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ILLUMINATION

ACCREDITED LABORATORY
SAC-SINGLAS
Cert No: LA-2016-0634-E

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council (SAC).



Mark Spencer
Quality and Reliability Engineer

This report issued to K-Lite Industries

Report number S114e issued to prabhakar@rksales.in on Wed Mar 06 02:53:19 2019

Lumileds

IESNA LM-80 Test Report

1. Description of LED light sources tested

LUXEON 2835C 3V: L128-2780CA3500001 (nominal CCT 2700K).

2. Package Pictures

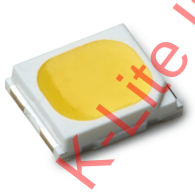


Figure 1. Picture of the LUXEON 2835 series.

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

	If = 150mA
Ts = 105°C	51,918
Ts = 85°C	59,381

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

	If = 150mA
Ts = 105°C	51,918
Ts = 85°C	59,381

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4. Applicable LUXEON® Series part number(s)

This IESNA LM-80 Test Report applies to the following LUXEON part numbers:

Product Family	Part Number	Nominal CCT
LUXEON 2835C 3V	L128-2780CA3500001	2700K
LUXEON 2835C 3V	L128-2780CA35000T1	2700K
LUXEON 2835C 3V	L128-3080CA35000T1	3000K
LUXEON 2835C 3V	L128-3080CA3500001	3000K
LUXEON 2835C 3V	L128-3580CA3500001	3500K
LUXEON 2835C 3V	L128-3580CA35000T1	3500K
LUXEON 2835C 3V	L128-4080CA3500001	4000K
LUXEON 2835C 3V	L128-4080CA35000T1	4000K
LUXEON 2835C 3V	L128-5080CA35000T1	5000K
LUXEON 2835C 3V	L128-5080CA3500001	5000K
LUXEON 2835C 3V	L128-5780CA3500001	5700K
LUXEON 2835C 3V	L128-5780CA35000T1	5700K
LUXEON 2835C 3V	L128-6580CA3500001	6500K
LUXEON 2835C 3V	L128-6580CA35000T1	6500K

5. Number of LED light sources tested

22 units per test.

6. Dates Tests Started

2014/01/16.

7. Date Report First Issued

2017/10/12.

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8. Mechanical Drawing

For detailed mechanical drawings, please see individual product data sheets.

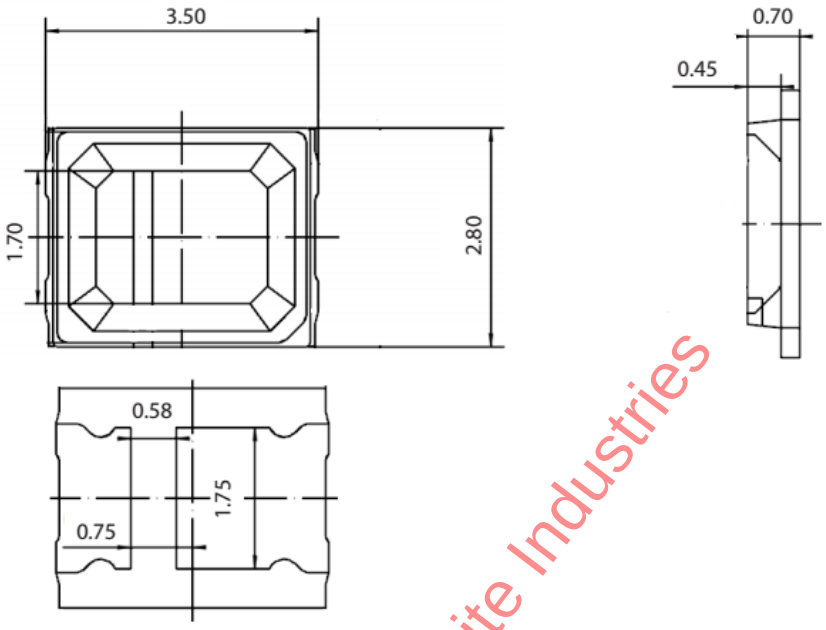


Figure 2: Mechanical Drawing for LUXEON 2835. All dimensions are in millimeters.

9. T_s Measurement Point

The point below in the right side of the LUXEON 2835 corresponds to the recommended temperature measurement point T_s, see Figure 3.

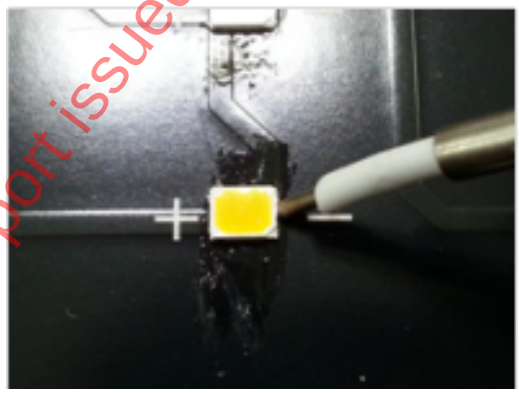


Figure 3: Preferred T_s measurement point for LUXEON 2835.

For further information on measuring the in-situ T_s, please see the appropriate application Lumileds Application Brief which is available online at www.lumileds.com.

10. Description of auxiliary equipment

LUXEON LED devices are soldered to reliability stress boards..

Reliability stress boards are mounted in a chamber with minimal ambient airflow. The chamber temperature is controlled based on the temperature of a control Ts point, which is located on the stress board.

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The reliability stress board is periodically removed from the thermal chamber, allowed to cool to room temperature, and then tested. After testing, the reliability stress board is returned to the thermal chamber for additional operation.

11. Operating Cycle

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

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

The typical relative humidity within the chamber is < 65%.

13. T_s and ambient temperatures (ambient temperature measured 5mm above reliability stress board)

In all cases, both T_s and T_{air} meet or exceed the IESNA LM-80-08 limits.

14. Drive current of the LED light source during lifetime 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 in devices reported.

18. LED light source monitoring interval

Units were tested at 0 hour and at subsequent 1,000 hours intervals.

19. Measurement uncertainty

Long-term measurement uncertainty is based on reproducibility tests done over a period of one year, calculated to k = 1.97 coverage (i.e. 95% coverage).

