



# 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:** HD60i

## 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:** BTF230601R00103  
**Test Standards:** 47 CFR Part 15.247

**Test Conclusion:** Pass  
**FCC ID:** 2ADLJ-HD60I  
**Test Date:** 2023-06-01 to 2023-06-13  
**Date of Issue:** 2023-06-14

**Prepared By:**

*Elma.Yang*

elma.yang / Project Engineer

**Date:**

2023-06-14

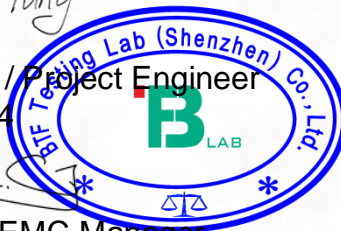
**Approved By:**

*Ryan.CJ*

Ryan.CJ / EMC Manager

**Date:**

2023-06-14



*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	2023-06-14	Original

*Note: Once the revision has been made, then previous versions reports are invalid.*

## Table of Contents

1	INTRODUCTION.....	5
1.1	Identification of Testing Laboratory .....	5
1.2	Identification of the Responsible Testing Location .....	5
1.3	Announcement.....	5
2	PRODUCT INFORMATION.....	6
2.1	Application Information .....	6
2.2	Manufacturer Information.....	6
2.3	Factory Information .....	6
2.4	General Description of Equipment under Test (EUT) .....	6
2.5	Technical Information .....	6
3	SUMMARY OF TEST RESULTS.....	7
3.1	Test Standards .....	7
3.2	Uncertainty of Test.....	7
3.3	Summary of Test Result .....	7
4	TEST CONFIGURATION .....	8
4.1	Test Equipment List .....	8
4.2	Test Auxiliary Equipment.....	12
4.3	Test Modes .....	12
5	EVALUATION RESULTS (EVALUATION) .....	13
5.1	Antenna requirement .....	13
6	RADIO SPECTRUM MATTER TEST RESULTS (RF).....	13
6.1	Conducted Emission at AC power line .....	13
6.1.1	E.U.T. Operation: .....	13
6.1.2	Test Setup Diagram: .....	13
6.1.3	Test Data: .....	15
6.2	Occupied Bandwidth.....	17
6.2.1	E.U.T. Operation: .....	17
6.2.2	Test Setup Diagram: .....	17
6.2.3	Test Data: .....	17
6.3	Maximum Conducted Output Power .....	18
6.3.1	E.U.T. Operation: .....	18
6.3.2	Test Setup Diagram: .....	19
6.3.3	Test Data: .....	19
6.4	Power Spectral Density .....	20
6.4.1	E.U.T. Operation: .....	20
6.4.2	Test Setup Diagram: .....	20
6.4.3	Test Data: .....	20
6.5	Emissions in non-restricted frequency bands .....	21
6.5.1	E.U.T. Operation: .....	21
6.5.2	Test Setup Diagram: .....	22
6.5.3	Test Data: .....	22
6.6	Band edge emissions (Radiated) .....	23
6.6.1	E.U.T. Operation: .....	23
6.6.2	Test Data: .....	24
6.7	Emissions in restricted frequency bands (below 1GHz) .....	28
6.7.1	E.U.T. Operation: .....	28
6.7.2	Test Data: .....	29



6.8	Emissions in restricted frequency bands (above 1GHz) .....	31
6.8.1	E.U.T. Operation: .....	31
6.8.2	Test Data: .....	32
7	TEST SETUP PHOTOS .....	38
8	EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS).....	40
	APPENDIX.....	41

## 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:	HD60i

### 2.5 Technical Information

Power Supply:	DC 3.8V from Battery
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 <sup>#</sup> :	2.39 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 Preampilifier	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
Preampilifier	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 Preampilifier	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
Preampilifier	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_EM C	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.
-------------------	--

## 6 Radio Spectrum Matter Test Results (RF)

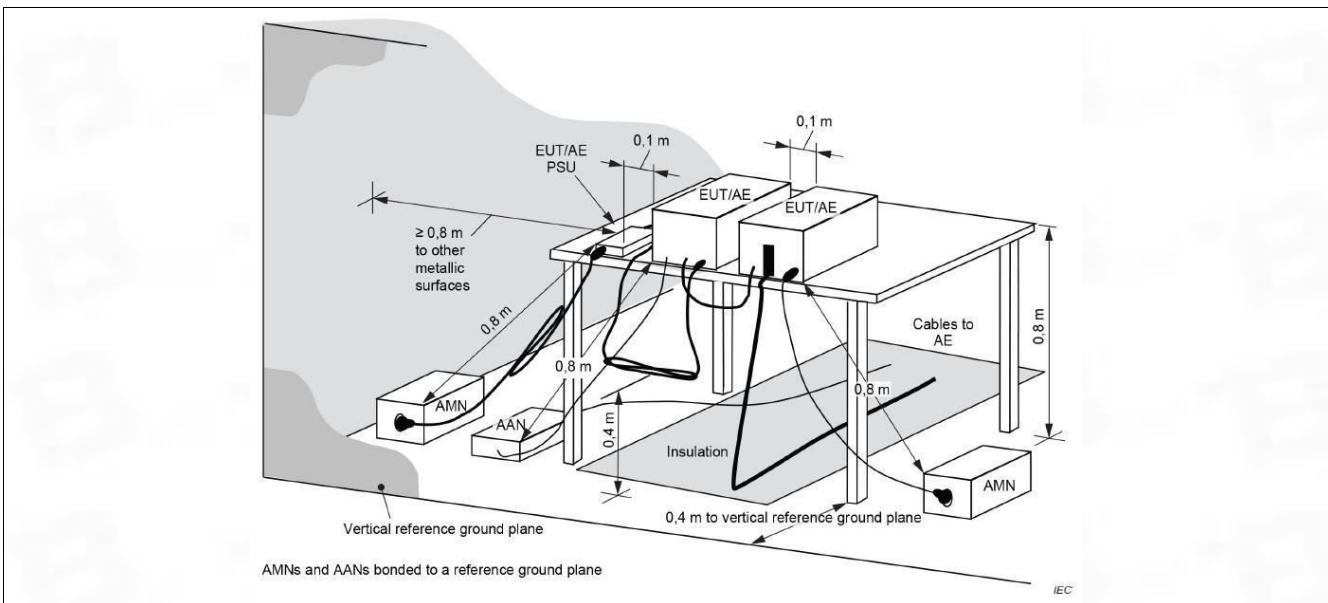
### 6.1 Conducted Emission at AC power line

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 $\mu$ 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 $\mu$ 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:	24.1 °C
Humidity:	53.8 %
Atmospheric Pressure:	1010 mbar

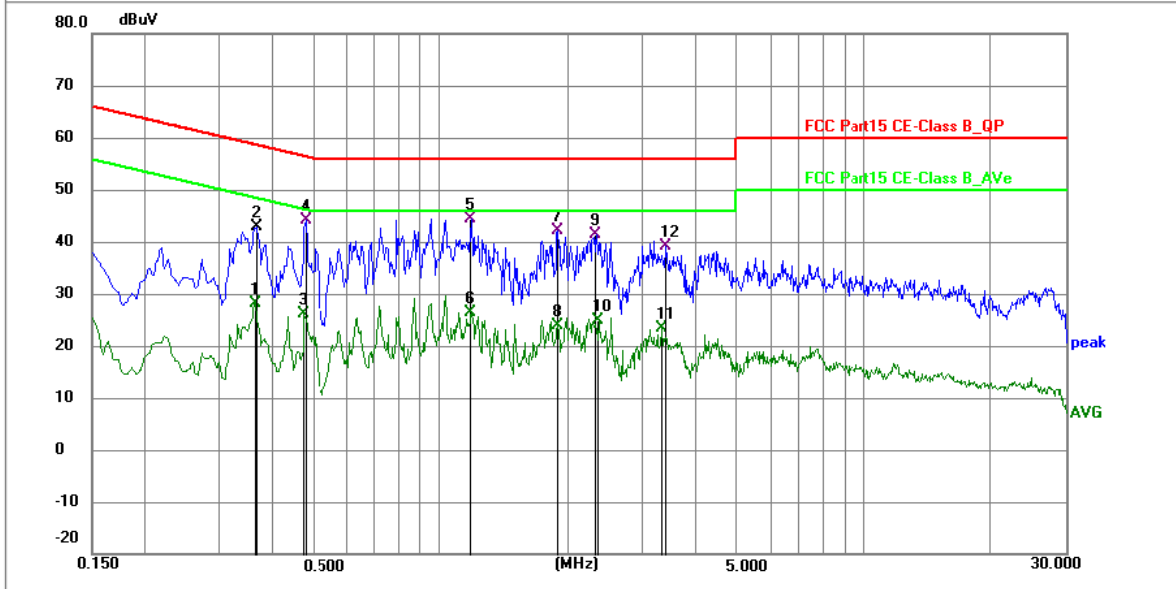
#### 6.1.2 Test Setup Diagram:





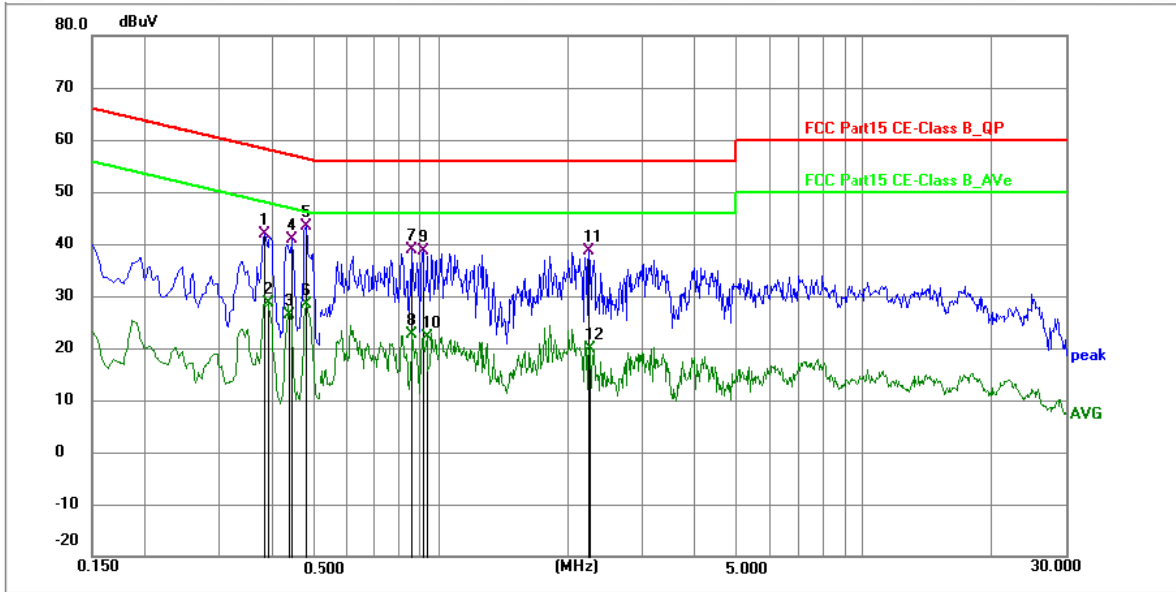
6.1.3 Test Data:

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	0.3614	17.47	10.60	28.07	48.70	-20.63	AVG	P	
2	0.3660	32.16	10.60	42.76	58.59	-15.83	peak	P	
3	0.4740	15.49	10.61	26.10	46.44	-20.34	AVG	P	
4	0.4784	33.50	10.61	44.11	56.37	-12.26	QP	P	
5 *	1.1849	33.54	10.76	44.30	56.00	-11.70	QP	P	
6	1.1849	15.62	10.76	26.38	46.00	-19.62	AVG	P	
7	1.8960	31.39	10.70	42.09	56.00	-13.91	QP	P	
8	1.8960	13.22	10.70	23.92	46.00	-22.08	AVG	P	
9	2.3413	30.62	10.70	41.32	56.00	-14.68	QP	P	
10	2.3594	14.25	10.70	24.95	46.00	-21.05	AVG	P	
11	3.3180	12.67	10.72	23.39	46.00	-22.61	CAV	P	
12	3.4080	28.37	10.72	39.09	56.00	-16.91	QP	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	0.3795	31.22	10.60	41.82	58.29	-16.47	QP	P	
2	0.3885	17.97	10.60	28.57	48.10	-19.53	AVG	P	
3	0.4374	15.70	10.61	26.31	47.11	-20.80	AVG	P	
4	0.4425	30.33	10.61	40.94	57.01	-16.07	QP	P	
5 *	0.4784	32.66	10.61	43.27	56.37	-13.10	QP	P	
6	0.4784	17.86	10.61	28.47	46.37	-17.90	AVG	P	
7	0.8610	28.19	10.76	38.95	56.00	-17.05	QP	P	
8	0.8610	11.83	10.76	22.59	46.00	-23.41	AVG	P	
9	0.9104	27.99	10.76	38.75	56.00	-17.25	QP	P	
10	0.9284	11.24	10.77	22.01	46.00	-23.99	AVG	P	
11	2.2380	27.92	10.69	38.61	56.00	-17.39	QP	P	
12	2.2515	9.25	10.69	19.94	46.00	-26.06	AVG	P	



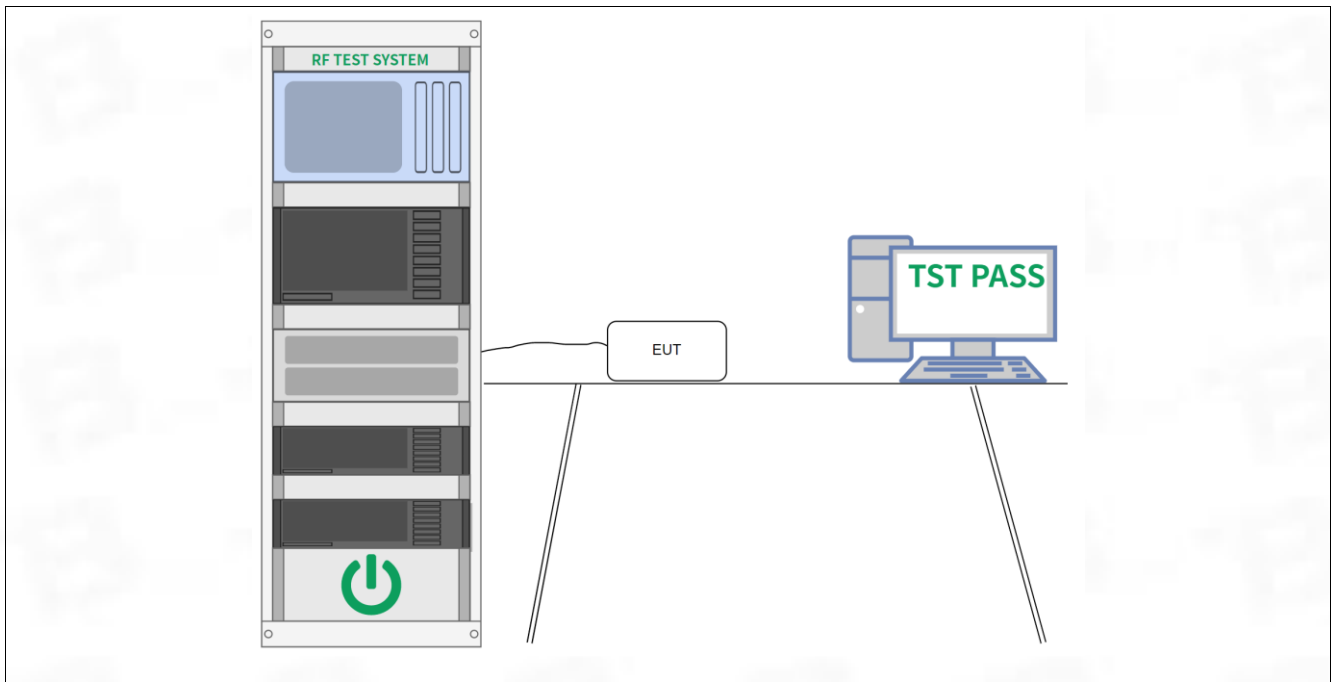
## 6.2 Occupied Bandwidth

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"> <li>a) Set RBW = 100 kHz.</li> <li>b) Set the VBW <math>\geq</math> [3 × RBW].</li> <li>c) Detector = peak.</li> <li>d) Trace mode = max hold.</li> <li>e) Sweep = auto couple.</li> <li>f) Allow the trace to stabilize.</li> <li>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.</li> </ul>

### 6.2.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.8 °C
Humidity:	51.9 %
Atmospheric Pressure:	1010 mbar

### 6.2.2 Test Setup Diagram:



### 6.2.3 Test Data:

Please Refer to Appendix for Details.

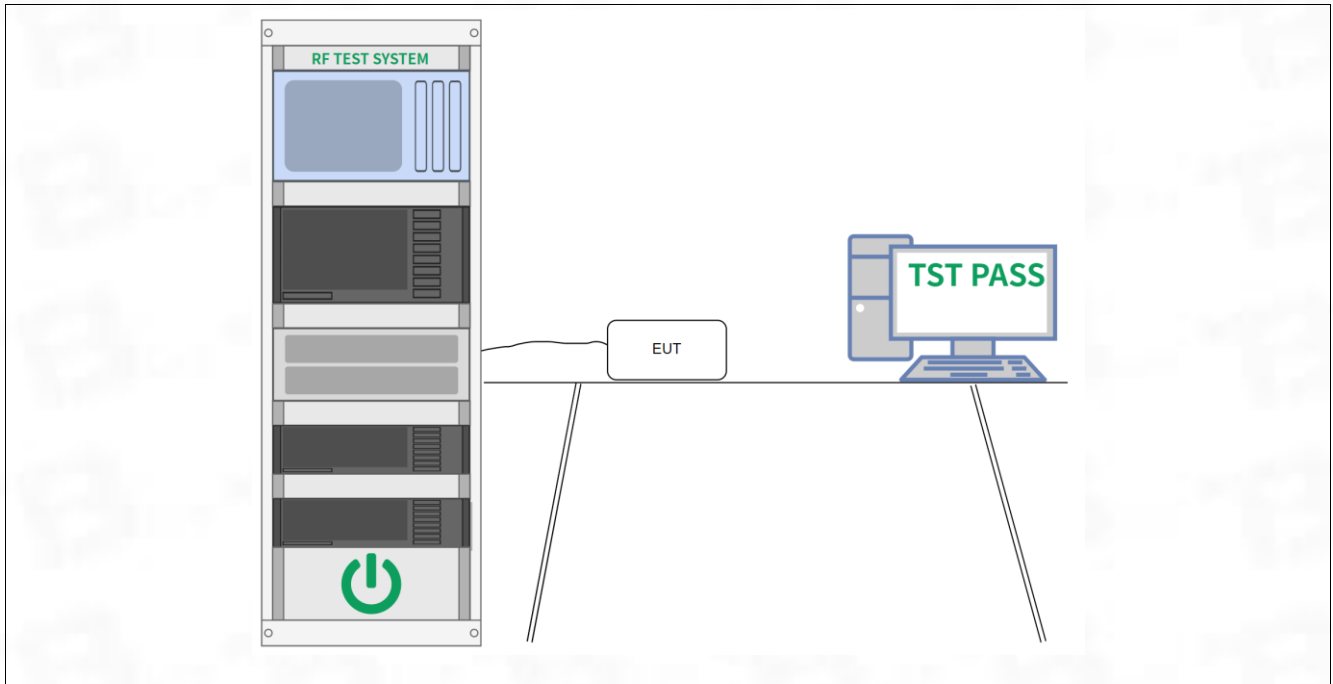
### 6.3 Maximum Conducted Output Power

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:	24.8 °C
Humidity:	51.9 %
Atmospheric Pressure:	1010 mbar

### 6.3.2 Test Setup Diagram:



### 6.3.3 Test Data:

Please Refer to Appendix for Details.

