



IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Foshan NationStar Optoelectronics Co., LTD

18 S HUABAO RD CHAN CHENG DISTRICT FOSHAN, GUANGDONG, 528000, China

Model:4014W

Report Type: 6000 Hours Test Report		Product Type: LED Package	
Test Engineer:	Daniel Duan	<i>Daniel Duan</i>	
Report Number:	RSZ140508506-10		
Test Date:	2014-05-17 to 2015-01-25		
Report Date:	2015-01-30		
Reviewed By:	Jeanne Han /Safety Manager	<i>Jeanne Han</i>	
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		

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).

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

1 - GENERAL INFORMATION.....	3
1.1 DESCRIPTION OF LED LIGHT SOURCES	3
1.2 STANDARDS USED:.....	3
1.3 TEST FACILITY	3
1.4 DESCRIPTION OF AUXILIARY EQUIPMENT	3
1.5 OPERATING CYCLE.....	4
1.6 AMBIENT CONDITIONS	4
1.7 PHOTOMETRY MEASUREMENT UNCERTAINTY	4
1.8 SAMPLE SET	5
2 - SUMMARY OF TEST RESULT	6
3 - TEST DATA	7
3.1 DATA SET 1, 55 °C, 60MA (LUMEN MAINTENANCE)	7
3.2 DATA SET 1, 55 °C, 60MA (CHROMATICITY SHIFT)	8
3.3 DATA SET 2, 85 °C, 60MA (LUMEN MAINTENANCE)	9
3.4 DATA SET 2, 85 °C, 60MA (CHROMATICITY SHIFT)	10
3.5 DATA SET 3, 100 °C, 60MA (LUMEN MAINTENANCE)	11
3.6 DATA SET 3, 100 °C, 60MA (CHROMATICITY SHIFT)	12
APPENDIX A – EUT PHOTO	13
A.1 MECHANICAL DIMENSIONS (TA = 25 °C).....	13
A.2 EUT PHOTO	13

1 - GENERAL INFORMATION

1.1 Description of LED Light Sources

Devices tested

Part Number: 4014W
 Part Name: 0.2W-4014WDS
 Part Type: LED Package
 Nominal CCT: 4500K

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	2014-03-04	2015-03-04
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
Multilayer aging machine	BACL	B2-270	20022	25°C~110°C	2014-10-27	2015-10-27
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060010	(50V/15A)	2014-03-12	2015-03-12
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060002	(50V/15A)	2014-07-11	2015-07-11

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090008	(50V/15A)	2014-07-11	2015-07-11

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, Ts 85 °C and Ts 105 °C were received at 2014-05-08 and tested during 2014-05-17 to 2015-01-25. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75

Data Set 1: 55 °C, 60mA

Part Number:	4014W
Number of Units:	25
Actual Case Temperature(T _S):	T _S =54.3 °C
Actual Ambient Temperature(T _A):	T _A =51.4 °C
Life Test Drive Current:	I _F = 60mA
Measurement Current:	I _F = 60mA

Data Set 2: 85 °C,60mA

Part Number:	4014W
Number of Units:	25
Actual Case Temperature(T _S):	T _S =84.2 °C
Actual Ambient Temperature(T _A):	T _A =82.4 °C
Life Test Drive Current:	I _F = 60mA
Measurement Current:	I _F = 60mA

Data Set 3: 100 °C, 60mA

Part Number:	4014W
Number of Units:	25
Actual Case Temperature(T _S):	T _S =99.4 °C
Actual Ambient Temperature(T _A):	T _A =97.2 °C
Life Test Drive Current:	I _F = 60mA
Measurement Current:	I _F = 60mA

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:	97.24%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$):	0.0021
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:	96.83%
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, 100 °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:	96.11%
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)

