IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Premium Quality Lighting, Inc.

2285 Ward Avenue / Simi Valley, CA 93065

Model: 2835 White SMD LED-0.2W

Report Type: 6000 Hours Test Report	**Product Type:** LED Package
Test Engineer:	Daniel Duan
Report Number:	R2DG140124050-10
Test Date:	2014-01-27 to 2014-10-04
Report Date:	2014-10-09
Reviewed By:	Jeanne Han /Safety Manager
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China. Tel: +86-0769-86858888 Fax:+86-0769-86858588

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1 - GENERAL INFORMATION

1.1 Description of LED Light Sources

Devices tested

Part Number: 2835 White SMD LED-0.2W
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	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	20013	N/A	2014-08-11	2015-08-11
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090005	(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	11090003	(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°C ± 2°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=21K (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 95°C were received at 2014-01-25 and tested during 2014-01-27 to 2014-10-04. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75

Data Set 1: 55°C, 75mA	
Part Number:	2835 White SMD LED-0.2W
Number of Units:	25
Actual Case Temperature(T_S):	T_S =53.7°C
Actual Ambient Temperature(T_A):	T_A =52.3°C
Life Test Drive Current:	I_F = 75mA
Measurement Current:	I_F = 75mA

Data Set 2: 85°C,75mA	
Part Number:	2835 White SMD LED-0.2W
Number of Units:	25
Actual Case Temperature(T_S):	T_S =84.5°C
Actual Ambient Temperature(T_A):	T_A =81.3°C
Life Test Drive Current:	I_F =75mA
Measurement Current:	I_F = 75mA

Data Set 3: 95°C, 75mA	
Part Number:	2835 White SMD LED-0.2W
Number of Units:	25
Actual Case Temperature(T_S):	T_S =94.6°C
Actual Ambient Temperature(T_A):	T_A =92.1°C
Life Test Drive Current:	I_F = 75mA
Measurement Current:	I_F = 75mA

2 - SUMMARY OF TEST RESULT

Data Set:	**Data Set 1, 55°C, 75mA**
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:	97.58%
Average Chromaticity Shift at 6000 hours (Δu′v′):	0.0017
Reported TM-21 L_{70} Lifetime:	>36,000 hours

Data Set:	**Data Set 2, 85°C, 75mA**
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:	96.96%
Average Chromaticity Shift at 6000 hours(Δu′v′) :	0.0022
Reported TM-21 L_{70} Lifetime:	>36,000 hours

Data Set:	**Data Set 3, 95°C, 75mA**
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:	96.37%
Average Chromaticity Shift at 6000 hours(Δu′v′):	0.0026
Reported TM-21 L_{70} Lifetime:	>36,000 hours

3 - Test Data

3.1 Data Set 1, 55°C, 75mA (Lumen Maintenance)

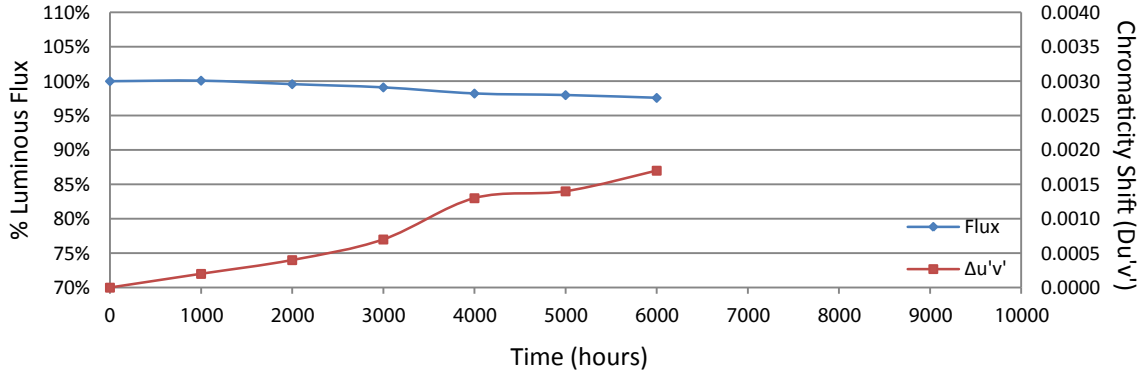
No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2.941	30.80	100.29	99.51	99.16	98.34	97.34	96.92
2	2.927	30.95	100.23	99.61	99.06	98.16	97.80	97.42
3	2.936	31.12	100.16	99.55	98.97	98.30	98.10	97.72
4	2.917	32.30	100.00	99.72	99.13	98.20	98.05	97.65
5	2.942	30.69	100.16	99.80	99.25	98.66	98.57	98.24
6	2.925	31.50	100.06	99.68	99.24	98.57	98.25	97.71
7	2.939	30.52	99.97	99.44	99.02	97.80	97.77	97.31
8	2.930	32.32	100.03	99.57	98.92	97.90	98.21	97.74
9	2.924	31.59	100.00	99.65	98.89	97.94	97.82	97.50
10	2.910	31.92	100.44	99.78	99.25	98.15	98.18	97.71
11	2.937	31.37	100.03	99.46	99.20	98.02	97.58	97.10
12	2.939	31.26	100.32	99.74	99.33	98.18	98.40	97.95
13	2.924	32.00	100.13	99.59	99.16	98.06	98.34	98.00
14	2.924	30.92	100.10	99.45	99.35	98.16	98.29	97.93
15	2.941	31.34	99.78	99.17	98.28	97.61	97.45	97.13
16	2.919	31.27	100.06	99.46	99.23	98.72	98.69	98.31
17	2.925	32.24	100.03	99.47	99.01	98.23	98.33	97.95
18	2.914	32.43	100.19	99.75	99.32	98.43	98.15	97.78
19	2.937	31.64	100.00	99.40	98.86	97.82	97.53	97.09
20	2.926	32.28	100.22	99.54	99.10	98.39	97.83	97.43
21	2.916	31.90	100.03	99.47	98.97	98.18	97.40	96.99
22	2.918	32.34	100.00	99.51	99.01	98.21	97.40	97.06
23	2.918	31.43	100.06	99.68	99.40	98.54	97.93	97.55
24	2.913	31.29	99.81	99.58	99.23	98.37	97.95	97.54
25	2.938	31.57	100.03	99.59	99.18	98.35	98.13	97.75
Ave.	2.927	31.56	100.08	99.57	99.10	98.21	97.98	97.58
Med.	2.925	31.50	100.06	99.57	99.16	98.20	98.05	97.65
st dev	0.0101	0.5650	0.1464	0.1436	0.2278	0.2719	0.3798	0.3848
Min.	2.910	30.52	99.78	99.17	98.28	97.61	97.34	96.92
Max.	2.942	32.43	100.44	99.80	99.40	98.72	98.69	98.31

TM-21 Projection:

Test Duration:	6000 hours
Failures Observed:	0
α:	5.251E-06
β:	1.006
Calculated L_{70}:	69,000 hours
Reported L_{70}:	>36,000 hours

3.2 Data Set 1, 55°C, 75mA(Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2509	0.5260	2964	0.0001	0.0005	0.0007	0.0012	0.0015	0.0017
2	0.2510	0.5229	2980	0.0002	0.0004	0.0004	0.0010	0.0014	0.0017
3	0.2542	0.5265	2885	0.0003	0.0004	0.0005	0.0010	0.0015	0.0017
4	0.2513	0.5243	2965	0.0003	0.0005	0.0004	0.0007	0.0017	0.0019
5	0.2532	0.5267	2907	0.0003	0.0004	0.0006	0.0009	0.0013	0.0016
6	0.2511	0.5245	2968	0.0004	0.0003	0.0007	0.0010	0.0014	0.0017
7	0.2520	0.5246	2946	0.0003	0.0004	0.0008	0.0011	0.0014	0.0017
8	0.2521	0.5243	2946	0.0002	0.0003	0.0009	0.0011	0.0013	0.0016
9	0.2506	0.5246	2978	0.0002	0.0003	0.0009	0.0014	0.0014	0.0017
10	0.2498	0.5238	3004	0.0004	0.0001	0.0006	0.0013	0.0014	0.0016
11	0.2534	0.5272	2899	0.0002	0.0004	0.0007	0.0013	0.0010	0.0013
12	0.2542	0.5281	2877	0.0002	0.0003	0.0007	0.0014	0.0014	0.0017
13	0.2522	0.5253	2938	0.0003	0.0001	0.0006	0.0014	0.0012	0.0015
14	0.2505	0.5233	2991	0.0004	0.0006	0.0003	0.0010	0.0021	0.0025
15	0.2506	0.5265	2968	0.0002	0.0004	0.0007	0.0014	0.0013	0.0016
16	0.2514	0.5239	2965	0.0002	0.0004	0.0006	0.0013	0.0013	0.0016
17	0.2516	0.5245	2956	0.0003	0.0004	0.0006	0.0013	0.0013	0.0015
18	0.2523	0.5248	2938	0.0002	0.0002	0.0008	0.0014	0.0016	0.0019
19	0.2509	0.5237	2977	0.0001	0.0005	0.0009	0.0016	0.0013	0.0017
20	0.2513	0.5252	2958	0.0002	0.0004	0.0009	0.0015	0.0014	0.0016
21	0.2508	0.5235	2981	0.0002	0.0004	0.0007	0.0014	0.0016	0.0019
22	0.2517	0.5262	2944	0.0002	0.0004	0.0007	0.0014	0.0015	0.0019
23	0.2504	0.5218	3002	0.0002	0.0004	0.0006	0.0013	0.0016	0.0019
24	0.2506	0.5242	2983	0.0002	0.0004	0.0006	0.0013	0.0014	0.0018
25	0.2497	0.5283	2980	0.0002	0.0004	0.0007	0.0014	0.0015	0.0019
Ave.	0.2515	0.5250	2956	0.0002	0.0004	0.0007	0.0013	0.0014	0.0017
Med.	0.2513	0.5246	2965	0.0002	0.0004	0.0007	0.0013	0.0014	0.0017
st dev	0.0012	0.0016	33.8612	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002
Min.	0.2497	0.5218	2877	0.0001	0.0001	0.0003	0.0007	0.0010	0.0013
Max.	0.2542	0.5283	3004	0.0004	0.0006	0.0009	0.0016	0.0021	0.0025



3.3 Data Set 2, 85°C, 75mA(Lumen Maintenance)

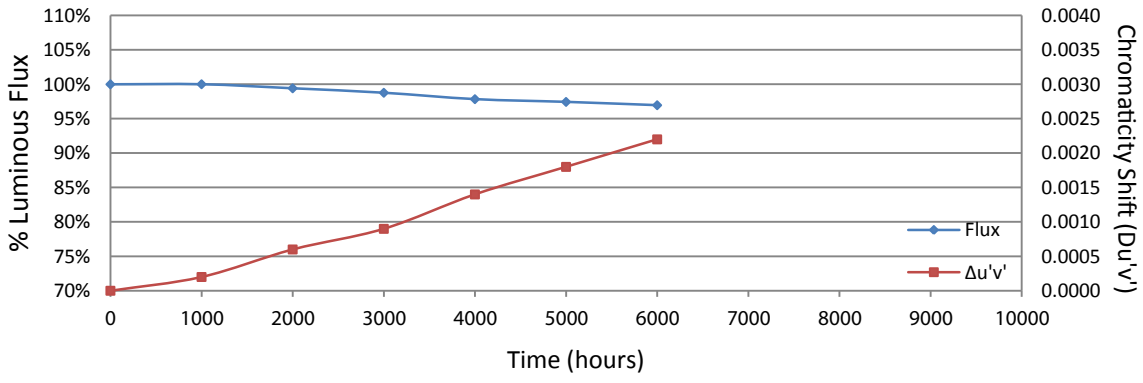
No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	2.916	32.63	99.94	99.39	98.71	97.82	97.21	96.87
27	2.912	31.51	100.38	99.90	99.14	98.86	97.91	97.49
28	2.916	31.01	100.29	99.77	98.71	97.87	98.55	98.19
29	2.937	30.73	99.97	99.28	98.24	97.53	97.14	96.75
30	2.941	30.86	100.06	99.68	98.80	98.02	97.47	97.08
31	2.936	30.59	99.84	99.28	98.17	97.38	97.06	96.70
32	2.918	32.46	100.06	99.20	98.34	97.57	97.26	96.77
33	2.925	31.60	100.03	99.21	98.26	97.44	97.15	96.68
34	2.916	31.63	99.78	99.30	98.23	97.34	97.22	96.71
35	2.940	30.82	99.90	99.35	98.86	97.53	97.34	96.92
36	2.927	31.62	99.91	99.21	98.83	97.34	97.28	96.77
37	2.912	31.65	100.09	99.43	98.99	97.57	97.25	96.71
38	2.920	30.90	99.90	99.48	98.96	97.93	97.44	96.76
39	2.912	32.63	99.97	99.51	98.87	98.19	97.49	97.09
40	2.922	31.42	100.06	99.75	99.27	98.19	97.93	97.49
41	2.939	30.07	100.07	99.73	99.17	98.20	97.64	97.14
42	2.917	31.14	100.19	99.78	99.33	98.43	97.69	97.27
43	2.915	31.61	99.87	99.40	98.92	98.07	97.22	96.68
44	2.938	31.32	99.97	99.65	99.23	98.15	97.64	97.03
45	2.921	31.81	100.35	99.65	99.06	98.46	98.24	97.74
46	2.942	30.29	100.07	99.17	98.35	97.76	97.23	96.53
47	2.939	31.30	99.78	98.91	98.50	97.54	97.12	96.58
48	2.938	32.01	99.91	99.13	98.84	97.75	97.09	96.59
49	2.940	31.33	99.90	99.11	98.63	97.41	97.16	96.55
50	2.912	31.59	99.97	99.21	98.77	97.56	97.34	96.80
Ave.	2.926	31.38	100.01	99.42	98.77	97.84	97.44	96.96
Med.	2.922	31.42	99.97	99.39	98.83	97.76	97.28	96.77
st dev	0.0115	0.6520	0.1594	0.2596	0.3504	0.4029	0.3764	0.4091
Min.	2.912	30.07	99.78	98.91	98.17	97.34	97.06	96.53
Max.	2.942	32.63	100.38	99.90	99.33	98.86	98.55	98.19

TM-21 Projection:

Test Duration:	6000 hours
Failures Observed:	0
α:	6.419E-06
β:	1.006
Calculated L_{70}:	57,000 hours
Reported L_{70}:	>36,000 hours

3.4 Data Set 2, 85°C, 75mA(Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	0.2528	0.5255	2922	0.0001	0.0004	0.0007	0.0013	0.0019	0.0023
27	0.2508	0.5242	2977	0.0001	0.0003	0.0006	0.0014	0.0021	0.0025
28	0.2519	0.5239	2952	0.0004	0.0007	0.0008	0.0014	0.0014	0.0018
29	0.2527	0.5241	2932	0.0002	0.0006	0.0010	0.0015	0.0018	0.0021
30	0.2501	0.5249	2991	0.0003	0.0005	0.0011	0.0014	0.0018	0.0021
31	0.2510	0.5248	2969	0.0003	0.0005	0.0008	0.0013	0.0019	0.0022
32	0.2520	0.5265	2936	0.0004	0.0006	0.0009	0.0014	0.0017	0.0022
33	0.2523	0.5244	2940	0.0002	0.0007	0.0009	0.0014	0.0019	0.0023
34	0.2514	0.5236	2965	0.0001	0.0004	0.0009	0.0016	0.0018	0.0023
35	0.2533	0.5275	2900	0.0001	0.0007	0.0012	0.0021	0.0013	0.0016
36	0.2509	0.5257	2966	0.0001	0.0006	0.0010	0.0017	0.0018	0.0021
37	0.2508	0.5242	2976	0.0001	0.0007	0.0009	0.0017	0.0018	0.0023
38	0.2518	0.5228	2961	0.0002	0.0005	0.0008	0.0017	0.0017	0.0021
39	0.2521	0.5261	2936	0.0001	0.0005	0.0008	0.0016	0.0016	0.0019
40	0.2522	0.5242	2944	0.0001	0.0007	0.0009	0.0016	0.0014	0.0019
41	0.2507	0.5240	2980	0.0003	0.0006	0.0010	0.0014	0.0017	0.0022
42	0.2519	0.5231	2958	0.0003	0.0004	0.0009	0.0014	0.0018	0.0023
43	0.2521	0.5253	2939	0.0001	0.0007	0.0009	0.0011	0.0018	0.0023
44	0.2500	0.5243	2995	0.0001	0.0006	0.0010	0.0014	0.0017	0.0021
45	0.2510	0.5243	2971	0.0001	0.0006	0.0009	0.0014	0.0017	0.0021
46	0.2510	0.5236	2975	0.0002	0.0006	0.0008	0.0014	0.0017	0.0023
47	0.2524	0.5254	2931	0.0001	0.0008	0.0009	0.0013	0.0019	0.0024
48	0.2512	0.5239	2969	0.0001	0.0006	0.0009	0.0013	0.0018	0.0024
49	0.2527	0.5266	2917	0.0002	0.0006	0.0008	0.0012	0.0018	0.0023
50	0.2523	0.5258	2931	0.0002	0.0005	0.0007	0.0013	0.0019	0.0024
Ave.	0.2517	0.5247	2953	0.0002	0.0006	0.0009	0.0014	0.0018	0.0022
Med.	0.2519	0.5243	2958	0.0001	0.0006	0.0009	0.0014	0.0018	0.0022
st dev	0.0009	0.0012	24.3768	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
Min.	0.2500	0.5228	2900	0.0001	0.0003	0.0006	0.0011	0.0013	0.0016
Max.	0.2533	0.5275	2995	0.0004	0.0008	0.0012	0.0021	0.0021	0.0025



3.5 Data Set 3, 95°C, 75mA(Lumen Maintenance)

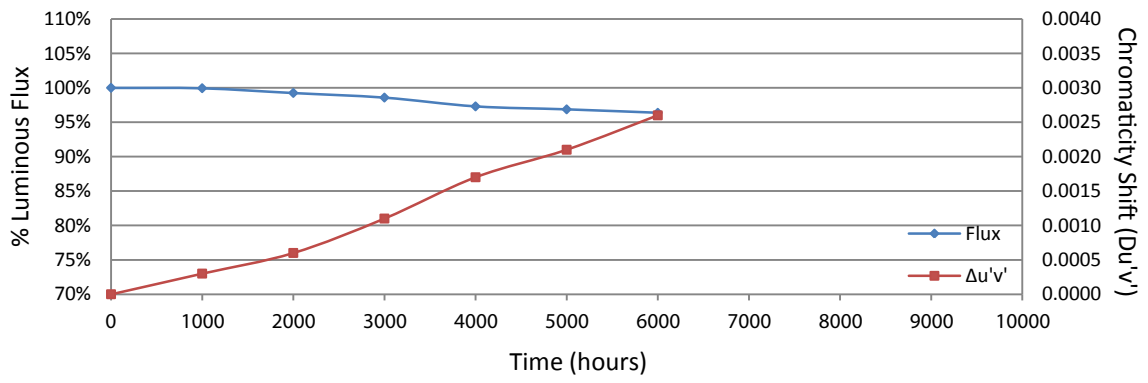
No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	2.941	30.78	99.94	99.35	98.51	97.63	96.95	96.56
52	2.928	32.30	100.00	99.41	98.67	97.52	97.09	96.59
53	2.913	32.78	99.91	99.51	98.75	97.74	97.07	96.52
54	2.917	31.52	99.78	99.18	98.32	97.18	96.89	96.35
55	2.940	30.51	99.77	99.18	98.36	97.28	96.36	95.94
56	2.912	31.38	99.65	99.08	98.25	97.16	96.75	96.37
57	2.923	32.12	99.66	98.97	98.13	97.26	96.82	96.33
58	2.922	31.97	100.03	99.41	98.44	97.56	97.31	96.75
59	2.909	32.37	99.81	99.41	98.24	97.37	96.63	95.95
60	2.923	31.16	100.26	99.94	98.94	98.04	97.79	97.37
61	2.917	31.92	99.91	99.66	98.50	97.53	97.15	96.55
62	2.924	31.29	99.87	99.52	98.43	97.48	96.55	96.07
63	2.921	31.22	99.78	99.30	98.49	97.31	97.15	96.60
64	2.939	30.12	99.77	99.47	98.97	97.05	96.91	96.45
65	2.939	30.76	99.84	99.15	98.89	97.17	96.42	95.90
66	2.912	31.20	99.90	99.49	99.07	97.76	97.28	96.76
67	2.939	30.96	99.90	99.29	98.87	97.29	96.77	96.35
68	2.924	32.47	99.88	99.23	98.86	97.32	96.80	96.21
69	2.941	30.20	100.03	99.14	98.74	97.15	96.69	96.19
70	2.923	31.47	100.03	99.17	98.70	96.98	96.50	95.93
71	2.923	31.43	100.22	98.70	98.66	97.20	96.91	96.37
72	2.918	32.74	100.15	98.90	98.66	96.92	96.88	96.52
73	2.926	32.67	99.97	98.93	98.41	96.94	96.94	96.54
74	2.939	30.64	100.26	98.86	98.14	96.70	96.54	95.89
75	2.918	32.35	100.09	99.07	98.42	96.97	96.60	96.07
Ave.	2.925	31.53	99.94	99.25	98.58	97.30	96.87	96.37
Med.	2.923	31.43	99.91	99.23	98.51	97.28	96.88	96.37
st dev	0.0103	0.8005	0.1704	0.2765	0.2683	0.3070	0.3197	0.3408
Min.	2.909	30.12	99.65	98.70	98.13	96.70	96.36	95.89
Max.	2.941	32.78	100.26	99.94	99.07	98.04	97.79	97.37

TM-21 Projection:

Test Duration:	6000 hours
Failures Observed:	0
α:	7.650E-06
β:	1.007
Calculated L_{70}:	48,000 hours
Reported L_{70}:	>36,000 hours

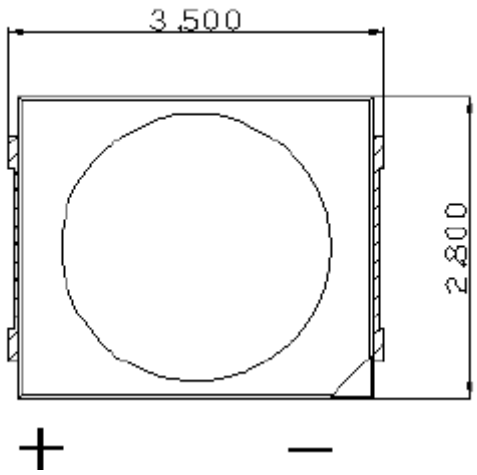
3.6 Data Set 3, 95°C, 75mA(Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	0.2508	0.5243	2976	0.0001	0.0007	0.0009	0.0017	0.0020	0.0024
52	0.2510	0.5240	2973	0.0003	0.0007	0.0011	0.0017	0.0019	0.0023
53	0.2509	0.5237	2977	0.0004	0.0006	0.0010	0.0015	0.0020	0.0025
54	0.2511	0.5225	2980	0.0004	0.0005	0.0009	0.0015	0.0020	0.0024
55	0.2516	0.5243	2958	0.0004	0.0005	0.0010	0.0016	0.0021	0.0027
56	0.2510	0.5230	2980	0.0004	0.0006	0.0009	0.0015	0.0019	0.0024
57	0.2528	0.5258	2920	0.0002	0.0006	0.0010	0.0017	0.0019	0.0024
58	0.2511	0.5240	2971	0.0003	0.0005	0.0011	0.0017	0.0019	0.0023
59	0.2526	0.5248	2930	0.0004	0.0006	0.0011	0.0018	0.0021	0.0025
60	0.2516	0.5249	2954	0.0003	0.0007	0.0012	0.0019	0.0020	0.0025
61	0.2507	0.5246	2978	0.0004	0.0006	0.0011	0.0017	0.0022	0.0027
62	0.2497	0.5227	3013	0.0004	0.0006	0.0011	0.0018	0.0021	0.0027
63	0.2506	0.5231	2988	0.0002	0.0007	0.0013	0.0019	0.0019	0.0023
64	0.2509	0.5250	2971	0.0004	0.0004	0.0009	0.0014	0.0022	0.0025
65	0.2512	0.5249	2962	0.0002	0.0006	0.0012	0.0017	0.0025	0.0029
66	0.2535	0.5278	2893	0.0003	0.0007	0.0012	0.0018	0.0023	0.0028
67	0.2514	0.5242	2962	0.0002	0.0007	0.0013	0.0017	0.0022	0.0026
68	0.2504	0.5238	2989	0.0003	0.0007	0.0012	0.0017	0.0023	0.0028
69	0.2531	0.5244	2922	0.0004	0.0005	0.0011	0.0016	0.0021	0.0025
70	0.2515	0.5254	2954	0.0003	0.0005	0.0011	0.0016	0.0025	0.0029
71	0.2509	0.5236	2979	0.0003	0.0004	0.0009	0.0015	0.0023	0.0028
72	0.2510	0.5260	2963	0.0004	0.0004	0.0011	0.0017	0.0022	0.0026
73	0.2525	0.5265	2923	0.0003	0.0005	0.0012	0.0015	0.0021	0.0025
74	0.2513	0.5245	2963	0.0003	0.0007	0.0012	0.0017	0.0024	0.0029
75	0.2528	0.5251	2925	0.0003	0.0006	0.0012	0.0016	0.0024	0.0028
Ave.	0.2514	0.5245	2960	0.0003	0.0006	0.0011	0.0017	0.0021	0.0026
Med.	0.2511	0.5244	2963	0.0003	0.0006	0.0011	0.0017	0.0021	0.0025
st dev	0.0009	0.0012	27.3887	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Min.	0.2497	0.5225	2893	0.0001	0.0004	0.0009	0.0014	0.0019	0.0023
Max.	0.2535	0.5278	3013	0.0004	0.0007	0.0013	0.0019	0.0025	0.0029



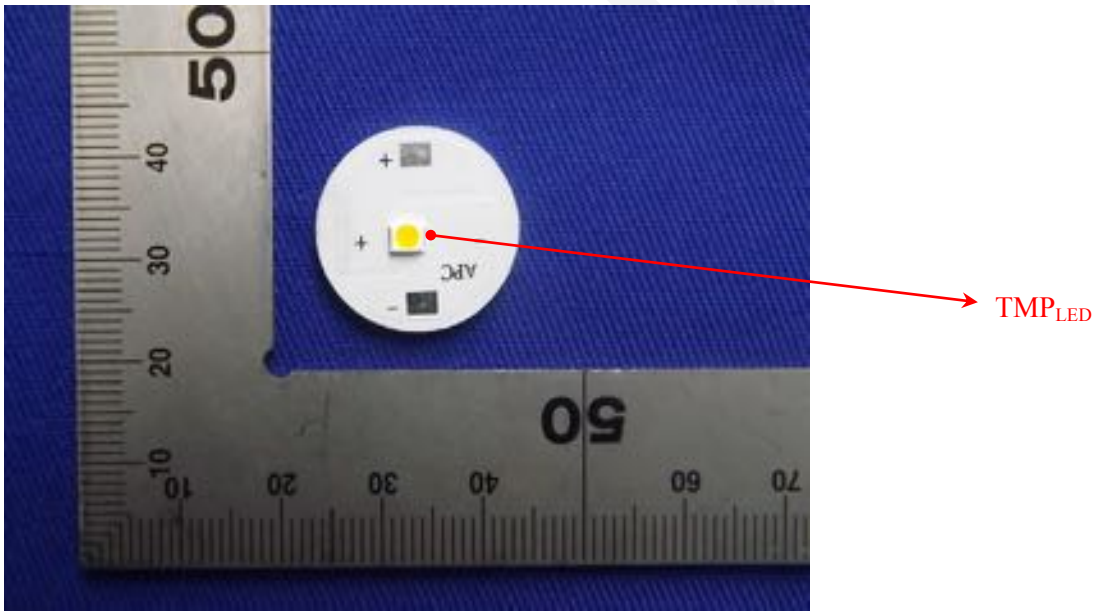
Appendix A – EUT PHOTO

A.1 Mechanical Dimensions (Ta = 25°C)



All dimensions are in millimeter

A.2 EUT Photo



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