

# TEST REPORT

According to ANSI/IES LM-80-15

For

**SHENZHEN CHINST ILLUMINATION CO.,LTD**

5F, Juzhi Industrial Zone, Longgang, Shenzhen, Guangdong, China

**Model: L130-2790003000W2C**

<b>Report Type:</b> 15000 Hours Test Report		<b>Product Type:</b> LED Package	
<b>Reviewed By:</b>	Pote Wang	<i>Pote Wang</i>	
<b>Report Number:</b>	SZ2202308-68754E-10-19000		
<b>Test Date:</b>	2020-04-08 to 2022-05-31		
<b>Report Date:</b>	2022-11-22		
<b>Approved by:</b>	Bill Xiong / EE Engineer	<i>Bill Xiong</i>	
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<b>Test Facility:</b>	Test facility was located at No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China.		



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## 1 - General Information

### 1.1 Description of LED Light Sources<sup>#</sup>

#### Sample Size:

50 PCS test samples were in good condition and received on 2020-07-06. The samples were numbered from 1 to 25 and 26 to 50.

Manufacturer:	SHENZHEN CHINST ILLUMINATION CO.,LTD
Part Number:	L130-2790003000W2C
Part Type:	LED Package
Drive Level:	DC 350mA
Nominal CCT:	2700K-6500K
Power:	0.85W
Average Current Density per LED die:	1039.81mA/mm <sup>2</sup>
Average Power Density per LED die:	3.12W/mm <sup>2</sup>
CRI:	90
Die Spacing:	0.15mm

#### Sampling Method:

LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive days.

These manufacturing lots are picked to represent a wide parametric distribution.

#### Family products covered by this report:

According to *ENERGY STAR<sup>®</sup> Requirements for the Use of LM-80 Data*, the following products can be covered by this report base on the information and declaration provided by manufacturer. The information of these models shows that the covered products meet all section 4 requirements of *ENERGY STAR<sup>®</sup> Requirements for the Use of LM-80 Data* (September 28, 2017)

This report covers the following models:

Model Name	Total Input Current (mA)	Power (W)	CCT (K)	Series	Parallel	Current Density per LED die (mA/mm <sup>2</sup> )	Power Density per PCB (W/mm <sup>2</sup> )	Die Spacing (mm)
L130-2790003000W2C	350	0.85	2700-6500K	1	2	1039.81	0.111	0.15

X1= internal code, it can be 0 to 9 or A to Z.

## 1.2 Standards and Reference Documentations

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- \*CIE 127:2007: Measurement of LEDs (This standard was not accredited by NVLAP)
- \*ANSI/ASABE S640 JUL2017 Quantities and Units of Electromagnetic Radiation for Plants (Photosynthetic Organisms) (This standard was not accredited by NVLAP)
- \*ANSI/ASABE S642 SEP2018: Recommended Methods for Measurement and Testing of LED Products for Plant Growth and Development (This standard was not accredited by NVLAP)

## 1.3 Testing Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
High Accuracy Array Spectroradiometer	EVERFINE	HAAS 2000	P600674CM5391140	2021-09-27	2022-09-26
0.5M Integrating Sphere	EVERFINE	0.5m	NA	2021-09-27	2022-09-26
LED Test Source	EVERFINE	LTS-300	P185616CJ1391143	2022-01-05	2023-01-04
Standard Light Source	EVERFINE	D062	1011093	2021-10-15	2022-10-14
Multilayer aging machine	BACL	B2-384	N/A	2022-01-04	2023-01-03
Program-controlled D.C. Stabilized Voltage Supply	Hanshenpuyuan	HSPY-60-03	N/A	2022-01-05	2023-01-04

## 1.4 Drive Level

Samples are driven with a constant direct current (DC) during maintenance test, photometric and electrical measurement. The current value was regulated to within  $\pm 3\%$  of the specified value of the manufacturer during maintenance test, and was within  $\pm 0.5\%$  during photometric and electrical measurement test.

## 1.5 Ambient Conditions for Maintenance Test

For lumen maintenance test, samples within one data set, were installed on cooling boards in thermal chambers with minimal ambient airflow. The case temperature and ambient temperature was monitored by thermocouples which one was soldered to the coldest DUTs' case (TMP<sub>LED</sub>) location, while the other is mounted at a distance of 5 mm above the TMP location.

During life testing, TMP<sub>LED</sub> of the coldest LEDs were maintained at a temperature that was greater than or equal to 2°C below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to 5°C below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with ASTM E230 Table 1 "Special Limits".

Samples were connected to DC power supply in series circuits with a constant current. The forward current was regulated to within  $\pm 3\%$  of the specified value of the manufacturer.

The relative humidity within chamber was kept less than 65% during test.

For photometry measurement, the ambient temperature during test was set to 25°C  $\pm$  2°C, RH <65%.

## 1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure spectral power distribution and photon flux. 2 $\pi$  measurement was used and sample was driven by DC power supply. The forward current was regulated to within  $\pm 0.5\%$  of the nominal value. The test system was calibrated by halogen reference lamp. The ambient temperature during test was set to 25°C  $\pm$  2°C, RH <65%. The temperature measurement point was located in the sphere and the temperature was detected by a temperature probe.

## 1.7 Statement of Traceability

Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).



## Bay Area Compliance Laboratories Corp. (Shenzhen)

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The NVLAP Lab Code is 200707-0

### 1.8 Sample Set

#### Data Set 1: 85°C, 350mA

Part Number: L130-2790003000W2C

Number of Units: 25

Case Temperature: >83°C

Ambient Temperature: >80°C

Life Test Drive Current: 350mA

Measurement Current: 350mA

#### Data Set 2: 105°C, 350mA

Part Number: L130-2790003000W2C

Number of Units: 25

Case Temperature: >103°C

Ambient Temperature: >100°C

Life Test Drive Current: 350mA

Measurement Current: 350mA

## 2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	$\alpha$	$\beta$	Reported TM-21 L70 Lifetime	Reported TM-21 L90 Lifetime
1	25	0	1000hrs	15000hrs	2.013E-06	1.004	>90000 hours	54000 hours
2	25	0	1000hrs	15000hrs	2.229E-06	1.003	>90000 hours	49000 hours

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	$\alpha$	$\beta$	Reported TM-21 Q70 Lifetime	Reported TM-21 Q90 Lifetime
1	25	0	1000hrs	15000hrs	2.006E-06	1.005	>90000 hours	55000 hours
2	25	0	1000hrs	15000hrs	2.214E-06	1.003	>90000 hours	49000 hours

### Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	100.20%	100.00%	99.80%	99.60%	99.41%	99.20%	99.01%	98.79%	98.59%
2	100.12%	99.88%	99.65%	99.42%	99.22%	98.98%	98.76%	98.53%	98.31%

Data Set:	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
1	98.39%	98.20%	98.01%	97.80%	97.61%	97.42%
2	98.09%	97.87%	97.67%	97.44%	97.22%	97.01%

### Average Photon Flux Maintenance, Photosynthetic 400-700nm (PFM<sub>p</sub>) (Percentage of Initial)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	100.24%	100.06%	99.84%	99.65%	99.47%	99.25%	99.07%	98.85%	98.66%
2	100.18%	99.93%	99.67%	99.45%	99.25%	99.02%	98.81%	98.58%	98.35%

Data Set:	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
1	98.45%	98.26%	98.08%	97.87%	97.69%	97.47%
2	98.14%	97.94%	97.74%	97.52%	97.29%	97.04%

### Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0008
2	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010

Data Set:	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
1	0.0009	0.0011	0.0012	0.0013	0.0013	0.0014
2	0.0011	0.0012	0.0013	0.0014	0.0015	0.0016