



IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Shenzhen Runlite Technology Co., Ltd

Building 15, Tantou Wset Industrial Zone, Songgang Street, Baoan District, Shenzhen City, China.

Model: T2016

Report Type: 9000 Hours Test Report	Product Type: LED Package
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Report Number: RSZ141117509-10-9000	
Test Date: 2014-11-20 to 2015-11-30	
Report Date: 2015-12-16	
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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: T2016
 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	2015-03-25	2016-03-25
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	15V/2000mA	2015-03-05	2016-03-05
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2015-03-25	2016-03-25
Standard Light Source	EVERFINE	D062	1011093	N/A	2015-08-05	2016-08-05
Precision digital stabilized DC power supply	EVERFINE	WY605	G115987C J7321114	300VA	2015-03-05	2016-03-05
Multilayer aging machine	BACL	B2-270	20022	25°C~110°C	2015-11-23	2016-11-22
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060002	(50V/15A)	2015-07-11	2016-07-11
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060010	(50V/15A)	2015-03-05	2016-03-05
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090007	(50V/15A)	2015-03-05	2016-03-05

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 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 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 Ts55°C, Ts 85°C and Ts 105°C were received at 2014-11-17 and tested during 2014-11-20 to 2015-11-30. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75

Data Set 1: 55°C, 150mA

Part Number:	T2016
Number of Units:	25
Actual Case Temperature(T _S):	T _S =54.2°C
Actual Ambient Temperature(T _A):	T _A =51.3°C
Life Test Drive Current:	I _F = 150mA
Measurement Current:	I _F = 150mA

Data Set 2: 85°C,150mA

Part Number:	T2016
Number of Units:	25
Actual Case Temperature(T _S):	T _S =84.1°C
Actual Ambient Temperature(T _A):	T _A =82.3°C
Life Test Drive Current:	I _F =150mA
Measurement Current:	I _F = 150mA

Data Set 3: 105°C, 150mA

Part Number:	T2016
Number of Units:	25
Actual Case Temperature(T _S):	T _S =104.3°C
Actual Ambient Temperature(T _A):	T _A =103.1°C
Life Test Drive Current:	I _F = 150mA
Measurement Current:	I _F = 150mA

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:	98.48%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$):	0.0018
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:	97.80%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0019
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,7000h,8000h,9000h
Average. Lumen Maintenance at 6000 hours:	97.30%
Average. Lumen Maintenance at 9000 hours:	94.98%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0021
Average Chromaticity Shift at 9000 hours($\Delta u'v'$):	0.0030
Reported TM-21 L ₇₀ Lifetime:	45,000 hours

3 - Test Data

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

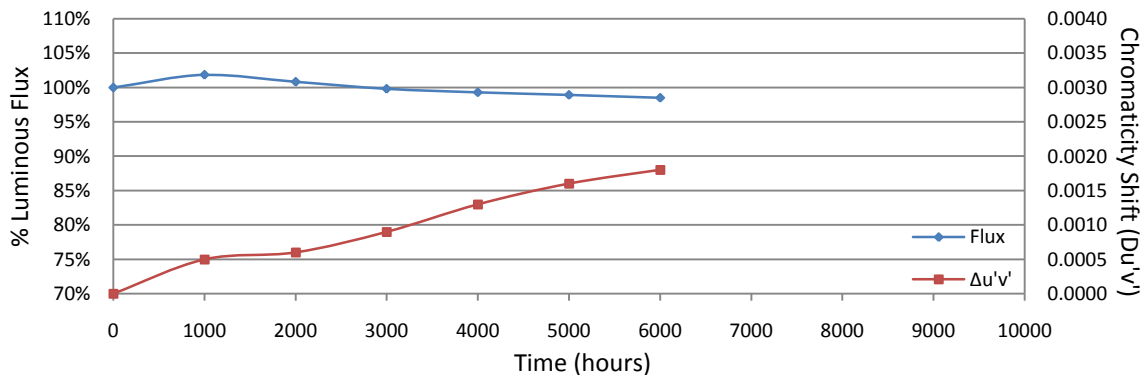
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
			0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs
1	3.221	47.11	101.74	100.70	99.51	99.00	98.60	98.09
2	3.229	47.74	99.41	98.85	97.72	97.15	96.80	96.50
3	3.220	46.86	102.11	101.15	99.91	99.38	99.04	98.51
4	3.231	47.75	101.80	100.96	99.94	99.52	99.08	98.74
5	3.228	46.94	101.92	100.98	100.02	99.62	99.23	98.83
6	3.222	45.56	102.63	101.49	100.42	99.93	99.50	99.45
7	3.226	47.77	101.82	100.67	99.62	99.23	98.81	97.80
8	3.218	44.82	102.41	101.43	100.47	100.02	99.62	99.35
9	3.223	46.22	102.44	101.36	100.45	99.85	99.24	98.66
10	3.218	46.22	102.40	101.41	100.43	100.04	99.70	99.46
11	3.216	46.16	101.99	100.97	99.91	99.39	98.96	98.44
12	3.227	46.57	101.67	100.56	99.59	99.06	98.56	97.98
13	3.223	46.53	102.19	101.38	100.11	99.83	99.40	99.20
14	3.221	45.12	102.44	101.31	100.22	99.76	99.11	99.00
15	3.230	43.95	101.82	100.71	99.73	99.34	98.95	98.50
16	3.222	47.83	101.90	101.02	100.08	99.64	99.16	98.37
17	3.219	46.32	101.73	100.45	99.07	98.47	98.10	97.75
18	3.224	46.99	101.75	100.68	100.09	99.51	99.02	98.87
19	3.227	46.25	101.84	101.10	100.09	99.48	99.01	98.66
20	3.214	46.93	101.88	100.64	101.07	100.64	100.21	99.72
21	3.228	47.28	101.63	100.57	100.68	100.08	99.47	99.03
22	3.223	46.76	101.67	100.71	99.53	98.97	99.57	98.95
23	3.231	47.33	100.85	99.58	97.95	97.49	97.04	96.53
24	3.222	46.63	102.02	100.97	99.36	98.80	98.24	98.07
25	3.221	45.69	101.55	100.53	98.91	98.14	97.75	97.42
Ave.	3.223	46.53	101.82	100.81	99.79	99.29	98.89	98.48
Med.	3.223	46.63	101.84	100.96	99.94	99.48	99.04	98.66
st dev	0.0047	0.9596	0.6240	0.5854	0.7681	0.8035	0.7954	0.8249
Min.	3.214	43.95	99.41	98.85	97.72	97.15	96.80	96.50
Max.	3.231	47.83	102.63	101.49	101.07	100.64	100.21	99.72

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 6.556E-06
β: 1.022
Calculated L₇₀: 58,000hours
Reported L₇₀: >36,000hours

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	0.2629	0.5315	2675	0.0004	0.0003	0.0008	0.0013	0.0017	0.0021
2	0.2625	0.5284	2696	0.0005	0.0007	0.0015	0.0016	0.0021	0.0029
3	0.2628	0.5302	2683	0.0004	0.0001	0.0007	0.0009	0.0010	0.0014
4	0.2628	0.5297	2684	0.0005	0.0006	0.0011	0.0014	0.0015	0.0016
5	0.2566	0.5232	2848	0.0007	0.0006	0.0008	0.0011	0.0012	0.0013
6	0.2618	0.5309	2699	0.0008	0.0007	0.0007	0.0011	0.0016	0.0017
7	0.2633	0.5313	2669	0.0004	0.0006	0.0010	0.0018	0.0022	0.0021
8	0.2639	0.5313	2657	0.0004	0.0006	0.0012	0.0018	0.0023	0.0026
9	0.2614	0.5286	2717	0.0006	0.0007	0.0008	0.0012	0.0017	0.0020
10	0.2643	0.5316	2647	0.0005	0.0005	0.0006	0.0010	0.0016	0.0023
11	0.2626	0.5291	2691	0.0005	0.0005	0.0007	0.0011	0.0014	0.0019
12	0.2642	0.5307	2653	0.0004	0.0006	0.0011	0.0016	0.0018	0.0024
13	0.2647	0.5324	2636	0.0004	0.0006	0.0008	0.0014	0.0019	0.0025
14	0.2633	0.5291	2678	0.0006	0.0007	0.0008	0.0011	0.0017	0.0025
15	0.2602	0.5286	2742	0.0007	0.0006	0.0006	0.0009	0.0010	0.0005
16	0.2602	0.5268	2751	0.0005	0.0006	0.0010	0.0013	0.0016	0.0018
17	0.2656	0.5320	2620	0.0004	0.0007	0.0010	0.0016	0.0020	0.0022
18	0.2643	0.5330	2643	0.0004	0.0006	0.0009	0.0012	0.0014	0.0016
19	0.2630	0.5298	2681	0.0005	0.0006	0.0008	0.0010	0.0011	0.0014
20	0.2612	0.5285	2722	0.0005	0.0006	0.0007	0.0011	0.0013	0.0010
21	0.2634	0.5301	2670	0.0005	0.0006	0.0009	0.0014	0.0015	0.0014
22	0.2599	0.5276	2755	0.0005	0.0007	0.0010	0.0014	0.0015	0.0016
23	0.2645	0.5301	2648	0.0005	0.0007	0.0014	0.0017	0.0019	0.0020
24	0.2636	0.5309	2664	0.0006	0.0006	0.0009	0.0012	0.0014	0.0015
25	0.2631	0.5314	2671	0.0005	0.0005	0.0009	0.0012	0.0013	0.0016
Ave.	0.2626	0.5299	2688	0.0005	0.0006	0.0009	0.0013	0.0016	0.0018
Med.	0.2630	0.5301	2678	0.0005	0.0006	0.0009	0.0012	0.0016	0.0018
st dev	0.0019	0.0021	48.2589	0.0001	0.0001	0.0002	0.0003	0.0003	0.0005
Min.	0.2566	0.5232	2620	0.0004	0.0001	0.0006	0.0009	0.0010	0.0005
Max.	0.2656	0.5330	2848	0.0008	0.0007	0.0015	0.0018	0.0023	0.0029



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

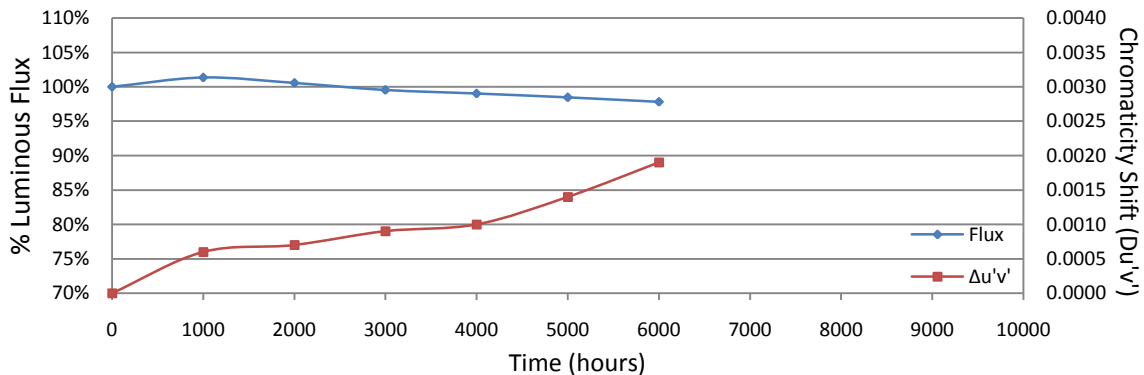
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	3.218	45.62	100.94	101.27	100.59	100.18	99.58	98.90
27	3.230	46.99	101.45	98.96	97.81	97.45	96.94	96.06
28	3.225	46.10	102.08	101.34	99.48	99.02	98.46	97.83
29	3.232	47.83	100.84	99.96	98.29	97.87	97.41	97.09
30	3.232	46.64	101.20	100.06	99.01	98.56	98.01	97.73
31	3.228	47.35	100.06	99.07	97.51	97.00	96.56	95.99
32	3.222	46.67	100.92	99.87	98.52	98.16	97.62	96.81
33	3.225	45.50	100.88	102.31	101.47	101.10	99.58	98.11
34	3.226	45.41	101.15	101.74	100.62	100.04	99.52	99.16
35	3.217	43.23	101.99	99.95	103.98	103.52	102.94	102.11
36	3.204	47.13	101.97	101.04	99.11	98.60	98.11	97.35
37	3.226	46.19	100.71	99.72	98.66	97.86	97.42	96.97
38	3.222	45.92	101.81	100.87	100.09	99.54	98.80	98.17
39	3.221	47.49	99.92	98.95	97.70	97.09	96.55	95.79
40	3.223	46.59	102.83	102.17	100.47	99.98	99.53	99.10
41	3.237	47.40	101.90	101.60	100.36	99.92	99.47	98.69
42	3.220	43.92	102.39	101.59	100.50	99.91	99.20	98.54
43	3.218	47.75	101.40	100.06	98.74	98.22	97.68	96.94
44	3.223	47.13	101.27	100.81	98.32	97.77	97.35	96.52
45	3.218	47.04	100.28	99.70	98.68	98.19	97.70	97.26
46	3.222	46.66	101.33	100.26	99.49	98.97	98.46	98.31
47	3.225	46.68	101.97	100.81	100.32	99.61	99.10	98.16
48	3.221	45.10	101.95	101.11	101.31	100.78	100.16	99.11
49	3.225	45.16	100.93	100.93	99.20	98.91	98.27	97.65
50	3.223	46.36	100.88	98.90	97.99	97.30	96.92	96.72
Ave.	3.223	46.31	101.32	100.52	99.53	99.02	98.45	97.80
Med.	3.223	46.64	101.27	100.81	99.20	98.91	98.27	97.73
st dev	0.0063	1.1384	0.7198	1.0112	1.4707	1.4868	1.4063	1.3474
Min.	3.204	43.23	99.92	98.90	97.51	97.00	96.55	95.79
Max.	3.237	47.83	102.83	102.31	103.98	103.52	102.94	102.11

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 6.982E-06
 β : 1.019
Calculated L₇₀: 54,000hours
Reported L₇₀: >36,000hours

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	0.2620	0.5308	2697	0.0003	0.0005	0.0006	0.0010	0.0013	0.0016
27	0.2637	0.5326	2656	0.0008	0.0011	0.0012	0.0015	0.0021	0.0024
28	0.2644	0.5328	2642	0.0004	0.0004	0.0005	0.0008	0.0013	0.0016
29	0.2632	0.5308	2673	0.0005	0.0006	0.0005	0.0007	0.0014	0.0016
30	0.2649	0.5309	2638	0.0006	0.0006	0.0009	0.0011	0.0015	0.0018
31	0.2609	0.5250	2743	0.0010	0.0010	0.0011	0.0014	0.0020	0.0022
32	0.2624	0.5305	2689	0.0009	0.0009	0.0011	0.0014	0.0019	0.0022
33	0.2627	0.5307	2683	0.0007	0.0007	0.0006	0.0006	0.0011	0.0017
34	0.2616	0.5283	2715	0.0006	0.0008	0.0007	0.0008	0.0013	0.0021
35	0.2646	0.5331	2637	0.0004	0.0007	0.0019	0.0020	0.0026	0.0035
36	0.2605	0.5256	2750	0.0006	0.0007	0.0008	0.0009	0.0014	0.0022
37	0.2635	0.5299	2671	0.0007	0.0007	0.0009	0.0009	0.0014	0.0024
38	0.2653	0.5340	2619	0.0004	0.0005	0.0007	0.0008	0.0012	0.0019
39	0.2612	0.5288	2721	0.0007	0.0008	0.0011	0.0011	0.0014	0.0023
40	0.2638	0.5313	2658	0.0007	0.0008	0.0012	0.0013	0.0017	0.0024
41	0.2611	0.5277	2727	0.0007	0.0007	0.0008	0.0008	0.0009	0.0015
42	0.2554	0.5260	2861	0.0013	0.0012	0.0011	0.0009	0.0005	0.0004
43	0.2618	0.5292	2706	0.0004	0.0006	0.0007	0.0008	0.0011	0.0016
44	0.2623	0.5322	2685	0.0010	0.0010	0.0016	0.0016	0.0019	0.0025
45	0.2646	0.5338	2634	0.0006	0.0006	0.0011	0.0012	0.0016	0.0022
46	0.2623	0.5314	2688	0.0006	0.0007	0.0009	0.0010	0.0014	0.0019
47	0.2665	0.5324	2602	0.0006	0.0005	0.0008	0.0009	0.0012	0.0016
48	0.2630	0.5294	2681	0.0006	0.0006	0.0007	0.0007	0.0009	0.0011
49	0.2649	0.5316	2635	0.0005	0.0008	0.0008	0.0008	0.0011	0.0017
50	0.2620	0.5280	2708	0.0004	0.0009	0.0008	0.0009	0.0011	0.0015
Ave.	0.2627	0.5303	2685	0.0006	0.0007	0.0009	0.0010	0.0014	0.0019
Med.	0.2627	0.5308	2683	0.0006	0.0007	0.0008	0.0009	0.0014	0.0019
st dev	0.0022	0.0025	53.3466	0.0002	0.0002	0.0003	0.0003	0.0004	0.0006
Min.	0.2554	0.5250	2602	0.0003	0.0004	0.0005	0.0006	0.0005	0.0004
Max.	0.2665	0.5340	2861	0.0013	0.0012	0.0019	0.0020	0.0026	0.0035



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

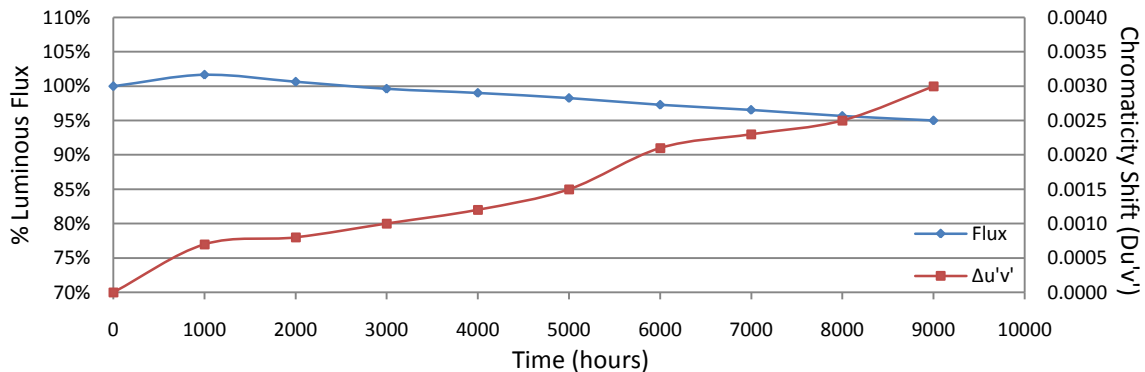
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)								
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
51	3.221	47.31	101.73	100.49	99.07	98.46	97.72	96.85	95.94	94.91	94.19
52	3.224	46.87	101.56	100.45	99.66	98.95	98.06	97.08	95.92	95.22	94.45
53	3.223	47.16	100.76	100.06	99.11	98.47	97.94	97.12	96.14	95.29	94.85
54	3.221	46.30	101.99	101.02	99.63	98.98	98.29	97.34	97.26	96.50	96.11
55	3.225	45.55	100.48	99.91	99.06	98.53	97.72	96.86	96.84	96.07	95.59
56	3.221	47.09	102.21	100.70	99.45	98.85	98.13	97.24	96.86	96.24	95.50
57	3.222	45.02	102.29	101.80	99.91	99.42	98.73	97.67	97.09	96.33	95.49
58	3.223	47.07	100.21	99.60	98.19	97.60	96.90	96.05	95.13	94.37	93.61
59	3.221	45.95	101.98	101.35	99.65	99.13	98.45	97.48	96.47	95.78	94.89
60	3.224	46.31	102.44	101.60	99.94	99.31	98.57	97.65	97.26	96.59	95.96
61	3.230	46.76	101.75	100.94	99.32	98.80	98.12	97.37	95.81	95.23	94.48
62	3.228	47.45	101.85	101.01	99.54	98.95	98.17	97.15	96.59	96.08	95.38
63	3.220	46.43	101.64	101.06	99.16	98.41	97.76	96.88	96.23	95.71	95.00
64	3.220	47.81	101.28	100.69	99.41	99.00	97.16	96.78	96.38	95.77	95.21
65	3.216	47.38	101.54	100.57	99.32	98.63	97.89	97.28	96.90	96.33	95.63
66	3.223	45.46	102.02	100.66	99.80	99.21	98.50	97.23	96.55	93.80	92.94
67	3.233	45.21	102.01	100.53	101.59	100.84	99.93	99.03	98.34	97.15	96.37
68	3.231	46.60	102.17	100.86	99.81	99.25	98.50	97.42	96.97	95.60	94.94
69	3.221	42.86	102.31	101.31	100.30	99.77	98.97	97.83	96.97	95.43	94.77
70	3.221	46.33	102.20	100.95	99.89	99.20	98.51	97.80	96.16	95.47	94.65
71	3.224	46.42	101.36	100.37	98.84	98.32	97.50	96.49	96.27	95.78	95.07
72	3.226	46.11	100.78	99.83	99.78	99.35	98.68	97.25	97.03	96.33	95.97
73	3.226	44.89	101.69	100.33	101.43	100.87	100.07	99.22	97.24	96.30	95.43
74	3.223	45.19	101.24	99.91	99.00	98.45	97.70	96.72	95.09	93.96	93.21
75	3.223	41.77	101.77	100.31	99.26	98.76	97.92	96.67	95.83	95.57	94.73
Ave.	3.224	46.05	101.65	100.65	99.60	99.02	98.24	97.30	96.53	95.67	94.98
Med.	3.223	46.33	101.75	100.66	99.54	98.95	98.13	97.24	96.55	95.77	95.00
st dev	0.0038	1.3949	0.5883	0.5551	0.7210	0.7116	0.7223	0.6898	0.7172	0.8032	0.8541
Min.	3.216	41.77	100.21	99.60	98.19	97.60	96.90	96.05	95.09	93.80	92.94
Max.	3.233	47.81	102.44	101.80	101.59	100.87	100.07	99.22	98.34	97.15	96.37

TM-21 Projection:

Test Duration: 9000 hours
Failures Observed: 0
α: 8.450E-06
β: 1.024
Calculated L₇₀: 45,000 hours
Reported L₇₀: 45,000 hours

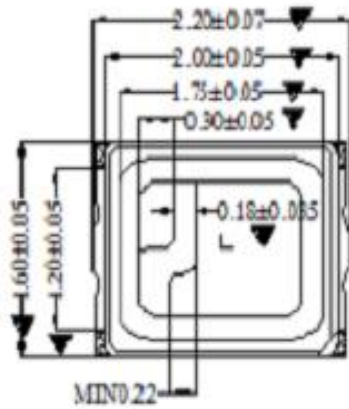
3.6 Data Set 3, 105°C, 150 mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
51	0.2623	0.5300	2693	0.0005	0.0009	0.0011	0.0013	0.0015	0.0018	0.0022	0.0024	0.0028
52	0.2622	0.5287	2701	0.0008	0.0009	0.0014	0.0015	0.0017	0.0019	0.0025	0.0026	0.0030
53	0.2627	0.5308	2683	0.0012	0.0014	0.0018	0.0022	0.0025	0.0028	0.0031	0.0034	0.0038
54	0.2651	0.5319	2631	0.0004	0.0005	0.0009	0.0012	0.0016	0.0021	0.0021	0.0023	0.0028
55	0.2659	0.5339	2608	0.0006	0.0008	0.0011	0.0015	0.0017	0.0023	0.0023	0.0024	0.0029
56	0.2627	0.5304	2684	0.0005	0.0007	0.0009	0.0012	0.0015	0.0021	0.0023	0.0025	0.0030
57	0.2621	0.5309	2694	0.0008	0.0008	0.0008	0.0011	0.0013	0.0017	0.0019	0.0021	0.0026
58	0.2617	0.5274	2717	0.0006	0.0009	0.0010	0.0014	0.0018	0.0023	0.0026	0.0028	0.0033
59	0.2630	0.5310	2676	0.0006	0.0008	0.0010	0.0014	0.0018	0.0023	0.0026	0.0027	0.0032
60	0.2603	0.5279	2744	0.0006	0.0007	0.0007	0.0009	0.0011	0.0016	0.0018	0.0021	0.0024
61	0.2605	0.5268	2743	0.0005	0.0007	0.0007	0.0011	0.0015	0.0020	0.0024	0.0025	0.0030
62	0.2619	0.5276	2712	0.0006	0.0007	0.0009	0.0011	0.0015	0.0019	0.0022	0.0025	0.0028
63	0.2652	0.5299	2636	0.0006	0.0007	0.0010	0.0012	0.0016	0.0020	0.0024	0.0025	0.0029
64	0.2619	0.5304	2699	0.0006	0.0006	0.0009	0.0011	0.0015	0.0021	0.0022	0.0025	0.0029
65	0.2592	0.5252	2779	0.0005	0.0006	0.0007	0.0009	0.0013	0.0017	0.0021	0.0022	0.0027
66	0.2587	0.5270	2783	0.0005	0.0006	0.0007	0.0011	0.0016	0.0026	0.0031	0.0036	0.0040
67	0.2625	0.5291	2693	0.0010	0.0009	0.0007	0.0008	0.0009	0.0014	0.0016	0.0019	0.0022
68	0.2627	0.5297	2686	0.0004	0.0006	0.0009	0.0012	0.0015	0.0021	0.0023	0.0026	0.0030
69	0.2666	0.5342	2594	0.0006	0.0007	0.0011	0.0013	0.0017	0.0025	0.0028	0.0032	0.0038
70	0.2642	0.5321	2648	0.0004	0.0006	0.0009	0.0013	0.0017	0.0023	0.0026	0.0029	0.0034
71	0.2603	0.5284	2742	0.0006	0.0008	0.0009	0.0011	0.0014	0.0019	0.0021	0.0024	0.0029
72	0.2621	0.5287	2702	0.0007	0.0007	0.0008	0.0011	0.0014	0.0018	0.0021	0.0023	0.0026
73	0.2661	0.5334	2606	0.0009	0.0012	0.0015	0.0019	0.0024	0.0030	0.0032	0.0035	0.0039
74	0.2646	0.5337	2635	0.0007	0.0007	0.0009	0.0011	0.0013	0.0018	0.0019	0.0023	0.0025
75	0.2622	0.5332	2684	0.0008	0.0006	0.0006	0.0006	0.0006	0.0013	0.0015	0.0017	0.0021
Ave.	0.2627	0.5301	2687	0.0007	0.0008	0.0010	0.0012	0.0015	0.0021	0.0023	0.0025	0.0030
Med.	0.2623	0.5300	2693	0.0006	0.0007	0.0009	0.0012	0.0015	0.0020	0.0023	0.0025	0.0029
st dev	0.0021	0.0025	50.3611	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0005
Min.	0.2587	0.5252	2594	0.0004	0.0005	0.0006	0.0006	0.0006	0.0013	0.0015	0.0017	0.0021
Max.	0.2666	0.5342	2783	0.0012	0.0014	0.0018	0.0022	0.0025	0.0030	0.0032	0.0036	0.0040



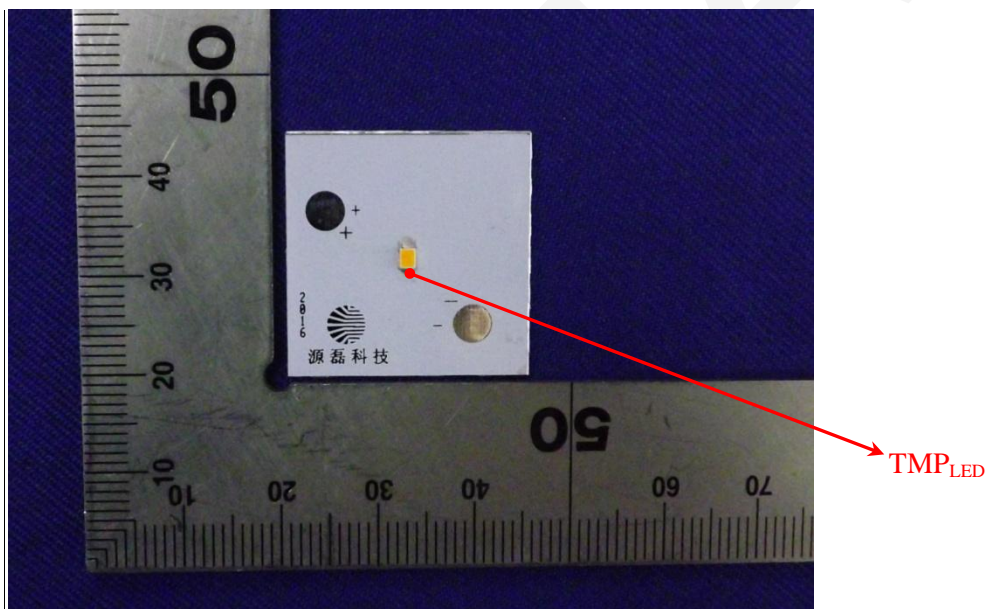
Appendix A – EUT PHOTO

A.1 Mechanical Dimensions (Ta = 25°C)



All dimensions are in millimeter

A.2 EUT Photo



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