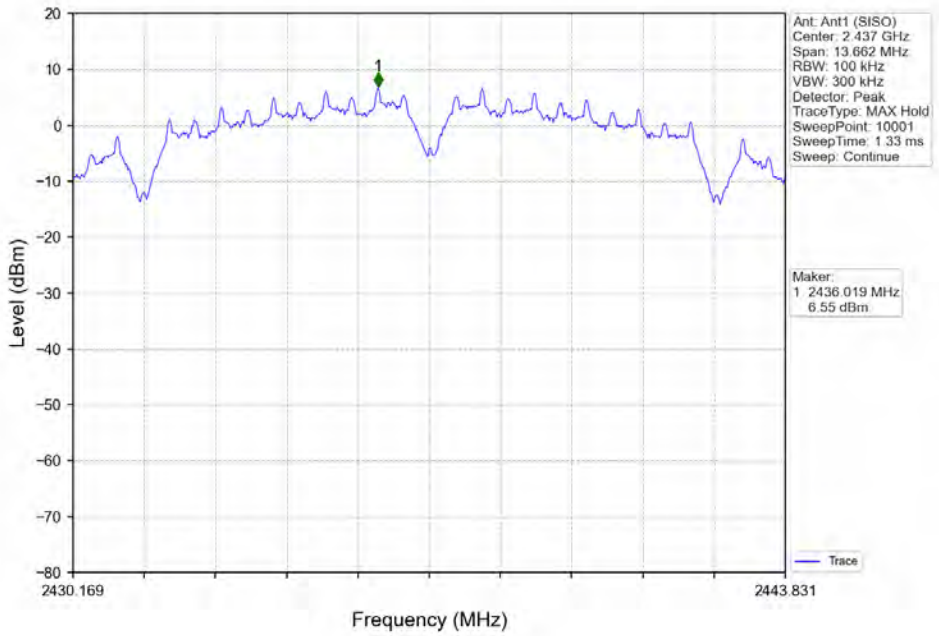
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



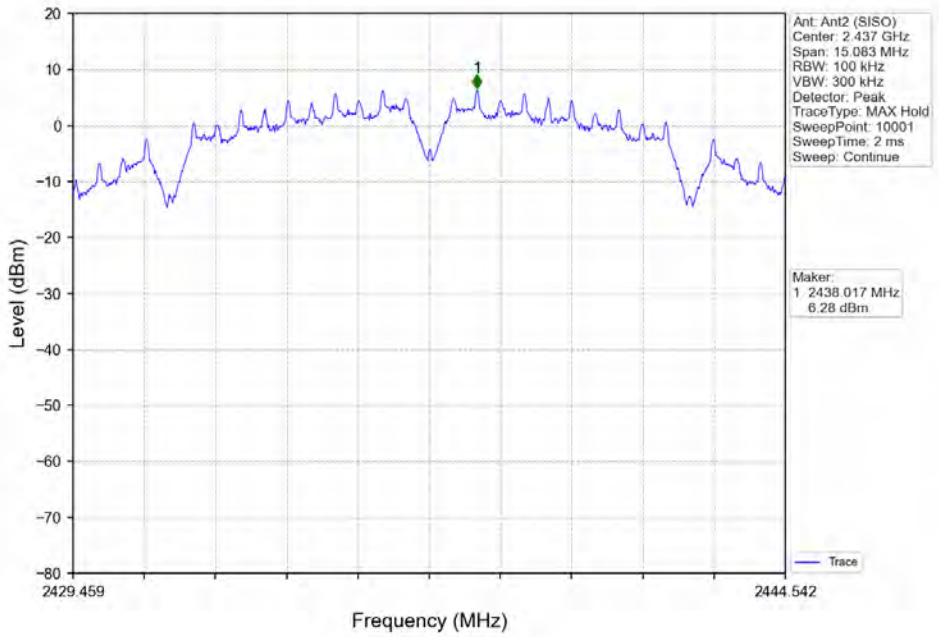
802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



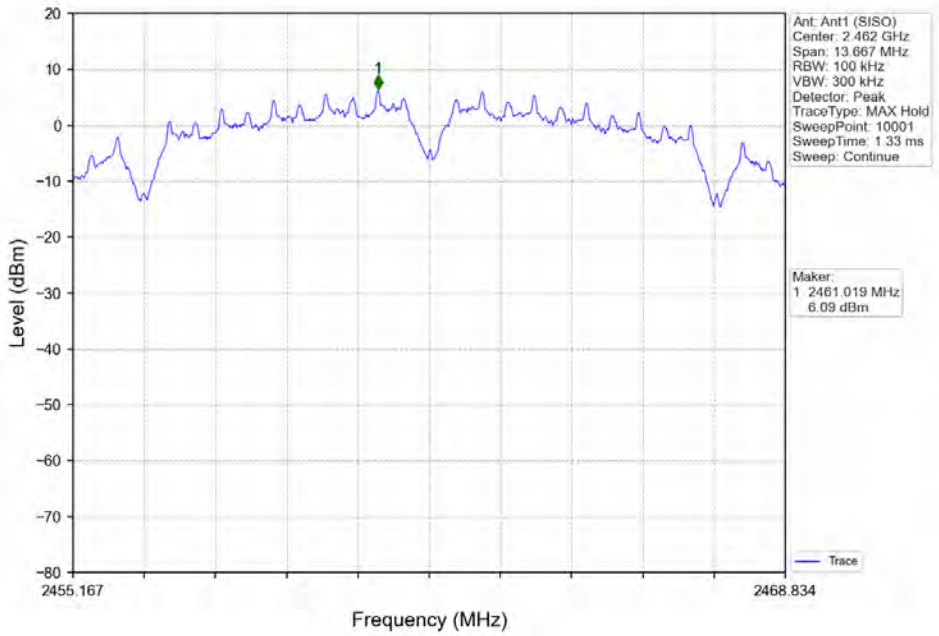
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



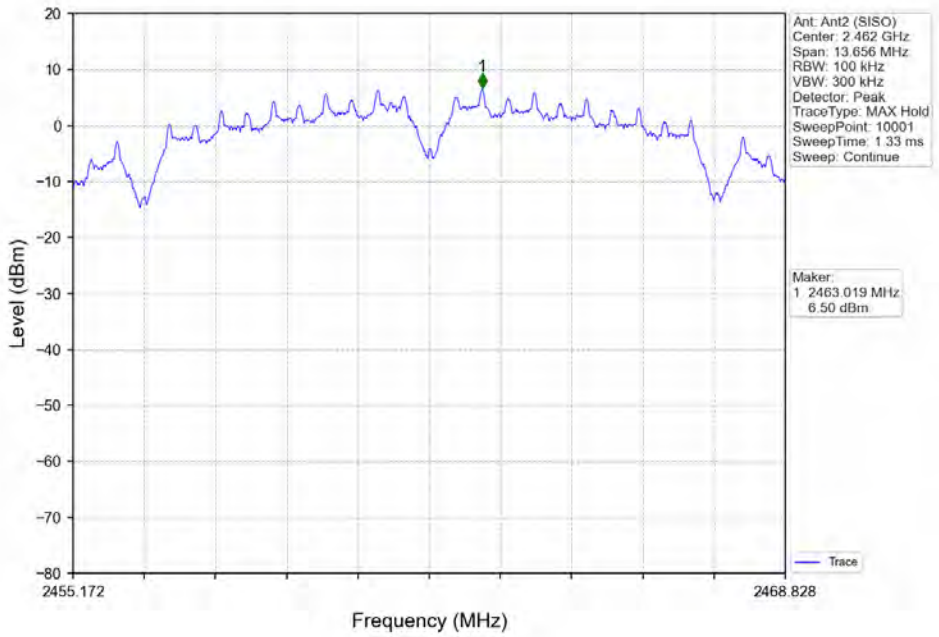
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



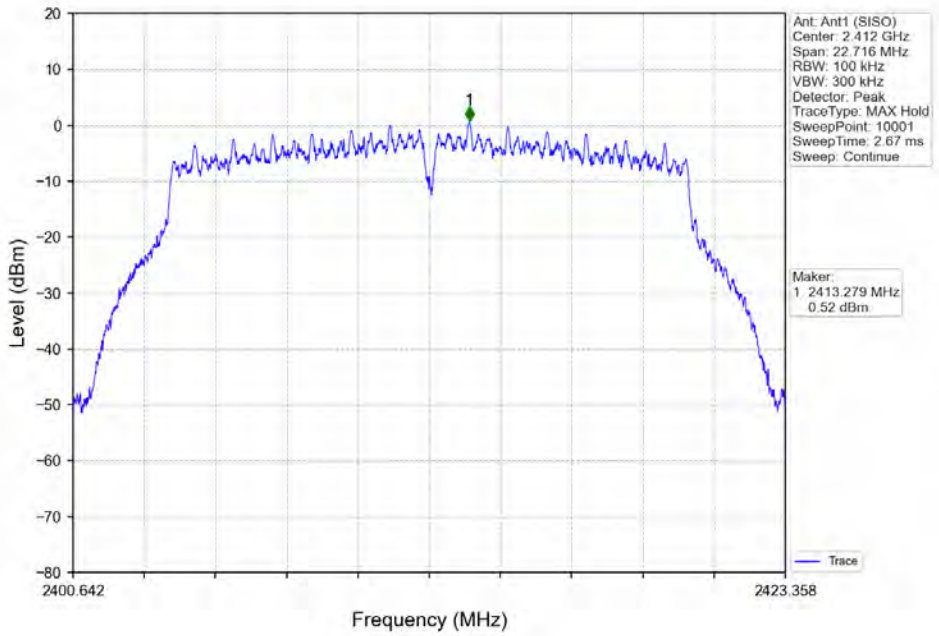
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



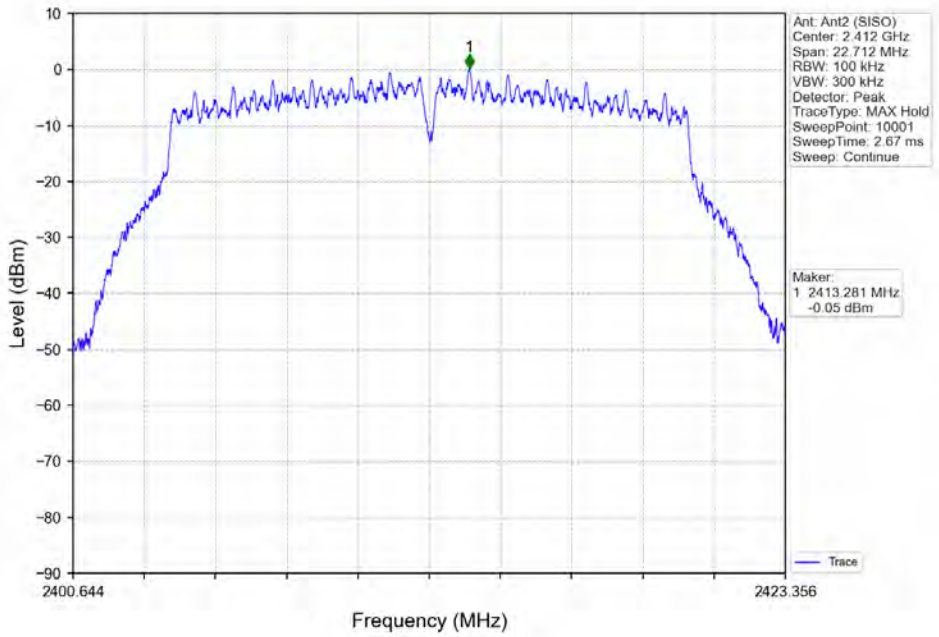
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



