



RF Test Report

For

Project No.:	ZKT-240913L11618E-2
Client:	Shenzhen Huiran Technology Co., Ltd
Manufacturer:	Shenzhen Huiran Technology Co., Ltd
Product Description:	MP4 Player
Test Model	YMP-A1
Test Engineer:	Franco
Test Date:	2024-09-19

Test Summary

Item	Result
Duty Cycle	Pass
Bandwidth	Pass
Maximum Conducted Output Power	Pass
Maximum Power Spectral Density	Pass
Unwanted Emissions In Non-restricted Frequency Bands	Pass
Frequency Error	Pass
Form731	Pass



1. Duty Cycle

1.1 Test Result

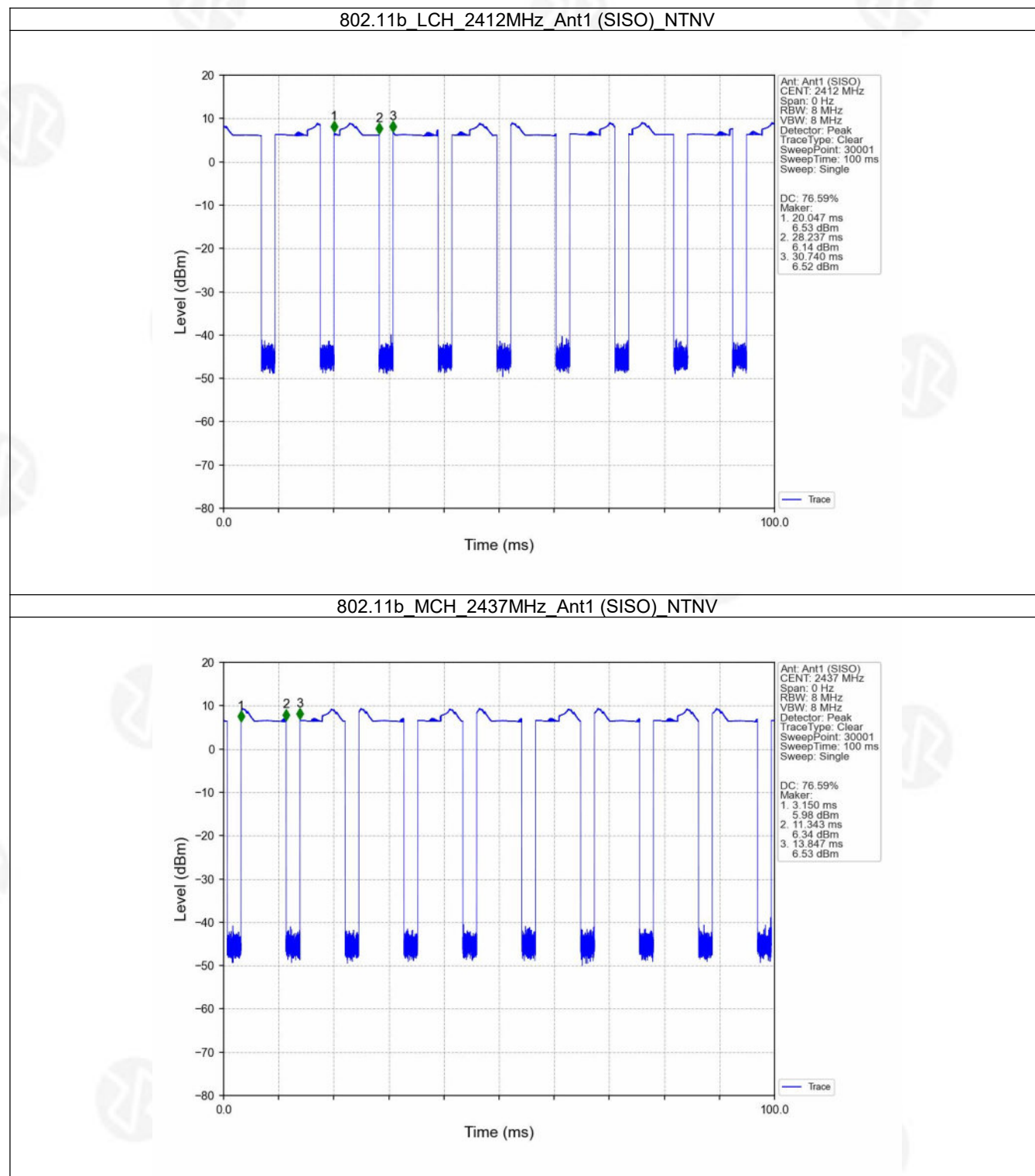
1.1.1 Ant1

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	8.190	10.693	76.59	1.16	0.01
		2437	8.193	10.697	76.59	1.16	0.02
		2462	8.190	10.693	76.59	1.16	0.03
802.11g	SISO	2412	1.360	3.863	35.21	4.53	0.00
		2437	1.360	3.863	35.21	4.53	0.00
		2462	1.360	3.863	35.21	4.53	0.00
802.11n (HT20)	SISO	2412	1.361	3.862	35.24	4.53	0.00
		2437	1.361	3.863	35.23	4.53	0.00
		2462	1.360	3.863	35.21	4.53	0.00
802.11n (HT40)	SISO	2422	0.573	3.075	18.63	7.30	0.01
		2437	0.573	3.076	18.63	7.30	0.03
		2452	0.573	3.075	18.63	7.30	0.03



