

Report No.: SHCR230800164701

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# TEST REPORT

Application No.: SHCR2308001647AT

FCC ID: 2AK4CPP2OUS IC: 20191-PP2OUS Applicant: PETCUBE, Inc.

Address of Applicant: 251 Little Falls Drive, Wilmington DE 19808, United States

Manufacturer: PETCUBE, Inc.

Address of Manufacturer: 251 Little Falls Drive, Wilmington DE 19808, United States

Factory: Hangzhou Meari Technology Co., Ltd.

Address of Factory: Room 604-605, Building 1, No. 768 Jianghong Road, Changhe Street, Binjiang

District, Hangzhou, zhejiang, China

**Equipment Under Test (EUT):** 

**EUT Name:** Petcube Play 2

Model No.: PP20US
HVIN: PP2OUS
Trade Mark: Petcube

Standard(s): 47 CFR Part 15, Subpart C 15.247

RSS-247 Issue 2, February 2017

RSS-Gen Issue 5 Amendment 2 (February 2021)

**Date of Receipt:** 2023-08-01

**Date of Test:** 2023-08-03 to 2023-08-13

**Date of Issue:** 2023-08-15

Test Result: Pass\*

Parlam Zhan



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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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	Revision Record					
Version	Description	Date	Remark			
00	Original	2023-08-15	/			

Authorized for issue by:		
	hichal Nil	
	Micheal Niu /Project Engineer	-
	Parlam zhan	
	Parlam Zhan /Reviewer	-



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# **Test Summary**

Radio Spectrum Technical Requirement						
Item	FCC Requirement	IC Requirement	Method	Result		
Antenna Requirement	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	RSS-Gen Clause 6.8	N/A	Customer Declaration		

N/A: Not applicable

Radio Spectrum Matter Part						
Item	FCC Requirement	IC Requirement	Method	Result		
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.207	RSS-Gen Clause 8.8	ANSI C63.10 (2013) Section 6.2	Pass		
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247a(2)	RSS-247 Clause 5.2(a)	ANSI C63.10 (2013) Section 11.8.1	Pass		
Conducted Average Output Power	47 CFR Part 15, Subpart C 15.247(b)(3)	RSS-247 Clause 5.4(d)	ANSI C63.10 (2013) Section 11.9.2	Pass		
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247(e)	RSS-247 Clause 5.2(b)	ANSI C63.10 (2013) Section 11.10.2	Pass		
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Clause 5.5	ANSI C63.10 (2013) Section 11.13.3.2	Pass		
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247(d)	RSS-247 Clause 5.5	ANSI C63.10 (2013) Section 11.11	Pass		
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	RSS-247 Section 3.3 & RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.10.5	Pass		
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	RSS-247 Section 3.3 & RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.4,6.5,6.6	Pass		
99% Bandwidth	-	RSS-Gen Section 6.7	ANSI C63.10 Section 6.9.3	Pass		



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### **General Information**

### 4.1 Details of E.U.T.

AC 100-240V,50/60Hz
Adapter model:TPA-46B050100UU
Input:AC 100-240V50/60Hz
Output:DC 5V,1000mA
AC 120V/60Hz
802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
802.11b/g/n(HT20):11;802.11n(HT40):7
5MHz
PCB Antenna
3.48dBi(Provided by the manufacturer)
112940898
6.2.110.1183

4.2 Power level setting using in test.

20

20

4.2 FOWEI IE	vei setting using in test.	ı	
Channal	802.11b	802.11g	802.11n(HT20)
Channel	Ant 1	Ant 1	Ant 1
1	20	20	20
6	20	20	20
11	20	20	20
Oh ann al	802.11n(HT40)		
Channel	Ant 1		
3	20		

### 4.3 Environment Parameter

6

9

Environment Parameter		Selected Values During Tests		sts
Relative Humidity		Ambient		
Value		Temperature(°C)		Voltage(V)
NTNV		25		AC 120
Note:				
NV:Normal Voltage LV:Low Extreme Test Vo		oltage HV:High Extreme Test Voltage		ne Test Voltage
NT:Normal Temperature LT:Low Extreme Test Te		mperature HT:High Extreme Test Temperatu		ne Test Temperature



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### 4.4 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	LENOVO	K27	EB24537645
Serial port adapter plate	1	Test Plate 3	/

### 4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 <sup>-8</sup>
2	Timeout	2s
3	Duty Cycle	0.4%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz)
0	Kr Kadiated Fowei	5.9dB (Above 1GHz)
		4.2dB (Below 30MHz)
9	Dadiated Spurious Emission Test	4.5dB (30MHz-1GHz)
9	Radiated Spurious Emission Test	5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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#### 4.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc.) is provided by the applicant. (if applicable).

2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

### 4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 6332.01)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• FCC (Designation Number: CN1301)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• ISED (CAB Identifier: CN0020)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

### 4.8 Deviation from Standards

None

### 4.9 Abnormalities from Standard Conditions

None



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#### **Equipment List** 5

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Conducted Test			•		
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2022-12-20	2023-12-19
Spectrum Analyzer	Keysight	N9020B	SHEM241-1	2022-12-20	2023-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2023-08-02	2024-08-01
Signal Generator	R&S	SMR20	SHEM006-1	2023-08-02	2024-08-01
Signal Generator	Agilent	N5182A	SHEM182-1	2023-08-02	2024-08-01
Communication Tester	R&S	CMW270	SHEM183-1	2023-06-01	2024-05-31
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Power Sensor	Keysight	U2021XA * 4	SHEM184-1	2023-08-02	2024-08-01
Splitter	Anritsu	MA1612A	SHEM185-1	1	/
Coupler	e-meca	803-S-1	SHEM186-1	1	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2022-11-08	2024-11-07
AC Power Stabilizer	APC	KDF-31020T-V0-F0	SHEM216-1	2022-12-20	2023-12-19
DC Power Supply	MCH	MCH-303A	SHEM210-1	2022-12-20	2023-12-19
Conducted test Cable	/	RF01~RF04	1	2022-12-20	2023-12-19
Switcher	Tonscend	JS0806	SHEM184-1	2023-08-02	2024-08-01
Test software	Tonscend	JS Tonscend BT/WIFI System	Version: 2.6	1	1
Coaxial Cable	TST	-	SHEM263-1	2023-08-02	2024-08-01
Test software	TST	TST PASS	Version: 2.0	/	/
RF Radiated Test		•			
EMI test Receiver	R&S	ESU40	SHEM051-1	2022-12-20	2023-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2022-12-20	2023-12-19
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2022-12-20	2023-12-19
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2021-09-11	2023-09-10
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2022-05-07	2024-05-06
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2022-08-11	2024-08-10
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2021-09-18	2023-09-17
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2021-09-18	2023-09-17
Pre-Amplifier	HP	8447D	SHEM236-1	2023-08-02	2024-08-01
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2022-12-20	2023-12-19
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	1	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	1	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	1	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	1	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	1	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2021-05-25	2024-05-24
RE test Cable	1	RE01, RE02, RE06	/	2023-01-07	2024-01-06
Test software	ESE	E3	Version: 6.111221a	1	1



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Conducted Emissions at AC Mains Power Port (150kHz-30MHz)							
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2022/12/20	2023/12/19		
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2022/12/20	2023/12/19		
Line impedance stabilization network	EMCO	3816_2	SHEM019-1	2022/12/20	2023/12/19		
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2022/12/20	2023/12/19		
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2020/12/20	2023/12/19		
CE test Cable	1	1	SHEM172-1	2022/12/20	2023/12/19		
Test Software	ESE	e3	Version: 6.111221a	N/A	N/A		



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

#### 6.1.2 Conclusion

Standard 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.15.247(b) (4) requirement:The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **EUT Antenna:**

The antenna is PCB Antenna and no consideration of replacement. The best case gain of the antenna is 3.48dBi.

Antenna location: Refer to internal photo.



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# 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207 Test Method: ANSI C63.10 (2013) Section 6.2

#### Limit:

Frequency of	Conducted limit(dBμV)			
emission(MHz)	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.				
Detector: Peak for pre-scan (9k	Hz resolution bandwidth) 0.15M	to 30MHz		

### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C Humidity: 50.6 % RH Atmospheric Pressure: 1010 mbar

#### 7.1.2 Test Mode Description

1.1.2 163t W	7.1.2 Test Mode Description			
Pre-scan / Final test	Mode Code	Description		
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.		



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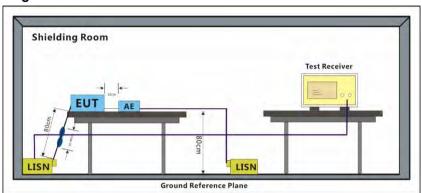
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#### 7.1.3 Test Setup Diagram



#### 7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50µH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



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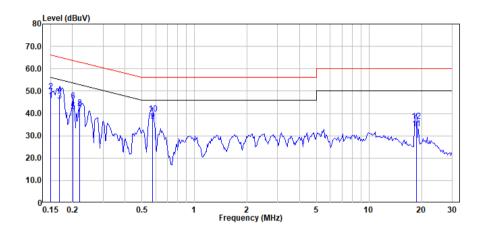
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Test Mode: 00; Line: Live line



Site : Chanmber Condition: Line Test Mode: 00

	Freq	Read Level	LISN Factor		Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.150	26.44	19.56	46.00	56.00	-10.00	Average
2	0.150	30.28	19.56	49.84	66.00	-16.16	QP
3	0.169	26.05	19.56	45.61	55.03	-9.42	Average
4	0.169	28.72	19.56	48.28	65.03	-16.75	QP
5	0.202	21.53	19.56	41.09	53.54	-12.45	Average
6	0.202	26.16	19.56	45.72	63.54	-17.82	QP
7	0.220	20.26	19.56	39.82	52.83	-13.01	Average
8	0.220	23.03	19.56	42.59	62.83	-20.24	QP
9	0.576	16.81	19.57	36.38	46.00	-9.62	Average
10	0.576	20.30	19.57	39.87	56.00	-16.13	QP
11	18.622	13.24	19.84	33.08	50.00	-16.92	Average
12	18.622	16.67	19.84	36.51	60.00	-23.49	OP



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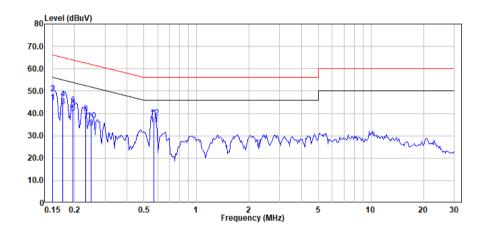
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Test Mode: 00; Line: Neutral Line



Site : Chanmber Condition: Neutral Test Mode: 00

	Freq	Read Level	LISN Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	——dB	dBuV	dBuV	dB	
1	0.150	25.55	19.56	45.11	56.00	-10.89	Average
2	0.150	29.36	19.56	48.92	66.00	-17.08	QP
3	0.172	23.73	19.56	43.29	54.86	-11.57	Average
4	0.172	26.79	19.56	46.35	64.86	-18.51	QP
5	0.196	20.65	19.56	40.21	53.80	-13.59	Average
6	0.196	24.20	19.56	43.76	63.80	-20.04	QP
7	0.232	16.82	19.56	36.38	52.39	-16.01	Average
8	0.232	20.29	19.56	39.85	62.39	-22.54	QP
9	0.249	13.92	19.57	33.49	51.78	-18.29	Average
10	0.249	17.14	19.57	36.71	61.78	-25.07	QP
11	0.570	15.54	19.57	35.11	46.00	-10.89	Average
12	0.570	18.54	19.57	38.11	56.00	-17.89	OP



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### 7.2 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3) Test Method: ANSI C63.10 (2013) Section 11.9.2

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)	
	1 for ≥50 hopping channels	
902-928	0.25 for 25≤ hopping channels <50	
	1 for digital modulation	
	1 for ≥75 non-overlapping hopping channels	
2400-2483.5	0.125 for all other frequency hopping systems	
	1 for digital modulation	
5725-5850	1 for frequency hopping systems and digital modulation	

### 7.2.1 E.U.T. Operation

**Operating Environment:** 

Temperature: 24.5 °C Humidity: 50.6 % RH Atmospheric Pressure: 1010 mbar

#### 7.2.2 Test Mode Description

	7.2.2 Test mode bescription			
Pre-scan / Final test	Mode Code	Description		
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.		



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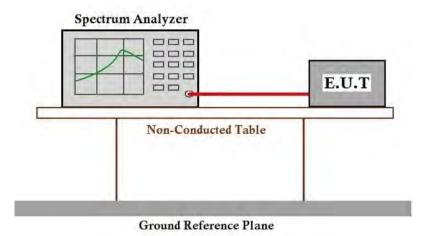
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### 7.2.3 Test Setup Diagram



### 7.2.4 Measurement Procedure and Data

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.

Please Refer to Appendix for Details



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### 7.3 Minimum 6dB Bandwidth

Test Requirement

47 CFR Part 15, Subpart C 15.247a(2)

Test Method:

ANSI C63.10 (2013) Section 11.8.1

Limit:

≥500 kHz

### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C

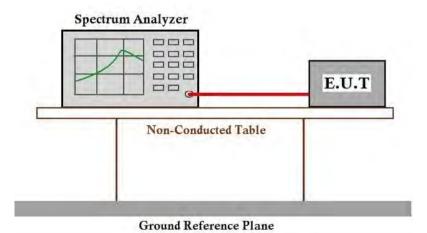
Humidity: 50.6 % RH

Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

### 7.3.3 Test Setup Diagram



#### 7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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### 7.4 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)
Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

### 7.4.1 E.U.T. Operation

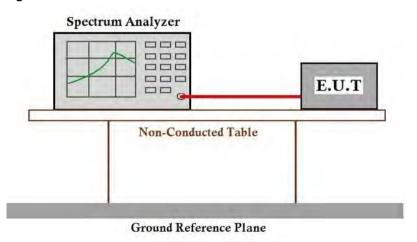
**Operating Environment:** 

Temperature: 24.5 °C Humidity: 50.6 % RH Atmospheric Pressure: 1010 mbar

### 7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

### 7.4.3 Test Setup Diagram



#### 7.4.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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### 7.5 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.13.3.2

#### 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. 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).

### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C Humidity: 50.6 % RH Atmospheric Pressure: 1010 mbar

#### 7.5.2 Test Mode Description

7.0.2 1.000.10	7.0.2 Test mode bescription			
Pre-scan / Final test	Mode Code	Description		
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.		



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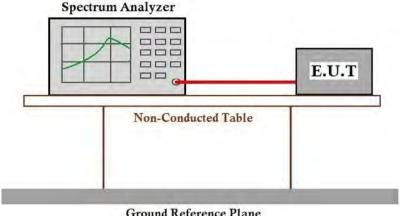
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### 7.5.3 Test Setup Diagram



Ground Reference Plane

### 7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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### 7.6 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.11

#### 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. 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).

### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C Humidity: 50.6 % RH Atmospheric Pressure: 1010 mbar

#### 7.6.2 Test Mode Description

	1.0.2 Test mode Besonption			
Pre-scan / Final test	Mode Code	Description		
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.		



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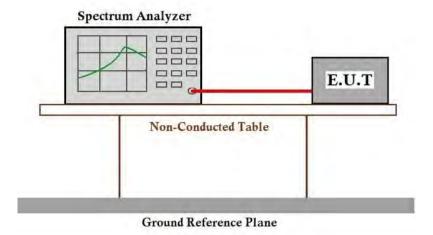
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### 7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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### 7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

#### 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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22.1 °C Humidity: 48.8 % RH Atmospheric Pressure: 1010 mbar

#### 7.7.2 Test Mode Description

	1 Tot moud Boompaon			
Pre-scan / Final test	Mode Code	Description		
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.		



