

CL-L261 LM-80 Report

September 30,2010
BGC10-035-03

1. Number of LED sources
25 randomly selected samples.
2. Description of LED sources
LED sources containing 1 wire bonded bonded InGaN die covered in phosphor and attached to FR4.
The report is applied to the following products
CL-L261-MU1*-A , CL-L261-U1*-A .

The report is applied to the following CCT: 2700K , 3000K , 3500K , 4000K , 5000K , 6300K .
3. Description of Auxillary Equipment.
LED+Sn-Ag-Cu Solder + Substrate for Testing
4. Operating Cycle.
DC driving.
5. Ambient Conditions
Minimal air flow.
Ta= 25.4 C during photometric testing .
6. Case Temperature (Tc) / 7. Drive Current

Table-1 LM-80 Test condition

Tc (deg C)	Actual Tc (deg C)	Actual Ta (deg C)	Tc -Ta (deg C)	Drive current (mA)	Relative humidity	Average Lumen Maintenance	Average $\Delta u'v'$
85	84.5	80.8	3.7	20	8%	96.9%	0.0031
55	54.7	51.7	3.0	20	17%	98.6%	0.0028
25	24.5	21.5	3.0	20	28%	99.5%	0.0022

8. Initial Luminous flux and forward voltage and CCT
Typ 5.75lm , Typ 3.2V , Typ 2700K . (CL-L261-MU1L2-A)
9. Lumen Maintenance DATA
Refer to Tables .
10. Observation of LED Light Source failures
No failures observed.
11. LED light source monitoring interval
1000H.
12. Photometric measurement uncertainty
 $\pm 2\%$ lumens
13. Chromaticity shift
Refer to Tabales. Delta u' and v' at each 1,000 hours.

Test conditions	Tc=84.5 deg C Ta=80.8 deg C IFDC=20mA
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	Luminous Flux(lm)						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	5.6	5.5	5.6	5.5	5.5	5.4	5.4
2	5.7	5.7	5.7	5.7	5.6	5.6	5.6
3	5.8	5.7	5.7	5.7	5.6	5.6	5.5
4	5.6	5.5	5.5	5.5	5.4	5.4	5.4
5	5.8	5.7	5.7	5.7	5.7	5.6	5.5
6	5.8	5.9	5.9	5.8	5.8	5.8	5.8
7	5.8	5.8	5.7	5.7	5.7	5.7	5.6
8	5.8	5.7	5.6	5.6	5.6	5.6	5.5
9	5.7	5.6	5.6	5.6	5.5	5.5	5.4
10	5.6	5.6	5.6	5.5	5.5	5.4	5.5
11	5.8	5.7	5.7	5.7	5.7	5.7	5.6
12	5.8	5.8	5.8	5.7	5.7	5.7	5.7
13	5.6	5.6	5.6	5.6	5.6	5.5	5.5
14	5.7	5.7	5.7	5.6	5.6	5.6	5.5
15	5.8	5.8	5.7	5.7	5.6	5.6	5.5
16	5.7	5.6	5.6	5.6	5.5	5.5	5.5
17	5.8	5.7	5.7	5.6	5.6	5.6	5.5
18	5.9	5.8	5.8	5.8	5.8	5.7	5.7
19	5.8	5.7	5.8	5.7	5.7	5.7	5.7
20	5.8	5.7	5.7	5.7	5.7	5.6	5.6
21	5.8	5.8	5.7	5.7	5.6	5.6	5.5
22	5.8	5.7	5.7	5.7	5.7	5.6	5.7
23	5.8	5.7	5.8	5.7	5.7	5.6	5.7
24	5.7	5.7	5.7	5.6	5.6	5.6	5.5
25	5.9	5.8	5.8	5.8	5.8	5.8	5.7
Max.	5.9	5.9	5.9	5.8	5.8	5.8	5.8
Ave.	5.8	5.7	5.7	5.7	5.6	5.6	5.6
Min.	5.6	5.5	5.5	5.5	5.4	5.4	5.4
Sigma	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Median	5.8	5.7	5.7	5.7	5.6	5.6	5.5

