

Application for FCC Certificate
On Behalf of
Tospo Electronics Co., Ltd.

Energy Saving Lamp

Model No.: TP120-5UL/2	TP120-7UL/2
TP120-9UL/2	TP120-11UL/2
TP120-13UL/2	TP120-15UL/2
TP120-15UL/3	TP120-20UL/3
TP120-25UL/3	

FCC ID : PDYTPU525

Prepared For : Tospo Electronics Co., Ltd.
No.2 West Xing-Sheng Road, Hengdian Industrial Area,
Dong Yang City, Zhejiang, P.R. 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-F01041
Date of Test : Jul 05 ~ 12, 2001
Date of Report : Jul 17, 2001

TABLE OF CONTENTS

	Page
1 GENERAL INFORMATION	4
1.1 DESCRIPTION OF EQUIPMENT UNDER TEST.....	4
1.2 DESCRIPTION OF TEST FACILITY	5
1.3 MEASUREMENT UNCERTAINTY	5
2 AC POWERLINE CONDUCTED EMISSION TEST	6
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
3 RADIATED EMISSION TEST	14
3.1 TEST EQUIPMENT.....	14
3.2 BLOCK DIAGRAM OF TEST SETUP	14
3.3 RADIATED EMISSION LIMITS	15
3.4 TEST CONFIGURATION	15
3.5 OPERATING CONDITION OF EUT	15
3.6 TEST PROCEDURES	15
3.7 TEST RESULTS	16
4 RADIATED ELECTROMAGNETIC EMISSION TEST	22
4.1 BLOCK DIAGRAM OF TEST SETUP.....	22
4.2 TEST CONFIGURATION	22
4.3 OPERATING CONDITION OF EUT	22
4.4 TEST PROCEDURE	23
4.5 TEST RESULT	23

TEST REPORT FOR FCC CERTIFICATE

Applicant : Tospo Electronics Co., Ltd.

Manufacturer : Tospo Electronics Co., Ltd.

EUT Description : Energy Saving Lamp

(A) Model No.:

TP120-5UL/2	TP120-7UL/2	TP120-9UL/2
TP120-11UL/2	TP120-13UL/2	TP120-15UL/2
TP120-15UL/3	TP120-20UL/3	TP120-25UL/3

(B) Serial No.:

E070401-1	E070402-1	E070403-1
E070404-1	E070405-1	E070406-1
E070407-1	E070408-1	E070409-1

(C) Power Supply: 120V/60Hz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 18 CONSUMER DEVICES (1998)
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 radiated and conducted emissions.

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 : Jul 05 ~ 26, 2001

Prepared by : <u>Stella Tang 2001.7.23</u>	Test Engineer : <u>Ada Zou</u>
Stella Tang / Assistant	Ada Zou / Engineer
Reviewer : <u>Hall Wang</u>	Approved Signatory : <u>Alex Chiu</u>
Hall Wang / Supervisor	Alex Chiu / Assistant Manager
	Authorized Signature(s)

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test

Description : Energy Saving Lamp

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

Model Number : TP120-5UL/2, TP120-7UL/2, TP120-9UL/2, TP120-11UL/2, TP120-13UL/2, TP120-15UL/2, TP120-15UL/3, TP120-20UL/3, TP120-25UL/3
(All the above models have been tested. In this report, only the data of TP120-5UL/2, TP120-11UL/2, TP120-15UL/2, TP120-15UL/3, TP120-20UL/3 & TP120-25UL/3 are reported.)

Applicant : Tospo Electronics Co., Ltd.
No.2 West Xing-Sheng Road, Hengdian Industrial Area,
Dong Yang City, Zhejiang, P.R. China

Manufacturer : Tospo Electronics Co., Ltd.
No.2 West Xing-Sheng Road, Hengdian Industrial Area,
Dong Yang City, Zhejiang, P.R. China

M/N	INPUT POWER (VA)	OUTPUT POWER (W)
TP120-25UL/3	190.8	25.4
TP120-20UL/3	37.7	20.6
TP120-15UL/3	27.0	15.6
TP120-15UL/2	24.5	14.0
TP120-13UL/2	21.4	12.0
TP120-11UL/2	19.4	10.7
TP120-9UL/2	16.6	8.9
TP120-7UL/2	13.9	7.1
TP120-5UL/2	11.8	5.6

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 = 2.66dB
Radiated Emission Uncertainty	:	U = 4.26dB

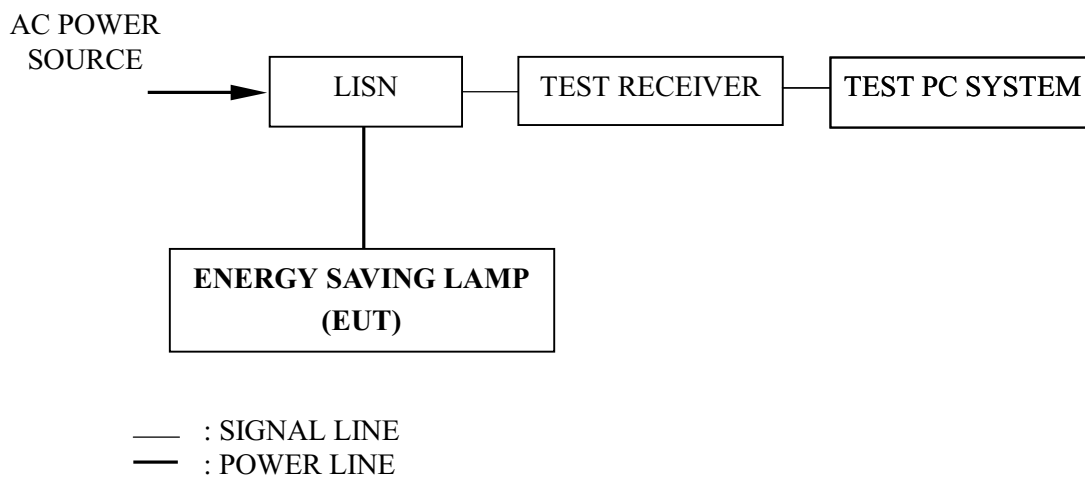
2 AC POWERLINE CONDUCTED EMISSION TEST

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	
	(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)		

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 : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-5UL/2 Humidity : 53%

Test Mode : ON Date of Test : Jul 05, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.489	0.31	35.77	36.08	48.00	11.92
	0.591	0.30	32.65	32.95	48.00	15.05
	0.696	0.29	29.92	30.21	48.00	17.79
	0.754	0.29	29.66	29.95	48.00	18.05
	0.911	0.28	29.64	29.92	48.00	18.08
	1.025	0.27	28.31	28.58	48.00	19.42
VB	0.481	0.32	35.85	36.17	48.00	11.83
	0.591	0.30	38.38	38.68	48.00	9.32
	0.651	0.29	29.24	29.53	48.00	18.47
	0.708	0.29	27.97	28.26	48.00	19.74
	0.814	0.28	28.30	28.58	48.00	19.42
	0.866	0.28	27.90	28.18	48.00	19.82
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 0.591 MHz with corrected signal level of 38.68 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 : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-11UL/2 Humidity : 53%

Test Mode : ON Date of Test : Jul 05, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.467	0.32	39.85	40.17	48.00	7.83
	0.519	0.31	38.69	39.00	48.00	9.00
	0.640	0.30	34.74	35.04	48.00	12.96
	0.748	0.29	37.03	37.32	48.00	10.68
	0.907	0.28	33.55	33.83	48.00	14.17
	1.021	0.27	35.22	35.49	48.00	12.51
VB	0.467	0.32	41.80	42.12	48.00	5.88
	0.521	0.31	37.10	37.41	48.00	10.59
	0.571	0.30	34.80	35.10	48.00	12.90
	0.624	0.30	37.20	37.50	48.00	10.50
	0.697	0.29	32.00	32.29	48.00	15.71
	0.805	0.28	33.50	33.78	48.00	14.22
<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 0.467 MHz with corrected signal level of 42.12 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)

EUT : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-15UL/2 Humidity : 53%

Test Mode : ON Date of Test : Jul 05, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.506	0.31	39.90	40.21	48.00	7.79
	0.575	0.30	33.00	33.30	48.00	14.70
	0.622	0.30	38.50	38.80	48.00	9.20
	0.736	0.29	33.10	33.39	48.00	14.61
	0.992	0.27	31.70	31.97	48.00	16.03
	1.098	0.27	30.70	30.97	48.00	17.03
VB	0.510	0.31	44.00	44.31	48.00	3.69
	0.565	0.30	31.70	32.00	48.00	16.00
	0.590	0.30	27.30	27.60	48.00	20.40
	0.620	0.30	33.30	33.60	48.00	14.40
	0.683	0.29	30.60	30.89	48.00	17.11
	0.978	0.27	34.40	34.67	48.00	13.33
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 0.510 MHz with corrected signal level of 44.31 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 : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-15UL/3 Humidity : 53%

Test Mode : ON Date of Test : Jul 05, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.472	0.32	31.40	31.72	48.00	16.28
	0.529	0.31	33.50	33.81	48.00	14.19
	0.609	0.30	28.90	29.20	48.00	18.80
	0.670	0.29	30.30	30.59	48.00	17.41
	0.710	0.29	25.70	25.99	48.00	22.01
	0.777	0.28	29.40	29.68	48.00	18.32
VB	0.476	0.32	31.20	31.52	48.00	16.48
	0.532	0.31	33.80	34.11	48.00	13.89
	0.594	0.30	29.30	29.60	48.00	18.40
	0.670	0.29	30.30	30.59	48.00	17.41
	0.778	0.28	29.50	29.78	48.00	18.22
	0.832	0.28	25.80	26.08	48.00	21.92
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 0.532 MHz with corrected signal level of 34.11 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 : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-20UL/3 Humidity : 53%

Test Mode : ON Date of Test : Jul 05, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.475	0.32	34.90	35.22	48.00	12.78
	0.504	0.31	39.00	39.31	48.00	8.69
	0.581	0.30	37.20	37.50	48.00	10.50
	0.677	0.29	33.80	34.09	48.00	13.91
	0.730	0.29	35.70	35.99	48.00	12.01
	0.904	0.28	33.00	33.28	48.00	14.72
VB	0.497	0.31	39.80	40.11	48.00	7.89
	0.518	0.31	32.10	32.41	48.00	15.59
	0.554	0.30	34.50	34.80	48.00	13.20
	0.586	0.30	36.70	37.00	48.00	11.00
	0.708	0.29	32.50	32.79	48.00	15.21
	0.846	0.28	35.00	35.28	48.00	12.72
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 0.497 MHz with corrected signal level of 40.11 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 : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-25UL/3 Humidity : 53%

Test Mode : ON Date of Test : Jul 05, 2001

Test Line	Frequency (MHz)	Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)
VA	0.455	0.33	41.60	41.93	48.00	6.07
	0.496	0.31	42.50	42.81	48.00	5.19
	0.523	0.31	43.40	43.71	48.00	4.29
	0.593	0.30	37.20	37.50	48.00	10.50
	0.618	0.30	42.80	43.10	48.00	4.90
	0.795	0.28	38.50	38.78	48.00	9.22
VB	0.457	0.33	43.10	43.43	48.00	4.57
	0.491	0.31	39.00	39.31	48.00	8.69
	0.516	0.31	42.40	42.71	48.00	5.29
	0.586	0.30	36.70	37.00	48.00	11.00
	0.616	0.30	44.70	45.00	48.00	3.00
	0.784	0.28	39.60	39.88	48.00	8.12
<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 0.616 MHz with corrected signal level of 45.00 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)

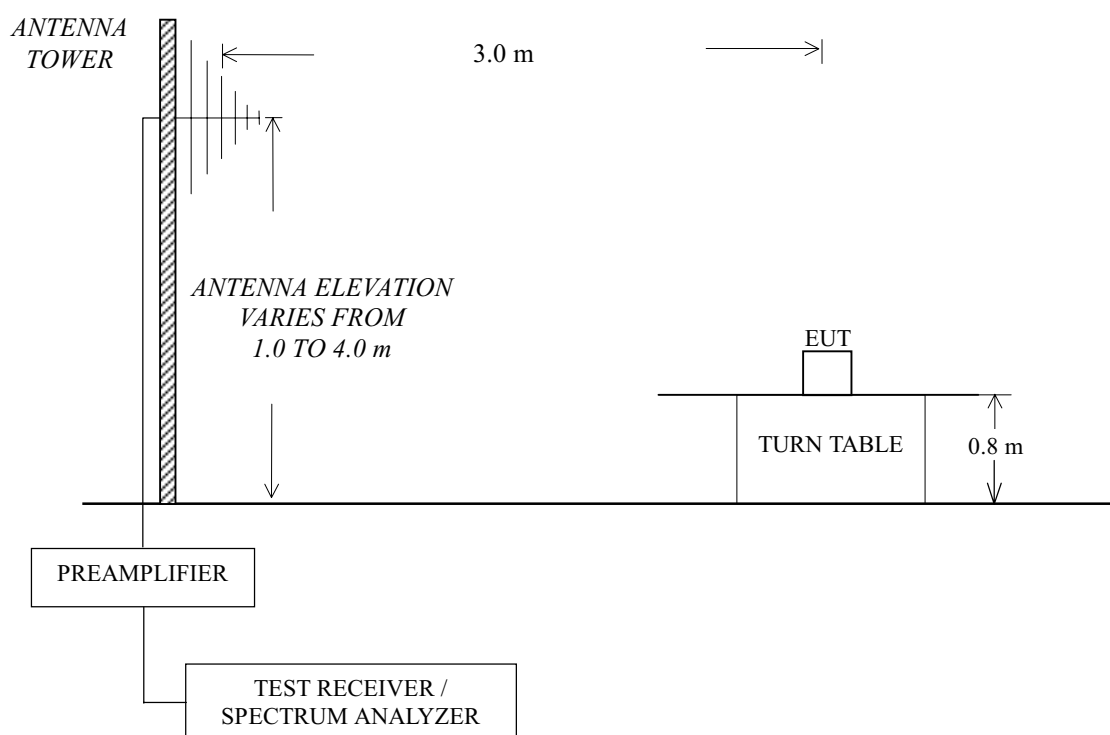
3 RADIATED EMISSION TEST

3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Preamplifier	HP	8447D	2944A06849	May 02, 2001	1/2 Year
2.	Bilog Antenna	Chase	CBL6111	1146	May 02, 2001	1/2 Year
3.	Test Receiver	Rohde & Schwarz	ESVS10	844594/001	Sep 20, 2000	1 Year

3.2 Block Diagram of Test Setup



3.3 Radiated Emission Limits

Frequency (MHz)	Distance (m)	Field strength limits ($\mu\text{V/m}$)	Converted Field Strengths Limits By 3 meters Measuring Distance	
			$\mu\text{V/m}$	$\text{dB}(\mu\text{V/m})$
30 ~ 88	30	10	100	40.0
88 ~ 216	30	15	150	43.5
216 ~ 1000	30	20	200	46.0
NOTE 1 - Emission Level $\text{dB}(\mu\text{V/m}) = 20 \log \text{Emission Level } (\mu\text{V/m})$ NOTE 2 - The tighter limit applies at the band edges. NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system. NOTE 4 - The measurements are made at 3 meters distance, then the permissible field strength limits be adjusted using $1/d$ as an attenuation factor.				

3.4 Test Configuration

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

Please refer to Sec. 2.4.

3.5 Operating Condition of EUT

The EUT was placed on a turn table which is 0.8 meter above ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to MP-5/1986 requirements during radiated test.

The bandwidth setting on Test Receiver ESVS10 was 120 kHz.

The frequency range from 30 MHz to 1000 MHz was checked. The test mode (ON) was done on radiated emission test and the test results of the highest emissions are listed in Sec. 3.7.

3.6 Test Procedures

Same as conducted emission test which is listed in Sec. 2.6, except the test set up replaced by Sec. 3.2.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emissions relative the limit is reported. All the emissions not reported below are too low against the FCC Part 18 limit.

EUT : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-5UL/2 Humidity : 53%

Test Mode : ON Date of Test : Jul 12, 2001

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	124.090	13.12	1.44	25.10	22.94	12.40	43.50	31.10
	141.550	13.15	1.60	25.10	23.69	13.34	43.50	30.16
	154.160	12.38	1.70	25.10	25.23	14.21	43.50	29.29
	282.200	13.65	2.42	25.10	25.43	16.40	46.00	29.60
	351.070	16.03	2.80	25.60	29.84	23.07	46.00	22.93
	679.900	22.00	4.09	26.70	21.34	20.73	46.00	25.27
Vertical	40.670	14.62	0.80	25.45	29.97	19.94	40.00	20.06
	48.430	10.03	0.87	25.38	32.15	17.67	40.00	22.33
	127.970	13.21	1.48	25.10	26.36	15.95	43.50	27.55
	160.950	11.96	1.75	25.10	27.18	15.79	43.50	27.71
	206.540	10.57	2.04	25.10	29.94	17.45	43.50	26.05
	243.400	12.63	2.24	25.10	25.36	15.13	46.00	30.87
<p>NOTE 1 – Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor</p> <p>NOTE 2 – All reading are Quasi-Peak values.</p> <p>NOTE 3 – The worst emission at horizontal polarization was detected at 351.070 MHz with corrected signal level of 23.07 dB(μV/m) (limit is 46.00 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 204°.</p> <p>NOTE 4 – The worst emission at vertical polarization was detected at 40.670 MHz with corrected signal level of 19.94 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00 m height and the turn table was at 26°.</p> <p>NOTE 5 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.</p>								

TEST ENGINEER: Ada Zou
(ADA ZOU)

EUT : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-11UL/2 Humidity : 53%

Test Mode : ON Date of Test : Jul 12, 2001

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	43.580	12.02	0.83	25.42	25.11	12.54	40.00	27.46
	80.440	8.01	1.09	25.18	24.68	8.60	40.00	31.40
	139.610	12.51	1.58	25.10	23.32	12.31	43.50	31.19
	359.800	14.74	2.85	25.68	24.29	16.20	46.00	29.80
	579.020	19.64	3.78	26.70	20.86	17.58	46.00	28.42
	649.830	19.79	4.00	26.70	23.64	20.73	46.00	25.27
Vertical	40.670	14.62	0.80	25.45	30.53	20.50	40.00	19.50
	49.400	9.46	0.88	25.37	34.77	19.74	40.00	20.26
	127.970	13.21	1.48	25.10	29.50	19.09	43.50	24.41
	242.430	12.59	2.24	25.10	28.29	18.02	46.00	27.98
	282.200	13.65	2.42	25.10	24.76	15.73	46.00	30.27
	443.220	18.19	3.25	26.33	22.94	18.05	46.00	27.95

NOTE 1 – Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor

NOTE 2 – All reading are Quasi-Peak values.

NOTE 3 – The worst emission at horizontal polarization was detected at 649.830 MHz with corrected signal level of 20.73dB(μV/m) (limit is 46.00 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 201°.

NOTE 4 – The worst emission at vertical polarization was detected at 40.670 MHz with corrected signal level of 20.50 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00 m height and the turn table was at 286°.

NOTE 5 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

TEST ENGINEER: Ada Zou
(ADA ZOU)

EUT : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-15UL/2 Humidity : 53%

Test Mode : ON Date of Test : Jul 12, 2001

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	41.640	13.47	0.81	25.44	24.15	12.99	40.00	27.01
	81.410	8.03	1.09	25.18	24.02	7.96	40.00	32.04
	132.820	11.60	1.52	25.10	22.51	10.53	43.50	32.97
	328.760	14.34	2.67	25.40	21.62	13.23	46.00	32.77
	515.000	17.90	3.55	26.70	21.35	16.10	46.00	29.90
	649.830	19.79	4.00	26.70	23.64	20.73	46.00	25.27
Vertical	42.610	13.62	0.82	25.43	29.00	18.01	40.00	21.99
	50.370	8.87	0.89	25.37	33.16	17.55	40.00	22.45
	77.530	7.50	1.07	25.20	30.78	14.15	40.00	25.85
	136.700	13.24	1.56	25.10	23.46	13.16	43.50	30.34
	159.010	12.13	1.74	25.10	24.39	13.16	43.50	30.34
	242.430	12.59	2.24	25.10	28.29	18.02	46.00	27.98

NOTE 1 – Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor

NOTE 2 – All reading are Quasi-Peak values.

NOTE 3 – The worst emission at horizontal polarization was detected at 649.830 MHz with corrected signal level of 20.73dB(μV/m) (limit is 46.00 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 228°.

NOTE 4 – The worst emission at vertical polarization was detected at 42.610 MHz with corrected signal level of 18.01 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00 m height and the turn table was at 347°.

NOTE 5 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

TEST ENGINEER: Ada Zou
(ADA ZOU)

EUT : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-15UL/3 Humidity : 53%

Test Mode : ON Date of Test : Jul 12, 2001

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	43.580	13.16	0.83	25.42	23.54	12.11	40.00	27.89
	105.660	10.43	1.25	25.10	23.15	9.73	43.50	33.77
	127.000	13.21	1.47	25.10	26.52	16.10	43.50	27.40
	142.520	13.09	1.60	25.10	23.17	12.76	43.50	30.74
	282.200	13.65	2.42	25.10	23.48	14.45	46.00	31.55
	366.590	16.63	2.88	25.74	21.80	15.57	46.00	30.43
Vertical	49.400	9.46	0.88	25.37	30.18	15.15	40.00	24.85
	99.840	9.40	1.18	25.10	24.75	10.23	43.50	33.27
	150.280	12.57	1.67	25.10	22.93	12.07	43.50	31.43
	214.300	11.06	2.09	25.10	24.56	12.61	43.50	30.89
	282.200	13.65	2.42	25.10	26.33	17.30	46.00	28.70
	515.000	19.02	3.55	26.70	20.95	16.82	46.00	29.18

NOTE 1 – Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor

NOTE 2 – All reading are Quasi-Peak values.

NOTE 3 – The worst emission at horizontal polarization was detected at 127.000 MHz with corrected signal level of 16.10dB(μV/m) (limit is 43.50 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 38°.

NOTE 4 – The worst emission at vertical polarization was detected at 49.400 MHz with corrected signal level of 15.15 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00 m height and the turn table was at 37°.

NOTE 5 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

TEST ENGINEER: Ada Zou
(ADA ZOU)

EUT : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-20UL/3 Humidity : 53%

Test Mode : ON Date of Test : Jul 12, 2001

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	53.280	7.73	0.91	25.34	25.90	9.20	40.00	30.80
	120.210	12.79	1.40	25.10	24.64	13.73	43.50	29.77
	137.670	13.24	1.56	25.10	23.11	12.81	43.50	30.69
	227.880	11.80	2.16	25.10	21.96	10.82	46.00	35.18
	285.110	13.71	2.43	25.10	21.87	12.91	46.00	33.09
	515.000	19.02	3.55	26.70	21.12	16.99	46.00	29.01
Vertical	41.640	14.08	0.81	25.44	27.93	17.83	40.00	22.62
	49.400	9.46	0.88	25.37	30.18	15.15	40.00	24.85
	84.320	7.94	1.11	25.16	24.87	8.76	40.00	31.24
	152.220	12.49	1.68	25.10	28.18	17.25	43.50	26.25
	242.430	12.59	2.24	25.10	28.33	18.06	46.00	27.94
	515.000	19.02	3.55	26.70	20.95	16.82	46.00	29.18

NOTE 1 – Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor

NOTE 2 – All reading are Quasi-Peak values.

NOTE 3 – The worst emission at horizontal polarization was detected at 515.000 MHz with corrected signal level of 16.99dB(μV/m) (limit is 46.00 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 182°.

NOTE 4 – The worst emission at vertical polarization was detected at 41.640 MHz with corrected signal level of 17.83 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00 m height and the turn table was at 0°.

NOTE 5 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

TEST ENGINEER: Ada Zou
(ADA ZOU)

EUT : Energy Saving Lamp Temperature : 23°C

Model No. : TP120-25UL/3 Humidity : 53%

Test Mode : ON Date of Test : Jul 12, 2001

Polarization	Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Meter Reading dB(μV)	Emission Level dB(μV/m)	Limits dB(μV/m)	Margin (dB)
Horizontal	52.310	8.08	0.91	25.35	25.16	8.80	40.00	31.20
	118.270	12.49	1.38	25.10	24.40	13.17	43.50	30.33
	127.000	13.21	1.47	25.10	26.52	16.10	43.50	27.40
	151.250	12.54	1.68	25.10	23.17	12.29	43.50	31.21
	280.260	13.61	2.41	25.10	22.97	13.89	46.00	32.11
	371.440	16.81	2.91	25.78	23.88	17.82	46.00	28.18
Vertical	48.430	10.03	0.87	25.38	31.82	17.34	40.00	22.66
	85.290	8.02	1.11	25.16	25.36	9.33	40.00	30.67
	127.000	13.21	1.47	25.10	29.60	19.18	43.50	24.32
	153.190	12.43	1.69	25.10	30.81	19.83	43.50	23.67
	211.390	10.88	2.07	25.10	28.60	16.45	43.50	27.05
	242.430	12.59	2.24	25.10	28.33	18.06	46.00	27.94

NOTE 1 – Emission Level = Meter Reading + Antenna Factor + Cable Loss – Preamp Factor

NOTE 2 – All reading are Quasi-Peak values.

NOTE 3 – The worst emission at horizontal polarization was detected at 127.000 MHz with corrected signal level of 16.10dB(μV/m) (limit is 43.50 dB(μV/m)), when the antenna was 1.00m height and the turn table was at 228°.

NOTE 4 – The worst emission at vertical polarization was detected at 48.430 MHz with corrected signal level of 17.34 dB(μV/m) (limit is 40.00 dB(μV/m)), when the antenna was 1.00 m height and the turn table was at 10°.

NOTE 5 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

TEST ENGINEER: Ada Zou
(ADA ZOU)

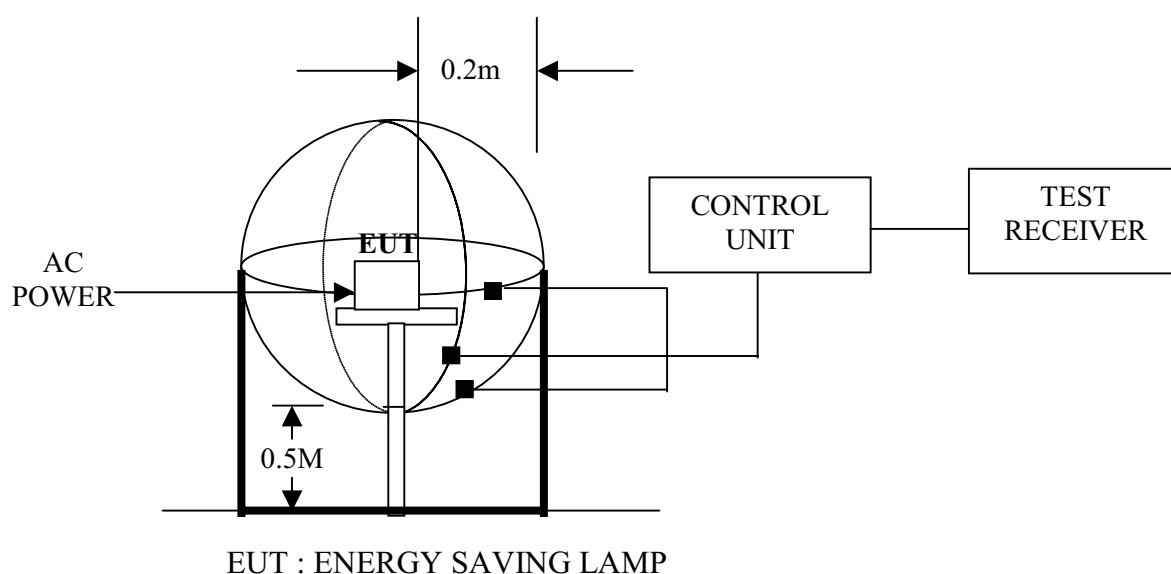
4 RADIATED ELECTROMAGNETIC EMISSION TEST

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

4.2 Block Diagram of Test Setup



4.3 Test Configuration

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

Refer to Sec. 2.4.

4.4 Operating Condition of EUT

Same as conducted Emission test which is listed in Sec. 2.5, except the test set up replaced by Sec. 4.1.

4.5 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. The sides of the EUT were 0.2 meters away from the loop antenna. 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 radiated electromagnetic emission test and all the test results are listed in Sec. 4.6.

4.6 Test Result

<PASS>

Refer to the following pages.

For TP120-5UL/2:

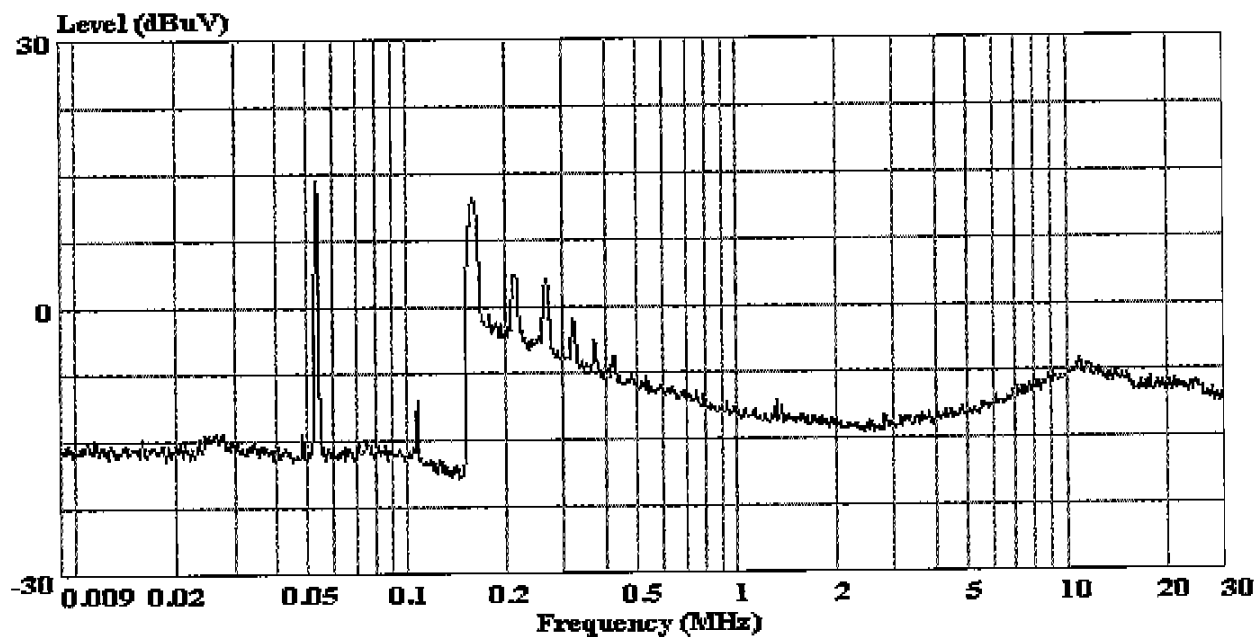


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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\H\Hd.emi

Date: 2001-07-26 Time: 18:57:49



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-5UL/2
S/N : E070401-1
Power supply: 120V, 60Hz
Ambient : 23°C 53%
Test line : A
Test mode : ON
: Ada

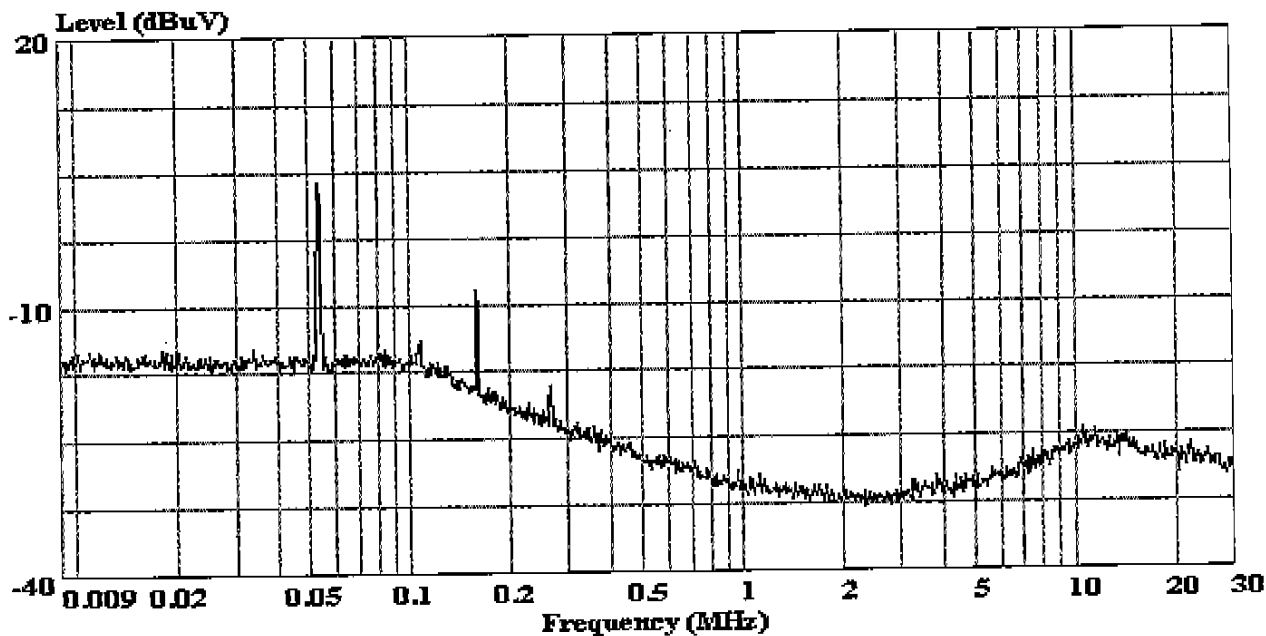


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 107 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-26 Time: 19:09:28



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co.,Ltd
EUT : Energy Saving Lamp
M/N : TP120-SUL/2
S/N : E070401-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : B
Test mode : ON
: Ada

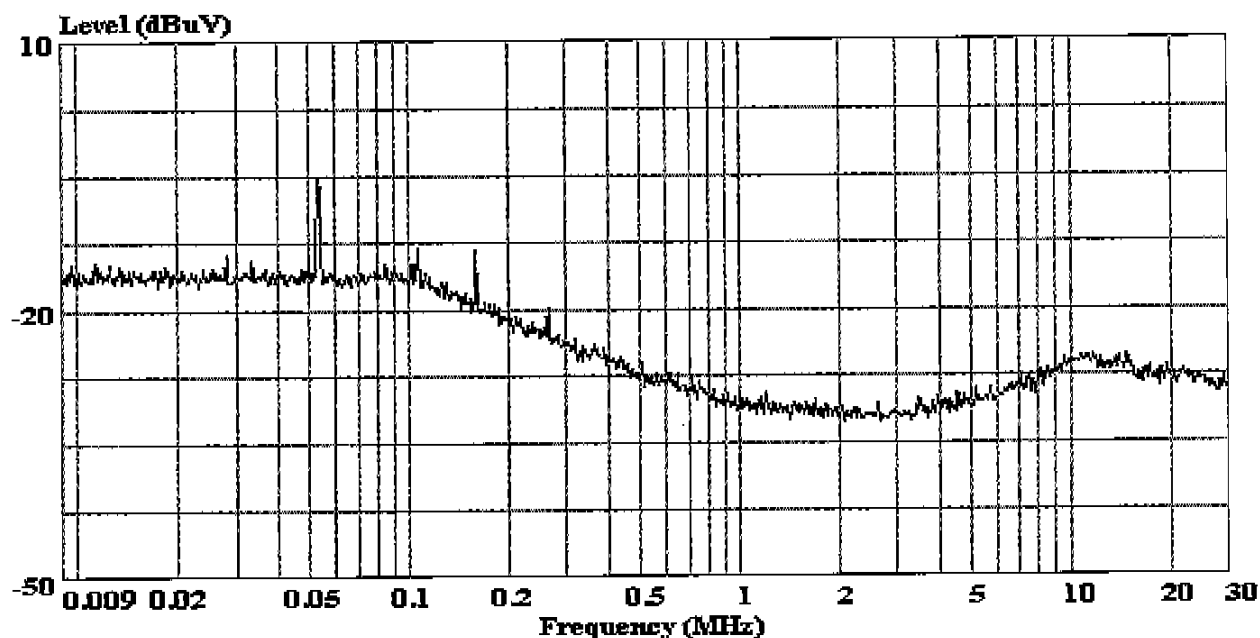


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 110 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-26 Time: 19:16:58



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-5UL/2
S/N : E070401-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : C
Test mode : ON
: Ada

For TP120-11UL/2:

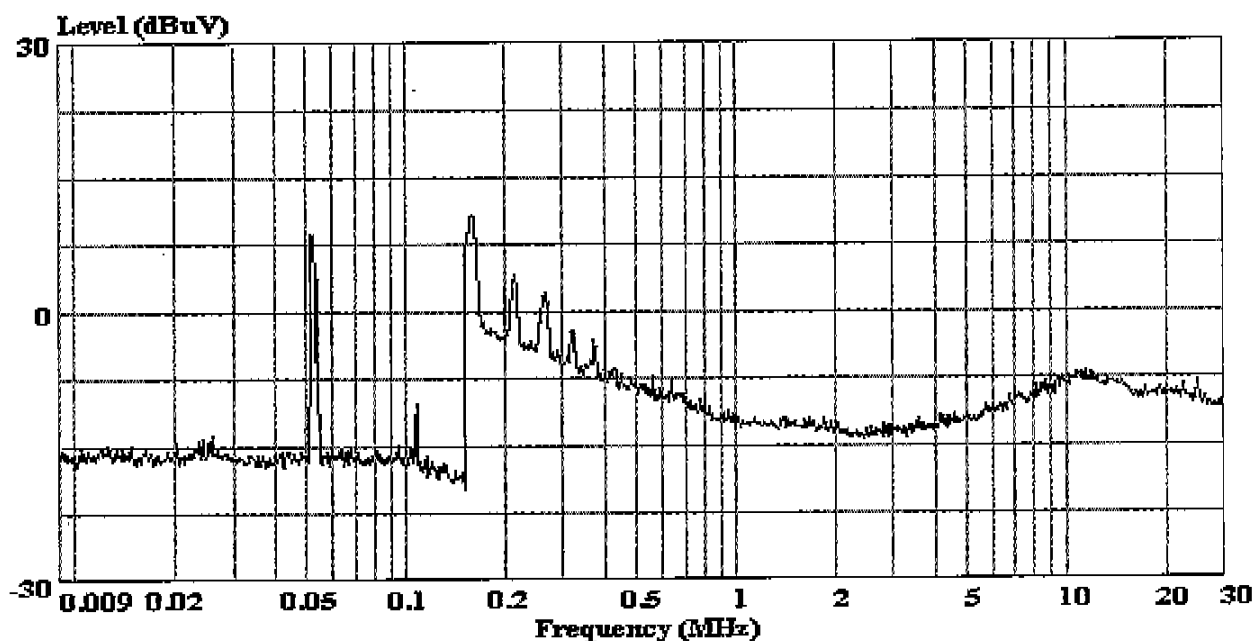


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 119 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-26 Time: 19:49:21



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co.,Ltd
EUT : Energy Saving Lamp
M/N : TP120-11UL/2
S/N : E070404-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : A
Test mode : ON
: Ada

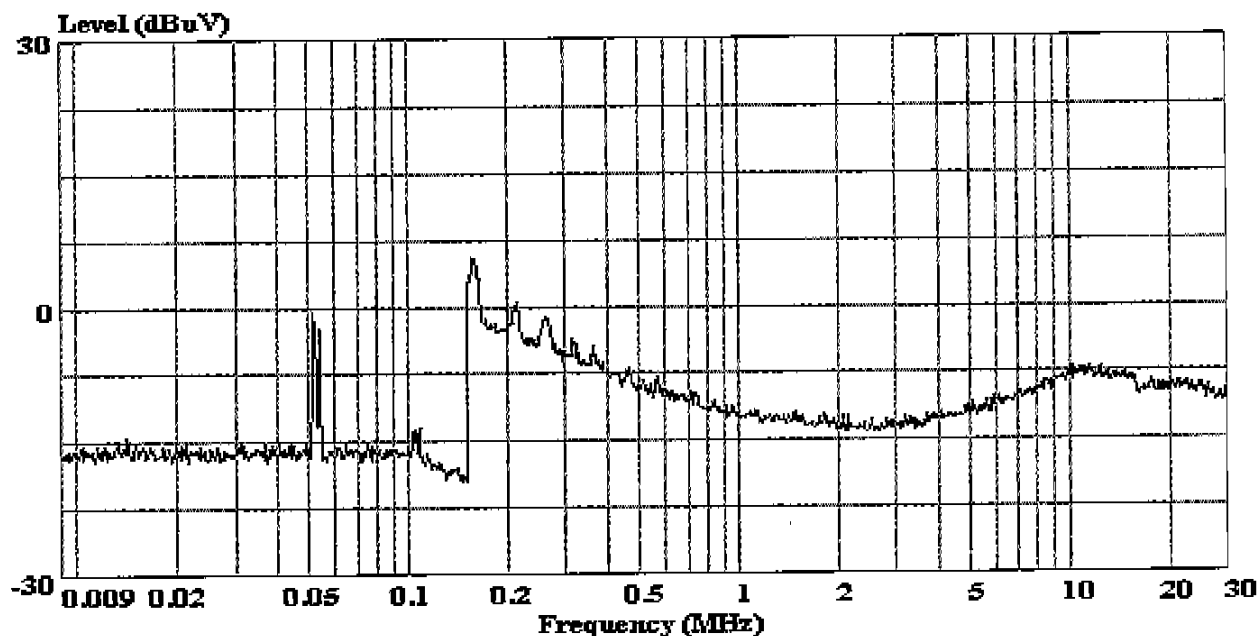


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 116 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-26 Time: 19:45:12



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-11UL/2
S/N : E070404-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : B
Test mode : ON
: Ada

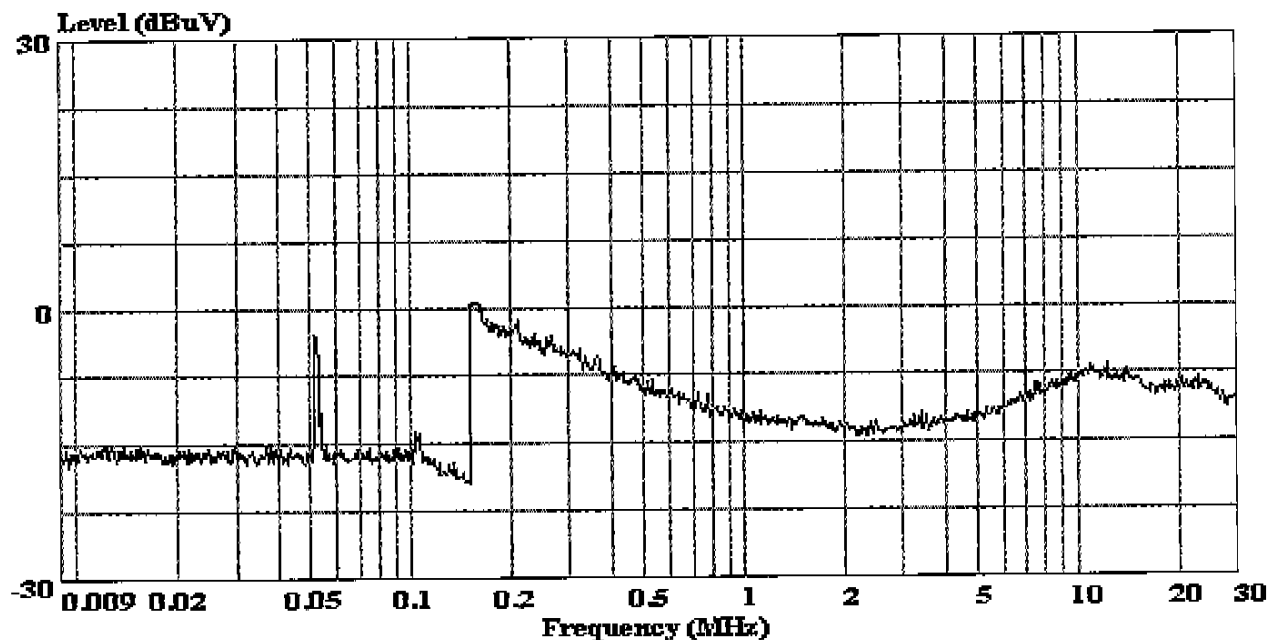


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 113 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-26 Time: 19:37:41



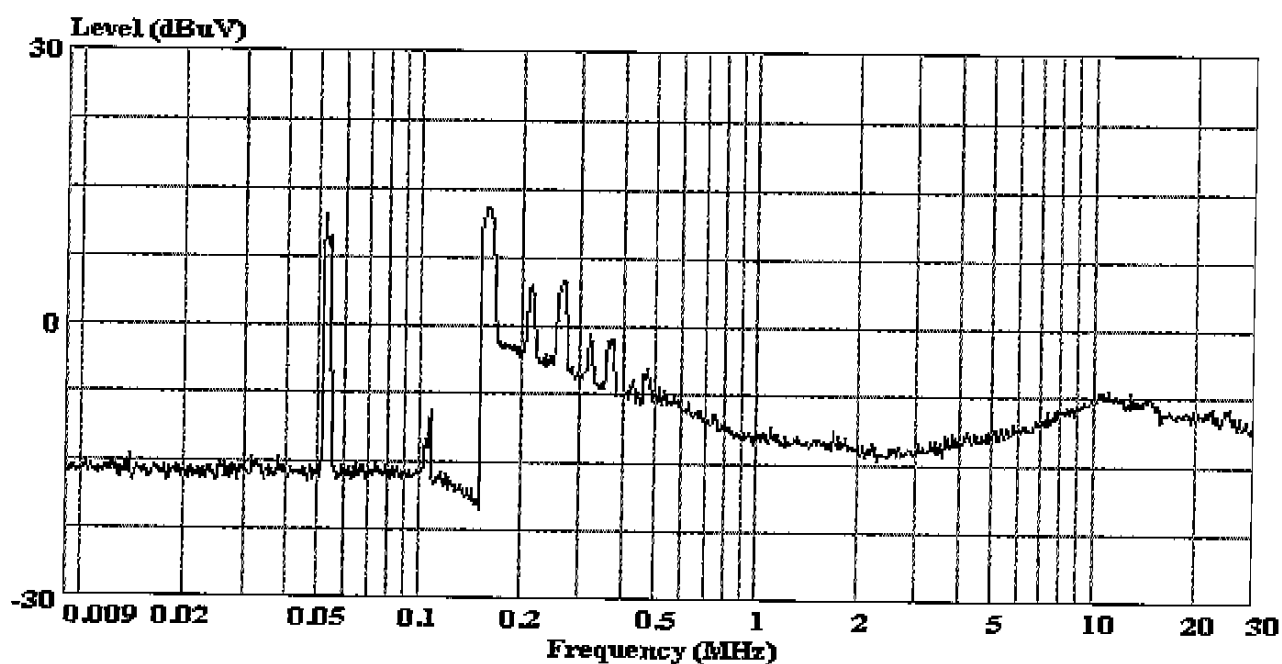
Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co.,Ltd
EUT : Energy Saving Lamp
M/N : TP120-11UL/2
S/N : E070404-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : C
Test mode : ON
: Ada

For TP120-15UL/2:

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#: 155 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 10:13:24



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-15UL/2
S/N : E0704051
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : A
Test mode : ON
Test mode : Ada

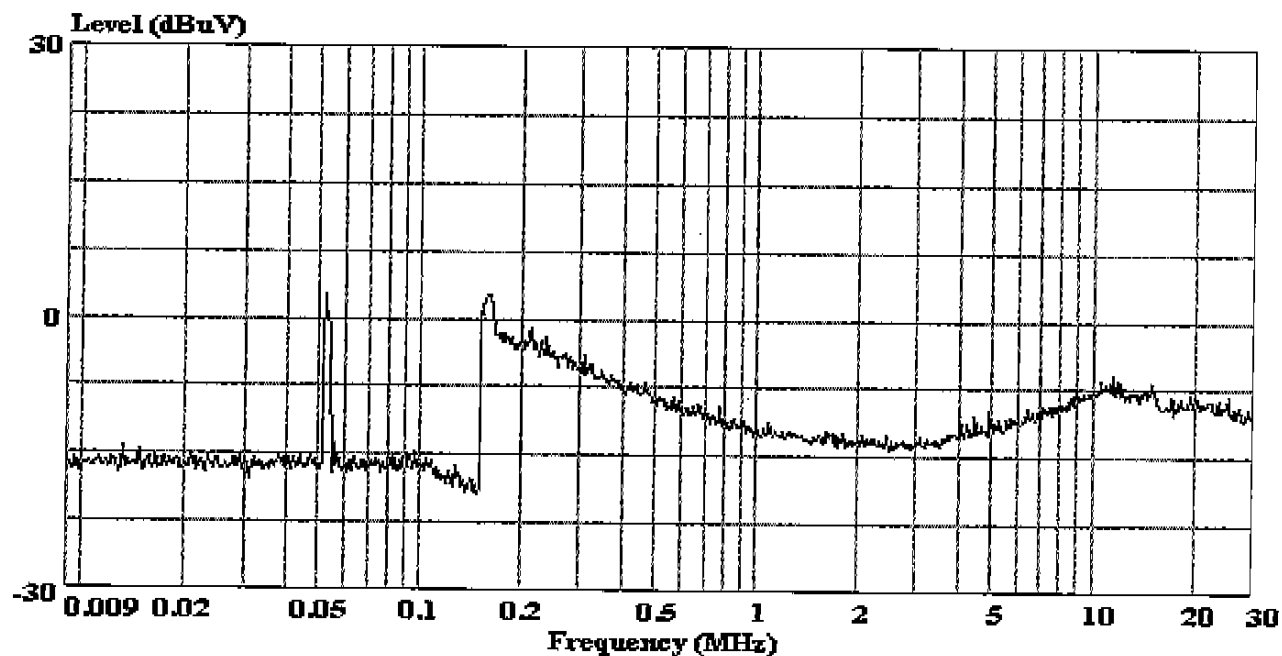


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 152 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 10:00:08



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co.,Ltd
EUT : Energy Saving Lamp
M/N : TP120-15UL/2
S/N : E0704051
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : B
Test mode : ON
: Ada

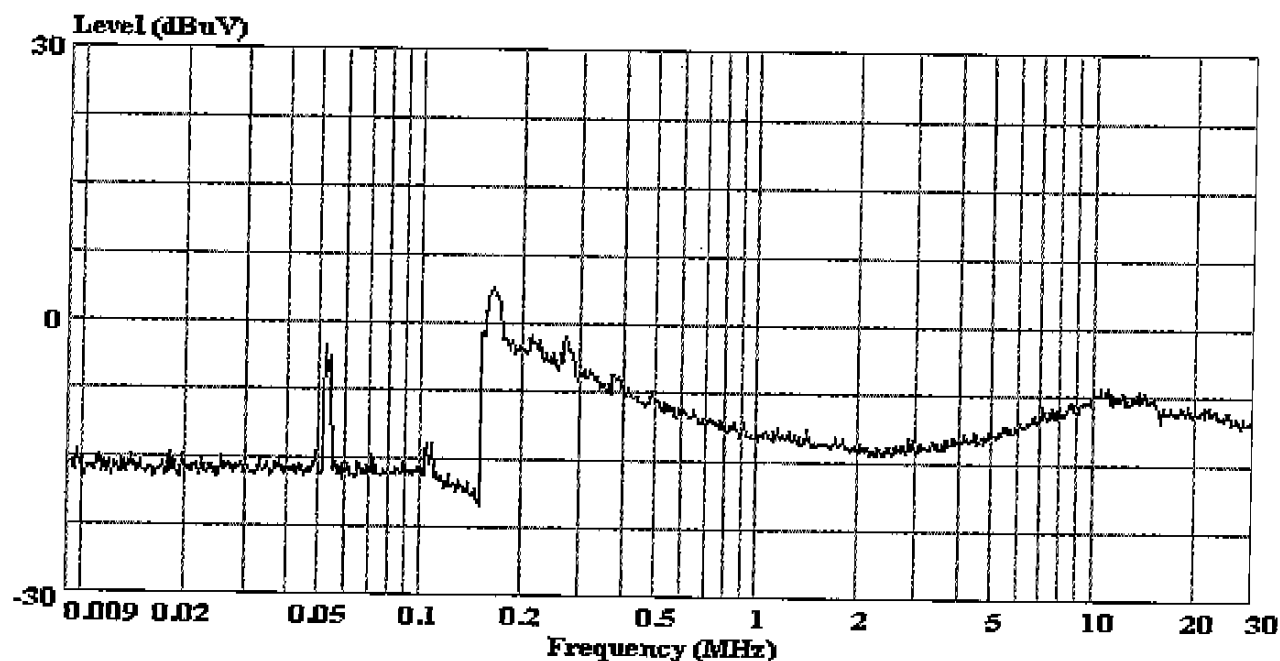


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 149 File#: D:\EMI\VM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 09:54:30



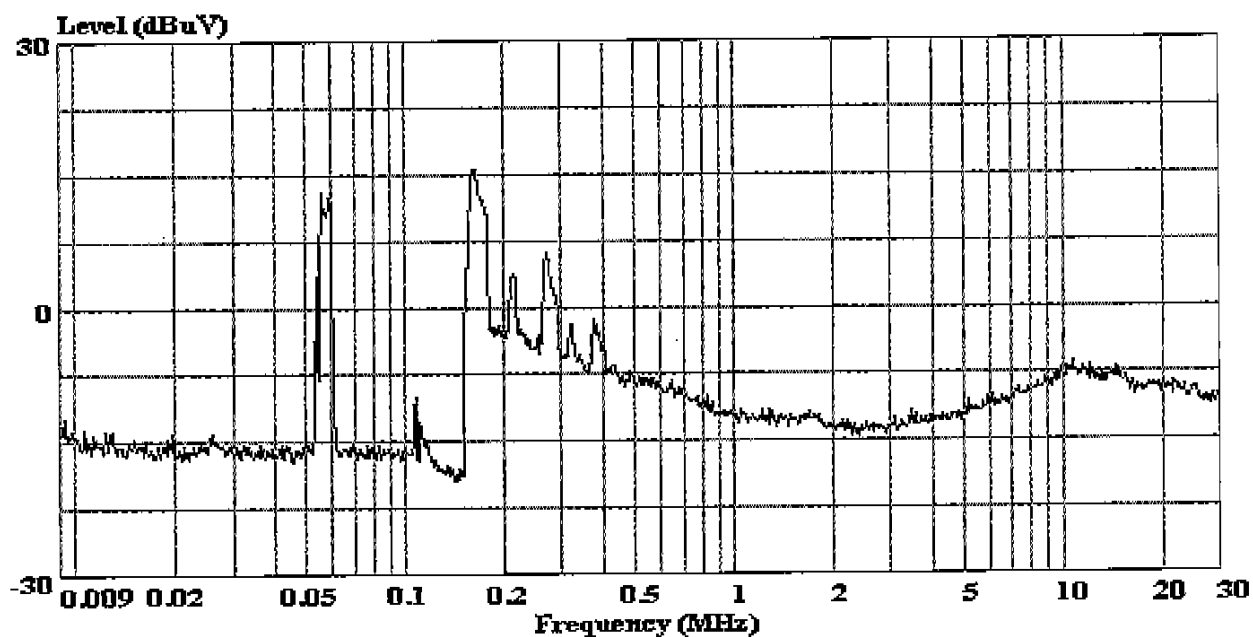
Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-15UL/2
S/N : E0704051
Power supply: 120V, 60Hz
Ambient : 23°C 53%
Test line : C
Test mode : ON
: Ada

For TP120-15UL/3:

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#: 122 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-26 Time: 19:58:53



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-15UL/3
S/N : E070407-1
Power supply: 120V, 60Hz
Ambient : 23°C 53%
Test line : A
Test mode : ON
: Ada

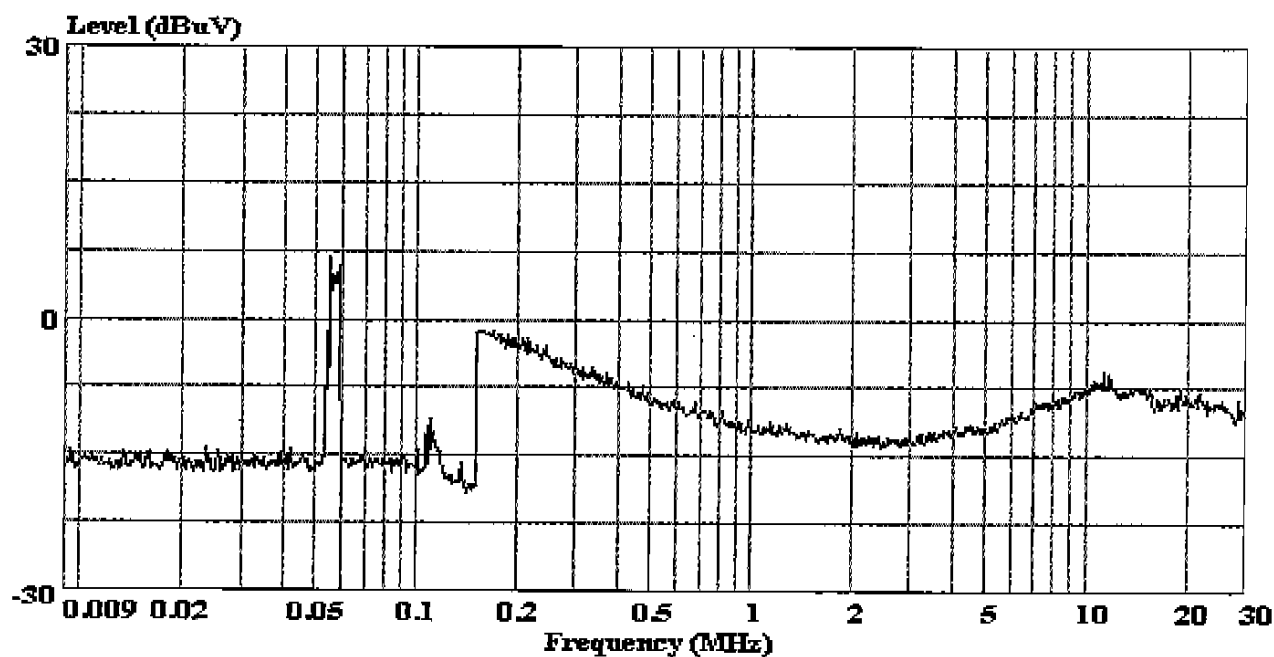


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

3F #34Bldg. No.680 GuiPing Rd.,
CaoHeJing Hi-Tech Park,
Shanghai, China
Tel:+86-21-64955500
Fax:+86-21-64955491
audixaci@6848.net

Data#: 125 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 08:45:51



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-15UL/3
S/N : E070407-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : B
Test mode : ON
: Ada

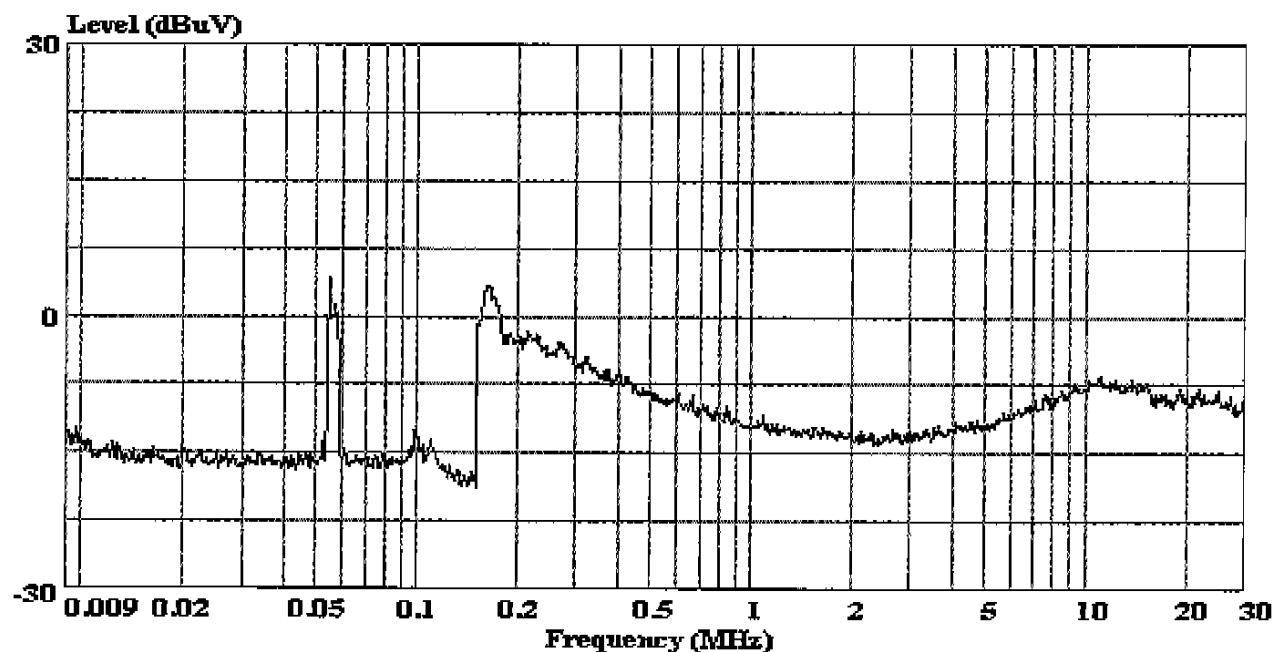


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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\H\Hd.emi

Date: 2001-07-27 Time: 08:51:48



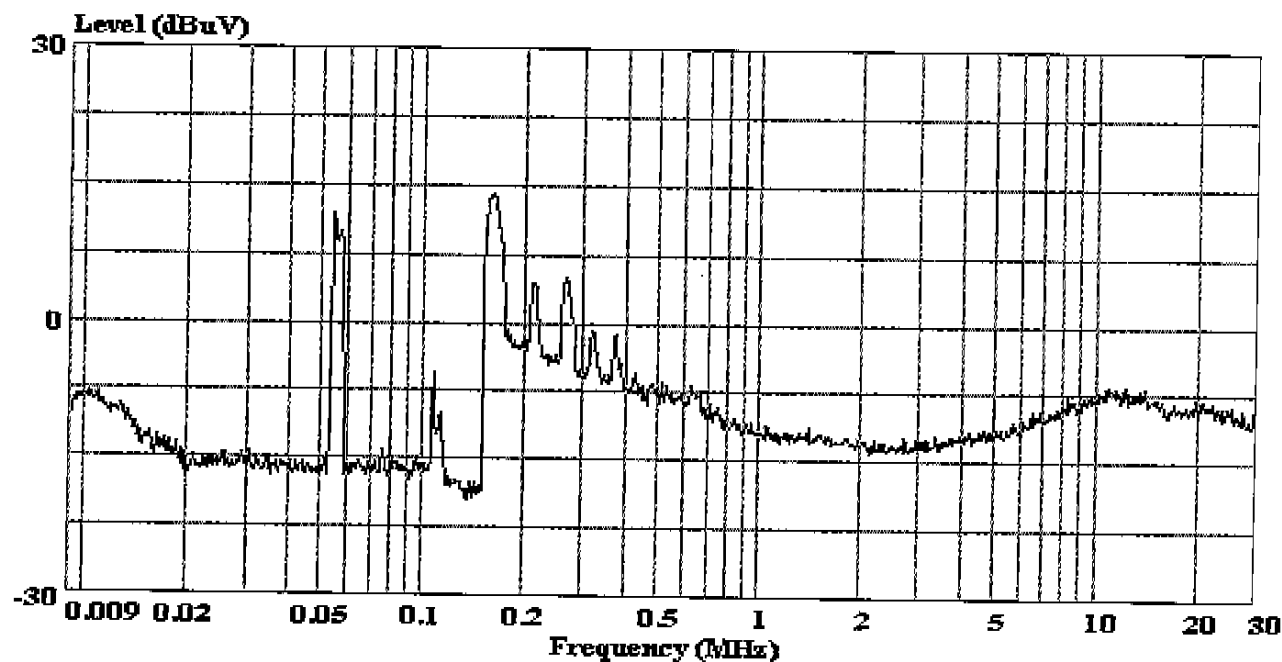
Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co.,Ltd
EUT : Energy Saving Lamp
M/N : TF120-15UL/3
S/N : E070407-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : C
Test mode : ON
: Ada

For TP120-20UL/3:

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#: 140 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 09:28:05



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-20UL/3
S/N : E070408-1
Power supply: 120V, 60Hz
Ambient : 23°C 53%
Test line : A
Test mode : ON
: Ada

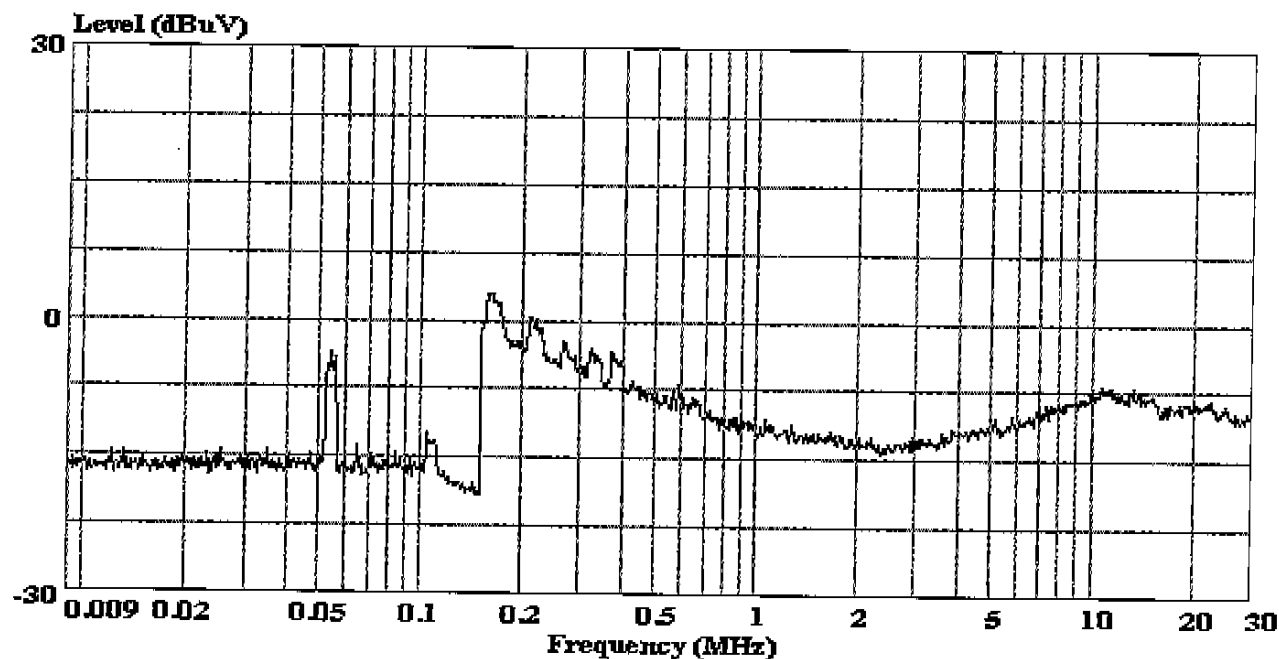


Audix Technology (Shanghai) Co., Ltd.
敦吉电子(上海)有限公司

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

Data#: 143 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 09:33:28



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-20UL/3
S/N : E070408-1
Power supply: 120V, 60Hz
Ambient : 23°C 53%
Test line : B
Test mode : ON
: Ada

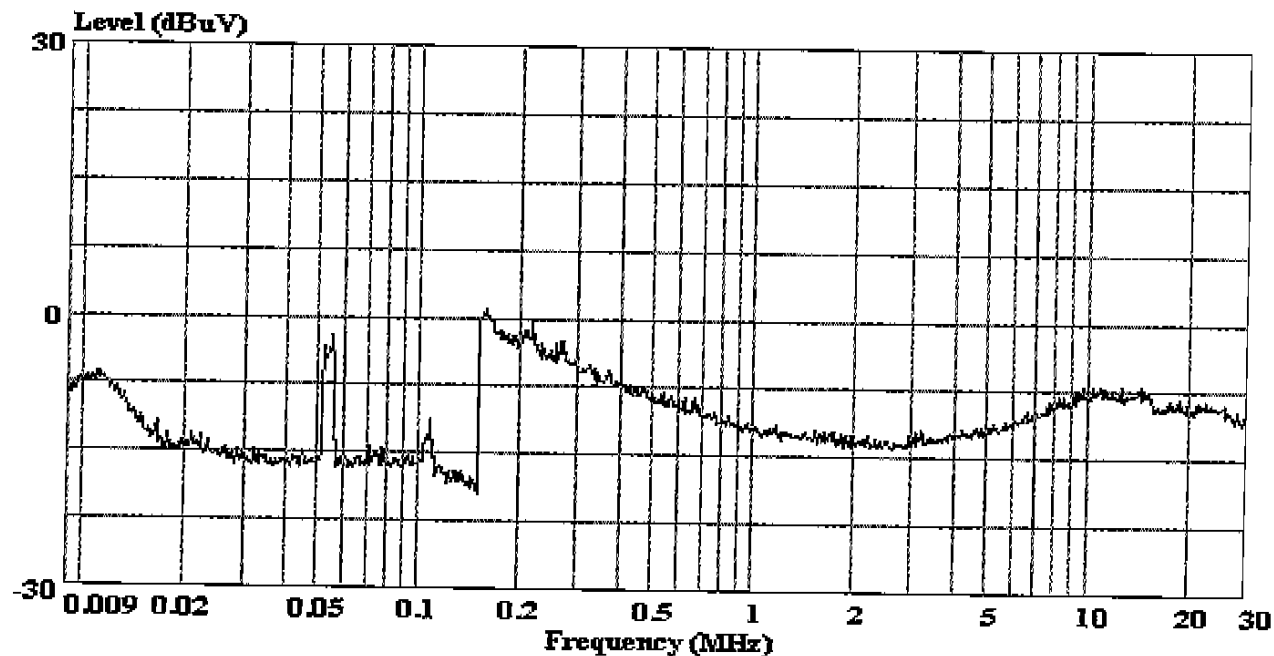


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 146 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 09:39:02



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-20UL/3
S/N : E070408-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : C
Test mode : ON
: Ada

For TP120-25UL/3:

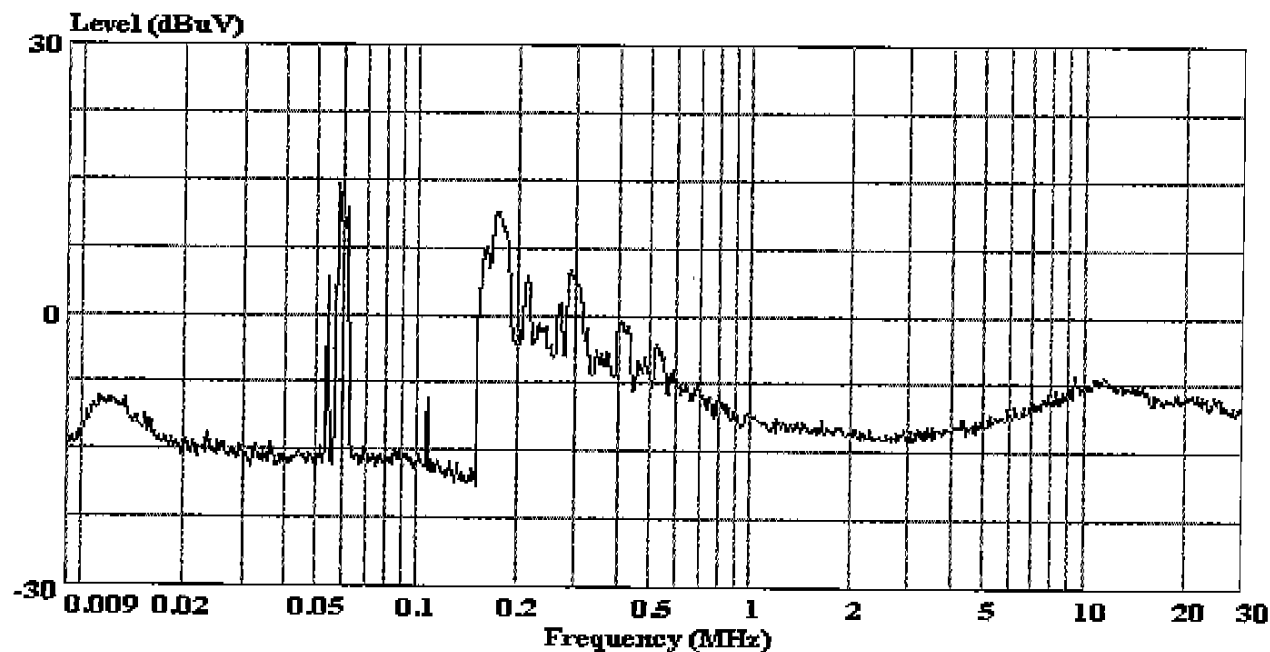


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 137 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 09:19:14



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co.,Ltd
EUT : Energy Saving Lamp
M/N : TP120-25UL/3
S/N : E070409-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : A
Test mode : ON
: Ada

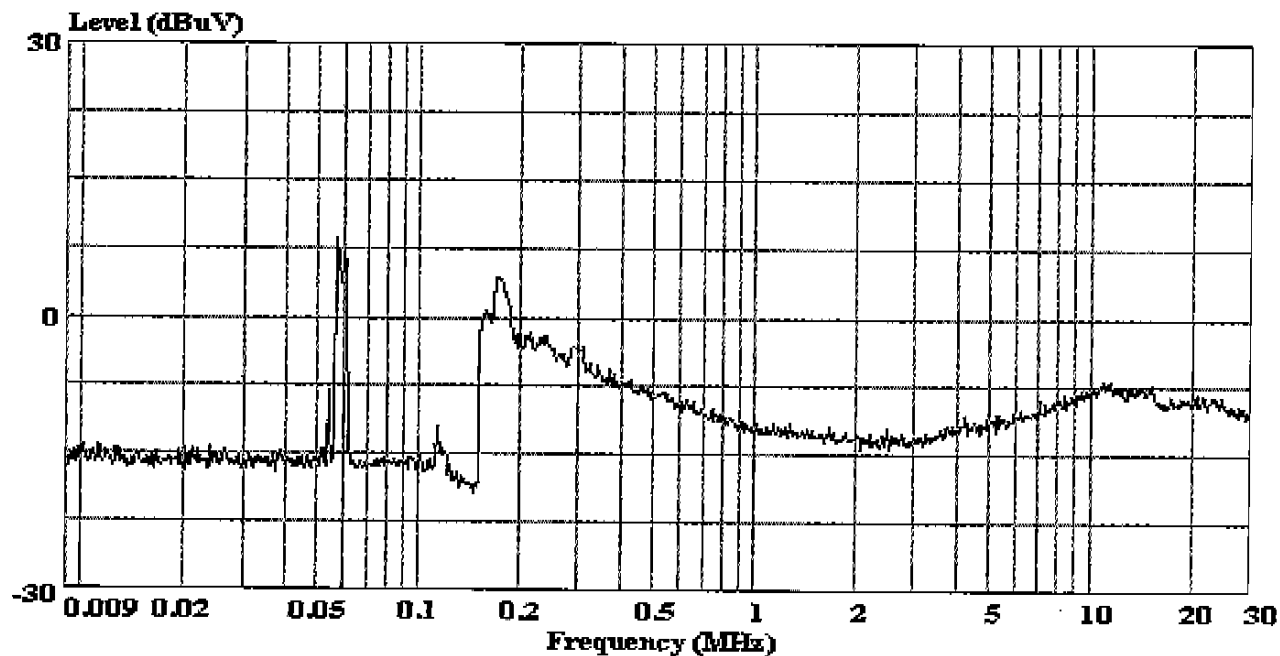


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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\H\Hd.emi

Date: 2001-07-27 Time: 09:11:26



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co.,Ltd
EUT : Energy Saving Lamp
M/N : TP120-25UL/3
S/N : E070409-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : B
Test mode : ON
: Ada

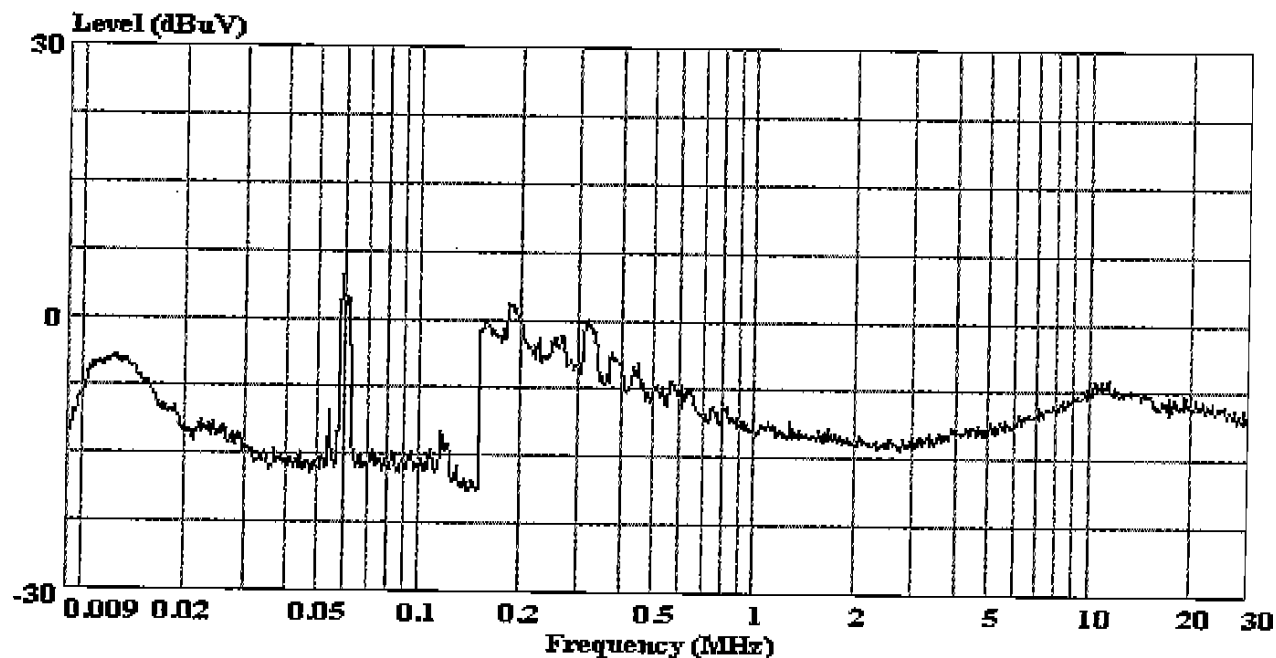


Audix Technology (Shanghai) Co., Ltd.
敦吉電子(上海)有限公司

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

Data#: 131 File#: D:\EMIVM\TEST\H\Hd.emi

Date: 2001-07-27 Time: 09:04:01



Site : audix-aci
Condition :
Project No. : AQE-00089
Applicant : Tospo Electronics Co., Ltd
EUT : Energy Saving Lamp
M/N : TP120-25UL/3
S/N : E070409-1
Power supply: 120V, 60Hz
Ambient : 23'C 53%
Test line : C
Test mode : ON
: Ada