



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: HD60

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: BTF230512R00203
Test Standards: 47 CFR Part 15.247
Test Conclusion: Pass
FCC ID: 2ADLJ-HD60
Test Date: 2023-05-12 to 2023-05-25
Date of Issue: 2023-05-26

Prepared By:

Elma.yang

Date:

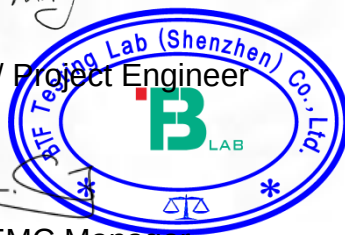
Elma.yang / Project Engineer
2023-05-26

Approved By:

Ryan.CJ

Date:

Ryan.CJ / EMC Manager
2023-05-26



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	2023-05-26	Original
<i>Note: Once the revision has been made, then previous versions reports are invalid.</i>		

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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:	HD60

2.5 Technical Information

Power Supply:	DC 3.8V from Battery
Power Adaptor:	Input:100-240V,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 [#] :	2.41 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-SMAM-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-SMAM-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 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
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2021-11-28	2023-11-27
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2022-11-24	2023-11-23
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2022-11-24	2023-11-23
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplifier	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
Preamplifier	SCHWARZBECK	BBV9744	00246	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022-11-24	2023-11-23
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022-11-24	2023-11-23

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

4.2 Test Auxiliary Equipment

The EUT was tested as an independent device.

4.3 Test Modes

No.	Test Modes	Description
TM1	802.11b mode	Keep the EUT in continuously transmitting mode with 802.11b modulation.
TM2	802.11g mode	Keep the EUT in continuously transmitting mode with 802.11g modulation.
TM3	802.11n(HT20) mode	Keep the EUT in continuously transmitting mode with 802.11n(HT20)modulation.
TM4	802.11n(HT40) mode	Keep the EUT in continuously transmitting mode with 802.11n(HT40)modulation

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)

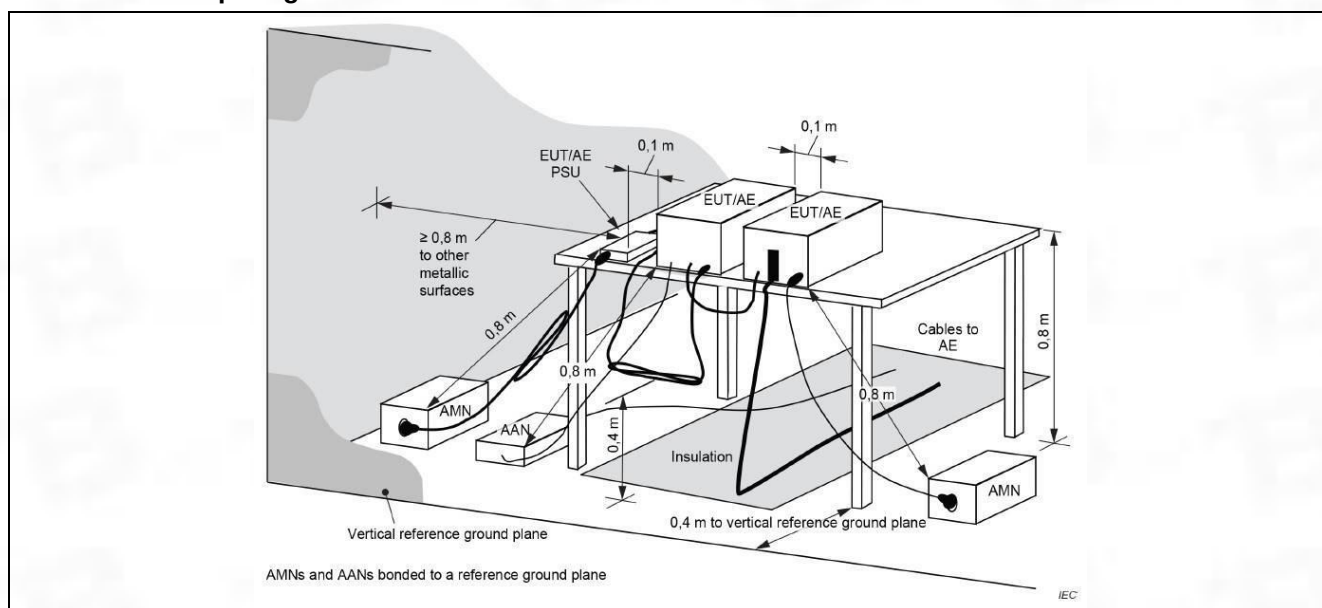
6.1 Conducted Emission at AC power line

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:

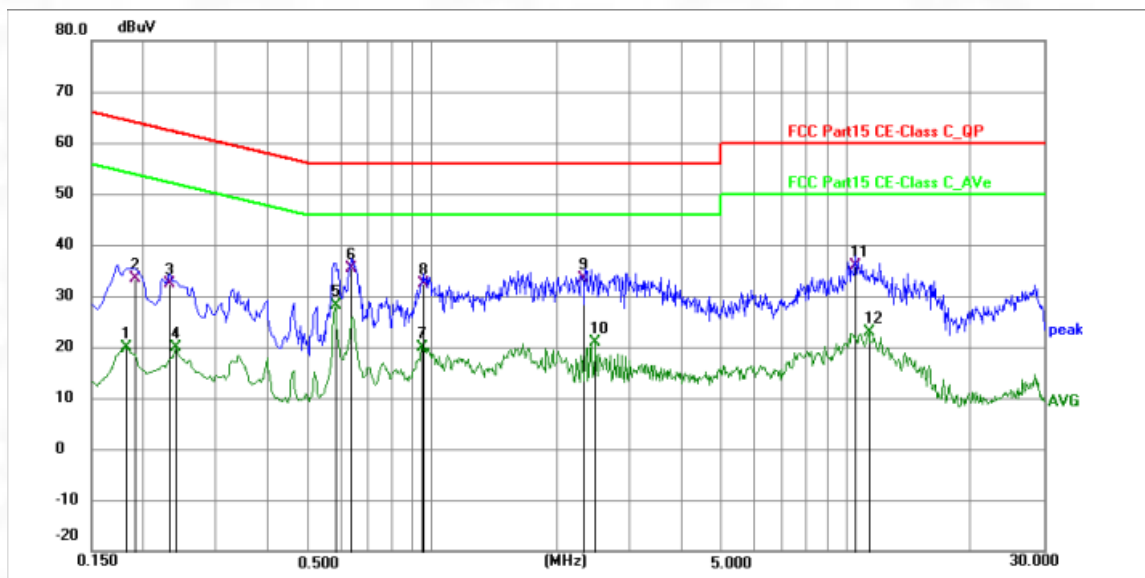
Operating Environment:	
Temperature:	22 °C
Humidity:	53.4 %
Atmospheric Pressure:	1010 mbar

6.1.2 Test Setup Diagram:



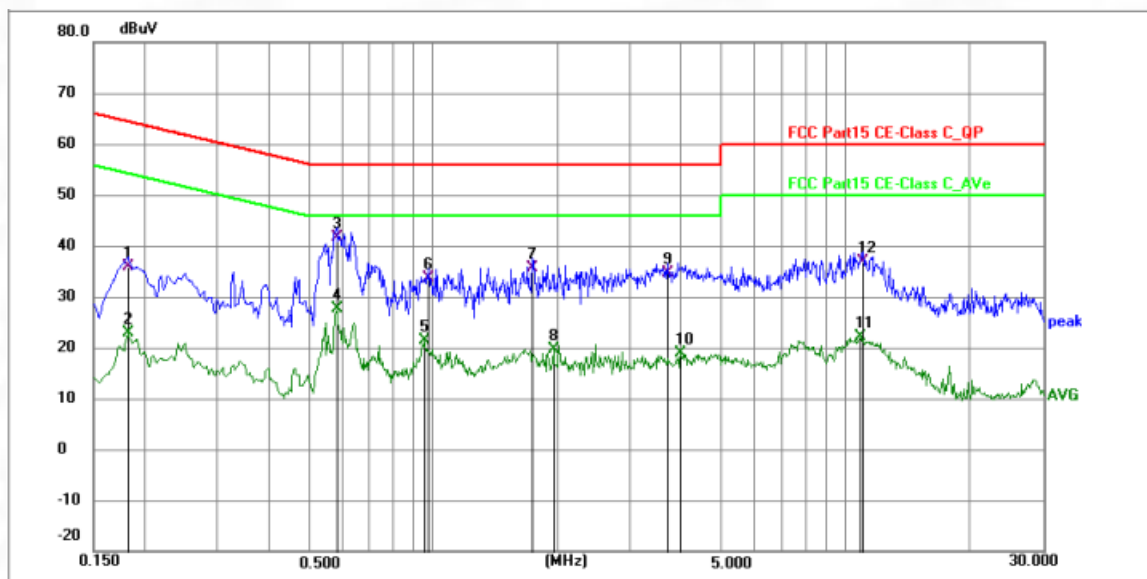
6.1.3 Test Data:

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	0.1814	9.39	10.57	19.96	54.42	-34.46	AVG	P	
2	0.1905	22.87	10.58	33.45	64.01	-30.56	QP	P	
3	0.2310	21.80	10.59	32.39	62.41	-30.02	QP	P	
4	0.2400	9.35	10.59	19.94	52.10	-32.16	AVG	P	
5 *	0.5820	17.38	10.66	28.04	46.00	-17.96	AVG	P	
6	0.6360	24.80	10.69	35.49	56.00	-20.51	QP	P	
7	0.9465	9.16	10.77	19.93	46.00	-26.07	AVG	P	
8	0.9510	21.68	10.77	32.45	56.00	-23.55	QP	P	
9	2.3413	22.68	10.70	33.38	56.00	-22.62	QP	P	
10	2.4765	10.27	10.70	20.97	46.00	-25.03	AVG	P	
11	10.5135	24.87	10.95	35.82	60.00	-24.18	QP	P	
12	11.3280	11.82	10.95	22.77	50.00	-27.23	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	0.1814	25.34	10.57	35.91	64.42	-28.51	QP	P	
2	0.1814	12.24	10.57	22.81	54.42	-31.61	AVG	P	
3 *	0.5820	30.96	10.66	41.62	56.00	-14.38	QP	P	
4	0.5820	16.92	10.66	27.58	46.00	-18.42	AVG	P	
5	0.9510	10.55	10.77	21.32	46.00	-24.68	AVG	P	
6	0.9780	22.83	10.78	33.61	56.00	-22.39	QP	P	
7	1.7384	24.84	10.71	35.55	56.00	-20.45	QP	P	
8	1.9544	8.97	10.69	19.66	46.00	-26.34	AVG	P	
9	3.6825	24.02	10.72	34.74	56.00	-21.26	QP	P	
10	3.9660	8.15	10.73	18.88	46.00	-27.12	AVG	P	
11	10.8959	11.08	10.93	22.01	50.00	-27.99	AVG	P	
12	11.0084	25.88	10.92	36.80	60.00	-23.20	QP	P	

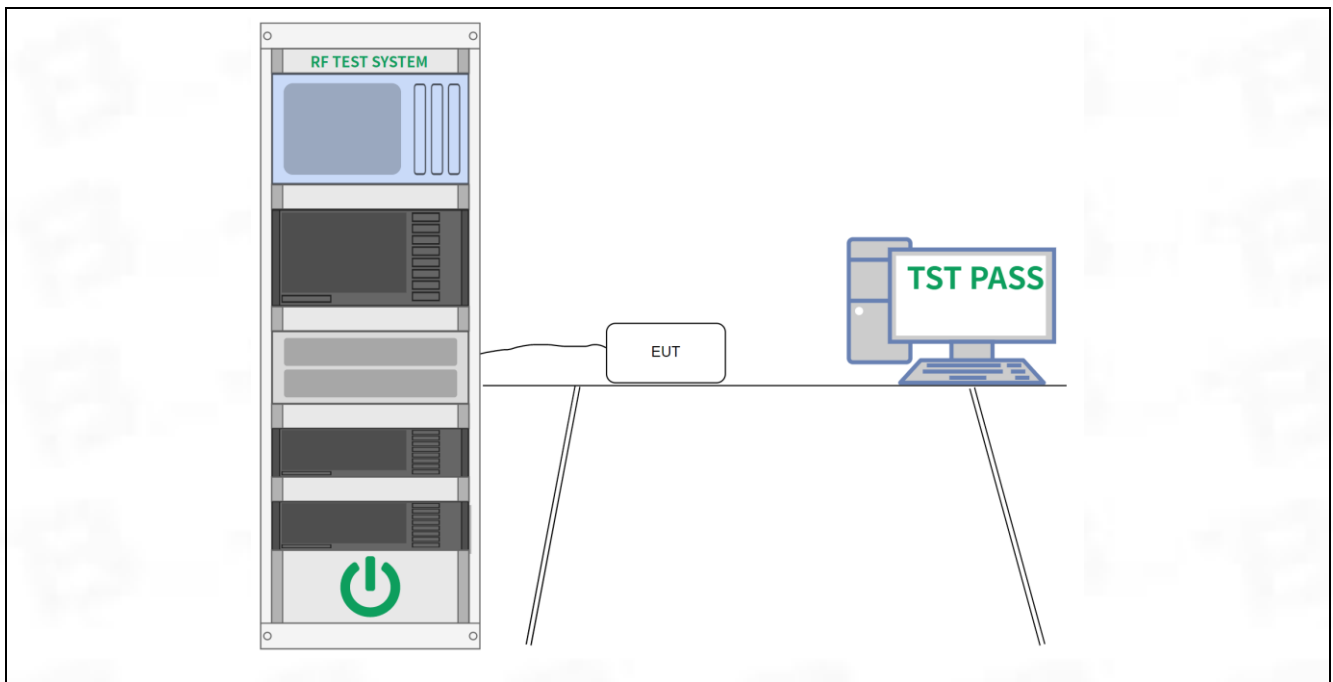
6.2 Occupied Bandwidth

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:	a) Set RBW = 100 kHz. b) Set the VBW $\geq [3 \times \text{RBW}]$. 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:	25.9 °C
Humidity:	52 %
Atmospheric Pressure:	1010 mbar

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

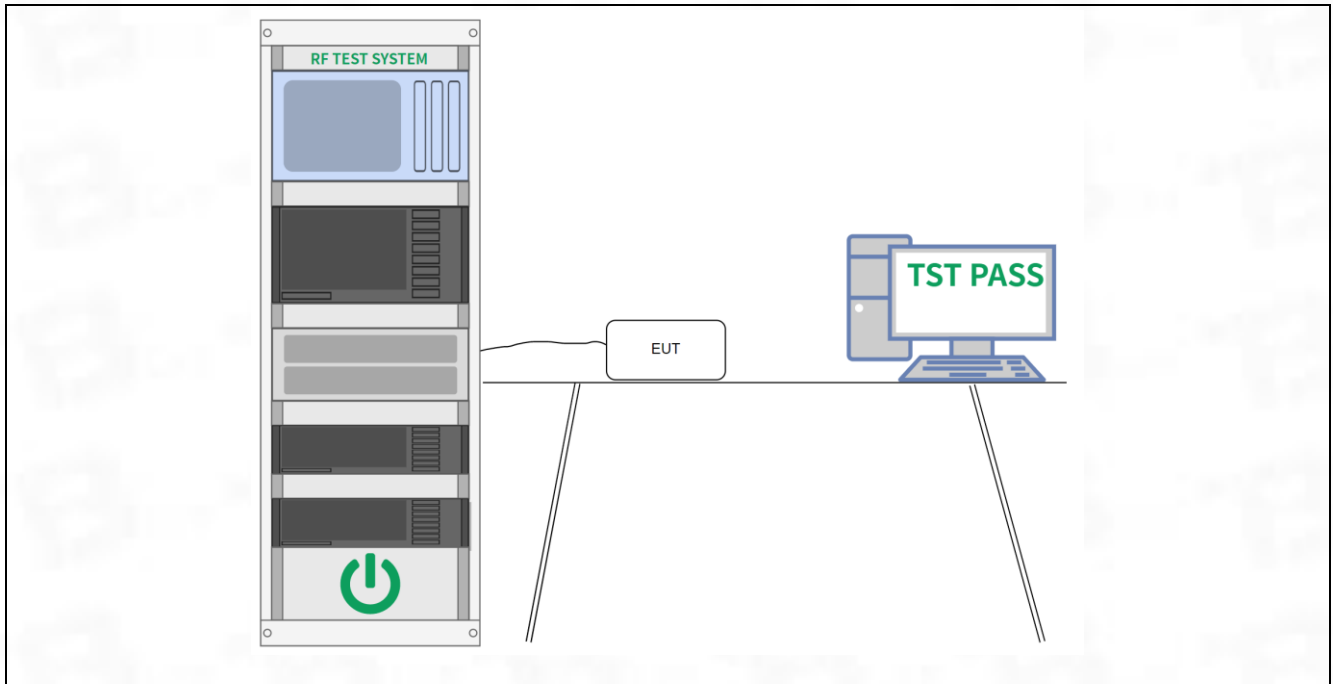
6.3 Maximum Conducted Output Power

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:	25.9 °C
Humidity:	52 %
Atmospheric Pressure:	1010 mbar

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Please Refer to Appendix for Details.

