



RF Test Report

For

Applicant Name: Xwireless LLC
Address: 11565 Old Georgetown Road, Rockville, MD, USA
EUT Name: Mobile Phone
Brand Name: Vortex
Model Number: HD60L

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: BTF230810R00503
Test Standards: 47 CFR Part 15.247

Test Conclusion: Pass
FCC ID: 2ADLJ-HD60L
Test Date: 2023-08-10 to 2023-08-25
Date of Issue: 2023-08-28

Prepared By:

Elma. Yang

Date:

elma.yang / Project Engineer
2023-08-28

Approved By:

Ryan.CJ

Date:

Ryan.CJ / EMC Manager
2023-08-28



Note: All the test results in this report only related to the testing samples. Which can be duplicated completely for the legal use with approval of applicant; it shall not be reproduced except in full without the written approval of BTF Testing Lab (Shenzhen) Co., Ltd., All the objections should be raised within thirty days from the date of issue. To validate the report, you can contact us.



Revision History		
Version	Issue Date	Revisions Content
R_V0	2023-08-28	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.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

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 COMMUNICATION(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:	HD60L

2.5 Technical Information

Power Supply:	DC 5V from adapter
Power Adaptor:	Input: 100-240V AC. 50/60Hz 0.15A Output: 5V 1Amp
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 [#] :	1.09 dBi

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.

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
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	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

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 COMMUNICATION 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 COMMUNICATION 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	/	/	/

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 COMMUNICATION 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 COMMUNICATION 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	2023-03-24	2024-03-23
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMAMAM-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-SMAMAM-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 Preampplifier	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	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	2023-03-24	2024-03-23
Preampplifier	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 Preampplifier	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	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	2023-03-24	2024-03-23
Preampplifier	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 Preamplifier	SCHWARZBECK	BBV9718D	00008	2023-03-24	2024-03-23
Horn Antenna	SCHWARZBECK	BBHA9120D	2597	2022-05-22	2024-05-21
EZ_EMCC	Frad	FA-03A2 RE+	/	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2021-11-28	2023-11-27

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.
TM4	802.11n(HT40) mode	Keep the EUT in 802.11n(HT40) transmitting mode.

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.
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6 Radio Spectrum Matter Test Results (RF)

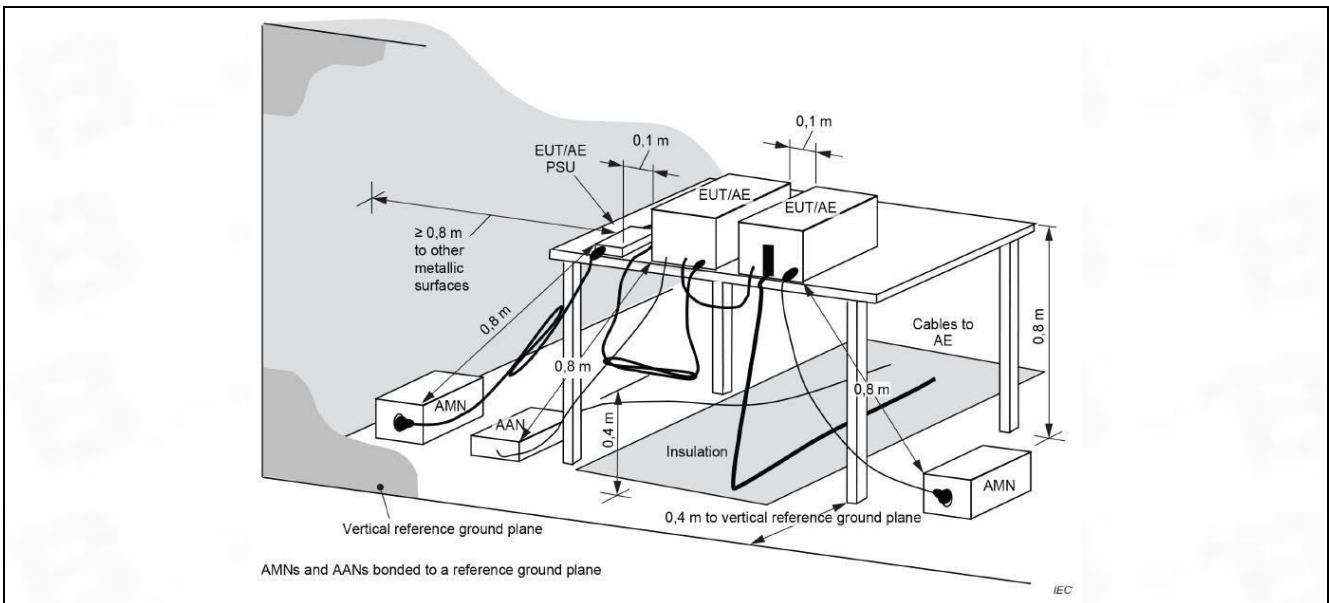
6.1 Conducted Emission at AC power line

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 μ H/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 (dB μ V)	
		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:	23.2 °C
Humidity:	54.7 %
Atmospheric Pressure:	1010 mbar

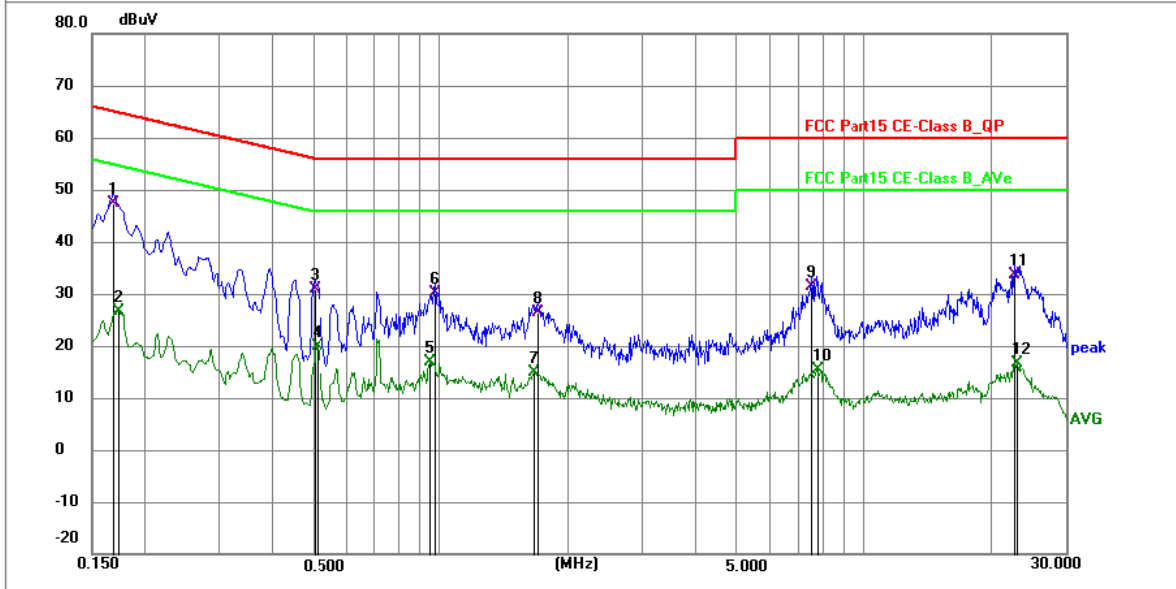
6.1.2 Test Setup Diagram:





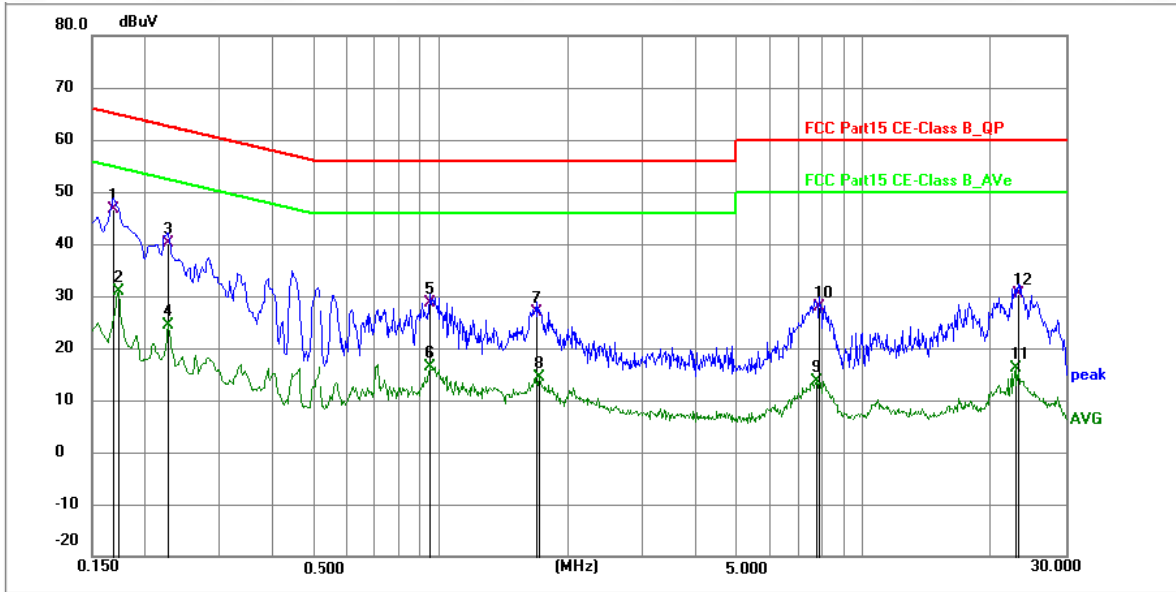
6.1.3 Test Data:

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 *	0.1680	36.74	10.56	47.30	65.06	-17.76	QP	P	
2	0.1724	15.99	10.56	26.55	54.84	-28.29	AVG	P	
3	0.5010	20.19	10.61	30.80	56.00	-25.20	QP	P	
4	0.5100	9.15	10.61	19.76	46.00	-26.24	AVG	P	
5	0.9465	6.12	10.77	16.89	46.00	-29.11	AVG	P	
6	0.9780	19.32	10.78	30.10	56.00	-25.90	QP	P	
7	1.6710	4.18	10.72	14.90	46.00	-31.10	AVG	P	
8	1.7024	15.68	10.72	26.40	56.00	-29.60	QP	P	
9	7.5210	20.62	10.78	31.40	60.00	-28.60	QP	P	
10	7.7280	4.55	10.79	15.34	50.00	-34.66	AVG	P	
11	22.7354	22.56	11.04	33.60	60.00	-26.40	QP	P	
12	23.1000	5.61	11.04	16.65	50.00	-33.35	AVG	P	

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 *	0.1680	36.14	10.56	46.70	65.06	-18.36	QP	P	
2	0.1724	20.37	10.56	30.93	54.84	-23.91	AVG	P	
3	0.2265	29.51	10.59	40.10	62.58	-22.48	QP	P	
4	0.2265	13.82	10.59	24.41	52.58	-28.17	AVG	P	
5	0.9465	17.83	10.77	28.60	56.00	-27.40	QP	P	
6	0.9465	5.72	10.77	16.49	46.00	-29.51	AVG	P	
7	1.6845	16.08	10.72	26.80	56.00	-29.20	QP	P	
8	1.7115	3.58	10.72	14.30	46.00	-31.70	AVG	P	
9	7.7145	2.92	10.79	13.71	50.00	-36.29	AVG	P	
10	7.8404	17.10	10.80	27.90	60.00	-32.10	QP	P	
11	22.9785	4.99	11.04	16.03	50.00	-33.97	AVG	P	
12	23.2214	19.36	11.04	30.40	60.00	-29.60	QP	P	

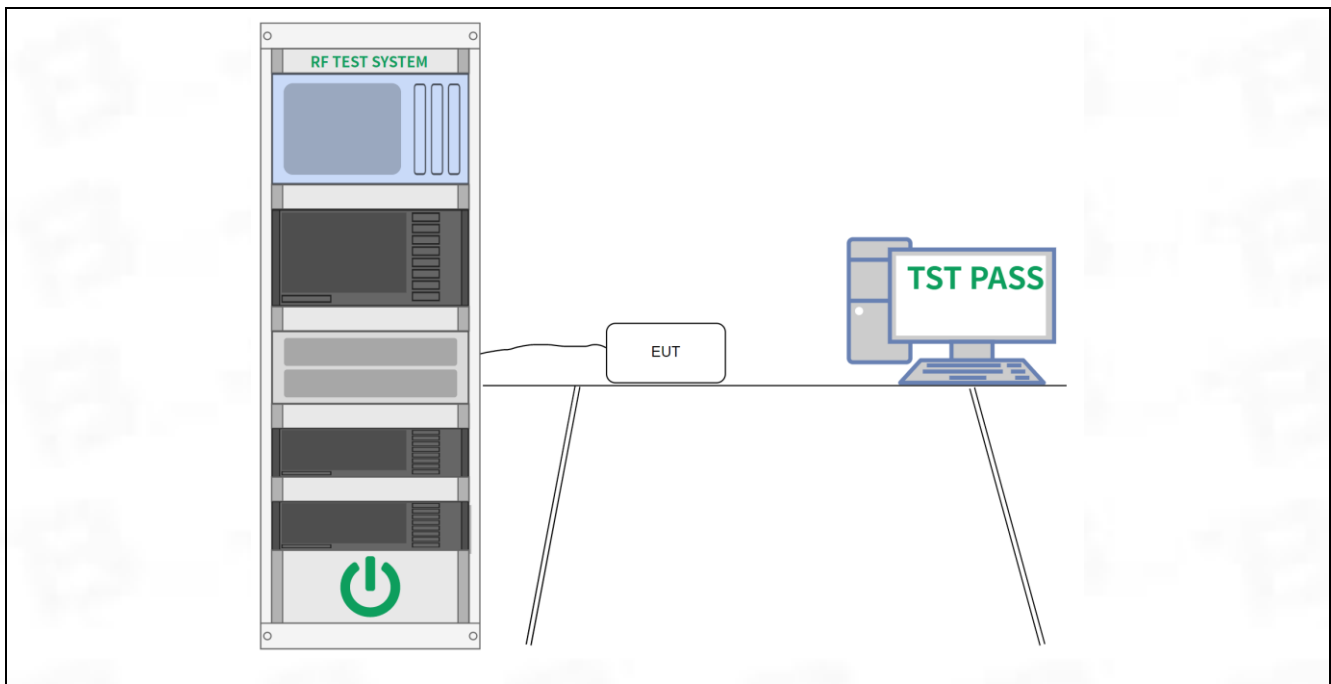
6.2 Occupied Bandwidth

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:	<ul style="list-style-type: none"> a) Set RBW = 100 kHz. b) Set the VBW \geq [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:	24.5 °C
Humidity:	49.7 %
Atmospheric Pressure:	1010 mbar

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

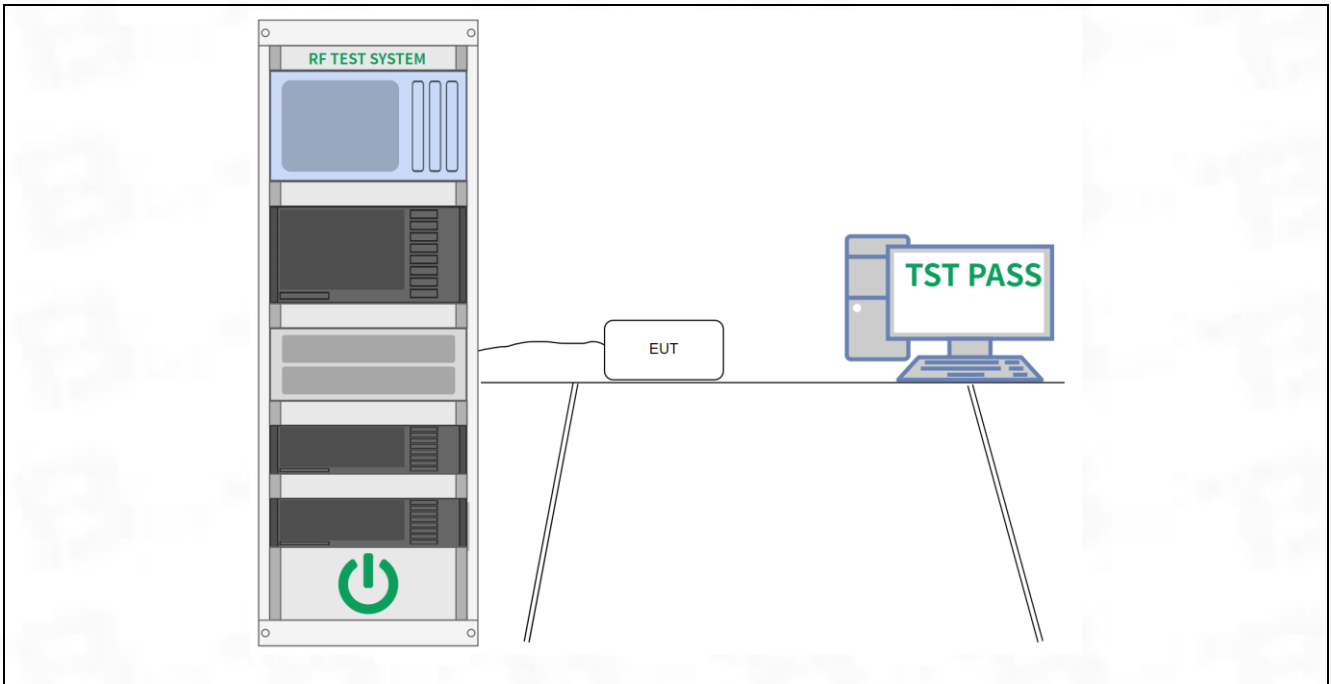
6.3 Maximum Conducted Output Power

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:	24.5 °C
Humidity:	49.7 %
Atmospheric Pressure:	1010 mbar

