# TEST REPORT

| | |
|---|---|
| **Application No.:** | SHCR2210002313AT |
| **FCC ID:** | 2ADTD-3WR15X |
| **IC:** | 20199-3WR15X |
| **Applicant:** | Hangzhou Hikvision Digital Technology Co., Ltd. |
| **Address of Applicant:** | No.555 Qianmo Road,Binjiang District Hangzhou 310052,China |
| **Manufacturer:** | Hangzhou Hikvision Digital Technology Co., Ltd. |
| **Address of Manufacturer:** | No.555 Qianmo Road,Binjiang District Hangzhou 310052,China |
| **Factory:** | 1, Hangzhou Hikvision Technology Co., Ltd.<br>2, Hangzhou Hikvision Electronics Co., Ltd.<br>3, Chongqing Hikvision technology Co., LTD. |
| **Address of Factory:** | 1, No.700,Dongliu Road, Binjiang District, Hangzhou City,Zhejiang, 310052, China<br>2, No.299,Qiushi Road,Tonglu Economic Development Zone,Tonglu County, Hangzhou,Zhejiang,310052,China.<br>3, No. 118, Haikang Road, Area C, Jianqiao Industrial Park, Dadukou District, Chongqing, 401325,China |
| **Equipment Under Test (EUT):** | |
| **EUT Name:** | Wireless Router |
| **Model No.:** | DS-3WR15X |
| **Standard(s) :** | 47 CFR Part 15, Subpart C 15.247<br>RSS-247 Issue 2, February 2017<br>RSS-Gen Issue 5 April 2018 Amendment 2 |
| **Date of Receipt:** | 2022-10-28 |
| **Date of Test:** | 2022-10-29 to 2022-11-03 |
| **Date of Issue:** | 2022-11-06 |
| **Test Result:** | **Pass*** |

* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan
Laboratory Manager

| Revision Record | | | |
|---|---|---|---|
| **Version** | **Description** | **Date** | **Remark** |
| 00 | Original | 2022-11-06 | / |
| | | | |
| | | | |

| | | | | |
|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| | | Bill Wu<br>**Bill Wu/Project Engineer** | | |
| | | Parlam Zhan<br>**Parlam Zhan/Reviewer** | | |

# 2 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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# 3 Contents

# 4 General Information

## 4.1 Details of E.U.T.

| | |
|---|---|
| Power supply: | DC 12V 1A By Adapter:<br>Adapter:<br>Model:RD1201000-C55-91MG<br>Input:100-240V~50/60Hz<br>Output:12V 1A |
| Test Voltage: | AC 120V 60Hz |
| Operation Frequency: | 802.11b/g/n(HT20): 2412-2462MHz<br>802.11n(HT40): 2422-2452MHz |
| Modulation Type: | 802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) |
| Number of Channels: | 802.11b/g/n(HT20):11;802.11n(HT40):7 |
| Channel Spacing: | 5MHz |
| Antenna Type: | Antenna 1: Dipole Antenna<br>Antenna 2: Dipole Antenna |
| Antenna Gain: | Antenna 1: 5.56 dBi,<br>Antenna 2: 5.20 dBi<br>(Provided by manufacturer)<br>Directional Gain: 8.39dBi |
| Date Rate: | 802.11b:1/2/5.5./11Mbps<br>802.11g:6/9/12/18/24/36/48/54Mbps<br>802.11n:MCS0-MCS7 |
| S/N: | K60945370 |
| Firmware Version: | V1.0.0 build 220914 |

## 4.2 Description of Support Units

| Description | Manufacturer | Model No. | Serial No. |
|---|---|---|---|
| Laptop | LENOVO | L460 | - |
| SecureCRT | VanDyke | V 6.2.0 | - |

## 4.3 Power level setting using in test

| Channel | 802.11b | 802.11g | 802.11n(HT20) |
|---|---|---|---|
| 1 | Default | Default | Default |
| 6 | Default | Default | Default |
| 11 | Default | Default | Default |

| Channel | 802.11n(HT40) |
|---|---|
| 3 | Default |
| 6 | Default |
| 9 | Default |

## 4.4 Measurement Uncertainty & Decision Rule

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Radio Frequency | $8.4 \times 10^{-8}$ |
| 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) |
| | | 5.9dB (Above 1GHz) |
| 9 | Radiated Spurious emission test | 4.2dB (Below 30MHz) |
| | | 4.5dB (30MHz-1GHz) |
| | | 5.1dB (1GHz-6GHz) |
| | | 5.4dB (6GHz-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.

## 4.5 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).

## 4.6 Test Facility

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

**• CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

**• 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.

## 4.7 Deviation from Standards

None

## 4.8 Abnormalities from Standard Conditions

None

# 5 Equipment List

| Equipment | Manufacturer | Model No | Inventory No | Cal Date | Cal Due Date |
|---|---|---|---|---|---|
| **RF Conducted Test** | | | | | |
| Spectrum Analyzer | R&S | FSP-30 | SHEM002-1 | 2021-12-20 | 2022-12-19 |
| Spectrum Analyzer | Keysight | N9020B | SHEM241-1 | 2021-12-20 | 2022-12-19 |
| Spectrum Analyzer | Agilent | N9020A | SHEM181-1 | 2022-08-02 | 2023-08-01 |
| Signal Generator | R&S | SMR20 | SHEM006-1 | 2022-08-02 | 2023-08-01 |
| Signal Generator | Agilent | N5182A | SHEM182-1 | 2022-08-02 | 2023-08-01 |
| Communication Tester | R&S | CMW270 | SHEM183-1 | 2022-07-25 | 2023-07-24 |
| Communication Tester | R&S | CMW500 | SHEM268-1 | 2022-07-25 | 2023-07-24 |
| Power Sensor | Keysight | U2021XA * 4 | SHEM184-1 | 2022-08-02 | 2023-08-01 |
| Splitter | Anritsu | MA1612A | SHEM185-1 | / | / |
| Coupler | e-meca | 803-S-1 | SHEM186-1 | / | / |
| High-low Temp Cabinet | Suzhou Zhihe | TL-40 | SHEM087-1 | 2020-04-15 | 2023-04-14 |
| AC Power Stabilizer | APC | KDF-31020T-V0-F0 | SHEM216-1 | 2021-12-20 | 2022-12-19 |
| DC Power Supply | MCH | MCH-303A | SHEM210-1 | 2021-12-20 | 2022-12-19 |
| Conducted test Cable | / | RF01~RF04 | / | 2021-12-20 | 2022-12-19 |
| Switcher | Tonscend | JS0806 | SHEM184-1 | 2022-08-02 | 2023-08-01 |
| Test software | Tonscend | JS Tonscend BT/WIFI System | Version: 2.6 | / | / |
| Coaxial Cable | TST | | SHEM263-1 | 2022-08-02 | 2023-08-01 |
| Test software | TST | TST PASS | Version: 2.0 | / | / |
| **RF Radiated Test** | | | | | |
| EMI test Receiver | R&S | ESU40 | SHEM051-1 | 2021-12-20 | 2022-12-19 |
| Spectrum Analyzer | R&S | FSP-30 | SHEM002-1 | 2021-12-20 | 2022-12-19 |
| Communication Tester | R&S | CMW500 | SHEM268-1 | 2022-07-25 | 2023-07-24 |
| Loop Antenna (9kHz-30MHz) | Schwarzbeck | FMZB1519 | SHEM135-1 | 2021-12-20 | 2022-12-19 |
| Antenna (25MHz-2GHz) | Schwarzbeck | VULB9168 | SHEM048-1 | 2021-09-11 | 2023-09-10 |
| Antenna (25MHz-2GHz) | Schwarzbeck | VULB9168 | SHEM202-1 | 2021-05-07 | 2023-05-06 |
| Horn Antenna (1-18GHz) | Schwarzbeck | HF906 | SHEM009-1 | 2022/8/11 | 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 | 2022-08-02 | 2023-08-01 |
| High-amplifier (14-40GHz) | Schwarzbeck | 10001 | SHEM049-2 | 2021-12-20 | 2022-12-19 |
| Band Filter | LORCH | 9BRX-875/X150 | SHEM156-1 | / | / |
| Band Filter | LORCH | 13BRX-1950/X500 | SHEM083-2 | / | / |
| Band Filter | LORCH | 5BRX-2400/X200 | SHEM155-1 | / | / |
| Band Filter | LORCH | 5BRX-5500/X1000 | SHEM157-2 | / | / |
| High pass Filter | Wainwright | WHK3.0/18G | SHEM157-1 | / | / |
| High pass Filter | Wainwright | WHKS1700 | SHEM157-3 | / | / |
| Semi/Fully Anechoic | ST | 11*6*6M | SHEM078-2 | 2020-05-25 | 2023-05-24 |
| RE test Cable | / | RE01, RE02, RE06 | / | 2022-01-07 | 2023-01-06 |
| Test software | ESE | E3 | Version: 6.111221a | / | / |

| Equipment | Manufacturer | Model No | Inventory No | Cal Date | Cal Due Date |
|---|---|---|---|---|---|
| **Conducted Emission at Mains Terminals (150kHz-30MHz)** | | | | | |
| EMI test receiver | R&S | ESR7 | SHEM162-1 | 2021-12-20 | 2022-12-19 |
| LISN | Schwarzbeck | NSLK8127 | SHEM061-1 | 2021-12-20 | 2022-12-19 |
| LISN | EMCO | 3816/2 | SHEM019-1 | 2021-12-20 | 2022-12-19 |
| Pulse limiter | R&S | ESH3-Z2 | SHEM029-1 | 2021-12-20 | 2022-12-19 |
| Shielding Room | ZHONGYU | 8*4*3M | SHEM079-2 | 2021-12-20 | 2022-12-19 |
| CE test Cable | / | CE01 | / | 2022-01-07 | 2023-01-07 |
| Test software | ESE | E3 | Version: 6.111221a | / | / |

# 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 dipole antenna and no consideration of replacement. The best case gain of the antenna1 is 5.56 dBi, antenna2 is 5.20 dBi.

Antenna location: Refer to internal photo.

# 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 emission(MHz) | Conducted limit(dBμV) | |
|---|---|---|
| | 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 (9kHz resolution bandwidth) 0.15M to 30MHz | | |

### 7.1.1 E.U.T. Operation

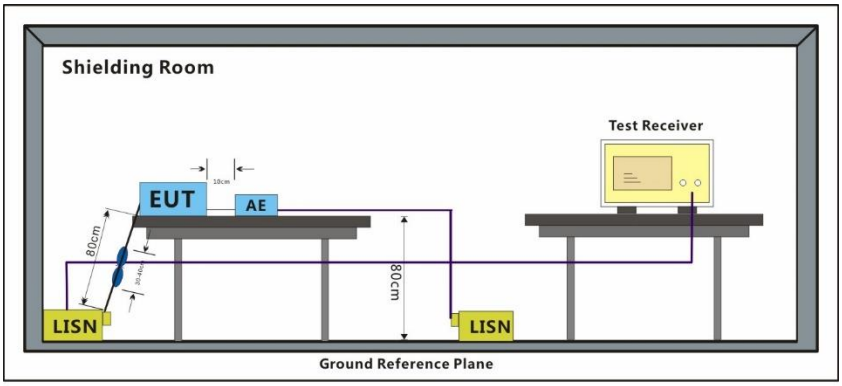
Operating Environment:

Temperature: 23.4 °C Humidity: 48.8 % RH Atmospheric Pressure: 1010 mbar

### 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. |

### 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.

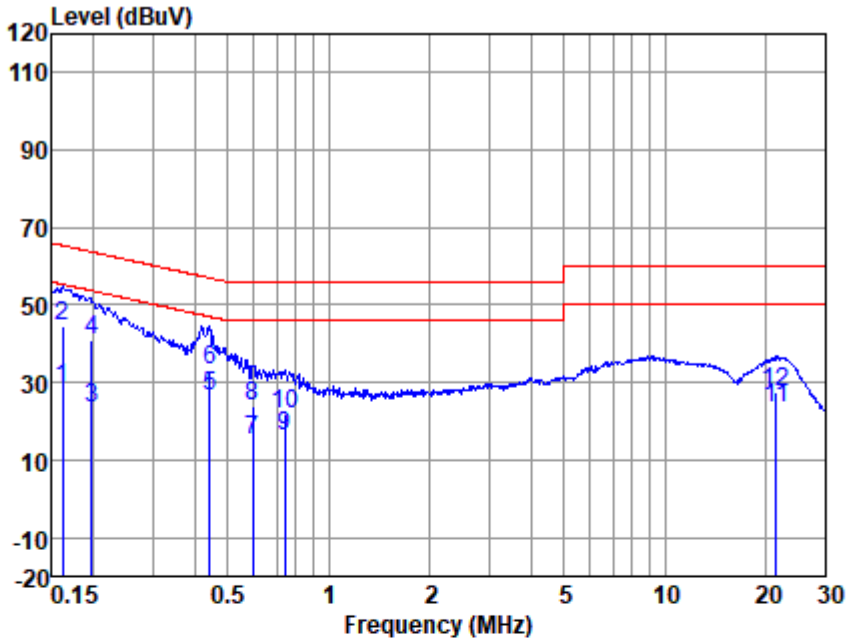
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

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

Test Mode: 00; Line:Live Line

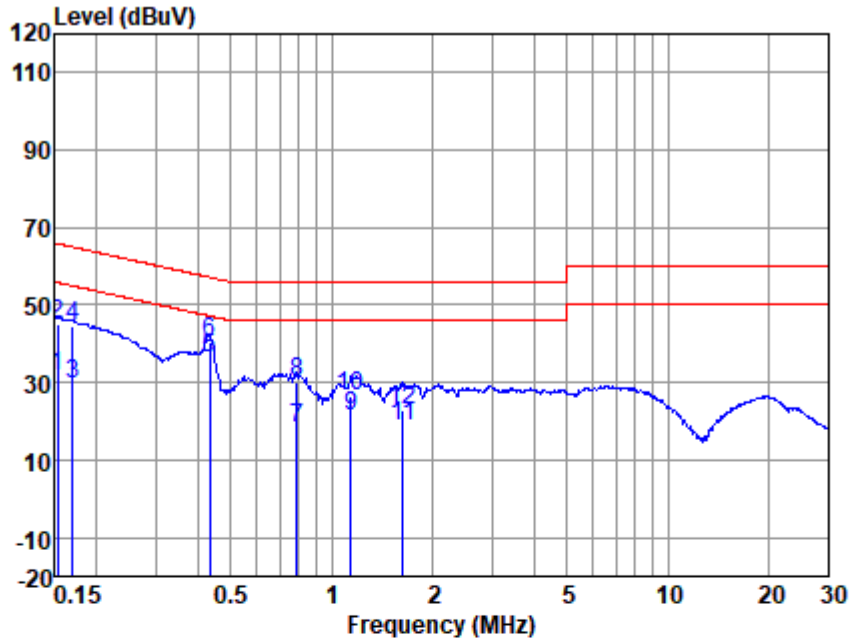



LISN : LINE
EUT/Project No : 02313AT
Test Mode : 00

| | Freq (MHz) | Read level (dBuV) | LISN Factor (dB) | Cable Loss (dB) | Emission Level (dBuV) | Limit (dBuV) | Over Limit (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.16 | 18.44 | 0.13 | 10.02 | 28.59 | 55.38 | -26.79 | Average |
| 2 | 0.16 | 34.20 | 0.13 | 10.02 | 44.35 | 65.38 | -21.03 | QP |
| 3 | 0.20 | 13.51 | 0.10 | 10.03 | 23.64 | 53.71 | -30.07 | Average |
| 4 | 0.20 | 30.68 | 0.10 | 10.03 | 40.81 | 63.71 | -22.90 | QP |
| 5 | 0.44 | 16.23 | 0.10 | 10.07 | 26.40 | 47.02 | -20.62 | Average |
| 6 | 0.44 | 23.02 | 0.10 | 10.07 | 33.19 | 57.02 | -23.83 | QP |
| 7 | 0.59 | 4.90 | 0.10 | 10.09 | 15.09 | 46.00 | -30.91 | Average |
| 8 | 0.59 | 13.74 | 0.10 | 10.09 | 23.93 | 56.00 | -32.07 | QP |
| 9 | 0.74 | 5.89 | 0.10 | 10.09 | 16.08 | 46.00 | -29.92 | Average |
| 10 | 0.74 | 11.47 | 0.10 | 10.09 | 21.66 | 56.00 | -34.34 | QP |
| 11 | 21.49 | 12.17 | 0.73 | 10.38 | 23.28 | 50.00 | -26.72 | Average |
| 12 | 21.49 | 16.47 | 0.73 | 10.38 | 27.58 | 60.00 | -32.42 | QP |

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

Test Mode: 00; Line:Neutral Line




LISN : NEUTRAL
EUT/Project No : 02313AT
Test Mode : 00

| | Freq (MHz) | Read level (dBuV) | LISN Factor (dB) | Cable Loss (dB) | Emission Level (dBuV) | Limit (dBuV) | Over Limit (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.15 | 21.40 | 0.10 | 10.01 | 31.51 | 55.87 | -24.36 | Average |
| 2 | 0.15 | 34.82 | 0.10 | 10.01 | 44.93 | 65.87 | -20.94 | QP |
| 3 | 0.17 | 19.62 | 0.10 | 10.02 | 29.74 | 54.99 | -25.25 | Average |
| 4 | 0.17 | 34.43 | 0.10 | 10.02 | 44.55 | 64.99 | -20.44 | QP |
| 5 | 0.43 | 26.21 | 0.10 | 10.07 | 36.38 | 47.20 | -10.82 | Average |
| 6 | 0.43 | 30.06 | 0.10 | 10.07 | 40.23 | 57.20 | -16.97 | QP |
| 7 | 0.79 | 8.19 | 0.10 | 10.09 | 18.38 | 46.00 | -27.62 | Average |
| 8 | 0.79 | 20.00 | 0.10 | 10.09 | 30.19 | 56.00 | -25.81 | QP |
| 9 | 1.14 | 11.34 | 0.10 | 10.12 | 21.56 | 46.00 | -24.44 | Average |
| 10 | 1.14 | 16.21 | 0.10 | 10.12 | 26.43 | 56.00 | -29.57 | QP |
| 11 | 1.63 | 8.54 | 0.10 | 10.16 | 18.80 | 46.00 | -27.20 | Average |
| 12 | 1.63 | 12.86 | 0.10 | 10.16 | 23.12 | 56.00 | -32.88 | QP |

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

## 7.2 Conducted Average 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) |
|---|---|
| 902-928 | 1 for ≥50 hopping channels |
| | 0.25 for 25≤ hopping channels <50 |
| | 1 for digital modulation |
| 2400-2483.5 | 1 for ≥75 non-overlapping hopping channels |
| | 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

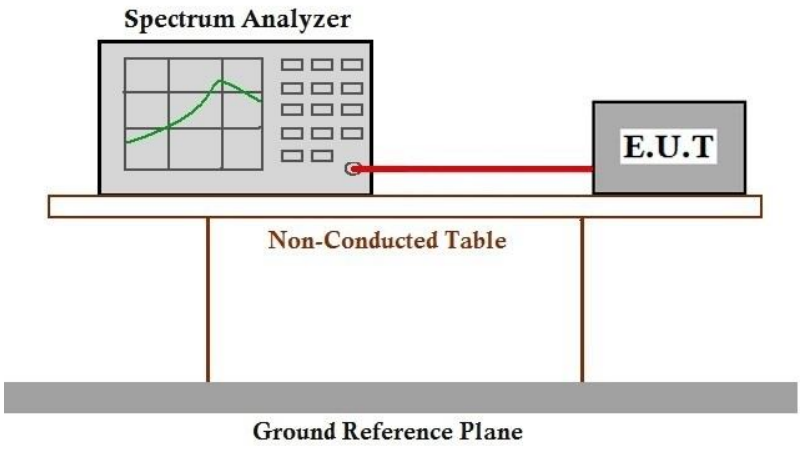
Operating Environment:

Temperature: 23.4 °C Humidity: 48.9 % RH Atmospheric Pressure: 1010 mbar

### 7.2.2 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. |

### 7.2.3 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

## 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

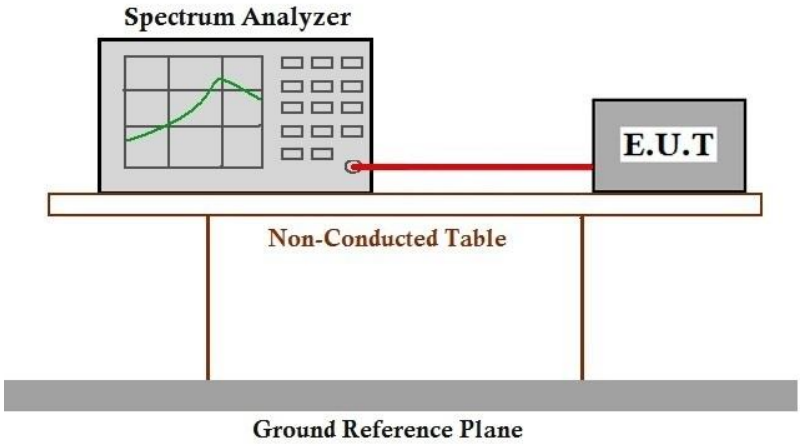
Operating Environment:

Temperature: 23.4 °C Humidity: 48.9 % 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

## 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

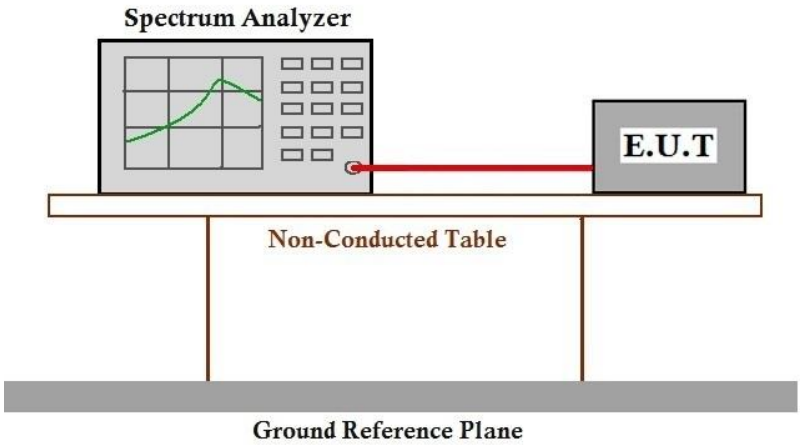
Operating Environment:

Temperature: 23.4 °C Humidity: 49.1 % 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

## 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

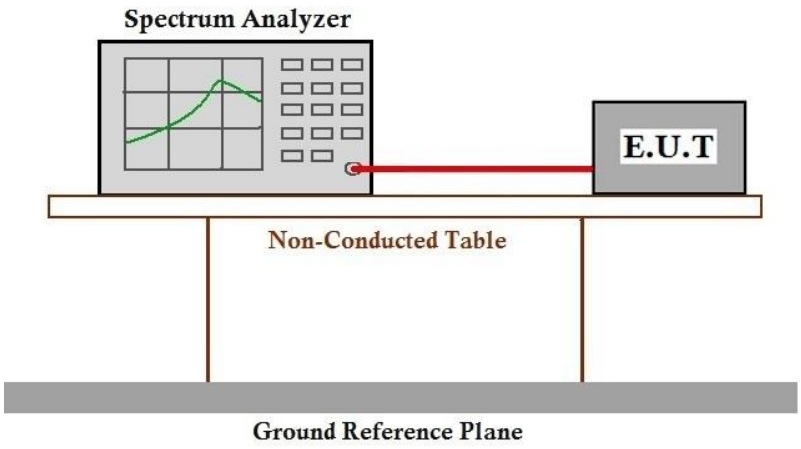
Operating Environment:

Temperature: 23.4 °C Humidity: 49.3 % RH Atmospheric Pressure: 1010 mbar

### 7.5.2 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. |

### 7.5.3 Test Setup Diagram




### 7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

## 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

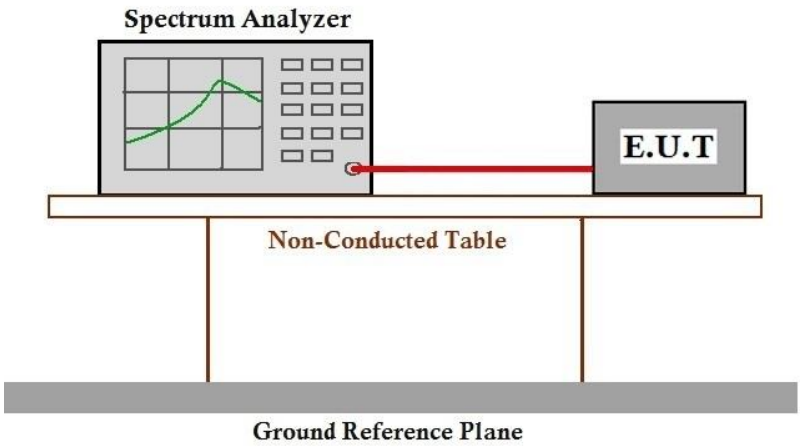
Operating Environment:

Temperature: 23.4 °C Humidity: 49.5 % RH Atmospheric Pressure: 1010 mbar

### 7.6.2 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. |

### 7.6.3 Test Setup Diagram




### 7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details

## 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

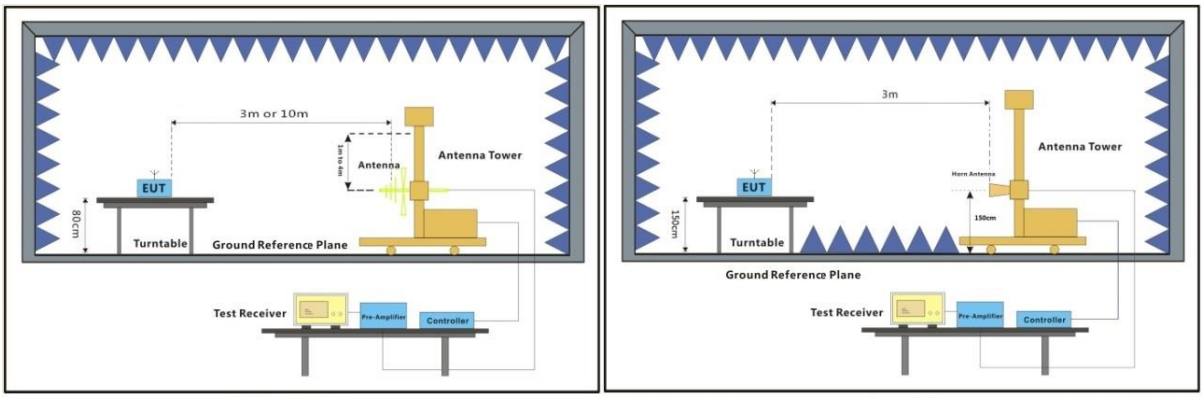
Operating Environment:

Temperature: 23.4 °C Humidity: 49.6 % RH Atmospheric Pressure: 1010 mbar

### 7.7.2 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. |

### 7.7.3 Test Setup Diagram




30MHz-1GHz　　Above 1GHz

### 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.

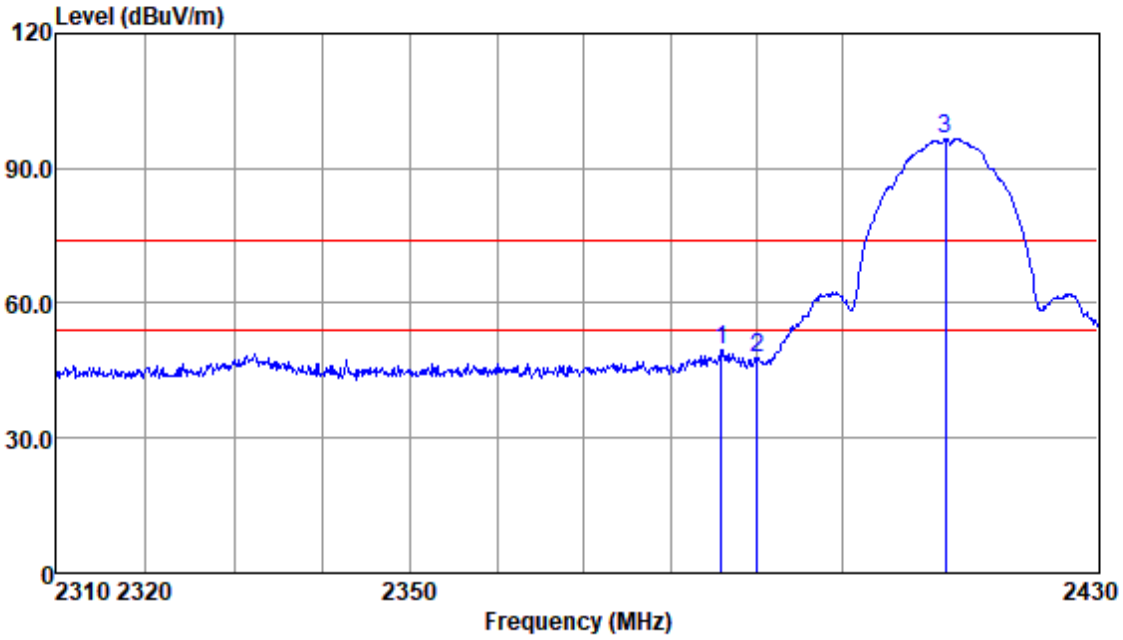
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

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.

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

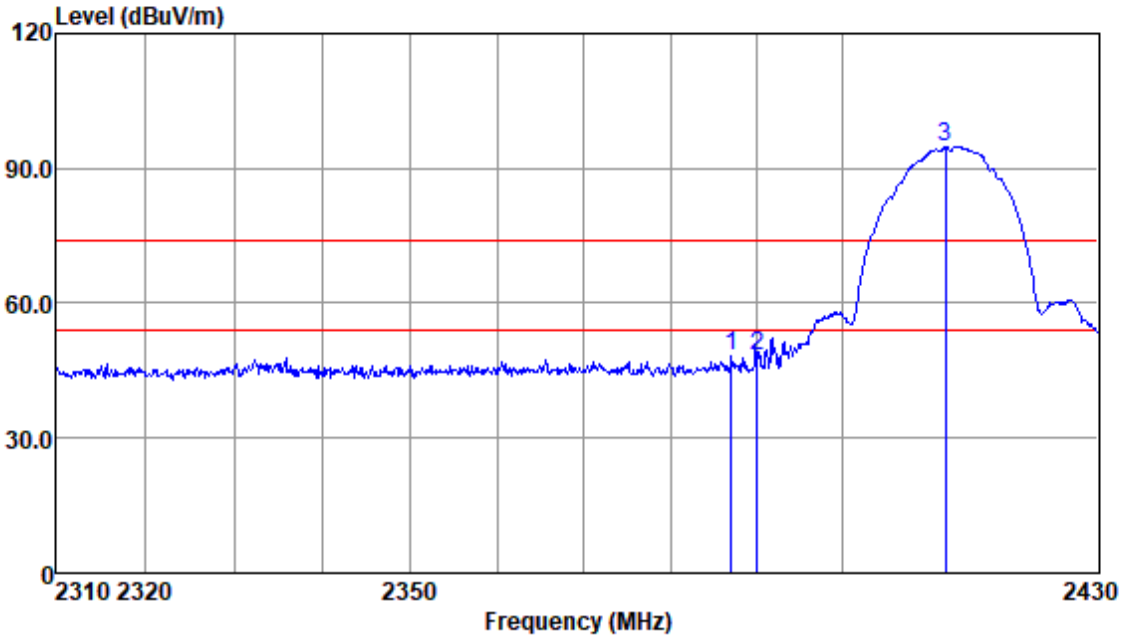



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2385.86 | 51.30 | 28.80 | 4.60 | 35.18 | 49.52 | 74.00 | -24.48 | Peak |
| 2390.00 | 49.81 | 28.80 | 4.60 | 35.18 | 48.03 | 74.00 | -25.97 | Peak |
| 2411.98 | 98.36 | 28.90 | 4.65 | 35.20 | 96.71 | 74.00 | 22.71 | Peak |

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

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

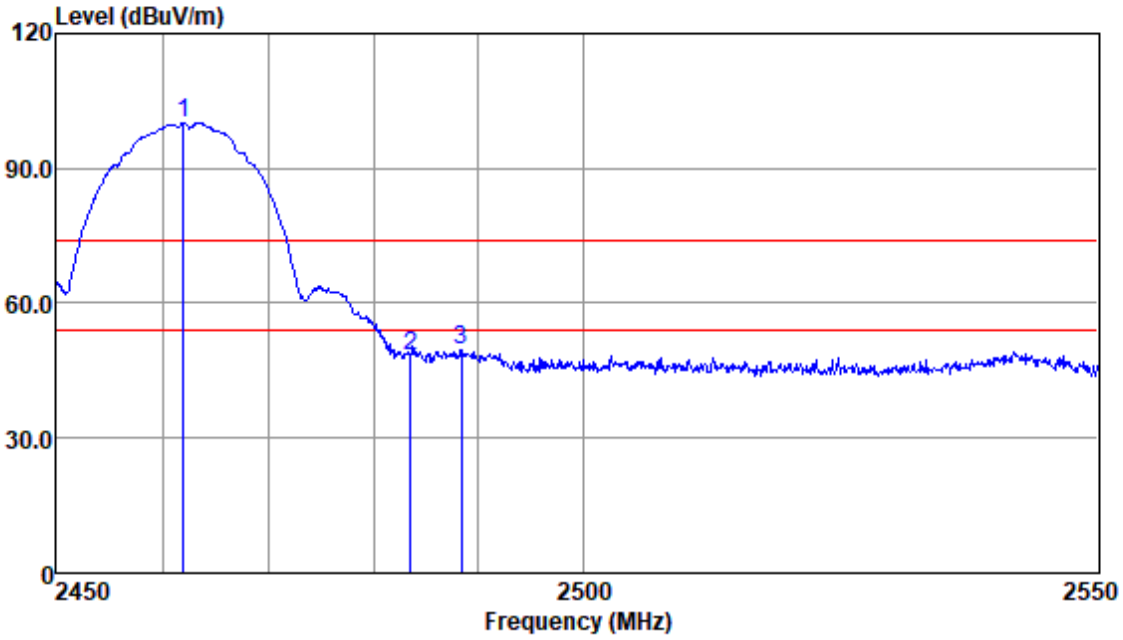



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2387.07 | 50.04 | 28.80 | 4.60 | 35.18 | 48.26 | 74.00 | -25.74 | Peak |
| 2390.00 | 49.83 | 28.80 | 4.60 | 35.18 | 48.05 | 74.00 | -25.95 | Peak |
| 2411.98 | 96.52 | 28.90 | 4.65 | 35.20 | 94.87 | 74.00 | 20.87 | Peak |

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

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

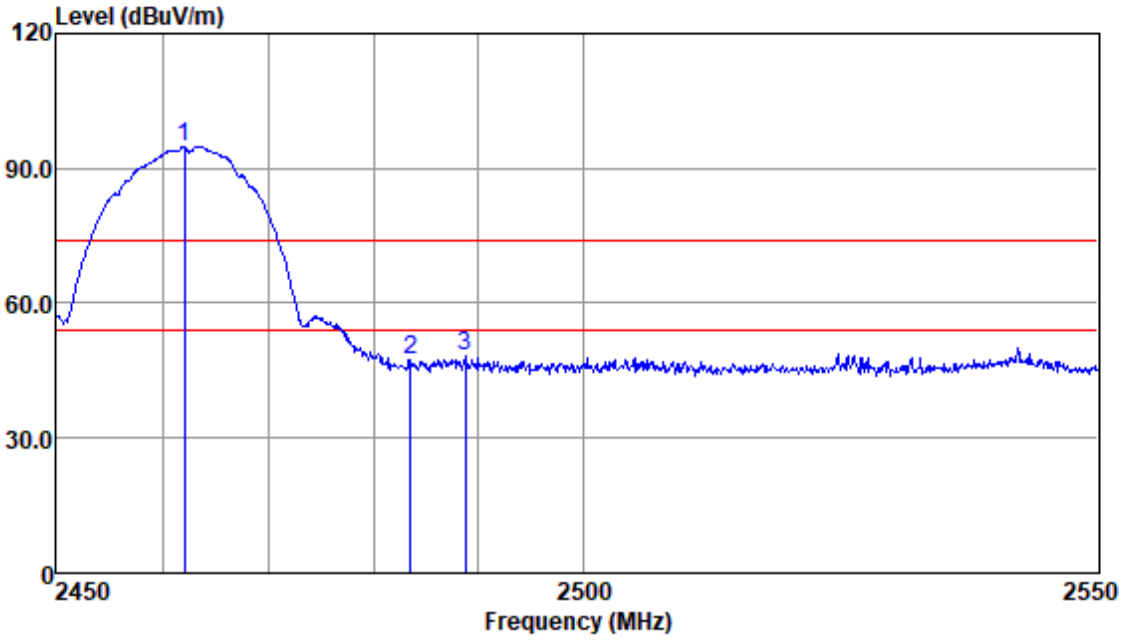



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2461.99 | 101.68 | 29.05 | 4.74 | 35.24 | 100.23 | 74.00 | 26.23 | Peak |
| 2483.50 | 49.85 | 29.09 | 4.78 | 35.26 | 48.46 | 74.00 | -25.54 | Peak |
| 2488.43 | 51.07 | 29.09 | 4.78 | 35.26 | 49.68 | 74.00 | -24.32 | Peak |

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

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

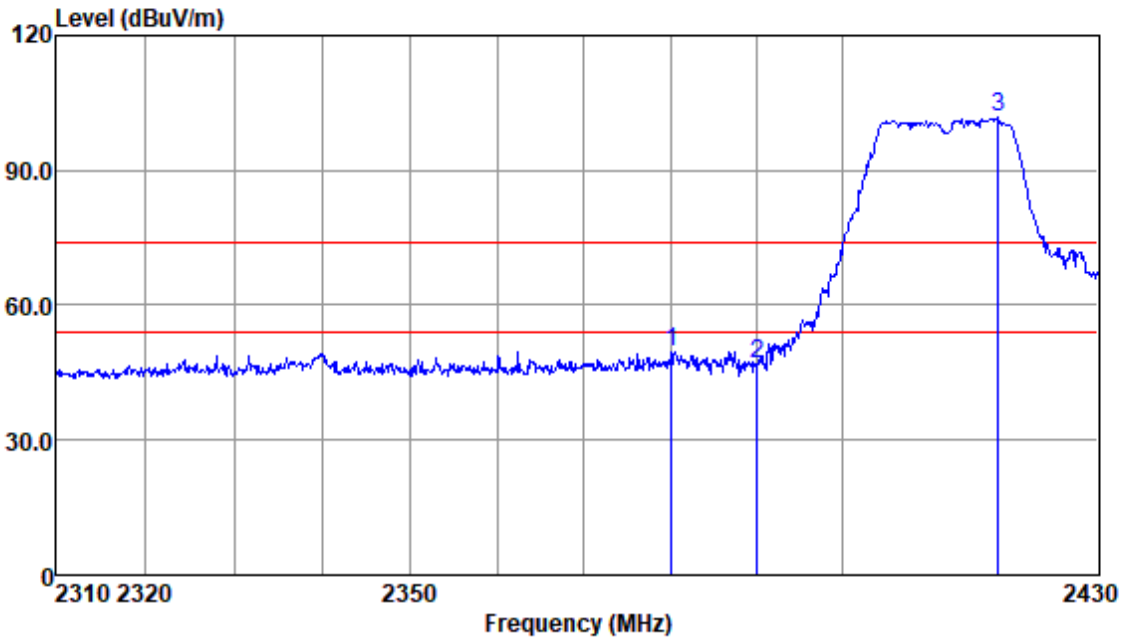



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2462.09 | 96.26 | 29.05 | 4.74 | 35.24 | 94.81 | 74.00 | 20.81 | Peak |
| 2483.50 | 48.89 | 29.09 | 4.78 | 35.26 | 47.50 | 74.00 | -26.50 | Peak |
| 2488.72 | 49.62 | 29.09 | 4.78 | 35.26 | 48.23 | 74.00 | -25.77 | Peak |

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

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

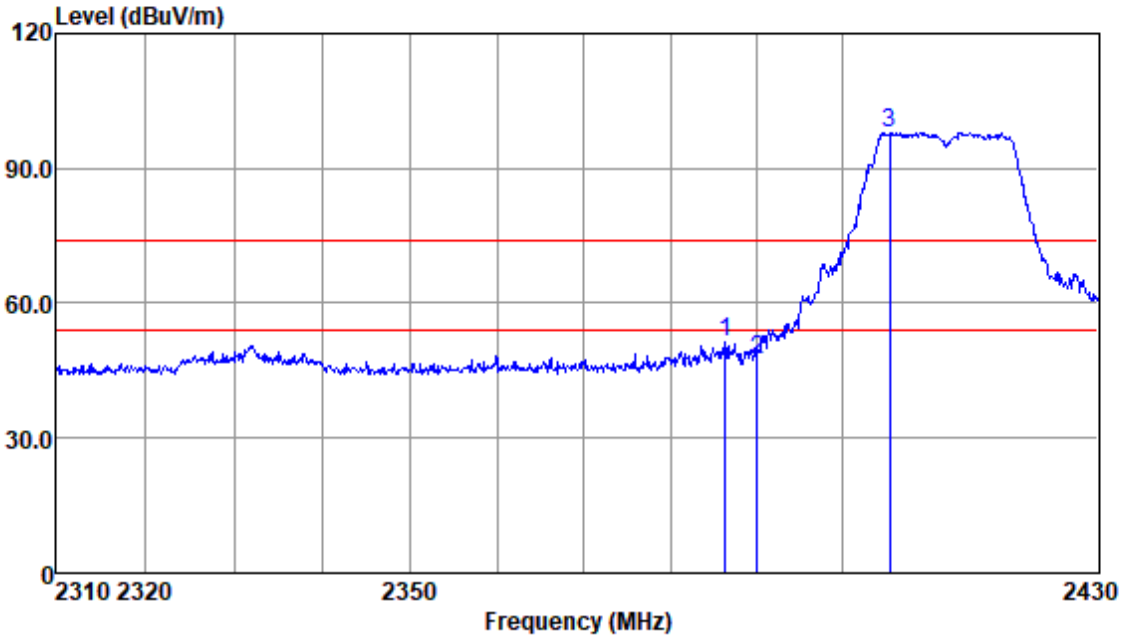



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2380.06 | 51.49 | 28.76 | 4.59 | 35.17 | 49.67 | 74.00 | -24.33 | Peak |
| 2390.00 | 48.84 | 28.80 | 4.60 | 35.18 | 47.06 | 74.00 | -26.94 | Peak |
| 2418.22 | 103.46 | 28.92 | 4.66 | 35.21 | 101.83 | 74.00 | 27.83 | Peak |

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

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

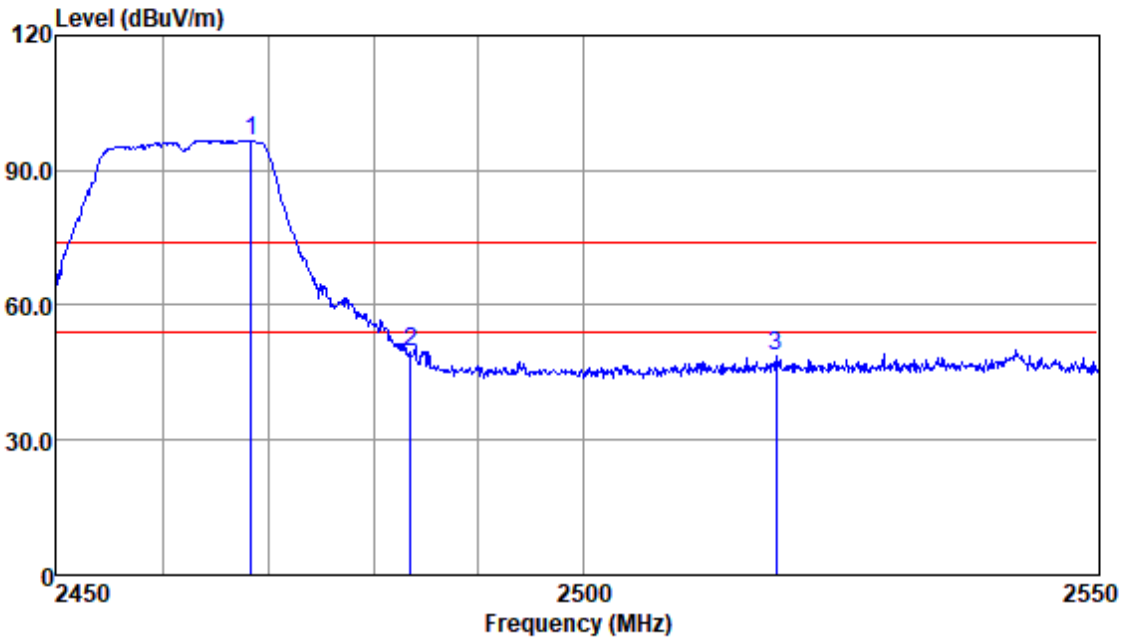



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2386.34 | 53.36 | 28.80 | 4.60 | 35.18 | 51.58 | 74.00 | -22.42 | Peak |
| 2390.00 | 49.29 | 28.80 | 4.60 | 35.18 | 47.51 | 74.00 | -26.49 | Peak |
| 2405.51 | 99.70 | 28.89 | 4.64 | 35.20 | 98.03 | 74.00 | 24.03 | Peak |

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

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

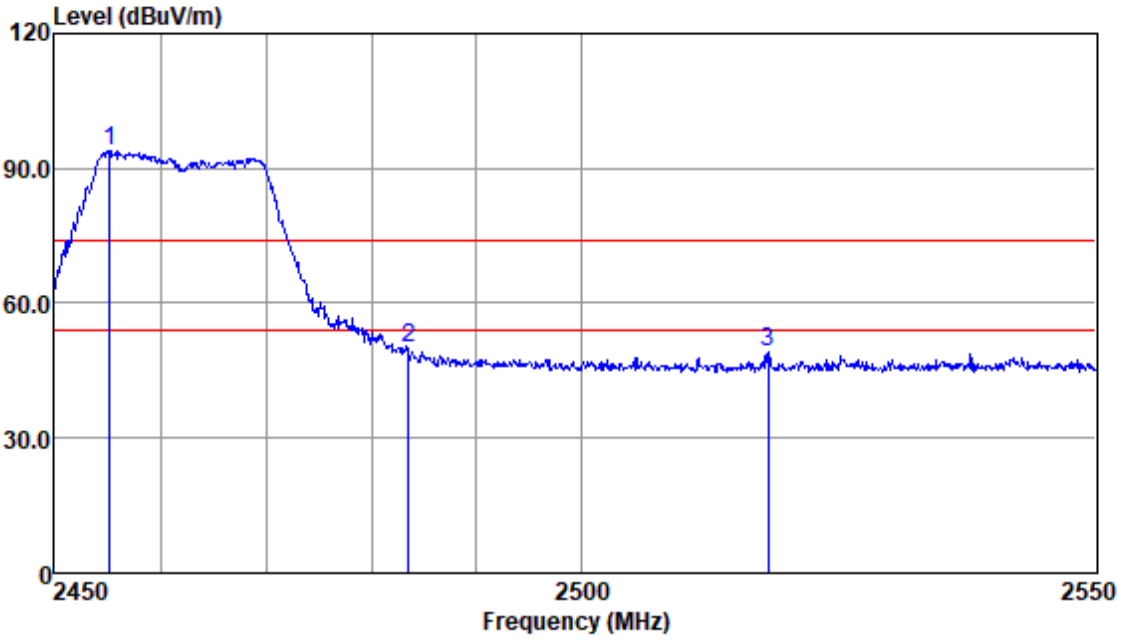



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2468.40 | 98.17 | 29.06 | 4.75 | 35.25 | 96.73 | 74.00 | 22.73 | Peak |
| 2483.50 | 51.15 | 29.09 | 4.78 | 35.26 | 49.76 | 74.00 | -24.24 | Peak |
| 2518.67 | 49.92 | 29.13 | 4.84 | 35.30 | 48.59 | 74.00 | -25.41 | Peak |

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

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

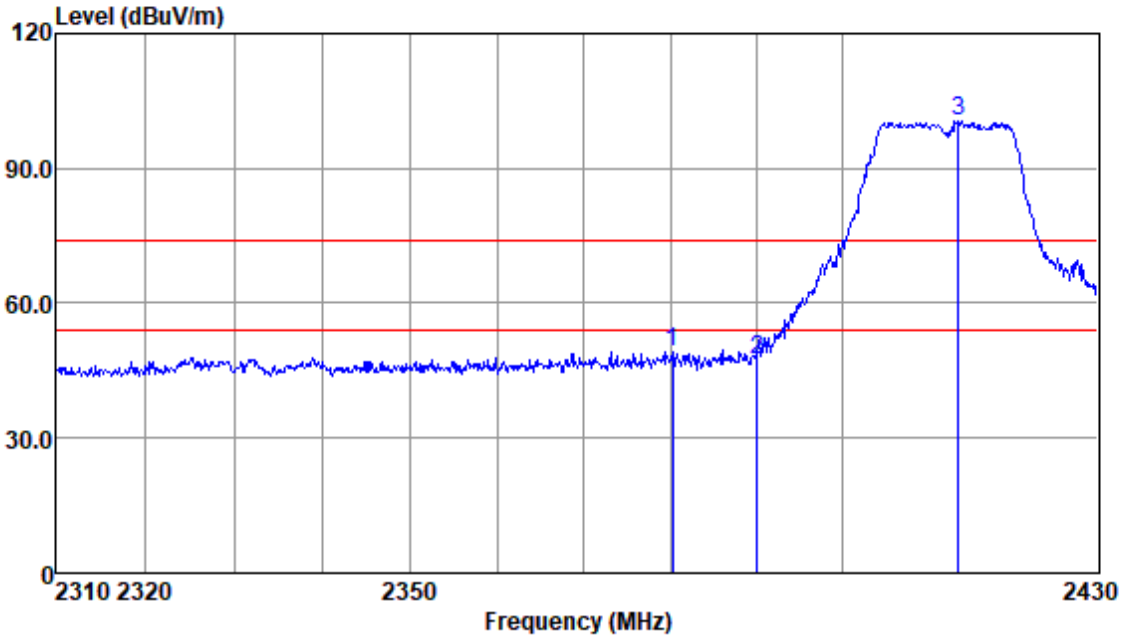



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2455.20 | 95.40 | 29.04 | 4.73 | 35.24 | 93.93 | 74.00 | 19.93 | Peak |
| 2483.50 | 51.43 | 29.09 | 4.78 | 35.26 | 50.04 | 74.00 | -23.96 | Peak |
| 2518.07 | 50.64 | 29.13 | 4.84 | 35.30 | 49.31 | 74.00 | -24.69 | Peak |

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

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

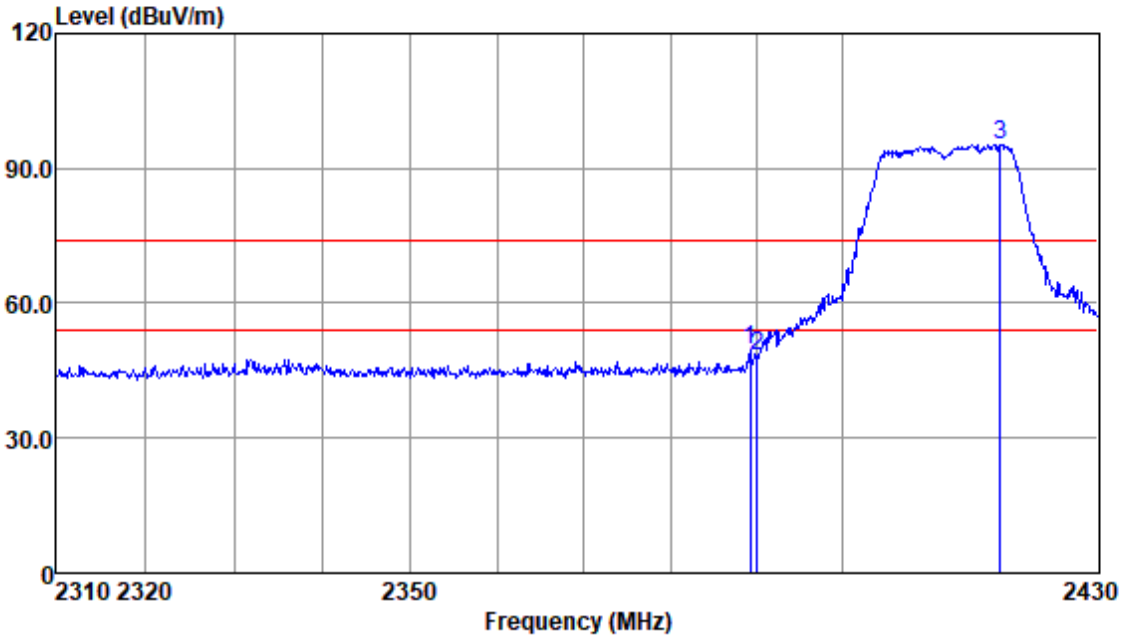



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2380.18 | 51.04 | 28.76 | 4.59 | 35.17 | 49.22 | 74.00 | -24.78 | Peak |
| 2390.00 | 49.11 | 28.80 | 4.60 | 35.18 | 47.33 | 74.00 | -26.67 | Peak |
| 2413.57 | 102.12 | 28.90 | 4.65 | 35.20 | 100.47 | 74.00 | 26.47 | Peak |

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

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

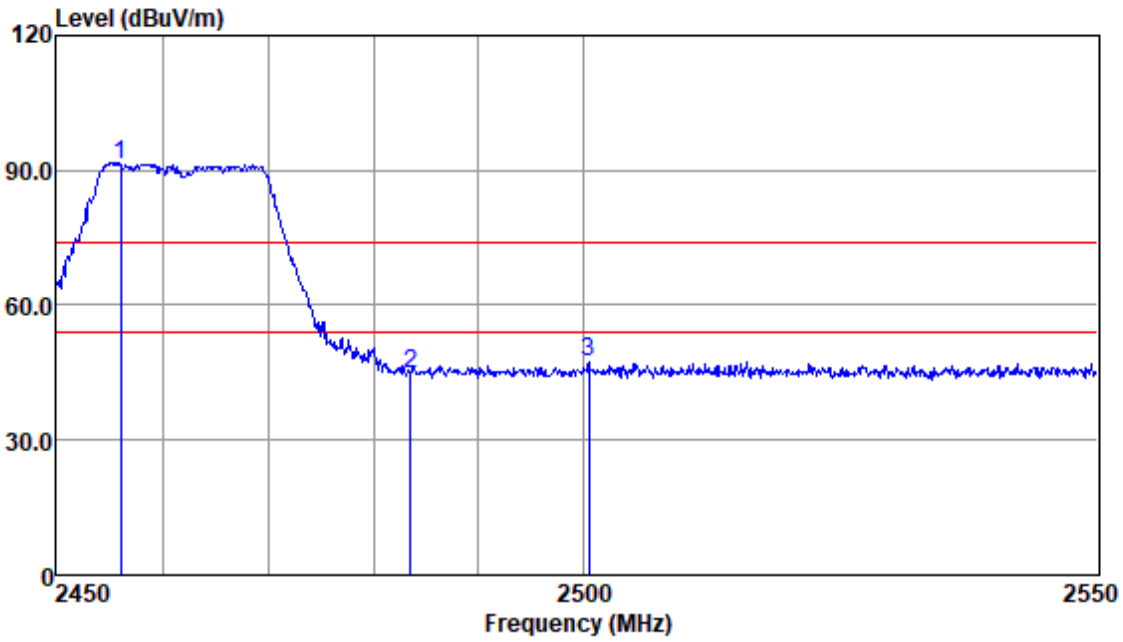



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2389.24 | 51.46 | 28.80 | 4.60 | 35.18 | 49.68 | 74.00 | -24.32 | Peak |
| 2390.00 | 49.98 | 28.80 | 4.60 | 35.18 | 48.20 | 74.00 | -25.80 | Peak |
| 2418.46 | 96.92 | 28.92 | 4.66 | 35.21 | 95.29 | 74.00 | 21.29 | Peak |

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

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

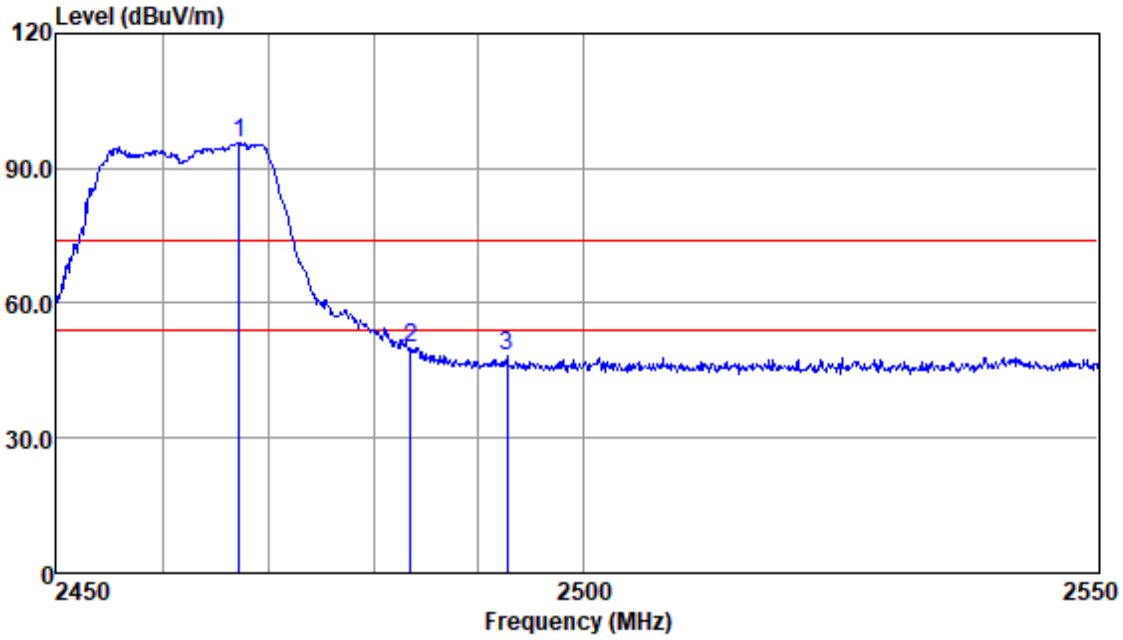



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2456.08 | 92.80 | 29.04 | 4.73 | 35.24 | 91.33 | 74.00 | 17.33 | Peak |
| 2483.50 | 46.23 | 29.09 | 4.78 | 35.26 | 44.84 | 74.00 | -29.16 | Peak |
| 2500.60 | 48.52 | 29.12 | 4.80 | 35.27 | 47.17 | 74.00 | -26.83 | Peak |

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

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

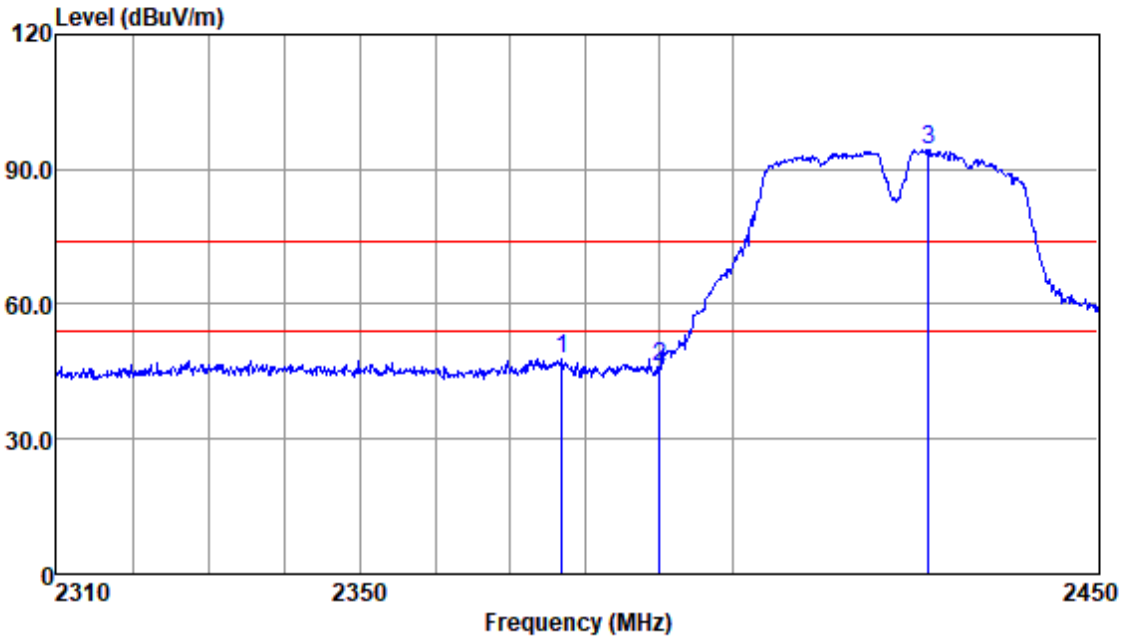



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2467.21 | 97.19 | 29.05 | 4.74 | 35.24 | 95.74 | 74.00 | 21.74 | Peak |
| 2483.50 | 51.45 | 29.09 | 4.78 | 35.26 | 50.06 | 74.00 | -23.94 | Peak |
| 2492.81 | 49.52 | 29.10 | 4.79 | 35.26 | 48.15 | 74.00 | -25.85 | Peak |

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

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

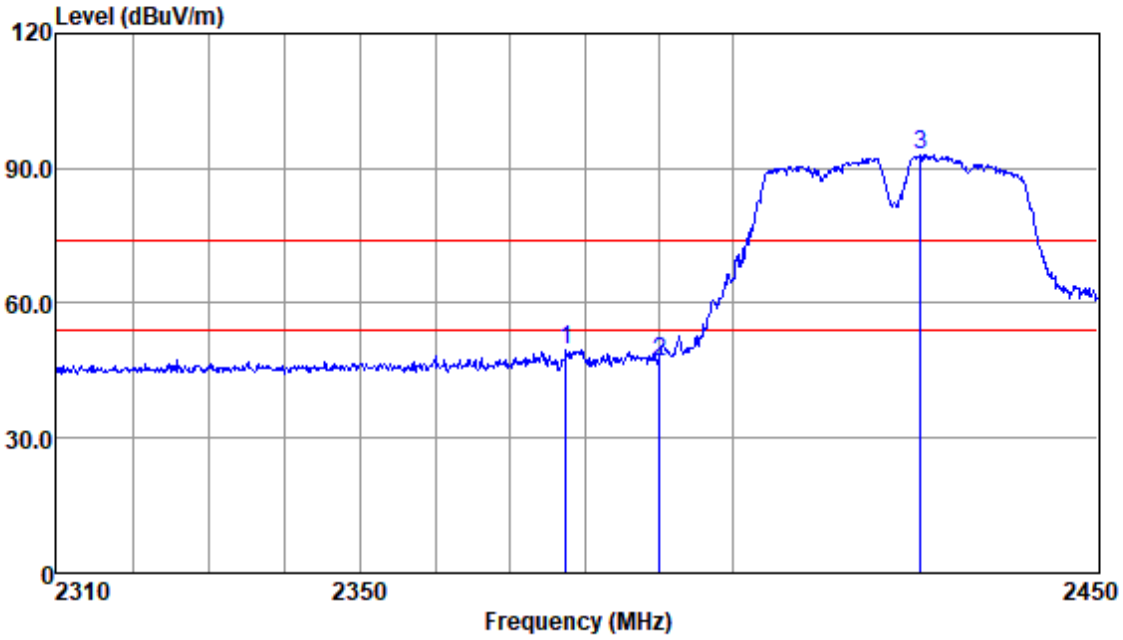



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2376.87 | 49.81 | 28.76 | 4.59 | 35.17 | 47.99 | 74.00 | -26.01 | Peak |
| 2390.00 | 47.65 | 28.80 | 4.60 | 35.18 | 45.87 | 74.00 | -28.13 | Peak |
| 2426.61 | 95.88 | 28.96 | 4.67 | 35.21 | 94.30 | 74.00 | 20.30 | Peak |

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

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

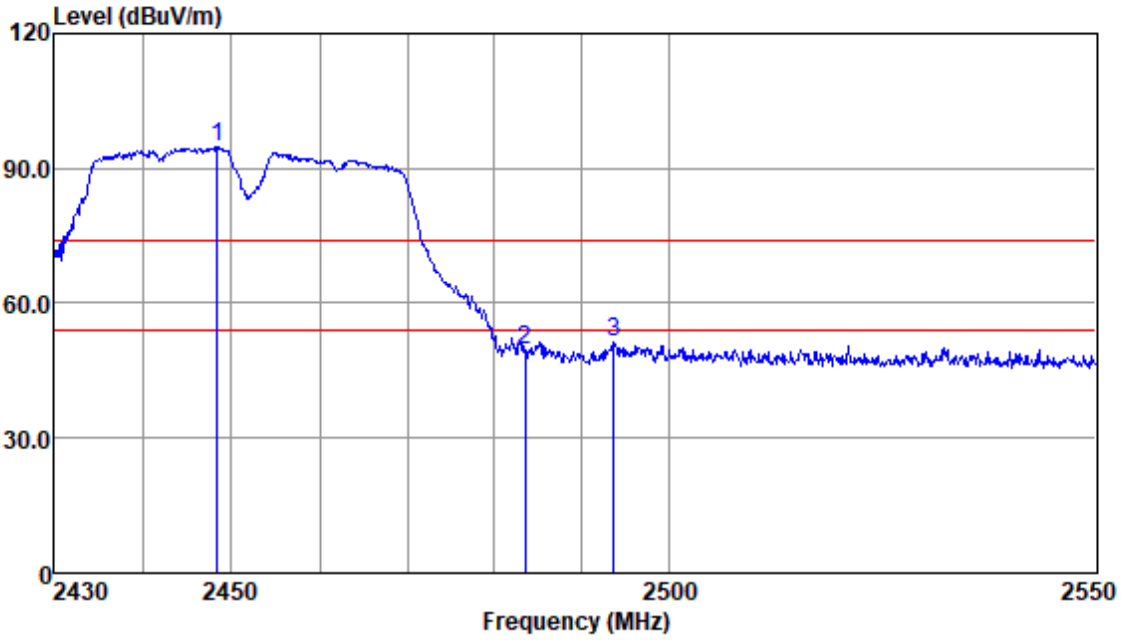



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2377.43 | 51.32 | 28.76 | 4.59 | 35.17 | 49.50 | 74.00 | -24.50 | Peak |
| 2390.00 | 48.82 | 28.80 | 4.60 | 35.18 | 47.04 | 74.00 | -26.96 | Peak |
| 2425.47 | 94.58 | 28.96 | 4.67 | 35.21 | 93.00 | 74.00 | 19.00 | Peak |

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

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

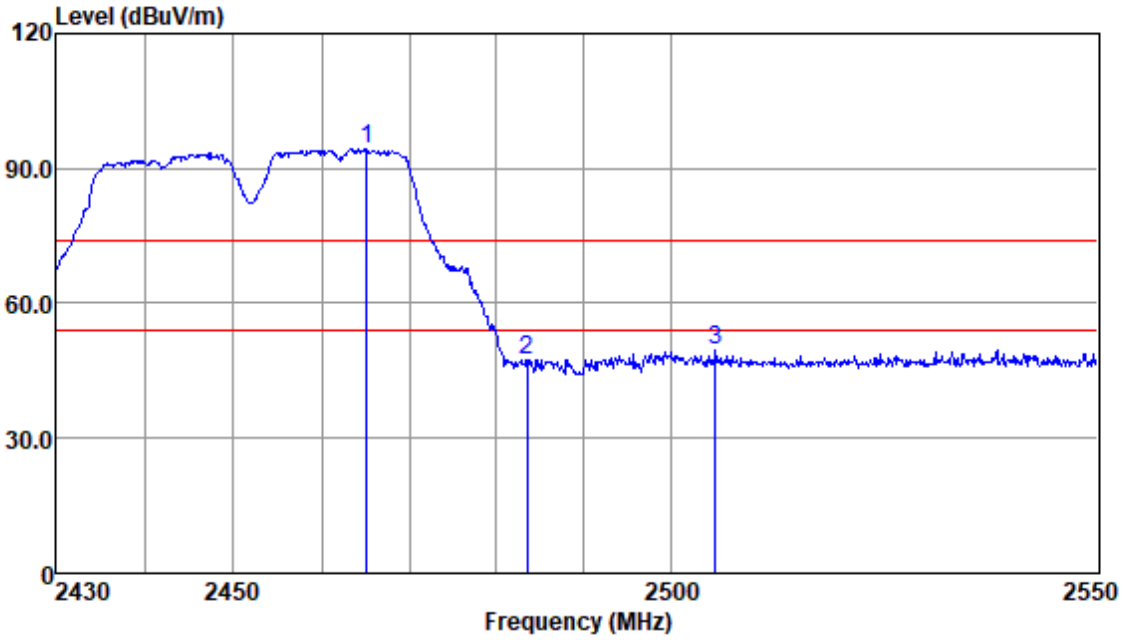



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2448.34 | 96.17 | 29.02 | 4.71 | 35.23 | 94.67 | 74.00 | 20.67 | Peak |
| 2483.50 | 50.84 | 29.09 | 4.78 | 35.26 | 49.45 | 74.00 | -24.55 | Peak |
| 2493.72 | 52.66 | 29.10 | 4.79 | 35.26 | 51.29 | 74.00 | -22.71 | Peak |

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

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




Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2465.16 | 95.70 | 29.05 | 4.74 | 35.24 | 94.25 | 74.00 | 20.25 | Peak |
| 2483.50 | 48.65 | 29.09 | 4.78 | 35.26 | 47.26 | 74.00 | -26.74 | Peak |
| 2505.17 | 50.74 | 29.13 | 4.81 | 35.28 | 49.40 | 74.00 | -24.60 | Peak |

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

## 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

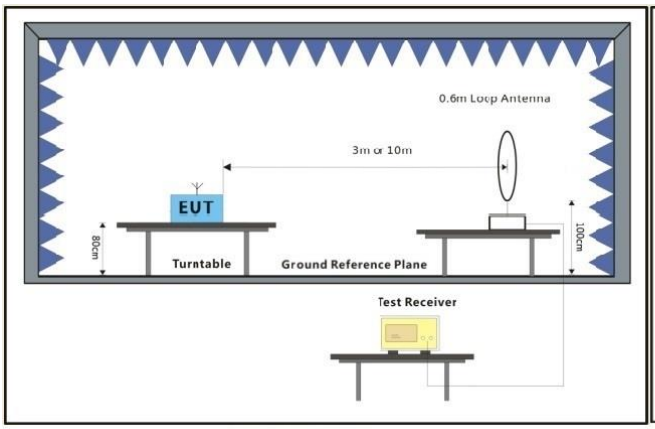
Operating Environment:

Temperature: 23.4 °C Humidity: 49.8 % RH Atmospheric Pressure: 1010 mbar

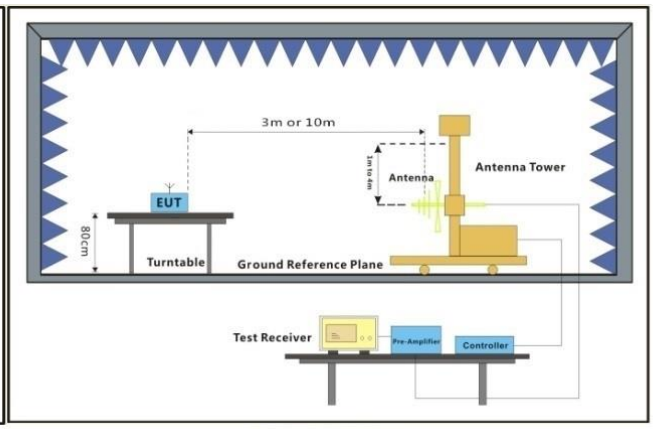
### 7.8.2 Test Mode Description

| 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. |

### 7.8.3 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.

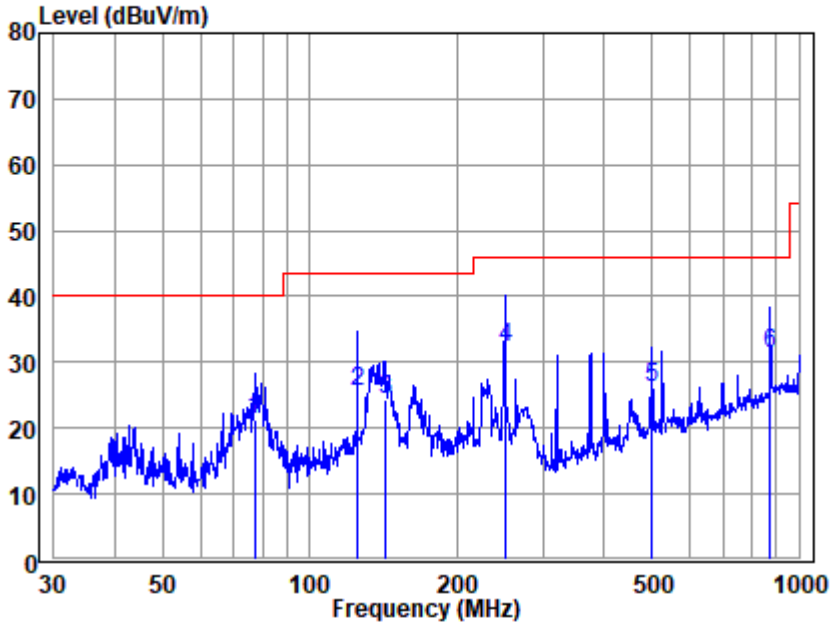
Remark:

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.

Test Mode: 00; Polarity: Horizontal

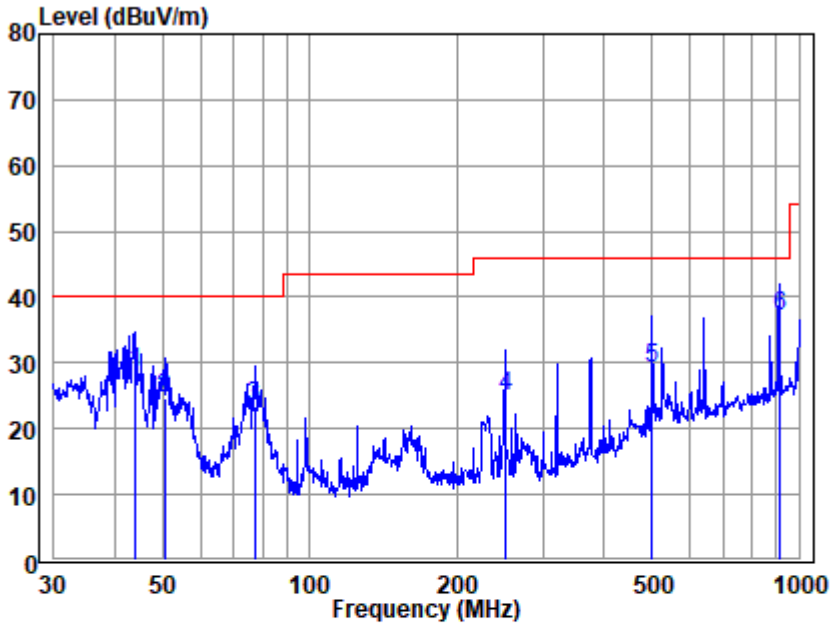



Antenna Polarity :Horizontal
EUT/Project :2313AT
Test mode :00

| | Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 1 | 77.05 | 41.17 | 9.81 | 2.11 | 31.70 | 21.39 | 40.00 | -18.61 | QP |
| 2 | 125.01 | 43.45 | 11.50 | 2.56 | 31.90 | 25.61 | 43.50 | -17.89 | QP |
| 3 | 143.33 | 40.18 | 13.08 | 2.87 | 31.91 | 24.22 | 43.50 | -19.28 | QP |
| 4 | 250.30 | 48.76 | 11.85 | 3.93 | 32.40 | 32.14 | 46.00 | -13.86 | QP |
| 5 | 501.18 | 36.49 | 17.89 | 5.60 | 33.68 | 26.30 | 46.00 | -19.70 | QP |
| 6 | 875.25 | 30.85 | 23.19 | 7.44 | 30.15 | 31.33 | 46.00 | -14.67 | QP |

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

Test Mode: 00; Polarity: Vertical




Antenna Polarity :Vertical
EUT/Project :2313AT
Test mode :00

| | Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 1 | 43.81 | 45.19 | 13.72 | 1.67 | 31.88 | 28.70 | 40.00 | -11.30 | QP |
| 2 | 50.41 | 41.10 | 13.81 | 1.69 | 32.00 | 24.60 | 40.00 | -15.40 | QP |
| 3 | 77.05 | 43.20 | 9.81 | 2.11 | 31.70 | 23.42 | 40.00 | -16.58 | QP |
| 4 | 250.30 | 41.48 | 11.85 | 3.93 | 32.40 | 24.86 | 46.00 | -21.14 | QP |
| 5 | 501.18 | 39.39 | 17.89 | 5.60 | 33.68 | 29.20 | 46.00 | -16.80 | QP |
| 6 | 912.86 | 35.57 | 23.76 | 7.55 | 29.80 | 37.08 | 46.00 | -8.92 | QP |

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

## 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

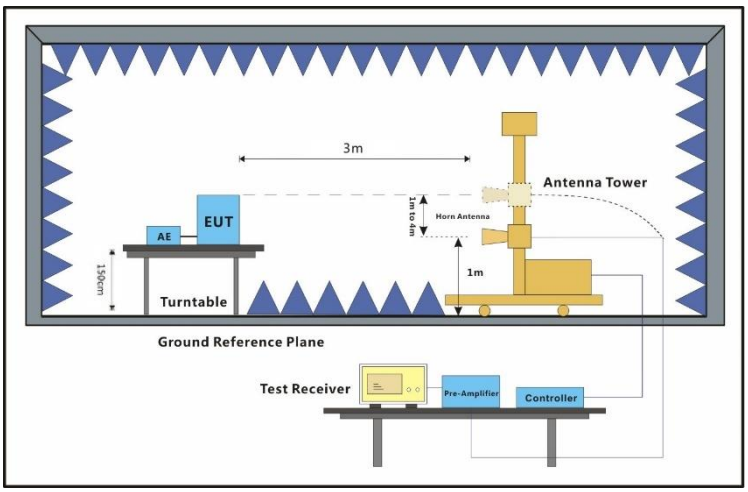
Operating Environment:

Temperature: 23.4 °C Humidity: 50.0 % RH Atmospheric Pressure: 1010 mbar

### 7.9.2 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. |

### 7.9.3 Test Setup Diagram



### 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:

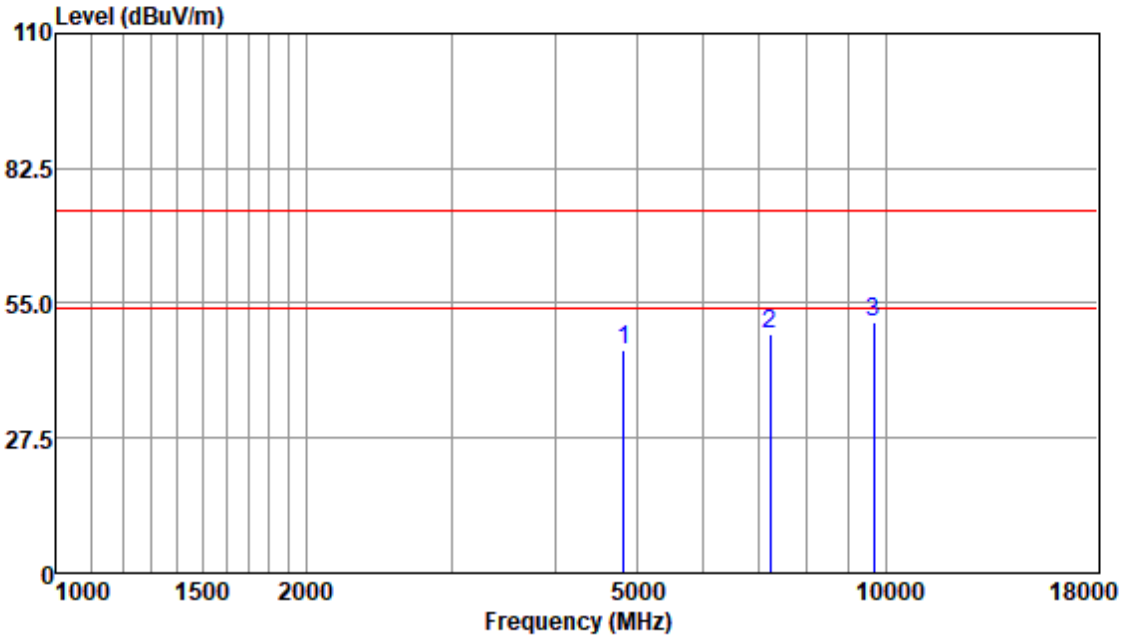
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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.

Remark: This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for b/g modulation and MIMO antenna operation for n/ax modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.

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

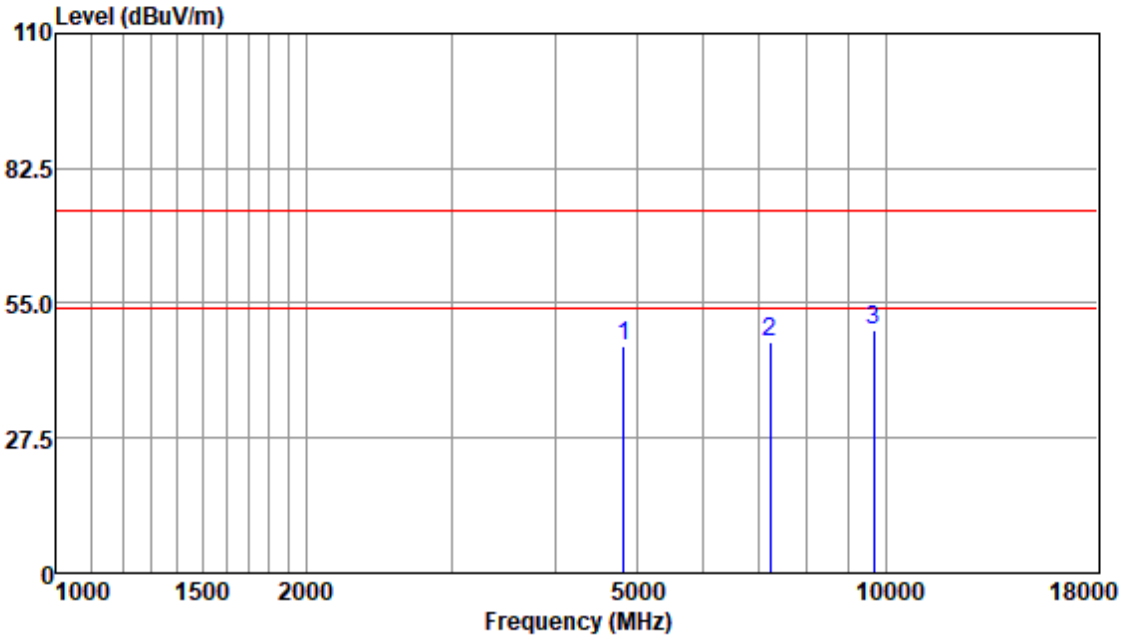



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4824.00 | 40.81 | 33.78 | 7.46 | 36.79 | 45.26 | 74.00 | -28.74 | Peak |
| 7236.00 | 39.91 | 36.35 | 7.80 | 35.50 | 48.56 | 74.00 | -25.44 | Peak |
| 9648.00 | 38.52 | 37.69 | 8.57 | 33.56 | 51.22 | 74.00 | -22.78 | Peak |

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

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

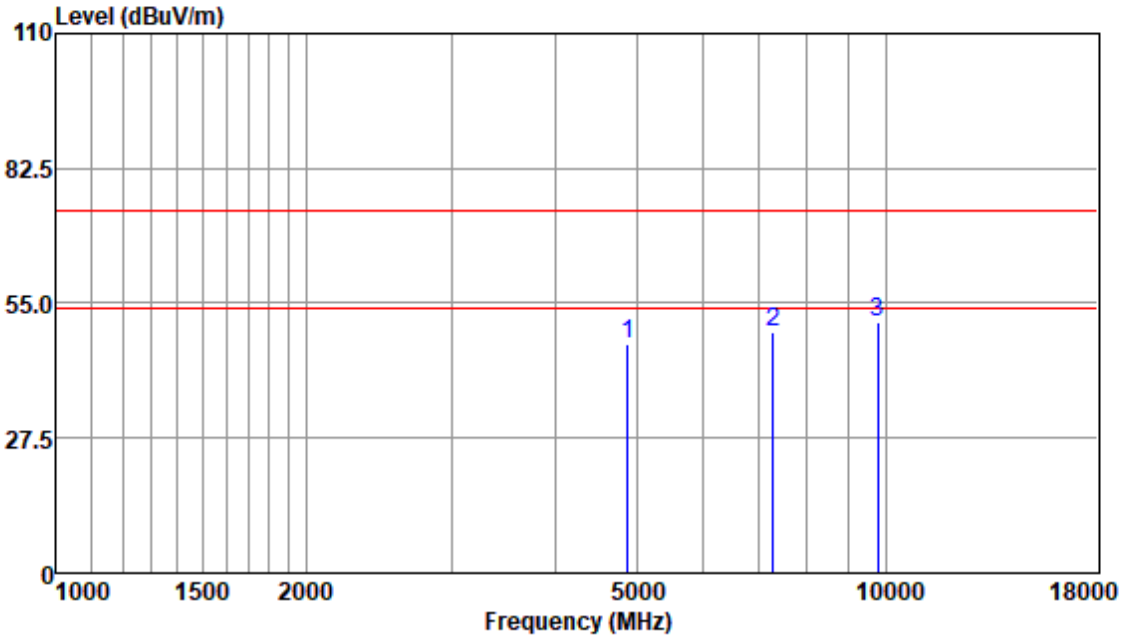



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4824.00 | 41.80 | 33.78 | 7.46 | 36.79 | 46.25 | 74.00 | -27.75 | Peak |
| 7236.00 | 38.61 | 36.35 | 7.80 | 35.50 | 47.26 | 74.00 | -26.74 | Peak |
| 9648.00 | 36.97 | 37.69 | 8.57 | 33.56 | 49.67 | 74.00 | -24.33 | Peak |

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

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

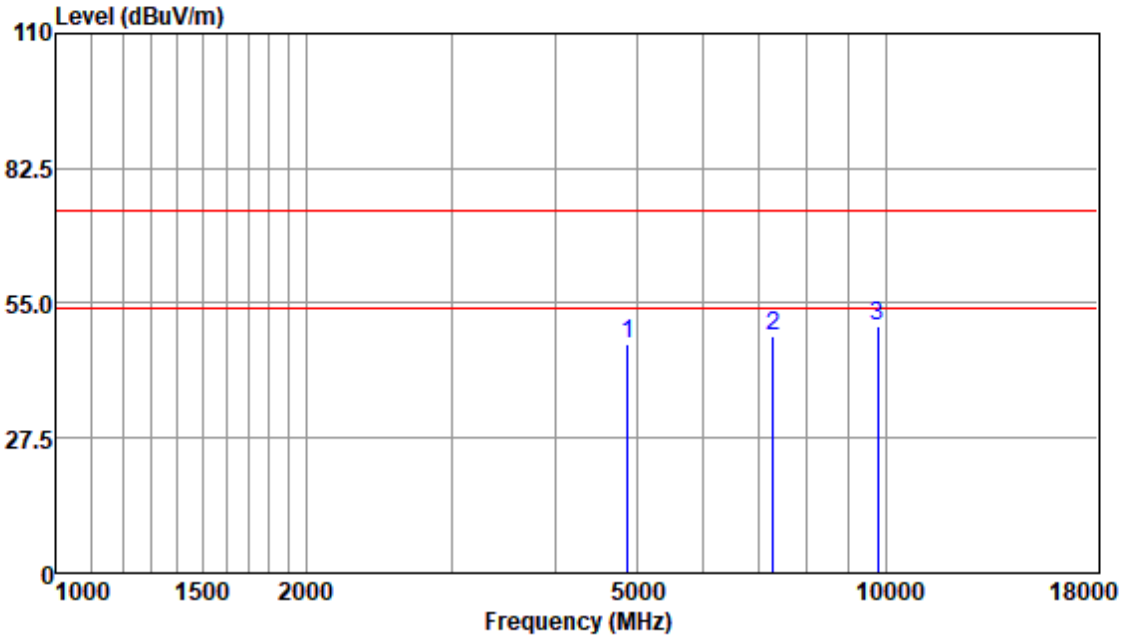



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4874.00 | 41.98 | 33.93 | 7.46 | 36.81 | 46.56 | 74.00 | -27.44 | Peak |
| 7311.00 | 40.44 | 36.47 | 7.82 | 35.44 | 49.29 | 74.00 | -24.71 | Peak |
| 9748.00 | 38.52 | 37.68 | 8.57 | 33.50 | 51.27 | 74.00 | -22.73 | Peak |

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

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

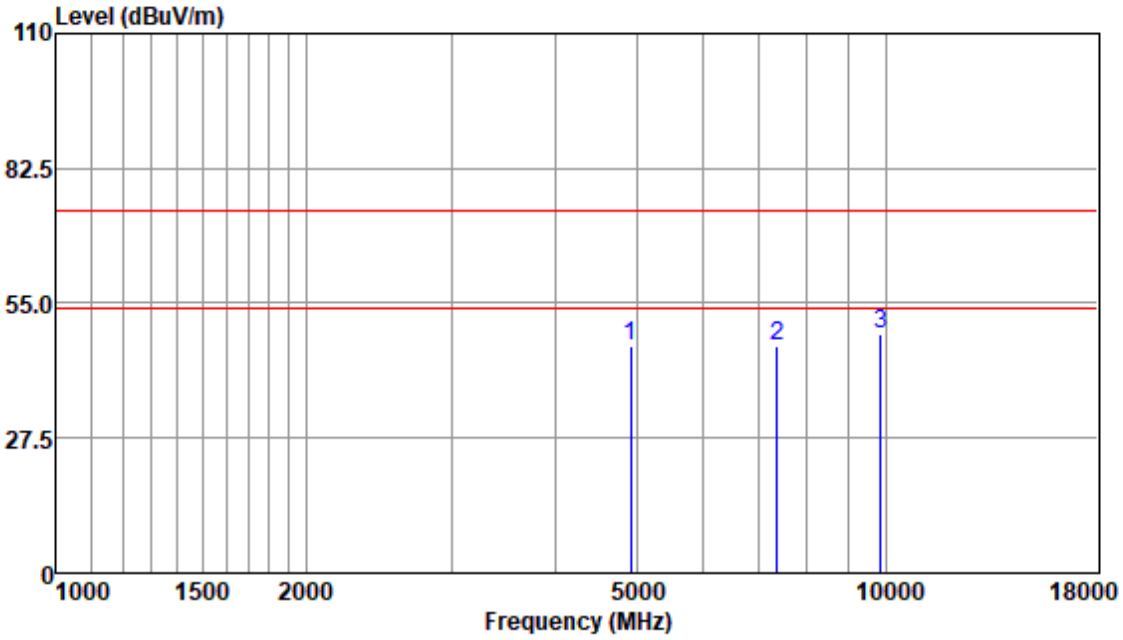



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4874.00 | 42.00 | 33.93 | 7.46 | 36.81 | 46.58 | 74.00 | -27.42 | Peak |
| 7311.00 | 39.29 | 36.47 | 7.82 | 35.44 | 48.14 | 74.00 | -25.86 | Peak |
| 9748.00 | 37.52 | 37.68 | 8.57 | 33.50 | 50.27 | 74.00 | -23.73 | Peak |

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

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

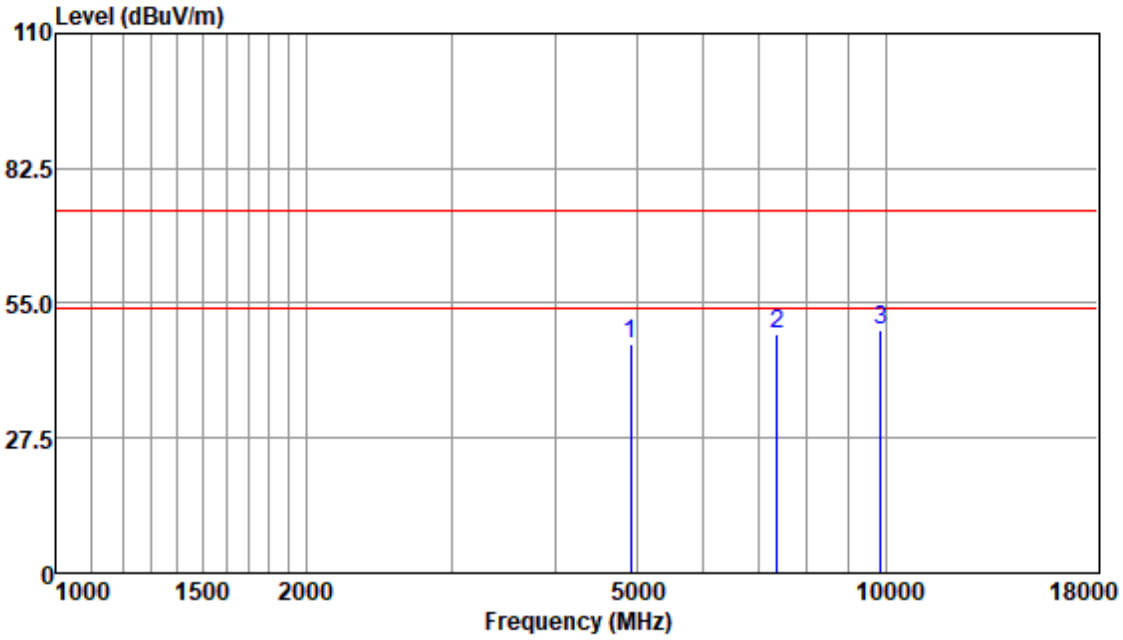



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4924.00 | 41.66 | 33.98 | 7.46 | 36.82 | 46.28 | 74.00 | -27.72 | Peak |
| 7386.00 | 37.20 | 36.48 | 7.86 | 35.37 | 46.17 | 74.00 | -27.83 | Peak |
| 9848.00 | 35.87 | 37.56 | 8.58 | 33.45 | 48.56 | 74.00 | -25.44 | Peak |

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

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

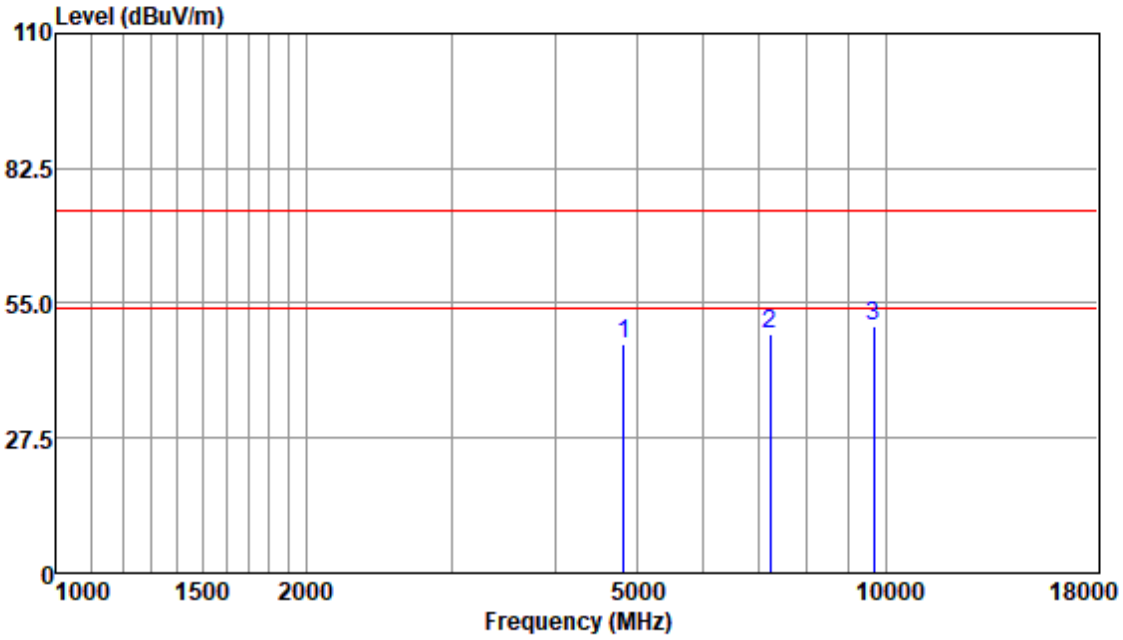



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4924.00 | 41.92 | 33.98 | 7.46 | 36.82 | 46.54 | 74.00 | -27.46 | Peak |
| 7386.00 | 39.58 | 36.48 | 7.86 | 35.37 | 48.55 | 74.00 | -25.45 | Peak |
| 9848.00 | 36.97 | 37.56 | 8.58 | 33.45 | 49.66 | 74.00 | -24.34 | Peak |

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

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

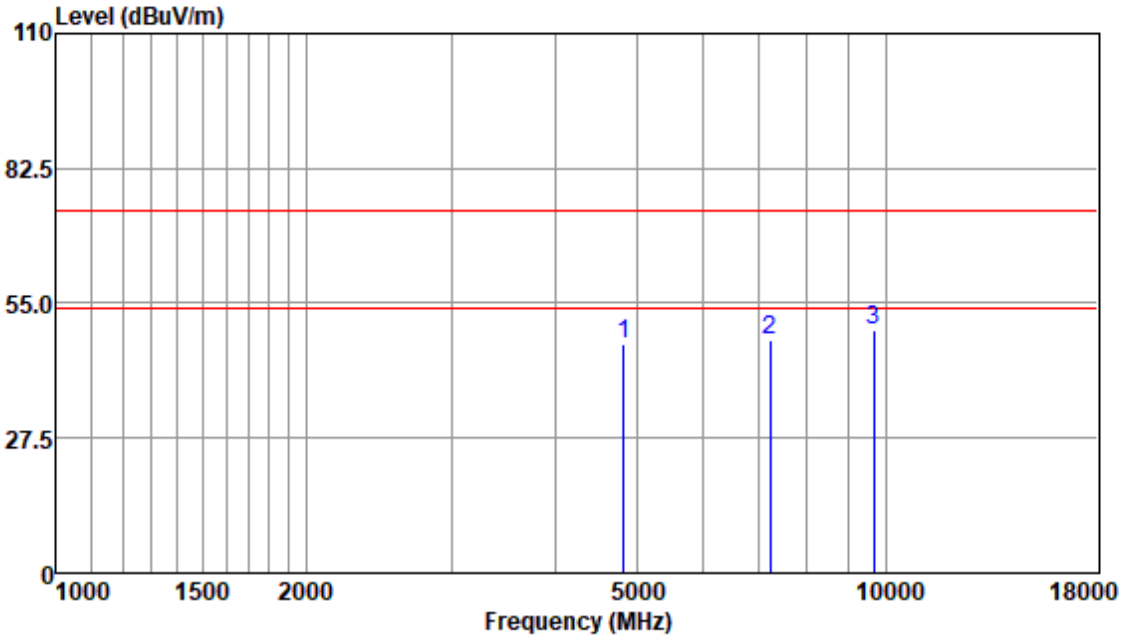



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4824.00 | 42.21 | 33.78 | 7.46 | 36.79 | 46.66 | 74.00 | -27.34 | Peak |
| 7236.00 | 39.92 | 36.35 | 7.80 | 35.50 | 48.57 | 74.00 | -25.43 | Peak |
| 9648.00 | 37.74 | 37.69 | 8.57 | 33.56 | 50.44 | 74.00 | -23.56 | Peak |

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

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

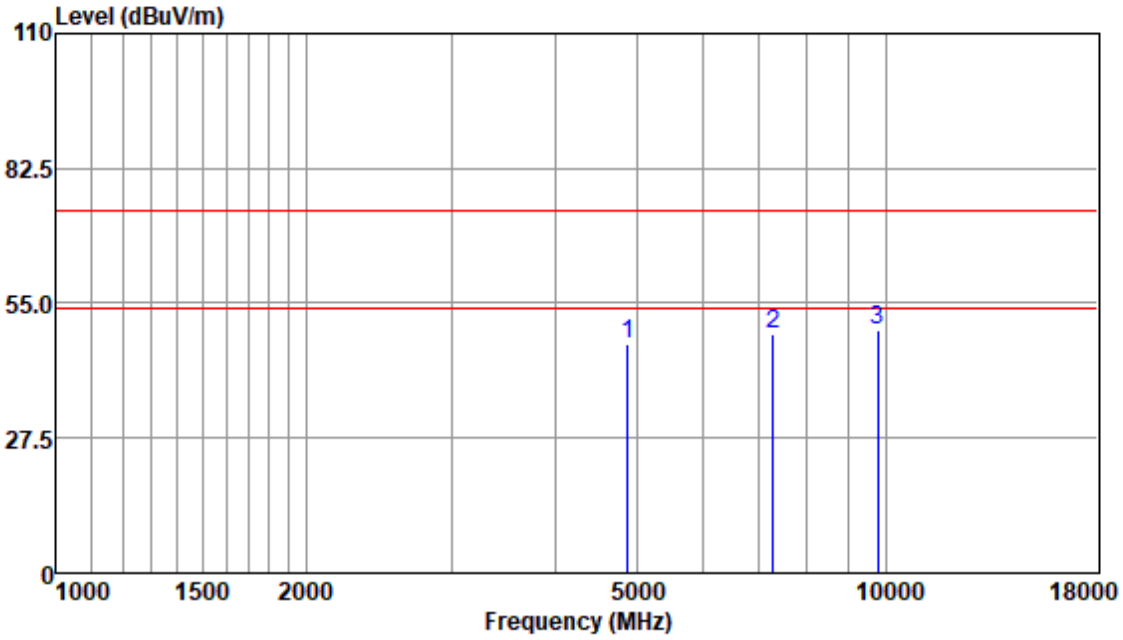



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4824.00 | 42.09 | 33.78 | 7.46 | 36.79 | 46.54 | 74.00 | -27.46 | Peak |
| 7236.00 | 38.76 | 36.35 | 7.80 | 35.50 | 47.41 | 74.00 | -26.59 | Peak |
| 9648.00 | 36.93 | 37.69 | 8.57 | 33.56 | 49.63 | 74.00 | -24.37 | Peak |

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

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

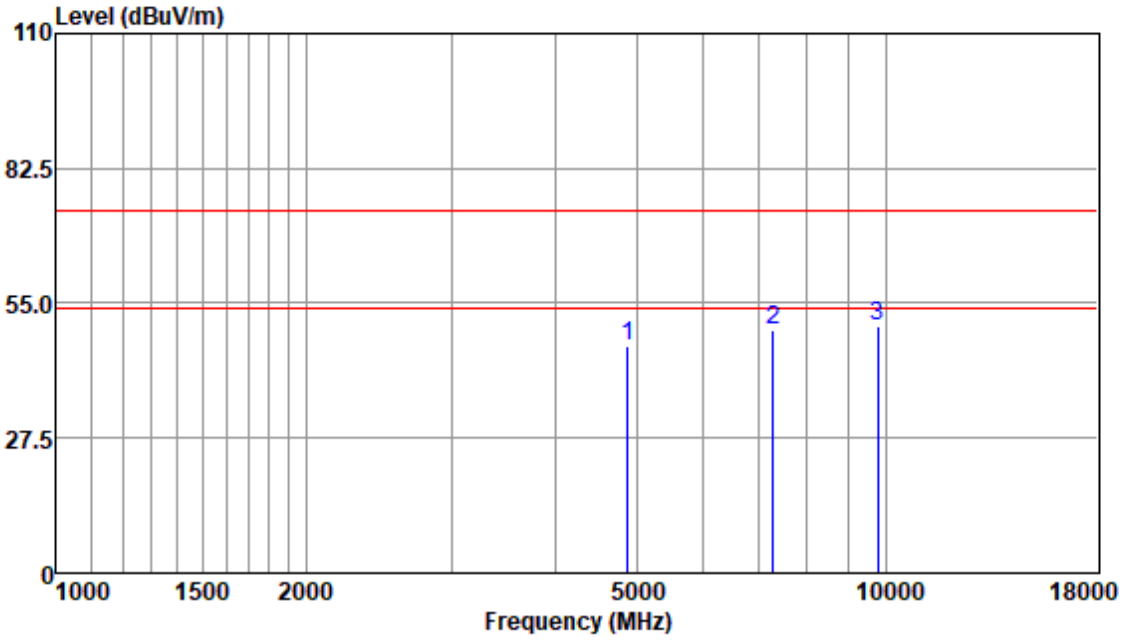



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4874.00 | 41.96 | 33.93 | 7.46 | 36.81 | 46.54 | 74.00 | -27.46 | Peak |
| 7311.00 | 39.86 | 36.47 | 7.82 | 35.44 | 48.71 | 74.00 | -25.29 | Peak |
| 9748.00 | 36.90 | 37.68 | 8.57 | 33.50 | 49.65 | 74.00 | -24.35 | Peak |

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

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

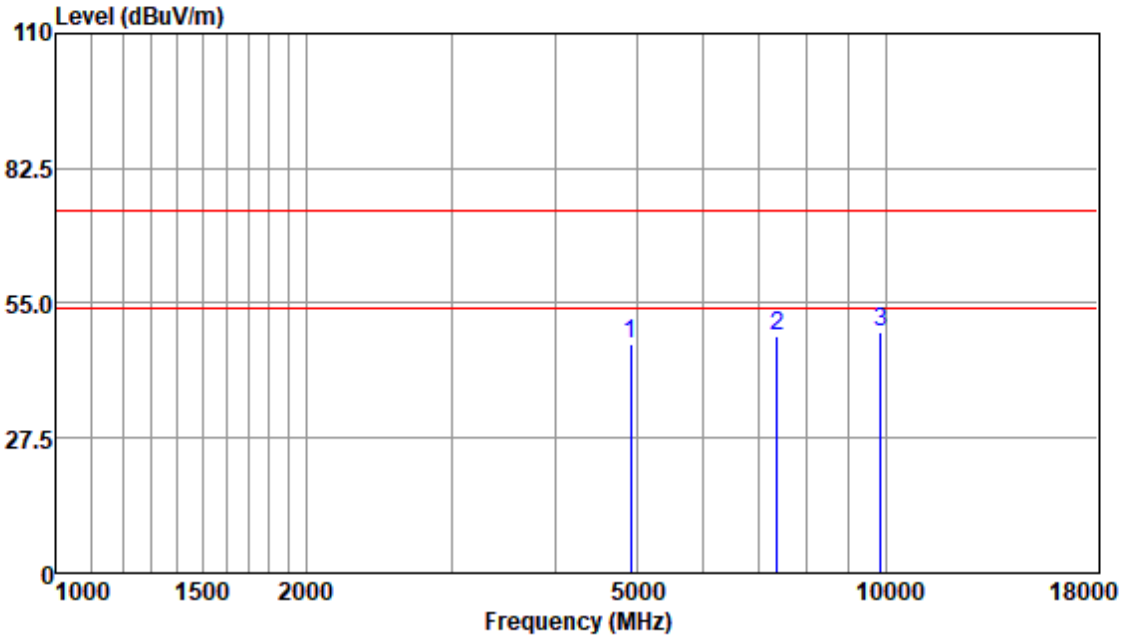



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4874.00 | 41.67 | 33.93 | 7.46 | 36.81 | 46.25 | 74.00 | -27.75 | Peak |
| 7311.00 | 40.62 | 36.47 | 7.82 | 35.44 | 49.47 | 74.00 | -24.53 | Peak |
| 9748.00 | 37.42 | 37.68 | 8.57 | 33.50 | 50.17 | 74.00 | -23.83 | Peak |

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

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

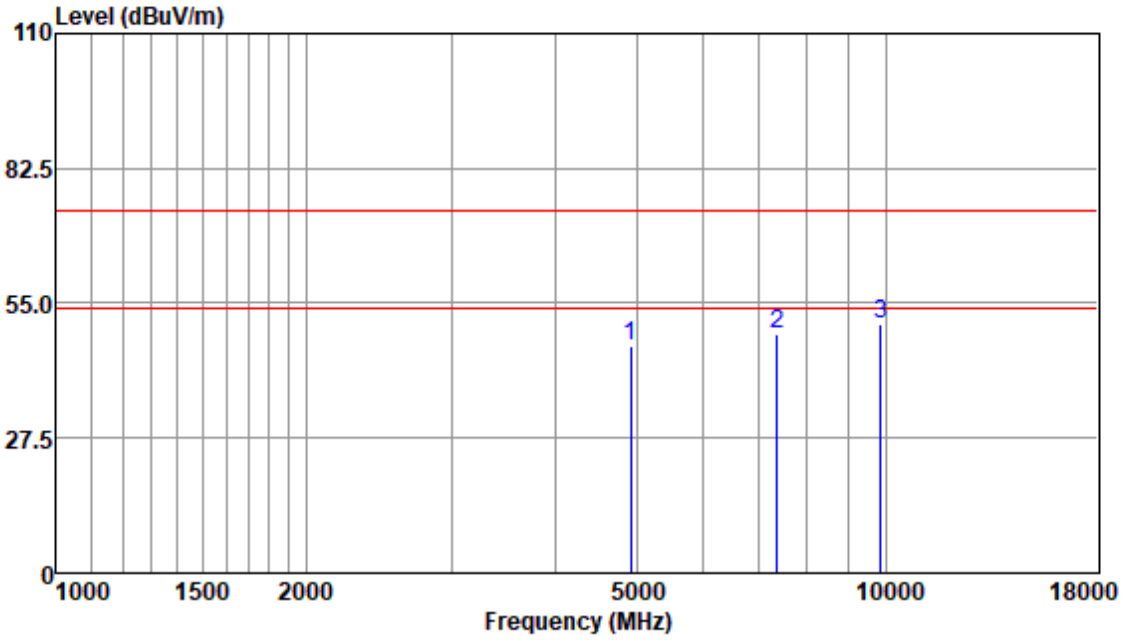



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4924.00 | 42.09 | 33.98 | 7.46 | 36.82 | 46.71 | 74.00 | -27.29 | Peak |
| 7386.00 | 39.28 | 36.48 | 7.86 | 35.37 | 48.25 | 74.00 | -25.75 | Peak |
| 9848.00 | 36.57 | 37.56 | 8.58 | 33.45 | 49.26 | 74.00 | -24.74 | Peak |

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

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

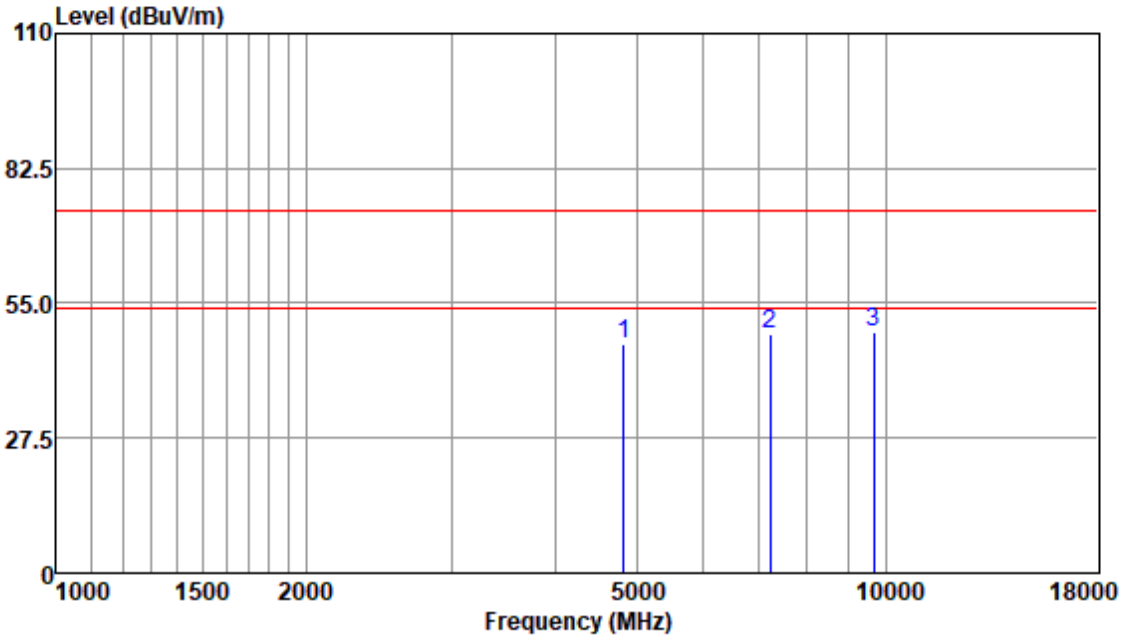



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4924.00 | 41.64 | 33.98 | 7.46 | 36.82 | 46.26 | 74.00 | -27.74 | Peak |
| 7386.00 | 39.79 | 36.48 | 7.86 | 35.37 | 48.76 | 74.00 | -25.24 | Peak |
| 9848.00 | 38.23 | 37.56 | 8.58 | 33.45 | 50.92 | 74.00 | -23.08 | Peak |

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

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

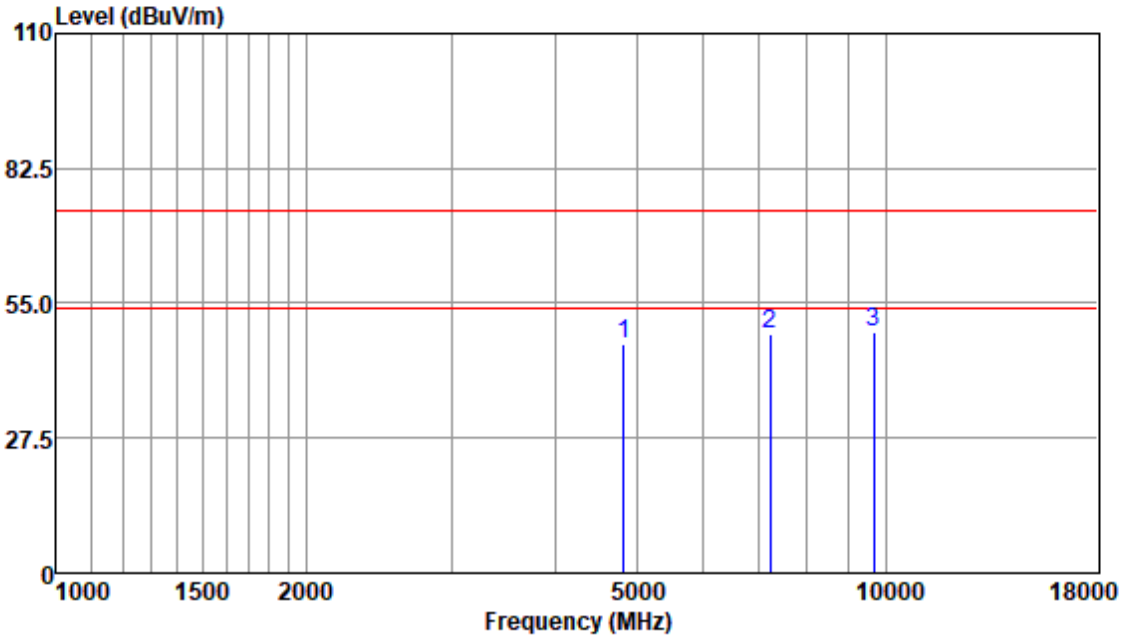



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4824.00 | 42.06 | 33.78 | 7.46 | 36.79 | 46.51 | 74.00 | -27.49 | Peak |
| 7236.00 | 40.06 | 36.35 | 7.80 | 35.50 | 48.71 | 74.00 | -25.29 | Peak |
| 9648.00 | 36.42 | 37.69 | 8.57 | 33.56 | 49.12 | 74.00 | -24.88 | Peak |

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

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

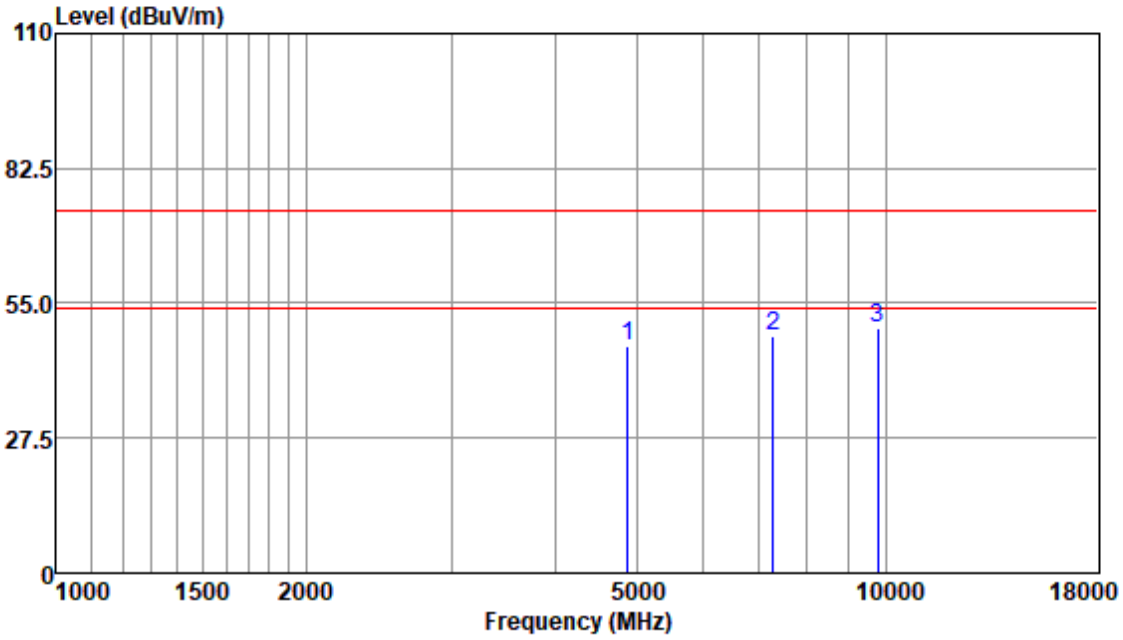



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4824.00 | 42.26 | 33.78 | 7.46 | 36.79 | 46.71 | 74.00 | -27.29 | Peak |
| 7236.00 | 39.94 | 36.35 | 7.80 | 35.50 | 48.59 | 74.00 | -25.41 | Peak |
| 9648.00 | 36.56 | 37.69 | 8.57 | 33.56 | 49.26 | 74.00 | -24.74 | Peak |

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

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

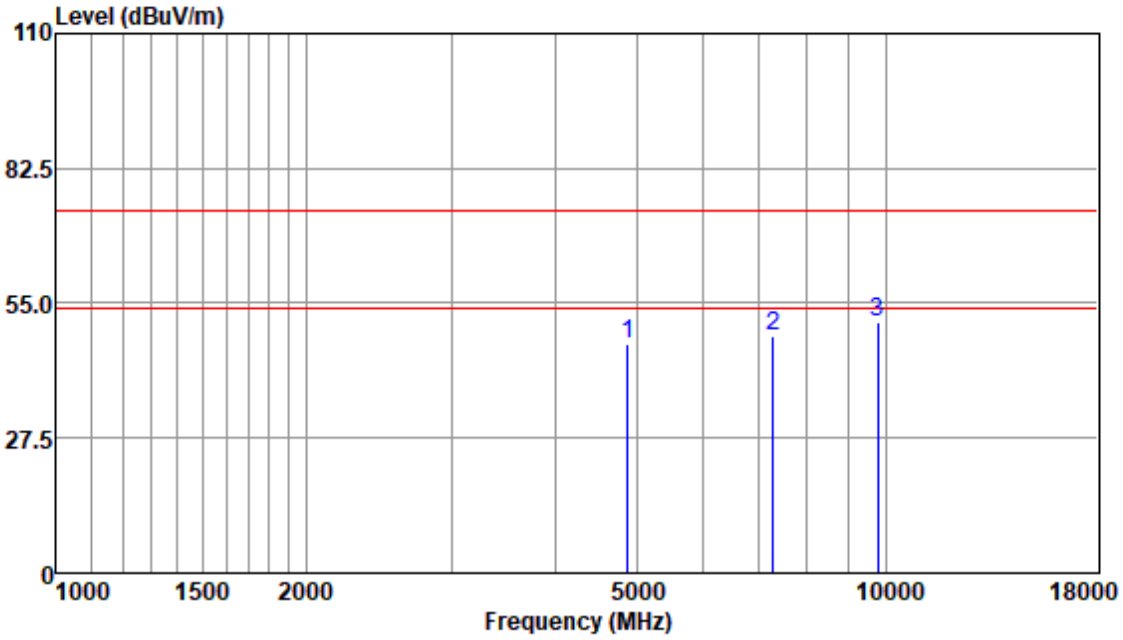



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4874.00 | 41.69 | 33.93 | 7.46 | 36.81 | 46.27 | 74.00 | -27.73 | Peak |
| 7311.00 | 39.59 | 36.47 | 7.82 | 35.44 | 48.44 | 74.00 | -25.56 | Peak |
| 9748.00 | 37.36 | 37.68 | 8.57 | 33.50 | 50.11 | 74.00 | -23.89 | Peak |

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

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

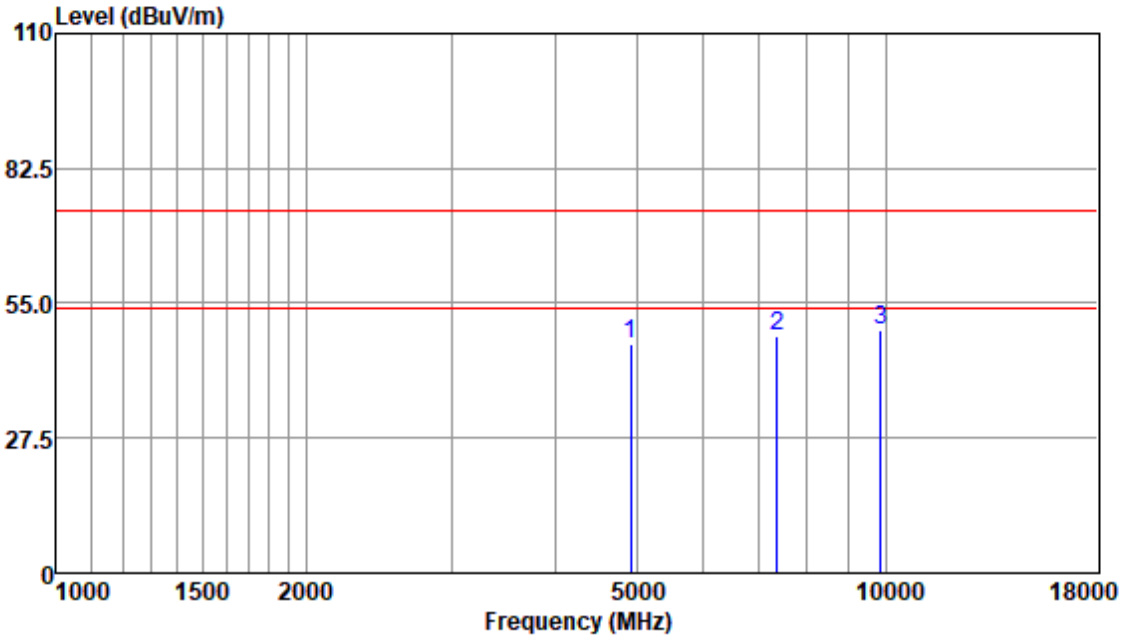



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4874.00 | 42.19 | 33.93 | 7.46 | 36.81 | 46.77 | 74.00 | -27.23 | Peak |
| 7311.00 | 39.30 | 36.47 | 7.82 | 35.44 | 48.15 | 74.00 | -25.85 | Peak |
| 9748.00 | 38.53 | 37.68 | 8.57 | 33.50 | 51.28 | 74.00 | -22.72 | Peak |

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

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

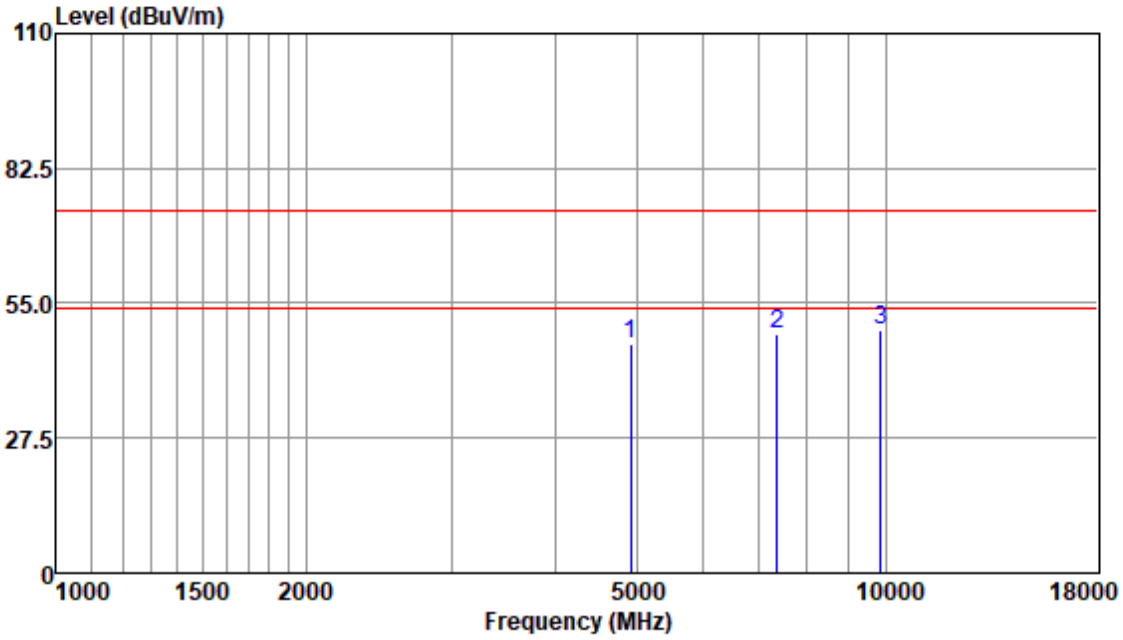



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4924.00 | 42.13 | 33.98 | 7.46 | 36.82 | 46.75 | 74.00 | -27.25 | Peak |
| 7386.00 | 39.14 | 36.48 | 7.86 | 35.37 | 48.11 | 74.00 | -25.89 | Peak |
| 9848.00 | 36.95 | 37.56 | 8.58 | 33.45 | 49.64 | 74.00 | -24.36 | Peak |

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

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

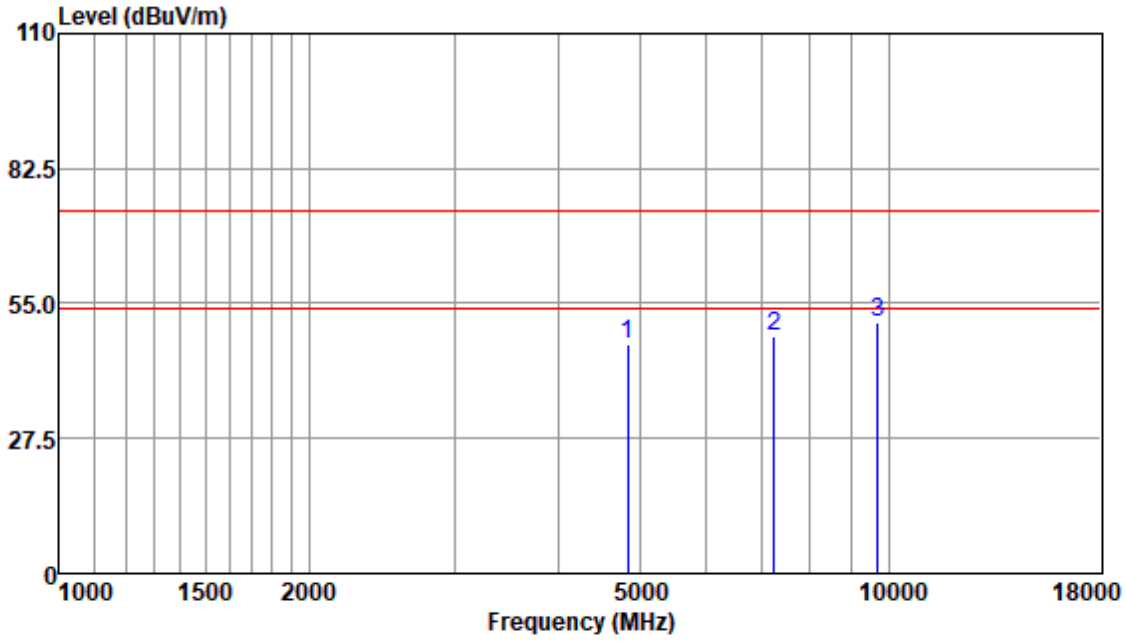



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4924.00 | 42.12 | 33.98 | 7.46 | 36.82 | 46.74 | 74.00 | -27.26 | Peak |
| 7386.00 | 39.54 | 36.48 | 7.86 | 35.37 | 48.51 | 74.00 | -25.49 | Peak |
| 9848.00 | 36.88 | 37.56 | 8.58 | 33.45 | 49.57 | 74.00 | -24.43 | Peak |

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

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

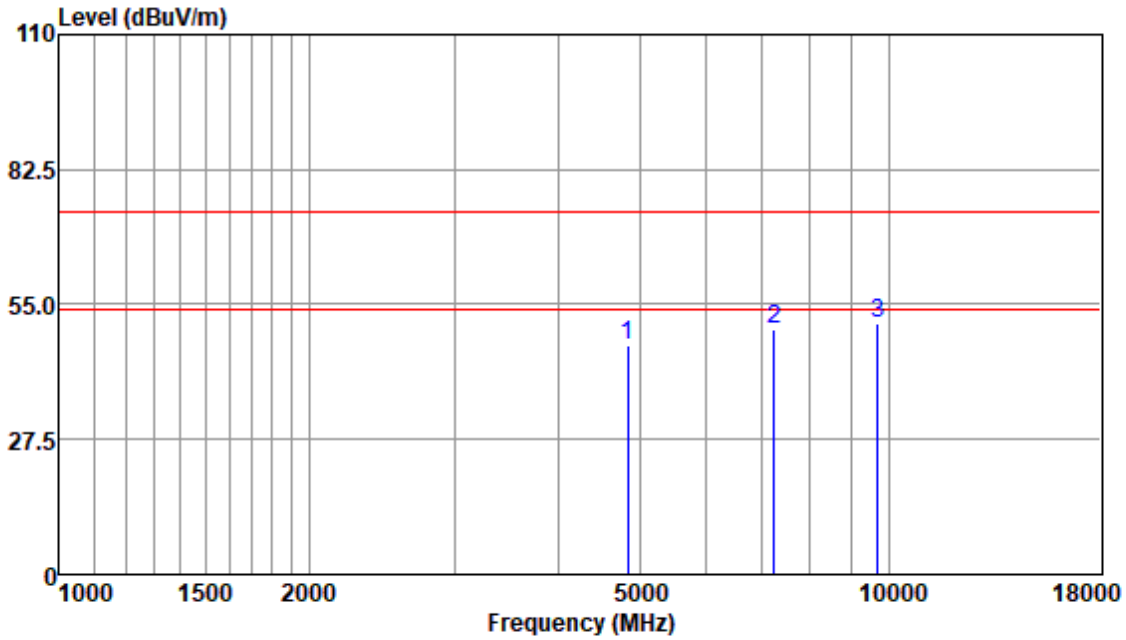



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4844.00 | 42.00 | 33.89 | 7.46 | 36.80 | 46.55 | 74.00 | -27.45 | Peak |
| 7266.00 | 39.56 | 36.39 | 7.80 | 35.48 | 48.27 | 74.00 | -25.73 | Peak |
| 9688.00 | 38.20 | 37.79 | 8.57 | 33.53 | 51.03 | 74.00 | -22.97 | Peak |

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

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

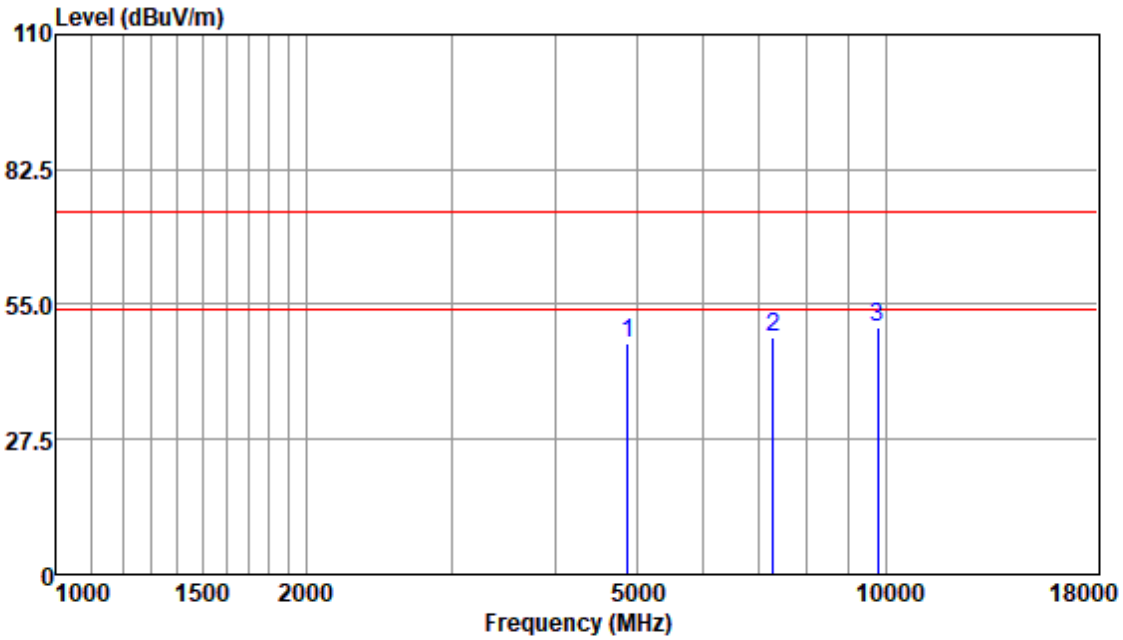



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4844.00 | 42.16 | 33.89 | 7.46 | 36.80 | 46.71 | 74.00 | -27.29 | Peak |
| 7266.00 | 41.15 | 36.39 | 7.80 | 35.48 | 49.86 | 74.00 | -24.14 | Peak |
| 9688.00 | 38.17 | 37.79 | 8.57 | 33.53 | 51.00 | 74.00 | -23.00 | Peak |

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

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

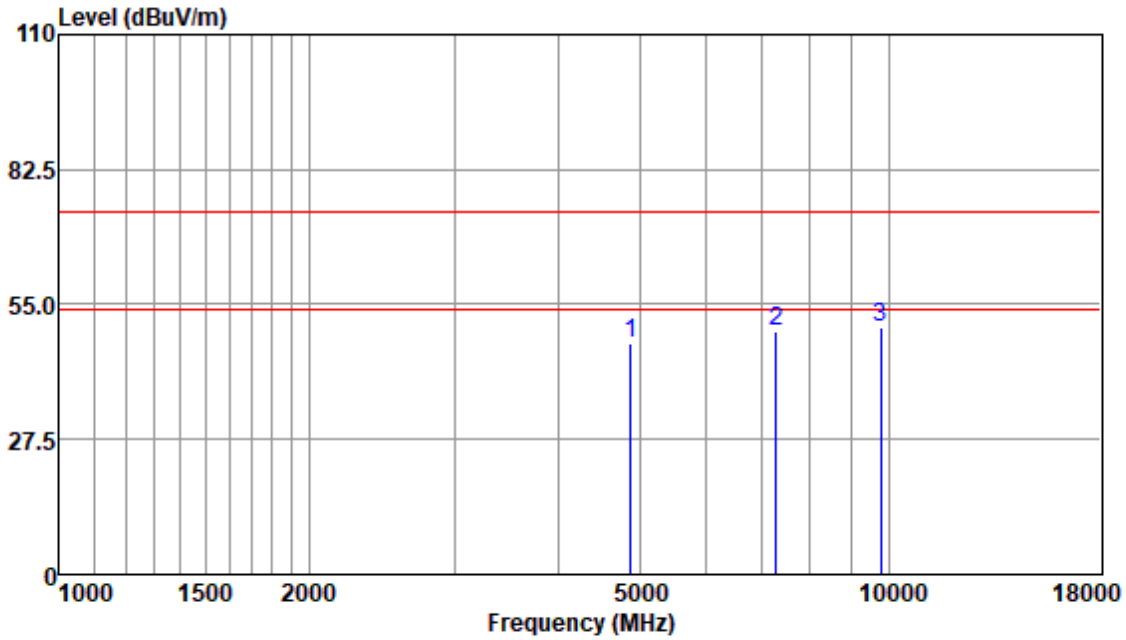



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4874.00 | 42.40 | 33.93 | 7.46 | 36.81 | 46.98 | 74.00 | -27.02 | Peak |
| 7311.00 | 39.29 | 36.47 | 7.82 | 35.44 | 48.14 | 74.00 | -25.86 | Peak |
| 9748.00 | 37.71 | 37.68 | 8.57 | 33.50 | 50.46 | 74.00 | -23.54 | Peak |

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

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

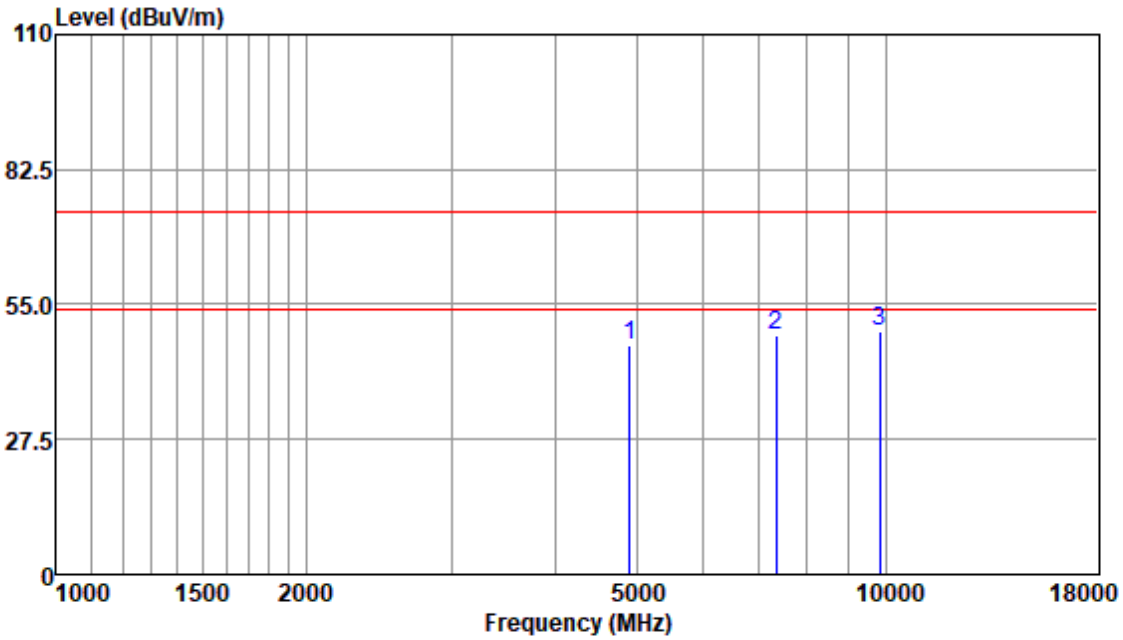



Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4874.00 | 42.67 | 33.93 | 7.46 | 36.81 | 47.25 | 74.00 | -26.75 | Peak |
| 7311.00 | 40.71 | 36.47 | 7.82 | 35.44 | 49.56 | 74.00 | -24.44 | Peak |
| 9748.00 | 37.47 | 37.68 | 8.57 | 33.50 | 50.22 | 74.00 | -23.78 | Peak |

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

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

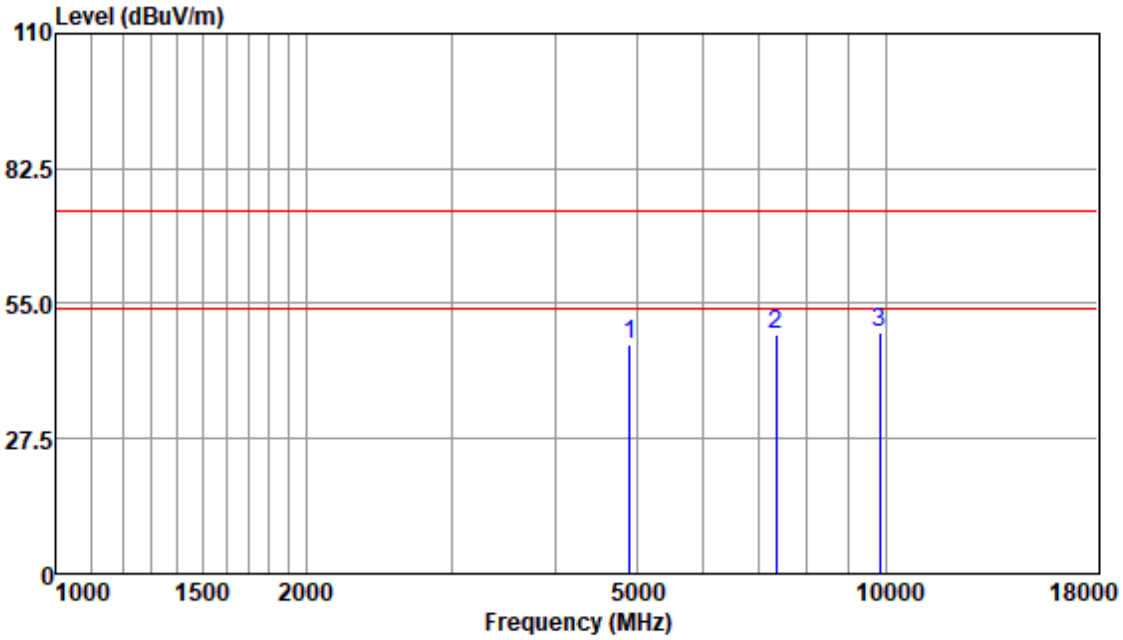



Antenna Polarity :HORIZONTAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4904.00 | 42.23 | 33.97 | 7.46 | 36.81 | 46.85 | 74.00 | -27.15 | Peak |
| 7356.00 | 39.65 | 36.47 | 7.84 | 35.41 | 48.55 | 74.00 | -25.45 | Peak |
| 9808.00 | 36.98 | 37.55 | 8.57 | 33.47 | 49.63 | 74.00 | -24.37 | Peak |

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

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




Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4904.00 | 41.89 | 33.97 | 7.46 | 36.81 | 46.51 | 74.00 | -27.49 | Peak |
| 7356.00 | 39.66 | 36.47 | 7.84 | 35.41 | 48.56 | 74.00 | -25.44 | Peak |
| 9808.00 | 36.52 | 37.55 | 8.57 | 33.47 | 49.17 | 74.00 | -24.83 | Peak |

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

## 7.10 99% Bandwidth

Test Requirement RSS-Gen Section 6.7

Test Method: ANSI C63.10 Section 6.9.3

### 7.10.1 E.U.T. Operation

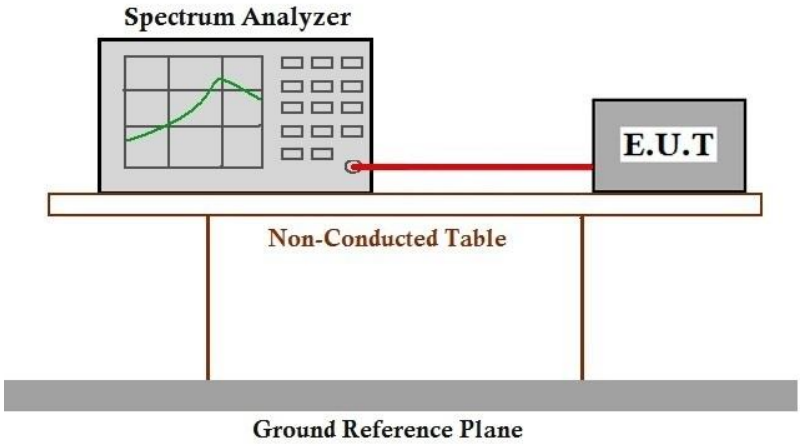
Operating Environment:

Temperature: 23.4 °C Humidity: 49.5 % RH Atmospheric Pressure: 1010 mbar

### 7.10.2 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. |

### 7.10.3 Test Setup Diagram




### 7.10.4 Measurement Procedure and Data

Please Refer to Appendix for Details

# 8 Test Setup Photographs

Refer to the < Test Setup photos >.

# 9 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

**-- End of the Report --**