IESNA LM-80-08

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Nirrau electronics design and manufacturing co., Ltd

7/F., Bonham Centre 79-85 Bonham Strand Sheung Wan, HONG KONG

Model: NE-2835-50-27

Report Type: 15000 Hours Test Report	**Product Type:** LED Package
Test Engineer:	Daniel Duan
Report Number:	R2DG190827051-10
Test Date:	2015-02-04 to 2017-10-28
Report Date:	2019-09-17
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1 - GENERAL INFORMATION

1.1 Description of LED Light Sources

Devices tested

Part Number:	NE-2835-50-27
Part Type:	LED Package
Nominal CCT:	2700K
Power:	0.5W
Average Current Density per LED die:	533.33mA/mm^2
Average Power Density per LED die:	1.78W/mm^2
CRI:	80
Die Spacing:	N/A

#Family products covered by this report:

According to *ENERGY STAR® Requirements for the Use of LM-80 Data*, the following products can be covered by this report base on the information and declaration provided by manufacturer. The information of these models shows that the covered products meet all section 4 requirements of *ENERGY STAR® Requirements for the Use of LM-80 Data* (September 28, 2017)

This report covers the following models:

Testing Model	Multiple Model	Difference	Details
NE-2835-50-27	NE-2835-**-**	1-Power 2-CCT	See below

Identifiers Information (if any):

1. The "NE" means "Nirrau electronics design and manufacturing co., Ltd" brand..
2. The letter “2835” is a fixed code
3. The first and second *, indicates the product power, it can be: 05-0.5W; 10-1W; 20-2W; 50-5W; A0-AW, ….
4. The third to fourth * represent the product CCT, it can be 27-2700K; 30-3000K; 35-3500K; 40-4000K; 454500K; 50-5000K; 57-5700K; 60-6000K; 62-6200K; 65-6500K; 82-8200K;....

Note:

1. The applicant Nirrau electronics design and manufacturing co., Ltd declare that their products with model NE-2835-50-27 are the same to the products in report # R2DG151225056-10-15000-M1 and is authorized by original applicant to use their test data.

2. All the data in previous report (R2DG151225056-10-15000-M1) is shared in this report.

1.2 Standards Used:

- IESNA LM-80-08: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- CIE 127:2007: Measurement of LEDs

- ENERGY STAR® Requirements for the Use of LM-80 Data (This standard was not accredited by IAS)

1.3 Test Facility

The testing facility used by Bay Area Compliance Laboratories Corp. (Dongguan). is located at No.69, Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

1.4 Description of Auxiliary Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
0.3m integrating sphere	EVERFINE	Diameter 0.3m	1011119	2017-03-09	2018-03-09
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	2017-03-03	2018-03-03
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	2017-03-09	2018-03-09
Standard Light Source	EVERFINE	D062	1011093	2017-09-13	2018-09-13
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987CJ7321114	2017-03-03	2018-03-03
Multilayer aging machine	BACL	B2-270	20022	2016-12-08	2017-12-08
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090007	2017-03-03	2018-03-03

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℃ ±2℃, RH <65%.

1.7 Photometry Measurement Uncertainty

The uncertainty of the light output (luminous flux) 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. The uncertainty of the CRI is U=1.7 (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 90Pcs;
Each Ts test condition 30Pcs
The samples tested at Ts 55℃, Ts 85℃ and Ts 105℃ were received at 2014-12-17 and tested during 2015-02-04 to 2017-10-28. The samples were numbered from 1 to 30, 31 to 60 and 61 to 90

Data Set 1: 55℃, 150mA	
Part Number:	NE-2835-50-27
Number of Units:	30
Actual Case Temperature(T_S):	T_S =54.6℃
Actual Ambient Temperature(T_A):	T_A =53.1℃
Life Test Drive Current:	I_F = 150mA
Measurement Current:	I_F = 150mA

Data Set 2: 85℃,150mA	
Part Number:	NE-2835-50-27
Number of Units:	30
Actual Case Temperature(T_S):	T_S =84.2℃
Actual Ambient Temperature(T_A):	T_A =82.6℃
Life Test Drive Current:	I_F =150mA
Measurement Current:	I_F = 150mA

Data Set 3: 105℃, 150mA	
Part Number:	NE-2835-50-27
Number of Units:	30
Actual Case Temperature(T_S):	T_S =104.1℃
Actual Ambient Temperature(T_A):	T_A =102.9℃
Life Test Drive Current:	I_F = 150mA
Measurement Current:	I_F = 150mA

2 - SUMMARY OF TEST RESULT

Data Set:	**Data Set 1, 55℃, 150mA**
Number of Units:	30
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h,7000h,8000h, 9000h,10000h,11000h,12000h,13000h,14000h,15000h
Average. Lumen Maintenance at 6000 hours:	97.14%
Average. Lumen Maintenance at 9000 hours:	96.27%
Average. Lumen Maintenance at 10000 hours:	96.03%
Average. Lumen Maintenance at 15000 hours:	95.08%
Average Chromaticity Shift at 6000 hours (Δu'v'):	0.0028
Average Chromaticity Shift at 9000 hours (Δu'v'):	0.0035
Average Chromaticity Shift at 10000 hours (Δu'v'):	0.0037
Average Chromaticity Shift at 15000 hours (Δu'v'):	0.0049
Reported TM-21 L_{70} Lifetime:	>90000hours

Data Set:	**Data Set 2, 85℃, 150mA**
Number of Units:	30
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h,7000h,8000h, 9000h,10000h,11000h,12000h,13000h,14000h,15000h
Average. Lumen Maintenance at 6000 hours:	96.34%
Average. Lumen Maintenance at 9000 hours:	95.11%
Average. Lumen Maintenance at 10000 hours:	94.77%
Average. Lumen Maintenance at 15000 hours:	93.54%
Average Chromaticity Shift at 6000 hours(Δu'v'):	0.0024
Average Chromaticity Shift at 9000 hours(Δu'v'):	0.0035
Average Chromaticity Shift at 10000 hours (Δu'v'):	0.0037
Average Chromaticity Shift at 15000 hours (Δu'v'):	0.0051
Reported TM-21 L_{70} Lifetime:	>90000hours

Data Set:	**Data Set 3, 105℃, 150mA**
Number of Units:	30
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h,7000h,8000h, 9000h,10000h,11000h,12000h,13000h,14000h,15000h
Average. Lumen Maintenance at 6000 hours:	95.77%
Average. Lumen Maintenance at 9000 hours:	94.30%
Average. Lumen Maintenance at 10000 hours:	93.87%
Average. Lumen Maintenance at 15000 hours:	92.44%
Average Chromaticity Shift at 6000 hours(Δu'v'):	0.0024
Average. Lumen Maintenance at 9000 hours:	0.0037
Average Chromaticity Shift at 10000 hours (Δu'v'):	0.0040
Average Chromaticity Shift at 15000 hours (Δu'v'):	0.0053
Reported TM-21 L_{70} Lifetime:	>90000hours

3 - Test Data

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

No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)						
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	3.090	57.24	99.60	99.13	98.64	97.57	97.13	96.80	96.44
2	3.086	57.04	99.63	99.26	98.62	97.41	96.65	96.13	95.76
3	3.079	56.71	99.82	99.33	98.92	97.80	97.34	96.67	96.49
4	3.087	57.47	99.93	99.37	98.90	97.76	97.34	96.71	96.49
5	3.088	56.76	99.68	99.14	98.38	97.52	97.20	96.56	96.39
6	3.087	57.28	99.74	99.35	98.90	98.32	97.54	96.88	96.56
7	3.079	56.93	99.60	99.16	98.63	98.45	97.65	97.00	96.56
8	3.094	55.06	100.35	99.71	99.42	98.62	98.35	98.06	97.75
9	3.093	54.86	100.16	99.69	99.16	98.63	98.14	97.67	97.54
10	3.093	57.40	99.65	99.25	98.83	98.45	97.91	97.02	96.81
11	3.088	58.00	99.66	99.03	98.47	98.03	97.55	96.71	96.38
12	3.084	57.74	99.93	99.43	99.05	98.41	97.66	96.93	96.74
13	3.080	57.25	100.14	99.72	99.30	99.27	99.00	98.03	97.75
14	3.079	56.84	99.58	99.03	98.84	98.03	97.73	97.54	97.26
15	3.080	58.19	99.48	98.99	98.76	97.87	97.75	97.35	97.13
16	3.084	57.01	99.67	99.30	99.00	98.33	98.21	98.02	97.70
17	3.088	56.58	99.47	99.20	98.71	97.37	96.94	96.52	96.04
18	3.086	57.99	99.67	99.17	98.52	97.03	96.62	96.57	96.10
19	3.087	57.88	99.67	99.10	98.67	97.98	97.13	96.60	96.30
20	3.074	56.65	99.79	99.49	99.01	98.38	97.83	96.91	96.72
21	3.083	57.63	99.74	99.22	98.79	98.18	97.69	97.31	96.81
22	3.086	56.38	100.09	99.86	99.38	98.76	98.14	97.77	97.37
23	3.092	56.12	100.11	99.55	99.22	98.15	97.97	97.68	97.40
24	3.093	57.07	99.30	98.98	98.46	97.28	96.92	96.65	96.34
25	3.086	57.62	99.65	99.18	98.75	96.95	96.79	96.67	96.22
26	3.089	55.78	99.87	99.28	98.64	97.85	97.28	97.15	96.86
27	3.080	54.60	100.24	99.73	99.32	98.02	97.93	97.71	97.40
28	3.089	56.99	100.18	99.44	98.95	98.32	97.77	97.40	96.98
29	3.083	54.55	100.05	99.63	99.12	98.26	97.91	97.36	97.05
30	3.075	57.03	99.74	99.07	98.74	98.39	97.95	97.88	97.33
Ave.	3.085	56.82	99.81	99.33	98.87	98.05	97.60	97.14	96.82
Med.	3.086	57.02	99.74	99.27	98.84	98.09	97.68	97.01	96.78
st dev	0.0054	0.9888	0.2573	0.2479	0.2844	0.5278	0.5395	0.5356	0.5458
Min.	3.074	54.55	99.30	98.98	98.38	96.95	96.62	96.13	95.76
Max.	3.094	58.19	100.35	99.86	99.42	99.27	99.00	98.06	97.75

No.	Lumen Maintenance (%)							
	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
1	96.14	95.89	95.79	95.77	95.56	95.27	95.23	95.00
2	95.27	95.13	95.06	94.99	94.76	94.69	94.55	94.07
3	96.16	95.89	95.84	95.64	95.57	95.43	95.29	94.97
4	95.82	95.53	95.23	95.13	94.97	94.87	94.54	94.17
5	96.11	96.00	95.97	95.81	95.51	95.40	95.30	95.16
6	96.02	95.76	95.27	95.06	94.68	94.38	94.17	93.96
7	96.35	96.07	95.80	95.64	95.61	95.45	95.29	95.20
8	97.57	97.06	96.95	96.71	96.49	96.29	96.17	95.80
9	97.21	96.96	96.74	96.45	96.24	96.01	95.83	95.55
10	96.59	96.27	96.10	95.85	95.70	95.49	95.33	95.26
11	96.19	95.79	95.60	95.36	95.26	95.05	94.86	94.64
12	96.62	96.36	96.21	96.09	95.88	95.65	95.27	95.01
13	97.61	97.36	97.15	96.89	96.84	96.61	96.51	96.31
14	96.97	96.57	96.48	96.27	96.22	96.02	95.90	95.65
15	96.68	96.37	96.05	95.86	95.53	95.41	95.03	94.91
16	97.47	97.12	96.88	96.77	96.65	96.44	96.32	96.16
17	95.81	95.33	95.05	95.03	94.86	94.61	94.45	94.19
18	95.86	95.62	95.24	95.09	95.00	94.81	94.62	94.43
19	95.97	95.80	95.63	95.59	95.46	95.21	95.11	94.94
20	96.56	96.43	96.13	95.87	95.82	95.60	95.46	95.20
21	96.65	96.48	96.25	96.11	95.92	95.80	95.56	95.14
22	96.98	96.72	96.33	96.15	96.08	95.83	95.74	95.62
23	97.36	97.18	96.88	96.83	96.63	96.42	96.35	96.10
24	96.09	95.99	95.60	95.34	95.08	94.85	94.57	94.32
25	96.10	95.89	95.66	95.42	95.37	95.19	94.85	94.43
26	96.74	96.52	96.31	96.11	95.88	95.43	95.36	95.12
27	97.22	96.83	96.48	96.30	96.19	95.92	95.79	95.53
28	96.75	96.42	96.30	96.09	95.84	95.56	95.37	95.33
29	96.79	96.22	95.91	95.66	95.45	95.29	95.27	95.05
30	96.88	96.41	95.88	95.62	95.35	95.25	95.07	95.00
Ave.	96.55	96.27	96.03	95.85	95.68	95.47	95.30	95.08
Med.	96.60	96.32	96.01	95.83	95.59	95.43	95.29	95.09
st dev	0.5904	0.5615	0.5689	0.5505	0.5722	0.5602	0.5937	0.6164
Min.	95.27	95.13	95.05	94.99	94.68	94.38	94.17	93.96
Max.	97.61	97.36	97.15	96.89	96.84	96.61	96.51	96.31

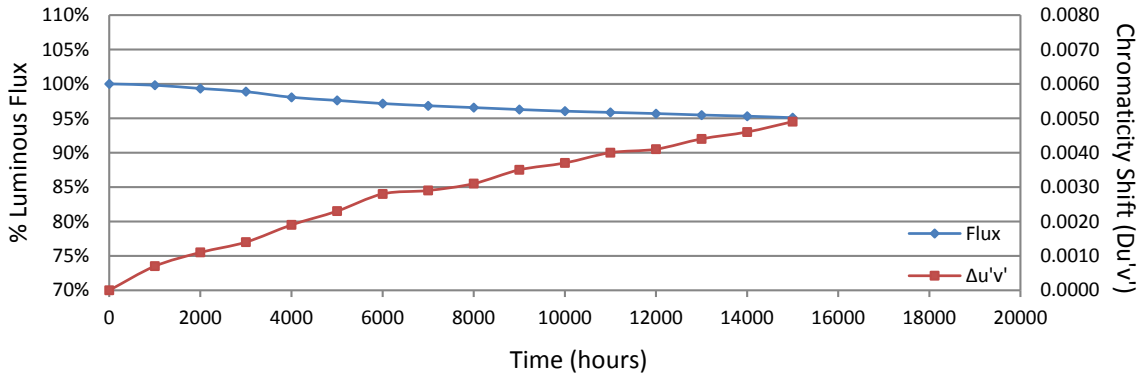
TM-21 Projection:

Test Duration: 15,000 hours
Failures Observed: 0
α: 2.200E-06
β: 0.982
Reported L_{70}: >90000 hours

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

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')						
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	0.2610	0.5291	2725	0.0007	0.0012	0.0015	0.0019	0.0022	0.0026	0.0027
2	0.2592	0.5269	2771	0.0007	0.0009	0.0014	0.0020	0.0023	0.0027	0.0028
3	0.2619	0.5305	2700	0.0007	0.0011	0.0015	0.0019	0.0024	0.0025	0.0029
4	0.2611	0.5294	2720	0.0007	0.0011	0.0014	0.0021	0.0024	0.0027	0.0029
5	0.2617	0.5300	2706	0.0007	0.0012	0.0014	0.0021	0.0025	0.0027	0.0031
6	0.2613	0.5285	2719	0.0006	0.0009	0.0012	0.0017	0.0022	0.0024	0.0022
7	0.2606	0.5290	2733	0.0007	0.0011	0.0015	0.0020	0.0026	0.0028	0.0030
8	0.2614	0.5288	2716	0.0009	0.0014	0.0018	0.0024	0.0029	0.0034	0.0036
9	0.2606	0.5303	2727	0.0009	0.0014	0.0016	0.0021	0.0025	0.0030	0.0031
10	0.2622	0.5307	2693	0.0005	0.0010	0.0013	0.0018	0.0019	0.0025	0.0024
11	0.2599	0.5277	2754	0.0006	0.0011	0.0012	0.0017	0.0020	0.0025	0.0025
12	0.2613	0.5292	2717	0.0009	0.0014	0.0017	0.0023	0.0025	0.0031	0.0034
13	0.2604	0.5273	2745	0.0008	0.0012	0.0015	0.0022	0.0026	0.0030	0.0033
14	0.2608	0.5280	2733	0.0008	0.0012	0.0013	0.0017	0.0022	0.0026	0.0026
15	0.2592	0.5272	2771	0.0007	0.0011	0.0014	0.0017	0.0021	0.0024	0.0027
16	0.2605	0.5266	2745	0.0009	0.0012	0.0014	0.0018	0.0022	0.0026	0.0026
17	0.2602	0.5293	2740	0.0006	0.0012	0.0014	0.0017	0.0021	0.0026	0.0023
18	0.2619	0.5302	2702	0.0008	0.0013	0.0016	0.0019	0.0023	0.0028	0.0029
19	0.2612	0.5298	2716	0.0004	0.0009	0.0012	0.0016	0.0020	0.0024	0.0023
20	0.2594	0.5261	2771	0.0005	0.0010	0.0015	0.0019	0.0022	0.0028	0.0028
21	0.2596	0.5280	2759	0.0008	0.0011	0.0015	0.0019	0.0022	0.0027	0.0024
22	0.2608	0.5273	2736	0.0009	0.0016	0.0020	0.0025	0.0029	0.0034	0.0036
23	0.2603	0.5282	2743	0.0008	0.0014	0.0018	0.0023	0.0026	0.0031	0.0038
24	0.2606	0.5308	2725	0.0002	0.0007	0.0010	0.0015	0.0019	0.0024	0.0026
25	0.2609	0.5303	2722	0.0004	0.0009	0.0013	0.0017	0.0020	0.0025	0.0027
26	0.2620	0.5303	2698	0.0005	0.0011	0.0015	0.0020	0.0024	0.0029	0.0029
27	0.2615	0.5293	2713	0.0007	0.0011	0.0017	0.0022	0.0027	0.0032	0.0036
28	0.2611	0.5293	2721	0.0006	0.0007	0.0012	0.0017	0.0022	0.0026	0.0027
29	0.2614	0.5304	2711	0.0005	0.0012	0.0017	0.0023	0.0028	0.0034	0.0034
30	0.2611	0.5284	2724	0.0004	0.0006	0.0009	0.0018	0.0022	0.0027	0.0028
Ave.	0.2608	0.5289	2729	0.0007	0.0011	0.0014	0.0019	0.0023	0.0028	0.0029
Med.	0.2610	0.5292	2725	0.0007	0.0011	0.0015	0.0019	0.0023	0.0027	0.0028
st dev	0.0008	0.0013	21.5706	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0004
Min.	0.2592	0.5261	2693	0.0002	0.0006	0.0009	0.0015	0.0019	0.0024	0.0022
Max.	0.2622	0.5308	2771	0.0009	0.0016	0.0020	0.0025	0.0029	0.0034	0.0038

No.	Chromaticity Shift (Δu'v')							
	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
1	0.0032	0.0033	0.0039	0.0044	0.0048	0.0050	0.0050	0.0054
2	0.0031	0.0035	0.0034	0.0032	0.0027	0.0031	0.0037	0.0046
3	0.0033	0.0037	0.0039	0.0039	0.0042	0.0045	0.0048	0.0052
4	0.0032	0.0033	0.0035	0.0035	0.0038	0.0042	0.0043	0.0047
5	0.0032	0.0034	0.0036	0.0041	0.0043	0.0047	0.0049	0.0053
6	0.0025	0.0029	0.0029	0.0028	0.0030	0.0033	0.0037	0.0040
7	0.0032	0.0035	0.0036	0.0036	0.0036	0.0040	0.0043	0.0046
8	0.0038	0.0042	0.0045	0.0048	0.0050	0.0054	0.0059	0.0062
9	0.0033	0.0038	0.0039	0.0037	0.0035	0.0039	0.0045	0.0050
10	0.0029	0.0031	0.0036	0.0039	0.0036	0.0040	0.0042	0.0046
11	0.0026	0.0028	0.0038	0.0041	0.0040	0.0042	0.0045	0.0049
12	0.0036	0.0038	0.0036	0.0041	0.0042	0.0045	0.0045	0.0051
13	0.0035	0.0036	0.0042	0.0048	0.0045	0.0047	0.0044	0.0045
14	0.0029	0.0032	0.0046	0.0045	0.0043	0.0045	0.0049	0.0047
15	0.0029	0.0032	0.0033	0.0036	0.0042	0.0045	0.0049	0.0047
16	0.0030	0.0035	0.0034	0.0038	0.0042	0.0045	0.0050	0.0050
17	0.0026	0.0028	0.0030	0.0032	0.0038	0.0040	0.0043	0.0044
18	0.0031	0.0033	0.0030	0.0035	0.0037	0.0040	0.0043	0.0045
19	0.0024	0.0030	0.0027	0.0030	0.0034	0.0036	0.0037	0.0044
20	0.0032	0.0034	0.0034	0.0038	0.0042	0.0045	0.0045	0.0050
21	0.0027	0.0031	0.0033	0.0033	0.0037	0.0040	0.0041	0.0045
22	0.0039	0.0042	0.0045	0.0049	0.0049	0.0052	0.0052	0.0057
23	0.0038	0.0042	0.0043	0.0045	0.0044	0.0047	0.0042	0.0050
24	0.0028	0.0031	0.0044	0.0049	0.0046	0.0048	0.0049	0.0052
25	0.0028	0.0031	0.0034	0.0038	0.0038	0.0041	0.0043	0.0044
26	0.0034	0.0038	0.0035	0.0039	0.0040	0.0044	0.0047	0.0048
27	0.0037	0.0041	0.0043	0.0047	0.0050	0.0053	0.0049	0.0057
28	0.0030	0.0035	0.0039	0.0040	0.0043	0.0046	0.0047	0.0048
29	0.0036	0.0040	0.0047	0.0048	0.0050	0.0051	0.0055	0.0057
30	0.0029	0.0033	0.0037	0.0038	0.0037	0.0038	0.0045	0.0041
Ave.	0.0031	0.0035	0.0037	0.0040	0.0041	0.0044	0.0046	0.0049
Med.	0.0031	0.0034	0.0036	0.0039	0.0042	0.0045	0.0045	0.0048
st dev	0.0004	0.0004	0.0005	0.0006	0.0006	0.0006	0.0005	0.0005
Min.	0.0024	0.0028	0.0027	0.0028	0.0027	0.0031	0.0037	0.0040
Max.	0.0039	0.0042	0.0047	0.0049	0.0050	0.0054	0.0059	0.0062



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

No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)						
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
31	3.078	56.02	100.02	99.43	98.82	97.86	97.30	96.39	96.05
32	3.069	57.68	99.55	98.96	98.28	97.75	97.17	96.29	95.96
33	3.085	57.10	99.56	98.91	98.16	97.23	96.94	96.25	95.83
34	3.084	55.93	100.13	99.57	98.27	97.23	96.78	95.96	95.55
35	3.068	56.41	99.98	99.47	98.23	97.16	96.56	96.21	95.64
36	3.080	53.77	99.94	99.40	98.79	97.64	96.97	96.80	96.56
37	3.082	57.54	99.60	99.13	98.45	97.43	96.54	95.52	95.20
38	3.075	57.10	99.61	99.00	98.37	97.39	96.50	95.69	94.96
39	3.093	56.24	100.25	99.75	99.06	98.13	97.40	96.60	96.27
40	3.088	57.30	99.69	99.02	98.38	97.52	96.68	96.02	95.43
41	3.115	56.00	99.55	98.89	98.50	97.21	96.70	95.89	95.59
42	3.082	57.13	100.04	99.63	99.04	97.78	97.36	96.52	96.29
43	3.091	57.50	99.69	98.99	98.56	97.53	97.13	96.37	95.98
44	3.094	57.43	99.79	99.08	99.27	98.21	97.86	97.25	96.94
45	3.093	55.54	99.98	99.33	98.87	97.80	97.70	97.43	96.98
46	3.099	57.91	99.08	98.51	98.22	96.22	95.96	95.86	95.61
47	3.088	57.52	99.13	98.61	98.40	97.46	96.14	96.05	95.48
48	3.098	56.95	99.65	98.98	98.33	97.30	96.54	96.47	96.01
49	3.137	56.83	99.67	99.12	98.56	97.06	96.48	96.16	95.53
50	3.123	55.87	99.50	99.02	98.50	98.21	97.19	96.46	96.15
51	3.098	56.27	99.56	98.88	98.47	98.19	97.09	96.32	95.66
52	3.110	56.66	99.21	98.66	97.90	97.44	96.35	95.80	95.46
53	3.114	56.97	99.37	98.93	98.42	97.70	97.09	96.65	95.98
54	3.113	56.31	99.47	98.77	98.33	97.82	97.03	96.41	95.84
55	3.121	55.60	99.55	98.97	98.40	97.90	97.21	96.91	96.65
56	3.080	56.50	99.45	98.85	98.41	98.05	97.52	97.22	96.65
57	3.081	56.83	99.51	98.98	98.50	97.62	96.96	96.53	95.92
58	3.089	55.37	100.05	99.55	99.04	98.05	97.13	96.91	96.42
59	3.093	55.86	99.79	99.09	98.37	96.35	95.95	94.97	94.61
60	3.086	57.21	99.44	98.97	98.32	97.26	96.92	96.26	95.80
Ave.	3.094	56.58	99.66	99.08	98.51	97.55	96.90	96.34	95.90
Med.	3.090	56.75	99.61	99.00	98.41	97.58	96.96	96.34	95.88
st dev	0.0167	0.8779	0.2908	0.3069	0.3060	0.4816	0.4733	0.5256	0.5473
Min.	3.068	53.77	99.08	98.51	97.90	96.22	95.95	94.97	94.61
Max.	3.137	57.91	100.25	99.75	99.27	98.21	97.86	97.43	96.98

No.	Lumen Maintenance (%)							
	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
31	95.61	95.00	94.63	94.38	94.31	94.00	93.77	93.34
32	95.63	95.27	94.97	94.69	94.49	94.11	93.86	93.65
33	95.52	95.11	95.01	94.76	94.59	94.43	94.24	93.85
34	95.01	94.58	94.31	94.01	93.78	93.55	93.31	92.99
35	94.98	94.45	94.15	93.88	93.71	93.39	93.14	92.86
36	96.43	96.15	95.87	95.65	95.48	95.33	95.13	94.90
37	94.96	94.60	94.33	94.07	93.80	93.43	93.26	92.89
38	94.69	94.33	94.03	93.80	93.40	93.22	93.01	92.75
39	96.23	95.93	95.64	95.32	95.11	94.86	94.75	94.52
40	95.31	95.06	94.47	94.17	94.03	93.80	93.40	93.09
41	94.82	94.36	93.86	93.70	93.57	93.36	93.02	92.73
42	95.92	95.69	95.36	95.08	94.80	94.56	94.36	94.00
43	95.39	94.92	94.56	94.35	94.21	93.97	93.83	93.67
44	96.50	96.10	95.70	95.40	95.25	94.99	94.58	94.36
45	96.72	96.36	96.09	95.86	95.62	95.48	95.17	95.10
46	94.99	94.42	94.23	93.99	93.84	93.65	93.40	93.02
47	95.34	94.94	94.63	94.38	93.97	93.88	93.69	93.27
48	95.72	95.26	94.87	94.61	94.33	94.19	93.96	93.54
49	95.06	94.58	94.26	94.00	93.77	93.45	93.35	93.19
50	96.04	95.54	95.17	94.92	94.74	94.61	94.51	94.31
51	95.29	94.99	94.74	94.44	94.01	93.80	93.60	93.28
52	95.25	94.78	94.33	94.03	93.86	93.63	93.33	93.10
53	95.35	94.87	94.58	94.28	94.05	93.75	93.61	93.36
54	95.12	94.58	94.16	93.89	93.64	93.34	93.13	92.90
55	96.04	95.61	95.13	94.93	94.64	94.51	94.24	94.03
56	96.35	95.89	95.49	95.20	94.99	94.62	94.50	94.23
57	95.88	95.57	95.21	94.97	94.76	94.58	94.23	94.02
58	96.15	95.67	95.27	94.89	94.56	94.27	93.91	93.44
59	93.91	93.47	93.13	92.82	92.55	92.30	92.03	91.85
60	95.46	95.07	94.95	94.79	94.49	94.28	94.02	93.81
Ave.	95.52	95.11	94.77	94.51	94.28	94.04	93.81	93.54
Med.	95.42	95.03	94.68	94.41	94.26	93.98	93.80	93.40
st dev	0.6231	0.6542	0.6570	0.6561	0.6668	0.6857	0.6883	0.7097
Min.	93.91	93.47	93.13	92.82	92.55	92.30	92.03	91.85
Max.	96.72	96.36	96.09	95.86	95.62	95.48	95.17	95.10

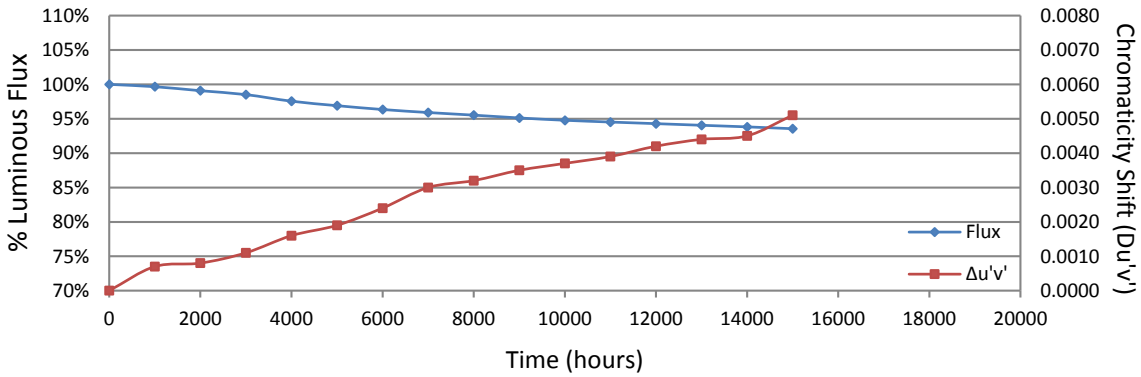
TM-21 Projection:

Test Duration: 15,000 hours
Failures Observed: 0
α: 3.028E-06
β: 0.978
Reported L_{70}: >90000 hours

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

No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')						
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
31	0.2614	0.5293	2716	0.0008	0.0010	0.0012	0.0020	0.0024	0.0028	0.0031
32	0.2606	0.5296	2730	0.0005	0.0008	0.0012	0.0019	0.0023	0.0027	0.0033
33	0.2608	0.5301	2724	0.0004	0.0006	0.0008	0.0014	0.0017	0.0023	0.0029
34	0.2606	0.5288	2734	0.0003	0.0007	0.0011	0.0016	0.0021	0.0025	0.0031
35	0.2606	0.5280	2737	0.0004	0.0006	0.0010	0.0016	0.0019	0.0024	0.0033
36	0.2615	0.5305	2709	0.0005	0.0006	0.0009	0.0015	0.0019	0.0024	0.0031
37	0.2608	0.5283	2732	0.0006	0.0007	0.0009	0.0014	0.0018	0.0023	0.0029
38	0.2605	0.5284	2738	0.0006	0.0006	0.0009	0.0016	0.0019	0.0025	0.0033
39	0.2612	0.5293	2719	0.0010	0.0010	0.0013	0.0018	0.0022	0.0026	0.0033
40	0.2597	0.5280	2756	0.0006	0.0007	0.0011	0.0017	0.0021	0.0026	0.0028
41	0.2594	0.5276	2765	0.0006	0.0008	0.0009	0.0015	0.0020	0.0024	0.0026
42	0.2605	0.5289	2735	0.0007	0.0008	0.0010	0.0016	0.0019	0.0024	0.0029
43	0.2616	0.5302	2708	0.0005	0.0006	0.0008	0.0014	0.0017	0.0022	0.0026
44	0.2599	0.5284	2750	0.0005	0.0006	0.0007	0.0014	0.0017	0.0022	0.0026
45	0.2621	0.5287	2704	0.0008	0.0010	0.0012	0.0017	0.0021	0.0025	0.0032
46	0.2602	0.5294	2740	0.0005	0.0006	0.0007	0.0013	0.0016	0.0021	0.0026
47	0.2607	0.5284	2733	0.0007	0.0007	0.0009	0.0015	0.0018	0.0022	0.0028
48	0.2605	0.5280	2740	0.0007	0.0006	0.0008	0.0013	0.0017	0.0022	0.0024
49	0.2593	0.5278	2766	0.0010	0.0010	0.0013	0.0016	0.0020	0.0024	0.0031
50	0.2618	0.5304	2703	0.0009	0.0009	0.0013	0.0018	0.0020	0.0025	0.0031
51	0.2617	0.5307	2704	0.0009	0.0011	0.0013	0.0018	0.0021	0.0025	0.0031
52	0.2617	0.5278	2715	0.0008	0.0009	0.0011	0.0016	0.0019	0.0024	0.0028
53	0.2593	0.5266	2770	0.0008	0.0008	0.0013	0.0016	0.0018	0.0023	0.0029
54	0.2617	0.5298	2707	0.0008	0.0012	0.0015	0.0017	0.0019	0.0027	0.0030
55	0.2602	0.5289	2741	0.0006	0.0007	0.0009	0.0013	0.0017	0.0019	0.0027
56	0.2601	0.5278	2749	0.0007	0.0007	0.0011	0.0014	0.0019	0.0021	0.0029
57	0.2596	0.5273	2761	0.0008	0.0008	0.0009	0.0014	0.0018	0.0020	0.0029
58	0.2612	0.5294	2720	0.0008	0.0008	0.0012	0.0015	0.0018	0.0022	0.0029
59	0.2588	0.5273	2779	0.0004	0.0010	0.0016	0.0027	0.0030	0.0037	0.0042
60	0.2613	0.5290	2718	0.0007	0.0006	0.0012	0.0015	0.0016	0.0020	0.0026
Ave.	0.2606	0.5288	2733	0.0007	0.0008	0.0011	0.0016	0.0019	0.0024	0.0030
Med.	0.2606	0.5288	2734	0.0007	0.0008	0.0011	0.0016	0.0019	0.0024	0.0029
st dev	0.0009	0.0011	21.5049	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003
Min.	0.2588	0.5266	2703	0.0003	0.0006	0.0007	0.0013	0.0016	0.0019	0.0024
Max.	0.2621	0.5307	2779	0.0010	0.0012	0.0016	0.0027	0.0030	0.0037	0.0042

No.	Chromaticity Shift (Δu'v')							
	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
31	0.0032	0.0036	0.0037	0.0039	0.0044	0.0048	0.0046	0.0054
32	0.0032	0.0035	0.0038	0.0040	0.0041	0.0040	0.0041	0.0046
33	0.0030	0.0031	0.0036	0.0036	0.0039	0.0040	0.0045	0.0048
34	0.0031	0.0035	0.0039	0.0042	0.0042	0.0046	0.0045	0.0052
35	0.0034	0.0035	0.0036	0.0040	0.0043	0.0045	0.0041	0.0053
36	0.0033	0.0035	0.0036	0.0041	0.0042	0.0045	0.0047	0.0055
37	0.0031	0.0033	0.0035	0.0039	0.0041	0.0044	0.0043	0.0052
38	0.0033	0.0034	0.0033	0.0036	0.0038	0.0042	0.0042	0.0048
39	0.0036	0.0037	0.0041	0.0045	0.0046	0.0049	0.0048	0.0055
40	0.0031	0.0034	0.0034	0.0039	0.0042	0.0043	0.0043	0.0050
41	0.0029	0.0030	0.0031	0.0035	0.0037	0.0038	0.0038	0.0045
42	0.0028	0.0033	0.0034	0.0037	0.0038	0.0041	0.0040	0.0048
43	0.0028	0.0030	0.0032	0.0034	0.0035	0.0037	0.0040	0.0043
44	0.0027	0.0027	0.0028	0.0033	0.0038	0.0039	0.0040	0.0038
45	0.0036	0.0035	0.0037	0.0036	0.0042	0.0045	0.0050	0.0057
46	0.0028	0.0027	0.0033	0.0034	0.0041	0.0044	0.0045	0.0051
47	0.0033	0.0033	0.0035	0.0036	0.0045	0.0048	0.0052	0.0055
48	0.0029	0.0029	0.0029	0.0030	0.0039	0.0042	0.0042	0.0049
49	0.0034	0.0034	0.0041	0.0042	0.0047	0.0043	0.0050	0.0057
50	0.0032	0.0036	0.0038	0.0040	0.0044	0.0047	0.0052	0.0057
51	0.0032	0.0038	0.0031	0.0033	0.0040	0.0042	0.0045	0.0051
52	0.0030	0.0037	0.0037	0.0039	0.0044	0.0047	0.0050	0.0054
53	0.0030	0.0037	0.0037	0.0040	0.0040	0.0045	0.0045	0.0052
54	0.0032	0.0038	0.0044	0.0045	0.0047	0.0049	0.0050	0.0055
55	0.0029	0.0037	0.0036	0.0038	0.0039	0.0041	0.0043	0.0047
56	0.0032	0.0038	0.0037	0.0040	0.0041	0.0043	0.0045	0.0051
57	0.0032	0.0037	0.0040	0.0043	0.0041	0.0043	0.0045	0.0052
58	0.0033	0.0042	0.0040	0.0042	0.0042	0.0044	0.0044	0.0050
59	0.0043	0.0050	0.0051	0.0054	0.0050	0.0052	0.0057	0.0059
60	0.0029	0.0038	0.0042	0.0044	0.0040	0.0042	0.0038	0.0042
Ave.	0.0032	0.0035	0.0037	0.0039	0.0042	0.0044	0.0045	0.0051
Med.	0.0032	0.0035	0.0037	0.0039	0.0041	0.0044	0.0045	0.0051
st dev	0.0003	0.0004	0.0005	0.0005	0.0003	0.0003	0.0005	0.0005
Min.	0.0027	0.0027	0.0028	0.0030	0.0035	0.0037	0.0038	0.0038
Max.	0.0043	0.0050	0.0051	0.0054	0.0050	0.0052	0.0057	0.0059



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

No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)						
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
61	3.086	58.02	99.62	99.12	98.43	97.48	96.60	96.10	95.66
62	3.101	56.28	99.91	101.76	100.11	100.00	99.68	99.15	98.69
63	3.101	57.79	99.62	99.22	98.55	97.89	96.94	96.02	95.45
64	3.095	55.86	99.57	99.03	98.42	97.15	96.60	96.24	96.85
65	3.122	56.91	99.81	99.14	98.37	97.35	96.80	96.47	95.84
66	3.102	56.94	99.77	99.26	98.37	96.91	96.28	96.12	95.86
67	3.098	57.94	99.62	99.21	98.58	97.15	96.58	95.10	94.58
68	3.088	56.81	99.67	99.10	98.38	95.56	94.77	94.24	93.49
69	3.089	57.33	99.63	99.20	98.43	97.56	96.23	95.24	94.68
70	3.092	56.09	99.96	99.27	98.57	97.15	96.52	96.31	95.90
71	3.084	56.14	99.86	99.41	98.88	96.72	96.03	95.69	95.17
72	3.077	55.35	99.33	98.81	98.23	96.80	96.13	95.50	94.92
73	3.087	56.73	98.50	98.17	97.41	96.26	96.02	94.32	93.78
74	3.091	57.14	99.46	99.02	98.48	96.18	95.31	94.59	94.31
75	3.092	53.56	99.79	99.33	98.64	96.51	95.95	95.37	95.03
76	3.092	56.71	99.38	98.85	98.13	97.30	96.60	94.83	94.16
77	3.082	56.85	99.56	98.84	98.14	97.24	96.50	95.25	94.81
78	3.077	57.10	99.74	99.09	98.35	97.53	96.71	96.01	95.46
79	3.086	57.91	99.90	99.45	98.69	97.32	96.68	95.99	95.30
80	3.080	56.95	99.72	99.37	98.61	96.35	95.82	95.22	94.73
81	3.085	56.94	99.98	99.26	98.38	97.28	96.77	96.21	95.61
82	3.088	57.26	99.86	99.48	98.67	97.14	96.75	96.12	95.69
83	3.084	57.77	99.57	98.82	98.22	96.71	95.91	95.24	94.91
84	3.092	55.71	99.28	98.73	98.99	97.42	96.91	96.16	95.64
85	3.091	56.72	99.45	98.96	98.15	97.88	97.21	96.91	96.42
86	3.096	57.99	99.72	99.28	98.31	97.28	96.46	95.90	95.45
87	3.095	56.77	99.67	99.12	98.34	97.15	96.44	95.75	95.07
88	3.104	57.77	99.46	99.05	98.36	97.07	96.17	95.31	94.74
89	3.086	56.79	99.56	98.87	98.24	97.90	96.97	95.95	95.39
90	3.077	57.47	99.88	99.29	98.69	97.60	96.31	95.79	95.21
Ave.	3.091	56.85	99.63	99.18	98.47	97.20	96.49	95.77	95.29
Med.	3.090	56.93	99.65	99.13	98.40	97.20	96.51	95.84	95.26
st dev	0.0095	0.9347	0.2824	0.5546	0.4185	0.7518	0.7860	0.8973	0.9600
Min.	3.077	53.56	98.50	98.17	97.41	95.56	94.77	94.24	93.49
Max.	3.122	58.02	99.98	101.76	100.11	100.00	99.68	99.15	98.69

No.	Lumen Maintenance (%)							
	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
61	95.33	94.85	94.42	94.04	93.73	93.47	93.14	92.86
62	98.21	97.74	97.41	97.14	96.89	96.75	96.59	96.29
63	95.12	94.45	94.00	93.65	93.49	93.23	93.03	92.68
64	96.33	95.92	95.33	95.02	94.58	94.36	93.95	93.59
65	95.24	94.55	94.11	93.87	93.78	93.50	93.36	93.08
66	95.40	95.15	94.64	94.40	94.13	93.87	93.64	93.26
67	94.06	93.51	93.11	92.70	92.37	92.13	91.63	91.42
68	92.69	92.06	91.73	91.37	91.06	90.95	90.65	90.39
69	94.12	93.70	93.09	92.67	92.24	91.85	91.58	91.37
70	95.69	95.24	94.79	94.54	94.06	93.87	93.60	93.35
71	94.60	94.01	93.66	93.30	93.16	92.80	92.63	92.34
72	94.33	93.69	93.35	92.97	92.72	92.36	92.21	91.83
73	93.28	92.90	92.49	92.21	91.82	91.57	91.08	90.76
74	93.79	93.21	92.68	92.39	92.09	91.83	91.62	91.35
75	94.68	94.31	93.98	93.65	93.37	93.13	92.89	92.51
76	93.99	93.37	92.79	92.42	92.24	91.92	91.64	91.38
77	94.25	93.84	93.53	93.28	93.02	92.66	92.42	92.28
78	94.97	94.47	94.03	93.80	93.38	93.01	92.52	92.14
79	94.73	94.04	93.78	93.58	93.21	93.04	92.71	92.44
80	94.49	94.08	93.78	93.47	93.22	93.03	92.85	92.48
81	95.15	94.87	94.59	94.38	94.22	93.89	93.54	93.27
82	95.08	94.52	94.01	93.73	93.50	93.29	92.98	92.61
83	94.11	93.51	92.87	92.64	92.33	92.02	91.64	91.40
84	95.03	94.61	94.22	93.90	93.66	93.34	93.29	92.93
85	95.68	95.24	94.82	94.57	94.41	94.09	93.83	93.55
86	95.09	94.45	94.02	93.76	93.46	93.12	92.88	92.55
87	94.49	93.92	93.61	93.31	92.97	92.80	92.36	92.00
88	94.34	93.79	93.25	92.94	92.61	92.38	92.19	92.00
89	94.95	94.31	93.89	93.63	93.41	93.11	93.01	92.50
90	94.88	94.57	94.01	93.70	93.46	93.18	93.02	92.69
Ave.	94.80	94.30	93.87	93.57	93.29	93.02	92.75	92.44
Med.	94.81	94.31	93.93	93.64	93.38	93.08	92.87	92.49
st dev	0.9775	1.0132	1.0212	1.0425	1.0561	1.0662	1.1002	1.0830
Min.	92.69	92.06	91.73	91.37	91.06	90.95	90.65	90.39
Max.	98.21	97.74	97.41	97.14	96.89	96.75	96.59	96.29

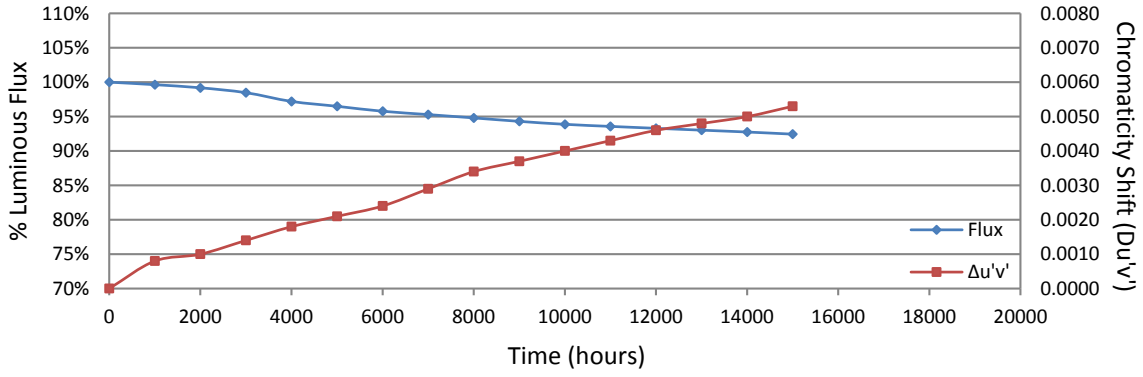
TM-21 Projection:

Test Duration: 15,000 hours
Failures Observed: 0
α: 3.676E-06
β: 0.976
Reported L_{70}: >90000 hours

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

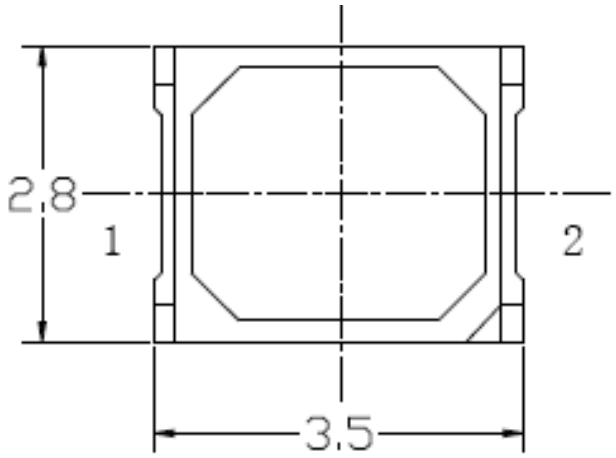
No.	u'	v'	CCT(K)	Chromaticity Shift (Δu'v')						
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
61	0.2592	0.5271	2771	0.0007	0.0008	0.0012	0.0015	0.0018	0.0022	0.0030
62	0.2601	0.5266	2754	0.0008	0.0008	0.0012	0.0016	0.0020	0.0024	0.0032
63	0.2598	0.5277	2755	0.0007	0.0006	0.0011	0.0015	0.0021	0.0027	0.0036
64	0.2600	0.5286	2747	0.0007	0.0009	0.0011	0.0016	0.0017	0.0022	0.0030
65	0.2600	0.5274	2752	0.0008	0.0008	0.0011	0.0015	0.0016	0.0021	0.0027
66	0.2607	0.5282	2733	0.0006	0.0006	0.0010	0.0013	0.0015	0.0019	0.0026
67	0.2586	0.5251	2793	0.0009	0.0009	0.0013	0.0016	0.0016	0.0022	0.0029
68	0.2591	0.5293	2763	0.0006	0.0009	0.0013	0.0021	0.0030	0.0039	0.0040
69	0.2611	0.5298	2720	0.0007	0.0009	0.0011	0.0014	0.0015	0.0020	0.0028
70	0.2605	0.5292	2734	0.0008	0.0010	0.0013	0.0015	0.0016	0.0019	0.0028
71	0.2619	0.5303	2700	0.0008	0.0010	0.0014	0.0016	0.0017	0.0020	0.0029
72	0.2581	0.5268	2797	0.0008	0.0009	0.0011	0.0014	0.0015	0.0017	0.0024
73	0.2588	0.5266	2781	0.0009	0.0011	0.0013	0.0014	0.0019	0.0021	0.0028
74	0.2609	0.5285	2729	0.0008	0.0011	0.0014	0.0014	0.0016	0.0019	0.0025
75	0.2611	0.5290	2723	0.0008	0.0010	0.0015	0.0014	0.0015	0.0018	0.0024
76	0.2620	0.5301	2700	0.0010	0.0013	0.0018	0.0020	0.0017	0.0021	0.0029
77	0.2612	0.5290	2720	0.0008	0.0010	0.0015	0.0017	0.0018	0.0019	0.0025
78	0.2603	0.5278	2744	0.0009	0.0011	0.0017	0.0020	0.0021	0.0023	0.0029
79	0.2597	0.5274	2758	0.0007	0.0010	0.0012	0.0016	0.0018	0.0019	0.0021
80	0.2612	0.5284	2723	0.0010	0.0014	0.0018	0.0022	0.0023	0.0030	0.0031
81	0.2620	0.5301	2700	0.0009	0.0011	0.0017	0.0022	0.0025	0.0027	0.0028
82	0.2589	0.5266	2779	0.0008	0.0011	0.0017	0.0021	0.0025	0.0027	0.0028
83	0.2592	0.5272	2770	0.0009	0.0009	0.0016	0.0021	0.0024	0.0026	0.0030
84	0.2620	0.5299	2700	0.0011	0.0013	0.0017	0.0021	0.0025	0.0028	0.0030
85	0.2616	0.5299	2709	0.0007	0.0016	0.0023	0.0028	0.0033	0.0034	0.0035
86	0.2592	0.5274	2770	0.0007	0.0008	0.0018	0.0022	0.0025	0.0027	0.0028
87	0.2609	0.5288	2728	0.0004	0.0006	0.0013	0.0021	0.0024	0.0025	0.0026
88	0.2590	0.5273	2773	0.0007	0.0006	0.0013	0.0020	0.0023	0.0025	0.0026
89	0.2610	0.5285	2726	0.0009	0.0009	0.0013	0.0021	0.0025	0.0026	0.0027
90	0.2606	0.5302	2727	0.0007	0.0008	0.0012	0.0018	0.0024	0.0025	0.0030
Ave.	0.2603	0.5283	2743	0.0008	0.0010	0.0014	0.0018	0.0021	0.0024	0.0029
Med.	0.2604	0.5285	2739	0.0008	0.0009	0.0013	0.0017	0.0020	0.0023	0.0028
st dev	0.0011	0.0013	28.6711	0.0001	0.0002	0.0003	0.0004	0.0005	0.0005	0.0004
Min.	0.2581	0.5251	2700	0.0004	0.0006	0.0010	0.0013	0.0015	0.0017	0.0021
Max.	0.2620	0.5303	2797	0.0011	0.0016	0.0023	0.0028	0.0033	0.0039	0.0040

No.	Chromaticity Shift (Δu'v')							
	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs	15000hrs
61	0.0031	0.0036	0.0040	0.0042	0.0045	0.0048	0.0047	0.0050
62	0.0034	0.0039	0.0041	0.0043	0.0047	0.0050	0.0052	0.0055
63	0.0040	0.0044	0.0046	0.0048	0.0054	0.0057	0.0057	0.0061
64	0.0033	0.0036	0.0041	0.0042	0.0040	0.0043	0.0047	0.0050
65	0.0030	0.0034	0.0041	0.0045	0.0043	0.0046	0.0047	0.0050
66	0.0030	0.0033	0.0039	0.0043	0.0043	0.0046	0.0049	0.0053
67	0.0032	0.0035	0.0039	0.0043	0.0050	0.0052	0.0054	0.0057
68	0.0040	0.0047	0.0048	0.0052	0.0054	0.0057	0.0055	0.0061
69	0.0035	0.0037	0.0041	0.0044	0.0040	0.0042	0.0043	0.0049
70	0.0035	0.0037	0.0039	0.0040	0.0040	0.0043	0.0045	0.0050
71	0.0034	0.0037	0.0040	0.0045	0.0052	0.0055	0.0059	0.0059
72	0.0029	0.0034	0.0035	0.0037	0.0045	0.0048	0.0050	0.0053
73	0.0034	0.0038	0.0042	0.0045	0.0041	0.0045	0.0047	0.0050
74	0.0032	0.0035	0.0040	0.0042	0.0041	0.0043	0.0043	0.0048
75	0.0031	0.0035	0.0040	0.0042	0.0040	0.0042	0.0044	0.0050
76	0.0035	0.0038	0.0042	0.0052	0.0050	0.0054	0.0051	0.0057
77	0.0031	0.0034	0.0035	0.0038	0.0045	0.0047	0.0048	0.0054
78	0.0036	0.0040	0.0045	0.0046	0.0046	0.0050	0.0049	0.0057
79	0.0028	0.0031	0.0035	0.0036	0.0036	0.0039	0.0037	0.0043
80	0.0037	0.0039	0.0038	0.0040	0.0043	0.0045	0.0042	0.0050
81	0.0034	0.0037	0.0039	0.0044	0.0045	0.0047	0.0047	0.0049
82	0.0033	0.0036	0.0039	0.0042	0.0048	0.0052	0.0054	0.0055
83	0.0036	0.0039	0.0041	0.0043	0.0047	0.0048	0.0052	0.0056
84	0.0036	0.0040	0.0042	0.0047	0.0051	0.0053	0.0059	0.0063
85	0.0042	0.0046	0.0049	0.0051	0.0052	0.0055	0.0059	0.0052
86	0.0034	0.0037	0.0040	0.0044	0.0048	0.0051	0.0056	0.0054
87	0.0034	0.0037	0.0038	0.0040	0.0044	0.0047	0.0050	0.0050
88	0.0032	0.0035	0.0039	0.0042	0.0042	0.0045	0.0045	0.0050
89	0.0033	0.0037	0.0040	0.0042	0.0049	0.0050	0.0054	0.0052
90	0.0031	0.0033	0.0037	0.0040	0.0042	0.0045	0.0052	0.0052
Ave.	0.0034	0.0037	0.0040	0.0043	0.0046	0.0048	0.0050	0.0053
Med.	0.0034	0.0037	0.0040	0.0043	0.0045	0.0047	0.0050	0.0052
st dev	0.0003	0.0004	0.0003	0.0004	0.0005	0.0005	0.0005	0.0004
Min.	0.0028	0.0031	0.0035	0.0036	0.0036	0.0039	0.0037	0.0043
Max.	0.0042	0.0047	0.0049	0.0052	0.0054	0.0057	0.0059	0.0063



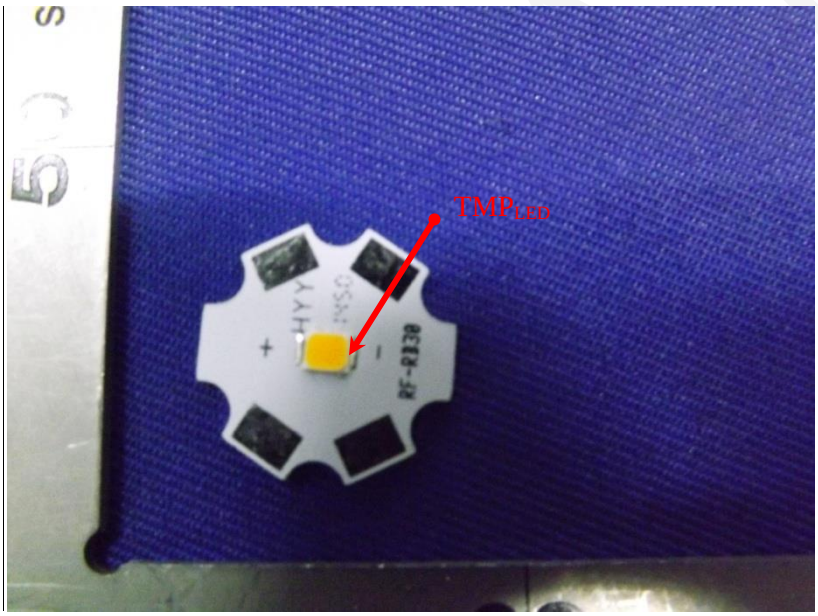
Attachment A – EUT PHOTO

A.1 Mechanical Dimensions (Ta = 25℃)



All dimensions are in millimeter

A.2 EUT Photo



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