IES LM-80 Test Report

Report Issue Date : July 06, 2018
Report Number : I-160105-03-K-01
Testing Start Date : February 25, 2016
Testing Completion Date : April 11, 2017
Revision Number : 01
Test Duration : 9 000 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 : Z5M3
Part Number : SZ5-M3-Wx-Cx
Drive Current : 700 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

Seoul Semiconductor Testing Laboratory(KT-484) is accredited to ISO/IEC 17025:2005 for the above test procedure by KOLAS, Republic of KOREA which is a signatory to ILAC-MRA.

Seoul Semiconductor Testing Laboratory

97-11, Sandan-ro 163, Danwon-gu, Ansan, Gyeonggi-do, Korea 15429, E-mail: LM80@seoulsemicon.com

1. Test Summary

Items	Nominal Case Temperature		
	55 ℃	85 ℃	105 ℃
Number of LED tested	20	20	20
Drive and Measurment Current	700 mA	700 mA	700 mA
Test Duration	9 000 h	9 000 h	9 000 h
Actual Case Temperature	≥53.0 ℃	≥83.0 ℃	≥103.9 ℃
Actual Ambient Temperature	≥50.0 ℃	≥80.0 ℃	≥100.0 ℃
Air Flow Velocity	≤0.70 m/s	≤0.41 m/s	≤0.09 m/s
Averaged Initial Luminous Flux	260.6 lm	261.2 lm	260.3 lm
Initial Nominal CCT	5700 K	5700 K	5700 K
Average Initial CRI	74	74	74
Total Input Power	2.1 W	2.1 W	2.1 W
Average Current Density (mA/mm^2)	291	291	291
Average Power Density (W/mm^2)	0.17	0.17	0.17
Minimum Spacing from die edge to die edge	-	-	-
Average Lumen Maintenance	99.7 %	97.7 %	94.5 %
Average Chromacity Shift	0.000 7	0.000 8	0.000 6
α	3.668E-06	5.375E-06	9.901E-06
B	1.029	1.026	1.033
TM-21 Projection L_{70}	>54000	>54000	39000
TM-21 Projection L_{80}	>54000	46000	26000
TM-21 Projection L_{90}	36000	24000	14000

※ The results shown in this certificate refer only to the sample(s) tested unless otherwise stated.
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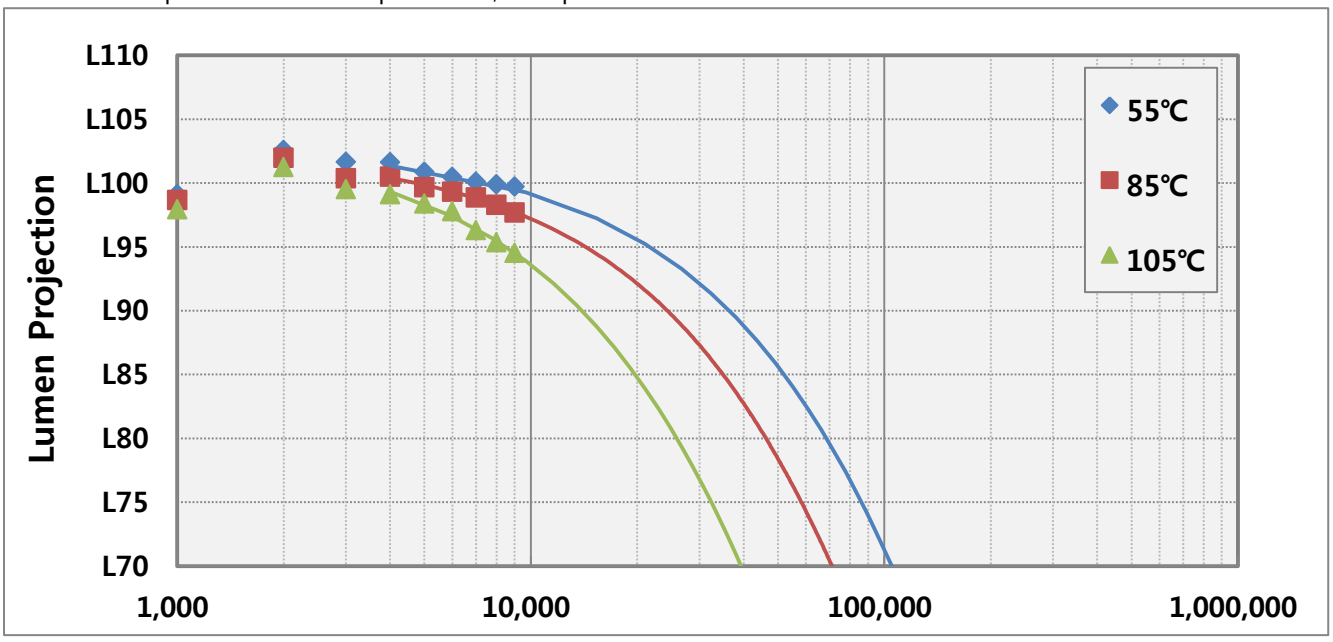


2. IES LM-80-08 Test Report Requirement :

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

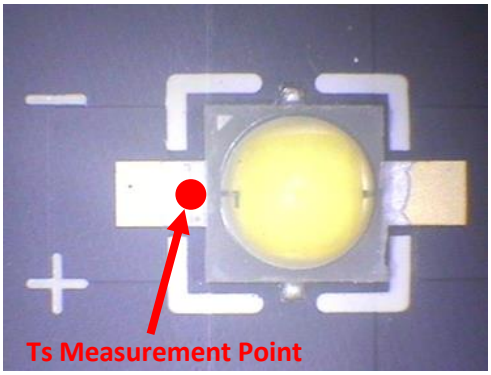
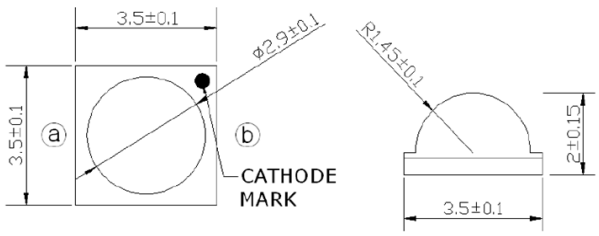
Ambient temperature : ≥ -5 ℃ of Nominal T_A

(See the Test Summary for actual T_A)

Relative Humidity : ≤ 65% RH

Case Temperature (Test Point Temperature)

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

Case Temperature Measurement Point	Package 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

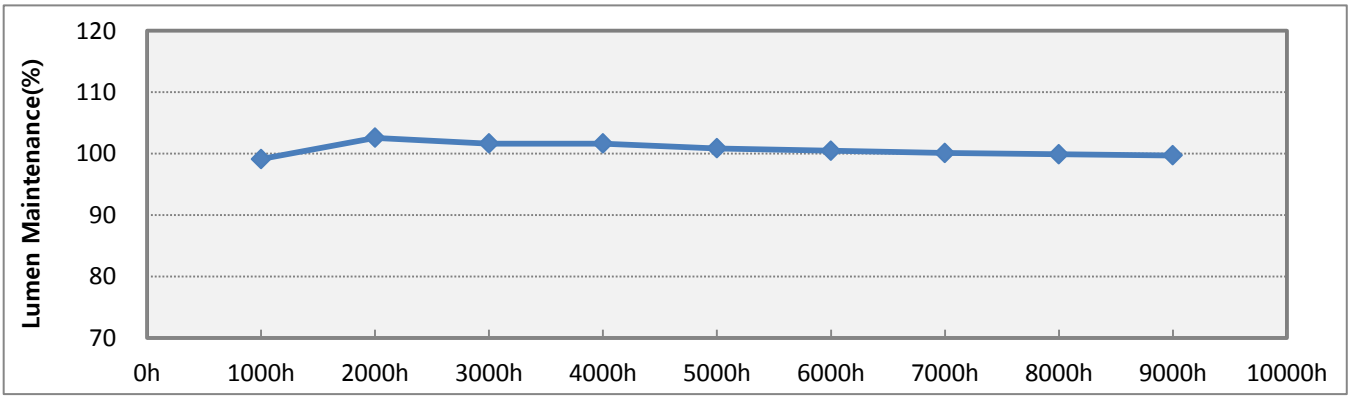
Seoul Semiconducr maintain a tolerance of ± 3.04 % at 95 % confidence level (k = 2)

Chromaticity Shift Over the Measurement Time

See the table of each data set

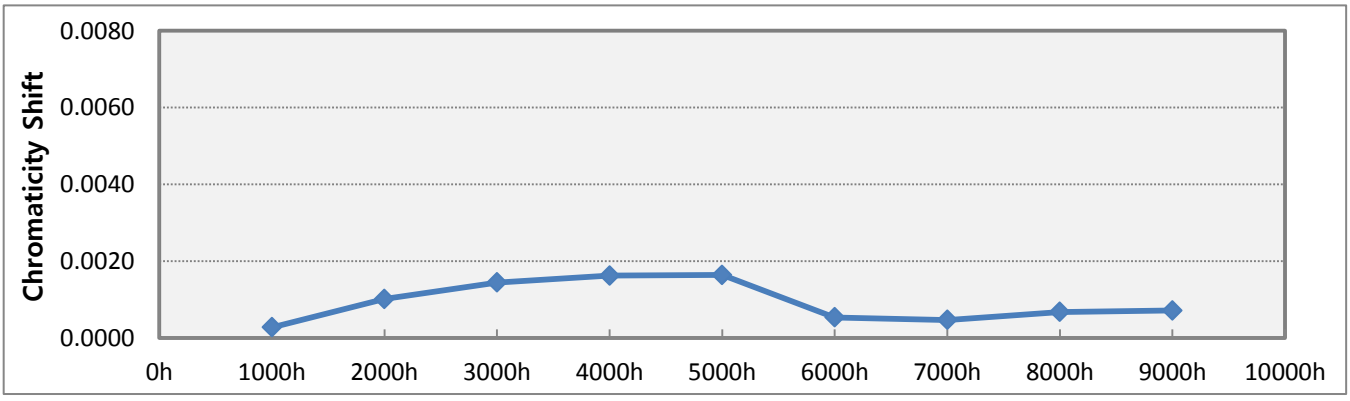
3. 55℃ Data Set

No.	Initial Characteristics			Lumen Maintenance								
	Vf (V)	Flux (lm)	CCT (K)	1000 h	2000 h	3000 h	4000 h	5000 h	6000 h	7000 h	8000 h	9000 h
01	3.07	240.66	5476	100.7	103.8	102.8	102.9	102.0	101.7	101.2	100.7	100.7
02	3.02	269.33	5426	99.3	102.9	102.1	101.8	101.5	100.8	100.3	100.3	99.9
03	3.13	253.41	5578	98.5	102.1	101.3	101.2	100.7	100.0	99.6	99.3	98.9
04	3.04	248.94	5286	99.4	103.0	102.4	102.2	101.8	101.2	100.7	101.4	100.5
05	3.07	261.17	5538	99.9	103.2	102.0	102.0	101.5	100.8	100.4	99.7	99.6
06	3.02	268.34	5438	99.2	102.8	101.7	101.4	101.1	100.4	100.1	99.5	99.5
07	3.06	272.45	5506	98.9	102.0	101.1	100.9	100.4	99.7	99.3	99.3	98.9
08	3.03	275.95	5398	99.4	102.4	101.5	101.4	100.9	100.0	99.8	99.6	99.2
09	3.03	254.11	5454	100.7	104.4	102.7	103.2	102.6	102.3	102.0	100.9	101.5
10	3.12	251.17	5305	99.0	102.5	102.7	103.0	102.5	101.8	101.5	101.1	101.0
11	3.04	275.56	5463	99.0	102.3	101.3	101.3	100.5	99.8	99.4	99.1	99.6
12	3.05	255.61	5435	98.6	102.1	101.5	101.2	100.9	100.2	99.4	99.8	99.9
13	3.03	263.17	5468	99.0	103.2	102.3	102.1	100.9	100.9	100.7	100.7	100.2
14	3.02	274.27	5434	98.7	102.1	101.2	101.1	100.3	99.8	99.5	98.9	98.8
15	3.03	260.72	5559	98.3	102.0	101.0	100.8	100.3	99.4	99.1	99.5	99.1
16	3.03	261.65	5509	99.1	102.7	101.8	102.1	99.8	100.7	100.3	99.6	99.5
17	3.04	271.12	5482	98.1	101.4	100.4	100.6	99.1	99.2	99.2	98.9	98.9
18	3.03	267.93	5421	98.5	101.7	100.8	100.6	100.1	99.3	99.1	99.2	98.4
19	3.04	250.92	5534	99.5	103.4	101.5	102.0	99.7	101.1	100.6	99.9	99.9
20	3.07	236.21	5565	98.3	101.7	100.8	100.7	100.7	100.0	99.6	100.4	100.2
Ave.	3.05	260.64	5464	99.1	102.6	101.6	101.6	100.9	100.5	100.1	99.9	99.7
Med.	3.04	261.41	5465	99.0	102.4	101.5	101.4	100.8	100.3	99.9	99.7	99.6
Min.	3.02	236.21	5286	98.1	101.4	100.4	100.6	99.1	99.2	99.1	98.9	98.4
Max.	3.13	275.95	5578	100.7	104.4	102.8	103.2	102.6	102.3	102.0	101.4	101.5
σ	0.03	11.53	77	0.7	0.8	0.7	0.8	0.9	0.9	0.9	0.7	0.8



