

Application for FCC Certificate  
On Behalf of  
Shanghai Kao Chyi Electronic Co., Ltd.

Twist Lamp

Model No.: TL20      TL23

FCC ID : PTRKCTL120

Prepared For : Shanghai Kao Chyi Electronic Co., Ltd.  
Rm 2402, Zhong Da Square,  
No. 989 Dong Fang Road, Shanghai China

Prepared By : Audix Technology (Shanghai) Co., Ltd.  
3 F 34 Bldg 680 Guiping Rd,  
Caohejing Hi-Tech Park,  
Shanghai, China 200233

Tel: +86-21-64955500  
Fax: +86-21-64955491

Report No. : ACI-F01056  
Date of Test : Aug 14-18, 2001  
Date of Report : Sept 20, 2001

## TABLE OF CONTENTS

	Page
<b>1 GENERAL INFORMATION .....</b>	<b>4</b>
1.1 Description of Equipment Under Test .....	4
1.2 Description of Test Facility .....	5
1.3 Measurement Uncertainty .....	5
<b>2 AC POWERLINE CONDUCTED EMISSION TEST .....</b>	<b>6</b>
2.1 Test Equipment .....	6
2.2 Block Diagram of Test Setup .....	6
2.3 Conducted Emission Limits .....	6
2.4 Test Configuration .....	7
2.5 Operating Condition of EUT .....	7
2.6 Test Procedures .....	7
2.7 Test Results .....	8
<b>3 FIELD STRENGTH TEST .....</b>	<b>10</b>
3.1 Test Equipment .....	10
3.2 Block Diagram of Test Setup .....	10
3.3 Test Configuration .....	10
3.4 Operating Condition of EUT .....	10
3.5 Test Procedure .....	11
3.6 Test Result .....	11

## TEST REPORT FOR FCC CERTIFICATE

Applicant : Shanghai Kao Chyi Electronic Co., Ltd.  
Manufacturer : Shanghai Kao Chyi Electronic Co., Ltd.  
EUT Description : Twist Lamp  
(A) Model No.:  
TL20 TL23  
(B) Serial No.:  
E0020 E0023  
(C) Power Supply: 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 18 CONSUMER DEVICES (2000)  
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 : Aug 14-18, 2001

Prepared by : Stella Tang Test Engineer :  
STELLA TANG  
Assistant

ADA ZOU  
For and on behalf of  
ENGINEER  
AUDIX TECHNOLOGY (SHANGHAI) CO., LTD.

Reviewer : Byron Kwo Approved Signatory :  
BYRON KWO  
Supervisor

Aaron Su  
AARON SU  
Senior Manager  
Signature(s)

# 1 GENERAL INFORMATION

## 1.1 Description of Equipment Under Test

Description : Twist Lamp

Type of EUT : ☒ Production ☐ Pre-product ☐ Pro-type

Model Number : TL20, TL23

Applicant : Shanghai Kao Chyi Electronic Co., Ltd.

Rm 2402, Zhong Da Square,  
No. 989 Dong Fang Road, Shanghai, China

Manufacturer : Shanghai Kao Chyi Electronic Co., Ltd.

FL.5 South Building, Hong Chang Industrial Building, No.  
98, Lane 91 E Shan Road, Shanghai, China

M/N	APPARENT POWER (VA)	REAL POWER (W)
TL20	36.2	21.0
TL23	35.6	19.1

## 1.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	:	Audix Technology (Shanghai) Co., Ltd.
Site Location	:	3 F 34 Bldg 680 Guiping Rd, Caohejing Hi-Tech Park, Shanghai, China 200233
NVLAP Lab Code	:	200371-0

