



Shenzhen Belling Efficiency Testing Lab Co., Ltd



TEST REPORT

ANSI/IES LM-80-15

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES For

Shenzhen HoneBright Technology Co.,Ltd

Floor, 5 Building, Hongyu Guangming Valley, 11 Youmagang Road,
Gongming Town, Guangming District, Shenzhen, China

Report No.: BL210609011-9

Product Description: SMD LED

Model No.: AW-22/C1A1C30Y24HJ

Test Initiation Date: 2021-06-12

Test Completion Date: 2021-06-13 to 2023-07-21

Report Issue Date: 2023-07-24

Test Standard: ANSI/IES LM-80-15

Test Laboratory: Shenzhen Belling Efficiency Testing Lab Co.,Ltd

Tested by
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Reviewed by
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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 use in part without prior written consent from Shenzhen Belling Efficiency Testing Lab Co., Ltd. This report must not be used by the customer to claim product certification, approval, or endorsement By NVLAP, NIST, or any agency of the U.S. Government.

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1-GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

Manufacturer: Shenzhen HoneBright Technology Co.,Ltd

Brand name: HoneBright

Part Number: AW-22/C1A1C30Y24HJ

Part Type: SMD LED

Product Description: VF 3V, IF 150mA, 0.5W

CCT: 3000K

Die Spacing(mm): N/A

Average Power Density per LED die(W/mm2): 1.55

Average Current Density per LED die(mA/mm2): 516.67

**Repersnetative CRI (Ra) of the tested sample set
(Indicate whether the reported calue s the mean or median value of the sample set, or per unit):** 90

LED light source monitoring interval: The LED array are inspected at regular interval (24 hours) throughout the 17000 hours test.

Photometric measurement uncertainty: 1.8% on flux measurements for LM-80 testing.

1.2 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 IES/NA LM-80 Data (September 28, 2017)

This report covers the following models:

Test Model Name	Family Model Name	Difference
AW-22/C1A1C30Y24HJ	AW-22/A1A1CXXXXXXJ	First XXX: CCT code;
	AW-22/B1A1CXXXXXXJ	Sencond XX: Flux code;
	AW-22/C1A1CXXXXXXJ	Last X: CRI code.

1.3 Drive Level

Samples are driven with a constant direct current (DC) during maintenance test, photometric and electrical measurement. The current value was regulated to within $\pm 3\%$ of the specified value of the manufacturer during maintenance test, and was within $\pm 0.5\%$ during photometric and electrical measurement test.

1.4 Ambient Conditions for Maintenance Test

For lumen maintenance test, samples within one data set, were installed on cooling boards in thermal chambers with minimal ambient airflow. The case temperature and ambient temperature was monitored by thermocouples which one was soldered to the coldest DUTs' case (TMP_{LED}) location, while the other is mounted at a distance of 5 mm above the TMP location. During life testing, TMP_{LED} of the coldest LEDs were maintained at a temperature that was greater than or equal to $2^{\circ}C$ below the corresponding nominal case temperature.

Surrounding air was maintained at a temperature that was greater than or equal to $5^{\circ}C$ below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with Type K.

Samples were connected to DC power supply in series circuits with a constant current. The forward current was regulated to within $\pm 3\%$ of the specified value of the manufacturer.

Surrounding Air temperature for life test : controlled to within $-5^{\circ}C$ of the case temperature (T_s)

Humidity : $< 65\%$ RH

Ambient temperature for Photometry measurement : maintained at $25^{\circ}C \pm 2^{\circ}C$

1.5 Photometric measurement uncertainty

The uncertainty of the light output measurements is $U=1.8\%$ ($K=2$)

Long term measurement uncertainty is based on reproducibility tests done over a period of one year, calculated to $K=2$ coverage (i.e. 95% coverage).

1.6 Standards Used:

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- CIE 127:2007: Measurement of LEDs(This test method was not accredited by NVLAP)

1.7 Test Facility Description

The test facility used by Shenzhen Belling Efficiency Testing Lab Co., Ltd is located at 1Floor, No.1 Building, Meibaohe Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong Prov.518101 China.

1.8 Statement of Traceability

Shenzhen Belling Efficiency Testing Lab Co., Ltd attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

1.9 Test Equipment List

Device	Manufacture	Model No.	Serial No.	Calibration due date
Digital Power Meter	YOKOGAWA	WT310	N.A	2024-03-27
Integral Sphere(0.5M)	SENSING	Ball0516	N.A	2024-03-27
Spectral radiometer	SENSING	SPR-3000	S1101108	2024-03-27
Stop watch	KISLO	K610	N/A	2024-04-19
LED aging equipment	Guangzhou CK	Box0516	N.A	2024-04-11
DC Power Supply	AIKESAI	APS300-5	N.A	2024-03-27
Thermocouple K	OMEGA	Type K	23736-1	2024-04-17

1.10 Sample Set

Sampling Method:

LED samples for ANSI/IES LM-80-15 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 ANSI/IES LM-80-15 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 2021-06-12 and tested during 2021-06-13 to 2023-07-21. The samples were numbered from L1 to L25, L26 to L50 and L51 to L75.

2-Summary of Test Result

Data Set	1	2	3
Nominal case temperatures	55°C	85°C	105°C
Drive Current	150mA	150mA	150mA
Condition	Ts=54.8°C Ta=53.7°C	Ts=84.2°C Ta=83.6°C	Ts=104.8°C Ta=103.3°C
Sample size	25	25	25
Duration (in Hours)	17000	17000	17000
Intervals (in Hours)	1000	1000	1000
Failure	0	0	0
α	2.239E-06	2.341E-06	2.388E-06
β	1.006	1.004	1.003
Reported L70 (17k) (17000h)	>102000	>102000	>102000
Reported L90 (17k) (17000h)	50,000	47,000	45,000

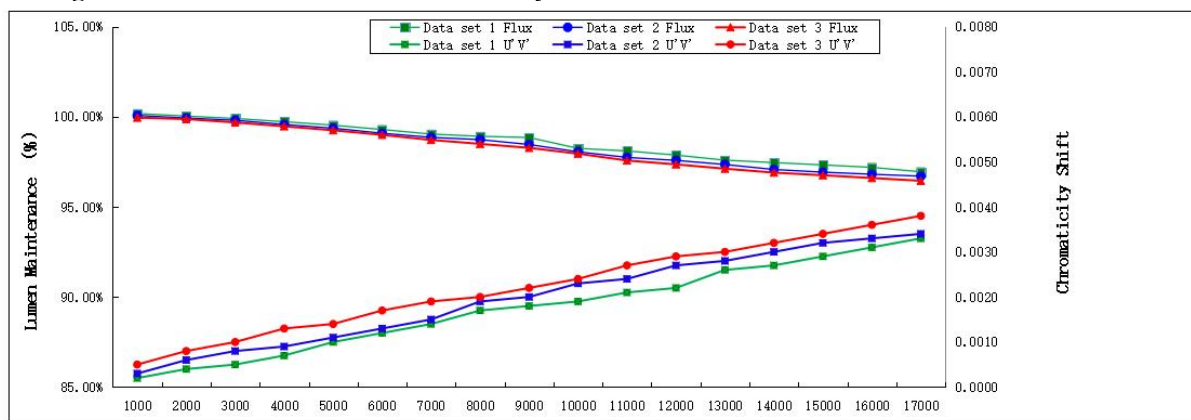
Average Lumen Maintenance (%)

Data Set	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
1	100.18	100.03	99.90	99.72	99.53	99.29	99.04	98.91	98.85
2	100.07	99.92	99.80	99.57	99.36	99.08	98.85	98.73	98.46
3	99.95	99.87	99.68	99.47	99.25	98.99	98.71	98.49	98.27
Data Set	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
1	98.24	98.10	97.87	97.59	97.45	97.32	97.19	96.94	-
2	98.05	97.74	97.58	97.35	97.07	96.92	96.81	96.70	-
3	97.95	97.57	97.35	97.12	96.90	96.75	96.60	96.44	-


Average Chromaticity Shift


Data Set	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
1	0.0002	0.0004	0.0005	0.0007	0.0010	0.0012	0.0014	0.0017	0.0018
2	0.0003	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0020
3	0.0005	0.0008	0.0010	0.0013	0.0014	0.0017	0.0019	0.0020	0.0022
Data Set	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
1	0.0019	0.0021	0.0022	0.0026	0.0027	0.0029	0.0031	0.0033	-
2	0.0023	0.0024	0.0027	0.0028	0.0030	0.0032	0.0033	0.0034	-
3	0.0024	0.0027	0.0029	0.0030	0.0032	0.0034	0.0036	0.0038	-

Average Lumen Maintenance and Chromaticity Shift Vs. Time



TM-21 Report for Lumen Maintenance

		TM-21 Report					
Description of LED Light Source Tested (manufacturer, model, catalog number)		Table 1: Report at each LM-80 Test Condition Shenzhen HoneBright Technology Co.,Ltd AW-22/C1A1C30Y24HJ					
		Test Condition 1 - 55°C Case Temp		Test Condition 2 - 85°C Case Temp		Test Condition 3 - 105°C Case Temp	
Sample size	25	Sample size	25	Sample size	25	Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
Number of failures	0	Number of failures	0	Number of failures	0		
DUT drive current used in the test (mA)	150	DUT drive current used in the test (mA)	150	DUT drive current used in the test (mA)	150		
Test duration (hours)	17,000	Test duration (hours)	17,000	Test duration (hours)	17,000		
Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	8,000 - 17,000		
Tested case temperature (°C)	55	Tested case temperature (°C)	85	Tested case temperature (°C)	105		
α	2.239E-06	α	2.341E-06	α	2.388E-06		
B	1.006	B	1.004	B	1.003		
Reported L70(17k) (hours)	>102000	Reported L70(17k) (hours)	>102000	Reported L70(17k) (hours)	>102000		
$T_{s,1}$ (°C)	105.00	$T_{s,1}$ (K)	378.15	α_1	2.388E-06		
B_1	1.003	$T_{s,2}$ (°C)	-	B_1	1.003		
$T_{s,2}$ (K)	-	α_2	-	B_2	-		
α_2	-	B_2	-	E_a/k_b	-		
E_a/k_b	-	A	-	A	-		
A	-	B_0	1.003	B_0	1.003		
B_0	1.003	$T_{s,1}$ (°C)	105.00	$T_{s,1}$ (K)	378.15		
$T_{s,1}$ (°C)	105.00	$T_{s,1}$ (K)	378.15	α_1	2.388E-06		
$T_{s,1}$ (K)	378.15	α_1	2.388E-06	Reported L70(17k) at 105°C (hours)	>102000		
α_1	2.388E-06	Reported L70(17k) at 105°C (hours)	>102000				

		TM-21 Report					
Description of LED Light Source Tested (manufacturer, model, catalog number)		Table 1: Report at each LM-80 Test Condition Shenzhen HoneBright Technology Co.,Ltd AW-22/C1A1C30Y24HJ					
		Test Condition 1 - 55°C Case Temp		Test Condition 2 - 85°C Case Temp		Test Condition 3 - 105°C Case Temp	
Sample size	25	Sample size	25	Sample size	25	Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
Number of failures	0	Number of failures	0	Number of failures	0		
DUT drive current used in the test (mA)	150	DUT drive current used in the test (mA)	150	DUT drive current used in the test (mA)	150		
Test duration (hours)	17,000	Test duration (hours)	17,000	Test duration (hours)	17,000		
Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	8,000 - 17,000		
Tested case temperature (°C)	55	Tested case temperature (°C)	85	Tested case temperature (°C)	105		
α	2.239E-06	α	2.341E-06	α	2.388E-06		
B	1.006	B	1.004	B	1.003		
Reported L90(17k) (hours)	50,000	Reported L90(17k) (hours)	47,000	Reported L90(17k) (hours)	45,000		
$T_{s,1}$ (°C)	105.00	$T_{s,1}$ (K)	378.15	α_1	2.388E-06		
B_1	1.003	$T_{s,2}$ (°C)	-	B_1	1.003		
$T_{s,2}$ (K)	-	α_2	-	B_2	-		
α_2	-	B_2	-	E_a/k_b	-		
E_a/k_b	-	A	-	A	-		
A	-	B_0	1.003	B_0	1.003		
B_0	1.003	$T_{s,1}$ (°C)	105.00	$T_{s,1}$ (K)	378.15		
$T_{s,1}$ (°C)	105.00	$T_{s,1}$ (K)	378.15	α_1	2.388E-06		
$T_{s,1}$ (K)	378.15	α_1	2.388E-06	Reported L90(17k) at 105°C (hours)	45,000		
α_1	2.388E-06	Reported L90(17k) at 105°C (hours)	45,000				

3 Test Data

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

Sample No.	Φ(lm)	Lumen Maintenance (%)								
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L1	63.60	100.30	100.15	99.93	99.83	99.42	99.38	98.99	98.87	98.80
L2	62.00	100.06	99.97	99.81	99.64	99.48	99.32	98.96	98.83	98.78
L3	62.91	100.25	100.09	99.79	99.72	99.53	99.18	98.94	98.88	98.81
L4	63.69	100.10	99.99	99.83	99.80	99.45	99.33	99.13	99.03	98.98
L5	63.48	100.18	100.11	99.97	99.82	99.50	99.35	99.01	98.92	98.88
L6	63.18	100.26	100.01	99.84	99.65	99.46	99.36	99.12	98.99	98.87
L7	63.19	100.05	100.00	99.99	99.79	99.64	99.26	99.03	98.89	98.76
L8	63.09	100.24	100.03	99.85	99.78	99.51	99.37	99.10	99.01	98.95
L9	63.37	100.14	100.06	99.82	99.74	99.47	99.19	98.98	98.96	98.94
L10	63.39	100.11	100.04	99.88	99.75	99.56	99.25	99.05	98.95	98.85
L11	62.71	100.13	100.10	100.01	99.65	99.40	99.21	99.00	98.91	98.79
L12	63.17	100.27	99.96	99.92	99.61	99.52	99.20	98.92	98.84	98.80
L13	62.07	100.22	100.14	99.95	99.69	99.57	99.22	98.97	98.94	98.84
L14	62.42	100.23	100.08	99.98	99.76	99.49	99.31	99.14	98.81	98.77
L15	63.63	100.15	100.02	99.94	99.84	99.44	99.24	99.04	98.98	98.92
L16	62.25	100.19	99.96	99.92	99.71	99.61	99.27	99.02	98.80	98.76
L17	63.50	100.08	99.95	99.90	99.77	99.65	99.29	99.06	98.85	98.82
L18	62.99	100.17	100.12	100.00	99.62	99.58	99.28	99.08	98.82	98.70
L19	63.39	100.04	99.93	99.89	99.81	99.55	99.23	99.06	99.00	98.96
L20	63.21	100.28	100.07	99.87	99.63	99.59	99.39	98.95	98.93	98.91
L21	62.99	100.29	99.98	99.91	99.67	99.43	99.30	99.11	98.86	98.83
L22	63.50	100.31	100.13	100.02	99.73	99.60	99.17	99.09	98.97	98.80
L23	64.00	100.12	99.94	99.80	99.70	99.54	99.35	99.15	99.02	98.97
L24	63.40	100.16	100.05	99.86	99.68	99.63	99.40	99.07	98.86	98.80
L25	63.43	100.09	99.94	99.79	99.66	99.62	99.34	98.93	98.90	98.84
Ave.	63.14	100.18	100.03	99.90	99.72	99.53	99.29	99.04	98.91	98.85
Med.	63.21	100.17	100.03	99.90	99.72	99.53	99.29	99.04	98.91	98.83
st dev	0.5102	0.0841	0.0696	0.0720	0.0708	0.0743	0.0704	0.0694	0.0701	0.0757
Min.	62.00	100.04	99.93	99.79	99.61	99.40	99.17	98.92	98.80	98.70
Max.	64.00	100.31	100.15	100.02	99.84	99.65	99.40	99.15	99.03	98.98

Sample No.	Lumen Maintenance (%)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L1	98.24	98.18	97.95	97.65	97.40	97.35	97.28	96.91	-
L2	98.17	98.16	97.98	97.54	97.48	97.42	97.19	97.03	-
L3	98.22	97.98	97.82	97.63	97.59	97.27	97.22	97.06	-
L4	98.15	98.08	97.75	97.58	97.50	97.32	97.11	97.05	-
L5	98.25	98.13	97.97	97.59	97.53	97.44	97.25	97.01	-
L6	98.16	98.06	97.83	97.56	97.42	97.36	97.12	96.86	-
L7	98.20	98.11	97.88	97.49	97.39	97.33	97.08	96.93	-
L8	98.40	98.14	97.77	97.62	97.50	97.41	97.31	96.90	-
L9	98.20	98.15	97.87	97.60	97.35	97.24	97.20	96.87	-
L10	98.26	98.19	97.79	97.52	97.43	97.30	97.18	97.00	-
L11	98.21	98.02	97.99	97.48	97.38	97.29	97.14	96.88	-
L12	98.31	98.01	97.89	97.53	97.34	97.23	97.17	97.04	-
L13	98.32	98.03	97.93	97.51	97.33	97.25	97.16	96.80	-
L14	98.28	98.00	97.80	97.57	97.55	97.27	97.15	96.85	-
L15	98.12	98.04	97.81	97.68	97.36	97.28	97.24	96.99	-
L16	98.37	98.21	97.96	97.69	97.56	97.37	97.23	96.96	-
L17	98.23	98.07	97.86	97.66	97.41	97.26	97.21	96.94	-
L18	98.18	98.12	97.90	97.52	97.44	97.27	97.22	96.92	-
L19	98.36	98.22	97.91	97.47	97.45	97.40	97.09	97.02	-
L20	98.34	98.17	97.84	97.70	97.46	97.39	97.11	96.84	-
L21	98.21	98.10	97.92	97.61	97.54	97.43	97.29	96.89	-
L22	98.33	98.20	97.94	97.67	97.47	97.38	97.26	96.96	-
L23	98.13	97.99	97.78	97.65	97.58	97.34	97.13	96.95	-
L24	98.19	98.05	97.76	97.64	97.49	97.31	97.30	96.97	-
L25	98.27	98.09	97.85	97.55	97.37	97.21	97.07	96.98	-
Ave.	98.24	98.10	97.87	97.59	97.45	97.32	97.19	96.94	-
Med.	98.23	98.10	97.87	97.59	97.45	97.32	97.19	96.95	-
st dev	0.0781	0.0736	0.0736	0.0695	0.0780	0.0677	0.0715	0.0716	-
Min.	98.12	97.98	97.75	97.47	97.33	97.21	97.07	96.80	-
Max.	98.40	98.22	97.99	97.70	97.59	97.44	97.31	97.06	-

3.2 Data Set 1, 55°C, 150mA (Forward Voltage)

Sample No.	Forward Voltage (V)									
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L1	3.024	3.027	3.031	3.035	3.025	3.023	3.026	3.020	3.018	3.044
L2	3.035	3.032	3.034	3.016	3.031	3.027	3.035	3.020	3.029	3.040
L3	3.024	3.040	3.017	3.037	3.022	3.024	3.024	3.028	3.023	3.036
L4	3.029	3.045	3.039	3.039	3.028	3.034	3.037	3.021	3.017	3.040
L5	3.031	3.040	3.019	3.043	3.021	3.035	3.041	3.018	3.018	3.039
L6	3.027	3.040	3.030	3.032	3.035	3.028	3.041	3.032	3.033	3.028
L7	3.032	3.045	3.017	3.030	3.035	3.034	3.040	3.027	3.021	3.021
L8	3.024	3.052	3.011	3.039	3.042	3.036	3.025	3.026	3.034	3.035
L9	3.017	3.029	3.025	3.034	3.031	3.020	3.020	3.021	3.041	3.036
L10	3.026	3.050	3.030	3.038	3.019	3.039	3.024	3.011	3.018	3.035
L11	3.024	3.045	3.023	3.025	3.023	3.032	3.024	3.033	3.020	3.043
L12	3.018	3.029	3.030	3.037	3.027	3.021	3.032	3.028	3.029	3.022
L13	3.018	3.026	3.036	3.016	3.031	3.032	3.028	3.012	3.040	3.031
L14	3.026	3.038	3.026	3.022	3.022	3.032	3.039	3.030	3.018	3.029
L15	3.034	3.042	3.033	3.017	3.026	3.032	3.025	3.033	3.025	3.021
L16	3.041	3.043	3.016	3.033	3.029	3.019	3.035	3.015	3.029	3.040
L17	3.015	3.041	3.018	3.043	3.036	3.030	3.021	3.037	3.022	3.025
L18	3.030	3.028	3.014	3.018	3.027	3.017	3.027	3.030	3.042	3.019
L19	3.034	3.033	3.017	3.044	3.027	3.043	3.027	3.012	3.017	3.044
L20	3.017	3.047	3.029	3.017	3.040	3.026	3.032	3.031	3.019	3.027
L21	3.014	3.035	3.021	3.029	3.025	3.028	3.042	3.030	3.041	3.039
L22	3.042	3.025	3.025	3.036	3.034	3.029	3.028	3.032	3.022	3.042
L23	3.018	3.028	3.033	3.041	3.023	3.019	3.042	3.021	3.044	3.040
L24	3.027	3.046	3.027	3.035	3.034	3.023	3.029	3.014	3.031	3.025
L25	3.019	3.043	3.035	3.043	3.031	3.029	3.033	3.035	3.037	3.025
Ave.	3.026	3.038	3.025	3.032	3.029	3.028	3.031	3.025	3.028	3.033
Med.	3.026	3.040	3.026	3.035	3.028	3.029	3.029	3.027	3.025	3.035
st dev	0.0078	0.0081	0.0078	0.0094	0.0060	0.0067	0.0070	0.0079	0.0092	0.0082
Min.	3.014	3.025	3.011	3.016	3.019	3.017	3.020	3.011	3.017	3.019
Max.	3.042	3.052	3.039	3.044	3.042	3.043	3.042	3.037	3.044	3.044

Sample No.	Forward Voltage (V)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L1	3.018	3.022	3.034	3.023	3.044	3.030	3.028	3.039	-
L2	3.019	3.023	3.039	3.017	3.034	3.028	3.021	3.040	-
L3	3.028	3.039	3.031	3.036	3.028	3.045	3.042	3.019	-
L4	3.038	3.024	3.040	3.016	3.027	3.033	3.025	3.035	-
L5	3.029	3.021	3.031	3.016	3.022	3.023	3.029	3.034	-
L6	3.029	3.024	3.045	3.022	3.031	3.038	3.034	3.020	-
L7	3.021	3.039	3.041	3.020	3.033	3.045	3.028	3.030	-
L8	3.041	3.022	3.037	3.025	3.038	3.033	3.027	3.019	-
L9	3.032	3.024	3.028	3.022	3.036	3.023	3.039	3.026	-
L10	3.022	3.031	3.046	3.036	3.032	3.035	3.024	3.045	-
L11	3.036	3.023	3.025	3.016	3.018	3.033	3.021	3.022	-
L12	3.033	3.027	3.024	3.035	3.025	3.026	3.028	3.034	-
L13	3.039	3.040	3.046	3.026	3.037	3.029	3.037	3.031	-
L14	3.029	3.024	3.028	3.026	3.026	3.044	3.029	3.023	-
L15	3.020	3.019	3.044	3.013	3.038	3.023	3.025	3.042	-
L16	3.032	3.035	3.035	3.024	3.030	3.028	3.024	3.032	-
L17	3.044	3.031	3.046	3.029	3.022	3.046	3.016	3.041	-
L18	3.025	3.026	3.038	3.018	3.040	3.032	3.026	3.042	-
L19	3.043	3.041	3.040	3.027	3.026	3.040	3.024	3.021	-
L20	3.035	3.029	3.040	3.033	3.021	3.035	3.030	3.043	-
L21	3.027	3.029	3.024	3.018	3.037	3.026	3.044	3.041	-
L22	3.038	3.024	3.038	3.021	3.025	3.029	3.032	3.039	-
L23	3.044	3.030	3.041	3.024	3.038	3.034	3.036	3.044	-
L24	3.020	3.041	3.022	3.036	3.025	3.042	3.038	3.032	-
L25	3.041	3.026	3.038	3.037	3.030	3.040	3.020	3.017	-
Ave.	3.031	3.029	3.036	3.025	3.031	3.034	3.029	3.032	-
Med.	3.032	3.026	3.038	3.024	3.030	3.033	3.028	3.034	-
st dev	0.0084	0.0069	0.0075	0.0074	0.0068	0.0073	0.0071	0.0092	-
Min.	3.018	3.019	3.022	3.013	3.018	3.023	3.016	3.017	-
Max.	3.044	3.041	3.046	3.037	3.044	3.046	3.044	3.045	-

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

Sample No.	u'	v'	CCT(K)	Chromaticity Shift Δu'v'								
	0hr(Initial)			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L1	0.2491	0.5243	3018	0.0002	0.0003	0.0004	0.0005	0.0008	0.0011	0.0013	0.0015	0.0016
L2	0.2487	0.5214	3047	0.0001	0.0002	0.0006	0.0007	0.0010	0.0013	0.0015	0.0017	0.0018
L3	0.2483	0.5205	3062	0.0002	0.0004	0.0005	0.0008	0.0011	0.0012	0.0014	0.0018	0.0019
L4	0.2476	0.5211	3077	0.0001	0.0003	0.0004	0.0006	0.0009	0.0010	0.0014	0.0016	0.0017
L5	0.2481	0.5201	3070	0.0003	0.0004	0.0005	0.0007	0.0010	0.0013	0.0015	0.0017	0.0018
L6	0.2494	0.5214	3030	0.0002	0.0003	0.0004	0.0006	0.0008	0.0012	0.0013	0.0018	0.0019
L7	0.2485	0.5200	3062	0.0002	0.0004	0.0006	0.0007	0.0009	0.0013	0.0014	0.0017	0.0018
L8	0.2483	0.5223	3050	0.0003	0.0005	0.0006	0.0008	0.0011	0.0013	0.0015	0.0016	0.0017
L9	0.2471	0.5216	3085	0.0001	0.0002	0.0003	0.0007	0.0010	0.0012	0.0013	0.0018	0.0019
L10	0.2485	0.5226	3044	0.0002	0.0003	0.0004	0.0006	0.0008	0.0011	0.0014	0.0017	0.0018
L11	0.2490	0.5205	3045	0.0003	0.0004	0.0005	0.0007	0.0011	0.0013	0.0015	0.0018	0.0019
L12	0.2479	0.5222	3062	0.0002	0.0003	0.0006	0.0008	0.0010	0.0011	0.0012	0.0014	0.0015
L13	0.2484	0.5208	3058	0.0003	0.0004	0.0005	0.0006	0.0009	0.0010	0.0013	0.0015	0.0016
L14	0.2495	0.5232	3015	0.0001	0.0002	0.0004	0.0005	0.0010	0.0012	0.0014	0.0016	0.0017
L15	0.2480	0.5218	3061	0.0002	0.0005	0.0006	0.0007	0.0008	0.0010	0.0012	0.0017	0.0018
L16	0.2500	0.5212	3016	0.0003	0.0004	0.0005	0.0006	0.0009	0.0011	0.0013	0.0015	0.0016
L17	0.2480	0.5234	3052	0.0002	0.0003	0.0004	0.0005	0.0010	0.0012	0.0013	0.0016	0.0017
L18	0.2484	0.5212	3055	0.0001	0.0005	0.0006	0.0008	0.0011	0.0012	0.0014	0.0016	0.0018
L19	0.2477	0.5234	3058	0.0002	0.0004	0.0005	0.0007	0.0010	0.0011	0.0012	0.0018	0.0019
L20	0.2480	0.5220	3061	0.0002	0.0003	0.0004	0.0006	0.0009	0.0010	0.0013	0.0016	0.0017
L21	0.2466	0.5212	3102	0.0003	0.0004	0.0005	0.0007	0.0008	0.0009	0.0014	0.0015	0.0016
L22	0.2497	0.5246	3002	0.0001	0.0002	0.0006	0.0008	0.0010	0.0011	0.0013	0.0017	0.0018
L23	0.2455	0.5214	3128	0.0001	0.0005	0.0006	0.0007	0.0011	0.0012	0.0014	0.0016	0.0017
L24	0.2486	0.5217	3047	0.0003	0.0004	0.0005	0.0008	0.0010	0.0011	0.0012	0.0018	0.0019
L25	0.2456	0.5198	3139	0.0002	0.0003	0.0004	0.0005	0.0009	0.0013	0.0014	0.0017	0.0018
Ave.	0.2482	0.5217	3058	0.0002	0.0004	0.0005	0.0007	0.0010	0.0012	0.0014	0.0017	0.0018
Med.	0.2483	0.5214	3058	0.0002	0.0004	0.0005	0.0007	0.0010	0.0012	0.0014	0.0017	0.0018
st dev	0.0011	0.0013	31.98	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2455	0.5198	3002	0.0001	0.0002	0.0003	0.0005	0.0008	0.0009	0.0012	0.0014	0.0015
Max.	0.2500	0.5246	3139	0.0003	0.0005	0.0006	0.0008	0.0011	0.0013	0.0015	0.0018	0.0019

Sample No.	Chromaticity Shift $\Delta u'v'$								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L1	0.0018	0.0020	0.0022	0.0027	0.0028	0.0029	0.0030	0.0032	-
L2	0.0020	0.0022	0.0023	0.0026	0.0027	0.0028	0.0032	0.0033	-
L3	0.0020	0.0021	0.0022	0.0027	0.0028	0.0030	0.0031	0.0034	-
L4	0.0018	0.0023	0.0024	0.0025	0.0026	0.0027	0.0030	0.0032	-
L5	0.0019	0.0020	0.0021	0.0026	0.0027	0.0028	0.0031	0.0033	-
L6	0.0020	0.0023	0.0024	0.0027	0.0028	0.0029	0.0030	0.0034	-
L7	0.0019	0.0022	0.0023	0.0026	0.0027	0.0028	0.0032	0.0033	-
L8	0.0021	0.0022	0.0023	0.0024	0.0026	0.0027	0.0030	0.0034	-
L9	0.0020	0.0023	0.0024	0.0025	0.0027	0.0028	0.0031	0.0032	-
L10	0.0019	0.0020	0.0021	0.0027	0.0028	0.0029	0.0030	0.0031	-
L11	0.0020	0.0021	0.0022	0.0025	0.0026	0.0028	0.0029	0.0030	-
L12	0.0018	0.0023	0.0024	0.0027	0.0028	0.0029	0.0032	0.0033	-
L13	0.0019	0.0022	0.0023	0.0026	0.0027	0.0030	0.0031	0.0032	-
L14	0.0021	0.0023	0.0024	0.0027	0.0028	0.0029	0.0032	0.0033	-
L15	0.0020	0.0021	0.0022	0.0025	0.0026	0.0030	0.0031	0.0034	-
L16	0.0018	0.0022	0.0023	0.0026	0.0027	0.0028	0.0029	0.0030	-
L17	0.0019	0.0020	0.0021	0.0025	0.0026	0.0027	0.0032	0.0033	-
L18	0.0020	0.0021	0.0022	0.0027	0.0028	0.0029	0.0030	0.0031	-
L19	0.0021	0.0022	0.0023	0.0026	0.0027	0.0030	0.0031	0.0032	-
L20	0.0018	0.0019	0.0020	0.0027	0.0028	0.0029	0.0031	0.0033	-
L21	0.0019	0.0020	0.0021	0.0024	0.0026	0.0027	0.0028	0.0031	-
L22	0.0020	0.0021	0.0022	0.0025	0.0027	0.0028	0.0029	0.0034	-
L23	0.0021	0.0022	0.0023	0.0027	0.0028	0.0030	0.0031	0.0032	-
L24	0.0020	0.0022	0.0023	0.0027	0.0028	0.0029	0.0030	0.0033	-
L25	0.0019	0.0021	0.0022	0.0026	0.0027	0.0028	0.0032	0.0034	-
Ave.	0.0019	0.0021	0.0022	0.0026	0.0027	0.0029	0.0031	0.0033	-
Med.	0.0020	0.0022	0.0023	0.0026	0.0027	0.0029	0.0031	0.0033	-
st dev	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	-
Min.	0.0018	0.0019	0.0020	0.0024	0.0026	0.0027	0.0028	0.0030	-
Max.	0.0021	0.0023	0.0024	0.0027	0.0028	0.0030	0.0032	0.0034	-

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

Sample No.	Φ (lm)	Lumen Maintenance (%)								
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L26	62.76	100.16	99.90	99.83	99.53	99.38	99.16	98.84	98.74	98.51
L27	62.85	100.17	99.88	99.80	99.45	99.34	99.14	98.75	98.66	98.50
L28	63.93	100.08	99.98	99.68	99.61	99.33	99.00	98.80	98.73	98.52
L29	63.36	100.18	99.95	99.85	99.63	99.26	99.05	98.77	98.67	98.43
L30	63.40	99.98	99.94	99.69	99.66	99.29	99.03	98.80	98.61	98.46
L31	62.31	99.99	99.82	99.71	99.48	99.42	99.12	98.82	98.75	98.42
L32	63.46	100.09	99.92	99.88	99.57	99.43	99.06	98.94	98.82	98.38
L33	63.70	100.19	100.02	99.87	99.51	99.45	99.18	98.81	98.71	98.57
L34	62.95	99.96	99.89	99.81	99.47	99.41	99.03	98.96	98.83	98.39
L35	63.28	100.04	100.01	99.89	99.67	99.48	99.04	98.85	98.68	98.49
L36	63.43	100.12	99.85	99.76	99.56	99.37	98.98	98.76	98.64	98.45
L37	62.42	100.15	99.80	99.77	99.64	99.25	99.02	98.83	98.63	98.55
L38	63.48	100.03	99.83	99.74	99.68	99.46	99.07	98.93	98.79	98.43
L39	63.42	99.97	99.91	99.70	99.50	99.35	99.20	98.90	98.69	98.53
L40	63.04	100.14	100.05	99.92	99.58	99.36	98.96	98.79	98.62	98.48
L41	63.98	100.02	99.93	99.86	99.55	99.24	99.17	98.95	98.76	98.47
L42	62.74	100.05	99.99	99.72	99.62	99.29	98.99	98.74	98.65	98.44
L43	62.43	100.06	100.00	99.91	99.49	99.40	99.10	98.88	98.78	98.54
L44	63.54	100.10	99.87	99.82	99.54	99.32	99.19	98.87	98.80	98.43
L45	63.16	100.11	99.92	99.84	99.46	99.30	99.09	98.86	98.72	98.35
L46	63.02	100.00	99.96	99.78	99.60	99.27	99.13	98.78	98.70	98.56
L47	63.96	100.01	99.86	99.79	99.59	99.31	99.11	98.91	98.84	98.41
L48	62.62	100.13	99.97	99.75	99.62	99.44	99.01	98.92	98.79	98.37
L49	63.35	100.07	100.03	99.90	99.65	99.47	99.08	98.97	98.81	98.40
L50	63.08	99.95	99.81	99.73	99.52	99.39	99.15	98.89	98.77	98.34
Ave.	63.19	100.07	99.92	99.80	99.57	99.36	99.08	98.85	98.73	98.46
Med.	63.28	100.07	99.92	99.80	99.57	99.36	99.08	98.85	98.73	98.45
st dev	0.4750	0.0736	0.0724	0.0736	0.0701	0.0732	0.0708	0.0701	0.0704	0.0668
Min.	62.31	99.95	99.80	99.68	99.45	99.24	98.96	98.74	98.61	98.34
Max.	63.98	100.19	100.05	99.92	99.68	99.48	99.20	98.97	98.84	98.57

Sample No.	Lumen Maintenance (%)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L26	97.95	97.65	97.59	97.39	97.14	96.85	96.72	96.62	-
L27	98.05	97.76	97.57	97.35	97.12	96.92	96.80	96.77	-
L28	98.07	97.81	97.58	97.29	97.00	96.97	96.75	96.69	-
L29	98.17	97.72	97.63	97.32	97.16	96.84	96.80	96.67	-
L30	98.16	97.69	97.47	97.44	97.09	96.91	96.81	96.59	-
L31	97.96	97.83	97.66	97.46	97.05	96.85	96.71	96.66	-
L32	98.15	97.68	97.60	97.37	97.10	97.01	96.92	96.82	-
L33	97.99	97.82	97.55	97.30	97.04	96.96	96.90	96.81	-
L34	97.94	97.86	97.50	97.33	96.97	96.82	96.76	96.64	-
L35	98.14	97.64	97.54	97.41	96.98	96.81	96.76	96.69	-
L36	98.13	97.84	97.56	97.28	97.15	96.86	96.78	96.63	-
L37	98.02	97.67	97.61	97.23	97.11	96.94	96.70	96.65	-
L38	98.04	97.85	97.65	97.44	97.02	96.87	96.73	96.61	-
L39	98.06	97.71	97.46	97.24	97.07	97.02	96.88	96.79	-
L40	98.12	97.79	97.68	97.40	97.18	97.03	96.84	96.73	-
L41	98.00	97.73	97.49	97.31	97.05	96.95	96.77	96.69	-
L42	97.97	97.80	97.67	97.26	97.06	96.99	96.82	96.75	-
L43	98.09	97.70	97.52	97.43	97.04	97.03	96.79	96.72	-
L44	98.01	97.78	97.64	97.38	96.96	96.88	96.74	96.70	-
L45	98.00	97.63	97.51	97.45	96.99	96.89	96.86	96.68	-
L46	97.98	97.74	97.62	97.27	97.01	96.98	96.87	96.78	-
L47	98.08	97.75	97.48	97.42	97.13	96.90	96.83	96.58	-
L48	98.11	97.77	97.69	97.25	97.08	97.00	96.89	96.80	-
L49	98.03	97.62	97.53	97.34	97.09	96.86	96.83	96.71	-
L50	98.10	97.66	97.61	97.36	97.17	96.93	96.91	96.74	-
Ave.	98.05	97.74	97.58	97.35	97.07	96.92	96.81	96.70	-
Med.	98.05	97.74	97.58	97.35	97.07	96.92	96.80	96.69	-
st dev	0.0701	0.0736	0.0696	0.0718	0.0650	0.0688	0.0653	0.0697	-
Min.	97.94	97.62	97.46	97.23	96.96	96.81	96.70	96.58	-
Max.	98.17	97.86	97.69	97.46	97.18	97.03	96.92	96.82	-

3.5 Data Set 2, 85°C, 150mA (Forward Voltage)

Sample No.	Forward Voltage (V)									
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L26	3.039	3.026	3.048	3.054	3.046	3.038	3.054	3.038	3.020	3.038
L27	3.016	3.047	3.043	3.054	3.045	3.050	3.052	3.029	3.054	3.040
L28	3.023	3.050	3.044	3.016	3.050	3.060	3.050	3.043	3.034	3.033
L29	3.029	3.027	3.027	3.037	3.023	3.022	3.042	3.035	3.021	3.031
L30	3.024	3.039	3.022	3.052	3.022	3.042	3.034	3.042	3.052	3.043
L31	3.033	3.034	3.048	3.044	3.042	3.024	3.035	3.047	3.033	3.046
L32	3.026	3.032	3.056	3.058	3.046	3.046	3.053	3.032	3.040	3.029
L33	3.053	3.038	3.046	3.013	3.013	3.041	3.025	3.027	3.043	3.059
L34	3.029	3.050	3.040	3.023	3.055	3.045	3.055	3.042	3.016	3.052
L35	3.021	3.043	3.013	3.049	3.043	3.035	3.025	3.062	3.044	3.045
L36	3.029	3.049	3.020	3.045	3.058	3.052	3.053	3.024	3.019	3.038
L37	3.031	3.040	3.013	3.038	3.043	3.023	3.046	3.052	3.018	3.036
L38	3.030	3.027	3.039	3.039	3.044	3.057	3.052	3.033	3.056	3.038
L39	3.026	3.043	3.042	3.058	3.013	3.018	3.017	3.021	3.032	3.030
L40	3.018	3.038	3.015	3.050	3.047	3.051	3.058	3.043	3.044	3.031
L41	3.027	3.048	3.030	3.020	3.015	3.025	3.021	3.038	3.052	3.031
L42	3.039	3.033	3.039	3.045	3.036	3.025	3.041	3.031	3.033	3.053
L43	3.028	3.031	3.029	3.025	3.022	3.033	3.049	3.063	3.048	3.045
L44	3.021	3.053	3.050	3.016	3.050	3.029	3.040	3.029	3.035	3.043
L45	3.031	3.030	3.017	3.041	3.023	3.034	3.029	3.036	3.049	3.046
L46	3.027	3.036	3.045	3.038	3.052	3.061	3.055	3.058	3.015	3.049
L47	3.024	3.050	3.011	3.052	3.047	3.032	3.041	3.037	3.037	3.048
L48	3.020	3.051	3.035	3.036	3.020	3.017	3.031	3.031	3.056	3.046
L49	3.026	3.028	3.047	3.040	3.013	3.055	3.042	3.048	3.014	3.046
L50	3.063	3.030	3.030	3.058	3.041	3.046	3.028	3.025	3.029	3.039
Ave.	3.029	3.039	3.034	3.040	3.036	3.038	3.041	3.039	3.036	3.041
Med.	3.027	3.038	3.039	3.041	3.043	3.038	3.042	3.037	3.035	3.043
st dev	0.0104	0.0089	0.0135	0.0140	0.0148	0.0135	0.0121	0.0115	0.0139	0.0080
Min.	3.016	3.026	3.011	3.013	3.013	3.017	3.017	3.021	3.014	3.029
Max.	3.063	3.053	3.056	3.058	3.058	3.061	3.058	3.063	3.056	3.059

Sample No.	Forward Voltage (V)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L26	3.033	3.021	3.060	3.013	3.047	3.051	3.047	3.061	-
L27	3.023	3.042	3.052	3.039	3.052	3.039	3.055	3.021	-
L28	3.030	3.046	3.019	3.049	3.038	3.054	3.024	3.040	-
L29	3.025	3.053	3.013	3.053	3.010	3.019	3.012	3.058	-
L30	3.058	3.032	3.027	3.035	3.035	3.035	3.041	3.036	-
L31	3.012	3.043	3.043	3.031	3.046	3.025	3.032	3.046	-
L32	3.047	3.026	3.021	3.029	3.050	3.022	3.054	3.032	-
L33	3.013	3.040	3.050	3.032	3.050	3.042	3.057	3.047	-
L34	3.044	3.039	3.020	3.019	3.018	3.059	3.014	3.032	-
L35	3.026	3.024	3.045	3.025	3.034	3.017	3.017	3.023	-
L36	3.061	3.051	3.056	3.047	3.036	3.046	3.040	3.046	-
L37	3.024	3.036	3.038	3.040	3.012	3.057	3.048	3.038	-
L38	3.051	3.027	3.052	3.031	3.054	3.029	3.026	3.033	-
L39	3.027	3.044	3.025	3.039	3.058	3.036	3.028	3.025	-
L40	3.027	3.052	3.051	3.049	3.020	3.035	3.058	3.028	-
L41	3.031	3.049	3.045	3.038	3.055	3.020	3.048	3.048	-
L42	3.014	3.021	3.020	3.039	3.051	3.037	3.023	3.028	-
L43	3.060	3.034	3.035	3.058	3.047	3.057	3.041	3.040	-
L44	3.013	3.022	3.048	3.019	3.014	3.021	3.045	3.042	-
L45	3.014	3.047	3.022	3.043	3.053	3.038	3.025	3.039	-
L46	3.022	3.045	3.054	3.017	3.039	3.029	3.045	3.033	-
L47	3.044	3.052	3.029	3.053	3.010	3.023	3.062	3.047	-
L48	3.028	3.032	3.059	3.035	3.022	3.027	3.037	3.042	-
L49	3.035	3.045	3.021	3.022	3.028	3.028	3.056	3.025	-
L50	3.037	3.022	3.027	3.038	3.037	3.030	3.061	3.056	-
Ave.	3.032	3.038	3.037	3.036	3.037	3.035	3.040	3.039	-
Med.	3.028	3.040	3.038	3.038	3.038	3.035	3.041	3.039	-
st dev	0.0150	0.0109	0.0150	0.0121	0.0157	0.0129	0.0153	0.0109	-
Min.	3.012	3.021	3.013	3.013	3.010	3.017	3.012	3.021	-
Max.	3.061	3.053	3.060	3.058	3.058	3.059	3.062	3.061	-

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

Sample No.	u'	v'	CCT(K)	Chromaticity Shift $\Delta u'v'$								
	0hr(Initial)			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L26	0.2469	0.5209	3095	0.0002	0.0003	0.0005	0.0007	0.0010	0.0013	0.0014	0.0019	0.0020
L27	0.2455	0.5210	3132	0.0004	0.0005	0.0006	0.0008	0.0012	0.0013	0.0015	0.0018	0.0019
L28	0.2461	0.5195	3127	0.0001	0.0006	0.0008	0.0010	0.0011	0.0014	0.0016	0.0020	0.0021
L29	0.2488	0.5222	3040	0.0002	0.0007	0.0009	0.0010	0.0012	0.0013	0.0015	0.0019	0.0020
L30	0.2472	0.5201	3094	0.0003	0.0006	0.0007	0.0008	0.0009	0.0011	0.0014	0.0020	0.0021
L31	0.2503	0.5227	2998	0.0002	0.0005	0.0009	0.0010	0.0011	0.0013	0.0015	0.0018	0.0020
L32	0.2479	0.5228	3058	0.0004	0.0007	0.0008	0.0009	0.0010	0.0014	0.0016	0.0020	0.0021
L33	0.2465	0.5237	3087	0.0003	0.0006	0.0009	0.0010	0.0011	0.0013	0.0014	0.0019	0.0020
L34	0.2500	0.5242	2995	0.0001	0.0005	0.0007	0.0008	0.0010	0.0011	0.0013	0.0020	0.0021
L35	0.2490	0.5243	3021	0.0003	0.0004	0.0006	0.0007	0.0012	0.0013	0.0014	0.0018	0.0022
L36	0.2508	0.5239	2980	0.0004	0.0007	0.0009	0.0010	0.0011	0.0012	0.0013	0.0019	0.0020
L37	0.2502	0.5234	2995	0.0003	0.0006	0.0008	0.0009	0.0010	0.0011	0.0012	0.0017	0.0021
L38	0.2467	0.5184	3120	0.0004	0.0005	0.0006	0.0007	0.0008	0.0012	0.0013	0.0018	0.0019
L39	0.2492	0.5231	3024	0.0002	0.0007	0.0008	0.0009	0.0010	0.0014	0.0015	0.0020	0.0021
L40	0.2481	0.5193	3077	0.0004	0.0005	0.0006	0.0007	0.0008	0.0013	0.0014	0.0021	0.0022
L41	0.2457	0.5185	3146	0.0003	0.0006	0.0007	0.0008	0.0009	0.0012	0.0015	0.0018	0.0020
L42	0.2498	0.5253	2995	0.0001	0.0007	0.0009	0.0010	0.0011	0.0013	0.0016	0.0020	0.0021
L43	0.2494	0.5227	3021	0.0004	0.0007	0.0009	0.0010	0.0012	0.0014	0.0015	0.0019	0.0020
L44	0.2484	0.5241	3036	0.0002	0.0005	0.0008	0.0009	0.0011	0.0012	0.0014	0.0018	0.0019
L45	0.2499	0.5230	3008	0.0004	0.0006	0.0009	0.0010	0.0012	0.0013	0.0016	0.0019	0.0022
L46	0.2483	0.5225	3050	0.0003	0.0006	0.0007	0.0008	0.0011	0.0014	0.0015	0.0017	0.0018
L47	0.2468	0.5195	3109	0.0004	0.0005	0.0006	0.0007	0.0010	0.0014	0.0016	0.0018	0.0019
L48	0.2498	0.5233	3008	0.0003	0.0004	0.0005	0.0006	0.0009	0.0013	0.0015	0.0020	0.0021
L49	0.2488	0.5231	3032	0.0004	0.0007	0.0008	0.0009	0.0012	0.0014	0.0016	0.0021	0.0022
L50	0.2494	0.5237	3014	0.0002	0.0006	0.0009	0.0010	0.0011	0.0012	0.0014	0.0020	0.0021
Ave.	0.2484	0.5222	3050	0.0003	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0020
Med.	0.2488	0.5228	3036	0.0003	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015	0.0019	0.0021
st dev	0.0016	0.0020	50.35	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2455	0.5184	2980	0.0001	0.0003	0.0005	0.0006	0.0008	0.0011	0.0012	0.0017	0.0018
Max.	0.2508	0.5253	3146	0.0004	0.0007	0.0009	0.0010	0.0012	0.0014	0.0016	0.0021	0.0022

Sample No.	Chromaticity Shift $\Delta u'v'$								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L26	0.0022	0.0024	0.0025	0.0026	0.0028	0.0030	0.0032	0.0033	-
L27	0.0024	0.0026	0.0027	0.0028	0.0030	0.0032	0.0034	0.0035	-
L28	0.0023	0.0024	0.0028	0.0029	0.0031	0.0033	0.0035	0.0036	-
L29	0.0023	0.0024	0.0026	0.0027	0.0028	0.0032	0.0033	0.0034	-
L30	0.0024	0.0025	0.0027	0.0028	0.0030	0.0031	0.0034	0.0035	-
L31	0.0023	0.0024	0.0026	0.0027	0.0028	0.0032	0.0033	0.0034	-
L32	0.0024	0.0025	0.0028	0.0029	0.0030	0.0033	0.0034	0.0035	-
L33	0.0025	0.0026	0.0027	0.0028	0.0029	0.0032	0.0034	0.0036	-
L34	0.0024	0.0025	0.0028	0.0029	0.0030	0.0031	0.0033	0.0034	-
L35	0.0023	0.0024	0.0026	0.0027	0.0028	0.0030	0.0032	0.0033	-
L36	0.0022	0.0023	0.0025	0.0026	0.0031	0.0032	0.0034	0.0035	-
L37	0.0023	0.0025	0.0027	0.0028	0.0029	0.0030	0.0032	0.0033	-
L38	0.0020	0.0021	0.0026	0.0027	0.0028	0.0029	0.0030	0.0031	-
L39	0.0022	0.0024	0.0028	0.0029	0.0030	0.0031	0.0032	0.0033	-
L40	0.0023	0.0025	0.0028	0.0029	0.0030	0.0033	0.0034	0.0035	-
L41	0.0022	0.0024	0.0027	0.0028	0.0029	0.0032	0.0033	0.0034	-
L42	0.0024	0.0026	0.0028	0.0029	0.0031	0.0033	0.0035	0.0036	-
L43	0.0023	0.0025	0.0027	0.0028	0.0029	0.0030	0.0034	0.0035	-
L44	0.0022	0.0024	0.0029	0.0030	0.0031	0.0032	0.0033	0.0034	-
L45	0.0024	0.0026	0.0028	0.0029	0.0030	0.0033	0.0034	0.0035	-
L46	0.0023	0.0025	0.0027	0.0028	0.0029	0.0030	0.0035	0.0036	-
L47	0.0020	0.0024	0.0026	0.0027	0.0031	0.0032	0.0033	0.0034	-
L48	0.0022	0.0023	0.0028	0.0029	0.0030	0.0033	0.0034	0.0035	-
L49	0.0024	0.0025	0.0027	0.0028	0.0029	0.0031	0.0035	0.0036	-
L50	0.0023	0.0025	0.0028	0.0029	0.0030	0.0032	0.0033	0.0034	-
Ave.	0.0023	0.0024	0.0027	0.0028	0.0030	0.0032	0.0033	0.0034	-
Med.	0.0023	0.0025	0.0027	0.0028	0.0030	0.0032	0.0034	0.0035	-
st dev	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	-
Min.	0.0020	0.0021	0.0025	0.0026	0.0028	0.0029	0.0030	0.0031	-
Max.	0.0025	0.0026	0.0029	0.0030	0.0031	0.0033	0.0035	0.0036	-

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

Sample No.	Φ(lm)	Lumen Maintenance (%)								
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L51	63.23	99.88	99.86	99.77	99.41	99.16	98.90	98.78	98.50	98.34
L52	62.91	99.93	99.84	99.58	99.44	99.24	98.98	98.65	98.39	98.17
L53	62.91	99.89	99.83	99.70	99.48	99.33	99.09	98.75	98.42	98.22
L54	63.77	100.03	99.98	99.57	99.52	99.25	98.99	98.66	98.41	98.18
L55	63.81	99.84	99.80	99.75	99.51	99.29	98.92	98.73	98.60	98.24
L56	63.87	99.90	99.82	99.62	99.42	99.22	99.11	98.64	98.48	98.30
L57	62.92	99.86	99.76	99.61	99.46	99.30	99.07	98.70	98.49	98.25
L58	63.48	99.85	99.75	99.63	99.54	99.18	98.93	98.76	98.53	98.39
L59	63.47	99.92	99.89	99.67	99.47	99.17	99.00	98.72	98.56	98.16
L60	63.91	99.91	99.88	99.79	99.40	99.19	98.96	98.81	98.61	98.35
L61	62.75	99.87	99.81	99.68	99.53	99.32	99.06	98.82	98.55	98.18
L62	63.84	99.91	99.79	99.73	99.49	99.21	98.93	98.77	98.52	98.21
L63	63.74	100.00	99.95	99.65	99.50	99.36	98.91	98.62	98.42	98.19
L64	62.65	99.98	99.93	99.66	99.39	99.23	99.05	98.83	98.59	98.29
L65	63.04	99.94	99.85	99.80	99.35	99.28	98.94	98.60	98.43	98.27
L66	62.77	99.90	99.87	99.69	99.43	99.26	99.01	98.80	98.54	98.36
L67	63.00	99.95	99.91	99.78	99.56	99.31	99.04	98.74	98.51	98.28
L68	63.34	100.06	99.99	99.60	99.45	99.14	99.08	98.67	98.47	98.37
L69	63.75	99.97	99.88	99.71	99.58	99.20	98.97	98.68	98.58	98.20
L70	63.48	99.96	99.92	99.64	99.37	99.15	99.03	98.61	98.57	98.33
L71	62.90	100.01	99.77	99.72	99.55	99.27	98.89	98.63	98.46	98.38
L72	62.39	100.04	99.96	99.76	99.49	99.34	98.91	98.79	98.40	98.31
L73	62.30	100.02	99.97	99.59	99.38	99.20	99.02	98.59	98.36	98.23
L74	63.01	99.99	99.94	99.74	99.57	99.35	98.95	98.71	98.45	98.32
L75	62.45	100.05	99.78	99.56	99.36	99.22	99.10	98.69	98.44	98.26
Ave.	63.19	99.95	99.87	99.68	99.47	99.25	98.99	98.71	98.49	98.27
Med.	63.04	99.94	99.87	99.68	99.47	99.24	98.99	98.71	98.49	98.27
st dev	0.5024	0.0661	0.0734	0.0736	0.0694	0.0659	0.0687	0.0736	0.0722	0.0718
Min.	62.30	99.84	99.75	99.56	99.35	99.14	98.89	98.59	98.36	98.16
Max.	63.91	100.06	99.99	99.80	99.58	99.36	99.11	98.83	98.61	98.39

Sample No.	Lumen Maintenance (%)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L51	98.04	97.69	97.49	97.03	96.95	96.86	96.62	96.56	-
L52	97.93	97.48	97.23	97.11	96.90	96.79	96.56	96.47	-
L53	97.92	97.68	97.29	97.23	96.87	96.77	96.55	96.40	-
L54	97.82	97.64	97.25	97.20	96.98	96.82	96.66	96.44	-
L55	97.97	97.62	97.30	97.05	96.89	96.85	96.64	96.48	-
L56	97.99	97.49	97.36	97.04	96.78	96.77	96.68	96.51	-
L57	97.95	97.45	97.34	97.12	97.01	96.69	96.62	96.49	-
L58	97.94	97.55	97.33	97.14	96.81	96.81	96.61	96.46	-
L59	97.90	97.54	97.46	97.18	96.92	96.80	96.69	96.39	-
L60	97.91	97.61	97.27	97.06	96.97	96.63	96.60	96.33	-
L61	98.05	97.53	97.45	97.02	96.80	96.78	96.54	96.38	-
L62	97.87	97.58	97.44	97.17	96.99	96.66	96.58	96.41	-
L63	97.88	97.47	97.32	97.07	96.88	96.75	96.53	96.45	-
L64	97.98	97.46	97.31	97.13	96.96	96.65	96.52	96.43	-
L65	98.00	97.53	97.38	97.21	96.86	96.72	96.67	96.52	-
L66	98.03	97.60	97.40	97.19	96.96	96.64	96.57	96.53	-
L67	98.06	97.66	97.28	97.16	96.83	96.67	96.55	96.51	-
L68	97.96	97.65	97.43	97.15	96.91	96.83	96.50	96.42	-
L69	97.86	97.56	97.24	97.13	96.94	96.73	96.63	96.34	-
L70	98.01	97.67	97.37	97.08	96.85	96.84	96.59	96.54	-
L71	97.89	97.63	97.35	97.00	96.82	96.71	96.49	96.36	-
L72	97.84	97.59	97.26	97.01	97.00	96.68	96.48	96.37	-
L73	98.02	97.54	97.42	97.10	96.93	96.84	96.74	96.35	-
L74	97.85	97.50	97.41	97.22	96.85	96.75	96.65	96.43	-
L75	98.07	97.57	97.48	97.09	96.79	96.76	96.71	96.50	-
Ave.	97.95	97.57	97.35	97.12	96.90	96.75	96.60	96.44	-
Med.	97.95	97.57	97.35	97.12	96.90	96.76	96.60	96.44	-
st dev	0.0743	0.0726	0.0791	0.0693	0.0701	0.0711	0.0707	0.0672	-
Min.	97.82	97.45	97.23	97.00	96.78	96.63	96.48	96.33	-
Max.	98.07	97.69	97.49	97.23	97.01	96.86	96.74	96.56	-

3.8 Data Set 3, 105°C, 150mA (Forward Voltage)

Sample No.	Forward Voltage (V)									
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L51	3.042	3.021	3.036	3.046	3.055	3.027	3.047	3.051	3.028	3.037
L52	3.024	3.019	3.030	3.019	3.057	3.024	3.049	3.021	3.054	3.041
L53	3.043	3.046	3.030	3.036	3.024	3.049	3.043	3.059	3.031	3.037
L54	3.040	3.048	3.035	3.048	3.021	3.055	3.063	3.033	3.035	3.051
L55	3.032	3.046	3.057	3.031	3.046	3.028	3.024	3.023	3.024	3.032
L56	3.033	3.025	3.036	3.033	3.043	3.057	3.047	3.035	3.048	3.037
L57	3.046	3.024	3.047	3.051	3.022	3.020	3.046	3.029	3.062	3.043
L58	3.037	3.049	3.046	3.054	3.062	3.038	3.027	3.047	3.022	3.028
L59	3.026	3.029	3.057	3.034	3.026	3.041	3.053	3.023	3.039	3.043
L60	3.041	3.039	3.040	3.042	3.025	3.032	3.050	3.018	3.047	3.026
L61	3.032	3.032	3.048	3.020	3.041	3.048	3.028	3.044	3.061	3.032
L62	3.032	3.041	3.031	3.018	3.021	3.041	3.052	3.054	3.038	3.035
L63	3.029	3.047	3.031	3.047	3.046	3.054	3.045	3.045	3.034	3.021
L64	3.035	3.021	3.034	3.030	3.024	3.039	3.054	3.025	3.048	3.044
L65	3.035	3.020	3.029	3.040	3.048	3.039	3.029	3.035	3.031	3.047
L66	3.037	3.031	3.042	3.048	3.062	3.042	3.027	3.037	3.058	3.048
L67	3.029	3.046	3.035	3.029	3.064	3.051	3.050	3.038	3.056	3.024
L68	3.043	3.037	3.055	3.021	3.020	3.049	3.054	3.029	3.044	3.036
L69	3.032	3.038	3.045	3.040	3.051	3.035	3.037	3.019	3.048	3.035
L70	3.033	3.043	3.050	3.035	3.058	3.023	3.058	3.030	3.043	3.027
L71	3.026	3.032	3.043	3.021	3.045	3.043	3.031	3.062	3.044	3.034
L72	3.032	3.043	3.037	3.054	3.028	3.018	3.037	3.028	3.033	3.035
L73	3.020	3.027	3.038	3.038	3.043	3.037	3.040	3.061	3.021	3.050
L74	3.018	3.043	3.026	3.021	3.021	3.054	3.052	3.036	3.020	3.035
L75	3.031	3.036	3.039	3.032	3.033	3.051	3.065	3.034	3.027	3.042
Ave.	3.033	3.035	3.040	3.036	3.039	3.040	3.044	3.037	3.040	3.037
Med.	3.032	3.037	3.038	3.035	3.043	3.041	3.047	3.035	3.039	3.036
st dev	0.0071	0.0099	0.0089	0.0114	0.0153	0.0116	0.0117	0.0131	0.0128	0.0080
Min.	3.018	3.019	3.026	3.018	3.020	3.018	3.024	3.018	3.020	3.021
Max.	3.046	3.049	3.057	3.054	3.064	3.057	3.065	3.062	3.062	3.051

Sample No.	Forward Voltage (V)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L51	3.015	3.023	3.049	3.056	3.058	3.032	3.023	3.014	-
L52	3.028	3.028	3.050	3.057	3.023	3.025	3.034	3.049	-
L53	3.016	3.018	3.045	3.019	3.056	3.045	3.024	3.019	-
L54	3.018	3.024	3.044	3.057	3.047	3.034	3.023	3.032	-
L55	3.037	3.029	3.040	3.034	3.019	3.033	3.026	3.048	-
L56	3.027	3.040	3.039	3.015	3.043	3.016	3.042	3.024	-
L57	3.040	3.025	3.028	3.030	3.041	3.039	3.044	3.032	-
L58	3.019	3.021	3.022	3.048	3.018	3.053	3.025	3.013	-
L59	3.015	3.038	3.039	3.016	3.046	3.040	3.053	3.038	-
L60	3.020	3.036	3.049	3.041	3.063	3.048	3.051	3.026	-
L61	3.013	3.034	3.017	3.030	3.023	3.044	3.032	3.037	-
L62	3.050	3.034	3.043	3.029	3.029	3.022	3.043	3.050	-
L63	3.026	3.036	3.038	3.017	3.042	3.020	3.033	3.044	-
L64	3.028	3.021	3.052	3.036	3.059	3.040	3.048	3.017	-
L65	3.041	3.029	3.039	3.057	3.035	3.024	3.039	3.046	-
L66	3.050	3.045	3.026	3.033	3.052	3.035	3.053	3.014	-
L67	3.049	3.029	3.026	3.015	3.036	3.040	3.034	3.042	-
L68	3.025	3.040	3.015	3.053	3.033	3.020	3.022	3.044	-
L69	3.028	3.036	3.049	3.022	3.064	3.018	3.039	3.018	-
L70	3.043	3.035	3.028	3.041	3.050	3.041	3.028	3.017	-
L71	3.021	3.016	3.044	3.049	3.020	3.023	3.049	3.028	-
L72	3.037	3.039	3.025	3.055	3.043	3.020	3.045	3.032	-
L73	3.032	3.042	3.039	3.043	3.028	3.028	3.050	3.026	-
L74	3.031	3.044	3.029	3.032	3.030	3.017	3.022	3.036	-
L75	3.014	3.042	3.037	3.060	3.022	3.025	3.023	3.037	-
Ave.	3.029	3.032	3.036	3.038	3.039	3.031	3.036	3.031	-
Med.	3.028	3.034	3.039	3.036	3.041	3.032	3.034	3.032	-
st dev	0.0118	0.0085	0.0107	0.0152	0.0145	0.0108	0.0110	0.0121	-
Min.	3.013	3.016	3.015	3.015	3.018	3.016	3.022	3.013	-
Max.	3.050	3.045	3.052	3.060	3.064	3.053	3.053	3.050	-

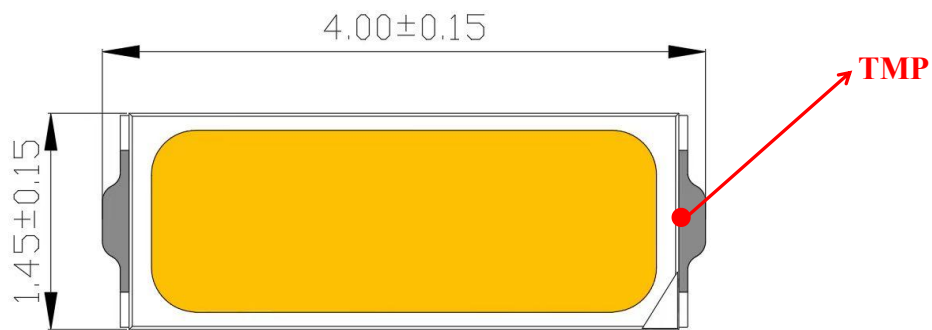
3.9 Data Set 3, 105°C, 150mA (Chromaticity Shift)

Sample No.	u'	v'	CCT(K)	Chromaticity Shift Δu'v'								
	0hr(Initial)			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L51	0.2497	0.5236	3007	0.0005	0.0006	0.0008	0.0010	0.0012	0.0016	0.0018	0.0019	0.0020
L52	0.2502	0.5254	2985	0.0006	0.0008	0.0009	0.0012	0.0015	0.0018	0.0020	0.0021	0.0022
L53	0.2484	0.5209	3057	0.0002	0.0007	0.0011	0.0014	0.0016	0.0017	0.0019	0.0020	0.0021
L54	0.2484	0.5256	3027	0.0006	0.0009	0.0010	0.0013	0.0014	0.0018	0.0020	0.0021	0.0022
L55	0.2482	0.5197	3070	0.0004	0.0008	0.0009	0.0014	0.0015	0.0017	0.0018	0.0022	0.0023
L56	0.2468	0.5233	3082	0.0005	0.0007	0.0008	0.0013	0.0016	0.0018	0.0019	0.0020	0.0021
L57	0.2493	0.5234	3018	0.0004	0.0009	0.0010	0.0014	0.0015	0.0016	0.0020	0.0021	0.0022
L58	0.2463	0.5207	3113	0.0005	0.0008	0.0011	0.0012	0.0014	0.0015	0.0017	0.0019	0.0020
L59	0.2490	0.5263	3007	0.0006	0.0007	0.0010	0.0013	0.0015	0.0017	0.0018	0.0020	0.0021
L60	0.2478	0.5217	3067	0.0005	0.0008	0.0009	0.0011	0.0013	0.0018	0.0020	0.0021	0.0022
L61	0.2476	0.5219	3072	0.0003	0.0007	0.0008	0.0012	0.0014	0.0017	0.0019	0.0022	0.0023
L62	0.2470	0.5198	3101	0.0004	0.0008	0.0009	0.0014	0.0015	0.0016	0.0018	0.0020	0.0022
L63	0.2470	0.5198	3100	0.0005	0.0009	0.0010	0.0013	0.0014	0.0015	0.0020	0.0021	0.0023
L64	0.2505	0.5220	2998	0.0001	0.0007	0.0011	0.0012	0.0013	0.0017	0.0018	0.0019	0.0020
L65	0.2495	0.5254	3002	0.0006	0.0008	0.0010	0.0011	0.0012	0.0013	0.0019	0.0020	0.0021
L66	0.2503	0.5210	3009	0.0003	0.0009	0.0011	0.0013	0.0014	0.0015	0.0017	0.0021	0.0022
L67	0.2475	0.5173	3107	0.0004	0.0006	0.0010	0.0014	0.0015	0.0017	0.0020	0.0021	0.0023
L68	0.2474	0.5211	3083	0.0002	0.0005	0.0009	0.0010	0.0013	0.0016	0.0018	0.0022	0.0024
L69	0.2479	0.5229	3056	0.0006	0.0007	0.0008	0.0012	0.0014	0.0018	0.0019	0.0020	0.0022
L70	0.2488	0.5210	3046	0.0004	0.0008	0.0010	0.0014	0.0015	0.0018	0.0019	0.0020	0.0021
L71	0.2476	0.5218	3073	0.0006	0.0009	0.0011	0.0013	0.0014	0.0017	0.0020	0.0021	0.0022
L72	0.2500	0.5235	3000	0.0005	0.0006	0.0010	0.0011	0.0015	0.0016	0.0018	0.0019	0.0020
L73	0.2467	0.5190	3116	0.0006	0.0008	0.0009	0.0012	0.0014	0.0015	0.0020	0.0021	0.0023
L74	0.2500	0.5248	2994	0.0004	0.0009	0.0010	0.0014	0.0015	0.0018	0.0019	0.0020	0.0021
L75	0.2515	0.5209	2981	0.0006	0.0008	0.0011	0.0012	0.0013	0.0017	0.0020	0.0021	0.0023
Ave.	0.2485	0.5221	3047	0.0005	0.0008	0.0010	0.0013	0.0014	0.0017	0.0019	0.0020	0.0022
Med.	0.2484	0.5218	3056	0.0005	0.0008	0.0010	0.0013	0.0014	0.0017	0.0019	0.0021	0.0022
st dev	0.0014	0.0023	44.21	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2463	0.5173	2981	0.0001	0.0005	0.0008	0.0010	0.0012	0.0013	0.0017	0.0019	0.0020
Max.	0.2515	0.5263	3116	0.0006	0.0009	0.0011	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024

Sample No.	Chromaticity Shift $\Delta u'v'$								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L51	0.0022	0.0025	0.0027	0.0028	0.0032	0.0033	0.0034	0.0036	-
L52	0.0024	0.0028	0.0029	0.0030	0.0033	0.0035	0.0036	0.0038	-
L53	0.0023	0.0027	0.0030	0.0031	0.0032	0.0034	0.0037	0.0039	-
L54	0.0025	0.0026	0.0028	0.0029	0.0031	0.0032	0.0035	0.0037	-
L55	0.0024	0.0028	0.0029	0.0030	0.0032	0.0033	0.0036	0.0038	-
L56	0.0025	0.0027	0.0030	0.0031	0.0033	0.0034	0.0037	0.0039	-
L57	0.0023	0.0026	0.0030	0.0031	0.0032	0.0035	0.0036	0.0037	-
L58	0.0022	0.0025	0.0028	0.0029	0.0030	0.0032	0.0037	0.0038	-
L59	0.0024	0.0026	0.0029	0.0030	0.0031	0.0033	0.0035	0.0039	-
L60	0.0025	0.0028	0.0029	0.0031	0.0032	0.0034	0.0035	0.0036	-
L61	0.0024	0.0027	0.0030	0.0031	0.0033	0.0035	0.0036	0.0037	-
L62	0.0023	0.0026	0.0028	0.0029	0.0030	0.0033	0.0037	0.0038	-
L63	0.0025	0.0028	0.0029	0.0030	0.0031	0.0032	0.0036	0.0037	-
L64	0.0024	0.0027	0.0028	0.0029	0.0030	0.0035	0.0036	0.0039	-
L65	0.0023	0.0026	0.0029	0.0030	0.0032	0.0033	0.0037	0.0038	-
L66	0.0024	0.0028	0.0029	0.0031	0.0032	0.0034	0.0035	0.0036	-
L67	0.0025	0.0027	0.0028	0.0029	0.0030	0.0035	0.0036	0.0039	-
L68	0.0025	0.0026	0.0027	0.0028	0.0033	0.0034	0.0037	0.0038	-
L69	0.0024	0.0028	0.0029	0.0030	0.0031	0.0032	0.0036	0.0037	-
L70	0.0023	0.0027	0.0028	0.0029	0.0032	0.0035	0.0037	0.0038	-
L71	0.0024	0.0025	0.0027	0.0028	0.0033	0.0034	0.0035	0.0036	-
L72	0.0023	0.0027	0.0030	0.0031	0.0032	0.0033	0.0036	0.0037	-
L73	0.0024	0.0026	0.0028	0.0029	0.0030	0.0032	0.0033	0.0039	-
L74	0.0023	0.0025	0.0029	0.0030	0.0031	0.0033	0.0035	0.0037	-
L75	0.0024	0.0028	0.0030	0.0031	0.0033	0.0034	0.0036	0.0038	-
Ave.	0.0024	0.0027	0.0029	0.0030	0.0032	0.0034	0.0036	0.0038	-
Med.	0.0024	0.0027	0.0029	0.0030	0.0032	0.0034	0.0036	0.0038	-
st dev	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	-
Min.	0.0022	0.0025	0.0027	0.0028	0.0030	0.0032	0.0033	0.0036	-
Max.	0.0025	0.0028	0.0030	0.0031	0.0033	0.0035	0.0037	0.0039	-

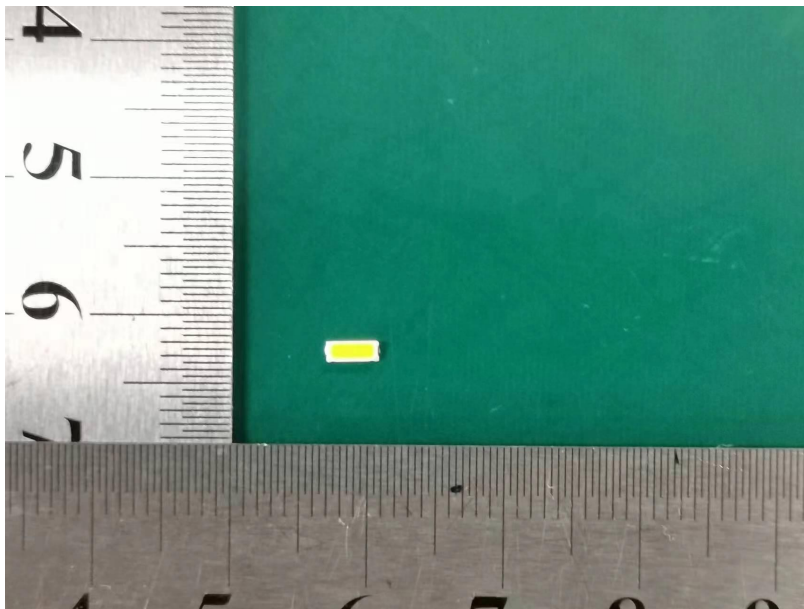
4-EUT Photos

4.1 Mechanical Dimensions



Note: All dimensions are in millimeters(mm).

4.2 EUT Photo



----End of report----