# TEST REPORT

| | |
|---|---|
| **Report No.:** | 8330EU122130W1 |
| **Applicant:** | Shenzhen Ruheng Technology Co., Ltd. |
| **Address:** | Room 1201, Yousuowei Building, 2000 Jiaxian Road, Gangtou Community, Bantian Street, Longgang District, Shenzhen, Guangdong, China |
| **Product Name:** | Dash cam |
| **Model No.:** | D016 (refer to clause 2.4) |
| **Trademark:** | N/A |
| **FCC ID:** | 2BPRI-D016 |
| **Test Standard(s):** | 47 CFR Part 15 Subpart C |
| **Test Result:** | Pass |
| **Date of Receipt:** | May 21, 2025 |
| **Test Date:** | May 21, 2025 – Jun. 06, 2025 |
| **Date of Issue:** | Jun. 26, 2025 |

**ISSUED BY:**

SHENZHEN EU TESTING LABORATORY LIMITED

SHENZHEN EU TESTING LABORATORY LIMITED APPROVED

**Prepared by:**

Mikey Zhu

Mikey Zhu/ Engineer

**Reviewed and Approved by:**

Sally Zhang

Sally Zhang/ Manager

# Revision Record

| Report Version | Issued Date | Description | Status |
|---|---|---|---|
| V0 | Jun. 26, 2025 | Original | Valid |
| | | | |
| | | | |


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

# Table of Contents

1 COVER PAGE ..... 1
2 GENERAL INFORMATION ..... 5
2.1 APPLICANT INFORMATION ..... 5
2.2 MANUFACTURER INFORMATION ..... 5
2.3 FACTORY INFORMATION ..... 5
2.4 GENERAL DESCRIPTION OF E.U.T. ..... 5
2.5 TECHNICAL INFORMATION OF E.U.T. ..... 6
3 TEST SUMMARY ..... 8
3.1 TEST STANDARD ..... 8
3.2 TEST VERDICT ..... 8
3.3 TEST LABORATORY ..... 8
4 TEST CONFIGURATION ..... 9
4.1 TEST ENVIRONMENT ..... 9
4.2 TEST EQUIPMENT ..... 9
4.3 DESCRIPTION OF SUPPORT UNIT ..... 10
4.4 TEST MODE ..... 10
4.5 DESCRIPTION OF CALCULATION ..... 10
4.6 MEASUREMENT UNCERTAINTY ..... 11
4.7 DEVIATION FROM STANDARDS ..... 11
4.8 ABNORMALITIES FROM STANDARD CONDITION ..... 11
5 TEST ITEMS ..... 12
5.1 ANTENNA REQUIREMENT ..... 12
5.1.1 Test Requirement ..... 12
5.1.2 Antenna Anti-Replacement Construction ..... 12
5.1.3 Antenna Gain ..... 12
5.2 CONDUCTED EMISSION AT AC POWER LINE ..... 13
5.2.1 Test Requirement ..... 13
5.2.2 Test Setup Diagram ..... 13
5.2.3 Test Procedure ..... 13
5.2.4 Test Data ..... 13
5.3 DTS BANDWIDTH ..... 14
5.3.1 Test Requirement ..... 14
5.3.2 Test Setup Diagram ..... 14
5.3.3 Test Procedure ..... 14
5.3.4 Test Data ..... 14
5.4 MAXIMUM CONDUCTED OUTPUT POWER ..... 15
5.4.1 Test Requirement ..... 15
5.4.2 Test Setup Diagram ..... 15
5.4.3 Test Procedure ..... 15
5.4.4 Test Data ..... 15
5.5 POWER SPECTRAL DENSITY ..... 16
5.5.1 Test Requirement ..... 16
5.5.2 Test Setup Diagram ..... 16
5.5.3 Test Procedure ..... 16
5.5.4 Test Data ..... 16
5.6 EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS (CONDUCTED) ..... 17
5.6.1 Test Requirement ..... 17
5.6.2 Test Setup Diagram ..... 17
5.6.3 Test Procedure ..... 18
5.6.4 Test Data ..... 18


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**5.7 BAND EDGE EMISSIONS (RESTRICTED FREQUENCY BANDS) ..... 19**
5.7.1 Test Requirement ..... 19
5.7.2 Test Setup Diagram ..... 19
5.7.3 Test Procedure ..... 20
5.7.4 Test Data ..... 20
**5.8 RADIATED SPURIOUS EMISSIONS ..... 25**
5.8.1 Test Requirement ..... 25
5.8.2 Test Setup Diagram ..... 26
5.8.3 Test Procedure ..... 27
5.8.4 Test Data ..... 27
**ANNEX A TEST SETUP PHOTOS ..... 33**
**ANNEX B EXTERNAL PHOTOS ..... 33**
**ANNEX C INTERNAL PHOTOS ..... 33**
**ANNEX D TEST DATA ..... 33**


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

# 2 General Information

## 2.1 Applicant Information

| | |
|---|---|
| Applicant | Shenzhen Ruheng Technology Co., Ltd. |
| Address | Room 1201, Yousuowei Building, 2000 Jiaxian Road, Gangtou Community, Bantian Street, Longgang District, Shenzhen, Guangdong, China |

## 2.2 Manufacturer Information

| | |
|---|---|
| Manufacturer | Shenzhen Ruheng Technology Co., Ltd. |
| Address | Room 1201, Yousuowei Building, 2000 Jiaxian Road, Gangtou Community, Bantian Street, Longgang District, Shenzhen, Guangdong, China |

## 2.3 Factory Information

| | |
|---|---|
| Factory | Shenzhen Mili Automotive Electronics Co., Ltd. |
| Address | Room 401, No. 5, Phase I, District 3, Xinxing Industrial Park, Xinhua Community, Fuhai Subdistrict, Bao'an District, Shenzhen City, China |

## 2.4 General Description of E.U.T.

| | |
|---|---|
| Product Name | Dash cam |
| Model No. Under Test | D016 |
| List Model No. | D017, D018, D019, D020, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, D036, D037, D038, D039, D040, D041, D042, D043, D044, D045, D046 |
| Description of Model differentiation | All models are same with electrical parameters and internal circuit structure, but only differ in appearance color and model name.<br>(this information provided by the customer) |
| Rating(s) | Input: 5V⎓3A |
| Product Type | ☒ Mobile<br>☐ Portable<br>☐ Fix Location |
| Test Sample No. | -1/2(Normal Sample), -2/2(Engineering Sample) |
| Hardware Version | N/A |
| Software Version | N/A |
| Remark | For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. |

## 2.5 Technical Information of E.U.T.

| | |
|---|---|
| Network and Wireless Connectivity | WiFi 2.4G: 802.11b, 802.11g, 802.11n(HT20/40)<br>WiFi 5G: 802.11a, 802.11n(HT20/40)<br>U-NII-1/3 |

The requirement for the following technical information of the EUT was tested in this report:

| | | | | |
|---|---|---|---|---|
| Technology | **WiFi 2.4G** | | | |
| Operation Mode | ☒ b | ☒ g | ☒ n(HT20) | ☒ n(HT40) |
| | ☐ ac(VHT20) | ☐ ac(VHT40) | ☐ ax(HEW20) | ☐ ax(HEW40) |
| Operating Frequency | 802.11b/g/n(HT20): 2412MHz to 2462MHz<br>802.11n(HT40): 2422MHz to 2452MHz | | | |
| Number of Channels | 802.11b/g/n(HT20): 11 Channels<br>802.11n(HT40): 7 Channels | | | |
| Modulation Technology | DSSS, OFDM | | | |
| Modulation Type | ☒ 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>☒ 802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>☒ 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>☐ 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>☐ 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM,1024QAM) | | | |
| Antenna System (eg., MIMO, Smart Antenna) | N/A | | | |
| Categorization as Correlated or Completely Uncorrelated | N/A | | | |
| Antenna Type | FPC Antenna | | | |
| Antenna Gain(Peak) | -2.79 dBi | | | |
| Remark | The above information are declared by the applicant, EU-LAB is not responsible for the information accuracy provided by the applicant. | | | |

All channels were listed on the following table:

| Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|---|---|---|
| 01 | 2412 | 04 | 2427 | 07 | 2442 | 10 | 2457 |
| 02 | 2417 | 05 | 2432 | 08 | 2447 | 11 | 2462 |
| 03 | 2422 | 06 | 2437 | 09 | 2452 | | |


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

| Modulation technology | Modulation Type | Transfer Rate (Mbps)(Single RF path) |
|---|---|---|
| DSSS (802.11b) | DBPSK | 1 |
| | DQPSK | 2 |
| | CCK | 5.5/11 |
| OFDM (802.11g) | BPSK | 6/9 |
| | QPSK | 12/18 |
| | 16QAM | 24/36 |
| | 64QAM | 48/54 |
| OFDM (802.11n-20 MHz) | BPSK | 6.5/7.2 |
| | QPSK | 13/19.5/14.4/21.7 |
| | 16QAM | 26/39/28.9/43.3 |
| | 64QAM | 52/58.5/65/57.8/65/72.2 |
| OFDM (802.11n-40 MHz) | BPSK | 13.5/15 |
| | QPSK | 27/40.5/30/45 |
| | 16QAM | 54/81/60/90 |
| | 64QAM | 108/121.5/135/120/150 |

Note: Preliminary tests were performed in different data rate in above table to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Test Items | Mode | Data Rate | Channel | |
|---|---|---|---|---|
| Conducted Emission at AC Power Line | 11b/11g/11n20/11n40 | 1/6/6.5/13.5 Mbps | 1/6/11 | 3/6/9 |
| DTS Bandwidth | 11b/11g/11n20/11n40 | 1/6/6.5/13.5 Mbps | 1/6/11 | 3/6/9 |
| Maximum Conducted Output Power | 11b/11g/11n20/11n40 | 1/6/6.5/13.5 Mbps | 1/6/11 | 3/6/9 |
| Power spectral density (PSD) | 11b/11g/11n20/11n40 | 1/6/6.5/13.5 Mbps | 1/6/11 | 3/6/9 |
| Emission in non-restricted frequency bands (Conducted) | 11b/11g/11n20/11n40 | 1/6/6.5/13.5 Mbps | 1/6/11 | 3/6/9 |
| Band Edge Emissions (Restricted frequency bands) | 11b/11g/11n20/11n40 | 1/6/6.5/13.5 Mbps | 1/6/11 | 3/6/9 |
| Radiated Spurious Emission | 11b/11g/11n20/11n40 | 1/6/6.5/13.5 Mbps | 1/6/11 | 3/6/9 |

Note: The above EUT information in section 2.5 was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

# 3 Test Summary

## 3.1 Test Standard

The tests were performed according to following standards:

| No. | Identity | Document Title |
|---|---|---|
| 1 | 47 CFR Part 15, Subpart C | Intentional radiators of radio frequency equipment |
| 2 | ANSI C63.10-2020 | American National Standard for Testing Unlicensed Wireless Devices |
| 3 | KDB Publication 558074 D01v05r02 | 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 |

Remark:
Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

## 3.2 Test Verdict

| No. | Description | FCC Part No. | Verdict | Remark |
|---|---|---|---|---|
| 1 | Antenna Requirement | 15.203 | Pass | Note [1] |
| 2 | Conducted Emission at AC Power Line | 15.207 | N/A | -- |
| 3 | DTS Bandwidth | 15.247(a)(2) | Pass | -- |
| 4 | Maximum Conducted Output Power | 15.247(b)(3) | Pass | -- |
| 5 | Power spectral density (PSD) | 15.247(e) | Pass | -- |
| 6 | Emission in non-restricted frequency bands (Conducted) | 15.247(d) | Pass | -- |
| 7 | Band Edge Emissions (Restricted frequency bands) | 15.247(d) | Pass | -- |
| 8 | Radiated Spurious Emission | 15.247(d) | Pass | -- |

Note [1]: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.
Note [2]: N/A" denotes test is not applicable in this test report.

## 3.3 Test Laboratory

| | |
|---|---|
| Test Laboratory | Shenzhen EU Testing Laboratory Limited |
| Address | 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China |
| Designation Number | CN1368 |
| Test Firm Registration Number | 952583 |

# 4 Test Configuration

## 4.1 Test Environment

During the measurement, the normal environmental conditions were within the listed ranges:

| | | |
|---|---|---|
| Relative Humidity | 30% to 60% | |
| Atmospheric Pressure | 86 kPa to 106 kPa | |
| Temperature | NT (Normal Temperature) | +15℃ to +35℃ |
| Working Voltage of the EUT | NV (Normal Voltage) | AC 120V, 60Hz for adapter |

## 4.2 Test Equipment

| Conducted Emission at AC power line | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Serial No** | **Cal Date** | **Cal Due Date** |
| L.I.S.N. Artificial Mains Network | Rohde & Schwarz | ENV216 | EE-004 | 2025/01/08 | 2026/01/07 |
| EMI Test Receiver | Rohde & Schwarz | ESCI | EE-005 | 2025/01/08 | 2026/01/07 |
| Test Software | Farad | EZ-EMC | EE-014 | N.C.R | N.C.R |

| Radiated Emission and RF Test | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Serial No** | **Cal. Date** | **Cal. Due Date** |
| EMI Test Receiver | ROHDE & SCHWARZ | ESPI | EE-006 | 2025/01/08 | 2026/01/07 |
| Bilog Broadband Antenna | SCHWARZBECK | VULB 9163 | EE-007 | 2023/01/14 | 2026/01/13 |
| Double Ridged Horn Antenna | A-INFOMW | LB-10180-NF | EE-008 | 2023/01/12 | 2026/01/11 |
| Pre-amplifier | Agilent | 8447D | EE-009 | 2025/01/08 | 2026/01/07 |
| Pre-amplifier | Agilent | 8449B | EE-010 | 2025/01/08 | 2026/01/07 |
| MXA Signal Analyzer | Agilent | N9020A | EE-011 | 2025/01/08 | 2026/01/07 |
| MXG RF Vector Signal Generator | Agilent | N5182A | EE-012 | 2025/01/08 | 2026/01/07 |
| Test Software | Farad | EZ-EMC | EE-015 | N.C.R | N.C.R |
| MIMO Power Measurement Module | TSTPASS | TSPS 2023R | EE-016 | 2025/01/08 | 2026/01/07 |
| RF Test Software | TSTPASS | TS32893 V2.0 | EE-017 | N.C.R | N.C.R |
| Antenna Mast | TOP Precision | TPBAM-4 | EE-306 | N.C.R | N.C.R |
| Wideband Radio Communication Tester | ROHDE & SCHWARZ | CMW500 | EE-402 | 2025/02/14 | 2026/02/13 |
| Loop Antenna | TESEQ | HLA6121 | EE-403 | 2025/02/14 | 2026/02/13 |
| MXG RF Analog Signal Generator | Agilent | N5181A | EE-406 | 2025/02/14 | 2026/02/13 |
| DRG Horn Antenna | SCHWARZBECK | BBHA 9170 | EE-410 | 2025/02/14 | 2026/02/13 |
| Pre-amplifier | SKET | LNPA-1840-50 | EE-411 | 2025/02/14 | 2026/02/13 |
| Power Meter | Anritsu | ML2495A | EE-416 | 2025/02/14 | 2026/02/13 |
| Constant Temperature Humidity Chamber | Guangxin | GXP-401 | ES-002 | 2024/07/30 | 2025/07/29 |


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

## 4.3 Description of Support Unit

| No. | Title | Manufacturer | Model No. | Serial No. |
|---|---|---|---|---|
| 1 | Car Charger | N/A | N/A | -- |

## 4.4 Test Mode

| 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. |

## 4.5 Description of Calculation

### 4.5.1. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

**FS (dBuV/m) = RA (dBuV) + AF (dB/m) + CL (dB) – AG (dB)**

| | | |
|---|---|---|
| Where | FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| | RA = Reading Amplitude | AG = Amplifier Gain |
| | AF = Antenna Factor | |

### 4.5.2. Disturbance Calculation

The AC mains conducted disturbance is calculated by adding the 10dB Pulse Limiter and Cable Factor and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

**CD (dBuV) = RA (dBuV) + PL (dB) + CL (dB)**

| | | |
|---|---|---|
| Where | CD = Conducted Disturbance | CL = Cable Attenuation Factor (Cable Loss) |
| | RA = Reading Amplitude | PL = 10 dB Pulse Limiter Factor |


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

## 4.6 Measurement Uncertainty

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.

| Test Item | Measurement Uncertainty |
|---|---|
| Conducted Emission | 2.64 dB |
| Occupied Channel Bandwidth | 70 kHz |
| RF output power, conducted | 1.04 dB |
| Power Spectral Density, conducted | 0.91 dB |
| Time of Occupancy (Dwell Time) | 1.8 % |
| Unwanted Emissions, conducted | 2.72 dB |
| Radiated Emission (9kHz- 30MHz) | Ur = 2.50 dB |
| Radiated Emission (30MHz- 1GHz) | Ur = 2.70 dB (Horizontal) |
| | Ur = 2.70 dB (Vertical) |
| Radiated Emission (1GHz- 18GHz) | Ur = 3.50 dB (Horizontal) |
| | Ur = 3.50 dB (Vertical) |
| Radiated Emission (18GHz- 40GHz) | Ur = 5.15 dB (Horizontal) |
| | Ur = 5.24 dB (Vertical) |
| Temperature | 0.8°C |
| Humidity | 4% |

## 4.7 Deviation from Standards

None.

## 4.8 Abnormalities from Standard Condition

None.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

# 5 Test Items

## 5.1 Antenna requirement

### 5.1.1 Test Requirement

| | |
|---|---|
| Test Requirement | According to FCC §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.<br><br>If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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 FCC rule. |

### 5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

| Protected Method | Description |
|---|---|
| The antenna is embedded in the product. | An embedded-in antenna design is used. |

| Reference Documents | Item |
|---|---|
| Photo | Please refer to the EUT Photo documents. |

### 5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

## 5.2 Conducted Emission at AC Power Line

### 5.2.1 Test Requirement

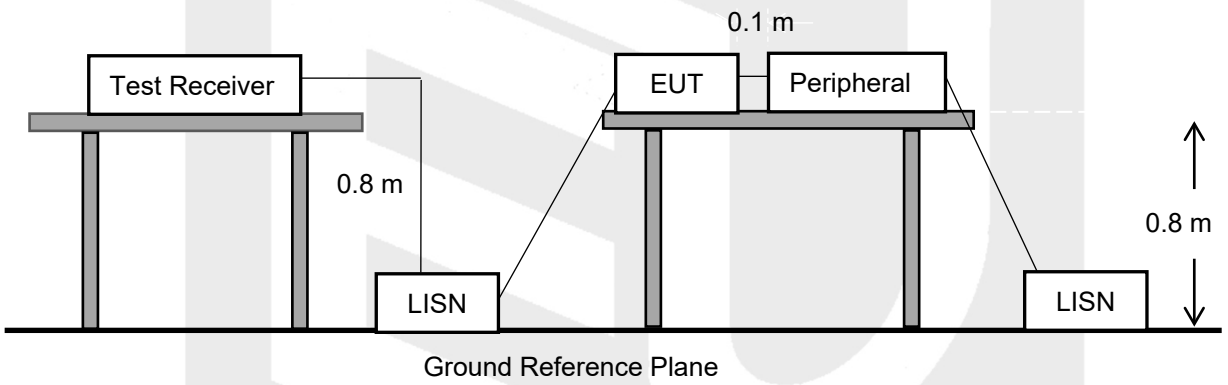
| | |
|---|---|
| Test Requirement | Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, 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 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.

| | |
|---|---|
| Test Method | ANSI C63.10-2020 section 6.2 |

### 5.2.2 Test Setup Diagram




### 5.2.3 Test Procedure

The EUT is put on the plane 0.8 m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipment. Both sides of AC line are investigated to find out the maximum conducted emission according to the test standard regulations during conducted emission measurement.
The bandwidth of the field strength meter (R&S Test Receiver ESCI) is set at 9kHz in 150kHz~30MHz.
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.
Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

### 5.2.4 Test Data

**Not Applicable.**

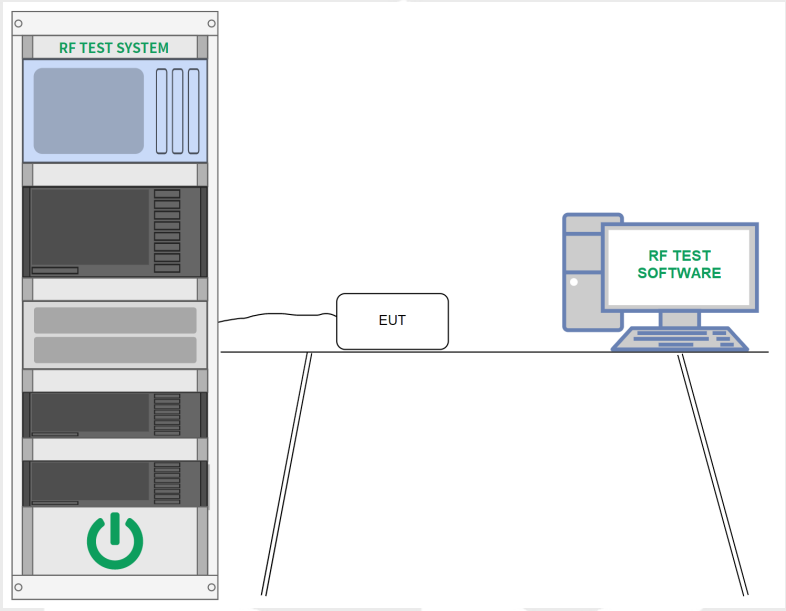
The EUT can not be connected to AC power lines, so there is no need to conduct this test item.

## 5.3 DTS Bandwidth

### 5.3.1 Test Requirement

| | |
|---|---|
| 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 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. |
| Test Method | ANSI C63.10-2020 section 11.8 |

### 5.3.2 Test Setup Diagram




### 5.3.3 Test Procedure

a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
b) Set the VBW >= [3 × RBW].
c) Detector = peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 5.3.4 Test Data

**PASS.**

Please refer to Annex D for details.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

## 5.4 Maximum Conducted Output Power

### 5.4.1 Test Requirement

| | |
|---|---|
| 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 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. |
| Test Method | ANSI C63.10-2020 section 11.9 |

### 5.4.2 Test Setup Diagram

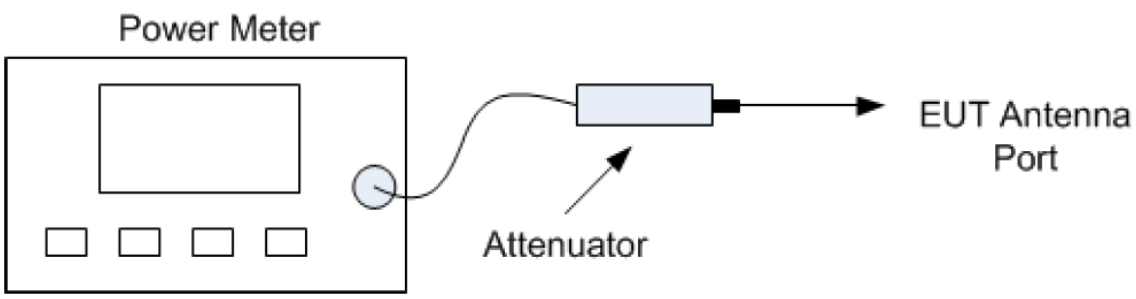



**Figure 24—Example of a power meter conducted test setup**

### 5.4.3 Test Procedure

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast responding diode detector.

### 5.4.4 Test Data

**PASS.**

Please refer to Annex D for details.

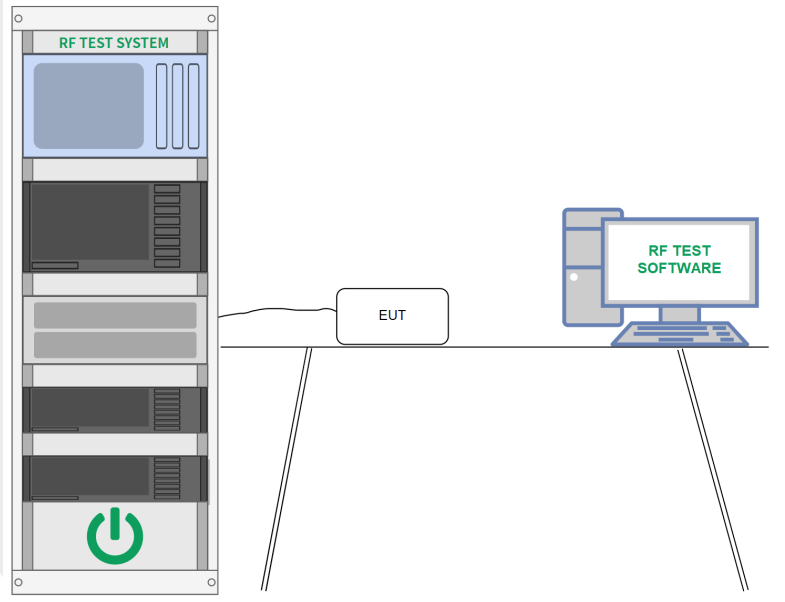

Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

## 5.5 Power Spectral Density

### 5.5.1 Test Requirement

| | |
|---|---|
| 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 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. |
| Test Method | ANSI C63.10-2020 section 11.10 |

### 5.5.2 Test Setup Diagram




### 5.5.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.
Set the span to 1.5 times the DTS bandwidth.
Set the RBW to: 3 kHz ⩽ RBW ⩽ 100 kHz.
Set the VBW ⩾ 3 RBW.
Detector = peak.
Sweep time = auto couple.
Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum amplitude level within the RBW.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 5.5.4 Test Data

**PASS.**

Please refer to Annex D for details.

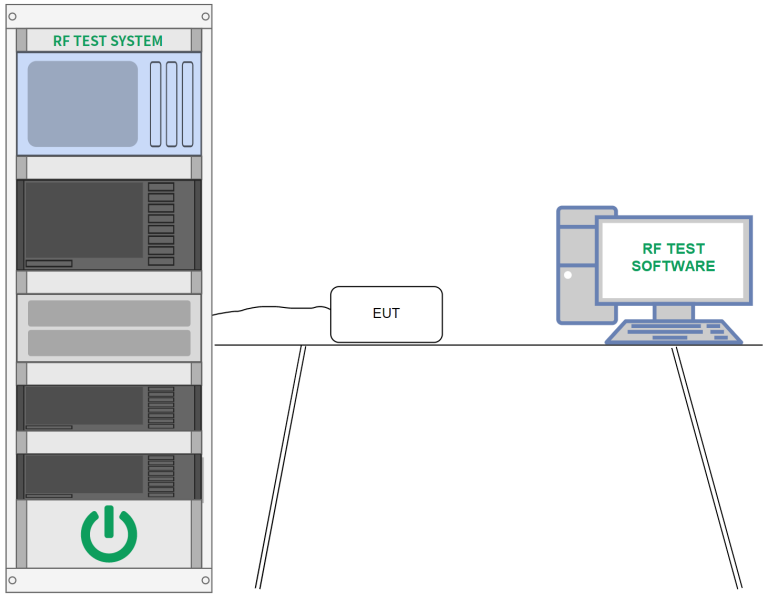

Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

## 5.6 Emissions in Non-restricted Frequency Bands (Conducted)

### 5.6.1 Test Requirement

| | |
|---|---|
| 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 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. |
| Test Method | ANSI C63.10-2020 section 11.11 |

### 5.6.2 Test Setup Diagram



### 5.6.3 Test Procedure

The following procedures may be used to determine the peak or average field strength or power of an unwanted emission that is within 2 MHz of the authorized band edge. If a peak detector is utilized, use the procedure described in 13.2.1. Use the procedure described in 13.2.2 when using an average detector and the EUT can be configured to transmit continuously (i.e., duty cycle ⩾ 98%). Use the procedure described in 13.2.3 when using an average detector and the EUT cannot be configured to transmit continuously but the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent). Use the procedure described in 13.2.4 when using an average detector for those cases where the EUT cannot be configured to transmit continuously and the duty cycle is not constant (duty cycle variations equal or exceed 2 percent).
When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used.
Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).
Set span to 2 MHz
RBW = 100 kHz.
VBW ⩾ 3 x RBW.
Detector = peak.
Sweep time = auto.
Trace mode = max hold.
Allow sweep to continue until the trace stabilizes (required measurement time may increase for low duty cycle applications)
Compute the power by integrating the spectrum over 1 MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency (femission) ± 0.5 MHz. If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by femission ± 0.5 MHz.
Standard method(The 99% OBW of the fundamental emission is without 2 MHz of the authorized band):
Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.
Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
Attenuation: Auto (at least 10 dB preferred).
Sweep time: Coupled.
Resolution bandwidth: 100 kHz.
Video bandwidth: 300 kHz.
Detector: Peak.
Trace: Max hold.

### 5.6.4 Test Data

**PASS.**

Please refer to Annex D for details.

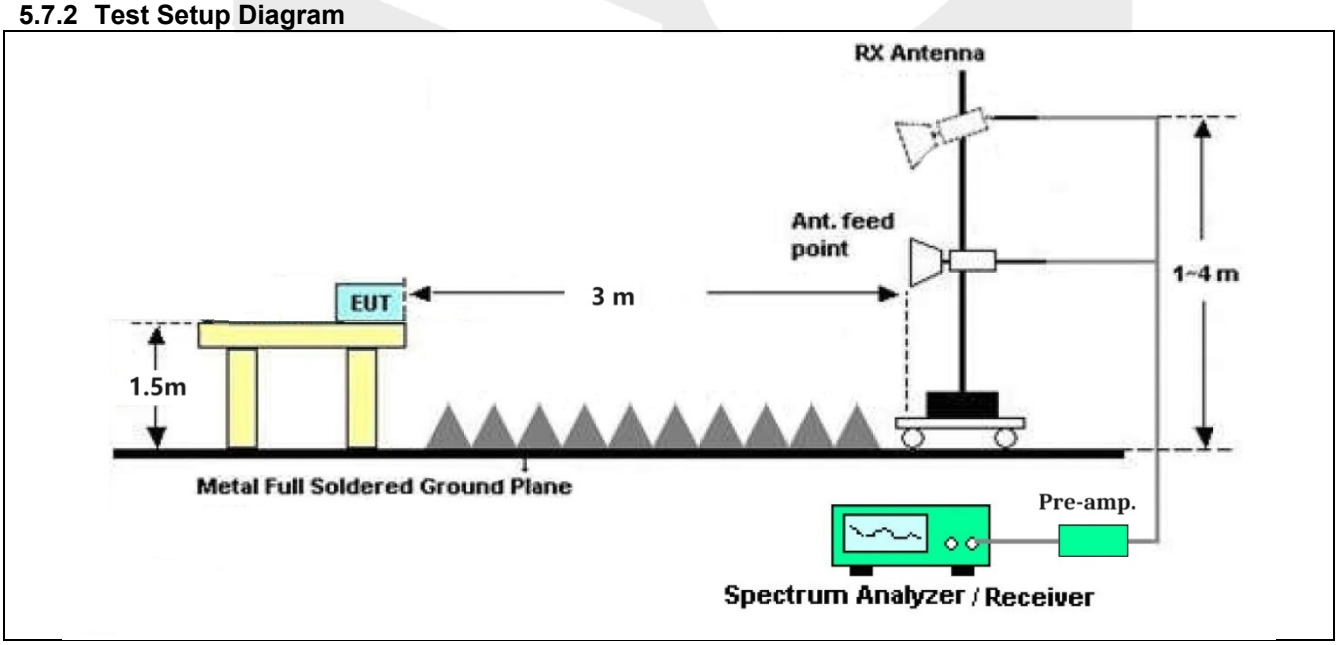

Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

## 5.7 Band edge Emissions (Restricted frequency bands)

### 5.7.1 Test Requirement

<table>
<tr><td>Test Requirement</td><td>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)).</td></tr>
<tr><td>Test Limit</td><td>
<table>
<tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** 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.<br>Note:<br>1) Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].<br>2) In the emission tables above, the tighter limit applies at the band edges.<br>3) For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.<br>4) For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).
</td></tr>
<tr><td>Test Method</td><td>ANSI C63.10-2020 section 11.12</td></tr>
</table>

### 5.7.2 Test Setup Diagram



### 5.7.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.
The power of the EUT transmitting frequency should be ignored.
All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.
Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold.

### 5.7.4 Test Data

**PASS.**

Please refer to the following pages.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**Band Edge Emissions (Restricted frequency bands):**

| Test Mode: 802.11b | | | | | CH Low: 2412 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| H | 2310.00 | 45.78 | -2.81 | 42.97 | 74.00 | -31.03 | PK | PASS |
| H | 2390.00 | 46.51 | -2.69 | 43.82 | 74.00 | -30.18 | PK | PASS |
| H | **2400.00 | 62.13 | -2.68 | 59.45 | 74.00 | -14.55 | PK | PASS |
| V | 2310.00 | 44.73 | -2.81 | 41.92 | 74.00 | -32.08 | PK | PASS |
| V | 2390.00 | 48.58 | -2.69 | 45.89 | 74.00 | -28.11 | PK | PASS |
| V | **2400.00 | 63.84 | -2.68 | 61.16 | 74.00 | -12.84 | PK | PASS |
| H | 2310.00 | 32.31 | -2.81 | 29.50 | 54.00 | -24.50 | AV | PASS |
| H | 2390.00 | 35.10 | -2.69 | 32.41 | 54.00 | -21.59 | AV | PASS |
| H | **2400.00 | 49.63 | -2.68 | 46.95 | 54.00 | -7.05 | AV | PASS |
| V | 2310.00 | 32.58 | -2.81 | 29.77 | 54.00 | -24.23 | AV | PASS |
| V | 2390.00 | 38.58 | -2.69 | 35.89 | 54.00 | -18.11 | AV | PASS |
| V | **2400.00 | 46.19 | -2.68 | 43.51 | 54.00 | -10.49 | AV | PASS |

| Test Mode: 802.11b | | | | | CH High: 2462 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| H | **2483.50 | 47.57 | -2.56 | 45.01 | 74.00 | -28.99 | PK | PASS |
| H | 2500.00 | 52.45 | -2.54 | 49.91 | 74.00 | -24.09 | PK | PASS |
| V | **2483.50 | 46.16 | -2.56 | 43.60 | 74.00 | -30.40 | PK | PASS |
| V | 2500.00 | 49.38 | -2.54 | 46.84 | 74.00 | -27.16 | PK | PASS |
| H | **2483.50 | 38.33 | -2.56 | 35.77 | 54.00 | -18.23 | AV | PASS |
| H | 2500.00 | 39.73 | -2.54 | 37.19 | 54.00 | -16.81 | AV | PASS |
| V | **2483.50 | 37.23 | -2.56 | 34.67 | 54.00 | -19.33 | AV | PASS |
| V | 2500.00 | 39.55 | -2.54 | 37.01 | 54.00 | -16.99 | AV | PASS |

Remark:
1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**Band Edge Emissions (Restricted frequency bands):**

| Test Mode: 802.11g | | | | | CH Low: 2412 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| H | 2310.00 | 42.73 | -2.81 | 39.92 | 74.00 | -34.08 | PK | PASS |
| H | 2390.00 | 49.39 | -2.69 | 46.70 | 74.00 | -27.30 | PK | PASS |
| H | **2400.00 | 62.17 | -2.68 | 59.49 | 74.00 | -14.51 | PK | PASS |
| V | 2310.00 | 45.12 | -2.81 | 42.31 | 74.00 | -31.69 | PK | PASS |
| V | 2390.00 | 46.20 | -2.69 | 43.51 | 74.00 | -30.49 | PK | PASS |
| V | **2400.00 | 61.50 | -2.68 | 58.82 | 74.00 | -15.18 | PK | PASS |
| H | 2310.00 | 35.51 | -2.81 | 32.70 | 54.00 | -21.30 | AV | PASS |
| H | 2390.00 | 35.10 | -2.69 | 32.41 | 54.00 | -21.59 | AV | PASS |
| H | **2400.00 | 48.13 | -2.68 | 45.45 | 54.00 | -8.55 | AV | PASS |
| V | 2310.00 | 34.15 | -2.81 | 31.34 | 54.00 | -22.66 | AV | PASS |
| V | 2390.00 | 35.82 | -2.69 | 33.13 | 54.00 | -20.87 | AV | PASS |
| V | **2400.00 | 48.32 | -2.68 | 45.64 | 54.00 | -8.36 | AV | PASS |

| Test Mode: 802.11g | | | | | CH High: 2462 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| H | **2483.50 | 47.12 | -2.56 | 44.56 | 74.00 | -29.44 | PK | PASS |
| H | 2500.00 | 49.93 | -2.54 | 47.39 | 74.00 | -26.61 | PK | PASS |
| V | **2483.50 | 47.66 | -2.56 | 45.10 | 74.00 | -28.90 | PK | PASS |
| V | 2500.00 | 49.20 | -2.54 | 46.66 | 74.00 | -27.34 | PK | PASS |
| H | **2483.50 | 39.40 | -2.56 | 36.84 | 54.00 | -17.16 | AV | PASS |
| H | 2500.00 | 41.65 | -2.54 | 39.11 | 54.00 | -14.89 | AV | PASS |
| V | **2483.50 | 37.88 | -2.56 | 35.32 | 54.00 | -18.68 | AV | PASS |
| V | 2500.00 | 39.94 | -2.54 | 37.40 | 54.00 | -16.60 | AV | PASS |

Remark:
1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**Band Edge Emissions (Restricted frequency bands):**

| Test Mode: 802.11n(HT20) | | | | | CH Low: 2412 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| H | 2310.00 | 42.71 | -2.81 | 39.90 | 74.00 | -34.10 | PK | PASS |
| H | 2390.00 | 46.03 | -2.69 | 43.34 | 74.00 | -30.66 | PK | PASS |
| H | **2400.00 | 63.17 | -2.68 | 60.49 | 74.00 | -13.51 | PK | PASS |
| V | 2310.00 | 44.71 | -2.81 | 41.90 | 74.00 | -32.10 | PK | PASS |
| V | 2390.00 | 45.98 | -2.69 | 43.29 | 74.00 | -30.71 | PK | PASS |
| V | **2400.00 | 64.53 | -2.68 | 61.85 | 74.00 | -12.15 | PK | PASS |
| H | 2310.00 | 33.07 | -2.81 | 30.26 | 54.00 | -23.74 | AV | PASS |
| H | 2390.00 | 37.81 | -2.69 | 35.12 | 54.00 | -18.88 | AV | PASS |
| H | **2400.00 | 46.35 | -2.68 | 43.67 | 54.00 | -10.33 | AV | PASS |
| V | 2310.00 | 34.32 | -2.81 | 31.51 | 54.00 | -22.49 | AV | PASS |
| V | 2390.00 | 35.23 | -2.69 | 32.54 | 54.00 | -21.46 | AV | PASS |
| V | **2400.00 | 47.81 | -2.68 | 45.13 | 54.00 | -8.87 | AV | PASS |

| Test Mode: 802.11n(HT20) | | | | | CH High: 2462 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| H | **2483.50 | 48.48 | -2.56 | 45.92 | 74.00 | -28.08 | PK | PASS |
| H | 2500.00 | 48.54 | -2.54 | 46.00 | 74.00 | -28.00 | PK | PASS |
| V | **2483.50 | 47.77 | -2.56 | 45.21 | 74.00 | -28.79 | PK | PASS |
| V | 2500.00 | 50.73 | -2.54 | 48.19 | 74.00 | -25.81 | PK | PASS |
| H | **2483.50 | 37.88 | -2.56 | 35.32 | 54.00 | -18.68 | AV | PASS |
| H | 2500.00 | 38.75 | -2.54 | 36.21 | 54.00 | -17.79 | AV | PASS |
| V | **2483.50 | 39.80 | -2.56 | 37.24 | 54.00 | -16.76 | AV | PASS |
| V | 2500.00 | 38.95 | -2.54 | 36.41 | 54.00 | -17.59 | AV | PASS |

Remark:
1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**Band Edge Emissions (Restricted frequency bands):**

| Test Mode: 802.11n(HT40) | | | | | CH Low: 2422 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| H | 2310.00 | 44.04 | -2.81 | 41.23 | 74.00 | -32.77 | PK | PASS |
| H | 2390.00 | 48.74 | -2.69 | 46.05 | 74.00 | -27.95 | PK | PASS |
| H | **2400.00 | 62.17 | -2.68 | 59.49 | 74.00 | -14.51 | PK | PASS |
| V | 2310.00 | 46.15 | -2.81 | 43.34 | 74.00 | -30.66 | PK | PASS |
| V | 2390.00 | 48.47 | -2.69 | 45.78 | 74.00 | -28.22 | PK | PASS |
| V | **2400.00 | 62.28 | -2.68 | 59.60 | 74.00 | -14.40 | PK | PASS |
| H | 2310.00 | 34.69 | -2.81 | 31.88 | 54.00 | -22.12 | AV | PASS |
| H | 2390.00 | 38.67 | -2.69 | 35.98 | 54.00 | -18.02 | AV | PASS |
| H | **2400.00 | 46.91 | -2.68 | 44.23 | 54.00 | -9.77 | AV | PASS |
| V | 2310.00 | 33.50 | -2.81 | 30.69 | 54.00 | -23.31 | AV | PASS |
| V | 2390.00 | 34.87 | -2.69 | 32.18 | 54.00 | -21.82 | AV | PASS |
| V | **2400.00 | 48.44 | -2.68 | 45.76 | 54.00 | -8.24 | AV | PASS |

| Test Mode: 802.11n(HT40) | | | | | CH High: 2452 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| H | **2483.50 | 46.24 | -2.56 | 43.68 | 74.00 | -30.32 | PK | PASS |
| H | 2500.00 | 49.17 | -2.54 | 46.63 | 74.00 | -27.37 | PK | PASS |
| V | **2483.50 | 47.02 | -2.56 | 44.46 | 74.00 | -29.54 | PK | PASS |
| V | 2500.00 | 50.43 | -2.54 | 47.89 | 74.00 | -26.11 | PK | PASS |
| H | **2483.50 | 38.19 | -2.56 | 35.63 | 54.00 | -18.37 | AV | PASS |
| H | 2500.00 | 41.49 | -2.54 | 38.95 | 54.00 | -15.05 | AV | PASS |
| V | **2483.50 | 39.11 | -2.56 | 36.55 | 54.00 | -17.45 | AV | PASS |
| V | 2500.00 | 38.68 | -2.54 | 36.14 | 54.00 | -17.86 | AV | PASS |

Remark:
1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

## 5.8 Radiated Spurious Emissions

### 5.8.1 Test Requirement

<table>
<tr><td>Test Requirement</td><td>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)).</td></tr>
<tr><td>Test Limit</td><td>
<table>
<tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** 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.<br>Note:<br>1) Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].<br>2) In the emission tables above, the tighter limit applies at the band edges.<br>3) For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.<br>4) For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).
</td></tr>
<tr><td>Test Method</td><td>ANSI C63.10-2020 section 6.6.4</td></tr>
</table>


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

### 5.8.2 Test Setup Diagram

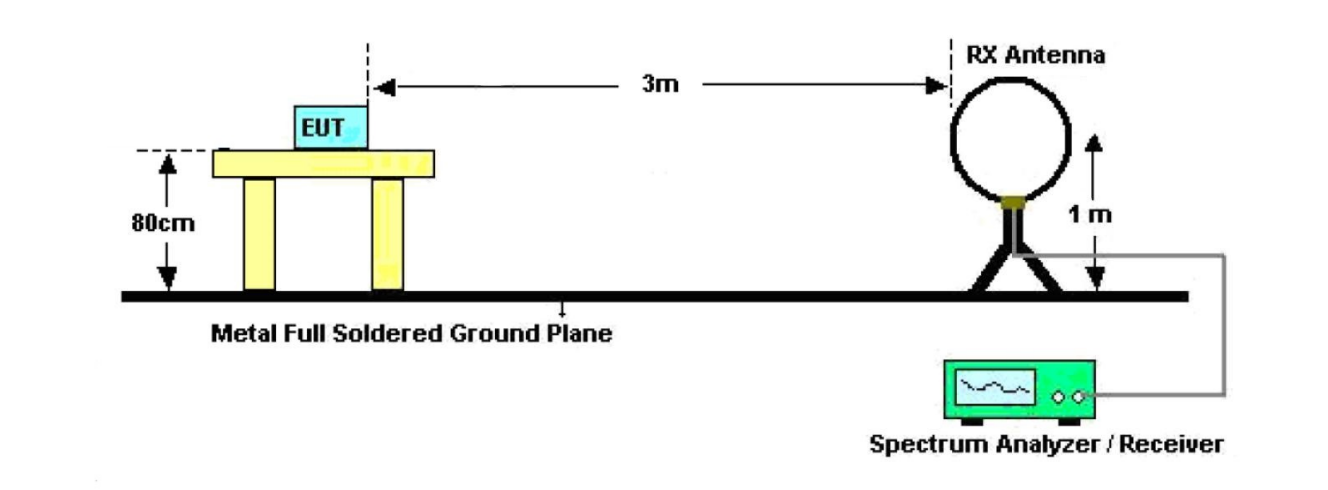



Figure 1. Below 30MHz

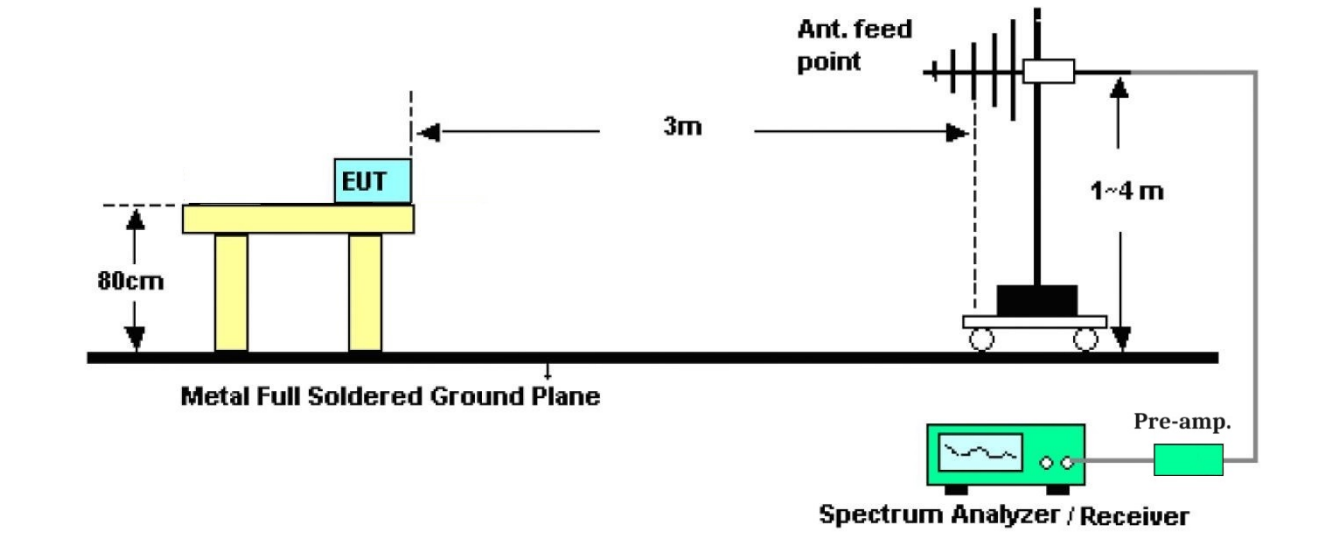



Figure 2. 30MHz to 1GHz

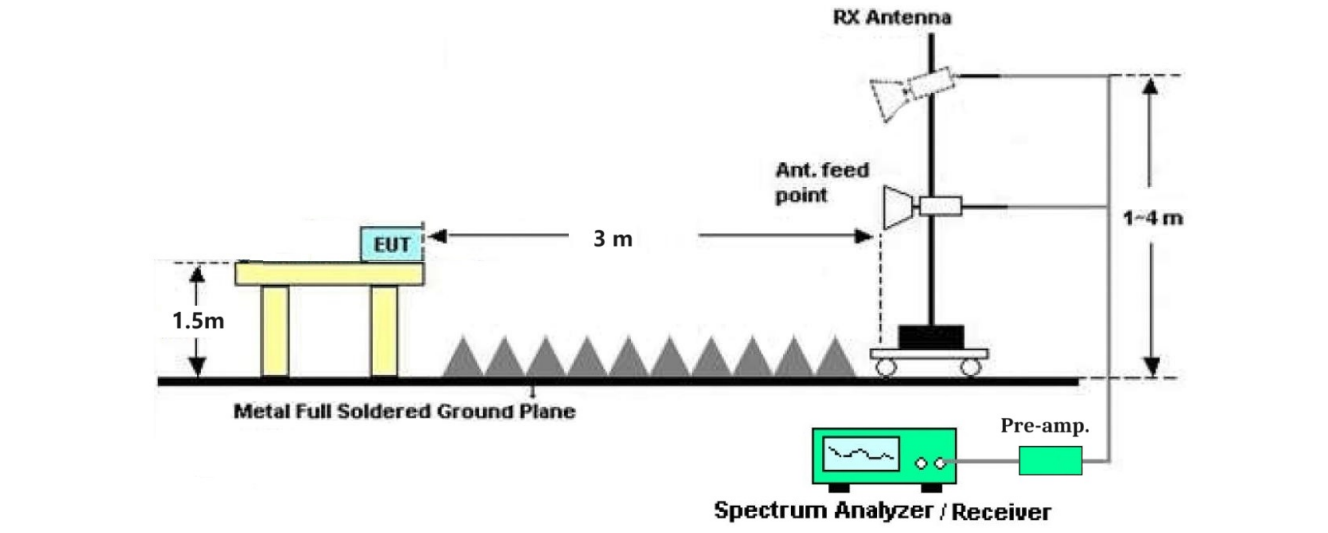



Figure 3. Above 1 GHz

### 5.8.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power.
Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.
The power of the EUT transmitting frequency should be ignored.
All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.
Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz, Set the spectrum analyzer as:
RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.
RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

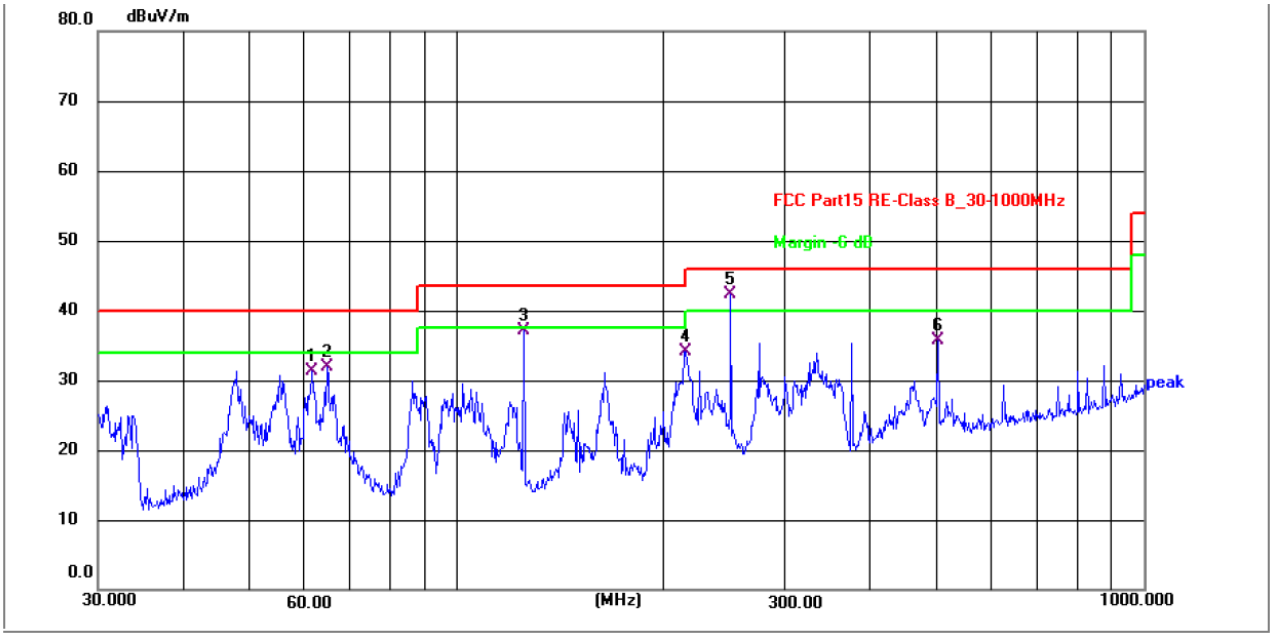
### 5.8.4 Test Data

PASS.
Please to see the following pages.
The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.
For test of 30MHz-1GHz, during the test, pre-scan all modes, only the worst case is recorded in the report.
For test of 1GHz-25GHz, during the test, pre-scan all test modes, and found the 802.11n(HT20) is worse case, the report only record this mode.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**Radiated Emission Test Data (30-1000MHz)**

| | | | |
|---|---|---|---|
| **Test Site:** | **966 Chamber #1** | **Polarization:** | **Horizontal** |
| **Distance:** | **3m** | **Test Mode:** | **TM1/ CH Middle** |



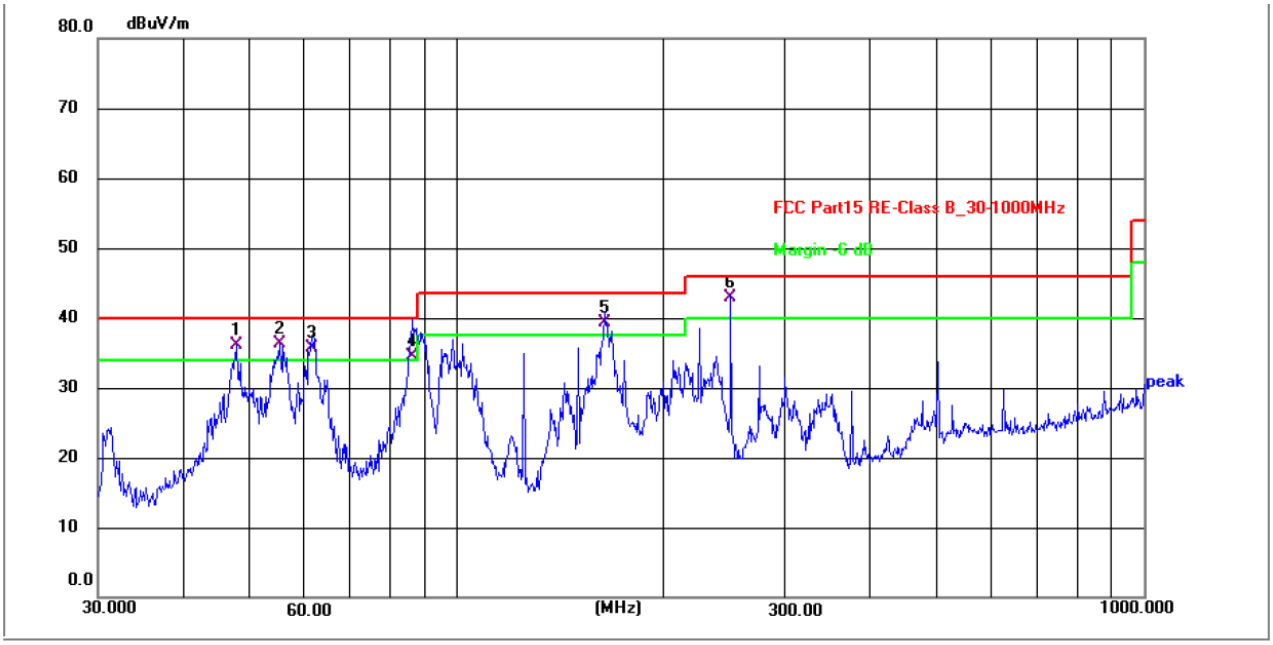

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 61.5618 | 47.07 | -15.68 | 31.39 | 40.00 | -8.61 | QP | P | |
| 2 | 64.6594 | 48.13 | -16.13 | 32.00 | 40.00 | -8.00 | QP | P | |
| 3 | 125.0066 | 54.31 | -17.21 | 37.10 | 43.50 | -6.40 | QP | P | |
| 4 | 215.2678 | 48.72 | -14.53 | 34.19 | 43.50 | -9.31 | QP | P | |
| 5 * | 250.3012 | 55.67 | -13.31 | 42.36 | 46.00 | -3.64 | QP | P | |
| 6 | 501.1790 | 44.07 | -8.43 | 35.64 | 46.00 | -10.36 | QP | P | |

**Note: Level = Reading + Factor** **Margin = Level - Limit**


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**Radiated Emission Test Data (30-1000MHz)**

| | | | |
|---|---|---|---|
| **Test Site:** | **966 Chamber #1** | **Polarization:** | **Vertical** |
| **Distance:** | **3m** | **Test Mode:** | **TM1/ CH Middle** |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 ! | 47.8260 | 50.29 | -14.19 | 36.10 | 40.00 | -3.90 | QP | P | |
| 2 ! | 55.2207 | 50.85 | -14.55 | 36.30 | 40.00 | -3.70 | QP | P | |
| 3 ! | 61.3463 | 51.35 | -15.65 | 35.70 | 40.00 | -4.30 | QP | P | |
| 4 ! | 86.2000 | 53.02 | -18.42 | 34.60 | 40.00 | -5.40 | QP | P | |
| 5 ! | 163.7550 | 57.10 | -17.70 | 39.40 | 43.50 | -4.10 | QP | P | |
| 6 * | 250.3011 | 56.49 | -13.49 | 43.00 | 46.00 | -3.00 | QP | P | |

**Note: Level = Reading + Factor** **Margin = Level - Limit**

**Radiated Spurious Emission (1GHz-25GHz)**

| Test Mode: 802.11n(HT20) | | | | | CH Low: 2412 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| V | 4824.36 | 40.61 | 4.74 | 45.35 | 74.00 | -28.66 | PK | PASS |
| V | 7236.09 | 33.90 | 9.84 | 43.74 | 74.00 | -30.26 | PK | PASS |
| V | 9648.48 | 30.81 | 13.18 | 43.99 | 74.00 | -30.01 | PK | PASS |
| V | 12060.95 | * | * | * | 74.00 | * | PK | PASS |
| V | 14472.34 | * | * | * | 74.00 | * | PK | PASS |
| V | 16884.28 | * | * | * | 74.00 | * | PK | PASS |
| H | 4824.10 | 40.67 | 4.74 | 45.41 | 74.00 | -28.59 | PK | PASS |
| H | 7236.86 | 34.53 | 9.84 | 44.37 | 74.00 | -29.64 | PK | PASS |
| H | 9648.97 | 30.40 | 13.18 | 43.58 | 74.00 | -30.43 | PK | PASS |
| H | 12060.93 | * | * | * | 74.00 | * | PK | PASS |
| H | 14472.29 | * | * | * | 74.00 | * | PK | PASS |
| H | 16884.86 | * | * | * | 74.00 | * | PK | PASS |
| V | 4824.78 | 30.00 | 4.74 | 34.74 | 54.00 | -19.26 | AV | PASS |
| V | 7236.63 | 22.97 | 9.84 | 32.81 | 54.00 | -21.19 | AV | PASS |
| V | 9648.97 | 18.12 | 13.18 | 31.30 | 54.00 | -22.71 | AV | PASS |
| V | 12060.88 | * | * | * | 54.00 | * | AV | PASS |
| V | 14472.27 | * | * | * | 54.00 | * | AV | PASS |
| V | 16884.51 | * | * | * | 54.00 | * | AV | PASS |
| H | 4824.21 | 31.82 | 4.74 | 36.56 | 54.00 | -17.45 | AV | PASS |
| H | 7236.86 | 22.69 | 9.84 | 32.53 | 54.00 | -21.47 | AV | PASS |
| H | 9648.97 | 18.05 | 13.18 | 31.23 | 54.00 | -22.78 | AV | PASS |
| H | 12060.93 | * | * | * | 54.00 | * | AV | PASS |
| H | 14472.29 | * | * | * | 54.00 | * | AV | PASS |
| H | 16884.86 | * | * | * | 54.00 | * | AV | PASS |

Remark:
1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.
2. “*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**Radiated Spurious Emission (1GHz-25GHz)**

| Test Mode: 802.11n(HT20) | | | | | CH Middle: 2437 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| V | 4874.21 | 41.61 | 4.90 | 46.51 | 74.00 | -27.49 | PK | PASS |
| V | 7311.11 | 33.62 | 9.83 | 43.45 | 74.00 | -30.55 | PK | PASS |
| V | 9748.76 | 28.65 | 13.21 | 41.86 | 74.00 | -32.14 | PK | PASS |
| V | 12185.36 | * | * | * | 74.00 | * | PK | PASS |
| V | 14622.18 | * | * | * | 74.00 | * | PK | PASS |
| V | 17059.04 | * | * | * | 74.00 | * | PK | PASS |
| H | 4874.74 | 42.79 | 4.90 | 47.69 | 74.00 | -26.32 | PK | PASS |
| H | 7311.57 | 35.31 | 9.83 | 45.14 | 74.00 | -28.87 | PK | PASS |
| H | 9748.96 | 30.16 | 13.21 | 43.37 | 74.00 | -30.63 | PK | PASS |
| H | 12185.09 | * | * | * | 74.00 | * | PK | PASS |
| H | 14622.21 | * | * | * | 74.00 | * | PK | PASS |
| H | 17059.96 | * | * | * | 74.00 | * | PK | PASS |
| V | 4874.57 | 30.19 | 4.90 | 35.09 | 54.00 | -18.91 | AV | PASS |
| V | 7311.16 | 24.94 | 9.83 | 34.77 | 54.00 | -19.23 | AV | PASS |
| V | 9748.72 | 19.30 | 13.21 | 32.51 | 54.00 | -21.49 | AV | PASS |
| V | 12185.46 | * | * | * | 54.00 | * | AV | PASS |
| V | 14622.30 | * | * | * | 54.00 | * | AV | PASS |
| V | 17059.31 | * | * | * | 54.00 | * | AV | PASS |
| H | 4874.74 | 32.07 | 4.90 | 36.97 | 54.00 | -17.03 | AV | PASS |
| H | 7311.57 | 22.66 | 9.83 | 32.49 | 54.00 | -21.52 | AV | PASS |
| H | 9748.96 | 18.15 | 13.21 | 31.36 | 54.00 | -22.65 | AV | PASS |
| H | 12185.09 | * | * | * | 54.00 | * | AV | PASS |
| H | 14622.21 | * | * | * | 54.00 | * | AV | PASS |
| H | 17059.96 | * | * | * | 54.00 | * | AV | PASS |

Remark:
1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.
2. “*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

**Radiated Spurious Emission (1GHz-25GHz)**

| Test Mode: 802.11n(HT20) | | | | | CH High: 2462 MHz | | | |
|---|---|---|---|---|---|---|---|---|
| Pol. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type | Result |
| V | 4924.94 | 40.59 | 5.05 | 45.64 | 74.00 | -28.36 | PK | PASS |
| V | 7386.37 | 33.51 | 9.83 | 43.34 | 74.00 | -30.66 | PK | PASS |
| V | 9848.85 | 28.85 | 13.24 | 42.09 | 74.00 | -31.92 | PK | PASS |
| V | 12310.23 | * | * | * | 74.00 | * | PK | PASS |
| V | 14772.79 | * | * | * | 74.00 | * | PK | PASS |
| V | 17234.06 | * | * | * | 74.00 | * | PK | PASS |
| H | 4924.83 | 42.07 | 5.05 | 47.12 | 74.00 | -26.89 | PK | PASS |
| H | 7386.21 | 33.91 | 9.83 | 43.74 | 74.00 | -30.26 | PK | PASS |
| H | 9848.94 | 30.34 | 13.24 | 43.58 | 74.00 | -30.43 | PK | PASS |
| H | 12310.09 | * | * | * | 74.00 | * | PK | PASS |
| H | 14772.83 | * | * | * | 74.00 | * | PK | PASS |
| H | 17234.45 | * | * | * | 74.00 | * | PK | PASS |
| V | 4924.79 | 32.32 | 5.05 | 37.37 | 54.00 | -16.63 | AV | PASS |
| V | 7386.80 | 22.34 | 9.83 | 32.17 | 54.00 | -21.83 | AV | PASS |
| V | 9848.76 | 19.46 | 13.24 | 32.70 | 54.00 | -21.30 | AV | PASS |
| V | 12310.32 | * | * | * | 54.00 | * | AV | PASS |
| V | 14772.53 | * | * | * | 54.00 | * | AV | PASS |
| V | 17234.44 | * | * | * | 54.00 | * | AV | PASS |
| H | 4924.83 | 31.92 | 5.05 | 36.97 | 54.00 | -17.03 | AV | PASS |
| H | 7386.21 | 22.83 | 9.83 | 32.66 | 54.00 | -21.34 | AV | PASS |
| H | 9848.94 | 18.21 | 13.24 | 31.45 | 54.00 | -22.56 | AV | PASS |
| H | 12310.09 | * | * | * | 54.00 | * | AV | PASS |
| H | 14772.83 | * | * | * | 54.00 | * | AV | PASS |
| H | 17234.45 | * | * | * | 54.00 | * | AV | PASS |

Remark:
1. Emission Level = Reading + Factor, Margin= Emission Level – Limit.
2. “*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

# ANNEX A TEST SETUP PHOTOS

Please refer to the document “8330EU122130W-AA.PDF”

# ANNEX B EXTERNAL PHOTOS

Please refer to the document “8330EU122130W-AB.PDF”

# ANNEX C INTERNAL PHOTOS

Please refer to the document “8330EU122130W-AC.PDF”

# ANNEX D TEST DATA

Please refer to the document “8330EU122130W-AD.PDF”


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com

# STATEMENT

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
3. For the report with CNAS mark or A2LA mark, the items marked with "☆" are not within the accredited scope.
4. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the “inspection and testing dedicated stamp” or test report stamp.
5. The test data and results are only valid for the tested samples provided by the customer.
6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

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


Address: 101, Building B1, Fuqiao Fourth Area, Qiaotou Community, Fuhai Subdistrict, Baoan District, Shenzhen, Guangdong, China
Website: www.eu-test.com
Tel: (86)-755-2357-9714 Email: Service@eu-test.com