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)

Luminous Flux (Φ_v) ± 2%

20. Chromaticity shift reported over the measurement time

See tables.

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21. Sampling Method/Sample size

IESNA LM-80-08 requires LED samples to be operated at a minimum of 1 case temperature, T_s. The drive current may be different for the different case temperatures. LED sample size is indicated in Section 5 of this report.

22. ISO 17025-2005 Accreditation

Lumileds holds certificate LA-2016-0634-E issued by SAC-SINGLAS under scope of accreditation for IESNA LM-80-15 and LM-80-08.

Notes

Data is for reference only and is not an endorsement to exceed the Data Sheet operating conditions. Data was collected at a subcontracted laboratory.

The TM-21 extrapolations are based on IES TM-21-11 "Projecting Long Term Lumen Maintenance of LED Light Sources. The TM-21 lumen maintenance model is based on the flux data normalized to 1 at 0 hours and the use of a exponential model for flux(time):

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

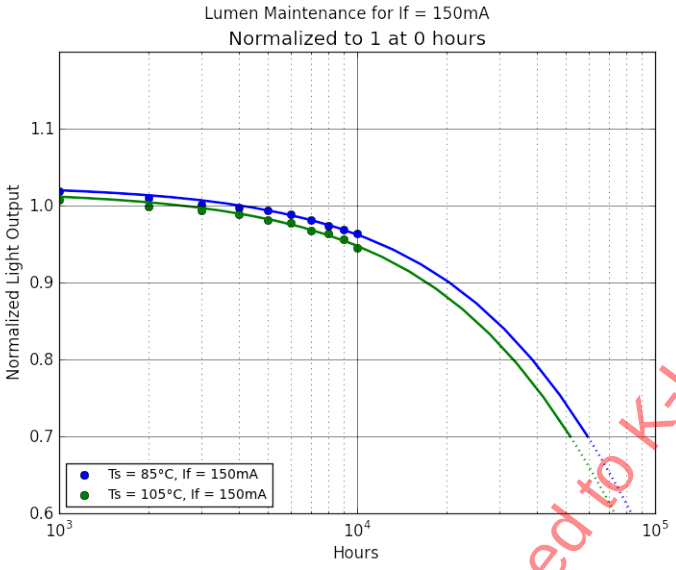
An L70 extrapolation less than 0 means that the model predicts an increasing flux output with time, i.e. alpha < 0 (see graphs). Generally, this means that additional test time is needed to determine the long-term lumen maintenance behavior.

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Normalized Flux Statistics for I_f = 150mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	alpha	B	L70
	median =	1.000	1.008	1.000	0.998	0.992	0.984	0.979	0.971	0.967	0.959	0.949			
Ts=Tair=105°C	average =	1.000	1.008	0.998	0.994	0.989	0.981	0.977	0.968	0.964	0.957	0.945	7.2287e-06	1.0188	51,918
	st dev =	0.000	0.010	0.017	0.016	0.016	0.015	0.014	0.014	0.014	0.014	0.014	TM-21 L70(10k) = 51,918hrs		
	min =	1.000	0.988	0.952	0.951	0.950	0.944	0.944	0.935	0.931	0.928	0.914			
	max =	1.000	1.026	1.035	1.026	1.020	1.009	1.004	0.992	0.986	0.981	0.967			
	median =	1.000	1.016	1.009	1.000	0.996	0.992	0.987	0.979	0.970	0.965	0.960			
Ts=Tair=85°C	average =	1.000	1.019	1.010	1.001	0.997	0.994	0.989	0.981	0.973	0.968	0.964	6.4475e-06	1.0265	59,381
	st dev =	0.000	0.011	0.010	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.010	TM-21 L70(10k) = 59,381hrs		
	min =	1.000	1.007	0.998	0.989	0.985	0.982	0.975	0.969	0.960	0.956	0.949			
	max =	1.000	1.055	1.046	1.032	1.026	1.022	1.016	1.009	1.001	0.996	0.992			



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Delta u'v' for I_f = 150mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
	median =	0.0000	0.0011	0.0011	0.0013	0.0019	0.0023	0.0028	0.0032	0.0035	0.0037	0.0041
Ts=Tair=105°C	average =	0.0000	0.0011	0.0011	0.0013	0.0019	0.0023	0.0028	0.0032	0.0035	0.0038	0.0042
	st dev =	0.0000	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0003	0.0003
	min =	0.0000	0.0006	0.0006	0.0009	0.0016	0.0018	0.0022	0.0026	0.0029	0.0033	0.0037
	max =	0.0000	0.0013	0.0014	0.0016	0.0024	0.0029	0.0035	0.0037	0.0040	0.0044	0.0047
	median =	0.0000	0.0010	0.0011	0.0013	0.0018	0.0020	0.0023	0.0025	0.0028	0.0031	0.0034
Ts=Tair=85°C	average =	0.0000	0.0010	0.0011	0.0012	0.0019	0.0020	0.0023	0.0026	0.0028	0.0031	0.0034
	st dev =	0.0000	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003
	min =	0.0000	0.0005	0.0007	0.0009	0.0014	0.0016	0.0019	0.0021	0.0023	0.0026	0.0029
	max =	0.0000	0.0013	0.0013	0.0015	0.0023	0.0024	0.0027	0.0032	0.0035	0.0037	0.0041

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Luminous Flux [lm] data for tested units

