



TEST REPORT

According to ANSI/IES LM-80-15
For

Seoul Semiconductor Co., LTD

97-11, Sandan-ro 163beon-gil, Danwon-gu, Ansan-si, Gyeonggi-do, Republic of Korea

Model: STW8A2PD-D1-DN

Report Type: 13000 Hours Test Report		Product Type: LED Package	
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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 2019-10-09. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75.

Manufacturer:	Seoul Semiconductor Co., LTD
Part Number:	STW8A2PD-D1-DN
Part Type:	LED Package
#Drive Level:	DC 100mA
#Nominal CCT:	2700 K
#Power:	0.3W
#Average Current Density per LED die:	100.8mA/mm ²
#Average Power Density per LED die:	0.3024W/mm ²
#CRI:	80
#Die Spacing:	0.15mm

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:

Model Name	Series Name	Total Input Current (mA)	Power (W)	Number of dies	Driver current per die (mA)	Current Density per Die (mA/mm ²)	Power Density per PCB (W/mm ²)	Die Spacing (mm)
STW8A2PD-D1-DN	STW*A**D-**-**	100	0.3	2	100	100.8	0.03	0.15

NOTES:

The first * is different product solutions (color coordinates and applications and special solutions, etc.), and the second and third * represent Internal code ,and the fourth and fifth* is different version number, and the six and seven * is different customer code.

. Note:

- 1、 The applicant Seoul Semiconductor Co., LTD declare that their products with model STW8A2PD-D1-DN are the same to the products in report# R2DG191009069-10-13000 and is authorized by original applicant to use their test data.
- 2、 All the data in previous report (R2DG191009069-10-13000) is shared in this report.

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
0.5m integrating sphere	EVERFINE	AIS-2	G185304TA1381172	2020-10-22	2021-10-21
LED Test Source	EVERFINE	LTS-300	P185616CD1371113	2020-10-22	2021-10-21
High Accuracy Array Spectroradiometer	EVERFINE	HAAS-2000	P600674CM1381123	2020-10-22	2021-10-21
Standard Light Source	EVERFINE	D062	1011093	2020-10-20	2021-10-19
Multilayer aging machine	BACL	B2-270	20015	2021-02-24	2022-02-23
DC Power Supply	GUTE	LLA1200112-U	2012082001	2020-08-25	2021-08-24

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 $2^{\circ}C$ below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to $5^{\circ}C$ below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with 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 $25^{\circ}C \pm 2^{\circ}C$, RH <65%.

1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate $u'v'$. 2π 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 $25^{\circ}C \pm 2^{\circ}C$, 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 $U=0.8671^{\circ}C$ ($K=2$), 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: STW8A2PD-D1-DN
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: STW8A2PD-D1-DN
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: STW8A2PD-D1-DN
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
1	25	0	1000hrs	13000hrs	2.404E-06	1.003	>78000 hours
2	25	0	1000hrs	13000hrs	2.753E-06	1.003	>78000 hours
3	25	0	1000hrs	13000hrs	3.026E-06	1.003	>78000 hours

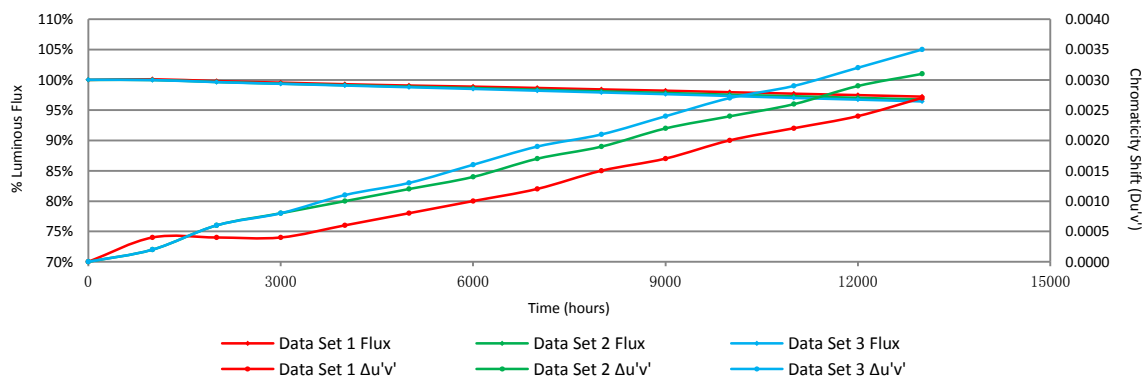
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
1	100.11%	99.80%	99.55%	99.29%	99.07%	98.89%	98.67%	98.43%	98.22%	97.97%	97.73%	97.49%	97.24%
2	99.99%	99.66%	99.39%	99.14%	98.89%	98.66%	98.38%	98.12%	97.86%	97.57%	97.31%	97.05%	96.77%
3	99.95%	99.61%	99.33%	99.05%	98.77%	98.49%	98.20%	97.91%	97.63%	97.33%	97.01%	96.73%	96.43%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
1	0.0004	0.0004	0.0004	0.0006	0.0008	0.0010	0.0012	0.0015	0.0017	0.0020	0.0022	0.0024	0.0027
2	0.0002	0.0006	0.0008	0.0010	0.0012	0.0014	0.0017	0.0019	0.0022	0.0024	0.0026	0.0029	0.0031
3	0.0002	0.0006	0.0008	0.0011	0.0013	0.0016	0.0019	0.0021	0.0024	0.0027	0.0029	0.0032	0.0035