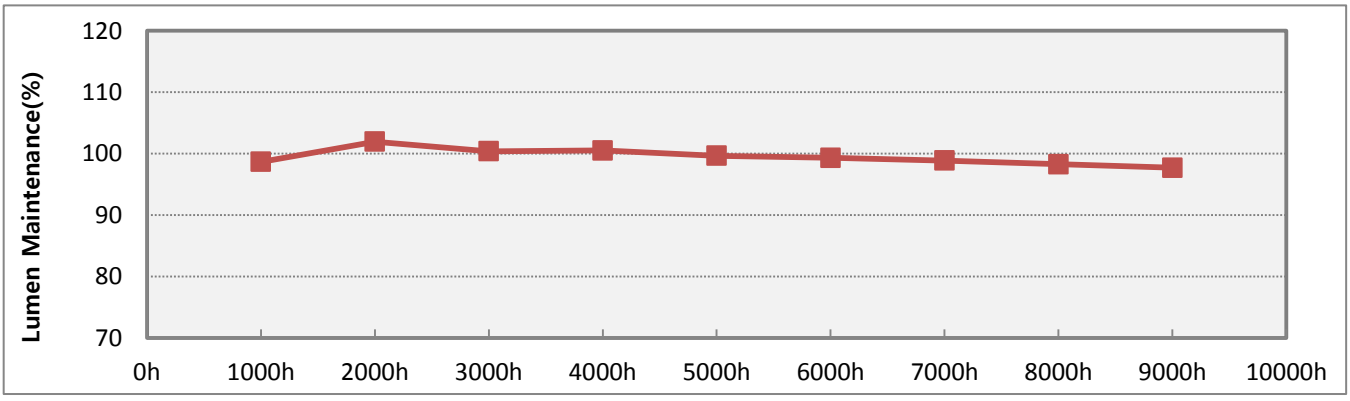
3. 55℃ Data Set

No.	Initial Characteristics			Chromaticity Shift du'v'								
	u'	v'	CRI	1000 h	2000 h	3000 h	4000 h	5000 h	6000 h	7000 h	8000 h	9000 h
01	0.2097	0.4743	74	0.0003	0.0006	0.0012	0.0012	0.0012	0.0003	0.0004	0.0005	0.0006
02	0.2098	0.4754	74	0.0001	0.0008	0.0012	0.0015	0.0014	0.0003	0.0003	0.0005	0.0006
03	0.2087	0.4734	75	0.0004	0.0011	0.0014	0.0016	0.0014	0.0005	0.0003	0.0005	0.0004
04	0.2089	0.4803	74	0.0005	0.0011	0.0015	0.0016	0.0016	0.0005	0.0003	0.0006	0.0007
05	0.2092	0.4735	74	0.0001	0.0008	0.0013	0.0015	0.0013	0.0004	0.0004	0.0005	0.0006
06	0.2095	0.4754	75	0.0002	0.0008	0.0012	0.0014	0.0013	0.0003	0.0003	0.0006	0.0004
07	0.2101	0.4732	74	0.0004	0.0013	0.0017	0.0020	0.0019	0.0008	0.0005	0.0008	0.0008
08	0.2096	0.4764	74	0.0004	0.0013	0.0016	0.0018	0.0018	0.0007	0.0004	0.0008	0.0008
09	0.2087	0.4763	75	0.0005	0.0002	0.0007	0.0008	0.0009	0.0003	0.0005	0.0004	0.0003
10	0.2093	0.4792	74	0.0002	0.0009	0.0013	0.0014	0.0013	0.0004	0.0003	0.0004	0.0005
11	0.2101	0.4741	73	0.0002	0.0011	0.0014	0.0015	0.0017	0.0005	0.0004	0.0006	0.0008
12	0.2095	0.4756	74	0.0003	0.0010	0.0016	0.0019	0.0019	0.0008	0.0007	0.0008	0.0006
13	0.2095	0.4749	74	0.0005	0.0016	0.0020	0.0023	0.0025	0.0011	0.0010	0.0012	0.0014
14	0.2099	0.4751	74	0.0004	0.0012	0.0015	0.0017	0.0017	0.0005	0.0004	0.0005	0.0005
15	0.2092	0.4731	74	0.0001	0.0011	0.0016	0.0017	0.0017	0.0005	0.0004	0.0006	0.0007
16	0.2093	0.4741	74	0.0002	0.0011	0.0018	0.0020	0.0022	0.0008	0.0008	0.0011	0.0012
17	0.2088	0.4754	74	0.0003	0.0013	0.0017	0.0017	0.0018	0.0005	0.0005	0.0010	0.0011
18	0.2098	0.4756	73	0.0002	0.0012	0.0014	0.0017	0.0017	0.0006	0.0005	0.0008	0.0007
19	0.2090	0.4739	74	0.0001	0.0006	0.0013	0.0014	0.0019	0.0005	0.0004	0.0006	0.0009
20	0.2096	0.4725	74	0.0003	0.0012	0.0015	0.0018	0.0017	0.0006	0.0005	0.0006	0.0007
Ave.	0.2094	0.4751	74	0.0003	0.0010	0.0014	0.0016	0.0016	0.0005	0.0005	0.0007	0.0007
Med.	0.2095	0.4750	74	0.0003	0.0011	0.0015	0.0016	0.0017	0.0005	0.0004	0.0006	0.0007
Min.	0.2087	0.4725	73	0.0001	0.0002	0.0007	0.0008	0.0009	0.0003	0.0003	0.0004	0.0003
Max.	0.2101	0.4803	75	0.0005	0.0016	0.0020	0.0023	0.0025	0.0011	0.0010	0.0012	0.0014
σ	0.0004	0.0019	0.4	0.0001	0.0003	0.0003	0.0003	0.0004	0.0002	0.0002	0.0002	0.0003