$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2622K	49.904	50.718	50.547	50.010	49.814	49.589	49.166	48.819	48.283	48.142	47.873
2	2664K	50.919	51.487	50.951	50.883	50.808	50.740	50.420	50.032	49.663	49.432	49.167
3	2666K	50.082	51.185	50.637	50.136	49.886	49.572	49.308	48.884	48.454	48.253	47.942
4	2589K	51.746	52.815	52.169	51.492	51.197	51.233	50.987	50.542	50.074	49.802	49.488
5	2682K	50.772	51.143	50.899	50.432	50.410	50.364	50.245	49.832	49.436	49.239	49.086
6	2677K	51.939	52.507	51.857	51.623	51.527	51.636	51.564	51.179	50.816	50.667	50.392
7	2627K	51.266	52.120	51.631	51.095	50.808	50.650	50.389	49.923	49.465	49.201	49.003
8	2567K	49.455	50.519	50.071	49.633	49.274	49.078	48.886	48.445	48.039	47.781	47.473
9	2668K	51.362	52.000	51.893	51.334	51.321	51.112	50.908	50.586	50.152	49.844	49.705
10	2732K	50.815	51.607	51.139	50.613	50.298	50.125	49.925	49.522	49.027	48.843	48.519
11	2658K	51.284	51.789	51.190	50.738	50.524	50.353	50.022	49.694	49.257	49.004	48.687
12	2650K	51.293	51.821	51.470	51.103	50.886	50.618	50.363	49.966	49.510	49.411	49.047
13	2651K	50.763	51.348	51.126	50.774	50.632	50.569	50.314	50.005	49.709	49.490	49.219
14	2595K	48.641	51.338	50.855	50.175	49.913	49.727	49.419	49.061	48.693	48.434	48.251
15	2603K	49.854	50.982	50.604	50.164	49.845	49.750	49.526	49.120	48.778	47.822	48.173
16	2745K	51.934	52.563	51.867	51.485	51.323	51.156	50.971	50.618	50.336	50.066	49.813
17	2635K	51.110	52.213	51.742	51.480	51.236	50.932	50.620	50.290	49.886	49.527	49.327
18	2618K	51.012	51.804	51.753	51.086	50.816	50.499	50.195	49.794	49.354	49.231	48.939
19	2649K	51.740	52.876	52.213	51.631	51.373	51.209	50.491	50.506	49.989	49.840	49.473
20	2661K	52.328	53.289	52.838	52.613	52.440	52.373	52.201	51.919	51.492	51.322	51.143
21	2691K	50.689	52.849	52.072	51.599	51.466	51.135	50.794	50.357	50.010	49.776	49.485
22	2706K	50.892	52.336	51.730	51.222	50.822	50.476	50.199	49.714	49.301	49.041	48.745

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2622K	1.000	1.016	1.013	1.002	0.998	0.994	0.985	0.978	0.968	0.965	0.959
2	2664K	1.000	1.011	1.001	0.999	0.998	0.996	0.990	0.983	0.975	0.971	0.966
3	2666K	1.000	1.022	1.011	1.001	0.996	0.990	0.985	0.976	0.968	0.963	0.957
4	2589K	1.000	1.021	1.008	0.995	0.989	0.990	0.985	0.977	0.968	0.962	0.956
5	2682K	1.000	1.007	1.002	0.993	0.993	0.992	0.990	0.981	0.974	0.970	0.967
6	2677K	1.000	1.011	0.998	0.994	0.992	0.994	0.993	0.985	0.978	0.976	0.970
7	2627K	1.000	1.017	1.007	0.997	0.991	0.988	0.983	0.974	0.965	0.960	0.956
8	2567K	1.000	1.022	1.012	1.004	0.996	0.992	0.988	0.980	0.971	0.966	0.960
9	2668K	1.000	1.012	1.010	0.999	0.999	0.995	0.991	0.985	0.976	0.970	0.968
10	2732K	1.000	1.016	1.006	0.996	0.990	0.986	0.982	0.975	0.965	0.961	0.955
11	2658K	1.000	1.010	0.998	0.989	0.985	0.982	0.975	0.969	0.960	0.956	0.949
12	2650K	1.000	1.010	1.003	0.996	0.992	0.987	0.982	0.974	0.965	0.963	0.956
13	2651K	1.000	1.012	1.007	1.000	0.997	0.996	0.991	0.985	0.979	0.975	0.970
14	2595K	1.000	1.055	1.046	1.032	1.026	1.022	1.016	1.009	1.001	0.996	0.992
15	2603K	1.000	1.023	1.015	1.006	1.000	0.998	0.993	0.985	0.978	0.959	0.966
16	2745K	1.000	1.012	0.999	0.991	0.988	0.985	0.981	0.975	0.969	0.964	0.959
17	2635K	1.000	1.022	1.012	1.007	1.002	0.997	0.990	0.984	0.976	0.969	0.965
18	2618K	1.000	1.016	1.015	1.001	0.996	0.990	0.984	0.976	0.967	0.965	0.959
19	2649K	1.000	1.022	1.009	0.998	0.993	0.990	0.976	0.976	0.966	0.963	0.956
20	2661K	1.000	1.018	1.010	1.005	1.002	1.001	0.998	0.992	0.984	0.981	0.977
21	2691K	1.000	1.043	1.027	1.018	1.015	1.009	1.002	0.993	0.987	0.982	0.976
22	2706K	1.000	1.028	1.016	1.006	0.999	0.992	0.986	0.977	0.969	0.964	0.958

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CIE 1976 u' data for tested units

