

# APPLICATION FOR CERTIFICATION

On Behalf of  
Viva Home Improvement Co., Ltd.  
Electronic Dimmable Ballast

Model: 84155-D

Prepared for : Viva Home Improvement Co., Ltd.  
No.888, Zhangcao Rd, Caojing,  
Jinshan, Shanghai.

Prepared By : Audix Technology (Shenzhen) Co., Ltd.  
No. 6, Ke Feng Rd., 52 Block,  
Shenzhen Science & Industrial Park,  
Nantou, Shenzhen, Guangdong, China

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Report Number • ACS-20F006  
Date of Test • Jan. 03 / 17, 2000  
Date of Report • Jan. 19, 2000

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## TEST REPORT DECLARATION

Applicant • Viva Home Improvement Co., Ltd.  
Manufacturer • Elec-Mart Co., Ltd  
EUT Description • Electronic Dimmable Ballast  
(A) MODEL NO. : 84155-D  
(B) SERIAL NO. : F2000010402  
(C) POWER SUPPLY : AC 120V / 60Hz

Test Procedure Used:

FCC RULES AND REGULATIONS PART 18 SUBPART C RF LIGHTING DEVICES  
CONSUMER PRODUCT (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 18 Part RF Lighting Device limits both radiated and conducted 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 tests. Also, this report shows that the EUT is 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 (SHENZHEN) CO., LTD.

Date of Test : Jan. 03 / 17, 2000

Prepared by : Fanny Yang 2/16, 2000  
(FANNY YANG / ASSISTANT)

Reviewer : Martin Lu 16/2  
(MARTIN LU / SUPERVISOR)

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

Approved & Authorized Signer : [Signature]  
\*\*\*\* (SMARCTAL / MANAGER)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

Description	•	Electronic Dimmable Ballast
Power Cord	•	Unshielded Detachable 1.5m
Model Number	•	84155-D
Power Cord	•	Unshielded Detachable 1.5m
Applicant	•	Viva Home Improvement Co., Ltd. No.888, Zhangcao Rd, Caojing, Jinshan, Shanghai.
Manufacturer	•	Elec-Mart Co., Ltd. 4th, Ind. Zone, Paisha, Humen, Dongguan.
Date of Test	•	Jan. 03 / 17, 2000

## 1.2. Test Facility

### Site Description

3m Anechoic Chamber : Certificated by FCC, USA  
Aug. 18, 1997

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 =  $\pm 4.26\text{dB}$

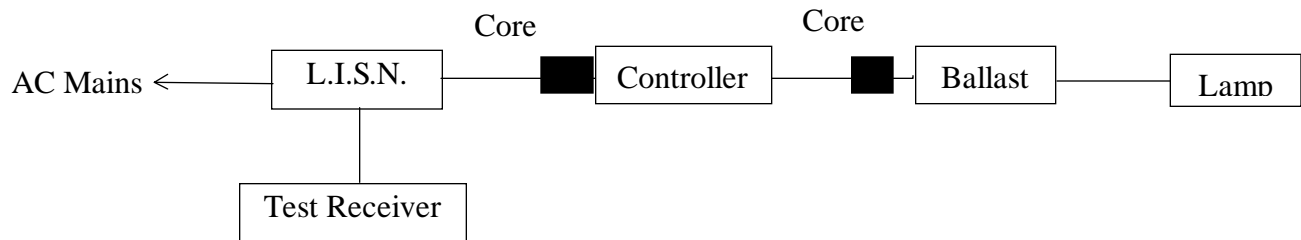
## 2. POWER LINE CONDUCTED EMISSION TEST

### 2.1. Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS20	836600/006	Jun. 06, 99	1 Year
2.	L.I.S.N.	Kyoritsu	KNW-407	8-541-4	Jun. 06, 99	1 Year
3.	Terminator	EMCO	50 •	No. 1	Jun. 06, 99	1 Year
4.	Terminator	EMCO	50 •	No. 2	Jun. 06, 99	1 Year
5.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	Aug. 30, 99	1/2 Year
6.	Coaxial Switch	Anritsu	MP59B	M73989	Dec. 05, 99	1/2 Year