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	11000hrs	12000hrs	13000hrs
1	37.43	100.16	99.87	99.57	99.17	98.90	98.69	98.58	98.53	98.45	98.24	97.97	97.70	97.54
2	37.63	100.37	100.29	99.89	99.42	99.02	98.70	98.46	98.19	97.95	97.90	97.74	97.45	97.16
3	36.38	100.49	100.05	99.84	99.62	99.29	99.07	98.49	98.32	98.10	97.88	97.61	97.28	97.14
4	36.17	100.03	99.64	99.47	99.42	99.34	99.17	99.03	98.37	98.26	97.87	97.54	97.12	96.88
5	37.51	99.81	99.39	99.09	99.01	98.96	98.91	98.85	98.75	98.61	98.37	98.13	97.84	97.52
6	36.39	99.89	99.48	99.20	98.85	98.79	98.68	98.60	98.54	98.49	98.41	98.10	97.91	97.58
7	36.34	100.39	100.14	99.75	99.37	99.26	99.17	98.93	98.82	98.60	98.46	98.13	97.91	97.66
8	36.41	99.89	99.70	99.59	99.51	99.12	99.01	98.74	98.43	98.27	97.97	97.75	97.53	97.23
9	37.52	99.89	99.47	99.23	99.01	98.96	98.77	98.56	98.37	98.16	97.73	97.36	97.17	96.88
10	36.36	99.78	99.42	98.95	98.87	98.79	98.73	98.35	98.10	98.05	97.72	97.33	97.11	96.97
11	35.26	99.66	99.40	99.15	99.06	98.98	98.89	98.55	98.27	98.07	97.90	97.65	97.22	96.85
12	36.75	99.97	99.73	99.54	99.13	98.94	98.86	98.61	98.20	97.96	97.74	97.66	97.25	97.20
13	36.36	100.44	100.08	99.86	99.61	99.26	98.93	98.71	98.40	97.96	97.52	97.22	97.08	97.03
14	36.74	100.27	99.89	99.56	99.29	98.97	98.72	98.31	98.04	97.85	97.47	97.28	97.20	96.98
15	35.91	100.33	100.28	100.11	99.81	99.44	99.33	98.97	98.52	98.08	97.63	97.49	97.44	97.27
16	37.05	100.30	100.16	100.05	99.38	98.89	98.79	98.54	98.27	98.22	98.06	97.89	97.73	97.60
17	37.86	100.18	99.71	99.39	99.26	99.05	98.76	98.49	98.36	98.23	98.10	97.86	97.75	97.52
18	36.31	100.47	100.22	100.03	99.92	99.78	99.70	99.56	99.34	99.04	98.76	98.40	98.38	98.13
19	36.75	99.65	99.51	99.24	98.67	98.45	98.10	97.96	97.90	97.63	97.33	97.12	96.73	96.54
20	37.53	99.81	99.25	99.07	98.75	98.40	98.13	97.97	97.76	97.50	97.12	97.02	96.83	96.54
21	36.71	99.84	99.51	99.29	99.24	99.16	99.07	99.02	98.91	98.83	98.56	98.34	98.12	97.71
22	36.25	99.83	99.39	99.12	99.03	98.98	98.84	98.70	98.54	98.37	98.34	97.93	97.68	97.35
23	34.65	100.12	99.68	99.51	99.05	98.70	98.56	98.41	98.01	97.78	97.75	97.58	97.37	97.06
24	33.55	100.51	100.15	99.97	99.64	99.31	99.02	98.81	98.45	98.06	97.62	97.47	97.17	96.84
25	35.75	100.70	100.62	100.31	100.20	99.92	99.72	99.58	99.41	99.08	98.80	98.60	98.21	97.93
Avg.	36.46	100.11	99.80	99.55	99.29	99.07	98.89	98.67	98.43	98.22	97.97	97.73	97.49	97.24
Med.	36.39	100.12	99.71	99.54	99.26	98.98	98.86	98.60	98.37	98.16	97.90	97.66	97.44	97.20
st dev	0.97	0.30	0.37	0.38	0.37	0.35	0.37	0.38	0.39	0.39	0.43	0.41	0.42	0.41
Min.	33.55	99.65	99.25	98.95	98.67	98.40	98.10	97.96	97.76	97.50	97.12	97.02	96.73	96.54
Max.	37.86	100.70	100.62	100.31	100.20	99.92	99.72	99.58	99.41	99.08	98.80	98.60	98.38	98.13

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

No.	Forward Voltage (V)													
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
1	3.319	3.333	3.327	3.317	3.301	3.324	3.302	3.324	3.323	3.276	3.305	3.328	3.339	3.323
2	3.306	3.320	3.316	3.333	3.340	3.289	3.321	3.301	3.327	3.279	3.325	3.321	3.328	3.326
3	3.301	3.312	3.310	3.330	3.324	3.294	3.326	3.311	3.316	3.313	3.325	3.327	3.322	3.327
4	3.307	3.318	3.308	3.332	3.334	3.323	3.327	3.324	3.325	3.319	3.328	3.332	3.312	3.321
5	3.318	3.331	3.327	3.325	3.328	3.324	3.326	3.302	3.304	3.276	3.333	3.330	3.339	3.332
6	3.305	3.312	3.310	3.327	3.318	3.324	3.326	3.277	3.315	3.272	3.309	3.339	3.343	3.326
7	3.328	3.299	3.291	3.309	3.315	3.319	3.337	3.304	3.315	3.298	3.317	3.316	3.314	3.312
8	3.298	3.310	3.304	3.326	3.325	3.283	3.325	3.289	3.285	3.303	3.315	3.318	3.314	3.323
9	3.309	3.324	3.320	3.338	3.340	3.277	3.316	3.314	3.293	3.275	3.313	3.337	3.316	3.327
10	3.301	3.316	3.310	3.330	3.298	3.294	3.340	3.308	3.311	3.309	3.306	3.347	3.337	3.343
11	3.311	3.322	3.322	3.336	3.301	3.298	3.317	3.318	3.318	3.322	3.311	3.312	3.317	3.321
12	3.309	3.318	3.312	3.330	3.323	3.281	3.298	3.308	3.295	3.273	3.310	3.331	3.337	3.324
13	3.296	3.308	3.308	3.323	3.324	3.303	3.293	3.286	3.326	3.271	3.317	3.329	3.318	3.348
14	3.299	3.310	3.306	3.325	3.306	3.316	3.325	3.298	3.326	3.279	3.302	3.313	3.309	3.317
15	3.309	3.322	3.320	3.338	3.306	3.277	3.286	3.311	3.303	3.320	3.286	3.315	3.331	3.325
16	3.311	3.329	3.320	3.342	3.306	3.283	3.309	3.311	3.292	3.300	3.329	3.314	3.321	3.329
17	3.296	3.318	3.310	3.327	3.322	3.307	3.294	3.304	3.299	3.293	3.293	3.305	3.315	3.313
18	3.287	3.304	3.297	3.320	3.314	3.307	3.290	3.293	3.290	3.283	3.288	3.310	3.332	3.316
19	3.319	3.324	3.327	3.323	3.323	3.318	3.302	3.285	3.320	3.319	3.309	3.314	3.327	3.324
20	3.310	3.324	3.322	3.322	3.326	3.299	3.307	3.293	3.303	3.302	3.298	3.327	3.325	3.325
21	3.305	3.322	3.316	3.332	3.325	3.285	3.338	3.308	3.277	3.318	3.289	3.324	3.319	3.322
22	3.314	3.329	3.324	3.323	3.289	3.304	3.294	3.317	3.293	3.273	3.321	3.319	3.319	3.327
23	3.317	3.299	3.295	3.295	3.288	3.286	3.298	3.297	3.320	3.324	3.328	3.311	3.319	3.319
24	3.313	3.296	3.298	3.295	3.294	3.295	3.283	3.280	3.298	3.282	3.321	3.347	3.349	3.323
25	3.317	3.301	3.306	3.306	3.314	3.317	3.280	3.305	3.317	3.315	3.298	3.314	3.313	3.311
Avg.	3.308	3.316	3.312	3.324	3.315	3.301	3.310	3.303	3.308	3.296	3.311	3.323	3.325	3.324
Med.	3.309	3.318	3.310	3.326	3.318	3.299	3.309	3.304	3.311	3.298	3.311	3.321	3.321	3.324
st dev	0.009	0.011	0.010	0.012	0.015	0.016	0.018	0.013	0.015	0.019	0.014	0.011	0.011	0.008
Min.	3.287	3.296	3.291	3.295	3.288	3.277	3.280	3.277	3.277	3.271	3.286	3.305	3.309	3.311
Max.	3.328	3.333	3.327	3.342	3.340	3.324	3.340	3.324	3.327	3.324	3.333	3.347	3.349	3.348