## 1.3 Measurement Uncertainty

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

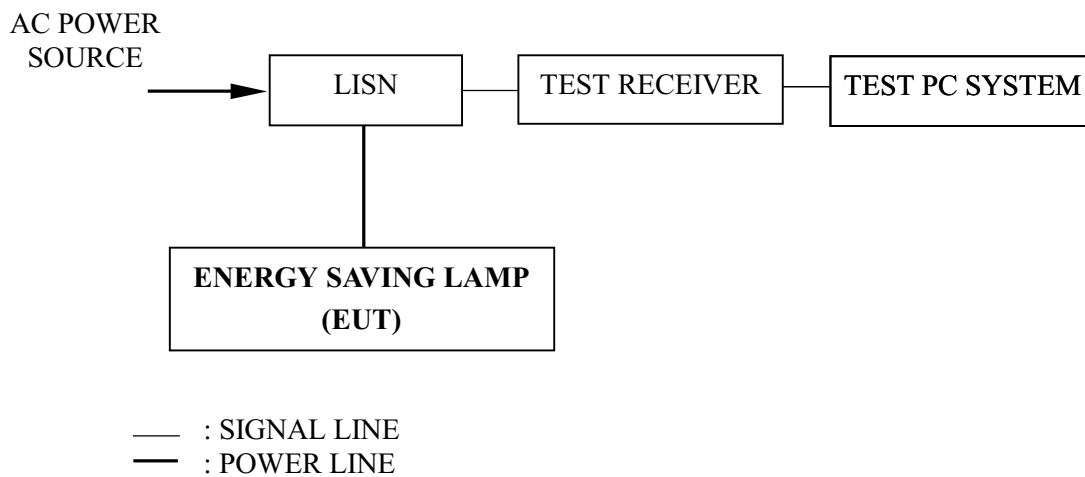
## 2 AC POWERLINE CONDUCTED EMISSION TEST

### 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 24, 2001	1 Year
2.	Line Impedance Stabilization Network (LISN)	Kyoritsu	KNW-407	8-1280-5	May 08, 2001	1 Year

### 2.2 Block Diagram of Test Setup



### 2.3 Conducted Emission Limits

Frequency (MHz)	Maximum RF Line Voltage	
	( $\mu\text{V}$ )	$\text{dB}(\mu\text{V})$
0.45 ~ 2.51	250	48
2.51 ~ 3	3000	70
3 ~ 30	250	48
NOTE 1 – RF Line Voltage $\text{dB}(\mu\text{V}) = 20 \log \text{RF Line Voltage } (\mu\text{V})$		

## 2.4 Test 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

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 bandwidth of Test Receiver ESHS10 was set at 10 kHz.

The frequency range from 450 kHz to 30 MHz was checked. The test mode (ON) was done on conducted test and the test results of the highest emissions are listed in Sec. 2.7.

## 2.6 Test Procedures

- 2.6.1 Setup the EUT as shown in Sec. 2.2.
- 2.6.2 Turn on the power of all equipment.
- 2.6.3 The EUT will be operated normally.

## 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 : Twist Lamp Temperature : 22°C

Model No. : TL20 Humidity : 53%

Test Mode : ON Date of Test : Aug 14, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.456	0.07	40.42	40.49	48.00	7.51
	0.495	0.06	41.90	41.96	48.00	6.04
	0.572	0.05	40.82	40.87	48.00	7.13
	0.655	0.04	41.59	41.63	48.00	6.37
	0.755	0.03	41.90	41.93	48.00	6.07
	0.859	0.04	41.78	41.82	48.00	6.18
VB	0.534	0.09	39.45	39.54	48.00	8.46
	<b>0.651</b>	<b>0.08</b>	<b>42.79</b>	<b>42.87</b>	<b>48.00</b>	<b>5.13</b>
	0.756	0.08	41.64	41.72	48.00	6.28
	0.860	0.08	42.66	42.74	48.00	5.26
	0.964	0.08	41.36	41.44	48.00	6.56
	1.018	0.08	38.58	38.66	48.00	9.34
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 0.651 MHz with corrected signal level of 42.87 dB(μV) (limit is 48.00 dB(μV)), when the VB of the EUT is connected to LISN.						

TEST ENGINEER: Ada Zou  
(ADA ZOU)



EUT : Twist Lamp Temperature : 22°C

Model No. : TL23 Humidity : 53%

Test Mode : ON Date of Test : Aug 14, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.455	0.07	42.59	42.66	48.00	5.34
	0.517	0.06	42.92	42.98	48.00	5.02
	0.576	0.05	40.41	40.46	48.00	7.54
	0.719	0.03	39.79	39.82	48.00	8.18
	0.912	0.04	41.12	41.16	48.00	6.84
	0.976	0.05	41.40	41.45	48.00	6.55
VB	0.479	0.09	44.09	44.18	48.00	3.82
	<b>0.520</b>	<b>0.09</b>	<b>45.12</b>	<b>45.21</b>	<b>48.00</b>	<b>2.79</b>
	0.643	0.08	43.87	43.95	48.00	4.05
	0.704	0.08	43.99	44.07	48.00	3.93
	0.825	0.08	42.21	42.29	48.00	5.71
	0.922	0.08	41.18	41.26	48.00	6.74
<p>NOTE 1 – Emission Level = Meter Reading + Factor</p> <p>NOTE 2 – Factor = Insertion Loss + Cable Loss</p> <p>NOTE 3 – All reading are Quasi-Peak Values.</p> <p>NOTE 4 – The worst emission is detected at 0.520 MHz with corrected signal level of 45.21 dB(μV) (limit is 48.00 dB(μV)), when the VB of the EUT is connected to LISN.</p>						

TEST ENGINEER: Ada Zou  
(ADA ZOU)

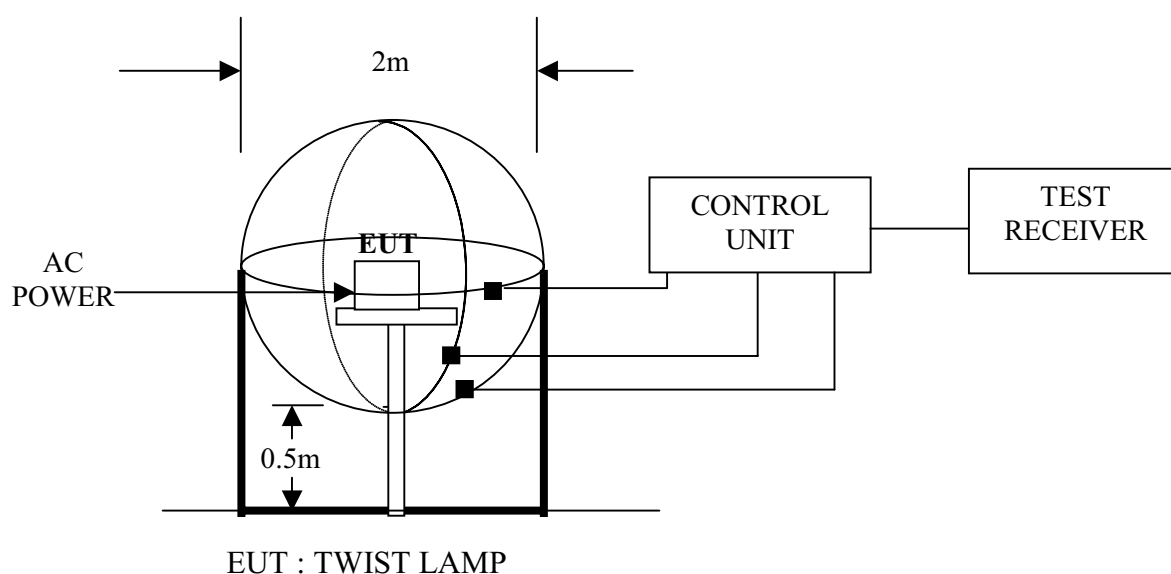
### 3 FIELD STRENGTH TEST

#### 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	Laplace	RF300	5001	May 5, 2001	1/2 Year
2.	Test Receiver	Rohde & Schwarz	ESHS10	844077/020	Apr 24, 2001	1 Year

#### 3.2 Block Diagram of Test Setup



#### 3.3 Test Configuration

The configuration of the EUT is same as those used in conducted emission test.

Refer to Sec. 2.4.

#### 3.4 Operating Condition of EUT

Same as conducted emission test which is listed in Sec. 2.5, except the test setup replaced by Sec. 3.2.

### 3.5 Test Procedure

The EUT was placed on a wooden table, which is in the center of the loop antenna. The loop antenna is 0.5 meters above the ground. Each side had one sensor. The three sensors were through the control unit to connect the Test receiver, which receiving the emission and find out the maximum emission of each side of the loop antenna.

The bandwidth of R&S Test Receiver ESHS10 was set at 200 Hz from 9kHz to 150kHz and 10kHz from 150 kHz to 30 MHz.

The frequency range from 9 kHz to 30 MHz was checked.

The “ON” mode was done on field strength test and all the test results are listed in Sec. 3.6.

### 3.6 Test Result

**<PASS>**

Refer to the following pages.

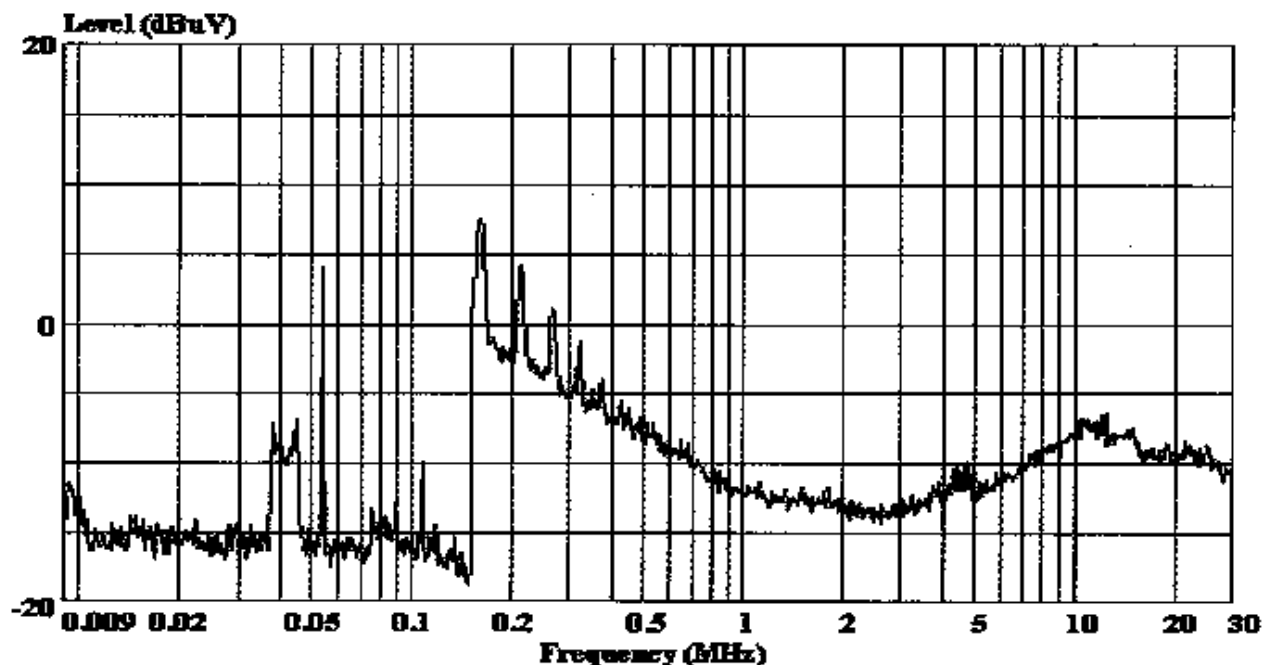


Audix Technology (Shanghai) Co., Ltd.  
敦吉電子(上海)有限公司

3F #34Bldg. No.680 GuiPing Rd.,  
CaoHeJing Hi-Tech Park,  
Shanghai, China  
Tel:+86-21-64955500  
Fax:+86-21-64955491  
audixaci@8848.net

Data#: 134 File#: D:\EMIVM\TEST\K\kaochyi.EMI

Date: 2001-08-18 Time: 17:43:46



Site : audix-aci Conducted Emission  
Condition :  
Project No. : AQE-000097  
Applicant : Shanghai Kao Chyi Electronic Co., Ltd  
EUT : Energy Saving Lamp  
M/N : TL 20  
S/N : E0020  
Power Supply : 120V/60Hz  
Ambient : 22°C 53%  
Test Line : A  
Test Mode : ON  
Test Engineer: Ada *Ada*  
Memo :

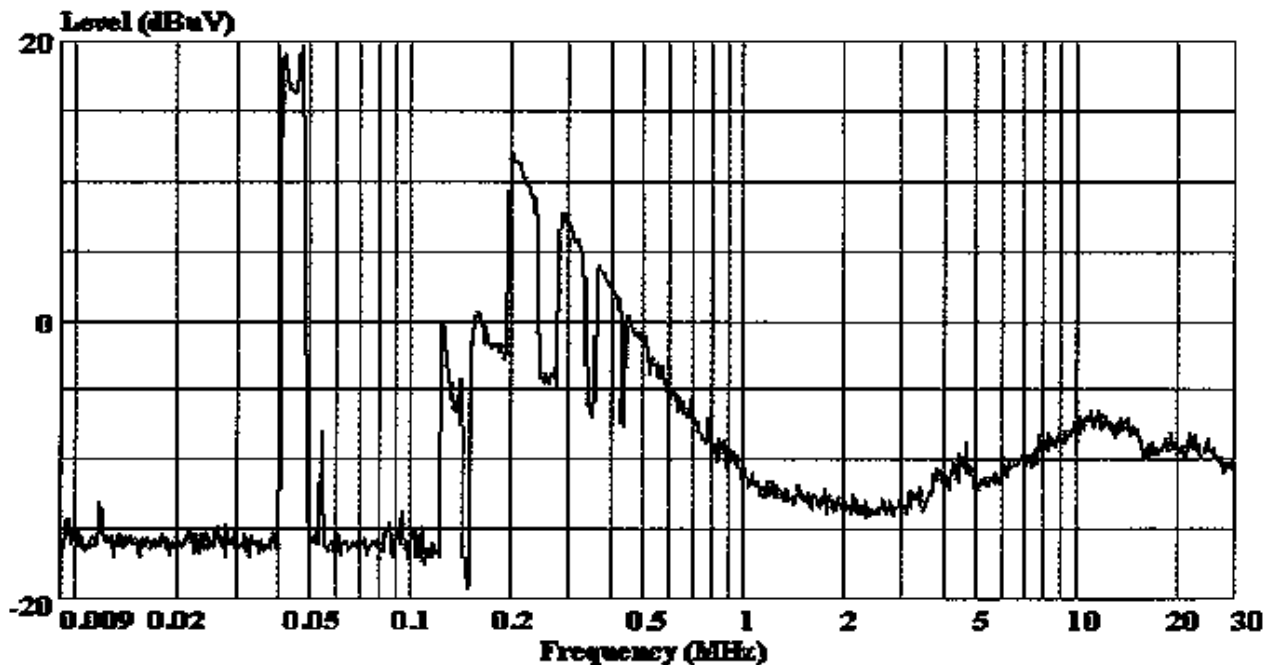


Audix Technology (Shanghai) Co., Ltd.  
敦吉電子(上海)有限公司

3F #348ldg. No.680 GuiPing Rd.,  
CaoHeJing Hi-Tech Park,  
Shanghai, China  
Tel:+86-21-64955500  
Fax:+86-21-64955491  
audixaci@8848.net

Data#: 131 File#: D:\EMIVM\TEST\K\kaochyi.EMI

Date: 2001-08-18 Time: 17:36:25



Site : audix-aci Conducted Emission  
Condition :  
Project No. : AQE-000097  
Applicant : Shanghai Kao Chyi Electronic Co., Ltd  
EUT : Energy Saving Lamp  
M/N : TL 20  
S/N : E0020  
Power Supply : 120V/60Hz  
Ambient : 22°C 53%  
Test Line : B  
Test Mode : ON  
Test Engineer: Ada *Ada*  
Memo :

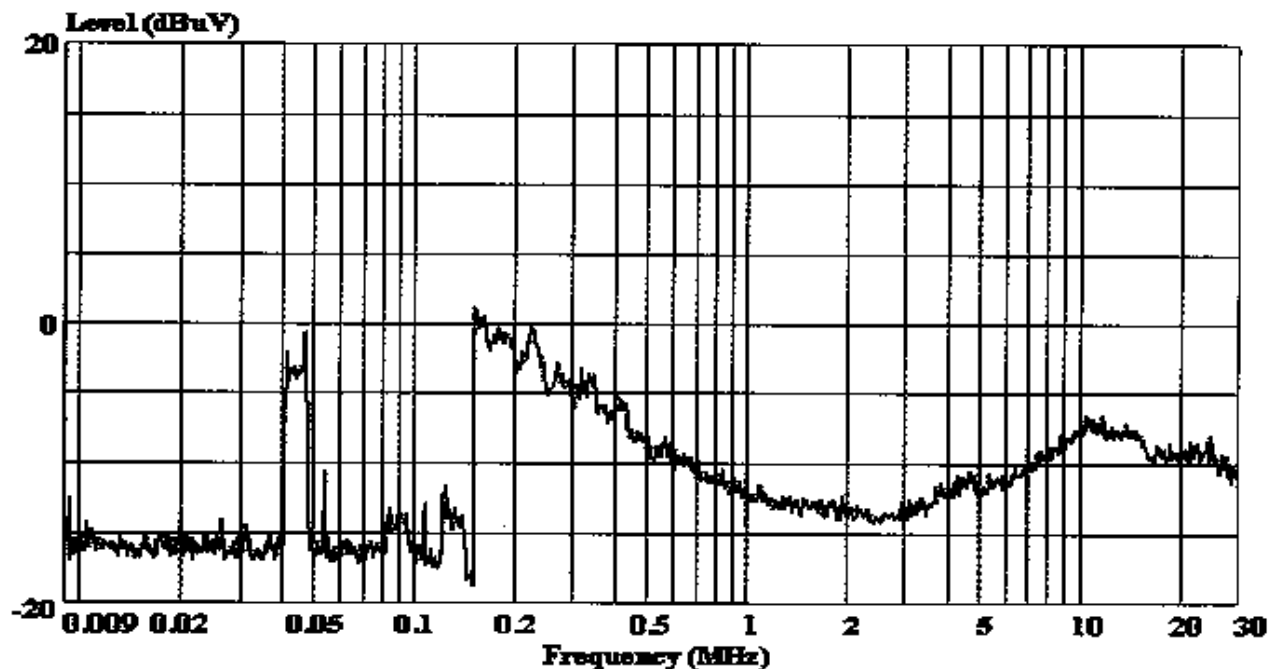


Audix Technology (Shanghai) Co., Ltd.  
敦吉電子(上海)有限公司

3F #34Bldg. No.680 GuiPing Rd.,  
CaoHeJing Hi-Tech Park,  
Shanghai, China  
Tel:+86-21-64955500  
Fax:+86-21-64955491  
audixaci@8848.net

Data#: 128 File#: D:\EMIVM\TEST\K\kaochyi.EMI

Date: 2001-08-18 Time: 17:32:08



Site : audix-aci Conducted Emission  
Condition :  
Project No. : AQE-000097  
Applicant : Shanghai Kao Chyi Electronic Co., Ltd  
EUT : Energy Saving Lamp  
M/N : TL-20  
S/N : E0020  
Power Supply : 120V/60Hz  
Ambient : 22°C 53%  
Test Line : C  
Test Mode : ON  
Test Engineer: Ada *Ada*  
Memo :

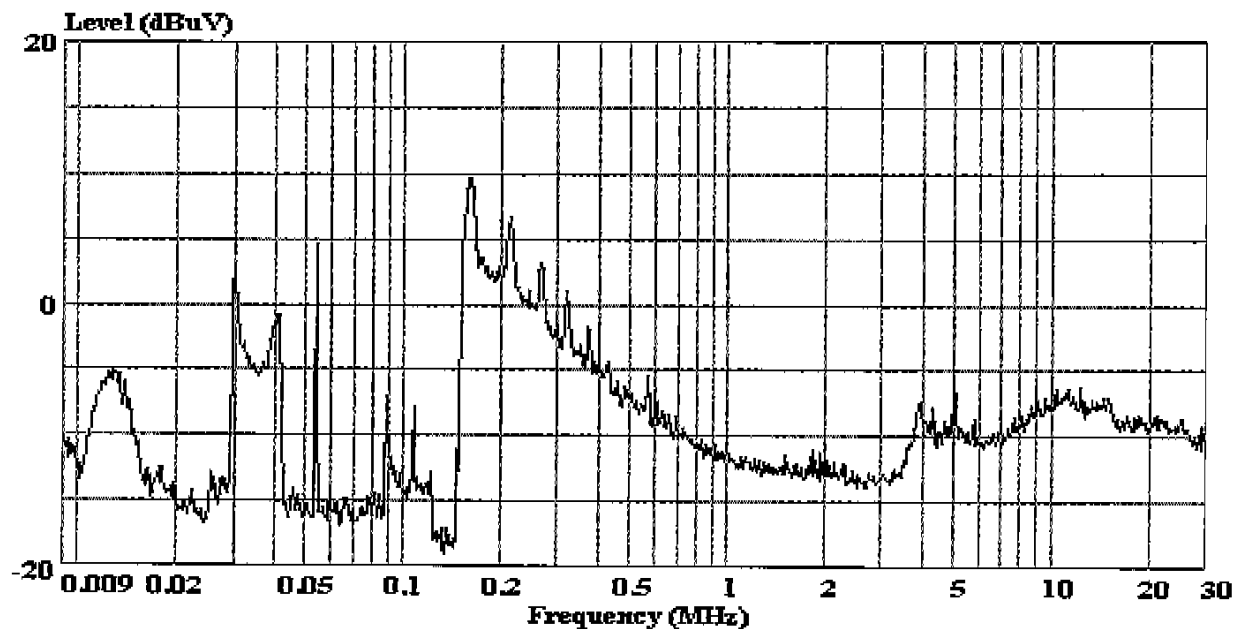


Audix Technology (Shanghai) Co., Ltd.  
教吉電子(上海)有限公司

3F #34Bldg. No.680 GuiPing Rd.,  
CaoHeJing Hi-Tech Park,  
Shanghai, China  
Tel:+86-21-64955500  
Fax:+86-21-64955491  
audixaci@8848.net

Data#: 101 File#: D:\EMIVM\TEST\K\kaochyι.EMI

Date: 2001-08-16 Time: 12:04:13



Site : audix-aci  
Condition :  
Project No. : AQE-000097  
Applicant : Shanghai Kao Chyi Electronic Co., Ltd  
EUT : Twist Lamp  
M/N : TL23  
S/N : E0023  
Power Supply : 120V/60Hz  
Ambient : 22'C 53%  
Test Line : A  
Test Mode : ON  
Test Engineer: Ada *[Signature]*  
Memo :

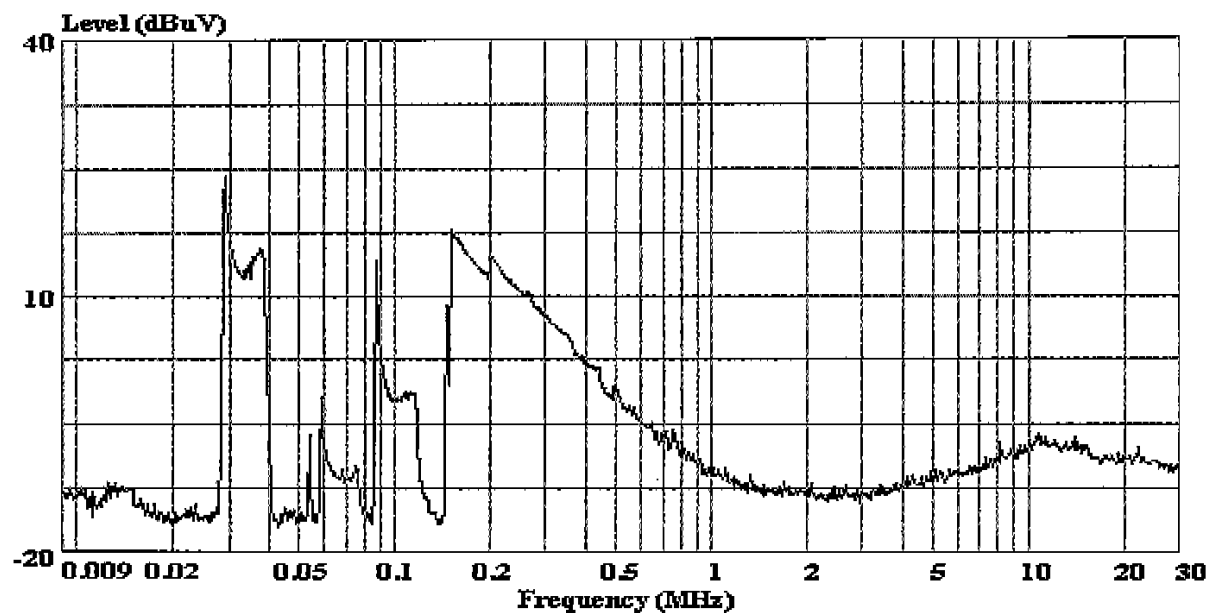


Audix Technology (Shanghai) Co., Ltd.  
敦吉電子(上海)有限公司

3F #34Bldg. No.680 GuiPing Rd.,  
CaoHeJing Hi-Tech Park,  
Shanghai, China  
Tel:+86-21-64955500  
Fax:+86-21-64955491  
audixaci@8848.net

Data#: 104 File#: D:\EMIVM\TEST\K\kaochyι.EMI

Date: 2001-08-16 Time: 13:52:34



Site : audix-aci  
Condition :  
Project No. : AQE-000097  
Applicant : Shanghai Kao Chyi Electronic Co., Ltd  
EUT : Twist Lamp  
M/N : TL23  
S/N : E0023  
Power Supply : 120V/60Hz  
Ambient : 22'C 53%  
Test Line : B  
Test Mode : ON  
Test Engineer: Ada *Ada*  
Memo :



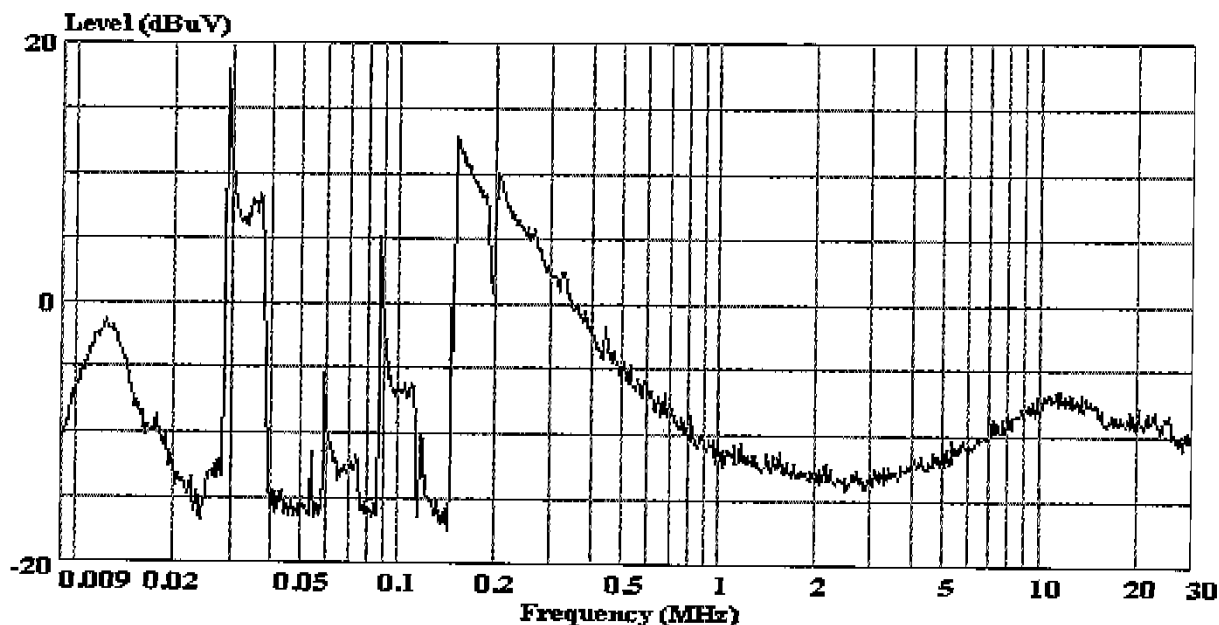


Audix Technology (Shanghai) Co., Ltd.  
敦吉电子(上海)有限公司

3F #34Bldg. No.680 GuiPing Rd.,  
CaoHeJing Hi-Tech Park,  
Shanghai, China  
Tel:+86-21-64955500  
Fax:+86-21-64955491  
audixaci@8848.net

Data#: 107 File#: D:\EMIVM\TEST\K\kaochyi.EMI

Date: 2001-08-16 Time: 13:59:09



Site : audix-aci  
Condition :  
Project No. : AQE-000097  
Applicant : Shanghai Kao Chyi Electronic Co., Ltd  
EUT : Twist Lamp  
M/N : TL23  
S/N : E0023  
Power Supply : 120V/60Hz  
Ambient : 22°C 53%  
Test Line : C  
Test Mode : ON  
Test Engineer: Ada *Ada*  
Memo :