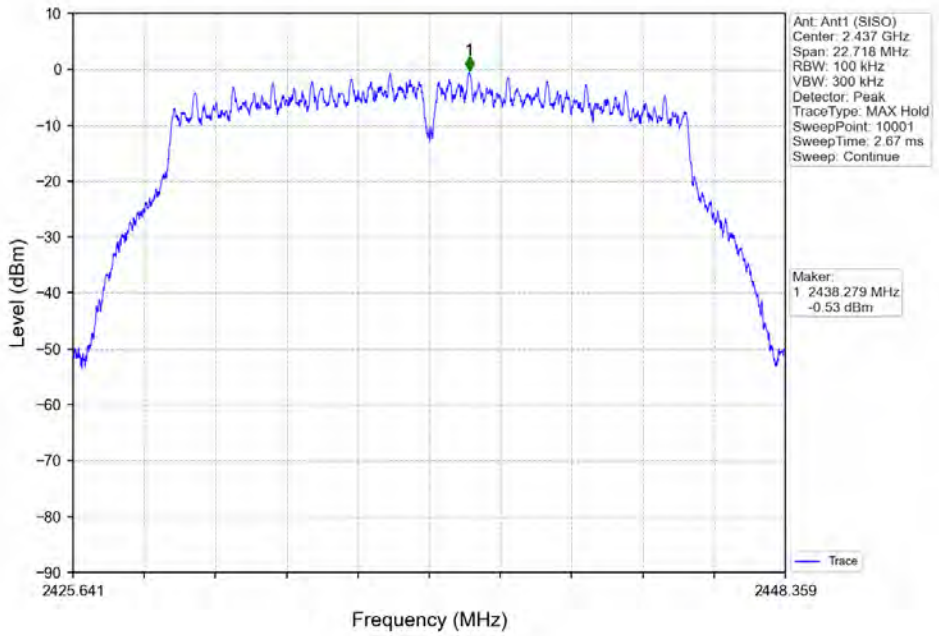
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



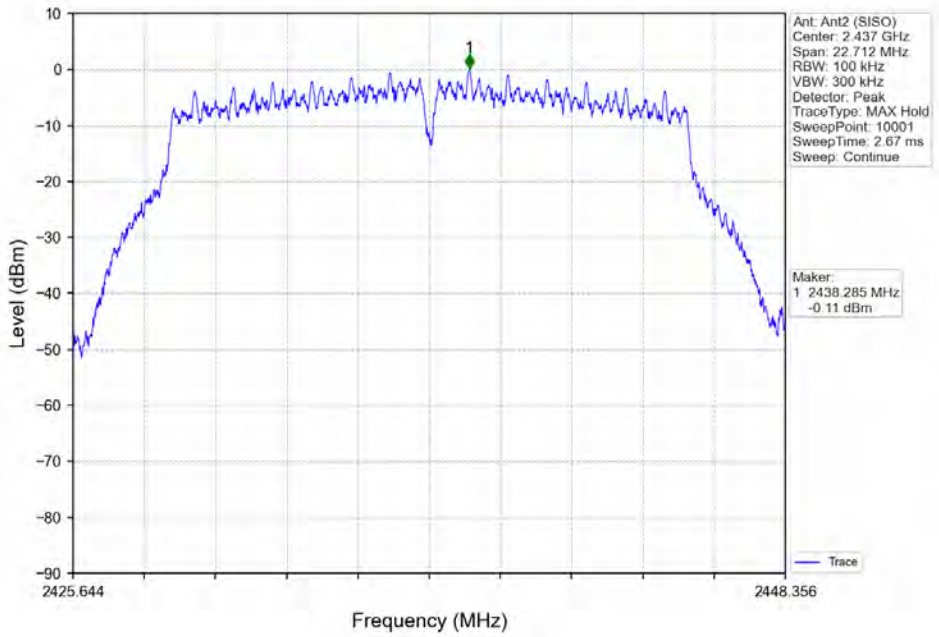
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



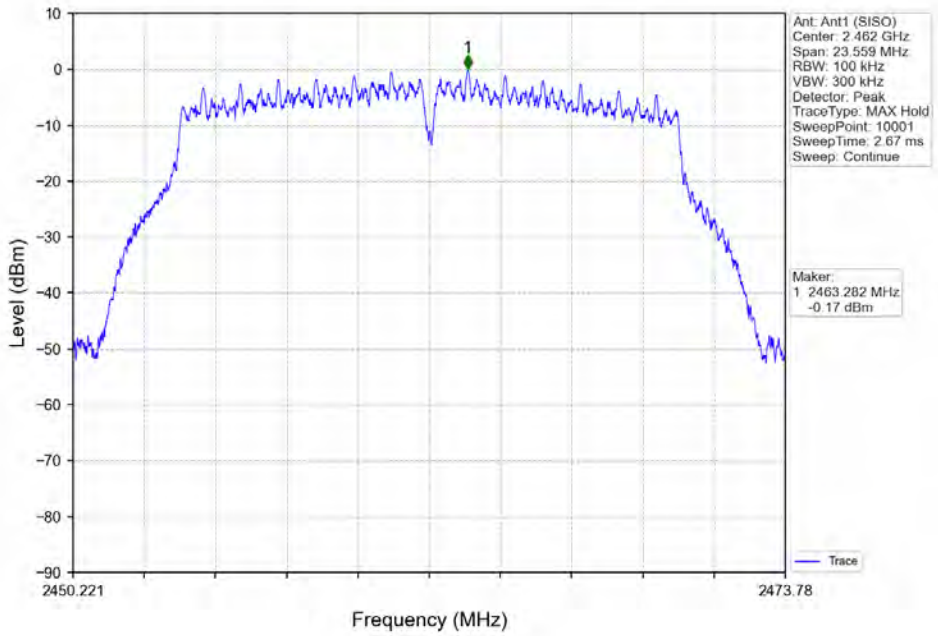
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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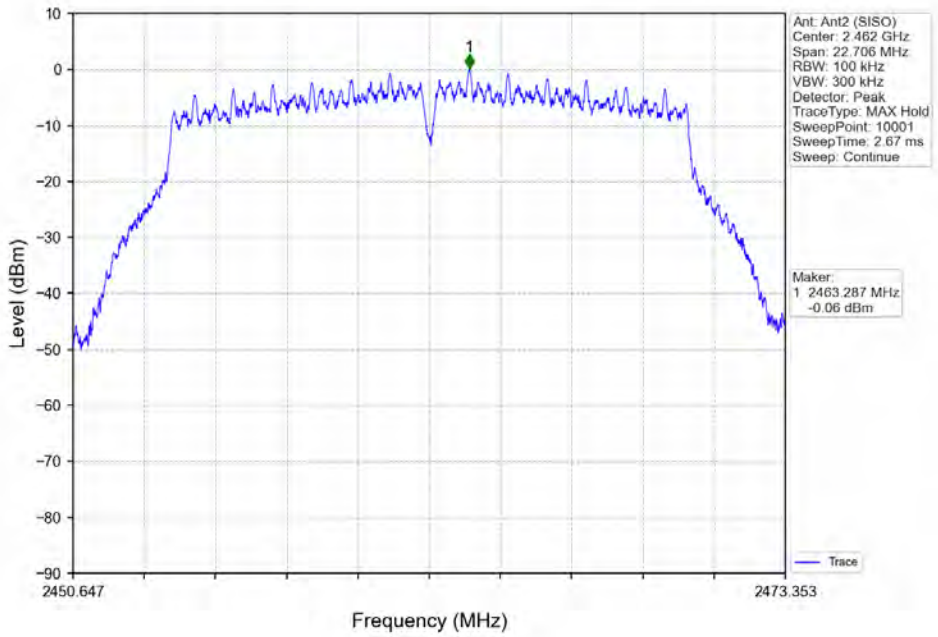
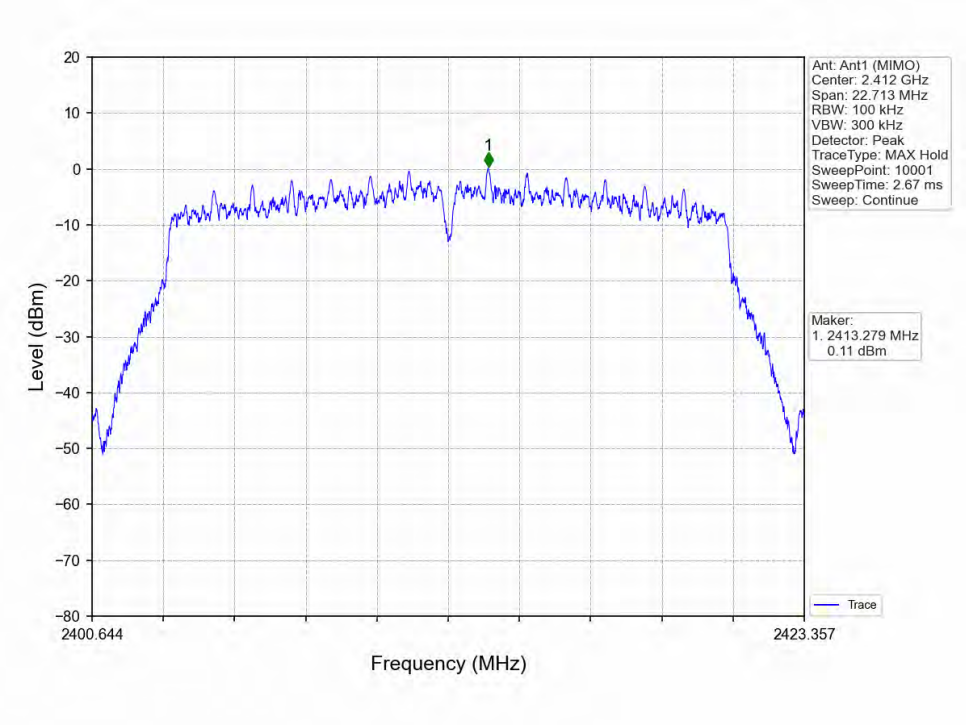


