

Appendix - 2.4G WIFI

1. Duty Cycle

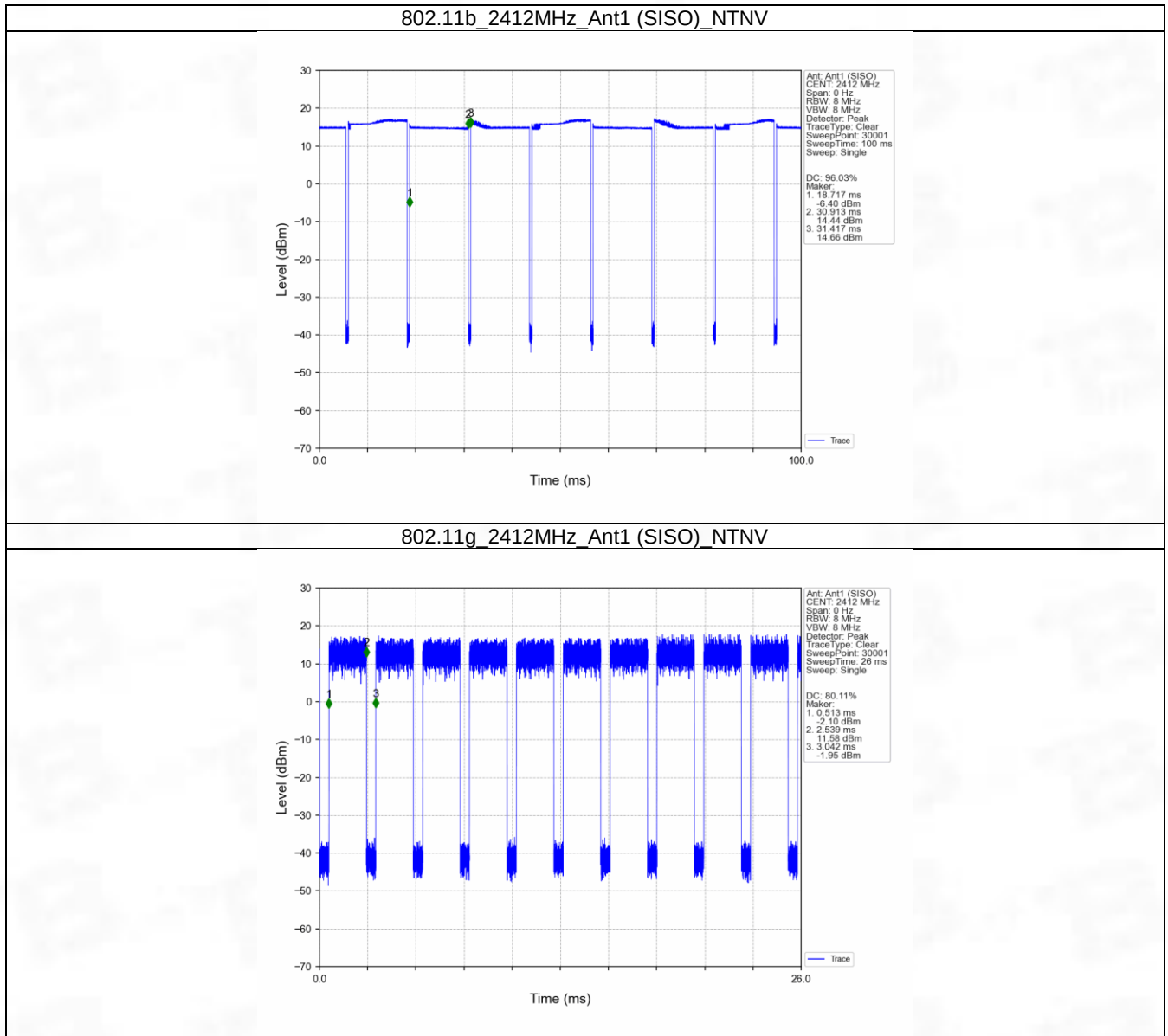
1.1 Test Result

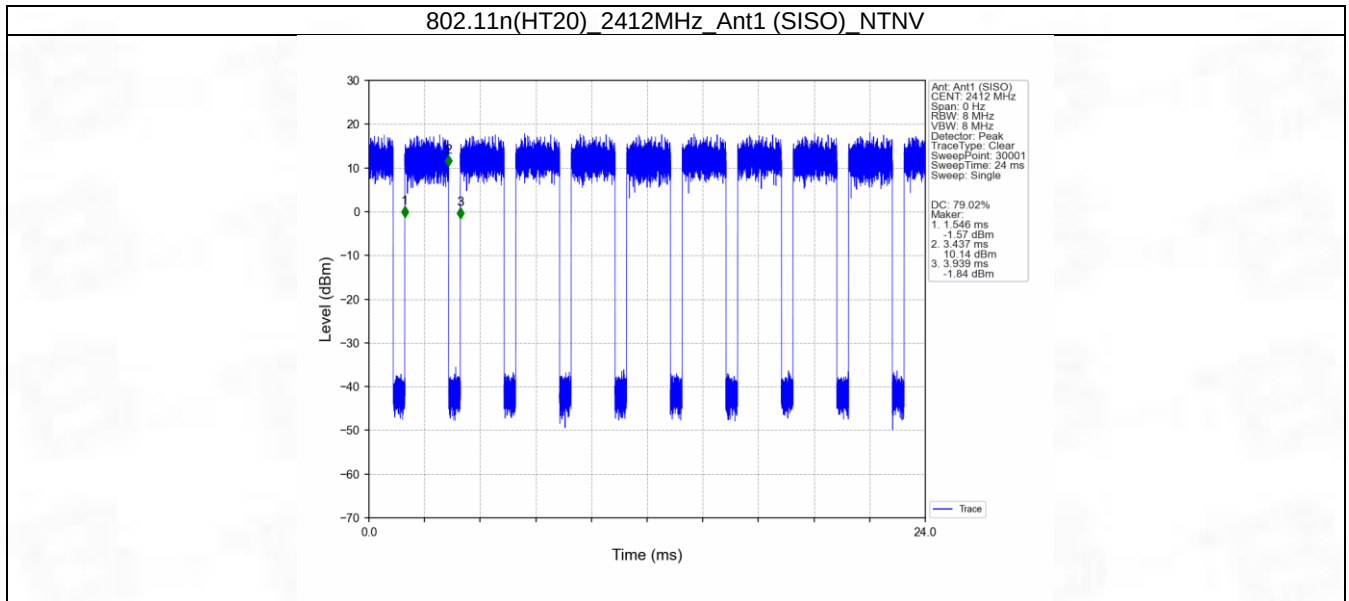
1.1.1 Ant1

Ant1								
ENV	Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
NTNV	802.11b	SISO	2412	12.196	12.700	96.03	0.18	0.03
	802.11g	SISO	2412	2.026	2.529	80.11	0.96	0.03
	802.11n (HT20)	SISO	2412	1.891	2.393	79.02	1.02	0.03

1.2 Test Graph

1.2.1 Ant1





2. Frequency Error

2.1 Test Result

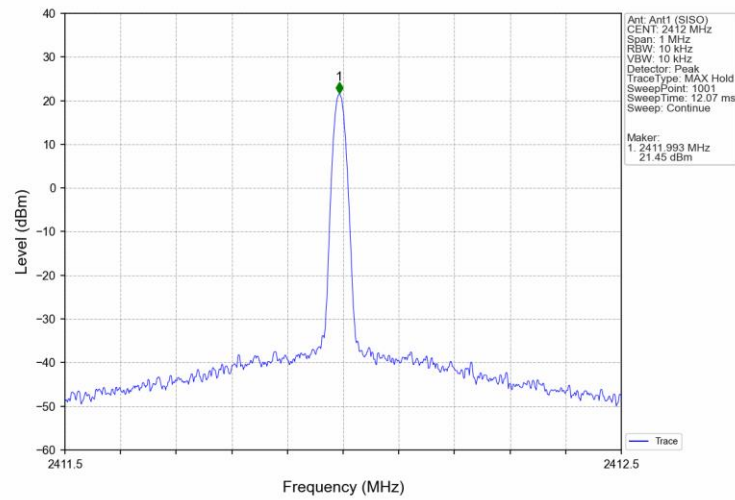
2.1.1 Ant1

Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)		Verdict
					Result	Limit	
NTNV	Carrier Wave	SISO	2412	2411.993	-2.90	-50 to 50	Pass
			2472	2471.995	-2.02	-50 to 50	Pass