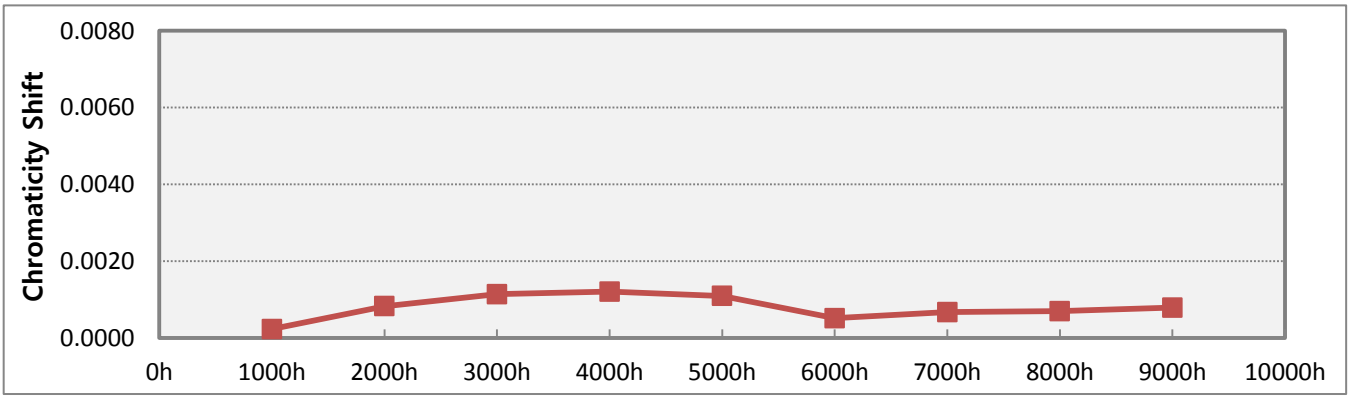
4. 85℃ Data Set

No.	Initial Characteristics			Lumen Maintenance								
	Vf (V)	Flux (lm)	CCT (K)	1000 h	2000 h	3000 h	4000 h	5000 h	6000 h	7000 h	8000 h	9000 h
01	3.00	262.24	5458	98.3	101.6	100.4	100.9	100.2	100.1	99.8	99.6	99.1
02	3.02	273.21	5434	98.4	101.7	100.4	100.3	99.1	98.7	97.9	97.1	95.5
03	2.98	250.81	5509	98.4	101.9	100.6	100.4	99.5	98.8	98.3	98.1	97.0
04	2.98	264.72	5426	99.4	102.5	101.1	100.9	100.0	99.5	99.1	98.6	97.6
05	3.04	269.34	5467	98.3	102.0	100.3	100.0	99.2	98.7	98.5	97.3	96.2
06	3.05	265.23	5439	98.0	101.1	99.9	99.4	98.7	98.3	97.4	97.1	95.7
07	3.03	242.37	5558	99.3	102.8	101.1	101.5	100.8	100.8	100.5	100.2	100.3
08	3.04	264.33	5415	98.4	101.7	100.3	100.4	99.4	98.9	98.7	98.5	97.8
09	3.06	276.28	5394	98.1	101.2	99.7	99.6	98.8	98.3	97.9	97.0	96.2
10	3.06	253.50	5532	97.4	101.0	100.2	99.8	99.4	99.5	99.6	99.6	99.9
11	3.02	249.84	5588	99.7	102.9	100.2	101.3	100.3	99.8	99.8	98.8	98.2
12	3.02	267.97	5382	98.1	101.5	99.8	100.1	99.1	98.5	98.1	97.4	96.7
13	3.02	273.62	5419	98.7	102.0	100.5	100.5	99.5	99.1	98.5	98.2	97.4
14	3.10	250.58	5423	97.7	100.8	99.6	99.5	98.8	98.8	98.5	98.6	98.4
15	3.00	253.20	5511	98.6	101.7	100.5	100.3	99.7	99.1	98.8	98.4	98.2
16	3.01	258.24	5473	99.6	102.8	100.2	101.2	100.2	100.0	99.3	98.1	97.7
17	3.02	268.76	5380	98.9	101.9	100.7	100.5	99.6	99.3	98.5	97.6	96.6
18	2.98	248.80	5476	100.5	104.2	101.1	102.5	101.5	101.1	100.8	99.4	99.9
19	3.08	275.08	5427	98.5	101.6	100.0	100.3	99.2	98.9	98.0	97.0	96.4
20	3.05	255.35	5579	98.8	102.1	100.9	100.7	100.3	100.0	99.6	99.0	98.9
Ave.	3.03	261.17	5464	98.7	102.0	100.4	100.5	99.7	99.3	98.9	98.3	97.7
Med.	3.02	263.28	5448	98.5	101.8	100.4	100.4	99.5	99.1	98.6	98.3	97.7
Min.	2.98	242.37	5380	97.4	100.8	99.6	99.4	98.7	98.3	97.4	97.0	95.5
Max.	3.10	276.28	5588	100.5	104.2	101.1	102.5	101.5	101.1	100.8	100.2	100.3
σ	0.03	10.13	63	0.7	0.8	0.5	0.7	0.7	0.8	0.9	1.0	1.4