### 2.2. Block Diagram of Test Setup



(EUT: Electronic Dimmable Ballast)

### 2.3. Power Line Conducted Emission Limit

Frequency MHz	Limit dB(μV)
0.45 ~ 30	48

### 2.4. EUT Configuration on Test

The following equipments are installed on RF LINE VOLTAGE test to meet the FCC 18 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

#### 2.4.1. Electronic Dimmable Ballast • EUT)

Model Number	•	84155-D
Serial Number	•	F2000010402
Manufacturer	•	Elec-Mart Co., Ltd.

## 2.5. Operating Condition of EUT

- 2.5.1. Setup the EUT as shown in Section 2.2.
- 2.5.2. Turn on the power of all equipments.
- 2.5.3. Let the EUT works in test mode (ON) and measure it.

## 2.6. Test Procedure

The EUT is put on table which is 0.8m above the ground and away from other metallic surface at least 0.4m. 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 tested equipments. Both sides of AC line(Line & Neutral) are checked for maximum conducted interference. In order to find the maximum emission Levels, the relative positions of equipments and all of the interface cables must be changed according to MP-5/1986 on conducted Emission test.

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

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

All the test results are listed in Section 2.7. and all the scanning waveforms are attached within 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.

Date of Test •	<u>Jan. 17, 2000</u>	Temperature •	<u>25 •</u>
EUT •	<u>Electronic Dimmable Ballast</u>	Humidity •	<u>57 •</u>
Model No. •	<u>84155-D</u>	Test Mode •	<u>ON</u>
Test Engineer •	<u>Rees Zeng</u>		

Frequency MHz	Reading		Limit dB(μV)
	Phase VA dB(μV)	Phase VB dB(μV)	
0.450	*	40.8	48.0
0.452	40.2	*	48.0
0.695	*	38.2	48.0
<b>0.723</b>	<b>42.0</b>	*	<b>48.0</b>
0.800	39.4	*	48.0
0.830	*	38.8	48.0
0.950	*	39.2	48.0

- Remark •
1. All readings are Quasi-Peak values.
  2. The worst emission is detected at 0.723 MHz with corrected signal level of 42.0 dB(μV) (limit is 48 dB(μV)) when the VA side of the EUT is connected to L.I.S.N.

Reviewer:

Martin Lu 16/2



### 3. RADIATED EMISSION TEST

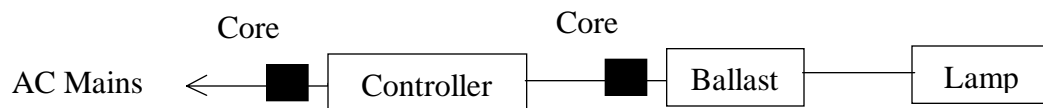
#### 3.1. Test Equipment

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

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	HP	85422E	3625A00181	Jun. 06, 99	1 Year
2.	Test Receiver	Rohde & Schwarz	ESVS20	830350/005	Jun. 06, 99	1 Year
3.	Amplifier	HP	8447D	2944A07794	Dec. 05, 99	1/2 Year
4.	Bilog Antenna	Chase	CBL6112A	2176	Sep. 26, 99	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.11, 99	1/2 Year
8.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.2	Aug.11, 99	1/2 Year
9.	RF Cable	FUJIKURA	RG-55/U	3# Chamber No.3	Aug.11, 99	1/2 Year
10.	RF Cable	FUJIKURA	RG-55/U	3# Chamber No.4	Aug.11, 99	1/2 Year
11.	Coaxial Switch	Anritsu	MP59B	M74389	Dec. 05, 99	1/2 Year

#### 3.2. Block Diagram of Test Setup

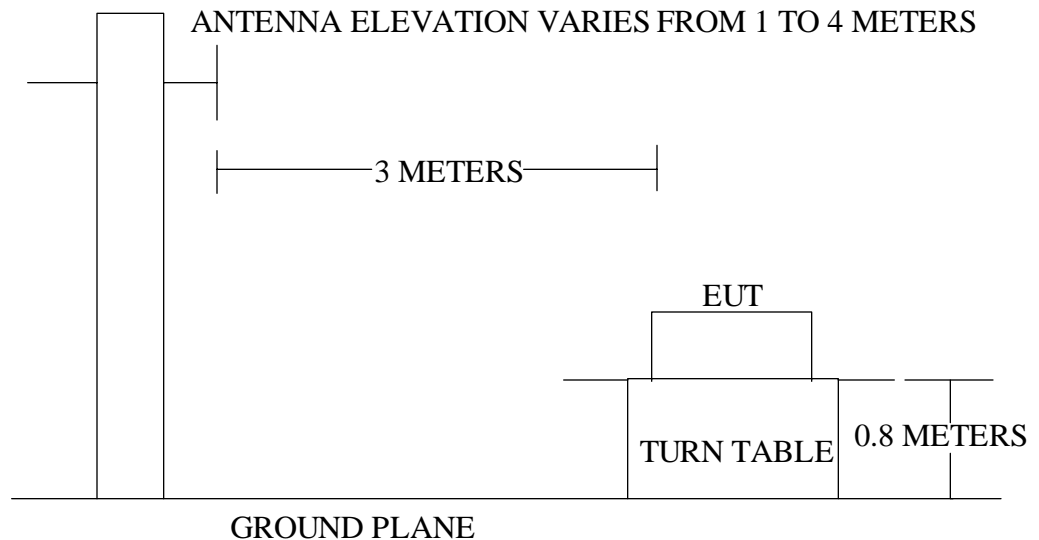
##### 3.2.1. Block Diagram of EUT



(EUT: Electronic Dimmable Ballast)

##### 3.2.2. Anechoic Chamber Test Setup Diagram

ANTENNA TOWER



### 3.3. Radiation Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS dB( $\mu$ V)/m
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 1000	3	46.0

Remark • (1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

### 3.4. EUT Configuration on Test

The configuration of EUT is same as those used in conducted Emission test. Please refer to Section 2.4.

### 3.5. Operating Condition of EUT

Same as conducted Emission test which is listed in Section 2.5.

### 3.6. Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

The Resolution bandwidth setting on the test receiver (R&S Test Receiver ESVS20) is set at 120KHz.

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

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

### 3.7. Radiated Emission Test Results.

**PASS.**

The frequency range from 30MHz to 1000MHz is investigated.  
Please see the following pages.

#### 3.7.1. Horizontal Value Test Results.

As the Horizontal peak-value is too low against the limit, So the Quasi-peak value had been omitted.