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

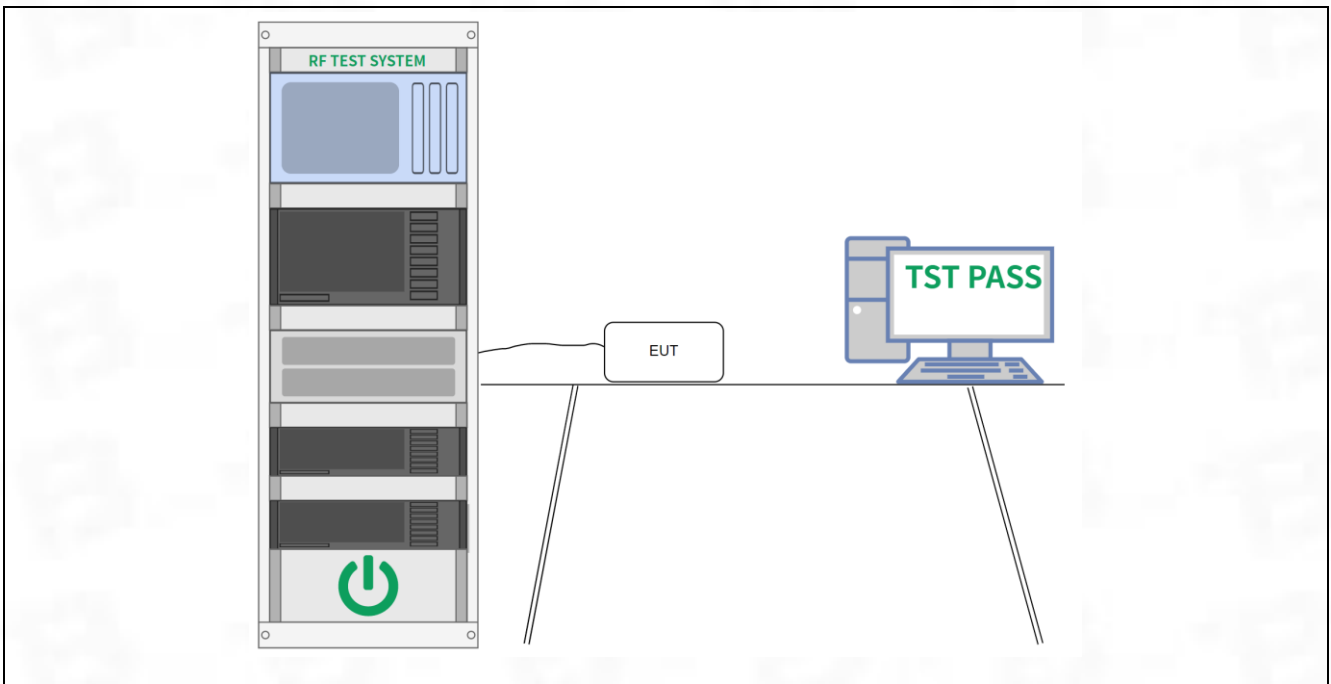
6.4 Power Spectral Density

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:	24.5 °C
Humidity:	49.7 %
Atmospheric Pressure:	1010 mbar

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

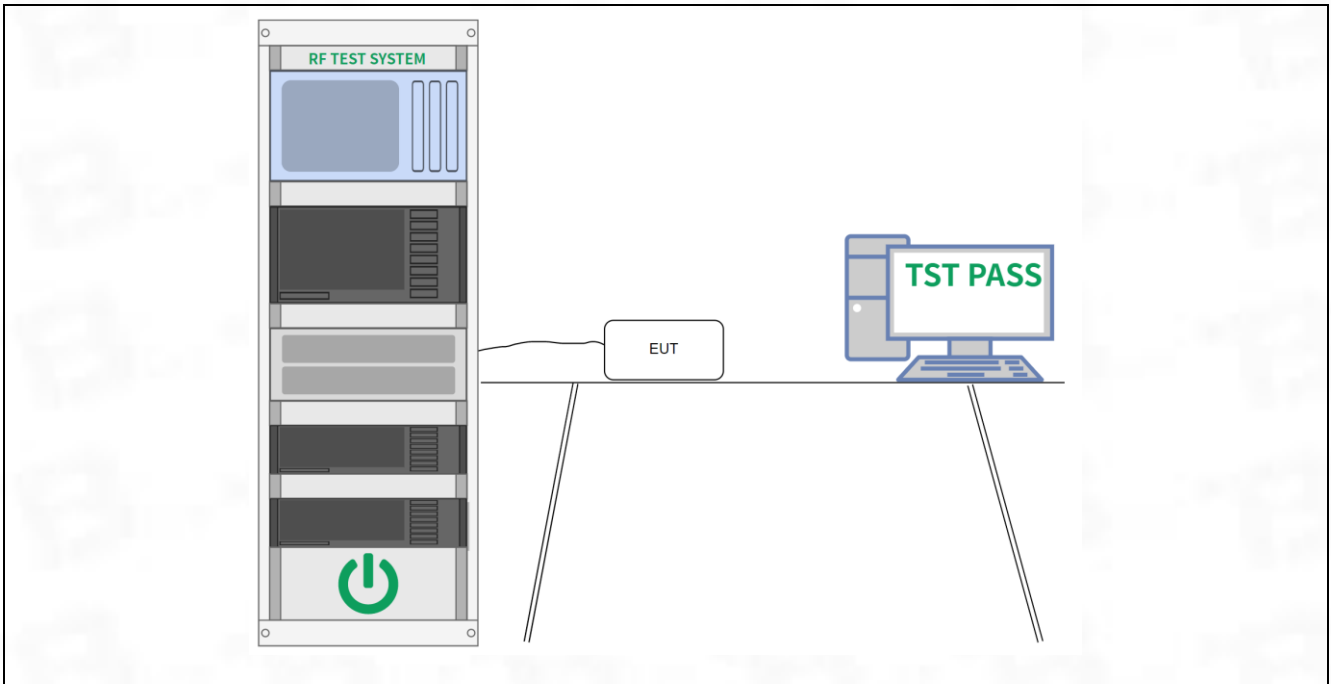
6.5 Emissions in non-restricted frequency bands

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:	24.5 °C
Humidity:	49.7 %
Atmospheric Pressure:	1010 mbar

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

Please Refer to Appendix for Details.

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:	23.2 °C
Humidity:	54.7 %
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	67.34	-30.59	36.75	74.00	-37.25	peak	P
2	2390.000	74.74	-30.49	44.25	74.00	-29.75	peak	P
3 *	2400.000	83.83	-30.48	53.35	74.00	-20.65	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	68.74	-30.59	38.15	74.00	-35.85	peak	P
2	2390.000	72.43	-30.49	41.94	74.00	-32.06	peak	P
3 *	2400.000	82.67	-30.48	52.19	74.00	-21.81	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	81.53	-30.39	51.14	74.00	-22.86	peak	P
2	2500.000	72.13	-30.37	41.76	74.00	-32.24	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	82.03	-30.39	51.64	74.00	-22.36	peak	P
2	2500.000	67.63	-30.37	37.26	74.00	-36.74	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	2310.000	67.34	-30.59	36.75	74.00	-37.25	peak	P
2	2390.000	72.74	-30.49	42.25	74.00	-31.75	peak	P
3 *	2400.000	81.33	-30.48	50.85	74.00	-23.15	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	70.74	-30.59	40.15	74.00	-33.85	peak	P
2	2390.000	72.43	-30.49	41.94	74.00	-32.06	peak	P
3 *	2400.000	81.67	-30.48	51.19	74.00	-22.81	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	79.53	-30.39	49.14	74.00	-24.86	peak	P
2	2500.000	70.13	-30.37	39.76	74.00	-34.24	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	81.03	-30.39	50.64	74.00	-23.36	peak	P
2	2500.000	67.63	-30.37	37.26	74.00	-36.74	peak	P

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	70.34	-30.59	39.75	74.00	-34.25	peak	P
2	2390.000	73.24	-30.49	42.75	74.00	-31.25	peak	P
3 *	2400.000	78.83	-30.48	48.35	74.00	-25.65	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	66.74	-30.59	36.15	74.00	-37.85	peak	P
2	2390.000	69.43	-30.49	38.94	74.00	-35.06	peak	P
3 *	2400.000	81.67	-30.48	51.19	74.00	-22.81	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	80.03	-30.39	49.64	74.00	-24.36	peak	P
2	2500.000	71.13	-30.37	40.76	74.00	-33.24	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	81.53	-30.39	51.14	74.00	-22.86	peak	P
2	2500.000	65.63	-30.37	35.26	74.00	-38.74	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	2310.000	65.34	-30.59	34.75	74.00	-39.25	peak	P
2	2390.000	70.74	-30.49	40.25	74.00	-33.75	peak	P
3 *	2400.000	82.33	-30.48	51.85	74.00	-22.15	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	68.74	-30.59	38.15	74.00	-35.85	peak	P
2	2390.000	70.93	-30.49	40.44	74.00	-33.56	peak	P
3 *	2400.000	80.17	-30.48	49.69	74.00	-24.31	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	78.53	-30.39	48.14	74.00	-25.86	peak	P
2	2500.000	69.13	-30.37	38.76	74.00	-35.24	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	81.53	-30.39	51.14	74.00	-22.86	peak	P
2	2500.000	70.63	-30.37	40.26	74.00	-33.74	peak	P

6.7 Emissions in restricted frequency bands (below 1GHz)

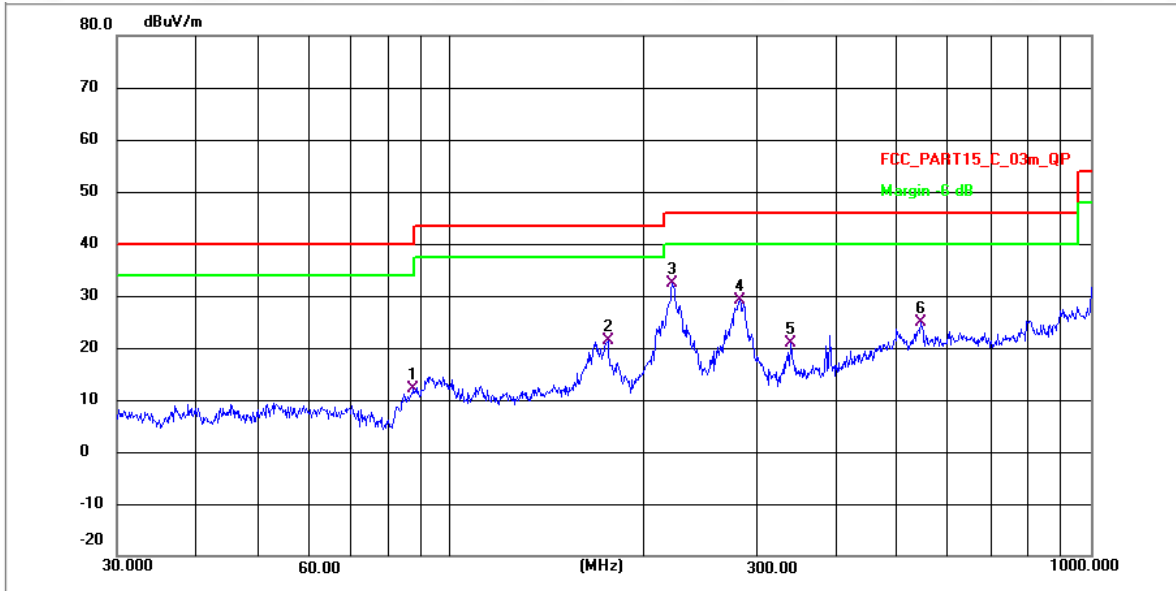
Test Requirement:	In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`		
Test Method:	Radiated emissions tests		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	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:	23.2 °C
Humidity:	54.7 %
Atmospheric Pressure:	1010 mbar

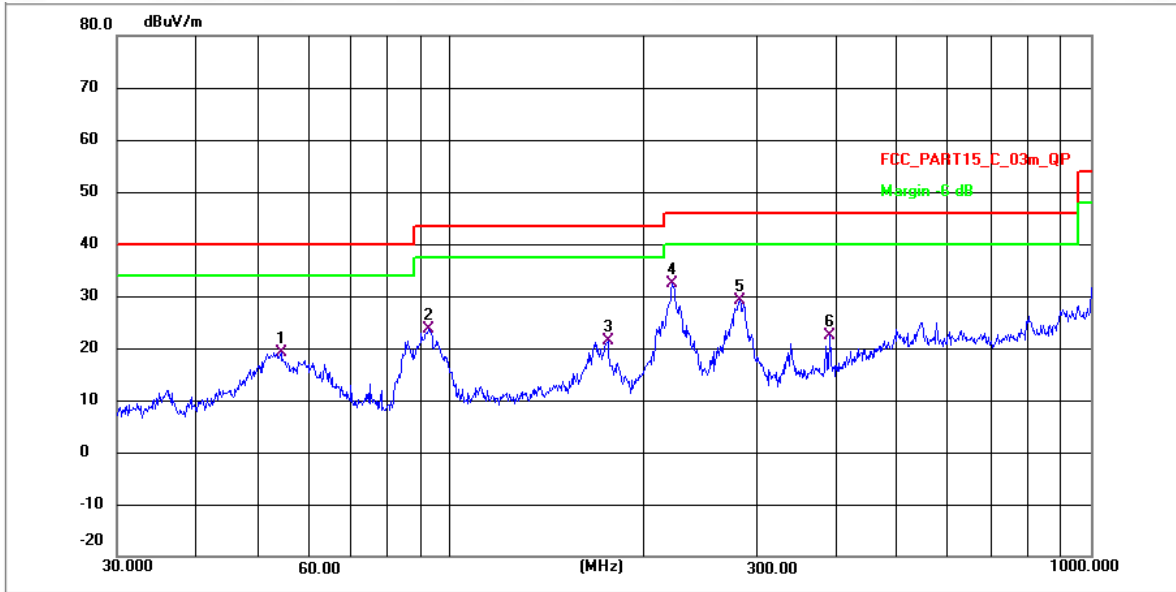
6.7.2 Test Data:

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	87.7248	42.31	-30.25	12.06	40.00	-27.94	QP	P
2	175.6516	48.83	-27.55	21.28	43.50	-22.22	QP	P
3 *	221.7806	58.65	-26.38	32.27	46.00	-13.73	QP	P
4	281.9946	54.71	-25.59	29.12	46.00	-16.88	QP	P
5	338.4001	46.01	-25.12	20.89	46.00	-25.11	QP	P
6	544.2276	46.37	-21.60	24.77	46.00	-21.23	QP	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	54.2610	39.47	-20.25	19.22	40.00	-20.78	QP	P
2	92.4624	53.03	-29.47	23.56	43.50	-19.94	QP	P
3	175.6516	48.83	-27.55	21.28	43.50	-22.22	QP	P
4 *	221.7806	58.65	-26.38	32.27	46.00	-13.73	QP	P
5	281.9946	54.71	-25.59	29.12	46.00	-16.88	QP	P
6	390.0381	47.11	-24.71	22.40	46.00	-23.60	QP	P

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:	23.2 °C
Humidity:	54.7 %
Atmospheric Pressure:	1010 mbar

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	3123.039	66.20	-29.40	36.80	74.00	-37.20	peak	P
2	4933.572	65.97	-27.56	38.41	74.00	-35.59	peak	P
3	6503.775	69.42	-25.38	44.04	74.00	-29.96	peak	P
4	8544.040	72.12	-25.23	46.89	74.00	-27.11	peak	P
5	11493.551	71.72	-23.07	48.65	74.00	-25.35	peak	P
6 *	14601.275	71.92	-21.04	50.88	74.00	-23.12	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	3123.942	68.55	-29.40	39.15	74.00	-34.85	peak	P
2	4883.914	66.86	-27.70	39.16	74.00	-34.84	peak	P
3	6386.418	70.72	-25.36	45.36	74.00	-28.64	peak	P
4	8843.028	71.21	-24.63	46.58	74.00	-27.42	peak	P
5 *	11227.589	73.60	-23.26	50.34	74.00	-23.66	peak	P
6	16648.693	68.90	-18.91	49.99	74.00	-24.01	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	3169.416	64.56	-29.36	35.20	74.00	-38.80	peak	P
2	4592.305	65.84	-28.53	37.31	74.00	-36.69	peak	P
3	7129.896	67.51	-24.89	42.62	74.00	-31.38	peak	P
4	9641.257	70.72	-23.51	47.21	74.00	-26.79	peak	P
5 *	12030.606	71.12	-22.16	48.96	74.00	-25.04	peak	P
6	14622.392	69.80	-21.00	48.80	74.00	-25.20	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	3510.879	64.58	-29.06	35.52	74.00	-38.48	peak	P
2	4966.479	65.80	-27.46	38.34	74.00	-35.66	peak	P
3	7072.426	67.46	-24.91	42.55	74.00	-31.45	peak	P
4	9883.915	71.13	-24.04	47.09	74.00	-26.91	peak	P
5	12739.193	70.02	-21.48	48.54	74.00	-25.46	peak	P
6 *	17664.983	68.17	-16.49	51.68	74.00	-22.32	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	3629.540	63.70	-29.04	34.66	74.00	-39.34	peak	P
2	4966.479	65.80	-27.46	38.34	74.00	-35.66	peak	P
3	6833.303	65.18	-25.08	40.10	74.00	-33.90	peak	P
4	10538.918	70.85	-24.43	46.42	74.00	-27.58	peak	P
5	13022.129	67.69	-21.33	46.36	74.00	-27.64	peak	P
6 *	16286.962	69.39	-20.21	49.18	74.00	-24.82	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	3061.371	60.66	-29.46	31.20	74.00	-42.80	peak	P
2	4932.146	63.61	-27.56	36.05	74.00	-37.95	peak	P
3	7183.679	63.85	-24.88	38.97	74.00	-35.03	peak	P
4	10027.793	69.07	-24.30	44.77	74.00	-29.23	peak	P
5 *	12673.087	70.20	-21.52	48.68	74.00	-25.32	peak	P
6	15910.080	69.56	-21.58	47.98	74.00	-26.02	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	3140.237	62.53	-29.38	33.15	74.00	-40.85	peak	P
2	4384.765	65.54	-28.84	36.70	74.00	-37.30	peak	P
3	5712.205	63.23	-26.26	36.97	74.00	-37.03	peak	P
4	7793.734	65.10	-25.22	39.88	74.00	-34.12	peak	P
5	10566.369	68.87	-24.37	44.50	74.00	-29.50	peak	P
6 *	12426.436	69.12	-21.70	47.42	74.00	-26.58	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	3288.870	65.16	-29.24	35.92	74.00	-38.08	peak	P
2	4011.289	66.18	-28.99	37.19	74.00	-36.81	peak	P
3	5263.560	66.89	-27.15	39.74	74.00	-34.26	peak	P
4	7668.600	70.99	-25.03	45.96	74.00	-28.04	peak	P
5	10676.890	70.96	-24.14	46.82	74.00	-27.18	peak	P
6 *	16886.163	71.30	-18.49	52.81	74.00	-21.19	peak	P

