



# TEST REPORT

For

## CNLIGHT CO., LTD.

A Zone, Shi-shan Technology Industry District, Nanhai,  
Foshan City, Guangdong, China

### FCC PART 18

**FCC ID: ZCHES315**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Self-ballasted Fluorescent Lamps
<b>Test Engineer:</b> <u>Jeaason Lee</u> <i>Jeaason Lee</i>	
<b>Report Number:</b> <u>RSZ11042752</u>	
<b>Report Date:</b> <u>2011-06-20</u>	
Lisa Zhu	
<b>Reviewed By:</b> <u>EMC Engineer</u> <i>[Signature]</i>	
<b>Prepared By:</b> 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	

**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**

<b>GENERAL INFORMATION.....</b>	<b>3</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
OBJECTIVE .....	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY .....	3
TEST FACILITY .....	3
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>5</b>
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
<b>FCC §18.307 - AC LINE CONDUCTED EMISSIONS.....</b>	<b>7</b>
MEASUREMENT UNCERTAINTY .....	7
EUT SETUP .....	7
EMI TEST RECEIVER SETUP.....	8
TEST PROCEDURE .....	8
TEST EQUIPMENT LIST AND DETAILS.....	8
TEST RESULTS SUMMARY .....	8
TEST DATA .....	8
<b>FCC §18.305 – FIELD STRENGTH.....</b>	<b>11</b>
MEASUREMENT UNCERTAINTY .....	11
EUT SETUP .....	11
EMI TEST RECEIVER SETUP AND SPECTRUM ANALYZER SETUP.....	12
TEST PROCEDURE .....	12
TEST RESULT CALCULATION .....	12
TEST EQUIPMENT LIST AND DETAILS.....	12
TEST DATA .....	13

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

The *CNLIGHT CO.,LTD.*’s model: *ES3-15W (FCC ID: ZCHES315)*, or the “EUT” as referred to this report is a *Self-ballasted fluorescent lamps*, which measure approximately: 4.0 cm (L) x 4.0 cm (W) x 12.5 cm (H) , rated input voltage: AC 120V/60Hz.

*\* All measurement and test data in this report was gathered from production sample serial number: 1104029 (Assigned by BACL, Shenzhen). The EUT was received on 2011-04-27.*

### Objective

The following test report is prepared on behalf of *CNLIGHT 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 the compliance of the product with FCC Part 18 requirements.

### 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. (Shenzhen). 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 operation mode (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.

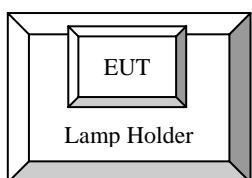
### Equipment Modifications

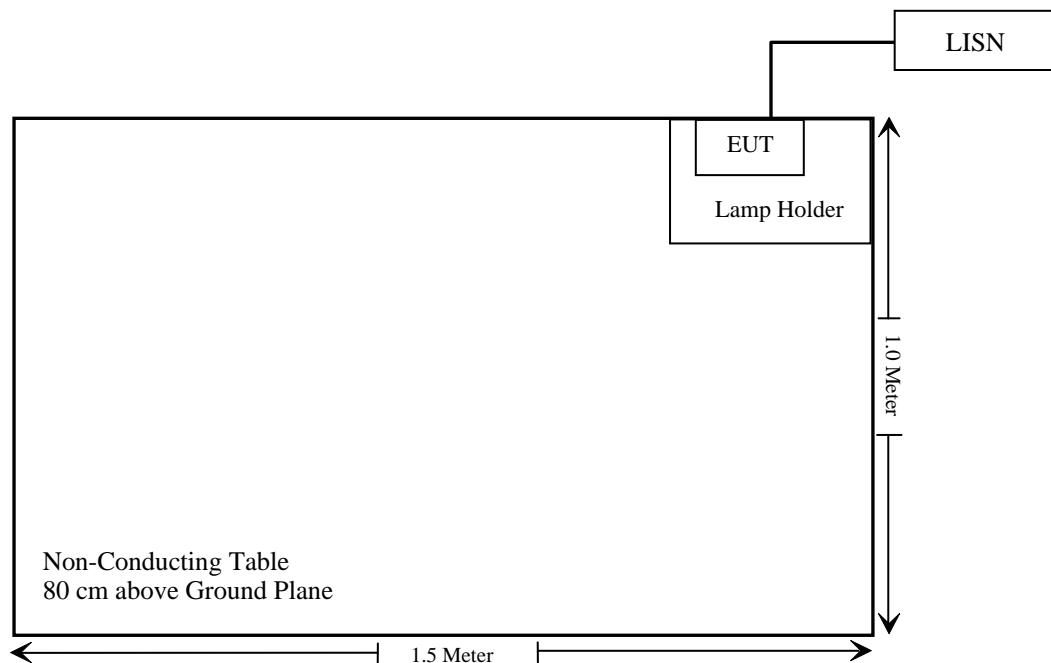
No modifications were made to the unit tested.