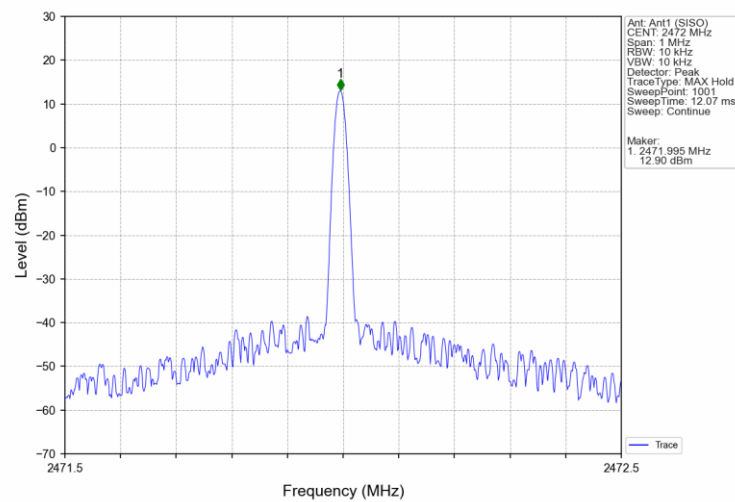
2.2 Test Graph

2.2.1 Ant1

Frequency Error_NTNV_Carrier Wave_2412MHz_Ant1 (SISO)_NTNV



Frequency Error_NTNV_Carrier Wave_2472MHz_Ant1 (SISO)_NTNV



3. Occupied Bandwidth

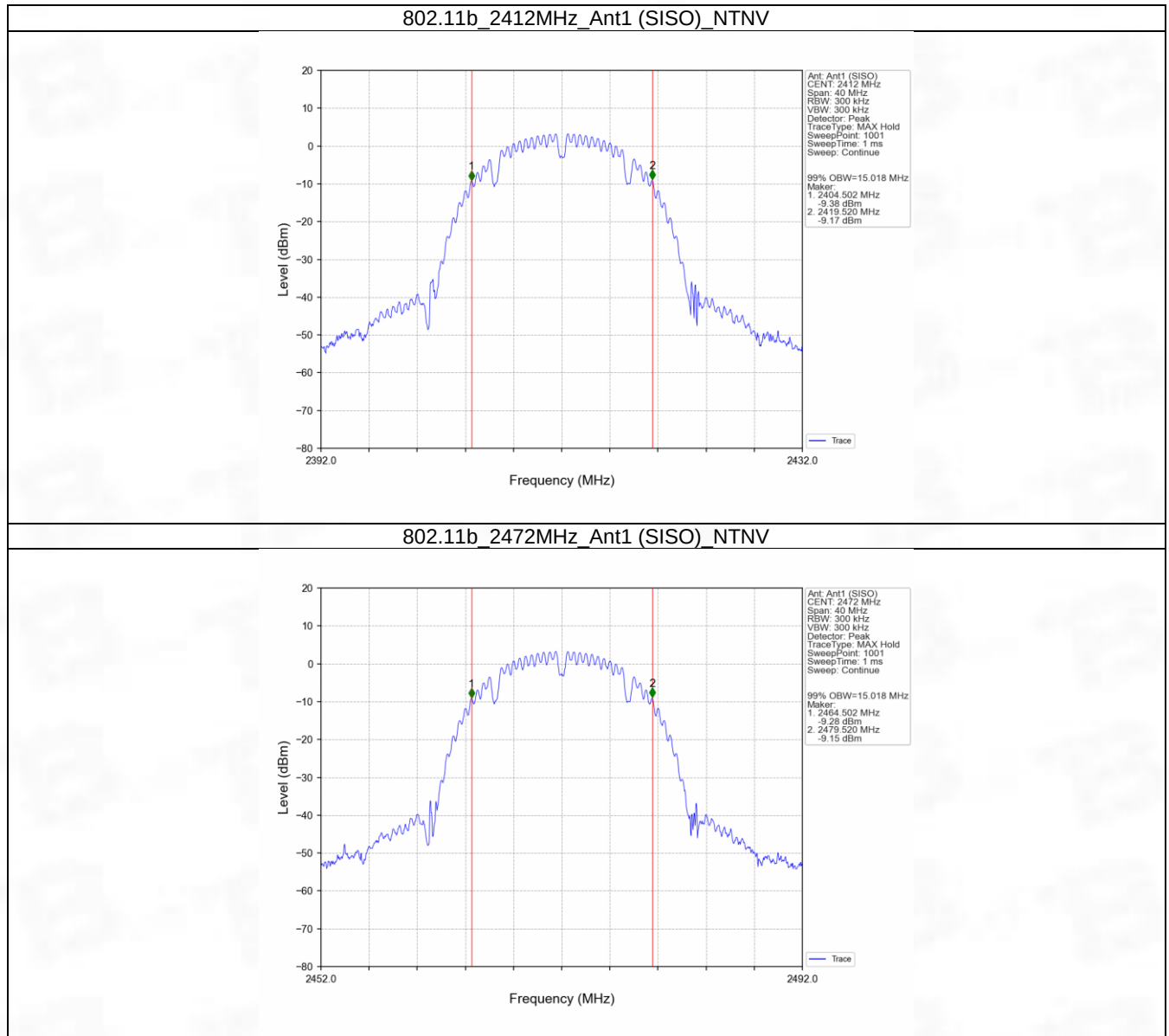
3.1 Test Result

3.1.1 OBW

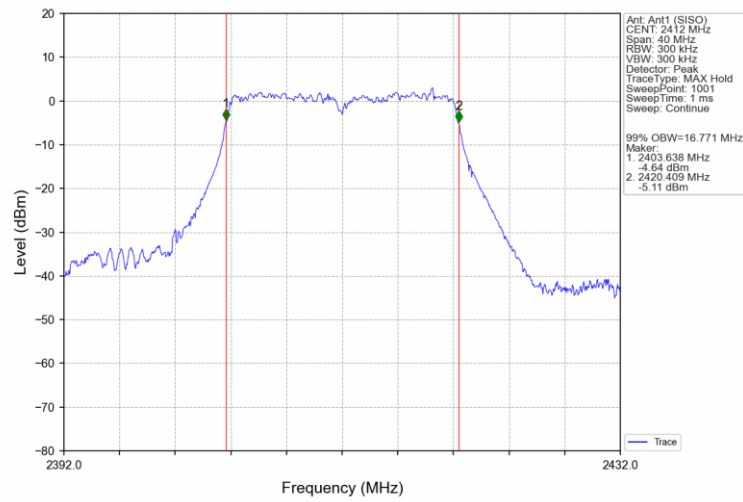
ENV	Mode	TX Type	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Verdict
				ANT1	Limit	
NTNV	802.11b	SISO	2412	15.018	<=26	Pass
			2472	15.018	<=26	Pass
	802.11g	SISO	2412	16.771	<=26	Pass
			2472	16.775	<=26	Pass
	802.11n (HT20)	SISO	2412	17.769	<=26	Pass
			2472	17.775	<=26	Pass

3.2 Test Graph

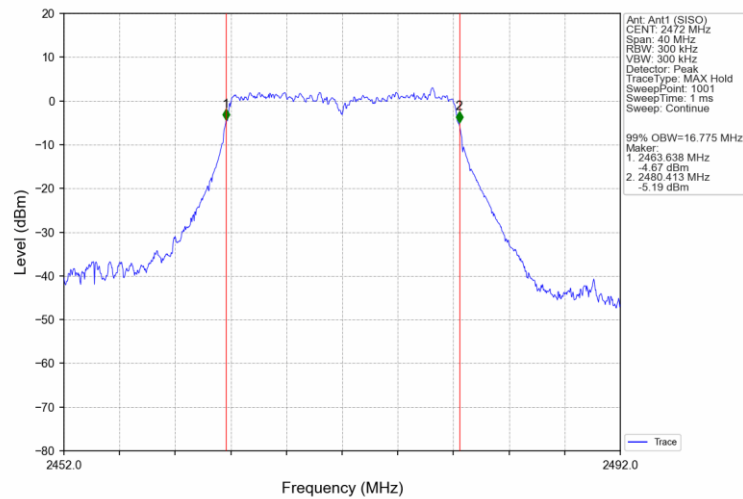
3.2.1 OBW



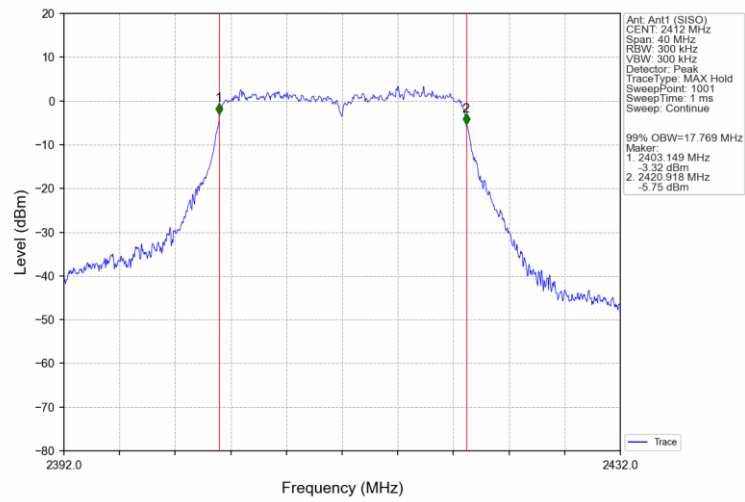
802.11g_2412MHz_Ant1 (SISO)_NTNV



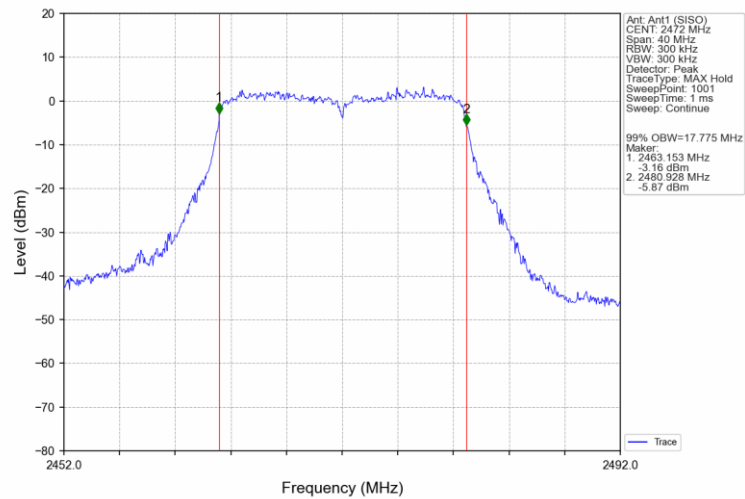
802.11g_2472MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



