RF Test Report

For

Applicant Name:	**Xwireless LLC**
Address:	11565 Old Georgetown Road, Rockville, MD, USA
EUT Name:	Mobile Phone
Brand Name:	N/A
Model Number:	HD65

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:	BTF230413R01503
Test Standards:	47 CFR Part 15.247
Test Conclusion:	Pass
FCC ID:	2ADLJ-HD65
Test Date:	2023-04-13 to 2023-04-24
Date of Issue:	2023-04-25

Prepared By: Elma.Yang

Elma.Yang / Project Engineer

Date: 2023-04-25

Approved By: Ryan.CJ

Ryan.CJ / EMC Manager

Date: 2023-04-25

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Revision History		
Version	Issue Date	Revisions Content
R_V0	2023-04-25	Original
Note: Once the revision has been made, then previous versions reports are invalid.		

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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:	Xwireless LLC
Address:	11565 Old Georgetown Road, Rockville, MD, USA

2.2 Manufacturer Information

Company Name:	Xwireless LLC
Address:	11565 Old Georgetown Road, Rockville, MD, USA

2.3 Factory Information

Company Name:	ZTECH COMMNICATION(SZ) CO LTD
Address:	FL 7 BLOCK D BAO'AN ZHIGU INNOVATION PARK YIN'TIAN ROAD NO. 4 XI'XIANG STR' BAO'AN DISTRICT SZ CHINA

2.4 General Description of Equipment under Test (EUT)

EUT Name:	Mobile Phone
Test Model Number:	HD65

2.5 Technical Information

Power Supply:	DC 3.85V from Battery
Power Adaptor:	Input:100-240V,50/60Hz 0.3V Output:5.0V 2.0A 10.0W
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz; 802.11n(HT40): 2422MHz to 2452MHz
Number of Channels:	802.11b/g/n(HT20): 11 Channels; 802.11n(HT40): 7 Channels
Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK); 802.11g: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n(HT20 and HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type:	PIFA ANT
Antenna Gain:	1.11dBi

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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

Measurement	Value
Occupied Channel Bandwidth	69 KHz
RF output power, conducted	0.87 dB
Power Spectral Density, conducted	0.69 dB
Unwanted Emissions, conducted	0.94 dB
All emissions, radiated(<1GHz)	4.12 dB
All emissions, radiated(>1GHz)	4.16 dB
Temperature	0.82 °C
Humidity	4.1 %

3.3 Summary of Test Result

Item	Standard	Requirement	Result
Antenna requirement	47 CFR Part 15.247	Part 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)	Pass
Band edge emissions (Radiated)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
Emissions in restricted frequency bands (below 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d)	Pass
Emissions in restricted frequency bands (above 1GHz)	47 CFR Part 15.247	47 CFR 15.247(d)	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	2022-11-24	2023-11-23
Coaxial Switcher	SCHWARZBECK	CX210	CX210	2022-11-24	2023-11-23
V-LISN	SCHWARZBECK	NSLK 8127	01073	2022-11-24	2023-11-23
LISN	AFJ	LS16/110VAC	16010020076	2023-02-23	2024-02-22
EMI Receiver	ROHDE&SCHWARZ	ESCI3	101422	2022-11-24	2023-11-23

Occupied Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RFTest software	/	V1.00	/	/	/
RF Control Unit	Techy	TR1029-1	/	2022-11-24	2023-11-23
RF Sensor Unit	Techy	TR1029-2	/	2022-11-24	2023-11-23
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022-11-24	2023-11-23
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022-11-24	2023-11-23
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022-11-24	2023-11-23
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022-11-24	2023-11-23

Maximum Conducted Output Power					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RFTest software	/	V1.00	/	/	/
RF Control Unit	Techy	TR1029-1	/	2022-11-24	2023-11-23
RF Sensor Unit	Techy	TR1029-2	/	2022-11-24	2023-11-23
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022-11-24	2023-11-23
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022-11-24	2023-11-23
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022-11-24	2023-11-23
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022-11-24	2023-11-23

Power Spectral Density					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RFTest software	/	V1.00	/	/	/

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RF Control Unit	Techy	TR1029-1	/	2022-11-24	2023-11-23
RF Sensor Unit	Techy	TR1029-2	/	2022-11-24	2023-11-23
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022-11-24	2023-11-23
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022-11-24	2023-11-23
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022-11-24	2023-11-23
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022-11-24	2023-11-23

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	/	2022-11-24	2023-11-23
RF Sensor Unit	Techy	TR1029-2	/	2022-11-24	2023-11-23
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022-11-24	2023-11-23
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022-11-24	2023-11-23
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022-11-24	2023-11-23
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022-11-24	2023-11-23

Band edge emissions (Radiated)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2022-03-26	2023-03-25
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2021-11-28	2023-11-27
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2022-11-24	2023-11-23
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2022-11-24	2023-11-23

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POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2022-03-26	2023-03-25
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	2021-11-28	2023-11-27

Emissions in restricted frequency bands (below 1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2022-03-26	2023-03-25
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2021-11-28	2023-11-27
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2022-11-24	2023-11-23
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2022-03-26	2023-03-25
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	2021-11-28	2023-11-27

Emissions in restricted 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	2022-03-26	2023-03-25
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022-11-24	2023-11-23

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POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2021-11-28	2023-11-27
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2022-11-24	2023-11-23
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2022-03-26	2023-03-25
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	2021-11-28	2023-11-27

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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 continuously transmitting mode with 802.11b modulation.
TM2	802.11g mode	Keep the EUT in continuously transmitting mode with 802.11g modulation.
TM3	802.11n(HT20) mode	Keep the EUT in continuously transmitting mode with 802.11n(HT20) modulation.
TM4	802.11n(HT40) mode	Keep the EUT in continuously transmitting mode with 802.11n(HT40) modulation.

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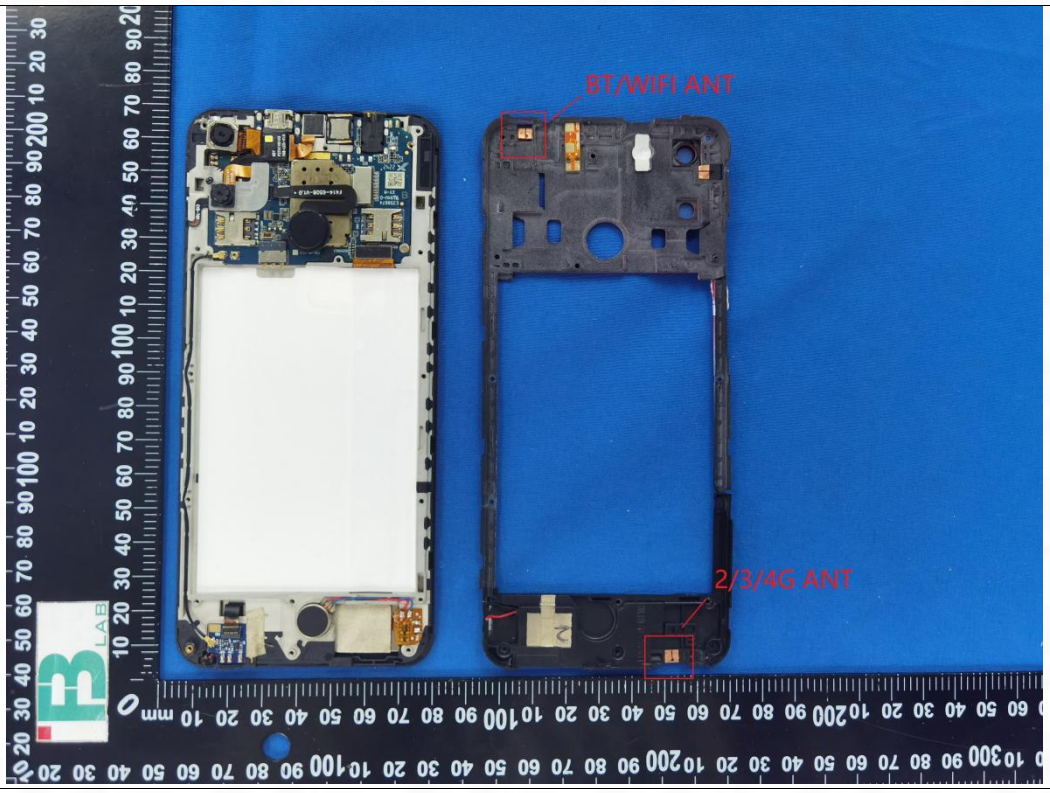
5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test Requirement:	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.

5.1.1 Conclusion:



6 Radio Spectrum Matter Test Results (RF)

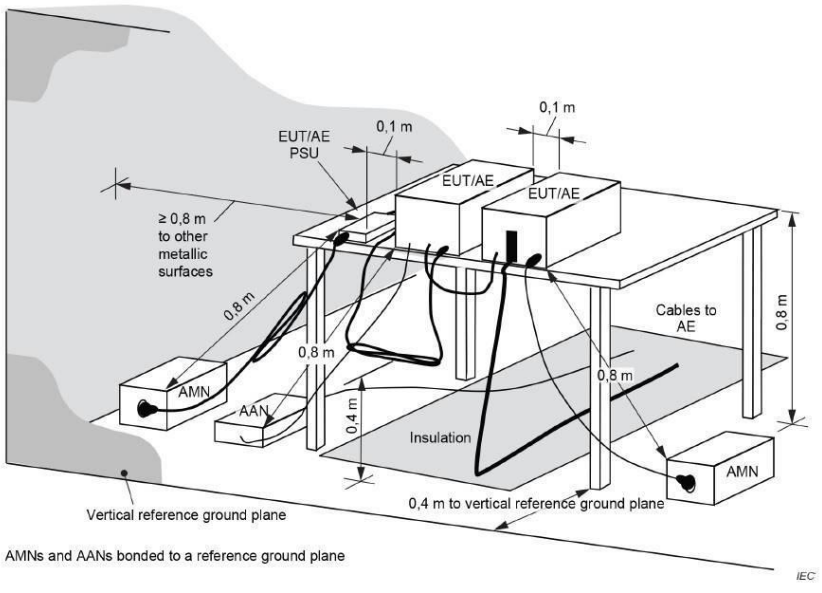
6.1 Conducted Emission at AC power line

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

6.1.1 E.U.T. Operation:

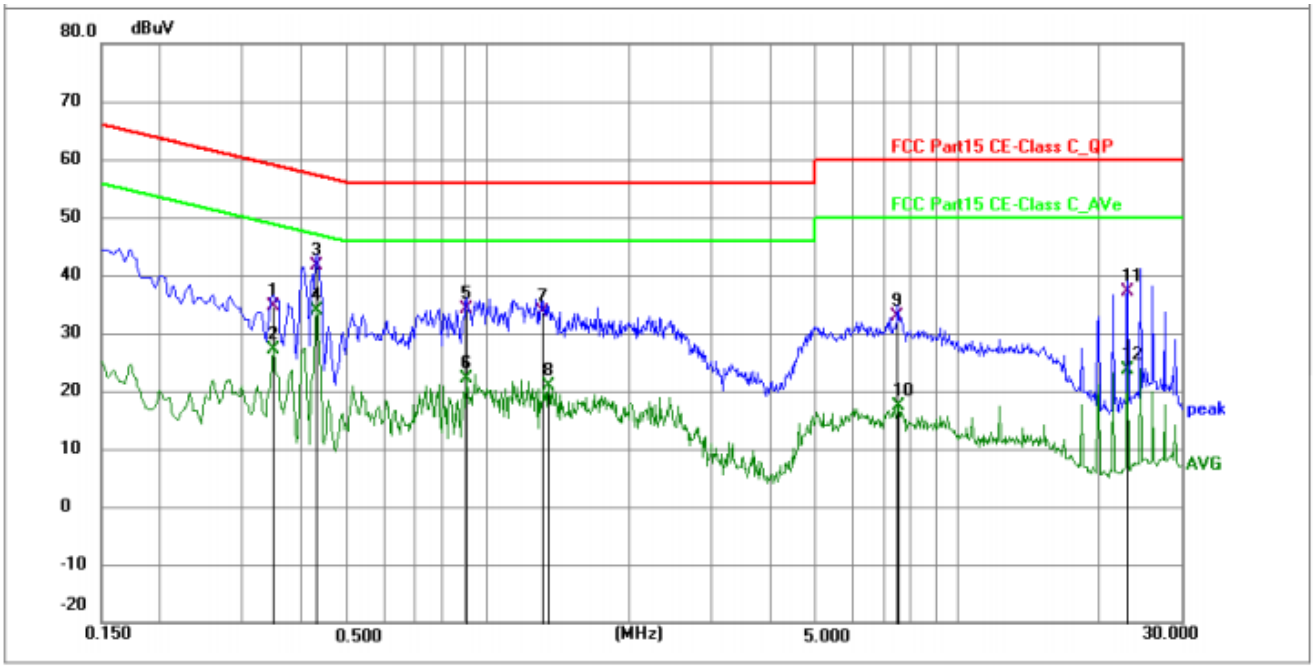
Operating Environment:	
Temperature:	24.8 °C
Humidity:	52.5 %
Atmospheric Pressure:	1010 mbar

6.1.2 Test Setup Diagram:



6.1.3 Test Data:

TM1 / Line: Line / Band: 2.4G / BW: 20 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.3480	23.91	10.62	34.53	59.01	-24.48	QP	P	
2	0.3480	16.53	10.62	27.15	49.01	-21.86	AVG	P	
3	0.4290	31.05	10.61	41.66	57.27	-15.61	QP	P	
4 *	0.4290	23.19	10.61	33.80	47.27	-13.47	AVG	P	
5	0.9015	23.26	10.76	34.02	56.00	-21.98	QP	P	
6	0.9015	11.39	10.76	22.15	46.00	-23.85	AVG	P	
7	1.3110	22.95	10.75	33.70	56.00	-22.30	QP	P	
8	1.3470	10.11	10.75	20.86	46.00	-25.14	AVG	P	
9	7.4850	22.03	10.78	32.81	60.00	-27.19	QP	P	
10	7.5120	6.59	10.78	17.37	50.00	-32.63	AVG	P	
11	23.0190	26.18	11.04	37.22	60.00	-22.78	QP	P	
12	23.0190	12.54	11.04	23.58	50.00	-26.42	AVG	P	

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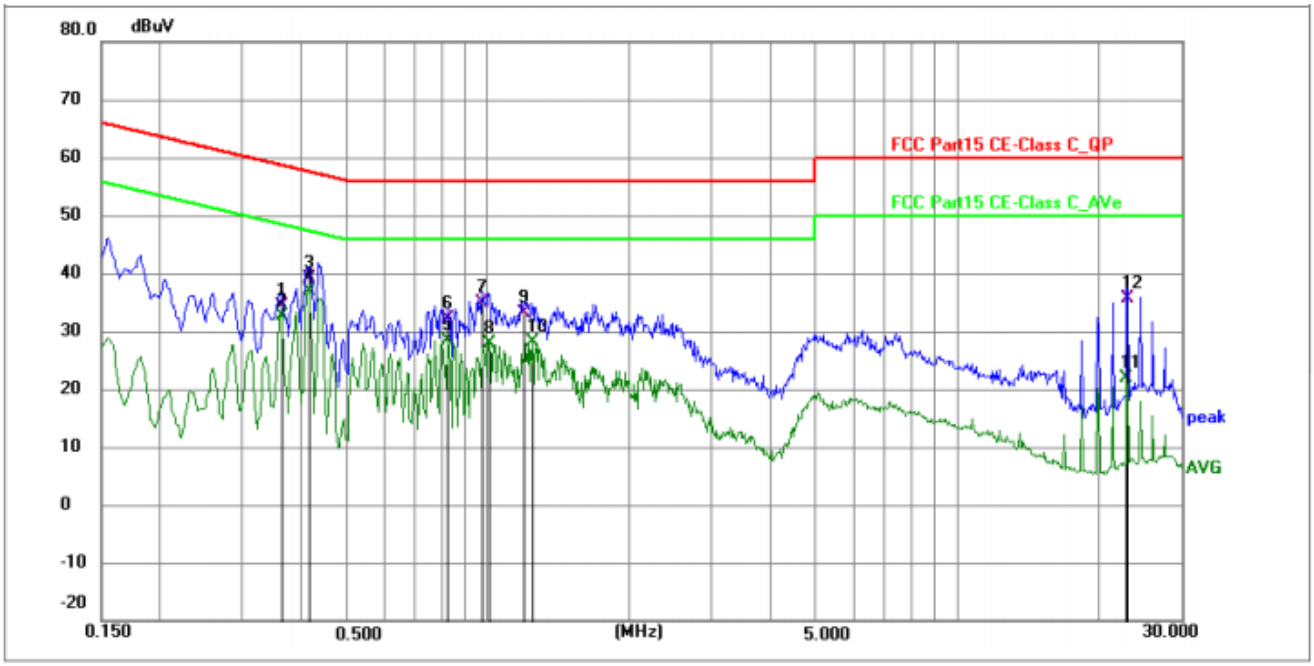
TM1 / Line: Neutral / Band: 2.4G / BW: 20 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.3614	23.84	10.62	34.46	58.70	-24.24	QP	P	
2	0.3614	22.11	10.62	32.73	48.70	-15.97	AVG	P	
3	0.4154	28.60	10.62	39.22	57.54	-18.32	QP	P	
4 *	0.4154	26.22	10.62	36.84	47.54	-10.70	AVG	P	
5	0.8205	17.67	10.75	28.42	46.00	-17.58	AVG	P	
6	0.8250	21.42	10.75	32.17	56.00	-23.83	QP	P	
7	0.9735	23.99	10.78	34.77	56.00	-21.23	QP	P	
8	1.0095	17.12	10.78	27.90	46.00	-18.10	AVG	P	
9	1.1940	22.25	10.76	33.01	56.00	-22.99	QP	P	
10	1.2435	17.37	10.76	28.13	46.00	-17.87	AVG	P	
11	23.0145	10.92	11.04	21.96	50.00	-28.04	AVG	P	
12	23.0190	24.52	11.04	35.56	60.00	-24.44	QP	P	

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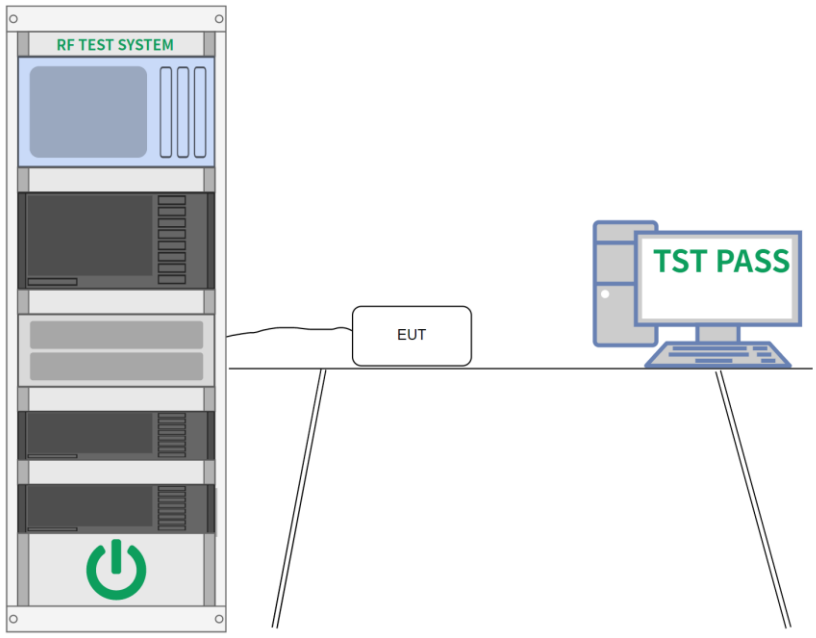
6.2 Occupied Bandwidth

Test Requirement:	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.
Test Method:	DTS bandwidth
Test Limit:	Section (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.

