

IES LM-80 Test Report

Report Issue Date : August 05, 2016 **Report Number :** I-151012-81-K-01
Testing Start Date : October 22, 2015 **Testing Completion Date :** July 27, 2016
Revision Number : 01 **Test Duration :** 6 000 h

Manufacturer Information :

Applicant : Seoul Semiconductor Co., LTD
Address : 97-11, Sandan-ro 163, Danwon-gu, Ansan, Gyeonggi-do, Korea 15429

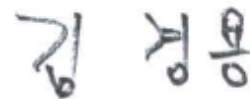
Description of Test Samples :

Classification : LED Package
PKG Name : MJT3528
Part Number : SAWxA32E-xx
Drive Current : 100 mA

Test Procedure :

IES LM-80-08 Approved Method for Measuring Lumen Maintenance of LED Light Sources

Tested by



KyungYong KIM, Research Engineer

Approved by



YoungJoon WON, Laboratory Manager



The above testing certificate is the accredited test result by
Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

Seoul Semiconductor Testing Laboratory

97-11, Sandan-ro 163, Danwon-gu, Ansan, Gyeonggi-do, Korea 15429

Accredited by KOLAS, Republic of KOREA

Applicable Series Model Numbers

This LM-80 report is applicable to the following

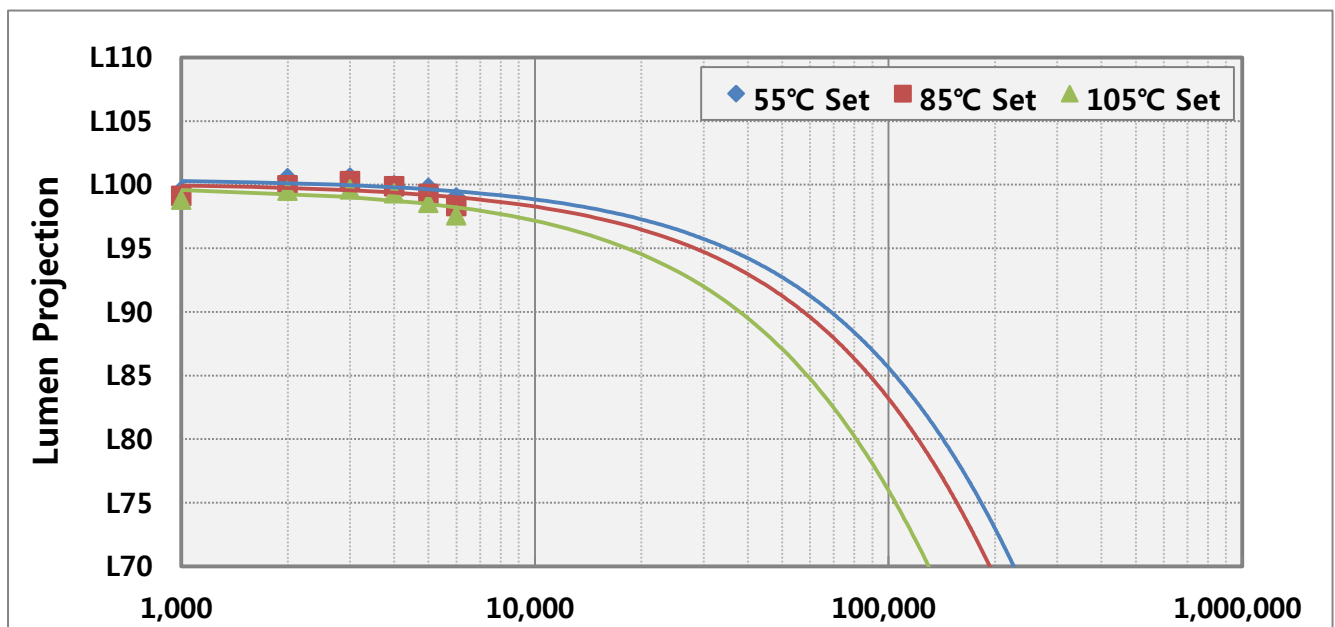
| Series | Model Number | Case Temperature | Forward Current | Typical VF | Power | CCT |
|---------|--------------|------------------|-----------------|------------|--------|---------|
| MJT3528 | SAWxA42E-xx | 55 °C | 75 mA | 12.0 V | 0.90 W | ≥2700 K |
| MJT3528 | SAWxA42E-xx | 85 °C | 75 mA | 12.0 V | 0.90 W | ≥2700 K |
| MJT3528 | SAWxA42E-xx | 105 °C | 75 mA | 12.0 V | 0.90 W | ≥2700 K |
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SEOUL SEMICONDUCTOR

1. Test Summary

| Items | Nominal Case Temperature | | |
|----------------------------------|--------------------------|-----------|-----------|
| | 55 °C | 85 °C | 105 °C |
| Number of LED tested | 20 | 20 | 20 |
| Drive Current | 100 mA | 100 mA | 100 mA |
| Measurement Current | 100 mA | 100 mA | 100 mA |
| Test Duration | 6 000 h | 6 000 h | 6 000 h |
| Actual Case Temperature | ≥53.2 °C | ≥83.3 °C | ≥103.0 °C |
| Actual Ambient Temperature | ≥52.3 °C | ≥82.6 °C | ≥102.5 °C |
| Air Flow Velocity | ≤0.77 m/s | ≤0.49 m/s | ≤0.11 m/s |
| Averaged Initial Luminous Flux | 115.2 lm | 115.1 lm | 115.1 lm |
| Averaged Initial CCT | 2664 K | 2664 K | 2659 K |
| Averaged Forward Voltage | 9.61 V | 9.59 V | 9.60 V |
| Averaged Lumen Maintenance | 99.0 % | 98.3 % | 97.6 % |
| Averaged Chromacity Shift | 0.001 3 | 0.001 0 | 0.001 3 |
| α | 1.597E-06 | 1.852E-06 | 2.735E-06 |
| B | 1.004 | 1.001 | 0.999 |
| TM-21 Projection L ₇₀ | >36000 | >36000 | >36000 |
| TM-21 Projection L ₈₀ | >36000 | >36000 | >36000 |
| TM-21 Projection L ₉₀ | >36000 | >36000 | >36000 |

※ The results shown in this certificate refer only to the sample(s) tested unless otherwise stated.
This test report cannot be reproduced, except in full.



