



## FCC PART 18

# MEASUREMENT AND TEST REPORT

For

**Yantai Haolibest Lighting Co., Ltd.**

Haolibest Industry Zone, 27 Jinxiu Road, Qixia,

Shandong 265300, China

**FCC ID: ZFCR100A7019W**

**Model Number: A70 19W E26**

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Original Report	<b>Equipment Type:</b> Self-Ballasted Lamp
<b>Test Engineer:</b>	Fisher He <i>Fisher.he</i> Sally Ni <i>Sally.ni</i>
<b>Report Number:</b>	RSH110329001
<b>Report Date:</b>	2011-04-08
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## GENERAL INFORMATION

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

The **Yantai Haolibest Lighting Co., Ltd.**'s product, model number: **A70 19W E26 (FCC ID: ZFCR100A7019W)** or the "EUT" as referred to in this report is the **Self-ballasted lamp**, which has plastic enclosure. It is measures approximately: 140 mm L x 80 mm D.  
Rated input voltage: AC 120V/60Hz

*Note: All measurement and test data in this report was gathered from production sample, serial number: 110328003, (Assigned by BACL), the item was received on 2011-03-29.*

### Objective

The following test report is prepared on behalf of **Yantai Haolibest 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 measurements were performed at Bay Area Compliance Laboratory Corporation.

### Test Facility

The test site used by BACL to collect test data is located in the Room 5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China

Test site at BACL 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 July 31, 2009. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The EUT was provided for tests as a stand-alone device. The system is configured for testing in a typical fashion (as a normally used by a typical user).

### EUT Exercise Software

N/A.

### Special Accessories

No special accessories were supplied by BACL.

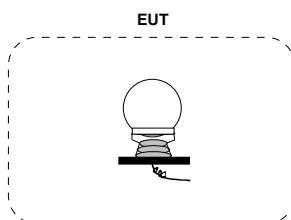
### Equipment Modifications

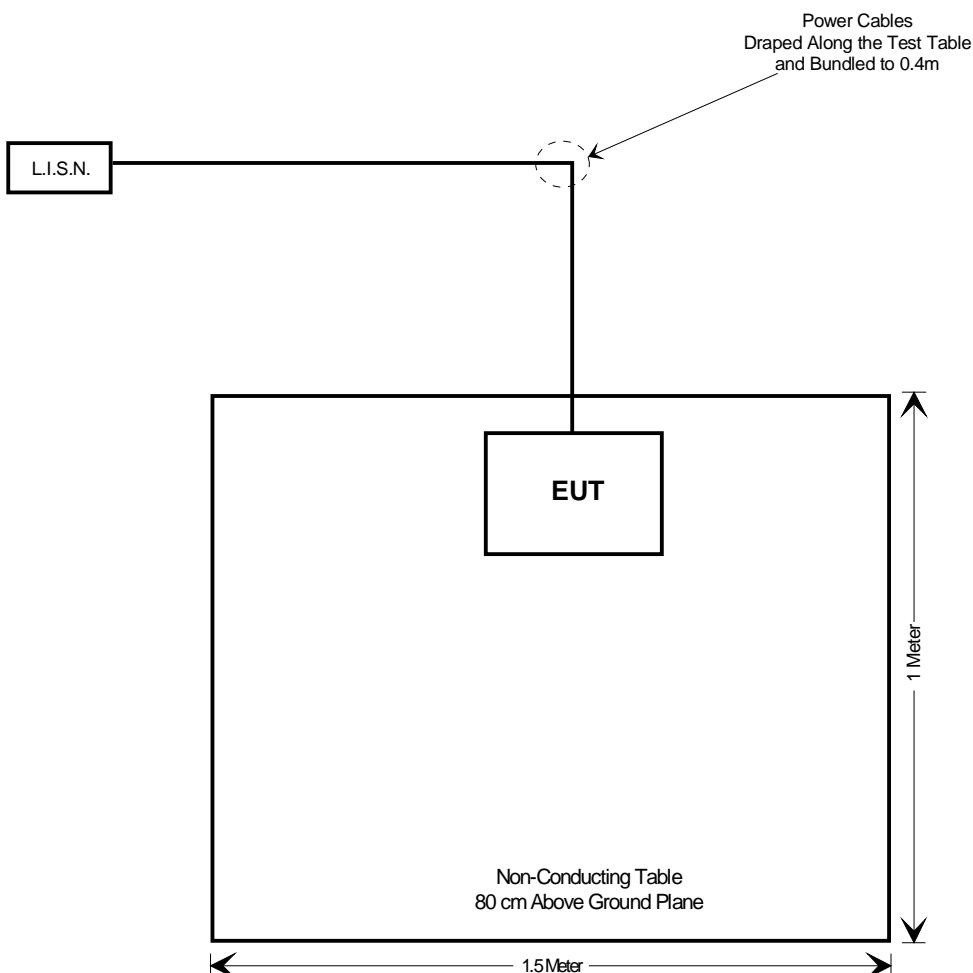
No modification to the EUT was made by BACL to make sure the EUT comply with applicable limits.

### External I/O Cable

Cable Description	Length (m)	From/Port	To
AC Power Cable	1.2	L.I.S.N.	EUT

### Configuration of Test System



**Test Setup Block Diagram**

**SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Results
§18.307	AC Line Conducted Emission	Compliance
§18.305	Field Strength	Compliance

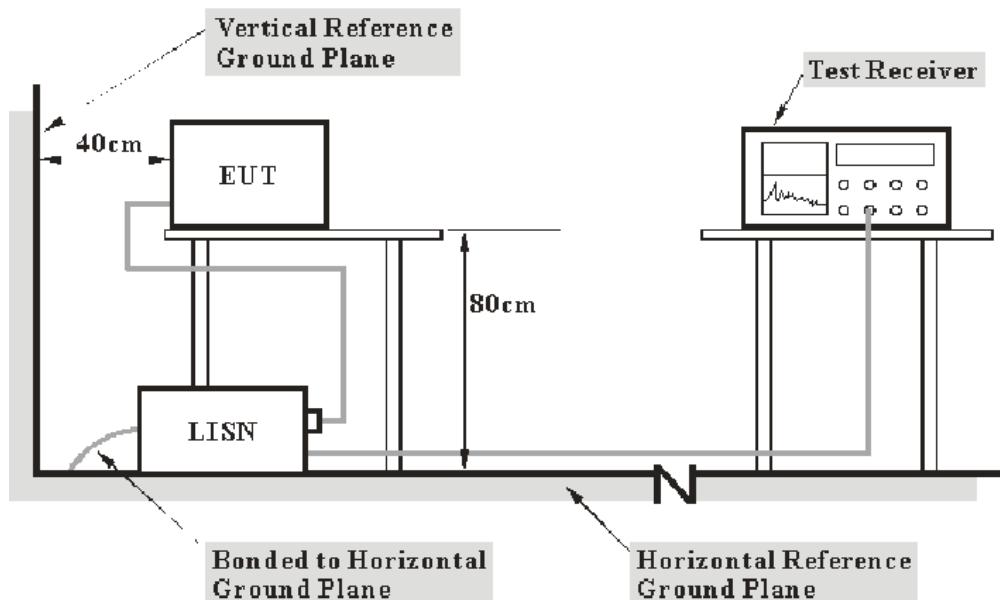
## FCC §18.307 – AC LINE CONDUCTED EMISSIONS

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMI. The factors contributing to uncertainties are EMI Test Receiver, cable loss, and L.I.S.N.

Based on NIS 81, The Treatment of Uncertainty in EMI Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is  $\pm 2.4$  dB.

### Test Setup



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 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 per MP-5 measurement procedure. Specification used was with the FCC Part 18.307.

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

A 120VAC/60Hz power source was provided to the EUT through the L.I.S.N.

## 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>Frequency Range</b>	<b>IF B/W</b>
450 kHz – 30 MHz	9 kHz

## Test Procedure

During the conducted emission test, the power cord of the EUT is connected to the outlet of the L.I.S.N.(Line Impedance Stabilization Network).

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

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

## Test Equipment List and Details

<b>Manufacturer</b>	<b>Description</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	EMI Test Receiver	ESCI	10028	2011-09-27
SOLAR	L.I.S.N.	9252-50-R-24-BNC	984412	2011-12-20
Rohde & Schwarz	L.I.S.N.	ENV216	100081	2011-11-12
Rohde & Schwarz	Pulse Limiter	ESH3Z2	DE25985	2011-10-12

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

## Test Environment Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56%
<b>ATM Pressure:</b>	100.0 KPa

*The testing was performed by Sally Ni and Fisher He.*

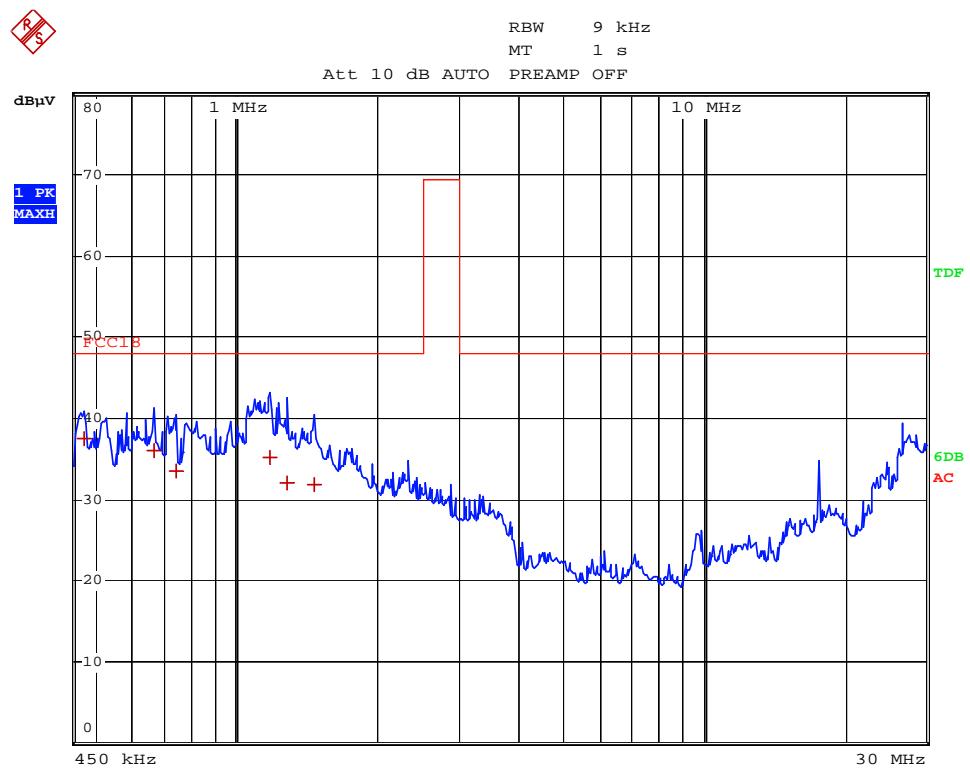
## Test Results

According to the recorded data in following table, the EUT complied with the FCC Part 18.307, with the worst margin reading of:

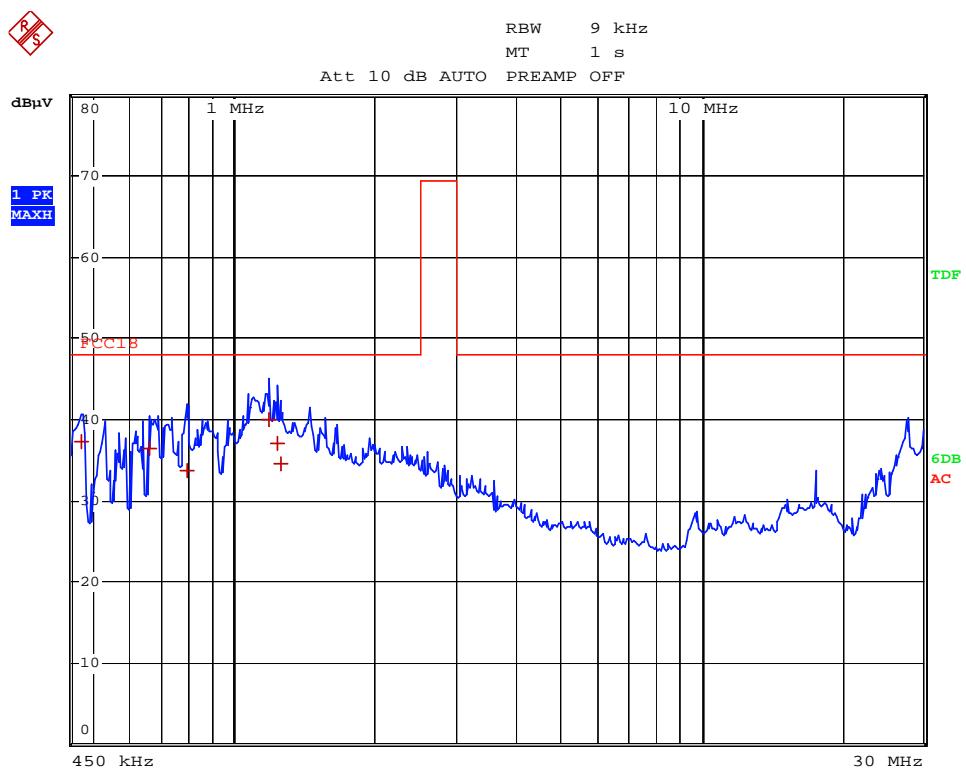
**6.2 dB at 0.46 MHz** at the **Line** mode with the power cord extension, 0.45–30 MHz

**Conducted Emissions Test Data & Plots***Test mode: operating mode*

Line Conducted Emissions				FCC Part 18.307	
Frequency (MHz)	Amplitude (dB $\mu$ V)	Detector (QP/Ave/Peak)	(Line/Neutral)	Limit (dB $\mu$ V)	Margin (dB)
0.46	41.8	PK	Line	48	6.2
0.46	41.0	PK	Neutral	48	7.0
0.57	40.8	PK	Line	48	7.2
0.46	40.3	QP	Line	48	7.7
1.12	40.3	PK	Neutral	48	7.7
0.74	40.0	PK	Neutral	48	8.0
0.85	39.8	PK	Neutral	48	8.2
0.58	39.6	PK	Neutral	48	8.4
1.12	39.3	PK	Line	48	8.7
0.62	39.2	PK	Neutral	48	8.8
0.85	39.1	PK	Line	48	9.0
1.01	39.0	PK	Line	48	9.0
0.46	38.8	QP	Neutral	48	9.3
0.57	38.6	QP	Line	48	9.4
0.92	38.3	PK	Line	48	9.7
1.12	36.9	QP	Neutral	48	11.1
0.85	36.8	QP	Line	48	11.2
1.01	36.5	QP	Line	48	11.5
1.12	36.6	QP	Line	48	11.5
0.92	36.0	QP	Line	48	12.0
0.85	35.8	QP	Neutral	48	12.2
0.58	34.7	QP	Neutral	48	13.3
0.62	34.0	QP	Neutral	48	14.0
0.74	34.0	QP	Neutral	48	14.0

**120 V/60 Hz, Line**

Date: 30.MAR.2011 10:35:48

**120 V/60 Hz, Neutral**

Date: 30.MAR.2011 10:40:16

## 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 EMI Test Receiver, cable loss, antenna factor calibration antenna factor frequency interpolation, 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. (Chengdu) is  $\pm 4.0$  dB.

### EUT Setup

The radiated emission tests were performed in the 3 meters chamber test site, the EUT was placed on the test table and the distant from the receiver antenna 3m using the setup accordance with MP-5.

The specification used was FCC Part 18.305.

The power source which EUT used was AC 120V, 60Hz.

### EMI Test Receiver Setup

The system was investigated from 9 kHz to 30 MHz.

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

Frequency	R B/W	V B/W	IF B/W
9 kHz – 150 kHz	3 kHz	3 kHz	200 Hz
150 kHz-30 MHz	100 kHz	100 kHz	9 kHz

### Test Procedure

During the field strength test, the power cord of the EUT is connected to the auxiliary outlet of the AC power.

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

All data was recorded in the Peak detection mode.

### Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Amp.} = \text{Receiver Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Pre-amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Amp.}$$

## Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	10028	2011-09-27
Rohde & Schwarz	Loop Antenna	HFH2-Z2	040904	2011-08-14

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

## Test Environment Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56%
<b>ATM Pressure:</b>	100.0 KPa

*The testing was performed by Sally Ni and Fisher He.*

## Test Results

*Test mode: operating mode*

Frequency (MHz)	Cord. Amp. (dB $\mu$ V/m)	Detector (QP/Ave/Peak)	Limit (dB $\mu$ V/m)	Margin (dB)
9.08	34.51	PK	63.5	28.99
12.28	28.06	PK	63.5	35.44
11.48	26.58	PK	63.5	36.92
13.08	24.11	PK	63.5	39.39
10.68	24.09	PK	63.5	39.41
12.76	23.7	PK	63.5	39.80

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