RF Test Report

Project Number:	**5214055**	**Offer Number:**	**SUW-202408006976**
Report Number:	**5214055EMC03**	**Revision Level:**	**4**

Client: **Alarm.com Incorporated**
Equipment Under Test: **Alarm.com 4MP Indoor/Outdoor Spotlight Battery Camera**
Model Number: **ADC-V731B**
FCC ID: **YL6-143V731B**
IC ID: **9111A-143V731B**

Applicable Standards: **ANSI C63.10: 2020 (FCC Part 15 Subpart C, § 15.247)**
RSS-247, Issue 3
RSS-GEN Issue 5

Report issued on: **30 May 2025**
Report revised on: **17 July 2025**
Test Result: **Compliant**

FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 3212.01
Report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

Prepared by: Dan Alvarez, RF/EMC Sr. Staff Engineer

Reviewed by: Martin Taylor, Project Engineer

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Table of Contents

1 Summary of Test Results

Test Description	Test Specification		Test Result
Bandwidth	15.247(a)(2)	RSS-247 S5.2 (a) RSS-GEN S6.6	Compliant
Peak Output Power	15.247(b)(3)	RSS-247 S5.4 (d)	Compliant
Power Spectral Density	15.247(e)	RSS-247 S5.2 (b)	Compliant
Conducted Spurious Emissions / Band Edge	15.247(d)	RSS-247 S5.5	Compliant
Field Strength of Spurious Radiation	15.247(d), 15.209	RSS-247 S5.5	Compliant
Emissions in Restricted Frequency Bands	15.205, 15.209	RSS-GEN S8.9, S8.10	Compliant
Antenna Requirement	15.203	RSS-GEN S8.3	Compliant
AC Powerline Conducted Emissions	15.107, 15.207	RSS-GEN S8.8	N/A (1)

1) Product is battery powered. Conducted Emissions is not applicable.

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name: Alarm.com Incorporated
Address: 8281 Greensboro Drive, Suite 100
City, State, Zip, Country: Tysons, VA 22102, USA

2.2 *Test Laboratory*

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA
Type of lab: Testing Laboratory
Certificate Number: 3212.01

2.3 *General Information of EUT*

Product Marketing Name (PMN): Alarm.com 4MP Indoor/Outdoor Spotlight Battery Camera
Model Number (HVIN): ADC-V731B
Firmware Version ID (FVIN): v0.0.22-v731b-20240927-dev
Serial Number: 50407410F2F1 (Conducted Sample); 50407410F2B2 (Radiated Sample)

Frequency Range: 2412 – 2462 MHz
Data Modes: **Supported standards and data rate**

		2.4GHz
Standards	PHY	20MHz
802.11b	DSSS/CCK	1Mbps ~ 11Mbps
802.11a	OFDM	x
802.11g	OFDM	6Mbps ~ 54Mbps
802.11n	HT	MCS0 ~ MCS7
802.11ac	VHT	x

**Only supports 20MHz

Antenna:

2.4GHz	Frequency(MHz)	2400	2450	2500
Ant.1	Peak Gain(dBi)	1.7	1.5	1.4
	Efficiency(%)	62	60	59
Ant.2	Peak Gain(dBi)	1.9	2.0	1.7
	Efficiency(%)	62	60	57

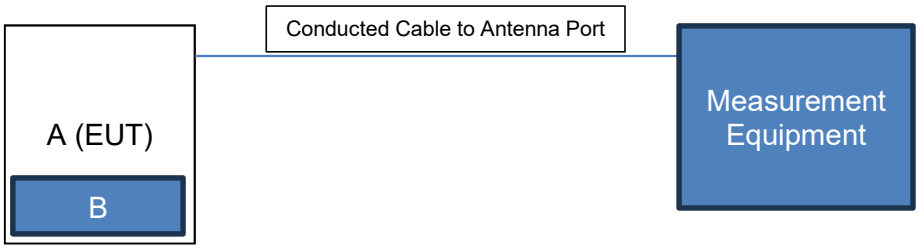
Rated Voltage: Battery (3.6VDC)
Test Voltage: Battery (3.6VDC)

Sample Received Date: 30 October 2024
Dates of testing: 26 November 2024 – 17 July 2025

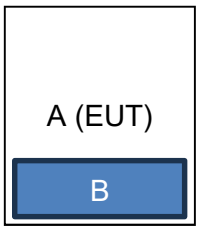
2.4 *Operating Modes and Conditions*

The EUT was programmed by the manufacturer to transmit on low, mid and high channels in all necessary modulation and modes of operation.

2.5 *EUT Connection Block Diagram – Conducted Measurements*



2.6 *EUT Connection Block Diagram – Radiated Measurements*



Inside Chamber

Outside Chamber

2.7 *System Configurations*

Device Reference	Manufacturer	Description	Model Number	Serial Number
A	Alarm.com Incorporated	Alarm.com 4MP Indoor/Outdoor Spotlight Battery Camera (Conducted Sample)	ADC-V731B	50407410F2F1
A	Alarm.com Incorporated	Alarm.com 4MP Indoor/Outdoor Spotlight Battery Camera (Radiated Sample)	ADC-V731B	50407410F2B2
B	Fuji Electronics (Shenzhen) Co., LTD	Battery	833002	FJ8330022401000139

2.8 *Cable List*

Cable reference	Port Name	Start	End	Cable Length (m)	Ferrite installed?	Shielded?
1	None					

3 Bandwidth

3.1 *Test Result*

Test Description	Test Specification		Test Result
6 dB bandwidth	15.247(a)(2)	RSS-247 S5.2 (a) RSS-GEN S6.6	Compliant

3.2 *Test Method*

The procedures from ANSI C63.10: 2020 clause 11.8 and KBD 558074 D01 15.247 Meas Guidance v05r02 were used to determine the 6 dB bandwidth.

3.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	24.10 °C
Relative Humidity:	19.9 %
Atmospheric Pressure:	98.58 kPa

3.4 *Test Equipment*

Test End Date: 3-Dec-2024 Tester: SGM

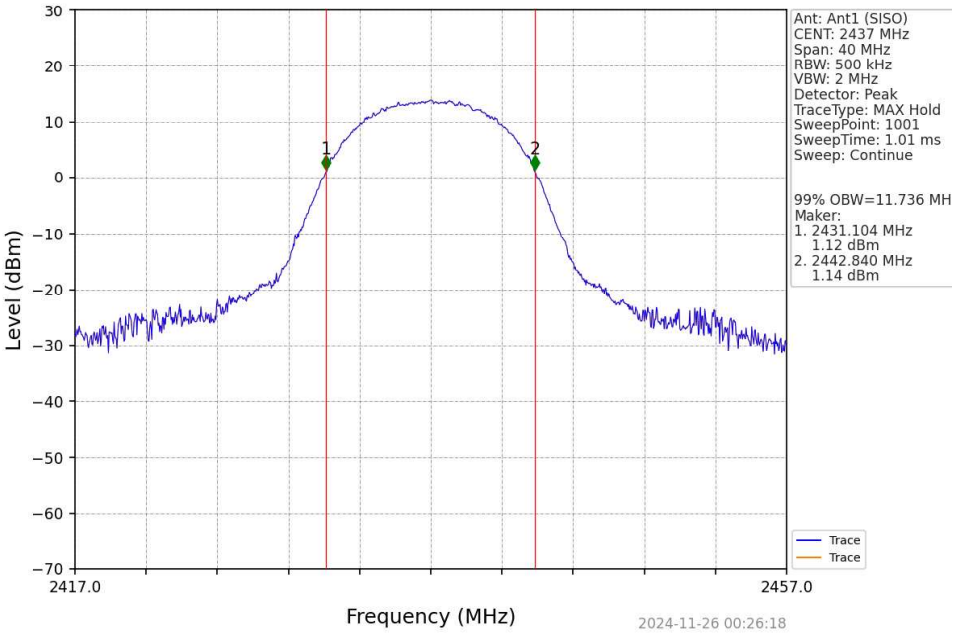
Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20108	20-Mar-2024	20-Mar-2025
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20109	20-Mar-2024	20-Mar-2025
SIGNAL ANALYZER (TS8997)	ROHDE & SCHWARZ	FSV30	B085749	3-Jan-2024	3-Jan-2025
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	8-Apr-2024	8-Apr-2025

3.5 *Test Data - 99%OBW*

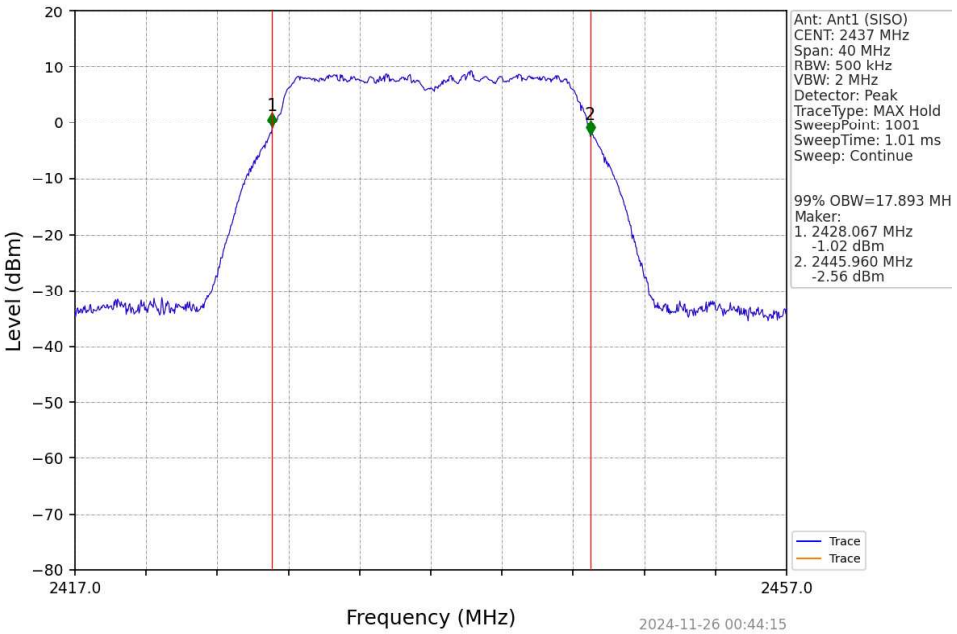
Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)
				Result
802.11b	SISO	2412	1	11.496
		2437	1	11.736
		2462	1	11.531
802.11g	SISO	2412	1	17.888
		2437	1	17.893
		2462	1	17.972
802.11n (HT20)	SISO	2412	1	18.464
		2437	1	18.421
		2462	1	18.485

3.5.1 Example Plots

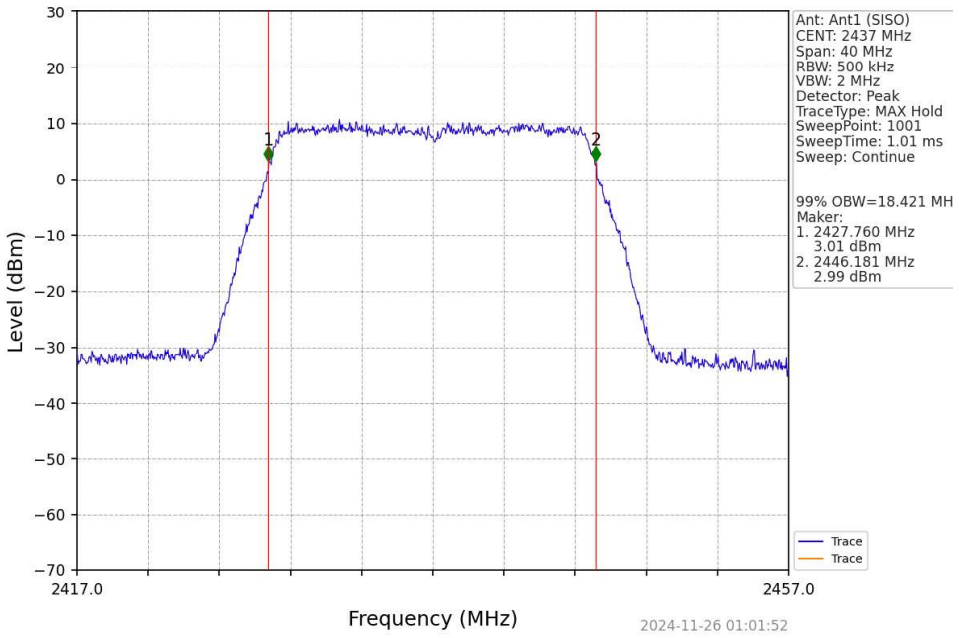
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV

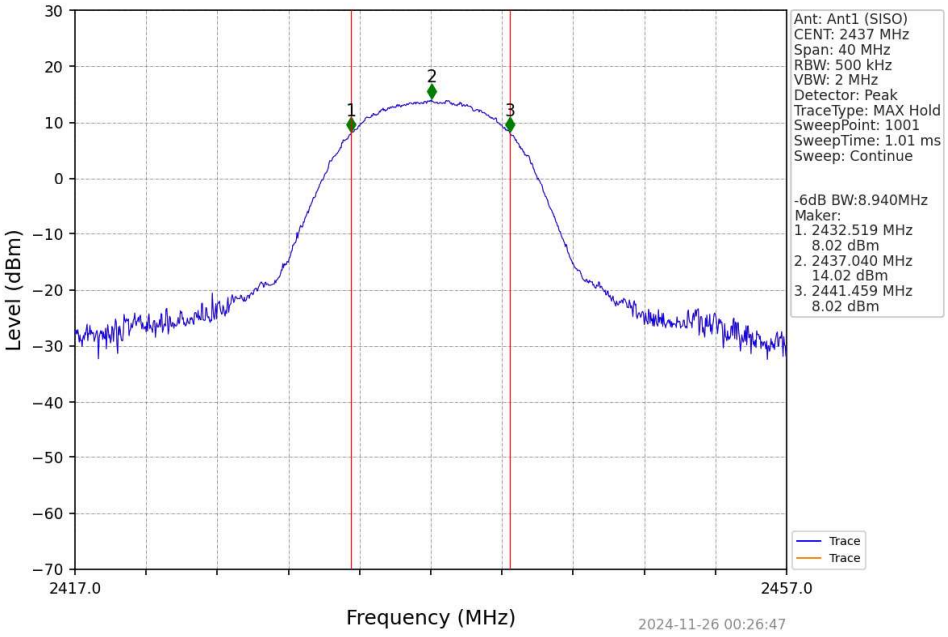


3.5.2 Test Data - 6dB down

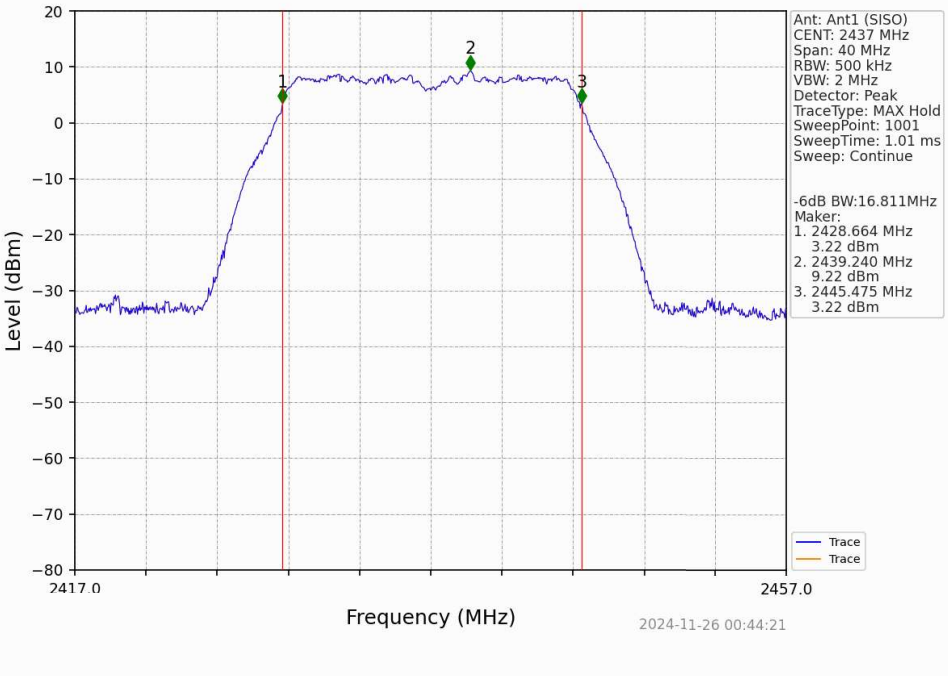
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)
				Result
802.11b	SISO	2412	1	8.874
		2437	1	8.940
		2462	1	8.838
802.11g	SISO	2412	1	16.786
		2437	1	16.811
		2462	1	16.800
802.11n (HT20)	SISO	2412	1	18.034
		2437	1	17.960
		2462	1	17.965

