

IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

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:5730

Report Type: 6000 Hours Test Report		Product Type: LED Package	
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Report Date:	2013-12-26		
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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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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.....	3
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, 150 mA (LUMEN MAINTENANCE).....	7
3.2 DATA SET 1, 55 °C, 150 mA (CHROMATICITY SHIFT)	8
3.3 DATA SET 2, 85 °C, 150 mA (LUMEN MAINTENANCE).....	9
3.4 DATA SET 2, 85 °C, 150 mA (CHROMATICITY SHIFT)	10
3.5 DATA SET 3, 105 °C, 150 mA (LUMEN MAINTENANCE).....	11
3.6 DATA SET 3, 105 °C, 150 mA (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: 5730
 Part Name: Top LED
 Part Type: LED Package
 Nominal CCT: 3500K

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, length:0.3M ,0-1999LUMEN	2013-03-08	2014-03-08
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	15V/2000mA	2013-03-25	2014-03-25
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2013-03-08	2014-03-08
Standard Light Source	EVERFINE	D062	1011093	3000K	2013-05-23	2014-05-23
Precision digital stabilized DC power supply	EVERFINE	WY605	G115987CJ 7321114	300VA	2013-03-25	2014-03-25
LM-80 Aging equipment	BACL	N/A	#5	N/A	2013-03-25	2014-03-25
Adjustable constant-current DC switching power supply	GOTER	WYG-5V40A	N/A	N/A	2013-03-26	2014-03-26

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

Data Set 1: 55 °C, 150mA

Part Number:	5730
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 54.1 \text{ }^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A = 52.3 \text{ }^\circ\text{C}$
Life Test Drive Current:	$I_F = 150\text{mA}$
Measurement Current:	$I_F = 150\text{mA}$

Data Set 2: 85 °C,150mA

Part Number:	5730
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 83.7 \text{ }^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A = 82.3 \text{ }^\circ\text{C}$
Life Test Drive Current:	$I_F = 150\text{mA}$
Measurement Current:	$I_F = 150\text{mA}$

Data Set 3: 105 °C, 150mA

Part Number:	5730
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 103.8 \text{ }^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A = 102.3 \text{ }^\circ\text{C}$
Life Test Drive Current:	$I_F = 150\text{mA}$
Measurement Current:	$I_F = 150\text{mA}$

2 - SUMMARY OF TEST RESULT

Data Set:	Data Set 1, 55 °C, 150mA
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:	97.16%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$):	0.0015
Reported TM-21 L ₇₀ Lifetime:	>36,000 hours

Data Set:	Data Set 2, 85 °C, 150mA
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:	96.23%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0016
Reported TM-21 L ₇₀ Lifetime	>36,000 hours

Data Set:	Data Set 3, 105 °C, 150mA
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:	95.63%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0018
Reported TM-21 L ₇₀ Lifetime	>36,000 hours

3 - Test Data

3.1 Data Set 1, 55 °C, 150 mA (Lumen Maintenance)

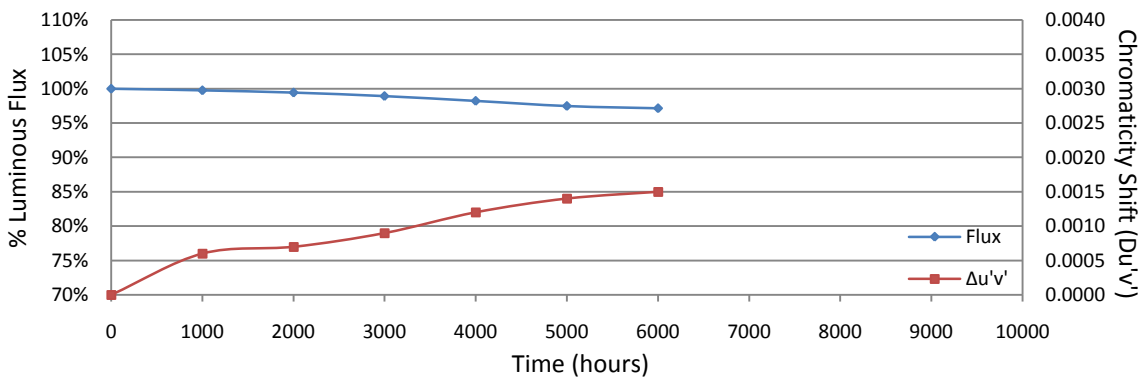
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3.030	50.80	99.86	99.47	99.07	98.35	97.54	97.48
2	3.030	49.58	99.78	99.42	98.79	98.23	97.60	97.44
3	3.028	51.19	99.77	99.43	98.83	98.09	97.56	97.25
4	3.032	50.30	99.84	99.38	98.95	98.11	97.36	97.06
5	3.090	49.83	99.86	99.66	99.08	98.23	97.53	97.41
6	3.027	50.89	99.72	99.57	99.02	98.15	97.41	97.19
7	3.104	49.65	99.64	99.27	98.83	98.15	97.46	97.18
8	3.024	51.36	99.84	99.28	99.01	98.29	97.74	97.59
9	3.027	50.58	99.82	99.68	99.03	98.32	97.67	97.55
10	3.091	50.15	99.86	99.20	98.78	98.21	97.39	97.17
11	3.028	49.95	99.76	99.30	98.96	98.36	97.66	97.46
12	3.088	50.25	99.72	99.32	99.94	98.43	97.57	97.39
13	3.024	50.22	99.84	99.62	99.10	98.09	97.19	97.07
14	3.029	49.73	99.74	99.38	99.01	98.17	97.35	97.29
15	3.031	50.12	99.86	99.66	98.84	98.36	97.79	96.93
16	3.025	50.07	99.74	99.38	98.94	98.14	97.64	97.12
17	3.089	50.89	99.72	99.57	98.82	98.41	97.23	96.86
18	3.068	51.02	99.86	99.24	98.86	98.33	97.57	96.92
19	3.051	49.65	99.90	99.64	98.77	98.01	97.30	96.96
20	3.091	50.91	99.65	99.25	98.76	98.08	97.43	96.84
21	3.031	50.77	99.72	99.45	98.88	98.07	97.30	96.89
22	3.103	50.19	99.82	99.34	98.70	98.11	97.39	96.99
23	3.028	50.71	99.76	99.31	98.94	98.42	97.30	96.88
24	3.091	49.78	99.82	99.32	98.73	98.21	97.29	96.85
25	3.084	50.13	99.84	99.54	98.94	98.46	97.55	97.31
Ave.	3.054	50.35	99.79	99.43	98.94	98.23	97.47	97.16
Med.	3.031	50.22	99.82	99.38	98.94	98.21	97.46	97.17
st dev	0.0311	0.5252	0.0007	0.0015	0.0024	0.0013	0.0016	0.0024
Min.	3.024	49.58	99.64	99.20	98.70	98.01	97.19	96.84
Max.	3.104	51.36	99.90	99.68	99.94	98.46	97.79	97.59

TM-21 Projection:

Test Duration: 6000 hour
Failures Observed: 0
α: 5.728E-06
β: 1.005
Calculated L₇₀: 63,000 hours
Reported L₇₀: >36000 hours

3.2 Data Set 1, 55 °C, 150 mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2332	0.5124	3565	0.0006	0.0007	0.0008	0.0010	0.0013	0.0014
2	0.2350	0.5075	3568	0.0005	0.0006	0.0008	0.0012	0.0015	0.0017
3	0.2335	0.5093	3594	0.0007	0.0008	0.0010	0.0012	0.0013	0.0014
4	0.2353	0.5120	3505	0.0006	0.0006	0.0007	0.0008	0.0009	0.0010
5	0.2344	0.5131	3521	0.0005	0.0007	0.0009	0.0012	0.0013	0.0016
6	0.2349	0.5115	3523	0.0007	0.0007	0.0009	0.0012	0.0013	0.0016
7	0.2355	0.5115	3504	0.0006	0.0007	0.0009	0.0010	0.0012	0.0013
8	0.2349	0.5124	3513	0.0004	0.0005	0.0007	0.0009	0.0011	0.0012
9	0.2344	0.5108	3546	0.0006	0.0007	0.0009	0.0013	0.0016	0.0018
10	0.2346	0.5121	3524	0.0005	0.0006	0.0008	0.0011	0.0014	0.0016
11	0.2342	0.5123	3536	0.0006	0.0009	0.0010	0.0011	0.0012	0.0012
12	0.2351	0.5119	3513	0.0008	0.0010	0.0011	0.0013	0.0016	0.0018
13	0.2356	0.5112	3503	0.0006	0.0007	0.0009	0.0011	0.0011	0.0011
14	0.2358	0.5108	3502	0.0007	0.0008	0.0010	0.0014	0.0015	0.0016
15	0.2344	0.5125	3529	0.0004	0.0005	0.0006	0.0009	0.0015	0.0017
16	0.2358	0.5105	3505	0.0005	0.0005	0.0008	0.0011	0.0016	0.0019
17	0.2343	0.5094	3567	0.0008	0.0009	0.0011	0.0012	0.0013	0.0015
18	0.2342	0.5102	3561	0.0006	0.0007	0.0009	0.0014	0.0015	0.0017
19	0.2355	0.5087	3537	0.0008	0.0008	0.0009	0.0014	0.0016	0.0015
20	0.2331	0.5117	3577	0.0009	0.0011	0.0012	0.0014	0.0016	0.0017
21	0.2348	0.5117	3524	0.0004	0.0006	0.0007	0.0009	0.0010	0.0011
22	0.2339	0.5094	3580	0.0006	0.0008	0.0009	0.0012	0.0016	0.0016
23	0.2351	0.5115	3516	0.0007	0.0008	0.0010	0.0011	0.0015	0.0017
24	0.2356	0.5111	3505	0.0005	0.0007	0.0009	0.0014	0.0015	0.0017
25	0.2342	0.5098	3566	0.0004	0.0006	0.0009	0.0011	0.0012	0.0013
Ave.	0.2347	0.5110	3535	0.0006	0.0007	0.0009	0.0012	0.0014	0.0015
Med.	0.2348	0.5115	3524	0.0006	0.0007	0.0009	0.0012	0.0014	0.0016
st dev	0.0008	0.0014	28.6965	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
Min.	0.2331	0.5075	3502	0.0004	0.0005	0.0006	0.0008	0.0009	0.0010
Max.	0.2358	0.5131	3594	0.0009	0.0011	0.0012	0.0014	0.0016	0.0019



3.3 Data Set 2, 85 °C, 150 mA (Lumen Maintenance)

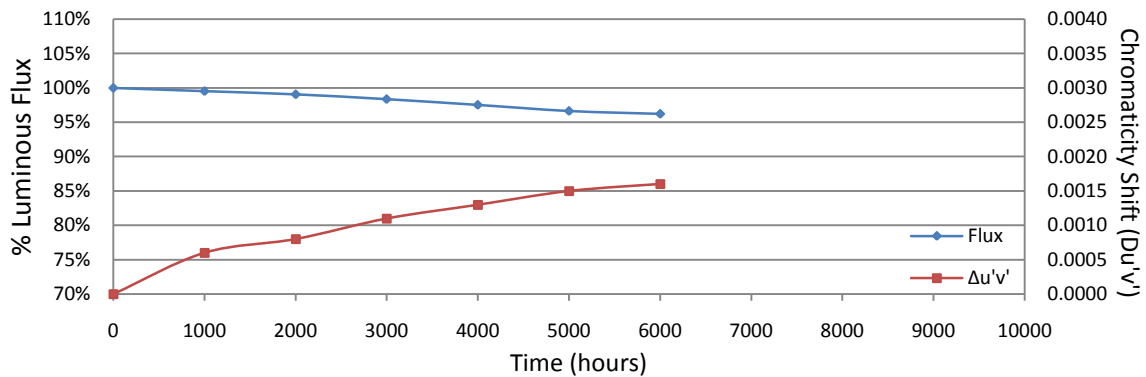
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	3.024	50.61	99.59	99.19	98.34	97.65	96.68	96.42
27	3.024	50.01	99.54	99.12	98.38	97.42	96.48	96.24
28	3.081	49.76	99.48	98.93	98.47	97.53	96.50	96.08
29	3.082	49.16	99.49	98.96	98.41	97.46	96.58	96.11
30	3.024	48.69	99.61	99.08	98.19	97.33	96.45	96.08
31	3.027	50.38	99.52	98.95	98.21	97.70	96.65	96.29
32	3.022	50.24	99.44	99.06	98.51	97.61	96.91	96.60
33	3.096	49.38	99.53	99.25	98.24	97.65	96.94	96.46
34	3.088	50.38	99.52	99.23	98.39	97.62	96.86	96.39
35	3.026	50.00	99.52	99.20	98.38	97.62	96.50	96.12
36	3.027	50.40	99.48	98.93	98.12	97.30	96.45	95.95
37	3.024	50.35	99.46	98.95	98.25	97.36	96.66	96.03
38	3.093	50.51	99.52	99.09	98.53	97.55	96.81	96.38
39	3.028	50.07	99.60	99.04	98.48	97.40	96.80	96.46
40	3.101	50.06	99.56	99.16	98.18	97.44	96.54	96.24
41	3.119	52.16	99.65	99.23	98.47	97.72	96.49	96.07
42	3.084	49.87	99.46	99.06	98.10	97.39	96.55	96.19
43	3.084	50.03	99.50	99.14	98.26	97.58	96.90	96.32
44	3.088	49.65	99.52	99.19	98.47	97.38	96.41	96.21
45	3.026	49.56	99.50	99.07	98.41	97.44	96.49	96.11
46	3.025	50.56	99.53	98.99	98.28	97.45	96.76	96.20
47	3.096	49.76	99.38	98.81	98.43	97.49	96.42	96.06
48	3.086	50.30	99.60	99.01	98.25	97.57	96.84	96.38
49	3.086	49.56	99.56	98.97	98.51	97.66	96.63	96.19
50	3.101	49.44	99.45	98.89	98.46	97.71	96.66	96.06
Ave.	3.062	50.04	99.52	99.06	98.35	97.52	96.64	96.23
Med.	3.082	50.03	99.52	99.06	98.38	97.53	96.63	96.20
st dev	0.0346	0.6477	0.0006	0.0012	0.0013	0.0013	0.0017	0.0016
Min.	3.022	48.69	99.38	98.81	98.10	97.30	96.41	95.95
Max.	3.119	52.16	99.65	99.25	98.53	97.72	96.94	96.60

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 7.165E-06
 β : 1.004
Calculated L₇₀: 50,000 hours
Reported L₇₀: >36000 hours

3.4 Data Set 2, 85 °C, 150 mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	0.2339	0.5102	3569	0.0006	0.0007	0.0010	0.0013	0.0015	0.0016
27	0.2346	0.5100	3549	0.0004	0.0007	0.0009	0.0011	0.0013	0.0014
28	0.2349	0.5136	3499	0.0005	0.0008	0.0009	0.0012	0.0013	0.0014
29	0.2356	0.5118	3498	0.0007	0.0008	0.0009	0.0012	0.0013	0.0016
30	0.2359	0.5098	3512	0.0006	0.0007	0.0011	0.0013	0.0015	0.0017
31	0.2342	0.5096	3567	0.0007	0.0008	0.0010	0.0016	0.0017	0.0019
32	0.2345	0.5127	3521	0.0006	0.0009	0.0011	0.0013	0.0015	0.0016
33	0.2356	0.5096	3523	0.0006	0.0009	0.0011	0.0015	0.0016	0.0018
34	0.2362	0.5114	3485	0.0004	0.0008	0.0009	0.0013	0.0015	0.0015
35	0.2358	0.5108	3501	0.0004	0.0004	0.0009	0.0014	0.0016	0.0018
36	0.2344	0.5129	3524	0.0006	0.0008	0.0009	0.0009	0.0011	0.0014
37	0.2345	0.5116	3535	0.0006	0.0008	0.0009	0.0014	0.0016	0.0016
38	0.2351	0.5113	3519	0.0007	0.0009	0.0010	0.0015	0.0016	0.0018
39	0.2350	0.5114	3521	0.0008	0.0009	0.0012	0.0015	0.0017	0.0019
40	0.2354	0.5126	3494	0.0004	0.0007	0.0010	0.0012	0.0013	0.0013
41	0.2346	0.5103	3545	0.0007	0.0008	0.0013	0.0015	0.0017	0.0018
42	0.2355	0.5106	3513	0.0005	0.0006	0.0011	0.0014	0.0016	0.0017
43	0.2351	0.5099	3536	0.0004	0.0005	0.0010	0.0014	0.0016	0.0018
44	0.2339	0.5077	3601	0.0009	0.0010	0.0014	0.0016	0.0018	0.0017
45	0.2342	0.5116	3544	0.0008	0.0010	0.0012	0.0014	0.0015	0.0016
46	0.2347	0.5108	3536	0.0009	0.0011	0.0013	0.0015	0.0016	0.0018
47	0.2351	0.5078	3558	0.0007	0.0008	0.0011	0.0013	0.0014	0.0014
48	0.2351	0.5090	3546	0.0009	0.0010	0.0011	0.0013	0.0015	0.0016
49	0.2347	0.5113	3532	0.0006	0.0008	0.0010	0.0015	0.0017	0.0018
50	0.2352	0.5125	3503	0.0004	0.0006	0.0009	0.0012	0.0013	0.0013
Ave.	0.2349	0.5108	3529	0.0006	0.0008	0.0011	0.0013	0.0015	0.0016
Med.	0.2350	0.5108	3524	0.0006	0.0008	0.0010	0.0014	0.0015	0.0016
st dev	0.0006	0.0015	27.1543	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002
Min.	0.2339	0.5077	3485	0.0004	0.0004	0.0009	0.0009	0.0011	0.0013
Max.	0.2362	0.5136	3601	0.0009	0.0011	0.0014	0.0016	0.0018	0.0019



3.5 Data Set 3, 105 °C, 150 mA (Lumen Maintenance)

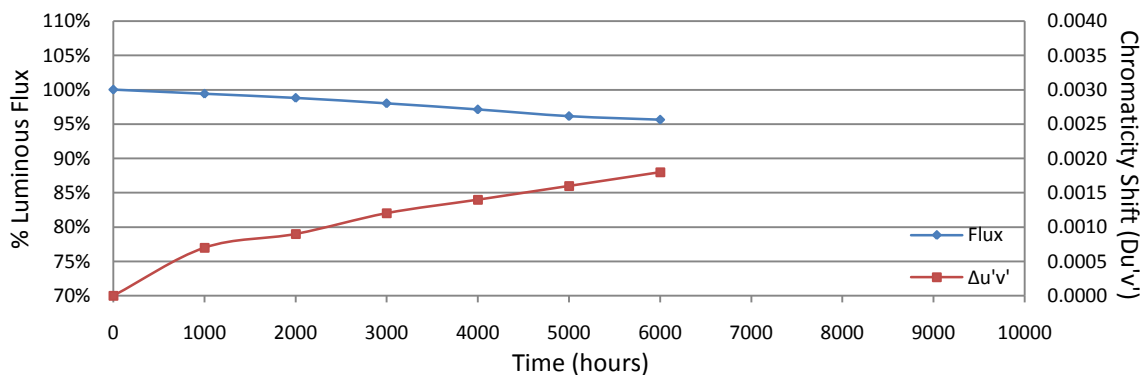
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	3.084	49.45	99.29	98.73	97.86	97.01	96.20	95.89
52	3.019	50.64	99.31	98.76	98.03	97.02	95.99	95.56
53	3.088	50.21	99.40	98.82	98.01	97.05	96.12	95.80
54	3.086	49.90	99.52	99.02	98.10	96.99	95.99	95.41
55	3.086	50.33	99.44	98.73	97.99	97.34	96.13	95.61
56	3.038	49.14	99.41	98.66	98.03	97.01	95.99	95.67
57	3.022	50.22	99.34	98.67	97.89	97.09	96.00	95.60
58	3.086	49.97	99.36	98.60	98.12	97.10	96.20	95.90
59	3.025	49.61	99.46	98.91	98.19	97.12	96.43	95.83
60	3.023	49.30	99.41	98.80	98.11	97.34	96.04	95.76
61	3.083	50.37	99.38	98.73	97.99	97.06	96.11	95.71
62	3.085	50.24	99.36	98.83	98.07	97.05	96.24	95.48
63	3.091	49.90	99.44	98.74	97.96	97.11	95.91	95.63
64	3.023	51.03	99.35	98.73	97.88	97.30	96.00	95.75
65	3.021	50.15	99.36	98.60	98.15	97.29	96.19	95.59
66	3.033	50.19	99.38	98.72	97.89	97.05	95.98	95.42
67	3.086	49.79	99.42	98.90	98.15	97.07	96.16	95.64
68	3.085	49.56	99.44	98.81	98.06	97.07	96.23	95.46
69	3.025	49.74	99.30	98.81	97.83	97.23	96.36	95.56
70	3.086	49.82	99.44	98.90	97.91	97.05	96.45	95.87
71	3.026	50.53	99.35	98.93	97.96	97.11	96.42	95.65
72	3.112	51.43	99.32	98.76	98.06	97.22	95.96	95.47
73	3.087	49.96	99.42	98.94	98.22	97.32	96.32	95.46
74	3.104	47.95	99.33	98.81	97.89	97.04	95.89	95.52
75	3.073	49.18	99.35	98.98	97.91	96.97	96.16	95.65
Ave.	3.063	49.94	99.38	98.79	98.01	97.12	96.14	95.63
Med.	3.084	49.96	99.38	98.80	98.01	97.07	96.13	95.63
st dev	0.0323	0.6799	0.0006	0.0011	0.0011	0.0012	0.0017	0.0015
Min.	3.019	47.95	99.29	98.60	97.83	96.97	95.89	95.41
Max.	3.112	51.43	99.52	99.02	98.22	97.34	96.45	95.90

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 8.086E-06
 β : 1.003
Calculated L₇₀: 44,000 hours
Reported L₇₀: >36000 hours

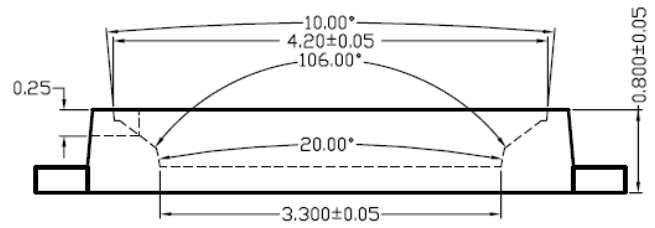
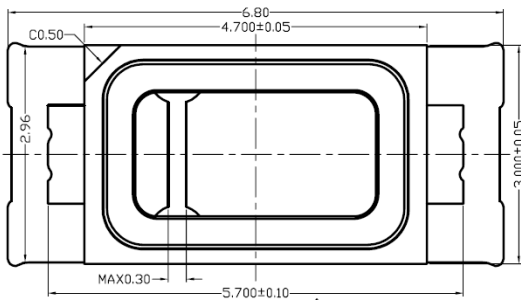
3.6 Data Set 3, 105 °C, 150 mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	0.2353	0.5109	3517	0.0007	0.0009	0.0011	0.0015	0.0016	0.0017
52	0.2343	0.5101	3558	0.0005	0.0006	0.0010	0.0015	0.0017	0.0018
53	0.2345	0.5063	3599	0.0008	0.0010	0.0012	0.0014	0.0018	0.0021
54	0.2351	0.5114	3516	0.0007	0.0008	0.0011	0.0013	0.0014	0.0017
55	0.2343	0.5088	3574	0.0009	0.0010	0.0011	0.0014	0.0016	0.0018
56	0.2353	0.5113	3513	0.0007	0.0007	0.0010	0.0014	0.0014	0.0016
57	0.2352	0.5107	3521	0.0007	0.0008	0.0012	0.0015	0.0016	0.0016
58	0.2342	0.5077	3592	0.0010	0.0010	0.0012	0.0014	0.0017	0.0018
59	0.2350	0.5099	3538	0.0009	0.0011	0.0013	0.0014	0.0018	0.0020
60	0.2350	0.5119	3515	0.0005	0.0008	0.0012	0.0014	0.0015	0.0016
61	0.2343	0.5135	3519	0.0008	0.0009	0.0012	0.0015	0.0016	0.0019
62	0.2345	0.5086	3571	0.0007	0.0008	0.0010	0.0016	0.0018	0.0019
63	0.2343	0.5083	3579	0.0009	0.0011	0.0012	0.0014	0.0015	0.0015
64	0.2348	0.5133	3506	0.0007	0.0010	0.0011	0.0013	0.0015	0.0016
65	0.2352	0.5105	3525	0.0010	0.0012	0.0014	0.0016	0.0017	0.0019
66	0.2353	0.5128	3496	0.0004	0.0005	0.0011	0.0014	0.0016	0.0017
67	0.2348	0.5093	3553	0.0009	0.0010	0.0012	0.0014	0.0017	0.0019
68	0.2344	0.5101	3554	0.0007	0.0009	0.0013	0.0015	0.0016	0.0017
69	0.2341	0.5122	3539	0.0007	0.0010	0.0014	0.0015	0.0016	0.0016
70	0.2348	0.5112	3530	0.0008	0.0009	0.0013	0.0014	0.0016	0.0017
71	0.2349	0.5128	3509	0.0005	0.0005	0.0009	0.0015	0.0017	0.0019
72	0.2349	0.5091	3551	0.0009	0.0011	0.0012	0.0015	0.0016	0.0018
73	0.2345	0.5109	3542	0.0007	0.0008	0.0012	0.0016	0.0018	0.0021
74	0.2361	0.5087	3516	0.0004	0.0005	0.0009	0.0010	0.0013	0.0017
75	0.2352	0.5119	3509	0.0006	0.0008	0.0012	0.0013	0.0015	0.0018
Ave.	0.2348	0.5105	3538	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018
Med.	0.2348	0.5107	3530	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018
st dev	0.0005	0.0018	28.6381	0.0002	0.0002	0.0001	0.0001	0.0001	0.0002
Min.	0.2341	0.5063	3496	0.0004	0.0005	0.0009	0.0010	0.0013	0.0015
Max.	0.2361	0.5135	3599	0.0010	0.0012	0.0014	0.0016	0.0018	0.0021

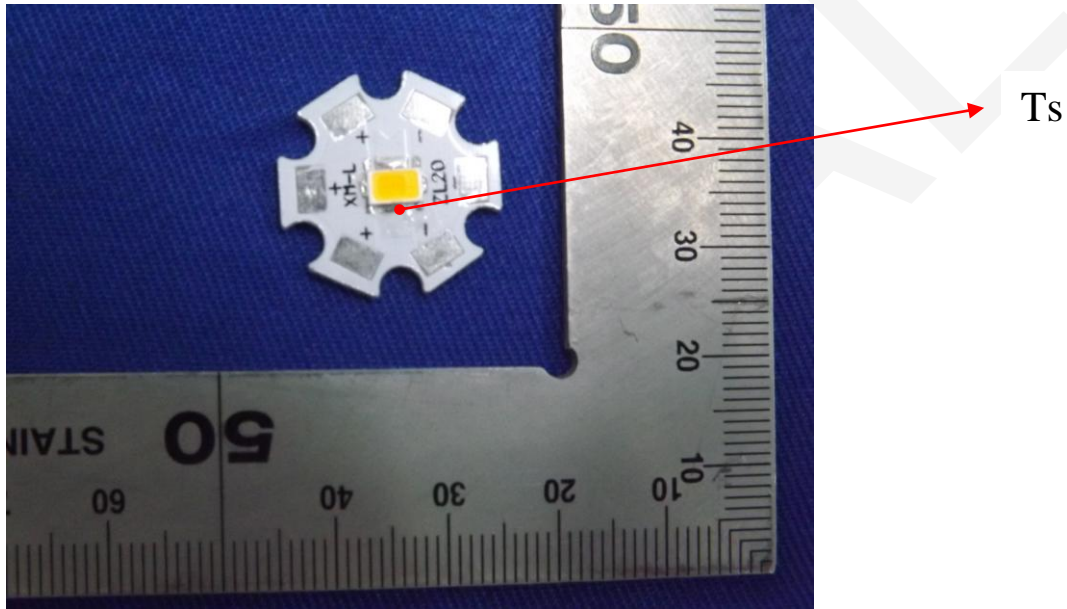


Appendix A – EUT PHOTO

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



A.2 EUT Photo



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