



TEST REPORT

According to ANSI/IES LM-80-15
For

Xiamen Dacol Photoelectronics Technology Co., Ltd.

No. 8021 Xiang'an West Road(Xiang'an) industrial zone, Torch Hi-Tech Industrial Development Zone , Xiamen City,Fujian,China

#Model: 2835

Report Type: 9000 Hours Test Report		Product Type: LED Package	
Test Engineer:	Pote Wang	<i>Pote Wang</i>	
Report Number:	R2DG180914050-10		
Test Date:	2018-09-26 to 2019-10-17		
Report Date:	2019-11-27		
Reviewed By:	Bill Xiong / EE Engineer	<i>Bill Xiong</i>	
Test Facility:	Test facility was located at No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China.		
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Accreditation:	The IAS Accreditation Number TL-460.		

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1 - General Information

1.1 Description of LED Light Sources

Sample Size:

75 PCS test samples were in good condition and received on 2018-09-14. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75.

#Manufacturer:	Xiamen Dacol Photoelectronics Technology Co., Ltd.
#Part Number:	2835
#Part Type:	LED Package
#Drive Level:	DC 100mA
#Nominal CCT:	2700K
#Power:	0.9W
#Average Current Density per LED die:	425.5mA/mm ²
#Average Power Density per LED die:	1.276W/mm ²
#CRI:	80
#Die Spacing:	0.18mm

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.

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
0.5m integrating sphere	EVERFINE	AIS-2	G185304TA1381172	2019-06-28	2020-06-27
LED Test Source	EVERFINE	LTS-300	P185616CD1371113	2019-07-23	2020-07-22
High Accuracy Array Spectroradiometer	EVERFINE	HAAS-2000	P600674CM1381123	2019-06-28	2020-06-27
Standard Light Source	EVERFINE	D062	G100278CJ7351206	2018-12-24	2019-12-24
Multilayer aging machine	BACL	B2-270	20023	2019-03-10	2020-03-09
DC Power Supply	BACL	B12001-12	90023	2019-01-07	2020-01-07

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 driven 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 (luminous flux) measurements is U=1.8% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=20K (K=2), at the 95% confidence level.

The uncertainty of the CRI is U=1.5 (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: 2835
Number of Units: 25
Case Temperature: >53°C
Ambient Temperature: >50°C
Life Test Drive Current: 100mA
Measurement Current: 100mA

Data Set 2: 85°C, 100mA

Part Number: 2835
Number of Units: 25
Case Temperature: >83°C
Ambient Temperature: >80°C
Life Test Drive Current: 100mA
Measurement Current: 100mA

Data Set 3: 115° C, 100mA

Part Number: 2835
Number of Units: 25
Case Temperature: >113°C
Ambient Temperature: >110°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	9000hrs	2.740E-06	1.005	>54000hrs
2	25	0	1000hrs	9000hrs	3.216E-06	1.004	>54000hrs
3	25	0	1000hrs	9000hrs	3.822E-06	1.004	>54000hrs

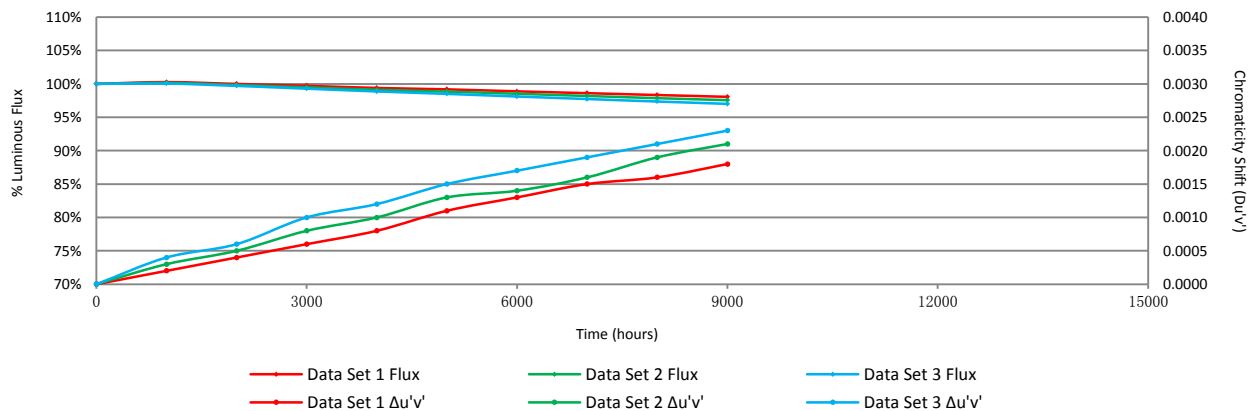
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	100.27%	99.99%	99.71%	99.39%	99.18%	98.88%	98.61%	98.33%	98.06%
2	100.16%	99.83%	99.48%	99.12%	98.84%	98.52%	98.19%	97.86%	97.56%
3	100.05%	99.70%	99.28%	98.87%	98.50%	98.11%	97.73%	97.36%	97.01%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	0.0002	0.0004	0.0006	0.0008	0.0011	0.0013	0.0015	0.0016	0.0018
2	0.0003	0.0005	0.0008	0.0010	0.0013	0.0014	0.0016	0.0019	0.0021
3	0.0004	0.0006	0.0010	0.0012	0.0015	0.0017	0.0019	0.0021	0.0023

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 (%)								
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	131.1	100.31	100.08	99.92	99.69	99.47	99.31	99.08	98.70	98.40
2	130.7	100.46	100.23	100.08	99.85	99.69	99.39	99.08	98.93	98.70
3	132.0	100.38	100.15	99.85	99.39	99.09	99.02	98.71	98.26	98.03
4	131.2	100.15	99.70	99.39	99.31	98.93	98.78	98.40	98.17	97.87
5	133.7	100.15	99.93	99.55	99.33	99.10	98.80	98.43	98.13	97.83
6	132.0	100.15	99.85	99.55	99.09	98.86	98.48	98.11	97.88	97.65
7	132.5	100.23	100.08	99.85	99.55	99.40	98.64	98.42	98.26	97.96
8	132.4	100.30	100.08	99.85	99.62	99.40	99.02	98.79	98.56	98.34
9	131.1	100.15	99.92	99.54	99.47	99.31	98.55	98.32	97.94	97.64
10	132.2	100.53	100.23	99.92	99.62	99.39	99.24	98.94	98.79	98.49
11	132.1	100.30	100.08	99.85	99.32	99.17	98.86	98.64	98.41	98.11
12	132.1	100.23	99.85	99.70	99.39	99.24	99.02	98.64	98.56	98.26
13	131.9	100.30	99.92	99.70	99.17	98.94	98.79	98.64	98.18	97.88
14	131.7	100.46	100.15	99.77	99.47	99.32	99.16	98.94	98.63	98.48
15	131.0	100.31	100.15	99.77	99.39	99.31	99.08	98.78	98.63	98.40
16	132.0	100.53	100.15	99.77	99.47	99.39	99.02	98.71	98.41	98.26
17	131.9	100.45	100.15	99.92	99.39	99.01	98.86	98.56	98.03	97.65
18	130.4	100.61	100.38	100.15	99.54	99.31	99.08	98.85	98.47	98.08
19	132.0	100.61	100.45	100.08	99.77	99.47	98.86	98.64	98.41	98.18
20	131.8	99.92	99.54	99.17	98.86	98.56	98.25	98.03	97.88	97.65
21	131.3	100.08	99.85	99.70	99.39	99.16	98.86	98.71	98.40	98.02
22	134.2	99.85	99.48	99.18	98.88	98.58	98.14	97.76	97.39	97.09
23	130.4	100.15	99.92	99.54	99.16	99.00	98.85	98.62	98.31	98.16
24	130.5	100.15	99.85	99.54	99.39	99.08	98.93	98.70	98.47	98.39
25	130.8	99.92	99.69	99.46	99.31	99.24	99.08	98.70	98.55	98.09
Avg.	131.7	100.27	99.99	99.71	99.39	99.18	98.88	98.61	98.33	98.06
Med.	131.9	100.30	100.08	99.77	99.39	99.24	98.86	98.64	98.41	98.09
st dev	0.9	0.21	0.24	0.26	0.24	0.27	0.30	0.31	0.34	0.36
Min.	130.4	99.85	99.48	99.17	98.86	98.56	98.14	97.76	97.39	97.09
Max.	134.2	100.61	100.45	100.15	99.85	99.69	99.39	99.08	98.93	98.70

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

No.	Forward Voltage (V)									
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	8.803	8.726	8.772	8.767	8.802	8.749	8.802	8.745	8.749	8.745
2	8.768	8.786	8.786	8.819	8.838	8.818	8.846	8.782	8.786	8.838
3	8.816	8.820	8.821	8.838	8.902	8.844	8.826	8.856	8.828	9.048
4	8.822	8.797	8.841	8.845	8.878	8.821	8.879	8.826	8.809	8.810
5	8.786	8.778	8.821	8.835	8.860	8.802	8.854	8.803	8.806	8.861
6	8.795	8.795	8.864	8.829	8.872	8.831	8.862	8.814	8.815	8.808
7	8.826	8.829	8.866	8.853	8.895	8.848	8.917	8.908	8.837	8.990
8	8.801	8.820	8.877	8.831	8.859	8.816	8.863	8.800	8.808	8.812
9	8.797	8.809	8.847	8.835	8.868	8.827	8.859	8.808	8.818	8.815
10	8.813	8.816	8.838	8.848	8.886	8.832	8.857	8.816	8.826	8.830
11	8.805	8.803	8.839	8.835	8.871	8.834	8.869	8.818	8.825	8.829
12	8.912	8.839	8.861	8.870	8.948	8.840	9.026	8.864	8.828	9.031
13	8.797	8.797	8.838	8.846	8.884	8.825	8.860	8.814	8.815	8.814
14	8.793	8.795	8.823	8.862	8.868	8.827	8.881	8.815	8.809	8.814
15	8.720	8.736	8.791	8.768	8.809	8.758	8.758	8.741	8.748	8.738
16	8.797	8.799	8.921	8.839	8.896	8.844	8.871	8.811	8.817	8.818
17	8.874	8.797	8.829	8.818	8.900	8.821	8.869	8.802	8.818	8.808
18	8.903	8.805	8.864	8.849	8.879	8.847	8.915	8.820	8.903	8.818
19	8.761	8.747	8.784	8.791	8.820	8.772	8.815	8.794	8.774	8.771
20	8.797	8.803	8.799	8.828	8.863	8.855	8.861	8.815	8.821	8.811
21	8.907	8.811	8.904	8.823	8.894	8.825	8.861	8.806	8.819	8.812
22	8.820	8.866	8.832	8.854	8.879	8.843	8.837	8.855	8.831	8.832
23	8.780	8.791	8.862	8.834	8.869	8.822	8.852	8.809	8.811	8.809
24	8.811	8.809	8.849	8.877	8.868	8.832	8.932	8.833	8.841	8.827
25	8.799	8.799	8.827	8.837	8.868	8.830	8.867	8.828	8.816	8.817
Avg.	8.812	8.799	8.838	8.833	8.871	8.823	8.866	8.815	8.814	8.836
Med.	8.801	8.799	8.838	8.835	8.871	8.827	8.861	8.814	8.817	8.815
st dev	0.045	0.030	0.036	0.026	0.031	0.027	0.049	0.034	0.030	0.075
Min.	8.720	8.726	8.772	8.767	8.802	8.749	8.758	8.741	8.748	8.738
Max.	8.912	8.866	8.921	8.877	8.948	8.855	9.026	8.908	8.903	9.048

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
				0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs
1	0.2660	0.5276	2629	0.0003	0.0004	0.0005	0.0005	0.0007	0.0008	0.0009	0.0011	0.0013
2	0.2653	0.5279	2640	0.0001	0.0004	0.0007	0.0007	0.0008	0.0010	0.0012	0.0014	0.0016
3	0.2647	0.5279	2654	0.0002	0.0003	0.0007	0.0007	0.0008	0.0008	0.0010	0.0013	0.0014
4	0.2646	0.5280	2655	0.0001	0.0003	0.0006	0.0008	0.0010	0.0012	0.0014	0.0015	0.0016
5	0.2619	0.5284	2707	0.0001	0.0004	0.0007	0.0008	0.0012	0.0014	0.0015	0.0017	0.0018
6	0.2637	0.5276	2675	0.0001	0.0002	0.0004	0.0009	0.0013	0.0013	0.0014	0.0016	0.0019
7	0.2653	0.5293	2636	0.0001	0.0003	0.0004	0.0011	0.0016	0.0016	0.0020	0.0021	0.0022
8	0.2632	0.5293	2678	0.0002	0.0004	0.0006	0.0005	0.0009	0.0011	0.0014	0.0017	0.0018
9	0.2657	0.5279	2634	0.0001	0.0004	0.0007	0.0006	0.0009	0.0012	0.0015	0.0017	0.0019
10	0.2646	0.5267	2659	0.0003	0.0005	0.0007	0.0006	0.0008	0.0010	0.0013	0.0014	0.0017
11	0.2642	0.5289	2660	0.0001	0.0003	0.0004	0.0009	0.0013	0.0013	0.0016	0.0017	0.0020
12	0.2656	0.5274	2636	0.0002	0.0004	0.0005	0.0007	0.0013	0.0015	0.0016	0.0017	0.0020
13	0.2650	0.5281	2646	0.0002	0.0003	0.0005	0.0006	0.0009	0.0012	0.0014	0.0015	0.0017
14	0.2636	0.5276	2676	0.0002	0.0004	0.0007	0.0005	0.0009	0.0012	0.0013	0.0015	0.0016
15	0.2628	0.5294	2685	0.0002	0.0003	0.0004	0.0006	0.0009	0.0012	0.0013	0.0014	0.0016
16	0.2649	0.5282	2648	0.0002	0.0005	0.0008	0.0006	0.0010	0.0013	0.0015	0.0017	0.0019
17	0.2645	0.5273	2659	0.0001	0.0004	0.0007	0.0006	0.0009	0.0011	0.0014	0.0017	0.0018
18	0.2654	0.5290	2636	0.0002	0.0003	0.0004	0.0007	0.0009	0.0012	0.0014	0.0018	0.0021
19	0.2618	0.5269	2717	0.0002	0.0005	0.0008	0.0009	0.0010	0.0012	0.0013	0.0016	0.0018
20	0.2635	0.5268	2681	0.0002	0.0004	0.0007	0.0009	0.0013	0.0013	0.0015	0.0016	0.0019
21	0.2648	0.5289	2648	0.0001	0.0002	0.0005	0.0010	0.0016	0.0017	0.0018	0.0021	0.0022
22	0.2641	0.5285	2664	0.0001	0.0004	0.0006	0.0010	0.0014	0.0016	0.0018	0.0019	0.0021
23	0.2642	0.5251	2674	0.0003	0.0004	0.0005	0.0008	0.0011	0.0011	0.0012	0.0014	0.0015
24	0.2650	0.5266	2652	0.0002	0.0005	0.0009	0.0009	0.0013	0.0016	0.0018	0.0019	0.0021
25	0.2645	0.5258	2666	0.0001	0.0005	0.0008	0.0010	0.0014	0.0016	0.0018	0.0019	0.0020
Avg.	0.2644	0.5278	2661	0.0002	0.0004	0.0006	0.0008	0.0011	0.0013	0.0015	0.0016	0.0018
Med.	0.2646	0.5279	2659	0.0002	0.0004	0.0006	0.0007	0.0010	0.0012	0.0014	0.0017	0.0018
st dev	0.0011	0.0011	22	0.0001	0.0001	0.0001	0.0002	0.0003	0.0002	0.0003	0.0002	0.0003
Min.	0.2618	0.5251	2629	0.0001	0.0002	0.0004	0.0005	0.0007	0.0008	0.0009	0.0011	0.0013
Max.	0.2660	0.5294	2717	0.0003	0.0005	0.0009	0.0011	0.0016	0.0017	0.0020	0.0021	0.0022

3.4 Data Set 2, 85°C, 100mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)								
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
26	131.7	100.08	99.77	99.32	99.16	98.94	98.71	98.41	97.95	97.49
27	132.4	99.92	99.62	99.17	98.94	98.56	98.41	97.96	97.58	97.28
28	130.8	100.08	99.85	99.69	99.24	98.85	98.47	98.09	97.78	97.48
29	131.7	100.00	99.77	99.39	99.32	99.09	98.94	98.71	98.41	98.03
30	132.1	100.30	99.77	99.55	99.17	98.86	98.56	98.26	98.11	97.73
31	133.1	100.38	100.08	99.77	99.25	98.95	98.65	98.35	97.90	97.60
32	130.5	100.61	100.23	99.62	99.46	99.08	98.77	98.47	98.08	97.78
33	130.8	100.15	99.69	99.24	99.08	98.70	98.62	98.17	97.94	97.71
34	130.5	100.08	99.85	99.54	99.08	98.77	98.39	98.08	97.70	97.24
35	130.5	100.23	99.92	99.69	99.31	99.08	98.39	98.08	97.93	97.70
36	132.9	100.30	99.92	99.40	98.95	98.57	98.19	97.82	97.37	97.14
37	131.9	99.92	99.62	99.17	98.79	98.56	97.95	97.65	97.35	96.97
38	130.8	99.85	99.46	99.08	98.70	98.47	97.94	97.63	97.40	97.09
39	131.1	99.92	99.62	99.08	98.70	98.47	98.40	98.09	97.71	97.41
40	131.6	99.77	99.39	99.09	98.78	98.63	98.25	97.80	97.49	97.04
41	132.1	99.85	99.55	99.17	98.94	98.71	98.41	98.03	97.65	97.27
42	132.5	100.15	99.77	99.47	98.94	98.79	98.57	98.26	97.96	97.66
43	132.0	100.38	100.23	99.92	99.55	99.24	99.09	98.86	98.48	98.26
44	131.4	100.53	100.38	100.30	99.70	99.32	99.01	98.78	98.55	98.40
45	131.7	100.46	100.23	100.08	99.77	99.39	99.24	98.86	98.63	98.33
46	131.3	100.46	100.08	99.54	99.16	98.93	98.78	98.55	98.25	97.87
47	130.9	99.92	99.39	99.08	98.78	98.55	98.24	97.94	97.56	97.25
48	131.3	100.30	99.85	99.39	99.01	98.71	98.32	98.02	97.64	97.41
49	130.8	100.15	99.85	99.62	99.08	98.78	98.32	97.94	97.63	97.40
50	130.8	100.08	99.85	99.54	99.16	98.93	98.24	97.86	97.55	97.40
Avg.	131.5	100.16	99.83	99.48	99.12	98.84	98.52	98.19	97.86	97.56
Med.	131.4	100.15	99.85	99.47	99.08	98.79	98.41	98.09	97.78	97.48
st dev	0.8	0.23	0.26	0.32	0.29	0.26	0.33	0.36	0.37	0.39
Min.	130.5	99.77	99.39	99.08	98.70	98.47	97.94	97.63	97.35	96.97
Max.	133.1	100.61	100.38	100.30	99.77	99.39	99.24	98.86	98.63	98.40

3.5 Data Set 2, 85°C, 100mA (Forward Voltage)

No.	Forward Voltage (V)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
26	8.780	8.791	8.808	8.843	8.867	8.830	8.850	8.821	8.814	8.823
27	8.841	8.803	8.837	8.853	8.907	8.838	8.919	8.821	8.811	8.822
28	8.797	8.813	8.842	8.853	8.858	8.839	8.897	8.830	8.823	8.830
29	8.761	8.736	8.856	8.818	8.837	8.772	8.781	8.758	8.747	8.755
30	8.788	8.807	8.853	8.859	8.881	8.826	8.863	8.798	8.838	8.822
31	8.782	8.866	8.903	8.857	8.885	8.816	8.871	8.808	8.808	8.826
32	8.809	8.811	8.841	8.837	8.882	8.846	8.873	8.827	8.823	8.820
33	8.793	8.793	8.823	8.864	8.866	8.825	8.864	8.807	8.815	8.809
34	8.778	8.793	8.826	8.822	8.863	8.847	8.858	8.811	8.808	8.824
35	8.803	8.849	8.840	8.867	8.850	8.858	8.900	8.841	8.829	8.852
36	8.809	8.816	8.843	8.854	8.883	8.844	8.887	8.874	8.830	8.827
37	8.757	8.768	8.767	8.800	8.783	8.798	8.864	8.835	8.787	8.815
38	8.788	8.822	8.837	8.843	8.890	8.825	8.875	8.812	8.809	8.809
39	8.799	8.803	8.832	8.833	8.876	8.826	8.865	8.819	8.816	8.812
40	8.887	8.795	8.832	8.831	8.834	8.823	8.871	8.815	8.812	8.810
41	8.801	8.811	8.843	8.898	8.876	8.849	8.874	8.824	8.825	8.824
42	8.784	8.788	8.824	8.826	8.856	8.810	8.858	8.803	8.808	8.804
43	8.816	8.805	8.839	8.843	8.862	8.833	8.912	8.827	8.826	8.856
44	8.786	8.809	8.843	8.827	8.881	8.822	8.901	8.810	8.804	8.811
45	8.859	8.855	8.838	8.842	8.880	8.837	8.984	8.839	8.816	8.853
46	8.730	8.726	8.767	8.761	8.800	8.769	8.751	8.762	8.740	8.753
47	8.786	8.839	8.786	8.835	8.867	8.847	8.929	8.843	8.814	8.818
48	8.786	8.824	8.858	8.843	8.915	8.839	8.870	8.781	8.817	8.819
49	8.811	8.813	8.867	8.835	8.902	8.833	8.859	8.821	8.811	8.807
50	8.749	8.759	8.802	8.842	8.852	8.806	8.819	8.812	8.782	8.785
Avg.	8.795	8.804	8.832	8.839	8.866	8.826	8.872	8.816	8.809	8.815
Med.	8.788	8.807	8.838	8.842	8.867	8.830	8.871	8.819	8.814	8.819
st dev	0.033	0.033	0.030	0.025	0.030	0.022	0.045	0.025	0.023	0.024
Min.	8.730	8.726	8.767	8.761	8.783	8.769	8.751	8.758	8.740	8.753
Max.	8.887	8.866	8.903	8.898	8.915	8.858	8.984	8.874	8.838	8.856

3.6 Data Set 2, 85°C, 100mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
	Ohr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
26	0.2636	0.5267	2679	0.0002	0.0004	0.0008	0.0008	0.0010	0.0011	0.0013	0.0018	0.0019
27	0.2656	0.5291	2631	0.0002	0.0004	0.0007	0.0008	0.0010	0.0010	0.0012	0.0015	0.0018
28	0.2654	0.5280	2639	0.0002	0.0004	0.0007	0.0007	0.0011	0.0012	0.0014	0.0015	0.0017
29	0.2646	0.5292	2650	0.0002	0.0004	0.0007	0.0010	0.0014	0.0015	0.0016	0.0017	0.0018
30	0.2660	0.5291	2624	0.0004	0.0005	0.0007	0.0008	0.0013	0.0015	0.0018	0.0019	0.0020
31	0.2633	0.5293	2675	0.0004	0.0006	0.0007	0.0006	0.0010	0.0012	0.0015	0.0017	0.0018
32	0.2637	0.5287	2669	0.0004	0.0007	0.0009	0.0007	0.0009	0.0010	0.0013	0.0017	0.0018
33	0.2649	0.5293	2644	0.0004	0.0008	0.0011	0.0007	0.0009	0.0012	0.0013	0.0014	0.0017
34	0.2657	0.5276	2634	0.0004	0.0006	0.0008	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015
35	0.2651	0.5278	2645	0.0002	0.0004	0.0007	0.0007	0.0010	0.0012	0.0013	0.0015	0.0018
36	0.2646	0.5293	2650	0.0004	0.0006	0.0007	0.0008	0.0011	0.0012	0.0015	0.0016	0.0018
37	0.2652	0.5300	2636	0.0004	0.0006	0.0008	0.0012	0.0013	0.0013	0.0014	0.0016	0.0019
38	0.2636	0.5269	2680	0.0004	0.0006	0.0009	0.0013	0.0015	0.0016	0.0018	0.0019	0.0020
39	0.2656	0.5281	2635	0.0002	0.0005	0.0010	0.0013	0.0017	0.0017	0.0021	0.0022	0.0023
40	0.2652	0.5291	2639	0.0004	0.0005	0.0007	0.0011	0.0015	0.0017	0.0018	0.0021	0.0022
41	0.2631	0.5272	2689	0.0004	0.0005	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024	0.0026
42	0.2656	0.5302	2628	0.0004	0.0005	0.0008	0.0011	0.0014	0.0015	0.0018	0.0024	0.0027
43	0.2624	0.5274	2702	0.0003	0.0006	0.0009	0.0011	0.0014	0.0015	0.0017	0.0020	0.0022
44	0.2648	0.5275	2653	0.0004	0.0005	0.0007	0.0011	0.0015	0.0017	0.0018	0.0021	0.0023
45	0.2659	0.5278	2630	0.0003	0.0005	0.0009	0.0013	0.0017	0.0017	0.0021	0.0022	0.0023
46	0.2634	0.5282	2679	0.0003	0.0004	0.0008	0.0010	0.0015	0.0016	0.0018	0.0020	0.0023
47	0.2638	0.5275	2673	0.0004	0.0006	0.0008	0.0011	0.0014	0.0015	0.0018	0.0021	0.0023
48	0.2624	0.5272	2702	0.0004	0.0007	0.0009	0.0009	0.0012	0.0015	0.0016	0.0019	0.0022
49	0.2662	0.5286	2621	0.0003	0.0006	0.0009	0.0011	0.0014	0.0017	0.0019	0.0021	0.0022
50	0.2661	0.5288	2622	0.0004	0.0005	0.0009	0.0009	0.0014	0.0016	0.0017	0.0020	0.0023
Avg.	0.2646	0.5283	2653	0.0003	0.0005	0.0008	0.0010	0.0013	0.0014	0.0016	0.0019	0.0021
Med.	0.2649	0.5282	2645	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	0.0020
st dev	0.0012	0.0010	25	0.0001	0.0001	0.0001	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003
Min.	0.2624	0.5267	2621	0.0002	0.0004	0.0007	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015
Max.	0.2662	0.5302	2702	0.0004	0.0008	0.0011	0.0013	0.0017	0.0018	0.0021	0.0024	0.0027

3.7 Data Set 3, 115° C, 100mA (Lumen Maintenance)

No.	Φ(m)	Lumen Maintenance (%)								
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
51	131.7	99.85	99.47	99.01	98.79	98.33	98.18	97.72	97.19	96.96
52	131.6	100.08	99.62	99.24	98.78	98.40	97.80	97.49	97.04	96.81
53	132.0	100.23	99.85	99.62	99.24	98.79	98.26	97.88	97.73	97.20
54	131.7	100.15	99.92	99.39	98.86	98.48	97.87	97.65	97.57	97.19
55	131.0	100.08	99.62	98.93	98.78	98.40	97.94	97.48	97.02	96.79
56	132.3	100.15	99.92	99.55	98.87	98.49	98.03	97.73	97.51	97.20
57	131.1	100.08	99.62	99.16	98.55	98.40	97.94	97.71	97.56	97.25
58	131.2	99.77	99.24	98.93	98.78	98.32	97.94	97.56	97.33	96.95
59	129.8	99.92	99.61	99.23	98.84	98.54	98.46	98.00	97.53	97.00
60	132.3	99.62	99.40	99.02	98.72	98.41	98.26	97.81	97.43	97.05
61	131.7	99.85	99.32	99.09	98.56	98.33	98.10	97.80	97.34	96.96
62	133.4	100.15	99.85	99.40	98.73	98.35	97.98	97.53	97.30	97.15
63	131.6	100.23	100.08	99.62	99.09	98.71	98.40	98.10	97.72	97.19
64	131.2	100.53	100.15	99.85	99.47	98.93	98.55	98.17	97.71	97.41
65	130.7	100.69	100.38	99.69	99.39	99.01	98.85	98.47	98.01	97.70
66	130.9	100.38	100.15	99.62	99.24	99.01	98.47	98.09	97.63	97.17
67	129.8	99.85	99.38	99.15	98.77	98.23	97.77	97.46	97.00	96.61
68	131.3	99.92	99.54	99.24	99.01	98.71	97.87	97.41	97.03	96.73
69	132.4	99.85	99.47	98.79	98.41	98.04	97.73	97.28	96.90	96.68
70	131.4	99.92	99.54	98.93	98.71	98.10	97.87	97.41	97.18	96.73
71	131.8	100.15	99.92	99.39	98.71	98.33	97.88	97.34	96.89	96.51
72	131.0	99.62	99.16	98.78	98.47	98.40	98.02	97.56	96.95	96.72
73	130.3	99.62	99.46	99.08	98.47	98.08	97.54	97.24	96.93	96.47
74	130.5	100.38	99.92	99.77	99.39	99.08	98.93	98.54	98.16	97.85
75	132.1	100.15	99.77	99.39	99.24	98.56	98.11	97.73	97.35	96.90
Avg.	131.4	100.05	99.70	99.28	98.87	98.50	98.11	97.73	97.36	97.01
Med.	131.4	100.08	99.62	99.24	98.78	98.40	98.02	97.71	97.34	96.96
st dev	0.8	0.28	0.31	0.31	0.31	0.29	0.34	0.35	0.35	0.34
Min.	129.8	99.62	99.16	98.78	98.41	98.04	97.54	97.24	96.89	96.47
Max.	133.4	100.69	100.38	99.85	99.47	99.08	98.93	98.54	98.16	97.85

3.8 Data Set 3, 115° C, 100mA (Forward Voltage)

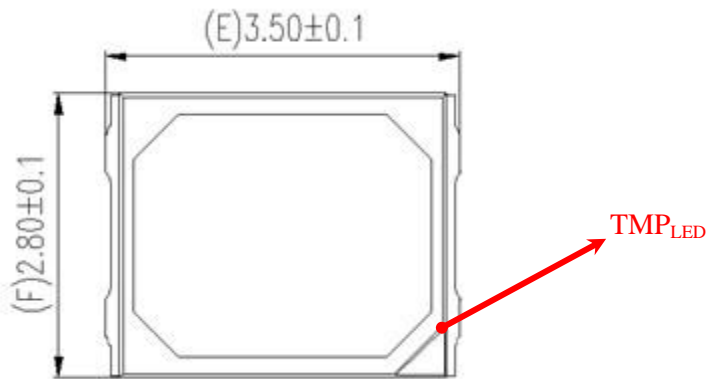
No.	Forward Voltage (V)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
51	8.853	8.857	8.835	8.875	8.887	8.829	8.901	8.819	8.942	8.826
52	8.782	8.807	8.864	8.851	8.883	8.823	8.902	8.814	8.806	8.874
53	8.795	8.805	8.845	8.884	8.882	8.840	8.852	8.905	8.821	8.824
54	8.791	8.788	8.826	8.834	8.870	8.823	8.877	8.806	8.807	8.824
55	8.799	8.830	8.842	8.848	8.902	8.844	8.876	8.844	8.817	8.818
56	8.799	8.793	8.852	8.856	8.906	8.858	8.773	8.867	8.834	8.897
57	8.786	8.791	8.823	8.823	8.857	8.826	8.873	8.811	8.807	8.810
58	8.720	8.713	8.749	8.749	8.788	8.751	8.786	8.735	8.739	8.744
59	8.722	8.845	8.770	8.802	8.842	8.756	8.780	8.804	8.767	9.062
60	8.916	8.811	8.901	8.915	8.917	8.840	8.881	8.838	8.832	8.832
61	8.803	8.793	8.831	8.833	8.866	8.825	8.881	8.814	8.827	8.814
62	8.757	8.755	8.799	8.823	8.851	8.795	8.894	8.799	8.801	8.785
63	8.803	8.788	8.831	8.857	8.869	8.839	8.857	8.826	8.819	8.824
64	8.788	8.797	8.834	8.829	8.861	8.823	8.868	8.819	8.818	8.818
65	8.816	8.811	8.858	8.841	8.871	8.853	8.964	8.835	8.849	8.882
66	8.770	8.788	8.797	8.800	8.916	8.791	8.863	8.795	8.781	8.783
67	8.791	8.832	8.861	8.874	8.883	8.835	8.773	8.889	8.812	8.821
68	8.788	8.795	8.829	8.845	8.871	8.829	8.868	8.826	8.820	8.814
69	8.805	8.801	8.840	8.840	8.877	8.839	8.876	8.829	8.828	8.838
70	8.791	8.793	8.827	8.840	8.869	8.828	8.878	8.821	8.814	8.811
71	8.797	8.820	8.839	8.842	8.869	8.821	8.932	8.841	8.819	8.819
72	8.816	8.818	8.845	8.839	8.851	8.816	8.928	8.902	8.806	8.811
73	8.776	8.797	8.826	8.826	8.856	8.829	8.876	8.822	8.811	8.815
74	8.786	8.784	8.832	8.822	8.856	8.818	8.870	8.820	8.823	8.808
75	8.776	8.778	8.817	8.817	8.846	8.808	8.850	8.806	8.801	8.802
Avg.	8.793	8.800	8.831	8.839	8.870	8.822	8.867	8.827	8.816	8.830
Med.	8.791	8.797	8.832	8.840	8.869	8.826	8.876	8.821	8.817	8.818
st dev	0.037	0.028	0.030	0.031	0.027	0.026	0.047	0.036	0.034	0.057
Min.	8.720	8.713	8.749	8.749	8.788	8.751	8.773	8.735	8.739	8.744
Max.	8.916	8.857	8.901	8.915	8.917	8.858	8.964	8.905	8.942	9.062

3.9 Data Set 3, 115° C, 100mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
				0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs
51	0.2622	0.5275	2706	0.0004	0.0006	0.0008	0.0013	0.0016	0.0016	0.0017	0.0020	0.0023
52	0.2651	0.5290	2642	0.0003	0.0005	0.0009	0.0013	0.0017	0.0017	0.0021	0.0022	0.0025
53	0.2645	0.5310	2645	0.0004	0.0005	0.0009	0.0012	0.0014	0.0016	0.0019	0.0020	0.0022
54	0.2634	0.5302	2671	0.0004	0.0005	0.0009	0.0013	0.0015	0.0017	0.0020	0.0022	0.0023
55	0.2651	0.5282	2644	0.0004	0.0005	0.0011	0.0011	0.0016	0.0017	0.0019	0.0024	0.0026
56	0.2646	0.5250	2666	0.0005	0.0006	0.0009	0.0009	0.0014	0.0016	0.0018	0.0021	0.0023
57	0.2635	0.5272	2681	0.0003	0.0006	0.0011	0.0012	0.0014	0.0017	0.0019	0.0021	0.0022
58	0.2649	0.5277	2649	0.0004	0.0006	0.0013	0.0013	0.0017	0.0020	0.0022	0.0023	0.0026
59	0.2647	0.5286	2650	0.0004	0.0006	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024
60	0.2634	0.5272	2682	0.0004	0.0008	0.0010	0.0012	0.0016	0.0017	0.0019	0.0022	0.0024
61	0.2654	0.5276	2639	0.0004	0.0005	0.0010	0.0011	0.0015	0.0016	0.0017	0.0020	0.0022
62	0.2619	0.5282	2709	0.0003	0.0006	0.0010	0.0012	0.0016	0.0017	0.0019	0.0022	0.0023
63	0.2662	0.5278	2625	0.0001	0.0004	0.0009	0.0013	0.0015	0.0018	0.0022	0.0024	0.0027
64	0.2650	0.5280	2646	0.0004	0.0005	0.0008	0.0012	0.0014	0.0016	0.0019	0.0023	0.0026
65	0.2643	0.5288	2659	0.0002	0.0004	0.0009	0.0011	0.0013	0.0015	0.0017	0.0020	0.0022
66	0.2651	0.5278	2646	0.0005	0.0006	0.0008	0.0013	0.0014	0.0016	0.0018	0.0019	0.0021
67	0.2666	0.5279	2615	0.0006	0.0008	0.0011	0.0011	0.0013	0.0015	0.0017	0.0020	0.0021
68	0.2660	0.5285	2624	0.0006	0.0008	0.0010	0.0012	0.0015	0.0016	0.0018	0.0020	0.0022
69	0.2620	0.5275	2710	0.0005	0.0008	0.0011	0.0011	0.0016	0.0016	0.0017	0.0020	0.0022
70	0.2657	0.5295	2628	0.0004	0.0007	0.0011	0.0014	0.0016	0.0017	0.0020	0.0021	0.0023
71	0.2643	0.5289	2658	0.0004	0.0006	0.0009	0.0013	0.0016	0.0018	0.0020	0.0022	0.0023
72	0.2645	0.5275	2657	0.0006	0.0007	0.0010	0.0012	0.0015	0.0017	0.0019	0.0020	0.0023
73	0.2640	0.5256	2676	0.0004	0.0006	0.0010	0.0010	0.0016	0.0018	0.0021	0.0022	0.0025
74	0.2656	0.5278	2635	0.0008	0.0009	0.0011	0.0013	0.0015	0.0015	0.0018	0.0021	0.0023
75	0.2651	0.5291	2640	0.0005	0.0009	0.0013	0.0014	0.0016	0.0016	0.0020	0.0022	0.0023
Avg.	0.2645	0.5281	2656	0.0004	0.0006	0.0010	0.0012	0.0015	0.0017	0.0019	0.0021	0.0023
Med.	0.2647	0.5279	2649	0.0004	0.0006	0.0010	0.0012	0.0015	0.0017	0.0019	0.0021	0.0023
st dev	0.0012	0.0012	26	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2619	0.5250	2615	0.0001	0.0004	0.0008	0.0009	0.0013	0.0015	0.0017	0.0019	0.0021
Max.	0.2666	0.5310	2710	0.0008	0.0009	0.0013	0.0014	0.0017	0.0020	0.0022	0.0024	0.0027

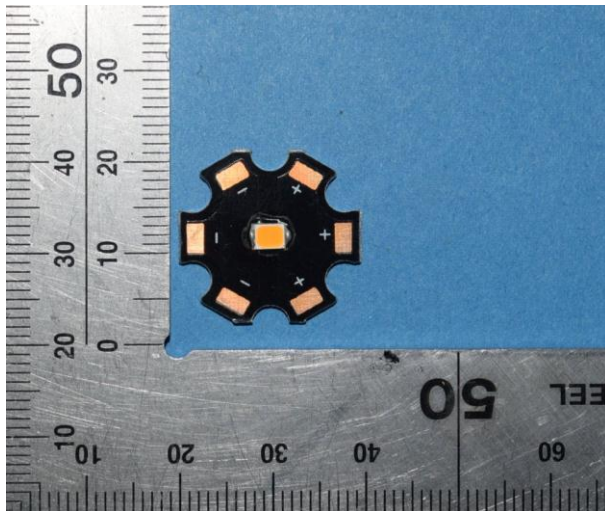
4 - DUT Photo

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*****