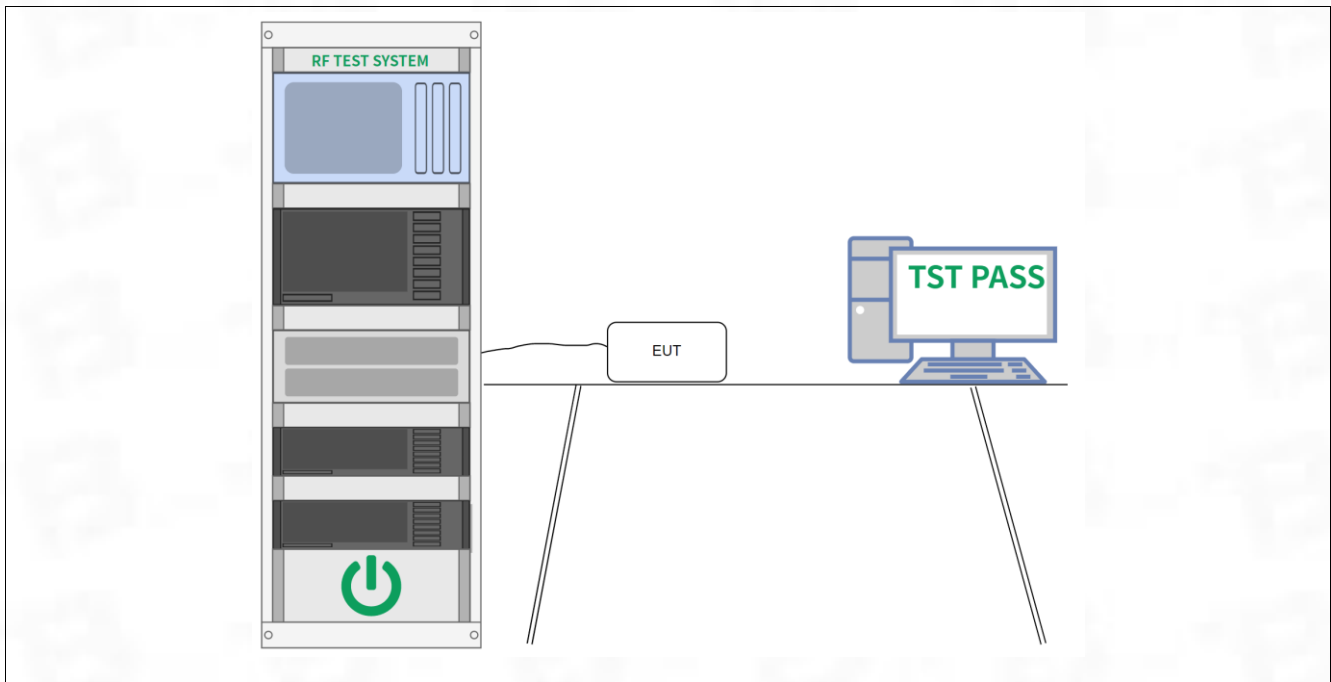
### 6.4 Power Spectral Density

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:	24.8 °C
Humidity:	51.9 %
Atmospheric Pressure:	1010 mbar

#### 6.4.2 Test Setup Diagram:



#### 6.4.3 Test Data:

Please Refer to Appendix for Details.

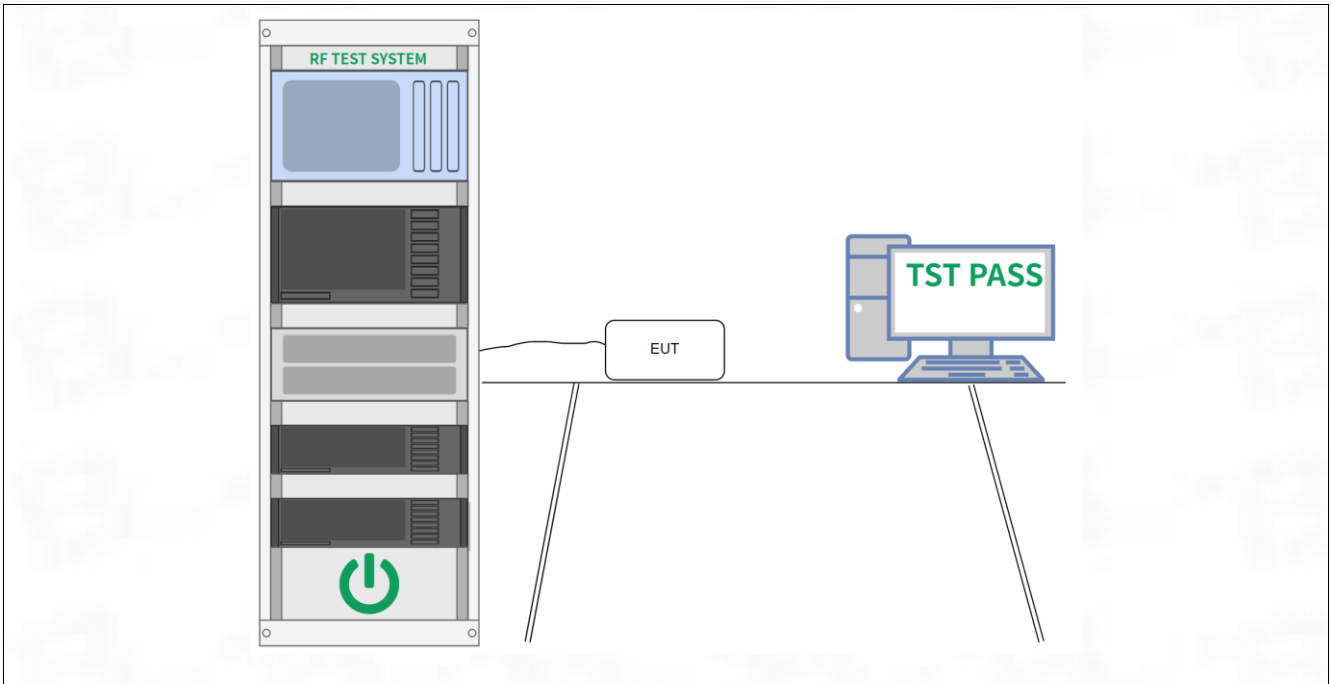
### 6.5 Emissions in non-restricted frequency bands

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:	24.8 °C
Humidity:	51.9 %
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:	25.9 °C
Humidity:	52.5 %
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	66.01	-30.59	35.42	74.00	-38.58	peak	P
2	2390.000	65.56	-30.49	35.07	74.00	-38.93	peak	P
3 *	2400.000	66.16	-30.48	35.68	74.00	-38.32	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	65.01	-30.59	34.42	74.00	-39.58	peak	P
2	2390.000	64.56	-30.49	34.07	74.00	-39.93	peak	P
3	2400.000	64.16	-30.48	33.68	74.00	-40.32	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 *	2483.500	76.07	-30.39	45.68	74.00	-28.32	peak	P
2	2500.000	66.60	-30.37	36.23	74.00	-37.77	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	73.07	-30.39	42.68	74.00	-31.32	peak	P
2	2500.000	68.60	-30.37	38.23	74.00	-35.77	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	66.69	-30.59	36.10	74.00	-37.90	peak	P
2	2390.000	66.56	-30.49	36.07	74.00	-37.93	peak	P
3 *	2400.000	78.63	-30.48	48.15	74.00	-25.85	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	64.69	-30.59	34.10	74.00	-39.90	peak	P
2	2390.000	67.56	-30.49	37.07	74.00	-36.93	peak	P
3 *	2400.000	76.13	-30.48	45.65	74.00	-28.35	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	82.34	-30.39	51.95	74.00	-22.05	peak	P
2	2500.000	68.71	-30.37	38.34	74.00	-35.66	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	80.84	-30.39	50.45	74.00	-23.55	peak	P
2	2500.000	69.71	-30.37	39.34	74.00	-34.66	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	65.35	-30.59	34.76	74.00	-39.24	peak	P
2	2390.000	74.69	-30.49	44.20	74.00	-29.80	peak	P
3 *	2400.000	80.98	-30.48	50.50	74.00	-23.50	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	63.35	-30.59	32.76	74.00	-41.24	peak	P
2	2390.000	70.69	-30.49	40.20	74.00	-33.80	peak	P
3 *	2400.000	77.98	-30.48	47.50	74.00	-26.50	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	81.91	-30.39	51.52	74.00	-22.48	peak	P
2	2500.000	68.76	-30.37	38.39	74.00	-35.61	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	80.41	-30.39	50.02	74.00	-23.98	peak	P
2	2500.000	70.76	-30.37	40.39	74.00	-33.61	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	66.68	-30.59	36.09	74.00	-37.91	peak	P
2 *	2390.000	75.48	-30.49	44.99	74.00	-29.01	peak	P
3	2400.000	74.74	-30.48	44.26	74.00	-29.74	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	64.68	-30.59	34.09	74.00	-39.91	peak	P
2	2390.000	70.48	-30.49	39.99	74.00	-34.01	peak	P
3 *	2400.000	74.24	-30.48	43.76	74.00	-30.24	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	79.83	-30.39	49.44	74.00	-24.56	peak	P
2	2500.000	78.90	-30.37	48.53	74.00	-25.47	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	79.33	-30.39	48.94	74.00	-25.06	peak	P
2	2500.000	74.90	-30.37	44.53	74.00	-29.47	peak	P

### 6.7 Emissions in restricted frequency bands (below 1GHz)

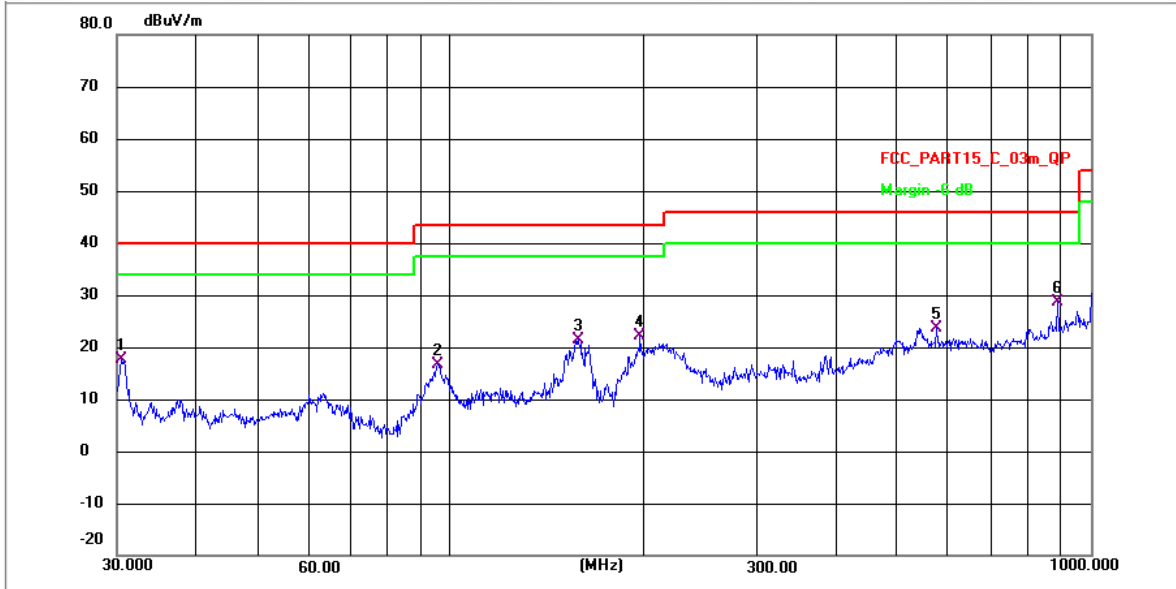
Test Requirement:	In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`		
Test Method:	Radiated emissions tests		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	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:	24.1 °C
Humidity:	54 %
Atmospheric Pressure:	1010 mbar

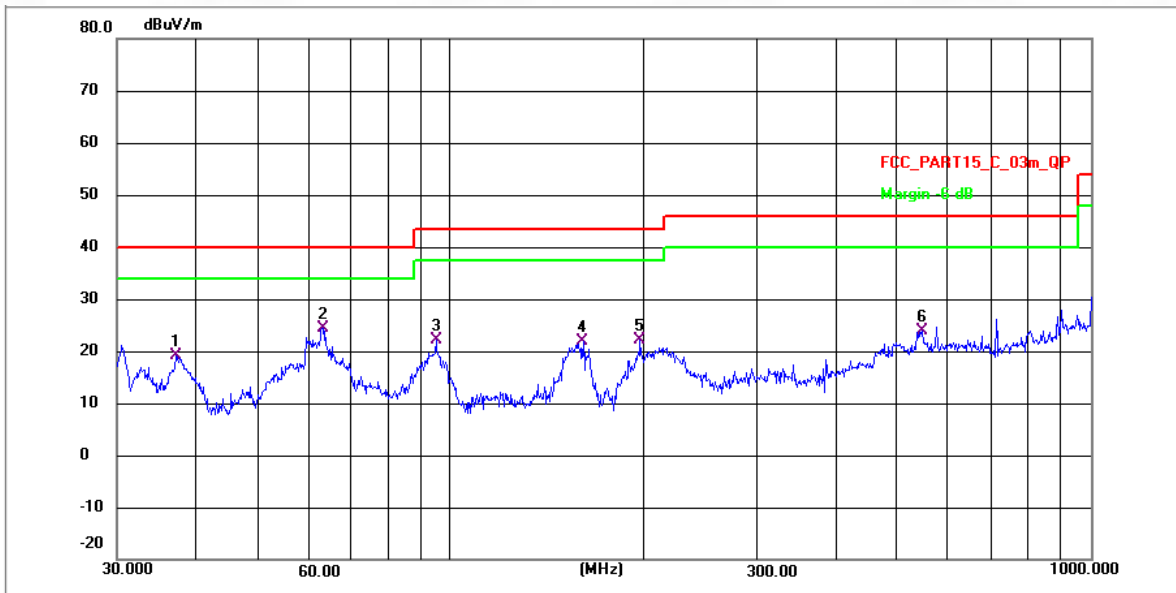
**6.7.2 Test Data:**

Note: All the mode have been tested, and only the worst mode are in the report  
 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	30.5842	36.17	-18.64	17.53	40.00	-22.47	QP	P
2	95.4270	45.74	-28.99	16.75	43.50	-26.75	QP	P
3	158.6677	48.99	-27.70	21.29	43.50	-22.21	QP	P
4	197.5462	49.49	-27.35	22.14	43.50	-21.36	QP	P
5	576.6443	45.65	-21.95	23.70	46.00	-22.30	QP	P
6 *	890.7278	50.78	-22.23	28.55	46.00	-17.45	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	37.1550	39.61	-20.59	19.02	40.00	-20.98	QP	P
2 *	62.8708	44.50	-20.11	24.39	40.00	-15.61	QP	P
3	94.7601	51.25	-29.10	22.15	43.50	-21.35	QP	P
4	160.9089	49.44	-27.68	21.76	43.50	-21.74	QP	P
5	197.5462	49.49	-27.35	22.14	43.50	-21.36	QP	P
6	546.1393	45.42	-21.62	23.80	46.00	-22.20	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:	24.1 °C
Humidity:	54 %
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	3779.422	64.43	-29.03	35.40	74.00	-38.60	peak	P
2	4881.092	66.71	-27.70	39.01	74.00	-34.99	peak	P
3	6331.280	68.35	-25.36	42.99	74.00	-31.01	peak	P
4	7650.888	71.67	-25.00	46.67	74.00	-27.33	peak	P
5	9566.309	72.31	-23.34	48.97	74.00	-25.03	peak	P
6 *	14329.515	74.11	-21.16	52.95	74.00	-21.05	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	3491.651	63.53	-29.06	34.47	74.00	-39.53	peak	P
2	4476.971	66.05	-28.80	37.25	74.00	-36.75	peak	P
3	5623.741	66.40	-26.55	39.85	74.00	-34.15	peak	P
4	7096.999	69.21	-24.90	44.31	74.00	-29.69	peak	P
5	8640.897	71.81	-25.03	46.78	74.00	-27.22	peak	P
6 *	13610.925	71.20	-20.99	50.21	74.00	-23.79	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	3731.661	61.31	-29.03	32.28	74.00	-41.72	peak	P
2	4698.372	64.37	-28.22	36.15	74.00	-37.85	peak	P
3	5979.118	66.30	-25.39	40.91	74.00	-33.09	peak	P
4	7582.641	69.62	-24.91	44.71	74.00	-29.29	peak	P
5	8922.619	70.16	-24.46	45.70	74.00	-28.30	peak	P
6 *	12706.097	71.66	-21.50	50.16	74.00	-23.84	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	3408.883	62.18	-29.14	33.04	74.00	-40.96	peak	P
2	4561.877	67.48	-28.61	38.87	74.00	-35.13	peak	P
3	5979.118	67.30	-25.39	41.91	74.00	-32.09	peak	P
4	7432.914	69.11	-24.80	44.31	74.00	-29.69	peak	P
5	8761.614	70.58	-24.79	45.79	74.00	-28.21	peak	P
6 *	12643.817	71.76	-21.53	50.23	74.00	-23.77	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	3633.738	61.87	-29.04	32.83	74.00	-41.17	peak	P
2	4962.174	64.52	-27.47	37.05	74.00	-36.95	peak	P
3	6762.569	67.36	-25.14	42.22	74.00	-31.78	peak	P
4	7827.598	68.15	-25.27	42.88	74.00	-31.12	peak	P
5	9607.874	71.03	-23.43	47.60	74.00	-26.40	peak	P
6 *	14563.341	68.90	-21.09	47.81	74.00	-26.19	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	3253.885	61.70	-29.28	32.42	74.00	-41.58	peak	P
2	3985.863	64.66	-29.00	35.66	74.00	-38.34	peak	P
3	5364.934	67.54	-27.07	40.47	74.00	-33.53	peak	P
4	6870.933	69.30	-25.05	44.25	74.00	-29.75	peak	P
5	8812.409	70.66	-24.69	45.97	74.00	-28.03	peak	P
6 *	13957.529	72.33	-21.08	51.25	74.00	-22.75	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	3158.442	61.35	-29.37	31.98	74.00	-42.02	peak	P
2	4220.625	61.31	-28.90	32.41	74.00	-41.59	peak	P
3	5332.469	66.39	-27.09	39.30	74.00	-34.70	peak	P
4	6900.787	65.88	-25.02	40.86	74.00	-33.14	peak	P
5	8252.774	68.91	-25.42	43.49	74.00	-30.51	peak	P
6 *	14609.718	70.76	-21.02	49.74	74.00	-24.26	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	3710.151	64.40	-29.04	35.36	74.00	-38.64	peak	P
2	4804.110	63.86	-27.92	35.94	74.00	-38.06	peak	P
3	6166.923	67.72	-25.35	42.37	74.00	-31.63	peak	P
4	8148.483	70.58	-25.47	45.11	74.00	-28.89	peak	P
5	13473.927	72.41	-20.99	51.42	74.00	-22.58	peak	P
6 *	16090.440	72.69	-21.15	51.54	74.00	-22.46	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	3340.606	64.55	-29.20	35.35	74.00	-38.65	peak	P
2	4881.092	67.21	-27.70	39.51	74.00	-34.49	peak	P
3	6421.586	68.90	-25.37	43.53	74.00	-30.47	peak	P
4	7737.620	71.01	-25.14	45.87	74.00	-28.13	peak	P
5	9683.148	71.59	-23.60	47.99	74.00	-26.01	peak	P
6 *	15217.425	72.01	-20.88	51.13	74.00	-22.87	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	3598.203	60.57	-29.05	31.52	74.00	-42.48	peak	P
2	4532.961	64.78	-28.69	36.09	74.00	-37.91	peak	P
3	6179.413	67.11	-25.35	41.76	74.00	-32.24	peak	P
4	7617.789	68.31	-24.95	43.36	74.00	-30.64	peak	P
5	9644.044	70.11	-23.51	46.60	74.00	-27.40	peak	P
6 *	13729.460	70.14	-21.02	49.12	74.00	-24.88	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	3926.404	64.21	-29.01	35.20	74.00	-38.80	peak	P
2	5326.307	65.45	-27.09	38.36	74.00	-35.64	peak	P
3	7467.368	67.16	-24.79	42.37	74.00	-31.63	peak	P
4	8956.208	68.79	-24.40	44.39	74.00	-29.61	peak	P
5	13610.925	70.20	-20.99	49.21	74.00	-24.79	peak	P
6 *	16730.700	70.61	-18.77	51.84	74.00	-22.16	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	3862.246	64.59	-29.02	35.57	74.00	-38.43	peak	P
2	5268.126	66.45	-27.15	39.30	74.00	-34.70	peak	P
3	6671.322	69.33	-25.23	44.10	74.00	-29.90	peak	P
4	8553.924	71.68	-25.21	46.47	74.00	-27.53	peak	P
5	13481.718	69.87	-20.98	48.89	74.00	-25.11	peak	P
6 *	16730.700	70.11	-18.77	51.34	74.00	-22.66	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	3422.705	60.96	-29.13	31.83	74.00	-42.17	peak	P
2	5539.849	66.79	-26.82	39.97	74.00	-34.03	peak	P
3	7045.902	67.89	-24.92	42.97	74.00	-31.03	peak	P
4	8922.619	68.66	-24.46	44.20	74.00	-29.80	peak	P
5	12801.943	68.84	-21.45	47.39	74.00	-26.61	peak	P
6 *	17948.048	69.20	-16.81	52.39	74.00	-21.61	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	3253.885	63.70	-29.28	34.42	74.00	-39.58	peak	P
2	4916.490	67.82	-27.60	40.22	74.00	-33.78	peak	P
3	7007.314	66.08	-24.93	41.15	74.00	-32.85	peak	P
4	8305.420	70.13	-25.40	44.73	74.00	-29.27	peak	P
5	12706.097	70.16	-21.50	48.66	74.00	-25.34	peak	P
6 *	14934.198	71.88	-20.51	51.37	74.00	-22.63	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	3051.653	61.87	-29.46	32.41	74.00	-41.59	peak	P
2	3913.940	63.94	-29.01	34.93	74.00	-39.07	peak	P
3	4957.873	66.60	-27.49	39.11	74.00	-34.89	peak	P
4	6166.923	66.22	-25.35	40.87	74.00	-33.13	peak	P
5	7895.767	68.03	-25.37	42.66	74.00	-31.34	peak	P
6 *	10732.583	70.91	-24.02	46.89	74.00	-27.11	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	3491.651	63.53	-29.06	34.47	74.00	-39.53	peak	P
2	4378.433	62.94	-28.84	34.10	74.00	-39.90	peak	P
3	6258.502	65.83	-25.35	40.48	74.00	-33.52	peak	P
4	7744.332	69.11	-25.15	43.96	74.00	-30.04	peak	P
5	11633.928	69.17	-22.83	46.34	74.00	-27.66	peak	P
6 *	16547.945	70.92	-19.10	51.82	74.00	-22.18	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	3755.465	65.48	-29.02	36.46	74.00	-37.54	peak	P
2	4714.696	65.36	-28.18	37.18	74.00	-36.82	peak	P
3	6564.209	68.53	-25.32	43.21	74.00	-30.79	peak	P
4	9358.459	69.10	-23.51	45.59	74.00	-28.41	peak	P
5	11374.576	71.36	-23.15	48.21	74.00	-25.79	peak	P
6 *	14412.591	70.65	-21.18	49.47	74.00	-24.53	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	2729.491	63.44	-29.97	33.47	74.00	-40.53	peak	P
2	3550.679	61.81	-29.05	32.76	74.00	-41.24	peak	P
3	5185.041	67.83	-27.21	40.62	74.00	-33.38	peak	P
4	7366.612	65.88	-24.82	41.06	74.00	-32.94	peak	P
5	10007.524	69.22	-24.30	44.92	74.00	-29.08	peak	P
6 *	14042.505	69.36	-21.10	48.26	74.00	-25.74	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	3215.553	63.86	-29.32	34.54	74.00	-39.46	peak	P
2	4154.060	63.85	-28.93	34.92	74.00	-39.08	peak	P
3	5239.274	64.95	-27.17	37.78	74.00	-36.22	peak	P
4	6440.174	66.59	-25.38	41.21	74.00	-32.79	peak	P
5	8956.208	69.79	-24.40	45.39	74.00	-28.61	peak	P
6 *	13025.893	72.94	-21.32	51.62	74.00	-22.38	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	3130.268	62.77	-29.39	33.38	74.00	-40.62	peak	P
2	4721.515	63.26	-28.16	35.10	74.00	-38.90	peak	P
3	6331.280	66.35	-25.36	40.99	74.00	-33.01	peak	P
4	7895.767	69.03	-25.37	43.66	74.00	-30.34	peak	P
5	11143.530	69.58	-23.33	46.25	74.00	-27.75	peak	P
6 *	13423.394	73.30	-21.03	52.27	74.00	-21.73	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	3541.455	63.97	-29.05	34.92	74.00	-39.08	peak	P
2	5132.852	62.25	-27.25	35.00	74.00	-39.00	peak	P
3	5999.892	65.05	-25.33	39.72	74.00	-34.28	peak	P
4	7256.720	65.46	-24.85	40.61	74.00	-33.39	peak	P
5	9036.818	67.42	-24.22	43.20	74.00	-30.80	peak	P
6 *	11506.846	71.01	-23.05	47.96	74.00	-26.04	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	3429.637	58.28	-29.12	29.16	74.00	-44.84	peak	P
2	4333.110	60.72	-28.86	31.86	74.00	-42.14	peak	P
3	5717.160	64.96	-26.25	38.71	74.00	-35.29	peak	P
4	6835.279	62.91	-25.08	37.83	74.00	-36.17	peak	P
5	8529.235	67.85	-25.26	42.59	74.00	-31.41	peak	P
6 *	11483.589	71.53	-23.07	48.46	74.00	-25.54	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	2824.190	65.42	-29.82	35.60	74.00	-38.40	peak	P
2	4120.577	63.28	-28.94	34.34	74.00	-39.66	peak	P
3	6520.716	65.44	-25.36	40.08	74.00	-33.92	peak	P
4	8812.409	66.16	-24.69	41.47	74.00	-32.53	peak	P
5	11610.413	68.27	-22.87	45.40	74.00	-28.60	peak	P
6 *	14852.408	71.30	-20.64	50.66	74.00	-23.34	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	3130.268	62.77	-29.39	33.38	74.00	-40.62	peak	P
2	4251.233	63.81	-28.89	34.92	74.00	-39.08	peak	P
3	5979.118	67.80	-25.39	42.41	74.00	-31.59	peak	P
4	7027.597	66.84	-24.92	41.92	74.00	-32.08	peak	P
5	9644.044	68.11	-23.51	44.60	74.00	-29.40	peak	P
6 *	12865.001	69.61	-21.41	48.20	74.00	-25.80	peak	P



