# TEST REPORT

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|---|---|---|---|
| **Applicant:**<br>**Address:** | **Dong Guan Qiangde Electronics Technology Co.,Ltd.**<br>**Room501, Building3, No.60 Xinyang Middle Road, Lincun, Tangxia Town, Dongguan City，Guangdong Province** | | |
| **Manufacturer:**<br>**Address:** | **Dong Guan Qiangde Electronics Technology Co.,Ltd.**<br>**Room501, Building3, No.60 Xinyang Middle Road, Lincun, Tangxia Town, Dongguan City，Guangdong Province** | | |
| **Factory:**<br>**Address:** | **Dong Guan Qiangde Electronics Technology Co.,Ltd.**<br>**Room501, Building3, No.60 Xinyang Middle Road, Lincun, Tangxia Town, Dongguan City，Guangdong Province** | | |
| **E.U.T.:** | **Light Stream (TM) Cloud** | | |
| **Model Number:** | **V-20913** | | |
| **Trade mark:** | **N/A** | | |
| **FCC ID:** | **2BHEG-LSC** | | |
| **Date of Receipt:** | **July 03, 2024** | **Date of Test:** | **July 04, 2024 - July24, 2024** |
| **Test Specification:** | **FCC 47 CFR Part 15, Subpart C** | | |
| **Test Result:** | **The equipment under test was found to be compliance with the requirements of the standards applied.** | | |

Prepared by:

Jerry Hu/ Engineer

Approved & Authorized Signer:

Frank Shen/ Manager

Issue Date: August 6, 2024

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Dongguan Lepont Service Co., Ltd.

# TABLE OF CONTENTS

**1. GENERAL PRODUCT INFORMATION....4**

1.1. PRODUCT FUNCTION....4
1.2. EUT TECHNICAL DESCRIPTION....4
1.3. INDEPENDENT OPERATION MODES....5
1.4. TEST SOFTWARE....6
1.5. GENERAL CONDITION....6
1.6. SUPPORT EQUIPMENT....6

**2. TEST STANDARDS AND SITES....7**

2.1. DESCRIPTION OF STANDARDS AND RESULTS....7
2.2. LIST OF TEST AND MEASUREMENT INSTRUMENTS....8
2.3. MEASUREMENT UNCERTAINTY....9
2.4. TEST FACILITY....9

**3. SETUP OF EQUIPMENT UNDER TEST....10**

3.1. RADIO FREQUENCY TEST SETUP 1....10
3.2. RADIO FREQUENCY TEST SETUP 2....10
3.3. CONDUCTED EMISSION TEST SETUP....12
3.4. BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM....12

**4. TEST RESULTS AND MEASUREMENT DATA....13**

4.1. DTS (6DB) BANDWIDTH....13
4.2. MAXIMUM PEAK CONDUCTED OUTPUT POWER....20
4.3. MAXIMUM POWER SPECTRAL DENSITY....22
4.4. UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS....29
4.5. RADIATED SPURIOUS EMISSION....43
4.6. CONDUCTED EMISSION TEST....51
4.7. ANTENNA APPLICATION....54

| Revision History of This Test Report | | |
|---|---|---|
| Report Number | Description | Issued Date |
| LP23080282C01-31 | Initial Issue | 2024-8-6 |
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# 1. GENERAL PRODUCT INFORMATION

## 1.1. PRODUCT FUNCTION

Refer to Technical Construction Form and User Manual.

## 1.2. EUT TECHNICAL DESCRIPTION

| | |
|---|---|
| Product Name: | Light Stream (TM) Cloud |
| Model No.: | V-20913 |
| Test Model No: | V-20913 |
| Difference: | N/A |
| Serial No.: | N/A |
| Test sample(s) ID: | LP23080282C31-S001 |
| Sample(s) Status | Engineer sample |
| IEEE 802.11 WLAN Mode Supported : | ☒802.11b ☒802.11g<br>☒802.11n(20MHz channel bandwidth) |
| Modulation : | DSSS with DBPSK/DQPSK/CCK for 802.11b;<br>OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n; |
| Operating Frequency Range : | ☒2412-2462MHz for 802.11b/g/n(HT20) |
| Number of Channels : | ☒11 channels for 802.11b/g/n(HT20); |
| Antenna Type : | PCB Antenna |
| Antenna Gain : | -0.58dBi |
| Power Supply: | AC 120V/60Hz |

## 1.3. INDEPENDENT OPERATION MODES

The EUT has been tested under its typical operating condition.
The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

| Mode | Date Rate | Test Channel |
|---|---|---|
| IEEE 802.11b | 1Mbps | Low/Middle/High |
| IEEE 802.11g | 6Mbps | Low/Middle/High |
| IEEE 802.11n HT20 | MCS0 | Low/Middle/High |
| IEEE 802.11n HT40 | MCS0 | Low/Middle/High |

Frequency and Channel list

| Channel List | | | |
|---|---|---|---|
| Channel No. | Frequency (MHz) | | |
| 1 | 2412 | | |
| 2 | 2417 | | |
| 3 | 2422 | | |
| 4 | 2427 | | |
| 5 | 2432 | | |
| 6 | 2437 | | |
| 7 | 2442 | | |
| 8 | 2447 | | |
| 9 | 2452 | | |
| 10 | 2457 | | |
| 11 | 2462 | | |
| | | | |
| | | | |
| 802.11b/g/n(HT20) | | | |

## 1.4. TEST SOFTWARE

| Software | | Description |
|---|---|---|
| GD_RF_Test_Tool_V1.0.0 | | Set the COM Port Test Tool to set the corresponding Test conditions |

## 1.5. GENERAL CONDITION

| | Temperature | Humidity |
|---|---|---|
| Ambient Condition: | 22.4℃ | 51.2 %RH |

## 1.6. SUPPORT EQUIPMENT

| EUT Cable List and Details | | | |
|---|---|---|---|
| Cable Description | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| / | / | / | / |

| Auxiliary Cable List and Details | | | |
|---|---|---|---|
| Cable Description | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| / | / | / | / |

| Auxiliary Equipment List and Details | | | |
|---|---|---|---|
| Description | Manufacturer | Model | Serial Number |
| Laptop computer | Lenovo | Xiaoxin Pro IA5HR | PF490VB0 |
| | | | |

**Notes:**

1.All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2.Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

# 2. TEST STANDARDS AND SITES

## 2.1. DESCRIPTION OF STANDARDS AND RESULTS

The EUT have been tested according to the applicable standards as referenced below.

| FCC Part Clause | Test Parameter | Verdict | Remark |
|---|---|---|---|
| 15.247(a)(2) | DTS (6dB) Bandwidth | PASS | |
| 15.247(b)(3) | Maximum Peak Conducted Output Power | PASS | |
| 15.247(e) | Maximum Power Spectral Density Level | PASS | |
| 15.247(d) | Unwanted Emission Into Non-Restricted Frequency Bands | PASS | |
| 15.247(d)<br>15.209 | Unwanted Emission Into Restricted Frequency Bands (conducted) | PASS | |
| 15.247(d)；15.209 | Radiated Spurious Emission | PASS | |
| 15.207 | Conducted Emission Test | PASS | |
| 15.203 | Antenna Application | PASS | |

NOTE1: N/A (Not Applicable)
NOTE2: The report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.

## 2.2. LIST OF TEST AND MEASUREMENT INSTRUMENTS

| For conducted emission at the mains terminals test(Shielded Room 1) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval | Lab No. | Remark |
| EMI Test Receiver | Rohde & Schwarz | ESHS30 | 8290501003 | Jan. 24, 2024 | 1 Year | LEP-E002 | ☑ |
| Artificial Mains Network | Baluelec | LSN016 | BL041122050121 | Nov. 15, 2023 | 1 Year | LEP-E067 | ☑ |
| Shielded Room 1 | MR | MR-L05 | LEP-E053 | Nov. 17, 2022 | 3 Year | LEP-E053 | ☑ |
| Test software | EZ-EMC | Fala | LEPONT-03A2 | N/A | N/A | N/A | ☑ |
| **For radiated(9K-30M) emission test(966 Chamber 1)** | | | | | | | |
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval | Lab No. | Remark |
| EMI Test Receiver | Rohde & Schwarz | ESR 3 | 101849 | Jan. 31, 2024 | 1 Year | LEP-E006 | ☑ |
| Active Loop Antenna | Schwarzbeck | FMZB 1519C | 00008 | Jan. 24, 2024 | 3 Year | LEP-E068 | ☑ |
| 966 Chamber 1 | MR | MR-L02 | LEP-E051 | Nov. 17, 2022 | 3 Year | LEP-E051 | ☑ |
| Test software | EZ-EMC | Fala | EMEC-3A1 | N/A | N/A | N/A | ☑ |
| **For radiated(30M-1G) emission test(966 Chamber 1)** | | | | | | | |
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval | Lab No. | Remark |
| EMI Test Receiver | Rohde & Schwarz | ESR 3 | 101849 | Jan. 31, 2024 | 1 Year | LEP-E006 | ☑ |
| TRILOG Broadband Antenna | Schwarzbeck | VULB 9163 | 743 | Nov. 20, 2022 | 3 Year | LEP-E005 | ☑ |
| Signal Amplifier | HP | 8447D | 1726A01222 | Jan. 24, 2024 | 1 Year | LEP-E007 | ☑ |
| 6dB Attenuator | RswTech | 5W 6dB | LEP-E084 | Jan. 24, 2024 | 1 Year | LEP-E084 | ☑ |
| 966 Chamber 1 | MR | MR-L02 | LEP-E051 | Nov. 17, 2022 | 3 Year | LEP-E051 | ☑ |
| Test software | EZ-EMC | Fala | EMEC-3A1 | N/A | N/A | N/A | ☑ |
| **For radiated(1-18G) emission test(966 Chamber 1)** | | | | | | | |
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval | Lab No. | Remark |
| Spectrum analyzer | Rohde & Schwarz | FSV40 | 101412 | Jan. 24, 2024 | 1 Year | LEP-E076 | ☑ |
| Spectrum analyzer | Agilent | N9020A | MY49100060 | Jan. 24, 2024 | 1 Year | LEP-E020 | ☑ |
| Horn antenna | Schwarzbeck | BBHA 9120D | 01875 | Nov. 20, 2022 | 3 Year | LEP-E024 | ☑ |
| Preamplifier | Schwarzbeck | BBN 9718B | 00010 | Jan. 24, 2024 | 1 Year | LEP-E025 | ☑ |
| 966 Chamber 1 | MR | MR-L02 | LEP-E051 | Nov. 17, 2022 | 3 Year | LEP-E051 | ☑ |
| Test software | EZ-EMC | Fala | EMEC-3A1 | N/A | N/A | N/A | ☑ |
| **For radiated(18-40G) emission test(966 Chamber 1)** | | | | | | | |
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval | Lab No. | Remark |
| Spectrum analyzer | Rohde & Schwarz | FSV40 | 101412 | Jan. 24, 2024 | 1 Year | LEP-E076 | ☑ |
| Horn antenna+Preamplifier | COM-POWER | AH840 | 10100020 | Sep. 05, 2022 | 3 Year | LEP-E075 | ☑ |
| 966 Chamber 1 | MR | MR-L02 | LEP-E051 | Nov. 17, 2022 | 3 Year | LEP-E051 | ☑ |
| Test software | EZ-EMC | Fala | EMEC-3A1 | N/A | N/A | N/A | ☑ |
| **For RF test** | | | | | | | |
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval | Lab No. | Remark |
| Spectrum analyzer | Rohde & Schwarz | FSV40 | 101412 | Jan. 24, 2024 | 1 Year | LEP-E076 | ☑ |
| Spectrum analyzer | Agilent | N9020A | MY49100060 | Jan. 24, 2024 | 1 Year | LEP-E020 | ☑ |
| Vector source | Agilent | N5182A | MY47420382 | Jan. 24, 2024 | 1 Year | LEP-E021 | ☑ |
| Analog signal source | Agilent | N5171B | MY51350292 | Jan. 24, 2024 | 1 Year | LEP-E022 | ☑ |
| All instrument | Rohde & Schwarz | CMW 500 | 1201.002K50 | Jan. 24, 2024 | 1 Year | LEP-E019 | ☑ |
| High and low temperature chamber | Math-mart | MT-1202-40 | LEP-E041 | Jan. 24, 2024 | 1 Year | LEP-E041 | ☑ |
| control unit | Tonscend | JS0806-2 | 10165 | Jan. 24, 2024 | 1 Year | LEP-E034 | ☑ |
| Testing software | Tonscend | JSTS1120-3 | Ver 2.6.77.0518 | N/A | N/A | N/A | ☑ |

## 2.3. MEASUREMENT UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Parameter | Uncertainty |
|---|---|
| Radio Frequency | ±1x10^-5 |
| Maximum Peak Output Power Test | ±1.0% |
| Conducted Emissions Test | ±3.08dB |
| Radiated Emission Test | ±4.60dB |
| Power Density | ±0.9% |
| Occupied Bandwidth Test | ±2.3% |
| Band Edge Test | ±1.2% |
| Antenna Port Emission | ±3dB |
| Temperature | ±3.2% |
| Humidity | ±2.5% |
| Measurement Uncertainty for a level of Confidence of 95% | |

## 2.4. TEST FACILITY

EMC Lab. : The Laboratory has been assessed and proved to be in compliance with CNAS/CL01
The Certificate Registration Number is L10100.
The Laboratory has been assessed and proved to be in compliance with A2LA
The Certificate Registration Number is 6901.01

FCC Designation No.: CN1351
Test Firm Registration No.: 397428

ISED CAB identifier: CN0151
Test Firm Registration No.: 20133

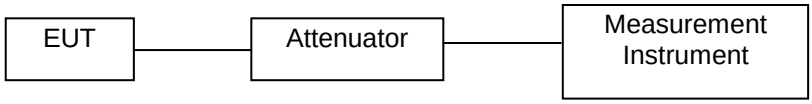
Test Location : Dongguan Lepont Testing Service Co., Ltd.

Address : Room 102, Building 11, No.7, Houjie Science And Technology Avenue, Houjie, Dongguan, Guangdong, China

# 3. SETUP OF EQUIPMENT UNDER TEST

## 3.1. RADIO FREQUENCY TEST SETUP 1

The component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.




## 3.2. RADIO FREQUENCY TEST SETUP 2

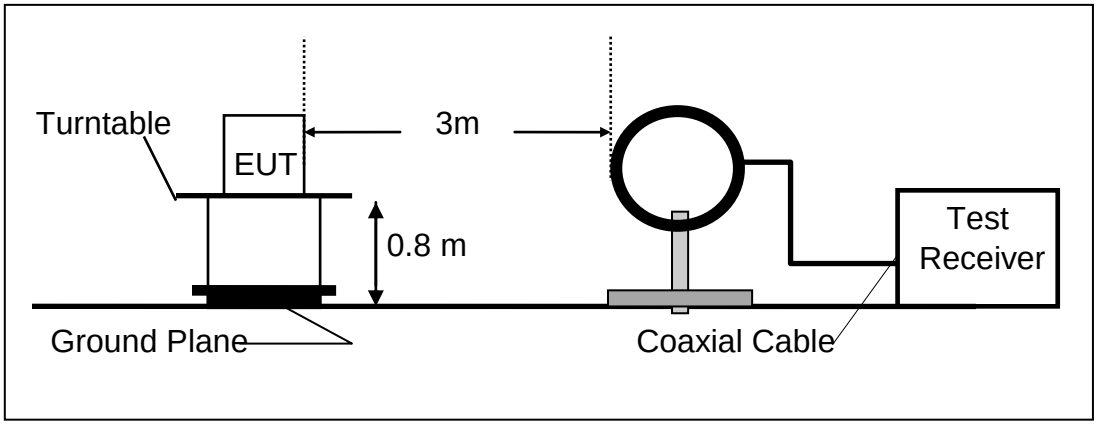
The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 32.

