



TEST REPORT

According to ANSI/IES LM-80-15
For

EVERSTAR OPTO ELECTRONICS PVT. LTD.

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Kolshet Road, Thane West-400607

Model: ES-2835-1018V-L3-827

Report Type: 9000 Hours Test Report		Product Type: LED Package
Test Engineer:	Pote Wang <i>Pote Wang</i>	
Report Number:	R2DG180130060-10	
Test Date:	2018-03-14 to 2019-02-24	
Report Date:	2019-03-29	
Reviewed By:	Daniel Duan / EE Engineer <i>Daniel</i>	
Test Facility:	Test facility was located at No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China.	
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Accreditation:	The IAS Accreditation Number TL-460.	

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

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TABLE OF CONTENTS

1 - General Information	3
1.1 Description of LED Light Sources	3
1.2 Standards and Reference Documentations	3
1.3 Testing Equipment	3
1.4 Drive Level	4
1.5 Ambient Conditions for Maintenance Test	4
1.6 Photometric Measurement Method and Uncertainty	4
1.7 Statement of Traceability	4
1.8 Sample Set	5
2 - Summary of Test Result	6
3 - Test Data	7
3.1 Data Set 1, 85°C, 60mA (Lumen Maintenance)	7
3.2 Data Set 1, 85°C, 60mA (Forward Voltage)	8
3.3 Data Set 1, 85°C, 60mA (Chromaticity Shift)	9
3.4 Data Set 2, 105°C, 60mA (Lumen Maintenance)	10
3.5 Data Set 2, 105°C, 60mA (Forward Voltage)	11
3.6 Data Set 2, 105°C, 60mA (Chromaticity Shift)	12
4 - DUT Photo	13
4.1 Mechanical Dimensions	13
4.2 DUT Photo	13

1 - General Information

1.1 Description of LED Light Sources

Sample Size:

50 PCS samples were received on 2018-01-30. The samples were numbered from 1 to 25 and 26 to 50.

Part Number:	ES-2835-1018V-L3-827
Part Type:	LED Package
Drive Level:	DC 60mA
Nominal CCT:	2700K
Power:	1.08W
Average Current Density per LED die:	257 mA/mm ²
Average Power Density per LED die:	2.31 W/mm ²
CRI:	80
Die Spacing:	0.17mm

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:

Tested model	Multiple model	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)
ES-2835-1018V-L3-827	ES-2835-1018V-XX-8XX	60	1.08	2	60	257	0.11	0.17

Note:

1. The tested model is 2700k.
2. The first and second X means sorting version.
3. The third and fourth X is CCT, it can be 27=2700K, 30=3000K, 35=3500K, 40=4000K, 45=4500K, 50=5000K, 57=5700K, 65=6500K.

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	2019-03-18	2020-03-17
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	2019-03-26	2020-03-25

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	2019-03-18	2020-03-17
Standard Light Source	EVERFINE	D062	G100278CJ7351206	2018-12-24	2019-12-24
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987CJ7321114	2019-03-26	2020-03-25
Multilayer aging machine	BACL	B2-270	20023	2019-03-13	2020-03-12
DC Power Supply	BACL	B12001-12	90023	2018-12-17	2019-12-17

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 $u'v'$. 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 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 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: 85°C, 60mA

Part Number: ES-2835-1018V-L3-827

Number of Units: 25

Case Temperature: >83°C

Ambient Temperature: >80°C

Life Test Drive Current: 60mA

Measurement Current: 60mA

Data Set 2: 105°C, 60mA

Part Number: ES-2835-1018V-L3-827

Number of Units: 25

Case Temperature: >103°C

Ambient Temperature: >100°C

Life Test Drive Current: 60mA

Measurement Current: 60mA

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	9000hrs	2.635E-06	1.004	>54000 hours
2	25	0	1000hrs	9000hrs	2.898E-06	1.002	>54000 hours

