



# TEST REPORT

According to ANSI/IES LM-80-15  
For

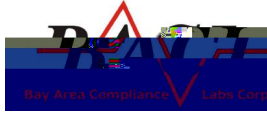
## Hongli Zhihui Group Co.,Ltd. Guangzhou Branch

Room 316, Building 2, No.1, Xianke Yi Road, Huadong Town, Huadu District, Guangzhou, China

**#Model: HL-A-2835D15FC-S1-08**

<b>Report Type:</b> 6000 Hours Test Report		<b>Product Type:</b> LED Package	
<b>Reviewed By:</b>	Pote Wang		
<b>Report Number:</b>	RSZ190428532-10-6000		
<b>Test Date:</b>	2020-01-04 to 2020-10-16		
<b>Report Date:</b>	2020-10-23		
<b>Approved by:</b>	Blake Zhang / EE Engineer		
<b>Test Facility:</b>	Test facility was located at No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China.		
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588		
<b>Accreditation:</b>	The IAS Accreditation Number TL-460.		





## 1. General Information

### 1.1 Description of LED Light Sources

#### Sample Size:

60 PCS test samples were in good condition and received on 2019-04-28. The samples were numbered from 1 to 30 and 31 to 60.

#Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
#Part Number:	HL-A-2835D15FC-S1-08
#Part Type:	LED Package
#Drive Level:	DC 150mA
#Wavelength:	665nm
#Power:	0.315W
#Average Current Density per LED die:	600.000mA/mm <sup>2</sup>
#Average Power Density per LED die:	1.260W/mm <sup>2</sup>
#CRI:	NA
#Die Spacing:	NA

#### 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:

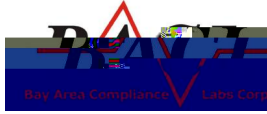
According to *ENERGY STAR® Requirements for the Use of LM-80 Data*, the following products can be covered by this report base on the information and declaration provided by manufacturer. The information of these models shows that the covered products meet all section 4 requirements of *ENERGY STAR® Requirements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

This report covers the following models:

Test Model Number	Multiple Models	Details
HL-A-2835D15FC-S1-08	HL-A-2835D**FC-S1-08	1. Different Model name for different market. 2. brightness level.
	HL-A-2835D**FC-S1-08L	
	HL-A-2835D**FC-S1-08HL	
	HL-A-2835D**FC-S1-08-PCT	
	HL-A-2835D**FC-S1-08L-PCT	
	HL-AS-2835D**FC-S1-08-PCT	
	HL-AS-2835D**FC-S1-08L-PCT	

### 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
- ANSI/ASABE S640 JUL2017 Quantities and Units of Electromagnetic Radiation for Plants (Photosynthetic Organisms) (This standard was not accredited by IAS)
- ANSI/ASABE S642 SEP2018: Recommended Methods for Measurement and Testing of LED Products for Plant Growth and Development (This standard was not accredited by IAS)



### 1.3 Testing Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
High Accuracy Array Spectroradiometer	EVERFINE	HAAS 2000	P600674CM5391140	2019-10-22	2020-10-21
0.5M Integrating Sphere	EVERFINE	0.5m	NA	2019-10-22	2020-10-21
LED Test Source	EVERFINE	LTS-300	P185616CJ1391143	2019-11-05	2020-11-04
Standard Light Source	EVERFINE	D062	1011093	2019-11-19	2020-11-18
Multilayer aging machine	BACL	N/A	N/A	2019-11-05	2020-11-04
Program-controlled D.C. Stabilized Voltage Supply	Hanshenpuyuan	HSPY-60-03	N/A	2020-07-01	2021-06-30

### 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 <sub>LED</sub> location, while the other is mounted at a distance of 5 mm above the TMP location.

During life testing,  $TMP_{LED}$  of the coldest LEDs were maintained at a temperature that was greater than or equal to  $2^{\circ}C$  below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to  $5^{\circ}C$  below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with

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.

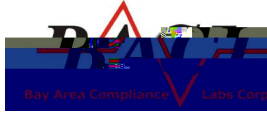
For photometry measurement, the ambient temperature during test was set to  $25^{\circ}C \pm 2^{\circ}C$ , RH <65%.

### 1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure spectral power distribution and photon flux. 2 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  $25^{\circ}C \pm 2^{\circ}C$ , 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. (Dongguan) 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. (Dongguan)

No.69, Pulongcun, Puxinhu Industrial Area Tangxia ,  
Dongguan, Guangdong, China.  
The IAS Accreditation Number TL-460

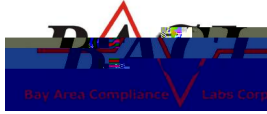
### 1.8 Sample Set

#### Data Set 1: 85°C, 150mA

Part Number: HL-A-2835D15FC-S1-08  
Number of Units: 30  
Case Temperature: >83°C  
Ambient Temperature: >80°C  
Life Test Drive Current: 150mA  
Measurement Current: 150mA

#### Data Set 2: 105°C, 150mA

Part Number: HL-A-2835D15FC-S1-08  
Number of Units: 30  
Case Temperature: >103°C  
Ambient Temperature: >100°C  
Life Test Drive Current: 150mA  
Measurement Current: 150mA

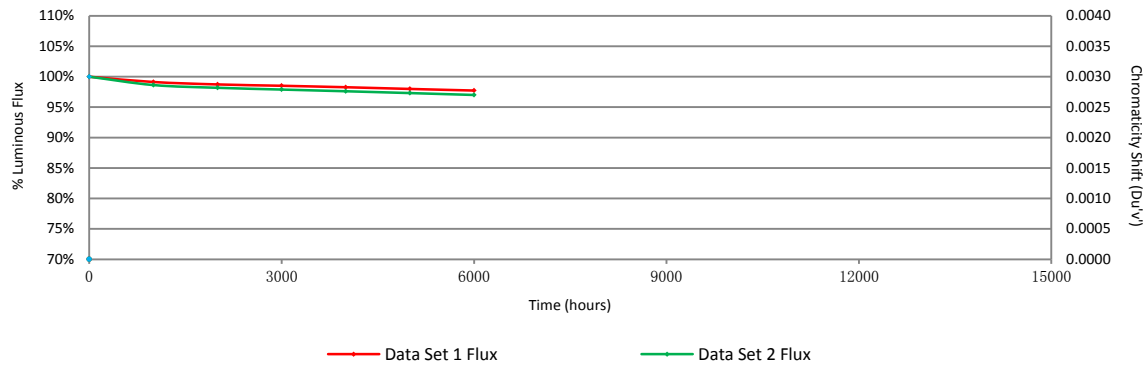


## 2. Summary of Test Result

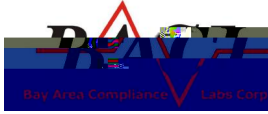
Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration			Reported TM-21 Q <sub>70</sub> Lifetime	Reported TM-21 Q <sub>90</sub> Lifetime
1	30	0	1000hrs	6000hrs	2.746E-06	0.993	>36000 hours	>36000 hours
2	30	0	1000hrs	6000hrs	3.225E-06	0.989	>36000 hours	29000 hours

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

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	99.13%	98.73%	98.51%	98.27%	97.99%	97.73%
2	98.63%	98.18%	97.89%	97.61%	97.31%	97.00%



FINAL



## Bay Area Compliance Laboratories Corp. (Dongguan)

No.69, Pulongcun, Puxinhu Industrial Area Tangxia ,  
Dongguan, Guangdong, China.  
The IAS Accreditation Number TL-460

### 3.2 Data Set 1, 85°C, 150mA (Forward Voltage)

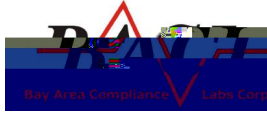
No.

FINAL





FINAL



**3.5 Data Set 2, 105°C, 150mA (Forward Voltage)**

No.	Forward Voltage (V)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
31	2.549	2.597	2.589	2.588	2.592	2.592	2.601
32	2.441	2.484	2.477	2.483	2.480	2.480	2.485
33	2.506	2.550	2.542	2.538	2.543	2.545	2.550
34	2.612	2.666	2.656	2.668	2.659	2.659	2.671
35	2.621	2.678	2.670	2.664	2.672	2.670	2.682
36	2.490	2.528	2.520	2.518	2.523	2.521	2.528
37	2.451	2.494	2.490	2.486	2.490	2.487	2.494
38	2.501	2.538	2.533	2.534	2.535	2.532	2.538
39	2.454	2.498	2.491	2.522	2.494	2.490	2.500
40	2.461	2.504	2.501	2.493	2.501	2.500	2.508
41	2.569	2.617	2.614	2.609	2.613	2.614	2.625
42	2.613	2.660	2.655	2.647	2.656	2.655	2.669
43	2.554	2.600	2.598	2.587	2.595	2.595	2.601
44	2.469	2.506	2.502	2.496	2.501	2.501	2.508
45	2.552	2.601	2.597	2.588	2.597	2.598	2.610
46	2.545	2.593	2.590	2.579	2.588	2.588	2.602
47	2.459	2.503	2.496	2.489	2.498	2.498	2.507
48	2.504	2.549	2.542	2.534	2.545	2.543	2.554
49	2.471	2.510	2.504	2.501	2.507	2.504	2.511
50	2.487	2.531	2.525	2.518	2.529	2.527	2.536
51	2.478	2.518	2.513	2.504	2.516	2.513	2.522
52	2.479	2.563	2.571	2.563	2.572	2.573	2.582
53	2.550	2.594	2.591	2.584	2.595	2.595	2.600

51

**Bay Area Compliance Laboratories Corp. (Dongguan)**

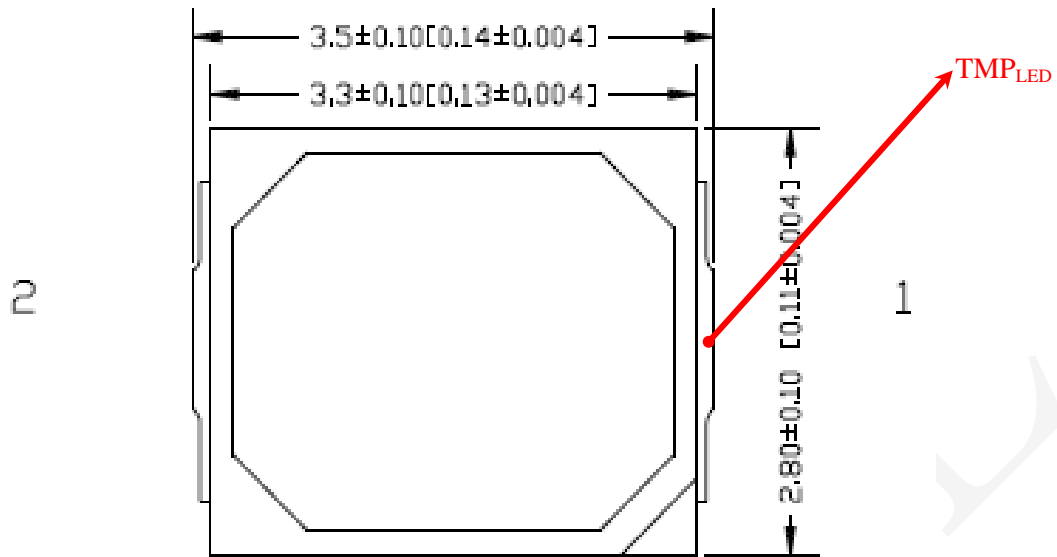
No.69, Pulongcun, Puxinhu Industrial Area Tangxia ,

Dongguan, Guangdong, China.

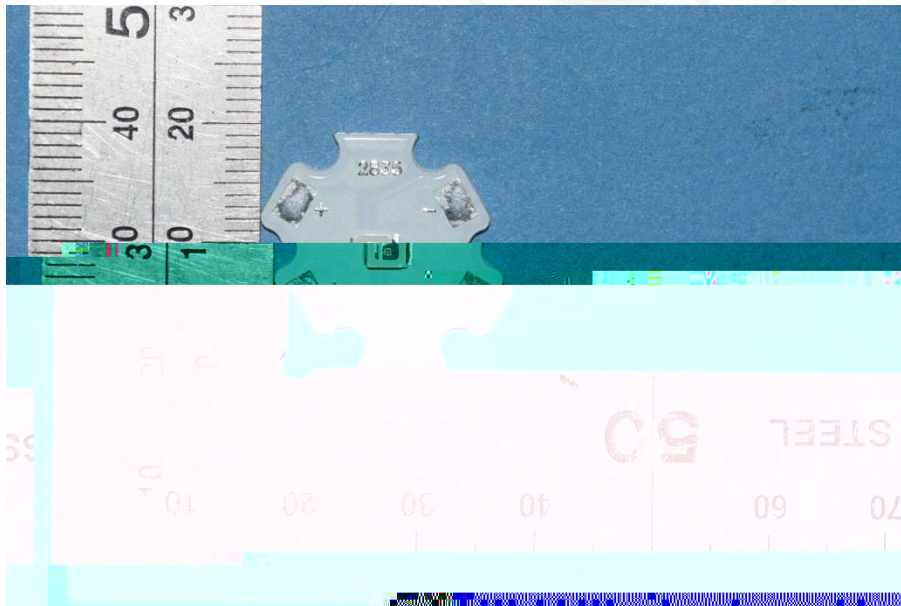
The IAS Accreditation Number TL-460

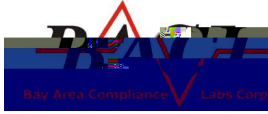
FINAL

4. DUT Photo



All dimensions are in millimeter





## Bay Area Compliance Laboratories Corp. (Dongguan)

No.69, Pulongcun, Puxinhu Industrial Area Tangxia ,  
Dongguan, Guangdong, China.  
The IAS Accreditation Number TL-460

### Directions

---

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

FINAL