2. IES LM-80-08 Test Report Requirement :

Number of LED Light Sources Tested

See the Test Summary

Description of LED Light Sources

See the Description of Test samples at the cover of certificate

Description of auxiliary equipment

Active cooling Test System

Temperature controlling chamber for LED package/array/module consists of the water cooling heat-sink plates to control the case temperature of each device and of the power supply required by LM-80 test conditions.

Measurement System

Photometric measurement tester for LED package/array/module consists of the integrating sphere with temperature controlling system(TEC) and of programmable current source meter.

Operating Cycle

Constant Direct Current (DC)

Ambient Conditions Including Airflow, Temperature and Relative Humidity

Airflow : < 1 m/s

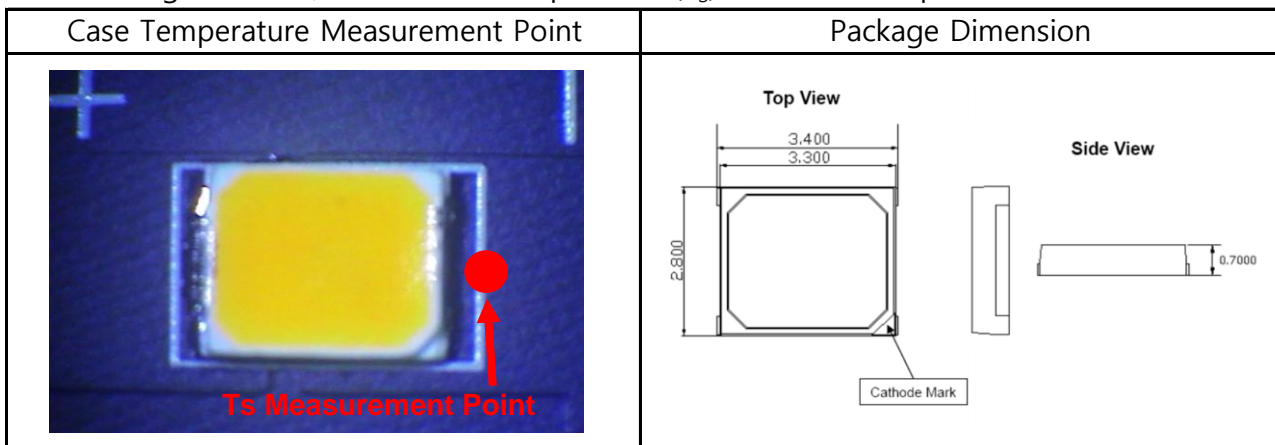
Ambient temperature : ≥ -5 °C of Nominal T_A

(See the Test Summary for actual T_A)

Relative Humidity : $\leq 65\%$ RH

Case Temperature (Test Point Temperature)

See the figure below, for the case temperature (T_C) measurement point and dimension



Drive Current of the LED Light Source During Lifetime Test

See the Test Summary

Initial Luminous Flux and Forward Voltage at Photometric Measurement Current

See the Test Summary

Lumen Maintenance Data for Each Individual LED Light Source Along with Median Value, Standard Deviation, Minimum and Maximum Lumen Maintenance Value for All of the LED Light Sources

See the table of each data set

Observation of LED light Sources Failures

No failure observed

LED Light Source Monitoring Interval

See the table of each data set

Photometric Measurement Uncertainty

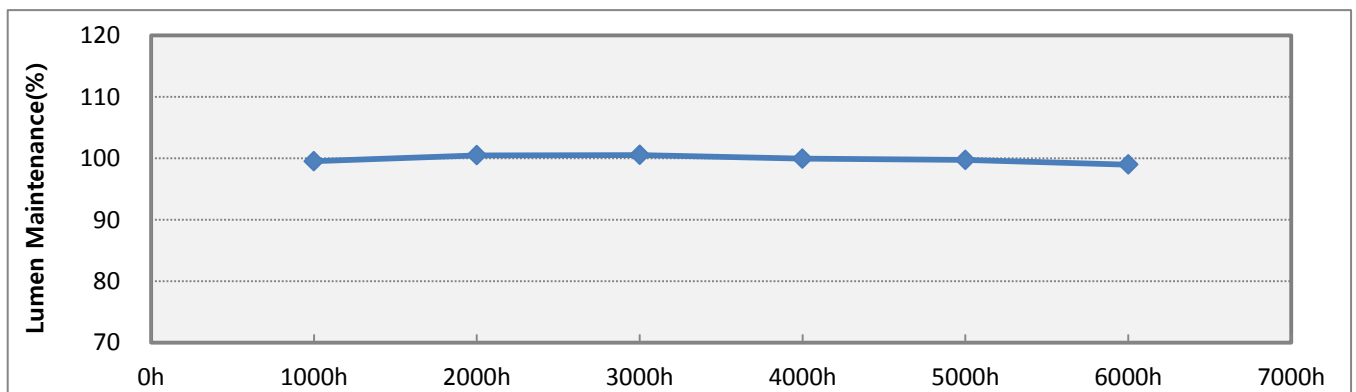
Seoul Semiconduc maintain a tolerance of ± 3.04 % at 95% confidence level ($k = 2$)

Chromaticity Shift Over the Measurement Time

See the table of each data set

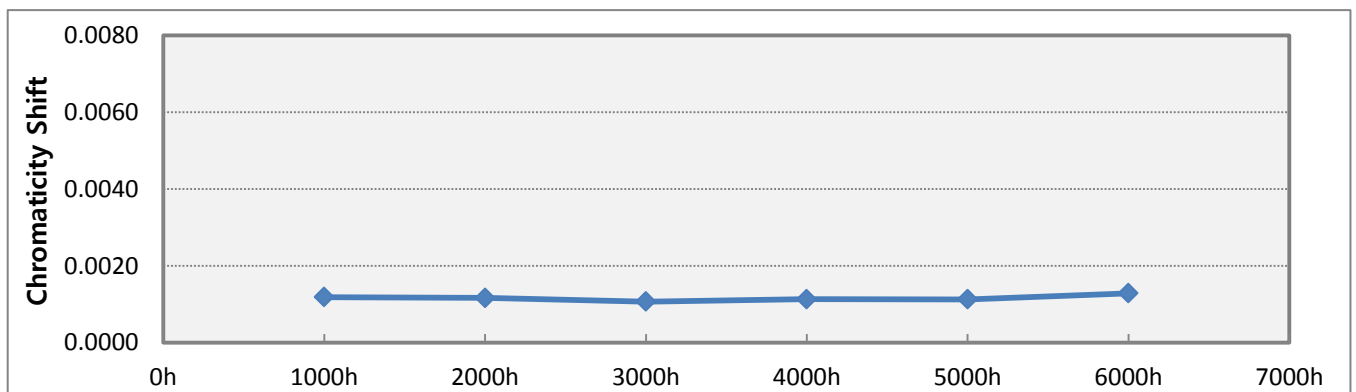
3. 55°C Data Set

| No. | Initial Characteristics | | | Lumen Maintenance | | | | | | | | |
|------|-------------------------|-----------|---------|-------------------|--------|--------|--------|--------|--------|--|--|--|
| | V _f (V) | Flux (lm) | CCT (K) | 1000 h | 2000 h | 3000 h | 4000 h | 5000 h | 6000 h | | | |
| 01 | 9.61 | 107.56 | 2628 | 99.6 | 101.1 | 100.3 | 100.6 | 100.2 | 99.2 | | | |
| 02 | 9.60 | 116.10 | 2668 | 99.5 | 100.4 | 100.6 | 100.0 | 99.9 | 99.1 | | | |
| 03 | 9.60 | 114.29 | 2660 | 100.1 | 101.6 | 100.8 | 101.2 | 101.4 | 99.8 | | | |
| 04 | 9.55 | 114.02 | 2643 | 100.1 | 101.0 | 100.7 | 100.4 | 100.3 | 100.1 | | | |
| 05 | 9.58 | 110.00 | 2693 | 98.8 | 100.0 | 100.1 | 98.9 | 99.3 | 99.0 | | | |
| 06 | 9.61 | 113.98 | 2689 | 99.1 | 100.3 | 100.3 | 99.8 | 99.3 | 99.1 | | | |
| 07 | 9.61 | 118.17 | 2723 | 100.3 | 100.5 | 100.5 | 100.8 | 100.1 | 99.8 | | | |
| 08 | 9.61 | 117.03 | 2699 | 99.1 | 100.1 | 100.1 | 100.0 | 99.5 | 99.1 | | | |
| 09 | 9.60 | 117.51 | 2693 | 99.2 | 100.6 | 100.5 | 99.6 | 99.6 | 98.6 | | | |
| 10 | 9.67 | 114.16 | 2653 | 99.9 | 100.5 | 101.2 | 100.8 | 99.4 | 99.2 | | | |
| 11 | 9.56 | 116.34 | 2686 | 98.8 | 100.3 | 99.9 | 98.9 | 98.4 | 97.7 | | | |
| 12 | 9.65 | 116.68 | 2620 | 99.4 | 99.7 | 101.0 | 99.3 | 99.8 | 98.9 | | | |
| 13 | 9.55 | 116.19 | 2634 | 99.2 | 99.9 | 99.7 | 99.3 | 99.1 | 98.7 | | | |
| 14 | 9.62 | 114.00 | 2681 | 99.9 | 101.1 | 100.9 | 100.0 | 100.7 | 98.7 | | | |
| 15 | 9.64 | 115.74 | 2608 | 99.9 | 100.6 | 100.9 | 100.3 | 100.4 | 99.2 | | | |
| 16 | 9.63 | 118.20 | 2727 | 99.9 | 100.5 | 100.8 | 100.1 | 99.5 | 99.1 | | | |
| 17 | 9.68 | 115.38 | 2627 | 99.1 | 100.8 | 100.8 | 99.3 | 99.3 | 98.6 | | | |
| 18 | 9.65 | 113.72 | 2591 | 99.5 | 100.5 | 101.0 | 99.6 | 99.2 | 98.4 | | | |
| 19 | 9.55 | 119.46 | 2707 | 99.2 | 99.9 | 100.0 | 98.9 | 98.8 | 98.3 | | | |
| 20 | 9.56 | 115.61 | 2641 | 100.0 | 101.0 | 100.9 | 101.1 | 100.4 | 99.2 | | | |
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| Ave. | 9.61 | 115.21 | 2664 | 99.5 | 100.5 | 100.5 | 100.0 | 99.7 | 99.0 | | | |
| Med. | 9.61 | 115.68 | 2664 | 99.5 | 100.5 | 100.6 | 100.0 | 99.5 | 99.1 | | | |
| Min. | 9.55 | 107.56 | 2591 | 98.8 | 99.7 | 99.7 | 98.9 | 98.4 | 97.7 | | | |
| Max. | 9.68 | 119.46 | 2727 | 100.3 | 101.6 | 101.2 | 101.2 | 101.4 | 100.1 | | | |
| σ | 0.04 | 2.76 | 39 | 0.4 | 0.5 | 0.4 | 0.7 | 0.7 | 0.6 | | | |



