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-2835HW-3C-S1-08L-PCT-HR6

Report Type: 10000 Hours Test Report	**Product Type:** LED Package
Reviewed By:	Pote Wang
Report Number:	RSZ200805501-10-10000
Test Date:	2020-08-05 to 2021-11-01
Report Date:	2021-11-10
Approved by:	Blake Zhang / EE Engineer
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1 - General Information

1.1 Description of LED Light Sources

Sample Size:

50 PCS test samples were in good condition and received on 2020-08-05. The samples were numbered from 1 to 25 and 26 to 50.

Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
Part Number:	HL-A-2835HW-3C-S1-08L-PCT-HR6
Part Type:	LED Package
#Drive Level:	DC 100mA
#Nominal CCT:	2700K
#Power:	0.96W
#Average Current Density per LED die:	688.895mA/mm^2
#Average Power Density per LED die:	2.204W/mm^2
#CRI:	95
#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® 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 name	CRI (typ.)	CCT (typ.)	Series	Parallel	Power density (W/mm^2)	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies	Current (mA)
HL-A-2835HW-3C-S1-08L-PCT-HR6	95	2700K	3	1	0.098	688.895	100	0.15	100
HL-**-2835H***W-3C-S1-08*-PCT-HR6-***	95	2200-6500K	3	1	0.098	688.895	100	0.15	100
HL-**-2835D***W-3C-S1-08*-PCT-HR6-***	95	2200-6500K	3	1	0.098	517	100	0.15	100
HL-**-2835D***W-2C-S1-08*-PCT-HR6-***	95	2200-6500K	2	1	0.098	638.74	150	0.15	150
HL-**-2835H***W-S1-08*-PCT-HR6-***	95	2200-6500K	1	1	0.0204	413.33	60	/	60
HL-**-2835H***W-S1-08*-PCT-HR6-***	95	2200-6500K	1	1	0.0347	688.89	100	/	100
HL-**-2835D***W-S1-08*-PCT-HR6-***	95	2200-6500K	1	1	0.0521	638.74	150	/	150
HL-**-2835H***W-2-S1-08*-PCT-HR6-***	95	2200-6500K	1	2	0.0521	516.89	75	0.15	150
HL-**-2835D***W-2-S1-08*-PCT-HR6-***	95	2200-6500K	1	2	0.0521	387.50	75	0.15	150

Note: The model name begins with "HL", such as "HL-**-2835H***W-3C-S1-08*-PCT-HR6-***","*" is described in detail as follows:

1. The first "**" is a letter A or AS which stands for the process type.
2. The second "***" is a number from 1 to 999 which stands for the brightness level.
3. The third "*" is a letter L or None which stands for the bonding wire style.
4. The fourth "***" is the letter, which stands for the customer code.

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
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	2021-09-24	2022-09-23
Standard Light Source	EVERFINE	D062	1011093	2021-10-15	2022-10-14
Multilayer aging machine	BACL	B2-270	20015	2021-02-24	2022-02-23
DC Power Supply	BACL	B12001-12	90023	2021-02-24	2022-02-23

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. (Dongguan) 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, 100mA

Part Number:	HL-A-2835HW-3C-S1-08L-PCT-HR6
Number of Units:	25
Case Temperature:	>53°C
Ambient Temperature:	>50°C
Life Test Drive Current:	100mA
Measurement Current:	100mA

Data Set 2: 105°C, 100mA

Part Number:	HL-A-2835HW-3C-S1-08L-PCT-HR6
Number of Units:	25
Case Temperature:	>103°C
Ambient Temperature:	>100°C
Life Test Drive Current:	100mA
Measurement Current:	100mA

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	α	β	Reported TM-21 L_{70} Lifetime
1	25	0	1000hrs	10000hrs	2.375E-06	1.005	>60000 hours
2	25	0	1000hrs	10000hrs	2.802E-06	1.002	>60000 hours