## 7 Test Setup Photos

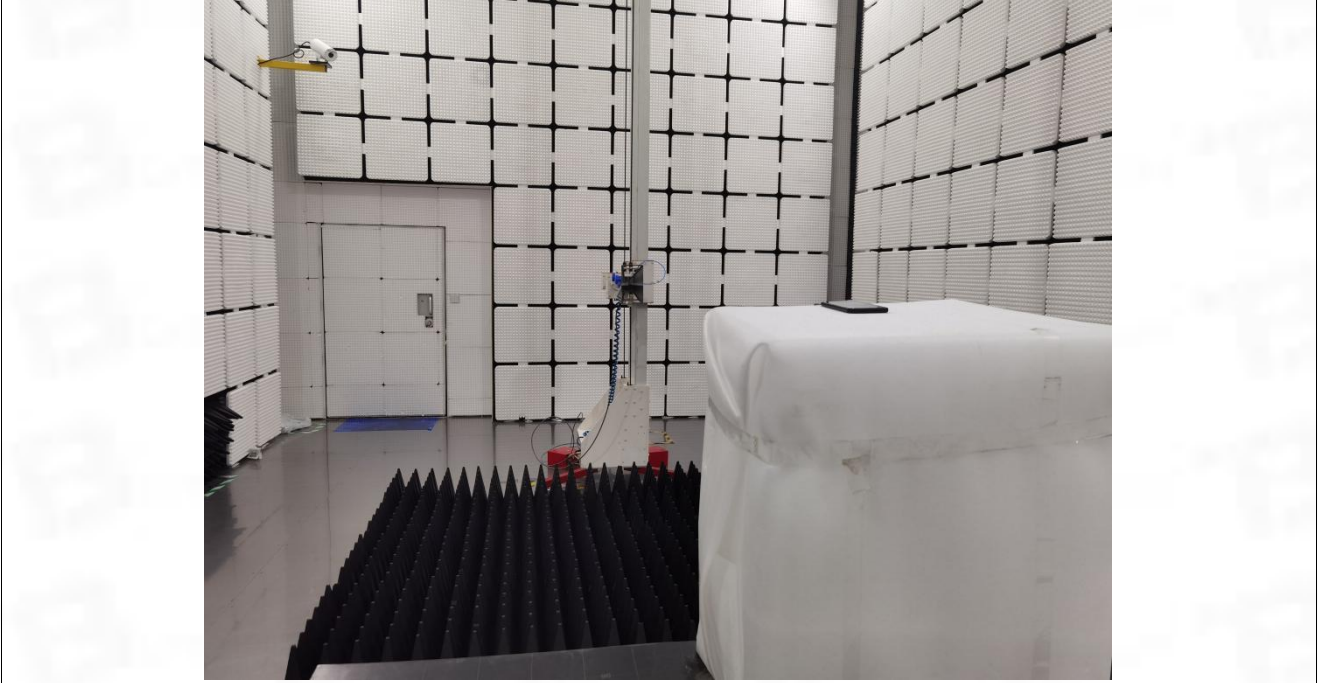
Conducted Emission at AC power line



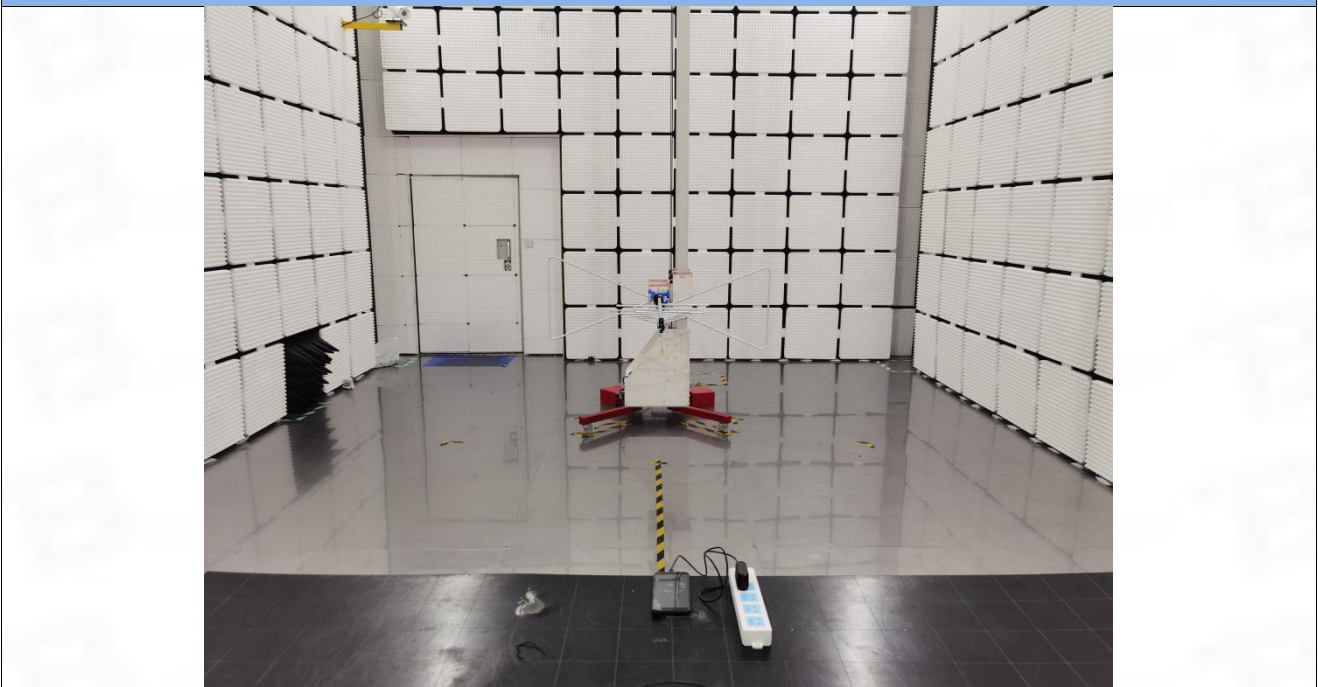
Occupied Bandwidth  
Maximum Conducted Output Power  
Power Spectral Density  
Emissions in non-restricted frequency bands



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



**Emissions in restricted frequency bands (below 1GHz)**



## 8 EUT Constructional Details (EUT Photos)

Please refer to Report BTF230601R00101



# Appendix

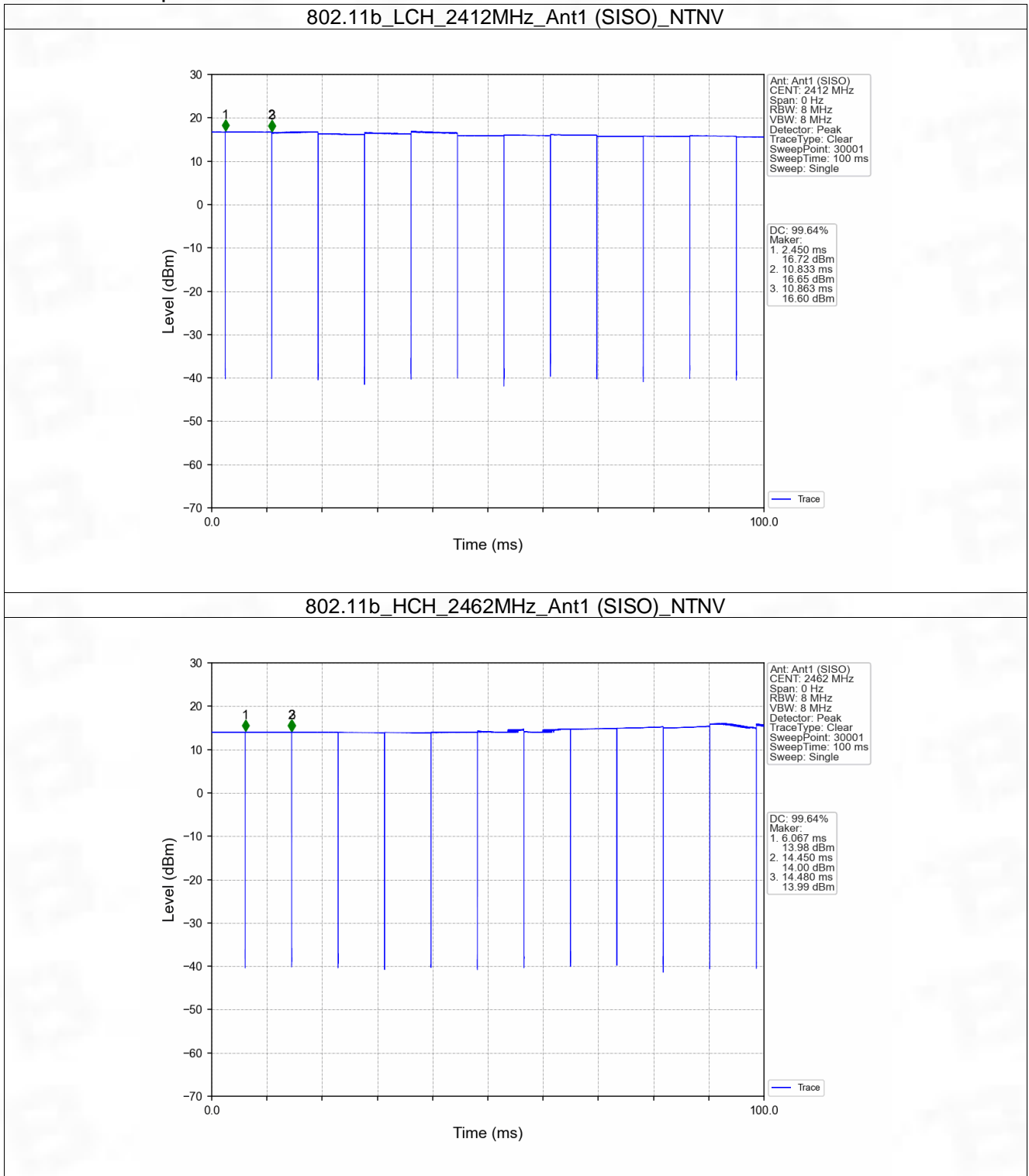
# 1. Duty Cycle

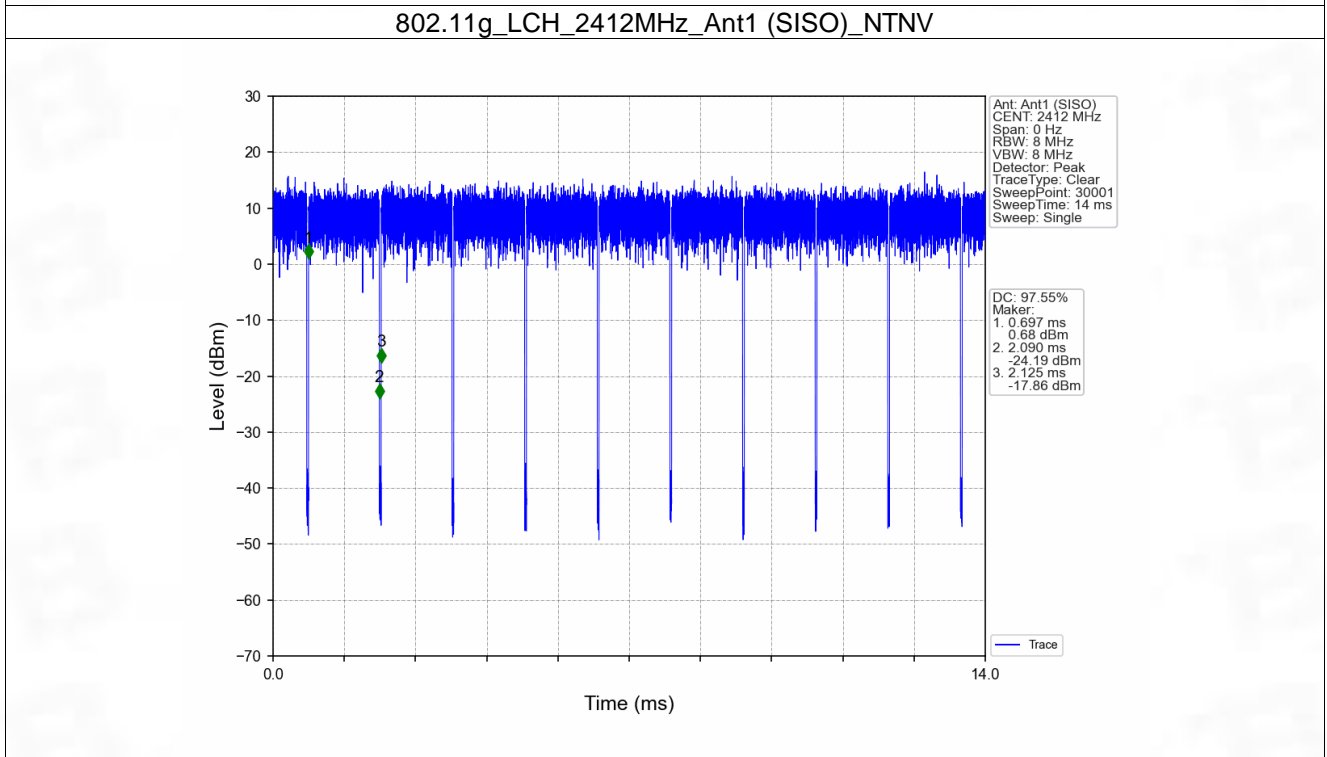
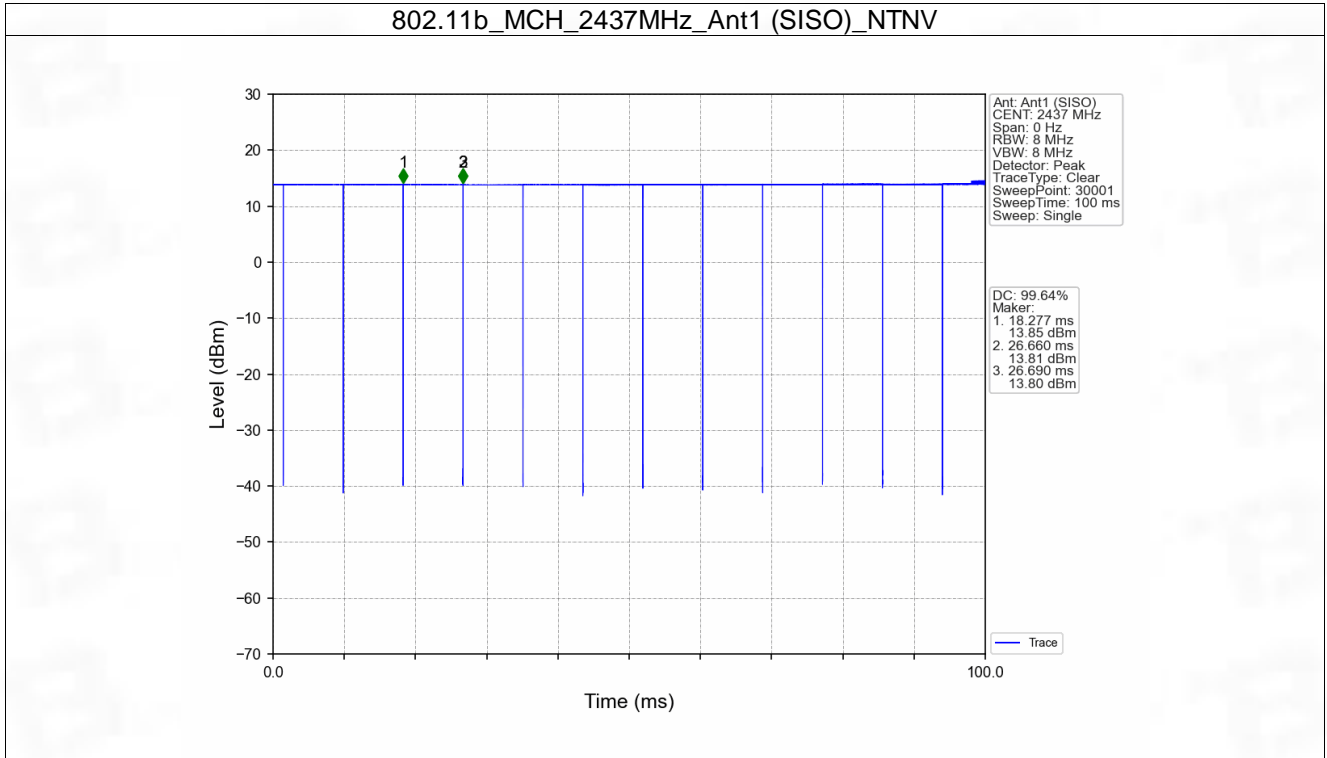
## 1.1 Ant1