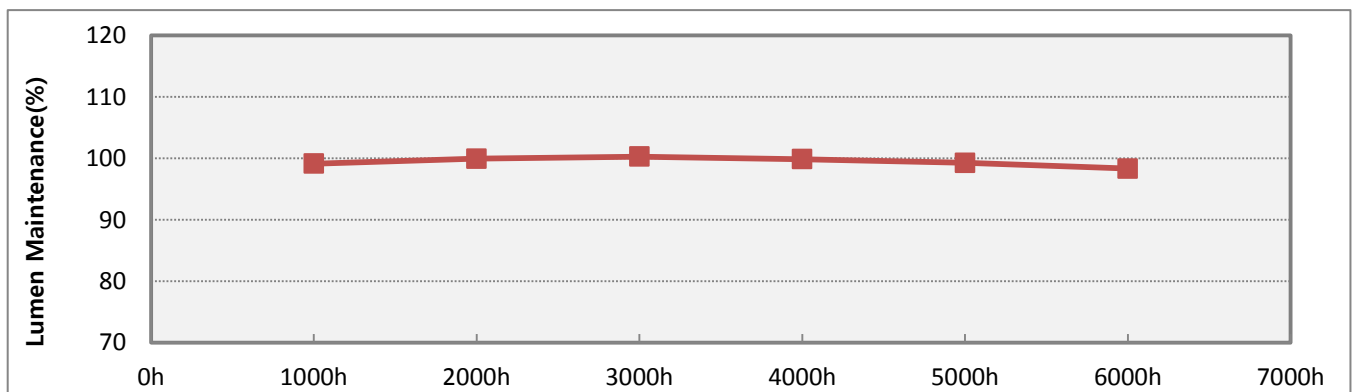
3. 55°C Data Set

| No. | Initial Characteristics | | Chromaticity Shift du'v' | | | | | | | | |
|----------|-------------------------|------------|--------------------------|--------|--------|--------|--------|--------|--|--|--|
| | CIE1976 u' | CIE1976 v' | 1000 h | 2000 h | 3000 h | 4000 h | 5000 h | 6000 h | | | |
| 01 | 0.2654 | 0.5310 | 0.0020 | 0.0018 | 0.0015 | 0.0015 | 0.0016 | 0.0018 | | | |
| 02 | 0.2639 | 0.5283 | 0.0012 | 0.0012 | 0.0011 | 0.0012 | 0.0012 | 0.0013 | | | |
| 03 | 0.2640 | 0.5301 | 0.0020 | 0.0017 | 0.0016 | 0.0015 | 0.0015 | 0.0016 | | | |
| 04 | 0.2647 | 0.5307 | 0.0008 | 0.0009 | 0.0008 | 0.0008 | 0.0008 | 0.0010 | | | |
| 05 | 0.2629 | 0.5269 | 0.0017 | 0.0016 | 0.0014 | 0.0014 | 0.0014 | 0.0015 | | | |
| 06 | 0.2627 | 0.5288 | 0.0010 | 0.0014 | 0.0013 | 0.0013 | 0.0012 | 0.0013 | | | |
| 07 | 0.2616 | 0.5260 | 0.0009 | 0.0009 | 0.0008 | 0.0009 | 0.0008 | 0.0009 | | | |
| 08 | 0.2626 | 0.5272 | 0.0012 | 0.0011 | 0.0011 | 0.0011 | 0.0012 | 0.0014 | | | |
| 09 | 0.2625 | 0.5292 | 0.0009 | 0.0008 | 0.0007 | 0.0007 | 0.0007 | 0.0011 | | | |
| 10 | 0.2641 | 0.5312 | 0.0012 | 0.0012 | 0.0011 | 0.0013 | 0.0014 | 0.0015 | | | |
| 11 | 0.2628 | 0.5292 | 0.0012 | 0.0011 | 0.0010 | 0.0011 | 0.0012 | 0.0014 | | | |
| 12 | 0.2657 | 0.5315 | 0.0011 | 0.0011 | 0.0009 | 0.0010 | 0.0010 | 0.0011 | | | |
| 13 | 0.2652 | 0.5306 | 0.0014 | 0.0013 | 0.0012 | 0.0013 | 0.0012 | 0.0014 | | | |
| 14 | 0.2632 | 0.5285 | 0.0010 | 0.0009 | 0.0009 | 0.0010 | 0.0009 | 0.0012 | | | |
| 15 | 0.2660 | 0.5331 | 0.0010 | 0.0010 | 0.0009 | 0.0011 | 0.0010 | 0.0012 | | | |
| 16 | 0.2612 | 0.5275 | 0.0009 | 0.0009 | 0.0008 | 0.0008 | 0.0008 | 0.0010 | | | |
| 17 | 0.2657 | 0.5297 | 0.0013 | 0.0012 | 0.0012 | 0.0013 | 0.0013 | 0.0014 | | | |
| 18 | 0.2668 | 0.5340 | 0.0008 | 0.0009 | 0.0008 | 0.0009 | 0.0009 | 0.0011 | | | |
| 19 | 0.2619 | 0.5289 | 0.0011 | 0.0011 | 0.0010 | 0.0011 | 0.0011 | 0.0013 | | | |
| 20 | 0.2645 | 0.5320 | 0.0012 | 0.0012 | 0.0011 | 0.0013 | 0.0012 | 0.0013 | | | |
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| Ave. | 0.2639 | 0.5297 | 0.0012 | 0.0012 | 0.0011 | 0.0011 | 0.0011 | 0.0013 | | | |
| Med. | 0.2639 | 0.5294 | 0.0011 | 0.0011 | 0.0011 | 0.0011 | 0.0012 | 0.0013 | | | |
| Min. | 0.2612 | 0.5260 | 0.0008 | 0.0008 | 0.0007 | 0.0007 | 0.0007 | 0.0009 | | | |
| Max. | 0.2668 | 0.5340 | 0.0020 | 0.0018 | 0.0016 | 0.0015 | 0.0016 | 0.0018 | | | |
| σ | 0.0016 | 0.0021 | 0.0003 | 0.0003 | 0.0002 | 0.0002 | 0.0003 | 0.0002 | | | |