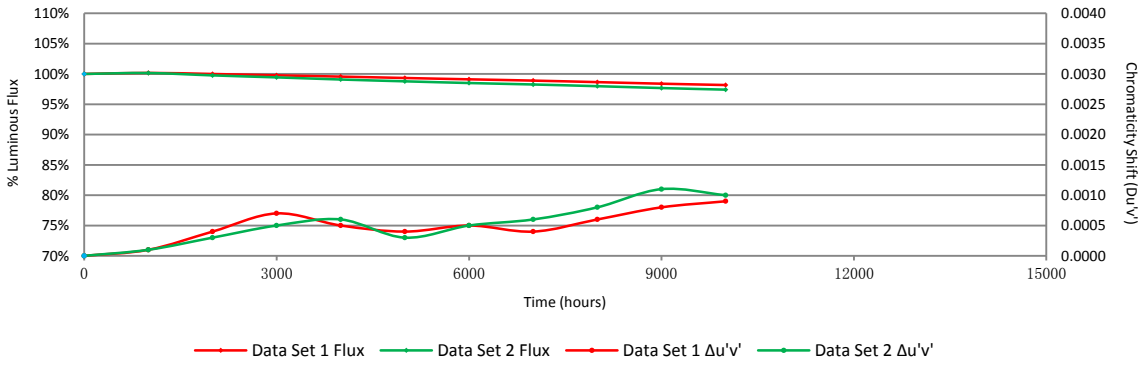
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	100.17%	99.99%	99.77%	99.56%	99.33%	99.11%	98.90%	98.65%	98.39%	98.17%
2	100.15%	99.76%	99.43%	99.08%	98.78%	98.50%	98.26%	97.98%	97.67%	97.41%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.0001	0.0004	0.0007	0.0005	0.0004	0.0005	0.0004	0.0006	0.0008	0.0009
2	0.0001	0.0003	0.0005	0.0006	0.0003	0.0005	0.0006	0.0008	0.0011	0.001

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 - Test Data

3.1 Data Set 1, 55°C, 100mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	92.48	100.38	100.32	100.14	99.77	99.71	99.52	99.39	99.16	98.91	98.70
2	92.31	100.32	99.92	99.73	99.50	99.29	99.14	98.70	98.48	98.34	97.74
3	93.05	100.18	99.82	99.30	99.28	98.82	98.53	98.02	97.80	97.54	97.20
4	91.73	100.28	100.15	100.07	99.95	99.79	99.55	99.08	98.89	98.68	98.66
5	91.42	100.31	100.19	100.13	99.91	99.38	99.07	98.95	98.62	98.28	97.93
6	92.31	100.22	99.95	99.70	99.63	99.09	98.72	98.65	98.51	98.15	97.95
7	91.70	100.36	100.33	100.25	100.20	99.85	99.64	99.03	98.77	98.52	98.48
8	92.63	99.89	99.84	99.56	99.36	99.35	99.10	98.86	98.59	98.24	97.94
9	91.95	100.15	100.03	99.93	99.64	99.48	99.31	99.12	98.98	98.78	98.43
10	91.83	100.21	100.04	99.93	99.65	99.32	99.07	98.86	98.61	98.32	98.22
11	92.08	100.08	99.90	99.74	99.44	99.12	98.95	98.83	98.65	98.46	98.19
12	93.33	99.95	99.83	99.66	99.56	98.98	98.77	98.71	98.30	97.95	97.55
13	92.45	100.31	100.17	100.11	99.85	99.34	99.12	99.00	98.75	98.52	98.47
14	92.02	100.39	100.24	99.88	99.68	99.64	99.42	99.17	99.01	98.63	98.25
15	91.90	100.24	100.20	99.98	99.68	99.52	99.37	99.34	99.04	98.94	98.88
16	92.24	100.33	100.27	99.88	99.79	99.59	99.48	99.27	99.12	98.95	98.82
17	91.71	100.09	99.98	99.75	99.65	99.31	99.11	98.79	98.57	98.31	98.23
18	91.09	100.23	100.08	99.95	99.81	99.64	99.45	99.36	99.09	98.77	98.76
19	89.68	100.14	99.86	99.63	99.44	99.33	99.17	98.80	98.58	98.37	98.35
20	89.53	99.78	99.72	99.59	99.41	99.26	99.02	98.82	98.53	98.21	97.82
21	90.88	99.96	99.71	99.31	99.11	98.99	98.69	98.59	98.44	98.27	98.26
22	91.08	99.88	99.64	99.42	99.00	98.99	98.69	98.58	98.24	97.90	97.71
23	89.52	100.23	99.84	99.60	99.25	99.24	98.95	98.75	98.44	98.21	97.68
24	89.37	100.19	99.85	99.69	99.30	99.14	99.03	98.96	98.75	98.39	98.12
25	90.72	100.24	99.93	99.35	99.06	99.03	98.90	98.78	98.45	98.20	98.02
Avg.	91.56	100.17	99.99	99.77	99.56	99.33	99.11	98.90	98.65	98.39	98.17
Med.	91.83	100.22	99.95	99.74	99.63	99.32	99.10	98.86	98.61	98.34	98.22
st dev	1.10	0.17	0.20	0.27	0.29	0.27	0.30	0.30	0.32	0.34	0.43
Min.	89.37	99.78	99.64	99.30	99.00	98.82	98.53	98.02	97.80	97.54	97.20
Max.	93.33	100.39	100.33	100.25	100.20	99.85	99.64	99.39	99.16	98.95	98.88

3.2 Data Set 1, 55°C, 100mA (Forward Voltage)

No.	Forward Voltage (V)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	9.116	9.112	9.118	9.123	9.127	9.138	9.146	9.123	9.125	9.125	9.116
2	9.128	9.127	9.143	9.157	9.163	9.165	9.149	9.155	9.150	9.143	9.142
3	9.091	9.098	9.112	9.118	9.125	9.131	9.112	9.116	9.117	9.129	9.106
4	9.091	9.092	9.110	9.120	9.130	9.136	9.122	9.123	9.117	9.122	9.105
5	9.095	9.094	9.129	9.132	9.141	9.145	9.135	9.132	9.127	9.128	9.121
6	9.087	9.094	9.113	9.115	9.127	9.132	9.126	9.116	9.116	9.107	9.103
7	9.108	9.108	9.139	9.145	9.153	9.159	9.156	9.143	9.143	9.132	9.129
8	9.095	9.100	9.121	9.127	9.136	9.139	9.135	9.122	9.127	9.122	9.116
9	9.095	9.105	9.122	9.121	9.133	9.133	9.161	9.121	9.125	9.124	9.110
10	9.103	9.106	9.130	9.134	9.150	9.147	9.135	9.129	9.140	9.129	9.116
11	9.099	9.091	9.123	9.118	9.131	9.137	9.126	9.116	9.124	9.127	9.113
12	9.103	9.103	9.124	9.128	9.142	9.144	9.128	9.127	9.131	9.133	9.118
13	9.095	9.094	9.127	9.121	9.136	9.142	9.127	9.134	9.138	9.130	9.120
14	9.078	9.086	9.109	9.109	9.125	9.125	9.111	9.127	9.120	9.122	9.100
15	9.103	9.102	9.128	9.128	9.140	9.141	9.128	9.122	9.141	9.125	9.115
16	9.099	9.101	9.125	9.122	9.139	9.136	9.136	9.121	9.127	9.133	9.111
17	9.083	9.091	9.122	9.117	9.131	9.134	9.122	9.112	9.129	9.129	9.115
18	9.120	9.123	9.153	9.142	9.161	9.157	9.152	9.137	9.156	9.154	9.132
19	9.078	9.071	9.110	9.107	9.120	9.123	9.115	9.100	9.116	9.110	9.098
20	9.087	9.091	9.116	9.111	9.129	9.129	9.140	9.135	9.124	9.107	9.101
21	9.087	9.085	9.119	9.115	9.133	9.133	9.125	9.111	9.131	9.119	9.110
22	9.087	9.087	9.113	9.109	9.125	9.128	9.124	9.126	9.123	9.115	9.100
23	9.087	9.097	9.119	9.117	9.131	9.134	9.170	9.139	9.130	9.125	9.103
24	9.103	9.101	9.136	9.137	9.153	9.151	9.150	9.132	9.143	9.134	9.124
25	9.091	9.098	9.115	9.111	9.129	9.133	9.139	9.139	9.125	9.127	9.101
Avg.	9.096	9.098	9.123	9.123	9.136	9.139	9.135	9.126	9.130	9.126	9.113
Med.	9.095	9.098	9.122	9.121	9.133	9.136	9.135	9.126	9.127	9.127	9.113
st dev	0.012	0.012	0.011	0.012	0.012	0.011	0.015	0.012	0.011	0.010	0.011
Min.	9.078	9.071	9.109	9.107	9.120	9.123	9.111	9.100	9.116	9.107	9.098
Max.	9.128	9.127	9.153	9.157	9.163	9.165	9.170	9.155	9.156	9.154	9.142

3.3 Data Set 1, 55°C, 100mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')									
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.2550	0.5323	2837	0.0000	0.0004	0.0005	0.0006	0.0009	0.0012	0.0010	0.0012	0.0014	0.0014
2	0.2567	0.5324	2800	0.0002	0.0004	0.0011	0.0008	0.0006	0.0006	0.0003	0.0005	0.0008	0.0011
3	0.2550	0.5325	2837	0.0001	0.0004	0.0006	0.0004	0.0003	0.0005	0.0001	0.0004	0.0005	0.0013
4	0.2575	0.5325	2784	0.0000	0.0005	0.0007	0.0005	0.0003	0.0004	0.0001	0.0002	0.0004	0.0009
5	0.2584	0.5343	2756	0.0000	0.0004	0.0009	0.0006	0.0004	0.0005	0.0002	0.0004	0.0005	0.0009
6	0.2560	0.5328	2813	0.0001	0.0006	0.0011	0.0008	0.0006	0.0007	0.0004	0.0007	0.0008	0.0009
7	0.2575	0.5330	2780	0.0002	0.0002	0.0009	0.0006	0.0003	0.0005	0.0004	0.0006	0.0009	0.0010
8	0.2559	0.5326	2817	0.0001	0.0004	0.0007	0.0004	0.0003	0.0004	0.0002	0.0005	0.0007	0.0009
9	0.2559	0.5332	2814	0.0000	0.0004	0.0008	0.0005	0.0001	0.0004	0.0003	0.0004	0.0006	0.0008
10	0.2563	0.5323	2810	0.0001	0.0006	0.0008	0.0007	0.0004	0.0003	0.0004	0.0005	0.0005	0.0007
11	0.2560	0.5336	2809	0.0001	0.0004	0.0009	0.0006	0.0004	0.0004	0.0005	0.0006	0.0007	0.0008
12	0.2553	0.5332	2826	0.0001	0.0002	0.0007	0.0004	0.0003	0.0004	0.0006	0.0007	0.0009	0.0009
13	0.2557	0.5331	2817	0.0001	0.0006	0.0008	0.0007	0.0004	0.0004	0.0007	0.0009	0.0010	0.0004
14	0.2571	0.5337	2786	0.0003	0.0005	0.0012	0.0010	0.0006	0.0007	0.0010	0.0012	0.0013	0.0010
15	0.2582	0.5336	2765	0.0002	0.0003	0.0011	0.0007	0.0003	0.0006	0.0007	0.0008	0.0010	0.0010
16	0.2565	0.5327	2803	0.0001	0.0003	0.0009	0.0007	0.0003	0.0005	0.0006	0.0007	0.0009	0.0010
17	0.2563	0.5332	2805	0.0002	0.0003	0.0012	0.0008	0.0007	0.0008	0.0008	0.0009	0.0011	0.0009
18	0.2572	0.5321	2791	0.0001	0.0005	0.0004	0.0001	0.0004	0.0006	0.0002	0.0005	0.0007	0.0007
19	0.2580	0.5331	2769	0.0000	0.0002	0.0005	0.0002	0.0002	0.0004	0.0002	0.0005	0.0007	0.0007
20	0.2586	0.5327	2758	0.0002	0.0006	0.0003	0.0002	0.0003	0.0006	0.0001	0.0003	0.0006	0.0009
21	0.2553	0.5307	2838	0.0000	0.0006	0.0002	0.0003	0.0004	0.0005	0.0001	0.0003	0.0004	0.0008
22	0.2571	0.5328	2790	0.0001	0.0003	0.0002	0.0002	0.0004	0.0006	0.0002	0.0004	0.0006	0.0009
23	0.2586	0.5321	2762	0.0001	0.0004	0.0002	0.0001	0.0003	0.0006	0.0004	0.0006	0.0009	0.0012
24	0.2589	0.5328	2751	0.0001	0.0005	0.0004	0.0001	0.0002	0.0003	0.0001	0.0003	0.0006	0.0008
25	0.2560	0.5324	2816	0.0001	0.0004	0.0004	0.0002	0.0001	0.0003	0.0001	0.0005	0.0006	0.0007
Avg.	0.2568	0.5328	2797	0.0001	0.0004	0.0007	0.0005	0.0004	0.0005	0.0004	0.0006	0.0008	0.0009
Med.	0.2565	0.5328	2803	0.0001	0.0004	0.0007	0.0005	0.0003	0.0005	0.0003	0.0005	0.0007	0.0009
st dev	0.0012	0.0007	27	0.0001	0.0001	0.0003	0.0003	0.0002	0.0002	0.0003	0.0003	0.0003	0.0002
Min.	0.2550	0.5307	2751	0.0000	0.0002	0.0002	0.0001	0.0001	0.0003	0.0001	0.0002	0.0004	0.0004
Max.	0.2589	0.5343	2838	0.0003	0.0006	0.0012	0.0010	0.0009	0.0012	0.0010	0.0012	0.0014	0.0014

3.4 Data Set 2, 105°C, 100mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	90.08	100.43	100.20	99.89	99.57	99.28	99.09	98.73	98.31	98.10	98.02
27	90.39	100.07	100.06	99.66	99.31	99.16	99.04	98.86	98.73	98.44	98.32
28	90.07	100.11	100.08	99.69	99.34	99.20	98.85	98.70	98.36	97.88	97.77
29	89.51	99.92	99.77	99.71	99.16	98.92	98.61	98.35	98.03	97.62	97.51
30	91.54	100.38	99.67	99.56	99.10	98.99	98.70	98.50	98.23	97.87	97.79
31	91.37	99.84	99.30	99.03	98.70	98.59	98.29	98.11	97.73	97.36	97.26
32	90.32	100.09	99.60	99.38	99.24	98.99	98.75	98.43	97.97	97.65	97.31
33	91.06	100.16	99.69	99.31	99.12	98.99	98.68	98.39	98.06	97.80	97.14
34	90.19	100.08	99.68	99.38	99.16	99.04	98.59	98.48	98.25	97.93	97.56
35	90.35	100.13	99.58	99.24	99.05	98.76	98.58	98.53	98.16	97.80	97.63
36	90.38	100.12	99.85	99.56	98.93	98.45	98.25	98.16	97.80	97.62	97.34
37	89.37	99.99	99.40	99.24	99.02	98.83	98.67	98.42	98.18	97.78	97.59
38	91.07	99.78	99.52	98.96	98.55	98.13	97.89	97.83	97.60	97.35	97.08
39	89.09	100.16	99.81	99.43	98.94	98.27	97.97	97.90	97.73	97.40	97.17
40	89.79	100.35	99.55	99.12	98.75	98.65	98.33	97.84	97.42	97.16	96.78
41	89.59	100.17	99.65	99.26	98.96	98.84	98.52	98.11	97.89	97.58	97.27
42	89.94	100.31	99.99	99.56	99.07	98.70	98.53	98.45	98.27	97.93	97.42
43	90.01	100.30	99.57	99.29	98.80	98.11	97.86	97.59	97.37	97.06	96.80
44	90.43	100.22	99.70	99.37	99.09	98.45	98.10	97.76	97.35	96.97	96.65
45	90.69	100.10	99.98	99.34	98.86	98.42	98.11	97.79	97.54	97.44	96.99
46	90.49	100.22	99.93	99.69	99.27	98.76	98.49	97.96	97.70	97.50	97.24
47	90.33	100.03	99.79	99.63	99.34	98.90	98.44	98.11	97.86	97.48	97.30
48	89.89	100.13	99.62	98.97	98.78	98.64	98.45	98.20	97.93	97.61	97.12
49	90.92	100.26	100.10	99.92	99.82	99.62	99.29	98.97	98.70	98.50	98.21
50	91.31	100.32	99.85	99.63	99.06	98.92	98.53	98.44	98.21	98.02	97.96
Avg.	90.33	100.15	99.76	99.43	99.08	98.78	98.50	98.26	97.98	97.67	97.41
Med.	90.33	100.13	99.70	99.38	99.07	98.83	98.53	98.35	97.97	97.62	97.31
st dev	0.63	0.16	0.23	0.27	0.28	0.36	0.36	0.37	0.38	0.38	0.43
Min.	89.09	99.78	99.30	98.96	98.55	98.11	97.86	97.59	97.35	96.97	96.65
Max.	91.54	100.43	100.20	99.92	99.82	99.62	99.29	98.97	98.73	98.50	98.32

3.5 Data Set 2, 105°C, 100mA (Forward Voltage)

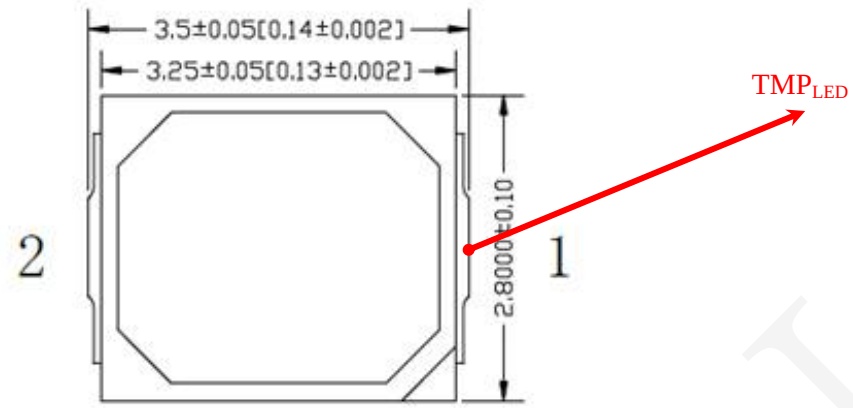
No.	Forward Voltage (V)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	9.091	9.108	9.123	9.123	9.138	9.136	9.144	9.133	9.148	9.139	9.100
27	9.095	9.096	9.120	9.126	9.142	9.136	9.138	9.140	9.149	9.135	9.109
28	9.074	9.085	9.107	9.107	9.119	9.119	9.132	9.118	9.132	9.120	9.087
29	9.083	9.082	9.108	9.113	9.125	9.125	9.121	9.122	9.132	9.134	9.100
30	9.099	9.098	9.138	9.141	9.153	9.143	9.154	9.145	9.157	9.152	9.120
31	9.099	9.100	9.142	9.137	9.149	9.141	9.142	9.147	9.157	9.164	9.118
32	9.091	9.094	9.115	9.119	9.132	9.126	9.132	9.129	9.135	9.127	9.104
33	9.091	9.091	9.131	9.127	9.138	9.133	9.136	9.135	9.140	9.147	9.106
34	9.083	9.096	9.115	9.117	9.129	9.126	9.127	9.126	9.157	9.149	9.113
35	9.087	9.089	9.110	9.117	9.130	9.124	9.128	9.125	9.153	9.130	9.108
36	9.091	9.084	9.118	9.124	9.131	9.131	9.129	9.132	9.155	9.149	9.112
37	9.087	9.095	9.107	9.119	9.130	9.125	9.121	9.127	9.142	9.142	9.104
38	9.099	9.096	9.124	9.129	9.139	9.137	9.138	9.141	9.156	9.143	9.121
39	9.095	9.089	9.101	9.112	9.124	9.123	9.120	9.125	9.158	9.124	9.100
40	9.103	9.109	9.124	9.129	9.142	9.137	9.141	9.143	9.149	9.139	9.124
41	9.103	9.107	9.124	9.128	9.136	9.135	9.133	9.138	9.152	9.147	9.114
42	9.087	9.089	9.116	9.121	9.131	9.133	9.140	9.136	9.142	9.140	9.112
43	9.087	9.092	9.124	9.127	9.137	9.135	9.136	9.136	9.144	9.124	9.115
44	9.099	9.106	9.120	9.129	9.141	9.135	9.141	9.142	9.143	9.133	9.111
45	9.091	9.090	9.116	9.123	9.133	9.128	9.133	9.134	9.147	9.124	9.111
46	9.095	9.100	9.123	9.129	9.140	9.131	9.134	9.134	9.142	9.124	9.119
47	9.070	9.077	9.101	9.105	9.116	9.111	9.116	9.112	9.147	9.147	9.093
48	9.066	9.074	9.096	9.098	9.109	9.112	9.109	9.111	9.136	9.138	9.092
49	9.091	9.100	9.114	9.127	9.133	9.135	9.136	9.136	9.143	9.133	9.108
50	9.078	9.085	9.112	9.118	9.128	9.126	9.130	9.127	9.150	9.129	9.105
Avg.	9.089	9.093	9.117	9.122	9.133	9.130	9.132	9.132	9.147	9.137	9.108
Med.	9.091	9.094	9.116	9.123	9.133	9.131	9.133	9.134	9.147	9.138	9.109
st dev	0.010	0.009	0.011	0.010	0.010	0.008	0.010	0.010	0.008	0.011	0.009
Min.	9.066	9.074	9.096	9.098	9.109	9.111	9.109	9.111	9.132	9.120	9.087
Max.	9.103	9.109	9.142	9.141	9.153	9.143	9.154	9.147	9.158	9.164	9.124

3.6 Data Set 2, 105°C, 100mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')									
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	0.2585	0.5328	2760	0.0001	0.0004	0.0006	0.0007	0.0004	0.0007	0.0005	0.0007	0.0010	0.0009
27	0.2583	0.5323	2767	0.0001	0.0004	0.0007	0.0007	0.0006	0.0008	0.0007	0.0009	0.0010	0.0010
28	0.2578	0.5330	2775	0.0002	0.0002	0.0004	0.0005	0.0002	0.0004	0.0006	0.0009	0.0011	0.0012
29	0.2578	0.5319	2780	0.0002	0.0001	0.0004	0.0005	0.0002	0.0003	0.0005	0.0009	0.0010	0.0011
30	0.2559	0.5315	2822	0.0002	0.0001	0.0003	0.0006	0.0005	0.0006	0.0007	0.0009	0.0011	0.0012
31	0.2573	0.5330	2785	0.0003	0.0001	0.0005	0.0007	0.0004	0.0006	0.0008	0.0011	0.0012	0.0010
32	0.2568	0.5321	2799	0.0000	0.0001	0.0001	0.0004	0.0002	0.0004	0.0004	0.0008	0.0009	0.0009
33	0.2570	0.5329	2792	0.0002	0.0003	0.0003	0.0005	0.0001	0.0006	0.0005	0.0007	0.0011	0.0009
34	0.2570	0.5323	2794	0.0002	0.0003	0.0002	0.0004	0.0001	0.0003	0.0006	0.0007	0.0010	0.0007
35	0.2570	0.5328	2792	0.0002	0.0003	0.0005	0.0006	0.0002	0.0003	0.0006	0.0009	0.0012	0.0009
36	0.2578	0.5324	2778	0.0002	0.0004	0.0006	0.0007	0.0004	0.0006	0.0008	0.0009	0.0012	0.0010
37	0.2581	0.5317	2774	0.0001	0.0003	0.0004	0.0005	0.0003	0.0005	0.0007	0.0009	0.0011	0.0011
38	0.2565	0.5333	2800	0.0001	0.0003	0.0006	0.0007	0.0003	0.0005	0.0006	0.0008	0.0011	0.0010
39	0.2587	0.5317	2762	0.0001	0.0003	0.0005	0.0006	0.0002	0.0005	0.0006	0.0008	0.0010	0.0011
40	0.2595	0.5328	2739	0.0001	0.0003	0.0005	0.0006	0.0003	0.0007	0.0006	0.0008	0.0011	0.0012
41	0.2572	0.5322	2791	0.0001	0.0003	0.0005	0.0007	0.0003	0.0005	0.0006	0.0008	0.0010	0.0009
42	0.2583	0.5334	2761	0.0001	0.0003	0.0004	0.0005	0.0002	0.0003	0.0006	0.0008	0.0009	0.0008
43	0.2583	0.5330	2764	0.0002	0.0005	0.0005	0.0007	0.0003	0.0005	0.0006	0.0009	0.0013	0.0011
44	0.2571	0.5329	2789	0.0000	0.0003	0.0004	0.0006	0.0002	0.0004	0.0004	0.0008	0.0011	0.0011
45	0.2575	0.5343	2774	0.0001	0.0003	0.0005	0.0007	0.0001	0.0004	0.0006	0.0007	0.0008	0.0009
46	0.2578	0.5327	2776	0.0001	0.0003	0.0004	0.0005	0.0002	0.0004	0.0004	0.0007	0.0010	0.0011
47	0.2574	0.5338	2780	0.0001	0.0003	0.0003	0.0005	0.0003	0.0005	0.0004	0.0005	0.0008	0.0011
48	0.2579	0.5324	2775	0.0001	0.0005	0.0009	0.0011	0.0008	0.0011	0.0010	0.0012	0.0015	0.0012
49	0.2572	0.5331	2787	0.0001	0.0003	0.0005	0.0006	0.0004	0.0006	0.0008	0.0011	0.0014	0.0011
50	0.2555	0.5332	2822	0.0000	0.0002	0.0002	0.0005	0.0004	0.0005	0.0005	0.0009	0.0013	0.0009
Avg.	0.2575	0.5327	2782	0.0001	0.0003	0.0005	0.0006	0.0003	0.0005	0.0006	0.0008	0.0011	0.0010
Med.	0.2575	0.5328	2780	0.0001	0.0003	0.0005	0.0006	0.0003	0.0005	0.0006	0.0008	0.0011	0.0010
st dev	0.0009	0.0007	19	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0001	0.0001	0.0002	0.0001
Min.	0.2555	0.5315	2739	0.0000	0.0001	0.0001	0.0004	0.0001	0.0003	0.0004	0.0005	0.0008	0.0007
Max.	0.2595	0.5343	2822	0.0003	0.0005	0.0009	0.0011	0.0008	0.0011	0.0010	0.0012	0.0015	0.0012

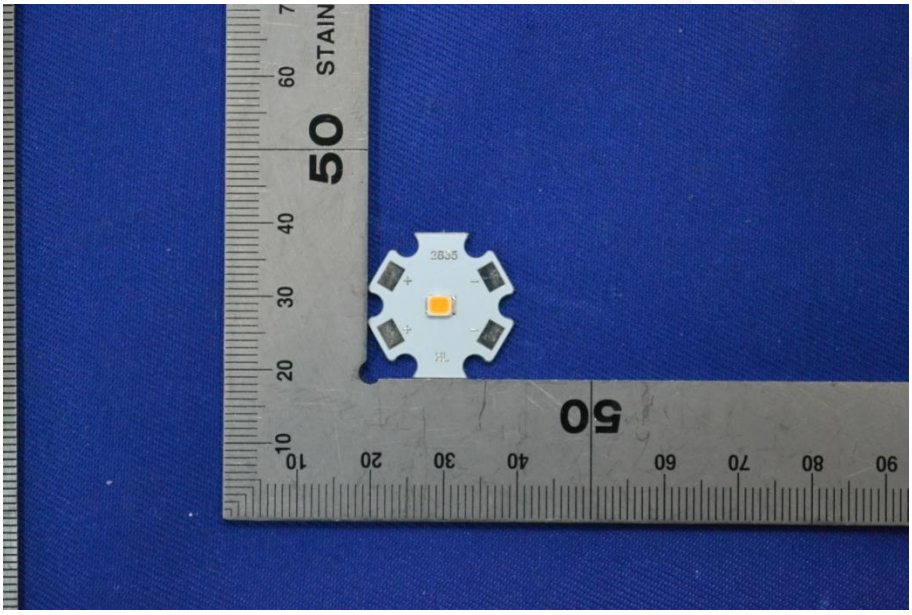
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



Directions

1. The information marked “superscript #” is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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**********END OF REPORT**********