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Annex for 2.4G Wi-Fi

Test Report No.: CTL2503278011-WF02

TABLE OF CONTENTS

Annex for 2.4G Wi-Fi 1

1. Duty Cycle 2

2. Bandwidth 9

3. Maximum Conducted Output Power 22

4. Maximum Power Spectral Density 23

5. Unwanted Emissions In Non-restricted Frequency Bands 30

1. Duty Cycle

1.1 Test Result

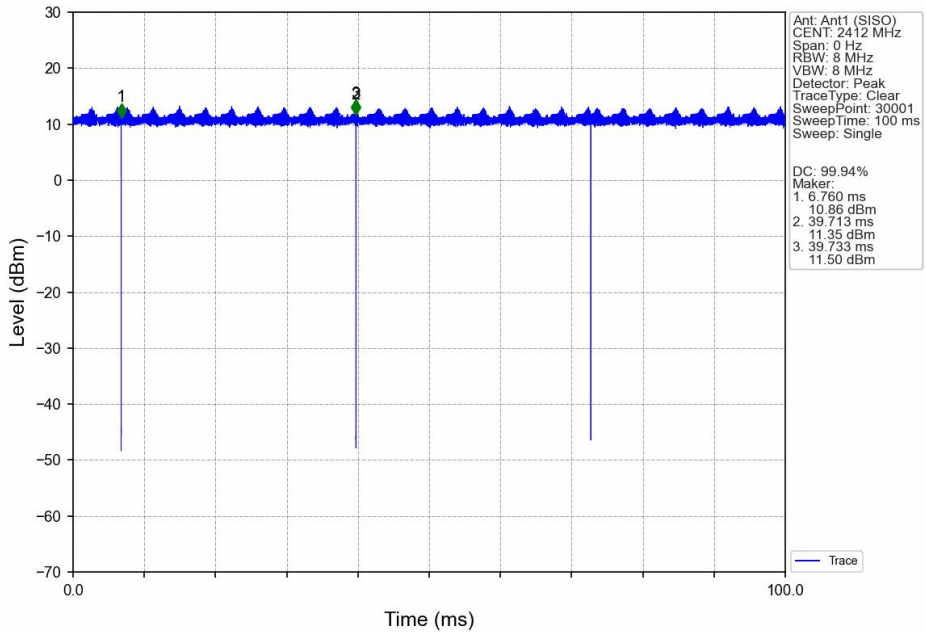
1.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	32.953	32.973	99.94	0.00	0.00
		2437	32.953	32.973	99.94	0.00	0.01
		2462	32.953	32.973	99.94	0.00	0.01
802.11g	SISO	2412	5.484	5.510	99.53	0.02	0.04
		2437	5.484	5.510	99.53	0.02	0.04
		2462	5.484	5.510	99.53	0.02	0.04
802.11n (HT20)	SISO	2412	5.079	5.105	99.49	0.02	0.00
		2437	5.079	5.105	99.49	0.02	0.04
		2462	5.079	5.105	99.49	0.02	0.04
802.11n (HT40)	SISO	2422	2.469	2.494	99.00	0.04	0.03
		2437	2.470	2.495	99.00	0.04	0.03
		2452	2.470	2.495	99.00	0.04	0.03

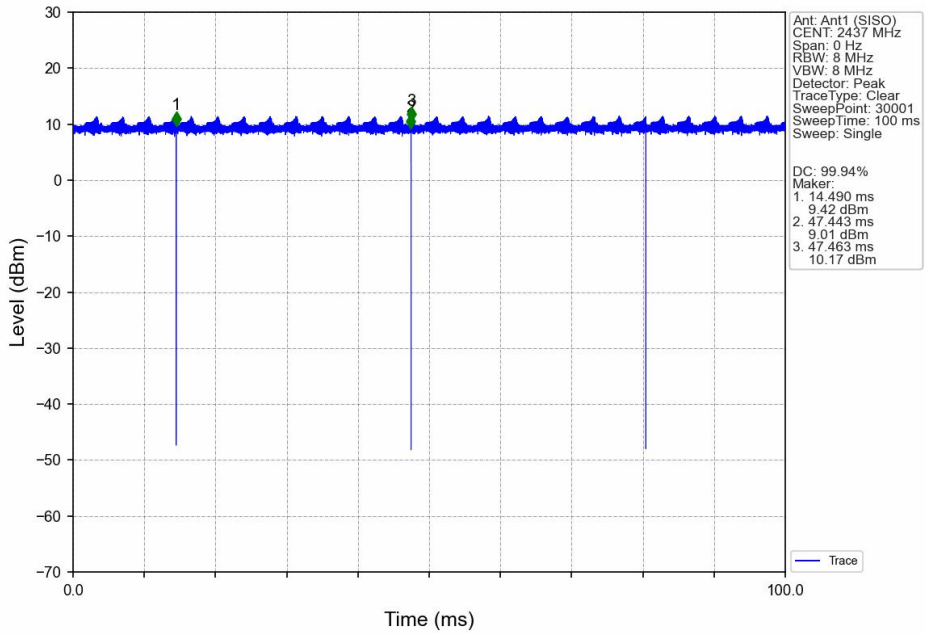
1.2 Test Graph

1.2.1 Ant1

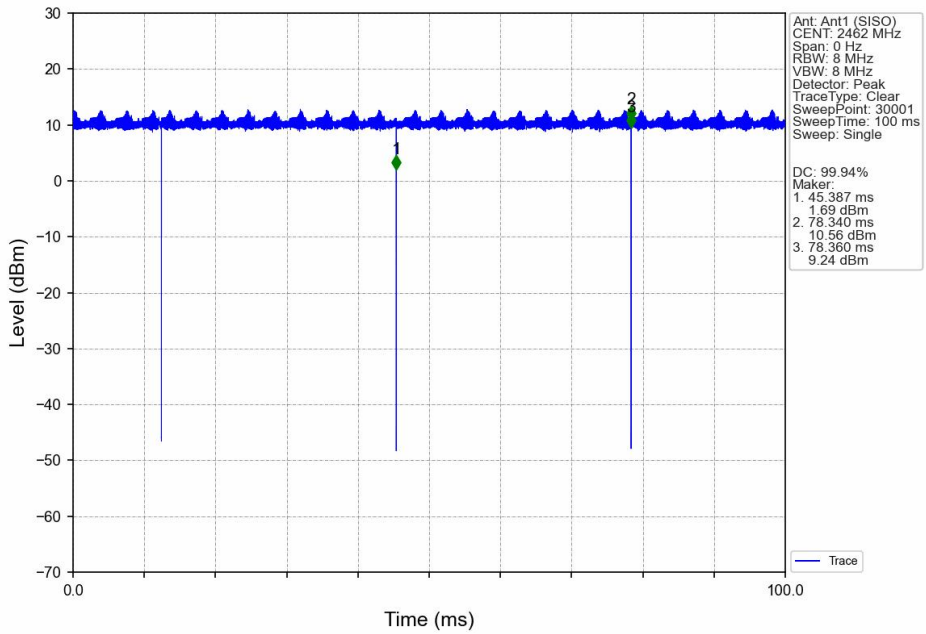
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



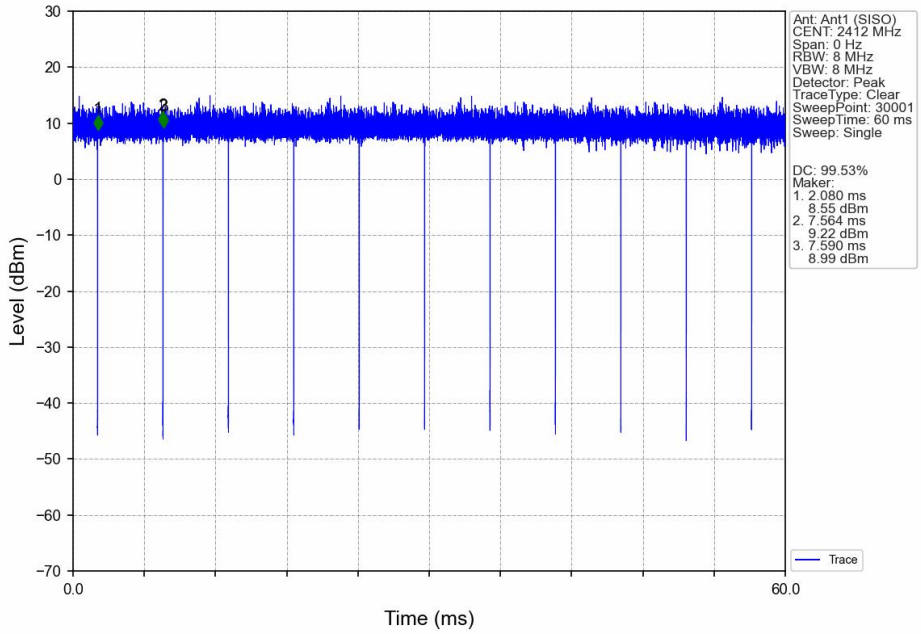
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



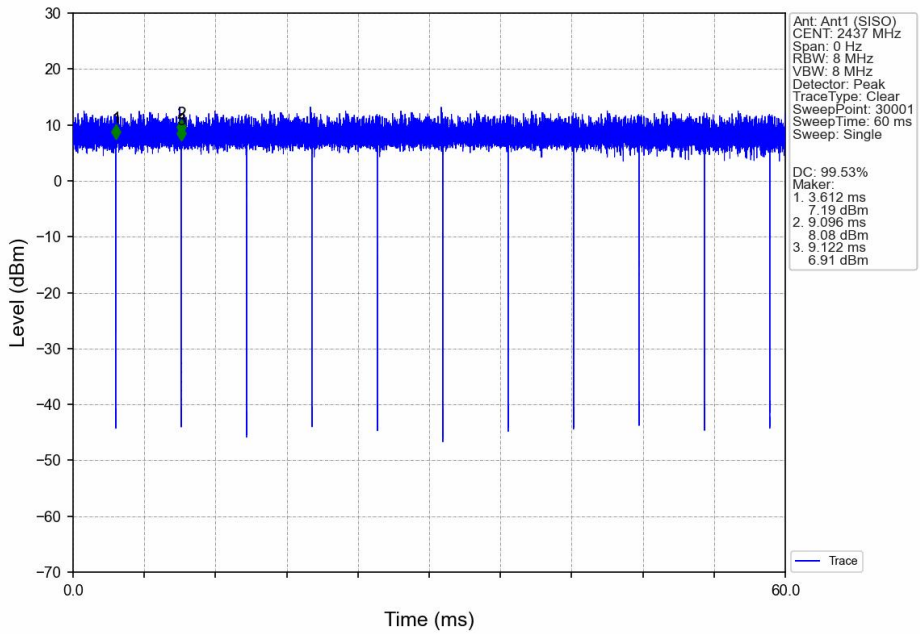
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



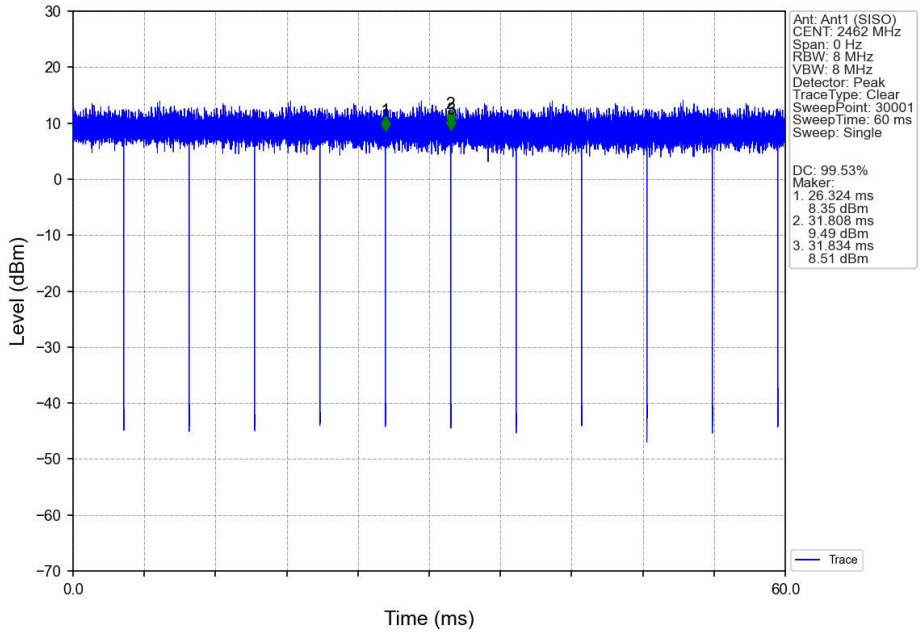
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



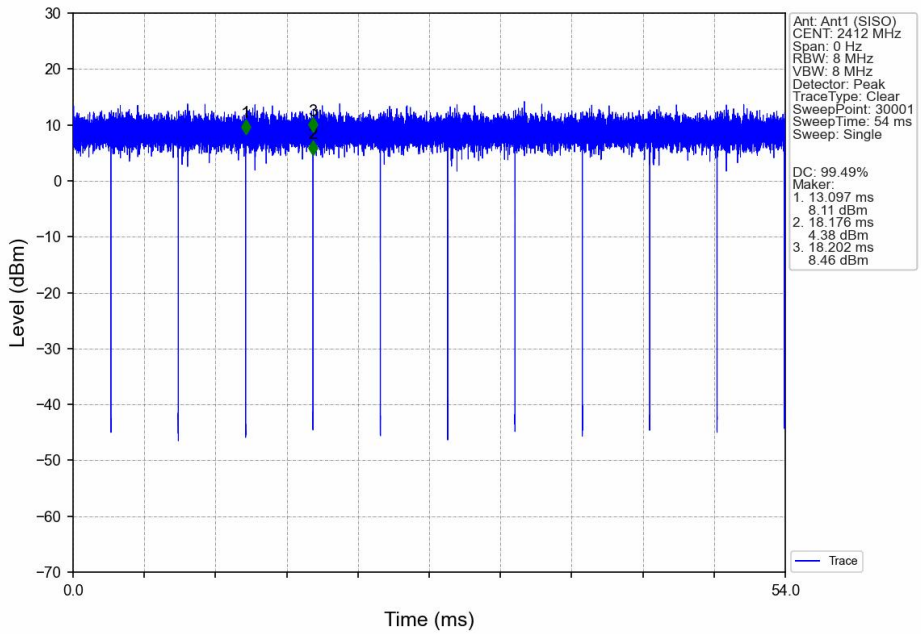
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