3.5.3 Example Plots

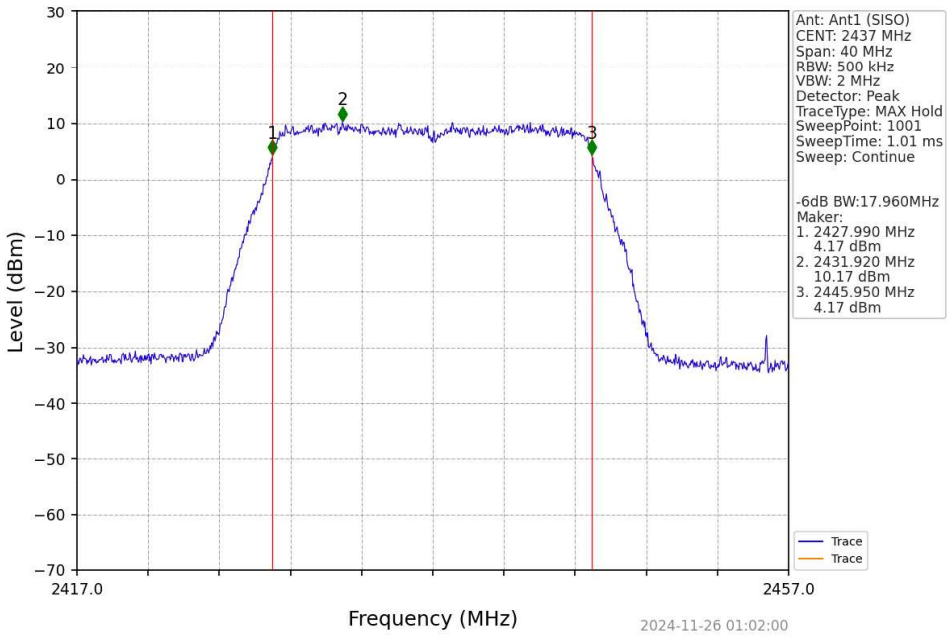
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



4 Peak Output Power

4.1 *Test Result*

Test Description	Test Specification		Test Result
Peak Output Power	15.247(b)(3)	RSS-247 S5.4 (d)	Compliant

4.2 *Test Method*

Fundamental peak power measurements were recorded using the procedures from ANSI C63.10: 2020 clause 11.9 and KDB 558074 D01 15.247 Meas Guidance v05r02.

Limit

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. For using antennas with greater than 6dBi of gain, the limit is reduced in dB by the amount the gain exceeds 6dBi (e.g. for a 7.4dBi antenna, the limit is reduced from 30dBm to 28.6dBm)

4.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	23.06 °C
Relative Humidity:	53.9 %
Atmospheric Pressure:	98.26 kPa

4.4 *Test Equipment*

Test End Date: 2-May-2025 Tester: SGM

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20108	3-Apr-2025	3-Apr-2026
SIGNAL ANALYZER (TS8997)	ROHDE & SCHWARZ	FSV30	B085749	4-Mar-2025	4-Mar-2026
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	4-Apr-2025	4-Apr-2026

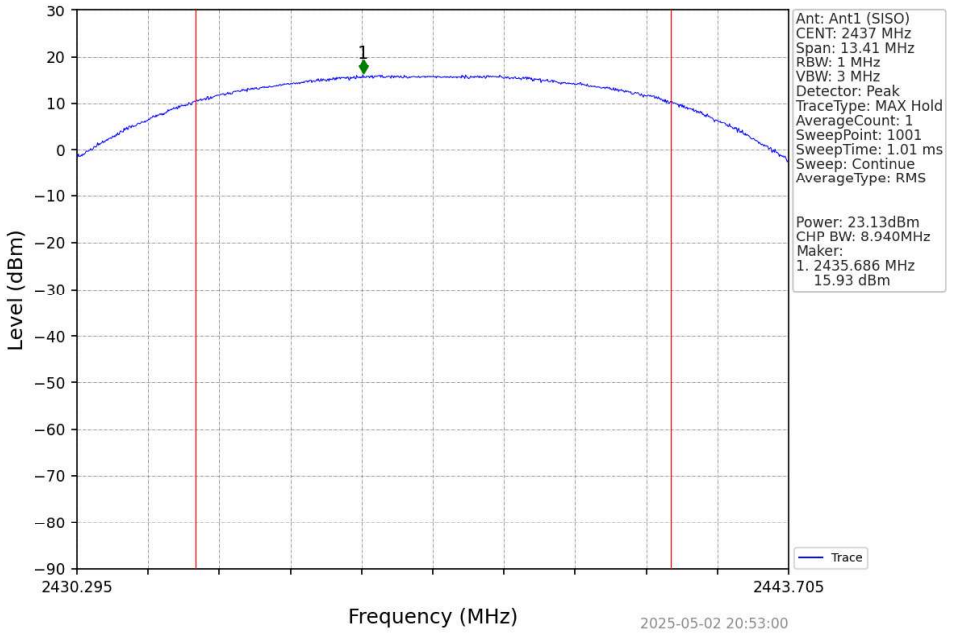
4.5 *Test Data*

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)			Verdict
			ANT1	ANT2	Limit	
802.11b	SISO	2412	18.93	19.76	<=30	Pass
		2437	23.13	24.22	<=30	Pass
		2462	19.07	19.82	<=30	Pass
802.11g	SISO	2412	19.51	20.38	<=30	Pass
		2437	22.87	23.46	<=30	Pass
		2462	20.35	21.16	<=30	Pass
802.11n (HT20)	SISO	2412	18.77	19.77	<=30	Pass
		2437	23.42	24.04	<=30	Pass
		2462	19.08	19.86	<=30	Pass
Note1: Antenna Gain: Ant1: 1.70dBi; Ant2: 2.00dBi;						

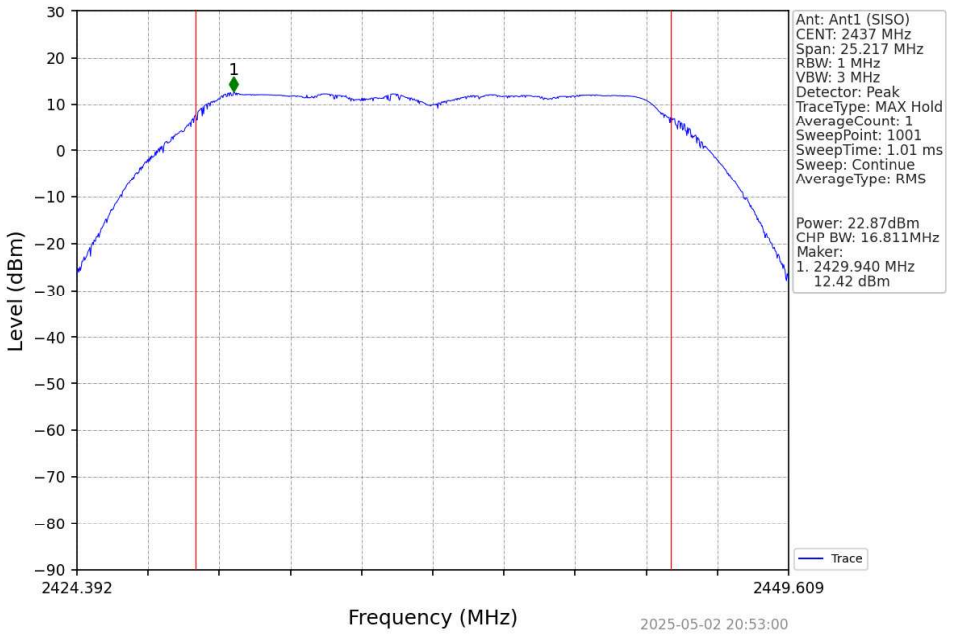
Mode	TX Type	Frequency (MHz)	E.I.R.P (dBm)			Verdict
			ANT1	ANT2	Limit	
802.11b	SISO	2412	20.69	21.76	<=36.02	Pass
		2437	24.81	26.18	<=36.02	Pass
		2462	20.68	21.76	<=36.02	Pass
802.11g	SISO	2412	21.62	22.78	<=36.02	Pass
		2437	24.55	25.42	<=36.02	Pass
		2462	22.75	23.49	<=36.02	Pass
802.11n (HT20)	SISO	2412	21.07	21.98	<=36.02	Pass
		2437	25.10	26.00	<=36.02	Pass
		2462	20.80	22.09	<=36.02	Pass
Note1: Antenna Gain: Ant1: 1.70dBi; Ant2: 2.00dBi; Note2: E.I.R.P = Measured Power + Antenna Gain						

4.5.1 Example Plots

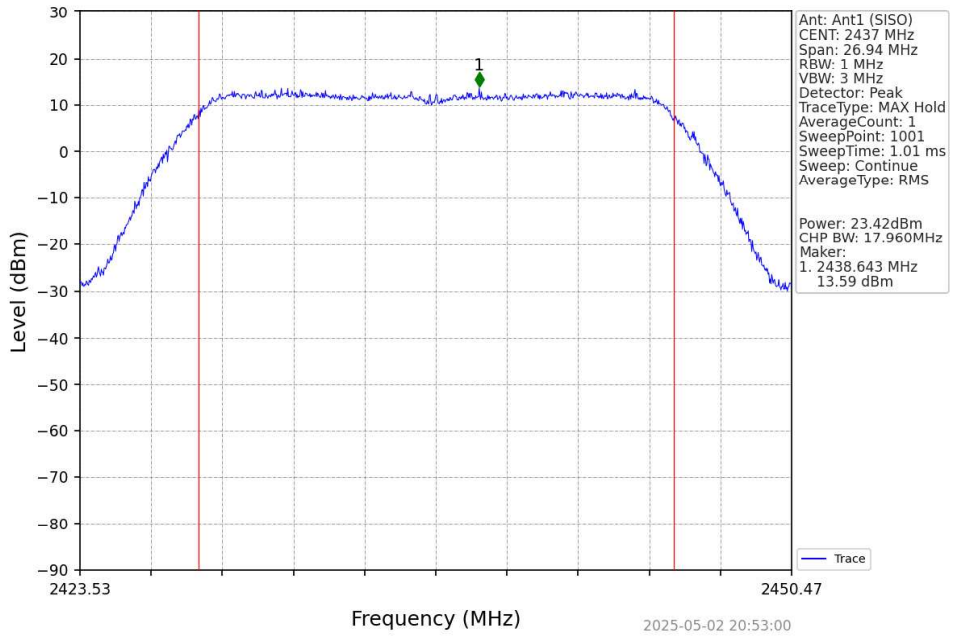
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



5 Power Spectral Density

5.1 *Test Result*

Test Description	Test Specification		Test Result
Power Spectral Density	15.247(e)	RSS-247 S5.2 (b)	Compliant

5.2 *Test Method*

Power spectral density measurements were recorded using the procedures from ANSI C63.10: 2020 clause 11.10 and KDB 558074 D01 15.247 Meas Guidance v05r02.

Limit
The limit is 8 dBm.

5.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	23.06 °C
Relative Humidity:	53.9 %
Atmospheric Pressure:	98.26 kPa

5.4 *Test Equipment*

Test End Date: 2-May-2025 Tester: SGM

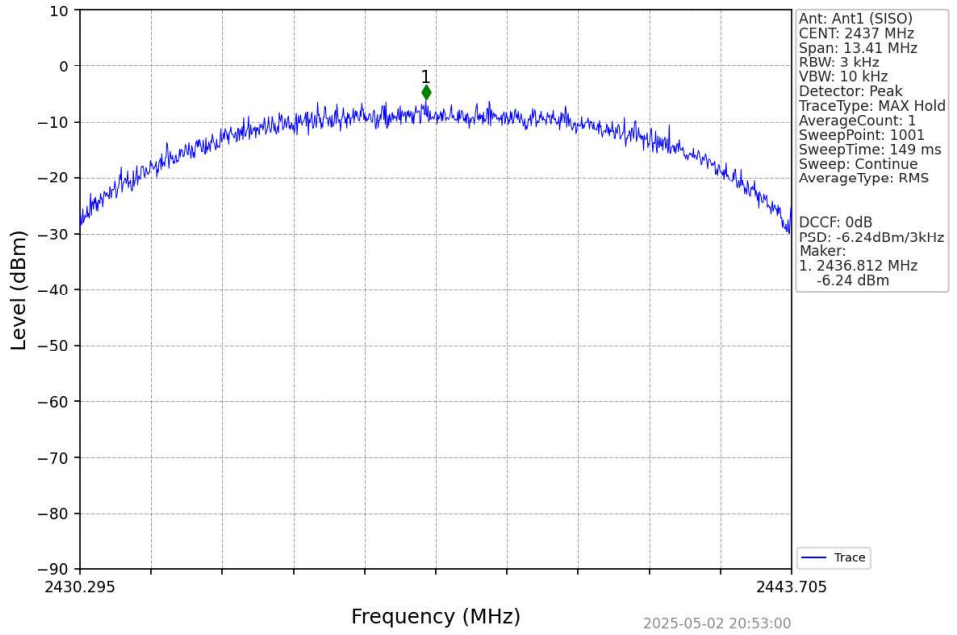
Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20108	3-Apr-2025	3-Apr-2026
SIGNAL ANALYZER (TS8997)	ROHDE & SCHWARZ	FSV30	B085749	4-Mar-2025	4-Mar-2026
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	4-Apr-2025	4-Apr-2026

5.5 *Test Data*

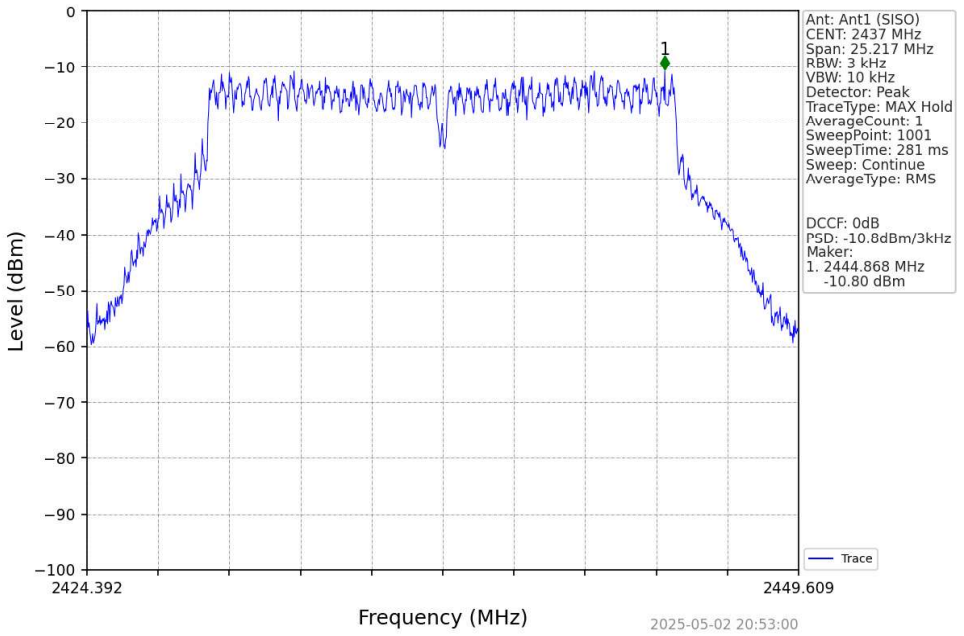
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)			Verdict
			ANT1	ANT2	Limit	
802.11b	SISO	2412	-9.86	-8.98	<=8	Pass
		2437	-6.24	-4.72	<=8	Pass
		2462	-10.00	-9.21	<=8	Pass
802.11g	SISO	2412	-13.99	-13.18	<=8	Pass
		2437	-10.80	-10.02	<=8	Pass
		2462	-13.29	-12.54	<=8	Pass
802.11n (HT20)	SISO	2412	-15.65	-14.32	<=8	Pass
		2437	-10.51	-9.74	<=8	Pass
		2462	-14.99	-12.84	<=8	Pass
Note1: Antenna Gain: Ant1: 1.70dBi; Ant2: 2.00dBi;						

5.5.1 Example Plots

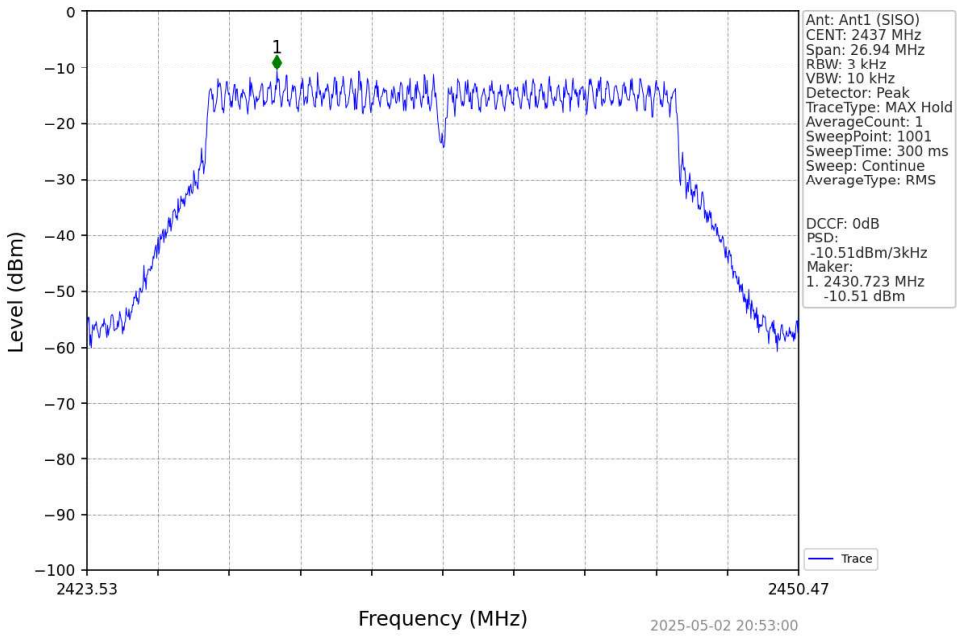
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



6 Conducted Spurious Emissions / Band Edge

6.1 *Test Result*

Test Description	Test Specification		Test Result
Conducted Spurious Emissions	15.247(d)	RSS-247 S5.5	Compliant

6.2 *Test Method*

Spurious emissions in non-restricted frequency bands were recorded using the methods defined in ANSI C63.10 clause 11.11 and KDB 558074 D01 15.247 Meas Guidance v05r02.

Lowest, middle, and highest channels were investigated.

Because the maximum conducted peak output power was used to determine compliance with the output power limits, the limit in any 100 kHz band outside of the authorized band is 20 dB below the maximum in-band peak level.

6.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	23.06 °C
Relative Humidity:	53.9 %
Atmospheric Pressure:	98.26 kPa

6.4 *Test Equipment*

Test End Date: 2-May-2025 Tester: SGM

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	TELEDYNE STORM MICROWAVE	084-0505-059	20108	3-Apr-2025	3-Apr-2026
SIGNAL ANALYZER (TS8997)	ROHDE & SCHWARZ	FSV30	B085749	4-Mar-2025	4-Mar-2026
TSTPASS SWITCHBOX	TSTPASS	SB2	23009	4-Apr-2025	4-Apr-2026

6.5 *Test Data – DTS Band Edge*

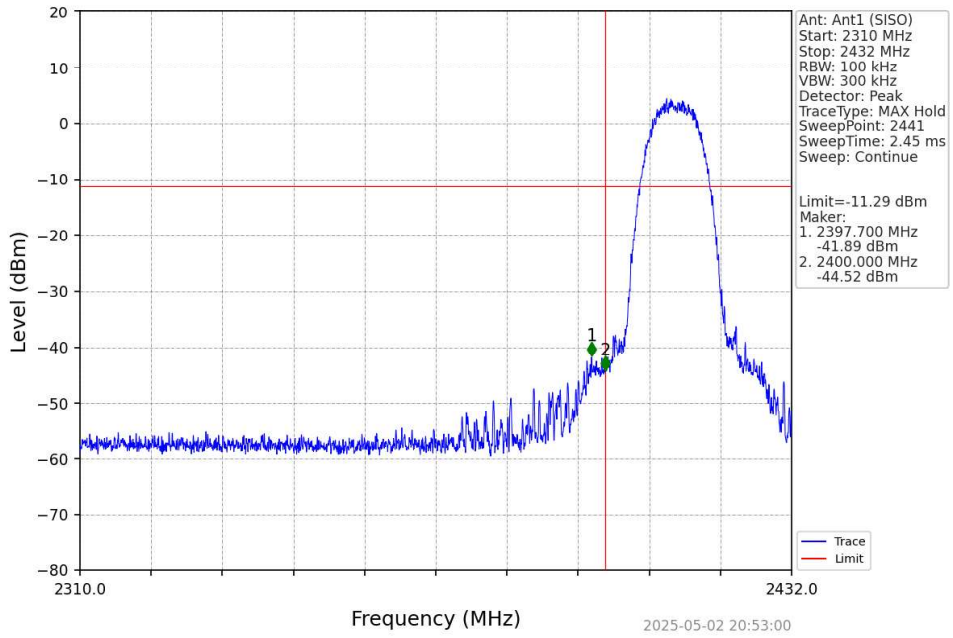
Reference:

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	1	4.62
			2	5.41
		2437	1	8.71
			2	10.64
		2462	1	4.29
			2	5.60
802.11g	SISO	2412	1	0.46
			2	1.50
		2437	1	4.09
			2	4.32
		2462	1	1.19
			2	1.88
802.11n (HT20)	SISO	2412	1	-1.02
			2	0.04
		2437	1	3.36
			2	4.43
		2462	1	-0.57
			2	-0.09
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.				

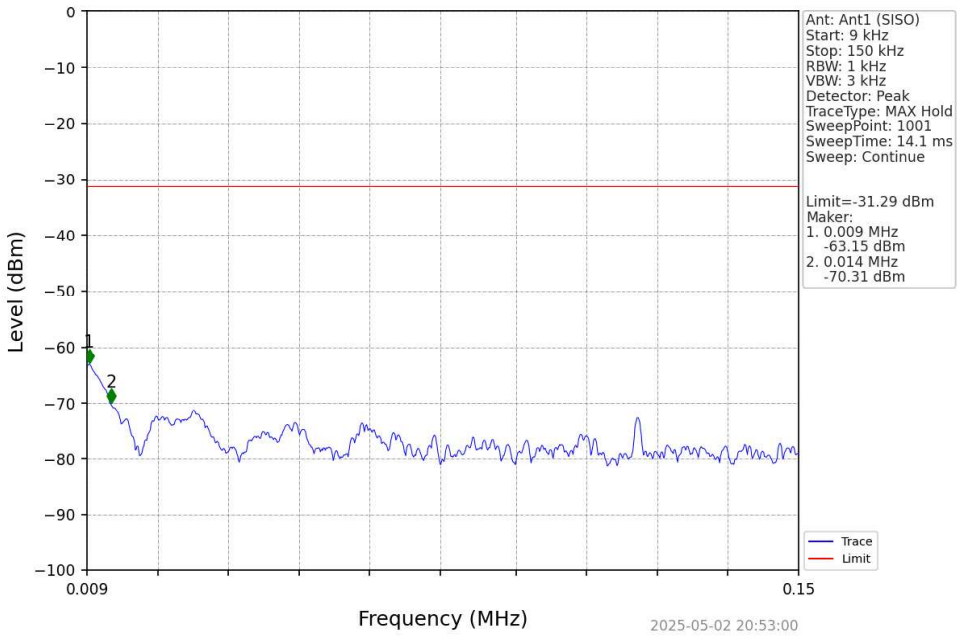
CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	8.71	-11.29	Pass
			2	10.64	-9.36	Pass
		2437	1	8.71	-11.29	Pass
			2	10.64	-9.36	Pass
		2462	1	8.71	-11.29	Pass
			2	10.64	-9.36	Pass
802.11g	SISO	2412	1	4.09	-15.91	Pass
			2	4.32	-15.68	Pass
		2437	1	4.09	-15.91	Pass
			2	4.32	-15.68	Pass
		2462	1	4.09	-15.91	Pass
			2	4.32	-15.68	Pass
802.11n (HT20)	SISO	2412	1	3.36	-16.64	Pass
			2	4.43	-15.57	Pass
		2437	1	3.36	-16.64	Pass
			2	4.43	-15.57	Pass
		2462	1	3.36	-16.64	Pass
			2	4.43	-15.57	Pass
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.						

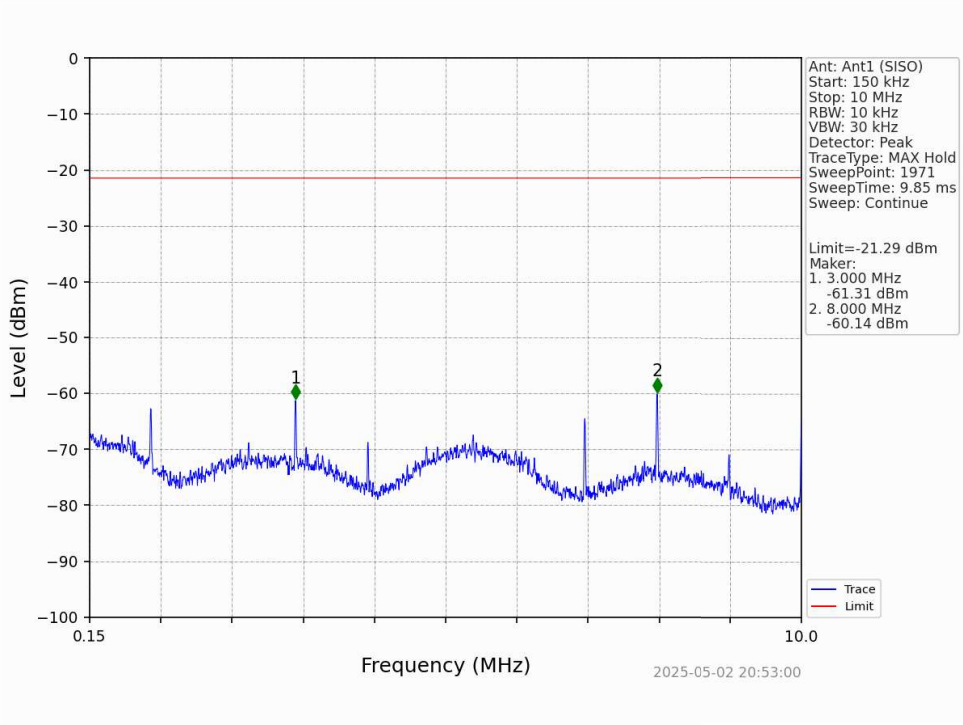
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



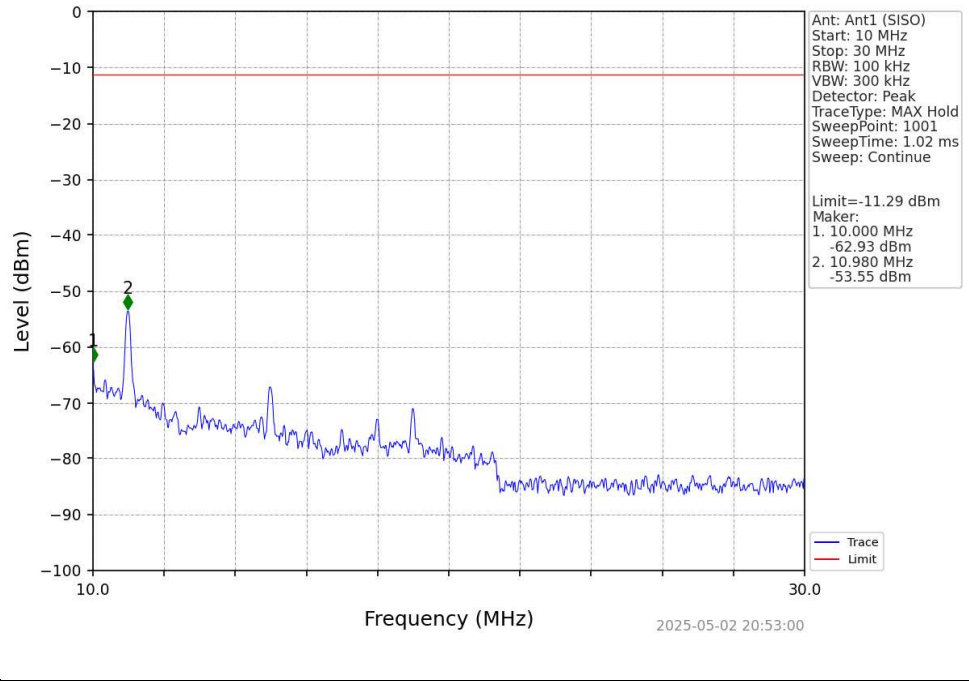
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



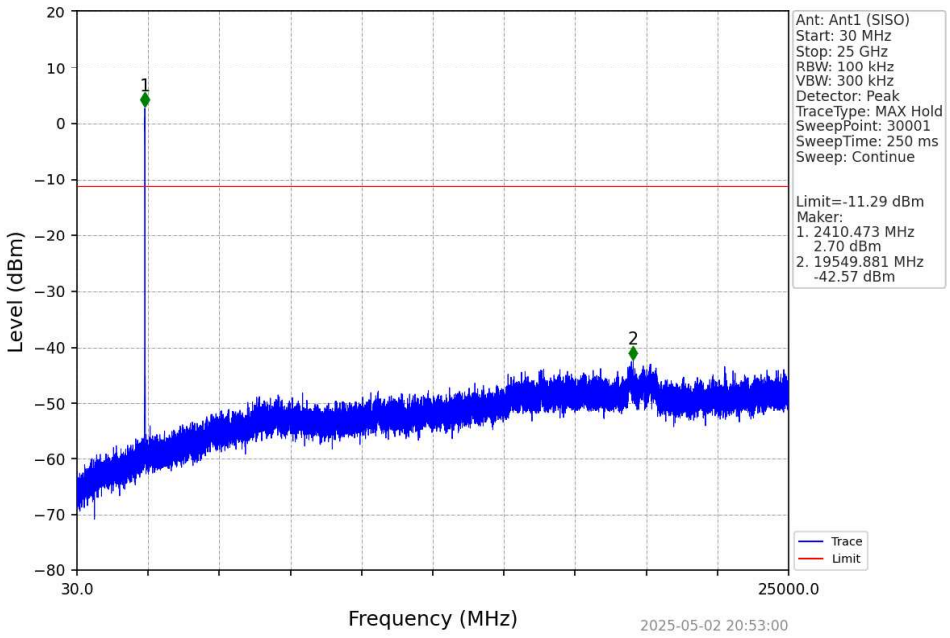
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



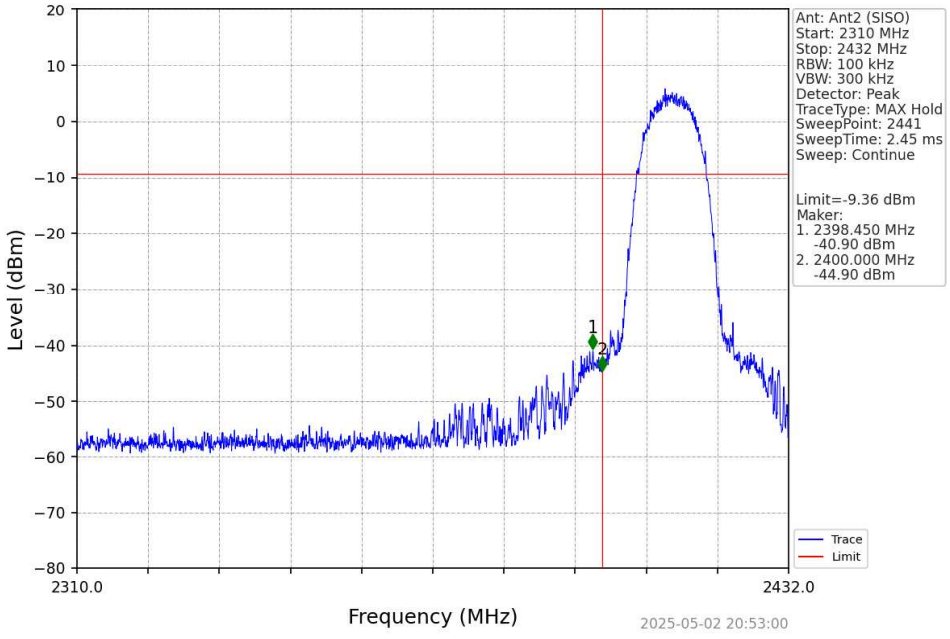
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



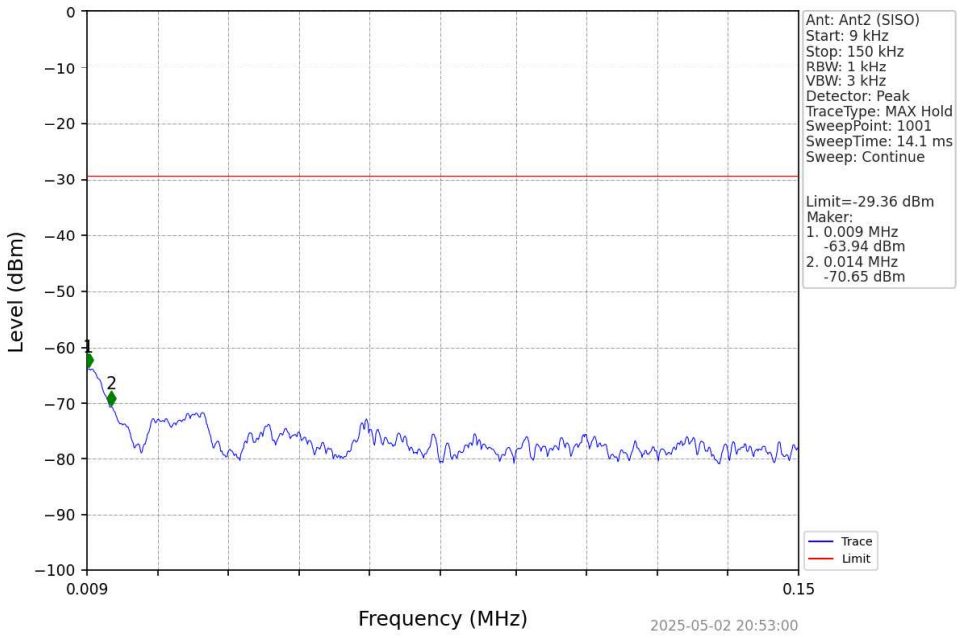
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



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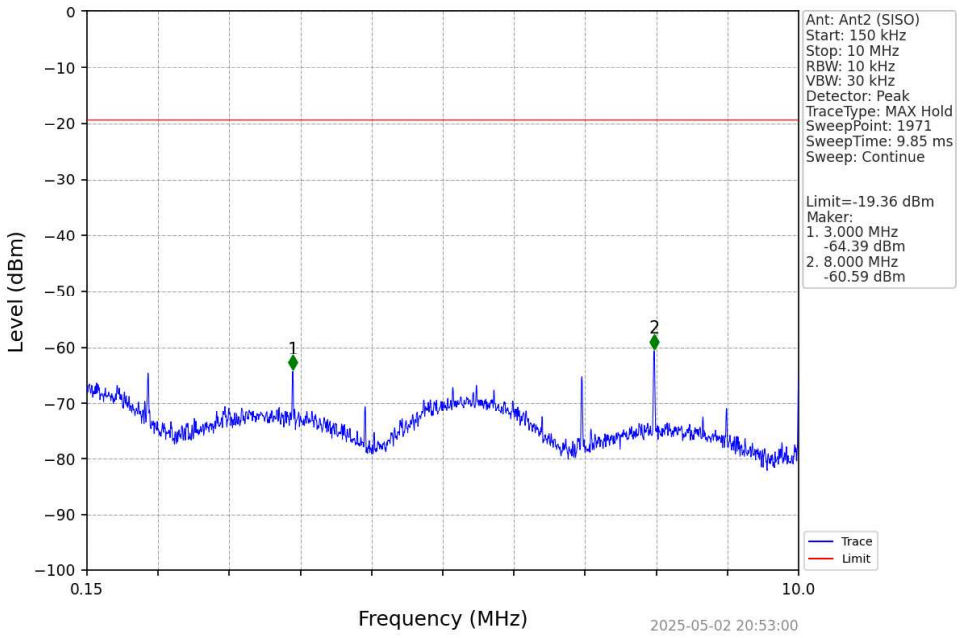

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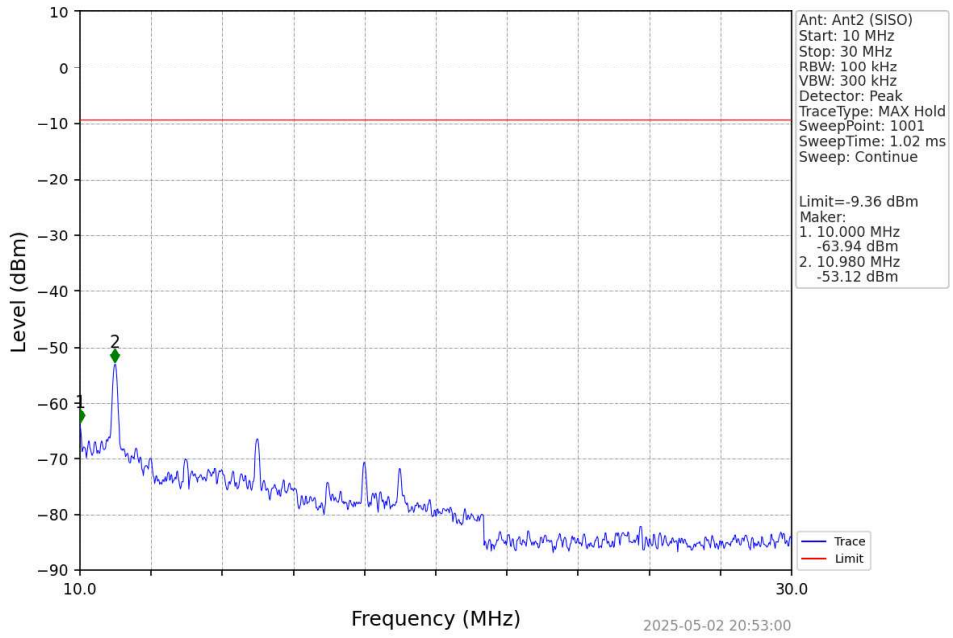

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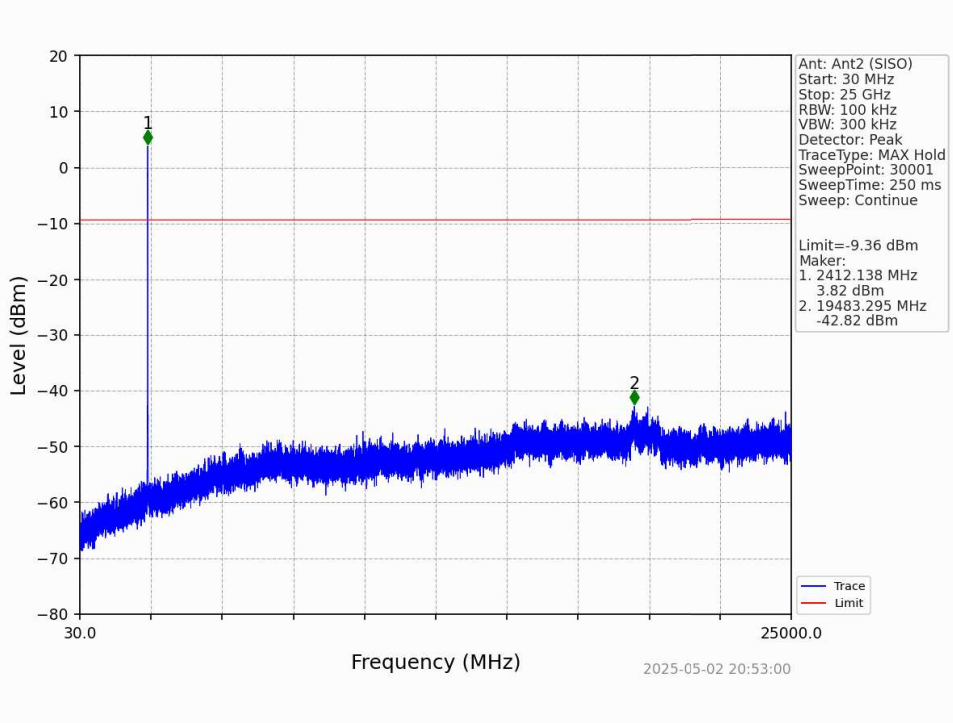
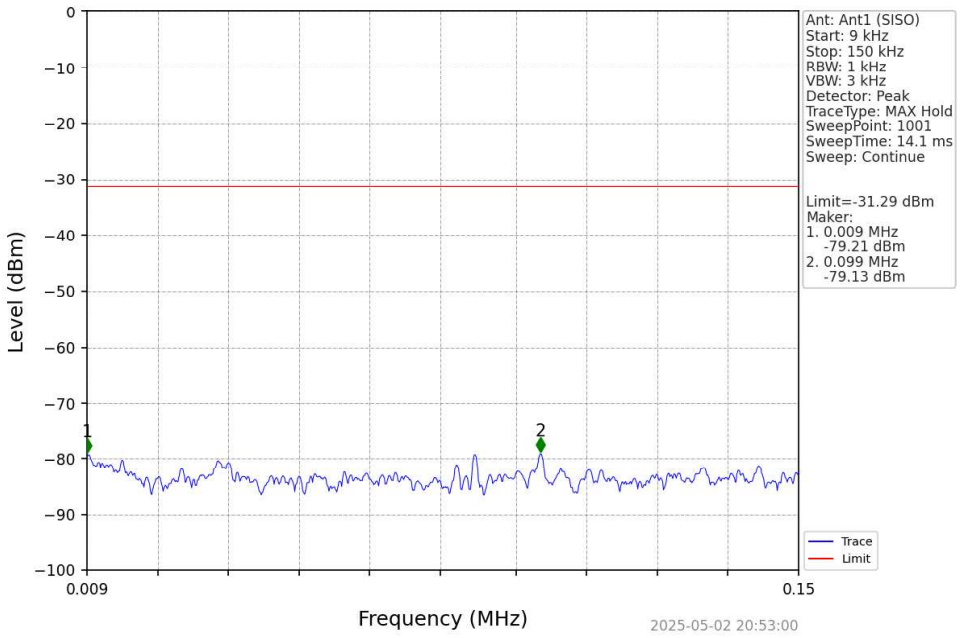


802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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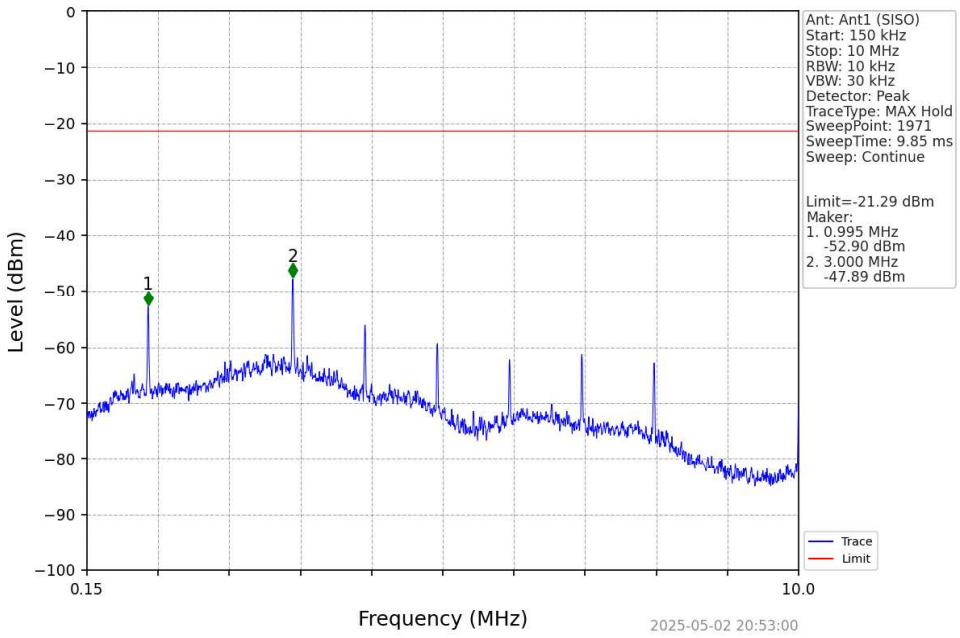

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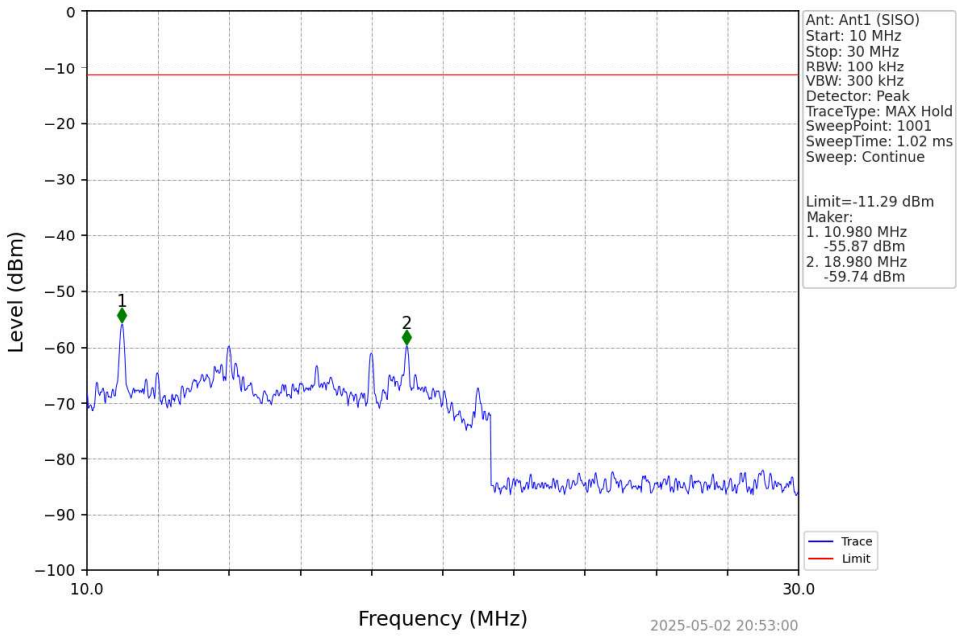

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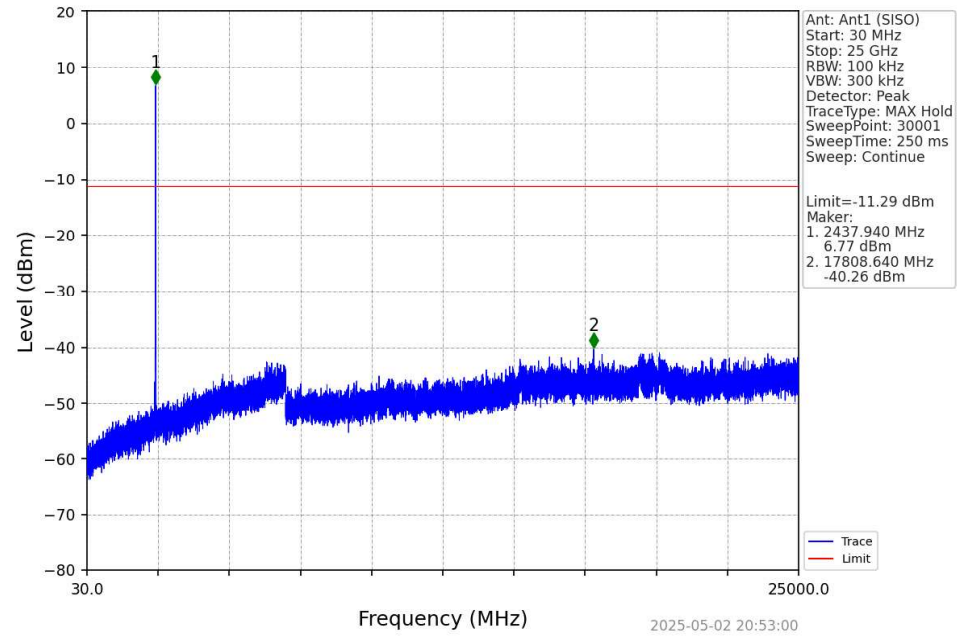

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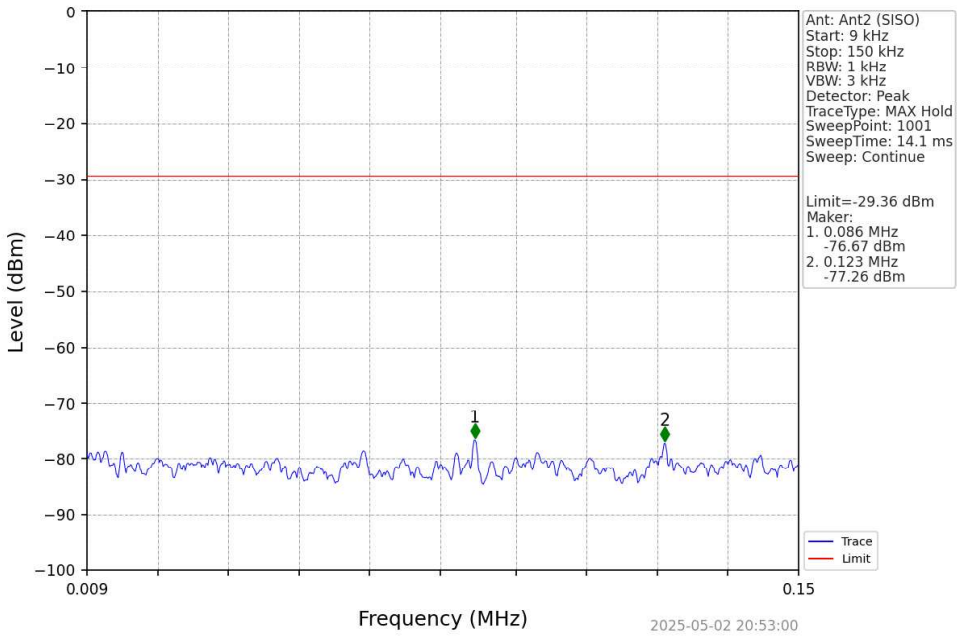
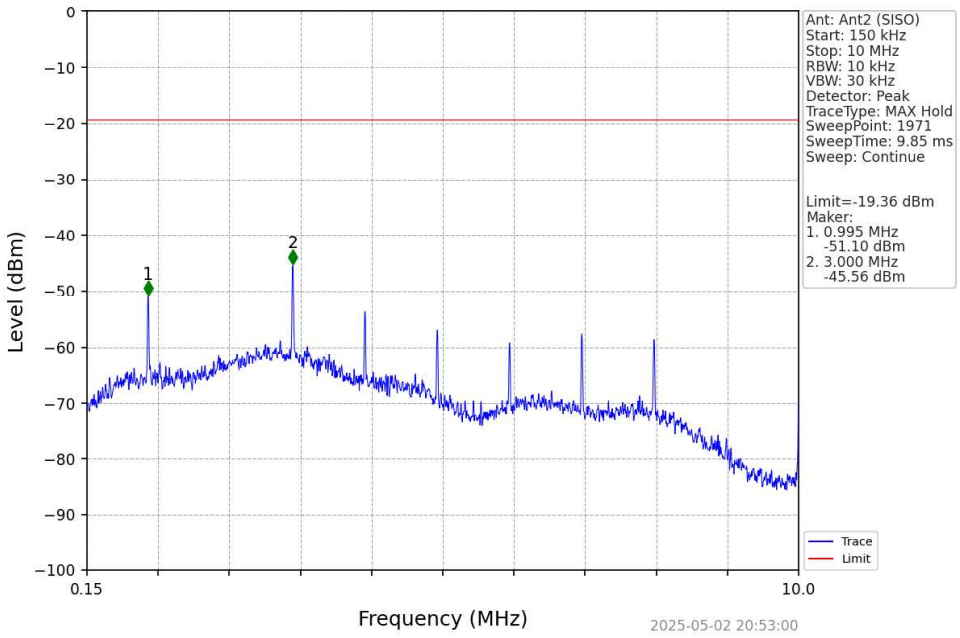
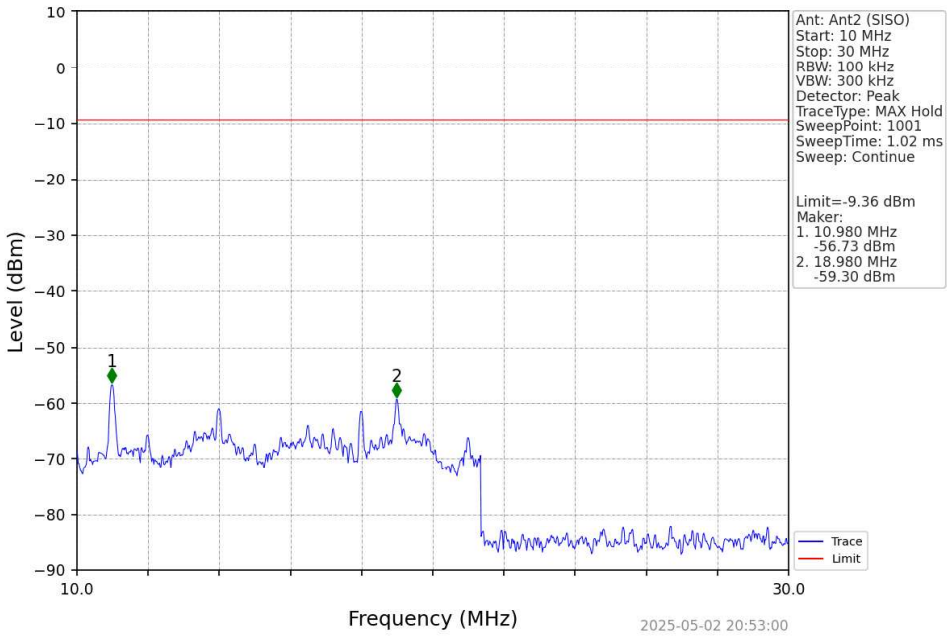


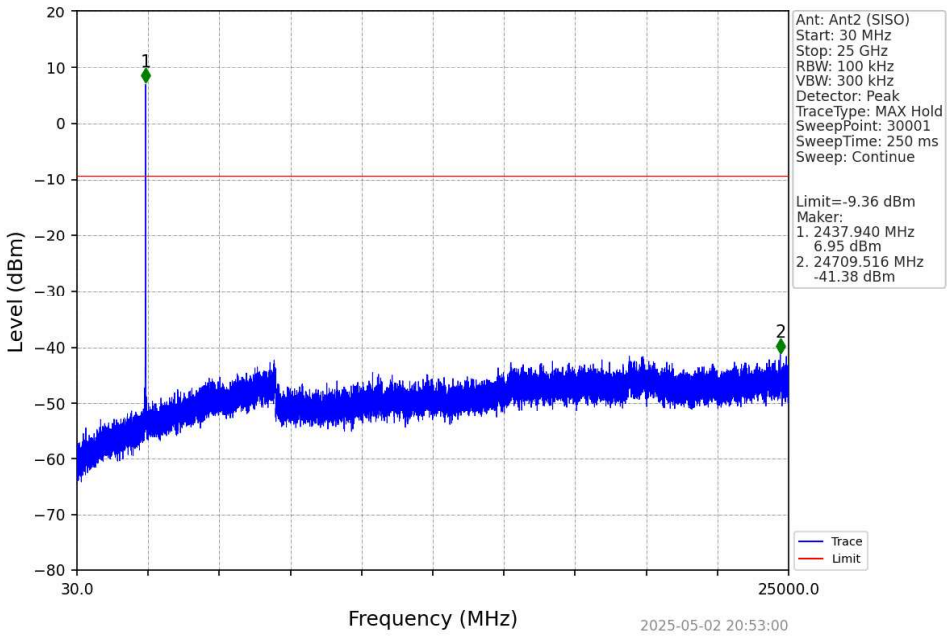
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



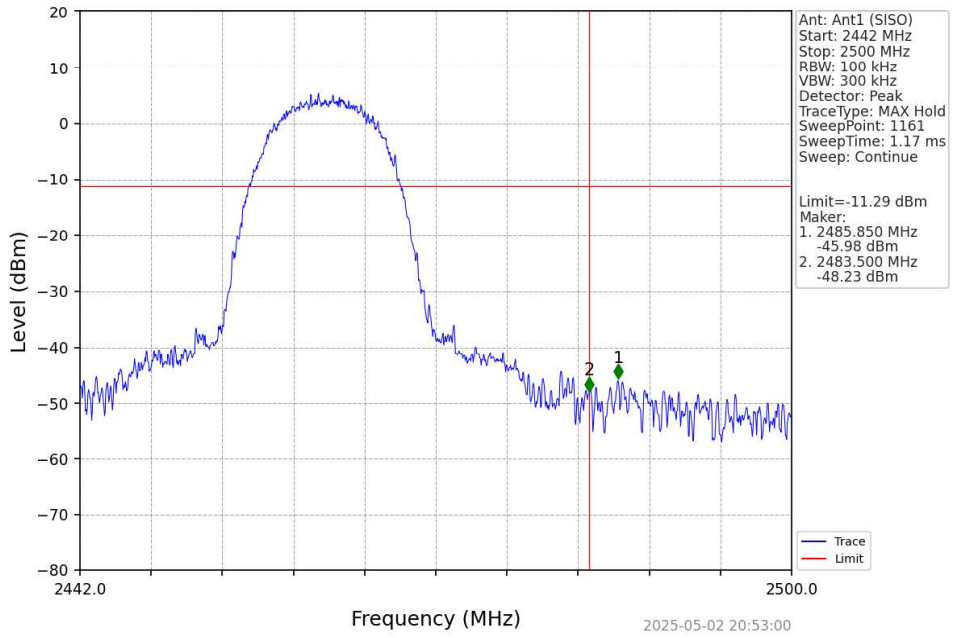
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



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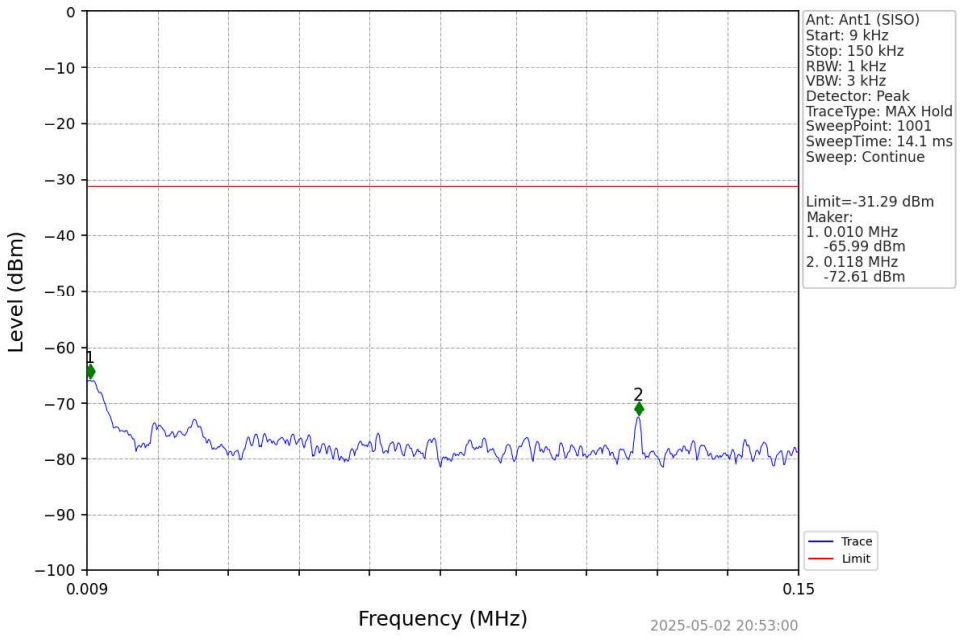

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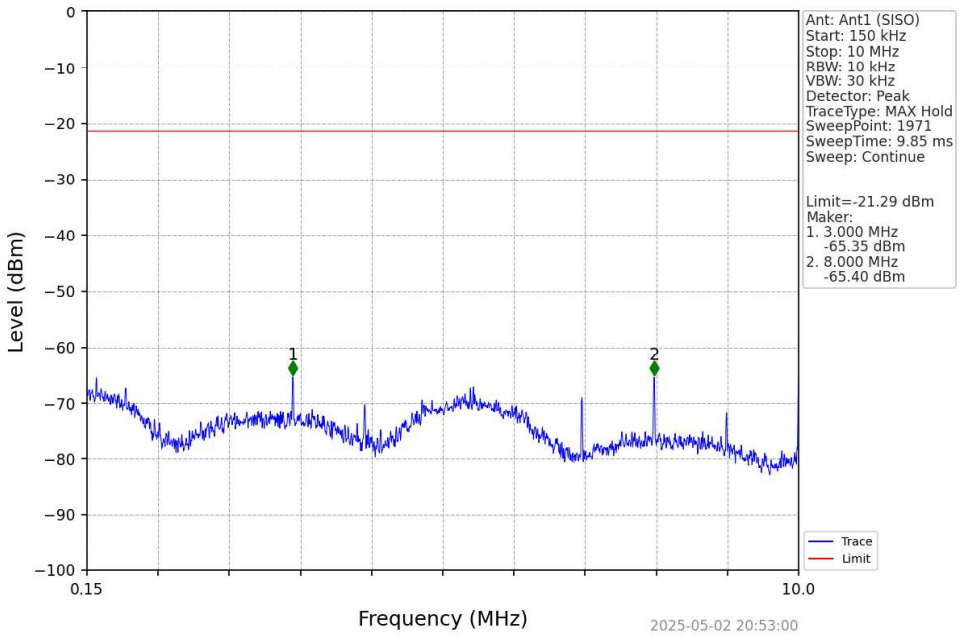

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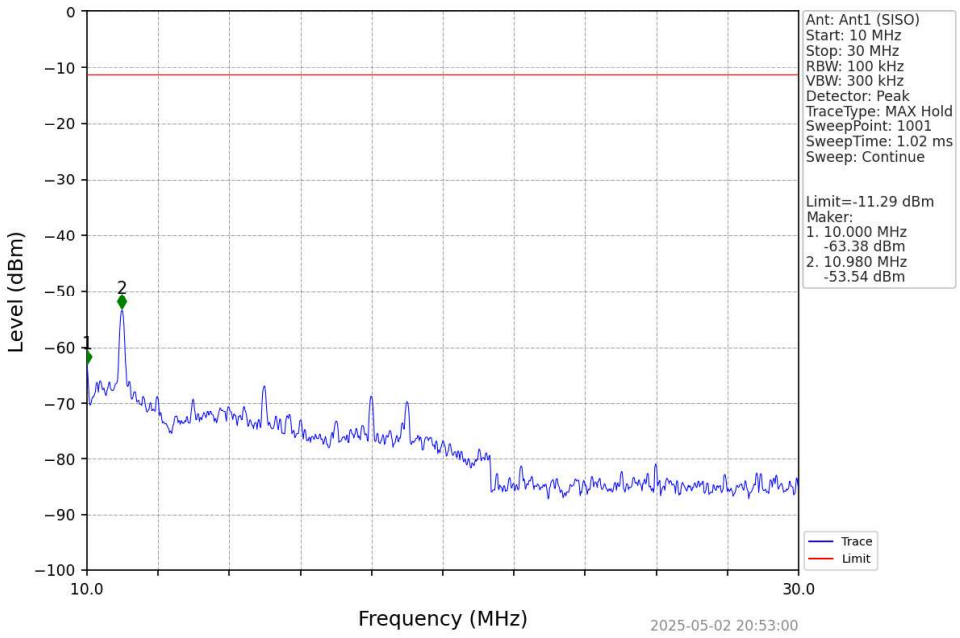
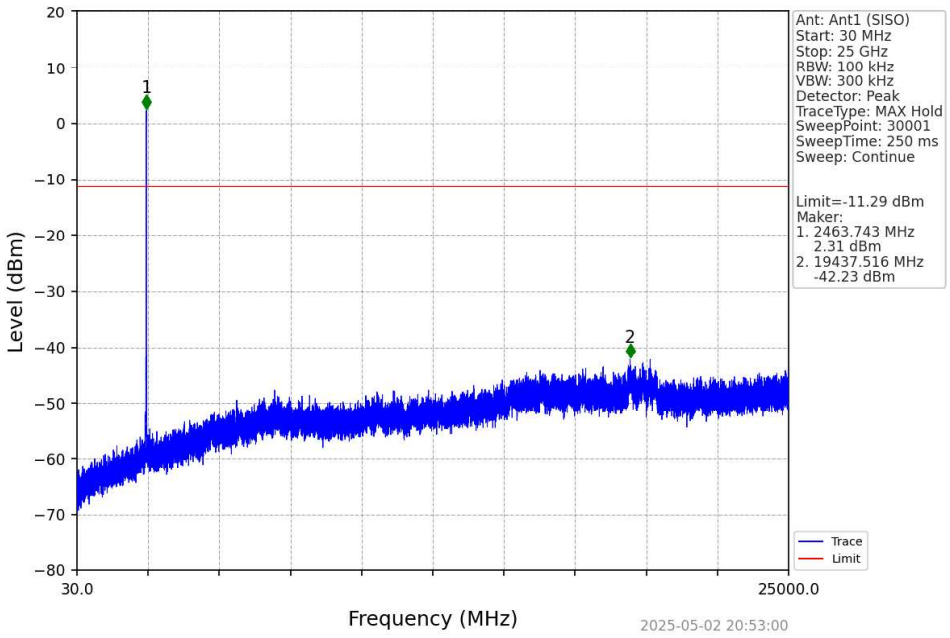
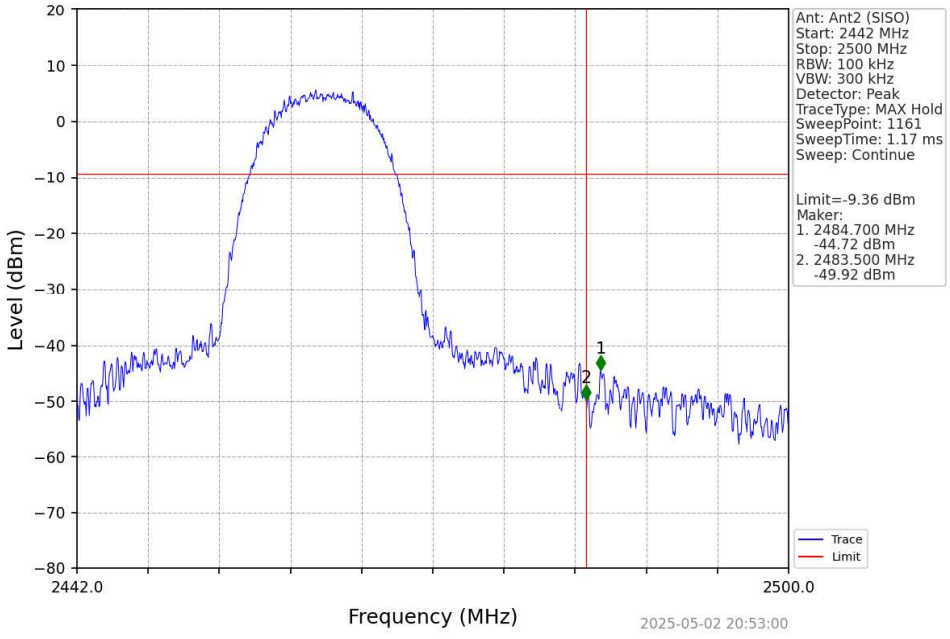


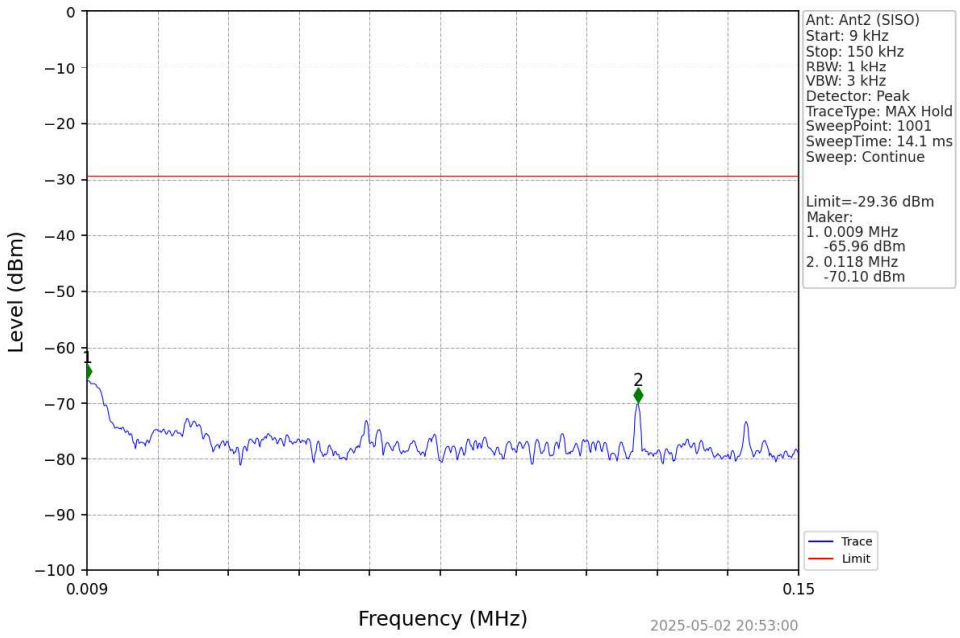
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



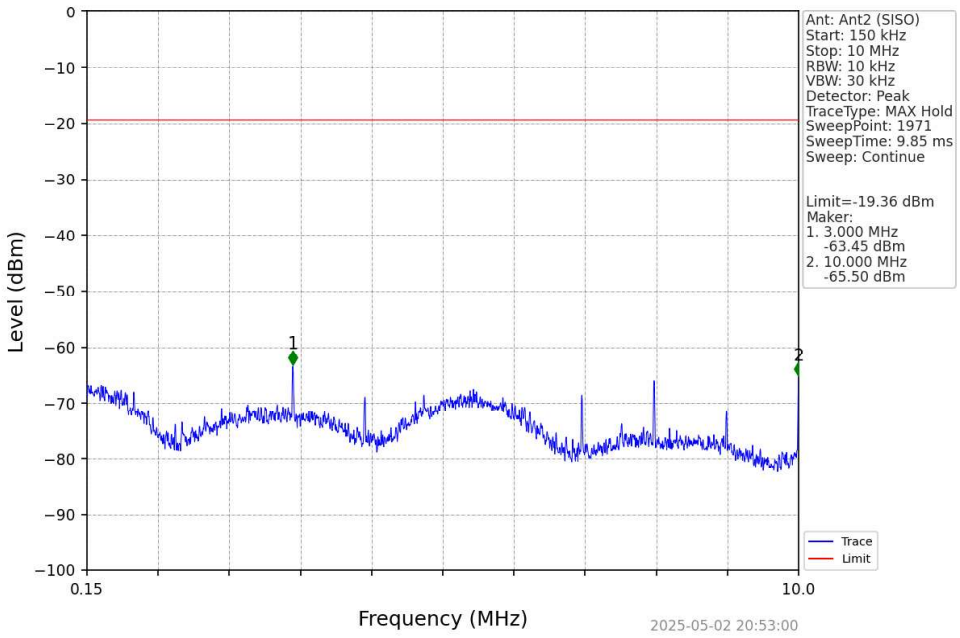
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



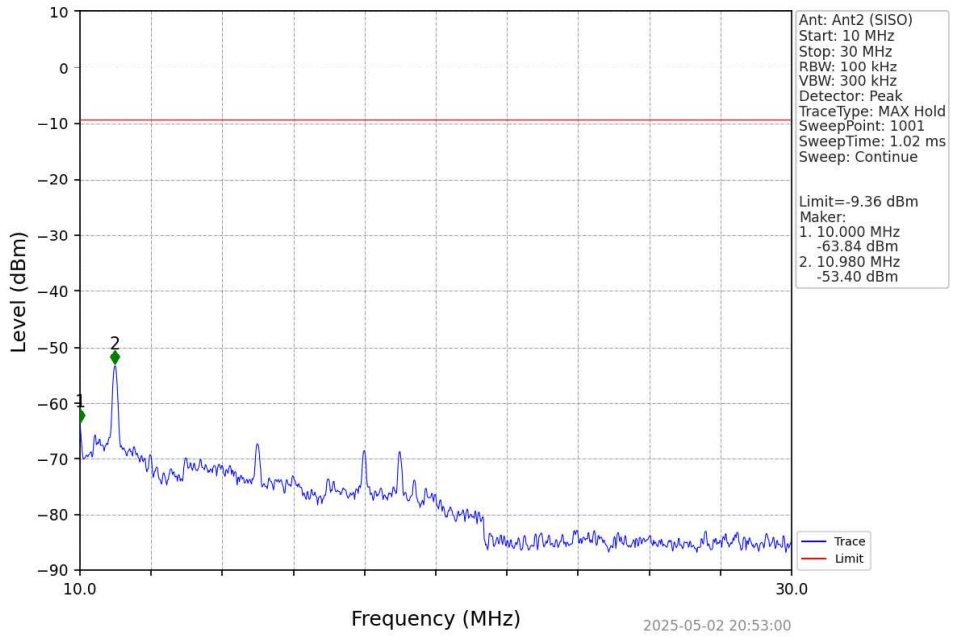
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



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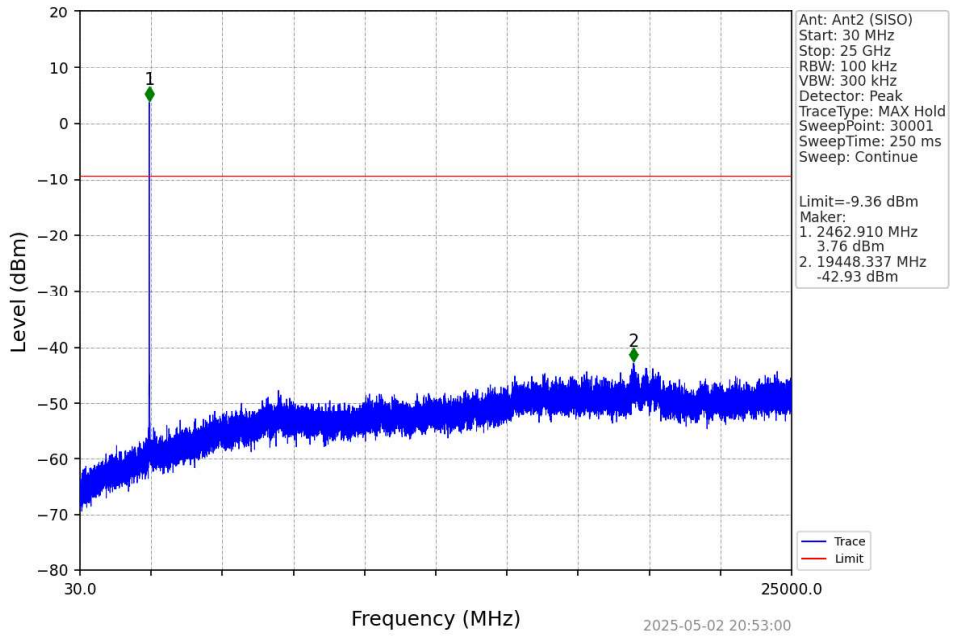
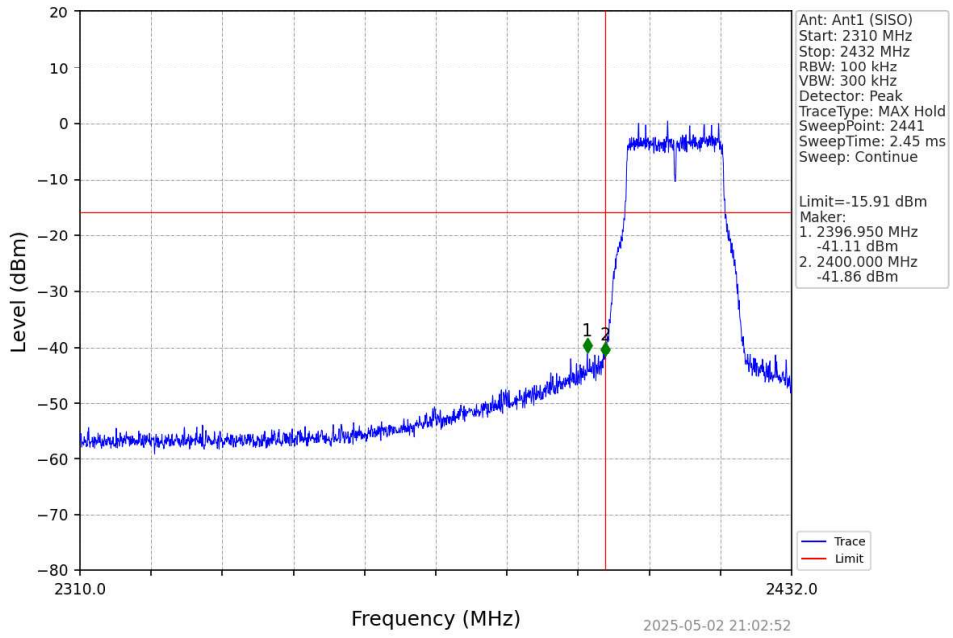


802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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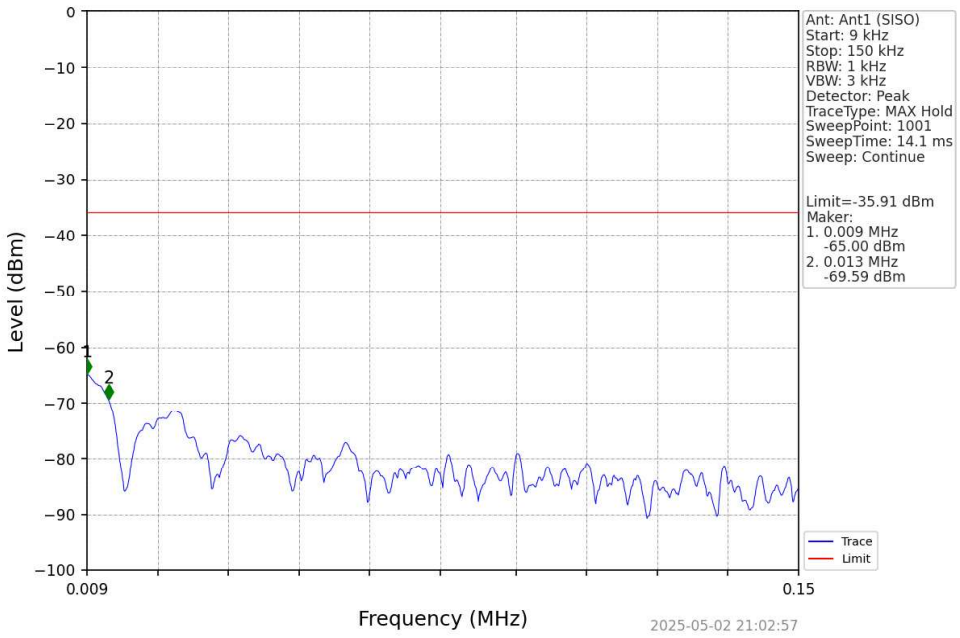

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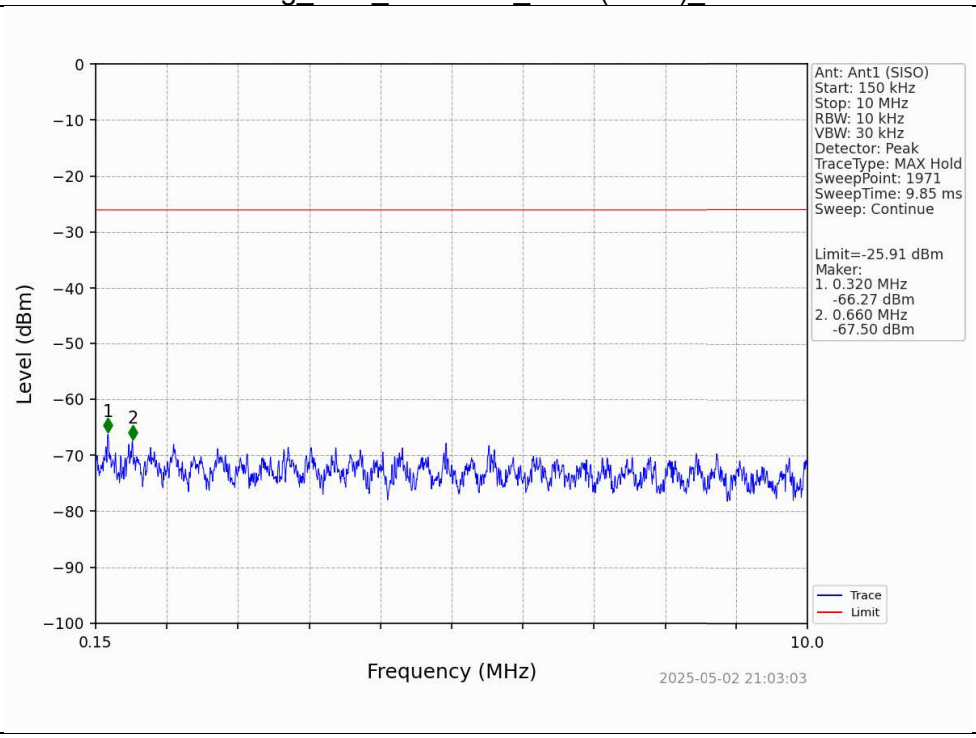

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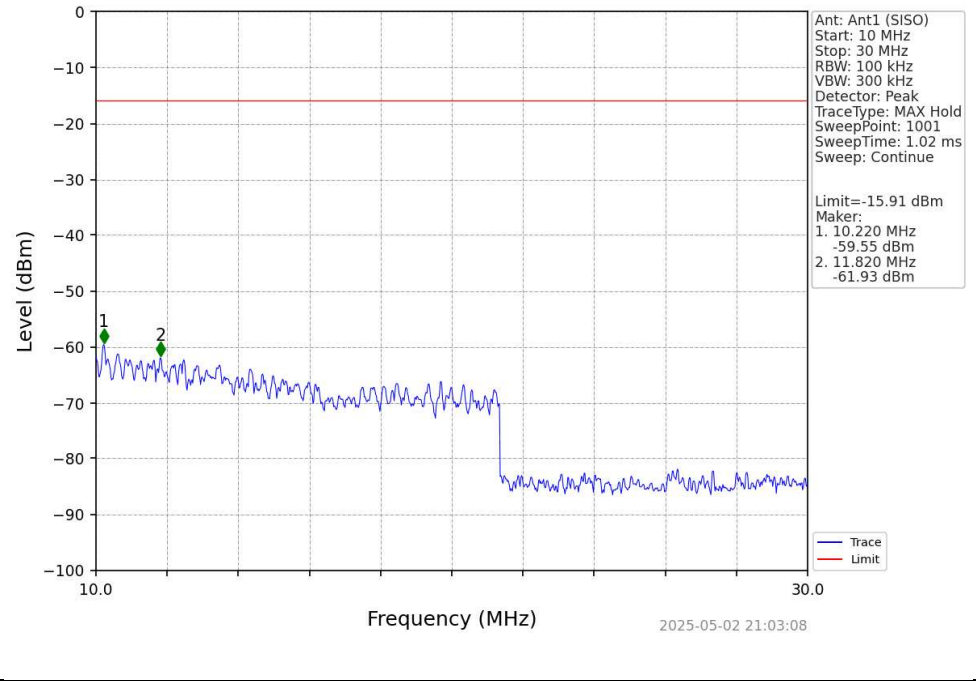

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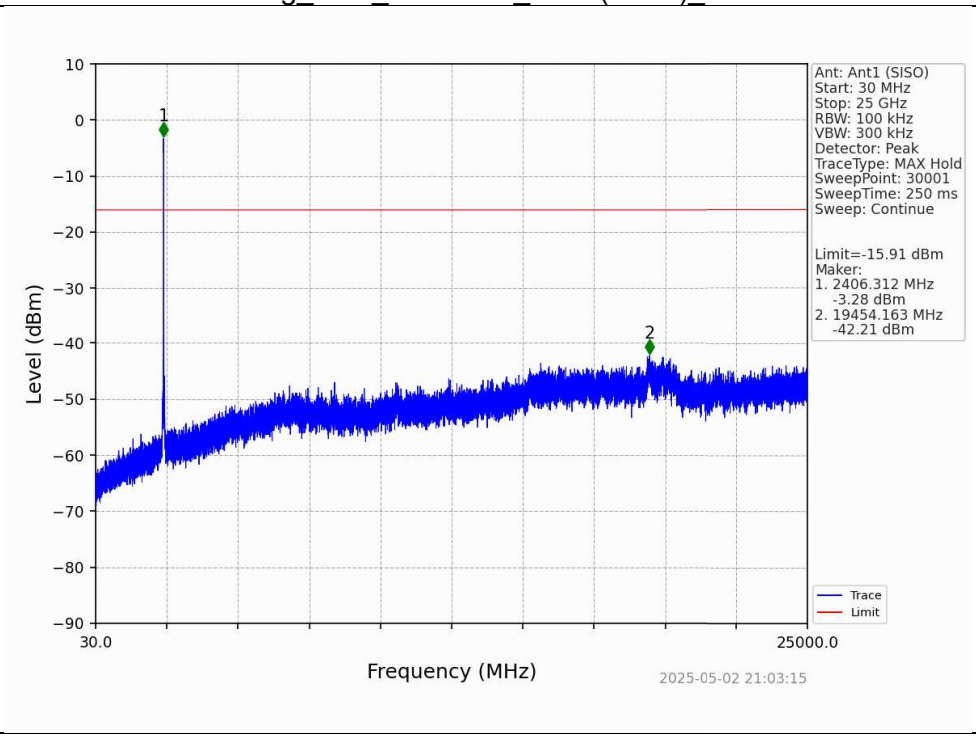
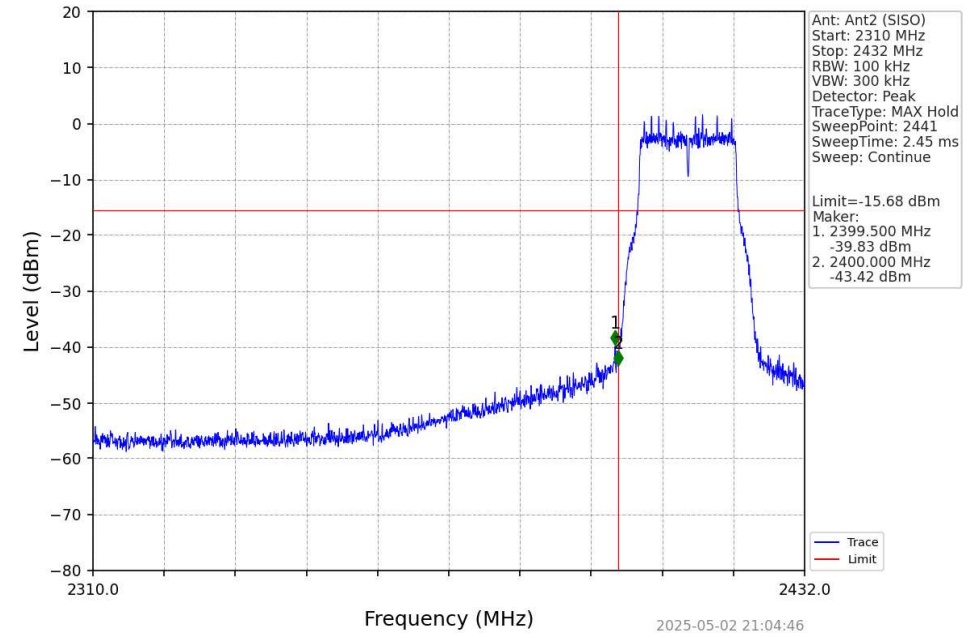
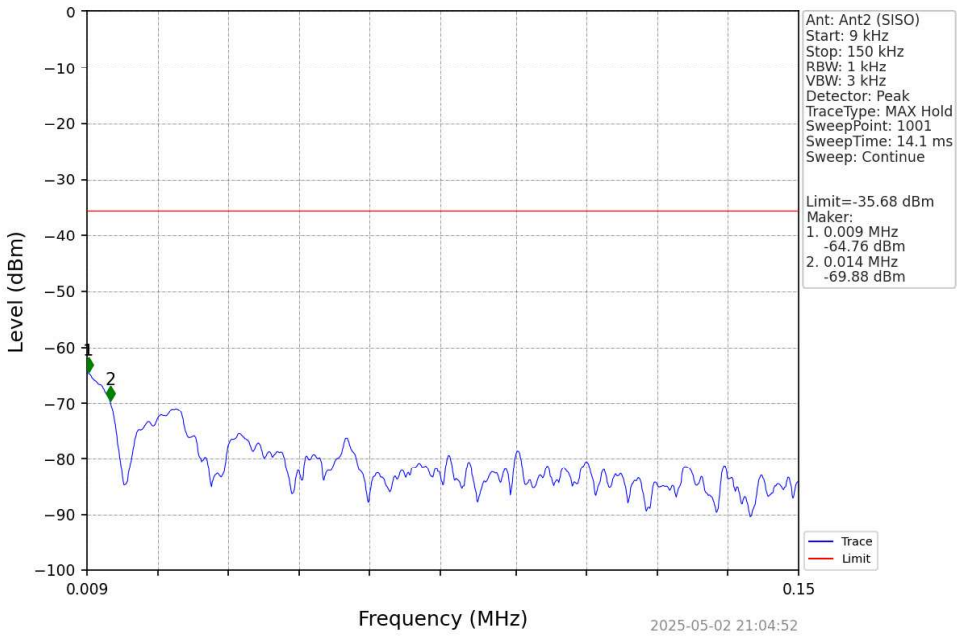


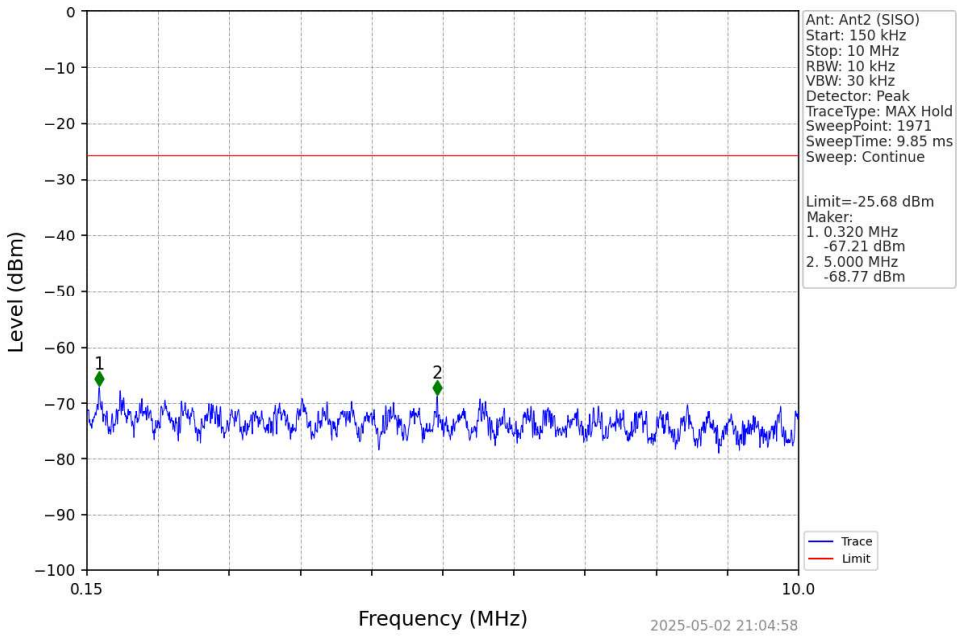
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



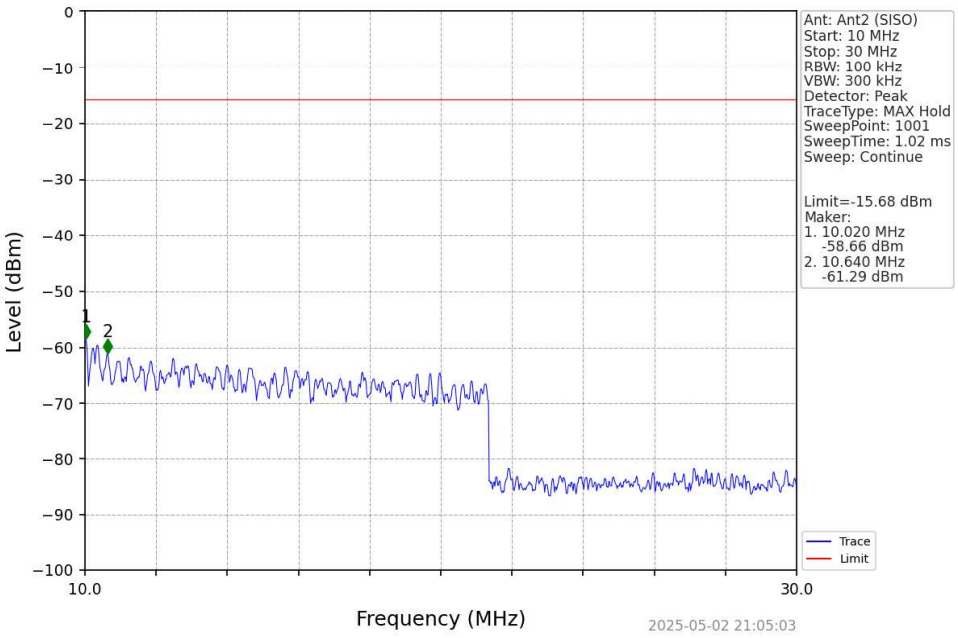
802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



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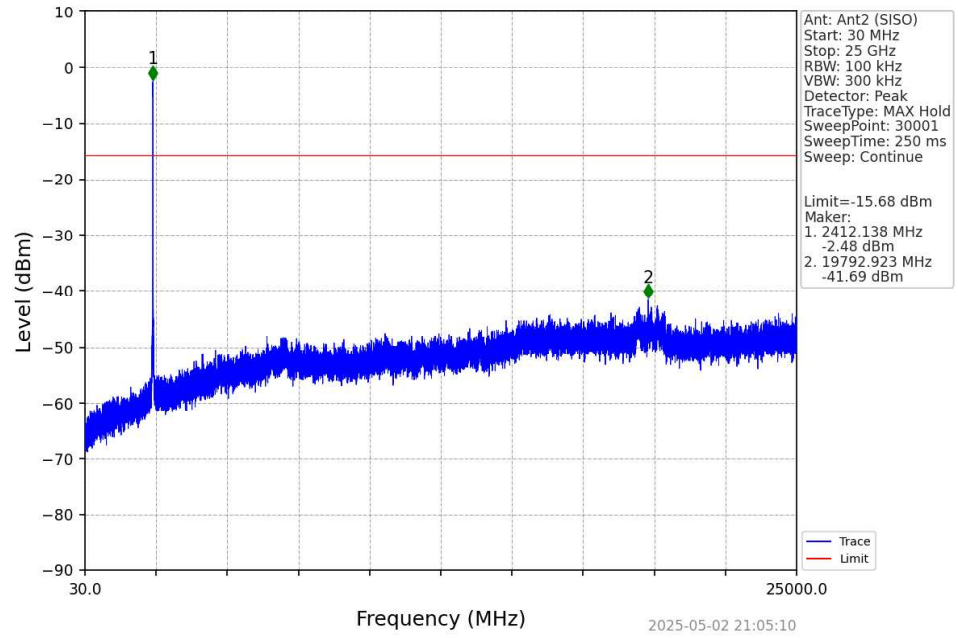
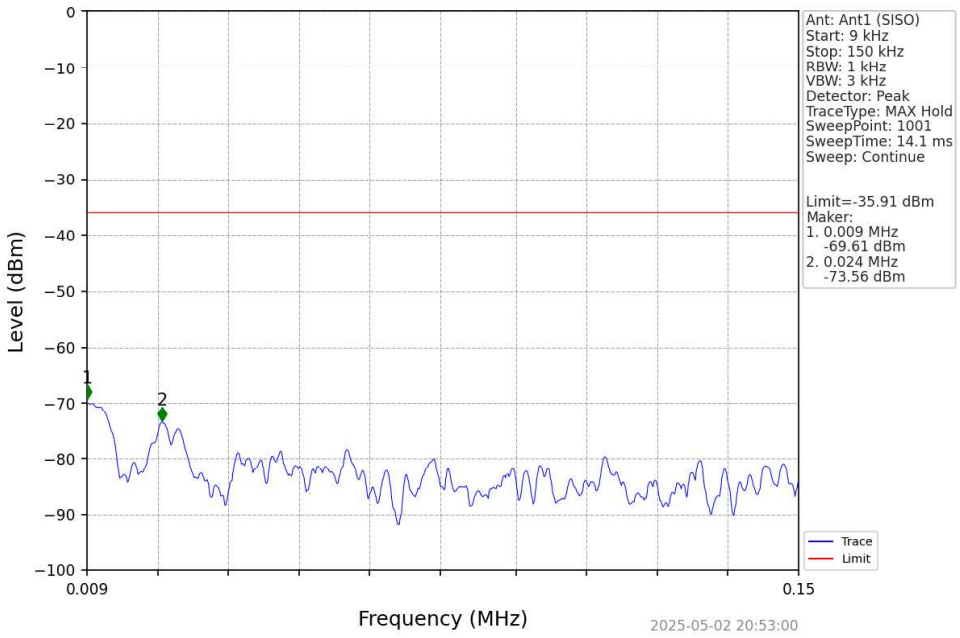


802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



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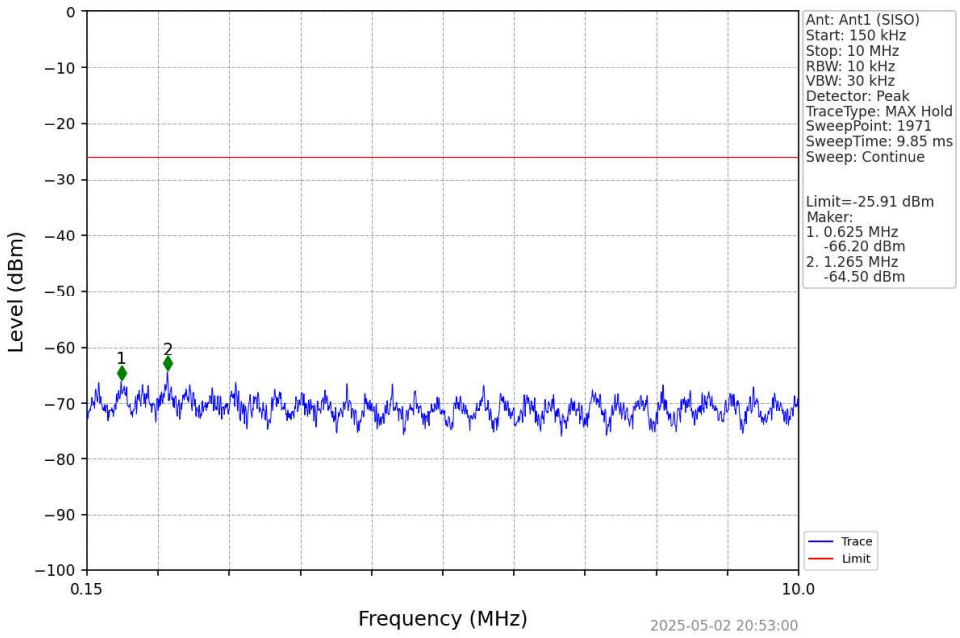

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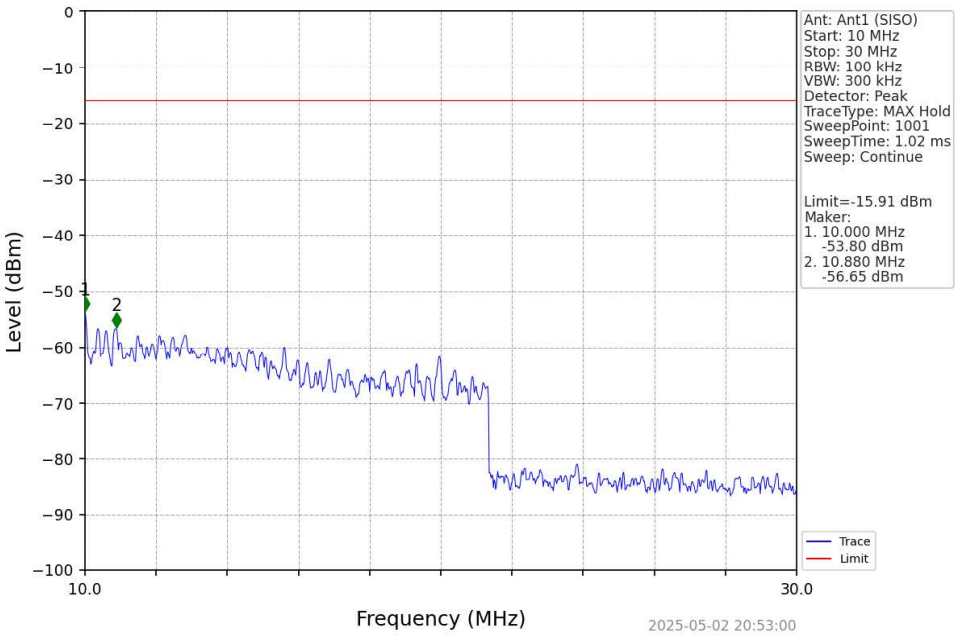

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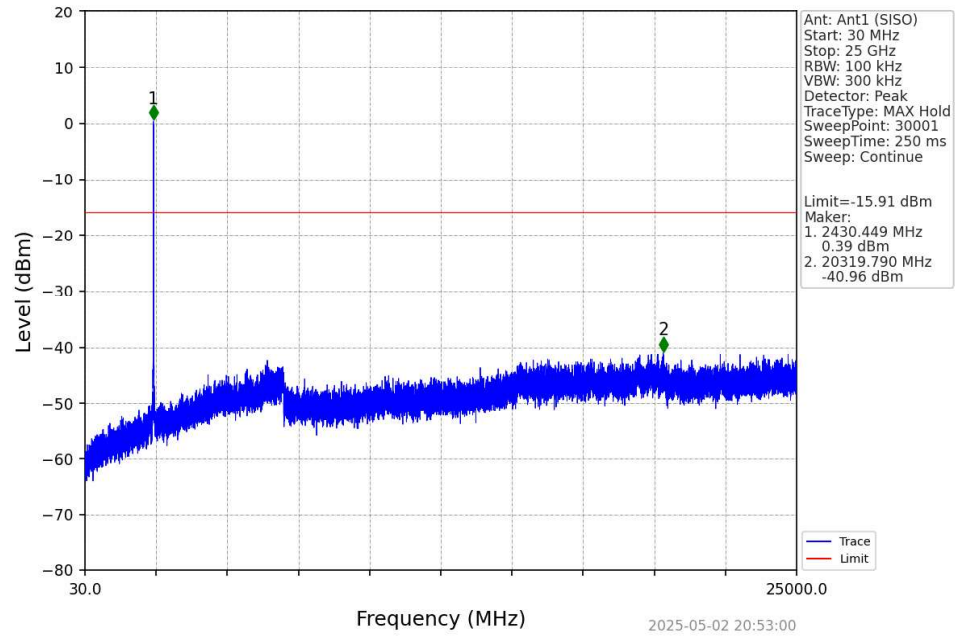
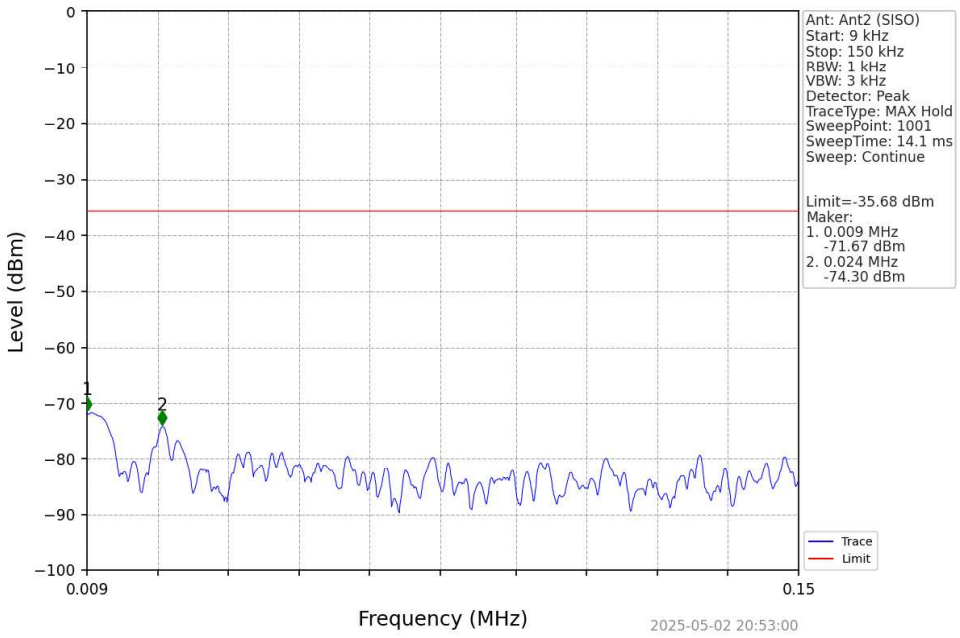
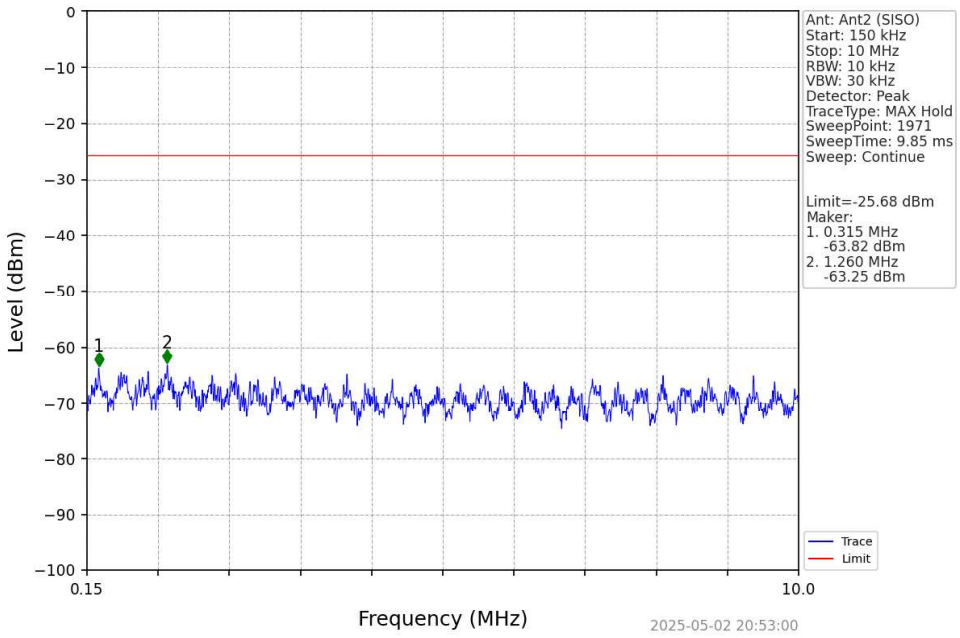


802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



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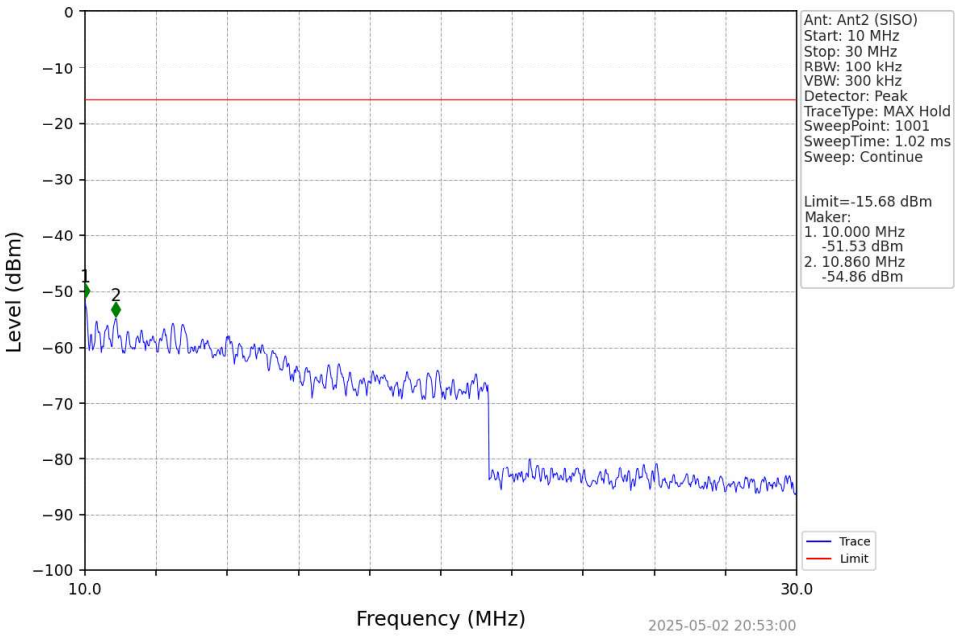

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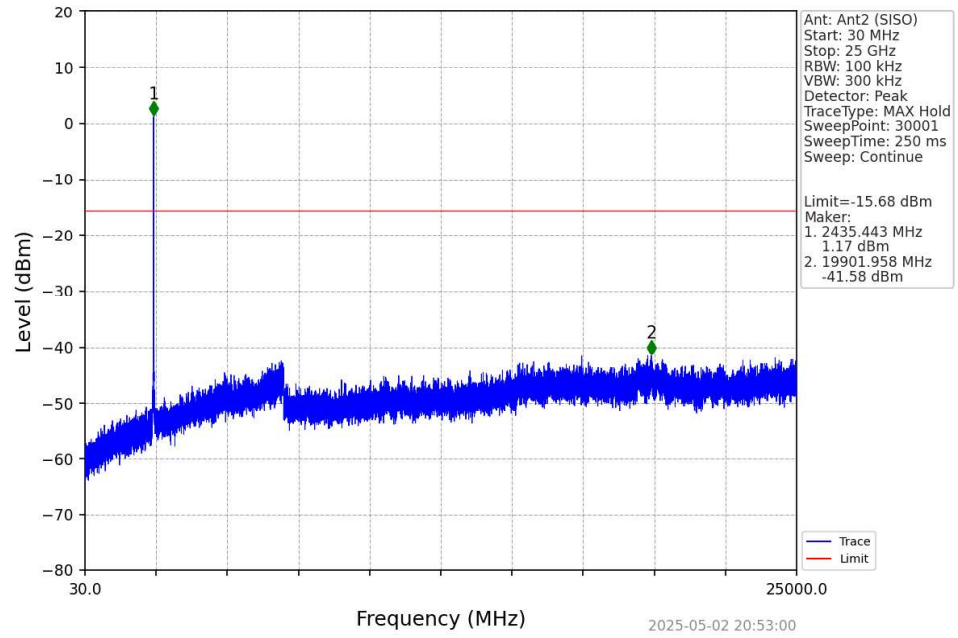

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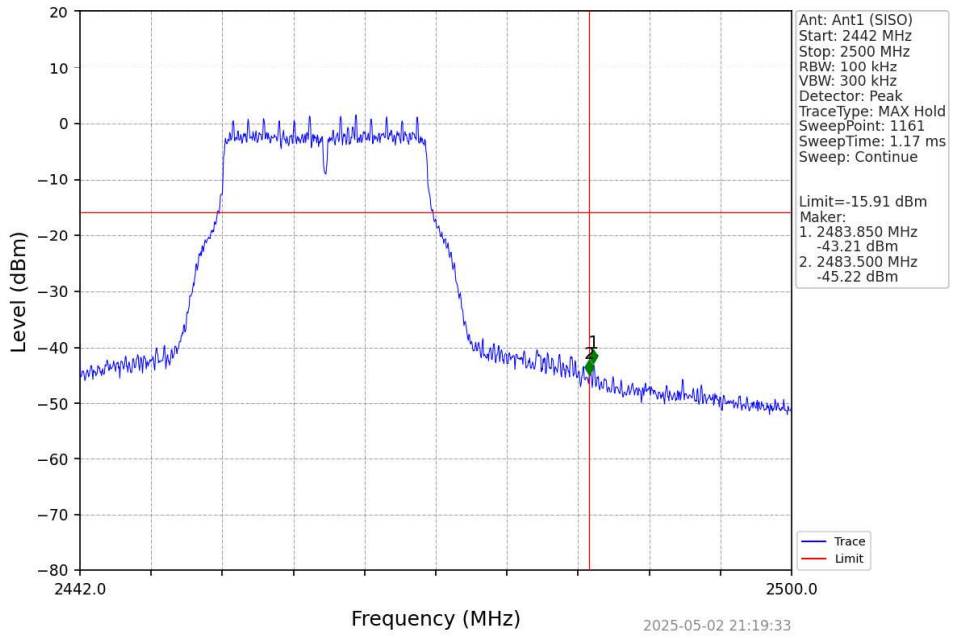

802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV