

Address:

RF Test Report

For

Applicant Name: Xwireless LLC

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

EUT Name: Mobile Phone

Brand Name: Vortex Model Number: C24

Issued By

Company Name: BTF Testing Lab (Shenzhen) Co., Ltd.

> F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen,

China

Report Number: BTF240419R00203 Test Standards: 47 CFR Part 15.247

Test Conclusion: Pass

2ADLJ-C24 FCC ID:

Test Date: 2024-04-20 to 2024-05-14

Date of Issue: 2024-05-15

Aria Zhang Prepared By:

Aria Zhang / Project Engine Prozh

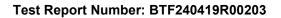
2024-05-15 Date:

Approved By:

Ryan.CJ / EMC Manager

2024-05-15 Date:

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	2024-05-15	Original	
Note: Once the	revision has been made, then pre	vious versions reports are invalid.	



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Test Report Number: BTF240419R00203



1 Introduction

1.1 Identification of Testing Laboratory

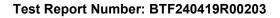
Company Name: BTF Testing Lab (Shenzhen) Co., Ltd.		
Address: F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China		
Phone Number:	+86-0755-23146130	
Fax Number:	+86-0755-23146130	

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

2.4 General Description of Equipment under Test (EUT)

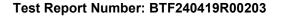
EUT Name:	Mobile Phone
Test Model Number:	C24

2.5 Technical Information

Power Supply:	DC 5V from adaptor or DC 3.8V from battery		
Power Adaptor:	Input:100-240V, 50/60Hz 0.15A Output:DC5.0V,1.0Amp		
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;		
Number of Channels:	802.11b/g/n(HT20): 11 Channels		
Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK); 802.11g: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n(HT20): OFDM (BPSK, QPSK, 16QAM, 64QAM)		
Antenna Type:	PIFA Antenna		
Antenna Gain#:	-0.37dBi		
Notes			

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

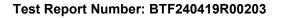
3.2 Uncertainty of Test

Item	Measurement Uncertainty
Conducted Emission (150 kHz-30 MHz)	±2.64dB
Occupied Bandwidth	±69kHz
Transmitter Power, Conducted	±0.87dB
Power Spectral Density	±0.69dB
Conducted Spurious Emissions	±0.95dB
Radiated Spurious Emissions (above 1GHz)	1-6GHz: ±3.94dB 6-18GHz: ±4.16dB
Radiated Spurious Emissions (30M - 1GHz)	±4.12dB

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.3 Summary of Test Result

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



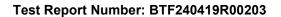


Test Configuration

Test Equipment List

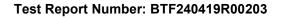
Conducted Emission at AC power line							
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date		
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00953	2023-11-13	2024-11-12		
Coaxial Switcher	SCHWARZBECK	CX210	CX210	2023-11-13	2024-11-12		
V-LISN	SCHWARZBECK	NSLK 8127	01073	2023-11-16	2024-11-15		
LISN	AFJ	LS16/110VAC	16010020076	2024-02-22	2025-02-21		
EMI Receiver	ROHDE&SCHWA RZ	ESCI3	101422	2023-11-15	2024-11-14		

Occupied Bandwidth Maximum Conducted Power Spectral Densi Emissions in non-res	ty	ands			
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RFTest software	1	V1.00	1	1	1
RF Control Unit	Techy	TR1029-1	1	2023-11-13	2024-11-12
RF Sensor Unit	Techy	TR1029-2	1	2023-11-13	2024-11-12
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2023-11-16	2024-11-15
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2023-11-13	2024-11-12
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2023-11-16	2024-11-15
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2023-11-16	2024-11-15





	Band edge emissions (Radiated) Emissions in frequency bands (below 1GHz)							
Emissions in frequent								
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date			
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2024-03-23	2025-03-22			
Preamplifier	SCHWARZBECK	BBV9744	00246	2023-11-13	2024-11-12			
RE Cable	REBES Talent	UF1-SMASMAM-1 0m	21101566	2023-11-13	2024-11-12			
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2023-11-13	2024-11-12			
RE Cable	REBES Talent	UF1-SMASMAM-1 m	21101568	2023-11-13	2024-11-12			
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2023-11-13	2024-11-12			
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2023-11-13	2024-11-12			
POSITIONAL CONTROLLER	SKET	PCI-GPIB	1	2023-11-13	2024-11-12			
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2023-11-13	2024-11-12			
EMI TEST RECEIVER	ROHDE&SCHWA RZ	ESCI7	101032	2023-11-16	2024-11-15			
SIGNAL ANALYZER	ROHDE&SCHWA RZ	FSQ40	100010	2023-11-16	2024-11-15			
POSITIONAL CONTROLLER	SKET	PCI-GPIB	1	2023-11-13	2024-11-12			
Broadband Preamplilifier	SCHWARZBECK	BBV9718D	00008	2024-03-23	2025-03-22			
Horn Antenna	SCHWARZBECK	BBHA9120D	2597	2024-05-21	2025-05-20			
EZ_EMC	Frad	FA-03A2 RE+	1	1	1			
POSITIONAL CONTROLLER	SKET	PCI-GPIB	1	2023-11-13	2024-11-12			
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2023-11-13	2024-11-12			



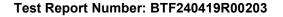


4.2 Test Auxiliary Equipment

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.





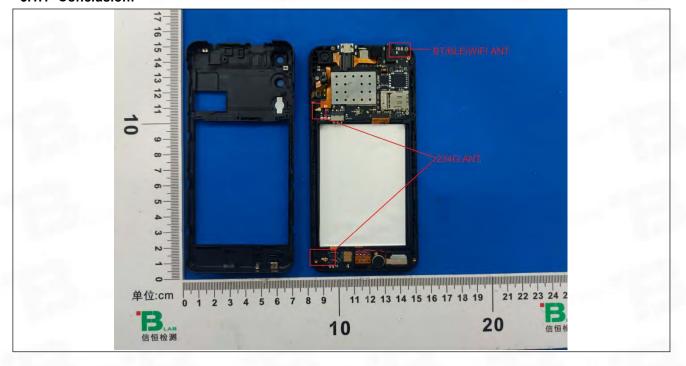
5 Evaluation Results (Evaluation)

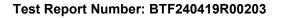
5.1 Antenna requirement

Test Requirement:

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

5.1.1 Conclusion:







Radio Spectrum Matter Test Results (RF) 6

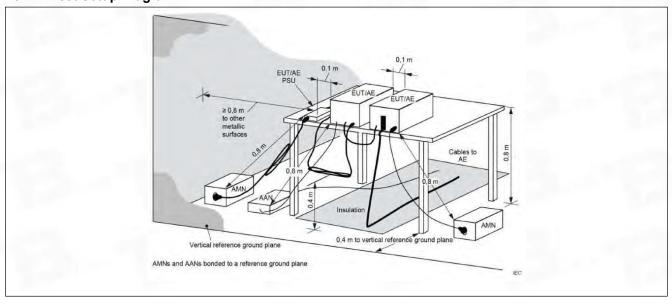
Conducted Emission at AC power line

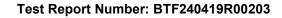
Test Requirement:	Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN).					
Test Method:	ANSI C63.10-2013 section 6.2					
	Frequency of emission (MHz)	Conducted limit (dBµV)				
		Quasi-peak	Average			
T41 ::4.	0.15-0.5	66 to 56*	56 to 46*			
Test Limit:	0.5-5	56	46			
	5-30	60	50			
	*Decreases with the logarithm of the frequency.					
Procedure:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices					

6.1.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.7 °C
Humidity:	52 %
Atmospheric Pressure:	1010 mbar

6.1.2 Test Setup Diagram:

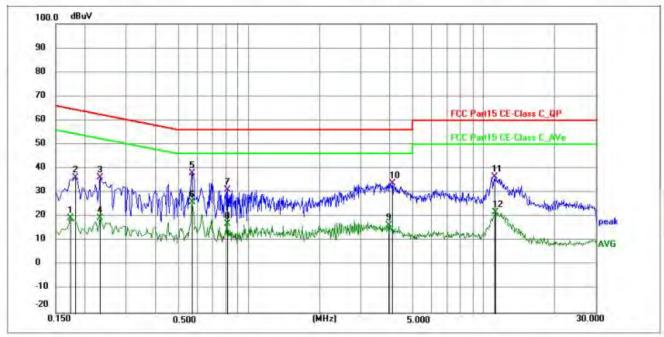




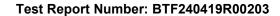


6.1.3 Test Data:

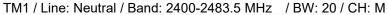
TM1 / Line: Line / Band: 2400-2483.5 MHz / BW: 20 / CH: M

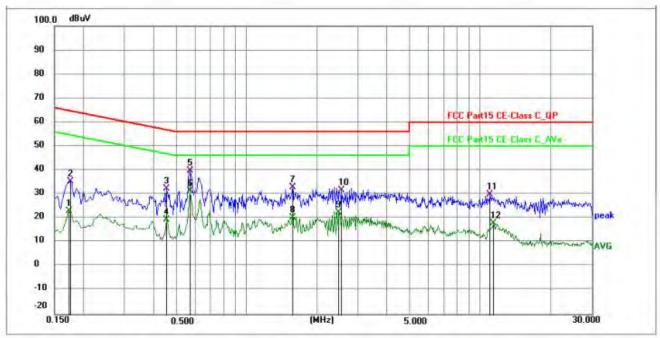


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1723	8.85	10.49	19.34	54.85	-35.51	AVG	Р	
2	0.1814	25.82	10.52	36.34	64.42	-28.08	QP	Р	
3	0.2310	25.55	10.56	36.11	62.41	-26.30	QP	P	
4	0.2310	8.87	10.56	19.43	52.41	-32.98	AVG	P	
5 *	0.5730	27.37	10.62	37.99	56.00	-18.01	QP	Р	
6	0.5730	15.47	10.62	26.09	46.00	-19.91	AVG	P	
7	0.8114	20.58	10.69	31.27	56.00	-24.73	QP	P	
8	0.8114	6.29	10.69	16.98	46.00	-29.02	AVG	Р	
9	3.9570	5.76	10.68	16.44	46.00	-29.56	AVG	Р	
10	4.0785	23.27	10.68	33.95	56.00	-22.05	QP	Р	
11	11.0850	25.69	10.86	36.55	60.00	-23.45	QP	Р	
12	11.2290	10.87	10.86	21.73	50.00	-28.27	AVG	P	

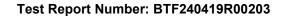








No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1724	12.52	10.49	23.01	54.84	-31.83	AVG	Р	
2	0.1758	24.81	10.51	35.32	64.68	-29.36	QP	P	
3	0.4515	21.88	10.57	32.45	56.85	-24.40	QP	Р	
4	0.4515	8.82	10.57	19.39	46.85	-27.46	AVG	Р	
5	0.5730	29.09	10.62	39.71	56.00	-16.29	QP	Р	
6 *	0.5730	20.97	10.62	31.59	46.00	-14.41	AVG	P	
7	1.5765	22.39	10.66	33.05	56.00	-22.95	QP	P	
8	1.5809	9.60	10.66	20.26	46.00	-25.74	AVG	Р	
9	2.4855	11.69	10.67	22.36	46.00	-23.64	AVG	P	
10	2.5530	21.03	10.67	31.70	56.00	-24.30	QP	P	
11	11.0084	19.04	10.84	29.88	60.00	-30.12	QP	P	
12	11.4270	7.19	10.84	18.03	50.00	-31.97	AVG	Р	





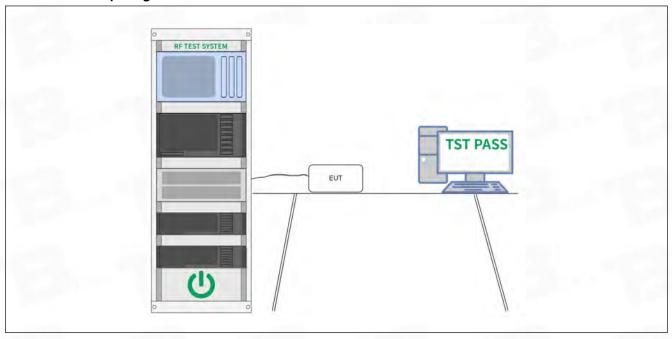
6.2 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Method:	ANSI C63.10-2013, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Procedure:	a) Set RBW = 100 kHz. b) Set the VBW >= [3 × RBW]. c) Detector = peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

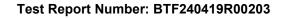
6.2.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	50 %
Atmospheric Pressure:	1010 mbar

6.2.2 Test Setup Diagram:



6.2.3 Test Data:





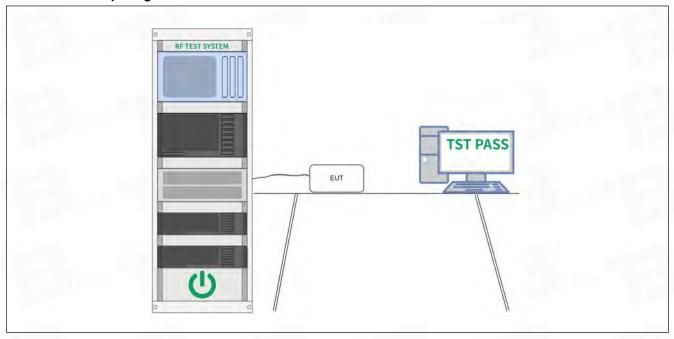
6.3 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Method:	ANSI C63.10-2013, section 11.9.1 KDB 558074 D01 15.247 Meas Guidance v05r02
Test Limit:	Refer to 47 CFR 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Procedure:	ANSI C63.10-2013, section 11.9.1 Maximum peak conducted output power

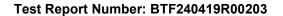
6.3.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	50 %
Atmospheric Pressure:	1010 mbar

6.3.2 Test Setup Diagram:



6.3.3 Test Data:





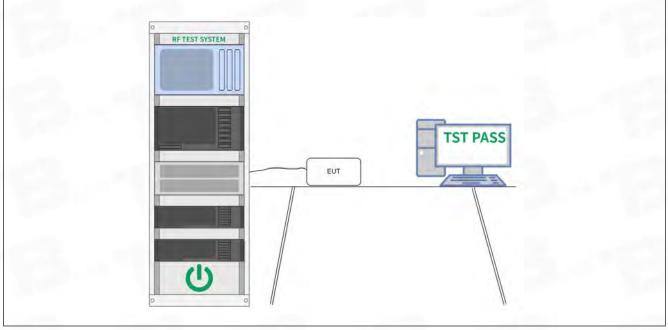
6.4 Power Spectral Density

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

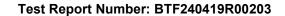
6.4.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	50 %
Atmospheric Pressure:	1010 mbar

6.4.2 Test Setup Diagram:



6.4.3 Test Data:





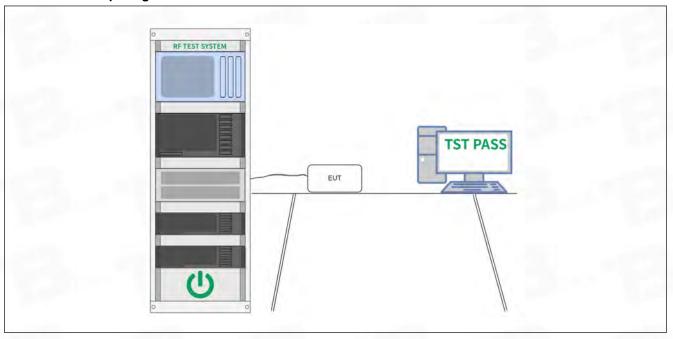
6.5 Emissions in non-restricted frequency bands

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

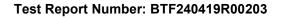
6.5.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.3 °C
Humidity:	50 %
Atmospheric Pressure:	1010 mbar

6.5.2 Test Setup Diagram:



6.5.3 Test Data:





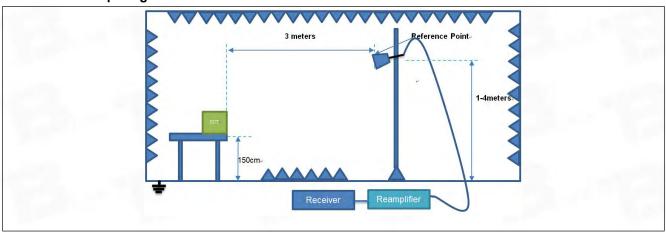
6.6 Band edge emissions (Radiated)

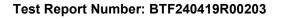
Test Requirement:	Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).						
Test Method:		ANSI C63.10-2013 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02					
	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				
Test Limit:	Above 960	500	3				
	radiators operating under 54-72 MHz, 76-88 MHz, these frequency bands in 15.231 and 15.241. In the emission table about the emission limits shown and allowed the same than 110–490 kHz and above	paragraph (g), fundamental emer this section shall not be located 174-216 MHz or 470-806 MHz. It is permitted under other sections ove, the tighter limit applies at the win in the above table are based si-peak detector except for the feat 1000 MHz. Radiated emission	ed in the frequency bands. However, operation within s of this part, e.g., §§ ne band edges. on measurements frequency bands 9–90 kHz, limits in these three bands				
	are based on measurem	ients employing an average det	ector.				
Procedure:	ANSI C63.10-2013 secti	on 6.10.5.2					

6.6.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.7 °C
Humidity:	52 %
Atmospheric Pressure:	1010 mbar

6.6.2 Test Setup Diagram:







6.6.3 Test Data:

Note: All the mode have been tested, and only the worst case of mode are in the report

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

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2310.00	61.21	3.39	64.60	74.00	-9.40	peak
2	2310.00	41.63	3.39	45.02	54.00	-8.98	AV
3	2390.00	61.02	3.45	64.47	74.00	-9.53	peak
4	2390.00	40.93	3.45	44.38	54.00	-9.62	AV

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

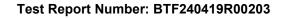
No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2310.00	61.24	3.39	64.63	74.00	-9.37	peak
2	2310.00	41.25	3.39	44.64	54.00	-9.36	AV
3	2390.00	61.52	3.45	64.97	74.00	-9.03	peak
4	2390.00	41.39	3.45	44.84	54.00	-9.16	AV

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

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.50	63.02	3.52	66.54	74.00	-7.46	peak
2	2483.50	43.27	3.52	46.79	54.00	-7.21	AV
3	2500.00	61.31	3.53	64.84	74.00	-9.16	peak
4	2500.00	41.67	3.53	45.20	54.00	-8.80	AV

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

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.50	63.03	3.52	66.55	74.00	-7.45	peak
2	2483.50	42.67	3.52	46.19	54.00	-7.81	AV
3	2500.00	64.70	3.53	68.23	74.00	-5.77	peak
4	2500.00	44.52	3.53	48.05	54.00	-5.95	AV





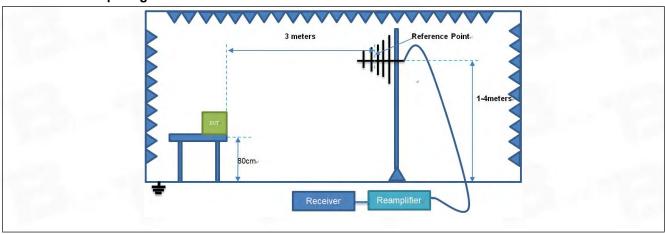
6.7 Emissions in frequency bands (below 1GHz)

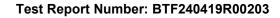
Test Requirement:	Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`					
Test Method:	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02					
	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			
Test Limit:	Above 960	500	3			
	radiators operating under 54-72 MHz, 76-88 MHz, these frequency bands is 15.231 and 15.241. In the emission table about the emission limits show employing a CISPR quasi	paragraph (g), fundamental em this section shall not be locate 174-216 MHz or 470-806 MHz. permitted under other sections eve, the tighter limit applies at the in the above table are based si-peak detector except for the f 1000 MHz. Radiated emission	ed in the frequency bands However, operation within s of this part, e.g., §§ ne band edges. on measurements requency bands 9–90 kHz,			
	are based on measurements employing an average detector.					
Procedure:	ANSI C63.10-2013 section	on 6.6.4				

6.7.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.6 °C
Humidity:	52 %
Atmospheric Pressure:	1010 mbar

6.7.2 Test Setup Diagram:

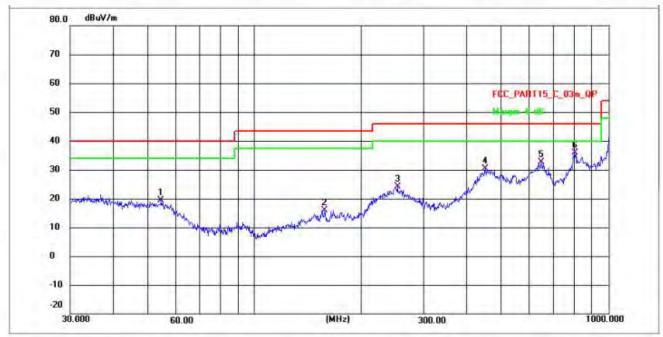




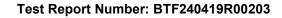


6.7.3 Test Data:

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

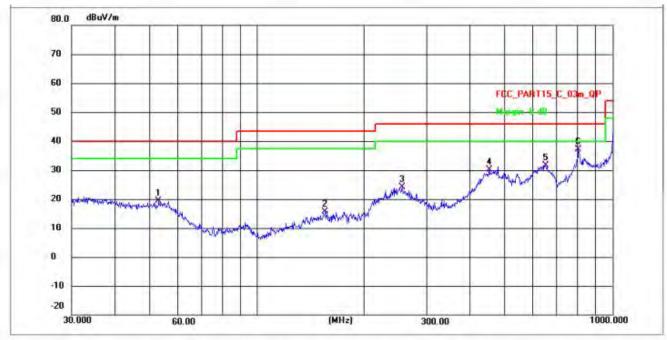


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	54.4515	20.61	-1.22	19.39	40.00	-20.61	QP	Р
2	157.8353	35.55	-19.57	15.98	43.50	-27.52	QP	Р
3	253.8366	33.17	-9.11	24.06	46.00	-21.94	QP	Р
4	448.7683	36.14	-5.69	30.45	46.00	-15.55	QP	Р
5	647.3856	41.34	-8.60	32.74	46.00	-13.26	QP	Р
6 *	808.8459	44.82	-8.92	35.90	46.00	-10.10	QP	Р

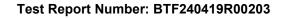








No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	52.7600	22.98	-3.52	19.46	40.00	-20.54	QP	Р
2	155.6370	22.05	-6.44	15.61	43.50	-27.89	QP	Р
3	256.0717	21.71	2.51	24.22	46.00	-21.78	QP	Р
4	450.3447	25.43	4.58	30.01	46.00	-15.99	QP	P
5	650.7997	40.21	-8.61	31.60	46.00	-14.40	QP	Р
6 *	801.7863	45.98	-8.91	37.07	46.00	-8.93	QP	Р





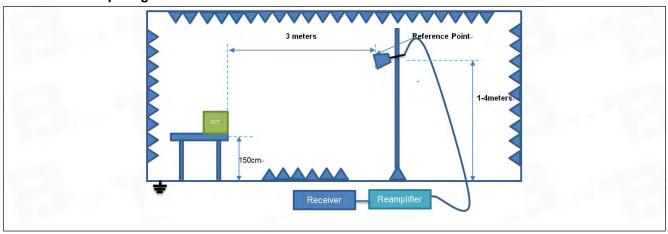
6.8 Emissions in frequency bands (above 1GHz)

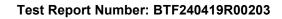
Test Requirement:		ssions which fall in the restricted in the restricted in the madiated emission c)).`						
Test Method:	ANSI C63.10-2013 secti KDB 558074 D01 15.24	on 6.6.4 7 Meas Guidance v05r02						
	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)					
	0.009-0.490	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					
Test Limit:	Above 960	500	3					
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges.							
	The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.							
Procedure:	ANSI C63.10-2013 secti	on 6.6.4						

6.8.1 E.U.T. Operation:

Operating Environment:	
Temperature:	24.7 °C
Humidity:	52 %
Atmospheric Pressure:	1010 mbar

6.8.2 Test Setup Diagram:







6.8.3 Test Data:

Note: All the mode have been tested, and only the worst case of mode are in the report

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	4824.000	81.11	-49.31	31.80	74.00	-42.20	peak	P
2	7236.000	87.25	-47.64	39.61	74.00	-34.39	peak	Р
3	9648.000	89.32	-45.95	43.37	74.00	-30.63	peak	Р

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	4824.000	81.42	-49.31	32.11	74.00	-41.89	peak	Р
2	7236.000	87.56	-47.64	39.92	74.00	-34.08	peak	Р
3	9648.000	89.63	-45.95	43.68	74.00	-30.32	peak	P

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	4874.000	85.38	-49.34	36.04	74.00	-37.96	peak	Р
2	7311.000	87.39	-47.51	39.88	74.00	-34.12	peak	Р
3	9748.000	85.32	-45.91	39.41	74.00	-34.59	peak	P

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	4874.000	85.77	-49.34	36.43	74.00	-37.57	peak	Р
2	7311.000	87.78	-47.51	40.27	74.00	-33.73	peak	Р
3	9748.000	85.71	-45.91	39.80	74.00	-34.20	peak	Р





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

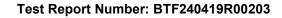
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	4924.000	83.27	-49.25	34.02	74.00	-39.98	peak	Р
2	7386.000	87.70	-47.25	40.45	74.00	-33.55	peak	Р
3	9848.000	88.57	-45.74	42.83	74.00	-31.17	peak	P

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	4924.000	82.92	-49.25	33.67	74.00	-40.33	peak	Р
2	7386.000	87.35	-47.25	40.10	74.00	-33.90	peak	Р
3	9848.000	88.22	-45.74	42.48	74.00	-31.52	peak	P

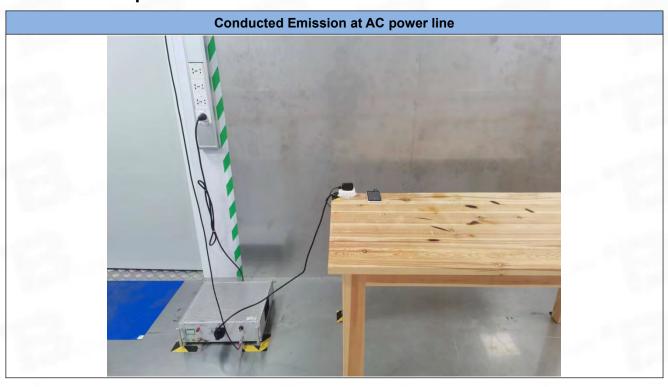
Note:

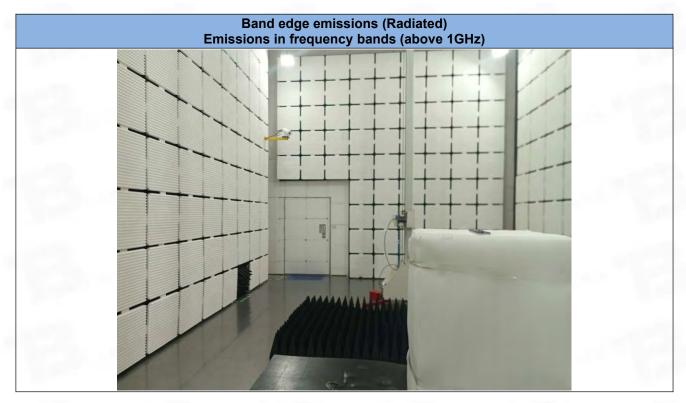
Because the peak value is less than the AV limit 54dBuV/m, the AV value is not evaluated

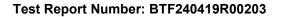




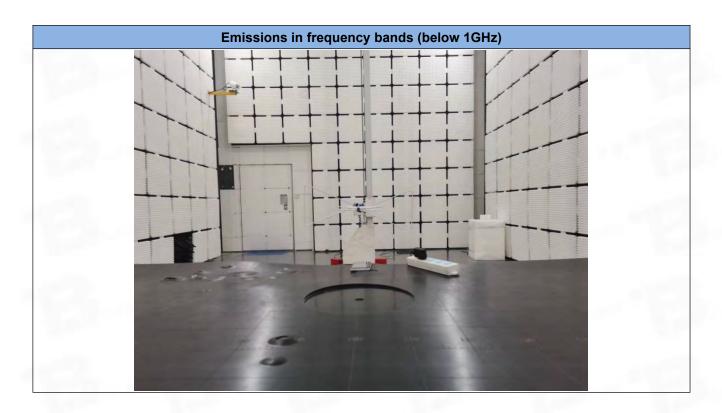
Test Setup Photos

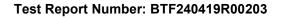














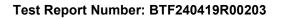
EUT Constructional Details (EUT Photos)

Please refer to the test report No. BTF240419R00901





Appendix





1. Duty Cycle

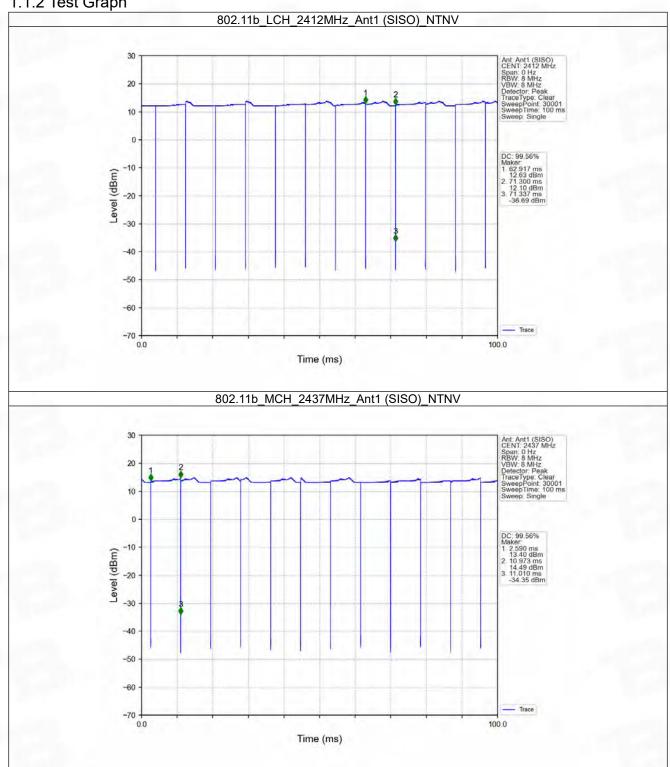
1.1 Ant1

1.1.1 Test Result

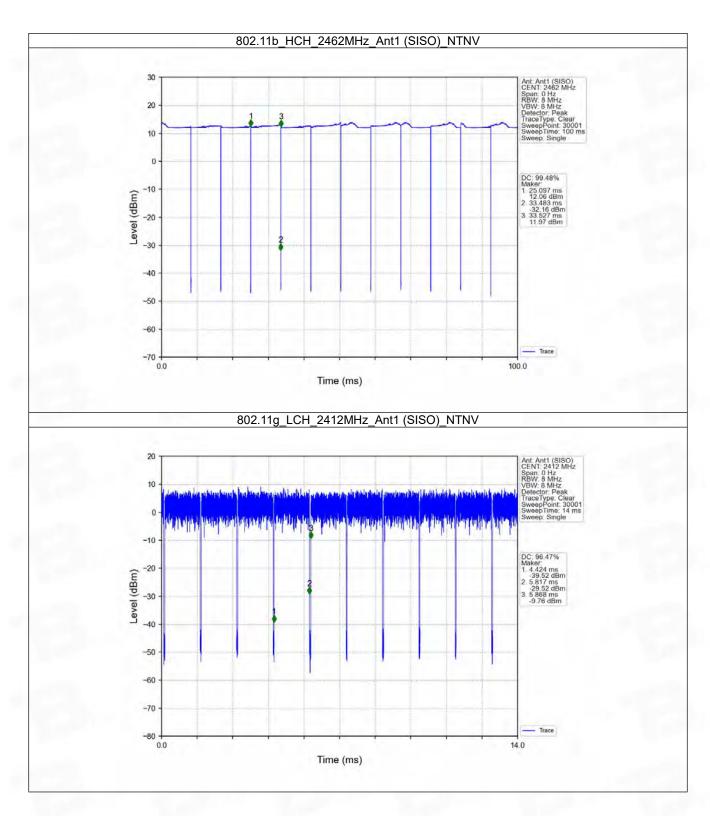
					Ant1		
Mode	TX	Frequency	T_on	Period	Duty Cycle	Duty Cycle	Max. DC
wode	Туре	(MHz)	(ms)	(ms)	(%)	Correction Factor (dB)	Variation (%)
		2412	8.383	8.420	99.56	0.02	0.04
802.11b	SISO	2437	8.383	8.420	99.56	0.02	0.04
		2462	8.386	8.430	99.48	0.02	0.08
		2412	1.393	1.444	96.47	0.16	1.23
802.11g	SISO	2437	1.393	1.444	96.47	0.16	1.23
		2462	1.393	1.471	94.70	0.24	3.01
000 11n		2412	1.301	1.343	96.87	0.14	0.64
802.11n	SISO	2437	1.301	1.343	96.87	0.14	0.68
(HT20)	, [2462	1.302	1.353	96.23	0.17	1.31



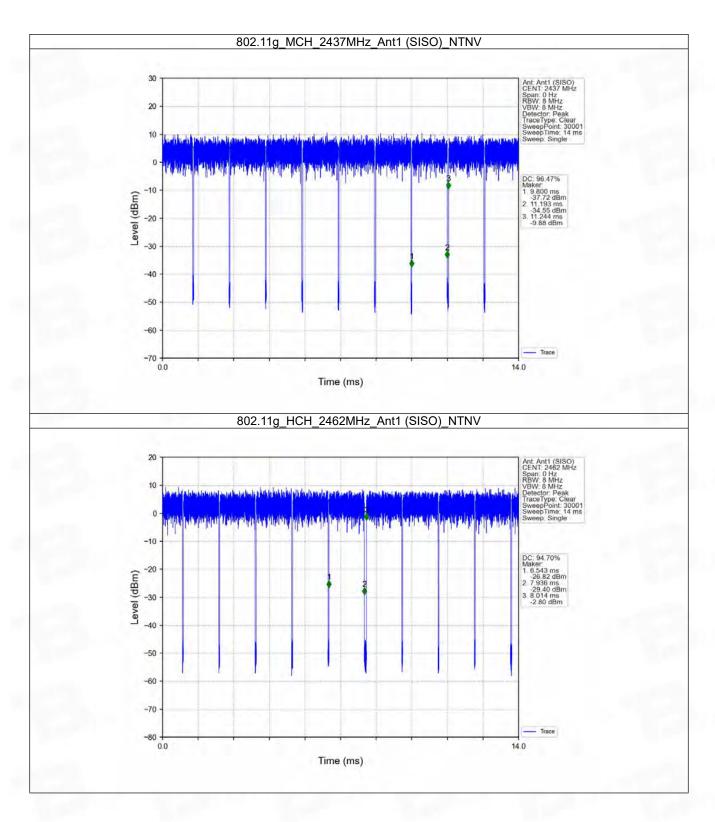
1.1.2 Test Graph



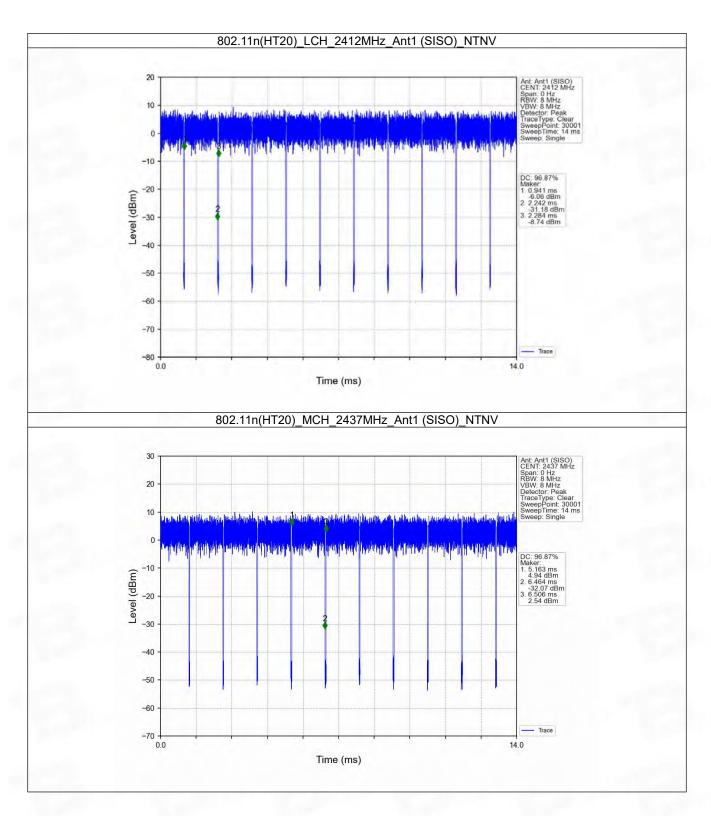




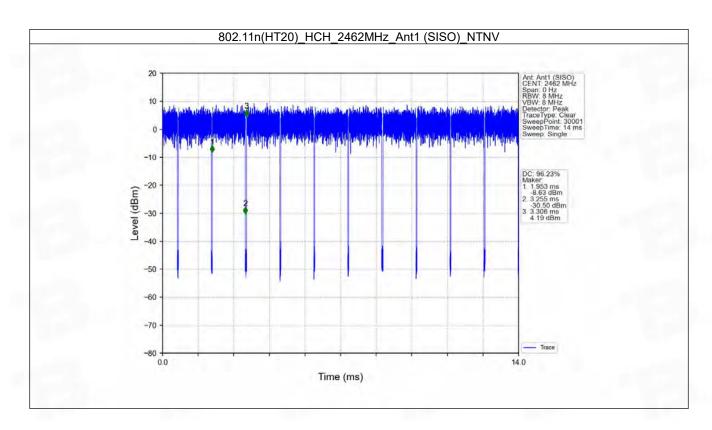


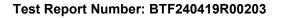














2. Bandwidth

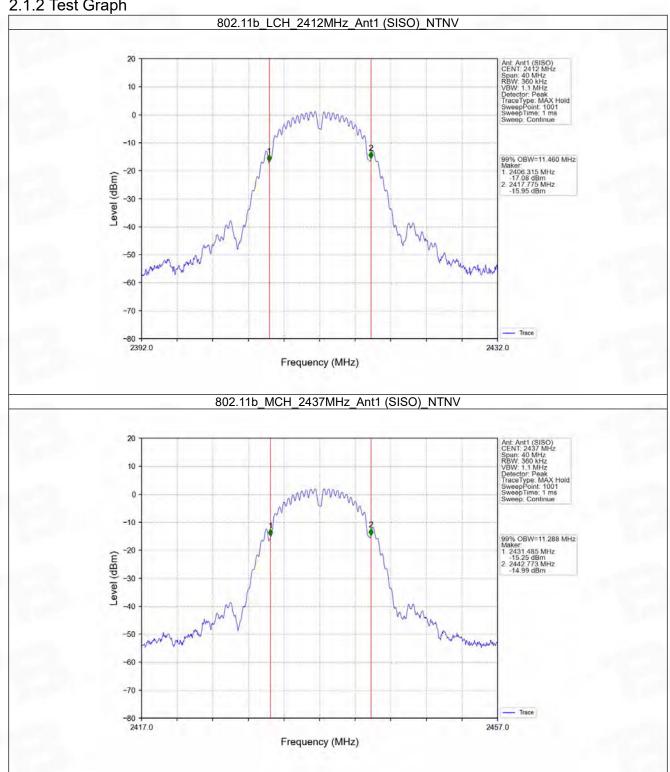
2.1 OBW

2.1.1 Test Result

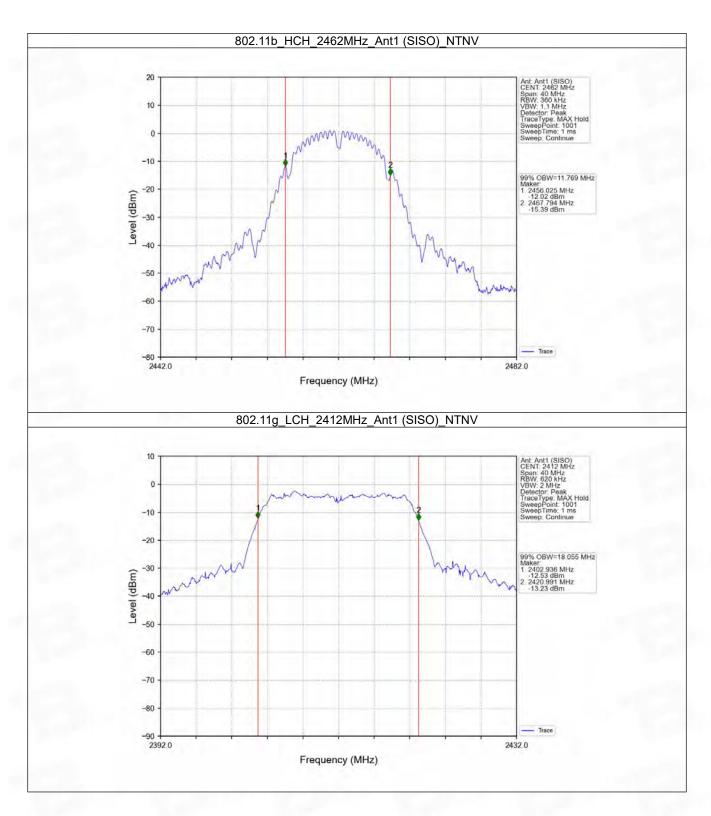
Mode	TX	Frequency		99% Occupied Bandwidth (MHz)		\/li4	
	Type		Result	Limit	Verdict		
		2412	1	11.460	1	Pass	
802.11b	SISO	2437	1	11.288	1	Pass	
		2462	1	11.769	1	Pass	
802.11g	SISO		2412	1	18.055	1	Pass
		2437	1	18.048	1	Pass	
		2462	1	18.116	1	Pass	
802.11n (HT20)	000 44		2412	1	18.713	1	Pass
	SISO	2437	1	18.726	1	Pass	
		2462	1	18.774	1	Pass	



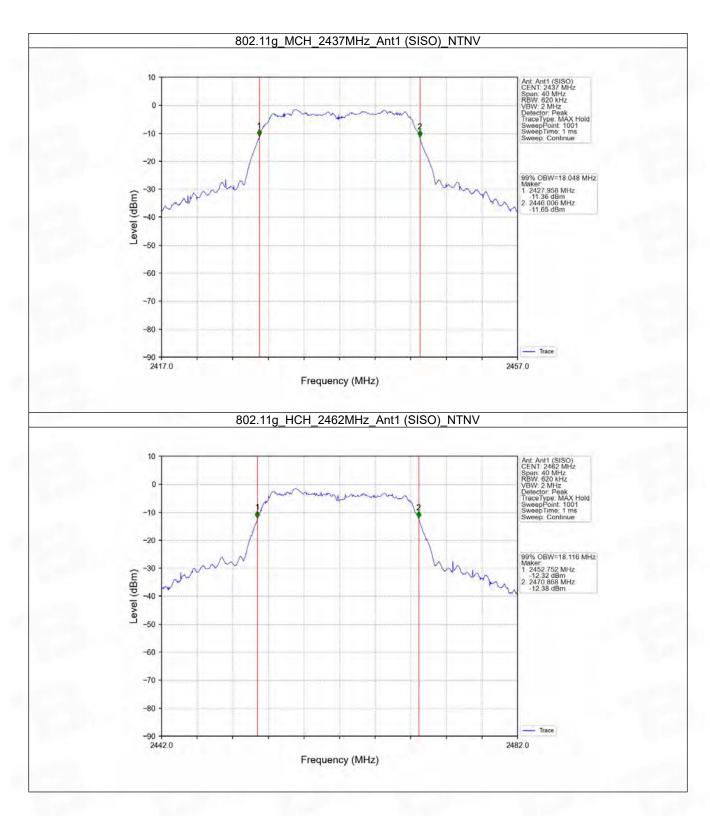
2.1.2 Test Graph



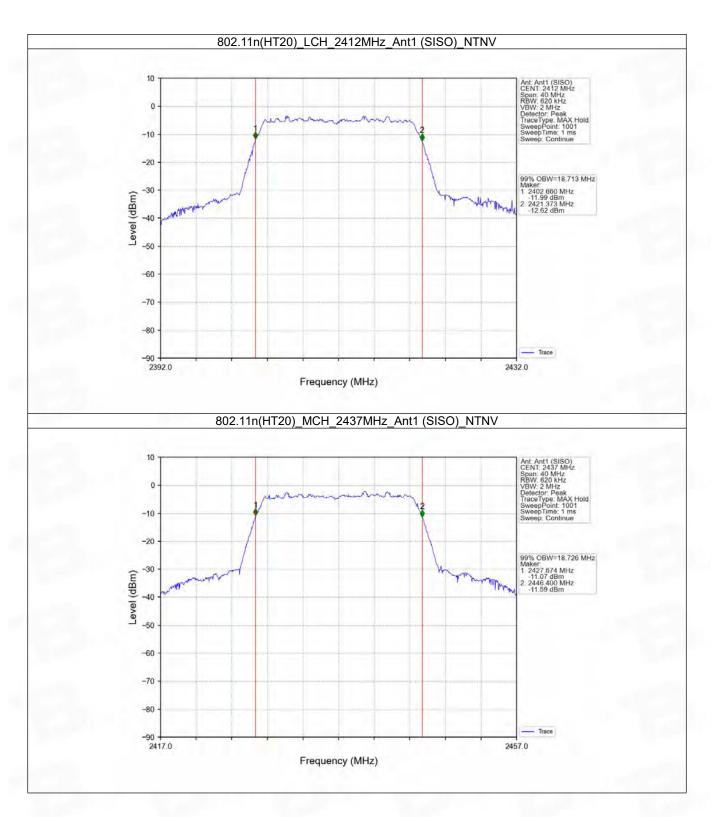




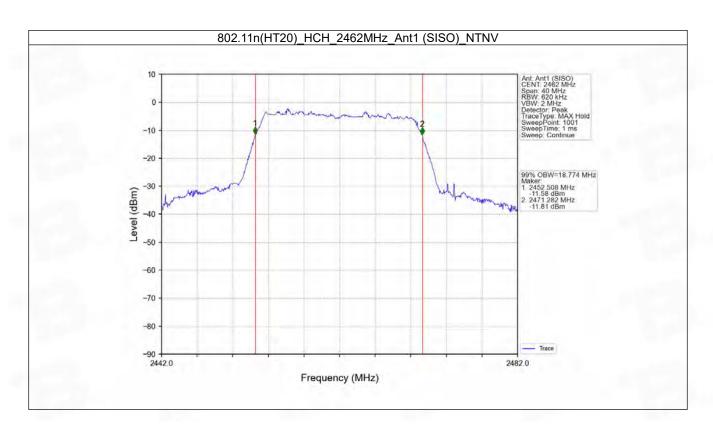


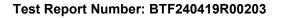














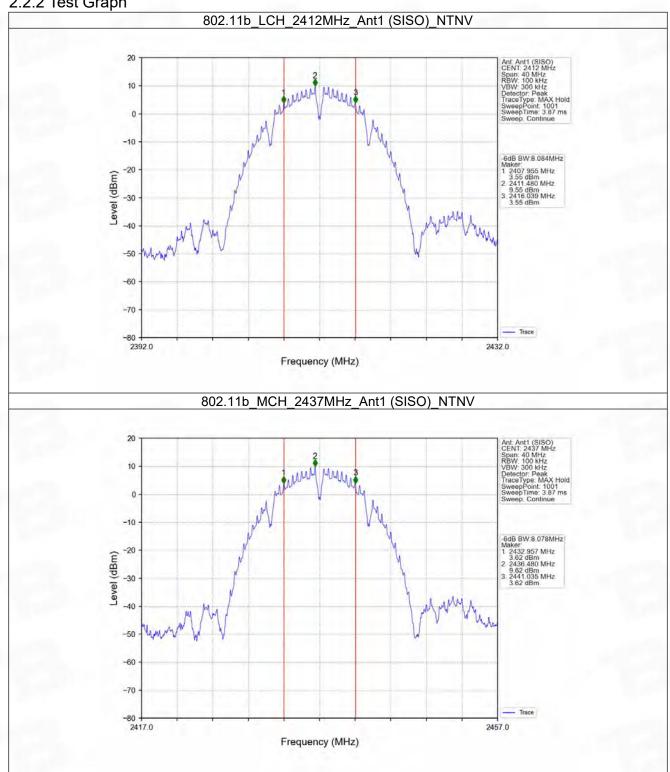
2.2 6dB BW

2.2.1 Test Result

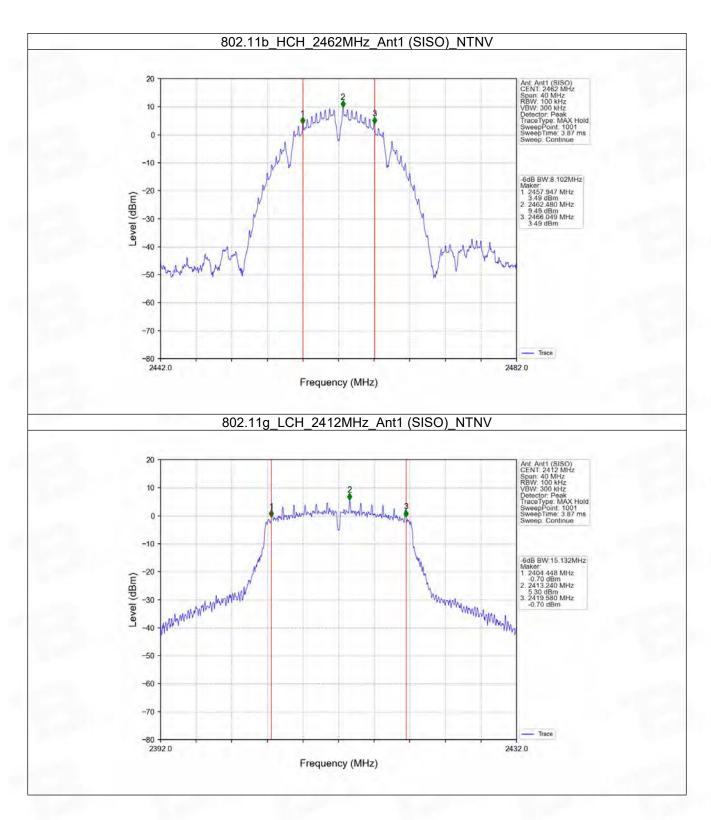
Mode	TX	Frequency	ANT	6dB Bandwidth (MHz)		\	
	Type	(MHz)	ANI	Result	Limit	Verdict	
		2412	1	8.084	>=0.5	Pass	
802.11b	SISO	2437	1	8.078	>=0.5	Pass	
		2462	1	8.102	>=0.5	Pass	
802.11g	SISO		2412	1	15.132	>=0.5	Pass
		2437	1	15.174	>=0.5	Pass	
		2462	1	15.172	>=0.5	Pass	
802.11n (HT20)	SISO	2412	1	15.172	>=0.5	Pass	
		2437	1	15.165	>=0.5	Pass	
		2462	1	15.165	>=0.5	Pass	



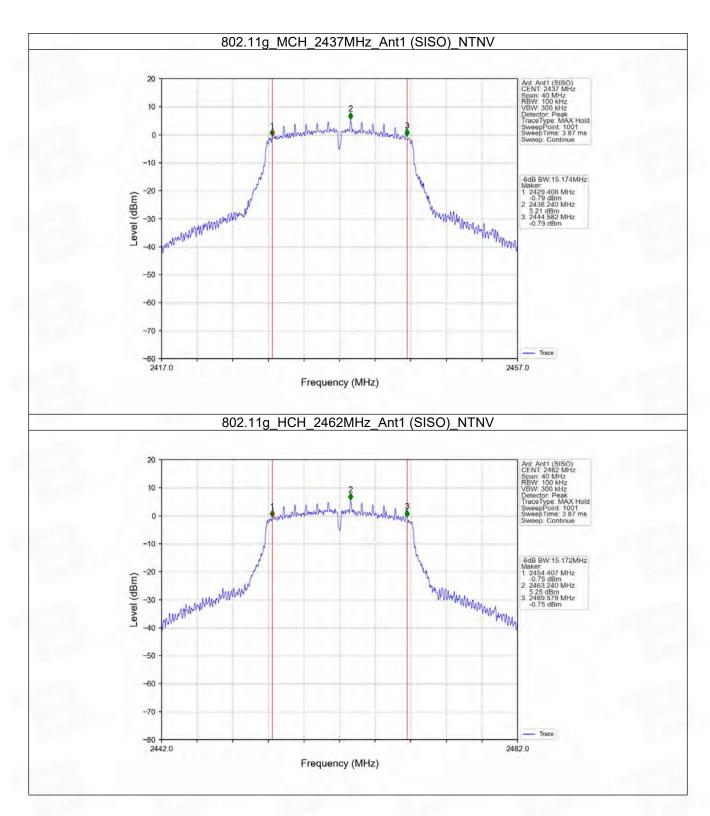
2.2.2 Test Graph



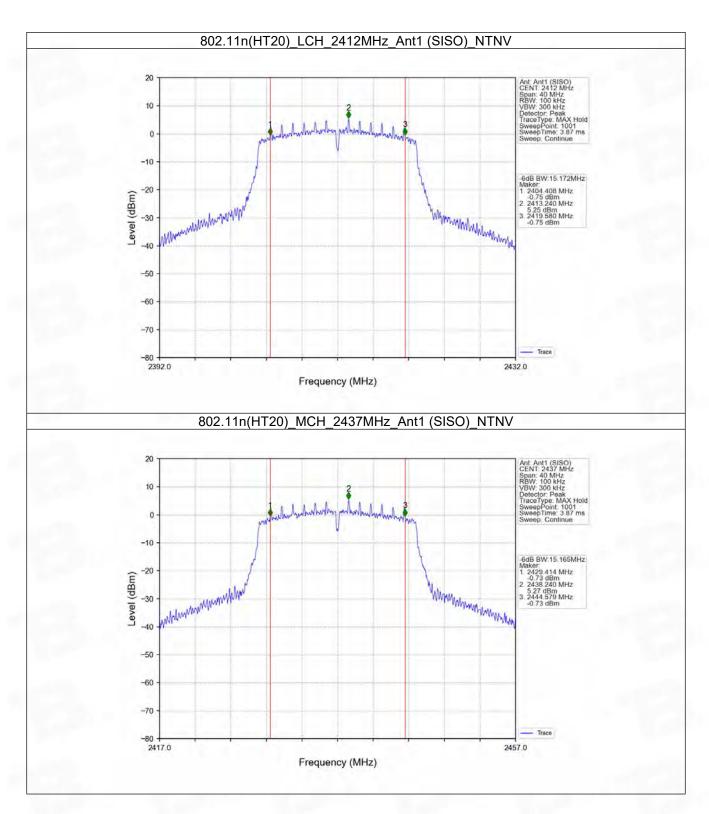




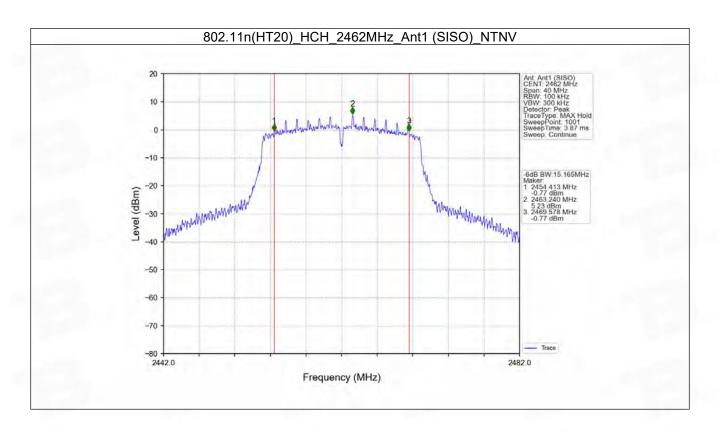


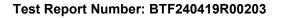














3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mada	TX	Frequency	Maximum Peak Conduc	cted Output Power (dBm)	\
Mode	Туре	(MHz)	ANT1	Limit	Verdict
		2412	11.89	<=30	Pass
802.11b	SISO	2437	12.17	<=30	Pass
		2462	12.08	<=30	Pass
		2412	11.51	<=30	Pass
802.11g	SISO	2437	11.40	<=30	Pass
		2462	11.41	<=30	Pass
802.11n (HT20)	SISO	2412	11.54	<=30	Pass
		2437	11.91	<=30	Pass
		2462	11.74	<=30	Pass

4. Maximum Power Spectral Density

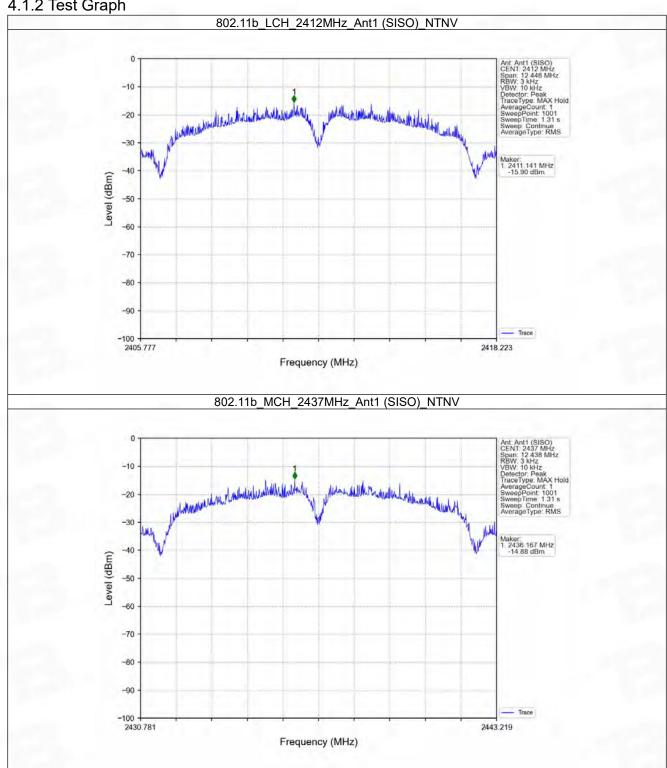
4.1 PSD

4.1.1 Test Result

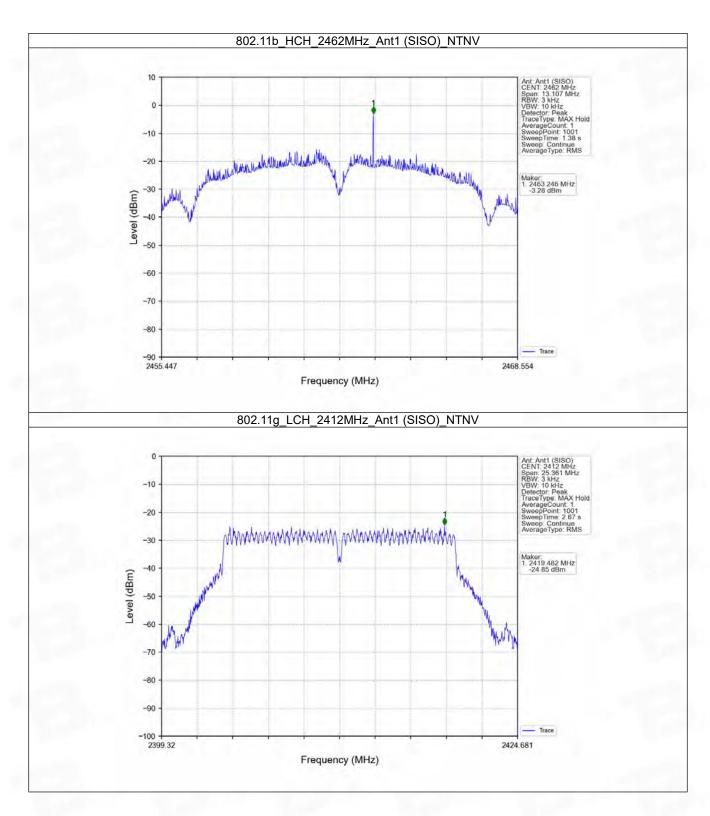
Mode	TX	Frequency	Maximum PSD (dBm/3kHz)		\
wode	Туре	(MHz)	ANT1	Limit	Verdict
		2412	-15.90	<=8	Pass
802.11b	SISO	2437	-14.88	<=8	Pass
		2462	-3.28	<=8	Pass
802.11g	SISO	2412	-24.85	<=8	Pass
		2437	-22.63	<=8	Pass
		2462	-23.09	<=8	Pass
802.11n (HT20)		2412	-24.97	<=8	Pass
	SISO	2437	-23.95	<=8	Pass
		2462	-24.88	<=8	Pass



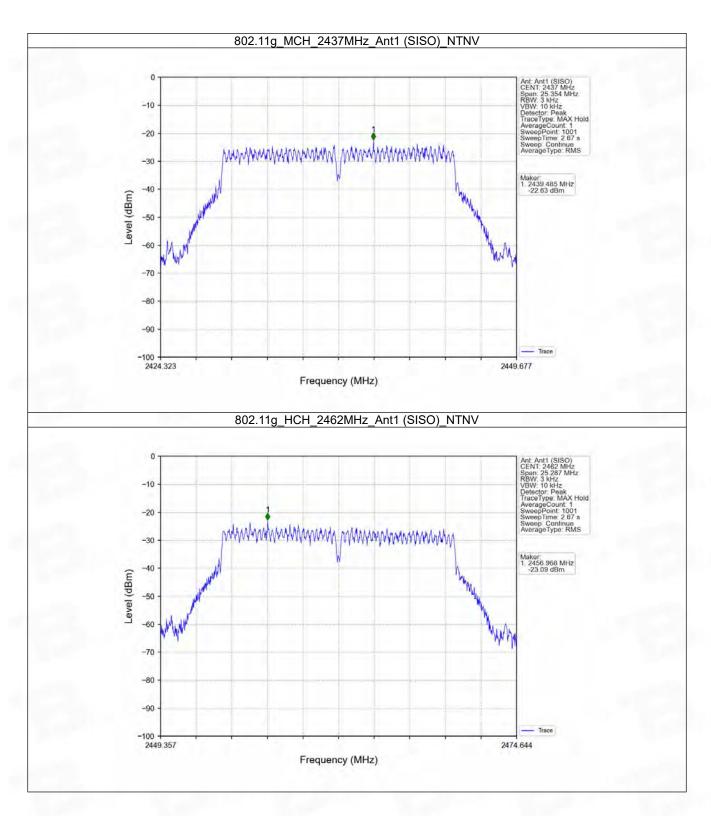
4.1.2 Test Graph



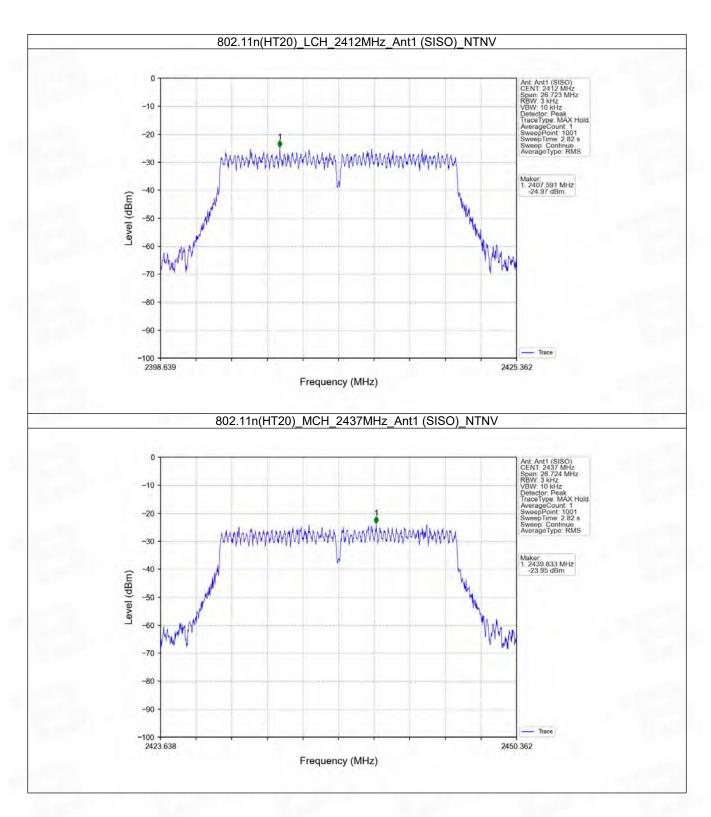




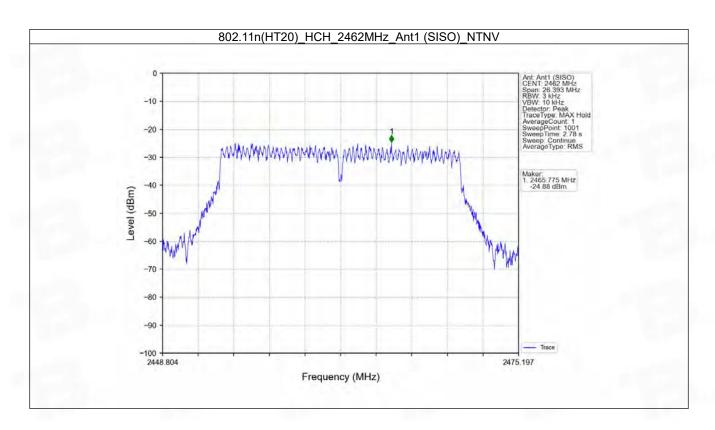


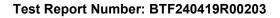














5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Ref

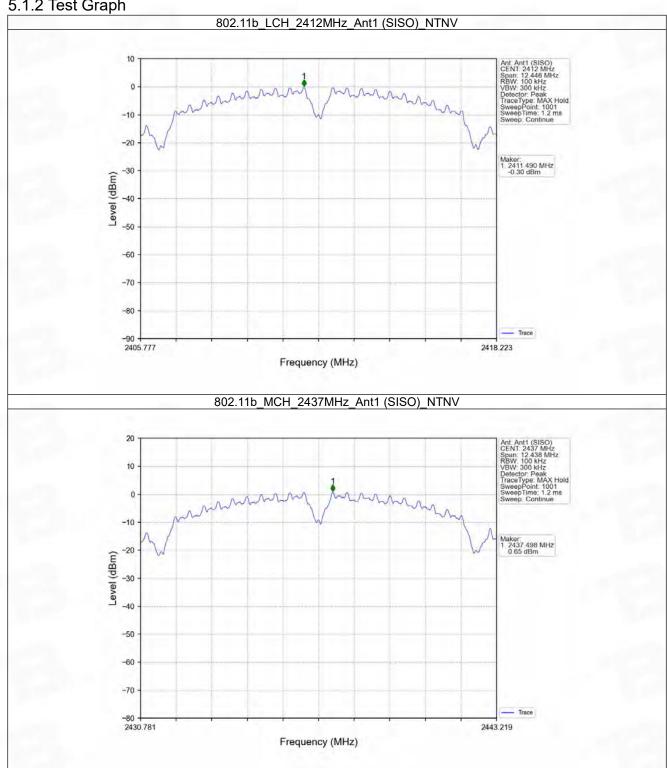
5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
		2412	1	-0.30
802.11b	SISO	2437	1	0.65
		2462	1	-0.49
	SISO	2412	1	-8.59
802.11g		2437	1	-7.25
		2462	1	-7.75
802.11n (HT20)	SISO	2412	1	-9.13
		2437	1	-7.89
(11120)		2462	1	-8.20

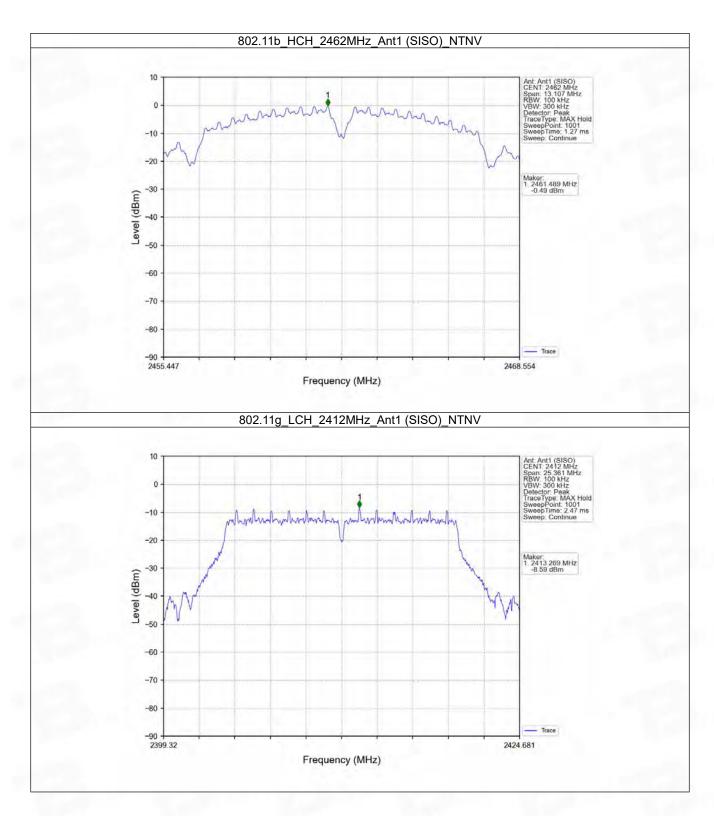
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.



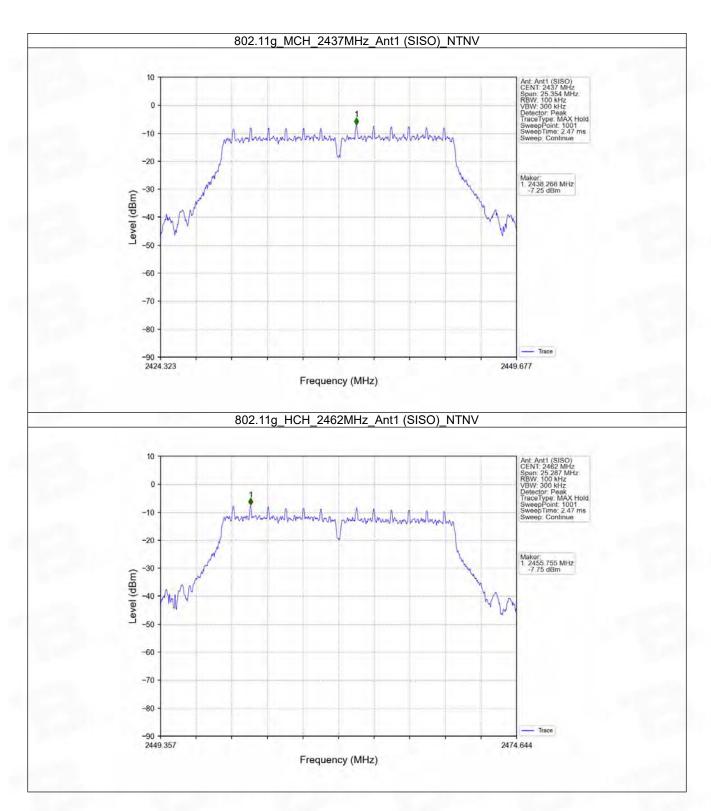
5.1.2 Test Graph



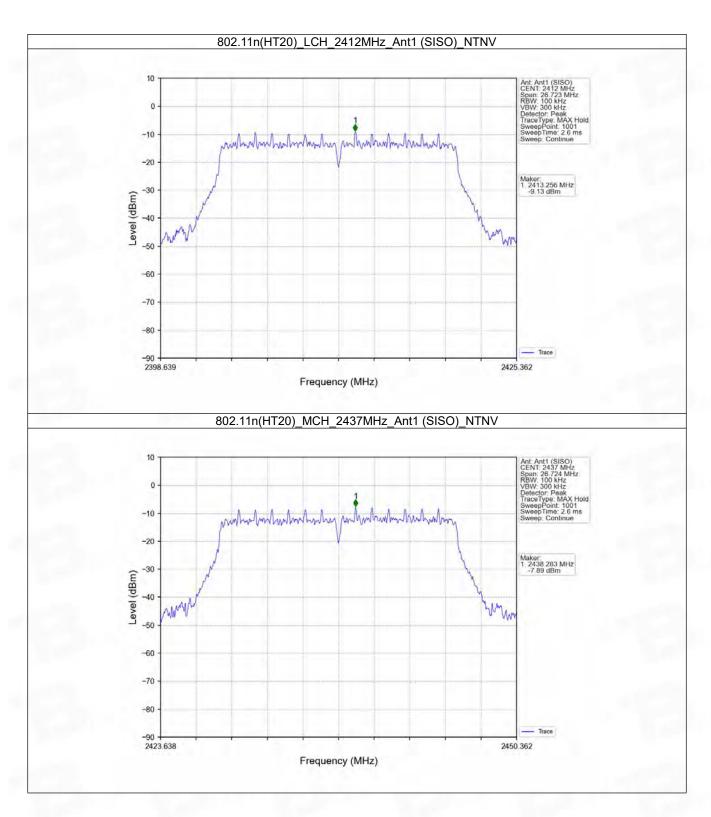




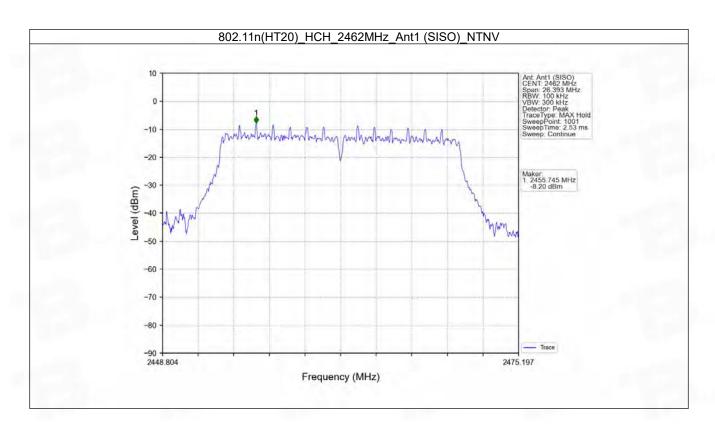


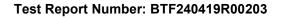














5.2 CSE

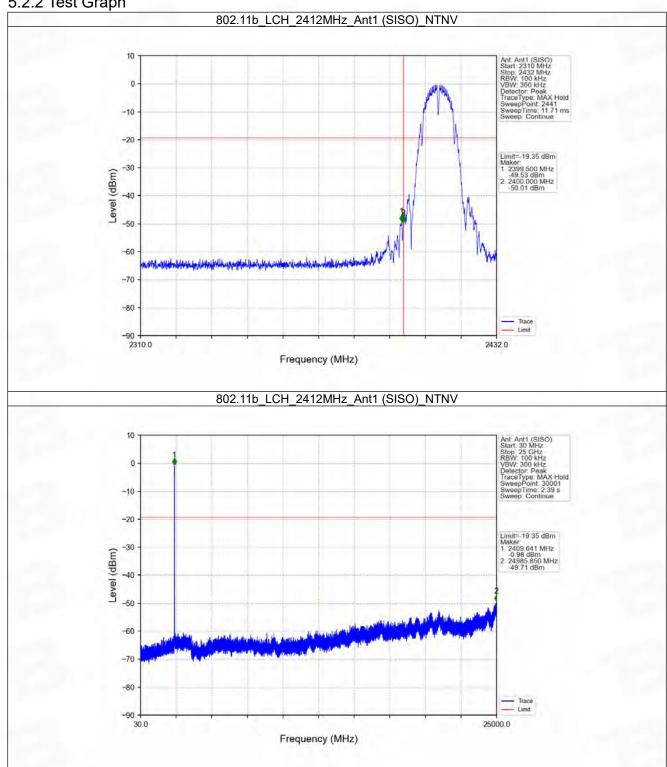
5.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict	
802.11b	•	2412	1	0.65	-19.35	Pass	
	SISO	2437	1	0.65	-19.35	Pass	
		2462	1	0.65	-19.35	Pass	
802.11g	SISO	2412	1	-7.25	-27.25	Pass	
		2437	1	-7.25	-27.25	Pass	
		2462	1	-7.25	-27.25	Pass	
802.11n (HT20)		2412	1	-7.89	-27.89	Pass	
		SISO	2437	1	-7.89	-27.89	Pass
	(0)	2462	1	-7.89	-27.89	Pass	

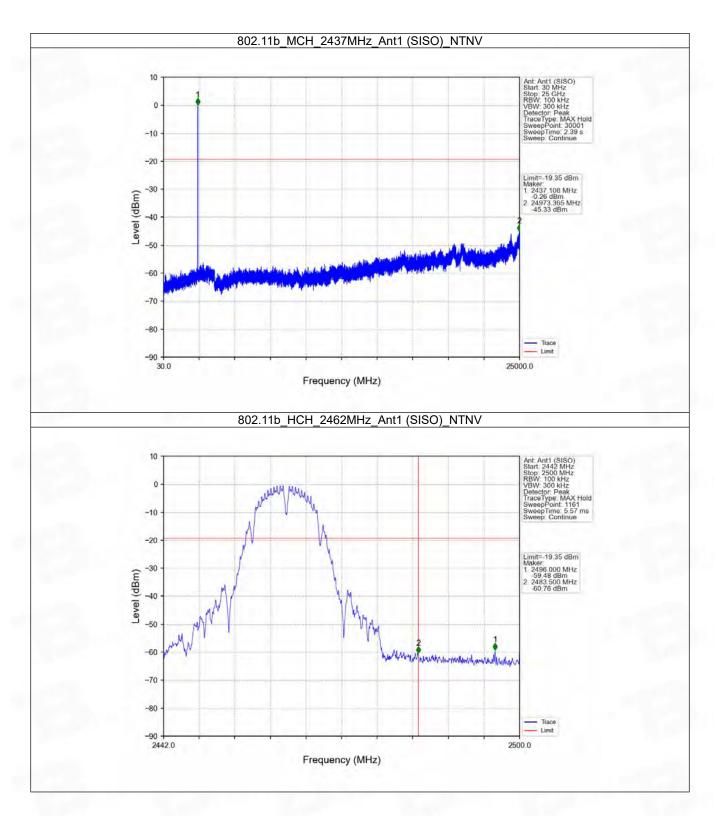
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.



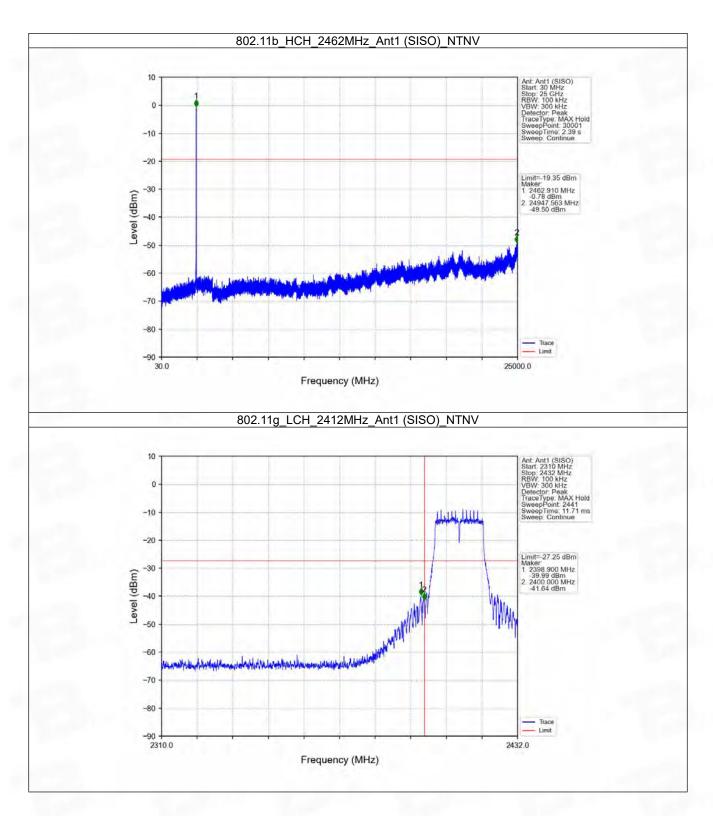
5.2.2 Test Graph



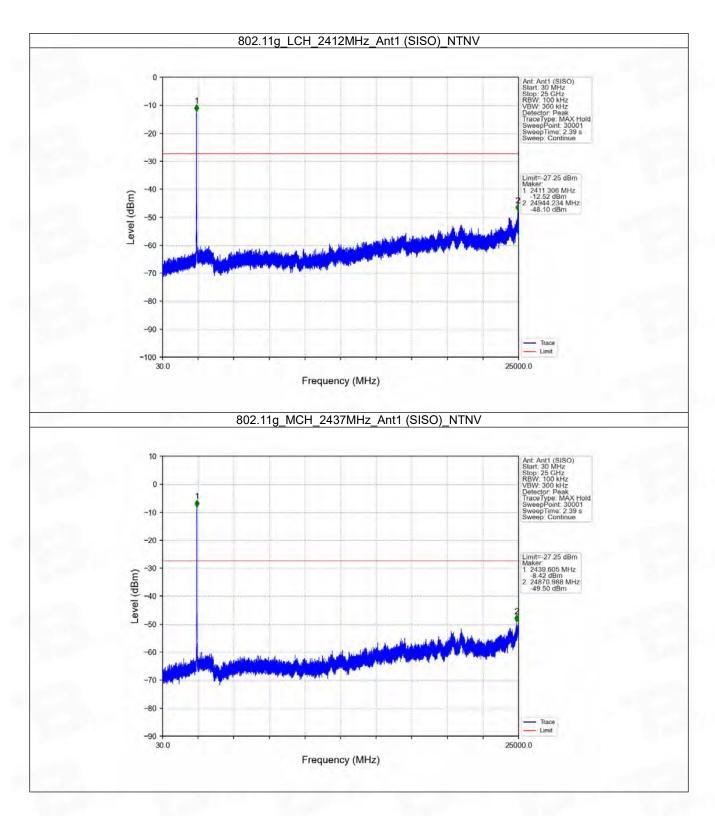




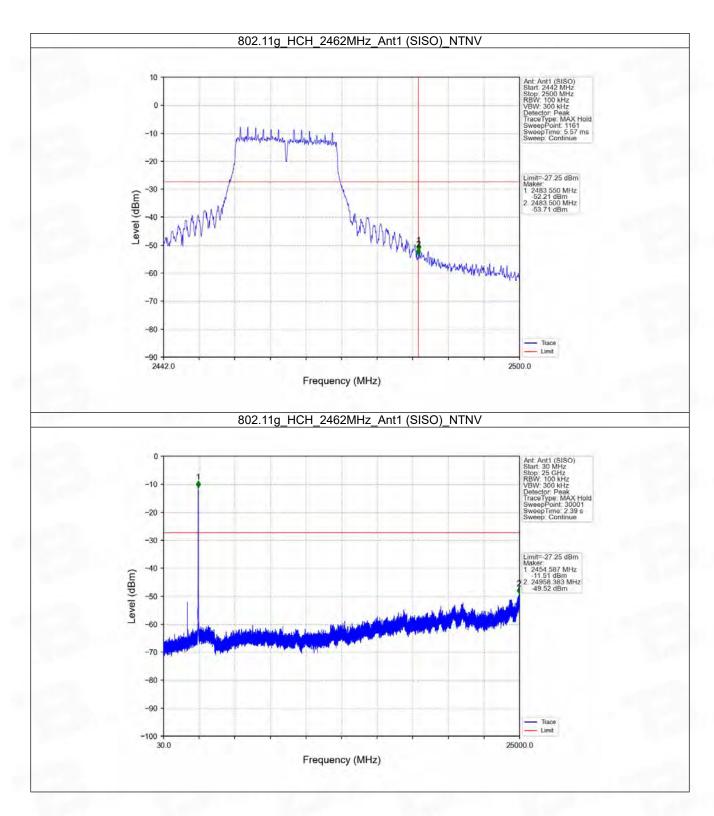




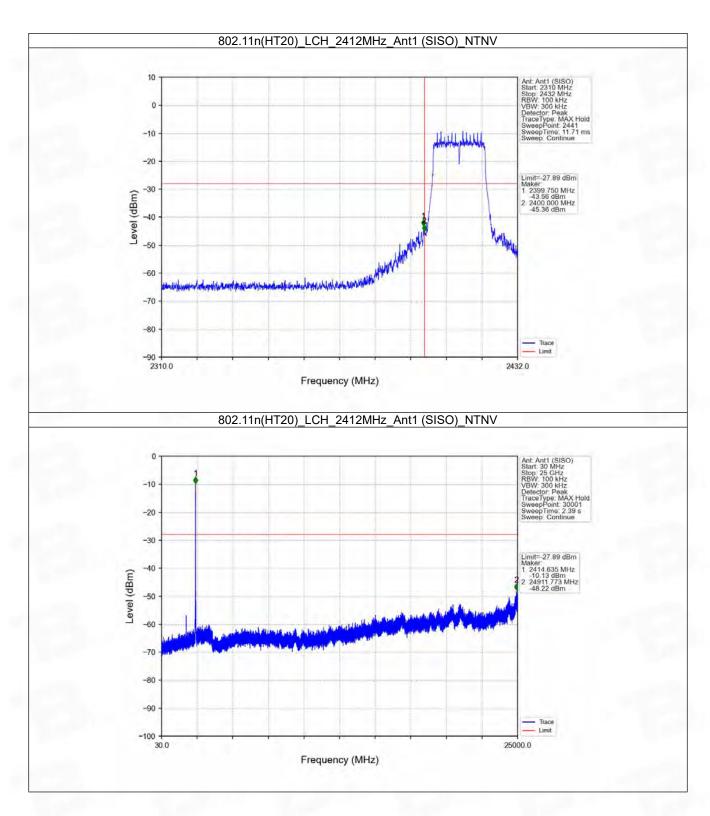




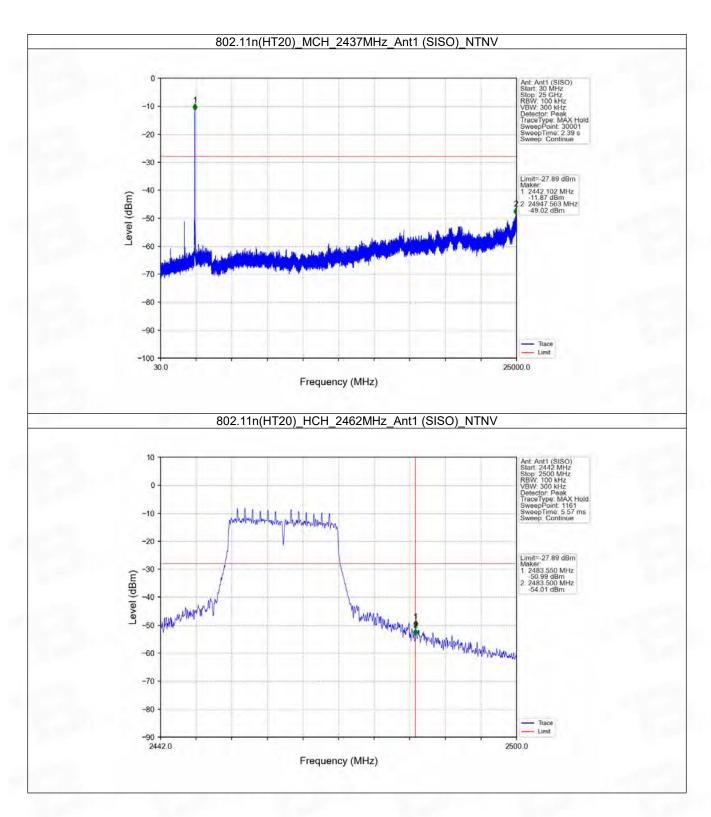




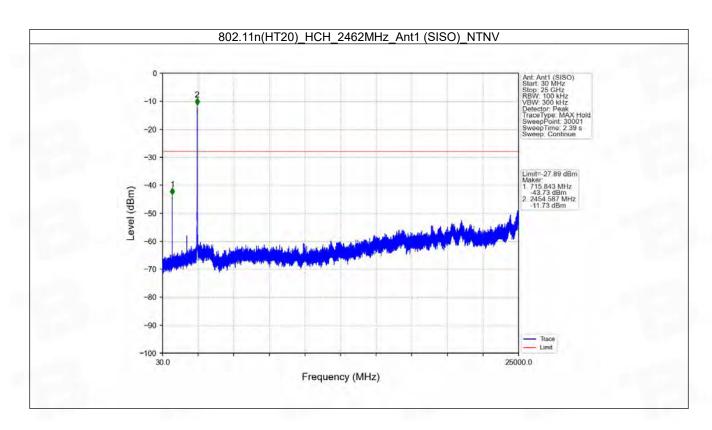


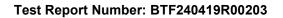












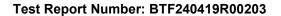


6. Form731

6.1 Form731

6.1.1 Test Result

Lower Freq (MHz)	High Freq (MHz)	MAX Power (W)	MAX Power (dBm)
2412	2462	0.0165	12.17







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-- END OF REPORT --