6.2.1 E.U.T. Operation:

Operating Environment:	
Temperature:	23.6 °C
Humidity:	52.9 %
Atmospheric Pressure:	1010 mbar

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

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6.3 Maximum Conducted Output Power

Test Requirement:	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.
Test Method:	Maximum peak conducted output power
Test Limit:	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 11.9.1 Maximum peak conducted output power

6.3.1 E.U.T. Operation:

Operating Environment:	
Temperature:	23.6 °C
Humidity:	52.9 %
Atmospheric Pressure:	1010 mbar

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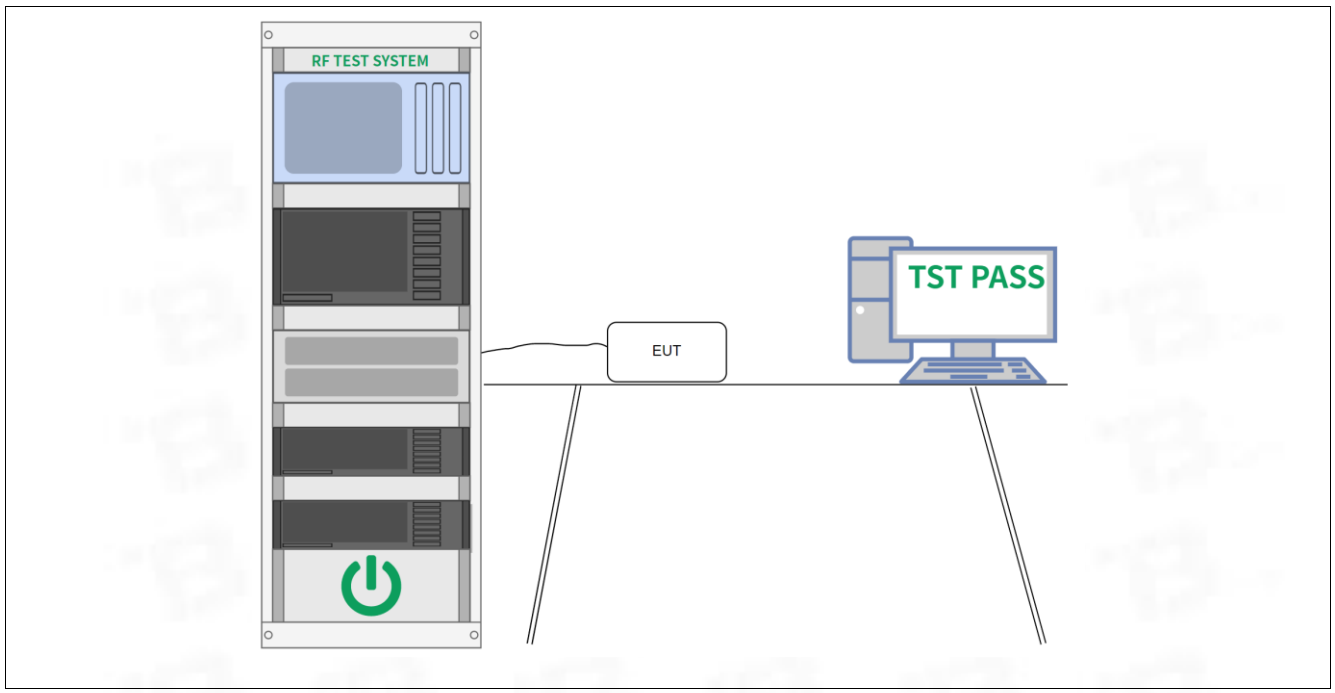
6.3.2 Test Setup Diagram:



6.3.3 Test Data:

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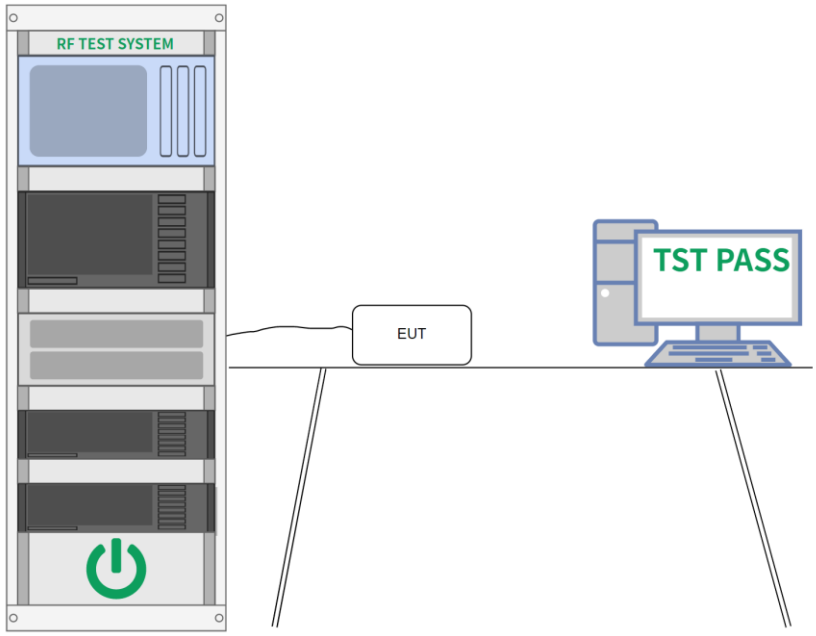
6.4 Power Spectral Density

Test Requirement:	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.
Test Method:	Maximum power spectral density level in the fundamental emission
Test Limit:	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.

6.4.1 E.U.T. Operation:

Operating Environment:	
Temperature:	23.6 °C
Humidity:	52.9 %
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:	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.
Test Method:	Emissions in nonrestricted frequency bands
Test Limit:	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

6.5.1 E.U.T. Operation:

Operating Environment:	
Temperature:	23.6 °C
Humidity:	52.9 %
Atmospheric Pressure:	1010 mbar

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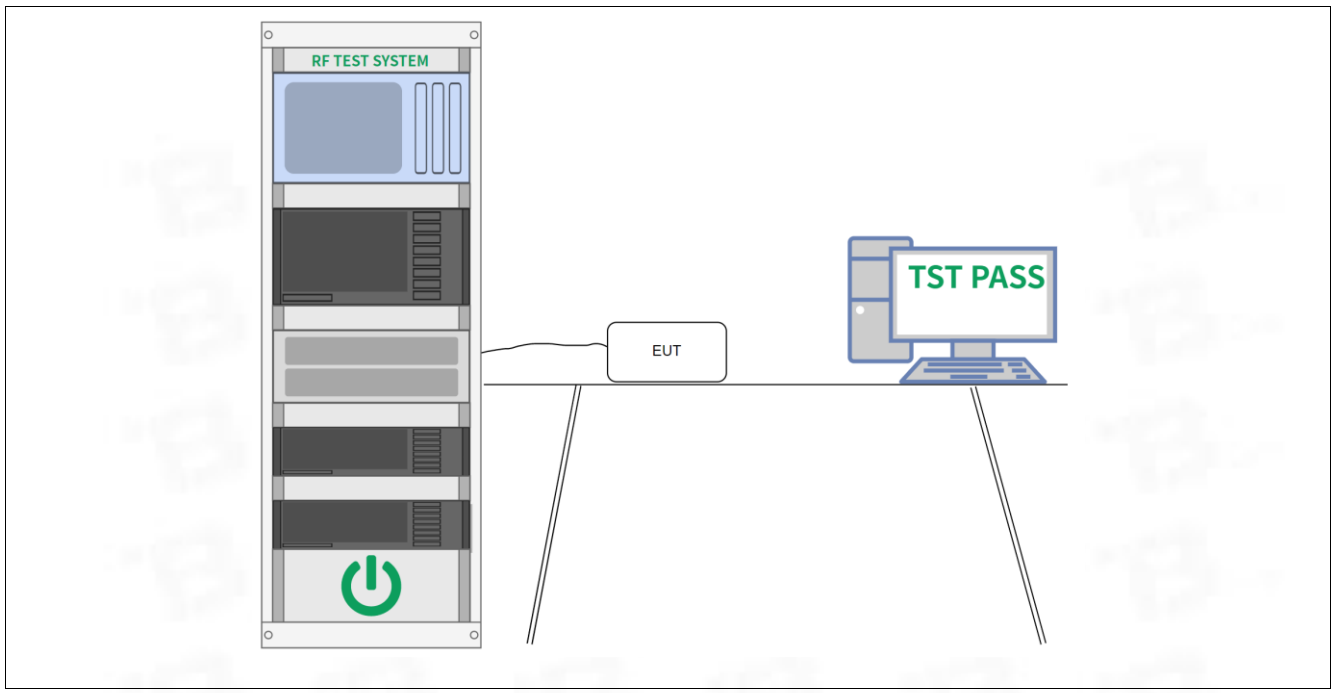
6.5.2 Test Setup Diagram:



6.5.3 Test Data:

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6.6 Band edge emissions (Radiated)

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:	Radiated emissions tests
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.
Procedure:	ANSI C63.10-2013 section 6.6.4

6.6.1 E.U.T. Operation:

Operating Environment:	
Temperature:	25.8 °C
Humidity:	51.2 %
Atmospheric Pressure:	1010 mbar

6.6.2 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / 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	68.06	-30.59	37.47	74.00	-36.53	peak	P
2	2390.000	69.88	-30.49	39.39	74.00	-34.61	peak	P
3 *	2400.000	78.34	-30.48	47.86	74.00	-26.14	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / 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	69.06	-30.59	38.47	74.00	-35.53	peak	P
2	2390.000	70.88	-30.49	40.39	74.00	-33.61	peak	P
3 *	2400.000	76.84	-30.48	46.36	74.00	-27.64	peak	P

TM1 / Polarization: Horizontal / Band: 2.4G / 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	80.10	-30.39	49.71	74.00	-24.29	peak	P
2	2500.000	70.87	-30.37	40.50	74.00	-33.50	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / 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	73.60	-30.39	43.21	74.00	-30.79	peak	P
2	2500.000	68.37	-30.37	38.00	74.00	-36.00	peak	P

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TM2 / Polarization: Horizontal / Band: 2.4G / 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	68.93	-30.59	38.34	74.00	-35.66	peak	P
2	2390.000	70.61	-30.49	40.12	74.00	-33.88	peak	P
3 *	2400.000	78.68	-30.48	48.20	74.00	-25.80	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / 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	67.93	-30.59	37.34	74.00	-36.66	peak	P
2	2390.000	69.11	-30.49	38.62	74.00	-35.38	peak	P
3 *	2400.000	76.68	-30.48	46.20	74.00	-27.80	peak	P

TM2 / Polarization: Horizontal / Band: 2.4G / 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	76.75	-30.39	46.36	74.00	-27.64	peak	P
2	2500.000	71.25	-30.37	40.88	74.00	-33.12	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / 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	75.25	-30.39	44.86	74.00	-29.14	peak	P
2	2500.000	71.25	-30.37	40.88	74.00	-33.12	peak	P

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TM3 / Polarization: Horizontal / Band: 2.4G / 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	68.84	-30.59	38.25	74.00	-35.75	peak	P
2	2390.000	76.84	-30.49	46.35	74.00	-27.65	peak	P
3 *	2400.000	83.13	-30.48	52.65	74.00	-21.35	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / 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	70.84	-30.59	40.25	74.00	-33.75	peak	P
2	2390.000	71.84	-30.49	41.35	74.00	-32.65	peak	P
3 *	2400.000	79.13	-30.48	48.65	74.00	-25.35	peak	P

TM3 / Polarization: Horizontal / Band: 2.4G / 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	81.41	-30.39	51.02	74.00	-22.98	peak	P
2	2500.000	71.85	-30.37	41.48	74.00	-32.52	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / 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	78.91	-30.39	48.52	74.00	-25.48	peak	P
2	2500.000	71.35	-30.37	40.98	74.00	-33.02	peak	P

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TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	71.69	-30.59	41.10	74.00	-32.90	peak	P
2	2390.000	69.28	-30.49	38.79	74.00	-35.21	peak	P
3 *	2400.000	79.07	-30.48	48.59	74.00	-25.41	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	68.69	-30.59	38.10	74.00	-35.90	peak	P
2	2390.000	72.28	-30.49	41.79	74.00	-32.21	peak	P
3 *	2400.000	80.07	-30.48	49.59	74.00	-24.41	peak	P

TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	81.93	-30.39	51.54	74.00	-22.46	peak	P
2	2500.000	75.07	-30.37	44.70	74.00	-29.30	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	76.43	-30.39	46.04	74.00	-27.96	peak	P
2	2500.000	69.57	-30.37	39.20	74.00	-34.80	peak	P

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6.7 Emissions in restricted frequency bands (below 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:	Radiated emissions tests
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.
Procedure:	ANSI C63.10-2013 section 6.6.4

6.7.1 E.U.T. Operation:

Operating Environment:	
Temperature:	25.8 °C
Humidity:	51.2 %
Atmospheric Pressure:	1010 mbar

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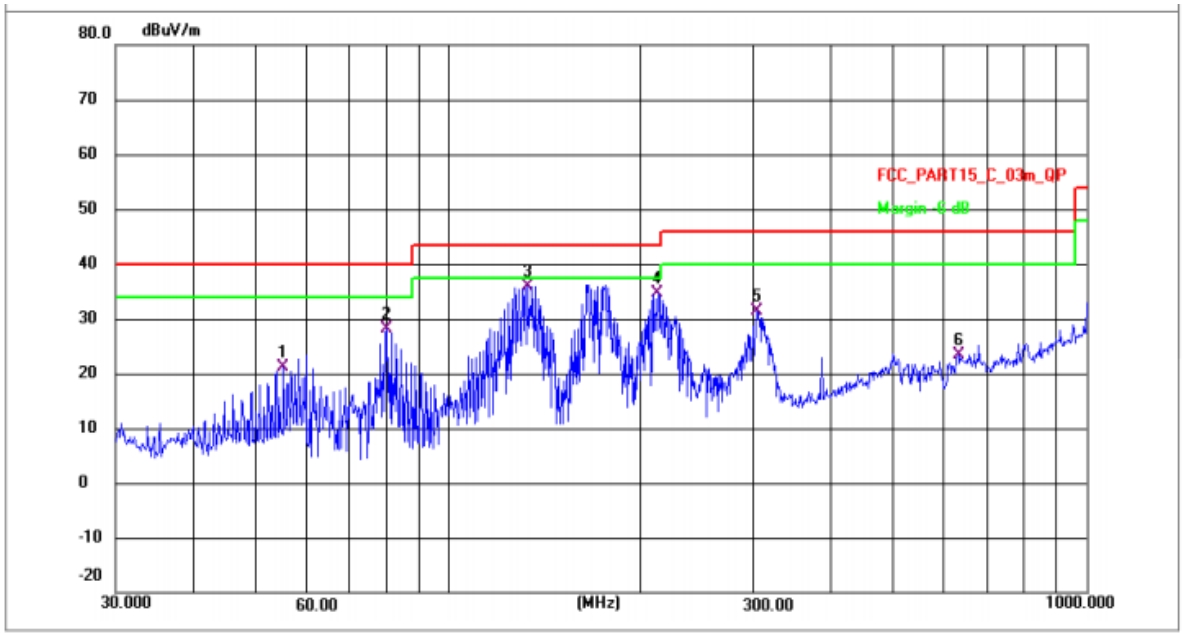
6.7.2 Test Data:

Note: All the mode have been tested, and only the worst case of 802.11n mode are in the report
TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	55.2207	39.33	-18.23	21.10	40.00	-18.90	QP	P
2	79.8003	46.03	-18.01	28.02	40.00	-11.98	QP	P
3 *	133.3847	63.91	-27.93	35.98	43.50	-7.52	QP	P
4	213.3889	61.49	-26.75	34.74	43.50	-8.76	QP	P
5	305.1445	56.66	-25.38	31.28	46.00	-14.72	QP	P
6	631.6884	45.85	-22.59	23.26	46.00	-22.74	QP	P

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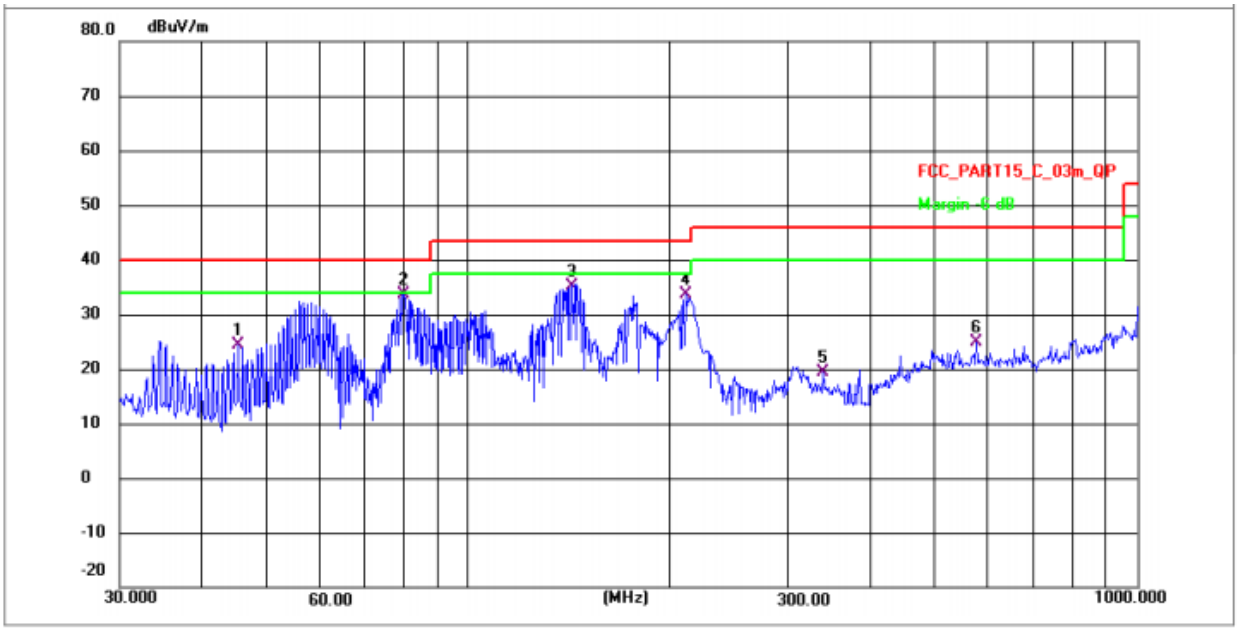
TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	45.2166	44.82	-20.42	24.40	40.00	-15.60	QP	P
2 *	79.8003	53.56	-19.82	33.74	40.00	-6.26	QP	P
3	142.5742	62.87	-27.84	35.03	43.50	-8.47	QP	P
4	212.2695	60.30	-26.79	33.51	43.50	-9.99	QP	P
5	338.4001	44.47	-25.12	19.35	46.00	-26.65	QP	P
6	576.6443	46.88	-21.95	24.93	46.00	-21.07	QP	P