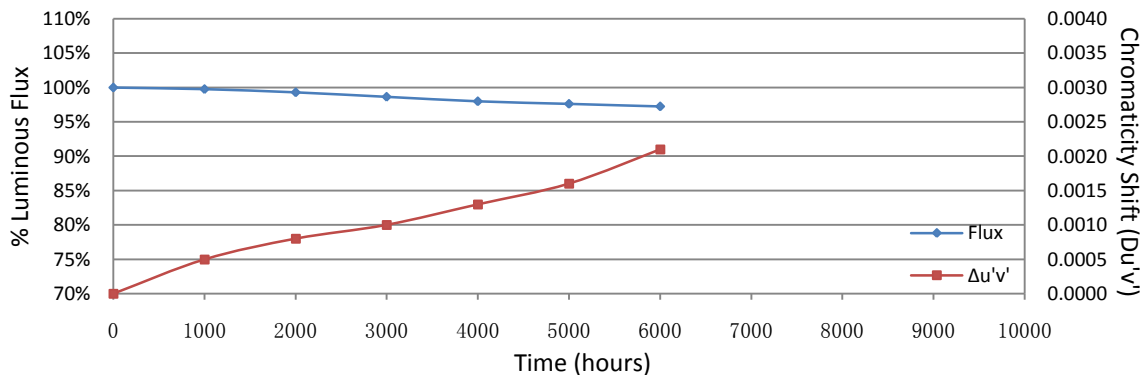
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2.986	23.59	99.36	99.11	98.35	97.97	97.50	97.16
2	2.967	23.82	99.45	98.95	98.49	97.82	97.48	97.06
3	2.975	23.57	99.41	99.07	98.60	98.13	97.79	97.37
4	2.979	23.34	99.61	98.89	98.24	97.77	97.47	97.34
5	2.990	23.86	99.54	98.87	98.24	97.82	97.23	96.65
6	2.976	23.74	99.62	98.78	98.19	97.77	97.35	97.14
7	2.987	23.69	99.79	98.99	98.40	98.23	97.76	97.34
8	2.989	23.29	99.83	99.27	98.33	97.94	97.60	97.38
9	2.991	23.27	99.87	99.31	98.67	97.72	97.12	96.65
10	2.991	22.66	99.96	99.60	99.16	98.81	98.28	97.84
11	2.974	23.58	99.79	99.36	98.60	97.84	97.46	97.20
12	2.973	23.55	99.87	99.32	98.64	97.88	97.58	97.15
13	2.989	23.46	99.91	99.45	99.06	98.04	97.78	97.57
14	2.981	23.11	99.74	99.13	98.40	98.10	97.75	97.36
15	2.987	23.58	99.66	99.19	98.64	97.84	97.41	97.20
16	2.992	23.36	100.00	99.79	99.10	98.24	97.86	97.43
17	2.992	23.40	99.74	99.49	98.85	98.12	97.65	97.09
18	2.992	23.34	99.91	99.53	98.67	97.73	97.34	96.92
19	2.990	23.24	99.44	98.75	98.28	97.85	97.42	96.94
20	2.988	23.89	99.54	99.41	98.79	97.49	97.24	97.03
21	2.987	23.55	99.75	99.49	98.85	98.13	97.83	97.49
22	2.992	23.26	99.83	99.48	98.80	98.02	97.55	97.08
23	2.977	23.38	99.83	99.32	98.59	97.82	97.26	96.75
24	2.968	23.23	99.87	99.40	99.05	98.32	97.98	97.85
25	2.988	23.01	99.96	99.44	98.70	98.35	98.13	98.09
Ave.	2.984	23.43	99.73	99.26	98.63	97.99	97.59	97.24
Med.	2.987	23.40	99.79	99.32	98.64	97.94	97.55	97.20
st dev	0.0080	0.2798	0.1872	0.2725	0.2851	0.2708	0.2887	0.3544
Min.	2.992	23.89	99.36	98.75	98.19	97.49	97.12	96.65
Max.	2.967	22.66	100.00	99.79	99.16	98.81	98.28	98.09

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 5.252E-06
 β : 1.002
Calculated L₇₀: 68,000hours
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	0.2030	0.5123	4627	0.0007	0.0009	0.0009	0.0012	0.0015	0.0019
2	0.2029	0.5119	4637	0.0006	0.0009	0.0009	0.0012	0.0016	0.0020
3	0.2024	0.5100	4701	0.0006	0.0010	0.0011	0.0012	0.0016	0.0022
4	0.2030	0.5102	4674	0.0006	0.0008	0.0009	0.0012	0.0016	0.0022
5	0.2028	0.5112	4658	0.0005	0.0007	0.0009	0.0012	0.0015	0.0018
6	0.2026	0.5106	4678	0.0006	0.0008	0.0010	0.0012	0.0015	0.0020
7	0.2025	0.5102	4691	0.0006	0.0009	0.0009	0.0012	0.0015	0.0020
8	0.2030	0.5117	4642	0.0007	0.0011	0.0010	0.0013	0.0017	0.0022
9	0.2025	0.5086	4732	0.0004	0.0009	0.0012	0.0012	0.0017	0.0022
10	0.2032	0.5118	4631	0.0004	0.0006	0.0008	0.0016	0.0018	0.0022
11	0.2026	0.5113	4664	0.0005	0.0008	0.0010	0.0013	0.0016	0.0019
12	0.2028	0.5113	4656	0.0004	0.0009	0.0010	0.0013	0.0015	0.0020
13	0.2027	0.5093	4708	0.0006	0.0010	0.0011	0.0014	0.0016	0.0021
14	0.2032	0.5109	4651	0.0005	0.0006	0.0011	0.0014	0.0017	0.0023
15	0.2030	0.5104	4669	0.0004	0.0007	0.0011	0.0012	0.0016	0.0021
16	0.2030	0.5142	4586	0.0004	0.0006	0.0008	0.0012	0.0016	0.0020
17	0.2035	0.5097	4664	0.0005	0.0005	0.0010	0.0012	0.0015	0.0017
18	0.2026	0.5084	4730	0.0004	0.0007	0.0013	0.0013	0.0017	0.0022
19	0.2024	0.5096	4710	0.0006	0.0009	0.0012	0.0010	0.0014	0.0019
20	0.2029	0.5107	4667	0.0005	0.0009	0.0011	0.0013	0.0016	0.0020
21	0.2037	0.5154	4534	0.0005	0.0008	0.0013	0.0013	0.0016	0.0022
22	0.2026	0.5136	4615	0.0005	0.0007	0.0011	0.0013	0.0016	0.0021
23	0.2023	0.5086	4739	0.0004	0.0007	0.0011	0.0013	0.0016	0.0020
24	0.2026	0.5089	4721	0.0004	0.0006	0.0009	0.0015	0.0016	0.0020
25	0.2028	0.5092	4705	0.0004	0.0007	0.0013	0.0019	0.0026	0.0032
Ave.	0.2028	0.5108	4668	0.0005	0.0008	0.0010	0.0013	0.0016	0.0021
Med.	0.2028	0.5106	4667	0.0005	0.0008	0.0010	0.0013	0.0016	0.0020
st dev	0.0003	0.0018	47.8783	0.0001	0.0001	0.0001	0.0002	0.0002	0.0003
Min.	0.2037	0.5154	4739	0.0004	0.0005	0.0008	0.0010	0.0014	0.0017
Max.	0.2023	0.5084	4534	0.0007	0.0011	0.0013	0.0019	0.0026	0.0032



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

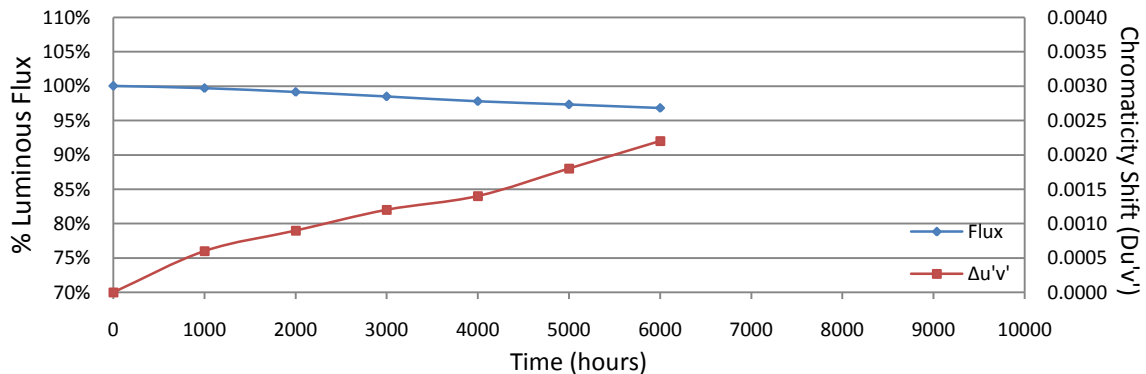
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	2.987	23.78	99.75	99.03	98.36	97.60	97.14	96.72
27	2.987	23.35	99.87	99.27	98.46	97.47	97.00	96.66
28	2.981	23.04	99.70	99.09	98.52	98.18	97.44	96.61
29	2.981	23.17	99.83	99.14	98.71	97.84	97.15	96.42
30	2.968	23.98	99.83	99.25	98.62	98.29	97.46	96.66
31	2.988	22.82	99.52	99.21	98.60	98.29	97.98	97.59
32	2.983	23.13	99.57	99.22	98.57	98.10	97.58	97.06
33	2.987	23.21	99.57	98.92	98.02	97.33	96.90	96.55
34	2.979	23.18	99.78	99.05	98.32	97.71	97.50	97.20
35	2.980	23.13	99.83	99.18	98.57	98.05	97.58	97.06
36	2.974	23.64	99.45	98.69	97.93	97.12	96.83	96.57
37	2.989	23.58	99.36	98.69	97.96	97.54	96.99	96.52
38	2.986	23.70	99.70	99.11	98.48	98.06	97.43	96.84
39	2.988	23.22	99.40	98.79	98.23	98.06	97.50	97.03
40	2.962	23.35	99.53	98.97	98.16	97.43	96.92	96.40
41	2.988	23.25	99.57	99.10	98.37	97.55	96.99	96.52
42	2.975	23.42	99.66	99.15	98.76	97.78	97.35	96.97
43	2.980	23.50	99.74	99.06	98.47	98.13	97.66	97.11
44	2.989	22.47	100.00	99.51	98.89	98.18	97.77	97.37
45	2.986	23.43	99.96	99.40	98.80	97.95	97.44	96.93
46	2.987	23.56	99.79	99.19	98.39	97.50	96.99	96.39
47	2.968	23.60	99.92	99.24	98.43	97.67	97.50	97.37
48	2.974	23.43	99.83	99.45	99.02	97.70	97.31	96.76
49	2.989	23.53	99.70	99.28	98.64	97.88	97.45	97.07
50	2.973	23.57	99.70	99.24	98.39	97.67	97.07	96.35
Ave.	2.981	23.36	99.70	99.13	98.47	97.80	97.32	96.83
Med.	2.983	23.42	99.70	99.15	98.47	97.78	97.43	96.76
st dev	0.0077	0.3176	0.1709	0.2057	0.2730	0.3182	0.3033	0.3439
Min.	2.962	22.47	99.36	98.69	97.93	97.12	96.83	96.35
Max.	2.989	23.98	100.00	99.51	99.02	98.29	97.98	97.59

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 5.947E-06
β: 1.003
Calculated L₇₀: 60,000hours
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	0.2026	0.5101	4691	0.0003	0.0006	0.0009	0.0013	0.0017	0.0020
27	0.2031	0.5123	4622	0.0005	0.0009	0.0012	0.0015	0.0019	0.0025
28	0.2023	0.5095	4718	0.0004	0.0008	0.0011	0.0014	0.0018	0.0024
29	0.2029	0.5118	4637	0.0003	0.0008	0.0010	0.0013	0.0016	0.0022
30	0.2026	0.5125	4634	0.0003	0.0007	0.0010	0.0015	0.0018	0.0024
31	0.2028	0.5139	4600	0.0007	0.0010	0.0011	0.0014	0.0017	0.0022
32	0.2025	0.5090	4721	0.0007	0.0009	0.0012	0.0012	0.0017	0.0022
33	0.2027	0.5112	4661	0.0006	0.0009	0.0014	0.0014	0.0019	0.0023
34	0.2032	0.5135	4593	0.0007	0.0011	0.0013	0.0013	0.0018	0.0023
35	0.2025	0.5108	4678	0.0006	0.0008	0.0011	0.0013	0.0016	0.0019
36	0.2028	0.5123	4634	0.0008	0.0010	0.0013	0.0014	0.0018	0.0023
37	0.2031	0.5089	4698	0.0007	0.0011	0.0014	0.0014	0.0018	0.0021
38	0.2036	0.5142	4563	0.0008	0.0011	0.0013	0.0015	0.0018	0.0021
39	0.2027	0.5088	4718	0.0007	0.0009	0.0013	0.0014	0.0017	0.0022
40	0.2037	0.5149	4543	0.0006	0.0008	0.0011	0.0012	0.0016	0.0021
41	0.2028	0.5105	4674	0.0005	0.0008	0.0012	0.0014	0.0018	0.0021
42	0.2033	0.5126	4607	0.0006	0.0009	0.0013	0.0015	0.0017	0.0021
43	0.2031	0.5132	4604	0.0009	0.0011	0.0015	0.0016	0.0020	0.0024
44	0.2032	0.5142	4577	0.0008	0.0009	0.0012	0.0015	0.0018	0.0022
45	0.2026	0.5097	4701	0.0008	0.0012	0.0011	0.0015	0.0018	0.0021
46	0.2028	0.5094	4703	0.0005	0.0009	0.0011	0.0014	0.0018	0.0023
47	0.2030	0.5144	4583	0.0005	0.0009	0.0012	0.0014	0.0019	0.0023
48	0.2029	0.5121	4634	0.0006	0.0009	0.0012	0.0013	0.0016	0.0020
49	0.2031	0.5111	4649	0.0005	0.0011	0.0013	0.0012	0.0016	0.0020
50	0.2024	0.5119	4658	0.0005	0.0008	0.0013	0.0015	0.0019	0.0023
Ave.	0.2029	0.5117	4644	0.0006	0.0009	0.0012	0.0014	0.0018	0.0022
Med.	0.2028	0.5119	4637	0.0006	0.0009	0.0012	0.0014	0.0018	0.0022
st dev	0.0004	0.0019	51.8865	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2023	0.5088	4543	0.0003	0.0006	0.0009	0.0012	0.0016	0.0019
Max.	0.2037	0.5149	4721	0.0009	0.0012	0.0015	0.0016	0.0020	0.0025



3.5 Data Set 3, 100 °C, 60mA (Lumen Maintenance)

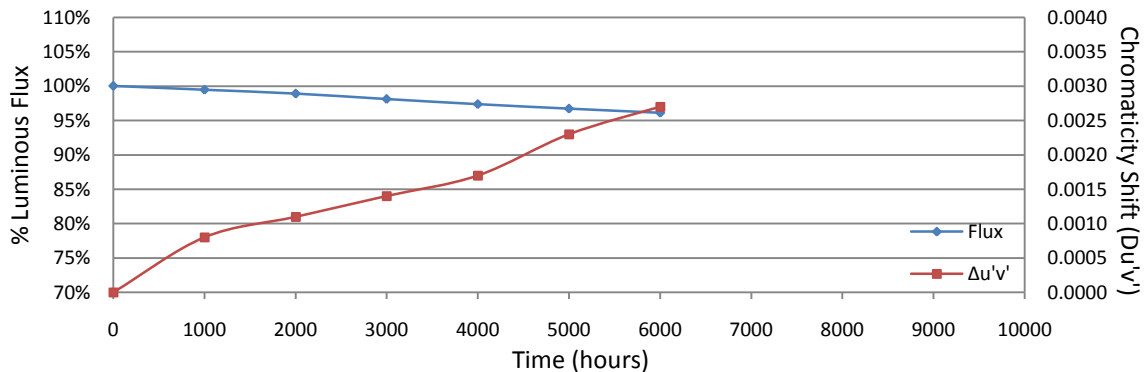
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	2.982	23.36	99.83	99.36	98.67	97.82	97.09	96.28
52	2.990	23.65	99.75	99.07	98.27	97.25	96.53	95.73
53	2.989	23.92	99.71	99.21	98.49	97.74	96.86	95.99
54	2.989	23.26	99.74	99.01	98.11	97.51	96.95	96.43
55	2.975	23.36	99.57	99.23	98.24	97.60	97.22	96.58
56	2.962	23.13	99.57	98.96	98.05	97.32	96.63	95.94
57	2.987	23.81	99.24	98.57	98.11	97.31	96.85	96.30
58	2.987	23.39	99.10	98.46	97.73	96.96	96.58	96.19
59	2.984	23.12	99.52	99.09	98.44	97.66	96.93	96.19
60	2.985	23.43	99.27	98.80	97.91	97.23	96.76	96.37
61	2.988	22.63	99.73	99.20	98.90	98.45	98.01	97.39
62	2.990	23.15	99.96	99.74	98.88	98.06	96.98	96.72
63	2.974	23.36	99.27	98.59	97.77	97.00	96.58	96.06
64	2.987	23.27	99.31	98.75	98.24	97.55	97.03	95.62
65	2.987	23.45	99.36	99.15	98.42	97.36	96.80	96.20
66	2.991	23.21	99.22	98.54	97.67	96.73	96.21	95.56
67	2.990	22.97	99.43	98.48	98.00	97.69	97.21	96.73
68	2.988	23.53	99.41	98.81	98.17	97.20	96.47	95.62
69	2.987	23.12	99.31	98.79	98.14	97.49	96.54	95.50
70	2.990	23.20	99.31	98.66	97.46	96.47	95.99	95.52
71	2.987	23.63	99.28	98.69	97.76	97.12	96.53	96.02
72	2.988	23.57	99.45	98.68	97.79	96.69	96.22	95.71
73	2.971	23.45	99.57	99.10	98.12	97.44	96.89	96.25
74	2.986	23.45	99.49	98.68	97.74	96.97	96.46	95.91
75	2.968	23.41	99.36	98.93	98.12	97.31	96.28	95.86
Ave.	2.984	23.35	99.47	98.90	98.13	97.36	96.74	96.11
Med.	2.987	23.36	99.43	98.81	98.12	97.32	96.76	96.06
st dev	0.0078	0.2693	0.2182	0.3132	0.3664	0.4370	0.4146	0.4502
Min.	2.962	22.63	99.10	98.46	97.46	96.47	95.99	95.50
Max.	2.991	23.92	99.96	99.74	98.90	98.45	98.01	97.39

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 7.027E-06
β: 1.002
Calculated L₇₀: 51,000 hours
Reported L₇₀: >36,000 hours

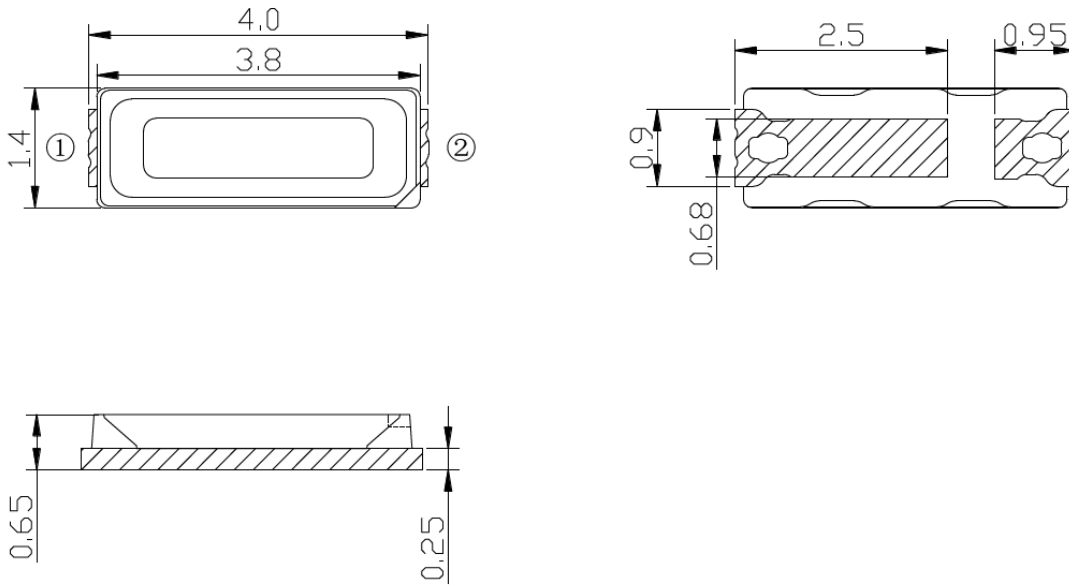
3.6 Data Set 3, 100 °C, 60mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	0.2026	0.5109	4674	0.0009	0.0012	0.0016	0.0018	0.0023	0.0029
52	0.2028	0.5104	4678	0.0007	0.0011	0.0013	0.0016	0.0021	0.0026
53	0.2032	0.5133	4597	0.0008	0.0011	0.0014	0.0016	0.0021	0.0024
54	0.2025	0.5093	4712	0.0007	0.0008	0.0011	0.0016	0.0021	0.0024
55	0.2031	0.5107	4658	0.0007	0.0009	0.0012	0.0016	0.0021	0.0028
56	0.2029	0.5090	4703	0.0007	0.0009	0.0014	0.0015	0.0021	0.0024
57	0.2027	0.5090	4712	0.0007	0.0012	0.0015	0.0016	0.0021	0.0025
58	0.2028	0.5108	4667	0.0011	0.0016	0.0019	0.0027	0.0033	0.0038
59	0.2027	0.5090	4712	0.0006	0.0010	0.0012	0.0016	0.0021	0.0026
60	0.2031	0.5097	4681	0.0007	0.0011	0.0011	0.0016	0.0021	0.0026
61	0.2032	0.5106	4658	0.0005	0.0009	0.0011	0.0017	0.0022	0.0026
62	0.2025	0.5105	4685	0.0014	0.0018	0.0022	0.0023	0.0029	0.0034
63	0.2023	0.5099	4705	0.0007	0.0011	0.0016	0.0016	0.0022	0.0027
64	0.2036	0.5107	4637	0.0009	0.0009	0.0013	0.0016	0.0021	0.0025
65	0.2029	0.5123	4629	0.0010	0.0012	0.0013	0.0016	0.0022	0.0027
66	0.2028	0.5090	4710	0.0009	0.0013	0.0014	0.0016	0.0022	0.0026
67	0.2030	0.5082	4718	0.0009	0.0011	0.0015	0.0017	0.0021	0.0026
68	0.2025	0.5095	4710	0.0011	0.0013	0.0016	0.0017	0.0023	0.0029
69	0.2034	0.5129	4597	0.0010	0.0013	0.0018	0.0022	0.0028	0.0033
70	0.2035	0.5162	4526	0.0010	0.0013	0.0018	0.0017	0.0024	0.0028
71	0.2032	0.5133	4597	0.0010	0.0012	0.0017	0.0017	0.0022	0.0026
72	0.2031	0.5137	4593	0.0007	0.0011	0.0013	0.0017	0.0023	0.0026
73	0.2027	0.5108	4671	0.0007	0.0010	0.0014	0.0016	0.0022	0.0026
74	0.2028	0.5100	4685	0.0006	0.0009	0.0011	0.0015	0.0021	0.0025
75	0.2022	0.5084	4745	0.0006	0.0009	0.0010	0.0015	0.0019	0.0023
Ave.	0.2029	0.5107	4666	0.0008	0.0011	0.0014	0.0017	0.0023	0.0027
Med.	0.2028	0.5105	4678	0.0007	0.0011	0.0014	0.0016	0.0022	0.0026
st dev	0.0004	0.0019	51.9543	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003
Min.	0.2022	0.5082	4526	0.0005	0.0008	0.0010	0.0015	0.0019	0.0023
Max.	0.2036	0.5162	4745	0.0014	0.0018	0.0022	0.0027	0.0033	0.0038



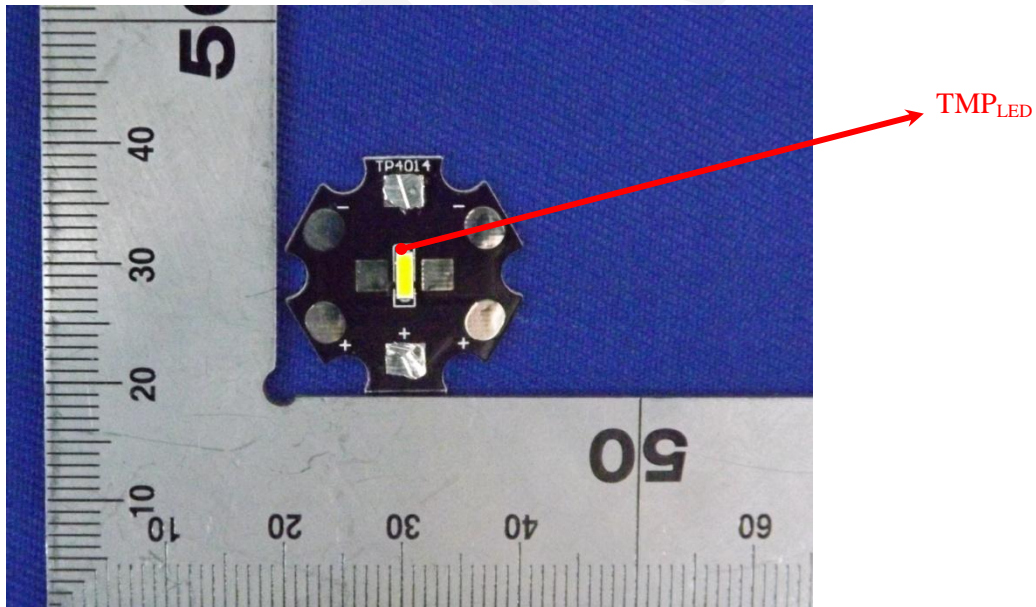
Appendix A – EUT PHOTO

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



All dimensions are in millimeter

A.2 EUT Photo



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