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-LC2824H466W-80B18C18(Ra2)-S

Report Type: 10000 Hours Test Report	**Product Type:** LED Package
Reviewed By:	Pote Wang
Report Number:	RSZ210225503-10-10000
Test Date:	2021-03-05 to 2022-06-14
Report Date:	2022-06-30
Approved by:	Blake Zhang / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5/F(B-West) -7/F, the 3rd Phase of Wan Li Industrial Building D, Shihua Road, Futian Free Trade Zone Shenzhen, Guangdong, China. Tel: +86-755-33320018 Fax: +86-755-33320008
Test Facility:	Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

Note: 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.(Shenzhen). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government.

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Note：

**: The items tested by Bay Area Compliance Laboratories Corp. (Dongguan) and covered by IAS accreditation, the reference report No. is RSZ210225503-10-7000-M1 (test Date: 2021-03-05 to 2022-01-20).
Bay Area Compliance Laboratories Corp. (Dongguan) is EPA-Recognized Laboratories and the ORG ID: 1109266.

1 - General Information

1.1 Description of LED Light Sources#

Sample Size:

24 PCS test samples were in good condition and received on 2021-02-25. The samples were numbered from 1 to 12 and 13 to 24.

Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
Part Number:	HL-LC2824H466W-80B18C18(Ra2)-S
Part Type:	LED Package
Drive Level:	DC 2700mA
Nominal CCT:	2700K
Power:	152.55W
Average Current Density per LED die:	1033.335 mA/mm^2
Average Power Density per LED die:	3.1W/mm^2
RI:	80
Die Spacing:	0.28mm

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:

Model type	Model name	CRI	CCT (K)	Series	Parallel	Power density (W/mm^2)	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies (mm)	Current (mA)
Test model	HL-LC2824H466W-80B18C18(Ra2)-S	80	2700	18	18	0.1946	1033.335	150	0.28	2700
Multiple models	HL-LC2824H466W-80B18C18(Ra2)-S	80	2200～6500	18	18	0.1946	1033.335	150	0.28	2700
	HL-LC055H384W-5B2C12(Ra2)-S	80	2200～6500	12	2	0.0593	775.002	150	0.96	300
	HL-LC055H384W-9B4C12(Ra2)-S	80	2200～6500	12	4	0.1185	775.002	150	0.54	600
	HL-LC055H384W-7B1C24(Ra2)-S	80	2200～6500	24	1	0.0593	775.002	150	0.85	150
	HL-LC055H384W-9B2C24(Ra2)-S	80	2200～6500	24	2	0.1185	775.002	150	0.54	300
	HL-LC055D4W-5B2C12(Ra2)-S	80	2200～6500	12	2	0.0593	516.668	150	0.91	300
	HL-LC055D4W-9B4C12(Ra2)-S	80	2200～6500	12	4	0.1185	516.668	150	0.42	600
	HL-LC055H9VW-5B1C28(Ra2)	80	2200～6500	28	1	0.0553	246.032	40	0.71	40
	HL-LC065D90W-15B2C25(Ra2)-R5-S	80	2200～6500	25	2	0.0624	301.949	150	0.34	300

Model type	Model name	CRI	CCT (K)	Series	Parallel	Power density (W/mm^2)	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies (mm)	Current (mA)
Multiple models	HL-LC066D90W-20B3C25(Ra2)-R5-S	80	2200～6500	25	3	0.1054	301.949	150	0.67	450
	HL-LC066D90W-20B6C13(Ra2)-R5-S	80	2200～6500	13	6	0.1096	301.949	150	0.40	900
	HL-LC2009DV35W-10B3C8(Ra2)-S	80	2200～6500	8	3	0.0412	300.001	60	0.33	180
	HL-LC2009H384W-10B1C36(Ra2)-S	80	2200～6500	36	1	0.0514	775.002	150	0.30	150
	HL-LC2009H384W-7B2C7(Ra2)-S	80	2200～6500	7	2	0.0200	775.002	150	0.60	300
	HL-LC2009H384W-10B2C12(Ra2)-S	80	2200～6500	12	2	0.0343	775.002	150	0.55	300
	HL-LC2009D4W-7B1C14(Ra2)-S	80	2200～6500	14	1	0.0199	516.668	150	0.79	150
	HL-LC2009D4W-9B1C18(Ra2)-S	80	2200～6500	18	1	0.0257	516.668	150	0.59	150
	HL-LC2009D4W-10B1C20(Ra2)-S	80	2200～6500	20	1	0.0286	516.668	150	0.59	150
	HL-LC2009D4W-12B1C24(Ra2)-S	80	2200～6500	24	1	0.0343	516.668	150	0.50	150
	HL-LC2009D4W-7B1C26(Ra2)-S	80	2200～6500	26	1	0.0371	516.668	150	0.33	150
	HL-LC2009D4W-18B1C36(Ra2)-S	80	2200～6500	36	1	0.0514	516.668	150	0.30	150
	HL-LC2009D4W-10B2C12(Ra2)-S	80	2200～6500	12	2	0.0343	516.668	150	0.50	300
	HL-LC2009D90W-5B1C12(Ra2)-S	80	2200～6500	12	1	0.0172	301.949	150	0.52	150
	HL-LC2009D90W-9B1C22(Ra2)-S	80	2200～6500	22	1	0.0315	301.949	150	0.33	150
	HL-LC2611DV35W-16B4C12(Ra2)-S	80	2200～6500	12	4	0.0587	300.001	60	0.45	240
	HL-LC2611H384W-20B2C30(Ra2)-S	80	2200～6500	30	2	0.0612	775.002	150	0.44	300
	HL-LC2611D4W-13B1C26(Ra2)-S	80	2200～6500	26	1	0.0265	516.668	150	0.52	150
	HL-LC2611D4W-18B1C36(Ra2)-S	80	2200～6500	36	1	0.0367	516.668	150	0.30	150
	HL-LC2611D4W-22B1C44(Ra2)-S	80	2200～6500	44	1	0.0448	516.668	150	0.30	150
	HL-LC2611D4W-20B1C50(Ra2)-S	80	2200～6500	50	1	0.0509	516.668	150	0.47	150
	HL-LC2611D4W-24B1C54(Ra2)-S	80	2200～6500	54	1	0.0550	516.668	150	0.47	150
	HL-LC2611D4W-24B2C26(Ra2)-S	80	2200～6500	26	2	0.0530	516.668	150	0.47	300
	HL-LC2611D90W-15B1C30(Ra2)-S	80	2200～6500	30	1	0.0306	301.949	150	0.35	150
	HL-LC2611D90W-24B1C48(Ra2)-S	80	2200～6500	48	1	0.0490	301.949	150	0.33	150

Model type	Model name	CRI	CCT (K)	Series	Parallel	Power density (W/mm^2)	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies (mm)	Current (mA)
Multiple models	HL-LC2614DV35W-24B5C12(Ra2)-S	80	2200～6500	12	5	0.0734	300.001	60	0.59	300
	HL-LC2614H384W-20B2C24(Ra2)-S	80	2200～6500	24	2	0.0490	775.002	150	0.87	300
	HL-LC2614H384W-30B2C30(Ra2)-S	80	2200～6500	30	2	0.0612	775.002	150	0.69	300
	HL-LC2614H384W-30B2C54(Ra2)-S	80	2200～6500	54	2	0.1101	775.002	150	0.40	300
	HL-LC2614D4W-30B1C62(Ra2)-S	80	2200～6500	62	1	0.0632	516.668	150	0.34	150
	HL-LC2614D4W-40B1C74(Ra2)-S	80	2200～6500	74	1	0.0754	516.668	150	0.40	150
	HL-LC2614D4W-32B2C39(Ra2)-S	80	2200～6500	39	2	0.0795	516.668	150	0.46	300
	HL-LC2614D4W-40B2C46(Ra2)-S	80	2200～6500	46	2	0.0625	516.668	150	0.42	300
	HL-LC2614D4W-40B2C54(Ra2)-S	80	2200～6500	54	2	0.1101	516.668	150	0.31	300
	HL-LC2614D4W-40B3C32(Ra2)-S	80	2200～6500	32	3	0.0979	516.668	150	0.42	450
	HL-LC2614D90W-35B2C36(Ra2)-S	80	2200～6500	36	2	0.0734	301.949	150	0.40	300
	HL-LC2811DV35W-16B4C12(Ra2)-S	80	2200～6500	12	4	0.0539	300.001	60	0.45	240
	HL-LC2811H384W-16B1C36(Ra2)-S	80	2200～6500	36	1	0.0360	775.002	150	0.40	150
	HL-LC2814DV35W-24B5C12(Ra2)-S	80	2200～6500	12	5	0.0673	300.001	60	0.59	300
	HL-LC2814DV35W-30B7C12(Ra2)-S	80	2200～6500	12	7	0.0943	300.001	60	0.36	420
	HL-LC2814DV35W-35B10C12(Ra2)-S	80	2200～6500	12	10	0.1346	300.001	60	0.40	600
	HL-LC2814D4W-35B2C36(Ra2)-S	80	2200～6500	36	2	0.0838	602.779	175	0.57	350

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

1.3 Testing Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
0.5m integrating sphere	EVERFINE	AIS-2	G185304TA1381172	2021-09-27	2022-09-26
LED Test Source	EVERFINE	LTS-300	P185616CD1371113	2021-09-23	2022-09-22

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
High Accuracy Array Spectroradiometer	EVERFINE	HAAS-2000	P600674CM1381123	2021-09-27	2022-09-26
Standard Light Source	EVERFINE	D062	1011093	2021-10-15	2022-10-14
Multilayer aging machine	BACL	B3-900	20030	2022-01-04	2023-01-03
Programmable D.C. power supply	Xinnuoer	ATP-5005	N/A	2022-01-04	2023-01-03

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 DUTs' case (TMP_{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 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 ±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'. 2π measurement was used and sample was drived by DC power supply. The forward current was regulated to within ±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 ± 2°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 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°C (K=2), at the 95% confidence level.

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).

1.8 Sample Set

Data Set 1: 55°C, 2700mA

Part Number:	HL-LC2824H466W-80B18C18(Ra2)-S
Number of Units:	12
Case Temperature:	>53°C
Ambient Temperature:	>50°C
Life Test Drive Current:	2700mA
Measurement Current:	2700mA

Data Set 2: 85°C, 2700mA

Part Number:	HL-LC2824H466W-80B18C18(Ra2)-S
Number of Units:	12
Case Temperature:	>83°C
Ambient Temperature:	>80°C
Life Test Drive Current:	2700mA
Measurement Current:	2700mA

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	α	β	Reported TM-21 L_{70} Lifetime	Reported TM-21 L_{90} Lifetime
1	12	0	1000hrs	10000hrs	3.085E-06	1.006	>55000 hours	36,000 hours
2	12	0	1000hrs	10000hrs	3.876E-06	1.004	>55000 hours	28,000 hours

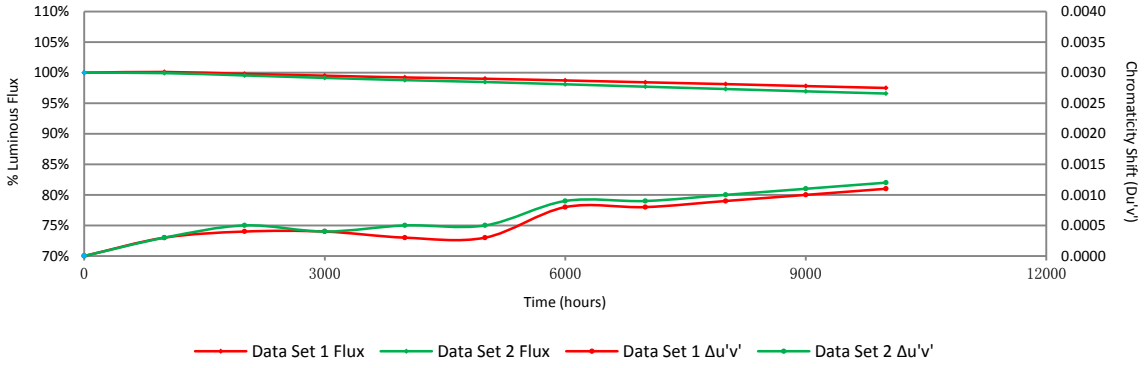
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	**7000hrs	8000hrs	9000hrs	10000hrs
1	100.12%	99.81%	99.51%	99.22%	99.01%	98.73%	98.43%	98.13%	97.81%	97.50%
2	99.93%	99.55%	99.15%	98.78%	98.47%	98.10%	97.71%	97.33%	96.95%	96.59%

Average Chromaticity Shift

Data Set:	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	**7000hrs	8000hrs	9000hrs	10000hrs
1	0.0003	0.0004	0.0004	0.0003	0.0003	0.0008	0.0008	0.0009	0.0010	0.0011
2	0.0003	0.0005	0.0004	0.0005	0.0005	0.0009	0.0009	0.0010	0.0011	0.0012

Average Lumen Maintenance and Chromaticity Shift VS. Time



Note：

**: The items tested by Bay Area Compliance Laboratories Corp. (Dongguan) and covered by IAS accreditation, the reference report No. is RSZ210225503-10-7000-M1 (test Date: 2021-03-05 to 2022-01-20).

3 - Test Data

3.1 Data Set 1, 55°C, 2700mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)									
	**0hr(Initial)	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	**7000hrs	8000hrs	9000hrs	10000hrs
1	13664.00	100.11	99.89	99.43	99.28	98.99	98.83	98.17	97.76	97.34	97.07
2	13566.00	100.15	99.72	99.42	99.26	98.92	98.66	98.43	98.11	97.91	97.59
3	13304.00	100.14	99.78	99.71	99.40	99.33	99.24	99.08	98.94	98.57	98.32
4	13814.00	100.18	99.81	99.78	99.75	99.41	99.25	99.04	98.73	98.33	98.13
5	13748.00	100.11	99.72	99.27	98.81	98.79	98.55	98.48	98.06	97.60	97.18
6	13456.00	100.08	99.95	99.61	99.35	98.97	98.40	98.17	97.87	97.59	97.06
7	13629.00	100.12	99.83	99.70	99.16	98.97	98.55	98.18	97.91	97.59	97.28
8	13366.00	100.12	100.09	99.97	99.81	99.72	99.45	99.25	98.80	98.56	98.34
9	13677.00	99.92	99.80	99.23	98.98	98.82	98.63	98.50	97.87	97.59	97.25
10	13991.00	100.26	99.67	99.13	98.71	98.61	98.22	97.64	97.46	97.21	96.85
11	13646.00	100.15	99.48	99.35	98.80	98.38	98.06	97.72	97.63	97.27	97.08
12	13755.00	100.14	99.95	99.59	99.37	99.16	98.87	98.54	98.39	98.15	97.81
Avg.	13634.67	100.12	99.81	99.51	99.22	99.01	98.73	98.43	98.13	97.81	97.50
Med.	13655.00	100.13	99.80	99.51	99.27	98.97	98.64	98.45	97.98	97.60	97.26
st dev	192.46	0.08	0.16	0.25	0.35	0.36	0.42	0.51	0.48	0.49	0.53
Min.	13304.00	99.92	99.48	99.13	98.71	98.38	98.06	97.64	97.46	97.21	96.85
Max.	13991.00	100.26	100.09	99.97	99.81	99.72	99.45	99.25	98.94	98.57	98.34

3.2 Data Set 1, 55°C, 2700mA (Forward Voltage)

No.	Forward Voltage (V)										
	**0hr(Initial)	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	**7000hrs	8000hrs	9000hrs	10000hrs
1	57.65	57.89	57.90	57.18	57.34	57.29	57.45	57.44	57.44	57.59	57.43
2	57.64	57.14	57.13	56.95	57.09	57.02	56.95	56.91	56.81	56.80	56.97
3	57.91	58.03	58.01	57.72	57.73	57.69	57.64	57.79	57.82	57.79	57.80
4	57.33	57.86	57.99	57.28	57.24	57.23	57.42	57.42	57.38	57.31	57.34
5	57.68	58.08	58.02	57.61	57.54	57.63	57.71	57.79	57.73	57.75	57.75
6	57.92	58.05	58.05	57.72	57.79	57.75	57.66	57.84	57.87	57.83	57.88
7	57.45	57.65	57.60	57.03	57.00	56.99	57.06	57.13	57.14	57.17	57.12
8	57.23	57.62	58.01	56.80	56.81	56.85	56.91	56.93	56.97	57.01	57.03
9	56.92	57.21	57.44	56.63	56.69	56.72	56.79	56.74	56.73	56.76	56.77
10	57.68	57.54	57.49	57.00	57.49	57.50	57.62	57.62	57.62	57.74	57.62
11	56.91	57.11	57.38	56.93	56.98	56.91	56.69	56.70	56.65	56.79	56.71
12	57.36	57.75	57.72	56.96	57.02	57.00	57.11	57.11	57.09	57.12	57.07
Avg.	57.47	57.66	57.73	57.15	57.23	57.22	57.25	57.29	57.27	57.31	57.29
Med.	57.55	57.70	57.81	57.02	57.17	57.13	57.27	57.28	57.26	57.24	57.23
st dev	0.34	0.35	0.31	0.36	0.36	0.35	0.37	0.42	0.43	0.42	0.41
Min.	56.91	57.11	57.13	56.63	56.69	56.72	56.69	56.70	56.65	56.76	56.71
Max.	57.92	58.08	58.05	57.72	57.79	57.75	57.71	57.84	57.87	57.83	57.88

3.3 Data Set 1, 55°C, 2700mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')									
	**0hr(Initial)			**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	**7000hrs	8000hrs	9000hrs	10000hrs
1	0.2613	0.5290	2719	0.0004	0.0002	0.0005	0.0006	0.0004	0.0009	0.0009	0.0009	0.0009	0.0009
2	0.2617	0.5284	2712	0.0003	0.0005	0.0005	0.0002	0.0003	0.0007	0.0009	0.0009	0.0010	0.0011
3	0.2619	0.5301	2701	0.0002	0.0004	0.0003	0.0001	0.0002	0.0008	0.0007	0.0007	0.0007	0.0007
4	0.2622	0.5298	2696	0.0002	0.0004	0.0004	0.0004	0.0002	0.0008	0.0007	0.0008	0.0008	0.0009
5	0.2624	0.5300	2692	0.0002	0.0005	0.0005	0.0004	0.0003	0.0009	0.0007	0.0009	0.0010	0.0011
6	0.2618	0.5292	2708	0.0001	0.0001	0.0004	0.0003	0.0002	0.0007	0.0007	0.0009	0.0012	0.0014
7	0.2612	0.5289	2721	0.0004	0.0006	0.0005	0.0004	0.0003	0.0009	0.0009	0.0010	0.0012	0.0014
8	0.2611	0.5273	2729	0.0001	0.0004	0.0004	0.0002	0.0002	0.0009	0.0008	0.0011	0.0013	0.0016
9	0.2615	0.5286	2716	0.0003	0.0002	0.0001	0.0003	0.0002	0.0010	0.0009	0.0009	0.0009	0.0010
10	0.2622	0.5298	2697	0.0004	0.0006	0.0004	0.0004	0.0005	0.0008	0.0006	0.0008	0.0009	0.0010
11	0.2616	0.5284	2715	0.0002	0.0005	0.0005	0.0004	0.0004	0.0009	0.0008	0.0009	0.0010	0.0011
12	0.2608	0.5281	2733	0.0005	0.0006	0.0007	0.0003	0.0003	0.0007	0.0007	0.0009	0.0011	0.0013
Avg.	0.2616	0.5290	2712	0.0003	0.0004	0.0004	0.0003	0.0003	0.0008	0.0008	0.0009	0.0010	0.0011
Med.	0.2617	0.5290	2714	0.0003	0.0004	0.0005	0.0003	0.0003	0.0008	0.0008	0.0009	0.0010	0.0011
st dev	0.0005	0.0009	13	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0003
Min.	0.2608	0.5273	2692	0.0001	0.0001	0.0001	0.0001	0.0002	0.0007	0.0006	0.0007	0.0007	0.0007
Max.	0.2624	0.5301	2733	0.0005	0.0006	0.0007	0.0006	0.0005	0.0010	0.0009	0.0011	0.0013	0.0016

3.4 Data Set 2, 85°C, 2700mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)									
	**0hr(Initial)	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	**7000hrs	8000hrs	9000hrs	10000hrs
13	13755.00	99.83	99.64	99.16	98.97	98.58	98.23	97.92	97.74	97.42	97.19
14	13109.00	100.09	99.44	99.05	98.78	98.70	98.35	98.29	97.76	97.33	96.94
15	13717.00	99.37	99.13	98.77	98.02	97.70	97.29	96.97	96.49	96.14	95.82
16	13380.00	100.16	99.93	99.60	99.32	99.19	98.56	98.12	97.66	97.32	97.19
17	13494.00	99.79	99.24	99.03	98.58	98.18	98.04	97.37	97.24	96.93	96.39
18	13723.00	100.17	99.99	99.90	99.49	99.31	99.05	98.37	97.92	97.49	97.05
19	13868.00	100.11	99.69	99.05	98.71	98.43	97.94	97.48	96.97	96.52	96.12
20	13754.00	99.72	99.33	98.94	98.56	97.83	97.51	97.29	96.98	96.52	96.06
21	13646.00	99.97	99.44	99.05	98.89	98.34	97.71	97.44	97.11	96.77	96.41
22	13270.00	99.88	99.45	99.07	98.49	98.21	97.78	97.24	97.20	96.80	96.50
23	13233.00	99.94	99.76	99.07	98.72	98.67	98.47	98.38	97.95	97.54	97.02
24	13439.00	100.16	99.55	99.08	98.79	98.49	98.27	97.62	96.92	96.63	96.35
Avg.	13532.33	99.93	99.55	99.15	98.78	98.47	98.10	97.71	97.33	96.95	96.59
Med.	13570.00	99.96	99.50	99.06	98.75	98.46	98.14	97.55	97.22	96.87	96.45
st dev	246.02	0.24	0.26	0.30	0.38	0.48	0.49	0.49	0.47	0.46	0.47
Min.	13109.00	99.37	99.13	98.77	98.02	97.70	97.29	96.97	96.49	96.14	95.82
Max.	13868.00	100.17	99.99	99.90	99.49	99.31	99.05	98.38	97.95	97.54	97.19

3.5 Data Set 2, 85°C, 2700mA (Forward Voltage)

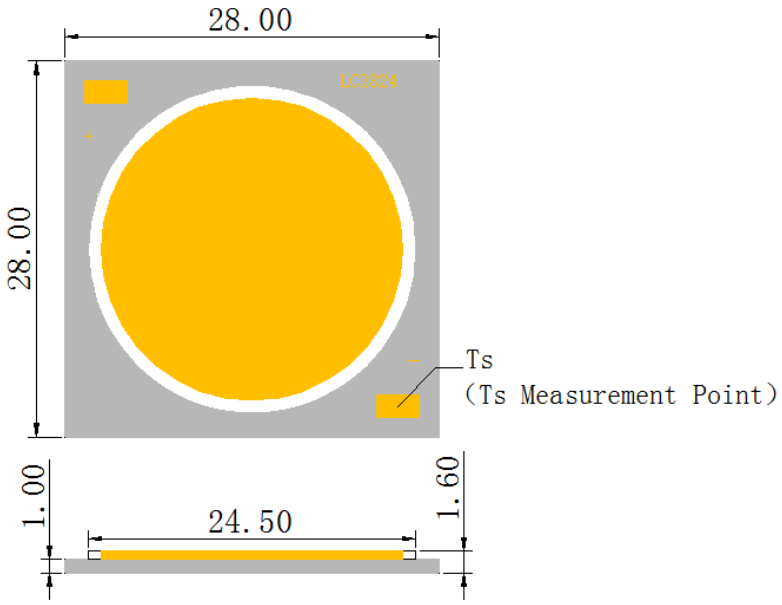
No.	Forward Voltage (V)										
	**0hr(Initial)	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	**7000hrs	8000hrs	9000hrs	10000hrs
13	57.70	57.73	57.85	57.60	57.02	57.12	57.32	57.26	57.29	57.30	57.26
14	57.63	57.52	57.50	57.05	57.11	57.01	56.62	56.59	56.64	56.67	56.66
15	57.38	57.35	57.21	57.35	57.28	57.26	57.02	57.00	57.04	57.14	57.06
16	57.05	57.05	57.36	57.18	57.13	57.17	56.80	56.73	56.74	56.89	56.68
17	57.47	57.42	57.39	57.11	57.22	57.15	56.72	56.73	56.69	56.71	56.66
18	57.77	57.63	56.99	57.39	56.96	57.03	57.03	57.03	56.99	57.03	56.95
19	57.60	57.51	56.94	57.46	57.02	56.99	57.01	57.09	57.06	57.19	57.11
20	57.56	57.71	56.93	57.52	57.03	57.03	57.08	57.13	57.05	57.13	57.02
21	57.87	57.98	57.95	56.94	57.01	56.95	56.58	56.64	56.59	56.63	56.60
22	57.80	57.99	57.95	57.16	57.38	57.40	57.37	57.36	57.71	57.42	57.45
23	57.00	57.08	56.98	57.10	57.09	56.96	56.66	56.68	56.72	56.70	56.78
24	57.70	57.63	57.60	57.14	57.02	56.91	56.68	56.65	56.69	56.69	56.70
Avg.	57.54	57.55	57.39	57.25	57.11	57.08	56.91	56.91	56.93	56.96	56.91
Med.	57.62	57.58	57.38	57.17	57.06	57.03	56.91	56.87	56.87	56.96	56.87
st dev	0.28	0.30	0.39	0.21	0.13	0.14	0.27	0.27	0.33	0.28	0.27
Min.	57.00	57.05	56.93	56.94	56.96	56.91	56.58	56.59	56.59	56.63	56.60
Max.	57.87	57.99	57.95	57.60	57.38	57.40	57.37	57.36	57.71	57.42	57.45

3.6 Data Set 2, 85°C, 2700mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')									
	**0hr(Initial)			**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	**7000hrs	8000hrs	9000hrs	10000hrs
13	0.2614	0.5291	2717	0.0005	0.0004	0.0006	0.0008	0.0007	0.0007	0.0009	0.0008	0.0008	0.0008
14	0.2617	0.5284	2713	0.0002	0.0005	0.0003	0.0006	0.0006	0.0009	0.0008	0.0010	0.0013	0.0016
15	0.2618	0.5284	2711	0.0004	0.0001	0.0002	0.0006	0.0005	0.0010	0.0009	0.0009	0.0009	0.0009
16	0.2621	0.5286	2703	0.0003	0.0009	0.0002	0.0003	0.0006	0.0013	0.0010	0.0010	0.0011	0.0012
17	0.2616	0.5283	2714	0.0002	0.0005	0.0003	0.0003	0.0003	0.0010	0.0010	0.0010	0.0009	0.0009
18	0.2610	0.5276	2731	0.0001	0.0007	0.0006	0.0006	0.0007	0.0008	0.0008	0.0010	0.0012	0.0014
19	0.2617	0.5295	2708	0.0002	0.0007	0.0004	0.0005	0.0005	0.0007	0.0008	0.0009	0.0010	0.0012
20	0.2611	0.5275	2729	0.0003	0.0005	0.0005	0.0004	0.0005	0.0009	0.0009	0.0010	0.0012	0.0013
21	0.2635	0.5294	2672	0.0004	0.0008	0.0007	0.0005	0.0005	0.0009	0.0007	0.0009	0.0011	0.0013
22	0.2621	0.5300	2697	0.0001	0.0002	0.0003	0.0002	0.0004	0.0009	0.0008	0.0009	0.0009	0.0010
23	0.2616	0.5280	2715	0.0001	0.0006	0.0004	0.0005	0.0006	0.0010	0.0009	0.0010	0.0010	0.0011
24	0.2618	0.5284	2710	0.0002	0.0005	0.0002	0.0004	0.0003	0.0010	0.0009	0.0010	0.0012	0.0014
Avg.	0.2618	0.5286	2710	0.0003	0.0005	0.0004	0.0005	0.0005	0.0009	0.0009	0.0010	0.0011	0.0012
Med.	0.2617	0.5284	2712	0.0002	0.0005	0.0004	0.0005	0.0005	0.0009	0.0009	0.0010	0.0011	0.0012
st dev	0.0006	0.0008	15	0.0001	0.0002	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002
Min.	0.2610	0.5275	2672	0.0001	0.0001	0.0002	0.0002	0.0003	0.0007	0.0007	0.0008	0.0008	0.0008
Max.	0.2635	0.5300	2731	0.0005	0.0009	0.0007	0.0008	0.0007	0.0013	0.0010	0.0010	0.0013	0.0016

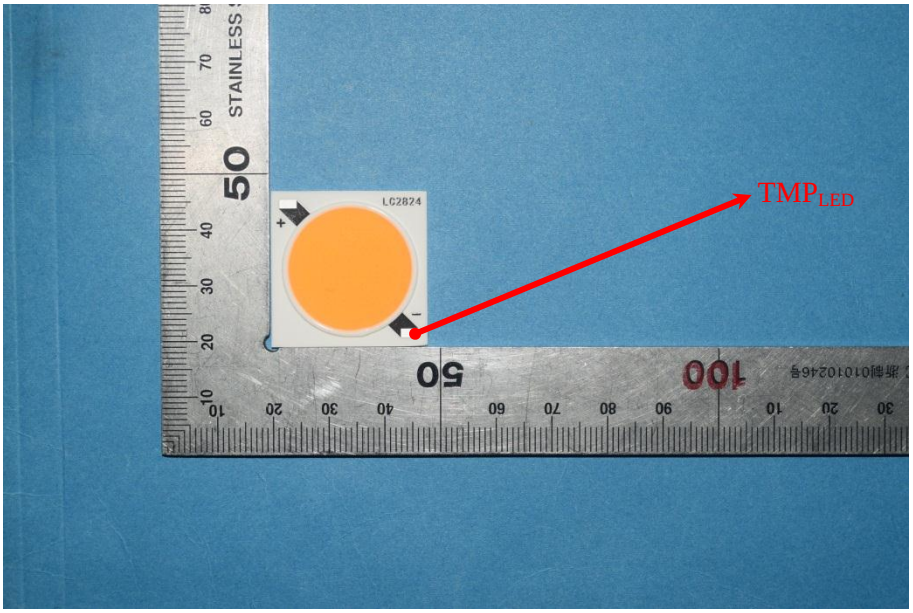
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



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