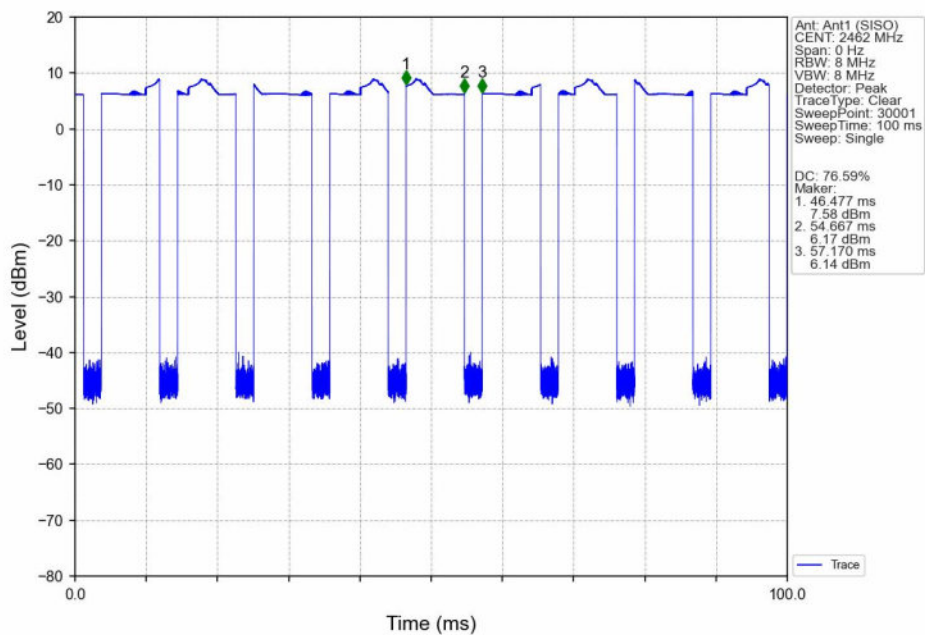
1.2 Test Graph

1.2.1 Ant1

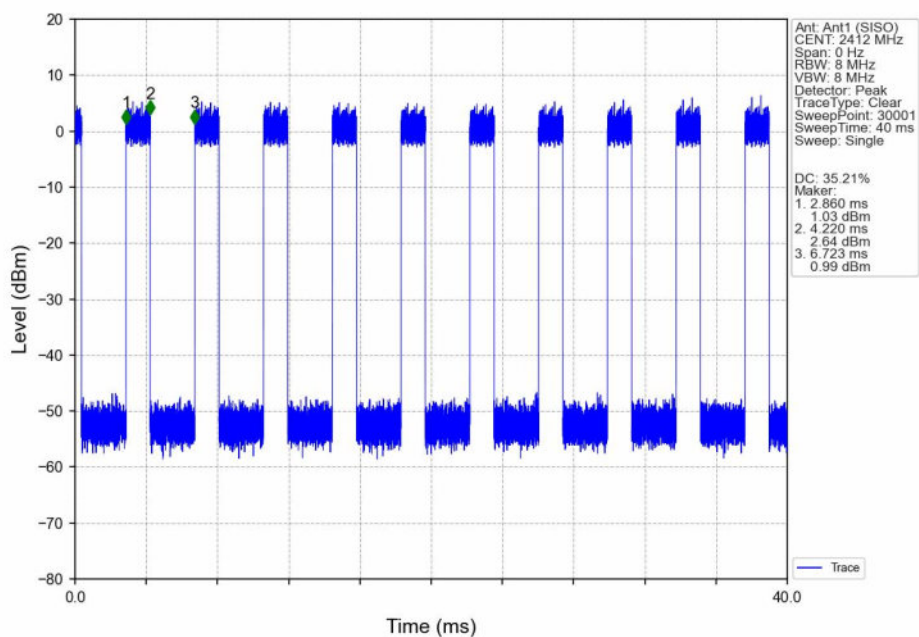




802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV

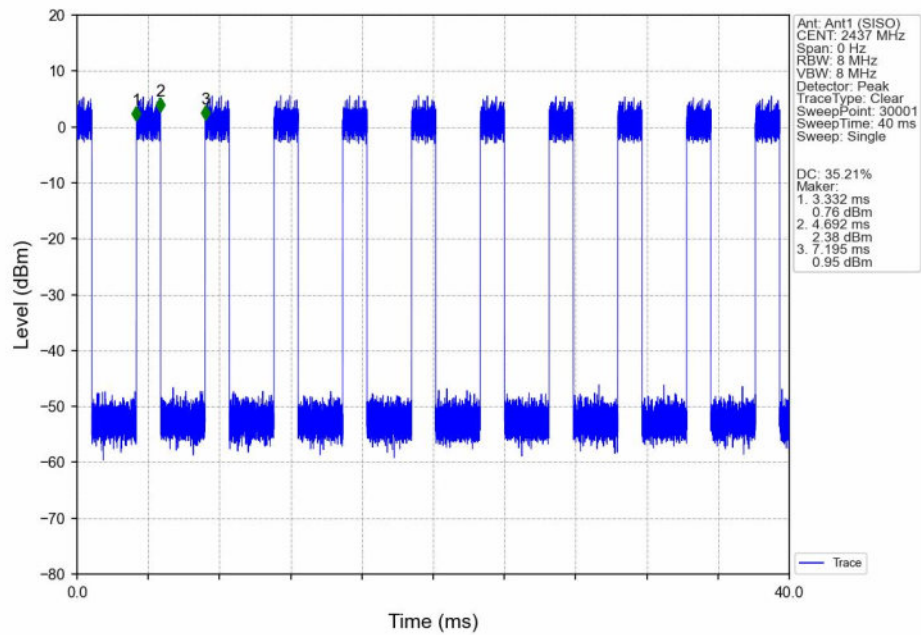


802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

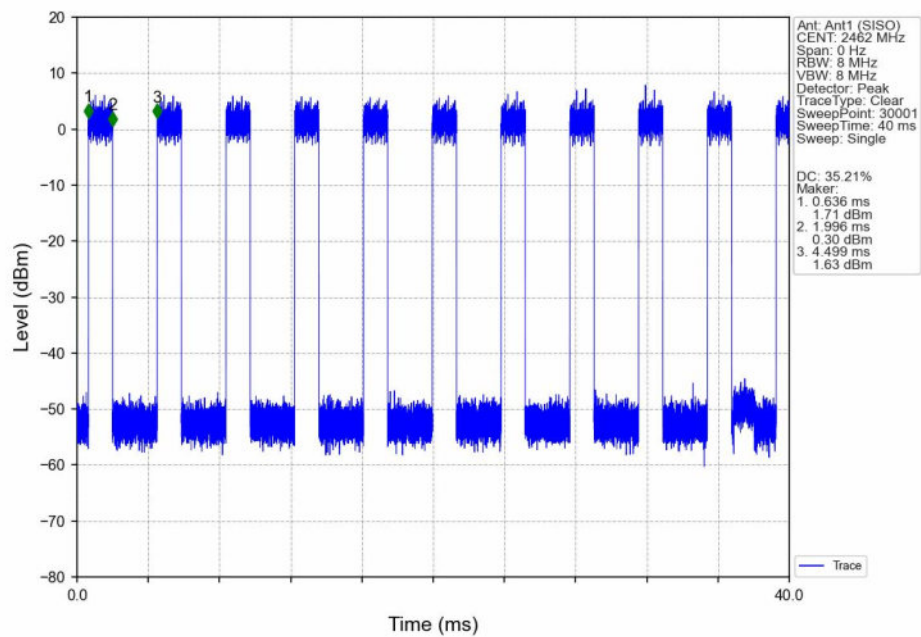




802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV

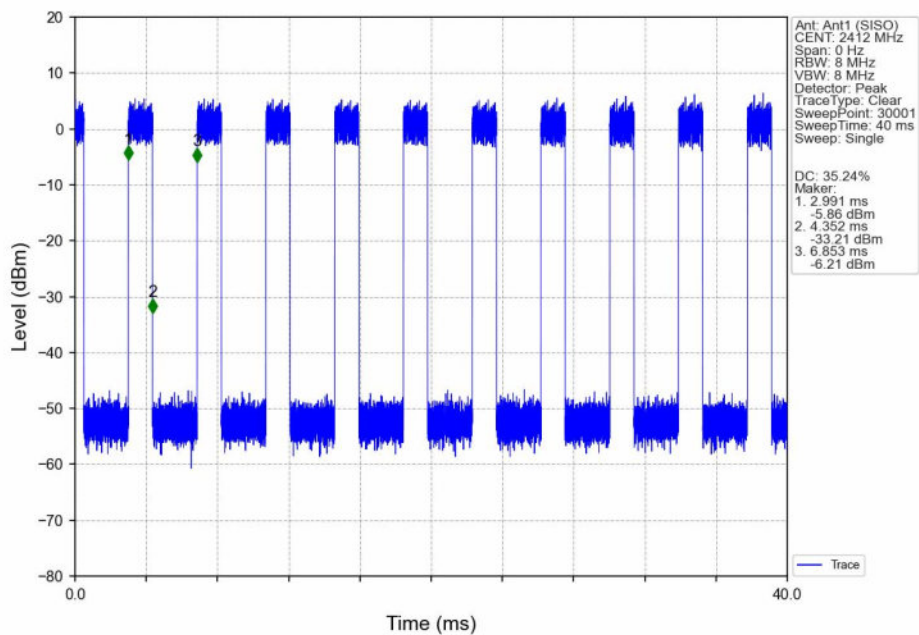


802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV

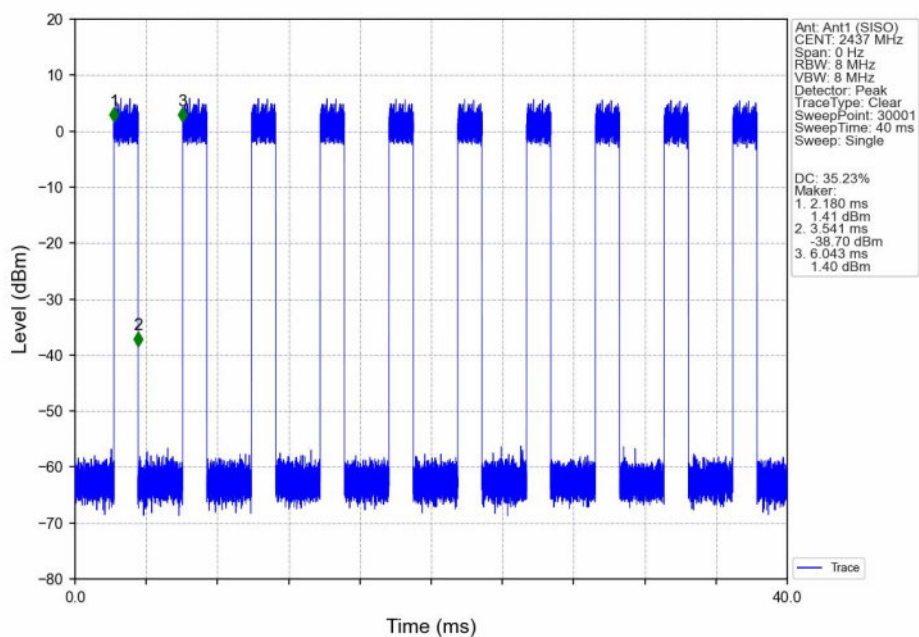




802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV

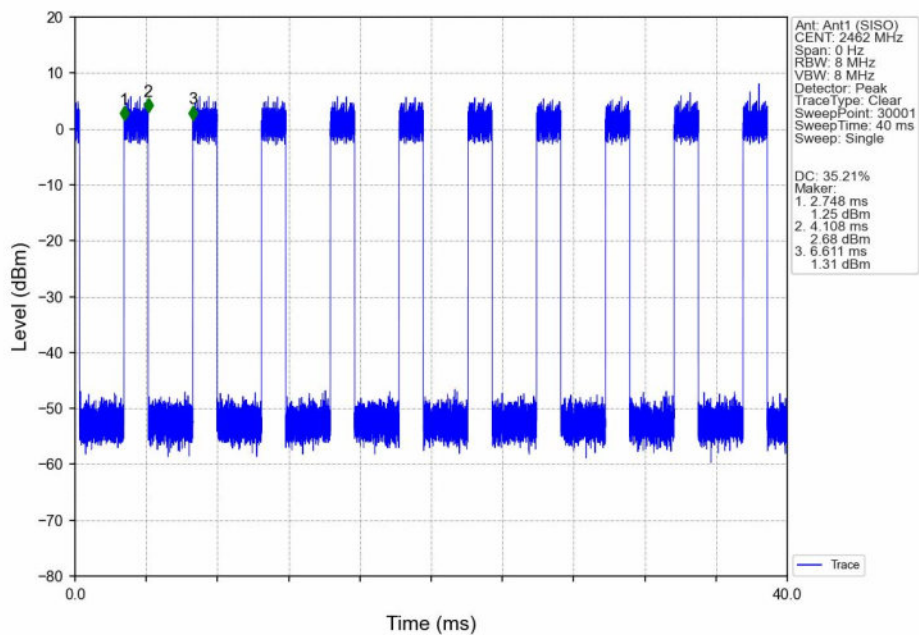


802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV

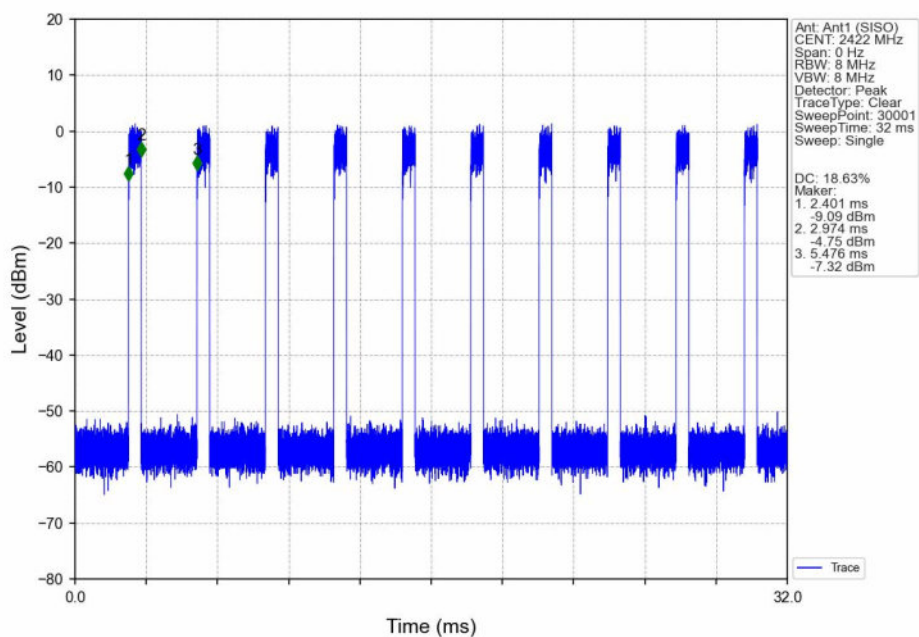




802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV

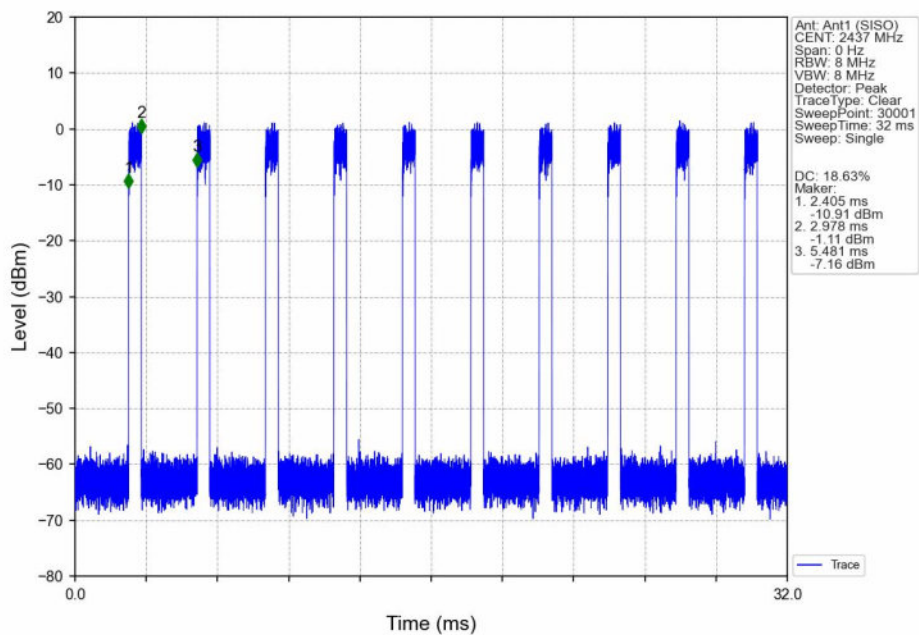


802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

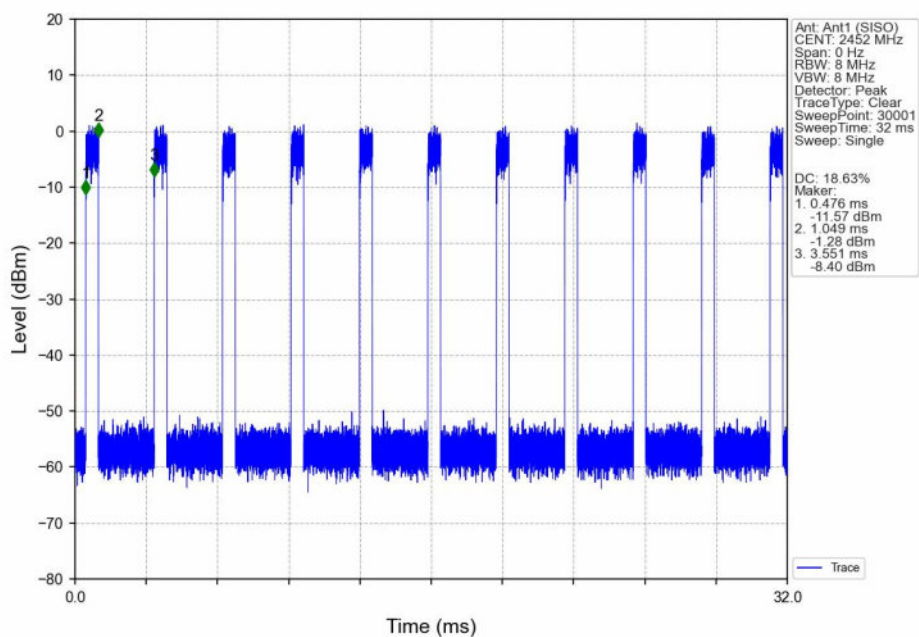




802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



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	14.929	/	Pass
		2437	1	14.925	/	Pass
		2462	1	14.936	/	Pass
802.11g	SISO	2412	1	16.691	/	Pass
		2437	1	16.699	/	Pass
		2462	1	16.690	/	Pass
802.11n (HT20)	SISO	2412	1	16.698	/	Pass
		2437	1	16.698	/	Pass
		2462	1	16.689	/	Pass
802.11n (HT40)	SISO	2422	1	36.257	/	Pass
		2437	1	36.264	/	Pass
		2452	1	36.259	/	Pass

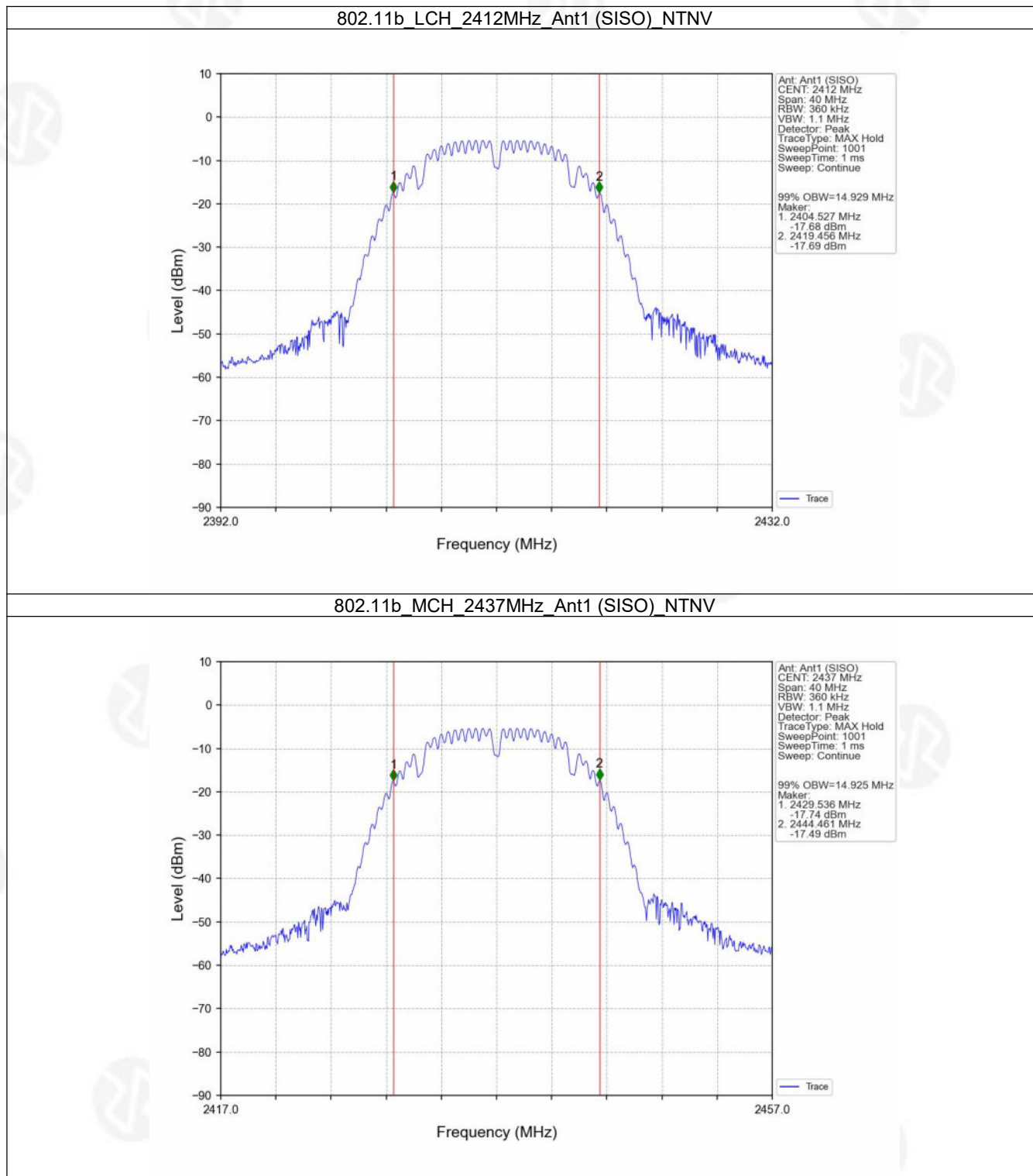
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	12.033	≥ 0.5	Pass
		2437	1	10.177	≥ 0.5	Pass
		2462	1	11.101	≥ 0.5	Pass
802.11g	SISO	2412	1	16.337	≥ 0.5	Pass
		2437	1	16.321	≥ 0.5	Pass
		2462	1	16.302	≥ 0.5	Pass
802.11n (HT20)	SISO	2412	1	16.311	≥ 0.5	Pass
		2437	1	16.327	≥ 0.5	Pass
		2462	1	16.308	≥ 0.5	Pass
802.11n (HT40)	SISO	2422	1	36.027	≥ 0.5	Pass
		2437	1	36.054	≥ 0.5	Pass
		2452	1	35.974	≥ 0.5	Pass



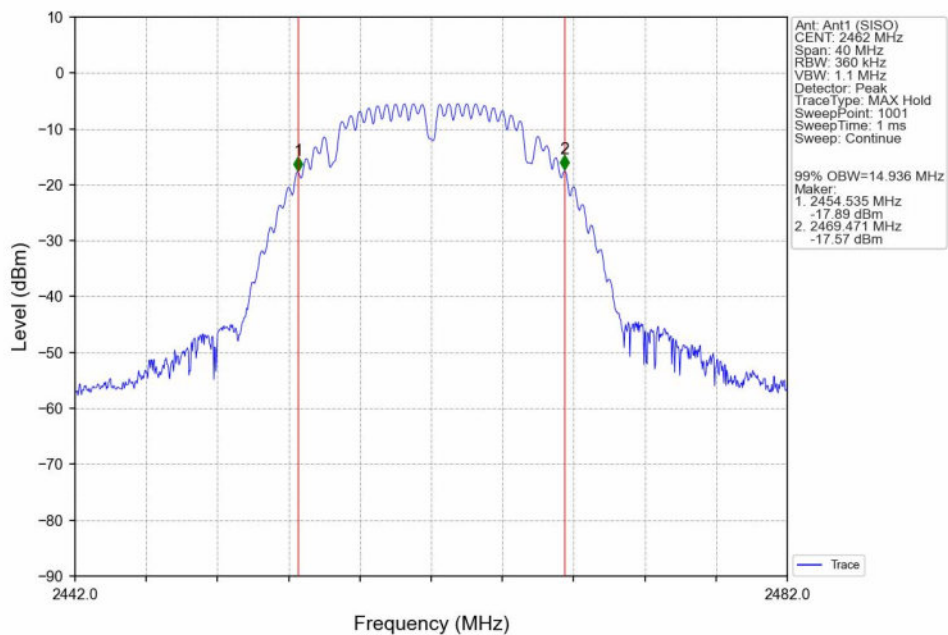
2.2 Test Graph

2.2.1 OBW

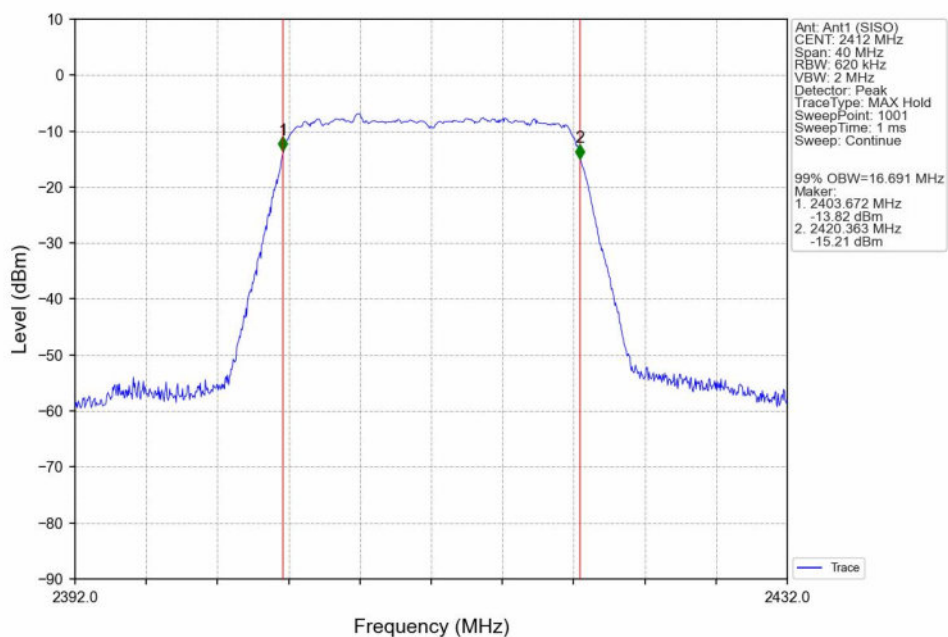




802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV

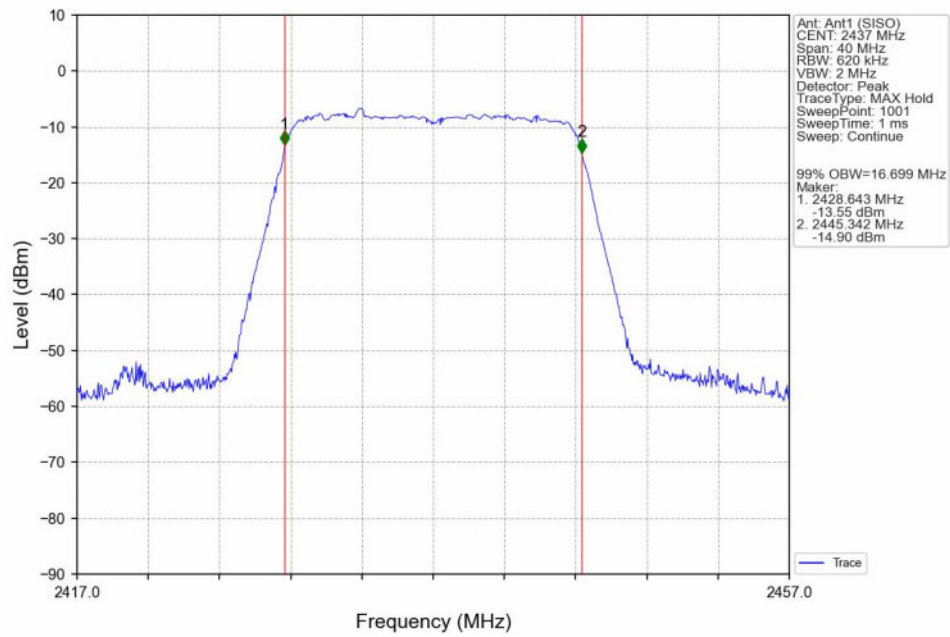


802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

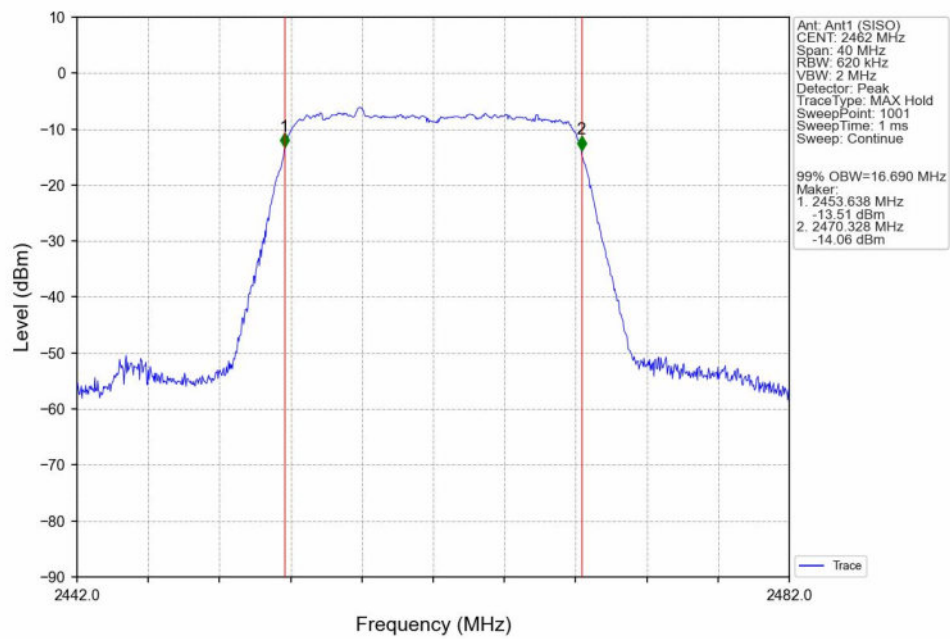




802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV

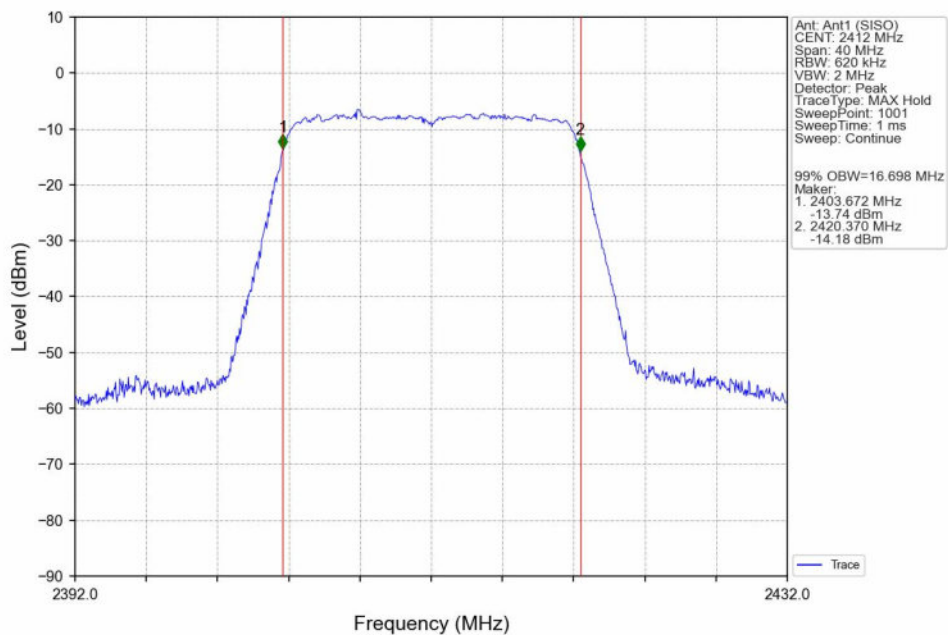


802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV

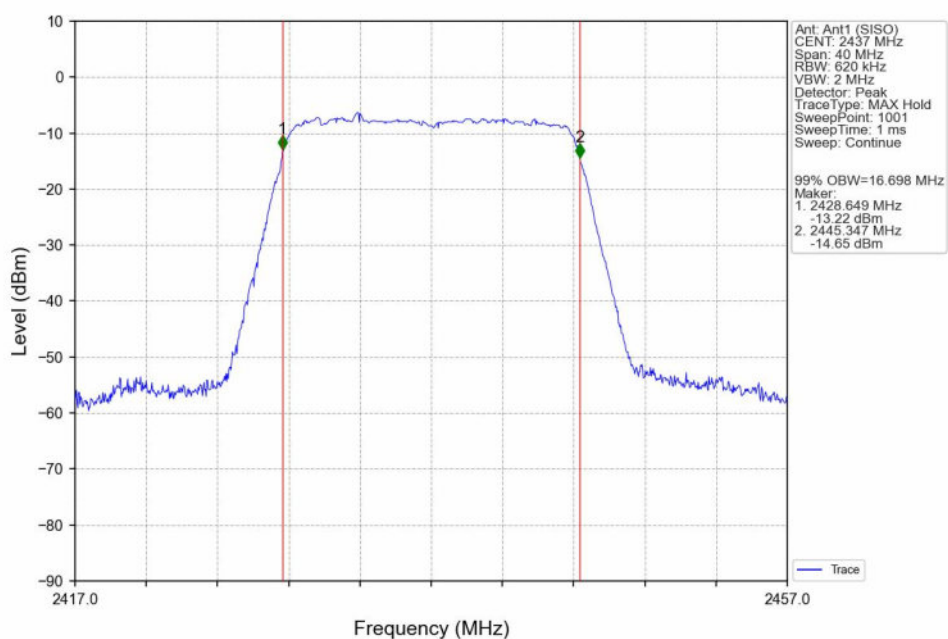




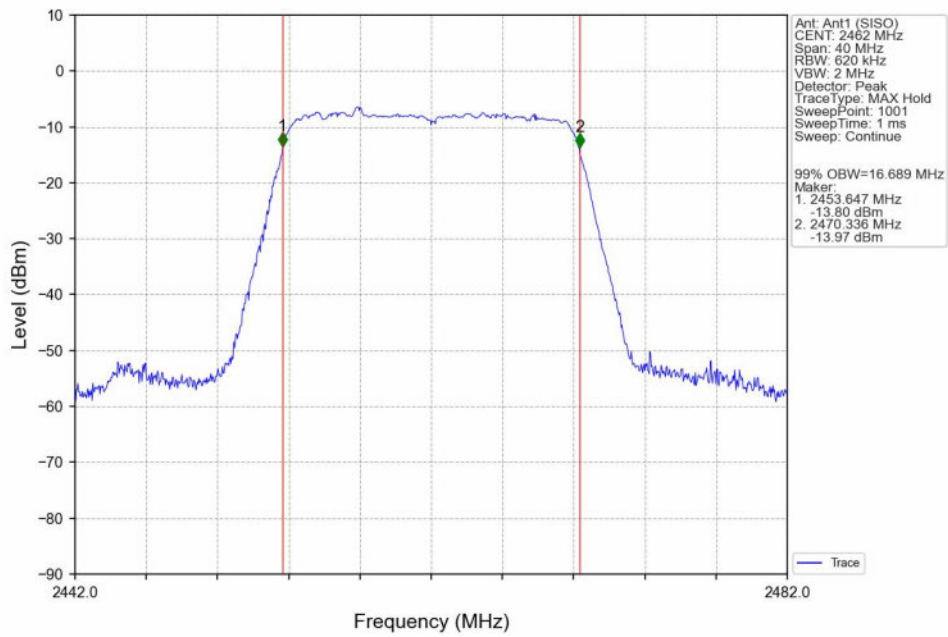
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



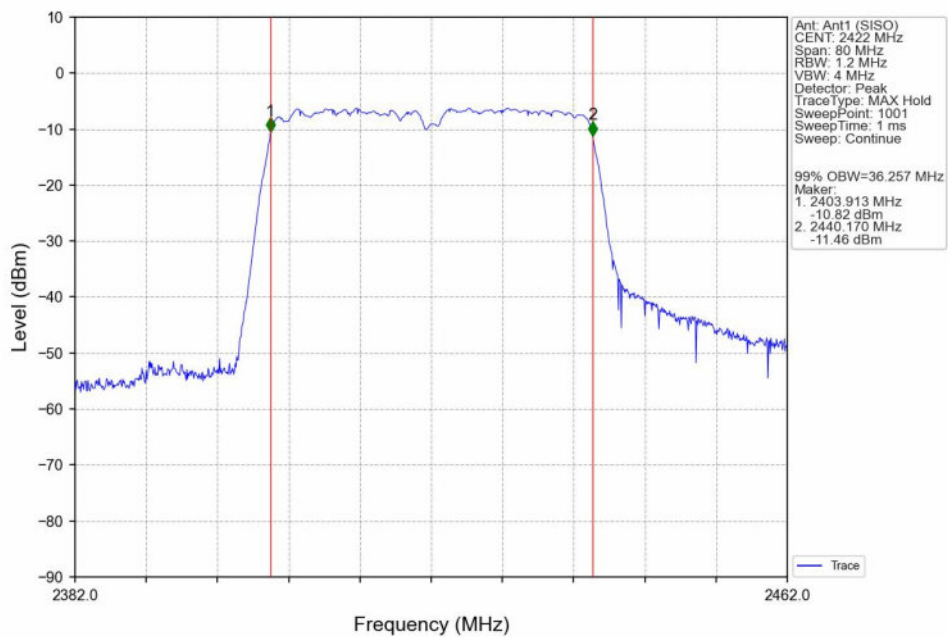
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV

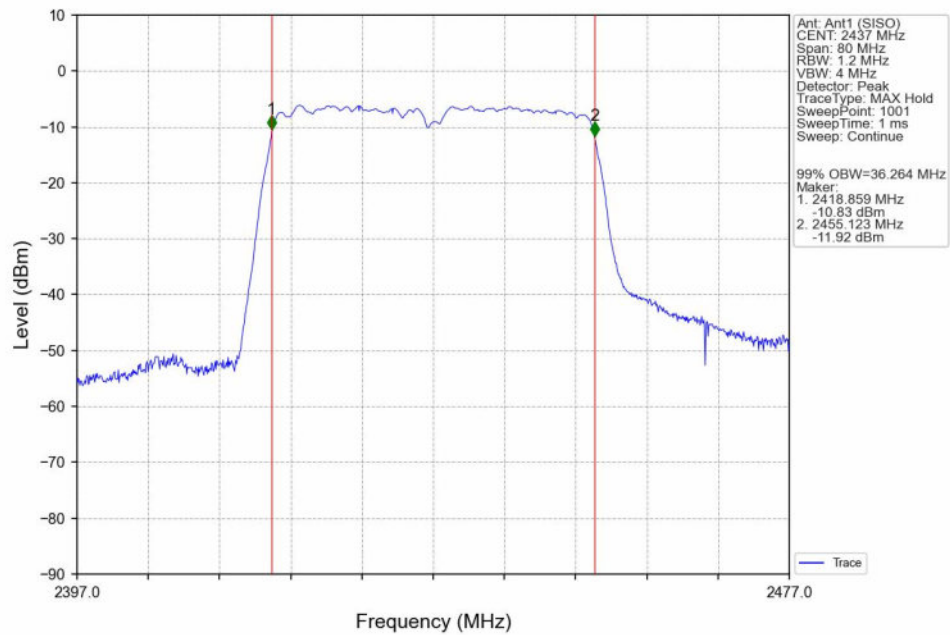


802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

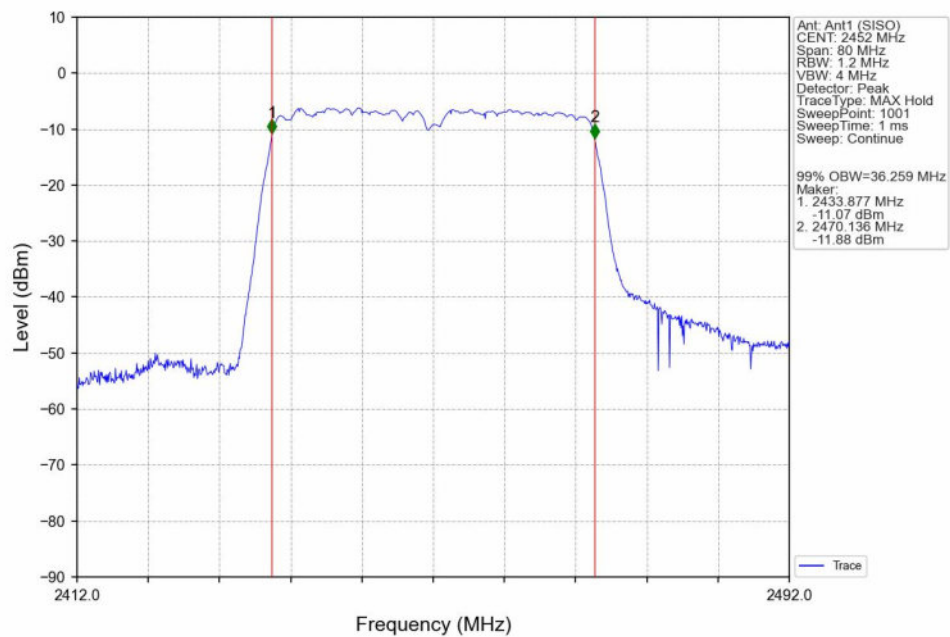




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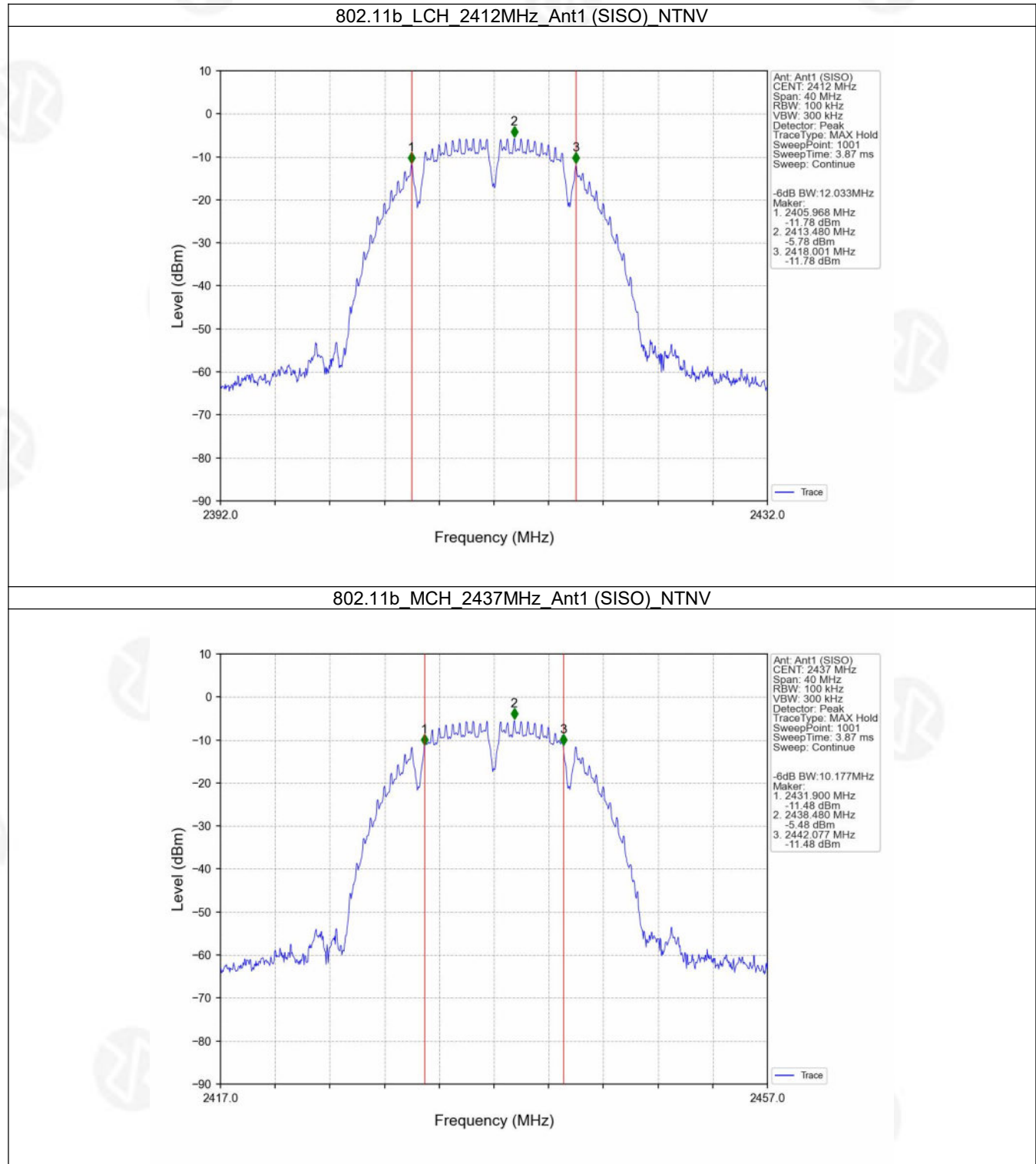


802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



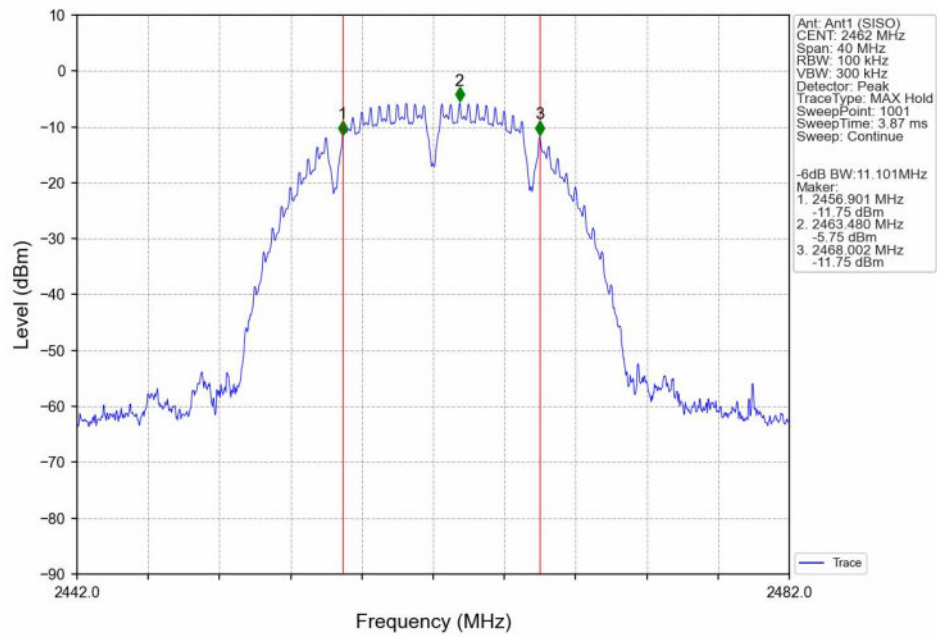


2.2.2 6dB BW

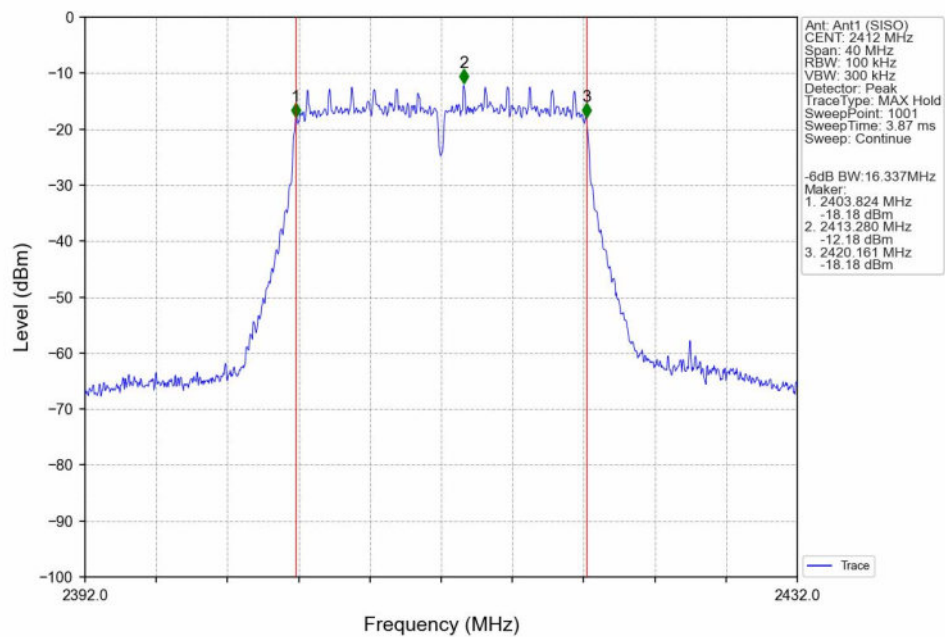




802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV

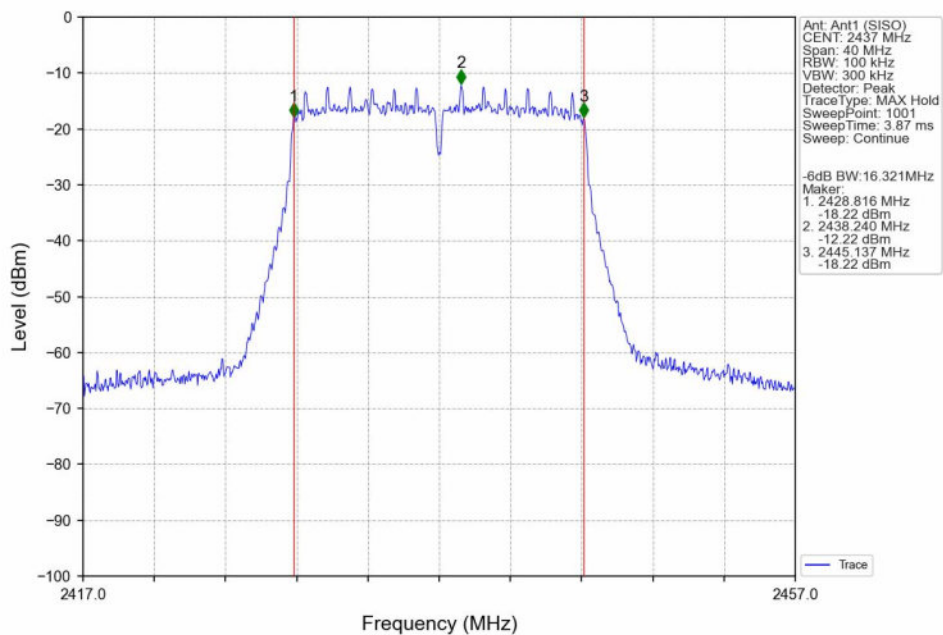


802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

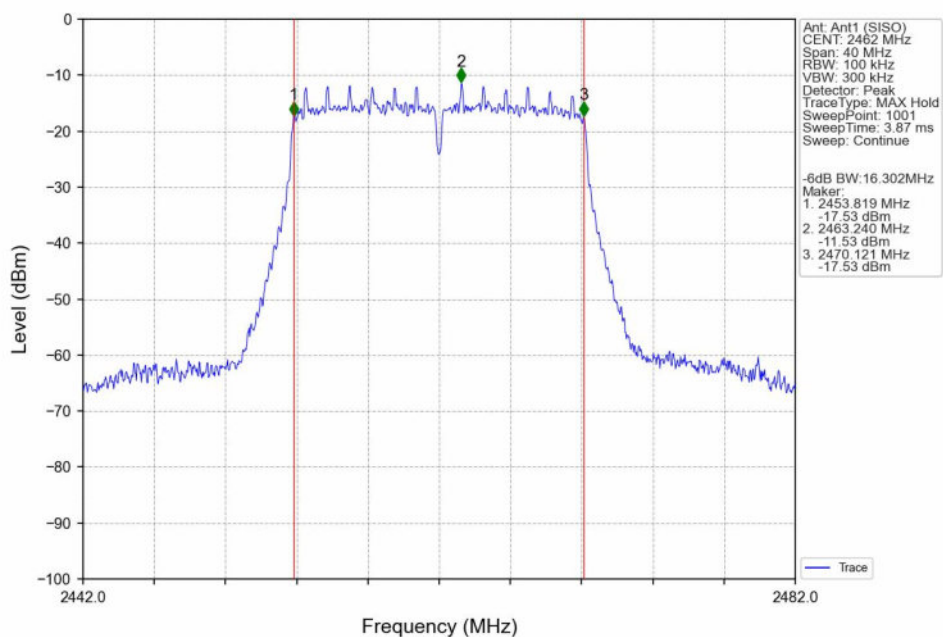




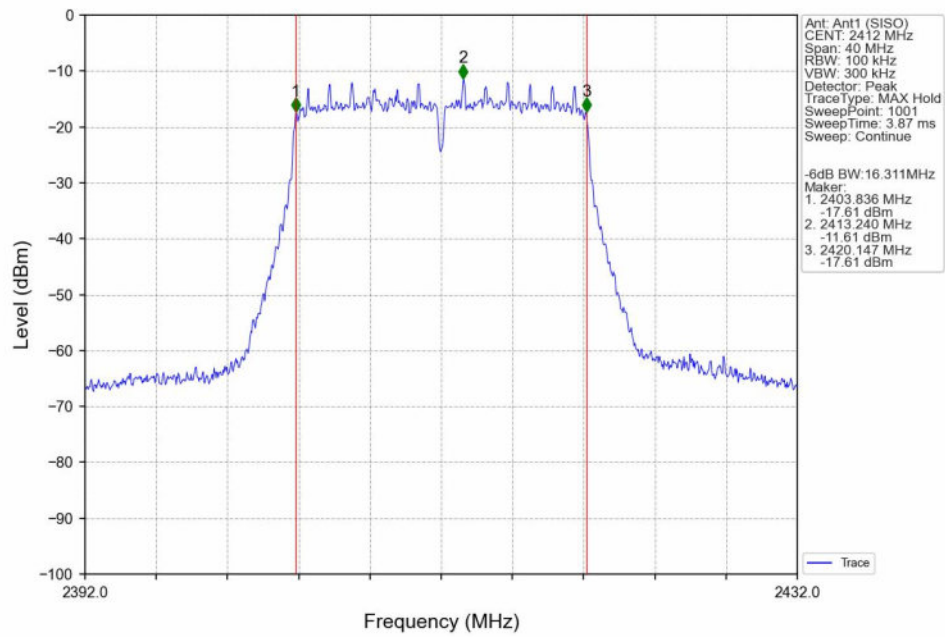
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