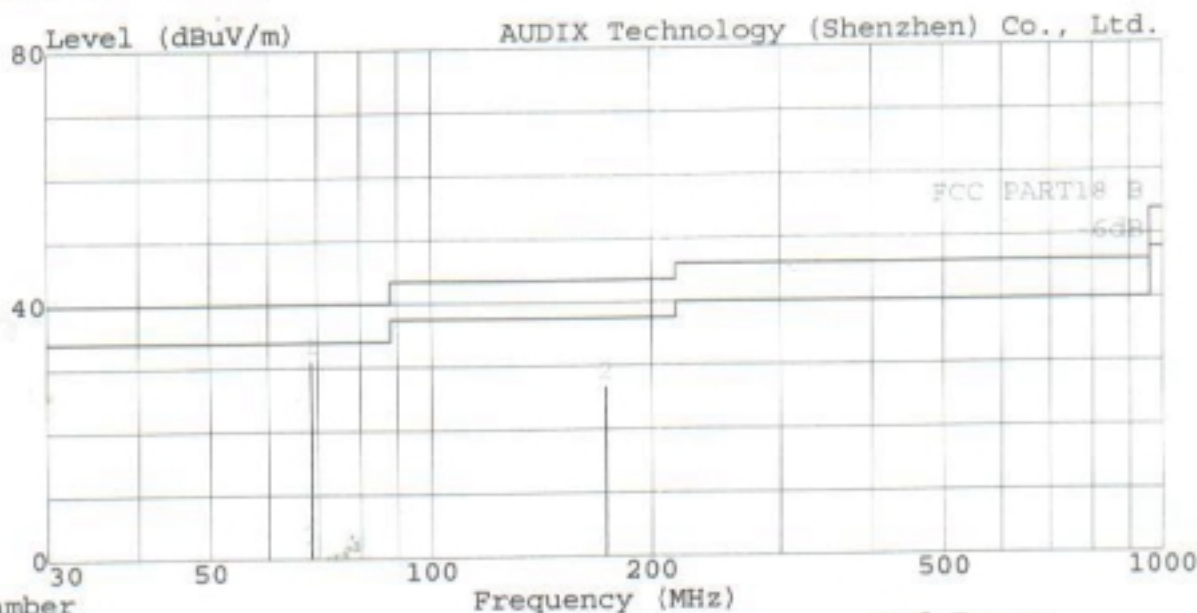
#### 3.7.2. Vertical Value Test Results

Date of Test :	Jan 03, 2000			Temperature :	25•	
EUT :	Electronic Dimmable Ballast			Humidity :	57•	
Model No. :	84155-D			Test Mode :	ON	
Test Site :	Anechoic Chamber			Test Engineer :	Rees Zeng	
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
68.633	13.14	2.17	15.70	31.02	-8.98	40.00
173.470	14.40	3.55	8.70	26.65	-16.85	43.50

Remark: 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading

Reviewer: Martin Lu 16/2

Data#: 131 File#: VIVA.EMI Date: 1-3,2000 Time: 09:13:33



Chamber  
Trace :  
Limit : FCC PART18 B 3m  
Probe : 2176FACTOR VERTICAL  
Margin: -6.0dB  
EUT : Electronic Dimmable Ballast  
Power : 120V/60Hz  
Memo : M/N:84155-D  
:  
:

Ref Trace:

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dB	dB	dB	dB	dB	dB	dB	
1	68.633	31.02	-8.98	40.00	15.70	13.14	2.17	0.00	
2	173.470	26.65	-16.85	43.50	8.70	14.40	3.55	0.00	