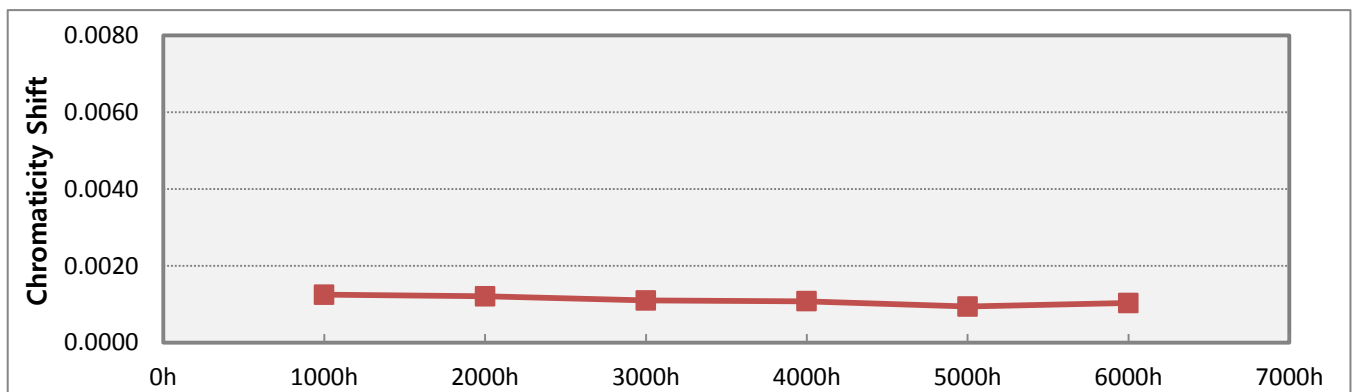
3. 85°C Data Set

| No. | Initial Characteristics | | | Lumen Maintenance | | | | | | | | |
|------|-------------------------|-----------|---------|-------------------|--------|--------|--------|--------|--------|--|--|--|
| | V _f (V) | Flux (lm) | CCT (K) | 1000 h | 2000 h | 3000 h | 4000 h | 5000 h | 6000 h | | | |
| 01 | 9.62 | 110.97 | 2624 | 99.7 | 100.2 | 100.7 | 100.5 | 100.1 | 98.5 | | | |
| 02 | 9.59 | 113.72 | 2674 | 98.9 | 99.4 | 100.4 | 99.3 | 100.0 | 98.4 | | | |
| 03 | 9.58 | 115.19 | 2646 | 99.8 | 99.7 | 100.1 | 99.7 | 99.4 | 97.8 | | | |
| 04 | 9.55 | 117.87 | 2688 | 98.8 | 99.3 | 100.5 | 100.1 | 99.1 | 97.6 | | | |
| 05 | 9.61 | 113.70 | 2596 | 100.1 | 100.6 | 101.0 | 100.6 | 100.3 | 98.3 | | | |
| 06 | 9.56 | 118.01 | 2674 | 98.6 | 99.6 | 99.4 | 99.0 | 98.5 | 98.2 | | | |
| 07 | 9.56 | 114.19 | 2663 | 99.6 | 101.2 | 100.9 | 101.0 | 99.9 | 99.7 | | | |
| 08 | 9.56 | 111.47 | 2629 | 98.6 | 99.4 | 100.4 | 99.4 | 99.0 | 98.2 | | | |
| 09 | 9.64 | 111.21 | 2638 | 99.1 | 100.3 | 99.9 | 99.3 | 99.1 | 97.7 | | | |
| 10 | 9.62 | 117.77 | 2683 | 99.4 | 99.7 | 100.6 | 99.3 | 99.1 | 97.7 | | | |
| 11 | 9.62 | 117.71 | 2667 | 98.8 | 99.5 | 99.9 | 99.4 | 98.8 | 98.8 | | | |
| 12 | 9.57 | 116.33 | 2663 | 100.1 | 100.7 | 101.1 | 100.5 | 99.6 | 99.3 | | | |
| 13 | 9.57 | 117.71 | 2715 | 99.4 | 101.0 | 100.2 | 100.3 | 99.2 | 98.5 | | | |
| 14 | 9.68 | 109.55 | 2753 | 98.9 | 99.4 | 100.1 | 99.9 | 99.2 | 98.1 | | | |
| 15 | 9.55 | 116.09 | 2652 | 98.9 | 100.3 | 100.3 | 99.5 | 99.1 | 98.4 | | | |
| 16 | 9.55 | 116.42 | 2610 | 99.4 | 100.3 | 100.7 | 100.5 | 99.7 | 98.3 | | | |
| 17 | 9.54 | 116.53 | 2643 | 99.5 | 99.8 | 100.0 | 100.6 | 99.4 | 98.2 | | | |
| 18 | 9.64 | 117.55 | 2705 | 98.2 | 99.4 | 99.0 | 99.3 | 98.1 | 98.3 | | | |
| 19 | 9.59 | 117.81 | 2672 | 98.1 | 99.5 | 100.1 | 98.9 | 98.8 | 98.1 | | | |
| 20 | 9.60 | 112.43 | 2685 | 98.6 | 99.6 | 100.2 | 99.9 | 99.3 | 98.5 | | | |
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| Ave. | 9.59 | 115.11 | 2664 | 99.1 | 99.9 | 100.3 | 99.9 | 99.3 | 98.3 | | | |
| Med. | 9.58 | 116.21 | 2665 | 99.0 | 99.7 | 100.2 | 99.8 | 99.2 | 98.3 | | | |
| Min. | 9.54 | 109.55 | 2596 | 98.1 | 99.3 | 99.0 | 98.9 | 98.1 | 97.6 | | | |
| Max. | 9.68 | 118.01 | 2753 | 100.1 | 101.2 | 101.1 | 101.0 | 100.3 | 99.7 | | | |
| σ | 0.04 | 2.76 | 37 | 0.6 | 0.6 | 0.5 | 0.6 | 0.5 | 0.5 | | | |