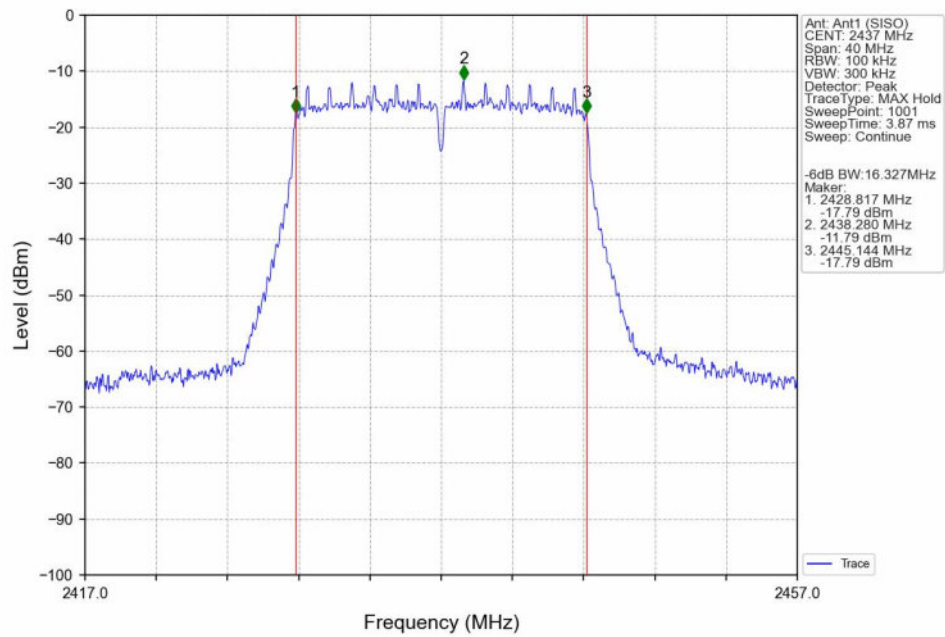
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV

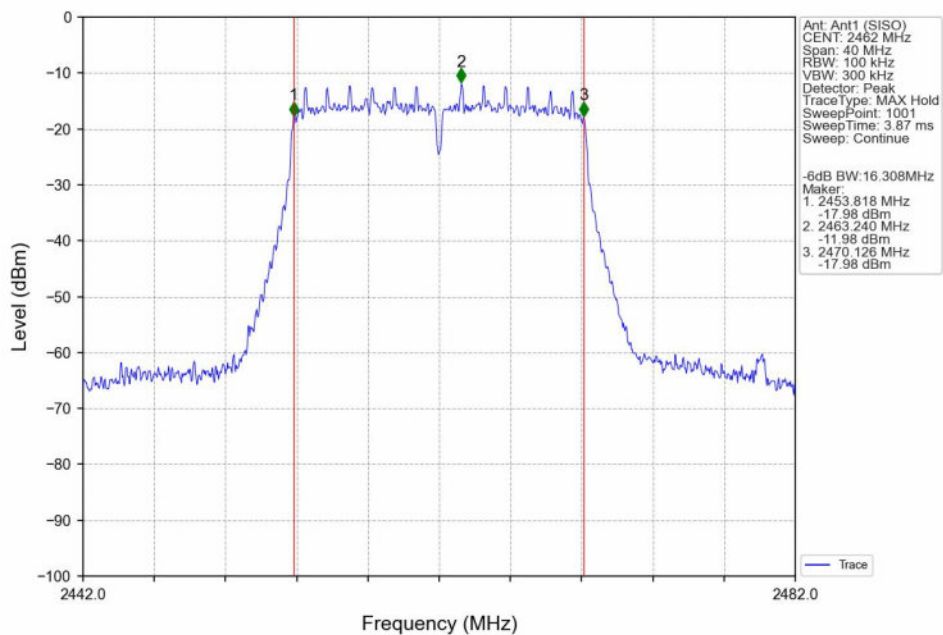


802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV

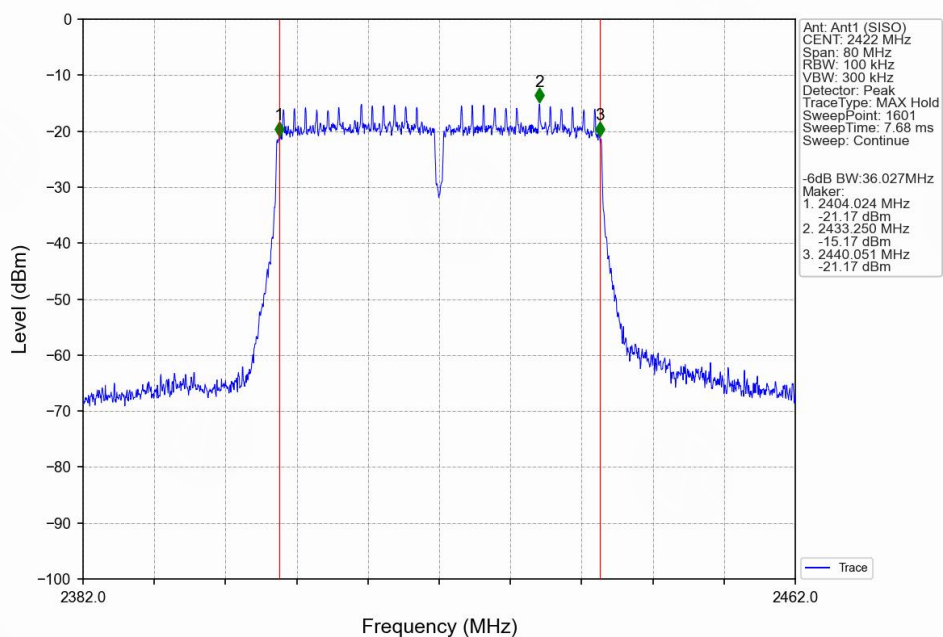




802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV

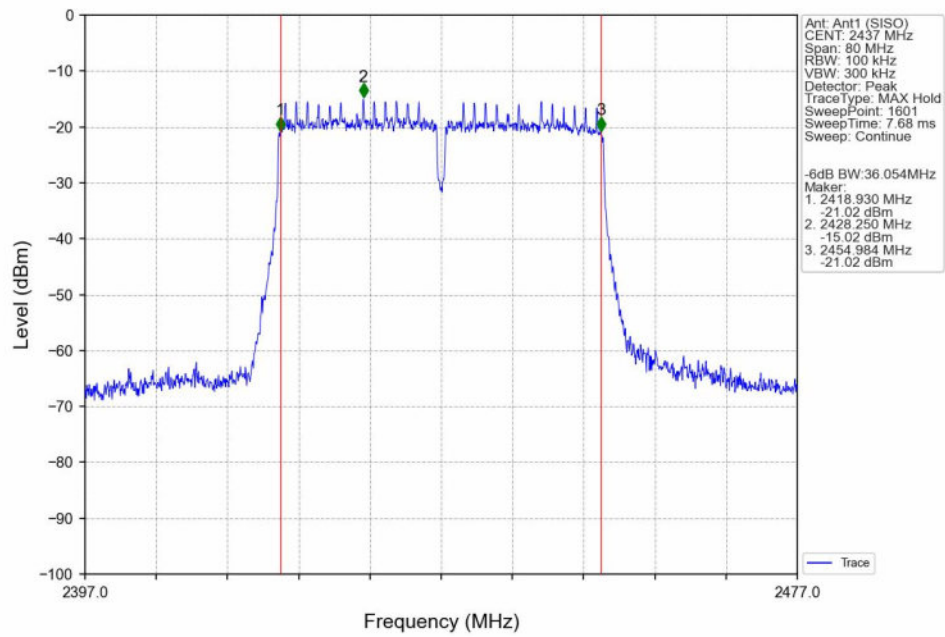


802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

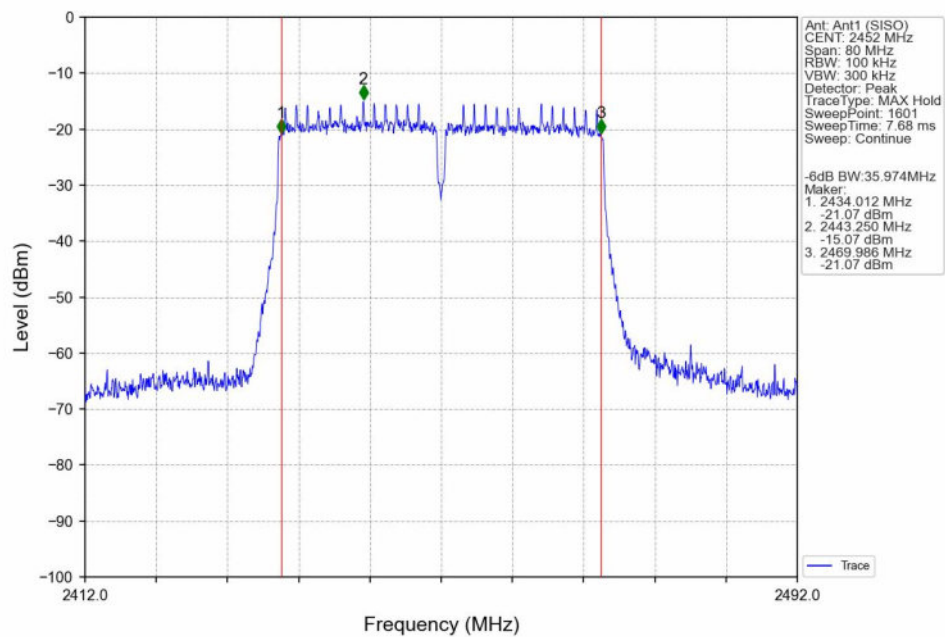




802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV





3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	6.84	<=30	Pass
		2437	6.66	<=30	Pass
		2462	6.54	<=30	Pass
802.11g	SISO	2412	6.57	<=30	Pass
		2437	6.57	<=30	Pass
		2462	6.94	<=30	Pass
802.11n (HT20)	SISO	2412	6.82	<=30	Pass
		2437	6.86	<=30	Pass
		2462	6.71	<=30	Pass
802.11n (HT40)	SISO	2422	6.89	<=30	Pass
		2437	6.90	<=30	Pass
		2452	6.80	<=30	Pass

Note1: Antenna Gain: Ant1: 0.25dBi;



4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

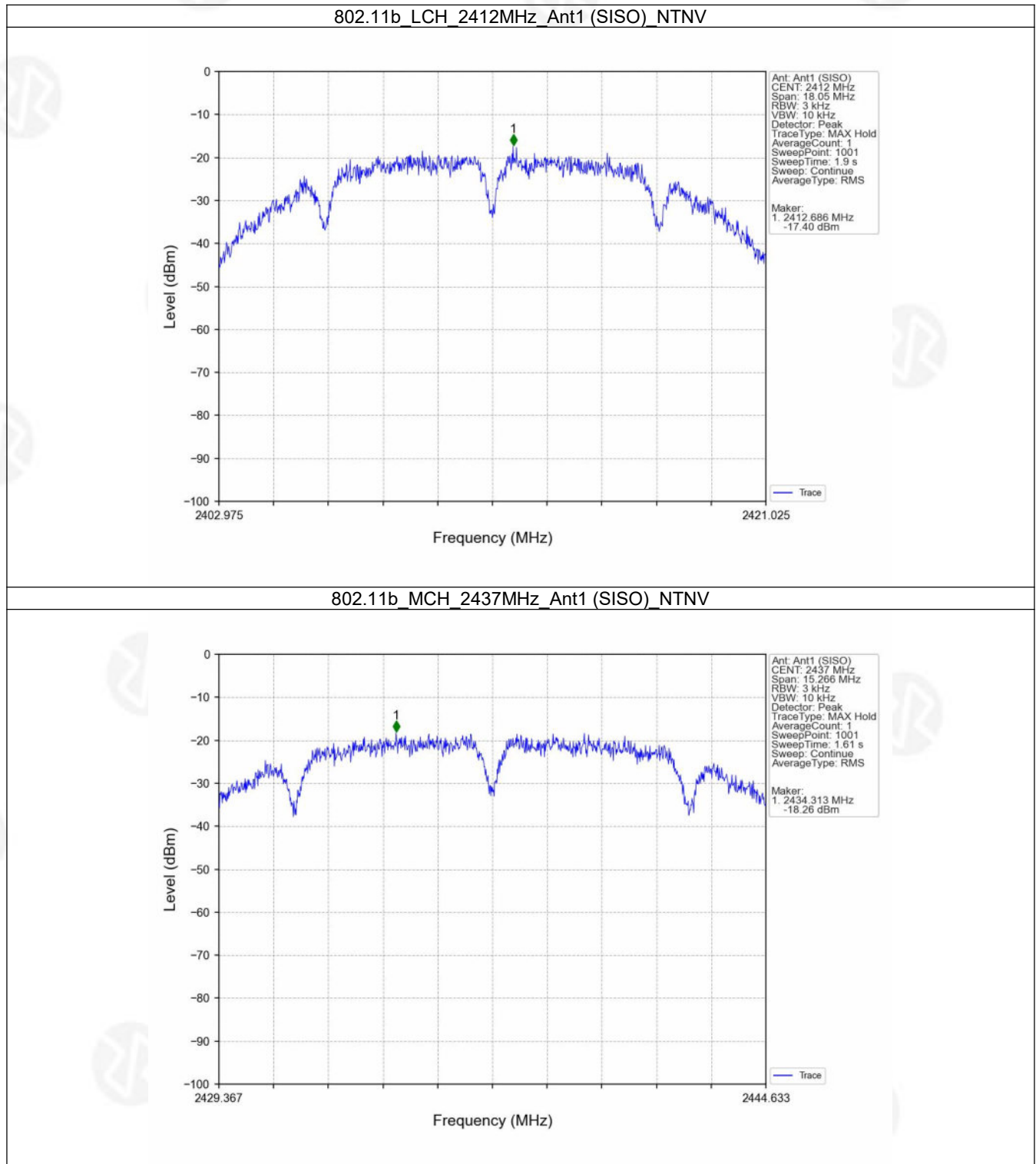
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-17.40	<=8	Pass
		2437	-18.26	<=8	Pass
		2462	-18.18	<=8	Pass
802.11g	SISO	2412	-27.17	<=8	Pass
		2437	-27.22	<=8	Pass
		2462	-26.48	<=8	Pass
802.11n (HT20)	SISO	2412	-26.48	<=8	Pass
		2437	-26.36	<=8	Pass
		2462	-26.61	<=8	Pass
802.11n (HT40)	SISO	2422	-29.92	<=8	Pass
		2437	-30.35	<=8	Pass
		2452	-30.19	<=8	Pass

Note1: Antenna Gain: Ant1: 0.25dBi;