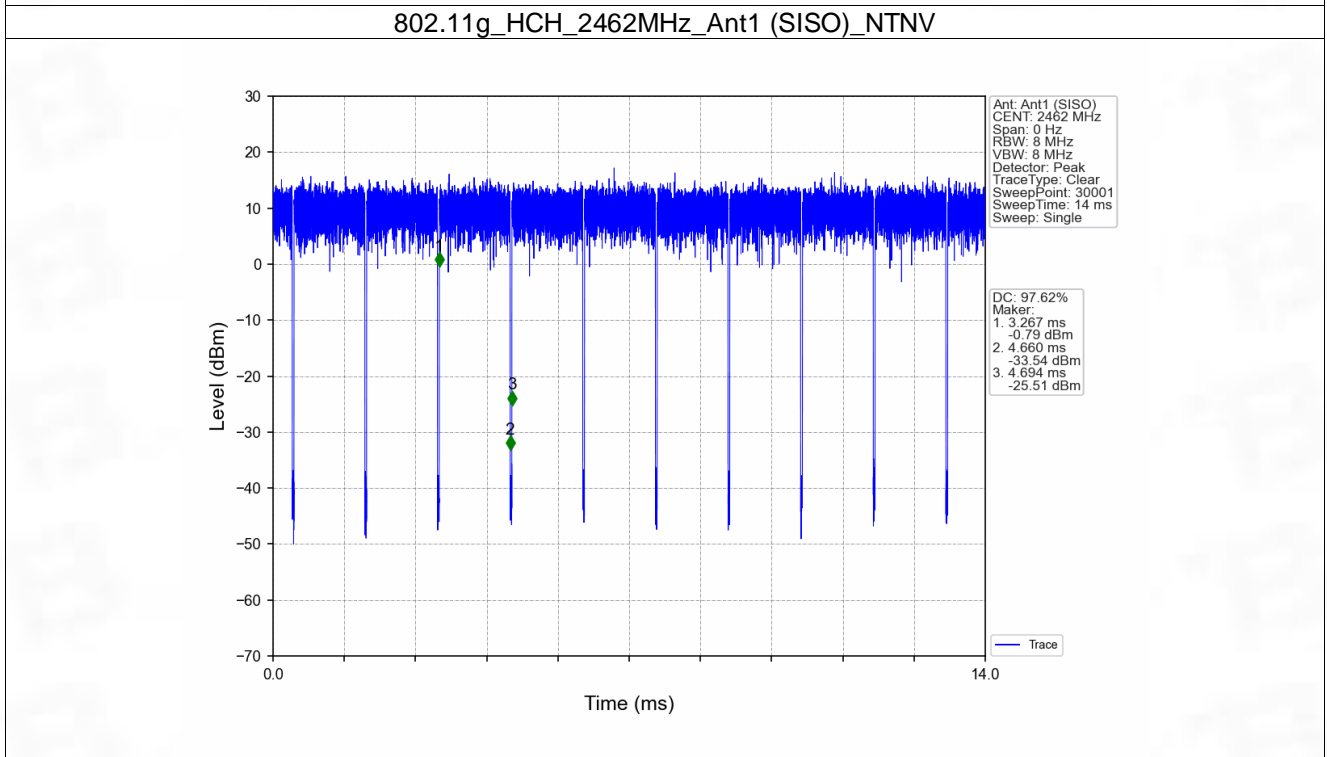
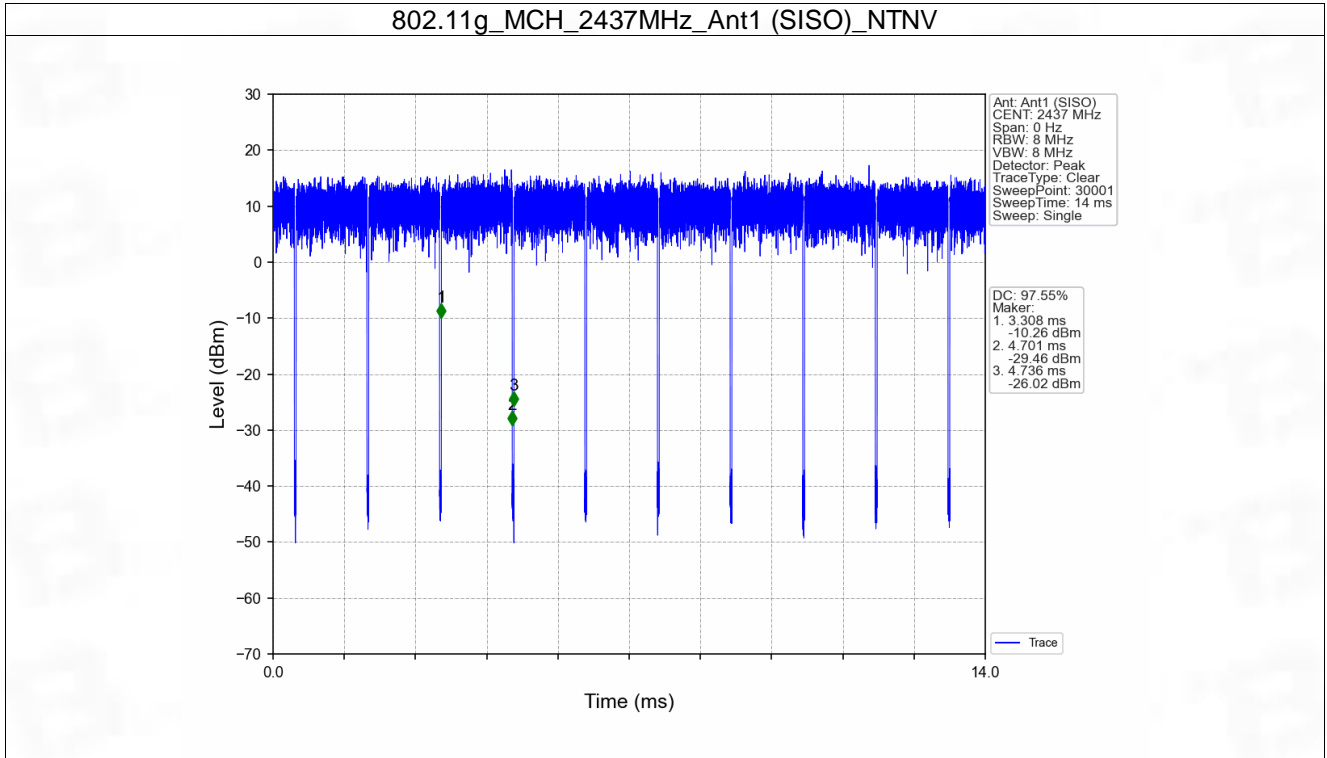
### 1.1.1 Test Result

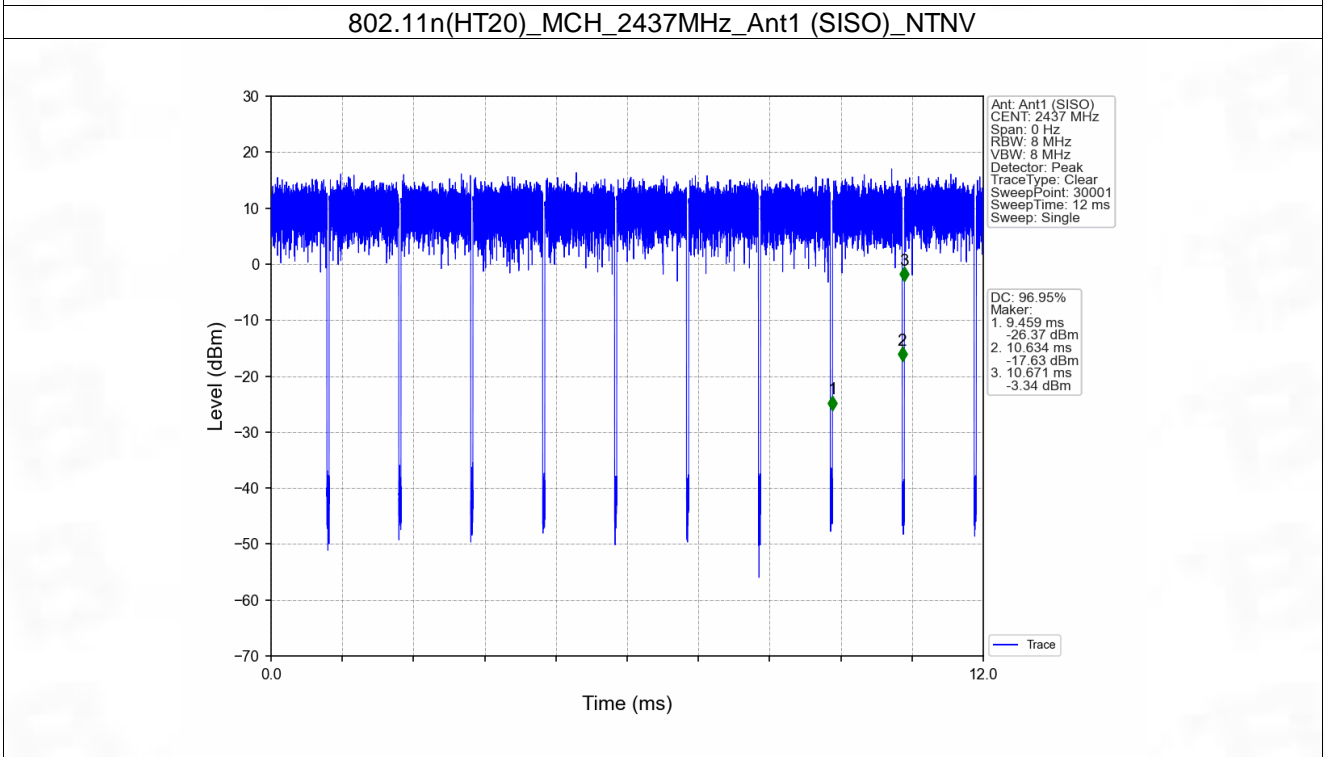
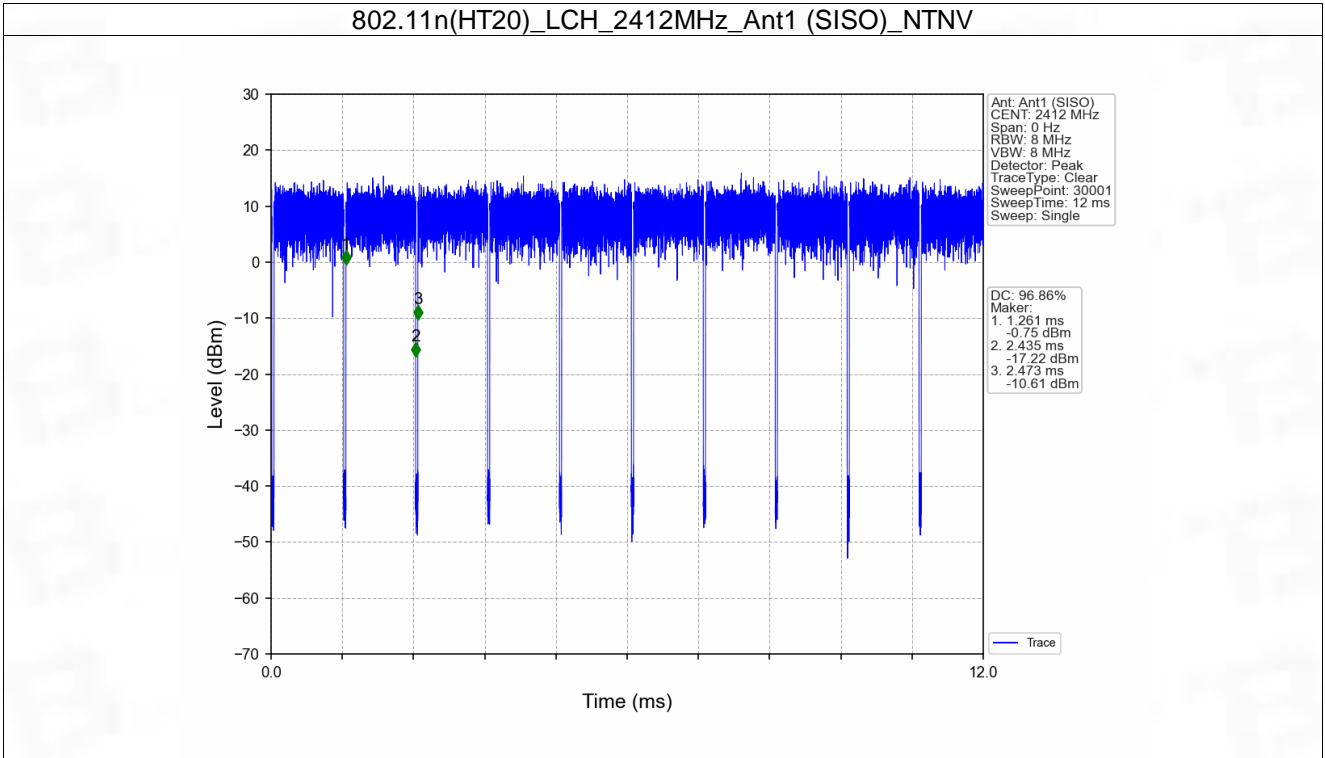
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	8.383	8.413	99.64	0.02	0.00
		2462	8.383	8.413	99.64	0.02	0.00
		2437	8.383	8.413	99.64	0.02	0.04
802.11g	SISO	2412	1.393	1.428	97.55	0.11	0.03
		2437	1.393	1.428	97.55	0.11	0.03
		2462	1.393	1.427	97.62	0.10	0.03
802.11n (HT20)	SISO	2412	1.174	1.212	96.86	0.14	0.07
		2437	1.175	1.212	96.95	0.13	0.10
		2462	1.175	1.212	96.95	0.13	0.00
802.11n (HT40)	SISO	2422	0.587	0.623	94.22	0.26	0.03
		2437	0.587	0.623	94.22	0.26	0.03
		2452	0.588	0.623	94.38	0.25	0.06

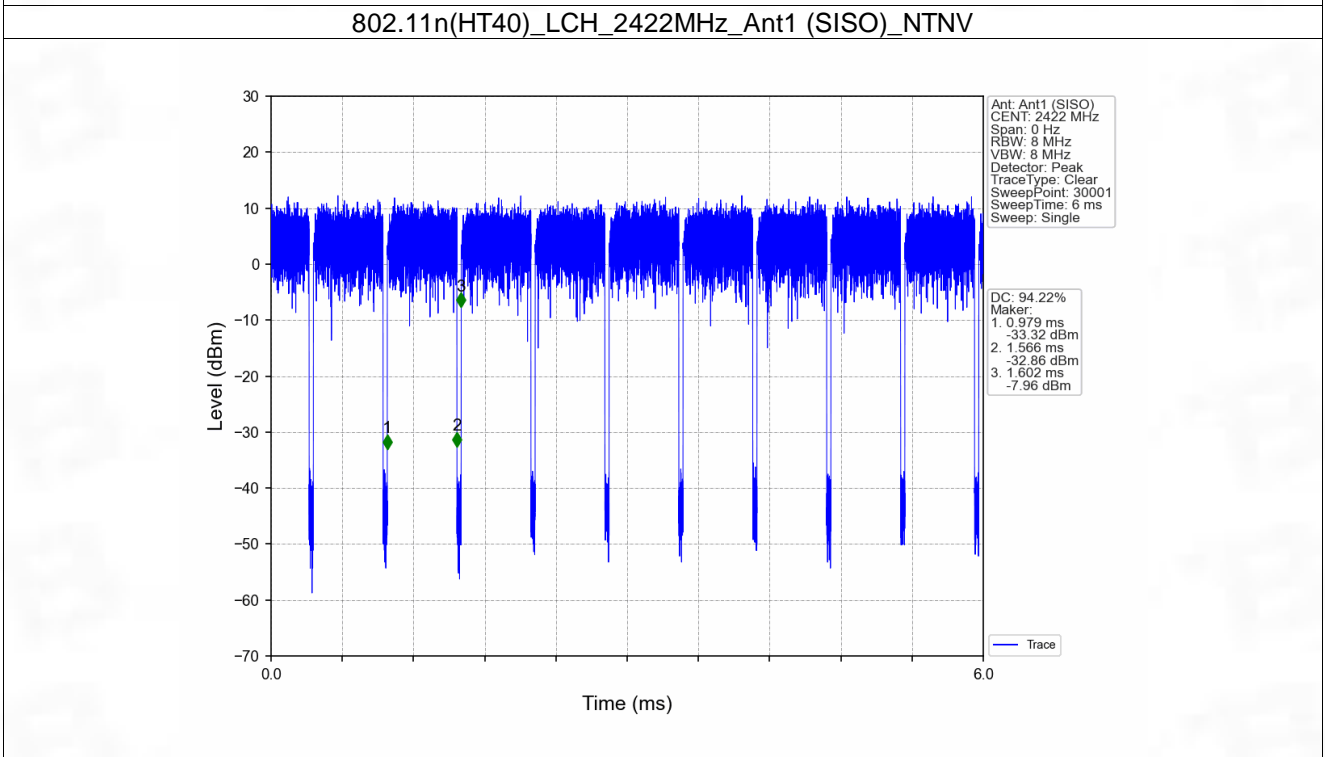
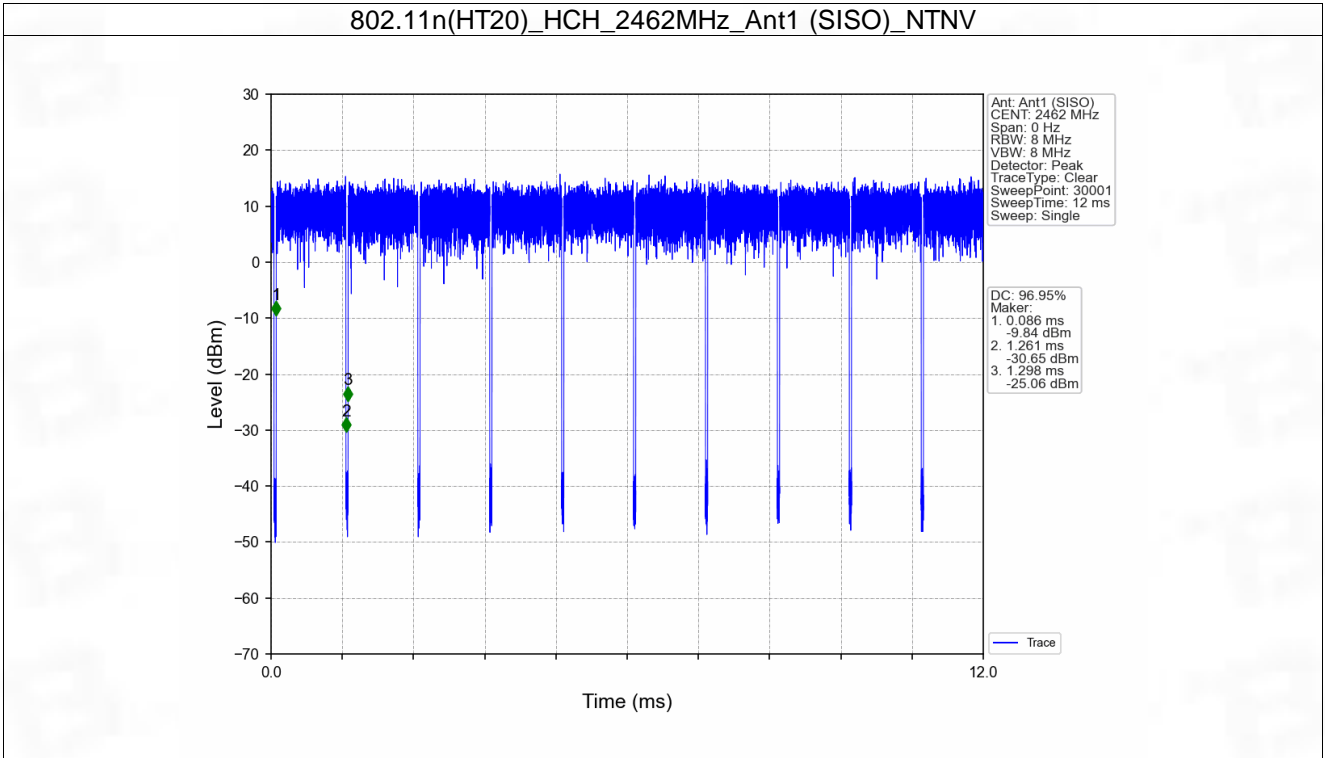
### 1.1.2 Test Graph