4. Antenna Power

4.1 Test Result

4.1.1 Power

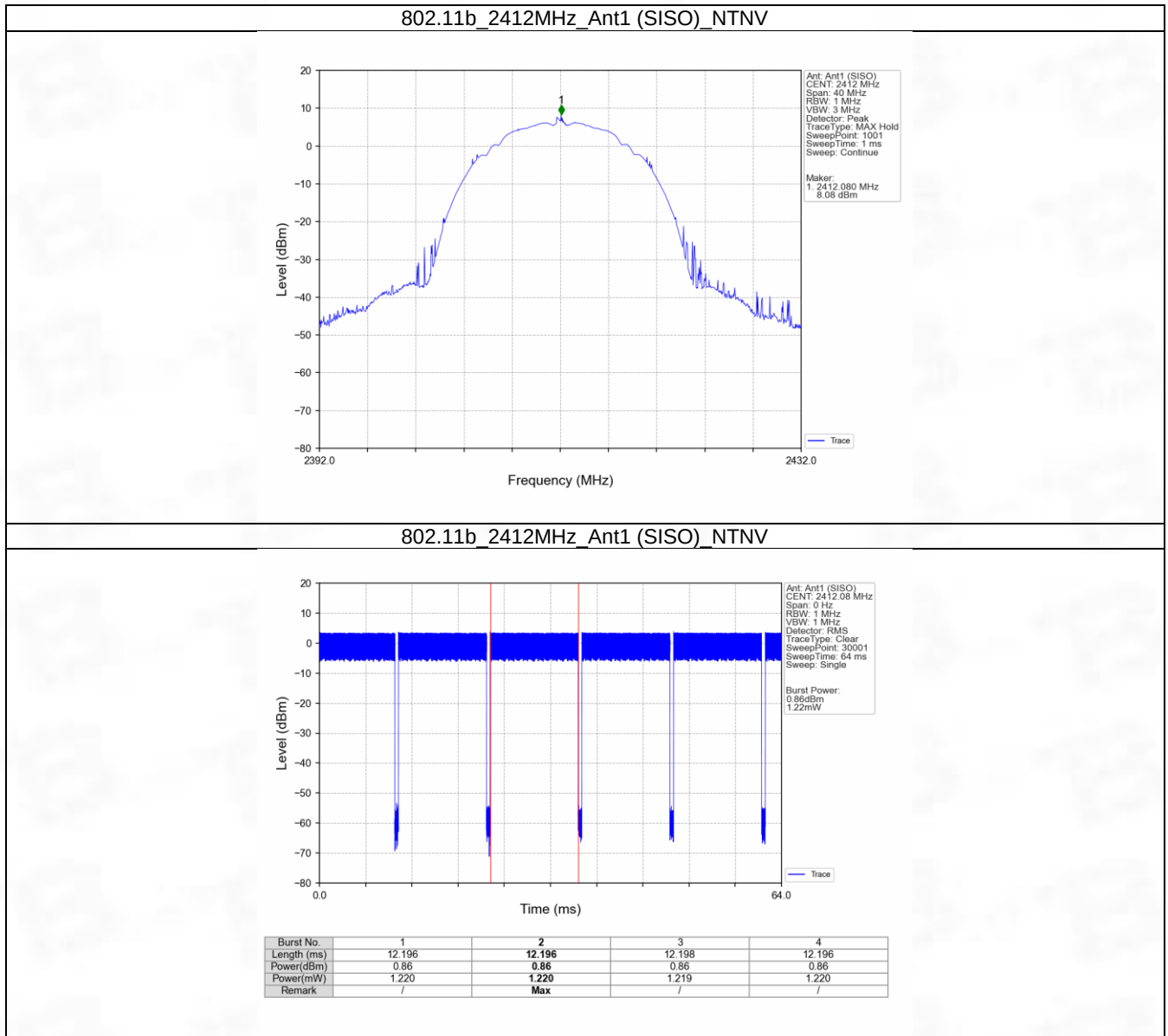
ENV	Mode	TX Type	Frequency (MHz)	ANT	Antenna Power (mW/MHz)		Nominal Power (mW/MHz)	Tolerance (%)		Verdict
					Measured	Limit		Measured	Limit	
NTNV	802.11b	SISO	2412	1	1.220	<=10.00	1.200	1.67	<=20	Pass
			2472	1	1.216	<=10.00	1.200	1.33	<=20	Pass
	802.11g	SISO	2412	1	1.070	<=10.00	1.100	-2.73	<=20	Pass
			2472	1	1.057	<=10.00	1.100	-3.91	<=20	Pass
	802.11n (HT20)	SISO	2412	1	0.958	<=10.00	0.960	-0.21	<=20	Pass
			2472	1	0.920	<=10.00	0.960	-4.17	<=20	Pass

4.1.2 EIRP

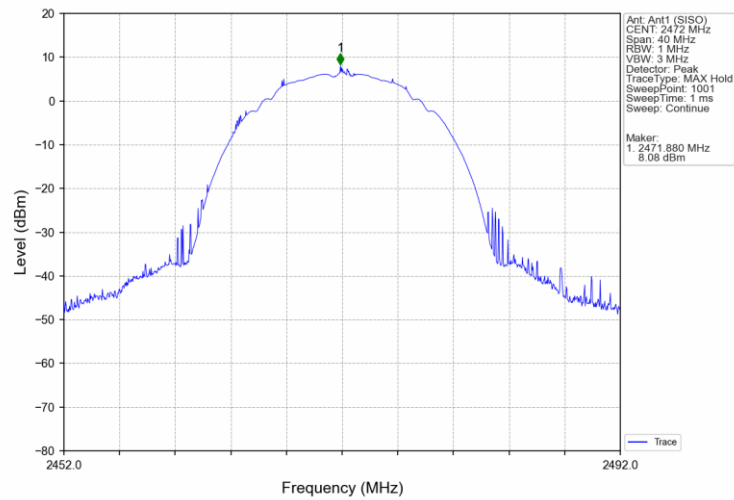
ENV	Mode	TX Type	Frequency (MHz)	ANT	Gain (dBi)	EIRP (dBm/MHz)		Verdict
						Result	Limit	
NTNV	802.11b	SISO	2412	1	3.68	4.54	<=12.14	Pass
			2472	1	3.68	4.53	<=12.14	Pass
	802.11g	SISO	2412	1	3.68	3.98	<=12.14	Pass
			2472	1	3.68	3.92	<=12.14	Pass
	802.11n (HT20)	SISO	2412	1	3.68	3.49	<=12.14	Pass
			2472	1	3.68	3.32	<=12.14	Pass

4.2 Test Graph

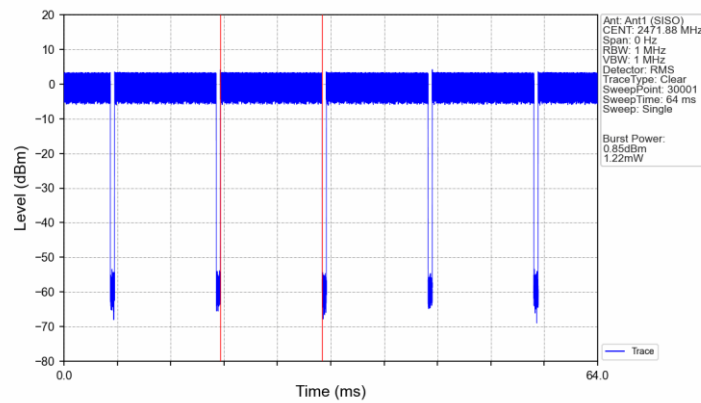
4.2.1 Power



802.11b_2472MHz_Ant1 (SISO)_NTNV

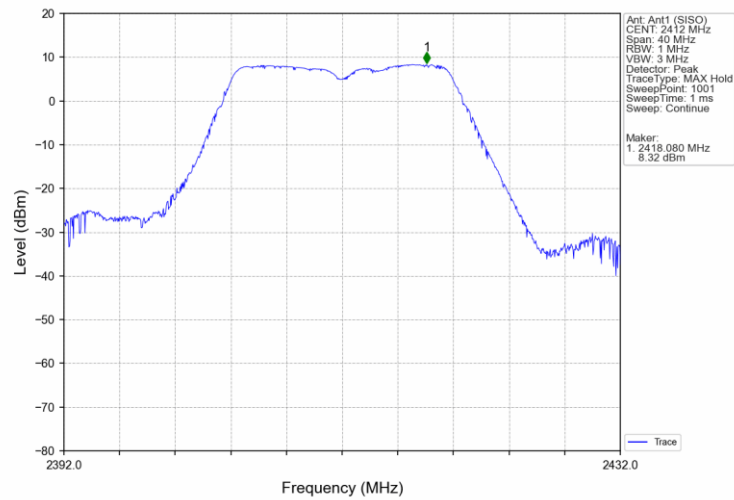


802.11b_2472MHz_Ant1 (SISO)_NTNV

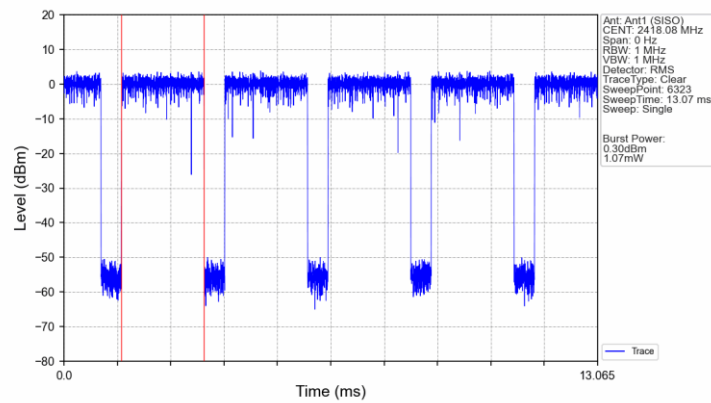


Burst No.	1	2	3	4
Length (ms)	12.198	12.196	12.198	12.196
Power(dBm)	0.85	0.85	0.85	0.85
Power(mW)	1.215	1.216	1.215	1.215
Remark	/	Max	/	/

802.11g_2412MHz_Ant1 (SISO)_NTNV

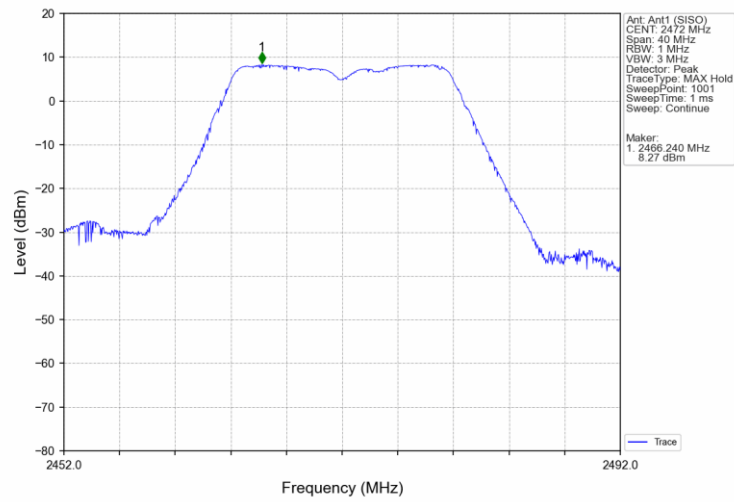


802.11g_2412MHz_Ant1 (SISO)_NTNV

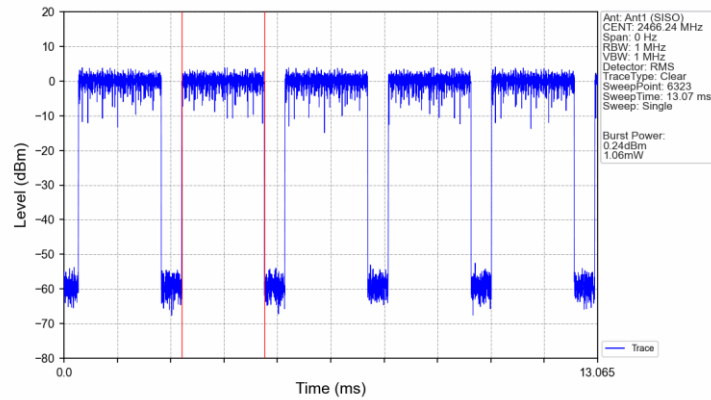


Burst No.	1	2	3	4
Length (ms)	2.027	2.025	2.027	2.027
Power(dBm)	0.30	0.29	0.29	0.29
Power(mW)	1.070	1.069	1.068	1.070
Remark	Max	/	/	/