	Lumen Maintenance(%)						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	100	99.2	99.4	98.5	97.6	97.0	96.8
2	100	99.5	99.1	98.6	98.3	97.4	97.1
3	100	99.2	98.9	98.0	97.1	96.9	96.1
4	100	98.5	98.3	98.3	97.2	97.1	97.2
5	100	99.8	99.0	99.1	98.5	97.3	96.2
6	100	101.1	100.4	99.8	99.7	99.7	99.6
7	100	99.5	99.0	98.9	98.1	98.3	97.0
8	100	98.6	97.2	96.4	96.5	96.8	95.5
9	100	97.8	97.8	97.2	95.6	95.4	95.0
10	100	100.2	99.6	98.3	96.9	96.9	97.0
11	100	99.3	98.4	98.2	98.4	98.8	97.5
12	100	99.2	99.3	98.5	98.2	98.7	98.0
13	100	99.2	98.9	99.1	98.8	98.6	97.8
14	100	100.0	99.0	98.3	98.3	97.1	96.1
15	100	100.1	99.8	99.7	97.8	96.9	95.5
16	100	99.1	98.7	98.1	97.8	96.8	97.5
17	100	98.6	98.9	97.7	97.0	96.5	95.2
18	100	99.0	98.5	98.8	97.9	96.8	97.3
19	100	98.7	99.3	98.6	98.6	98.5	97.4
20	100	99.3	98.5	98.0	98.0	97.1	96.9
21	100	100.2	99.5	98.0	97.9	97.8	96.3
22	100	99.0	98.4	98.4	97.9	97.4	97.8
23	100	98.7	99.8	98.3	97.7	97.1	97.7
24	100	99.3	99.3	98.4	98.2	97.2	96.6
25	100	99.4	98.6	98.4	98.4	98.0	97.0
Max.		101.1	100.4	99.8	99.7	99.7	99.6
Ave.		99.3	98.9	98.4	97.9	97.4	96.9
Min.		97.8	97.2	96.4	95.6	95.4	95.0
Sigma		0.7	0.7	0.7	0.8	0.9	1.0
Median		99.2	99.0	98.4	97.9	97.1	97.0

Test conditions	Tc=84.5 deg C Ta=80.8 deg C IFDC=20mA
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	Chromaticity u'						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	0.2615	0.2596	0.2592	0.2602	0.2603	0.2598	0.2600
2	0.2621	0.2608	0.2611	0.2619	0.2601	0.2606	0.2587
3	0.2629	0.2606	0.2605	0.2626	0.2616	0.2625	0.2615
4	0.2622	0.2617	0.2629	0.2627	0.2616	0.2599	0.2609
5	0.2627	0.2603	0.2615	0.2606	0.2612	0.2609	0.2621
6	0.2596	0.2579	0.2578	0.2592	0.2591	0.2589	0.2578
7	0.2622	0.2606	0.2602	0.2599	0.2600	0.2600	0.2598
8	0.2618	0.2601	0.2605	0.2607	0.2620	0.2604	0.2600
9	0.2609	0.2592	0.2579	0.2606	0.2591	0.2591	0.2602
10	0.2603	0.2586	0.2595	0.2589	0.2606	0.2598	0.2575
11	0.2626	0.2601	0.2599	0.2614	0.2611	0.2609	0.2618
12	0.2584	0.2559	0.2574	0.2579	0.2572	0.2558	0.2573
13	0.2633	0.2628	0.2611	0.2613	0.2622	0.2629	0.2628
14	0.2605	0.2597	0.2578	0.2597	0.2587	0.2599	0.2580
15	0.2625	0.2608	0.2614	0.2618	0.2607	0.2620	0.2602
16	0.2634	0.2624	0.2633	0.2619	0.2638	0.2623	0.2627
17	0.2651	0.2629	0.2634	0.2653	0.2638	0.2641	0.2635
18	0.2631	0.2622	0.2613	0.2614	0.2629	0.2626	0.2623
19	0.2617	0.2608	0.2612	0.2612	0.2597	0.2595	0.2598
20	0.2618	0.2613	0.2614	0.2592	0.2609	0.2599	0.2607
21	0.2634	0.2614	0.2630	0.2632	0.2616	0.2626	0.2623
22	0.2604	0.2581	0.2585	0.2605	0.2590	0.2596	0.2585
23	0.2609	0.2591	0.2598	0.2583	0.2605	0.2597	0.2596
24	0.2613	0.2598	0.2600	0.2599	0.2599	0.2611	0.2588
25	0.2628	0.2611	0.2608	0.2613	0.2613	0.2614	0.2606
Max.	0.2651	0.2629	0.2634	0.2653	0.2638	0.2641	0.2635
Ave.	0.2619	0.2603	0.2605	0.2609	0.2608	0.2606	0.2603
Min.	0.2584	0.2559	0.2574	0.2579	0.2572	0.2558	0.2573
Sigma	0.0014	0.0016	0.0017	0.0016	0.0015	0.0017	0.0017
Median	0.2621	0.2606	0.2605	0.2607	0.2607	0.2604	0.2602

	Chromaticity v'						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	0.5271	0.5248	0.5250	0.5248	0.5233	0.5243	0.5242
2	0.5277	0.5246	0.5249	0.5246	0.5255	0.5249	0.5253
3	0.5271	0.5249	0.5244	0.5242	0.5249	0.5242	0.5250
4	0.5261	0.5236	0.5233	0.5231	0.5229	0.5225	0.5241
5	0.5266	0.5237	0.5231	0.5230	0.5237	0.5243	0.5232
6	0.5279	0.5252	0.5247	0.5247	0.5247	0.5259	0.5254
7	0.5258	0.5232	0.5241	0.5233	0.5228	0.5235	0.5227
8	0.5261	0.5233	0.5229	0.5230	0.5234	0.5230	0.5238
9	0.5266	0.5243	0.5235	0.5239	0.5233	0.5238	0.5243
10	0.5277	0.5253	0.5247	0.5251	0.5246	0.5252	0.5250
11	0.5276	0.5244	0.5238	0.5244	0.5247	0.5239	0.5261
12	0.5266	0.5233	0.5242	0.5236	0.5234	0.5251	0.5244
13	0.5270	0.5239	0.5243	0.5241	0.5245	0.5248	0.5238
14	0.5278	0.5244	0.5253	0.5258	0.5246	0.5249	0.5249
15	0.5275	0.5241	0.5246	0.5240	0.5243	0.5244	0.5257
16	0.5277	0.5250	0.5248	0.5253	0.5252	0.5252	0.5248
17	0.5267	0.5234	0.5234	0.5232	0.5236	0.5243	0.5235
18	0.5238	0.5213	0.5210	0.5206	0.5208	0.5209	0.5205
19	0.5274	0.5245	0.5245	0.5250	0.5239	0.5241	0.5249
20	0.5256	0.5229	0.5228	0.5231	0.5225	0.5232	0.5228
21	0.5269	0.5249	0.5238	0.5243	0.5240	0.5236	0.5249
22	0.5257	0.5230	0.5224	0.5238	0.5231	0.5227	0.5234
23	0.5268	0.5245	0.5235	0.5237	0.5241	0.5235	0.5239
24	0.5269	0.5255	0.5241	0.5243	0.5237	0.5238	0.5246
25	0.5269	0.5238	0.5242	0.5241	0.5242	0.5248	0.5245
Max.	0.5279	0.5255	0.5253	0.5258	0.5255	0.5259	0.5261
Ave.	0.5268	0.5241	0.5239	0.5240	0.5238	0.5240	0.5242
Min.	0.5238	0.5213	0.5210	0.5206	0.5208	0.5209	0.5205
Sigma	0.0009	0.0009	0.0009	0.0010	0.0010	0.0010	0.0011
Median	0.5269	0.5243	0.5241	0.5241	0.5239	0.5242	0.5244

Test conditions	Tc=84.5 deg C Ta=80.8 deg C IFDC=20mA
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	$\Delta u'v'$						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1		0.0030	0.0031	0.0026	0.0040	0.0033	0.0033
2		0.0034	0.0029	0.0031	0.0030	0.0032	0.0042
3		0.0032	0.0036	0.0030	0.0026	0.0030	0.0026
4		0.0026	0.0029	0.0030	0.0032	0.0043	0.0024
5		0.0038	0.0036	0.0041	0.0032	0.0028	0.0034
6		0.0032	0.0037	0.0032	0.0033	0.0022	0.0031
7		0.0030	0.0025	0.0034	0.0037	0.0031	0.0038
8		0.0033	0.0034	0.0033	0.0027	0.0033	0.0029
9		0.0029	0.0043	0.0027	0.0038	0.0034	0.0024
10		0.0029	0.0031	0.0030	0.0031	0.0025	0.0039
11		0.0040	0.0046	0.0035	0.0033	0.0041	0.0017
12		0.0041	0.0027	0.0031	0.0034	0.0030	0.0025
13		0.0032	0.0035	0.0035	0.0027	0.0022	0.0032
14		0.0035	0.0037	0.0022	0.0037	0.0030	0.0038
15		0.0038	0.0031	0.0036	0.0037	0.0032	0.0029
16		0.0029	0.0029	0.0028	0.0025	0.0027	0.0030
17		0.0039	0.0037	0.0035	0.0034	0.0026	0.0036
18		0.0026	0.0033	0.0036	0.0030	0.0029	0.0033
19		0.0031	0.0030	0.0024	0.0040	0.0040	0.0032
20		0.0028	0.0029	0.0037	0.0033	0.0030	0.0031
21		0.0028	0.0032	0.0027	0.0034	0.0035	0.0023
22		0.0036	0.0038	0.0019	0.0029	0.0031	0.0030
23		0.0029	0.0034	0.0040	0.0027	0.0034	0.0032
24		0.0021	0.0031	0.0029	0.0035	0.0031	0.0034
25		0.0036	0.0034	0.0032	0.0032	0.0025	0.0033
Max.		0.0041	0.0046	0.0041	0.0040	0.0043	0.0042
Ave.		0.0032	0.0033	0.0031	0.0033	0.0031	0.0031
Min.		0.0021	0.0025	0.0019	0.0025	0.0022	0.0017
Sigma		0.0005	0.0005	0.0005	0.0004	0.0005	0.0006
Median		0.0032	0.0033	0.0031	0.0033	0.0031	0.0032

Test conditions	Tc=54.7 deg C Ta=50.7 deg C IFDC=20mA
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	Luminous Flux(lm)						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	5.8	5.8	5.8	5.8	5.8	5.8	5.7
2	5.8	5.8	5.8	5.8	5.8	5.8	5.7
3	5.7	5.7	5.6	5.7	5.6	5.6	5.6
4	5.7	5.7	5.7	5.6	5.6	5.6	5.6
5	5.8	5.8	5.8	5.7	5.7	5.7	5.7
6	5.8	5.7	5.7	5.7	5.7	5.7	5.7
7	5.8	5.8	5.8	5.8	5.7	5.7	5.8
8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
9	5.9	5.8	5.8	5.8	5.8	5.8	5.8
10	5.8	5.7	5.8	5.8	5.8	5.7	5.7
11	5.8	5.8	5.8	5.8	5.8	5.8	5.7
12	5.8	5.8	5.8	5.7	5.7	5.7	5.8
13	5.7	5.7	5.6	5.6	5.6	5.6	5.6
14	5.7	5.7	5.7	5.6	5.7	5.6	5.6
15	5.9	5.9	5.8	5.8	5.8	5.8	5.8
16	5.8	5.8	5.8	5.8	5.7	5.8	5.7
17	5.8	5.7	5.8	5.8	5.8	5.8	5.8
18	5.8	5.8	5.8	5.8	5.8	5.8	5.8
19	5.7	5.7	5.7	5.7	5.7	5.6	5.6
20	5.8	5.7	5.7	5.7	5.7	5.7	5.6
21	5.8	5.8	5.8	5.7	5.7	5.8	5.7
22	5.6	5.7	5.7	5.6	5.6	5.6	5.6
23	5.8	5.7	5.8	5.7	5.8	5.7	5.7
24	5.9	5.8	5.8	5.8	5.8	5.8	5.7
25	5.6	5.6	5.5	5.6	5.5	5.5	5.5
Max.	5.9	5.9	5.8	5.8	5.8	5.8	5.8
Ave.	5.8	5.8	5.7	5.7	5.7	5.7	5.7
Min.	5.6	5.6	5.5	5.6	5.5	5.5	5.5
Sigma	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Median	5.8	5.8	5.8	5.7	5.7	5.7	5.7

	Lumen Maintenance(%)						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	100	99.5	99.6	99.4	98.9	99.1	98.3
2	100	99.3	99.1	99.3	99.1	98.5	98.3
3	100	100.1	99.5	99.6	98.9	98.9	98.8
4	100	99.4	99.6	98.4	98.5	98.4	98.9
5	100	100.0	100.3	99.0	99.1	98.6	98.7
6	100	98.3	98.3	98.4	98.2	97.6	97.3
7	100	100.1	99.5	99.3	98.8	98.8	99.1
8	100	100.8	100.0	100.5	100.5	100.7	100.6
9	100	99.2	98.9	98.8	98.4	98.5	98.2
10	100	99.3	99.6	99.3	99.7	99.0	98.3
11	100	99.1	98.7	99.0	98.9	98.4	97.6
12	100	100.3	99.9	99.4	99.2	98.8	99.5
13	100	99.5	99.0	98.8	98.4	98.0	97.7
14	100	100.0	98.9	98.4	98.7	98.5	98.3
15	100	100.0	99.6	99.3	98.8	98.5	99.1
16	100	100.1	99.6	99.2	98.5	98.7	98.6
17	100	99.3	99.4	100.2	100.4	100.5	100.7
18	100	99.3	98.6	99.1	98.9	98.8	98.9
19	100	99.8	99.5	99.5	99.9	98.7	98.3
20	100	98.8	99.4	99.4	99.0	99.6	98.0
21	100	99.7	99.9	99.0	98.9	99.7	98.1
22	100	100.5	100.7	99.8	99.2	98.7	98.5
23	100	99.1	99.6	99.4	99.5	99.0	99.3
24	100	99.1	99.5	98.5	98.3	98.3	97.6
25	100	99.5	99.1	99.6	99.0	98.4	98.8
Max.		100.8	100.7	100.5	100.5	100.7	100.7
Ave.		99.6	99.4	99.2	99.0	98.8	98.6
Min.		98.3	98.3	98.4	98.2	97.6	97.3
Sigma		0.6	0.5	0.5	0.6	0.7	0.8
Median		99.5	99.5	99.3	98.9	98.7	98.5