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	3075.562	63.48	-29.44	34.04	74.00	-39.96	peak	P
2	4182.976	63.08	-28.92	34.16	74.00	-39.84	peak	P
3	6910.767	66.39	-25.01	41.38	74.00	-32.62	peak	P
4	8477.621	67.96	-25.33	42.63	74.00	-31.37	peak	P
5	14050.625	64.30	-21.10	43.20	74.00	-30.80	peak	P
6 *	16193.083	67.96	-20.66	47.30	74.00	-26.70	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	3397.080	58.42	-29.15	29.27	74.00	-44.73	peak	P
2	4783.327	61.39	-27.99	33.40	74.00	-40.60	peak	P
3	6038.166	62.70	-25.34	37.36	74.00	-36.64	peak	P
4	7298.791	65.25	-24.84	40.41	74.00	-33.59	peak	P
5	10375.704	69.31	-24.46	44.85	74.00	-29.15	peak	P
6 *	13404.009	71.42	-21.04	50.38	74.00	-23.62	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	3288.870	61.16	-29.24	31.92	74.00	-42.08	peak	P
2	4103.936	65.82	-28.95	36.87	74.00	-37.13	peak	P
3	5295.606	63.71	-27.12	36.59	74.00	-37.41	peak	P
4	6954.851	64.72	-24.97	39.75	74.00	-34.25	peak	P
5	9155.125	67.13	-23.97	43.16	74.00	-30.84	peak	P
6 *	12037.563	70.51	-22.14	48.37	74.00	-25.63	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	3118.529	60.28	-29.41	30.87	74.00	-43.13	peak	P
2	3923.001	60.71	-29.00	31.71	74.00	-42.29	peak	P
3	5120.997	63.55	-27.27	36.28	74.00	-37.72	peak	P
4	6910.767	65.39	-25.01	40.38	74.00	-33.62	peak	P
5	10112.200	69.44	-24.34	45.10	74.00	-28.90	peak	P
6 *	12739.193	69.52	-21.48	48.04	74.00	-25.96	peak	P

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	3338.675	66.19	-29.20	36.99	74.00	-37.01	peak	P
2	4486.039	64.23	-28.79	35.44	74.00	-38.56	peak	P
3	5725.429	63.98	-26.22	37.76	74.00	-36.24	peak	P
4	7827.598	68.29	-25.27	43.02	74.00	-30.98	peak	P
5	10393.713	67.46	-24.46	43.00	74.00	-31.00	peak	P
6 *	13165.945	70.64	-21.22	49.42	74.00	-24.58	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	3315.595	64.24	-29.23	35.01	74.00	-38.99	peak	P
2	4769.521	65.52	-28.03	37.49	74.00	-36.51	peak	P
3	5889.924	65.11	-25.69	39.42	74.00	-34.58	peak	P
4	8399.572	70.24	-25.36	44.88	74.00	-29.12	peak	P
5	11453.755	72.54	-23.10	49.44	74.00	-24.56	peak	P
6 *	14955.796	70.62	-20.47	50.15	74.00	-23.85	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	3240.745	63.73	-29.29	34.44	74.00	-39.56	peak	P
2	4593.632	63.69	-28.52	35.17	74.00	-38.83	peak	P
3	5813.812	67.39	-25.93	41.46	74.00	-32.54	peak	P
4	9240.195	67.59	-23.78	43.81	74.00	-30.19	peak	P
5 *	11480.270	71.53	-23.08	48.45	74.00	-25.55	peak	P
6	13833.026	68.79	-21.05	47.74	74.00	-26.26	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	3649.527	61.52	-29.04	32.48	74.00	-41.52	peak	P
2	5461.942	64.00	-26.98	37.02	74.00	-36.98	peak	P
3	8164.987	69.55	-25.46	44.09	74.00	-29.91	peak	P
4	11391.027	70.55	-23.14	47.41	74.00	-26.59	peak	P
5	13396.263	70.54	-21.04	49.50	74.00	-24.50	peak	P
6 *	15274.712	73.30	-21.00	52.30	74.00	-21.70	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	3260.475	61.81	-29.28	32.53	74.00	-41.47	peak	P
2	3987.015	63.68	-29.00	34.68	74.00	-39.32	peak	P
3	4982.295	65.21	-27.42	37.79	74.00	-36.21	peak	P
4	6566.107	65.06	-25.32	39.74	74.00	-34.26	peak	P
5	8728.754	68.99	-24.85	44.14	74.00	-29.86	peak	P
6 *	9574.608	68.36	-23.36	45.00	74.00	-29.00	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	3227.658	59.18	-29.30	29.88	74.00	-44.12	peak	P
2	4692.943	65.95	-28.24	37.71	74.00	-36.29	peak	P
3	6323.964	67.19	-25.36	41.83	74.00	-32.17	peak	P
4	8848.141	67.38	-24.61	42.77	74.00	-31.23	peak	P
5	10898.261	69.05	-23.66	45.39	74.00	-28.61	peak	P
6 *	12498.478	68.63	-21.62	47.01	74.00	-26.99	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	3227.658	59.18	-29.30	29.88	74.00	-44.12	peak	P
2	4927.871	65.61	-27.58	38.03	74.00	-35.97	peak	P
3	6003.361	62.99	-25.33	37.66	74.00	-36.34	peak	P
4	9958.472	67.01	-24.20	42.81	74.00	-31.19	peak	P
5	12527.411	69.14	-21.60	47.54	74.00	-26.46	peak	P
6 *	14728.435	69.07	-20.84	48.23	74.00	-25.77	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	3377.499	62.51	-29.16	33.35	74.00	-40.65	peak	P
2	4695.656	63.65	-28.23	35.42	74.00	-38.58	peak	P
3	5677.638	64.53	-26.38	38.15	74.00	-35.85	peak	P
4	6550.941	64.75	-25.33	39.42	74.00	-34.58	peak	P
5	9336.844	68.49	-23.56	44.93	74.00	-29.07	peak	P
6 *	11510.173	71.77	-23.05	48.72	74.00	-25.28	peak	P

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	3005.261	61.05	-29.51	31.54	74.00	-42.46	peak	P
2	4757.130	64.41	-28.05	36.36	74.00	-37.64	peak	P
3	7013.392	68.00	-24.93	43.07	74.00	-30.93	peak	P
4	12145.906	69.58	-22.02	47.56	74.00	-26.44	peak	P
5	13481.718	71.84	-20.98	50.86	74.00	-23.14	peak	P
6 *	17608.908	68.42	-16.43	51.99	74.00	-22.01	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	3579.532	61.54	-29.05	32.49	74.00	-41.51	peak	P
2	4995.272	63.13	-27.38	35.75	74.00	-38.25	peak	P
3	6496.260	66.13	-25.38	40.75	74.00	-33.25	peak	P
4	8899.438	68.23	-24.51	43.72	74.00	-30.28	peak	P
5	10879.377	70.08	-23.70	46.38	74.00	-27.62	peak	P
6 *	14698.665	71.90	-20.88	51.02	74.00	-22.98	peak	P

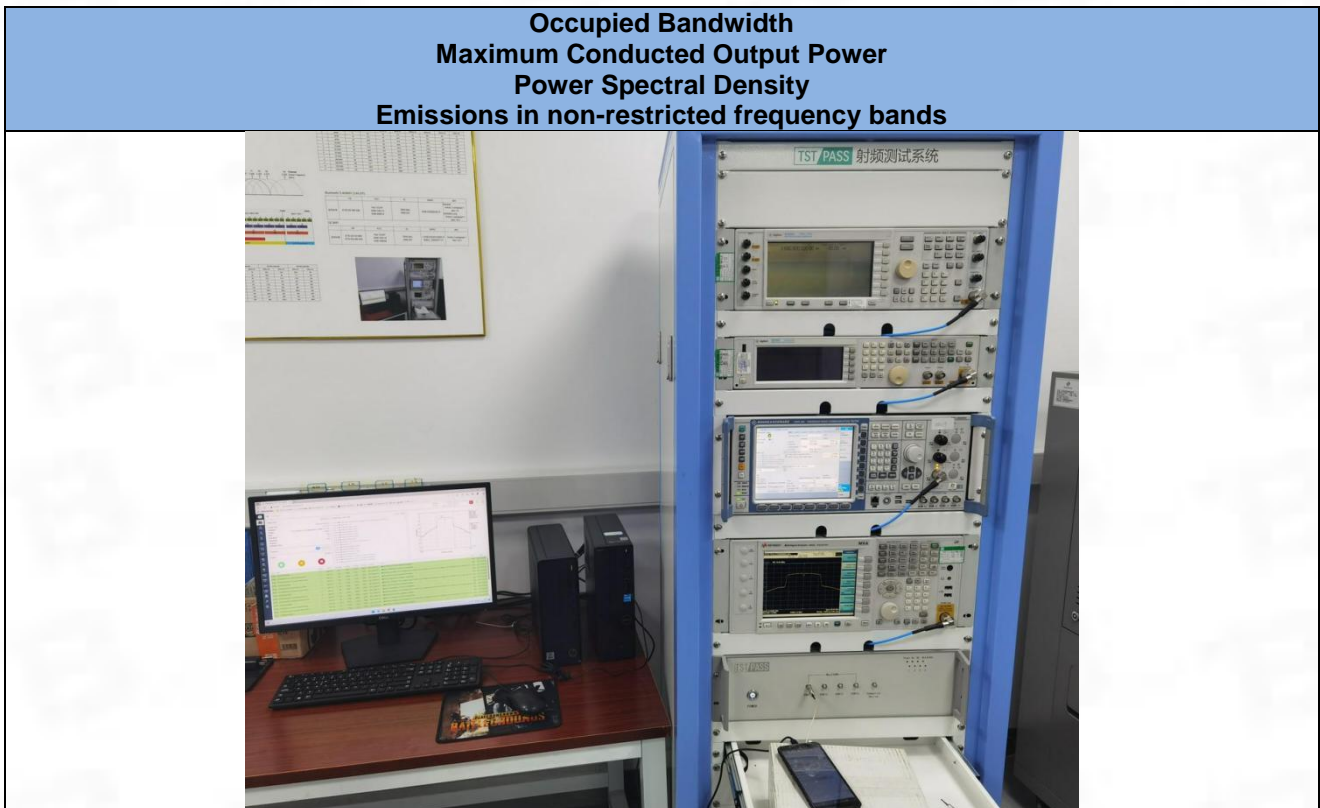
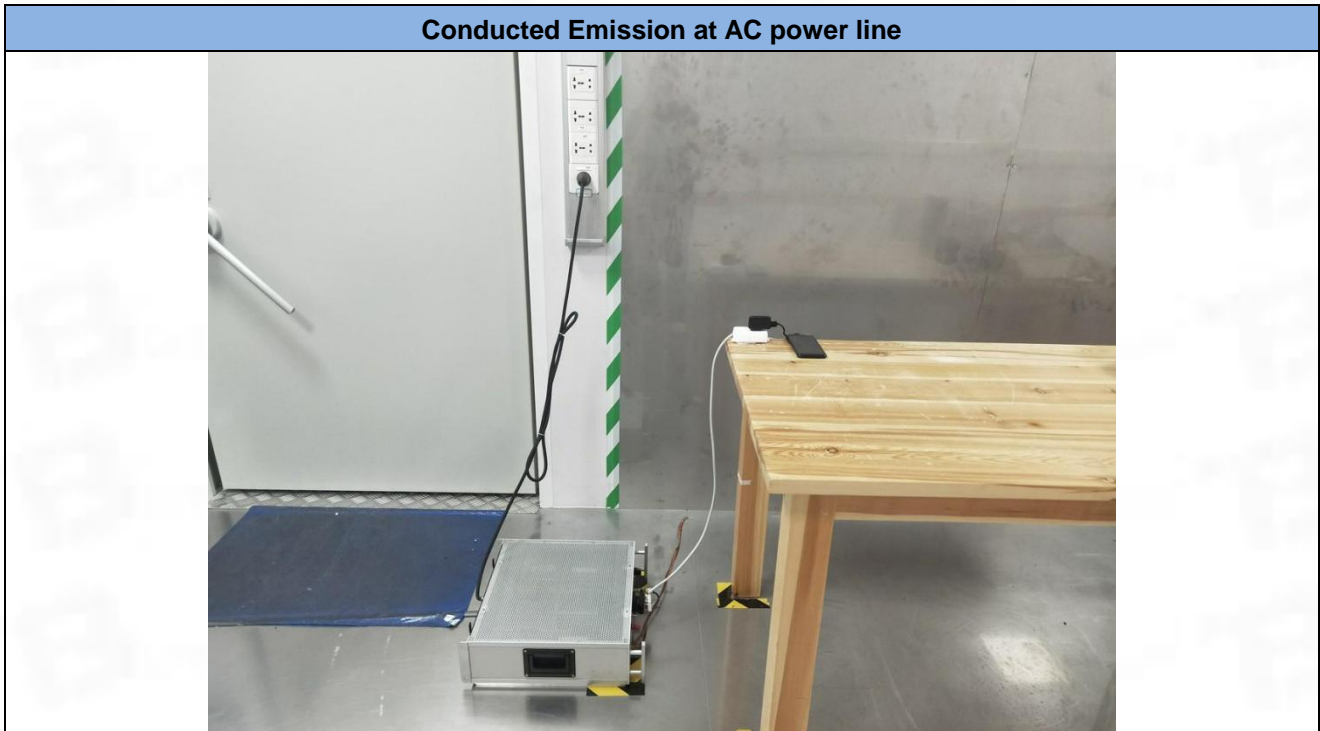
TM4 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3320.390	63.11	-29.22	33.89	74.00	-40.11	peak	P
2	5191.039	65.92	-27.21	38.71	74.00	-35.29	peak	P
3	6296.605	65.60	-25.36	40.24	74.00	-33.76	peak	P
4	9555.255	70.66	-23.32	47.34	74.00	-26.66	peak	P
5	11930.186	71.10	-22.31	48.79	74.00	-25.21	peak	P
6 *	14592.837	71.27	-21.05	50.22	74.00	-23.78	peak	P

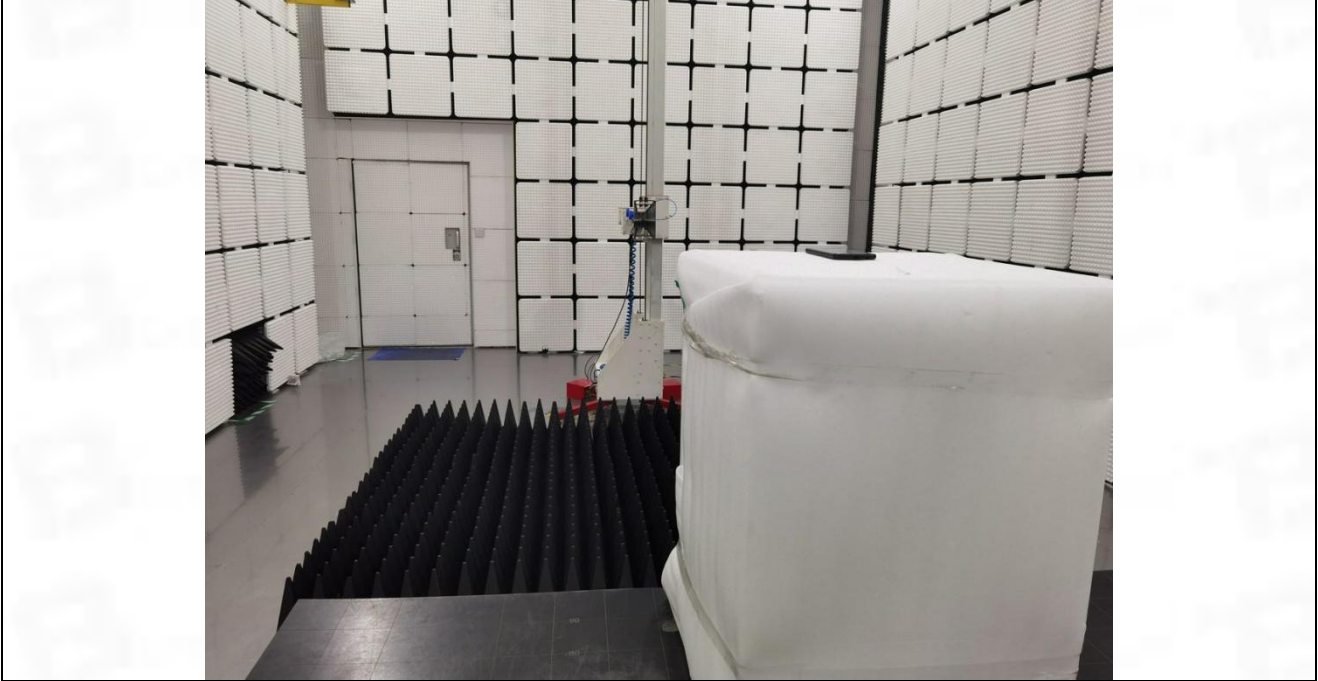
TM4 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: H

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3219.272	62.50	-29.31	33.19	74.00	-40.81	peak	P
2	4157.663	62.98	-28.93	34.05	74.00	-39.95	peak	P
3	5386.687	63.15	-27.04	36.11	74.00	-37.89	peak	P
4	7134.019	66.20	-24.89	41.31	74.00	-32.69	peak	P
5	9000.324	68.40	-24.31	44.09	74.00	-29.91	peak	P
6 *	11975.098	72.52	-22.23	50.29	74.00	-23.71	peak	P

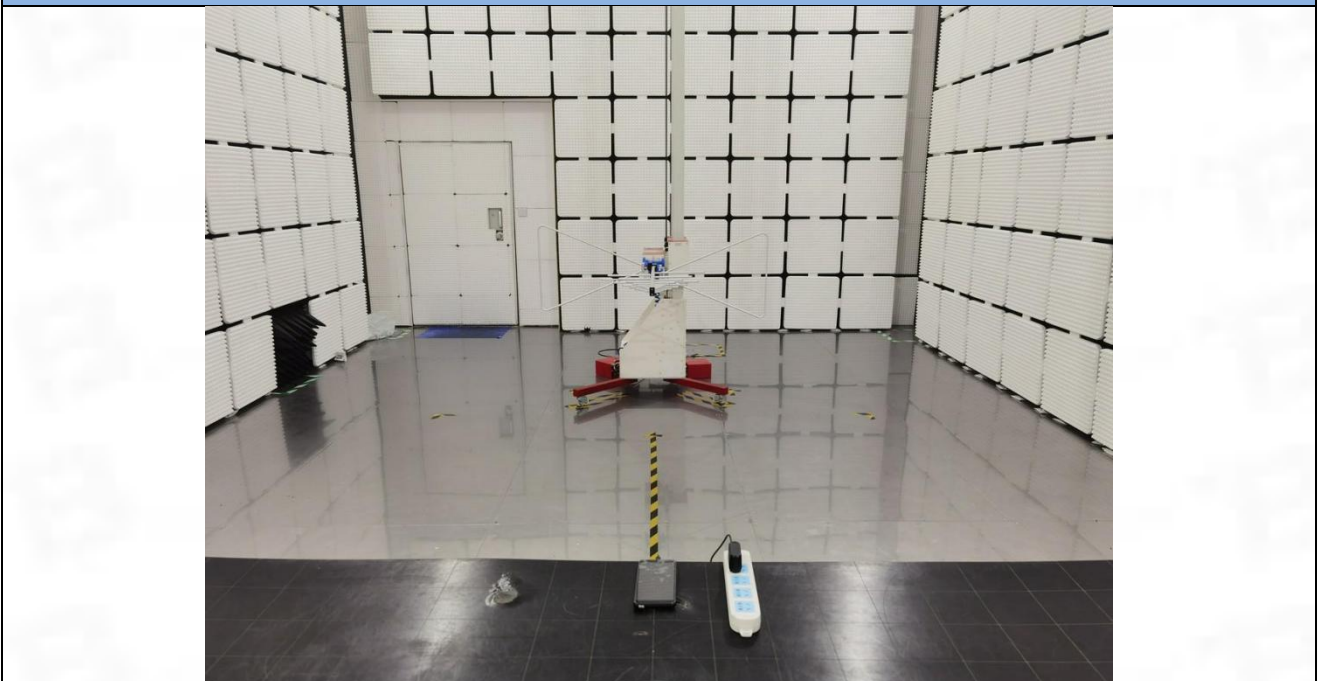
7 Test Setup Photos



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



Emissions in restricted frequency bands (below 1GHz)



