



TEST REPORT

According to ANSI/IES LM-80-15
For

Shenzhen Runlite Technology Co.,Ltd

#Building A15, Tantou the 4th Industrial Estate, SongGang Town, BaoAn District, ShenZhen,
China

Model: P28351-W27SF0F1IB5B7-MJ00

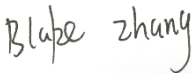
Report Type: 12000 Hours Test Report		Product Type: LED Package
Reviewed By:	Pote Wang 	
Report Number:	RSZ210128508-10-12000-M1	
Test Date:	2021-02-05 to 2023-11-04	
Report Date:	2023-12-06	
Approved by:	Blake Zhang / EE Engineer 	
Revised Note:	The previous report RSZ210128508-10-12000 is replaced by this report on 2023-12-06	
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588	

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Note:

The data marked**come from the test report RSZ210128508-10-10000 issued by Bay Area Compliance Laboratories Corp (Shenzhen) on 2022-09-29 (NVLAP Lab Cod 200707-0)

Bay Area Compliance Laboratories Corp. (Shenzhen) is EPA-Recognized Laboratories and the ORG ID: 1105318

1 - General Information

1.1 Description of LED Light Sources[#]

Sample Size:

75 PCS test samples were in good condition and received on 2021-01-28. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75.

Manufacturer:	Shenzhen Runlite Technology Co.,Ltd
Part Number:	P28351-W27SF0F1IB5B7-MJ00
Part Type:	LED Package
Drive Level:	DC 150mA
Nominal CCT:	2700K
Power:	0.5W
Average Current Density per LED die:	2075mA/mm ²
Average Power Density per LED die:	6.9W/mm ²
CRI:	97
Die Spacing:	N/A

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	CCT (typ.)	Series	Parallel	Power density per PCB (W/mm ²)	Current density per LED die (mA/mm ²)	Current per die (mA)	Distance between of dies (mm)	Current (mA)
P28351-W27SF0F1IB5B7-MJ00	2700	1	1	0.0459	2075	150	N/A	150
X2835X-WXXXXXXXXXXXX-XXXX-AA	≥2200	1	1	0.0306	1383	100	N/A	100
X2835X-WXXXXXXXXXXXX-XXXX-AA	≥2200	1	1	0.018	830	60	N/A	60
X2835X-WXXXXXXXXXXXX-XXXX-AA	≥2200	1	1	0.009	415	30	N/A	30
X2835X-WXXXXXXXXXXXX-XXXX-AA	≥2200	1	1	0.006	276	20	N/A	20

Note:

Table "X" means internal code number, it can be Numbers or letters.

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	2023-09-02	2024-09-11
LED Test Source	EVERFINE	LTS-300	P185616CD1371113	2023-09-02	2024-09-11
High Accuracy Array Spectroradiometer	EVERFINE	HAAS-2000	P600674CM1381123	2023-09-02	2024-09-11
Standard Light Source	EVERFINE	D062	M133799CM1381112	2023-05-12	2025-05-11
Multilayer aging machine	BACL	B2-270	20013	2023-10-16	2024-10-15
Program-controlled D.C. Stabilized Voltage Supply	Hanshenpuyuan	HSPY-60-03	N/A	2023-09-02	2024-09-01

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 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 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 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 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 $U=21\text{K}$ (K=2), at the 95% confidence level.

The uncertainty of the temperature is $U=0.8671^{\circ}\text{C}$ (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, 150mA

Part Number: P28351-W27SF0F1IB5B7-MJ00
Number of Units: 25
Case Temperature: >53°C
Ambient Temperature: >50°C
Life Test Drive Current: 150mA
Measurement Current: 150mA

Data Set 2: 85°C, 150mA

Part Number: P28351-W27SF0F1IB5B7-MJ00
Number of Units: 25
Case Temperature: >83°C
Ambient Temperature: >80°C
Life Test Drive Current: 150mA
Measurement Current: 150mA

Data Set 3: 105°C, 150mA

Part Number: P28351-W27SF0F1IB5B7-MJ00
Number of Units: 25
Case Temperature: >103°C
Ambient Temperature: >100°C
Life Test Drive Current: 150mA
Measurement Current: 150mA

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 ₉₀ Lifetime
1	25	0	1000hrs	12000hrs	2.410E-06	1.004	>72000 hours	45000 hours
2	25	0	1000hrs	12000hrs	2.736E-06	1.003	>72000 hours	40000 hours
3	25	0	1000hrs	12000hrs	3.132E-06	1.004	>72000 hours	35000 hours

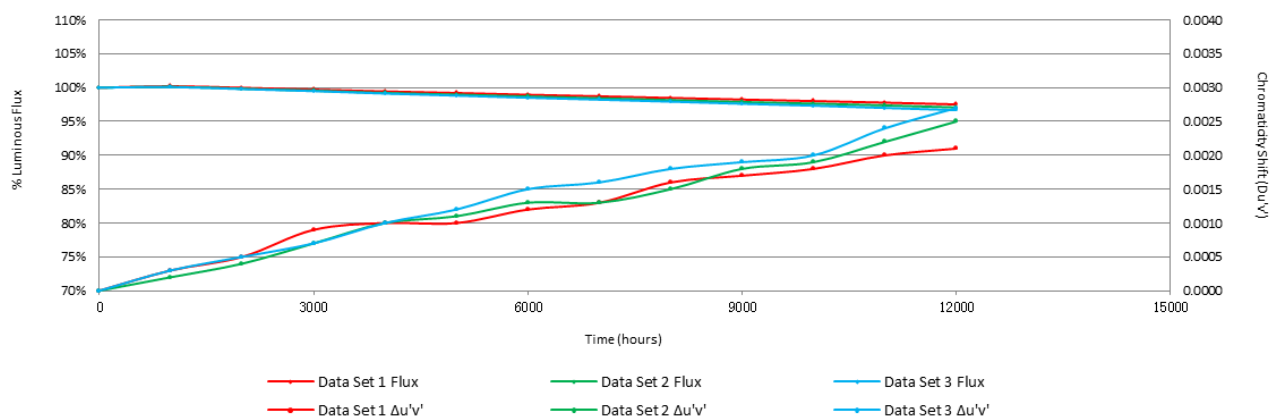
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	**10000 hrs	11000hrs	12000hrs
1	100.23%	99.98%	99.72%	99.45%	99.22%	98.96%	98.73%	98.48%	98.24%	98.02%	97.79%	97.53%
2	100.13%	99.85%	99.56%	99.22%	98.98%	98.70%	98.44%	98.17%	97.89%	97.65%	97.38%	97.08%
3	100.10%	99.79%	99.50%	99.13%	98.83%	98.52%	98.23%	97.94%	97.63%	97.34%	97.01%	96.68%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	**10000 hrs	11000hrs	12000hrs
1	0.0003	0.0005	0.0009	0.0010	0.0010	0.0012	0.0013	0.0016	0.0017	0.0018	0.0020	0.0021
2	0.0002	0.0004	0.0007	0.0010	0.0011	0.0013	0.0013	0.0015	0.0018	0.0019	0.0022	0.0025
3	0.0003	0.0005	0.0007	0.0010	0.0012	0.0015	0.0016	0.0018	0.0019	0.0020	0.0024	0.0027