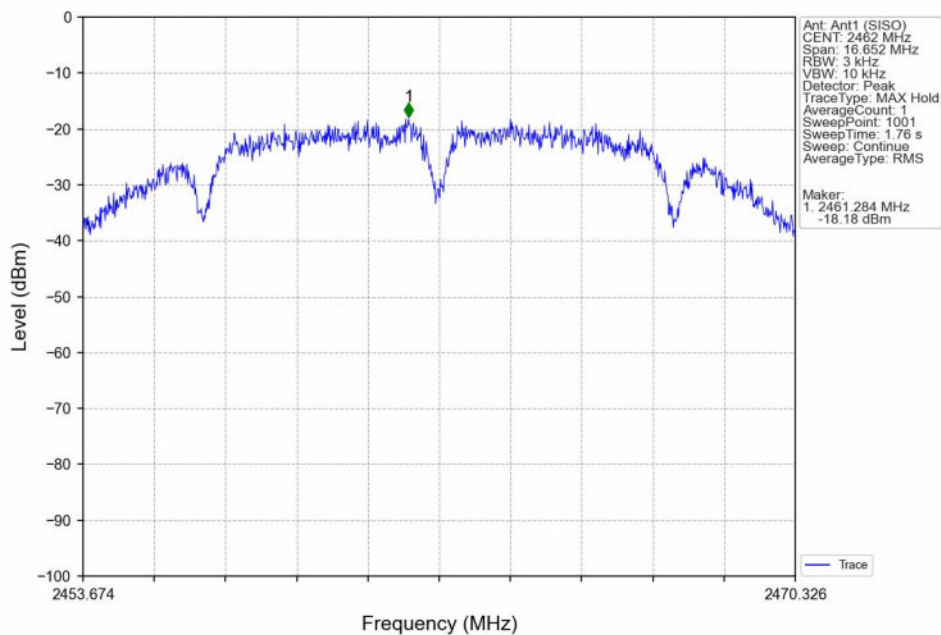
4.2 Test Graph

4.2.1 PSD

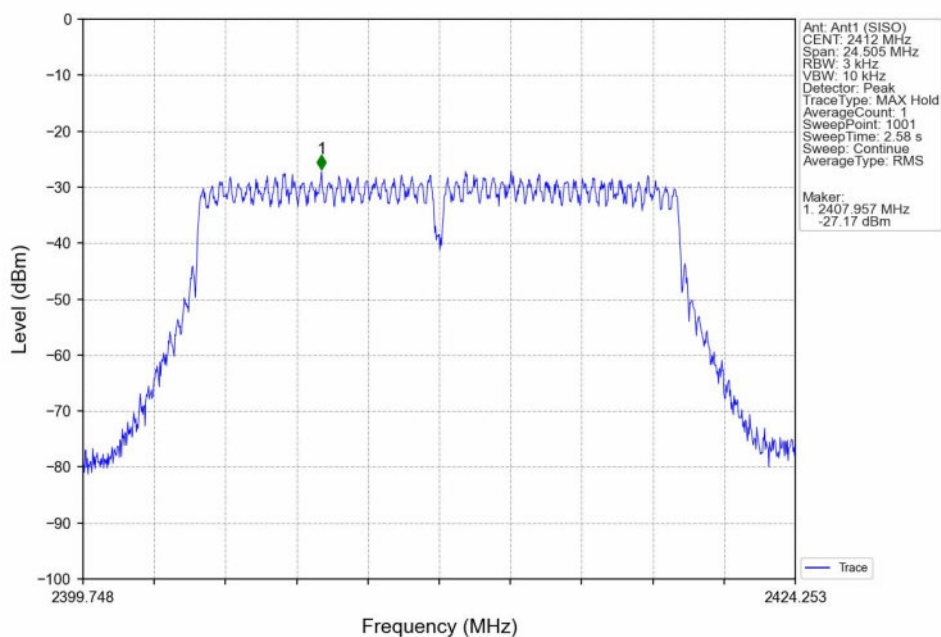




802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV

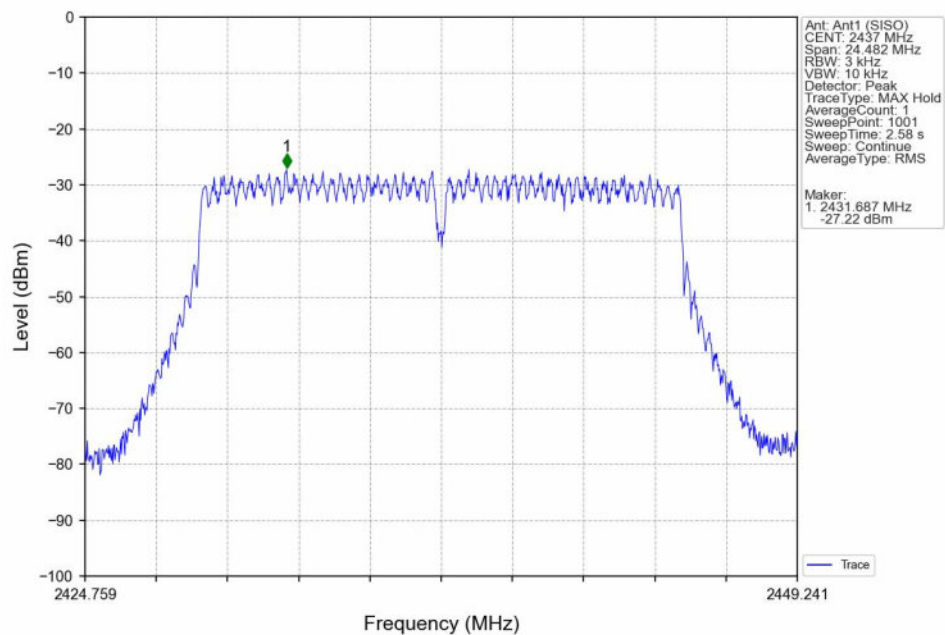


802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

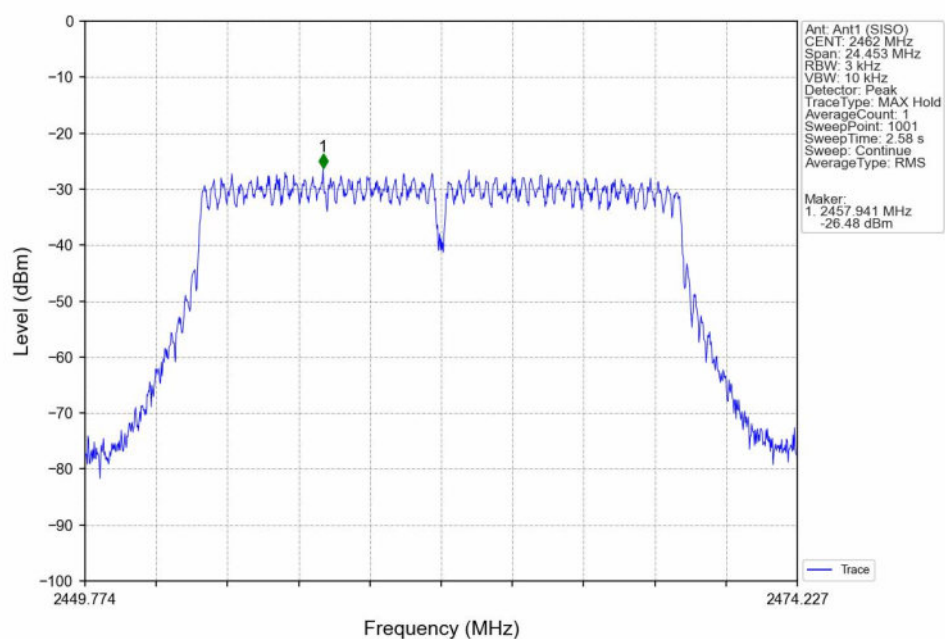




802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV

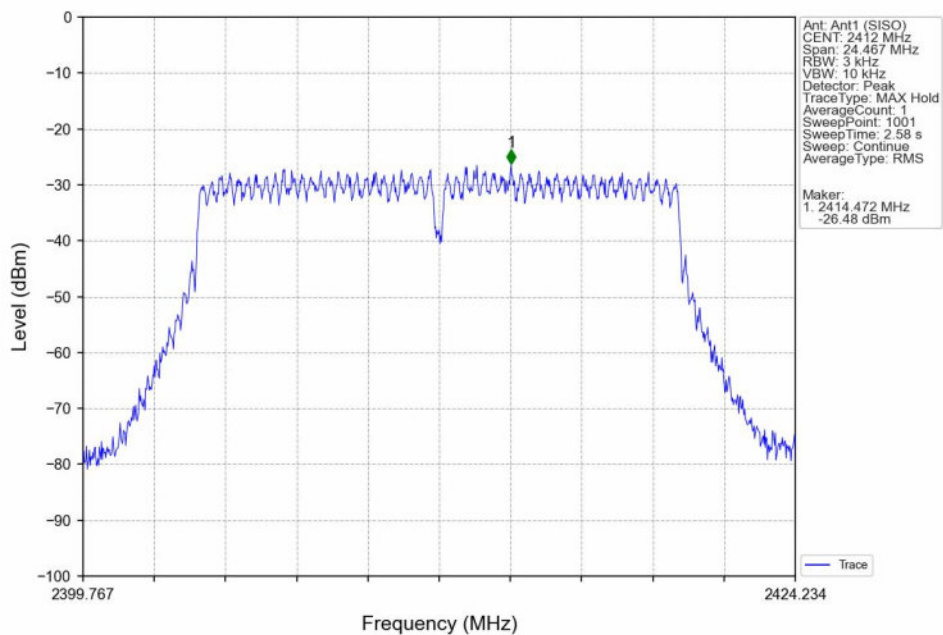


802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV

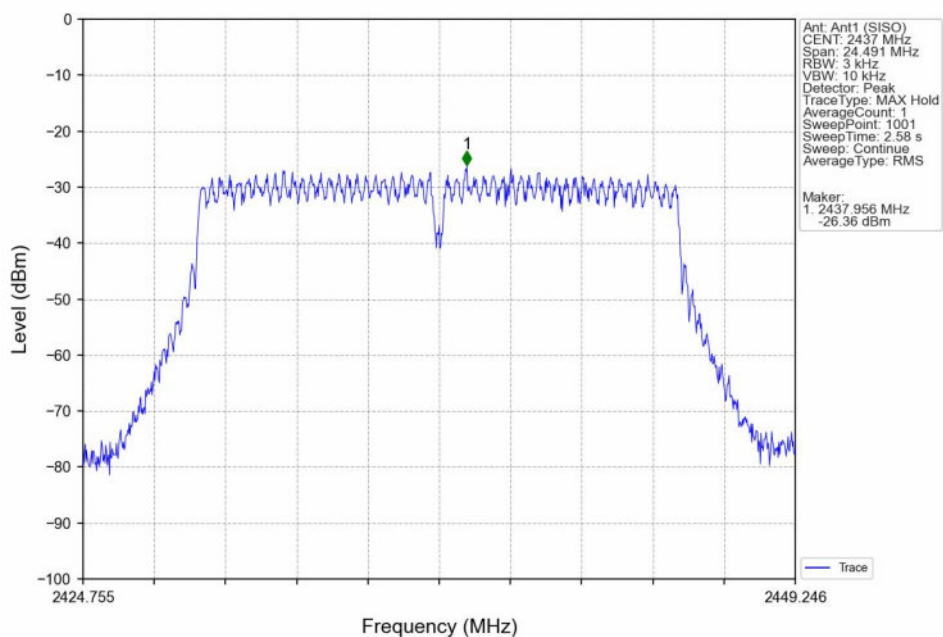




802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV

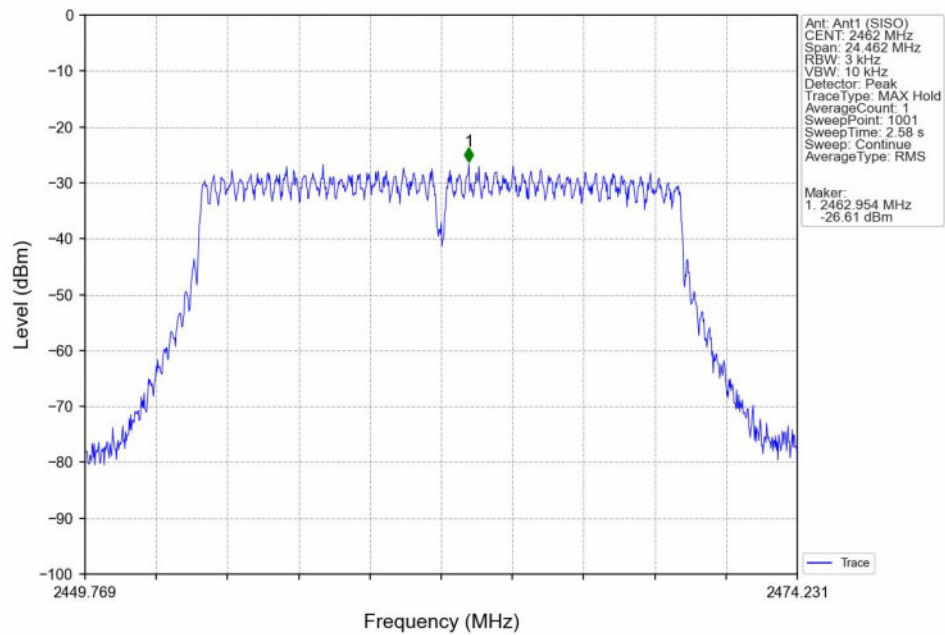


802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV

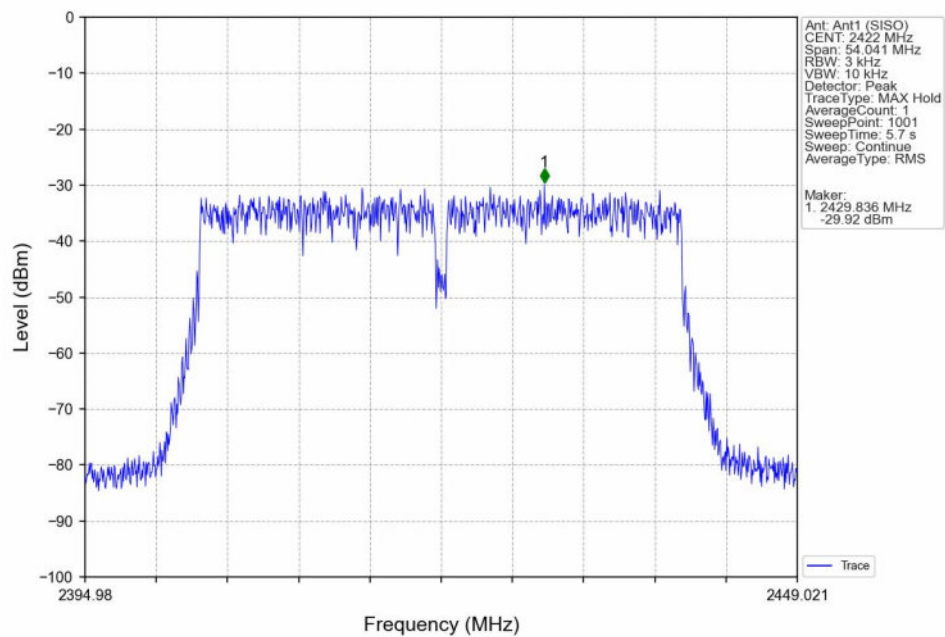




802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV

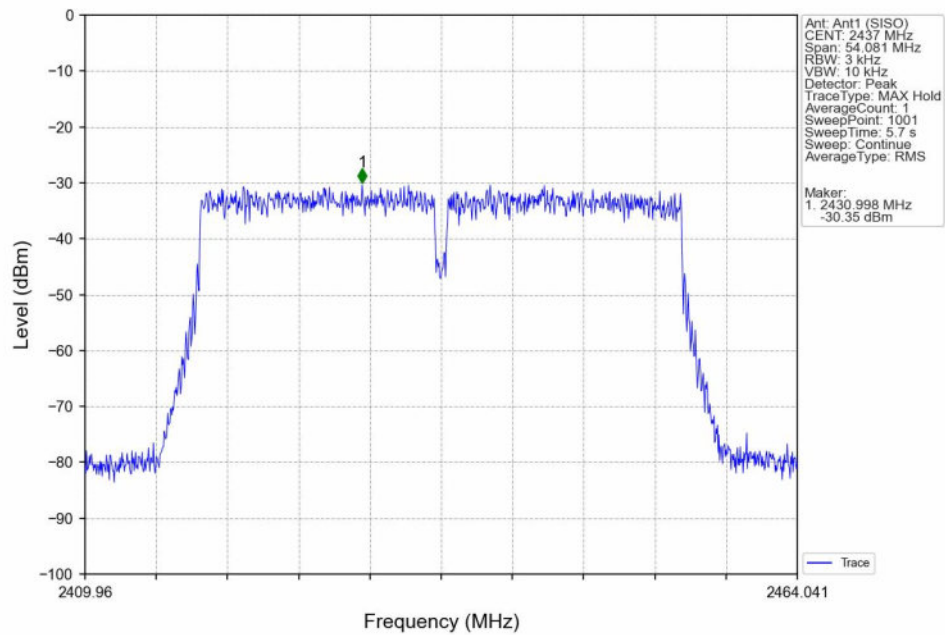


802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

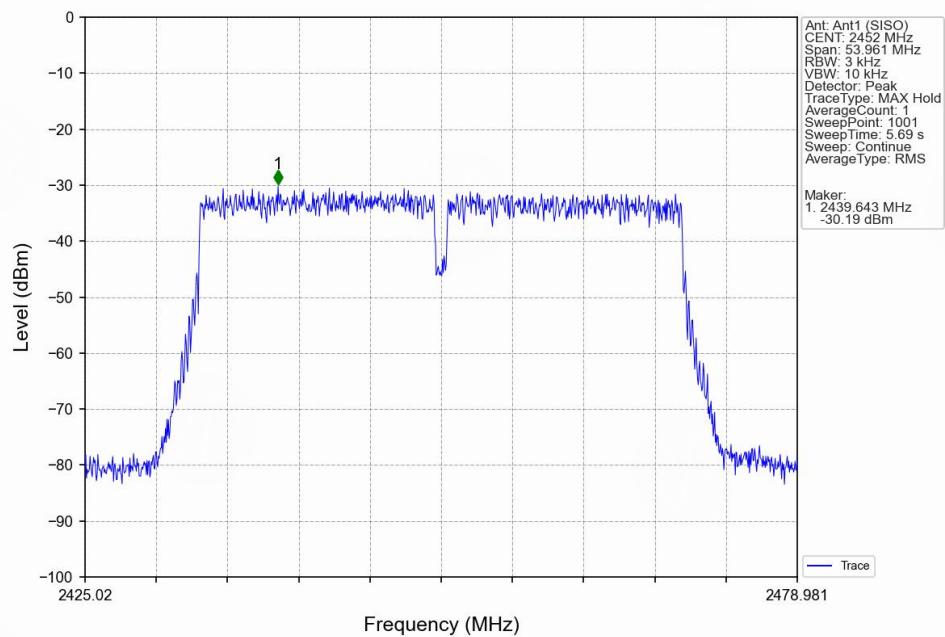




802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV





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	-5.77
		2437	1	-5.65
		2462	1	-5.87
802.11g	SISO	2412	1	-12.65
		2437	1	-12.03
		2462	1	-11.76
802.11n (HT20)	SISO	2412	1	-12.10
		2437	1	-11.92
		2462	1	-11.87
802.11n (HT40)	SISO	2422	1	-15.14
		2437	1	-15.01
		2452	1	-15.43

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

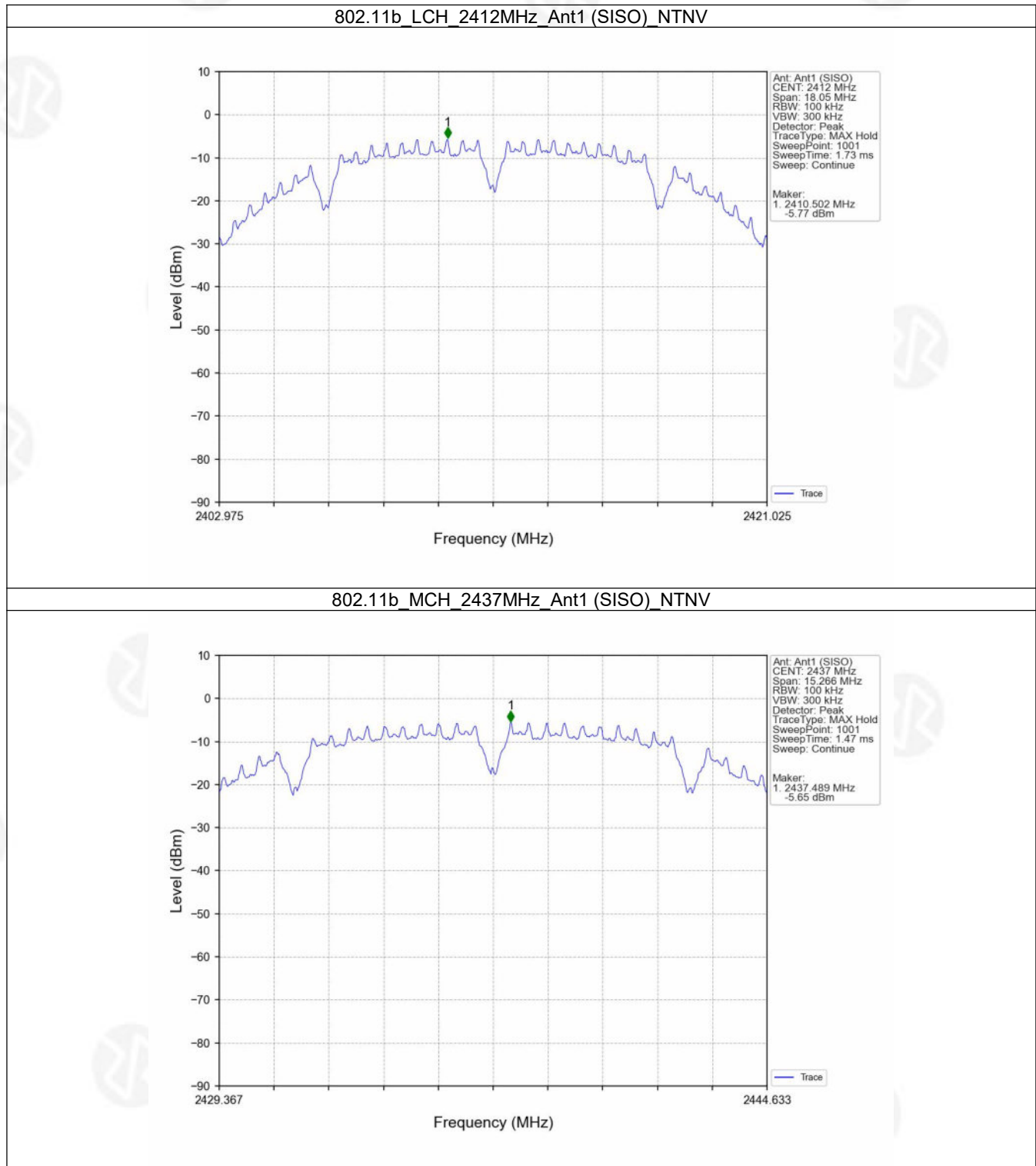
Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	-5.77	-25.77	Pass
		2437	1	-5.65	-25.65	Pass
		2462	1	-5.87	-25.87	Pass
802.11g	SISO	2412	1	-12.65	-32.65	Pass
		2437	1	-12.03	-32.03	Pass
		2462	1	-11.76	-31.76	Pass
802.11n (HT20)	SISO	2412	1	-12.10	-32.10	Pass
		2437	1	-11.92	-31.92	Pass
		2462	1	-11.87	-31.87	Pass
802.11n (HT40)	SISO	2422	1	-15.14	-35.14	Pass
		2437	1	-15.01	-35.01	Pass
		2452	1	-15.43	-35.43	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.