802.11g_2472MHz_Ant1 (SISO)_NTNV

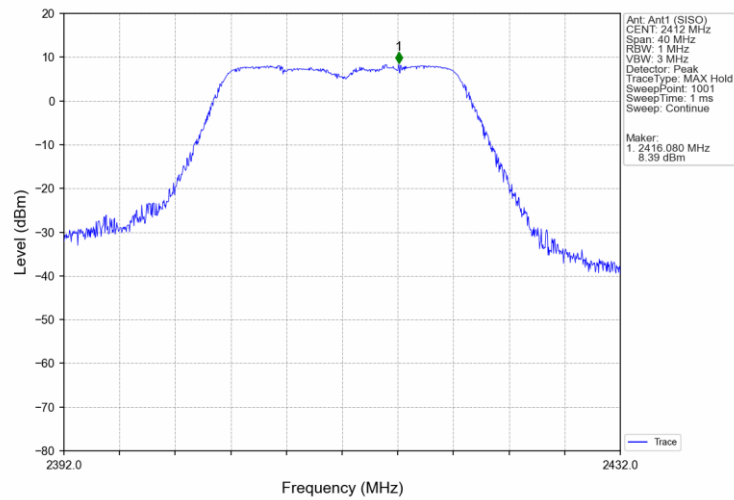


802.11g_2472MHz_Ant1 (SISO)_NTNV

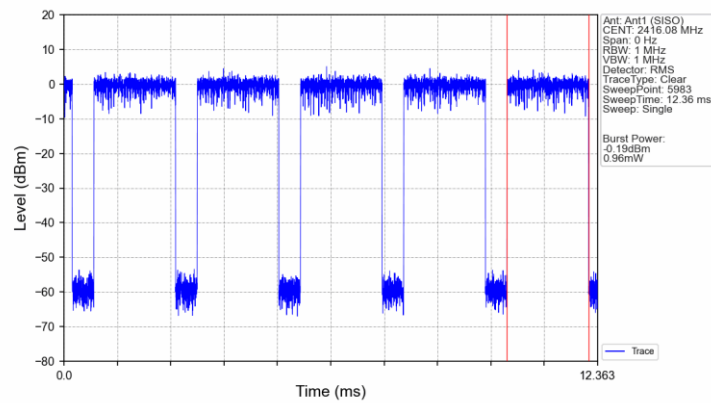


Burst No.	1	2	3	4	5
Length (ms)	2.027	2.025	2.027	2.025	2.027
Power(dBm)	0.23	0.24	0.23	0.23	0.23
Power(mW)	1.055	1.057	1.054	1.054	1.055
Remark	/	Max	/	/	/

802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

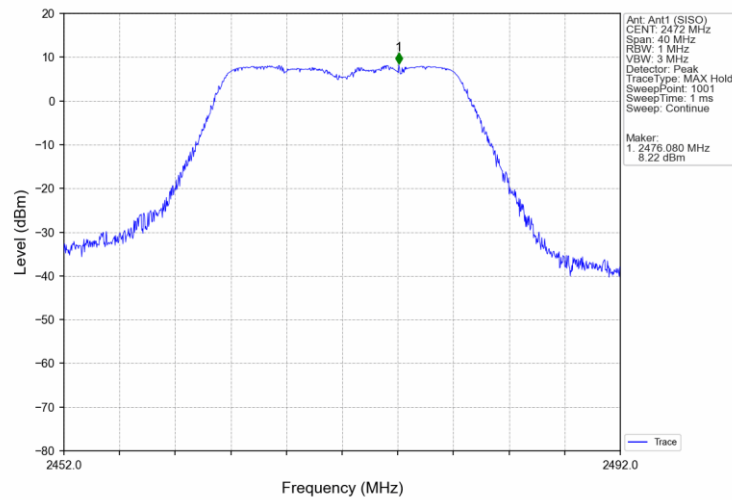


802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

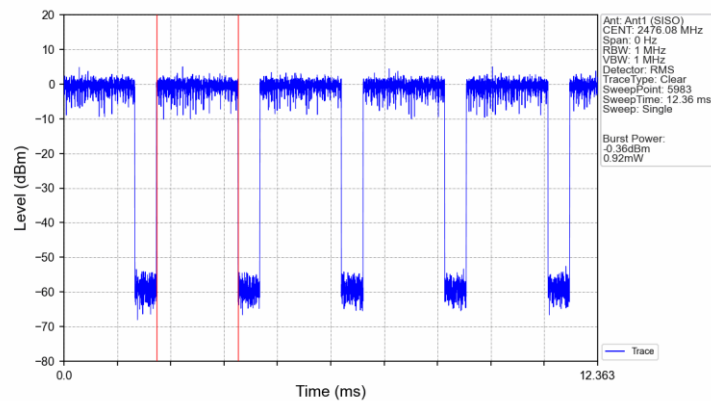


Burst No.	1	2	3	4	5
Length (ms)	1.891	1.891	1.891	1.891	1.891
Power(dBm)	-0.19	-0.19	-0.19	-0.19	-0.19
Power(mW)	0.958	0.958	0.958	0.958	0.958
Remark	/	/	/	/	Max

802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



Burst No.	1	2	3	4
Length (ms)	1.891	1.891	1.891	1.891
Power(dBm)	-0.36	-0.37	-0.37	-0.37
Power(mW)	0.920	0.919	0.919	0.919
Remark	Max	/	/	/

5. Spurious Emission Intensity

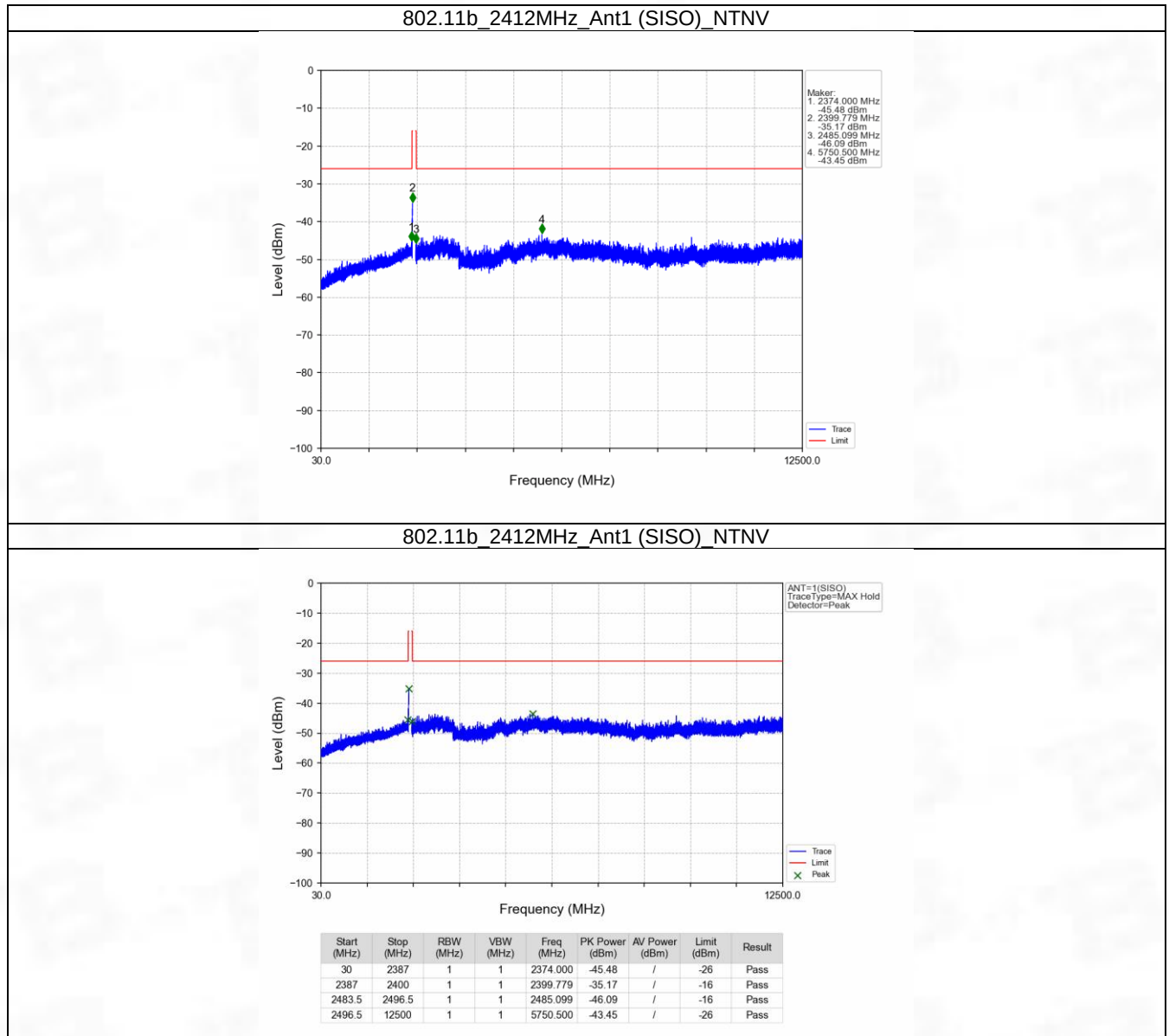
5.1 Test Result

5.1.1 TxSe_NTNV

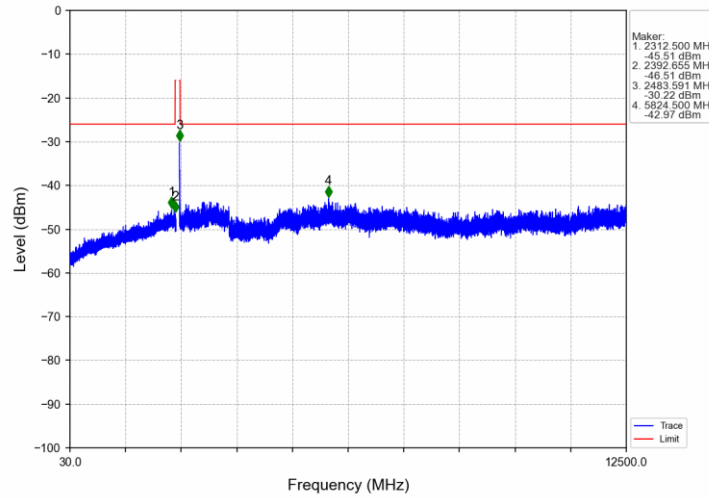
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (uW /MHz)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm /MHz)	PK Power (uW /MHz)	AV Power (dBm /MHz)	AV Power (uW /MHz)		
802.11b	SISO	2412	1	30	2387	2374	-45.48	0.028	/	/	2.5	Pass
				2387	2400	2399.779	-35.17	0.304	/	/	25	Pass
				2483.5	2496.5	2485.099	-46.09	0.025	/	/	25	Pass
				2496.5	12500	5750.5	-43.45	0.045	/	/	2.5	Pass
		2472	1	30	2387	2312.5	-45.51	0.028	/	/	2.5	Pass
				2387	2400	2392.655	-46.51	0.022	/	/	25	Pass
				2483.5	2496.5	2483.591	-30.22	0.951	/	/	25	Pass
				2496.5	12500	5824.5	-42.97	0.050	/	/	2.5	Pass
802.11g	SISO	2412	1	30	2387	2381.5	-39.84	0.104	/	/	2.5	Pass
				2387	2400	2399.948	-21.42	7.211	/	/	25	Pass
				2483.5	2496.5	2487.66	-42.87	0.052	/	/	25	Pass
				2496.5	12500	6943	-38.98	0.126	/	/	2.5	Pass
		2472	1	30	2387	2383	-45.79	0.026	/	/	2.5	Pass
				2387	2400	2392.642	-46.08	0.025	/	/	25	Pass
				2483.5	2496.5	2483.513	-18.89	12.912	-39.72	0.107	25	Pass
				2496.5	12500	2504	-38.57	0.139	/	/	2.5	Pass
802.11n (HT20)	SISO	2412	1	30	2387	2386	-41.46	0.071	/	/	2.5	Pass
				2387	2400	2399.974	-19.03	12.503	/	/	25	Pass
				2483.5	2496.5	2492.093	-45.91	0.026	/	/	25	Pass
				2496.5	12500	3010.5	-43.42	0.045	/	/	2.5	Pass
		2472	1	30	2387	2304	-46.05	0.025	/	/	2.5	Pass
				2387	2400	2393.903	-46.59	0.022	/	/	25	Pass
				2483.5	2496.5	2483.513	-15.36	29.107	-38.88	0.129	25	Pass
				2496.5	12500	2497	-40.42	0.091	/	/	2.5	Pass

5.2 Test Graph

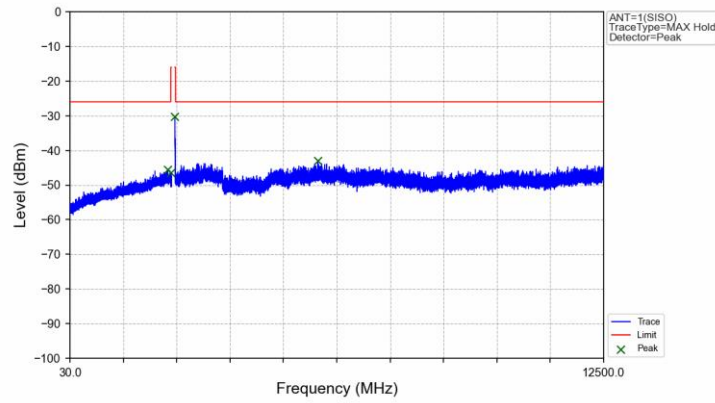
5.2.1 TxSe_NTNV



802.11b_2472MHz_Ant1 (SISO)_NTNV

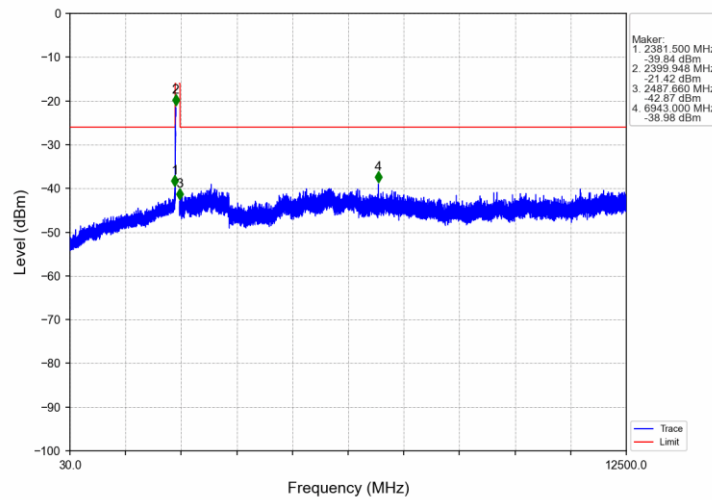


802.11b_2472MHz_Ant1 (SISO)_NTNV

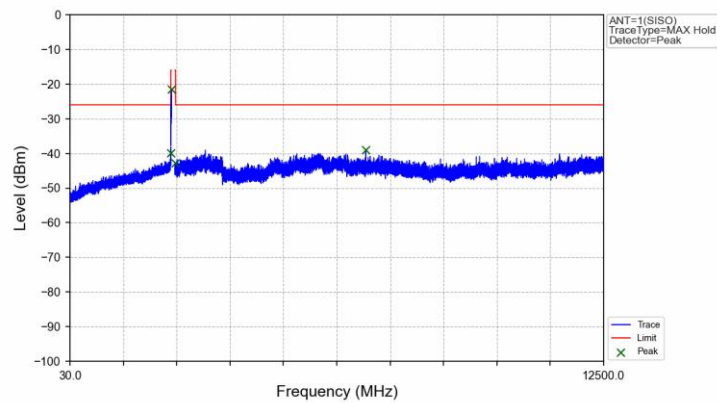


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2312.500	-45.51	/	-26	Pass
2387	2400	1	1	2392.655	-46.51	/	-16	Pass
2483.5	2496.5	1	1	2483.591	-30.22	/	-16	Pass
2496.5	12500	1	1	5824.500	-42.97	/	-26	Pass

802.11g_2412MHz_Ant1 (SISO)_NTNV

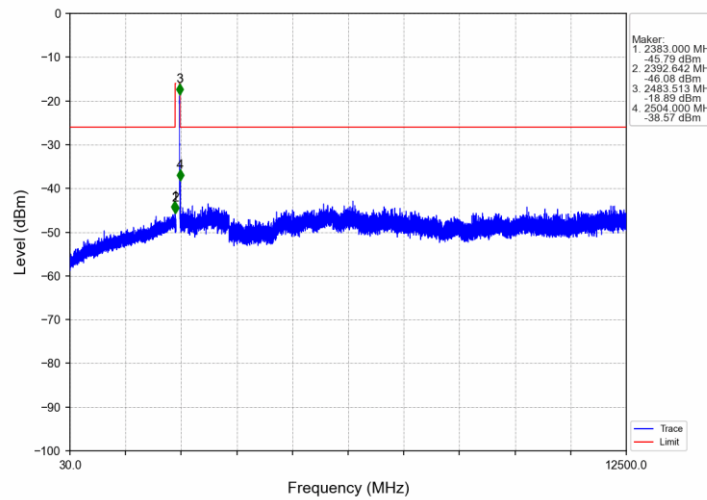


802.11g_2412MHz_Ant1 (SISO)_NTNV

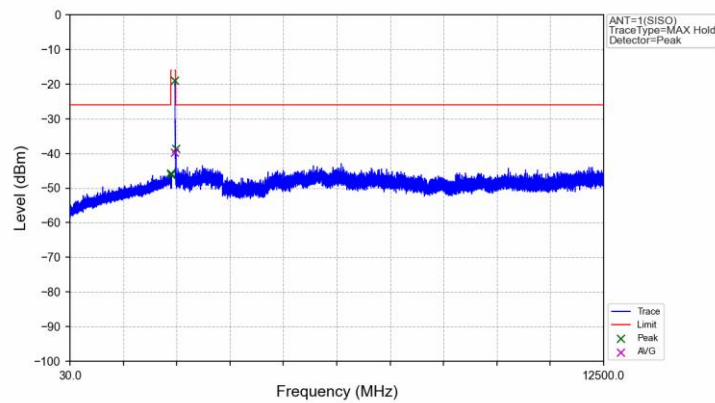


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2381.500	-39.84	/	-26	Pass
2387	2400	1	1	2399.948	-21.42	/	-16	Pass
2483.5	2496.5	1	1	2487.660	-42.87	/	-16	Pass
2496.5	12500	1	1	6943.000	-38.98	/	-26	Pass