Below 30MHz：
The EUT is placed on a turntable 0.8meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

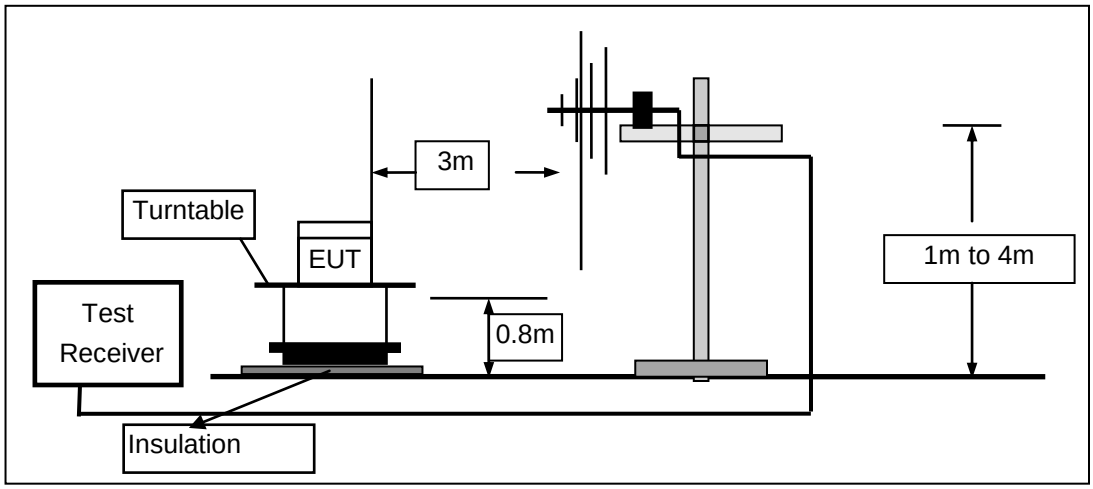
Above 30MHz：
The EUT is placed on a turntable 0.8meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)
The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

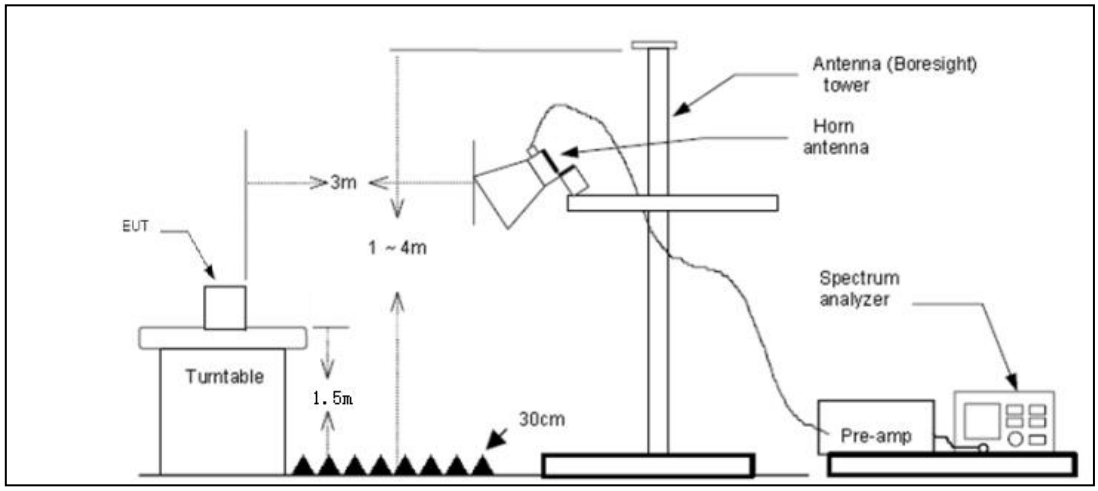
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz

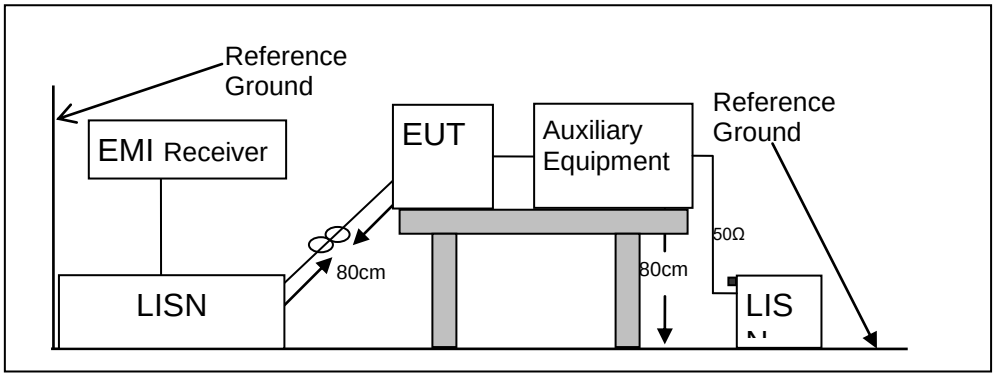



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

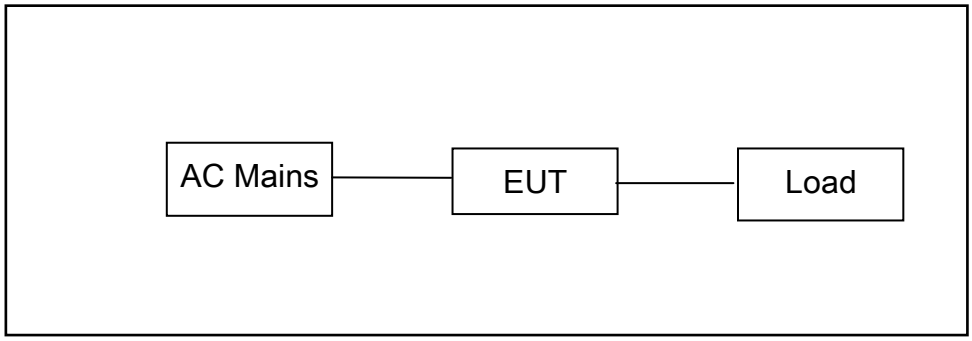


## 3.3. CONDUCTED EMISSION TEST SETUP

The mains cable of the EUT (Perfect Share Mini) must be connected to LISN. The LISN shall be placed 0.8m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.
Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.8m.
According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.




## 3.4. BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



# 4. TEST RESULTS AND MEASUREMENT DATA

## 4.1. DTS (6DB) BANDWIDTH

### 4.1.1. Applicable Standard

According to FCC Part 15.247(a)(2) and KDB 558074 D01 15.247 Meas Guidance v05r02

### 4.1.2. Conformance Limit

The minimum -6 dB bandwidth shall be at least 500 kHz.

### 4.1.3. Test Configuration

Test according to clause 3.1 radio frequency test setup 1

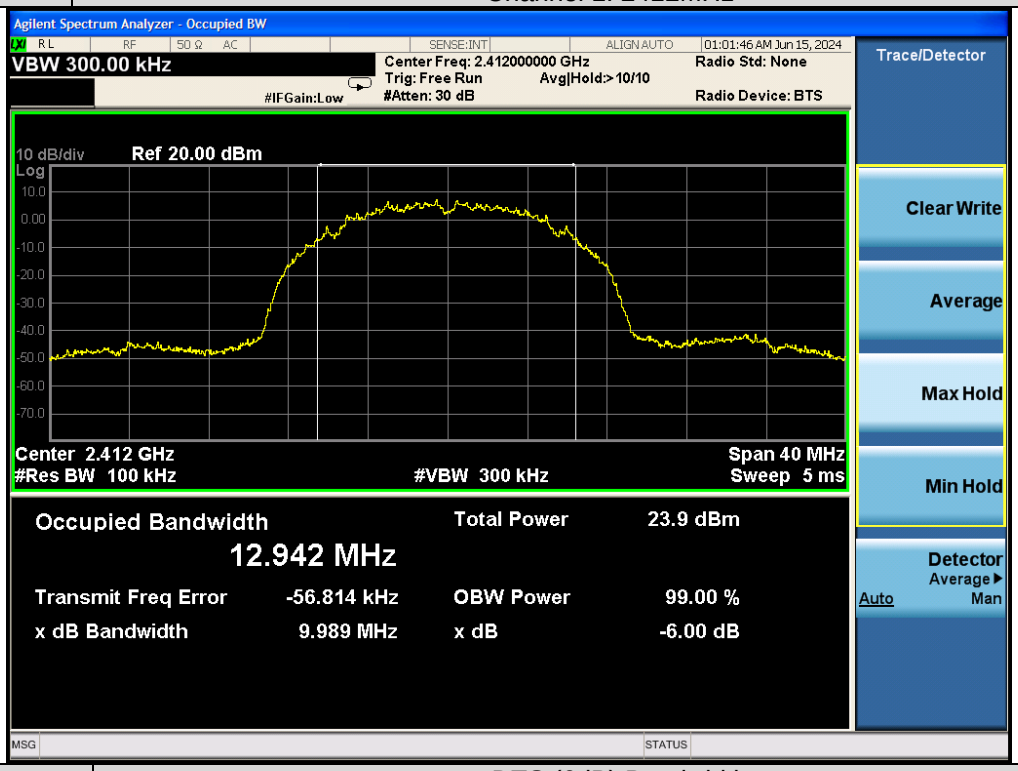
### 4.1.4. Test Procedure

The EUT was operating in IEEE 802.11b/g/n mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
Set to the maximum power setting and enable the EUT transmit continuously
Set RBW = 100 kHz.
Set the VBW ≥3xRBW(about 300kHz).
Set Span=2 times OBW
Set Detector = Peak.
Set Trace mode = max hold.
Set Sweep = auto couple.
Allow the trace to stabilize.
Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
Measure and record the results in the test report.

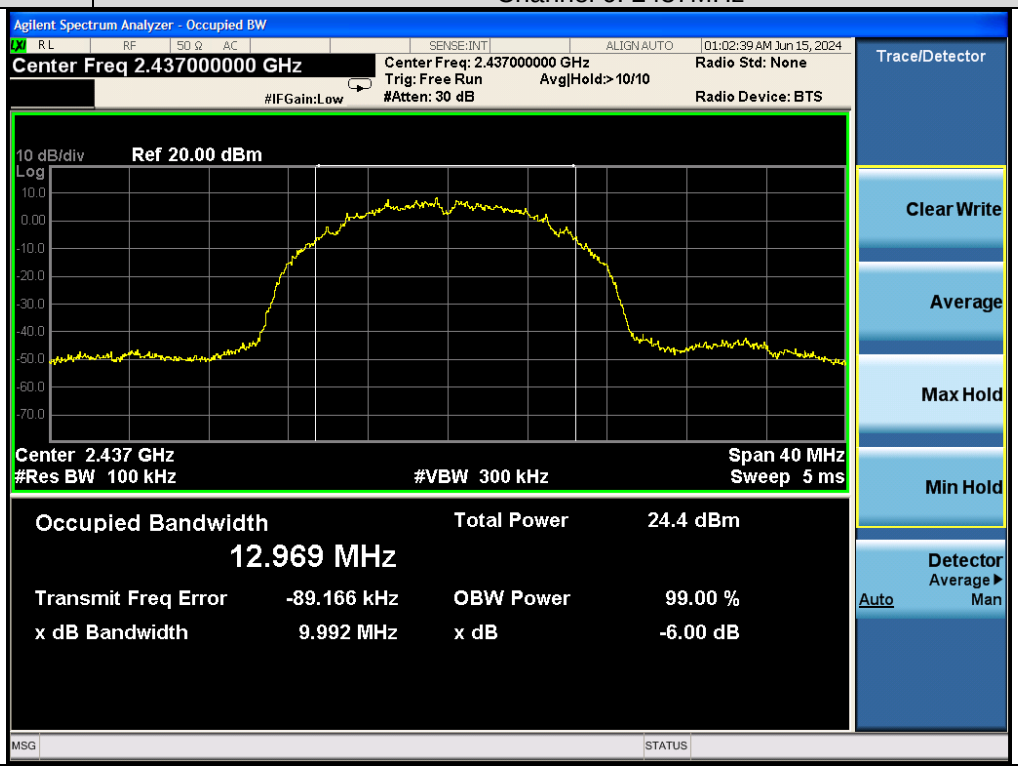
**Test Results:**

| Operation Mode | Channel Number | Channel Frequency (MHz) | Measurement Bandwidth (MHz) | Limit (kHz) | Verdict |
|---|---|---|---|---|---|
| 802.11b | 1 | 2412 | 9.989 | >500 | PASS |
| | 6 | 2437 | 9.992 | >500 | PASS |
| | 11 | 2462 | 10.04 | >500 | PASS |
| 802.11g | 1 | 2412 | 16.44 | >500 | PASS |
| | 6 | 2437 | 16.44 | >500 | PASS |
| | 11 | 2462 | 16.41 | >500 | PASS |
| 802.11n (HT20) | 1 | 2412 | 17.08 | >500 | PASS |
| | 6 | 2437 | 17.15 | >500 | PASS |
| | 11 | 2462 | 17.16 | >500 | PASS |

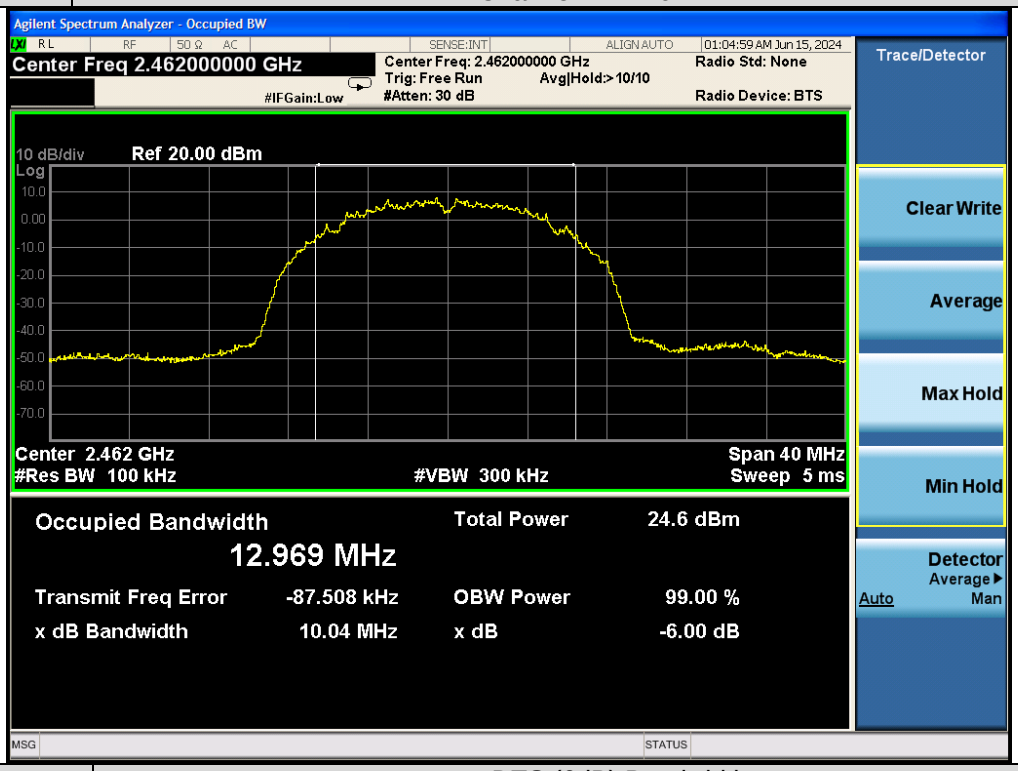
| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11b |
| | Channel 1: 2412MHz |



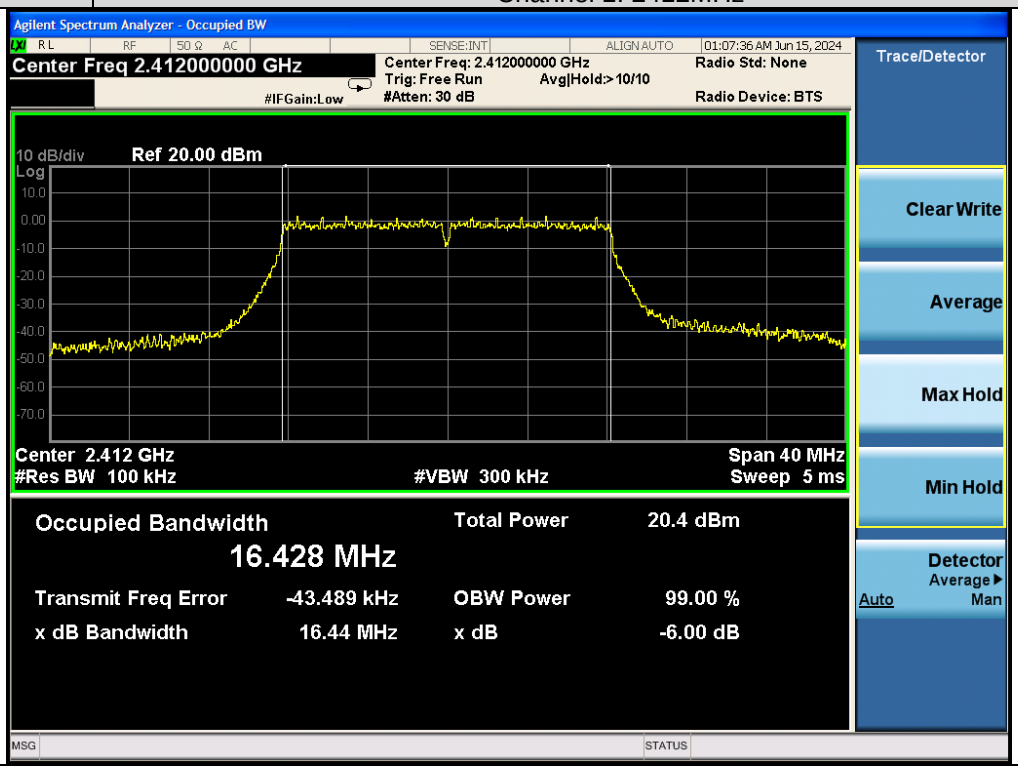

| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11b |
| | Channel 6: 2437MHz |



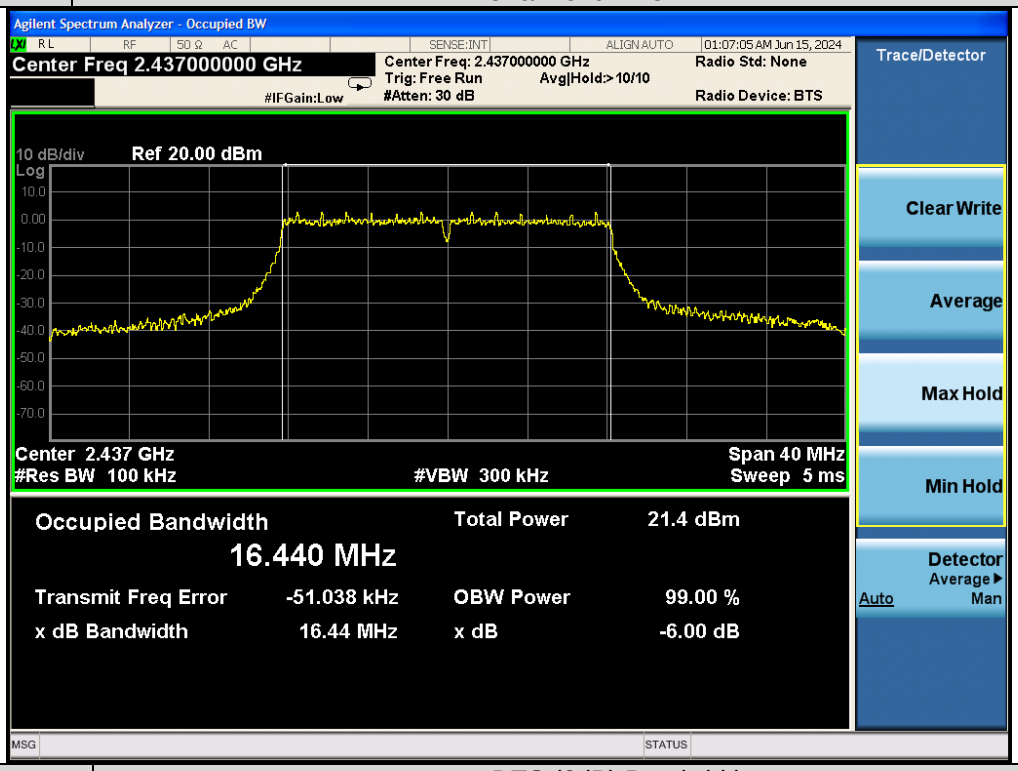
| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11b |
| | Channel 11: 2462MHz |