### External I/O Cable

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

### Configuration of Test Setup



**Block Diagram of Test Setup**

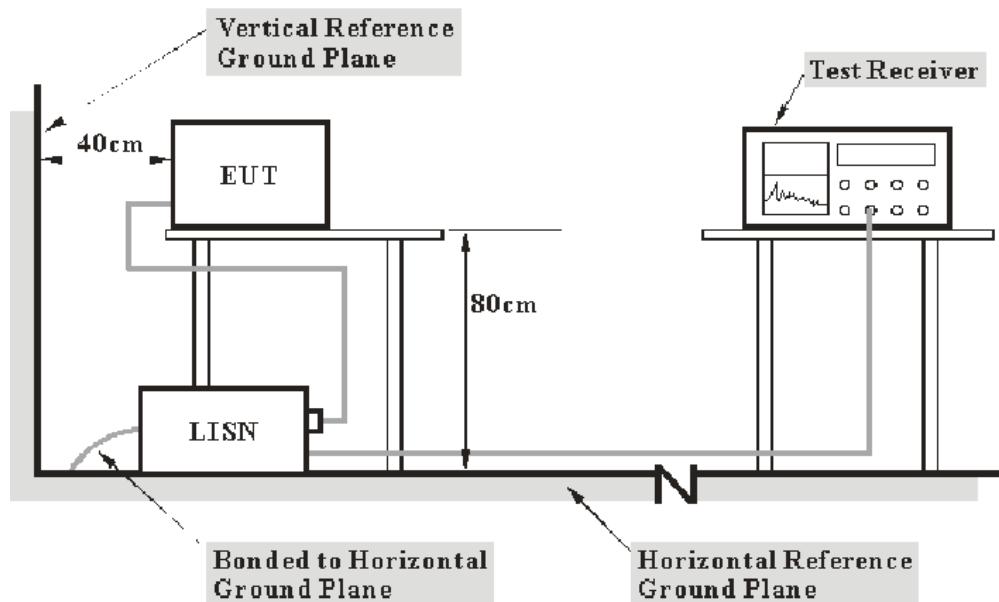
## FCC §18.307 - AC LINE CONDUCTED EMISSIONS

### 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  $\pm 2.4$  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:

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

## 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 Equipment List and Details

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
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 Results Summary

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

**11.30 dB at 0.465 MHz** in the **Line** conductor mode

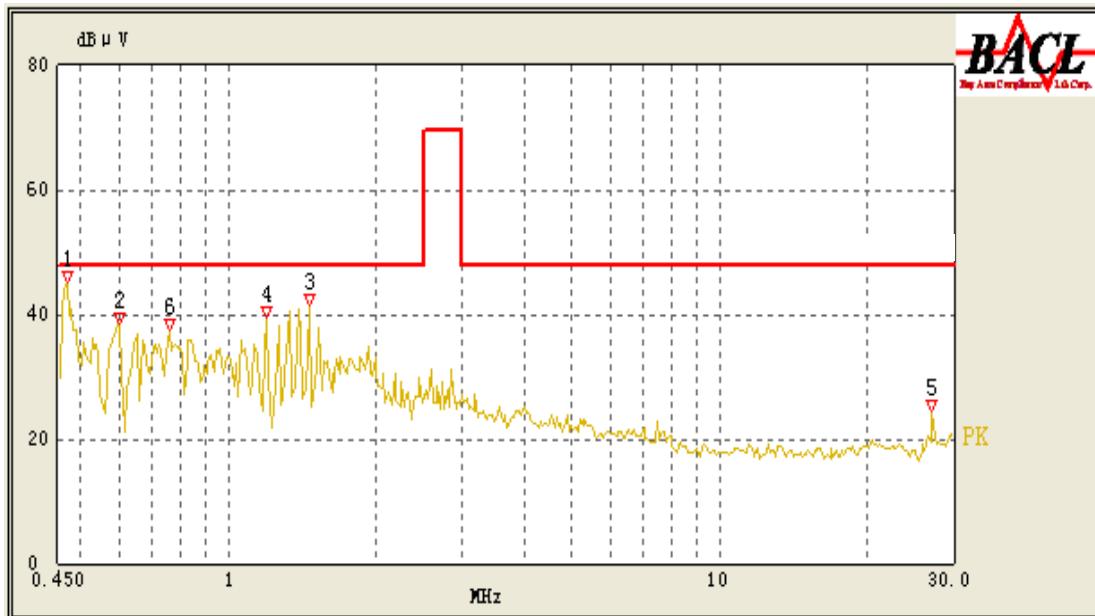
## Test Data

### Environmental Conditions

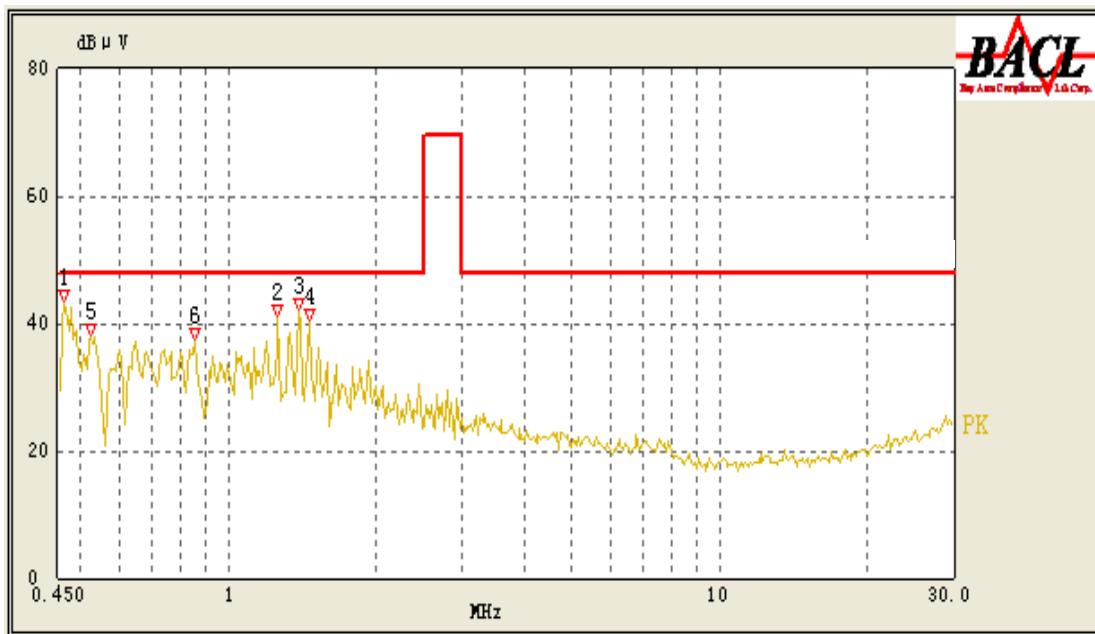
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	101.0 kPa

Testing was performed by Jeaason Lee on 2011-04-28.

EUT operation mode: On

**AC 120V/ 60 Hz, Line:**

Frequency (MHz)	Cord. Result (dB $\mu$ V)	Correction Factor (dB)	Limit (dB $\mu$ V)	Margin (dB)
0.465	36.7	10.10	48.00	11.30
1.452	35.9	10.10	48.00	12.10
1.190	30.7	10.10	48.00	17.30
0.595	22.3	10.10	48.00	25.70
0.762	22.3	10.10	48.00	25.70
27.120	14.2	10.10	48.00	33.80

**AC 120V/60 Hz, Neutral:**

Frequency (MHz)	Cord. Result (dB $\mu$ V)	Correction Factor (dB)	Limit (dB $\mu$ V)	Margin (dB)
1.389	36.1	10.10	48.00	11.90
1.452	36.0	10.10	48.00	12.00
0.465	35.1	10.10	48.00	12.90
1.257	31.1	10.10	48.00	16.90
0.528	25.5	10.10	48.00	22.50
0.857	24.6	10.10	48.00	23.40

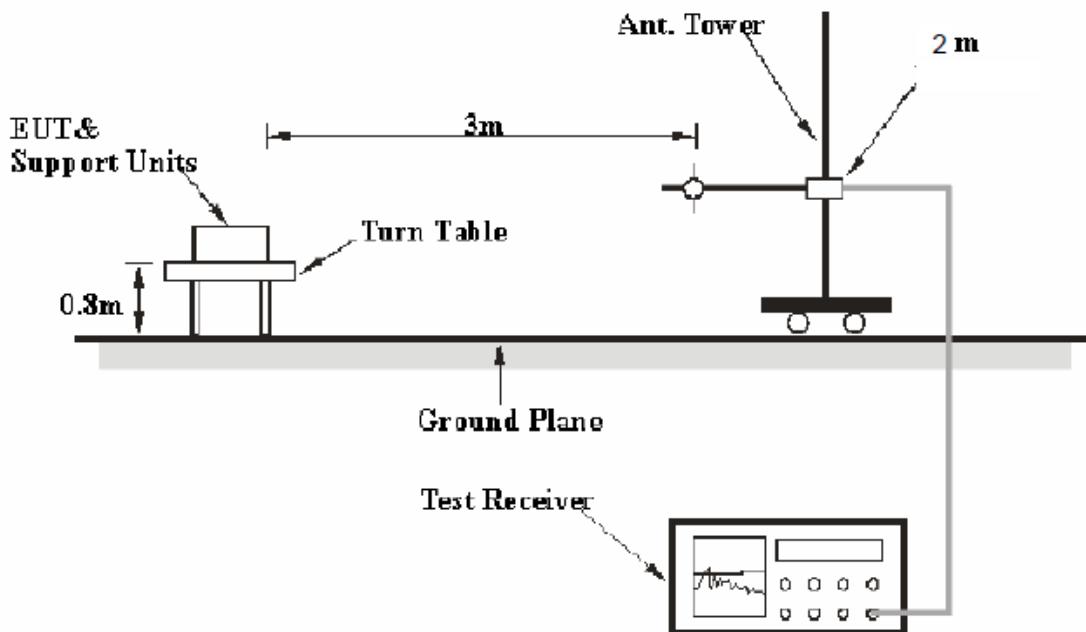
## FCC §18.305 – FIELD STRENGTH

### 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  $\pm 4.0$  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:

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

## 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.

The EUT was in the normal operating mode during the final qualification test to represent the worst results.

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

## Test Result Calculation

The test result is calculated by adding the Antenna Factor, Cable Loss and conversion factor to the Receiver Reading. The basic equation is as follows:

Test Result (dB $\mu$ V/m) = Receiver Reading (dB $\mu$ A/m) + Antenna Factor (dB/m) + Cable Loss (dB) + 51.5 dB\*

\*Note: 51.5 dB is the conversion factor for the conversion from (dB $\mu$ A/m) to (dB $\mu$ V/m).

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS	Passive Loop Antenna	6512	00029604	2010-07-14	2011-07-13
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10
Sunol Sciences	System Controller	SC99V	041304-1	N/A	N/A

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

**Test Data****Environmental Conditions**

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

*The testing was performed by Jeason Lee on 2011-05-03*

EUT operation mode: On

Frequency (MHz)	Receiver Reading (dB $\mu$ A/m)	Detector (PK/QP/Ave.)	Direction (Degree)	Test Antenna		Cable Loss (dB)	Test Result (dB $\mu$ V/m)
				Height (m)	Factor (dB/m)		
7.374	-27.74	QP	185	2.00	33.5	0.1	57.36
0.117	-32.77	QP	120	2.00	65.5	0.1	84.33
0.102	-32.56	QP	175	2.00	65.9	0.1	84.94
0.067	-34.56	QP	210	2.00	72.0	0.1	89.04
0.063	-36.63	QP	85	2.00	72.5	0.1	87.47

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