802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



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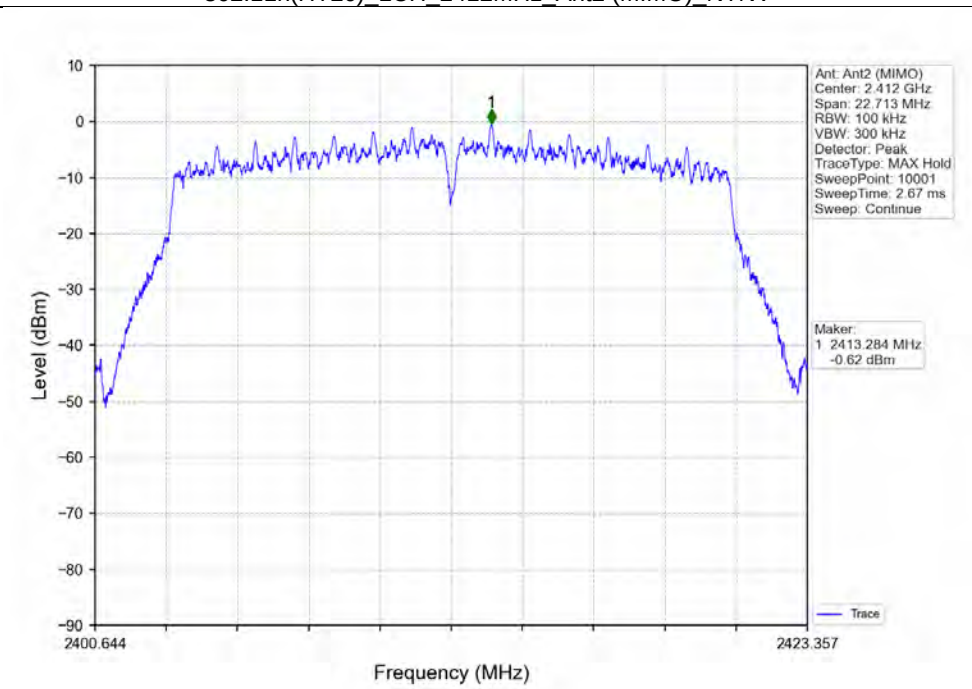
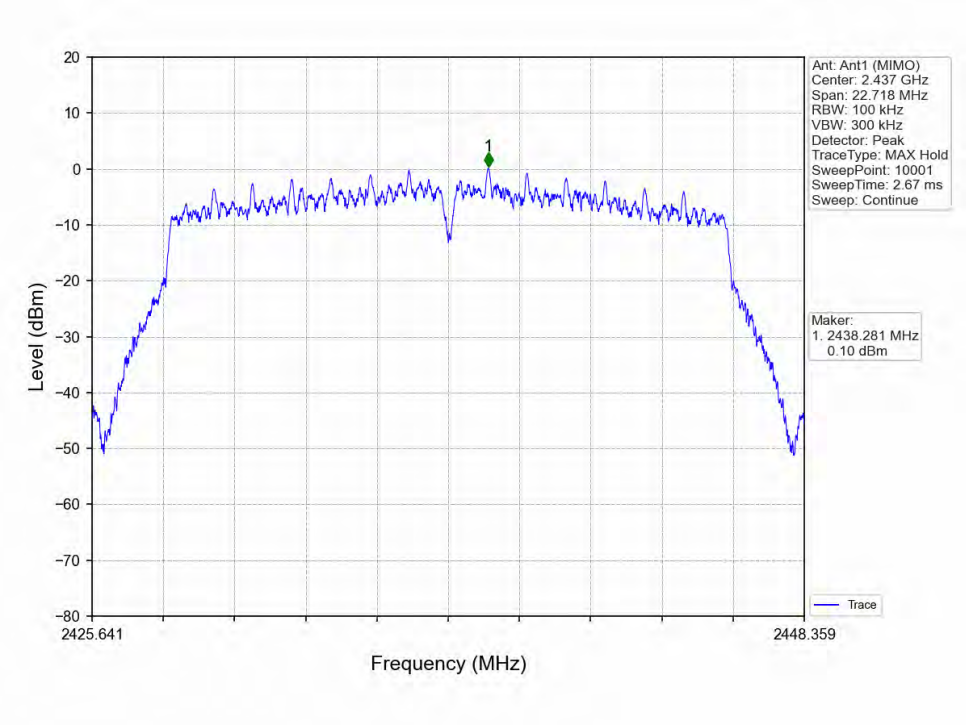
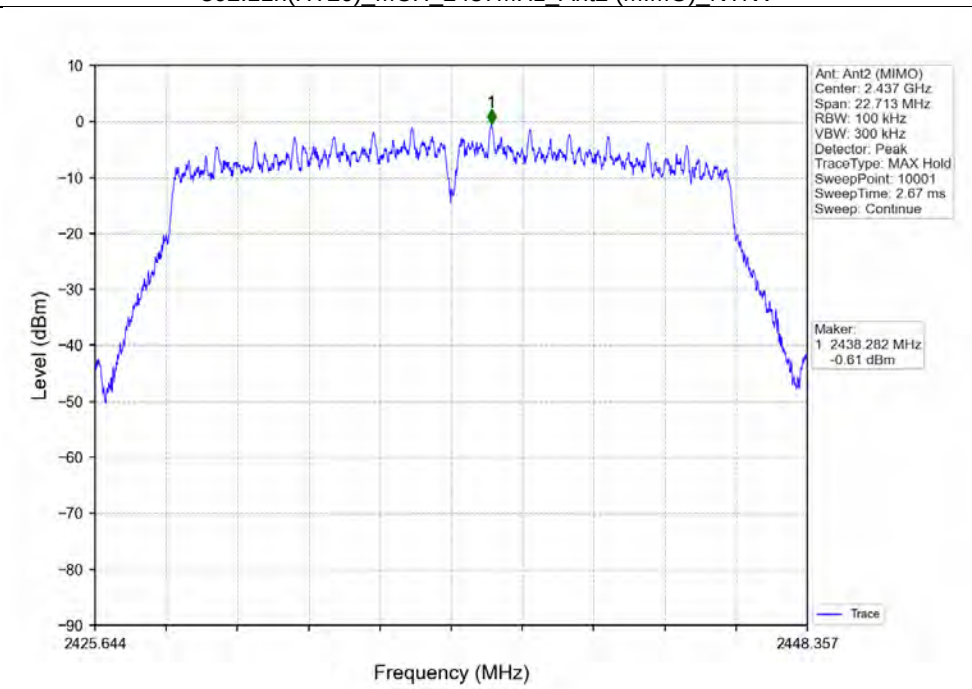


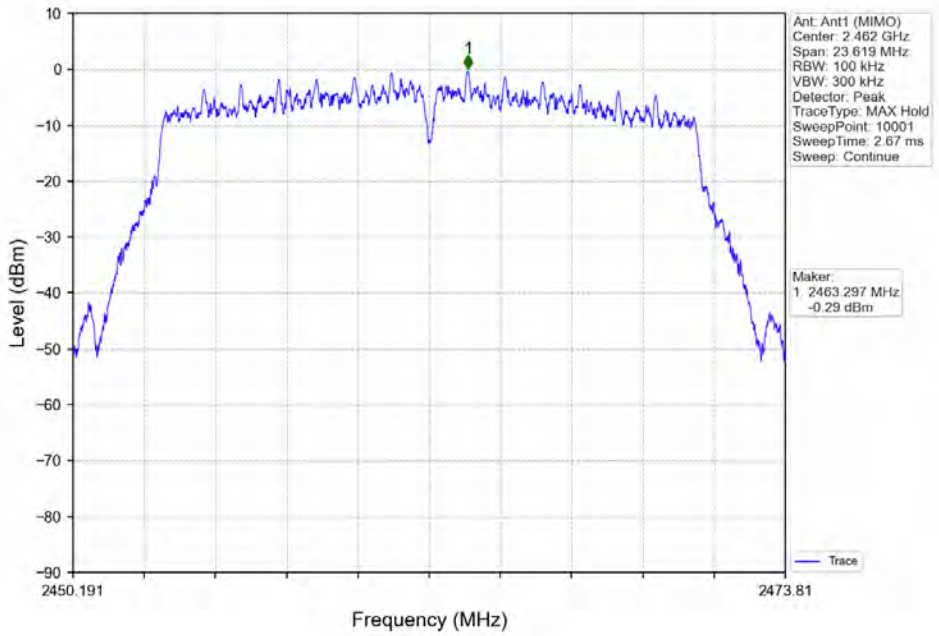
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



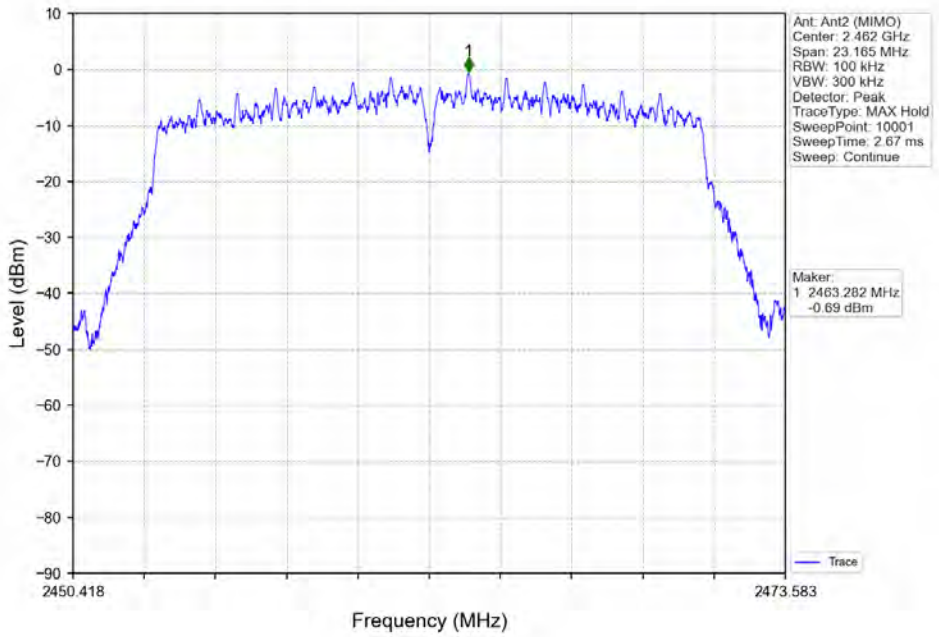
802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



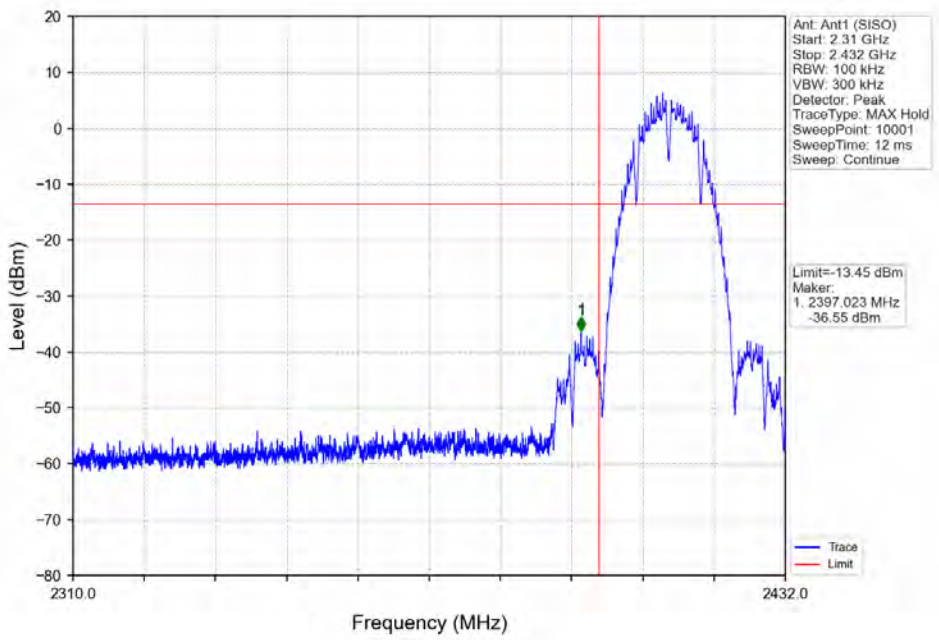
5.2 CSE

5.2.1 Test Result

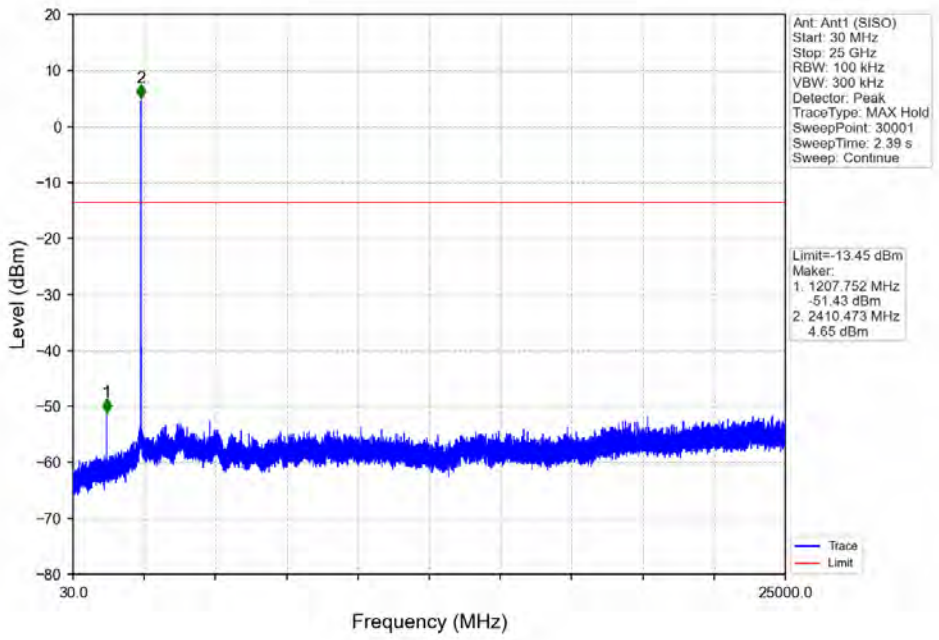
Mode	TX Type	Frequency (MHz)	Ant	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	6.55	-13.45	Pass
			2	6.50	-13.50	Pass
		2437	1	6.55	-13.45	Pass
			2	6.50	-13.50	Pass
		2462	1	6.55	-13.45	Pass
			2	6.50	-13.50	Pass
802.11g	SISO	2412	1	0.52	-19.48	Pass
			2	-0.05	-20.05	Pass
		2437	1	0.52	-19.48	Pass
			2	-0.05	-20.05	Pass
		2462	1	0.52	-19.48	Pass
			2	-0.05	-20.05	Pass
802.11n (HT20)	MIMO	2412	1	0.11	-19.89	Pass
			2	-0.61	-20.61	Pass
		2437	1	0.11	-19.89	Pass
			2	-0.61	-20.61	Pass
		2462	1	0.11	-19.89	Pass
			2	-0.61	-20.61	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.						

5.2.2 Test Graph

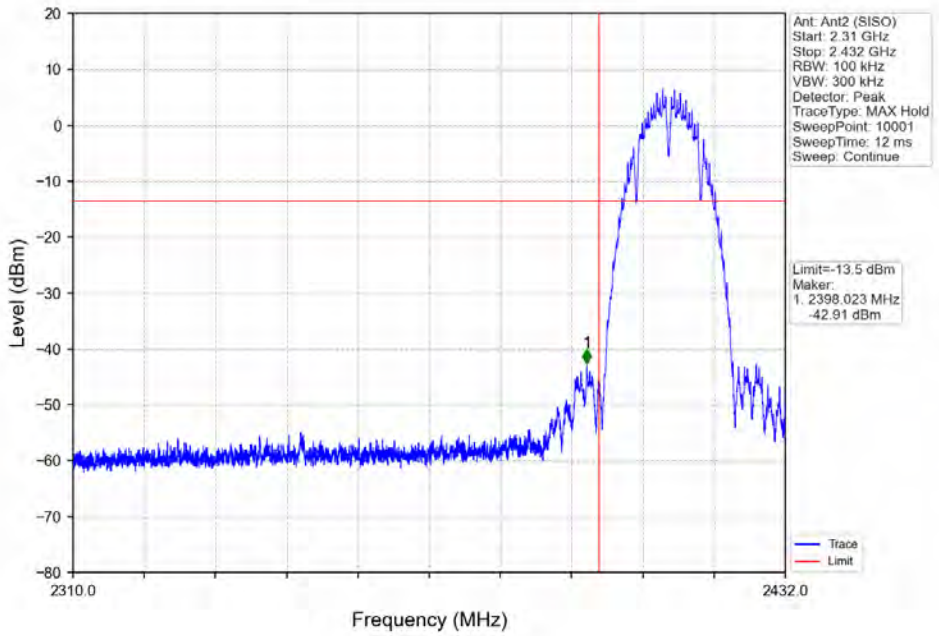
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



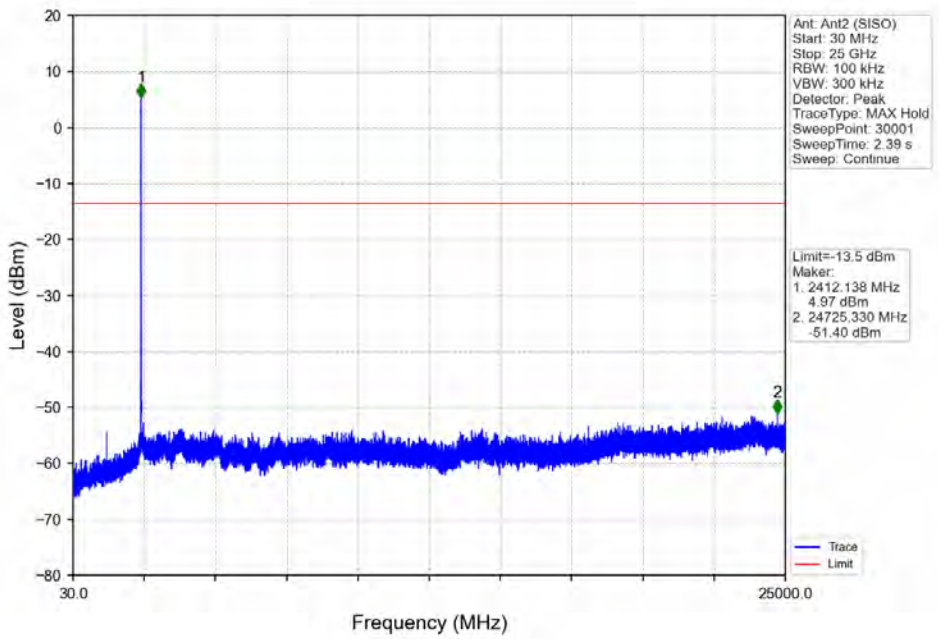
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



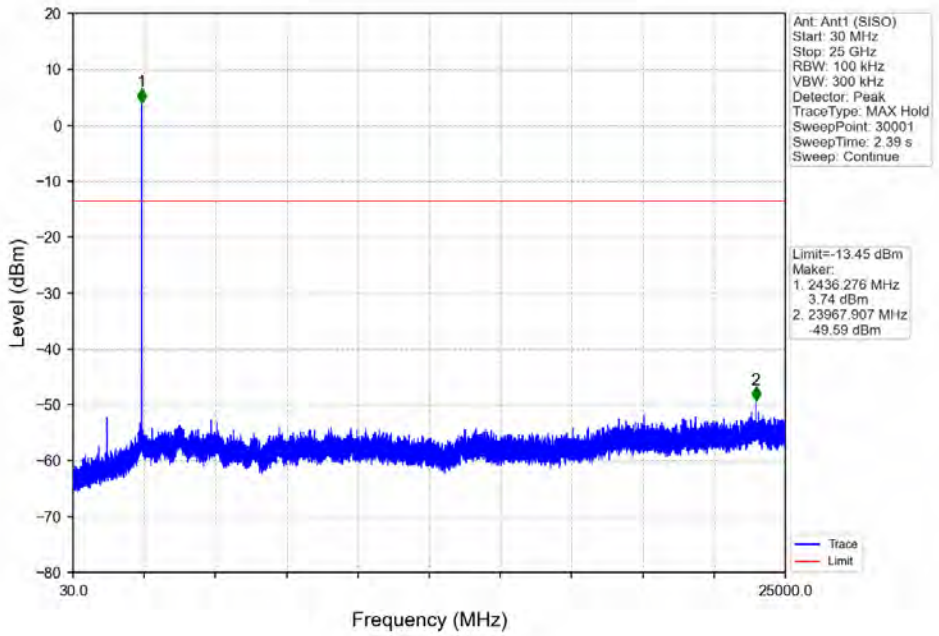
802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



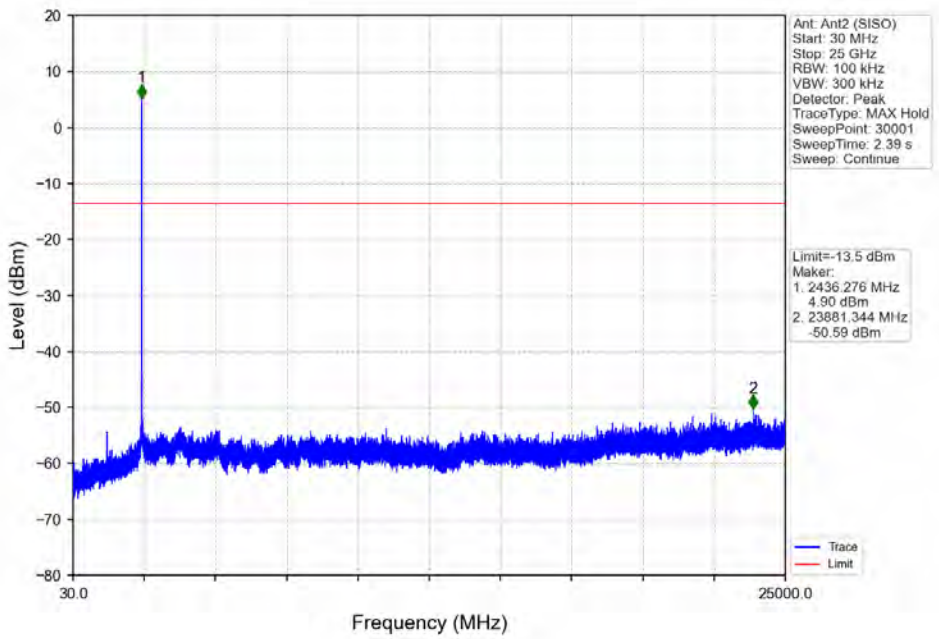
802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