Test conditions Tc=54.7 deg C Ta=50.7 deg C IFDC=20mA

	Chromaticity u'						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	0.2591	0.2586	0.2582	0.2591	0.2578	0.2577	0.2589
2	0.2631	0.2617	0.2629	0.2615	0.2619	0.2603	0.2631
3	0.2593	0.2589	0.2571	0.2591	0.2589	0.2575	0.2565
4	0.2605	0.2596	0.2596	0.2587	0.2596	0.2581	0.2582
5	0.2614	0.2594	0.2599	0.2609	0.2600	0.2593	0.2599
6	0.2631	0.2614	0.2610	0.2619	0.2608	0.2623	0.2610
7	0.2609	0.2600	0.2619	0.2600	0.2597	0.2596	0.2595
8	0.2619	0.2610	0.2597	0.2604	0.2597	0.2612	0.2603
9	0.2597	0.2591	0.2575	0.2578	0.2582	0.2570	0.2572
10	0.2645	0.2637	0.2635	0.2644	0.2634	0.2619	0.2620
11	0.2611	0.2610	0.2614	0.2606	0.2590	0.2584	0.2582
12	0.2631	0.2608	0.2624	0.2622	0.2630	0.2632	0.2606
13	0.2630	0.2647	0.2622	0.2618	0.2630	0.2627	0.2613
14	0.2646	0.2639	0.2637	0.2647	0.2641	0.2626	0.2622
15	0.2612	0.2615	0.2602	0.2601	0.2601	0.2610	0.2596
16	0.2597	0.2590	0.2586	0.2575	0.2582	0.2582	0.2582
17	0.2639	0.2626	0.2628	0.2622	0.2629	0.2637	0.2616
18	0.2629	0.2619	0.2615	0.2630	0.2627	0.2612	0.2611
19	0.2600	0.2604	0.2587	0.2595	0.2580	0.2591	0.2596
20	0.2604	0.2591	0.2581	0.2587	0.2595	0.2590	0.2587
21	0.2575	0.2571	0.2565	0.2576	0.2551	0.2562	0.2530
22	0.2589	0.2577	0.2568	0.2578	0.2579	0.2579	0.2569
23	0.2630	0.2625	0.2632	0.2612	0.2603	0.2614	0.2614
24	0.2617	0.2611	0.2605	0.2619	0.2596	0.2611	0.2595
25	0.2626	0.2611	0.2621	0.2621	0.2608	0.2612	0.2607
Max.	0.2646	0.2647	0.2637	0.2647	0.2641	0.2637	0.2631
Ave.	0.2615	0.2607	0.2604	0.2606	0.2602	0.2601	0.2596
Min.	0.2575	0.2571	0.2565	0.2575	0.2551	0.2562	0.2530
Sigma	0.0018	0.0019	0.0022	0.0020	0.0021	0.0021	0.0021
Median	0.2614	0.2610	0.2605	0.2606	0.2597	0.2603	0.2596

	Chromaticity v'						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	0.5273	0.5256	0.5249	0.5254	0.5248	0.5249	0.5254
2	0.5281	0.5273	0.5261	0.5261	0.5268	0.5264	0.5253
3	0.5268	0.5248	0.5248	0.5247	0.5244	0.5250	0.5250
4	0.5273	0.5255	0.5252	0.5265	0.5248	0.5258	0.5253
5	0.5258	0.5236	0.5242	0.5237	0.5226	0.5235	0.5239
6	0.5276	0.5253	0.5260	0.5251	0.5251	0.5252	0.5259
7	0.5282	0.5268	0.5269	0.5261	0.5259	0.5261	0.5261
8	0.5274	0.5250	0.5255	0.5251	0.5254	0.5250	0.5253
9	0.5265	0.5243	0.5245	0.5237	0.5242	0.5247	0.5246
10	0.5261	0.5239	0.5243	0.5240	0.5238	0.5243	0.5247
11	0.5247	0.5225	0.5224	0.5234	0.5222	0.5231	0.5234
12	0.5273	0.5257	0.5259	0.5251	0.5247	0.5257	0.5255
13	0.5265	0.5251	0.5242	0.5250	0.5242	0.5241	0.5244
14	0.5273	0.5245	0.5241	0.5252	0.5246	0.5244	0.5248
15	0.5272	0.5255	0.5258	0.5250	0.5247	0.5252	0.5255
16	0.5261	0.5239	0.5244	0.5243	0.5244	0.5240	0.5243
17	0.5257	0.5237	0.5235	0.5243	0.5238	0.5237	0.5239
18	0.5273	0.5262	0.5252	0.5251	0.5254	0.5251	0.5255
19	0.5251	0.5227	0.5241	0.5228	0.5231	0.5230	0.5234
20	0.5271	0.5253	0.5250	0.5251	0.5243	0.5251	0.5247
21	0.5273	0.5255	0.5251	0.5252	0.5251	0.5247	0.5246
22	0.5266	0.5250	0.5245	0.5242	0.5256	0.5239	0.5252
23	0.5271	0.5258	0.5253	0.5252	0.5252	0.5244	0.5246
24	0.5258	0.5239	0.5239	0.5238	0.5245	0.5232	0.5242
25	0.5271	0.5256	0.5253	0.5240	0.5243	0.5245	0.5248
Max.	0.5282	0.5273	0.5269	0.5265	0.5268	0.5264	0.5261
Ave.	0.5268	0.5249	0.5248	0.5247	0.5246	0.5246	0.5248
Min.	0.5247	0.5225	0.5224	0.5228	0.5222	0.5230	0.5234
Sigma	0.0009	0.0011	0.0009	0.0009	0.0010	0.0009	0.0007
Median	0.5271	0.5251	0.5249	0.5250	0.5246	0.5247	0.5248

Test conditions Tc=54.7 deg C Ta=50.7 deg C IFDC=20mA

	$\Delta u'v'$						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1		0.0018	0.0025	0.0019	0.0028	0.0027	0.0019
2		0.0016	0.0020	0.0026	0.0017	0.0033	0.0028
3		0.0021	0.0029	0.0021	0.0024	0.0025	0.0033
4		0.0020	0.0023	0.0020	0.0027	0.0029	0.0030
5		0.0029	0.0021	0.0021	0.0035	0.0031	0.0023
6		0.0028	0.0027	0.0028	0.0034	0.0025	0.0026
7		0.0018	0.0016	0.0023	0.0026	0.0025	0.0025
8		0.0025	0.0028	0.0028	0.0029	0.0024	0.0026
9		0.0023	0.0030	0.0033	0.0027	0.0032	0.0031
10		0.0023	0.0020	0.0021	0.0025	0.0031	0.0028
11		0.0021	0.0022	0.0014	0.0033	0.0032	0.0032
12		0.0028	0.0016	0.0024	0.0025	0.0016	0.0031
13		0.0022	0.0025	0.0020	0.0023	0.0025	0.0028
14		0.0029	0.0033	0.0021	0.0028	0.0035	0.0035
15		0.0018	0.0018	0.0025	0.0027	0.0020	0.0024
16		0.0024	0.0020	0.0029	0.0023	0.0027	0.0024
17		0.0024	0.0025	0.0022	0.0021	0.0021	0.0029
18		0.0015	0.0025	0.0022	0.0019	0.0028	0.0025
19		0.0025	0.0016	0.0023	0.0028	0.0023	0.0017
20		0.0022	0.0032	0.0027	0.0029	0.0024	0.0029
21		0.0018	0.0024	0.0020	0.0032	0.0029	0.0052
22		0.0020	0.0030	0.0026	0.0015	0.0029	0.0025
23		0.0013	0.0018	0.0026	0.0033	0.0031	0.0029
24		0.0020	0.0022	0.0020	0.0024	0.0027	0.0027
25		0.0022	0.0019	0.0031	0.0033	0.0030	0.0029
Max.		0.0029	0.0033	0.0033	0.0035	0.0035	0.0052
Ave.		0.0022	0.0023	0.0024	0.0027	0.0027	0.0028
Min.		0.0013	0.0016	0.0014	0.0015	0.0016	0.0017
Sigma		0.0004	0.0005	0.0004	0.0005	0.0004	0.0006
Median		0.0022	0.0023	0.0023	0.0027	0.0027	0.0028

Test conditions	Tc=24.5 deg C Ta=20.5 deg C IFDC=20mA
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	Luminous Flux(lm)						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	5.8	5.7	5.7	5.7	5.7	5.7	5.7
2	5.5	5.5	5.5	5.5	5.5	5.5	5.5
3	5.6	5.5	5.5	5.6	5.6	5.6	5.5
4	5.7	5.7	5.7	5.6	5.6	5.7	5.7
5	5.7	5.7	5.7	5.7	5.7	5.7	5.7
6	5.7	5.8	5.7	5.7	5.7	5.7	5.7
7	5.7	5.6	5.6	5.6	5.6	5.6	5.6
8	5.8	5.9	5.9	5.9	5.9	5.9	5.9
9	5.6	5.6	5.6	5.5	5.6	5.5	5.5
10	5.6	5.7	5.7	5.6	5.6	5.6	5.6
11	5.8	5.8	5.8	5.8	5.7	5.7	5.8
12	5.7	5.7	5.7	5.7	5.7	5.7	5.7
13	5.8	5.8	5.8	5.7	5.7	5.7	5.8
14	5.7	5.6	5.6	5.6	5.6	5.5	5.5
15	5.6	5.6	5.6	5.6	5.6	5.6	5.6
16	5.8	5.8	5.8	5.8	5.8	5.8	5.8
17	5.6	5.5	5.5	5.6	5.6	5.6	5.6
18	5.7	5.7	5.7	5.7	5.7	5.7	5.7
19	5.8	5.8	5.8	5.8	5.8	5.8	5.8
20	5.6	5.5	5.6	5.6	5.6	5.6	5.5
21	5.9	5.9	5.9	5.9	5.9	5.8	5.8
22	5.7	5.7	5.7	5.7	5.7	5.7	5.7
23	5.8	5.8	5.8	5.8	5.8	5.8	5.8
24	5.6	5.6	5.6	5.6	5.6	5.6	5.6
25	5.8	5.8	5.7	5.7	5.8	5.8	5.8
Max.	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Ave.	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Min.	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Sigma	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Median	5.7	5.7	5.7	5.7	5.7	5.7	5.7

	Lumen Maintenance(%)						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	100	99.6	99.6	98.6	99.4	99.4	99.5
2	100	99.8	99.5	100.0	99.4	99.3	99.4
3	100	99.1	99.2	100.0	99.6	99.7	99.3
4	100	99.8	99.3	98.4	98.4	98.7	99.4
5	100	100.1	99.8	99.9	99.8	99.7	100.1
6	100	100.2	99.8	99.6	99.3	99.3	99.6
7	100	98.3	98.2	98.2	98.1	98.0	98.4
8	100	100.5	100.4	101.0	101.1	101.2	101.3
9	100	100.0	99.8	99.6	99.9	99.5	99.5
10	100	100.4	100.3	100.0	99.7	100.0	99.8
11	100	100.1	99.8	99.3	98.7	99.0	99.4
12	100	99.9	100.3	99.9	99.8	99.7	100.4
13	100	100.3	100.0	99.7	99.6	99.9	100.0
14	100	98.4	98.3	98.4	98.8	98.2	98.0
15	100	99.7	100.1	99.9	100.5	100.0	99.1
16	100	99.7	100.3	99.9	100.0	100.0	99.9
17	100	99.0	98.9	99.5	99.8	100.0	99.8
18	100	99.7	100.2	99.3	99.9	99.3	100.0
19	100	99.9	99.6	99.7	99.8	99.7	98.7
20	100	99.0	100.1	100.1	100.4	100.1	99.2
21	100	100.1	100.0	99.8	99.6	98.8	98.6
22	100	100.1	99.5	99.0	99.5	99.7	99.3
23	100	100.2	99.7	99.8	100.1	100.0	99.9
24	100	100.0	99.8	99.8	99.9	99.7	100.1
25	100	99.9	99.4	99.3	99.7	100.1	99.8
Max.		100.5	100.4	101.0	101.1	101.2	101.3
Ave.		99.7	99.7	99.6	99.6	99.6	99.5
Min.		98.3	98.2	98.2	98.1	98.0	98.0
Sigma		0.6	0.6	0.6	0.6	0.7	0.7
Median		99.9	99.8	99.7	99.7	99.7	99.5

Test conditions	Tc=24.5 deg C Ta=20.5 deg C IFDC=20mA
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	Chromaticity u'						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	0.2640	0.2631	0.2622	0.2616	0.2635	0.2605	0.2615
2	0.2595	0.2605	0.2588	0.2572	0.2581	0.2576	0.2580
3	0.2619	0.2609	0.2615	0.2614	0.2608	0.2605	0.2611
4	0.2612	0.2615	0.2606	0.2594	0.2591	0.2600	0.2595
5	0.2597	0.2595	0.2575	0.2585	0.2593	0.2579	0.2591
6	0.2609	0.2602	0.2600	0.2585	0.2592	0.2593	0.2596
7	0.2612	0.2608	0.2595	0.2601	0.2596	0.2591	0.2613
8	0.2610	0.2605	0.2604	0.2592	0.2599	0.2589	0.2598
9	0.2632	0.2625	0.2628	0.2621	0.2620	0.2617	0.2617
10	0.2627	0.2612	0.2611	0.2605	0.2604	0.2622	0.2617
11	0.2605	0.2613	0.2600	0.2600	0.2593	0.2586	0.2596
12	0.2611	0.2607	0.2612	0.2597	0.2599	0.2603	0.2591
13	0.2591	0.2580	0.2584	0.2574	0.2580	0.2574	0.2560
14	0.2612	0.2621	0.2604	0.2597	0.2598	0.2588	0.2592
15	0.2610	0.2608	0.2594	0.2597	0.2595	0.2606	0.2621
16	0.2605	0.2594	0.2590	0.2597	0.2579	0.2581	0.2589
17	0.2591	0.2602	0.2570	0.2569	0.2565	0.2570	0.2581
18	0.2618	0.2613	0.2614	0.2588	0.2606	0.2611	0.2597
19	0.2603	0.2594	0.2587	0.2587	0.2582	0.2580	0.2596
20	0.2588	0.2588	0.2561	0.2572	0.2579	0.2571	0.2568
21	0.2602	0.2596	0.2574	0.2584	0.2580	0.2575	0.2603
22	0.2605	0.2602	0.2597	0.2596	0.2601	0.2587	0.2596
23	0.2609	0.2590	0.2595	0.2600	0.2588	0.2588	0.2604
24	0.2604	0.2599	0.2594	0.2581	0.2588	0.2599	0.2592
25	0.2615	0.2611	0.2595	0.2590	0.2606	0.2591	0.2599
Max.	0.2640	0.2631	0.2628	0.2621	0.2635	0.2622	0.2621
Ave.	0.2609	0.2605	0.2597	0.2593	0.2594	0.2591	0.2597
Min.	0.2588	0.2580	0.2561	0.2569	0.2565	0.2570	0.2560
Sigma	0.0012	0.0011	0.0016	0.0013	0.0014	0.0014	0.0014
Median	0.2609	0.2605	0.2595	0.2594	0.2593	0.2589	0.2596

	Chromaticity v'						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1	0.5269	0.5244	0.5244	0.5256	0.5249	0.5253	0.5254
2	0.5271	0.5252	0.5250	0.5258	0.5251	0.5255	0.5256
3	0.5288	0.5260	0.5272	0.5275	0.5269	0.5273	0.5268
4	0.5276	0.5266	0.5255	0.5258	0.5256	0.5265	0.5251
5	0.5273	0.5254	0.5255	0.5251	0.5267	0.5260	0.5254
6	0.5264	0.5258	0.5253	0.5253	0.5255	0.5253	0.5249
7	0.5279	0.5267	0.5260	0.5267	0.5257	0.5269	0.5259
8	0.5276	0.5262	0.5251	0.5255	0.5265	0.5255	0.5261
9	0.5267	0.5250	0.5252	0.5253	0.5252	0.5248	0.5247
10	0.5251	0.5234	0.5238	0.5242	0.5227	0.5226	0.5234
11	0.5250	0.5229	0.5242	0.5234	0.5238	0.5235	0.5234
12	0.5267	0.5247	0.5253	0.5256	0.5250	0.5252	0.5248
13	0.5264	0.5250	0.5247	0.5246	0.5247	0.5248	0.5243
14	0.5266	0.5258	0.5247	0.5252	0.5241	0.5250	0.5250
15	0.5277	0.5261	0.5266	0.5268	0.5250	0.5266	0.5261
16	0.5268	0.5250	0.5249	0.5251	0.5253	0.5247	0.5248
17	0.5261	0.5246	0.5243	0.5242	0.5247	0.52448	0.5247
18	0.5274	0.5259	0.5260	0.5262	0.5257	0.5259	0.5259
19	0.5260	0.5244	0.5244	0.5249	0.5246	0.5247	0.5243
20	0.5265	0.5252	0.5253	0.5249	0.5240	0.5248	0.5250
21	0.5265	0.5250	0.5260	0.5248	0.5243	0.5244	0.5254
22	0.5248	0.5233	0.5232	0.5227	0.5228	0.5230	0.5231
23	0.5276	0.5268	0.5261	0.5254	0.5263	0.5263	0.5257
24	0.5258	0.5243	0.5245	0.5240	0.5242	0.5242	0.5238
25	0.5272	0.5260	0.5256	0.5260	0.5257	0.5248	0.5257
Max.	0.5288	0.5268	0.5272	0.5275	0.5269	0.5273	0.5268
Ave.	0.5267	0.5252	0.5252	0.5252	0.5250	0.5251	0.5250
Min.	0.5248	0.5229	0.5232	0.5227	0.5227	0.5226	0.5231
Sigma	0.0009	0.0010	0.0009	0.0010	0.0011	0.0011	0.0009
Median	0.5267	0.5252	0.5252	0.5253	0.5250	0.5250	0.5250

Test conditions	Tc=24.5 deg C Ta=20.5 deg C IFDC=20mA
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	$\Delta u'v'$						
	0H	1000H	2000H	3000H	4000H	5000H	6000H
1		0.0026	0.0030	0.0027	0.0021	0.0038	0.0029
2		0.0022	0.0022	0.0026	0.0024	0.0025	0.0022
3		0.0030	0.0016	0.0013	0.0021	0.0020	0.0022
4		0.0010	0.0022	0.0025	0.0029	0.0016	0.0030
5		0.0020	0.0029	0.0025	0.0007	0.0022	0.0020
6		0.0009	0.0014	0.0026	0.0018	0.0019	0.0019
7		0.0013	0.0026	0.0017	0.0028	0.0023	0.0020
8		0.0015	0.0026	0.0028	0.0015	0.0030	0.0020
9		0.0019	0.0016	0.0018	0.0019	0.0025	0.0025
10		0.0023	0.0021	0.0024	0.0034	0.0025	0.0020
11		0.0022	0.0009	0.0017	0.0017	0.0024	0.0018
12		0.0020	0.0014	0.0018	0.0020	0.0017	0.0027
13		0.0018	0.0019	0.0025	0.0021	0.0024	0.0038
14		0.0012	0.0020	0.0021	0.0028	0.0028	0.0025
15		0.0016	0.0019	0.0016	0.0031	0.0012	0.0019
16		0.0021	0.0024	0.0019	0.0030	0.0032	0.0026
17		0.0018	0.0027	0.0029	0.0030	0.0026	0.0017
18		0.0016	0.0015	0.0033	0.0021	0.0017	0.0026
19		0.0018	0.0022	0.0020	0.0025	0.0026	0.0018
20		0.0013	0.0030	0.0023	0.0027	0.0024	0.0025
21		0.0016	0.0028	0.0024	0.0031	0.0034	0.0011
22		0.0015	0.0017	0.0023	0.0020	0.0025	0.0020
23		0.0020	0.0020	0.0024	0.0025	0.0025	0.0019
24		0.0015	0.0016	0.0029	0.0022	0.0016	0.0023
25		0.0013	0.0025	0.0027	0.0017	0.0033	0.0021
Max.		0.0030	0.0030	0.0033	0.0034	0.0038	0.0038
Ave.		0.0018	0.0021	0.0023	0.0023	0.0024	0.0022
Min.		0.0009	0.0009	0.0013	0.0007	0.0012	0.0011
Sigma		0.0005	0.0005	0.0005	0.0006	0.0006	0.0005
Median		0.0018	0.0021	0.0024	0.0022	0.0025	0.0021