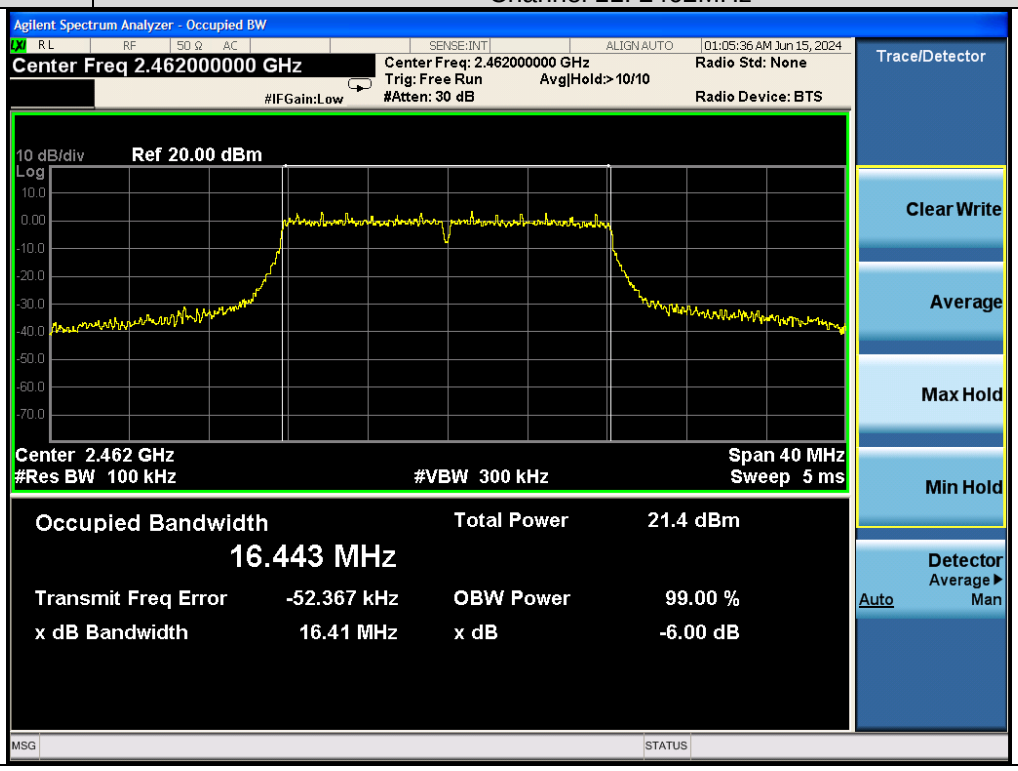

| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11g |
| | Channel 1: 2412MHz |



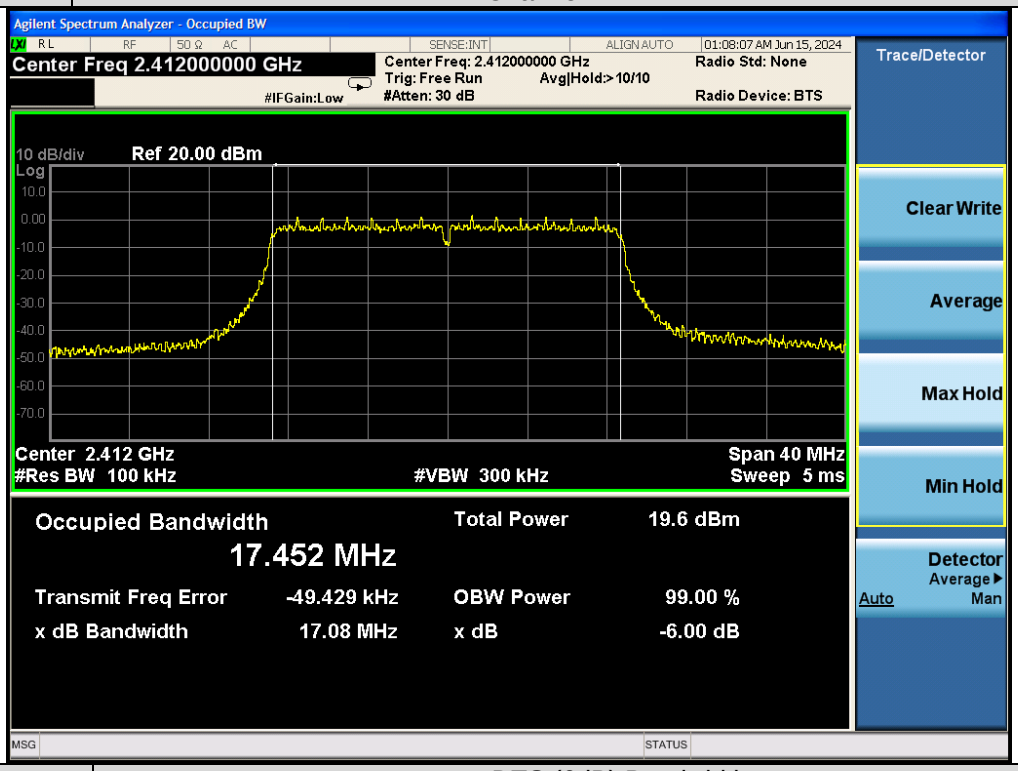
| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11g |
| | Channel 6: 2437MHz |



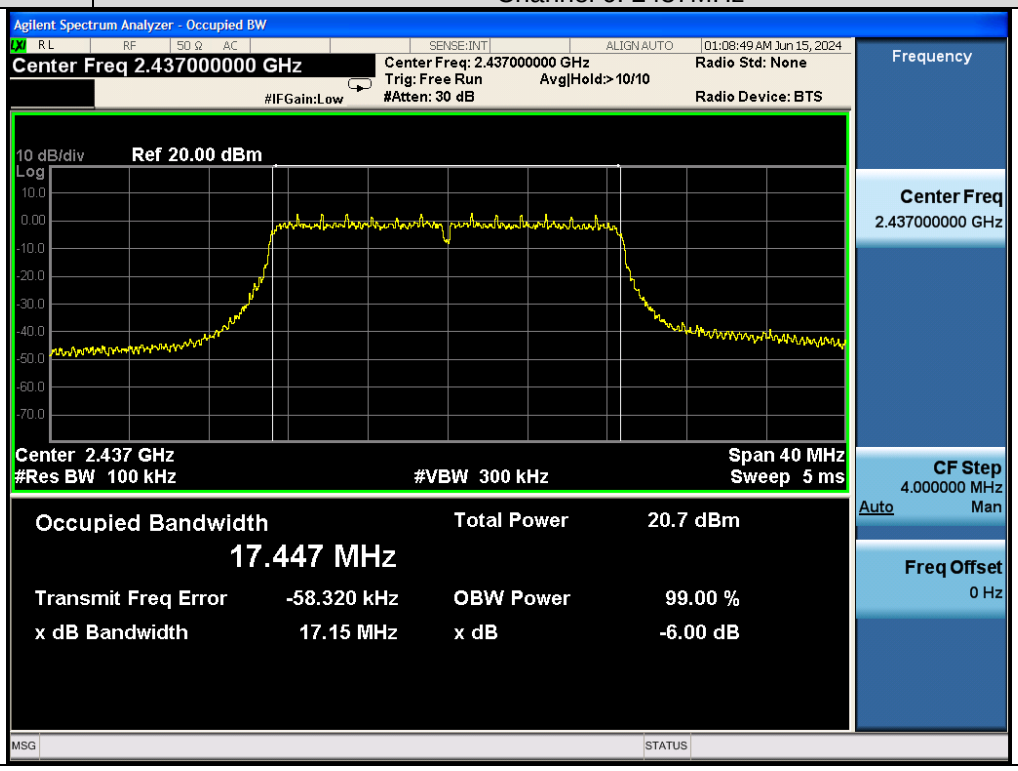

| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11g |
| | Channel 11: 2462MHz |



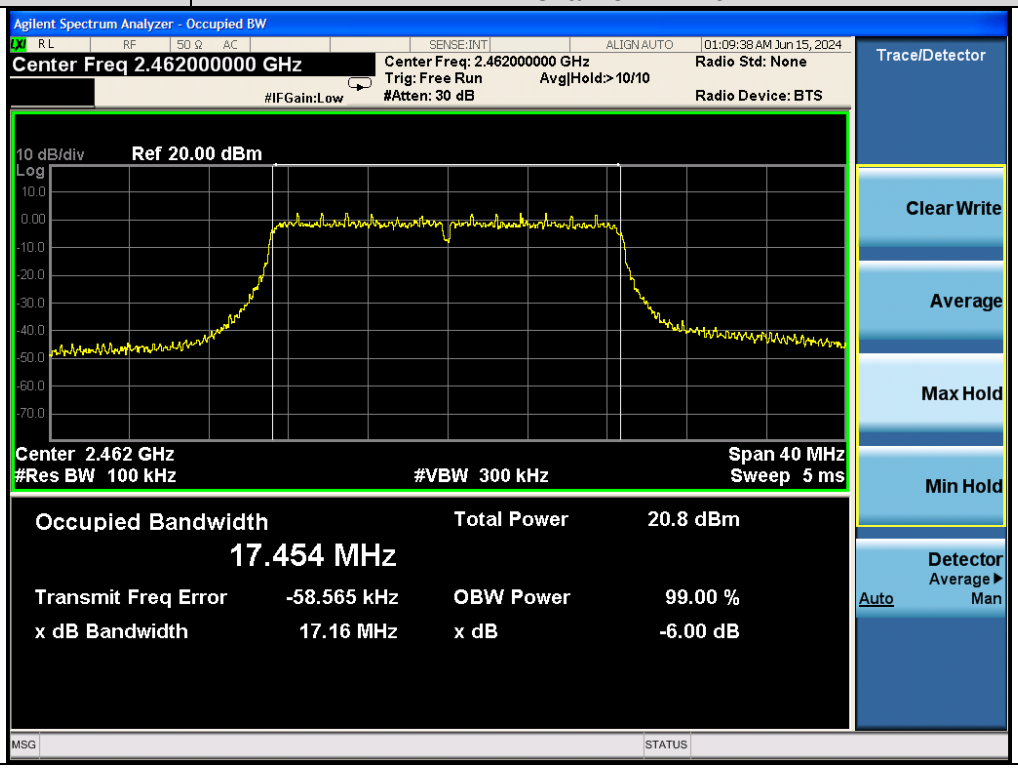
| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11n (HT20) |
| | Channel 1: 2412MHz |




| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11n (HT20) |
| | Channel 6: 2437MHz |



| Test Model | DTS (6dB) Bandwidth |
|---|---|
| | 802.11n (HT20) |
| | Channel 11: 2462MHz |



## 4.2. MAXIMUM PEAK CONDUCTED OUTPUT POWER

### 4.2.1. Applicable Standard

According to FCC Part 15.247(b)(1) and KDB 558074 D01 15.247 Meas Guidance v05r02

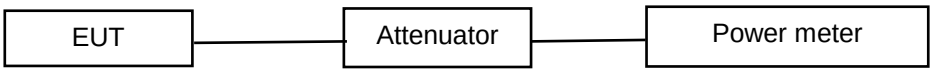
### 4.2.2. Conformance Limit

The maximum conducted output power of the intentional radiator for systems using digital modulation in the 2400 - 2483.5 MHz bands shall not exceed: 1 Watt (30dBm).

### 4.2.3. Test Configuration

Test according to clause 4.2.4 radio frequency test setup 1

### 4.2.4. Test Procedure




■ **According to FCC Part15.247(b)(3)**

As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the *maximum conducted output power* is the highest total transmit power occurring in any mode.

Set the RBW ≧DTS bandwidth(about 1MHz).
Set VBW =3*RBW(about 3MHz)
Set the span ≧3*RBW
Set Sweep time = auto couple.
Set Detector = peak.
Set Trace mode = max hold.
Allow trace to fully stabilize.
Use peak marker function to determine the peak amplitude level.

■ **According to FCC Part 15.247(b)(4):**

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 (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ Place the EUT on the desktop and set it to launch mode. Remove the antenna from the EUT and connect the low-loss RF cable from the antenna port to the power meter. Measure the peak power of each channel.

**Test Results**

| Operation Mode | Channel Number | Channel Frequency (MHz) | Measurement Level (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|
| 802.11b | 1 | 2412 | 15.23 | 30 | PASS |
| | 6 | 2437 | 14.68 | 30 | PASS |
| | 11 | 2462 | 14.91 | 30 | PASS |
| 802.11g | 1 | 2412 | 16.43 | 30 | PASS |
| | 6 | 2437 | 16.09 | 30 | PASS |
| | 11 | 2462 | 17.15 | 30 | PASS |
| 802.11n (HT20) | 1 | 2412 | 17.48 | 30 | PASS |
| | 6 | 2437 | 17.52 | 30 | PASS |
| | 11 | 2462 | 17.89 | 30 | PASS |

## 4.3. MAXIMUM POWER SPECTRAL DENSITY

### 4.3.1. Applicable Standard

According to FCC Part15.247(e) and KDB 558074 D01 15.247 Meas Guidance v05r02

### 4.3.2. Conformance Limit

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 4.3.3. Test Configuration

Test according to clause 3.1 radio frequency test setup 1

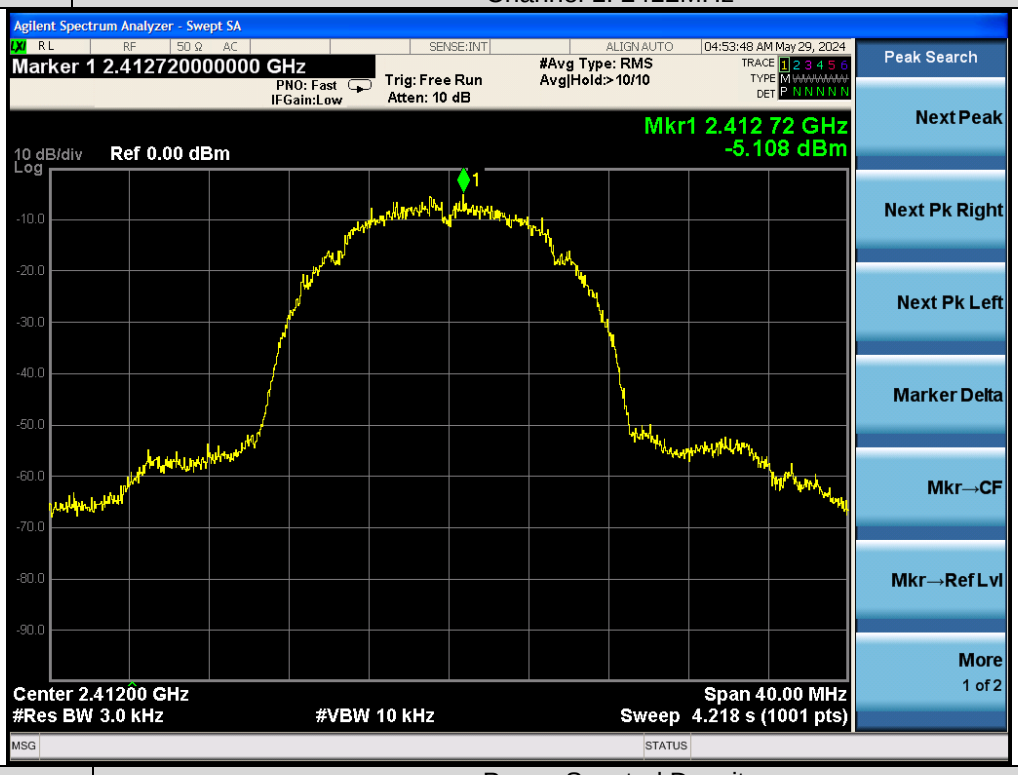
### 4.3.4. Test Procedure

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance
The transmitter output (antenna port) was connected to the spectrum analyzer
Set analyzer center frequency to DTS channel center frequency.
Set the span to 1.5 times the DTS bandwidth.
Set the RBW to: 3 kHz
Set the VBW to:10 kHz.
Set Detector =Peak.
Set Sweep time = auto couple.
Set Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum amplitude level within the RBW.
Note: If antenna Gain exceeds 6 dBi, then PSD Limit=8-(Gain- 6)

| Operation Mode | Channel Number | Channel Frequency (MHz) | Measurement Level (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|---|---|---|---|---|---|
| 802.11b | 1 | 2412 | -5.108 | 8 | PASS |
| | 6 | 2437 | -5.927 | 8 | PASS |
| | 11 | 2462 | -5.012 | 8 | PASS |
| 802.11g | 1 | 2412 | -8.764 | 8 | PASS |
| | 6 | 2437 | -8.048 | 8 | PASS |
| | 11 | 2462 | -7.758 | 8 | PASS |
| 802.11n (HT20) | 1 | 2412 | -9.340 | 8 | PASS |
| | 6 | 2437 | -9.138 | 8 | PASS |
| | 11 | 2462 | -8.980 | 8 | PASS |

Note: the test RF cable loss is 0.5 dB that had added the result.