802.11g_2472MHz_Ant1 (SISO)_NTNV

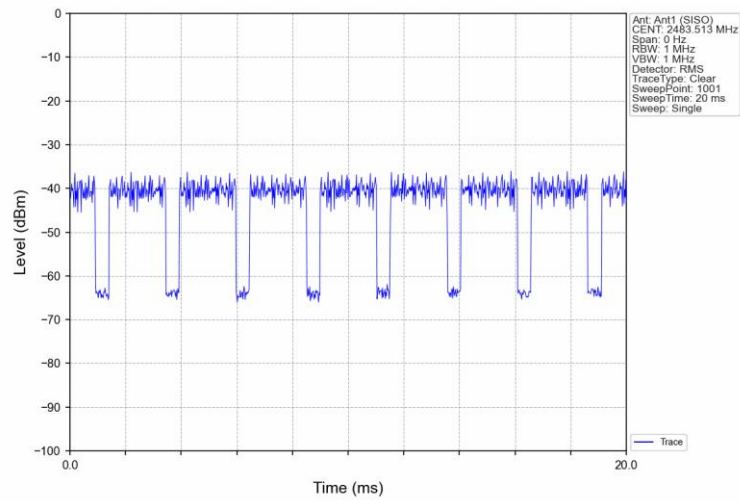


802.11g_2472MHz_Ant1 (SISO)_NTNV

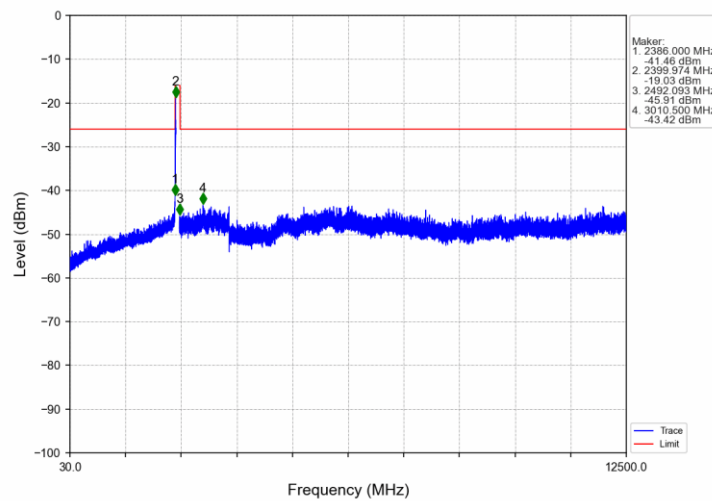


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2383.000	-45.79	/	-26	Pass
2387	2400	1	1	2392.642	-46.08	/	-16	Pass
2483.5	2496.5	1	1	2483.513	-18.89	-39.72	-16	Pass
2496.5	12500	1	1	2504.000	-38.57	/	-26	Pass

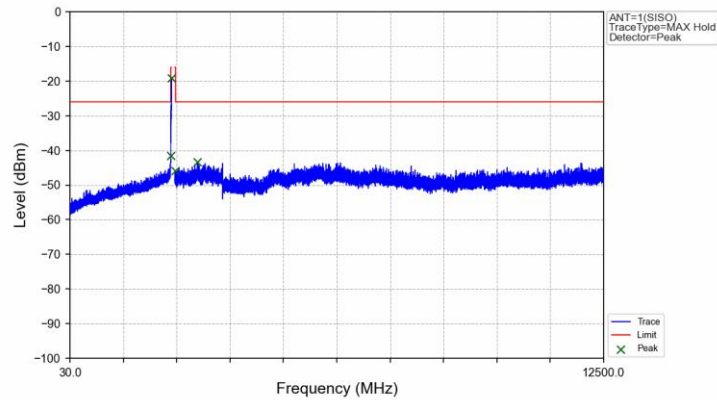
802.11g_2472MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

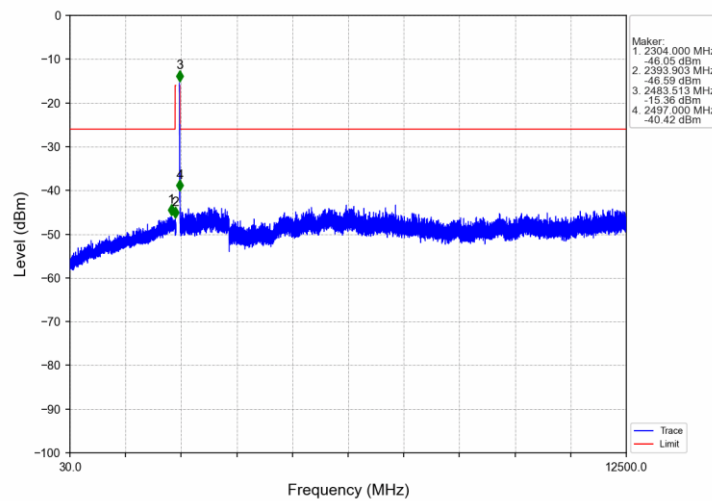


802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

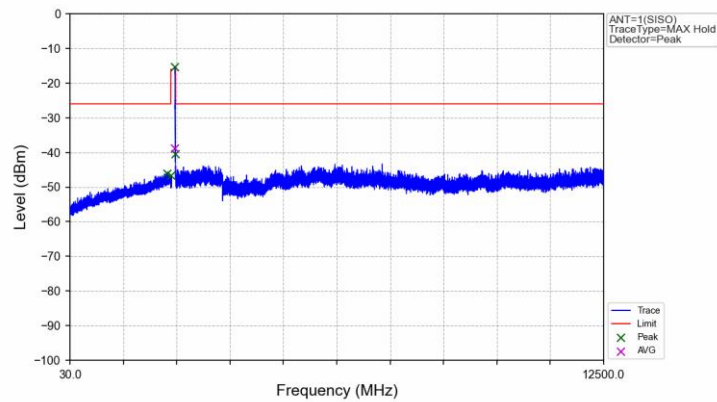


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2386.000	-41.46	/	-26	Pass
2387	2400	1	1	2399.974	-19.03	/	-16	Pass
2483.5	2496.5	1	1	2492.093	-45.91	/	-16	Pass
2496.5	12500	1	1	3010.500	-43.42	/	-26	Pass

802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV

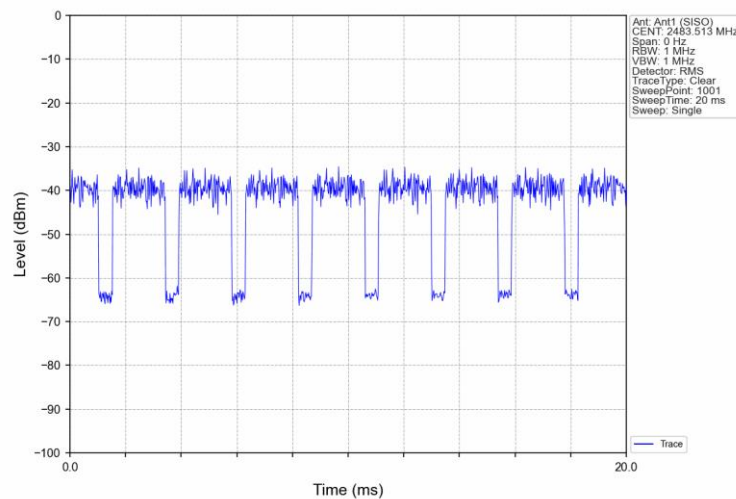


802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	2387	1	1	2304.000	-46.05	/	-26	Pass
2387	2400	1	1	2393.903	-46.59	/	-16	Pass
2483.5	2496.5	1	1	2483.513	-15.36	-38.88	-16	Pass
2496.5	12500	1	1	2497.000	-40.42	/	-26	Pass

802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



6. Secondary Radiated Emission

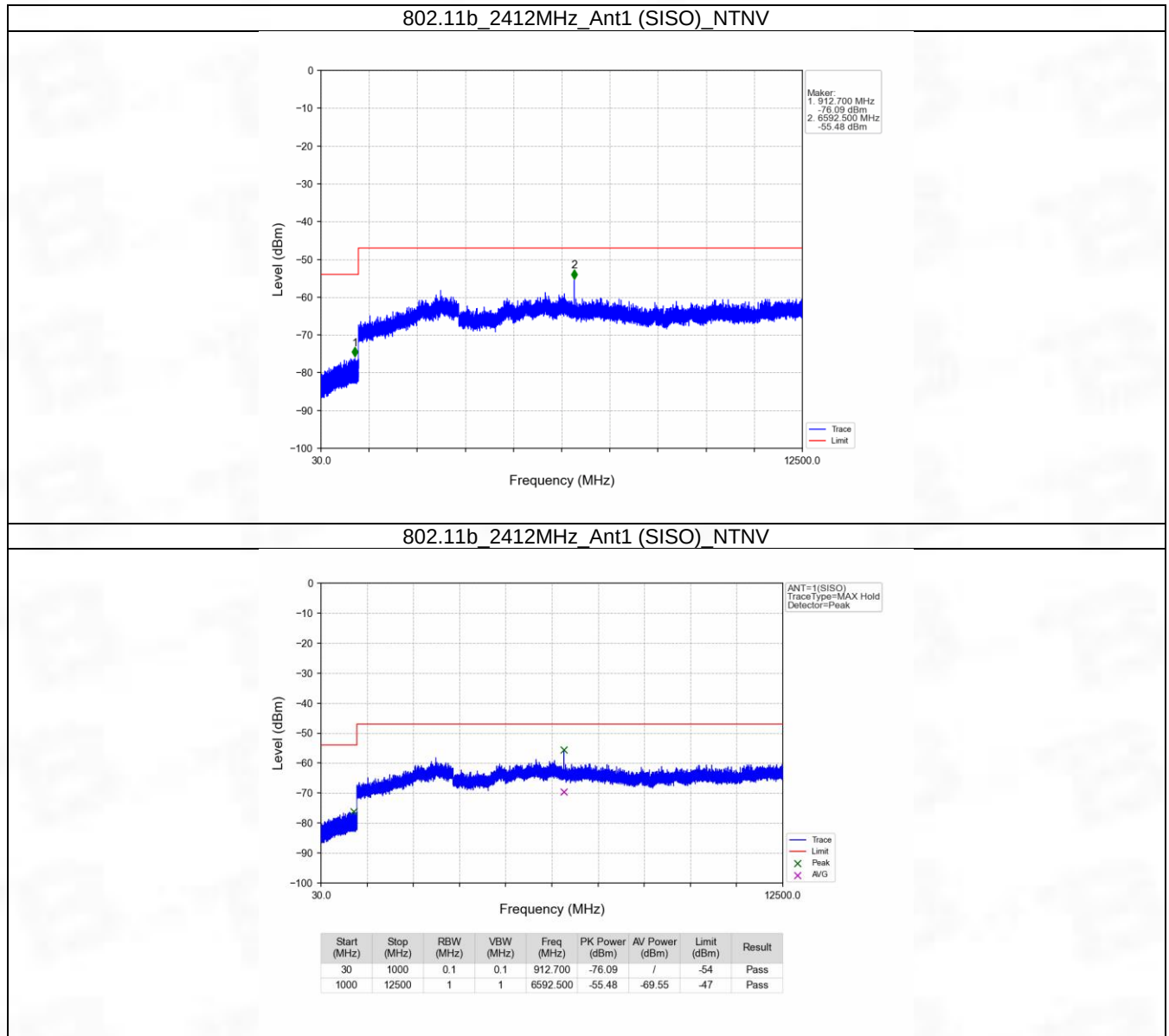
6.1 Test Result

6.1.1 RxSe_NTNV

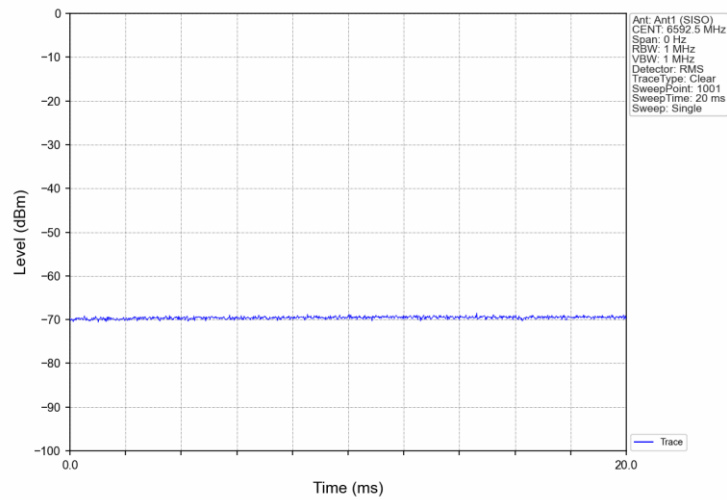
NTNV												
Mode	TX Type	Freq. (MHz)	ANT	Freq. Range		Marker					Limit (nW)	Verdict
				Start (MHz)	Stop (MHz)	Freq. (MHz)	PK Power (dBm)	PK Power (nW)	AV Power (dBm)	AV Power (nW)		
802.11b	SISO	2412	1	30	1000	912.7	-76.09	0.025	/	/	4	Pass
				1000	12500	6592.5	-55.48	2.831	-69.55	0.111	20	Pass
		2472	1	30	1000	640	-75.84	0.026	/	/	4	Pass
				1000	12500	6592	-55.94	2.547	-66.63	0.217	20	Pass
802.11g	SISO	2412	1	30	1000	831.6	-75.04	0.031	/	/	4	Pass
				1000	12500	3518.5	-52.85	5.188	-79.99	0.010	20	Pass
		2472	1	1000	12500	6592.5	-55.75	2.661	-69.51	0.112	20	Pass
				30	1000	936.75	-75.60	0.028	/	/	4	Pass
802.11n (HT20)	SISO	2412	1	1000	12500	6592	-56.27	2.360	-66.61	0.218	20	Pass
				30	1000	912.5	-75.84	0.026	/	/	4	Pass
		2472	1	1000	12500	6592	-54.55	3.508	-66.62	0.218	20	Pass
				30	1000	933.9	-76.17	0.024	/	/	4	Pass
				1000	12500	6592	-54.92	3.221	-66.63	0.217	20	Pass

6.2 Test Graph

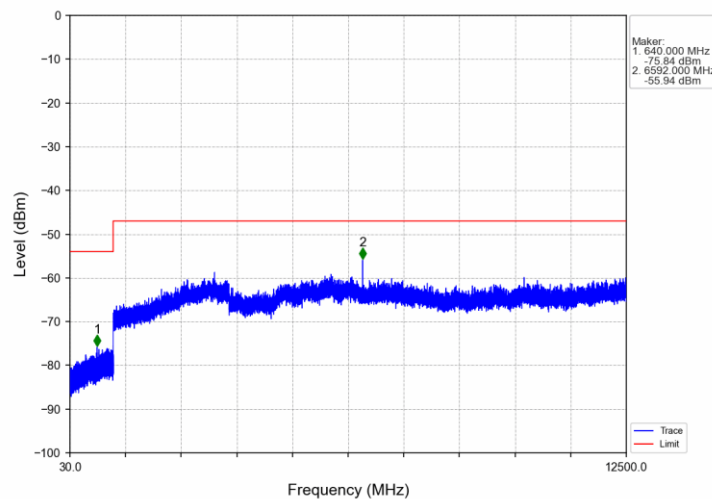
6.2.1 RxSe_NTNV



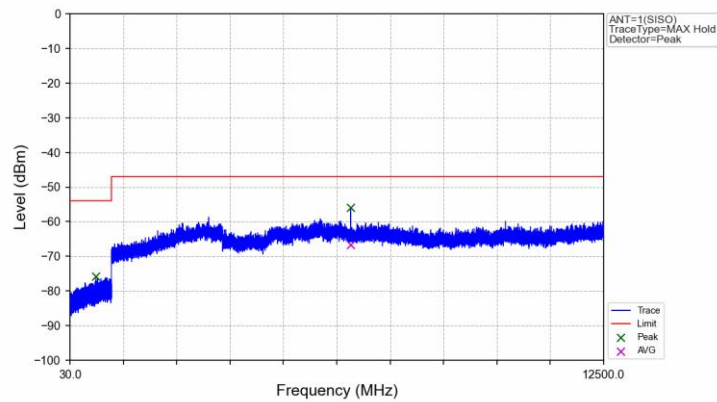
802.11b_2412MHz_Ant1 (SISO)_NTNV



802.11b_2472MHz_Ant1 (SISO)_NTNV

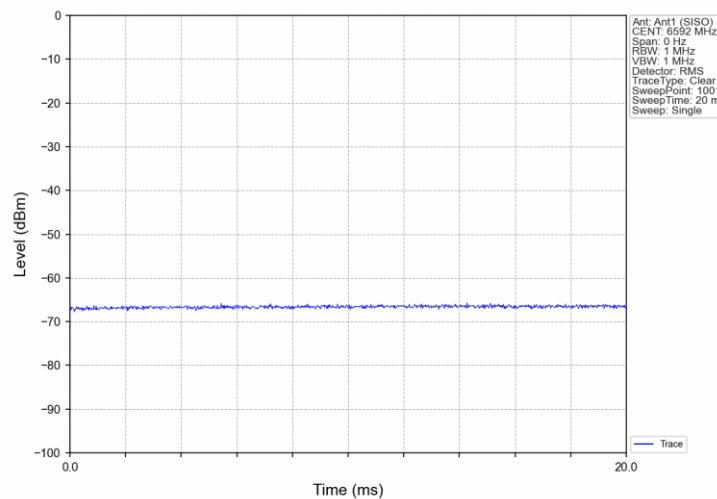


802.11b_2472MHz_Ant1 (SISO)_NTNV

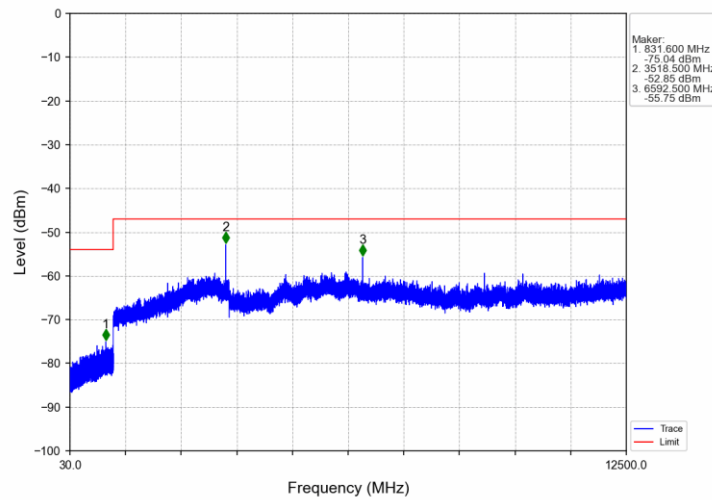


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	640.000	-75.84	/	-54	Pass
1000	12500	1	1	6592.000	-55.94	-66.63	-47	Pass

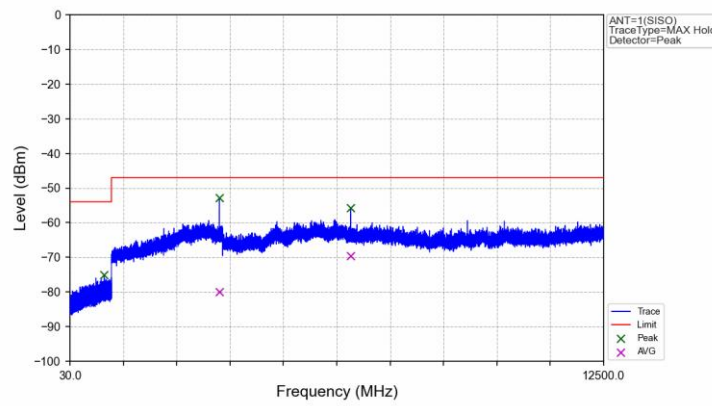
802.11b_2472MHz_Ant1 (SISO)_NTNV



802.11g_2412MHz_Ant1 (SISO)_NTNV

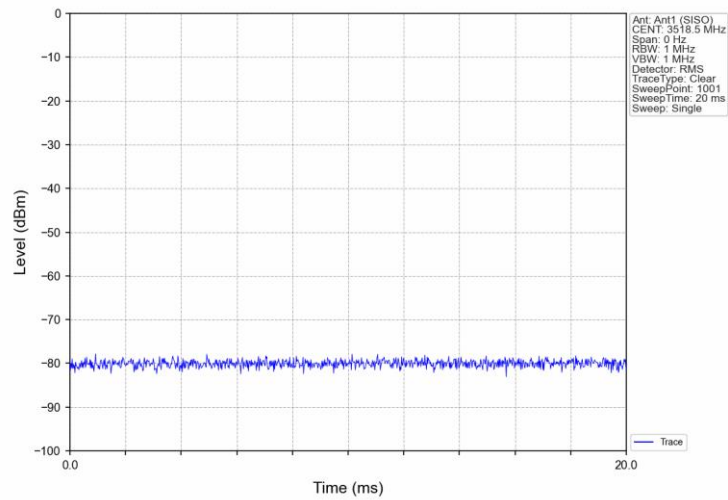


802.11g_2412MHz_Ant1 (SISO)_NTNV

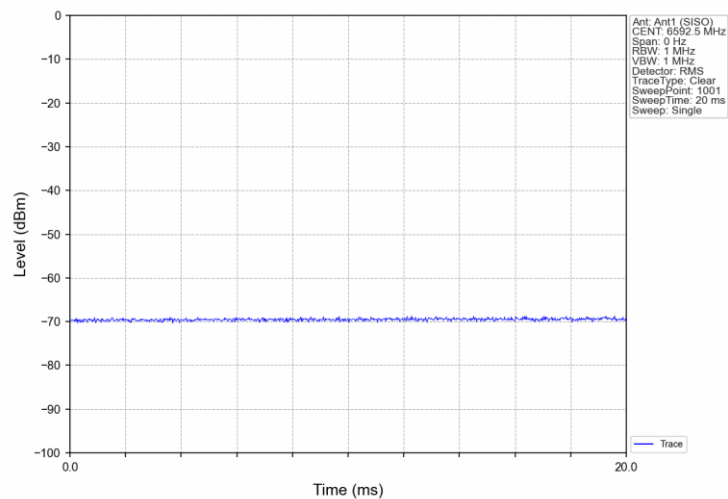


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	831.600	-75.04	/	-54	Pass
1000	12500	1	1	3518.500	-52.85	-79.99	-47	Pass
1000	12500	1	1	6592.500	-55.75	-69.51	-47	Pass

