EUROFINS ELECTRICAL TESTING SERVICE (SHENZHEN) CO., LTD.

# EMC TEST- REPORT

**FCC Compliance Test Report for**

**Product name: Portable PC**

**Model name: CoreBook X**

**FCC ID: 2AHLZ-COERBOOKX**

**TEST REPORT NUMBER: EFGX22030020-IE-01-E08**

## CONTENTS






Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

# 1 General Information

## 1.1 Notes

The results of this test report relate exclusively to the item tested as specified in chapter “Description of test item” and are not transferable to any other test items.

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd. is not responsible for any generalisations and conclusions drawn from this report. Any modification of the test item can lead to invalidity of test results and this test report may therefore be not applicable to the modified test item.

The test report may only be reproduced or published in full. Reproducing or publishing extracts of the report requires the prior written approval of the Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.

This document is subject to the General Terms and Conditions and the Testing and Certification System of Eurofins Electrical Testing Service (Shenzhen) Co., Ltd. available on request or accessible at www.eurofins.com.

**Operator:**

| | | | |
|---|---|---|---|
| 2022-03-12 | | Bruce Zheng / Project Engineer | Bruce Zheng |
| Date | Eurofins-Lab. | Name / Title | Signature |

**Technical responsibility for area of testing:**

| | | | |
|---|---|---|---|
| 2022-03-12 | | Tom Tian / EMC Supervisor | Tom Tian |
| Date | Eurofins-Lab. | Name / Title | Signature |



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

## 1.2 Testing laboratory

**Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.**
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park, No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China
Telephone : +86-0755-82911867
Fax : +86-0755-82910749

## 1.3 Details of approval holder

| | | |
|---|---|---|
| Name | : | CHUWI TECHNOLOGY (ShenZhen) CO., LIMITED |
| Address | : | 2 Floor Building 3 LiJinCheng Industrial park the east of Gongye road LongHua, Shenzhen, China |
| Telephone | : | +86 755 29706511 |
| Fax | : | N/A |

## 1.4 Details of manufacturer

| | | |
|---|---|---|
| Name | : | CHUWI TECHNOLOGY (ShenZhen) CO., LIMITED |
| Address | : | 2 Floor Building 3 LiJinCheng Industrial park the east of Gongye road LongHua, Shenzhen, China |
| Telephone | : | +86 755 29706511 |
| Fax | : | N/A |

## 1.5 Application details

| | | |
|---|---|---|
| Date of receipt of test item | : | 2022-03-01 |
| Date of receipt of test sample | : | 2022-03-01 |
| Date of test | : | 2022-03-01 to 2022-03-11 |
| Date of issue | : | 2022-03-12 |

## 1.6 Test item

| | | |
|---|---|---|
| Product type | : | Portable PC |
| Model name | : | CoreBook X |
| Brand name | : | CHUWI |
| Sample ID | : | 220301-126-003 |
| Ratings | : | 100-240V~, 19V DC 3.42A |
| Test voltage | : | 120V~ 60Hz |
| Additional information | : | ./. |

(General disclaimer:
The above sample(s) and sample information was/were submitted and identified on behalf of the applicant. Eurofins assures objectivity and impartiality of the test, and fulfills the obligation of confidentiality for applicant's commercial information and technical documents.)

## 1.7 Test standards

# FCC 47 CFR Part 15, Subpart B

# 2 Technical test

## 2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

**or**

The deviations as specified were ascertained in the course of the tests performed. ☐

## 2.2 Test environment

| | | | |
|---|---|---|---|
| Temperature | : 15 | … | 35°C |
| Relative humidity content | : 30 | … | 60% |
| Air pressure | : 86 | … | 103kPa |

## 2.3 Test mode

TM1: USB Link + Earphone



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

## 2.4 List of Test equipment

| EQUIPMENT ID | EQUIPMENT NAME | MODEL NO. | CAL. DUE DATE |
|---|---|---|---|
| 23-2-13-05 | EMI Test Receiver | ESR3 | 2022-03-15 |
| 23-2-13-06 | LISN | NNLK 8127 RC | 2022-03-15 |
| 23-2-10-16 | Attenuator | VTSD 9561-F | 2022-03-16 |
| 23-2-13-01 | EMI Test Receiver | ESR7 | 2022-03-15 |
| 23-2-13-02 | Signal Analyzer | N9020B-544 | 2022-03-15 |
| 23-2-12-02 | TRILOG Broadband Antenna | VULB9168 | 2022-04-27 |
| 23-2-12-03 | Horn Antenna | 3117 | 2022-05-11 |
| 23-2-12-04 | Horn Antenna | BBHA 9170 | 2022-05-11 |
| 23-2-10-01 | Preamplifier | BBV9745 | 2022-03-16 |
| 23-2-10-02 | Preamplifier | TAP01018048 | 2022-03-16 |
| 23-2-10-03 | Preamplifier | TAP18040048 | 2022-03-22 |
| 23-2-10-14 | Switch and Control Unit | ERIT-E-JS0806-SF1 | N/A |
| 23-2-18-005 | Test software | TS+VER2.1-JS32-CE | N/A |
| 23-2-18-007 | Test software | TS+VER2.1-JS32-RE | N/A |
| 23-2-10-69 | PC | M4000E-16 | N/A |
| 23-2-10-70 | LED Monitor | D18215FD0 | N/A |
| 23-2-10-71 | PC | M4000E-16 | N/A |
| 23-2-10-72 | LED Monitor | V193HQV | N/A |

## 2.5 System Measurement Uncertainty

| System Measurement Uncertainty | |
|---|---|
| Test Items | Extended Uncertainty |
| Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz | Horizontal: 4.56dB;<br>Vertical: 4.55dB; |
| Uncertainty for Radiated Emission in 3m chamber 1000MHz-6000MHz | Horizontal: 4.22dB;<br>Vertical: 4.21dB; |
| Uncertainty for Conducted Emission 150kHz-30MHz | 1.96dB |
| Uncertainty for Conducted Emission 150kHz-30MHz (for test using High Voltage Probe TK9420(VT9420)) | 2.18 dB |



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

## 2.6 Test results

☒ 1st test ☐ test after modification ☐ production test

| Test case | Subclause | Required | Test passed | Test failed |
|---|---|---|---|---|
| Conducted Emission | FCC part 15.107<br>ANSI C63.4: 2014 | ☒ | ☒ | ☐ |
| Radiated Emission | FCC part 15.109<br>ANSI C63.4: 2014 | ☒ | ☒ | ☐ |



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

# 3 Emission Test

## 3.1 Radiated emission

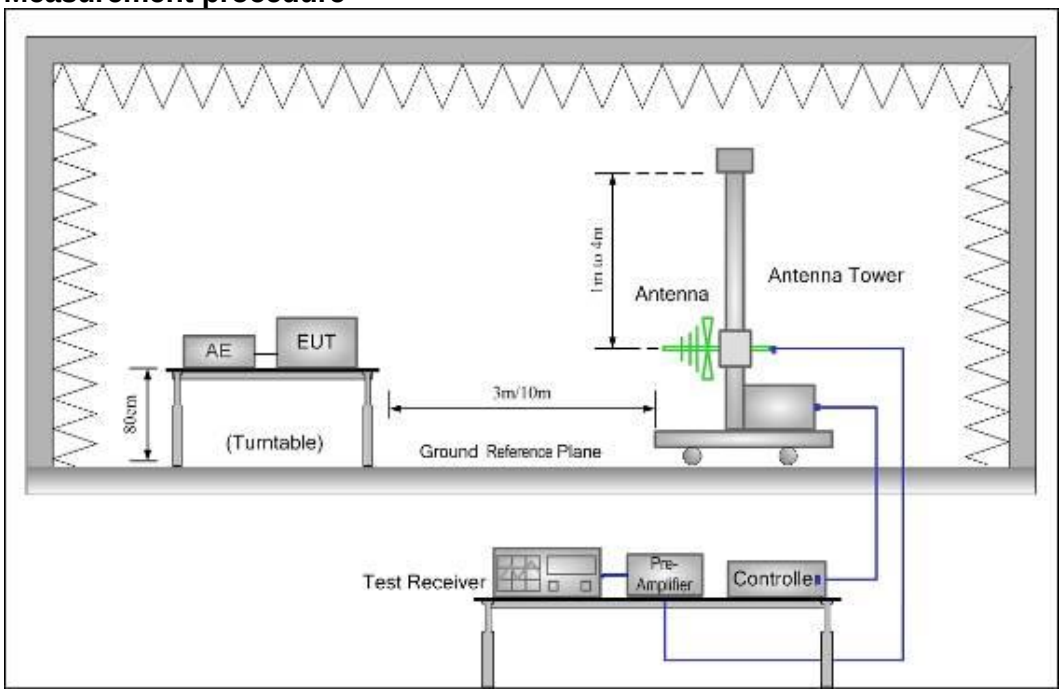
This clause lays down the general requirements for the measurement of Radiated disturbance produced at the space of apparatus.

### 3.1.1 Limits

| Frequency range | Limits at 3m |
|---|---|
| MHz | dB (μV/m) |
| 30 to 88 | 40.0 |
| 88 to 216 | 43.5 |
| 216 to 960 | 46.0 |
| Above 960 | 54.0 |
| The tighter limit applies at the band edges. | |

Note 1: Result Level= Read Level + Corrector Factor
Note 2: Below 1GHz: Corrector factor = Antenna Factor + Cable Loss - Amplifier Gain.
Note 3: Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain.

### 3.1.2 Measurement procedure




1. The radiated emissions test was conducted in a semi-anechoic chamber. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
2. Before get the final emission results with quasi-peak(QP) detector, a pre-scan was performed with the peak(PK) detector to find out the maximum emission data plots of the EUT.
3. The frequencies of maximum emission were determined in the final radiated emissions measurement, the physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization. Test was performed at 3 m distance.



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

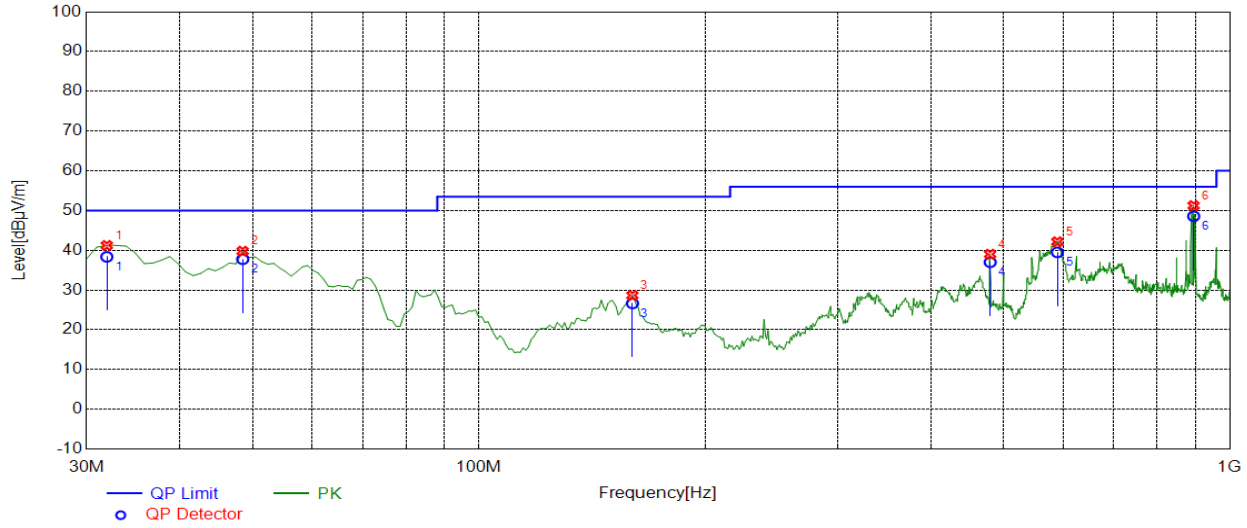
### 3.1.3 Test environment

Temperature : 24.6 °C
Relative humidity content : 57.6 %
Air pressure : 101.5 kPa

### 3.1.4 Results

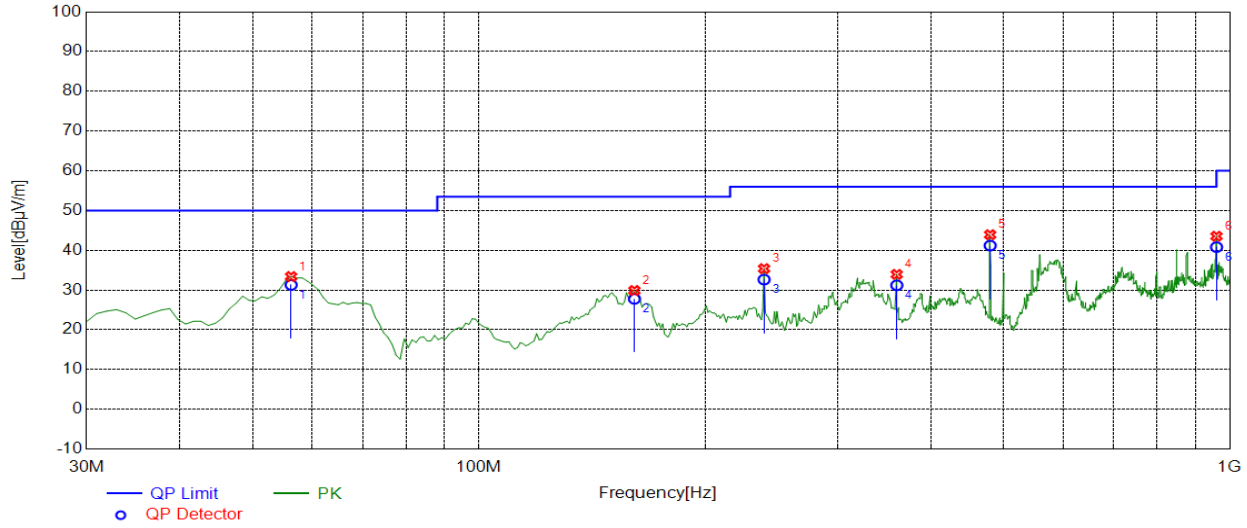
**Below 1GHz**

**Vertical Polarity Test Data**




| NO. | Freq. [MHz] | Factor [dB/m] | QP Value [dBµV/m] | QP Limit [dBµV/m] | QP Margin [dB] | Polarity | Verdict |
|---|---|---|---|---|---|---|---|
| 1 | 31.9419 | -17.14 | 38.36 | 50.00 | 11.64 | Vertical | PASS |
| 2 | 48.4484 | -15.39 | 37.76 | 50.00 | 12.24 | Vertical | PASS |
| 3 | 160.1101 | -15.66 | 26.64 | 53.50 | 26.86 | Vertical | PASS |
| 4 | 479.5596 | -17.50 | 37.00 | 56.00 | 19.00 | Vertical | PASS |
| 5 | 589.2793 | -3.48 | 39.49 | 56.00 | 16.51 | Vertical | PASS |
| 6 | 895.1351 | -4.26 | 48.58 | 56.00 | 7.42 | Vertical | PASS |

**Horizontal Polarity Test Data**




| NO. | Freq. [MHz] | Factor [dB/m] | QP Value [dBµV/m] | QP Limit [dBµV/m] | QP Margin [dB] | Polarity | Verdict |
|---|---|---|---|---|---|---|---|
| 1 | 56.2162 | -15.85 | 31.29 | 50.00 | 18.71 | Horizontal | PASS |
| 2 | 161.0811 | -15.73 | 27.79 | 53.50 | 25.71 | Horizontal | PASS |
| 3 | 239.7297 | -17.70 | 32.64 | 56.00 | 23.36 | Horizontal | PASS |
| 4 | 360.1301 | -15.71 | 31.20 | 56.00 | 24.80 | Horizontal | PASS |
| 5 | 479.5596 | -17.50 | 41.19 | 56.00 | 14.81 | Horizontal | PASS |
| 6 | 960.1902 | -3.92 | 40.80 | 60.00 | 19.20 | Horizontal | PASS |



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

**Above 1GHz**

**Vertical Polarity Test Data**

| PK Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1318.3183 | 40.55 | -26.66 | 74.00 | 33.45 | 150 | 304 | Vertical |
| 2 | 1628.6286 | 40.49 | -25.79 | 74.00 | 33.51 | 150 | 262 | Vertical |
| 3 | 2119.1191 | 43.21 | -22.38 | 74.00 | 30.79 | 150 | 72 | Vertical |
| 4 | 2923.9239 | 46.43 | -19.20 | 74.00 | 27.57 | 150 | 172 | Vertical |
| 5 | 3732.7327 | 48.42 | -16.37 | 74.00 | 25.58 | 150 | 253 | Vertical |
| 6 | 4945.9459 | 49.44 | -14.63 | 74.00 | 24.56 | 150 | 206 | Vertical |

**Horizontal Polarity Test Data**

| PK Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1360.3604 | 40.34 | -26.61 | 74.00 | 33.66 | 150 | 289 | Horizontal |
| 2 | 1830.8308 | 41.73 | -24.07 | 74.00 | 32.27 | 150 | 46 | Horizontal |
| 3 | 2979.9800 | 46.78 | -18.83 | 74.00 | 27.22 | 150 | 326 | Horizontal |
| 4 | 3858.8589 | 49.20 | -15.77 | 74.00 | 24.80 | 150 | 309 | Horizontal |
| 5 | 4477.4775 | 49.27 | -15.19 | 74.00 | 24.73 | 150 | 319 | Horizontal |
| 6 | 5057.0571 | 49.90 | -14.84 | 74.00 | 24.10 | 150 | 0 | Horizontal |



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

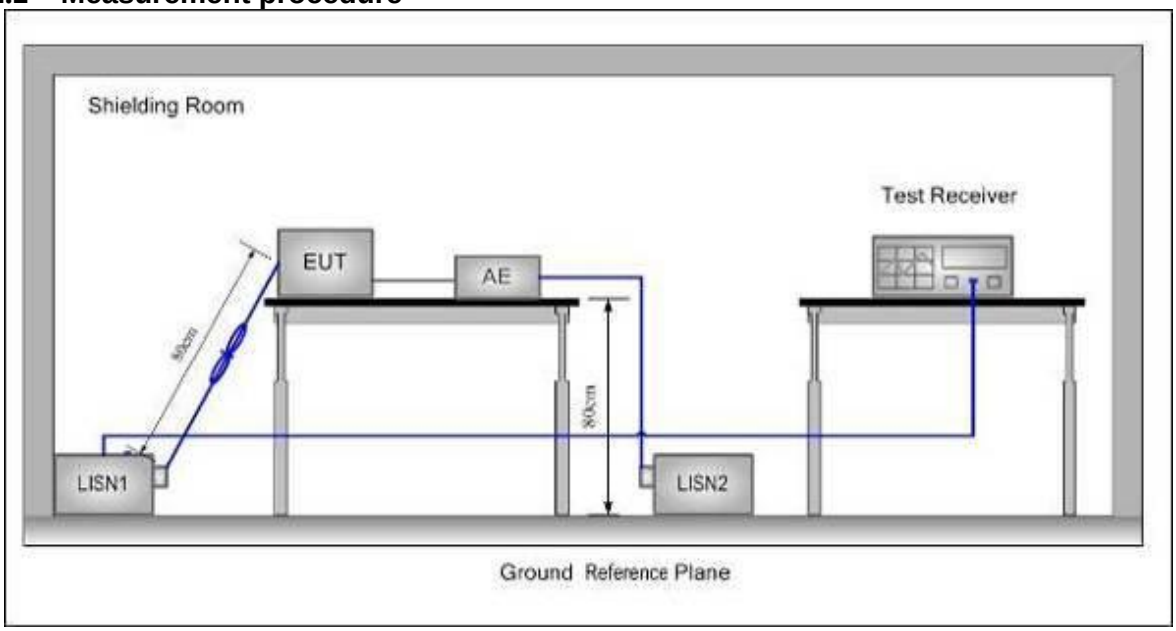
## 3.2 Conducted Emission

This clause lays down the general requirements for the measurement of disturbance voltage produced at the terminals of apparatus.

### 3.2.1 Limits

| Frequency range MHz | At mains terminals dB (μV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |
| Note 1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 30 MHz.<br>Note 2: The lower limit is applicable at the transition frequency. | | |

### 3.2.2 Measurement procedure



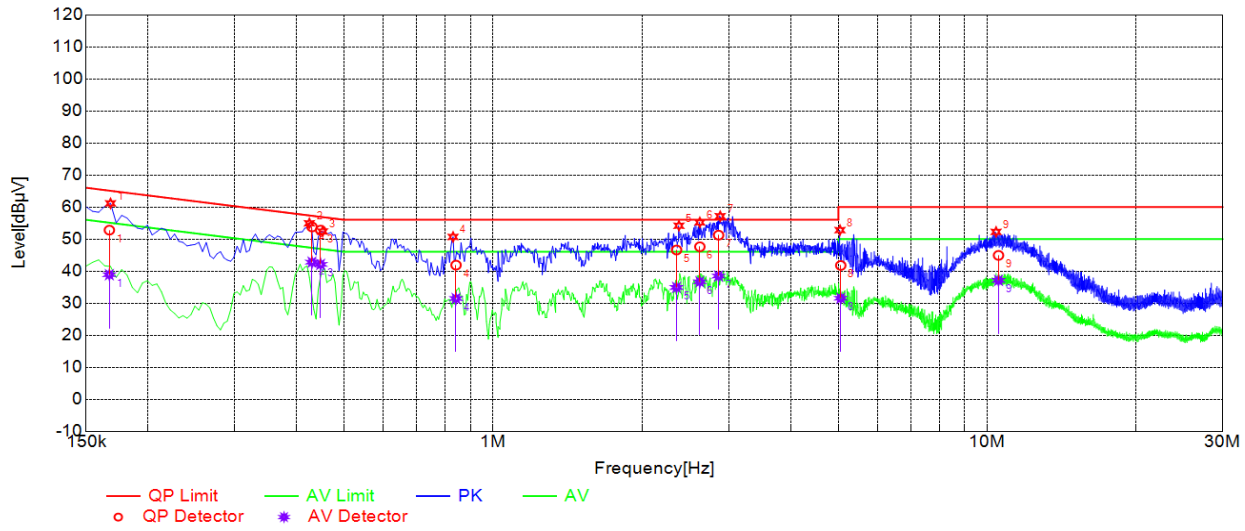

1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a (50 μH + 5 Ω) || 50 Ω linear impedance. The power cables of all other units of the EUT was connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

### 3.2.3 Test environment

Temperature : 25.2 °C
Relative humidity content : 57.1 %
Air pressure : 101.5 kPa

### 3.2.4 Results -Measurement Data

**Live line test data**

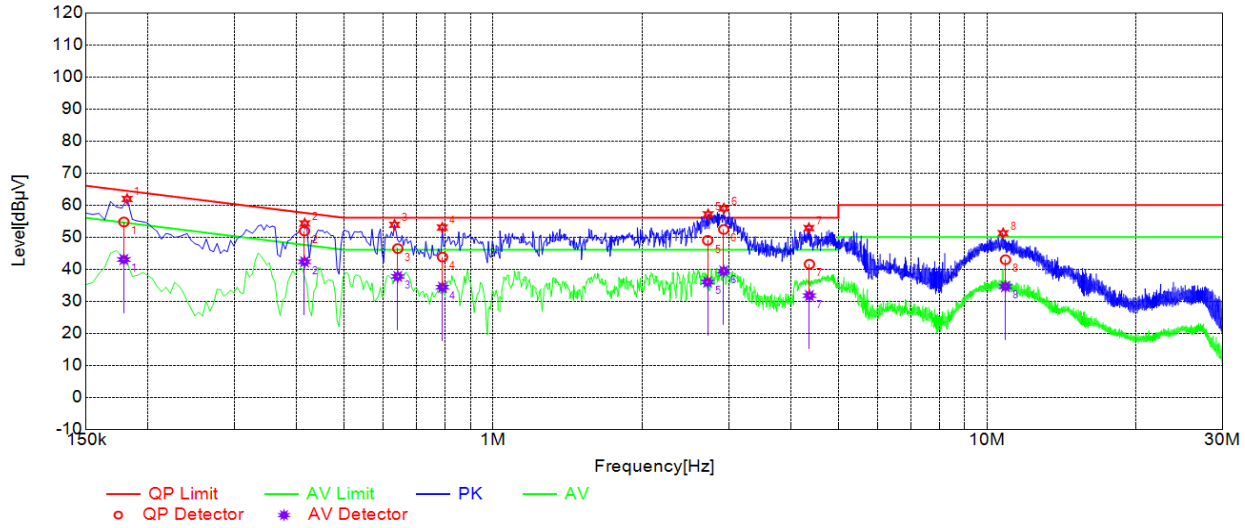



| NO. | Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Type | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1671 | 10.25 | 52.79 | 65.11 | 12.32 | 38.88 | 55.11 | 16.23 | L | PASS |
| 2 | 0.4297 | 10.25 | 53.79 | 57.26 | 3.47 | 42.79 | 47.26 | 4.47 | L | PASS |
| 3 | 0.4474 | 10.26 | 52.80 | 56.92 | 4.12 | 42.10 | 46.92 | 4.82 | L | PASS |
| 4 | 0.8410 | 10.28 | 41.87 | 56.00 | 14.13 | 31.44 | 46.00 | 14.56 | L | PASS |
| 5 | 2.3510 | 10.35 | 46.60 | 56.00 | 9.40 | 34.90 | 46.00 | 11.10 | L | PASS |
| 6 | 2.6205 | 10.37 | 47.60 | 56.00 | 8.40 | 36.67 | 46.00 | 9.33 | L | PASS |
| 7 | 2.8597 | 10.37 | 51.23 | 56.00 | 4.77 | 38.46 | 46.00 | 7.54 | L | PASS |
| 8 | 5.0538 | 10.41 | 41.77 | 60.00 | 18.23 | 31.53 | 50.00 | 18.47 | L | PASS |
| 9 | 10.5462 | 10.54 | 44.92 | 60.00 | 15.08 | 37.11 | 50.00 | 12.89 | L | PASS |



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

**Neutral line test data**




| NO. | Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Type | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1788 | 10.24 | 54.72 | 64.54 | 9.82 | 43.00 | 54.54 | 11.54 | N | PASS |
| 2 | 0.4150 | 10.25 | 51.90 | 57.55 | 5.65 | 42.29 | 47.55 | 5.26 | N | PASS |
| 3 | 0.6410 | 10.26 | 46.43 | 56.00 | 9.57 | 37.72 | 46.00 | 8.28 | N | PASS |
| 4 | 0.7895 | 10.26 | 43.76 | 56.00 | 12.24 | 34.37 | 46.00 | 11.63 | N | PASS |
| 5 | 2.7175 | 10.32 | 48.98 | 56.00 | 7.02 | 35.96 | 46.00 | 10.04 | N | PASS |
| 6 | 2.9291 | 10.32 | 52.37 | 56.00 | 3.63 | 39.39 | 46.00 | 6.61 | N | PASS |
| 7 | 4.3677 | 10.35 | 41.54 | 56.00 | 14.46 | 31.73 | 46.00 | 14.27 | N | PASS |
| 8 | 10.8924 | 10.50 | 42.93 | 60.00 | 17.07 | 34.54 | 50.00 | 15.46 | N | PASS |

---End of Report---