



IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Ningbo outlux Electrical Co.,LTD

No.1 Hetou Rd. Hengxi Ind. Ningbo China

Model:OLK LED SMD-2835 9v 100mA

Report Type: 6000 Hours Test Report		Product Type: LED Package	
Test Engineer:	Pote Wang <i>Pote Wang</i>		
Report Number:	RSZ160628501-10		
Test Date:	2016-07-01 to 2017-03-08		
Report Date:	2017-03-14		
Reviewed By:	Daniel Duan / EE Manager <i>Daniel Duan</i>		
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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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1 - General Information

1.1 Description of LED Light Sources

Devices tested

Part Number: OLK LED SMD-2835 9v 100mA
 Part Type: LED Package
 Nominal CCT: 3000K

1.2 Standards Used:

- IESNA LM-80-08: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- ENERGY STAR® Program Guidance Regarding LED Package, LED Array and LED Module Lumen Maintenance Performance Data Supporting Qualification of Lighting Products(This test method was not accredited by IAS)

1.3 Test Facility

The testing facility used by Bay Area Compliance Laboratories Corp. (Dongguan). is located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.

1.4 Description of Auxiliary Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Integral Sphere	EVERFINE	Diameter 0.3m	1011119	0.3m	2017-03-09	2018-03-08
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	15V/2000mA	2017-03-03	2018-03-02
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2017-03-09	2018-03-08
Standard Light Source	EVERFINE	D062	1011093	3000K	2016-09-13	2017-09-12
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987C J7321114	300VA	2017-03-03	2018-03-02
Multilayer aging machine	BACL	B2-270	20015	25 ℃~130 ℃	2017-03-03	2018-03-02
DC Power Supply	GUTE	LLA120011 2-U	201208200 1	0~120V,0~1A	2016-12-21	2017-12-20
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060010	(50/15A)	2017-03-03	2018-03-02

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090008	(50/15A)	2016-07-07	2017-07-06

1.5 Operating Cycle

Samples are driven with a constant direct current (DC)

1.6 Ambient Conditions

For lumen maintenance test, samples were operated in thermal chambers with minimal ambient airflow. For long term reliability test, the case temperature was controlled by mounting several thermocouples on a sample reliability stress board at the designated thermal measurement point, as shown in APPENDIX. The ambient temperature T_A was measured by several thermocouples at a distance of 5 mm above the reliability test board. The relative humidity within chamber was less than 65%.

For photometry measurement, temperature was set to $25\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, RH <65%.

1.7 Photometry 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 $U=21\text{K}$ ($K=2$), at the 95% confidence level. This calibration results traceable to the NATIONAL INSTITUTE OF METROLOGY (NIM).

1.8 Sample Set

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.

Each Sample is soldered to all of the reliability stress boards for a given set of IESNA LM-80 tests.

Sample Size:

Total 75Pcs;

Each Ts test condition 25Pcs

The samples tested at T_s 55 °C, T_s 85 °C and T_s 105 °C were received at 2016-06-28 and tested during 2016-07-01 to 2017-03-08. The samples were numbered from 1to 25, 26 to 50 and 51 to 75

Data Set 1: 55 °C, 100mA

Part Number:	OLK LED SMD-2835 9v 100mA
Number of Units:	25
Actual Case Temperature(T_s):	T_s =54.2 °C
Actual Ambient Temperature(T_A):	T_A =51.5 °C
Life Test Drive Current:	I_F = 100mA
Measurement Current:	I_F = 100mA

Data Set 2: 85 °C,100mA

Part Number:	OLK LED SMD-2835 9v 100mA
Number of Units:	25
Actual Case Temperature(T_s):	T_s =84.1 °C
Actual Ambient Temperature(T_A):	T_A =82.5 °C
Life Test Drive Current:	I_F =100mA
Measurement Current:	I_F = 100mA

Data Set 3: 105 °C, 100mA

Part Number:	OLK LED SMD-2835 9v 100mA
Number of Units:	25
Actual Case Temperature(T_s):	T_s =104.5 °C
Actual Ambient Temperature(T_A):	T_A =103.1 °C
Life Test Drive Current:	I_F = 100mA
Measurement Current:	I_F = 100mA

2 - Summary of Test Result

Data Set:	Data Set 1, 55 °C, 100mA
Number of Units:	25
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h
Average. Lumen Maintenance at 6000 hours:	99.32%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$):	0.0011
Reported TM-21 L ₇₀ Lifetime:	>36000 hours

Data Set:	Data Set 2, 85 °C, 100mA
Number of Units:	25
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h
Average. Lumen Maintenance at 6000 hours:	98.82%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0014
Reported TM-21 L ₇₀ Lifetime:	>36000 hours

Data Set:	Data Set 3, 105 °C, 100mA
Number of Units:	25
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h
Average. Lumen Maintenance at 6000 hours:	98.43%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0015
Reported TM-21 L ₇₀ Lifetime:	>36000 hours

3 - Test Data

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

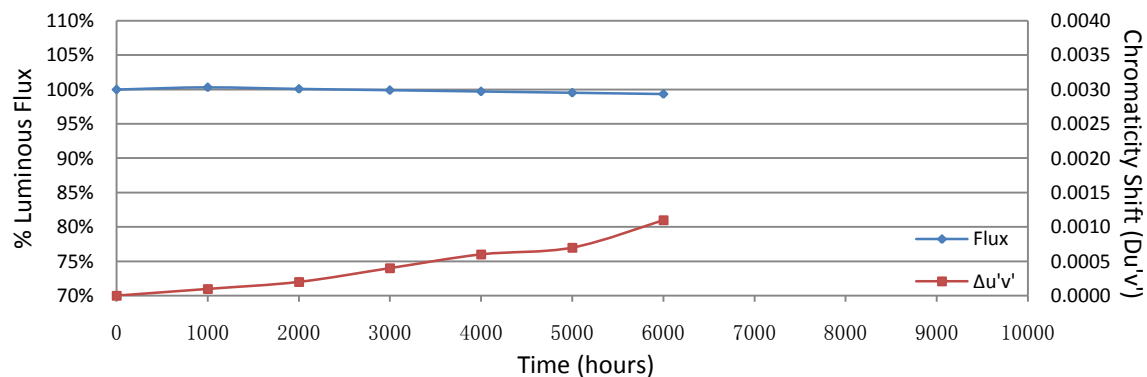
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	9.279	144.2	100.35	100.28	100.07	99.86	99.65	99.45
2	9.000	142.0	100.28	100.14	99.86	99.65	99.51	99.30
3	8.966	146.3	100.41	100.14	99.93	99.73	99.59	99.32
4	9.072	146.7	100.48	100.14	99.86	99.59	99.32	99.18
5	8.993	145.1	100.34	100.07	99.93	99.86	99.72	99.59
6	9.203	142.9	100.42	100.28	100.07	99.86	99.65	99.44
7	9.104	144.8	100.48	100.35	100.21	99.86	99.65	99.59
8	9.014	144.2	100.21	100.07	99.93	99.79	99.51	99.38
9	9.098	145.1	100.28	100.21	100.14	99.93	99.59	99.31
10	9.045	144.3	100.35	99.93	99.86	99.72	99.51	99.38
11	9.188	143.8	100.14	100.07	99.79	99.58	99.24	99.17
12	9.056	145.0	100.28	100.00	99.86	99.59	99.38	99.31
13	9.002	141.9	100.21	100.07	99.93	99.79	99.58	99.30
14	9.234	144.7	100.28	99.86	99.65	99.52	99.45	99.38
15	9.037	142.8	100.35	100.07	99.93	99.72	99.58	99.37
16	9.264	143.7	100.21	99.79	99.58	99.44	99.37	99.10
17	8.973	144.0	100.35	99.86	99.72	99.31	99.17	99.03
18	9.064	144.1	100.28	100.14	99.93	99.86	99.65	99.31
19	8.920	143.1	100.35	99.93	99.86	99.72	99.51	99.23
20	9.078	144.3	100.42	100.35	100.14	99.86	99.65	99.51
21	9.032	141.3	100.28	100.07	99.93	99.79	99.58	99.50
22	8.968	142.9	100.21	100.00	99.72	99.51	99.37	99.16
23	9.041	144.5	100.28	100.07	99.86	99.52	99.45	99.24
24	9.140	142.7	100.21	100.00	99.93	99.72	99.51	99.37
25	8.953	142.7	100.35	100.14	99.79	99.58	99.37	99.09
Ave.	9.069	143.9	100.31	100.08	99.90	99.69	99.50	99.32
Med.	9.045	144.1	100.28	100.07	99.93	99.72	99.51	99.31
st dev	0.099	1.3	0.0885	0.1439	0.1487	0.1602	0.1423	0.1489
Min.	8.920	141.3	100.14	99.79	99.58	99.31	99.17	99.03
Max.	9.279	146.7	100.48	100.35	100.21	99.93	99.72	99.59

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 1.975E-06
 β : 1.005
Reported L₇₀: >36000 hours

3.2 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
1	0.2496	0.5253	3000	0.0001	0.0004	0.0006	0.0005	0.0009	0.0012
2	0.2494	0.5246	3009	0.0001	0.0002	0.0005	0.0005	0.0008	0.0011
3	0.2489	0.5254	3016	0.0001	0.0001	0.0005	0.0008	0.0006	0.0010
4	0.2498	0.5251	2996	0.0001	0.0002	0.0004	0.0008	0.0008	0.0010
5	0.2496	0.5259	2995	0.0001	0.0002	0.0004	0.0008	0.0006	0.0011
6	0.2492	0.5250	3011	0.0001	0.0001	0.0004	0.0008	0.0009	0.0012
7	0.2493	0.5259	3004	0.0001	0.0001	0.0005	0.0006	0.0008	0.0010
8	0.2495	0.5241	3009	0.0001	0.0001	0.0005	0.0005	0.0007	0.0010
9	0.2482	0.5254	3032	0.0002	0.0003	0.0006	0.0004	0.0008	0.0012
10	0.2498	0.5242	3002	0.0002	0.0003	0.0004	0.0002	0.0006	0.0009
11	0.2498	0.5252	2996	0.0002	0.0002	0.0005	0.0008	0.0007	0.0012
12	0.2500	0.5249	2992	0.0001	0.0001	0.0004	0.0008	0.0006	0.0009
13	0.2490	0.5238	3024	0.0001	0.0002	0.0004	0.0006	0.0009	0.0012
14	0.2490	0.5250	3016	0.0001	0.0002	0.0004	0.0006	0.0007	0.0009
15	0.2494	0.5240	3012	0.0001	0.0001	0.0003	0.0005	0.0006	0.0009
16	0.2466	0.5235	3085	0.0001	0.0001	0.0004	0.0005	0.0006	0.0009
17	0.2488	0.5247	3023	0.0001	0.0004	0.0005	0.0006	0.0007	0.0010
18	0.2494	0.5266	2997	0.0001	0.0002	0.0004	0.0006	0.0009	0.0011
19	0.2495	0.5248	3006	0.0001	0.0005	0.0004	0.0006	0.0008	0.0011
20	0.2496	0.5243	3006	0.0001	0.0003	0.0004	0.0007	0.0008	0.0010
21	0.2497	0.5251	2998	0.0001	0.0004	0.0005	0.0006	0.0009	0.0012
22	0.2490	0.5227	3031	0.0000	0.0002	0.0003	0.0006	0.0006	0.0009
23	0.2492	0.5245	3014	0.0001	0.0001	0.0003	0.0005	0.0007	0.0009
24	0.2491	0.5247	3016	0.0001	0.0003	0.0004	0.0006	0.0007	0.0011
25	0.2502	0.5242	2991	0.0001	0.0002	0.0004	0.0007	0.0008	0.0012
Ave.	0.2493	0.5248	3011	0.0001	0.0002	0.0004	0.0006	0.0007	0.0011
Med.	0.2494	0.5248	3009	0.0001	0.0002	0.0004	0.0006	0.0007	0.0010
st dev	0.0007	0.0008	19	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2466	0.5227	2991	0.0000	0.0001	0.0003	0.0002	0.0006	0.0009
Max.	0.2502	0.5266	3085	0.0002	0.0005	0.0006	0.0008	0.0009	0.0012



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

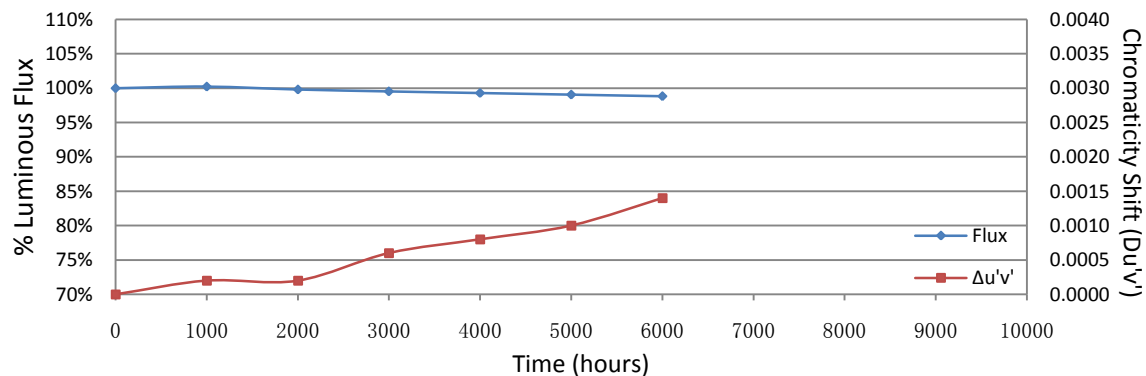
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	9.272	144.5	100.28	99.93	99.72	99.38	99.17	98.96
27	9.057	144.0	100.14	99.65	99.38	99.24	99.03	98.68
28	9.178	144.2	100.21	99.79	99.51	99.31	99.10	98.82
29	9.015	142.6	100.07	99.79	99.65	99.37	99.23	99.02
30	9.251	144.3	100.14	99.65	99.31	98.89	98.61	98.41
31	9.242	142.8	100.28	99.79	99.37	99.30	99.02	98.74
32	9.250	143.7	100.07	99.58	99.23	98.96	98.82	98.68
33	9.106	143.4	100.21	99.93	99.65	99.51	99.23	98.95
34	9.193	144.5	100.28	99.86	99.72	99.58	99.45	99.31
35	9.046	144.5	100.14	99.58	99.38	99.03	98.96	98.69
36	9.128	144.6	100.35	99.72	99.59	99.17	98.96	98.76
37	8.976	144.3	100.21	99.86	99.58	99.45	99.03	98.68
38	9.112	143.9	100.35	100.28	100.14	99.79	99.51	99.31
39	9.086	143.3	100.07	99.86	99.58	99.44	99.23	99.16
40	9.129	143.2	100.28	99.86	99.51	99.23	99.09	98.81
41	9.056	143.4	100.07	99.65	99.37	99.09	98.81	98.54
42	9.088	141.5	100.14	99.65	99.36	99.08	98.59	98.37
43	9.105	142.5	100.21	99.93	99.51	99.37	99.02	98.88
44	9.073	143.4	100.14	99.93	99.65	99.44	99.09	98.88
45	9.180	143.6	100.28	99.79	99.37	98.96	98.75	98.61
46	9.179	143.7	100.35	99.79	99.44	99.23	98.82	98.68
47	9.038	142.1	100.28	100.07	99.79	99.65	99.58	99.23
48	9.350	145.1	100.14	99.79	99.45	99.17	98.97	98.69
49	9.143	144.1	100.28	99.72	99.44	99.31	99.03	98.61
50	9.105	145.2	100.34	99.79	99.59	99.45	99.24	98.97
Ave.	9.134	143.7	100.21	99.81	99.53	99.30	99.05	98.82
Med.	9.112	143.7	100.21	99.79	99.51	99.31	99.03	98.76
st dev	0.090	0.9	0.0949	0.1549	0.1912	0.2236	0.2494	0.2521
Min.	8.976	141.5	100.07	99.58	99.23	98.89	98.59	98.37
Max.	9.350	145.2	100.35	100.28	100.14	99.79	99.58	99.31

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 2.717E-06
 β : 1.004
Reported L₇₀: >36000 hours

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	0.2484	0.5244	3035	0.0001	0.0001	0.0005	0.0006	0.0010	0.0013
27	0.2498	0.5248	2997	0.0001	0.0001	0.0005	0.0006	0.0011	0.0013
28	0.2496	0.5248	3002	0.0002	0.0001	0.0005	0.0006	0.0007	0.0012
29	0.2499	0.5253	2991	0.0001	0.0004	0.0008	0.0008	0.0012	0.0016
30	0.2502	0.5239	2993	0.0001	0.0001	0.0005	0.0006	0.0006	0.0013
31	0.2490	0.5248	3016	0.0002	0.0001	0.0004	0.0008	0.0011	0.0015
32	0.2494	0.5245	3008	0.0001	0.0001	0.0005	0.0008	0.0010	0.0013
33	0.2496	0.5254	2999	0.0001	0.0001	0.0006	0.0008	0.0013	0.0016
34	0.2492	0.5247	3013	0.0002	0.0002	0.0006	0.0009	0.0011	0.0015
35	0.2472	0.5244	3064	0.0001	0.0002	0.0006	0.0009	0.0009	0.0014
36	0.2488	0.5243	3026	0.0001	0.0002	0.0005	0.0008	0.0009	0.0013
37	0.2488	0.5245	3024	0.0002	0.0002	0.0006	0.0011	0.0014	0.0016
38	0.2482	0.5251	3036	0.0001	0.0001	0.0006	0.0008	0.0011	0.0014
39	0.2471	0.5253	3060	0.0001	0.0001	0.0004	0.0008	0.0009	0.0013
40	0.2498	0.5248	2996	0.0002	0.0002	0.0005	0.0008	0.0010	0.0013
41	0.2497	0.5252	2997	0.0001	0.0001	0.0005	0.0008	0.0011	0.0016
42	0.2490	0.5252	3016	0.0003	0.0003	0.0006	0.0009	0.0011	0.0015
43	0.2496	0.5253	3000	0.0001	0.0002	0.0005	0.0007	0.0009	0.0013
44	0.2494	0.5243	3010	0.0001	0.0002	0.0006	0.0005	0.0008	0.0013
45	0.2489	0.5254	3017	0.0002	0.0002	0.0006	0.0007	0.0008	0.0014
46	0.2478	0.5258	3041	0.0001	0.0004	0.0008	0.0008	0.0009	0.0015
47	0.2505	0.5238	2986	0.0004	0.0007	0.0011	0.0011	0.0014	0.0017
48	0.2497	0.5251	2999	0.0002	0.0003	0.0006	0.0007	0.0010	0.0016
49	0.2495	0.5253	3002	0.0002	0.0002	0.0006	0.0007	0.0008	0.0013
50	0.2487	0.5243	3027	0.0003	0.0003	0.0006	0.0006	0.0007	0.0014
Ave.	0.2491	0.5248	3014	0.0002	0.0002	0.0006	0.0008	0.0010	0.0014
Med.	0.2494	0.5248	3010	0.0001	0.0002	0.0006	0.0008	0.0010	0.0014
st dev	0.0009	0.0005	21	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001
Min.	0.2471	0.5238	2986	0.0001	0.0001	0.0004	0.0005	0.0006	0.0012
Max.	0.2505	0.5258	3064	0.0004	0.0007	0.0011	0.0011	0.0014	0.0017



3.5 Data Set 3, 105 °C, 100mA (Lumen Maintenance)

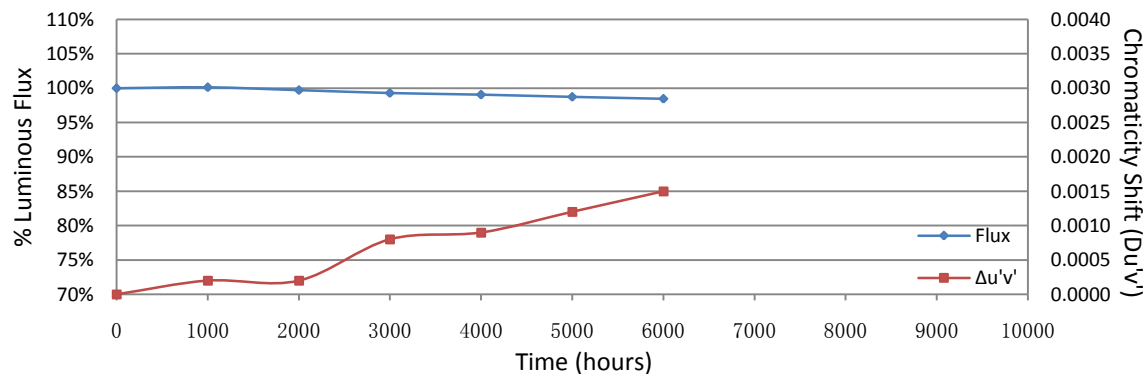
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	8.968	144.2	100.14	99.72	99.38	99.31	99.17	98.96
52	9.073	142.1	100.28	99.65	99.44	99.30	98.87	98.52
53	8.981	144.2	100.35	100.14	99.72	99.58	99.31	98.89
54	9.144	144.2	100.07	99.72	99.38	99.10	98.82	98.61
55	8.932	144.0	100.14	99.51	99.24	99.10	98.89	98.61
56	9.092	144.8	100.07	99.86	99.31	98.96	98.83	98.62
57	9.259	143.5	100.14	99.58	99.30	99.16	98.75	98.40
58	9.102	144.8	100.07	99.93	99.45	99.38	98.96	98.62
59	8.978	144.2	100.21	99.93	99.31	98.89	98.54	98.27
60	9.148	143.9	99.86	99.31	98.96	98.75	98.61	98.40
61	9.090	144.5	100.07	99.86	99.38	99.03	98.75	98.41
62	9.155	143.9	100.21	99.72	99.37	99.17	98.89	98.68
63	8.981	142.3	100.21	99.65	99.16	98.81	98.66	98.45
64	9.127	144.2	100.07	99.86	99.31	99.10	98.89	98.61
65	9.111	142.6	99.93	99.79	99.37	99.02	98.74	98.60
66	9.059	144.7	99.86	99.45	99.10	98.76	98.48	98.13
67	8.989	143.8	100.14	99.72	99.30	99.03	98.75	98.33
68	9.317	142.4	100.07	99.93	99.51	99.09	98.53	98.24
69	9.239	145.8	99.93	99.31	98.90	98.49	98.08	97.81
70	9.114	142.7	100.07	99.58	99.23	99.02	98.53	98.18
71	9.012	143.5	100.14	99.44	98.95	98.75	98.40	98.12
72	9.092	144.7	100.35	100.00	99.65	99.31	98.96	98.69
73	9.049	145.4	100.28	99.59	99.17	98.90	98.49	98.14
74	9.219	144.2	100.07	99.58	99.24	98.82	98.47	97.99
75	9.082	144.0	99.93	99.72	99.44	99.03	98.75	98.40
Ave.	9.093	143.9	100.11	99.70	99.30	99.03	98.72	98.43
Med.	9.092	144.2	100.07	99.72	99.31	99.03	98.75	98.41
st dev	0.097	0.9	0.1346	0.2102	0.1958	0.2387	0.2586	0.2753
Min.	8.932	142.1	99.86	99.31	98.90	98.49	98.08	97.81
Max.	9.317	145.8	100.35	100.14	99.72	99.58	99.31	98.96

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 3.342E-06
 β : 1.004
Reported L₇₀: >36000 hours

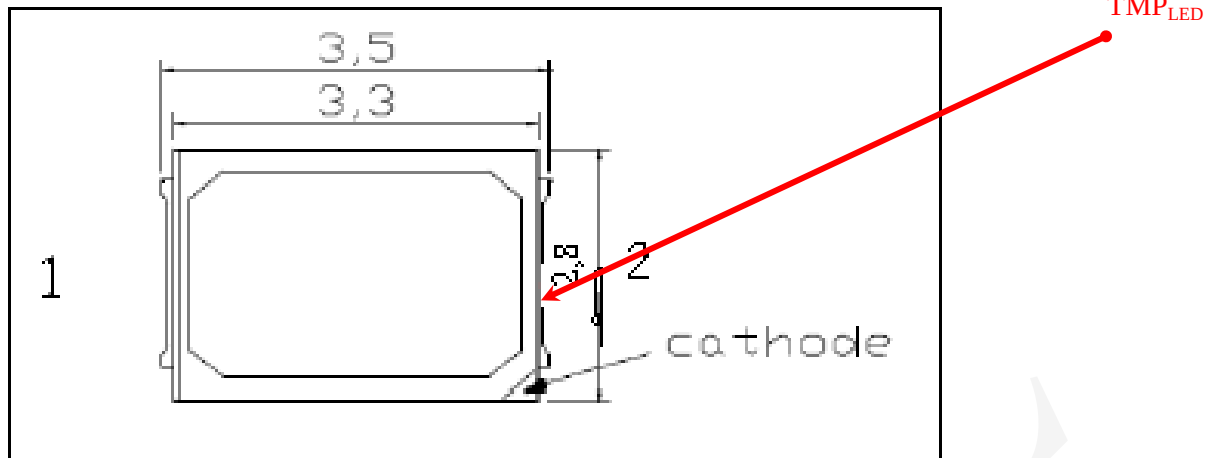
3.6 Data Set 3, 105 °C, 100mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	0.2493	0.5258	3003	0.0001	0.0003	0.0008	0.0006	0.0008	0.0014
52	0.2493	0.5256	3005	0.0001	0.0004	0.0009	0.0013	0.0014	0.0018
53	0.2486	0.5249	3026	0.0001	0.0002	0.0007	0.0010	0.0010	0.0014
54	0.2497	0.5259	2993	0.0002	0.0002	0.0008	0.0012	0.0009	0.0014
55	0.2490	0.5249	3017	0.0002	0.0002	0.0009	0.0013	0.0010	0.0015
56	0.2488	0.5243	3024	0.0002	0.0001	0.0008	0.0009	0.0011	0.0015
57	0.2488	0.5250	3020	0.0003	0.0004	0.0010	0.0009	0.0012	0.0017
58	0.2504	0.5243	2986	0.0002	0.0002	0.0008	0.0009	0.0010	0.0014
59	0.2493	0.5239	3016	0.0001	0.0001	0.0009	0.0009	0.0010	0.0014
60	0.2490	0.5263	3006	0.0002	0.0001	0.0007	0.0009	0.0009	0.0013
61	0.2488	0.5235	3029	0.0001	0.0001	0.0006	0.0012	0.0012	0.0014
62	0.2480	0.5242	3047	0.0003	0.0002	0.0009	0.0009	0.0011	0.0015
63	0.2498	0.5252	2995	0.0002	0.0001	0.0007	0.0009	0.0011	0.0014
64	0.2490	0.5249	3016	0.0002	0.0002	0.0008	0.0008	0.0015	0.0016
65	0.2499	0.5243	2999	0.0001	0.0001	0.0008	0.0007	0.0012	0.0014
66	0.2498	0.5249	2996	0.0001	0.0002	0.0007	0.0009	0.0011	0.0014
67	0.2478	0.5260	3040	0.0003	0.0006	0.0011	0.0012	0.0016	0.0018
68	0.2492	0.5238	3019	0.0002	0.0002	0.0008	0.0009	0.0012	0.0016
69	0.2495	0.5261	2996	0.0001	0.0001	0.0007	0.0007	0.0012	0.0014
70	0.2498	0.5252	2994	0.0001	0.0002	0.0007	0.0008	0.0012	0.0017
71	0.2489	0.5247	3021	0.0002	0.0004	0.0009	0.0011	0.0013	0.0017
72	0.2486	0.5245	3030	0.0002	0.0004	0.0009	0.0009	0.0013	0.0016
73	0.2487	0.5244	3027	0.0002	0.0002	0.0008	0.0008	0.0013	0.0015
74	0.2482	0.5249	3036	0.0002	0.0002	0.0007	0.0008	0.0011	0.0014
75	0.2492	0.5265	3002	0.0002	0.0002	0.0009	0.0010	0.0013	0.0016
Ave.	0.2491	0.5250	3014	0.0002	0.0002	0.0008	0.0009	0.0012	0.0015
Med.	0.2490	0.5249	3016	0.0002	0.0002	0.0008	0.0009	0.0012	0.0015
st dev	0.0006	0.0008	17	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001
Min.	0.2478	0.5235	2986	0.0001	0.0001	0.0006	0.0006	0.0008	0.0013
Max.	0.2504	0.5265	3047	0.0003	0.0006	0.0011	0.0013	0.0016	0.0018



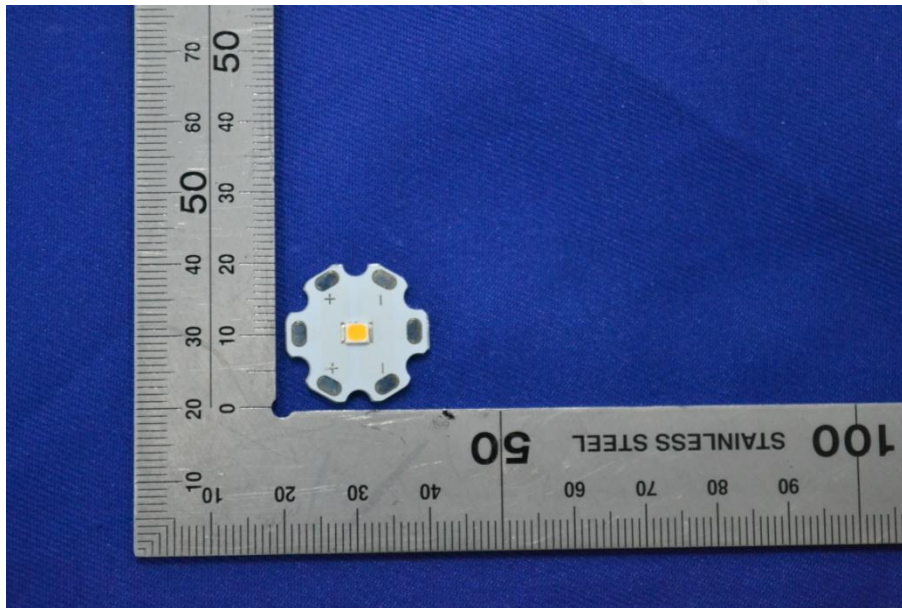
Attachment A – EUT Photo

A.1 Mechanical Dimensions (Ta = 25 °C)



All dimensions are in millimeter

A.2 EUT Photo



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