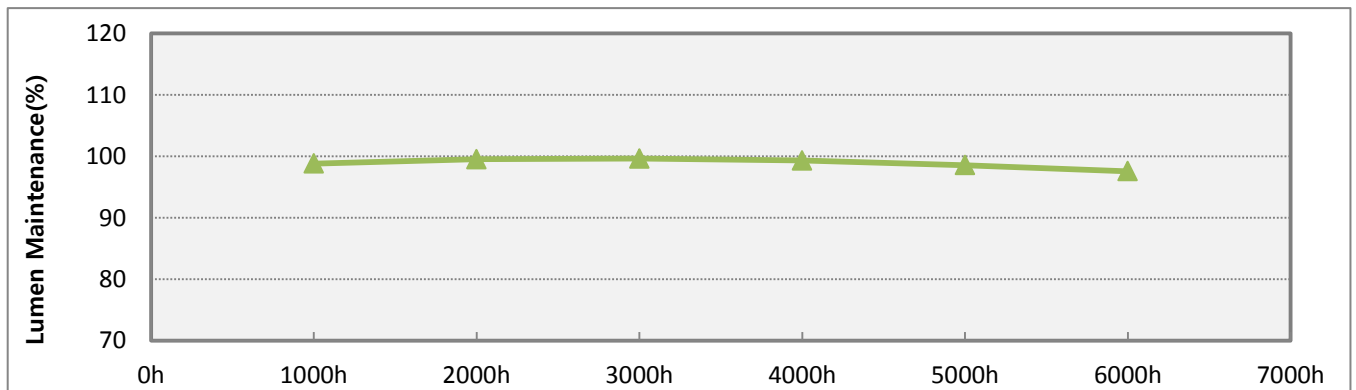
3. 85°C Data Set

| No. | Initial Characteristics | | Chromaticity Shift du'v' | | | | | | | | |
|----------|-------------------------|------------|--------------------------|--------|--------|--------|--------|--------|--|--|--|
| | CIE1976 u' | CIE1976 v' | 1000 h | 2000 h | 3000 h | 4000 h | 5000 h | 6000 h | | | |
| 01 | 0.2654 | 0.5320 | 0.0015 | 0.0014 | 0.0012 | 0.0011 | 0.0011 | 0.0012 | | | |
| 02 | 0.2630 | 0.5312 | 0.0014 | 0.0014 | 0.0012 | 0.0010 | 0.0009 | 0.0008 | | | |
| 03 | 0.2645 | 0.5311 | 0.0009 | 0.0011 | 0.0012 | 0.0010 | 0.0010 | 0.0010 | | | |
| 04 | 0.2627 | 0.5290 | 0.0014 | 0.0013 | 0.0011 | 0.0011 | 0.0010 | 0.0011 | | | |
| 05 | 0.2670 | 0.5314 | 0.0020 | 0.0016 | 0.0014 | 0.0012 | 0.0012 | 0.0013 | | | |
| 06 | 0.2634 | 0.5292 | 0.0015 | 0.0013 | 0.0012 | 0.0011 | 0.0011 | 0.0011 | | | |
| 07 | 0.2637 | 0.5303 | 0.0015 | 0.0013 | 0.0011 | 0.0011 | 0.0009 | 0.0012 | | | |
| 08 | 0.2654 | 0.5303 | 0.0018 | 0.0015 | 0.0013 | 0.0013 | 0.0014 | 0.0014 | | | |
| 09 | 0.2649 | 0.5306 | 0.0014 | 0.0014 | 0.0012 | 0.0011 | 0.0009 | 0.0010 | | | |
| 10 | 0.2629 | 0.5298 | 0.0012 | 0.0011 | 0.0010 | 0.0010 | 0.0009 | 0.0011 | | | |
| 11 | 0.2639 | 0.5284 | 0.0010 | 0.0009 | 0.0009 | 0.0009 | 0.0008 | 0.0009 | | | |
| 12 | 0.2641 | 0.5282 | 0.0010 | 0.0010 | 0.0010 | 0.0010 | 0.0008 | 0.0009 | | | |
| 13 | 0.2617 | 0.5279 | 0.0011 | 0.0012 | 0.0010 | 0.0012 | 0.0011 | 0.0011 | | | |
| 14 | 0.2608 | 0.5234 | 0.0010 | 0.0011 | 0.0011 | 0.0012 | 0.0009 | 0.0010 | | | |
| 15 | 0.2643 | 0.5306 | 0.0009 | 0.0010 | 0.0009 | 0.0009 | 0.0007 | 0.0008 | | | |
| 16 | 0.2661 | 0.5322 | 0.0011 | 0.0011 | 0.0010 | 0.0010 | 0.0008 | 0.0010 | | | |
| 17 | 0.2644 | 0.5324 | 0.0012 | 0.0011 | 0.0010 | 0.0012 | 0.0009 | 0.0010 | | | |
| 18 | 0.2625 | 0.5260 | 0.0011 | 0.0011 | 0.0010 | 0.0011 | 0.0008 | 0.0009 | | | |
| 19 | 0.2636 | 0.5288 | 0.0010 | 0.0009 | 0.0009 | 0.0008 | 0.0007 | 0.0008 | | | |
| 20 | 0.2629 | 0.5291 | 0.0010 | 0.0011 | 0.0010 | 0.0011 | 0.0008 | 0.0009 | | | |
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| Ave. | 0.2639 | 0.5296 | 0.0012 | 0.0012 | 0.0011 | 0.0011 | 0.0009 | 0.0010 | | | |
| Med. | 0.2638 | 0.5300 | 0.0011 | 0.0011 | 0.0011 | 0.0011 | 0.0009 | 0.0010 | | | |
| Min. | 0.2608 | 0.5234 | 0.0009 | 0.0009 | 0.0009 | 0.0008 | 0.0007 | 0.0008 | | | |
| Max. | 0.2670 | 0.5324 | 0.0020 | 0.0016 | 0.0014 | 0.0013 | 0.0014 | 0.0014 | | | |
| σ | 0.0015 | 0.0022 | 0.0003 | 0.0002 | 0.0001 | 0.0001 | 0.0002 | 0.0002 | | | |



3. 105°C Data Set

| No. | Initial Characteristics | | | Lumen Maintenance | | | | | | | | |
|------|-------------------------|-----------|---------|-------------------|--------|--------|--------|--------|--------|--|--|--|
| | V _f (V) | Flux (lm) | CCT (K) | 1000 h | 2000 h | 3000 h | 4000 h | 5000 h | 6000 h | | | |
| 01 | 9.73 | 109.44 | 2640 | 100.4 | 101.1 | 101.3 | 101.2 | 100.7 | 99.5 | | | |
| 02 | 9.57 | 116.34 | 2666 | 98.7 | 99.2 | 99.7 | 99.0 | 98.6 | 97.4 | | | |
| 03 | 9.54 | 115.31 | 2607 | 98.1 | 99.9 | 99.0 | 99.8 | 98.1 | 97.8 | | | |
| 04 | 9.54 | 116.64 | 2640 | 98.7 | 99.3 | 100.2 | 99.4 | 98.8 | 97.6 | | | |
| 05 | 9.55 | 118.07 | 2700 | 99.9 | 99.8 | 100.6 | 99.7 | 98.8 | 97.9 | | | |
| 06 | 9.55 | 117.41 | 2720 | 99.5 | 99.1 | 99.1 | 99.0 | 98.8 | 97.4 | | | |
| 07 | 9.62 | 110.68 | 2655 | 98.0 | 98.5 | 99.3 | 98.8 | 97.6 | 97.2 | | | |
| 08 | 9.66 | 113.49 | 2617 | 98.0 | 98.0 | 98.5 | 97.6 | 97.7 | 96.0 | | | |
| 09 | 9.64 | 115.35 | 2662 | 97.9 | 98.9 | 98.8 | 99.2 | 98.0 | 97.2 | | | |
| 10 | 9.56 | 116.19 | 2642 | 98.8 | 99.7 | 100.1 | 99.9 | 98.5 | 97.4 | | | |
| 11 | 9.62 | 114.82 | 2654 | 98.8 | 99.9 | 99.5 | 99.3 | 98.9 | 97.9 | | | |
| 12 | 9.61 | 115.63 | 2653 | 98.3 | 99.6 | 99.0 | 98.6 | 98.3 | 96.1 | | | |
| 13 | 9.74 | 109.40 | 2605 | 98.7 | 99.4 | 99.1 | 98.4 | 98.6 | 97.0 | | | |
| 14 | 9.60 | 116.06 | 2641 | 99.6 | 99.5 | 100.1 | 99.4 | 98.6 | 98.0 | | | |
| 15 | 9.59 | 117.76 | 2638 | 98.5 | 99.6 | 99.6 | 99.0 | 97.9 | 96.6 | | | |
| 16 | 9.59 | 116.09 | 2631 | 99.3 | 100.1 | 100.1 | 99.5 | 98.7 | 98.2 | | | |
| 17 | 9.57 | 119.13 | 2747 | 98.9 | 100.1 | 99.6 | 99.8 | 98.6 | 98.3 | | | |
| 18 | 9.57 | 117.88 | 2709 | 98.6 | 100.3 | 99.8 | 99.0 | 98.5 | 98.2 | | | |
| 19 | 9.58 | 113.70 | 2622 | 99.3 | 99.6 | 100.0 | 100.6 | 99.6 | 98.3 | | | |
| 20 | 9.63 | 113.04 | 2727 | 98.7 | 99.1 | 98.8 | 98.9 | 97.9 | 97.5 | | | |
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| Ave. | 9.60 | 115.12 | 2659 | 98.8 | 99.5 | 99.6 | 99.3 | 98.6 | 97.6 | | | |
| Med. | 9.59 | 115.84 | 2648 | 98.7 | 99.6 | 99.6 | 99.2 | 98.6 | 97.5 | | | |
| Min. | 9.54 | 109.40 | 2605 | 97.9 | 98.0 | 98.5 | 97.6 | 97.6 | 96.0 | | | |
| Max. | 9.74 | 119.13 | 2747 | 100.4 | 101.1 | 101.3 | 101.2 | 100.7 | 99.5 | | | |
| σ | 0.06 | 2.77 | 41 | 0.7 | 0.7 | 0.7 | 0.8 | 0.7 | 0.8 | | | |



3. 105°C Data Set

| No. | Initial Characteristics | | Chromaticity Shift du'v' | | | | | | | | |
|----------|-------------------------|------------|--------------------------|--------|--------|--------|--------|--------|--|--|--|
| | CIE1976 u' | CIE1976 v' | 1000 h | 2000 h | 3000 h | 4000 h | 5000 h | 6000 h | | | |
| 01 | 0.2647 | 0.5314 | 0.0012 | 0.0009 | 0.0011 | 0.0016 | 0.0006 | 0.0009 | | | |
| 02 | 0.2636 | 0.5302 | 0.0014 | 0.0012 | 0.0012 | 0.0013 | 0.0010 | 0.0011 | | | |
| 03 | 0.2662 | 0.5324 | 0.0013 | 0.0011 | 0.0011 | 0.0014 | 0.0009 | 0.0012 | | | |
| 04 | 0.2647 | 0.5315 | 0.0022 | 0.0017 | 0.0016 | 0.0016 | 0.0012 | 0.0012 | | | |
| 05 | 0.2624 | 0.5278 | 0.0018 | 0.0014 | 0.0014 | 0.0015 | 0.0011 | 0.0012 | | | |
| 06 | 0.2614 | 0.5280 | 0.0013 | 0.0011 | 0.0012 | 0.0015 | 0.0011 | 0.0013 | | | |
| 07 | 0.2643 | 0.5295 | 0.0016 | 0.0013 | 0.0013 | 0.0013 | 0.0011 | 0.0011 | | | |
| 08 | 0.2661 | 0.5300 | 0.0011 | 0.0010 | 0.0011 | 0.0012 | 0.0009 | 0.0009 | | | |
| 09 | 0.2640 | 0.5294 | 0.0010 | 0.0010 | 0.0010 | 0.0014 | 0.0009 | 0.0013 | | | |
| 10 | 0.2649 | 0.5297 | 0.0012 | 0.0012 | 0.0014 | 0.0017 | 0.0013 | 0.0015 | | | |
| 11 | 0.2643 | 0.5299 | 0.0011 | 0.0012 | 0.0012 | 0.0014 | 0.0012 | 0.0015 | | | |
| 12 | 0.2646 | 0.5287 | 0.0011 | 0.0012 | 0.0012 | 0.0014 | 0.0015 | 0.0019 | | | |
| 13 | 0.2664 | 0.5318 | 0.0010 | 0.0011 | 0.0012 | 0.0014 | 0.0013 | 0.0017 | | | |
| 14 | 0.2648 | 0.5304 | 0.0011 | 0.0010 | 0.0012 | 0.0013 | 0.0010 | 0.0014 | | | |
| 15 | 0.2650 | 0.5304 | 0.0010 | 0.0010 | 0.0012 | 0.0013 | 0.0009 | 0.0013 | | | |
| 16 | 0.2654 | 0.5303 | 0.0011 | 0.0010 | 0.0011 | 0.0012 | 0.0009 | 0.0012 | | | |
| 17 | 0.2602 | 0.5274 | 0.0009 | 0.0011 | 0.0012 | 0.0015 | 0.0011 | 0.0016 | | | |
| 18 | 0.2620 | 0.5278 | 0.0009 | 0.0011 | 0.0011 | 0.0012 | 0.0009 | 0.0011 | | | |
| 19 | 0.2656 | 0.5315 | 0.0010 | 0.0009 | 0.0011 | 0.0014 | 0.0011 | 0.0012 | | | |
| 20 | 0.2613 | 0.5271 | 0.0011 | 0.0012 | 0.0012 | 0.0014 | 0.0010 | 0.0012 | | | |
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| Ave. | 0.2641 | 0.5298 | 0.0012 | 0.0011 | 0.0012 | 0.0014 | 0.0011 | 0.0013 | | | |
| Med. | 0.2646 | 0.5300 | 0.0011 | 0.0011 | 0.0012 | 0.0014 | 0.0010 | 0.0012 | | | |
| Min. | 0.2602 | 0.5271 | 0.0009 | 0.0009 | 0.0010 | 0.0012 | 0.0006 | 0.0009 | | | |
| Max. | 0.2664 | 0.5324 | 0.0022 | 0.0017 | 0.0016 | 0.0017 | 0.0015 | 0.0019 | | | |
| σ | 0.0018 | 0.0016 | 0.0003 | 0.0002 | 0.0001 | 0.0001 | 0.0002 | 0.0003 | | | |

