



TEST REPORT

ACCORDING TO IES LM-80-15
For

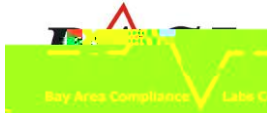
Hongli Zhihui Group Co.,Ltd. Guangzhou Branch

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

Model: A2835W1H3-D01-8D2AA1

Report Type: 6000 Hours Test Report		Product Type: LED Package	
Test Engineer:	Pote Wang		
Report Number:	RSZ160930505-10-M5		
Test Date:	2016-10-09 to 2017-06-18		
Report Date:	2019-04-15		
Reviewed By:	Daniel Duan / EE Manager		<i>Daniel</i>
Revised Note:	The previous report RSZ160930505-10-M4 is replaced by this report on 2019-04-15		
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		

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).
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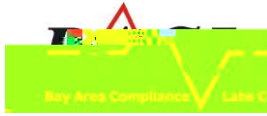
Test Model Number	Multiple Models	Details
A2835W1H3-D01-8D2AA1	HL-A-2835HW-S1-08HL-HR3	Only different Model name for different market
	HL-AM-2835HW-S1-08HL-HR3	
	HL-A-2835HW-S1-08HL-HR3(R9)	
	HL-AM-2835HW-S1-08HL-HR3(R9)	
	HL-AM-2835HW-S1-08-HR3	
	HL-AM-2835HW-S1-08-HR3(R9)	
	P*2835W*H6-D01-8D2A*	<ol style="list-style-type: none"> 1. Different Model name for different market 2. 4 is a letter which stand for special code which do not affect product performance. 3. A * is a number from 1 to 9 which stand for CCT. 1 means 2600-2800K, 2 means 2800-3100K, 3 means 3800-4250K, 4 means 4750-5300K, 5 means 5700-6500K, 6 means 6000-7000K, 8 means 3200-3800K, 9 means 5050-5650K. 4. Third * is a serial number from 1 to 9.

1.2 Standards Used:

- IESNA 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
Integral Sphere	EVERFINE	Diameter 0.3m	1011119	2017-03-09	2018-03-08
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	2017-03-03	2018-03-02



Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	2017-03-09	2018-03-08
Standard Light Source	EVERFINE	D062	1011093	2016-09-13	2017-09-12
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987CJ7321114	2017-03-03	2018-03-02
Multilayer aging machine	BACL	B2-270	20005	2016-09-01	2017-09-01
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090009	2016-12-15	2017-12-14
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090004	2017-03-03	2018-03-02

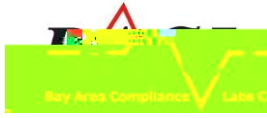
1.4 Drive Level

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

2 CB B >



1.6 Measurement Uncertainty

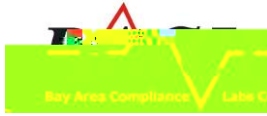
The uncertainty of the light output measurements is $U=1.59\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=21K$ ($K=2$), at the 95% confidence level.

The uncertainty of the temperature is $U=0.8671^{\circ}C$ ($K=2$), 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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1.8 Sample Set

Data Set 1: 55°C, 90mA

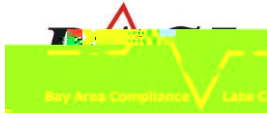
Part Number: A2835W1H3-D01-8D2AA1
Number of Units: 30
Case Temperature: >53°C
Ambient Temperature: >50°C
Life Test Drive Current: 90mA
Measurement Current: 90mA

Data Set 2: 85°C, 90mA

Part Number: A2835W1H3-D01-8D2AA1
Number of Units: 30
Case Temperature: >83°C
Ambient Temperature: >80°C
Life Test Drive Current: 90mA
Measurement Current: 90mA

Data Set 3: 105°C, 90mA

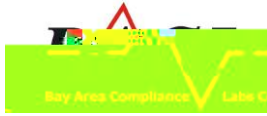
Part Number: A2835W1H3-D01-8D2AA1
Number of Units: 30
Case Temperature: >103°C
Ambient Temperature: >100°C
Life Test Drive Current: 90mA
Measurement Current: 90mA



2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	Reported TM-21 L ₇₀ Lifetime
1	30	0			

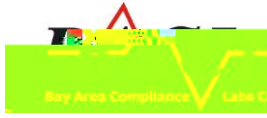
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3 - Test Data

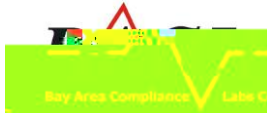
3.1 Data Set 1, 55°C, 90mA (Lumen Maintenance)

No.	Lumen Maintenance (%)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	42.33	100.33	100.12	99.86	99.74	99.50	99.29
2	42.11	100.36	100.19	100.07	99.98	99.79	99.62
3	41.99	100.33	100.17	99.95	99.81	99.69	99.45
4	42.38	100.24	100.19	100.09	99.74	99.62	99.46
5	41.75	100.19	100.02	99.95	99.76	99.50	99.26
6	42.17	100.43	100.38	100.14	99.95	99.60	99.26
7	42.38	100.24	100.17	99.81	99.72	99.48	99.17
8	41.71	100.41	100.31	100.05	99.98	99.83	99.57
9	42.12	100.33	100.05	9reW* n /P .			



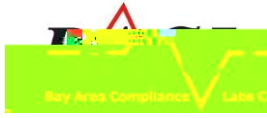
3.2 Data Set 1, 55°C, 90mA (Forward Voltage)

No.	Forward Voltage (V)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2.981	2.983	2.988	2.999	2.984	2.990	2.984
2	2.987	2.953	2.957	2.989	2.957	2.959	2.953
3	2.985	2.982	2.986	3.009	2.987	2.992	2.984
4	2.980	2.978	2.981	2.989	2.995	2.987	2.982
5	2.981	2.981	2.984	3.009	2.987	2.989	2.982
6	2.952	2.990	2.993	3.001	2.993	2.999	2.990
7	2.975	2.975	2.978	2.979	2.983	2.983	2.978
8	2.976	2.975	2.977	2.980	2.999	2.984	2.975
9	2.972	2.970	2.975	2.974	2.976	2.981	2.971
10	2.975	2.974	2.978	2.979	2.975	2.982	2.977
11	2.978	2.977	2.980	2.982	2.982	2.986	2.975
12	2.994	2.993	2.998	3.004	2.995	3.001	2.990
13	2.981	2.978	2.984	2.986	2.981	2.987	2.980
14	2.994	2.992	2.996	3.002	2.995	2.999	2.993
15	2.980	2.976	2.981	2.987	2.986	2.987	2.979
16	2.987	2.987	2.992	2.993	2.995	2.996	2.989
17	2.969	2.967	2.972	2.974	2.970	2.974	2.968
18	2.988	2.986	2.989	2.992	2.993	2.994	2.987



3.5 Data Set 2, 85°C, 90mA (Forward Voltage)

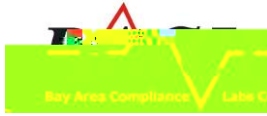
No.	Forward Voltage (V)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
31	2.983	2.982	2.987	2.995	2.984	2.992	2.982
32	2.978	2.978	2.982	3.006	2.979	2.985	2.982
33	2.972	2.972	2.978	2.983	2.974	2.980	2.975
34	2.986	2.981	2.987	2.989	2.985	2.990	2.984
35	2.995	2.993	3.000	3.033	3.001	3.002	2.994
36	2.950	2.949	2.955	2.960	2.956	2.957	2.950
37	2.980	2.979	2.985	2.985	2.985	2.986	2.981
38	2.989	2.988	2.994	2.997	2.993	2.996	2.987
39	2.989	2.987	2.992	2.991	2.990	2.993	2.986
40	2.975	2.974	2.980	2.996	2.987	2.981	2.977
41	2.979	2.977	2.983	2.992	2.981	2.984	2.978
42	2.982	2.983	2.987	2.990	2.990	2.990	2.980
43	2.988	2.987	2.992	2.992	2.989	2.993	2.986
44	2.991	2.989	2.996	2.997	2.998	2.998	2.992
45	2.989	2.988	2.994	3.017	2.989	2.995	2.989
46	2.979	2.978	2.984	2.995	2.980	2.987	2.981
47	2.977	2.974	2.982	2.993	2.977	2.983	2.978
48	2.952	2.950	2.957	2.958	2.953	2.956	2.957



3.6 Data Set 2, 85°C, 90mA (Chromaticity Shift)

No.			CCT(K)	1 A					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
31	0.2618	0.5216	2739	0.0006	0.0009	0.0013	0.0012	0.0016	0.0018
32	0.2625	0.5246	2711	0.0006	0.0008	0.0011	0.0012	0.0016	0.0018
33	0.2614	0.5247	2733	0.0006	0.0008	0.0011	0.0011	0.0016	0.0018
34	0.2617	0.5233	2734	0.0005	0.0007	0.0010	0.0011	0.0015	0.0017
35	0.2633	0.5245	2694	0.0006	0.0008	0.0012	0.0012	0.0016	0.0018
36	0.2614	0.5242 45	2735	0.0007	0.0008	0.0013	0.0012	0.0016	0.0018
37	0.2629	0.5249	2701	0.0005	0.0008	0.0012	0.0011	0.0014	0.0017

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3.7 Data Set 3, 105°C, 90mA (Lumen Maintenance) 42.48

No.	Lumen Maintenance (%)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
61	42.03	100.17	99.95	99.81	99.60	99.26	98.95
62	42.12	100.26	99.86	99.60	99.50	99.12	98.96
63	41.75	100.14	99.88	99.62	99.38	99.16	98.97
64	41.38	100.24	100.02	99.86	99.59	99.37	99.11
65	42.01	99.98	99.76	99.52	99.33	99.10	98.64
66	42.21	100.07	99.81	99.64	99.53	99.15	98.91
67	41.26	100.05	99.59	99.35	99.25	98.96	98.69
68	41.30	100.15	99.76	99.39	99.30	99.18	98.86
69	41.42	99.98	99.73	99.40	99.35	98.89	98.43
70	42.47	100.14	99.84	99.41	99.27	99.03	98.75
71	42.05	100.05	99.69	99.45	99.17	98.91	98.69
72	41.65	100.07	99.64	99.30	99.18	98.73	98.39
73	41.80	100.14	99.81	99.50	99.28	99.02	98.71
74	41.73	100.22	99.93	99.54	99.35	98.85	98.66
75	42.57	100.07	99.77	99.53	99.27	98.75	98.33
76	42.48	100.14	99.79	99.46	99.13	98.82	98.59



3.8 Data Set 3, 105°C, 90mA (Forward Voltage)

No.	Forward Voltage (V)						
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
61	2.981	2.984	2.986	2.988	2.983	2.990	2.986
62	2.970	2.973	2.975	2.981	2.970	2.976	2.975
63	2.973	2.971	2.978	2.982	2.974	2.980	2.980
64	2.974	2.973	2.980	2.981	2.975	2.981	2.977
65	2.975	2.976	2.983	2.983	2.979	2.982	2.977
66	2.981	2.981	2.986	2.992	2.983	2.987	2.982
67	2.947	2.945	2.949	2.953	2.947	2.951	2.956
68	2.953	2.951	2.956	2.958	2.951	2.956	2.952
69	2.991	2.989	2.995	2.996	2.991	2.995	2.992
70	2.978	2.976	2.982	2.992	2.979	2.982	2.978
71	2.960	2.957	2.962	2.966	2.958	2.964	2.960
72	2.980	2.977	2.983	2.984	2.978	2.981	2.981
73	2.977	2.975	2.981	2.987	2.977	2.982	2.977
74	2.981	2.977	2.986	2.987	2.984	2.986	2.981
75	2.980	2.977	2.983	2.986	2.989	2.987	2.980
76	2.987	2.986	2.994	2.992	2.993	2.993	2.990
77	2.952	2.948	2.955	2.956	2.954	2.956	2.952
78	2.982	2.981	2.986	2.993	2.989	2.988	2.983
79	2.983	2.980	2.987	2.989	2.986	2.989	2.983
80	2.984	2.983	2.991	2.990	2.989	2.991	2.984
81	2.991	2.987	2.994	2.994	2.988	2.996	2.989
82	2.992	2.988	2.997	2.997	2.992	2.997	2.994
83	2.991	2.989	2.997	2.999	2.993	2.999	2.996
	2.989	2.989	2.999	3.000	2.992	2.997	2.993
	2.985	2.983	2.991	2.993	2.984	2.990	2.989
	2.979	2.976	2.987	2.990	2.980	2.986	2.981

Bay Area Compliance Laboratories Corp. (Dongguan)

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Dongguan, Guangdong, China.

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