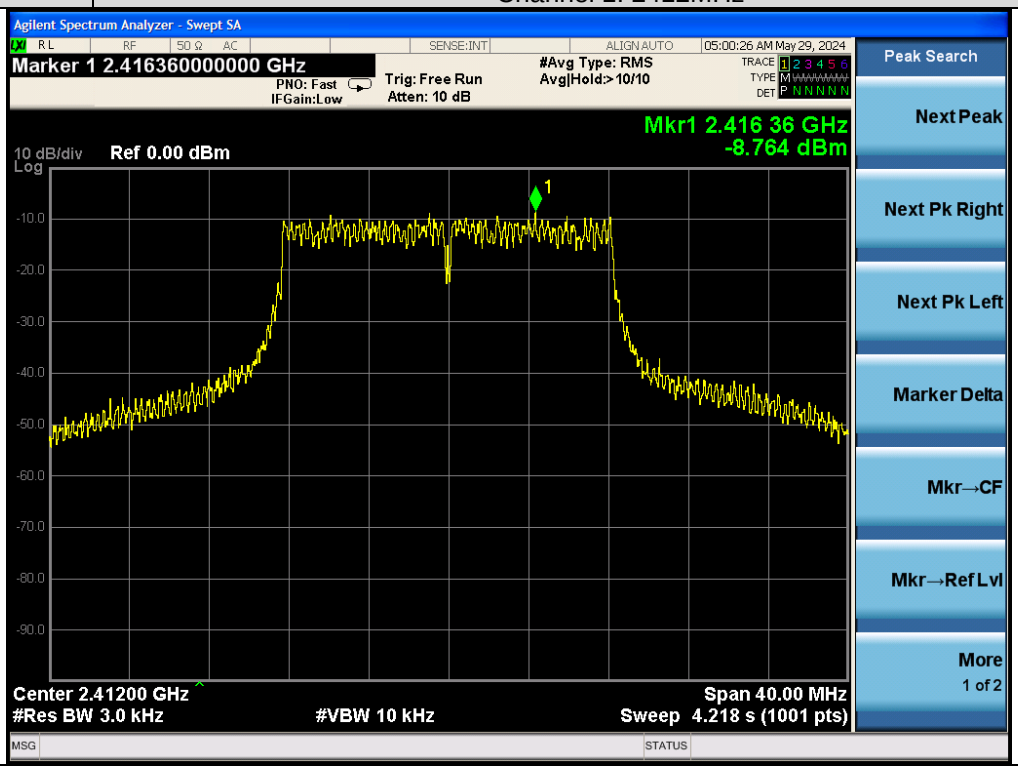
| Test Model | Power Spectral Density |
|---|---|
| | 802.11b |
| | Channel 1: 2412MHz |



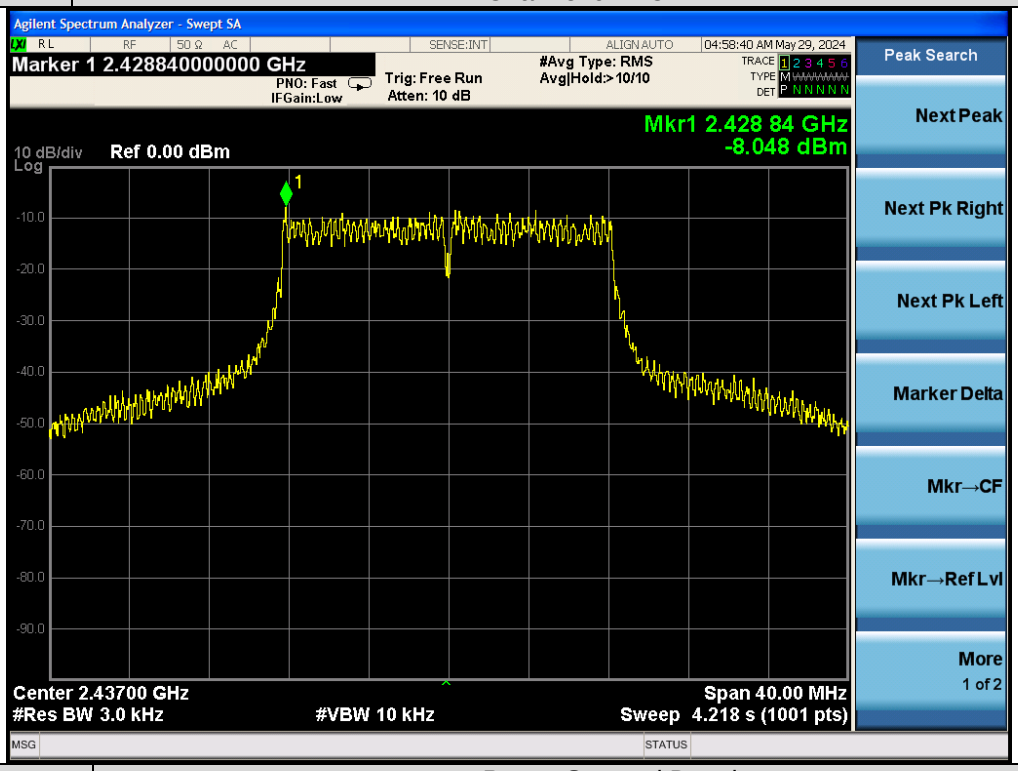

| Test Model | Power Spectral Density |
|---|---|
| | 802.11b |
| | Channel 6: 2437MHz |

| Test Model | Power Spectral Density |
|---|---|
| | 802.11b |
| | Channel 11: 2462MHz |

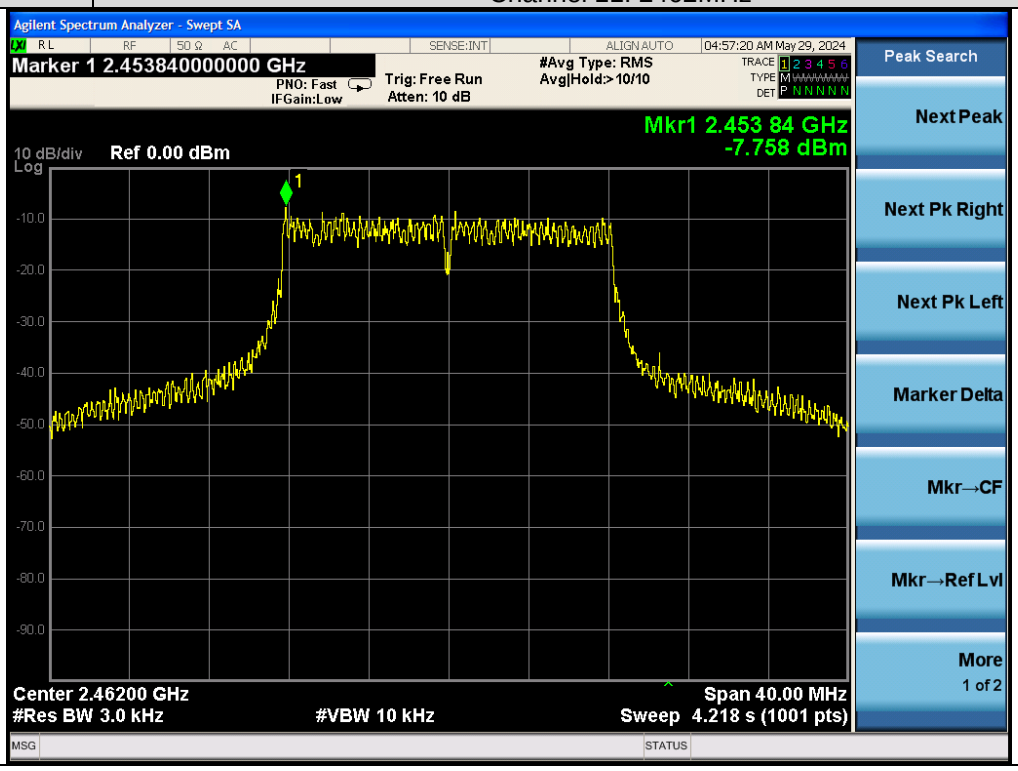
| Test Model | Power Spectral Density |
|---|---|
| | 802.11g |
| | Channel 1: 2412MHz |



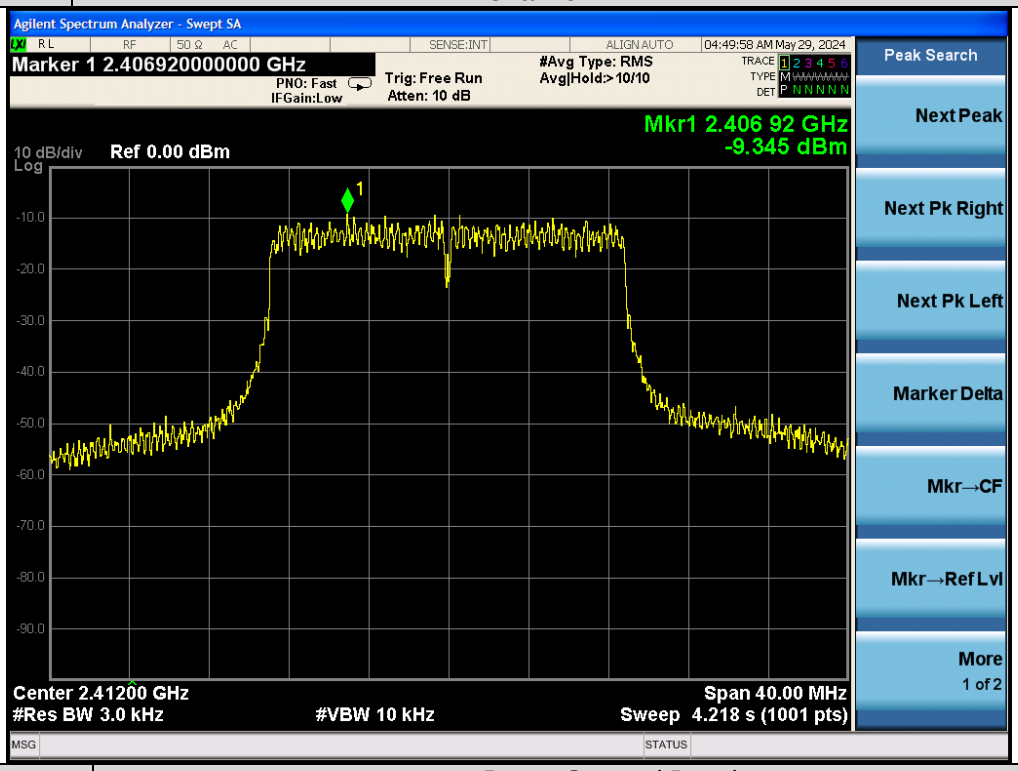
| Test Model | Power Spectral Density |
|---|---|
| | 802.11g |
| | Channel 6: 2437MHz |



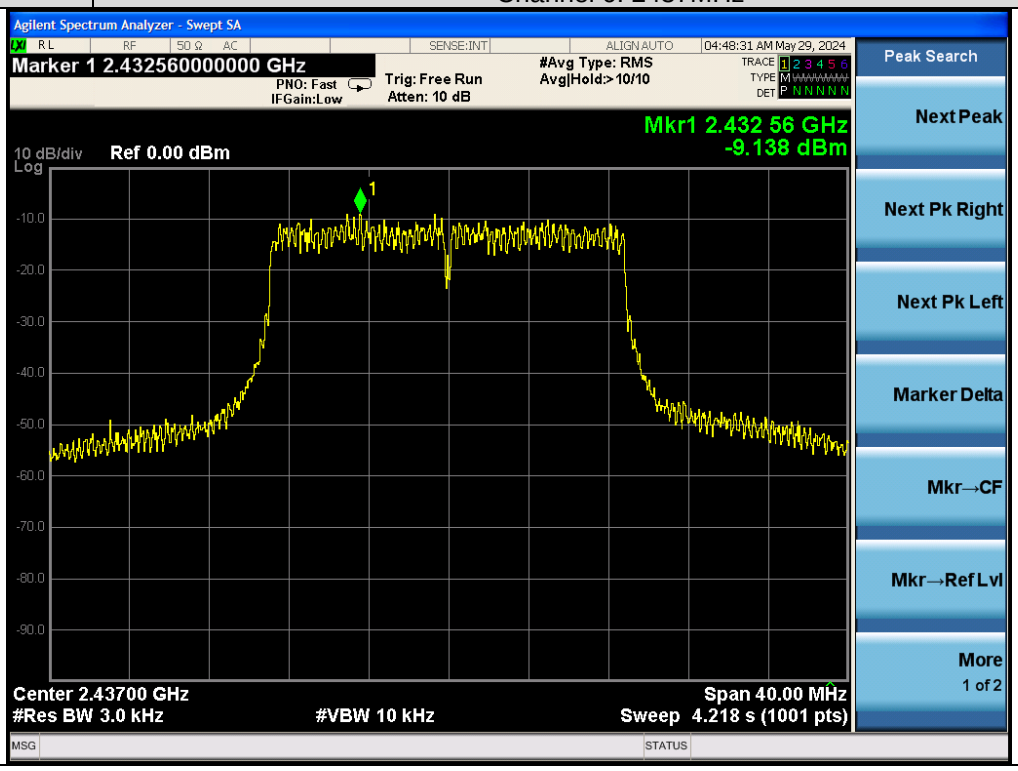

| Test Model | Power Spectral Density |
|---|---|
| | 802.11g |
| | Channel 11: 2462MHz |



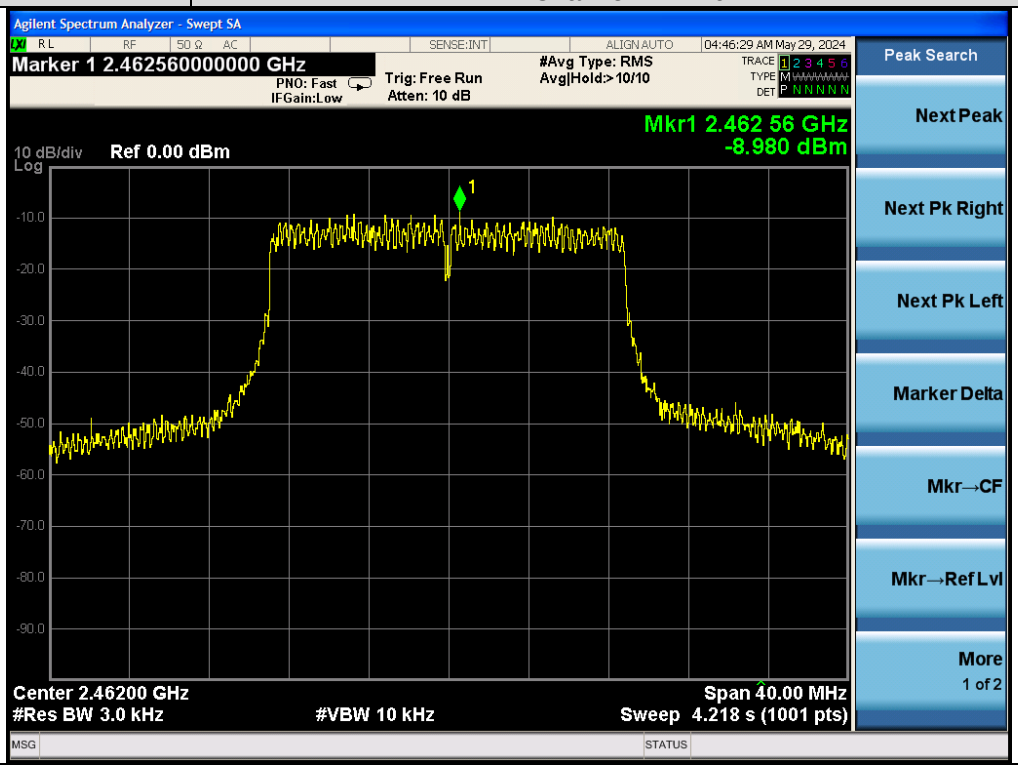
| Test Model | Power Spectral Density |
|---|---|
| | 802.11n (HT20) |
| | Channel 1: 2412MHz |




| Test Model | Power Spectral Density |
|---|---|
| | 802.11n (HT20) |
| | Channel 6: 2437MHz |



| Test Model | Power Spectral Density |
|---|---|
| | 802.11n (HT20) |
| | Channel 11: 2462MHz |



## 4.4. UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

### 4.4.1. Applicable Standard

According to FCC Part15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02

### 4.4.2. Conformance Limit

According to FCC Part 15.247(d):
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

### 4.4.3. Test Configuration

Test according to clause 3.1 radio frequency test setup 1

### 4.4.4. Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer
**Reference level measurement**
Establish a reference level by using the following procedure:
Set instrument center frequency to DTS channel center frequency.
Set the span to ≥ 1.5 times the DTS bandwidth.
Set the RBW = 100 kHz.
Set the VBW ≥ 3 x RBW.
Set Detector = peak.
Set Sweep time = auto couple.
Set Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum PSD level.
Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

**Emission level measurement**

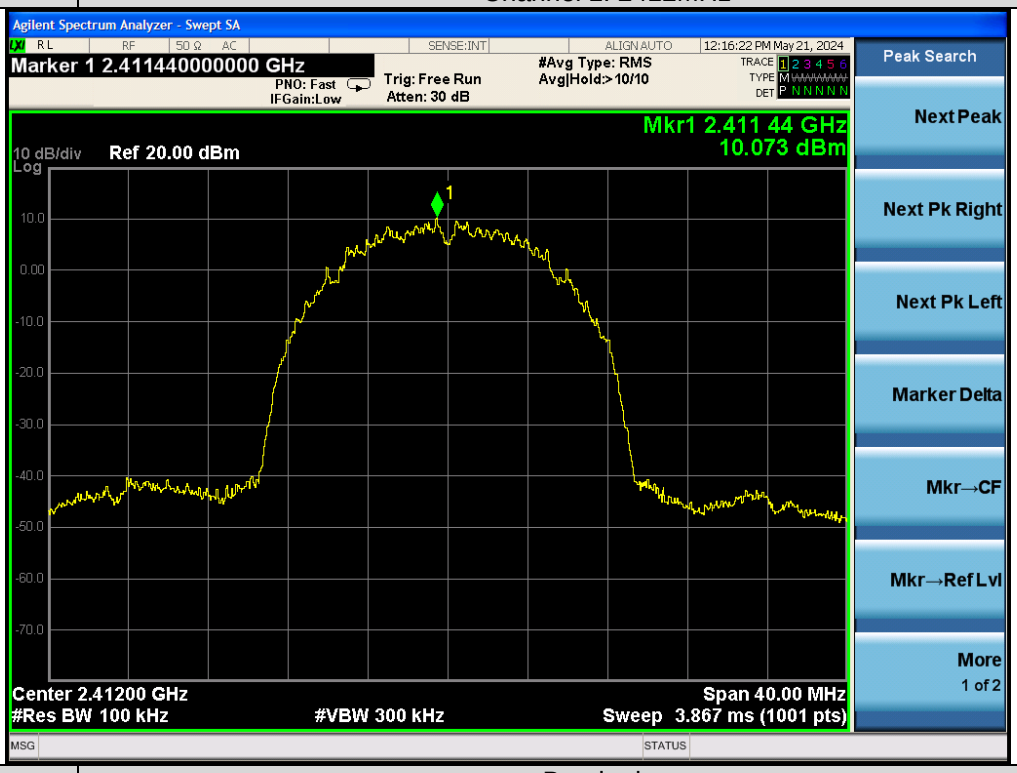
Set the center frequency and span to encompass frequency range to be measured.
Set the RBW = 100 kHz.
Set the VBW =300 kHz.
Set Detector = Peak
Sweep time = auto couple.
Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements . Report the three highest emissions relative to the limit.

**Test Results**

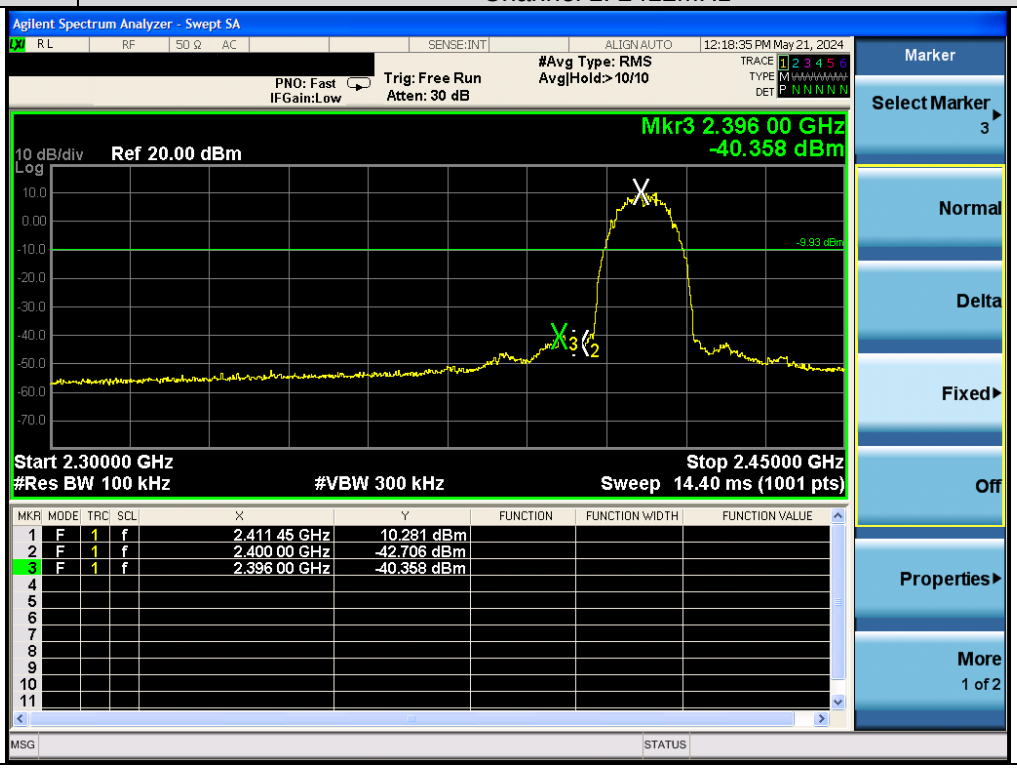
All the antennas and modulation modes were tested, and the worst data for is shown in the table below.

Note: the test RF cable loss is 0.5 dB, we checked all test conducted spurious test data with this loss that complied with FCC rule requirement.

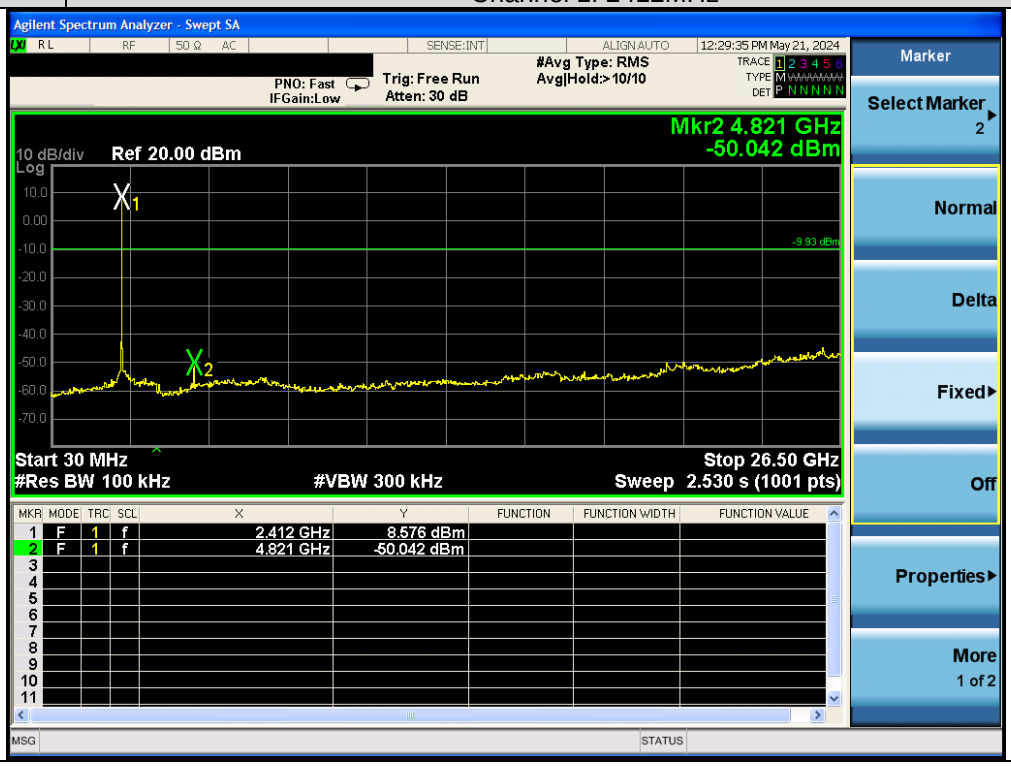
| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☒802.11b | ☐802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 1: 2412MHz | | | |



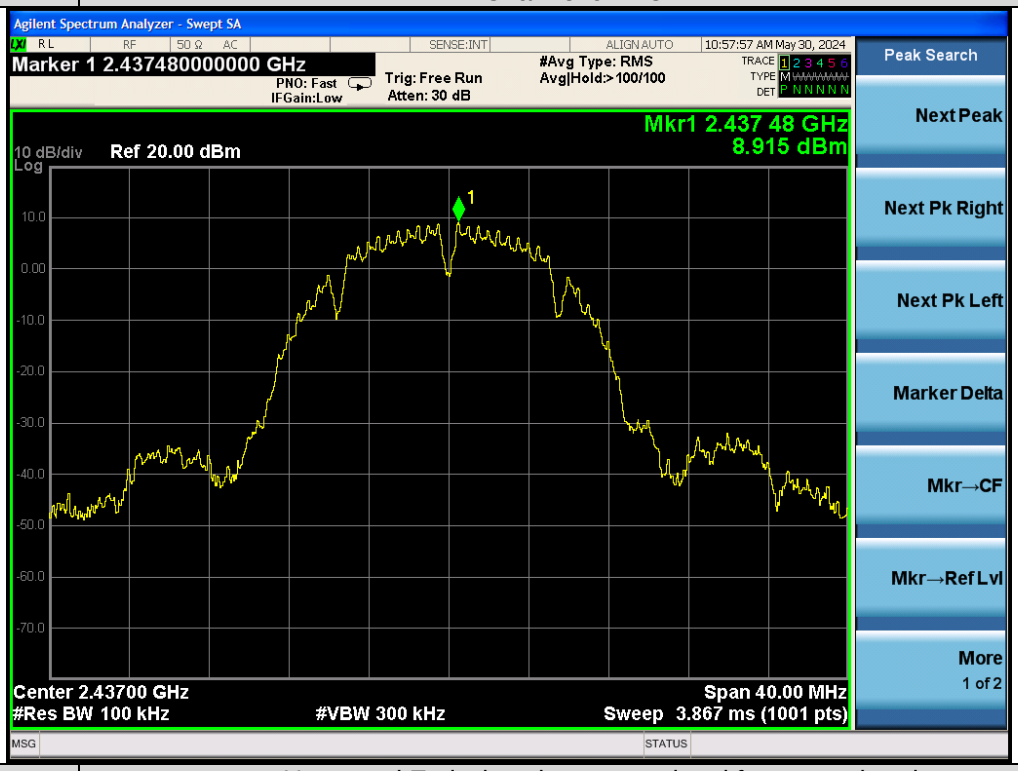

| Test Model | Band edge | | | |
|---|---|---|---|---|
| | ☒802.11b | ☐802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 1: 2412MHz | | | |



| Test Model | Unwanted Emissions in non-restricted frequency bands | | | |
|---|---|---|---|---|
| | ☒802.11b | ☐802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 1: 2412MHz | | | |

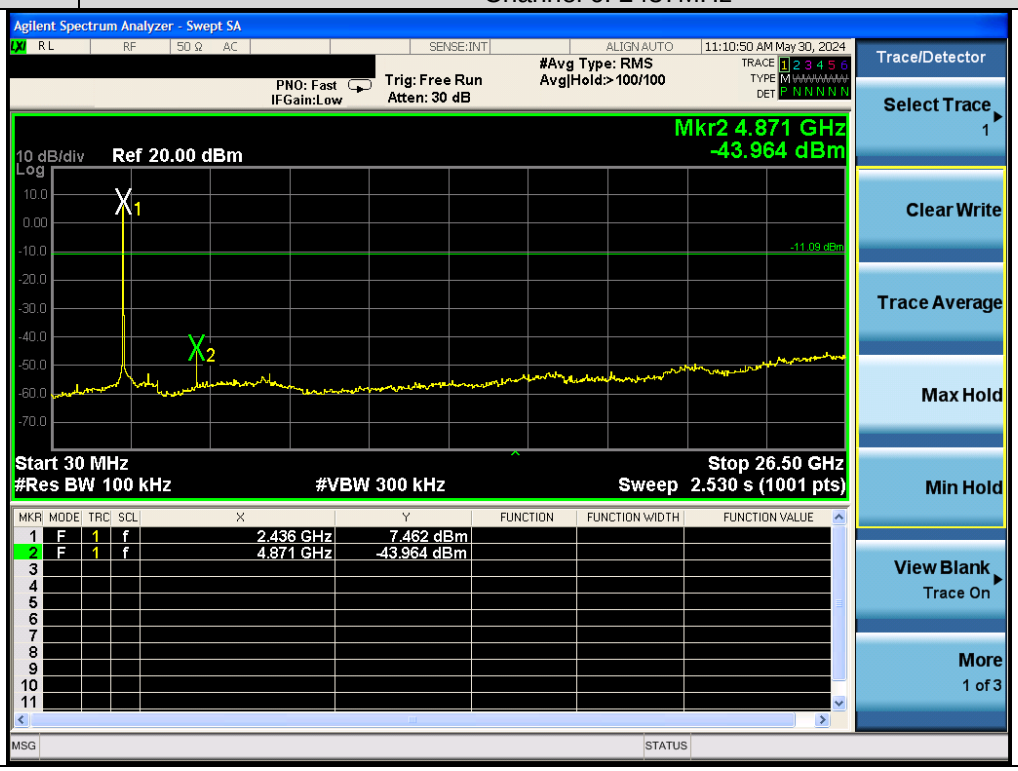



| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☒802.11b | ☐802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 6: 2437MHz | | | |

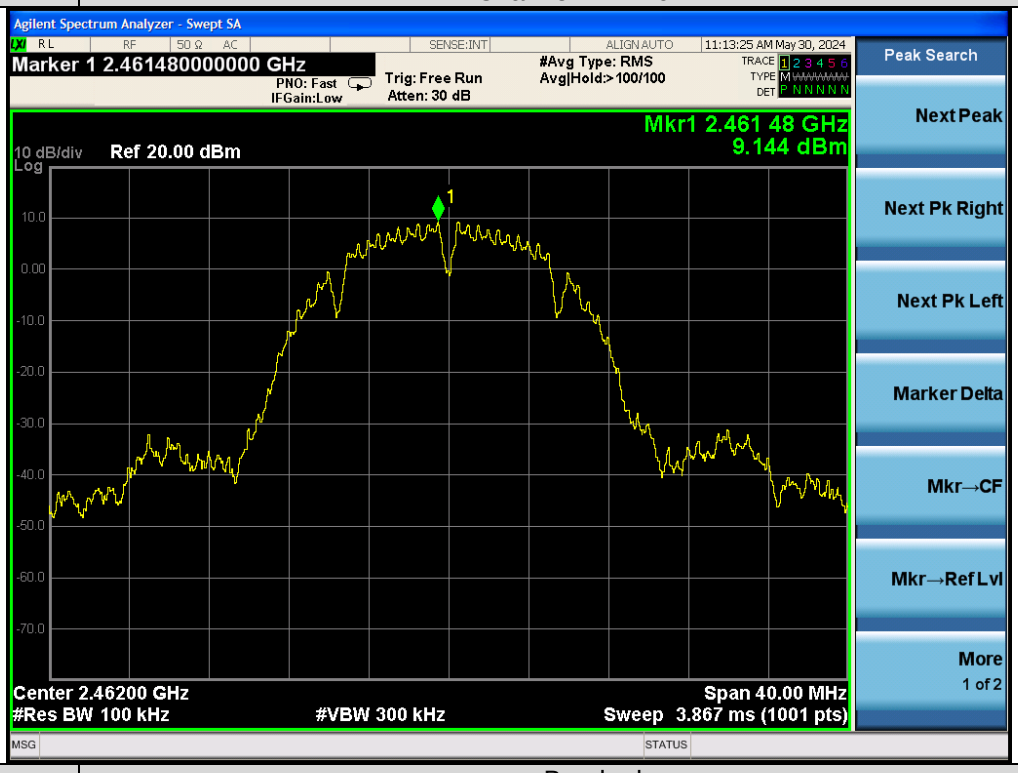



| | Unwanted Emissions in non-restricted frequency bands |
|---|---|

| Test Model | ☒802.11b | ☐802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
|---|---|---|---|---|
| | Channel 6: 2437MHz | | | |



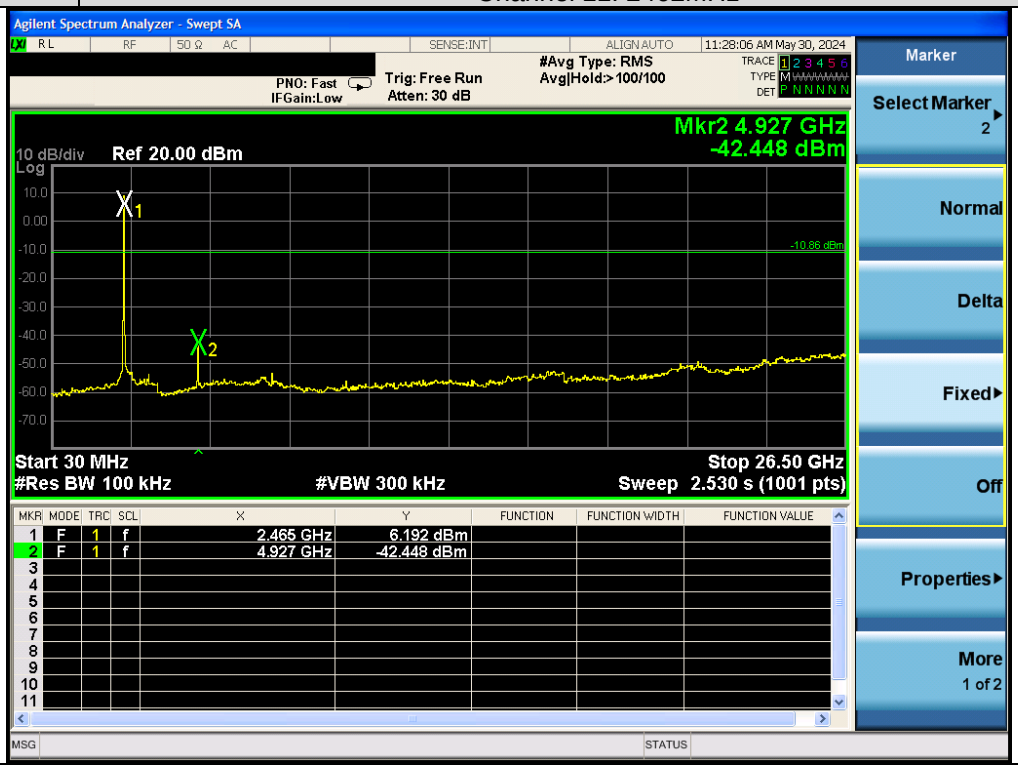

| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☒802.11b | ☐802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 11: 2462MHz | | | |



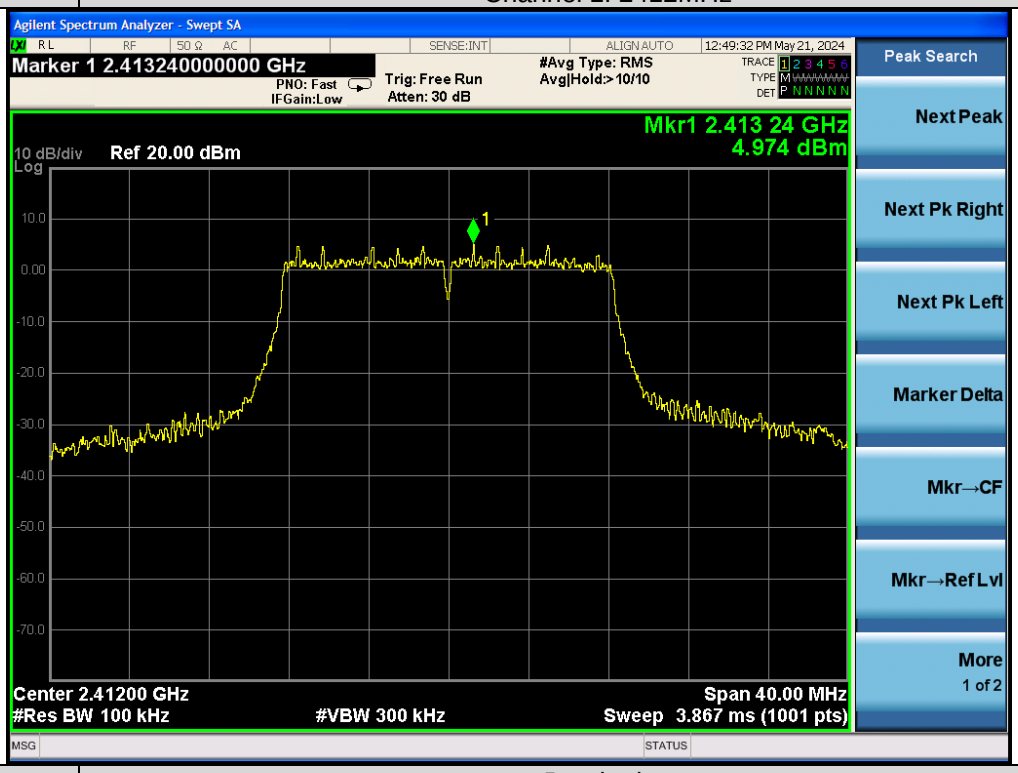

| | Band edge | | | |
|---|---|---|---|---|
| Test Model | ☒802.11b | ☐802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |

| | Channel 11: 2462MHz |
|---|---|

| Test Model | Unwanted Emissions in non-restricted frequency bands | | | |
|---|---|---|---|---|
| | ☒802.11b | ☐802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 11: 2462MHz | | | |



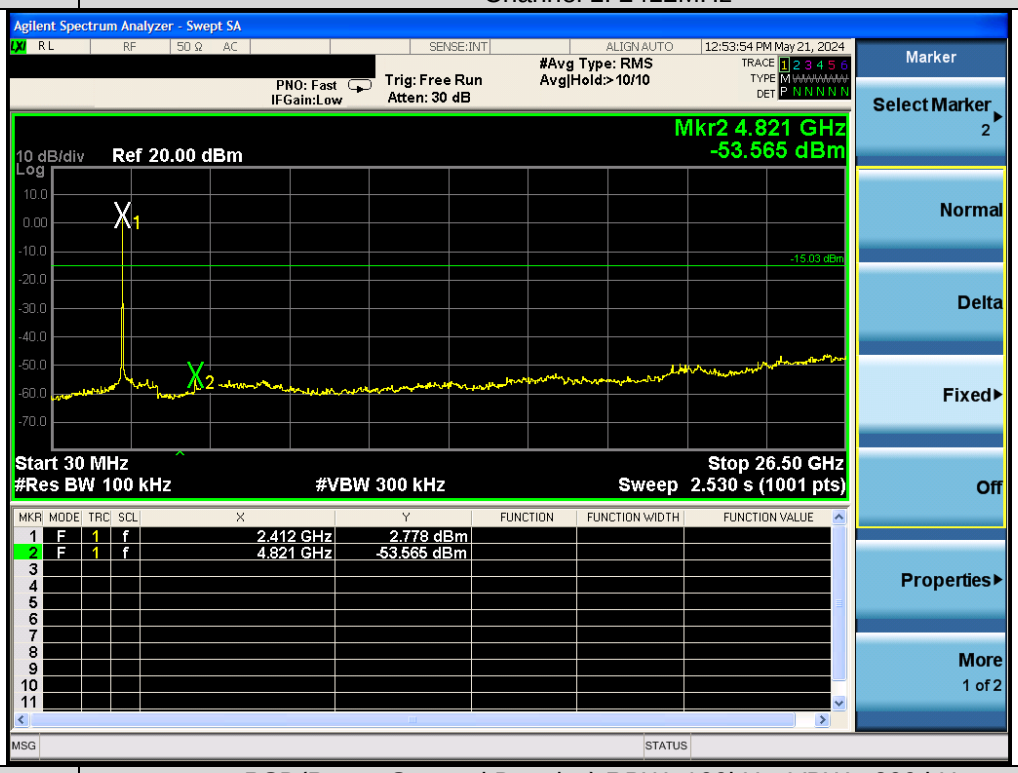
| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☐802.11b | ☒802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 1: 2412MHz | | | |



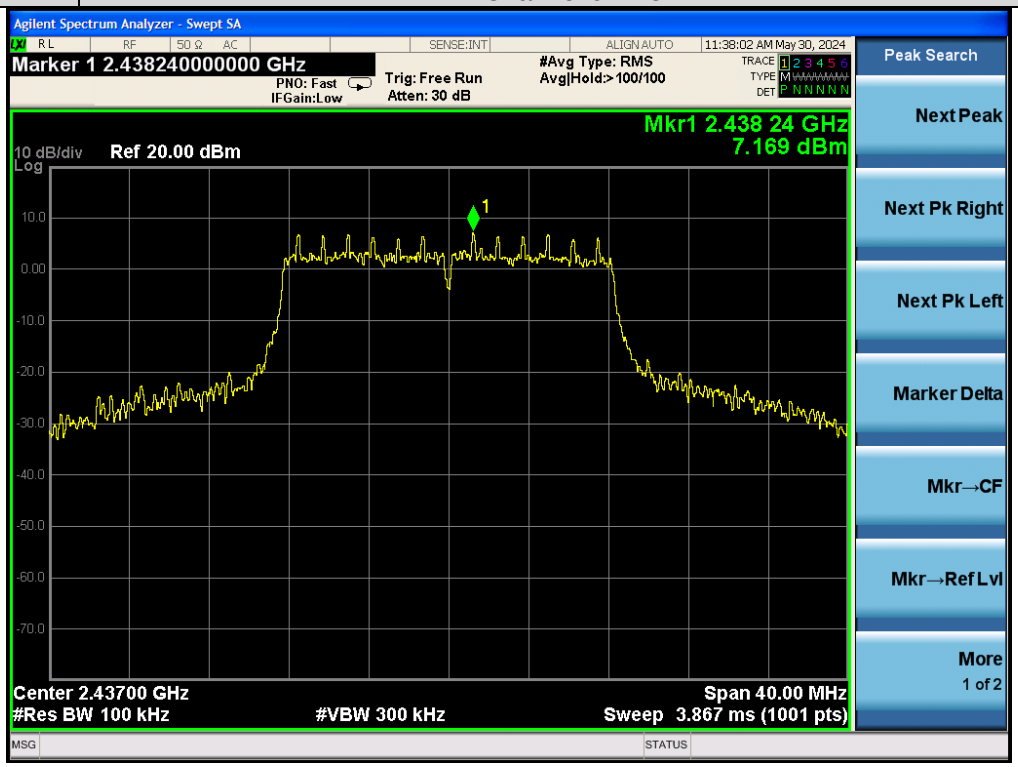

| Test Model | Band edge | | | |
|---|---|---|---|---|
| | ☐802.11b | ☒802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 1: 2412MHz | | | |

| | Unwanted Emissions in non-restricted frequency bands |
|---|---|

| Test Model | ☐802.11b | ☒802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
|---|---|---|---|---|
| | Channel 1: 2412MHz | | | |

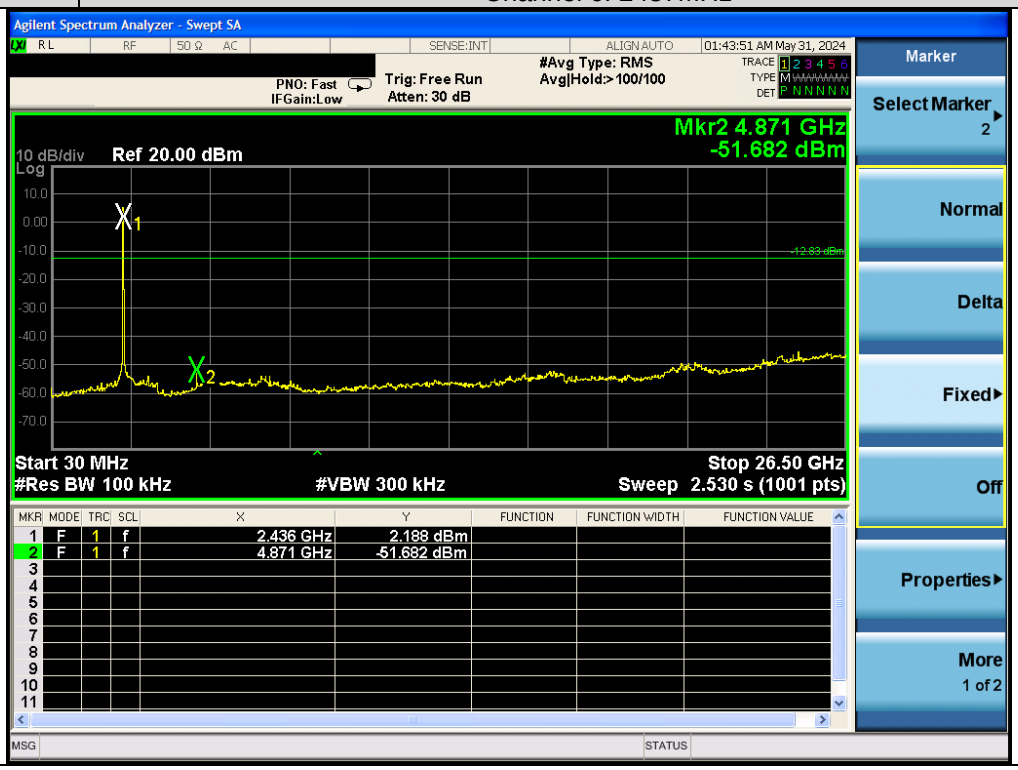



| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☐802.11b | ☒802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 6: 2437MHz | | | |



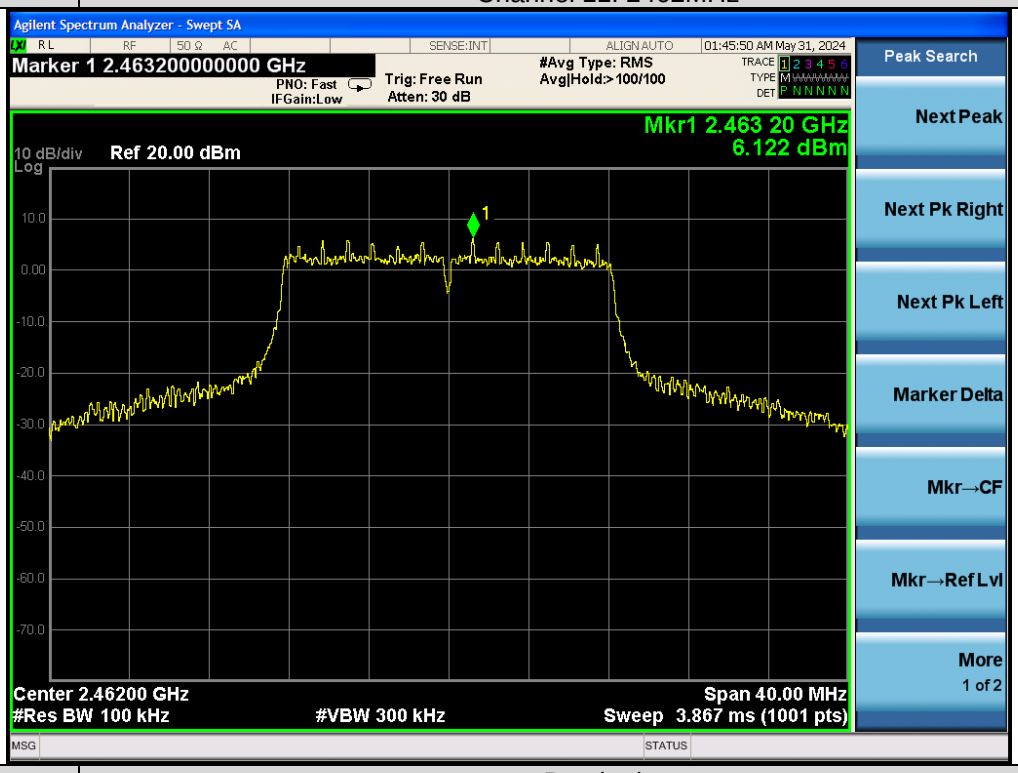

| | Unwanted Emissions in non-restricted frequency bands | | | |
|---|---|---|---|---|
| Test Model | ☐802.11b | ☒802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |

Channel 6: 2437MHz




| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☐802.11b | ☒802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |

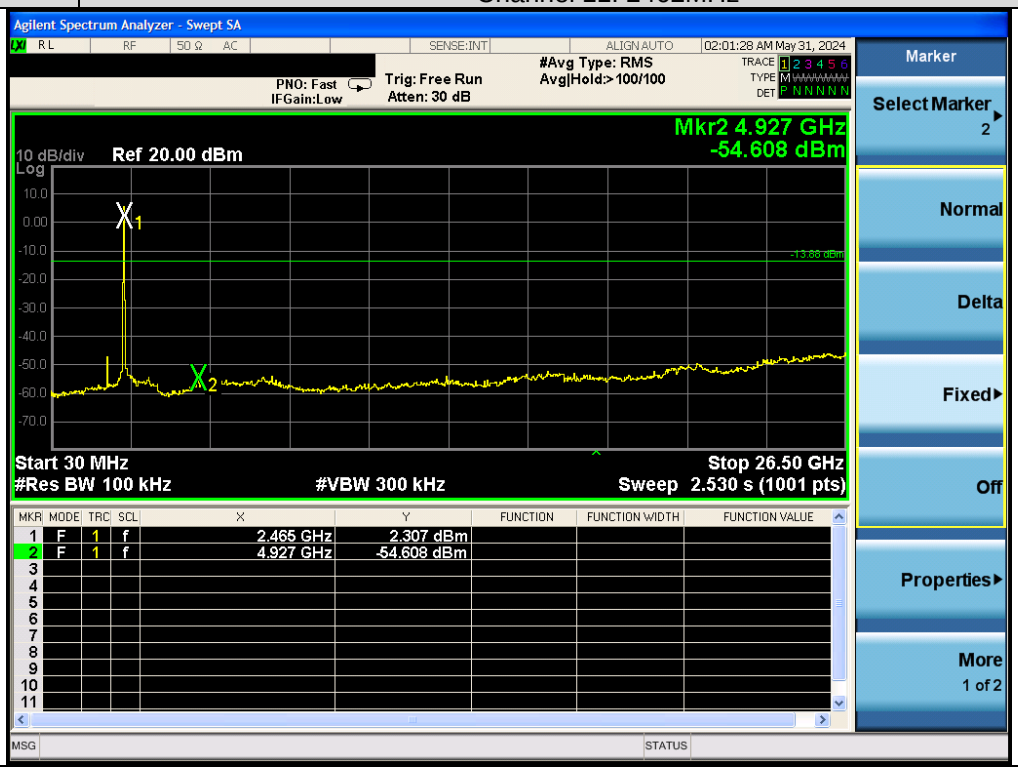
Channel 11: 2462MHz



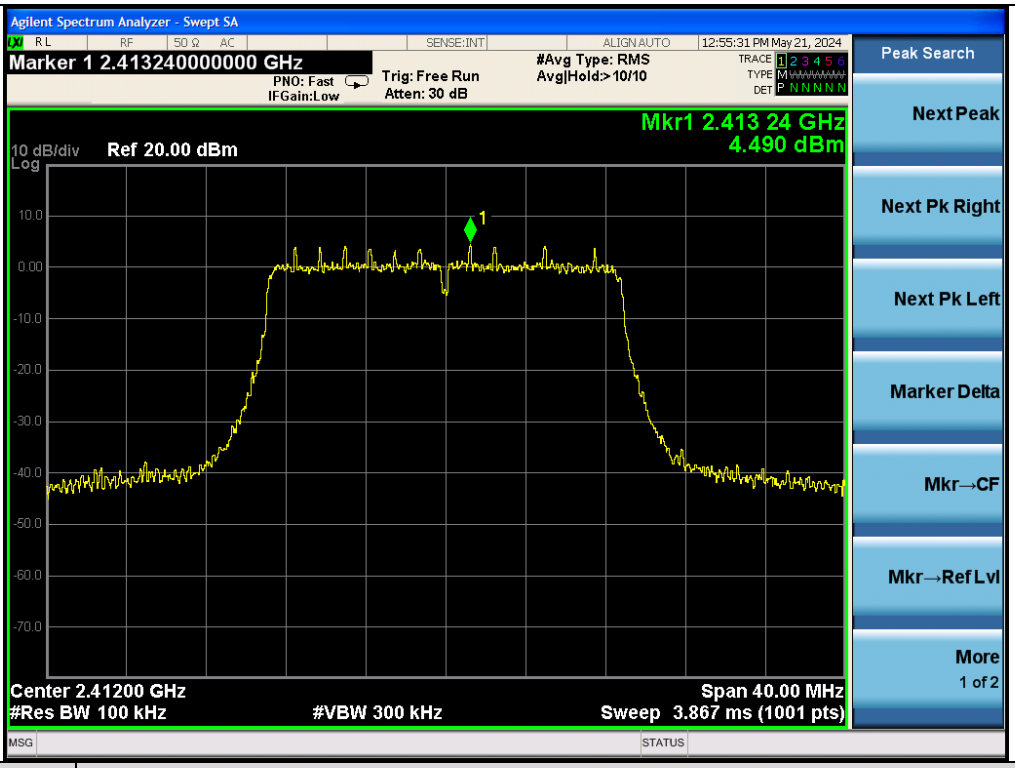

| Test Model | Band edge | | | |
|---|---|---|---|---|
| | ☐802.11b | ☒802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |

Channel 11: 2462MHz

| Test Model | Unwanted Emissions in non-restricted frequency bands | | | |
|---|---|---|---|---|
| | ☐802.11b | ☒802.11g | ☐802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 11: 2462MHz | | | |