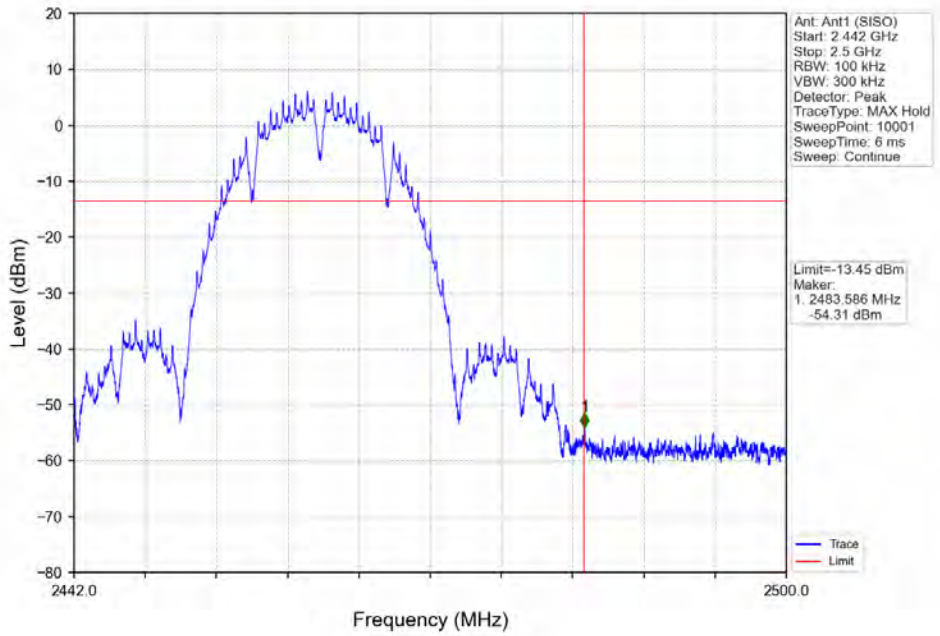
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



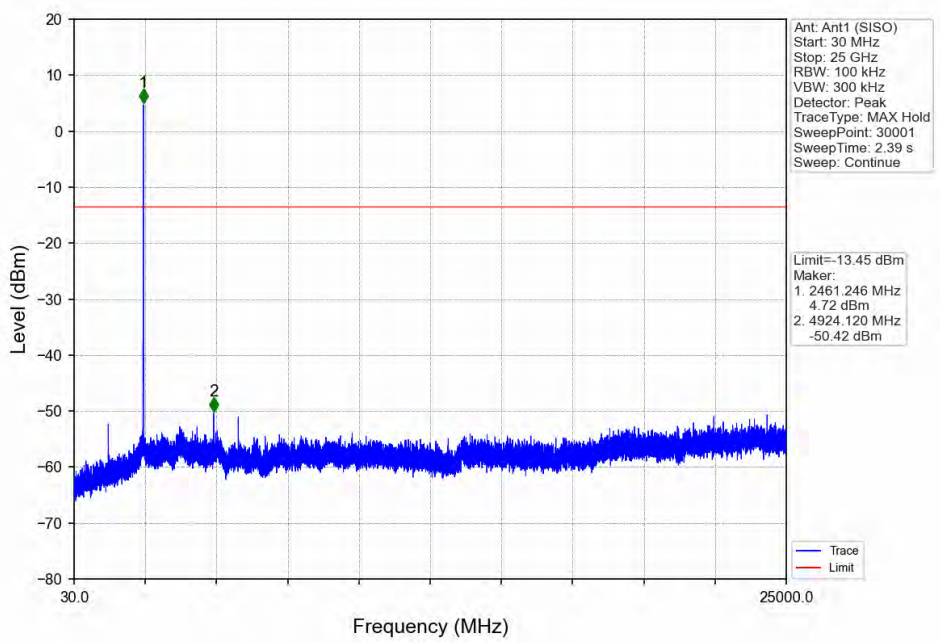
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



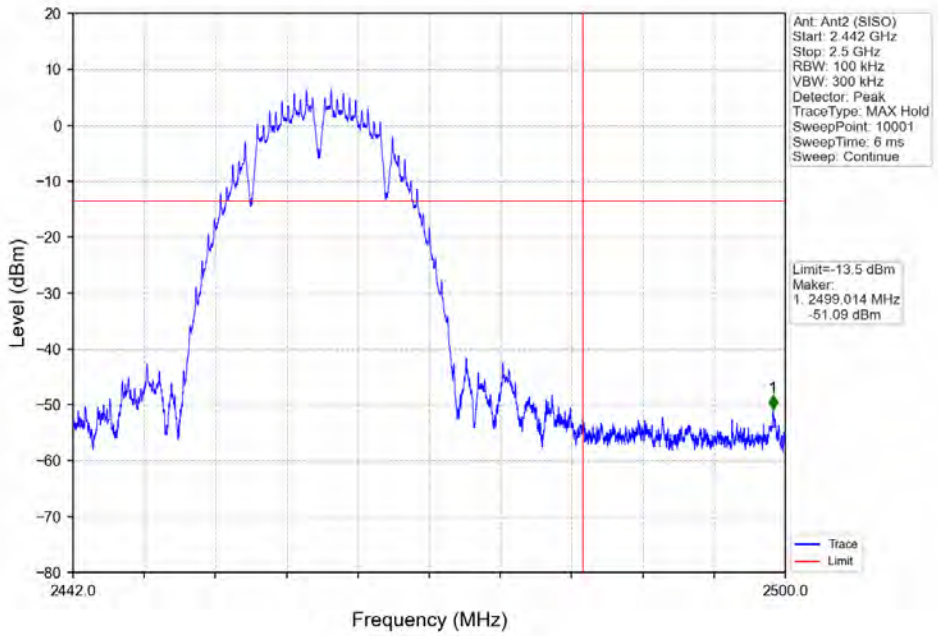
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



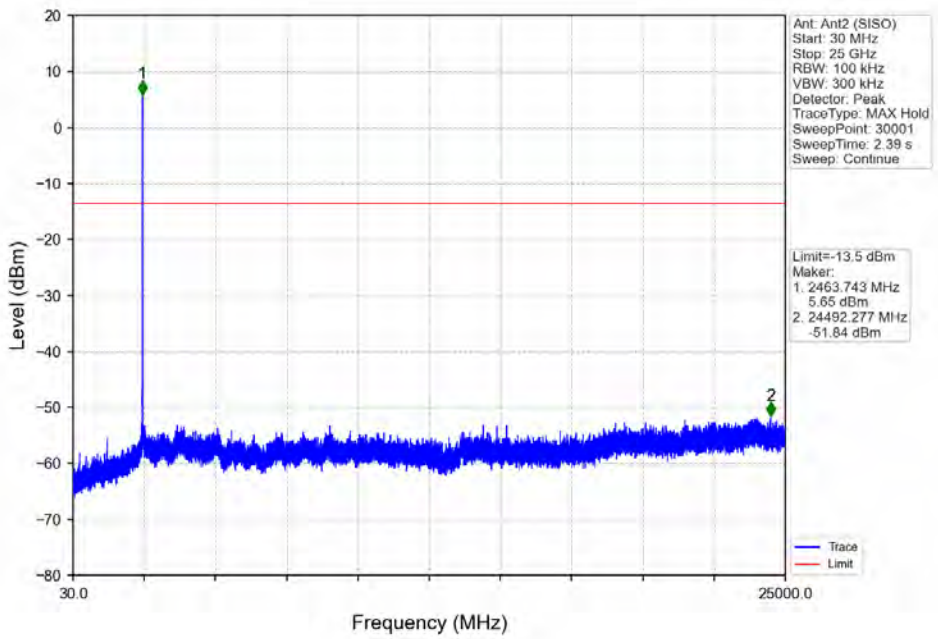
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



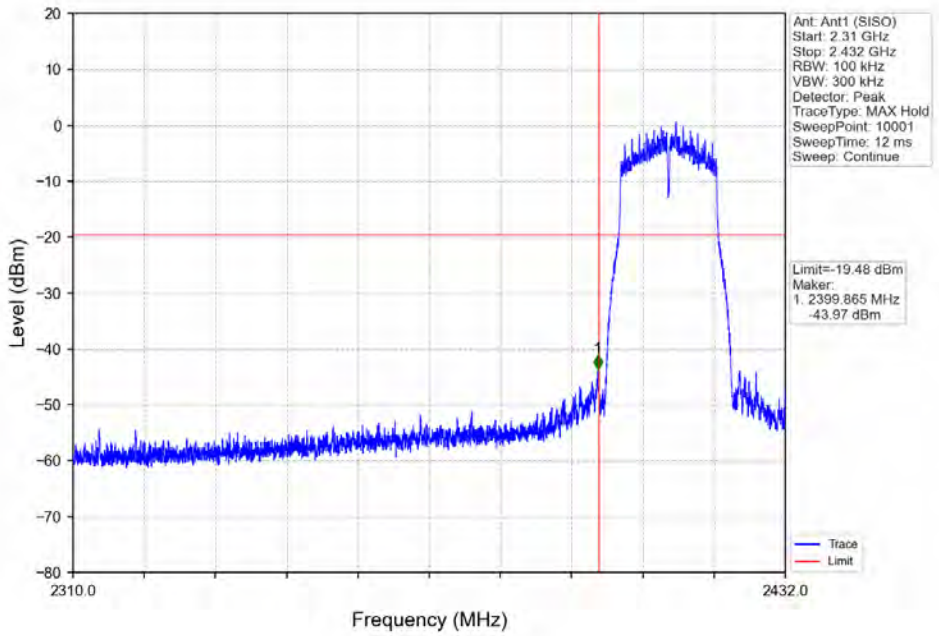
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



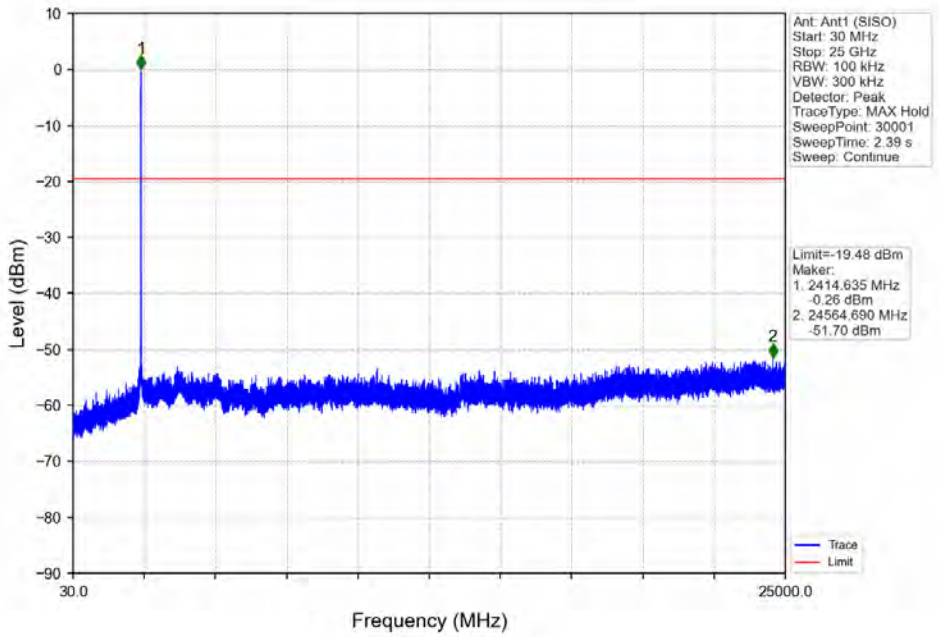
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



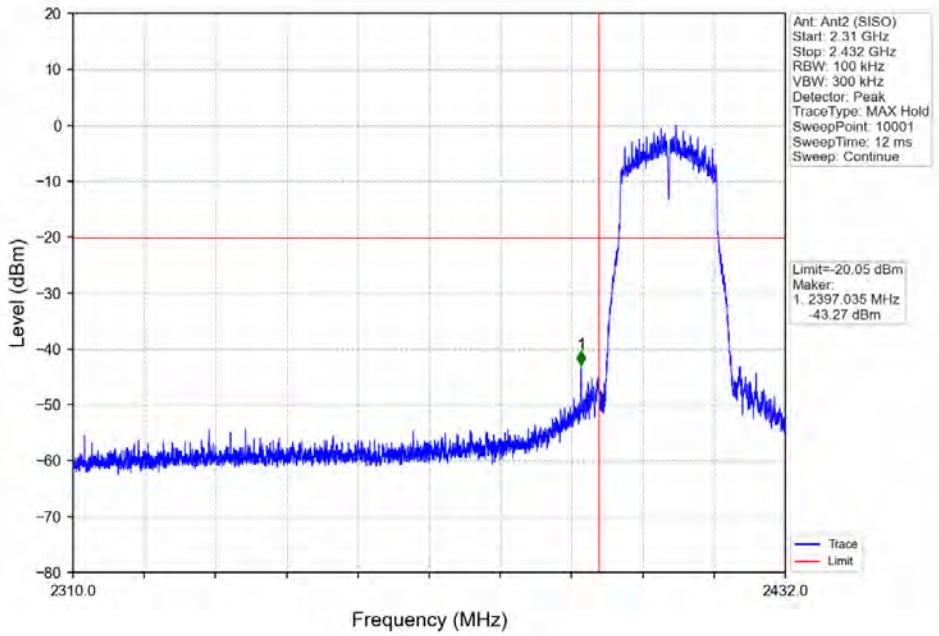
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



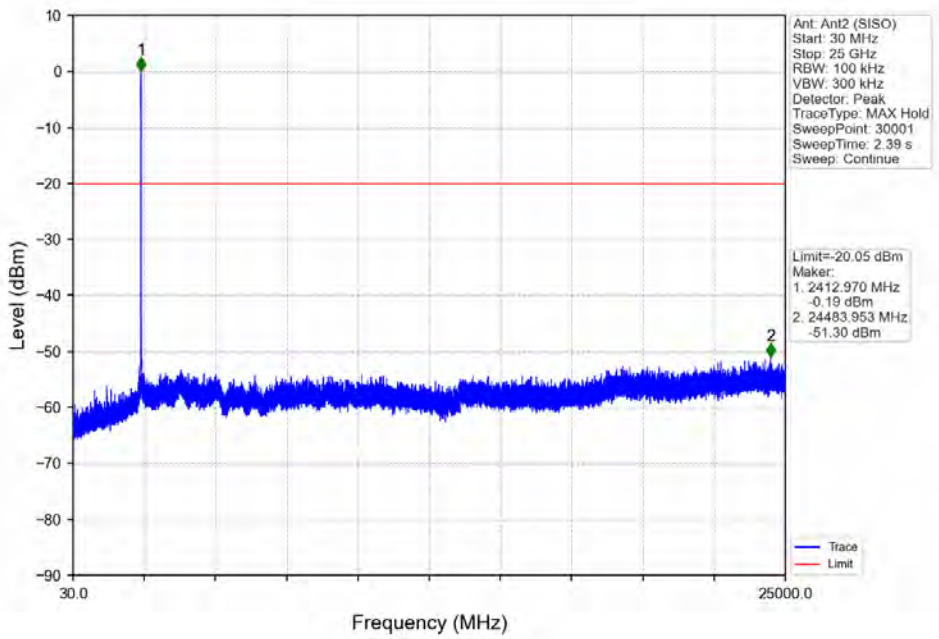
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



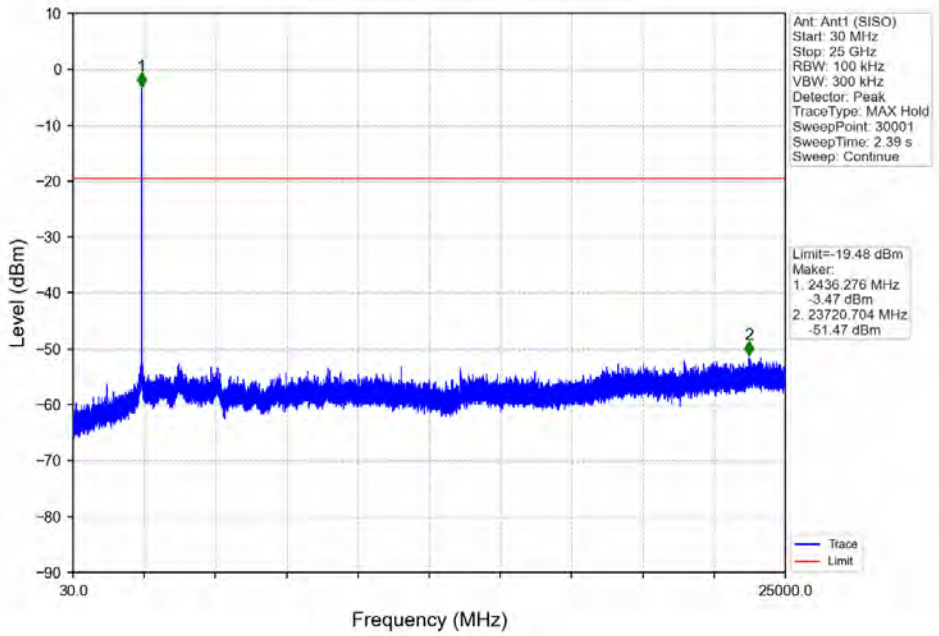
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



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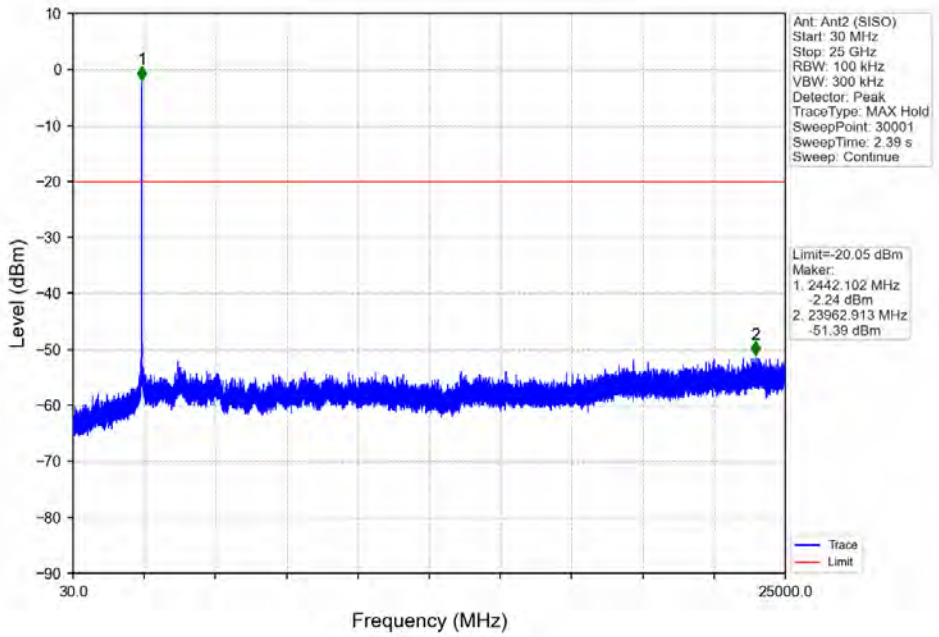

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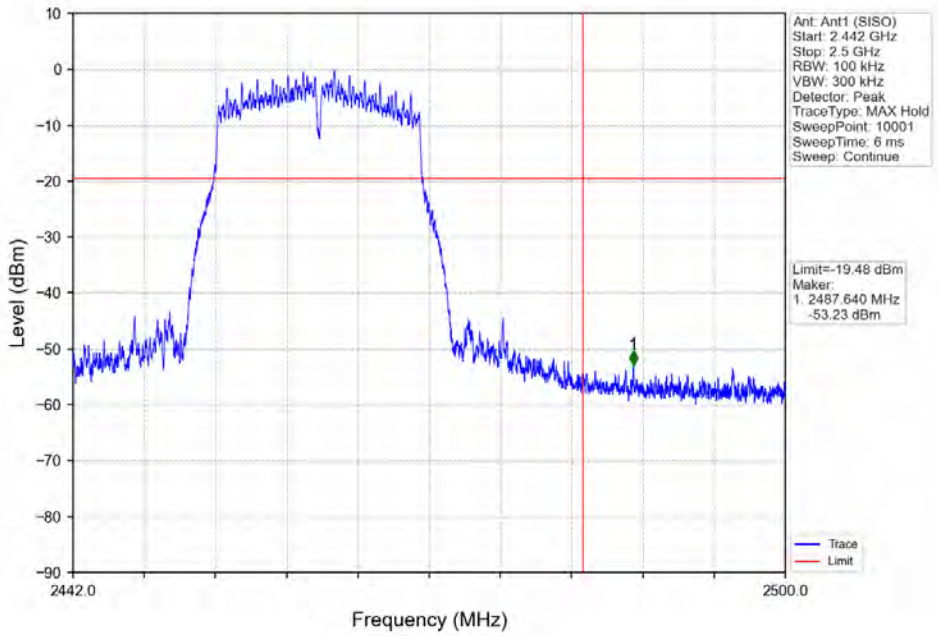
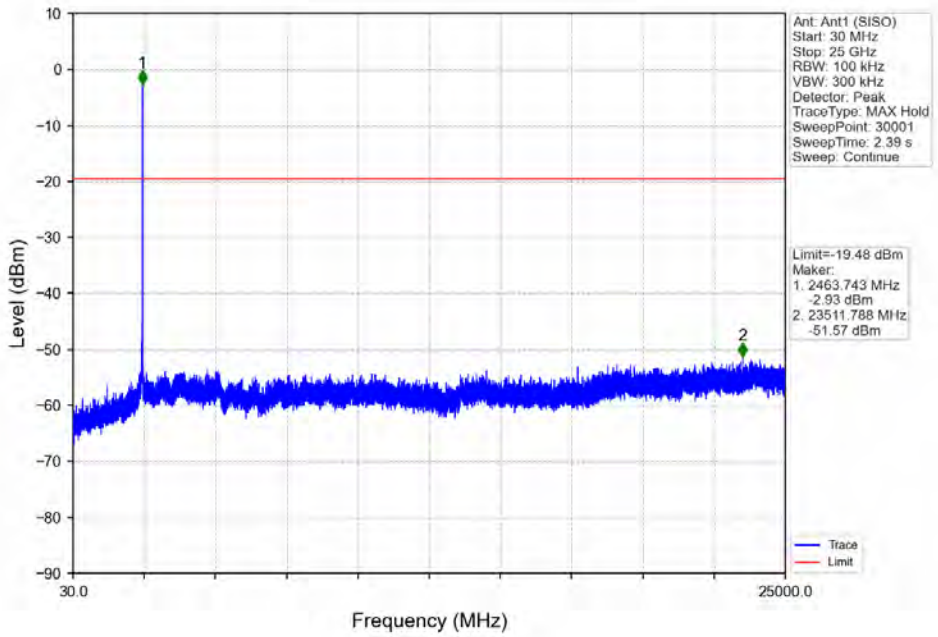
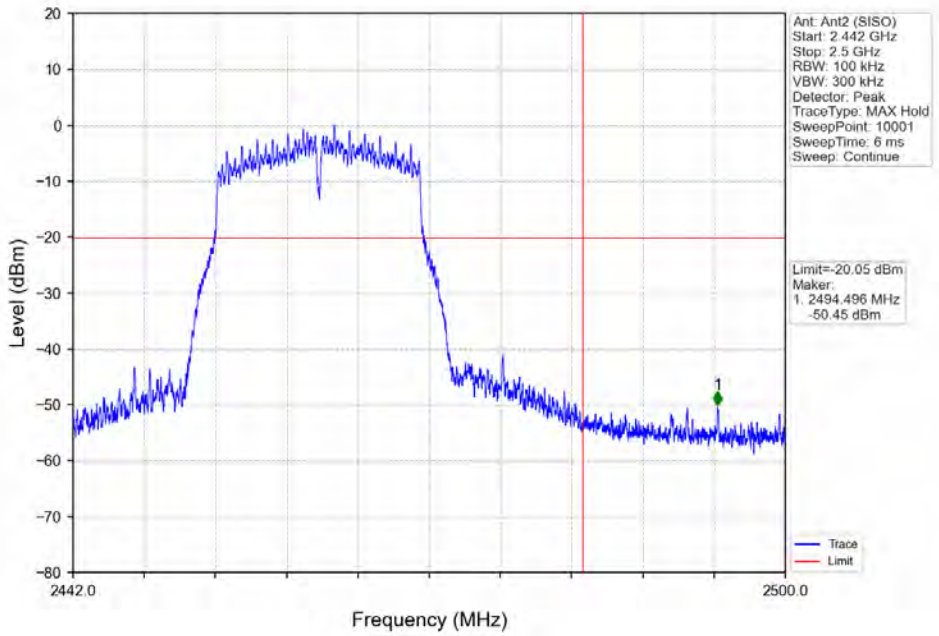


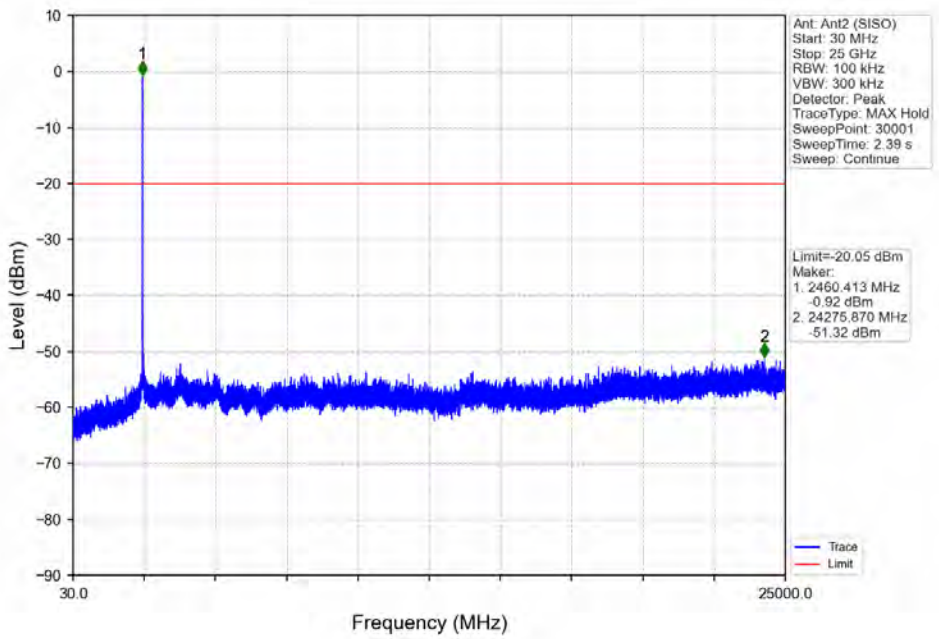
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



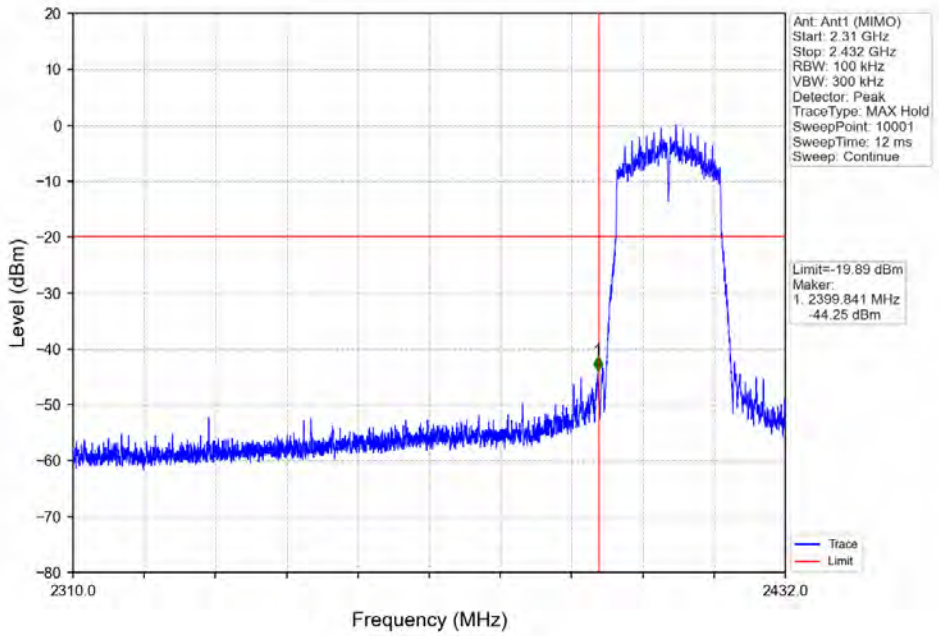
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



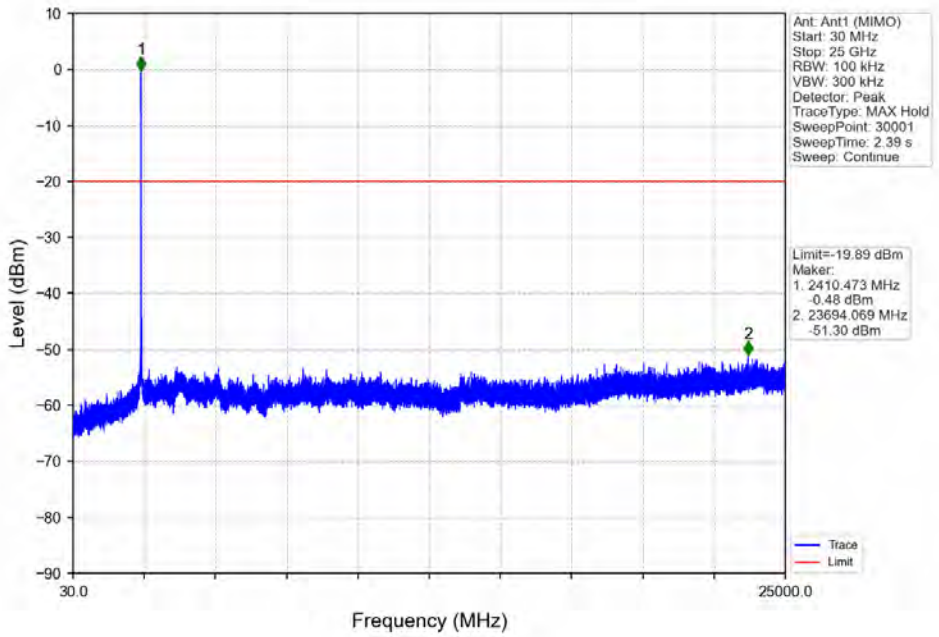
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



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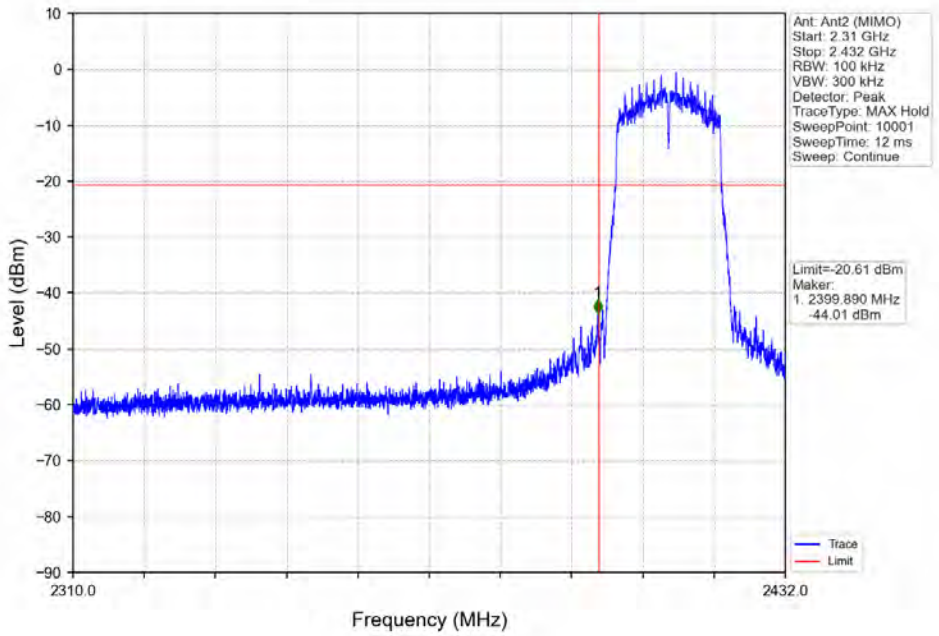
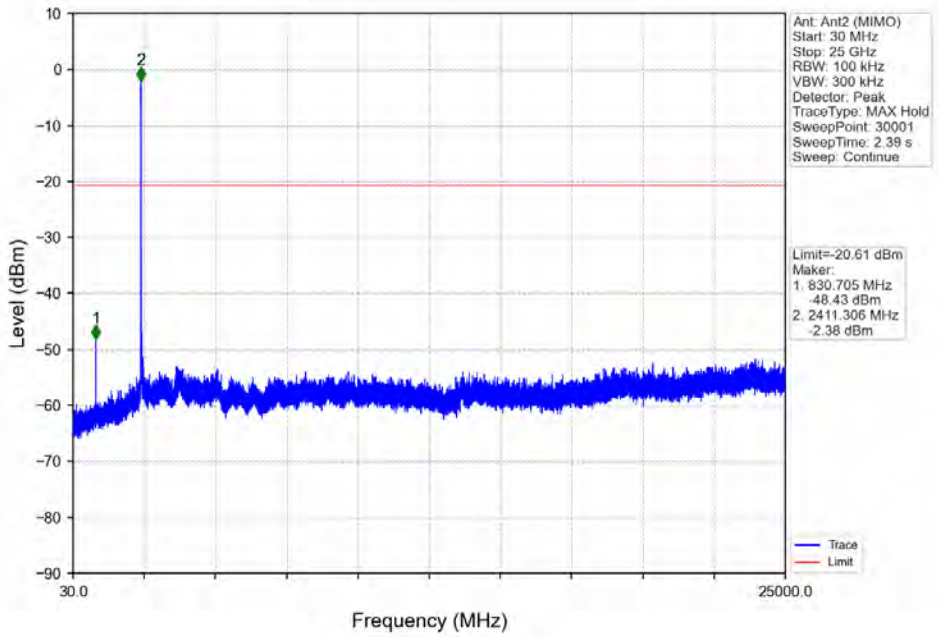
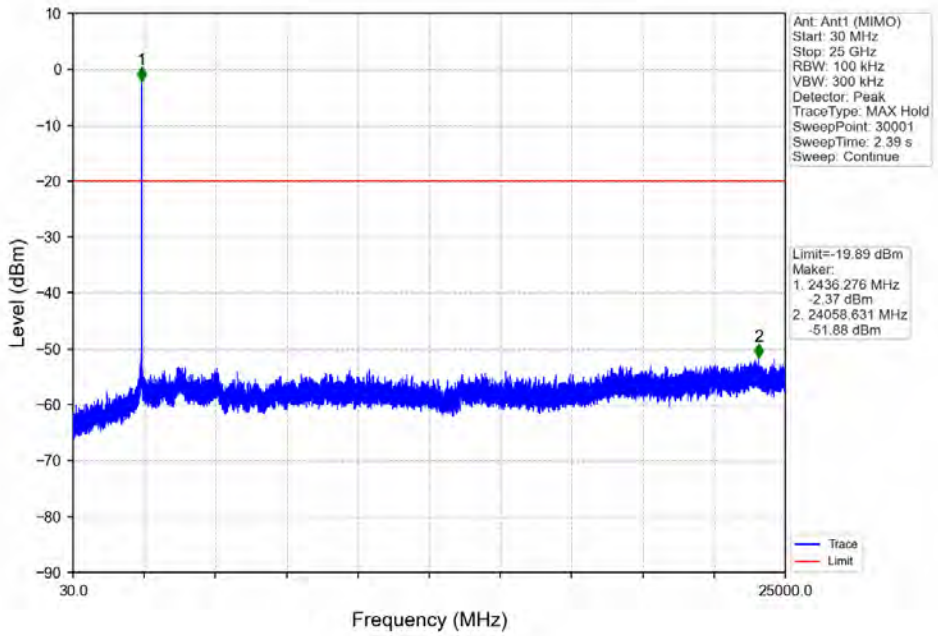


