



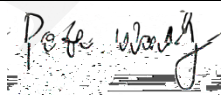
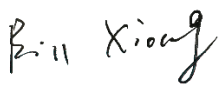
TEST REPORT

According to ANSI/IES LM-80-15
For

HongliZhihui Group Co.,Ltd. Guangzhou Branch

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

Model:A2835W1H2-D01-7D2AA1

| | | | |
|---|---|---|--|
| Report Type: 6000 Hours Test Report | | Product Type: LED Package | |
| Test Engineer: | Pote Wang |  | |
| Report Number: | RSZ180319504-10 | | |
| Test Date: | 2018-04-05 to 2018-12-15 | | |
| Report Date: | 2018-12-25 | | |
| Reviewed By: | Bill Xiong / EE Engineer |  | |
| Test Facility: | Test facility was located at No.69,Pulongcun,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. | | |
| Prepared By: | Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588 | | |
| Accreditation: | The IAS Accreditation Number TL-460. | | |

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.



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| 3.3 Data Set 1, 55°C, | |



Note:

Multiple model SL-*Z2835FAB-11CA*, and so on, the first temperature (I means 2200-3700K, N means 3700-4700K, W means above 4700K), the second * is a different product solution (color coordinate and applications and special solution

Multiple model SL-**Z2835FTA-11CA***C-APH***/SL-**Z2835FAA-11CA***C-APH***/SL-**Z2835FAB-11CA***C-APH**, the first

The m color coordinate , the last
ates version numbers, Use 001 002 003 expression.

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
- ENERGY STAR® Requirements for the Use of LM-80 Data(This standard was not accredited by IAS)

1.3 Testing Equipment

| Device | Manufacture | Model No | Serial No | Calibration date | Calibration due date |
|--|-------------|---------------|------------------|------------------|----------------------|
| 0.3m integrating sphere | EVERFINE | Diameter 0.3m | 1011119 | 2018-03-18 | 2019-03-18 |
| Programmable Test Power for LEDs | EVERFINE | LED300E | 1008002 | 2018-03-26 | 2019-03-26 |
| High accuracy array spectroradiometer | EVERFINE | HAAS-2000 | 1012016T | 2018-03-18 | 2019-03-18 |
| Standard Light Source | EVERFINE | D062 | 1011064 | 2018-01-15 | 2019-01-15 |
| Precision digital stabilized DC power supply | EVERFINE | WY605-V110 | G115987CJ7321114 | 2018-03-26 | 2019-03-26 |
| Multilayer aging machine | BACL | B2-270 | 20024 | 2018-03-13 | 2019-03-13 |
| Digital CC&CV DC Power Supply | EVERFINE | WY5015 | 11090007 | 2018-03-26 | 2019-03-26 |
| Digital CC&CV DC Power Supply | EVERFINE | WY5015 | 11090004 | 2018-03-26 | 2019-03-26 |

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 ±3% of the specified value of the manufacturer during maintenance test, and was within ±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 (LED) 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°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

Samples were connected to DC power supply in series circuits with a constant current. The forward current was regulated to within ±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 ± 2°C, RH <65%.



1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate u_v . 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 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, RH <65%. The temperature measurement point was located in the sphere and the temperature was detected by a temperature probe.

The uncertainty of the light output (luminous flux) measurements is $U=1.6\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=20\text{K}$ ($K=2$), at the 95% confidence level. The uncertainty of the CRI is $U=1.6$ ($K=2$), at the 95% confidence level.

The uncertainty of the temperature is $U=0.8671^{\circ}\text{C}$ ($K=2$), at the 95% confidence level.

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).

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344 D

| No. |
|-----|
| 31 |
| 32 |
| 33 |
| 34 |

| 0hrs | 6000hrs |
|------|---------|
| 63 | 98.35 |
| 71 | 98.55 |
| 61 | 98.22 |
| 30 | 97.83 |
| 00 | 98.80 |

| | | |
|-------|-------|-------|
| 98.40 | 98.20 | 97.93 |
| 98.69 | 98.10 | 97.46 |
| 98.76 | 98.37 | 97.84 |
| 98.67 | 98.44 | 97.67 |
| 98.94 | 98.58 | 98.16 |
| 98.67 | 98.47 | 98.28 |
| 98.48 | | |
| 98.67 | 98.45 | 98.08 |

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3.5 Data Set 2, 85°C, 80mA (Forward Voltage)

| No. | Forward Voltage (V) | | | | | | |
|-----|---------------------|---------|---------|---------|---------|---------|---------|
| | 0hr(Initial) | 1000hrs | 2000hrs | 3000hrs | 4000hrs | 5000hrs | 6000hrs |
| 31 | 3.191 | 3.196 | 3.201 | 3.178 | 3.185 | 3.206 | 3.208 |
| 32 | 3.182 | 3.187 | 3.192 | 3.167 | 3.177 | 3.184 | 3.195 |
| 33 | 3.176 | 3.179 | 3.180 | 3.155 | 3.169 | 3.208 | 3.204 |
| 34 | 3.198 | 3.197 | 3.200 | 3.180 | 3.191 | 3.218 | 3.192 |
| 35 | 3.217 | 3.221 | 3.220 | 3.204 | 3.214 | 3.239 | 3.214 |
| 36 | 3.180 | 3.182 | 3.184 | 3.162 | 3.175 | 3.173 | 3.188 |
| 37 | 3.203 | 3.204 | 3.209 | 3.191 | 3.204 | 3.204 | 3.205 |
| 38 | 3.180 | 3.185 | 3.185 | 3.167 | 3.176 | 3.174 | 3.176 |
| 39 | 3.189 | 3.187 | 3.190 | 3.172 | 3.179 | 3.182 | 3.190 |
| 40 | 3.194 | 3.198 | 3.195 | 3.176 | 3.185 | 3.188 | 3.208 |
| 41 | 3.201 | 3.198 | 3.202 | 3.184 | 3.193 | 3.193 | 3.201 |
| 42 | 3.202 | 3.204 | 3.204 | 3.175 | 3.196 | 3.197 | 3.203 |
| 43 | 3.197 | 3.198 | 3.202 | 3.185 | 3.197 | 3.194 | 3.206 |
| 44 | 3.193 | 3.190 | 3.194 | 3.176 | 3.185 | 3.182 | 3.208 |
| 45 | 3.175 | 3.179 | 3.181 | 3.160 | 3.172 | 3.168 | 3.170 |
| 46 | 3.207 | 3.208 | 3.210 | 3.191 | 3.203 | 3.200 | 3.206 |
| 47 | 3.179 | 3.181 | 3.180 | 3.159 | 3.172 | 3.170 | 3.180 |
| 48 | 3.179 | 3.180 | 3.181 | 3.159 | 3.176 | 3.170 | 3.190 |
| 49 | 3.185 | 3.190 | 3.188 | 3.169 | 3.181 | 3.177 | 3.205 |
| 50 | 3.200 | 3.205 | 3.202 | 3.185 | 3.199 | 3.192 | 3.206 |
| 51 | 3.214 | 3.216 | 3.218 | 3.200 | 3.212 | 3.209 | 3.229 |
| 52 | 3.204 | 3.208 | 3.205 | 3.185 | 3.200 | 3.194 | 3.219 |
| 53 | 3.201 | 3.202 | 3.204 | 3.183 | 3.201 | 3.197 | 3.220 |
| 54 | 3.170 | 3.178 | 3.187 | 3.153 | 3.169 | 3.165 | 3.198 |
| 55 | 3.175 | 3.176 | 3.188 | 3.154 | 3.170 | 3.163 | 3.194 |
| 56 | 3.175 | 3.175 | 3.188 | 3.152 | 3.167 | 3.165 | 3.195 |
| 57 | 3.181 | 3.186 | 3.191 | 3.165 | 3.180 | 3.175 | 3.187 |
| 58 | 3.171 | 3.172 | 3.187 | 3.153 | 3.164 | 3.162 | 3.180 |
| 59 | 3.173 | 3.174 | 3.181 | 3.183 | 3.169 | 3.164 | 3.171 |
| 60 | 3.196 | 3.197 | 3.211 | 3.175 | 3.197 | 3.194 | 3.201 |
| Av | | | | | | | |



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3.6 Data Set 2, 85°C, 80mA(Chromaticity Shift) 0.0017

| No. | | | CCT(K) | | | | | | |
|-----|--------------|--------|--------|---------|---------|---------|---------|---------|---------|
| | 0hr(Initial) | | | 1000hrs | 2000hrs | 3000hrs | 4000hrs | 5000hrs | 6000hrs |
| 31 | 0.2604 | 0.5227 | 2764 | 0.0003 | 0.0008 | 0.0007 | 0.0005 | 0.0009 | 0.0011 |
| 32 | 0.2609 | 0.5232 | 2752 | 0.0003 | 0.0007 | 0.0008 | 0.0005 | 0.0014 | 0.0025 |
| 33 | 0.2610 | 0.5208 | 2760 | 0.0002 | 0.0007 | 0.0009 | 0.0004 | 0.0016 | 0.0015 |
| 34 | 0.2598 | 0.5222 | 2779 | 0.0003 | 0.0006 | 0.0008 | 0.0009 | 0.0016 | 0.0017 |
| 35 | 0.2609 | 0.5225 | 2753 | 0.0003 | 0.0007 | 0.0011 | 0.0008 | 0.0012 | 0.0015 |
| 36 | 0.2604 | 0.5225 | 2766 | 0.0004 | 0.0009 | 0.0013 | 0.0011 | 0.0011 | 0.0017 |
| 37 | 0.2593 | 0.5214 | 2794 | 0.0002 | 0.0007 | 0.0011 | 0.0009 | 0.0016 | 0.0015 |
| 38 | 0.2603 | 0.5222 | 2768 | 0.0004 | 0.0007 | 0.0012 | 0.0010 | 0.0012 | 0.0016 |
| 39 | 0.2606 | 0.5218 | 2765 | 0.0004 | 0.0007 | 0.0011 | 0.0011 | 0.0015 | 0.0016 |
| 40 | 0.2599 | 0.5223 | 2776 | 0.0001 | 0.0006 | 0.0009 | 0.0009 | 0.0014 | 0.0016 |
| 41 | 0.2605 | 0.5225 | 2762 | 0.0002 | 0.0005 | 0.0008 | 0.0007 | 0.0011 | 0.0018 |
| 42 | 0.2598 | 0.5223 | 2780 | 0.0003 | 0.0006 | 0.0011 | 0.0008 | 0.0012 | 0.0017 |

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