RF Test Report

For

Applicant Name:	**Klydoclock LTD**
Address:	HaOranim st 22 Rinatya, Israel. zip: 7316500
EUT Name:	klydoclock
Brand Name:	klydoclock
Model Number:	KC-KS-V1.0
Series Model Number:	Refer to section 2

Issued By

Company Name:	**BTF Testing Lab (Shenzhen) Co., Ltd.**
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Report Number:	BTF231108R00403
Test Standards:	47 CFR Part 15.247
FCC ID:	2BDOI-KCKS
Test Conclusion:	Pass
Test Date:	2023-11-09 to 2023-12-12
Date of Issue:	2023-12-13

Prepared By: Gavin Cui

Gavin Cui / Project Engineer

Date: 2023-12-13

Approved By: Ryan.CJ

Ryan.CJ / EMC Manager

Date: 2023-12-13

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Revision History		
Version	Issue Date	Revisions Content
R_V0	2023-12-13	Original
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1 Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130
FCC Registration Number:	518915
Designation Number:	CN1330

1.3 Announcement

(1) The test report reference to the report template version v0.
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(3) The test report is invalid if there is any evidence and/or falsification.
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2 Product Information

2.1 Application Information

Company Name:	Klydoclock LTD
Address:	HaOranim st 22 Rinatya, Israel. zip: 7316500

2.2 Manufacturer Information

Company Name:	Shenzhen Sunchip Technology Co.,Ltd
Address:	2nd-3rd Floor, Building 4, Fuan Industry Area Phase 2,Dayang Development Zone, Fuyong, Baoan, Shenzhen

2.3 Factory Information

Company Name:	Shenzhen Sunchip Technology Co.,Ltd
Address:	2nd-3rd Floor, Building 4, Fuan Industry Area Phase 2,Dayang Development Zone, Fuyong, Baoan, Shenzhen

2.4 General Description of Equipment under Test (EUT)

EUT Name:	klydoclock
Test Model Number:	KC-KS-V1.0
Series Model Number:	KC-KS-V2.0, KC-KS-V3.0, KC-KS-V4.0, KC-KS-V5.0, KC-KS-V6.0, KC-KS-V7.0, KC-KS-V8.0, KC-KS-V9.0, KC-KS-V10.0, KC-KS-V11.0, KC-KS-V12.0, KC-KS-V13.0, KC-KS-V14.0, KC-KS-V15.0, KC-KS-V16.0, KC-KS-V17.0, KC-KS-V18.0,
Description of Model name differentiation:	All the models are identical to each other except for model name.
Hardware Version:	V1.0
Software and Firmware Version:	K72-8.0-11.6-SW0.7-20231027-90

2.5 Technical Information

Power Supply:	DC 12V
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;
Number of Channels:	802.11b/g/n(HT20): 11 Channels;
Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK); 802.11g: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n(HT20): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type:	FPC Antenna
Antenna Gain#:	3dBi
Note: #: The antenna gain provided by the applicant, and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.	

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3 Summary of Test Results

3.1 Test Standards

The tests were performed according to following standards:
47 CFR Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

3.2 Uncertainty of Test

Item	Measurement Uncertainty
Conducted Emission (150 kHz-30 MHz)	±2.64dB
Occupied Bandwidth	±69kHz
Transmitter Power, Conducted	±0.87dB
Power Spectral Density	±0.69dB
Conducted Spurious Emissions	±0.95dB
Radiated Spurious Emissions (above 1GHz)	1-6GHz: ±3.94dB 6-18GHz: ±4.16dB
Radiated Spurious Emissions (30M - 1GHz)	±4.12dB
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3.3 Summary of Test Result

Item	Standard	Requirement	Result
Antenna requirement	47 CFR Part 15.247	47 CFR 15.203	Pass
Conducted Emission at AC power line	47 CFR Part 15.247	47 CFR 15.207(a)	Pass
Occupied Bandwidth	47 CFR Part 15.247	47 CFR 15.247(a)(2)	Pass
Maximum Conducted Output Power	47 CFR Part 15.247	47 CFR 15.247(b)(3)	Pass
Power Spectral Density	47 CFR Part 15.247	47 CFR 15.247(e)	Pass
Emissions in non-restricted frequency bands	47 CFR Part 15.247	47 CFR 15.247(d), 15.209, 15.205	Pass
Band edge emissions (Radiated)	47 CFR Part 15.247	47 CFR 15.247(d), 15.209, 15.205	Pass
Emissions in frequency bands (below 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d), 15.209, 15.205	Pass
Emissions in frequency bands (above 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d), 15.209, 15.205	Pass

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4 Test Configuration

4.1 Test Equipment List

Conducted Emission at AC power line					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00953	/	/
Coaxial Switcher	SCHWARZBECK	CX210	CX210	/	/
V-LISN	SCHWARZBECK	NSLK 8127	01073	2023-11-16	2024-11-15
LISN	AFJ	LS16/110VAC	16010020076	2023-02-23	2024-02-22
EMI Receiver	ROHDE&SCHWARZ	ESCI3	101422	2023-11-15	2024-11-14

Occupied Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in non-restricted frequency bands					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RFTest software	/	V1.00	/	/	/
RF Control Unit	Techy	TR1029-1	/	/	/
RF Sensor Unit	Techy	TR1029-2	/	/	/
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2023-11-16	2024-11-15
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	/	/
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2023-11-16	2024-11-15
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2023-11-16	2024-11-15

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Band edge emissions (Radiated) Emissions in frequency bands (below 1GHz) Emissions in frequency bands (above 1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2023-03-24	2024-03-23
Preamplifier	SCHWARZBECK	BBV9744	00246	/	/
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	/	/
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	/	/
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	/	/
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	/	/
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2023-11-13	2024-11-12
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2023-11-16	2024-11-15
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2023-11-16	2024-11-15
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2023-03-24	2024-03-23
Horn Antenna	SCHWARZBECK	BBHA9120D	2597	2022-05-22	2024-05-21
EZ_EMC	Frad	FA-03A2 RE+	/	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2023-11-13	2024-11-12

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4.2 Test Auxiliary Equipment

The EUT was tested as an independent device.

4.3 Test Modes

No.	Test Modes	Description
TM1	802.11b mode	Keep the EUT in 802.11b transmitting mode.
TM2	802.11g mode	Keep the EUT in 802.11g transmitting mode.
TM3	802.11n(HT20) mode	Keep the EUT in 802.11n(HT20) transmitting mode.

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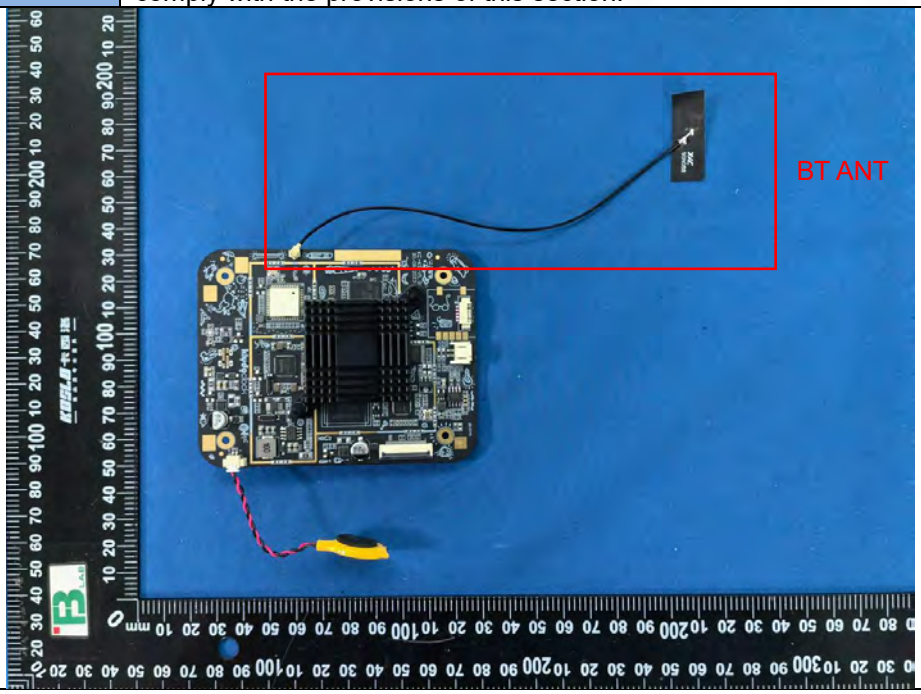
5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.



6 Radio Spectrum Matter Test Results (RF)

6.1 Conducted Emission at AC power line

Test Requirement:	Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).
Test Method:	ANSI C63.10-2013 section 6.2 ANSI C63.10-2020 section 6.2
Test Limit:	

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

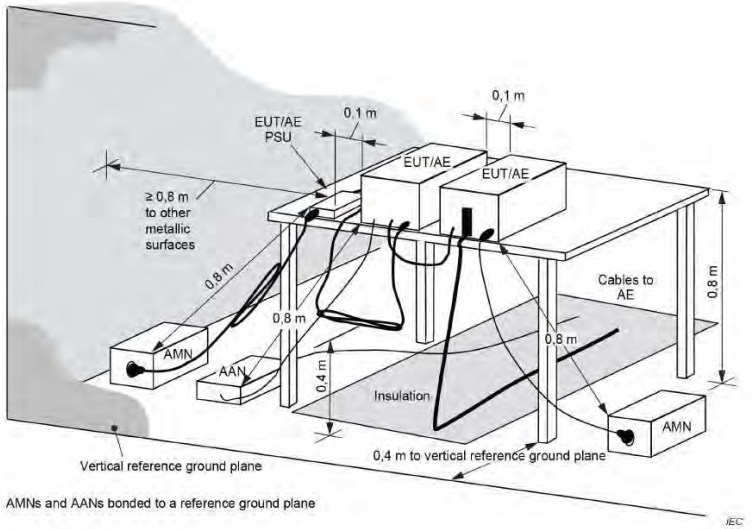
*Decreases with the logarithm of the frequency.

Procedure:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices Refer to ANSI C63.10-2020 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices

6.1.1 E.U.T. Operation:

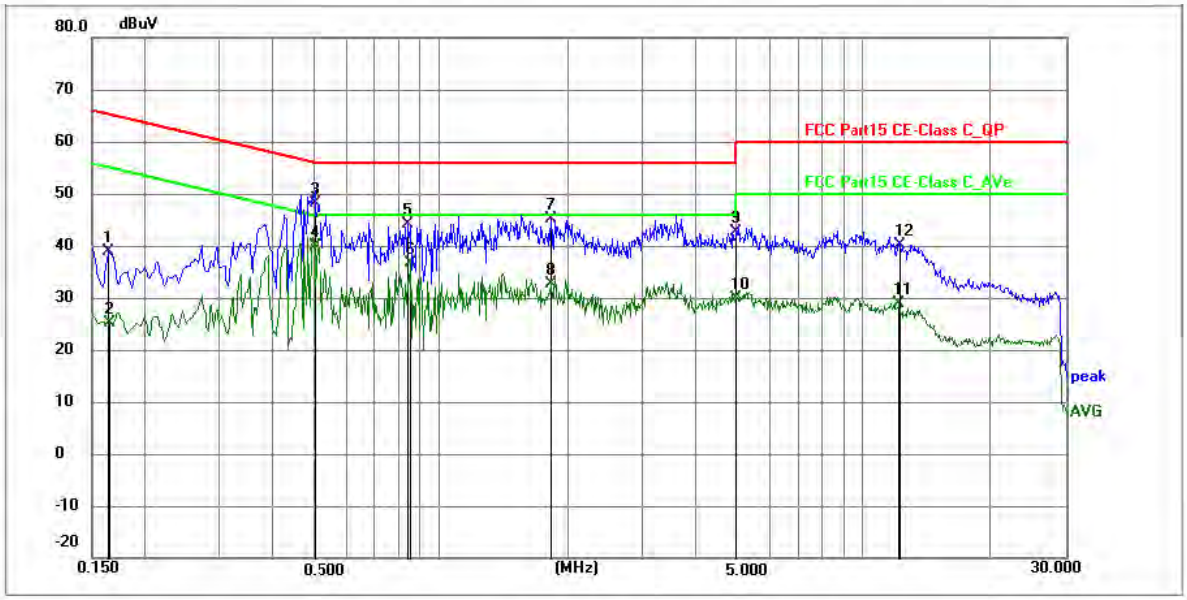
Operating Environment:	
Temperature:	24.3 °C
Humidity:	53.1 %
Atmospheric Pressure:	1010 mbar

6.1.2 Test Setup Diagram:



6.1.3 Test Data:

TM1 / Line: Line / Band: 2400-2483.5 MHz / BW: 20 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1635	28.45	10.48	38.93	65.28	-26.35	QP	P	
2	0.1650	14.54	10.48	25.02	55.21	-30.19	AVG	P	
3	0.5010	37.00	11.20	48.20	56.00	-7.80	QP	P	
4 *	0.5010	28.78	11.20	39.98	46.00	-6.02	AVG	P	
5	0.8385	33.44	10.68	44.12	56.00	-11.88	QP	P	
6	0.8520	26.06	10.68	36.74	46.00	-9.26	AVG	P	
7	1.8285	34.57	10.67	45.24	56.00	-10.76	QP	P	
8	1.8285	22.00	10.67	32.67	46.00	-13.33	AVG	P	
9	4.9830	31.93	10.73	42.66	56.00	-13.34	QP	P	
10	4.9830	19.25	10.73	29.98	46.00	-16.02	AVG	P	
11	12.1425	18.08	10.87	28.95	50.00	-21.05	AVG	P	
12	12.2055	29.26	10.87	40.13	60.00	-19.87	QP	P	

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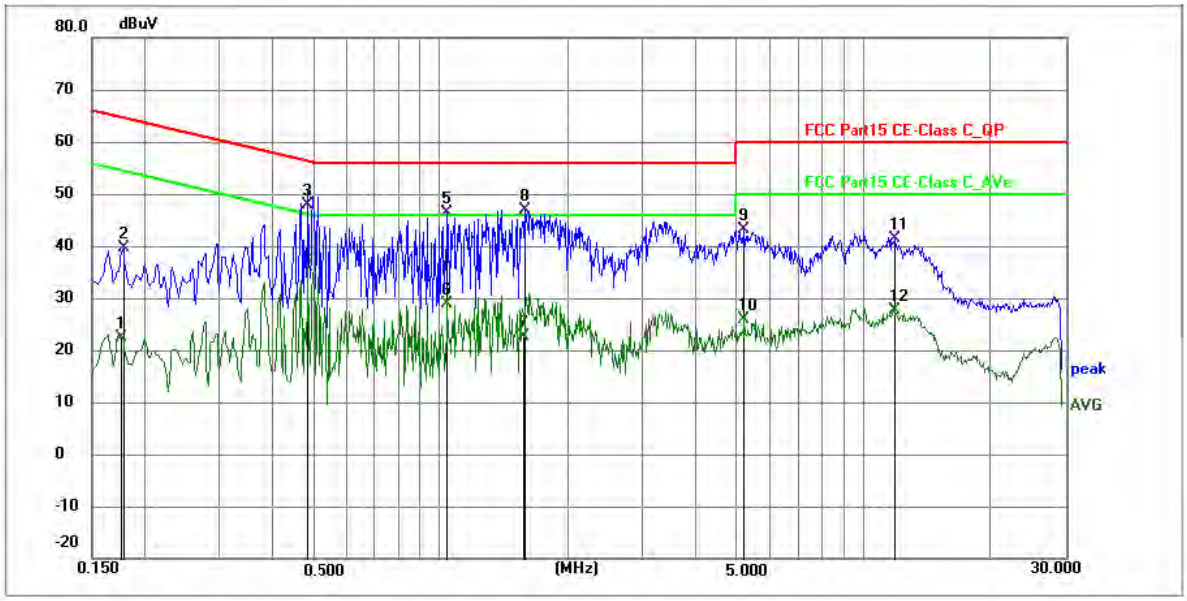
TM1 / Line: Neutral / Band: 2400-2483.5 MHz / BW: 20 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1758	11.78	10.51	22.29	54.68	-32.39	AVG	P	
2	0.1770	29.19	10.51	39.70	64.63	-24.93	QP	P	
3 *	0.4830	36.70	11.20	47.90	56.29	-8.39	QP	P	
4	0.4830	24.60	11.20	35.80	46.29	-10.49	AVG	P	
5	1.0410	35.69	10.66	46.35	56.00	-9.65	QP	P	
6	1.0410	18.25	10.66	28.91	46.00	-17.09	AVG	P	
7	1.5809	12.00	10.66	22.66	46.00	-23.34	AVG	P	
8	1.5855	36.34	10.66	47.00	56.00	-9.00	QP	P	
9	5.2035	32.28	10.74	43.02	60.00	-16.98	QP	P	
10	5.2035	15.03	10.74	25.77	50.00	-24.23	AVG	P	
11	11.8500	30.56	10.83	41.39	60.00	-18.61	QP	P	
12	11.8500	16.88	10.83	27.71	50.00	-22.29	AVG	P	

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6.2 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Method:	ANSI C63.10-2013, section 11.8 ANSI C63.10-2020, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Procedure:	a) Set RBW = 100 kHz. b) Set the VBW >= [3 × RBW]. c) Detector = peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. 11.8.1 Option 1 The steps for the first option are as follows: a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz. b) Set the VBW ≥ [3 × RBW]. c) Detector = peak. d) Trace mode = max-hold. e) Sweep = No faster than coupled (auto) time. f) Allow the trace to stabilize. g) Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “−6 dB down amplitude”. If a marker is below this “−6 dB down amplitude” value, then it shall be as close as possible to this value. 11.8.2 Option 2 The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW ≥ 3 × RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

6.2.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	53.1 %
Atmospheric Pressure:	1010 mbar

6.2.2 Test Setup Diagram:

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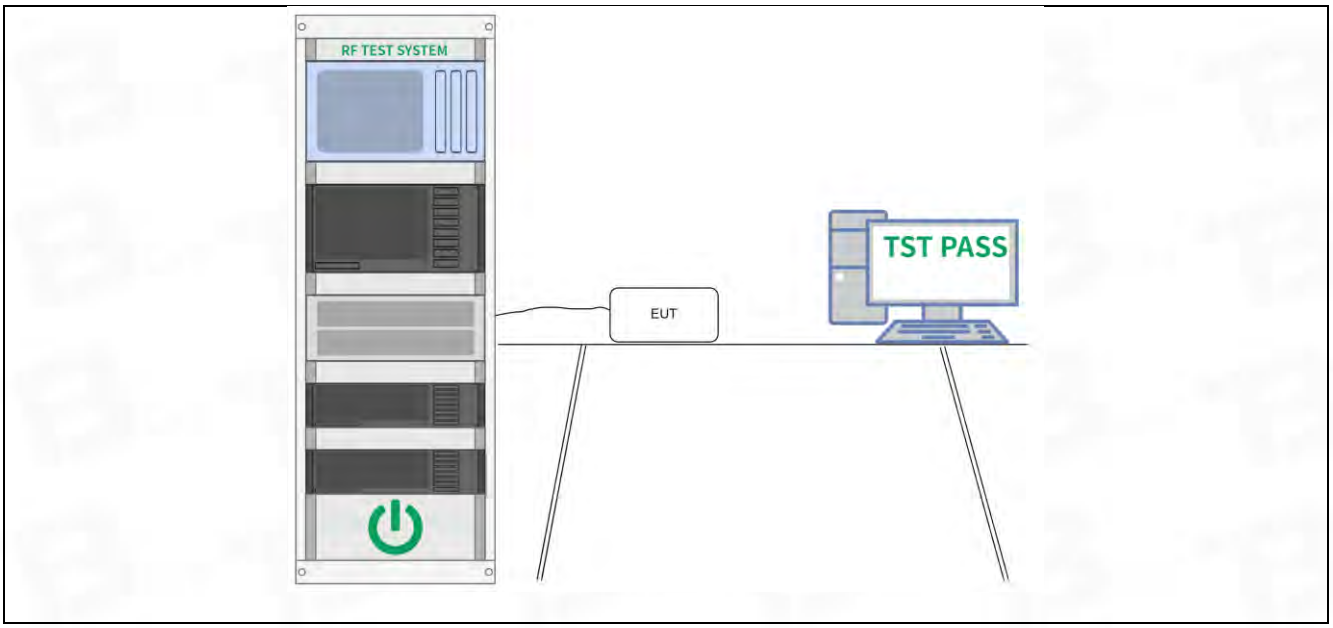


6.2.3 Test Data:

Please Refer to Appendix for Details.

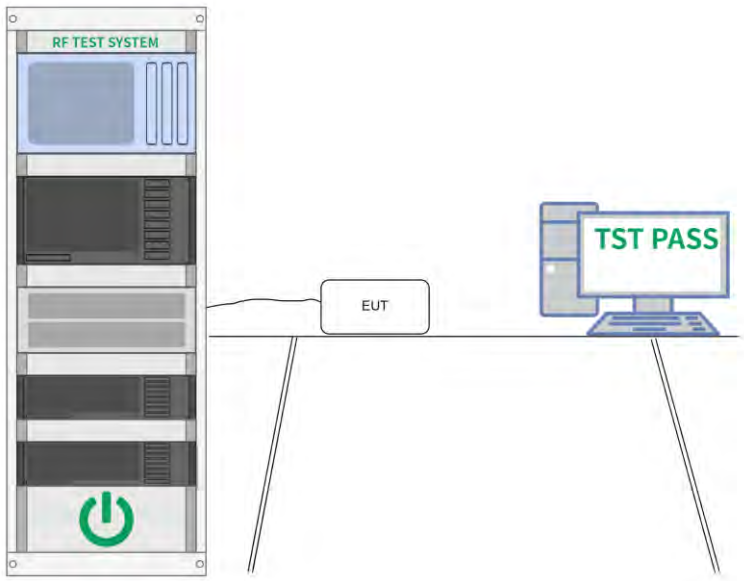
6.3 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Method:	ANSI C63.10-2013, section 11.9.2 ANSI C63.10-2020, section 11.9.2 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Procedure:	ANSI C63.10-2013, section 11.9.2 Maximum conducted (average) output power ANSI C63.10-2020, section 11.9.2 Maximum conducted (average) output power

6.3.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	53.1 %
Atmospheric Pressure:	1010 mbar

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

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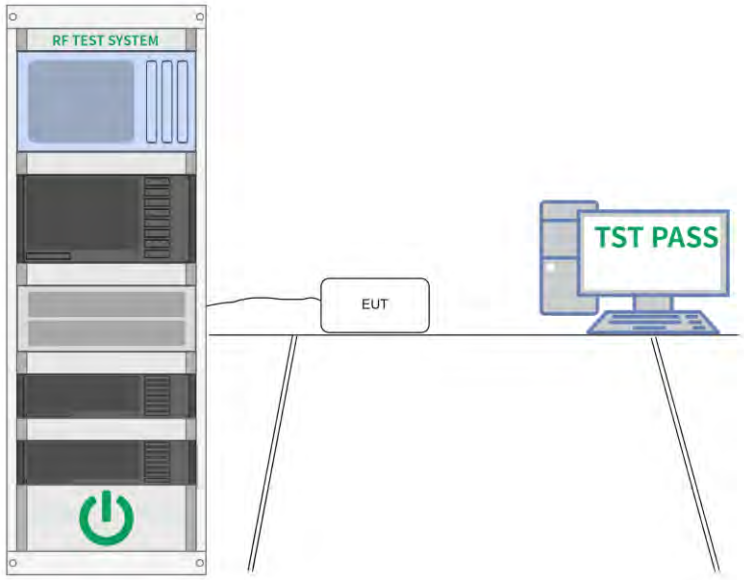
6.4 Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Method:	ANSI C63.10-2013, section 11.10 ANSI C63.10-2020, section 11.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Procedure:	ANSI C63.10-2013, section 11.10, Maximum power spectral density level in the fundamental emission ANSI C63.10-2020, section 11.10, Maximum power spectral density level in the fundamental emission

6.4.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	53.1 %
Atmospheric Pressure:	1010 mbar

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

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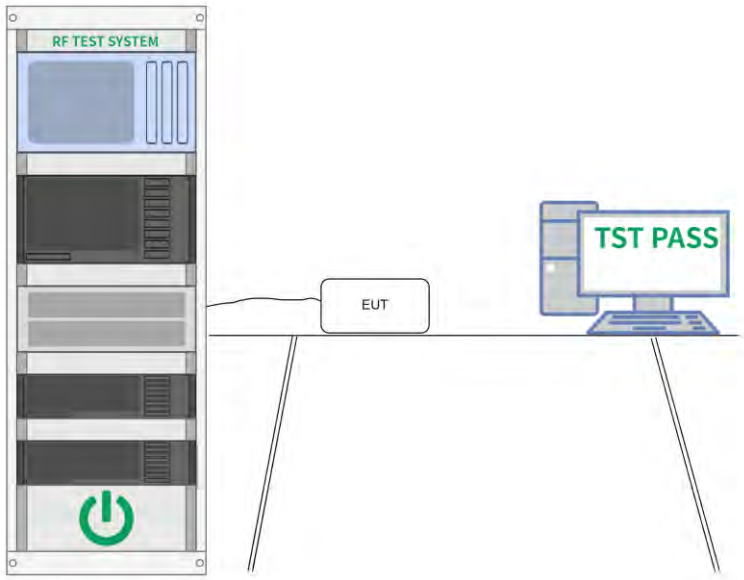
6.5 Emissions in non-restricted frequency bands

Test Requirement:	47 CFR 15.247(d), 15.209, 15.205
Test Method:	ANSI C63.10-2013 section 11.11 ANSI C63.10-2020 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required.
Procedure:	ANSI C63.10-2013 Section 11.11.1, Section 11.11.2, Section 11.11.3 ANSI C63.10-2020 Section 11.11.1, Section 11.11.2, Section 11.11.3

6.5.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	53.1 %
Atmospheric Pressure:	1010 mbar

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

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6.6 Band edge emissions (Radiated)

Test Requirement:	Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`
Test Method:	ANSI C63.10-2013 section 6.10 ANSI C63.10-2020 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

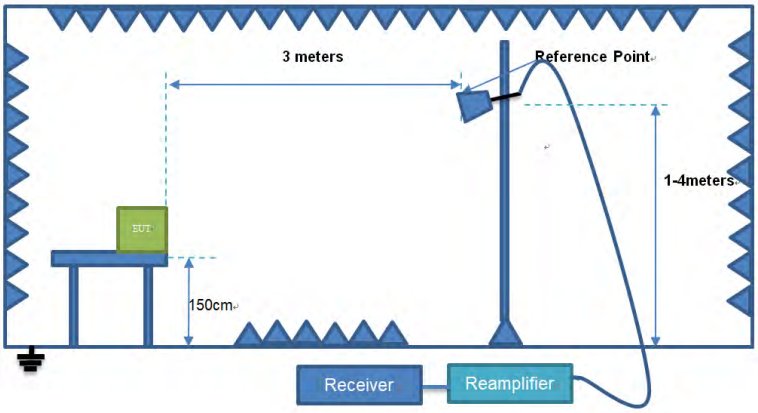
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Procedure:	ANSI C63.10-2013 section 6.10.5.2 ANSI C63.10-2020 section 6.10.5.2

6.6.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	53.1 %
Atmospheric Pressure:	1010 mbar

6.6.2 Test Setup Diagram:



6.6.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	51.63	-30.59	21.04	74.00	-52.96	peak	P
2 *	2390.000	54.59	-30.49	24.10	74.00	-49.90	peak	P

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	51.42	-30.59	20.83	74.00	-53.17	peak	P
2 *	2390.000	53.91	-30.49	23.42	74.00	-50.58	peak	P

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	53.77	-30.39	23.38	74.00	-50.62	peak	P
2	2500.000	52.13	-30.37	21.76	74.00	-52.24	peak	P

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	53.25	-30.39	22.86	74.00	-51.14	peak	P
2	2500.000	51.47	-30.37	21.10	74.00	-52.90	peak	P

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6.7 Emissions in frequency bands (below 1GHz)

Test Requirement:	Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`
Test Method:	ANSI C63.10-2013 section 6.6.4 ANSI C63.10-2020 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

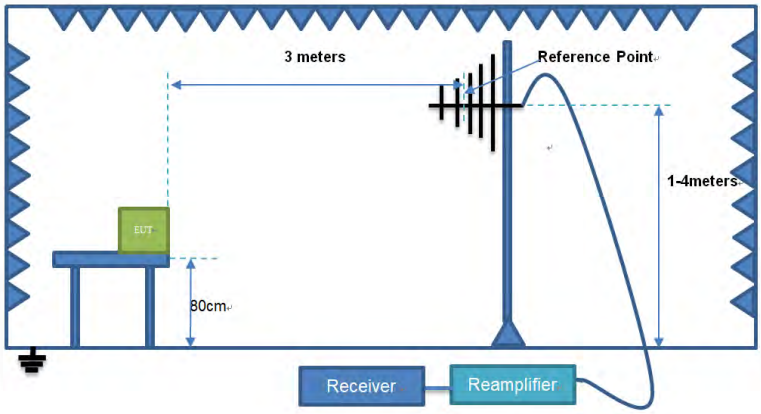
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Procedure:	ANSI C63.10-2013 section 6.6.4 ANSI C63.10-2020 section 6.6.4

6.7.1 E.U.T. Operation:

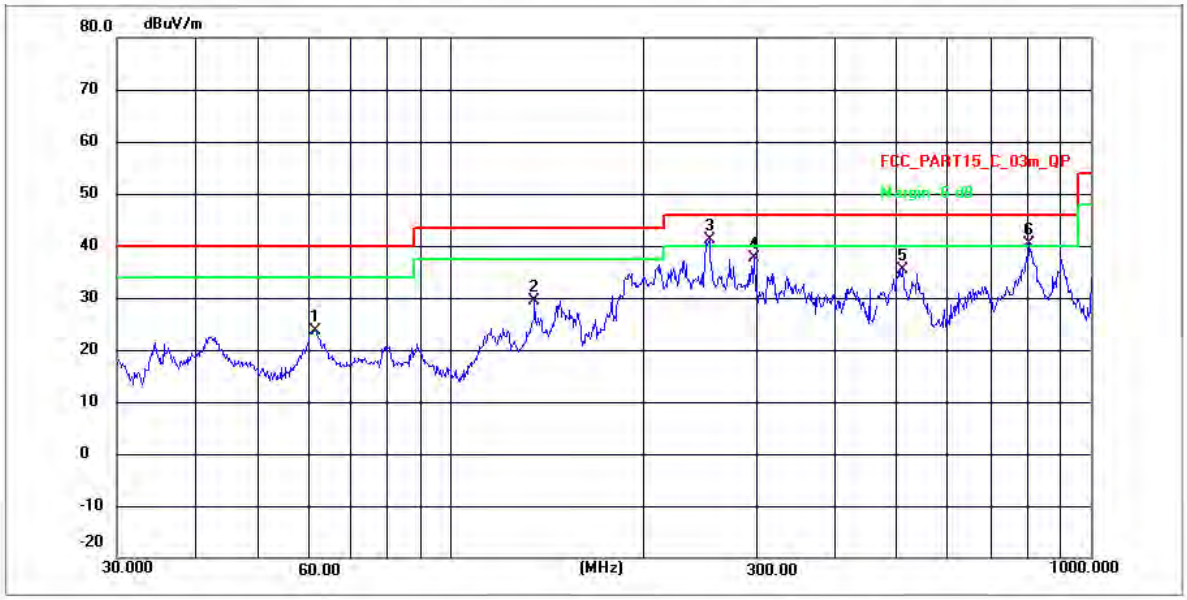
Operating Environment:	
Temperature:	24.3 °C
Humidity:	53.1 %
Atmospheric Pressure:	1010 mbar

6.7.2 Test Setup Diagram:



6.7.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 20 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	61.2387	41.87	-18.18	23.69	40.00	-16.31	QP	P
2	135.0318	57.38	-27.91	29.47	43.50	-14.03	QP	P
3 *	253.8366	66.90	-25.82	41.08	46.00	-4.92	QP	P
4	297.2240	63.19	-25.45	37.74	46.00	-8.26	QP	P
5	508.2581	56.55	-21.22	35.33	46.00	-10.67	QP	P
6 !	803.1933	64.01	-23.67	40.34	46.00	-5.66	QP	P

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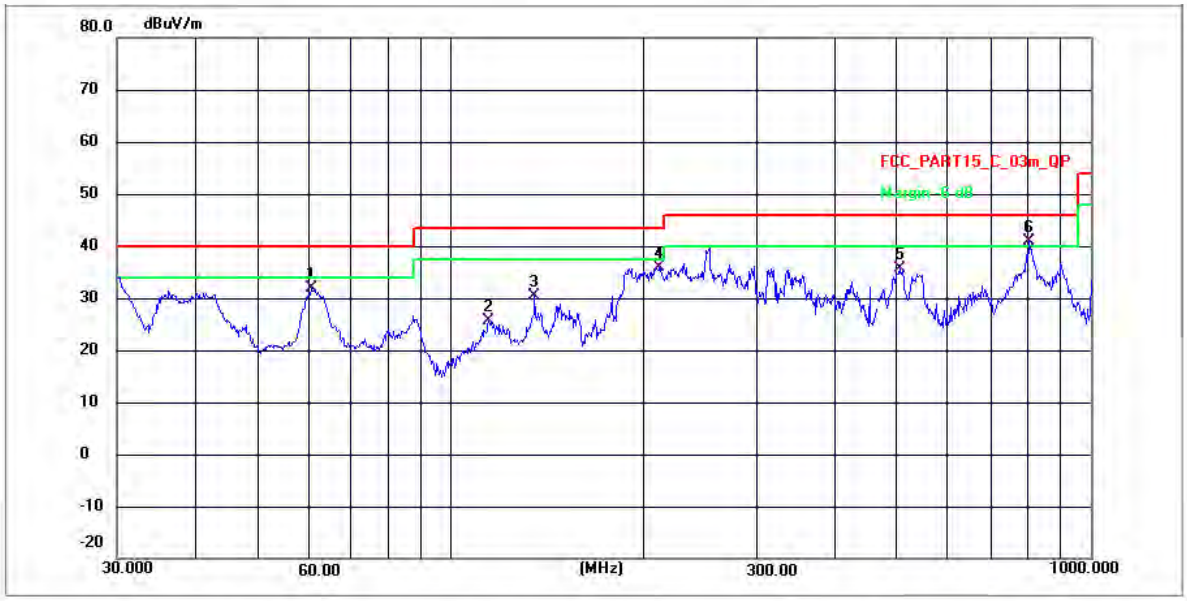
TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 20 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	60.2800	51.91	-20.15	31.76	40.00	-8.24	QP	P
2	114.9167	53.64	-28.10	25.54	43.50	-17.96	QP	P
3	135.0318	58.38	-27.91	30.47	43.50	-13.03	QP	P
4	212.2693	62.75	-26.79	35.96	43.50	-7.54	QP	P
5	503.8220	56.77	-21.18	35.59	46.00	-10.41	QP	P
6 *	803.1933	64.51	-23.67	40.84	46.00	-5.16	QP	P

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6.8 Emissions in frequency bands (above 1GHz)

Test Requirement:	In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`
Test Method:	ANSI C63.10-2013 section 6.6.4 ANSI C63.10-2020 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

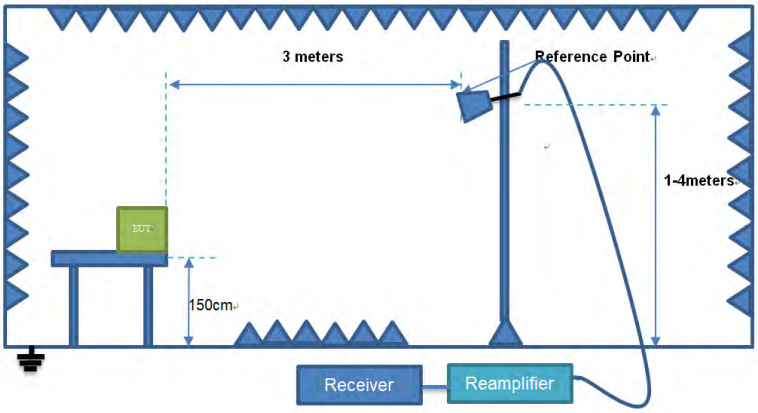
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Procedure:	ANSI C63.10-2013 section 6.6.4 ANSI C63.10-2020 section 6.6.4

6.8.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	53.1 %
Atmospheric Pressure:	1010 mbar

6.8.2 Test Setup Diagram:



6.8.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2194.998	61.05	-30.71	30.34	74.00	-43.66	peak	P
2	3252.005	70.73	-29.28	41.45	74.00	-32.55	peak	P
3	4902.300	70.89	-27.64	43.25	74.00	-30.75	peak	P
4	6621.376	73.87	-25.27	48.60	74.00	-25.40	peak	P
5	8738.852	77.67	-24.84	52.83	74.00	-21.17	peak	P
6 *	12009.761	81.60	-22.18	59.42	74.00	-14.58	peak	P

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3196.094	70.46	-29.33	41.13	74.00	-32.87	peak	P
2	4050.903	70.45	-28.98	41.47	74.00	-32.53	peak	P
3	5134.335	72.20	-27.25	44.95	74.00	-29.05	peak	P
4	7390.070	75.57	-24.81	50.76	74.00	-23.24	peak	P
5	8295.823	77.68	-25.41	52.27	74.00	-21.73	peak	P
6 *	10039.393	79.52	-24.31	55.21	74.00	-18.79	peak	P

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TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3016.575	71.01	-29.50	41.51	74.00	-32.49	peak	P
2	3465.510	71.16	-29.09	42.07	74.00	-31.93	peak	P
3	4521.185	70.59	-28.72	41.87	74.00	-32.13	peak	P
4	5346.358	72.97	-27.08	45.89	74.00	-28.11	peak	P
5	6583.209	74.88	-25.31	49.57	74.00	-24.43	peak	P
6 *	8738.852	78.22	-24.84	53.38	74.00	-20.62	peak	P

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3270.858	70.01	-29.27	40.74	74.00	-33.26	peak	P
2	4291.977	70.62	-28.88	41.74	74.00	-32.26	peak	P
3	5315.541	72.19	-27.11	45.08	74.00	-28.92	peak	P
4	6322.136	73.69	-25.36	48.33	74.00	-25.67	peak	P
5	8539.102	77.28	-25.24	52.04	74.00	-21.96	peak	P
6 *	9475.497	78.57	-23.25	55.32	74.00	-18.68	peak	P

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TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2272.466	61.34	-30.62	30.72	74.00	-43.28	peak	P
2	3252.005	70.50	-29.28	41.22	74.00	-32.78	peak	P
3	3671.746	70.65	-29.03	41.62	74.00	-32.38	peak	P
4	5315.541	73.28	-27.11	46.17	74.00	-27.83	peak	P
5	6545.263	74.02	-25.34	48.68	74.00	-25.32	peak	P
6 *	8343.918	76.94	-25.39	51.55	74.00	-22.45	peak	P

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2169.767	60.69	-30.74	29.95	74.00	-44.05	peak	P
2	3252.005	71.16	-29.28	41.88	74.00	-32.12	peak	P
3	3465.510	71.10	-29.09	42.01	74.00	-31.99	peak	P
4	4495.124	71.05	-28.79	42.26	74.00	-31.74	peak	P
5	5932.638	72.41	-25.54	46.87	74.00	-27.13	peak	P
6 *	7390.070	76.35	-24.81	51.54	74.00	-22.46	peak	P

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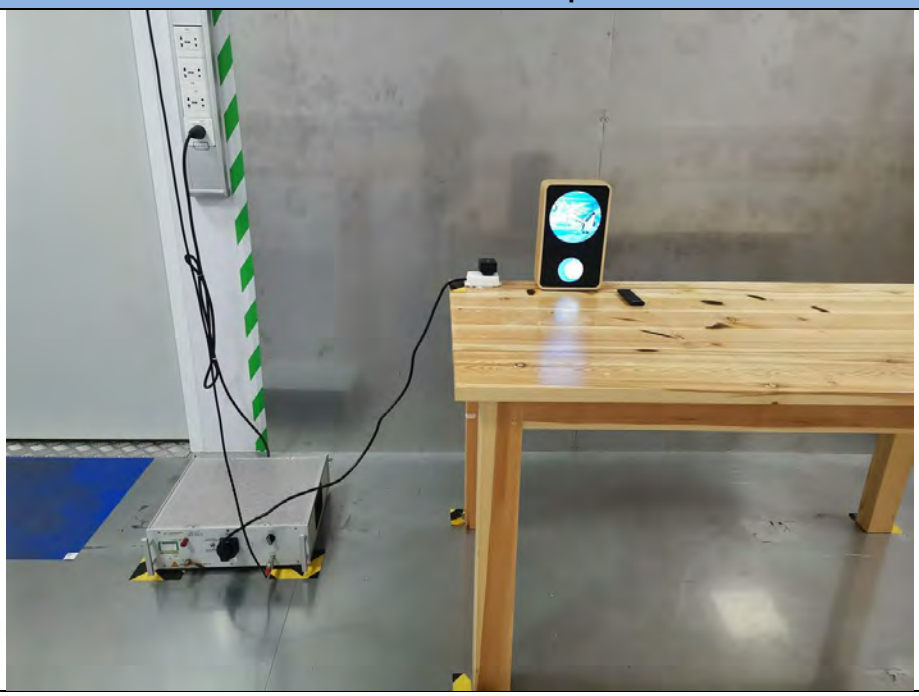
7 Test Setup Photos

Conducted Emission at AC power line


Band edge emissions (Radiated) Emissions in frequency bands (above 1GHz)

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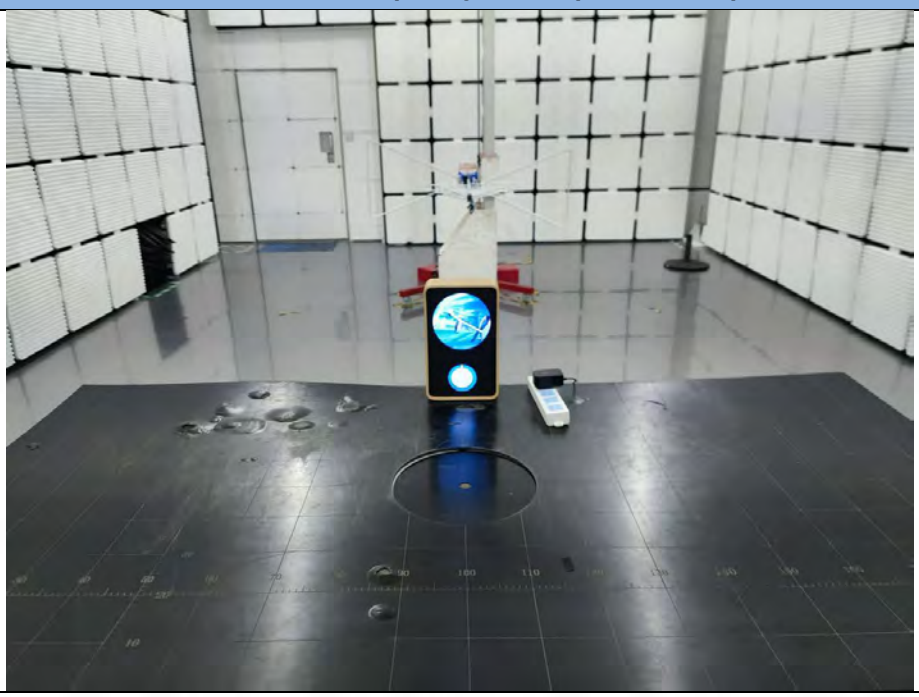
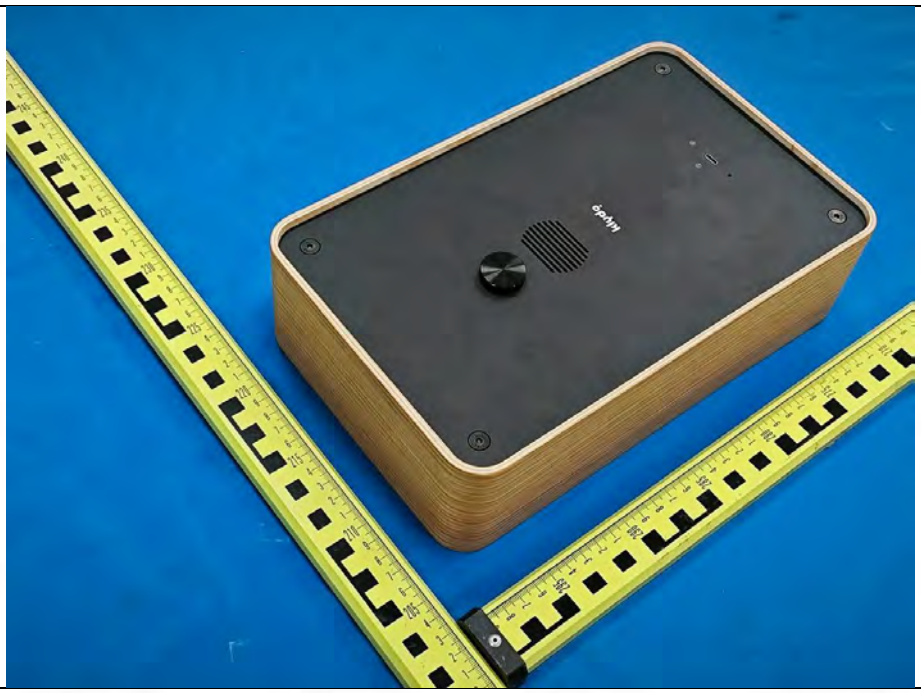
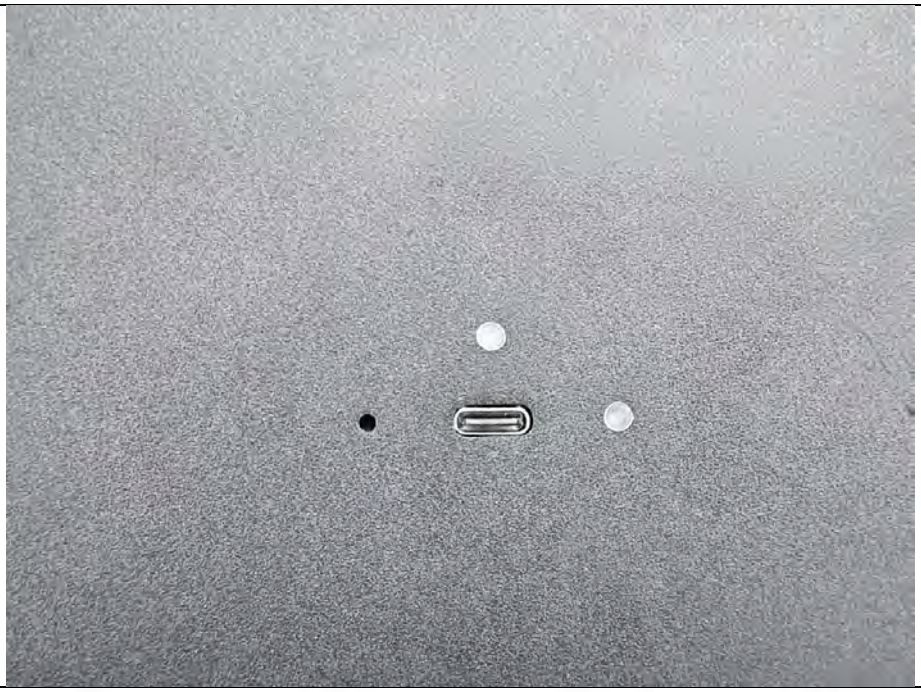
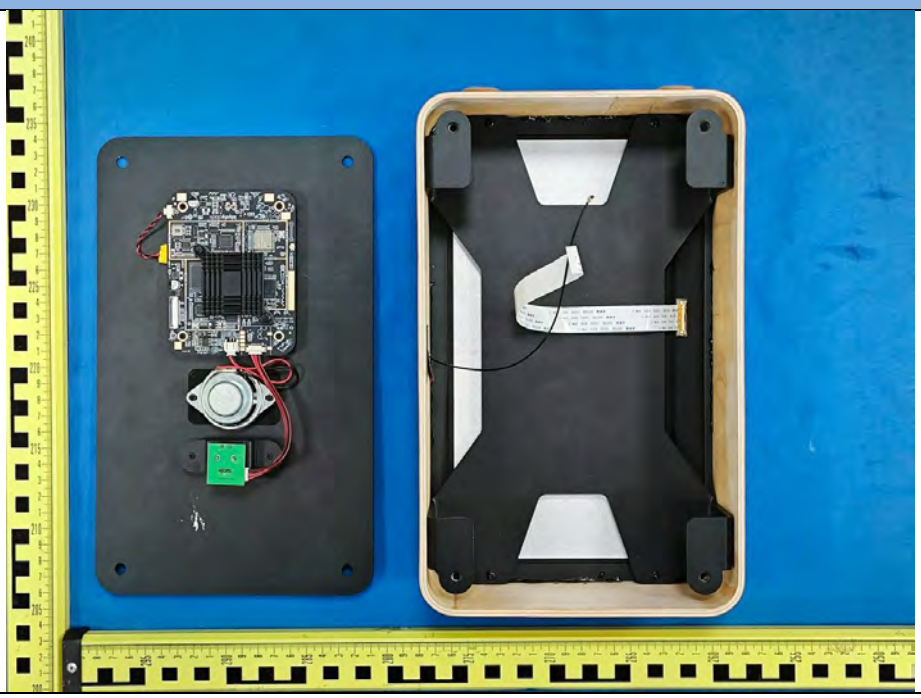
Emissions in frequency bands (below 1GHz)


8 EUT Constructional Details (EUT Photos)

External





Internal


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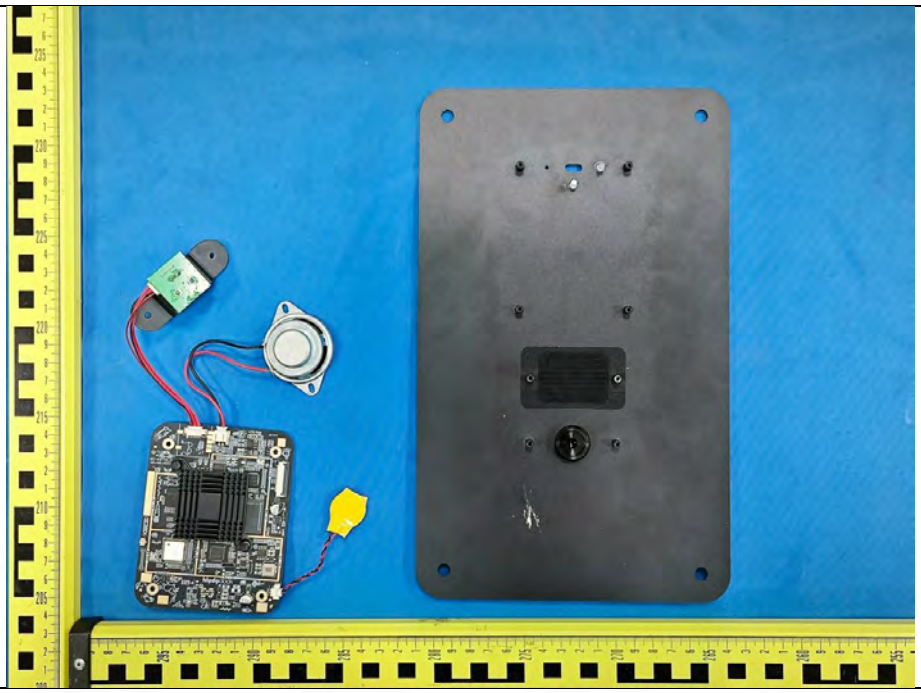

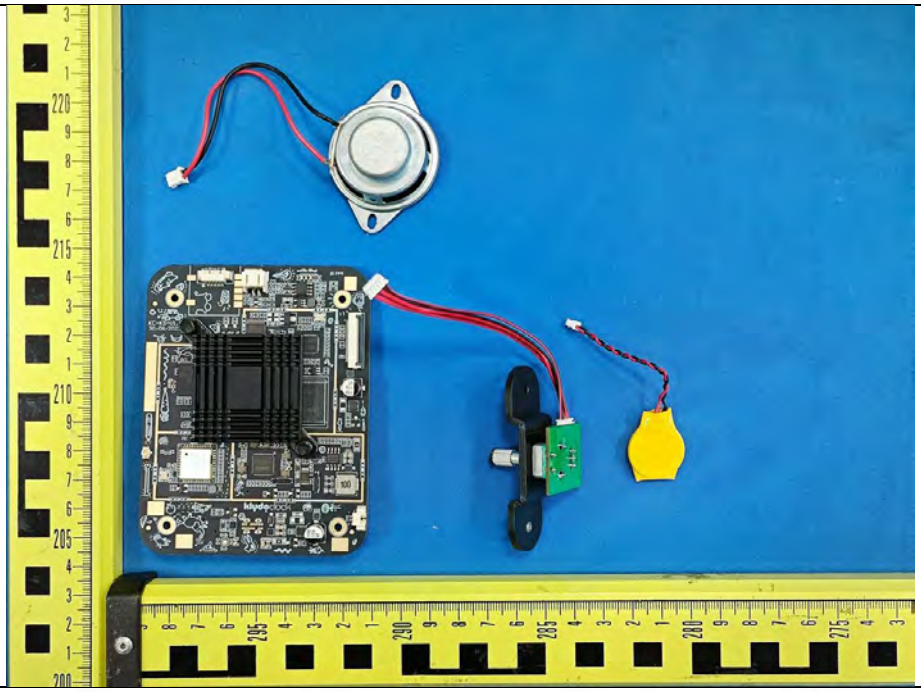

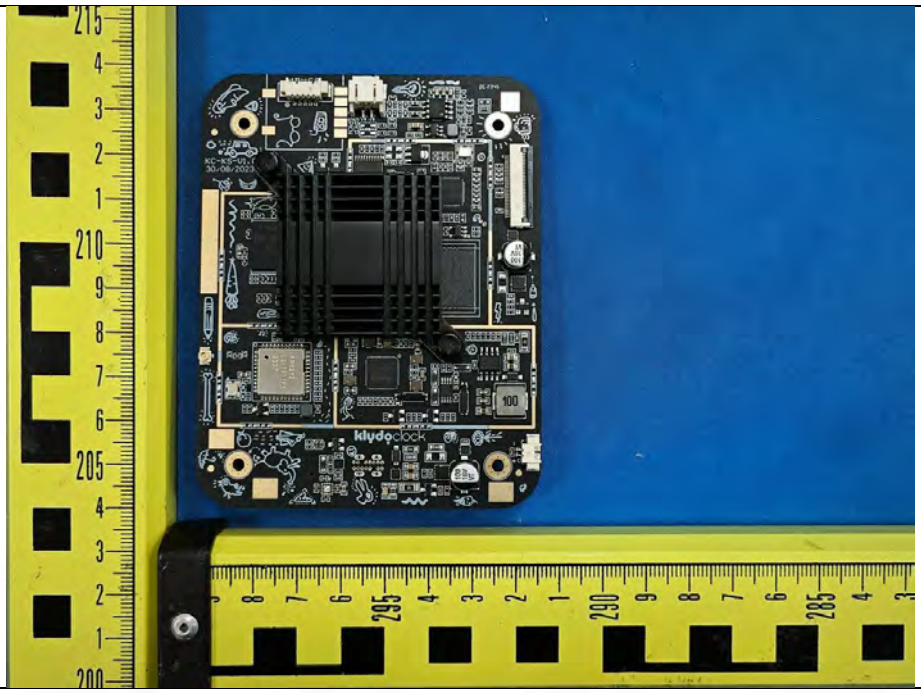

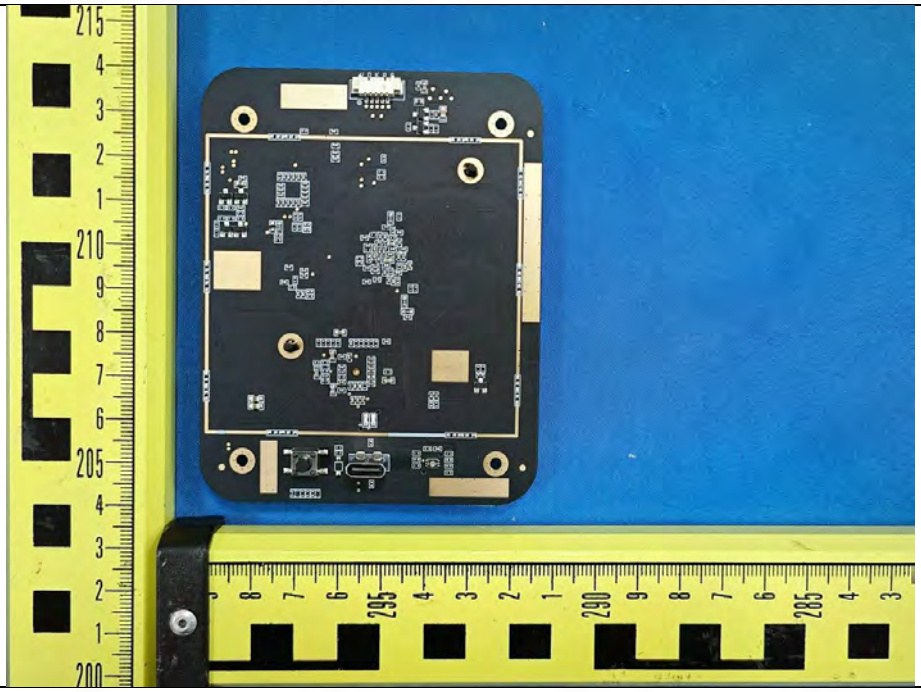

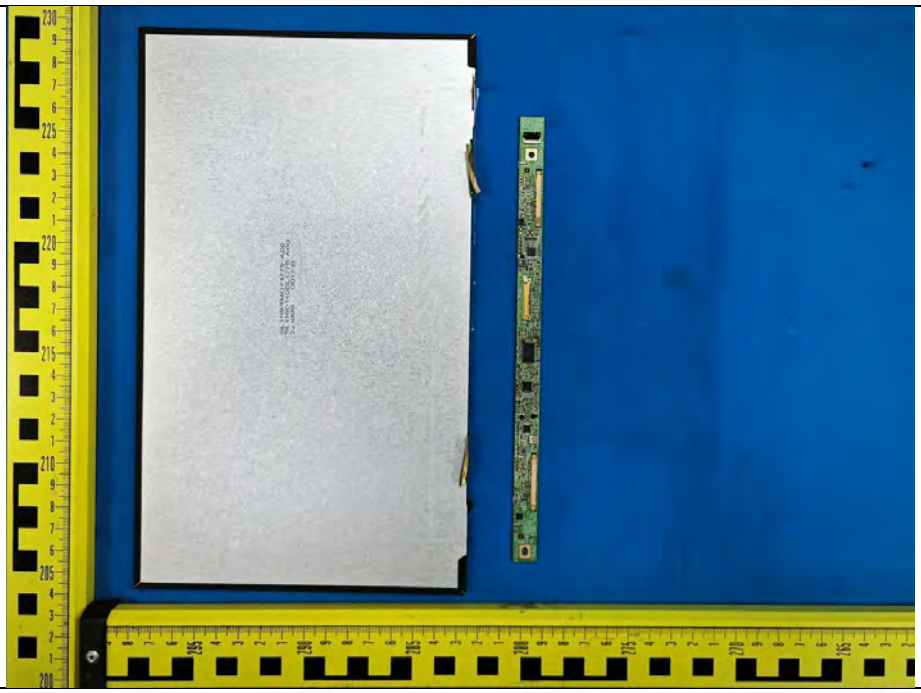

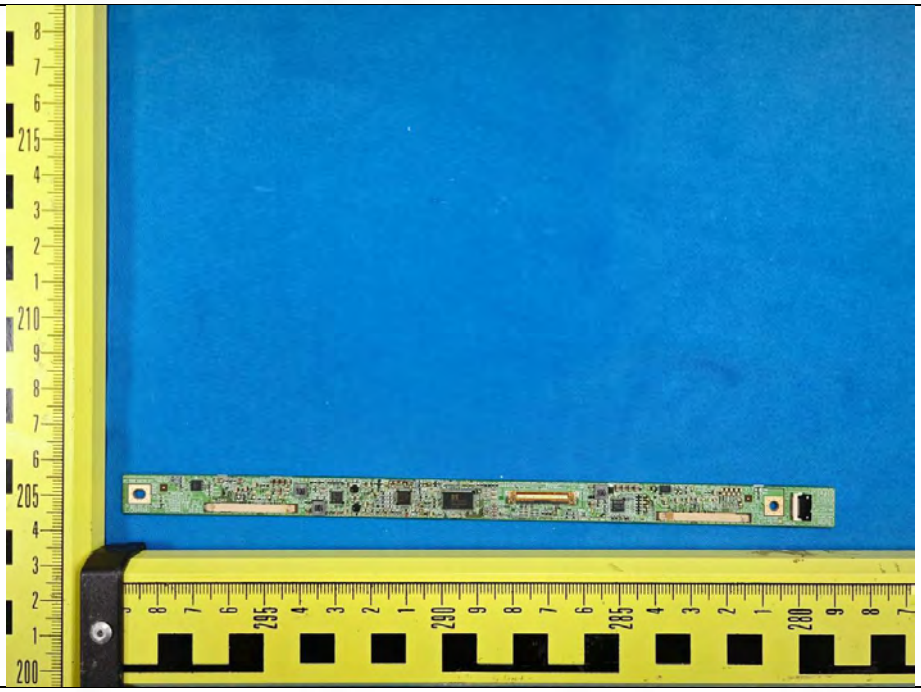

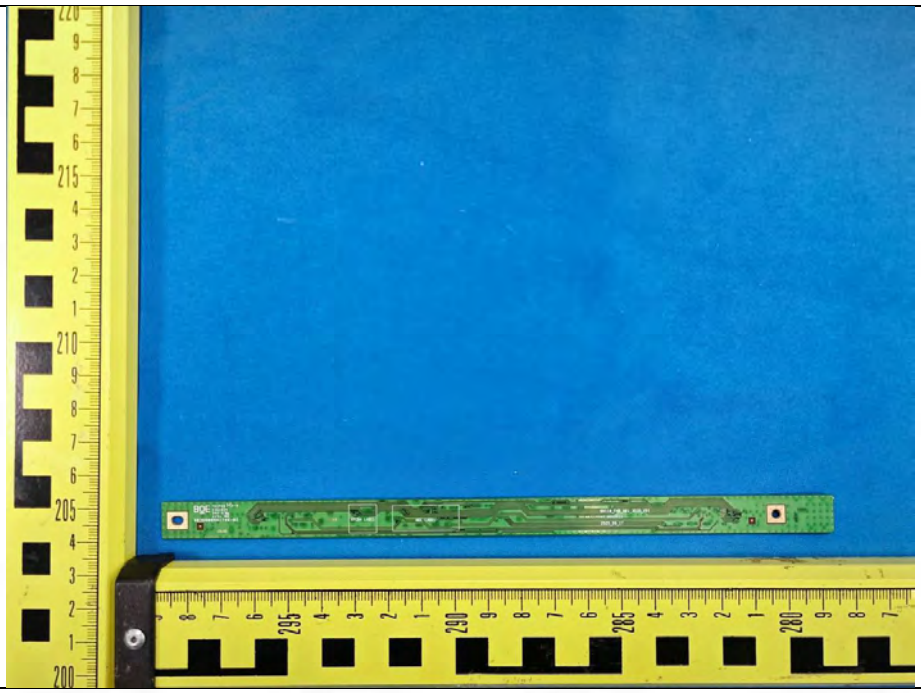

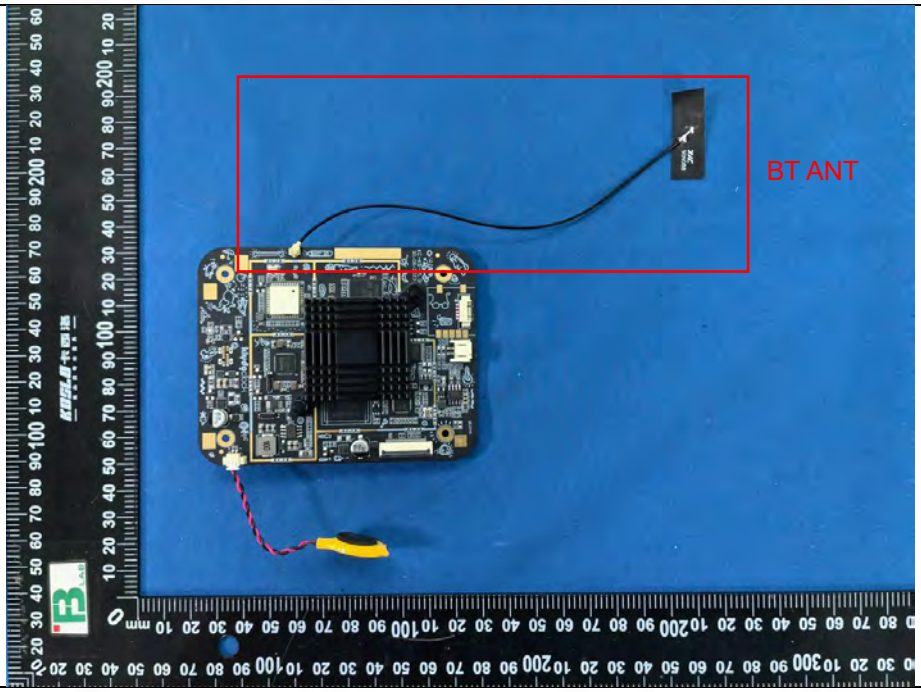
BT ANT

Appendix

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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	8.423	8.453	99.65	0.02	0.00
		2437	8.423	8.453	99.65	0.02	0.00
		2462	8.420	8.453	99.61	0.02	0.04
802.11g	SISO	2412	1.397	1.436	97.28	0.12	0.03
		2437	1.397	1.436	97.28	0.12	0.06
		2462	1.397	1.437	97.22	0.12	0.03
802.11n (HT20)	SISO	2412	1.309	1.349	97.03	0.13	0.03
		2437	1.309	1.348	97.11	0.13	0.07
		2462	1.309	1.349	97.03	0.13	0.03

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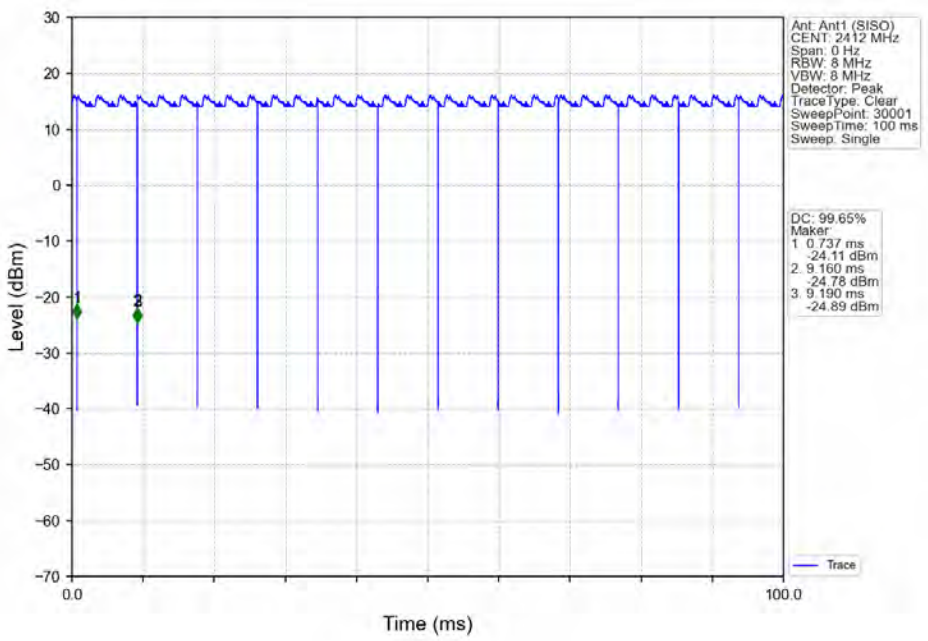
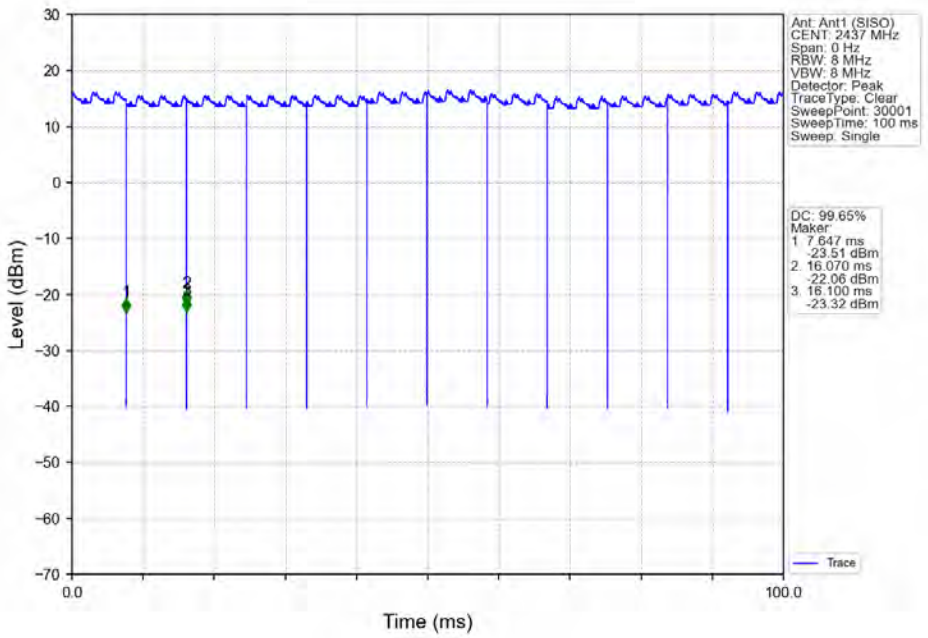
1.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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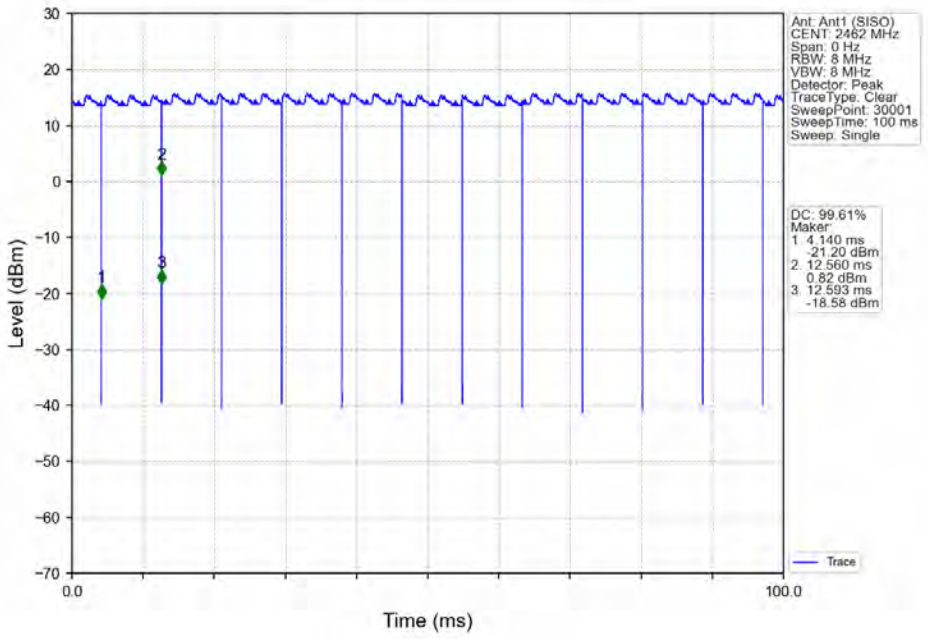
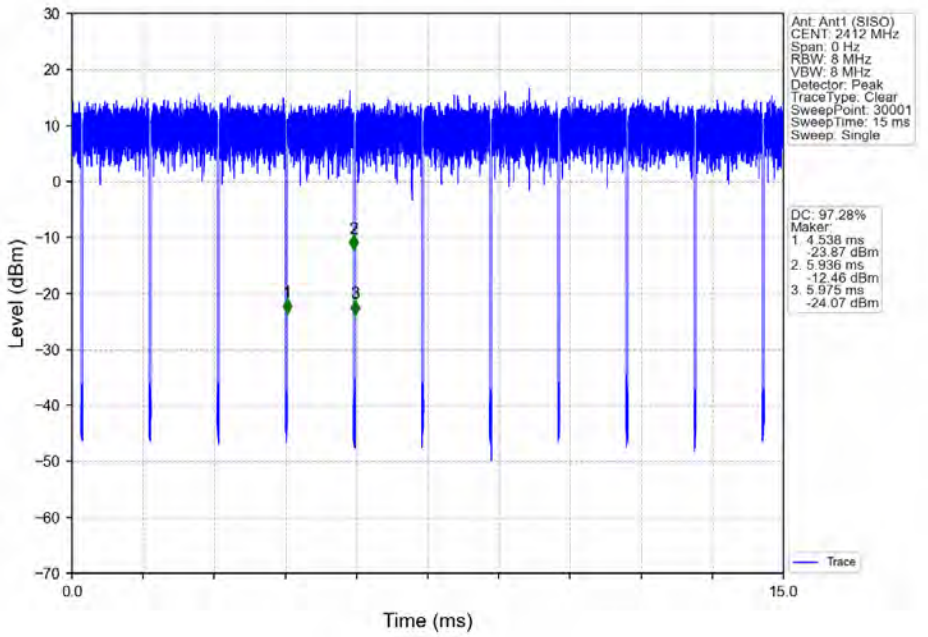
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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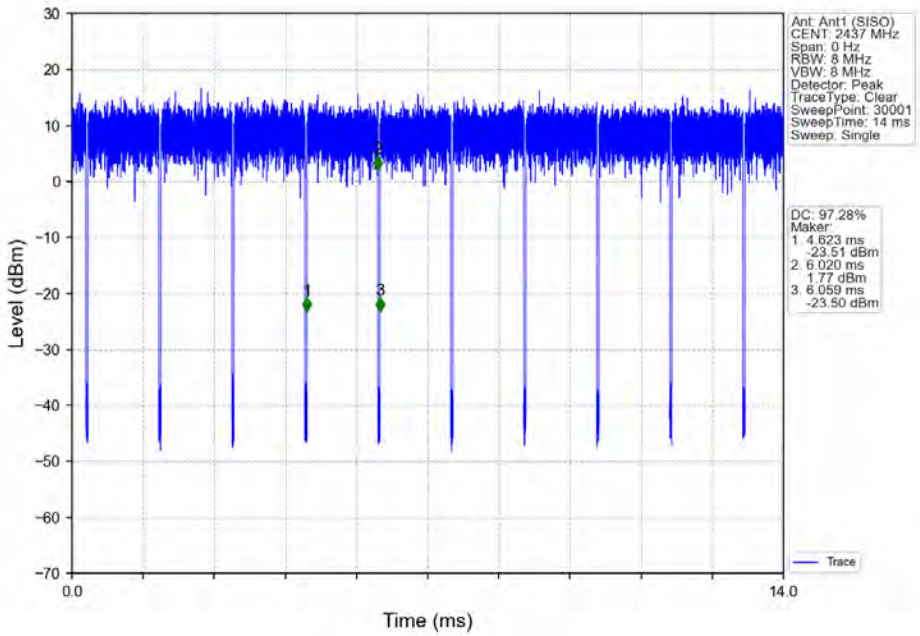
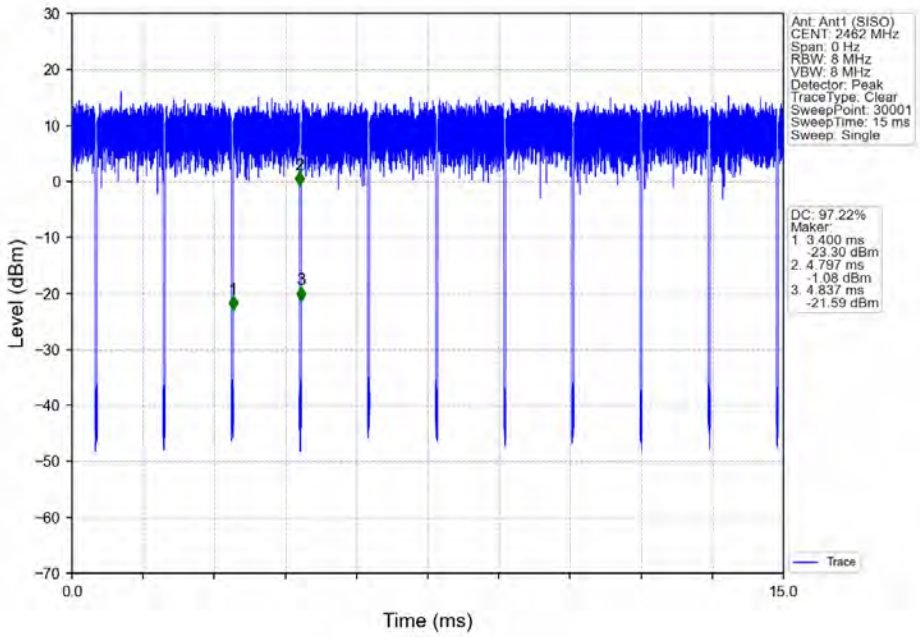
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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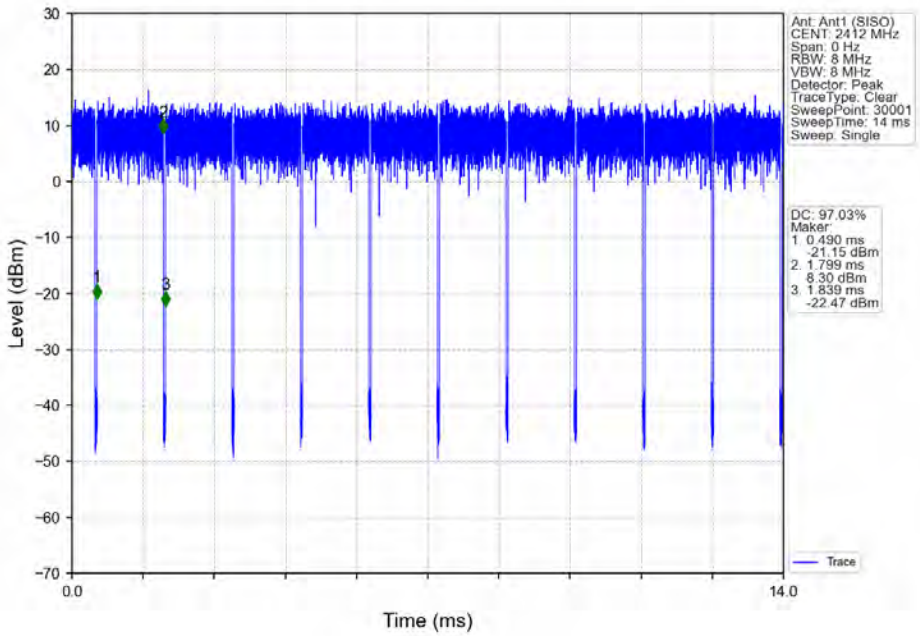
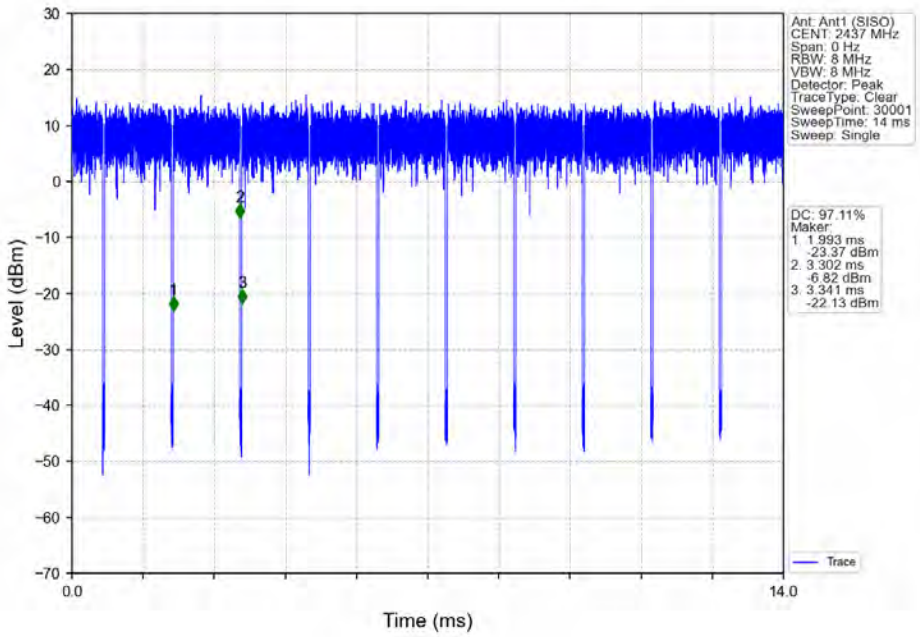
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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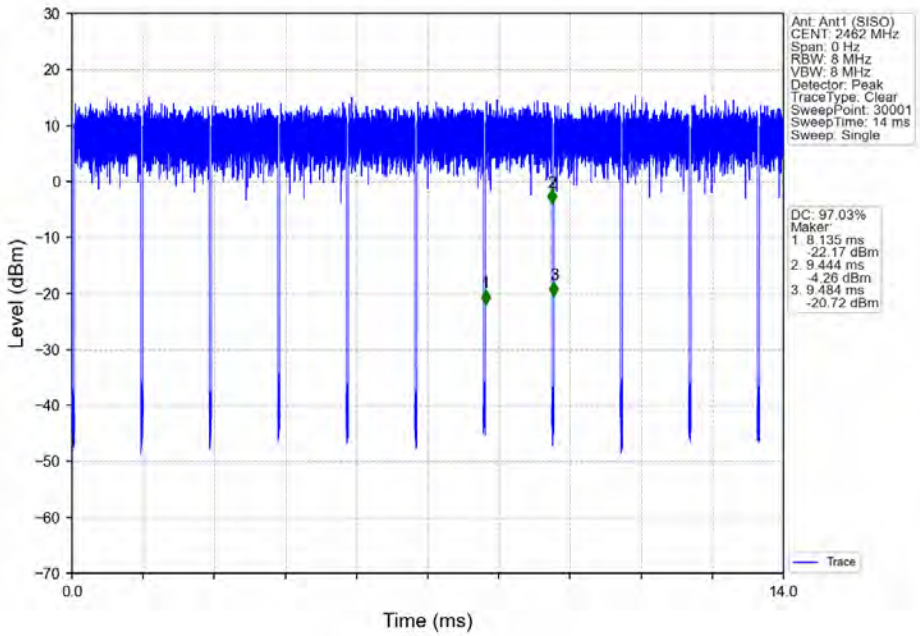
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	13.947	/	Pass
		2437	1	13.946	/	Pass
		2462	1	13.924	/	Pass
802.11g	SISO	2412	1	17.250	/	Pass
		2437	1	17.168	/	Pass
		2462	1	17.204	/	Pass
802.11n (HT20)	SISO	2412	1	18.187	/	Pass
		2437	1	18.150	/	Pass
		2462	1	18.224	/	Pass

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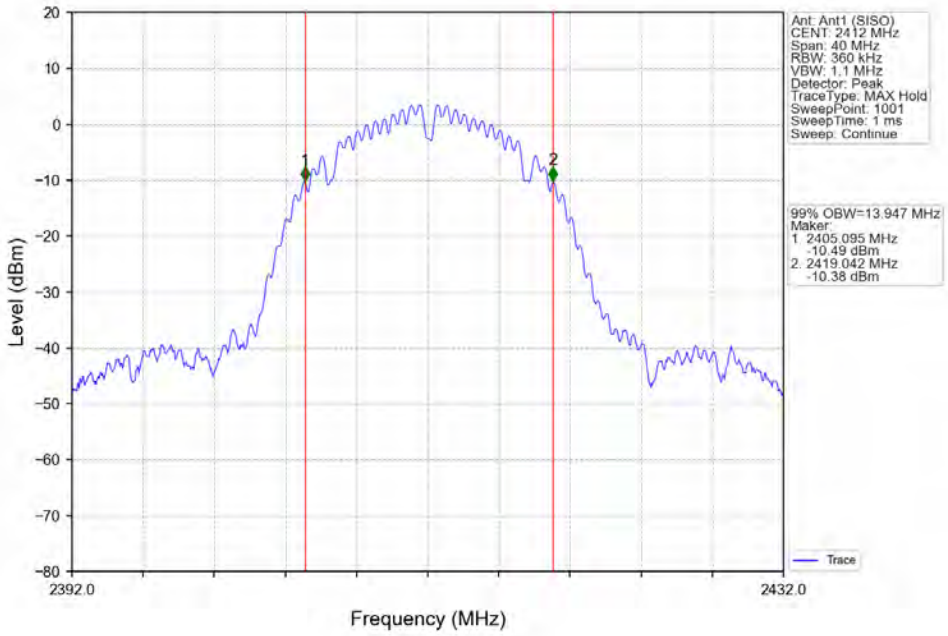
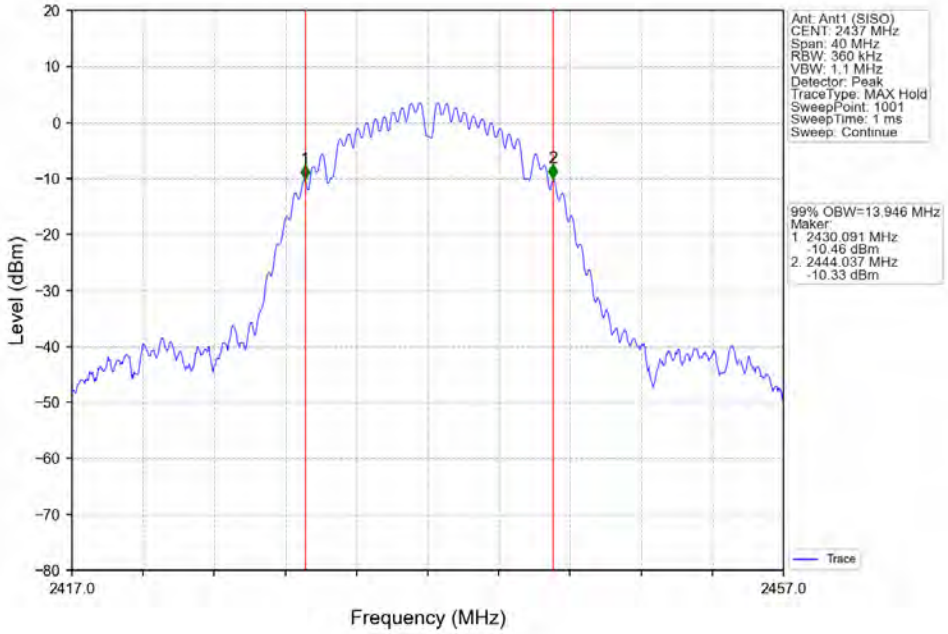
2.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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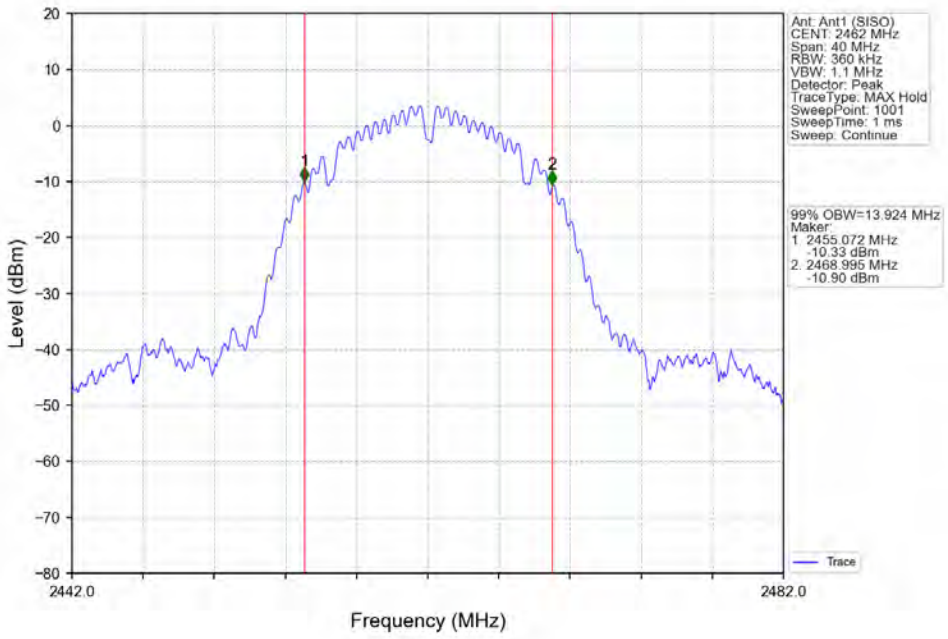
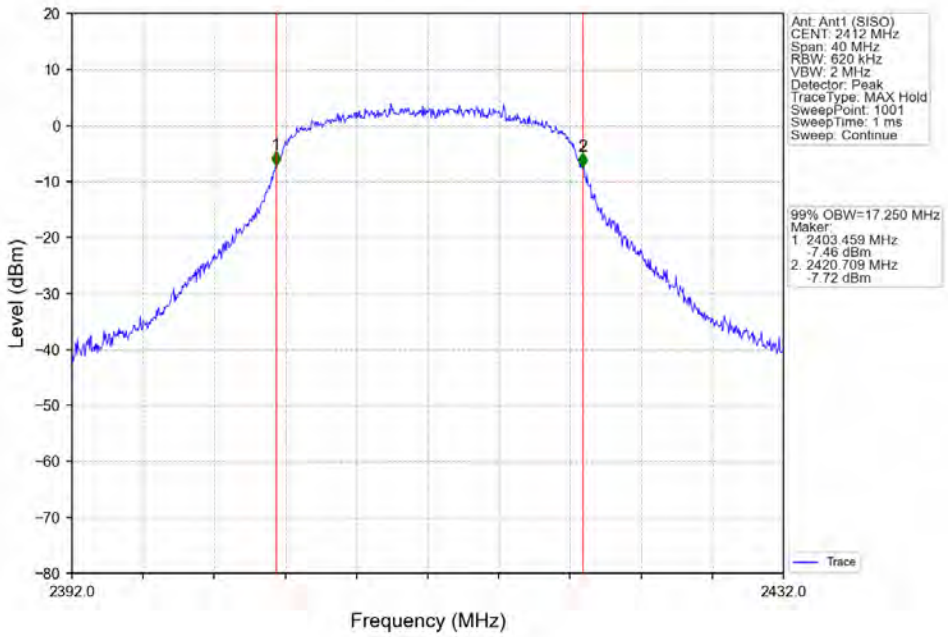
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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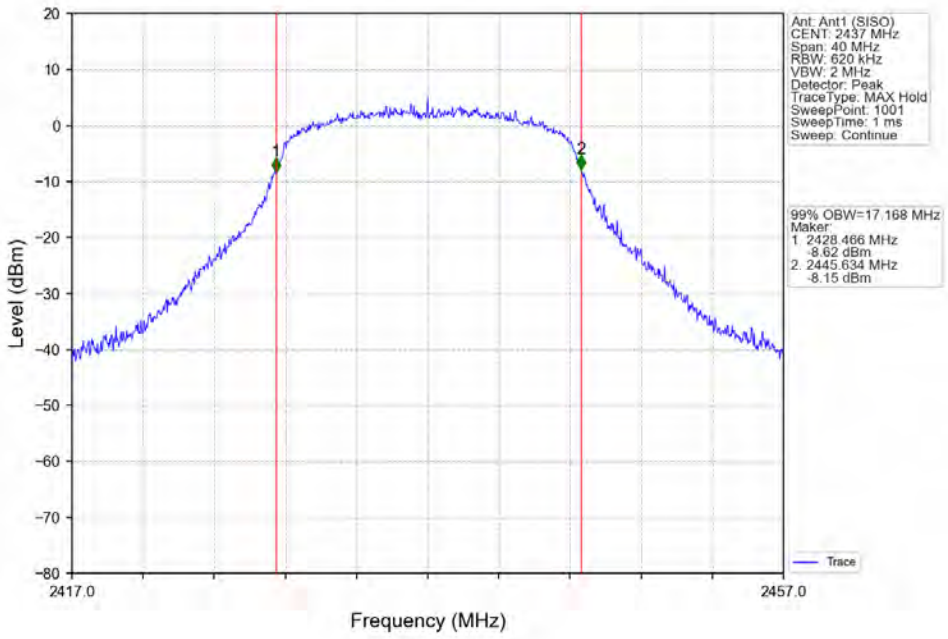
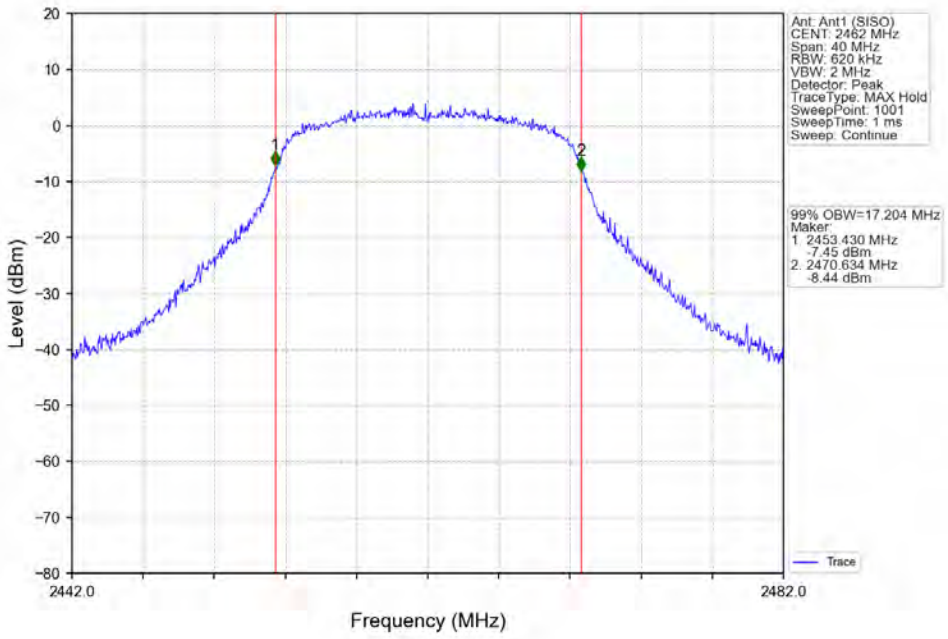
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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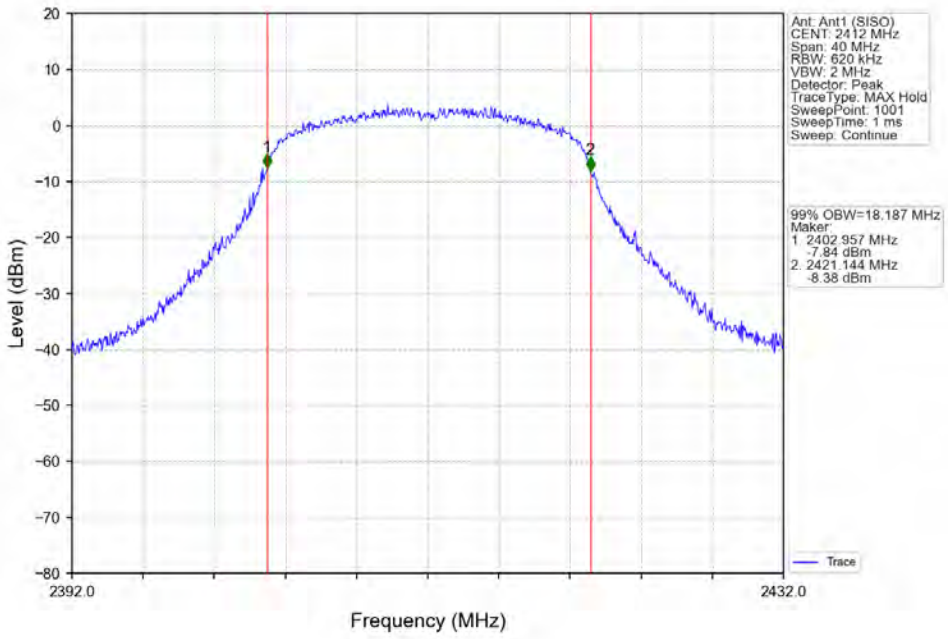
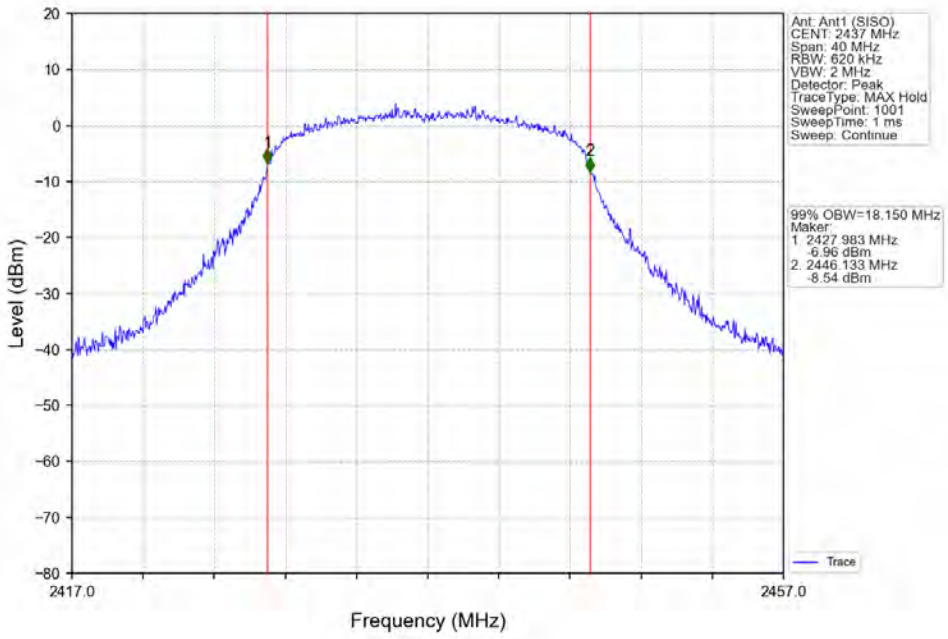
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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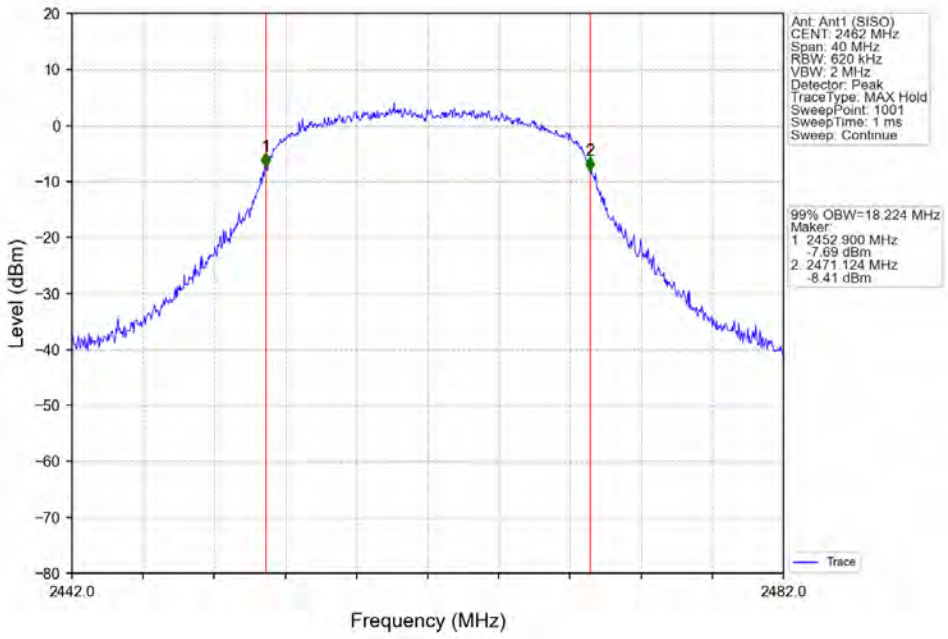
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



2.2 6dB BW

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	8.082	>=0.5	Pass
		2437	1	9.035	>=0.5	Pass
		2462	1	8.109	>=0.5	Pass
802.11g	SISO	2412	1	15.147	>=0.5	Pass
		2437	1	15.148	>=0.5	Pass
		2462	1	15.147	>=0.5	Pass
802.11n (HT20)	SISO	2412	1	15.168	>=0.5	Pass
		2437	1	15.145	>=0.5	Pass
		2462	1	15.134	>=0.5	Pass

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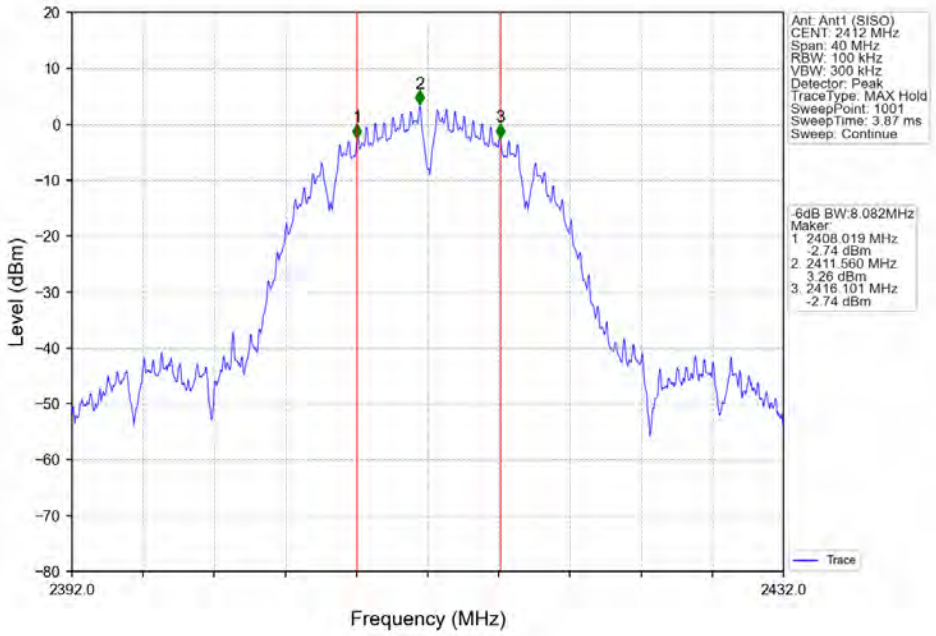
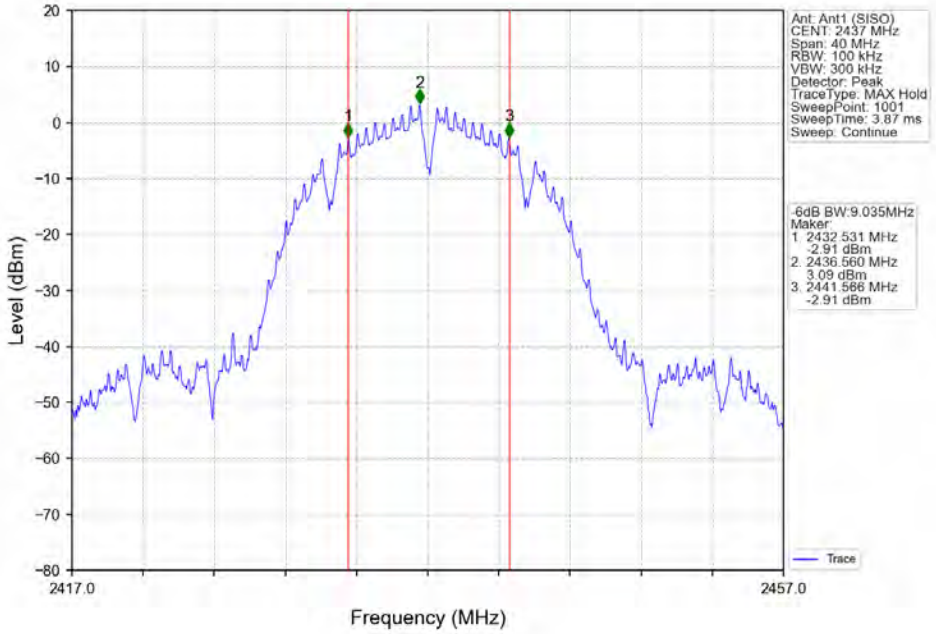
2.2.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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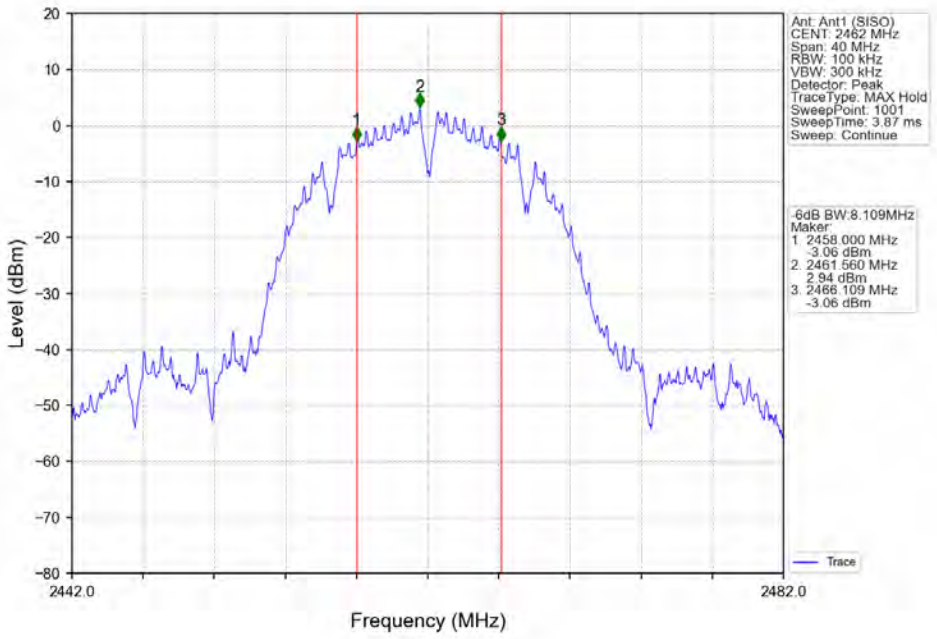
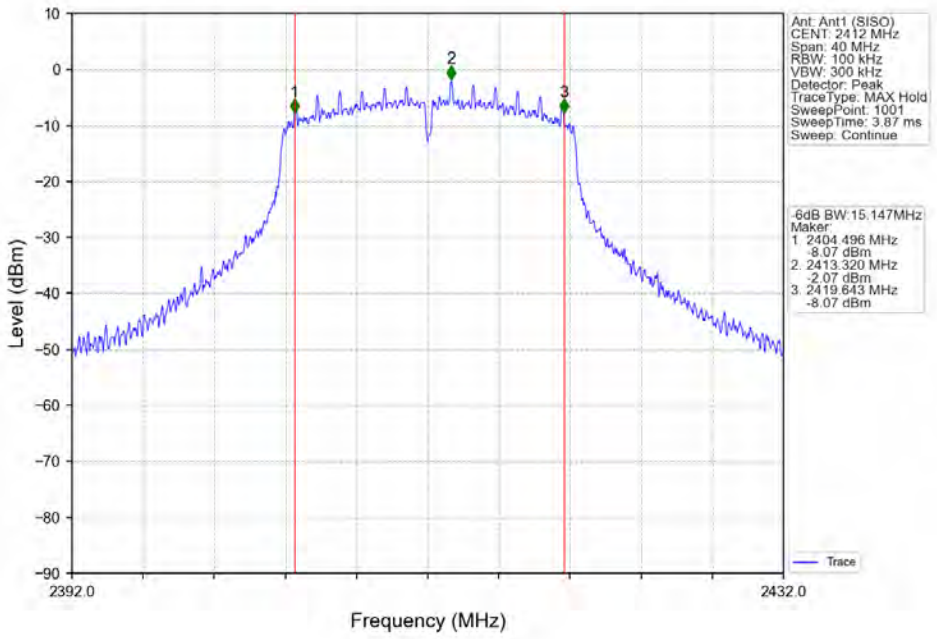
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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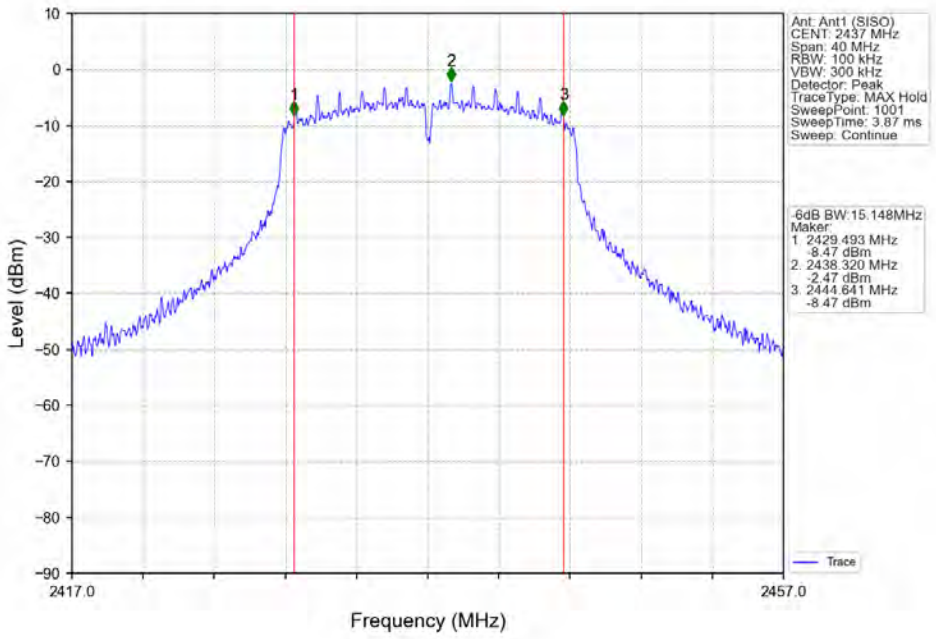
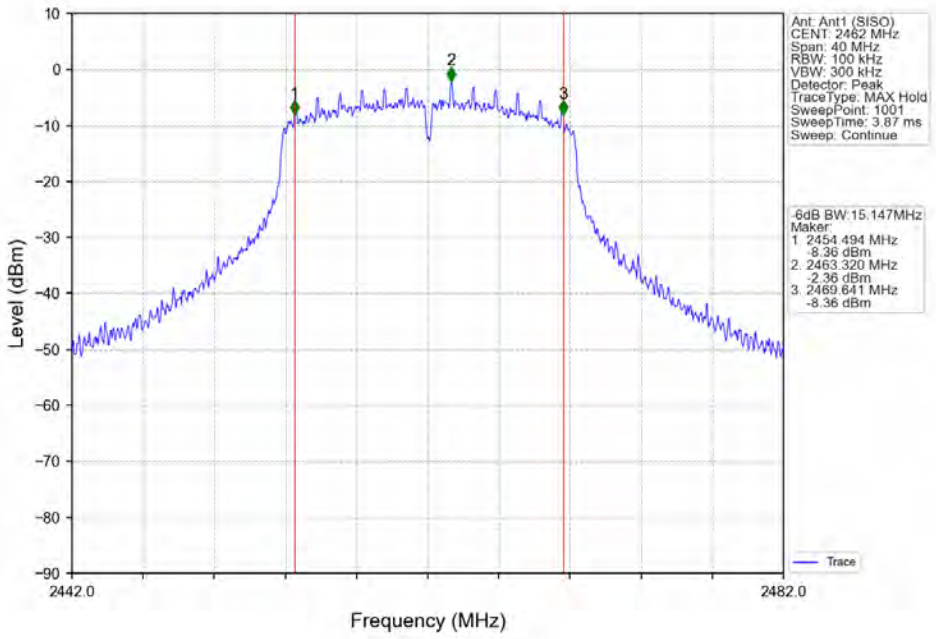
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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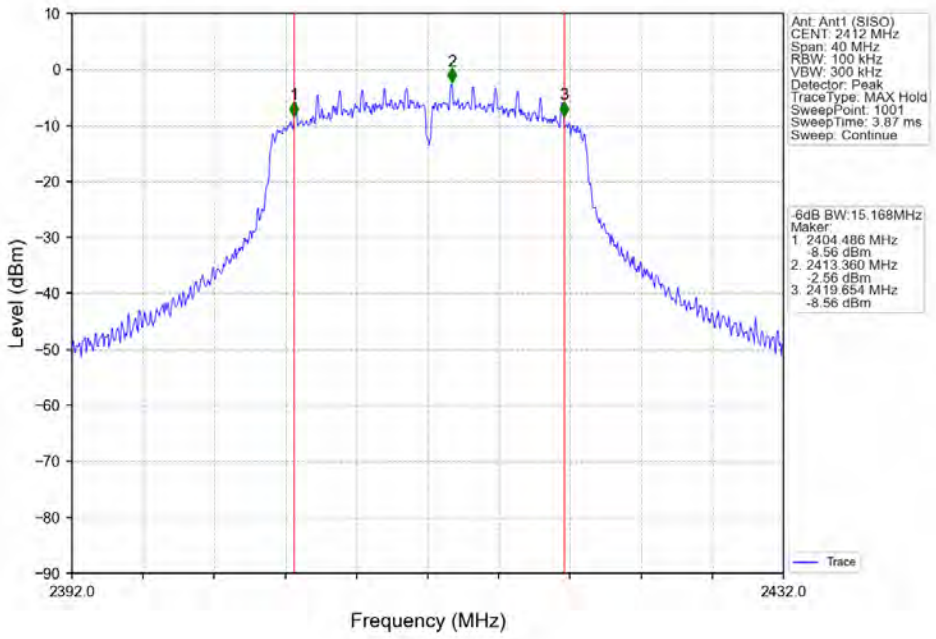
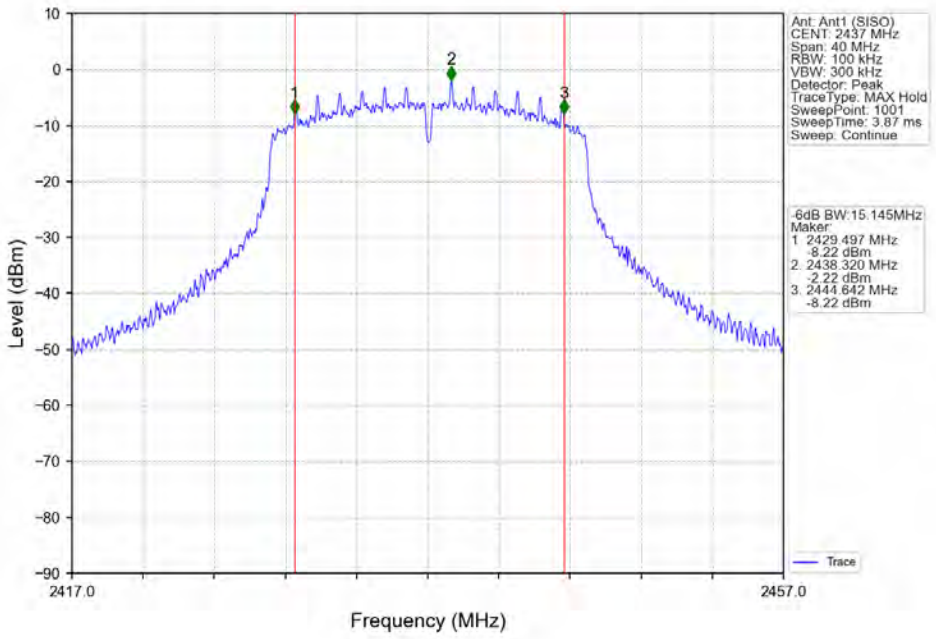
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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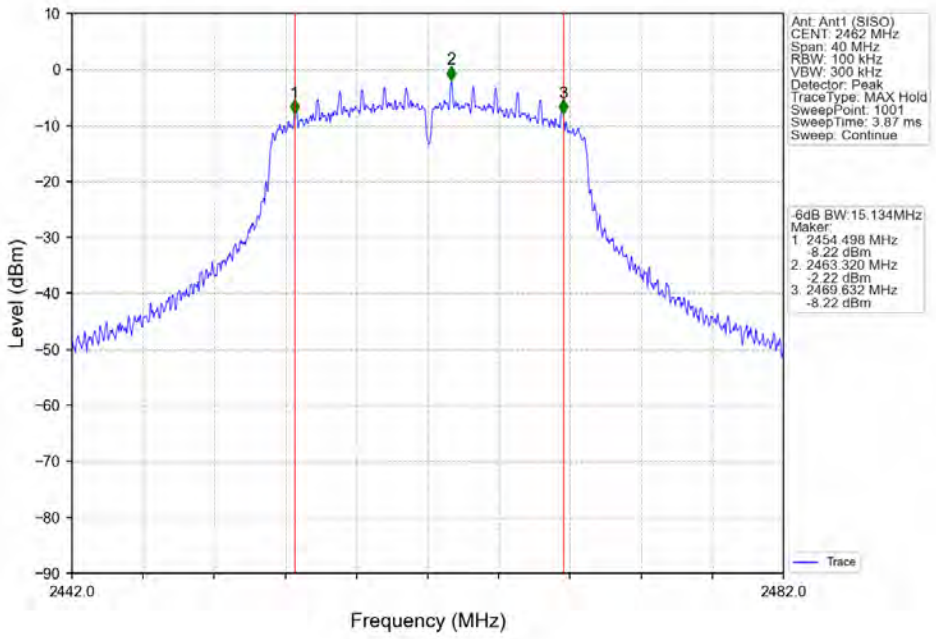
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	13.45	<=30	Pass
		2437	13.99	<=30	Pass
		2462	13.48	<=30	Pass
802.11g	SISO	2412	15.78	<=30	Pass
		2437	15.72	<=30	Pass
		2462	15.57	<=30	Pass
802.11n (HT20)	SISO	2412	15.47	<=30	Pass
		2437	15.28	<=30	Pass
		2462	15.22	<=30	Pass
Note1: Antenna Gain: Ant1: 3.00dBi;					

4. Maximum Power Spectral Density

4.1 PSD

4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-11.10	<=8	Pass
		2437	-11.32	<=8	Pass
		2462	-12.48	<=8	Pass
802.11g	SISO	2412	-17.30	<=8	Pass
		2437	-17.09	<=8	Pass
		2462	-16.27	<=8	Pass
802.11n (HT20)	SISO	2412	-16.40	<=8	Pass
		2437	-16.89	<=8	Pass
		2462	-17.39	<=8	Pass
Note1: Antenna Gain: Ant1: 3.00dBi;					

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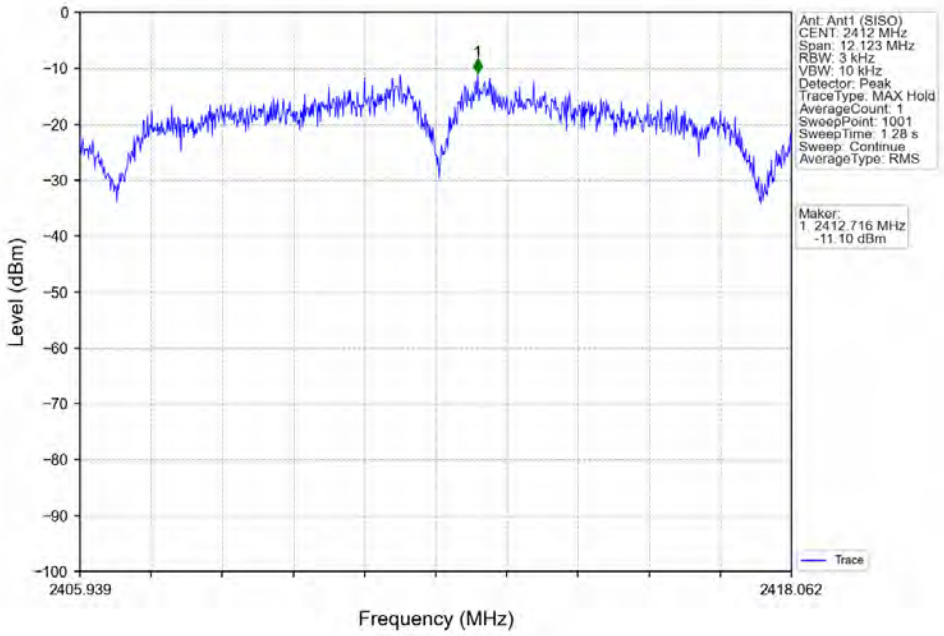
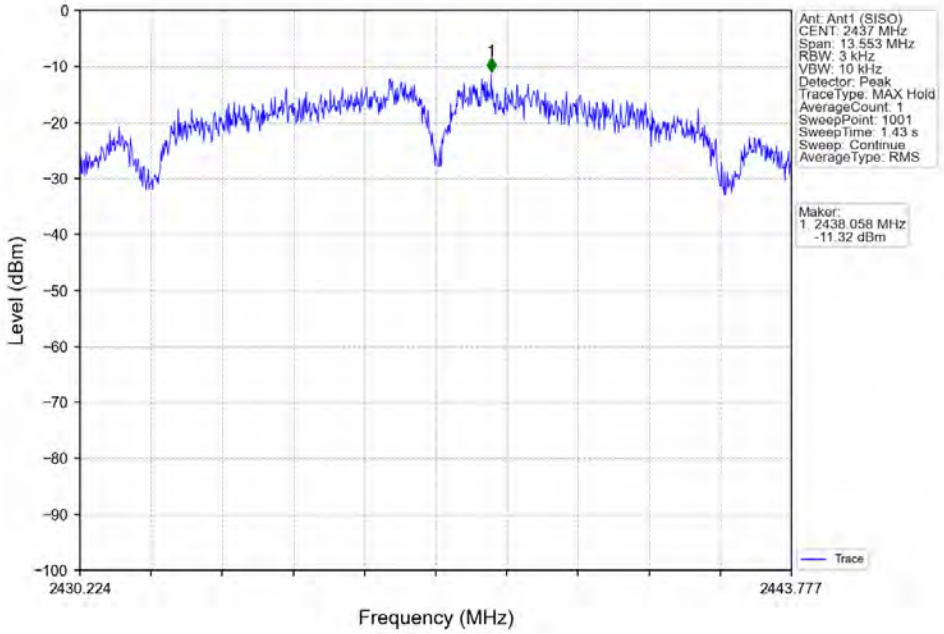
4.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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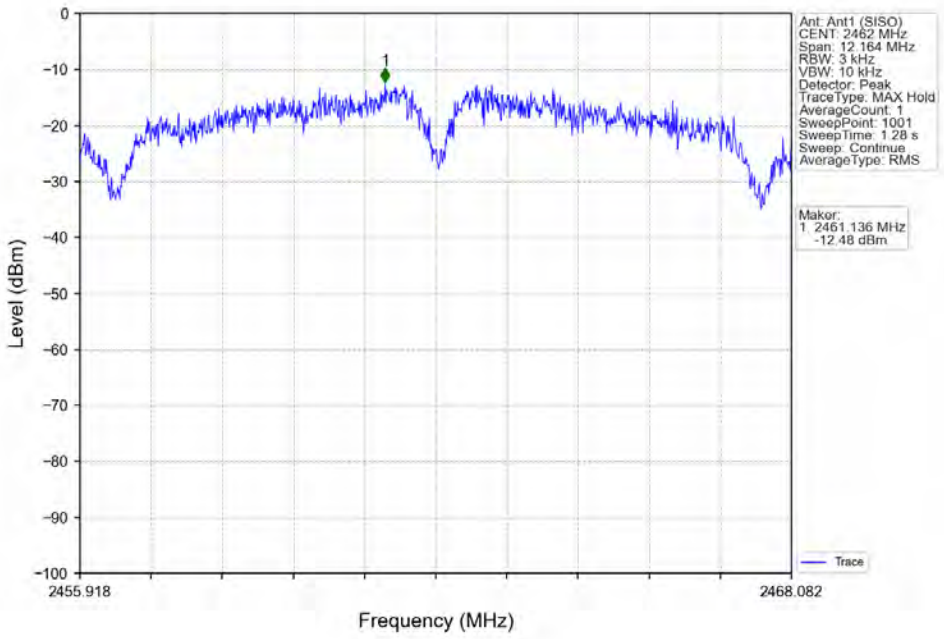
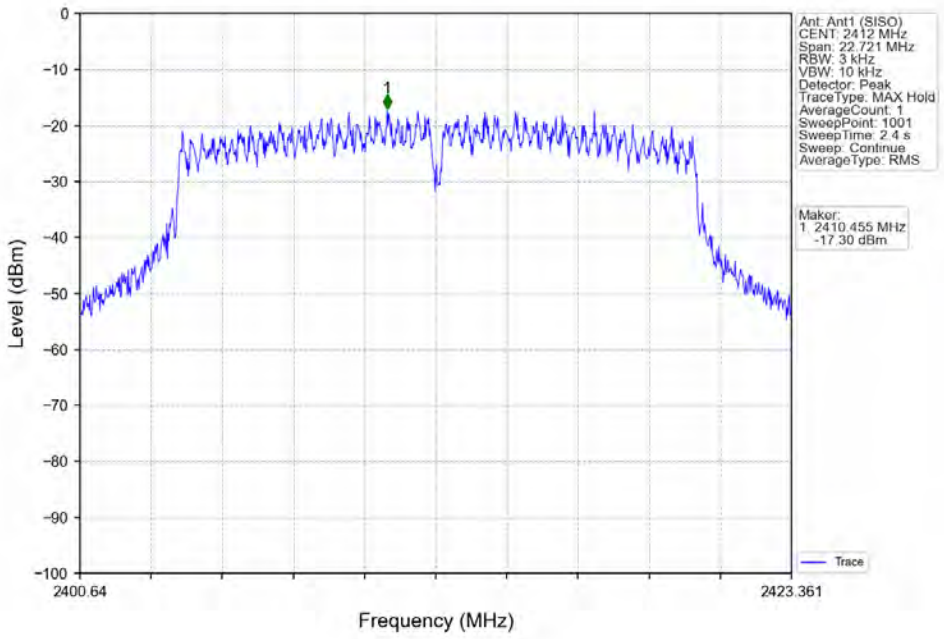
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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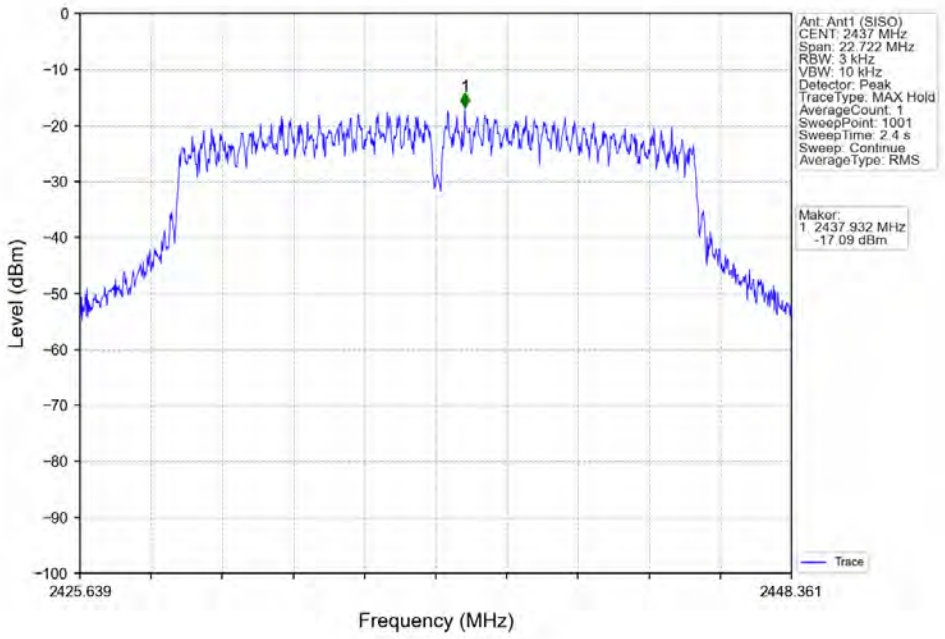
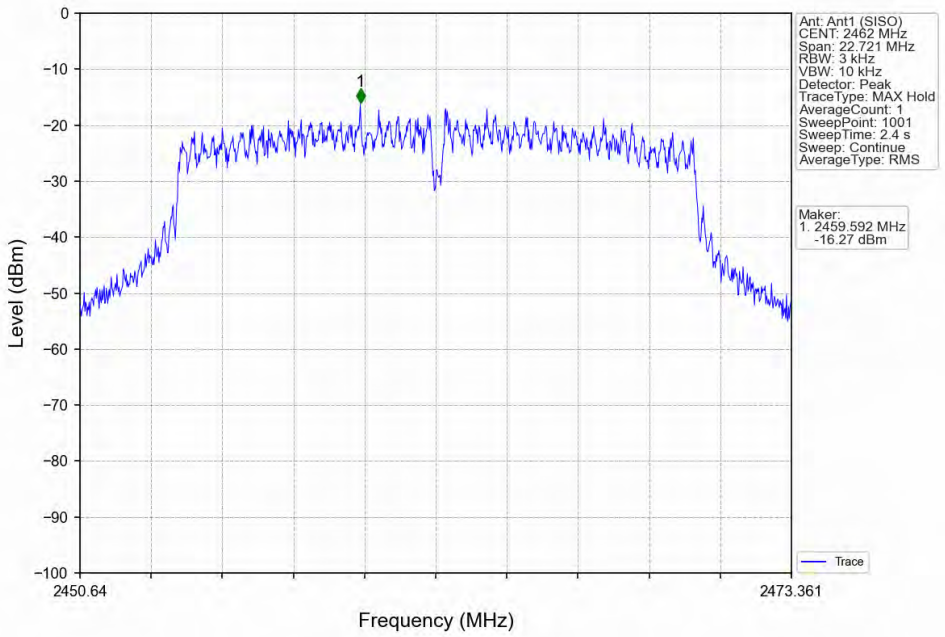
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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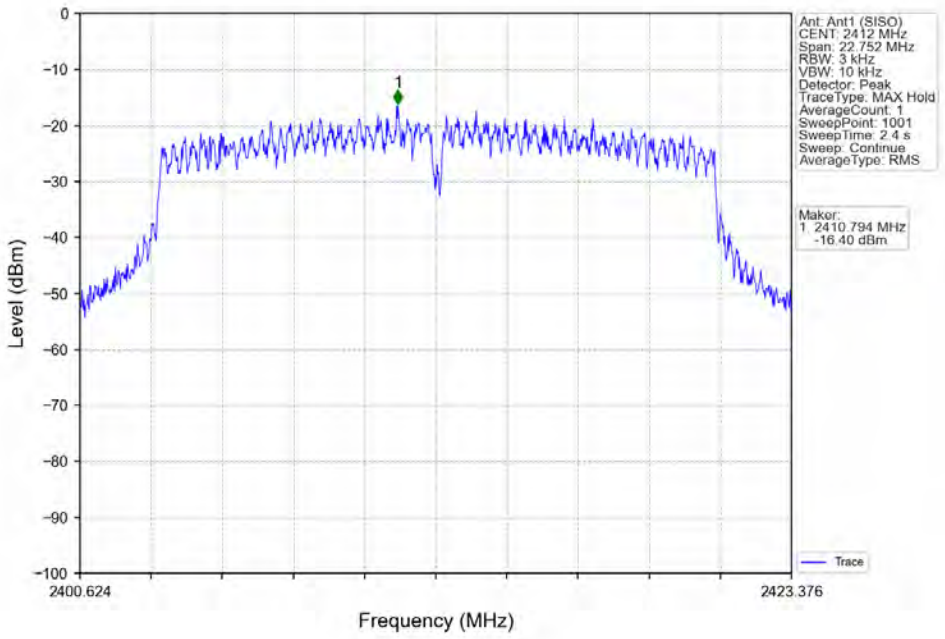
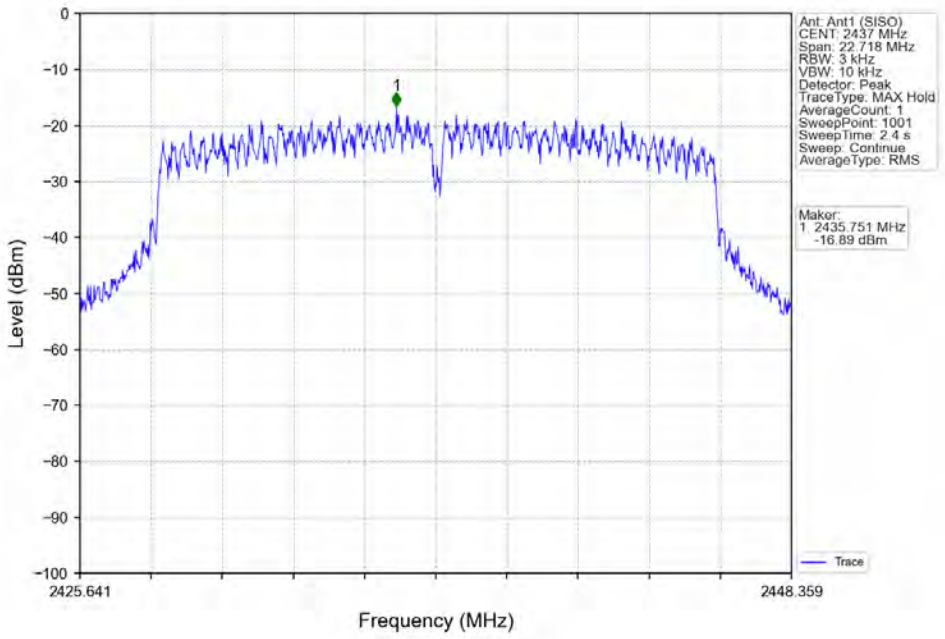
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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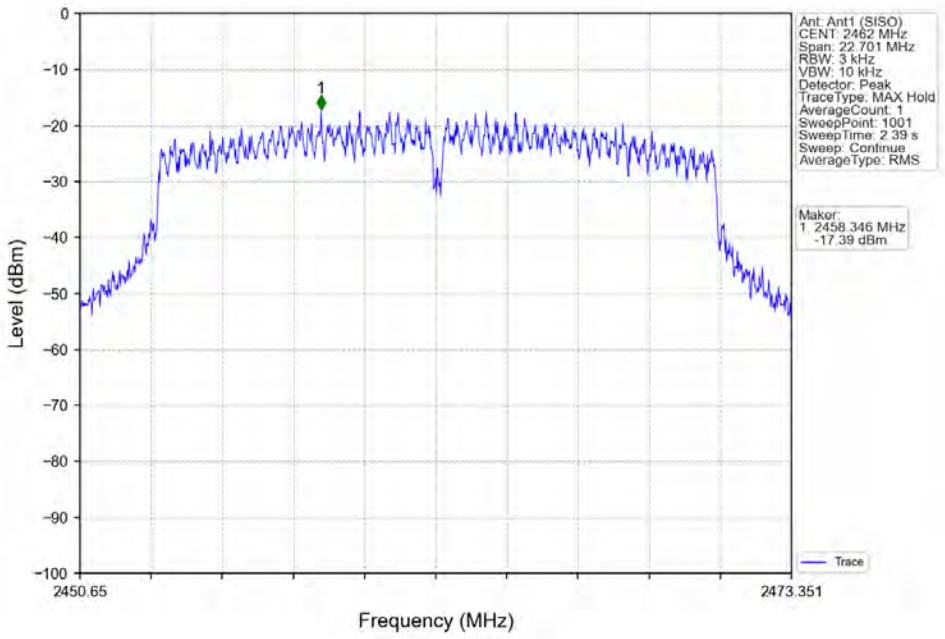
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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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	3.40
		2437	1	3.03
		2462	1	3.15
802.11g	SISO	2412	1	-2.00
		2437	1	-1.92
		2462	1	-2.12
802.11n (HT20)	SISO	2412	1	-2.00
		2437	1	-2.02
		2462	1	-2.61
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.				

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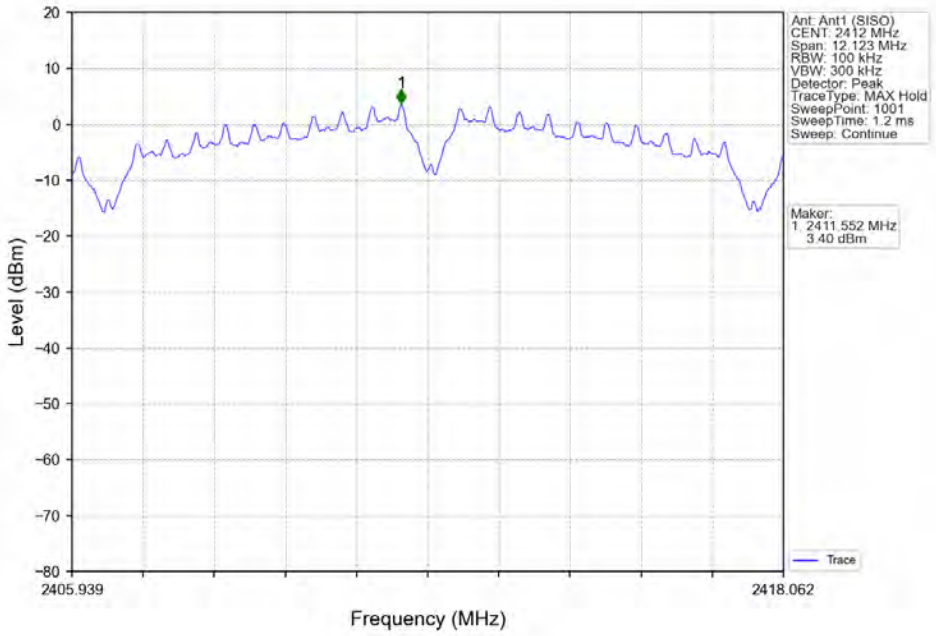
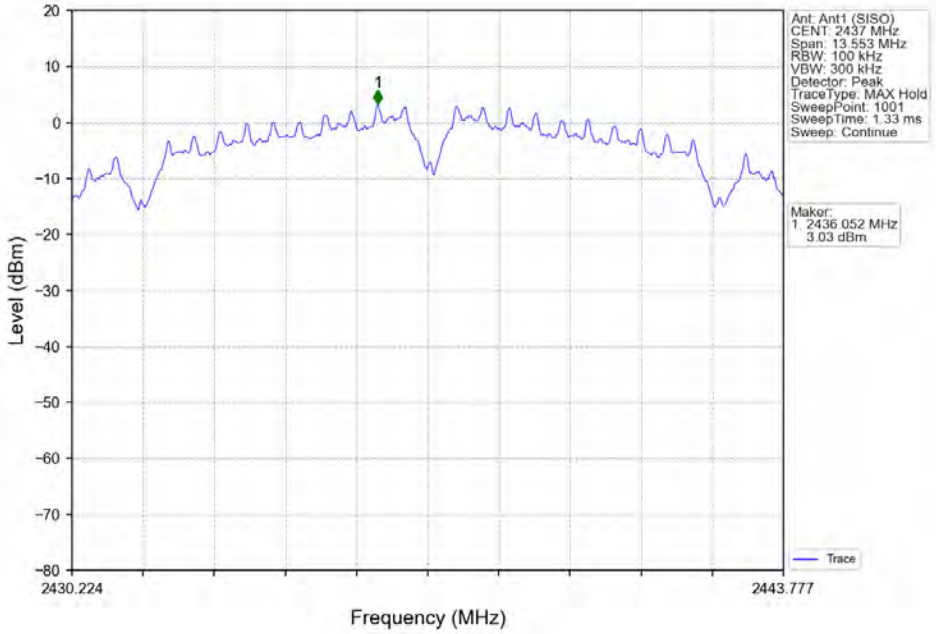
5.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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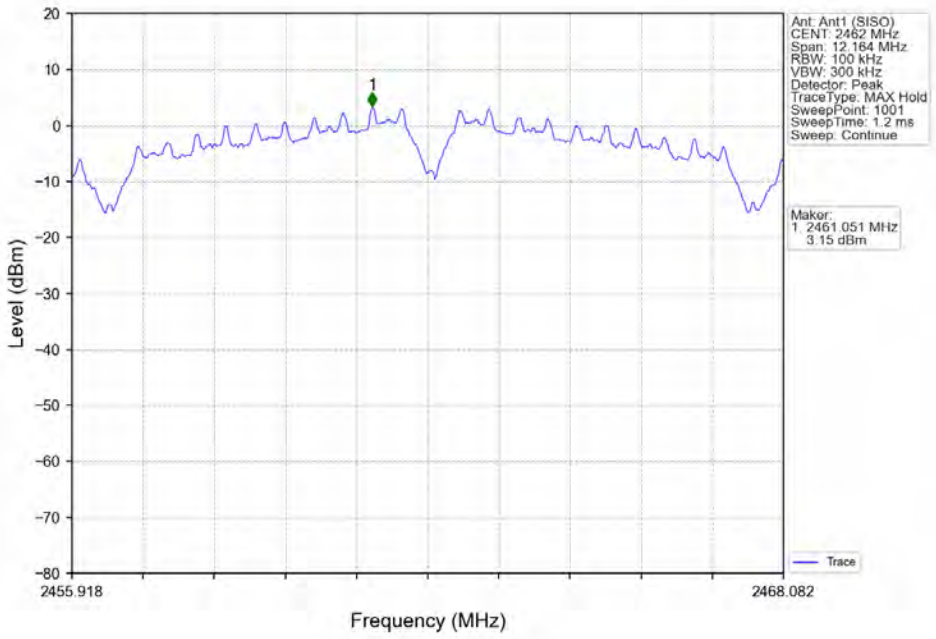
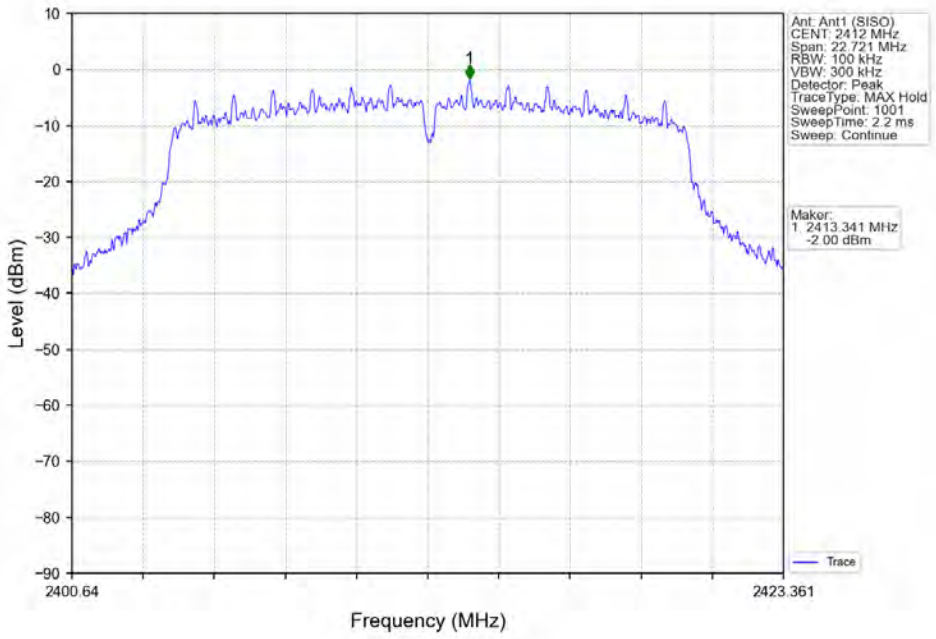
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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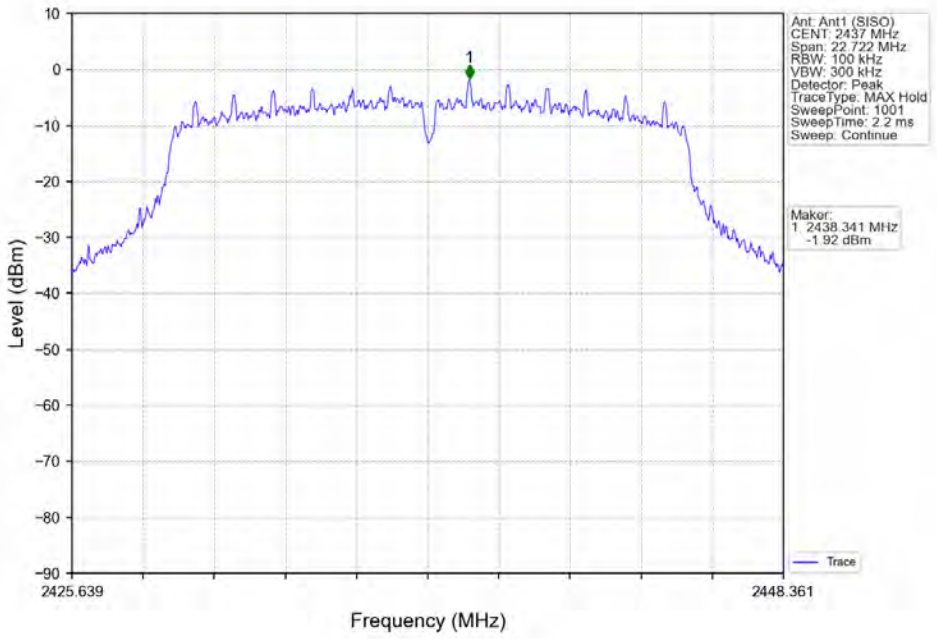
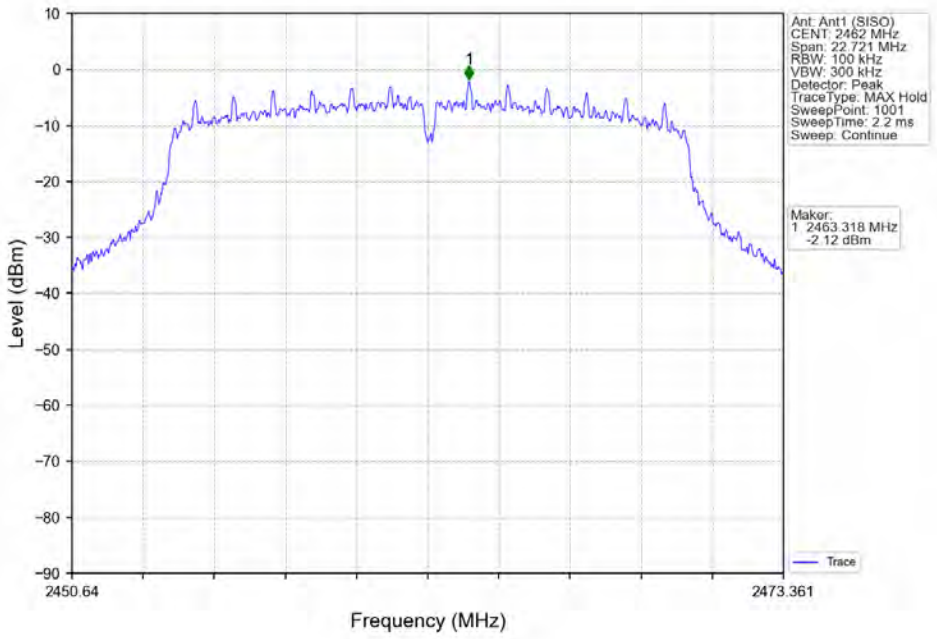
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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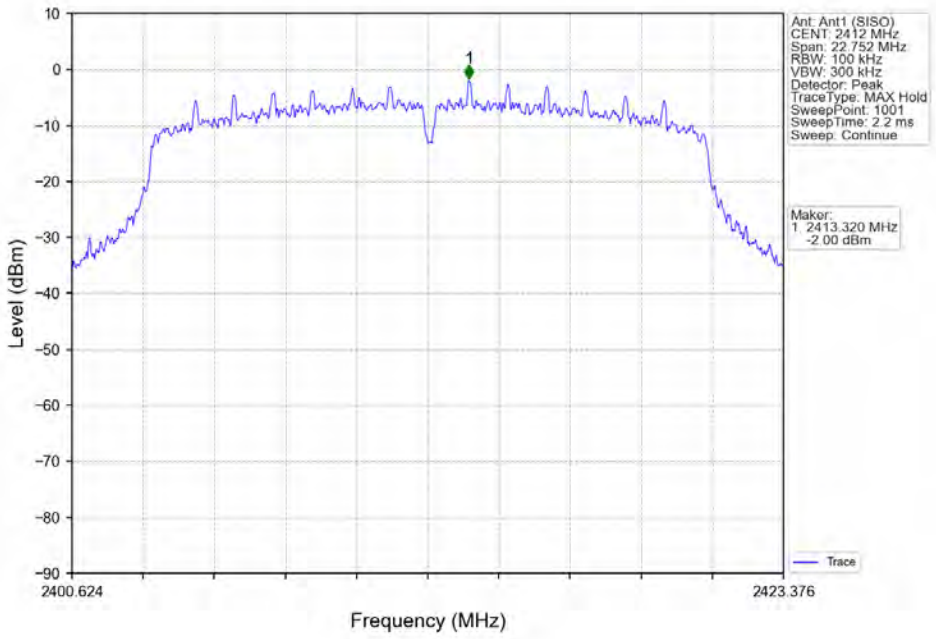
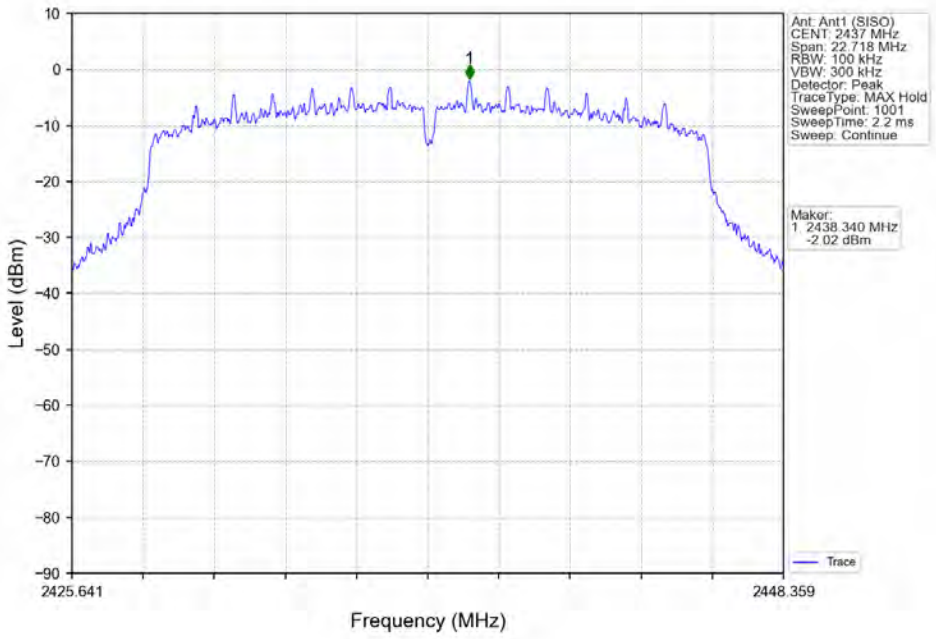
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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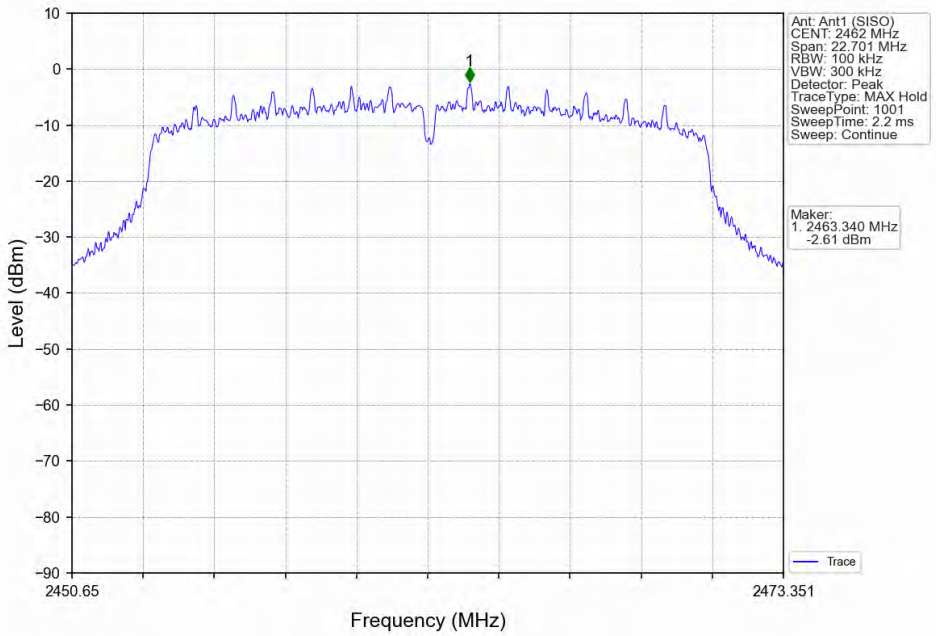
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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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	3.40	-16.60	Pass
		2437	1	3.40	-16.60	Pass
		2462	1	3.40	-16.60	Pass
802.11g	SISO	2412	1	-1.92	-21.92	Pass
		2437	1	-1.92	-21.92	Pass
		2462	1	-1.92	-21.92	Pass
802.11n (HT20)	SISO	2412	1	-2.00	-22.00	Pass
		2437	1	-2.00	-22.00	Pass
		2462	1	-2.00	-22.00	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.						

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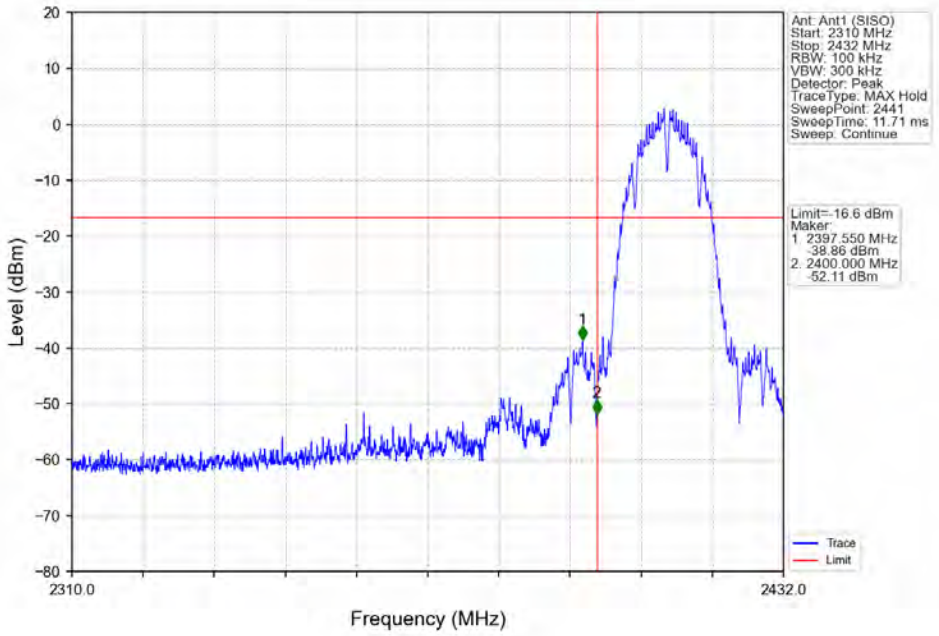
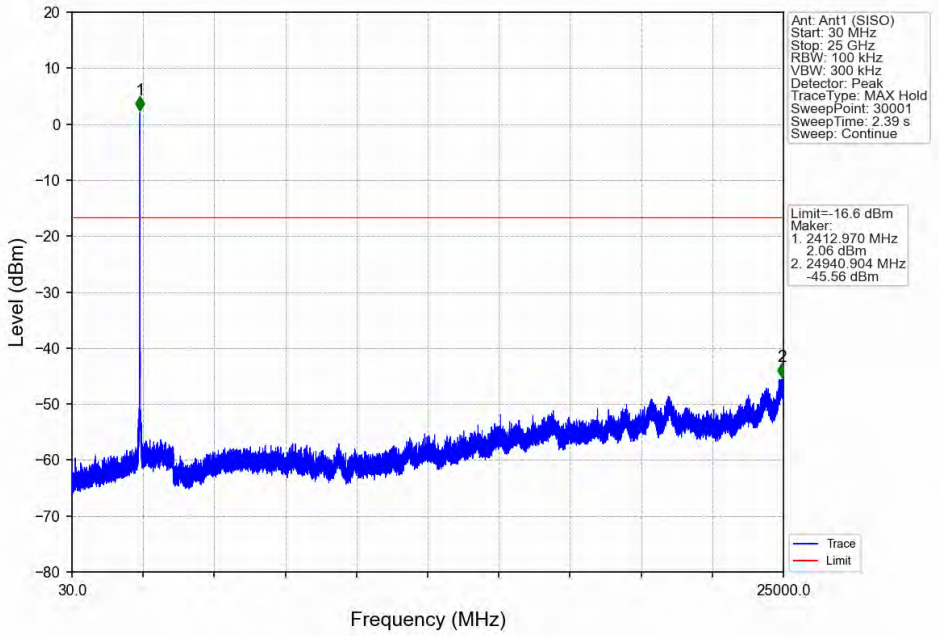
5.2.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



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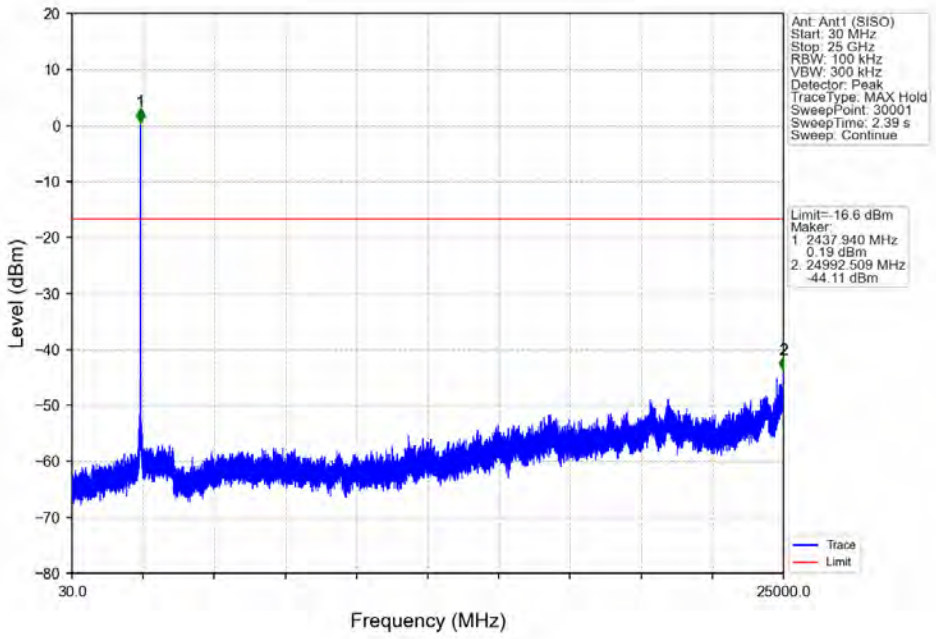
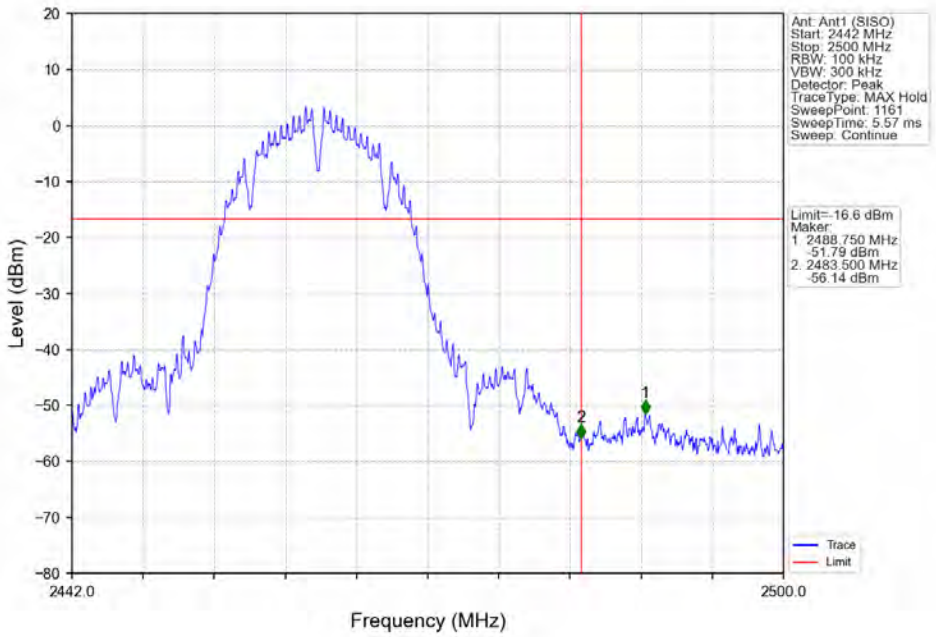
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



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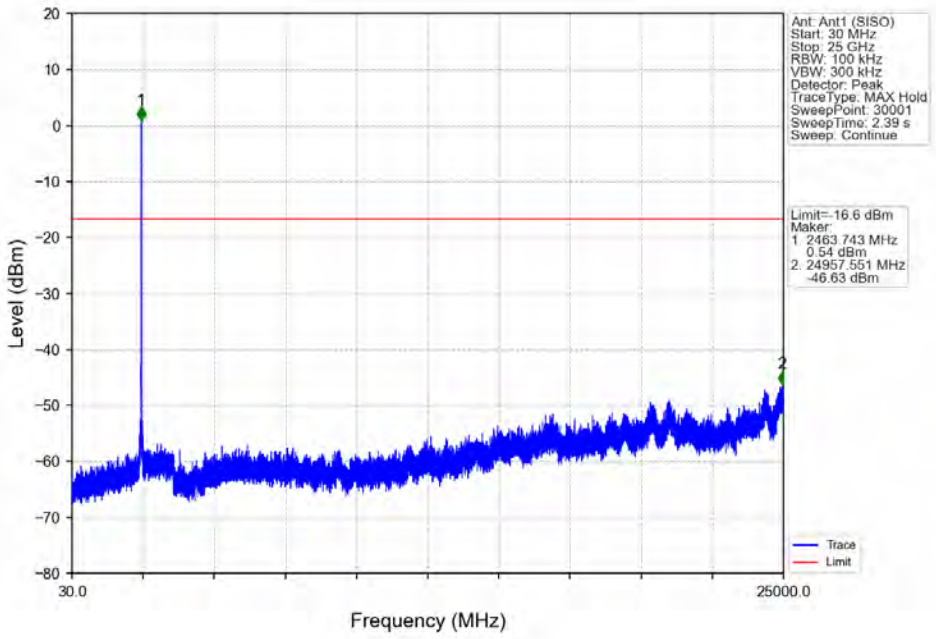
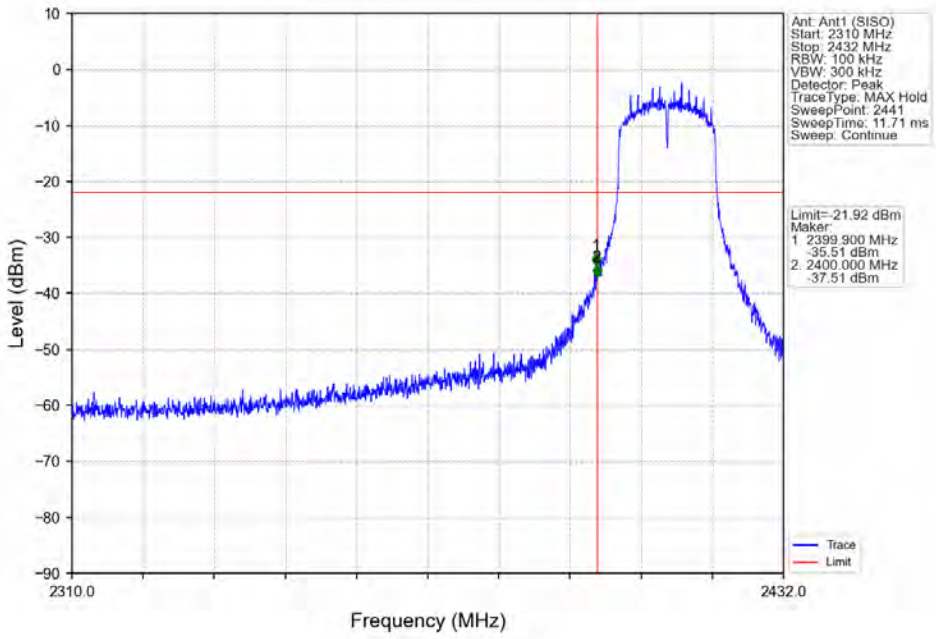
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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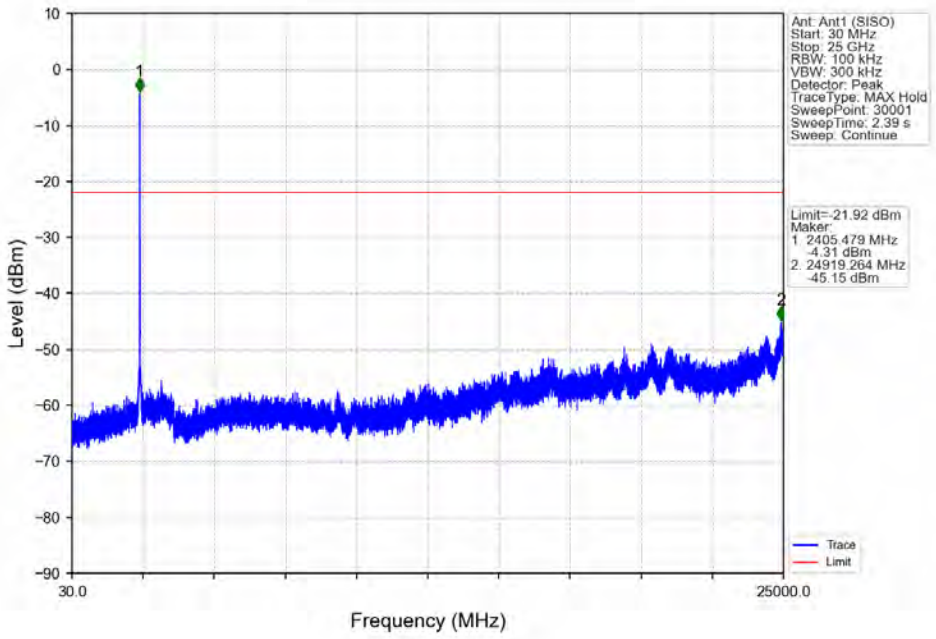
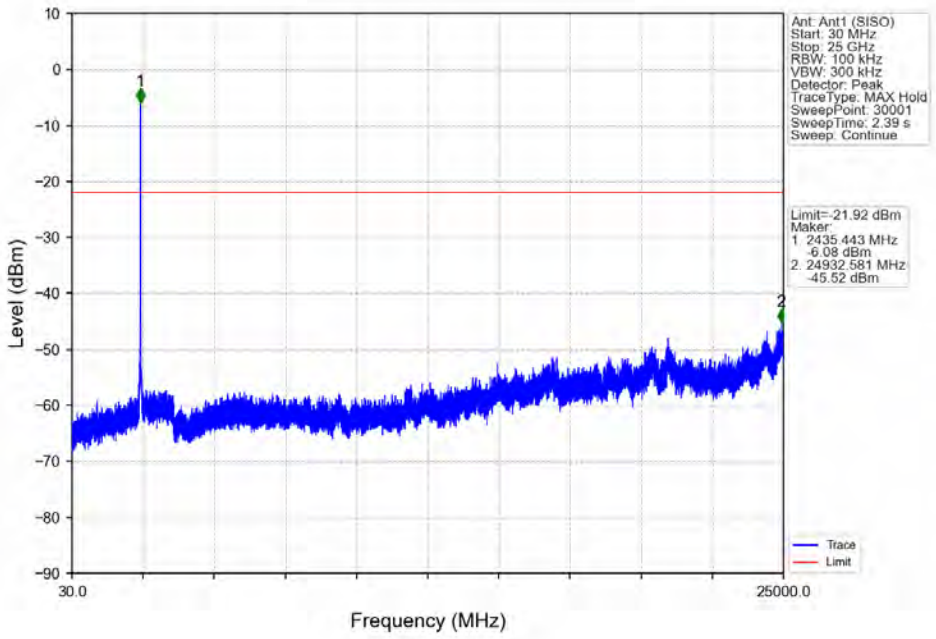
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



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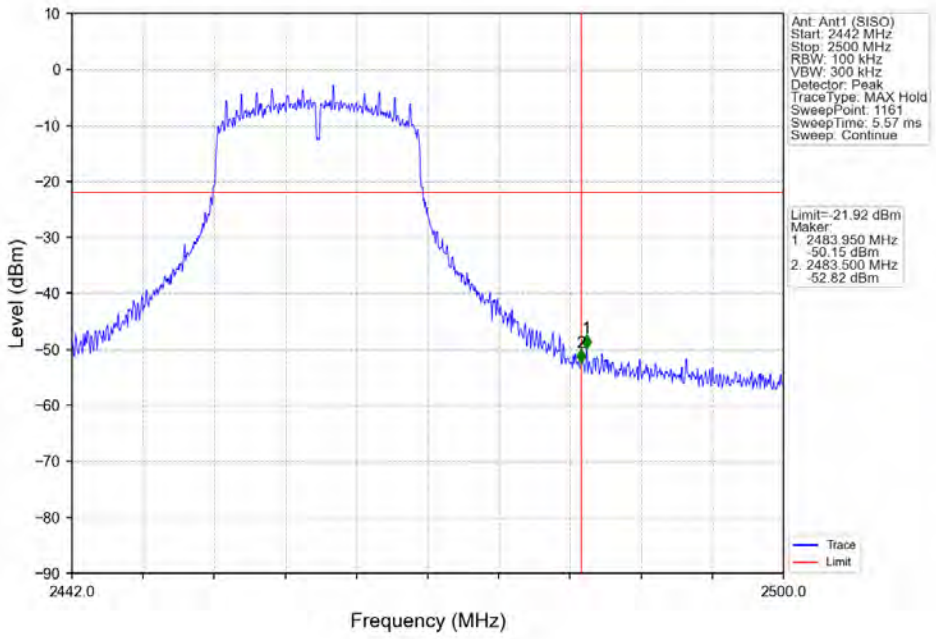
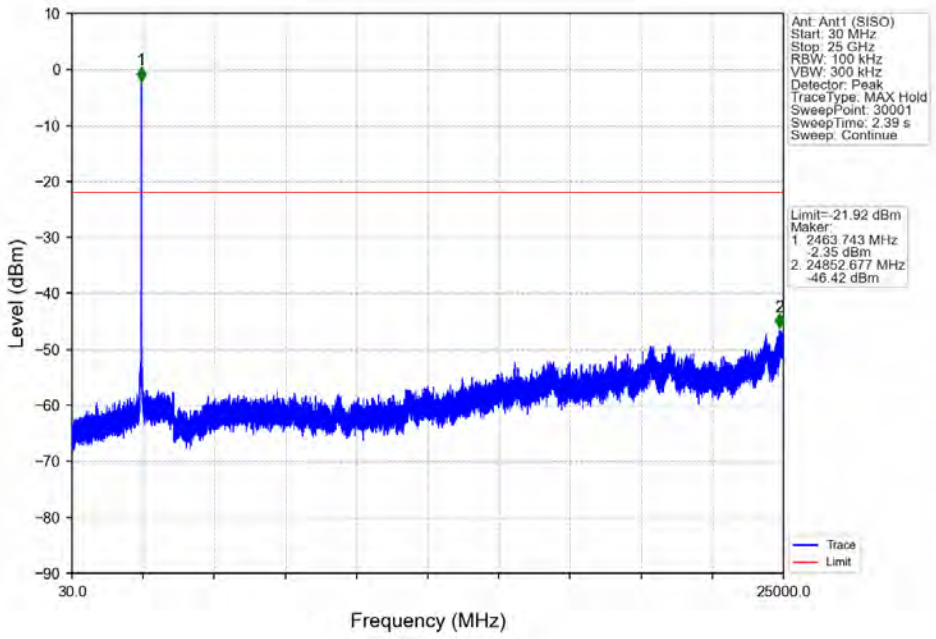
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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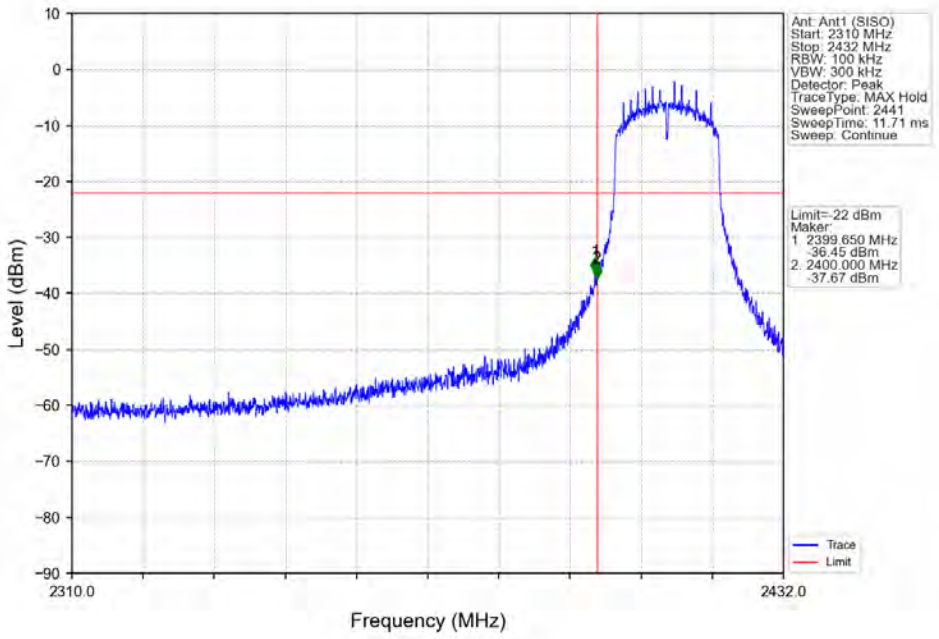
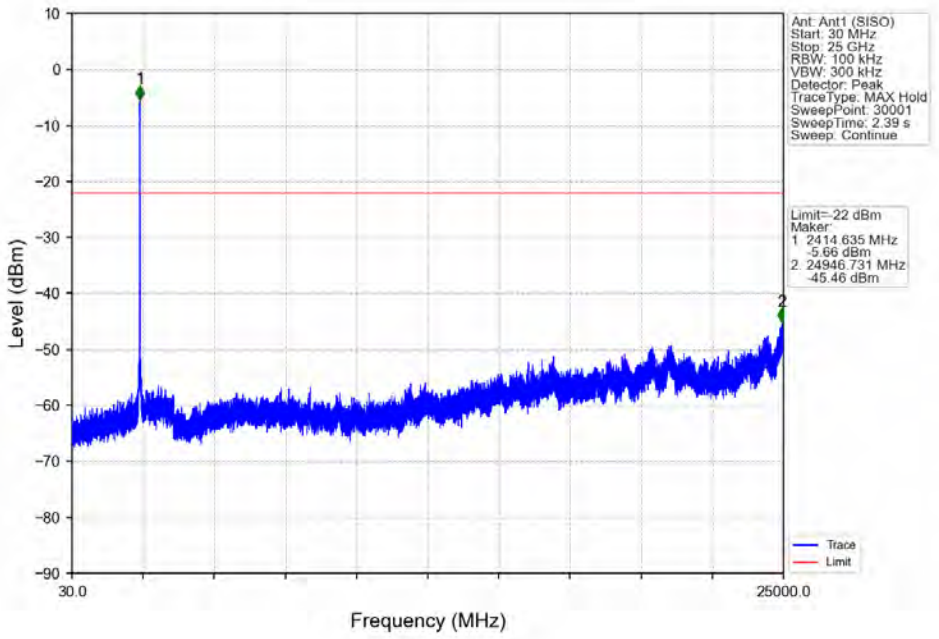
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



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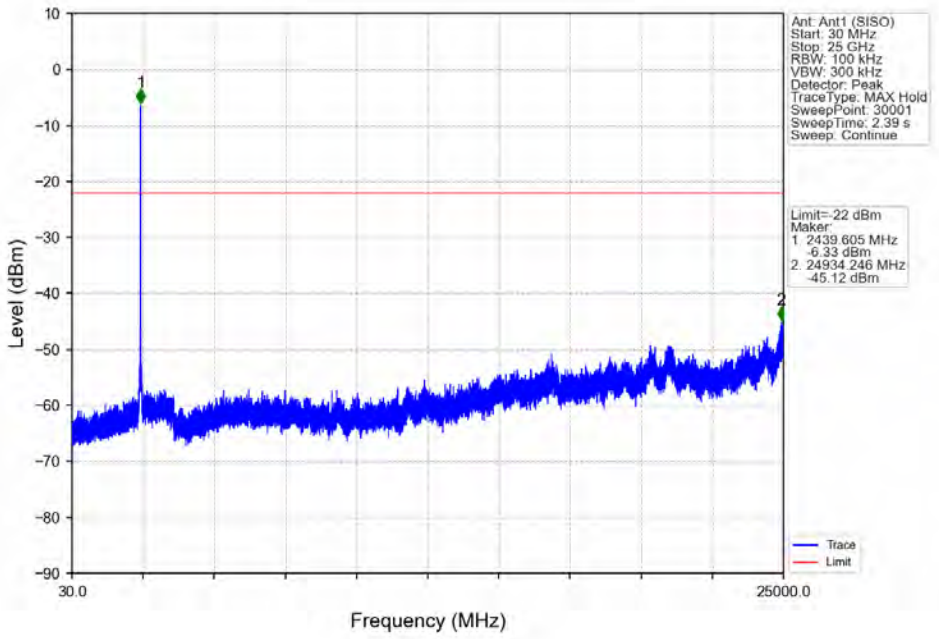
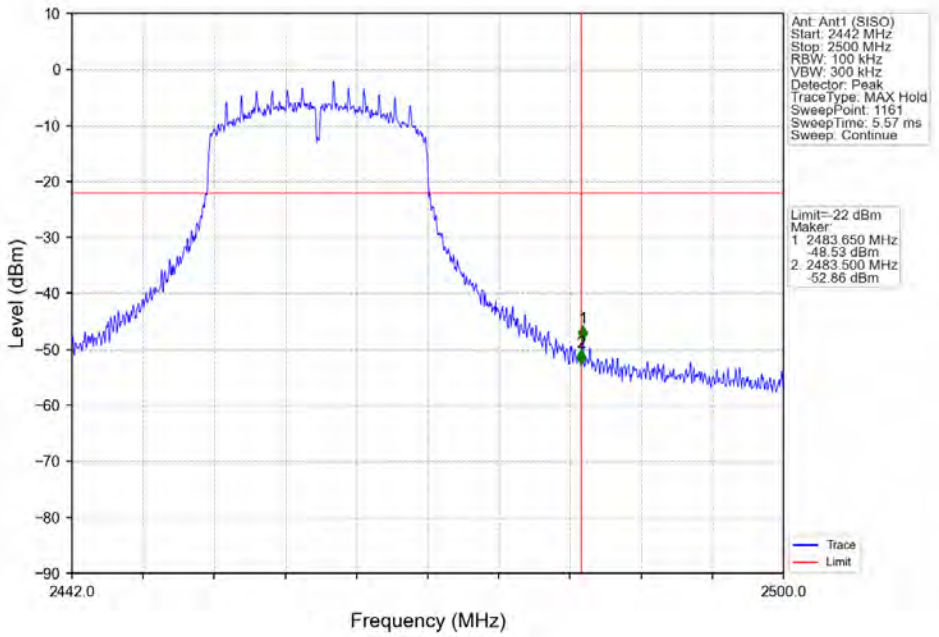
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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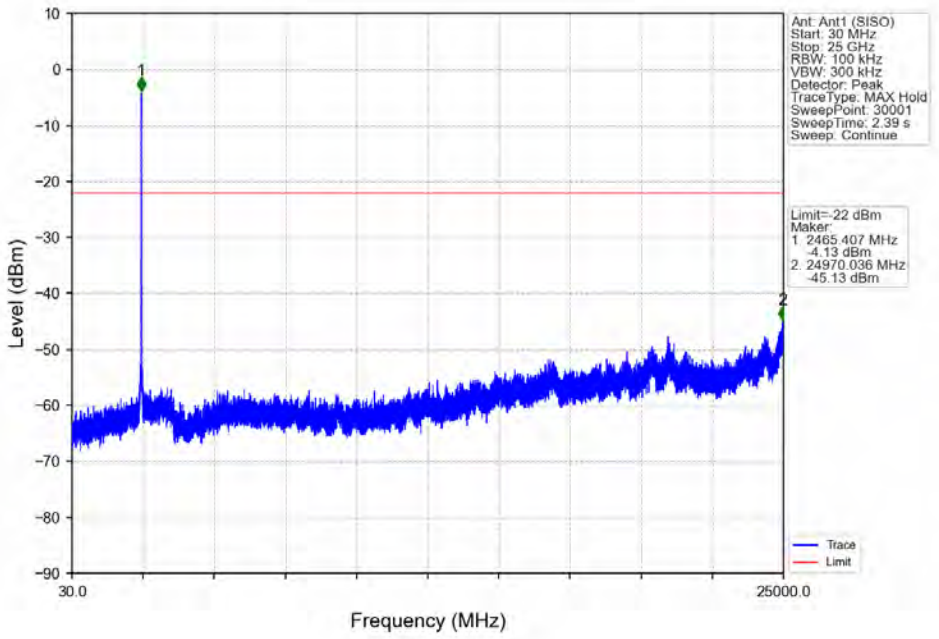
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



6. Form731

6.1 Form731

6.1.1 Test Result

Lower Freq (MHz)	High Freq (MHz)	MAX Power (W)	MAX Power (dBm)
2412	2462	0.0378	15.78

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