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6.8 Emissions in restricted 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:	Radiated emissions tests
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.
Procedure:	ANSI C63.10-2013 section 6.6.4

6.8.1 E.U.T. Operation:

Operating Environment:	
Temperature:	25.8 °C
Humidity:	51.2 %
Atmospheric Pressure:	1010 mbar

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6.8.2 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2914.582	69.67	-29.66	40.01	74.00	-33.99	peak	P
2	4277.116	68.18	-28.89	39.29	74.00	-34.71	peak	P
3	6085.472	64.91	-25.33	39.58	74.00	-34.42	peak	P
4	8645.893	69.79	-25.03	44.76	74.00	-29.24	peak	P
5	11047.321	67.94	-23.40	44.54	74.00	-29.46	peak	P
6 *	14218.123	70.79	-21.13	49.66	74.00	-24.34	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2973.293	66.98	-29.56	37.42	74.00	-36.58	peak	P
2	4313.118	68.82	-28.86	39.96	74.00	-34.04	peak	P
3	6353.277	67.48	-25.36	42.12	74.00	-31.88	peak	P
4	8576.204	69.09	-25.17	43.92	74.00	-30.08	peak	P
5	11286.155	70.93	-23.22	47.71	74.00	-26.29	peak	P
6 *	14955.796	72.08	-20.47	51.61	74.00	-22.39	peak	P

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3206.272	66.11	-29.32	36.79	74.00	-37.21	peak	P
2	4334.363	69.03	-28.86	40.17	74.00	-33.83	peak	P
3	6609.903	67.29	-25.28	42.01	74.00	-31.99	peak	P
4	8262.322	71.21	-25.42	45.79	74.00	-28.21	peak	P
5	10658.390	70.42	-24.18	46.24	74.00	-27.76	peak	P
6 *	13269.094	72.90	-21.14	51.76	74.00	-22.24	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2996.588	65.31	-29.51	35.80	74.00	-38.20	peak	P
2	4018.252	64.18	-28.99	35.19	74.00	-38.81	peak	P
3	5722.120	63.36	-26.23	37.13	74.00	-36.87	peak	P
4	7177.452	66.34	-24.88	41.46	74.00	-32.54	peak	P
5	8825.154	69.57	-24.66	44.91	74.00	-29.09	peak	P
6 *	12731.831	71.32	-21.49	49.83	74.00	-24.17	peak	P

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TM1 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3003.524	62.46	-29.51	32.95	74.00	-41.05	peak	P
2	3934.356	63.80	-29.01	34.79	74.00	-39.21	peak	P
3	5391.360	66.31	-27.04	39.27	74.00	-34.73	peak	P
4	6698.373	68.62	-25.20	43.42	74.00	-30.58	peak	P
5	8850.699	67.85	-24.61	43.24	74.00	-30.76	peak	P
6 *	11721.685	69.42	-22.67	46.75	74.00	-27.25	peak	P

TM1 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2987.939	62.69	-29.53	33.16	74.00	-40.84	peak	P
2	3649.527	64.22	-29.04	35.18	74.00	-38.82	peak	P
3	4802.722	68.21	-27.92	40.29	74.00	-33.71	peak	P
4	6778.224	67.66	-25.13	42.53	74.00	-31.47	peak	P
5	9787.258	70.95	-23.83	47.12	74.00	-26.88	peak	P
6 *	12731.831	70.82	-21.49	49.33	74.00	-24.67	peak	P

TM2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3194.247	59.99	-29.33	30.66	74.00	-43.34	peak	P
2	4246.321	61.86	-28.89	32.97	74.00	-41.03	peak	P
3	5538.248	65.53	-26.83	38.70	74.00	-35.30	peak	P
4	7198.228	66.43	-24.87	41.56	74.00	-32.44	peak	P
5	9708.370	68.29	-23.65	44.64	74.00	-29.36	peak	P
6 *	13181.175	71.00	-21.20	49.80	74.00	-24.20	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2952.739	65.29	-29.59	35.70	74.00	-38.30	peak	P
2	3916.203	65.02	-29.01	36.01	74.00	-37.99	peak	P
3	5533.448	70.24	-26.84	43.40	74.00	-30.60	peak	P
4	7117.542	66.39	-24.89	41.50	74.00	-32.50	peak	P
5	10212.065	69.01	-24.38	44.63	74.00	-29.37	peak	P
6 *	14054.687	70.60	-21.10	49.50	74.00	-24.50	peak	P

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TM2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3033.186	66.37	-29.48	36.89	74.00	-37.11	peak	P
2	4478.266	67.21	-28.80	38.41	74.00	-35.59	peak	P
3	6404.903	68.81	-25.37	43.44	74.00	-30.56	peak	P
4	9118.153	68.63	-24.05	44.58	74.00	-29.42	peak	P
5	11647.386	70.19	-22.80	47.39	74.00	-26.61	peak	P
6 *	13473.927	72.39	-20.99	51.40	74.00	-22.60	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3119.430	64.00	-29.41	34.59	74.00	-39.41	peak	P
2	4109.872	67.74	-28.95	38.79	74.00	-35.21	peak	P
3	5953.251	68.65	-25.48	43.17	74.00	-30.83	peak	P
4	7571.691	65.52	-24.89	40.63	74.00	-33.37	peak	P
5	9929.730	70.34	-24.14	46.20	74.00	-27.80	peak	P
6 *	12827.871	70.52	-21.44	49.08	74.00	-24.92	peak	P

TM2 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3033.186	63.37	-29.48	33.89	74.00	-40.11	peak	P
2	4164.880	67.53	-28.93	38.60	74.00	-35.40	peak	P
3	5301.732	67.60	-27.12	40.48	74.00	-33.52	peak	P
4	6851.102	70.02	-25.06	44.96	74.00	-29.04	peak	P
5	9205.540	70.76	-23.85	46.91	74.00	-27.09	peak	P
6 *	13937.372	70.78	-21.07	49.71	74.00	-24.29	peak	P

TM2 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2907.851	63.48	-29.67	33.81	74.00	-40.19	peak	P
2	3857.783	66.24	-29.01	37.23	74.00	-36.77	peak	P
3	5002.496	67.82	-27.37	40.45	74.00	-33.55	peak	P
4	6912.765	68.48	-25.01	43.47	74.00	-30.53	peak	P
5	9599.547	71.36	-23.42	47.94	74.00	-26.06	peak	P
6 *	12640.163	71.00	-21.53	49.47	74.00	-24.53	peak	P

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TM3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2739.766	66.49	-29.96	36.53	74.00	-37.47	peak	P
2	3812.336	67.30	-29.02	38.28	74.00	-35.72	peak	P
3	5427.320	63.49	-27.01	36.48	74.00	-37.52	peak	P
4	7708.601	65.09	-25.10	39.99	74.00	-34.01	peak	P
5	10062.634	67.09	-24.32	42.77	74.00	-31.23	peak	P
6 *	12731.831	68.82	-21.49	47.33	74.00	-26.67	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3103.243	68.46	-29.42	39.04	74.00	-34.96	peak	P
2	4303.156	69.68	-28.87	40.81	74.00	-33.19	peak	P
3	5917.225	68.49	-25.59	42.90	74.00	-31.10	peak	P
4	7628.806	66.91	-24.97	41.94	74.00	-32.06	peak	P
5	10123.898	69.69	-24.34	45.35	74.00	-28.65	peak	P
6 *	12505.705	71.56	-21.61	49.95	74.00	-24.05	peak	P

TM3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3355.120	65.55	-29.19	36.36	74.00	-37.64	peak	P
2	4593.632	66.58	-28.52	38.06	74.00	-35.94	peak	P
3	7439.362	65.60	-24.80	40.80	74.00	-33.20	peak	P
4	10551.110	68.99	-24.41	44.58	74.00	-29.42	peak	P
5	13709.633	68.73	-21.01	47.72	74.00	-26.28	peak	P
6 *	17191.496	67.32	-17.53	49.79	74.00	-24.21	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3044.605	61.31	-29.47	31.84	74.00	-42.16	peak	P
2	3883.514	61.74	-29.01	32.73	74.00	-41.27	peak	P
3	5119.517	64.19	-27.27	36.92	74.00	-37.08	peak	P
4	6596.542	66.02	-25.29	40.73	74.00	-33.27	peak	P
5 *	8348.743	69.65	-25.38	44.27	74.00	-29.73	peak	P
6	10658.390	68.42	-24.18	44.24	74.00	-29.76	peak	P

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TM3 / Polarization: Horizontal / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3035.818	62.72	-29.47	33.25	74.00	-40.75	peak	P
2	3825.582	64.11	-29.02	35.09	74.00	-38.91	peak	P
3	5364.934	64.70	-27.07	37.63	74.00	-36.37	peak	P
4	7893.485	67.63	-25.37	42.26	74.00	-31.74	peak	P
5	10390.709	72.50	-24.47	48.03	74.00	-25.97	peak	P
6 *	17346.227	66.13	-16.92	49.21	74.00	-24.79	peak	P

TM3 / Polarization: Vertical / Band: 2.4G / BW: 20 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3173.082	60.27	-29.36	30.91	74.00	-43.09	peak	P
2	3883.514	64.74	-29.01	35.73	74.00	-38.27	peak	P
3	5301.732	66.60	-27.12	39.48	74.00	-34.52	peak	P
4	6762.569	66.39	-25.14	41.25	74.00	-32.75	peak	P
5	9750.552	69.24	-23.74	45.50	74.00	-28.50	peak	P
6 *	13709.633	70.23	-21.01	49.22	74.00	-24.78	peak	P

TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3044.605	63.31	-29.47	33.84	74.00	-40.16	peak	P
2	4087.363	67.33	-28.97	38.36	74.00	-35.64	peak	P
3	5110.646	69.91	-27.28	42.63	74.00	-31.37	peak	P
4	6698.373	68.12	-25.20	42.92	74.00	-31.08	peak	P
5	9258.909	70.98	-23.73	47.25	74.00	-26.75	peak	P
6 *	13717.561	70.31	-21.02	49.29	74.00	-24.71	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3033.186	63.37	-29.48	33.89	74.00	-40.11	peak	P
2	3883.514	67.74	-29.01	38.73	74.00	-35.27	peak	P
3	5405.403	69.40	-27.03	42.37	74.00	-31.63	peak	P
4	7256.720	70.17	-24.85	45.32	74.00	-28.68	peak	P
5	9818.426	70.06	-23.90	46.16	74.00	-27.84	peak	P
6 *	13662.164	71.15	-21.00	50.15	74.00	-23.85	peak	P

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TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3086.247	63.75	-29.43	34.32	74.00	-39.68	peak	P
2	4151.659	70.35	-28.93	41.42	74.00	-32.58	peak	P
3	5975.662	68.12	-25.41	42.71	74.00	-31.29	peak	P
4	8748.961	69.16	-24.82	44.34	74.00	-29.66	peak	P
5	11793.050	69.42	-22.55	46.87	74.00	-27.13	peak	P
6 *	15564.397	72.36	-21.51	50.85	74.00	-23.15	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: M

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3268.968	64.47	-29.27	35.20	74.00	-38.80	peak	P
2	4460.181	68.75	-28.80	39.95	74.00	-34.05	peak	P
3	6131.376	67.95	-25.34	42.61	74.00	-31.39	peak	P
4	7863.881	66.96	-25.32	41.64	74.00	-32.36	peak	P
5	9818.426	70.06	-23.90	46.16	74.00	-27.84	peak	P
6 *	12935.847	71.13	-21.38	49.75	74.00	-24.25	peak	P

TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2952.739	66.29	-29.59	36.70	74.00	-37.30	peak	P
2	4608.261	64.68	-28.48	36.20	74.00	-37.80	peak	P
3	7360.227	66.33	-24.82	41.51	74.00	-32.49	peak	P
4	9708.370	66.29	-23.65	42.64	74.00	-31.36	peak	P
5	12502.091	69.16	-21.61	47.55	74.00	-26.45	peak	P
6 *	16371.918	69.18	-19.80	49.38	74.00	-24.62	peak	P

TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3131.173	67.74	-29.39	38.35	74.00	-35.65	peak	P
2	4380.965	69.48	-28.84	40.64	74.00	-33.36	peak	P
3	6609.903	70.79	-25.28	45.51	74.00	-28.49	peak	P
4	9128.701	70.67	-24.03	46.64	74.00	-27.36	peak	P
5	12850.136	72.14	-21.42	50.72	74.00	-23.28	peak	P
6 *	17271.184	68.77	-17.22	51.55	74.00	-22.45	peak	P

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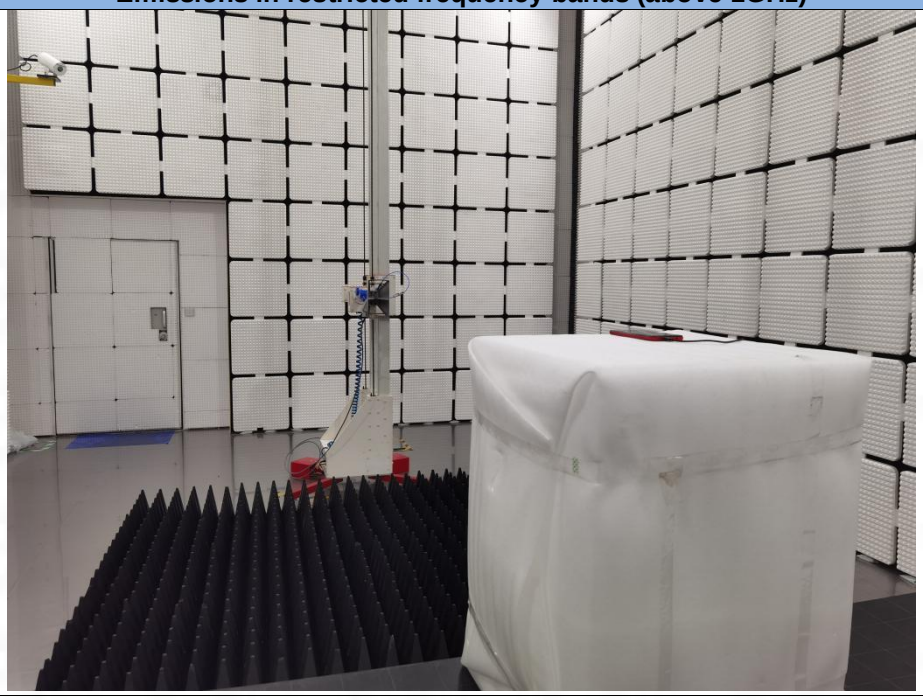
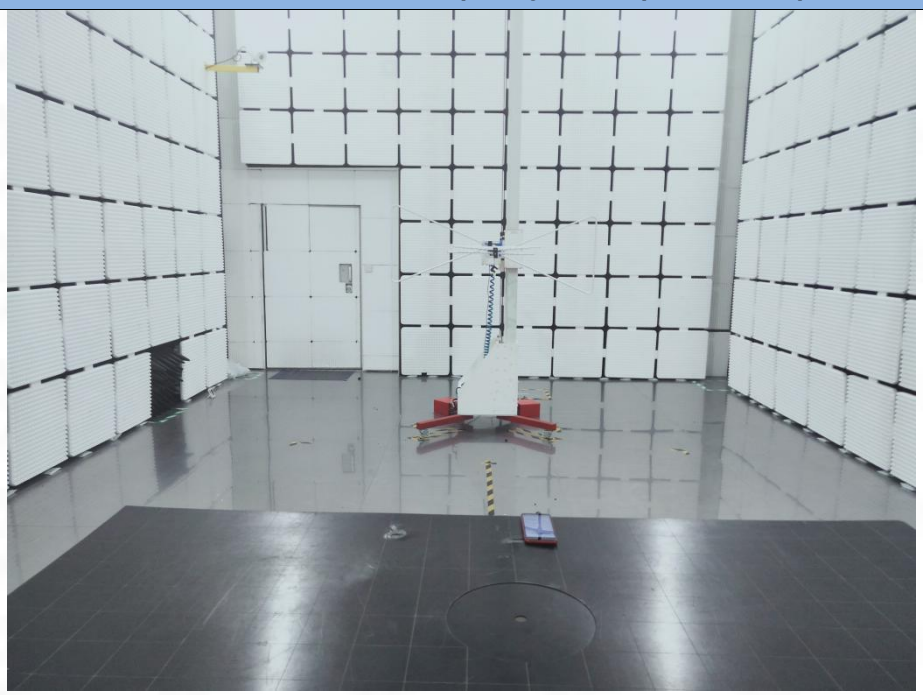
7 Test Setup Photos

Conducted Emission at AC power line


Occupied Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in non-restricted frequency bands


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


Emissions in restricted frequency bands (below 1GHz)


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8 EUT Constructional Details (EUT Photos)

Please refer to the report No.BTF230413R01501

Appendix

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	8.384	8.414	99.64	0.02	0.04
		2437	8.384	8.414	99.64	0.02	0.04
		2462	8.384	8.414	99.64	0.02	0.04
802.11g	SISO	2412	1.393	1.428	97.55	0.11	0.10
		2437	1.392	1.428	97.48	0.11	0.10
		2462	1.394	1.428	97.62	0.10	0.06
802.11n (HT20)	SISO	2412	1.300	1.336	97.31	0.12	0.07
		2437	1.300	1.335	97.38	0.12	0.07
		2462	1.302	1.336	97.46	0.11	0.07
802.11n (HT40)	SISO	2422	0.648	0.683	94.88	0.23	0.03
		2437	0.649	0.683	95.02	0.22	0.03
		2452	0.649	0.683	95.02	0.22	0.03

