



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.:** BL210622007-9

**Product Description:** SMD LED

**Model No.:** AW-21/DBB1E27Y39NJ

**Test Initiation Date:** 2021-06-04

**Test Completion Date:** 2021-06-07 to 2023-07-19

**Report Issue Date:** 2023-07-25

**Test Standard:** ANSI/IES LM-80-15

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

**Tested by**

Sam Chen

**Reviewed by**

Jason zhou



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.

## TABLE OF CONTENTS

<b>1-GENERAL INFORMATION.....</b>	<b>3</b>
1.1 Product Description for Equipment under Test (EUT).....	3
1.2 Family products covered by this report:.....	3
1.3 Drive Level.....	4
1.4 Ambient Conditions for Maintenance Test.....	4
1.5 Photometric measurement uncertainty.....	4
1.6 Standards Used:.....	4
1.7 Test Facility Description.....	4
1.8 Statement of Traceability.....	4
1.9 Test Equipment List.....	5
1.10 Sample Set.....	5
<b>2-Summary of Test Result.....</b>	<b>6</b>
<b>3 Test Data.....</b>	<b>8</b>
3.1 Data Set 1, 55°C, 100mA (Lumen Maintenance).....	8
3.2 Data Set 1, 55°C, 100mA (Forward Voltage).....	10
3.3 Data Set 1, 55°C, 100mA (Chromaticity Shift).....	12
3.4 Data Set 2, 85°C, 100mA (Lumen Maintenance).....	14
3.5 Data Set 2, 85°C, 100mA (Forward Voltage).....	16
3.6 Data Set 2, 85°C, 100mA (Chromaticity Shift).....	18
3.7 Data Set 3, 105°C, 100mA (Lumen Maintenance).....	20
3.8 Data Set 3, 105°C, 100mA (Forward Voltage).....	22
3.9 Data Set 3, 105°C, 100mA (Chromaticity Shift).....	24
<b>4-EUT Photos.....</b>	<b>26</b>

# 1-GENERAL INFORMATION

## 1.1 Product Description for Equipment under Test (EUT)

**Manufacturer:** Shenzhen HoneBright Technology Co.,Ltd

**Brand name:** HoneBright

**Part Number:** AW-21/DBB1E27Y39NJ

**Part Type:** SMD LED

**Product Description:** VF 9V, IF 100mA, 1W

**CCT:** 2700K

**Die Spacing(mm):** N/A

**Average Power Density per LED die(W/mm2):** 1.033

**Average Current Density per LED die(mA/mm2):** 344.45

**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):** 80

**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-21/DBB1E27Y39NJ	AW-21/ABB1EXXXXXXJ	First XXX: CCT code; Sencond XX: Flux code; Last X: CRI code.
	AW-21/BBB1EXXXXXXJ	
	AW-21/CBB1EXXXXXXJ	
	AW-21/DBB1EXXXXXXJ	

### 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  $2^{\circ}\text{C}$  below the corresponding nominal case temperature.

Surrounding air was maintained at a temperature that was greater than or equal to  $5^{\circ}\text{C}$  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  $-5^{\circ}\text{C}$  of the case temperature ( $T_s$ )

Humidity :  $< 65\%$  RH

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

### 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 2021-06-04 and tested during 2021-06-07 to 2023-07-19. 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	100mA	100mA	100mA
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
$\alpha$	2.157E-06	2.291E-06	2.311E-06
$\beta$	1.005	1.003	1.002
Reported L70 (17k) (17000h)	>102000	>102000	>102000
Reported L90 (17k) (17000h)	51,000	48,000	46,000

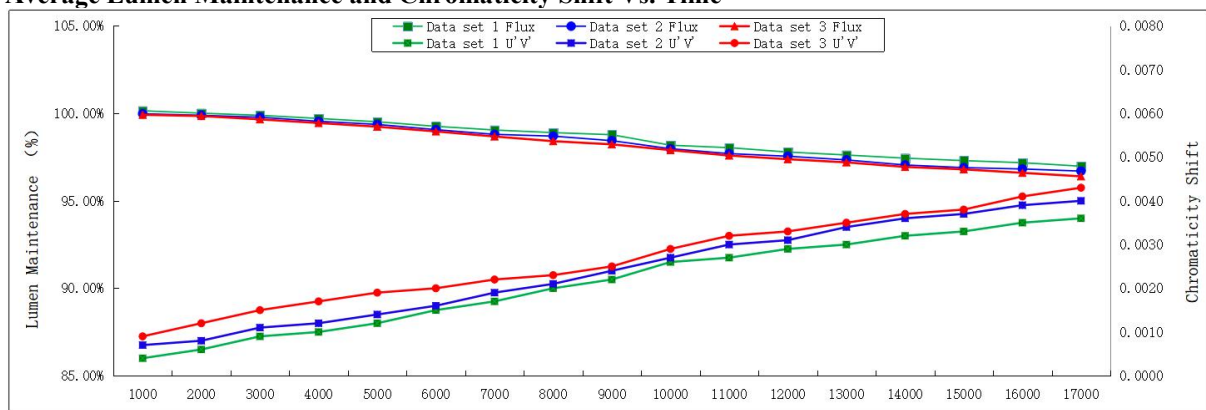
### Average Lumen Maintenance (%)

Data Set	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
1	100.15	100.01	99.89	99.71	99.52	99.26	99.05	98.90	98.78
2	99.98	99.89	99.78	99.55	99.37	99.07	98.80	98.70	98.44
3	99.92	99.85	99.66	99.45	99.24	98.97	98.68	98.41	98.23
Data Set	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
1	98.18	98.04	97.79	97.62	97.44	97.30	97.18	96.98	-
2	97.98	97.70	97.55	97.34	97.05	96.90	96.82	96.70	-
3	97.90	97.59	97.38	97.20	96.94	96.80	96.60	96.40	-

### Average Chromaticity Shift

Data Set	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
1	0.0004	0.0006	0.0009	0.0010	0.0012	0.0015	0.0017	0.0020	0.0022
2	0.0007	0.0008	0.0011	0.0012	0.0014	0.0016	0.0019	0.0021	0.0024
3	0.0009	0.0012	0.0015	0.0017	0.0019	0.0020	0.0022	0.0023	0.0025
Data Set	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
1	0.0026	0.0027	0.0029	0.0030	0.0032	0.0033	0.0035	0.0036	-
2	0.0027	0.0030	0.0031	0.0034	0.0036	0.0037	0.0039	0.0040	-
3	0.0029	0.0032	0.0033	0.0035	0.0037	0.0038	0.0041	0.0043	-

### Average Lumen Maintenance and Chromaticity Shift Vs. Time



### TM-21 Report for Lumen Maintenance

Description of LED Light Source Tested (manufacturer, model, catalog number)		Table 1: Report at each LM-80 Test Condition						Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
		Shenzhen HoneBright Technology Co.,Ltd AW-21/DBB1E27Y39NJ							
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	$T_{s,1}$ (°C)	105.00		
Number of failures	0	Number of failures	0	Number of failures	0	$T_{s,1}$ (K)	378.15		
DUT drive current used in the test (mA)	100	DUT drive current used in the test (mA)	100	DUT drive current used in the test (mA)	100	$\alpha_1$	2.311E-06		
Test duration (hours)	17,000	Test duration (hours)	17,000	Test duration (hours)	17,000	$B_1$	1.002		
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	$T_{s,2}$ (°C)	-		
Tested case temperature (°C)	55	Tested case temperature (°C)	85	Tested case temperature (°C)	105	$T_{s,2}$ (K)	-		
$\alpha$	2.157E-06	$\alpha$	2.291E-06	$\alpha$	2.311E-06	$\alpha_2$	-		
B	1.005	B	1.003	B	1.002	$B_2$	-		
Reported L70(17k) (hours)	>102000	Reported L70(17k) (hours)	>102000	Reported L70(17k) (hours)	>102000	$E_{a/k_b}$	-		
						A	-		
						$B_0$	1.002		
						$T_{s,i}$ (°C)	105.00		
						$T_{s,i}$ (K)	378.15		
						$\alpha_i$	2.311E-06		
						Reported L70(17k) at 105°C (hours)	>102000		

Description of LED Light Source Tested (manufacturer, model, catalog number)		Table 1: Report at each LM-80 Test Condition						Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
		Shenzhen HoneBright Technology Co.,Ltd AW-21/DBB1E27Y39NJ							
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	$T_{s,1}$ (°C)	105.00		
Number of failures	0	Number of failures	0	Number of failures	0	$T_{s,1}$ (K)	378.15		
DUT drive current used in the test (mA)	100	DUT drive current used in the test (mA)	100	DUT drive current used in the test (mA)	100	$\alpha_1$	2.311E-06		
Test duration (hours)	17,000	Test duration (hours)	17,000	Test duration (hours)	17,000	$B_1$	1.002		
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	$T_{s,2}$ (°C)	-		
Tested case temperature (°C)	55	Tested case temperature (°C)	85	Tested case temperature (°C)	105	$T_{s,2}$ (K)	-		
$\alpha$	2.157E-06	$\alpha$	2.291E-06	$\alpha$	2.311E-06	$\alpha_2$	-		
B	1.005	B	1.003	B	1.002	$B_2$	-		
Reported L90(17k) (hours)	51,000	Reported L90(17k) (hours)	48,000	Reported L90(17k) (hours)	46,000	$E_{a/k_b}$	-		
						A	-		
						$B_0$	1.002		
						$T_{s,i}$ (°C)	105.00		
						$T_{s,i}$ (K)	378.15		
						$\alpha_i$	2.311E-06		
						Reported L90(17k) at 105°C (hours)	46,000		

### 3 Test Data

#### 3.1 Data Set 1, 55°C, 100mA (Lumen Maintenance)

Sample No.	Φ(lm)	Lumen Maintenance (%)								
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L1	136.3	100.04	99.98	99.91	99.61	99.48	99.23	99.08	99.01	98.90
L2	134.8	100.09	100.00	99.83	99.78	99.54	99.34	99.13	98.96	98.89
L3	134.4	100.22	100.04	99.88	99.76	99.63	99.17	99.11	99.02	98.79
L4	134.7	100.18	99.99	99.93	99.61	99.47	99.22	98.98	98.89	98.81
L5	135.1	100.11	100.06	99.91	99.78	99.60	99.29	99.12	98.99	98.72
L6	133.3	100.26	99.97	99.85	99.64	99.52	99.31	99.02	98.82	98.67
L7	133.8	100.21	100.13	100.00	99.73	99.46	99.33	98.94	98.88	98.78
L8	134.2	100.14	100.08	99.98	99.82	99.64	99.20	99.00	98.80	98.75
L9	136.0	100.19	100.09	100.01	99.80	99.62	99.37	99.16	99.00	98.68
L10	134.6	100.17	100.02	99.81	99.63	99.49	99.21	99.05	98.78	98.70
L11	136.2	100.27	100.12	99.83	99.60	99.55	99.23	98.95	98.87	98.80
L12	136.3	100.16	99.93	99.82	99.62	99.53	99.28	99.01	98.83	98.76
L13	133.9	100.15	99.94	99.89	99.68	99.50	99.18	99.09	98.97	98.88
L14	134.5	100.08	99.96	99.90	99.80	99.45	99.32	99.03	98.84	98.74
L15	135.4	100.13	99.93	99.81	99.69	99.58	99.19	99.06	98.93	98.85
L16	134.1	100.23	100.10	99.87	99.71	99.43	99.27	98.98	98.94	98.82
L17	133.9	100.20	100.07	99.96	99.66	99.59	99.35	98.99	98.90	98.86
L18	136.9	100.10	100.03	99.97	99.65	99.44	99.25	99.14	98.97	98.83
L19	133.7	100.25	100.11	99.94	99.70	99.42	99.36	99.07	98.85	98.77
L20	136.7	100.07	99.92	99.83	99.77	99.57	99.38	99.15	98.92	98.73
L21	136.3	100.12	100.05	99.95	99.67	99.61	99.30	99.01	98.95	98.87
L22	133.5	100.24	99.92	99.86	99.79	99.41	99.16	99.00	98.81	98.78
L23	136.2	100.05	100.01	99.90	99.74	99.40	99.18	99.04	98.86	98.71
L24	133.8	100.06	99.95	99.84	99.75	99.56	99.26	99.10	98.79	98.69
L25	134.0	100.07	99.91	99.79	99.72	99.51	99.24	98.96	98.91	98.84
Ave.	134.9	100.15	100.01	99.89	99.71	99.52	99.26	99.05	98.90	98.78
Med.	134.6	100.15	100.01	99.89	99.71	99.52	99.26	99.04	98.90	98.78
st dev	1.1341	0.0713	0.0701	0.0641	0.0690	0.0736	0.0678	0.0657	0.0732	0.0692
Min.	133.3	100.04	99.91	99.79	99.60	99.40	99.16	98.94	98.78	98.67
Max.	136.9	100.27	100.13	100.01	99.82	99.64	99.38	99.16	99.02	98.90



Sample No.	Lumen Maintenance (%)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L1	98.12	98.03	97.78	97.69	97.54	97.32	97.29	96.89	-
L2	98.30	98.11	97.88	97.72	97.43	97.27	97.17	97.04	-
L3	98.25	98.17	97.79	97.71	97.41	97.34	97.23	97.09	-
L4	98.14	97.97	97.81	97.74	97.51	97.40	97.10	97.02	-
L5	98.08	98.02	97.72	97.64	97.40	97.35	97.22	96.99	-
L6	98.23	98.09	97.87	97.65	97.50	97.33	97.16	96.98	-
L7	98.15	98.00	97.69	97.60	97.55	97.42	97.24	97.05	-
L8	98.20	98.13	97.86	97.63	97.48	97.37	97.25	96.95	-
L9	98.11	98.04	97.91	97.73	97.50	97.41	97.30	97.09	-
L10	98.29	97.95	97.85	97.67	97.47	97.23	97.18	96.94	-
L11	98.16	98.08	97.75	97.51	97.42	97.31	97.24	96.96	-
L12	98.27	97.94	97.77	97.70	97.52	97.28	97.15	96.91	-
L13	98.21	97.99	97.90	97.54	97.49	97.36	97.13	97.08	-
L14	98.17	97.96	97.76	97.52	97.34	97.25	97.11	97.00	-
L15	98.09	98.01	97.82	97.68	97.35	97.30	97.07	97.01	-
L16	98.11	98.05	97.73	97.62	97.53	97.29	97.09	96.93	-
L17	98.07	97.92	97.89	97.57	97.38	97.31	97.26	96.87	-
L18	98.24	98.07	97.80	97.53	97.36	97.22	97.19	96.97	-
L19	98.19	98.12	97.67	97.58	97.45	97.39	97.23	96.88	-
L20	98.22	98.14	97.70	97.56	97.44	97.27	97.20	97.03	-
L21	98.10	97.91	97.71	97.61	97.52	97.28	97.21	96.86	-
L22	98.13	98.04	97.74	97.55	97.32	97.26	97.08	96.90	-
L23	98.14	98.06	97.68	97.52	97.33	97.19	97.14	97.06	-
L24	98.28	98.15	97.84	97.66	97.46	97.20	97.12	97.07	-
L25	98.26	97.93	97.83	97.59	97.39	97.21	97.10	96.92	-
Ave.	98.18	98.04	97.79	97.62	97.44	97.30	97.18	96.98	-
Med.	98.17	98.04	97.79	97.62	97.45	97.30	97.18	96.98	-
st dev	0.0713	0.0768	0.0736	0.0723	0.0708	0.0667	0.0677	0.0729	-
Min.	98.07	97.91	97.67	97.51	97.32	97.19	97.07	96.86	-
Max.	98.30	98.17	97.91	97.74	97.55	97.42	97.30	97.09	-

**3.2 Data Set 1, 55°C, 100mA (Forward Voltage)**

Sample No.	Forward Voltage (V)									
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L1	8.989	8.909	9.020	8.974	8.991	9.038	8.978	9.032	8.995	9.057
L2	8.995	9.044	9.011	9.029	9.048	9.031	8.929	8.910	9.028	9.055
L3	8.905	9.049	9.054	8.945	9.057	8.997	8.960	9.019	9.052	9.008
L4	8.949	8.947	9.033	9.015	8.984	8.926	8.956	9.011	9.020	9.057
L5	9.048	9.057	9.061	8.999	9.060	9.065	9.061	9.041	8.984	9.042
L6	8.995	8.981	8.992	9.048	8.955	8.986	9.049	8.965	9.045	8.971
L7	9.056	8.952	9.035	8.966	9.043	9.028	9.061	8.967	8.994	9.055
L8	9.034	8.921	8.993	8.969	9.023	9.003	8.970	8.945	9.020	9.050
L9	9.057	9.000	8.947	9.019	8.969	9.011	9.057	8.962	9.040	9.058
L10	9.008	9.002	9.038	9.026	8.999	9.016	8.954	9.050	8.974	8.998
L11	9.019	8.940	9.042	9.026	8.915	9.019	8.947	8.924	8.940	9.046
L12	8.953	9.025	8.959	9.021	8.987	9.064	8.983	8.924	9.040	8.924
L13	9.019	9.044	9.005	9.029	9.000	9.030	9.064	9.031	8.959	8.997
L14	8.990	9.013	8.972	8.964	8.997	8.991	9.061	9.063	9.041	9.035
L15	9.002	9.061	8.991	9.012	9.039	9.039	9.038	9.062	8.912	8.969
L16	8.993	8.999	8.945	8.949	9.055	8.954	8.925	8.989	8.943	9.028
L17	9.044	8.981	8.961	9.018	8.924	8.965	9.062	8.987	8.971	9.021
L18	9.019	8.991	9.055	8.951	9.020	9.048	9.014	8.966	9.066	9.022
L19	9.034	9.041	9.019	9.045	8.932	8.951	9.019	9.023	9.034	8.996
L20	8.956	8.996	9.014	8.924	8.983	9.061	9.013	8.945	8.959	8.957
L21	8.968	8.951	8.963	9.018	8.919	9.039	9.001	9.053	8.971	8.928
L22	9.034	8.981	9.007	8.992	9.019	9.047	8.983	8.949	8.999	8.997
L23	9.017	8.981	8.956	9.013	8.918	9.020	9.037	9.000	9.049	8.921
L24	8.993	8.906	9.045	8.949	8.982	8.942	9.057	9.010	9.066	9.054
L25	8.974	9.021	8.934	9.026	9.052	8.971	8.984	9.037	8.989	8.981
Ave.	9.002	8.992	9.002	8.997	8.995	9.010	9.007	8.995	9.004	9.009
Med.	9.002	8.996	9.007	9.013	8.997	9.019	9.013	9.000	8.999	9.021
st dev	0.0372	0.0459	0.0387	0.0356	0.0474	0.0399	0.0465	0.0466	0.0428	0.0444
Min.	8.905	8.906	8.934	8.924	8.915	8.926	8.925	8.910	8.912	8.921
Max.	9.057	9.061	9.061	9.048	9.060	9.065	9.064	9.063	9.066	9.058

Sample No.	Forward Voltage (V)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L1	9.031	9.041	8.920	9.063	9.007	9.005	8.937	8.998	-
L2	9.031	9.041	8.997	9.023	8.962	8.963	8.981	9.009	-
L3	9.058	9.007	9.025	9.053	9.032	9.062	8.965	9.008	-
L4	8.935	9.008	8.911	8.953	8.970	8.962	9.032	9.016	-
L5	8.990	8.979	8.993	9.017	9.014	9.057	9.038	9.055	-
L6	8.955	9.056	8.929	8.967	8.997	8.967	9.014	8.956	-
L7	8.999	8.992	9.058	8.956	9.057	9.015	9.070	9.029	-
L8	8.969	8.946	9.004	9.040	8.962	8.980	8.990	8.992	-
L9	8.939	9.045	8.996	9.018	9.035	8.963	9.065	9.015	-
L10	8.990	9.000	9.057	9.003	8.940	8.995	9.043	8.946	-
L11	9.063	9.019	8.985	8.995	8.925	9.036	9.018	8.935	-
L12	9.058	9.006	8.974	9.011	9.036	9.008	9.054	8.968	-
L13	8.929	8.949	8.997	8.959	8.937	8.949	8.946	9.048	-
L14	9.041	8.937	8.982	8.987	8.981	9.064	9.036	8.986	-
L15	8.962	9.056	9.024	8.936	9.051	9.002	8.928	8.927	-
L16	8.978	9.039	8.934	8.998	9.042	8.953	8.962	9.052	-
L17	9.057	9.005	9.039	9.001	9.063	8.970	8.966	9.058	-
L18	8.919	9.002	8.942	8.977	9.061	8.963	9.054	9.009	-
L19	9.031	8.983	8.995	9.048	9.041	8.959	9.045	8.949	-
L20	9.017	8.951	9.059	8.942	9.003	9.033	9.067	8.956	-
L21	9.039	8.985	8.929	8.952	9.027	8.991	9.016	9.010	-
L22	9.062	8.932	9.020	9.003	9.018	9.003	9.057	9.014	-
L23	8.996	9.044	8.924	9.024	9.017	9.057	8.985	8.998	-
L24	8.979	8.958	9.043	8.961	9.051	9.044	9.002	9.054	-
L25	8.961	8.960	9.043	8.993	8.996	8.966	8.953	9.046	-
Ave.	9.000	8.998	8.991	8.995	9.009	8.999	9.009	9.001	-
Med.	8.996	9.002	8.996	8.998	9.017	8.995	9.016	9.009	-
st dev	0.0460	0.0389	0.0475	0.0359	0.0409	0.0380	0.0447	0.0400	-
Min.	8.919	8.932	8.911	8.936	8.925	8.949	8.928	8.927	-
Max.	9.063	9.056	9.059	9.063	9.063	9.064	9.070	9.058	-

### 3.3 Data Set 1, 55°C, 100mA (Chromaticity Shift)

Sample No.	u'	v'	CCT(K)	Chromaticity Shift Δu'v'								
	0hr(Initial)			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L1	0.2609	0.5279	2732	0.0003	0.0004	0.0008	0.0009	0.0011	0.0013	0.0014	0.0018	0.0022
L2	0.2618	0.5269	2718	0.0005	0.0007	0.0010	0.0011	0.0013	0.0015	0.0016	0.0017	0.0024
L3	0.2611	0.5250	2739	0.0004	0.0006	0.0009	0.0010	0.0012	0.0016	0.0018	0.0019	0.0020
L4	0.2606	0.5270	2740	0.0003	0.0004	0.0008	0.0009	0.0010	0.0014	0.0017	0.0021	0.0022
L5	0.2626	0.5284	2694	0.0004	0.0007	0.0010	0.0011	0.0012	0.0016	0.0018	0.0020	0.0021
L6	0.2630	0.5277	2687	0.0003	0.0006	0.0009	0.0010	0.0013	0.0015	0.0016	0.0018	0.0020
L7	0.2626	0.5252	2706	0.0005	0.0007	0.0010	0.0011	0.0012	0.0014	0.0017	0.0019	0.0023
L8	0.2611	0.5264	2733	0.0003	0.0004	0.0008	0.0009	0.0011	0.0015	0.0016	0.0021	0.0024
L9	0.2610	0.5286	2727	0.0002	0.0005	0.0007	0.0008	0.0010	0.0016	0.0017	0.0020	0.0022
L10	0.2611	0.5264	2732	0.0004	0.0007	0.0009	0.0010	0.0011	0.0012	0.0018	0.0019	0.0020
L11	0.2596	0.5289	2754	0.0003	0.0004	0.0008	0.0009	0.0012	0.0014	0.0016	0.0020	0.0024
L12	0.2610	0.5261	2737	0.0005	0.0006	0.0009	0.0010	0.0013	0.0016	0.0017	0.0021	0.0023
L13	0.2620	0.5265	2713	0.0002	0.0004	0.0010	0.0011	0.0012	0.0015	0.0018	0.0020	0.0022
L14	0.2626	0.5246	2709	0.0004	0.0005	0.0009	0.0010	0.0013	0.0014	0.0015	0.0021	0.0023
L15	0.2597	0.5270	2761	0.0003	0.0004	0.0008	0.0009	0.0012	0.0016	0.0017	0.0018	0.0024
L16	0.2634	0.5283	2677	0.0001	0.0003	0.0009	0.0011	0.0013	0.0015	0.0016	0.0019	0.0022
L17	0.2644	0.5283	2658	0.0002	0.0007	0.0010	0.0011	0.0012	0.0014	0.0018	0.0021	0.0024
L18	0.2610	0.5285	2726	0.0005	0.0006	0.0008	0.0010	0.0011	0.0016	0.0017	0.0020	0.0023
L19	0.2639	0.5265	2674	0.0004	0.0005	0.0007	0.0008	0.0010	0.0013	0.0016	0.0018	0.0022
L20	0.2614	0.5266	2725	0.0003	0.0006	0.0010	0.0011	0.0012	0.0015	0.0017	0.0019	0.0021
L21	0.2614	0.5263	2726	0.0005	0.0007	0.0008	0.0009	0.0010	0.0016	0.0018	0.0021	0.0022
L22	0.2637	0.5261	2680	0.0004	0.0005	0.0009	0.0010	0.0011	0.0014	0.0015	0.0020	0.0023
L23	0.2621	0.5280	2706	0.0002	0.0007	0.0010	0.0011	0.0012	0.0015	0.0016	0.0018	0.0023
L24	0.2633	0.5273	2685	0.0005	0.0006	0.0007	0.0008	0.0010	0.0016	0.0017	0.0019	0.0022
L25	0.2644	0.5273	2662	0.0004	0.0007	0.0008	0.0009	0.0011	0.0015	0.0018	0.0021	0.0024
Ave.	0.2620	0.5270	2712	0.0004	0.0006	0.0009	0.0010	0.0012	0.0015	0.0017	0.0020	0.0022
Med.	0.2618	0.5270	2718	0.0004	0.0006	0.0009	0.0010	0.0012	0.0015	0.0017	0.0020	0.0022
st dev	0.0014	0.0012	28.31	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2596	0.5246	2658	0.0001	0.0003	0.0007	0.0008	0.0010	0.0012	0.0014	0.0017	0.0020
Max.	0.2644	0.5289	2761	0.0005	0.0007	0.0010	0.0011	0.0013	0.0016	0.0018	0.0021	0.0024

Sample No.	Chromaticity Shift $\Delta u'v'$								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L1	0.0024	0.0027	0.0028	0.0029	0.0030	0.0032	0.0036	0.0037	-
L2	0.0027	0.0028	0.0030	0.0031	0.0033	0.0034	0.0035	0.0036	-
L3	0.0026	0.0027	0.0029	0.0030	0.0032	0.0033	0.0034	0.0035	-
L4	0.0025	0.0026	0.0028	0.0029	0.0031	0.0032	0.0036	0.0037	-
L5	0.0024	0.0025	0.0030	0.0031	0.0032	0.0033	0.0035	0.0036	-
L6	0.0026	0.0028	0.0029	0.0030	0.0033	0.0034	0.0036	0.0037	-
L7	0.0025	0.0027	0.0028	0.0029	0.0030	0.0031	0.0034	0.0035	-
L8	0.0027	0.0028	0.0030	0.0031	0.0032	0.0033	0.0035	0.0036	-
L9	0.0026	0.0027	0.0029	0.0030	0.0031	0.0032	0.0033	0.0037	-
L10	0.0027	0.0028	0.0029	0.0031	0.0032	0.0033	0.0034	0.0035	-
L11	0.0025	0.0026	0.0030	0.0031	0.0033	0.0034	0.0036	0.0037	-
L12	0.0026	0.0027	0.0028	0.0029	0.0030	0.0031	0.0035	0.0036	-
L13	0.0027	0.0028	0.0029	0.0030	0.0032	0.0033	0.0036	0.0037	-
L14	0.0026	0.0027	0.0028	0.0029	0.0033	0.0034	0.0035	0.0036	-
L15	0.0025	0.0026	0.0027	0.0028	0.0029	0.0030	0.0033	0.0035	-
L16	0.0024	0.0025	0.0028	0.0029	0.0030	0.0031	0.0032	0.0034	-
L17	0.0025	0.0026	0.0030	0.0031	0.0032	0.0033	0.0034	0.0036	-
L18	0.0024	0.0027	0.0029	0.0030	0.0031	0.0032	0.0033	0.0037	-
L19	0.0023	0.0028	0.0030	0.0031	0.0033	0.0034	0.0035	0.0036	-
L20	0.0026	0.0027	0.0028	0.0029	0.0032	0.0033	0.0034	0.0035	-
L21	0.0025	0.0028	0.0030	0.0031	0.0033	0.0034	0.0035	0.0037	-
L22	0.0026	0.0027	0.0029	0.0030	0.0031	0.0032	0.0033	0.0035	-
L23	0.0027	0.0028	0.0029	0.0031	0.0032	0.0033	0.0034	0.0036	-
L24	0.0025	0.0026	0.0030	0.0031	0.0033	0.0034	0.0035	0.0037	-
L25	0.0027	0.0028	0.0029	0.0030	0.0032	0.0033	0.0036	0.0038	-
Ave.	0.0026	0.0027	0.0029	0.0030	0.0032	0.0033	0.0035	0.0036	-
Med.	0.0026	0.0027	0.0029	0.0030	0.0032	0.0033	0.0035	0.0036	-
st dev	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	-
Min.	0.0023	0.0025	0.0027	0.0028	0.0029	0.0030	0.0032	0.0034	-
Max.	0.0027	0.0028	0.0030	0.0031	0.0033	0.0034	0.0036	0.0038	-

**3.4 Data Set 2, 85°C, 100mA (Lumen Maintenance)**

Sample No.	Φ(lm)	Lumen Maintenance (%)								
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L26	133.0	100.01	99.94	99.89	99.60	99.39	98.97	98.76	98.64	98.35
L27	133.6	99.90	99.84	99.80	99.52	99.42	99.11	98.79	98.69	98.56
L28	133.4	99.95	99.88	99.84	99.61	99.43	98.98	98.90	98.82	98.38
L29	134.9	100.00	99.95	99.72	99.66	99.48	99.15	98.83	98.73	98.55
L30	136.7	100.08	100.01	99.87	99.44	99.32	99.13	98.92	98.81	98.42
L31	134.5	99.94	99.85	99.74	99.54	99.34	98.96	98.91	98.58	98.52
L32	134.6	100.04	99.93	99.81	99.53	99.45	99.08	98.84	98.79	98.45
L33	133.6	99.92	99.78	99.67	99.49	99.38	99.09	98.80	98.67	98.36
L34	134.7	100.10	100.00	99.66	99.46	99.29	99.00	98.74	98.63	98.49
L35	136.2	99.88	99.81	99.77	99.65	99.41	99.19	98.86	98.80	98.44
L36	135.8	100.06	99.98	99.73	99.56	99.33	99.14	98.73	98.68	98.41
L37	133.8	100.09	99.97	99.90	99.63	99.31	99.17	98.71	98.65	98.39
L38	134.6	99.98	99.86	99.82	99.59	99.27	99.04	98.81	98.76	98.33
L39	134.1	100.05	99.96	99.69	99.55	99.46	98.99	98.68	98.60	98.46
L40	133.3	99.89	99.83	99.79	99.57	99.47	99.06	98.89	98.75	98.53
L41	135.4	99.91	99.87	99.78	99.58	99.49	99.01	98.87	98.72	98.47
L42	135.5	100.03	99.89	99.83	99.67	99.40	99.10	98.88	98.77	98.48
L43	134.9	99.97	99.92	99.86	99.62	99.30	99.12	98.82	98.78	98.35
L44	135.7	99.87	99.79	99.71	99.45	99.37	99.03	98.77	98.59	98.50
L45	135.7	99.88	99.82	99.79	99.64	99.26	99.16	98.78	98.70	98.54
L46	134.0	99.99	99.90	99.85	99.50	99.34	99.05	98.70	98.62	98.43
L47	136.1	99.93	99.86	99.75	99.47	99.36	99.00	98.75	98.71	98.34
L48	134.5	100.02	99.91	99.76	99.51	99.44	99.02	98.85	98.74	98.37
L49	135.1	100.07	99.99	99.68	99.48	99.35	99.18	98.72	98.66	98.40
L50	134.4	99.96	99.77	99.70	99.43	99.28	99.07	98.69	98.61	98.51
Ave.	134.7	99.98	99.89	99.78	99.55	99.37	99.07	98.80	98.70	98.44
Med.	134.6	99.98	99.89	99.78	99.55	99.37	99.07	98.80	98.70	98.44
st dev	0.9913	0.0723	0.0715	0.0706	0.0736	0.0696	0.0708	0.0736	0.0736	0.0718
Min.	133.0	99.87	99.77	99.66	99.43	99.26	98.96	98.68	98.58	98.33
Max.	136.7	100.10	100.01	99.90	99.67	99.49	99.19	98.92	98.82	98.56

Sample No.	Lumen Maintenance (%)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L26	98.04	97.70	97.54	97.46	96.95	96.84	96.73	96.66	-
L27	98.00	97.74	97.60	97.32	97.04	96.99	96.89	96.80	-
L28	97.97	97.64	97.47	97.26	97.13	96.92	96.86	96.81	-
L29	97.99	97.71	97.61	97.28	97.02	96.85	96.75	96.69	-
L30	97.94	97.67	97.60	97.31	96.93	96.86	96.79	96.59	-
L31	98.05	97.69	97.53	97.40	97.08	96.90	96.81	96.71	-
L32	98.03	97.73	97.56	97.29	97.12	97.02	96.92	96.84	-
L33	97.98	97.65	97.49	97.34	97.05	96.94	96.74	96.57	-
L34	97.92	97.68	97.44	97.30	97.07	96.93	96.80	96.69	-
L35	97.95	97.80	97.57	97.36	96.99	96.89	96.78	96.70	-
L36	97.85	97.63	97.48	97.32	97.06	96.87	96.73	96.65	-
L37	98.01	97.79	97.62	97.24	97.17	96.82	96.79	96.67	-
L38	98.09	97.72	97.55	97.27	97.09	96.83	96.77	96.68	-
L39	98.07	97.64	97.51	97.44	96.94	96.79	96.71	96.61	-
L40	98.06	97.62	97.58	97.42	97.14	96.81	96.72	96.63	-
L41	98.02	97.61	97.46	97.39	97.11	96.95	96.88	96.68	-
L42	97.86	97.77	97.66	97.41	96.96	96.80	96.76	96.70	-
L43	97.90	97.78	97.65	97.38	97.15	97.00	96.95	96.82	-
L44	98.09	97.58	97.43	97.35	97.03	96.98	96.93	96.83	-
L45	97.91	97.59	97.45	97.37	97.01	96.91	96.85	96.64	-
L46	97.96	97.81	97.52	97.43	97.16	97.01	96.94	96.79	-
L47	97.93	97.75	97.59	97.25	97.10	96.96	96.84	96.68	-
L48	98.08	97.82	97.67	97.33	96.98	96.92	96.83	96.60	-
L49	97.84	97.76	97.63	97.23	97.00	96.89	96.87	96.77	-
L50	97.89	97.66	97.50	97.45	96.97	96.88	96.82	96.62	-
Ave.	97.98	97.70	97.55	97.34	97.05	96.90	96.82	96.70	-
Med.	97.98	97.70	97.55	97.34	97.05	96.90	96.81	96.68	-
st dev	0.0769	0.0717	0.0720	0.0694	0.0736	0.0680	0.0727	0.0802	-
Min.	97.84	97.58	97.43	97.23	96.93	96.79	96.71	96.57	-
Max.	98.09	97.82	97.67	97.46	97.17	97.02	96.95	96.84	-

**3.5 Data Set 2, 85°C, 100mA (Forward Voltage)**

Sample No.	Forward Voltage (V)									
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L26	9.034	9.075	8.962	8.982	9.078	9.008	8.998	8.954	9.076	9.060
L27	8.971	8.961	8.952	9.080	9.082	9.022	8.962	8.956	9.013	9.055
L28	8.998	9.074	8.990	9.067	9.016	9.083	8.993	9.015	9.072	9.003
L29	8.968	8.960	9.002	8.999	8.990	9.077	8.955	9.033	9.066	9.067
L30	8.968	9.020	9.052	8.992	9.061	9.004	8.967	9.055	8.993	9.004
L31	9.038	8.955	8.972	8.992	8.981	8.993	8.982	9.036	8.997	9.015
L32	9.049	9.011	9.004	8.990	8.987	9.023	9.079	8.980	8.979	8.990
L33	8.999	9.042	8.961	9.053	8.985	8.976	8.960	9.018	8.964	9.055
L34	9.053	9.069	9.004	9.052	9.041	8.949	9.035	8.973	9.060	8.990
L35	8.967	8.955	9.037	8.944	9.004	8.984	9.047	9.084	9.021	8.969
L36	8.966	9.091	9.047	8.949	9.014	8.970	9.043	9.067	9.070	9.004
L37	9.020	8.963	9.008	9.075	8.980	8.964	9.040	8.955	9.040	9.043
L38	9.081	9.065	9.032	8.946	8.969	8.955	9.006	8.984	8.966	9.030
L39	9.022	8.996	9.048	8.998	9.073	9.053	9.048	9.054	8.955	8.979
L40	8.985	8.992	9.005	8.991	8.989	9.051	9.091	9.064	8.968	8.977
L41	9.012	9.020	8.969	9.021	8.967	9.027	9.023	9.058	8.963	9.034
L42	9.041	8.977	8.948	9.038	9.079	9.061	9.007	8.955	8.977	9.033
L43	8.980	9.004	9.019	9.036	9.005	9.025	8.950	9.060	9.042	9.075
L44	8.951	8.987	9.021	9.058	8.970	9.044	8.955	8.952	9.012	8.971
L45	9.051	9.057	8.970	9.070	9.003	9.036	9.040	9.068	9.009	8.995
L46	8.977	8.994	8.954	9.020	9.068	9.030	8.969	9.057	9.012	9.062
L47	9.099	8.964	8.996	9.081	9.016	8.987	8.974	9.037	8.955	9.064
L48	9.094	9.001	9.009	8.993	8.976	8.954	9.079	9.018	9.066	8.957
L49	8.952	8.957	9.050	8.955	9.091	9.039	8.999	9.063	9.007	9.032
L50	9.026	9.065	9.070	9.004	9.070	9.014	9.093	9.010	8.978	8.990
Ave.	9.012	9.010	9.003	9.015	9.020	9.013	9.012	9.020	9.010	9.018
Med.	9.012	9.001	9.004	9.004	9.005	9.022	9.006	9.033	9.009	9.015
st dev	0.0439	0.0449	0.0357	0.0437	0.0425	0.0387	0.0457	0.0441	0.0410	0.0358
Min.	8.951	8.955	8.948	8.944	8.967	8.949	8.950	8.952	8.955	8.957
Max.	9.099	9.091	9.070	9.081	9.091	9.083	9.093	9.084	9.076	9.075



Sample No.	Forward Voltage (V)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L26	9.072	9.001	8.996	9.044	9.043	9.087	9.060	8.976	-
L27	8.985	8.990	8.984	9.007	8.966	9.011	8.957	9.027	-
L28	9.049	8.960	8.948	8.981	9.030	9.037	9.055	9.053	-
L29	9.075	9.020	8.980	9.023	8.983	9.080	9.033	9.093	-
L30	9.027	9.014	9.053	8.954	9.029	9.028	9.005	9.017	-
L31	9.036	8.979	9.062	9.056	9.039	8.975	9.082	9.006	-
L32	8.981	9.059	8.946	9.007	8.997	8.971	8.967	9.038	-
L33	9.079	8.995	9.033	9.063	9.037	9.035	8.983	9.002	-
L34	9.083	9.066	9.035	9.079	8.963	8.977	8.997	8.975	-
L35	9.091	8.993	8.950	8.994	9.076	9.081	9.084	9.036	-
L36	8.977	9.016	9.039	8.981	8.967	8.971	9.042	8.996	-
L37	8.971	9.076	9.006	8.966	8.961	8.966	8.989	8.967	-
L38	8.961	8.996	8.958	8.995	9.033	9.077	9.031	8.979	-
L39	9.077	9.085	8.981	8.977	9.049	9.020	9.010	8.977	-
L40	9.056	9.097	9.048	9.081	9.053	8.983	9.036	9.100	-
L41	9.031	9.025	9.030	9.056	8.961	9.050	9.015	9.078	-
L42	9.056	9.092	9.037	9.035	9.037	9.042	9.091	9.053	-
L43	9.064	9.025	9.024	9.039	8.996	8.993	8.966	9.003	-
L44	8.972	8.967	8.983	9.055	9.070	9.011	8.981	9.072	-
L45	9.037	8.969	8.964	9.065	8.965	9.022	9.080	8.972	-
L46	8.963	9.050	8.996	9.035	8.976	9.037	8.985	9.090	-
L47	8.967	8.958	9.016	8.972	9.026	8.991	9.045	8.992	-
L48	9.040	8.979	9.059	9.053	8.957	9.079	8.968	8.994	-
L49	8.964	9.094	9.010	8.955	9.064	9.018	8.957	8.989	-
L50	8.976	8.965	9.026	9.065	8.997	8.965	8.986	8.998	-
Ave.	9.024	9.019	9.007	9.022	9.011	9.020	9.016	9.019	-
Med.	9.036	9.014	9.010	9.035	9.026	9.020	9.010	9.003	-
st dev	0.0463	0.0461	0.0363	0.0407	0.0394	0.0401	0.0429	0.0420	-
Min.	8.961	8.958	8.946	8.954	8.957	8.965	8.957	8.967	-
Max.	9.091	9.097	9.062	9.081	9.076	9.087	9.091	9.100	-

### 3.6 Data Set 2, 85°C, 100mA (Chromaticity Shift)

Sample No.	u'	v'	CCT(K)	Chromaticity Shift $\Delta u'v'$								
				0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h
L26	0.2638	0.5275	2672	0.0008	0.0009	0.0010	0.0011	0.0014	0.0015	0.0018	0.0019	0.0022
L27	0.2610	0.5253	2740	0.0007	0.0008	0.0012	0.0013	0.0015	0.0017	0.0020	0.0021	0.0024
L28	0.2630	0.5263	2695	0.0006	0.0007	0.0011	0.0012	0.0013	0.0016	0.0019	0.0020	0.0025
L29	0.2629	0.5271	2693	0.0007	0.0008	0.0010	0.0011	0.0012	0.0014	0.0018	0.0022	0.0023
L30	0.2614	0.5289	2716	0.0006	0.0007	0.0008	0.0010	0.0011	0.0017	0.0020	0.0021	0.0024
L31	0.2631	0.5262	2693	0.0008	0.0009	0.0010	0.0011	0.0013	0.0016	0.0019	0.0020	0.0025
L32	0.2631	0.5274	2687	0.0007	0.0008	0.0009	0.0013	0.0014	0.0015	0.0018	0.0022	0.0023
L33	0.2623	0.5270	2705	0.0005	0.0006	0.0008	0.0012	0.0015	0.0016	0.0017	0.0019	0.0024
L34	0.2618	0.5259	2721	0.0006	0.0007	0.0010	0.0011	0.0013	0.0017	0.0018	0.0020	0.0025
L35	0.2628	0.5278	2691	0.0007	0.0008	0.0009	0.0010	0.0012	0.0016	0.0020	0.0021	0.0024
L36	0.2628	0.5252	2702	0.0008	0.0009	0.0011	0.0012	0.0013	0.0015	0.0019	0.0020	0.0023
L37	0.2620	0.5266	2714	0.0006	0.0007	0.0012	0.0013	0.0014	0.0017	0.0020	0.0022	0.0024
L38	0.2617	0.5276	2716	0.0008	0.0009	0.0010	0.0011	0.0012	0.0016	0.0019	0.0021	0.0025
L39	0.2632	0.5278	2684	0.0007	0.0008	0.0012	0.0013	0.0014	0.0015	0.0018	0.0020	0.0023
L40	0.2623	0.5276	2704	0.0008	0.0009	0.0010	0.0011	0.0015	0.0016	0.0017	0.0021	0.0022
L41	0.2609	0.5276	2733	0.0002	0.0005	0.0009	0.0010	0.0013	0.0017	0.0018	0.0020	0.0024
L42	0.2619	0.5295	2704	0.0007	0.0008	0.0012	0.0013	0.0014	0.0015	0.0019	0.0021	0.0023
L43	0.2602	0.5286	2743	0.0006	0.0007	0.0013	0.0014	0.0015	0.0017	0.0020	0.0022	0.0025
L44	0.2628	0.5282	2691	0.0004	0.0006	0.0012	0.0013	0.0014	0.0016	0.0018	0.0019	0.0025
L45	0.2601	0.5268	2752	0.0008	0.0009	0.0010	0.0011	0.0012	0.0015	0.0017	0.0018	0.0023
L46	0.2603	0.5267	2749	0.0007	0.0008	0.0009	0.0010	0.0014	0.0017	0.0018	0.0019	0.0024
L47	0.2620	0.5281	2708	0.0008	0.0009	0.0010	0.0012	0.0013	0.0016	0.0019	0.0020	0.0022
L48	0.2622	0.5266	2709	0.0007	0.0008	0.0011	0.0013	0.0014	0.0015	0.0018	0.0022	0.0024
L49	0.2624	0.5263	2706	0.0006	0.0007	0.0012	0.0013	0.0015	0.0017	0.0020	0.0021	0.0025
L50	0.2628	0.5282	2691	0.0005	0.0006	0.0013	0.0014	0.0015	0.0016	0.0018	0.0022	0.0023
Ave.	0.2621	0.5272	2709	0.0007	0.0008	0.0011	0.0012	0.0014	0.0016	0.0019	0.0021	0.0024
Med.	0.2623	0.5274	2705	0.0007	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0021	0.0024
st dev	0.0010	0.0011	21.11	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2601	0.5252	2672	0.0002	0.0005	0.0008	0.0010	0.0011	0.0014	0.0017	0.0018	0.0022
Max.	0.2638	0.5295	2752	0.0008	0.0009	0.0013	0.0014	0.0015	0.0017	0.0020	0.0022	0.0025

Sample No.	Chromaticity Shift $\Delta u'v'$								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L26	0.0025	0.0028	0.0030	0.0035	0.0036	0.0037	0.0038	0.0039	-
L27	0.0027	0.0031	0.0032	0.0033	0.0037	0.0038	0.0040	0.0041	-
L28	0.0028	0.0029	0.0031	0.0035	0.0036	0.0037	0.0039	0.0040	-
L29	0.0026	0.0031	0.0033	0.0034	0.0035	0.0036	0.0037	0.0038	-
L30	0.0025	0.0029	0.0030	0.0033	0.0036	0.0038	0.0040	0.0041	-
L31	0.0026	0.0031	0.0032	0.0035	0.0037	0.0038	0.0039	0.0040	-
L32	0.0028	0.0030	0.0031	0.0034	0.0036	0.0037	0.0038	0.0039	-
L33	0.0027	0.0031	0.0032	0.0033	0.0035	0.0036	0.0040	0.0041	-
L34	0.0026	0.0029	0.0030	0.0035	0.0036	0.0037	0.0038	0.0039	-
L35	0.0027	0.0030	0.0031	0.0034	0.0037	0.0038	0.0040	0.0041	-
L36	0.0028	0.0031	0.0032	0.0033	0.0034	0.0035	0.0038	0.0039	-
L37	0.0026	0.0029	0.0030	0.0032	0.0037	0.0038	0.0039	0.0040	-
L38	0.0028	0.0030	0.0031	0.0033	0.0034	0.0035	0.0037	0.0038	-
L39	0.0027	0.0031	0.0033	0.0034	0.0035	0.0036	0.0038	0.0039	-
L40	0.0026	0.0029	0.0032	0.0035	0.0036	0.0037	0.0039	0.0040	-
L41	0.0025	0.0030	0.0031	0.0032	0.0033	0.0035	0.0037	0.0038	-
L42	0.0027	0.0031	0.0032	0.0033	0.0034	0.0036	0.0038	0.0041	-
L43	0.0028	0.0029	0.0030	0.0034	0.0035	0.0037	0.0039	0.0040	-
L44	0.0027	0.0030	0.0031	0.0032	0.0037	0.0038	0.0040	0.0041	-
L45	0.0026	0.0029	0.0030	0.0031	0.0035	0.0036	0.0037	0.0038	-
L46	0.0025	0.0028	0.0032	0.0033	0.0034	0.0035	0.0038	0.0039	-
L47	0.0027	0.0030	0.0032	0.0033	0.0035	0.0036	0.0037	0.0038	-
L48	0.0025	0.0029	0.0030	0.0034	0.0036	0.0037	0.0038	0.0039	-
L49	0.0026	0.0031	0.0032	0.0035	0.0037	0.0038	0.0039	0.0040	-
L50	0.0028	0.0030	0.0031	0.0035	0.0036	0.0037	0.0040	0.0041	-
Ave.	0.0027	0.0030	0.0031	0.0034	0.0036	0.0037	0.0039	0.0040	-
Med.	0.0027	0.0030	0.0031	0.0034	0.0036	0.0037	0.0038	0.0040	-
st dev	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	-
Min.	0.0025	0.0028	0.0030	0.0031	0.0033	0.0035	0.0037	0.0038	-
Max.	0.0028	0.0031	0.0033	0.0035	0.0037	0.0038	0.0040	0.0041	-

### 3.7 Data Set 3, 105°C, 100mA (Lumen Maintenance)

Sample No.	Φ(lm)	Lumen Maintenance (%)								
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L51	133.9	99.82	99.78	99.70	99.44	99.31	98.86	98.72	98.31	98.13
L52	135.2	99.85	99.73	99.62	99.53	99.34	99.07	98.64	98.38	98.27
L53	134.1	99.93	99.81	99.66	99.56	99.13	99.02	98.71	98.29	98.23
L54	135.2	99.91	99.88	99.58	99.48	99.18	99.04	98.62	98.53	98.33
L55	135.2	100.04	99.97	99.64	99.44	99.19	98.92	98.61	98.47	98.18
L56	135.3	99.94	99.86	99.75	99.37	99.14	98.89	98.73	98.50	98.12
L57	136.7	99.88	99.82	99.72	99.52	99.30	98.96	98.76	98.36	98.29
L58	135.8	99.90	99.80	99.69	99.41	99.24	98.90	98.79	98.45	98.19
L59	134.6	100.02	99.95	99.74	99.34	99.26	98.87	98.77	98.31	98.17
L60	135.2	99.98	99.91	99.59	99.38	99.22	99.01	98.78	98.33	98.25
L61	136.0	99.97	99.93	99.67	99.49	99.12	98.93	98.58	98.41	98.26
L62	135.5	99.89	99.84	99.56	99.51	99.16	99.00	98.80	98.37	98.20
L63	135.2	99.81	99.74	99.65	99.50	99.24	99.03	98.75	98.42	98.12
L64	136.3	99.97	99.87	99.71	99.58	99.15	98.94	98.70	98.32	98.24
L65	135.7	99.87	99.79	99.57	99.45	99.20	99.09	98.56	98.39	98.30
L66	134.2	99.83	99.76	99.63	99.54	99.33	99.05	98.60	98.52	98.35
L67	135.7	99.92	99.90	99.55	99.40	99.35	99.06	98.62	98.46	98.15
L68	134.6	99.96	99.80	99.69	99.36	99.25	98.88	98.65	98.43	98.22
L69	134.8	99.84	99.77	99.68	99.46	99.28	98.85	98.69	98.34	98.14
L70	135.5	100.03	99.96	99.54	99.47	99.17	98.98	98.66	98.40	98.32
L71	134.4	100.00	99.92	99.60	99.55	99.27	98.91	98.68	98.48	98.30
L72	134.7	99.99	99.85	99.77	99.39	99.23	98.95	98.63	98.35	98.21
L73	135.0	99.81	99.75	99.61	99.42	99.21	99.08	98.67	98.44	98.34
L74	134.5	99.95	99.83	99.76	99.43	99.32	98.97	98.57	98.49	98.16
L75	134.7	100.01	99.91	99.73	99.35	99.29	98.99	98.74	98.51	98.28
Ave.	135.1	99.92	99.85	99.66	99.45	99.24	98.97	98.68	98.41	98.23
Med.	135.2	99.93	99.84	99.66	99.45	99.24	98.97	98.68	98.41	98.23
st dev	0.6904	0.0725	0.0724	0.0696	0.0700	0.0692	0.0736	0.0723	0.0730	0.0725
Min.	133.9	99.81	99.73	99.54	99.34	99.12	98.85	98.56	98.29	98.12
Max.	136.7	100.04	99.97	99.77	99.58	99.35	99.09	98.80	98.53	98.35

Sample No.	Lumen Maintenance (%)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L51	97.90	97.68	97.37	97.17	97.02	96.91	96.61	96.41	-
L52	98.02	97.59	97.33	97.08	96.90	96.67	96.55	96.43	-
L53	97.78	97.69	97.49	97.13	97.01	96.83	96.56	96.39	-
L54	97.79	97.53	97.41	97.14	96.84	96.76	96.68	96.42	-
L55	98.01	97.64	97.47	97.25	97.05	96.85	96.49	96.32	-
L56	97.99	97.61	97.30	97.09	97.00	96.69	96.58	96.45	-
L57	97.82	97.60	97.32	97.29	96.99	96.90	96.68	96.33	-
L58	97.83	97.45	97.40	97.11	96.83	96.71	96.62	96.40	-
L59	98.00	97.67	97.38	97.24	96.86	96.70	96.52	96.38	-
L60	97.96	97.58	97.44	97.30	96.94	96.72	96.60	96.47	-
L61	97.81	97.71	97.29	97.22	96.93	96.89	96.50	96.31	-
L62	97.88	97.57	97.28	97.10	97.03	96.92	96.69	96.37	-
L63	97.80	97.65	97.34	97.15	96.82	96.77	96.67	96.50	-
L64	97.87	97.52	97.36	97.27	96.95	96.68	96.54	96.48	-
L65	97.95	97.54	97.35	97.26	96.91	96.79	96.70	96.51	-
L66	97.84	97.51	97.45	97.31	96.96	96.74	96.64	96.49	-
L67	97.97	97.56	97.46	97.32	96.85	96.75	96.71	96.34	-
L68	97.86	97.63	97.40	97.16	96.97	96.88	96.59	96.36	-
L69	97.85	97.55	97.26	97.12	96.92	96.87	96.66	96.28	-
L70	97.94	97.62	97.43	97.21	96.98	96.84	96.51	96.35	-
L71	97.93	97.70	97.48	97.25	97.04	96.86	96.65	96.29	-
L72	97.92	97.46	97.27	97.19	96.88	96.81	96.53	96.44	-
L73	97.91	97.66	97.42	97.18	97.06	96.80	96.48	96.30	-
L74	97.98	97.49	97.39	97.28	96.89	96.82	96.57	96.52	-
L75	97.89	97.47	97.31	97.23	96.87	96.78	96.63	96.46	-
Ave.	97.90	97.59	97.38	97.20	96.94	96.80	96.60	96.40	-
Med.	97.90	97.59	97.38	97.21	96.94	96.80	96.60	96.40	-
st dev	0.0736	0.0780	0.0694	0.0743	0.0736	0.0769	0.0713	0.0736	-
Min.	97.78	97.45	97.26	97.08	96.82	96.67	96.48	96.28	-
Max.	98.02	97.71	97.49	97.32	97.06	96.92	96.71	96.52	-

**3.8 Data Set 3, 105°C, 100mA (Forward Voltage)**

Sample No.	Forward Voltage (V)									
	0hr(Initial)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L51	9.014	9.036	8.965	8.960	9.016	9.085	8.944	8.997	8.964	9.041
L52	9.013	9.058	9.107	9.118	9.061	8.984	9.017	9.099	9.126	9.100
L53	9.032	9.108	8.958	8.950	9.003	8.966	8.996	9.091	9.020	9.106
L54	8.996	8.998	9.117	8.988	8.974	9.076	9.063	8.947	9.036	8.982
L55	8.951	9.103	8.997	9.084	9.127	9.061	8.997	9.126	8.955	8.980
L56	9.051	9.058	9.047	9.042	9.101	9.067	8.976	9.008	9.006	8.969
L57	8.950	8.968	9.028	9.048	9.027	8.999	9.051	9.038	9.080	9.103
L58	8.972	8.956	8.992	9.100	9.130	9.090	9.045	9.064	9.095	8.979
L59	9.066	9.129	8.960	8.962	8.968	9.083	9.095	9.041	8.953	9.098
L60	9.013	8.965	8.959	8.977	8.947	9.130	9.065	9.109	8.967	8.979
L61	9.051	9.129	8.993	9.011	9.114	9.052	9.028	8.950	8.998	8.955
L62	9.143	9.018	8.948	9.025	9.010	9.002	9.062	9.108	9.117	9.008
L63	8.977	8.975	9.069	9.029	9.135	9.022	9.036	9.105	9.062	9.011
L64	9.020	8.999	9.127	9.044	9.054	9.051	9.117	9.071	9.022	9.011
L65	9.013	9.104	8.987	9.045	9.094	9.059	9.055	9.008	9.030	9.123
L66	9.008	9.129	9.115	8.950	8.969	9.030	8.959	8.978	8.986	8.986
L67	9.091	9.008	9.099	9.027	9.093	8.963	9.132	9.054	9.099	9.047
L68	9.074	9.141	8.965	9.129	8.961	9.036	8.977	9.007	9.007	9.120
L69	9.068	9.071	9.009	8.963	8.981	8.979	9.065	9.033	8.986	8.999
L70	9.089	9.057	8.973	9.094	8.978	8.991	8.973	8.955	8.975	9.018
L71	9.072	9.102	9.021	8.950	9.111	9.088	8.996	8.961	9.130	9.131
L72	9.038	8.984	9.086	9.129	9.116	9.075	9.021	9.036	9.108	9.121
L73	9.119	8.983	9.132	9.107	8.987	8.999	8.981	9.019	9.133	9.124
L74	9.004	8.956	9.040	9.113	8.985	9.076	9.028	8.956	9.027	9.046
L75	9.013	9.074	9.029	9.129	9.143	8.974	8.992	8.985	8.988	9.123
Ave.	9.034	9.044	9.029	9.039	9.043	9.038	9.027	9.030	9.035	9.046
Med.	9.020	9.057	9.021	9.042	9.027	9.051	9.028	9.033	9.022	9.041
st dev	0.0490	0.0624	0.0613	0.0642	0.0668	0.0468	0.0486	0.0562	0.0600	0.0615
Min.	8.950	8.956	8.948	8.950	8.947	8.963	8.944	8.947	8.953	8.955
Max.	9.143	9.141	9.132	9.129	9.143	9.130	9.132	9.126	9.133	9.131

Sample No.	Forward Voltage (V)								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L51	9.031	9.132	8.976	9.110	9.010	9.001	9.067	9.018	-
L52	9.040	9.093	9.027	9.016	9.033	8.971	9.009	9.085	-
L53	8.968	9.069	9.056	8.958	9.052	9.054	9.014	8.985	-
L54	8.995	9.108	9.135	9.014	8.986	8.996	9.127	9.073	-
L55	9.066	8.959	8.945	9.037	9.006	8.989	8.958	9.038	-
L56	8.967	8.969	8.994	8.954	8.972	9.053	8.986	9.026	-
L57	9.102	9.129	9.044	9.103	8.961	9.005	9.036	9.011	-
L58	9.010	8.963	8.998	8.997	9.128	9.072	9.088	9.148	-
L59	9.103	9.014	9.071	8.976	9.089	9.007	9.075	9.049	-
L60	8.979	9.077	9.013	8.966	8.956	9.048	9.030	9.151	-
L61	9.061	9.038	8.957	8.997	9.046	8.975	8.952	9.065	-
L62	8.977	9.079	8.988	9.003	9.003	9.008	9.009	9.055	-
L63	9.139	8.959	8.992	8.964	9.130	9.098	9.047	9.007	-
L64	8.972	8.953	9.091	9.008	8.969	9.114	9.128	9.064	-
L65	9.015	9.027	9.096	9.147	9.027	8.989	8.991	9.022	-
L66	8.990	8.946	9.133	9.057	9.137	9.033	9.005	8.956	-
L67	9.114	9.004	8.985	9.125	9.116	9.067	9.094	8.955	-
L68	9.053	9.055	9.016	9.038	9.138	9.100	9.011	9.006	-
L69	9.069	9.033	9.014	9.069	9.104	9.023	9.067	8.957	-
L70	8.985	9.071	9.072	8.965	8.963	8.975	9.061	9.078	-
L71	9.016	9.079	9.040	9.095	9.044	8.997	8.998	9.117	-
L72	8.993	9.047	9.022	8.960	8.997	9.111	8.978	8.977	-
L73	9.120	9.110	9.055	9.128	9.076	9.062	9.089	8.966	-
L74	9.123	9.014	8.958	9.029	8.983	9.035	9.101	9.048	-
L75	8.965	9.001	9.030	9.157	9.106	9.029	9.034	8.971	-
Ave.	9.034	9.037	9.028	9.035	9.041	9.032	9.038	9.033	-
Med.	9.016	9.038	9.022	9.016	9.033	9.029	9.034	9.026	-
st dev	0.0570	0.0577	0.0515	0.0650	0.0624	0.0439	0.0500	0.0568	-
Min.	8.965	8.946	8.945	8.954	8.956	8.971	8.952	8.955	-
Max.	9.139	9.132	9.135	9.157	9.138	9.114	9.128	9.151	-

### 3.9 Data Set 3, 105°C, 100mA (Chromaticity Shift)

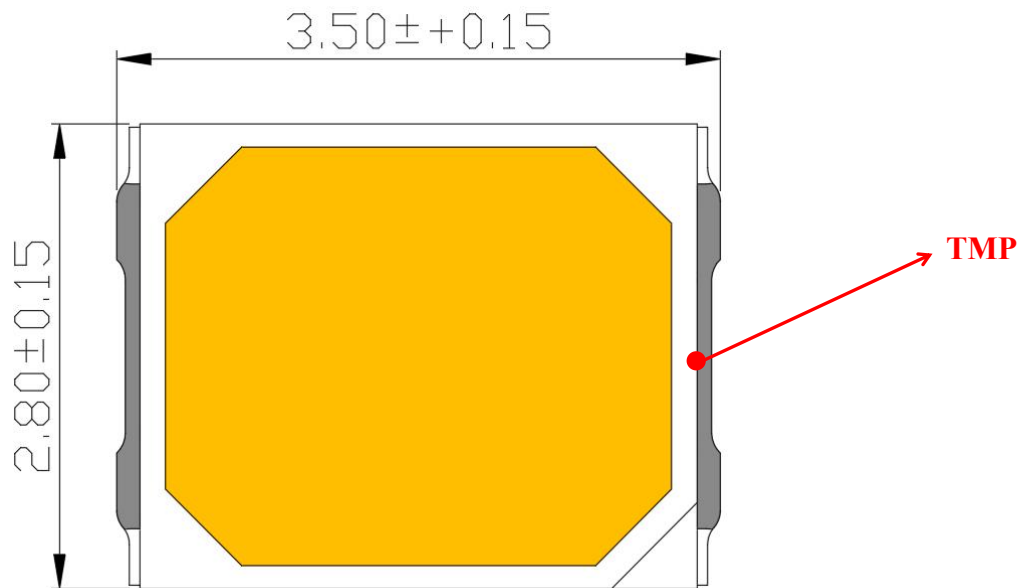
Sample No.	u'	v'	CCT(K)	Chromaticity Shift Δu'v'								
	0hr(Initial)			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
L51	0.2637	0.5270	2676	0.0008	0.0010	0.0013	0.0015	0.0017	0.0020	0.0022	0.0023	0.0025
L52	0.2607	0.5275	2737	0.0010	0.0012	0.0015	0.0017	0.0020	0.0021	0.0023	0.0024	0.0026
L53	0.2631	0.5286	2683	0.0006	0.0013	0.0016	0.0018	0.0019	0.0020	0.0021	0.0022	0.0024
L54	0.2611	0.5292	2721	0.0007	0.0010	0.0014	0.0016	0.0018	0.0019	0.0020	0.0024	0.0025
L55	0.2620	0.5278	2708	0.0010	0.0013	0.0016	0.0018	0.0020	0.0021	0.0023	0.0024	0.0026
L56	0.2611	0.5281	2726	0.0009	0.0012	0.0015	0.0017	0.0018	0.0019	0.0022	0.0023	0.0026
L57	0.2616	0.5268	2722	0.0010	0.0011	0.0014	0.0016	0.0017	0.0018	0.0020	0.0022	0.0023
L58	0.2609	0.5262	2739	0.0009	0.0013	0.0016	0.0018	0.0019	0.0020	0.0021	0.0023	0.0024
L59	0.2629	0.5284	2688	0.0008	0.0012	0.0015	0.0017	0.0018	0.0021	0.0022	0.0024	0.0026
L60	0.2617	0.5271	2718	0.0010	0.0011	0.0014	0.0016	0.0017	0.0020	0.0023	0.0024	0.0025
L61	0.2624	0.5267	2704	0.0007	0.0013	0.0014	0.0015	0.0020	0.0021	0.0022	0.0023	0.0024
L62	0.2655	0.5287	2635	0.0010	0.0012	0.0013	0.0018	0.0019	0.0020	0.0023	0.0024	0.0025
L63	0.2591	0.5256	2779	0.0008	0.0010	0.0016	0.0017	0.0018	0.0019	0.0022	0.0023	0.0026
L64	0.2625	0.5275	2700	0.0010	0.0011	0.0015	0.0016	0.0017	0.0018	0.0020	0.0022	0.0025
L65	0.2642	0.5287	2661	0.0010	0.0013	0.0014	0.0017	0.0019	0.0021	0.0022	0.0023	0.0024
L66	0.2619	0.5266	2715	0.0008	0.0012	0.0013	0.0018	0.0019	0.0020	0.0023	0.0024	0.0026
L67	0.2625	0.5282	2697	0.0006	0.0010	0.0015	0.0018	0.0020	0.0021	0.0022	0.0023	0.0025
L68	0.2615	0.5266	2724	0.0010	0.0011	0.0016	0.0017	0.0018	0.0019	0.0020	0.0021	0.0023
L69	0.2606	0.5275	2739	0.0010	0.0013	0.0014	0.0016	0.0020	0.0021	0.0023	0.0024	0.0025
L70	0.2625	0.5297	2691	0.0009	0.0012	0.0016	0.0018	0.0019	0.0020	0.0022	0.0023	0.0024
L71	0.2628	0.5269	2696	0.0008	0.0010	0.0015	0.0017	0.0018	0.0020	0.0021	0.0022	0.0023
L72	0.2646	0.5279	2654	0.0007	0.0009	0.0014	0.0016	0.0019	0.0020	0.0022	0.0024	0.0025
L73	0.2616	0.5273	2719	0.0010	0.0011	0.0016	0.0017	0.0018	0.0021	0.0022	0.0023	0.0026
L74	0.2616	0.5279	2717	0.0008	0.0012	0.0014	0.0018	0.0019	0.0020	0.0021	0.0024	0.0025
L75	0.2620	0.5281	2707	0.0009	0.0013	0.0015	0.0016	0.0017	0.0018	0.0020	0.0022	0.0024
Ave.	0.2622	0.5276	2706	0.0009	0.0012	0.0015	0.0017	0.0019	0.0020	0.0022	0.0023	0.0025
Med.	0.2620	0.5275	2708	0.0009	0.0012	0.0015	0.0017	0.0019	0.0020	0.0022	0.0023	0.0025
st dev	0.0014	0.0010	30.39	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.	0.2591	0.5256	2635	0.0006	0.0009	0.0013	0.0015	0.0017	0.0018	0.0020	0.0021	0.0023
Max.	0.2655	0.5297	2779	0.0010	0.0013	0.0016	0.0018	0.0020	0.0021	0.0023	0.0024	0.0026



Sample No.	Chromaticity Shift $\Delta u'v'$								
	10000h	11000h	12000h	13000h	14000h	15000h	16000h	17000h	-
L51	0.0028	0.0030	0.0033	0.0034	0.0037	0.0038	0.0039	0.0044	-
L52	0.0030	0.0033	0.0034	0.0036	0.0038	0.0039	0.0042	0.0043	-
L53	0.0029	0.0032	0.0033	0.0035	0.0036	0.0037	0.0041	0.0044	-
L54	0.0030	0.0031	0.0032	0.0034	0.0036	0.0038	0.0040	0.0042	-
L55	0.0029	0.0030	0.0031	0.0033	0.0038	0.0039	0.0042	0.0043	-
L56	0.0029	0.0032	0.0033	0.0035	0.0037	0.0038	0.0041	0.0044	-
L57	0.0032	0.0033	0.0034	0.0036	0.0038	0.0039	0.0040	0.0042	-
L58	0.0028	0.0032	0.0034	0.0036	0.0037	0.0038	0.0039	0.0044	-
L59	0.0030	0.0031	0.0032	0.0034	0.0035	0.0036	0.0040	0.0042	-
L60	0.0031	0.0033	0.0034	0.0035	0.0036	0.0037	0.0042	0.0043	-
L61	0.0029	0.0032	0.0034	0.0036	0.0037	0.0038	0.0041	0.0044	-
L62	0.0027	0.0030	0.0032	0.0033	0.0038	0.0039	0.0040	0.0043	-
L63	0.0028	0.0029	0.0030	0.0034	0.0036	0.0037	0.0039	0.0041	-
L64	0.0029	0.0033	0.0034	0.0035	0.0036	0.0038	0.0040	0.0042	-
L65	0.0027	0.0032	0.0033	0.0034	0.0038	0.0039	0.0042	0.0043	-
L66	0.0028	0.0033	0.0034	0.0036	0.0037	0.0038	0.0041	0.0044	-
L67	0.0029	0.0031	0.0032	0.0033	0.0038	0.0039	0.0040	0.0042	-
L68	0.0027	0.0030	0.0031	0.0032	0.0034	0.0035	0.0039	0.0040	-
L69	0.0026	0.0032	0.0033	0.0034	0.0035	0.0036	0.0042	0.0043	-
L70	0.0028	0.0033	0.0034	0.0035	0.0036	0.0037	0.0041	0.0042	-
L71	0.0026	0.0030	0.0032	0.0033	0.0038	0.0039	0.0040	0.0041	-
L72	0.0027	0.0032	0.0033	0.0036	0.0037	0.0038	0.0039	0.0040	-
L73	0.0029	0.0030	0.0034	0.0035	0.0036	0.0037	0.0042	0.0043	-
L74	0.0027	0.0033	0.0034	0.0036	0.0037	0.0038	0.0040	0.0044	-
L75	0.0030	0.0032	0.0033	0.0034	0.0035	0.0036	0.0041	0.0043	-
Ave.	0.0029	0.0032	0.0033	0.0035	0.0037	0.0038	0.0041	0.0043	-
Med.	0.0029	0.0032	0.0033	0.0035	0.0037	0.0038	0.0040	0.0043	-
st dev	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	-
Min.	0.0026	0.0029	0.0030	0.0032	0.0034	0.0035	0.0039	0.0040	-
Max.	0.0032	0.0033	0.0034	0.0036	0.0038	0.0039	0.0042	0.0044	-

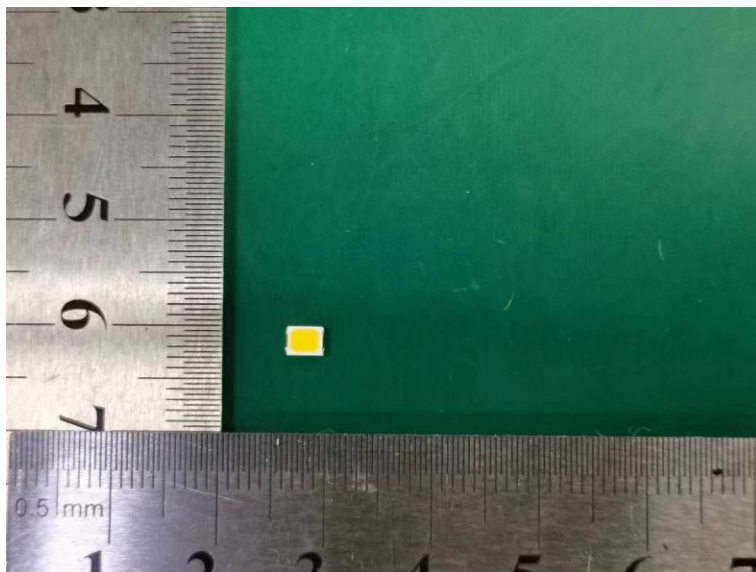
## 4-EUT Photos

### 4.1 Mechanical Dimensions



Note: All dimensions are in millimeters(mm).

### 4.2 EUT Photo



----End of report----