Lumileds

IESNA LM-80 Test Report

1. Description of LED light sources tested

LUXEON 5050 with nominal CCT of 3000K (L150-3080502400000).

2. Package Pictures

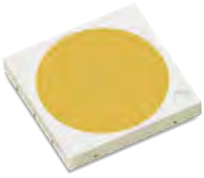

Figure 1. Picture of the LUXEON 5050.

3a. Projected L_{70} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	47,585
Ts = 85°C	61,569
Ts = 55°C	74,298

3b. Reported L_{70} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	> 36,000
Ts = 85°C	> 36,000
Ts = 55°C	> 36,000

In-Situ Inputs	
Drive current for each LED package/array/module(mA):	200
In-situ case temperature(Tc,°C):	55
Percentage of initial lumens to project to (e.g.for L_{70} ,enter 70):	80

Results	
Time(t) at which to estimate lumen maintenance(hours):	50,000
Lumen maintenance at time(t)(%):	92.46%
Reported L80 (hours):	> 61000

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4. Applicable LUXEON® Series part number(s)

This Test Report applies to the following LUXEON part numbers*:

Product Family	Part Number	Nominal CCT
LUXEON 5050	L150-2780502400000	2700K
LUXEON 5050	L150-2790502400000	2700K
LUXEON 5050	L150-3070502400000	3000K
LUXEON 5050	L150-3080502400000	3000K
LUXEON 5050	L150-3090502400000	3000K
LUXEON 5050	L150-4070502400000	4000K
LUXEON 5050	L150-4080502400000	4000K
LUXEON 5050	L150-4090502400000	4000K
LUXEON 5050	L150-5070502400000	5000K
LUXEON 5050	L150-5080502400000	5000K
LUXEON 5050	L150-5770502400000	5700K

5. Number of LED light sources tested

22 units per test.

6. Dates Tests Started

All DATA SETs: 04-20-2015.

7. Date Report First Issued

All DATA SETs: first reported on 09-21-2016.

8. Mechanical Drawing

For detailed mechanical drawings, please see the LUXEON 5050 datasheet.

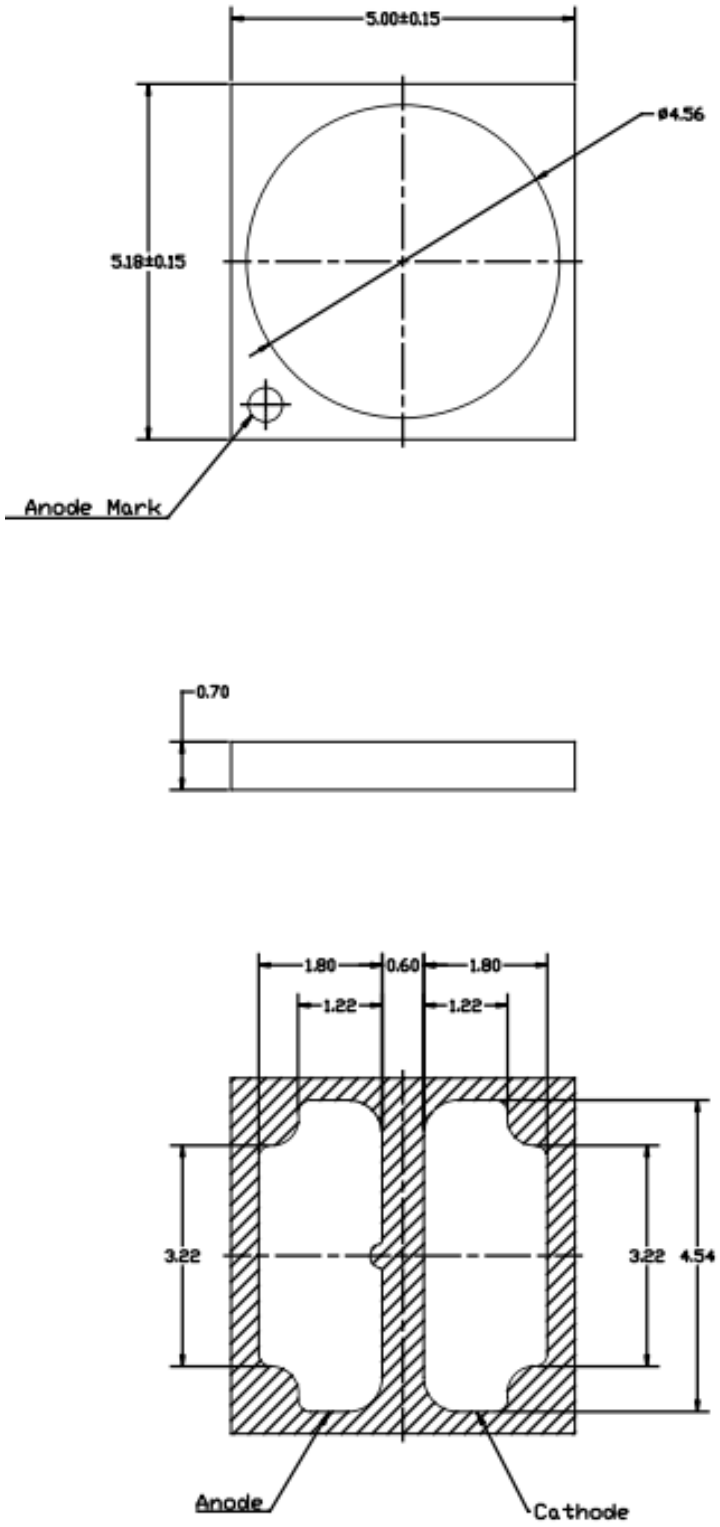

Figure 2. Mechanical drawings for the LUXEON 5050 (all dimensions in millimeters).

9. T_s Measurement Point

The circular pad in the bottom side of LUXEON 5050 corresponds to the recommended temperature measurement point T_s, see Figure 3.

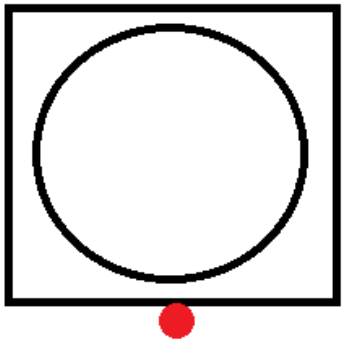

Figure 3. The recommended T_s point is located in the bottom of LUXEON 5050.

For further information on measuring the in-situ T_s, please see LUXEON 5050 Application Brief.

10. Description of auxiliary equipment

Reliability stress boards are mounted in a thermal chamber which provides liquid N2 cooling and has a controlled air temperature.

11. Operating Cycle

LUXEON 5050 LEDs are driven with a constant direct current (DC).

12. Ambient conditions including airflow, temperature, and relative humidity

Case temperature (Ts): controlled to within -2°C

Surrounding air temperature: controlled to within -5°C of Ts

Humidity: < 65 RH, No forced air flow.

13. Case and ambient temperatures

See Section 3.

14. Drive current of the LED light source during lumen maintenance test

See tables.

15. Initial luminous flux and forward voltage at photometric measurement current

See tables.

16. Lumen maintenance for data for each individual light source along with median value, standard deviation, minimum and maximum lumen maintenance value for all of the light sources

See tables.

17. Observation of LED light source failures including the failure conditions and time of failure

No failures observed.

18. LED light source monitoring interval

Units were tested at 0 and every 1000 hours thereafter.

19. Photometric measurement uncertainty

Long-term measurement uncertainty is based on reproducibility tests done over a period of one year, calculated to k = 2 coverage (i.e. 95% coverage)

Uncertainty of light output is U=1.59%. Uncertainy of correlated color temperature is U=21K.

20. Chromaticity shift reported over the measurement time

See tables.

21. Sampling Method/Sample size

LED sample size is indicated in Section 5 of this report.

22. ISO 17025-2005 Accreditation

Certificate for IESNA LM-80-08 with A2LA Certificate Number: 3129.01 .

Notes

Data is for reference only and is not an endorsement to exceed the datasheet operating conditions. The tests in this report were subcontracted to an external laboratory.

The TM-21 extrapolations are based on the IESNA TM-21-11 technical memorandum. The TM-21 lumen maintenance model is based on the flux data normalized to 1 at 0 hours and the use of an exponential model for flux (time):

Flux(time) = B exp[-alpha*time], where normally B ≅ 1, and alpha > 0.

An L70 extrapolation less than 0 means that the model predicts an increasing flux output with time, i.e. alpha < 0 (see graphs). Generally, this means that additional test time is needed to determine the long-term lumen maintenance behavior.

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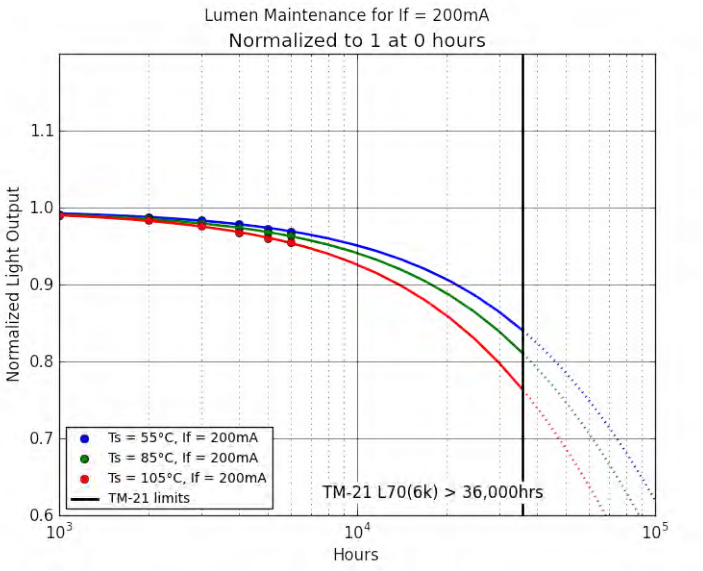
Normalized Flux Statistics for I_f = 200mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	alpha	B	L70
	median =	1.000	0.990	0.984	0.977	0.967	0.960	0.953			
Ts=Tair=105°C	average =	1.000	0.990	0.983	0.976	0.967	0.960	0.955	7.4430e-06	0.9975	47,585
	st dev =	0.000	0.002	0.003	0.003	0.004	0.005	0.005	TM-21 L70(6k) > 36,000hrs		
	min =	1.000	0.985	0.976	0.968	0.959	0.949	0.945			
	max =	1.000	0.994	0.987	0.982	0.974	0.972	0.968			
	median =	1.000	0.989	0.985	0.981	0.974	0.967	0.964			
Ts=Tair=85°C	average =	1.000	0.990	0.986	0.981	0.973	0.967	0.963	5.7351e-06	0.9964	61,569
	st dev =	0.000	0.003	0.003	0.004	0.005	0.006	0.007	TM-21 L70(6k) > 36,000hrs		
	min =	1.000	0.986	0.979	0.973	0.965	0.957	0.951			
	max =	1.000	0.998	0.993	0.992	0.985	0.980	0.976			
	median =	1.000	0.992	0.988	0.984	0.978	0.972	0.969			
Ts=Tair=55°C	average =	1.000	0.992	0.988	0.984	0.979	0.973	0.969	4.7631e-06	0.9972	74,298
	st dev =	0.000	0.002	0.003	0.003	0.005	0.005	0.004	TM-21 L70(6k) > 36,000hrs		
	min =	1.000	0.988	0.982	0.978	0.968	0.963	0.961			
	max =	1.000	0.998	0.993	0.991	0.988	0.981	0.977			



Delta u'v' for I_f = 200mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
	median =	0.0000	0.0007	0.0011	0.0015	0.0021	0.0023	0.0024
Ts=Tair=105°C	average =	0.0000	0.0007	0.0011	0.0015	0.0020	0.0022	0.0024
	st dev =	0.0000	0.0002	0.0001	0.0004	0.0008	0.0008	0.0009
	min =	0.0000	0.0001	0.0009	0.0004	0.0005	0.0006	0.0011
	max =	0.0000	0.0010	0.0013	0.0023	0.0035	0.0035	0.0046
	median =	0.0000	0.0007	0.0012	0.0017	0.0019	0.0023	0.0024
Ts=Tair=85°C	average =	0.0000	0.0008	0.0012	0.0017	0.0020	0.0022	0.0023
	st dev =	0.0000	0.0003	0.0003	0.0003	0.0006	0.0008	0.0007
	min =	0.0000	0.0002	0.0008	0.0014	0.0011	0.0004	0.0008
	max =	0.0000	0.0018	0.0023	0.0026	0.0036	0.0042	0.0037
	median =	0.0000	0.0007	0.0010	0.0012	0.0014	0.0017	0.0020
Ts=Tair=55°C	average =	0.0000	0.0007	0.0010	0.0011	0.0015	0.0017	0.0020
	st dev =	0.0000	0.0002	0.0003	0.0003	0.0005	0.0006	0.0005
	min =	0.0000	0.0002	0.0003	0.0004	0.0006	0.0005	0.0011
	max =	0.0000	0.0011	0.0016	0.0017	0.0022	0.0030	0.0029

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 55°C$, $I_f = 200mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3082K	630.400	625.400	623.200	620.400	616.300	613.200	612.000
2	3057K	650.300	643.400	642.300	641.100	639.700	633.500	630.600
3	3088K	648.800	643.700	643.500	643.000	638.300	636.200	633.400
4	3094K	640.900	635.400	633.500	628.600	621.900	620.200	619.300
5	3082K	638.100	632.600	630.600	626.200	621.400	619.500	617.200
6	3098K	641.300	636.200	635.300	630.700	628.300	622.000	619.200
7	3081K	636.700	629.900	627.200	625.900	621.900	618.800	616.300
8	3075K	645.800	640.900	638.300	636.600	632.000	629.700	628.900
9	3123K	644.800	640.900	639.100	636.500	635.800	631.800	629.600
10	3094K	635.300	627.500	627.200	624.100	621.000	615.900	614.700
11	3100K	639.000	633.700	632.100	627.700	622.900	619.200	616.900
12	3085K	607.800	601.500	596.900	595.400	590.900	588.200	585.500
13	3092K	627.600	621.900	619.200	615.800	612.200	607.200	603.900
14	3109K	625.600	621.700	621.000	618.700	615.000	610.300	607.800
15	3092K	643.600	638.300	636.300	635.300	631.200	625.200	623.800
16	3066K	627.300	619.800	617.100	613.800	607.400	604.300	603.100
17	3079K	632.900	628.900	624.700	623.600	620.800	614.800	613.500
18	3149K	631.300	625.100	622.200	620.300	615.800	613.600	610.500
19	3089K	651.500	646.400	643.500	640.400	636.900	635.800	633.100
20	3078K	636.200	634.700	630.300	628.800	628.400	623.600	621.800
21	3066K	636.400	632.000	630.100	627.800	626.900	624.000	620.000
22	3104K	634.100	628.400	625.400	624.100	622.900	617.600	613.900

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 55°C$, $I_f = 200mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3082K	1.000	0.992	0.989	0.984	0.978	0.973	0.971
2	3057K	1.000	0.989	0.988	0.986	0.984	0.974	0.970
3	3088K	1.000	0.992	0.992	0.991	0.984	0.981	0.976
4	3094K	1.000	0.991	0.988	0.981	0.970	0.968	0.966
5	3082K	1.000	0.991	0.988	0.981	0.974	0.971	0.967
6	3098K	1.000	0.992	0.991	0.983	0.980	0.970	0.966
7	3081K	1.000	0.989	0.985	0.983	0.977	0.972	0.968
8	3075K	1.000	0.992	0.988	0.986	0.979	0.975	0.974
9	3123K	1.000	0.994	0.991	0.987	0.986	0.980	0.976
10	3094K	1.000	0.988	0.987	0.982	0.977	0.969	0.968
11	3100K	1.000	0.992	0.989	0.982	0.975	0.969	0.965
12	3085K	1.000	0.990	0.982	0.980	0.972	0.968	0.963
13	3092K	1.000	0.991	0.987	0.981	0.975	0.967	0.962
14	3109K	1.000	0.994	0.993	0.989	0.983	0.976	0.972
15	3092K	1.000	0.992	0.989	0.987	0.981	0.971	0.969
16	3066K	1.000	0.988	0.984	0.978	0.968	0.963	0.961
17	3079K	1.000	0.994	0.987	0.985	0.981	0.971	0.969
18	3149K	1.000	0.990	0.986	0.983	0.975	0.972	0.967
19	3089K	1.000	0.992	0.988	0.983	0.978	0.976	0.972
20	3078K	1.000	0.998	0.991	0.988	0.988	0.980	0.977
21	3066K	1.000	0.993	0.990	0.986	0.985	0.981	0.974
22	3104K	1.000	0.991	0.986	0.984	0.982	0.974	0.968

TM-21 Extrapolation of Luminous Flux data for tested units
$T_s = T_{air} = 55°C$, $I_f = 200mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	alpha	B	L70
1	3082K	4.6702e-06	0.9971	75,757
2	3057K	4.1156e-06	0.9960	85,682
3	3088K	3.4919e-06	0.9981	101,585
4	3094K	5.7913e-06	0.9975	61,151
5	3082K	5.2628e-06	0.9970	67,197
6	3098K	5.7916e-06	1.0002	61,627
7	3081K	4.4571e-06	0.9944	78,758
8	3075K	4.0701e-06	0.9964	86,751
9	3123K	3.5574e-06	0.9981	99,726
10	3094K	4.6448e-06	0.9947	75,635
11	3100K	5.8251e-06	0.9989	61,034
12	3085K	5.3267e-06	0.9941	65,845
13	3092K	6.0408e-06	0.9982	58,738
14	3109K	4.8914e-06	1.0012	73,167
15	3092K	4.9761e-06	0.9987	71,414
16	3066K	5.9980e-06	0.9945	58,544
17	3079K	5.0395e-06	0.9987	70,517
18	3149K	4.7772e-06	0.9953	73,669
19	3089K	4.1584e-06	0.9957	84,738
20	3078K	3.8676e-06	1.0004	92,333
21	3066K	3.6134e-06	0.9974	97,997
22	3104K	4.4657e-06	0.9964	79,066
ave	3090K	4.7631e-06	0.9972	74,298

CIE 1976 u' data for tested units
$T_s = T_{air} = 55°C$, $I_f = 200mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3082K	0.2481	0.2478	0.2476	0.2475	0.2474	0.2476	0.2466
2	3057K	0.2487	0.2485	0.2483	0.2482	0.2491	0.2498	0.2478
3	3088K	0.2478	0.2475	0.2472	0.2473	0.2466	0.2469	0.2462
4	3094K	0.2475	0.2472	0.2469	0.2470	0.2460	0.2465	0.2463
5	3082K	0.2481	0.2479	0.2477	0.2476	0.2468	0.2472	0.2473
6	3098K	0.2474	0.2471	0.2468	0.2467	0.2464	0.2469	0.2475
7	3081K	0.2483	0.2480	0.2477	0.2477	0.2468	0.2468	0.2463
8	3075K	0.2481	0.2477	0.2474	0.2474	0.2473	0.2471	0.2473
9	3123K	0.2473	0.2469	0.2467	0.2467	0.2465	0.2463	0.2478
10	3094K	0.2477	0.2473	0.2471	0.2470	0.2470	0.2467	0.2465
11	3100K	0.2477	0.2474	0.2472	0.2470	0.2474	0.2468	0.2468
12	3085K	0.2480	0.2482	0.2480	0.2477	0.2470	0.2467	0.2471
13	3092K	0.2479	0.2477	0.2476	0.2472	0.2474	0.2472	0.2472
14	3109K	0.2473	0.2470	0.2470	0.2467	0.2470	0.2471	0.2470
15	3092K	0.2478	0.2474	0.2475	0.2472	0.2468	0.2468	0.2472
16	3066K	0.2487	0.2482	0.2483	0.2480	0.2479	0.2480	0.2474
17	3079K	0.2481	0.2475	0.2474	0.2473	0.2474	0.2475	0.2471
18	3149K	0.2463	0.2454	0.2456	0.2455	0.2454	0.2457	0.2453
19	3089K	0.2479	0.2472	0.2468	0.2469	0.2473	0.2474	0.2483
20	3078K	0.2481	0.2476	0.2474	0.2474	0.2469	0.2467	0.2466
21	3066K	0.2486	0.2482	0.2478	0.2478	0.2481	0.2479	0.2473
22	3104K	0.2474	0.2471	0.2466	0.2466	0.2482	0.2478	0.2466

CIE 1976 v' data for tested units

$T_s = T_{air} = 55°C$, $I_f = 200mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3082K	0.5184	0.5178	0.5177	0.5174	0.5171	0.5170	0.5175
2	3057K	0.5198	0.5192	0.5191	0.5190	0.5193	0.5210	0.5180
3	3088K	0.5186	0.5181	0.5179	0.5178	0.5169	0.5169	0.5172
4	3094K	0.5189	0.5183	0.5181	0.5180	0.5173	0.5170	0.5169
5	3082K	0.5183	0.5179	0.5176	0.5174	0.5171	0.5165	0.5163
6	3098K	0.5187	0.5183	0.5180	0.5177	0.5167	0.5160	0.5158
7	3081K	0.5177	0.5173	0.5169	0.5167	0.5172	0.5165	0.5164
8	3075K	0.5193	0.5188	0.5185	0.5183	0.5185	0.5181	0.5176
9	3123K	0.5156	0.5151	0.5147	0.5146	0.5146	0.5143	0.5173
10	3094K	0.5181	0.5175	0.5173	0.5171	0.5169	0.5167	0.5165
11	3100K	0.5173	0.5167	0.5165	0.5163	0.5165	0.5166	0.5162
12	3085K	0.5183	0.5182	0.5180	0.5181	0.5173	0.5171	0.5161
13	3092K	0.5177	0.5172	0.5170	0.5171	0.5170	0.5172	0.5167
14	3109K	0.5175	0.5168	0.5166	0.5167	0.5167	0.5170	0.5164
15	3092K	0.5181	0.5174	0.5172	0.5173	0.5169	0.5169	0.5171
16	3066K	0.5185	0.5176	0.5174	0.5174	0.5168	0.5168	0.5165
17	3079K	0.5188	0.5179	0.5176	0.5178	0.5173	0.5172	0.5166
18	3149K	0.5158	0.5151	0.5147	0.5147	0.5145	0.5142	0.5147
19	3089K	0.5181	0.5173	0.5169	0.5167	0.5170	0.5172	0.5196
20	3078K	0.5190	0.5185	0.5181	0.5179	0.5171	0.5164	0.5168
21	3066K	0.5188	0.5182	0.5179	0.5177	0.5177	0.5170	0.5163
22	3104K	0.5178	0.5173	0.5169	0.5167	0.5176	0.5174	0.5165

Delta u'v' data for tested units

$T_s = T_{air} = 55°C$, $I_f = 200mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3082K	0.0000	0.0007	0.0009	0.0012	0.0015	0.0015	0.0017
2	3057K	0.0000	0.0006	0.0008	0.0009	0.0006	0.0016	0.0020
3	3088K	0.0000	0.0006	0.0009	0.0009	0.0021	0.0019	0.0021
4	3094K	0.0000	0.0007	0.0010	0.0010	0.0022	0.0021	0.0023
5	3082K	0.0000	0.0004	0.0008	0.0010	0.0018	0.0020	0.0022
6	3098K	0.0000	0.0005	0.0009	0.0012	0.0022	0.0027	0.0029
7	3081K	0.0000	0.0005	0.0010	0.0012	0.0016	0.0019	0.0024
8	3075K	0.0000	0.0006	0.0011	0.0012	0.0011	0.0016	0.0019
9	3123K	0.0000	0.0006	0.0011	0.0012	0.0013	0.0016	0.0018
10	3094K	0.0000	0.0007	0.0010	0.0012	0.0014	0.0017	0.0020
11	3100K	0.0000	0.0007	0.0009	0.0012	0.0009	0.0011	0.0014
12	3085K	0.0000	0.0002	0.0003	0.0004	0.0014	0.0018	0.0024
13	3092K	0.0000	0.0005	0.0008	0.0009	0.0009	0.0009	0.0012
14	3109K	0.0000	0.0008	0.0009	0.0010	0.0009	0.0005	0.0011
15	3092K	0.0000	0.0008	0.0009	0.0010	0.0016	0.0016	0.0012
16	3066K	0.0000	0.0010	0.0012	0.0013	0.0019	0.0018	0.0024
17	3079K	0.0000	0.0011	0.0014	0.0013	0.0017	0.0017	0.0024
18	3149K	0.0000	0.0011	0.0013	0.0014	0.0016	0.0017	0.0015
19	3089K	0.0000	0.0011	0.0016	0.0017	0.0013	0.0010	0.0016
20	3078K	0.0000	0.0007	0.0011	0.0013	0.0022	0.0030	0.0027
21	3066K	0.0000	0.0007	0.0012	0.0014	0.0012	0.0019	0.0028
22	3104K	0.0000	0.0006	0.0012	0.0014	0.0008	0.0006	0.0015

Forward Voltage [V] data for tested units

$T_s = T_{air} = 55°C$, $I_f = 200mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3082K	25.920	26.160	25.910	25.920	25.950	25.920	26.090
2	3057K	26.250	26.540	26.250	26.260	26.320	26.250	26.160
3	3088K	26.160	26.520	26.170	26.200	26.230	26.200	26.460
4	3094K	26.470	26.640	26.480	26.520	26.540	26.520	26.330
5	3082K	26.190	26.290	26.190	26.230	26.240	26.260	26.470
6	3098K	26.050	26.210	26.050	26.080	26.380	26.380	26.370
7	3081K	26.340	26.460	26.320	26.380	26.450	26.470	26.170
8	3075K	26.270	26.410	26.270	26.330	26.310	26.310	26.300
9	3123K	26.220	26.400	26.200	26.270	26.270	26.260	26.320
10	3094K	26.150	26.160	26.130	26.200	26.190	26.150	26.110
11	3100K	26.140	26.180	26.140	26.220	26.150	26.120	26.280
12	3085K	26.120	26.310	26.300	26.330	25.990	26.000	25.880
13	3092K	25.860	25.960	25.950	25.970	26.040	25.980	26.020
14	3109K	26.060	26.130	26.120	26.140	26.020	25.970	26.140
15	3092K	26.170	26.250	26.220	26.270	26.170	26.150	26.200
16	3066K	26.240	26.280	26.270	26.290	26.260	26.250	26.070
17	3079K	26.250	26.300	26.390	26.320	26.300	26.310	26.420
18	3149K	26.280	26.320	26.320	26.340	26.380	26.340	26.360
19	3089K	26.090	26.130	26.120	26.130	26.210	26.200	26.260
20	3078K	26.130	26.190	26.240	26.190	26.090	26.090	26.040
21	3066K	26.250	26.300	26.280	26.310	26.290	26.310	26.310
22	3104K	25.990	26.040	26.080	26.020	26.340	26.350	26.030

Luminous Flux [lm] data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3073K	643.500	634.700	631.500	630.300	625.200	619.600	616.800
2	3090K	632.300	625.500	622.800	619.100	611.700	606.600	605.000
3	3095K	640.000	634.600	631.400	627.800	621.800	618.600	613.700
4	3073K	647.600	641.700	637.000	633.500	629.200	622.600	621.200
5	3086K	633.600	627.200	624.000	622.300	616.800	615.500	613.600
6	3063K	641.700	633.100	630.400	625.500	620.500	614.400	611.400
7	3058K	649.200	641.800	639.800	634.000	628.300	622.100	617.200
8	3064K	641.700	633.600	632.200	628.000	622.900	619.800	619.700
9	3060K	648.200	640.600	639.000	636.200	632.300	626.500	625.800
10	3070K	658.100	649.100	644.400	640.500	634.900	632.300	628.400
11	3087K	637.300	630.600	627.200	623.300	620.600	615.400	614.500
12	3078K	648.500	640.900	637.000	636.800	634.400	630.200	628.700
13	3082K	651.400	646.500	641.800	640.500	638.200	633.000	630.000
14	3100K	649.000	648.000	644.600	640.400	636.900	631.800	629.900
15	3058K	656.600	650.200	647.300	651.400	646.600	643.500	640.600
16	3073K	636.100	630.900	627.800	624.400	619.800	615.400	613.500
17	3087K	648.500	644.200	640.800	638.300	632.300	627.700	623.800
18	3081K	642.800	638.300	637.800	632.900	629.700	626.300	624.300
19	3117K	640.400	633.100	632.800	628.600	625.300	623.800	622.400
20	3089K	634.700	627.900	625.300	618.700	614.800	611.000	607.000
21	3066K	646.000	637.100	635.300	629.800	623.700	621.500	620.000
22	3079K	652.600	648.100	646.500	642.100	637.000	636.900	632.200

Normalized Luminous Flux data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3073K	1.000	0.986	0.981	0.979	0.972	0.963	0.959
2	3090K	1.000	0.989	0.985	0.979	0.967	0.959	0.957
3	3095K	1.000	0.992	0.987	0.981	0.972	0.967	0.959
4	3073K	1.000	0.991	0.984	0.978	0.972	0.961	0.959
5	3086K	1.000	0.990	0.985	0.982	0.973	0.971	0.968
6	3063K	1.000	0.987	0.982	0.975	0.967	0.957	0.953
7	3058K	1.000	0.989	0.986	0.977	0.968	0.958	0.951
8	3064K	1.000	0.987	0.985	0.979	0.971	0.966	0.966
9	3060K	1.000	0.988	0.986	0.981	0.975	0.967	0.965
10	3070K	1.000	0.986	0.979	0.973	0.965	0.961	0.955
11	3087K	1.000	0.989	0.984	0.978	0.974	0.966	0.964
12	3078K	1.000	0.988	0.982	0.982	0.978	0.972	0.969
13	3082K	1.000	0.992	0.985	0.983	0.980	0.972	0.967
14	3100K	1.000	0.998	0.993	0.987	0.981	0.973	0.971
15	3058K	1.000	0.990	0.986	0.992	0.985	0.980	0.976
16	3073K	1.000	0.992	0.987	0.982	0.974	0.967	0.964
17	3087K	1.000	0.993	0.988	0.984	0.975	0.968	0.962
18	3081K	1.000	0.993	0.992	0.985	0.980	0.974	0.971
19	3117K	1.000	0.989	0.988	0.982	0.976	0.974	0.972
20	3089K	1.000	0.989	0.985	0.975	0.969	0.963	0.956
21	3066K	1.000	0.986	0.983	0.975	0.965	0.962	0.960
22	3079K	1.000	0.993	0.991	0.984	0.976	0.976	0.969

TM-21 Extrapolation of Luminous Flux data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	alpha	B	L70
1	3073K	5.9495e-06	0.9938	58,901
2	3090K	7.3630e-06	0.9981	48,188
3	3095K	6.8140e-06	0.9995	52,272
4	3073K	6.7927e-06	0.9975	52,144
5	3086K	4.5610e-06	0.9941	76,902
6	3063K	7.4153e-06	0.9956	47,503
7	3058K	8.2461e-06	0.9996	43,204
8	3064K	5.0998e-06	0.9931	68,585
9	3060K	5.2082e-06	0.9951	67,540
10	3070K	6.5057e-06	0.9921	53,612
11	3087K	5.4467e-06	0.9946	64,495
12	3078K	3.7734e-06	0.9917	92,303
13	3082K	4.9795e-06	0.9971	71,052
14	3100K	5.9228e-06	1.0045	60,984
15	3058K	2.8410e-06	0.9946	123,640
16	3073K	5.9165e-06	0.9982	59,978
17	3087K	6.6373e-06	1.0014	53,944
18	3081K	4.8726e-06	0.9994	73,069
19	3117K	3.8133e-06	0.9933	91,763
20	3089K	6.9997e-06	0.9969	50,509
21	3066K	6.0472e-06	0.9927	57,773
22	3079K	5.0586e-06	0.9989	70,291
ave	3078K	5.7351e-06	0.9964	61,569

CIE 1976 u' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3073K	0.2484	0.2480	0.2477	0.2475	0.2475	0.2474	0.2472
2	3090K	0.2478	0.2472	0.2470	0.2470	0.2469	0.2472	0.2476
3	3095K	0.2476	0.2472	0.2469	0.2467	0.2454	0.2454	0.2465
4	3073K	0.2482	0.2478	0.2475	0.2474	0.2470	0.2467	0.2457
5	3086K	0.2480	0.2477	0.2473	0.2472	0.2486	0.2483	0.2478
6	3063K	0.2486	0.2480	0.2480	0.2478	0.2476	0.2481	0.2469
7	3058K	0.2486	0.2474	0.2477	0.2476	0.2473	0.2479	0.2472
8	3064K	0.2484	0.2477	0.2473	0.2475	0.2469	0.2480	0.2477
9	3060K	0.2487	0.2480	0.2479	0.2479	0.2474	0.2477	0.2478
10	3070K	0.2484	0.2475	0.2474	0.2474	0.2484	0.2474	0.2478
11	3087K	0.2480	0.2475	0.2471	0.2471	0.2462	0.2469	0.2472
12	3078K	0.2482	0.2475	0.2473	0.2472	0.2466	0.2470	0.2472
13	3082K	0.2479	0.2474	0.2471	0.2470	0.2464	0.2467	0.2462
14	3100K	0.2473	0.2473	0.2470	0.2468	0.2465	0.2466	0.2467
15	3058K	0.2489	0.2483	0.2481	0.2480	0.2485	0.2493	0.2483
16	3073K	0.2484	0.2479	0.2475	0.2475	0.2471	0.2477	0.2484
17	3087K	0.2477	0.2471	0.2468	0.2467	0.2465	0.2474	0.2488
18	3081K	0.2479	0.2474	0.2472	0.2471	0.2460	0.2473	0.2474
19	3117K	0.2472	0.2467	0.2464	0.2463	0.2461	0.2465	0.2461
20	3089K	0.2477	0.2473	0.2470	0.2469	0.2467	0.2472	0.2466
21	3066K	0.2486	0.2481	0.2479	0.2478	0.2476	0.2479	0.2477
22	3079K	0.2482	0.2476	0.2472	0.2473	0.2481	0.2468	0.2473

CIE 1976 v' data for tested units

$T_s = T_{air}$ = 85°C, I_f = 200mA; $T_s \geq$ 83°C and $T_{air} \geq$ 80°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3073K	0.5186	0.5179	0.5175	0.5175	0.5170	0.5165	0.5169
2	3090K	0.5183	0.5177	0.5173	0.5172	0.5169	0.5165	0.5169
3	3095K	0.5184	0.5178	0.5174	0.5170	0.5163	0.5148	0.5162
4	3073K	0.5193	0.5186	0.5183	0.5180	0.5187	0.5177	0.5169
5	3086K	0.5181	0.5175	0.5172	0.5169	0.5172	0.5179	0.5172
6	3063K	0.5193	0.5183	0.5182	0.5178	0.5169	0.5175	0.5171
7	3058K	0.5199	0.5186	0.5178	0.5175	0.5165	0.5172	0.5165
8	3064K	0.5199	0.5197	0.5191	0.5185	0.5179	0.5181	0.5181
9	3060K	0.5193	0.5192	0.5188	0.5180	0.5177	0.5174	0.5172
10	3070K	0.5189	0.5184	0.5181	0.5174	0.5174	0.5169	0.5173
11	3087K	0.5180	0.5175	0.5173	0.5165	0.5165	0.5159	0.5161
12	3078K	0.5185	0.5178	0.5177	0.5169	0.5167	0.5162	0.5164
13	3082K	0.5191	0.5185	0.5182	0.5175	0.5173	0.5167	0.5168
14	3100K	0.5188	0.5186	0.5181	0.5175	0.5176	0.5167	0.5164
15	3058K	0.5189	0.5185	0.5181	0.5176	0.5173	0.5185	0.5183
16	3073K	0.5186	0.5183	0.5178	0.5172	0.5172	0.5160	0.5169
17	3087K	0.5191	0.5187	0.5184	0.5177	0.5176	0.5174	0.5169
18	3081K	0.5192	0.5189	0.5186	0.5179	0.5172	0.5168	0.5173
19	3117K	0.5168	0.5164	0.5161	0.5154	0.5153	0.5142	0.5144
20	3089K	0.5188	0.5185	0.5181	0.5175	0.5173	0.5162	0.5164
21	3066K	0.5188	0.5185	0.5182	0.5175	0.5173	0.5161	0.5166
22	3079K	0.5184	0.5180	0.5177	0.5170	0.5173	0.5168	0.5161

Delta u'v' data for tested units

$T_s = T_{air}$ = 85°C, I_f = 200mA; $T_s \geq$ 83°C and $T_{air} \geq$ 80°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3073K	0.0000	0.0008	0.0013	0.0014	0.0018	0.0023	0.0021
2	3090K	0.0000	0.0008	0.0013	0.0014	0.0017	0.0019	0.0014
3	3095K	0.0000	0.0007	0.0012	0.0017	0.0030	0.0042	0.0025
4	3073K	0.0000	0.0008	0.0012	0.0015	0.0013	0.0022	0.0035
5	3086K	0.0000	0.0007	0.0011	0.0014	0.0011	0.0004	0.0009
6	3063K	0.0000	0.0012	0.0013	0.0017	0.0026	0.0019	0.0028
7	3058K	0.0000	0.0018	0.0023	0.0026	0.0036	0.0028	0.0037
8	3064K	0.0000	0.0007	0.0014	0.0017	0.0025	0.0018	0.0019
9	3060K	0.0000	0.0007	0.0009	0.0015	0.0021	0.0021	0.0023
10	3070K	0.0000	0.0010	0.0013	0.0018	0.0015	0.0022	0.0017
11	3087K	0.0000	0.0007	0.0011	0.0017	0.0023	0.0024	0.0021
12	3078K	0.0000	0.0010	0.0012	0.0019	0.0024	0.0026	0.0023
13	3082K	0.0000	0.0008	0.0012	0.0018	0.0023	0.0027	0.0029
14	3100K	0.0000	0.0002	0.0008	0.0014	0.0014	0.0022	0.0025
15	3058K	0.0000	0.0007	0.0011	0.0016	0.0016	0.0006	0.0008
16	3073K	0.0000	0.0006	0.0012	0.0017	0.0019	0.0027	0.0017
17	3087K	0.0000	0.0007	0.0011	0.0017	0.0019	0.0017	0.0025
18	3081K	0.0000	0.0006	0.0009	0.0015	0.0028	0.0025	0.0020
19	3117K	0.0000	0.0006	0.0011	0.0017	0.0019	0.0027	0.0026
20	3089K	0.0000	0.0005	0.0010	0.0015	0.0018	0.0026	0.0026
21	3066K	0.0000	0.0006	0.0009	0.0015	0.0018	0.0028	0.0024
22	3079K	0.0000	0.0007	0.0012	0.0017	0.0011	0.0021	0.0025

Forward Voltage [V] data for tested units

$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3073K	26.040	26.090	26.020	26.090	26.110	26.090	26.380
2	3090K	25.930	26.010	25.920	25.990	26.270	26.250	26.000
3	3095K	26.440	26.050	26.040	26.180	26.190	26.190	26.010
4	3073K	25.990	26.050	25.950	25.990	26.090	26.080	26.350
5	3086K	26.450	26.500	26.430	26.480	25.990	26.010	26.150
6	3063K	26.340	26.420	26.320	26.330	26.320	26.340	26.330
7	3058K	26.240	26.050	25.980	26.000	26.010	26.020	25.980
8	3064K	26.030	26.190	26.000	26.030	26.030	26.070	26.000
9	3060K	25.870	25.940	25.860	25.900	25.870	25.900	25.880
10	3070K	26.370	26.340	26.310	26.360	26.290	26.350	26.360
11	3087K	26.040	26.030	26.010	26.040	26.030	26.070	26.080
12	3078K	25.890	25.950	25.830	25.860	25.840	25.880	25.880
13	3082K	26.020	26.090	25.980	26.010	26.000	26.010	26.040
14	3100K	26.010	26.190	26.000	26.050	26.010	26.030	26.420
15	3058K	26.160	26.210	26.110	26.180	26.110	26.130	26.110
16	3073K	26.400	26.780	26.360	26.410	26.370	26.420	26.220
17	3087K	26.090	26.170	26.070	26.110	26.050	26.080	26.250
18	3081K	26.030	26.060	26.030	26.050	26.040	26.070	26.050
19	3117K	26.160	26.160	26.140	26.170	26.110	26.130	26.130
20	3089K	26.280	26.290	26.260	26.300	26.250	26.260	26.270
21	3066K	26.200	26.200	26.210	26.230	26.170	26.170	26.210
22	3079K	26.150	26.170	26.140	26.180	26.110	26.120	26.140

Luminous Flux [lm] data for tested units
$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3081K	639.000	632.700	629.300	624.900	618.100	612.900	609.000
2	3065K	645.400	638.900	633.900	629.700	626.500	620.600	615.200
3	3086K	648.000	642.500	639.400	635.200	629.400	626.400	622.800
4	3082K	639.600	632.900	630.300	625.000	619.700	613.700	609.500
5	3071K	648.500	642.200	639.200	633.400	627.400	624.600	621.300
6	3097K	648.200	644.000	639.900	636.600	631.500	629.800	627.700
7	3074K	635.700	628.500	626.400	622.000	617.000	610.700	606.000
8	3069K	633.800	627.300	623.500	621.200	615.900	611.300	605.600
9	3078K	641.500	635.600	629.100	626.600	615.100	608.500	606.200
10	3154K	637.900	631.700	626.500	622.100	618.900	611.400	610.400
11	3081K	639.000	631.900	629.200	626.100	618.900	616.500	613.800
12	3081K	639.400	633.800	627.900	625.300	618.100	613.400	613.000
13	3085K	632.300	626.200	619.400	615.300	608.800	603.200	601.600
14	3066K	643.200	634.400	629.600	625.500	618.100	614.900	612.200
15	3099K	632.800	626.800	622.900	616.900	612.400	607.300	605.800
16	3094K	638.000	632.700	628.000	621.300	615.400	609.100	607.700
17	3111K	636.000	630.200	626.600	622.700	615.000	612.800	610.900
18	3088K	636.800	629.800	628.200	622.200	615.700	609.700	602.400
19	3085K	641.900	634.900	631.200	626.200	620.900	617.200	612.700
20	3079K	632.000	627.100	621.100	615.000	607.400	604.900	600.200
21	3066K	636.300	627.000	621.300	616.100	612.100	612.000	606.300
22	3070K	644.500	635.700	631.800	626.100	625.200	620.300	613.900

Normalized Luminous Flux data for tested units
$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3081K	1.000	0.990	0.985	0.978	0.967	0.959	0.953
2	3065K	1.000	0.990	0.982	0.976	0.971	0.962	0.953
3	3086K	1.000	0.992	0.987	0.980	0.971	0.967	0.961
4	3082K	1.000	0.990	0.985	0.977	0.969	0.960	0.953
5	3071K	1.000	0.990	0.986	0.977	0.967	0.963	0.958
6	3097K	1.000	0.994	0.987	0.982	0.974	0.972	0.968
7	3074K	1.000	0.989	0.985	0.978	0.971	0.961	0.953
8	3069K	1.000	0.990	0.984	0.980	0.972	0.964	0.956
9	3078K	1.000	0.991	0.981	0.977	0.959	0.949	0.945
10	3154K	1.000	0.990	0.982	0.975	0.970	0.958	0.957
11	3081K	1.000	0.989	0.985	0.980	0.969	0.965	0.961
12	3081K	1.000	0.991	0.982	0.978	0.967	0.959	0.959
13	3085K	1.000	0.990	0.980	0.973	0.963	0.954	0.951
14	3066K	1.000	0.986	0.979	0.972	0.961	0.956	0.952
15	3099K	1.000	0.991	0.984	0.975	0.968	0.960	0.957
16	3094K	1.000	0.992	0.984	0.974	0.965	0.955	0.953
17	3111K	1.000	0.991	0.985	0.979	0.967	0.964	0.961
18	3088K	1.000	0.989	0.986	0.977	0.967	0.957	0.946
19	3085K	1.000	0.989	0.983	0.976	0.967	0.962	0.955
20	3079K	1.000	0.992	0.983	0.973	0.961	0.957	0.950
21	3066K	1.000	0.985	0.976	0.968	0.962	0.962	0.953
22	3070K	1.000	0.986	0.980	0.971	0.970	0.962	0.953

TM-21 Extrapolation of Luminous Flux data for tested units
$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	alpha	B	L70
1	3081K	8.0300e-06	0.9997	44,378
2	3065K	7.3632e-06	0.9975	48,103
3	3086K	6.4715e-06	0.9986	54,892
4	3082K	7.9129e-06	0.9995	45,007
5	3071K	6.9790e-06	0.9976	50,756
6	3097K	5.2558e-06	0.9977	67,415
7	3074K	7.6143e-06	0.9990	46,715
8	3069K	6.9679e-06	0.9982	50,931
9	3078K	1.0149e-05	1.0016	35,300
10	3154K	7.1386e-06	0.9967	49,504
11	3081K	6.2300e-06	0.9960	56,603
12	3081K	7.1004e-06	0.9971	49,818
13	3085K	8.3004e-06	0.9970	42,609
14	3066K	7.4537e-06	0.9932	46,942
15	3099K	7.2514e-06	0.9973	48,820
16	3094K	8.6511e-06	1.0000	41,227
17	3111K	6.7078e-06	0.9974	52,793
18	3088K	9.2166e-06	1.0022	38,934
19	3085K	7.2500e-06	0.9968	48,752
20	3079K	8.8839e-06	0.9998	40,129
21	3066K	6.2748e-06	0.9892	55,114
22	3070K	6.6006e-06	0.9931	52,993
ave	3084K	7.4430e-06	0.9975	47,585

CIE 1976 u' data for tested units
$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3081K	0.2481	0.2476	0.2475	0.2473	0.2471	0.2470	0.2471
2	3065K	0.2486	0.2481	0.2477	0.2476	0.2489	0.2473	0.2464
3	3086K	0.2476	0.2472	0.2468	0.2467	0.2454	0.2463	0.2466
4	3082K	0.2481	0.2477	0.2474	0.2471	0.2473	0.2473	0.2474
5	3071K	0.2482	0.2477	0.2474	0.2471	0.2460	0.2471	0.2474
6	3097K	0.2473	0.2469	0.2465	0.2463	0.2455	0.2463	0.2467
7	3074K	0.2483	0.2478	0.2476	0.2473	0.2469	0.2471	0.2474
8	3069K	0.2485	0.2481	0.2478	0.2476	0.2481	0.2479	0.2474
9	3078K	0.2482	0.2477	0.2474	0.2472	0.2467	0.2466	0.2470
10	3154K	0.2460	0.2454	0.2451	0.2450	0.2460	0.2462	0.2454
11	3081K	0.2480	0.2474	0.2474	0.2467	0.2461	0.2467	0.2474
12	3081K	0.2482	0.2481	0.2475	0.2479	0.2477	0.2485	0.2469
13	3085K	0.2481	0.2480	0.2473	0.2469	0.2453	0.2460	0.2462
14	3066K	0.2487	0.2478	0.2476	0.2475	0.2460	0.2469	0.2456
15	3099K	0.2475	0.2473	0.2472	0.2464	0.2456	0.2456	0.2450
16	3094K	0.2475	0.2470	0.2468	0.2464	0.2457	0.2453	0.2461
17	3111K	0.2471	0.2466	0.2464	0.2459	0.2454	0.2452	0.2460
18	3088K	0.2479	0.2474	0.2472	0.2467	0.2462	0.2459	0.2466
19	3085K	0.2478	0.2474	0.2472	0.2467	0.2468	0.2472	0.2474
20	3079K	0.2483	0.2478	0.2477	0.2472	0.2468	0.2463	0.2462
21	3066K	0.2484	0.2479	0.2477	0.2473	0.2469	0.2469	0.2463
22	3070K	0.2483	0.2478	0.2475	0.2470	0.2461	0.2462	0.2456

CIE 1976 v' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 200mA; $T_s \geq$ 103°C and $T_{air} \geq$ 100°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3081K	0.5185	0.5179	0.5177	0.5170	0.5165	0.5165	0.5161
2	3065K	0.5190	0.5183	0.5180	0.5174	0.5178	0.5171	0.5171
3	3086K	0.5196	0.5192	0.5188	0.5182	0.5176	0.5178	0.5180
4	3082K	0.5183	0.5178	0.5175	0.5168	0.5170	0.5173	0.5171
5	3071K	0.5196	0.5192	0.5188	0.5182	0.5174	0.5184	0.5183
6	3097K	0.5192	0.5188	0.5184	0.5178	0.5178	0.5188	0.5165
7	3074K	0.5187	0.5181	0.5180	0.5173	0.5170	0.5171	0.5170
8	3069K	0.5187	0.5183	0.5181	0.5174	0.5182	0.5180	0.5173
9	3078K	0.5186	0.5180	0.5179	0.5172	0.5162	0.5163	0.5165
10	3154K	0.5162	0.5157	0.5155	0.5148	0.5156	0.5168	0.5153
11	3081K	0.5189	0.5181	0.5179	0.5170	0.5160	0.5167	0.5173
12	3081K	0.5182	0.5180	0.5176	0.5180	0.5181	0.5189	0.5186
13	3085K	0.5180	0.5179	0.5173	0.5176	0.5166	0.5156	0.5157
14	3066K	0.5184	0.5185	0.5178	0.5180	0.5179	0.5171	0.5189
15	3099K	0.5181	0.5173	0.5173	0.5178	0.5171	0.5159	0.5155
16	3094K	0.5189	0.5185	0.5180	0.5186	0.5178	0.5166	0.5169
17	3111K	0.5180	0.5176	0.5172	0.5176	0.5174	0.5163	0.5169
18	3088K	0.5183	0.5178	0.5174	0.5178	0.5173	0.5159	0.5161
19	3085K	0.5191	0.5187	0.5183	0.5188	0.5182	0.5171	0.5170
20	3079K	0.5180	0.5176	0.5172	0.5176	0.5169	0.5157	0.5155
21	3066K	0.5196	0.5190	0.5186	0.5192	0.5186	0.5178	0.5170
22	3070K	0.5193	0.5188	0.5183	0.5189	0.5184	0.5165	0.5156

Delta u'v' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 200mA; $T_s \geq$ 103°C and $T_{air} \geq$ 100°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3081K	0.0000	0.0008	0.0010	0.0017	0.0022	0.0023	0.0026
2	3065K	0.0000	0.0009	0.0013	0.0019	0.0012	0.0023	0.0029
3	3086K	0.0000	0.0006	0.0011	0.0017	0.0030	0.0022	0.0019
4	3082K	0.0000	0.0006	0.0011	0.0018	0.0015	0.0013	0.0014
5	3071K	0.0000	0.0006	0.0011	0.0018	0.0031	0.0016	0.0015
6	3097K	0.0000	0.0006	0.0011	0.0017	0.0023	0.0011	0.0028
7	3074K	0.0000	0.0008	0.0010	0.0017	0.0022	0.0020	0.0019
8	3069K	0.0000	0.0006	0.0009	0.0016	0.0006	0.0009	0.0018
9	3078K	0.0000	0.0008	0.0011	0.0017	0.0028	0.0028	0.0024
10	3154K	0.0000	0.0008	0.0011	0.0017	0.0006	0.0006	0.0011
11	3081K	0.0000	0.0010	0.0012	0.0023	0.0035	0.0026	0.0017
12	3081K	0.0000	0.0002	0.0009	0.0004	0.0005	0.0008	0.0014
13	3085K	0.0000	0.0001	0.0011	0.0013	0.0031	0.0032	0.0030
14	3066K	0.0000	0.0009	0.0013	0.0013	0.0027	0.0022	0.0031
15	3099K	0.0000	0.0008	0.0009	0.0011	0.0021	0.0029	0.0036
16	3094K	0.0000	0.0006	0.0011	0.0011	0.0021	0.0032	0.0024
17	3111K	0.0000	0.0006	0.0011	0.0013	0.0018	0.0025	0.0016
18	3088K	0.0000	0.0007	0.0011	0.0013	0.0020	0.0031	0.0026
19	3085K	0.0000	0.0006	0.0010	0.0011	0.0013	0.0021	0.0021
20	3079K	0.0000	0.0006	0.0010	0.0012	0.0019	0.0030	0.0033
21	3066K	0.0000	0.0008	0.0012	0.0012	0.0018	0.0023	0.0033
22	3070K	0.0000	0.0007	0.0013	0.0014	0.0024	0.0035	0.0046

Forward Voltage [V] data for tested units
$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3081K	26.310	26.280	26.270	26.290	26.290	26.310	26.340
2	3065K	26.170	26.150	26.120	26.160	26.160	26.170	26.180
3	3086K	26.050	26.060	26.010	26.060	26.050	26.050	26.090
4	3082K	26.200	26.190	26.150	26.200	26.180	26.180	26.180
5	3071K	26.240	26.240	26.210	26.250	26.240	26.240	26.240
6	3097K	26.080	26.150	26.060	26.100	26.090	26.100	26.160
7	3074K	26.410	26.380	26.380	26.420	26.420	26.420	26.300
8	3069K	26.290	26.550	26.270	26.320	26.330	26.330	26.300
9	3078K	26.070	26.100	26.050	26.090	26.060	26.100	26.130
10	3154K	26.350	26.470	26.310	26.370	26.370	26.360	26.180
11	3081K	25.990	26.200	26.050	26.230	25.960	25.980	26.010
12	3081K	26.180	26.600	26.180	26.210	26.180	26.190	26.110
13	3085K	26.320	26.370	26.290	26.350	26.300	26.310	26.230
14	3066K	26.260	26.290	26.540	26.290	26.270	26.290	26.300
15	3099K	26.260	26.360	26.270	26.300	26.280	26.300	26.250
16	3094K	26.300	26.340	26.300	26.320	26.320	26.330	26.170
17	3111K	26.200	26.240	26.220	26.220	26.220	26.230	26.280
18	3088K	26.240	26.280	26.250	26.250	26.260	26.260	26.300
19	3085K	25.970	26.010	25.980	26.000	25.950	25.950	25.960
20	3079K	25.910	25.940	25.920	25.920	25.870	25.890	25.900
21	3066K	26.480	26.800	26.720	26.490	26.450	26.450	26.460
22	3070K	26.180	26.200	26.170	26.190	26.160	26.150	26.160

Company Information

Lumileds is a leading provider of power LEDs for everyday lighting applications. The company's records for light output, efficacy and thermal management are direct results of the ongoing commitment to advancing solid-state lighting technology and enabling lighting solutions that are more environmentally friendly, help reduce CO2 emissions and reduce the need for power plant expansion. Lumileds LUXEON LEDs are enabling never before possible applications in outdoor lighting, shop lighting, home lighting, digital imaging, display and automotive lighting.

Lumileds is a fully integrated supplier, producing core LED material in all three base colors, (red, green, blue) and white. Lumileds has R & D centers in San Jose, California and in the Netherlands, and production capabilities in San Jose, Singapore and Penang, Malaysia. Founded in 1999, Lumileds is the high flux LED technology leader and is dedicated to bridging the gap between solid-state technology and the lighting world. More information about the company's LUXEON LED products and solid-state lighting technologies can be found at www.lumileds.com.