Average Lumen Maintenance and Chromaticity Shift VS. Time



Note:

The data marked**come from the test report RSZ210128508-10-10000 issued by Bay Area Compliance Laboratories Corp (Shenzhen) on 2022-09-29 (NVLAP Lab Cod 200707-0)

3 - Test Data

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

No.	Φ(lm)	Lumen Maintenance (%)											
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	**10000hrs	11000hrs	12000hrs
1	53.19	100.19	99.72	99.44	99.23	98.80	98.48	98.35	97.93	97.86	97.59	97.31	97.07
2	52.88	100.25	100.15	99.87	99.43	99.28	99.07	98.68	98.22	98.05	97.90	97.47	97.13
3	52.55	100.36	100.27	99.90	99.58	99.33	99.03	98.63	98.61	98.48	98.21	97.85	97.66
4	51.36	99.96	99.79	99.71	99.28	99.01	98.91	98.75	98.54	98.19	97.99	97.61	97.41
5	52.30	100.19	99.83	99.77	99.69	99.64	99.35	99.14	98.95	98.66	98.45	98.20	97.97
6	52.31	100.23	99.85	99.71	99.68	99.58	99.43	99.22	99.04	98.93	98.74	98.60	98.39
7	52.53	100.25	99.90	99.79	99.70	99.64	99.28	98.84	98.57	98.38	98.25	98.12	97.77
8	52.02	100.19	99.75	99.35	99.15	98.90	98.62	98.44	98.15	98.00	97.75	97.58	97.44
9	52.28	100.13	100.02	99.60	99.22	99.10	98.85	98.49	98.20	97.80	97.59	97.13	96.96
10	51.91	100.19	100.10	99.92	99.61	99.06	98.81	98.50	98.15	97.98	97.75	97.40	97.01
11	51.27	100.10	99.92	99.59	99.53	98.95	98.58	98.52	98.42	98.03	97.80	97.56	97.21
12	52.48	99.98	99.85	99.43	99.22	99.05	98.70	98.67	98.38	98.04	97.77	97.39	97.18
13	51.92	100.17	99.94	99.81	99.17	98.83	98.59	98.54	98.32	97.90	97.69	97.36	97.00
14	52.01	100.04	99.87	99.60	99.02	98.87	98.65	98.56	98.46	98.44	98.19	98.00	97.81
15	51.93	100.33	99.94	99.73	99.44	99.27	99.02	98.81	98.69	98.59	98.32	98.17	97.88
16	52.55	100.36	100.27	100.13	99.79	99.52	99.24	99.30	98.95	98.90	98.78	98.69	98.33
17	52.23	100.21	99.85	99.52	99.46	99.33	99.06	98.93	98.76	98.43	98.18	97.89	97.65
18	52.59	100.17	100.02	99.66	99.56	99.54	99.47	99.18	99.14	98.67	98.40	98.31	98.14
19	52.46	100.32	99.98	99.60	99.56	99.20	98.91	98.36	98.00	97.98	97.69	97.62	97.24
20	52.41	100.21	99.90	99.47	99.31	98.97	98.70	98.26	97.75	97.58	97.33	97.23	96.91
21	52.81	100.32	100.04	99.66	99.39	99.15	98.94	98.79	98.60	98.47	98.24	98.05	97.80
22	53.13	100.26	100.06	99.81	99.64	99.42	99.17	98.66	98.48	98.06	97.82	97.67	97.38
23	52.66	100.44	99.94	99.75	99.58	99.56	99.24	99.18	98.73	98.25	98.01	97.91	97.65
24	52.28	100.36	100.08	100.06	99.45	99.12	99.02	98.72	98.49	98.05	97.93	97.59	97.42
25	51.80	100.52	100.37	100.17	99.56	99.38	99.00	98.86	98.55	98.36	98.11	97.93	97.84
Avg.	52.31	100.23	99.98	99.72	99.45	99.22	98.96	98.73	98.48	98.24	98.02	97.79	97.53
Med.	52.31	100.21	99.94	99.71	99.46	99.20	99.00	98.68	98.49	98.19	97.99	97.67	97.44
st dev	0.47	0.13	0.16	0.21	0.20	0.27	0.28	0.29	0.35	0.35	0.36	0.41	0.43
Min.	51.27	99.96	99.72	99.35	99.02	98.80	98.48	98.26	97.75	97.58	97.33	97.13	96.91
Max.	53.19	100.52	100.37	100.17	99.79	99.64	99.47	99.30	99.14	98.93	98.78	98.69	98.39