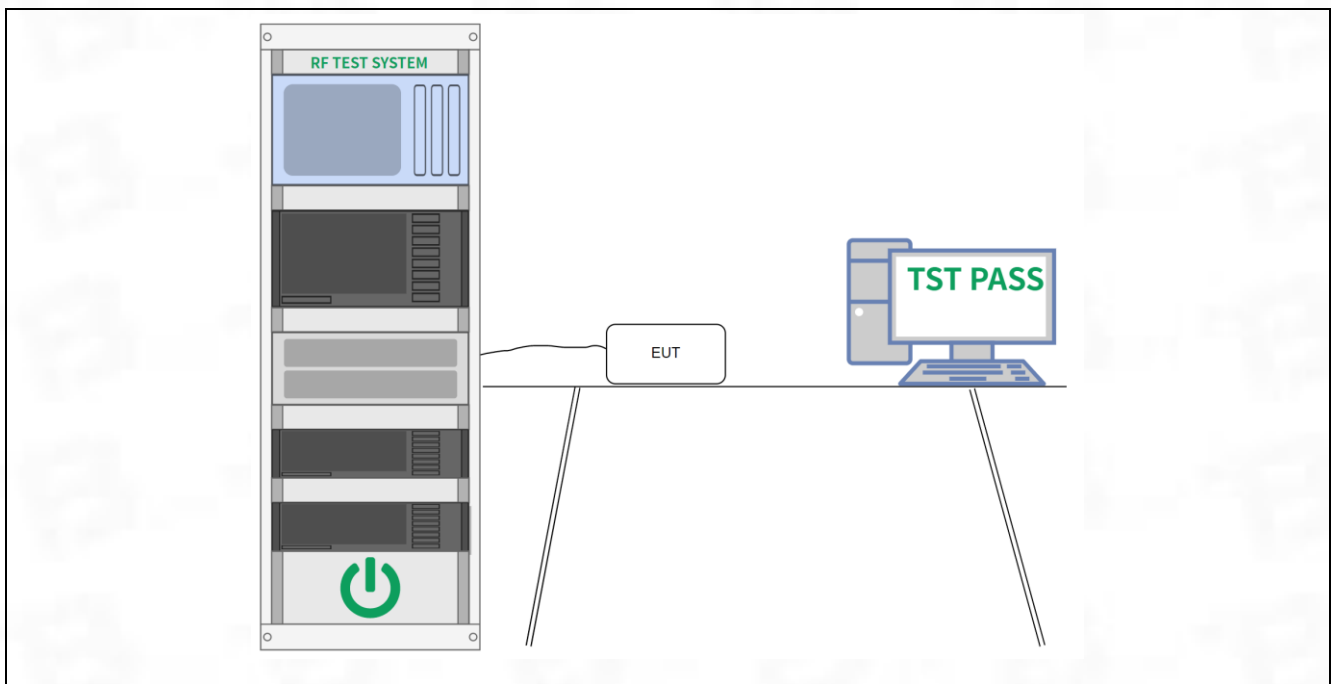
6.4 Power Spectral Density

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:	25.9 °C
Humidity:	52 %
Atmospheric Pressure:	1010 mbar

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

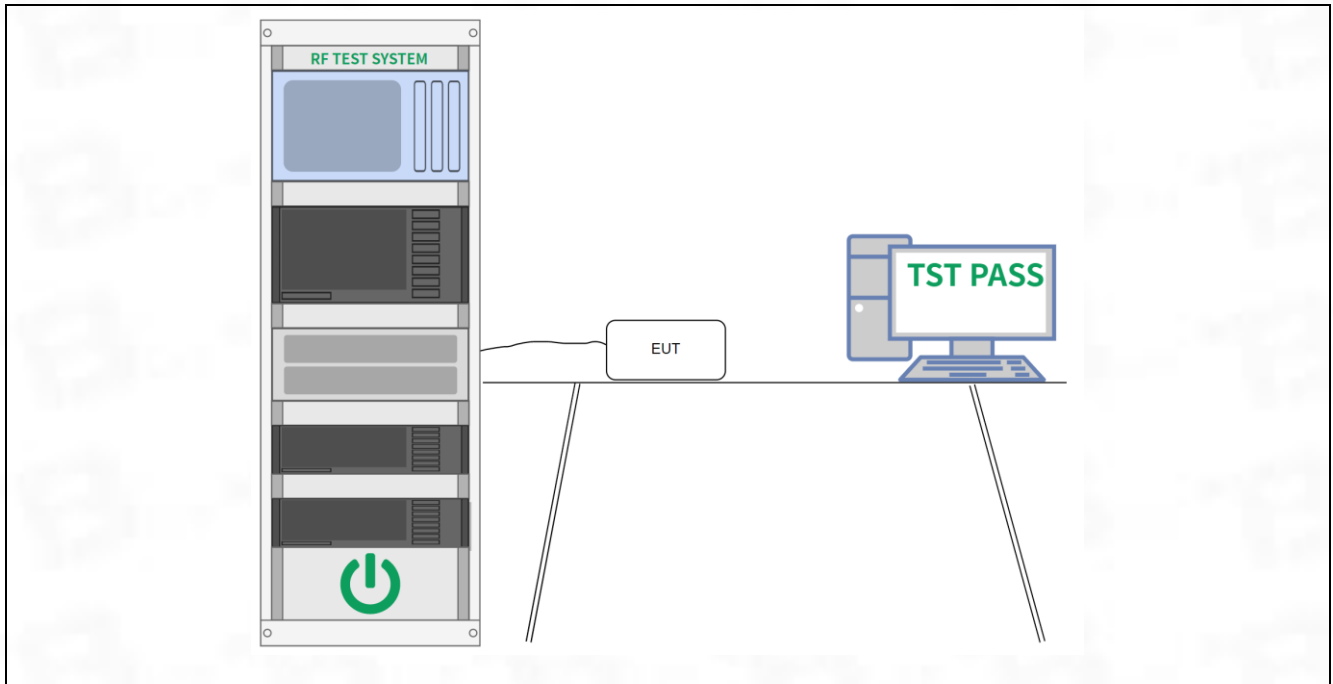
6.5 Emissions in non-restricted frequency bands

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:	25.9 °C
Humidity:	52 %
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:	25.1 °C
Humidity:	47.9 %
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	69.08	-30.59	38.49	74.00	-35.51	peak	P
2	2390.000	69.50	-30.49	39.01	74.00	-34.99	peak	P
3 *	2400.000	77.34	-30.48	46.86	74.00	-27.14	peak	P

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2310.000	68.44	-30.59	37.85	74.00	-36.15	peak	P
2	2390.000	69.37	-30.49	38.88	74.00	-35.12	peak	P
3 *	2400.000	76.59	-30.48	46.11	74.00	-27.89	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	77.07	-30.39	46.68	74.00	-27.32	peak	P
2	2500.000	72.27	-30.37	41.90	74.00	-32.10	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	74.57	-30.39	44.18	74.00	-29.82	peak	P
2	2500.000	71.27	-30.37	40.90	74.00	-33.10	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	67.43	-30.59	36.84	74.00	-37.16	peak	P
2	2390.000	71.45	-30.49	40.96	74.00	-33.04	peak	P
3 *	2400.000	83.26	-30.48	52.78	74.00	-21.22	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	64.43	-30.59	33.84	74.00	-40.16	peak	P
2	2390.000	74.45	-30.49	43.96	74.00	-30.04	peak	P
3 *	2400.000	82.76	-30.48	52.28	74.00	-21.72	peak	P

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	2483.500	76.40	-30.39	46.01	74.00	-27.99	peak	P
2	2500.000	67.29	-30.37	36.92	74.00	-37.08	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	70.90	-30.39	40.51	74.00	-33.49	peak	P
2	2500.000	69.29	-30.37	38.92	74.00	-35.08	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	69.73	-30.59	39.14	74.00	-34.86	peak	P
2	2390.000	71.53	-30.49	41.04	74.00	-32.96	peak	P
3 *	2400.000	83.59	-30.48	53.11	74.00	-20.89	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	67.73	-30.59	37.14	74.00	-36.86	peak	P
2	2390.000	72.03	-30.49	41.54	74.00	-32.46	peak	P
3 *	2400.000	82.09	-30.48	51.61	74.00	-22.39	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	72.52	-30.39	42.13	74.00	-31.87	peak	P
2	2500.000	68.58	-30.37	38.21	74.00	-35.79	peak	P

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2483.500	68.52	-30.39	38.13	74.00	-35.87	peak	P
2 *	2500.000	70.58	-30.37	40.21	74.00	-33.79	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	68.55	-30.59	37.96	74.00	-36.04	peak	P
2	2390.000	70.49	-30.49	40.00	74.00	-34.00	peak	P
3 *	2400.000	80.45	-30.48	49.97	74.00	-24.03	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	71.55	-30.59	40.96	74.00	-33.04	peak	P
2	2390.000	71.99	-30.49	41.50	74.00	-32.50	peak	P
3 *	2400.000	81.45	-30.48	50.97	74.00	-23.03	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	73.29	-30.39	42.90	74.00	-31.10	peak	P
2	2500.000	71.57	-30.37	41.20	74.00	-32.80	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	75.29	-30.39	44.90	74.00	-29.10	peak	P
2	2500.000	73.07	-30.37	42.70	74.00	-31.30	peak	P

6.7 Emissions in restricted frequency bands (below 1GHz)

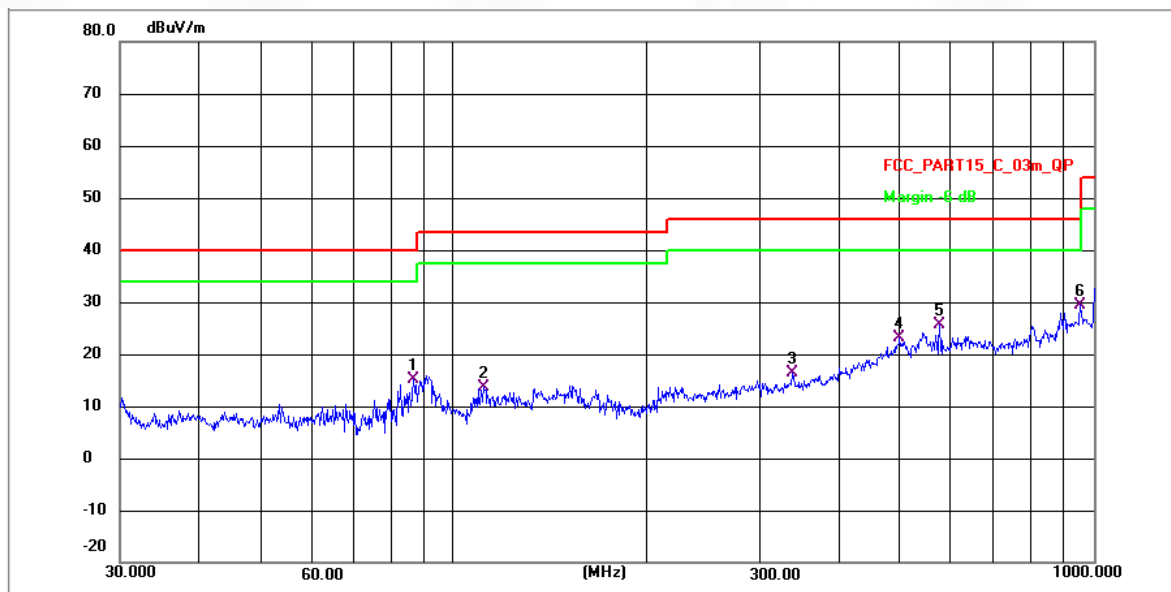
Test Requirement:	In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`		
Test Method:	Radiated emissions tests		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	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:	25.1 °C
Humidity:	47.9 %
Atmospheric Pressure:	1010 mbar

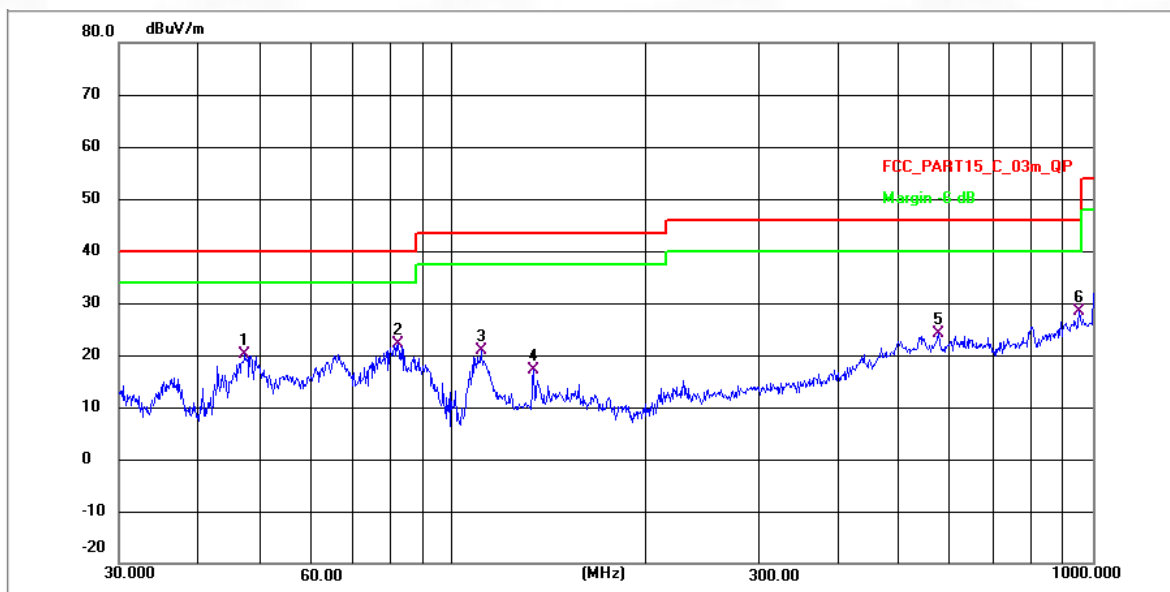
6.7.2 Test Data:

Note: All the mode have been tested, and only the worst case mode are in the report
 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	86.8068	45.43	-30.40	15.03	40.00	-24.97	QP	P
2	111.5422	41.78	-28.13	13.65	43.50	-29.85	QP	P
3	337.2155	41.46	-25.13	16.33	46.00	-29.67	QP	P
4	498.5498	44.20	-21.17	23.03	46.00	-22.97	QP	P
5	576.6443	47.59	-21.95	25.64	46.00	-20.36	QP	P
6 *	952.0937	51.25	-21.77	29.48	46.00	-16.52	QP	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	47.3255	40.48	-20.38	20.10	40.00	-19.90	QP	P
2	82.3588	53.19	-31.14	22.05	40.00	-17.95	QP	P
3	110.7627	48.89	-28.13	20.76	43.50	-22.74	QP	P
4	133.6188	45.02	-27.92	17.10	43.50	-26.40	QP	P
5	576.6443	45.99	-21.95	24.04	46.00	-21.96	QP	P
6 *	953.7645	50.18	-21.75	28.43	46.00	-17.57	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:	25.1 °C
Humidity:	47.9 %
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	4476.971	63.85	-28.80	35.05	74.00	-38.95	peak	P
2	5228.685	63.02	-27.17	35.85	74.00	-38.15	peak	P
3	6445.761	62.97	-25.38	37.59	74.00	-36.41	peak	P
4	7726.446	66.90	-25.12	41.78	74.00	-32.22	peak	P
5	9705.564	65.68	-23.64	42.04	74.00	-31.96	peak	P
6 *	15086.043	69.38	-20.58	48.80	74.00	-25.20	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	4027.554	64.33	-28.99	35.34	74.00	-38.66	peak	P
2	5667.801	61.93	-26.40	35.53	74.00	-38.47	peak	P
3	6717.761	63.05	-25.18	37.87	74.00	-36.13	peak	P
4	7893.485	64.96	-25.37	39.59	74.00	-34.41	peak	P
5	10945.613	67.07	-23.56	43.51	74.00	-30.49	peak	P
6 *	13693.792	68.82	-21.02	47.80	74.00	-26.20	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	3625.346	64.94	-29.05	35.89	74.00	-38.11	peak	P
2	4852.957	62.69	-27.78	34.91	74.00	-39.09	peak	P
3	6333.110	63.48	-25.36	38.12	74.00	-35.88	peak	P
4	7726.446	66.90	-25.12	41.78	74.00	-32.22	peak	P
5	9157.771	67.43	-23.96	43.47	74.00	-30.53	peak	P
6 *	12647.472	69.04	-21.53	47.51	74.00	-26.49	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	3339.640	61.92	-29.20	32.72	74.00	-41.28	peak	P
2	4314.364	62.86	-28.86	34.00	74.00	-40.00	peak	P
3	5823.903	63.26	-25.90	37.36	74.00	-36.64	peak	P
4	8006.074	67.25	-25.53	41.72	74.00	-32.28	peak	P
5	9264.263	66.44	-23.72	42.72	74.00	-31.28	peak	P
6 *	14279.900	68.51	-21.15	47.36	74.00	-26.64	peak	P

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	4240.189	62.61	-28.90	33.71	74.00	-40.29	peak	P
2	5770.285	63.99	-26.08	37.91	74.00	-36.09	peak	P
3	7764.504	69.16	-25.18	43.98	74.00	-30.02	peak	P
4	10045.198	68.06	-24.32	43.74	74.00	-30.26	peak	P
5	13280.604	66.96	-21.13	45.83	74.00	-28.17	peak	P
6 *	16174.372	69.27	-20.75	48.52	74.00	-25.48	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	3374.572	62.19	-29.16	33.03	74.00	-40.97	peak	P
2	4453.740	62.56	-28.80	33.76	74.00	-40.24	peak	P
3	5730.395	62.98	-26.20	36.78	74.00	-37.22	peak	P
4	7606.788	67.50	-24.94	42.56	74.00	-31.44	peak	P
5	10001.741	66.99	-24.29	42.70	74.00	-31.30	peak	P
6 *	14152.522	67.98	-21.12	46.86	74.00	-27.14	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	3425.674	64.62	-29.12	35.50	74.00	-38.50	peak	P
2	5122.477	65.18	-27.27	37.91	74.00	-36.09	peak	P
3	6564.209	63.67	-25.32	38.35	74.00	-35.65	peak	P
4	9450.880	66.59	-23.31	43.28	74.00	-30.72	peak	P
5	11964.719	68.90	-22.25	46.65	74.00	-27.35	peak	P
6 *	14741.211	68.01	-20.81	47.20	74.00	-26.80	peak	P

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3189.634	65.49	-29.34	36.15	74.00	-37.85	peak	P
2	3758.723	64.25	-29.03	35.22	74.00	-38.78	peak	P
3	5078.251	65.69	-27.30	38.39	74.00	-35.61	peak	P
4	6126.062	61.83	-25.34	36.49	74.00	-37.51	peak	P
5	8548.980	67.00	-25.22	41.78	74.00	-32.22	peak	P
6 *	12365.526	67.35	-21.77	45.58	74.00	-28.42	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	3422.705	62.56	-29.13	33.43	74.00	-40.57	peak	P
2	4592.305	64.67	-28.53	36.14	74.00	-37.86	peak	P
3	6076.684	64.47	-25.34	39.13	74.00	-34.87	peak	P
4	8953.620	65.87	-24.40	41.47	74.00	-32.53	peak	P
5	12280.045	64.74	-21.87	42.87	74.00	-31.13	peak	P
6 *	15020.779	70.44	-20.44	50.00	74.00	-24.00	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	3510.879	63.64	-29.06	34.58	74.00	-39.42	peak	P
2	4546.082	66.65	-28.66	37.99	74.00	-36.01	peak	P
3	5501.552	64.68	-26.95	37.73	74.00	-36.27	peak	P
4	7206.555	67.34	-24.87	42.47	74.00	-31.53	peak	P
5	10339.779	68.31	-24.44	43.87	74.00	-30.13	peak	P
6 *	14822.388	70.15	-20.68	49.47	74.00	-24.53	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	3739.218	66.06	-29.03	37.03	74.00	-36.97	peak	P
2	5179.049	65.02	-27.22	37.80	74.00	-36.20	peak	P
3	7845.718	69.17	-25.30	43.87	74.00	-30.13	peak	P
4	10259.401	68.06	-24.41	43.65	74.00	-30.35	peak	P
5	13989.840	67.81	-21.09	46.72	74.00	-27.28	peak	P
6 *	16543.163	66.05	-19.11	46.94	74.00	-27.06	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	3293.627	63.68	-29.24	34.44	74.00	-39.56	peak	P
2	4348.166	63.28	-28.85	34.43	74.00	-39.57	peak	P
3	5164.102	62.21	-27.23	34.98	74.00	-39.02	peak	P
4	7162.945	63.89	-24.88	39.01	74.00	-34.99	peak	P
5	9624.551	64.90	-23.47	41.43	74.00	-32.57	peak	P
6 *	15438.942	66.37	-21.36	45.01	74.00	-28.99	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	3247.308	62.46	-29.28	33.18	74.00	-40.82	peak	P
2	3993.936	60.02	-29.00	31.02	74.00	-42.98	peak	P
3	5078.251	62.69	-27.30	35.39	74.00	-38.61	peak	P
4	7300.900	64.22	-24.84	39.38	74.00	-34.62	peak	P
5	9730.844	65.82	-23.70	42.12	74.00	-31.88	peak	P
6 *	13485.616	67.24	-20.98	46.26	74.00	-27.74	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	3351.244	64.38	-29.19	35.19	74.00	-38.81	peak	P
2	4476.971	61.85	-28.80	33.05	74.00	-40.95	peak	P
3	7300.900	63.22	-24.84	38.38	74.00	-35.62	peak	P
4	9546.974	63.83	-23.30	40.53	74.00	-33.47	peak	P
5	12673.087	67.16	-21.52	45.64	74.00	-28.36	peak	P
6 *	15781.839	68.56	-21.55	47.01	74.00	-26.99	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	3385.318	65.71	-29.16	36.55	74.00	-37.45	peak	P
2	4251.233	64.28	-28.89	35.39	74.00	-38.61	peak	P
3	5164.102	61.71	-27.23	34.48	74.00	-39.52	peak	P
4	6948.823	61.73	-24.98	36.75	74.00	-37.25	peak	P
5	9293.765	64.35	-23.66	40.69	74.00	-33.31	peak	P
6 *	12673.087	65.66	-21.52	44.14	74.00	-29.86	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	3510.879	61.64	-29.06	32.58	74.00	-41.42	peak	P
2	4724.245	60.31	-28.15	32.16	74.00	-41.84	peak	P
3	5715.508	58.62	-26.25	32.37	74.00	-41.63	peak	P
4	8794.598	62.78	-24.73	38.05	74.00	-35.95	peak	P
5	12188.107	66.14	-21.97	44.17	74.00	-29.83	peak	P
6 *	17603.819	67.80	-16.44	51.36	74.00	-22.64	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	3447.527	60.74	-29.10	31.64	74.00	-42.36	peak	P
2	4547.396	58.86	-28.66	30.20	74.00	-43.80	peak	P
3	6233.228	59.37	-25.35	34.02	74.00	-39.98	peak	P
4	8061.805	63.37	-25.50	37.87	74.00	-36.13	peak	P
5	10393.713	65.57	-24.46	41.11	74.00	-32.89	peak	P
6 *	14994.752	65.16	-20.41	44.75	74.00	-29.25	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	3724.118	64.31	-29.03	35.28	74.00	-38.72	peak	P
2	4431.909	63.32	-28.82	34.50	74.00	-39.50	peak	P
3	6193.718	63.79	-25.35	38.44	74.00	-35.56	peak	P
4	7726.446	66.40	-25.12	41.28	74.00	-32.72	peak	P
5	11670.975	67.48	-22.76	44.72	74.00	-29.28	peak	P
6 *	15120.967	68.97	-20.66	48.31	74.00	-25.69	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	3351.244	63.88	-29.19	34.69	74.00	-39.31	peak	P
2	4019.413	62.80	-28.99	33.81	74.00	-40.19	peak	P
3	5146.221	63.74	-27.25	36.49	74.00	-37.51	peak	P
4	7047.938	63.11	-24.92	38.19	74.00	-35.81	peak	P
5	9641.257	66.82	-23.51	43.31	74.00	-30.69	peak	P
6 *	12494.865	66.11	-21.63	44.48	74.00	-29.52	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	3293.627	62.18	-29.24	32.94	74.00	-41.06	peak	P
2	4180.559	63.05	-28.93	34.12	74.00	-39.88	peak	P
3	4906.553	64.40	-27.64	36.76	74.00	-37.24	peak	P
4	6526.372	63.70	-25.35	38.35	74.00	-35.65	peak	P
5	9157.771	66.93	-23.96	42.97	74.00	-31.03	peak	P
6 *	12365.526	67.85	-21.77	46.08	74.00	-27.92	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	3612.793	58.12	-29.05	29.07	74.00	-44.93	peak	P
2	4348.166	62.28	-28.85	33.43	74.00	-40.57	peak	P
3	6309.358	62.76	-25.36	37.40	74.00	-36.60	peak	P
4	8397.144	66.58	-25.36	41.22	74.00	-32.78	peak	P
5	12068.917	64.57	-22.11	42.46	74.00	-31.54	peak	P
6 *	15274.712	70.80	-21.00	49.80	74.00	-24.20	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	3396.098	62.19	-29.15	33.04	74.00	-40.96	peak	P
2	4209.660	62.65	-28.91	33.74	74.00	-40.26	peak	P
3	5986.034	62.40	-25.38	37.02	74.00	-36.98	peak	P
4	8317.431	67.32	-25.40	41.92	74.00	-32.08	peak	P
5	10945.613	67.07	-23.56	43.51	74.00	-30.49	peak	P
6 *	13693.792	68.82	-21.02	47.80	74.00	-26.20	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	3633.738	63.64	-29.04	34.60	74.00	-39.40	peak	P
2	5078.251	65.69	-27.30	38.39	74.00	-35.61	peak	P
3	5905.265	65.24	-25.64	39.60	74.00	-34.40	peak	P
4	8110.887	68.09	-25.48	42.61	74.00	-31.39	peak	P
5	9967.111	67.83	-24.21	43.62	74.00	-30.38	peak	P
6 *	13693.792	69.32	-21.02	48.30	74.00	-25.70	peak	P

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

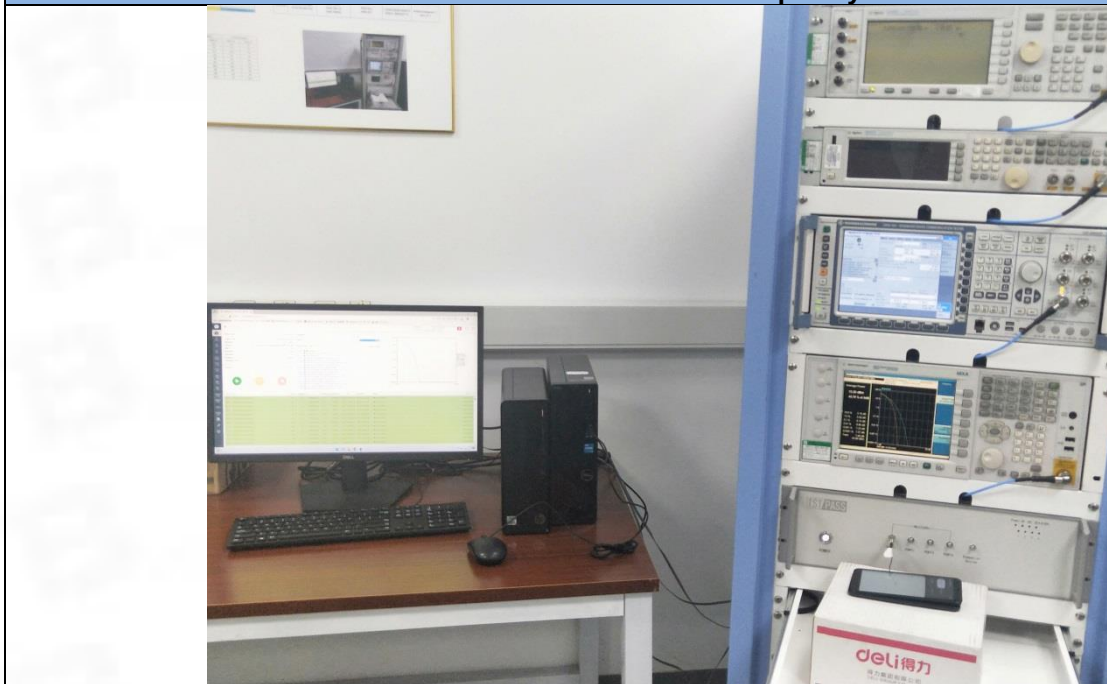
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	3223.928	66.42	-29.31	37.11	74.00	-36.89	peak	P
2	4348.166	65.78	-28.85	36.93	74.00	-37.07	peak	P
3	7179.527	64.20	-24.88	39.32	74.00	-34.68	peak	P
4	9826.943	65.04	-23.91	41.13	74.00	-32.87	peak	P
5	12494.865	67.61	-21.63	45.98	74.00	-28.02	peak	P
6 *	15501.542	68.95	-21.49	47.46	74.00	-26.54	peak	P

7 Test Setup Photos

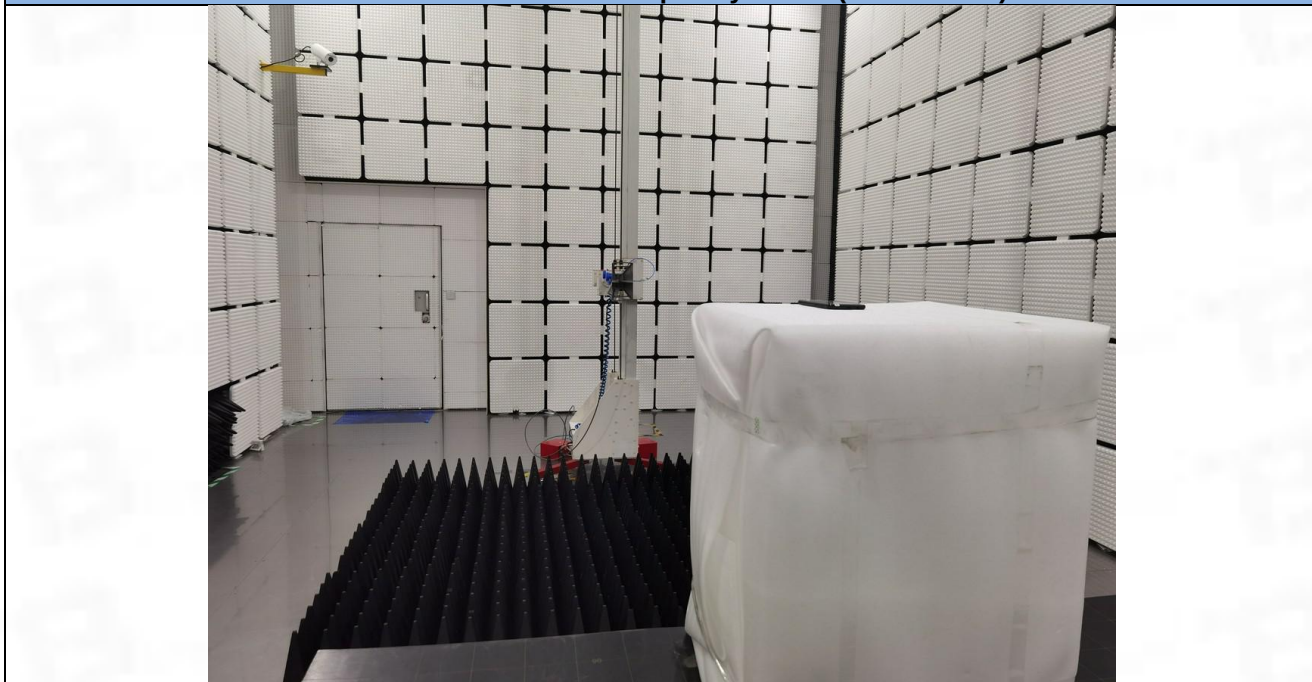
Conducted Emission at AC power line



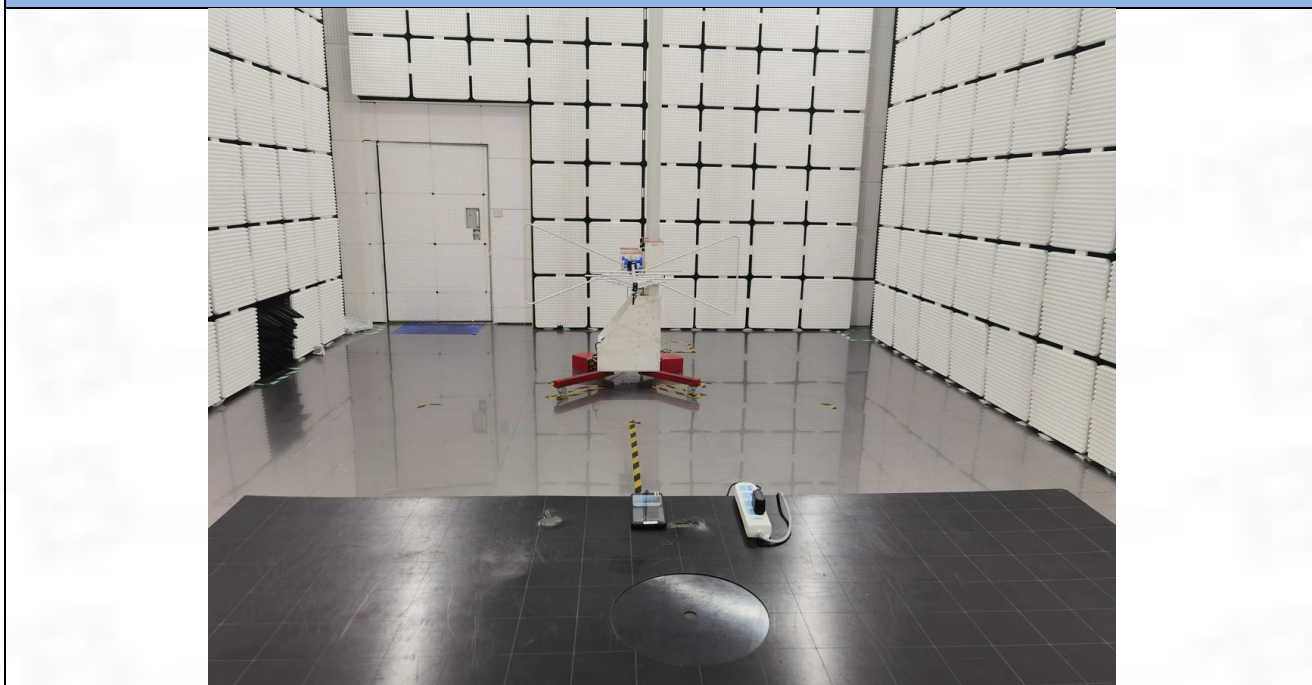
**Occupied Bandwidth
Maximum Conducted Output Power
Power Spectral Density
Emissions in non-restricted frequency bands**



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 the report No. BTF230512R00201

Appendix

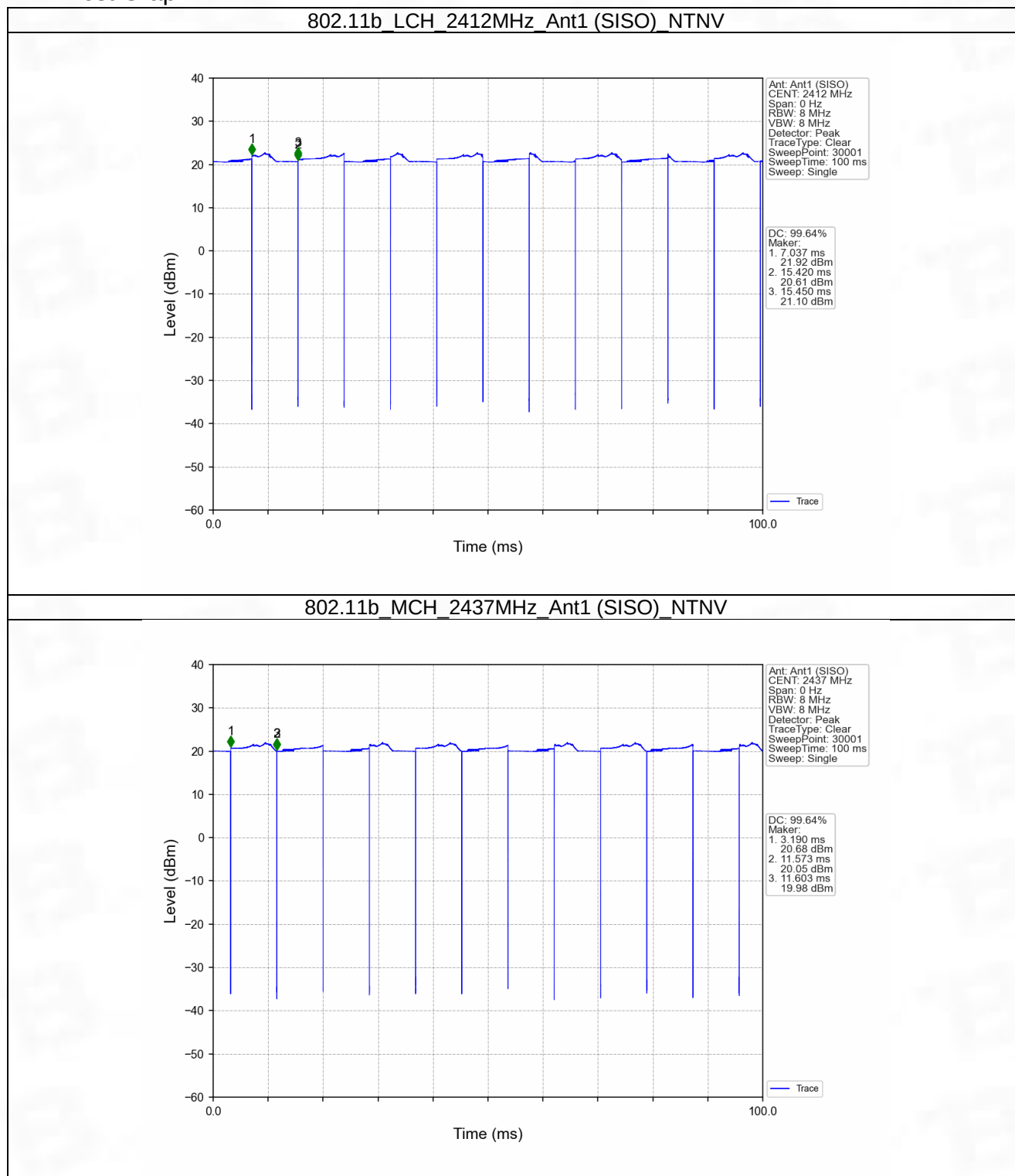
1. Duty Cycle

1.1 Ant1

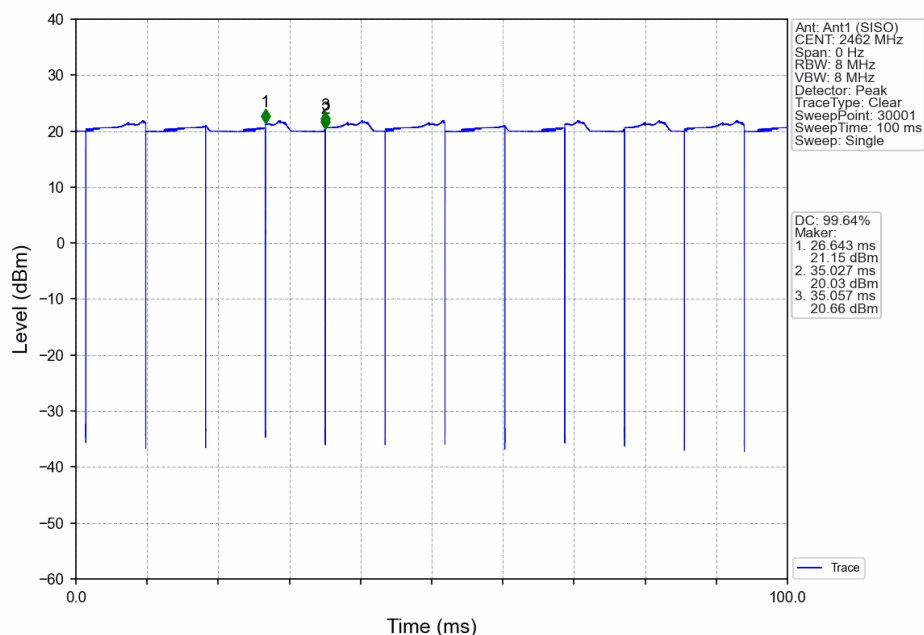
1.1.1 Test Result

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	1.428	97.55	0.11	0.03
		2437	1.394	1.428	97.62	0.10	0.03
		2462	1.392	1.427	97.55	0.11	0.07
802.11n (HT20)	SISO	2412	1.302	1.336	97.46	0.11	0.03
		2437	1.302	1.336	97.46	0.11	0.07
		2462	1.302	1.336	97.46	0.11	0.03
802.11n (HT40)	SISO	2422	0.649	0.683	95.02	0.22	0.00
		2437	0.648	0.683	94.88	0.23	0.03
		2452	0.649	0.683	95.02	0.22	0.10

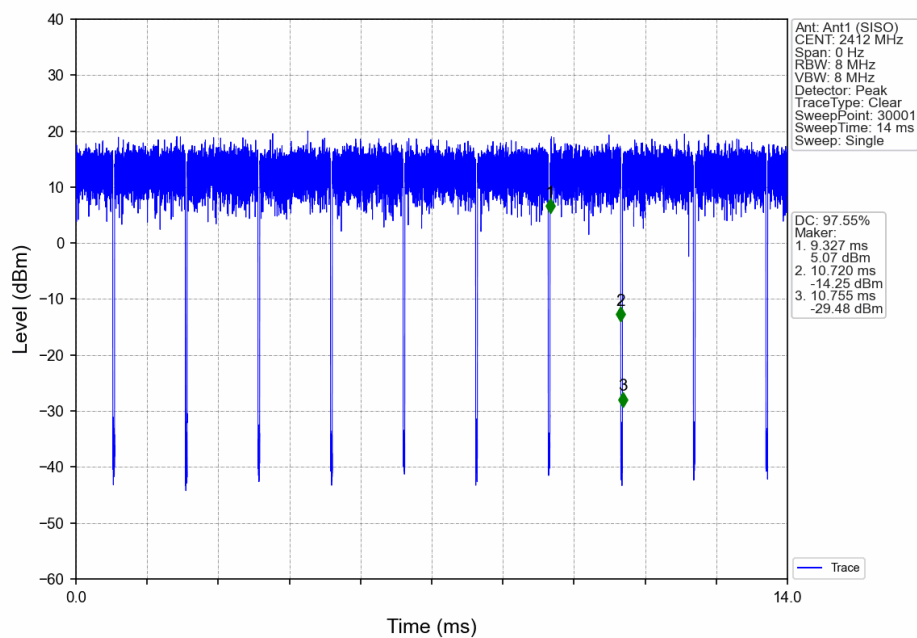
1.1.2 Test Graph



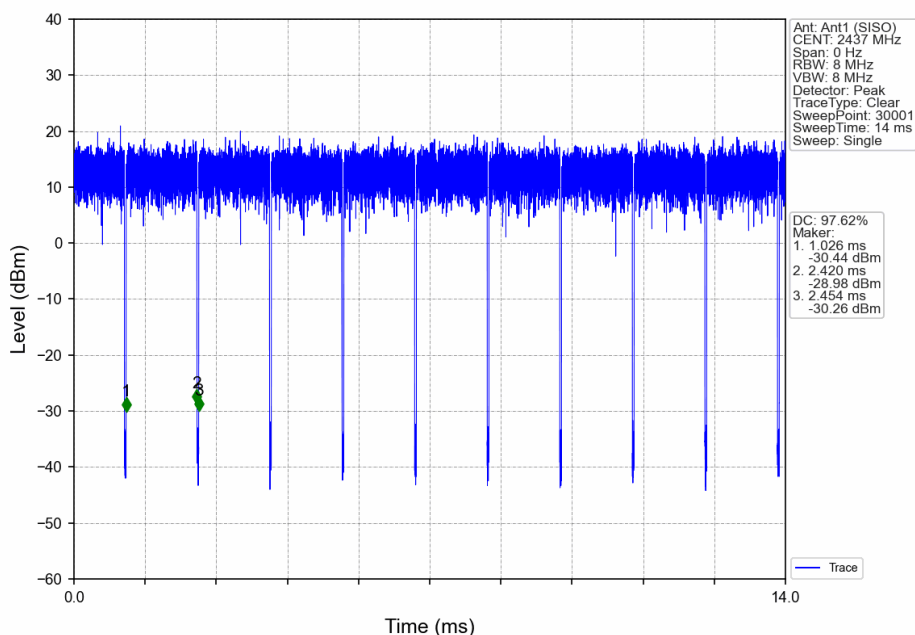
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



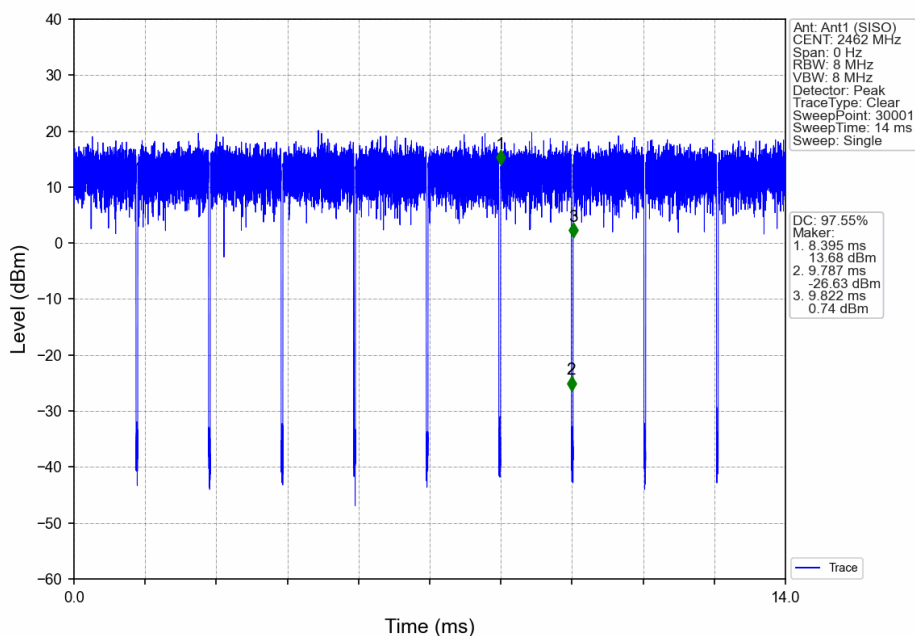
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



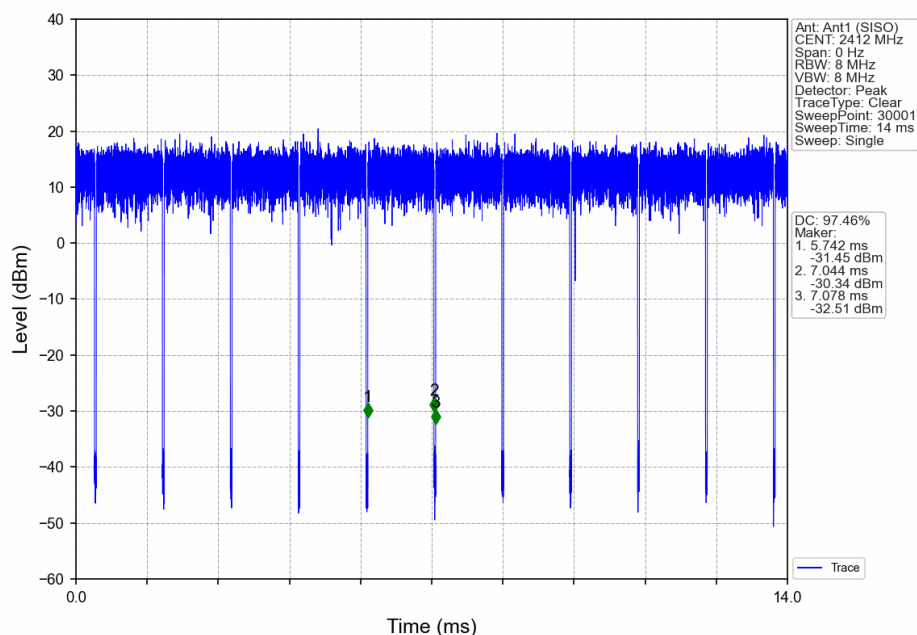
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



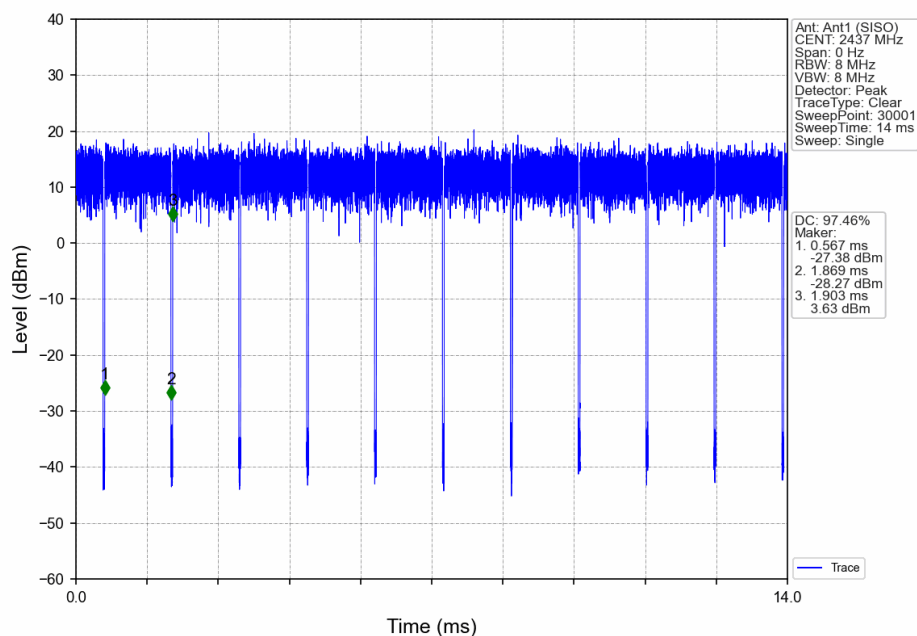
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



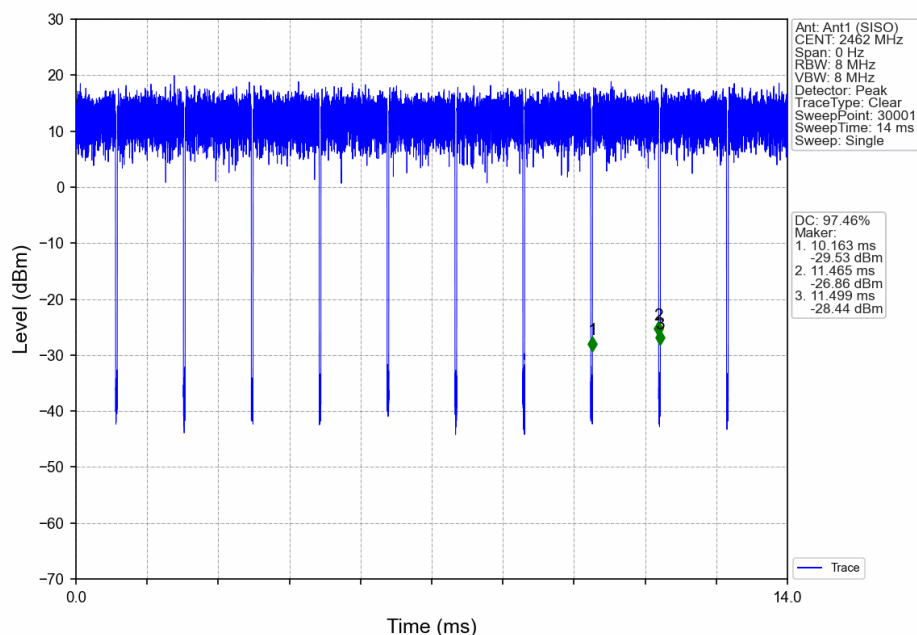
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



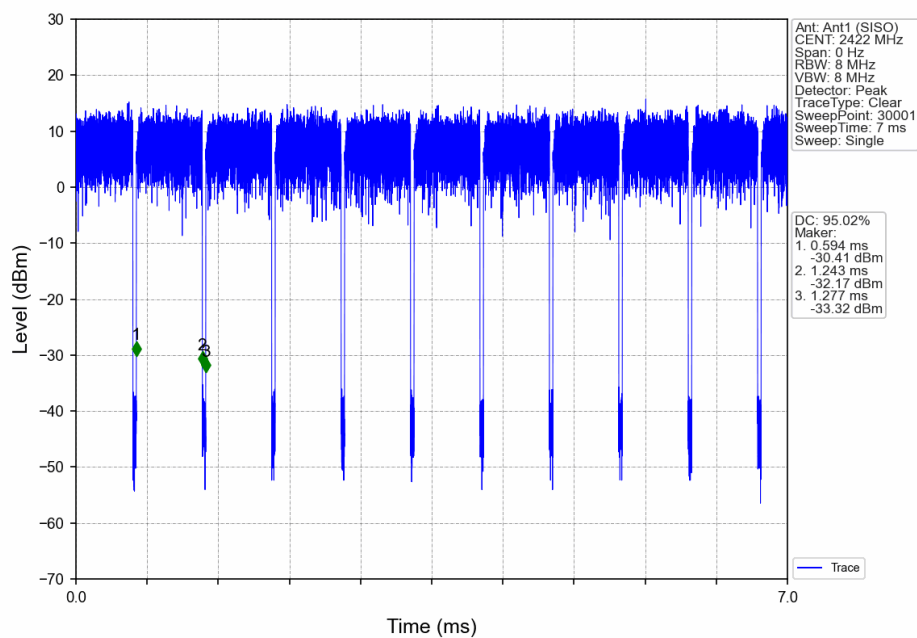
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



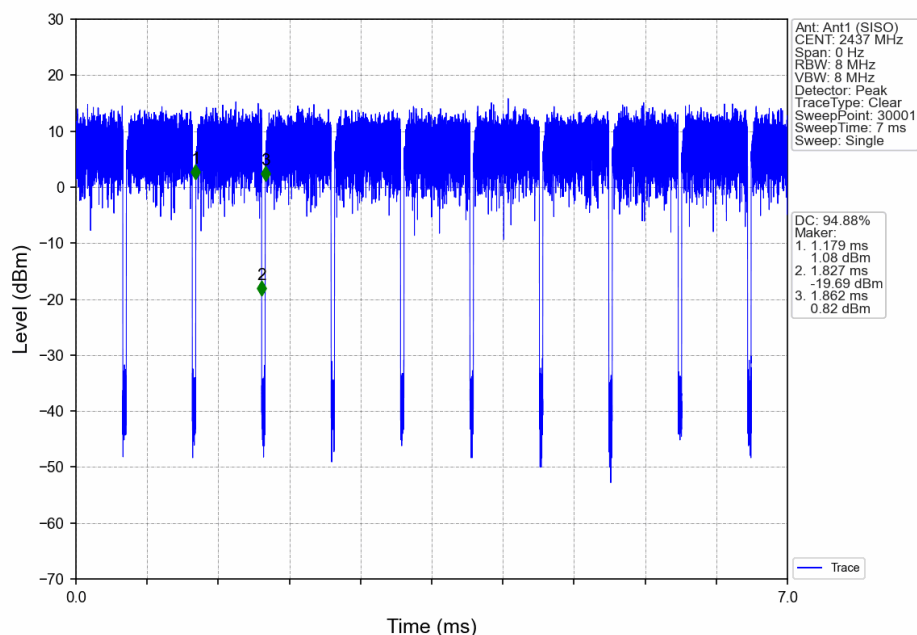
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



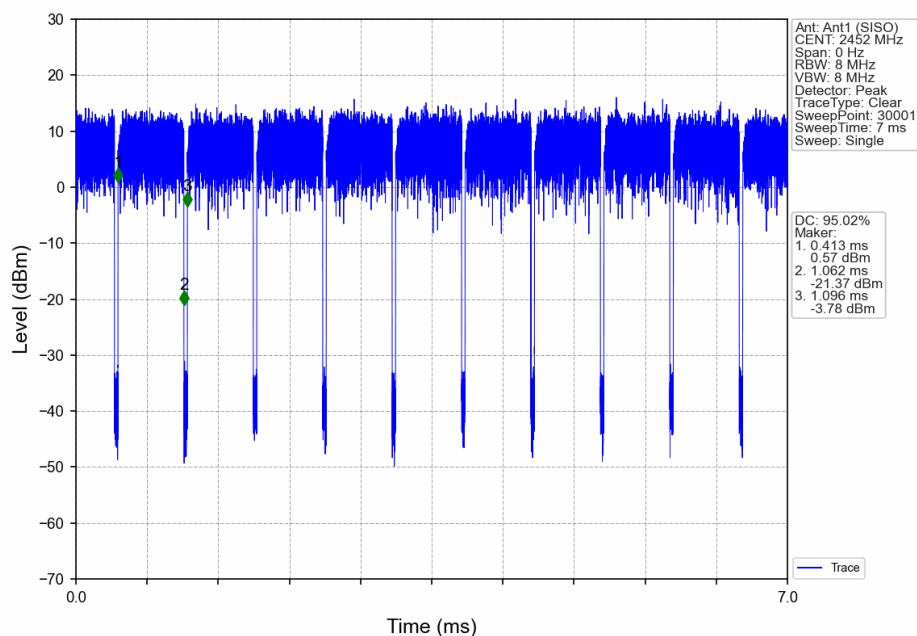
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



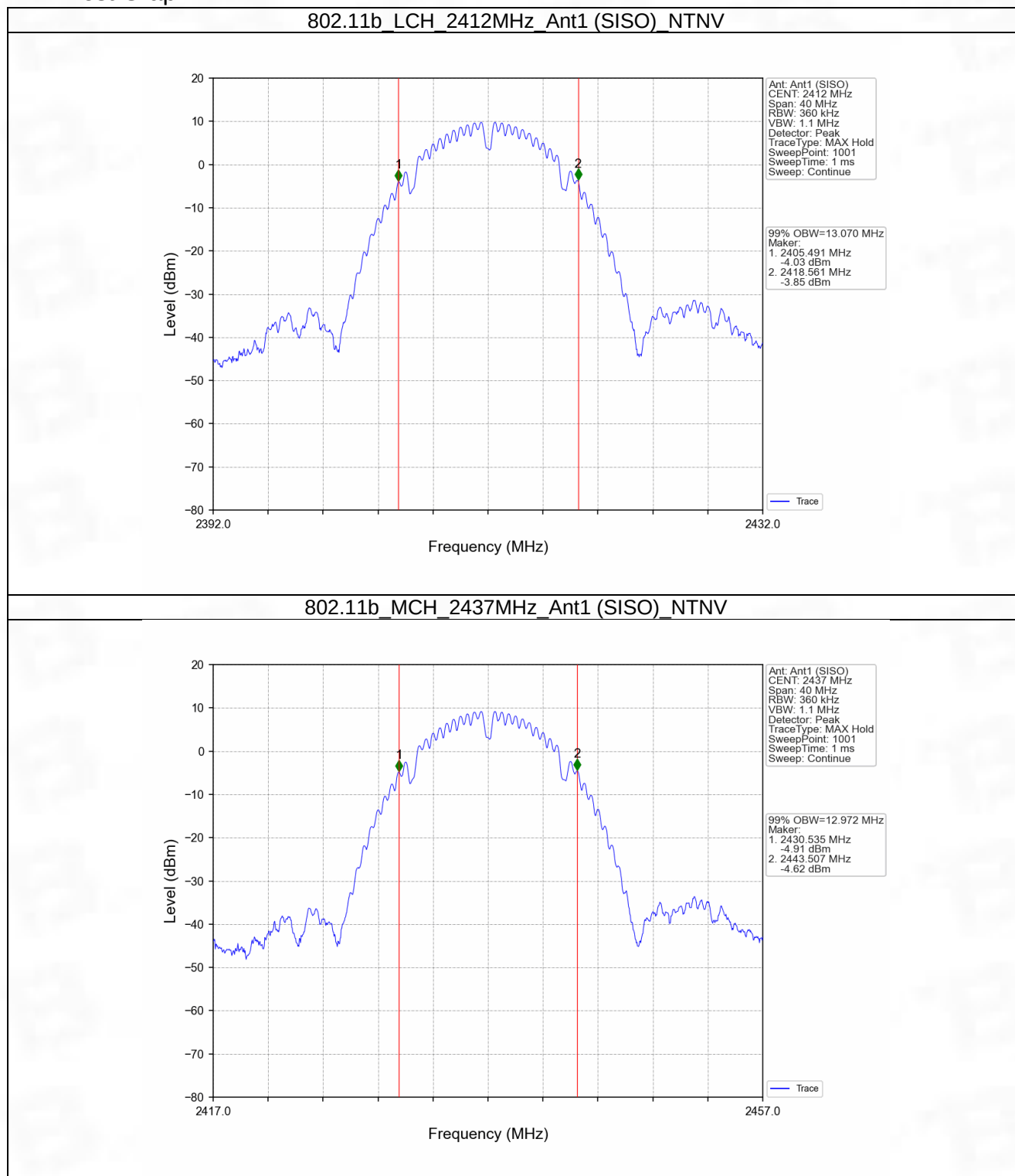
2. Bandwidth

2.1 OBW

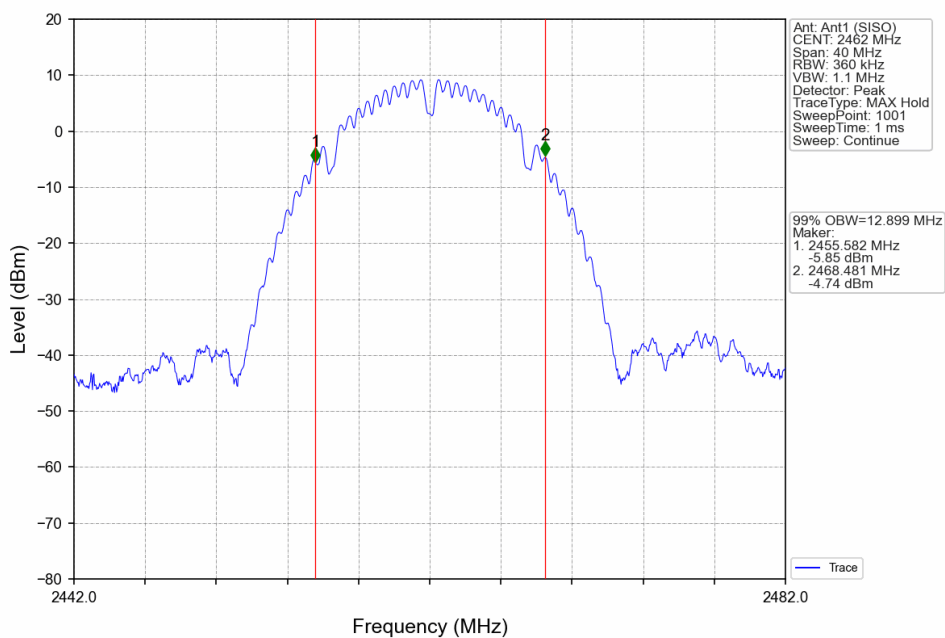
2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)	Verdict
				Result	
802.11b	SISO	2412	1	13.070	Pass
		2437	1	12.972	Pass
		2462	1	12.899	Pass
802.11g	SISO	2412	1	17.445	Pass
		2437	1	17.410	Pass
		2462	1	17.527	Pass
802.11n (HT20)	SISO	2412	1	18.242	Pass
		2437	1	18.249	Pass
		2462	1	18.298	Pass
802.11n (HT40)	SISO	2422	1	36.563	Pass
		2437	1	36.617	Pass
		2452	1	36.687	Pass

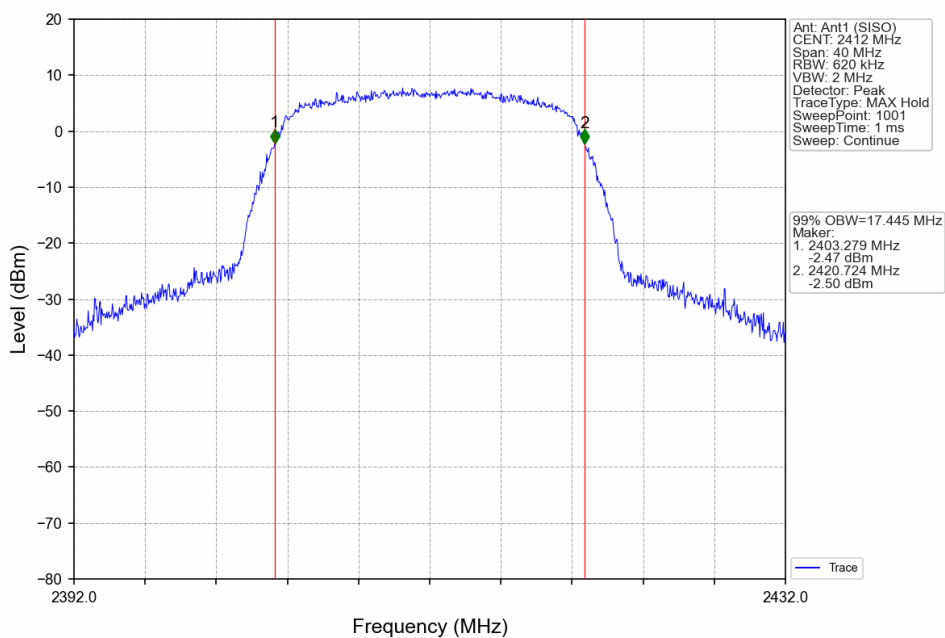
2.1.2 Test Graph



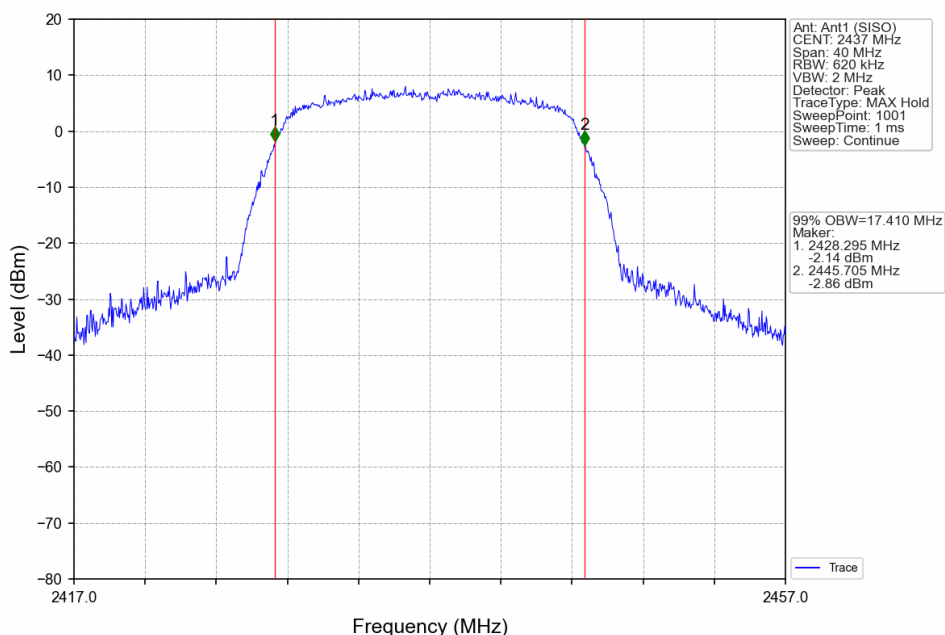
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



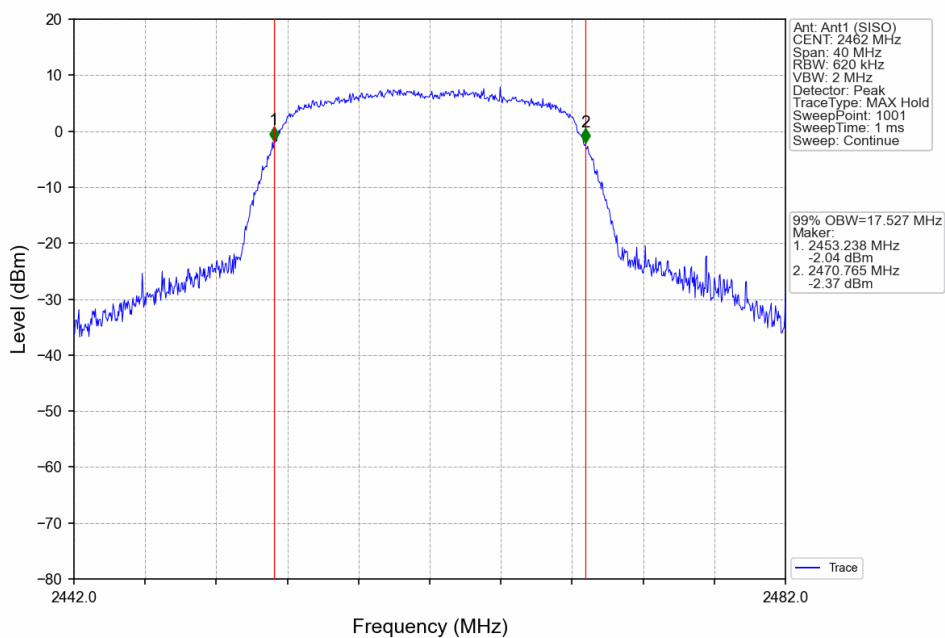
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



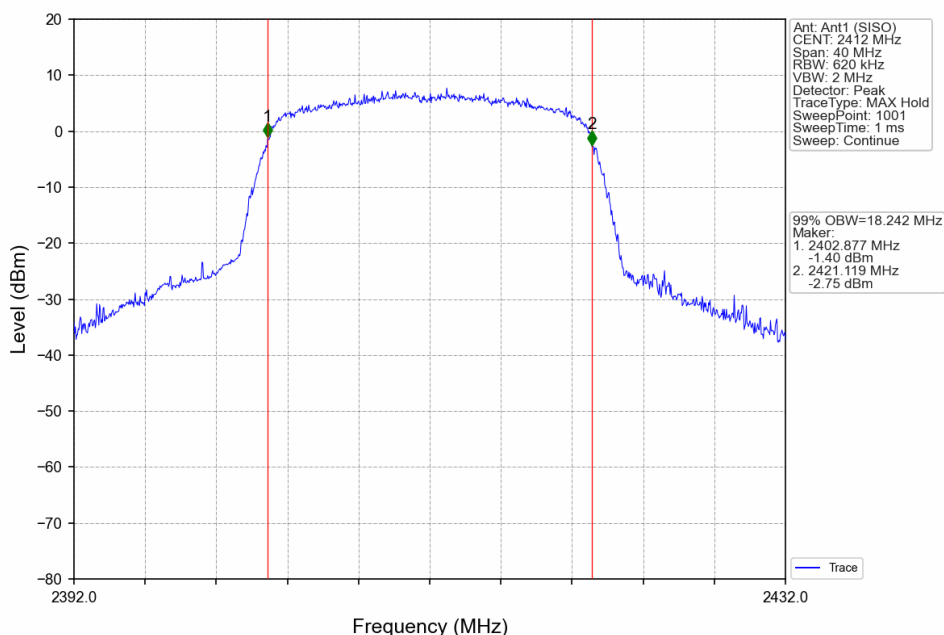
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



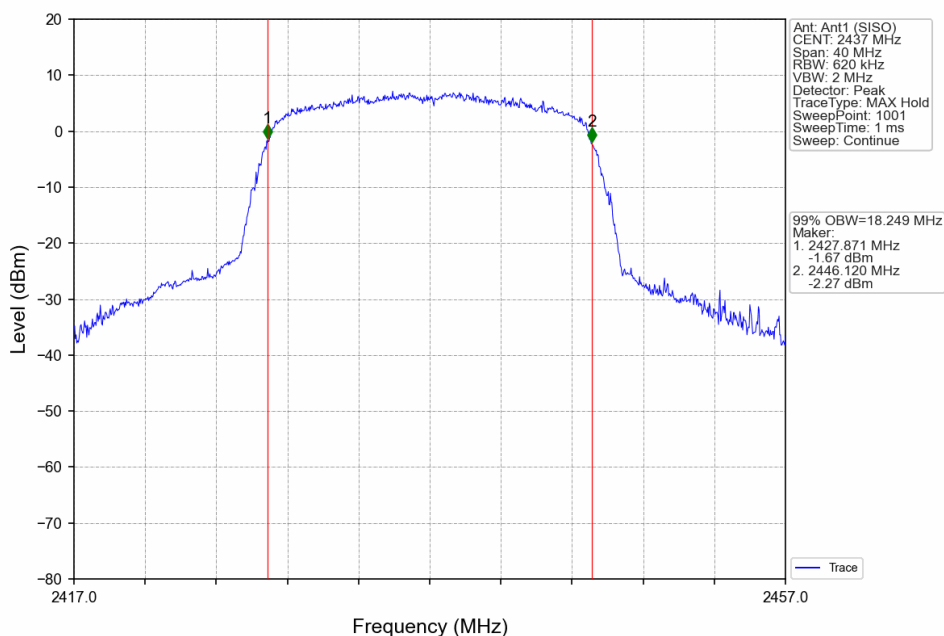
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



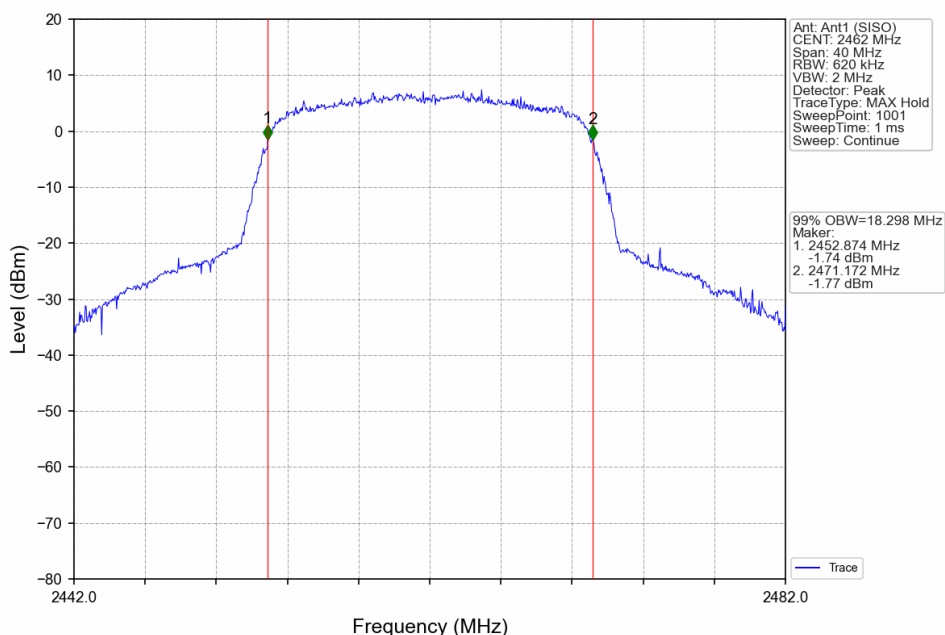
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



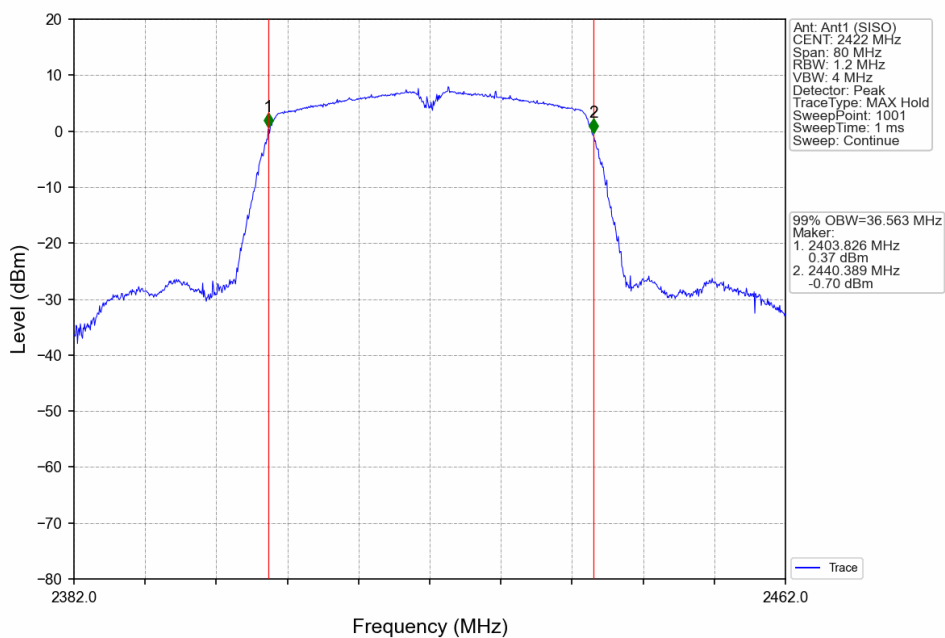
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



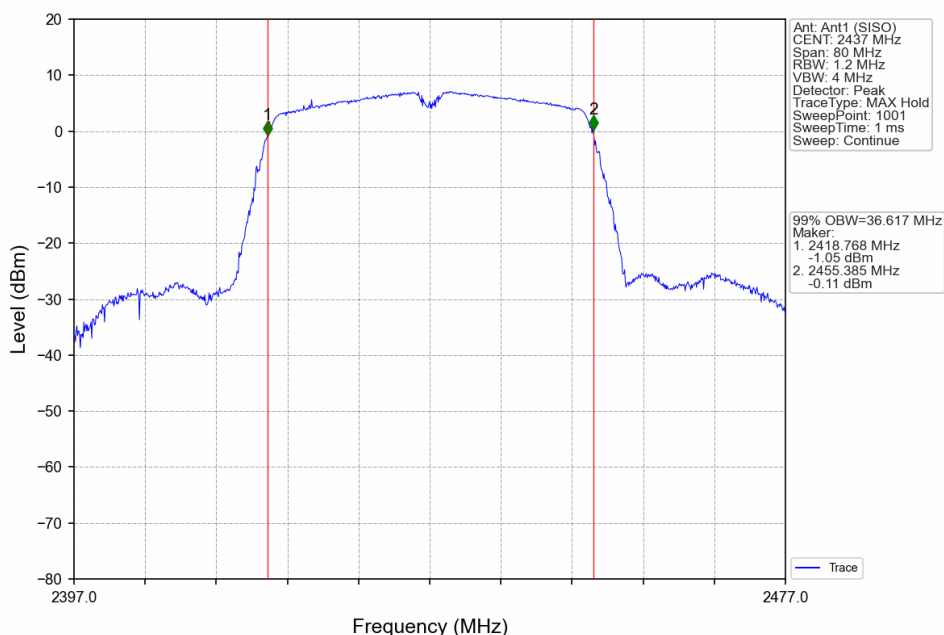
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



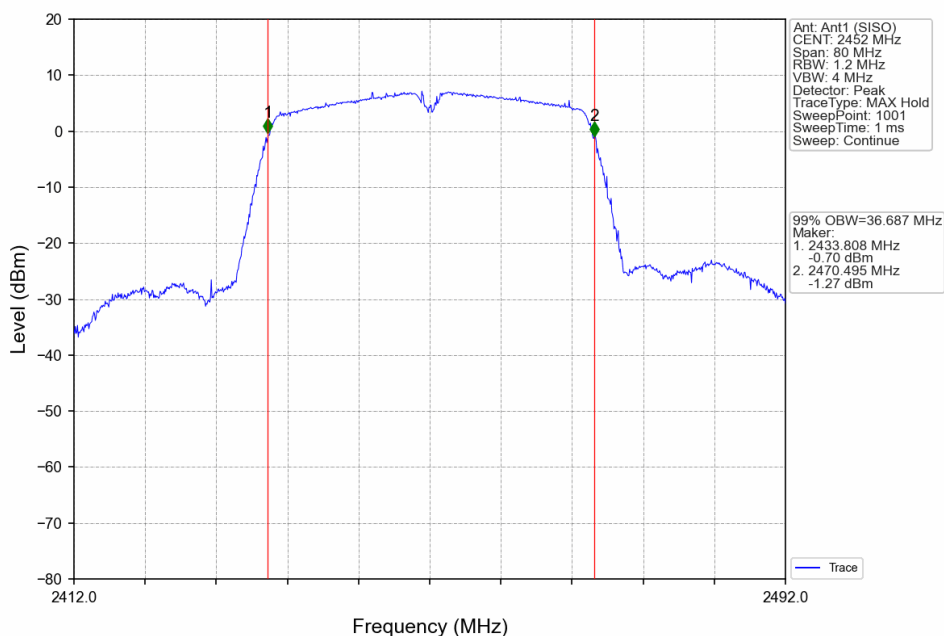
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV

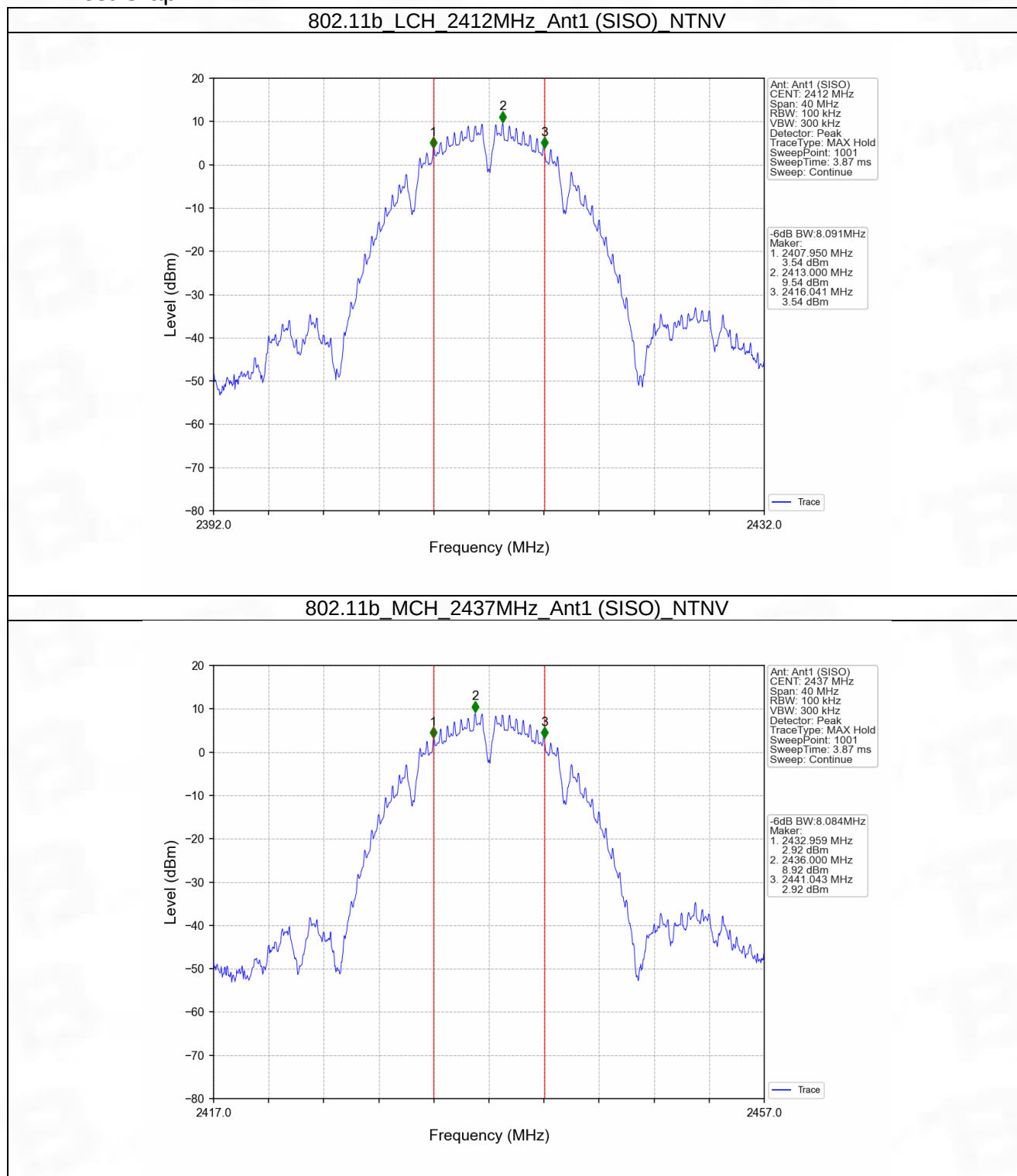


2.2 6dB BW

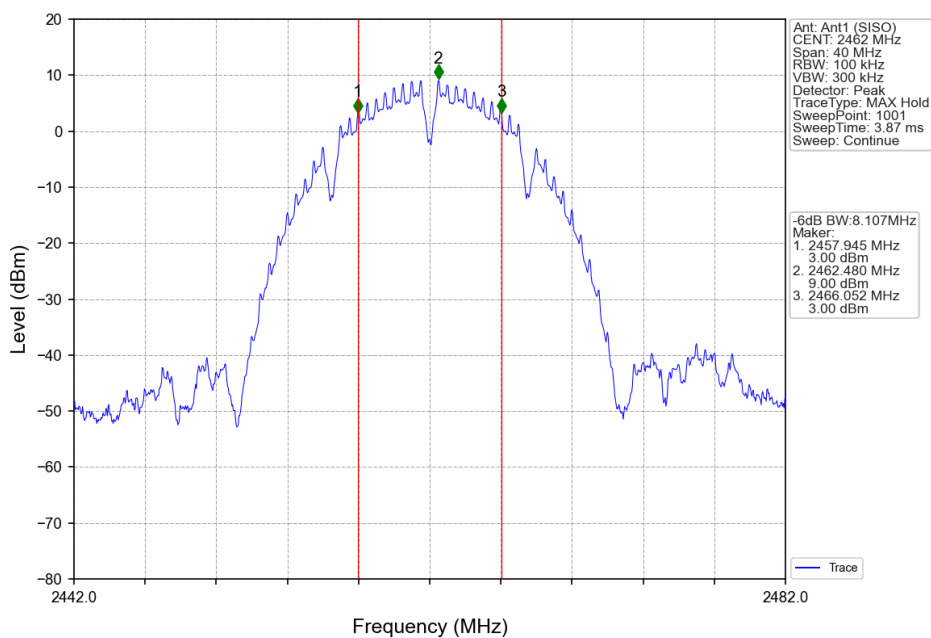
2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	8.091	≥ 0.5	Pass
		2437	1	8.084	≥ 0.5	Pass
		2462	1	8.107	≥ 0.5	Pass
802.11g	SISO	2412	1	15.167	≥ 0.5	Pass
		2437	1	15.170	≥ 0.5	Pass
		2462	1	15.356	≥ 0.5	Pass
802.11n (HT20)	SISO	2412	1	15.173	≥ 0.5	Pass
		2437	1	15.178	≥ 0.5	Pass
		2462	1	15.176	≥ 0.5	Pass
802.11n (HT40)	SISO	2422	1	35.156	≥ 0.5	Pass
		2437	1	35.157	≥ 0.5	Pass
		2452	1	35.166	≥ 0.5	Pass

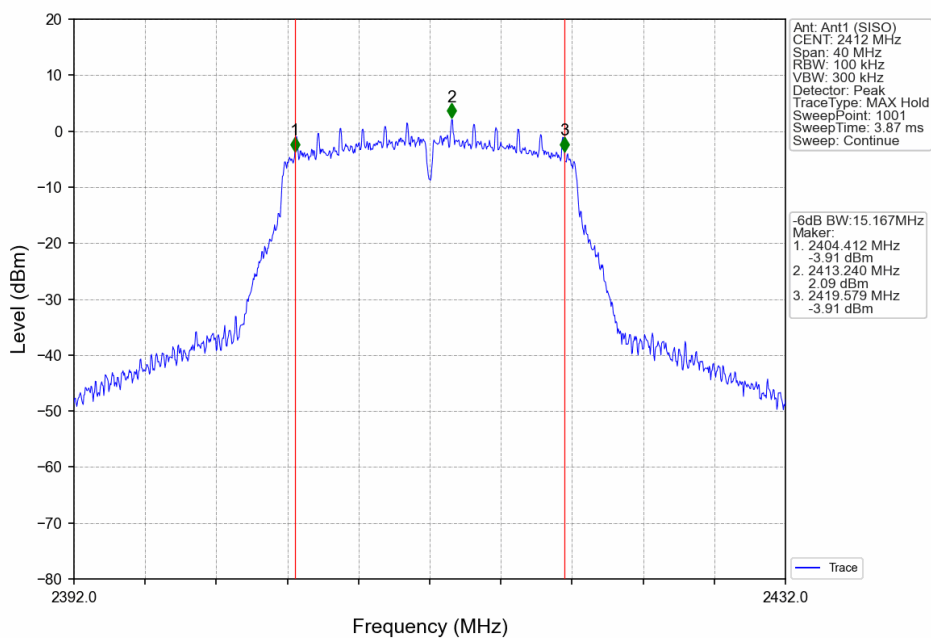
2.2.2 Test Graph



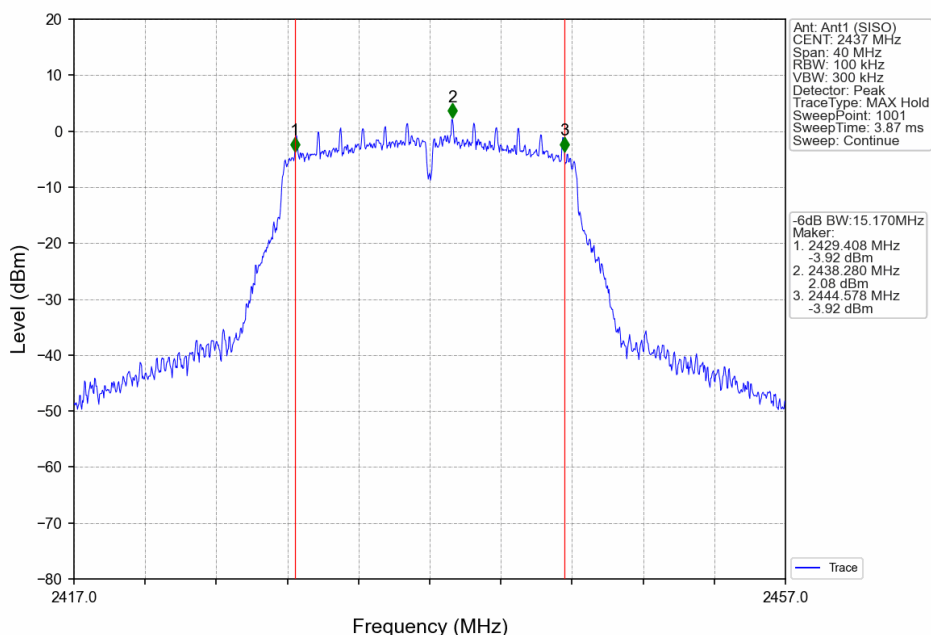
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



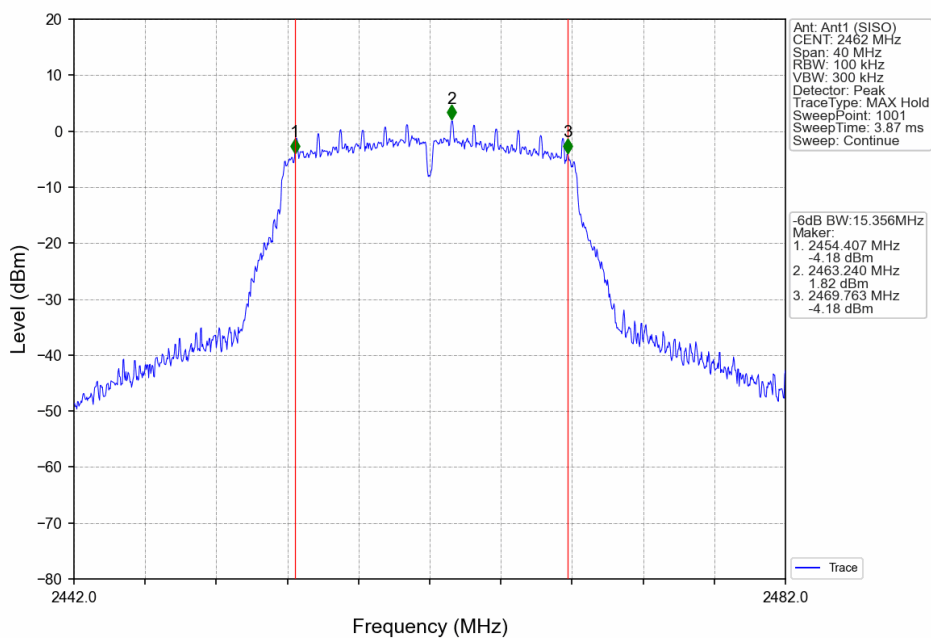
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



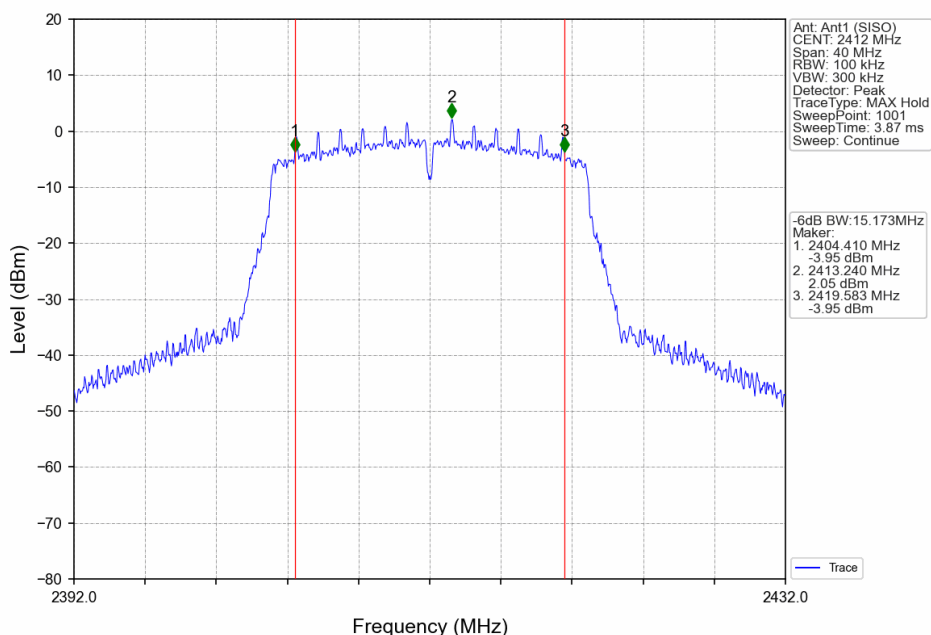
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



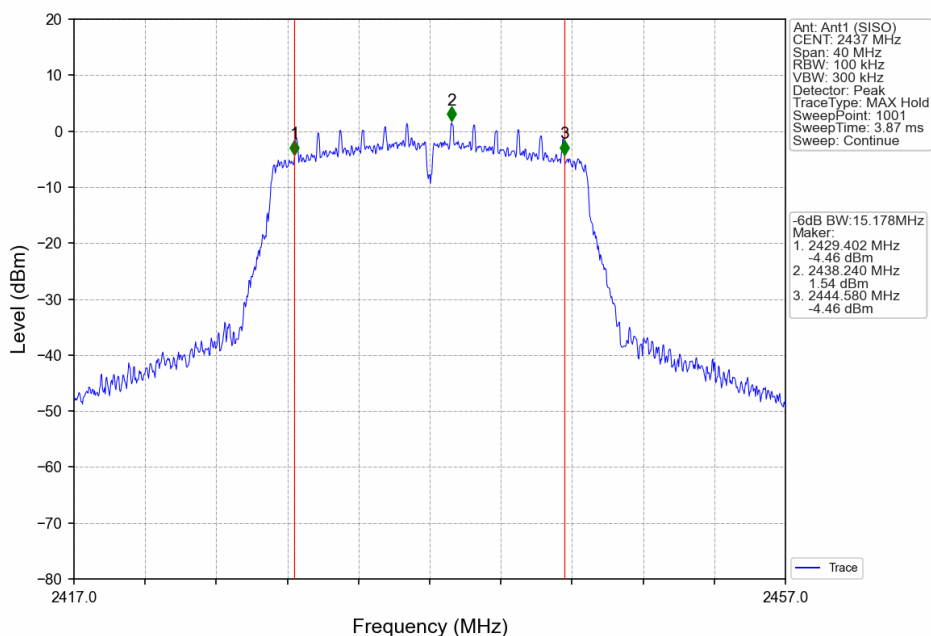
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



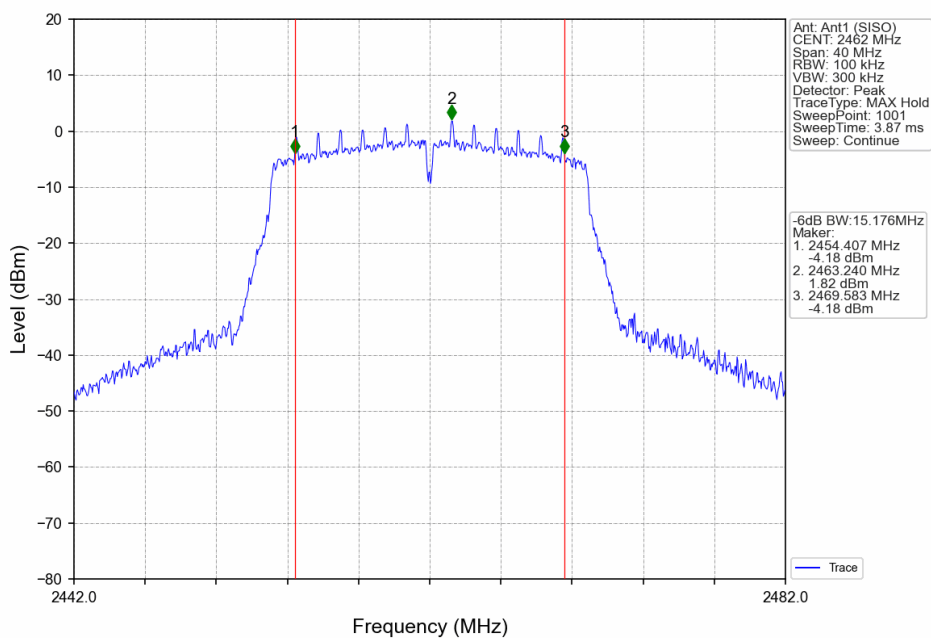
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