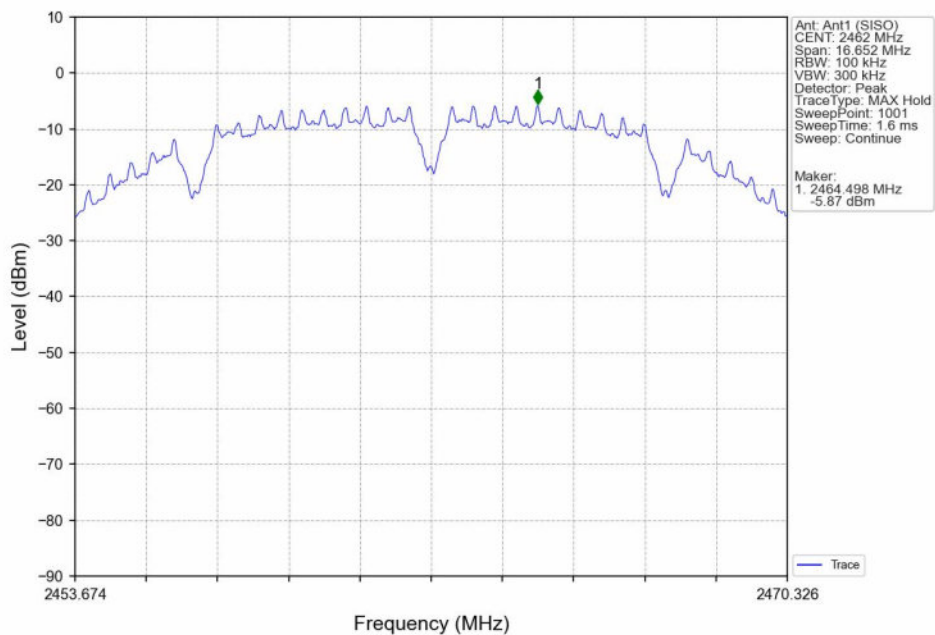
5.2 Test Graph

5.2.1 Ref

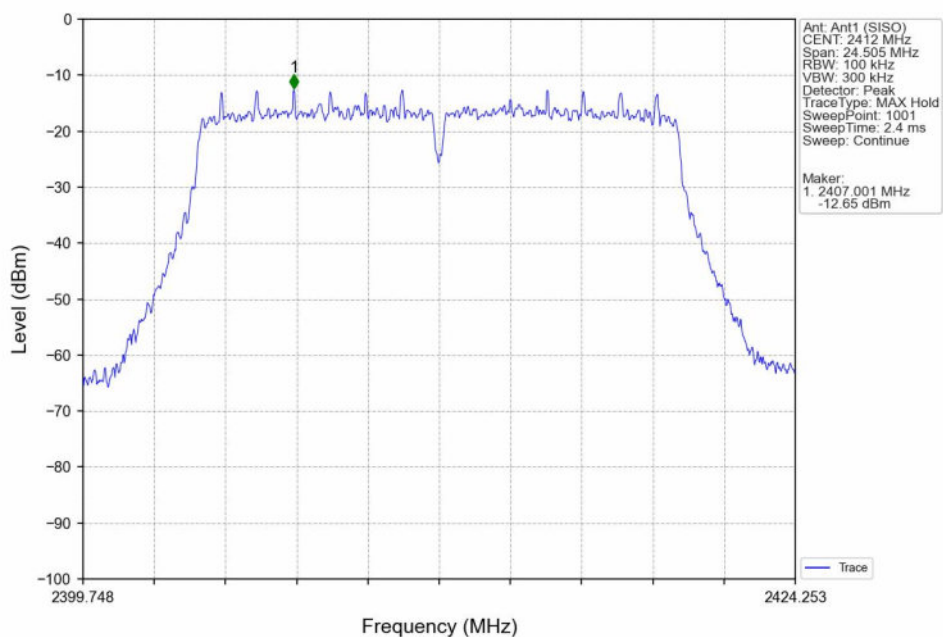




802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV

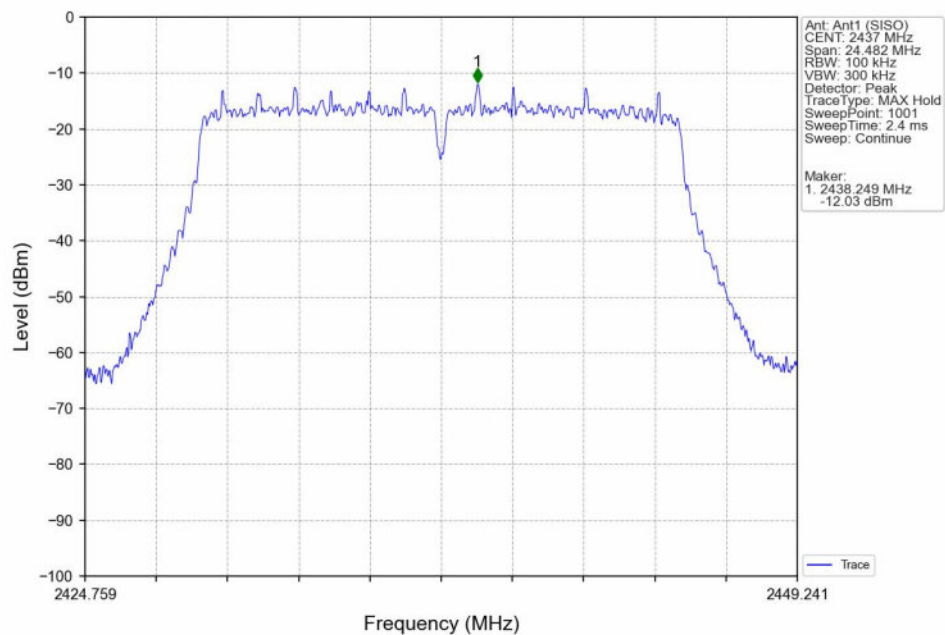


802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

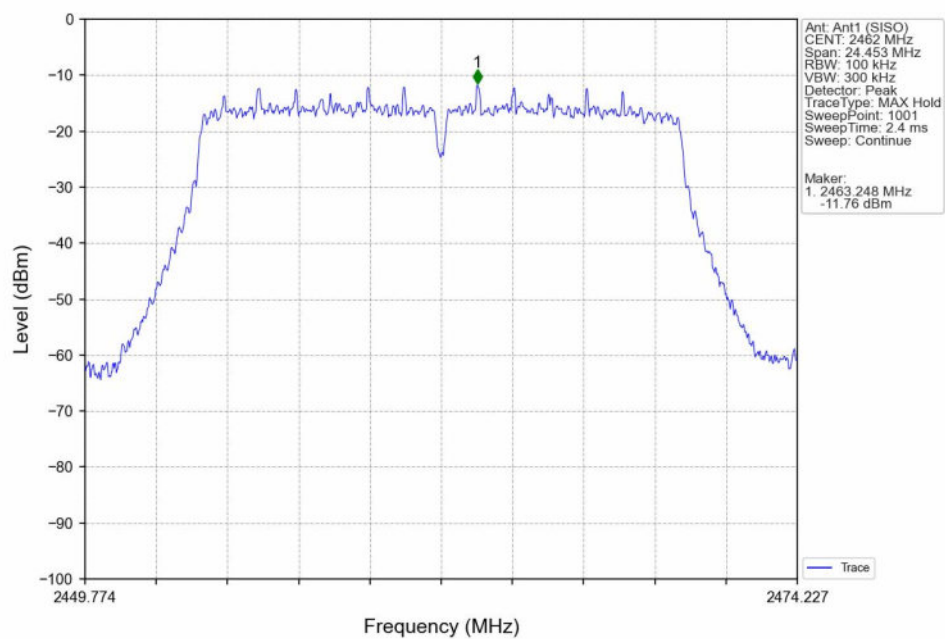




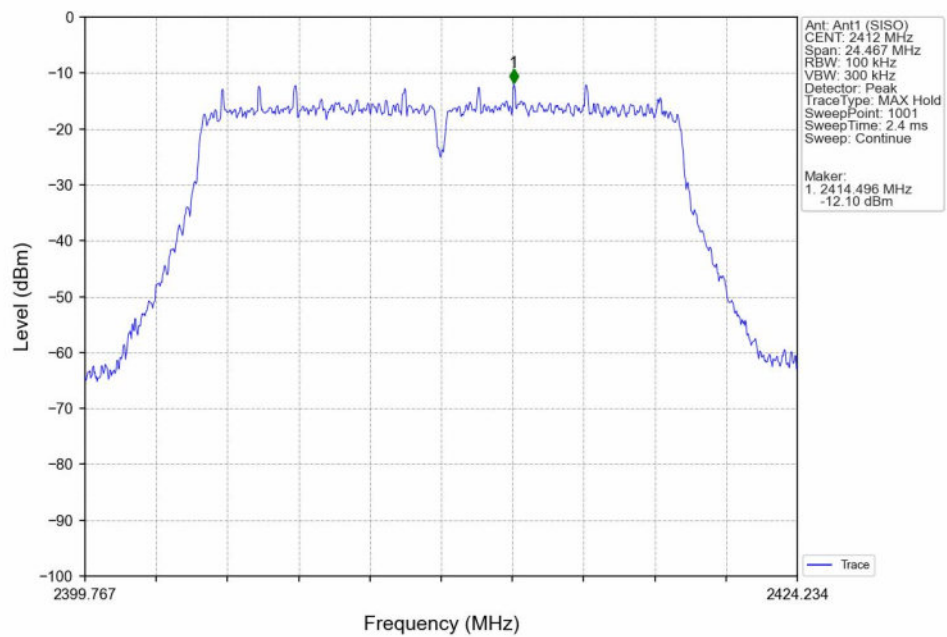
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



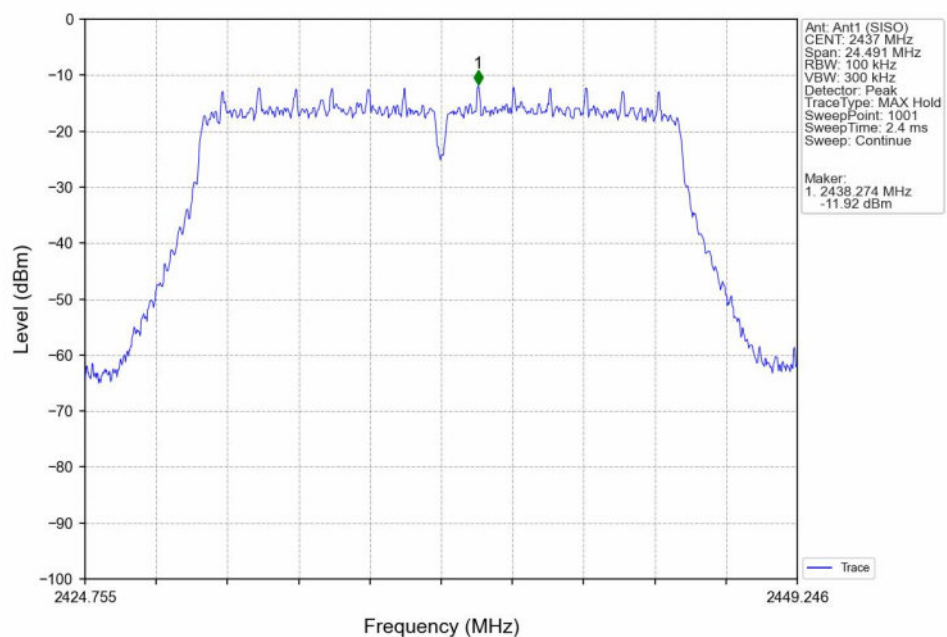
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV

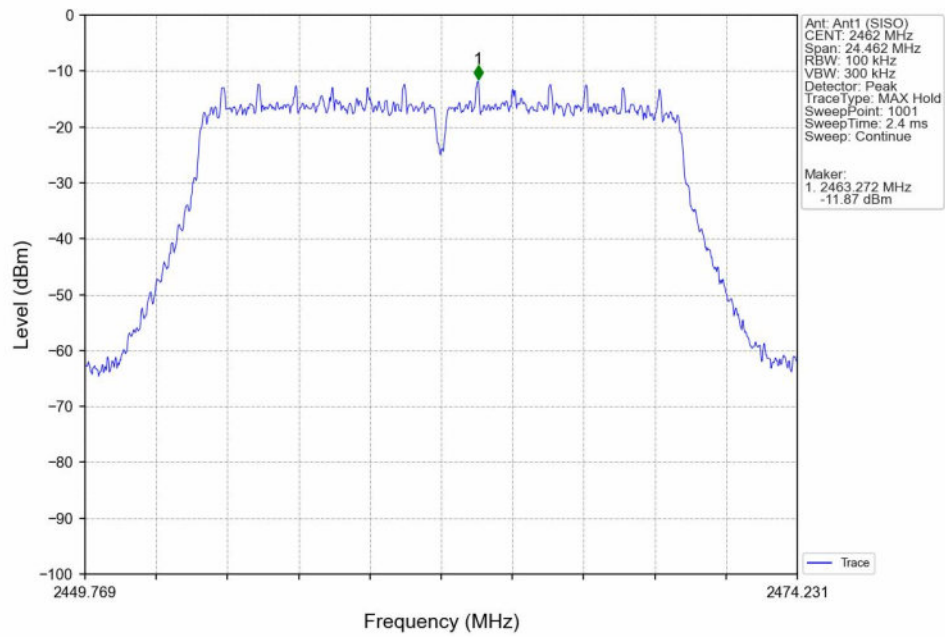


802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV

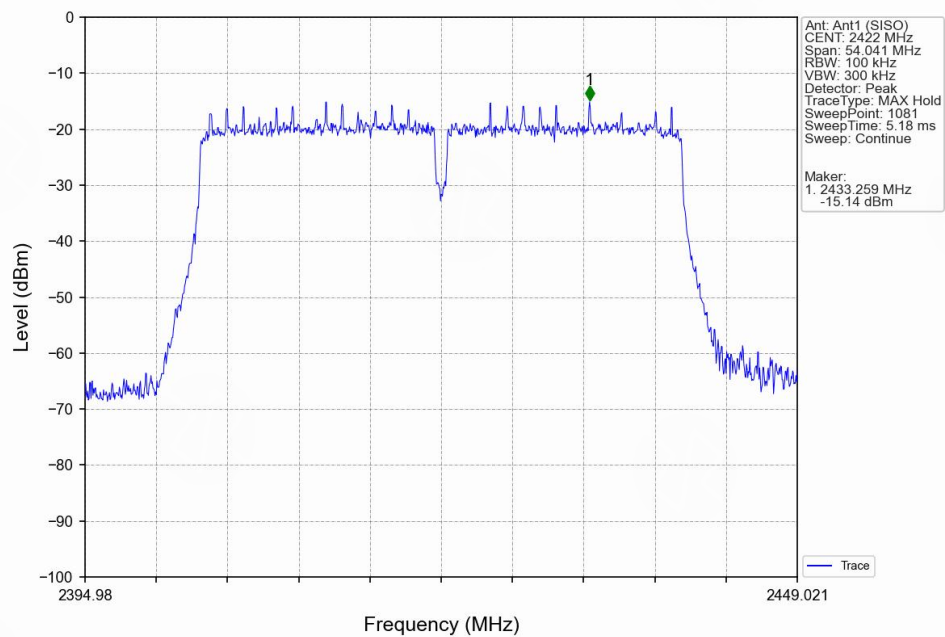




802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV

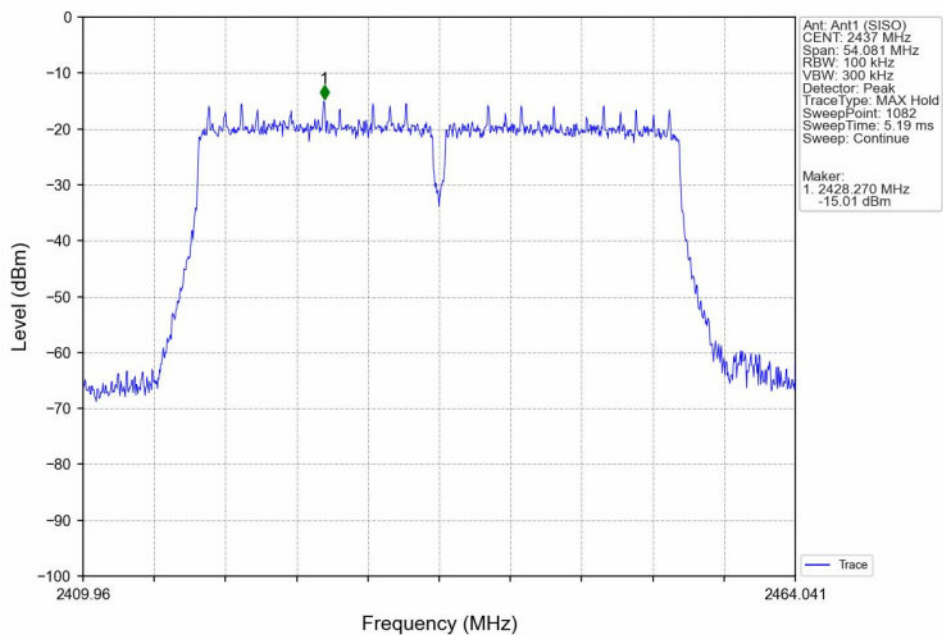


802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

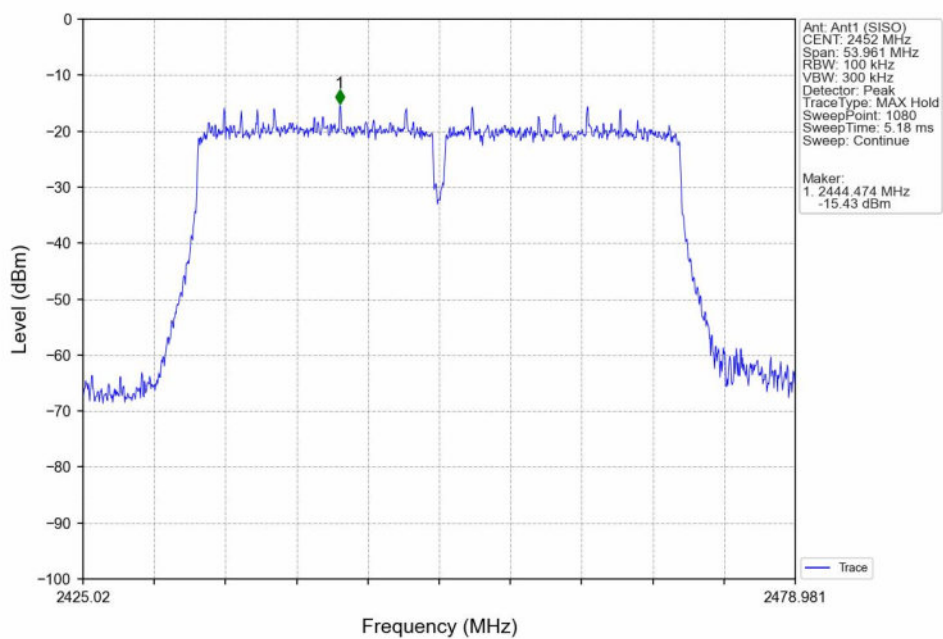




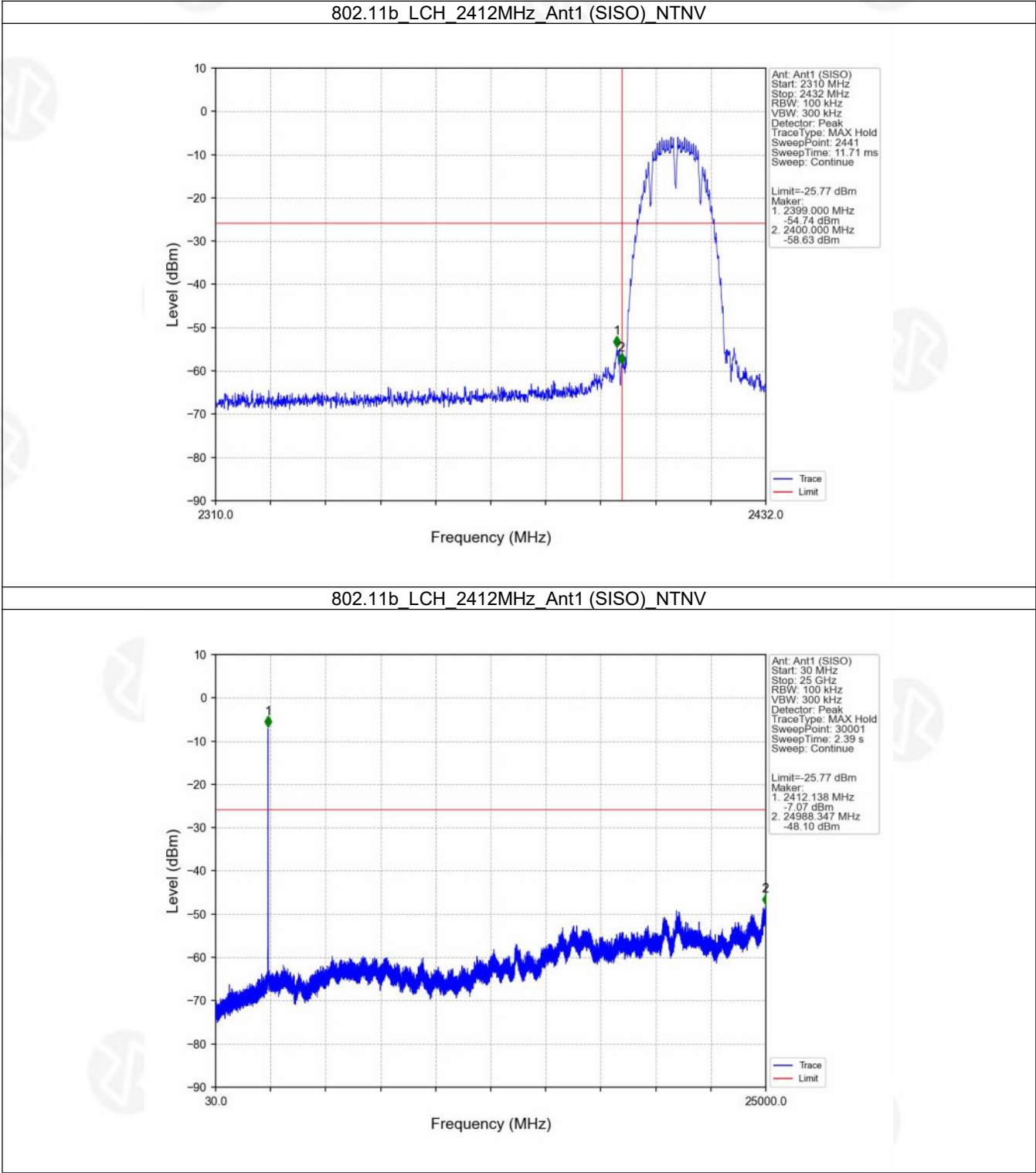
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV

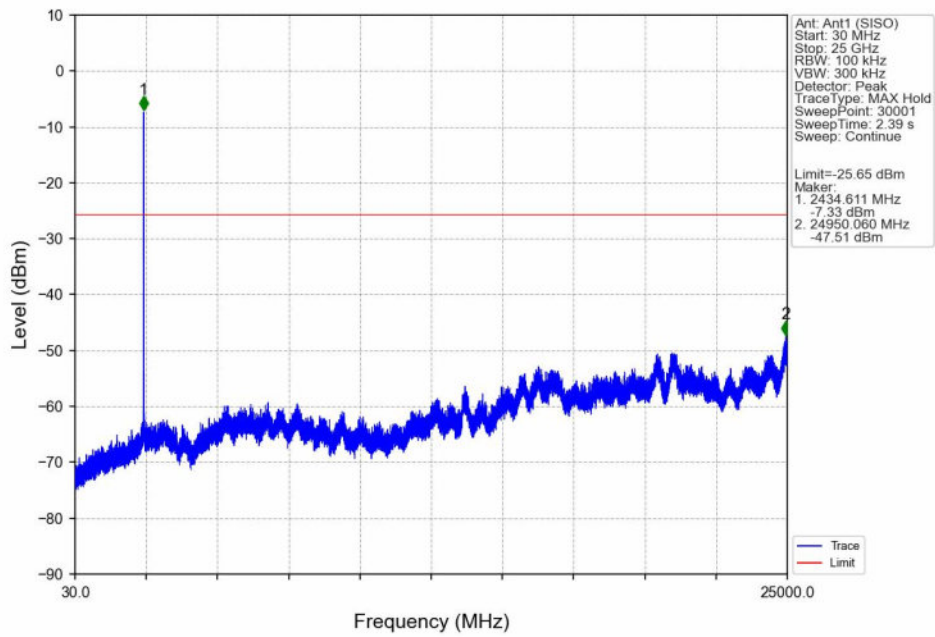


5.2.2 CSE

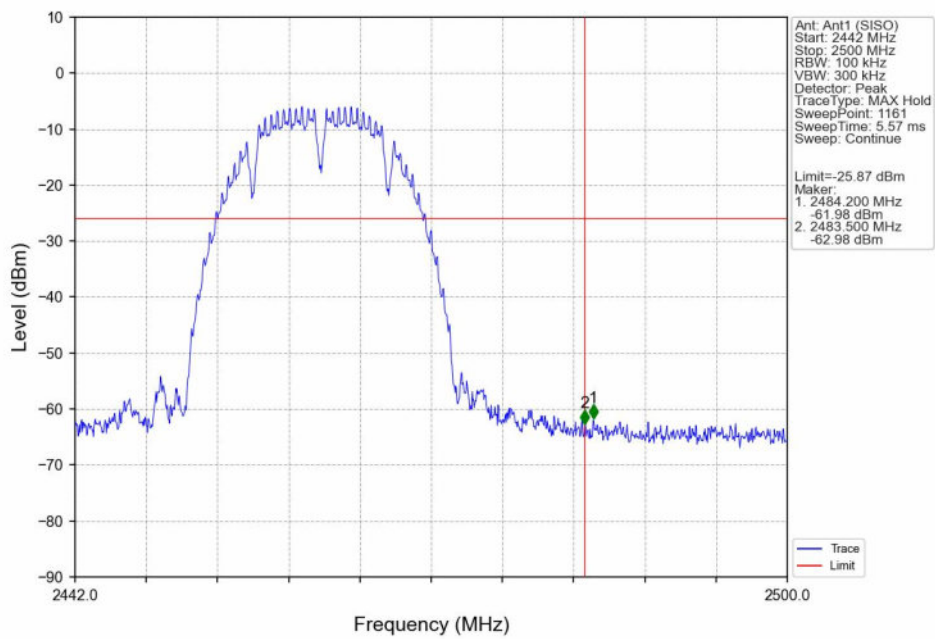




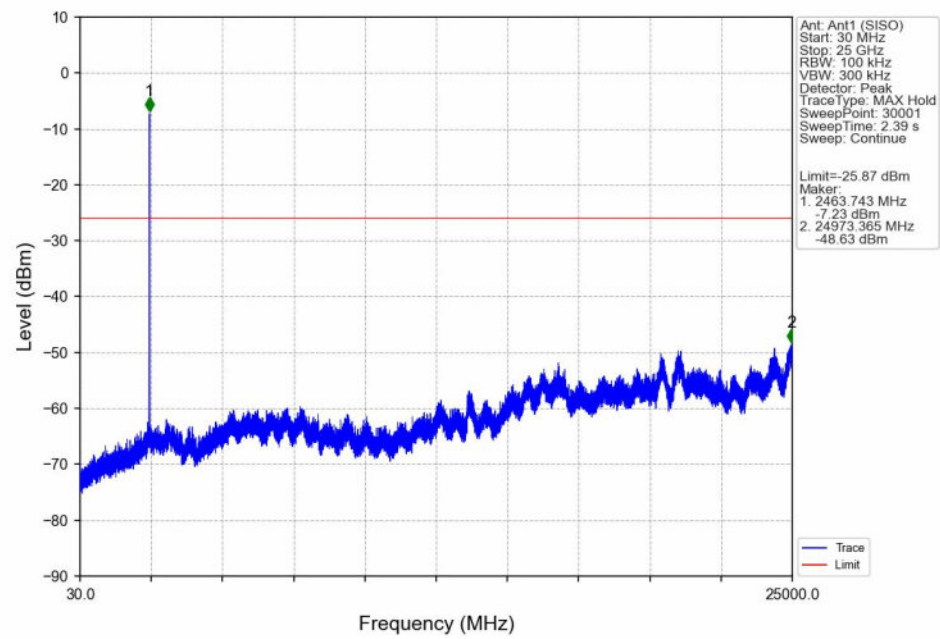
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



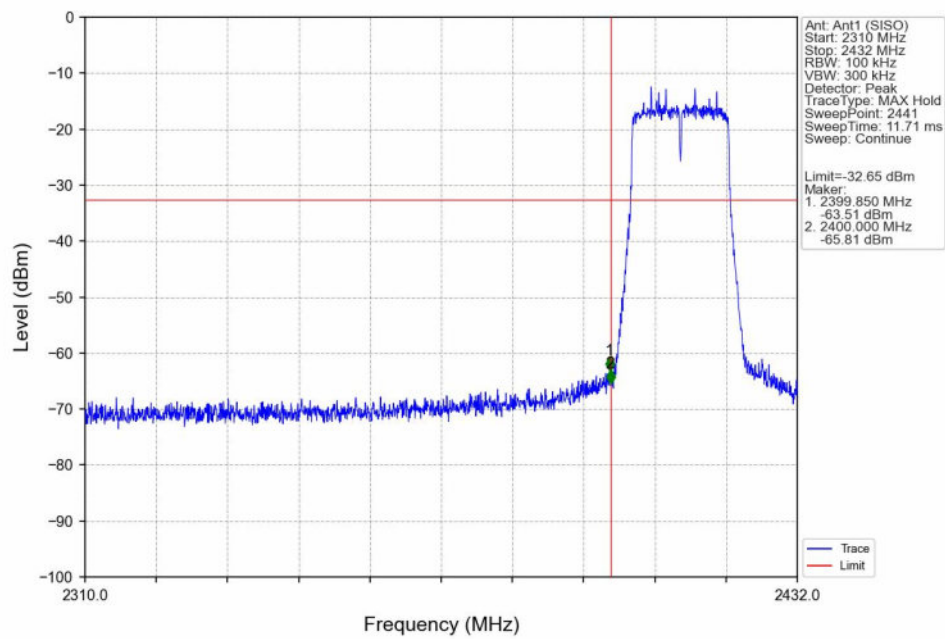
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



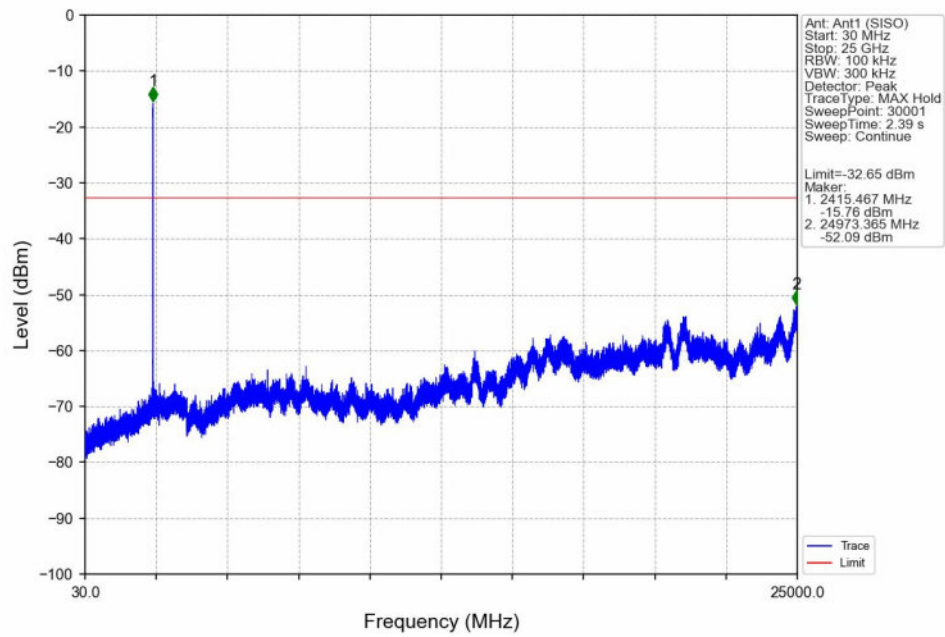
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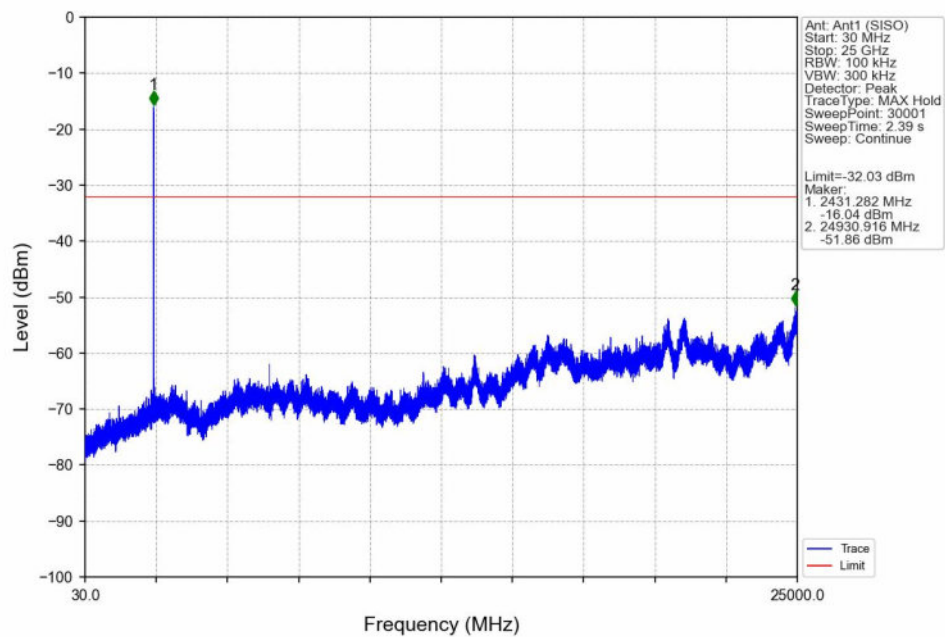
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