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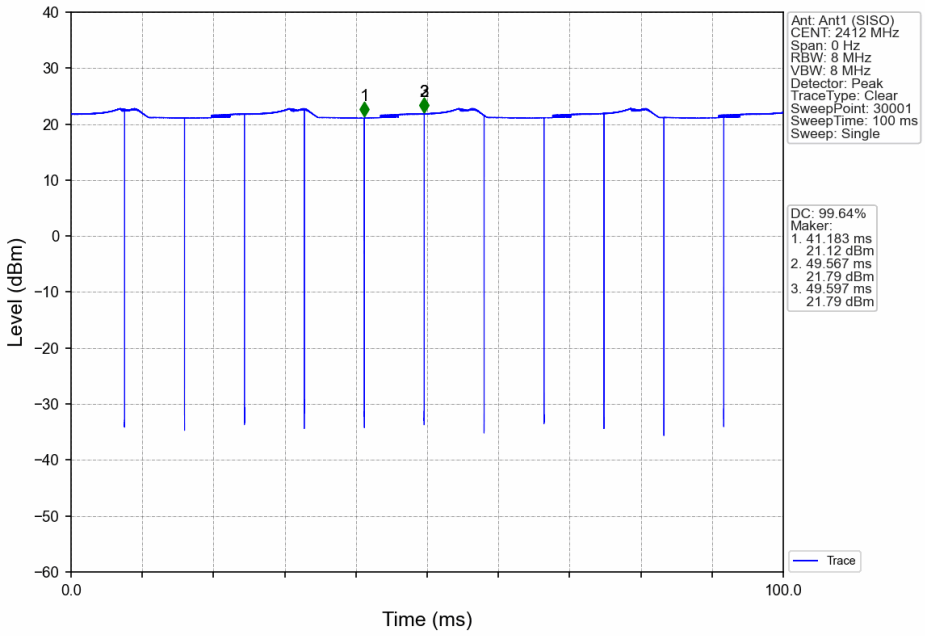
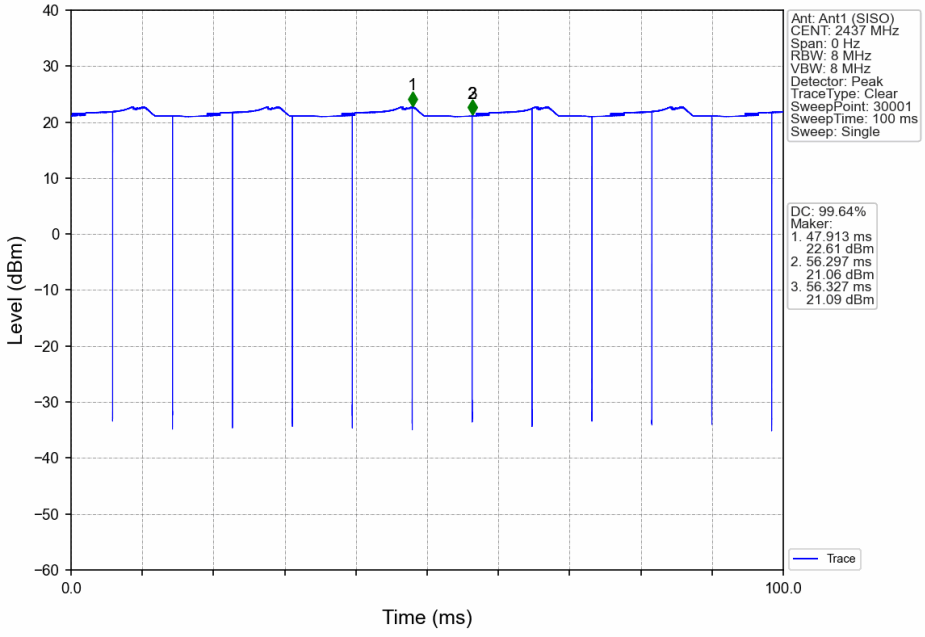
1.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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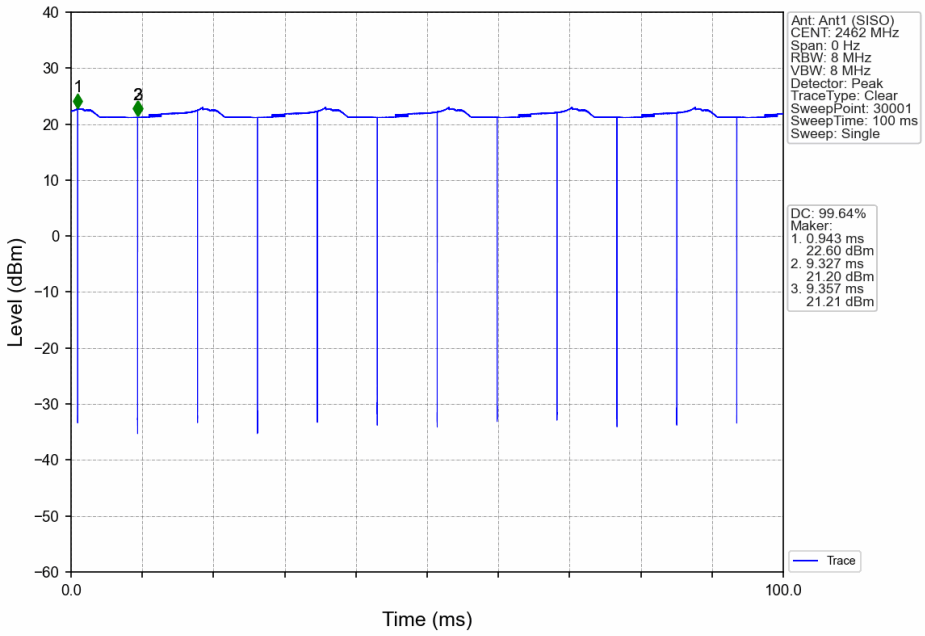
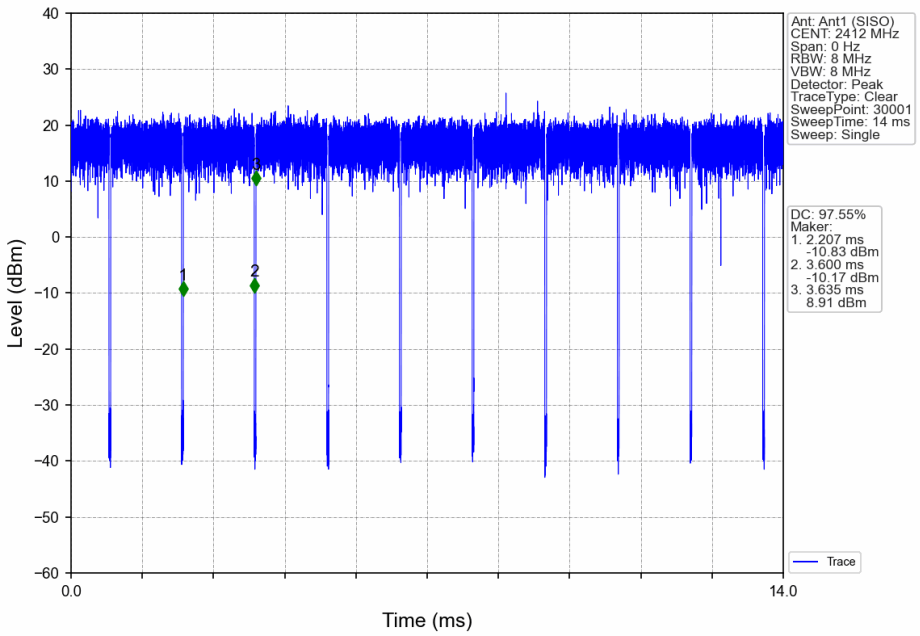
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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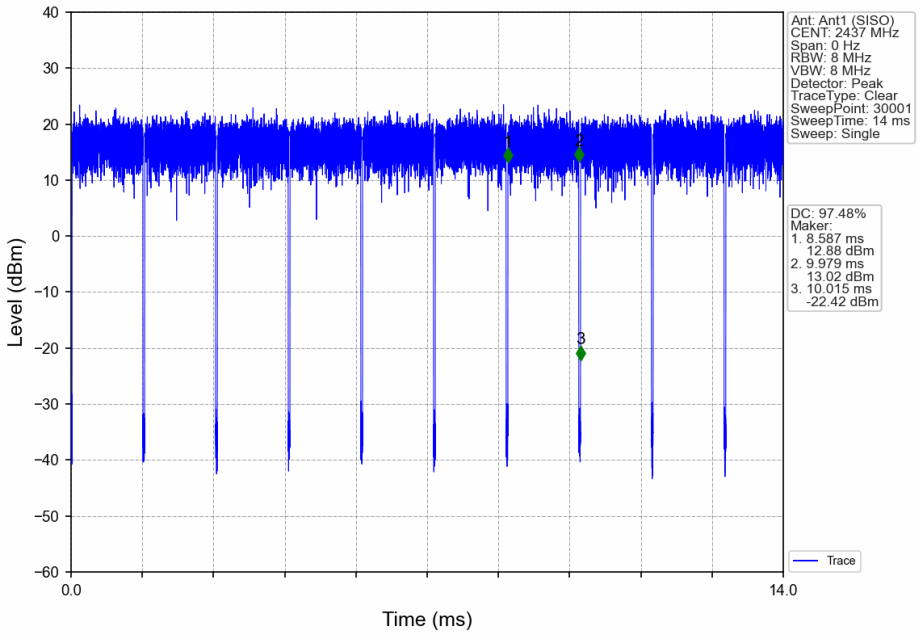
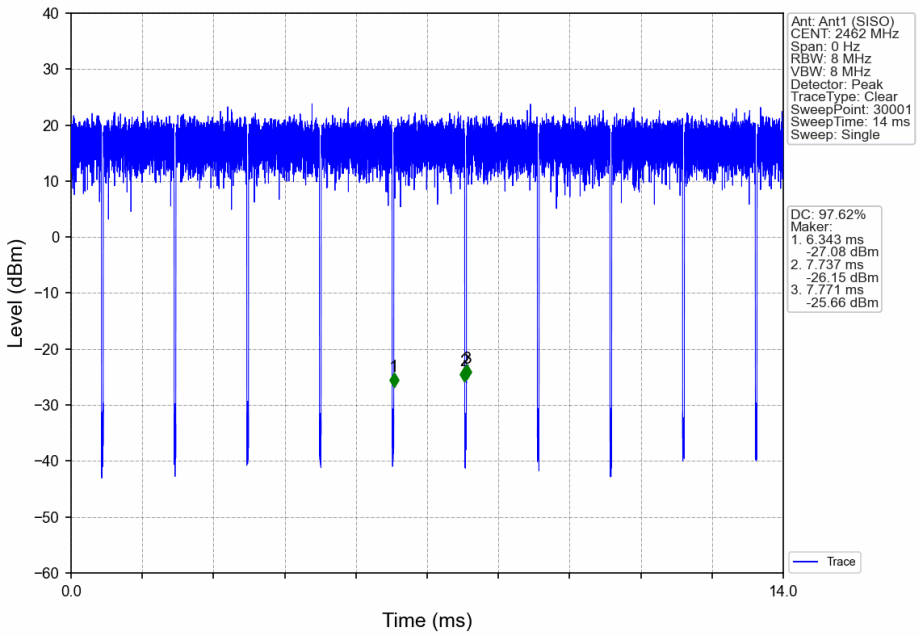
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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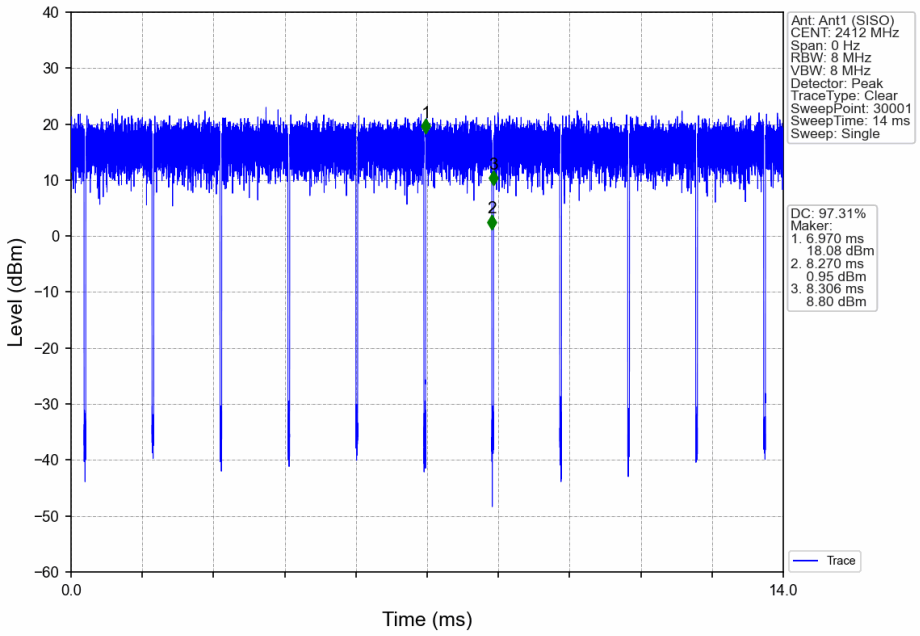
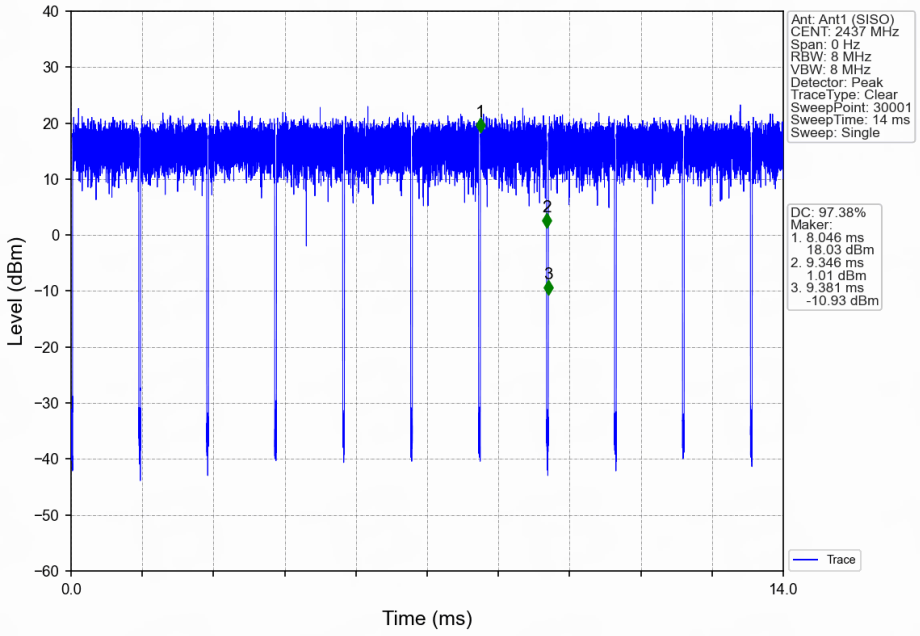
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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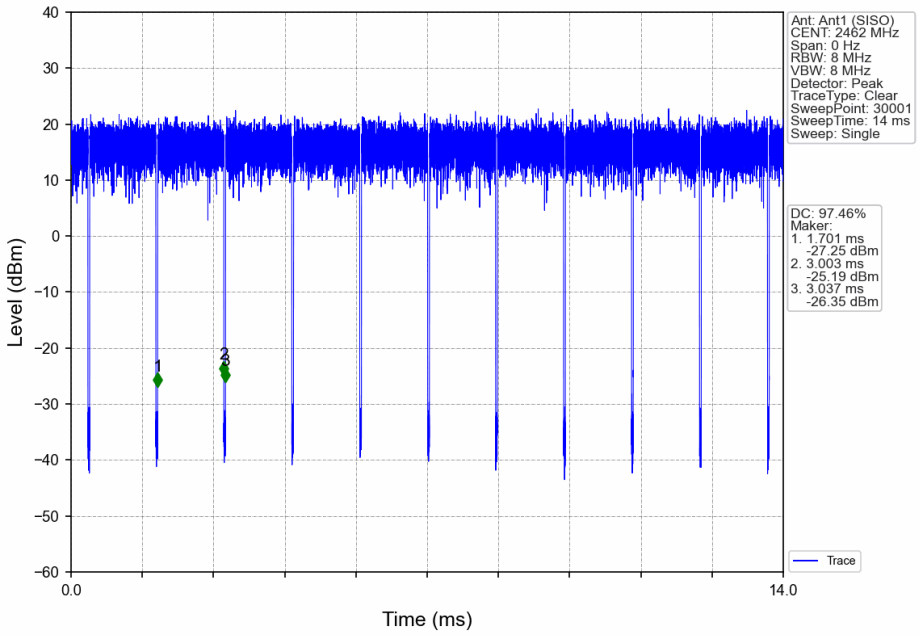
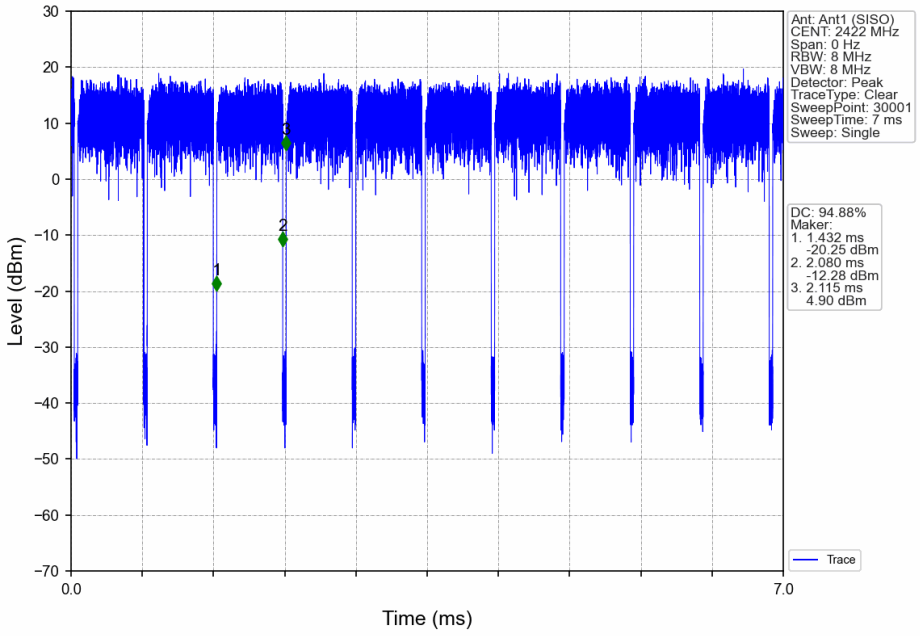
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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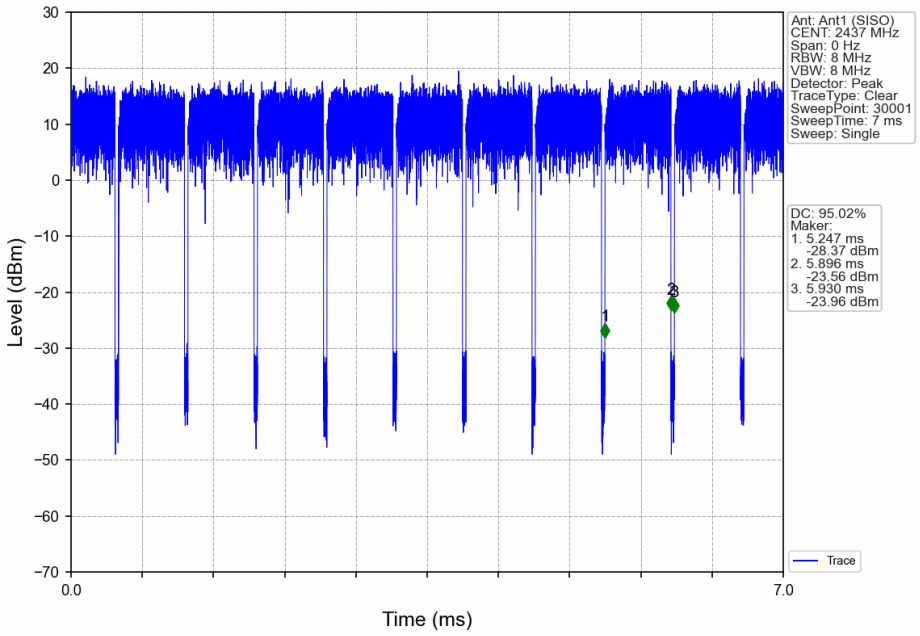
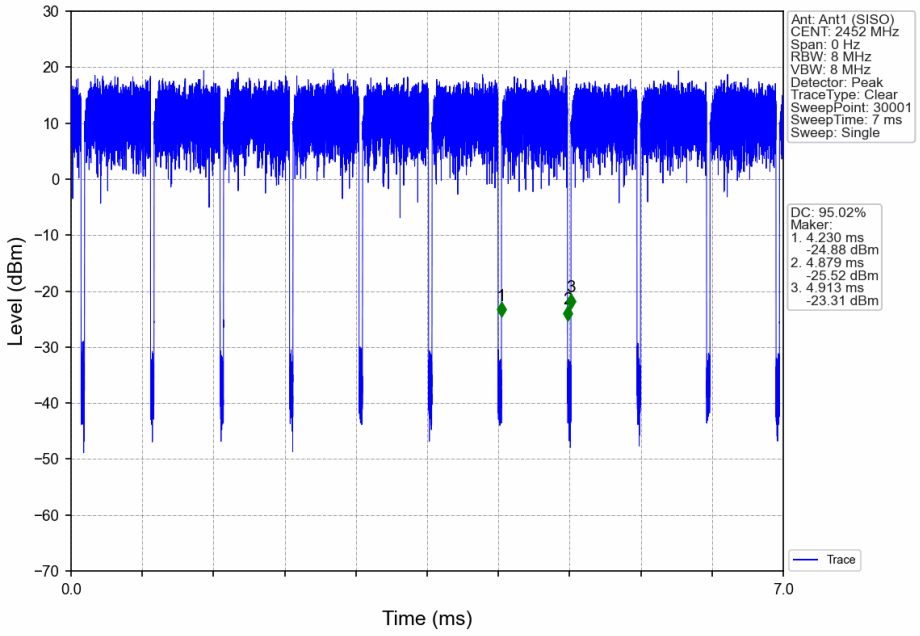
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz) Result	Verdict
802.11b	SISO	2412	1	12.917	Pass
		2437	1	12.985	Pass
		2462	1	12.966	Pass
802.11g	SISO	2412	1	17.494	Pass
		2437	1	17.551	Pass
		2462	1	17.596	Pass
802.11n (HT20)	SISO	2412	1	18.370	Pass
		2437	1	18.388	Pass
		2462	1	18.406	Pass
802.11n (HT40)	SISO	2422	1	36.720	Pass
		2437	1	36.850	Pass
		2452	1	36.654	Pass

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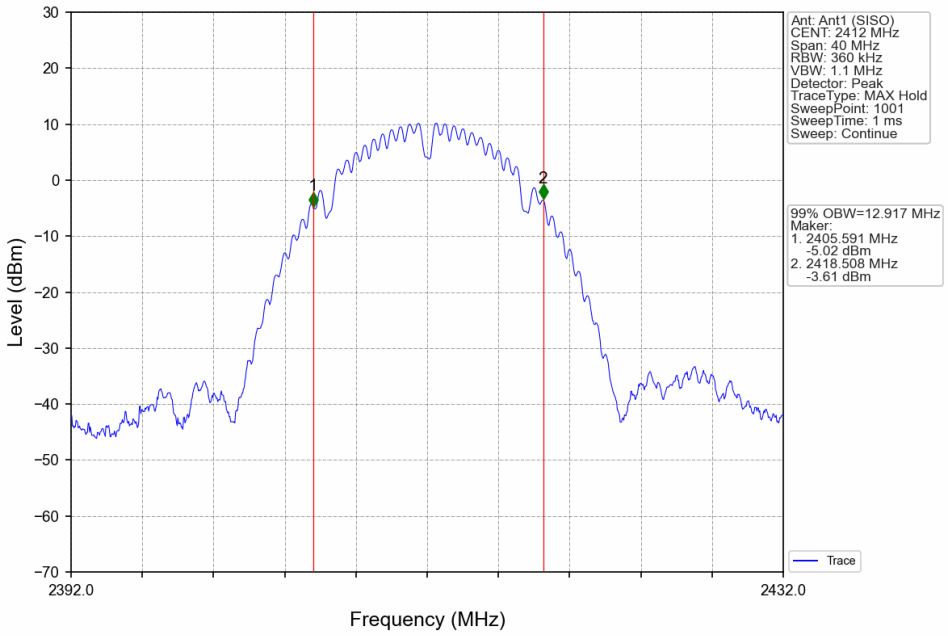
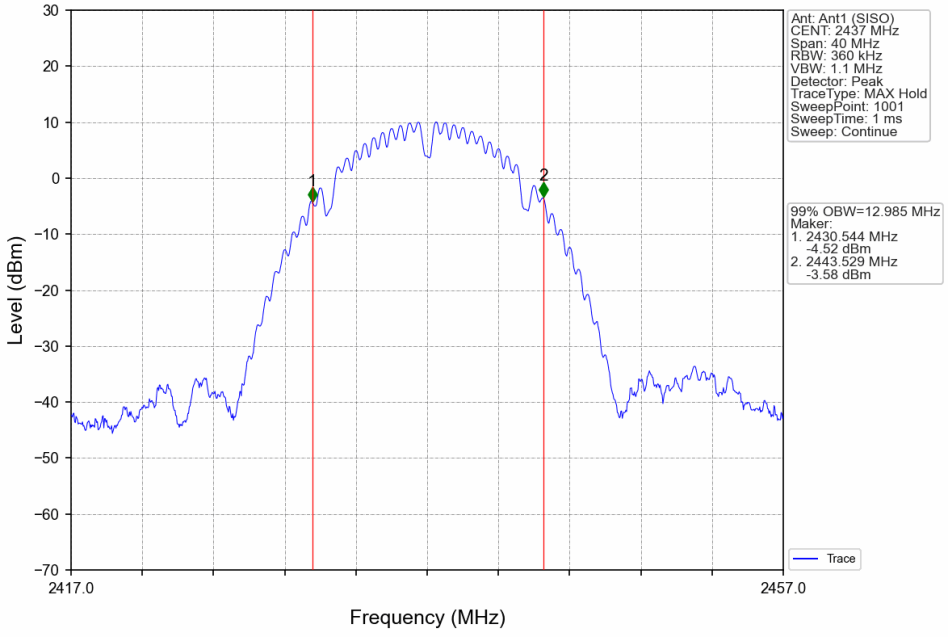
2.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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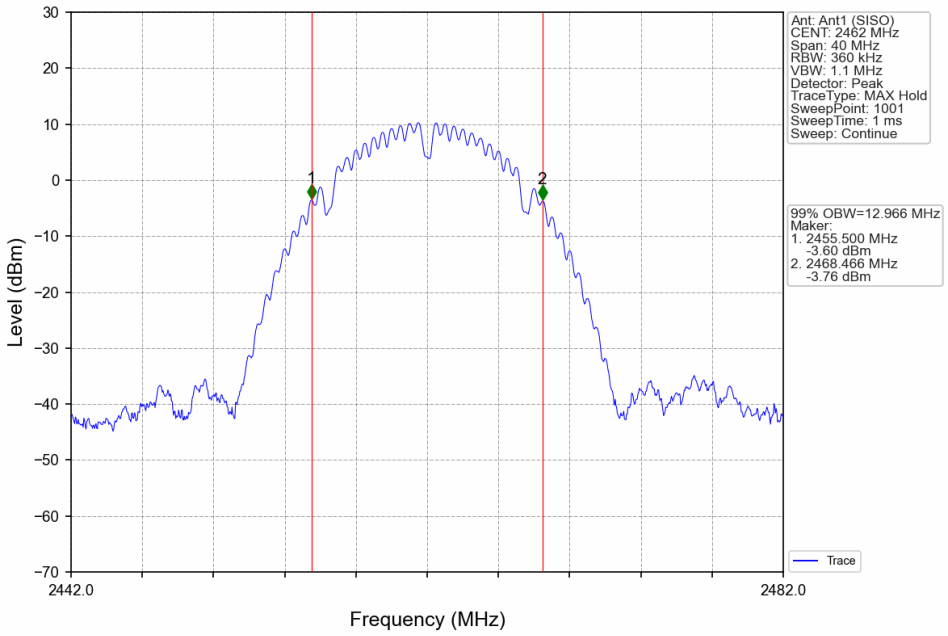
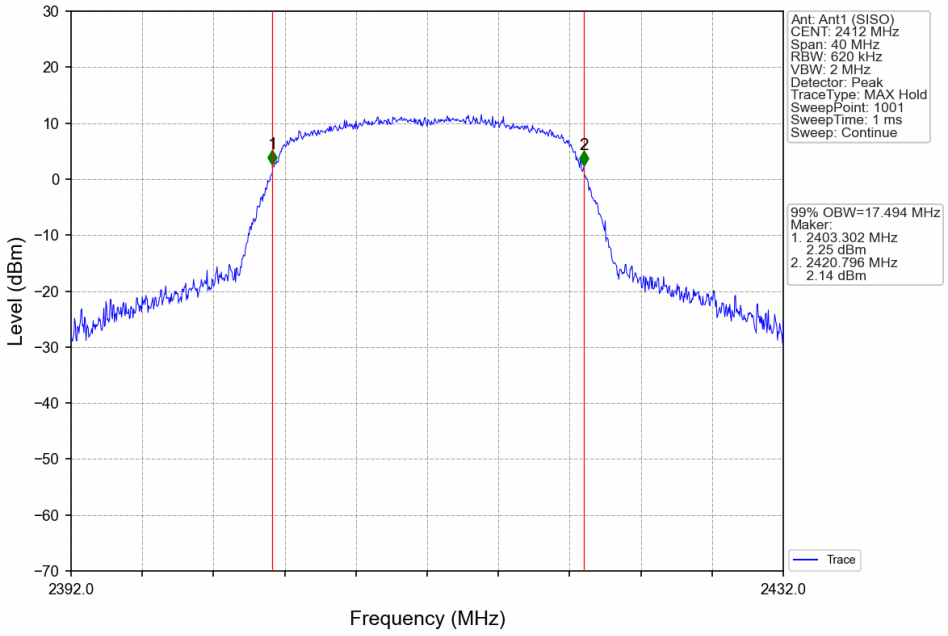
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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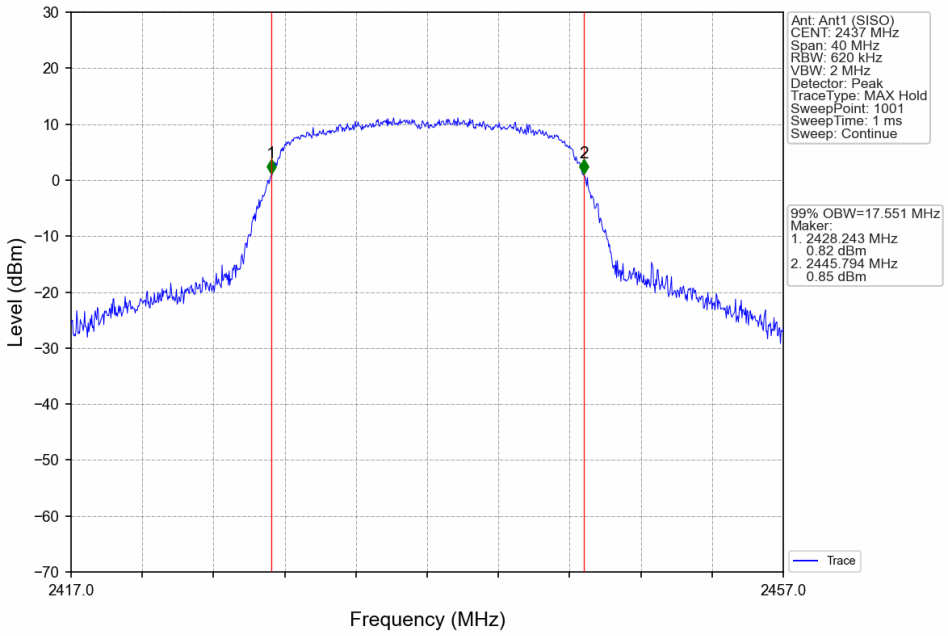
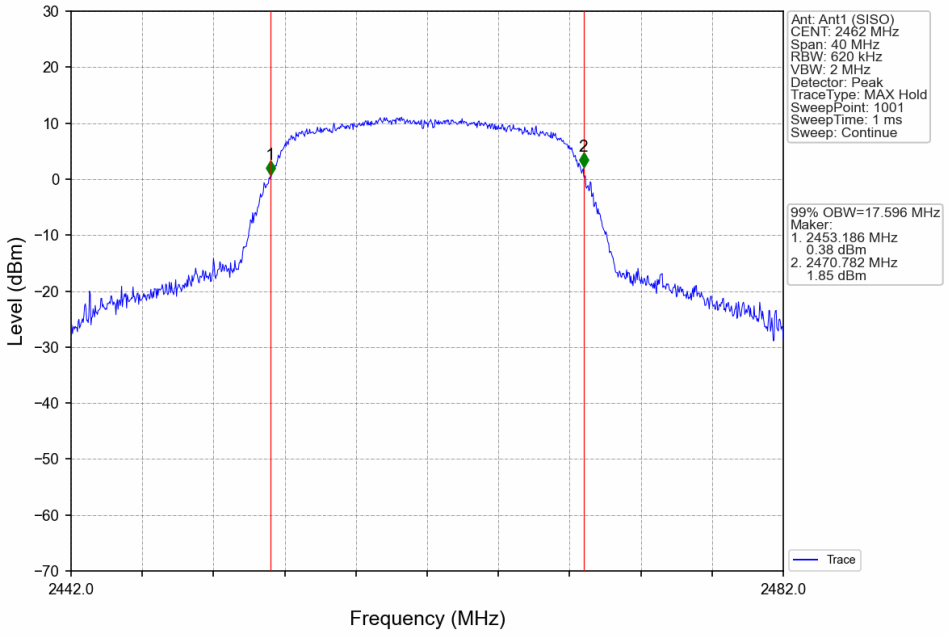
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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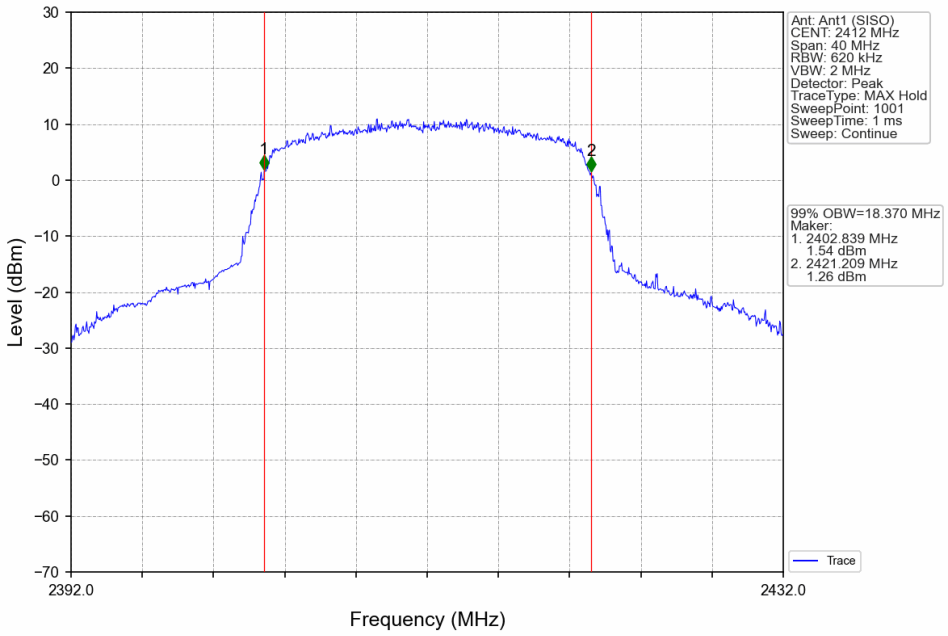
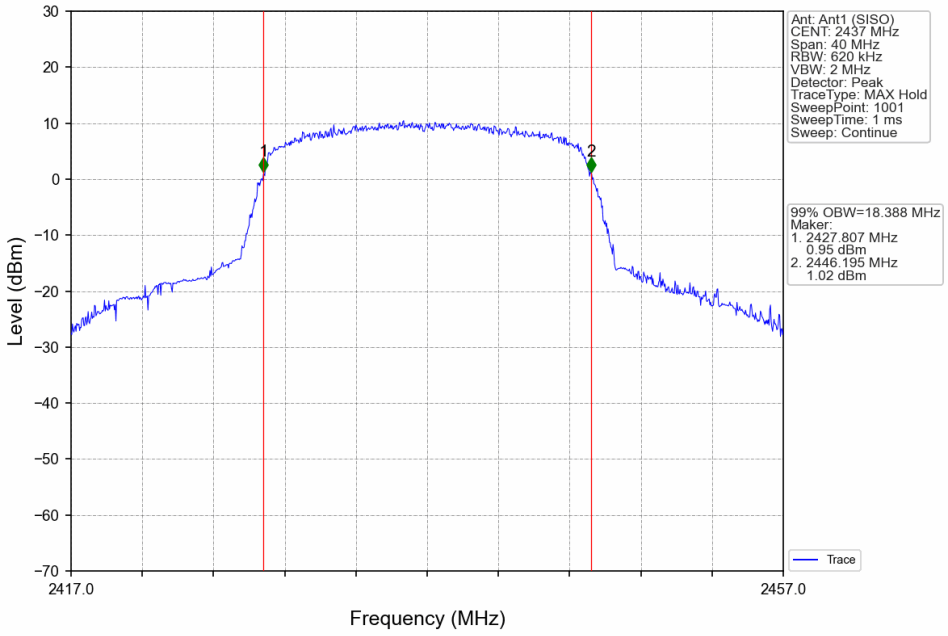
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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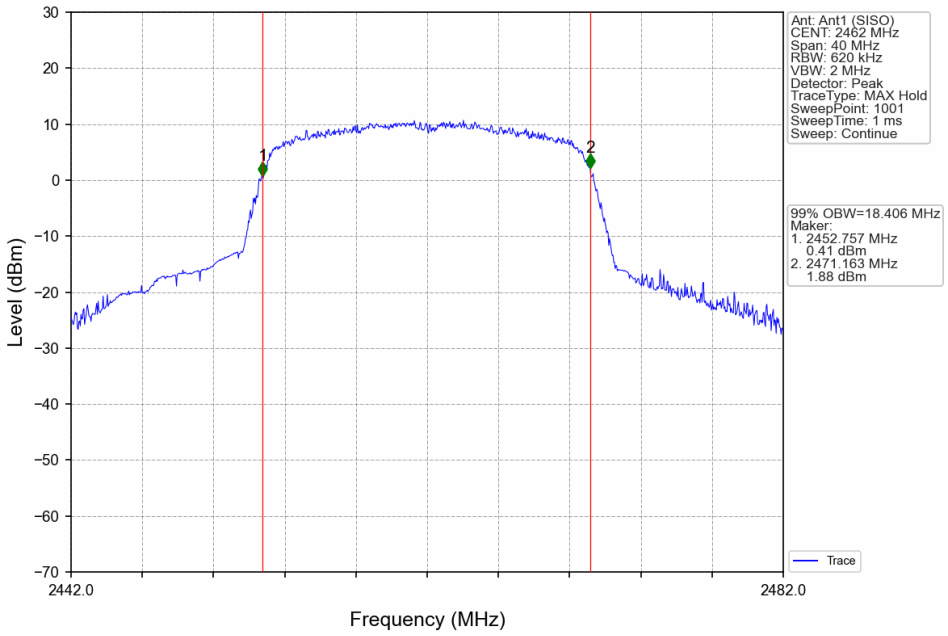
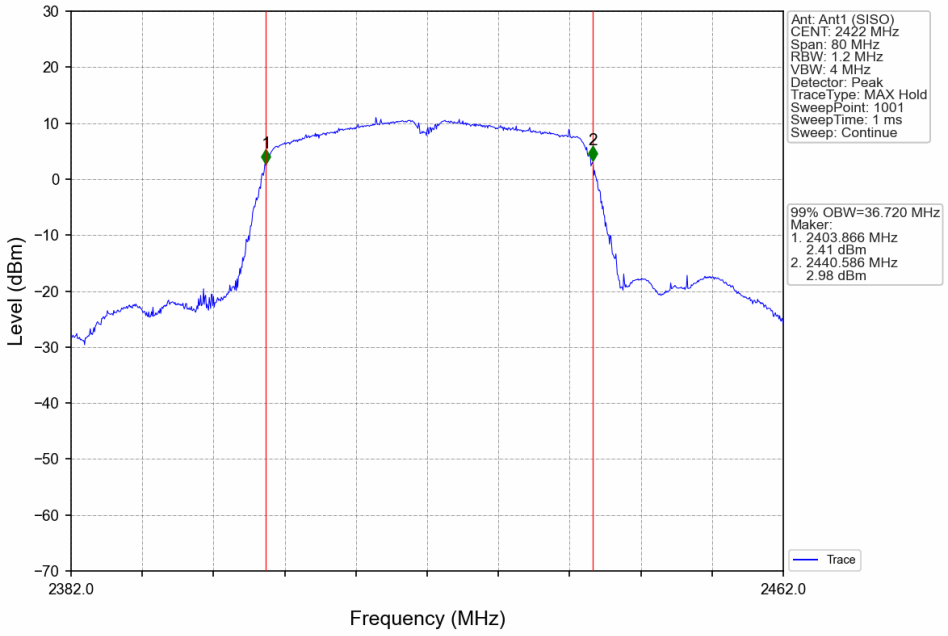
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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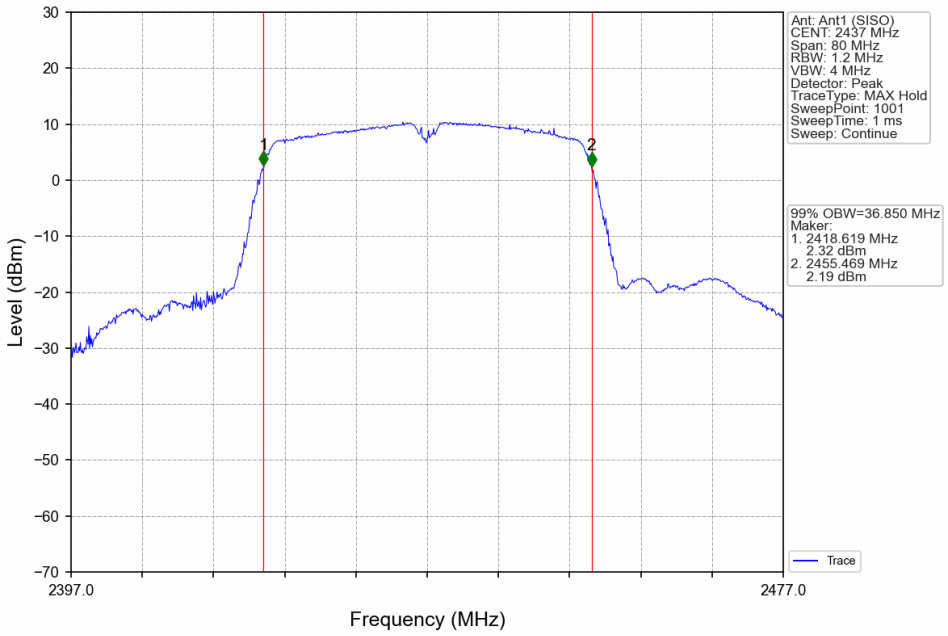
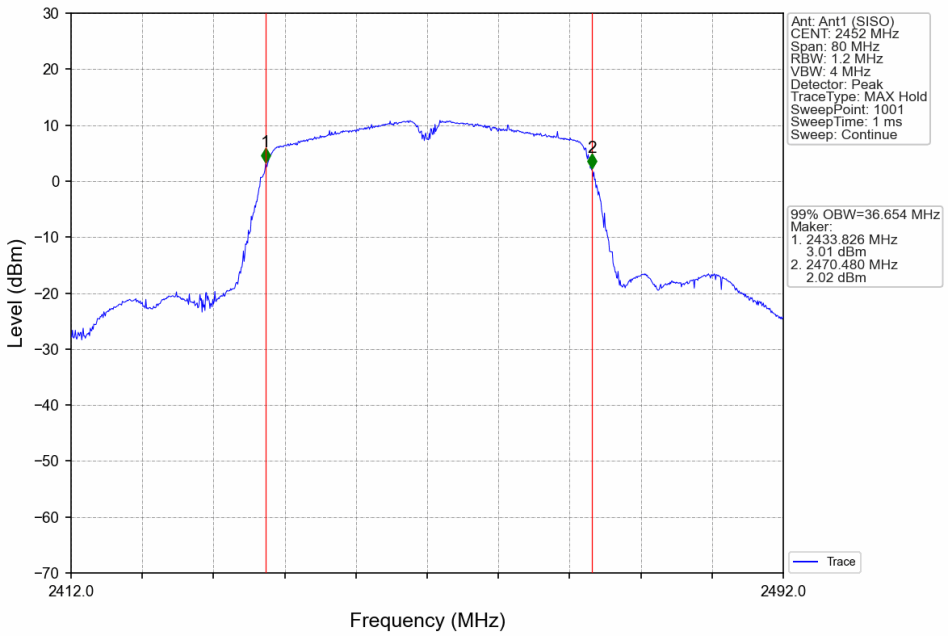
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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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	8.101	>=0.5	Pass
		2437	1	8.109	>=0.5	Pass
		2462	1	8.112	>=0.5	Pass
802.11g	SISO	2412	1	15.165	>=0.5	Pass
		2437	1	15.180	>=0.5	Pass
		2462	1	15.155	>=0.5	Pass
802.11n (HT20)	SISO	2412	1	15.157	>=0.5	Pass
		2437	1	15.173	>=0.5	Pass
		2462	1	15.172	>=0.5	Pass
802.11n (HT40)	SISO	2422	1	35.152	>=0.5	Pass
		2437	1	35.171	>=0.5	Pass
		2452	1	35.134	>=0.5	Pass

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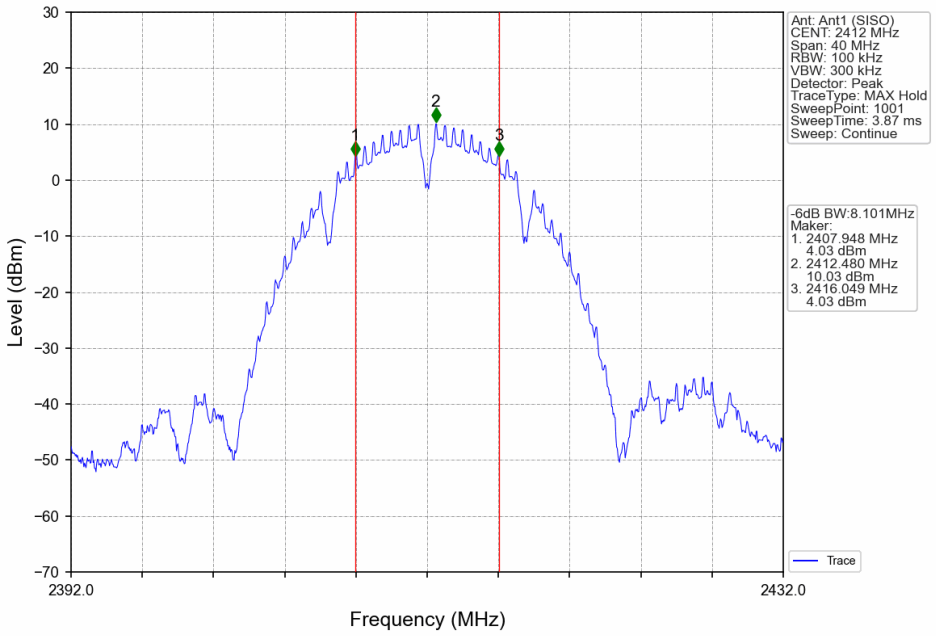
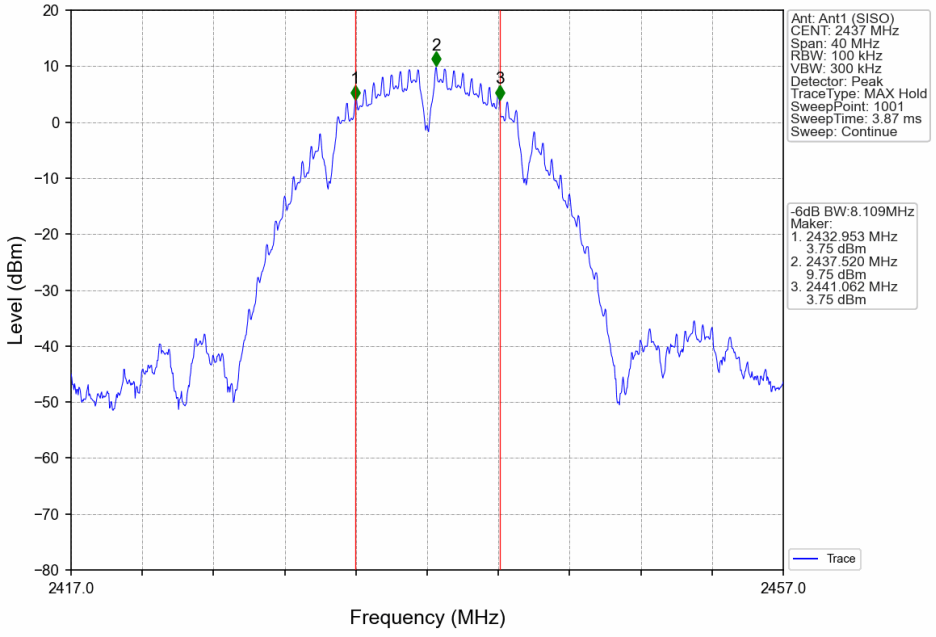
2.2.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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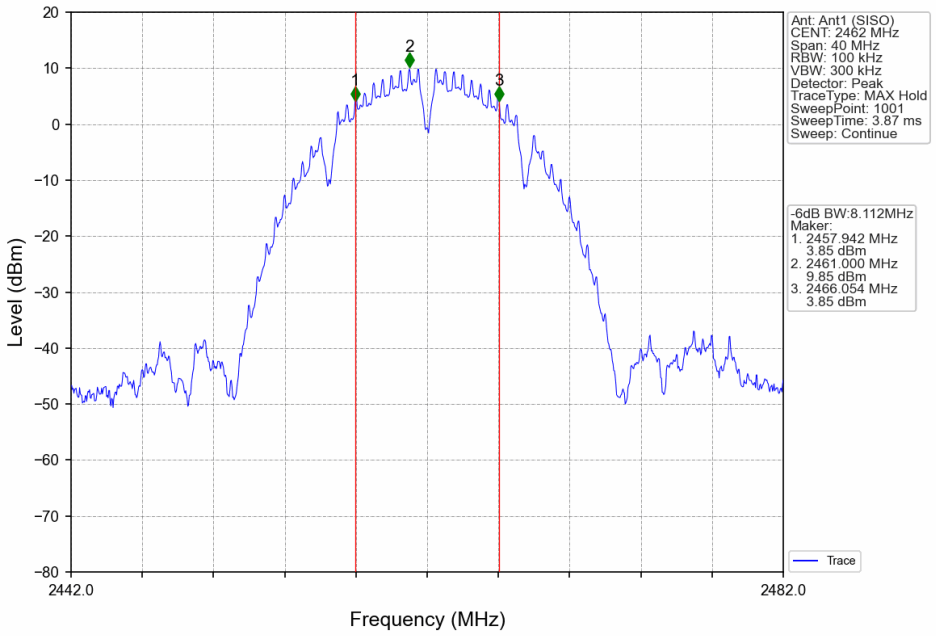
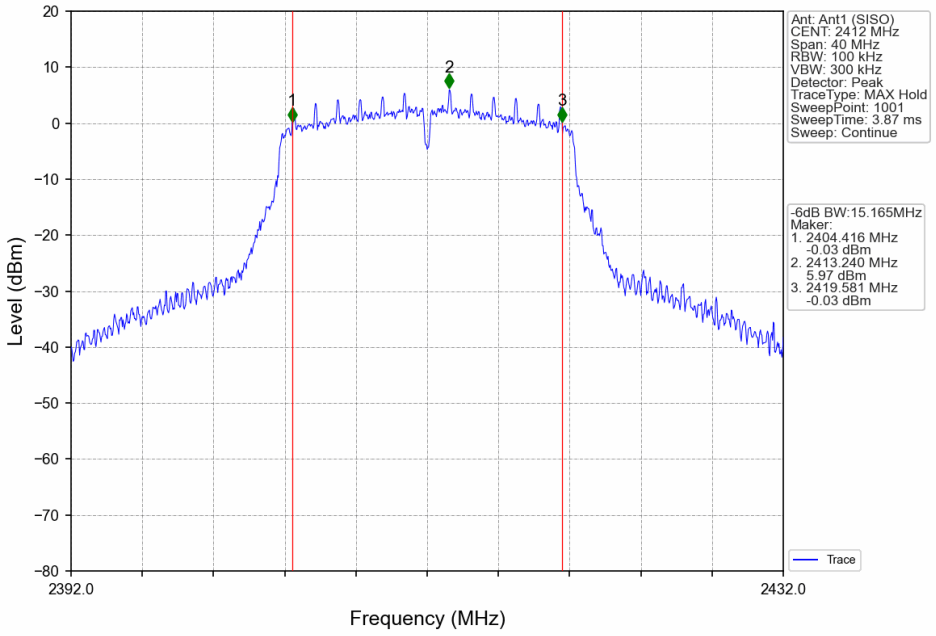
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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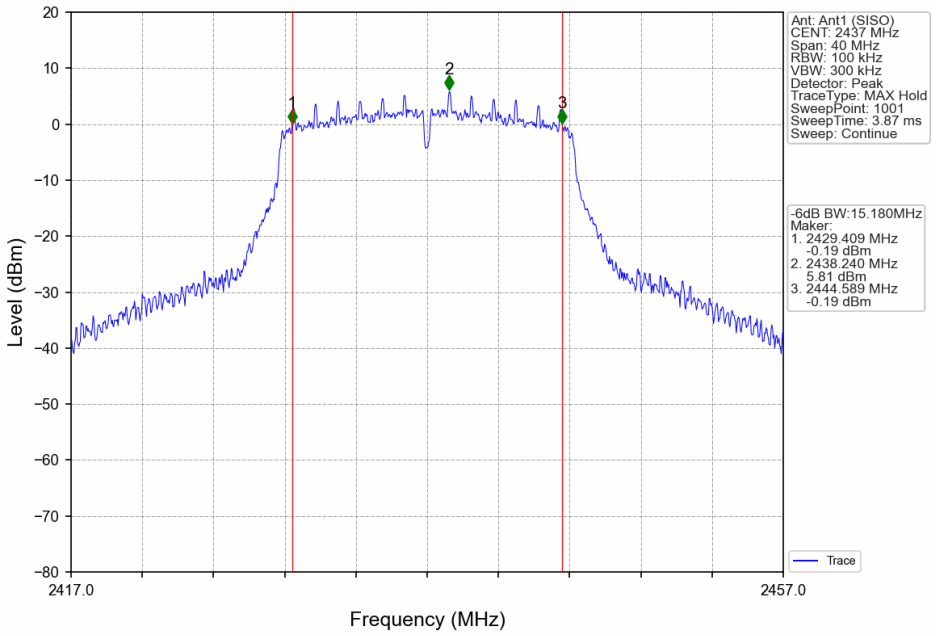
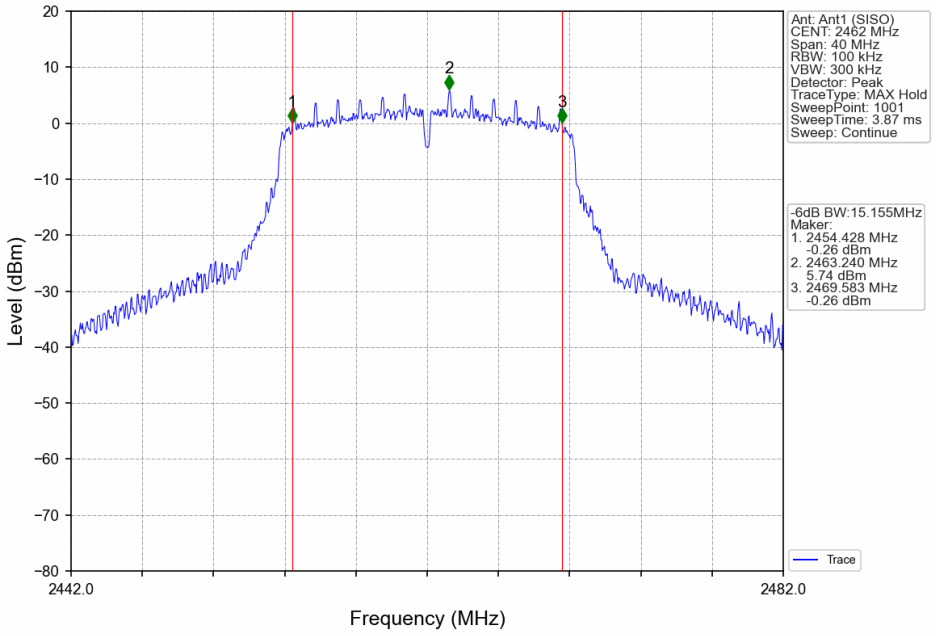
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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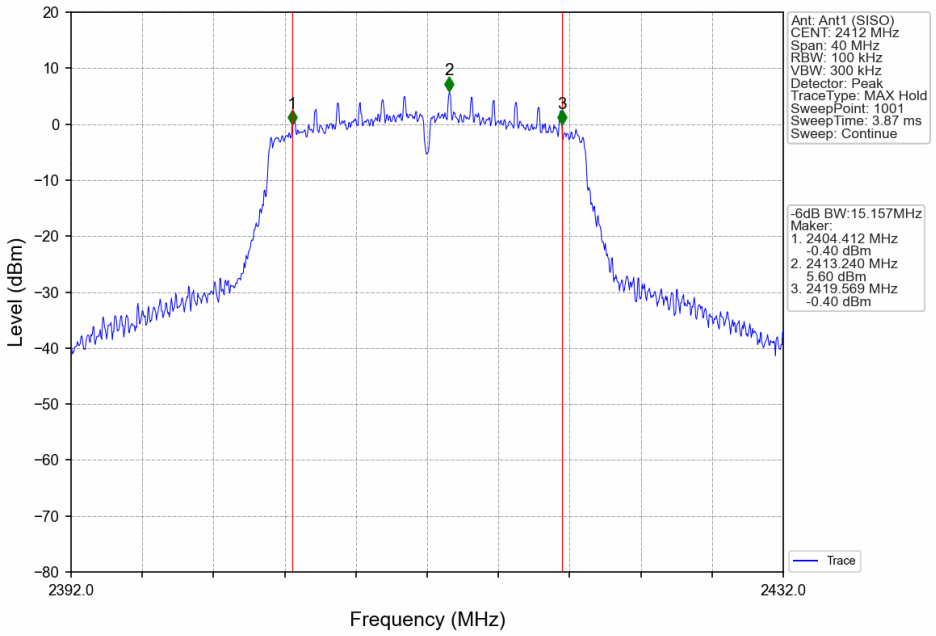
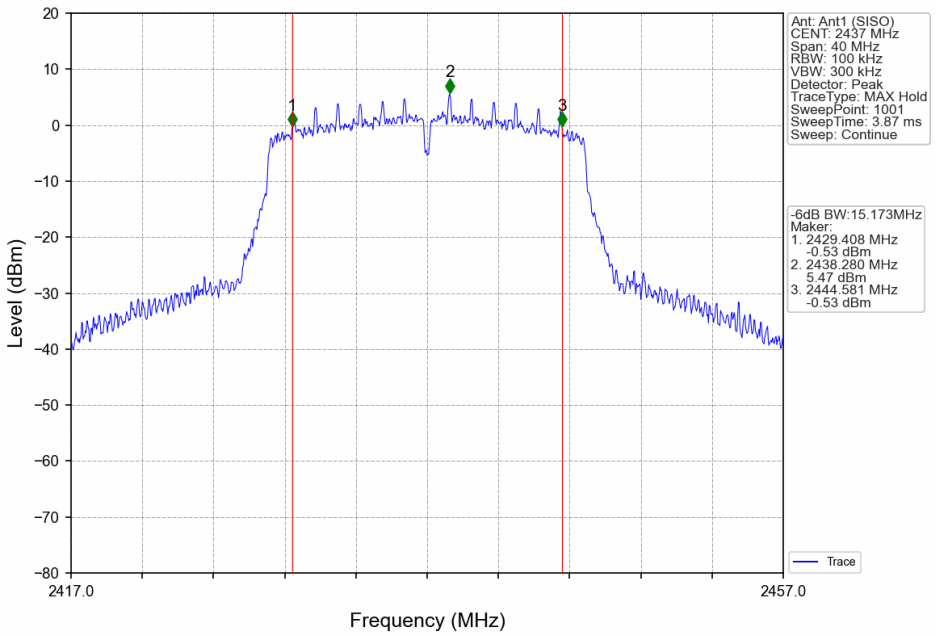
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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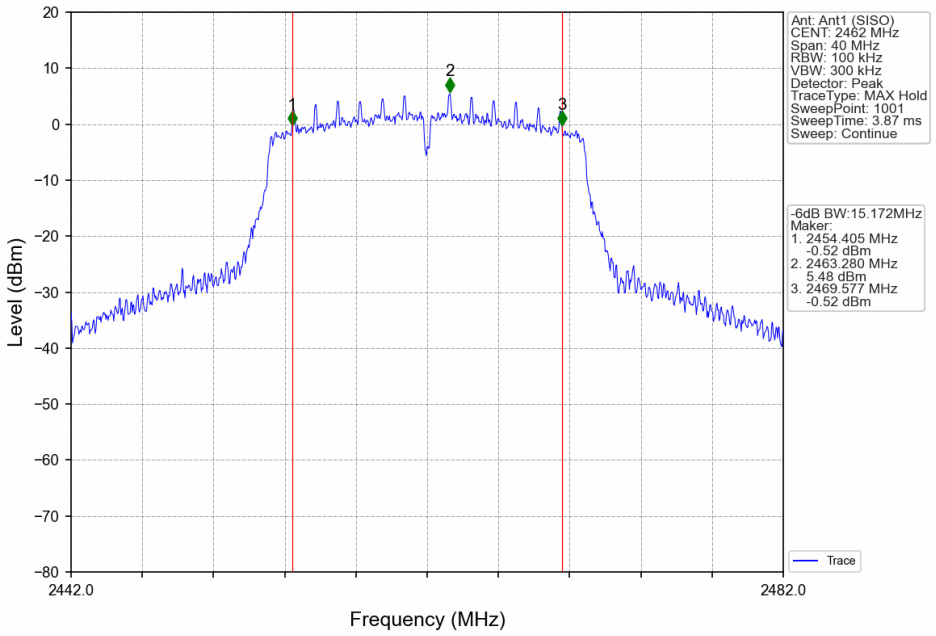
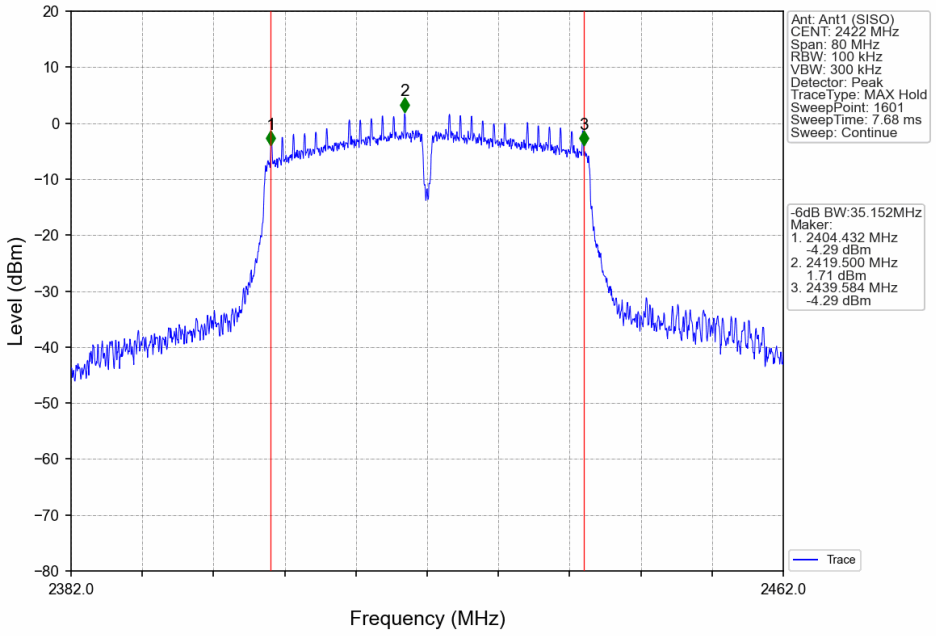
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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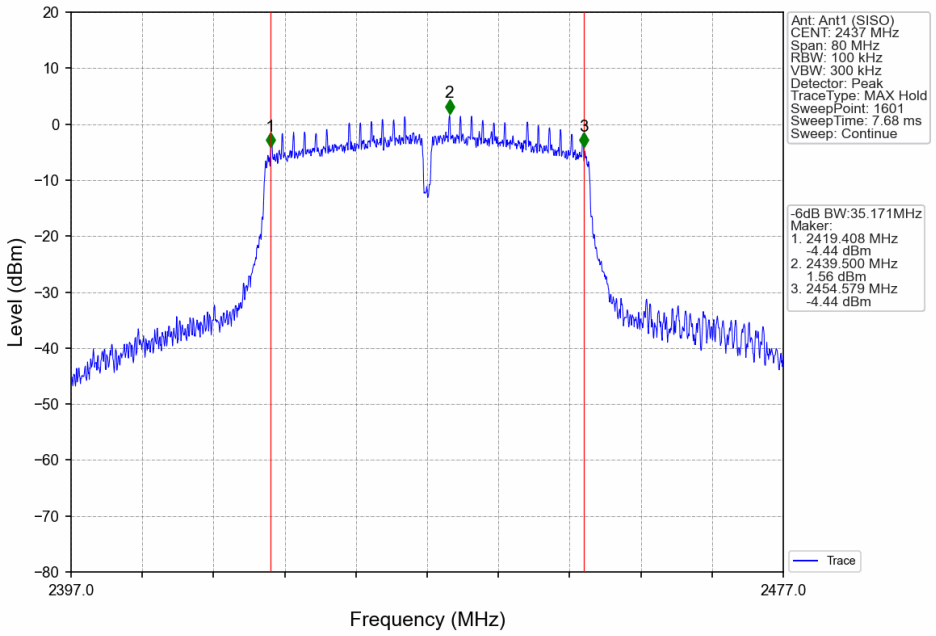
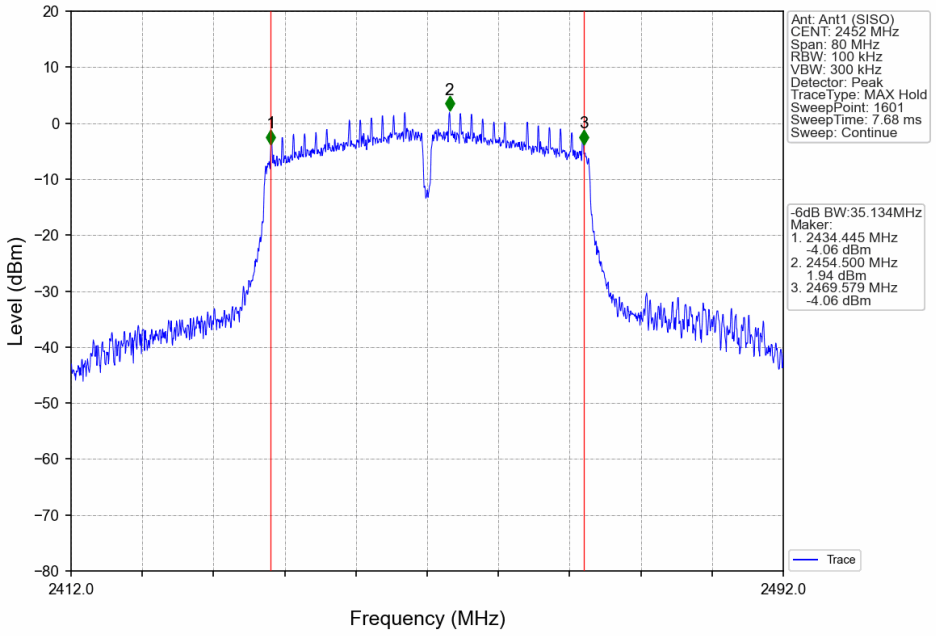
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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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	20.23	<=30	Pass
		2437	20.10	<=30	Pass
		2462	20.31	<=30	Pass
802.11g	SISO	2412	23.49	<=30	Pass
		2437	23.09	<=30	Pass
		2462	23.28	<=30	Pass
802.11n (HT20)	SISO	2412	22.89	<=30	Pass
		2437	22.81	<=30	Pass
		2462	23.07	<=30	Pass
802.11n (HT40)	SISO	2422	22.57	<=30	Pass
		2437	22.54	<=30	Pass
		2452	22.64	<=30	Pass
Note1: Antenna Gain: Ant1: 1.11dBi;					

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	-4.98	<=8	Pass
		2437	-4.79	<=8	Pass
		2462	-4.86	<=8	Pass
802.11g	SISO	2412	-9.37	<=8	Pass
		2437	-9.29	<=8	Pass
		2462	-9.24	<=8	Pass
802.11n (HT20)	SISO	2412	-9.88	<=8	Pass
		2437	-9.32	<=8	Pass
		2462	-8.36	<=8	Pass
802.11n (HT40)	SISO	2422	-12.62	<=8	Pass
		2437	-13.50	<=8	Pass
		2452	-11.95	<=8	Pass
Note1: Antenna Gain: Ant1: 1.11dBi;					

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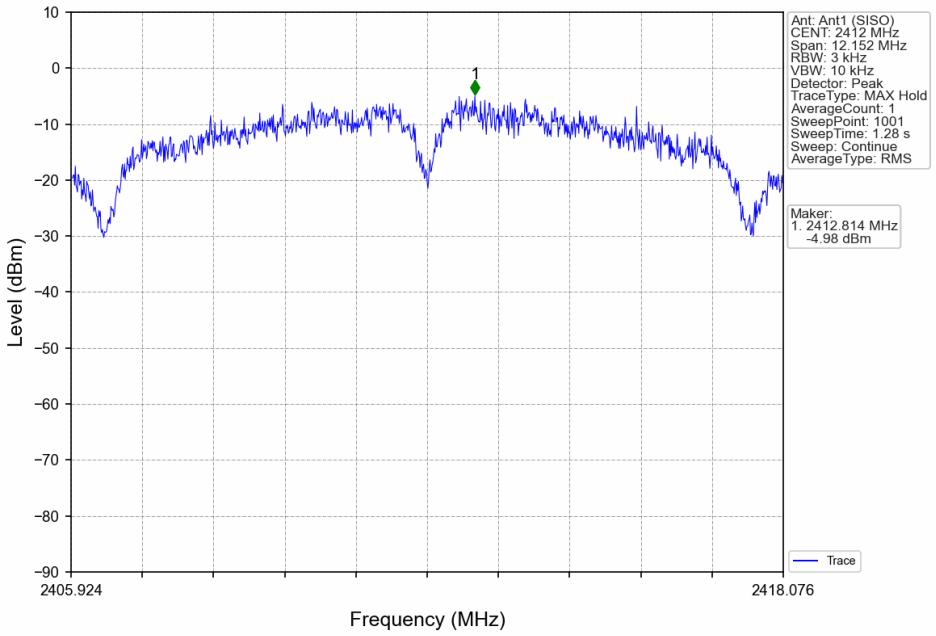
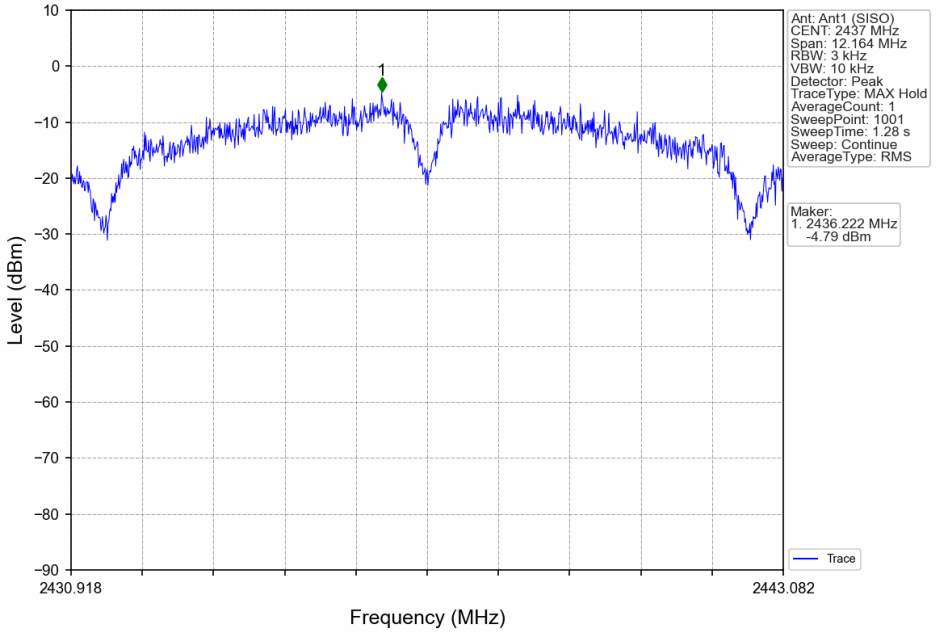
4.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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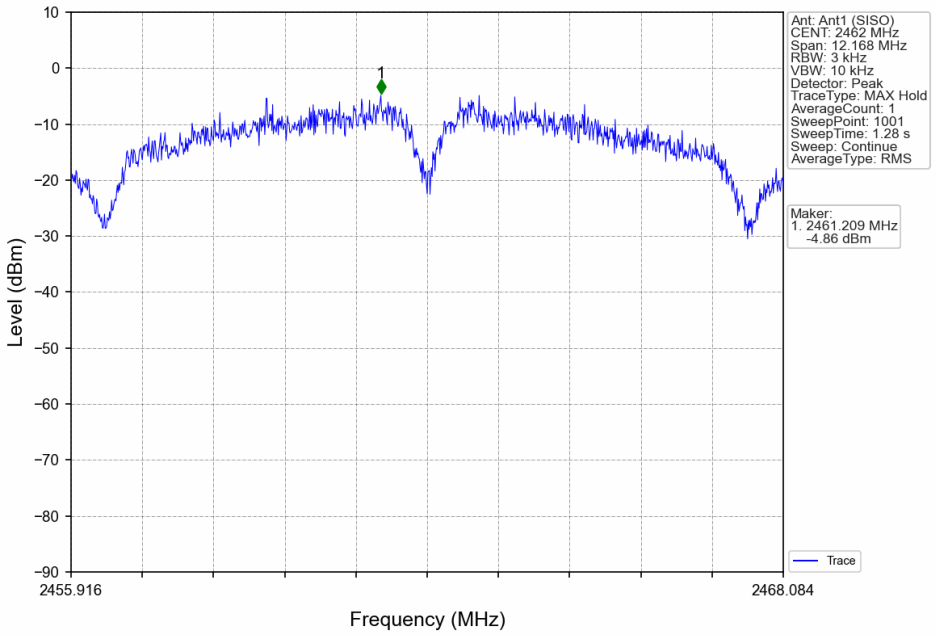
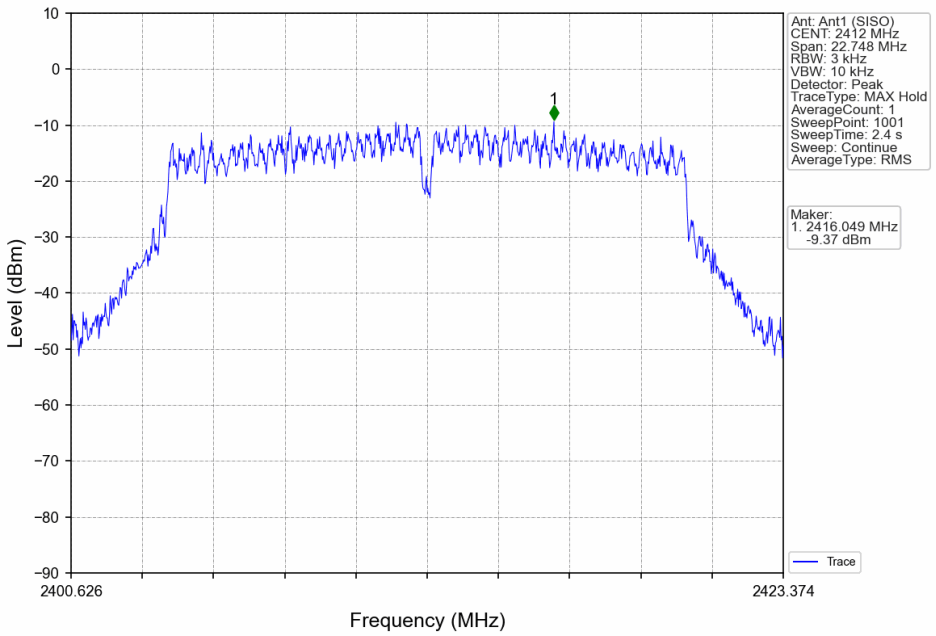
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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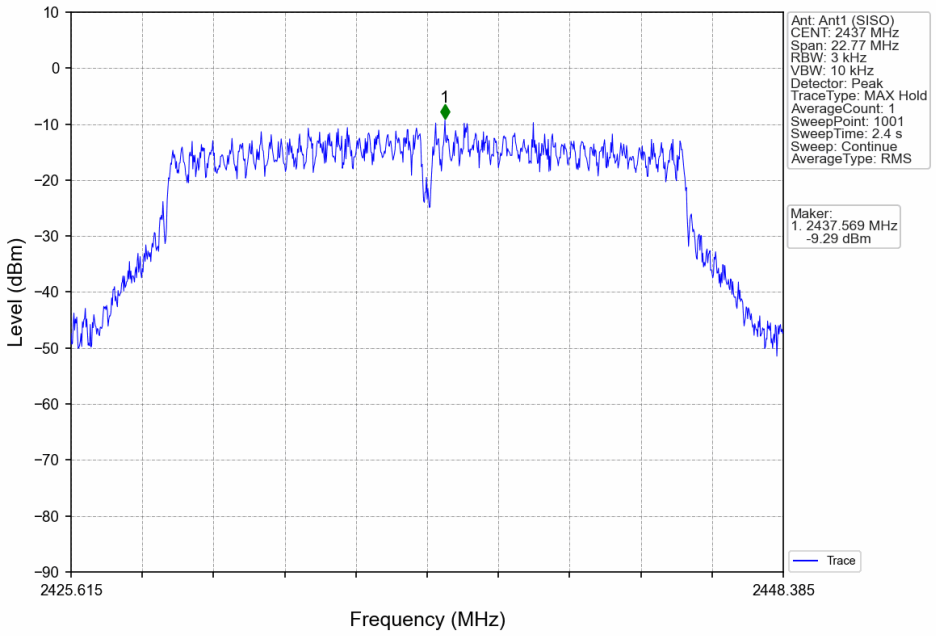
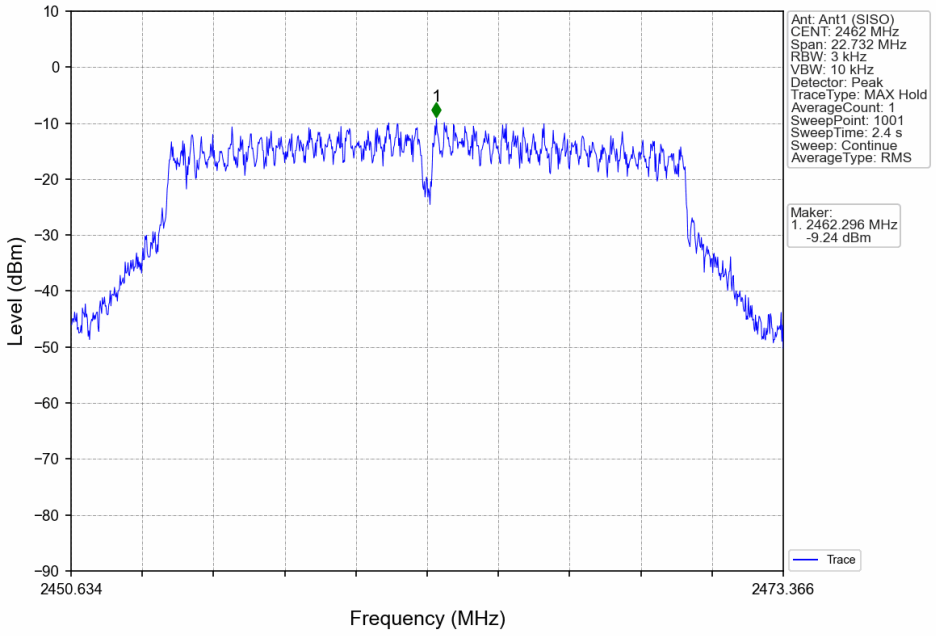
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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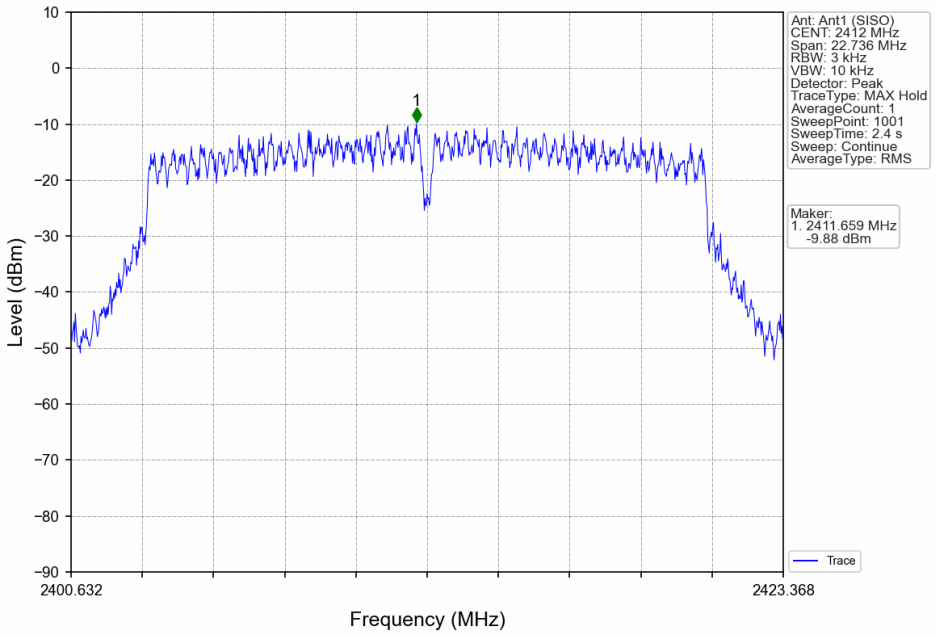
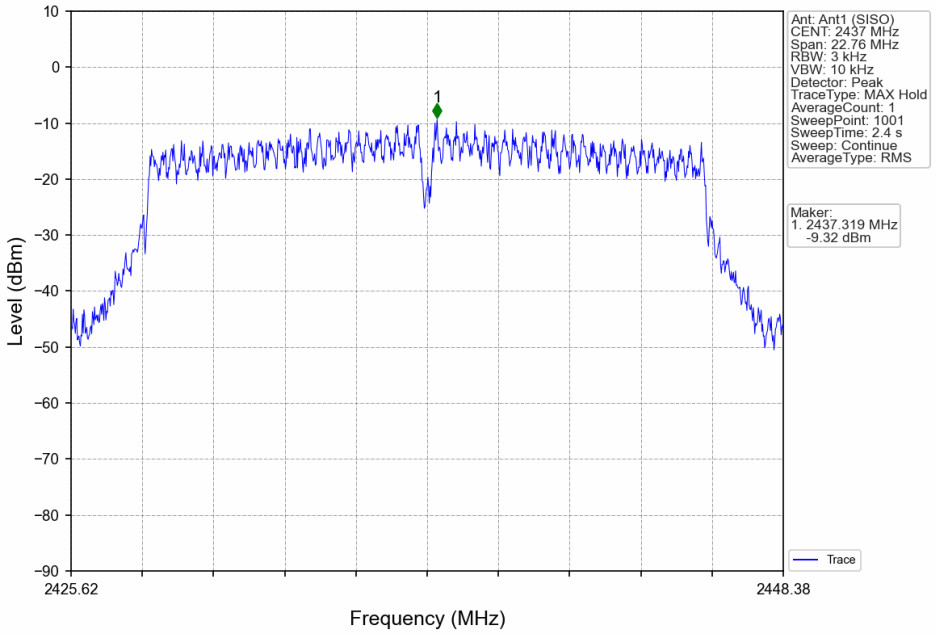
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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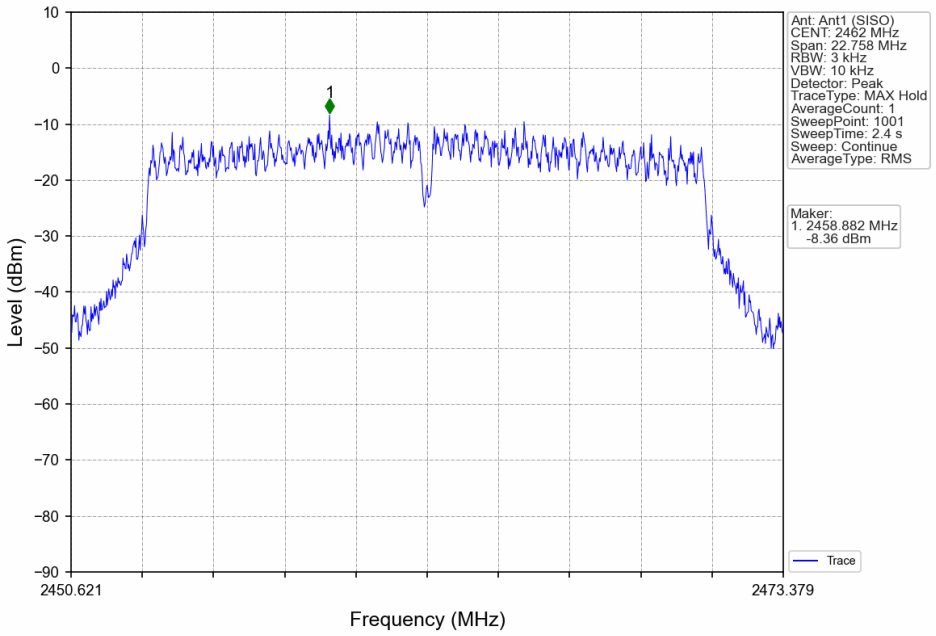
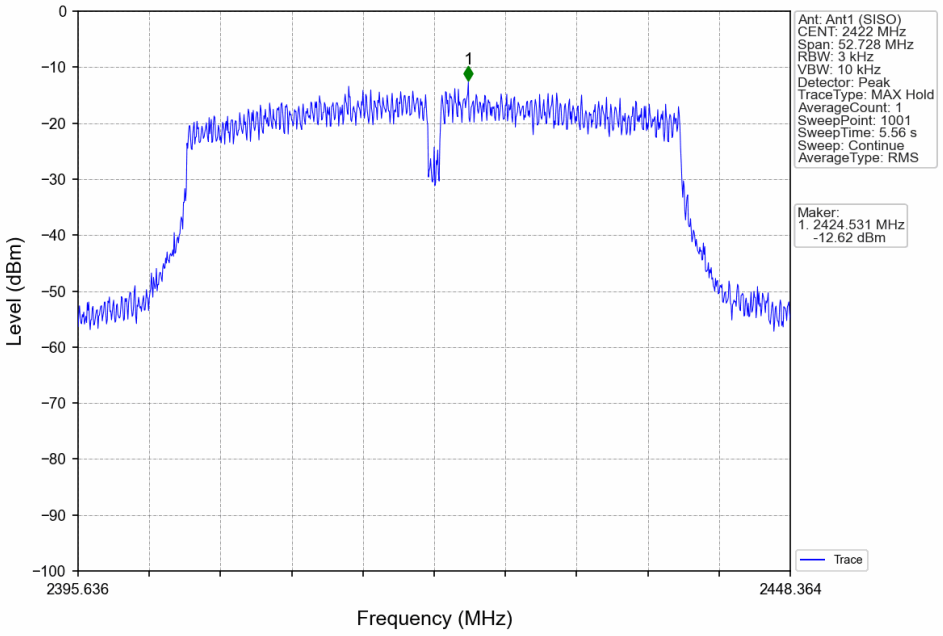
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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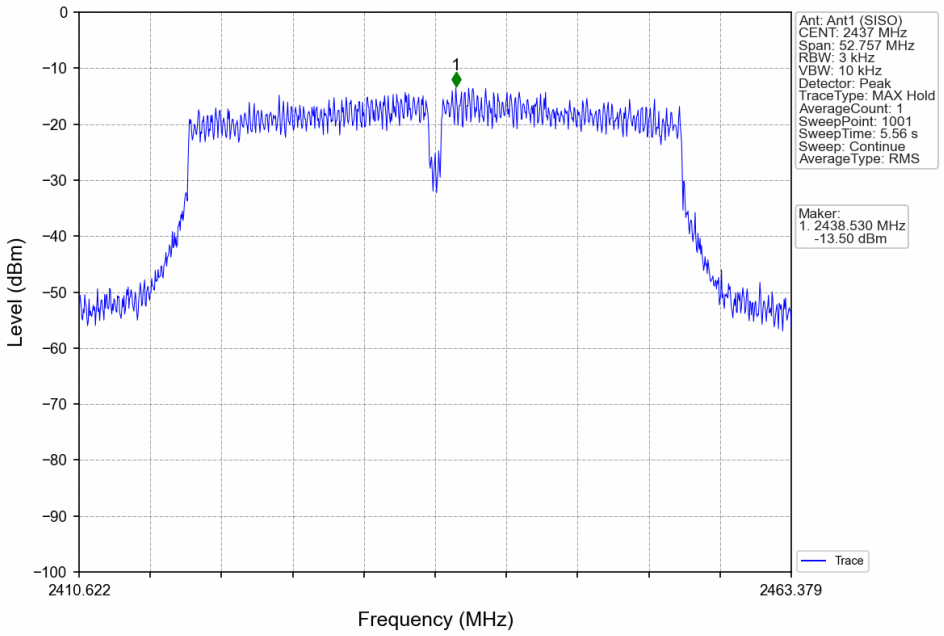
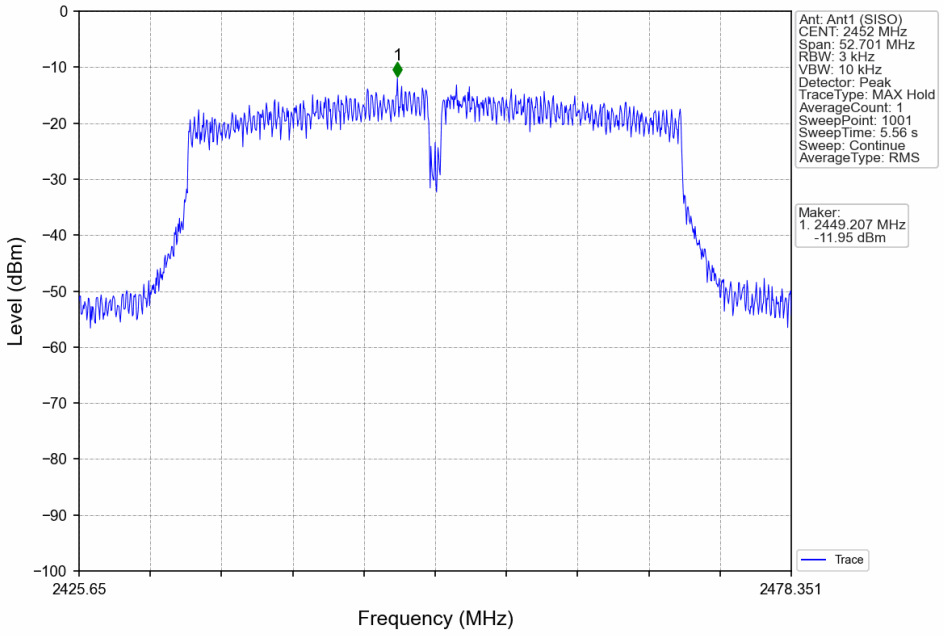
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_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	**9.88**
		2437	1	9.58
		2462	1	9.87
802.11g	SISO	2412	1	**5.81**
		2437	1	4.86
		2462	1	5.74
802.11n (HT20)	SISO	2412	1	5.59
		2437	1	5.43
		2462	1	**5.63**
802.11n (HT40)	SISO	2422	1	1.57
		2437	1	1.46
		2452	1	**1.96**
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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