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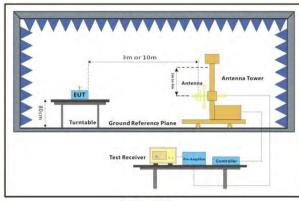
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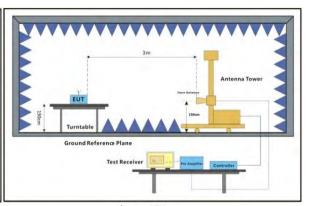


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### 7.7.3 Test Setup Diagram





Above 1GHz 30MHz-1GHz



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#### 7.7.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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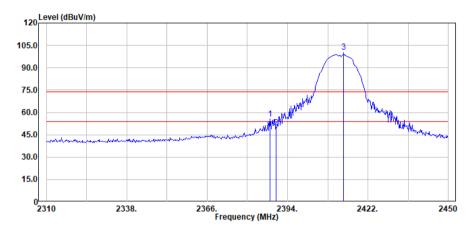
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Horizontal

No.	Freq	level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	2387.91					55.66 49.67			Peak Peak
						100.72			

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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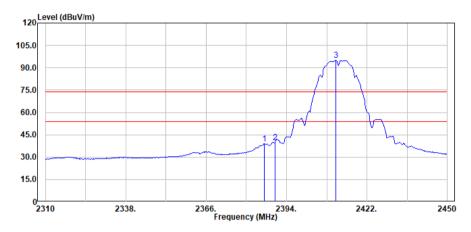
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Horizontal

No.	Freq  MHz	Read level  dBuv		Loss		Emission Level  dBuv/m	Line	Limit	Remark
2	2386.29 2390.00 2411.25	58.82 59.68 114.78	27.55 27.55 27.56	2.66	50.14 50.13 50.05	38.88 39.76 94.96		-15.12 -14.24 40.96	Average Average Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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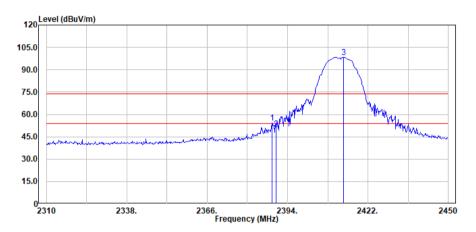
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Vertical

No.		level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
2	390.00		27.55	2.66		54.48 50.19 98.44	74.00		Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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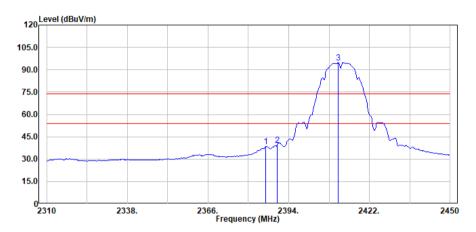
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Vertical

No.	Freq	Read level				Emission Level			Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2	2386.09 2390.00 2411.25	58.38 59.40 114.53	27.55 27.55 27.56	2.66	50.13	38.44 39.48 94.71	54.00	-15.56 -14.52 40.71	Average Average Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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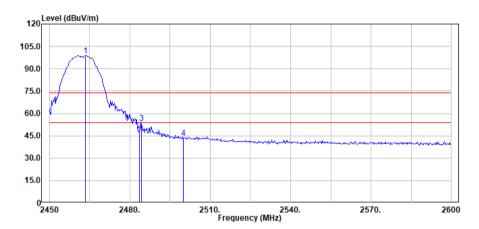
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



#### Antenna Polarity :Horizontal

No.	Freq					Emission Level			Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
	2463.48				49.86	98.78	74.00	24.78	Peak
	2483.50	68.12	27.58	2.73	49.90	48.53	74.00	-25.47	Peak
	2484.35	73.19	27.58	2.73	49.91	53.59	74.00	-20.41	Peak
	2500.00	63.14	27.59	2.74	49.94	43.53	74.00	-30.47	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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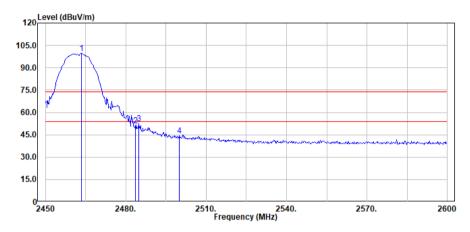
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Report No.: SHCR230800164701

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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



#### Antenna Polarity :Vertical

No.	Freq		Antenna Factor						Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
	2463.48		27.58		49.86		74.00	25.53	Peak
	2483.50 2484.78	70.56 72.03	27.58 27.58	2.73 2.73	49.90 49.91	50.97 52.43	74.00 74.00	-23.03 -21.57	Peak Peak
	2500.00	64.03	27.59	2.74	49.94	44.42	74.00	-29.58	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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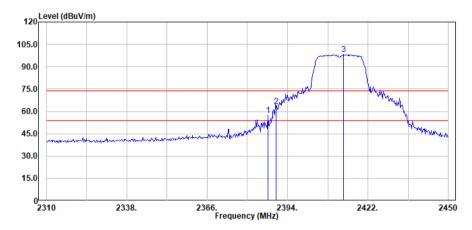
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Horizontal

	level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
2387.10 2390.00 2413.48	83.51	27.55	2.66	50.13	63.59	74.00	-10.41	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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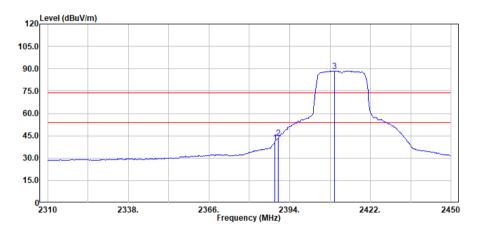
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Horizontal

No.	Freq	Read level				Emission Level			Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2	388.73 390.00 409.62	60.30 63.24 108.27	27.55 27.55 27.56	2.66	50.13 50.13 50.06	40.37 43.32 88.44	54.00 54.00 54.00	-13.63 -10.68 34.44	Average Average Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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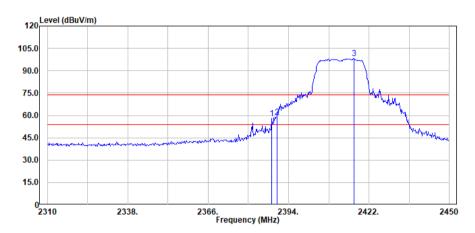
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Vertical

No.	Freq  MHz	level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
2	2390.00	78.65	27.55	2.66	50.13	58.05 58.73 98.32	74.00	-15.27	

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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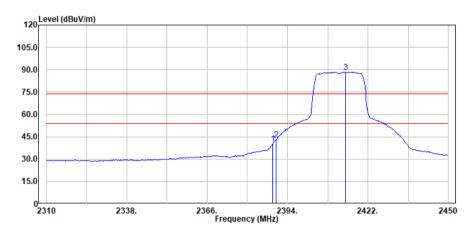
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Vertical

No.	Freq  MHz		Factor		Factor	Emission Level  dBuv/m	Line	Limit	Remark
2	2388.93 2390.00 2414.29	60.31 62.91 108.29	27.55 27.55 27.56	2.66	50.13 50.13 50.04	40.38 42.99 88.49		-13.62 -11.01 34.49	

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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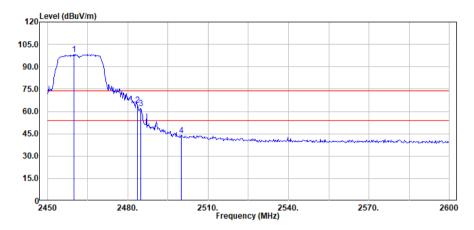
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



#### Antenna Polarity :Horizontal

No.		Read	Antenna	Cable	Preamp	Emission	Limit	0ver	
	Freq	level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
	2459.78	117.85	27.57	2.71	49.85	98.28	74.00	24.28	Peak
	2483.50	83.92	27.58	2.73	49.90	64.33	74.00	-9.67	Peak
	2484.78	81.85	27.58	2.73	49.91	62.25	74.00	-11.75	Peak
	2500.00	63.68	27.59	2.74	49.94	44.07	74.00	-29.93	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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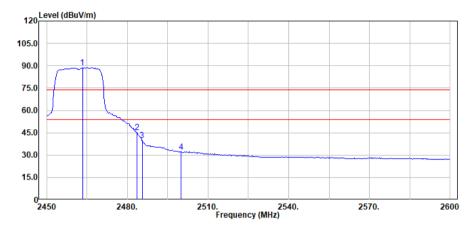
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Horizontal

No.	Freq	Read level		Cable Loss		Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
	2463.26	108.21	27.58	2.71	49.86	88.64	54.00	34.64	Average
	2483.50	64.68	27.58	2.73	49.90	45.09	54.00	-8.91	Average
	2485.44	59.26	27.58	2.73	49.91	39.66	54.00	-14.34	Average
	2500.00	51.65	27.59	2.74	49.94	32.04	54.00	-21.96	Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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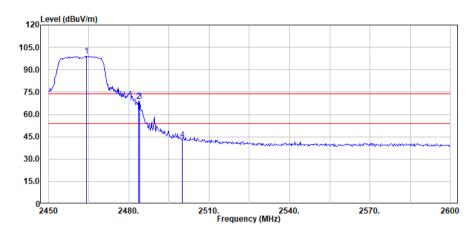
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Vertical

No.	Freq	Read level				Emission Level			Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
:	2464.13	118.65	27.58		49.86	99.09	74.00	25.09	Peak
	2483.50	88.29	27.58	2.73	49.90	68.70	74.00	-5.30	Peak
	2484.13	88.53	27.58	2.73	49.91	68.93	74.00	-5.07	Peak
	2500.00	62.78	27.59	2.74	49.94	43.17	74.00	-30.83	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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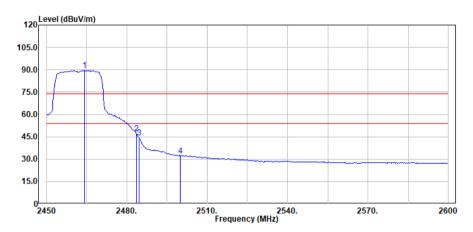
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Vertical

No.	Freq  MHz	Read level  dBuv	Antenna Factor dB/m	Cable Loss  dB		Emission Level  dBuv/m	Limit Line  dBuv/m	Over Limit  dB	Remark
	2464.13	109.01	27.58	2.72	49.86	89.45	54.00	35.45	Average
	2483.50	66.85	27.58	2.73	49.90	47.26	54.00	-6.74	Average
	2484.57	63.92	27.58	2.73	49.91	44.32	54.00	-9.68	Average
	2500.00	51.92	27.59	2.74	49.94	32.31	54.00	-21.69	Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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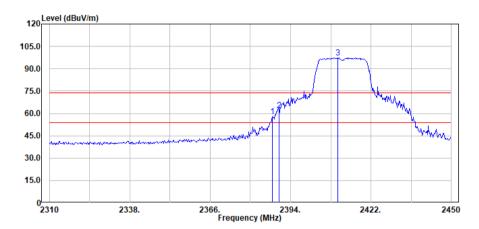
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



### Antenna Polarity :Horizontal

No.	Freq	level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
						57.83 62.08			Peak Peak
						97.31			

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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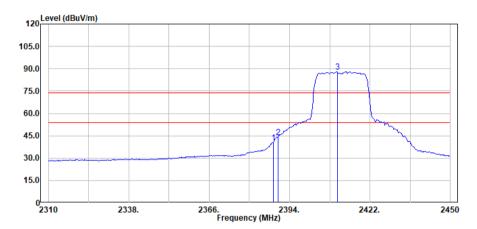
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



### Antenna Polarity :Horizontal

No.	Freq	Read level				Emission Level	Limit Line		Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2	2388.32 2390.00 2410.64	60.39 64.06 107.65	27.55 27.55 27.56	2.66	50.13 50.13 50.06	40.46 44.14 87.82	54.00 54.00 54.00	-13.54 -9.86 33.82	Average Average Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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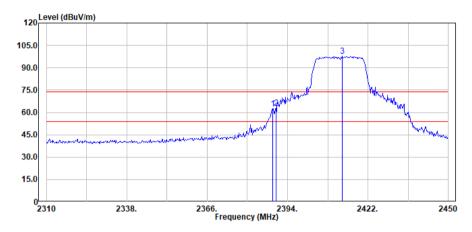
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



### Antenna Polarity :Vertical

No.		level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
2	390.00	82.85		2.66	50.13	62.61 62.93 97.80	74.00		Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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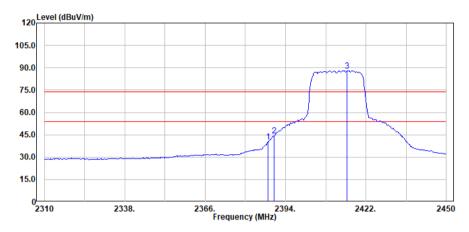
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



### Antenna Polarity :Vertical

No.	Freq 	Read level  dBuv		Loss		Emission Level  dBuv/m	Line	Limit	Remark
	2387.91	60.11	27.55	2.65	50.13 50.13	40.18	54.00	-13.82	
	2390.00	64.40 107.74	27.55 27.56		50.13	44.48 87.95	54.00	-9.52 33.95	Average Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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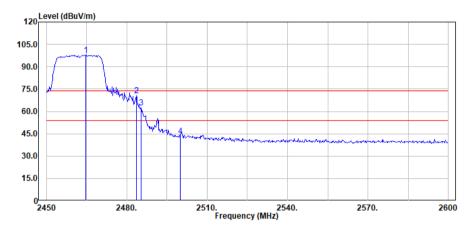
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Horizontal

No.	Freq		Antenna Factor						Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
	2464.57	117.37	27.58	2.72	49.86	97.81	74.00	23.81	Peak
	2483.50	90.35	27.58	2.73	49.90	70.76	74.00	-3.24	Peak
	2485.22	82.17	27.58	2.73	49.91	62.57	74.00	-11.43	Peak
	2500.00	63.07	27.59	2.74	49.94	43.46	74.00	-30.54	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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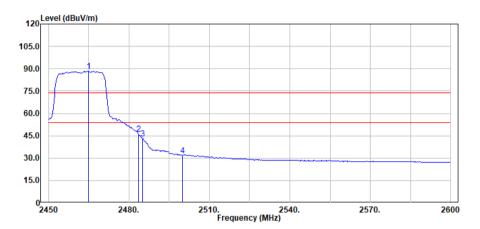
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Horizontal

No.		Read	Antenna	Cable	Preamp	Emission	Limit	0ver	
	Freq	level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
	2465.00	107.76	27.58	2.72	49.86	88.20	54.00	34.20	Average
	2483.50	65.94	27.58	2.73	49.90	46.35	54.00	-7.65	Average
	2485.00	62.79	27.58	2.73	49.91	43.19	54.00	-10.81	Average
	2500.00	51.19	27.59	2.74	49.94	31.58	54.00	-22.42	Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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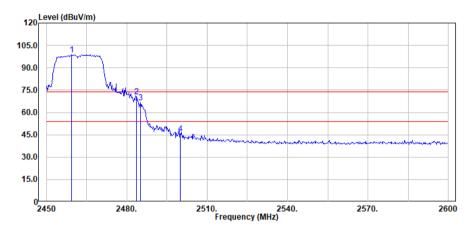
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Vertical

No.	Freq		Antenna Factor						Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
	2459.35		27.57		49.85	98.65	74.00	24.65	Peak
	2483.50 2485.00	90.39 86.35	27.58 27.58	2.73 2.73	49.90 49.91	70.80 66.75	74.00 74.00	-3.20 -7.25	Peak Peak
2	2500.00	65.21	27.59	2.74	49.94	45.60	74.00	-28.40	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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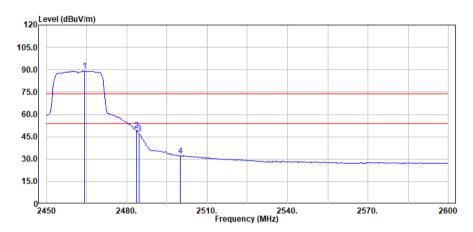
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Vertical

No.	Freq  MHz	Read level  dBuv	Antenna Factor  dB/m	Cable Loss  dB		Emission Level  dBuv/m	Limit Line  dBuv/m	Over Limit  dB	Remark
	2464.13	108.61	27.58	2.72	49.86	89.05	54.00	35.05	Average
	2483.50	69.12	27.58	2.73	49.90	49.53	54.00	-4.47	Average
	2484.57	66.71	27.58	2.73	49.91	47.11	54.00	-6.89	Average
	2500.00	51.66	27.59	2.74	49.94	32.05	54.00	-21.95	Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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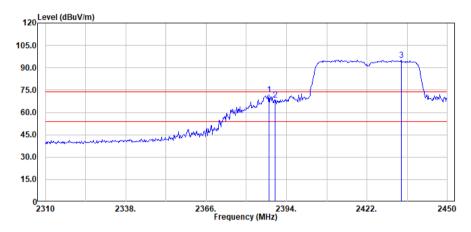
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



### Antenna Polarity :Horizontal

No.	Freq  MHz	level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
2	390.00		27.55	2.66	50.13	71.84 68.28 95.30	74.00		Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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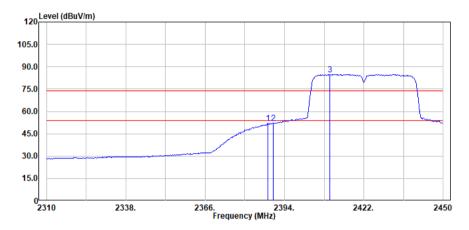
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



### Antenna Polarity :Horizontal

No.	Freq  MHz	Read level  dBuv	Antenna Factor dB/m	Loss		Emission Level  dBuv/m	Line	Limit	Remark
	2388.12 2390.00	71.89 71.96	27.55 27.55			51.96 52.04		-2.04 -1.96	Average Average
	2410.03	104.72	27.56	2.67	50.06	84.89	54.00	30.89	Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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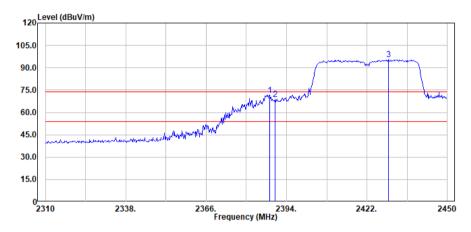
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



### Antenna Polarity :Vertical

No.		level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
2	390.00	88.59		2.66	50.13	71.68 68.67 95.34		-2.32 -5.33 21.34	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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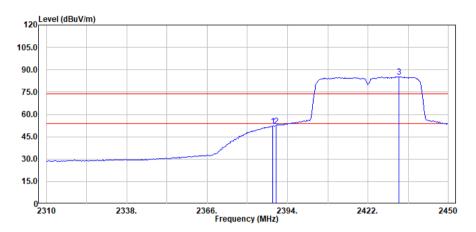
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



### Antenna Polarity :Vertical

No.	Freq  MHz	Read level  dBuv		Loss		Emission Level  dBuv/m	Line	Limit	Remark
2	2388.73 2390.00 2432.75	71.98 72.01 105.01	27.55 27.55 27.57	2.66	50.13	52.05 52.09 85.34		-1.95 -1.91 31.34	Average Average Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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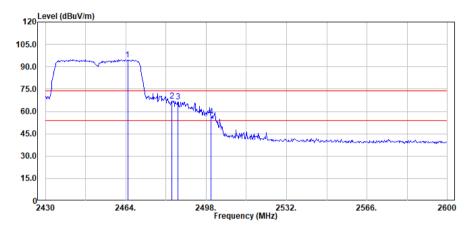
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



