

TEST REPORT

According to ANSI/IES LM-80-15
For

ShenZhen JuFei Optoelectronics Co., Ltd.

No.4 Eling Industrial Park, Egongling Community, Pinghu Subdistrict, Longgang District, Shenzhen City

#Model: 01.JT.AJ2835W80N05

Report Type: 10000 Hours Test Report		Product Type: LED Package	
Reviewed By:	Pote Wang 		
Report Number:	RSZ190928550-10-10000		
Test Date:	2019-09-28 to 2020-11-27		
Report Date:	2020-12-30		
Approved by:	Bill Xiong / EE Engineer		
Test Facility:	Test facility was located at No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China.		
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Accreditation:	The IAS Accreditation Number TL-460.		

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1 - General Information

1.1 Description of LED Light Sources

Sample Size:

75 PCS test samples were in good condition and received on 2019-09-28. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75.

#Manufacturer:	ShenZhen JuFei Optoelectronics Co., Ltd.
#Part Number:	01.JT.AJ2835W80N05
#Part Type:	LED Package
#Drive Level:	DC 100mA
#Nominal CCT:	2700K
#Power:	1 W
#Average Current Density per LED die:	516.67 mA/mm ²
#Average Power Density per LED die:	1.72 W/mm ²
#CRI:	80
#Die Spacing:	0.2mm

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.

#Family products covered by this report:

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

This report covers the following models:

Series Name	Model name	CCT (K)	CRI	Number of dies	current intensity of per LED die(mA/mm ²)	Current (mA)	Average power intensity of per PCB(W/mm ²)	Average power density per LED die (W/mm ²)	Power (W)	distance between of dies (mm)	Series	Parallel	Driver current of per die
SMD 2835	01.JT.AJ2835 W80N05	2700K	80	3	516.67	100	0.10	1.72	1	0.2	3	1	100
	01.JT.AJ2835 W*N*	≥ 2200K	80	3	516.67	100	0.10	1.72	1	0.2	3	1	100
	01.JT.AJ2835 W*P*	≥ 2200K	80	3	516.67	100	0.10	1.72	1	0.2	3	1	100

1.2 Standards and Reference Documentations

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- CIE 127:2007: Measurement of LEDs
- ENERGY STAR® Requirements for the Use of LM-80 Data (This standard was not accredited by IAS)

1.3 Testing Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
0.3m integrating sphere	EVERFINE	Diameter 0.3m	1011119	2020-03-08	2021-03-07
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	2020-03-08	2021-03-07
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	2020-03-08	2021-03-07
Standard Light Source	EVERFINE	D062	1011093	2020-10-20	2021-10-19
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987CJ7321114	2020-03-16	2021-03-15
Multilayer aging machine	BACL	B2-270	20024	2020-03-11	2021-03-10
DC Power Supply	BACL	B12001-12	90023	2020-03-16	2021-03-15

1.4 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.

1.5 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°C below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to 5°C below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with ASTM E230 Table 1 "Special Limits".

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.

The relative humidity within chamber was kept less than 65% during test.

For photometry measurement, the ambient temperature during test was set to 25°C $\pm$ 2°C, RH <65%.

1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate u'v'. 2 π measurement was used and sample was driven by DC power supply. The forward current was regulated to within $\pm 0.5\%$ of the nominal value. The test system was calibrated by halogen reference lamp. The ambient temperature during test was set to 25°C $\pm$ 2°C, RH <65%. The temperature measurement point was located in the sphere and the temperature was detected by a temperature probe.

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=21K (K=2), at the 95% confidence level.

The uncertainty of the temperature is U=0.8671°C (K=2), at the 95% confidence level.

1.7 Statement of Traceability

Bay Area Compliance Laboratories Corp. (Dongguan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

1.8 Sample Set

Data Set 1: 55°C, 100mA

Part Number: 01.JT.AJ2835W80N05
Number of Units: 25
Case Temperature: >53°C
Ambient Temperature: >50°C
Life Test Drive Current: 100mA
Measurement Current: 100mA

Data Set 2: 85°C, 100mA

Part Number: 01.JT.AJ2835W80N05
Number of Units: 25
Case Temperature: >83°C
Ambient Temperature: >80°C
Life Test Drive Current: 100mA
Measurement Current: 100mA

Data Set 3: 105°C, 100mA

Part Number: 01.JT.AJ2835W80N05
Number of Units: 25
Case Temperature: >103°C
Ambient Temperature: >100°C
Life Test Drive Current: 100mA
Measurement Current: 100mA

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	α	β	Reported TM-21 L ₇₀ Lifetime	Reported TM-21 L ₈₀ Lifetime	Reported TM-21 L ₉₀ Lifetime
1	25	0	1000hrs	10000hrs	2.040E-06	1.004	>60000 hours	>60000 hours	54,000 hours
2	25	0	1000hrs	10000hrs	2.533E-06	1.004	>60000 hours	>60000 hours	43,000 hours
3	25	0	1000hrs	10000hrs	2.949E-06	1.003	>60000 hours	>60000 hours	37,000 hours

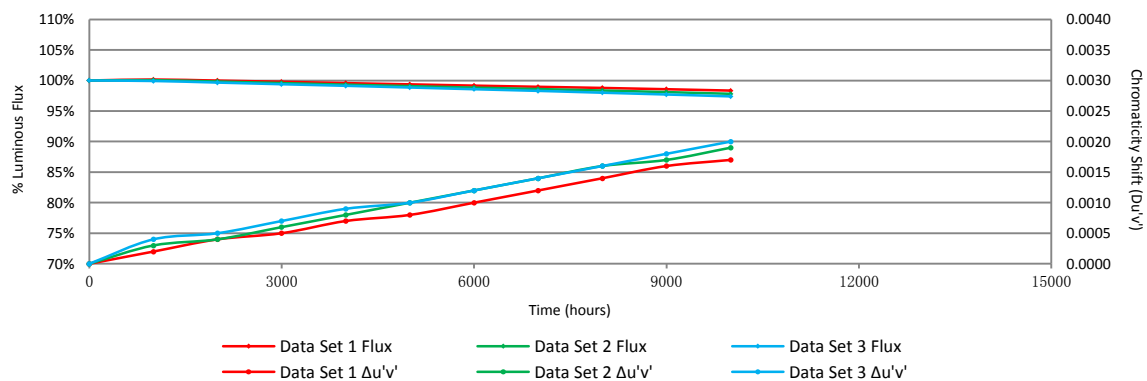
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	100.16%	99.98%	99.79%	99.57%	99.37%	99.16%	98.97%	98.78%	98.57%	98.35%
2	100.05%	99.83%	99.58%	99.32%	99.08%	98.83%	98.60%	98.36%	98.10%	97.82%
3	99.92%	99.66%	99.39%	99.13%	98.85%	98.57%	98.30%	98.00%	97.71%	97.40%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.0002	0.0004	0.0005	0.0007	0.0008	0.0010	0.0012	0.0014	0.0016	0.0017
2	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0017	0.0019
3	0.0004	0.0005	0.0007	0.0009	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 - Test Data

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

No.	Φ(lm)	Lumen Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	138.60	100.07	100.00	99.71	99.49	99.21	98.92	98.77	98.56	98.48	98.34
2	142.20	100.28	100.00	99.79	99.58	99.30	98.95	98.66	98.52	98.24	97.89
3	142.20	100.21	99.93	99.72	99.51	99.30	99.02	98.73	98.52	98.24	98.17
4	140.90	100.21	100.14	99.86	99.72	99.57	99.22	98.94	98.72	98.58	98.37
5	142.50	100.14	99.79	99.44	99.23	99.09	99.02	98.95	98.81	98.60	98.46
6	139.60	100.29	100.21	99.93	99.71	99.36	99.07	98.85	98.57	98.42	98.28
7	140.00	100.14	100.00	99.64	99.29	99.14	99.07	98.79	98.57	98.50	98.36
8	142.20	100.07	99.79	99.72	99.51	99.44	99.16	99.02	98.66	98.45	98.24
9	142.70	100.21	100.07	99.79	99.51	99.16	99.02	98.88	98.60	98.53	98.39
10	140.60	100.28	100.00	99.93	99.86	99.57	99.43	99.36	99.22	99.15	98.79
11	140.40	100.21	100.07	99.93	99.64	99.43	99.36	99.29	99.22	98.86	98.72
12	139.70	100.14	99.93	99.86	99.71	99.64	99.28	99.21	99.07	98.85	98.78
13	140.90	100.07	100.00	99.72	99.65	99.29	99.15	98.79	98.65	98.30	97.94
14	139.10	100.22	100.14	100.07	99.86	99.71	99.64	99.50	99.42	99.35	99.28
15	142.30	100.21	100.07	99.93	99.65	99.30	99.02	98.74	98.66	98.45	98.17
16	140.10	100.07	99.71	99.64	99.29	99.14	99.00	98.93	98.64	98.50	98.14
17	138.00	100.07	99.93	99.71	99.35	99.06	98.91	98.70	98.48	98.19	97.83
18	138.80	100.22	100.14	100.00	99.71	99.57	99.35	99.06	98.99	98.70	98.41
19	140.00	100.07	99.86	99.64	99.57	99.43	99.29	99.21	99.14	98.86	98.71
20	141.40	100.28	100.14	100.07	100.00	99.79	99.65	99.36	99.22	98.87	98.59
21	143.10	100.07	99.93	99.86	99.58	99.37	99.23	99.09	98.81	98.67	98.39
22	142.70	100.14	100.00	99.72	99.58	99.51	99.23	99.02	98.81	98.67	98.60
23	138.40	100.22	100.00	99.93	99.78	99.71	99.49	99.13	98.77	98.41	98.27
24	142.10	100.07	100.00	99.79	99.44	99.16	98.80	98.73	98.45	98.17	97.82
25	140.90	100.07	99.72	99.43	99.15	99.08	98.72	98.65	98.30	98.15	97.80
Avg.	140.78	100.16	99.98	99.79	99.57	99.37	99.16	98.97	98.78	98.57	98.35
Med.	140.90	100.14	100.00	99.79	99.58	99.36	99.15	98.94	98.66	98.50	98.36
st dev	1.52	0.08	0.13	0.17	0.21	0.22	0.24	0.24	0.29	0.30	0.35
Min.	138.00	100.07	99.71	99.43	99.15	99.06	98.72	98.65	98.30	98.15	97.80
Max.	143.10	100.29	100.21	100.07	100.00	99.79	99.65	99.50	99.42	99.35	99.28

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

No.	Forward Voltage (V)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	9.082	9.091	9.083	9.084	9.090	9.089	9.088	9.085	9.086	9.084	9.092
2	9.058	9.070	9.061	9.063	9.061	9.068	9.058	9.058	9.059	9.064	9.062
3	9.023	9.044	9.023	9.025	9.027	9.026	9.029	9.030	9.024	9.032	9.032
4	9.074	9.081	9.084	9.083	9.082	9.080	9.079	9.081	9.075	9.076	9.077
5	9.044	9.046	9.049	9.047	9.052	9.047	9.048	9.052	9.045	9.048	9.046
6	9.095	9.102	9.102	9.100	9.099	9.104	9.100	9.098	9.104	9.099	9.102
7	9.039	9.069	9.043	9.047	9.049	9.040	9.040	9.043	9.042	9.046	9.048
8	9.036	9.048	9.040	9.044	9.036	9.043	9.040	9.042	9.045	9.045	9.043
9	9.083	9.085	9.088	9.088	9.092	9.092	9.087	9.085	9.088	9.086	9.089
10	9.044	9.049	9.048	9.044	9.048	9.044	9.046	9.045	9.045	9.046	9.049
11	9.053	9.059	9.060	9.055	9.058	9.060	9.062	9.059	9.056	9.057	9.055
12	9.039	9.072	9.040	9.044	9.046	9.047	9.043	9.041	9.044	9.048	9.041
13	9.044	9.042	9.044	9.045	9.049	9.047	9.051	9.045	9.048	9.045	9.045
14	9.052	9.052	9.058	9.060	9.056	9.057	9.060	9.059	9.060	9.060	9.057
15	9.050	9.053	9.053	9.056	9.059	9.057	9.058	9.052	9.054	9.056	9.052
16	9.023	9.033	9.028	9.025	9.028	9.026	9.027	9.031	9.027	9.028	9.033
17	9.059	9.068	9.067	9.066	9.063	9.059	9.068	9.064	9.061	9.060	9.065
18	9.069	9.075	9.069	9.078	9.073	9.074	9.069	9.075	9.075	9.075	9.074
19	9.079	9.079	9.086	9.086	9.089	9.082	9.088	9.087	9.082	9.081	9.083
20	9.037	9.047	9.045	9.041	9.040	9.038	9.038	9.046	9.046	9.041	9.040
21	9.048	9.055	9.057	9.049	9.049	9.055	9.050	9.053	9.056	9.054	9.056
22	9.089	9.035	9.090	9.098	9.092	9.093	9.093	9.092	9.092	9.090	9.091
23	9.044	9.083	9.045	9.053	9.047	9.045	9.049	9.050	9.046	9.047	9.050
24	9.035	9.054	9.043	9.042	9.036	9.038	9.042	9.042	9.043	9.037	9.039
25	9.051	9.051	9.058	9.054	9.056	9.057	9.059	9.057	9.060	9.058	9.053
Avg.	9.054	9.062	9.059	9.059	9.059	9.059	9.059	9.059	9.059	9.059	9.059
Med.	9.050	9.055	9.057	9.054	9.056	9.057	9.058	9.053	9.056	9.056	9.053
st dev	0.020	0.018	0.021	0.021	0.021	0.021	0.020	0.019	0.020	0.019	0.020
Min.	9.023	9.033	9.023	9.025	9.027	9.026	9.027	9.030	9.024	9.028	9.032
Max.	9.095	9.102	9.102	9.100	9.099	9.104	9.100	9.098	9.104	9.099	9.102

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)									
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.2601	0.5296	2740	0.0001	0.0003	0.0005	0.0006	0.0008	0.0010	0.0011	0.0013	0.0015	0.0017
2	0.2575	0.5307	2791	0.0002	0.0004	0.0006	0.0008	0.0009	0.0012	0.0014	0.0016	0.0017	0.0018
3	0.2567	0.5296	2813	0.0003	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013	0.0016	0.0018	0.0020
4	0.2582	0.5300	2779	0.0002	0.0005	0.0006	0.0007	0.0009	0.0011	0.0013	0.0014	0.0016	0.0017
5	0.2578	0.5302	2787	0.0001	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013	0.0013	0.0014	0.0016
6	0.2594	0.5282	2762	0.0002	0.0004	0.0007	0.0009	0.0011	0.0014	0.0016	0.0017	0.0019	0.0021
7	0.2582	0.5289	2784	0.0001	0.0003	0.0005	0.0007	0.0009	0.0010	0.0012	0.0014	0.0015	0.0017
8	0.2582	0.5301	2778	0.0003	0.0004	0.0006	0.0006	0.0009	0.0010	0.0012	0.0014	0.0016	0.0018
9	0.2577	0.5293	2793	0.0002	0.0004	0.0005	0.0006	0.0007	0.0009	0.0011	0.0014	0.0016	0.0017
10	0.2598	0.5306	2742	0.0004	0.0005	0.0006	0.0008	0.0010	0.0013	0.0014	0.0015	0.0016	0.0018
11	0.2587	0.5293	2772	0.0002	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017	0.0017
12	0.2584	0.5300	2776	0.0001	0.0002	0.0003	0.0005	0.0007	0.0009	0.0011	0.0012	0.0013	0.0016
13	0.2593	0.5299	2756	0.0001	0.0003	0.0006	0.0007	0.0008	0.0010	0.0011	0.0013	0.0016	0.0018
14	0.2602	0.5296	2739	0.0001	0.0003	0.0004	0.0005	0.0006	0.0009	0.0011	0.0013	0.0015	0.0017
15	0.2603	0.5301	2734	0.0002	0.0004	0.0004	0.0007	0.0008	0.0010	0.0012	0.0015	0.0016	0.0018
16	0.2594	0.5291	2759	0.0003	0.0004	0.0006	0.0006	0.0008	0.0010	0.0011	0.0014	0.0016	0.0018
17	0.2599	0.5305	2741	0.0001	0.0002	0.0003	0.0005	0.0007	0.0009	0.0010	0.0012	0.0014	0.0016
18	0.2595	0.5297	2753	0.0001	0.0002	0.0005	0.0007	0.0009	0.0011	0.0012	0.0014	0.0016	0.0018
19	0.2584	0.5296	2777	0.0002	0.0005	0.0006	0.0009	0.0010	0.0011	0.0013	0.0015	0.0018	0.0019
20	0.2595	0.5299	2752	0.0001	0.0002	0.0004	0.0005	0.0007	0.0008	0.0009	0.0011	0.0013	0.0016
21	0.2591	0.5306	2757	0.0002	0.0004	0.0006	0.0007	0.0010	0.0011	0.0012	0.0014	0.0016	0.0016
22	0.2593	0.5297	2757	0.0000	0.0002	0.0004	0.0005	0.0007	0.0009	0.0011	0.0014	0.0015	0.0017
23	0.2576	0.5292	2797	0.0002	0.0004	0.0004	0.0005	0.0008	0.0009	0.0011	0.0013	0.0013	0.0014
24	0.2560	0.5283	2834	0.0001	0.0003	0.0004	0.0004	0.0007	0.0009	0.0009	0.0011	0.0012	0.0013
25	0.2602	0.5303	2735	0.0001	0.0003	0.0004	0.0006	0.0007	0.0009	0.0012	0.0013	0.0015	0.0016
Avg.	0.2588	0.5297	2768	0.0002	0.0004	0.0005	0.0007	0.0008	0.0010	0.0012	0.0014	0.0016	0.0017
Med.	0.2591	0.5297	2762	0.0002	0.0004	0.0005	0.0007	0.0008	0.0010	0.0012	0.0014	0.0016	0.0017
st dev	0.0011	0.0007	26	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Min.	0.2560	0.5282	2734	0.0000	0.0002	0.0003	0.0004	0.0006	0.0008	0.0009	0.0011	0.0012	0.0013
Max.	0.2603	0.5307	2834	0.0004	0.0005	0.0007	0.0009	0.0011	0.0014	0.0016	0.0017	0.0019	0.0021

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

No.	Φ(lm)	Lumen Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	143.10	100.21	100.00	99.86	99.51	99.30	98.95	98.81	98.46	98.18	97.83
27	139.80	99.93	99.64	99.43	99.28	99.07	98.93	98.64	98.50	98.35	98.00
28	140.60	100.14	100.00	99.86	99.64	99.50	99.29	99.00	98.79	98.51	98.29
29	138.40	100.07	99.86	99.49	99.13	98.84	98.55	98.41	98.12	97.98	97.76
30	140.00	100.07	99.93	99.64	99.43	99.14	98.93	98.71	98.36	98.00	97.64
31	139.70	99.93	99.64	99.50	99.14	98.93	98.78	98.57	98.35	98.21	98.00
32	136.30	100.15	99.93	99.71	99.41	99.19	99.05	98.68	98.53	98.17	97.87
33	139.00	100.07	99.93	99.64	99.35	98.99	98.78	98.49	98.35	98.06	97.70
34	140.10	99.93	99.79	99.57	99.43	99.07	98.79	98.57	98.36	98.00	97.64
35	140.70	99.93	99.79	99.43	99.22	99.00	98.65	98.51	98.22	97.94	97.73
36	141.20	100.07	99.86	99.58	99.43	99.15	98.80	98.65	98.51	98.23	97.95
37	139.60	100.14	99.86	99.57	99.43	99.28	99.07	98.78	98.50	98.28	97.92
38	141.40	100.14	99.79	99.58	99.36	99.01	98.73	98.44	98.23	97.95	97.67
39	142.00	99.86	99.72	99.37	99.15	99.01	98.73	98.59	98.38	98.17	97.96
40	139.70	100.21	99.93	99.71	99.43	99.28	99.07	98.85	98.50	98.28	98.07
41	141.70	100.07	99.93	99.65	99.29	99.08	98.94	98.73	98.52	98.24	97.88
42	141.00	99.86	99.50	99.22	98.87	98.51	98.16	97.87	97.73	97.59	97.38
43	138.40	99.93	99.57	99.42	99.06	98.84	98.70	98.41	98.12	97.76	97.40
44	138.20	99.93	99.57	99.35	99.06	98.91	98.55	98.26	97.97	97.76	97.40
45	140.80	100.07	99.86	99.64	99.43	99.22	99.01	98.65	98.37	98.08	97.87
46	140.10	100.14	100.00	99.86	99.64	99.43	99.21	98.93	98.72	98.36	98.14
47	140.70	99.93	99.79	99.64	99.36	99.15	98.86	98.58	98.44	98.15	97.94
48	142.00	100.07	99.93	99.58	99.37	99.15	98.87	98.59	98.38	98.17	97.82
49	140.30	100.21	100.00	99.64	99.43	99.14	98.79	98.65	98.43	98.22	98.00
50	141.10	100.14	99.86	99.57	99.22	98.87	98.65	98.51	98.16	97.80	97.59
Avg.	140.24	100.05	99.83	99.58	99.32	99.08	98.83	98.60	98.36	98.10	97.82
Med.	140.30	100.07	99.86	99.58	99.36	99.08	98.80	98.59	98.38	98.17	97.87
st dev	1.45	0.11	0.15	0.16	0.18	0.21	0.23	0.23	0.22	0.22	0.23
Min.	136.30	99.86	99.50	99.22	98.87	98.51	98.16	97.87	97.73	97.59	97.38
Max.	143.10	100.21	100.00	99.86	99.64	99.50	99.29	99.00	98.79	98.51	98.29

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

No.	Forward Voltage (V)										
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	9.036	9.046	9.036	9.037	9.044	9.042	9.037	9.041	9.046	9.043	9.043
27	9.050	9.052	9.055	9.054	9.054	9.059	9.058	9.058	9.054	9.051	9.057
28	9.048	9.042	9.055	9.058	9.054	9.049	9.051	9.053	9.053	9.053	9.049
29	9.035	9.066	9.042	9.038	9.040	9.040	9.036	9.043	9.040	9.044	9.037
30	9.053	9.042	9.056	9.055	9.059	9.063	9.061	9.058	9.053	9.056	9.062
31	9.071	9.088	9.078	9.080	9.077	9.072	9.074	9.079	9.075	9.071	9.073
32	9.063	9.070	9.070	9.071	9.072	9.064	9.066	9.065	9.073	9.070	9.064
33	9.061	9.068	9.064	9.063	9.065	9.064	9.064	9.065	9.071	9.066	9.065
34	9.064	9.075	9.065	9.067	9.066	9.066	9.065	9.065	9.067	9.071	9.070
35	9.071	9.066	9.074	9.078	9.080	9.081	9.077	9.071	9.073	9.076	9.079
36	9.084	9.090	9.090	9.093	9.094	9.094	9.090	9.090	9.086	9.084	9.087
37	9.055	9.062	9.060	9.056	9.060	9.061	9.055	9.059	9.060	9.058	9.064
38	9.047	9.049	9.048	9.054	9.050	9.050	9.051	9.056	9.051	9.048	9.050
39	9.038	9.041	9.044	9.043	9.048	9.047	9.047	9.046	9.047	9.044	9.038
40	9.050	9.048	9.051	9.053	9.057	9.056	9.055	9.056	9.055	9.059	9.052
41	9.047	9.079	9.052	9.056	9.048	9.048	9.050	9.049	9.053	9.054	9.050
42	9.077	9.083	9.084	9.082	9.086	9.085	9.081	9.082	9.087	9.080	9.086
43	9.048	9.055	9.050	9.052	9.051	9.050	9.057	9.050	9.052	9.057	9.052
44	9.048	9.056	9.054	9.053	9.048	9.054	9.053	9.055	9.052	9.058	9.048
45	9.045	9.053	9.052	9.050	9.054	9.047	9.047	9.054	9.052	9.054	9.052
46	9.072	9.084	9.082	9.080	9.076	9.077	9.081	9.076	9.079	9.078	9.078
47	9.074	9.086	9.076	9.084	9.082	9.076	9.074	9.077	9.076	9.079	9.079
48	9.072	9.079	9.076	9.077	9.080	9.078	9.075	9.078	9.078	9.079	9.078
49	9.041	9.068	9.042	9.043	9.042	9.050	9.046	9.047	9.047	9.042	9.044
50	9.062	9.066	9.068	9.064	9.064	9.069	9.071	9.067	9.069	9.066	9.070
Avg.	9.056	9.065	9.061	9.062	9.062	9.062	9.061	9.062	9.062	9.062	9.061
Med.	9.053	9.066	9.056	9.056	9.059	9.061	9.058	9.058	9.055	9.058	9.062
st dev	0.014	0.016	0.015	0.015	0.015	0.014	0.014	0.013	0.014	0.013	0.015
Min.	9.035	9.041	9.036	9.037	9.040	9.040	9.036	9.041	9.040	9.042	9.037
Max.	9.084	9.090	9.090	9.093	9.094	9.094	9.090	9.090	9.087	9.084	9.087

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)									
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	0.2568	0.5296	2811	0.0001	0.0004	0.0005	0.0006	0.0007	0.0009	0.0011	0.0013	0.0015	0.0016
27	0.2568	0.5296	2810	0.0002	0.0004	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	0.0018	0.0019
28	0.2602	0.5295	2739	0.0004	0.0005	0.0006	0.0008	0.0011	0.0013	0.0013	0.0016	0.0017	0.0018
29	0.2579	0.5301	2784	0.0005	0.0006	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017	0.0017	0.0020
30	0.2573	0.5284	2805	0.0003	0.0005	0.0007	0.0009	0.0011	0.0014	0.0016	0.0018	0.0020	0.0022
31	0.2595	0.5303	2751	0.0004	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018	0.0020	0.0023	0.0024
32	0.2578	0.5272	2801	0.0001	0.0003	0.0006	0.0008	0.0011	0.0013	0.0015	0.0018	0.0019	0.0021
33	0.2581	0.5299	2782	0.0003	0.0004	0.0005	0.0006	0.0008	0.0009	0.0011	0.0014	0.0016	0.0017
34	0.2596	0.5291	2753	0.0004	0.0004	0.0005	0.0007	0.0009	0.0011	0.0014	0.0016	0.0016	0.0018
35	0.2586	0.5303	2769	0.0004	0.0005	0.0006	0.0008	0.0009	0.0010	0.0013	0.0014	0.0015	0.0017
36	0.2567	0.5280	2821	0.0003	0.0004	0.0006	0.0008	0.0011	0.0011	0.0013	0.0015	0.0017	0.0017
37	0.2590	0.5304	2761	0.0003	0.0005	0.0007	0.0009	0.0011	0.0014	0.0015	0.0017	0.0017	0.0019
38	0.2586	0.5291	2775	0.0002	0.0004	0.0006	0.0008	0.0010	0.0011	0.0013	0.0014	0.0017	0.0019
39	0.2578	0.5299	2788	0.0003	0.0005	0.0008	0.0010	0.0011	0.0014	0.0015	0.0016	0.0018	0.0020
40	0.2585	0.5270	2786	0.0004	0.0004	0.0005	0.0008	0.0009	0.0011	0.0012	0.0013	0.0014	0.0015
41	0.2597	0.5304	2745	0.0003	0.0006	0.0007	0.0009	0.0010	0.0012	0.0014	0.0017	0.0017	0.0020
42	0.2579	0.5296	2787	0.0004	0.0005	0.0007	0.0009	0.0011	0.0012	0.0013	0.0014	0.0016	0.0017
43	0.2610	0.5316	2715	0.0003	0.0004	0.0006	0.0008	0.0010	0.0013	0.0014	0.0016	0.0017	0.0019
44	0.2586	0.5277	2781	0.0001	0.0002	0.0004	0.0006	0.0009	0.0010	0.0013	0.0016	0.0018	0.0020
45	0.2574	0.5278	2807	0.0002	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	0.0018	0.0021	0.0023
46	0.2608	0.5300	2725	0.0002	0.0003	0.0006	0.0008	0.0009	0.0012	0.0014	0.0016	0.0018	0.0021
47	0.2608	0.5302	2723	0.0002	0.0003	0.0005	0.0006	0.0009	0.0010	0.0013	0.0015	0.0016	0.0017
48	0.2595	0.5306	2749	0.0004	0.0004	0.0006	0.0008	0.0009	0.0011	0.0013	0.0016	0.0017	0.0019
49	0.2591	0.5284	2768	0.0001	0.0004	0.0007	0.0009	0.0011	0.0013	0.0014	0.0016	0.0017	0.0019
50	0.2601	0.5309	2734	0.0002	0.0004	0.0006	0.0007	0.0008	0.0010	0.0011	0.0013	0.0015	0.0016
Avg.	0.2587	0.5294	2771	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0017	0.0019
Med.	0.2586	0.5296	2775	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012	0.0013	0.0016	0.0017	0.0019
st dev	0.0013	0.0012	30	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	0.2567	0.5270	2715	0.0001	0.0002	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013	0.0014	0.0015
Max.	0.2610	0.5316	2821	0.0005	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018	0.0020	0.0023	0.0024

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

No.	Φ(lm)	Lumen Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
51	140.20	100.14	99.93	99.50	99.36	99.14	98.72	98.50	98.22	97.79	97.57
52	139.60	99.93	99.71	99.57	99.36	99.14	98.85	98.50	98.07	97.92	97.49
53	141.40	99.86	99.65	99.43	99.22	98.87	98.59	98.37	98.02	97.88	97.67
54	140.00	100.07	99.86	99.50	99.07	98.79	98.64	98.43	98.29	98.07	97.71
55	140.10	99.93	99.71	99.50	99.29	98.86	98.50	98.36	98.07	97.79	97.50
56	138.60	99.86	99.71	99.57	99.21	98.99	98.63	98.34	97.98	97.84	97.62
57	139.50	99.93	99.78	99.35	98.92	98.78	98.57	98.14	97.92	97.56	97.42
58	140.70	99.93	99.79	99.64	99.50	99.36	99.08	98.65	98.22	97.94	97.51
59	141.10	99.79	99.43	99.08	98.65	98.37	98.23	97.80	97.45	97.24	96.81
60	140.20	99.79	99.43	99.07	98.72	98.50	98.29	97.93	97.57	97.15	96.86
61	140.10	99.86	99.71	99.36	99.21	98.93	98.57	98.29	97.86	97.57	97.14
62	140.80	99.93	99.64	99.36	99.22	99.01	98.86	98.58	98.30	98.01	97.59
63	142.80	99.86	99.65	99.44	99.23	98.95	98.67	98.46	98.32	98.18	97.83
64	140.70	99.93	99.50	99.22	99.00	98.72	98.44	98.08	97.73	97.37	97.16
65	140.40	100.07	99.72	99.50	99.15	98.93	98.72	98.43	98.15	97.86	97.72
66	141.60	99.79	99.36	98.94	98.52	98.38	98.23	97.95	97.60	97.18	96.96
67	141.10	99.93	99.79	99.50	99.15	98.72	98.51	98.37	98.23	98.02	97.66
68	137.50	100.07	99.93	99.78	99.64	99.27	98.98	98.69	98.47	98.25	97.89
69	141.90	100.07	99.72	99.51	99.15	99.01	98.66	98.38	98.24	98.03	97.89
70	141.40	99.93	99.58	99.22	98.94	98.51	98.16	97.88	97.45	97.31	96.96
71	139.20	100.14	99.86	99.71	99.50	99.14	98.71	98.42	97.99	97.56	97.13
72	140.80	99.72	99.43	99.22	99.08	98.86	98.44	98.22	97.87	97.51	97.23
73	140.00	99.93	99.50	99.36	99.21	99.00	98.64	98.43	98.00	97.57	97.14
74	140.20	99.79	99.43	99.14	98.79	98.36	98.07	97.93	97.79	97.36	97.08
75	141.10	99.86	99.57	99.29	99.08	98.72	98.51	98.37	98.23	97.80	97.52
Avg.	140.44	99.92	99.66	99.39	99.13	98.85	98.57	98.30	98.00	97.71	97.40
Med.	140.40	99.93	99.71	99.43	99.15	98.87	98.59	98.37	98.02	97.79	97.50
st dev	1.09	0.12	0.16	0.21	0.27	0.27	0.25	0.25	0.28	0.32	0.33
Min.	137.50	99.72	99.36	98.94	98.52	98.36	98.07	97.80	97.45	97.15	96.81
Max.	142.80	100.14	99.93	99.78	99.64	99.36	99.08	98.69	98.47	98.25	97.89

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

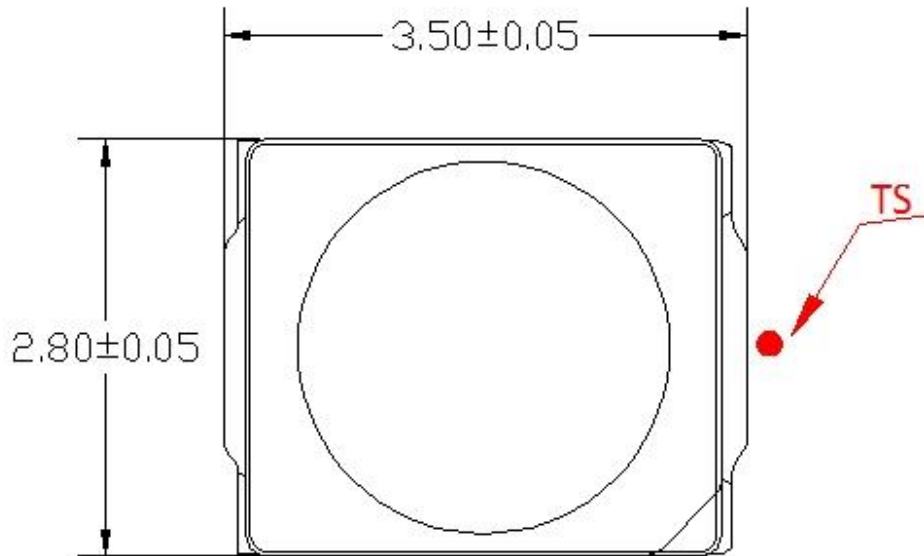
No.	Forward Voltage (V)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
51	9.067	9.061	9.074	9.075	9.070	9.075	9.068	9.073	9.067	9.068	9.075
52	9.078	9.041	9.086	9.082	9.079	9.084	9.083	9.086	9.088	9.084	9.079
53	9.066	9.055	9.075	9.071	9.072	9.070	9.070	9.069	9.070	9.072	9.075
54	9.063	9.073	9.071	9.069	9.069	9.070	9.066	9.064	9.065	9.063	9.070
55	9.042	9.051	9.049	9.043	9.046	9.046	9.046	9.046	9.050	9.045	9.048
56	9.065	9.057	9.074	9.070	9.066	9.071	9.070	9.068	9.072	9.073	9.071
57	9.056	9.061	9.058	9.066	9.062	9.058	9.060	9.066	9.065	9.063	9.056
58	9.074	9.073	9.083	9.076	9.083	9.083	9.075	9.084	9.076	9.077	9.075
59	9.024	9.026	9.028	9.027	9.025	9.026	9.032	9.031	9.029	9.028	9.032
60	9.055	9.052	9.059	9.057	9.062	9.055	9.063	9.057	9.058	9.064	9.062
61	9.033	9.043	9.034	9.033	9.042	9.036	9.042	9.042	9.034	9.039	9.039
62	9.026	9.038	9.029	9.032	9.034	9.034	9.026	9.026	9.028	9.027	9.032
63	9.032	9.045	9.033	9.041	9.040	9.040	9.034	9.038	9.038	9.040	9.040
64	9.049	9.052	9.056	9.057	9.051	9.058	9.049	9.056	9.055	9.054	9.054
65	9.046	9.051	9.048	9.054	9.048	9.054	9.052	9.049	9.050	9.054	9.053
66	9.045	9.048	9.051	9.054	9.046	9.050	9.048	9.047	9.046	9.051	9.051
67	9.035	9.044	9.039	9.039	9.039	9.037	9.044	9.042	9.042	9.037	9.035
68	9.033	9.042	9.042	9.040	9.039	9.037	9.033	9.037	9.034	9.040	9.041
69	9.037	9.036	9.037	9.037	9.039	9.039	9.038	9.043	9.047	9.040	9.043
70	9.069	9.073	9.079	9.078	9.078	9.077	9.070	9.079	9.073	9.072	9.077
71	9.097	9.104	9.106	9.103	9.099	9.104	9.104	9.098	9.103	9.107	9.103
72	9.024	9.030	9.033	9.033	9.030	9.029	9.029	9.032	9.032	9.025	9.033
73	9.027	9.039	9.031	9.037	9.035	9.028	9.036	9.029	9.028	9.030	9.027
74	9.044	9.046	9.047	9.051	9.047	9.046	9.045	9.047	9.045	9.053	9.049
75	9.033	9.043	9.041	9.042	9.034	9.036	9.033	9.041	9.039	9.041	9.039
Avg.	9.049	9.051	9.055	9.055	9.053	9.054	9.053	9.054	9.053	9.054	9.054
Med.	9.045	9.048	9.049	9.054	9.047	9.050	9.048	9.047	9.050	9.053	9.051
st dev	0.019	0.017	0.021	0.020	0.019	0.021	0.020	0.020	0.020	0.020	0.019
Min.	9.024	9.026	9.028	9.027	9.025	9.026	9.026	9.026	9.028	9.025	9.027
Max.	9.097	9.104	9.106	9.103	9.099	9.104	9.104	9.098	9.103	9.107	9.103

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)									
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
51	0.2584	0.5293	2779	0.0006	0.0008	0.0011	0.0013	0.0014	0.0016	0.0016	0.0018	0.0019	0.0022
52	0.2583	0.5299	2777	0.0004	0.0005	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0018
53	0.2607	0.5302	2725	0.0002	0.0005	0.0007	0.0009	0.0011	0.0014	0.0015	0.0017	0.0020	0.0021
54	0.2597	0.5304	2747	0.0004	0.0006	0.0008	0.0008	0.0011	0.0013	0.0014	0.0016	0.0017	0.0019
55	0.2608	0.5312	2720	0.0002	0.0004	0.0005	0.0006	0.0009	0.0011	0.0014	0.0016	0.0018	0.0020
56	0.2600	0.5294	2744	0.0004	0.0005	0.0008	0.0011	0.0011	0.0013	0.0014	0.0016	0.0018	0.0019
57	0.2584	0.5301	2774	0.0003	0.0004	0.0005	0.0007	0.0009	0.0011	0.0012	0.0013	0.0015	0.0018
58	0.2596	0.5295	2751	0.0002	0.0004	0.0006	0.0008	0.0009	0.0011	0.0014	0.0015	0.0017	0.0018
59	0.2590	0.5296	2764	0.0004	0.0006	0.0007	0.0009	0.0010	0.0013	0.0015	0.0018	0.0020	0.0021
60	0.2576	0.5295	2793	0.0002	0.0002	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0015	0.0016
61	0.2603	0.5314	2730	0.0003	0.0004	0.0006	0.0009	0.0011	0.0013	0.0014	0.0017	0.0019	0.0021
62	0.2597	0.5283	2755	0.0003	0.0004	0.0006	0.0008	0.0009	0.0012	0.0014	0.0016	0.0017	0.0020
63	0.2581	0.5312	2776	0.0004	0.0006	0.0007	0.0009	0.0010	0.0012	0.0014	0.0016	0.0017	0.0020
64	0.2580	0.5300	2782	0.0004	0.0007	0.0008	0.0010	0.0011	0.0013	0.0015	0.0017	0.0020	0.0022
65	0.2586	0.5288	2776	0.0003	0.0004	0.0006	0.0008	0.0009	0.0010	0.0013	0.0014	0.0017	0.0019
66	0.2621	0.5317	2691	0.0006	0.0006	0.0009	0.0009	0.0010	0.0012	0.0013	0.0015	0.0017	0.0019
67	0.2603	0.5298	2735	0.0003	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0017	0.0018
68	0.2616	0.5306	2705	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0017	0.0018	0.0021	0.0023
69	0.2593	0.5288	2761	0.0005	0.0007	0.0009	0.0010	0.0012	0.0013	0.0015	0.0017	0.0017	0.0019
70	0.2594	0.5316	2747	0.0004	0.0005	0.0006	0.0009	0.0010	0.0012	0.0015	0.0017	0.0019	0.0022
71	0.2596	0.5301	2749	0.0002	0.0004	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017	0.0018
72	0.2591	0.5292	2763	0.0002	0.0004	0.0004	0.0006	0.0008	0.0011	0.0012	0.0015	0.0016	0.0017
73	0.2579	0.5284	2793	0.0002	0.0005	0.0008	0.0009	0.0011	0.0013	0.0016	0.0018	0.0021	0.0022
74	0.2592	0.5278	2767	0.0004	0.0006	0.0009	0.0010	0.0012	0.0013	0.0016	0.0017	0.0018	0.0020
75	0.2589	0.5304	2763	0.0006	0.0009	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024
Avg.	0.2594	0.5299	2755	0.0004	0.0005	0.0007	0.0009	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020
Med.	0.2593	0.5299	2761	0.0004	0.0005	0.0007	0.0009	0.0010	0.0012	0.0014	0.0016	0.0017	0.0020
st dev	0.0011	0.0010	26	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	0.2576	0.5278	2691	0.0002	0.0002	0.0003	0.0005	0.0007	0.0009	0.0012	0.0013	0.0015	0.0016
Max.	0.2621	0.5317	2793	0.0006	0.0009	0.0011	0.0013	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024

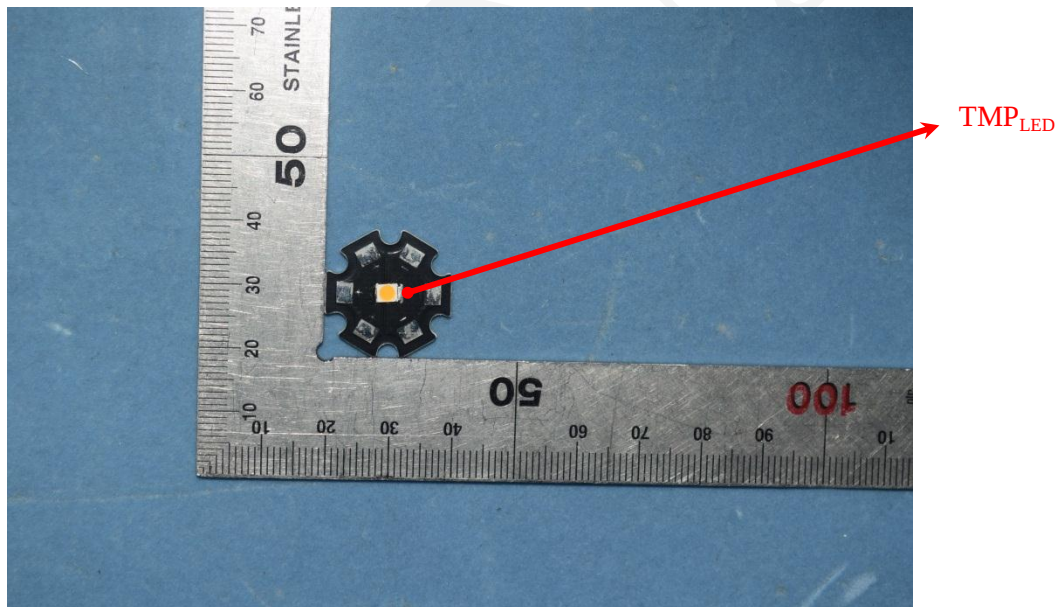
4 - DUT Photo

4.1 #Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



Directions

1. The information marked “superscript #” is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95 confidence interval.
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*****END OF REPORT*****