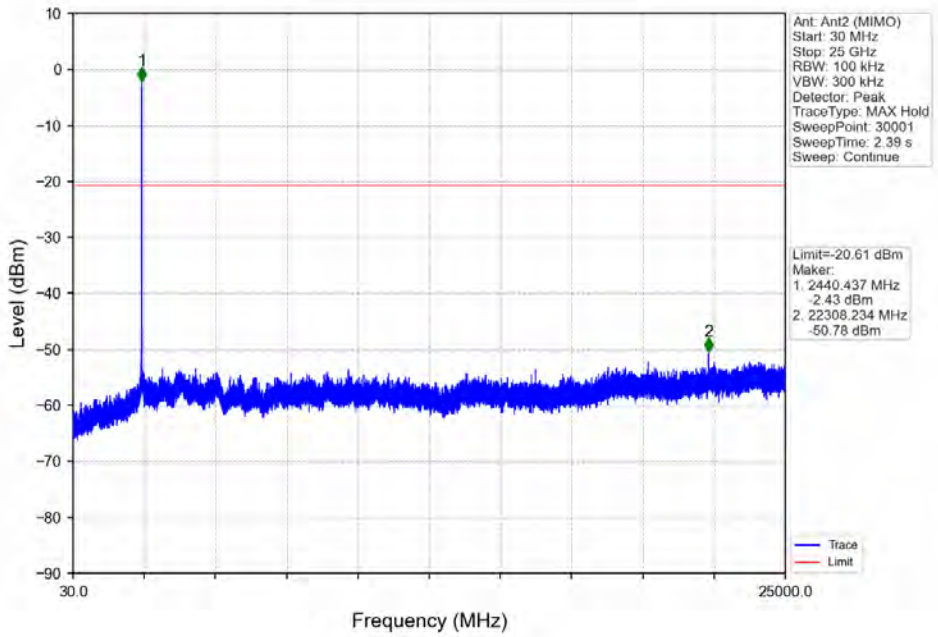
802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



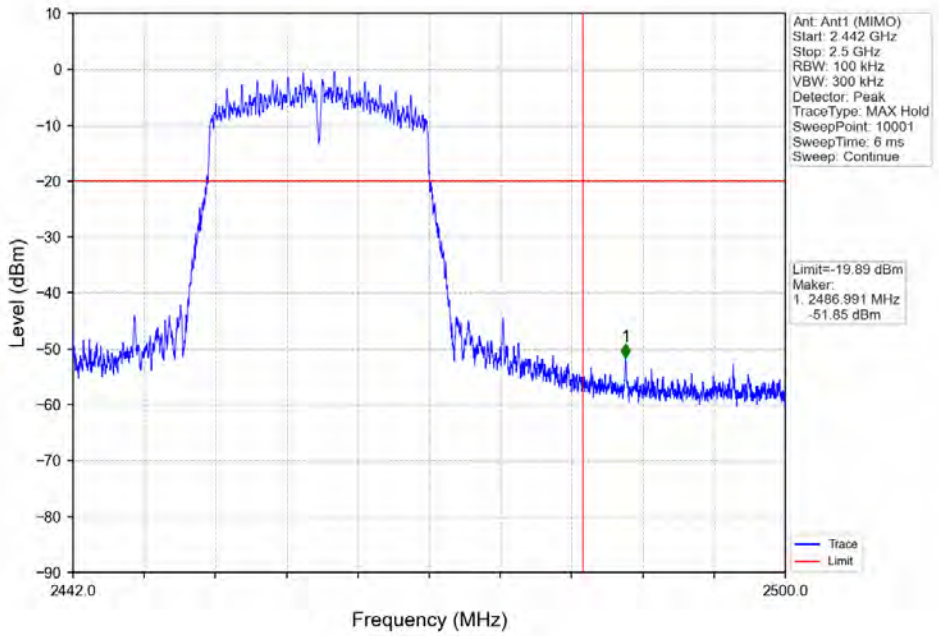
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



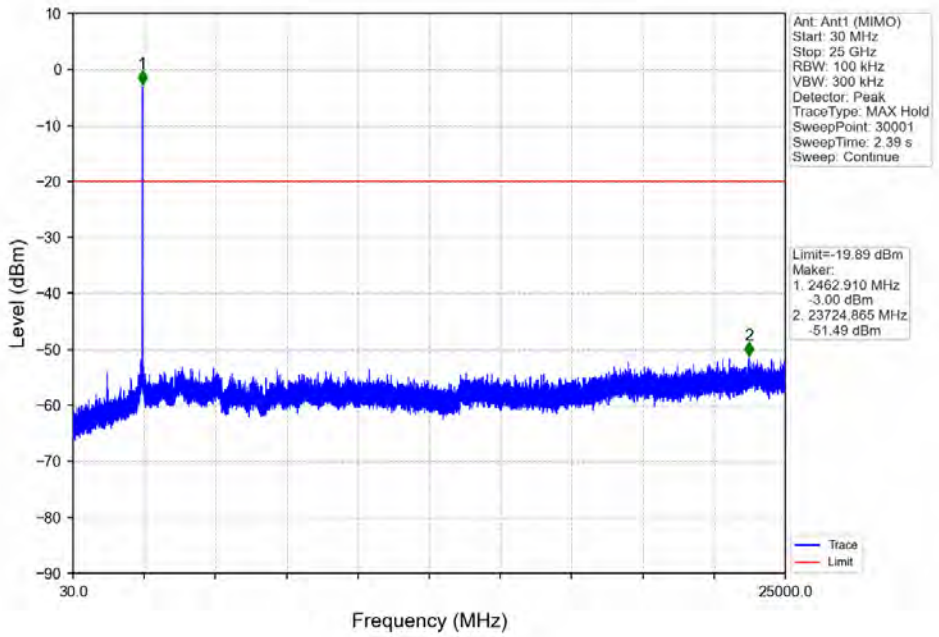
802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



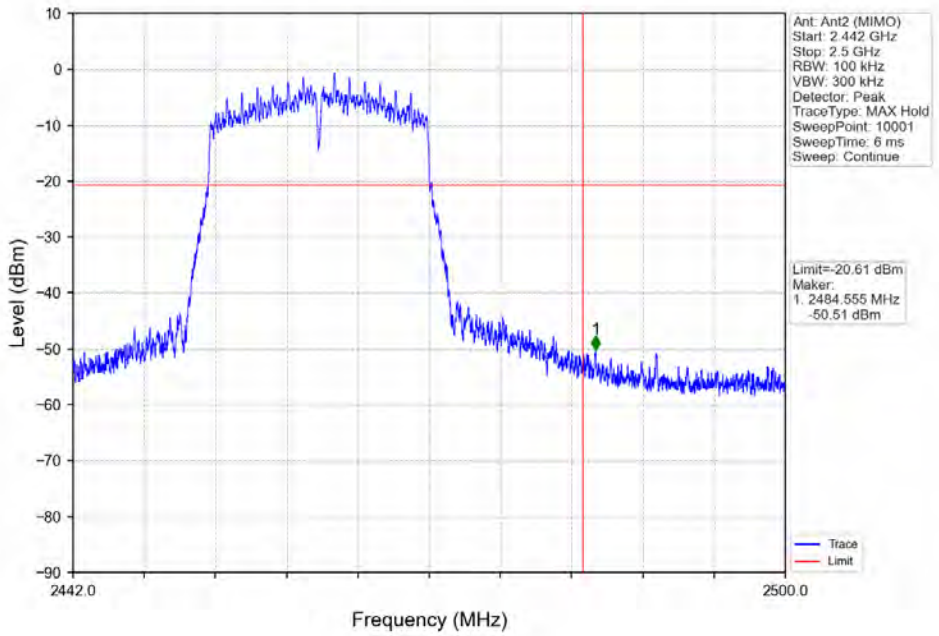
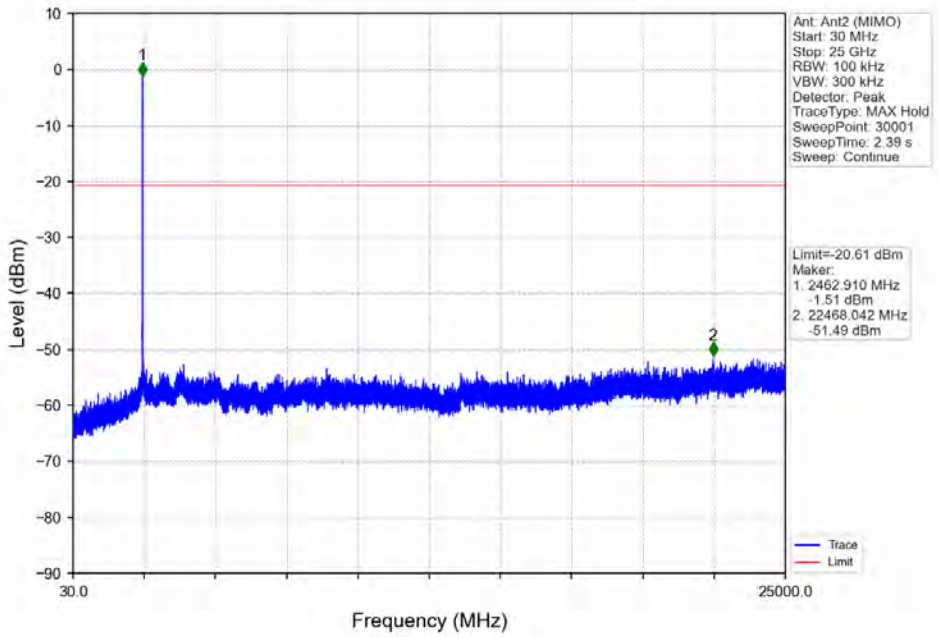
802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant2 (MIMO)_NTNV