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)												
				Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	0.2559	0.5252	2852	0.0002	0.0006	0.0007	0.0009	0.0010	0.0011	0.0013	0.0014	0.0015	0.0017	0.0018	0.0019	0.0021
2	0.2616	0.5239	2733	0.0003	0.0000	0.0004	0.0008	0.0009	0.0012	0.0014	0.0015	0.0017	0.0021	0.0023	0.0024	0.0026
3	0.2633	0.5238	2698	0.0004	0.0003	0.0003	0.0005	0.0008	0.0011	0.0014	0.0017	0.0020	0.0024	0.0027	0.0030	0.0033
4	0.2625	0.5233	2717	0.0004	0.0005	0.0004	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0021	0.0023
5	0.2567	0.5259	2831	0.0006	0.0004	0.0003	0.0001	0.0000	0.0001	0.0003	0.0004	0.0006	0.0007	0.0008	0.0010	0.0011
6	0.2629	0.5236	2706	0.0003	0.0004	0.0002	0.0005	0.0008	0.0011	0.0014	0.0019	0.0023	0.0026	0.0030	0.0033	0.0036
7	0.2590	0.5215	2800	0.0004	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018	0.0021	0.0023	0.0025	0.0027
8	0.2598	0.5262	2761	0.0004	0.0002	0.0003	0.0004	0.0006	0.0008	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0024
9	0.2601	0.5226	2772	0.0005	0.0004	0.0001	0.0002	0.0005	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024	0.0028	0.0031
10	0.2647	0.5242	2668	0.0002	0.0002	0.0004	0.0006	0.0009	0.0011	0.0013	0.0015	0.0017	0.0020	0.0022	0.0024	0.0026
11	0.2593	0.5218	2793	0.0005	0.0012	0.0007	0.0008	0.0011	0.0012	0.0015	0.0017	0.0019	0.0020	0.0025	0.0029	0.0038
12	0.2569	0.5219	2846	0.0006	0.0001	0.0001	0.0003	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021
13	0.2601	0.5196	2785	0.0001	0.0003	0.0002	0.0004	0.0007	0.0009	0.0011	0.0014	0.0016	0.0019	0.0021	0.0024	0.0026
14	0.2566	0.5255	2836	0.0004	0.0000	0.0003	0.0006	0.0009	0.0013	0.0016	0.0019	0.0022	0.0025	0.0028	0.0032	0.0035
15	0.2631	0.5213	2711	0.0001	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011	0.0013
16	0.2583	0.5247	2801	0.0001	0.0001	0.0003	0.0007	0.0011	0.0015	0.0019	0.0024	0.0028	0.0032	0.0036	0.0040	0.0044
17	0.2608	0.5278	2733	0.0004	0.0004	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0014
18	0.2614	0.5201	2754	0.0000	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
19	0.2615	0.5233	2737	0.0004	0.0002	0.0006	0.0007	0.0009	0.0012	0.0014	0.0018	0.0022	0.0025	0.0028	0.0031	0.0033
20	0.2601	0.5267	2753	0.0003	0.0004	0.0006	0.0010	0.0013	0.0016	0.0020	0.0024	0.0027	0.0030	0.0034	0.0038	0.0041
21	0.2585	0.5250	2794	0.0001	0.0001	0.0005	0.0009	0.0013	0.0017	0.0021	0.0025	0.0029	0.0033	0.0037	0.0041	0.0045
22	0.2590	0.5251	2783	0.0001	0.0003	0.0008	0.0011	0.0013	0.0014	0.0021	0.0024	0.0028	0.0032	0.0036	0.0039	0.0043
23	0.2583	0.5245	2803	0.0006	0.0003	0.0003	0.0004	0.0005	0.0006	0.0008	0.0009	0.0010	0.0012	0.0013	0.0014	0.0016
24	0.2585	0.5208	2815	0.0009	0.0006	0.0006	0.0006	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011	0.0013	0.0014	0.0015
25	0.2600	0.5262	2758	0.0006	0.0005	0.0005	0.0007	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024	0.0027	0.0030	0.0034
Avg.	0.2600	0.5238	2770	0.0004	0.0004	0.0004	0.0006	0.0008	0.0010	0.0012	0.0015	0.0017	0.0020	0.0022	0.0024	0.0027
Med.	0.2600	0.5239	2772	0.0004	0.0003	0.0004	0.0006	0.0008	0.0011	0.0013	0.0015	0.0017	0.0020	0.0023	0.0024	0.0026
st dev	0.0023	0.0022	49	0.0002	0.0003	0.0002	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011
Min.	0.2559	0.5196	2668	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Max.	0.2647	0.5278	2852	0.0009	0.0012	0.0008	0.0011	0.0013	0.0017	0.0021	0.0025	0.0029	0.0033	0.0037	0.0041	0.0045

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

No.	Φ(lm)	Lumen Maintenance (%)												
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
26	35.76	99.97	99.64	99.50	99.22	98.91	98.71	98.55	98.38	97.96	97.82	97.48	97.09	96.95
27	35.18	100.28	99.77	99.37	99.26	99.03	98.78	98.47	98.10	97.73	97.38	96.90	96.62	96.42
28	36.33	99.86	99.45	99.28	98.82	98.71	98.54	98.29	98.24	97.69	97.41	97.27	97.19	96.83
29	36.95	100.24	99.65	99.38	99.16	98.76	98.40	97.97	97.51	97.29	97.00	96.64	96.29	95.94
30	37.36	99.92	99.60	99.36	99.06	98.74	98.23	98.13	97.51	97.22	96.87	96.68	96.47	96.20
31	37.19	100.11	99.70	99.52	99.22	98.84	98.49	98.06	97.55	97.15	96.88	96.64	96.42	96.21
32	35.24	100.43	100.23	100.03	99.80	99.40	99.23	98.78	98.50	98.27	97.96	97.76	97.36	97.08
33	36.67	100.22	99.95	99.73	99.51	99.15	98.83	98.55	98.23	98.04	97.76	97.46	97.14	96.86
34	36.83	100.05	99.76	99.51	99.21	98.53	98.18	97.99	97.72	97.47	97.20	96.93	96.69	96.33
35	36.21	100.25	100.06	99.72	99.53	99.31	98.90	98.65	98.29	98.07	97.79	97.46	97.21	96.85
36	36.53	99.59	99.21	98.93	98.77	98.60	98.49	98.22	97.95	97.73	97.48	97.24	97.07	96.91
37	35.91	99.81	99.53	99.16	98.55	98.47	98.11	97.74	97.61	97.49	97.13	96.71	96.35	95.99
38	36.56	100.38	99.95	99.37	99.21	99.07	98.96	98.58	98.36	98.11	97.76	97.73	97.62	97.35
39	35.88	99.89	99.58	99.25	99.11	99.05	98.66	98.24	98.02	97.94	97.55	97.30	97.13	96.74
40	35.66	99.78	99.64	99.27	99.05	98.93	98.74	98.18	98.15	97.98	97.50	97.22	96.78	96.63
41	36.09	99.72	99.11	98.78	98.42	98.31	98.17	98.12	97.98	97.87	97.59	97.53	97.26	96.92
42	37.05	99.84	99.24	98.81	98.62	98.52	98.46	98.25	98.22	98.00	97.49	97.14	96.90	96.63
43	36.52	99.95	99.45	99.23	98.93	98.55	98.38	98.27	98.08	98.00	97.86	97.70	97.54	97.26
44	36.40	99.86	99.42	99.29	99.18	99.09	98.98	98.63	98.38	98.16	97.94	97.64	97.47	97.20
45	37.07	99.54	99.16	98.89	98.57	98.46	98.27	98.11	97.92	97.57	97.28	97.01	96.57	96.25
46	36.98	99.62	99.57	99.43	99.22	98.95	98.73	98.51	98.27	97.94	97.70	97.35	97.03	96.78
47	36.82	100.08	100.03	99.92	99.76	99.57	99.43	98.94	98.53	98.13	97.75	97.69	97.56	97.34
48	36.34	99.92	99.78	99.50	99.26	98.71	98.46	98.38	98.32	98.18	97.91	97.52	97.19	96.86
49	36.31	100.50	100.22	100.08	99.89	99.53	99.28	99.23	98.71	98.32	98.15	97.85	97.77	97.52
50	35.71	99.92	99.75	99.44	99.16	98.99	98.96	98.74	98.52	98.29	98.18	97.82	97.45	97.20
Avg.	36.38	99.99	99.66	99.39	99.14	98.89	98.66	98.38	98.12	97.86	97.57	97.31	97.05	96.77
Med.	36.40	99.92	99.64	99.37	99.18	98.91	98.66	98.29	98.22	97.96	97.59	97.35	97.13	96.85
st dev	0.59	0.26	0.31	0.34	0.38	0.34	0.36	0.34	0.34	0.34	0.37	0.39	0.42	0.44
Min.	35.18	99.54	99.11	98.78	98.42	98.31	98.11	97.74	97.51	97.15	96.87	96.64	96.29	95.94
Max.	37.36	100.50	100.23	100.08	99.89	99.57	99.43	99.23	98.71	98.32	98.18	97.85	97.77	97.52

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	11000hrs	12000hrs	13000hrs
26	3.305	3.304	3.307	3.306	3.301	3.300	3.306	3.308	3.303	3.308	3.307	3.302	3.306	3.315
27	3.307	3.281	3.281	3.299	3.303	3.292	3.308	3.306	3.305	3.300	3.315	3.323	3.302	3.316
28	3.309	3.308	3.304	3.318	3.302	3.299	3.344	3.325	3.304	3.298	3.351	3.306	3.307	3.312
29	3.295	3.316	3.310	3.327	3.318	3.293	3.294	3.309	3.305	3.274	3.303	3.316	3.317	3.315
30	3.307	3.322	3.324	3.338	3.336	3.296	3.319	3.337	3.328	3.271	3.322	3.323	3.324	3.309
31	3.310	3.324	3.329	3.339	3.343	3.323	3.328	3.323	3.332	3.325	3.327	3.314	3.304	3.315
32	3.302	3.316	3.314	3.330	3.333	3.322	3.327	3.344	3.337	3.284	3.307	3.308	3.314	3.317
33	3.291	3.308	3.308	3.321	3.327	3.308	3.315	3.305	3.314	3.311	3.314	3.316	3.329	3.329
34	3.312	3.331	3.322	3.341	3.328	3.301	3.306	3.304	3.312	3.320	3.326	3.336	3.347	3.329
35	3.290	3.312	3.308	3.323	3.300	3.332	3.314	3.336	3.322	3.319	3.328	3.321	3.346	3.324
36	3.312	3.329	3.318	3.341	3.293	3.318	3.301	3.289	3.332	3.325	3.329	3.324	3.332	3.323
37	3.286	3.306	3.297	3.315	3.296	3.301	3.311	3.342	3.329	3.297	3.313	3.311	3.323	3.315
38	3.312	3.291	3.291	3.303	3.304	3.307	3.309	3.315	3.347	3.279	3.304	3.319	3.318	3.321
39	3.296	3.306	3.301	3.323	3.314	3.312	3.323	3.316	3.337	3.319	3.310	3.336	3.336	3.318
40	3.316	3.331	3.329	3.343	3.293	3.301	3.306	3.309	3.319	3.288	3.338	3.328	3.324	3.324
41	3.305	3.320	3.320	3.334	3.307	3.307	3.302	3.317	3.317	3.289	3.343	3.324	3.317	3.314
42	3.313	3.331	3.329	3.346	3.325	3.319	3.318	3.341	3.319	3.282	3.298	3.321	3.324	3.343
43	3.309	3.329	3.318	3.339	3.321	3.318	3.301	3.306	3.322	3.315	3.315	3.342	3.329	3.322
44	3.290	3.306	3.301	3.318	3.298	3.308	3.307	3.325	3.308	3.268	3.312	3.338	3.326	3.324
45	3.298	3.318	3.310	3.331	3.327	3.319	3.333	3.309	3.313	3.285	3.344	3.318	3.316	3.324
46	3.312	3.333	3.322	3.343	3.346	3.327	3.312	3.315	3.311	3.310	3.336	3.324	3.329	3.321
47	3.301	3.320	3.310	3.333	3.300	3.282	3.302	3.317	3.339	3.290	3.334	3.326	3.322	3.324
48	3.310	3.318	3.318	3.336	3.327	3.327	3.321	3.328	3.324	3.285	3.333	3.320	3.346	3.325
49	3.287	3.299	3.297	3.317	3.312	3.302	3.295	3.298	3.302	3.308	3.346	3.321	3.329	3.326
50	3.312	3.289	3.278	3.300	3.297	3.276	3.307	3.303	3.293	3.290	3.316	3.331	3.347	3.353
Avg.	3.303	3.314	3.310	3.327	3.314	3.308	3.312	3.317	3.319	3.298	3.323	3.322	3.325	3.322
Med.	3.307	3.316	3.310	3.330	3.312	3.307	3.309	3.315	3.319	3.297	3.322	3.321	3.324	3.322
st dev	0.009	0.014	0.014	0.014	0.016	0.014	0.012	0.015	0.014	0.017	0.015	0.010	0.013	0.009
Min.	3.286	3.281	3.278	3.299	3.293	3.276	3.294	3.289	3.293	3.268	3.298	3.302	3.302	3.309
Max.	3.316	3.333	3.329	3.346	3.346	3.332	3.344	3.344	3.347	3.325	3.351	3.342	3.347	3.353

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	11000hrs	12000hrs
26	0.2608	0.5247	2746	0.0002	0.0006	0.0007	0.0008	0.0009	0.0009	0.0010	0.0011	0.0012	0.0013	0.0014	0.0015	0.0016
27	0.2568	0.5209	2854	0.0003	0.0005	0.0008	0.0011	0.0014	0.0017	0.0020	0.0023	0.0026	0.0030	0.0033	0.0036	0.0039
28	0.2636	0.5257	2683	0.0003	0.0006	0.0008	0.0011	0.0013	0.0016	0.0019	0.0022	0.0026	0.0029	0.0032	0.0035	0.0038
29	0.2596	0.5239	2776	0.0003	0.0004	0.0005	0.0006	0.0007	0.0009	0.0010	0.0011	0.0013	0.0014	0.0015	0.0017	0.0018
30	0.2567	0.5239	2841	0.0004	0.0006	0.0009	0.0013	0.0016	0.0019	0.0022	0.0025	0.0028	0.0032	0.0035	0.0038	0.0041
31	0.2626	0.5252	2706	0.0001	0.0006	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0023	0.0026	0.0028
32	0.2635	0.5218	2702	0.0002	0.0007	0.0007	0.0008	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0013	0.0014	0.0015
33	0.2597	0.5244	2772	0.0002	0.0007	0.0011	0.0014	0.0016	0.0018	0.0022	0.0025	0.0028	0.0030	0.0034	0.0038	0.0041
34	0.2594	0.5241	2779	0.0000	0.0007	0.0009	0.0011	0.0013	0.0016	0.0018	0.0021	0.0024	0.0027	0.0030	0.0033	0.0036
35	0.2618	0.5231	2732	0.0001	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0024	0.0026	0.0028
36	0.2645	0.5242	2671	0.0001	0.0006	0.0009	0.0011	0.0014	0.0017	0.0020	0.0023	0.0026	0.0030	0.0033	0.0036	0.0039
37	0.2605	0.5220	2765	0.0000	0.0005	0.0006	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0014	0.0015
38	0.2568	0.5243	2836	0.0001	0.0005	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018	0.0021	0.0023	0.0025	0.0027	0.0030
39	0.2622	0.5209	2732	0.0002	0.0005	0.0008	0.0011	0.0015	0.0019	0.0023	0.0026	0.0030	0.0034	0.0038	0.0042	0.0046
40	0.2626	0.5221	2719	0.0001	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0024	0.0026	0.0028
41	0.2642	0.5224	2684	0.0004	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018	0.0021	0.0023	0.0025	0.0027	0.0030	0.0032
42	0.2600	0.5237	2769	0.0001	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0023	0.0025	0.0027
43	0.2592	0.5252	2779	0.0001	0.0004	0.0007	0.0009	0.0011	0.0013	0.0016	0.0018	0.0020	0.0022	0.0025	0.0027	0.0029
44	0.2598	0.5236	2774	0.0006	0.0007	0.0008	0.0010	0.0013	0.0017	0.0020	0.0023	0.0027	0.0030	0.0034	0.0037	0.0041
45	0.2585	0.5252	2794	0.0003	0.0006	0.0009	0.0013	0.0017	0.0021	0.0025	0.0029	0.0033	0.0037	0.0041	0.0046	0.0050
46	0.2591	0.5241	2787	0.0003	0.0006	0.0010	0.0014	0.0017	0.0020	0.0024	0.0027	0.0030	0.0034	0.0038	0.0042	0.0044
47	0.2587	0.5222	2805	0.0003	0.0004	0.0009	0.0010	0.0012	0.0014	0.0018	0.0021	0.0023	0.0026	0.0029	0.0032	0.0034
48	0.2624	0.5245	2714	0.0001	0.0004	0.0004	0.0005	0.0006	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013
49	0.2604	0.5261	2750	0.0001	0.0007	0.0008	0.0009	0.0011	0.0012	0.0014	0.0016	0.0017	0.0019	0.0021	0.0023	0.0025
50	0.2592	0.5231	2789	0.0006	0.0007	0.0009	0.0011	0.0013	0.0016	0.0018	0.0020	0.0022	0.0024	0.0027	0.0029	0.0031
Avg.	0.2605	0.5237	2758	0.0002	0.0006	0.0008	0.0010	0.0012	0.0014	0.0017	0.0019	0.0022	0.0024	0.0026	0.0029	0.0031
Med.	0.2600	0.5239	2769	0.0002	0.0006	0.0008	0.0010	0.0012	0.0014	0.0018	0.0020	0.0022	0.0024	0.0027	0.0029	0.0031
st dev	0.0023	0.0014	50	0.0002	0.0001	0.0002	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010	0.0010
Min.	0.2567	0.5209	2671	0.0000	0.0004	0.0004	0.0005	0.0006	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013
Max.	0.2645	0.5261	2854	0.0006	0.0007	0.0011	0.0014	0.0017	0.0021	0.0025	0.0029	0.0033	0.0037	0.0041	0.0046	0.0050

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

No.	Φ(lm)	Lumen Maintenance (%)												
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
51	36.57	100.16	99.59	99.43	99.12	98.93	98.77	98.63	98.25	98.17	97.98	97.68	97.24	96.55
52	36.23	100.41	100.30	100.06	99.78	99.53	99.14	98.87	98.56	98.18	97.79	97.38	97.13	96.96
53	34.90	100.14	99.68	99.48	99.05	98.80	98.34	98.11	97.82	97.68	97.22	96.85	96.56	96.45
54	36.72	100.11	99.70	99.29	98.91	98.69	98.39	97.90	97.82	97.60	97.58	96.98	96.81	96.65
55	35.01	99.91	99.60	99.43	99.17	98.91	98.51	98.26	98.09	97.80	97.54	97.12	96.72	96.34
56	33.50	100.15	99.76	99.55	99.31	98.96	98.66	98.48	98.03	97.82	97.49	97.25	96.96	96.39
57	37.27	100.13	99.68	99.36	99.14	98.77	98.52	98.36	98.15	97.75	97.37	96.99	96.73	96.35
58	35.96	100.22	99.97	99.69	99.42	99.17	98.83	98.53	98.25	98.03	97.83	97.53	97.25	96.72
59	37.66	100.13	99.81	99.60	99.26	99.10	98.96	98.73	98.46	98.06	97.85	97.61	97.40	97.21
60	34.20	99.77	99.50	99.24	99.04	98.68	98.33	98.19	98.01	97.75	97.46	97.05	96.73	96.46
61	37.54	99.89	99.73	99.55	99.20	98.88	98.72	98.45	98.14	98.00	97.63	97.26	96.88	96.64
62	37.04	99.68	99.06	98.65	98.41	98.08	97.95	97.73	97.65	97.19	96.79	96.49	96.27	95.92
63	36.87	100.05	99.57	99.21	99.05	98.92	98.67	98.10	97.67	97.42	97.13	96.75	96.56	96.26
64	36.58	99.78	99.13	98.88	98.58	98.28	97.92	97.59	97.38	97.16	96.97	96.77	96.31	96.12
65	36.34	99.94	99.78	99.45	99.04	98.60	98.24	98.02	97.77	97.58	97.33	97.03	96.84	96.56
66	36.68	99.78	99.73	99.43	98.77	98.36	98.01	97.66	97.33	97.00	96.76	96.54	96.29	96.07
67	36.09	99.61	99.20	98.84	98.67	98.53	98.31	98.06	97.76	97.45	97.12	96.84	96.62	96.31
68	35.19	99.83	99.40	99.12	98.92	98.69	98.49	98.10	97.67	97.44	97.04	96.65	96.39	96.16
69	36.80	99.86	99.76	99.51	99.24	98.97	98.64	98.45	98.26	98.02	97.77	97.50	97.20	96.82
70	34.73	100.03	99.71	99.48	99.28	98.99	98.65	98.21	97.98	97.81	97.49	97.21	96.80	96.37
71	36.61	99.70	99.51	99.24	99.15	98.96	98.69	98.44	97.95	97.41	97.02	96.78	96.59	96.29
72	36.70	99.75	99.54	99.05	98.91	98.75	98.72	98.17	97.87	97.52	97.06	96.59	96.43	96.10
73	36.50	99.89	99.64	99.51	99.26	99.07	98.77	98.38	98.14	97.86	97.64	97.37	97.01	96.71
74	35.61	100.31	99.69	99.41	98.90	98.34	97.98	97.73	97.16	96.91	96.80	96.77	96.43	96.24
75	36.71	99.59	99.29	98.80	98.58	98.31	98.07	97.96	97.49	97.14	96.68	96.38	96.19	96.02
Avg.	36.16	99.95	99.61	99.33	99.05	98.77	98.49	98.20	97.91	97.63	97.33	97.01	96.73	96.43
Med.	36.57	99.91	99.68	99.43	99.05	98.80	98.52	98.19	97.95	97.68	97.37	96.99	96.73	96.37
st dev	1.04	0.22	0.26	0.31	0.30	0.33	0.33	0.33	0.35	0.36	0.38	0.37	0.34	0.31
Min.	33.50	99.59	99.06	98.65	98.41	98.08	97.92	97.59	97.16	96.91	96.68	96.38	96.19	95.92
Max.	37.66	100.41	100.30	100.06	99.78	99.53	99.14	98.87	98.56	98.18	97.98	97.68	97.40	97.21

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

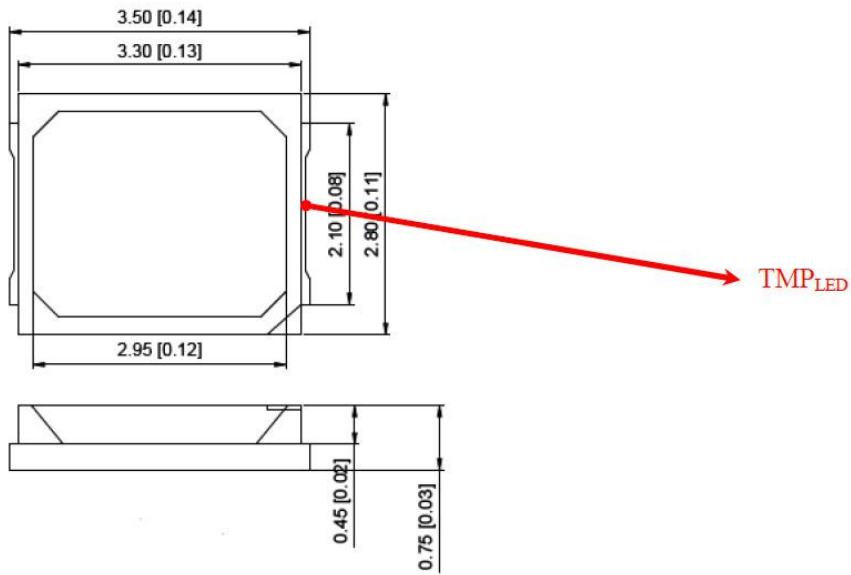
No.	Forward Voltage (V)													
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
51	3.289	3.308	3.304	3.319	3.312	3.292	3.312	3.316	3.319	3.319	3.315	3.319	3.315	3.324
52	3.296	3.314	3.308	3.327	3.321	3.319	3.302	3.315	3.312	3.312	3.316	3.321	3.325	3.325
53	3.317	3.318	3.318	3.315	3.318	3.318	3.319	3.318	3.315	3.313	3.319	3.329	3.329	3.328
54	3.314	3.331	3.329	3.347	3.326	3.323	3.328	3.327	3.312	3.322	3.327	3.325	3.326	3.328
55	3.314	3.331	3.327	3.345	3.356	3.329	3.322	3.322	3.318	3.318	3.315	3.319	3.328	3.329
56	3.313	3.315	3.313	3.319	3.315	3.319	3.318	3.318	3.314	3.316	3.322	3.329	3.329	3.321
57	3.313	3.333	3.327	3.345	3.327	3.325	3.328	3.324	3.319	3.317	3.327	3.321	3.322	3.323
58	3.290	3.308	3.301	3.318	3.313	3.312	3.318	3.325	3.326	3.321	3.322	3.327	3.326	3.327
59	3.314	3.316	3.310	3.324	3.324	3.313	3.329	3.314	3.312	3.328	3.326	3.312	3.319	3.326
60	3.312	3.329	3.323	3.322	3.322	3.320	3.326	3.325	3.326	3.327	3.327	3.329	3.327	3.328
61	3.297	3.316	3.310	3.329	3.327	3.316	3.303	3.318	3.314	3.318	3.325	3.323	3.324	3.324
62	3.303	3.327	3.318	3.335	3.321	3.316	3.322	3.323	3.321	3.325	3.329	3.322	3.319	3.314
63	3.300	3.318	3.314	3.327	3.322	3.328	3.323	3.318	3.319	3.314	3.319	3.318	3.327	3.326
64	3.303	3.320	3.314	3.332	3.326	3.315	3.318	3.321	3.327	3.328	3.316	3.321	3.322	3.329
65	3.307	3.327	3.320	3.336	3.331	3.314	3.323	3.329	3.321	3.326	3.327	3.325	3.326	3.329
66	3.308	3.320	3.324	3.334	3.336	3.318	3.317	3.318	3.311	3.313	3.316	3.319	3.323	3.324
67	3.312	3.327	3.318	3.337	3.309	3.328	3.322	3.326	3.322	3.321	3.325	3.317	3.319	3.314
68	3.283	3.301	3.297	3.311	3.311	3.329	3.327	3.325	3.323	3.322	3.318	3.327	3.328	3.322
69	3.302	3.320	3.316	3.330	3.317	3.321	3.325	3.321	3.313	3.340	3.323	3.327	3.337	3.333
70	3.305	3.314	3.314	3.332	3.323	3.328	3.324	3.326	3.315	3.340	3.315	3.318	3.331	3.321
71	3.306	3.293	3.291	3.304	3.356	3.323	3.325	3.316	3.324	3.342	3.324	3.328	3.327	3.327
72	3.299	3.316	3.312	3.327	3.324	3.326	3.328	3.327	3.324	3.319	3.318	3.325	3.321	3.323
73	3.293	3.310	3.304	3.321	3.324	3.326	3.329	3.325	3.328	3.326	3.321	3.328	3.324	3.323
74	3.307	3.322	3.320	3.335	3.327	3.321	3.334	3.325	3.321	3.341	3.313	3.314	3.315	3.322
75	3.302	3.316	3.314	3.327	3.355	3.324	3.327	3.329	3.323	3.327	3.319	3.316	3.324	3.321
Avg.	3.304	3.318	3.314	3.328	3.326	3.320	3.322	3.322	3.319	3.324	3.321	3.322	3.325	3.324
Med.	3.305	3.318	3.314	3.327	3.324	3.321	3.323	3.323	3.319	3.322	3.321	3.322	3.325	3.324
st dev	0.009	0.010	0.009	0.011	0.013	0.008	0.008	0.005	0.005	0.009	0.005	0.005	0.005	0.004
Min.	3.283	3.293	3.291	3.304	3.309	3.292	3.302	3.314	3.311	3.312	3.313	3.312	3.315	3.314
Max.	3.317	3.333	3.329	3.347	3.356	3.329	3.334	3.329	3.328	3.342	3.329	3.329	3.337	3.333

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)													
				Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
51	0.2568	0.5241	2839	0.0004	0.0009	0.0009	0.0009	0.0010	0.0010	0.0011	0.0011	0.0012	0.0013	0.0014	0.0014	0.0015	0.0016
52	0.2637	0.5205	2703	0.0000	0.0007	0.0010	0.0014	0.0017	0.0021	0.0024	0.0028	0.0031	0.0035	0.0038	0.0042	0.0045	
53	0.2628	0.5227	2712	0.0004	0.0001	0.0002	0.0004	0.0006	0.0009	0.0011	0.0013	0.0015	0.0017	0.0020	0.0022	0.0024	
54	0.2589	0.5229	2796	0.0002	0.0008	0.0010	0.0013	0.0016	0.0019	0.0022	0.0025	0.0027	0.0030	0.0033	0.0036	0.0039	
55	0.2634	0.5227	2700	0.0003	0.0004	0.0008	0.0012	0.0016	0.0021	0.0025	0.0030	0.0034	0.0039	0.0043	0.0048	0.0052	
56	0.2602	0.5244	2762	0.0010	0.0008	0.0010	0.0012	0.0015	0.0018	0.0021	0.0025	0.0028	0.0032	0.0035	0.0039	0.0042	
57	0.2576	0.5255	2813	0.0001	0.0007	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0014	0.0015	0.0016	0.0017	0.0018	
58	0.2644	0.5220	2681	0.0001	0.0006	0.0008	0.0011	0.0013	0.0016	0.0019	0.0022	0.0026	0.0029	0.0032	0.0035	0.0038	
59	0.2584	0.5248	2799	0.0002	0.0006	0.0009	0.0012	0.0015	0.0017	0.0020	0.0023	0.0026	0.0029	0.0032	0.0035	0.0038	
60	0.2608	0.5194	2770	0.0004	0.0002	0.0005	0.0008	0.0011	0.0014	0.0017	0.0021	0.0024	0.0027	0.0030	0.0033	0.0036	
61	0.2566	0.5251	2837	0.0003	0.0006	0.0008	0.0011	0.0014	0.0017	0.0021	0.0024	0.0027	0.0030	0.0033	0.0036	0.0039	
62	0.2588	0.5246	2791	0.0003	0.0007	0.0009	0.0011	0.0014	0.0017	0.0020	0.0023	0.0026	0.0029	0.0032	0.0035	0.0038	
63	0.2608	0.5271	2736	0.0001	0.0007	0.0010	0.0013	0.0016	0.0018	0.0021	0.0024	0.0027	0.0030	0.0033	0.0035	0.0038	
64	0.2600	0.5202	2785	0.0000	0.0006	0.0008	0.0011	0.0015	0.0019	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0047	
65	0.2633	0.5226	2702	0.0002	0.0006	0.0009	0.0012	0.0016	0.0019	0.0023	0.0026	0.0030	0.0033	0.0037	0.0040	0.0044	
66	0.2630	0.5239	2703	0.0002	0.0006	0.0009	0.0012	0.0014	0.0017	0.0019	0.0022	0.0025	0.0028	0.0031	0.0033	0.0036	
67	0.2651	0.5248	2657	0.0002	0.0007	0.0007	0.0008	0.0008	0.0009	0.0009	0.0010	0.0011	0.0011	0.0012	0.0013	0.0014	
68	0.2633	0.5201	2712	0.0002	0.0005	0.0008	0.0011	0.0014	0.0016	0.0019	0.0022	0.0025	0.0028	0.0030	0.0033	0.0036	
69	0.2590	0.5238	2791	0.0002	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018	0.0021	0.0023	0.0025	0.0027	0.0030	0.0032	
70	0.2643	0.5237	2677	0.0001	0.0007	0.0010	0.0014	0.0017	0.0021	0.0024	0.0028	0.0031	0.0035	0.0038	0.0042	0.0045	
71	0.2563	0.5244	2847	0.0002	0.0005	0.0008	0.0012	0.0016	0.0019	0.0023	0.0026	0.0030	0.0034	0.0037	0.0041	0.0044	
72	0.2576	0.5232	2824	0.0000	0.0004	0.0007	0.0010	0.0013	0.0016	0.0019	0.0022	0.0025	0.0028	0.0031	0.0034	0.0037	
73	0.2635	0.5271	2680	0.0003	0.0007	0.0009	0.0010	0.0011	0.0013	0.0014	0.0015	0.0017	0.0018	0.0019	0.0021	0.0022	
74	0.2606	0.5228	2759	0.0002	0.0006	0.0007	0.0008	0.0009	0.0011	0.0013	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	
75	0.2613	0.5235	2742	0.0002	0.0008	0.0009	0.0009	0.0011	0.0012	0.0014	0.0015	0.0017	0.0019	0.0021	0.0022	0.0024	
Avg.	0.2608	0.5234	2753	0.0002	0.0006	0.0008	0.0011	0.0013	0.0016	0.0019	0.0021	0.0024	0.0027	0.0029	0.0032	0.0035	
Med.	0.2608	0.5237	2759	0.0002	0.0006	0.0009	0.0011	0.0014	0.0017	0.0019	0.0022	0.0026	0.0029	0.0032	0.0035	0.0038	
st dev	0.0027	0.0020	58	0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0008	0.0009	0.0010	
Min.	0.2563	0.5194	2657	0.0000	0.0001	0.0002	0.0004	0.0006	0.0009	0.0009	0.0010	0.0011	0.0011	0.0012	0.0013	0.0014	
Max.	0.2651	0.5271	2847	0.0010	0.0009	0.0010	0.0014	0.0017	0.0021	0.0025	0.0030	0.0034	0.0039	0.0043	0.0048	0.0052	

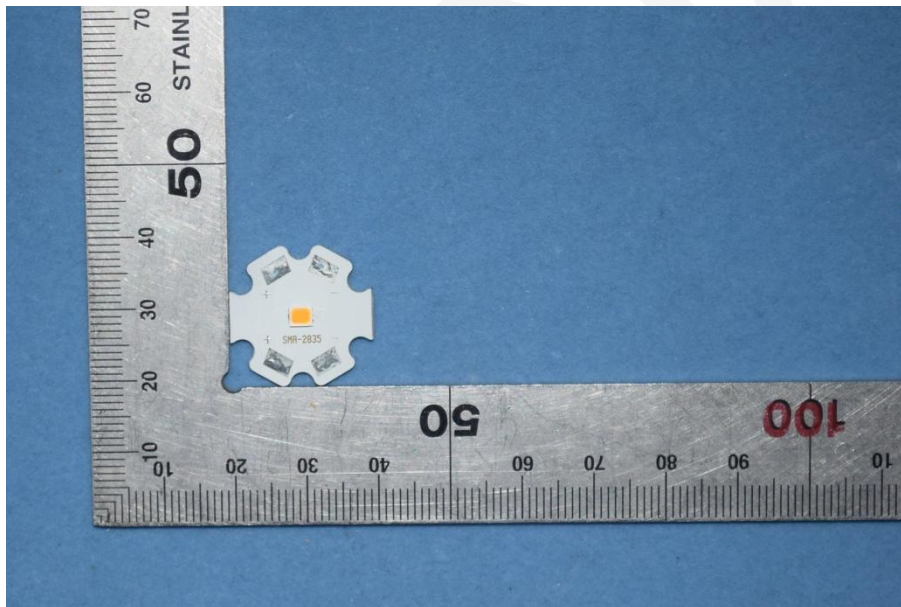
4 - DUT Photo

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 $K=2$ with the 95% confidence interval.
5. This report cannot be reproduced except in full, without prior written approval of the Company.
6. 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.

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