

# IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

## MEASUREMENT AND TEST REPORT

For

### AUTLED GmbH

zH Robert Sever, Resselstrasse 3, 2120 Obersdorf, Austria

**Model: AUTLED 2835 CRI 90+**

<b>Report Type:</b> 10000 Hours Test Report	<b>Product Type:</b> LED Package
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<b>Report Number:</b>	R2DG151009054-10
<b>Test Date:</b>	2015-10-20 to 2016-12-9
<b>Report Date:</b>	2017-02-15
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**Note:** The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

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## 1 - General Information

### 1.1 Description of LED Light Sources

Devices tested

Part Number: AUTLED 2835 CRI 90+  
 Part Type: LED Package  
 Nominal CCT: 3000K

### 1.2 Standards Used:

- IESNA LM-80-08: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- ENERGY STAR® Program Guidance Regarding LED Package, LED Array and LED Module Lumen Maintenance Performance Data Supporting Qualification of Lighting Products(This test method was not accredited by IAS)

### 1.3 Test Facility

The testing facility used by Bay Area Compliance Laboratories Corp. (Dongguan). is located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.

### 1.4 Description of Auxiliary Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Integral Sphere	EVERFINE	Diameter 0.3m	1011119	0.3m	2016-03-10	2017-03-09
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	15V/2000mA	2016-03-04	2017-03-03
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2016-03-10	2017-03-09
Standard Light Source	EVERFINE	D062	1011093	3000K	2015-09-17	2016-09-16
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987 CJ732111 4	300VA	2016-03-04	2017-03-03
Multilayer aging machine	BACL	B2-270	20024	25 °C~110 °C	2016-03-04	2017-03-03
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06607	0~5V,0~40A	2015-10-30	2016-10-29
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06606	0~5V,0~40A	2015-10-30	2016-10-29
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06605	0~5V,0~40A	2015-10-30	2016-10-29

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## 1.5 Operating Cycle

Samples are driven with a constant direct current (DC)

## 1.6 Ambient Conditions

For lumen maintenance test, samples were operated in thermal chambers with minimal ambient airflow. For long term reliability test, the case temperature was controlled by mounting several thermocouples on a sample reliability stress board at the designated thermal measurement point, as shown in APPENDIX. The ambient temperature  $T_A$  was measured by several thermocouples at a distance of 5 mm above the reliability test board. The relative humidity within chamber was less than 65%.

For photometry measurement, temperature was set to  $25\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ , RH <65%.

## 1.7 Photometry Measurement Uncertainty

The uncertainty of the light output measurements is  $U=1.59\%$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=21\text{K}$  ( $K=2$ ), at the 95% confidence level. This calibration results traceable to the NATIONAL INSTITUTE OF METROLOGY (NIM).

## 1.8 Sample Set

### Sampling Method:

LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive days.

These manufacturing lots are picked to represent a wide parametric distribution.

Each Sample is soldered to all of the reliability stress boards for a given set of IESNA LM-80 tests.

### Sample Size:

Total 48Pcs;

Each Ts test condition 24Pcs

The samples tested at TS 55 °C and TS 105 °C were received at 2015-10-19 and tested during 2015-10-20 to 2016-12-09. The samples were numbered from 1 to 24, 25 to 48

#### Data Set 1: 55 °C, 25mA

Part Number:	AUTLED 2835 CRI 90+
Number of Units:	24
Actual Case Temperature( $T_S$ ):	$T_S = 54.2$ °C
Actual Ambient Temperature( $T_A$ ):	$T_A = 52.5$ °C
Life Test Drive Current:	$I_F = 25$ mA
Measurement Current:	$I_F = 25$ mA

#### Data Set 3: 105 °C, 25mA

Part Number:	AUTLED 2835 CRI 90+
Number of Units:	24
Actual Case Temperature( $T_S$ ):	$T_S = 104.5$ °C
Actual Ambient Temperature( $T_A$ ):	$T_A = 103.1$ °C
Life Test Drive Current:	$I_F = 25$ mA
Measurement Current:	$I_F = 25$ mA

## 2 - Summary of Test Result

<b>Data Set:</b>	<b>Data Set 1, 55°C, 25mA</b>
Number of Units:	24
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h,7000h,8000h,9000h,10000h
Average. Lumen Maintenance at 6000 hours:	98.93%
Average Chromaticity Shift at 6000 hours ( $\Delta u'v'$ ):	0.0015
Average. Lumen Maintenance at 9000 hours:	98.16%
Average Chromaticity Shift at 9000 hours ( $\Delta u'v'$ ):	0.0021
Average. Lumen Maintenance at 10000 hours:	97.94%
Average Chromaticity Shift at 10000 hours ( $\Delta u'v'$ ):	0.0024
Reported TM-21 L <sub>70</sub> Lifetime:	>60000 hours

<b>Data Set:</b>	<b>Data Set 2, 105°C, 25mA</b>
Number of Units:	24
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h,7000h,8000h,9000h,10000h
Average. Lumen Maintenance at 6000 hours:	97.82%
Average Chromaticity Shift at 6000 hours( $\Delta u'v'$ ):	0.0020
Average. Lumen Maintenance at 9000 hours:	96.46%
Average Chromaticity Shift at 9000 hours ( $\Delta u'v'$ ):	0.0032
Average. Lumen Maintenance at 10000 hours:	96.09%
Average Chromaticity Shift at 10000 hours ( $\Delta u'v'$ ):	0.0034
Reported TM-21 L <sub>70</sub> Lifetime:	>60000 hours

### 3 - Test Data

#### 3.1 Data Set 1, 55 °C, 25mA (Lumen Maintenance)

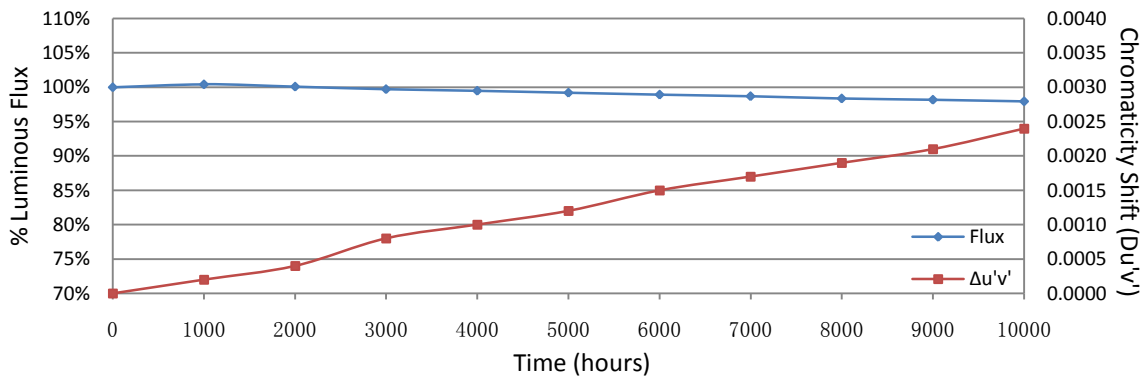
No.	V <sub>F</sub> (V)	Φ(lm)	Lumen Maintenance (%)									
	Ohr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2.821	10.38	100.29	99.90	99.61	99.42	98.94	98.75	98.36	98.07	97.88	97.59
2	2.819	10.25	100.39	99.71	99.41	99.22	99.02	98.83	98.54	98.44	98.34	98.15
3	2.824	10.23	100.59	99.90	99.71	99.51	99.32	98.92	98.83	98.53	98.34	98.04
4	2.832	10.35	100.39	99.90	99.52	99.32	98.84	98.65	98.45	98.26	98.07	97.78
5	2.824	10.24	100.49	100.20	99.71	99.51	99.22	98.93	98.73	98.44	98.24	98.14
6	2.835	10.25	100.29	99.90	99.80	99.61	99.12	98.73	98.44	97.95	97.66	97.56
7	2.819	10.29	100.19	99.51	99.42	99.13	98.93	98.64	98.15	97.76	97.57	97.28
8	2.829	10.20	100.10	99.71	99.31	98.92	98.63	98.43	98.14	97.92	97.82	97.66
9	2.827	10.48	100.38	99.90	99.52	99.33	99.14	98.95	98.76	98.28	98.09	97.81
10	2.819	10.32	100.29	99.81	99.42	99.22	98.93	98.74	98.64	98.35	98.26	97.87
11	2.818	10.37	100.77	100.29	99.90	99.71	99.42	99.13	98.94	98.65	98.46	98.26
12	2.818	10.28	100.88	100.49	100.10	99.71	99.61	99.32	99.03	98.64	98.54	98.15
13	2.838	10.29	100.49	100.19	99.90	99.61	99.22	99.13	98.83	98.54	98.25	97.96
14	2.826	10.47	100.19	100.10	99.71	99.52	99.33	99.04	98.95	98.57	98.38	98.09
15	2.818	10.36	100.58	100.87	100.29	100.10	99.71	99.52	99.23	99.03	98.84	98.65
16	2.817	10.49	100.67	100.29	99.81	99.62	99.43	99.24	99.05	98.67	98.57	98.47
17	2.824	10.29	100.49	100.39	99.90	99.51	99.32	99.03	98.74	98.35	98.06	97.76
18	2.820	10.17	100.29	100.10	99.80	99.71	99.51	99.21	98.92	98.72	98.62	98.53
19	2.817	10.31	100.19	99.90	99.61	99.42	99.22	98.93	98.55	98.25	97.96	97.87
20	2.824	10.31	100.68	100.39	99.90	99.81	99.32	99.03	98.55	98.16	97.87	97.58
21	2.813	10.46	100.19	99.71	99.33	99.24	99.04	98.85	98.57	98.18	97.99	97.80
22	2.813	10.42	100.19	99.81	99.62	99.42	99.14	98.66	98.37	98.08	97.89	97.60
23	2.822	10.22	100.78	100.39	100.10	99.80	99.32	98.92	98.53	98.34	98.04	97.95
24	2.827	10.17	100.39	100.10	99.80	99.41	99.12	98.82	98.53	98.24	98.08	97.92
Ave.	2.823	10.32	100.42	100.06	99.72	99.49	99.20	98.93	98.66	98.35	98.16	97.94
Med.	2.822	10.30	100.39	100.00	99.71	99.51	99.22	98.93	98.60	98.34	98.09	97.89
st dev	0.006	0.10	0.2176	0.3127	0.2536	0.2549	0.2505	0.2474	0.2793	0.2909	0.3147	0.3319
Min.	2.813	10.17	100.10	99.51	99.31	98.92	98.63	98.43	98.14	97.76	97.57	97.28
Max.	2.838	10.49	100.88	100.87	100.29	100.10	99.71	99.52	99.23	99.03	98.84	98.65

TM-21 Projection:

**Test Duration:** 10000  
 hours **Failures Observed:** 0  
 $\alpha$ : 2.595E-06  
 $\beta$ : 1.005  
**Calculated L<sub>70</sub>:** 140000 hours  
**Reported L<sub>70</sub>:** >60000 hours

### 3.2 Data Set 1, 55 °C, 25mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ( $\Delta u'v'$ )									
				0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	0.2471	0.5198	3097	0.0002	0.0004	0.0007	0.0009	0.0010	0.0013	0.0014	0.0016	0.0018	0.0022
2	0.2472	0.5163	3122	0.0003	0.0002	0.0005	0.0008	0.0009	0.0011	0.0014	0.0015	0.0016	0.0021
3	0.2489	0.5204	3049	0.0002	0.0003	0.0005	0.0007	0.0007	0.0011	0.0015	0.0016	0.0019	0.0023
4	0.2443	0.5150	3210	0.0002	0.0002	0.0006	0.0007	0.0008	0.0009	0.0013	0.0015	0.0016	0.0020
5	0.2491	0.5243	3019	0.0002	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0013	0.0015	0.0020
6	0.2445	0.5170	3189	0.0003	0.0003	0.0006	0.0006	0.0008	0.0009	0.0011	0.0012	0.0015	0.0019
7	0.2485	0.5211	3054	0.0000	0.0003	0.0007	0.0009	0.0010	0.0011	0.0014	0.0015	0.0017	0.0022
8	0.2469	0.5237	3077	0.0001	0.0002	0.0006	0.0009	0.0011	0.0012	0.0013	0.0013	0.0015	0.0019
9	0.2458	0.5196	3133	0.0001	0.0002	0.0006	0.0009	0.0011	0.0011	0.0011	0.0014	0.0016	0.0021
10	0.2510	0.5227	2983	0.0000	0.0002	0.0006	0.0008	0.0011	0.0012	0.0014	0.0014	0.0016	0.0021
11	0.2451	0.5131	3203	0.0003	0.0003	0.0006	0.0009	0.0011	0.0012	0.0013	0.0013	0.0015	0.0019
12	0.2457	0.5178	3150	0.0003	0.0004	0.0007	0.0010	0.0011	0.0013	0.0013	0.0013	0.0014	0.0019
13	0.2470	0.5211	3091	0.0000	0.0004	0.0008	0.0010	0.0015	0.0019	0.0021	0.0020	0.0019	0.0024
14	0.2468	0.5197	3107	0.0001	0.0002	0.0005	0.0007	0.0008	0.0011	0.0016	0.0018	0.0016	0.0020
15	0.2468	0.5199	3106	0.0002	0.0002	0.0007	0.0012	0.0013	0.0014	0.0017	0.0018	0.0018	0.0020
16	0.2445	0.5201	3164	0.0003	0.0002	0.0006	0.0009	0.0013	0.0014	0.0018	0.0019	0.0019	0.0021
17	0.2458	0.5180	3147	0.0002	0.0006	0.0011	0.0013	0.0017	0.0021	0.0023	0.0025	0.0026	0.0026
18	0.2512	0.5207	2990	0.0003	0.0007	0.0016	0.0018	0.0023	0.0027	0.0034	0.0038	0.0042	0.0046
19	0.2464	0.5178	3132	0.0003	0.0004	0.0013	0.0016	0.0017	0.0021	0.0024	0.0029	0.0032	0.0031
20	0.2466	0.5171	3131	0.0003	0.0008	0.0012	0.0013	0.0011	0.0012	0.0012	0.0014	0.0022	0.0025
21	0.2449	0.5155	3189	0.0003	0.0007	0.0014	0.0014	0.0015	0.0018	0.0021	0.0023	0.0029	0.0026
22	0.2464	0.5197	3118	0.0003	0.0011	0.0011	0.0015	0.0021	0.0026	0.0025	0.0025	0.0031	0.0039
23	0.2463	0.5204	3115	0.0004	0.0008	0.0009	0.0015	0.0020	0.0023	0.0025	0.0029	0.0031	0.0038
24	0.2461	0.5170	3146	0.0001	0.0005	0.0013	0.0010	0.0010	0.0013	0.0018	0.0018	0.0021	0.0027
Ave.	0.2468	0.5191	3113	0.0002	0.0004	0.0008	0.0010	0.0012	0.0015	0.0017	0.0019	0.0021	0.0024
Med.	0.2465	0.5197	3120	0.0002	0.0004	0.0007	0.0009	0.0011	0.0012	0.0015	0.0016	0.0018	0.0022
st dev	0.0018	0.0027	62	0.0001	0.0002	0.0003	0.0003	0.0004	0.0005	0.0006	0.0007	0.0007	0.0007
Min.	0.2443	0.5131	2983	0.0000	0.0002	0.0005	0.0006	0.0007	0.0009	0.0011	0.0012	0.0014	0.0019
Max.	0.2512	0.5243	3210	0.0004	0.0011	0.0016	0.0018	0.0023	0.0027	0.0034	0.0038	0.0042	0.0046





**3.3 Data Set 3, 105 °C, 25mA (Lumen Maintenance)**

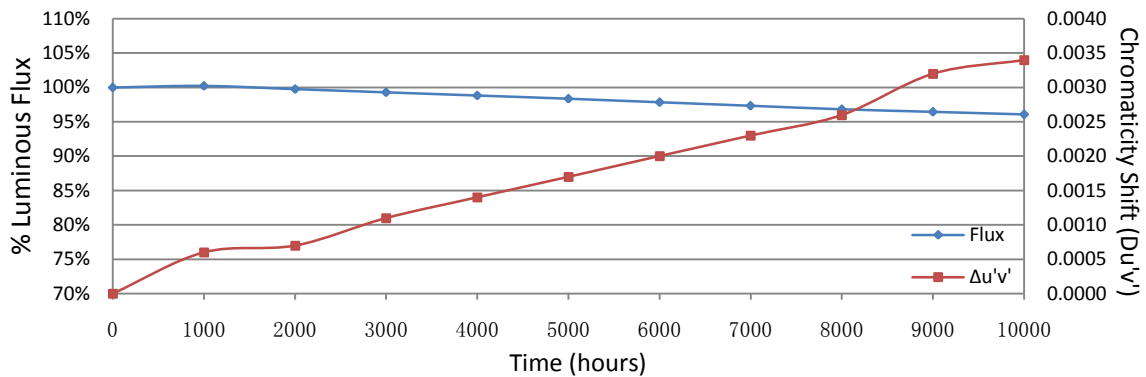
No.	V <sub>F</sub> (V)	Φ(lm)	Lumen Maintenance (%)									
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
25	2.847	10.19	100.20	99.90	99.51	99.12	98.63	98.14	97.67	97.31	97.05	96.74
26	2.845	10.21	100.20	99.41	98.82	98.53	98.04	97.72	97.34	96.94	96.76	96.21
27	2.829	10.12	100.99	100.30	99.90	99.31	99.21	98.81	98.23	97.76	97.65	97.17
28	2.819	10.33	100.19	99.61	99.13	98.64	97.97	97.48	96.90	96.43	95.84	95.49
29	2.830	10.14	100.10	99.90	99.51	99.21	98.72	98.33	97.86	97.33	96.92	96.61
30	2.818	10.35	100.19	99.81	99.23	98.94	98.45	98.16	97.68	97.20	96.91	96.53
31	2.815	10.02	100.20	99.90	99.31	99.15	98.56	98.09	97.66	97.18	96.81	96.43
32	2.822	10.28	100.19	99.42	98.83	98.64	98.35	97.86	97.28	96.80	96.40	95.97
33	2.817	10.33	100.19	99.71	99.32	98.74	98.16	97.87	97.29	96.77	96.37	95.93
34	2.825	10.43	100.19	99.90	99.42	99.14	98.66	98.08	97.60	97.12	96.74	96.26
35	2.821	10.37	100.77	100.29	99.71	99.13	98.55	97.97	97.40	96.82	96.53	96.27
36	2.819	10.35	100.10	99.81	99.32	98.84	98.36	97.78	97.20	96.81	96.50	96.12
37	2.821	10.43	100.19	99.71	99.14	98.95	98.27	97.60	97.12	96.45	95.97	95.88
38	2.820	10.61	100.09	99.43	99.06	98.49	97.93	97.36	96.89	96.32	95.85	95.29
39	2.814	10.30	100.29	99.90	99.22	98.74	98.06	97.57	97.09	96.58	96.03	95.65
40	2.837	10.24	100.10	99.61	98.93	98.44	97.85	97.21	96.84	96.24	96.04	95.61
41	2.819	10.43	100.10	99.52	99.33	99.04	98.66	97.99	97.51	97.03	96.64	96.36
42	2.813	10.24	100.29	99.90	99.41	99.02	98.54	98.05	97.63	97.14	96.83	96.62
43	2.842	10.27	100.19	99.71	99.22	98.54	98.05	97.34	96.86	96.42	95.95	95.48
44	2.849	10.37	100.10	99.61	99.13	98.55	98.17	97.69	97.11	96.53	96.19	95.82
45	2.818	10.30	100.10	99.42	98.93	98.25	97.57	96.99	96.51	96.00	95.45	95.15
46	2.834	10.22	100.20	99.90	99.32	98.83	98.34	97.70	97.26	96.74	96.36	95.98
47	2.820	10.00	100.10	99.39	98.92	98.41	97.90	97.35	96.81	96.30	95.86	95.45
48	2.817	10.16	100.20	99.90	99.51	99.11	98.82	98.43	98.06	97.67	97.34	97.04
Ave.	2.825	10.28	100.23	99.75	99.26	98.82	98.33	97.82	97.33	96.83	96.46	96.09
Med.	2.821	10.29	100.19	99.76	99.27	98.83	98.34	97.82	97.28	96.81	96.45	96.05
st dev	0.011	0.14	0.2118	0.2520	0.2693	0.2984	0.3731	0.4211	0.4238	0.4540	0.5321	0.5427
Min.	2.813	10.00	100.09	99.39	98.82	98.25	97.57	96.99	96.51	96.00	95.45	95.15
Max.	2.849	10.61	100.99	100.30	99.90	99.31	99.21	98.81	98.23	97.76	97.65	97.17

## TM-21 Projection:

**Test Duration:** 10000  
 hours **Failures Observed:** 0  
 $\alpha$ : 4.637E-06  
 $\beta$ : 1.006  
**Calculated L<sub>70</sub>:** 78000 hours  
**Reported L<sub>70</sub>:** >60000 hours

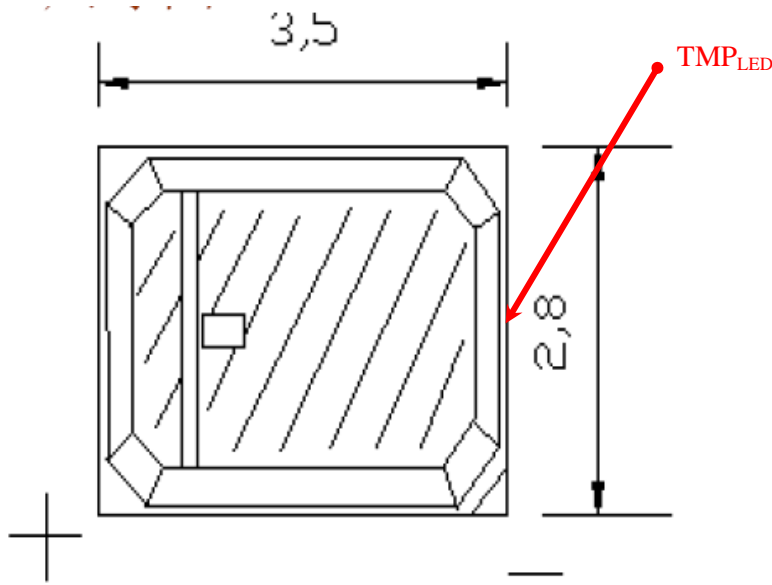
### 3.4 Data Set 3, 105 °C, 25mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ( $\Delta u'v'$ )									
				0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
25	0.2467	0.5181	3121	0.0003	0.0007	0.0016	0.0019	0.0024	0.0029	0.0031	0.0033	0.0035	0.0034
26	0.2464	0.5193	3120	0.0006	0.0004	0.0012	0.0014	0.0018	0.0022	0.0025	0.0033	0.0035	0.0036
27	0.2470	0.5197	3101	0.0009	0.0009	0.0010	0.0012	0.0016	0.0020	0.0023	0.0027	0.0028	0.0029
28	0.2474	0.5201	3088	0.0008	0.0007	0.0010	0.0012	0.0016	0.0020	0.0024	0.0028	0.0029	0.0031
29	0.2480	0.5210	3067	0.0004	0.0004	0.0013	0.0015	0.0019	0.0024	0.0027	0.0031	0.0032	0.0035
30	0.2455	0.5150	3178	0.0008	0.0011	0.0012	0.0015	0.0013	0.0012	0.0016	0.0017	0.0027	0.0033
31	0.2466	0.5180	3125	0.0002	0.0005	0.0014	0.0013	0.0018	0.0022	0.0023	0.0025	0.0032	0.0034
32	0.2467	0.5188	3116	0.0009	0.0008	0.0014	0.0016	0.0021	0.0025	0.0026	0.0028	0.0036	0.0038
33	0.2530	0.5260	2915	0.0004	0.0004	0.0010	0.0013	0.0017	0.0021	0.0023	0.0025	0.0033	0.0035
34	0.2475	0.5230	3065	0.0006	0.0007	0.0011	0.0013	0.0018	0.0022	0.0023	0.0027	0.0034	0.0036
35	0.2485	0.5197	3063	0.0004	0.0007	0.0011	0.0014	0.0018	0.0022	0.0023	0.0027	0.0035	0.0036
36	0.2452	0.5164	3174	0.0005	0.0007	0.0010	0.0013	0.0018	0.0022	0.0022	0.0025	0.0032	0.0035
37	0.2459	0.5212	3119	0.0002	0.0004	0.0007	0.0012	0.0015	0.0020	0.0021	0.0024	0.0031	0.0034
38	0.2458	0.5172	3152	0.0003	0.0004	0.0007	0.0008	0.0012	0.0016	0.0020	0.0023	0.0031	0.0028
39	0.2455	0.5180	3154	0.0004	0.0006	0.0009	0.0011	0.0015	0.0018	0.0024	0.0027	0.0036	0.0037
40	0.2441	0.5186	3186	0.0004	0.0006	0.0010	0.0013	0.0015	0.0017	0.0022	0.0026	0.0034	0.0037
41	0.2487	0.5241	3028	0.0004	0.0006	0.0010	0.0013	0.0016	0.0018	0.0023	0.0027	0.0034	0.0036
42	0.2466	0.5210	3102	0.0007	0.0009	0.0013	0.0014	0.0017	0.0018	0.0024	0.0026	0.0032	0.0036
43	0.2459	0.5224	3110	0.0009	0.0009	0.0014	0.0015	0.0017	0.0020	0.0025	0.0028	0.0033	0.0037
44	0.2521	0.5265	2933	0.0007	0.0009	0.0013	0.0016	0.0018	0.0021	0.0025	0.0028	0.0034	0.0037
45	0.2483	0.5201	3065	0.0012	0.0009	0.0007	0.0004	0.0004	0.0004	0.0009	0.0011	0.0016	0.0020
46	0.2470	0.5196	3102	0.0013	0.0012	0.0015	0.0017	0.0017	0.0018	0.0023	0.0025	0.0031	0.0035
47	0.2444	0.5224	3148	0.0004	0.0009	0.0016	0.0022	0.0026	0.0027	0.0030	0.0032	0.0036	0.0039
48	0.2505	0.5234	2989	0.0003	0.0011	0.0010	0.0014	0.0014	0.0013	0.0016	0.0017	0.0023	0.0026
Ave.	0.2472	0.5204	3093	0.0006	0.0007	0.0011	0.0014	0.0017	0.0020	0.0023	0.0026	0.0032	0.0034
Med.	0.2467	0.5199	3106	0.0005	0.0007	0.0011	0.0013	0.0017	0.0020	0.0023	0.0027	0.0033	0.0035
st dev	0.0022	0.0029	70	0.0003	0.0002	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0005	0.0004
Min.	0.2441	0.5150	2915	0.0002	0.0004	0.0007	0.0004	0.0004	0.0004	0.0009	0.0011	0.0016	0.0020
Max.	0.2530	0.5265	3186	0.0013	0.0012	0.0016	0.0022	0.0026	0.0029	0.0031	0.0033	0.0036	0.0039



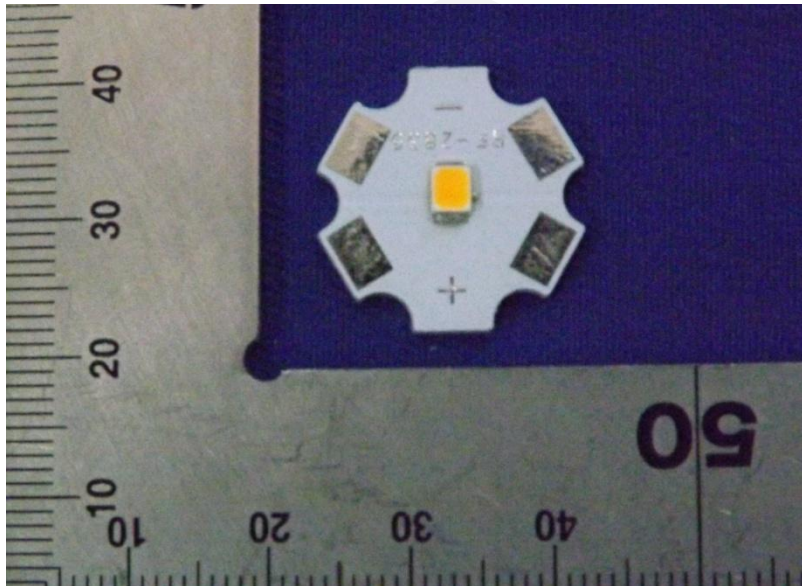
### Attachment A – EUT Photo

#### A.1 Mechanical Dimensions (Ta = 25°C)



All dimensions are in millimeter

#### A.2 EUT Photo



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