

Firefly Lighting Co., Ltd
Compact Fluorescent Lamp
Model Number: FB52-14

Prepared for : Firefly Lighting Co., Ltd.
Firefly Building, Jinzhong yuan Industrial Area
Zhongzhai, Xiamen, China

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
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Report Number : ACS-F07039
Date of Test : Jan.31~Feb.02, 2007
Date of Report : Feb.06, 2007

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TEST REPORT DECLARATION

Applicant : Firefly Lighting Co., Ltd
 Manufacturer : Firefly Lighting Co., Ltd
 EUT Description : Compact Fluorescent Lamp
 (A) MODEL NO. : FB52-14
 (B) SERIAL NO. : N/A
 (C) POWER SUPPLY : AC 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, NIST or any agency of the U.S. Government.

Date of Test : Jan.31~Feb.02, 2007

Prepared by :

YoYo Wang / Assistant

Reviewer :

Sean Xing / Assistant Manager



Approved & Authorized Signer:

Ken Lu / Deputy Manager

Name of the Representative of the Responsible Party :

Signature :

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	Standard	Results
Conducted Emission Test	FCC Part 18C ANSI C63.4: 2003	PASS
Magnetic Field Emission Test	FCC Part 18C	PASS

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Description	:	Compact Fluorescent Lamp
Model Number	:	FB52-14
Applicant	:	Firefly Lighting Co., Ltd Firefly Building, Jinzhong yuan Industrial Area Zhongzhai, Xiamen, China
Manufacturer	:	Firefly Lighting Co., Ltd Firefly Building, Jinzhong yuan Industrial Area Zhongzhai, Xiamen, China
Date of Test	:	Jan.31~Feb.02, 2007

Remark:

FB52-14 COMPONENT LIST

Serial No.	Item No.	Component	Type	Manufacturer	Quantity	Approval
1	Fuse	Fuse	20N 250V 2A	Xiamen Hollyland Co.,Ltd.	1	E156471
2	D1-D5	Diode	1N4007 1A,1KV	Changda Electronic Component Factory	5	No
3	T1-T2	Transistor	D4126L 1.2 A	Jilin Huawei Electronics Co., Ltd. Shenzhen Shen'ai Electronics Co., Ltd	2	No
4	R3,R5	Resistor	RT14 12 Ω 1/4W	Xiamen Gaoming Electronics Co., Ltd.	2	No
6	R0 R1,R2	Resistor	RT14 680k Ω 1/4W	Xiamen Gaoming Electronics Co., Ltd.	3	No
7	C1	Capacitor	CD11G 105 $^{\circ}$ C 15 μ F DC250V HXB 105 $^{\circ}$ C 15 μ F DC250V	Yiyang Zijiang Electronic Component Co., Ltd. Xiamen Fala HeXin Capacitor Factory	1	No
8	C01	Capacitor	CL 125 $^{\circ}$ C 68nF DC250V	Xiamen Faratronic Co., Ltd. Epcos	1	No
9	C2	Capacitor	CBB 125 $^{\circ}$ C 500PF DC1250V	Shanghai JiaLiBao Electron Co.,Ltd Zhejiang Changxing Huaqiang Electron Co., Ltd.	1	No
10	C3	Capacitor	CL 125 $^{\circ}$ C 22nF DC160V	Zhuji Wufeng Capacitor Factory Zhejiang Changxing Huaqiang Electron Co., Ltd.	1	No
11	C4	Capacitor	CL 125 $^{\circ}$ C 68nF DC250V	Xiamen Faratronic Co., Ltd. Epcos	1	No
12	C5	Capacitor	CBB 125 $^{\circ}$ C 5.6nF DC1250V	Shanghai JiaLiBao Electron Co.,Ltd Zhejiang Changxing Huaqiang Electron Co., Ltd.	1	No
13	DB3	Trigatron	DB3 Vz=32V	Jinan Jifu Semiconductor Co., Ltd.	1	No
14	L0	Inductor	LGA0410 150 μ H	Xiamen Coils Electronics Co., Ltd. Xiamen NangHua Electronics Co., Ltd	1	No
15	L1	Inductor	EE162.3-2.5mH	Xiamen Coils Electronics Co., Ltd.	1	No
		Bobbin	T375J,94V-0 150 $^{\circ}$ C	Chang Chun Plastics Co., Ltd.	1	E59481(S)
		Magnet Wire	XUEWH*-180 $^{\circ}$ C	Wuxi Jufeng Compound Line Co., Ltd.		E206882
		Insulating tape	WF 130 $^{\circ}$ C	JingJiang Pressure Sensitive Glue Fty		E165111
16	Tr	Coupling Winding	4:5:5 Φ 8x4x2	Xiamen Donglin Electronics Co., Ltd.	1	No
17		Plastic Cover and Base	420SEO,94V-0 130 $^{\circ}$ C	GE Plastics Americas	2	E45587
18		Lamp Cap	E26	Guangdong Jushi Caps Factory	1	No