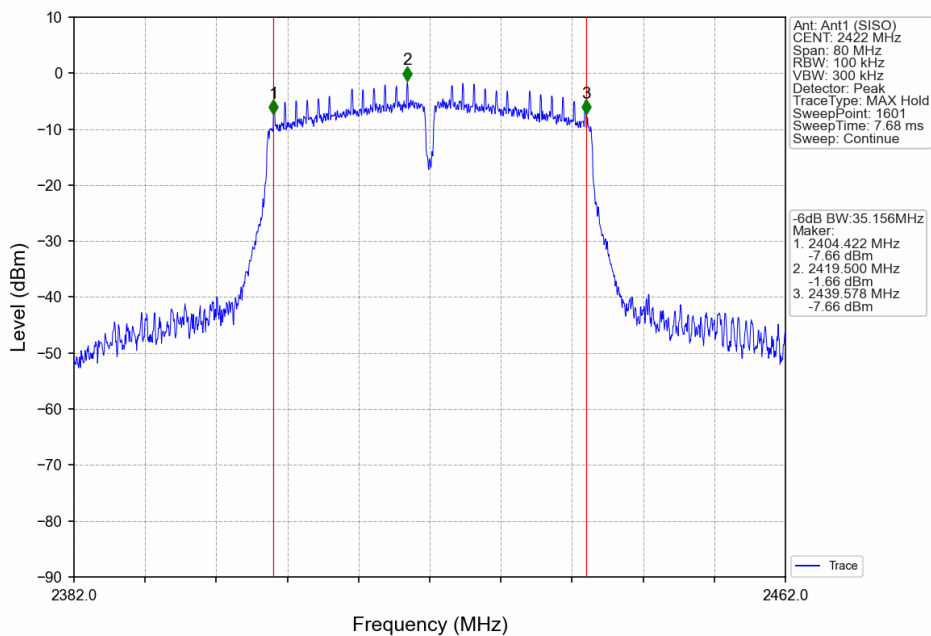
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



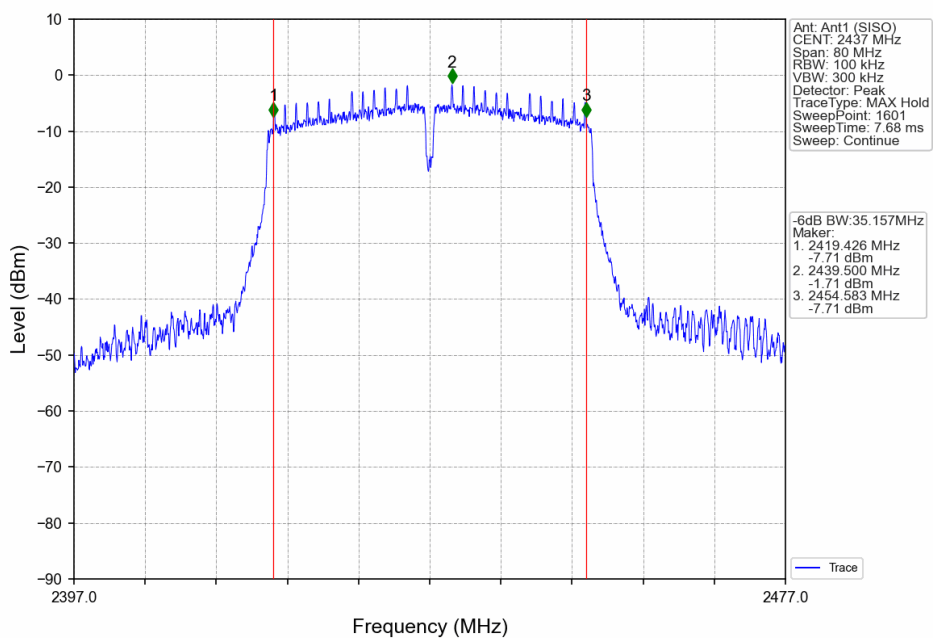
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



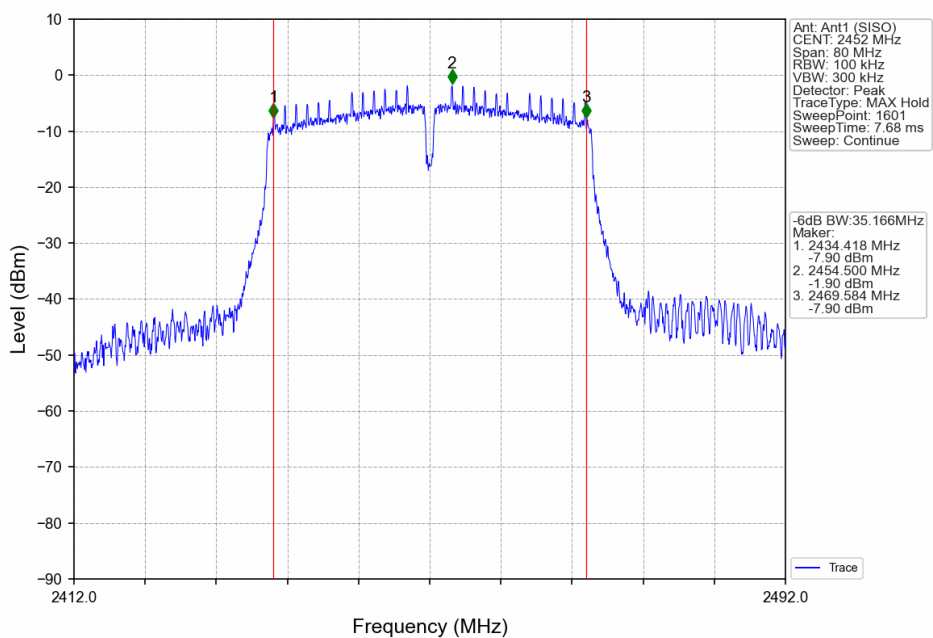
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_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	19.82	<=30	Pass
		2437	19.22	<=30	Pass
		2462	19.21	<=30	Pass
802.11g	SISO	2412	19.58	<=30	Pass
		2437	19.40	<=30	Pass
		2462	19.44	<=30	Pass
802.11n (HT20)	SISO	2412	19.26	<=30	Pass
		2437	19.19	<=30	Pass
		2462	19.20	<=30	Pass
802.11n (HT40)	SISO	2422	19.25	<=30	Pass
		2437	19.17	<=30	Pass
		2452	19.16	<=30	Pass

Note1: Antenna Gain: Ant1: 2.41dBi;

4. Maximum Power Spectral Density

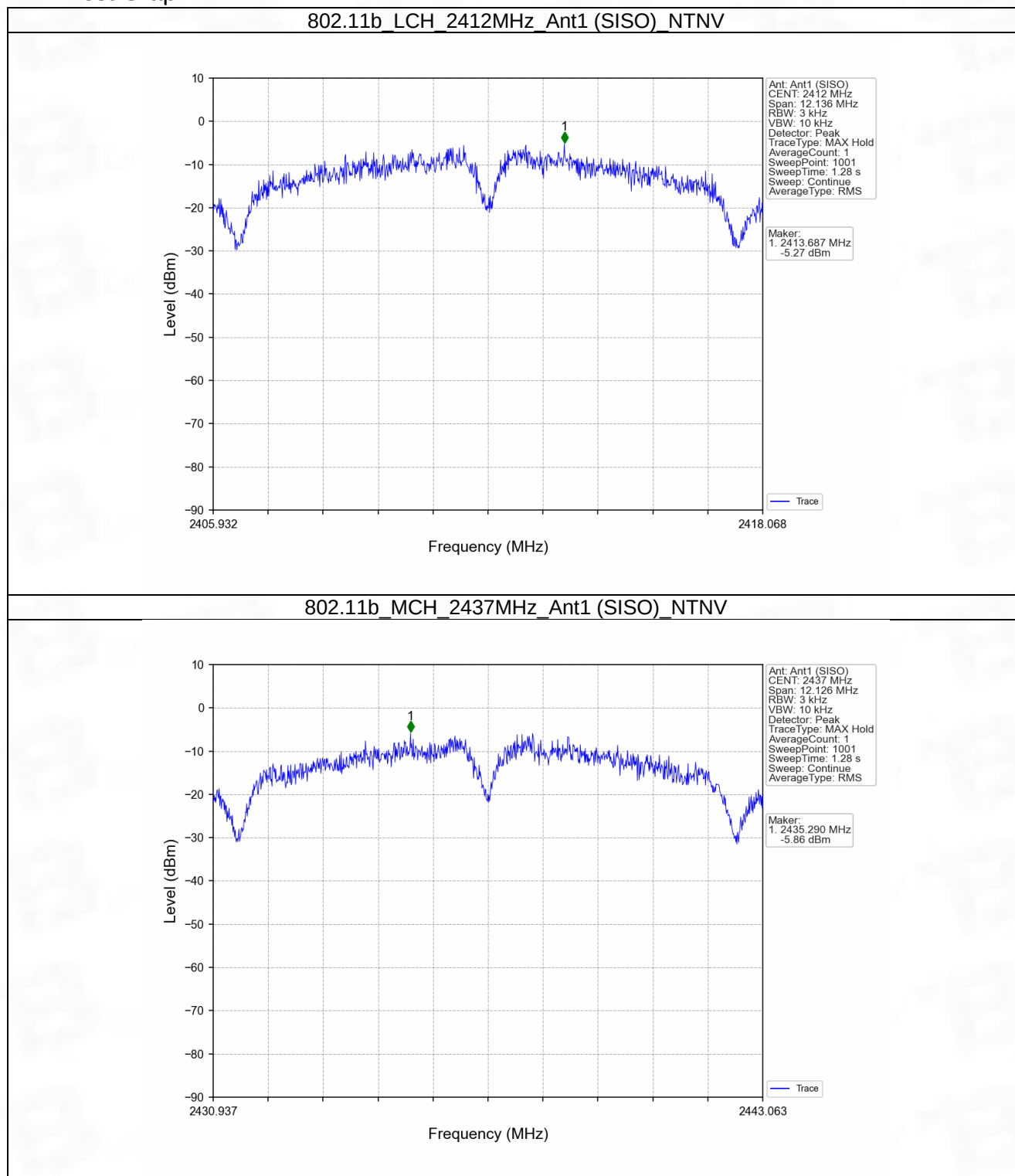
4.1 PSD

4.1.1 Test Result

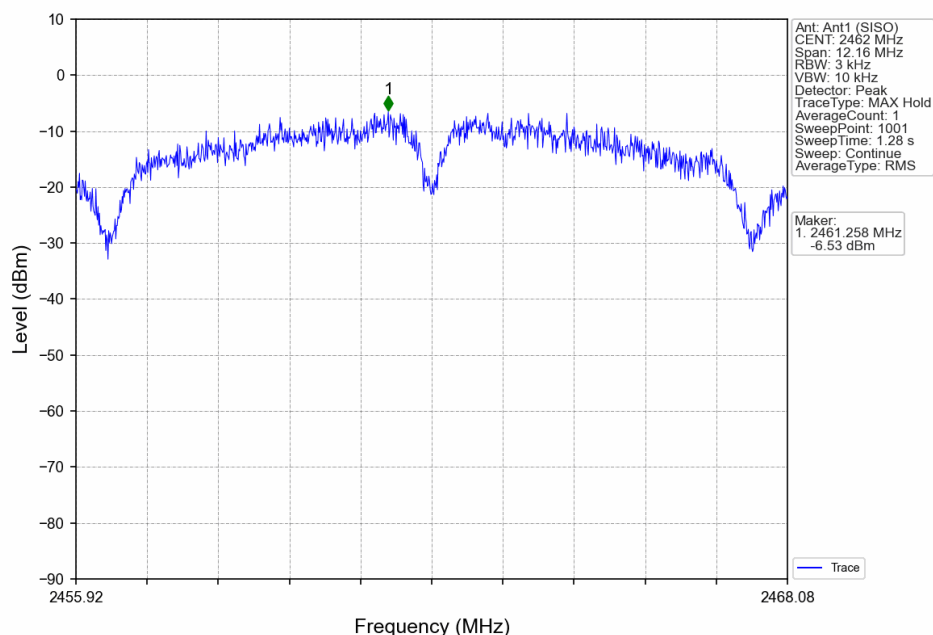
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-5.27	<=8	Pass
		2437	-5.86	<=8	Pass
		2462	-6.53	<=8	Pass
802.11g	SISO	2412	-13.35	<=8	Pass
		2437	-12.51	<=8	Pass
		2462	-12.70	<=8	Pass
802.11n (HT20)	SISO	2412	-14.07	<=8	Pass
		2437	-13.08	<=8	Pass
		2462	-13.70	<=8	Pass
802.11n (HT40)	SISO	2422	-16.37	<=8	Pass
		2437	-16.60	<=8	Pass
		2452	-16.73	<=8	Pass

Note1: Antenna Gain: Ant1: 2.41dBi;

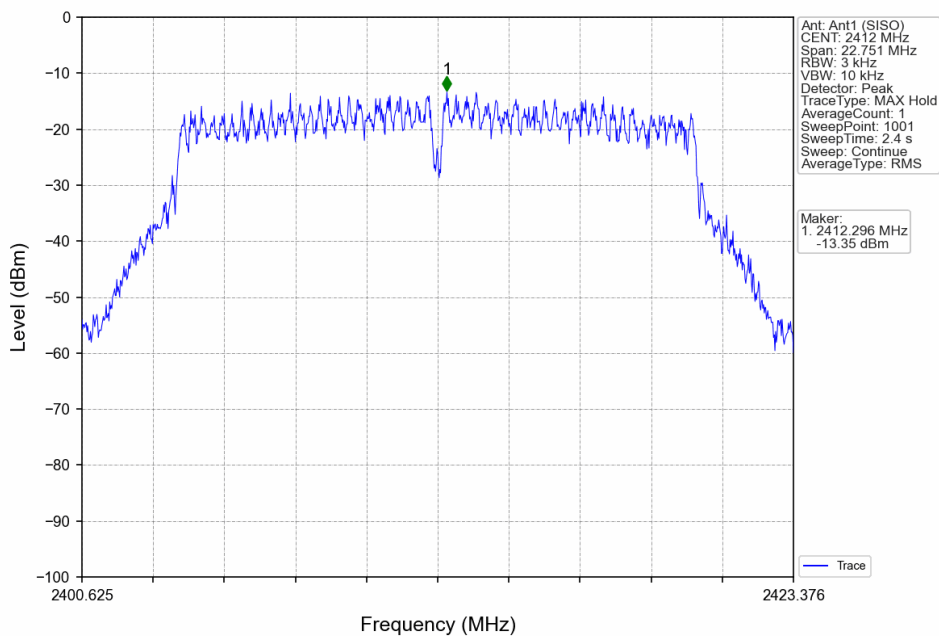
4.1.2 Test Graph



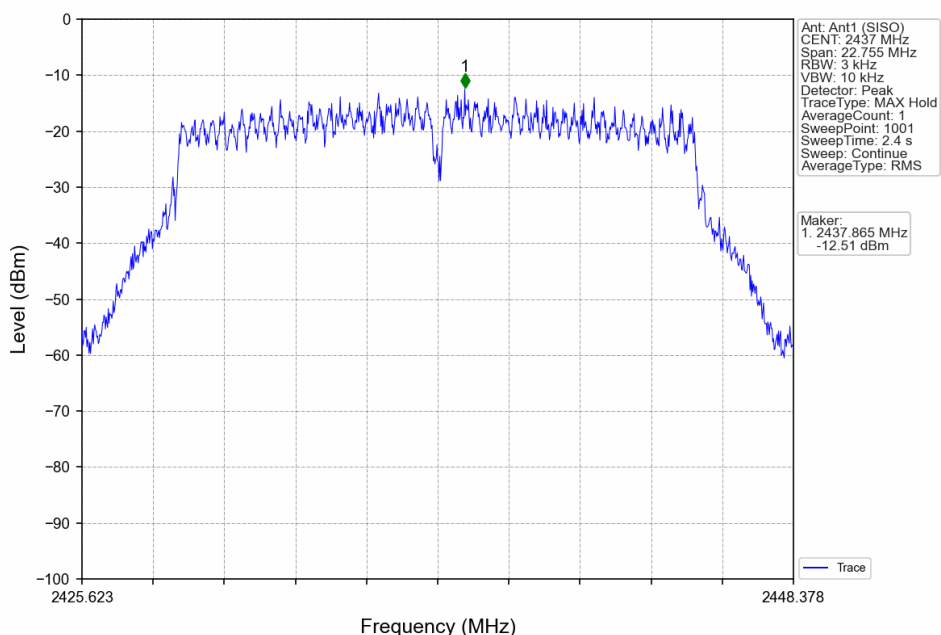
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV

