

Application for FCC Certificate
On Behalf of
Wuxi Hengfeng Electronic Products Co., Ltd.

Electronic Ballast

Model No.: HFE-232-120-IS

FCC ID: RERDEANZY32120

Prepared For : Wuxi Hengfeng Electronic Products Co., Ltd.
Industrial Area New Century Zhaqiao, Xishan, Wuxi,
Jiangsu, China.

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F03051
Date of Test : July 30- Aug 08, 2003
Date of Report : Aug 18, 2003

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Wuxi Hengfeng Electronic Products Co., Ltd.
Manufacturer : Wuxi Hengfeng Electronic Products Co., Ltd.
EUT Description : Energy Saving Lamp
(A) Model No. : HFE-232-120-IS
(B) Power Supply: 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 18 CONSUMER DEVICES (2002.10)
AND MP-5/1986*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 18 RF Lighting Device limits both conducted emissions and field strength.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report must not be used by the applicant to claim product endorsement by NVLAP or any agency of the U.S. Government.

Date of Test : July 30-Aug 08, 2003

Prepared by : Yolanda Liu ^{2003. 8. 21} Test Engineer :
YOLANDA LIU
(Assistant)

Solon Gong ^{2003. 8. 21}
SOLON GONG
AUDIX (Engineer)
For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Reviewer : Sammy Chen ^{2003. 8. 26} Approved Signatory :
SAMMY CHEN
(Engineer)

Byron Kwo ^{2003. 8. 26}
BYRON KWO
Authorized Signatory (Manager)

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test

Description : Electronic Ballast

Type of EUT : Production Pre-product Pro-type

Model Number : HFE-232-120-IS

Applicant : Wuxi Hengfeng Electronic Products Co., Ltd.
Industrial Area New Century Zhaqiao, Xishan, Wuxi,
Jiangsu, China.

Manufacturer : Wuxi Hengfeng Electronic Products Co., Ltd.
Industrial Area New Century Zhaqiao, Xishan, Wuxi,
Jiangsu, China.

| Test Model | Apparent Power (VA) | Real Power (W) |
|----------------|---------------------|----------------|
| HFE-232-120-IS | 53.27 | 52.12 |

1.2 Description of Test Facility

Site Description : Sept. 17, 1998 file on
(Semi-Anechoic Chamber) Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046, USA

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3F 34Bldg 680 Guiping Rd,
Caohejing Hi-Tech Park,
Shanghai, China 200233.

NVLAP Lab Code : 200371-0

1.3 Measurement Uncertainty

Conducted Emission Uncertainty : $U = \pm 2.66\text{dB}$

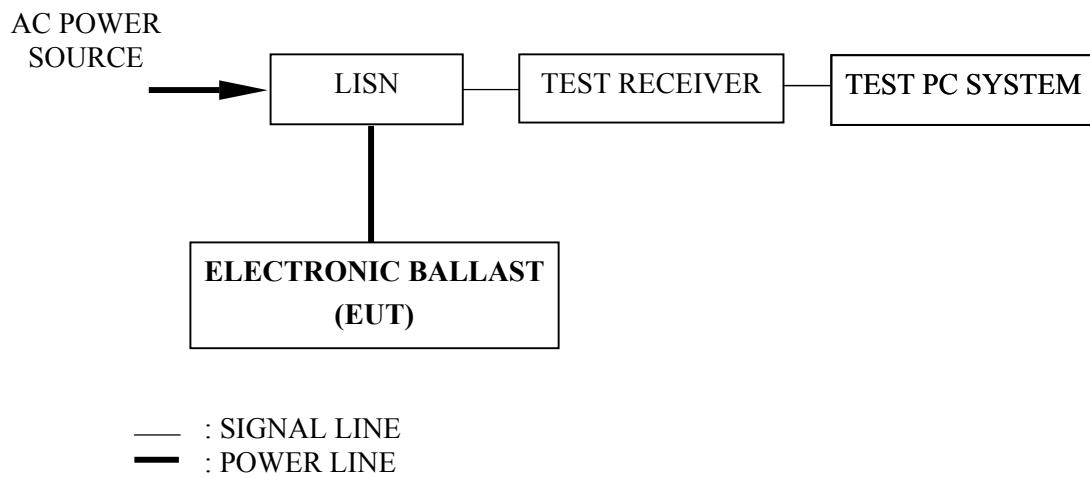
2 AC POWERLINE CONDUCTED EMISSION TEST

2.1 Test Equipment

The following test equipment are used during the powerline conducted emission test in a shielded room:

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|---|-----------------|-----------|------------|--------------|---------------|
| 1. | Test Receiver | Rohde & Schwarz | ESHS10 | 844077/020 | Apr 21, 2003 | 1 Year |
| 2. | Line Impedance Stabilization Network (LISN) | Kyoritsu | KNW-407 | 8-1280-5 | Apr 24, 2003 | 1 Year |

2.2 Block Diagram of Test Setup



2.3 Conducted Emission Limits

| Frequency (MHz) | Maximum RF Line Voltage | |
|-----------------|-------------------------|--------------|
| | (μ V) | dB(μ V) |
| 0.45 ~ 2.51 | 250 | 48 |
| 2.51 ~ 3 | 3000 | 70 |
| 3 ~ 30 | 250 | 48 |

NOTE 1 – RF Line Voltage dB (μ V) = 20 log RF Line Voltage (μ V)
 NOTE 2 – The tighter limits shall apply at the boundary between two frequency ranges.

2.4 EUT Configuration

The EUT (listed in Sec. 1.1) was installed as shown on Sec. 2.2 to meet FCC requirement and operating in a manner which tends to maximize its emission level in a normal application.

2.5 Operating Condition of EUT

- 2.5.1 Setup the EUT as shown in Sec. 2.2.
- 2.5.2 Turn on the power of all equipment.
- 2.5.3 The EUT will be operated normally.

2.6 Test Procedures

The EUT was connected to the power mains through a Line Impedance Stabilization Network (LISN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to MP-5/1986 during conducted emission test.

The IF bandwidth of Test Receiver ESHS10 was set at 10 kHz.

The frequency range from 450 kHz to 30 MHz was checked.

The test mode (Lighting) was done on conducted test and the test results of the highest emissions are listed in Sec. 2.7.

2.7 Test Results

< PASS >

The frequency and amplitude of the highest AC powerline conducted emissions relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

| | | | | |
|-----------|---|--------------------|----------------|---------------|
| EUT | : | Electronic Ballast | Temperature : | 21.8°C |
| Model No. | : | HFE-232-120-IS | Humidity : | 53% |
| Test Mode | : | Lighting | Date of Test : | June 25, 2003 |

| Test Line | Frequency (MHz) | Factor (dB) | Meter Reading dB(µV) | Emission Level DB(µV) | Limits dB(µV) | Margin (dB) |
|-----------|-----------------|-------------|----------------------|-----------------------|---------------|-------------|
| VA | 0.455 | 0.12 | 46.75 | 46.87 | 48.00 | 1.13 |
| | 0.503 | 0.12 | 46.14 | 46.26 | 48.00 | 1.74 |
| | 0.548 | 0.11 | 46.98 | 47.09 | 48.00 | 0.91 |
| | 0.599 | 0.11 | 47.25 | 47.36 | 48.00 | 0.64 |
| | 1.004 | 0.10 | 37.92 | 38.02 | 48.00 | 9.98 |
| | 5.615 | 0.22 | 33.28 | 33.50 | 48.00 | 14.50 |
| VB | 0.498 | 0.15 | 24.85 | 25.00 | 48.00 | 23.00 |
| | 1.143 | 0.17 | 19.50 | 19.67 | 48.00 | 28.33 |
| | 1.748 | 0.18 | 24.61 | 24.79 | 48.00 | 23.21 |
| | 2.941 | 0.20 | 20.94 | 21.14 | 48.00 | 48.86 |
| | 10.903 | 0.37 | 23.50 | 23.87 | 48.00 | 24.13 |
| | 17.972 | 0.65 | 23.45 | 24.10 | 48.00 | 23.90 |

NOTE 1 – Emission Level = Meter Reading + Factor

NOTE 2 – Factor = Insertion Loss + Cable Loss

NOTE 3 – All reading are Quasi-Peak Values.

NOTE 4 – The worst emission is detected at 0.599 MHz with corrected signal level of 47.36 dB (µV) (limit is 48.00 dB (µV)), when the VA of the EUT is connected to LISN.

NOTE 5 – At the frequency 0.455MHz 0.503 MHz, 0.548MHz, 0.599MHz measured result are below the specification limit by a margin less than the measurement uncertainty, it is not therefore possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a higher probability that the product tested complies with the specification limit.

TEST ENGINEER: Solon Gong
(SOLON GONG)

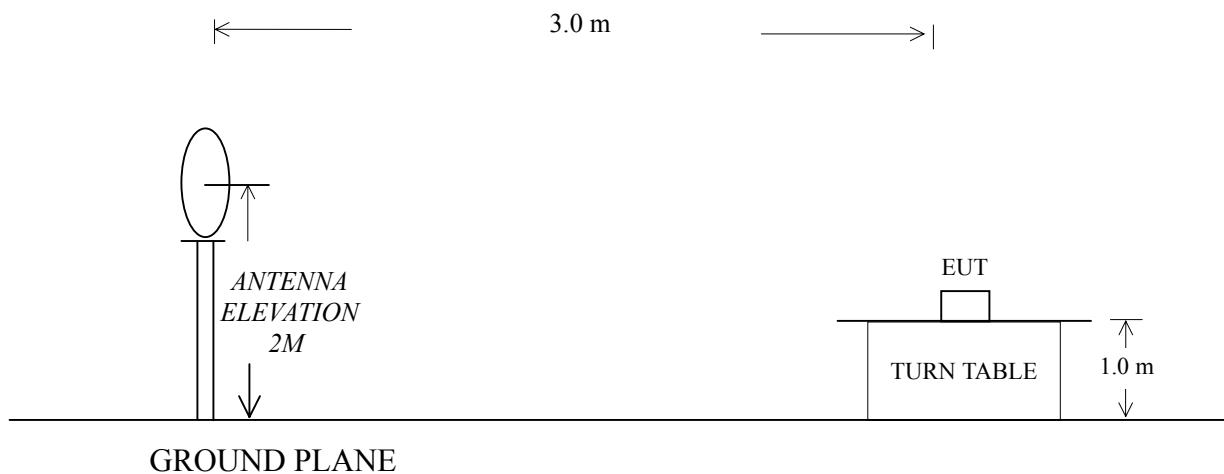
3 MAGNETIC FIELD EMISSION TEST

3.1 Test Equipment

The following test equipment are used during the field strength test in a shielded room:

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|---------------|-----------------|-----------|------------|------------|---------------|
| 1. | Loop Antenna | CHASE | HLA6120 | 1062 | Jun 02, 03 | 1 Year |
| 2. | Test Receiver | Rohde & Schwarz | ESVS10 | 844594/001 | Apr 22, 03 | 1 Year |

3.2 Block Diagram of Test Setup



3.3 Magnetic Field Emission Limit

All emanations from Non-ISM frequency devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

| Frequency (MHz) | Distance (m) | Field Strength Limits (μ V/m) | Converted Field Strength Limits By 3 Meters Measuring Distance dB(μ V/m) |
|--------------------|-----------------|--|--|
| 0.009~30 | 300 | 15 | 63.5 |

NOTE 1 – Distance refers to the distance in meters between the test antenna and the closed point of any part of the EUT.

NOTE 2 – Audix Technology (Shanghai) Co., Ltd. only has a 3 meters Semi-anechoic Chamber to do the radiated disturbance test, therefore, Audix Shanghai used 3 meters measuring distance and converted limits to judge the EUT compliance with or not.

3.4 EUT Configuration

The Fcc part 18 regulations test method must be used to find the maximum emission during Radiated Emission test.

The configuration of the EUT is same as used in conducted emission test. Please Refer to Section 2.4.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown on Section 3.2.

3.5.2 Turn on the power of all equipments.

3.5.3 Let the EUT work in test mode (Lighting) and test it.

3.6 Test Procedures

The EUT is placed on a table, which is 1.0 meter above ground. Measurements are performed at 3.0m distance with a 0.6m loop antenna as described in 2.2.4 of MP-5 . The antenna shall be with the lower edge of the loop at 2m height above the floor.

The bandwidth setting on the test receiver (R&S Test Receiver ESHS10) is 200Hz from 9kHz to 150kHz and 10kHz from 150kHz to 30MHz. The EUT is tested in a semi-anechoic chamber.

All the scanning waveforms are attached within Sec. 3.7.

3.7 Test Results

<PASS>

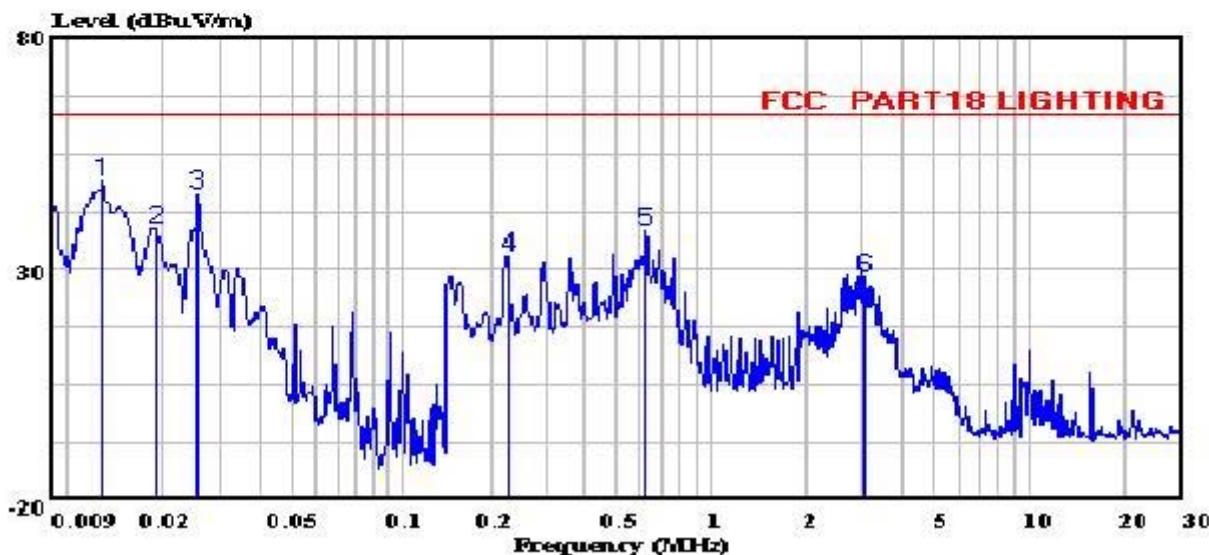
Refer to the following pages.



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Data#: 18 File#: E:\EMI_TEST\Data\H\hengfeng_new.EMI

Date: 2003-08-11 Time: 19:50:41



Site : audix-aci NO.3 CHAMBER
 Condition : FCC PART18 LIGHTING 3m
 Project No. : AOE-0000369
 Applicant : Wuxi Hengfeng Electronic Products
 Co., Ltd
 EUT : Electronic Ballast
 M/N : HFE-232-120-IS
 S/N :
 Power Supply : 230V/50Hz
 Ambient : 20.7C, 53%
 Test Mode : lighting
 Test Engineer : *S. Gao*

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| Freq | Level | Over Limit | |
|------|--------|------------|--------|
| | | Limit | Line |
| MHz | dBuV/m | dB | dBuV/m |
| 1 | 0.013 | 49.01 | -14.49 |
| 2 | 0.019 | 38.64 | -24.86 |
| 3 | 0.026 | 46.59 | -16.91 |
| 4 | 0.237 | 32.89 | -30.61 |
| 5 | 0.636 | 38.25 | -25.25 |
| 6 | 3.070 | 28.63 | -34.87 |