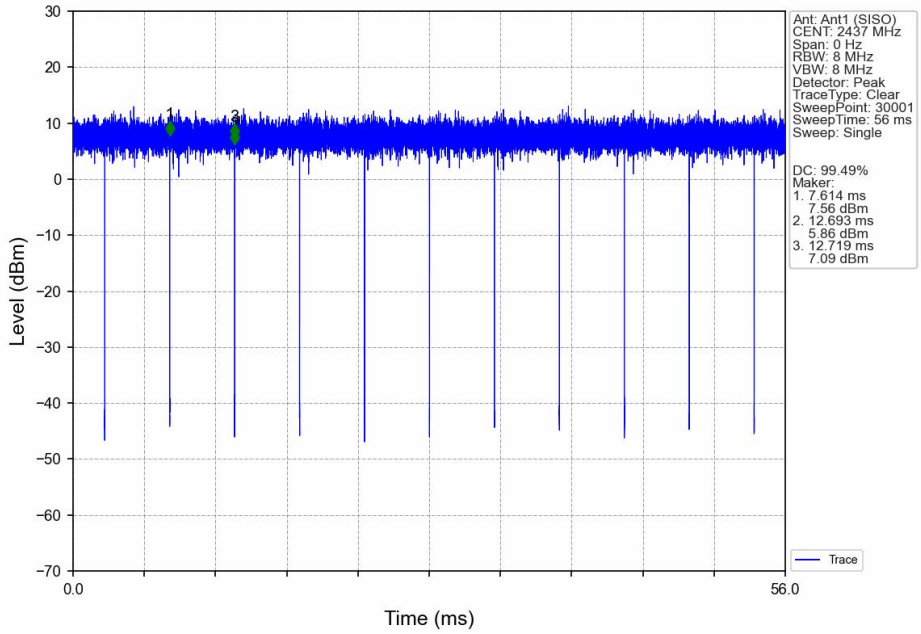
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



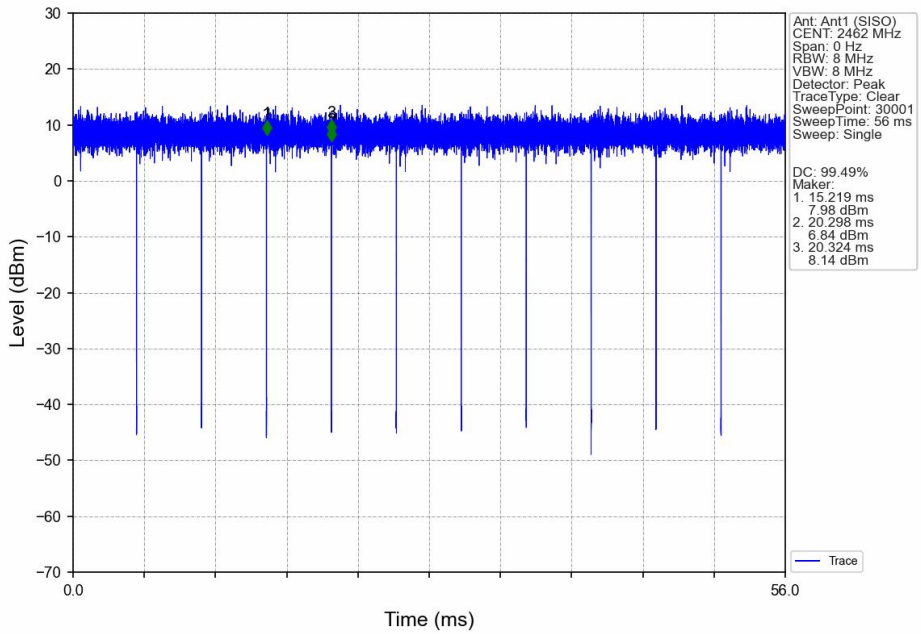
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



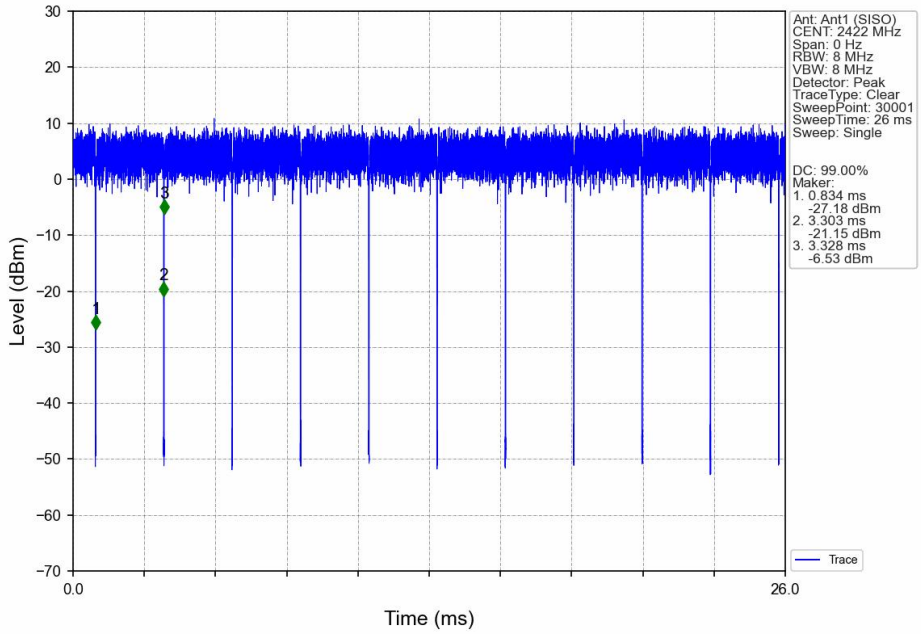
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



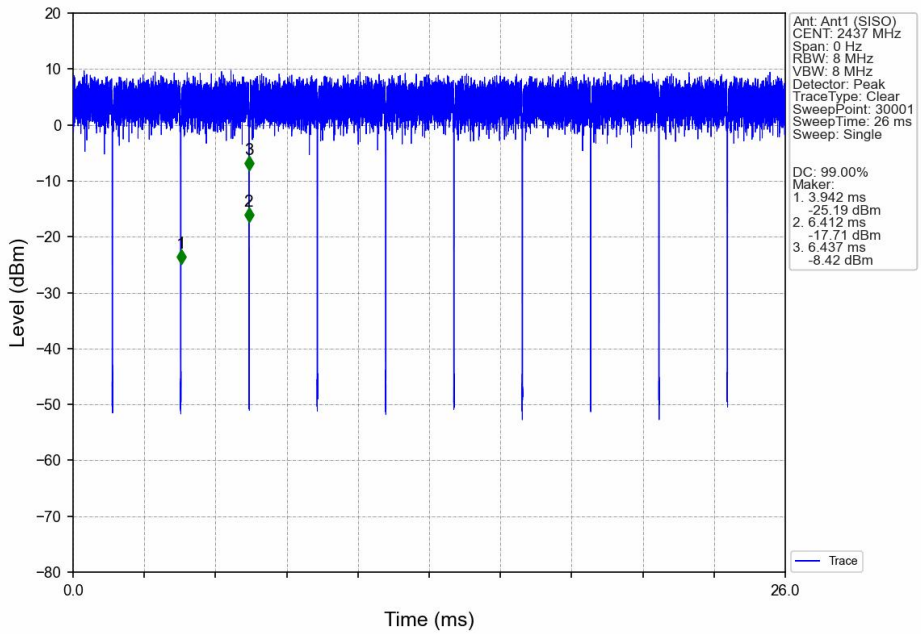
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



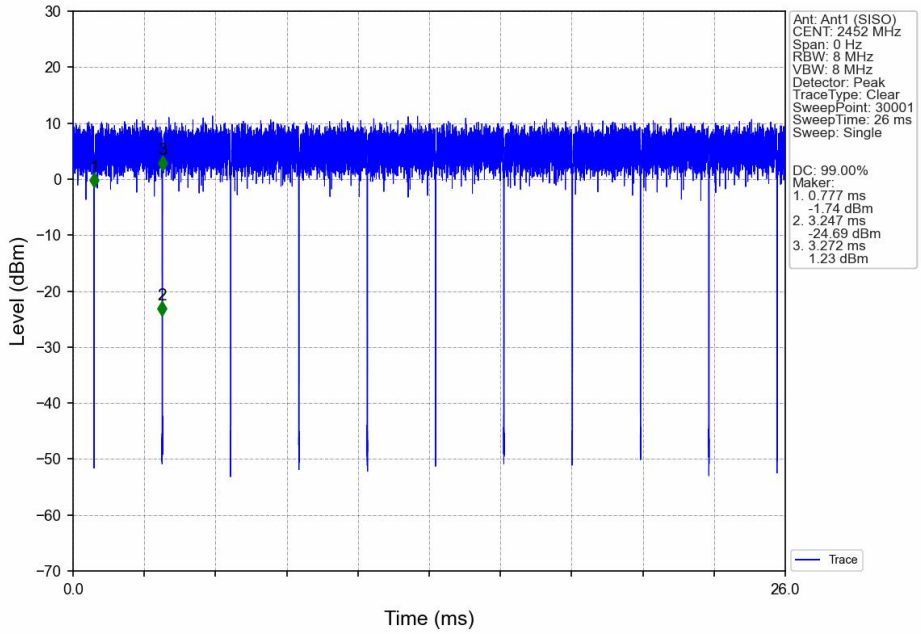
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



2. Bandwidth

2.1 Test Result

2.1.1 OBW

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	12.994	/	Pass
		2437	1	13.106	/	Pass
		2462	1	13.121	/	Pass
802.11g	SISO	2412	1	16.944	/	Pass
		2437	1	17.042	/	Pass
		2462	1	17.019	/	Pass
802.11n (HT20)	SISO	2412	1	17.519	/	Pass
		2437	1	17.602	/	Pass
		2462	1	17.606	/	Pass
802.11n (HT40)	SISO	2422	1	36.076	/	Pass
		2437	1	36.139	/	Pass
		2452	1	35.842	/	Pass

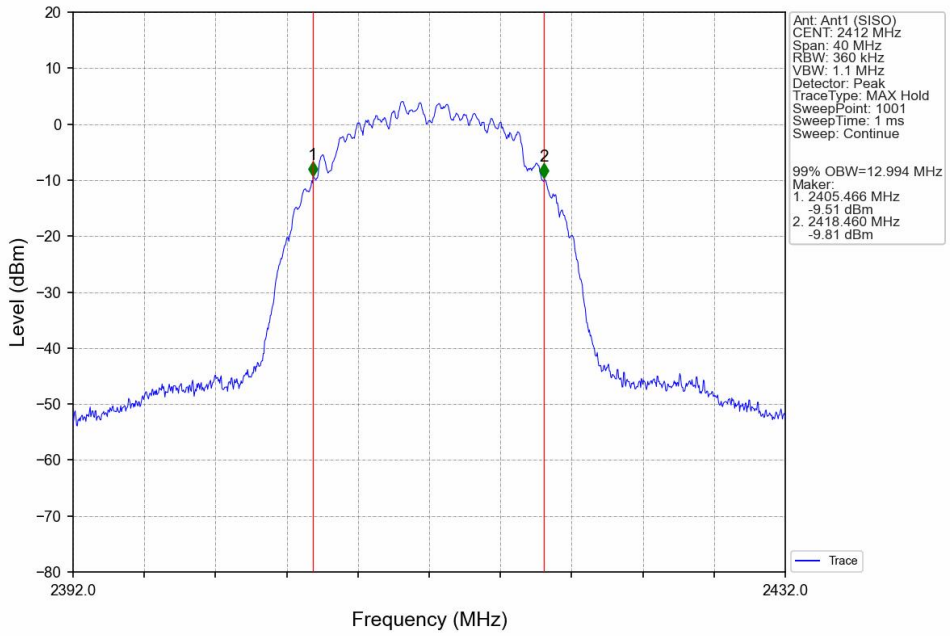
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	10.032	>=0.5	Pass
		2437	1	9.613	>=0.5	Pass
		2462	1	9.192	>=0.5	Pass
802.11g	SISO	2412	1	16.417	>=0.5	Pass
		2437	1	16.388	>=0.5	Pass
		2462	1	16.410	>=0.5	Pass
802.11n (HT20)	SISO	2412	1	16.814	>=0.5	Pass
		2437	1	16.949	>=0.5	Pass
		2462	1	16.948	>=0.5	Pass
802.11n (HT40)	SISO	2422	1	35.134	>=0.5	Pass
		2437	1	35.170	>=0.5	Pass
		2452	1	35.126	>=0.5	Pass