### Antenna Polarity :Horizontal

No.	Freq		Antenna Factor						Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
	2464.74	114.31	27.58			94.75	74.00	20.75	Peak
	2483.50	86.57	27.58	2.73	49.90	66.98	74.00	-7.02	Peak
	2485.93	86.38	27.58	2.73	49.91	66.78	74.00	-7.22	Peak
	2500.00	76.41	27.59	2.74	49.94	56.80	74.00	-17.20	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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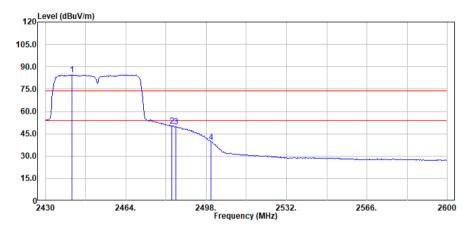
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



### Antenna Polarity :Horizontal

No. Fre	Read q level  dBuv	Factor	Cable Loss 	Preamp Factor  dB	Emission Level  dBuv/m	Limit Line  dBuv/m	Over Limit  dB	Remark
2441.0 2483.5 2485.1 2500.0	70.02 9 69.44	27.58 27.58	2.70 2.73 2.73 2.74	49.88 49.90 49.91 49.94	84.65 50.43 49.84 39.51	54.00 54.00 54.00 54.00	30.65 -3.57 -4.16 -14.49	Average Average Average Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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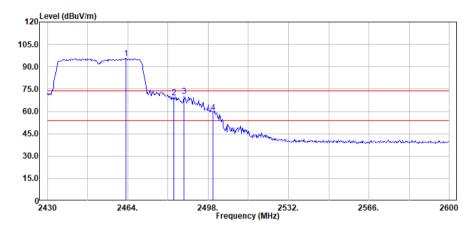
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



### Antenna Polarity :Vertical

No.	Freq		Antenna Factor						Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
		115.15	27.58		49.86		74.00	21.58	Peak
_	483.50 487.65	88.92 89.57	27.58 27.58	2.73	49.90 49.91	69.33 69.97	74.00 74.00	-4.67 -4.03	Peak Peak
	500.00	78.93	27.59		49.94		74.00	-14.68	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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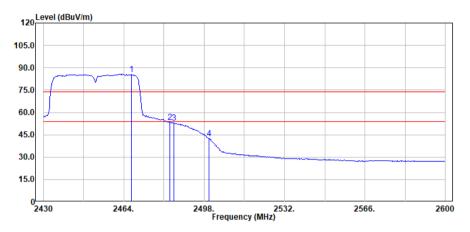
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



### Antenna Polarity :Vertical

No.	Freq	Read level	Factor	Loss	Factor		Line	Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
:	2467.20	105.23	27.58	2.72	49.87	85.66	54.00	31.66	Average
	2483.50	73.07	27.58	2.73	49.90	53.48	54.00	-0.52	Average
	2485.19	72.79	27.58	2.73	49.91	53.19	54.00	-0.81	Average
	2500.00	62.03	27.59	2.74	49.94	42.42	54.00	-11.58	Average

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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## 7.8 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5

### 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
960-1000	500	3

## 7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22.1 °C Humidity: 48.9 % RH Atmospheric Pressure: 1010 mbar

### 7.8.2 Test Mode Description

7.0.2 Test mode bescription								
Pre-scan / Final test	Mode Code	Description						
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.						



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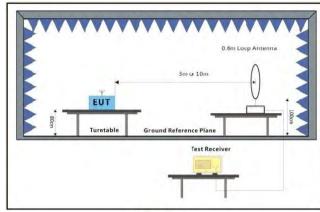
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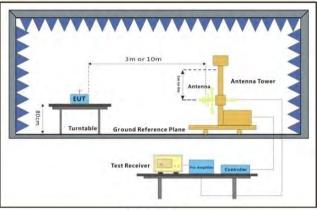


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## 7.8.3 Test Setup Diagram





Below 30MHz

30MHz-1GHz

## 7.8.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete. Remark:
- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



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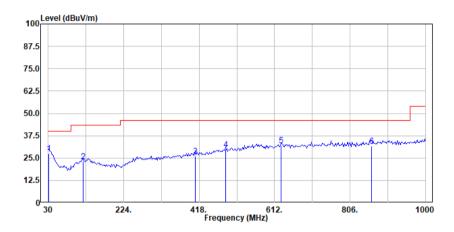
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Test Mode: 00; Polarity: Horizontal



Antenna Polarity: Horizontal

Test mode : 00

No.	Freq	Read level	LISN Factor	Cable Loss	Emission Level	n Limit	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	31.94	2.42	24.91	0.31	27.64	40.00	-12.36	QP
2	119.24	3.48	18.44	0.95	22.87	43.50	-20.63	QP
3	408.30	2.41	22.24	1.47	26.12	46.00	-19.88	QP
4	485.90	4.19	23.33	2.11	29.63	46.00	-16.37	QP
5	629.46	4.61	25.18	2.40	32.19	46.00	-13.81	QP
6	862.26	2.76	26.88	2.22	31.86	46.00	-14.14	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss



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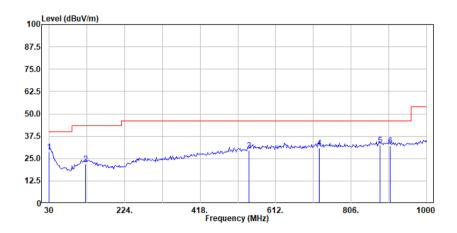
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Test Mode: 00; Polarity: Vertical



Antenna Polarity: Vertical

Test mode : 00

No.	Freq	Read level	LISN Factor	Cable Loss	Emissior Level	n Limit	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	30.00	3.30	25.04	0.29	28.63	40.00	-11.37	QP
2	123.12	2.27	18.48	0.97	21.72	43.50	-21.78	QP
3	544.10	2.56	24.66	2.25	29.47	46.00	-16.53	QP
4	724.52	3.12	25.50	2.43	31.05	46.00	-14.95	QP
5	879.72	3.19	26.99	2.35	32.53	46.00	-13.47	QP
6	906.88	2.78	26.90	2.51	32.19	46.00	-13.81	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss



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## 7.9 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.6

## Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

## 7.9.1 E.U.T. Operation

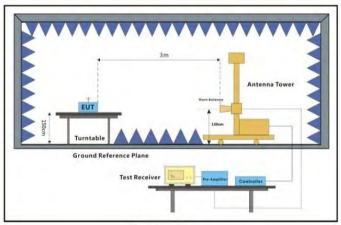
Operating Environment:

Temperature: 22.1 °C Humidity: 49.1 % RH Atmospheric Pressure: 1010 mbar

### 7.9.2 Test Mode Description

		<b>-</b>
Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

## 7.9.3 Test Setup Diagram



Above 1GHz



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#### 7.9.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

### Remark:

- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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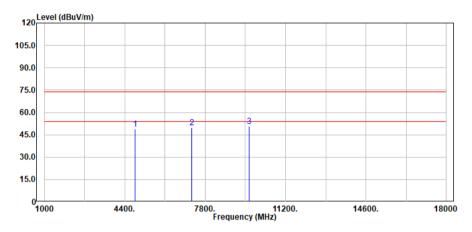
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



### Antenna Polarity :Horizontal

No.	Freq  MHz		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
		61.05 55.06			47.80 46.63	48.69 49.62		-25.31 -24.38	Peak Peak
9	9648.00	52.95	38.24	5.72	46.15	50.76	74.00	-23.24	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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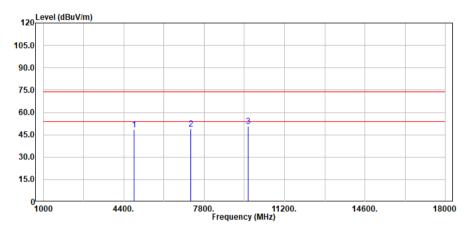
f (86-21) 61915678 f (86-21) 61915678



Report No.: SHCR230800164701

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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



### Antenna Polarity :Vertical

No.	Freq  MHz		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
7	1824.00 7236.00 9648.00	60.63 54.45 52.89	35.83	5.36		49.01	74.00	-25.73 -24.99 -23.30	Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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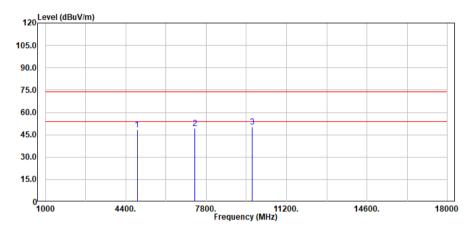
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



### Antenna Polarity :Horizontal

No.			Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
-	4874.00 7311.00	60.50 54.54	36.05	5.42	46.70	48.31 49.31	74.00	-24.69	Peak Peak
9	9748.00	52.39	38.34	5.74	46.11	50.36	74.00	-23.64	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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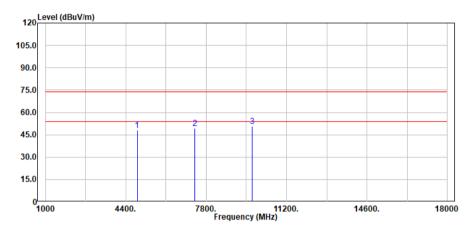
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



### Antenna Polarity :Vertical

No.	Freq  MHz	level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
7		60.34 54.40 52.69	36.05	5.42	46.70	48.15 49.17 50.66	74.00	-25.85 -24.83 -23.34	Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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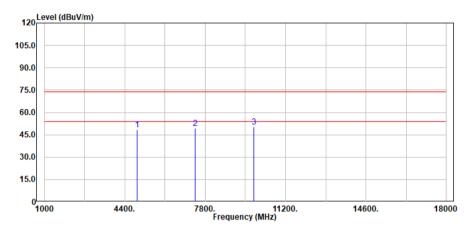
f (86-21) 61915678 f (86-21) 61915678



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Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Horizontal

No.			Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4924.00 7386.00	60.63 54.15			47.74 46.78			-25.41 -24.86	Peak Peak
		52.32	38.44			50.47	74.00	-23.53	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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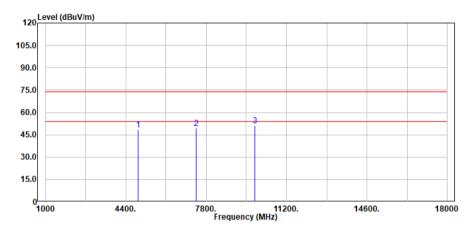
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Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Vertical

No.	Freq  MHz		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
7	924.00 7386.00 9848.00	60.43 54.31 52.84	36.28	5.49	47.74 46.78 46.06	49.30	74.00	-25.61 -24.70 -23.01	Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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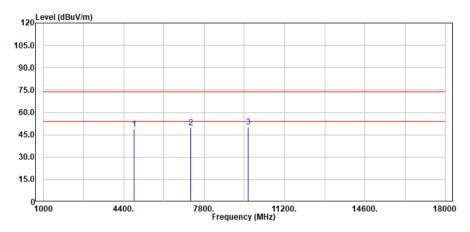
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



### Antenna Polarity :Horizontal

No.	Freq 		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
		61.23 55.34			47.80 46.63			-25.13 -24.10	Peak Peak
9	9648.00	52.38	38.24	5.72	46.15	50.19	74.00	-23.81	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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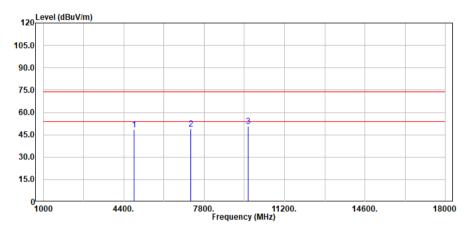
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



### Antenna Polarity :Vertical

No.			Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4824.00 7236.00	60.82 54.46			47.80 46.63	48.46 49.02		-25.54 -24.98	Peak Peak
	9648.00	52.93	38.24	5.72	46.15	50.74	74.00	-23.26	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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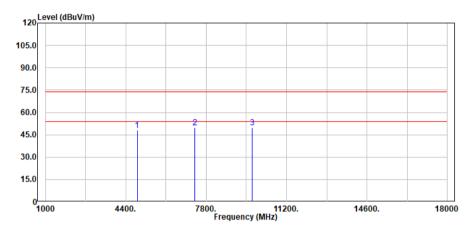
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



### Antenna Polarity :Horizontal

No.						Emission Level			Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4	4874.00	60.37	31.41	4.17	47.77	48.18	74.00	-25.82	Peak
	7311.00	55.03	36.05	5.42	46.70	49.80	74.00	-24.20	Peak
9	9748.00	52.04	38.34	5.74	46.11	50.01	74.00	-23.99	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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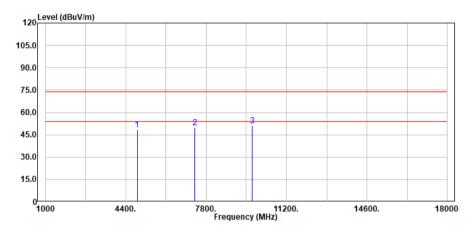
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



### Antenna Polarity :Vertical

No.	Freq  MHz	level	Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
7	1874.00 7311.00 9748.00	60.68 54.82 52.98	36.05	5.42	46.70	48.49 49.59 50.95	74.00		Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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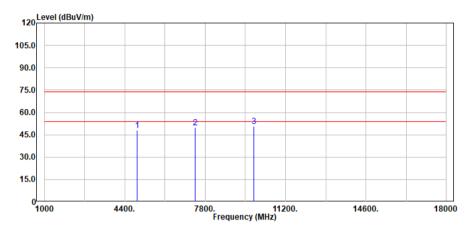
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



### Antenna Polarity :Horizontal

No.			Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4924.00 7386.00	60.19 54.69			47.74 46.78			-25.85 -24.32	Peak Peak
	9848.00	52.44	38.44	5.77	46.06	50.59		-23.41	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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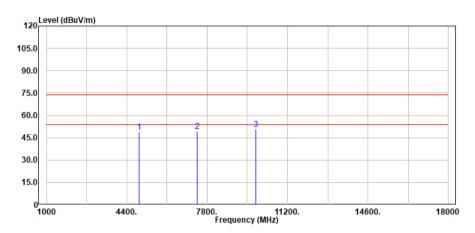
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Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



#### Antenna Polarity :Vertical

No.	Freq  MHz		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
7		60.72 54.15 52.58	36.28	5.49	47.74 46.78 46.06	49.14	74.00	-25.32 -24.86 -23.27	Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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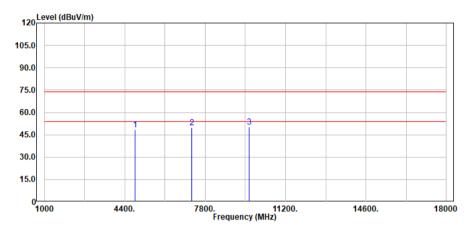
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Horizontal

No.	Freq 		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4824.00 7236.00	60.87 55.43			47.80 46.63	48.51 49.99		-25.49 -24.01	Peak Peak
9	9648.00	52.46	38.24	5.72	46.15	50.27	74.00	-23.73	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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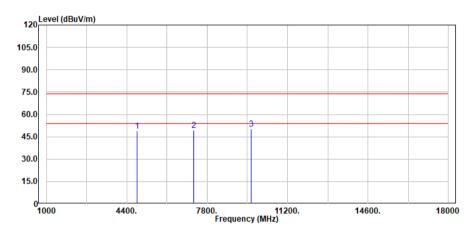
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Report No.: SHCR230800164701

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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



#### Antenna Polarity :Vertical

No. Freq  MHz		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
4824.00 7236.00 9648.00	61.06 54.84 52.68	31.30 35.83 38.24	5.36	47.80 46.63 46.15	49.40	74.00 74.00 74.00	-25.30 -24.60 -23.51	Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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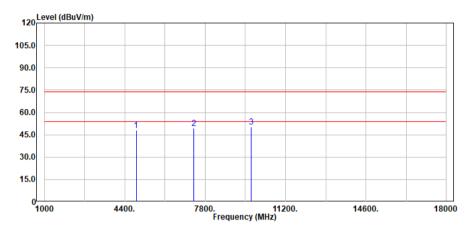
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



#### Antenna Polarity :Horizontal

No.	Freq 		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4874.00 7311.00	60.33 54.39			47.77 46.70	48.14 49.16	74.00 74.00	-25.86 -24.84	Peak Peak
9	9748.00	52.37	38.34	5.74	46.11	50.34	74.00	-23.66	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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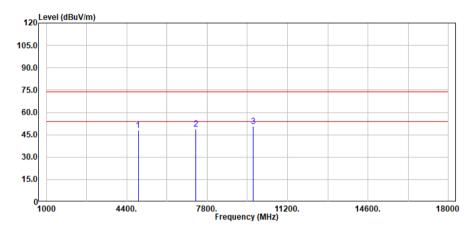
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