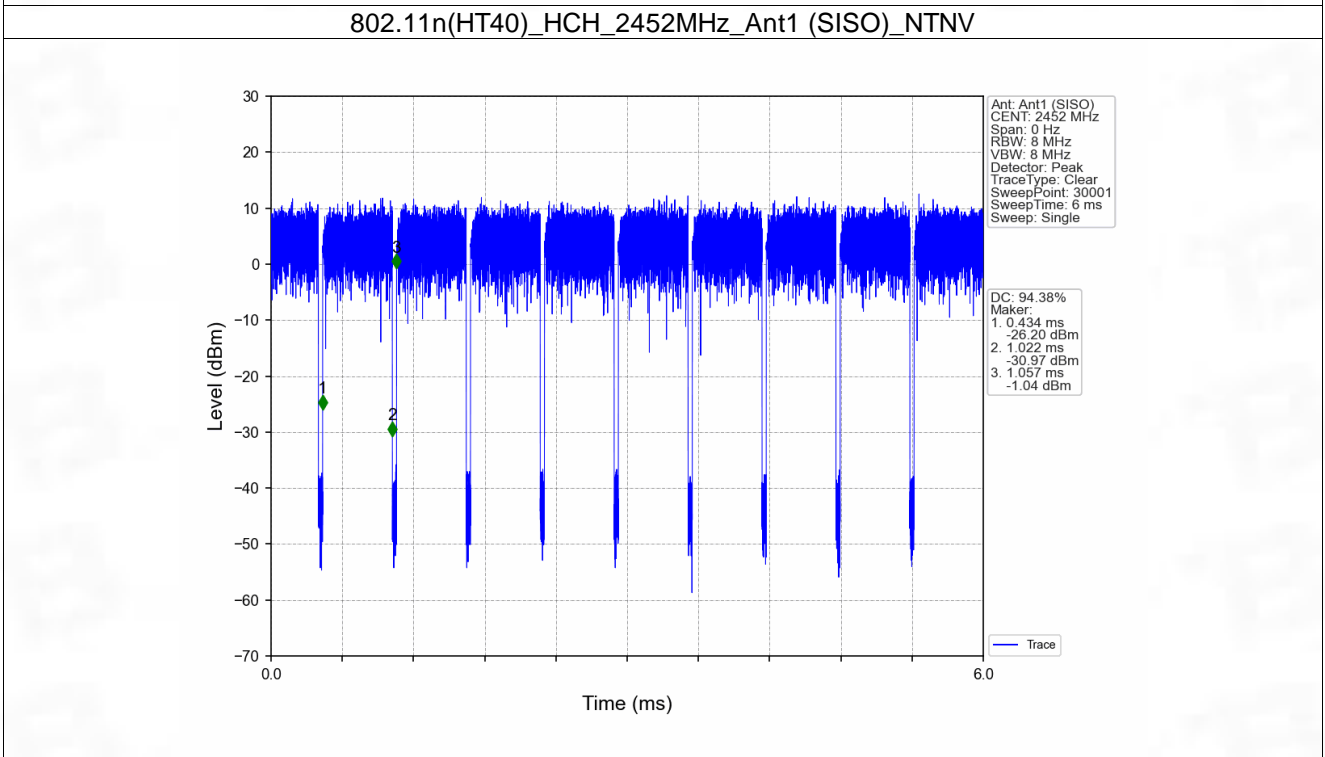
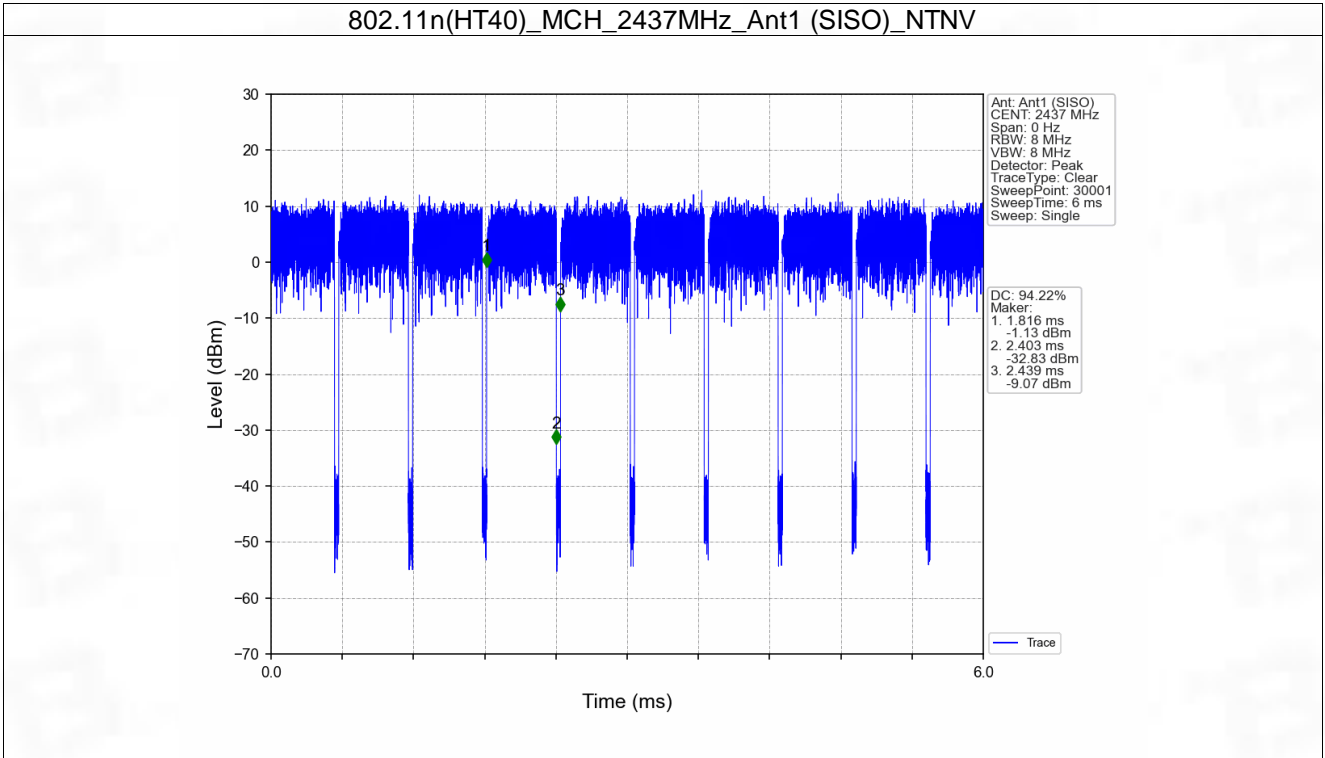














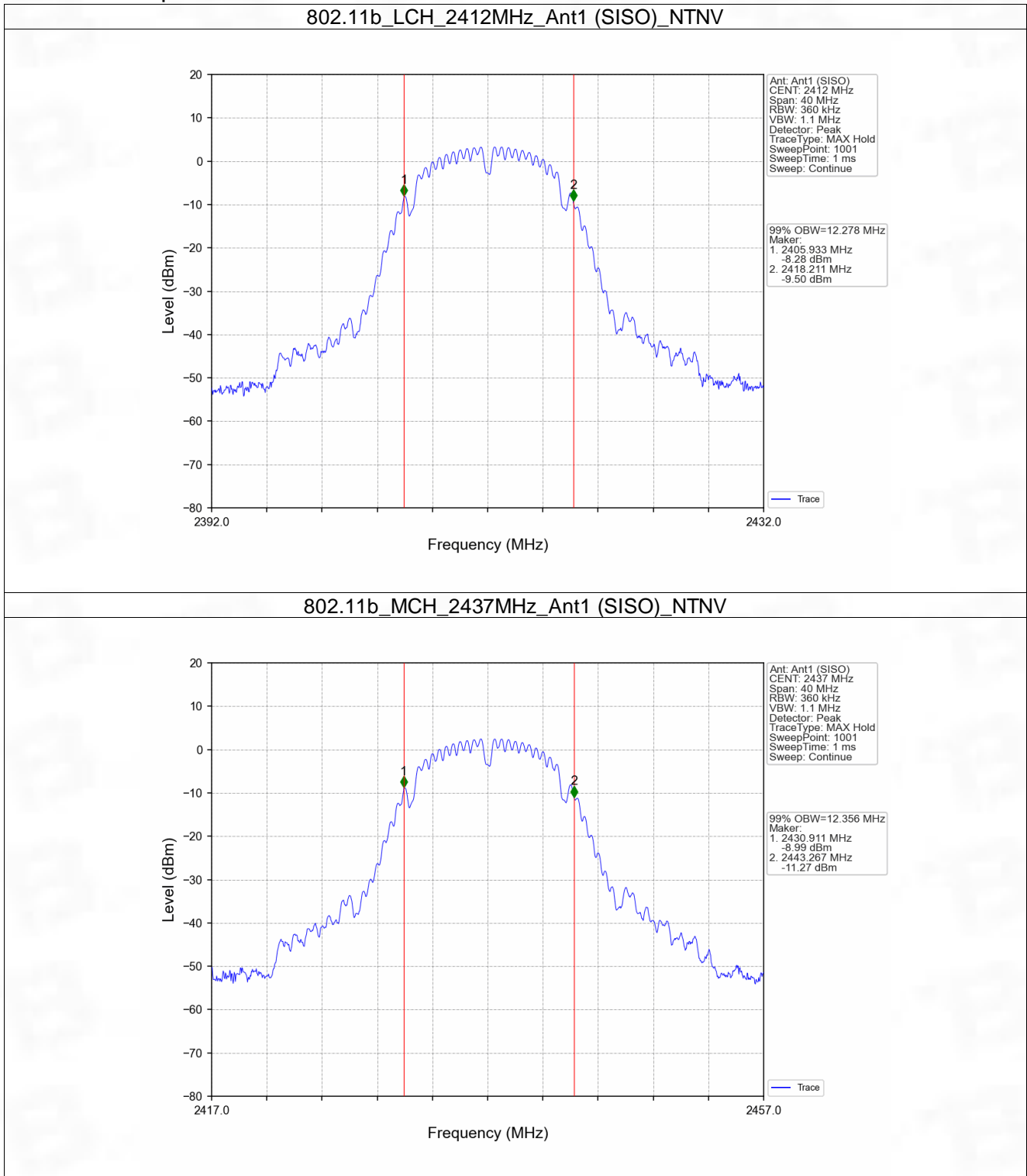
## 2. Bandwidth

### 2.1 OBW

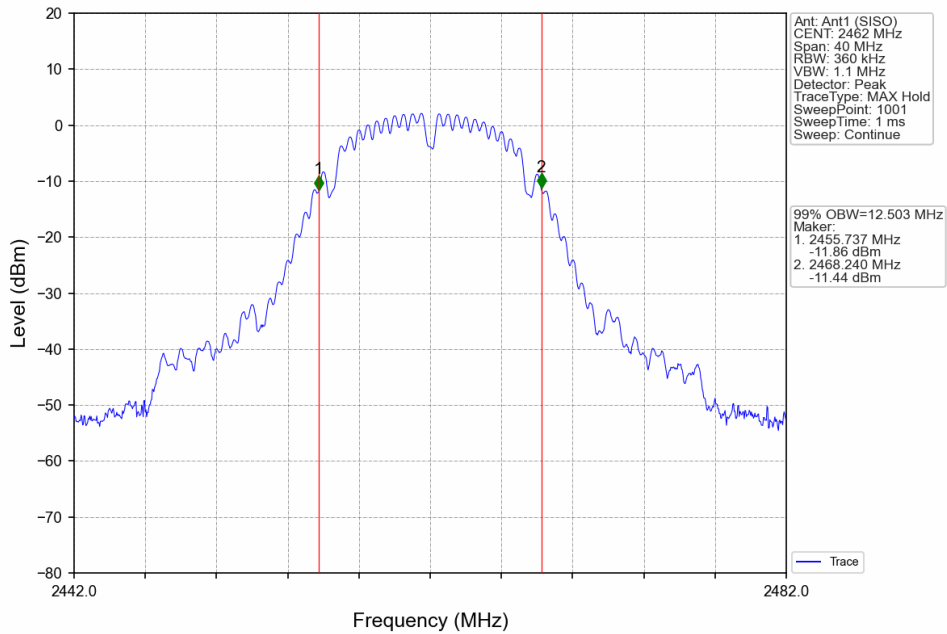
#### 2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)	Verdict
				Result	
802.11b	SISO	2412	1	12.278	Pass
		2437	1	12.356	Pass
		2462	1	12.503	Pass
802.11g	SISO	2412	1	17.749	Pass
		2437	1	17.811	Pass
		2462	1	17.733	Pass
802.11n (HT20)	SISO	2412	1	18.089	Pass
		2437	1	18.187	Pass
		2462	1	18.072	Pass
802.11n (HT40)	SISO	2422	1	36.371	Pass
		2437	1	36.333	Pass
		2452	1	36.409	Pass

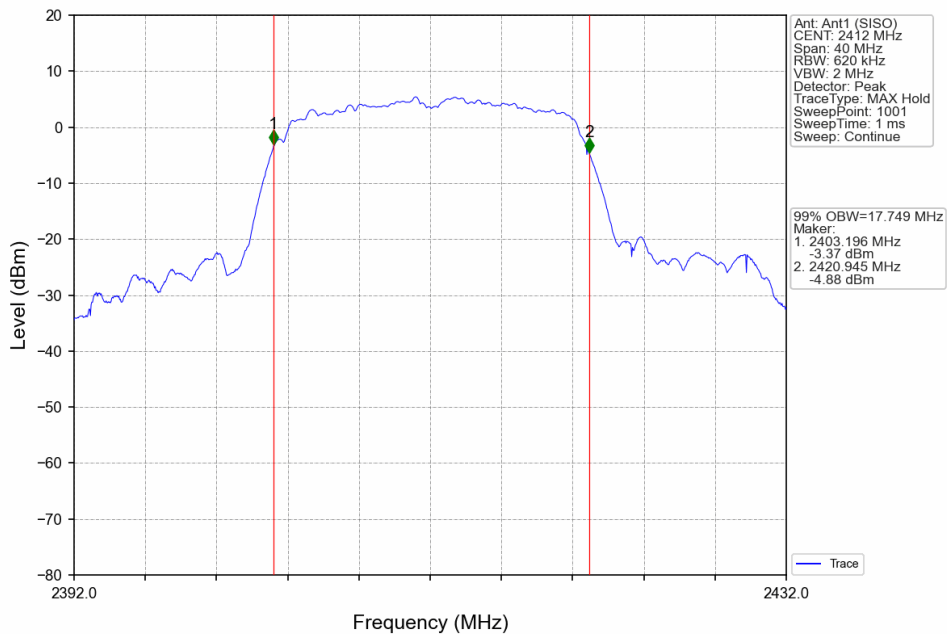
### 2.1.2 Test Graph



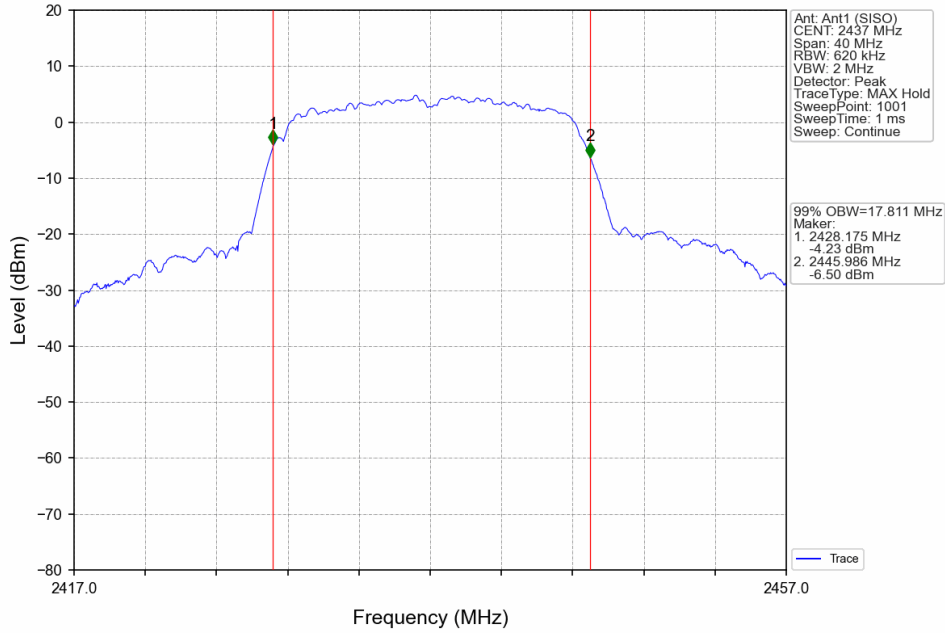
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



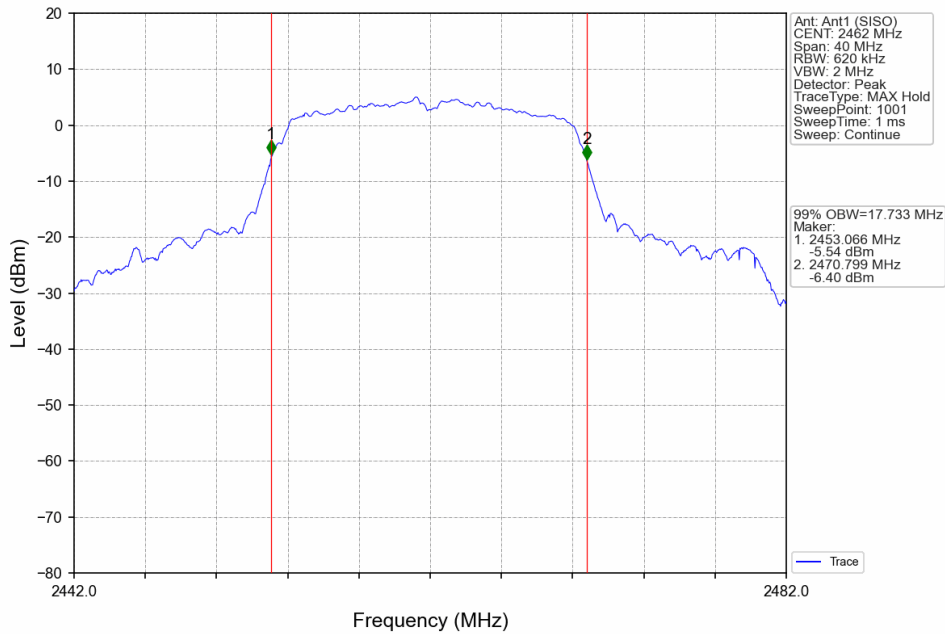
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

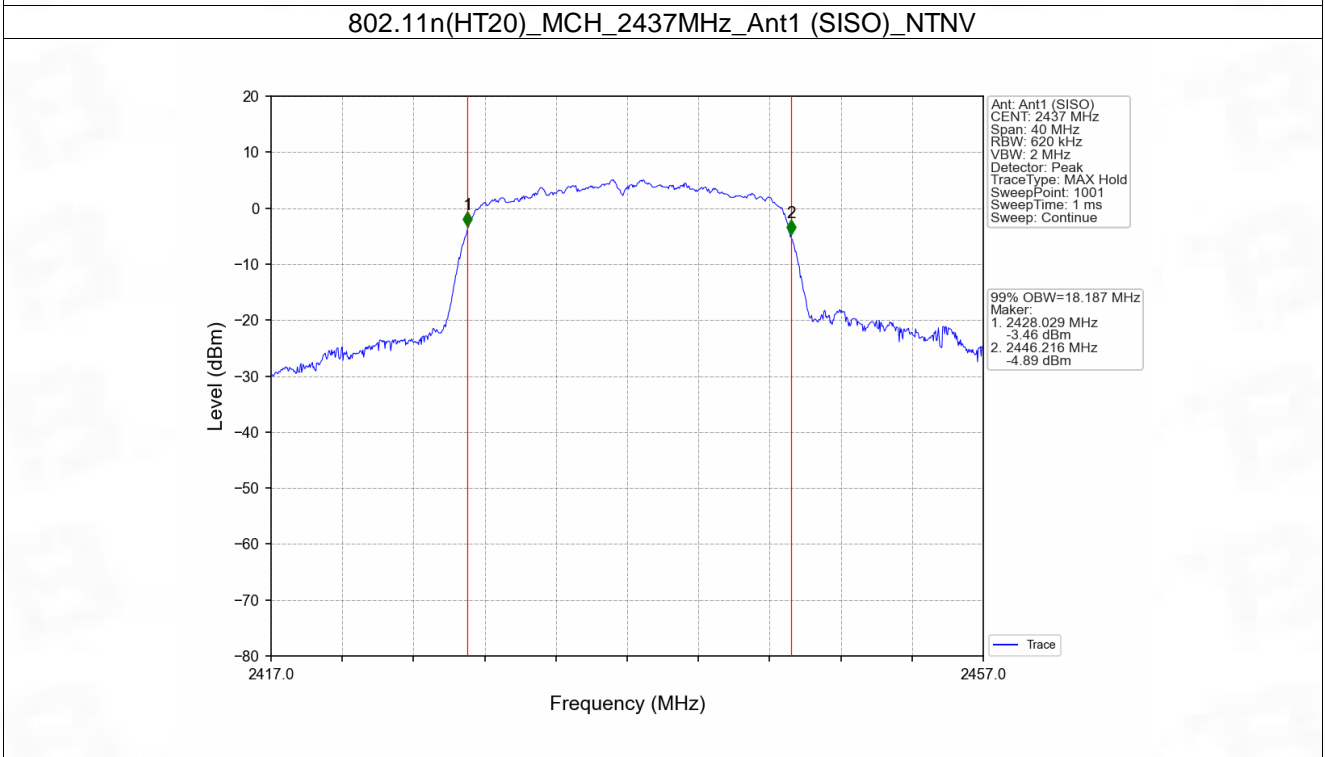
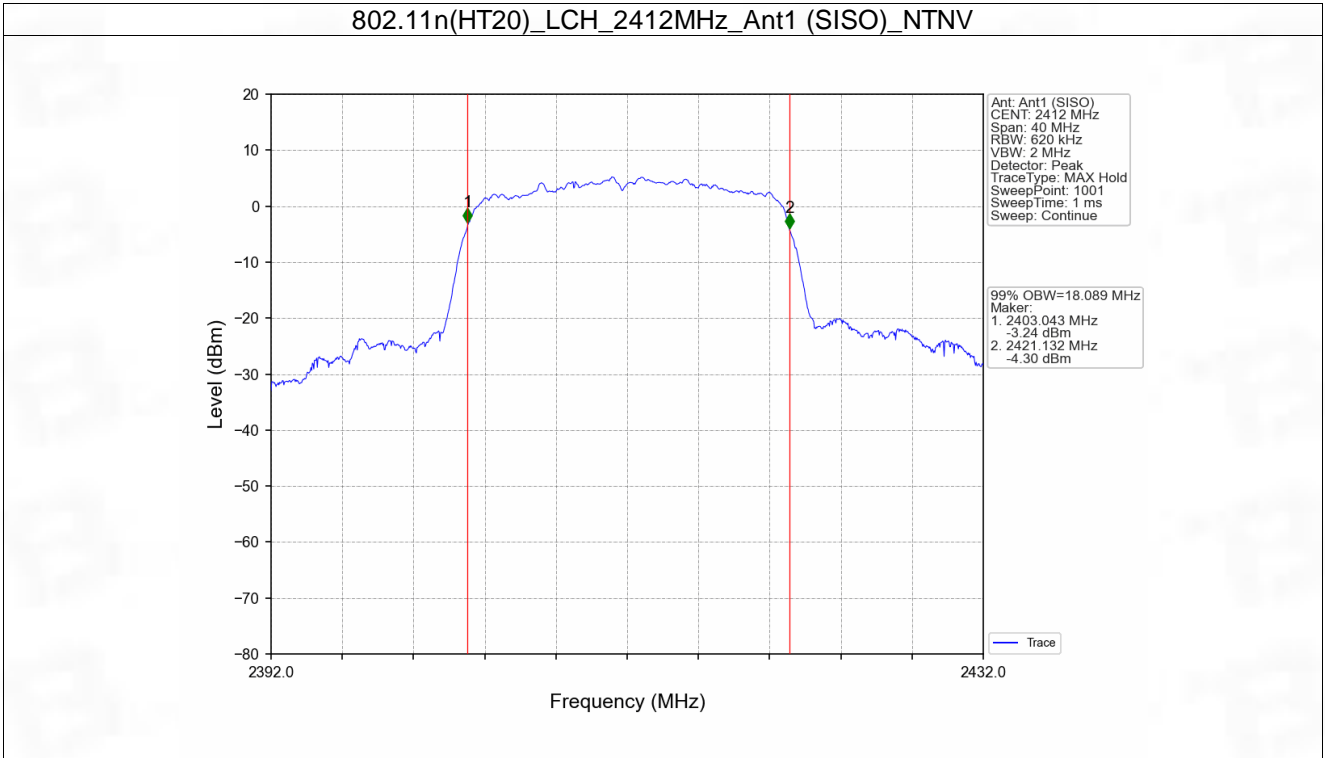


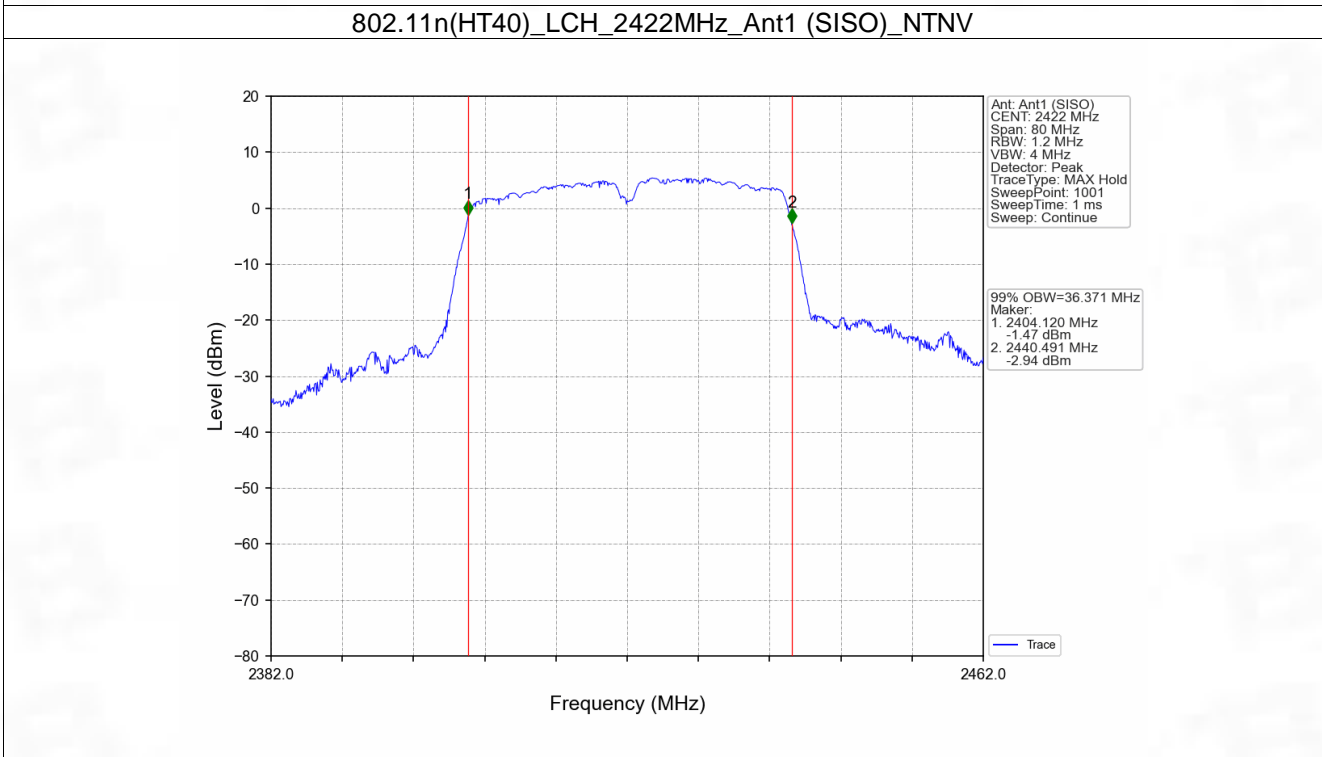
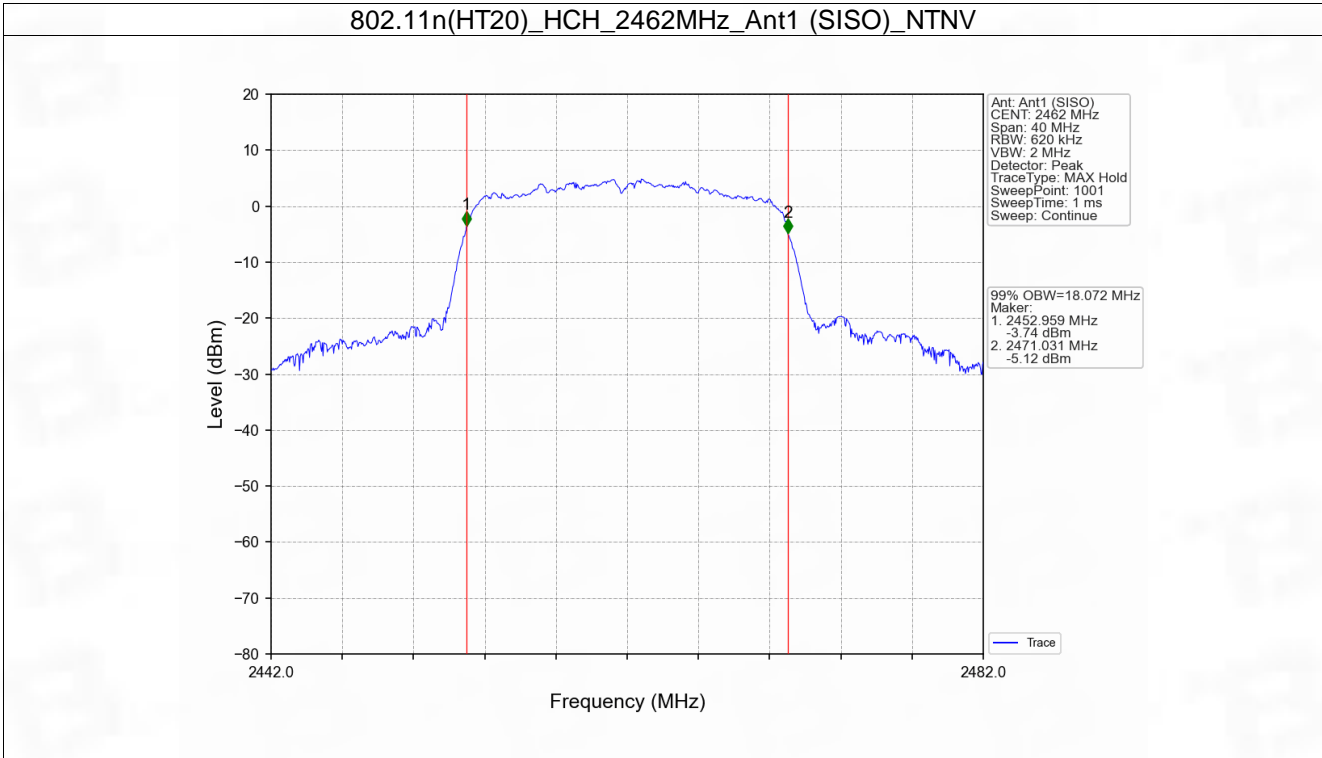
802.11g\_MCH\_2437MHz\_Ant1 (SISO)\_NTNV

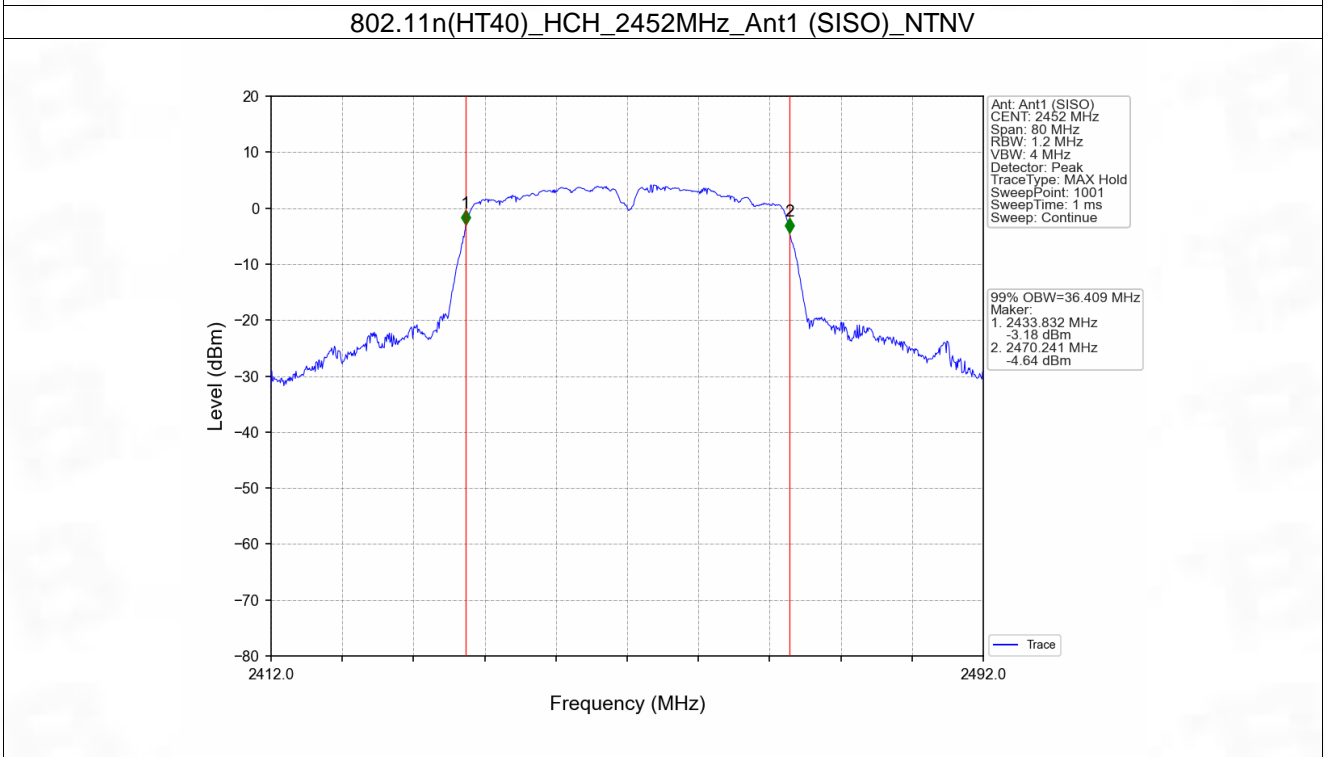
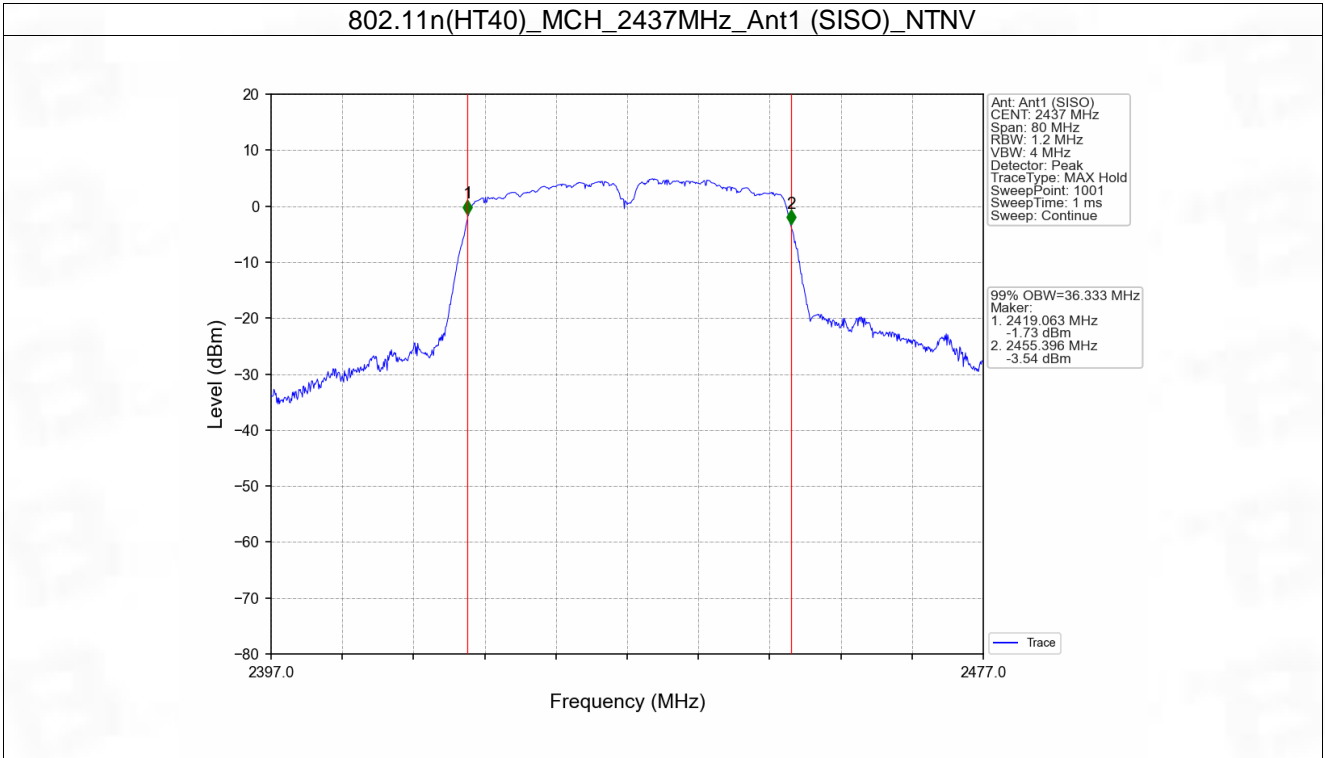


802.11g\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV









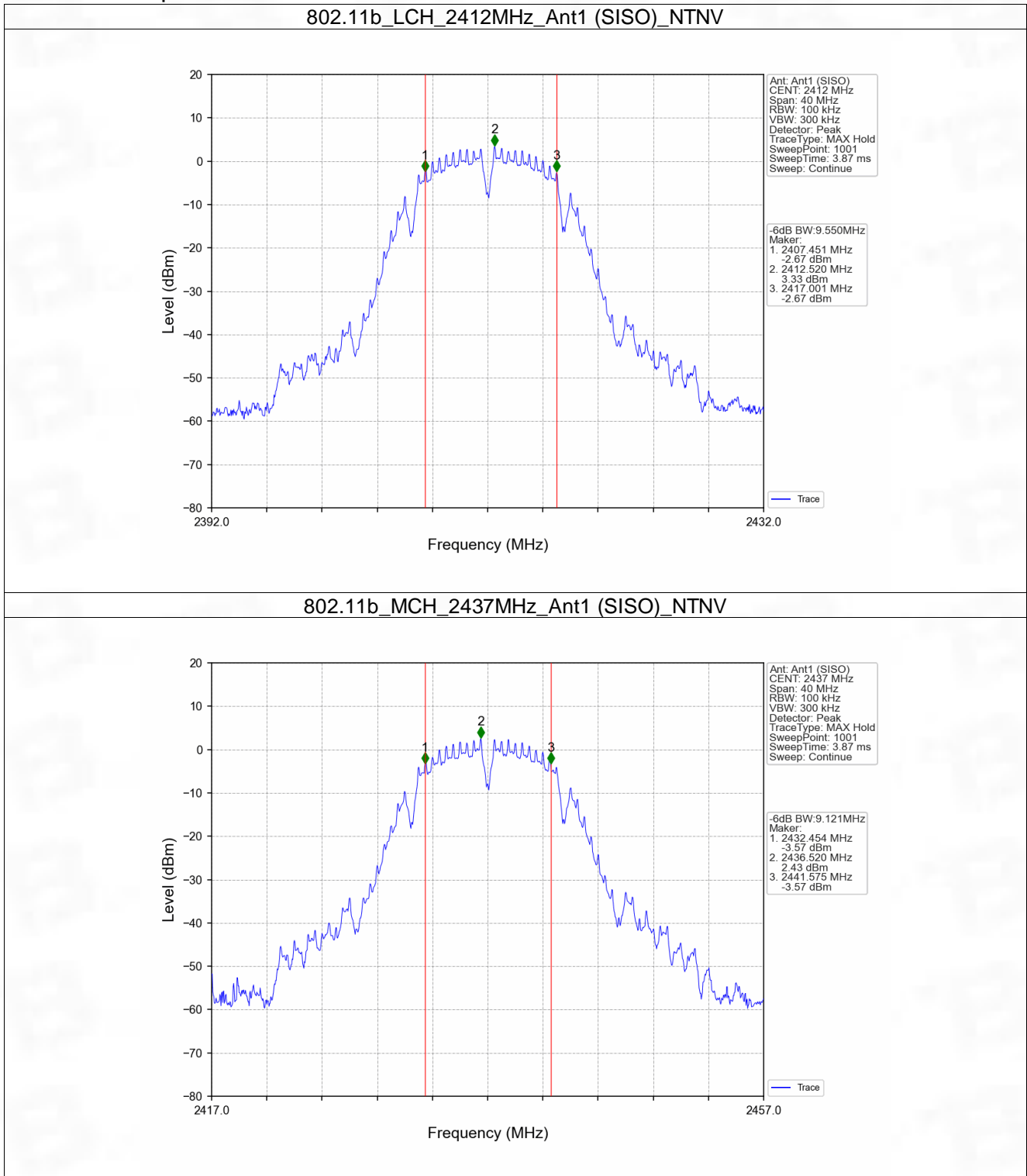
## 2.2 6dB BW

### 2.2.1 Test Result

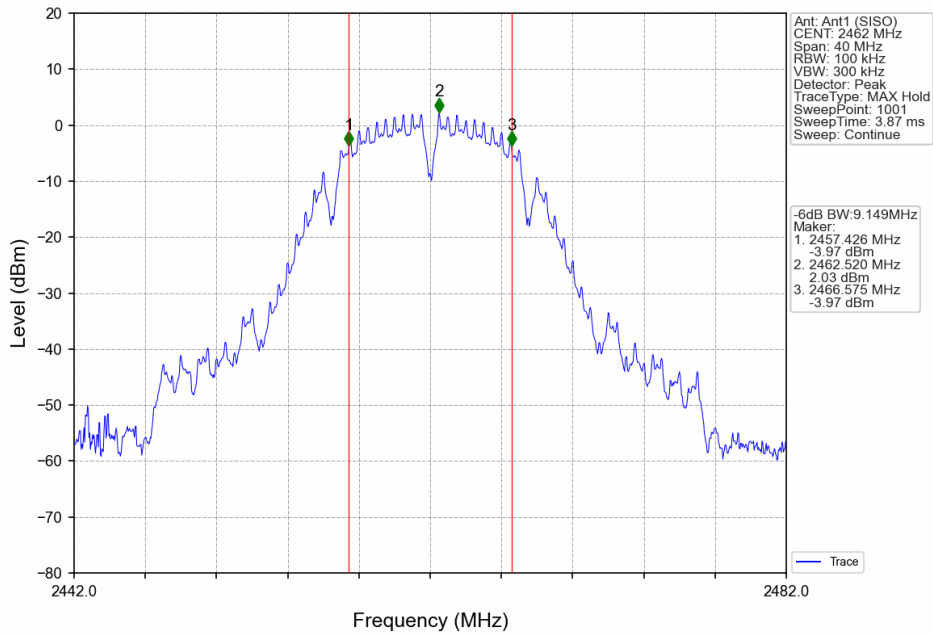
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	9.550	$\geq 0.5$	Pass
		2437	1	9.121	$\geq 0.5$	Pass
		2462	1	9.149	$\geq 0.5$	Pass
802.11g	SISO	2412	1	16.439	$\geq 0.5$	Pass
		2437	1	16.434	$\geq 0.5$	Pass
		2462	1	16.406	$\geq 0.5$	Pass
802.11n (HT20)	SISO	2412	1	17.623	$\geq 0.5$	Pass
		2437	1	17.643	$\geq 0.5$	Pass
		2462	1	17.642	$\geq 0.5$	Pass
802.11n (HT40)	SISO	2422	1	36.122	$\geq 0.5$	Pass
		2437	1	36.107	$\geq 0.5$	Pass
		2452	1	36.335	$\geq 0.5$	Pass



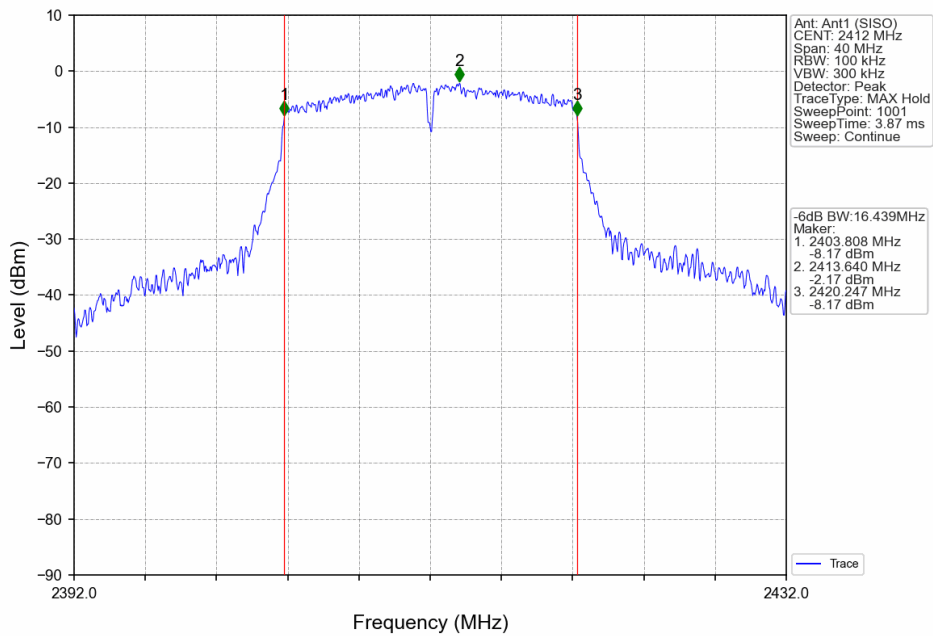
### 2.2.2 Test Graph

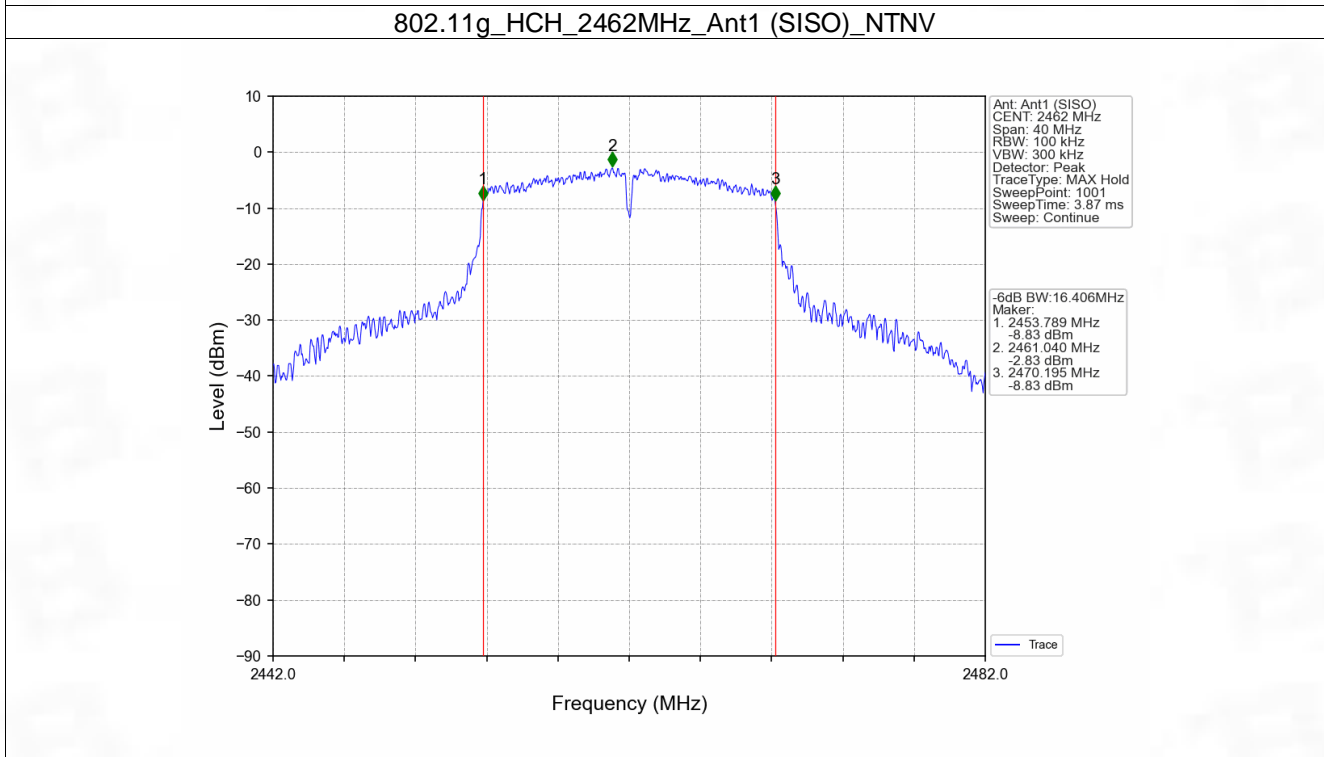
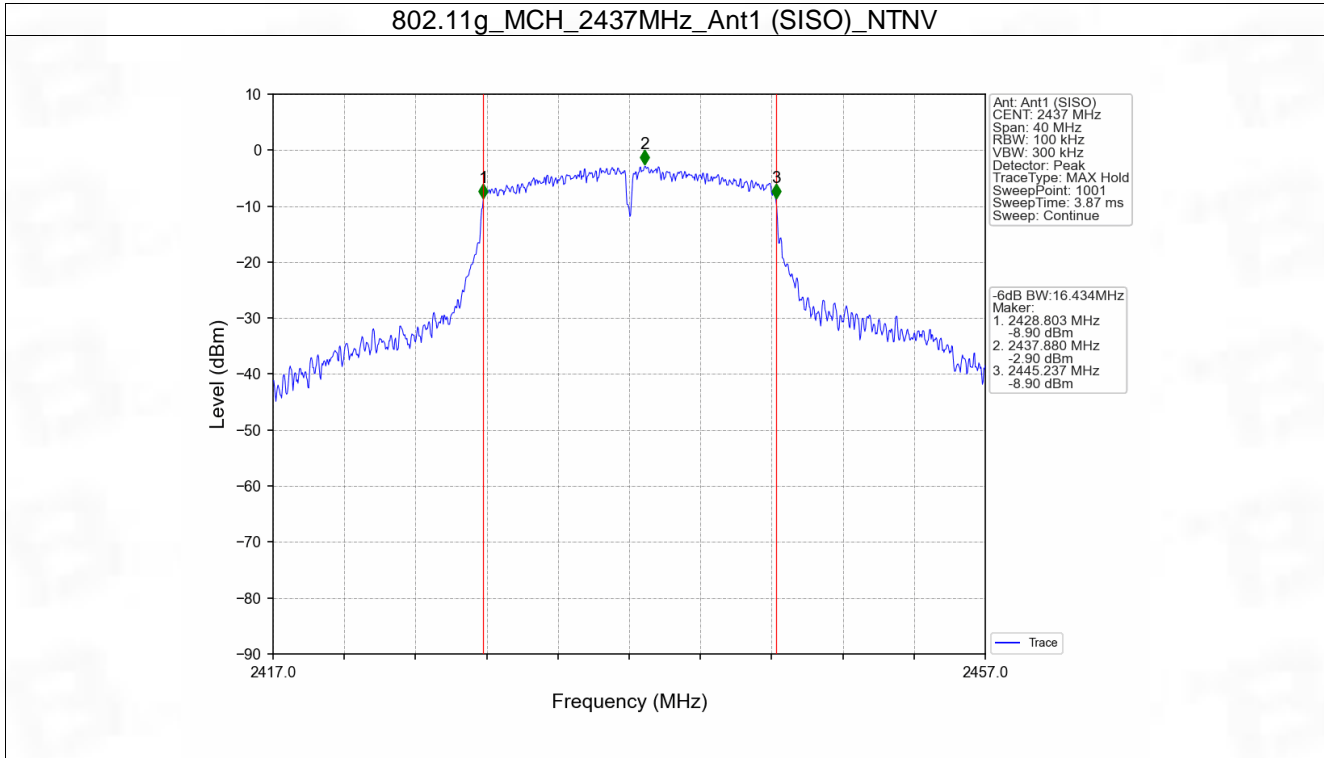


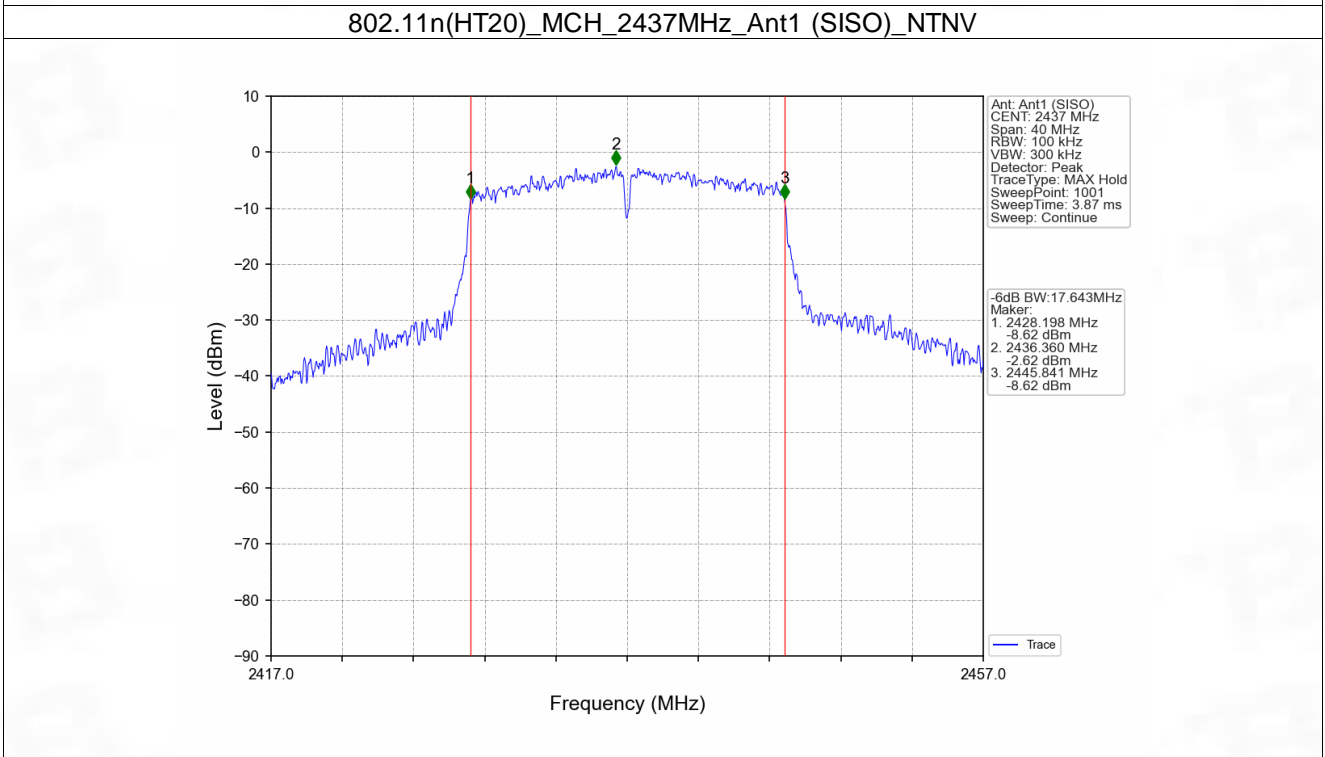
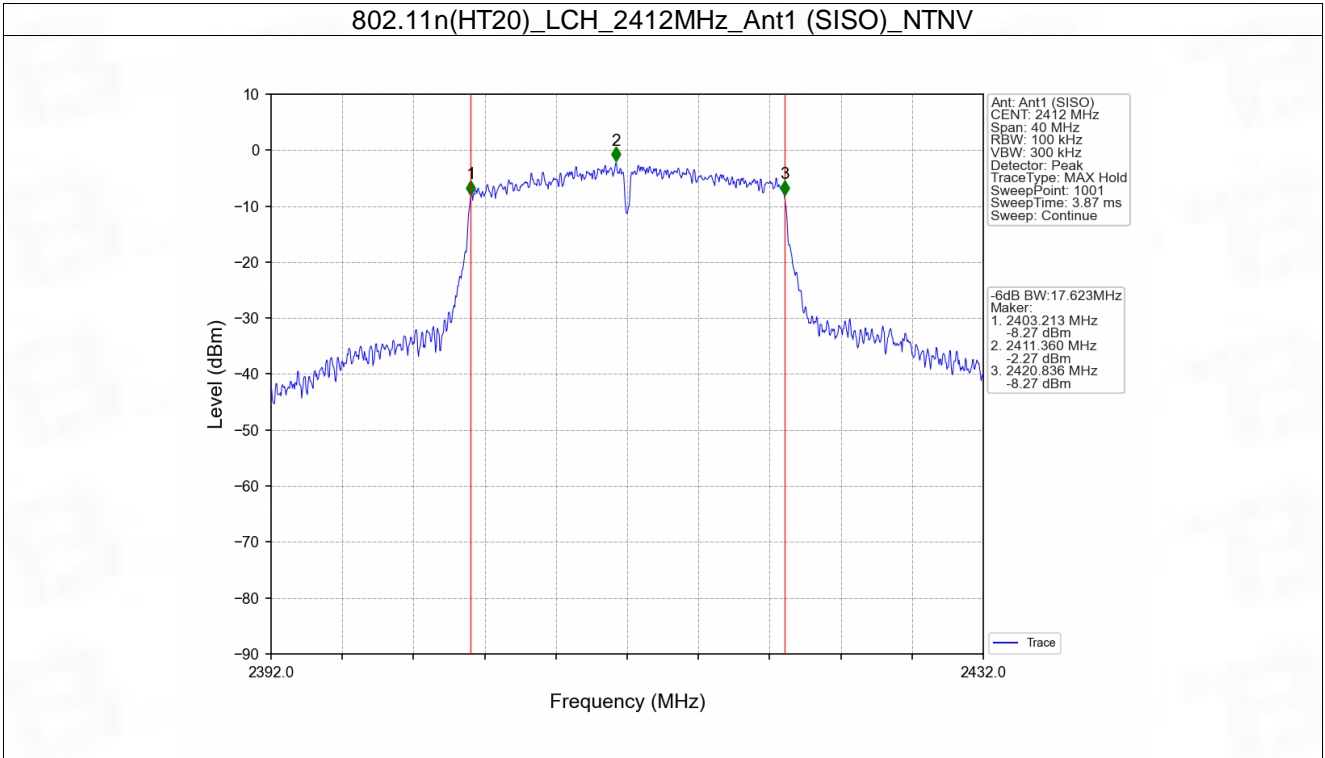
802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV

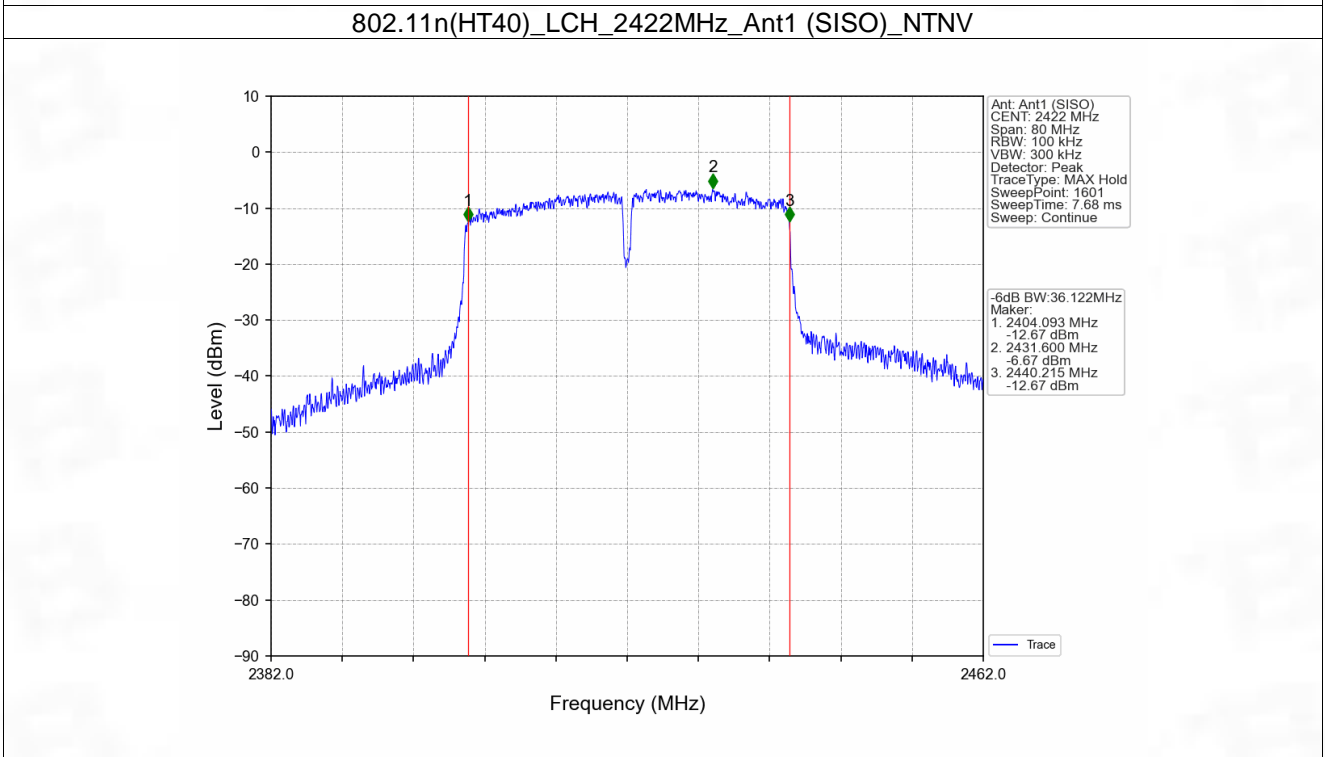
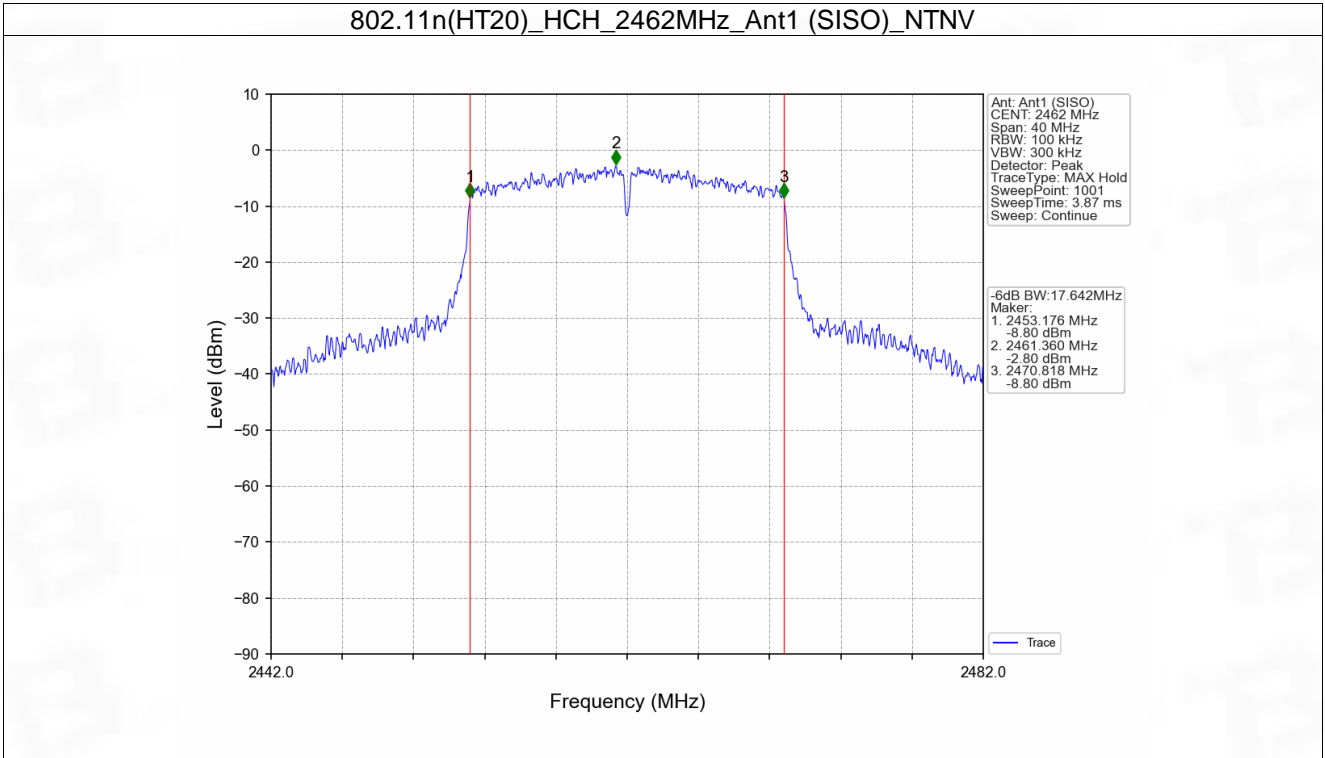


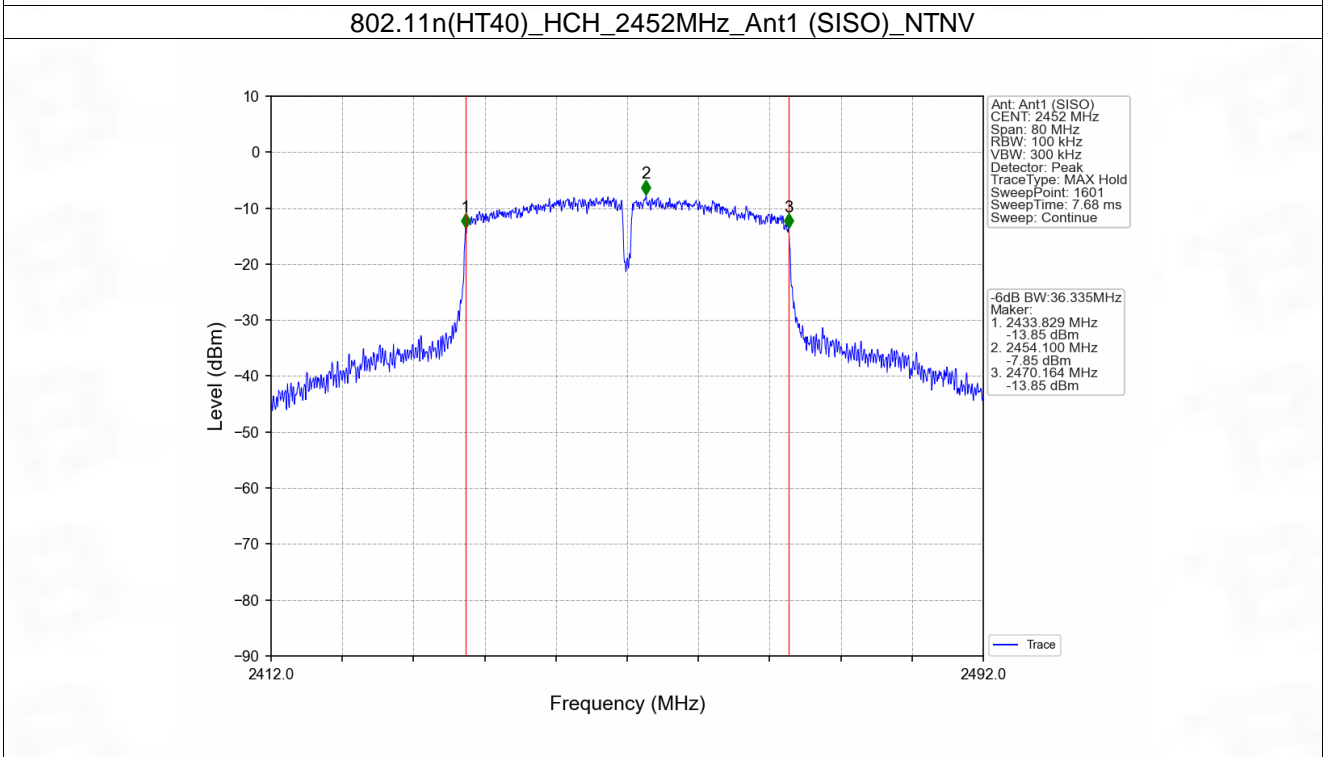
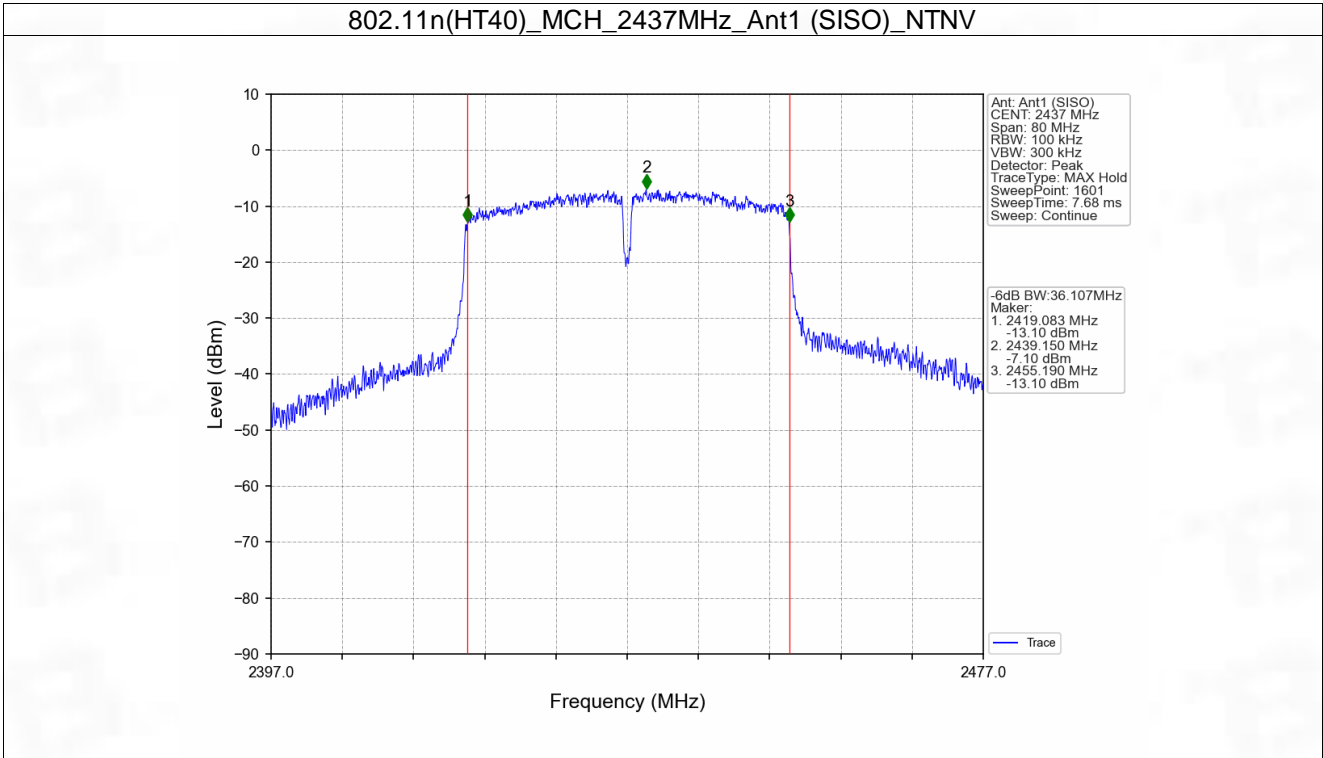
802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV











### 3. Maximum Conducted Output Power

#### 3.1 Power

##### 3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	14.62	<=30	Pass
		2437	13.42	<=30	Pass
		2462	19.50	<=30	Pass
802.11g	SISO	2412	18.51	<=30	Pass
		2437	17.88	<=30	Pass
		2462	17.36	<=30	Pass
802.11n (HT20)	SISO	2412	18.57	<=30	Pass
		2437	17.37	<=30	Pass
		2462	16.81	<=30	Pass
802.11n (HT40)	SISO	2422	18.07	<=30	Pass
		2437	17.09	<=30	Pass
		2452	16.35	<=30	Pass

Note1: Antenna Gain: Ant1: 2.39dBi;

### 4. Maximum Power Spectral Density

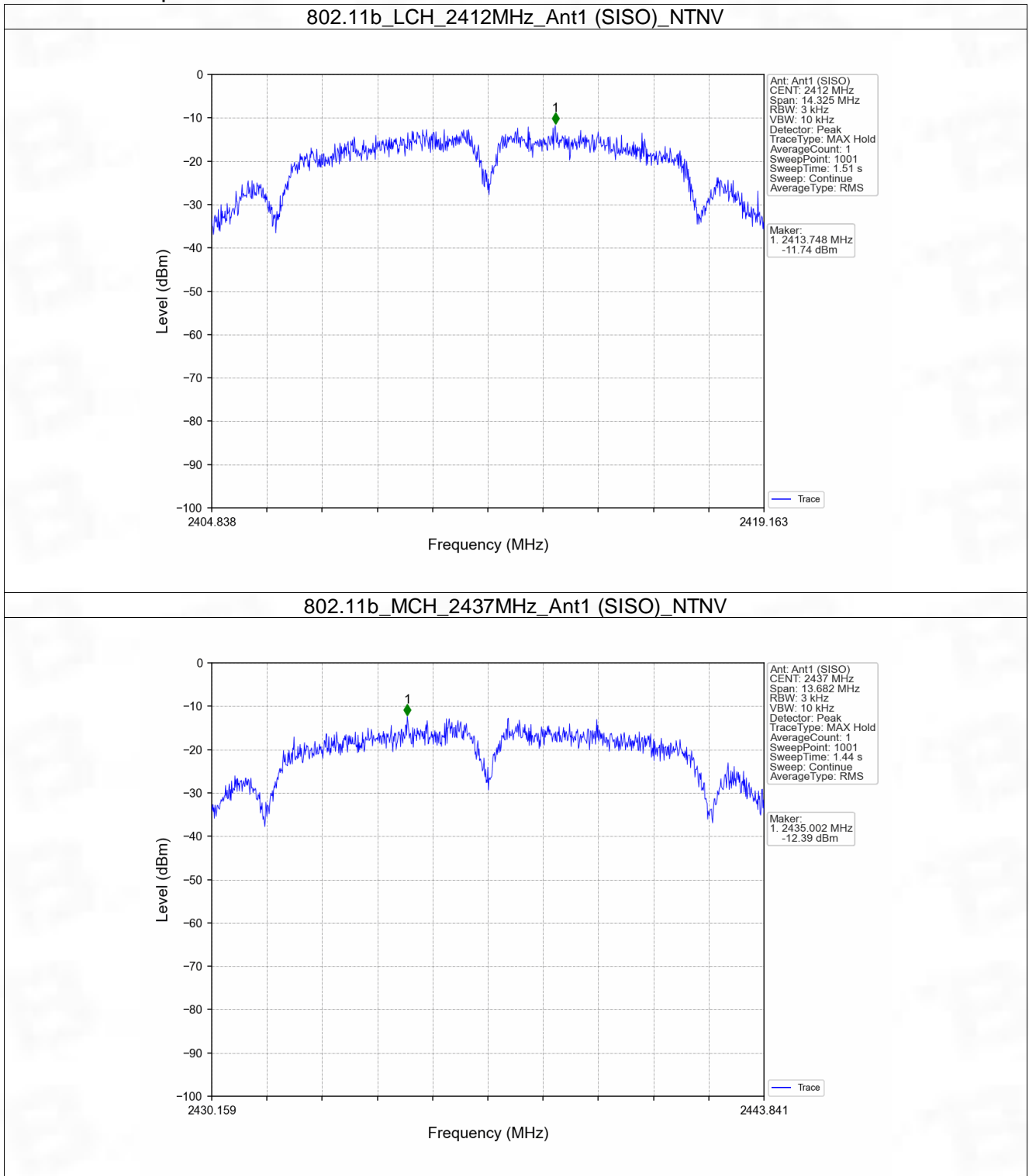
#### 4.1 PSD

##### 4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-11.74	<=8	Pass
		2437	-12.39	<=8	Pass
		2462	-12.38	<=8	Pass
802.11g	SISO	2412	-16.24	<=8	Pass
		2437	-16.94	<=8	Pass
		2462	-17.52	<=8	Pass
802.11n (HT20)	SISO	2412	-16.65	<=8	Pass
		2437	-17.62	<=8	Pass
		2462	-18.17	<=8	Pass
802.11n (HT40)	SISO	2422	-19.38	<=8	Pass
		2437	-20.27	<=8	Pass
		2452	-20.61	<=8	Pass

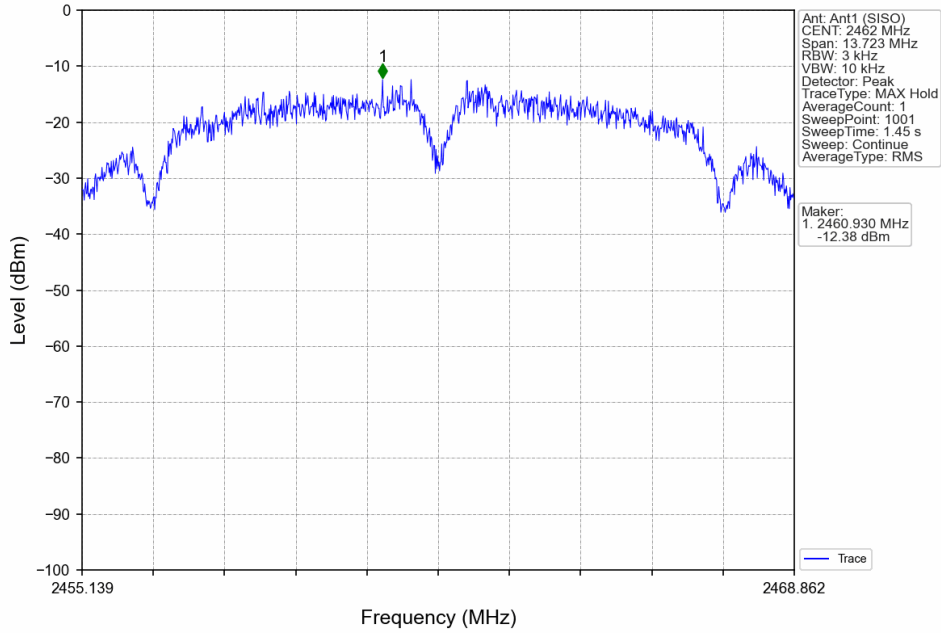
Note1: Antenna Gain: Ant1: 2.39dBi;

### 4.1.2 Test Graph





802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV

