Lumileds

IESNA LM-80 Test Report

1. Applicable LUXEON® Series part number(s)

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

Product Family	Part Number	CCT
LUXEON 3030 2D	L130-xxyy003000W21	white

In these part numbers xx designates the nominal ANSI color bin (e.g. 27 for 2700K, 30 for 3000K, etc.) and yy designates the minimum CRI value (e.g. 80 for a minimum CRI of 80).

2. L_{70} Extrapolations per IESNA TM-21-11

	If = 165mA	If = 200mA
Ts = 105°C	> 54,000	50,549
Ts = 85°C	> 54,000	> 54,000
Ts = 55°C	> 54,000	> 54,000
		= Limited by TM-21 6x rule

3. Number of LED light sources tested

50 units tested per stress condition / data reported for first 25 units per test condition.

4. Description of LED light sources tested

LUXEON 3030 2D: L130-2780003000W21 (nominal CCT 2700K)

5. Dates Tests Started

All DATA SETs: 03-23-2014.

6. Date Report First Issued

All DATA SETs: first reported on 01-20-2015.

7. Package Pictures

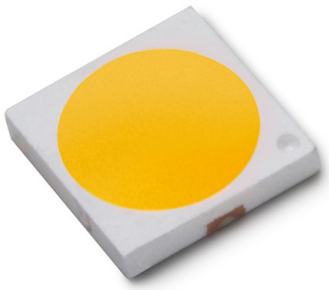


Figure 1. Picture of LUXEON 3030 2D.

8. Mechanical Drawing

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

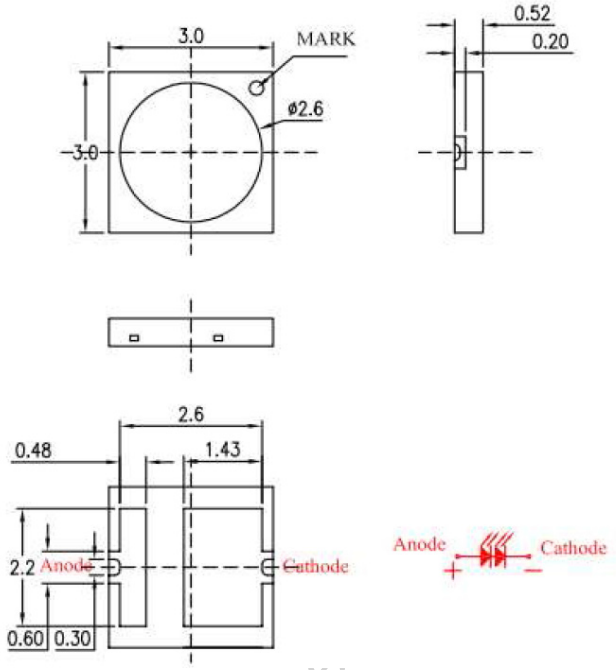


Figure 2: Mechanical Drawing for LUXEON 3030 2D. All dimensions are in millimeters.

9. T_s Measurement Point

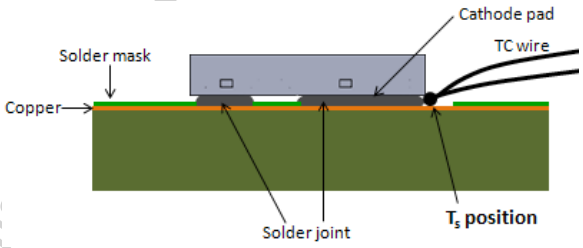


Figure 3: Preferred T_s measurement point for LUXEON 3030 2D.

For further information on measuring the in-situ T_s, please see Lumileds Application Brief AB207, which is available online at www.lumileds.com.

10. Description of auxiliary equipment

LUXEON LED devices are soldered to reliability stress boards that can accommodate up to 25 devices and are driven by a constant current source.

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.

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%. The temperature uniformity of the board (center to edge) was experimentally determined to be less than 2°C.

The photometry measurement temperature is set and monitored to be within 25°C ± 2°C with no forced airflow and RH < 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. 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).

Luminous Flux (Φ_v) ± 1.59%

Correlated Color Temperature (CCT) ± 21K

20. Chromaticity shift reported over the measurement time

See tables.

21. Sampling Method/Sample size

Please see Section 3.

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 Data Sheet operating conditions.

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.

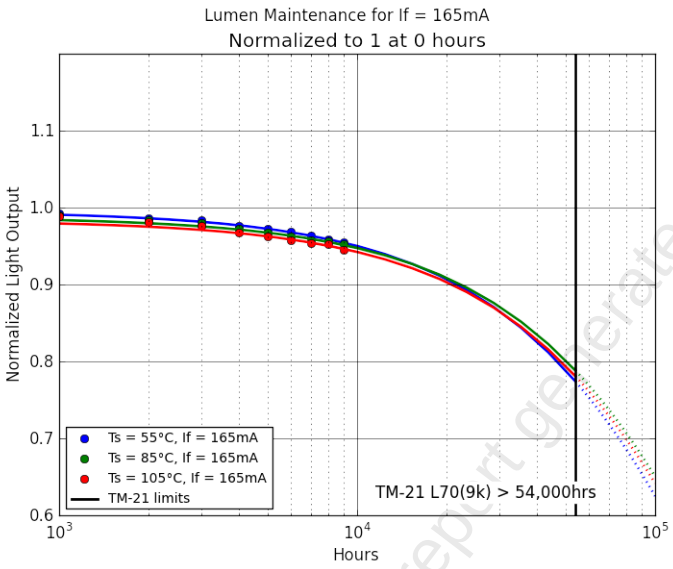
Disclaimer

Although LUMILEDS has attempted to provide the most accurate information and materials and services data (hereinafter "Data"), the Data is provided "as is" and may contain errors. The entire risk of use of the data shall be with the user. LUMILEDS makes no warranty, express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, regarding the contents or correctness of the Data provided or the ability of the Data to meet the user's needs or expectations. LUMILEDS reserves the right to make changes without notice. You as user agree to this disclaimer and user agreement with the download or use of the provided materials and Data.

In no event shall LUMILEDS be liable for any direct, indirect, special, incidental, exemplary, or consequential damages arising out of or related to the use of the Data, however caused, regardless of theory of liability, and whether or not LUMILEDS has been advised of the possibility of such damage. This limitation shall apply notwithstanding any failure of essential purpose or any exclusive remedy.

Normalized Flux Statistics for I_f = 165mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	alpha	B	L70
	median =	1.0000	0.9884	0.9822	0.9773	0.9660	0.9629	0.9581	0.9541	0.9510	0.9435			
Ts=Tair=105°C	average =	1.0000	0.9891	0.9815	0.9768	0.9674	0.9627	0.9573	0.9536	0.9525	0.9456	4.2712e-06	0.9834	79,596
	st dev =	0.0000	0.0046	0.0051	0.0047	0.0050	0.0049	0.0050	0.0051	0.0064	0.0069	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9807	0.9745	0.9701	0.9590	0.9560	0.9491	0.9446	0.9436	0.9330			
	max =	1.0000	0.9973	0.9911	0.9845	0.9776	0.9733	0.9701	0.9664	0.9673	0.9596			
	median =	1.0000	0.9905	0.9866	0.9803	0.9731	0.9666	0.9608	0.9582	0.9561	0.9513			
Ts=Tair=85°C	average =	1.0000	0.9897	0.9843	0.9801	0.9728	0.9671	0.9624	0.9577	0.9566	0.9519	4.1795e-06	0.9879	82,416
	st dev =	0.0000	0.0056	0.0061	0.0061	0.0062	0.0059	0.0061	0.0061	0.0060	0.0060	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9801	0.9749	0.9702	0.9614	0.9579	0.9529	0.9483	0.9448	0.9395			
	max =	1.0000	0.9973	0.9937	0.9928	0.9848	0.9778	0.9750	0.9707	0.9742	0.9682			
	median =	1.0000	0.9938	0.9877	0.9845	0.9785	0.9733	0.9696	0.9647	0.9599	0.9570			
Ts=Tair=55°C	average =	1.0000	0.9926	0.9864	0.9836	0.9769	0.9725	0.9681	0.9634	0.9584	0.9549	4.6545e-06	0.9953	75,623
	st dev =	0.0000	0.0044	0.0049	0.0049	0.0055	0.0055	0.0055	0.0061	0.0067	0.0068	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9839	0.9756	0.9729	0.9648	0.9621	0.9558	0.9493	0.9440	0.9413			
	max =	1.0000	0.9991	0.9964	0.9937	0.9865	0.9819	0.9792	0.9747	0.9682	0.9647			

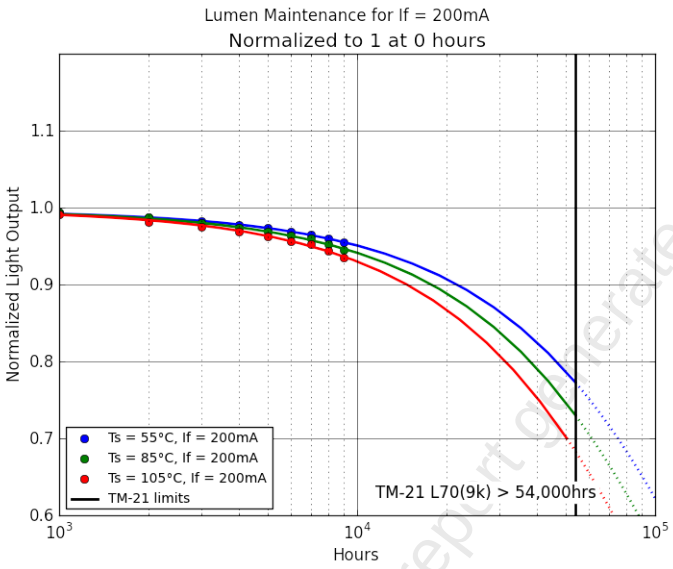


Delta u'v' for I_f = 165mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
	median =	0.0000	0.0014	0.0019	0.0022	0.0025	0.0029	0.0035	0.0040	0.0043	0.0048
Ts=Tair=105°C	average =	0.0000	0.0014	0.0019	0.0023	0.0026	0.0029	0.0036	0.0040	0.0044	0.0048
	st dev =	0.0000	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0006	0.0005
	min =	0.0000	0.0010	0.0013	0.0017	0.0021	0.0023	0.0030	0.0031	0.0028	0.0035
	max =	0.0000	0.0020	0.0028	0.0031	0.0033	0.0036	0.0044	0.0048	0.0056	0.0059
	median =	0.0000	0.0013	0.0019	0.0023	0.0026	0.0029	0.0033	0.0037	0.0040	0.0045
Ts=Tair=85°C	average =	0.0000	0.0013	0.0019	0.0023	0.0025	0.0028	0.0033	0.0038	0.0043	0.0048
	st dev =	0.0000	0.0003	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0006	0.0007
	min =	0.0000	0.0009	0.0013	0.0016	0.0018	0.0020	0.0026	0.0029	0.0034	0.0038
	max =	0.0000	0.0023	0.0028	0.0030	0.0032	0.0035	0.0049	0.0052	0.0056	0.0065
	median =	0.0000	0.0011	0.0016	0.0019	0.0021	0.0023	0.0027	0.0032	0.0037	0.0040
Ts=Tair=55°C	average =	0.0000	0.0012	0.0017	0.0019	0.0021	0.0024	0.0029	0.0033	0.0038	0.0042
	st dev =	0.0000	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0006
	min =	0.0000	0.0008	0.0012	0.0014	0.0017	0.0019	0.0023	0.0023	0.0029	0.0033
	max =	0.0000	0.0024	0.0025	0.0027	0.0029	0.0033	0.0043	0.0047	0.0054	0.0056

Normalized Flux Statistics for I_f = 200mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	alpha	B	L70
	median =	1.0000	0.9919	0.9810	0.9763	0.9686	0.9631	0.9571	0.9533	0.9438	0.9345			
Ts=Tair=105°C	average =	1.0000	0.9914	0.9810	0.9755	0.9688	0.9629	0.9567	0.9524	0.9434	0.9347	7.0063e-06	0.9975	50,549
	st dev =	0.0000	0.0045	0.0048	0.0053	0.0054	0.0057	0.0054	0.0054	0.0056	0.0054	TM-21 L70(9k) = 50,549hrs		
	min =	1.0000	0.9774	0.9702	0.9656	0.9586	0.9507	0.9445	0.9396	0.9297	0.9221			
	max =	1.0000	0.9977	0.9889	0.9838	0.9786	0.9734	0.9653	0.9607	0.9517	0.9435			
	median =	1.0000	0.9933	0.9864	0.9809	0.9737	0.9691	0.9632	0.9591	0.9534	0.9455			
Ts=Tair=85°C	average =	1.0000	0.9932	0.9870	0.9804	0.9739	0.9682	0.9636	0.9595	0.9527	0.9452	5.7725e-06	0.9972	61,304
	st dev =	0.0000	0.0041	0.0051	0.0043	0.0049	0.0047	0.0051	0.0051	0.0062	0.0062	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9825	0.9769	0.9722	0.9642	0.9586	0.9531	0.9491	0.9411	0.9324			
	max =	1.0000	1.0015	0.9985	0.9892	0.9830	0.9769	0.9722	0.9684	0.9622	0.9559			
	median =	1.0000	0.9932	0.9867	0.9818	0.9771	0.9726	0.9692	0.9657	0.9599	0.9540			
Ts=Tair=55°C	average =	1.0000	0.9936	0.9872	0.9828	0.9775	0.9734	0.9693	0.9650	0.9597	0.9547	4.7110e-06	0.9966	74,993
	st dev =	0.0000	0.0028	0.0029	0.0038	0.0045	0.0042	0.0047	0.0064	0.0070	0.0069	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9873	0.9806	0.9759	0.9704	0.9658	0.9603	0.9428	0.9374	0.9327			
	max =	1.0000	0.9992	0.9932	0.9924	0.9886	0.9833	0.9803	0.9765	0.9719	0.9666			



Delta u'v' for I_f = 200mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
	median =	0.0000	0.0016	0.0020	0.0022	0.0025	0.0029	0.0033	0.0037	0.0041	0.0047
Ts=Tair=105°C	average =	0.0000	0.0017	0.0020	0.0022	0.0026	0.0030	0.0033	0.0037	0.0041	0.0046
	st dev =	0.0000	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0005
	min =	0.0000	0.0014	0.0017	0.0018	0.0022	0.0025	0.0028	0.0033	0.0034	0.0038
	max =	0.0000	0.0025	0.0031	0.0032	0.0036	0.0039	0.0039	0.0044	0.0052	0.0055
	median =	0.0000	0.0015	0.0017	0.0020	0.0025	0.0027	0.0030	0.0034	0.0041	0.0047
Ts=Tair=85°C	average =	0.0000	0.0015	0.0017	0.0021	0.0024	0.0027	0.0030	0.0035	0.0041	0.0046
	st dev =	0.0000	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004
	min =	0.0000	0.0012	0.0014	0.0015	0.0019	0.0021	0.0025	0.0028	0.0033	0.0038
	max =	0.0000	0.0020	0.0022	0.0026	0.0029	0.0032	0.0035	0.0041	0.0048	0.0055
	median =	0.0000	0.0014	0.0017	0.0018	0.0021	0.0024	0.0028	0.0031	0.0035	0.0039
Ts=Tair=55°C	average =	0.0000	0.0015	0.0017	0.0019	0.0022	0.0024	0.0028	0.0032	0.0036	0.0040
	st dev =	0.0000	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0006	0.0006
	min =	0.0000	0.0011	0.0015	0.0016	0.0019	0.0022	0.0021	0.0024	0.0025	0.0030
	max =	0.0000	0.0017	0.0021	0.0023	0.0025	0.0028	0.0036	0.0041	0.0051	0.0057