$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2622K	0.2662	0.2656	0.2654	0.2653	0.2648	0.2646	0.2644	0.2642	0.2641	0.2639	0.2638
2	2664K	0.2649	0.2639	0.2638	0.2637	0.2632	0.2632	0.2631	0.2629	0.2628	0.2625	0.2623
3	2666K	0.2651	0.2641	0.2640	0.2639	0.2634	0.2633	0.2631	0.2629	0.2627	0.2624	0.2622
4	2589K	0.2678	0.2665	0.2666	0.2664	0.2657	0.2655	0.2654	0.2652	0.2648	0.2648	0.2646
5	2682K	0.2640	0.2629	0.2628	0.2628	0.2623	0.2623	0.2621	0.2619	0.2618	0.2615	0.2614
6	2677K	0.2635	0.2624	0.2623	0.2622	0.2616	0.2615	0.2614	0.2612	0.2611	0.2609	0.2608
7	2627K	0.2661	0.2652	0.2649	0.2648	0.2644	0.2643	0.2640	0.2637	0.2635	0.2633	0.2631
8	2567K	0.2691	0.2679	0.2680	0.2678	0.2673	0.2673	0.2670	0.2667	0.2664	0.2662	0.2661
9	2668K	0.2640	0.2629	0.2630	0.2629	0.2622	0.2622	0.2620	0.2619	0.2617	0.2616	0.2615
10	2732K	0.2619	0.2611	0.2610	0.2608	0.2602	0.2601	0.2598	0.2597	0.2596	0.2593	0.2592
11	2658K	0.2647	0.2635	0.2636	0.2635	0.2631	0.2629	0.2626	0.2625	0.2623	0.2621	0.2619
12	2650K	0.2657	0.2651	0.2649	0.2645	0.2640	0.2639	0.2635	0.2633	0.2633	0.2632	0.2631
13	2651K	0.2653	0.2642	0.2641	0.2639	0.2634	0.2634	0.2630	0.2628	0.2629	0.2627	0.2625
14	2595K	0.2674	0.2674	0.2667	0.2664	0.2658	0.2655	0.2653	0.2652	0.2651	0.2650	0.2649
15	2603K	0.2670	0.2662	0.2661	0.2661	0.2655	0.2655	0.2651	0.2650	0.2648	0.2648	0.2647
16	2745K	0.2611	0.2598	0.2598	0.2597	0.2593	0.2592	0.2590	0.2587	0.2586	0.2583	0.2581
17	2635K	0.2658	0.2649	0.2649	0.2648	0.2638	0.2637	0.2634	0.2634	0.2632	0.2631	0.2629
18	2618K	0.2671	0.2662	0.2661	0.2657	0.2650	0.2650	0.2647	0.2645	0.2645	0.2643	0.2642
19	2649K	0.2652	0.2642	0.2641	0.2638	0.2629	0.2629	0.2626	0.2624	0.2622	0.2620	0.2619
20	2661K	0.2643	0.2635	0.2634	0.2630	0.2626	0.2623	0.2622	0.2622	0.2621	0.2622	0.2620
21	2691K	0.2633	0.2621	0.2622	0.2619	0.2613	0.2612	0.2609	0.2605	0.2603	0.2602	0.2600
22	2706K	0.2629	0.2624	0.2622	0.2619	0.2611	0.2610	0.2606	0.2605	0.2603	0.2601	0.2600

CIE 1976 v' data for tested units

$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2622K	0.5279	0.5281	0.5280	0.5278	0.5277	0.5275	0.5273	0.5271	0.5268	0.5265	0.5261
2	2664K	0.5240	0.5239	0.5240	0.5239	0.5239	0.5237	0.5235	0.5232	0.5230	0.5228	0.5224
3	2666K	0.5224	0.5224	0.5225	0.5223	0.5221	0.5220	0.5218	0.5215	0.5212	0.5209	0.5206
4	2589K	0.5288	0.5287	0.5288	0.5287	0.5284	0.5282	0.5280	0.5277	0.5274	0.5272	0.5268
5	2682K	0.5238	0.5235	0.5236	0.5234	0.5232	0.5230	0.5229	0.5226	0.5223	0.5221	0.5217
6	2677K	0.5279	0.5276	0.5276	0.5275	0.5274	0.5273	0.5271	0.5268	0.5265	0.5263	0.5259
7	2627K	0.5271	0.5271	0.5272	0.5270	0.5268	0.5267	0.5266	0.5263	0.5261	0.5258	0.5254
8	2567K	0.5274	0.5273	0.5274	0.5272	0.5271	0.5269	0.5268	0.5265	0.5262	0.5260	0.5256
9	2668K	0.5275	0.5269	0.5268	0.5268	0.5268	0.5267	0.5265	0.5263	0.5260	0.5258	0.5254
10	2732K	0.5228	0.5229	0.5230	0.5227	0.5224	0.5223	0.5221	0.5218	0.5215	0.5213	0.5209
11	2658K	0.5261	0.5258	0.5258	0.5258	0.5256	0.5254	0.5252	0.5250	0.5247	0.5243	0.5240
12	2650K	0.5229	0.5233	0.5233	0.5231	0.5228	0.5227	0.5224	0.5222	0.5219	0.5217	0.5213
13	2651K	0.5250	0.5246	0.5248	0.5245	0.5244	0.5243	0.5241	0.5238	0.5236	0.5232	0.5229
14	2595K	0.5293	0.5299	0.5297	0.5296	0.5293	0.5291	0.5288	0.5286	0.5283	0.5281	0.5277
15	2603K	0.5290	0.5292	0.5292	0.5291	0.5287	0.5286	0.5284	0.5281	0.5279	0.5276	0.5272
16	2745K	0.5233	0.5230	0.5231	0.5229	0.5226	0.5225	0.5221	0.5219	0.5216	0.5213	0.5209
17	2635K	0.5263	0.5264	0.5265	0.5263	0.5259	0.5258	0.5257	0.5254	0.5251	0.5249	0.5246
18	2618K	0.5239	0.5240	0.5242	0.5239	0.5233	0.5232	0.5230	0.5227	0.5223	0.5221	0.5217
19	2649K	0.5257	0.5258	0.5258	0.5255	0.5253	0.5252	0.5249	0.5247	0.5243	0.5240	0.5236
20	2661K	0.5277	0.5276	0.5276	0.5274	0.5272	0.5271	0.5267	0.5264	0.5261	0.5258	0.5254
21	2691K	0.5251	0.5247	0.5247	0.5245	0.5243	0.5242	0.5239	0.5237	0.5234	0.5231	0.5228
22	2706K	0.5236	0.5235	0.5234	0.5233	0.5230	0.5229	0.5227	0.5225	0.5222	0.5219	0.5215

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Delta u'v' data for tested units

$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2622K	0.0000	0.0006	0.0008	0.0009	0.0014	0.0016	0.0019	0.0022	0.0024	0.0027	0.0030
2	2664K	0.0000	0.0010	0.0011	0.0011	0.0016	0.0017	0.0019	0.0021	0.0023	0.0026	0.0030
3	2666K	0.0000	0.0010	0.0011	0.0012	0.0017	0.0018	0.0021	0.0023	0.0026	0.0030	0.0034
4	2589K	0.0000	0.0013	0.0012	0.0014	0.0021	0.0024	0.0025	0.0028	0.0033	0.0034	0.0037
5	2682K	0.0000	0.0012	0.0012	0.0013	0.0018	0.0019	0.0021	0.0024	0.0027	0.0030	0.0033
6	2677K	0.0000	0.0011	0.0012	0.0013	0.0020	0.0020	0.0022	0.0025	0.0028	0.0030	0.0033
7	2627K	0.0000	0.0010	0.0012	0.0013	0.0017	0.0019	0.0022	0.0025	0.0028	0.0031	0.0035
8	2567K	0.0000	0.0012	0.0012	0.0013	0.0018	0.0019	0.0022	0.0026	0.0029	0.0032	0.0036
9	2668K	0.0000	0.0012	0.0012	0.0013	0.0019	0.0020	0.0023	0.0025	0.0027	0.0030	0.0032
10	2732K	0.0000	0.0008	0.0009	0.0011	0.0017	0.0018	0.0022	0.0023	0.0026	0.0030	0.0033
11	2658K	0.0000	0.0013	0.0012	0.0013	0.0017	0.0020	0.0023	0.0025	0.0028	0.0031	0.0035
12	2650K	0.0000	0.0007	0.0009	0.0012	0.0018	0.0018	0.0023	0.0025	0.0026	0.0028	0.0031
13	2651K	0.0000	0.0012	0.0012	0.0015	0.0020	0.0021	0.0025	0.0028	0.0028	0.0031	0.0035
14	2595K	0.0000	0.0007	0.0008	0.0010	0.0016	0.0019	0.0021	0.0023	0.0024	0.0026	0.0029
15	2603K	0.0000	0.0008	0.0009	0.0009	0.0015	0.0016	0.0020	0.0022	0.0025	0.0026	0.0030
16	2745K	0.0000	0.0013	0.0013	0.0015	0.0020	0.0021	0.0025	0.0028	0.0031	0.0035	0.0039
17	2635K	0.0000	0.0009	0.0010	0.0011	0.0020	0.0022	0.0025	0.0026	0.0029	0.0031	0.0034
18	2618K	0.0000	0.0010	0.0011	0.0014	0.0022	0.0023	0.0026	0.0029	0.0031	0.0033	0.0036
19	2649K	0.0000	0.0010	0.0012	0.0015	0.0023	0.0024	0.0027	0.0030	0.0034	0.0037	0.0040
20	2661K	0.0000	0.0008	0.0010	0.0013	0.0018	0.0021	0.0023	0.0025	0.0027	0.0029	0.0032
21	2691K	0.0000	0.0013	0.0012	0.0015	0.0022	0.0023	0.0027	0.0032	0.0035	0.0037	0.0041
22	2706K	0.0000	0.0005	0.0007	0.0010	0.0018	0.0021	0.0024	0.0026	0.0029	0.0032	0.0036

Forward Voltage [V] data for tested units

$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2622K	3.432	3.442	3.445	3.486	3.460	3.474	3.620	3.562	3.517	3.505	3.581
2	2664K	3.358	3.360	3.373	3.385	3.374	3.396	3.515	3.474	3.432	3.404	3.481
3	2666K	3.441	3.448	3.447	3.470	3.462	3.481	3.584	3.541	3.515	3.487	3.560
4	2589K	3.323	3.335	3.329	3.356	3.342	3.362	3.414	3.406	3.390	3.377	3.405
5	2682K	3.425	3.444	3.431	3.460	3.450	3.463	3.505	3.496	3.479	3.472	3.511
6	2677K	3.369	3.388	3.399	3.421	3.396	3.418	3.495	3.454	3.425	3.421	3.474
7	2627K	3.408	3.414	3.422	3.452	3.425	3.447	3.538	3.460	3.575	3.543	3.498
8	2567K	3.361	3.357	3.363	3.390	3.367	3.385	3.453	3.388	3.462	3.406	3.403
9	2668K	3.453	3.454	3.467	3.488	3.499	3.488	3.724	3.489	3.679	3.704	3.543
10	2732K	3.459	3.462	3.516	3.498	3.574	3.491	3.632	3.491	3.668	3.646	3.718
11	2658K	3.458	3.464	3.533	3.494	3.577	3.574	3.652	3.505	3.693	3.644	3.713
12	2650K	3.421	3.416	3.493	3.461	3.463	3.534	3.634	3.483	3.454	3.542	3.582
13	2651K	3.442	3.435	3.500	3.469	3.476	3.535	3.625	3.491	3.470	3.543	3.573
14	2595K	3.402	3.402	3.463	3.423	3.441	3.479	3.566	3.442	3.428	3.510	3.541
15	2603K	3.431	3.444	3.457	3.454	3.472	3.491	3.553	3.478	3.479	3.528	3.574
16	2745K	3.336	3.342	3.355	3.358	3.378	3.382	3.408	3.373	3.367	3.397	3.423
17	2635K	3.441	3.438	3.473	3.478	3.483	3.504	3.511	3.487	3.510	3.486	3.539
18	2618K	3.370	3.369	3.410	3.411	3.404	3.437	3.436	3.417	3.417	3.409	3.472
19	2649K	3.393	3.382	3.418	3.421	3.401	3.460	3.409	3.427	3.412	3.393	3.444
20	2661K	3.456	3.460	3.476	3.505	3.467	3.550	3.535	3.640	3.589	3.499	3.627
21	2691K	3.473	3.483	3.500	3.526	3.507	3.537	3.549	3.576	3.626	3.561	3.636
22	2706K	3.457	3.467	3.485	3.516	3.510	3.505	3.662	3.550	3.616	3.547	3.570

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Luminous Flux [lm] data for tested units

$T_s = T_{air} = 105°C$, $I_f = 150mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2654K	50.210	50.186	49.239	48.942	48.758	48.336	48.030	47.731	47.388	47.040	46.474
2	2665K	49.770	50.677	50.363	50.026	49.889	49.348	49.039	48.620	48.362	47.913	47.418
3	2686K	50.370	51.305	50.587	50.310	49.898	49.576	49.299	48.702	48.627	48.250	47.649
4	2682K	51.690	52.290	52.033	51.684	51.291	50.827	50.611	50.193	49.814	49.528	48.938
5	2622K	51.130	51.951	52.010	51.807	51.423	50.873	50.648	50.173	49.906	49.496	48.960
6	2564K	49.460	50.083	50.221	49.874	49.480	48.927	48.739	48.221	48.094	47.580	46.994
7	2622K	50.430	51.763	52.173	51.720	51.420	50.873	50.648	50.031	49.739	49.374	48.768
8	2676K	51.370	51.687	50.934	51.120	50.978	50.540	50.576	50.052	49.721	49.532	48.912
9	2647K	51.170	51.414	51.346	51.067	50.858	50.500	50.150	49.648	49.554	49.123	48.539
10	2687K	50.640	50.799	50.337	50.213	50.137	49.873	49.562	49.268	49.040	48.577	48.051
11	2769K	51.460	51.453	50.500	50.288	50.198	49.839	49.695	49.141	48.971	48.717	48.159
12	2618K	51.210	51.687	51.312	51.158	50.840	50.276	49.967	49.607	49.211	48.847	48.232
13	2717K	50.830	51.382	50.612	50.074	49.737	49.375	49.237	48.667	48.500	48.118	47.491
14	2709K	51.870	52.545	51.577	51.152	50.787	50.332	50.097	49.599	49.492	48.949	48.384
15	2705K	52.350	52.141	52.288	52.241	52.006	51.671	51.346	50.964	50.763	50.366	49.804
16	2614K	49.970	51.266	50.741	50.240	50.136	49.652	49.353	48.917	48.686	48.437	47.732
17	2726K	51.150	51.433	51.326	51.239	50.976	50.731	50.521	50.048	49.926	49.550	49.000
18	2608K	51.990	51.729	51.480	51.336	51.212	50.803	50.894	50.322	50.212	49.890	49.336
19	2711K	51.260	51.965	51.356	51.351	51.516	51.167	51.088	50.689	50.515	50.261	49.565
20	2676K	51.570	51.585	50.604	50.313	49.815	49.413	49.187	48.664	48.514	48.146	47.635
21	2695K	52.530	52.374	51.752	51.421	51.252	50.757	50.596	50.118	49.913	49.623	49.009
22	2632K	51.590	50.948	49.112	49.047	48.986	48.688	48.689	48.228	48.047	47.854	47.155

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 105°C$, $I_f = 150mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2654K	1.000	1.000	0.981	0.975	0.971	0.963	0.957	0.951	0.944	0.937	0.926
2	2665K	1.000	1.018	1.012	1.005	1.002	0.992	0.985	0.977	0.972	0.963	0.953
3	2686K	1.000	1.019	1.004	0.999	0.991	0.984	0.979	0.967	0.965	0.958	0.946
4	2682K	1.000	1.012	1.007	1.000	0.992	0.983	0.979	0.971	0.964	0.958	0.947
5	2622K	1.000	1.016	1.017	1.013	1.006	0.995	0.991	0.981	0.976	0.968	0.958
6	2564K	1.000	1.013	1.015	1.008	1.000	0.989	0.985	0.975	0.972	0.962	0.950
7	2622K	1.000	1.026	1.035	1.026	1.020	1.009	1.004	0.992	0.986	0.979	0.967
8	2676K	1.000	1.006	0.992	0.995	0.992	0.984	0.985	0.974	0.968	0.964	0.952
9	2647K	1.000	1.005	1.003	0.998	0.994	0.987	0.980	0.970	0.968	0.960	0.949
10	2687K	1.000	1.003	0.994	0.992	0.990	0.985	0.979	0.973	0.968	0.959	0.949
11	2769K	1.000	1.000	0.981	0.977	0.975	0.968	0.966	0.955	0.952	0.947	0.936
12	2618K	1.000	1.009	1.002	0.999	0.993	0.982	0.976	0.969	0.961	0.954	0.942
13	2717K	1.000	1.011	0.996	0.985	0.978	0.971	0.969	0.957	0.954	0.947	0.934
14	2709K	1.000	1.013	0.994	0.986	0.979	0.970	0.966	0.956	0.954	0.944	0.933
15	2705K	1.000	0.996	0.999	0.998	0.998	0.987	0.981	0.974	0.970	0.962	0.951
16	2614K	1.000	1.026	1.015	1.005	1.003	0.994	0.988	0.979	0.974	0.969	0.955
17	2726K	1.000	1.006	1.003	1.002	0.997	0.992	0.988	0.978	0.976	0.969	0.958
18	2608K	1.000	0.995	0.990	0.987	0.985	0.977	0.979	0.968	0.966	0.960	0.949
19	2711K	1.000	1.014	1.002	1.002	1.005	0.998	0.997	0.989	0.985	0.981	0.967
20	2676K	1.000	1.000	0.981	0.976	0.966	0.958	0.954	0.944	0.941	0.934	0.924
21	2695K	1.000	0.997	0.985	0.979	0.976	0.966	0.963	0.954	0.950	0.945	0.933
22	2632K	1.000	0.988	0.952	0.951	0.950	0.944	0.944	0.935	0.931	0.928	0.914

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CIE 1976 u' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 150mA; $T_s \geq$ 103°C and $T_{air} \geq$ 100°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2654K	0.2654	0.2645	0.2644	0.2646	0.2638	0.2636	0.2631	0.2629	0.2628	0.2625	0.2623
2	2665K	0.2646	0.2636	0.2636	0.2637	0.2632	0.2628	0.2622	0.2621	0.2620	0.2617	0.2616
3	2686K	0.2637	0.2624	0.2624	0.2623	0.2616	0.2611	0.2609	0.2607	0.2604	0.2602	0.2601
4	2682K	0.2636	0.2625	0.2627	0.2627	0.2622	0.2620	0.2618	0.2615	0.2614	0.2611	0.2610
5	2622K	0.2664	0.2653	0.2651	0.2650	0.2643	0.2638	0.2632	0.2631	0.2628	0.2626	0.2625
6	2564K	0.2691	0.2678	0.2677	0.2676	0.2668	0.2665	0.2661	0.2658	0.2657	0.2655	0.2654
7	2622K	0.2663	0.2651	0.2650	0.2648	0.2643	0.2639	0.2633	0.2630	0.2628	0.2627	0.2624
8	2676K	0.2645	0.2633	0.2632	0.2632	0.2628	0.2623	0.2617	0.2617	0.2613	0.2613	0.2611
9	2647K	0.2655	0.2644	0.2643	0.2641	0.2637	0.2635	0.2631	0.2628	0.2627	0.2626	0.2625
10	2687K	0.2638	0.2628	0.2628	0.2628	0.2624	0.2622	0.2617	0.2614	0.2613	0.2611	0.2609
11	2769K	0.2601	0.2591	0.2592	0.2596	0.2589	0.2585	0.2579	0.2577	0.2575	0.2574	0.2572
12	2618K	0.2663	0.2655	0.2655	0.2651	0.2646	0.2644	0.2642	0.2638	0.2637	0.2634	0.2632
13	2717K	0.2621	0.2612	0.2613	0.2617	0.2611	0.2609	0.2603	0.2600	0.2599	0.2597	0.2595
14	2709K	0.2628	0.2622	0.2623	0.2623	0.2618	0.2614	0.2607	0.2605	0.2605	0.2604	0.2602
15	2705K	0.2620	0.2611	0.2613	0.2610	0.2608	0.2605	0.2602	0.2600	0.2599	0.2598	0.2597
16	2614K	0.2668	0.2658	0.2657	0.2655	0.2649	0.2646	0.2644	0.2641	0.2640	0.2639	0.2638
17	2726K	0.2615	0.2605	0.2606	0.2606	0.2602	0.2599	0.2590	0.2588	0.2586	0.2585	0.2582
18	2608K	0.2670	0.2660	0.2660	0.2659	0.2655	0.2650	0.2647	0.2644	0.2643	0.2641	0.2641
19	2711K	0.2624	0.2614	0.2614	0.2613	0.2610	0.2607	0.2601	0.2599	0.2596	0.2595	0.2593
20	2676K	0.2641	0.2632	0.2631	0.2629	0.2625	0.2621	0.2616	0.2616	0.2614	0.2612	0.2610
21	2695K	0.2630	0.2619	0.2621	0.2625	0.2616	0.2612	0.2607	0.2604	0.2604	0.2603	0.2602
22	2632K	0.2658	0.2647	0.2652	0.2654	0.2647	0.2645	0.2638	0.2636	0.2634	0.2631	0.2629

CIE 1976 v' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 150mA; $T_s \geq$ 103°C and $T_{air} \geq$ 100°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2654K	0.5239	0.5237	0.5236	0.5228	0.5231	0.5230	0.5226	0.5222	0.5219	0.5216	0.5213
2	2665K	0.5249	0.5247	0.5250	0.5242	0.5241	0.5240	0.5237	0.5234	0.5231	0.5228	0.5224
3	2686K	0.5244	0.5243	0.5243	0.5238	0.5234	0.5232	0.5230	0.5227	0.5225	0.5221	0.5217
4	2682K	0.5261	0.5259	0.5261	0.5254	0.5252	0.5251	0.5248	0.5245	0.5242	0.5239	0.5234
5	2622K	0.5268	0.5266	0.5270	0.5262	0.5260	0.5259	0.5255	0.5253	0.5250	0.5247	0.5242
6	2564K	0.5284	0.5282	0.5284	0.5281	0.5277	0.5276	0.5272	0.5269	0.5266	0.5263	0.5259
7	2622K	0.5273	0.5269	0.5270	0.5268	0.5265	0.5263	0.5260	0.5257	0.5254	0.5252	0.5248
8	2676K	0.5228	0.5224	0.5224	0.5221	0.5217	0.5215	0.5212	0.5210	0.5206	0.5203	0.5199
9	2647K	0.5247	0.5246	0.5247	0.5241	0.5238	0.5237	0.5235	0.5232	0.5229	0.5226	0.5221
10	2687K	0.5240	0.5234	0.5233	0.5232	0.5229	0.5228	0.5226	0.5223	0.5220	0.5216	0.5212
11	2769K	0.5228	0.5225	0.5221	0.5215	0.5211	0.5210	0.5206	0.5203	0.5200	0.5196	0.5192
12	2618K	0.5286	0.5286	0.5290	0.5284	0.5281	0.5280	0.5277	0.5274	0.5271	0.5267	0.5263
13	2717K	0.5254	0.5250	0.5249	0.5242	0.5239	0.5238	0.5235	0.5233	0.5229	0.5226	0.5222
14	2709K	0.5232	0.5231	0.5229	0.5224	0.5219	0.5217	0.5213	0.5210	0.5207	0.5202	0.5197
15	2705K	0.5283	0.5280	0.5281	0.5279	0.5278	0.5271	0.5268	0.5265	0.5262	0.5259	0.5255
16	2614K	0.5267	0.5263	0.5264	0.5261	0.5257	0.5256	0.5253	0.5250	0.5248	0.5245	0.5241
17	2726K	0.5257	0.5253	0.5257	0.5252	0.5248	0.5247	0.5243	0.5241	0.5238	0.5235	0.5232
18	2608K	0.5274	0.5271	0.5271	0.5268	0.5264	0.5263	0.5260	0.5256	0.5254	0.5251	0.5247
19	2711K	0.5249	0.5243	0.5243	0.5239	0.5235	0.5234	0.5231	0.5228	0.5225	0.5222	0.5218
20	2676K	0.5251	0.5251	0.5252	0.5244	0.5241	0.5240	0.5237	0.5234	0.5231	0.5227	0.5224
21	2695K	0.5257	0.5251	0.5250	0.5243	0.5241	0.5239	0.5236	0.5234	0.5231	0.5227	0.5223
22	2632K	0.5277	0.5271	0.5267	0.5264	0.5259	0.5258	0.5255	0.5252	0.5249	0.5246	0.5242

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Delta u'v' data for tested units

$T_s = T_{air}$ = 105°C, I_f = 150mA; $T_s \geq$ 103°C and $T_{air} \geq$ 100°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2654K	0.0000	0.0009	0.0010	0.0013	0.0018	0.0020	0.0026	0.0030	0.0033	0.0037	0.0041
2	2665K	0.0000	0.0010	0.0010	0.0012	0.0017	0.0020	0.0027	0.0030	0.0032	0.0036	0.0040
3	2686K	0.0000	0.0013	0.0013	0.0016	0.0024	0.0029	0.0031	0.0035	0.0038	0.0042	0.0045
4	2682K	0.0000	0.0011	0.0008	0.0011	0.0016	0.0018	0.0022	0.0026	0.0029	0.0033	0.0037
5	2622K	0.0000	0.0012	0.0013	0.0016	0.0023	0.0028	0.0035	0.0037	0.0040	0.0044	0.0047
6	2564K	0.0000	0.0013	0.0014	0.0016	0.0024	0.0028	0.0033	0.0037	0.0039	0.0042	0.0046
7	2622K	0.0000	0.0013	0.0013	0.0016	0.0022	0.0026	0.0033	0.0037	0.0040	0.0043	0.0047
8	2676K	0.0000	0.0013	0.0013	0.0015	0.0021	0.0026	0.0032	0.0034	0.0039	0.0041	0.0045
9	2647K	0.0000	0.0011	0.0012	0.0015	0.0020	0.0022	0.0027	0.0031	0.0034	0.0036	0.0040
10	2687K	0.0000	0.0011	0.0011	0.0013	0.0017	0.0019	0.0025	0.0029	0.0032	0.0036	0.0040
11	2769K	0.0000	0.0011	0.0012	0.0015	0.0021	0.0025	0.0032	0.0035	0.0039	0.0042	0.0046
12	2618K	0.0000	0.0008	0.0009	0.0012	0.0018	0.0020	0.0022	0.0027	0.0029	0.0034	0.0038
13	2717K	0.0000	0.0010	0.0009	0.0012	0.0017	0.0019	0.0026	0.0029	0.0032	0.0036	0.0040
14	2709K	0.0000	0.0006	0.0006	0.0009	0.0017	0.0021	0.0028	0.0032	0.0035	0.0039	0.0044
15	2705K	0.0000	0.0010	0.0007	0.0011	0.0016	0.0019	0.0024	0.0027	0.0030	0.0033	0.0037
16	2614K	0.0000	0.0011	0.0012	0.0015	0.0022	0.0024	0.0028	0.0032	0.0034	0.0036	0.0040
17	2726K	0.0000	0.0011	0.0009	0.0011	0.0017	0.0019	0.0028	0.0032	0.0035	0.0038	0.0042
18	2608K	0.0000	0.0011	0.0011	0.0013	0.0018	0.0023	0.0027	0.0031	0.0034	0.0037	0.0040
19	2711K	0.0000	0.0012	0.0012	0.0015	0.0020	0.0023	0.0030	0.0033	0.0037	0.0040	0.0045
20	2676K	0.0000	0.0008	0.0010	0.0013	0.0019	0.0023	0.0028	0.0030	0.0033	0.0037	0.0040
21	2695K	0.0000	0.0012	0.0012	0.0015	0.0022	0.0026	0.0031	0.0035	0.0037	0.0041	0.0044
22	2632K	0.0000	0.0012	0.0012	0.0014	0.0021	0.0023	0.0030	0.0033	0.0037	0.0041	0.0045

Forward Voltage [V] data for tested units

$T_s = T_{air}$ = 105°C, I_f = 150mA; $T_s \geq$ 103°C and $T_{air} \geq$ 100°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2654K	3.466	3.471	3.505	3.562	3.565	3.516	3.675	3.563	3.638	3.575	3.734
2	2665K	3.395	3.403	3.444	3.492	3.495	3.461	3.614	3.504	3.570	3.501	3.612
3	2686K	3.380	3.398	3.426	3.479	3.474	3.454	3.567	3.473	3.541	3.492	3.640
4	2682K	3.366	3.385	3.419	3.473	3.449	3.438	3.520	3.479	3.516	3.495	3.602
5	2622K	3.383	3.395	3.435	3.486	3.462	3.452	3.526	3.484	3.514	3.493	3.576
6	2564K	3.467	3.479	3.527	3.586	3.546	3.559	3.640	3.581	3.586	3.575	3.660
7	2622K	3.350	3.353	3.400	3.460	3.415	3.460	3.518	3.445	3.456	3.459	3.511
8	2676K	3.395	3.401	3.428	3.503	3.453	3.490	3.516	3.482	3.453	3.466	3.482
9	2647K	3.411	3.427	3.497	3.581	3.573	3.528	3.715	3.630	3.583	3.688	3.766
10	2687K	3.451	3.477	3.531	3.522	3.650	3.592	3.616	3.665	3.623	3.721	3.656
11	2769K	3.436	3.454	3.530	3.537	3.614	3.553	3.582	3.634	3.571	3.677	3.616
12	2618K	3.394	3.413	3.489	3.481	3.533	3.578	3.535	3.566	3.500	3.575	3.552
13	2717K	3.461	3.469	3.531	3.544	3.582	3.630	3.586	3.615	3.551	3.614	3.598
14	2709K	3.393	3.405	3.472	3.464	3.495	3.531	3.499	3.505	3.488	3.545	3.508
15	2705K	3.361	3.419	3.477	3.472	3.488	3.535	3.506	3.516	3.519	3.537	3.500
16	2614K	3.420	3.437	3.496	3.486	3.502	3.544	3.511	3.533	3.545	3.521	3.507
17	2726K	3.460	3.470	3.529	3.533	3.534	3.570	3.582	3.560	3.561	3.642	3.551
18	2608K	3.385	3.398	3.460	3.465	3.458	3.489	3.531	3.471	3.520	3.578	3.482
19	2711K	3.338	3.344	3.383	3.410	3.389	3.411	3.438	3.402	3.426	3.430	3.407
20	2676K	3.379	3.378	3.417	3.463	3.494	3.455	3.508	3.556	3.561	3.507	3.534
21	2695K	3.463	3.516	3.502	3.551	3.632	3.575	3.557	3.574	3.623	3.655	3.591
22	2632K	3.386	3.410	3.427	3.477	3.537	3.498	3.546	3.500	3.524	3.526	3.544

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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.

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Appendix: Additional Projected Extrapolations per IESNA TM-21-11

Projected L_{75} extrapolations per IESNA TM-21-11

	If = 150mA
Ts = 105°C	42,373
Ts = 85°C	48,680

Projected L_{80} extrapolations per IESNA TM-21-11

	If = 150mA
Ts = 105°C	33,445
Ts = 85°C	38,670

Projected L_{85} extrapolations per IESNA TM-21-11

	If = 150mA
Ts = 105°C	25,058
Ts = 85°C	29,267

Projected L_{90} extrapolations per IESNA TM-21-11

	If = 150mA
Ts = 105°C	17,151
Ts = 85°C	20,402

Projected L_{95} extrapolations per IESNA TM-21-11

	If = 150mA
Ts = 105°C	9,571
Ts = 85°C	12,016

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Projected L_{100} extrapolations per IESNA TM-21-11

	If = 150mA
Ts = 105°C	1,815
Ts = 85°C	3,345

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