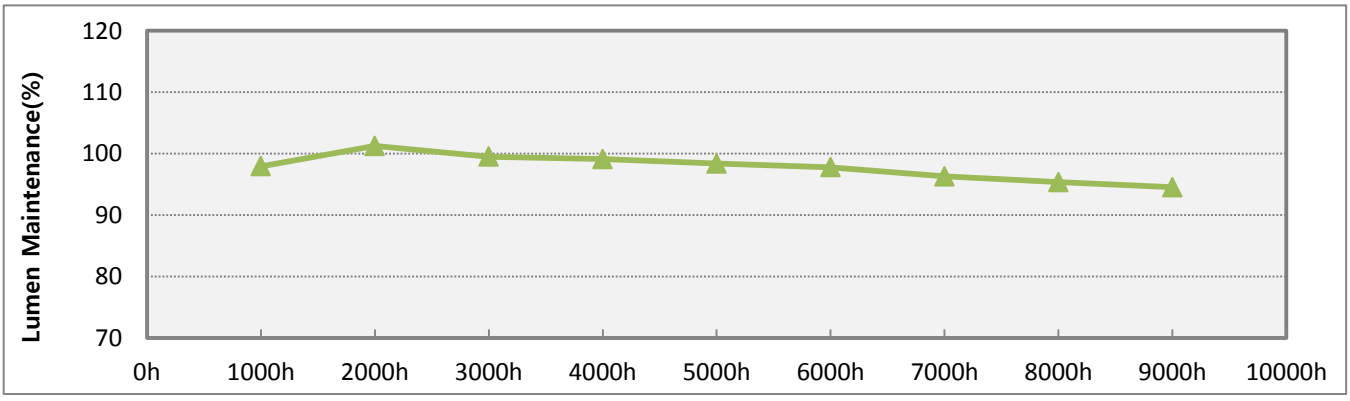
4. 85℃ Data Set

No.	Initial Characteristics			Chromaticity Shift du'v'								
	u'	v'	CRI	1000 h	2000 h	3000 h	4000 h	5000 h	6000 h	7000 h	8000 h	9000 h
01	0.2082	0.4767	74	0.0002	0.0006	0.0008	0.0008	0.0007	0.0008	0.0009	0.0007	0.0007
02	0.2086	0.4769	75	0.0006	0.0012	0.0017	0.0017	0.0017	0.0005	0.0006	0.0011	0.0013
03	0.2098	0.4734	74	0.0002	0.0007	0.0011	0.0012	0.0012	0.0004	0.0004	0.0005	0.0008
04	0.2095	0.4758	74	0.0002	0.0009	0.0012	0.0014	0.0013	0.0004	0.0005	0.0008	0.0010
05	0.2080	0.4769	75	0.0003	0.0009	0.0014	0.0015	0.0014	0.0005	0.0005	0.0008	0.0010
06	0.2085	0.4768	75	0.0003	0.0010	0.0013	0.0015	0.0013	0.0005	0.0006	0.0009	0.0012
07	0.2092	0.4731	75	0.0001	0.0006	0.0009	0.0010	0.0008	0.0007	0.0009	0.0007	0.0006
08	0.2090	0.4768	74	0.0002	0.0007	0.0009	0.0009	0.0008	0.0007	0.0010	0.0008	0.0009
09	0.2094	0.4768	74	0.0002	0.0007	0.0009	0.0010	0.0009	0.0005	0.0007	0.0005	0.0005
10	0.2082	0.4750	75	0.0002	0.0009	0.0011	0.0014	0.0011	0.0003	0.0006	0.0006	0.0006
11	0.2090	0.4726	75	0.0002	0.0008	0.0014	0.0013	0.0011	0.0004	0.0006	0.0005	0.0007
12	0.2090	0.4776	74	0.0002	0.0009	0.0013	0.0013	0.0013	0.0005	0.0004	0.0008	0.0009
13	0.2095	0.4760	73	0.0003	0.0008	0.0012	0.0013	0.0012	0.0004	0.0006	0.0005	0.0005
14	0.2094	0.4760	74	0.0002	0.0009	0.0009	0.0011	0.0010	0.0007	0.0009	0.0007	0.0008
15	0.2093	0.4741	74	0.0004	0.0010	0.0012	0.0012	0.0010	0.0004	0.0006	0.0005	0.0004
16	0.2099	0.4741	74	0.0002	0.0009	0.0014	0.0012	0.0011	0.0005	0.0006	0.0006	0.0006
17	0.2097	0.4766	74	0.0002	0.0009	0.0011	0.0014	0.0013	0.0005	0.0007	0.0013	0.0017
18	0.2094	0.4747	74	0.0003	0.0007	0.0013	0.0011	0.0011	0.0004	0.0006	0.0005	0.0005
19	0.2092	0.4762	74	0.0001	0.0008	0.0009	0.0009	0.0008	0.0007	0.0008	0.0005	0.0005
20	0.2087	0.4732	75	0.0001	0.0007	0.0009	0.0010	0.0008	0.0006	0.0009	0.0006	0.0005
Ave.	0.2091	0.4755	74	0.0002	0.0008	0.0011	0.0012	0.0011	0.0005	0.0007	0.0007	0.0008
Med.	0.2092	0.4760	74	0.0002	0.0009	0.0011	0.0012	0.0011	0.0005	0.0006	0.0007	0.0007
Min.	0.2080	0.4726	73	0.0001	0.0006	0.0008	0.0008	0.0007	0.0003	0.0004	0.0005	0.0004
Max.	0.2099	0.4776	75	0.0006	0.0012	0.0017	0.0017	0.0017	0.0008	0.0010	0.0013	0.0017
σ	0.0006	0.0015	0.6	0.0001	0.0001	0.0002	0.0002	0.0003	0.0001	0.0002	0.0002	0.0003



5. 105℃ Data Set

No.	Initial Characteristics			Lumen Maintenance								
	Vf (V)	Flux (lm)	CCT (K)	1000 h	2000 h	3000 h	4000 h	5000 h	6000 h	7000 h	8000 h	9000 h
01	2.96	265.00	5459	99.0	102.0	100.8	99.9	99.0	98.5	96.9	95.7	95.2
02	3.03	262.49	5428	98.2	101.7	100.7	100.1	99.4	98.4	96.8	95.3	94.6
03	3.04	248.21	5495	98.0	101.3	100.0	99.8	100.1	100.3	99.5	99.7	99.4
04	3.04	256.56	5432	99.1	102.7	101.0	100.5	98.8	98.8	96.9	95.8	96.2
05	3.05	267.66	5351	98.4	101.5	100.9	99.9	99.0	98.3	96.6	95.4	93.3
06	3.03	256.47	5514	98.2	101.4	100.3	99.5	99.1	98.5	96.7	96.0	94.0
07	3.08	247.55	5432	100.2	104.0	102.1	101.5	100.0	100.4	98.9	96.8	95.2
08	2.99	265.23	5441	98.7	101.8	100.4	99.9	98.9	98.3	96.3	95.2	94.9
09	3.08	272.60	5526	97.5	100.3	98.5	97.6	97.0	97.1	95.5	94.3	93.7
10	3.02	268.18	5428	98.3	101.7	94.7	99.5	98.8	97.9	96.3	95.3	92.9
11	3.04	253.25	5466	98.8	102.4	99.8	99.5	98.7	97.5	95.3	94.9	94.2
12	3.06	253.79	5385	97.7	100.9	99.3	98.4	97.8	97.0	96.1	94.9	94.5
13	3.02	276.97	5403	97.5	100.8	99.1	98.3	97.3	96.9	95.2	94.4	94.1
14	3.02	258.58	5480	97.3	100.5	99.0	98.4	97.9	96.9	95.5	94.3	91.1
15	3.03	273.57	5437	97.5	100.6	99.2	98.2	97.3	96.4	95.3	95.0	95.0
16	3.20	254.81	5406	96.1	99.7	98.2	97.7	97.2	96.4	94.2	93.0	90.6
17	3.12	250.77	5418	96.5	100.2	98.7	97.7	97.4	96.8	95.5	95.0	95.1
18	2.99	270.91	5412	98.1	101.2	99.8	99.1	98.1	97.4	95.4	94.0	94.1
19	3.09	246.23	5528	96.5	99.7	98.4	98.0	98.0	97.1	97.1	96.4	96.9
20	3.04	257.02	5505	97.3	100.6	99.2	98.8	97.8	97.0	95.8	95.5	95.3
Ave.	3.05	260.29	5447	97.9	101.2	99.5	99.1	98.4	97.8	96.3	95.3	94.5
Med.	3.04	257.80	5435	98.1	101.2	99.5	99.3	98.4	97.4	96.2	95.2	94.5
Min.	2.96	246.23	5351	96.1	99.7	94.7	97.6	97.0	96.4	94.2	93.0	90.6
Max.	3.20	276.97	5528	100.2	104.0	102.1	101.5	100.1	100.4	99.5	99.7	99.4
σ	0.05	9.31	48	1.0	1.0	1.5	1.1	0.9	1.1	1.2	1.3	1.9



5. 105℃ Data Set

No.	Initial Characteristics			Chromaticity Shift du'v'								
	u'	v'	CRI	1000 h	2000 h	3000 h	4000 h	5000 h	6000 h	7000 h	8000 h	9000 h
01	0.2088	0.4759	74	0.0005	0.0002	0.0004	0.0004	0.0006	0.0005	0.0004	0.0004	0.0004
02	0.2100	0.4751	74	0.0002	0.0006	0.0011	0.0011	0.0009	0.0002	0.0004	0.0008	0.0006
03	0.2091	0.4747	75	0.0003	0.0004	0.0004	0.0003	0.0001	0.0014	0.0018	0.0018	0.0020
04	0.2084	0.4772	75	0.0004	0.0000	0.0004	0.0003	0.0005	0.0007	0.0005	0.0002	0.0003
05	0.2096	0.4776	74	0.0001	0.0005	0.0010	0.0012	0.0012	0.0003	0.0004	0.0005	0.0005
06	0.2096	0.4736	74	0.0006	0.0001	0.0003	0.0003	0.0002	0.0010	0.0009	0.0009	0.0009
07	0.2102	0.4747	73	0.0002	0.0002	0.0008	0.0009	0.0010	0.0004	0.0005	0.0002	0.0005
08	0.2088	0.4764	74	0.0003	0.0003	0.0007	0.0006	0.0007	0.0004	0.0004	0.0006	0.0004
09	0.2094	0.4735	74	0.0001	0.0005	0.0006	0.0007	0.0008	0.0006	0.0006	0.0003	0.0003
10	0.2093	0.4760	74	0.0002	0.0005	0.0010	0.0011	0.0011	0.0003	0.0003	0.0005	0.0006
11	0.2089	0.4757	74	0.0003	0.0002	0.0014	0.0007	0.0008	0.0003	0.0005	0.0010	0.0009
12	0.2092	0.4773	74	0.0003	0.0009	0.0009	0.0012	0.0010	0.0004	0.0007	0.0012	0.0014
13	0.2091	0.4769	74	0.0001	0.0004	0.0004	0.0004	0.0006	0.0006	0.0003	0.0003	0.0003
14	0.2094	0.4746	74	0.0001	0.0005	0.0004	0.0004	0.0003	0.0009	0.0009	0.0011	0.0007
15	0.2087	0.4766	74	0.0003	0.0003	0.0003	0.0004	0.0006	0.0005	0.0004	0.0003	0.0004
16	0.2103	0.4752	73	0.0001	0.0005	0.0006	0.0006	0.0006	0.0005	0.0003	0.0004	0.0004
17	0.2093	0.4763	74	0.0002	0.0006	0.0006	0.0009	0.0009	0.0003	0.0003	0.0006	0.0004
18	0.2091	0.4768	74	0.0003	0.0003	0.0004	0.0005	0.0008	0.0004	0.0003	0.0006	0.0004
19	0.2092	0.4738	75	0.0001	0.0005	0.0005	0.0006	0.0002	0.0012	0.0014	0.0012	0.0015
20	0.2087	0.4750	75	0.0001	0.0005	0.0004	0.0004	0.0006	0.0005	0.0005	0.0003	0.0002
Ave.	0.2092	0.4756	74	0.0002	0.0004	0.0006	0.0007	0.0007	0.0006	0.0006	0.0007	0.0006
Med.	0.2092	0.4758	74	0.0002	0.0004	0.0006	0.0006	0.0007	0.0005	0.0004	0.0006	0.0004
Min.	0.2084	0.4735	73	0.0001	0.0000	0.0003	0.0003	0.0001	0.0002	0.0003	0.0002	0.0002
Max.	0.2103	0.4776	75	0.0006	0.0009	0.0014	0.0012	0.0012	0.0014	0.0018	0.0018	0.0020
σ	0.0005	0.0012	0.5	0.0001	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005