8 EUT Constructional Details (EUT Photos)

Please refer to Report BTF230810R00501

Appendix

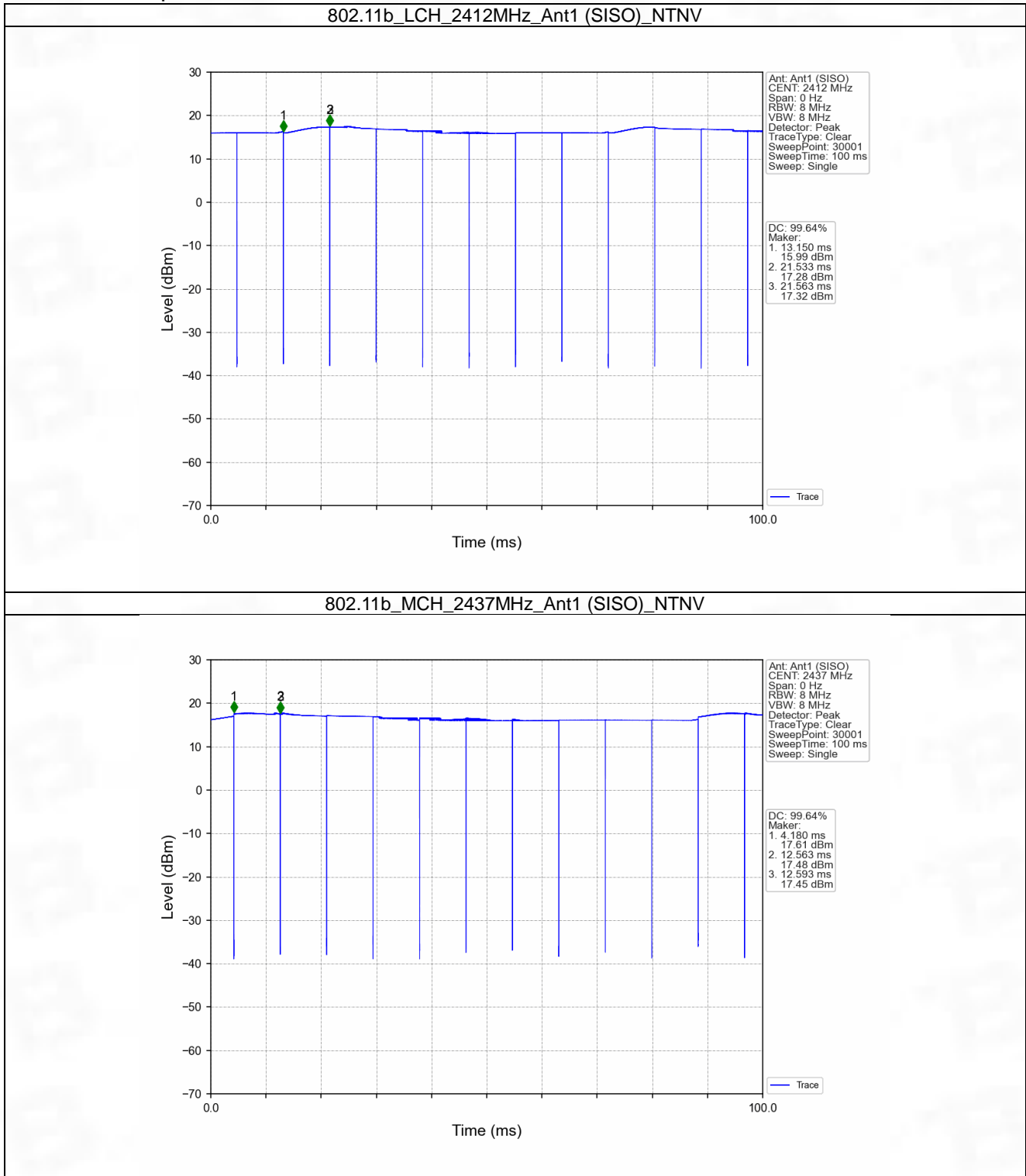
1. Duty Cycle

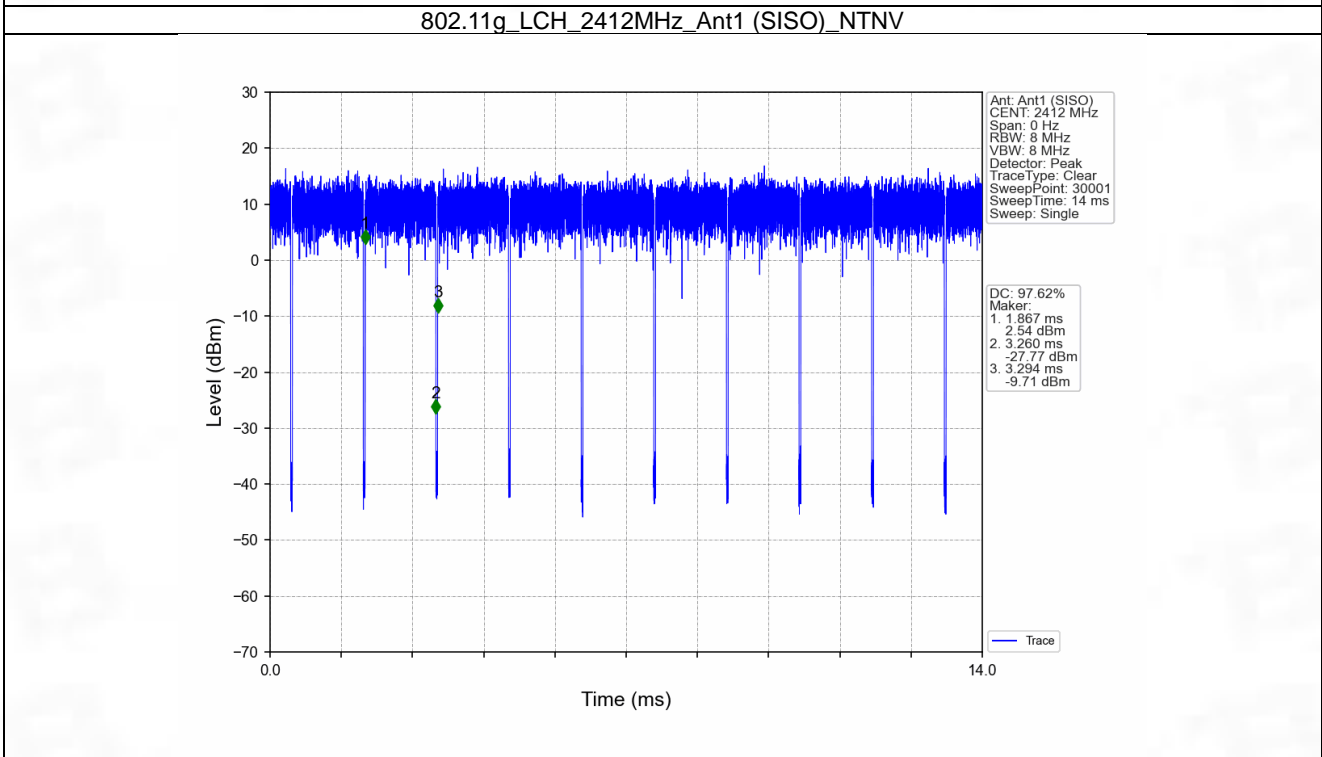
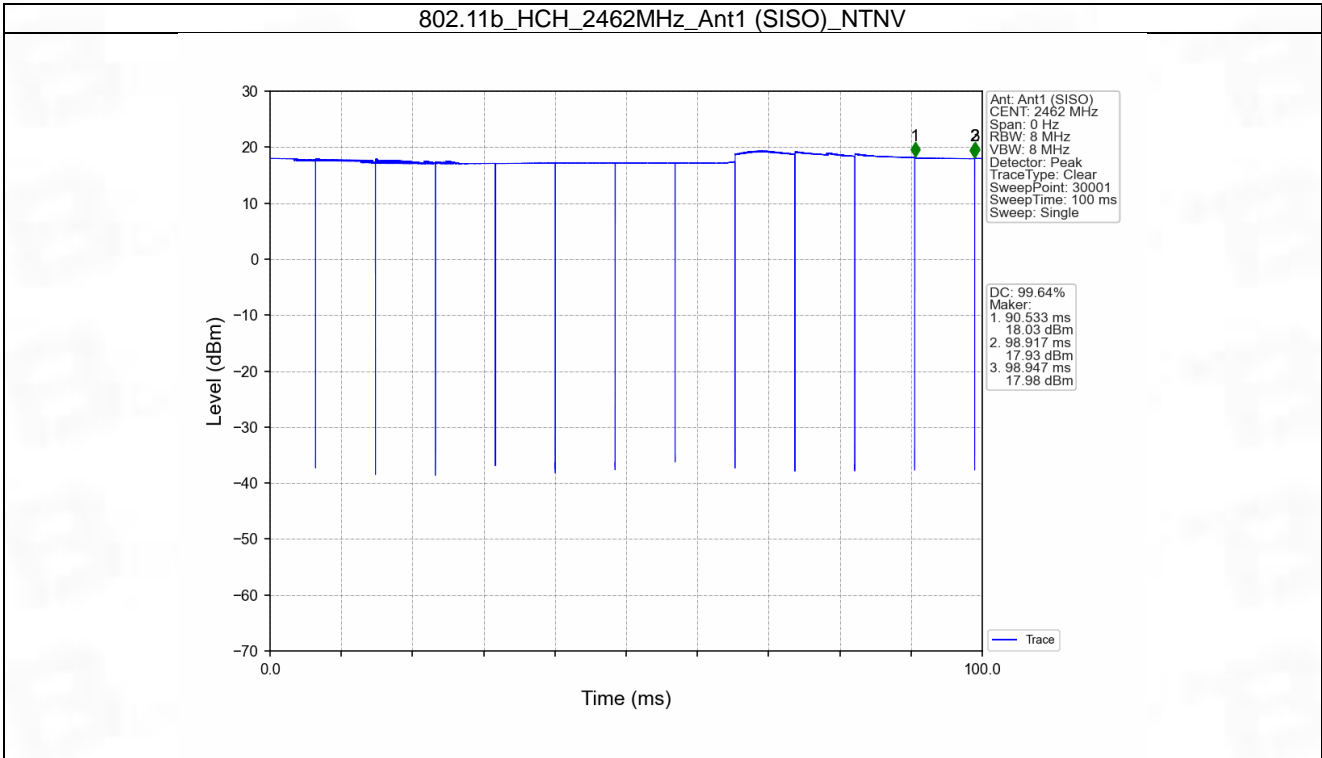
1.1 Ant1

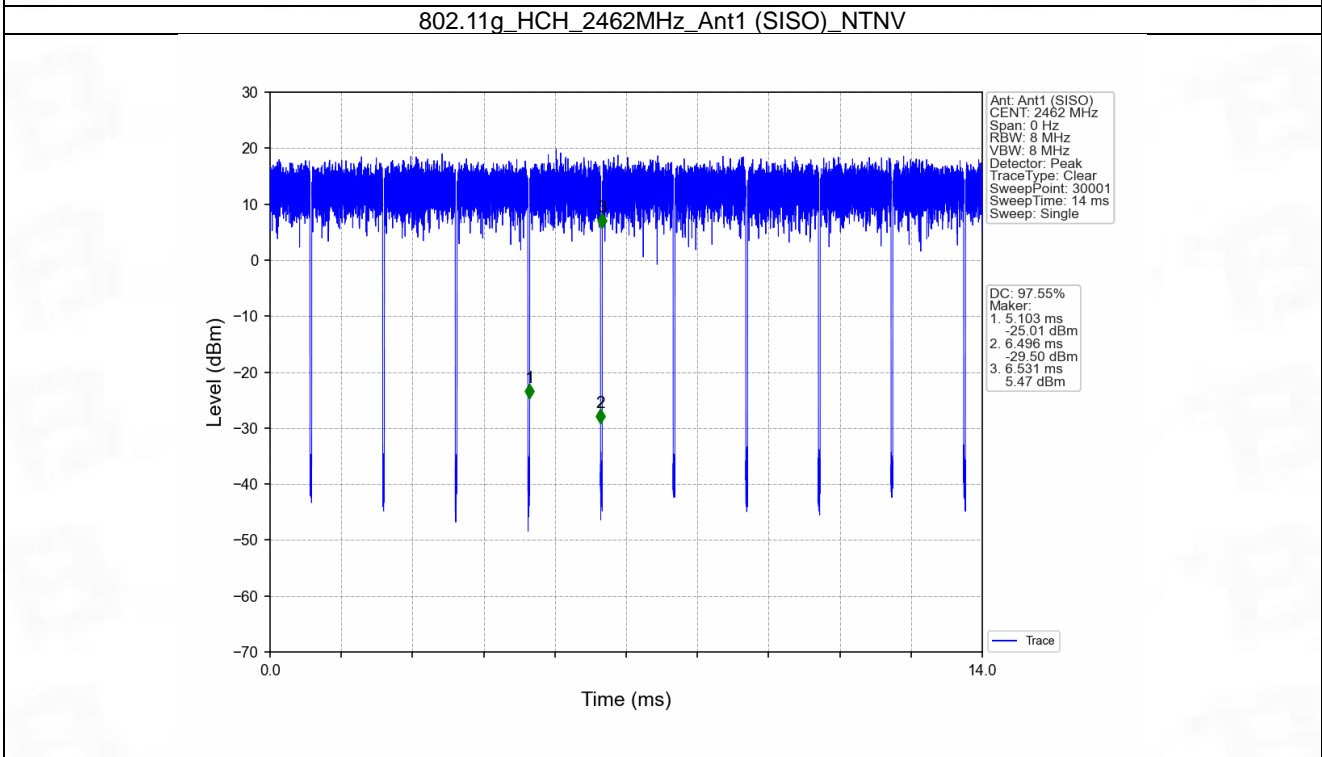
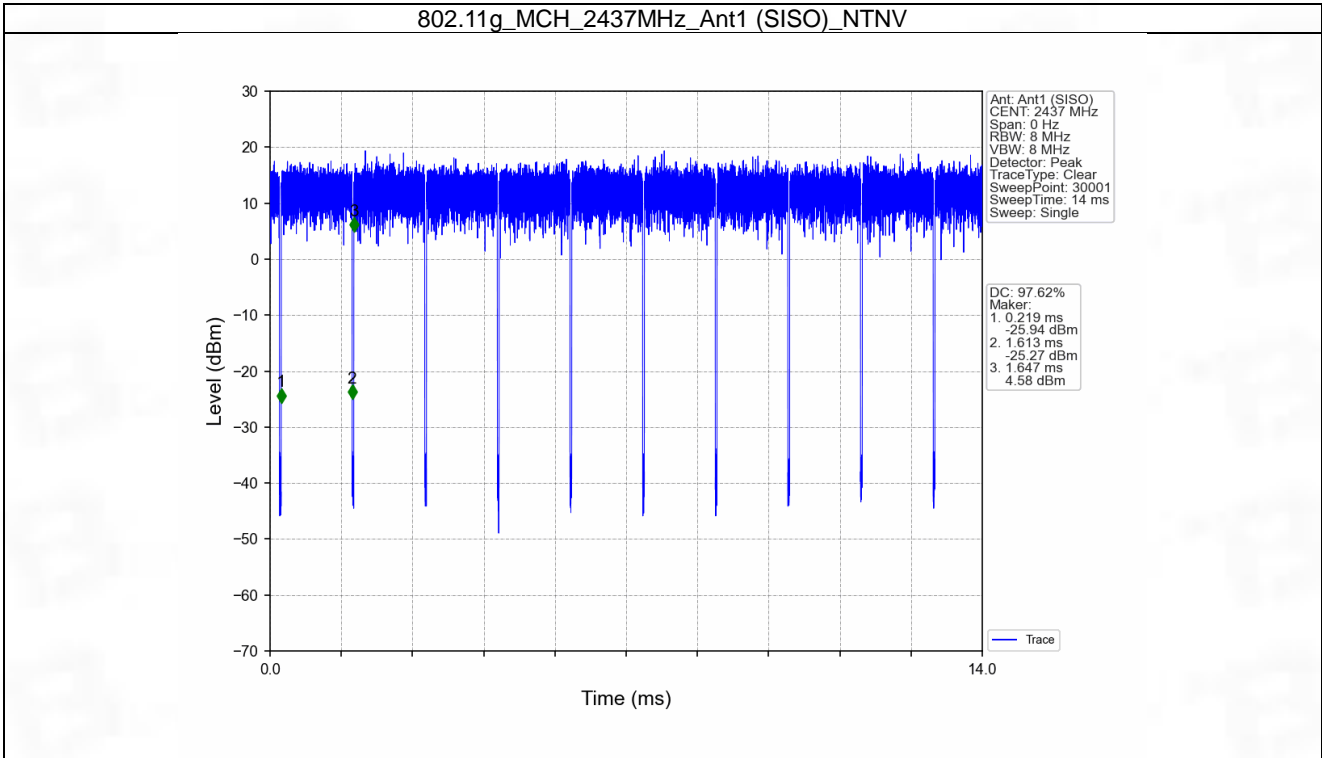
1.1.1 Test Result

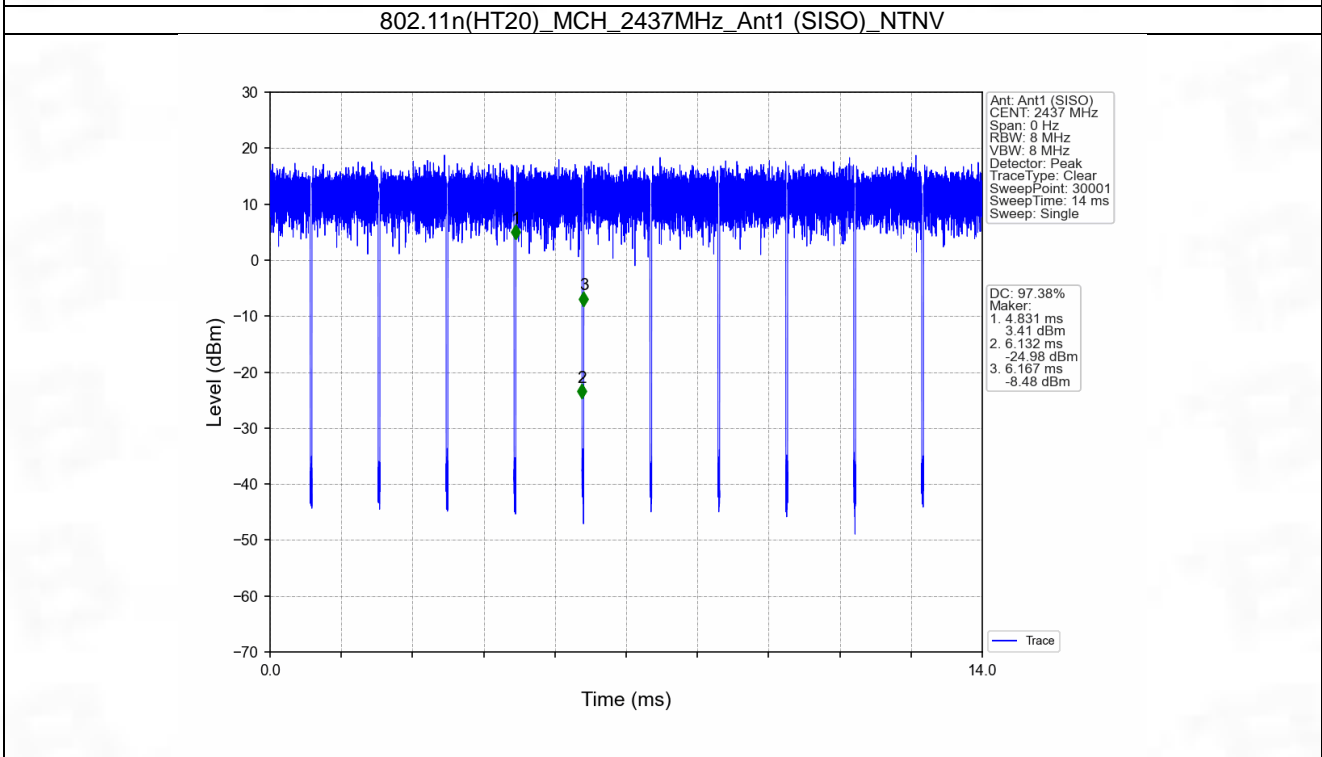
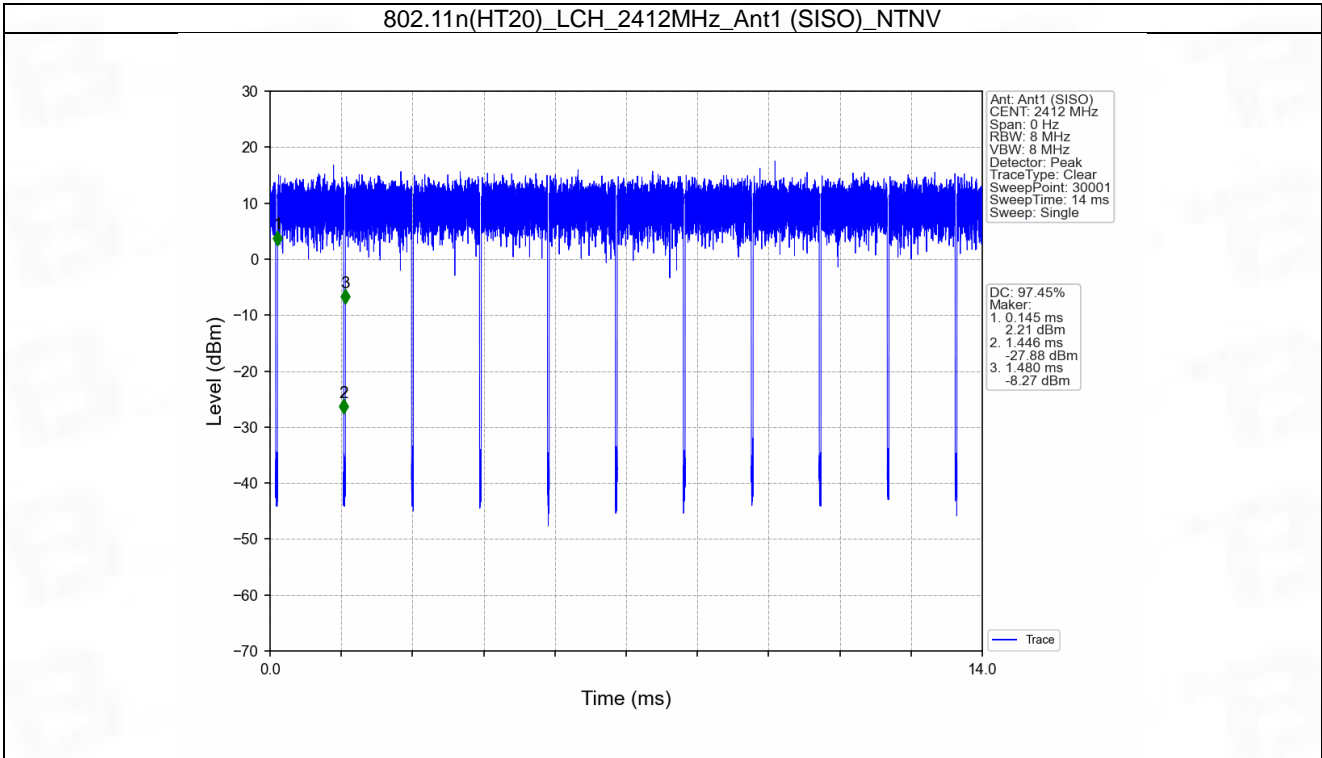
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	8.383	8.413	99.64	0.02	0.04
		2437	8.383	8.413	99.64	0.02	0.04
		2462	8.384	8.414	99.64	0.02	0.04
802.11g	SISO	2412	1.393	1.427	97.62	0.10	0.03
		2437	1.394	1.428	97.62	0.10	0.03
		2462	1.393	1.428	97.55	0.11	0.06
802.11n (HT20)	SISO	2412	1.301	1.335	97.45	0.11	0.03
		2437	1.301	1.336	97.38	0.12	0.03
		2462	1.301	1.336	97.38	0.12	0.04
802.11n (HT40)	SISO	2422	0.648	0.683	94.88	0.23	0.03
		2437	0.648	0.683	94.88	0.23	0.04
		2452	0.648	0.683	94.88	0.23	0.07

1.1.2 Test Graph

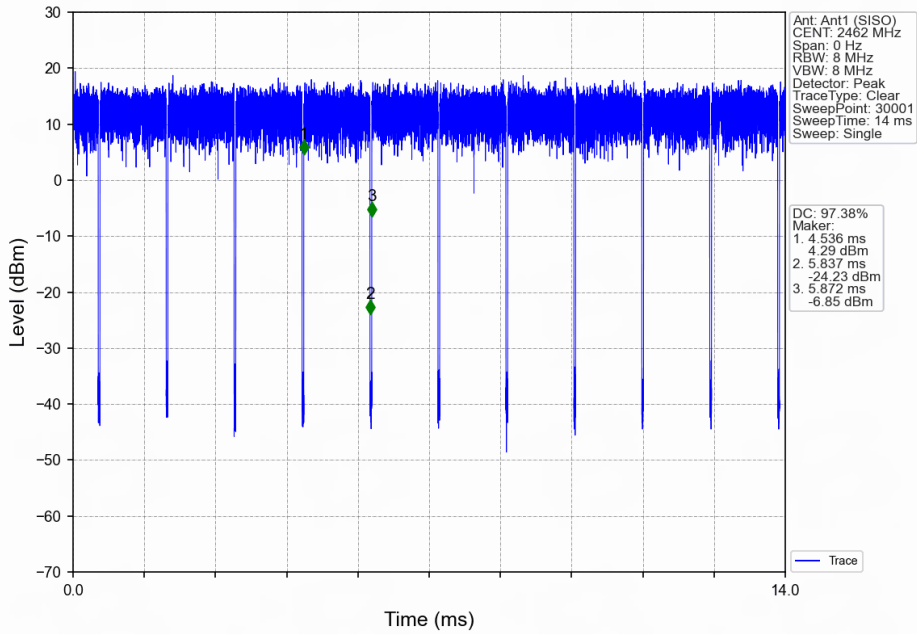




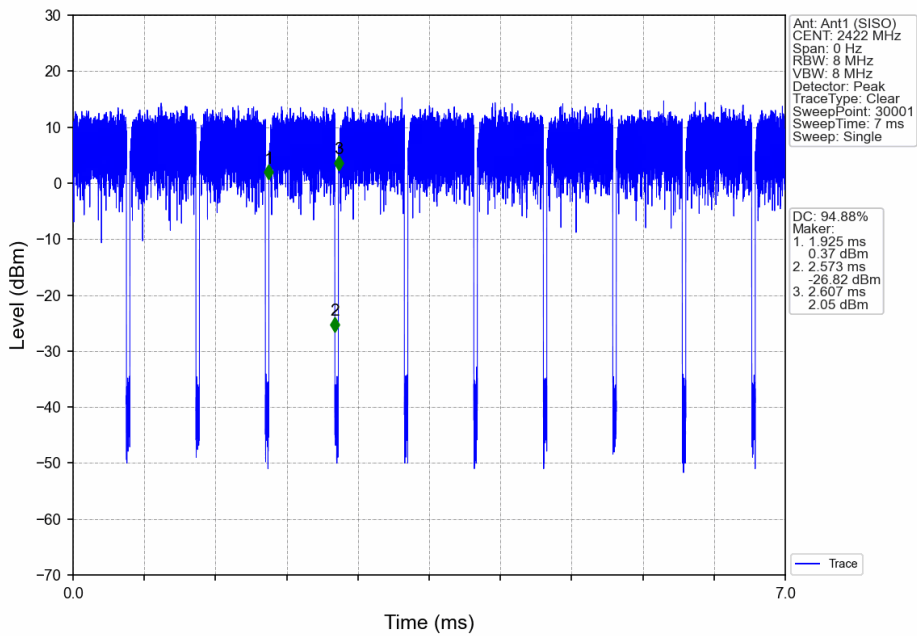


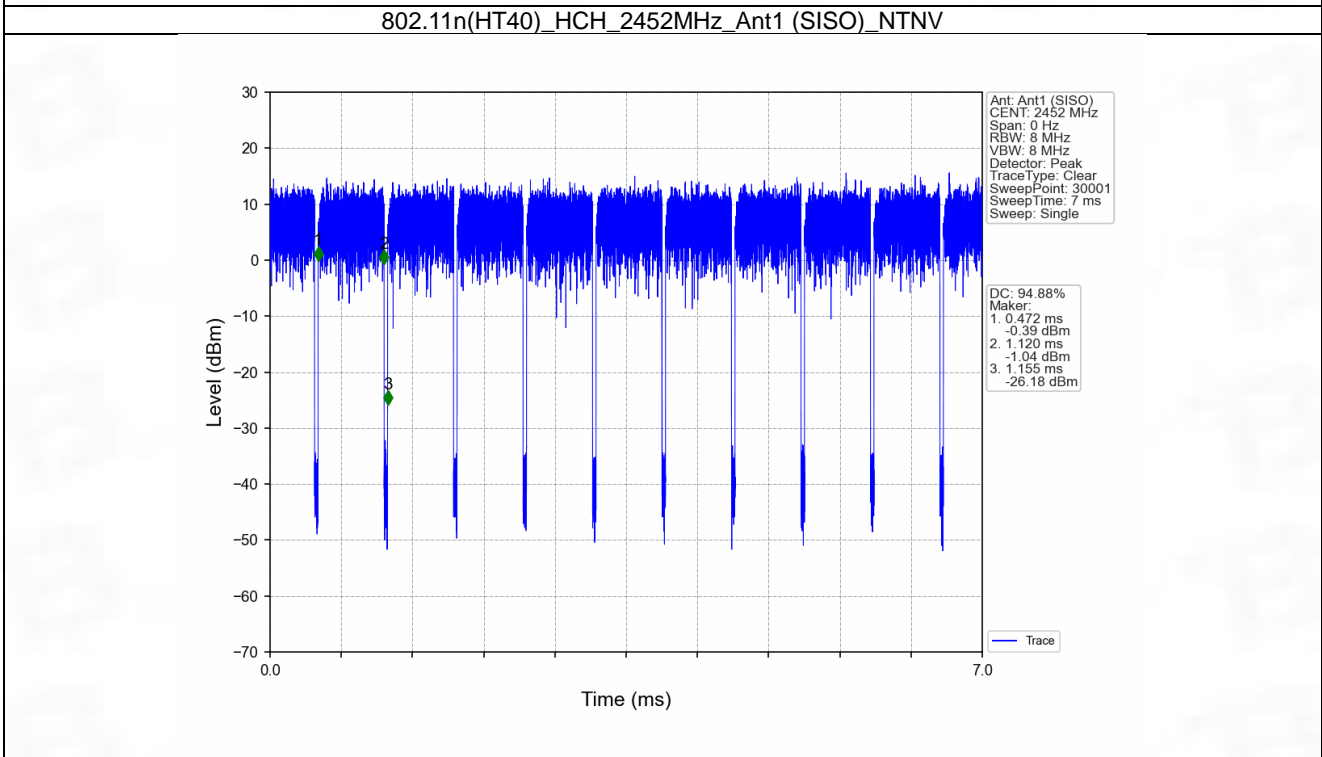
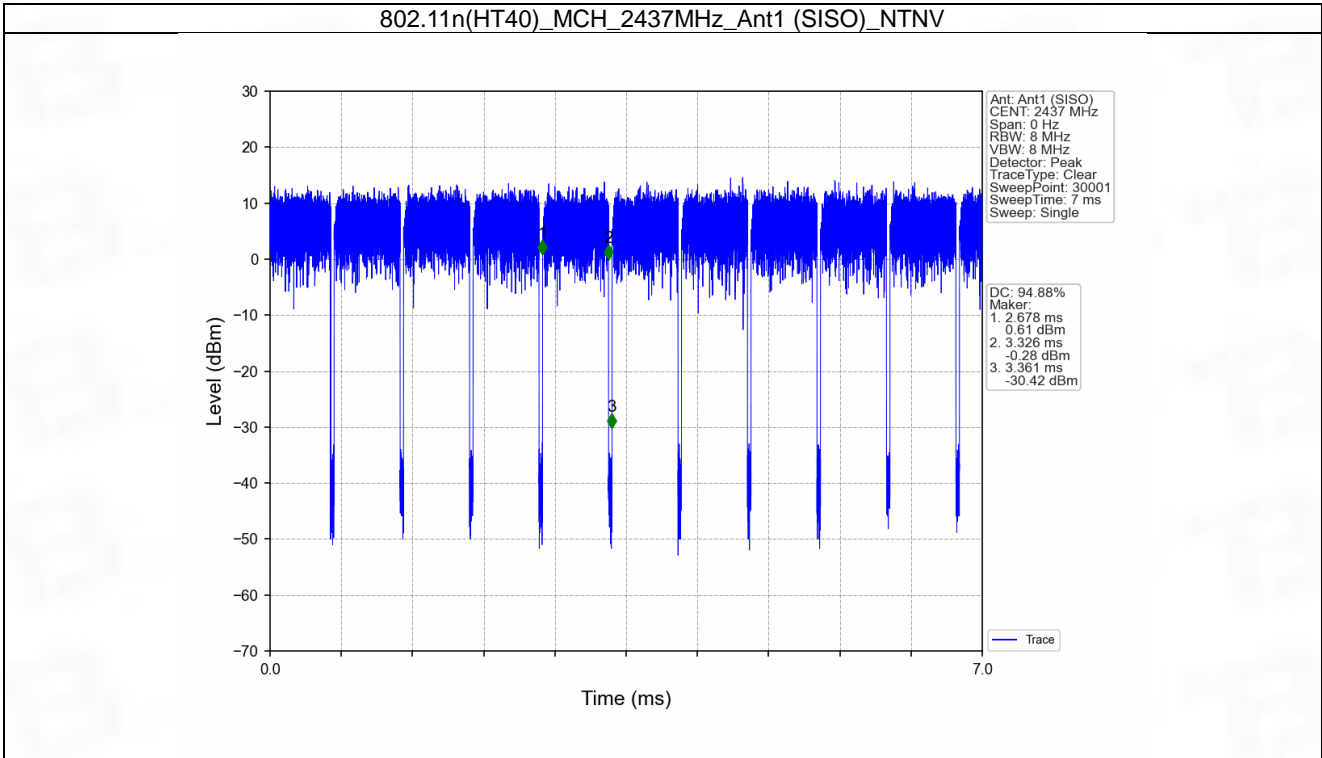


802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV





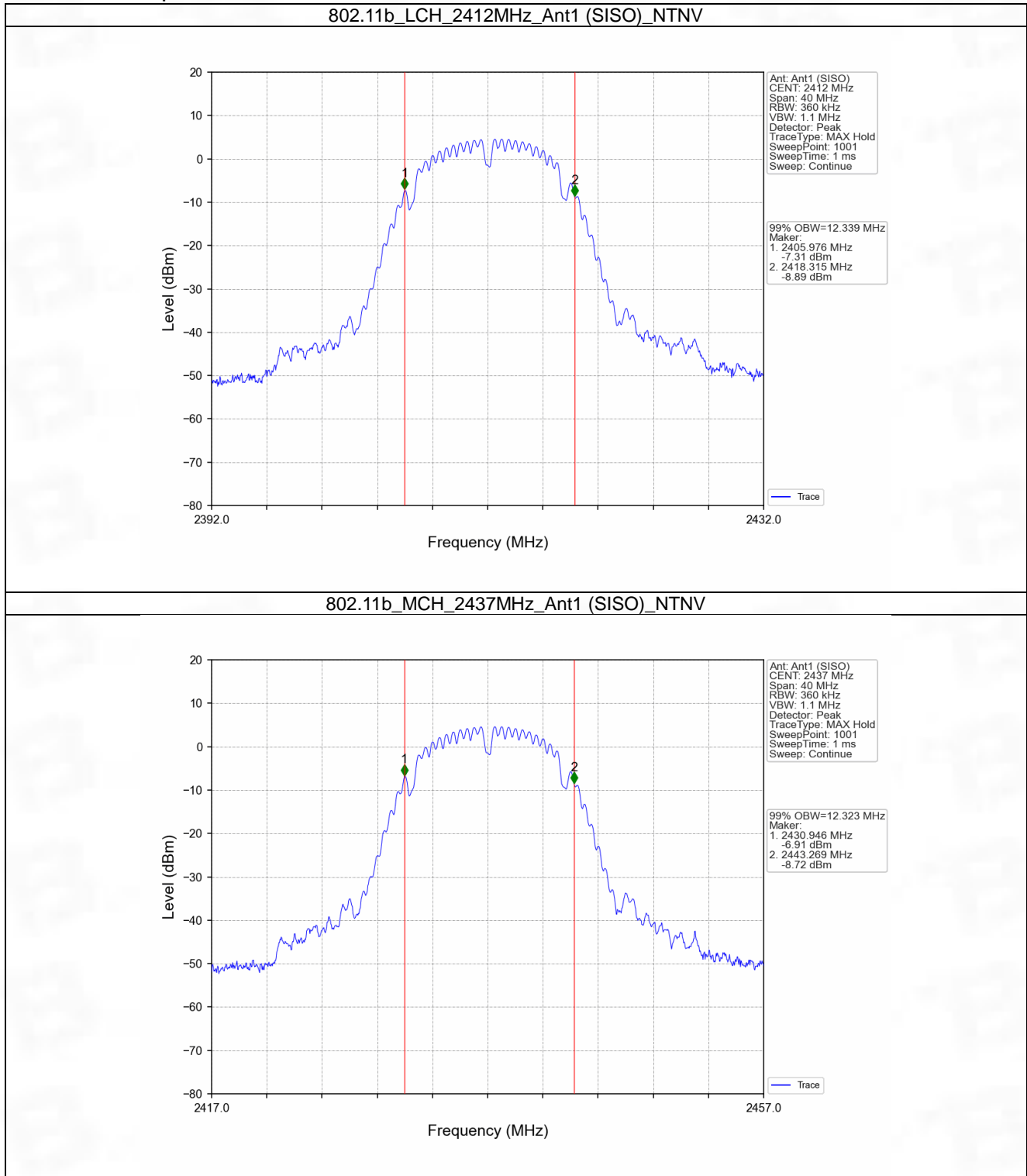
2. Bandwidth

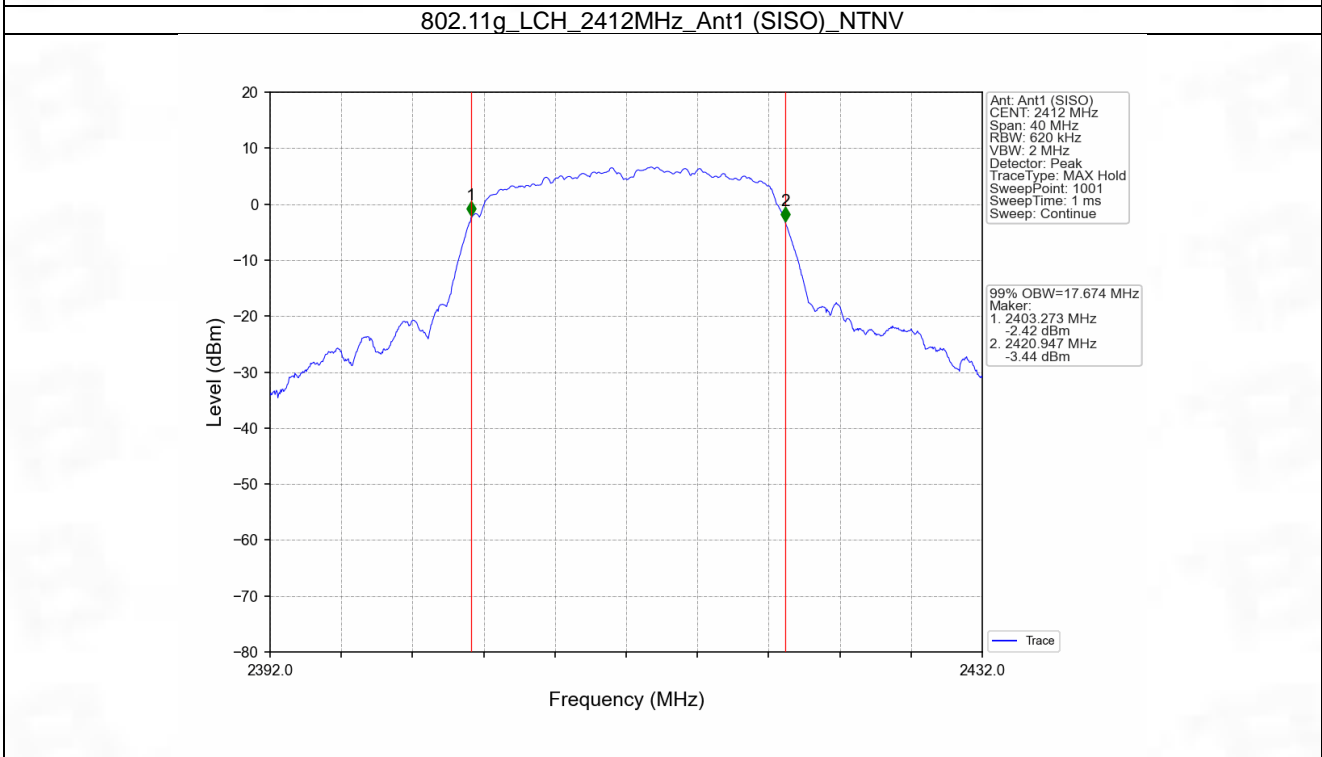
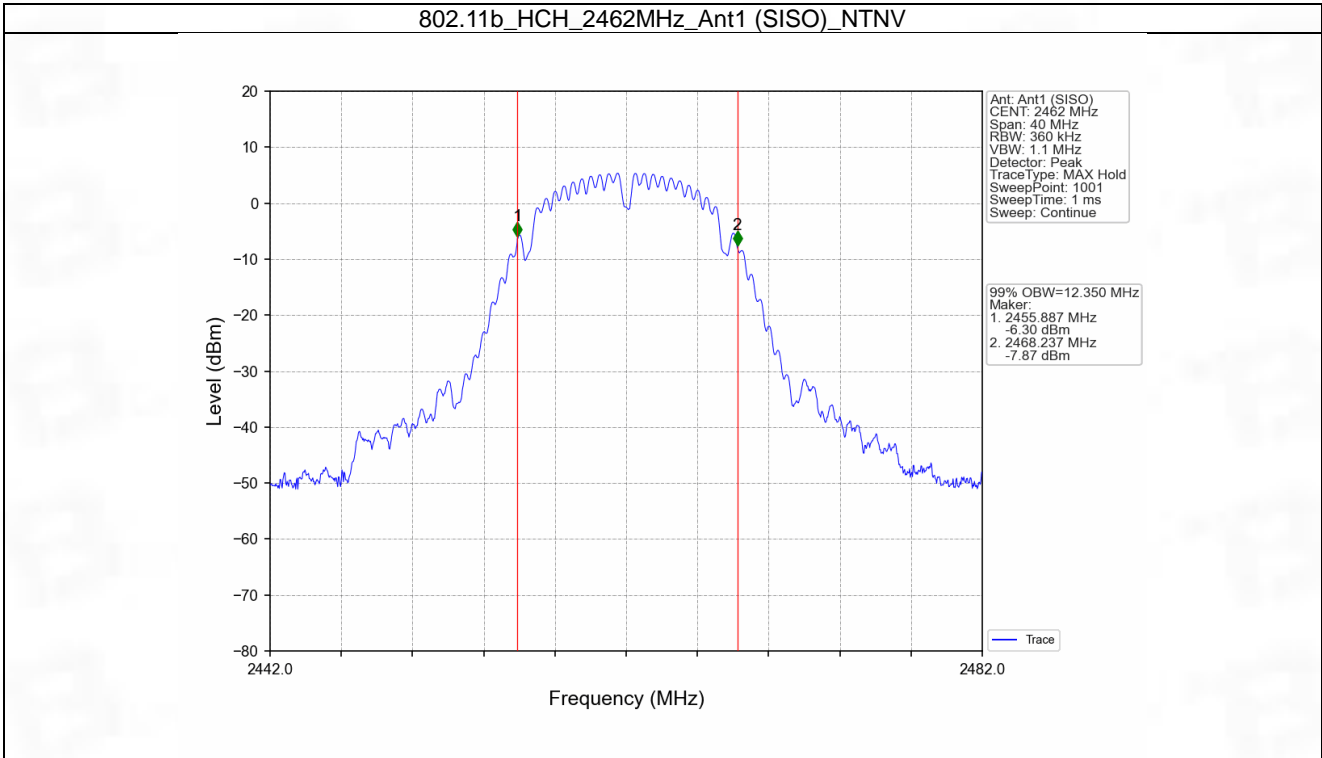
2.1 OBW

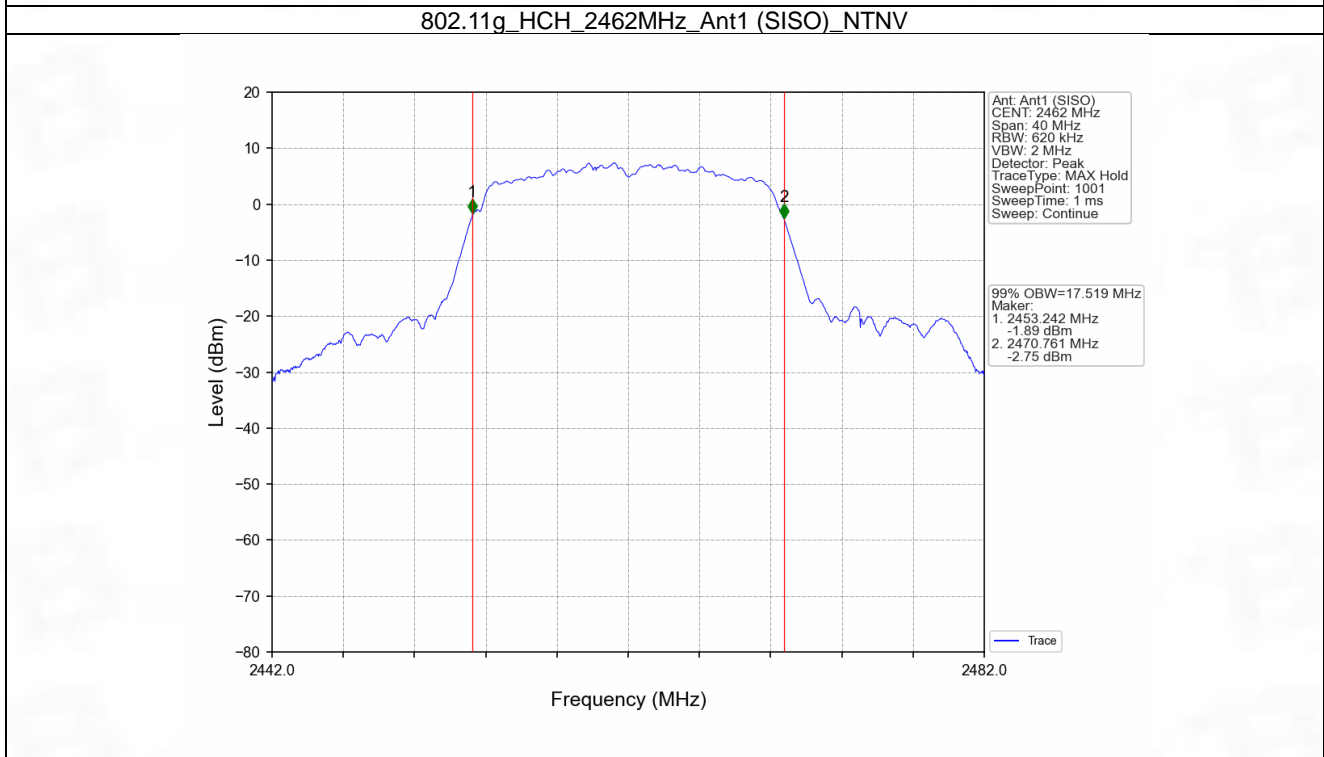
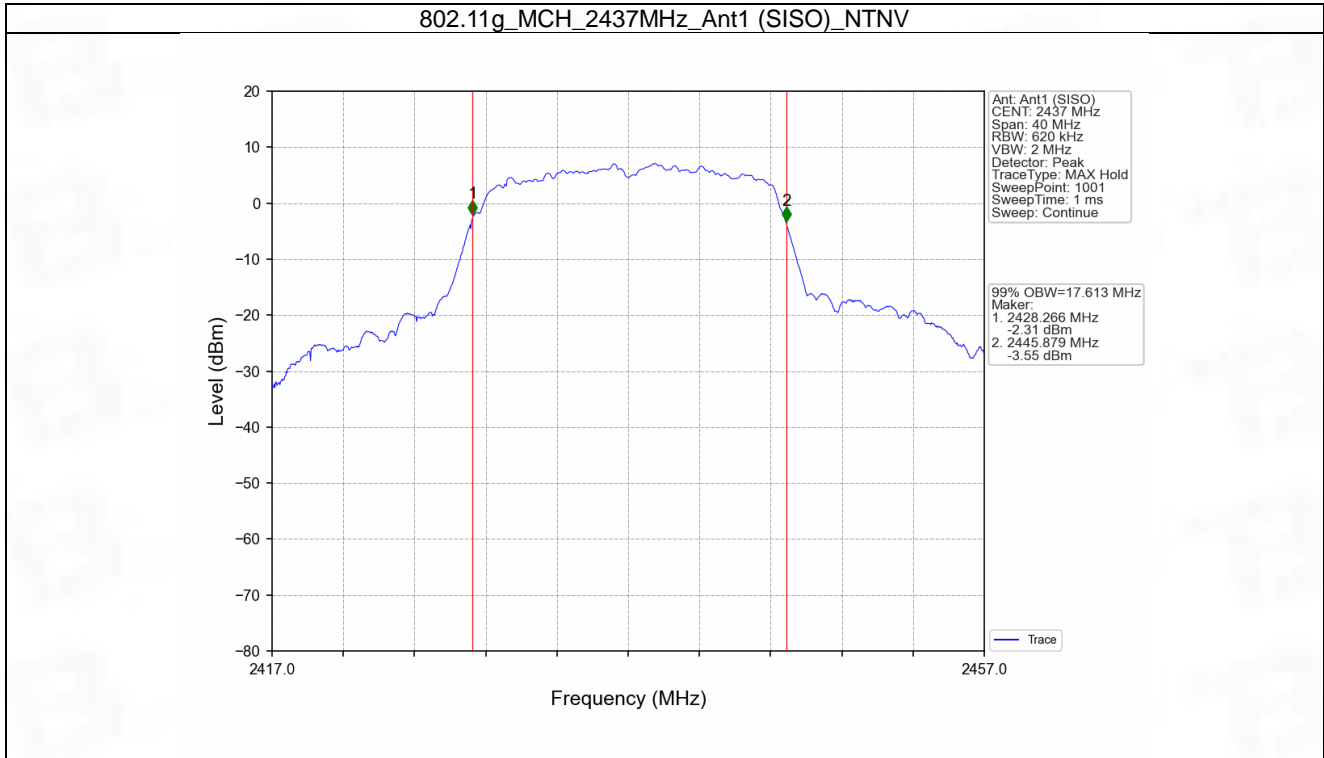
2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)	Verdict
				Result	
802.11b	SISO	2412	1	12.339	Pass
		2437	1	12.323	Pass
		2462	1	12.350	Pass
802.11g	SISO	2412	1	17.674	Pass
		2437	1	17.613	Pass
		2462	1	17.519	Pass
802.11n (HT20)	SISO	2412	1	18.037	Pass
		2437	1	18.371	Pass
		2462	1	18.138	Pass
802.11n (HT40)	SISO	2422	1	36.068	Pass
		2437	1	36.481	Pass
		2452	1	36.380	Pass

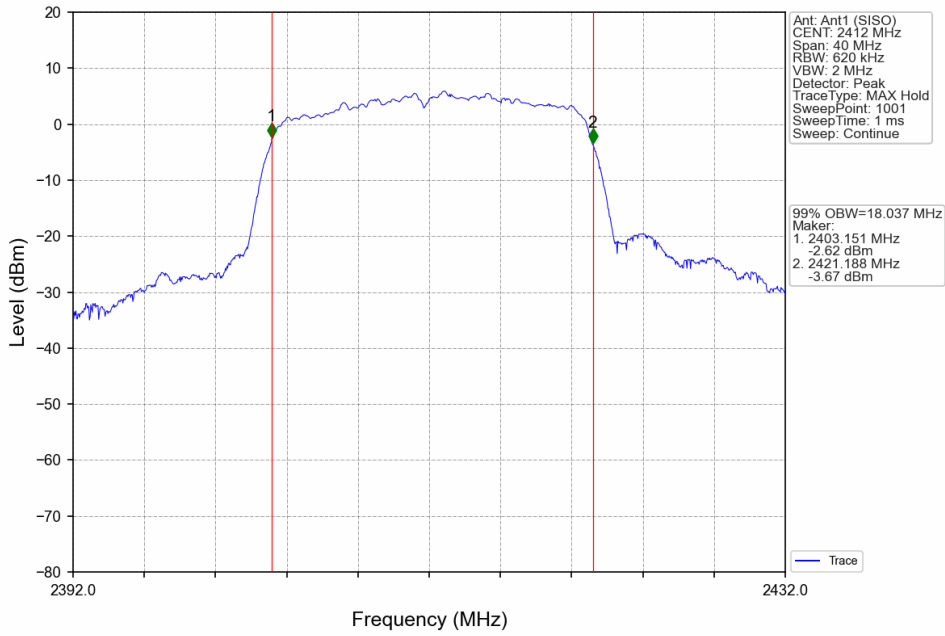
2.1.2 Test Graph



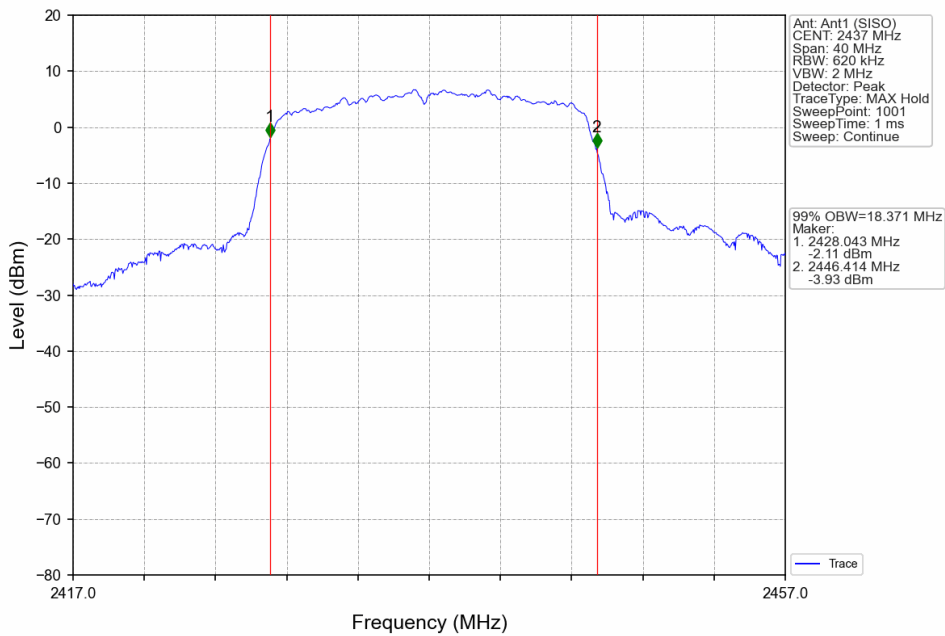




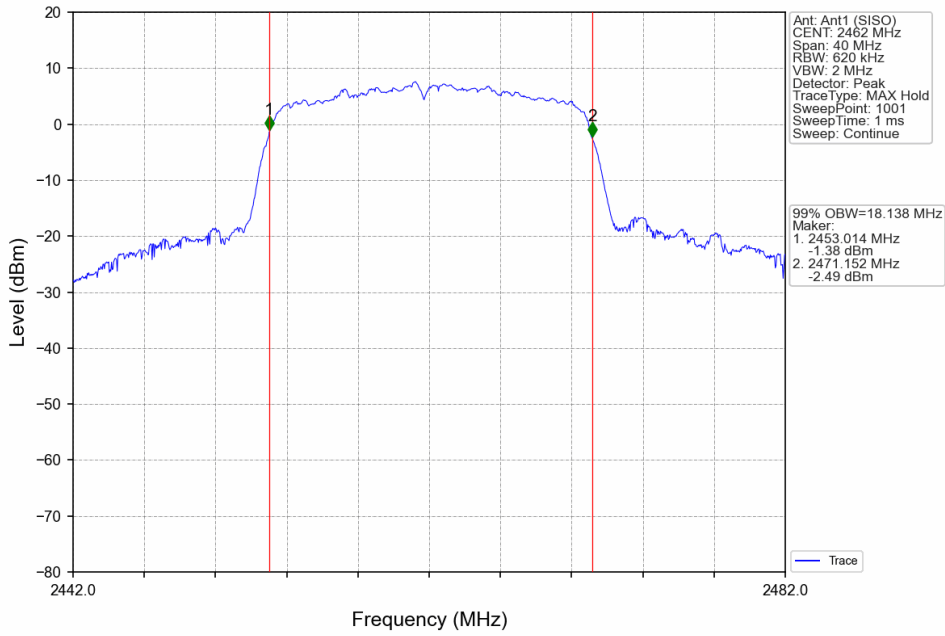
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



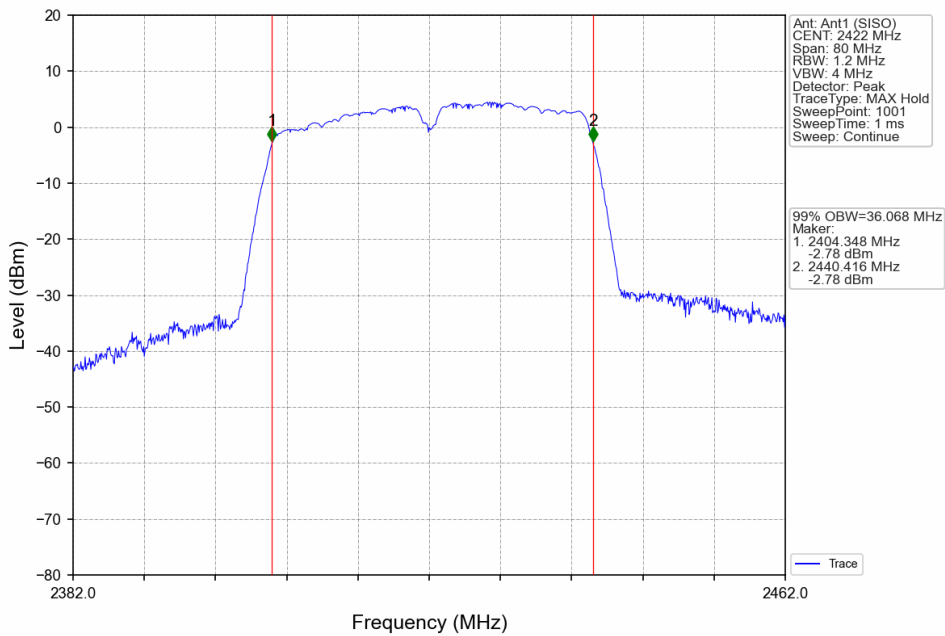
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV

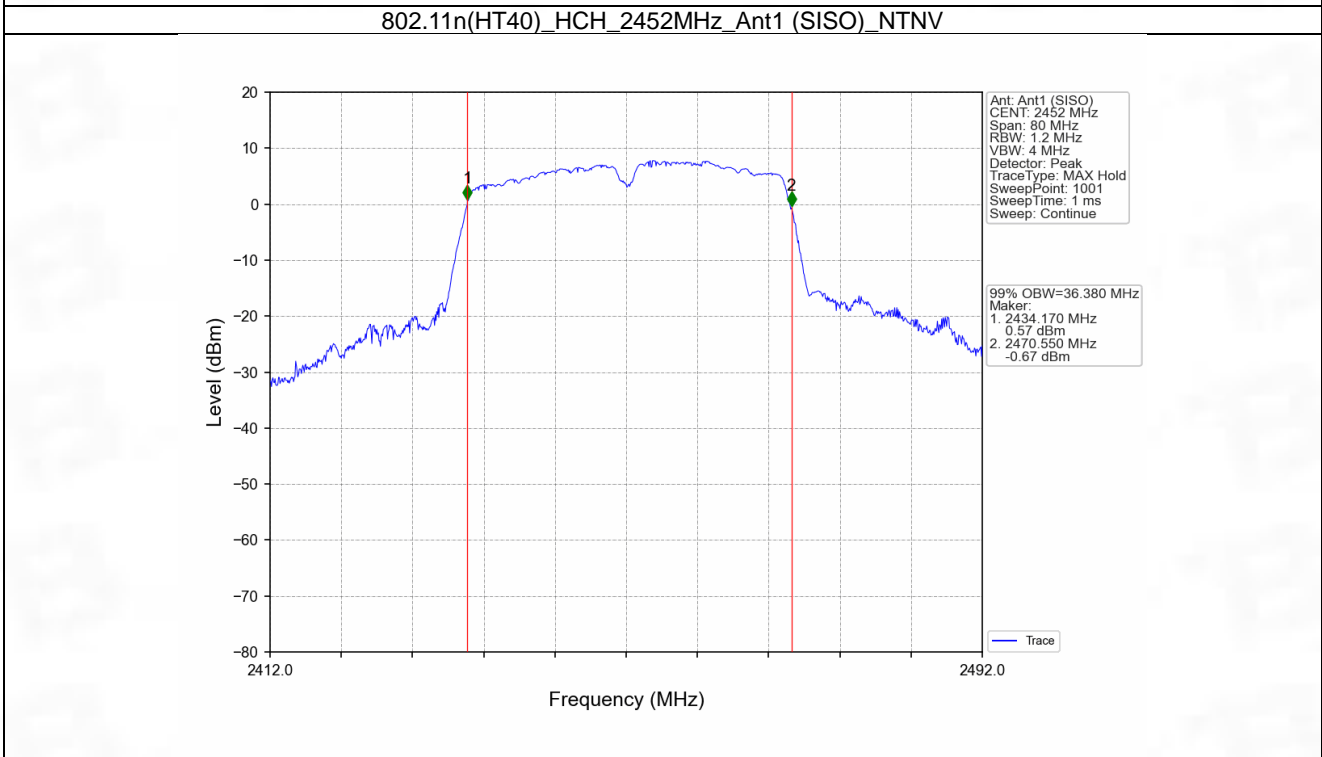
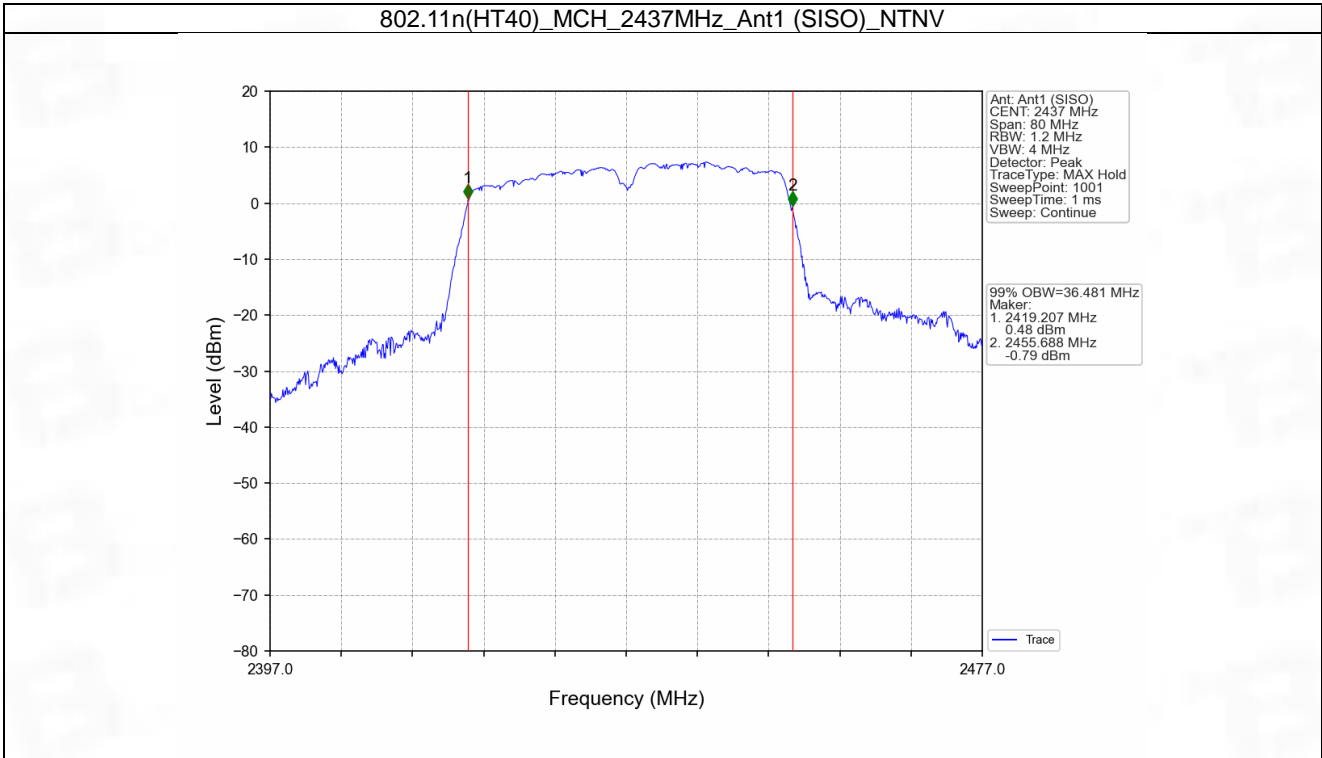


802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



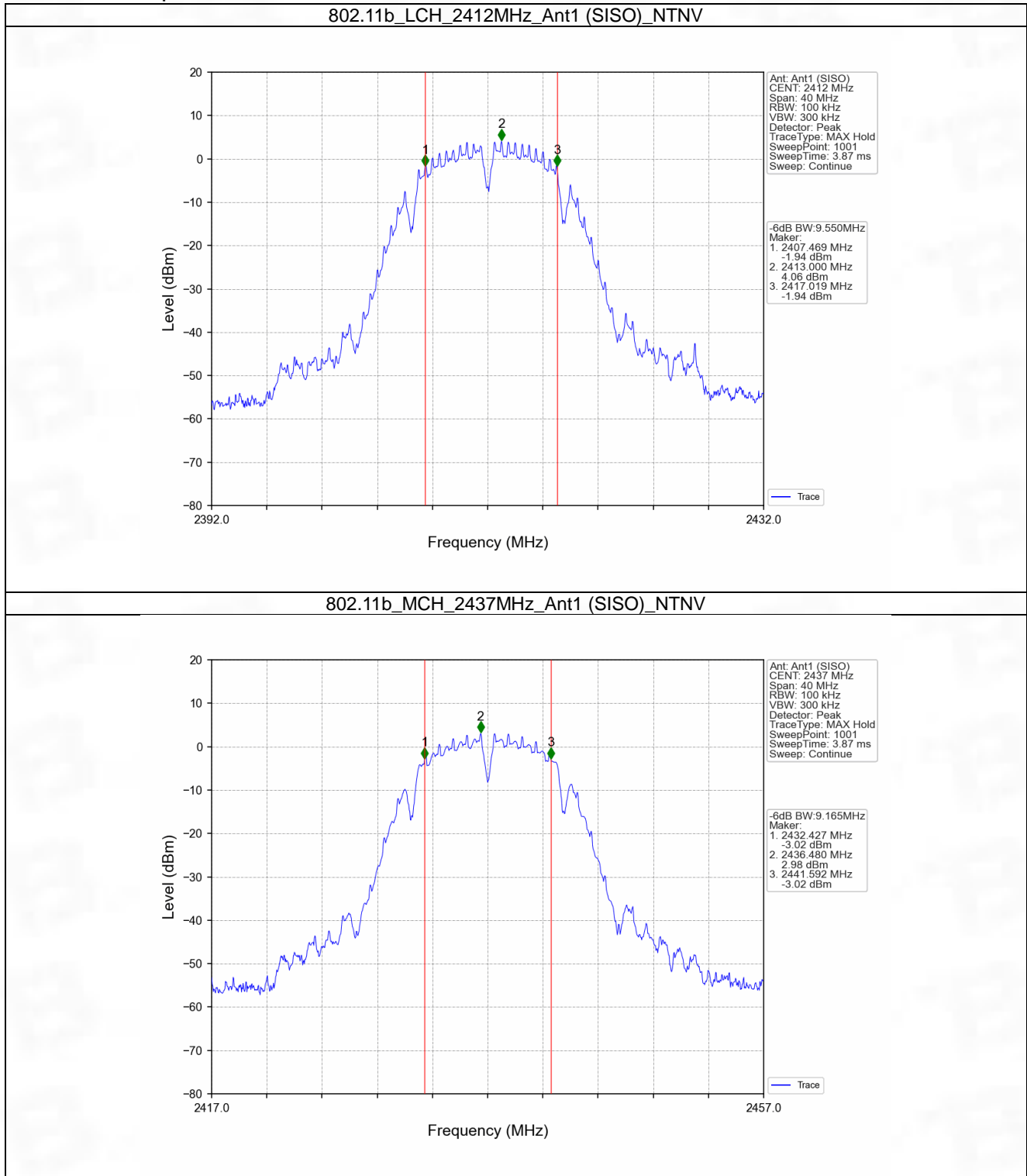


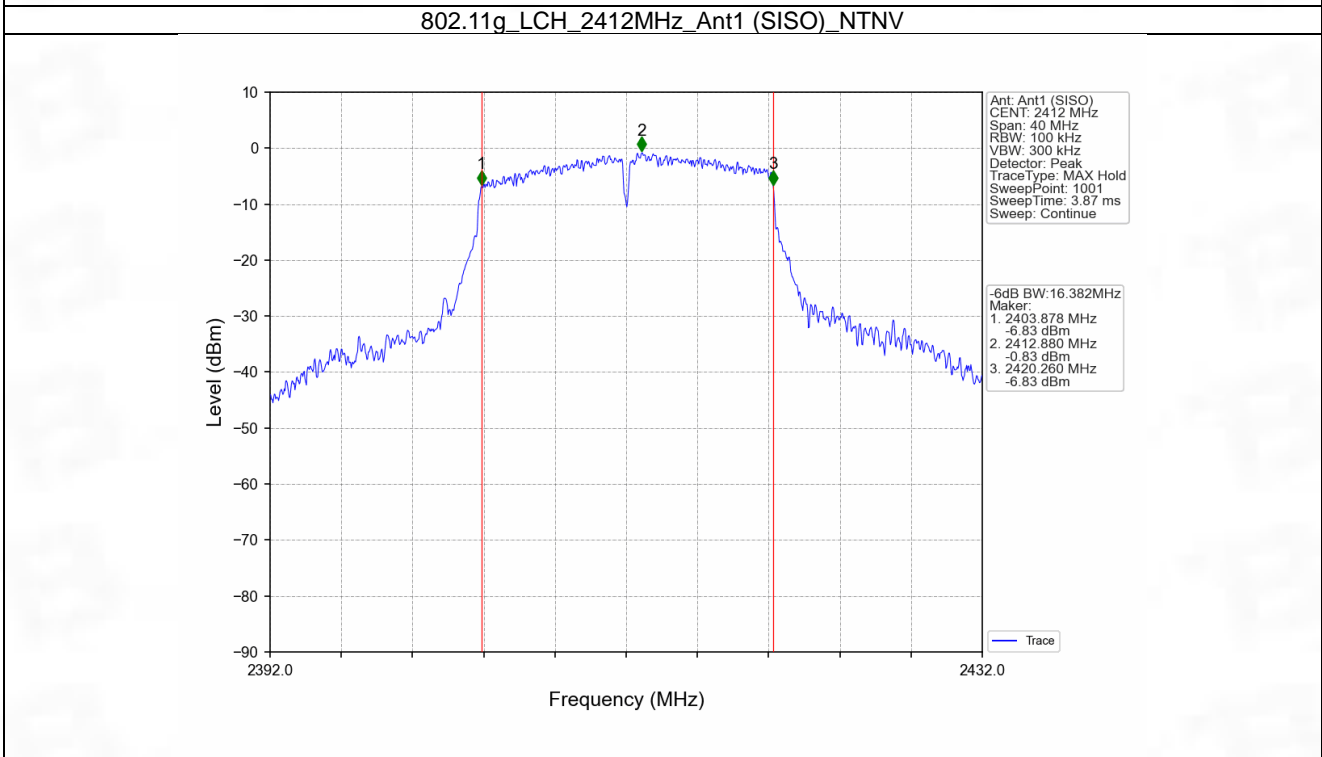
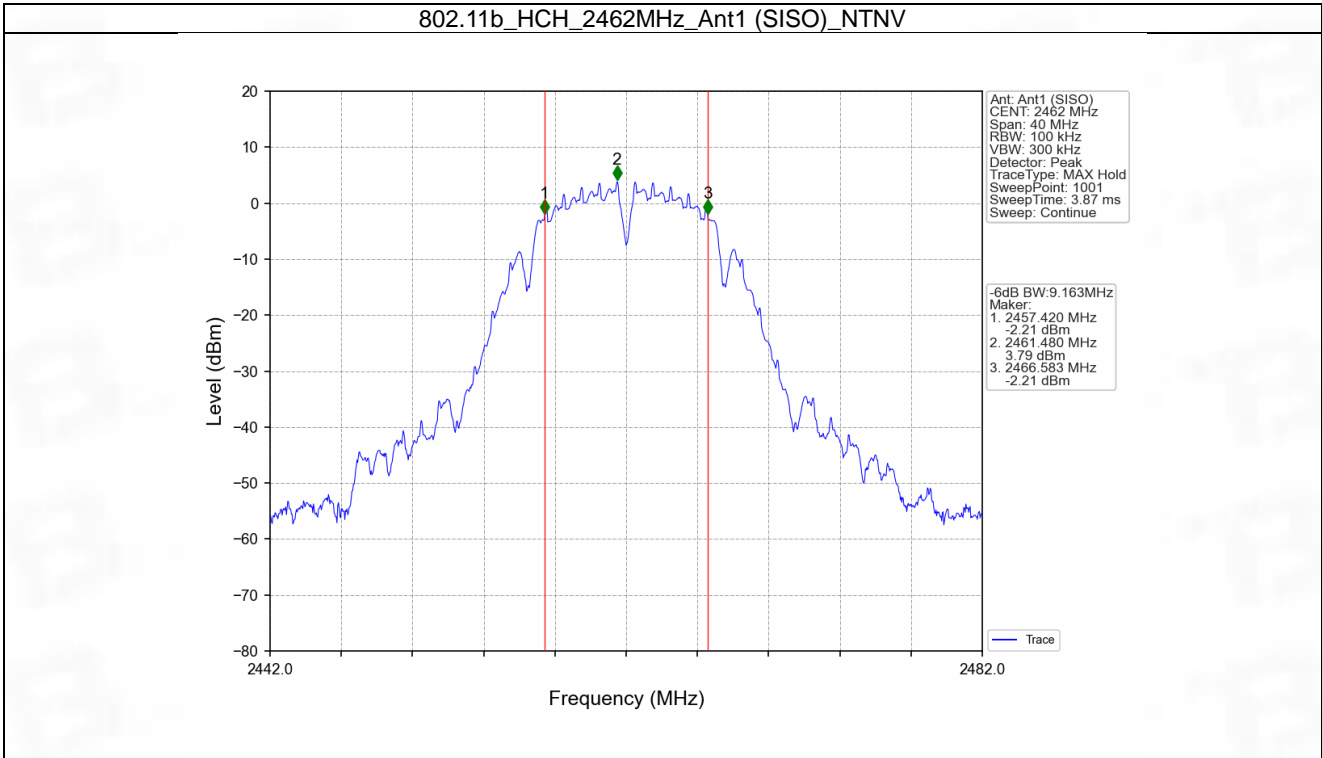
2.2 6dB BW

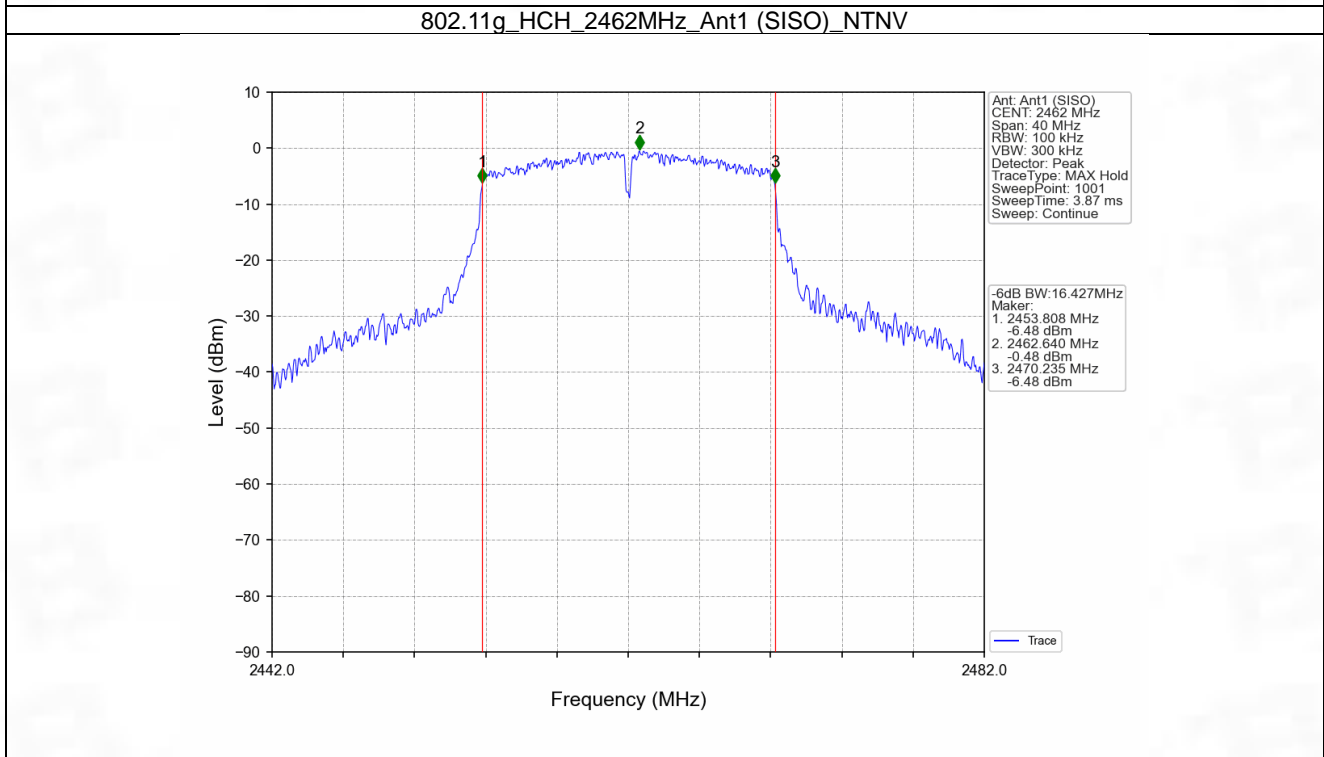
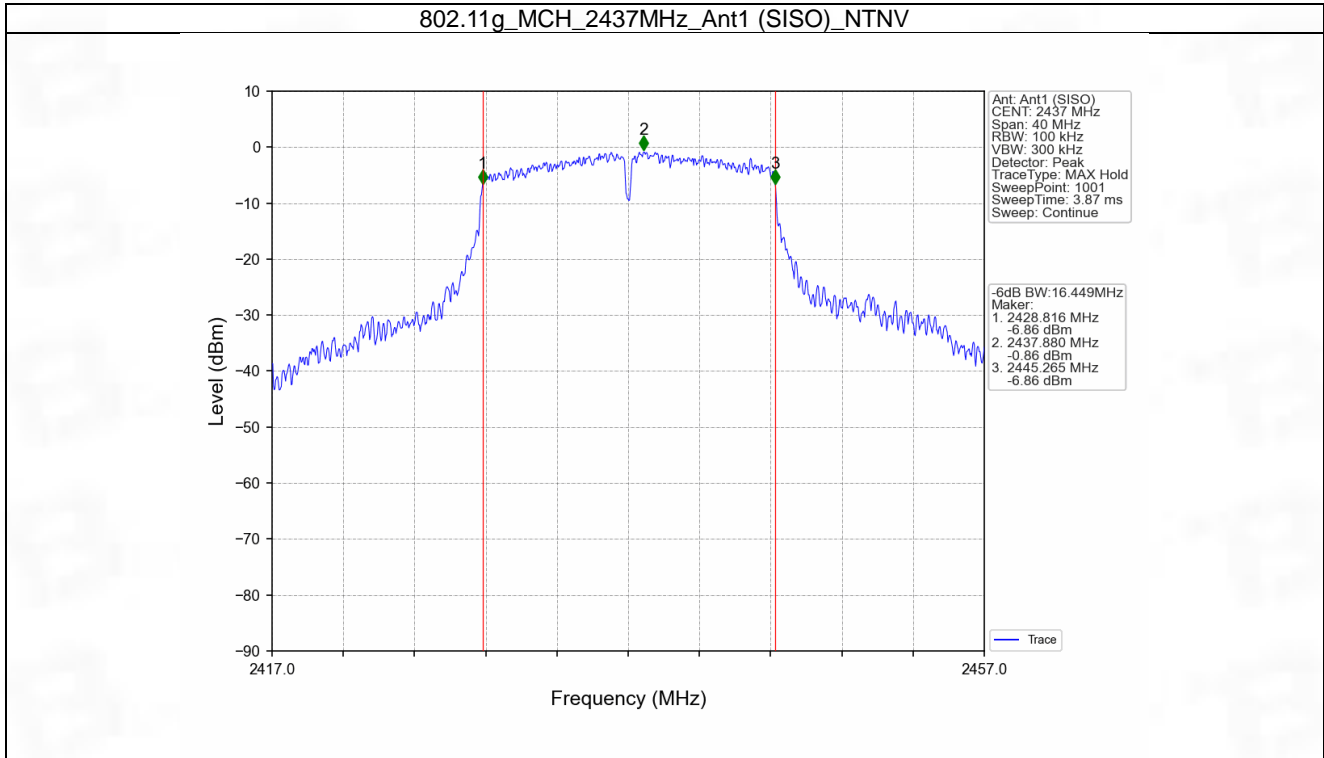
2.2.1 Test Result

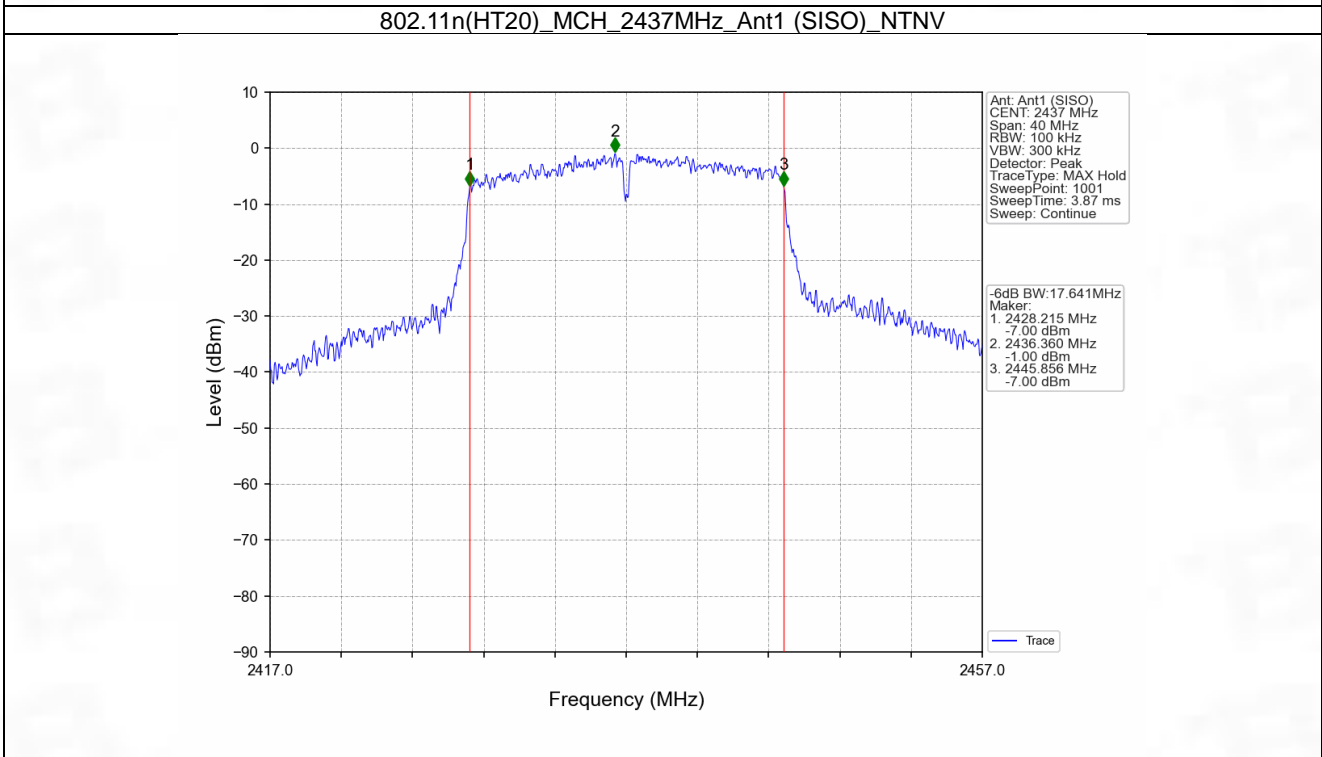
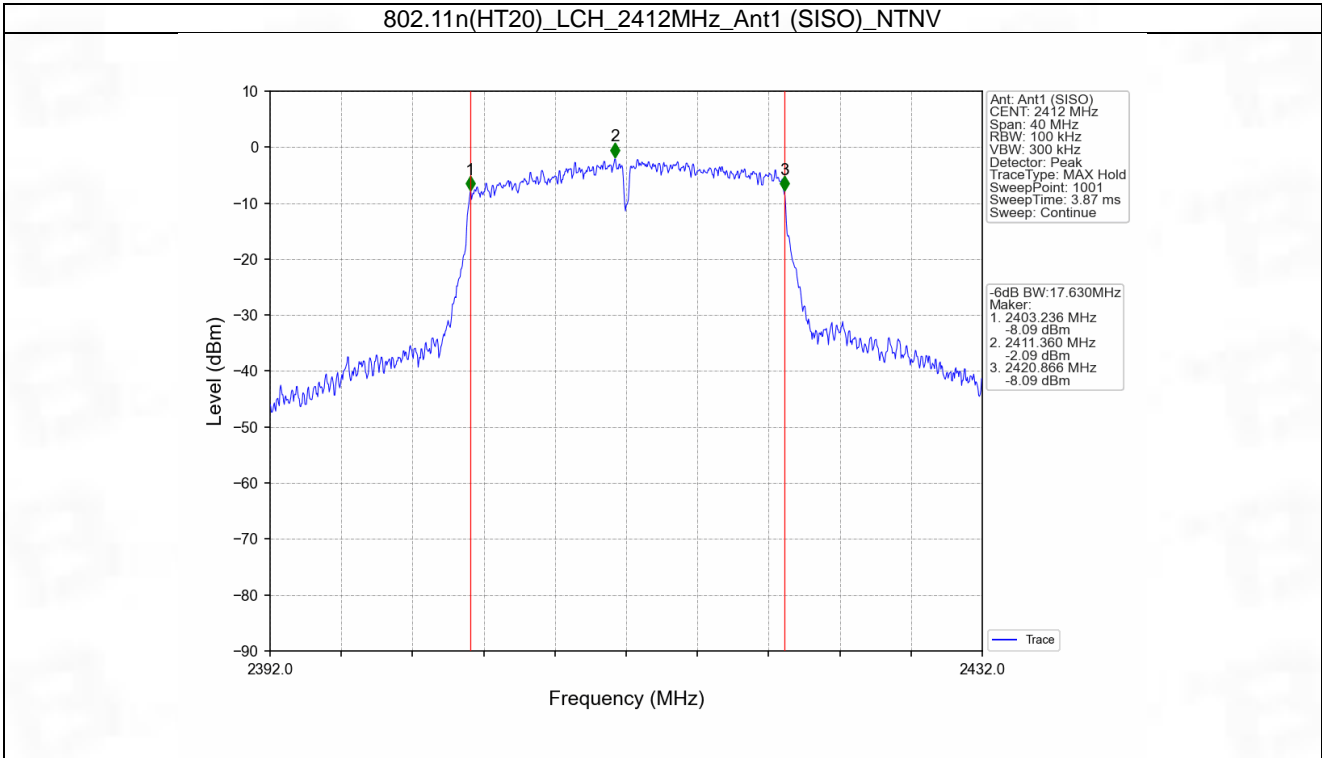
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	9.550	≥ 0.5	Pass
		2437	1	9.165	≥ 0.5	Pass
		2462	1	9.163	≥ 0.5	Pass
802.11g	SISO	2412	1	16.382	≥ 0.5	Pass
		2437	1	16.449	≥ 0.5	Pass
		2462	1	16.427	≥ 0.5	Pass
802.11n (HT20)	SISO	2412	1	17.630	≥ 0.5	Pass
		2437	1	17.641	≥ 0.5	Pass
		2462	1	17.634	≥ 0.5	Pass
802.11n (HT40)	SISO	2422	1	35.137	≥ 0.5	Pass
		2437	1	35.996	≥ 0.5	Pass
		2452	1	35.716	≥ 0.5	Pass

2.2.2 Test Graph

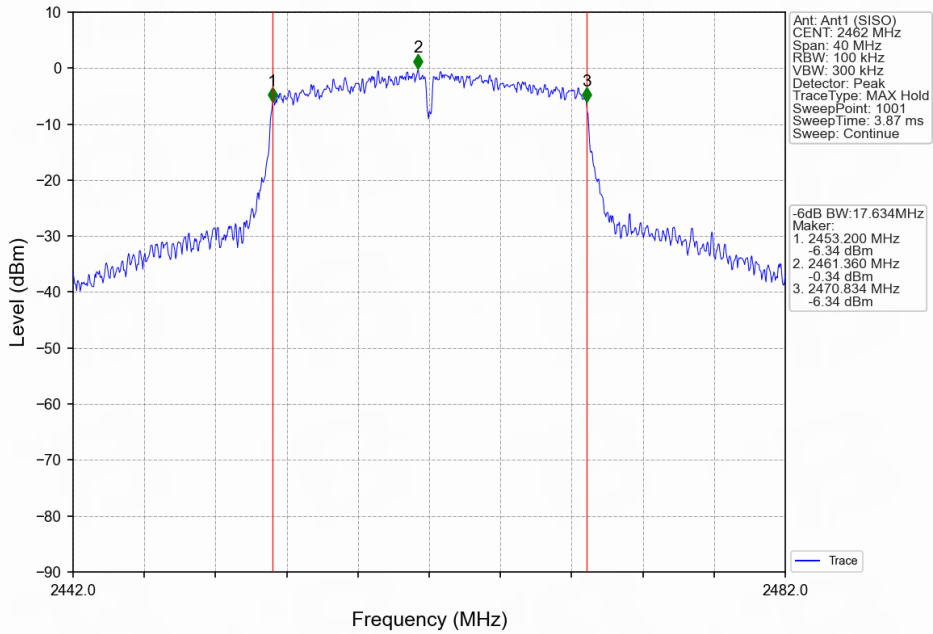








802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV

