



IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Samsung Electronics Co., LTD

1,Samsung-Ro,Giheung-Gu,Yongin-City,Gyeonggi-Do 17113, Korea

Model:SPMWHx228xxxxxxxxxx

Report Type: 6000 Hours Test Report	Product Type: LED Package
Test Engineer:	Bill Xiong, Pote Wang <i>Bill Xiong Pote Wang</i>
Report Number:	RSZ150717506--10
Test Date:	2015-12-07 to 2016-08-13
Report Date:	2016-08-17
Reviewed By:	Daniel Duan /EE Manager <i>Daniel Duan</i>
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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: SPMWHx228xxxxxxxxxx
 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	0.3m	2016-03-10	2017-03-09
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	15V/2000mA	2016-03-04	2017-03-03
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2016-03-10	2017-03-09
Standard Light Source	EVERFINE	D062	1011093	3000K	2015-09-17	2016-09-16
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987C J7321114	300VA	2016-03-04	2017-03-03
Multilayer aging machine	BACL	B2-270	20022	25°C~110°C	2015-11-23	2016-11-22
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06606	0~5V,0~40A	2015-10-30	2016-10-29
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06605	0~5V,0~40A	2015-10-30	2016-10-29
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06604	0~5V,0~40A	2015-10-30	2016-10-29

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 Ts 55°C, Ts 85°C and Ts 105°C were received at 2015-07-17 and tested during 2015-12-07 to 2016-08-13. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75

Data Set 1: 55°C, 150mA

Part Number:	SPMWHx228xxxxxxxxxx
Number of Units:	25
Actual Case Temperature(T _S):	T _S =54.4°C
Actual Ambient Temperature(T _A):	T _A =51.8°C
Life Test Drive Current:	I _F = 150mA
Measurement Current:	I _F = 150mA

Data Set 2: 85°C,150mA

Part Number:	SPMWHx228xxxxxxxxxx
Number of Units:	25
Actual Case Temperature(T _S):	T _S =84.4°C
Actual Ambient Temperature(T _A):	T _A =82.6°C
Life Test Drive Current:	I _F =150mA
Measurement Current:	I _F = 150mA

Data Set 3: 105°C, 150mA

Part Number:	SPMWHx228xxxxxxxxxx
Number of Units:	25
Actual Case Temperature(T _S):	T _S =104.1°C
Actual Ambient Temperature(T _A):	T _A =103.4°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:	98.54%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$):	0.0012
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:	97.88%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0014
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:	97.34%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0016
Reported TM-21 L ₇₀ Lifetime:	>36,000 hours

3 - Test Data

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

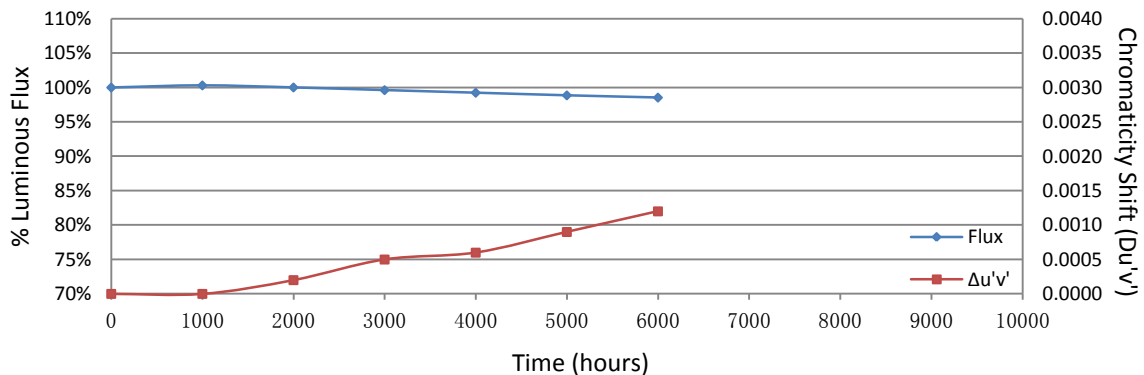
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2.973	57.30	100.35	100.14	99.72	99.35	98.88	98.46
2	2.967	57.58	100.38	100.21	99.72	99.31	98.92	98.58
3	2.955	57.20	100.33	100.12	99.79	99.35	99.04	98.71
4	2.972	57.25	100.33	100.07	99.74	99.41	99.02	98.79
5	2.971	57.20	100.31	100.02	99.60	99.25	98.95	98.71
6	2.970	57.40	100.17	99.93	99.55	99.18	98.85	98.66
7	2.964	57.39	100.28	100.00	99.65	99.34	99.01	98.78
8	2.956	56.92	100.30	100.07	99.70	99.31	98.96	98.66
9	2.968	57.23	100.26	99.95	99.58	99.18	98.92	98.67
10	3.014	57.16	100.44	100.12	99.67	99.41	99.09	98.69
11	2.981	57.80	100.40	100.05	99.57	99.27	98.93	98.53
12	2.953	56.87	100.39	100.09	99.56	99.23	98.89	98.54
13	3.005	57.09	100.35	100.12	99.67	99.30	98.93	98.63
14	2.956	56.93	100.40	100.05	99.54	99.21	98.88	98.51
15	2.962	56.72	100.30	100.04	99.68	99.31	98.92	98.55
16	2.955	57.44	100.37	100.05	99.60	99.27	98.83	98.56
17	2.964	56.99	100.32	100.11	99.74	99.32	98.95	98.60
18	2.966	57.41	100.19	99.98	99.65	99.29	98.80	98.40
19	3.030	56.98	100.21	99.96	99.60	99.28	98.79	98.39
20	3.064	57.00	100.25	99.93	99.58	99.25	98.88	98.46
21	2.957	57.78	100.22	99.90	99.53	99.15	98.70	98.39
22	3.002	57.46	100.19	99.86	99.44	99.03	98.68	98.28
23	2.961	56.87	100.21	99.88	99.53	99.05	98.72	98.36
24	2.966	57.15	100.40	99.84	99.55	99.02	98.53	98.30
25	2.959	56.77	100.32	99.86	99.51	99.07	98.56	98.27
Ave.	2.976	57.20	100.31	100.01	99.62	99.24	98.86	98.54
Med.	2.966	57.20	100.32	100.04	99.60	99.27	98.89	98.55
st dev	0.027	0.29	0.08	0.10	0.09	0.11	0.14	0.15
Min.	2.953	56.72	100.17	99.84	99.44	99.02	98.53	98.27
Max.	3.064	57.80	100.44	100.21	99.79	99.41	99.09	98.79

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
 α : 3.644E-06
 β : 1.007
Calculated L₇₀: 100000hours
Reported L₇₀: >36,000hours

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2589	0.5303	2764	0.0000	0.0002	0.0004	0.0007	0.0010	0.0012
2	0.2583	0.5303	2775	0.0001	0.0003	0.0005	0.0007	0.0010	0.0012
3	0.2590	0.5302	2760	0.0000	0.0002	0.0004	0.0006	0.0009	0.0011
4	0.2590	0.5297	2763	0.0000	0.0002	0.0004	0.0006	0.0009	0.0012
5	0.2591	0.5300	2761	0.0001	0.0002	0.0005	0.0007	0.0009	0.0011
6	0.2591	0.5302	2759	0.0001	0.0003	0.0004	0.0007	0.0009	0.0012
7	0.2567	0.5283	2820	0.0001	0.0002	0.0004	0.0007	0.0009	0.0012
8	0.2595	0.5307	2750	0.0001	0.0003	0.0006	0.0007	0.0010	0.0012
9	0.2581	0.5291	2785	0.0001	0.0002	0.0004	0.0007	0.0010	0.0012
10	0.2584	0.5297	2776	0.0000	0.0002	0.0004	0.0006	0.0009	0.0011
11	0.2579	0.5295	2788	0.0000	0.0002	0.0004	0.0006	0.0009	0.0012
12	0.2593	0.5287	2762	0.0000	0.0003	0.0004	0.0007	0.0009	0.0012
13	0.2596	0.5306	2746	0.0000	0.0002	0.0004	0.0005	0.0009	0.0012
14	0.2601	0.5292	2743	0.0000	0.0002	0.0004	0.0006	0.0009	0.0012
15	0.2605	0.5285	2736	0.0001	0.0002	0.0004	0.0006	0.0009	0.0011
16	0.2577	0.5286	2795	0.0001	0.0002	0.0004	0.0006	0.0009	0.0012
17	0.2583	0.5283	2784	0.0000	0.0002	0.0004	0.0006	0.0009	0.0012
18	0.2582	0.5290	2783	0.0000	0.0002	0.0004	0.0006	0.0009	0.0012
19	0.2591	0.5280	2770	0.0001	0.0002	0.0005	0.0006	0.0009	0.0012
20	0.2586	0.5297	2772	0.0001	0.0003	0.0004	0.0007	0.0009	0.0012
21	0.2580	0.5303	2782	0.0000	0.0002	0.0004	0.0007	0.0010	0.0012
22	0.2576	0.5287	2799	0.0001	0.0002	0.0004	0.0006	0.0009	0.0011
23	0.2590	0.5297	2763	0.0000	0.0002	0.0004	0.0006	0.0009	0.0011
24	0.2604	0.5306	2732	0.0001	0.0003	0.0005	0.0007	0.0009	0.0012
25	0.2593	0.5290	2760	0.0000	0.0002	0.0004	0.0006	0.0009	0.0012
Ave.	0.2588	0.5295	2769	0.0000	0.0002	0.0005	0.0006	0.0009	0.0012
Med.	0.2590	0.5297	2764	0.0000	0.0002	0.0004	0.0006	0.0009	0.0012
st dev	0.0009	0.0008	20	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
Min.	0.2567	0.5280	2732	0.0000	0.0002	0.0004	0.0005	0.0009	0.0011
Max.	0.2605	0.5307	2820	0.0001	0.0003	0.0006	0.0007	0.0010	0.0012



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

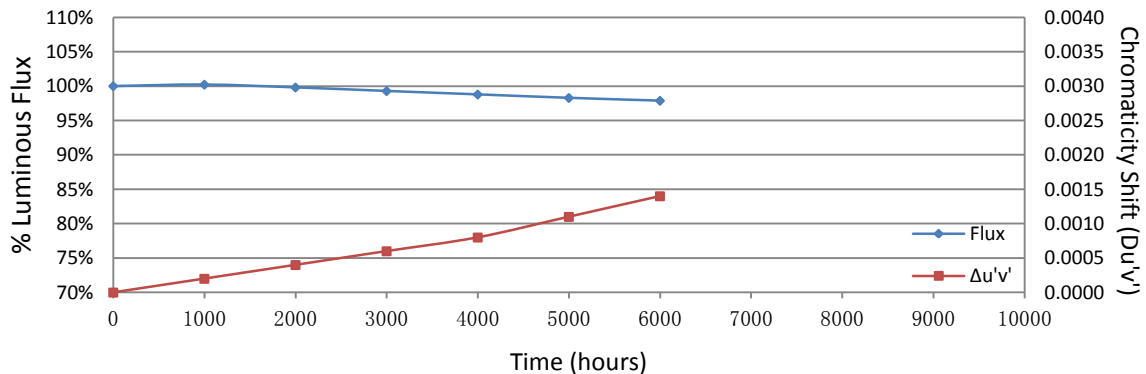
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	2.957	57.16	100.24	99.88	99.49	99.04	98.48	98.13
27	2.984	57.34	100.28	99.95	99.46	99.08	98.57	98.10
28	2.965	56.63	100.23	99.89	99.42	99.01	98.45	98.04
29	2.962	56.97	100.14	99.74	99.32	98.79	98.37	97.88
30	2.969	56.53	100.11	99.75	99.29	98.85	98.39	97.89
31	2.962	56.93	100.21	99.81	99.26	98.84	98.30	97.86
32	2.973	57.37	100.23	99.77	99.30	98.83	98.31	97.80
33	2.962	57.36	100.19	99.76	99.25	98.83	98.31	97.82
34	2.983	57.68	100.19	99.76	99.22	98.68	98.28	97.83
35	2.968	57.08	100.18	99.75	99.25	98.62	98.18	97.79
36	3.123	56.82	100.11	99.67	99.19	98.54	98.03	97.66
37	2.986	57.26	100.17	99.72	99.25	98.69	98.10	97.64
38	2.967	57.50	100.21	99.70	99.18	98.61	98.09	97.57
39	2.995	57.17	100.23	99.79	99.21	98.69	98.20	97.69
40	2.979	57.41	100.26	99.79	99.16	98.68	98.17	97.74
41	2.976	57.46	100.31	99.86	99.34	98.68	98.24	97.79
42	2.980	56.87	100.21	99.81	99.31	98.77	98.29	97.94
43	2.994	57.29	100.10	99.69	99.11	98.57	98.11	97.64
44	2.999	57.13	100.18	99.82	99.28	98.79	98.41	98.02
45	2.973	57.10	100.32	99.89	99.33	98.77	98.34	98.07
46	2.974	56.84	100.28	99.88	99.37	98.84	98.28	97.99
47	3.153	57.37	100.28	99.86	99.30	98.69	98.26	97.91
48	2.998	56.99	100.25	99.79	99.32	98.82	98.32	97.98
49	3.052	56.95	100.30	99.96	99.33	99.00	98.35	98.07
50	2.990	57.12	100.30	99.93	99.39	99.00	98.51	98.06
Ave.	2.993	57.13	100.22	99.81	99.29	98.79	98.29	97.88
Med.	2.979	57.13	100.23	99.79	99.30	98.79	98.30	97.88
st dev	0.048	0.28	0.06	0.08	0.09	0.15	0.14	0.16
Min.	2.957	56.53	100.10	99.67	99.11	98.54	98.03	97.57
Max.	3.153	57.68	100.32	99.96	99.49	99.08	98.57	98.13

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 4.835E-06
β: 1.007
Calculated L₇₀: 75,000hours
Reported L₇₀: >36,000 hours

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	0.2598	0.5315	2740	0.0002	0.0004	0.0007	0.0009	0.0012	0.0014
27	0.2577	0.5292	2794	0.0001	0.0004	0.0006	0.0009	0.0011	0.0014
28	0.2596	0.5286	2756	0.0001	0.0003	0.0006	0.0007	0.0011	0.0014
29	0.2590	0.5291	2766	0.0002	0.0004	0.0005	0.0009	0.0012	0.0015
30	0.2593	0.5296	2757	0.0002	0.0004	0.0007	0.0009	0.0011	0.0014
31	0.2604	0.5292	2737	0.0003	0.0004	0.0007	0.0009	0.0012	0.0014
32	0.2592	0.5285	2765	0.0002	0.0004	0.0007	0.0009	0.0011	0.0015
33	0.2585	0.5292	2777	0.0002	0.0004	0.0007	0.0009	0.0012	0.0014
34	0.2574	0.5292	2799	0.0001	0.0003	0.0005	0.0008	0.0010	0.0013
35	0.2601	0.5293	2742	0.0002	0.0004	0.0007	0.0009	0.0012	0.0015
36	0.2611	0.5298	2720	0.0002	0.0004	0.0006	0.0009	0.0011	0.0014
37	0.2585	0.5290	2776	0.0001	0.0003	0.0007	0.0008	0.0011	0.0014
38	0.2586	0.5302	2770	0.0001	0.0004	0.0006	0.0008	0.0011	0.0014
39	0.2593	0.5297	2757	0.0002	0.0004	0.0007	0.0009	0.0012	0.0015
40	0.2585	0.5289	2779	0.0002	0.0004	0.0007	0.0009	0.0012	0.0014
41	0.2578	0.5301	2787	0.0002	0.0004	0.0007	0.0009	0.0011	0.0014
42	0.2606	0.5285	2735	0.0001	0.0003	0.0006	0.0008	0.0011	0.0014
43	0.2583	0.5283	2785	0.0002	0.0004	0.0006	0.0009	0.0010	0.0014
44	0.2611	0.5301	2719	0.0002	0.0004	0.0007	0.0009	0.0011	0.0015
45	0.2595	0.5292	2754	0.0001	0.0004	0.0006	0.0008	0.0011	0.0014
46	0.2593	0.5290	2760	0.0001	0.0004	0.0006	0.0008	0.0010	0.0014
47	0.2594	0.5299	2755	0.0003	0.0005	0.0007	0.0009	0.0012	0.0015
48	0.2590	0.5302	2761	0.0001	0.0003	0.0006	0.0008	0.0011	0.0014
49	0.2604	0.5298	2733	0.0001	0.0004	0.0006	0.0008	0.0011	0.0014
50	0.2587	0.5293	2772	0.0001	0.0004	0.0006	0.0008	0.0011	0.0014
Ave.	0.2592	0.5294	2760	0.0002	0.0004	0.0006	0.0008	0.0011	0.0014
Med.	0.2593	0.5292	2760	0.0002	0.0004	0.0006	0.0009	0.0011	0.0014
st dev	0.0010	0.0007	22	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2574	0.5283	2719	0.0001	0.0003	0.0005	0.0007	0.0010	0.0013
Max.	0.2611	0.5315	2799	0.0003	0.0005	0.0007	0.0009	0.0012	0.0015



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

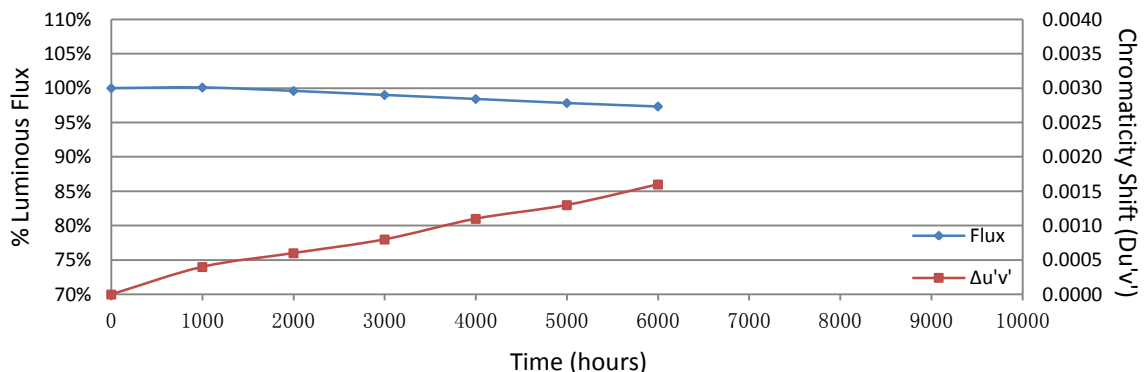
No.	V _F (V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	2.960	56.87	100.16	99.68	99.21	98.52	97.96	97.49
52	2.956	57.19	100.12	99.65	99.07	98.50	97.94	97.46
53	2.975	57.13	100.02	99.70	99.02	98.48	97.86	97.46
54	3.028	56.91	99.98	99.51	98.91	98.33	97.77	97.28
55	2.981	56.69	100.07	99.58	98.91	98.32	97.80	97.27
56	2.985	56.86	100.05	99.49	98.93	98.28	97.78	97.22
57	2.983	57.33	100.10	99.58	99.02	98.47	97.91	97.49
58	2.990	56.56	100.25	99.66	99.12	98.55	97.91	97.47
59	2.957	57.35	100.19	99.63	99.06	98.43	97.82	97.38
60	2.966	57.31	100.16	99.67	99.02	98.39	97.77	97.26
61	2.968	57.44	100.07	99.48	98.90	98.36	97.70	97.25
62	2.969	57.39	100.12	99.53	98.95	98.40	97.79	97.32
63	2.959	57.11	100.07	99.53	98.90	98.39	97.78	97.27
64	2.968	57.10	99.91	99.39	98.83	98.23	97.65	97.22
65	2.962	57.11	100.25	99.89	99.25	98.69	98.13	97.69
66	2.965	57.24	100.03	99.60	98.93	98.39	97.69	97.15
67	3.049	56.90	100.05	99.60	98.98	98.40	97.75	97.15
68	2.973	57.35	100.09	99.58	98.95	98.38	97.86	97.35
69	2.966	57.80	100.26	99.84	99.31	98.67	98.20	97.65
70	3.030	57.10	100.05	99.60	98.93	98.41	97.74	97.16
71	2.966	56.51	100.07	99.58	98.92	98.41	97.75	97.15
72	2.973	57.14	100.12	99.56	98.97	98.42	97.86	97.22
73	3.088	57.02	100.05	99.44	98.97	98.40	97.84	97.35
74	3.002	57.08	100.16	99.63	99.11	98.53	97.93	97.41
75	2.990	58.05	100.05	99.57	99.00	98.40	97.81	97.36
Ave.	2.984	57.14	100.10	99.60	99.01	98.43	97.84	97.34
Med.	2.973	57.11	100.07	99.58	98.97	98.40	97.81	97.32
st dev	0.032	0.34	0.08	0.11	0.12	0.10	0.13	0.15
Min.	2.956	56.51	99.91	99.39	98.83	98.23	97.65	97.15
Max.	3.088	58.05	100.26	99.89	99.31	98.69	98.20	97.69

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 5.690E-06
β: 1.007
Calculated L₇₀: 64,000 hours
Reported L₇₀: >36,000 hours

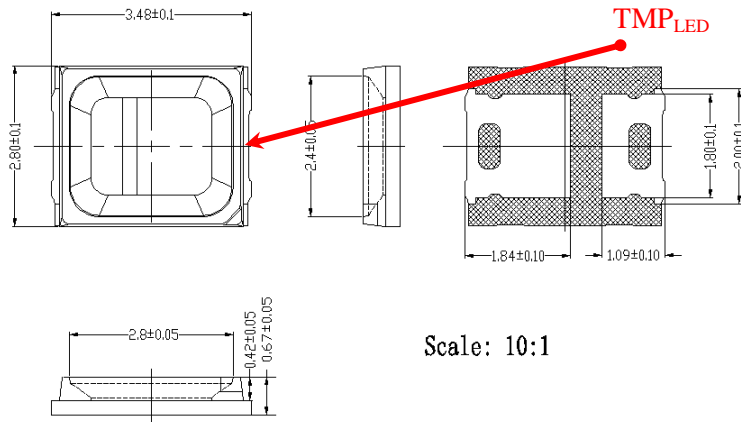
3.6 Data Set 3, 105°C, 150mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	0.2565	0.5282	2824	0.0003	0.0005	0.0008	0.0009	0.0012	0.0016
52	0.2576	0.5292	2797	0.0004	0.0006	0.0009	0.0012	0.0013	0.0017
53	0.2579	0.5299	2786	0.0004	0.0006	0.0008	0.0010	0.0012	0.0015
54	0.2598	0.5297	2747	0.0004	0.0005	0.0009	0.0011	0.0013	0.0017
55	0.2604	0.5306	2729	0.0003	0.0005	0.0007	0.0010	0.0012	0.0016
56	0.2595	0.5307	2749	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
57	0.2594	0.5305	2751	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
58	0.2592	0.5298	2758	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
59	0.2587	0.5303	2767	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
60	0.2597	0.5289	2752	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
61	0.2575	0.5285	2801	0.0003	0.0005	0.0008	0.0011	0.0012	0.0016
62	0.2590	0.5314	2755	0.0003	0.0005	0.0008	0.0010	0.0012	0.0016
63	0.2583	0.5303	2775	0.0003	0.0005	0.0008	0.0011	0.0012	0.0017
64	0.2593	0.5294	2759	0.0004	0.0006	0.0009	0.0011	0.0013	0.0016
65	0.2582	0.5287	2786	0.0006	0.0008	0.0009	0.0013	0.0015	0.0018
66	0.2577	0.5295	2791	0.0004	0.0006	0.0009	0.0011	0.0013	0.0017
67	0.2602	0.5295	2740	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
68	0.2583	0.5296	2778	0.0004	0.0006	0.0009	0.0011	0.0013	0.0016
69	0.2573	0.5288	2804	0.0005	0.0007	0.0009	0.0012	0.0013	0.0017
70	0.2594	0.5303	2753	0.0004	0.0006	0.0008	0.0011	0.0013	0.0017
71	0.2617	0.5296	2708	0.0003	0.0005	0.0008	0.0011	0.0012	0.0016
72	0.2591	0.5291	2764	0.0003	0.0006	0.0008	0.0011	0.0012	0.0017
73	0.2585	0.5307	2770	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
74	0.2589	0.5294	2766	0.0004	0.0005	0.0008	0.0011	0.0012	0.0016
75	0.2579	0.5308	2782	0.0004	0.0006	0.0009	0.0011	0.0013	0.0017
Ave.	0.2588	0.5297	2768	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
Med.	0.2589	0.5296	2766	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016
st dev	0.0011	0.0008	26	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000
Min.	0.2565	0.5282	2708	0.0003	0.0005	0.0007	0.0009	0.0012	0.0015
Max.	0.2617	0.5314	2824	0.0006	0.0008	0.0009	0.0013	0.0015	0.0018



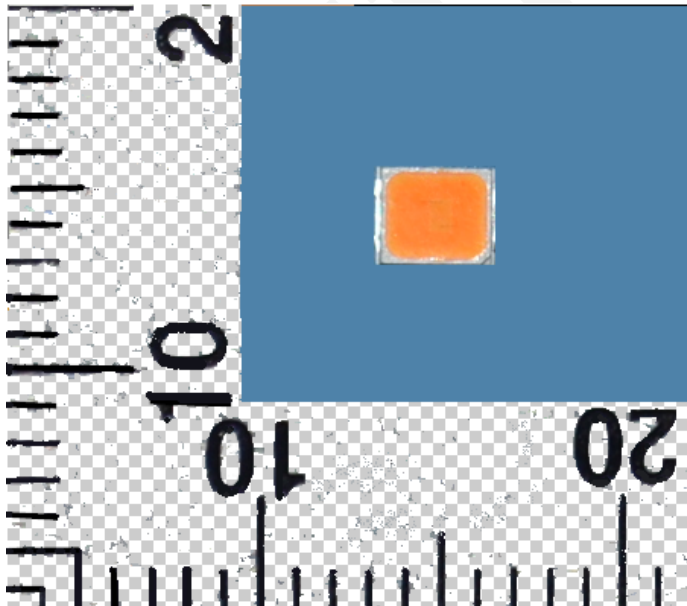
Attachment A – EUT Photo

A.1 Mechanical Dimensions (Ta = 25°C)



All dimensions are in millimeter

A.2 EUT Photo



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