#### Antenna Polarity :Vertical

No.	Freq 		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4874.00 7311.00	60.20 54.26			47.77 46.70	48.01 49.03		-25.99 -24.97	Peak Peak
	9748.00	52.56				50.53		-23.47	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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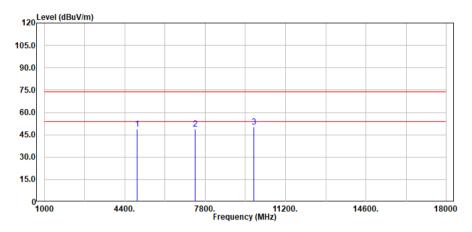
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



#### Antenna Polarity :Horizontal

No.	Freq  MHz		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
7		60.81 53.81 51.94	36.28	5.49	47.74 46.78 46.06	48.80	74.00	-25.23 -25.20 -23.91	Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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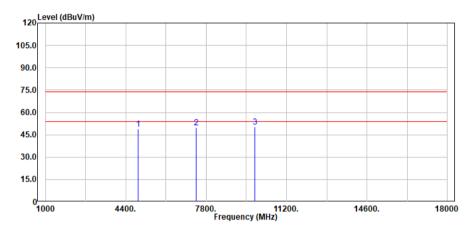
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



#### Antenna Polarity :Vertical

No.			Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
		61.02 54.87			47.74 46.78			-25.02 -24.14	Peak Peak
9	9848.00	52.22	38.44	5.77	46.06	50.37	74.00	-23.63	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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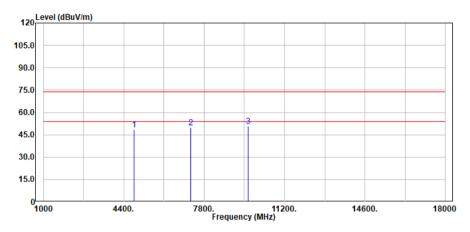
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



#### Antenna Polarity :Horizontal

No.	Freq					Emission Level			Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
-	4824.00 7236.00 9648.00	60.78 55.22 52.82	35.83	5.36	46.63	48.42 49.78 50.63	74.00	-24.22	Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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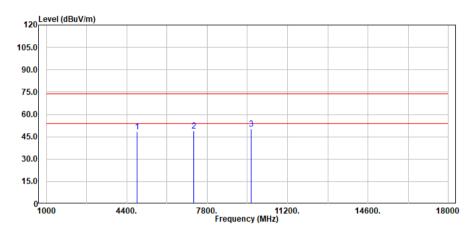
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



#### Antenna Polarity :Vertical

-	Freq 		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
723	4.00 6.00 8.00	60.60 54.50 52.58	35.83	5.36	47.80 46.63 46.15	49.06	74.00	-25.76 -24.94 -23.61	Peak Peak Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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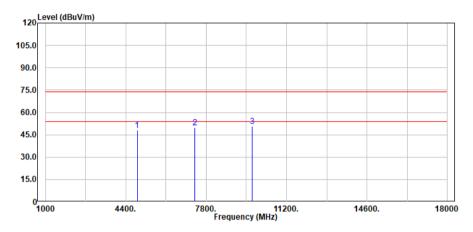
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



#### Antenna Polarity :Horizontal

No.	Freq 		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4874.00 7311.00	60.28 55.10			47.77 46.70	48.09 49.87		-25.91 -24.13	Peak Peak
(	9748.00	52.57	38.34	5.74	46.11	50.54	74.00	-23.46	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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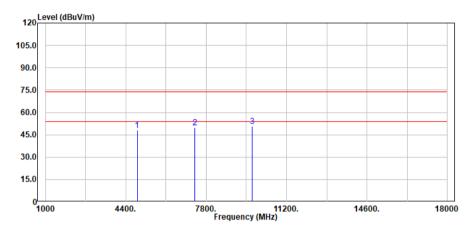
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



#### Antenna Polarity :Vertical

No.	Freq 		Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4874.00 7311.00	60.30 55.14				48.11 49.91		-25.89 -24.09	Peak Peak
		52.88				50.85			

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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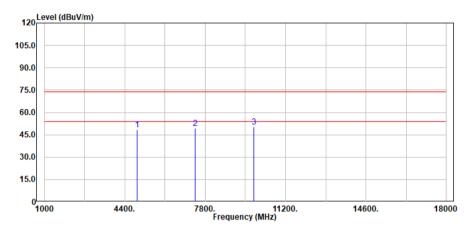
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Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



#### Antenna Polarity :Horizontal

No.			Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4924.00 7386.00	60.41 54.37			47.74 46.78			-25.63 -24.64	Peak Peak
	9848.00	52.10	38.44	5.77	46.06	50.25	74.00	-23.75	Peak

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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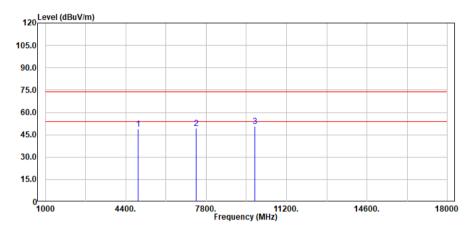
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Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



#### Antenna Polarity :Vertical

No.			Factor	Loss	Factor	Emission Level  dBuv/m	Line	Limit	Remark
	4924.00 7386.00	60.80 54.24			47.74 46.78	48.76 49.23		-25.24 -24.77	Peak Peak
		52.70				50.85			

Notes: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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#### 7.10 99% Bandwidth

Test Requirement

RSS-Gen Section 6.7

Test Method:

ANSI C63.10 (2013) Section 6.9.3

#### 7.10.1 E.U.T. Operation

Operating Environment:

Temperature:

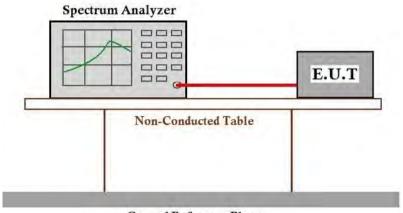
Humidity:

% RH

Atmospheric Pressure:

mbar

#### 7.10.2 Test Setup Diagram



Ground Reference Plane

#### 7.10.3 Measurement Procedure and Data

Please Refer to Appendix for Details



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#### **Test Setup Photo** 8

Refer to Appendix - Test Setup Photo for SHCR2308001647AT

#### **EUT Constructional Details (EUT Photos)** 9

Refer to Appendix - Photographs of EUT Constructional Details for SHCR2308001647AT



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### 10 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 (%)	
		2412	8.340	8.487	98.27	0.08	0.04	
802.11b	SISO	2437	8.340	8.487	98.27	0.08	0.00	
		2462	8.340	8.490	98.23	0.08	0.04	
	SISO	2412	1.378	1.417	97.25	0.12	0.03	
802.11g		2437	1.377	1.416	97.25	0.12	0.03	
		2462	1.377	1.416	97.25	0.12	0.03	
222 44		2412	1.289	1.329	96.99	0.13	0.07	
802.11n (HT20)	SISO	2437	1.290	1.328	97.14	0.13	0.00	
(11120)		2462	1.290	1.329	97.07	0.13	0.04	
222.44	SISO	2422	0.640	0.681	93.98	0.27	0.07	
802.11n (HT40)		2437	0.640	0.682	93.84	0.28	0.03	
(11140)		2452	0.642	0.682	94.13	0.26	0.03	



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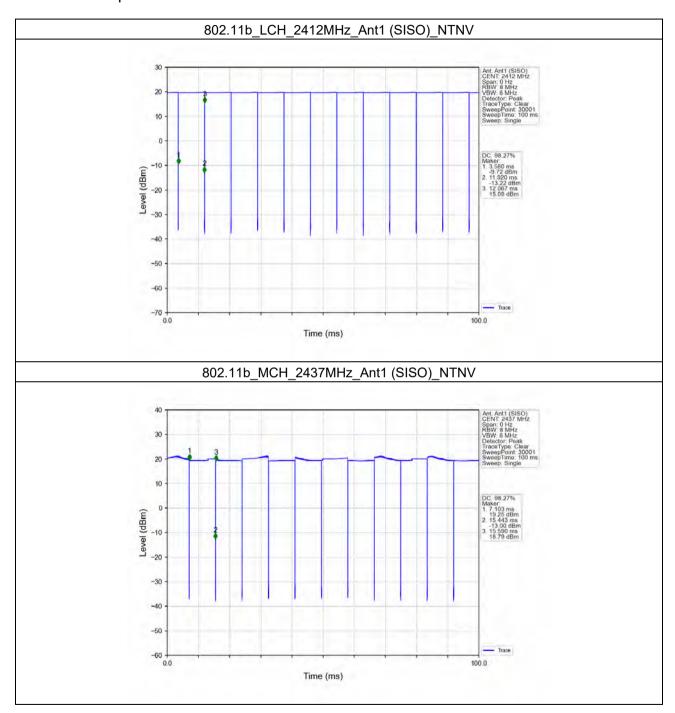
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#### 1.1.2 Test Graph





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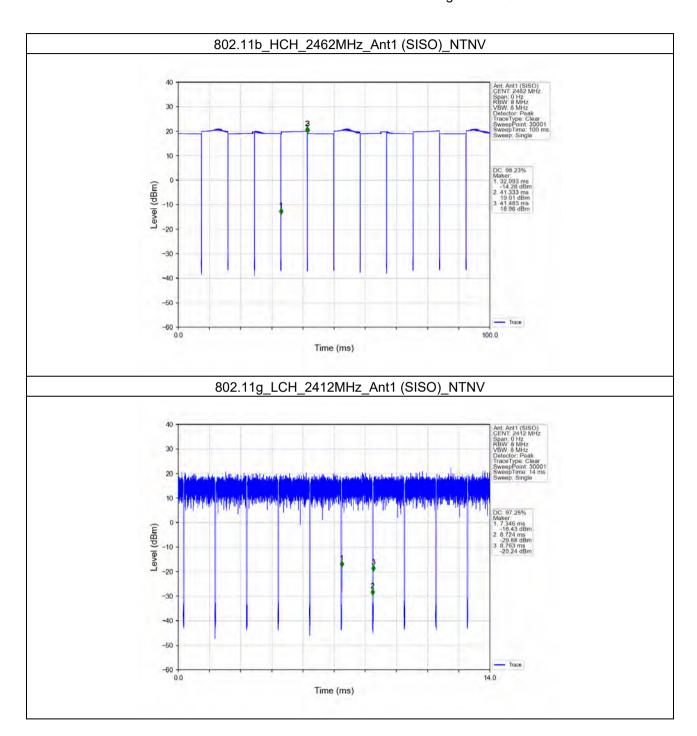
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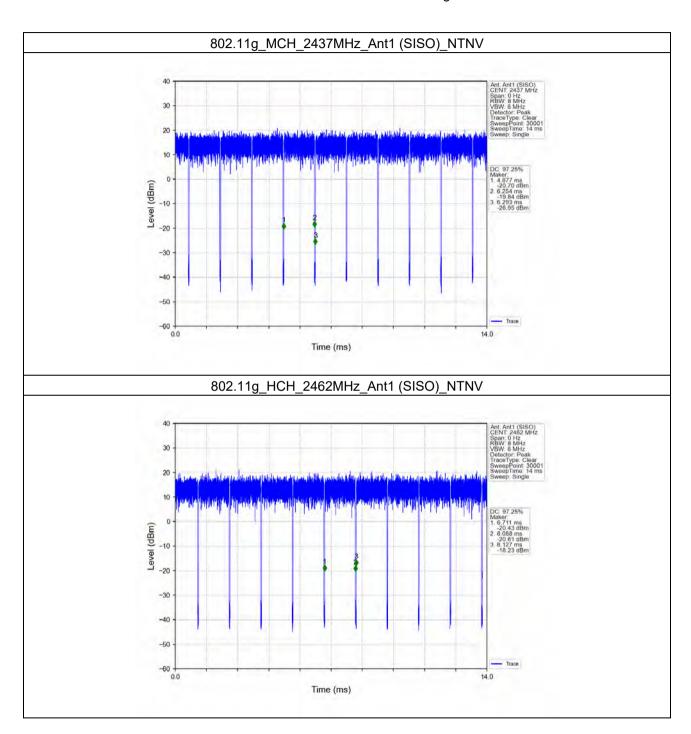
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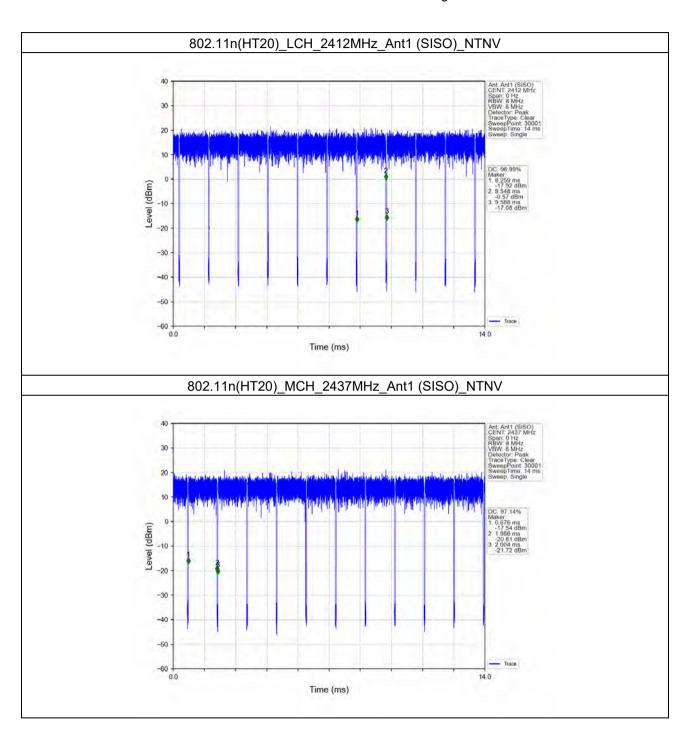
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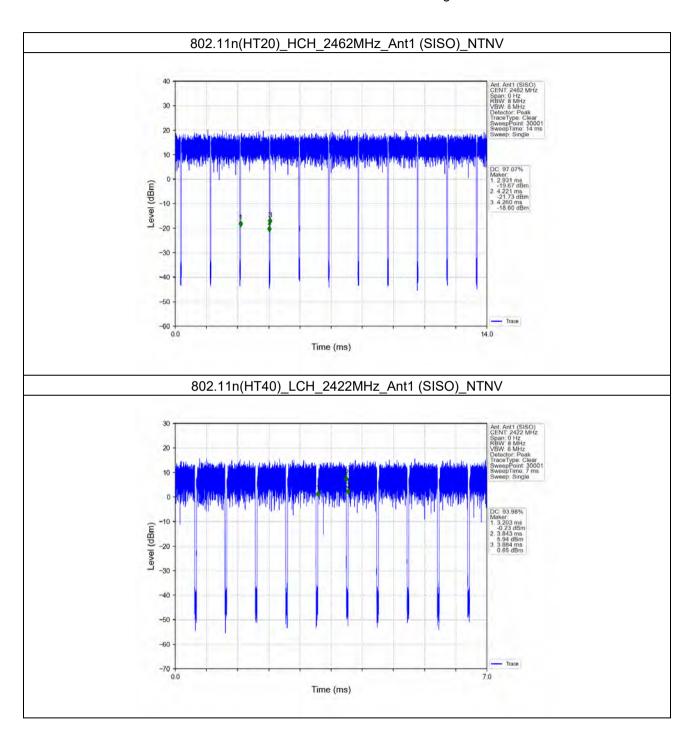
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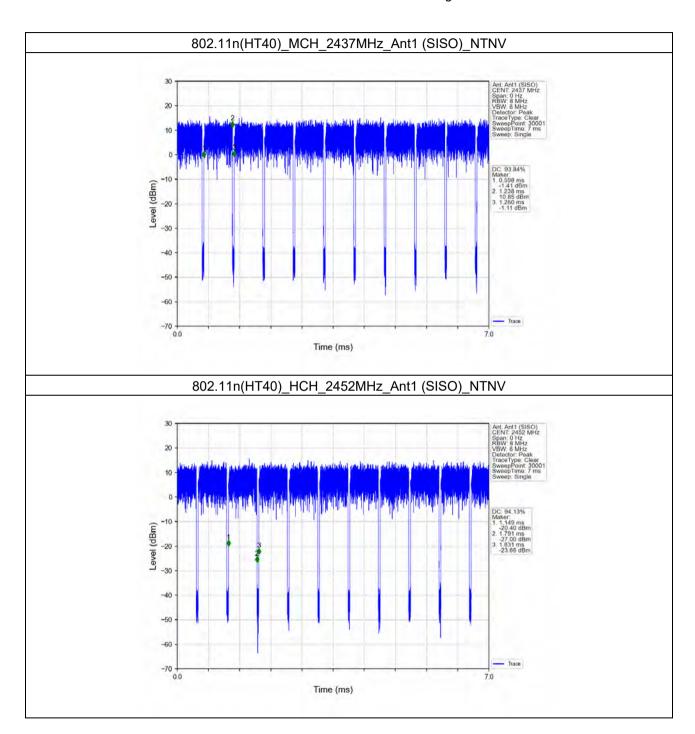
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#### 2. Bandwidth

#### 2.1 OBW

#### 2.1.1 Test Result

Mode	TX	Frequency	ANIT	99% Occupied Bandwidth (MHz)	Verdict	
Mode	Туре	(MHz)	ANT	Result	verdict	
	SISO	2412	1	13.104	Pass	
802.11b		2437	2437 1 13.145		Pass	
		2462	1	13.089	Pass	
	SISO	2412	1	17.388	Pass	
802.11g		2437	1	17.393	Pass	
		2462	1	17.316	Pass	
000.44	SISO	2412	1	18.027	Pass	
802.11n (HT20)		SO 2437 1 18.061		18.061	Pass	
(11120)		2462	1	17.985	Pass	
000.44	SISO	2422	1	36.233	Pass	
802.11n (HT40)		2437	1	36.273	Pass	
(11140)		2452	1	36.240	Pass	



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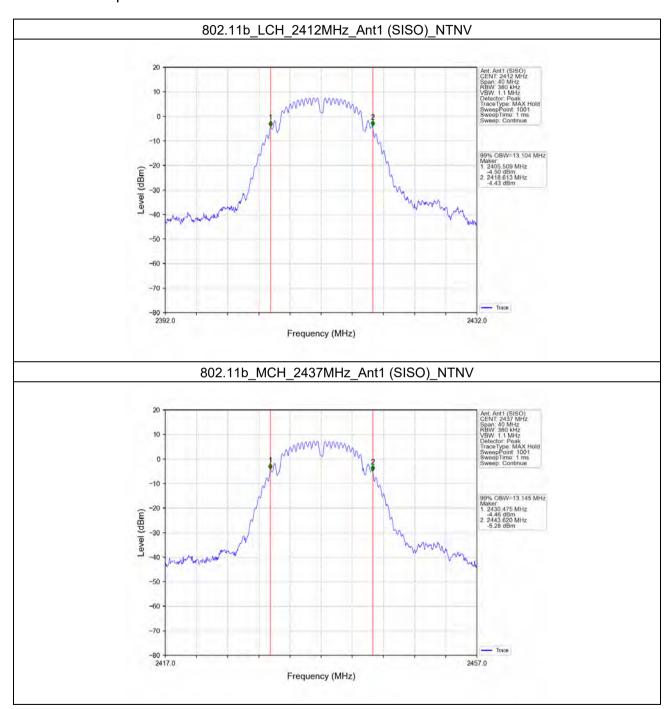
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#### 2.1.2 Test Graph





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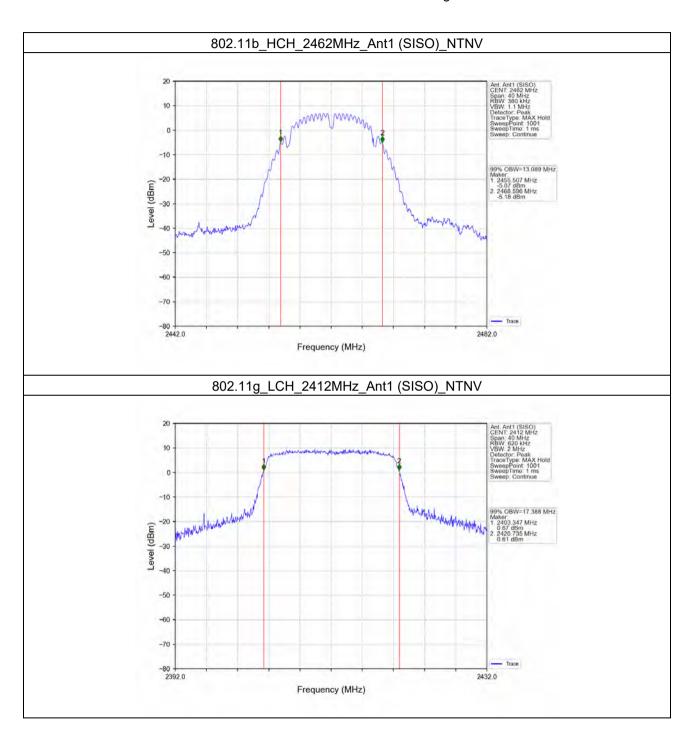
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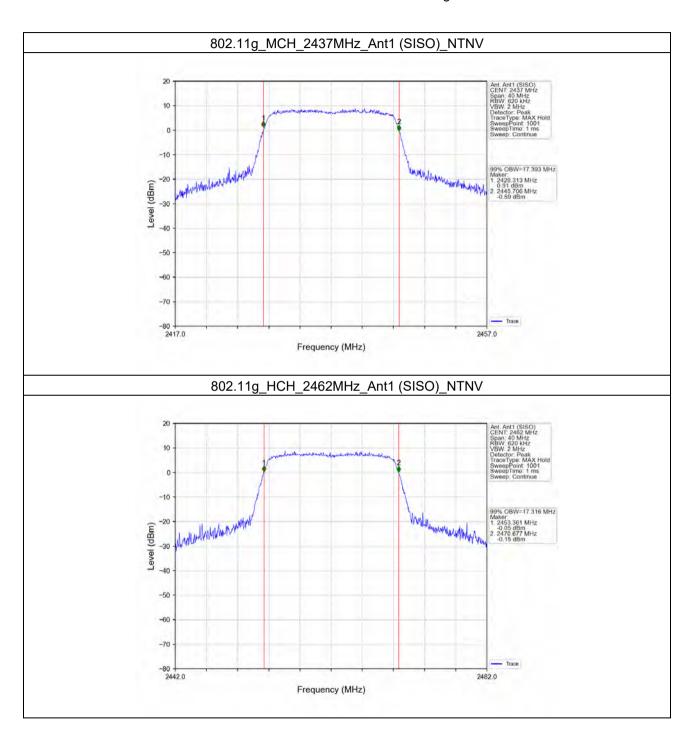
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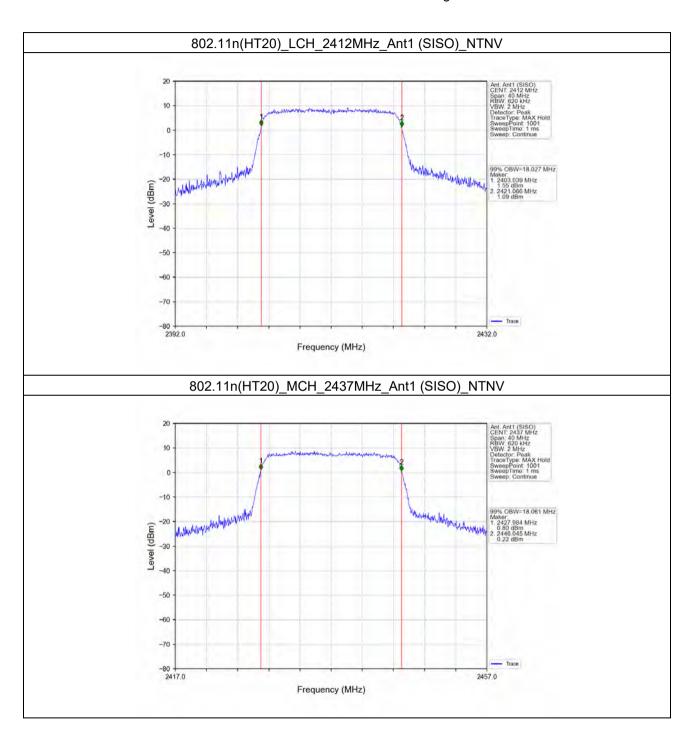
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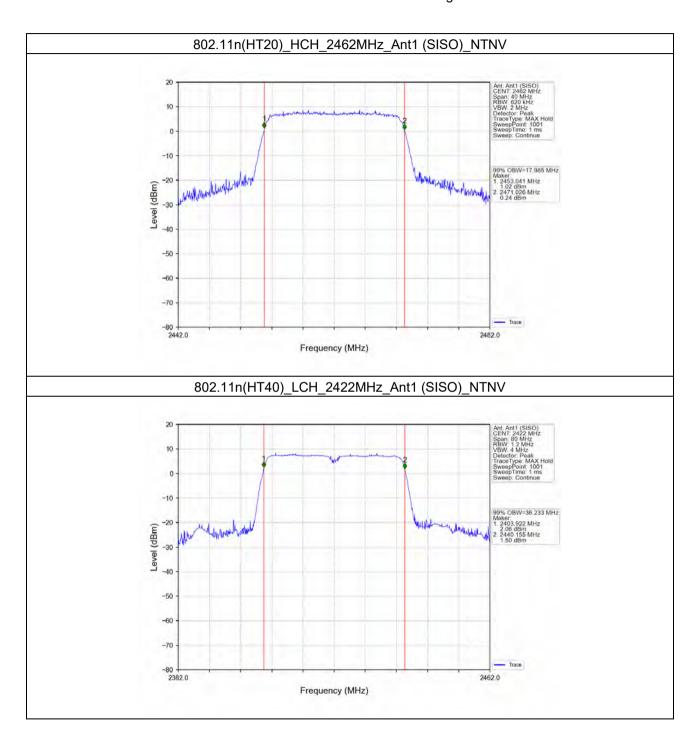
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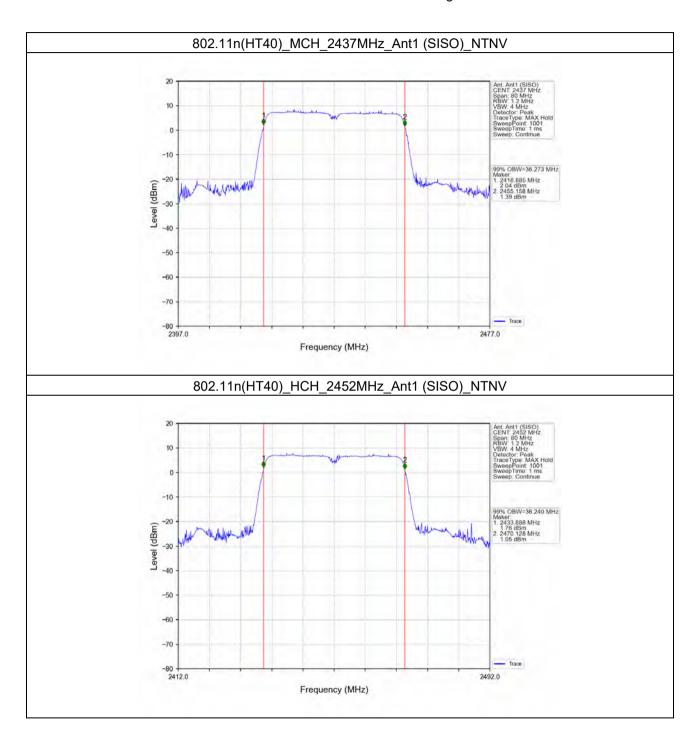
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#### 2.2 6dB BW

#### 2.2.1 Test Result

Mode	TX	Frequency	ANIT	6dB Bandv	\/andiat		
Mode	Type	(MHz)	ANT	Result	Limit	Verdict	
		2412	1	10.093	>=0.5	Pass	
802.11b	SISO	2437	1	10.093	>=0.5	Pass	
		2462	1	10.090	>=0.5	Pass	
	SISO	2412	1	16.374	>=0.5	Pass	
802.11g		2437	1	16.377	>=0.5	Pass	
		2462	1	16.390	>=0.5	Pass	
000.44	SISO	2412	1	17.110	>=0.5	Pass	
802.11n (HT20)		2437	1	17.101	>=0.5	Pass	
(11120)		2462	1	17.174	>=0.5	Pass	
000.44		2422	1	35.403	>=0.5	Pass	
802.11n (HT40)	SISO	2437	1	35.383	>=0.5	Pass	
(11140)		2452	1	35.493	>=0.5	Pass	



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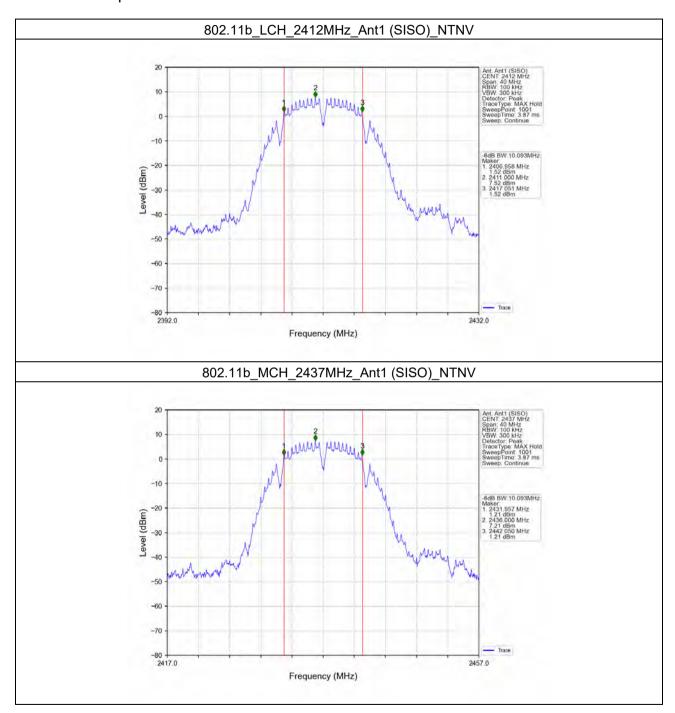
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#### 2.2.2 Test Graph





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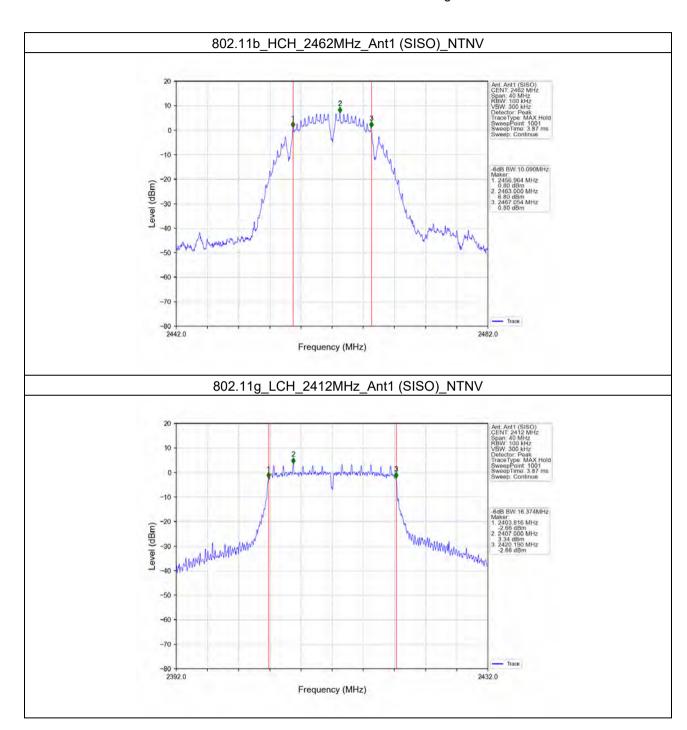
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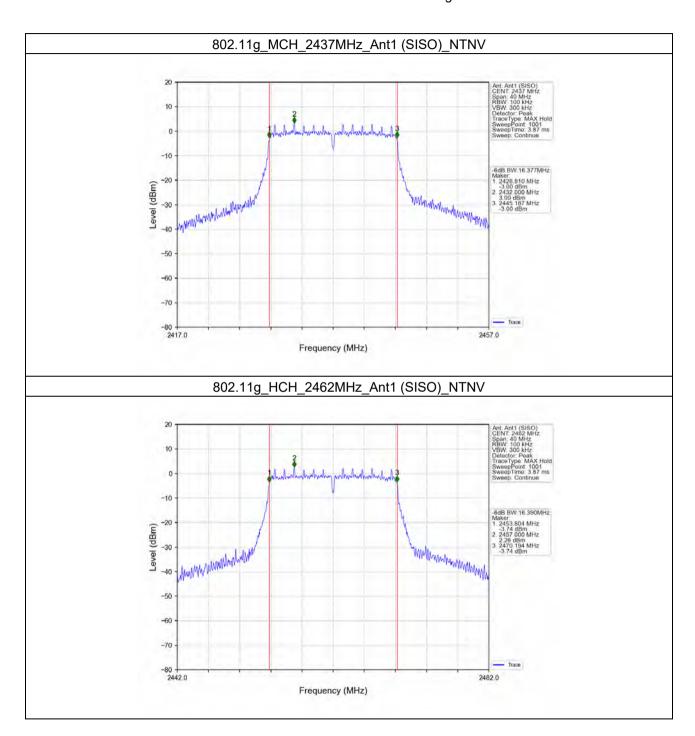
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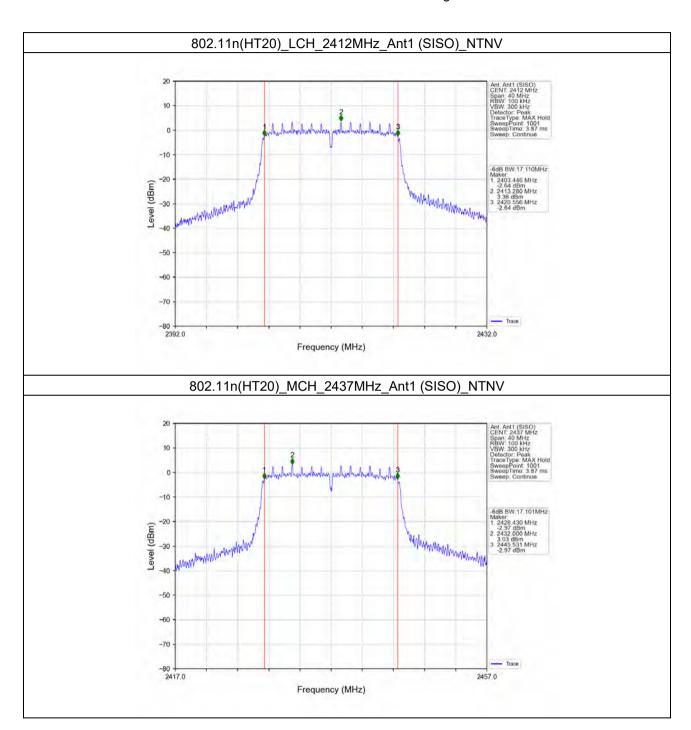
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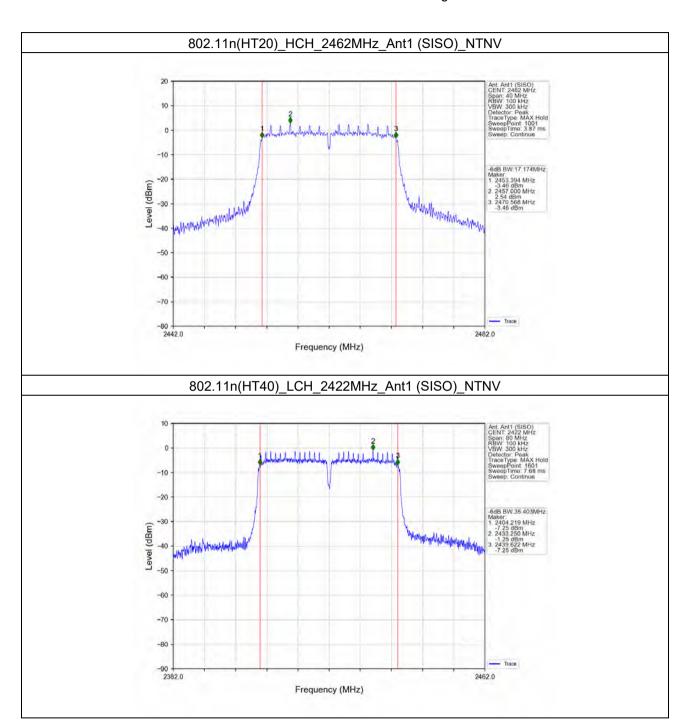
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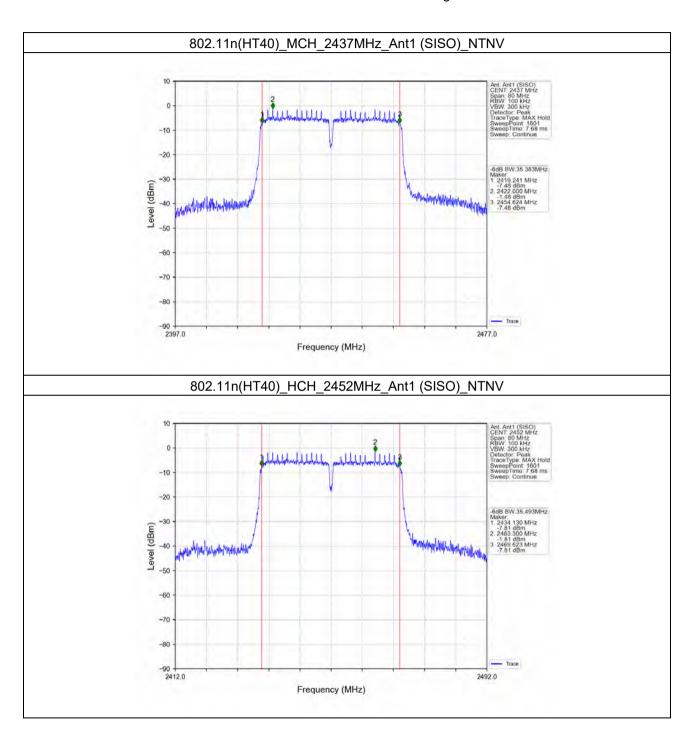
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### 3. Maximum Conducted Output Power

#### 3.1 Power

### 3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Average Co (dE	Verdict	
			ANT1	Limit	_
802.11b	SISO	2412	16.25	<=30	Pass
		2437	15.97	<=30	Pass
		2462	15.53	<=30	Pass
802.11g	SISO	2412	14.30	<=30	Pass
		2437	13.86	<=30	Pass
		2462	13.42	<=30	Pass
802.11n (HT20)	SISO	2412	14.21	<=30	Pass
		2437	13.77	<=30	Pass
		2462	13.35	<=30	Pass
802.11n (HT40)	SISO	2422	12.71	<=30	Pass
		2437	12.45	<=30	Pass
		2452	12.14	<=30	Pass
Note1: Antenna Gain: Ant1: 3.48dBi;					



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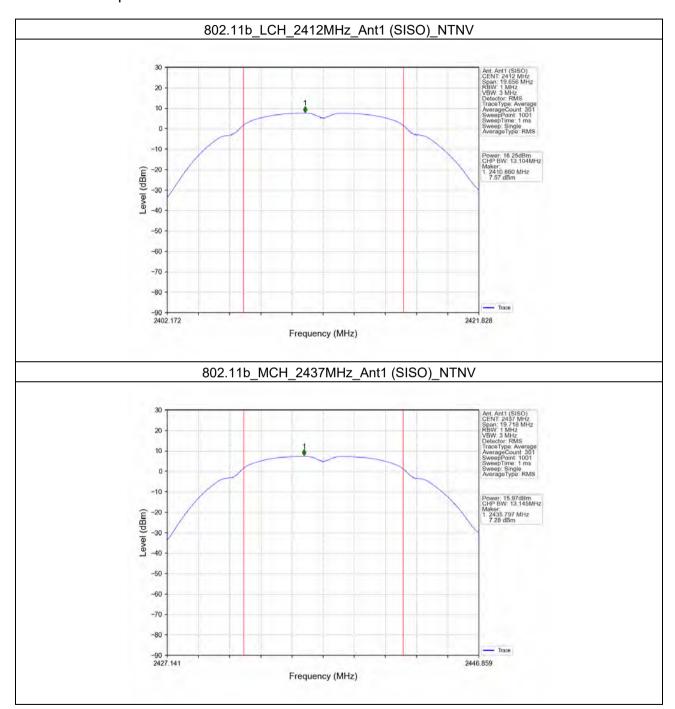
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### 3.1.2 Test Graph





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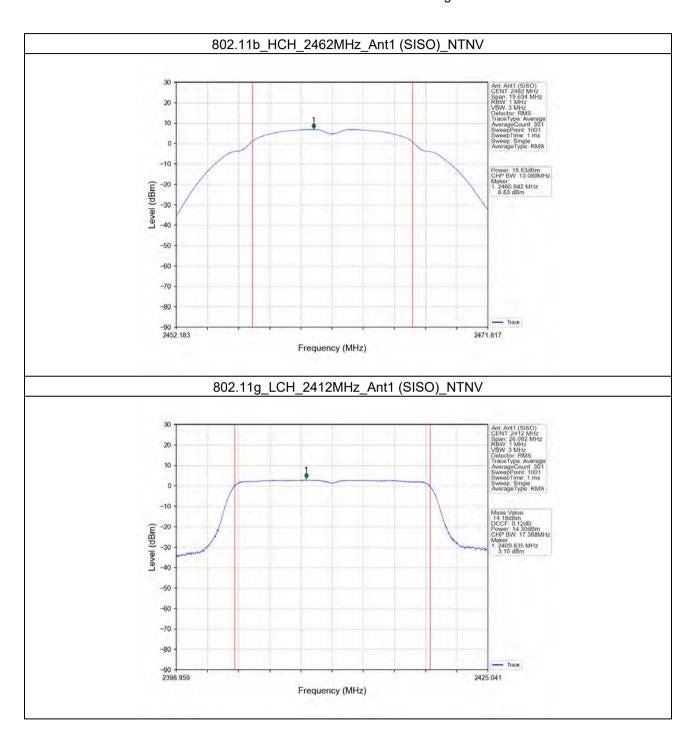
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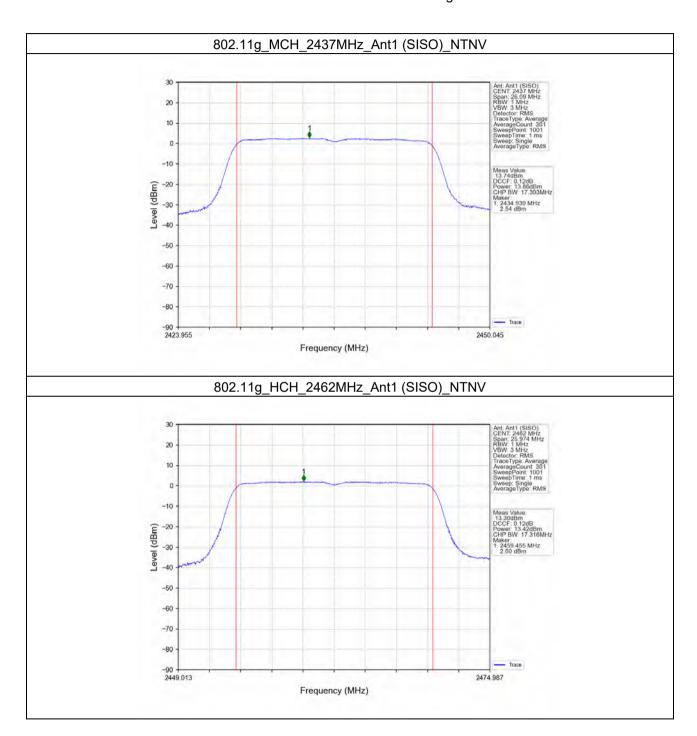
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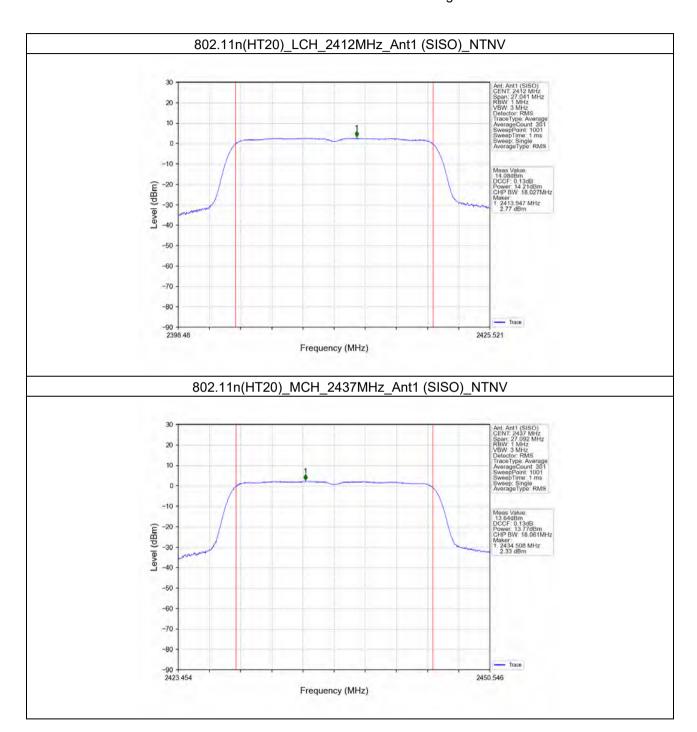
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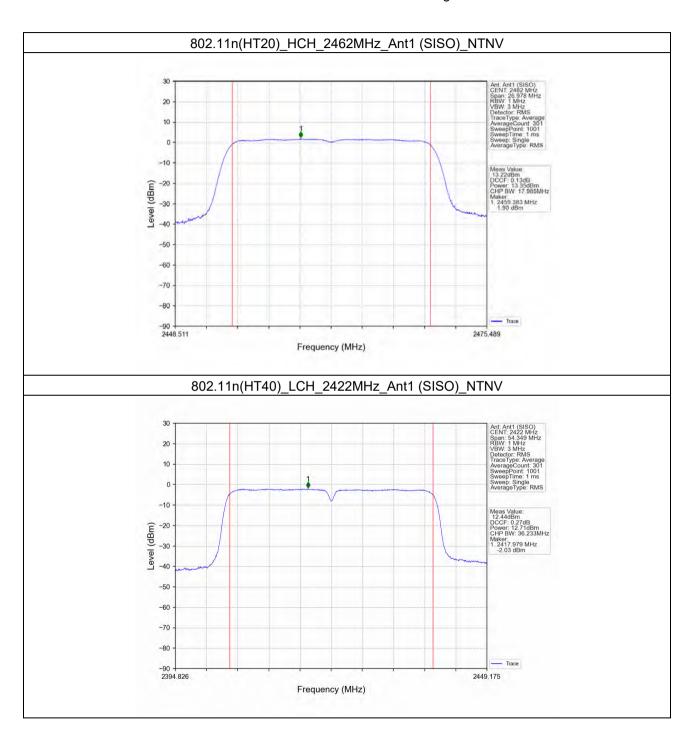
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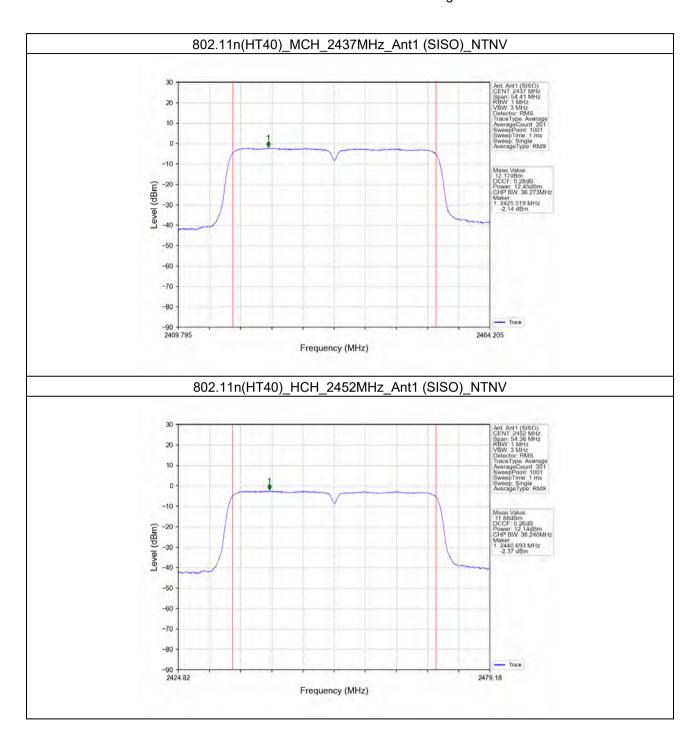
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### 4. Maximum Power Spectral Density

#### 4.1 PSD

### 4.1.1 Test Result

Mode	TX	Frequency	Maximum PS	Vordist	
	Type	(MHz)	ANT1	Limit	Verdict
802.11b	SISO	2412	-6.10	<=8	Pass
		2437	-7.14	<=8	Pass
		2462	-7.94	<=8	Pass
802.11g	SISO	2412	-10.80	<=8	Pass
		2437	-11.01	<=8	Pass
		2462	-12.29	<=8	Pass
802.11n (HT20)	SISO	2412	-11.68	<=8	Pass
		2437	-11.63	<=8	Pass
		2462	-12.46	<=8	Pass
802.11n (HT40)	SISO	2422	-16.20	<=8	Pass
		2437	-15.90	<=8	Pass
		2452	-16.88	<=8	Pass
Note1: Antenna Gain: Ant1: 3.48dBi;					



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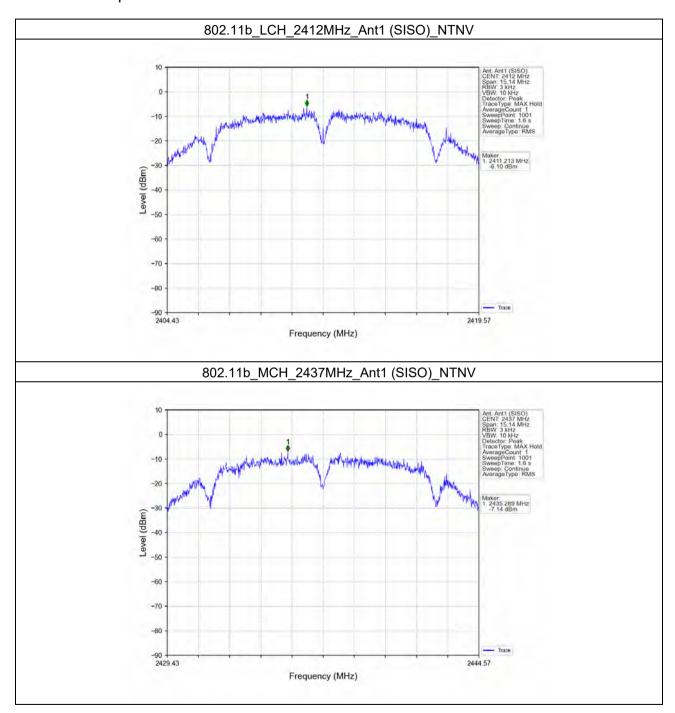
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### 4.1.2 Test Graph





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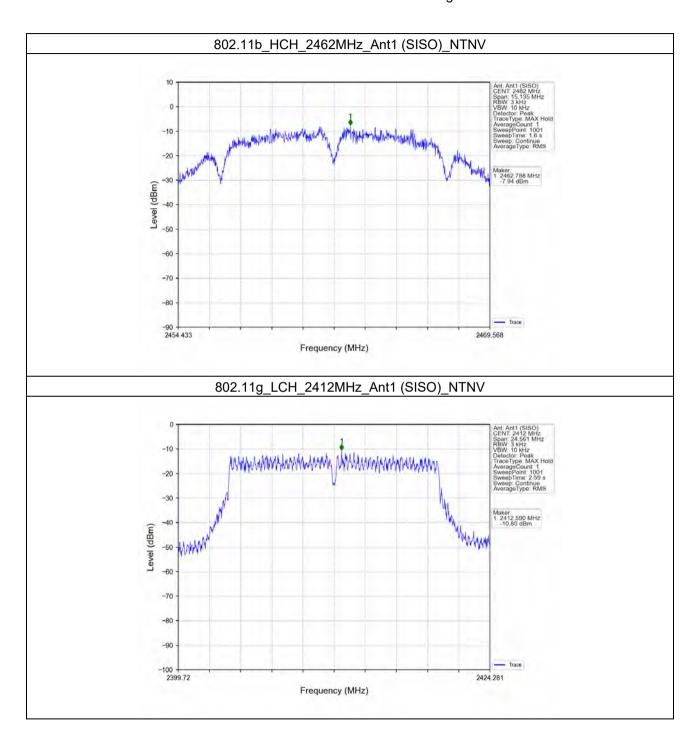
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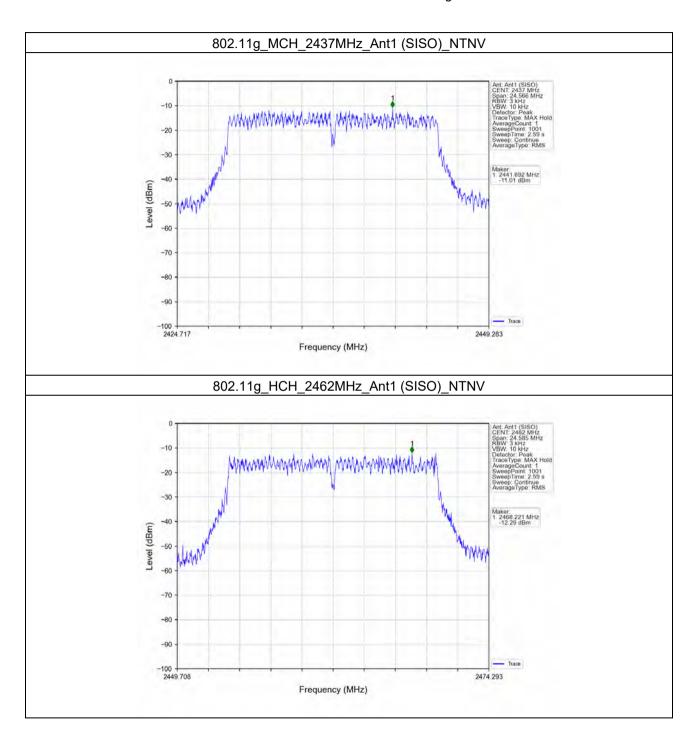
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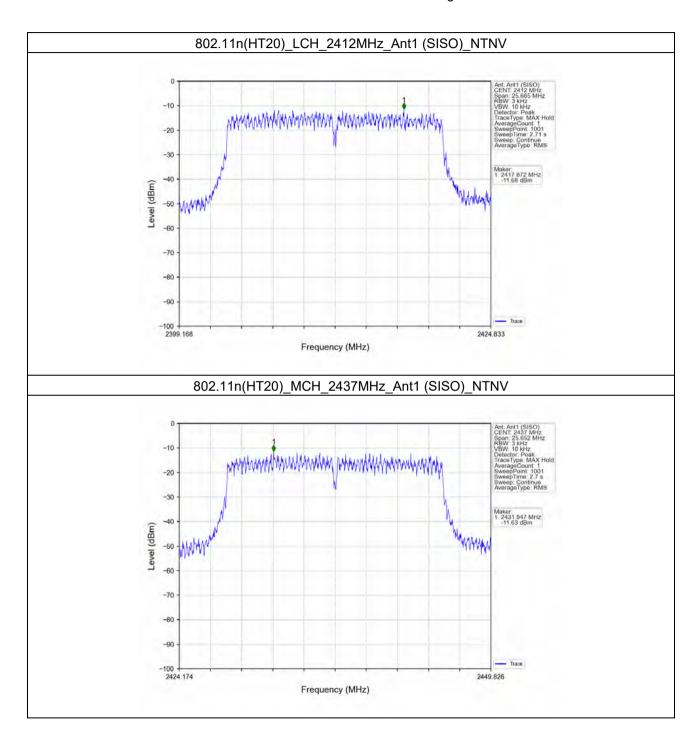
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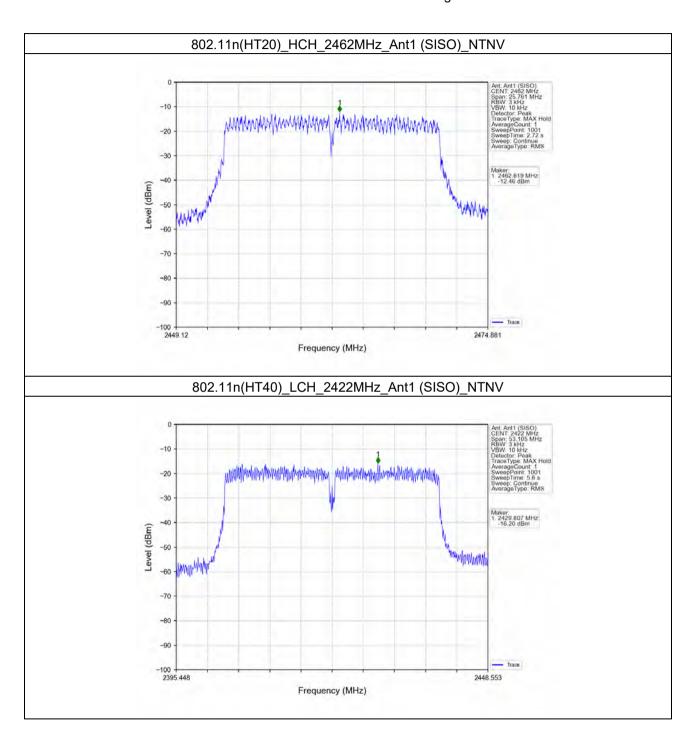
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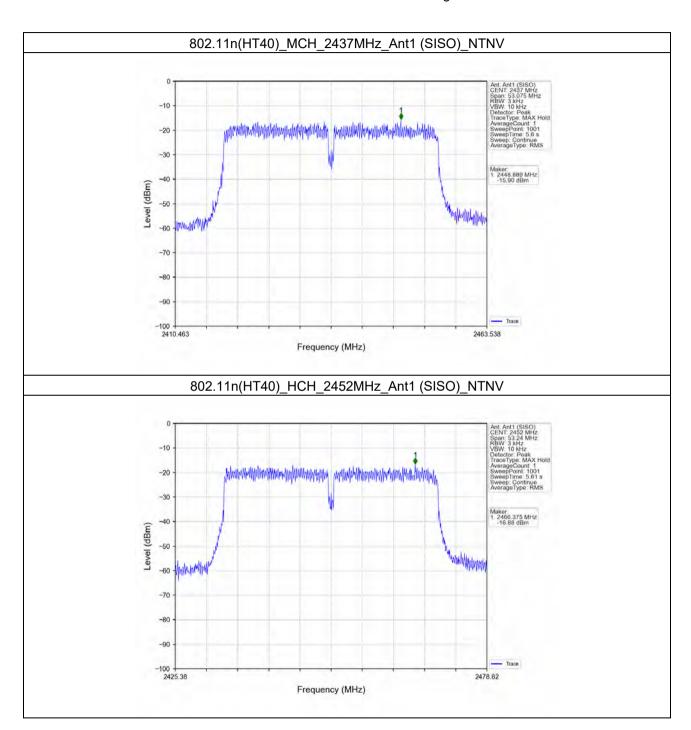
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### 5. Unwanted Emissions In Non-restricted Frequency Bands

#### 5.1 Ref

### 5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	1	7.48
		2437	1	7.17
		2462	1	6.77
802.11g	SISO	2412	1	3.33
		2437	1	3.00
		2462	1	2.40
802.11n (HT20)	SISO	2412	1	3.34
		2437	1	3.02
		2462	1	2.34
802.11n (HT40)	SISO	2422	1	-1.26
		2437	1	-1.55
		2452	1	-1.82

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



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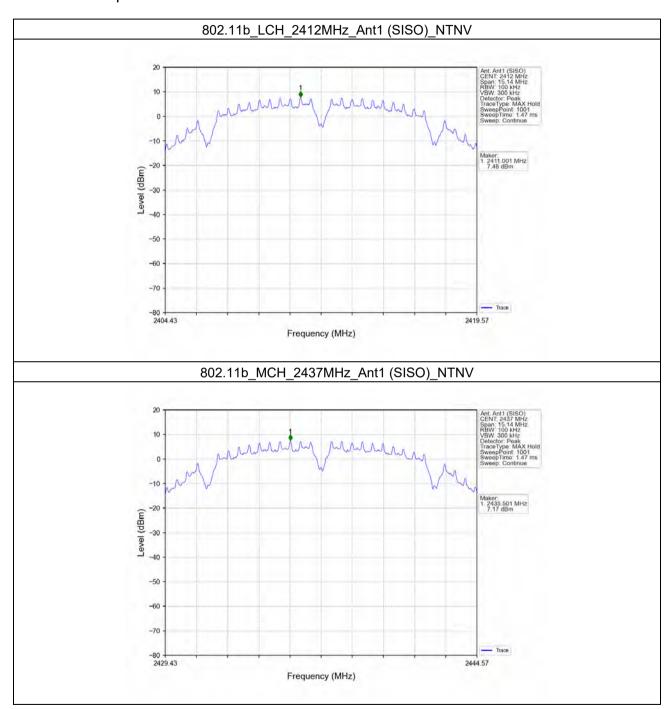
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### 5.1.2 Test Graph





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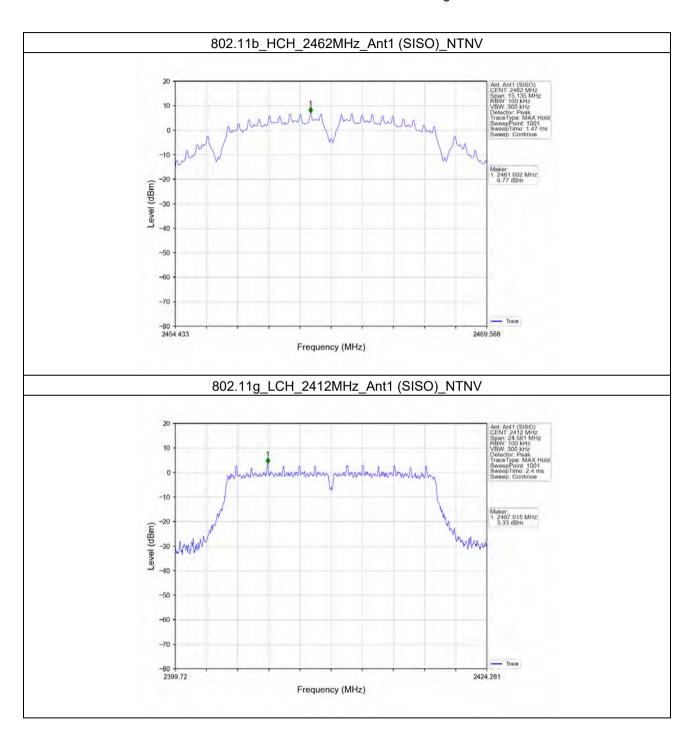
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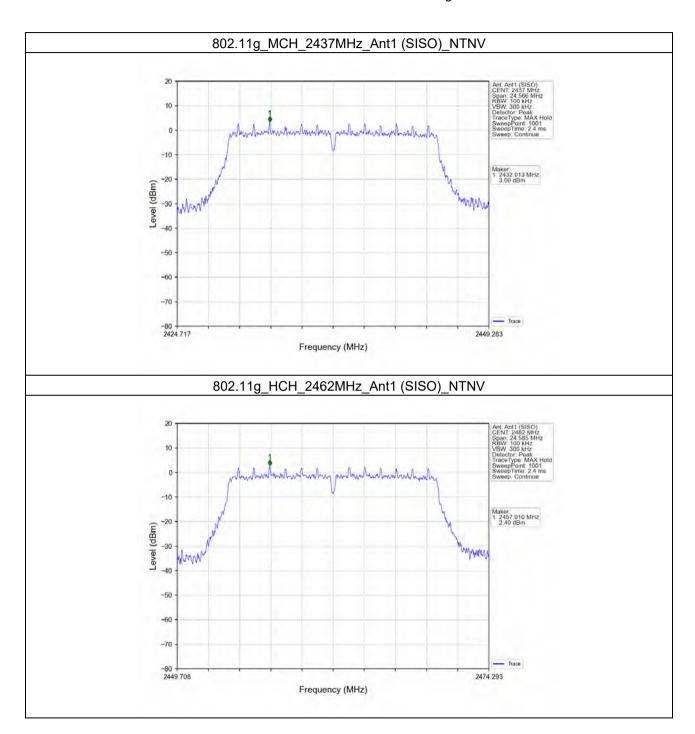
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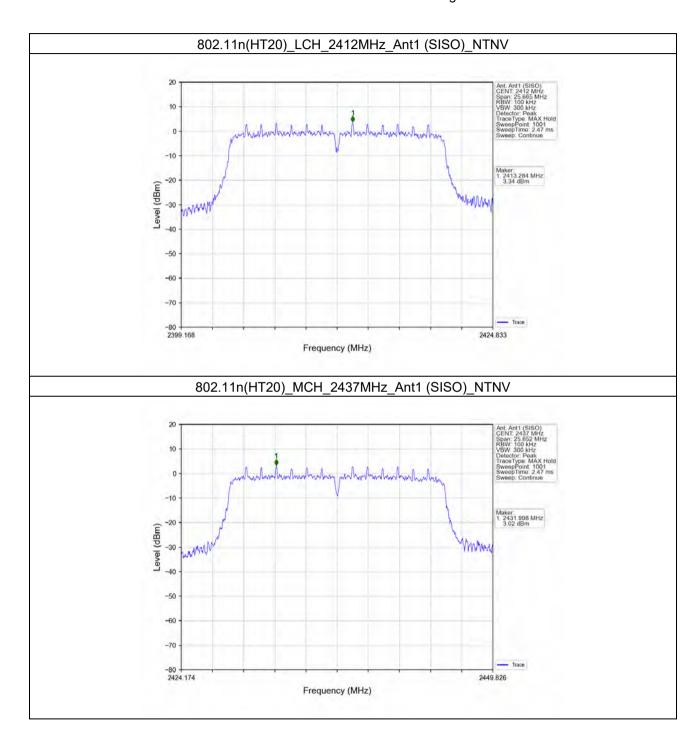
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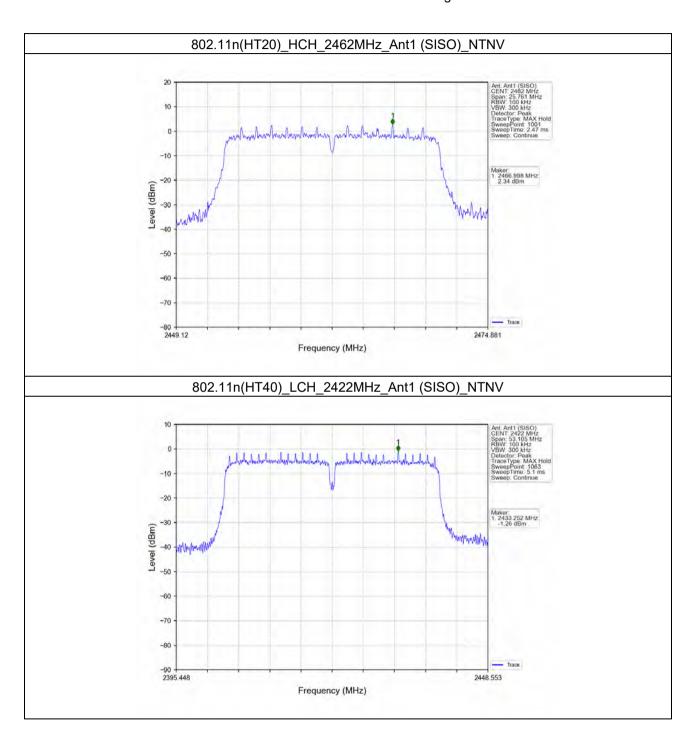
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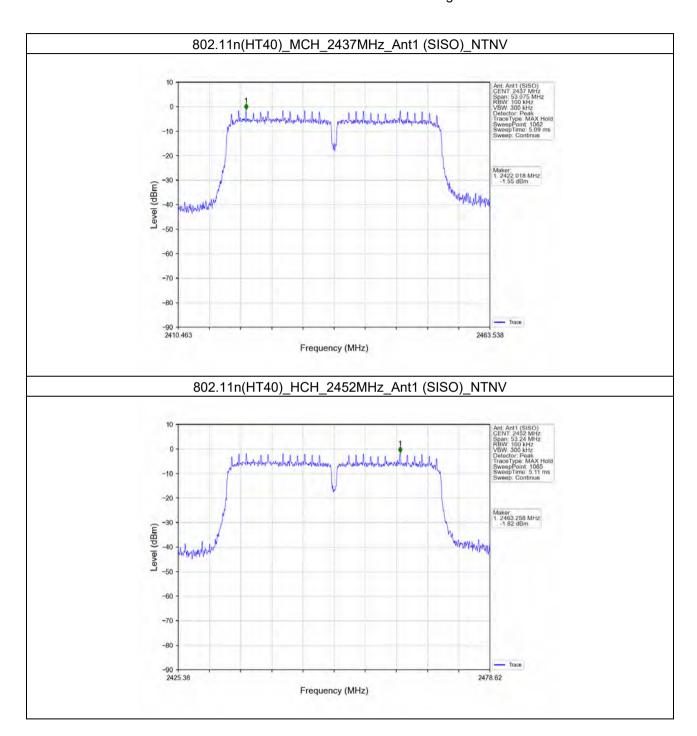
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#### 5.2 CSE

#### 5.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	7.48	-22.52	Pass
		2437	1	7.48	-22.52	Pass
		2462	1	7.48	-22.52	Pass
802.11g	SISO	2412	1	3.33	-26.67	Pass
		2437	1	3.33	-26.67	Pass
		2462	1	3.33	-26.67	Pass
802.11n (HT20)	SISO	2412	1	3.34	-26.66	Pass
		2437	1	3.34	-26.66	Pass
		2462	1	3.34	-26.66	Pass
802.11n (HT40)	SISO	2422	1	-1.26	-31.26	Pass
		2437	1	-1.26	-31.26	Pass
		2452	1	-1.26	-31.26	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.



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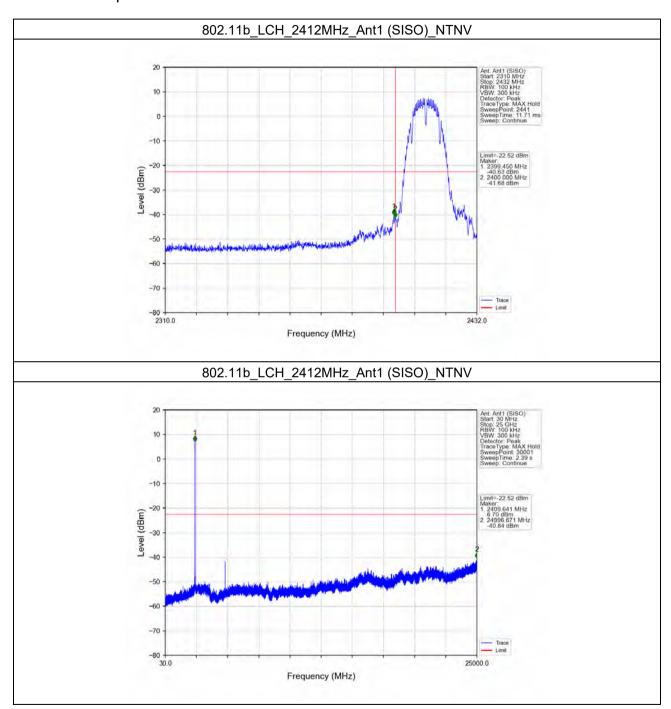
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### 5.2.2 Test Graph





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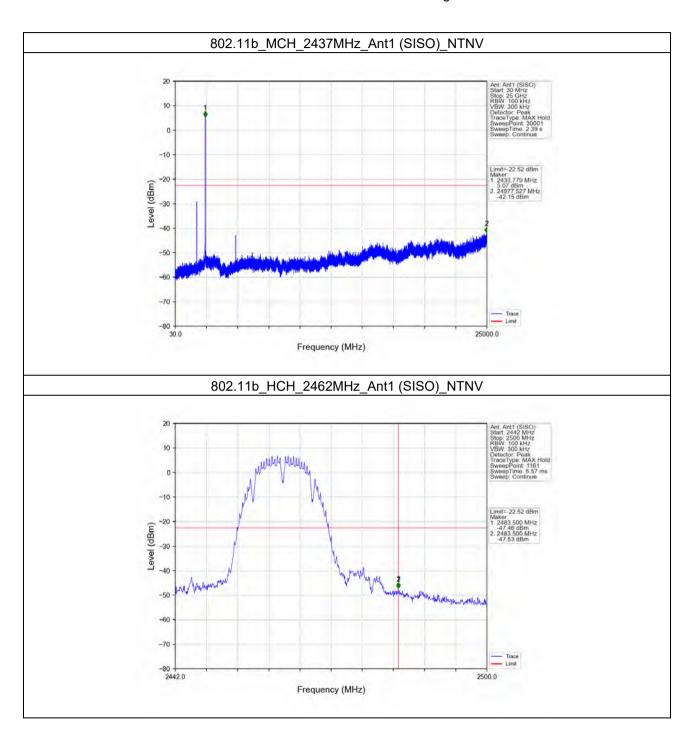
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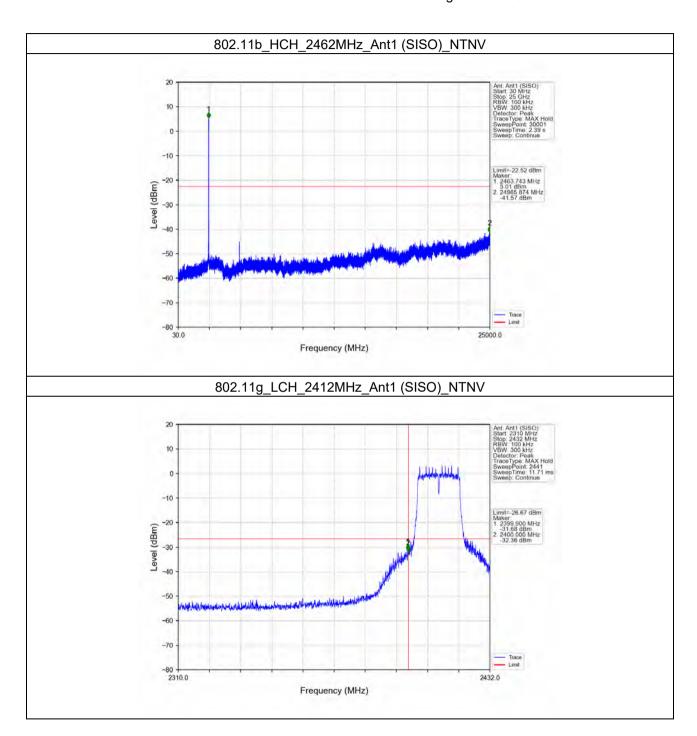
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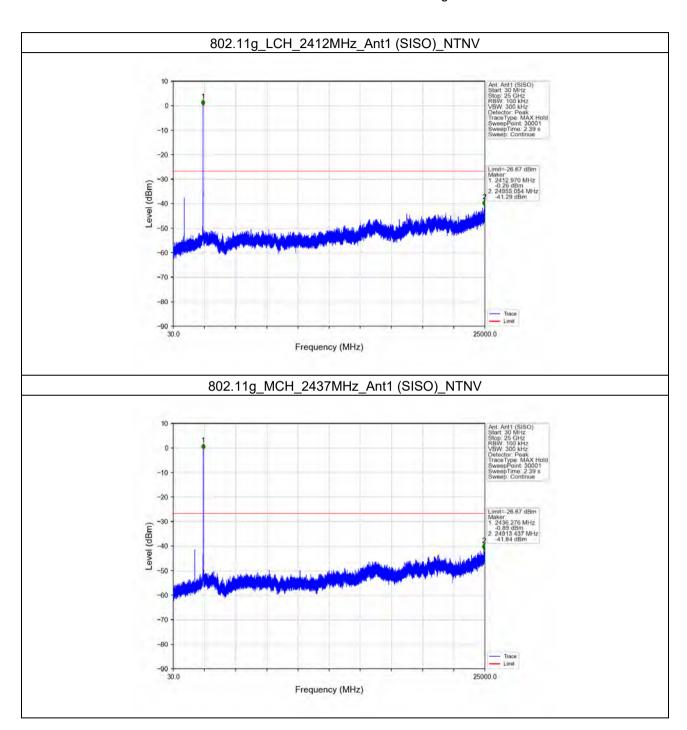
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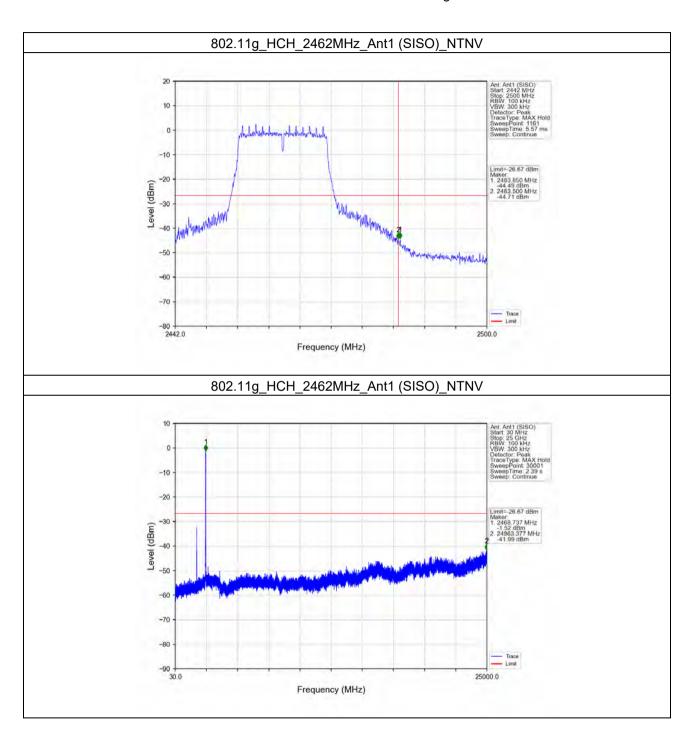
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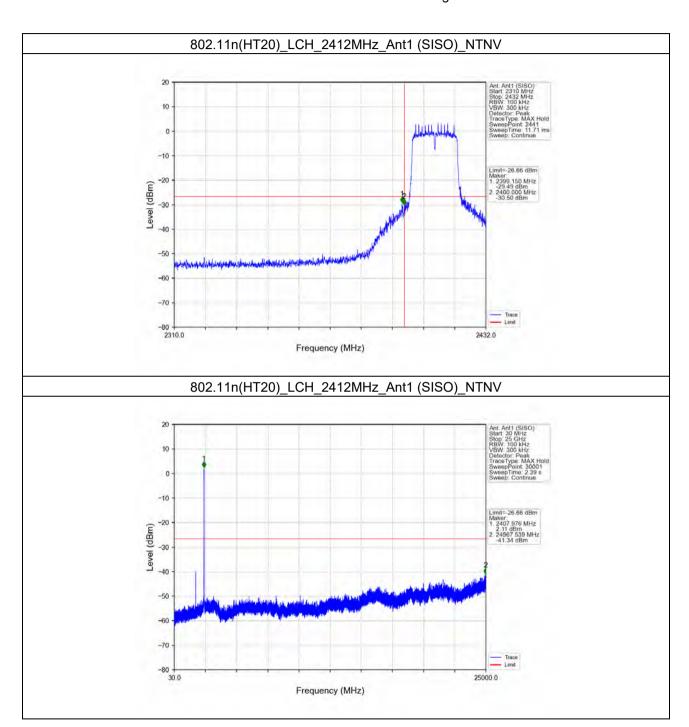
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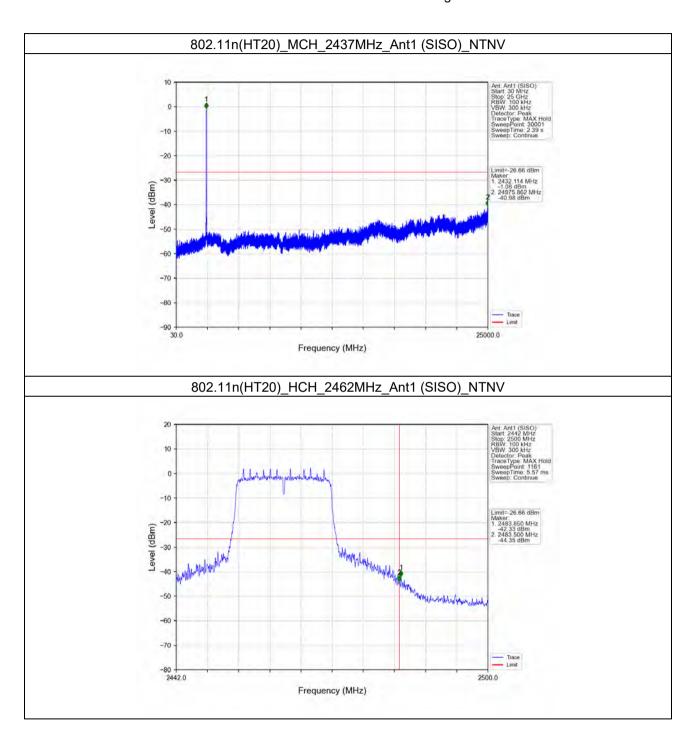
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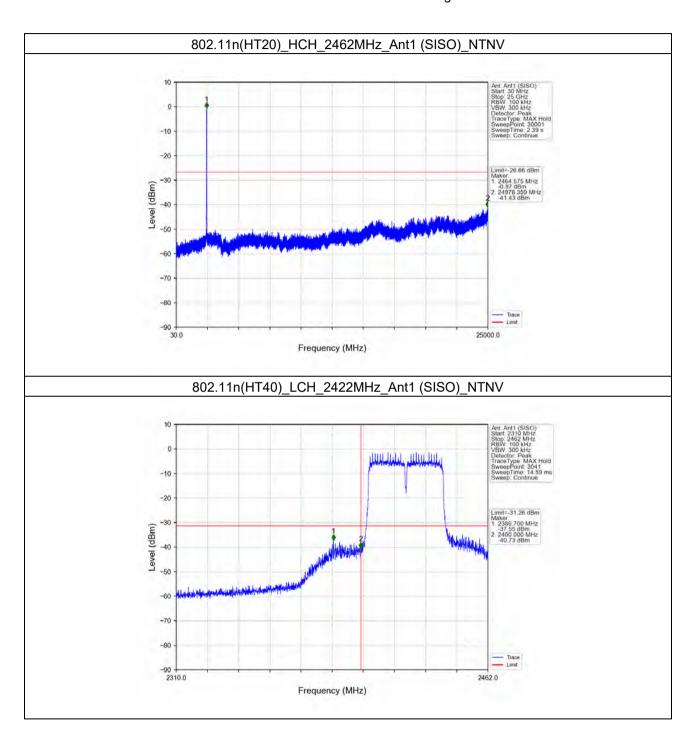
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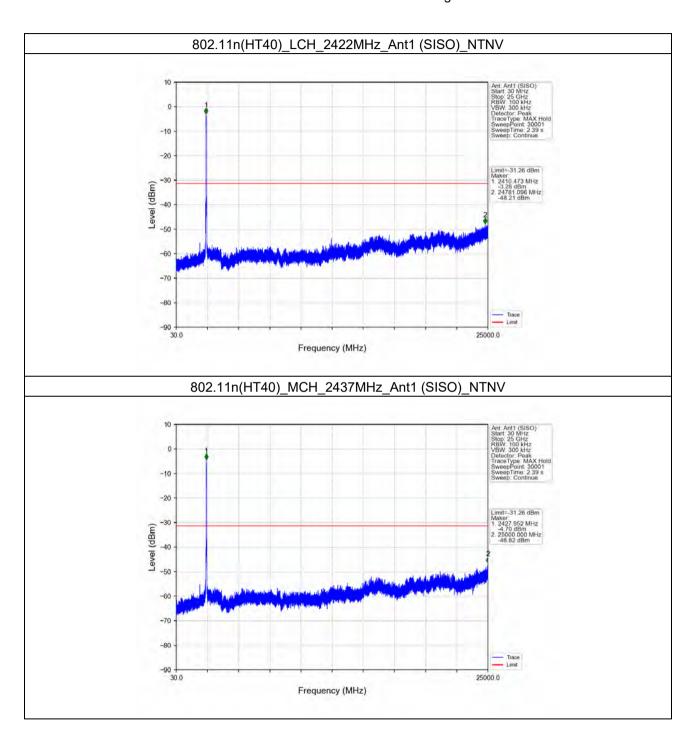
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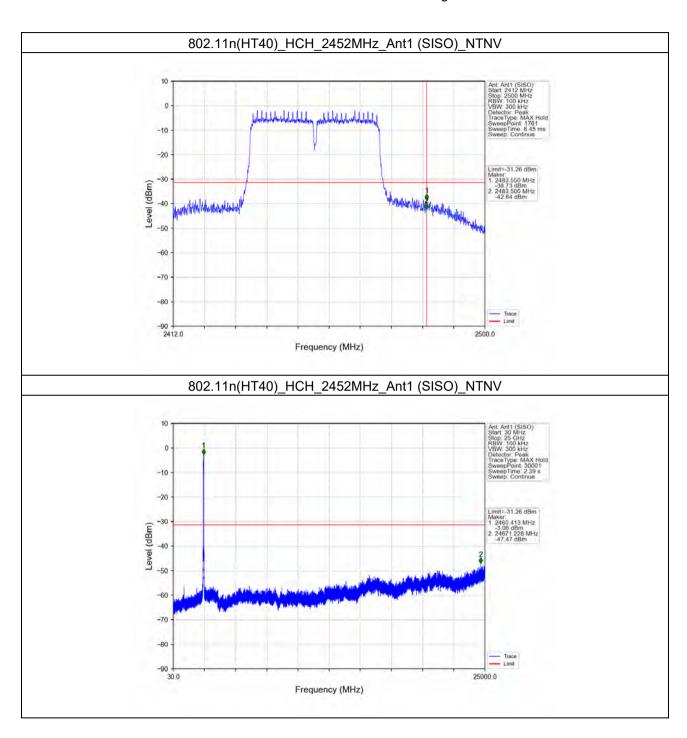
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