19		Wire	1015# 24AWG 105℃ 600v	LTK Electric Wire (Huizhou) Ltd. Xiamen Huilong Cableco Co.,ltd	2	E148000 E225375
20		Printed Wiring Board	16HO,130℃,94V-0 MW-R2 130℃ 94V-0	Xiamen Overseas Chinese Electronic Co.,Ltd FuJian Milky-Way Printed Circuit Board Co.,ltd	1	E105953 E168066
21		Lamp Tube	BU5u14w	Zhejiang Xinshiji Group	1	No
22		Extruded Tubing	SALIPT S-901, 125℃,600V	Dongguan Liaobu Sanlian Plastic Co., Ltd.		E209436
23		Sleeving	1E,200℃,600V/ FSG-3A+200℃VW-1	Fellowcom Industrial Co.,Ltd Sin Tiong Wah Electtric Products(shenzhen)Co.,ltd		E213654/E14 6955

2.2. Test Facility

Site Description

3m Anechoic Chamber : Jun.13, 2006 File on Federal Communication Commission
Registration Number: 90454

3m & 10m Anechoic Chamber : Mar.15,2004 File on Federal Communication Commission
Registration Number: 794232

EMC Lab. : Accredited by DATech, German
Registration Number: DAT-P-091/99-01
Feb. 02, 2004

Accredited by NVLAP, USA
NVLAP Code: 200372-0
Apr.01, 2006

2.3. Measurement Uncertainty

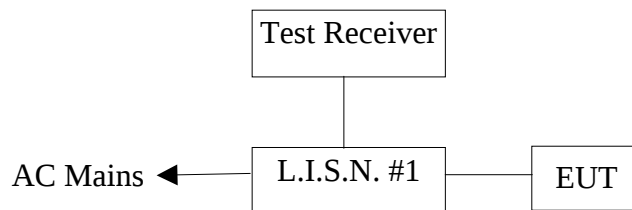
No.	Item	Uncertainty	Remark
1.	Uncertainty for Conducted Emission Test	1.22dB	
2.	Uncertainty for Radiated Emission Test	3.14dB	3m Chamber
3.	Uncertainty for Radiated Emission Test	3.18dB	10m Chamber
4.	Uncertainty for Power Clamp Test	1.38dB	

3. POWER LINE CONDUCTED EMISSION TEST

3.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	May 15, 06	1 Year
2.	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	May 15, 06	1 Year
3.	Terminator	Hubersuhner	50Ω	No. 1	May 15, 06	1 Year
4.	RF Cable	MIYAZAKI	5D-2W	LISN Cable 1#	Aug.16, 06	1/2 Year
5.	Coaxial Switch	Anritsu	MP59B	M55367	Aug.16, 06	1/2 Year
6.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100340	Aug.16, 06	1/2 Year

3.2. Block Diagram of Test Setup



(EUT: Compact Fluorescent Lamp)

3.3. Power Line Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
450kHz ~ 2.51kHz	48	N/A
2.51kHz ~ 3MHz	70	N/A
3MHz ~ 30MHz	48	N/A

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.4. 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.

3.4.1. Compact Fluorescent Lamp (EUT)

Model Number : FB52-14
Serial Number : N/A
Manufacturer : Firefly Lighting Co., Ltd

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown on Section 3.2..

3.5.2. Turn on the power of all equipment.

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

3.6. Test Procedure

The EUT is connected to the power mains through a line impedance stabilization network (L.I.S.N.#1). 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 C63.4-2003 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS10) is set at 10kHz.

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

The test result are reported on Section 3.7

3.7. Power Line Conducted Emission Test Results

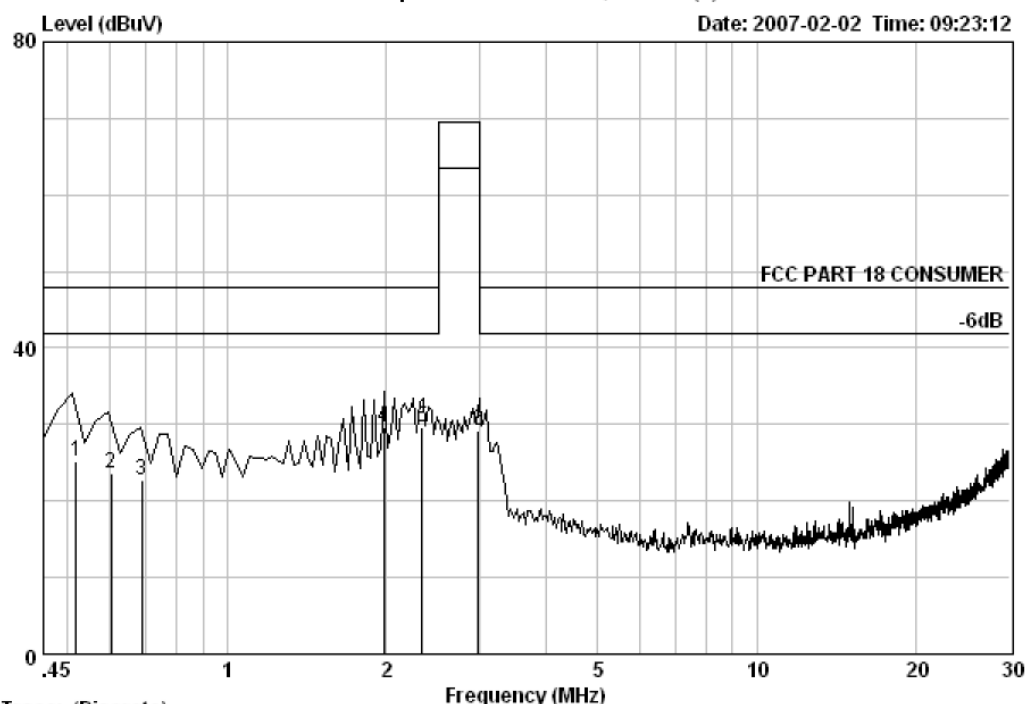
PASS.



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Data: 4

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Trace: (Discrete)

Site no. :	Audix 1#CE	Data no. :	4
Dis. / Ant. :	-- VA KNW-407	LISN Phase :	
Limit :	FCC PART 18 CONSUMER		
Env. / Ins. :	25.9*C/55% ESHS10	Engineer :	Chinalee
EUT :	Compact Fluorescent Lamp	M/N:	FB52-14
Power Rating :	AC 120V/60Hz		
Test Mode :	On		

	Freq. (MHz)	LISN. Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.52	0.25	10.13	14.80	25.18	48.00	22.82	QP
2	0.60	0.24	10.12	13.20	23.56	48.00	24.44	QP
3	0.69	0.23	10.13	12.40	22.76	48.00	25.24	QP
4	1.98	0.20	10.15	19.30	29.65	48.00	18.35	QP
5	2.34	0.20	10.16	19.31	29.67	48.00	18.33	QP
6	2.98	0.21	10.17	18.70	29.08	69.50	40.42	QP

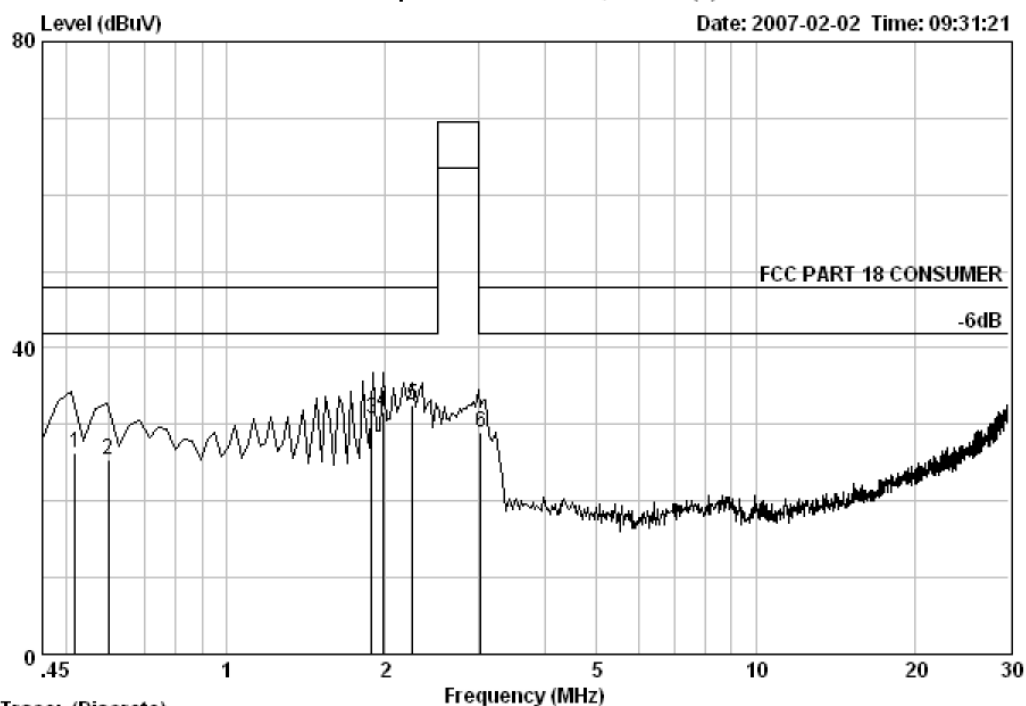
Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



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Data: 5

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Trace: (Discrete)

Site no. :	Audix 1#CE	Data no. :	5
Dis. / Ant. :	-- VB KNW-407	LISN Phase :	
Limit :	FCC PART 18 CONSUMER		
Env. / Ins. :	25.9°C/55% ESHS10	Engineer :	Chinalee
EUT :	Compact Fluorescent Lamp	M/N:	FB52-14
Power Rating :	AC 120V/60Hz		
Test Mode :	On		

	Freq. (MHz)	LISN. Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.52	0.51	10.13	15.60	26.24	48.00	21.76	QP
2	0.60	0.46	10.12	14.90	25.48	48.00	22.52	QP
3	1.89	0.31	10.15	20.20	30.66	48.00	17.34	QP
4	1.97	0.31	10.15	21.20	31.66	48.00	16.34	QP
5	2.25	0.31	10.16	22.10	32.57	48.00	15.43	QP
6	3.02	0.31	10.17	18.40	28.88	48.00	19.12	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

4. MAGNETIC FIELD EMISSION TEST

4.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Loop Antenna	Chase	HLA6120	1062	June 06,06	1 Year
2	Test Receiver	Rohde & Schwarz	ESHS20	836600/006	May 15, 06	1 Year

4.2. Block Diagram of Test Setup

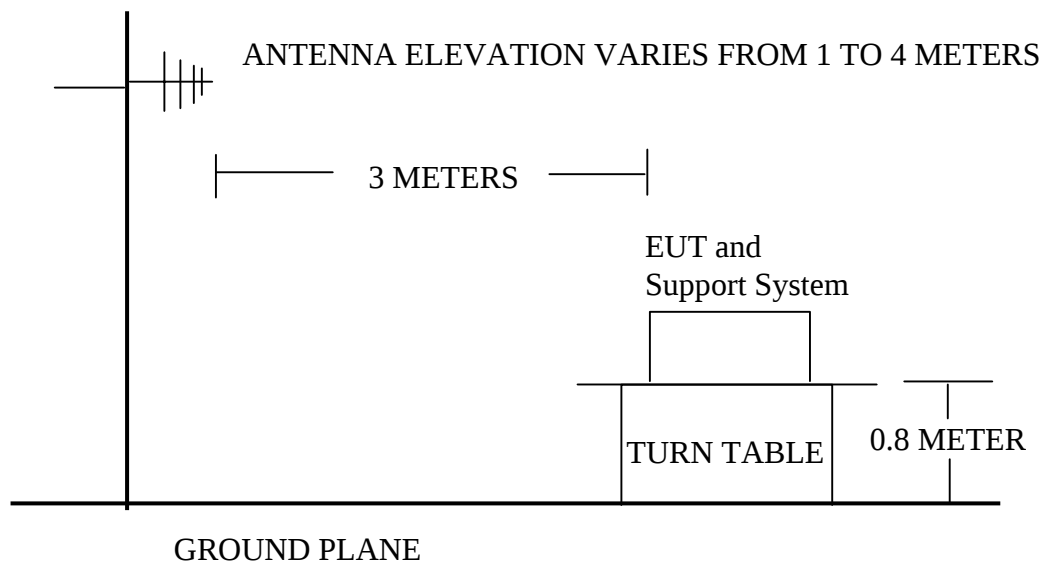
4.2.1. Block Diagram of connection between the EUT and simulators



(EUT: Compact Fluorescent Lamp)

4.2.2. In Anechoic Chamber

ANTENNA TOWER



4.3. Magnetic Field Emission Limit

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

Frequency band	Quasi-peak Electric Field Test Distance
MHz	3m dB(μ V/m)
0.009 - 30	63.5

Note: (1) The limit shall decreasing linearly with logarithm of frequency.
(2) Distance refers to the distance in meters between the test instrument antenna and the closed point of any part of the E.U.T.

4.4. EUT Configuration on Test

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

The configuration of EUT is same as used in Conducted Emission test. Please refer to Section 3.4.

4.5. Operating Condition of EUT

4.5.1. Setup the EUT and the simulators as shown on Section 4.2.

4.5.2. Turn on the power of all equipments.

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

4.6. Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. Measurements are performed at 3m distance with a 0.6m loop antenna as described in MP-5. The antenna shall be vertically installed, with the lower edge of the loop at 2m height above the floor.

The bandwidth setting on the test receiver (R&S TEST RECEIVER ESVS20) is 200Hz. The EUT is tested in Chamber. The test result are reported on Section 4.7

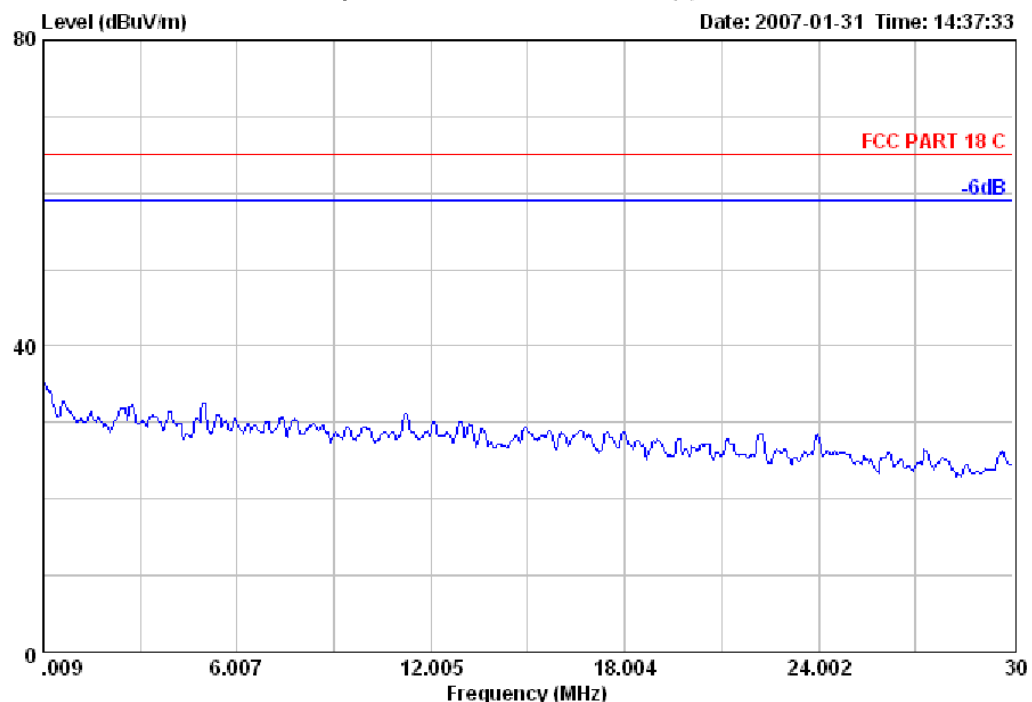
4.7. Magnetic Field Emission Test Results

PASS.



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Data: 5 File: D:\2007 Report Data\FIREFLY\ACS70068.EMI (5)



Site no.	: Audix No.1 Chamber	Data no.	: 5
Dis. / Ant.	: 3m HLA6120	Ant. pol.	:
Limit	: FCC PART 18 C		
Env. / Ins.	: 24°C/53% ESVS20	Engineer	: Skyle
EUT	: Compact Fluorescent Lamp	M/N:	FB52-14
Power Rating	: AC 120V/60Hz		
Test Mode	: On		

5. DEVIATION TO TEST SPECIFICATIONS

[NONE]