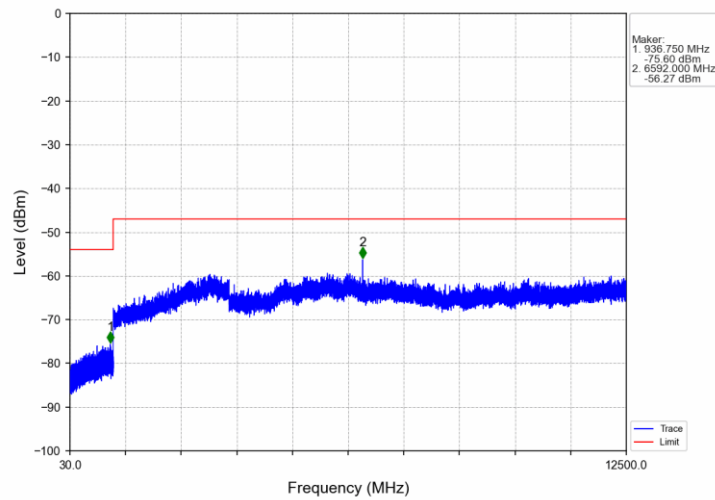
802.11g_2412MHz_Ant1 (SISO)_NTNV



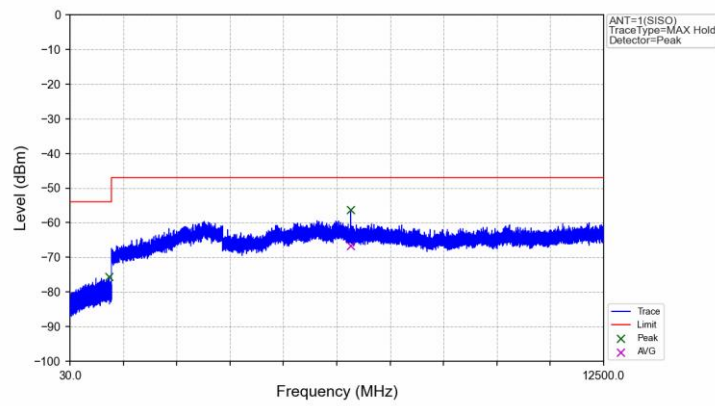
802.11g_2412MHz_Ant1 (SISO)_NTNV



802.11g_2472MHz_Ant1 (SISO)_NTNV

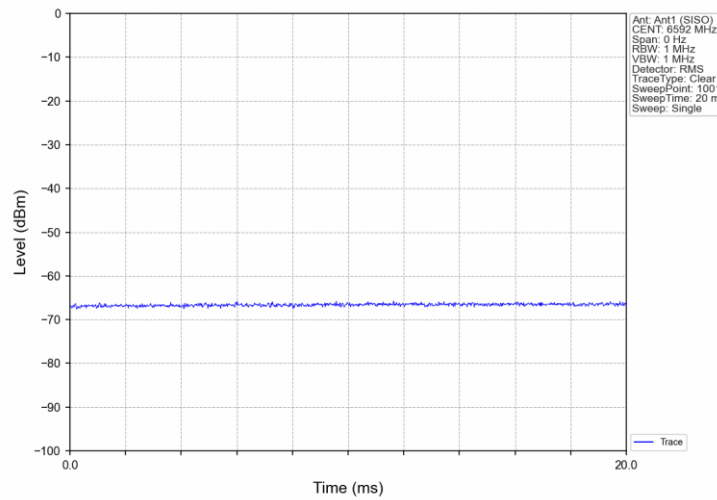


802.11g_2472MHz_Ant1 (SISO)_NTNV

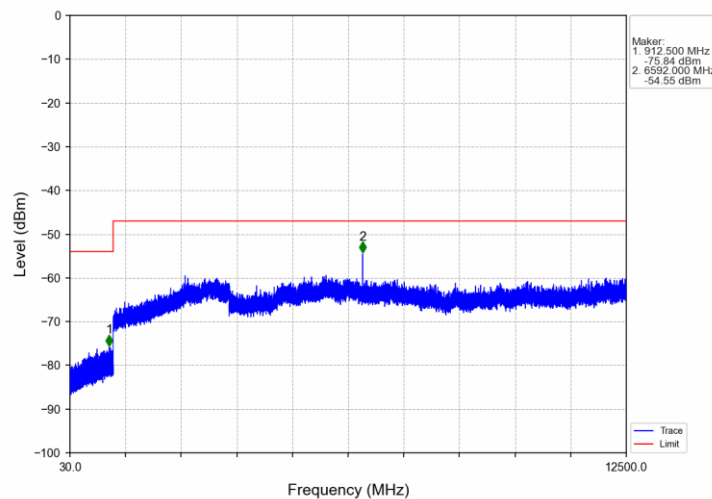


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	936.750	-75.60	/	-54	Pass
1000	12500	1	1	6592.000	-56.27	-66.61	-47	Pass

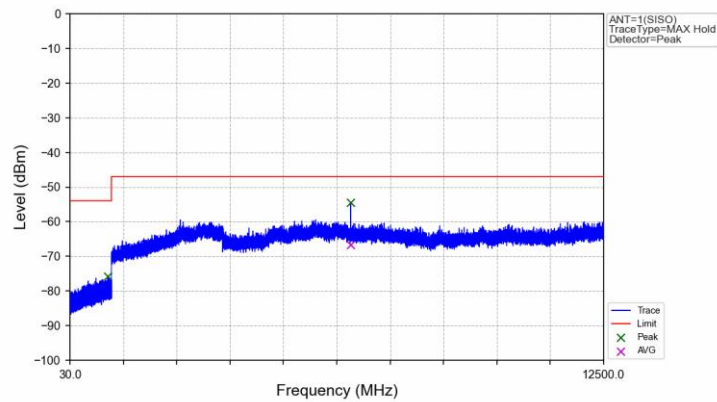
802.11g_2472MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

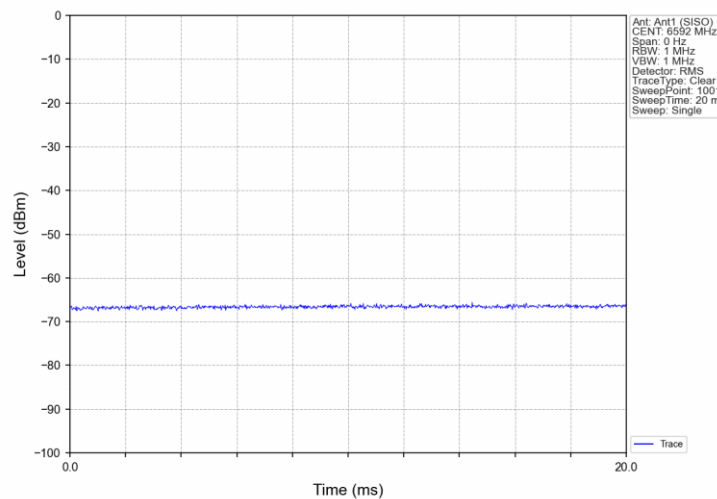


802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV

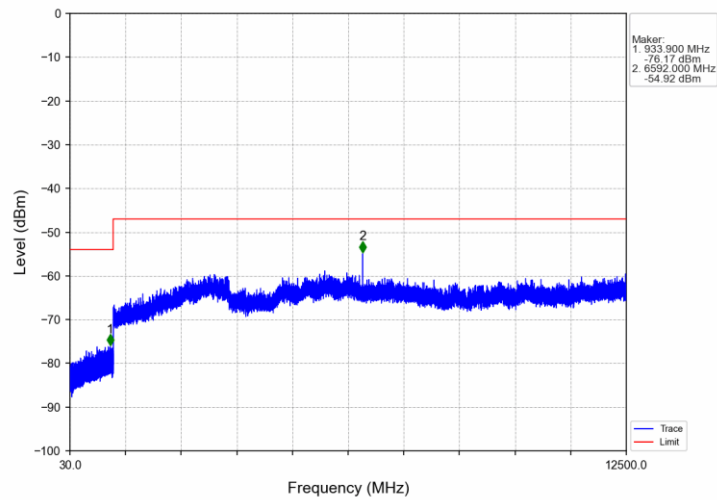


Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	912.500	-75.84	/	-54	Pass
1000	12500	1	1	6592.000	-54.55	-66.62	-47	Pass

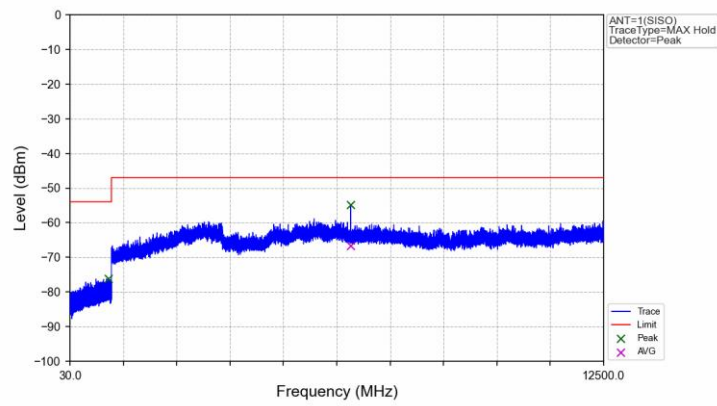
802.11n(HT20)_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_2472MHz_Ant1 (SISO)_NTNV



Start (MHz)	Stop (MHz)	RBW (MHz)	VBW (MHz)	Freq (MHz)	PK Power (dBm)	AV Power (dBm)	Limit (dBm)	Result
30	1000	0.1	0.1	933.900	-76.17	/	-54	Pass
1000	12500	1	1	6592.000	-54.92	-66.63	-47	Pass

