# FCC Test Report

**Test Report**
**On Behalf of**
**Guangdong Weili Intelligent Development Co., Ltd.**
**For**
**Remote control car series**
**Model No.: 6401-C, 6401, 6402, 6403, 6404, 6405, 6406, 6407, 6408, 6405-C, 6406-C, 6407-C, 6408-C, K4307, K4308, K4309, K4310, K4311, K4312, 284018, 284019, 164018, 124020, 244016, 22208, 104028, Q7201, Q7202, Q7203, Q7204, 184017, 184018, 184019, 184011, 184008, 184020, 184021, 184023, 144016, 144018, 22201, 22206, 322221, 284131, 284161, 284010, K969, K989, 2428, 204006**

**FCC ID: 2ASUS-6401-C**

| | |
|---|---|
| **Prepared For:** | **Guangdong Weili Intelligent Development Co., Ltd.**<br>**D Zone, Xiehe Industrial Park, South of Laimei Road, Chenghai District, Shantou, 515800, China** |
| **Prepared By:** | **Shenzhen HUAK Testing Technology Co., Ltd.**<br>**1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China** |
| **Date of Test:** | **Apr. 11, 2025 ~ Apr. 21, 2025** |
| **Date of Report:** | **Apr. 21, 2025** |
| **Report Number:** | **HK2504111811-E** |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

# Test Result Certification

| | |
|---|---|
| **Applicant's Name** ..... : | Guangdong Weili Intelligent Development Co., Ltd. |
| Address ..... : | D Zone, Xiehe Industrial Park, South of Laimei Road, Chenghai District, Shantou, 515800, China |
| **Manufacturer's Name** ..... : | Guangdong Weili Intelligent Development Co., Ltd. |
| Address ..... : | D Zone, Xiehe Industrial Park, South of Laimei Road, Chenghai District, Shantou, 515800, China |
| **Product Description** | |
| Trade Mark ..... : | N/A |
| Product Name ..... : | Remote control car series |
| Model and/or Type Reference.. : | 6401-C, 6401, 6402, 6403, 6404, 6405, 6406, 6407, 6408, 6405-C, 6406-C, 6407-C, 6408-C, K4307, K4308, K4309, K4310, K4311, K4312, 284018, 284019, 164018, 124020, 244016, 22208, 104028, Q7201, Q7202, Q7203, Q7204, 184017, 184018, 184019, 184011, 184008, 184020, 184021, 184023, 144016, 144018, 22201, 22206, 322221, 284131, 284161, 284010, K969, K989, 2428, 204006 |
| **Standards** ..... : | **FCC Rules and Regulations Part 15 Subpart C Section 15.249**<br>**ANSI C63.10: 2013** |

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen HUAK Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen HUAK Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

| | |
|---|---|
| **Date of Test** ..... : | |
| Date (s) of Performance of Tests ..... : | **Apr. 11, 2025 ~ Apr. 21, 2025** |
| Date of Issue ..... : | **Apr. 21, 2025** |
| Test Result ..... : | **Pass** |

Testing Engineer

Len Liao

Technical Manager

Sliver Wan

Authorized Signatory

Jason Zhou

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

**Table of Contents** **Page**


1 . Test Summary 5
1.1 Test Procedures and Results 5
1.2 Information of the Test Laboratory 5
1.3 Measurement Uncertainty 5
2 . General Information 6
2.1 General Description of EUT 6
2.2 Carrier Frequency of Channels 7
2.3 Operation of EUT during Testing 7
2.4 Description of Test Setup 8
2.5 Description of Support Units 9
2.5 Measurement Instruments List 10
3 . AC Conducted Emissions Test 11
3.1 AC Power Line Emission Limit 11
3.2 Test Setup 11
3.3 Test Procedure 11
3.4 Test Result 12
4. Radiated Emission Test 14
4.1 Radiation Limit 14
4.2 Test Setup 14
4.3 Test Procedure 15
4.4 Test Result 15
5. Band Edge 21
5.1 Limits 21
5.2 Test Procedure 21
5.3 Test Result 22
6. Occupied Bandwidth Measurement 24
6.1 Test Setup 24
6.2 Test Procedure 24
6.3 Measurement Equipment Used 24
6.4 Test Result 24
7. Antenna Requirement 26
8. Photographs of Test 27
9. Photos of the EUT 29


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

# ** Modified History **

| Revision | Description | Issued Data | Remark |
|---|---|---|---|
| Revision 1.0 | Initial Test Report Release | Apr. 21, 2025 | Jason Zhou |
| | | | |
| | | | |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

# 1. Test Summary

## 1.1 Test Procedures and Results

| DESCRIPTION OF TEST | SECTION NUMBER | RESULT |
|---|---|---|
| AC CONDUCTED EMISSIONS TEST | 15.207 | COMPLIANT |
| RADIATED EMISSION TEST | 15.249(a)/15.209 | COMPLIANT |
| BAND EDGE | 15.249(d)/15.205 | COMPLIANT |
| OCCUPIED BANDWIDTH MEASUREMENT | 15.215(c) | COMPLIANT |
| ANTENNA REQUIREMENT | 15.203 | COMPLIANT |

## 1.2 Information of the Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd.
Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization：

A2LA Accreditation Code is 4781.01.
FCC Designation Number is CN1229.
Canada IC CAB identifier is CN0045.
CNAS Registration Number is L9589.

## 1.3 Measurement Uncertainty

Measurement Uncertainty

| | | |
|---|---|---|
| AC Conducted Emission Expanded Uncertainty | = | 2.71dB, k=2 |
| Radiated emission expanded uncertainty(9kHz-30MHz) | = | 3.90dB, k=2 |
| Radiated emission expanded uncertainty(30MHz-1000MHz) | = | 3.90dB, k=2 |
| Radiated emission expanded uncertainty(Above 1GHz) | = | 4.28dB, k=2 |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

# 2. General Information

## 2.1 General Description of EUT

| | |
|---|---|
| Equipment: | Remote control car series |
| Model Name: | 6401-C |
| Series Model: | 6401, 6402, 6403, 6404, 6405, 6406, 6407, 6408, 6405-C, 6406-C, 6407-C, 6408-C, K4307, K4308, K4309, K4310, K4311, K4312, 284018, 284019, 164018, 124020, 244016, 22208, 104028, Q7201, Q7202, Q7203, Q7204, 184017, 184018, 184019, 184011, 184008, 184020, 184021, 184023, 144016, 144018, 22201, 22206, 322221, 284131, 284161, 284010, K969, K989, 2428, 204006 |
| Model Difference: | All model's the function, software and electric circuit are the same, only with a product model named different.<br>Test sample model: 6401-C. |
| FCC ID: | 2ASUS-6401-C |
| Antenna Type: | Internal Antenna |
| Antenna Gain: | 0.17dBi |
| Operation Frequency: | 2455-2480MHz |
| Number of Channels: | 22CH |
| Modulation Type: | GFSK |
| Power Source: | DC5V From Type-C or DC3.7V From Battery |
| Power Rating: | DC5V From Type-C or DC3.7V From Battery |
| Note:<br>1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.<br>2. Antenna gain Refer to the antenna specifications.<br>3. The cable loss data is obtained from the supplier.<br>4. The test results in the report only apply to the tested sample. | |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

## 2.2 Carrier Frequency of Channels

| Operation Frequency each of channel | | | |
|---|---|---|---|
| Channel | Frequency | Channel | Frequency |
| 1 | 2455MHz | 12 | 2470MHz |
| 2 | 2456MHz | 13 | 2471MHz |
| 3 | 2457MHz | 14 | 2472MHz |
| 4 | 2458MHz | 15 | 2473MHz |
| 5 | 2459MHz | 16 | 2474MHz |
| 6 | 2460MHz | 17 | 2475MHz |
| 7 | 2461MHz | 18 | 2476MHz |
| 8 | 2462MHz | 19 | 2477MHz |
| 9 | 2463MHz | 20 | 2478MHz |
| 10 | 2464MHz | 21 | 2479MHz |
| 11 | 2465MHz | 22 | 2480MHz |

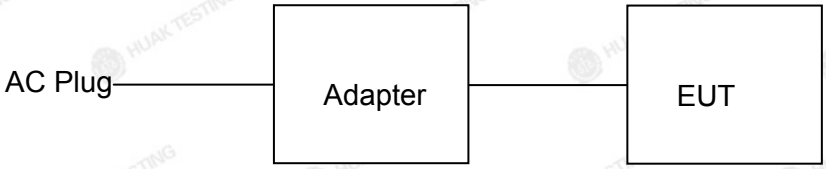
## 2.3 Operation of EUT during Testing

Operating Mode
The mode is used: **Transmitting mode**
Low Channel: 2455MHz
Middle Channel: 2470MHz
High Channel: 2480MHz

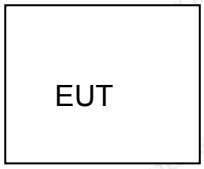
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

## 2.4 Description of Test Setup

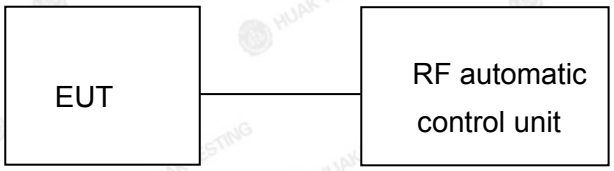
Operation of EUT during AC conducted testing and below 1GHz radiation testing:




Operation of EUT during above 1GHz radiation testing:




Operation of EUT during RF conducted testing:




The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

## 2.5 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Trade Mark | Model/Type No. | Specification | Note |
|---|---|---|---|---|---|
| 1 | Remote control car series | N/A | 6401-C | N/A | EUT |
| 2 | USB Cable | N/A | N/A | Length: 15cm | Accessory |
| 3 | Adapter | N/A | MDY-10-EH | Input: AC100-240V, 50/60Hz, 0.7A Output: DC5V/3A, 9V/3A, 12V/2.25A, 20V/1.35A | Peripheral |
| | | | | | |
| | | | | | |
| | | | | | |

***Note:***

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

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

*3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.*

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

## 2.5 Measurement Instruments List

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | L.I.S.N. | R&S | ENV216 | HKE-002 | 2025/02/19 | 1 Year |
| 2 | L.I.S.N. | R&S | ENV216 | HKE-059 | 2025/02/19 | 1 Year |
| 3 | EMI Test Receiver | R&S | ESR | HKE-005 | 2025/02/19 | 1 Year |
| 4 | Spectrum analyzer | Agilent | N9020A | HKE-025 | 2025/02/19 | 1 Year |
| 5 | Spectrum analyzer | R&S | FSV3044 | HKE-126 | 2025/02/19 | 1 Year |
| 6 | Preamplifier | EMCI | EMC051845S | HKE-006 | 2025/02/19 | 1 Year |
| 7 | Preamplifier | Schwarzbeck | BBV 9743 | HKE-016 | 2025/02/19 | 1 Year |
| 8 | Preamplifier | A.H. Systems | SAS-574 | HKE-182 | 2025/02/19 | 1 Year |
| 9 | 6dB Attenuator | Pasternack | 6db | HKE-184 | 2025/02/19 | 1 Year |
| 10 | EMI Test Receiver | Rohde & Schwarz | ESR-7 | HKE-010 | 2025/02/19 | 1 Year |
| 11 | Broadband Antenna | Schwarzbeck | VULB9168 | HKE-167 | 2024/02/21 | 2 Year |
| 12 | Loop Antenna | COM-POWER | AL-130R | HKE-014 | 2024/02/21 | 2 Year |
| 13 | Horn Antenna | Schwarzbeck | 9120D | HKE-013 | 2024/02/21 | 2 Year |
| 14 | EMI Test Software | Tonscend | JS32-CE 2.5.0.6 | HKE-081 | / | / |
| 15 | EMI Test Software | Tonscend | JS32-RE 5.0.0 | HKE-082 | / | / |
| 16 | RF Automatic control unit | Tonscend | JS0806-2 | HKE-060 | 2025/02/19 | 1 Year |
| 17 | High pass filter unit | Tonscend | JS0806-F | HKE-055 | 2025/02/19 | 1 Year |
| 18 | Wireless Communication Test Set | R&S | CMU200 | HKE-026 | 2025/02/19 | 1 Year |
| 19 | Wireless Communication Test Set | R&S | CMW500 | HKE-027 | 2025/02/19 | 1 Year |
| 20 | High-low temperature chamber | Guangke | HT-80L | HKE-118 | 2024/06/10 | 1 Year |
| 21 | Temperature and humidity meter | Boyang | HTC-1 | HKE-075 | 2024/06/10 | 1 Year |
| 22 | RF Test Software | Tonscend | JS1120-3 Version 3.5.39 | HKE-083 | / | / |
| 23 | 10dB Attenuator | Schwarzbeck | VTSD9561F | HKE-153 | 2025/02/19 | 1 Year |
| 24 | RSE Test Software | Tonscend | JS36-RSE 5.0.0 | HKE-184 | / | / |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

# 3. AC Conducted Emissions Test

## 3.1 AC Power Line Emission Limit

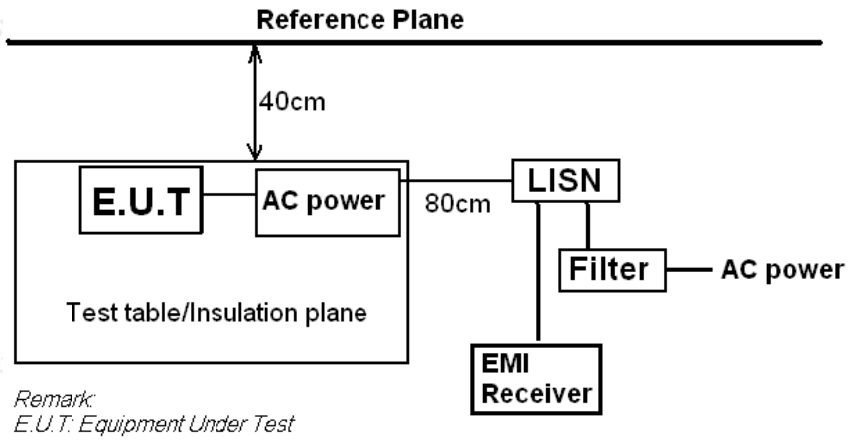
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following.

| Frequency (MHz) | Maximum RF Line Voltage (dBμV) | | | |
|---|---|---|---|---|
| | CLASS A | | CLASS B | |
| | Q.P. | Ave. | Q.P. | Ave. |
| 0.15 - 0.50 | 79 | 66 | 66-56* | 56-46* |
| 0.50 - 5.00 | 73 | 60 | 56 | 46 |
| 5.00 - 30.0 | 73 | 60 | 60 | 50 |

* Decreasing linearly with the logarithm of the frequency.

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

## 3.2 Test Setup




*Remark:*
*E.U.T: Equipment Under Test*
*LISN: Line Impedence Stabilization Network*
*Test table height=0.8m*

## 3.3 Test Procedure

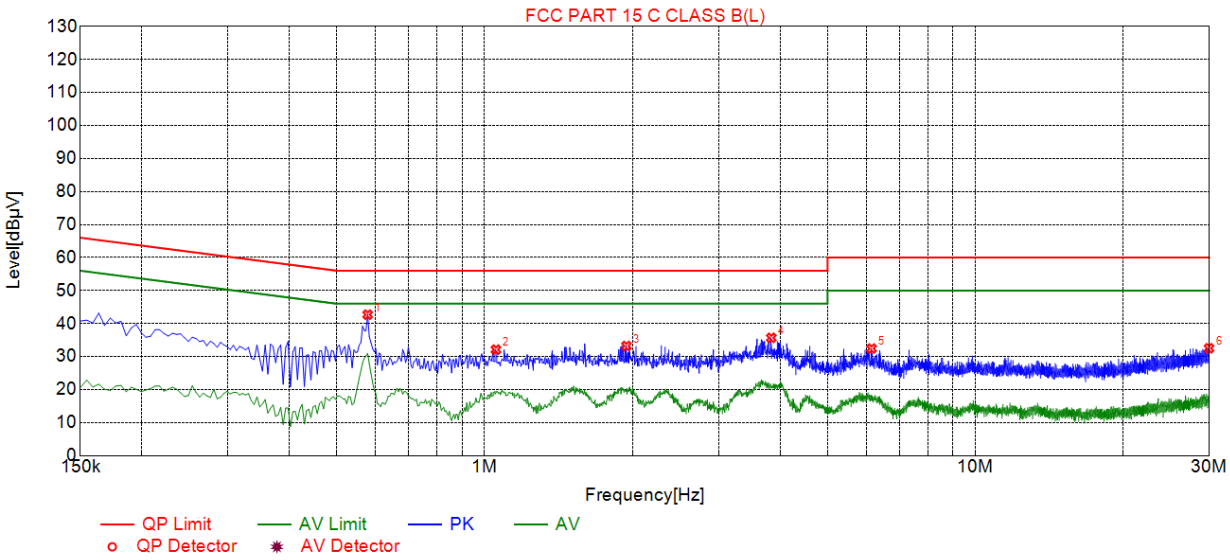
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

### 3.4 Test Result

All modes have been tested, only the worst result was reported as below:

Test Specification: Line




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV] | Factor [dB] | Limit [dBµV] | Margin [dB] | Reading [dBµV] | Detector | Type |
| 1 | 0.5775 | 42.70 | 19.77 | 56.00 | 13.30 | 22.93 | PK | L |
| 2 | 1.0545 | 32.10 | 19.79 | 56.00 | 23.90 | 12.31 | PK | L |
| 3 | 1.9455 | 33.20 | 20.12 | 56.00 | 22.80 | 13.08 | PK | L |
| 4 | 3.8400 | 35.68 | 20.34 | 56.00 | 20.32 | 15.34 | PK | L |
| 5 | 6.1485 | 32.43 | 20.40 | 60.00 | 27.57 | 12.03 | PK | L |
| 6 | 29.9580 | 32.51 | 25.55 | 60.00 | 27.49 | 6.96 | PK | L |

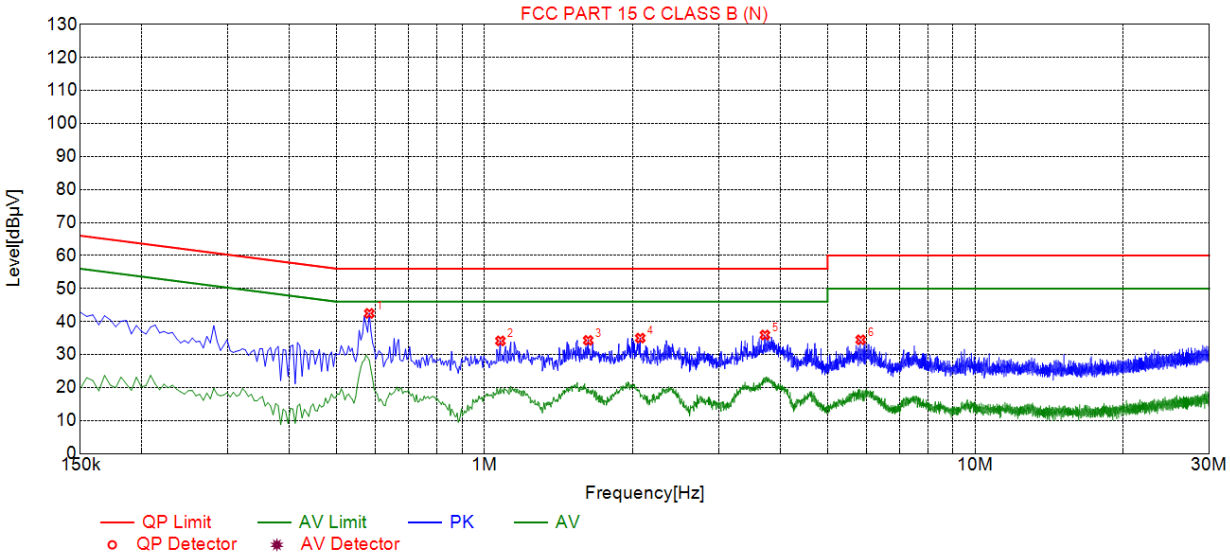
Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

Test Specification: Neutral




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV] | Factor [dB] | Limit [dBµV] | Margin [dB] | Reading [dBµV] | Detector | Type |
| 1 | 0.5820 | 42.48 | 19.75 | 56.00 | 13.52 | 22.73 | PK | N |
| 2 | 1.0770 | 34.14 | 19.78 | 56.00 | 21.86 | 14.36 | PK | N |
| 3 | 1.6260 | 34.30 | 19.88 | 56.00 | 21.70 | 14.42 | PK | N |
| 4 | 2.0760 | 34.99 | 19.96 | 56.00 | 21.01 | 15.03 | PK | N |
| 5 | 3.7275 | 35.93 | 20.14 | 56.00 | 20.07 | 15.79 | PK | N |
| 6 | 5.8425 | 34.47 | 20.38 | 60.00 | 25.53 | 14.09 | PK | N |

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

# 4. Radiated Emission Test

## 4.1 Radiation Limit

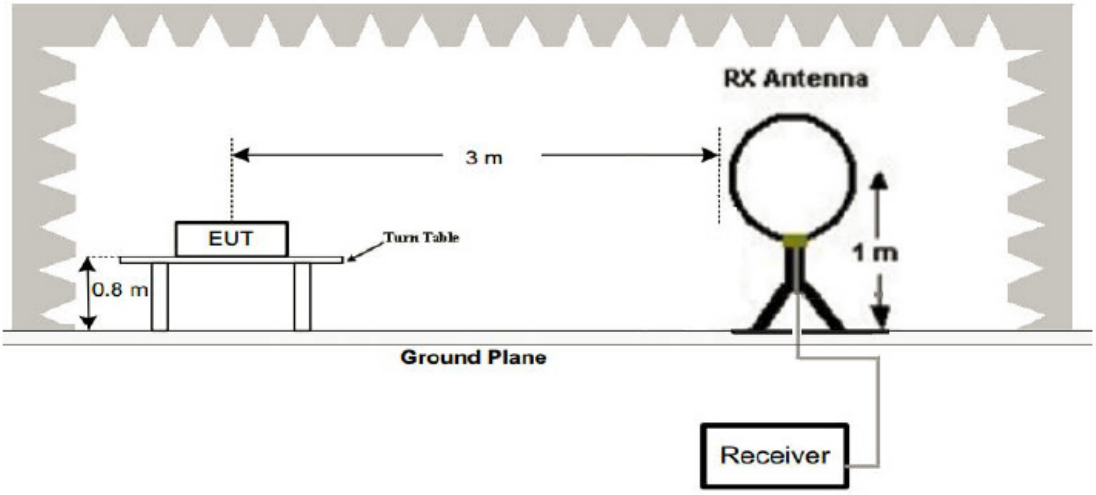
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m) | Radiated (μV/m) |
|---|---|---|---|
| 0.009-0.490 | 300 | 20log 2400/F (kHz) | 2400/F (kHz) |
| 0.490-1.705 | 30 | 20log 24000/F (kHz) | 24000/F (kHz) |
| 1.705-30 | 30 | 20log 30 | 30 |
| 30-88 | 3 | 40 | 100 |
| 88-216 | 3 | 43.5 | 150 |
| 216-960 | 3 | 46 | 200 |
| Above 960 | 3 | 54 | 500 |

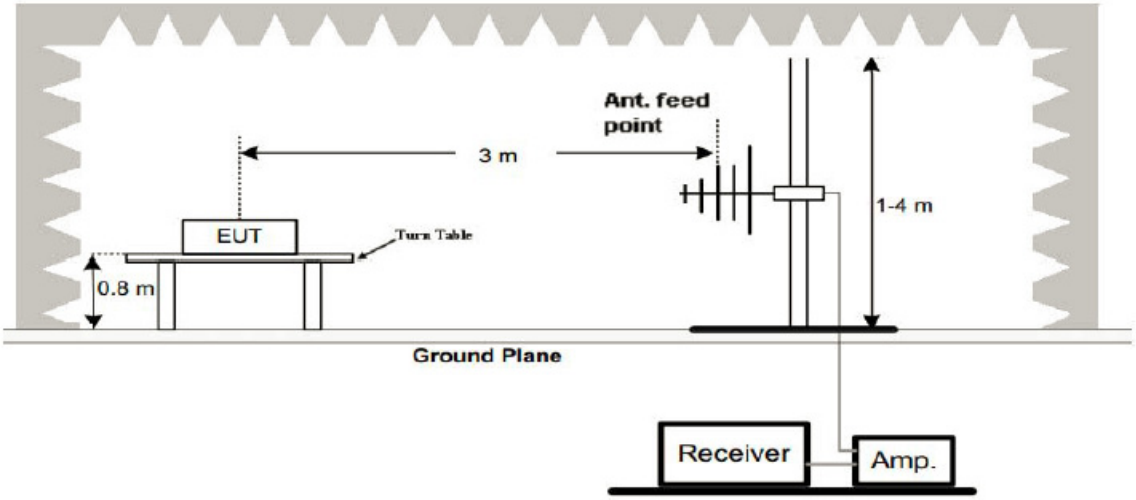
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

## 4.2 Test Setup

（1）Radiated Emission Test-Up Frequency Below 30MHz

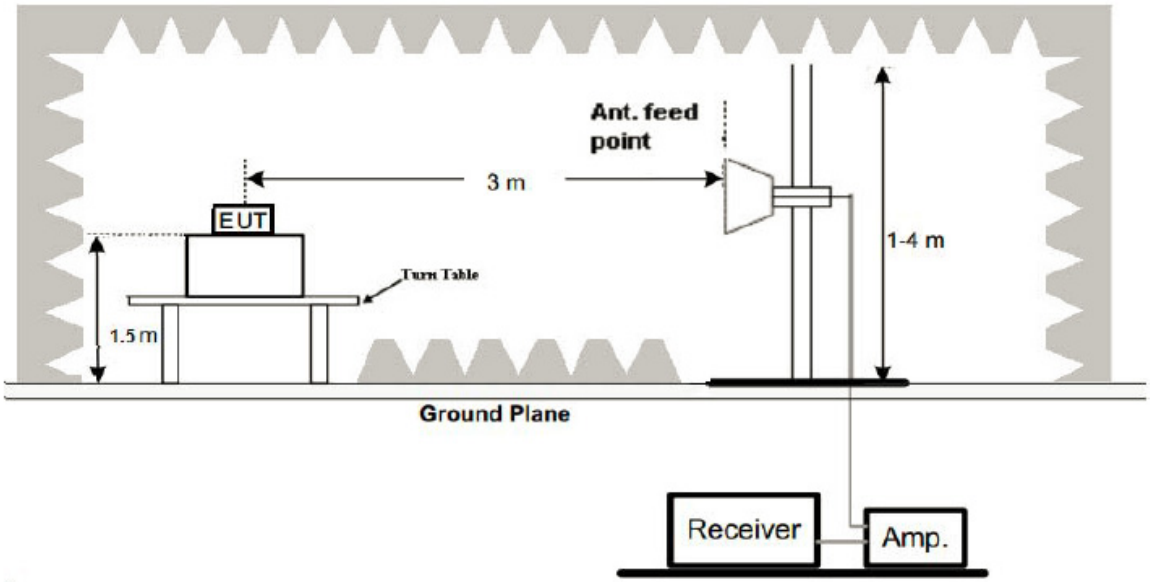



（2）Radiated Emission Test-Up Frequency 30MHz~1GHz




The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

（3）Radiated Emission Test-Up Frequency Above 1GHz




## 4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

Note:
For battery operated equipment, the equipment tests shall be performed using a new battery.

## 4.4 Test Result

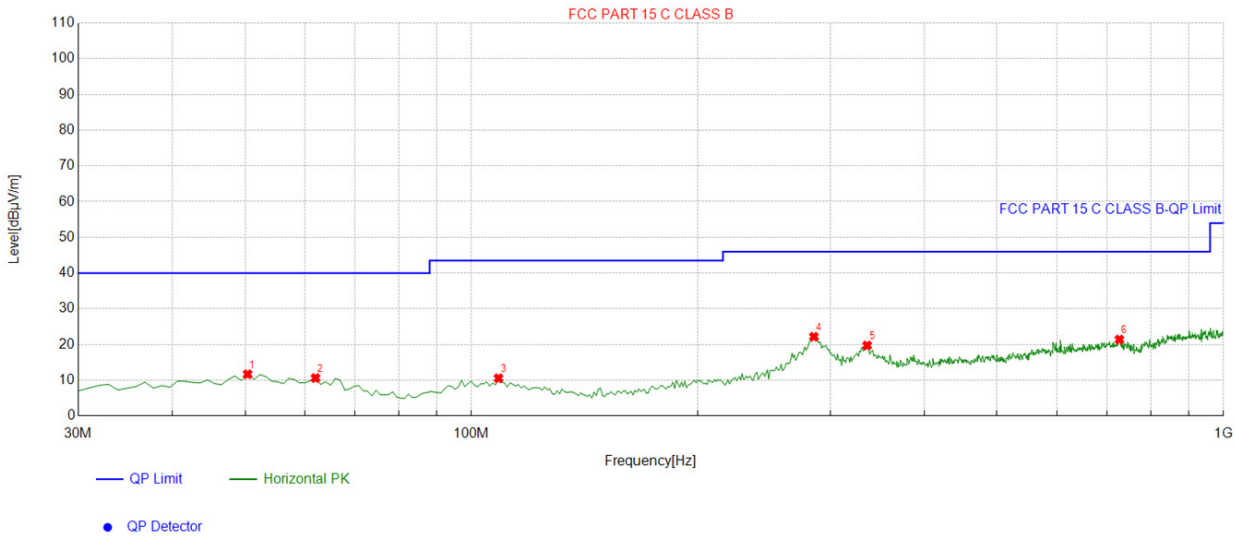
PASS

All the test modes completed for test. The worst case of Radiated Emission is CH 01; the test data of this mode was reported.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

Below 1GHz Test Results:

Antenna polarity: H

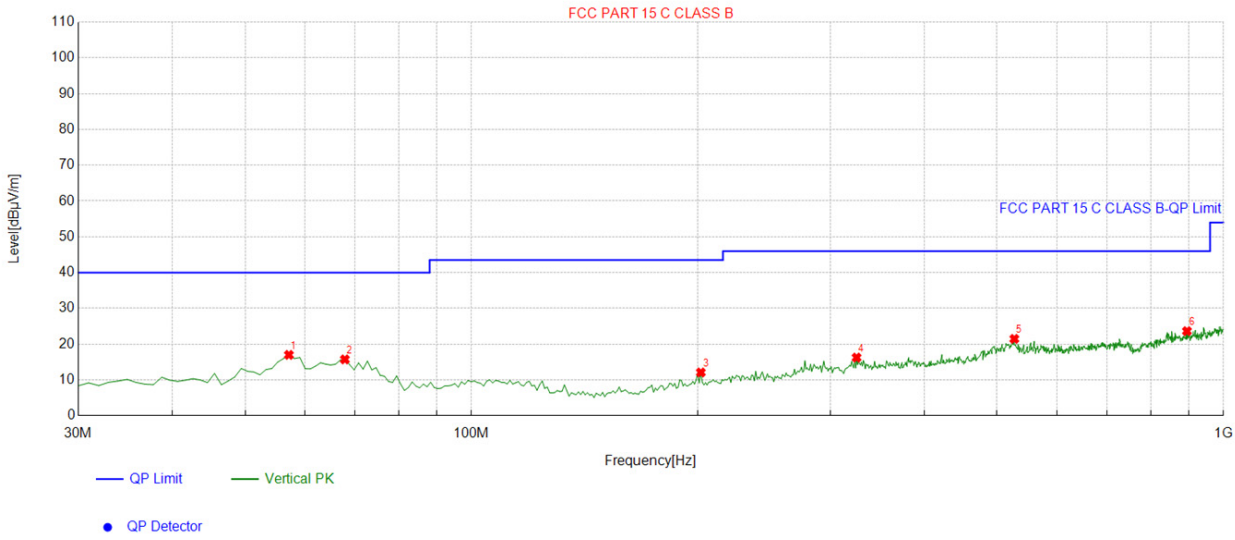



| Suspected List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Factor [dB] | Reading [dBμV/m] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 50.39039 | -13.15 | 24.83 | 11.68 | 40.00 | 28.32 | 100 | 23 | Horizontal |
| 2 | 62.042042 | -14.29 | 24.90 | 10.61 | 40.00 | 29.39 | 100 | 106 | Horizontal |
| 3 | 108.64864 | -14.02 | 24.57 | 10.55 | 43.50 | 32.95 | 100 | 121 | Horizontal |
| 4 | 285.36536 | -12.45 | 34.63 | 22.18 | 46.00 | 23.82 | 100 | 159 | Horizontal |
| 5 | 335.85585 | -10.57 | 30.31 | 19.74 | 46.00 | 26.26 | 100 | 147 | Horizontal |
| 6 | 727.15715 | -3.80 | 25.20 | 21.40 | 46.00 | 24.60 | 100 | 350 | Horizontal |

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

Antenna polarity: V




| Suspected List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Factor [dB] | Reading [dBμV/m] | Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 57.187187 | -13.76 | 30.77 | 17.01 | 40.00 | 22.99 | 100 | 337 | Vertical |
| 2 | 67.867868 | -16.02 | 31.76 | 15.74 | 40.00 | 24.26 | 100 | 83 | Vertical |
| 3 | 201.86186 | -15.19 | 27.28 | 12.09 | 43.50 | 31.41 | 100 | 48 | Vertical |
| 4 | 325.17517 | -11.00 | 27.25 | 16.25 | 46.00 | 29.75 | 100 | 225 | Vertical |
| 5 | 527.13713 | -7.08 | 28.55 | 21.47 | 46.00 | 24.53 | 100 | 280 | Vertical |
| 6 | 894.16416 | -1.20 | 24.84 | 23.64 | 46.00 | 22.36 | 100 | 163 | Vertical |

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

## Harmonics and Spurious Emissions

### Frequency Range (9 kHz-30MHz)

| Frequency (MHz) | Level@3m (dBμV/m) | Limit@3m (dBμV/m) |
|---|---|---|
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |

***Note:*** *1. Emission Level=Reading+ Cable loss+ Antenna factor-Amp factor.*

*2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.*

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

Above 1 GHz Test Results:

CH Low (2455MHz)

Horizontal:

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2455 | 101.04 | -5.84 | 95.2 | 114 | 18.8 | peak |
| 2455 | 84.05 | -5.84 | 78.21 | 94 | 15.79 | AVG |
| 4910 | 52.57 | -3.64 | 48.93 | 74 | 25.07 | peak |
| 4910 | 38.12 | -3.64 | 34.48 | 54 | 19.52 | AVG |
| 7365 | 50.52 | -0.95 | 49.57 | 74 | 24.43 | peak |
| 7365 | 39.46 | -0.95 | 38.51 | 54 | 15.49 | AVG |

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level.

Vertical:

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2455 | 102.83 | -5.84 | 96.99 | 114 | 17.01 | peak |
| 2455 | 81.43 | -5.84 | 75.59 | 94 | 18.41 | AVG |
| 4910 | 50.93 | -3.64 | 47.29 | 74 | 26.71 | peak |
| 4910 | 40.28 | -3.64 | 36.64 | 54 | 17.36 | AVG |
| 7365 | 48.89 | -0.95 | 47.94 | 74 | 26.06 | peak |
| 7365 | 39.49 | -0.95 | 38.54 | 54 | 15.46 | AVG |

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

CH Middle (2470MHz)

Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2470 | 104.77 | -5.71 | 99.06 | 114 | 14.94 | peak |
| 2470 | 73.82 | -5.71 | 68.11 | 94 | 25.89 | AVG |
| 4940 | 48.33 | -3.51 | 44.82 | 74 | 29.18 | peak |
| 4940 | 42.46 | -3.51 | 38.95 | 54 | 15.05 | AVG |
| 7410 | 49.47 | -0.82 | 48.65 | 74 | 25.35 | peak |
| 7410 | 41.80 | -0.82 | 40.98 | 54 | 13.02 | AVG |
| Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level. | | | | | | |

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2470 | 103.37 | -5.71 | 97.66 | 114 | 16.34 | peak |
| 2470 | 80.02 | -5.71 | 74.31 | 94 | 19.69 | AVG |
| 4940 | 55.92 | -3.51 | 52.41 | 74 | 21.59 | peak |
| 4940 | 42.58 | -3.51 | 39.07 | 54 | 14.93 | AVG |
| 7410 | 51.16 | -0.82 | 50.34 | 74 | 23.66 | peak |
| 7410 | 40.04 | -0.82 | 39.22 | 54 | 14.78 | AVG |
| Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level. | | | | | | |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

CH High (2480MHz)

Horizontal:

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2480 | 104.66 | -5.65 | 99.01 | 114 | 14.99 | peak |
| 2480 | 80.03 | -5.65 | 74.38 | 94 | 19.62 | AVG |
| 4960 | 53.37 | -3.43 | 49.94 | 74 | 24.06 | peak |
| 4960 | 41.69 | -3.43 | 38.26 | 54 | 15.74 | AVG |
| 7440 | 48.82 | -0.75 | 48.07 | 74 | 25.93 | peak |
| 7440 | 39.75 | -0.75 | 39 | 54 | 15 | AVG |

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level.

Vertical:

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2480 | 106.19 | -5.65 | 100.54 | 114 | 13.46 | peak |
| 2480 | 80.48 | -5.65 | 74.83 | 94 | 19.17 | AVG |
| 4960 | 53.03 | -3.43 | 49.6 | 74 | 24.4 | peak |
| 4960 | 42.16 | -3.43 | 38.73 | 54 | 15.27 | AVG |
| 7440 | 48.49 | -0.75 | 47.74 | 74 | 26.26 | peak |
| 7440 | 40.68 | -0.75 | 39.93 | 54 | 14.07 | AVG |

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level.

Remark：
(1) Measuring frequencies from 1 GHz to the 25 GHz.
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency; “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4)The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.
(7) All modes of operation were investigated and the worst-case emissions are reported.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

# 5. Band Edge

## 5.1 Limits

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

## 5.2 Test Procedure

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 1MHz and VBM to 3MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength. The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 1MHz and VBW to 3MHz, to measure the conducted peak band edge.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

## 5.3 Test Result

**PASS**

Radiated Band Edge Test:

Operation Mode: TX CH Low (2455MHz)

Horizontal (Worst case):

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2310 | 54.99 | -5.81 | 49.18 | 74 | 24.82 | peak |
| 2310 | / | -5.81 | / | 54 | / | AVG |
| 2390 | 54.01 | -5.84 | 48.17 | 74 | 25.83 | peak |
| 2390 | / | -5.84 | / | 54 | / | AVG |
| 2400 | 50.02 | -5.84 | 44.18 | 74 | 29.82 | peak |
| 2400 | / | -5.84 | / | 54 | / | AVG |
| Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level. | | | | | | |

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2310 | 56.89 | -5.81 | 51.08 | 74 | 22.92 | peak |
| 2310 | / | -5.81 | / | 54 | / | AVG |
| 2390 | 52.57 | -5.84 | 46.73 | 74 | 27.27 | peak |
| 2390 | / | -5.84 | / | 54 | / | AVG |
| 2400 | 52.71 | -5.84 | 46.87 | 74 | 27.13 | peak |
| 2400 | / | -5.84 | / | 54 | / | AVG |
| Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level. | | | | | | |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

Operation Mode: TX CH High (2480MHz)

Horizontal (Worst case):

| Frequency (MHz) | Reading Result (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2483.50 | 55.41 | -5.65 | 49.76 | 74 | 24.24 | peak |
| 2483.50 | / | -5.65 | / | 54 | / | AVG |
| 2500.00 | 53.07 | -5.65 | 47.42 | 74 | 26.58 | peak |
| 2500.00 | / | -5.65 | / | 54 | / | AVG |
| Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level. | | | | | | |

Vertical:

| Frequency (MHz) | Reading Result (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2483.50 | 52.27 | -5.65 | 46.62 | 74 | 27.38 | peak |
| 2483.50 | / | -5.65 | / | 54 | / | AVG |
| 2500.00 | 51.14 | -5.65 | 45.49 | 74 | 28.51 | peak |
| 2500.00 | / | -5.65 | / | 54 | / | AVG |
| Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit-Level. | | | | | | |
| Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit. | | | | | | |

Remark:

1. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.
2. In restricted bands of operation, the spurious emissions below the permissible value more than 20dB.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

# 6. Occupied Bandwidth Measurement

## 6.1 Test Setup

Same as Radiated Emission Measurement

## 6.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on ANSI C63.10 section 6.9.2: RBW= 20KHz. VBW= 62KHz, Span= 3MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector.

## 6.3 Measurement Equipment Used

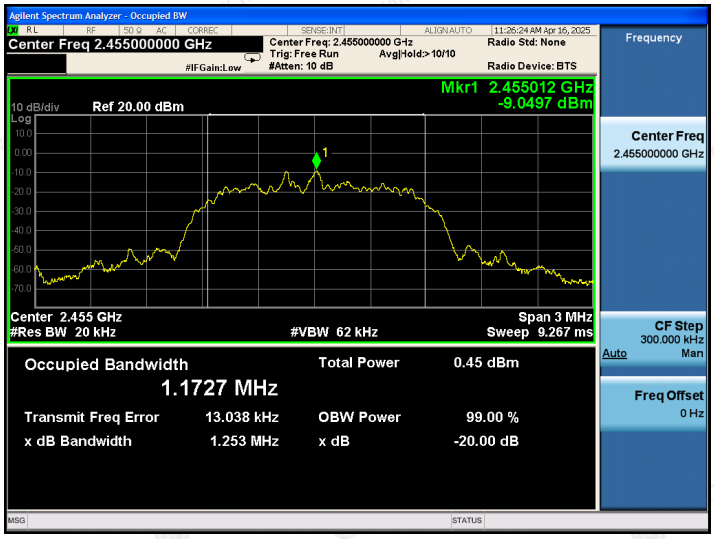
Same as Radiated Emission Measurement

## 6.4 Test Result

**PASS**

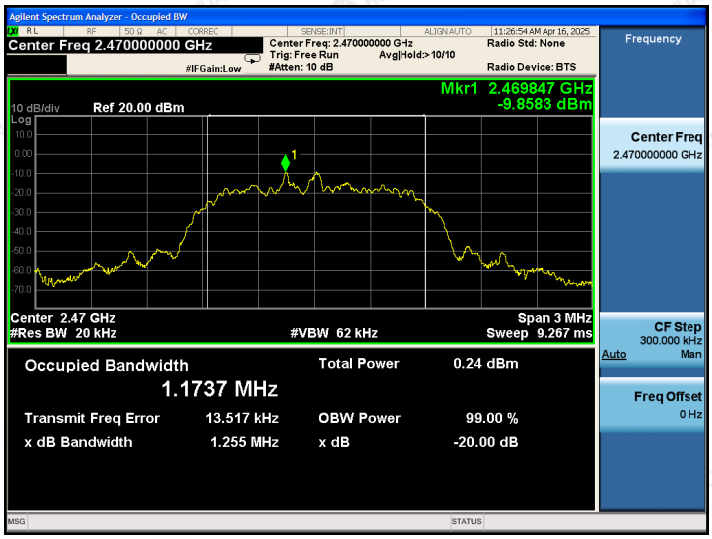
| Frequency | 20dB Bandwidth (MHz) | Result |
|---|---|---|
| 2455MHz | 1.253 | **PASS** |
| 2470MHz | 1.255 | **PASS** |
| 2480MHz | 1.255 | **PASS** |

CH: 2455MHz

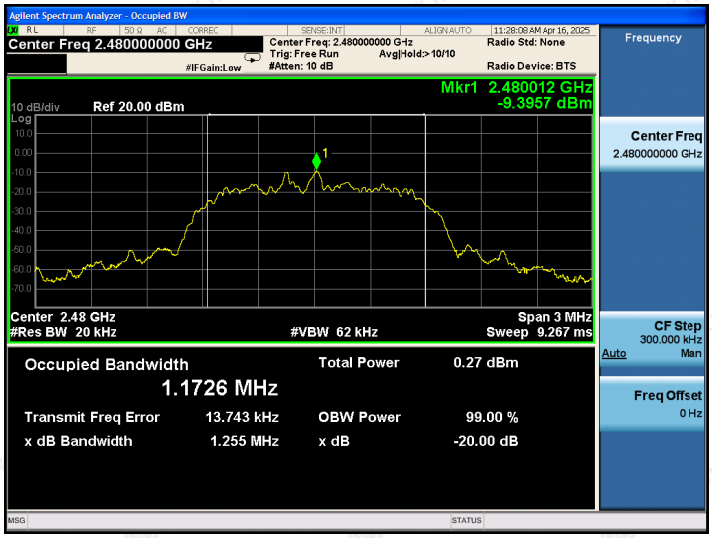



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

CH: 2470MHz




CH: 2480MHz




The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

# 7. Antenna Requirement

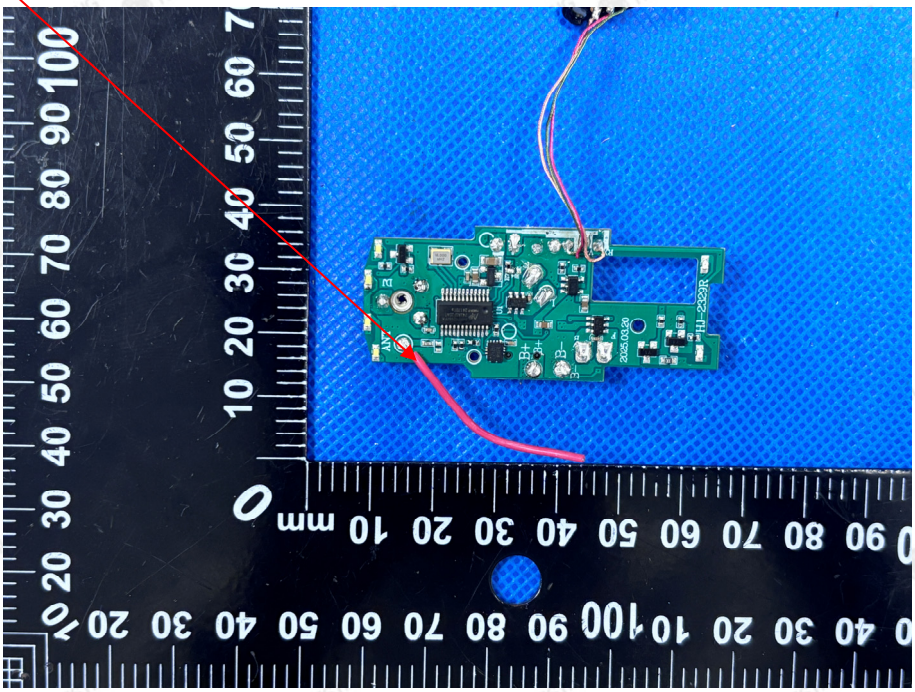
**Standard Applicable**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

**Antenna Connected Construction**

The antenna used in this product is a Internal antenna, need professional installation, not easy to remove. It conforms to the standard requirements. The directional gains of antenna used for transmitting is 0.17dBi.

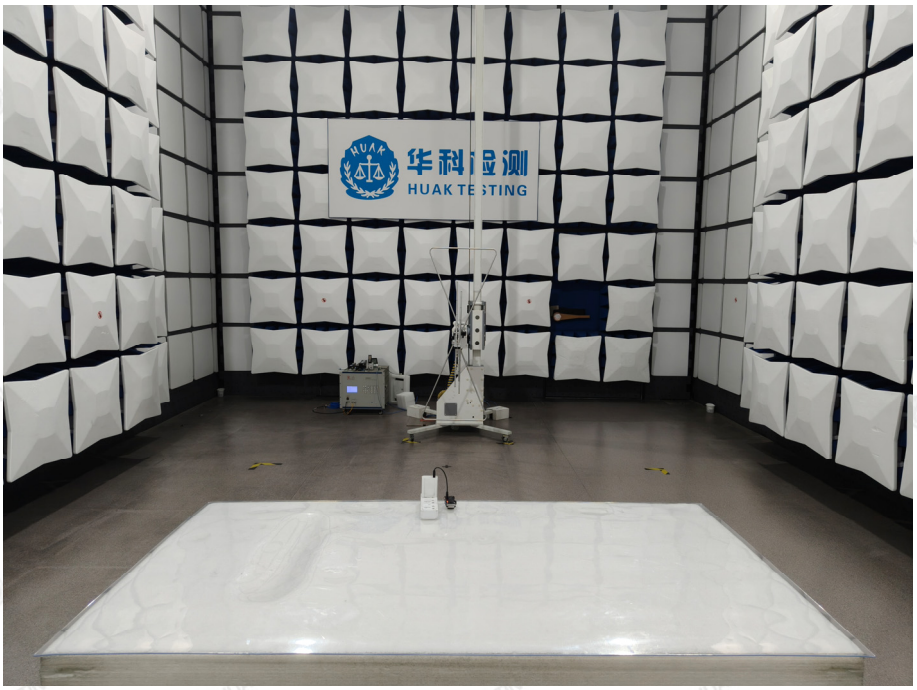
Antenna

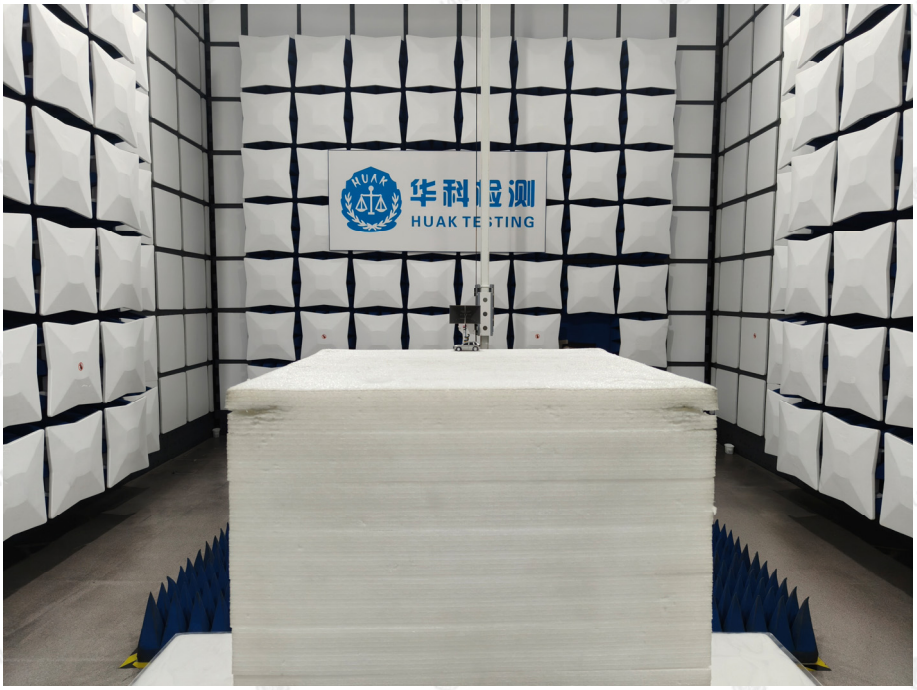


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

## 8. Photographs of Test

Radiated Emission

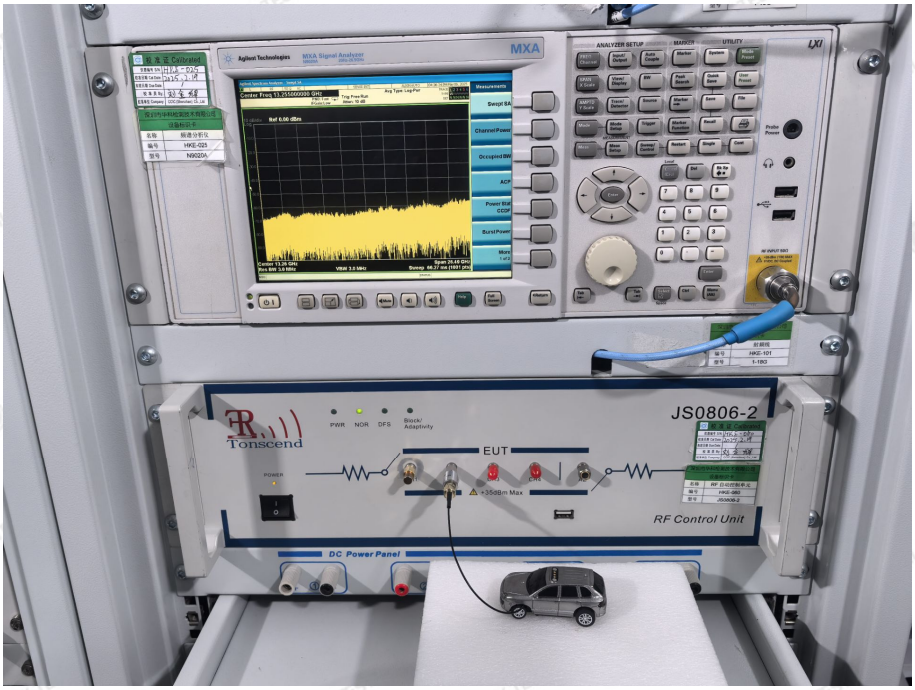



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

AC Conducted Emission

RF Conducted Emission




The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

## 9. Photos of the EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos.

---------End of test report---------

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China