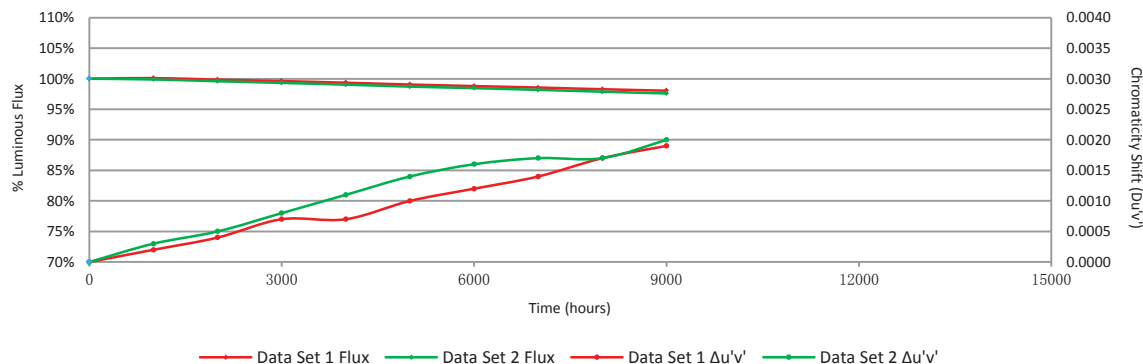
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	100.11%	99.84%	99.62%	99.35%	99.05%	98.80%	98.56%	98.28%	98.04%
2	99.88%	99.59%	99.32%	99.03%	98.71%	98.46%	98.18%	97.88%	97.59%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	0.0002	0.0004	0.0007	0.0007	0.0010	0.0012	0.0014	0.0017	0.0019
2	0.0003	0.0005	0.0008	0.0011	0.0014	0.0016	0.0017	0.0017	0.0020

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 - Test Data

3.1 Data Set 1, 85°C, 60mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)								
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	142.2	100.14	99.86	99.72	99.44	99.30	99.16	98.95	98.73	98.52
2	140.4	100.36	100.07	99.86	99.36	99.15	99.07	98.86	98.65	98.36
3	139.0	100.14	99.93	99.71	99.50	99.06	98.56	98.13	97.84	97.77
4	139.4	100.14	100.07	99.86	99.78	99.50	99.28	98.92	98.64	98.06
5	142.8	99.86	99.65	99.51	99.16	98.74	98.60	98.39	97.97	97.69
6	140.0	100.07	99.79	99.71	99.50	99.21	99.14	99.07	98.79	98.50
7	141.4	100.07	99.72	99.58	99.29	99.08	98.87	98.66	98.37	98.30
8	139.5	99.93	99.71	99.50	99.28	99.14	98.92	98.64	98.21	97.99
9	140.7	100.21	100.07	99.79	99.43	99.00	98.79	98.72	98.51	98.08
10	142.2	100.28	99.93	99.79	99.65	99.16	98.73	98.59	98.45	98.17
11	141.6	100.07	99.65	99.51	99.22	98.80	98.31	98.23	98.16	98.02
12	139.4	99.93	99.71	99.35	99.07	98.92	98.71	98.13	97.99	97.78
13	144.5	100.28	99.93	99.58	99.38	99.17	98.82	98.69	98.27	98.20
14	141.1	99.79	99.57	99.43	99.22	99.01	98.72	98.51	98.09	97.59
15	144.4	100.21	100.07	99.72	99.52	99.38	99.17	99.03	98.82	98.68
16	140.7	100.36	100.14	99.93	99.72	99.36	99.29	99.15	98.86	98.58
17	144.3	100.14	99.79	99.65	99.10	99.03	98.82	98.68	98.54	98.41
18	140.5	100.21	99.79	99.64	99.43	98.86	98.72	98.43	98.29	98.22
19	140.4	100.14	99.79	99.50	99.22	98.79	98.65	98.36	98.15	98.01
20	139.8	100.07	99.93	99.86	99.71	99.36	99.14	98.93	98.35	98.14
21	140.9	99.93	99.65	99.43	99.01	98.79	98.65	98.58	98.51	98.44
22	140.2	100.21	99.93	99.71	99.22	98.79	98.22	97.65	97.22	97.00
23	140.3	100.29	100.14	99.79	99.64	99.14	98.86	98.79	98.29	97.79
24	141.0	100.14	99.65	99.29	99.15	99.08	98.72	98.16	97.87	97.59
25	145.2	99.79	99.52	99.04	98.76	98.55	98.14	97.66	97.52	97.18
Avg.	141.3	100.11	99.84	99.62	99.35	99.05	98.80	98.56	98.28	98.04
Med.	140.7	100.14	99.79	99.65	99.36	99.08	98.79	98.64	98.29	98.08
st dev	1.7	0.16	0.18	0.21	0.25	0.23	0.31	0.40	0.40	0.42
Min.	139.0	99.79	99.52	99.04	98.76	98.55	98.14	97.65	97.22	97.00
Max.	145.2	100.36	100.14	99.93	99.78	99.50	99.29	99.15	98.86	98.68

3.2 Data Set 1, 85°C, 60mA (Forward Voltage)

No.	Forward Voltage (V)									
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	18.19	18.15	18.15	18.20	18.23	18.18	18.20	18.20	18.17	18.18
2	18.04	18.00	18.00	18.03	18.05	18.03	18.04	18.03	18.00	18.02
3	18.12	18.09	18.06	18.23	18.18	18.12	18.16	18.10	18.08	18.12
4	18.21	18.17	18.16	18.21	18.23	18.20	18.20	18.19	18.17	18.19
5	18.03	17.98	17.97	18.10	18.09	18.01	18.03	18.01	17.98	18.02
6	18.17	18.13	18.13	18.21	18.21	18.17	18.18	18.17	18.16	18.16
7	18.17	18.18	18.12	18.17	18.21	18.16	18.16	18.15	18.13	18.15
8	18.12	18.08	18.10	18.14	18.16	18.14	18.13	18.11	18.11	18.13
9	18.16	18.11	18.11	18.15	18.24	18.16	18.15	18.14	18.12	18.14
10	18.03	17.99	17.98	18.05	18.07	18.03	18.04	18.01	18.00	18.02
11	18.20	18.15	18.14	18.21	18.25	18.20	18.18	18.18	18.16	18.17
12	18.20	18.15	18.15	18.22	18.27	18.20	18.19	18.18	18.17	18.18
13	18.05	18.01	17.98	18.02	18.09	18.07	18.02	18.01	18.00	18.05
14	18.01	18.19	17.95	17.99	18.08	18.02	18.00	17.99	17.98	17.98
15	18.09	18.04	18.01	18.07	18.11	18.10	18.06	18.05	18.04	18.05
16	18.18	18.14	18.12	18.16	18.28	18.18	18.17	18.15	18.17	18.16
17	18.08	18.04	18.00	18.04	18.20	18.06	18.06	18.03	18.05	18.05
18	18.14	18.10	18.07	18.11	18.19	18.12	18.12	18.09	18.11	18.11
19	18.04	17.99	17.97	18.01	18.06	18.03	18.03	18.00	18.02	18.00
20	18.16	18.11	18.10	18.14	18.20	18.18	18.16	18.13	18.14	18.13
21	18.19	18.13	18.12	18.18	18.32	18.20	18.17	18.15	18.16	18.15
22	18.13	18.08	18.07	18.12	18.15	18.14	18.13	18.11	18.13	18.10
23	18.15	18.10	18.09	18.13	18.16	18.15	18.15	18.14	18.13	18.11
24	18.04	17.98	17.97	18.03	18.05	18.03	18.03	18.02	18.01	17.99
25	18.05	17.98	17.96	18.03	18.11	18.04	18.02	18.02	18.02	17.99
Avg.	18.12	18.08	18.06	18.12	18.17	18.12	18.11	18.09	18.09	18.09
Med.	18.13	18.10	18.07	18.13	18.18	18.14	18.13	18.11	18.11	18.11
st dev	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.07
Min.	18.01	17.98	17.95	17.99	18.05	18.01	18.00	17.99	17.98	17.98
Max.	18.21	18.19	18.16	18.23	18.32	18.20	18.20	18.20	18.17	18.19

3.3 Data Set 1, 85°C, 60mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	0.2582	0.5236	2809	0.0003	0.0004	0.0007	0.0006	0.0007	0.0011	0.0014	0.0018	0.0018
2	0.2558	0.5232	2865	0.0001	0.0002	0.0007	0.0009	0.0011	0.0012	0.0016	0.0018	0.0019
3	0.2582	0.5232	2811	0.0000	0.0003	0.0006	0.0006	0.0010	0.0011	0.0010	0.0016	0.0018
4	0.2592	0.5234	2787	0.0001	0.0005	0.0009	0.0007	0.0011	0.0013	0.0015	0.0018	0.0019
5	0.2586	0.5235	2800	0.0002	0.0003	0.0007	0.0007	0.0012	0.0013	0.0015	0.0017	0.0019
6	0.2584	0.5242	2802	0.0002	0.0002	0.0005	0.0005	0.0009	0.0011	0.0014	0.0015	0.0018
7	0.2583	0.5242	2804	0.0001	0.0001	0.0004	0.0005	0.0009	0.0011	0.0013	0.0015	0.0019
8	0.2574	0.5241	2824	0.0001	0.0003	0.0006	0.0005	0.0009	0.0011	0.0012	0.0016	0.0019
9	0.2578	0.5243	2815	0.0001	0.0004	0.0008	0.0009	0.0012	0.0012	0.0015	0.0017	0.0019
10	0.2599	0.5238	2770	0.0002	0.0000	0.0004	0.0006	0.0008	0.0010	0.0013	0.0014	0.0016
11	0.2592	0.5243	2784	0.0001	0.0001	0.0005	0.0005	0.0008	0.0010	0.0013	0.0016	0.0018
12	0.2590	0.5235	2792	0.0001	0.0002	0.0004	0.0005	0.0009	0.0011	0.0011	0.0015	0.0018
13	0.2566	0.5226	2850	0.0001	0.0004	0.0007	0.0008	0.0011	0.0011	0.0015	0.0016	0.0020
14	0.2595	0.5225	2785	0.0002	0.0003	0.0006	0.0006	0.0011	0.0012	0.0013	0.0016	0.0021
15	0.2599	0.5240	2770	0.0000	0.0004	0.0007	0.0007	0.0008	0.0011	0.0014	0.0016	0.0019
16	0.2581	0.5216	2820	0.0001	0.0003	0.0006	0.0006	0.0007	0.0009	0.0013	0.0016	0.0016
17	0.2593	0.5231	2788	0.0001	0.0004	0.0008	0.0009	0.0010	0.0011	0.0014	0.0016	0.0019
18	0.2580	0.5225	2819	0.0001	0.0003	0.0006	0.0007	0.0009	0.0011	0.0013	0.0014	0.0018
19	0.2595	0.5233	2782	0.0004	0.0005	0.0007	0.0007	0.0012	0.0012	0.0014	0.0016	0.0020
20	0.2585	0.5219	2810	0.0003	0.0004	0.0008	0.0009	0.0013	0.0013	0.0014	0.0016	0.0017
21	0.2582	0.5236	2808	0.0003	0.0005	0.0008	0.0009	0.0011	0.0012	0.0015	0.0016	0.0019
22	0.2591	0.5225	2794	0.0004	0.0005	0.0009	0.0009	0.0011	0.0011	0.0012	0.0016	0.0019
23	0.2582	0.5248	2804	0.0004	0.0004	0.0008	0.0008	0.0009	0.0011	0.0013	0.0016	0.0021
24	0.2589	0.5231	2795	0.0003	0.0006	0.0008	0.0008	0.0009	0.0011	0.0014	0.0023	0.0024
25	0.2561	0.5242	2854	0.0003	0.0007	0.0009	0.0015	0.0019	0.0024	0.0024	0.0026	0.0030
Avg.	0.2584	0.5234	2806	0.0002	0.0004	0.0007	0.0007	0.0010	0.0012	0.0014	0.0017	0.0019
Med.	0.2584	0.5235	2804	0.0001	0.0004	0.0007	0.0007	0.0010	0.0011	0.0014	0.0016	0.0019
st dev	0.0011	0.0008	24	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0003
Min.	0.2558	0.5216	2770	0.0000	0.0000	0.0004	0.0005	0.0007	0.0009	0.0010	0.0014	0.0016
Max.	0.2599	0.5248	2865	0.0004	0.0007	0.0009	0.0015	0.0019	0.0024	0.0024	0.0026	0.0030

3.4 Data Set 2, 105°C, 60mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)								
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
26	141.6	99.72	99.58	99.08	98.87	98.80	98.59	97.95	97.81	97.74
27	140.6	99.86	99.36	99.15	98.58	98.15	97.87	97.65	97.44	97.23
28	141.1	99.72	99.57	99.36	98.87	98.65	98.37	97.80	97.31	97.02
29	139.8	99.71	99.21	98.93	98.64	98.43	98.21	98.00	97.78	97.42
30	144.6	99.79	99.45	99.31	98.89	98.48	98.13	97.72	97.23	97.03
31	139.0	99.78	99.50	99.21	98.92	98.85	98.63	98.42	98.13	97.84
32	140.2	100.21	99.86	99.64	99.57	99.29	99.00	98.79	98.29	97.79
33	138.5	99.93	99.49	99.28	98.77	98.27	97.98	97.76	97.62	97.47
34	141.2	99.86	99.58	99.08	98.65	98.44	98.16	97.88	97.31	97.03
35	141.0	99.86	99.72	99.36	99.01	98.51	98.30	98.09	97.87	97.73
36	139.9	99.79	99.50	99.29	98.93	98.64	98.43	98.21	97.93	97.64
37	142.8	99.72	99.37	99.16	99.02	98.53	98.39	98.18	97.97	97.76
38	141.7	99.79	99.58	99.15	98.94	98.59	98.24	98.09	97.81	97.53
39	142.8	99.86	99.65	99.51	99.02	98.74	98.39	98.04	97.76	97.48
40	140.2	99.71	99.43	99.00	98.86	98.57	98.36	97.93	97.57	97.08
41	139.8	99.93	99.79	99.43	98.93	98.78	98.57	98.35	98.00	97.57
42	143.6	99.72	99.51	99.44	99.37	99.03	98.75	98.40	98.12	97.63
43	140.7	99.79	99.72	99.64	99.43	99.22	99.00	98.79	98.51	98.22
44	141.7	99.93	99.65	99.51	99.08	98.66	98.45	98.17	97.95	97.81
45	141.4	99.86	99.65	99.29	99.01	98.73	98.51	98.30	98.02	97.81
46	143.2	100.14	99.65	99.44	99.09	98.88	98.60	98.46	98.18	97.91
47	140.2	100.07	99.79	99.57	99.43	98.86	98.57	98.22	98.00	97.72
48	144.5	100.14	99.72	99.38	99.17	98.69	98.48	98.27	97.92	97.72
49	143.8	100.21	99.93	99.65	99.58	99.10	98.89	98.54	98.12	97.84
50	140.9	99.86	99.50	99.22	99.01	98.86	98.58	98.37	98.30	97.73
Avg.	141.4	99.88	99.59	99.32	99.03	98.71	98.46	98.18	97.88	97.59
Med.	141.1	99.86	99.58	99.31	99.01	98.69	98.45	98.18	97.93	97.72
st dev	1.7	0.16	0.17	0.20	0.27	0.27	0.28	0.30	0.32	0.31
Min.	138.5	99.71	99.21	98.93	98.58	98.15	97.87	97.65	97.23	97.02
Max.	144.6	100.21	99.93	99.65	99.58	99.29	99.00	98.79	98.51	98.22

3.5 Data Set 2, 105°C, 60mA (Forward Voltage)

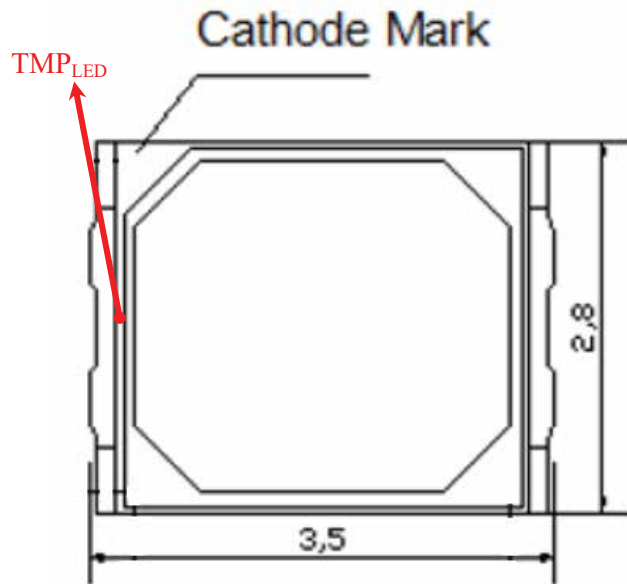
No.	Forward Voltage (V)									
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
26	18.16	18.10	18.07	18.15	18.20	18.16	18.16	18.13	18.15	18.11
27	18.19	18.16	18.13	18.19	18.21	18.20	18.19	18.16	18.18	18.15
28	18.03	17.97	17.98	18.04	18.05	18.05	18.03	18.00	18.00	17.99
29	18.11	18.06	18.05	18.12	18.12	18.13	18.10	18.09	18.08	18.07
30	18.07	18.01	18.01	18.07	18.08	18.09	18.07	18.04	18.03	18.02
31	18.14	18.08	18.08	18.16	18.13	18.16	18.14	18.10	18.11	18.09
32	18.15	18.10	18.18	18.18	18.17	18.17	18.14	18.12	18.13	18.11
33	18.17	18.11	18.11	18.18	18.19	18.18	18.18	18.13	18.14	18.12
34	18.21	18.14	18.13	18.19	18.20	18.19	18.20	18.16	18.16	18.14
35	18.13	18.08	18.07	18.13	18.13	18.13	18.14	18.10	18.10	18.09
36	18.14	18.09	18.08	18.14	18.14	18.14	18.15	18.11	18.12	18.10
37	18.02	17.96	17.96	18.07	18.07	18.03	18.03	18.01	18.00	17.98
38	18.01	17.96	17.96	18.04	18.02	18.04	18.02	17.98	17.98	17.98
39	18.15	18.08	18.06	18.12	18.12	18.12	18.12	18.09	18.09	18.10
40	18.17	18.11	18.12	18.14	18.16	18.22	18.16	18.12	18.13	18.13
41	18.18	18.14	18.12	18.18	18.20	18.18	18.19	18.14	18.15	18.14
42	18.07	18.02	18.00	18.04	18.06	18.05	18.07	18.02	18.02	18.02
43	18.18	18.14	18.14	18.17	18.18	18.17	18.19	18.15	18.15	18.15
44	18.17	18.12	18.11	18.15	18.16	18.15	18.16	18.14	18.13	18.13
45	18.15	18.11	18.09	18.13	18.14	18.14	18.15	18.12	18.11	18.11
46	18.04	18.00	17.98	18.01	18.03	18.02	18.05	18.00	17.99	17.99
47	18.15	18.12	18.11	18.13	18.14	18.16	18.17	18.13	18.12	18.11
48	18.05	18.01	18.02	18.05	18.06	18.05	18.08	18.02	18.02	18.01
49	18.03	17.98	17.98	18.00	18.03	18.02	18.02	17.99	17.99	17.98
50	18.16	18.12	18.13	18.14	18.18	18.16	18.17	18.13	18.13	18.13
Avg.	18.12	18.07	18.07	18.12	18.13	18.12	18.12	18.09	18.09	18.08
Med.	18.15	18.09	18.08	18.13	18.14	18.14	18.14	18.11	18.11	18.10
st dev	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Min.	18.01	17.96	17.96	18.00	18.02	18.02	18.02	17.98	17.98	17.98
Max.	18.21	18.16	18.18	18.19	18.21	18.22	18.20	18.16	18.18	18.15

3.6 Data Set 2, 105°C, 60mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
26	0.2585	0.5239	2801	0.0001	0.0006	0.0009	0.0007	0.0009	0.0012	0.0016	0.0018	0.0020
27	0.2597	0.5236	2777	0.0002	0.0005	0.0010	0.0010	0.0009	0.0012	0.0016	0.0018	0.0022
28	0.2580	0.5245	2809	0.0001	0.0005	0.0009	0.0012	0.0009	0.0011	0.0013	0.0017	0.0019
29	0.2575	0.5219	2833	0.0002	0.0006	0.0009	0.0011	0.0010	0.0014	0.0013	0.0018	0.0021
30	0.2589	0.5235	2794	0.0001	0.0005	0.0007	0.0011	0.0012	0.0012	0.0014	0.0018	0.0021
31	0.2570	0.5225	2841	0.0001	0.0004	0.0007	0.0012	0.0013	0.0014	0.0014	0.0017	0.0021
32	0.2606	0.5243	2753	0.0002	0.0003	0.0005	0.0007	0.0011	0.0013	0.0011	0.0015	0.0018
33	0.2593	0.5215	2794	0.0001	0.0004	0.0006	0.0012	0.0015	0.0016	0.0017	0.0017	0.0020
34	0.2590	0.5248	2786	0.0001	0.0008	0.0008	0.0011	0.0014	0.0015	0.0015	0.0018	0.0018
35	0.2572	0.5217	2841	0.0001	0.0005	0.0008	0.0012	0.0013	0.0016	0.0017	0.0017	0.0019
36	0.2576	0.5236	2822	0.0001	0.0005	0.0007	0.0011	0.0014	0.0015	0.0017	0.0017	0.0021
37	0.2579	0.5239	2814	0.0005	0.0005	0.0008	0.0012	0.0015	0.0016	0.0018	0.0017	0.0018
38	0.2578	0.5246	2812	0.0004	0.0005	0.0010	0.0013	0.0015	0.0016	0.0017	0.0018	0.0020
39	0.2617	0.5234	2732	0.0006	0.0006	0.0008	0.0011	0.0013	0.0017	0.0017	0.0017	0.0020
40	0.2597	0.5242	2772	0.0005	0.0004	0.0006	0.0011	0.0013	0.0016	0.0017	0.0016	0.0018
41	0.2609	0.5215	2759	0.0004	0.0004	0.0009	0.0011	0.0016	0.0019	0.0018	0.0014	0.0021
42	0.2575	0.5242	2821	0.0004	0.0005	0.0008	0.0014	0.0015	0.0017	0.0018	0.0018	0.0021
43	0.2573	0.5218	2838	0.0003	0.0003	0.0009	0.0012	0.0016	0.0018	0.0020	0.0019	0.0020
44	0.2588	0.5248	2789	0.0005	0.0004	0.0007	0.0011	0.0015	0.0017	0.0018	0.0018	0.0019
45	0.2574	0.5230	2830	0.0005	0.0003	0.0007	0.0011	0.0013	0.0017	0.0016	0.0017	0.0018
46	0.2586	0.5239	2799	0.0005	0.0004	0.0009	0.0013	0.0016	0.0018	0.0018	0.0018	0.0014
47	0.2575	0.5228	2829	0.0004	0.0004	0.0009	0.0011	0.0015	0.0017	0.0018	0.0017	0.0021
48	0.2580	0.5233	2814	0.0004	0.0006	0.0009	0.0013	0.0016	0.0018	0.0018	0.0018	0.0022
49	0.2565	0.5222	2854	0.0001	0.0002	0.0006	0.0011	0.0014	0.0018	0.0018	0.0018	0.0020
50	0.2575	0.5212	2837	0.0002	0.0003	0.0007	0.0013	0.0016	0.0018	0.0018	0.0018	0.0021
Avg.	0.2584	0.5232	2806	0.0003	0.0005	0.0008	0.0011	0.0014	0.0016	0.0017	0.0017	0.0020
Med.	0.2580	0.5235	2812	0.0002	0.0005	0.0008	0.0011	0.0014	0.0016	0.0017	0.0018	0.0020
st dev	0.0013	0.0011	31	0.0002	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002
Min.	0.2565	0.5212	2732	0.0001	0.0002	0.0005	0.0007	0.0009	0.0011	0.0011	0.0014	0.0014
Max.	0.2617	0.5248	2854	0.0006	0.0008	0.0010	0.0014	0.0016	0.0019	0.0020	0.0019	0.0022

4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



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