# RF Test Report

## For

| | |
|---|---|
| **Applicant Name:** | **Shanghai AllyNav Technology Co.,Ltd.** |
| Address: | Room 201, Buliding 1,No 215, Gaoguang RD, Qingpu District,Shanghai, China |
| EUT Name: | GNSS Receiver |
| Brand Name: | N/A |
| Model Number: | R62 |
| Series Model Number: | N/A |
| FCC ID: | 2AT4H-R62 |

## Issued By

| | |
|---|---|
| **Company name:** | **BTF Testing Lab (Shenzhen) Co., Ltd.** |
| Address: | 101/201/301, Building 1, Block 2, Tantou Industrial Park,Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China |
| Report number: | BTF250625R00403 |
| Test standards: | FCC CFR Title 47 Part 15 Subpart C (§15.247) |
| Test conclusion: | Pass |
| Date of sample receipt: | 2025-02-18 |
| Test date: | 2025-02-20-2025-05-10 |
| Date of issue: | 2025-07-09 |

Prepared by: Chris Liu

Chris Liu/ Project engineer

Approved by:

Ryan.CJ/EMC manager

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| Revision History | | |
|---|---|---|
| Version | Issue Date | Revisions Content |
| R_V0 | 2025-07-09 | Original |
| | | |
| *Note: Once the revision has been made, then previous versions reports are invalid.* | | |

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Email: info@btf-lab.com Tel: +86-755-23146130 http://www.btf-lab.com 

# 1 Introduction

## 1.1 Laboratory Location

| | |
|---|---|
| Test location: | BTF Testing Lab (Shenzhen) Co., Ltd. |
| Address: | 101/201/301, Building 1, Block 2, Tantou Industrial Park,Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China |
| Phone number: | +86-0755-23146130 |
| Fax number: | +86-0755-23146130 |

## 1.2 Laboratory Facility

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

- **FCC - Designation No.: CN1409**

  BTF Testing Lab (Shenzhen) Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 695374.

- **CNAS - Registration No.: CNAS L17568**

  BTF Testing Lab (Shenzhen) Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L17568.

- **A2LA - Registration No.: 6660.01**

  BTF Testing Lab (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.

## 1.3 Announcement

(1) The test report reference to the report template version v0.
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(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

# 2 Product Information

## 2.1 Application Information

| | |
|---|---|
| Company Name: | Shanghai AllyNav Technology Co.,Ltd. |
| Address: | Room 201, Buliding 1,No 215, Gaoguang RD, Qingpu District,Shanghai, China |

## 2.2 Manufacturer Information

| | |
|---|---|
| Company Name: | Shanghai AllyNav Technology Co.,Ltd. |
| Address: | Room 201, Buliding 1,No 215, Gaoguang RD, Qingpu District,Shanghai, China |

## 2.3 Factory Information

| | |
|---|---|
| Company Name: | Shanghai AllyNav Technology Co.,Ltd. |
| Address: | Room 201, Buliding 1,No 215, Gaoguang RD, Qingpu District,Shanghai, China |

## 2.4 General Description of Equipment under Test (EUT)

| | |
|---|---|
| EUT name | GNSS Receiver |
| Under test model name | R62 |
| Series model name | N/A |
| Description of model name differentiation | N/A |
| Hardware Version | D515 V2.0 |
| Software Version | D515_V015En20241021 |
| Rating: | Operating Current 2A/12V |

## 2.5 Technical Information

| | |
|---|---|
| Operation frequency: | 2412MHz ~ 2462MHz (for 802.11b/g/n-HT20)<br>2422MHz ~ 2452MHz (for 802.11n-HT40) |
| Channel numbers: | 11 (for 802.11b/g/n-HT20)<br>7 (for 802.11n-HT40) |
| Channel separation: | 5MHz |
| Modulation technology: (IEEE 802.11b) | DSSS-DBPSK, DQPSK, CCK |
| Modulation technology: (IEEE 802.11g/802.11n) | OFDM-BPSK, QPSK, 16QAM, 64QAM |
| Data rate: | 802.11b: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps<br>802.11g: 6Mbps, 9Mbps, 12Mbps etc., and up to 54Mbps<br>802.11n-HT20: 6.5Mbps, 13Mbps, 19.5Mbps etc., and up to 72.2Mbps<br>802.11n-HT40: 13.5Mbps, 27Mbps, 40.5Mbps etc., and up to 150Mbps |
| Max. Conducted Power: | 22.31 dBm (GFSK) |
| Antenna type: | Internal Antenna |
| Antenna gain: | 2.7 dBi (declare by Applicant) |
| Antenna transmit mode: | SISO (1TX, 1RX) |

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## Channel List:

### For 802.11b/g/n(HT20)/ax(HE20)

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 1 | 2412MHz | 4 | 2427MHz | 7 | 2442MHz | 10 | 2457MHz |
| 2 | 2417MHz | 5 | 2432MHz | 8 | 2447MHz | 11 | 2462MHz |
| 3 | 2422MHz | 6 | 2437MHz | 9 | 2452MHz | -- | -- |

### For 802.11n(HT40)/ax(HE40)

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| -- | -- | 4 | 2427MHz | 7 | 2442MHz | -- | -- |
| -- | -- | 5 | 2432MHz | 8 | 2447MHz | -- | -- |
| 3 | 2422MHz | 6 | 2437MHz | 9 | 2452MHz | | |

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# 3 Summary of Test Results

## 3.1 Test Standards

| Identity | Document Title |
|---|---|
| FCC CFR Title 47 Part 15 Subpart C (§15.247) | Intentional Radiators - Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz. |
| ANSI C63.10-2020 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| KDB 558074 D01 15.247 Meas Guidance v05r02 | Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of The FCC Rules |

## 3.2 Uncertainty of Test

| Measurement | Value |
|---|---|
| Occupied Channel Bandwidth | ±5 % |
| RF output power, conducted | ±1.5 dB |
| Power Spectral Density, conducted | ±3.0 dB |
| Unwanted Emissions, conducted | ±3.0 dB |
| Supply voltages | ±3 % |
| Time | ±5 % |
| Conducted Emission for LISN (9kHz ~ 150kHz) | ±2.97 dB |
| Conducted Emission for LISN (150kHz ~ 30MHz) | ±2.45 dB |
| Radiated Emission (30MHz ~ 1000MHz) | ±4.80 dB |
| Radiated Emission (1GHz ~ 18GHz) | ±4.82 dB |
| The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. | |

## 3.3 Summary of Test Result

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

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# 4 Test Configuration

## 4.1 Test Equipment List

| Radiated test method | | | | | |
|---|---|---|---|---|---|
| Test Equipment | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
| EMI Receiver | Rohde &Schwarz | ESCI7 | 101032 | 2024/10/25 | 2025/10/24 |
| Signal Analyzer | Rohde & Schwarz | FSQ40 | 100010 | 2024/10/25 | 2025/10/24 |
| Log periodic antenna | Schwarzbeck | VULB 9168 | 01328 | 2024/10/28 | 2025/10/27 |
| Preamplifier (30MHz ~ 1GHz) | Schwarzbeck | BBV9744 | 00246 | 2024/09/24 | 2025/09/23 |
| Horn Antenna (1GHz ~18GHz) | Schwarzbeck | BBHA9120D | 2597 | 2024/10/30 | 2025/10/29 |
| Horn Antenna (15GHz ~ 40GHz) | SCHWARZBECK | BBHA9170 | 1157 | 2024/10/24 | 2025/10/23 |
| Preamplifier (1GHz ~ 40GHz) | TST Pass | LNA10180G45 | 246 | 2024/09/24 | 2025/09/23 |
| Test Software | Frad | EZ_EMC | Version: FA-03A2 RE+ | | |

| Conducted test method | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
| Spectrum Analyzer | Keysight | N9020A | MY50410020 | 2024/10/25 | 2025/10/24 |
| ESG Vector Signal Generator | Agilent | E4438C | MY45094854 | 2024/10/25 | 2025/10/24 |
| MXG Vector Signal Generator | Agilent | N5182A | MY46240163 | 2024/10/25 | 2025/10/24 |
| Wideband Radio Communication Tester | Rohde&Schwarz | CMW500 | 161997 | 2024/10/25 | 2025/10/24 |
| Temperature Humidity Chamber | ZZCKONG | ZZ-K02A | 20210928007 | 2024/10/25 | 2025/10/24 |
| DC Power Supply | Tongmen | etm-6050c | 20211026123 | 2024/10/25 | 2025/10/24 |
| RF Control Unit | Techy | TR1029-1 | / | 2024/10/25 | 2025/10/24 |
| RF Sensor Unit | Techy | TR1029-2 | / | 2024/10/25 | 2025/10/24 |
| Test Software | TST Pass | / | Version: 2.0 | | |

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## 4.2 Test Auxiliary Equipment

| No. | Description | Manufacturer | Model | Serial Number | Certification |
|---|---|---|---|---|---|
| 1 | Adapter | Apple | A2244 | N/A | N/A |
| 2 | Load | Yuebuzhe | YBZ | N/A | N/A |

## 4.3 Test Modes

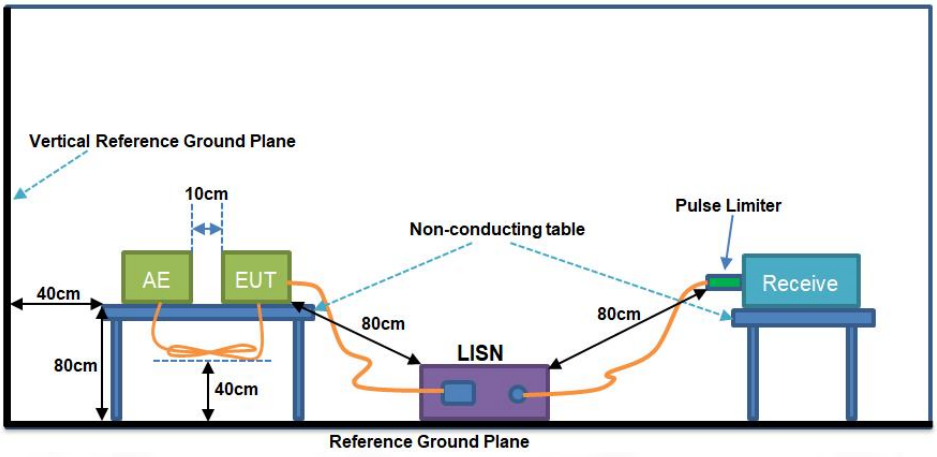
| No. | Test Modes | Description |
|---|---|---|
| TM1 | 802.11b mode | Keep the EUT in 802.11b transmitting mode. |
| TM2 | 802.11g mode | Keep the EUT in 802.11g transmitting mode. |
| TM3 | 802.11n(HT20) mode | Keep the EUT in 802.11n(HT20) transmitting mode. |
| TM4 | 802.11n(HT40) mode | Keep the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

## 4.4 Test software

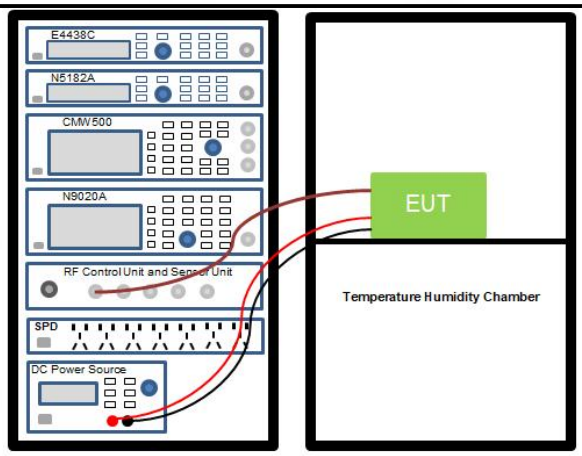
| Test software: | GNSS Receiver | Version: | N/A |
|---|---|---|---|
| Power Class: | 17 | | |

## 4.5 Test Setup Block

**1) Conducted emission measurement:**

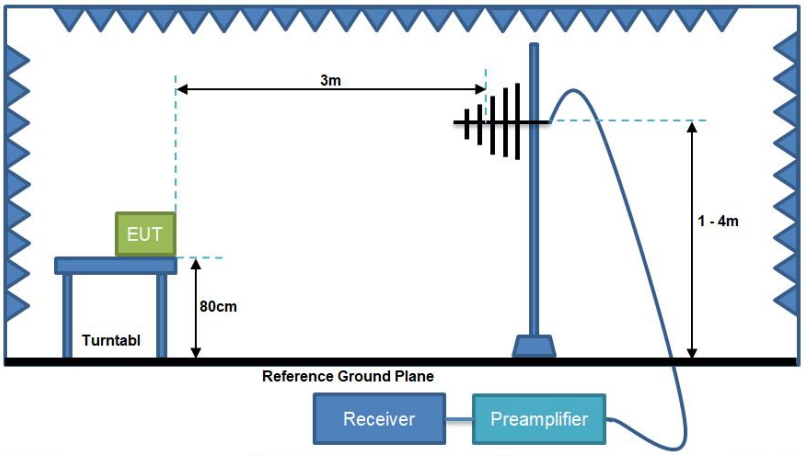



**2) Conducted test method:**

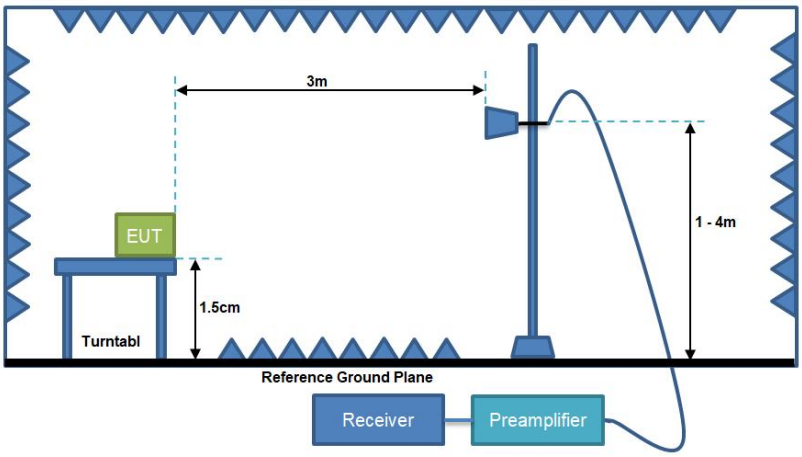



**3) Radiated test method:**

Below 1GHz




Above 1GHz



# 5 Evaluation Results (Evaluation)

## 5.1 Antenna requirement

| | |
|---|---|
| Test Requirement: | An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. |

### 5.1.1 Conclusion:

# 6 Radio Spectrum Matter Test Results (RF)

## 6.1 Conducted Emission at AC power line

| | |
|---|---|
| Test Requirement: | Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). |
| Test Method: | Refer to ANSI C63.10-2020 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices |
| Test Limit: | Frequency of emission (MHz) / Conducted limit (dBμV): Quasi-peak / Average<br>0.15-0.5: 66 to 56* / 56 to 46*<br>0.5-5: 56 / 46<br>5-30: 60 / 50<br>*Decreases with the logarithm of the frequency. |

### 6.1.1 E.U.T. Operation:

| Operating Environment: | |
|---|---|
| Temperature: | 22 °C |
| Humidity: | 51 % |
| Atmospheric Pressure: | 1010 hpa |
| Test Voltage | DC12V |

### 6.1.2 Test Setup

See section 4.5 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos

### 6.1.3 Test Data:

Note:This test item is not applicable.

## 6.2 Occupied Bandwidth

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

### 6.2.1 E.U.T. Operation:

| Operating Environment: | |
|---|---|
| Temperature: | 23 °C |
| Humidity: | 37 % |
| Atmospheric Pressure: | 1010 hpa |

### 6.2.2 Test Setup

See section 4.5 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos

### 6.2.3 Test Data:

Please Refer to Appendix-2.4GWIFI for Details.

## 6.3 Maximum Conducted Output Power

| | |
|---|---|
| Test Requirement: | For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode. |
| Test Method: | Maximum peak conducted output power |
| Test Limit: | For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode. |
| Procedure: | ANSI C63.10-2020, section 11.9.1 Maximum peak conducted output power |

### 6.3.1 E.U.T. Operation:

| Operating Environment: | |
|---|---|
| Temperature: | 22 °C |
| Humidity: | 39% |
| Atmospheric Pressure: | 1010 hpa |

### 6.3.2 Test Setup

See section 4.5 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos

### 6.3.3 Test Data:

Please Refer to Appendix-2.4GWIFI for Details.

## 6.4 Power Spectral Density

| | |
|---|---|
| Test Requirement: | For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density. |
| Test Method: | Maximum power spectral density level in the fundamental emission |
| Test Limit: | For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density. |

### 6.4.1 E.U.T. Operation:

| Operating Environment: | |
|---|---|
| Temperature: | 22 °C |
| Humidity: | 38 % |
| Atmospheric Pressure: | 1010 hpa |

### 6.4.2 Test Setup

See section 4.5 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos

### 6.4.3 Test Data:

Please Refer to Appendix-2.4GWIFI for Details.

## 6.5 Emissions in non-restricted frequency bands

| | |
|---|---|
| Test Requirement: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. |
| Test Method: | Emissions in nonrestricted frequency bands |
| Test Limit: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. |
| Procedure: | ANSI C63.10-2020<br>Section 11.11.1, Section 11.11.2, Section 11.11.3 |

### 6.5.1 E.U.T. Operation:

| Operating Environment: | |
|---|---|
| Temperature: | 23 °C |
| Humidity: | 39 % |
| Atmospheric Pressure: | 1010 hpa |
| Test Voltage | DC 12V |

### 6.5.2 Test Setup

See section 4.5 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos

### 6.5.3 Test Data:

Please Refer to Appendix-2.4GWIFI for Details.

## 6.6 Band edge emissions (Radiated)

| | |
|---|---|
| Test Requirement: | In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).` |
| Test Method: | Radiated emissions tests |
| Test Limit: | Frequency (MHz) / Field strength (microvolts/meter) / Measurement distance (meters)<br>0.009-0.490 / 2400/F(kHz) / 300<br>0.490-1.705 / 24000/F(kHz) / 30<br>1.705-30.0 / 30 / 30<br>30-88 / 100 ** / 3<br>88-216 / 150 ** / 3<br>216-960 / 200 ** / 3<br>Above 960 / 500 / 3<br>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. |
| Procedure: | ANSI C63.10-2020 section 6.10.5.2 |

### 6.6.1 E.U.T. Operation:

| Operating Environment: | |
|---|---|
| Temperature: | 24 °C |
| Humidity: | 53 % |
| Atmospheric Pressure: | 1010 hpa |
| Test Voltage | DC12V |

### 6.6.2 Test Setup

See section 4.5 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos

### 6.6.3 Test Data:

**Remark:** During the test, pre-scan 802.11b,802.11g, 802.11n20, 802.11n40 mode, found 802.11n40 was worse case mode. The report only reflects the test data of worst mode.

**Test Mode: 802.11n-HT40**
**Test Channel: Lowest channel, Test Polarization: Vertical**

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Marging (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Detector | Result |
|---|---|---|---|---|---|---|---|
| 2343.842 | 34.8 | 74.0 | 39.2 | 27.3 | 43.6 | peak | Pass |
| 2325.940 | 22.1 | 54.0 | 31.9 | 27.2 | 43.6 | AV | Pass |
| 2387.220 | 34.8 | 74.0 | 39.2 | 27.4 | 43.6 | peak | Pass |
| 2373.110 | 21.4 | 54.0 | 32.6 | 27.3 | 43.6 | AV | Pass |

**Test Channel: Lowest channel, Test Polarization: Horizontal**

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Marging (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Detector | Result |
|---|---|---|---|---|---|---|---|
| 2334.966 | 34.4 | 74.0 | 39.6 | 27.2 | 43.6 | peak | Pass |
| 2326.492 | 21.5 | 54.0 | 32.5 | 27.2 | 43.6 | AV | Pass |
| 2379.872 | 34.7 | 74.0 | 39.3 | 27.3 | 43.6 | peak | Pass |
| 2375.174 | 21.3 | 54.0 | 32.7 | 27.3 | 43.6 | AV | Pass |

**Test Channel: Highest channel, Test Polarization: Vertical**

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Marging (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Detector | Result |
|---|---|---|---|---|---|---|---|
| 2317.498 | 34.9 | 74.0 | 39.1 | 27.2 | 43.6 | peak | Pass |
| 2315.301 | 21.7 | 54.0 | 32.3 | 27.2 | 43.6 | AV | Pass |
| 2372.922 | 34.0 | 74.0 | 40.0 | 27.3 | 43.6 | peak | Pass |
| 2373.485 | 21.3 | 54.0 | 32.7 | 27.3 | 43.6 | AV | Pass |

**Test Channel: Highest channel, Test Polarization: Horizontal**

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Marging (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Detector | Result |
|---|---|---|---|---|---|---|---|
| 2335.335 | 34.5 | 74.0 | 39.5 | 27.2 | 43.6 | peak | Pass |
| 2330.909 | 21.6 | 54.0 | 32.4 | 27.2 | 43.6 | AV | Pass |
| 2381.754 | 34.3 | 74.0 | 39.7 | 27.3 | 43.6 | peak | Pass |
| 2388.730 | 21.6 | 54.0 | 32.4 | 27.4 | 43.6 | AV | Pass |

Note:Margin=Level-Limit=Reading+factor-Limit

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## 6.7 Emissions in restricted frequency bands (below 1GHz)

| | |
|---|---|
| Test Requirement: | In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).` |
| Test Method: | Radiated emissions tests |
| Test Limit: | Frequency (MHz) / Field strength (microvolts/meter) / Measurement distance (meters)<br>0.009-0.490 / 2400/F(kHz) / 300<br>0.490-1.705 / 24000/F(kHz) / 30<br>1.705-30.0 / 30 / 30<br>30-88 / 100 ** / 3<br>88-216 / 150 ** / 3<br>216-960 / 200 ** / 3<br>Above 960 / 500 / 3<br>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. |
| Procedure: | ANSI C63.10-2020 section 6.6.4 |

### 6.7.1 E.U.T. Operation:

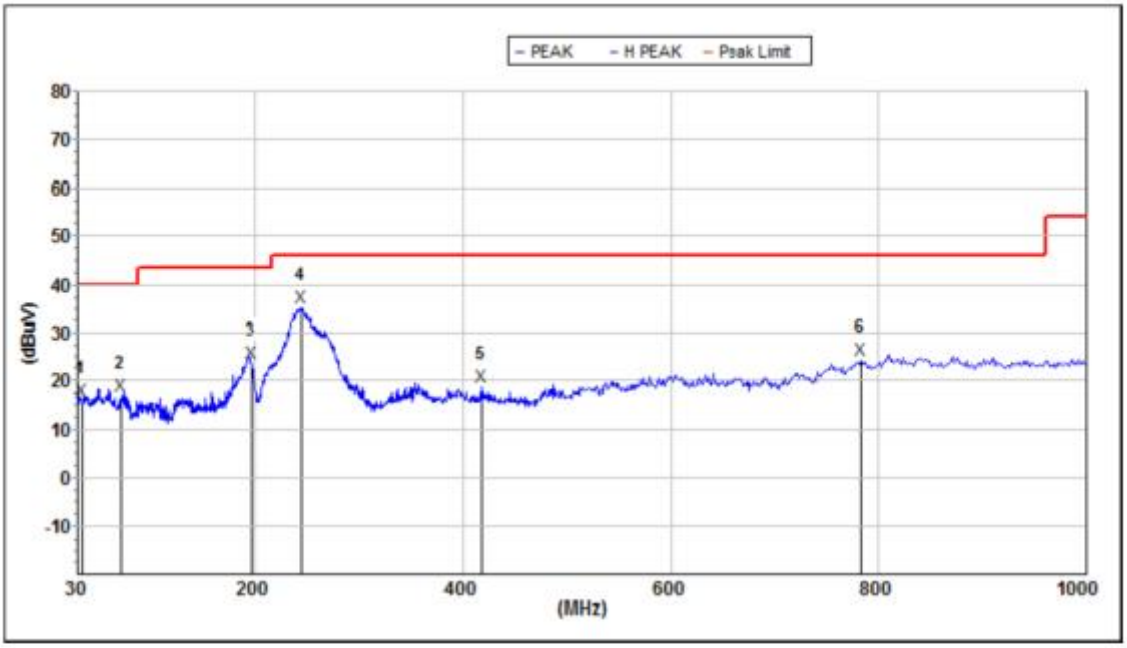
| Operating Environment: | |
|---|---|
| Temperature: | 23 °C |
| Humidity: | 52 % |
| Atmospheric Pressure: | 1010 hpa |
| Test Voltage | DC12V |

### 6.7.2 Test Setup

See section 4.5 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos

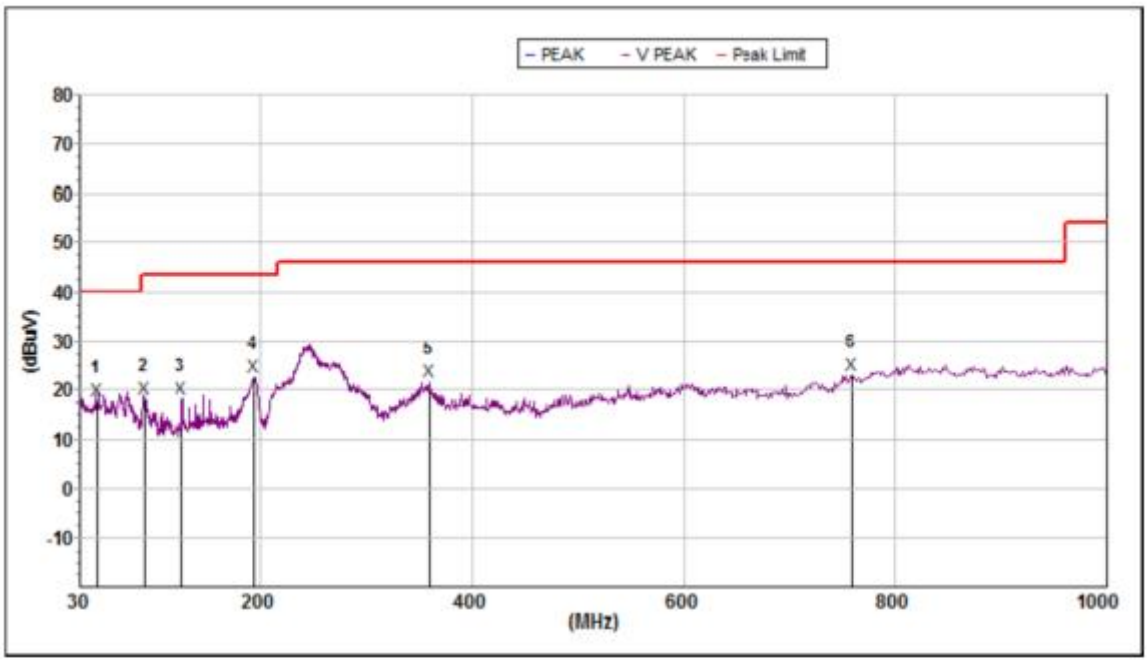
### 6.7.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G




| Mk. | Freq. (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Pol. |
|---|---|---|---|---|---|---|---|
| Peak: | | | | | | | |
| 1 | 34.578 | 15.8 | 40.0 | 24.2 | 18.7 | 29.5 | H |
| 2 | 70.707 | 16.9 | 40.0 | 23.1 | 16.3 | 29.3 | H |
| 3 | 196.510 | 23.7 | 43.5 | 19.8 | 15.9 | 33.3 | H |
| 4 | 244.661 | 35.2 | 46.0 | 10.8 | 17.4 | 32.4 | H |
| 5 | 418.374 | 18.8 | 46.0 | 27.2 | 22.0 | 32.7 | H |
| 6 | 783.718 | 24.4 | 46.0 | 21.6 | 28.2 | 31.9 | H |

TM1 / Polarization: Vertical / Band: 2.4G




| Mk. | Freq. (MHz) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Pol. |
|---|---|---|---|---|---|---|---|
| Peak: | | | | | | | |
| 1 | 45.936 | 17.8 | 40.0 | 22.2 | 19.3 | 29.7 | V |
| 2 | 90.696 | 18.2 | 43.5 | 25.3 | 14.8 | 30.3 | V |
| 3 | 126.329 | 18.3 | 43.5 | 25.2 | 17.1 | 32.5 | V |
| 4 | 193.433 | 22.6 | 43.5 | 20.9 | 16.2 | 33.3 | V |
| 5 | 360.448 | 21.9 | 46.0 | 24.1 | 20.4 | 32.4 | V |
| 6 | 758.041 | 23.1 | 46.0 | 22.9 | 27.7 | 32.5 | V |

Note:Margin=Level-Limit=Reading+factor-Limit

## 6.8 Emissions in restricted frequency bands (above 1GHz)

| | |
|---|---|
| Test Requirement: | In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).` |
| Test Method: | Radiated emissions tests |
| Test Limit: | Frequency (MHz) / Field strength (microvolts/meter) / Measurement distance (meters)<br>0.009-0.490 / 2400/F(kHz) / 300<br>0.490-1.705 / 24000/F(kHz) / 30<br>1.705-30.0 / 30 / 30<br>30-88 / 100 ** / 3<br>88-216 / 150 ** / 3<br>216-960 / 200 ** / 3<br>Above 960 / 500 / 3<br>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. |
| Procedure: | ANSI C63.10-2020 section 6.6.4 |

### 6.8.1 E.U.T. Operation:

| Operating Environment: | |
|---|---|
| Temperature: | 22°C |
| Humidity: | 52 % |
| Atmospheric Pressure: | 1010 hpa |
| Test Voltage | DC12V |

### 6.8.2 Test Setup

See section 4.5 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos

### 6.8.3 Test Data:

**Remark:** During the test, pre-scan 802.11b,802.11g, 802.11n20, 802.11n40 mode, found 802.11n40 was worse case mode. The report only reflects the test data of worst mode.

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: L

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Marging (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Detector | Result |
|---|---|---|---|---|---|---|---|
| 1962.847 | 39.2 | 74.0 | 34.8 | 26.2 | 43.8 | peak | Pass |
| 1962.847 | 34.0 | 54.0 | 20.0 | 26.2 | 43.8 | AV | Pass |
| 3432.364 | 40.5 | 74.0 | 33.5 | 29.5 | 42.1 | peak | Pass |
| 3432.364 | 32.0 | 54.0 | 22.0 | 29.5 | 42.1 | AV | Pass |

TM1 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: L

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Marging (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Detector | Result |
|---|---|---|---|---|---|---|---|
| 1806.100 | 36.7 | 74.0 | 37.3 | 25.1 | 43.9 | peak | Pass |
| 1806.100 | 27.5 | 54.0 | 26.5 | 25.1 | 43.9 | AV | Pass |
| 2518.600 | 38.7 | 74.0 | 35.3 | 27.7 | 43.4 | peak | Pass |
| 2518.600 | 24.9 | 54.0 | 29.1 | 27.7 | 43.4 | AV | Pass |

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 40 / CH: H

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Marging (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Detector | Result |
|---|---|---|---|---|---|---|---|
| 1891.000 | 31.1 | 74.0 | 42.9 | 25.7 | 43.8 | peak | Pass |
| 1891.000 | 22.7 | 54.0 | 31.3 | 25.7 | 43.8 | AV | Pass |
| 2479.900 | 40.8 | 74.0 | 33.2 | 27.6 | 43.5 | peak | Pass |
| 2479.900 | 37.4 | 54.0 | 16.6 | 27.6 | 43.5 | AV | Pass |

TM1 / Polarization: Vertical / Band: 2.4G / BW: 40 / CH: H

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Marging (dB) | Ant.F/G. (dB) | Amp.G. (dB) | Detector | Result |
|---|---|---|---|---|---|---|---|
| 1751.955 | 38.2 | 74.0 | 35.8 | 25.1 | 43.9 | peak | Pass |
| 1751.955 | 30.4 | 54.0 | 23.6 | 25.1 | 43.9 | AV | Pass |
| 3326.154 | 40.8 | 74.0 | 33.2 | 29.5 | 42.0 | peak | Pass |
| 3326.154 | 32.2 | 54.0 | 21.8 | 29.5 | 42.0 | AV | Pass |

Note:

1. Margin =Result (Result =Reading + Factor)-Limit
2. Factor= Cable Loss +Antenna Factor-Amplifier Gain

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# 7 Test Setup Photos

Please refer to the Appendix I Test Setup Photos

# 8 EUT Constructional Details (EUT Photos)

Please refer to the Appendix II External Photos &Appendix III External Photos

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