

APPLICATION FOR CERTIFICATION

On Behalf of

U Lighting Co., Ltd. Member of Wangfujing Group

Energy Saving Lamp

Model Number: EUT-15W,EUT-20W,EUT-24W,EUT-26W,
SRE-15W,SRE-20W,SRE-23W,SRE-26W,
EIM-3W,EIM-5W,EIM-7W,EUB-5W,
EUB-7W,EUB-9W,EUB-13W,EUB-15W,
EUG-15W,EUG-20W, ECL-15W, ECL-20W

Prepared for : U Lighting Co., Ltd. Member of Wangfujing Group
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Shenzhen, China.

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Report Number : ACS-20F159
Date of Test : Sep. 28~ Dec. 06, 2000
Date of Report : Dec. 20, 2000

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TEST REPORT DECLARATION

Applicant : U Lighting Co., Ltd. Member of Wangfujing Group

Manufacturer : Boy Lighting Co., Ltd.

EUT Description : Energy Saving Lamp

(A) MODEL NO. : EUT-15W,EUT-20W,EUT-24W,
EUT-26W,SRE-15W,SRE-20W,
SRE-23W,SRE-26W, EIM-3W,
EIM-5W,EIM-7W,EUB-5W,
EUB-7W,EUB-9W,EUB-13W,
EUB-15W, EUG-15W,EUG-20W,
ECL-15W, ECL-20W

(B) SERIAL NO. : N/A

(C) POWER SUPPLY : 120V / 60Hz

Test Procedure Used:

FCC RULES AND REGULATIONS PART 18 SUBPART C RF LIGHTING DEVICES
CONSUMER (1998) AND MP-5/1986

The device described above is tested by Audix Technology (Shenzhen) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 18 Subpart C limits for radiation and conduction emissions. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT is technically compliant with FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shenzhen) 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 : Sep. 28~ Dec. 06, 2000

Prepared by :

Fanny Yang
Fanny Yang / Assistant

Reviewer :

Alex Deng
Alex Deng / Assistant Manager

For and on behalf of
AUDIX TECHNOLOGY (SHENZHEN) CO.,LTD.

Approved & Authorized Signer :

Smart Test / Manufacturer
Authorized Signature(s)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Energy Saving Lamp
Model Number	:	EUT-15W,EUT-20W,EUT-24W,EUT-26W, SRE-15W,SRE-20W,SRE-23W,SRE-26W, EIM-3W,EIM-5W,EIM-7W,EUB-5W, EUB-7W,EUB-9W,EUB-13W,EUB-15W, EUG-15W,EUG-20W, ECL-15W, ECL-20W
Applicant	:	U Lighting Co., Ltd. Member of Wangfujing Group 22/F. Kerry Centre, Renming South Road, Shenzhen, China
Manufacturer	:	Boy Lighting Co., Ltd. A Bldg, Tianwo Industrial Park, Wo Gougling, Pinhu, Longgang Area, Shenzhen, P.R. China.
Date of Receipt of Sample	:	Sep. 20, 2000
Date of Test	:	Sep. 28~ Dec. 06, 2000

1.2. Test Facility

Site Description

3m Anechoic Chamber : Certificated by FCC, USA
Aug. 24, 2000

3m & 10m Open Site : Certificated by FCC, USA
Feb. 13, 1998

EMC Lab. : Certificated by VCCI, Japan
Oct. 29, 1998

Certificated by DATech, German
Feb. 02, 1999

Certificated by NVLAP, USA
Until Mar. 03, 2000
NVLAP Code: 200372-0

Certificated by DNV, Norway
May 26, 1999

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

Site Location : No. 6, Ke Feng Rd., 52 Block,
Shenzhen Science & Industrial Park,
Nantou, Shenzhen, Guangdong, China

1.3. Test Uncertainty

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

Radiated Emission Uncertainty = $\pm 4.26\text{dB}$

2. POWER LINE CONDUCTED EMISSION TEST

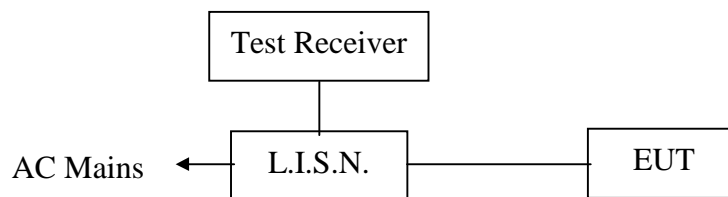
2.1. Test Equipment

The following test equipments are used during the power line conducted emission test:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS20	836600/006	Jun. 04, 00	1 Year
2.	L.I.S.N.	Kyoritsu	KNW-407	8-541-4	Jun. 04, 00	1 Year
3.	Terminator	EMCO	50Ω	No. 1	Jun. 04, 00	1 Year
4.	Terminator	EMCO	50Ω	No. 2	Jun. 04, 00	1 Year
5.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	Aug. 28, 00	1/2 Year
6.	Passive Probe	Rohde & Schwarz	ESH-Z3	299.7810.52	Jun. 04, 00	1 Year
7.	Coaxial Switch	Anritsu	MP59B	M73989	Jun. 04, 00	1/2 Year

2.2. Block Diagram of Test Setup

2.2.1. Block diagram of connection between the EUT and simulators



(EUT: Energy Saving Lamp)

2.3. Power Line Conducted Emission Test Limits

Frequency MHz	Maximum RF Line Voltage	
	μV	dB(μV)
0.45 ~ 30	250	48

Remarks: RF Line Voltage (dB(μV)) = 20 log RF Line Voltage (μV)

2.4. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

2.4.1. Energy Saving Lamp (EUT)

Model Number	:	EUT-15W,EUT-20W,EUT-24W,EUT-26W, SRE-15W,SRE-20W,SRE-23W,SRE-26W, EIM-3W,EIM-5W,EIM-7W,EUB-5W, EUB-7W,EUB-9W,EUB-13W,EUB-15W, EUG-15W,EUG-20W, ECL-15W, ECL-20W
Manufacturer	:	Boy Lighting Co., Ltd.

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown as Section 2.2.

2.5.2. Turn on the power of all equipment.

2.5.3. Let the EUT work in test mode (ON) and test it.

2.6. Test Procedure

The EUT is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm coupling impedance for the EUT. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission levels. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4-1992 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS20) is set at 10KHz.

The frequency range from 450KHz to 30MHz is checked.

The test result are reported on Section 2.7., all the scanning waveforms for Conducted Emission Test are attached in Appendix I.

2.7. Power Line Conducted Emission Test Results

PASS.

The frequency range from 450KHz to 30 MHz is investigated.

All emissions not reported below are too low against the prescribed limits.

The model EUT-24 conducted emission is the worst, please see the follow test data.
Other models test results Please see Appendix I.

Date of Test :	Sep 28, 1999	Temperature :	21°C
EUT :	Energy Saving Lamp	Humidity :	56%
Model No. :	EUT-24W	Test Mode :	ON

Frequency MHz	Reading		Limit dB(μV)
	Phase VA dB(μV)	Phase VB dB(μV)	
0.461	37.5	*	48.0
0.463	*	38.5	48.0
0.502	34.7	*	48.0
0.513	*	32.7	48.0
0.530	32.4	*	48.0
0.560	32.3	*	48.0
0.565	*	33.1	48.0
0.620	*	30.5	48.0
0.660	30.3	33.5	48.0
0.780	30.3	33.5	48.0

Remark :

1. All readings are Quasi-Peak values.
2. The worst emission is detected at 0.463 MHz with corrected signal level of 38.5 dB(μV) (limit is 48 dB(μV)) when the VB side of the EUT is connected to L.I.S.N.

3. RADIATED EMISSION TEST

3.1. Test Equipment

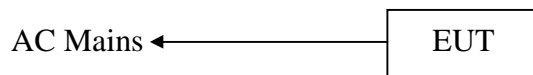
The following test equipments are used during the radiated emission test:

3.1.1. For Anechoic Chamber

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	HP	85422E	3625A00181	Jun. 04, 00	1 Year
2.	Test Receiver	Rohde & Schwarz	ESVS20	830350/005	Jun. 04, 00	1 Year
3.	Amplifier	HP	8447D	2944A07794	Jun. 04, 00	1/2 Year
4.	Bilog Antenna	Chase	CBL6112A	2176	Sep. 25, 00	1 Year
5.	Computer	N/A	N/A	N/A	N/A	N/A
6.	Printer	NEC	P3800	568101448	N/A	N/A
7.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.1	Aug. 09, 00	1/2 Year
8.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.2	Aug. 09, 00	1/2 Year
9.	RF Cable	FUJIKURA	RG-55/U	3# Chamber No.3	Aug. 09, 00	1/2 Year
10.	RF Cable	FUJIKURA	RG-55/U	3# Chamber No.4	Aug. 09, 00	1/2 Year
11.	Coaxial Switch	Anritsu	MP59B	M74389	Jun. 04, 00	1/2 Year

3.2. Block Diagram of Test Setup

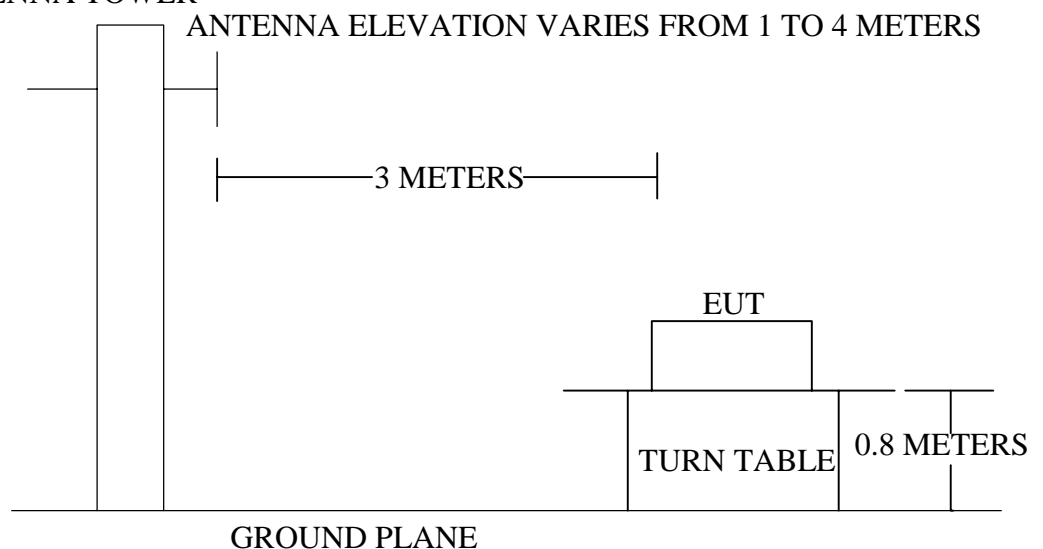
3.2.1. Block diagram of connection between the EUT and simulators



(EUT: Energy Saving Lamp)

3.2.2. Test Setup Diagram in Anechoic Chamber

ANTENNA TOWER



3.3. Radiated Emission Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

- Remark :
- (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
 - (2) The smaller limit shall apply at the cross point between two frequency bands.
 - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.4. EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.4.1. Energy Saving Lamp (EUT)

Model Number : EUT-15W,EUT-20W,EUT-24W,EUT-26W,
SRE-15W,SRE-20W,SRE-23W,SRE-26W,
EIM-3W,EIM-5W,EIM-7W,EUB-5W,
EUB-7W,EUB-9W,EUB-13W,EUB-15W,
EUG-15W,EUG-20W, ECL-15W, ECL-20W

Manufacturer : Boy Lighting Co., Ltd.

3.5. Operating Condition of EUT

1. Setup the EUT as shown in Section 3.2..
2. Let the EUT work in test mode (ON) and test it.

3.6. Test Procedure

The EUT and its simulators are placed on a turn table, which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission levels. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna are set on test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to MP-5/1986 on Radiated Emission Test.

The bandwidth of the EMI test receiver (R&S ESVS20) is set at 120KHz.

The frequency range from 30MHz to 1000MHz is checked.

The test mode (ON) are tested in Anechoic Chamber and all the scanning waveforms are attached in Appendix II.

3.7. Radiated Emission Test Results

PASS.

The frequency range from 30MHz to 1000MHz is investigated.

The model EUT-24 radiated emission is the worst, please see the follow test data.
Other models test results Please see Appendix II.

Date of Test :	Nov 25, 2000	Temperature :	21°C
EUT :	Energy Saving Lamp	Humidity :	56%
Model No. :	EUT-24W	Test Mode :	ON

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Over Limits dBμV/m	Limits dBμV/m
115.300	17.72	2.84	3.30	21.02	-22.48	2.84
215.700	17.98	3.78	1.00	18.98	-24.52	3.78
418.300	26.91	4.78	0.50	27.41	-18.59	4.78
612.320	29.53	5.36	1.00	30.53	-15.47	5.36
801.300	31.77	5.76	1.20	32.97	-13.03	5.76
908.300	32.56	5.95	-0.20	32.36	-13.64	5.95

Remark: 1. All readings are Quasi-Peak values.

2. Emission Level = Antenna Factor + Cable Loss + Meter Reading

Date of Test :	Nov. 25, 2000	Temperature :	21°C
EUT :	Energy Saving Lamp	Humidity :	56%
Model No. :	EUT-24W	Test Mode :	ON

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Over Limits dBμV/m	Limits dBμV/m
42.500	16.73	1.34	2.80	19.53	-20.47	40.00
115.800	19.66	2.84	1.70	21.36	-22.14	43.50
185.300	18.31	3.55	1.90	20.21	-23.29	43.50
410.540	26.53	4.75	1.20	27.73	-18.27	46.00
612.300	29.96	5.36	0.80	30.76	-15.24	46.00
802.300	31.57	5.77	0.50	32.07	-13.93	46.00

Remark: 1. All readings are Quasi-Peak values.

2. Emission Level = Antenna Factor + Cable Loss + Meter Reading

4. MODIFICATION TO TEST SPECIFICATIONS

[NONE]