## 4. PHOTOGRAPH

### 4.1. Photos of Power Line Conducted Emission Test



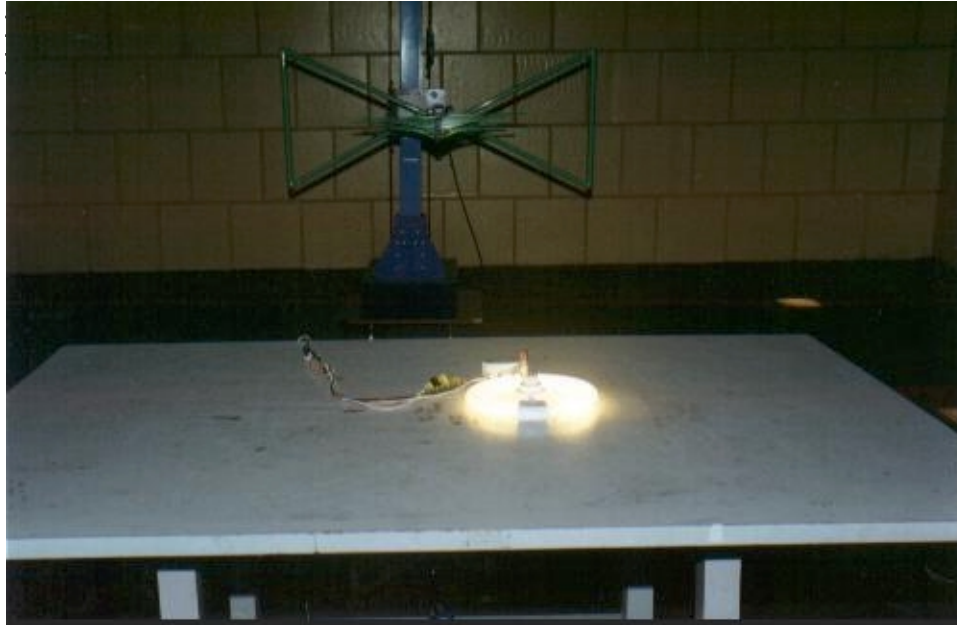
FRONT VIEW OF CONDUCTED EMISSION TEST



BACK VIEW OF CONDUCTED EMISSION TEST

## 4.2. Photos of Radiated Emission Test

### 4.2.1. Photos of Radiated Emission Test in Chamber

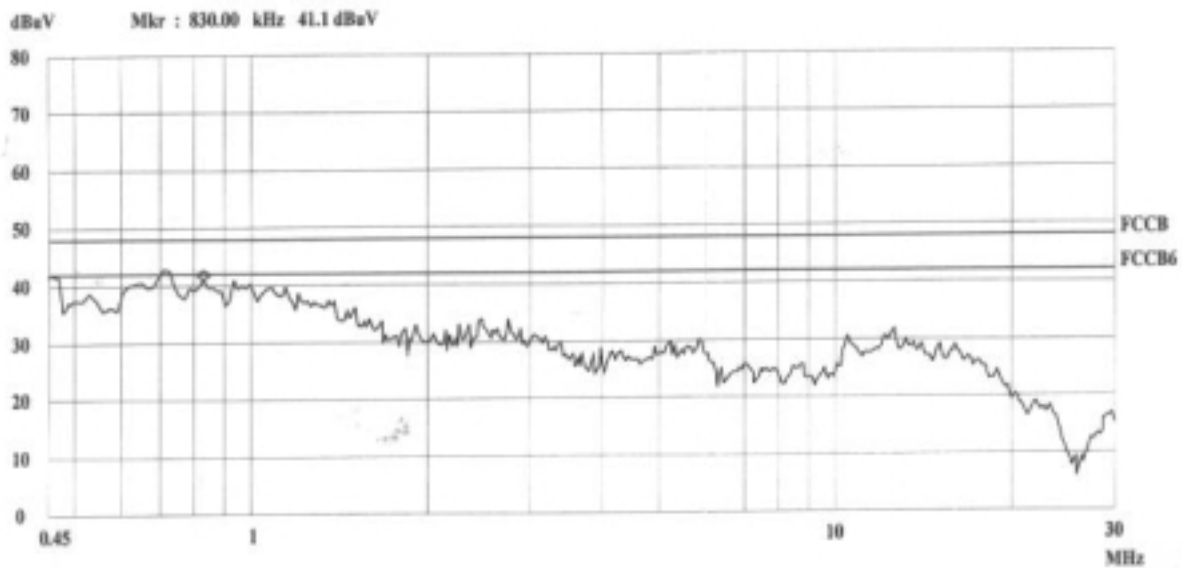


# APPENDIX I

# Conduction Emission Test FCC Part18

17. Jan 00 11:44

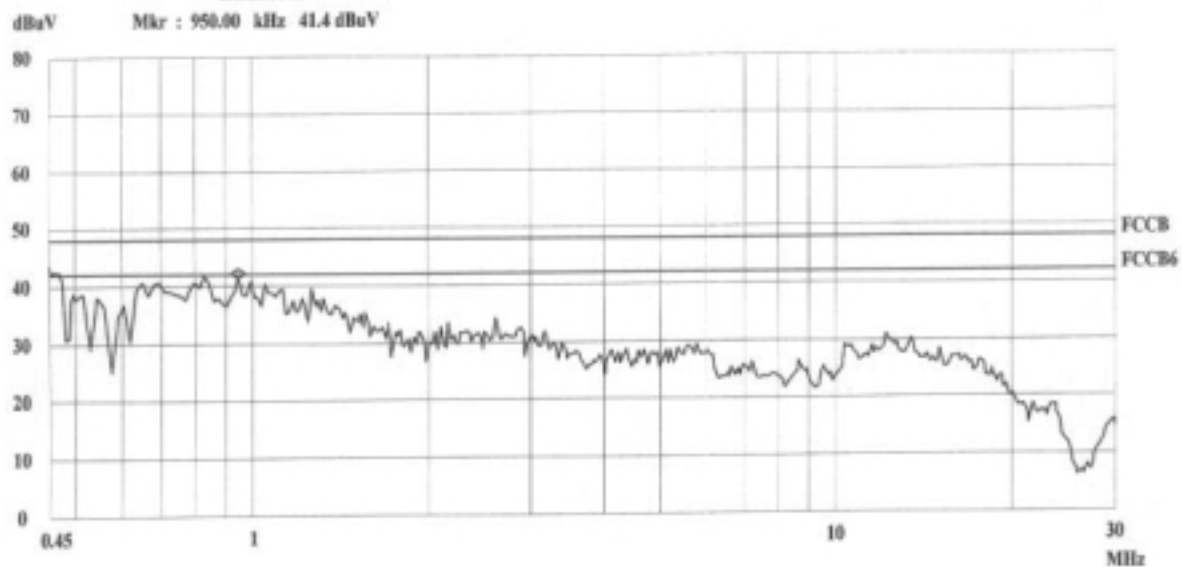
EUT: Electronic Dimmable Ballast M/N:84155-D  
 Manuf: Viva  
 Op Cond: ON  
 Operator: Rees  
 Test Spec: Va 120V/60Hz  
 Comment: Temp:25°C  
 Humi:60%



# Conduction Emission Test FCC Part18

17. Jan 00 11:51

EUT: Electronic Dimmable Ballast M/N:84155-D  
 Manuf: Viva  
 Op Cond: ON  
 Operator: Rees  
 Test Spec: Vb 120V/60Hz  
 Comment: Temp:25°C  
 Humi:60%





# APPENDIX II

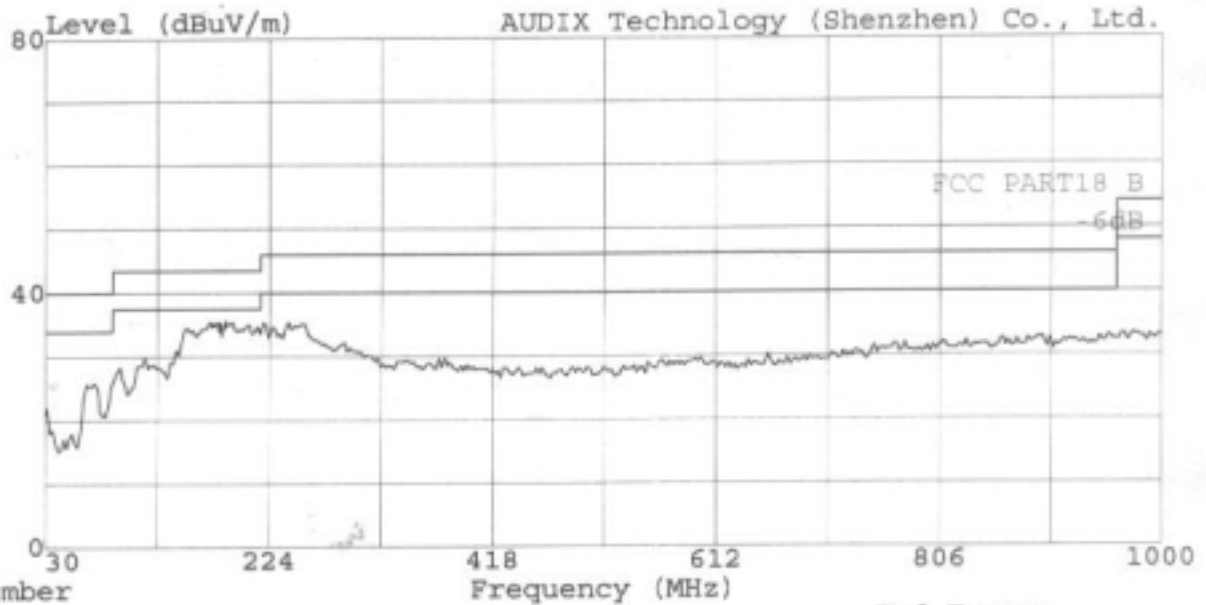
**AUDIX**

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AUDIX Technology (Shenzhen) Co., Ltd. Tel: 0755-6639495..7 Fax: 0755-6632877

Data#: 112 File#: VIVA.EMI

Date: 1-3, 2000 Time: 09:15:51



Chamber

Trace :

Limit : FCC PART18 B 3m

Probe : 2176FACTOR HORIZONTAL

Margin: -6.0dB

EUT : Electronic Dimmable Ballast

Power : 120V/60Hz

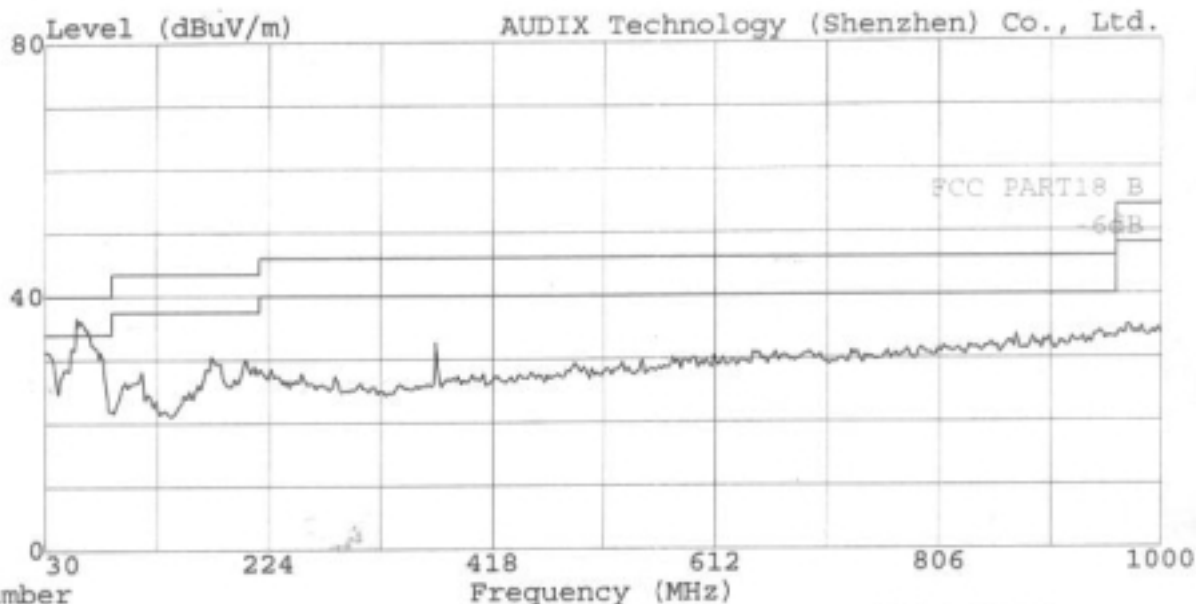
Memo : M/N:84155-D

: ON

Ref Trace:

AUDIX Technology (Shenzhen) Co., Ltd.

Data#: 130 File#: VIVA.EMI Date: 1-3,2000 Time: 09:11:46



Chamber  
Trace :  
Limit : FCC PART18 B 3m  
Probe : 2176FACTOR VERTICAL  
Margin: -6.0dB  
EUT : Electronic Dimmable Ballast  
Power : 120V/60Hz  
Memo : M/N:84155-D  
: ON

Ref Trace: