



FCC PART 18 TEST REPORT



For

Firefly Lighting Co., Ltd.

4th/ Fl, No. 8 Industrial Building, Huli Industrial Area,
Xiamen, Fujian, China

FCC ID: PGE-FST2-18W

Report Type: Original Report	Product Type: CFL
Test Engineer:	Lebron Wang <i>Lebron Wang</i>
Report Number:	RSZ110519503-00
Report Date:	2011-09-09
Reviewed By:	Lisa Zhu EMC Engineer <i>Lisa Zhu</i>
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.

* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk “★” (Rev.2)

TABLE OF CONTENTS

GENERAL INFORMATION	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE.....	3
RELATED SUBMITTAL(S)/GRANT(S)	3
TEST METHODOLOGY	3
TEST FACILITY	3
SYSTEM TEST CONFIGURATION	5
JUSTIFICATION.....	5
EUT EXERCISE SOFTWARE.....	5
SPECIAL ACCESSORIES	5
EQUIPMENT MODIFICATIONS.....	5
EXTERNAL I/O CABLE	5
CONFIGURATION OF TEST SETUP.....	5
BLOCK DIAGRAM OF TEST SETUP.....	6
FCC §18.307 - AC LINE CONDUCTED EMISSIONS.....	7
MEASUREMENT UNCERTAINTY	7
EUT SETUP	7
EMI TEST RECEIVER SETUP	8
TEST EQUIPMENT LIST AND DETAILS	8
TEST PROCEDURE.....	8
TEST RESULTS SUMMARY	8
TEST DATA.....	8
FCC §18.305 – FIELD STRENGTH	11
MEASUREMENT UNCERTAINTY	11
EUT SETUP	11
EMI TEST RECEIVER SETUP AND SPECTRUM ANALYZER SETUP	12
TEST EQUIPMENT LIST AND DETAILS	12
TEST PROCEDURE.....	12
CORRECTED AMPLITUDE CALCULATION	12
TEST DATA.....	12

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Firefly Lighting Co., Ltd.*'s model: *FST2-18W E26 2700K (FCC ID: PGE-FST2-18W)* the "EUT" in this report is a *CFL*, which was measured approximately: 5.4 cm (L) x 5.4 cm (W) x 11.6 cm (H), rated input voltage: AC 120V/60Hz.

** All measurement and test data in this report was gathered from production sample serial number: 1105016 (Assigned by BACL, Shenzhen). The EUT was received on 2011-05-19.*

Objective

The following test report is prepared on behalf of *Firefly Lighting Co., Ltd.* in accordance with Part 2, Subpart J, and Part 18, Subparts A, B and C of the Federal Communication Commissions rules and regulations.

The objective of the manufacturer is to determine compliance with FCC Part 18 limits.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with MP-5, FCC Methods of Measurements of Radio Noise Emissions from ISM Equipment, February 1986. All measurement was performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

N/A

Special Accessories

The special accessories were supplied by Bay Area Compliance Laboratories Corp.

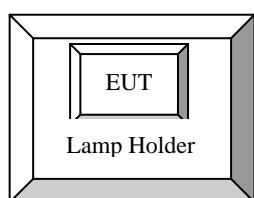
Equipment Modifications

No modifications were made to the unit tested.

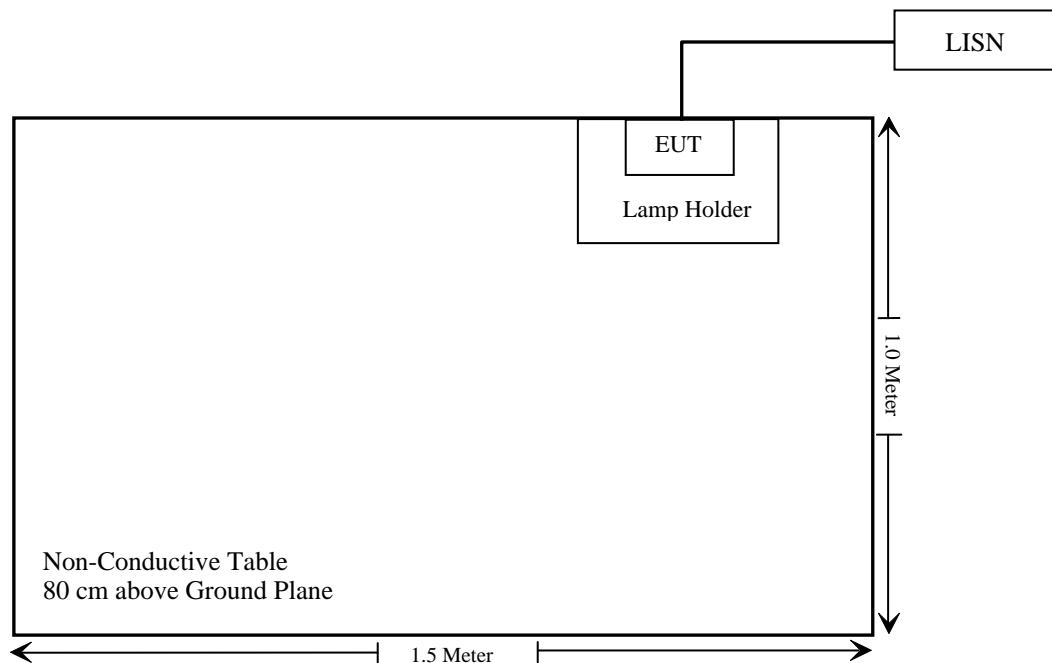
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable AC Power Cable	1.5	EUT	LISN

Configuration of Test Setup



Block Diagram of Test Setup



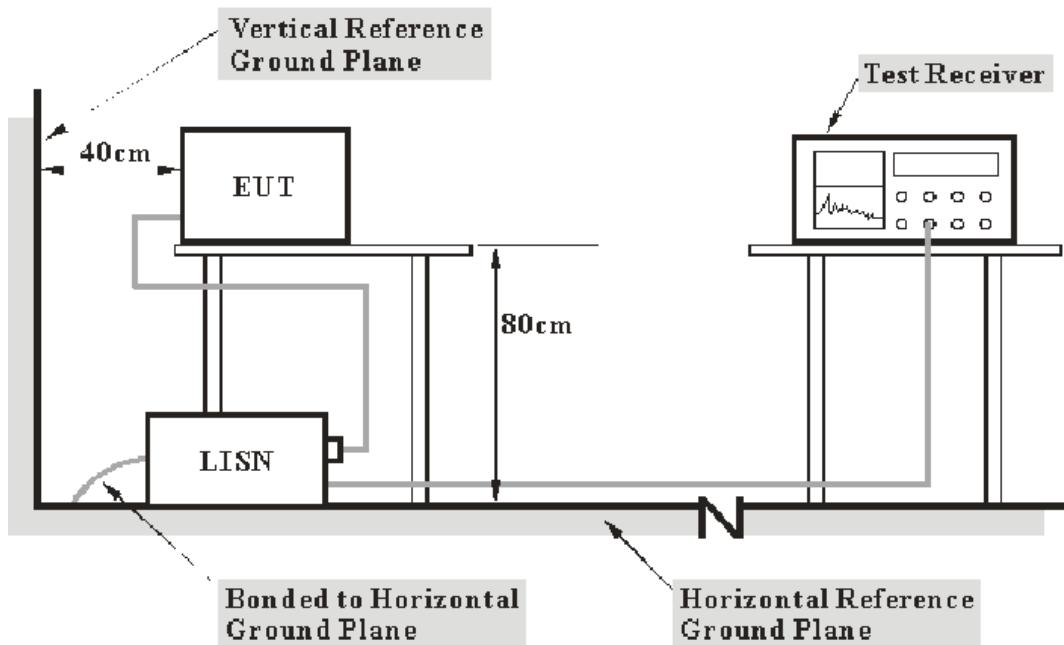
FCC §18.307 - AC LINE CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. is ± 2.4 dB (k=2, 95% level of confidence).

EUT Setup



Note:

1. Support units were connected to second LISN.
2. Both of LISNs (AMIN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with MP-5: 1986 measurement procedure. Specification used was with the FCC Part 18 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The EUT was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 450 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<u>Frequency Range</u>	<u>IFBW</u>
450 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2011-03-03	2012-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-03-09	2012-03-08

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-Peak detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 18, with the worst margin reading of:

10.31 dB at 0.490 MHz in the Line conducted mode

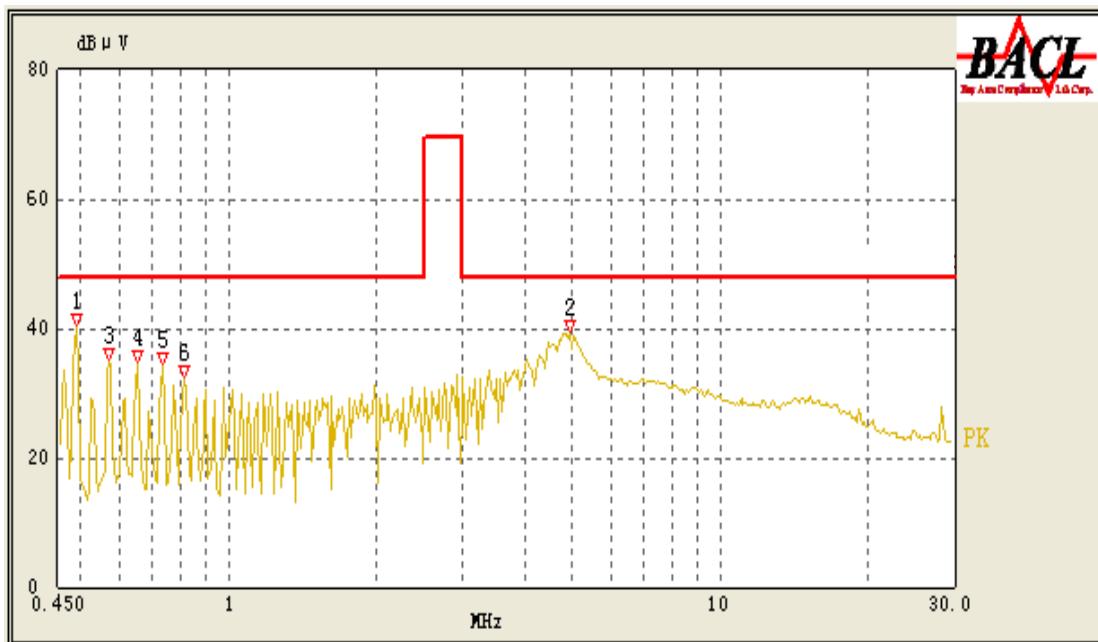
Test Data

Environmental Conditions

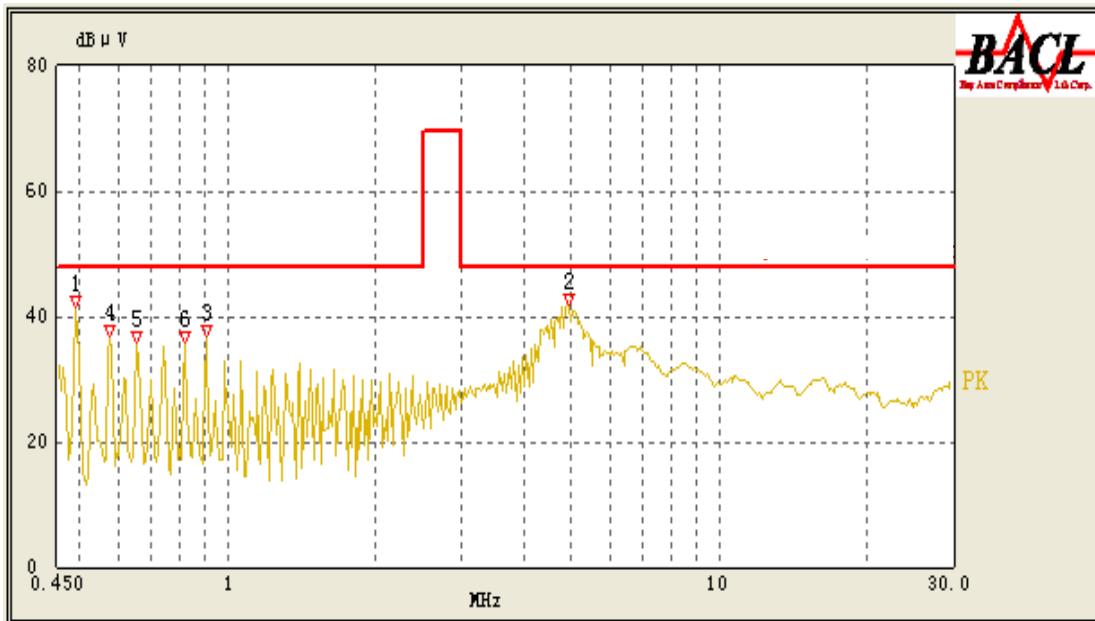
Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	101.0 kPa

Testing was performed by Lebron Wang on 2011-05-23.

Test Mode: On

AC 120V/60 Hz, Line:

Frequency (MHz)	Correction Factor (dB)	Corrected Result (dB μ V)	Limit (dB μ V)	Margin (dB)
0.490	10.10	37.69	48.00	10.31
0.655	10.10	34.46	48.00	13.54
0.570	10.10	34.42	48.00	13.58
0.735	10.10	32.74	48.00	15.26
0.815	10.10	30.79	48.00	17.21
4.950	10.10	29.11	48.00	18.89

AC 120V/ 60 Hz, Neutral:

Frequency (MHz)	Correction Factor (dB)	Corrected Result (dB μ V)	Limit (dB μ V)	Margin (dB)
0.490	10.10	37.41	48.00	10.59
0.655	10.10	36.16	48.00	11.84
4.970	10.10	34.84	48.00	13.16
0.575	10.10	32.79	48.00	15.21
0.820	10.10	31.35	48.00	16.65
0.905	10.10	25.80	48.00	22.20

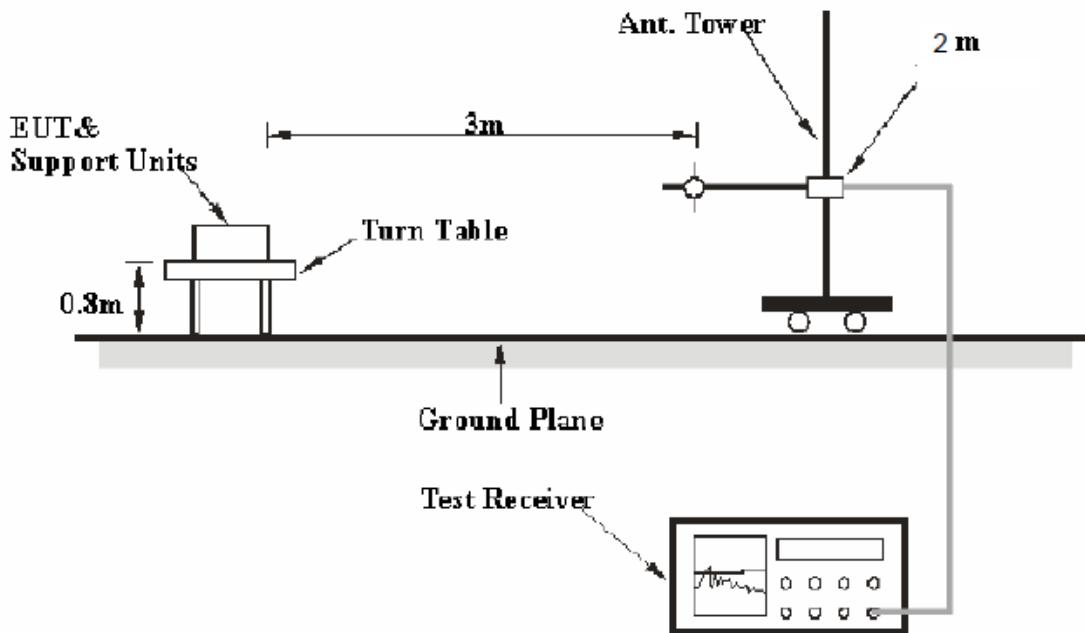
FCC §18.305 – FIELD STRENGTH

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ± 4.0 dB (k=2, 95% level of confidence).

EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the FCC MP - 5.

The EUT was connected to 120 VAC/60 Hz power source.

EMI Test Receiver Setup and Spectrum Analyzer Setup

The system was investigated from 9 kHz to 30 MHz.

During the radiated emission test, the EMI test receiver and Spectrum Analyzer were set with the following configurations:

Frequency Range	R B/W	Video B/W	IF B/W
9kHz– 150kHz	300 Hz	1 kHz	200Hz
150kHz– 30 MHz	100 kHz	300 kHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS-LINDGREN	Passive Loop Antenna	6512	00029604	2010-07-14	2011-07-13
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

For the radiated emissions test, the EUT was connected to the AC floor outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode from 9 kHz to 30 MHz.

Corrected Amplitude Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss}$$

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	101.0 kPa

The testing was performed by Lebron Wang on 2011-05-25.

Test Mode: On

Frequency (MHz)	Reading Amplitude (dB μ A/m)	Detector (PK/QP/Ave.)	Direction (Degree)	Antenna Height (m)	Antenna Factor (dB/m)	Cable Loss (dB)	Cord. Amp.	
							dB μ A/m	dB μ V/m
0.0527	-39.26	QP	46	2	20.0	0.1	-19.16	32.34
0.1224	-36.02	QP	19	2	13.0	0.1	-22.92	28.58
0.1418	-35.8	QP	191	2	12.0	0.1	-23.70	27.80
1.3440	-27.26	QP	163	2	-7.5	0.1	-34.66	16.84
6.8960	-22.89	QP	58	2	-18.2	0.1	-40.99	10.51
15.7900	-21.66	QP	245	2	-19.8	0.1	-41.36	10.14

***** END OF REPORT *****