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

No.	Forward Voltage (V)												
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	**10000hrs	11000hrs	12000hrs
1	3.116	3.115	3.109	3.113	3.109	3.112	3.111	3.103	3.109	3.105	3.119	3.109	3.109
2	3.127	3.126	3.118	3.126	3.119	3.119	3.124	3.116	3.122	3.117	3.137	3.102	3.120
3	3.110	3.106	3.106	3.107	3.106	3.104	3.103	3.099	3.103	3.119	3.122	3.113	3.120
4	3.110	3.104	3.105	3.107	3.104	3.102	3.107	3.097	3.103	3.108	3.114	3.107	3.132
5	3.110	3.106	3.104	3.106	3.105	3.102	3.107	3.103	3.132	3.126	3.120	3.118	3.118
6	3.111	3.108	3.106	3.108	3.105	3.106	3.107	3.099	3.103	3.108	3.131	3.106	3.122
7	3.102	3.104	3.098	3.103	3.096	3.096	3.099	3.091	3.097	3.121	3.107	3.127	3.110
8	3.118	3.110	3.109	3.112	3.110	3.109	3.107	3.103	3.107	3.105	3.129	3.109	3.108
9	3.117	3.108	3.107	3.108	3.105	3.107	3.107	3.097	3.101	3.102	3.118	3.109	3.119
10	3.112	3.104	3.103	3.104	3.102	3.102	3.103	3.095	3.103	3.105	3.115	3.119	3.131
11	3.111	3.103	3.104	3.105	3.102	3.100	3.103	3.099	3.107	3.109	3.118	3.119	3.107
12	3.106	3.100	3.098	3.099	3.098	3.096	3.095	3.091	3.105	3.106	3.104	3.105	3.134
13	3.111	3.105	3.105	3.107	3.103	3.107	3.103	3.099	3.109	3.113	3.108	3.109	3.117
14	3.105	3.115	3.113	3.115	3.111	3.118	3.115	3.139	3.139	3.134	3.119	3.116	3.118
15	3.116	3.112	3.109	3.109	3.108	3.109	3.107	3.103	3.113	3.116	3.112	3.107	3.107
16	3.112	3.106	3.105	3.103	3.104	3.103	3.099	3.099	3.107	3.113	3.106	3.109	3.107
17	3.110	3.107	3.103	3.105	3.107	3.101	3.107	3.099	3.118	3.108	3.110	3.119	3.123
18	3.110	3.106	3.102	3.105	3.101	3.102	3.099	3.099	3.105	3.104	3.108	3.125	3.134
19	3.112	3.106	3.105	3.104	3.106	3.102	3.103	3.099	3.109	3.111	3.108	3.132	3.107
20	3.114	3.105	3.107	3.107	3.104	3.104	3.103	3.099	3.111	3.104	3.109	3.120	3.124
21	3.110	3.104	3.103	3.104	3.101	3.102	3.103	3.099	3.107	3.107	3.106	3.125	3.118
22	3.110	3.108	3.104	3.104	3.106	3.102	3.099	3.101	3.109	3.109	3.105	3.127	3.119
23	3.112	3.108	3.106	3.102	3.104	3.108	3.103	3.099	3.107	3.104	3.107	3.109	3.120
24	3.105	3.099	3.098	3.096	3.102	3.098	3.099	3.095	3.101	3.106	3.101	3.147	3.108
25	3.110	3.107	3.104	3.102	3.102	3.105	3.103	3.103	3.107	3.109	3.107	3.146	3.109
Avg.	3.111	3.107	3.105	3.106	3.105	3.105	3.105	3.101	3.109	3.111	3.114	3.117	3.118
Med.	3.111	3.106	3.105	3.105	3.104	3.103	3.103	3.099	3.107	3.108	3.110	3.116	3.118
st dev	0.005	0.005	0.004	0.006	0.005	0.006	0.006	0.009	0.010	0.008	0.009	0.012	0.009
Min.	3.102	3.099	3.098	3.096	3.096	3.096	3.095	3.091	3.097	3.102	3.101	3.102	3.107
Max.	3.127	3.126	3.118	3.126	3.119	3.119	3.124	3.139	3.139	3.134	3.137	3.147	3.134

3.3 Data Set 1, 55°C, 150mA (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	0.2593	0.5316	2750	0.0004	0.0008	0.0009	0.0010	0.0010	0.0010	0.0014	0.0016	0.0016	0.0018	0.0019	0.0021
2	0.2600	0.5301	2740	0.0005	0.0010	0.0009	0.0011	0.0013	0.0013	0.0016	0.0015	0.0017	0.0016	0.0018	0.0019
3	0.2595	0.5290	2756	0.0004	0.0008	0.0011	0.0011	0.0011	0.0011	0.0014	0.0016	0.0017	0.0020	0.0021	0.0023
4	0.2632	0.5305	2673	0.0004	0.0009	0.0010	0.0010	0.0011	0.0011	0.0013	0.0016	0.0017	0.0018	0.0020	0.0022
5	0.2621	0.5307	2694	0.0004	0.0007	0.0008	0.0011	0.0009	0.0013	0.0014	0.0015	0.0017	0.0019	0.0021	0.0023
6	0.2609	0.5305	2720	0.0002	0.0004	0.0006	0.0009	0.0009	0.0013	0.0014	0.0014	0.0016	0.0019	0.0020	0.0022
7	0.2590	0.5303	2761	0.0004	0.0006	0.0010	0.0011	0.0010	0.0012	0.0016	0.0019	0.0021	0.0020	0.0022	0.0023
8	0.2621	0.5320	2691	0.0002	0.0005	0.0008	0.0008	0.0010	0.0008	0.0016	0.0015	0.0017	0.0019	0.0020	0.0022
9	0.2621	0.5315	2691	0.0001	0.0003	0.0008	0.0010	0.0010	0.0013	0.0013	0.0017	0.0017	0.0017	0.0019	0.0021
10	0.2621	0.5301	2697	0.0003	0.0005	0.0009	0.0010	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024
11	0.2607	0.5286	2732	0.0004	0.0003	0.0008	0.0009	0.0008	0.0012	0.0009	0.0012	0.0016	0.0016	0.0017	0.0018
12	0.2611	0.5310	2715	0.0004	0.0005	0.0009	0.0011	0.0011	0.0015	0.0014	0.0017	0.0019	0.0019	0.0021	0.0022
13	0.2618	0.5311	2700	0.0001	0.0002	0.0008	0.0009	0.0009	0.0014	0.0013	0.0016	0.0017	0.0019	0.0021	0.0023
14	0.2604	0.5298	2735	0.0004	0.0005	0.0010	0.0010	0.0010	0.0011	0.0013	0.0015	0.0017	0.0019	0.0020	0.0022
15	0.2601	0.5296	2741	0.0001	0.0003	0.0008	0.0009	0.0009	0.0012	0.0014	0.0015	0.0017	0.0016	0.0017	0.0019
16	0.2599	0.5308	2739	0.0003	0.0004	0.0008	0.0010	0.0010	0.0011	0.0012	0.0015	0.0017	0.0017	0.0018	0.0020
17	0.2595	0.5317	2745	0.0003	0.0004	0.0010	0.0011	0.0010	0.0012	0.0015	0.0017	0.0019	0.0019	0.0020	0.0022
18	0.2606	0.5308	2725	0.0002	0.0004	0.0008	0.0010	0.0010	0.0013	0.0014	0.0016	0.0017	0.0018	0.0020	0.0022
19	0.2609	0.5304	2722	0.0002	0.0004	0.0008	0.0010	0.0010	0.0010	0.0008	0.0017	0.0016	0.0018	0.0019	0.0021
20	0.2608	0.5314	2719	0.0002	0.0003	0.0007	0.0010	0.0009	0.0010	0.0011	0.0015	0.0016	0.0017	0.0018	0.0020
21	0.2592	0.5301	2758	0.0002	0.0004	0.0008	0.0011	0.0009	0.0010	0.0010	0.0014	0.0016	0.0017	0.0019	0.0021
22	0.2578	0.5301	2788	0.0003	0.0005	0.0009	0.0010	0.0012	0.0013	0.0012	0.0019	0.0018	0.0022	0.0024	0.0026
23	0.2605	0.5311	2727	0.0002	0.0004	0.0007	0.0010	0.0009	0.0010	0.0011	0.0016	0.0017	0.0018	0.0019	0.0021
24	0.2604	0.5304	2730	0.0002	0.0004	0.0008	0.0010	0.0010	0.0011	0.0012	0.0013	0.0014	0.0016	0.0018	0.0019
25	0.2629	0.5298	2683	0.0002	0.0003	0.0008	0.0008	0.0009	0.0009	0.0009	0.0013	0.0016	0.0017	0.0018	0.0020
Avg.	0.2607	0.5305	2725	0.0003	0.0005	0.0009	0.0010	0.0010	0.0012	0.0013	0.0016	0.0017	0.0018	0.0020	0.0021
Med.	0.2606	0.5305	2727	0.0003	0.0004	0.0008	0.0010	0.0010	0.0012	0.0013	0.0016	0.0017	0.0018	0.0020	0.0022
st dev	0.0013	0.0008	28	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002
Min.	0.2578	0.5286	2673	0.0001	0.0002	0.0006	0.0008	0.0008	0.0008	0.0008	0.0012	0.0014	0.0016	0.0017	0.0018
Max.	0.2632	0.5320	2788	0.0005	0.0010	0.0011	0.0011	0.0013	0.0015	0.0016	0.0019	0.0021	0.0022	0.0024	0.0026

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

No.	Φ(lm)	Lumen Maintenance (%)											
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	**10000hrs	11000hrs	12000hrs
26	52.31	100.29	100.19	99.98	99.90	99.69	99.68	99.43	98.99	98.62	98.36	97.92	97.51
27	52.29	100.29	100.08	99.75	99.69	99.66	99.22	98.78	98.66	98.32	98.05	97.59	97.48
28	52.81	100.27	99.91	99.72	99.62	99.51	98.98	98.90	98.45	98.24	97.97	97.69	97.44
29	51.17	100.31	99.96	99.75	99.59	99.22	99.18	98.85	98.57	98.42	98.10	97.71	97.44
30	52.66	100.49	100.25	99.94	99.54	99.20	98.97	98.80	98.52	98.21	97.93	97.74	97.34
31	51.60	100.06	99.67	99.50	99.15	98.97	98.59	98.35	98.33	98.00	97.69	97.34	96.94
32	52.35	99.94	99.64	99.48	99.03	98.66	98.36	98.03	97.75	97.40	97.21	97.00	96.73
33	51.04	100.08	99.84	99.73	99.12	99.10	98.98	98.67	98.43	98.26	98.00	97.83	97.53
34	52.52	100.08	99.92	99.60	99.22	99.07	98.82	98.51	98.31	98.00	97.70	97.51	97.16
35	51.69	100.23	99.98	99.59	99.28	99.07	98.84	98.65	98.43	98.14	97.83	97.43	97.14
36	51.03	100.24	99.80	99.59	99.35	99.08	99.00	98.71	98.53	98.16	97.96	97.69	97.30
37	51.99	99.90	99.60	99.48	98.96	98.77	98.44	98.13	97.94	97.60	97.35	97.04	96.67
38	50.91	99.88	99.59	99.45	99.08	98.74	98.45	98.17	97.78	97.53	97.29	97.17	96.76
39	51.79	100.02	99.90	99.17	98.82	98.36	97.99	97.82	97.43	97.32	97.03	96.78	96.60
40	51.15	100.22	99.92	99.71	99.41	99.18	98.98	98.73	98.53	98.16	97.95	97.75	97.54
41	51.92	100.10	99.71	99.48	99.17	98.88	98.59	98.15	97.80	97.75	97.52	97.30	97.13
42	52.64	100.19	99.94	99.34	99.13	98.94	98.59	98.31	98.16	97.78	97.57	97.40	96.98
43	52.76	99.98	99.77	99.49	99.09	98.92	98.75	98.41	97.71	97.44	97.27	97.08	96.70
44	52.47	100.11	99.71	99.37	99.16	99.05	98.70	98.61	98.44	98.23	98.09	97.81	97.43
45	51.87	100.44	100.02	99.69	99.07	98.82	98.52	98.32	98.01	97.90	97.76	97.53	97.34
46	51.50	100.33	99.90	99.51	98.95	98.60	98.27	97.90	97.59	97.26	97.03	96.80	96.62
47	52.59	100.11	99.85	99.56	99.01	98.52	98.02	97.62	97.49	97.11	96.96	96.71	96.50
48	51.35	100.02	99.90	99.51	98.97	98.85	98.50	98.23	97.88	97.76	97.45	97.27	97.08
49	50.83	99.84	99.59	99.37	99.00	98.66	98.25	98.09	97.89	97.52	97.29	96.81	96.40
50	52.40	99.71	99.48	99.27	99.22	99.03	98.89	98.72	98.53	98.15	97.92	97.52	97.27
Avg.	51.91	100.13	99.85	99.56	99.22	98.98	98.70	98.44	98.17	97.89	97.65	97.38	97.08
Med.	51.92	100.11	99.90	99.51	99.15	98.97	98.70	98.41	98.31	98.00	97.70	97.43	97.14
st dev	0.65	0.19	0.19	0.19	0.27	0.33	0.39	0.40	0.42	0.41	0.39	0.37	0.36
Min.	50.83	99.71	99.48	99.17	98.82	98.36	97.99	97.62	97.43	97.11	96.96	96.71	96.40
Max.	52.81	100.49	100.25	99.98	99.90	99.69	99.68	99.43	98.99	98.62	98.36	97.92	97.54

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

No.	Forward Voltage (V)												
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	**10000hrs	11000hrs	12000hrs
26	3.120	3.114	3.111	3.113	3.114	3.110	3.120	3.118	3.116	3.114	3.117	3.115	3.107
27	3.106	3.104	3.104	3.102	3.105	3.103	3.106	3.105	3.101	3.111	3.105	3.108	3.123
28	3.110	3.104	3.102	3.104	3.105	3.104	3.108	3.103	3.107	3.104	3.106	3.108	3.135
29	3.123	3.115	3.113	3.114	3.112	3.112	3.115	3.118	3.109	3.107	3.115	3.121	3.126
30	3.127	3.121	3.119	3.118	3.121	3.120	3.122	3.120	3.122	3.109	3.123	3.125	3.127
31	3.112	3.108	3.105	3.104	3.105	3.104	3.106	3.111	3.105	3.114	3.107	3.117	3.129
32	3.110	3.099	3.100	3.102	3.098	3.104	3.100	3.111	3.101	3.105	3.102	3.117	3.109
33	3.103	3.099	3.096	3.098	3.099	3.098	3.096	3.101	3.093	3.109	3.100	3.118	3.106
34	3.106	3.102	3.099	3.099	3.100	3.099	3.101	3.111	3.099	3.105	3.103	3.127	3.111
35	3.112	3.108	3.103	3.106	3.106	3.105	3.107	3.111	3.105	3.107	3.108	3.123	3.115
36	3.119	3.113	3.111	3.110	3.110	3.111	3.111	3.124	3.111	3.119	3.114	3.125	3.117
37	3.128	3.119	3.118	3.123	3.119	3.119	3.121	3.128	3.118	3.108	3.122	3.134	3.118
38	3.122	3.137	3.134	3.137	3.135	3.135	3.135	3.147	3.132	3.136	3.105	3.129	3.118
39	3.117	3.114	3.112	3.112	3.109	3.112	3.112	3.118	3.109	3.108	3.114	3.125	3.119
40	3.106	3.100	3.100	3.099	3.099	3.100	3.103	3.105	3.099	3.101	3.102	3.107	3.126
41	3.109	3.102	3.099	3.101	3.102	3.102	3.103	3.103	3.099	3.100	3.105	3.118	3.122
42	3.109	3.106	3.103	3.105	3.104	3.107	3.101	3.111	3.101	3.102	3.109	3.118	3.106
43	3.108	3.105	3.104	3.104	3.102	3.104	3.102	3.113	3.099	3.105	3.112	3.124	3.123
44	3.110	3.108	3.104	3.107	3.106	3.105	3.107	3.116	3.099	3.101	3.112	3.127	3.128
45	3.110	3.104	3.102	3.102	3.103	3.102	3.101	3.107	3.101	3.116	3.106	3.129	3.125
46	3.108	3.106	3.103	3.104	3.103	3.106	3.106	3.109	3.103	3.113	3.107	3.123	3.126
47	3.115	3.110	3.110	3.108	3.106	3.109	3.110	3.109	3.103	3.104	3.111	3.118	3.117
48	3.105	3.102	3.096	3.100	3.102	3.100	3.100	3.111	3.101	3.106	3.105	3.134	3.121
49	3.115	3.110	3.107	3.110	3.111	3.111	3.112	3.116	3.107	3.103	3.113	3.105	3.118
50	3.109	3.106	3.101	3.105	3.103	3.105	3.103	3.107	3.103	3.108	3.107	3.109	3.120
Avg.	3.113	3.109	3.106	3.107	3.107	3.107	3.108	3.113	3.106	3.109	3.109	3.120	3.120
Med.	3.110	3.106	3.104	3.105	3.105	3.105	3.106	3.111	3.103	3.107	3.107	3.121	3.120
st dev	0.007	0.008	0.008	0.009	0.008	0.008	0.009	0.010	0.009	0.008	0.006	0.008	0.008
Min.	3.103	3.099	3.096	3.098	3.098	3.098	3.096	3.101	3.093	3.100	3.100	3.105	3.106
Max.	3.128	3.137	3.134	3.137	3.135	3.135	3.135	3.147	3.132	3.136	3.123	3.134	3.135

3.6 Data Set 2, 85°C, 150mA (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	0.2635	0.5318	2662	0.0001	0.0004	0.0008	0.0009	0.0012	0.0011	0.0011	0.0016	0.0019	0.0019	0.0022	0.0025
27	0.2614	0.5308	2709	0.0001	0.0003	0.0006	0.0009	0.0011	0.0011	0.0013	0.0016	0.0018	0.0018	0.0021	0.0024
28	0.2581	0.5308	2779	0.0002	0.0004	0.0006	0.0008	0.0011	0.0011	0.0013	0.0013	0.0016	0.0020	0.0022	0.0025
29	0.2635	0.5295	2671	0.0001	0.0004	0.0006	0.0009	0.0011	0.0011	0.0011	0.0015	0.0017	0.0019	0.0022	0.0025
30	0.2630	0.5319	2672	0.0001	0.0002	0.0005	0.0008	0.0010	0.0014	0.0014	0.0013	0.0015	0.0019	0.0022	0.0025
31	0.2611	0.5314	2713	0.0002	0.0004	0.0006	0.0009	0.0010	0.0012	0.0012	0.0016	0.0019	0.0019	0.0022	0.0025
32	0.2603	0.5303	2734	0.0002	0.0003	0.0008	0.0009	0.0012	0.0011	0.0011	0.0014	0.0017	0.0020	0.0022	0.0025
33	0.2620	0.5302	2699	0.0002	0.0004	0.0006	0.0008	0.0010	0.0010	0.0014	0.0014	0.0015	0.0019	0.0022	0.0025
34	0.2609	0.5321	2714	0.0002	0.0004	0.0006	0.0012	0.0011	0.0013	0.0013	0.0016	0.0017	0.0021	0.0024	0.0026
35	0.2631	0.5312	2673	0.0001	0.0004	0.0007	0.0009	0.0011	0.0013	0.0012	0.0013	0.0016	0.0021	0.0024	0.0026
36	0.2624	0.5301	2691	0.0001	0.0004	0.0007	0.0008	0.0011	0.0013	0.0016	0.0014	0.0016	0.0021	0.0024	0.0027
37	0.2634	0.5317	2665	0.0002	0.0003	0.0007	0.0010	0.0011	0.0014	0.0013	0.0012	0.0018	0.0020	0.0023	0.0026
38	0.2638	0.5278	2672	0.0002	0.0003	0.0006	0.0009	0.0010	0.0012	0.0011	0.0013	0.0015	0.0016	0.0017	0.0018
39	0.2623	0.5319	2686	0.0003	0.0006	0.0008	0.0010	0.0011	0.0014	0.0014	0.0017	0.0023	0.0019	0.0022	0.0025
40	0.2612	0.5307	2713	0.0002	0.0004	0.0007	0.0009	0.0011	0.0013	0.0014	0.0017	0.0019	0.0019	0.0022	0.0024
41	0.2638	0.5304	2662	0.0003	0.0006	0.0008	0.0011	0.0013	0.0015	0.0016	0.0018	0.0017	0.0020	0.0023	0.0026
42	0.2613	0.5317	2708	0.0002	0.0004	0.0006	0.0009	0.0011	0.0011	0.0013	0.0016	0.0016	0.0018	0.0021	0.0023
43	0.2602	0.5309	2732	0.0005	0.0005	0.0008	0.0010	0.0012	0.0012	0.0013	0.0016	0.0017	0.0018	0.0021	0.0023
44	0.2614	0.5311	2708	0.0003	0.0005	0.0008	0.0010	0.0013	0.0014	0.0014	0.0018	0.0017	0.0021	0.0023	0.0026
45	0.2617	0.5313	2701	0.0005	0.0006	0.0009	0.0011	0.0013	0.0015	0.0017	0.0018	0.0020	0.0020	0.0022	0.0025
46	0.2645	0.5305	2648	0.0002	0.0004	0.0006	0.0010	0.0009	0.0010	0.0012	0.0014	0.0014	0.0015	0.0018	0.0021
47	0.2610	0.5307	2717	0.0002	0.0007	0.0008	0.0010	0.0012	0.0014	0.0016	0.0016	0.0020	0.0021	0.0024	0.0026
48	0.2627	0.5304	2684	0.0002	0.0004	0.0006	0.0010	0.0011	0.0013	0.0013	0.0011	0.0017	0.0017	0.0020	0.0022
49	0.2613	0.5300	2714	0.0002	0.0004	0.0009	0.0009	0.0012	0.0014	0.0015	0.0015	0.0020	0.0020	0.0022	0.0025
50	0.2602	0.5311	2733	0.0004	0.0008	0.0010	0.0014	0.0014	0.0018	0.0018	0.0019	0.0022	0.0021	0.0023	0.0026
Avg.	0.2619	0.5308	2698	0.0002	0.0004	0.0007	0.0010	0.0011	0.0013	0.0013	0.0015	0.0018	0.0019	0.0022	0.0025
Med.	0.2617	0.5308	2701	0.0002	0.0004	0.0007	0.0009	0.0011	0.0013	0.0013	0.0016	0.0017	0.0019	0.0022	0.0025
st dev	0.0015	0.0009	30	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002
Min.	0.2581	0.5278	2648	0.0001	0.0002	0.0005	0.0008	0.0009	0.0010	0.0011	0.0011	0.0014	0.0015	0.0017	0.0018
Max.	0.2645	0.5321	2779	0.0005	0.0008	0.0010	0.0014	0.0014	0.0018	0.0018	0.0019	0.0023	0.0021	0.0024	0.0027

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

No.	Φ(lm)	Lumen Maintenance (%)											
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	**10000hrs	11000hrs	12000hrs
51	52.91	99.68	99.60	99.28	99.09	98.87	98.56	98.15	97.92	97.47	97.22	96.79	96.43
52	52.05	100.17	99.75	99.44	99.02	98.79	98.67	98.56	98.35	97.94	97.60	97.31	96.95
53	52.48	100.34	99.90	99.68	98.99	98.61	98.48	98.36	98.34	98.13	97.94	97.62	97.24
54	51.75	100.35	100.04	99.57	99.27	98.96	98.55	98.40	98.20	97.89	97.57	97.16	96.71
55	50.97	99.90	99.71	99.47	99.04	98.78	98.51	98.18	97.96	97.59	97.25	97.06	96.61
56	51.37	100.43	100.06	99.65	99.12	99.03	98.35	98.09	97.94	97.63	97.27	96.85	96.52
57	52.49	100.17	99.94	99.58	98.93	98.61	98.21	97.96	97.79	97.41	97.07	96.69	96.49
58	52.05	100.23	99.94	99.75	99.46	99.17	98.87	98.62	98.50	97.96	97.81	97.66	97.29
59	51.89	100.08	99.61	99.44	99.29	99.25	98.81	98.32	97.98	97.75	97.42	97.01	96.76
60	50.93	100.08	99.65	99.39	99.23	98.98	98.31	97.92	97.76	97.62	97.29	97.13	96.78
61	51.29	99.94	99.79	99.40	99.08	98.71	98.23	98.03	97.82	97.50	97.19	97.06	96.86
62	51.28	100.31	99.98	99.43	99.28	98.87	98.58	98.32	97.93	97.72	97.48	97.07	96.68
63	51.59	100.14	99.98	99.67	99.26	99.15	98.97	98.60	98.27	98.06	97.71	97.23	96.98
64	51.12	99.78	99.51	99.08	98.49	98.16	98.12	97.87	97.34	97.16	96.87	96.54	96.28
65	52.21	100.13	99.77	99.66	99.37	98.97	98.64	98.35	98.08	98.05	97.78	97.55	97.28
66	51.73	100.39	99.96	99.81	99.79	99.46	99.23	98.84	98.05	97.51	97.20	96.68	96.33
67	52.00	99.96	99.48	99.37	99.17	98.87	98.67	98.58	98.40	98.00	97.67	97.40	97.19
68	51.42	99.96	99.59	99.26	98.91	98.48	98.19	97.80	97.28	96.93	96.64	96.38	95.74
69	52.08	100.21	99.96	99.40	98.75	98.37	98.16	97.72	97.48	97.29	97.06	96.89	96.41
70	51.78	99.77	99.75	99.56	99.02	98.57	98.05	97.76	97.51	97.28	97.10	96.62	96.35
71	51.04	99.94	99.49	99.14	98.77	98.67	98.39	98.12	97.86	97.28	96.96	96.49	96.10
72	51.92	100.08	99.75	99.33	98.86	98.46	98.23	97.82	97.50	97.25	96.96	96.71	96.34
73	51.87	100.17	99.83	99.54	99.04	98.80	98.25	97.94	97.49	97.20	96.90	96.45	96.18
74	51.38	100.18	99.98	99.88	99.53	99.12	99.09	98.97	98.79	98.46	98.13	97.74	97.51
75	51.06	100.10	99.84	99.65	99.41	99.10	98.94	98.49	97.92	97.55	97.38	97.30	97.02
Avg.	51.71	100.10	99.79	99.50	99.13	98.83	98.52	98.23	97.94	97.63	97.34	97.01	96.68
Med.	51.75	100.13	99.79	99.47	99.09	98.87	98.51	98.18	97.93	97.59	97.27	97.06	96.68
st dev	0.52	0.20	0.18	0.20	0.28	0.30	0.32	0.35	0.38	0.37	0.37	0.40	0.43
Min.	50.93	99.68	99.48	99.08	98.49	98.16	98.05	97.72	97.28	96.93	96.64	96.38	95.74
Max.	52.91	100.43	100.06	99.88	99.79	99.46	99.23	98.97	98.79	98.46	98.13	97.74	97.51

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

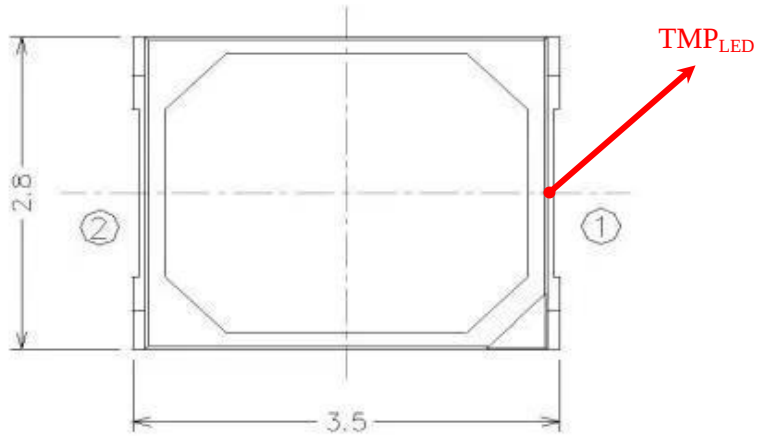
No.	Forward Voltage (V)												
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	**10000hrs	11000hrs	12000hrs
51	3.121	3.117	3.113	3.111	3.113	3.114	3.117	3.118	3.109	3.118	3.118	3.116	3.109
52	3.109	3.104	3.101	3.104	3.103	3.121	3.105	3.109	3.105	3.111	3.111	3.108	3.139
53	3.109	3.106	3.100	3.104	3.102	3.105	3.100	3.099	3.107	3.111	3.110	3.108	3.115
54	3.119	3.115	3.110	3.112	3.114	3.111	3.114	3.113	3.109	3.114	3.118	3.123	3.127
55	3.118	3.123	3.138	3.138	3.131	3.133	3.133	3.143	3.140	3.138	3.146	3.123	3.127
56	3.112	3.105	3.102	3.106	3.105	3.108	3.104	3.103	3.111	3.111	3.109	3.117	3.125
57	3.120	3.114	3.114	3.115	3.112	3.126	3.115	3.111	3.124	3.128	3.120	3.126	3.116
58	3.113	3.106	3.104	3.106	3.103	3.107	3.103	3.105	3.111	3.111	3.110	3.130	3.124
59	3.110	3.103	3.103	3.103	3.105	3.106	3.104	3.101	3.105	3.111	3.110	3.104	3.122
60	3.117	3.110	3.109	3.110	3.111	3.113	3.109	3.107	3.116	3.112	3.127	3.129	3.121
61	3.116	3.121	3.136	3.138	3.135	3.131	3.136	3.141	3.140	3.137	3.121	3.122	3.125
62	3.118	3.111	3.109	3.110	3.110	3.118	3.110	3.109	3.111	3.114	3.120	3.119	3.116
63	3.110	3.106	3.104	3.101	3.104	3.106	3.104	3.107	3.107	3.116	3.110	3.106	3.104
64	3.109	3.102	3.101	3.103	3.101	3.101	3.102	3.097	3.101	3.116	3.111	3.108	3.108
65	3.111	3.105	3.105	3.102	3.103	3.105	3.103	3.101	3.105	3.111	3.110	3.108	3.115
66	3.112	3.105	3.105	3.103	3.103	3.107	3.104	3.103	3.105	3.116	3.111	3.107	3.119
67	3.118	3.109	3.110	3.107	3.106	3.109	3.110	3.107	3.107	3.112	3.116	3.109	3.120
68	3.111	3.104	3.104	3.104	3.105	3.107	3.104	3.105	3.103	3.102	3.115	3.135	3.129
69	3.112	3.106	3.103	3.102	3.102	3.106	3.103	3.099	3.101	3.111	3.112	3.121	3.124
70	3.108	3.101	3.103	3.099	3.098	3.102	3.101	3.099	3.099	3.101	3.108	3.125	3.108
71	3.114	3.112	3.110	3.109	3.106	3.109	3.107	3.109	3.107	3.112	3.116	3.102	3.118
72	3.122	3.117	3.115	3.115	3.115	3.117	3.119	3.113	3.116	3.118	3.123	3.106	3.127
73	3.115	3.107	3.107	3.107	3.106	3.108	3.107	3.111	3.103	3.104	3.115	3.129	3.125
74	3.107	3.102	3.100	3.101	3.101	3.099	3.099	3.097	3.101	3.101	3.107	3.107	3.117
75	3.102	3.098	3.095	3.095	3.095	3.098	3.095	3.095	3.097	3.107	3.105	3.107	3.116
Avg.	3.113	3.108	3.108	3.108	3.108	3.111	3.108	3.108	3.110	3.114	3.115	3.116	3.120
Med.	3.112	3.106	3.105	3.106	3.105	3.108	3.104	3.107	3.107	3.112	3.112	3.116	3.120
st dev	0.005	0.006	0.010	0.010	0.009	0.009	0.010	0.012	0.011	0.009	0.008	0.010	0.008
Min.	3.102	3.098	3.095	3.095	3.095	3.098	3.095	3.095	3.097	3.101	3.105	3.102	3.104
Max.	3.122	3.123	3.138	3.138	3.135	3.133	3.136	3.143	3.140	3.138	3.146	3.135	3.139

3.9 Data Set 3, 105°C, 150mA (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
51	0.2572	0.5258	2819	0.0001	0.0004	0.0007	0.0010	0.0011	0.0015	0.0016	0.0017	0.0017	0.0019	0.0023	0.0026
52	0.2628	0.5313	2680	0.0003	0.0003	0.0007	0.0010	0.0012	0.0013	0.0017	0.0020	0.0020	0.0021	0.0024	0.0028
53	0.2593	0.5306	2753	0.0002	0.0005	0.0007	0.0009	0.0011	0.0011	0.0018	0.0017	0.0017	0.0019	0.0022	0.0026
54	0.2608	0.5307	2722	0.0003	0.0005	0.0009	0.0010	0.0012	0.0012	0.0017	0.0017	0.0018	0.0019	0.0022	0.0026
55	0.2588	0.5282	2775	0.0006	0.0006	0.0009	0.0012	0.0015	0.0015	0.0018	0.0017	0.0021	0.0022	0.0026	0.0028
56	0.2620	0.5299	2700	0.0002	0.0003	0.0007	0.0009	0.0011	0.0011	0.0017	0.0017	0.0019	0.0021	0.0025	0.0028
57	0.2575	0.5281	2803	0.0001	0.0004	0.0006	0.0008	0.0011	0.0015	0.0013	0.0017	0.0017	0.0018	0.0021	0.0025
58	0.2616	0.5313	2702	0.0003	0.0005	0.0007	0.0013	0.0013	0.0015	0.0016	0.0018	0.0019	0.0021	0.0024	0.0027
59	0.2619	0.5298	2702	0.0005	0.0006	0.0009	0.0011	0.0013	0.0016	0.0016	0.0019	0.0020	0.0022	0.0025	0.0028
60	0.2637	0.5295	2668	0.0002	0.0004	0.0007	0.0010	0.0011	0.0016	0.0017	0.0017	0.0017	0.0021	0.0024	0.0027
61	0.2625	0.5285	2695	0.0002	0.0006	0.0008	0.0011	0.0013	0.0016	0.0015	0.0017	0.0017	0.0021	0.0025	0.0028
62	0.2620	0.5303	2699	0.0002	0.0005	0.0007	0.0009	0.0012	0.0015	0.0016	0.0018	0.0021	0.0020	0.0024	0.0027
63	0.2610	0.5307	2718	0.0004	0.0005	0.0009	0.0011	0.0012	0.0016	0.0016	0.0018	0.0019	0.0020	0.0023	0.0027
64	0.2592	0.5275	2770	0.0002	0.0004	0.0007	0.0007	0.0011	0.0014	0.0013	0.0017	0.0019	0.0020	0.0023	0.0027
65	0.2592	0.5311	2752	0.0005	0.0004	0.0007	0.0010	0.0012	0.0017	0.0015	0.0017	0.0018	0.0021	0.0025	0.0029
66	0.2609	0.5303	2721	0.0004	0.0006	0.0009	0.0012	0.0015	0.0016	0.0017	0.0020	0.0022	0.0023	0.0027	0.0030
67	0.2621	0.5302	2698	0.0005	0.0004	0.0009	0.0010	0.0013	0.0016	0.0014	0.0017	0.0017	0.0020	0.0024	0.0027
68	0.2643	0.5302	2653	0.0002	0.0004	0.0005	0.0010	0.0013	0.0015	0.0016	0.0019	0.0018	0.0020	0.0023	0.0027
69	0.2614	0.5306	2709	0.0001	0.0004	0.0006	0.0009	0.0010	0.0013	0.0013	0.0017	0.0017	0.0019	0.0022	0.0026
70	0.2570	0.5304	2803	0.0002	0.0004	0.0006	0.0009	0.0012	0.0017	0.0015	0.0017	0.0017	0.0020	0.0024	0.0027
71	0.2627	0.5313	2682	0.0002	0.0006	0.0007	0.0012	0.0013	0.0016	0.0017	0.0019	0.0019	0.0022	0.0025	0.0029
72	0.2601	0.5294	2743	0.0003	0.0006	0.0008	0.0010	0.0014	0.0017	0.0018	0.0019	0.0021	0.0022	0.0026	0.0029
73	0.2627	0.5315	2680	0.0001	0.0003	0.0006	0.0008	0.0012	0.0015	0.0013	0.0016	0.0017	0.0019	0.0022	0.0026
74	0.2631	0.5298	2677	0.0001	0.0011	0.0009	0.0011	0.0015	0.0018	0.0017	0.0022	0.0023	0.0024	0.0027	0.0031
75	0.2610	0.5299	2720	0.0002	0.0004	0.0006	0.0011	0.0012	0.0015	0.0014	0.0017	0.0020	0.0019	0.0023	0.0026
Avg.	0.2610	0.5299	2722	0.0003	0.0005	0.0007	0.0010	0.0012	0.0015	0.0016	0.0018	0.0019	0.0020	0.0024	0.0027
Med.	0.2614	0.5302	2709	0.0002	0.0004	0.0007	0.0010	0.0012	0.0015	0.0016	0.0017	0.0019	0.0020	0.0024	0.0027
st dev	0.0020	0.0014	45	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001
Min.	0.2570	0.5258	2653	0.0001	0.0003	0.0005	0.0007	0.0010	0.0011	0.0013	0.0016	0.0017	0.0018	0.0021	0.0025
Max.	0.2643	0.5315	2819	0.0006	0.0011	0.0009	0.0013	0.0015	0.0018	0.0018	0.0022	0.0023	0.0024	0.0027	0.0031

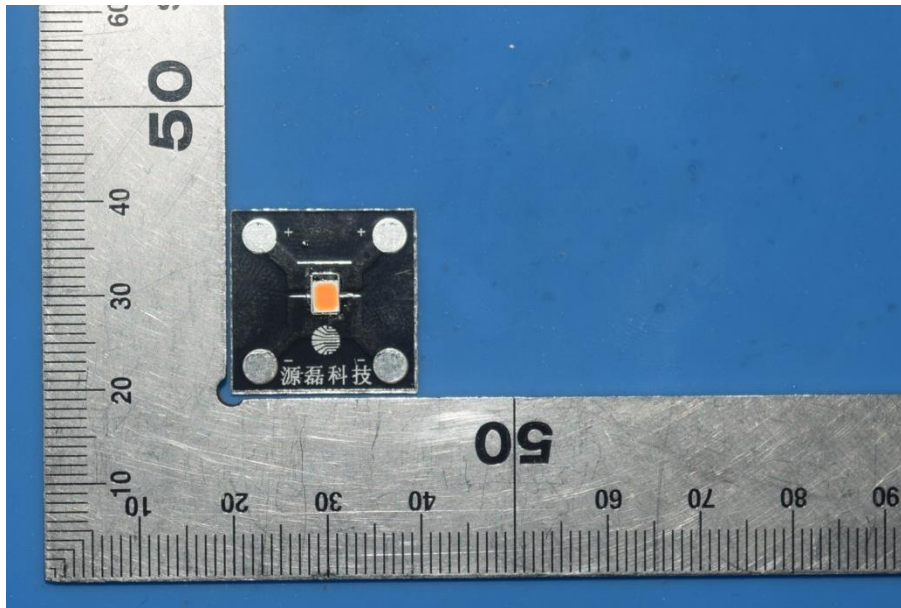
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



5 - Report Revision

Report Number	Report Date	Contents
RSZ210128508-10-12000	2023-11-25	Original report.
RSZ210128508-10-12000-M1	2023-12-06	Update Reported TM-21 L70 Lifetime on page6.

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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.
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END OF REPORT