Luminous Flux [lm] data for tested units

$T_s = T_{air}$ = 55°C, I_f = 165mA; $T_s \geq$ 53°C and $T_{air} \geq$ 50°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	2851K	111.900	111.300	110.500	110.400	109.700	109.200	108.800	108.400	107.400	106.900
2	2857K	116.300	114.600	114.300	114.100	113.100	112.600	112.300	111.900	111.200	110.800
3	2846K	115.900	114.100	113.700	113.200	112.600	112.100	111.600	111.200	110.300	109.900
4	2864K	112.200	111.500	110.700	110.600	108.700	108.000	107.700	107.000	106.500	106.100
5	2859K	111.600	111.400	110.500	110.400	109.600	109.000	108.300	107.800	107.700	107.200
6	2834K	110.800	110.700	110.400	110.100	109.300	108.800	108.500	108.000	106.700	106.400
7	2851K	116.100	115.200	114.600	114.400	113.600	113.000	112.400	112.000	112.200	111.900
8	2861K	113.300	112.400	112.200	111.900	111.100	110.400	110.200	109.700	108.800	108.500
9	2859K	114.900	113.800	113.000	112.700	112.000	111.400	110.900	110.500	110.200	110.000
10	2843K	115.600	114.900	114.200	113.800	113.100	112.400	111.900	111.400	110.100	109.700
11	2829K	110.500	110.000	109.600	109.000	108.300	107.700	106.900	106.600	105.900	105.500
12	2857K	112.100	110.300	109.500	109.400	108.600	108.200	107.700	107.300	106.700	106.200
13	2807K	116.200	115.800	115.300	114.900	114.300	113.900	113.200	112.700	112.500	112.100
14	2864K	109.600	109.300	108.400	108.000	107.300	106.900	106.500	105.900	105.200	104.700
15	2810K	112.300	112.000	111.100	110.500	109.900	109.600	109.000	108.500	107.400	107.100
16	2840K	114.500	113.500	112.400	111.800	111.000	110.400	109.700	108.700	108.400	108.000
17	2865K	116.300	115.700	114.900	114.500	113.800	113.100	112.500	112.000	111.700	111.500
18	2821K	113.500	113.100	112.100	111.600	110.800	110.400	110.100	109.500	109.500	108.900
19	2772K	110.800	109.900	108.100	107.800	106.900	106.600	105.900	105.200	104.600	104.300
20	2774K	111.900	110.400	109.800	109.600	109.000	108.900	108.500	108.100	107.800	107.400
21	2762K	110.800	109.200	108.600	108.300	107.600	107.200	107.000	106.400	105.100	104.500
22	2763K	113.000	111.900	111.300	111.200	110.600	110.100	109.800	109.400	109.300	108.900
23	2731K	109.600	109.000	108.400	108.100	107.500	107.000	106.400	105.900	105.600	105.200
24	2723K	109.300	108.500	108.100	108.000	107.500	107.100	106.000	104.900	105.200	104.800
25	2741K	111.500	111.000	110.300	110.000	109.300	109.000	108.800	108.200	107.100	106.700

Normalized Luminous Flux data for tested units

$T_s = T_{air}$ = 55°C, I_f = 165mA; $T_s \geq$ 53°C and $T_{air} \geq$ 50°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	2851K	1.0000	0.9946	0.9875	0.9866	0.9803	0.9759	0.9723	0.9687	0.9598	0.9553
2	2857K	1.0000	0.9854	0.9828	0.9811	0.9725	0.9682	0.9656	0.9622	0.9561	0.9527
3	2846K	1.0000	0.9845	0.9810	0.9767	0.9715	0.9672	0.9629	0.9594	0.9517	0.9482
4	2864K	1.0000	0.9938	0.9866	0.9857	0.9688	0.9626	0.9599	0.9537	0.9492	0.9456
5	2859K	1.0000	0.9982	0.9901	0.9892	0.9821	0.9767	0.9704	0.9659	0.9651	0.9606
6	2834K	1.0000	0.9991	0.9964	0.9937	0.9865	0.9819	0.9792	0.9747	0.9630	0.9603
7	2851K	1.0000	0.9922	0.9871	0.9854	0.9785	0.9733	0.9681	0.9647	0.9664	0.9638
8	2861K	1.0000	0.9921	0.9903	0.9876	0.9806	0.9744	0.9726	0.9682	0.9603	0.9576
9	2859K	1.0000	0.9904	0.9835	0.9809	0.9748	0.9695	0.9652	0.9617	0.9591	0.9574
10	2843K	1.0000	0.9939	0.9879	0.9844	0.9784	0.9723	0.9680	0.9637	0.9524	0.9490
11	2829K	1.0000	0.9955	0.9919	0.9864	0.9801	0.9747	0.9674	0.9647	0.9584	0.9548
12	2857K	1.0000	0.9839	0.9768	0.9759	0.9688	0.9652	0.9607	0.9572	0.9518	0.9474
13	2807K	1.0000	0.9966	0.9923	0.9888	0.9836	0.9802	0.9742	0.9699	0.9682	0.9647
14	2864K	1.0000	0.9973	0.9891	0.9854	0.9790	0.9754	0.9717	0.9662	0.9599	0.9553
15	2810K	1.0000	0.9973	0.9893	0.9840	0.9786	0.9760	0.9706	0.9662	0.9564	0.9537
16	2840K	1.0000	0.9913	0.9817	0.9764	0.9694	0.9642	0.9581	0.9493	0.9467	0.9432
17	2865K	1.0000	0.9948	0.9880	0.9845	0.9785	0.9725	0.9673	0.9630	0.9604	0.9587
18	2821K	1.0000	0.9965	0.9877	0.9833	0.9762	0.9727	0.9700	0.9648	0.9648	0.9595
19	2772K	1.0000	0.9919	0.9756	0.9729	0.9648	0.9621	0.9558	0.9495	0.9440	0.9413
20	2774K	1.0000	0.9866	0.9812	0.9794	0.9741	0.9732	0.9696	0.9660	0.9634	0.9598
21	2762K	1.0000	0.9856	0.9801	0.9774	0.9711	0.9675	0.9657	0.9603	0.9486	0.9431
22	2763K	1.0000	0.9903	0.9850	0.9841	0.9788	0.9743	0.9717	0.9681	0.9673	0.9637
23	2731K	1.0000	0.9945	0.9891	0.9863	0.9808	0.9763	0.9708	0.9662	0.9635	0.9599
24	2723K	1.0000	0.9927	0.9890	0.9881	0.9835	0.9799	0.9698	0.9597	0.9625	0.9588
25	2741K	1.0000	0.9955	0.9892	0.9865	0.9803	0.9776	0.9758	0.9704	0.9605	0.9570

CIE 1976 u' data for tested units
$T_s = T_{air} = 55°C$, $I_f = 165mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	2851K	0.2544	0.2527	0.2525	0.2529	0.2529	0.2527	0.2522	0.2518	0.2516	0.2516
2	2857K	0.2545	0.2529	0.2521	0.2520	0.2518	0.2516	0.2515	0.2513	0.2513	0.2515
3	2846K	0.2544	0.2532	0.2524	0.2526	0.2525	0.2521	0.2520	0.2517	0.2517	0.2516
4	2864K	0.2539	0.2526	0.2520	0.2517	0.2516	0.2511	0.2509	0.2507	0.2503	0.2502
5	2859K	0.2546	0.2537	0.2530	0.2527	0.2525	0.2524	0.2519	0.2514	0.2508	0.2506
6	2834K	0.2551	0.2539	0.2534	0.2530	0.2527	0.2525	0.2525	0.2521	0.2517	0.2511
7	2851K	0.2552	0.2543	0.2538	0.2537	0.2533	0.2531	0.2529	0.2525	0.2519	0.2515
8	2861K	0.2547	0.2530	0.2527	0.2527	0.2526	0.2524	0.2521	0.2517	0.2512	0.2505
9	2859K	0.2546	0.2537	0.2532	0.2532	0.2530	0.2528	0.2523	0.2522	0.2521	0.2519
10	2843K	0.2552	0.2543	0.2538	0.2540	0.2538	0.2536	0.2530	0.2528	0.2519	0.2515
11	2829K	0.2553	0.2543	0.2538	0.2535	0.2532	0.2530	0.2524	0.2522	0.2523	0.2521
12	2857K	0.2545	0.2536	0.2531	0.2532	0.2530	0.2528	0.2525	0.2518	0.2518	0.2515
13	2807K	0.2562	0.2551	0.2545	0.2545	0.2544	0.2542	0.2537	0.2535	0.2536	0.2536
14	2864K	0.2548	0.2535	0.2529	0.2529	0.2528	0.2527	0.2520	0.2518	0.2519	0.2519
15	2810K	0.2560	0.2552	0.2547	0.2546	0.2545	0.2544	0.2537	0.2536	0.2534	0.2532
16	2840K	0.2548	0.2539	0.2536	0.2536	0.2533	0.2532	0.2526	0.2520	0.2521	0.2521
17	2865K	0.2540	0.2525	0.2522	0.2522	0.2521	0.2519	0.2512	0.2510	0.2509	0.2509
18	2821K	0.2557	0.2545	0.2542	0.2541	0.2540	0.2538	0.2534	0.2531	0.2529	0.2528
19	2772K	0.2577	0.2554	0.2554	0.2562	0.2559	0.2557	0.2539	0.2535	0.2531	0.2530
20	2774K	0.2588	0.2579	0.2573	0.2578	0.2576	0.2574	0.2567	0.2563	0.2555	0.2554
21	2762K	0.2591	0.2584	0.2578	0.2576	0.2575	0.2573	0.2569	0.2566	0.2563	0.2561
22	2763K	0.2590	0.2583	0.2577	0.2578	0.2577	0.2576	0.2572	0.2568	0.2564	0.2562
23	2731K	0.2608	0.2597	0.2592	0.2592	0.2591	0.2592	0.2588	0.2585	0.2580	0.2577
24	2723K	0.2608	0.2599	0.2595	0.2611	0.2609	0.2607	0.2603	0.2598	0.2592	0.2583
25	2741K	0.2597	0.2588	0.2582	0.2581	0.2581	0.2579	0.2575	0.2573	0.2572	0.2568

CIE 1976 v' data for tested units
$T_s = T_{air} = 55°C$, $I_f = 165mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	2851K	0.5322	0.5317	0.5319	0.5310	0.5308	0.5306	0.5306	0.5302	0.5298	0.5297
2	2857K	0.5304	0.5298	0.5298	0.5294	0.5294	0.5291	0.5287	0.5282	0.5276	0.5274
3	2846K	0.5331	0.5328	0.5327	0.5323	0.5321	0.5321	0.5317	0.5312	0.5306	0.5303
4	2864K	0.5318	0.5313	0.5313	0.5308	0.5306	0.5305	0.5301	0.5297	0.5291	0.5286
5	2859K	0.5297	0.5294	0.5293	0.5288	0.5286	0.5284	0.5282	0.5278	0.5272	0.5265
6	2834K	0.5324	0.5321	0.5320	0.5315	0.5313	0.5311	0.5309	0.5306	0.5301	0.5295
7	2851K	0.5285	0.5281	0.5282	0.5277	0.5276	0.5274	0.5271	0.5267	0.5262	0.5254
8	2861K	0.5288	0.5280	0.5281	0.5276	0.5274	0.5271	0.5270	0.5268	0.5264	0.5259
9	2859K	0.5296	0.5294	0.5293	0.5289	0.5286	0.5284	0.5282	0.5278	0.5275	0.5275
10	2843K	0.5302	0.5299	0.5299	0.5293	0.5290	0.5287	0.5285	0.5284	0.5278	0.5275
11	2829K	0.5325	0.5322	0.5322	0.5315	0.5314	0.5312	0.5310	0.5306	0.5304	0.5303
12	2857K	0.5305	0.5302	0.5303	0.5299	0.5298	0.5296	0.5292	0.5287	0.5284	0.5283
13	2807K	0.5332	0.5330	0.5331	0.5326	0.5323	0.5321	0.5319	0.5316	0.5314	0.5312
14	2864K	0.5278	0.5272	0.5273	0.5268	0.5265	0.5263	0.5262	0.5257	0.5254	0.5251
15	2810K	0.5335	0.5333	0.5333	0.5328	0.5326	0.5323	0.5322	0.5318	0.5315	0.5312
16	2840K	0.5325	0.5322	0.5323	0.5318	0.5316	0.5313	0.5312	0.5306	0.5303	0.5301
17	2865K	0.5310	0.5305	0.5306	0.5301	0.5299	0.5296	0.5294	0.5290	0.5286	0.5283
18	2821K	0.5324	0.5322	0.5322	0.5318	0.5316	0.5312	0.5312	0.5307	0.5304	0.5301
19	2772K	0.5338	0.5330	0.5332	0.5318	0.5315	0.5312	0.5318	0.5316	0.5310	0.5308
20	2774K	0.5282	0.5275	0.5276	0.5267	0.5265	0.5263	0.5265	0.5264	0.5258	0.5253
21	2762K	0.5293	0.5287	0.5288	0.5284	0.5281	0.5279	0.5278	0.5275	0.5272	0.5266
22	2763K	0.5297	0.5292	0.5293	0.5289	0.5286	0.5284	0.5283	0.5280	0.5277	0.5271
23	2731K	0.5283	0.5276	0.5277	0.5272	0.5270	0.5268	0.5267	0.5264	0.5261	0.5254
24	2723K	0.5303	0.5298	0.5299	0.5289	0.5286	0.5284	0.5281	0.5282	0.5279	0.5275
25	2741K	0.5313	0.5308	0.5307	0.5302	0.5300	0.5298	0.5297	0.5294	0.5291	0.5289

Delta u'v' data for tested units

$T_s = T_{air}$ = 55°C, I_f = 165mA; $T_s \geq$ 53°C and $T_{air} \geq$ 50°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	2851K	0.0000	0.0018	0.0019	0.0019	0.0021	0.0023	0.0027	0.0033	0.0037	0.0038
2	2857K	0.0000	0.0017	0.0025	0.0027	0.0029	0.0032	0.0034	0.0039	0.0043	0.0042
3	2846K	0.0000	0.0012	0.0020	0.0020	0.0021	0.0025	0.0028	0.0033	0.0037	0.0040
4	2864K	0.0000	0.0014	0.0020	0.0024	0.0026	0.0031	0.0034	0.0038	0.0045	0.0049
5	2859K	0.0000	0.0009	0.0016	0.0021	0.0024	0.0026	0.0031	0.0037	0.0045	0.0051
6	2834K	0.0000	0.0012	0.0017	0.0023	0.0026	0.0029	0.0030	0.0035	0.0041	0.0049
7	2851K	0.0000	0.0010	0.0014	0.0017	0.0021	0.0024	0.0027	0.0032	0.0040	0.0048
8	2861K	0.0000	0.0019	0.0021	0.0023	0.0025	0.0029	0.0032	0.0036	0.0042	0.0051
9	2859K	0.0000	0.0009	0.0014	0.0016	0.0019	0.0022	0.0027	0.0030	0.0033	0.0034
10	2843K	0.0000	0.0009	0.0014	0.0015	0.0018	0.0022	0.0028	0.0030	0.0041	0.0046
11	2829K	0.0000	0.0010	0.0015	0.0021	0.0024	0.0026	0.0033	0.0036	0.0037	0.0039
12	2857K	0.0000	0.0009	0.0014	0.0014	0.0017	0.0019	0.0024	0.0032	0.0034	0.0037
13	2807K	0.0000	0.0011	0.0017	0.0018	0.0020	0.0023	0.0028	0.0031	0.0032	0.0033
14	2864K	0.0000	0.0014	0.0020	0.0021	0.0024	0.0026	0.0032	0.0037	0.0038	0.0040
15	2810K	0.0000	0.0008	0.0013	0.0016	0.0017	0.0020	0.0026	0.0029	0.0033	0.0036
16	2840K	0.0000	0.0009	0.0012	0.0014	0.0017	0.0020	0.0026	0.0034	0.0035	0.0036
17	2865K	0.0000	0.0016	0.0018	0.0020	0.0022	0.0025	0.0032	0.0036	0.0039	0.0041
18	2821K	0.0000	0.0012	0.0015	0.0017	0.0019	0.0022	0.0026	0.0031	0.0034	0.0037
19	2772K	0.0000	0.0024	0.0024	0.0025	0.0029	0.0033	0.0043	0.0047	0.0054	0.0056
20	2774K	0.0000	0.0011	0.0016	0.0018	0.0021	0.0024	0.0027	0.0031	0.0041	0.0045
21	2762K	0.0000	0.0009	0.0014	0.0017	0.0020	0.0023	0.0027	0.0031	0.0035	0.0040
22	2763K	0.0000	0.0009	0.0014	0.0014	0.0017	0.0019	0.0023	0.0028	0.0033	0.0038
23	2731K	0.0000	0.0013	0.0017	0.0019	0.0021	0.0022	0.0026	0.0030	0.0036	0.0042
24	2723K	0.0000	0.0010	0.0014	0.0014	0.0017	0.0019	0.0023	0.0023	0.0029	0.0038
25	2741K	0.0000	0.0010	0.0016	0.0019	0.0021	0.0023	0.0027	0.0031	0.0033	0.0038

Forward Voltage [V] data for tested units

$T_s = T_{air}$ = 55°C, I_f = 165mA; $T_s \geq$ 53°C and $T_{air} \geq$ 50°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	2851K	6.267	6.229	6.229	6.224	6.221	6.228	6.226	6.237	6.231	6.298
2	2857K	6.143	6.116	6.115	6.110	6.108	6.114	6.113	6.121	6.117	6.116
3	2846K	6.269	6.237	6.243	6.237	6.233	6.242	6.239	6.252	6.244	6.244
4	2864K	6.112	6.105	6.100	6.100	6.102	6.102	6.106	6.111	6.106	6.124
5	2859K	6.247	6.221	6.226	6.221	6.218	6.228	6.227	6.234	6.229	6.226
6	2834K	6.322	6.296	6.304	6.305	6.303	6.309	6.310	6.316	6.315	6.310
7	2851K	6.170	6.139	6.143	6.137	6.136	6.144	6.141	6.148	6.146	6.144
8	2861K	6.295	6.261	6.265	6.263	6.261	6.265	6.266	6.278	6.266	6.271
9	2859K	6.254	6.227	6.225	6.227	6.231	6.230	6.229	6.242	6.237	6.229
10	2843K	6.061	6.049	6.053	6.045	6.046	6.049	6.051	6.061	6.051	6.049
11	2829K	6.168	6.144	6.149	6.147	6.143	6.151	6.150	6.158	6.148	6.154
12	2857K	6.107	6.102	6.099	6.098	6.101	6.100	6.102	6.106	6.106	6.301
13	2807K	6.323	6.280	6.285	6.286	6.283	6.290	6.288	6.302	6.288	6.289
14	2864K	6.222	6.189	6.197	6.195	6.192	6.197	6.202	6.206	6.199	6.279
15	2810K	6.285	6.246	6.254	6.254	6.247	6.252	6.256	6.262	6.256	6.255
16	2840K	6.265	6.241	6.248	6.245	6.252	6.252	6.252	6.257	6.255	6.261
17	2865K	6.137	6.111	6.116	6.109	6.108	6.112	6.118	6.122	6.116	6.229
18	2821K	6.236	6.199	6.204	6.202	6.201	6.204	6.211	6.213	6.206	6.272
19	2772K	6.289	6.267	6.273	6.269	6.269	6.278	6.280	6.290	6.280	6.300
20	2774K	6.311	6.268	6.267	6.267	6.262	6.268	6.274	6.285	6.273	6.268
21	2762K	6.599	6.569	6.566	6.578	6.579	6.589	6.589	6.599	6.584	6.574
22	2763K	6.397	6.372	6.374	6.385	6.383	6.383	6.389	6.396	6.392	6.386
23	2731K	6.231	6.182	6.187	6.188	6.189	6.190	6.194	6.204	6.198	6.196
24	2723K	6.393	6.368	6.375	6.367	6.369	6.376	6.379	6.382	6.380	6.383
25	2741K	6.262	6.230	6.232	6.238	6.239	6.242	6.243	6.253	6.244	6.242

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 85°C$, $I_f = 165mA$; $T_s \geq 83°C$ 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
1	2849K	110.800	109.700	109.400	108.900	107.900	107.100	106.400	106.100	105.900	105.300
2	2865K	112.800	112.200	111.600	110.800	109.800	109.400	108.900	108.400	108.300	107.800
3	2796K	118.200	117.000	116.600	115.900	114.800	114.400	114.100	113.400	112.800	112.100
4	2822K	117.300	116.900	116.200	116.100	115.400	114.700	113.800	113.000	112.700	112.200
5	2862K	116.200	115.600	115.200	114.800	114.100	113.500	113.300	112.800	113.200	112.500
6	2870K	112.100	111.200	110.900	110.500	109.600	109.100	108.700	108.200	107.700	107.000
7	2869K	117.400	115.900	115.100	114.600	113.900	113.200	112.800	112.200	112.200	111.500
8	2867K	111.800	111.500	111.100	111.000	110.100	109.000	108.500	107.900	107.300	106.700
9	2859K	109.300	108.800	108.200	107.000	105.900	105.100	104.500	104.000	103.700	103.200
10	2798K	112.300	111.400	110.800	110.000	109.300	108.300	107.700	107.100	107.300	106.800
11	2850K	116.200	115.100	114.200	114.100	113.300	112.500	111.800	111.400	111.700	111.100
12	2865K	112.100	111.600	110.600	110.500	109.600	109.000	108.400	108.000	107.700	107.100
13	2850K	113.100	112.500	112.000	111.600	110.900	110.200	109.700	109.100	108.800	108.300
14	2869K	111.500	111.200	110.600	109.300	108.500	107.700	106.800	106.200	106.100	105.500
15	2844K	109.500	108.100	107.400	106.800	106.100	105.400	105.000	104.400	103.800	103.200
16	2808K	108.400	107.600	107.200	107.000	106.200	105.600	104.900	104.400	104.000	103.600
17	2867K	115.400	113.100	112.500	112.100	111.400	110.900	110.200	109.600	110.000	109.600
18	2818K	110.800	108.600	108.100	107.900	107.200	106.500	106.200	105.800	106.000	105.400
19	2869K	115.600	113.400	112.900	112.700	111.600	111.000	110.300	109.700	110.000	109.400
20	2825K	112.000	110.100	109.300	108.900	108.300	107.800	107.200	106.600	106.900	106.400
21	2838K	110.100	108.800	107.600	107.300	106.600	106.000	105.700	105.500	105.600	105.200
22	2867K	116.200	114.400	114.000	113.500	112.800	112.400	112.000	111.400	111.100	111.000
23	2755K	112.700	111.700	111.200	110.600	109.800	109.300	108.900	108.500	108.300	107.800
24	2728K	114.100	112.300	111.400	110.700	109.700	109.300	109.000	108.500	107.800	107.200
25	2838K	110.300	108.400	107.800	107.500	106.600	105.800	105.100	104.600	104.700	104.400

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 85°C$, $I_f = 165mA$; $T_s \geq 83°C$ 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
1	2849K	1.0000	0.9901	0.9874	0.9829	0.9738	0.9666	0.9603	0.9576	0.9558	0.9504
2	2865K	1.0000	0.9947	0.9894	0.9823	0.9734	0.9699	0.9654	0.9610	0.9601	0.9557
3	2796K	1.0000	0.9898	0.9865	0.9805	0.9712	0.9679	0.9653	0.9594	0.9543	0.9484
4	2822K	1.0000	0.9966	0.9906	0.9898	0.9838	0.9778	0.9702	0.9633	0.9608	0.9565
5	2862K	1.0000	0.9948	0.9914	0.9880	0.9819	0.9768	0.9750	0.9707	0.9742	0.9682
6	2870K	1.0000	0.9920	0.9893	0.9857	0.9777	0.9732	0.9697	0.9652	0.9607	0.9545
7	2869K	1.0000	0.9872	0.9804	0.9761	0.9702	0.9642	0.9608	0.9557	0.9557	0.9497
8	2867K	1.0000	0.9973	0.9937	0.9928	0.9848	0.9750	0.9705	0.9651	0.9597	0.9544
9	2859K	1.0000	0.9954	0.9899	0.9790	0.9689	0.9616	0.9561	0.9515	0.9488	0.9442
10	2798K	1.0000	0.9920	0.9866	0.9795	0.9733	0.9644	0.9590	0.9537	0.9555	0.9510
11	2850K	1.0000	0.9905	0.9828	0.9819	0.9750	0.9682	0.9621	0.9587	0.9613	0.9561
12	2865K	1.0000	0.9955	0.9866	0.9857	0.9777	0.9723	0.9670	0.9634	0.9607	0.9554
13	2850K	1.0000	0.9947	0.9903	0.9867	0.9805	0.9744	0.9699	0.9646	0.9620	0.9576
14	2869K	1.0000	0.9973	0.9919	0.9803	0.9731	0.9659	0.9578	0.9525	0.9516	0.9462
15	2844K	1.0000	0.9872	0.9808	0.9753	0.9689	0.9626	0.9589	0.9534	0.9479	0.9425
16	2808K	1.0000	0.9926	0.9889	0.9871	0.9797	0.9742	0.9677	0.9631	0.9594	0.9557
17	2867K	1.0000	0.9801	0.9749	0.9714	0.9653	0.9610	0.9549	0.9497	0.9532	0.9497
18	2818K	1.0000	0.9801	0.9756	0.9738	0.9675	0.9612	0.9585	0.9549	0.9567	0.9513
19	2869K	1.0000	0.9810	0.9766	0.9749	0.9654	0.9602	0.9542	0.9490	0.9516	0.9464
20	2825K	1.0000	0.9830	0.9759	0.9723	0.9670	0.9625	0.9571	0.9518	0.9545	0.9500
21	2838K	1.0000	0.9882	0.9773	0.9746	0.9682	0.9628	0.9600	0.9582	0.9591	0.9555
22	2867K	1.0000	0.9845	0.9811	0.9768	0.9707	0.9673	0.9639	0.9587	0.9561	0.9552
23	2755K	1.0000	0.9911	0.9867	0.9814	0.9743	0.9698	0.9663	0.9627	0.9610	0.9565
24	2728K	1.0000	0.9842	0.9763	0.9702	0.9614	0.9579	0.9553	0.9509	0.9448	0.9395
25	2838K	1.0000	0.9828	0.9773	0.9746	0.9665	0.9592	0.9529	0.9483	0.9492	0.9465

CIE 1976 u' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 165mA$; $T_s \geq 83°C$ 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
1	2849K	0.2550	0.2536	0.2529	0.2529	0.2527	0.2524	0.2519	0.2514	0.2508	0.2505
2	2865K	0.2540	0.2530	0.2526	0.2525	0.2524	0.2521	0.2517	0.2515	0.2512	0.2510
3	2796K	0.2571	0.2557	0.2552	0.2548	0.2548	0.2545	0.2542	0.2540	0.2538	0.2536
4	2822K	0.2555	0.2541	0.2537	0.2533	0.2531	0.2530	0.2525	0.2523	0.2521	0.2518
5	2862K	0.2548	0.2528	0.2526	0.2526	0.2525	0.2523	0.2522	0.2518	0.2506	0.2494
6	2870K	0.2540	0.2522	0.2515	0.2514	0.2512	0.2511	0.2507	0.2503	0.2503	0.2502
7	2869K	0.2542	0.2535	0.2528	0.2525	0.2523	0.2522	0.2519	0.2514	0.2511	0.2510
8	2867K	0.2541	0.2532	0.2519	0.2521	0.2518	0.2515	0.2513	0.2512	0.2509	0.2506
9	2859K	0.2548	0.2538	0.2525	0.2525	0.2522	0.2520	0.2519	0.2514	0.2506	0.2502
10	2798K	0.2565	0.2552	0.2544	0.2542	0.2541	0.2538	0.2535	0.2535	0.2535	0.2531
11	2850K	0.2549	0.2537	0.2526	0.2524	0.2523	0.2520	0.2519	0.2513	0.2510	0.2509
12	2865K	0.2548	0.2538	0.2532	0.2528	0.2527	0.2524	0.2521	0.2514	0.2510	0.2507
13	2850K	0.2547	0.2535	0.2530	0.2528	0.2526	0.2525	0.2522	0.2518	0.2515	0.2511
14	2869K	0.2539	0.2532	0.2526	0.2524	0.2522	0.2519	0.2519	0.2512	0.2508	0.2506
15	2844K	0.2558	0.2544	0.2537	0.2535	0.2533	0.2530	0.2524	0.2522	0.2514	0.2507
16	2808K	0.2564	0.2552	0.2545	0.2542	0.2540	0.2537	0.2532	0.2529	0.2532	0.2525
17	2867K	0.2545	0.2536	0.2530	0.2532	0.2532	0.2531	0.2525	0.2521	0.2512	0.2503
18	2818K	0.2561	0.2552	0.2547	0.2543	0.2541	0.2539	0.2534	0.2533	0.2534	0.2527
19	2869K	0.2537	0.2527	0.2521	0.2519	0.2517	0.2514	0.2510	0.2505	0.2507	0.2505
20	2825K	0.2553	0.2544	0.2535	0.2530	0.2529	0.2529	0.2508	0.2506	0.2505	0.2505
21	2838K	0.2553	0.2540	0.2534	0.2533	0.2531	0.2528	0.2526	0.2523	0.2520	0.2518
22	2867K	0.2534	0.2528	0.2521	0.2518	0.2517	0.2513	0.2512	0.2509	0.2507	0.2504
23	2755K	0.2591	0.2578	0.2573	0.2572	0.2570	0.2567	0.2563	0.2560	0.2558	0.2555
24	2728K	0.2599	0.2588	0.2583	0.2582	0.2580	0.2578	0.2575	0.2570	0.2570	0.2567
25	2838K	0.2568	0.2554	0.2547	0.2547	0.2545	0.2542	0.2537	0.2534	0.2528	0.2528

CIE 1976 v' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 165mA$; $T_s \geq 83°C$ 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
1	2849K	0.5298	0.5286	0.5290	0.5287	0.5284	0.5282	0.5279	0.5277	0.5272	0.5267
2	2865K	0.5311	0.5307	0.5310	0.5305	0.5302	0.5300	0.5298	0.5296	0.5292	0.5288
3	2796K	0.5313	0.5306	0.5309	0.5305	0.5301	0.5299	0.5298	0.5297	0.5293	0.5288
4	2822K	0.5331	0.5326	0.5329	0.5323	0.5320	0.5318	0.5317	0.5315	0.5311	0.5307
5	2862K	0.5282	0.5270	0.5265	0.5264	0.5261	0.5259	0.5256	0.5258	0.5254	0.5245
6	2870K	0.5300	0.5298	0.5289	0.5285	0.5284	0.5281	0.5278	0.5272	0.5270	0.5270
7	2869K	0.5294	0.5302	0.5292	0.5287	0.5286	0.5283	0.5281	0.5276	0.5271	0.5269
8	2867K	0.5303	0.5309	0.5299	0.5295	0.5293	0.5291	0.5287	0.5284	0.5279	0.5276
9	2859K	0.5287	0.5292	0.5281	0.5275	0.5275	0.5273	0.5268	0.5265	0.5257	0.5255
10	2798K	0.5337	0.5344	0.5334	0.5328	0.5325	0.5323	0.5319	0.5315	0.5313	0.5311
11	2850K	0.5301	0.5305	0.5295	0.5290	0.5287	0.5286	0.5284	0.5277	0.5273	0.5272
12	2865K	0.5276	0.5281	0.5273	0.5267	0.5264	0.5262	0.5259	0.5252	0.5247	0.5245
13	2850K	0.5310	0.5316	0.5306	0.5301	0.5299	0.5297	0.5295	0.5292	0.5286	0.5283
14	2869K	0.5308	0.5316	0.5307	0.5301	0.5298	0.5296	0.5292	0.5288	0.5282	0.5280
15	2844K	0.5272	0.5277	0.5267	0.5260	0.5257	0.5254	0.5252	0.5248	0.5243	0.5237
16	2808K	0.5321	0.5328	0.5318	0.5312	0.5308	0.5306	0.5305	0.5301	0.5299	0.5294
17	2867K	0.5285	0.5290	0.5282	0.5276	0.5273	0.5271	0.5269	0.5269	0.5263	0.5257
18	2818K	0.5313	0.5319	0.5310	0.5304	0.5301	0.5299	0.5297	0.5290	0.5291	0.5288
19	2869K	0.5316	0.5324	0.5314	0.5308	0.5303	0.5300	0.5296	0.5291	0.5288	0.5286
20	2825K	0.5334	0.5342	0.5326	0.5323	0.5319	0.5317	0.5314	0.5311	0.5306	0.5303
21	2838K	0.5307	0.5312	0.5302	0.5297	0.5295	0.5294	0.5291	0.5287	0.5282	0.5278
22	2867K	0.5334	0.5341	0.5332	0.5326	0.5323	0.5323	0.5318	0.5315	0.5311	0.5307
23	2755K	0.5311	0.5311	0.5302	0.5297	0.5294	0.5293	0.5290	0.5287	0.5282	0.5278
24	2728K	0.5334	0.5337	0.5328	0.5323	0.5321	0.5319	0.5317	0.5313	0.5310	0.5306
25	2838K	0.5240	0.5239	0.5231	0.5227	0.5223	0.5222	0.5219	0.5215	0.5210	0.5205

Delta u'v' data for tested units

$T_s = T_{air}$ = 85°C, I_f = 165mA; $T_s \geq$ 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
1	2849K	0.0000	0.0018	0.0022	0.0024	0.0027	0.0031	0.0036	0.0042	0.0049	0.0055
2	2865K	0.0000	0.0011	0.0014	0.0016	0.0018	0.0022	0.0026	0.0029	0.0034	0.0038
3	2796K	0.0000	0.0016	0.0019	0.0024	0.0026	0.0030	0.0033	0.0035	0.0039	0.0043
4	2822K	0.0000	0.0015	0.0018	0.0023	0.0026	0.0028	0.0033	0.0036	0.0039	0.0044
5	2862K	0.0000	0.0023	0.0028	0.0028	0.0031	0.0034	0.0037	0.0038	0.0050	0.0065
6	2870K	0.0000	0.0018	0.0027	0.0030	0.0032	0.0035	0.0040	0.0046	0.0048	0.0048
7	2869K	0.0000	0.0011	0.0014	0.0018	0.0021	0.0023	0.0026	0.0033	0.0039	0.0041
8	2867K	0.0000	0.0011	0.0022	0.0022	0.0025	0.0029	0.0032	0.0035	0.0040	0.0044
9	2859K	0.0000	0.0011	0.0024	0.0026	0.0029	0.0031	0.0035	0.0040	0.0052	0.0056
10	2798K	0.0000	0.0015	0.0021	0.0025	0.0027	0.0030	0.0035	0.0037	0.0038	0.0043
11	2850K	0.0000	0.0013	0.0024	0.0027	0.0030	0.0033	0.0034	0.0043	0.0048	0.0049
12	2865K	0.0000	0.0011	0.0016	0.0022	0.0024	0.0028	0.0032	0.0042	0.0048	0.0051
13	2850K	0.0000	0.0013	0.0017	0.0021	0.0024	0.0026	0.0029	0.0034	0.0040	0.0045
14	2869K	0.0000	0.0011	0.0013	0.0017	0.0020	0.0023	0.0026	0.0034	0.0040	0.0043
15	2844K	0.0000	0.0015	0.0022	0.0026	0.0029	0.0033	0.0039	0.0043	0.0053	0.0062
16	2808K	0.0000	0.0014	0.0019	0.0024	0.0027	0.0031	0.0036	0.0040	0.0039	0.0047
17	2867K	0.0000	0.0010	0.0015	0.0016	0.0018	0.0020	0.0026	0.0029	0.0040	0.0050
18	2818K	0.0000	0.0011	0.0014	0.0020	0.0023	0.0026	0.0031	0.0036	0.0035	0.0042
19	2869K	0.0000	0.0013	0.0016	0.0020	0.0024	0.0028	0.0034	0.0041	0.0041	0.0044
20	2825K	0.0000	0.0012	0.0020	0.0025	0.0028	0.0029	0.0049	0.0052	0.0056	0.0057
21	2838K	0.0000	0.0014	0.0020	0.0022	0.0025	0.0028	0.0031	0.0036	0.0041	0.0045
22	2867K	0.0000	0.0009	0.0013	0.0018	0.0020	0.0024	0.0027	0.0031	0.0035	0.0040
23	2755K	0.0000	0.0013	0.0020	0.0024	0.0027	0.0030	0.0035	0.0039	0.0044	0.0049
24	2728K	0.0000	0.0011	0.0017	0.0020	0.0023	0.0026	0.0029	0.0036	0.0038	0.0043
25	2838K	0.0000	0.0014	0.0023	0.0025	0.0029	0.0032	0.0037	0.0042	0.0050	0.0053

Forward Voltage [V] data for tested units

$T_s = T_{air}$ = 85°C, I_f = 165mA; $T_s \geq$ 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
1	2849K	6.243	6.209	6.208	6.213	6.227	6.223	6.220	6.223	6.223	6.299
2	2865K	6.113	6.107	6.108	6.113	6.124	6.114	6.118	6.123	6.122	6.120
3	2796K	6.043	6.033	6.035	6.040	6.050	6.046	6.044	6.049	6.052	6.043
4	2822K	6.243	6.216	6.219	6.224	6.243	6.237	6.238	6.243	6.238	6.228
5	2862K	6.318	6.284	6.289	6.301	6.320	6.310	6.313	6.321	6.310	6.306
6	2870K	6.224	6.197	6.203	6.205	6.221	6.212	6.212	6.222	6.216	6.211
7	2869K	6.060	6.047	6.048	6.047	6.056	6.049	6.059	6.064	6.054	6.051
8	2867K	6.249	6.225	6.223	6.229	6.239	6.234	6.235	6.247	6.232	6.233
9	2859K	6.238	6.221	6.223	6.224	6.228	6.228	6.228	6.235	6.229	6.229
10	2798K	6.181	6.159	6.157	6.159	6.169	6.165	6.163	6.172	6.163	6.154
11	2850K	6.028	6.019	6.019	6.016	6.026	6.022	6.026	6.028	6.023	6.020
12	2865K	6.245	6.223	6.225	6.226	6.237	6.234	6.232	6.242	6.235	6.229
13	2850K	6.118	6.114	6.116	6.117	6.122	6.121	6.123	6.129	6.122	6.119
14	2869K	6.094	6.091	6.098	6.098	6.103	6.099	6.103	6.108	6.102	6.109
15	2844K	6.239	6.216	6.222	6.226	6.235	6.235	6.235	6.243	6.235	6.256
16	2808K	6.185	6.157	6.161	6.163	6.163	6.166	6.162	6.174	6.166	6.270
17	2867K	6.214	6.193	6.192	6.197	6.206	6.201	6.205	6.210	6.203	6.251
18	2818K	6.204	6.179	6.177	6.179	6.191	6.189	6.188	6.195	6.185	6.185
19	2869K	6.132	6.113	6.108	6.109	6.120	6.114	6.117	6.130	6.118	6.259
20	2825K	6.267	6.235	6.237	6.236	6.248	6.242	6.238	6.253	6.243	6.254
21	2838K	6.220	6.205	6.200	6.206	6.214	6.211	6.212	6.221	6.212	6.218
22	2867K	6.222	6.193	6.193	6.197	6.206	6.201	6.204	6.217	6.203	6.202
23	2755K	6.339	6.297	6.296	6.299	6.309	6.305	6.310	6.318	6.308	6.299
24	2728K	6.530	6.488	6.484	6.495	6.513	6.512	6.514	6.521	6.569	6.502
25	2838K	6.203	6.177	6.175	6.183	6.192	6.185	6.187	6.191	6.190	6.183

Luminous Flux [lm] data for tested units

$T_s = T_{air}$ = 105°C, I_f = 165mA; $T_s \geq$ 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
1	2858K	112.400	112.100	111.400	110.300	109.400	108.900	108.200	107.800	107.600	106.900
2	2837K	113.100	112.300	111.500	111.000	109.900	109.200	108.600	108.400	107.700	107.100
3	2793K	109.700	108.400	107.900	106.900	105.900	105.500	105.100	104.500	104.100	103.500
4	2806K	116.300	114.700	113.400	113.200	112.300	111.600	111.000	110.500	110.100	109.200
5	2861K	112.800	111.300	110.100	109.600	108.600	107.900	107.100	106.700	107.000	106.200
6	2860K	112.200	111.500	110.900	110.300	109.300	108.500	107.800	107.200	106.400	105.600
7	2844K	112.100	110.800	110.200	109.600	108.700	108.200	107.600	107.100	107.300	106.700
8	2815K	111.900	110.600	109.800	108.600	107.600	107.100	106.800	106.300	105.800	104.800
9	2827K	115.000	114.300	113.200	112.900	111.500	110.900	109.900	109.500	109.300	108.500
10	2797K	111.800	111.200	110.400	108.800	107.700	106.900	106.500	106.000	105.500	104.600
11	2845K	109.600	109.100	108.400	107.900	107.000	106.500	105.700	105.200	105.400	104.800
12	2858K	114.400	113.500	112.700	112.200	111.100	110.100	109.300	108.800	108.800	108.000
13	2854K	112.300	110.700	109.900	109.500	108.200	107.600	107.100	106.500	106.400	105.700
14	2841K	114.200	112.100	111.300	111.000	110.200	110.000	109.600	109.200	109.300	108.600
15	2845K	113.200	111.500	110.600	110.100	109.100	109.000	108.500	108.000	107.500	106.800
16	2822K	118.600	117.100	116.100	116.000	115.100	114.600	114.000	113.800	114.100	113.200
17	2809K	117.500	116.600	115.700	115.300	113.900	113.500	112.900	112.300	112.400	111.500
18	2704K	112.400	111.200	110.400	110.100	108.900	108.400	107.900	107.300	107.700	107.000
19	2790K	107.200	105.800	104.600	104.000	102.800	102.600	102.200	101.600	101.500	100.900
20	2764K	113.700	111.500	110.800	110.500	109.300	108.700	108.200	109.000	109.200	108.600
21	2776K	110.500	108.600	107.800	107.700	106.500	106.000	105.100	104.900	104.300	103.100
22	2737K	114.700	112.800	112.200	112.100	110.800	110.400	109.800	109.200	109.500	108.600
23	2766K	104.300	103.300	102.500	102.200	101.200	100.800	100.000	99.560	99.220	98.300
24	2762K	102.500	102.000	101.200	100.900	100.200	99.760	99.440	99.060	99.150	98.360
25	2797K	112.000	110.700	109.400	108.700	107.600	107.100	106.300	105.800	106.000	105.300

Normalized Luminous Flux data for tested units

$T_s = T_{air}$ = 105°C, I_f = 165mA; $T_s \geq$ 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
1	2858K	1.0000	0.9973	0.9911	0.9813	0.9733	0.9689	0.9626	0.9591	0.9573	0.9511
2	2837K	1.0000	0.9929	0.9859	0.9814	0.9717	0.9655	0.9602	0.9584	0.9523	0.9469
3	2793K	1.0000	0.9881	0.9836	0.9745	0.9654	0.9617	0.9581	0.9526	0.9490	0.9435
4	2806K	1.0000	0.9862	0.9751	0.9733	0.9656	0.9596	0.9544	0.9501	0.9467	0.9390
5	2861K	1.0000	0.9867	0.9761	0.9716	0.9628	0.9566	0.9495	0.9459	0.9486	0.9415
6	2860K	1.0000	0.9938	0.9884	0.9831	0.9742	0.9670	0.9608	0.9554	0.9483	0.9412
7	2844K	1.0000	0.9884	0.9831	0.9777	0.9697	0.9652	0.9599	0.9554	0.9572	0.9518
8	2815K	1.0000	0.9884	0.9812	0.9705	0.9616	0.9571	0.9544	0.9500	0.9455	0.9366
9	2827K	1.0000	0.9939	0.9843	0.9817	0.9696	0.9643	0.9557	0.9522	0.9504	0.9435
10	2797K	1.0000	0.9946	0.9875	0.9732	0.9633	0.9562	0.9526	0.9481	0.9436	0.9356
11	2845K	1.0000	0.9954	0.9891	0.9845	0.9763	0.9717	0.9644	0.9599	0.9617	0.9562
12	2858K	1.0000	0.9921	0.9851	0.9808	0.9712	0.9624	0.9554	0.9510	0.9510	0.9441
13	2854K	1.0000	0.9858	0.9786	0.9751	0.9635	0.9581	0.9537	0.9484	0.9475	0.9412
14	2841K	1.0000	0.9816	0.9746	0.9720	0.9650	0.9632	0.9597	0.9562	0.9571	0.9510
15	2845K	1.0000	0.9850	0.9770	0.9726	0.9638	0.9629	0.9585	0.9541	0.9496	0.9435
16	2822K	1.0000	0.9874	0.9789	0.9781	0.9705	0.9663	0.9612	0.9595	0.9621	0.9545
17	2809K	1.0000	0.9923	0.9847	0.9813	0.9694	0.9660	0.9609	0.9557	0.9566	0.9489
18	2704K	1.0000	0.9893	0.9822	0.9795	0.9689	0.9644	0.9600	0.9546	0.9582	0.9520
19	2790K	1.0000	0.9869	0.9757	0.9701	0.9590	0.9571	0.9534	0.9478	0.9468	0.9412
20	2764K	1.0000	0.9807	0.9745	0.9719	0.9613	0.9560	0.9516	0.9587	0.9604	0.9551
21	2776K	1.0000	0.9828	0.9756	0.9747	0.9638	0.9593	0.9511	0.9493	0.9439	0.9330
22	2737K	1.0000	0.9834	0.9782	0.9773	0.9660	0.9625	0.9573	0.9520	0.9547	0.9468
23	2766K	1.0000	0.9904	0.9827	0.9799	0.9703	0.9664	0.9588	0.9546	0.9513	0.9425
24	2762K	1.0000	0.9951	0.9873	0.9844	0.9776	0.9733	0.9701	0.9664	0.9673	0.9596
25	2797K	1.0000	0.9884	0.9768	0.9705	0.9607	0.9562	0.9491	0.9446	0.9464	0.9402

CIE 1976 u' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 165mA; $T_s \geq$ 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
1	2858K	0.2541	0.2527	0.2522	0.2519	0.2517	0.2516	0.2515	0.2513	0.2510	0.2505
2	2837K	0.2553	0.2539	0.2535	0.2543	0.2540	0.2539	0.2537	0.2536	0.2536	0.2526
3	2793K	0.2573	0.2557	0.2546	0.2543	0.2541	0.2539	0.2536	0.2532	0.2524	0.2521
4	2806K	0.2565	0.2551	0.2543	0.2542	0.2539	0.2538	0.2532	0.2528	0.2526	0.2522
5	2861K	0.2547	0.2535	0.2529	0.2523	0.2522	0.2520	0.2516	0.2512	0.2510	0.2505
6	2860K	0.2547	0.2536	0.2530	0.2526	0.2524	0.2523	0.2518	0.2515	0.2515	0.2510
7	2844K	0.2550	0.2540	0.2532	0.2530	0.2529	0.2526	0.2522	0.2517	0.2514	0.2510
8	2815K	0.2561	0.2548	0.2547	0.2541	0.2538	0.2535	0.2532	0.2529	0.2525	0.2520
9	2827K	0.2559	0.2544	0.2542	0.2536	0.2535	0.2534	0.2528	0.2524	0.2519	0.2517
10	2797K	0.2568	0.2554	0.2552	0.2549	0.2546	0.2544	0.2537	0.2535	0.2531	0.2526
11	2845K	0.2554	0.2534	0.2533	0.2526	0.2525	0.2524	0.2519	0.2517	0.2513	0.2510
12	2858K	0.2546	0.2529	0.2524	0.2522	0.2520	0.2518	0.2510	0.2507	0.2504	0.2499
13	2854K	0.2549	0.2533	0.2529	0.2526	0.2524	0.2522	0.2515	0.2511	0.2509	0.2504
14	2841K	0.2550	0.2534	0.2530	0.2529	0.2528	0.2527	0.2521	0.2517	0.2516	0.2514
15	2845K	0.2555	0.2536	0.2531	0.2529	0.2527	0.2525	0.2520	0.2516	0.2512	0.2509
16	2822K	0.2560	0.2549	0.2547	0.2542	0.2540	0.2535	0.2529	0.2524	0.2523	0.2521
17	2809K	0.2562	0.2548	0.2546	0.2538	0.2537	0.2535	0.2529	0.2525	0.2524	0.2521
18	2704K	0.2612	0.2601	0.2597	0.2596	0.2593	0.2592	0.2585	0.2582	0.2581	0.2577
19	2790K	0.2585	0.2569	0.2564	0.2559	0.2557	0.2554	0.2547	0.2544	0.2543	0.2540
20	2764K	0.2588	0.2577	0.2573	0.2569	0.2568	0.2563	0.2557	0.2553	0.2551	0.2548
21	2776K	0.2588	0.2577	0.2572	0.2569	0.2567	0.2565	0.2561	0.2557	0.2556	0.2553
22	2737K	0.2596	0.2585	0.2579	0.2577	0.2575	0.2571	0.2567	0.2563	0.2561	0.2556
23	2766K	0.2591	0.2576	0.2572	0.2571	0.2569	0.2566	0.2561	0.2559	0.2556	0.2551
24	2762K	0.2596	0.2582	0.2577	0.2573	0.2571	0.2570	0.2558	0.2555	0.2554	0.2551
25	2797K	0.2577	0.2562	0.2557	0.2556	0.2555	0.2552	0.2546	0.2542	0.2541	0.2538

CIE 1976 v' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 165mA; $T_s \geq$ 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
1	2858K	0.5320	0.5320	0.5316	0.5315	0.5311	0.5309	0.5304	0.5302	0.5302	0.5298
2	2837K	0.5309	0.5309	0.5304	0.5293	0.5292	0.5289	0.5284	0.5283	0.5287	0.5287
3	2793K	0.5311	0.5311	0.5305	0.5305	0.5302	0.5299	0.5294	0.5290	0.5284	0.5283
4	2806K	0.5319	0.5320	0.5314	0.5315	0.5311	0.5309	0.5304	0.5300	0.5296	0.5295
5	2861K	0.5287	0.5286	0.5280	0.5281	0.5277	0.5274	0.5270	0.5267	0.5261	0.5260
6	2860K	0.5290	0.5290	0.5286	0.5286	0.5283	0.5280	0.5275	0.5272	0.5267	0.5266
7	2844K	0.5308	0.5309	0.5305	0.5305	0.5302	0.5298	0.5293	0.5290	0.5286	0.5284
8	2815K	0.5319	0.5321	0.5316	0.5312	0.5311	0.5307	0.5304	0.5301	0.5296	0.5294
9	2827K	0.5303	0.5302	0.5299	0.5297	0.5293	0.5292	0.5286	0.5284	0.5280	0.5277
10	2797K	0.5326	0.5327	0.5323	0.5321	0.5316	0.5314	0.5310	0.5308	0.5304	0.5301
11	2845K	0.5288	0.5285	0.5281	0.5280	0.5276	0.5273	0.5268	0.5266	0.5262	0.5259
12	2858K	0.5299	0.5298	0.5294	0.5293	0.5289	0.5287	0.5281	0.5278	0.5274	0.5271
13	2854K	0.5293	0.5293	0.5288	0.5288	0.5284	0.5282	0.5276	0.5273	0.5270	0.5266
14	2841K	0.5314	0.5316	0.5310	0.5311	0.5308	0.5306	0.5300	0.5298	0.5295	0.5293
15	2845K	0.5285	0.5281	0.5277	0.5278	0.5274	0.5271	0.5266	0.5263	0.5259	0.5257
16	2822K	0.5309	0.5311	0.5307	0.5307	0.5304	0.5301	0.5293	0.5290	0.5288	0.5286
17	2809K	0.5327	0.5328	0.5324	0.5322	0.5318	0.5315	0.5311	0.5308	0.5306	0.5303
18	2704K	0.5330	0.5330	0.5325	0.5325	0.5321	0.5318	0.5314	0.5311	0.5308	0.5305
19	2790K	0.5261	0.5258	0.5253	0.5250	0.5246	0.5244	0.5239	0.5236	0.5233	0.5229
20	2764K	0.5303	0.5304	0.5297	0.5297	0.5292	0.5290	0.5285	0.5282	0.5279	0.5276
21	2776K	0.5277	0.5275	0.5271	0.5271	0.5266	0.5263	0.5260	0.5256	0.5254	0.5251
22	2737K	0.5327	0.5326	0.5321	0.5322	0.5317	0.5313	0.5310	0.5307	0.5305	0.5301
23	2766K	0.5286	0.5283	0.5278	0.5280	0.5275	0.5271	0.5267	0.5265	0.5261	0.5257
24	2762K	0.5270	0.5264	0.5260	0.5260	0.5257	0.5254	0.5247	0.5245	0.5242	0.5239
25	2797K	0.5284	0.5282	0.5278	0.5278	0.5274	0.5272	0.5266	0.5263	0.5260	0.5258

Delta u'v' data for tested units

$T_s = T_{air}$ = 105°C, I_f = 165mA; $T_s \geq$ 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
1	2858K	0.0000	0.0014	0.0019	0.0023	0.0026	0.0027	0.0031	0.0033	0.0036	0.0042
2	2837K	0.0000	0.0014	0.0019	0.0019	0.0021	0.0024	0.0030	0.0031	0.0028	0.0035
3	2793K	0.0000	0.0016	0.0028	0.0031	0.0033	0.0036	0.0041	0.0046	0.0056	0.0059
4	2806K	0.0000	0.0014	0.0023	0.0023	0.0027	0.0029	0.0036	0.0042	0.0045	0.0049
5	2861K	0.0000	0.0012	0.0019	0.0025	0.0027	0.0030	0.0035	0.0040	0.0045	0.0050
6	2860K	0.0000	0.0011	0.0017	0.0021	0.0024	0.0026	0.0033	0.0037	0.0039	0.0044
7	2844K	0.0000	0.0010	0.0018	0.0020	0.0022	0.0026	0.0032	0.0038	0.0042	0.0047
8	2815K	0.0000	0.0013	0.0014	0.0021	0.0024	0.0029	0.0033	0.0037	0.0043	0.0048
9	2827K	0.0000	0.0015	0.0017	0.0024	0.0026	0.0027	0.0035	0.0040	0.0046	0.0049
10	2797K	0.0000	0.0014	0.0016	0.0020	0.0024	0.0027	0.0035	0.0038	0.0043	0.0049
11	2845K	0.0000	0.0020	0.0022	0.0029	0.0031	0.0034	0.0040	0.0043	0.0049	0.0053
12	2858K	0.0000	0.0017	0.0023	0.0025	0.0028	0.0030	0.0040	0.0044	0.0049	0.0055
13	2854K	0.0000	0.0016	0.0021	0.0024	0.0027	0.0029	0.0038	0.0043	0.0046	0.0052
14	2841K	0.0000	0.0016	0.0020	0.0021	0.0023	0.0024	0.0032	0.0037	0.0039	0.0042
15	2845K	0.0000	0.0019	0.0025	0.0027	0.0030	0.0033	0.0040	0.0045	0.0050	0.0054
16	2822K	0.0000	0.0011	0.0013	0.0018	0.0021	0.0026	0.0035	0.0041	0.0043	0.0045
17	2809K	0.0000	0.0014	0.0016	0.0025	0.0027	0.0030	0.0037	0.0042	0.0043	0.0048
18	2704K	0.0000	0.0011	0.0016	0.0017	0.0021	0.0023	0.0031	0.0036	0.0038	0.0043
19	2790K	0.0000	0.0016	0.0022	0.0028	0.0032	0.0035	0.0044	0.0048	0.0050	0.0055
20	2764K	0.0000	0.0011	0.0016	0.0020	0.0023	0.0028	0.0036	0.0041	0.0044	0.0048
21	2776K	0.0000	0.0011	0.0017	0.0020	0.0024	0.0027	0.0032	0.0037	0.0039	0.0044
22	2737K	0.0000	0.0011	0.0018	0.0020	0.0023	0.0029	0.0034	0.0039	0.0041	0.0048
23	2766K	0.0000	0.0015	0.0021	0.0021	0.0025	0.0029	0.0036	0.0038	0.0043	0.0049
24	2762K	0.0000	0.0015	0.0021	0.0025	0.0028	0.0031	0.0044	0.0048	0.0050	0.0055
25	2797K	0.0000	0.0015	0.0021	0.0022	0.0024	0.0028	0.0036	0.0041	0.0043	0.0047

Forward Voltage [V] data for tested units

$T_s = T_{air}$ = 105°C, I_f = 165mA; $T_s \geq$ 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
1	2858K	6.194	6.173	6.173	6.182	6.186	6.192	6.206	6.203	6.194	6.192
2	2837K	6.209	6.174	6.177	6.200	6.181	6.208	6.196	6.287	6.273	6.269
3	2793K	6.277	6.248	6.246	6.255	6.263	6.275	6.280	6.286	6.268	6.266
4	2806K	6.070	6.055	6.059	6.062	6.071	6.068	6.078	6.083	6.081	6.107
5	2861K	6.215	6.190	6.192	6.200	6.207	6.210	6.217	6.219	6.218	6.210
6	2860K	6.329	6.297	6.304	6.320	6.331	6.333	6.344	6.349	6.346	6.338
7	2844K	6.247	6.218	6.222	6.233	6.244	6.244	6.252	6.250	6.250	6.245
8	2815K	6.238	6.217	6.218	6.217	6.227	6.228	6.234	6.238	6.235	6.237
9	2827K	6.231	6.205	6.210	6.213	6.219	6.223	6.225	6.233	6.229	6.242
10	2797K	6.229	6.198	6.203	6.205	6.211	6.213	6.206	6.213	6.213	6.203
11	2845K	6.221	6.189	6.192	6.202	6.216	6.219	6.220	6.225	6.227	6.213
12	2858K	6.266	6.236	6.243	6.248	6.261	6.264	6.265	6.271	6.276	6.259
13	2854K	6.175	6.153	6.155	6.163	6.169	6.173	6.176	6.182	6.188	6.170
14	2841K	6.035	6.031	6.030	6.039	6.042	6.044	6.052	6.053	6.058	6.045
15	2845K	6.339	6.383	6.385	6.442	6.454	6.454	6.462	6.461	6.465	6.450
16	2822K	6.013	6.005	6.006	6.007	6.005	6.010	6.015	6.019	6.019	6.009
17	2809K	6.297	6.269	6.268	6.282	6.284	6.295	6.297	6.302	6.293	6.288
18	2704K	6.447	6.402	6.402	6.413	6.424	6.423	6.436	6.439	6.429	6.421
19	2790K	6.424	6.390	6.391	6.379	6.395	6.402	6.415	6.413	6.410	6.401
20	2764K	6.275	6.245	6.244	6.242	6.241	6.242	6.254	6.252	6.249	6.247
21	2776K	6.250	6.225	6.223	6.239	6.239	6.240	6.249	6.255	6.249	6.242
22	2737K	6.253	6.222	6.220	6.230	6.232	6.235	6.239	6.247	6.251	6.236
23	2766K	6.322	6.280	6.276	6.286	6.291	6.298	6.302	6.306	6.314	6.287
24	2762K	6.518	6.480	6.478	6.484	6.490	6.488	6.497	6.504	6.499	6.482
25	2797K	6.328	6.310	6.310	6.326	6.329	6.329	6.340	6.341	6.335	6.330

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	7000hrs	8000hrs	9000hrs
1	2845K	133.400	132.600	132.000	131.800	131.200	129.600	129.300	128.900	128.100	127.500
2	2841K	136.000	135.100	134.400	134.100	133.600	133.200	132.400	132.000	131.300	130.800
3	2862K	138.100	136.600	135.900	135.500	134.900	134.400	133.600	133.000	132.200	131.600
4	2856K	133.900	132.200	131.300	131.200	130.400	130.100	129.500	129.100	128.400	127.700
5	2838K	131.900	131.800	131.000	130.900	130.400	129.700	129.300	128.800	128.200	127.500
6	2863K	136.500	135.700	134.900	134.300	133.800	133.300	132.700	132.100	131.700	130.800
7	2828K	134.900	134.000	133.100	132.500	131.900	131.200	130.800	130.200	129.500	128.800
8	2827K	136.800	135.800	134.900	134.000	133.400	132.800	132.200	131.900	130.400	129.800
9	2806K	138.500	137.400	136.600	135.800	134.800	134.100	133.700	133.300	132.700	132.100
10	2829K	136.100	135.200	134.700	134.100	133.000	132.600	132.200	131.800	131.100	130.400
11	2838K	136.600	135.500	134.400	133.700	133.000	132.500	131.800	131.300	130.600	130.000
12	2851K	137.100	136.000	134.800	134.600	133.600	133.100	132.800	132.400	131.600	130.800
13	2853K	133.300	132.400	131.500	130.800	130.000	129.800	129.200	128.800	127.900	127.100
14	2856K	137.700	136.700	136.100	135.800	135.300	134.900	134.600	133.900	133.400	132.700
15	2846K	136.600	135.900	134.700	134.300	133.500	133.200	132.600	132.100	131.600	130.900
16	2863K	137.800	137.400	136.800	136.400	135.700	135.100	134.400	133.900	133.300	132.600
17	2844K	136.800	135.700	134.900	134.500	134.000	133.400	132.900	132.300	131.700	131.000
18	2766K	135.000	134.500	133.600	133.200	132.500	132.000	131.800	131.300	130.700	130.100
19	2808K	135.300	134.200	133.700	132.800	132.200	131.500	130.600	129.900	129.300	128.600
20	2742K	128.500	127.900	127.000	125.400	124.700	124.100	123.400	123.200	122.400	121.800
21	2761K	122.300	122.000	120.900	120.200	119.500	119.000	118.600	118.300	117.800	117.200
22	2765K	127.500	127.400	126.300	124.700	123.800	123.400	123.000	122.600	121.800	121.000
23	2731K	129.400	128.500	127.500	126.700	126.100	125.600	124.700	124.300	123.600	123.000
24	2745K	127.700	126.500	125.800	125.200	124.500	124.100	123.500	120.400	119.700	119.100
25	2765K	130.600	129.600	128.700	128.200	127.200	126.800	126.000	125.400	124.700	124.000

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	7000hrs	8000hrs	9000hrs
1	2845K	1.0000	0.9940	0.9895	0.9880	0.9835	0.9715	0.9693	0.9663	0.9603	0.9558
2	2841K	1.0000	0.9934	0.9882	0.9860	0.9824	0.9794	0.9735	0.9706	0.9654	0.9618
3	2862K	1.0000	0.9891	0.9841	0.9812	0.9768	0.9732	0.9674	0.9631	0.9573	0.9529
4	2856K	1.0000	0.9873	0.9806	0.9798	0.9739	0.9716	0.9671	0.9642	0.9589	0.9537
5	2838K	1.0000	0.9992	0.9932	0.9924	0.9886	0.9833	0.9803	0.9765	0.9719	0.9666
6	2863K	1.0000	0.9941	0.9883	0.9839	0.9802	0.9766	0.9722	0.9678	0.9648	0.9582
7	2828K	1.0000	0.9933	0.9867	0.9822	0.9778	0.9726	0.9696	0.9652	0.9600	0.9548
8	2827K	1.0000	0.9927	0.9861	0.9795	0.9751	0.9708	0.9664	0.9642	0.9532	0.9488
9	2806K	1.0000	0.9921	0.9863	0.9805	0.9733	0.9682	0.9653	0.9625	0.9581	0.9538
10	2829K	1.0000	0.9934	0.9897	0.9853	0.9772	0.9743	0.9713	0.9684	0.9633	0.9581
11	2838K	1.0000	0.9919	0.9839	0.9788	0.9736	0.9700	0.9649	0.9612	0.9561	0.9517
12	2851K	1.0000	0.9920	0.9832	0.9818	0.9745	0.9708	0.9686	0.9657	0.9599	0.9540
13	2853K	1.0000	0.9932	0.9865	0.9812	0.9752	0.9737	0.9692	0.9662	0.9595	0.9535
14	2856K	1.0000	0.9927	0.9884	0.9862	0.9826	0.9797	0.9775	0.9724	0.9688	0.9637
15	2846K	1.0000	0.9949	0.9861	0.9832	0.9773	0.9751	0.9707	0.9671	0.9634	0.9583
16	2863K	1.0000	0.9971	0.9927	0.9898	0.9848	0.9804	0.9753	0.9717	0.9673	0.9623
17	2844K	1.0000	0.9920	0.9861	0.9832	0.9795	0.9751	0.9715	0.9671	0.9627	0.9576
18	2766K	1.0000	0.9963	0.9896	0.9867	0.9815	0.9778	0.9763	0.9726	0.9681	0.9637
19	2808K	1.0000	0.9919	0.9882	0.9815	0.9771	0.9719	0.9653	0.9601	0.9557	0.9505
20	2742K	1.0000	0.9953	0.9883	0.9759	0.9704	0.9658	0.9603	0.9588	0.9525	0.9479
21	2761K	1.0000	0.9975	0.9886	0.9828	0.9771	0.9730	0.9697	0.9673	0.9632	0.9583
22	2765K	1.0000	0.9992	0.9906	0.9780	0.9710	0.9678	0.9647	0.9616	0.9553	0.9490
23	2731K	1.0000	0.9930	0.9853	0.9791	0.9745	0.9706	0.9637	0.9606	0.9552	0.9505
24	2745K	1.0000	0.9906	0.9851	0.9804	0.9749	0.9718	0.9671	0.9428	0.9374	0.9327
25	2765K	1.0000	0.9923	0.9855	0.9816	0.9740	0.9709	0.9648	0.9602	0.9548	0.9495

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	7000hrs	8000hrs	9000hrs
1	2845K	0.2553	0.2539	0.2539	0.2537	0.2535	0.2533	0.2530	0.2526	0.2529	0.2528
2	2841K	0.2552	0.2537	0.2538	0.2537	0.2534	0.2532	0.2530	0.2527	0.2525	0.2523
3	2862K	0.2541	0.2526	0.2525	0.2527	0.2524	0.2521	0.2519	0.2517	0.2518	0.2516
4	2856K	0.2550	0.2536	0.2535	0.2534	0.2532	0.2530	0.2527	0.2525	0.2522	0.2520
5	2838K	0.2551	0.2535	0.2536	0.2535	0.2533	0.2530	0.2528	0.2524	0.2529	0.2528
6	2863K	0.2543	0.2528	0.2526	0.2526	0.2525	0.2524	0.2526	0.2524	0.2521	0.2519
7	2828K	0.2557	0.2540	0.2538	0.2538	0.2537	0.2537	0.2537	0.2534	0.2534	0.2530
8	2827K	0.2556	0.2539	0.2538	0.2537	0.2535	0.2534	0.2532	0.2529	0.2534	0.2531
9	2806K	0.2565	0.2549	0.2549	0.2548	0.2546	0.2545	0.2543	0.2538	0.2539	0.2539
10	2829K	0.2555	0.2539	0.2535	0.2535	0.2532	0.2531	0.2530	0.2528	0.2523	0.2521
11	2838K	0.2548	0.2535	0.2532	0.2539	0.2536	0.2534	0.2531	0.2529	0.2532	0.2526
12	2851K	0.2544	0.2530	0.2526	0.2523	0.2521	0.2520	0.2517	0.2512	0.2519	0.2521
13	2853K	0.2547	0.2532	0.2529	0.2528	0.2526	0.2523	0.2520	0.2516	0.2517	0.2517
14	2856K	0.2539	0.2522	0.2521	0.2521	0.2519	0.2517	0.2513	0.2510	0.2509	0.2508
15	2846K	0.2543	0.2529	0.2526	0.2526	0.2525	0.2521	0.2519	0.2516	0.2514	0.2514
16	2863K	0.2547	0.2532	0.2530	0.2531	0.2529	0.2527	0.2523	0.2518	0.2517	0.2515
17	2844K	0.2548	0.2534	0.2532	0.2532	0.2531	0.2530	0.2525	0.2522	0.2519	0.2519
18	2766K	0.2578	0.2563	0.2561	0.2561	0.2560	0.2559	0.2557	0.2553	0.2547	0.2548
19	2808K	0.2571	0.2559	0.2554	0.2556	0.2553	0.2552	0.2551	0.2546	0.2536	0.2536
20	2742K	0.2594	0.2582	0.2578	0.2584	0.2581	0.2579	0.2575	0.2574	0.2568	0.2562
21	2761K	0.2591	0.2577	0.2574	0.2572	0.2570	0.2568	0.2561	0.2557	0.2552	0.2548
22	2765K	0.2587	0.2573	0.2572	0.2571	0.2570	0.2568	0.2564	0.2563	0.2566	0.2564
23	2731K	0.2604	0.2591	0.2588	0.2589	0.2587	0.2584	0.2581	0.2580	0.2580	0.2581
24	2745K	0.2600	0.2589	0.2585	0.2584	0.2581	0.2580	0.2577	0.2575	0.2571	0.2571
25	2765K	0.2589	0.2576	0.2574	0.2575	0.2573	0.2572	0.2571	0.2568	0.2564	0.2564

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	7000hrs	8000hrs	9000hrs
1	2845K	0.5294	0.5295	0.5290	0.5287	0.5285	0.5283	0.5280	0.5278	0.5274	0.5270
2	2841K	0.5306	0.5306	0.5302	0.5298	0.5296	0.5294	0.5291	0.5289	0.5285	0.5280
3	2862K	0.5313	0.5313	0.5309	0.5306	0.5305	0.5301	0.5299	0.5295	0.5294	0.5290
4	2856K	0.5285	0.5285	0.5281	0.5278	0.5275	0.5271	0.5269	0.5265	0.5263	0.5258
5	2838K	0.5316	0.5315	0.5311	0.5308	0.5306	0.5303	0.5301	0.5296	0.5296	0.5293
6	2863K	0.5302	0.5300	0.5297	0.5294	0.5293	0.5290	0.5290	0.5287	0.5284	0.5279
7	2828K	0.5309	0.5309	0.5304	0.5301	0.5300	0.5298	0.5295	0.5292	0.5290	0.5285
8	2827K	0.5317	0.5317	0.5313	0.5309	0.5307	0.5304	0.5302	0.5298	0.5299	0.5294
9	2806K	0.5320	0.5321	0.5317	0.5313	0.5311	0.5309	0.5307	0.5304	0.5302	0.5298
10	2829K	0.5317	0.5316	0.5311	0.5309	0.5306	0.5304	0.5301	0.5298	0.5295	0.5290
11	2838K	0.5330	0.5332	0.5327	0.5317	0.5315	0.5313	0.5309	0.5307	0.5311	0.5310
12	2851K	0.5321	0.5322	0.5317	0.5312	0.5310	0.5308	0.5306	0.5304	0.5297	0.5294
13	2853K	0.5303	0.5302	0.5298	0.5294	0.5291	0.5290	0.5287	0.5284	0.5275	0.5271
14	2856K	0.5334	0.5334	0.5330	0.5326	0.5323	0.5323	0.5320	0.5317	0.5309	0.5305
15	2846K	0.5335	0.5337	0.5332	0.5328	0.5325	0.5324	0.5321	0.5319	0.5310	0.5306
16	2863K	0.5284	0.5283	0.5280	0.5277	0.5274	0.5272	0.5269	0.5266	0.5257	0.5252
17	2844K	0.5317	0.5317	0.5314	0.5310	0.5308	0.5305	0.5303	0.5301	0.5292	0.5288
18	2766K	0.5347	0.5349	0.5343	0.5340	0.5338	0.5336	0.5334	0.5332	0.5323	0.5319
19	2808K	0.5288	0.5284	0.5281	0.5275	0.5275	0.5272	0.5269	0.5268	0.5257	0.5253
20	2742K	0.5327	0.5325	0.5322	0.5308	0.5306	0.5303	0.5300	0.5298	0.5299	0.5294
21	2761K	0.5297	0.5295	0.5291	0.5286	0.5283	0.5281	0.5278	0.5274	0.5264	0.5259
22	2765K	0.5306	0.5305	0.5301	0.5297	0.5294	0.5291	0.5290	0.5289	0.5280	0.5276
23	2731K	0.5303	0.5301	0.5298	0.5294	0.5291	0.5288	0.5287	0.5286	0.5277	0.5273
24	2745K	0.5289	0.5288	0.5282	0.5278	0.5276	0.5274	0.5271	0.5270	0.5260	0.5255
25	2765K	0.5296	0.5294	0.5291	0.5287	0.5284	0.5282	0.5281	0.5280	0.5271	0.5266

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	7000hrs	8000hrs	9000hrs
1	2845K	0.0000	0.0014	0.0015	0.0017	0.0020	0.0023	0.0027	0.0031	0.0031	0.0035
2	2841K	0.0000	0.0015	0.0015	0.0017	0.0021	0.0023	0.0027	0.0030	0.0034	0.0039
3	2862K	0.0000	0.0015	0.0016	0.0016	0.0019	0.0023	0.0026	0.0030	0.0030	0.0034
4	2856K	0.0000	0.0014	0.0016	0.0017	0.0021	0.0024	0.0028	0.0032	0.0036	0.0040
5	2838K	0.0000	0.0016	0.0016	0.0018	0.0021	0.0025	0.0027	0.0034	0.0030	0.0033
6	2863K	0.0000	0.0015	0.0018	0.0019	0.0020	0.0022	0.0021	0.0024	0.0028	0.0033
7	2828K	0.0000	0.0017	0.0020	0.0021	0.0022	0.0023	0.0024	0.0029	0.0030	0.0036
8	2827K	0.0000	0.0017	0.0018	0.0021	0.0023	0.0026	0.0028	0.0033	0.0028	0.0034
9	2806K	0.0000	0.0016	0.0016	0.0018	0.0021	0.0023	0.0026	0.0031	0.0032	0.0034
10	2829K	0.0000	0.0016	0.0021	0.0022	0.0025	0.0027	0.0030	0.0033	0.0039	0.0043
11	2838K	0.0000	0.0013	0.0016	0.0016	0.0019	0.0022	0.0027	0.0030	0.0025	0.0030
12	2851K	0.0000	0.0014	0.0018	0.0023	0.0025	0.0027	0.0031	0.0036	0.0035	0.0035
13	2853K	0.0000	0.0015	0.0019	0.0021	0.0024	0.0027	0.0031	0.0036	0.0041	0.0044
14	2856K	0.0000	0.0017	0.0018	0.0020	0.0023	0.0025	0.0030	0.0034	0.0039	0.0042
15	2846K	0.0000	0.0014	0.0017	0.0018	0.0021	0.0025	0.0028	0.0031	0.0038	0.0041
16	2863K	0.0000	0.0015	0.0017	0.0017	0.0021	0.0023	0.0028	0.0034	0.0040	0.0045
17	2844K	0.0000	0.0014	0.0016	0.0017	0.0019	0.0022	0.0027	0.0031	0.0038	0.0041
18	2766K	0.0000	0.0015	0.0017	0.0018	0.0020	0.0022	0.0025	0.0029	0.0039	0.0041
19	2808K	0.0000	0.0013	0.0018	0.0020	0.0022	0.0025	0.0028	0.0032	0.0047	0.0049
20	2742K	0.0000	0.0012	0.0017	0.0021	0.0025	0.0028	0.0033	0.0035	0.0038	0.0046
21	2761K	0.0000	0.0014	0.0018	0.0022	0.0025	0.0028	0.0036	0.0041	0.0051	0.0057
22	2765K	0.0000	0.0014	0.0016	0.0018	0.0021	0.0024	0.0028	0.0029	0.0033	0.0038
23	2731K	0.0000	0.0013	0.0017	0.0017	0.0021	0.0025	0.0028	0.0029	0.0035	0.0038
24	2745K	0.0000	0.0011	0.0017	0.0019	0.0023	0.0025	0.0029	0.0031	0.0041	0.0045
25	2765K	0.0000	0.0013	0.0016	0.0017	0.0020	0.0022	0.0023	0.0026	0.0035	0.0039

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	7000hrs	8000hrs	9000hrs
1	2845K	6.477	6.440	6.427	6.444	6.443	6.445	6.440	6.501	6.447	6.464
2	2841K	6.198	6.191	6.178	6.189	6.190	6.188	6.185	6.213	6.183	6.197
3	2862K	6.360	6.322	6.306	6.321	6.313	6.324	6.315	6.370	6.311	6.322
4	2856K	6.427	6.396	6.388	6.397	6.392	6.391	6.394	6.415	6.390	6.396
5	2838K	6.355	6.316	6.313	6.325	6.321	6.328	6.319	6.359	6.317	6.325
6	2863K	6.152	6.130	6.125	6.137	6.136	6.136	6.130	6.154	6.130	6.137
7	2828K	6.161	6.147	6.143	6.151	6.152	6.145	6.145	6.169	6.158	6.150
8	2827K	6.172	6.160	6.162	6.167	6.164	6.161	6.169	6.190	6.165	6.176
9	2806K	6.136	6.115	6.114	6.118	6.117	6.112	6.115	6.295	6.126	6.124
10	2829K	6.383	6.355	6.350	6.352	6.355	6.353	6.350	6.370	6.349	6.363
11	2838K	6.188	6.173	6.170	6.172	6.173	6.168	6.168	6.186	6.178	6.178
12	2851K	6.168	6.157	6.156	6.150	6.153	6.153	6.152	6.177	6.154	6.154
13	2853K	6.496	6.449	6.444	6.455	6.454	6.452	6.454	6.490	6.453	6.460
14	2856K	6.169	6.155	6.153	6.156	6.155	6.157	6.152	6.175	6.165	6.161
15	2846K	6.162	6.151	6.144	6.148	6.145	6.151	6.144	6.167	6.154	6.151
16	2863K	6.297	6.262	6.257	6.265	6.261	6.264	6.262	6.288	6.264	6.260
17	2844K	6.166	6.154	6.149	6.155	6.149	6.155	6.149	6.173	6.157	6.154
18	2766K	6.158	6.153	6.150	6.153	6.148	6.157	6.150	6.164	6.159	6.153
19	2808K	6.647	6.634	6.603	6.594	6.634	6.626	6.634	6.647	6.619	6.612
20	2742K	6.396	6.368	6.369	6.366	6.364	6.367	6.364	6.391	6.365	6.371
21	2761K	6.586	6.559	6.551	6.560	6.566	6.565	6.881	6.590	6.561	6.561
22	2765K	6.524	6.490	6.488	6.488	6.492	6.490	6.488	6.513	6.488	6.493
23	2731K	6.412	6.390	6.391	6.395	6.388	6.403	6.387	6.449	6.393	6.396
24	2745K	6.736	6.686	6.681	6.680	6.705	6.702	6.703	6.722	6.706	6.700
25	2765K	6.450	6.418	6.419	6.428	6.427	6.422	6.419	6.442	6.428	6.440

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	7000hrs	8000hrs	9000hrs
1	2831K	137.500	136.300	135.500	134.600	133.700	133.100	132.400	131.800	131.100	130.000
2	2864K	136.000	135.300	134.500	133.600	133.000	132.200	131.900	131.100	130.700	130.000
3	2826K	137.900	136.700	136.000	135.000	134.200	133.700	133.200	132.600	132.000	131.000
4	2865K	131.400	129.700	129.000	128.200	127.500	126.900	126.600	126.100	125.400	124.400
5	2802K	134.200	133.600	132.800	132.100	131.500	130.900	130.200	129.700	129.000	127.900
6	2793K	135.800	135.200	134.400	133.900	133.000	132.200	131.100	130.400	129.800	128.700
7	2858K	132.400	131.700	131.000	130.200	129.200	128.500	128.200	127.700	127.100	126.300
8	2851K	135.800	134.900	133.100	132.800	132.100	131.600	130.400	129.800	129.000	127.900
9	2842K	139.500	138.300	137.600	136.500	135.600	134.700	134.200	133.800	133.000	132.000
10	2866K	135.100	134.500	133.700	132.600	131.800	131.000	129.900	129.300	128.400	127.400
11	2838K	134.600	133.600	132.900	132.100	131.400	130.500	129.800	129.100	128.100	127.200
12	2861K	135.200	134.800	134.400	132.700	132.200	131.500	131.300	130.900	129.900	128.700
13	2867K	136.400	135.400	134.200	133.800	133.100	132.000	130.900	130.400	129.500	128.300
14	2853K	133.000	132.300	132.100	131.300	130.700	129.700	129.000	128.400	127.400	126.100
15	2862K	134.500	133.600	132.600	131.100	130.100	129.400	129.000	128.600	127.500	126.600
16	2795K	133.100	133.100	132.100	130.600	129.600	129.000	128.700	128.100	127.200	126.500
17	2830K	129.600	129.800	129.400	128.200	127.400	126.600	126.000	125.500	124.700	123.600
18	2787K	125.700	123.500	122.800	122.200	121.200	120.500	119.800	119.300	118.300	117.200
19	2786K	120.800	120.500	120.000	118.100	117.400	116.700	115.900	115.500	114.600	113.600
20	2712K	124.800	123.700	122.500	121.600	120.400	119.800	119.500	118.700	117.900	117.200
21	2828K	122.400	121.500	120.200	120.100	118.800	118.200	117.900	117.200	116.200	115.300
22	2803K	130.200	129.600	128.900	128.400	127.000	126.200	125.900	125.500	124.400	123.300
23	2751K	125.300	124.200	123.300	122.900	122.200	121.300	120.600	120.300	119.200	118.400
24	2828K	132.400	131.200	130.100	129.500	128.500	127.600	126.600	126.200	124.700	124.000
25	2756K	127.100	125.300	124.900	123.900	123.200	122.300	121.600	121.200	119.900	118.700

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	7000hrs	8000hrs	9000hrs
1	2831K	1.0000	0.9913	0.9855	0.9789	0.9724	0.9680	0.9629	0.9585	0.9535	0.9455
2	2864K	1.0000	0.9949	0.9890	0.9824	0.9779	0.9721	0.9699	0.9640	0.9610	0.9559
3	2826K	1.0000	0.9913	0.9862	0.9790	0.9732	0.9695	0.9659	0.9616	0.9572	0.9500
4	2865K	1.0000	0.9871	0.9817	0.9756	0.9703	0.9658	0.9635	0.9597	0.9543	0.9467
5	2802K	1.0000	0.9955	0.9896	0.9844	0.9799	0.9754	0.9702	0.9665	0.9613	0.9531
6	2793K	1.0000	0.9956	0.9897	0.9860	0.9794	0.9735	0.9654	0.9602	0.9558	0.9477
7	2858K	1.0000	0.9947	0.9894	0.9834	0.9758	0.9705	0.9683	0.9645	0.9600	0.9539
8	2851K	1.0000	0.9934	0.9801	0.9779	0.9728	0.9691	0.9602	0.9558	0.9499	0.9418
9	2842K	1.0000	0.9914	0.9864	0.9785	0.9720	0.9656	0.9620	0.9591	0.9534	0.9462
10	2866K	1.0000	0.9956	0.9896	0.9815	0.9756	0.9697	0.9615	0.9571	0.9504	0.9430
11	2838K	1.0000	0.9926	0.9874	0.9814	0.9762	0.9695	0.9643	0.9591	0.9517	0.9450
12	2861K	1.0000	0.9970	0.9941	0.9815	0.9778	0.9726	0.9712	0.9682	0.9608	0.9519
13	2867K	1.0000	0.9927	0.9839	0.9809	0.9758	0.9677	0.9597	0.9560	0.9494	0.9406
14	2853K	1.0000	0.9947	0.9932	0.9872	0.9827	0.9752	0.9699	0.9654	0.9579	0.9481
15	2862K	1.0000	0.9933	0.9859	0.9747	0.9673	0.9621	0.9591	0.9561	0.9480	0.9413
16	2795K	1.0000	1.0000	0.9925	0.9812	0.9737	0.9692	0.9669	0.9624	0.9557	0.9504
17	2830K	1.0000	1.0015	0.9985	0.9892	0.9830	0.9769	0.9722	0.9684	0.9622	0.9537
18	2787K	1.0000	0.9825	0.9769	0.9722	0.9642	0.9586	0.9531	0.9491	0.9411	0.9324
19	2786K	1.0000	0.9975	0.9934	0.9776	0.9719	0.9661	0.9594	0.9561	0.9487	0.9404
20	2712K	1.0000	0.9912	0.9816	0.9744	0.9647	0.9599	0.9575	0.9511	0.9447	0.9391
21	2828K	1.0000	0.9926	0.9820	0.9812	0.9706	0.9657	0.9632	0.9575	0.9493	0.9420
22	2803K	1.0000	0.9954	0.9900	0.9862	0.9754	0.9693	0.9670	0.9639	0.9555	0.9470
23	2751K	1.0000	0.9912	0.9840	0.9808	0.9753	0.9681	0.9625	0.9601	0.9513	0.9449
24	2828K	1.0000	0.9909	0.9826	0.9781	0.9705	0.9637	0.9562	0.9532	0.9418	0.9366
25	2756K	1.0000	0.9858	0.9827	0.9748	0.9693	0.9622	0.9567	0.9536	0.9434	0.9339

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	7000hrs	8000hrs	9000hrs
1	2831K	0.2551	0.2537	0.2537	0.2537	0.2534	0.2532	0.2527	0.2522	0.2521	0.2521
2	2864K	0.2545	0.2528	0.2527	0.2529	0.2527	0.2525	0.2517	0.2513	0.2509	0.2507
3	2826K	0.2554	0.2538	0.2536	0.2535	0.2535	0.2533	0.2527	0.2524	0.2516	0.2515
4	2865K	0.2537	0.2523	0.2522	0.2521	0.2521	0.2519	0.2512	0.2509	0.2502	0.2500
5	2802K	0.2564	0.2550	0.2548	0.2548	0.2547	0.2546	0.2541	0.2539	0.2532	0.2530
6	2793K	0.2565	0.2550	0.2548	0.2543	0.2541	0.2539	0.2538	0.2535	0.2529	0.2526
7	2858K	0.2544	0.2525	0.2523	0.2520	0.2518	0.2516	0.2515	0.2511	0.2509	0.2503
8	2851K	0.2545	0.2530	0.2529	0.2526	0.2523	0.2523	0.2519	0.2517	0.2510	0.2512
9	2842K	0.2547	0.2530	0.2528	0.2525	0.2522	0.2520	0.2518	0.2516	0.2509	0.2508
10	2866K	0.2544	0.2528	0.2526	0.2523	0.2522	0.2520	0.2517	0.2514	0.2507	0.2499
11	2838K	0.2552	0.2536	0.2535	0.2530	0.2529	0.2527	0.2524	0.2522	0.2518	0.2512
12	2861K	0.2542	0.2525	0.2525	0.2527	0.2524	0.2522	0.2516	0.2511	0.2503	0.2498
13	2867K	0.2539	0.2519	0.2519	0.2516	0.2515	0.2513	0.2510	0.2507	0.2505	0.2500
14	2853K	0.2552	0.2534	0.2534	0.2530	0.2530	0.2529	0.2523	0.2519	0.2516	0.2512
15	2862K	0.2546	0.2532	0.2529	0.2527	0.2526	0.2523	0.2521	0.2518	0.2515	0.2508
16	2795K	0.2568	0.2554	0.2553	0.2551	0.2548	0.2546	0.2544	0.2541	0.2540	0.2534
17	2830K	0.2563	0.2548	0.2548	0.2545	0.2543	0.2540	0.2538	0.2536	0.2535	0.2531
18	2787K	0.2585	0.2572	0.2572	0.2567	0.2564	0.2562	0.2559	0.2557	0.2554	0.2551
19	2786K	0.2578	0.2566	0.2565	0.2560	0.2558	0.2557	0.2553	0.2550	0.2550	0.2548
20	2712K	0.2608	0.2593	0.2592	0.2587	0.2584	0.2580	0.2577	0.2573	0.2571	0.2569
21	2828K	0.2569	0.2555	0.2554	0.2553	0.2550	0.2549	0.2548	0.2542	0.2533	0.2531
22	2803K	0.2574	0.2559	0.2558	0.2554	0.2552	0.2551	0.2543	0.2543	0.2537	0.2536
23	2751K	0.2588	0.2573	0.2572	0.2568	0.2567	0.2565	0.2557	0.2553	0.2552	0.2550
24	2828K	0.2564	0.2550	0.2550	0.2545	0.2543	0.2541	0.2536	0.2531	0.2532	0.2529
25	2756K	0.2596	0.2581	0.2580	0.2577	0.2575	0.2572	0.2570	0.2567	0.2561	0.2559

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	7000hrs	8000hrs	9000hrs
1	2831K	0.5331	0.5334	0.5329	0.5325	0.5322	0.5320	0.5320	0.5316	0.5309	0.5307
2	2864K	0.5291	0.5290	0.5287	0.5283	0.5280	0.5278	0.5277	0.5273	0.5264	0.5261
3	2826K	0.5328	0.5329	0.5324	0.5321	0.5317	0.5315	0.5315	0.5313	0.5306	0.5301
4	2865K	0.5323	0.5324	0.5320	0.5316	0.5313	0.5311	0.5310	0.5308	0.5301	0.5295
5	2802K	0.5334	0.5337	0.5332	0.5328	0.5325	0.5323	0.5324	0.5321	0.5316	0.5310
6	2793K	0.5349	0.5351	0.5346	0.5341	0.5337	0.5335	0.5336	0.5334	0.5329	0.5322
7	2858K	0.5308	0.5306	0.5303	0.5298	0.5295	0.5292	0.5293	0.5290	0.5286	0.5280
8	2851K	0.5316	0.5318	0.5313	0.5309	0.5305	0.5303	0.5304	0.5301	0.5288	0.5289
9	2842K	0.5327	0.5326	0.5322	0.5318	0.5314	0.5312	0.5313	0.5311	0.5298	0.5296
10	2866K	0.5292	0.5292	0.5288	0.5283	0.5279	0.5277	0.5277	0.5274	0.5269	0.5261
11	2838K	0.5312	0.5313	0.5310	0.5305	0.5302	0.5300	0.5300	0.5297	0.5293	0.5287
12	2861K	0.5309	0.5311	0.5309	0.5301	0.5300	0.5298	0.5299	0.5296	0.5291	0.5286
13	2867K	0.5312	0.5310	0.5307	0.5302	0.5299	0.5296	0.5296	0.5291	0.5290	0.5286
14	2853K	0.5281	0.5279	0.5276	0.5272	0.5269	0.5267	0.5265	0.5261	0.5258	0.5253
15	2862K	0.5291	0.5293	0.5289	0.5285	0.5282	0.5280	0.5280	0.5275	0.5272	0.5267
16	2795K	0.5329	0.5330	0.5327	0.5322	0.5320	0.5318	0.5317	0.5313	0.5311	0.5307
17	2830K	0.5278	0.5277	0.5274	0.5271	0.5268	0.5265	0.5264	0.5261	0.5257	0.5253
18	2787K	0.5266	0.5265	0.5262	0.5258	0.5253	0.5252	0.5251	0.5247	0.5244	0.5240
19	2786K	0.5303	0.5302	0.5299	0.5295	0.5291	0.5290	0.5289	0.5284	0.5282	0.5279
20	2712K	0.5328	0.5328	0.5323	0.5318	0.5314	0.5313	0.5312	0.5308	0.5305	0.5301
21	2828K	0.5256	0.5254	0.5251	0.5248	0.5243	0.5241	0.5240	0.5238	0.5230	0.5227
22	2803K	0.5284	0.5283	0.5280	0.5275	0.5270	0.5267	0.5267	0.5264	0.5259	0.5256
23	2751K	0.5334	0.5334	0.5329	0.5324	0.5322	0.5318	0.5317	0.5313	0.5311	0.5307
24	2828K	0.5277	0.5275	0.5273	0.5268	0.5264	0.5262	0.5261	0.5257	0.5254	0.5250
25	2756K	0.5284	0.5282	0.5278	0.5274	0.5270	0.5267	0.5267	0.5264	0.5258	0.5255

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	7000hrs	8000hrs	9000hrs
1	2831K	0.0000	0.0014	0.0014	0.0015	0.0019	0.0022	0.0026	0.0033	0.0037	0.0038
2	2864K	0.0000	0.0017	0.0018	0.0018	0.0021	0.0024	0.0031	0.0037	0.0045	0.0048
3	2826K	0.0000	0.0016	0.0018	0.0020	0.0022	0.0025	0.0030	0.0034	0.0044	0.0047
4	2865K	0.0000	0.0014	0.0015	0.0017	0.0019	0.0022	0.0028	0.0032	0.0041	0.0046
5	2802K	0.0000	0.0014	0.0016	0.0017	0.0019	0.0021	0.0025	0.0028	0.0037	0.0042
6	2793K	0.0000	0.0015	0.0017	0.0023	0.0027	0.0030	0.0030	0.0034	0.0041	0.0047
7	2858K	0.0000	0.0019	0.0022	0.0026	0.0029	0.0032	0.0033	0.0038	0.0041	0.0050
8	2851K	0.0000	0.0015	0.0016	0.0020	0.0025	0.0026	0.0029	0.0032	0.0045	0.0043
9	2842K	0.0000	0.0017	0.0020	0.0024	0.0028	0.0031	0.0032	0.0035	0.0048	0.0050
10	2866K	0.0000	0.0016	0.0018	0.0023	0.0026	0.0028	0.0031	0.0035	0.0044	0.0055
11	2838K	0.0000	0.0016	0.0017	0.0023	0.0025	0.0028	0.0030	0.0034	0.0039	0.0047
12	2861K	0.0000	0.0017	0.0017	0.0017	0.0020	0.0023	0.0028	0.0034	0.0043	0.0050
13	2867K	0.0000	0.0020	0.0021	0.0025	0.0027	0.0031	0.0033	0.0038	0.0040	0.0047
14	2853K	0.0000	0.0018	0.0019	0.0024	0.0025	0.0027	0.0033	0.0039	0.0043	0.0049
15	2862K	0.0000	0.0014	0.0017	0.0020	0.0022	0.0025	0.0027	0.0032	0.0036	0.0045
16	2795K	0.0000	0.0014	0.0015	0.0018	0.0022	0.0025	0.0027	0.0031	0.0033	0.0040
17	2830K	0.0000	0.0015	0.0016	0.0019	0.0022	0.0026	0.0029	0.0032	0.0035	0.0041
18	2787K	0.0000	0.0013	0.0014	0.0020	0.0025	0.0027	0.0030	0.0034	0.0038	0.0043
19	2786K	0.0000	0.0012	0.0014	0.0020	0.0023	0.0025	0.0029	0.0034	0.0035	0.0038
20	2712K	0.0000	0.0015	0.0017	0.0023	0.0028	0.0032	0.0035	0.0040	0.0044	0.0047
21	2828K	0.0000	0.0014	0.0016	0.0018	0.0023	0.0025	0.0026	0.0032	0.0044	0.0048
22	2803K	0.0000	0.0015	0.0016	0.0022	0.0026	0.0029	0.0035	0.0037	0.0045	0.0047
23	2751K	0.0000	0.0015	0.0017	0.0022	0.0024	0.0028	0.0035	0.0041	0.0043	0.0047
24	2828K	0.0000	0.0014	0.0015	0.0021	0.0025	0.0027	0.0032	0.0039	0.0039	0.0044
25	2756K	0.0000	0.0015	0.0017	0.0021	0.0025	0.0029	0.0031	0.0035	0.0044	0.0047

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	7000hrs	8000hrs	9000hrs
1	2831K	6.168	6.156	6.155	6.156	6.161	6.154	6.185	6.191	6.165	6.181
2	2864K	6.346	6.316	6.317	6.314	6.313	6.319	6.358	6.513	6.318	6.373
3	2826K	6.169	6.155	6.168	6.159	6.159	6.161	6.185	6.174	6.157	6.198
4	2865K	6.214	6.201	6.204	6.203	6.204	6.199	6.212	6.212	6.200	6.237
5	2802K	6.164	6.150	6.147	6.150	6.149	6.155	6.166	6.172	6.157	6.208
6	2793K	6.142	6.128	6.124	6.129	6.120	6.129	6.149	6.141	6.131	6.135
7	2858K	6.367	6.329	6.325	6.328	6.322	6.324	6.354	6.358	6.154	6.336
8	2851K	6.155	6.142	6.137	6.143	6.142	6.139	6.165	6.162	6.154	6.143
9	2842K	6.120	6.100	6.099	6.101	6.101	6.096	6.117	6.116	6.105	6.109
10	2866K	6.180	6.167	6.163	6.166	6.155	6.158	6.179	6.186	6.177	6.165
11	2838K	6.160	6.152	6.151	6.152	6.153	6.155	6.172	6.173	6.166	6.159
12	2861K	6.173	6.155	6.152	6.155	6.163	6.158	6.176	6.178	6.174	6.155
13	2867K	6.442	6.405	6.403	6.407	6.426	6.406	6.441	6.440	6.415	6.412
14	2853K	6.145	6.129	6.127	6.127	6.141	6.123	6.142	6.145	6.127	6.125
15	2862K	6.212	6.205	6.202	6.202	6.219	6.200	6.222	6.226	6.216	6.212
16	2795K	6.186	6.180	6.180	6.180	6.191	6.183	6.208	6.203	6.187	6.183
17	2830K	6.482	6.436	6.432	6.444	6.450	6.430	6.466	6.465	6.437	6.439
18	2787K	6.634	6.624	6.615	6.625	6.639	6.613	6.642	6.644	6.621	6.644
19	2786K	6.497	6.447	6.447	6.453	6.469	6.451	6.480	6.473	6.459	6.472
20	2712K	6.931	6.878	6.871	6.879	6.881	6.875	6.894	6.885	6.882	6.889
21	2828K	6.636	6.623	6.618	6.632	6.641	6.632	6.645	6.654	6.623	6.636
22	2803K	6.459	6.424	6.423	6.438	6.443	6.428	6.453	6.450	6.430	6.457
23	2751K	6.386	6.367	6.360	6.371	6.378	6.366	6.387	6.379	6.369	6.380
24	2828K	6.495	6.459	6.459	6.468	6.478	6.473	6.491	6.482	6.466	6.490
25	2756K	6.755	6.737	6.729	6.751	6.760	6.735	6.775	7.043	6.738	6.785

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	7000hrs	8000hrs	9000hrs
1	2801K	136.900	135.400	134.300	133.400	132.500	131.900	131.100	130.500	129.200	127.800
2	2820K	132.800	132.100	131.200	130.100	129.200	128.400	127.800	127.400	126.100	124.800
3	2841K	137.200	134.100	133.200	132.800	132.000	131.400	130.800	130.200	129.200	128.200
4	2846K	135.500	134.400	133.200	132.500	131.700	131.200	130.400	129.900	128.700	127.300
5	2788K	135.400	135.000	133.900	133.200	132.500	131.800	130.400	129.700	126.900	125.600
6	2799K	135.200	134.600	133.200	132.500	131.600	130.800	130.000	129.400	128.300	127.200
7	2868K	137.400	136.000	135.100	134.400	133.200	132.300	131.500	130.700	129.400	128.200
8	2858K	131.600	131.000	130.000	129.300	128.300	127.400	126.800	125.900	124.600	123.500
9	2809K	132.700	131.400	130.000	129.200	128.400	127.800	127.000	126.500	125.100	124.000
10	2823K	134.900	134.100	132.600	131.700	130.600	129.800	129.200	128.600	127.000	125.700
11	2865K	135.300	134.100	132.700	130.700	129.700	129.200	128.400	127.900	126.700	125.500
12	2849K	138.000	136.900	135.200	134.300	133.400	132.900	131.600	131.100	130.000	129.000
13	2869K	136.300	135.400	134.000	133.200	132.300	131.700	130.800	130.400	129.000	128.000
14	2818K	134.900	133.900	132.100	131.600	131.000	130.300	129.100	128.400	127.200	126.000
15	2838K	129.700	129.400	127.700	127.400	126.600	125.800	125.200	124.600	123.400	122.100
16	2749K	134.600	133.900	132.400	131.900	131.000	129.800	129.400	128.900	128.100	127.000
17	2781K	123.600	122.500	121.300	121.000	120.200	119.500	118.200	117.600	116.700	115.500
18	2691K	121.500	120.400	119.100	118.400	117.600	116.800	116.000	115.500	114.300	113.100
19	2725K	130.900	129.000	127.000	126.400	125.600	124.500	123.800	123.000	121.700	120.700
20	2761K	127.400	126.300	124.500	123.500	122.600	121.800	120.900	120.300	119.300	118.400
21	2812K	129.600	128.900	127.100	126.200	125.000	124.500	123.800	123.300	122.400	121.200
22	2837K	115.400	114.700	113.400	113.100	112.400	111.800	110.500	110.200	109.600	108.600
23	2770K	127.200	125.700	124.200	123.900	123.200	122.100	121.800	121.300	120.400	119.400
24	2759K	127.900	125.700	124.400	123.500	122.700	121.600	120.800	120.400	119.400	118.300
25	2770K	124.700	123.400	122.300	121.800	120.700	119.700	119.100	118.700	117.900	116.700

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	7000hrs	8000hrs	9000hrs
1	2801K	1.0000	0.9890	0.9810	0.9744	0.9679	0.9635	0.9576	0.9533	0.9438	0.9335
2	2820K	1.0000	0.9947	0.9880	0.9797	0.9729	0.9669	0.9623	0.9593	0.9495	0.9398
3	2841K	1.0000	0.9774	0.9708	0.9679	0.9621	0.9577	0.9534	0.9490	0.9417	0.9344
4	2846K	1.0000	0.9919	0.9830	0.9779	0.9720	0.9683	0.9624	0.9587	0.9498	0.9395
5	2788K	1.0000	0.9970	0.9889	0.9838	0.9786	0.9734	0.9631	0.9579	0.9372	0.9276
6	2799K	1.0000	0.9956	0.9852	0.9800	0.9734	0.9675	0.9615	0.9571	0.9490	0.9408
7	2868K	1.0000	0.9898	0.9833	0.9782	0.9694	0.9629	0.9571	0.9512	0.9418	0.9330
8	2858K	1.0000	0.9954	0.9878	0.9825	0.9749	0.9681	0.9635	0.9567	0.9468	0.9384
9	2809K	1.0000	0.9902	0.9797	0.9736	0.9676	0.9631	0.9570	0.9533	0.9427	0.9344
10	2823K	1.0000	0.9941	0.9830	0.9763	0.9681	0.9622	0.9577	0.9533	0.9414	0.9318
11	2865K	1.0000	0.9911	0.9808	0.9660	0.9586	0.9549	0.9490	0.9453	0.9364	0.9276
12	2849K	1.0000	0.9920	0.9797	0.9732	0.9667	0.9630	0.9536	0.9500	0.9420	0.9348
13	2869K	1.0000	0.9934	0.9831	0.9773	0.9707	0.9663	0.9596	0.9567	0.9464	0.9391
14	2818K	1.0000	0.9926	0.9792	0.9755	0.9711	0.9659	0.9570	0.9518	0.9429	0.9340
15	2838K	1.0000	0.9977	0.9846	0.9823	0.9761	0.9699	0.9653	0.9607	0.9514	0.9414
16	2749K	1.0000	0.9948	0.9837	0.9799	0.9733	0.9643	0.9614	0.9577	0.9517	0.9435
17	2781K	1.0000	0.9911	0.9814	0.9790	0.9725	0.9668	0.9563	0.9515	0.9442	0.9345
18	2691K	1.0000	0.9909	0.9802	0.9745	0.9679	0.9613	0.9547	0.9506	0.9407	0.9309
19	2725K	1.0000	0.9855	0.9702	0.9656	0.9595	0.9511	0.9458	0.9396	0.9297	0.9221
20	2761K	1.0000	0.9914	0.9772	0.9694	0.9623	0.9560	0.9490	0.9443	0.9364	0.9294
21	2812K	1.0000	0.9946	0.9807	0.9738	0.9645	0.9606	0.9552	0.9514	0.9444	0.9352
22	2837K	1.0000	0.9939	0.9827	0.9801	0.9740	0.9688	0.9575	0.9549	0.9497	0.9411
23	2770K	1.0000	0.9882	0.9764	0.9741	0.9686	0.9599	0.9575	0.9536	0.9465	0.9387
24	2759K	1.0000	0.9828	0.9726	0.9656	0.9593	0.9507	0.9445	0.9414	0.9335	0.9249
25	2770K	1.0000	0.9896	0.9808	0.9767	0.9679	0.9599	0.9551	0.9519	0.9455	0.9358

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	7000hrs	8000hrs	9000hrs
1	2801K	0.2565	0.2549	0.2545	0.2544	0.2542	0.2540	0.2538	0.2536	0.2535	0.2535
2	2820K	0.2561	0.2545	0.2541	0.2541	0.2539	0.2536	0.2534	0.2531	0.2532	0.2533
3	2841K	0.2548	0.2524	0.2518	0.2518	0.2515	0.2512	0.2514	0.2510	0.2504	0.2503
4	2846K	0.2546	0.2530	0.2525	0.2526	0.2525	0.2523	0.2520	0.2517	0.2517	0.2516
5	2788K	0.2570	0.2550	0.2546	0.2546	0.2545	0.2542	0.2537	0.2534	0.2533	0.2531
6	2799K	0.2566	0.2551	0.2548	0.2548	0.2547	0.2544	0.2543	0.2539	0.2539	0.2537
7	2868K	0.2544	0.2529	0.2526	0.2526	0.2524	0.2521	0.2519	0.2515	0.2514	0.2516
8	2858K	0.2540	0.2522	0.2519	0.2519	0.2518	0.2516	0.2513	0.2509	0.2507	0.2506
9	2809K	0.2561	0.2543	0.2539	0.2539	0.2539	0.2536	0.2535	0.2530	0.2529	0.2529
10	2823K	0.2551	0.2537	0.2533	0.2534	0.2532	0.2529	0.2528	0.2524	0.2519	0.2517
11	2865K	0.2541	0.2527	0.2524	0.2523	0.2520	0.2517	0.2516	0.2513	0.2509	0.2507
12	2849K	0.2550	0.2536	0.2532	0.2538	0.2535	0.2533	0.2522	0.2519	0.2515	0.2513
13	2869K	0.2546	0.2529	0.2525	0.2524	0.2521	0.2518	0.2517	0.2513	0.2509	0.2507
14	2818K	0.2557	0.2543	0.2539	0.2540	0.2537	0.2535	0.2533	0.2529	0.2527	0.2525
15	2838K	0.2551	0.2534	0.2532	0.2532	0.2531	0.2527	0.2524	0.2522	0.2517	0.2514
16	2749K	0.2592	0.2577	0.2573	0.2573	0.2571	0.2568	0.2566	0.2564	0.2560	0.2555
17	2781K	0.2582	0.2566	0.2563	0.2561	0.2561	0.2557	0.2555	0.2553	0.2549	0.2544
18	2691K	0.2620	0.2605	0.2602	0.2602	0.2600	0.2596	0.2595	0.2592	0.2590	0.2585
19	2725K	0.2604	0.2587	0.2583	0.2580	0.2577	0.2576	0.2575	0.2573	0.2570	0.2566
20	2761K	0.2592	0.2577	0.2574	0.2569	0.2567	0.2563	0.2561	0.2554	0.2553	0.2549
21	2812K	0.2570	0.2551	0.2548	0.2547	0.2544	0.2541	0.2540	0.2537	0.2536	0.2531
22	2837K	0.2562	0.2546	0.2542	0.2541	0.2540	0.2537	0.2534	0.2532	0.2530	0.2526
23	2770K	0.2584	0.2569	0.2566	0.2566	0.2564	0.2562	0.2560	0.2557	0.2555	0.2551
24	2759K	0.2591	0.2576	0.2571	0.2570	0.2567	0.2565	0.2564	0.2558	0.2558	0.2552
25	2770K	0.2587	0.2570	0.2568	0.2567	0.2566	0.2563	0.2560	0.2555	0.2554	0.2551

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	7000hrs	8000hrs	9000hrs
1	2801K	0.5331	0.5327	0.5327	0.5323	0.5318	0.5315	0.5313	0.5310	0.5308	0.5307
2	2820K	0.5309	0.5304	0.5305	0.5301	0.5296	0.5293	0.5291	0.5288	0.5286	0.5283
3	2841K	0.5323	0.5317	0.5316	0.5312	0.5309	0.5307	0.5303	0.5301	0.5296	0.5292
4	2846K	0.5323	0.5320	0.5320	0.5316	0.5314	0.5311	0.5306	0.5303	0.5301	0.5298
5	2788K	0.5335	0.5331	0.5331	0.5327	0.5324	0.5322	0.5317	0.5313	0.5312	0.5308
6	2799K	0.5330	0.5327	0.5327	0.5323	0.5319	0.5316	0.5314	0.5311	0.5309	0.5305
7	2868K	0.5287	0.5282	0.5284	0.5279	0.5273	0.5272	0.5270	0.5266	0.5263	0.5260
8	2858K	0.5324	0.5319	0.5319	0.5315	0.5309	0.5308	0.5305	0.5301	0.5299	0.5295
9	2809K	0.5331	0.5327	0.5327	0.5323	0.5317	0.5314	0.5314	0.5309	0.5307	0.5303
10	2823K	0.5348	0.5346	0.5345	0.5341	0.5336	0.5332	0.5332	0.5327	0.5325	0.5320
11	2865K	0.5306	0.5302	0.5303	0.5298	0.5295	0.5291	0.5290	0.5286	0.5283	0.5279
12	2849K	0.5298	0.5293	0.5294	0.5283	0.5280	0.5277	0.5281	0.5277	0.5273	0.5268
13	2869K	0.5277	0.5271	0.5273	0.5268	0.5264	0.5261	0.5259	0.5256	0.5250	0.5245
14	2818K	0.5330	0.5328	0.5328	0.5324	0.5320	0.5318	0.5315	0.5313	0.5308	0.5304
15	2838K	0.5316	0.5311	0.5312	0.5307	0.5304	0.5301	0.5297	0.5296	0.5290	0.5285
16	2749K	0.5319	0.5313	0.5314	0.5310	0.5306	0.5303	0.5300	0.5299	0.5293	0.5288
17	2781K	0.5295	0.5289	0.5291	0.5286	0.5282	0.5280	0.5276	0.5274	0.5268	0.5263
18	2691K	0.5322	0.5318	0.5318	0.5314	0.5309	0.5306	0.5303	0.5302	0.5297	0.5291
19	2725K	0.5318	0.5312	0.5313	0.5308	0.5305	0.5302	0.5299	0.5298	0.5293	0.5288
20	2761K	0.5292	0.5286	0.5287	0.5281	0.5277	0.5274	0.5272	0.5269	0.5263	0.5258
21	2812K	0.5283	0.5274	0.5277	0.5271	0.5268	0.5265	0.5262	0.5261	0.5256	0.5250
22	2837K	0.5269	0.5261	0.5263	0.5259	0.5255	0.5253	0.5248	0.5245	0.5242	0.5237
23	2770K	0.5309	0.5304	0.5304	0.5300	0.5297	0.5294	0.5290	0.5288	0.5284	0.5279
24	2759K	0.5300	0.5294	0.5295	0.5289	0.5286	0.5284	0.5281	0.5277	0.5273	0.5267
25	2770K	0.5295	0.5289	0.5290	0.5286	0.5282	0.5280	0.5276	0.5272	0.5268	0.5264

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	7000hrs	8000hrs	9000hrs
1	2801K	0.0000	0.0016	0.0020	0.0022	0.0026	0.0030	0.0032	0.0036	0.0038	0.0038
2	2820K	0.0000	0.0017	0.0020	0.0022	0.0026	0.0030	0.0032	0.0037	0.0037	0.0038
3	2841K	0.0000	0.0025	0.0031	0.0032	0.0036	0.0039	0.0039	0.0044	0.0052	0.0055
4	2846K	0.0000	0.0016	0.0021	0.0021	0.0023	0.0026	0.0031	0.0035	0.0036	0.0039
5	2788K	0.0000	0.0020	0.0024	0.0025	0.0027	0.0031	0.0038	0.0042	0.0044	0.0047
6	2799K	0.0000	0.0015	0.0018	0.0019	0.0022	0.0026	0.0028	0.0033	0.0034	0.0038
7	2868K	0.0000	0.0016	0.0018	0.0020	0.0024	0.0027	0.0030	0.0036	0.0038	0.0039
8	2858K	0.0000	0.0019	0.0022	0.0023	0.0027	0.0029	0.0033	0.0039	0.0041	0.0045
9	2809K	0.0000	0.0018	0.0022	0.0023	0.0026	0.0030	0.0031	0.0038	0.0040	0.0043
10	2823K	0.0000	0.0014	0.0018	0.0018	0.0022	0.0027	0.0028	0.0034	0.0039	0.0044
11	2865K	0.0000	0.0015	0.0017	0.0020	0.0024	0.0028	0.0030	0.0034	0.0039	0.0043
12	2849K	0.0000	0.0015	0.0018	0.0019	0.0023	0.0027	0.0033	0.0037	0.0043	0.0048
13	2869K	0.0000	0.0018	0.0021	0.0024	0.0028	0.0032	0.0034	0.0039	0.0046	0.0050
14	2818K	0.0000	0.0014	0.0018	0.0018	0.0022	0.0025	0.0028	0.0033	0.0037	0.0041
15	2838K	0.0000	0.0018	0.0019	0.0021	0.0023	0.0028	0.0033	0.0035	0.0043	0.0048
16	2749K	0.0000	0.0016	0.0020	0.0021	0.0025	0.0029	0.0032	0.0034	0.0041	0.0048
17	2781K	0.0000	0.0017	0.0019	0.0023	0.0025	0.0029	0.0033	0.0036	0.0043	0.0050
18	2691K	0.0000	0.0016	0.0018	0.0020	0.0024	0.0029	0.0031	0.0034	0.0039	0.0047
19	2725K	0.0000	0.0018	0.0022	0.0026	0.0030	0.0032	0.0035	0.0037	0.0042	0.0048
20	2761K	0.0000	0.0016	0.0019	0.0025	0.0029	0.0034	0.0037	0.0044	0.0049	0.0055
21	2812K	0.0000	0.0021	0.0023	0.0026	0.0030	0.0034	0.0037	0.0040	0.0043	0.0051
22	2837K	0.0000	0.0018	0.0021	0.0023	0.0026	0.0030	0.0035	0.0038	0.0042	0.0048
23	2770K	0.0000	0.0016	0.0019	0.0020	0.0023	0.0027	0.0031	0.0034	0.0038	0.0045
24	2759K	0.0000	0.0016	0.0021	0.0024	0.0028	0.0031	0.0033	0.0040	0.0043	0.0051
25	2770K	0.0000	0.0018	0.0020	0.0022	0.0025	0.0028	0.0033	0.0039	0.0043	0.0048

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	7000hrs	8000hrs	9000hrs
1	2801K	6.177	6.162	6.164	6.166	6.176	6.164	6.188	6.188	6.186	6.177
2	2820K	6.491	6.455	6.457	6.459	6.485	6.475	6.502	6.499	6.472	6.480
3	2841K	6.168	6.155	6.159	6.153	6.161	6.155	6.172	6.173	6.162	6.169
4	2846K	6.369	6.334	6.337	6.333	6.351	6.352	6.378	6.371	6.352	6.356
5	2788K	6.191	6.184	6.185	6.183	6.191	6.184	6.205	6.196	6.194	6.212
6	2799K	6.143	6.136	6.135	6.133	6.144	6.143	6.163	6.157	6.145	6.150
7	2868K	6.160	6.152	6.151	6.150	6.158	6.157	6.175	6.170	6.159	6.157
8	2858K	6.482	6.450	6.457	6.454	6.480	6.478	6.502	6.502	6.481	6.490
9	2809K	6.404	6.374	6.372	6.373	6.388	6.391	6.413	6.397	6.384	6.390
10	2823K	6.327	6.292	6.297	6.295	6.302	6.300	6.317	6.313	6.303	6.305
11	2865K	6.163	6.155	6.158	6.156	6.163	6.151	6.178	6.167	6.156	6.164
12	2849K	6.135	6.122	6.125	6.122	6.131	6.120	6.142	6.140	6.123	6.140
13	2869K	6.172	6.161	6.160	6.162	6.166	6.165	6.187	6.171	6.164	6.164
14	2818K	6.152	6.145	6.146	6.145	6.154	6.149	6.160	6.156	6.149	6.148
15	2838K	6.317	6.293	6.298	6.294	6.305	6.306	6.325	6.327	6.303	6.308
16	2749K	6.549	6.525	6.529	6.529	6.545	6.544	6.558	6.550	6.541	6.535
17	2781K	6.547	6.535	6.536	6.538	6.544	6.533	6.565	6.558	6.549	6.544
18	2691K	6.739	6.719	6.719	6.711	6.738	6.731	6.767	6.754	6.738	6.730
19	2725K	6.403	6.381	6.384	6.377	6.390	6.384	6.408	6.392	6.387	6.395
20	2761K	6.532	6.522	6.526	6.524	6.523	6.521	6.545	6.536	6.525	6.525
21	2812K	6.456	6.432	6.437	6.440	6.450	6.437	6.466	6.460	6.446	6.503
22	2837K	6.632	6.618	6.616	6.621	6.633	6.628	6.650	6.645	6.620	6.626
23	2770K	6.394	6.377	6.381	6.390	6.395	6.389	6.404	6.401	6.387	6.393
24	2759K	6.403	6.388	6.387	6.388	6.405	6.395	6.422	6.412	6.401	6.409
25	2770K	6.510	6.484	6.489	6.502	6.514	6.506	6.531	6.526	6.510	6.507

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.