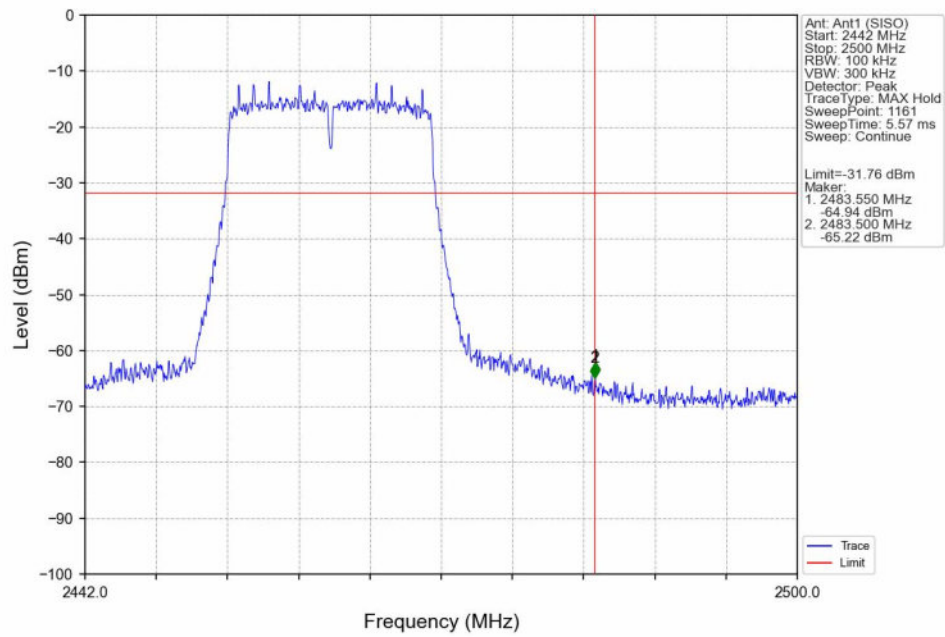
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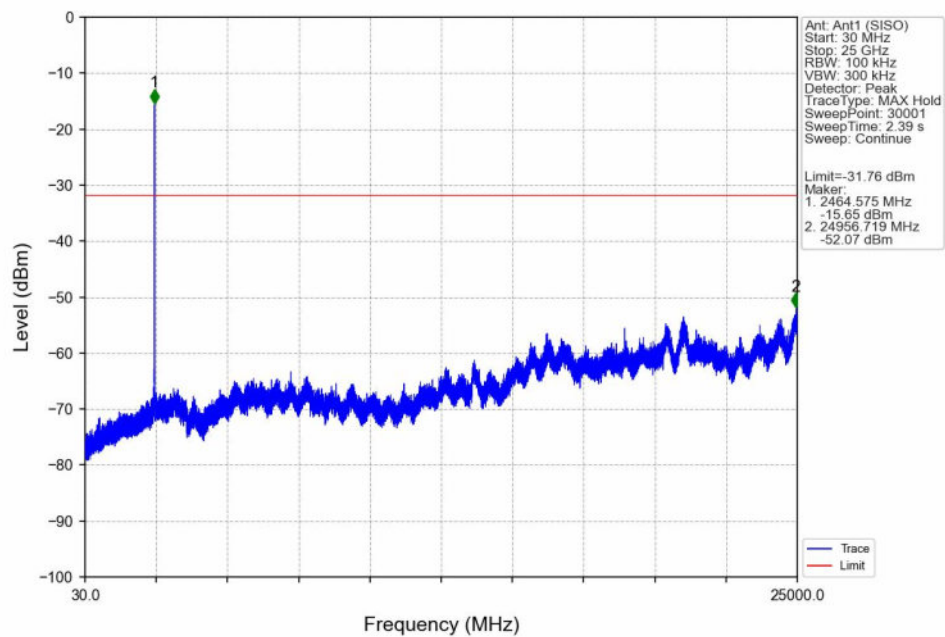
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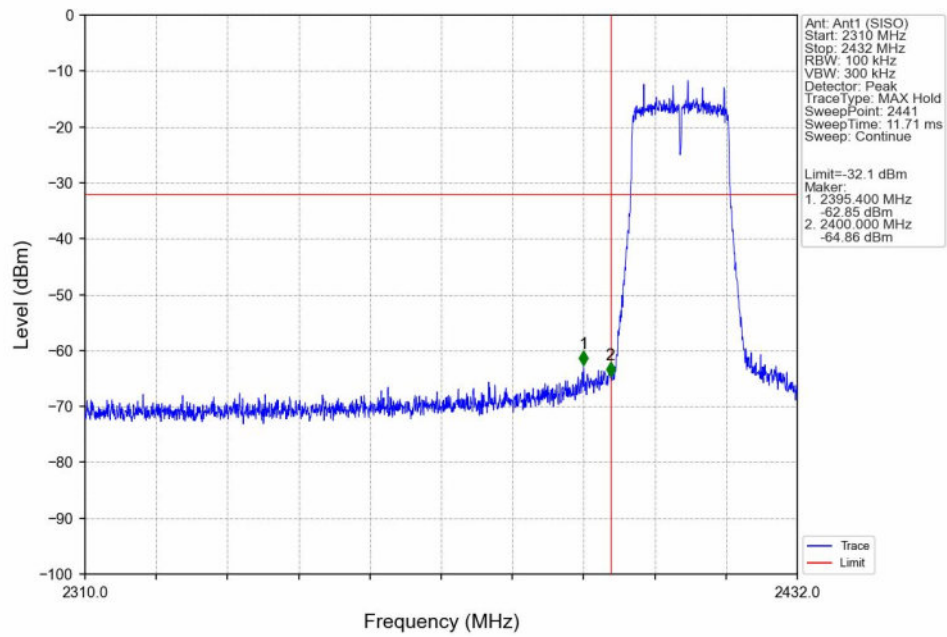
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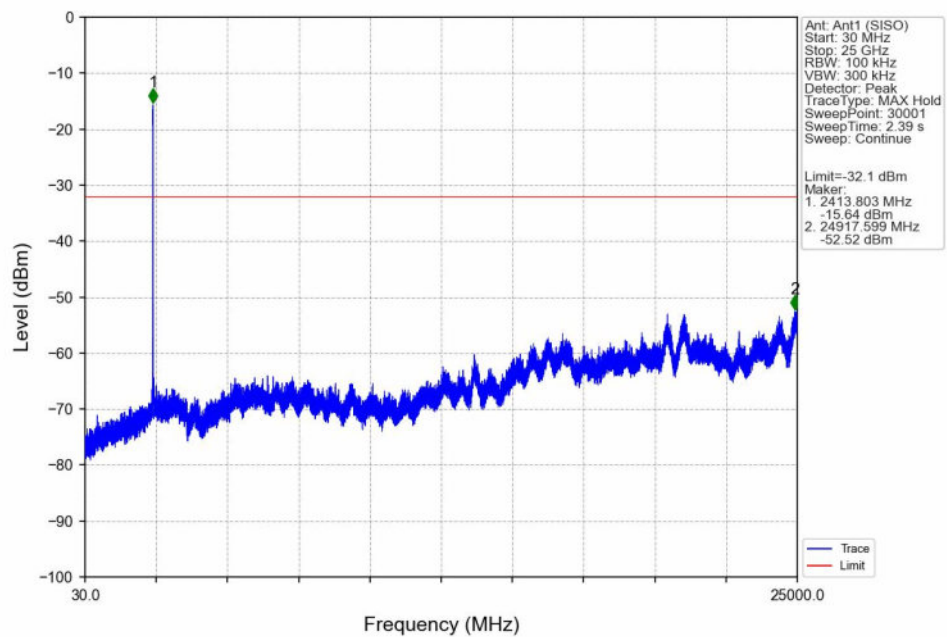
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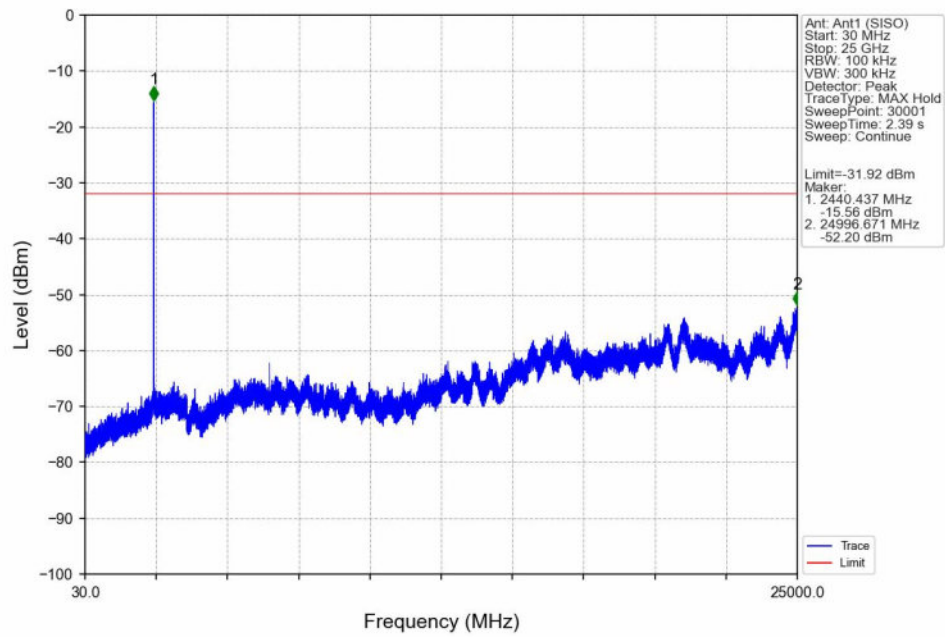
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



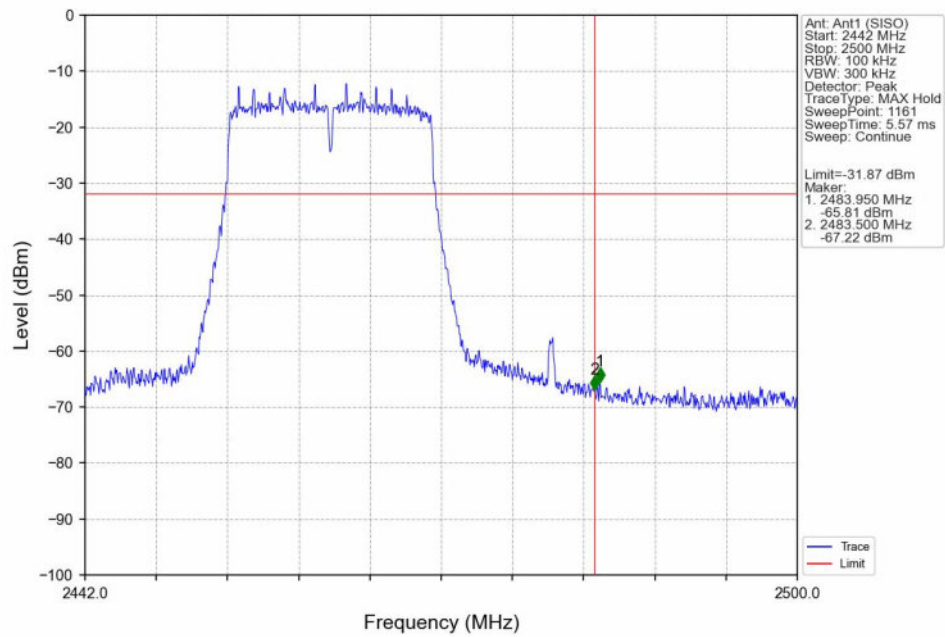
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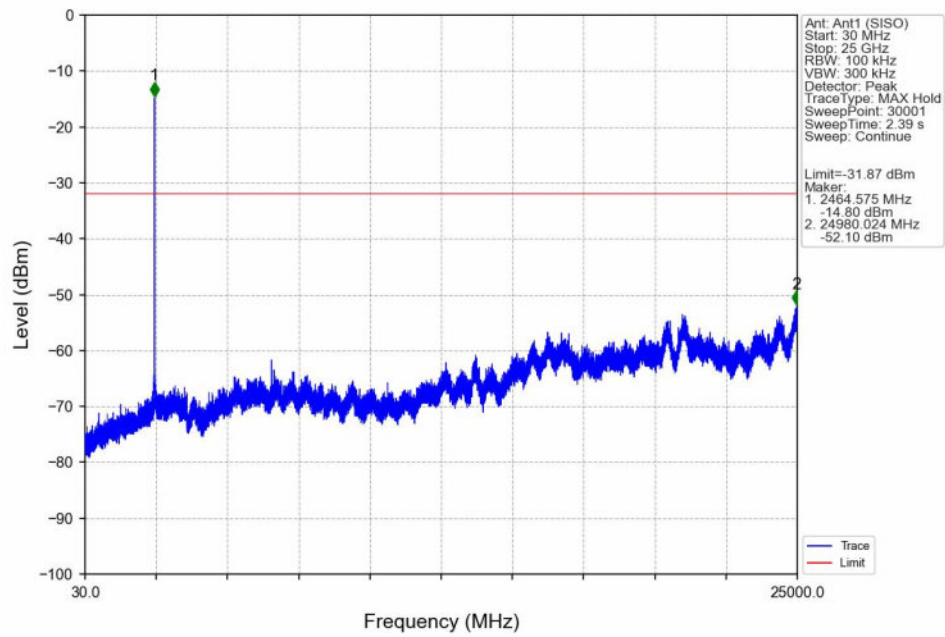
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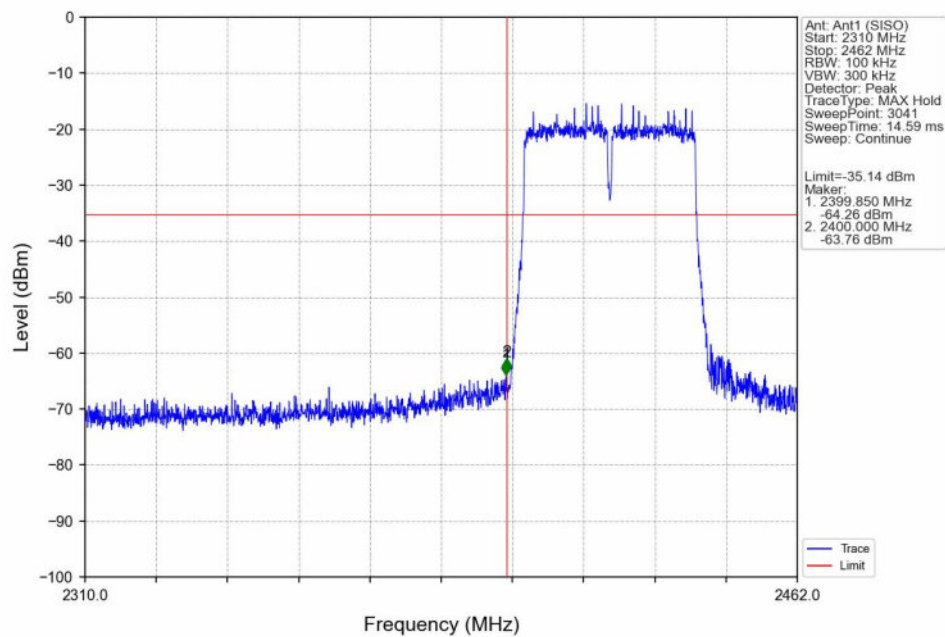
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



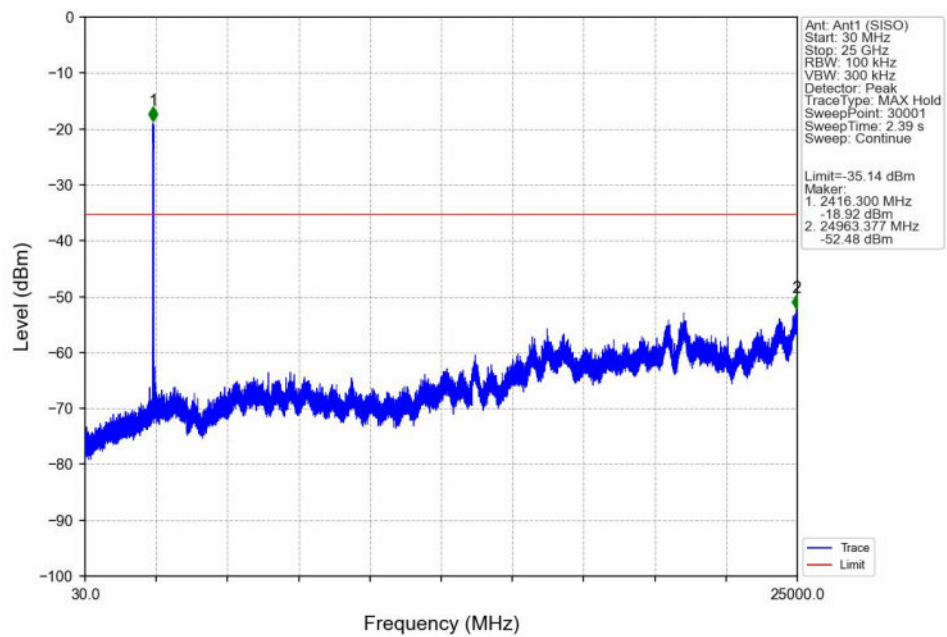
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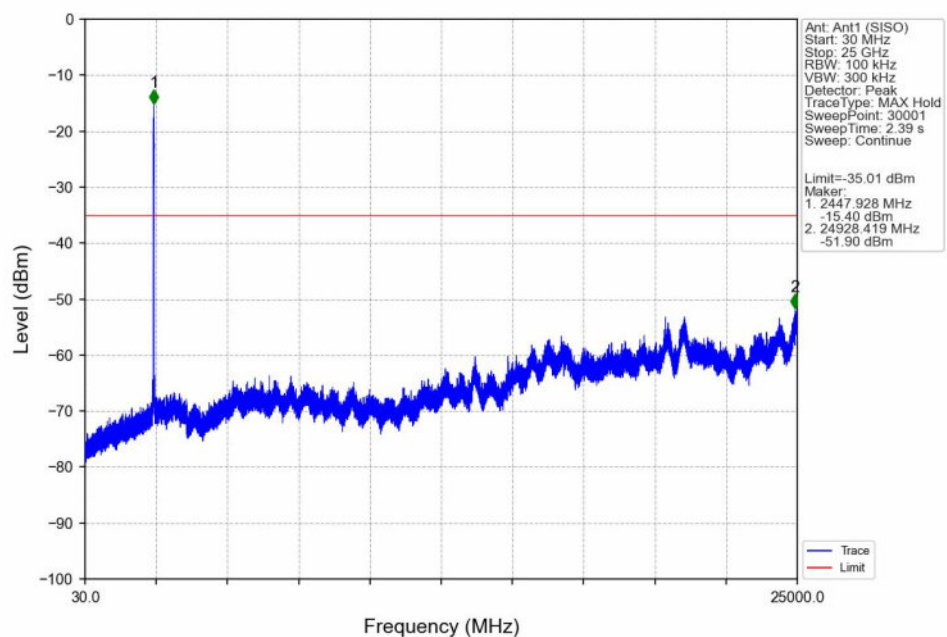
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



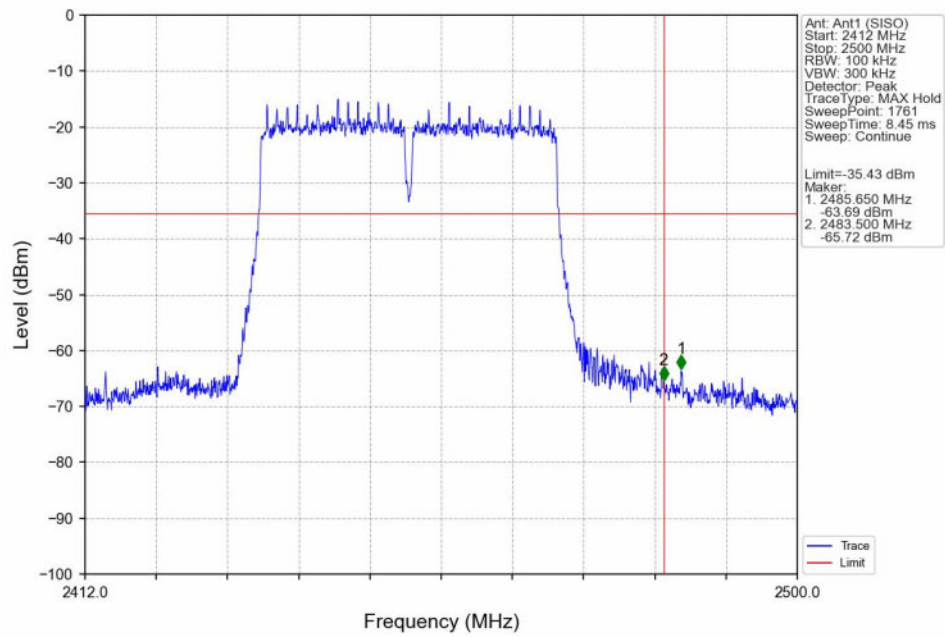
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



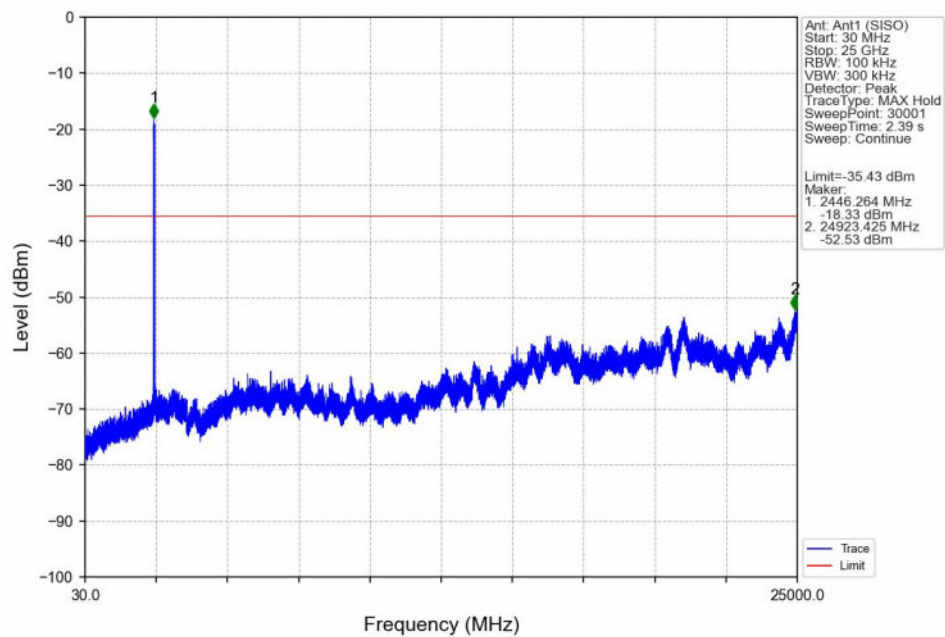
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV





6. Form731

6.1 Test Result

6.1.1 Form731

Lower Freq (MHz)	High Freq (MHz)	MAX Power (W)	MAX Power (dBm)
2412	2462	0.0049	6.94
2422	2452	0.0049	6.90