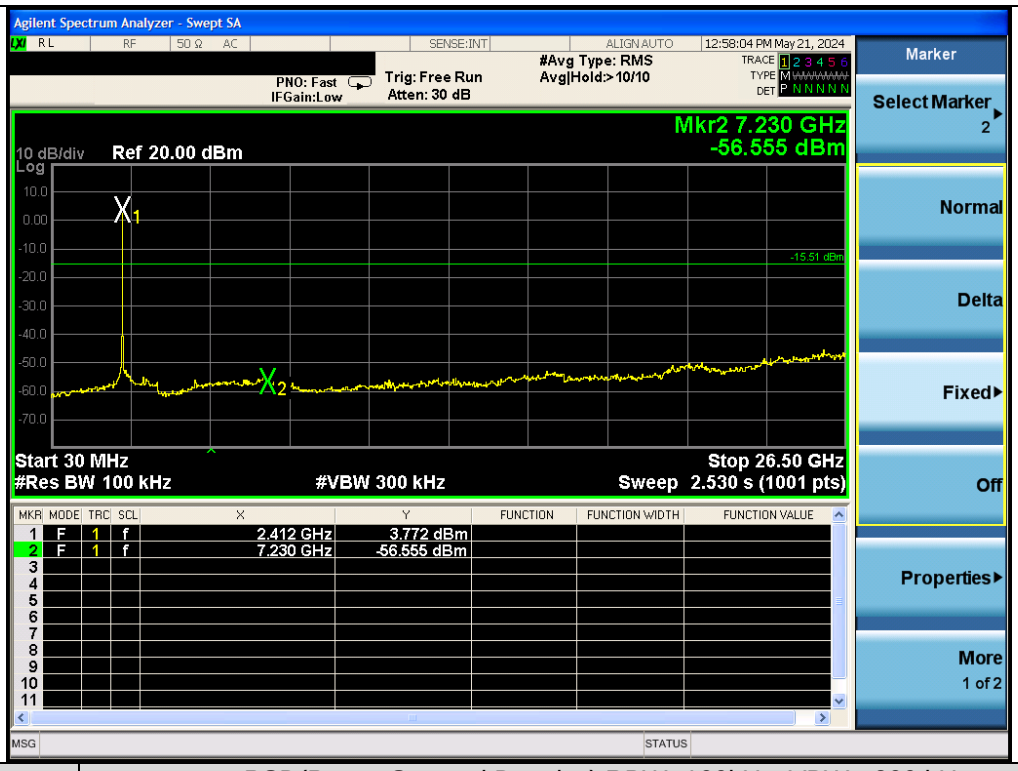



| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☐802.11b | ☐802.11g | ☒802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 1: 2412MHz | | | |

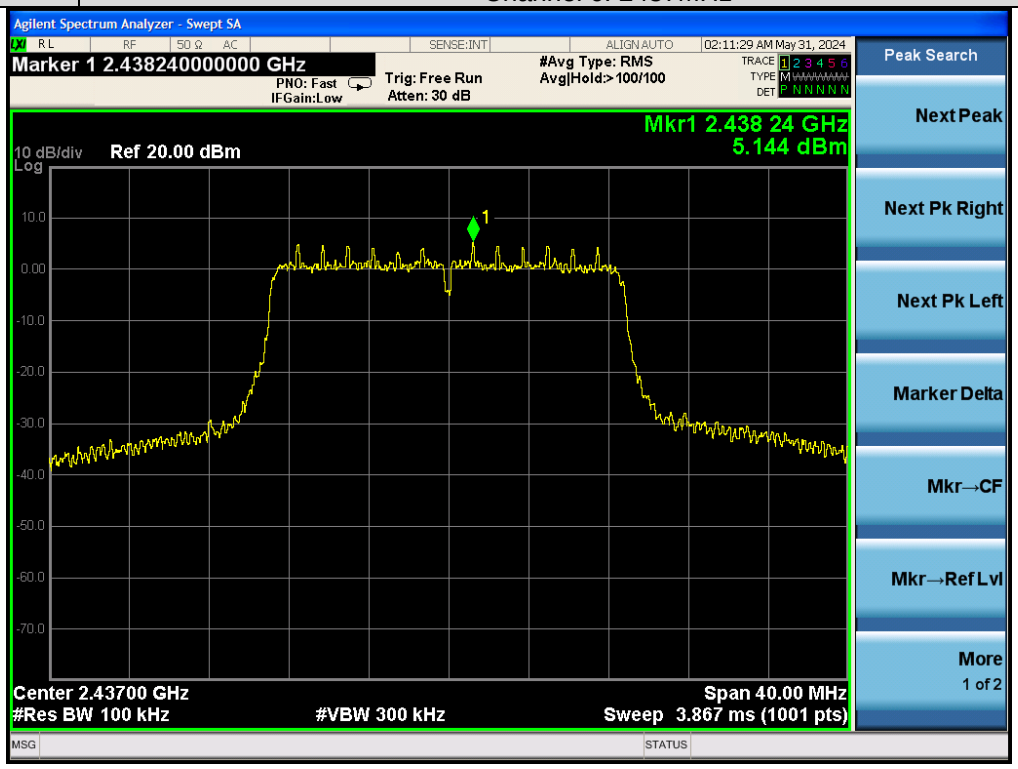



| Test Model | Band edge | | | |
|---|---|---|---|---|
| | ☐802.11b | ☐802.11g | ☒802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 1: 2412MHz | | | |

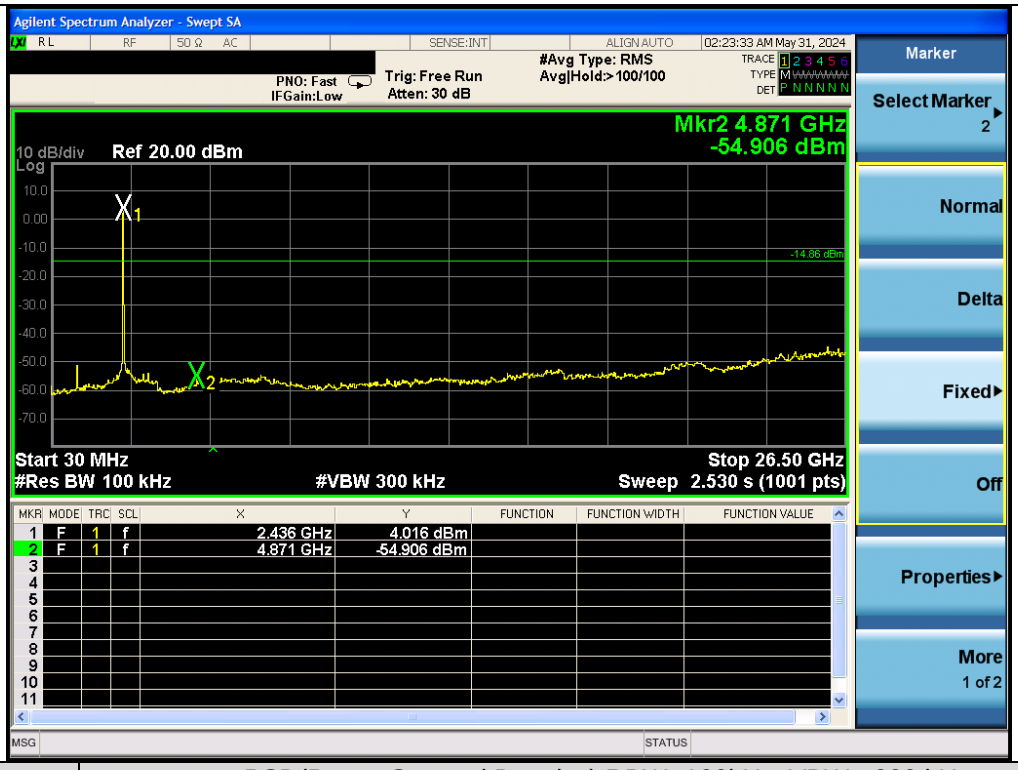
| Test Model | Unwanted Emissions in non-restricted frequency bands | | | |
|---|---|---|---|---|
| | ☐802.11b | ☐802.11g | ☒802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 1: 2412MHz | | | |



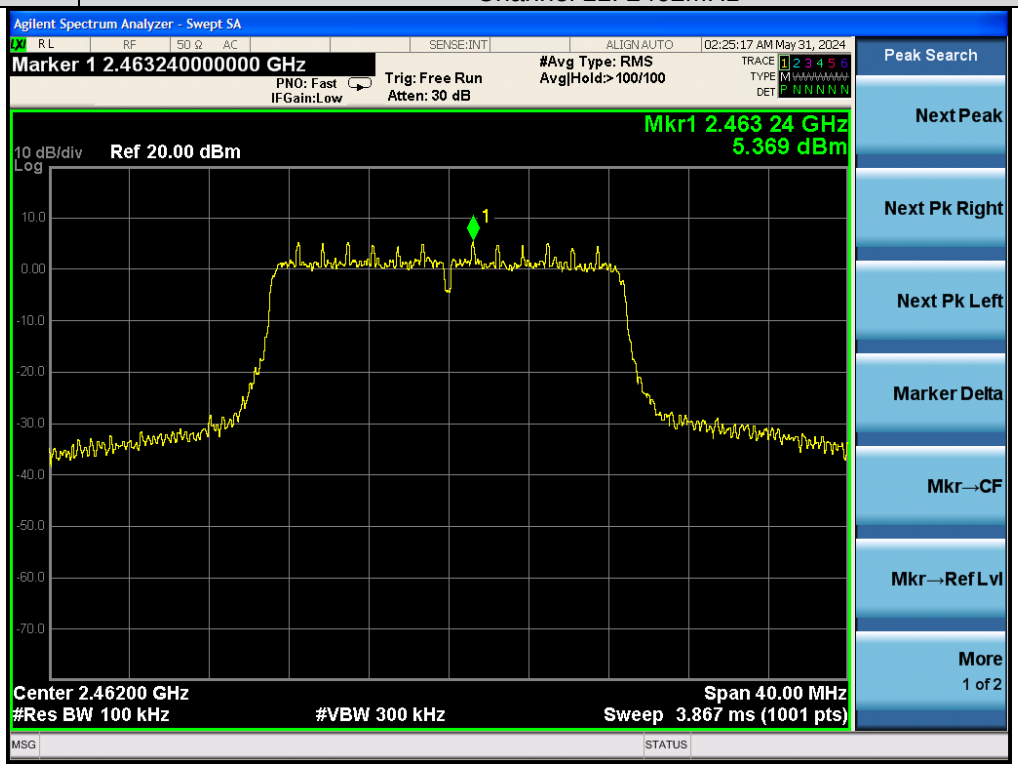

| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☐802.11b | ☐802.11g | ☒802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 6: 2437MHz | | | |




| Test Model | Unwanted Emissions in non-restricted frequency bands | | | |
|---|---|---|---|---|
| | ☐802.11b | ☐802.11g | ☒802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 6: 2437MHz | | | |

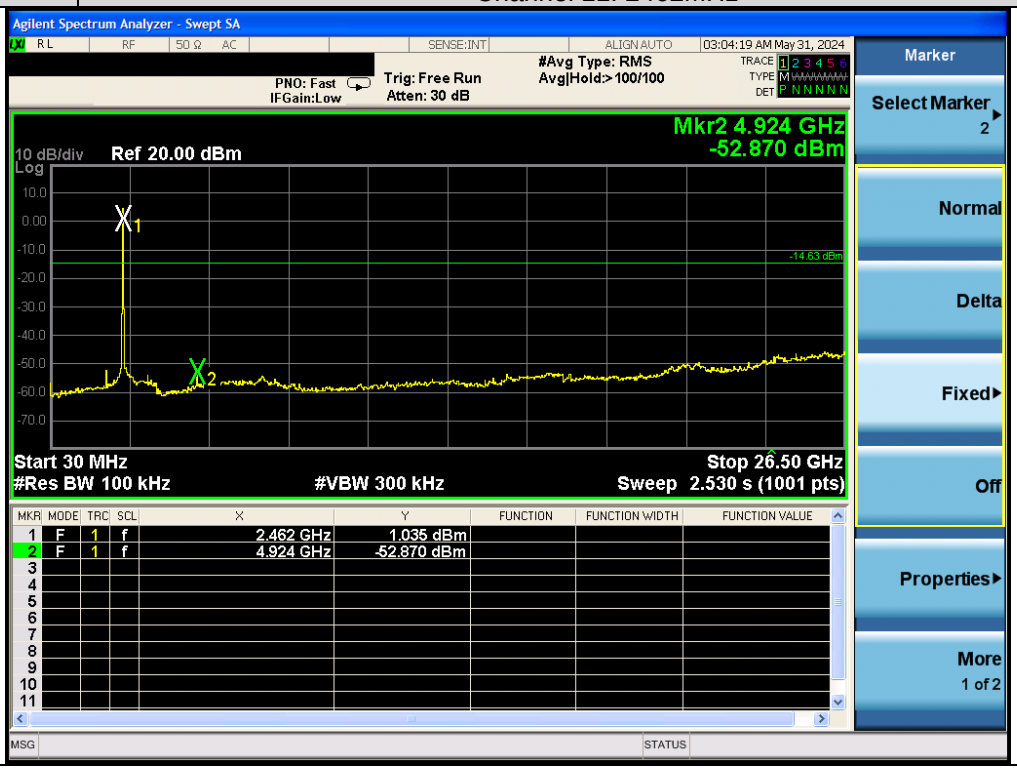



| Test Model | PSD(Power Spectral Density ) RBW=100kHz, VBW =300 kHz | | | |
|---|---|---|---|---|
| | ☐802.11b | ☐802.11g | ☒802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 11: 2462MHz | | | |




| Test Model | Band edge | | | |
|---|---|---|---|---|
| | ☐802.11b | ☐802.11g | ☒802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 11: 2462MHz | | | |

| Test Model | Unwanted Emissions in non-restricted frequency bands | | | |
|---|---|---|---|---|
| | ☐802.11b | ☐802.11g | ☒802.11n(HT20) | ☐802.11n(HT40) |
| | Channel 11: 2462MHz | | | |



## 4.5. RADIATED SPURIOUS EMISSION

### 4.5.1. Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

### 4.5.2. Conformance Limit

According to FCC Part 15.247(d): 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)).

According to FCC Part15.205, Restricted bands

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| 10.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | (2) |
| 13.36-13.41 | | | |

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

| Restricted Frequency(MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance |
|---|---|---|---|
| 0.009-0.490 | 2400/F(KHz) | 20 log (uV/m) | 300 |
| 0.490-1.705 | 24000/F(KHz) | 20 log (uV/m) | 30 |
| 1.705-30 | 30 | 29.5 | 30 |
| 30-88 | 100 | 40 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

### 4.5.3. Test Configuration

Test according to clause 3.2 radio frequency test setup 2

### 4.5.4. Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:
For Above 1GHz:
The EUT was placed on a turn table which is 1.5m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 1GHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 100 kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 30MHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 9kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 150KHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 200Hz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.
Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the

hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.
Repeat above procedures until all frequency measured was complete.

**Test Results：**

## ■ Spurious Emission below 30MHz (9KHz to 30MHz)

| Frequency | Factor | Meter Reading | Emission Level | Limits | Margin | Detector Type | Ant. Pol. |
|---|---|---|---|---|---|---|---|
| (MHz) | (dB) | (dBμV) | (dBμV/m) | (dBμV/m) | (dB) | | H/V |
| -- | -- | -- | -- | -- | -- | -- | -- |

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
Distance extrapolation factor =40log(Specific distance/ test distance)( dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor

## ■ Spurious Emission Above 1GHz (1GHz to 25GHz)

All modes 2.4G 802.11b/g/n have been tested, and the worst result recorded was report as below:

| Test mode: | 802.11b | Frequency: | Channel 1: 2412MHz |
|---|---|---|---|

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type | Ant. Pol. H/V |
|---|---|---|---|---|---|---|---|
| 4825 | 55.1 | 0.98 | 56.08 | 74 | -17.92 | peak | V |
| 4842 | 45.78 | 0.98 | 46.76 | 54 | -7.24 | AVG | V |
| 7236 | 38.96 | 7.66 | 46.62 | 74 | -27.38 | peak | V |
| 7239 | 29.34 | 7.67 | 37.01 | 54 | -16.99 | AVG | V |
| 4825 | 47.35 | 0.98 | 48.33 | 74 | -25.67 | peak | H |
| 4842 | 36.43 | 0.98 | 37.41 | 54 | -16.59 | AVG | H |
| 7236 | 38.68 | 7.66 | 46.34 | 74 | -27.66 | peak | H |
| 7239 | 28.79 | 7.67 | 36.46 | 54 | -17.54 | AVG | H |

| Test mode: | 802.11b | Frequency: | Channel 6: 2437MHz |
|---|---|---|---|

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type | Ant. Pol. H/V |
|---|---|---|---|---|---|---|---|
| 4876 | 53.48 | 0.99 | 54.47 | 74 | -19.53 | peak | V |
| 4893 | 42.92 | 1 | 43.92 | 54 | -10.08 | AVG | V |
| 1782 | 54.1 | -4.89 | 49.21 | 74 | -24.79 | peak | V |
| 1799 | 44.4 | -4.85 | 39.55 | 54 | -14.45 | AVG | V |
| 7311 | 38.42 | 7.64 | 46.06 | 74 | -27.94 | peak | V |
| 7307 | 28.51 | 7.64 | 36.15 | 54 | -17.85 | AVG | V |
| 4876 | 53.19 | 0.99 | 54.18 | 74 | -19.82 | peak | H |
| 4893 | 42.98 | 1 | 43.98 | 54 | -10.02 | AVG | H |
| 1765 | 57.72 | -4.93 | 52.79 | 74 | -21.21 | peak | H |
| 1782 | 44.92 | -4.89 | 40.03 | 54 | -13.97 | AVG | H |
| 7311 | 38.78 | 7.64 | 46.42 | 74 | -27.58 | peak | H |
| 7307 | 28.37 | 7.64 | 36.01 | 54 | -17.99 | AVG | H |

| Test mode: | 802.11b | Frequency: | Channel 11: 2462MHz |
|---|---|---|---|

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type | Ant. Pol. H/V |
|---|---|---|---|---|---|---|---|
| 4927 | 51.81 | 1 | 52.81 | 74 | -21.19 | peak | V |
| 4944 | 40.29 | 0.99 | 41.28 | 54 | -12.72 | AVG | V |
| 7386 | 37.97 | 7.6 | 45.57 | 74 | -28.43 | peak | V |
| 7426 | 28.29 | 7.59 | 35.88 | 54 | -18.12 | AVG | V |
| 4927 | 48.48 | 1 | 49.48 | 74 | -24.52 | peak | H |
| 4944 | 37.63 | 0.99 | 38.62 | 54 | -15.38 | AVG | H |
| 7386 | 38.41 | 7.6 | 46.01 | 74 | -27.99 | peak | H |
| 7426 | 28.39 | 7.59 | 35.98 | 54 | -18.02 | AVG | H |

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

## ■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

All modes 2.4G 802.11b/g/n have been tested, and the worst result recorded was report as below:

Test mode: 802.11 b Frequency: Channel 1: 2412MHz

| Frequency (MHz) | Polarity | PK(dBuV/m) (VBW=3MHz) | Limit 3m (dBuV/m) | AV(dBuV/m) (VBW=10Hz) | Limit 3m (dBuV/m) |
|---|---|---|---|---|---|
| 2389.99 | H | 62.72 | 74 | 41.10 | 54 |
| 2389.63 | V | 56.34 | 74 | 37.30 | 54 |

Test mode: 802.11 b Frequency: Channel 11: 2462MHz

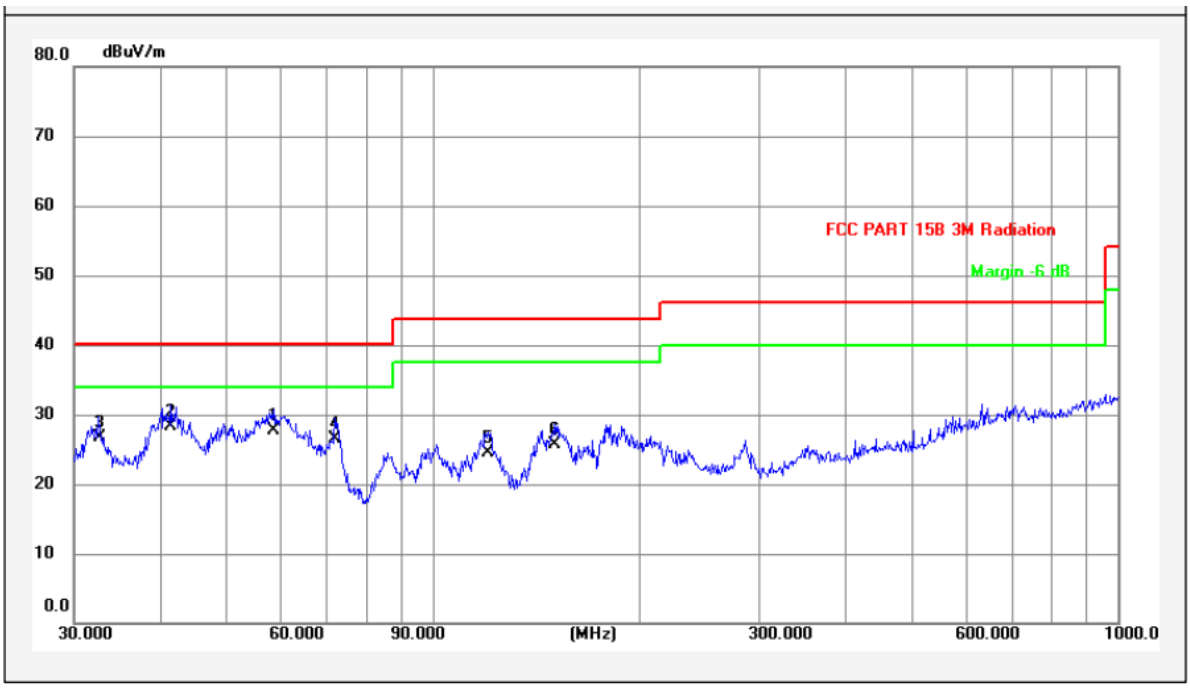
| Frequency (MHz) | Polarity | PK(dBuV/m) (VBW=3MHz) | Limit 3m (dBuV/m) | AV(dBuV/m) (VBW=10Hz) | Limit 3m (dBuV/m) |
|---|---|---|---|---|---|
| 2483.56 | H | 70.79 | 74 | 50.43 | 54 |
| 2484.25 | V | 63.35 | 74 | 45.60 | 54 |

Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor.
(3) Correct Factor= Ant_F + Cab_L - Preamp
(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

## ■ Spurious Emission below 1GHz (30MHz to 1GHz)

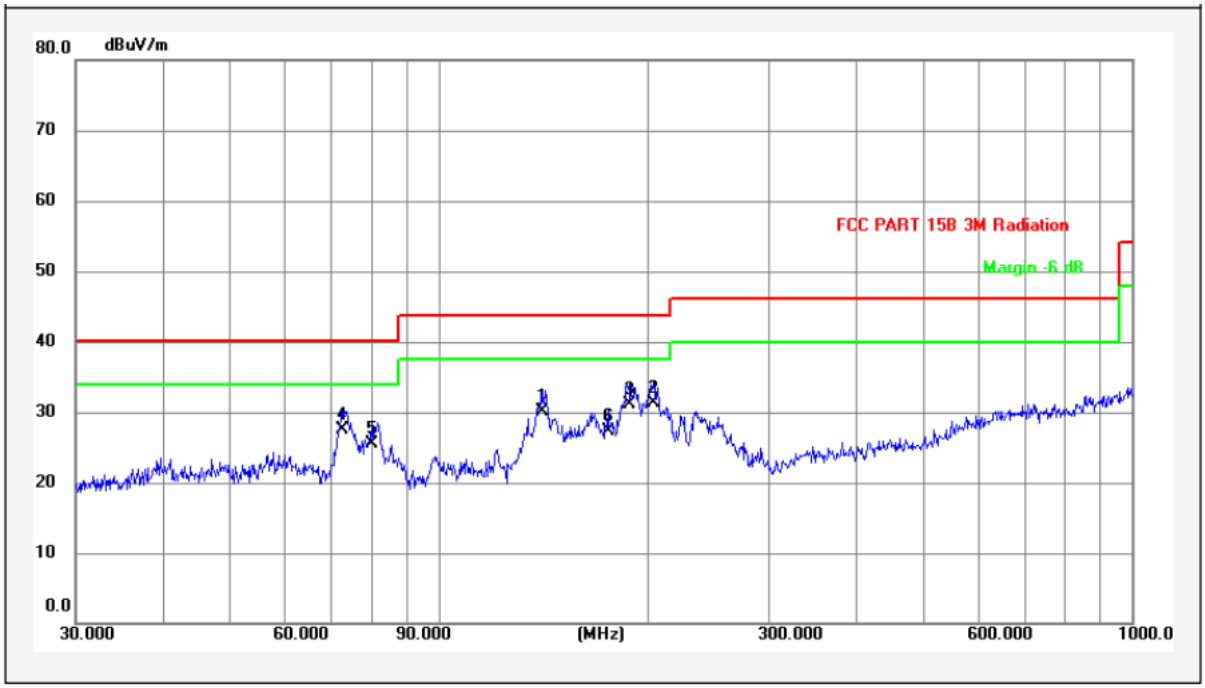
All antenna modes 2.4G 802.11b/g/n have been tested, and the worst result 802.1g recorded was report as below:

| | | | | |
|---|---|---|---|---|
| Test Mode: | 802.11b | 2412MHz | Test Voltage: | AC 120V/60Hz |
| Temperature: | 24.5℃ | | Phase: | Vertical |
| Relative Humidity: | 52% | | Pressure: | 101.4KPa |




| No. | Frequency (MHz) | Factor (dBuV/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | MK. | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 58.6126 | 11.52 | 16.18 | 27.70 | 40.00 | -12.30 | QP | | |
| 2 | 41.5670 | 11.87 | 16.44 | 28.31 | 40.00 | -11.69 | QP | * | |
| 3 | 32.5198 | 9.96 | 16.68 | 26.64 | 40.00 | -13.36 | QP | | |
| 4 | 72.0841 | 8.38 | 18.04 | 26.42 | 40.00 | -13.58 | QP | | |
| 5 | 120.2766 | 9.25 | 15.17 | 24.42 | 43.50 | -19.08 | QP | | |
| 6 | 151.0663 | 7.37 | 18.25 | 25.62 | 43.50 | -17.88 | QP | | |

| | | | | |
|---|---|---|---|---|
| Test Mode: | 802.11b | 2412MHz | Test Voltage: | AC 120V/60Hz |
| Temperature: | 24.5℃ | | Phase: | Horizontal |
| Relative Humidity: | 52% | | Pressure: | 101.4KPa |




| No. | Frequency (MHz) | Factor (dBuV/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | MK. | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 140.8351 | 6.75 | 23.30 | 30.05 | 43.50 | -13.45 | QP | | |
| 2 | 204.2377 | 10.83 | 20.44 | 31.27 | 43.50 | -12.23 | QP | * | |
| 3 | 188.4125 | 9.17 | 22.00 | 31.17 | 43.50 | -12.33 | QP | | |
| 4 | 72.5914 | 8.23 | 19.18 | 27.41 | 40.00 | -12.59 | QP | | |
| 5 | 80.0805 | 6.16 | 19.32 | 25.48 | 40.00 | -14.52 | QP | | |
| 6 | 175.6516 | 8.83 | 18.53 | 27.36 | 43.50 | -16.14 | QP | | |

## 4.6. CONDUCTED EMISSION TEST

### 4.6.1. Applicable Standard

According to FCC Part 15.207(a)

### 4.6.2. Conformance Limit

| Conducted Emission Limit | | |
|---|---|---|
| Frequency(MHz) | Quasi-peak | Average |
| 0.15-0.5 | 66-56 | 56-46 |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |
| Note: 1. The lower limit shall apply at the transition frequencies<br>2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz. | | |

Remark: Test results were obtained from the following equation:
Measurement (dBμV) = LISN Factor (dB) + Cable Loss (dB) + Reading (dBμV)
Margin (dB) = Measurement (dBμV) - Limit (dBμV)

### 4.6.3. Test Configuration

Test according to clause 3.3 conducted emission test setup

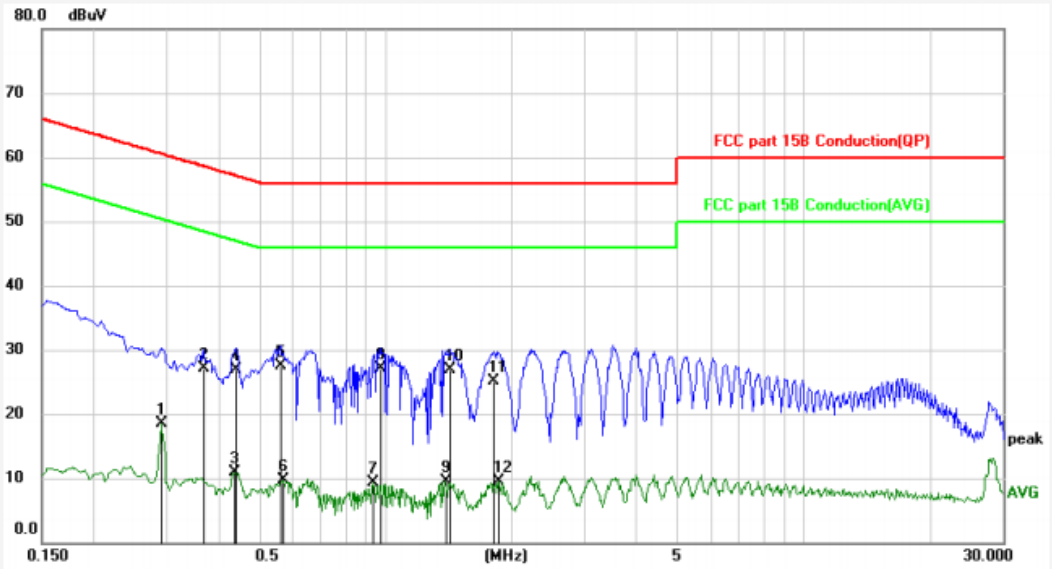
### 4.6.4. Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

**Test Results：**

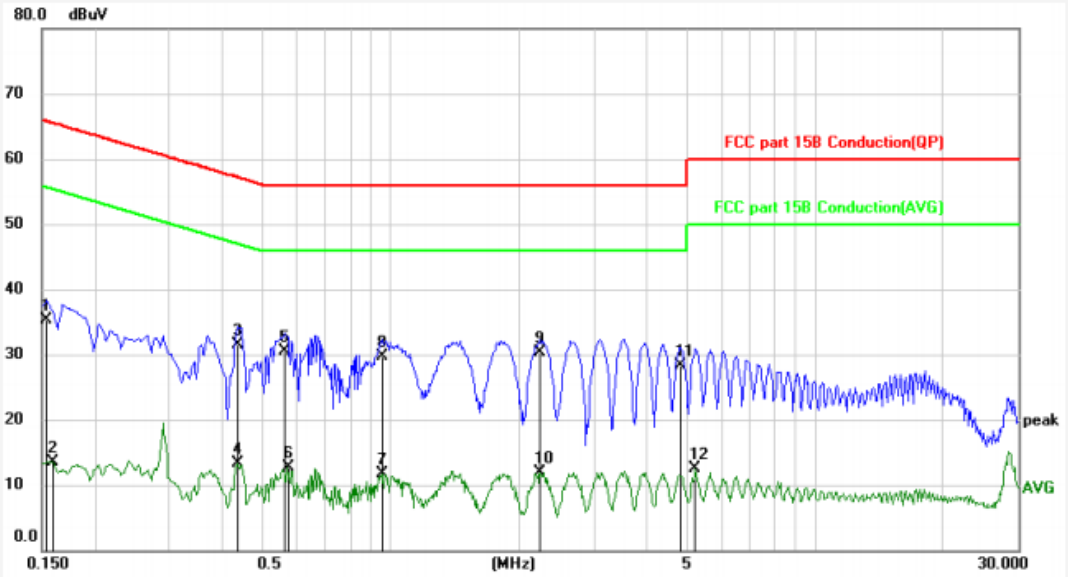
All antenna modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11b recorded was report as below:

| | | | | |
|---|---|---|---|---|
| Test Mode: | 802.11b | 2412MHz | Test Voltage: | AC 120V/60Hz |
| Temperature: | 24.3℃ | | Phase: | L1 |
| Relative Humidity: | 51% | | Pressure: | 101.5KPa |




| No. | Frequency (MHz) | Reading (dBuV) | Lisn/Isn (dB) | Cab_L (dB) | Result (dBuV) | Limit dBuV | Margin (dB) | Detector | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.2895 | 7.82 | 10.4 | 0.24 | 18.46 | 50.54 | -32.08 | AVG | |
| 2 | 0.3660 | 16.55 | 10.41 | 0.24 | 27.20 | 58.59 | -31.39 | QP | |
| 3 | 0.4335 | 0.29 | 10.41 | 0.24 | 10.94 | 47.19 | -36.25 | AVG | |
| 4 | 0.4380 | 16.25 | 10.41 | 0.24 | 26.90 | 57.10 | -30.20 | QP | |
| 5 | 0.5594 | 16.84 | 10.42 | 0.24 | 27.50 | 56.00 | -28.50 | QP | |
| 6 | 0.5684 | -0.89 | 10.42 | 0.24 | 9.77 | 46.00 | -36.23 | AVG | |
| 7 | 0.9374 | -1.40 | 10.43 | 0.23 | 9.26 | 46.00 | -36.74 | AVG | |
| 8 | 0.9734 | 16.54 | 10.43 | 0.23 | 27.20 | 56.00 | -28.80 | QP | |
| 9 | 1.3874 | -1.16 | 10.43 | 0.22 | 9.49 | 46.00 | -36.51 | AVG | |
| 10 | 1.4279 | 16.25 | 10.43 | 0.22 | 26.90 | 56.00 | -29.10 | QP | |
| 11 | 1.8104 | 14.46 | 10.43 | 0.21 | 25.10 | 56.00 | -30.90 | QP | |
| 12 | 1.8644 | -1.09 | 10.43 | 0.2 | 9.54 | 46.00 | -36.46 | AVG | |

| | | | | |
|---|---|---|---|---|
| Test Mode: | 802.11b | 2412MHz | Test Voltage: | AC 120V/60Hz |
| Temperature: | 24.3℃ | | Phase: | N |
| Relative Humidity: | 51% | | Pressure: | 101.5KPa |




| No. | Frequency (MHz) | Reading (dBuV) | Lisn/Isn (dB) | Cab_L (dB) | Result (dBuV) | Limit dBuV | Margin (dB) | Detector | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1545 | 24.72 | 10.36 | 0.22 | 35.30 | 65.75 | -30.45 | QP | |
| 2 | 0.1590 | 2.92 | 10.37 | 0.22 | 13.51 | 55.52 | -42.01 | AVG | |
| 3 | 0.4335 | 20.85 | 10.41 | 0.24 | 31.50 | 57.19 | -25.69 | QP | |
| 4 | 0.4335 | 2.73 | 10.41 | 0.24 | 13.38 | 47.19 | -33.81 | AVG | |
| 5 | 0.5639 | 19.94 | 10.42 | 0.24 | 30.60 | 56.00 | -25.40 | QP | |
| 6 | 0.5685 | 2.12 | 10.42 | 0.24 | 12.78 | 46.00 | -33.22 | AVG | |
| 7 | 0.9510 | 1.08 | 10.43 | 0.23 | 11.74 | 46.00 | -34.26 | AVG | |
| 8 | 0.9555 | 19.14 | 10.43 | 0.23 | 29.80 | 56.00 | -26.20 | QP | |
| 9 | 2.2380 | 19.77 | 10.43 | 0.2 | 30.40 | 56.00 | -25.60 | QP | |
| 10 | 2.2380 | 1.22 | 10.43 | 0.2 | 11.85 | 46.00 | -34.15 | AVG | |
| 11 | 4.8120 | 17.60 | 10.49 | 0.21 | 28.30 | 56.00 | -27.70 | QP | |
| 12 | 5.2080 | 1.81 | 10.49 | 0.21 | 12.51 | 50.00 | -37.49 | AVG | |

## 4.7. ANTENNA APPLICATION

### 4.7.1. Antenna Requirement

| Standard | Requirement |
|---|---|
| FCC CRF Part 15.203 | An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded. |

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.7.2. Result

**PASS.**

The EUT has 1 antenna: an PCB Antenna for WIFI 2.4G, antenna has a gain of -0.58dBi;

Note:which in accordance to section 15.203, please refer to the internal photos.

**--------- END OF REPORT --------**