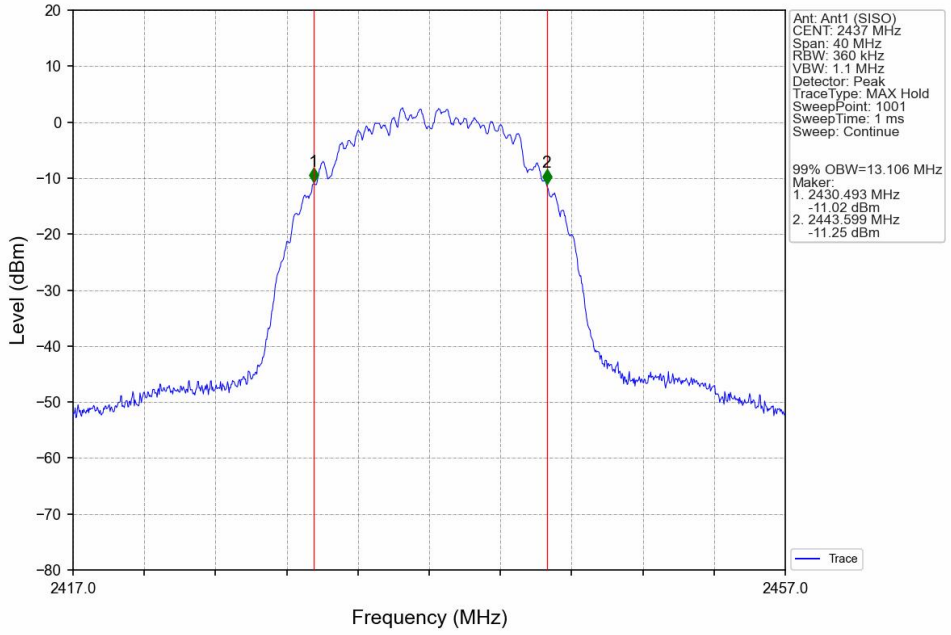
2.2 Test Graph

2.2.1 OBW

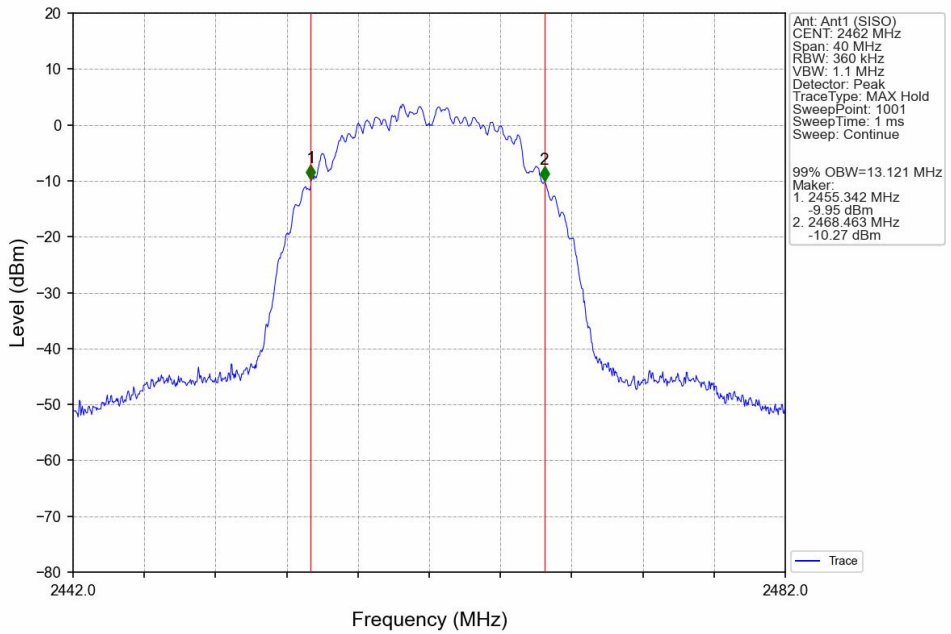
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



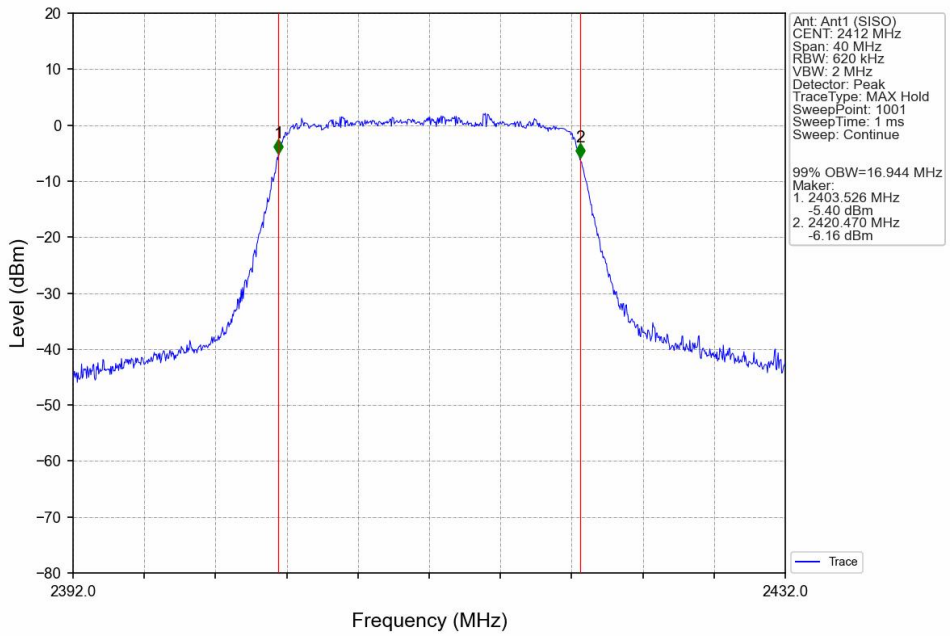
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



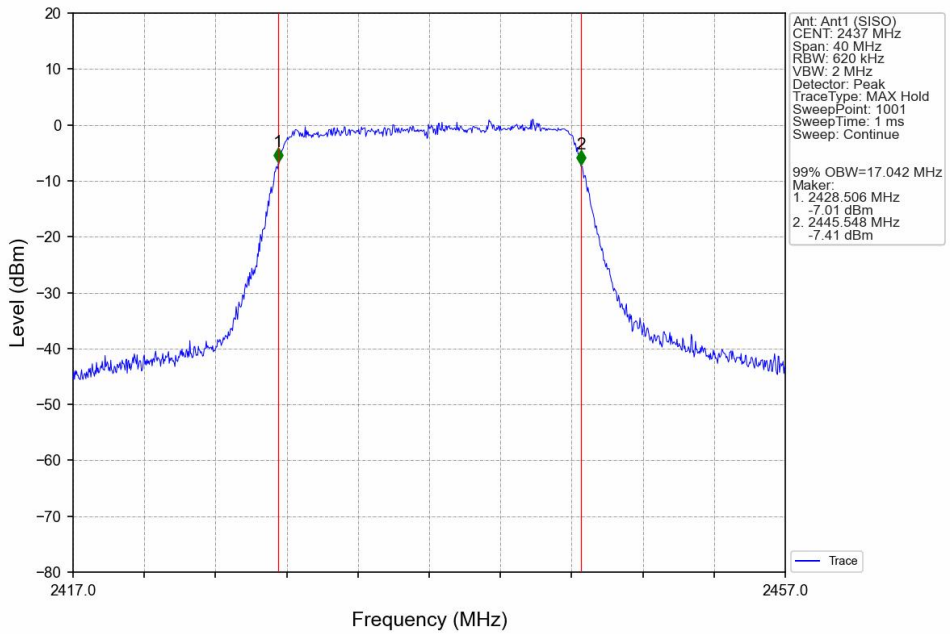
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



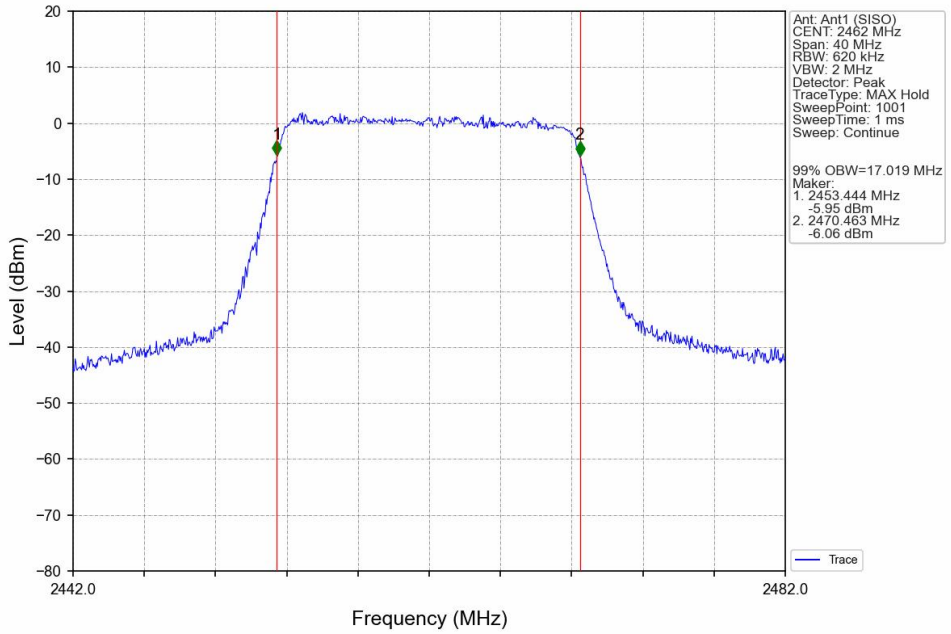
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



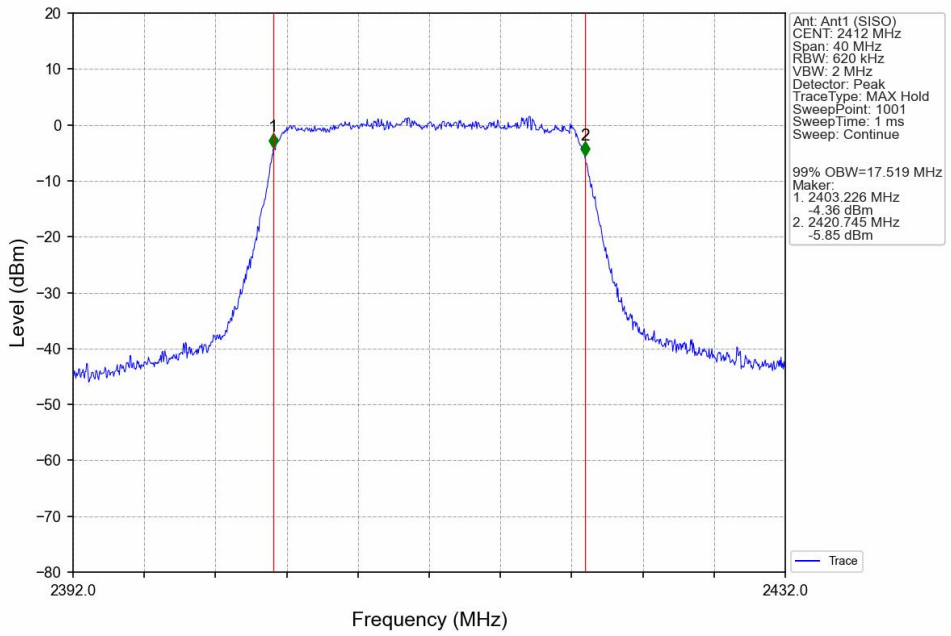
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



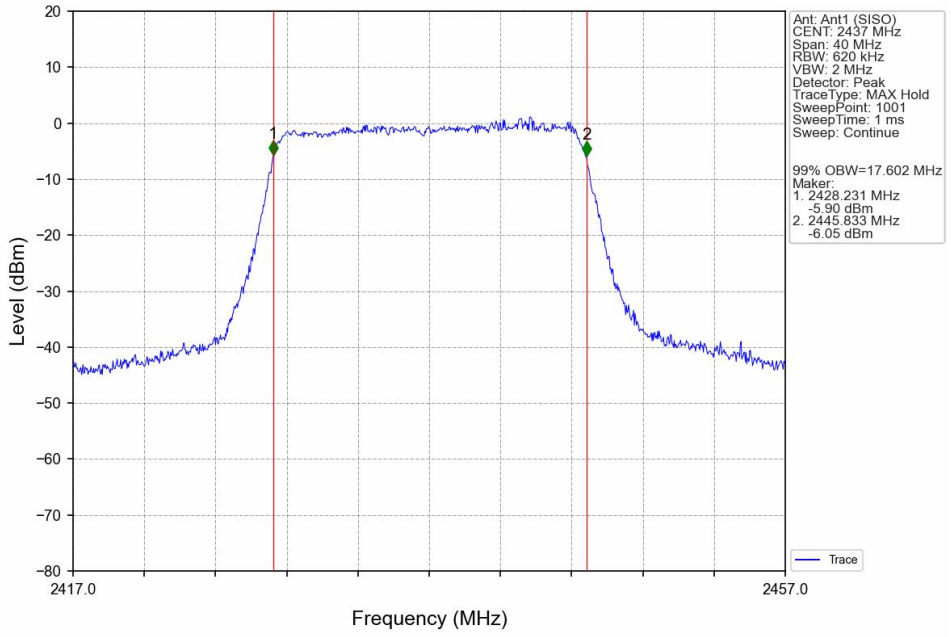
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



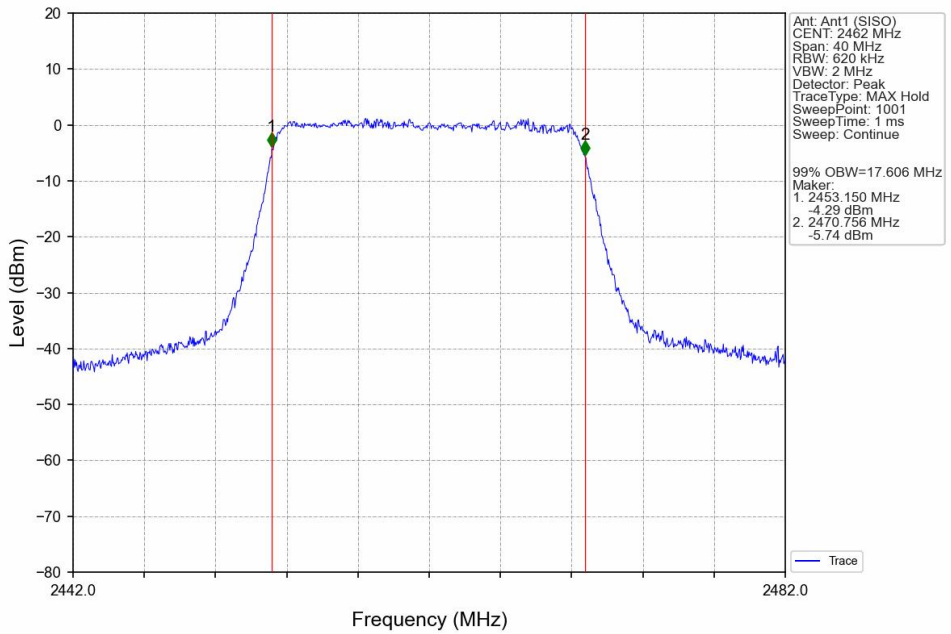
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



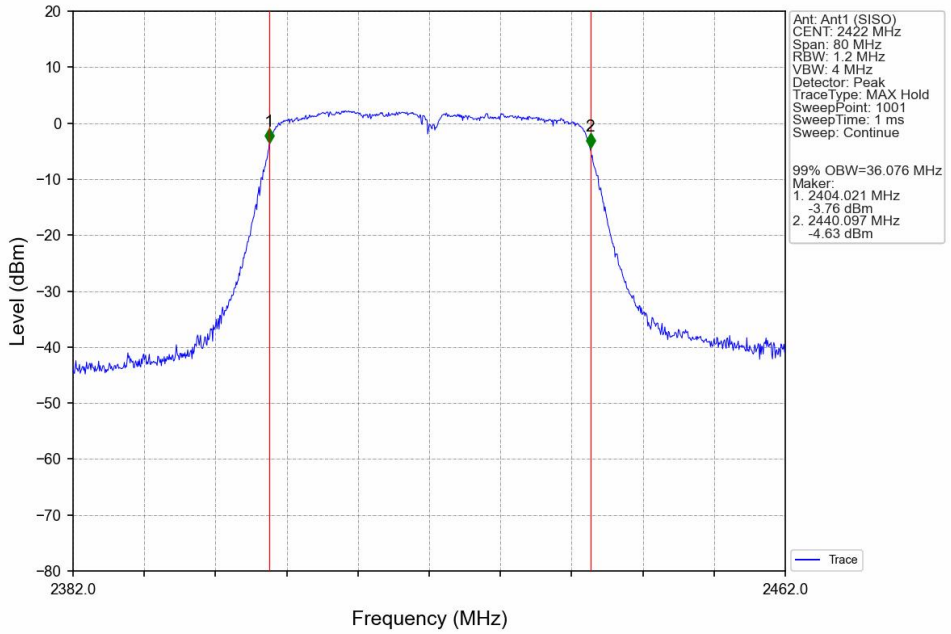
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



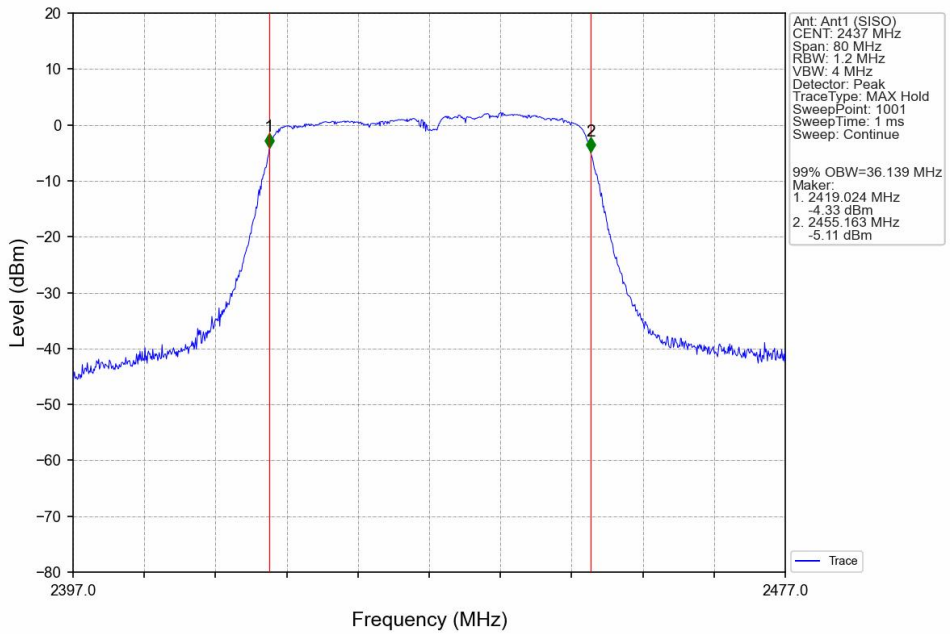
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



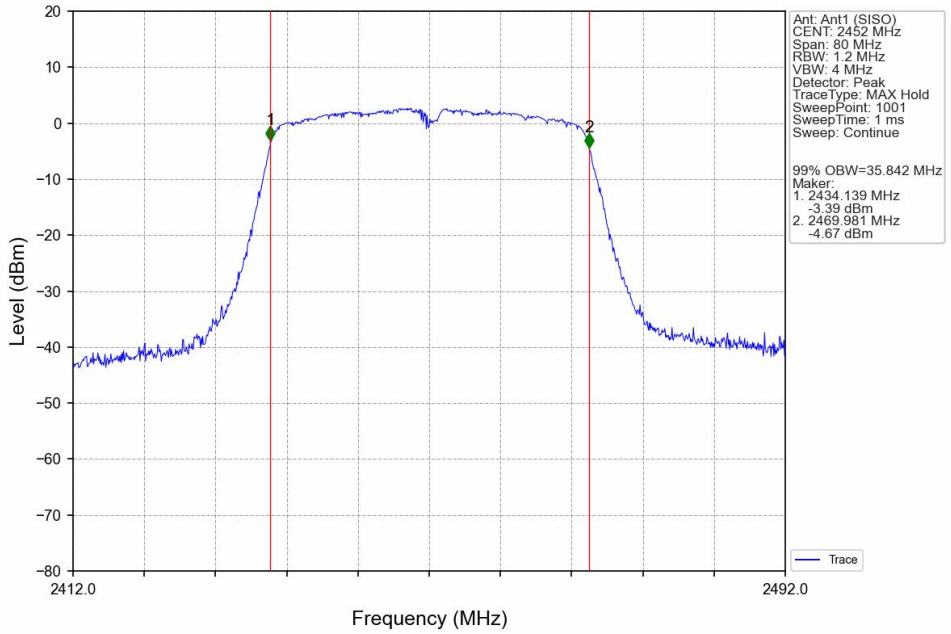
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV

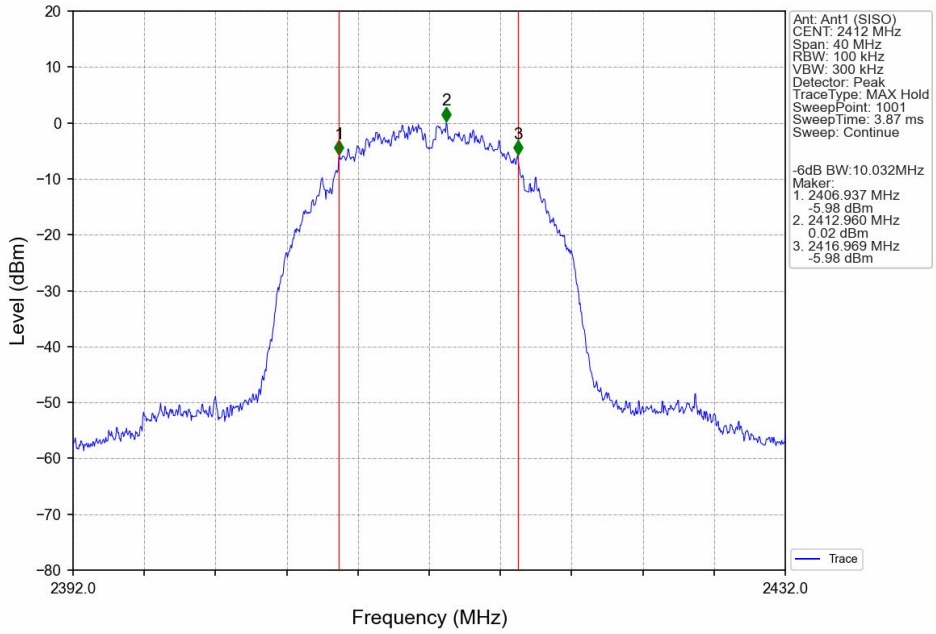


802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV

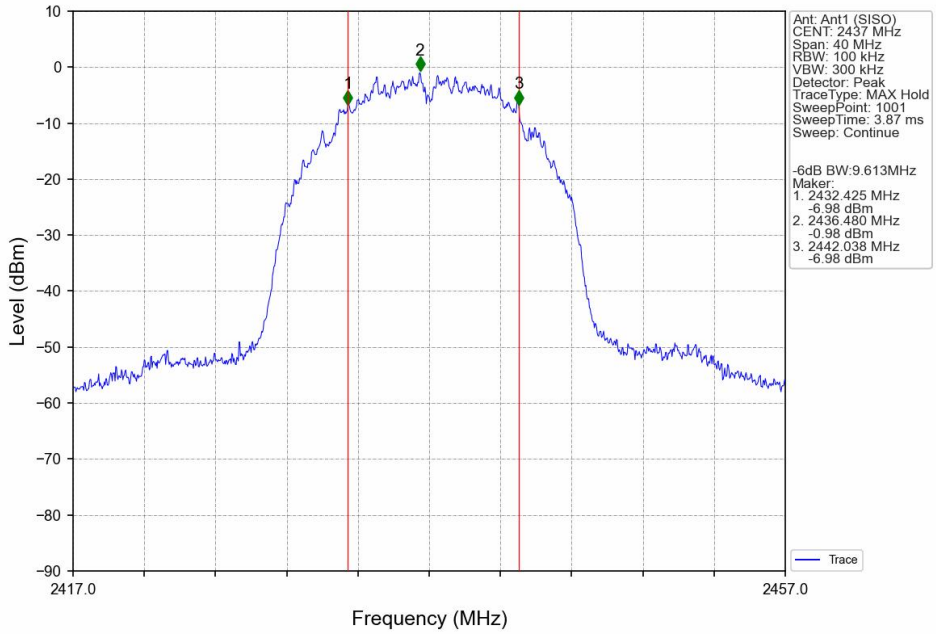


2.2.2 6dB BW

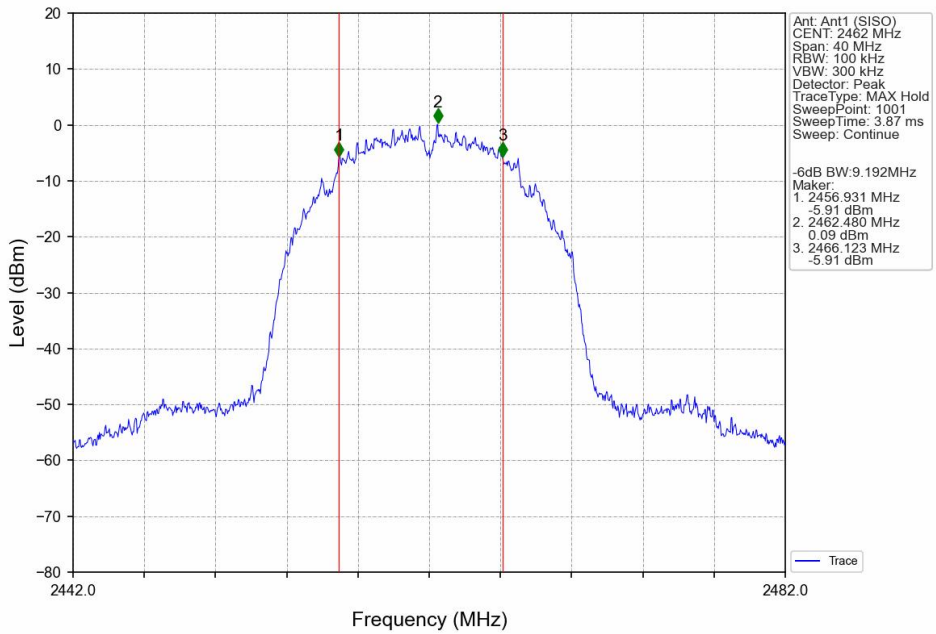
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



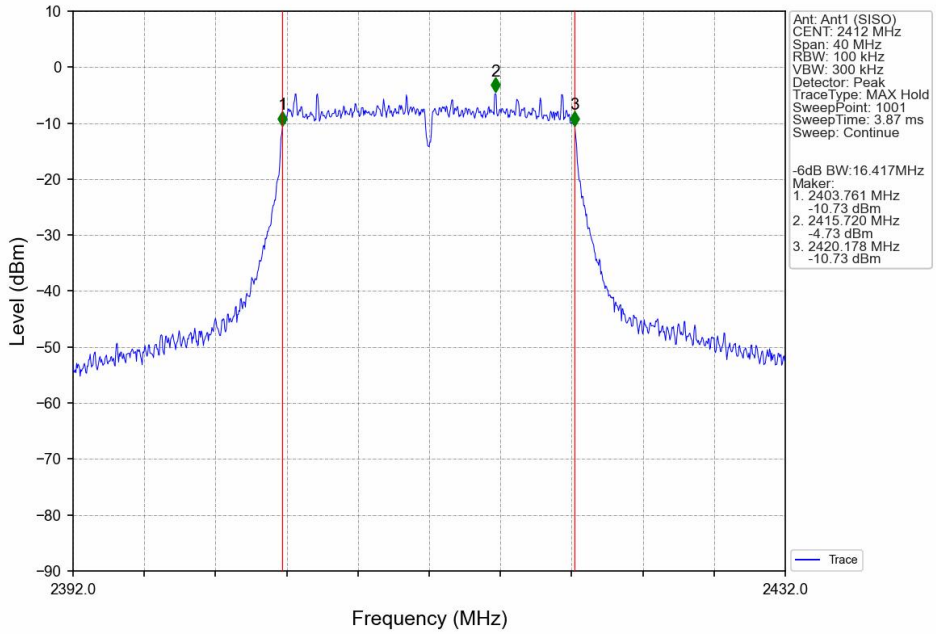
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



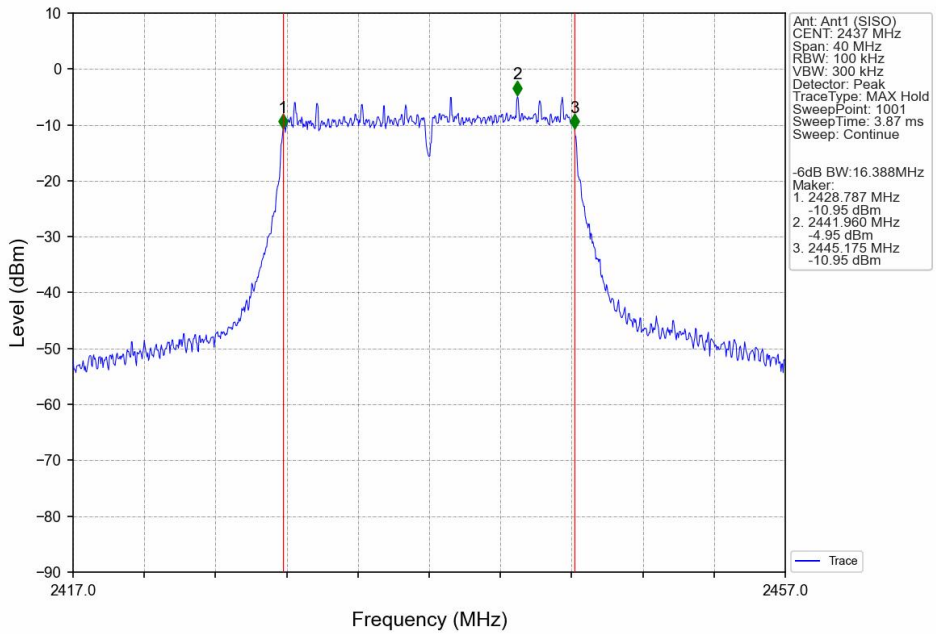
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



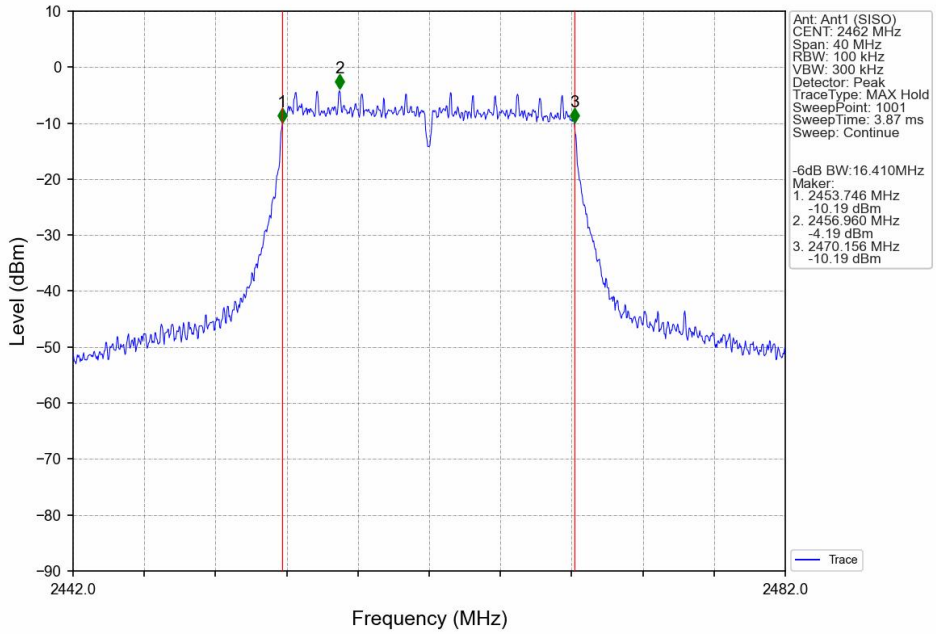
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



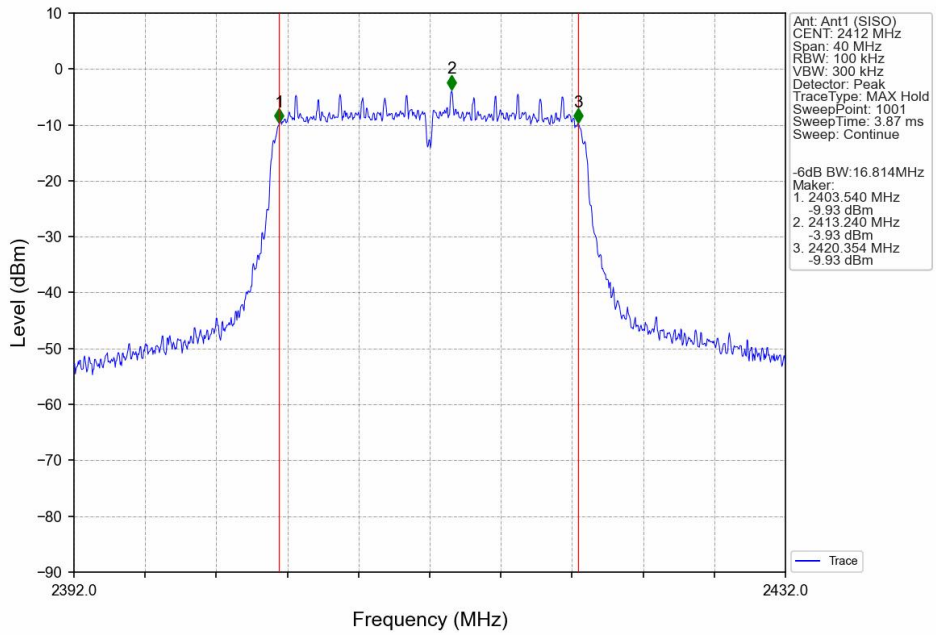
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



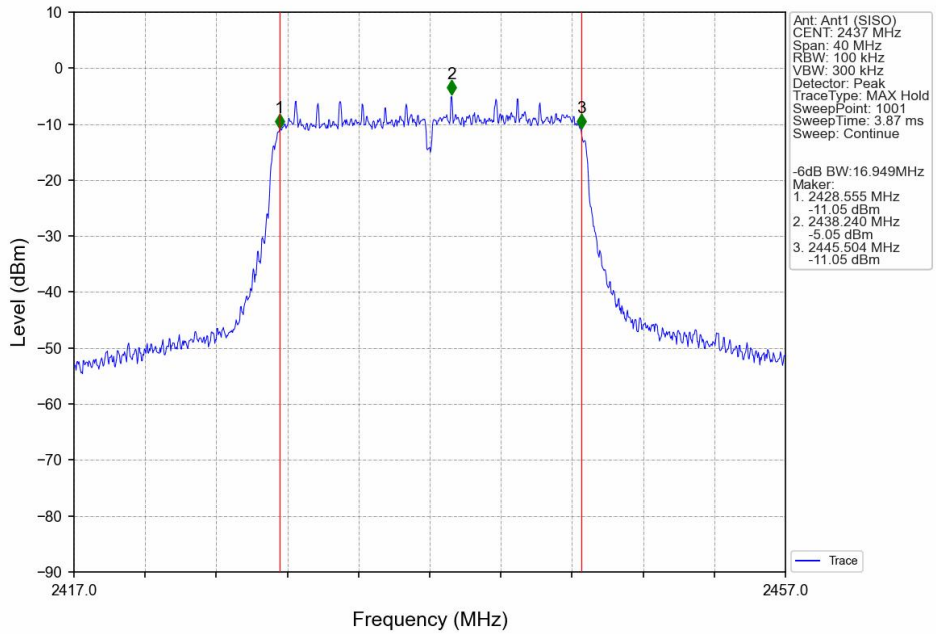
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



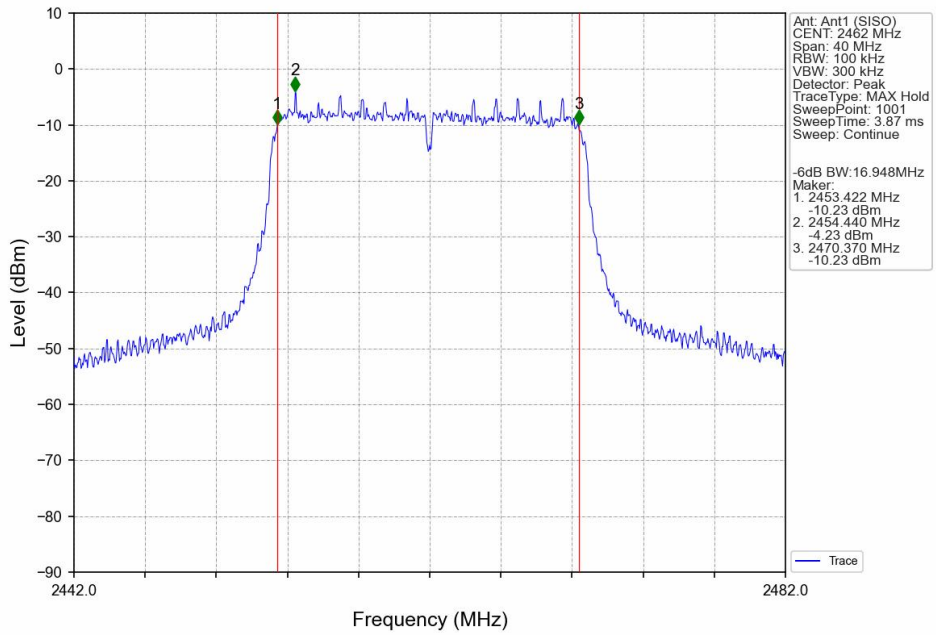
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



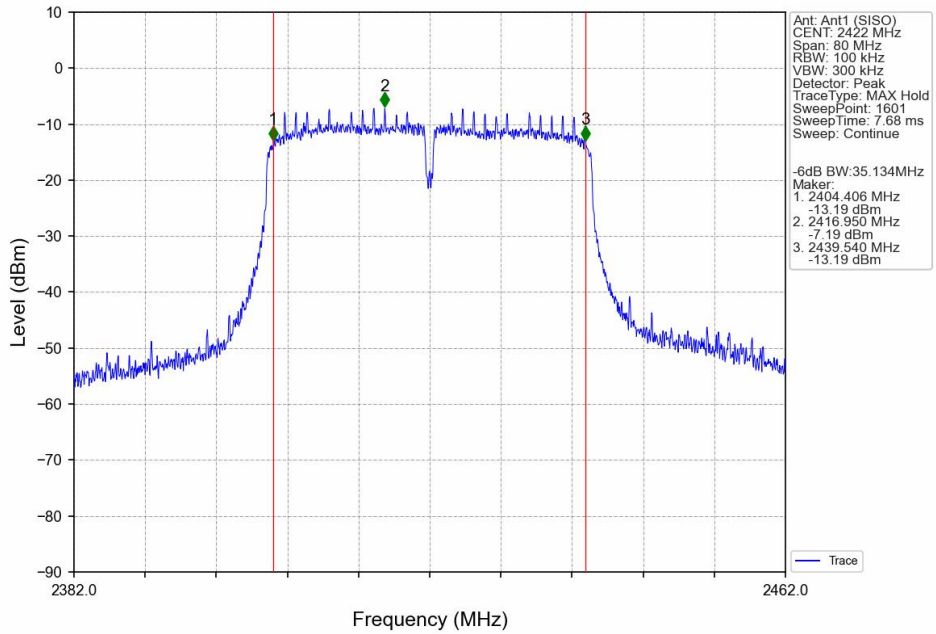
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



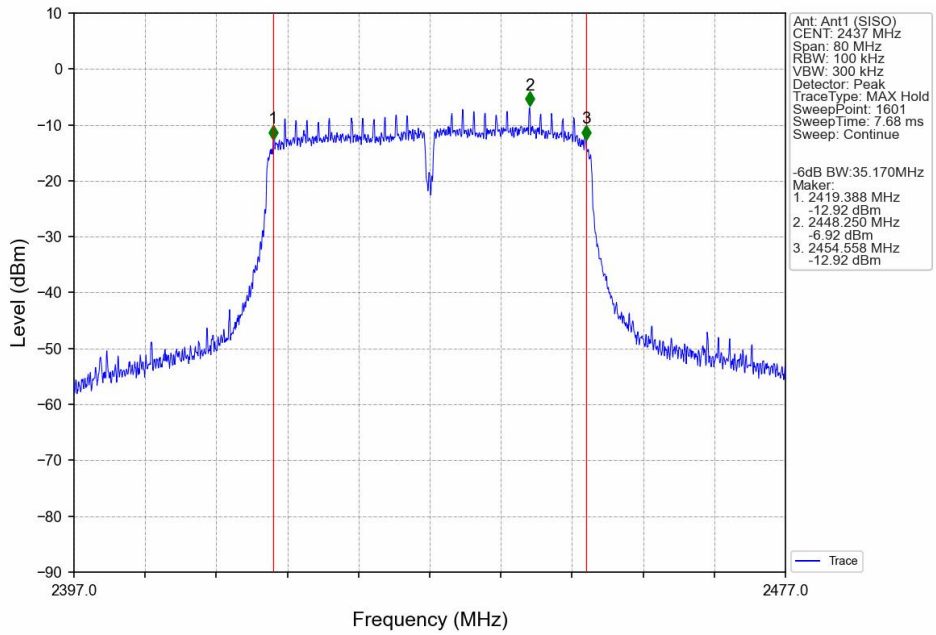
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



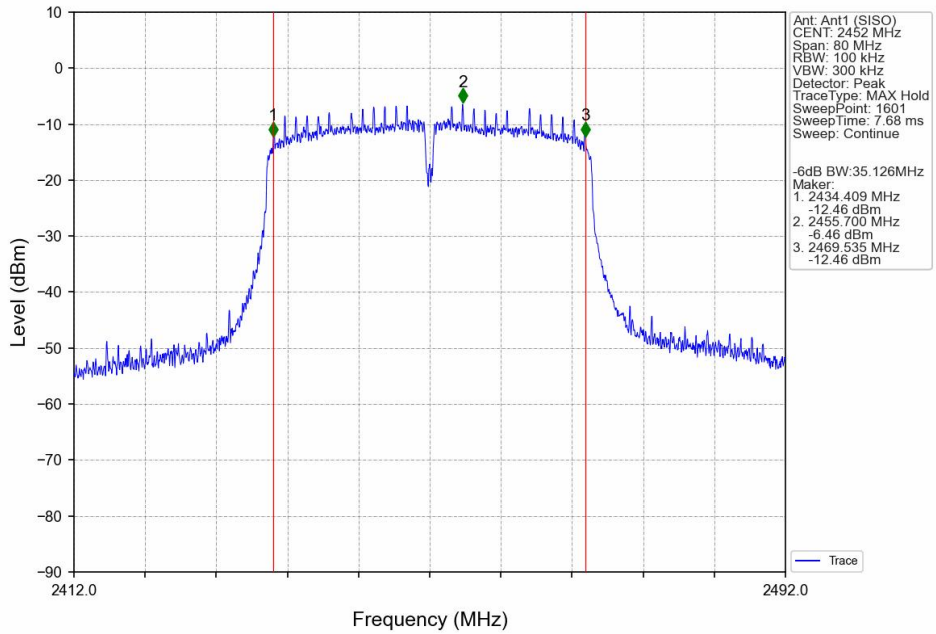
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



3. Maximum Conducted Output Power

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	14.38	<=30	Pass
		2437	13.10	<=30	Pass
		2462	13.87	<=30	Pass
802.11g	SISO	2412	14.77	<=30	Pass
		2437	13.75	<=30	Pass
		2462	14.63	<=30	Pass
802.11n (HT20)	SISO	2412	14.46	<=30	Pass
		2437	13.51	<=30	Pass
		2462	14.43	<=30	Pass
802.11n (HT40)	SISO	2422	14.86	<=30	Pass
		2437	14.41	<=30	Pass
		2452	15.06	<=30	Pass
Note1: Antenna Gain: Ant1: -0.25dBi;					

4. Maximum Power Spectral Density

4.1 Test Result

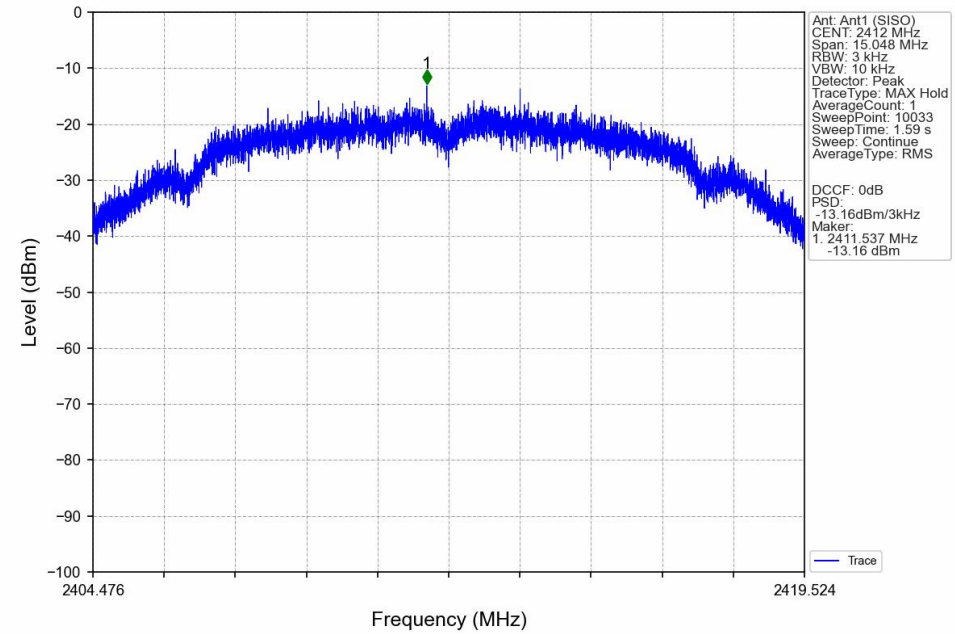
4.1.1 PSD

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-13.16	<=8	Pass
		2437	-16.29	<=8	Pass
		2462	-13.36	<=8	Pass
802.11g	SISO	2412	-17.80	<=8	Pass
		2437	-19.18	<=8	Pass
		2462	-18.39	<=8	Pass
802.11n (HT20)	SISO	2412	-17.65	<=8	Pass
		2437	-18.87	<=8	Pass
		2462	-17.55	<=8	Pass
802.11n (HT40)	SISO	2422	-19.97	<=8	Pass
		2437	-20.73	<=8	Pass
		2452	-19.11	<=8	Pass
Note1: Antenna Gain: Ant1: -0.25dBi;					

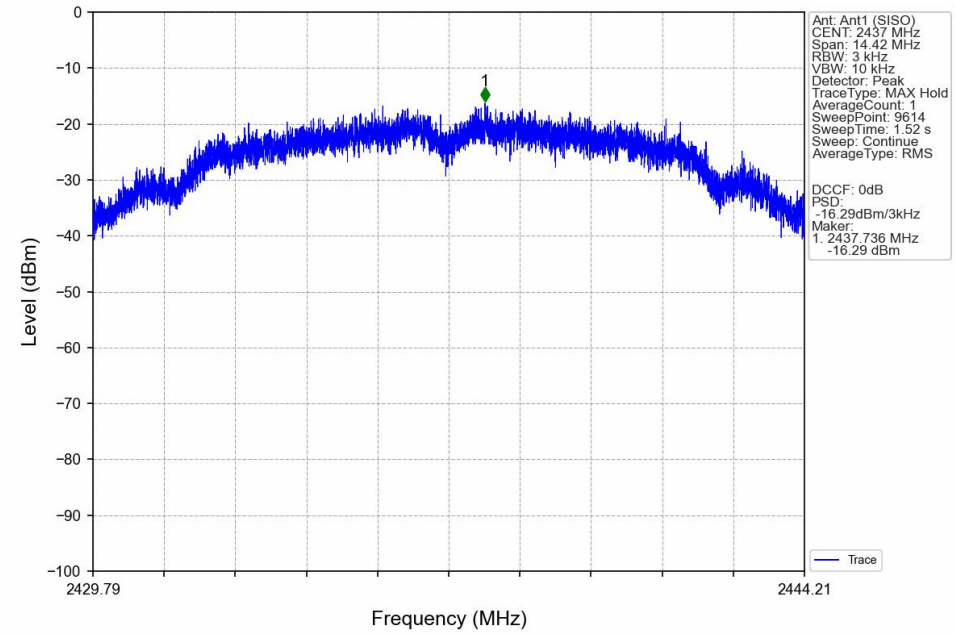
4.2 Test Graph

4.2.1 PSD

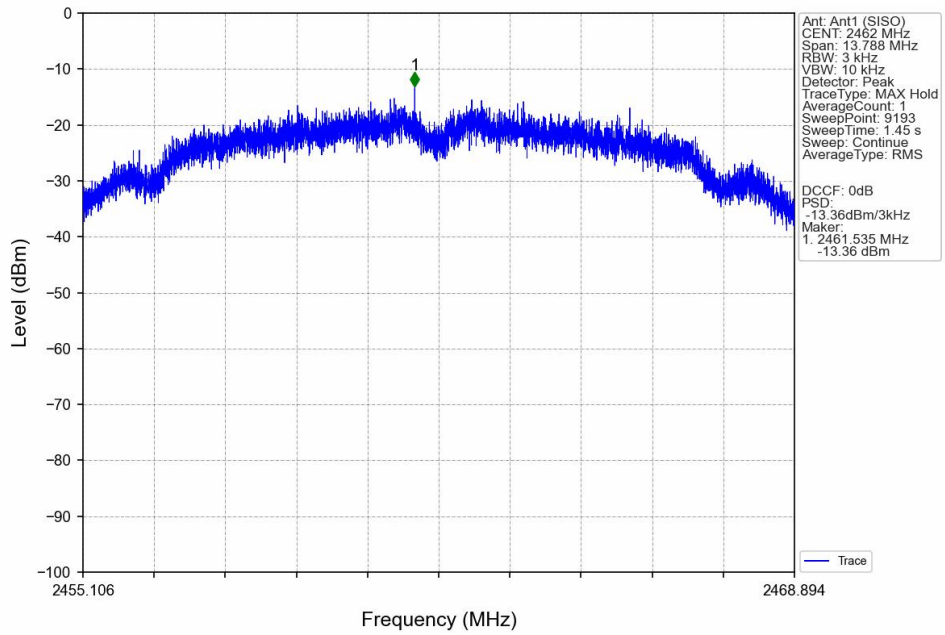
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



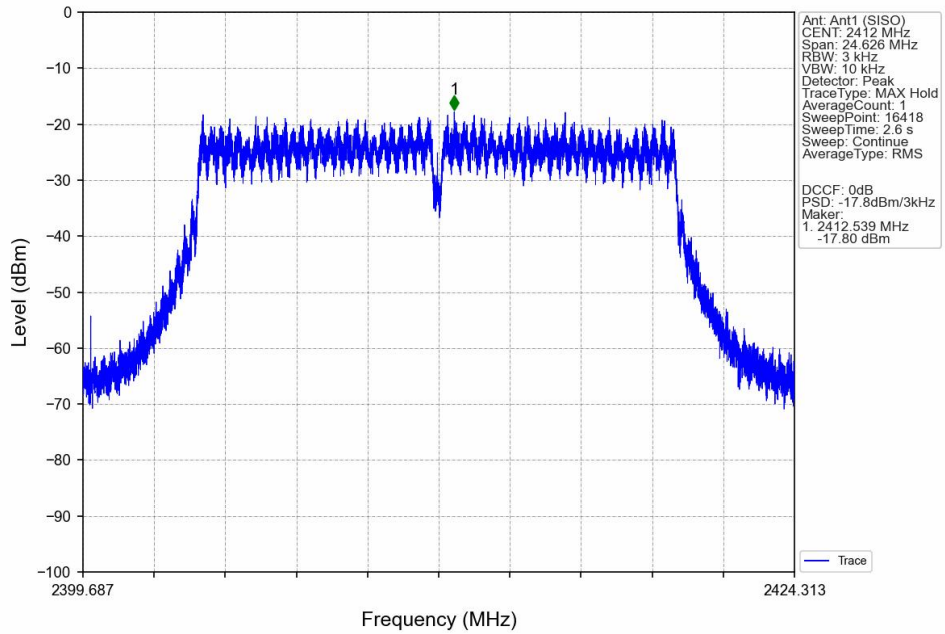
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



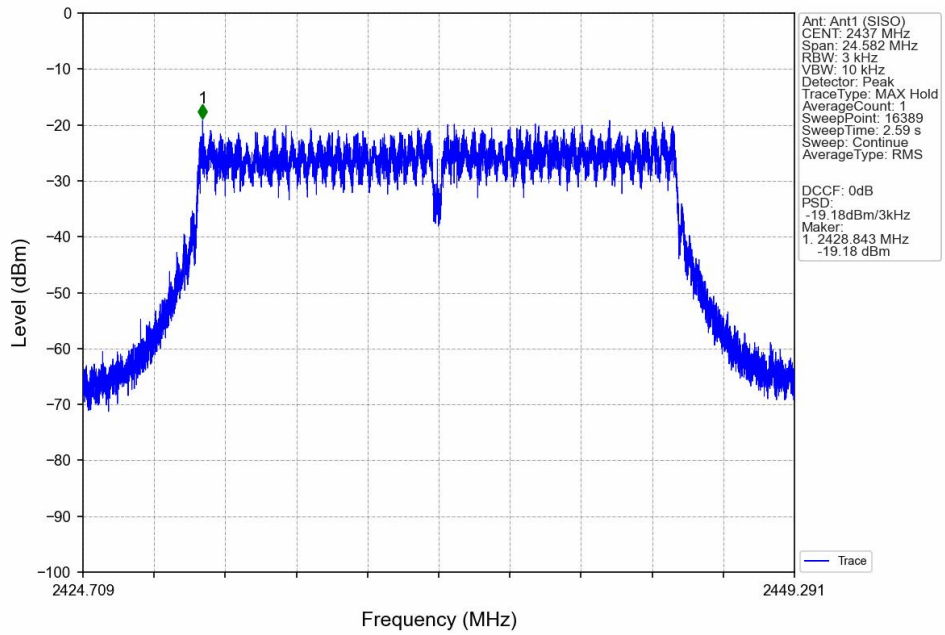
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



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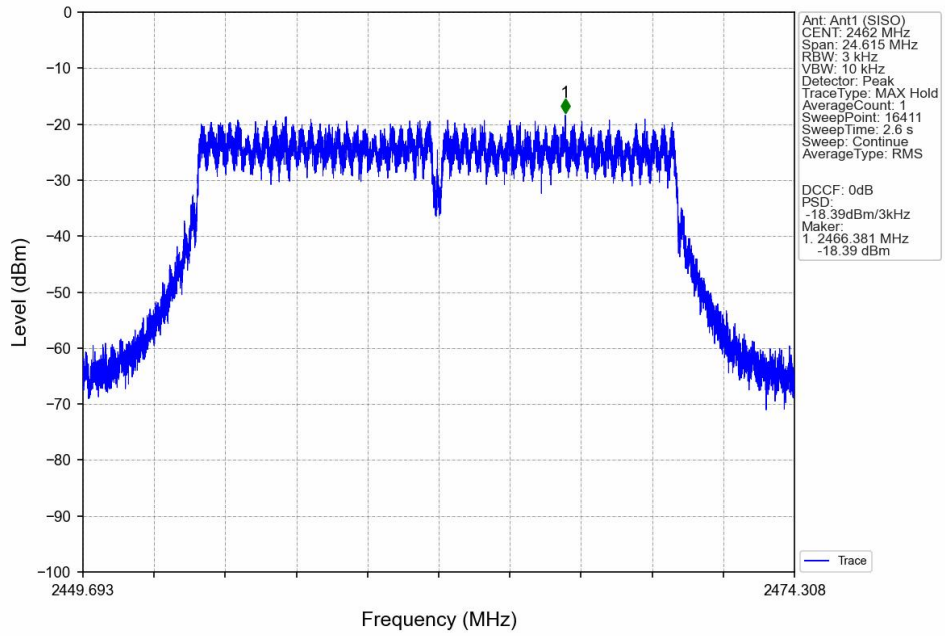
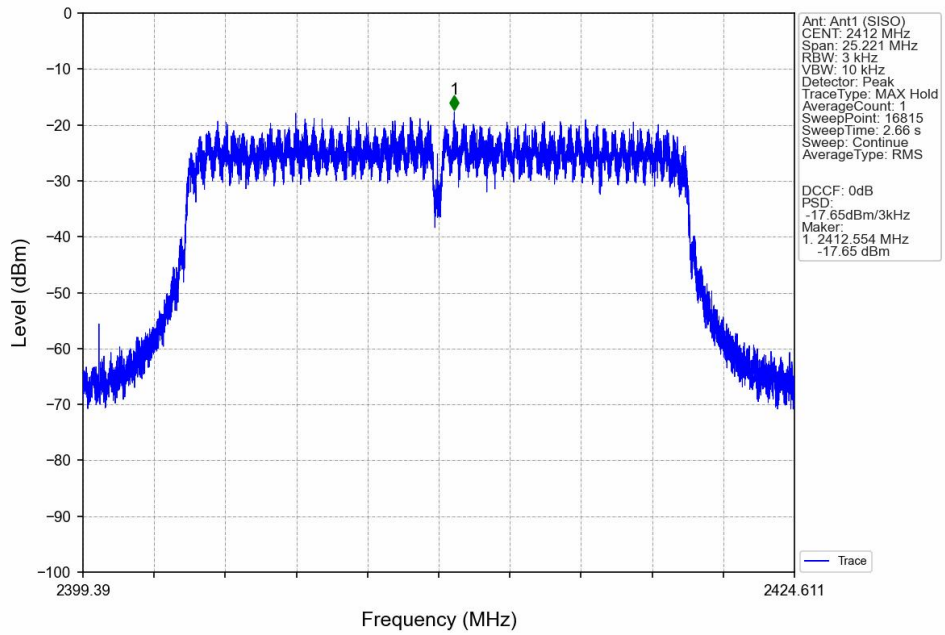


802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



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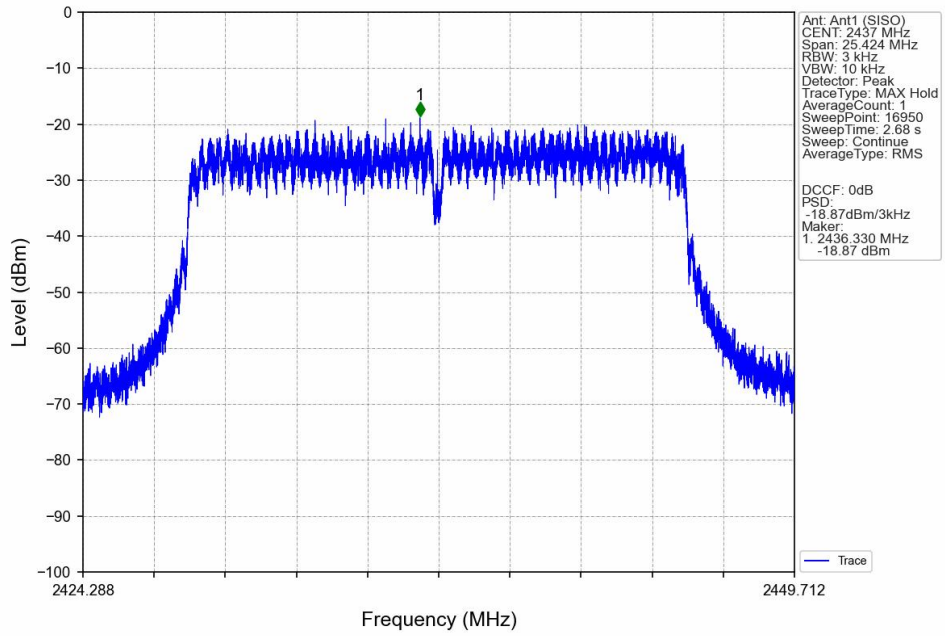
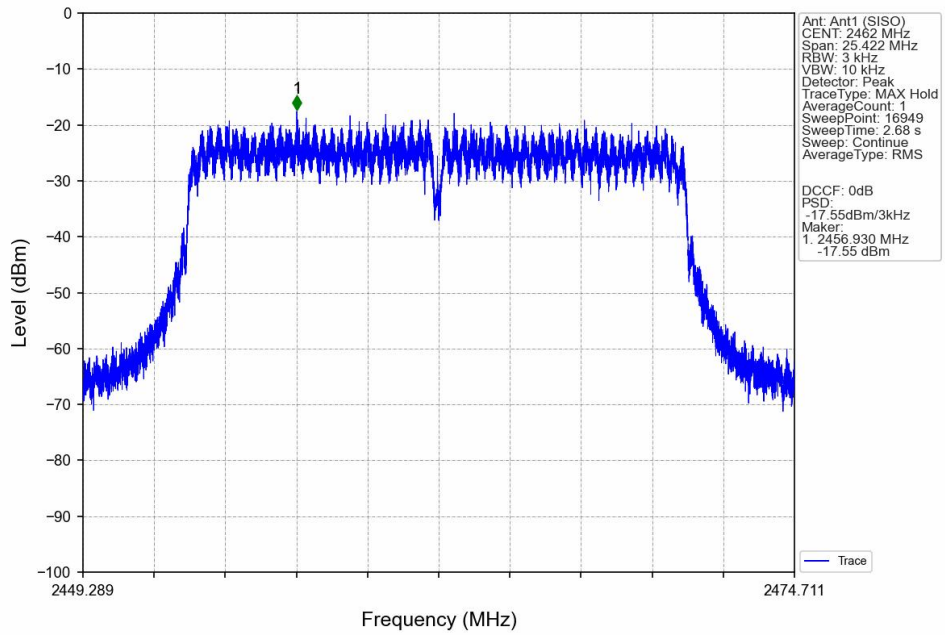
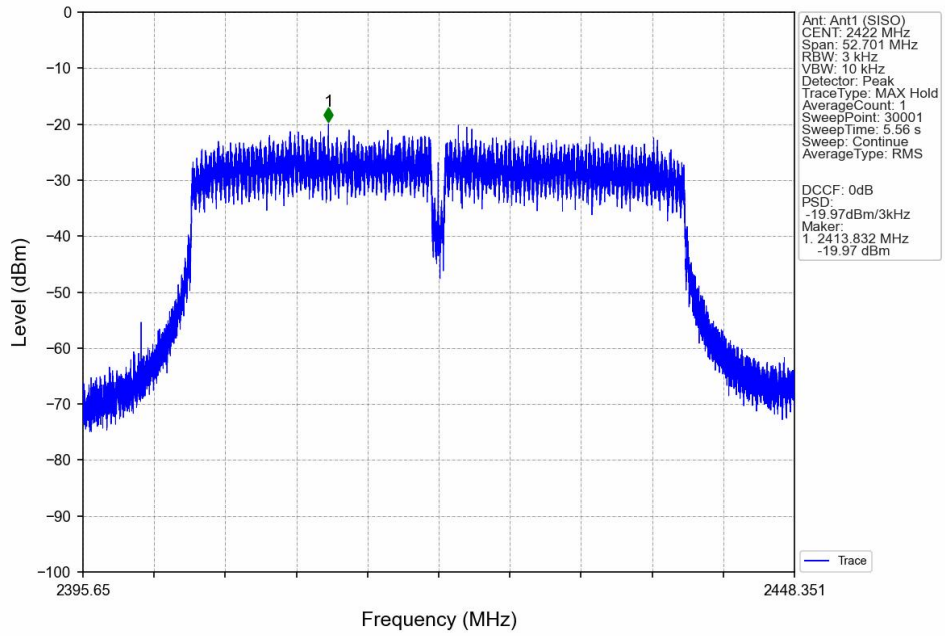


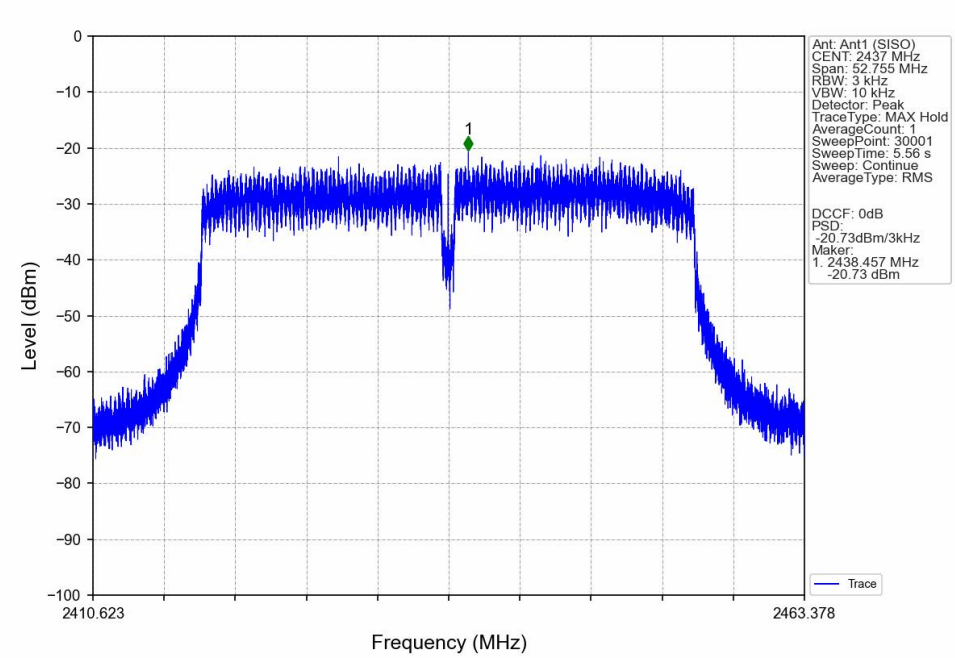
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



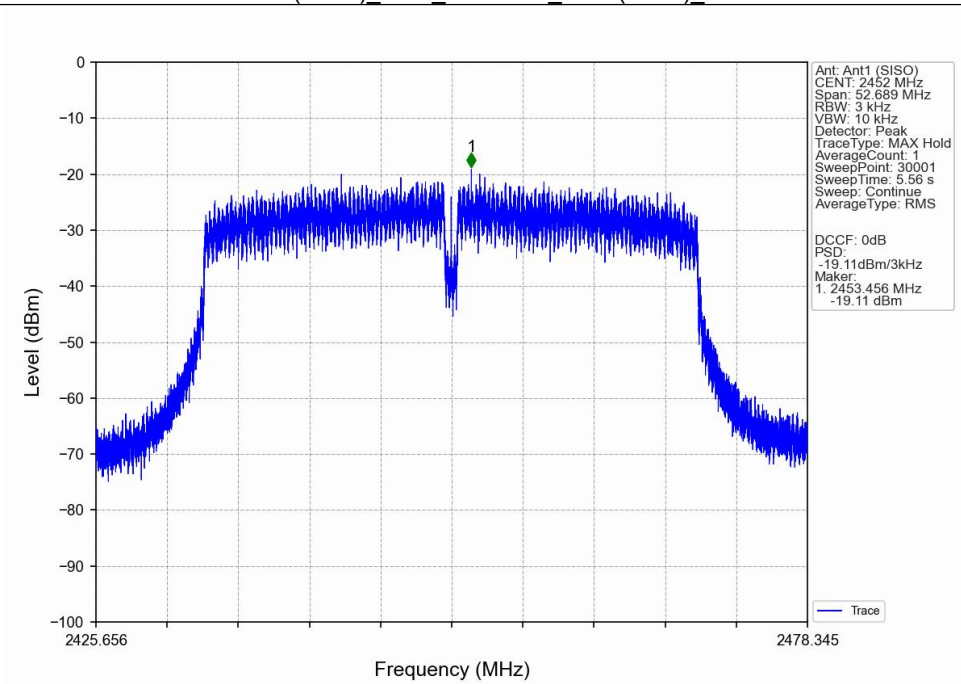
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_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)
802.11b	SISO	2412	1	1.04
		2437	1	-0.39
		2462	1	-0.18
802.11g	SISO	2412	1	-4.47
		2437	1	-5.00
		2462	1	-4.33
802.11n (HT20)	SISO	2412	1	-4.56
		2437	1	-5.06
		2462	1	-4.04
802.11n (HT40)	SISO	2422	1	-7.12
		2437	1	-7.28
		2452	1	-6.75
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.				

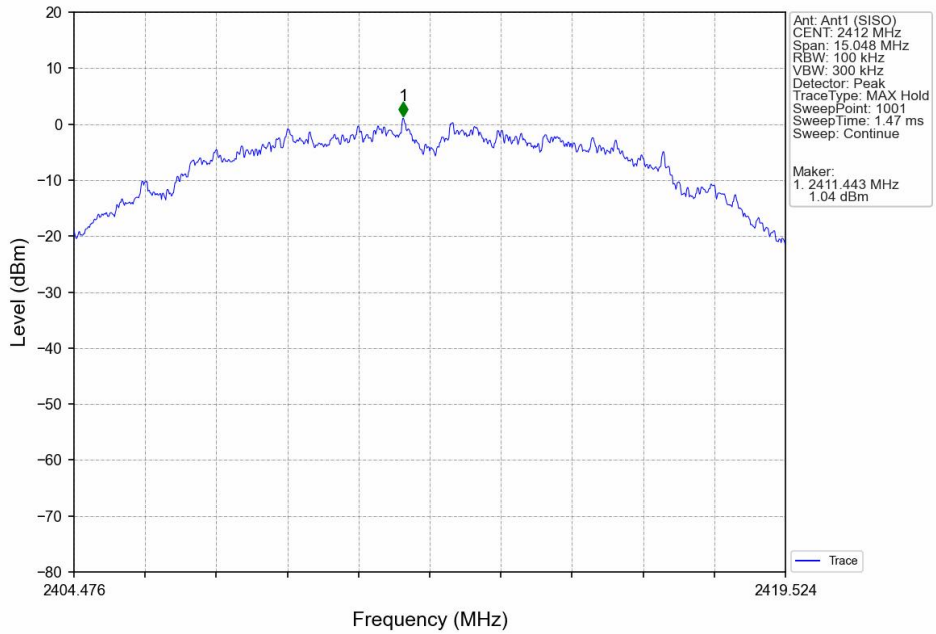
5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	1.04	-18.96	Pass
		2437	1	1.04	-18.96	Pass
		2462	1	1.04	-18.96	Pass
802.11g	SISO	2412	1	-4.33	-24.33	Pass
		2437	1	-4.33	-24.33	Pass
		2462	1	-4.33	-24.33	Pass
802.11n (HT20)	SISO	2412	1	-4.04	-24.04	Pass
		2437	1	-4.04	-24.04	Pass
		2462	1	-4.04	-24.04	Pass
802.11n (HT40)	SISO	2422	1	-6.75	-26.75	Pass
		2437	1	-6.75	-26.75	Pass
		2452	1	-6.75	-26.75	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.						

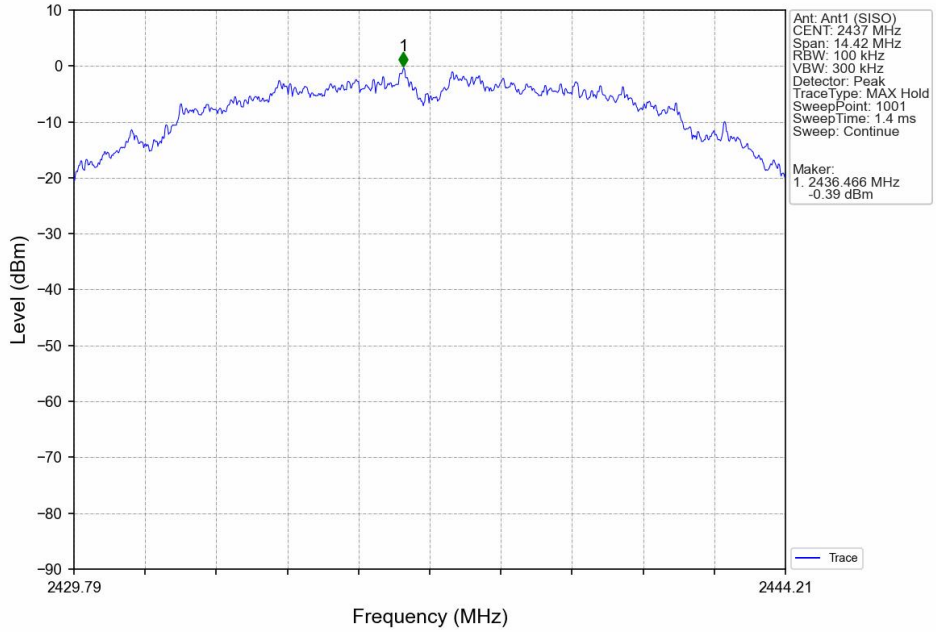
5.2 Test Graph

5.2.1 Ref

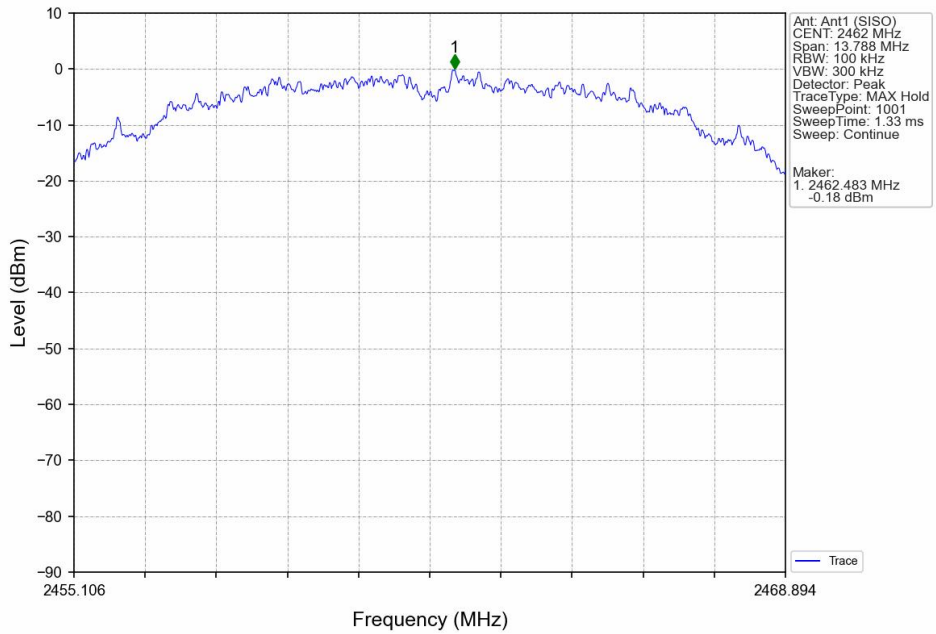
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



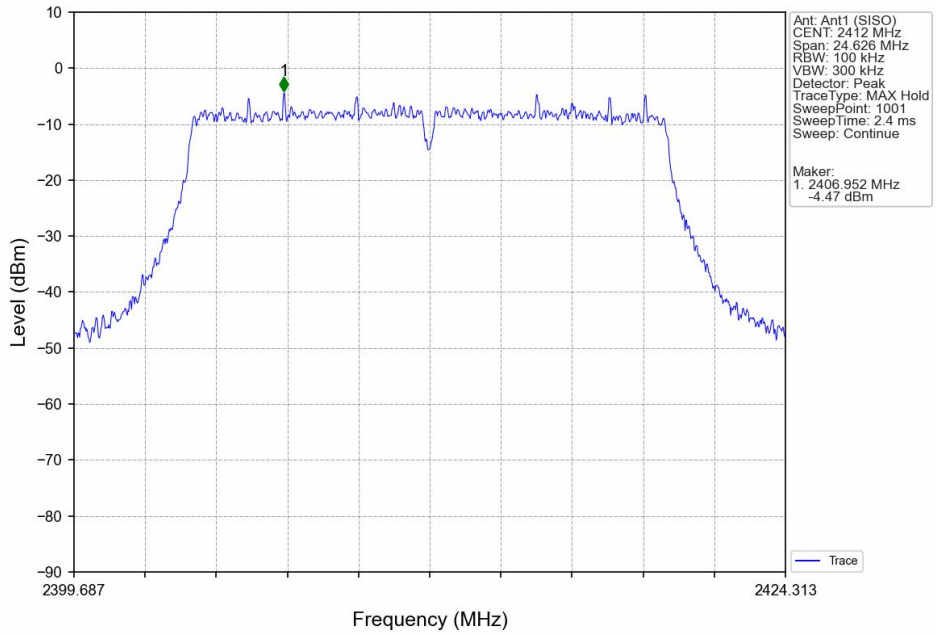
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



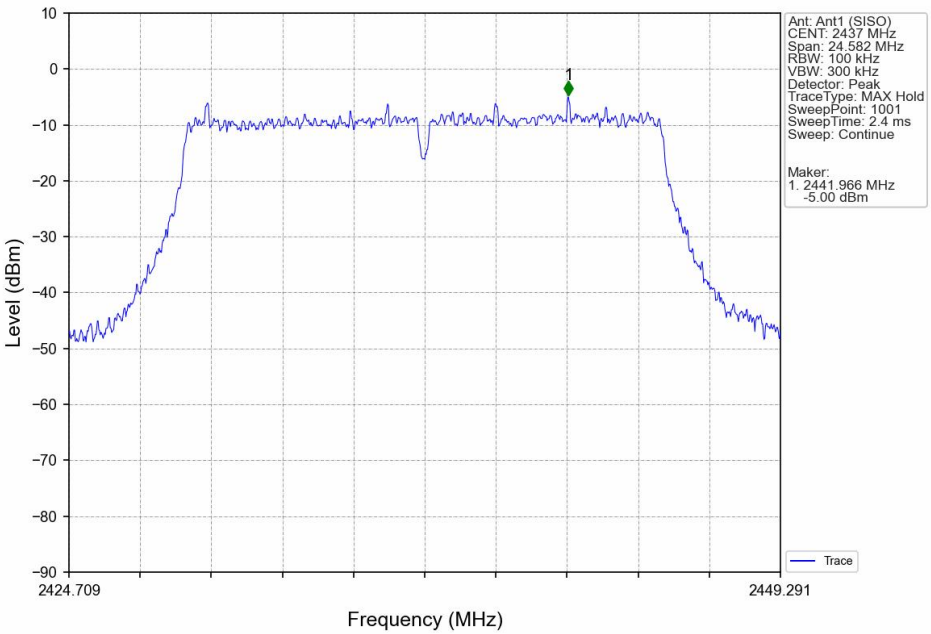
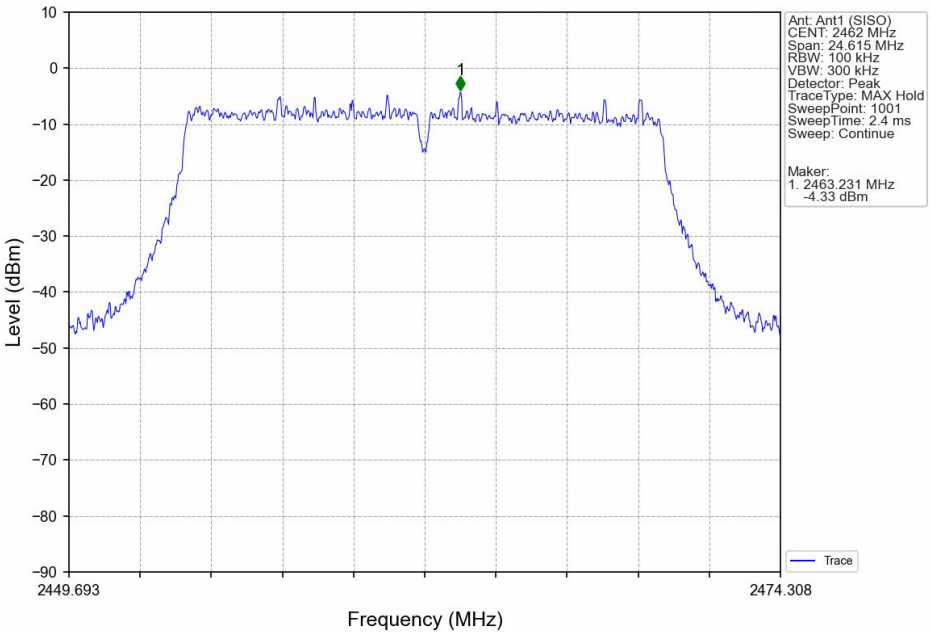
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV