



IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Guangzhou Hongli Opto-Electronic Co., Ltd.

No.1, Xianke Yi Road, Huadong Town, Huadu District, Guangzhou, China

Model: HL-A-2835HW-S1-08-HR3

Report Type: 6000 Hours Test Report	Product Type: LED Package
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Report Number: RSZ140217504-10	
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Report Date: 2014-11-06	
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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: HL-A-2835HW-S1-08-HR3
 Part Type: LED Package
 Nominal CCT: 2700K

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	380-780nm, Diameter:0.3m,0-1999Lumen	2014-03-04	2015-03-04
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	15V/2000mA	2014-03-12	2015-03-12
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2013-12-26	2014-12-26
Standard Light Source	EVERFINE	D062	1011093	N/A	2014-05-06	2015-05-06
Precision digital stabilized DC power supply	EVERFINE	WY605	G115987C J7321114	300VA	2014-03-12	2015-03-12
Multilayen aging machine	Bacl	B2-270	8/Oct/54	N/A	2014-08-11	2015-08-11
Digital CC&CV DC Power Supply	everfine	WY5015	11090003	(50/15A)	2014-03-12	2015-03-12
Digital CC&CV DC Power Supply	everfine	WY5015	11090006	(50/15A)	2014-03-12	2015-03-12
Digital CC&CV DC Power Supply	everfine	WY5015	11090007	(50/15A)	2014-03-12	2015-03-12

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 Ts 55 °C, 85 °C and Ts 105 °C were received at 2014-02-17 and tested during 2014-02-20 to 2014-10-28. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75

Data Set 1: 55 °C, 60mA

Part Number:	HL-A-2835HW-S1-08-HR3
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 54.1$ °C
Actual Ambient Temperature(T_A):	$T_A = 51.9$ °C
Life Test Drive Current:	$I_F = 60$ mA
Measurement Current:	$I_F = 60$ mA

Data Set 2: 85 °C, 60mA

Part Number:	HL-A-2835HW-S1-08-HR3
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 84.3$ °C
Actual Ambient Temperature(T_A):	$T_A = 82.7$ °C
Life Test Drive Current:	$I_F = 60$ mA
Measurement Current:	$I_F = 60$ mA

Data Set 3: 105 °C, 60mA

Part Number:	HL-A-2835HW-S1-08-HR3
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 104.2$ °C
Actual Ambient Temperature(T_A):	$T_A = 103.4$ °C
Life Test Drive Current:	$I_F = 60$ mA
Measurement Current:	$I_F = 60$ mA

2 - SUMMARY OF TEST RESULT

Data Set:	Data Set 1, 55 °C, 60mA
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:	97.47%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$):	0.0017
Reported TM-21 L ₇₀ Lifetime:	>36,000 hours

Data Set:	Data Set 2, 85 °C, 60mA
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:	96.90%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0022
Reported TM-21 L ₇₀ Lifetime:	>36,000 hours

Data Set:	Data Set 3, 105 °C, 60mA
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:	96.39%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0027
Reported TM-21 L ₇₀ Lifetime:	>36,000 hours

3 - Test Data

3.1 Data Set 1, 55 °C, 60mA (Lumen Maintenance)

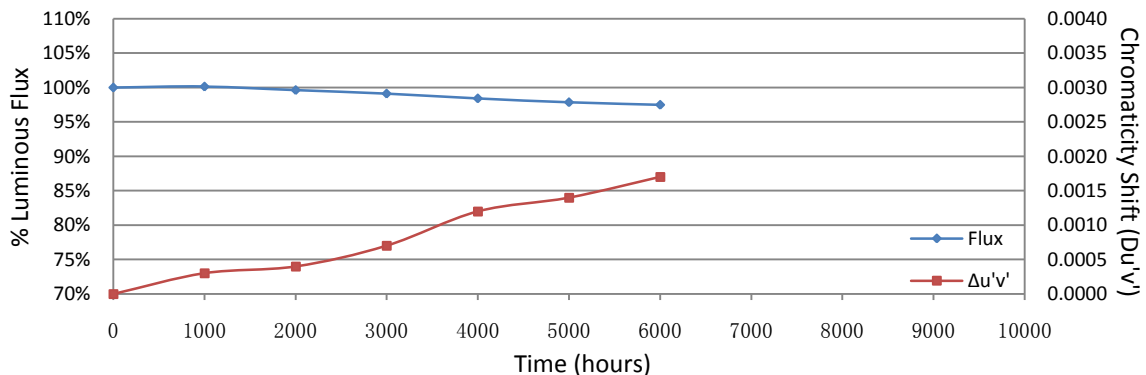
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2.808	23.10	100.30	99.52	99.18	98.53	98.10	97.62
2	2.806	23.48	100.21	99.62	99.11	98.55	97.83	97.40
3	2.804	23.15	100.22	99.61	99.05	98.36	97.80	97.41
4	2.806	23.51	100.17	99.53	98.98	98.30	98.09	97.70
5	2.807	23.81	100.00	99.71	99.12	98.45	97.82	97.65
6	2.803	23.18	100.17	99.78	99.27	98.66	98.14	97.84
7	2.804	23.42	100.04	99.70	99.23	98.59	98.25	97.69
8	2.806	23.12	99.96	99.44	99.01	98.31	97.75	97.32
9	2.800	23.33	100.43	99.57	98.93	98.41	97.47	97.09
10	2.808	23.31	100.00	99.66	98.88	97.94	97.81	97.51
11	2.808	23.03	100.43	99.78	99.26	98.61	97.83	97.70
12	2.809	23.08	100.52	99.83	99.22	98.22	97.57	97.10
13	2.806	23.20	100.30	99.74	99.31	98.49	97.80	97.24
14	2.806	23.21	100.13	99.61	99.14	98.62	97.76	97.63
15	2.805	23.62	100.76	100.17	99.36	98.52	97.63	97.21
16	2.801	23.27	99.79	99.18	98.28	97.59	97.46	97.12
17	2.809	23.44	100.04	99.45	99.23	98.72	98.12	97.82
18	2.809	23.60	100.04	99.49	99.03	98.22	97.88	97.42
19	2.805	23.06	100.17	99.74	99.31	98.44	98.14	97.79
20	2.804	23.64	100.00	99.41	98.86	98.14	97.55	97.08
21	2.806	22.93	100.22	99.52	99.08	98.39	97.82	97.43
22	2.802	22.63	99.78	99.51	99.03	98.19	97.39	97.08
23	2.807	23.33	100.04	99.70	99.40	98.54	97.94	97.56
24	2.804	23.09	99.83	99.22	98.70	98.35	97.96	97.53
25	2.805	23.36	100.04	99.44	99.19	98.37	98.12	97.73
Ave.	2.806	23.28	100.14	99.60	99.09	98.38	97.84	97.47
Med.	2.806	23.27	100.13	99.61	99.12	98.41	97.82	97.51
st dev	0.0024	0.2587	0.2299	0.2024	0.2382	0.2448	0.2377	0.2542
Min.	2.800	22.63	99.78	99.18	98.28	97.59	97.39	97.08
Max.	2.809	23.81	100.76	100.17	99.40	98.72	98.25	97.84

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 5.594E-06
 β : 1.007
Calculated L₇₀: 65,000hours
Reported L₇₀: >36,000hours

3.2 Data Set 1, 55 °C, 60mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2645	0.5254	2666	0.0001	0.0005	0.0007	0.0012	0.0015	0.0017
2	0.2636	0.5261	2683	0.0003	0.0004	0.0005	0.0010	0.0016	0.0018
3	0.2640	0.5244	2681	0.0002	0.0004	0.0004	0.0010	0.0014	0.0017
4	0.2648	0.5252	2660	0.0003	0.0004	0.0005	0.0010	0.0015	0.0017
5	0.2637	0.5247	2686	0.0003	0.0005	0.0004	0.0007	0.0017	0.0019
6	0.2643	0.5245	2673	0.0003	0.0004	0.0006	0.0009	0.0013	0.0016
7	0.2656	0.5261	2641	0.0004	0.0003	0.0007	0.0010	0.0014	0.0017
8	0.2643	0.5270	2665	0.0003	0.0004	0.0008	0.0011	0.0014	0.0017
9	0.2657	0.5265	2638	0.0002	0.0003	0.0009	0.0011	0.0013	0.0016
10	0.2651	0.5273	2647	0.0002	0.0003	0.0009	0.0014	0.0014	0.0017
11	0.2634	0.5249	2690	0.0004	0.0001	0.0006	0.0013	0.0014	0.0016
12	0.2647	0.5257	2662	0.0002	0.0004	0.0007	0.0013	0.0010	0.0013
13	0.2652	0.5256	2652	0.0002	0.0003	0.0007	0.0014	0.0014	0.0017
14	0.2642	0.5254	2672	0.0003	0.0001	0.0006	0.0014	0.0012	0.0015
15	0.2651	0.5273	2647	0.0004	0.0006	0.0003	0.0010	0.0021	0.0025
16	0.2646	0.5256	2663	0.0002	0.0004	0.0007	0.0014	0.0013	0.0016
17	0.2637	0.5249	2684	0.0002	0.0004	0.0006	0.0013	0.0013	0.0016
18	0.2644	0.5271	2662	0.0003	0.0004	0.0006	0.0013	0.0013	0.0015
19	0.2624	0.5227	2721	0.0002	0.0002	0.0008	0.0014	0.0016	0.0019
20	0.2647	0.5260	2660	0.0001	0.0005	0.0009	0.0016	0.0013	0.0017
21	0.2633	0.5249	2694	0.0002	0.0004	0.0009	0.0015	0.0014	0.0016
22	0.2651	0.5261	2652	0.0002	0.0004	0.0007	0.0014	0.0015	0.0019
23	0.2654	0.5265	2645	0.0002	0.0004	0.0006	0.0013	0.0016	0.0019
24	0.2625	0.5237	2715	0.0002	0.0004	0.0006	0.0013	0.0014	0.0018
25	0.2651	0.5249	2656	0.0002	0.0004	0.0007	0.0014	0.0015	0.0019
Ave.	0.2644	0.5255	2669	0.0003	0.0004	0.0007	0.0012	0.0014	0.0017
Med.	0.2645	0.5256	2663	0.0002	0.0004	0.0007	0.0013	0.0014	0.0017
st dev	0.0009	0.0011	21.5232	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002
Min.	0.2624	0.5227	2638	0.0001	0.0001	0.0003	0.0007	0.0010	0.0013
Max.	0.2657	0.5273	2721	0.0004	0.0006	0.0009	0.0016	0.0021	0.0025



3.3 Data Set 2, 85 °C, 60mA (Lumen Maintenance)

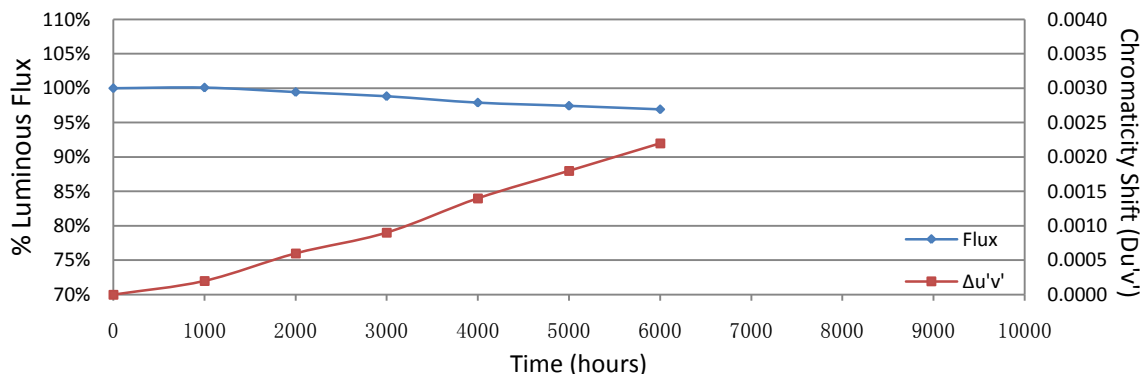
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	2.803	23.25	99.96	99.40	98.71	97.81	97.20	96.86
27	2.806	23.59	100.59	99.92	99.15	98.22	97.92	97.50
28	2.807	23.56	100.47	99.79	98.73	97.88	97.16	96.48
29	2.807	23.51	99.96	99.28	98.26	97.53	97.15	96.72
30	2.801	23.20	100.52	99.66	98.79	98.02	97.46	97.07
31	2.807	23.26	99.83	99.27	98.32	97.38	97.08	96.69
32	2.805	23.12	100.04	99.18	98.36	97.58	97.28	96.76
33	2.806	23.69	100.34	99.66	98.90	98.10	97.55	97.13
34	2.805	23.39	100.13	99.32	98.33	97.35	97.22	96.71
35	2.808	22.61	99.91	99.34	98.85	97.74	97.35	96.90
36	2.806	22.93	99.91	99.22	98.82	97.65	97.30	96.77
37	2.803	23.38	100.09	99.44	98.97	98.12	97.26	96.71
38	2.809	23.35	99.91	99.49	98.97	97.94	97.43	96.75
39	2.803	23.03	99.96	99.52	98.87	98.18	97.48	97.09
40	2.801	22.91	100.39	99.74	99.26	98.17	97.95	97.47
41	2.804	23.11	100.30	99.74	99.18	98.18	97.62	97.14
42	2.807	23.31	100.17	99.79	99.31	98.41	97.68	97.25
43	2.807	23.33	99.87	99.40	98.93	98.07	97.21	96.70
44	2.808	23.13	99.96	99.65	99.22	98.14	97.62	97.02
45	2.806	23.31	100.34	99.66	99.06	98.46	98.24	97.73
46	2.806	23.55	100.08	99.19	98.34	97.75	97.24	96.52
47	2.804	23.81	99.79	98.91	98.49	97.52	97.14	96.60
48	2.807	23.65	99.92	99.11	98.86	97.76	97.08	96.58
49	2.810	23.20	99.91	99.09	98.62	97.41	97.16	96.55
50	2.806	23.45	99.96	99.19	98.76	97.57	97.36	96.80
Ave.	2.806	23.31	100.09	99.44	98.80	97.88	97.41	96.90
Med.	2.806	23.31	99.96	99.40	98.85	97.88	97.30	96.77
st dev	0.0023	0.2733	0.2328	0.2646	0.3144	0.3242	0.2976	0.3282
Min.	2.801	22.61	99.79	98.91	98.26	97.35	97.08	96.48
Max.	2.810	23.81	100.59	99.92	99.31	98.46	98.24	97.73

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 6.662E-06
β: 1.007
Calculated L₇₀: 55,000hours
Reported L₇₀: >36,000hours

3.4 Data Set 2, 85 °C, 60mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	0.2654	0.5262	2646	0.0001	0.0004	0.0007	0.0013	0.0019	0.0023
27	0.2655	0.5264	2642	0.0001	0.0003	0.0006	0.0014	0.0021	0.0025
28	0.2647	0.5258	2661	0.0004	0.0007	0.0008	0.0014	0.0014	0.0018
29	0.2630	0.5244	2702	0.0002	0.0006	0.0010	0.0015	0.0018	0.0021
30	0.2632	0.5242	2699	0.0003	0.0005	0.0011	0.0014	0.0018	0.0021
31	0.2622	0.5231	2724	0.0003	0.0005	0.0008	0.0013	0.0019	0.0022
32	0.2652	0.5270	2646	0.0004	0.0006	0.0009	0.0014	0.0017	0.0022
33	0.2660	0.5256	2635	0.0002	0.0007	0.0009	0.0014	0.0019	0.0023
34	0.2666	0.5259	2623	0.0001	0.0004	0.0009	0.0016	0.0018	0.0023
35	0.2653	0.5251	2651	0.0001	0.0007	0.0012	0.0021	0.0013	0.0016
36	0.2631	0.5255	2694	0.0001	0.0006	0.0010	0.0017	0.0018	0.0021
37	0.2660	0.5257	2634	0.0001	0.0007	0.0009	0.0017	0.0018	0.0023
38	0.2639	0.5263	2676	0.0002	0.0005	0.0008	0.0017	0.0017	0.0021
39	0.2651	0.5262	2652	0.0001	0.0005	0.0008	0.0016	0.0016	0.0019
40	0.2649	0.5256	2657	0.0001	0.0007	0.0009	0.0016	0.0014	0.0019
41	0.2653	0.5259	2647	0.0003	0.0006	0.0010	0.0014	0.0017	0.0022
42	0.2631	0.5257	2695	0.0003	0.0004	0.0009	0.0014	0.0018	0.0023
43	0.2644	0.5255	2668	0.0001	0.0007	0.0009	0.0011	0.0018	0.0023
44	0.2641	0.5258	2674	0.0001	0.0006	0.0010	0.0014	0.0017	0.0021
45	0.2633	0.5245	2696	0.0001	0.0006	0.0009	0.0014	0.0017	0.0021
46	0.2655	0.5264	2643	0.0002	0.0006	0.0008	0.0014	0.0017	0.0023
47	0.2646	0.5258	2663	0.0001	0.0008	0.0009	0.0013	0.0019	0.0024
48	0.2643	0.5257	2669	0.0001	0.0006	0.0009	0.0013	0.0018	0.0024
49	0.2655	0.5275	2637	0.0002	0.0006	0.0008	0.0012	0.0018	0.0023
50	0.2620	0.5234	2728	0.0002	0.0005	0.0007	0.0013	0.0019	0.0024
Ave.	0.2645	0.5256	2666	0.0002	0.0006	0.0009	0.0014	0.0018	0.0022
Med.	0.2647	0.5257	2661	0.0001	0.0006	0.0009	0.0014	0.0018	0.0022
st dev	0.0012	0.0010	28.6983	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
Min.	0.2620	0.5231	2623	0.0001	0.0003	0.0006	0.0011	0.0013	0.0016
Max.	0.2666	0.5275	2728	0.0004	0.0008	0.0012	0.0021	0.0021	0.0025



3.5 Data Set 3, 105 °C, 60mA (Lumen Maintenance)

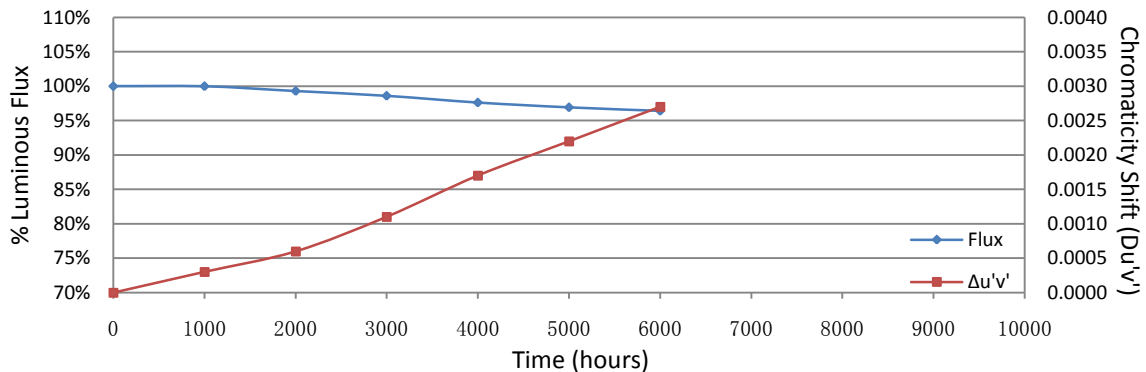
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	2.809	23.71	99.92	99.37	98.52	97.64	96.96	96.54
52	2.804	23.42	100.00	99.40	98.68	97.52	97.10	96.58
53	2.808	22.98	99.91	99.52	98.74	97.74	97.08	96.52
54	2.803	23.24	99.78	99.18	98.32	97.16	96.90	96.34
55	2.803	23.40	99.66	99.06	98.25	97.18	96.75	96.37
56	2.804	22.86	99.65	98.99	98.12	97.24	96.81	96.33
57	2.805	23.50	100.04	99.40	98.43	97.57	97.11	96.77
58	2.808	22.99	99.83	99.43	98.26	97.39	96.65	95.95
59	2.806	23.24	100.43	99.96	98.92	98.06	97.81	97.38
60	2.807	23.59	100.25	99.66	98.52	97.54	97.16	96.57
61	2.800	23.43	99.87	99.53	98.42	97.48	96.54	96.07
62	2.807	22.72	99.96	99.52	98.33	97.40	96.43	96.08
63	2.808	22.62	100.09	99.29	98.50	97.30	96.77	96.15
64	2.808	23.17	100.13	99.48	98.96	98.14	97.15	96.46
65	2.810	23.12	99.83	99.13	98.88	97.88	97.06	96.24
66	2.810	23.38	99.74	99.10	99.06	97.95	96.79	96.41
67	2.803	23.01	99.91	99.48	99.09	98.09	97.26	96.78
68	2.805	23.21	99.91	99.31	98.88	97.63	96.77	96.34
69	2.804	23.46	99.87	99.23	98.85	97.74	96.80	96.21
70	2.806	23.63	100.04	99.15	98.73	97.84	96.70	96.19
71	2.809	23.42	100.04	99.19	98.68	97.82	96.75	95.94
72	2.809	23.34	100.21	98.71	98.67	97.81	96.92	96.36
73	2.804	22.91	100.13	98.91	98.65	97.42	96.90	96.51
74	2.807	23.40	99.96	98.93	98.42	97.56	96.92	96.54
75	2.805	23.59	100.08	99.07	98.43	97.54	96.61	96.06
Ave.	2.806	23.25	99.97	99.28	98.61	97.63	96.91	96.39
Med.	2.806	23.34	99.96	99.29	98.65	97.57	96.90	96.36
st dev	0.0026	0.2903	0.1833	0.2713	0.2680	0.2778	0.2786	0.3078
Min.	2.800	22.62	99.65	98.71	98.12	97.16	96.43	95.94
Max.	2.810	23.71	100.43	99.96	99.09	98.14	97.81	97.38

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 7.566E-06
β: 1.008
Calculated L₇₀: 48,000 hours
Reported L₇₀: >36,000 hours

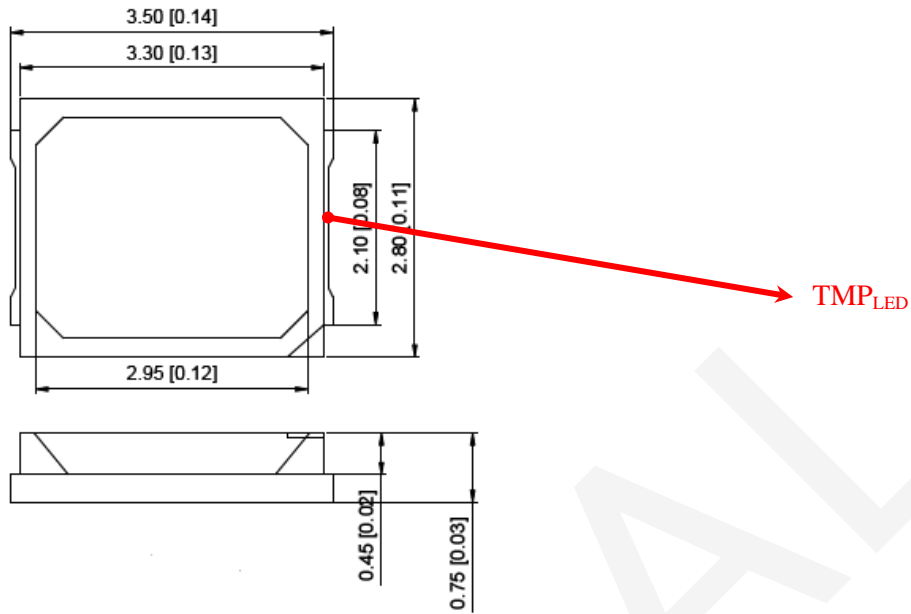
3.6 Data Set 3, 105 °C, 60mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	0.2640	0.5255	2676	0.0001	0.0007	0.0009	0.0017	0.0020	0.0024
52	0.2642	0.5255	2671	0.0003	0.0007	0.0011	0.0017	0.0019	0.0023
53	0.2629	0.5207	2719	0.0004	0.0006	0.0010	0.0015	0.0020	0.0025
54	0.2655	0.5254	2646	0.0004	0.0005	0.0009	0.0015	0.0020	0.0024
55	0.2641	0.5250	2676	0.0004	0.0006	0.0009	0.0015	0.0019	0.0024
56	0.2644	0.5251	2669	0.0002	0.0006	0.0010	0.0017	0.0019	0.0024
57	0.2653	0.5260	2649	0.0003	0.0005	0.0011	0.0017	0.0019	0.0023
58	0.2654	0.5259	2646	0.0004	0.0006	0.0011	0.0018	0.0021	0.0025
59	0.2653	0.5266	2645	0.0003	0.0007	0.0012	0.0019	0.0020	0.0025
60	0.2643	0.5259	2670	0.0004	0.0006	0.0011	0.0017	0.0022	0.0027
61	0.2654	0.5261	2645	0.0004	0.0006	0.0011	0.0018	0.0021	0.0026
62	0.2650	0.5257	2655	0.0003	0.0006	0.0011	0.0019	0.0037	0.0040
63	0.2636	0.5250	2687	0.0002	0.0007	0.0013	0.0019	0.0019	0.0023
64	0.2660	0.5256	2636	0.0004	0.0004	0.0009	0.0014	0.0022	0.0025
65	0.2642	0.5251	2675	0.0002	0.0006	0.0012	0.0017	0.0025	0.0029
66	0.2650	0.5253	2658	0.0003	0.0006	0.0011	0.0017	0.0025	0.0030
67	0.2655	0.5256	2646	0.0003	0.0007	0.0012	0.0018	0.0023	0.0028
68	0.2662	0.5257	2632	0.0002	0.0007	0.0013	0.0017	0.0022	0.0026
69	0.2650	0.5272	2649	0.0003	0.0007	0.0012	0.0017	0.0023	0.0028
70	0.2635	0.5240	2693	0.0004	0.0005	0.0011	0.0016	0.0021	0.0025
71	0.2638	0.5252	2682	0.0003	0.0005	0.0011	0.0016	0.0025	0.0029
72	0.2632	0.5264	2690	0.0003	0.0004	0.0009	0.0015	0.0023	0.0028
73	0.2645	0.5244	2669	0.0004	0.0004	0.0011	0.0017	0.0022	0.0026
74	0.2642	0.5254	2673	0.0003	0.0005	0.0012	0.0015	0.0021	0.0025
75	0.2631	0.5252	2696	0.0003	0.0006	0.0012	0.0016	0.0024	0.0028
Ave.	0.2645	0.5253	2666	0.0003	0.0006	0.0011	0.0017	0.0022	0.0027
Med.	0.2644	0.5255	2669	0.0003	0.0006	0.0011	0.0017	0.0021	0.0025
st dev	0.0009	0.0012	21.4093	0.0001	0.0001	0.0001	0.0001	0.0004	0.0003
Min.	0.2629	0.5207	2632	0.0001	0.0004	0.0009	0.0014	0.0019	0.0023
Max.	0.2662	0.5272	2719	0.0004	0.0007	0.0013	0.0019	0.0037	0.0040



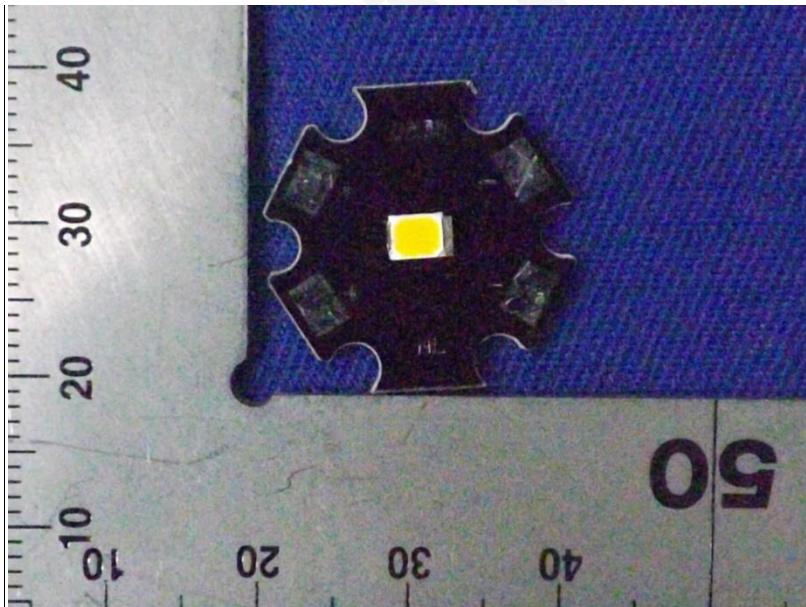
Appendix A – EUT PHOTO

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



All dimensions are in millimeter

A.2 EUT Photo



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