Lumileds

IESNA LM-80 Test Report

1. Description of LED light sources tested

LUXEON 3030 2D: L130-3080003000W2C (nominal CCT 3000K)

2. Package Pictures

Figure 1. Picture of LUXEON 3030 2D.

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

	If = 65mA	If = 100mA	If = 120mA	If = 150mA	If = 180mA
Ts = 115°C	-	-	146,911	-	110,959
Ts = 105°C	180,549	-	145,176	128,800	-
Ts = 85°C	-	158,213	-	-	-
Ts = 55°C	214,973	-	-	-	-

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

	If = 65mA	If = 100mA	If = 120mA	If = 150mA	If = 180mA
Ts = 115°C	-	-	> 54,000	-	> 54,000
Ts = 105°C	> 54,000	-	> 54,000	> 54,000	-
Ts = 85°C	-	> 54,000	-	-	-
Ts = 55°C	> 54,000	-	-	-	-

4. 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-AABBxx30xxxxx	white
LUXEON HR30	L130-AABBCCHR00000	white

For LUXEON 3030 2D: AA designates nominal CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K, 40=4000K, 50=5000K, 57=5700K and 65=6500K), BB designates minimum CRI (70=70CRI, 80=80CRI and 90=90CRI), CC designates ESD protection level (00=2kV and 0T=8kV), xx and xxxx designate Lumileds internal codes.

For LUXEON HR30: AA designates nominal CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K, 40=4000K, 50=5000K, 57=5700K, 65=6500K), BB designates minimum CRI (70=70CRI, 80=80CRI and 90=90CRI), and CC designates ESD protection level (00=2kV and 0T=8kV).

5. Number of LED light sources tested

25 units per test condition.

6. Dates Tests Started

2016/08/24.

7. Date Report First Issued

2017/10/17.

8. Mechanical Drawing

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

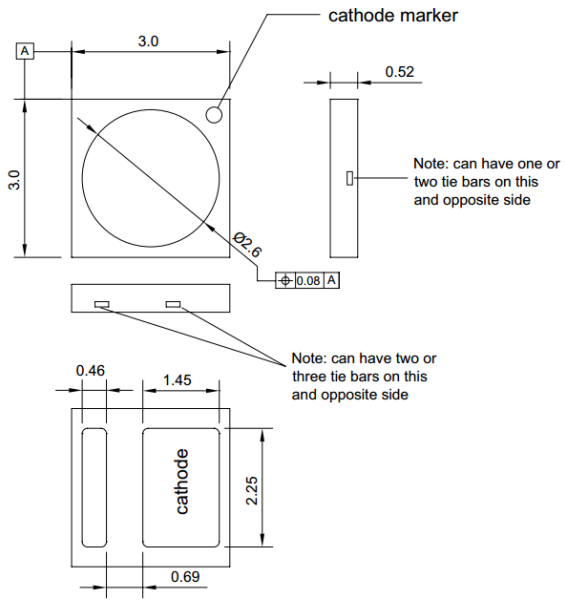

Figure 2: Mechanical Drawing for LUXEON 3030 2D. All dimensions are in millimeters.

9. T_s Measurement Point

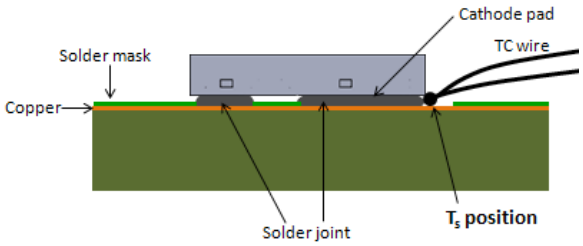

Figure 3: Preferred T_s measurement point for LUXEON 3030 2D.

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.

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

Tested samples are selected to be representative of the overall LED population. LED sample size is indicated in Section 5 of this report.

22. ISO 17025-2005 Accreditation

SINGAPORE LABORATORY ACCREDITATION SCHEME

SINGAPORE ACCREDITATION COUNCIL

Number : **LA-2016-0634-E**

Date of Issue : **14 December 2016**

Date of Expiry: **13 December 2020**

Certificate of Accreditation

This certifies that

Lumileds Malaysia Sdn. Bhd.
Reliability Test Laboratory
No. 3, Lintang Bayan Lepas 8,
Phase 4, Bayan Lepas Industrial Park
11900, Penang, Malaysia

is accredited by the Singapore Accreditation Council to

ISO / IEC 17025 : 2005

for specific scope within the field of

Electrical Testing

as detailed in the attached schedule.

Chairman

This Certificate is awarded subject to the organisation's compliance with the stated criteria and terms and conditions laid down by the Singapore Accreditation Council.

This Certificate may not be reproduced except with the written permission of the Chairman.

Notes

Data is for reference only and is not an endorsement to exceed the Data Sheet operating conditions.The data was collected by a subcontracted laboratory (ref. R2SH160822052-10,R2SH160822053-10 and R2SH160822051-10).

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

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

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

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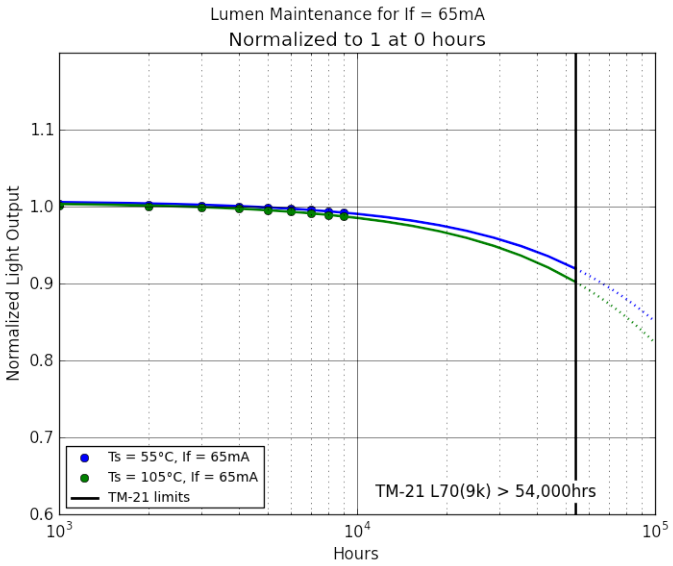
Normalized Flux Statistics for I_f = 65mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	alpha	B	L70
	median =	1.0000	1.0018	0.9999	0.9985	0.9970	0.9953	0.9928	0.9910	0.9895	0.9878			
Ts=Tair=105°C	average =	1.0000	1.0017	1.0001	0.9988	0.9972	0.9953	0.9932	0.9913	0.9892	0.9873	2.0046e-06	1.0053	180,549
	st dev =	0.0000	0.0008	0.0011	0.0013	0.0015	0.0015	0.0015	0.0017	0.0021	0.0022	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	1.0001	0.9983	0.9970	0.9945	0.9925	0.9911	0.9879	0.9846	0.9823			
	max =	1.0000	1.0031	1.0023	1.0015	0.9996	0.9989	0.9970	0.9951	0.9932	0.9918			
	median =	1.0000	1.0037	1.0026	1.0018	1.0003	0.9990	0.9972	0.9960	0.9939	0.9917			
Ts=Tair=55°C	average =	1.0000	1.0035	1.0026	1.0019	1.0004	0.9990	0.9975	0.9958	0.9939	0.9920	1.6938e-06	1.0075	214,973
	st dev =	0.0000	0.0010	0.0010	0.0013	0.0009	0.0012	0.0011	0.0012	0.0016	0.0019	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	1.0014	1.0004	0.9996	0.9989	0.9973	0.9951	0.9934	0.9907	0.9890			
	max =	1.0000	1.0052	1.0045	1.0038	1.0020	1.0015	0.9992	0.9976	0.9969	0.9968			

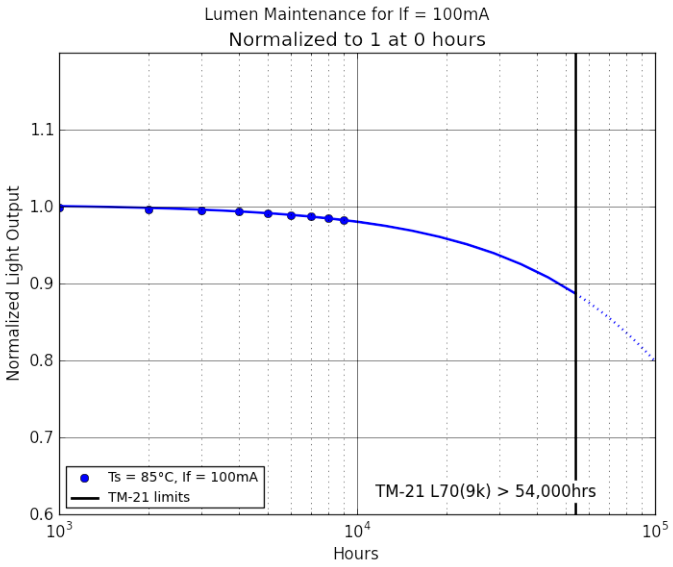


Delta u'v' for I_f = 65mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
	median =	0.0000	0.0004	0.0007	0.0009	0.0013	0.0014	0.0016	0.0020	0.0023	0.0026
Ts=Tair=105°C	average =	0.0000	0.0004	0.0007	0.0008	0.0013	0.0015	0.0016	0.0019	0.0023	0.0026
	st dev =	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	min =	0.0000	0.0002	0.0005	0.0007	0.0011	0.0013	0.0014	0.0017	0.0021	0.0025
	max =	0.0000	0.0006	0.0009	0.0010	0.0014	0.0017	0.0018	0.0022	0.0026	0.0029
	median =	0.0000	0.0003	0.0004	0.0005	0.0010	0.0012	0.0014	0.0018	0.0022	0.0024
Ts=Tair=55°C	average =	0.0000	0.0003	0.0004	0.0005	0.0010	0.0013	0.0015	0.0018	0.0022	0.0024
	st dev =	0.0000	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	min =	0.0000	0.0001	0.0003	0.0003	0.0008	0.0011	0.0012	0.0016	0.0019	0.0022
	max =	0.0000	0.0009	0.0010	0.0010	0.0017	0.0019	0.0021	0.0024	0.0027	0.0030

Normalized Flux Statistics for I_f = 100mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	alpha	B	L70
	median =	1.0000	0.9982	0.9963	0.9953	0.9935	0.9917	0.9889	0.9870	0.9851	0.9823			
Ts=Tair=85°C	average =	1.0000	0.9986	0.9968	0.9952	0.9937	0.9916	0.9893	0.9870	0.9848	0.9825	2.2724e-06	1.0029	158,213
	st dev =	0.0000	0.0017	0.0019	0.0018	0.0019	0.0020	0.0020	0.0022	0.0026	0.0026	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9962	0.9935	0.9925	0.9906	0.9880	0.9859	0.9835	0.9806	0.9784			
	max =	1.0000	1.0028	1.0018	0.9991	0.9982	0.9963	0.9935	0.9915	0.9896	0.9877			

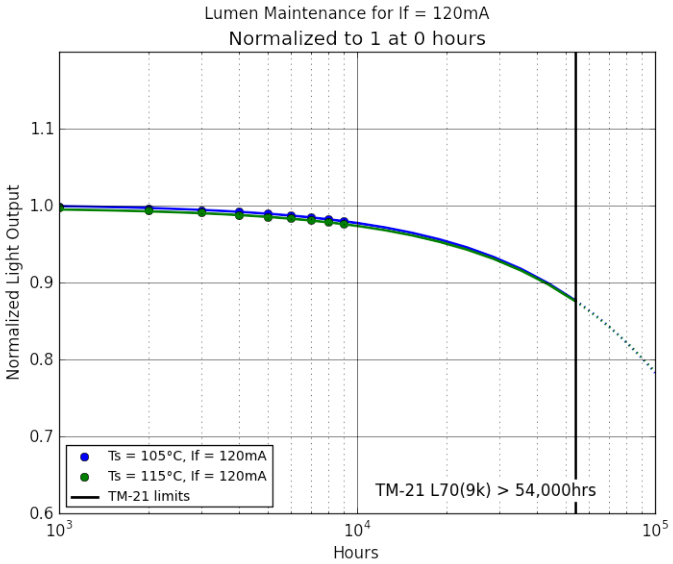


Delta u'v' for I_f = 100mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
	median =	0.0000	0.0005	0.0007	0.0009	0.0012	0.0014	0.0017	0.0021	0.0023	0.0028
Ts=Tair=85°C	average =	0.0000	0.0005	0.0007	0.0009	0.0012	0.0014	0.0017	0.0021	0.0023	0.0028
	st dev =	0.0000	0.0002	0.0001	0.0001	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002
	min =	0.0000	0.0002	0.0005	0.0007	0.0010	0.0012	0.0013	0.0019	0.0021	0.0025
	max =	0.0000	0.0009	0.0011	0.0014	0.0017	0.0020	0.0022	0.0025	0.0028	0.0032

Normalized Flux Statistics for I_f = 120mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	alpha	B	L70
	median =	1.0000	0.9969	0.9944	0.9920	0.9882	0.9850	0.9833	0.9805	0.9782	0.9756			
Ts=Tair=115°C	average =	1.0000	0.9973	0.9939	0.9912	0.9879	0.9848	0.9831	0.9808	0.9785	0.9756	2.4093e-06	0.9973	146,911
	st dev =	0.0000	0.0018	0.0021	0.0025	0.0031	0.0035	0.0035	0.0036	0.0037	0.0038	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9945	0.9904	0.9867	0.9824	0.9778	0.9762	0.9736	0.9715	0.9691			
	max =	1.0000	1.0008	0.9984	0.9953	0.9929	0.9913	0.9889	0.9866	0.9842	0.9818			
	median =	1.0000	0.9984	0.9961	0.9944	0.9920	0.9890	0.9866	0.9841	0.9824	0.9797			
Ts=Tair=105°C	average =	1.0000	0.9985	0.9960	0.9942	0.9919	0.9895	0.9870	0.9847	0.9824	0.9796	2.4692e-06	1.0018	145,176
	st dev =	0.0000	0.0017	0.0016	0.0016	0.0016	0.0018	0.0020	0.0023	0.0028	0.0031	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9952	0.9929	0.9907	0.9890	0.9859	0.9835	0.9811	0.9780	0.9740			
	max =	1.0000	1.0016	0.9984	0.9976	0.9952	0.9936	0.9920	0.9904	0.9888	0.9857			

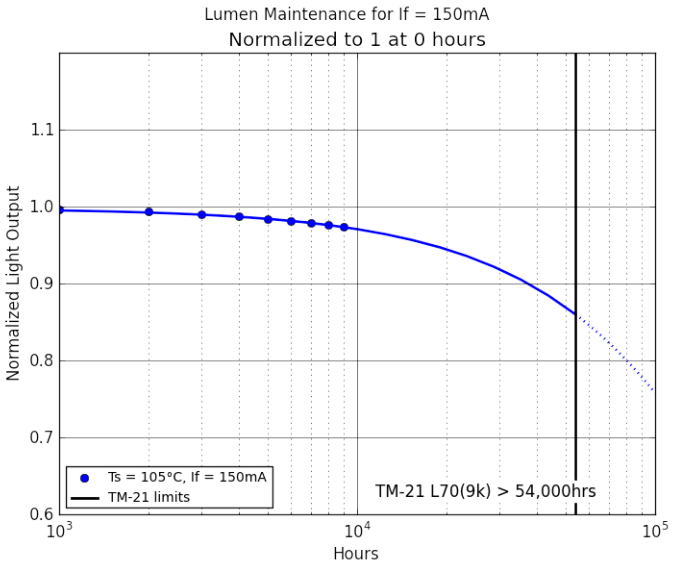


Delta u'v' for I_f = 120mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
	median =	0.0000	0.0007	0.0009	0.0013	0.0014	0.0017	0.0022	0.0024	0.0026	0.0028
Ts=Tair=115°C	average =	0.0000	0.0007	0.0010	0.0013	0.0015	0.0018	0.0021	0.0024	0.0026	0.0028
	st dev =	0.0000	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	min =	0.0000	0.0005	0.0008	0.0011	0.0013	0.0015	0.0019	0.0023	0.0023	0.0025
	max =	0.0000	0.0010	0.0013	0.0017	0.0020	0.0023	0.0025	0.0029	0.0031	0.0033
	median =	0.0000	0.0006	0.0007	0.0011	0.0013	0.0017	0.0019	0.0021	0.0024	0.0027
Ts=Tair=105°C	average =	0.0000	0.0006	0.0008	0.0011	0.0013	0.0017	0.0019	0.0022	0.0025	0.0028
	st dev =	0.0000	0.0002	0.0002	0.0002	0.0003	0.0003	0.0002	0.0003	0.0003	0.0003
	min =	0.0000	0.0002	0.0006	0.0009	0.0008	0.0012	0.0017	0.0019	0.0020	0.0022
	max =	0.0000	0.0013	0.0014	0.0020	0.0024	0.0027	0.0028	0.0031	0.0035	0.0038

Normalized Flux Statistics for I_f = 150mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	alpha	B	L70
	median =	1.0000	0.9961	0.9929	0.9902	0.9867	0.9837	0.9813	0.9791	0.9762	0.9741			
Ts=Tair=105°C	average =	1.0000	0.9965	0.9934	0.9904	0.9870	0.9840	0.9812	0.9787	0.9761	0.9733	2.7514e-06	0.9977	128,800
	st dev =	0.0000	0.0017	0.0018	0.0021	0.0022	0.0024	0.0022	0.0023	0.0024	0.0026	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9942	0.9904	0.9866	0.9838	0.9806	0.9780	0.9741	0.9715	0.9683			
	max =	1.0000	1.0013	0.9980	0.9954	0.9935	0.9895	0.9852	0.9830	0.9810	0.9784			

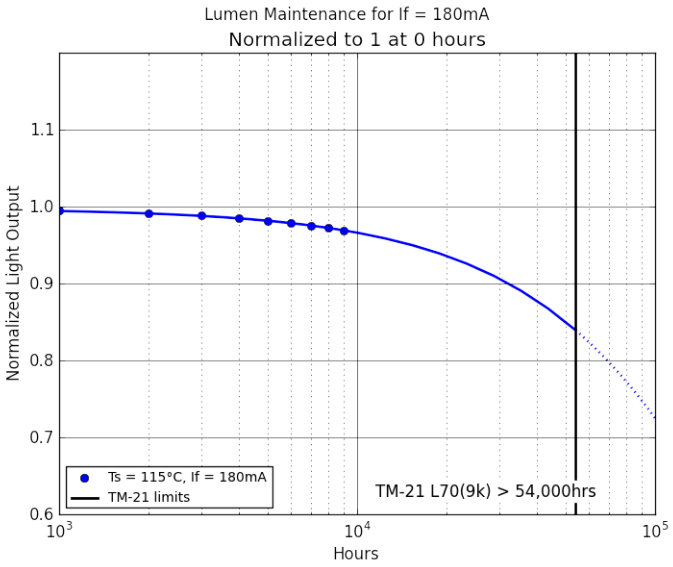


Delta u'v' for I_f = 150mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
	median =	0.0000	0.0008	0.0011	0.0014	0.0019	0.0021	0.0023	0.0026	0.0029	0.0032
Ts=Tair=105°C	average =	0.0000	0.0008	0.0011	0.0014	0.0019	0.0021	0.0022	0.0026	0.0029	0.0032
	st dev =	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	min =	0.0000	0.0006	0.0009	0.0013	0.0017	0.0018	0.0021	0.0023	0.0027	0.0030
	max =	0.0000	0.0010	0.0012	0.0016	0.0021	0.0023	0.0025	0.0028	0.0030	0.0034

Normalized Flux Statistics for I_f = 180mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	alpha	B	L70
	median =	1.0000	0.9945	0.9912	0.9888	0.9848	0.9818	0.9786	0.9752	0.9724	0.9692			
Ts=Tair=115°C	average =	1.0000	0.9949	0.9917	0.9887	0.9849	0.9816	0.9784	0.9753	0.9724	0.9692	3.1912e-06	0.9974	110,959
	st dev =	0.0000	0.0018	0.0022	0.0023	0.0024	0.0026	0.0029	0.0029	0.0024	0.0024	TM-21 L70(9k) > 54,000hrs		
	min =	1.0000	0.9917	0.9873	0.9846	0.9791	0.9757	0.9719	0.9680	0.9658	0.9631			
	max =	1.0000	0.9989	0.9972	0.9949	0.9898	0.9864	0.9835	0.9801	0.9761	0.9733			



Delta u'v' for I_f = 180mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
	median =	0.0000	0.0008	0.0010	0.0015	0.0019	0.0021	0.0025	0.0028	0.0029	0.0031
Ts=Tair=115°C	average =	0.0000	0.0008	0.0011	0.0015	0.0019	0.0021	0.0025	0.0028	0.0029	0.0031
	st dev =	0.0000	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0002
	min =	0.0000	0.0005	0.0008	0.0013	0.0015	0.0017	0.0023	0.0026	0.0027	0.0028
	max =	0.0000	0.0012	0.0015	0.0019	0.0023	0.0025	0.0029	0.0032	0.0033	0.0035

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 55°C$, $I_f = 65mA$; $T_s \geq 53°C$ 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	3117K	72.490	72.770	72.730	72.720	72.600	72.450	72.370	72.230	72.010	71.760
2	3115K	72.320	72.550	72.490	72.410	72.300	72.250	72.230	72.150	72.040	71.910
3	3106K	72.840	72.940	72.910	72.830	72.760	72.670	72.630	72.610	72.520	72.420
4	3104K	72.790	73.130	73.080	73.070	72.920	72.850	72.730	72.580	72.480	72.330
5	3088K	73.240	73.430	73.290	73.220	73.200	73.090	72.970	72.860	72.790	72.630
6	3123K	72.120	72.470	72.440	72.380	72.260	72.200	72.030	71.860	71.680	71.520
7	3085K	72.660	72.930	72.850	72.840	72.630	72.620	72.470	72.420	72.300	72.070
8	3126K	72.960	73.220	73.140	73.030	72.990	72.880	72.750	72.600	72.560	72.520
9	3101K	73.140	73.430	73.370	73.340	73.190	73.150	73.050	72.860	72.650	72.450
10	3139K	73.820	74.200	74.100	74.040	73.960	73.930	73.710	73.570	73.420	73.290
11	3106K	73.070	73.340	73.260	73.160	73.150	73.050	72.870	72.730	72.470	72.290
12	3134K	70.820	71.090	71.020	70.890	70.850	70.750	70.580	70.540	70.390	70.270
13	3124K	70.900	71.140	71.090	71.080	70.980	70.890	70.820	70.710	70.680	70.670
14	3136K	72.000	72.220	72.160	72.130	71.970	71.810	71.770	71.570	71.330	71.210
15	3107K	73.470	73.570	73.500	73.440	73.390	73.270	73.110	73.020	72.830	72.730
16	3100K	72.310	72.570	72.460	72.400	72.300	72.170	72.090	71.930	71.780	71.630
17	3117K	72.930	73.210	73.150	73.080	72.980	72.870	72.680	72.550	72.450	72.280
18	3098K	73.160	73.390	73.320	73.230	73.120	73.060	72.880	72.680	72.600	72.440
19	3142K	71.640	72.010	71.960	71.900	71.780	71.670	71.570	71.450	71.340	71.190
20	3103K	73.540	73.810	73.710	73.650	73.560	73.350	73.330	73.270	73.180	73.040
21	3105K	72.790	73.100	73.080	73.060	72.860	72.780	72.660	72.470	72.440	72.290
22	3121K	72.370	72.540	72.480	72.420	72.380	72.230	72.150	72.020	71.850	71.690
23	2965K	73.800	74.000	73.980	73.880	73.760	73.650	73.550	73.370	73.220	73.120
24	3101K	73.060	73.330	73.280	73.240	73.080	73.030	72.910	72.880	72.710	72.650
25	3104K	70.290	70.470	70.460	70.450	70.270	70.110	70.090	69.980	69.740	69.610

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 55°C$, $I_f = 65mA$; $T_s \geq 53°C$ 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	3117K	1.0000	1.0039	1.0033	1.0032	1.0015	0.9994	0.9983	0.9964	0.9934	0.9899
2	3115K	1.0000	1.0032	1.0024	1.0012	0.9997	0.9990	0.9988	0.9976	0.9961	0.9943
3	3106K	1.0000	1.0014	1.0010	0.9999	0.9989	0.9977	0.9971	0.9968	0.9956	0.9942
4	3104K	1.0000	1.0047	1.0040	1.0038	1.0018	1.0008	0.9992	0.9971	0.9957	0.9937
5	3088K	1.0000	1.0026	1.0007	0.9997	0.9995	0.9980	0.9963	0.9948	0.9939	0.9917
6	3123K	1.0000	1.0049	1.0044	1.0036	1.0019	1.0011	0.9988	0.9964	0.9939	0.9917
7	3085K	1.0000	1.0037	1.0026	1.0025	0.9996	0.9994	0.9974	0.9967	0.9950	0.9919
8	3126K	1.0000	1.0036	1.0025	1.0010	1.0004	0.9989	0.9971	0.9951	0.9945	0.9940
9	3101K	1.0000	1.0040	1.0031	1.0027	1.0007	1.0001	0.9988	0.9962	0.9933	0.9906
10	3139K	1.0000	1.0051	1.0038	1.0030	1.0019	1.0015	0.9985	0.9966	0.9946	0.9928
11	3106K	1.0000	1.0037	1.0026	1.0012	1.0011	0.9997	0.9973	0.9953	0.9918	0.9893
12	3134K	1.0000	1.0038	1.0028	1.0010	1.0004	0.9990	0.9966	0.9960	0.9939	0.9922
13	3124K	1.0000	1.0034	1.0027	1.0025	1.0011	0.9999	0.9989	0.9973	0.9969	0.9968
14	3136K	1.0000	1.0031	1.0022	1.0018	0.9996	0.9974	0.9968	0.9940	0.9907	0.9890
15	3107K	1.0000	1.0014	1.0004	0.9996	0.9989	0.9973	0.9951	0.9939	0.9913	0.9899
16	3100K	1.0000	1.0036	1.0021	1.0012	0.9999	0.9981	0.9970	0.9947	0.9927	0.9906
17	3117K	1.0000	1.0038	1.0030	1.0021	1.0007	0.9992	0.9966	0.9948	0.9934	0.9911
18	3098K	1.0000	1.0031	1.0022	1.0010	0.9995	0.9986	0.9962	0.9934	0.9923	0.9902
19	3142K	1.0000	1.0052	1.0045	1.0036	1.0020	1.0004	0.9990	0.9973	0.9958	0.9937
20	3103K	1.0000	1.0037	1.0023	1.0015	1.0003	0.9974	0.9971	0.9963	0.9951	0.9932
21	3105K	1.0000	1.0043	1.0040	1.0037	1.0010	0.9999	0.9982	0.9956	0.9952	0.9931
22	3121K	1.0000	1.0023	1.0015	1.0007	1.0001	0.9981	0.9970	0.9952	0.9928	0.9906
23	2965K	1.0000	1.0027	1.0024	1.0011	0.9995	0.9980	0.9966	0.9942	0.9921	0.9908
24	3101K	1.0000	1.0037	1.0030	1.0025	1.0003	0.9996	0.9979	0.9975	0.9952	0.9944
25	3104K	1.0000	1.0026	1.0024	1.0023	0.9997	0.9974	0.9972	0.9956	0.9922	0.9903

CIE 1976 u' data for tested units
$T_s = T_{air}$ = 55°C, I_f = 65mA; $T_s \geq$ 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	3117K	0.2469	0.2467	0.2469	0.2468	0.2465	0.2464	0.2466	0.2465	0.2463	0.2460
2	3115K	0.2467	0.2463	0.2465	0.2462	0.2460	0.2459	0.2461	0.2461	0.2458	0.2455
3	3106K	0.2473	0.2471	0.2472	0.2470	0.2468	0.2466	0.2469	0.2468	0.2465	0.2461
4	3104K	0.2472	0.2469	0.2471	0.2470	0.2466	0.2466	0.2468	0.2467	0.2465	0.2461
5	3088K	0.2480	0.2478	0.2480	0.2479	0.2476	0.2475	0.2477	0.2476	0.2473	0.2470
6	3123K	0.2465	0.2463	0.2464	0.2464	0.2460	0.2459	0.2462	0.2461	0.2456	0.2454
7	3085K	0.2481	0.2478	0.2480	0.2479	0.2476	0.2473	0.2477	0.2476	0.2472	0.2469
8	3126K	0.2465	0.2463	0.2464	0.2463	0.2460	0.2459	0.2461	0.2460	0.2457	0.2454
9	3101K	0.2471	0.2468	0.2470	0.2469	0.2466	0.2465	0.2467	0.2466	0.2463	0.2460
10	3139K	0.2463	0.2460	0.2461	0.2460	0.2457	0.2456	0.2459	0.2457	0.2454	0.2450
11	3106K	0.2473	0.2471	0.2473	0.2473	0.2468	0.2467	0.2471	0.2469	0.2465	0.2462
12	3134K	0.2463	0.2462	0.2463	0.2463	0.2458	0.2458	0.2461	0.2459	0.2457	0.2453
13	3124K	0.2465	0.2459	0.2460	0.2461	0.2455	0.2454	0.2459	0.2457	0.2454	0.2451
14	3136K	0.2457	0.2455	0.2456	0.2456	0.2452	0.2451	0.2454	0.2452	0.2449	0.2447
15	3107K	0.2470	0.2467	0.2468	0.2467	0.2463	0.2465	0.2467	0.2465	0.2462	0.2459
16	3100K	0.2473	0.2471	0.2472	0.2471	0.2467	0.2469	0.2470	0.2468	0.2464	0.2462
17	3117K	0.2469	0.2467	0.2467	0.2466	0.2462	0.2464	0.2466	0.2464	0.2460	0.2457
18	3098K	0.2473	0.2471	0.2472	0.2471	0.2468	0.2469	0.2471	0.2469	0.2466	0.2463
19	3142K	0.2456	0.2454	0.2455	0.2455	0.2451	0.2452	0.2454	0.2452	0.2448	0.2446
20	3103K	0.2476	0.2474	0.2474	0.2474	0.2471	0.2472	0.2473	0.2472	0.2468	0.2466
21	3105K	0.2472	0.2471	0.2472	0.2472	0.2468	0.2469	0.2471	0.2469	0.2465	0.2463
22	3121K	0.2464	0.2462	0.2463	0.2462	0.2459	0.2460	0.2461	0.2459	0.2456	0.2452
23	2965K	0.2512	0.2509	0.2511	0.2510	0.2506	0.2508	0.2509	0.2507	0.2503	0.2501
24	3101K	0.2475	0.2473	0.2475	0.2474	0.2471	0.2472	0.2474	0.2472	0.2469	0.2466
25	3104K	0.2476	0.2473	0.2474	0.2474	0.2470	0.2471	0.2473	0.2471	0.2467	0.2464

CIE 1976 v' data for tested units
$T_s = T_{air}$ = 55°C, I_f = 65mA; $T_s \geq$ 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	3117K	0.5179	0.5178	0.5176	0.5174	0.5170	0.5168	0.5164	0.5162	0.5159	0.5158
2	3115K	0.5189	0.5185	0.5184	0.5182	0.5179	0.5177	0.5172	0.5169	0.5166	0.5166
3	3106K	0.5179	0.5177	0.5175	0.5174	0.5170	0.5168	0.5164	0.5161	0.5158	0.5158
4	3104K	0.5185	0.5182	0.5180	0.5179	0.5175	0.5174	0.5169	0.5167	0.5165	0.5164
5	3088K	0.5179	0.5178	0.5176	0.5175	0.5171	0.5169	0.5165	0.5162	0.5159	0.5159
6	3123K	0.5185	0.5182	0.5181	0.5179	0.5175	0.5174	0.5169	0.5167	0.5164	0.5163
7	3085K	0.5179	0.5177	0.5175	0.5174	0.5170	0.5168	0.5163	0.5161	0.5158	0.5157
8	3126K	0.5181	0.5179	0.5177	0.5176	0.5172	0.5171	0.5166	0.5163	0.5161	0.5160
9	3101K	0.5193	0.5191	0.5189	0.5189	0.5185	0.5183	0.5179	0.5176	0.5173	0.5172
10	3139K	0.5170	0.5167	0.5165	0.5165	0.5161	0.5159	0.5155	0.5152	0.5149	0.5148
11	3106K	0.5179	0.5178	0.5175	0.5175	0.5171	0.5169	0.5166	0.5162	0.5159	0.5158
12	3134K	0.5177	0.5175	0.5174	0.5173	0.5169	0.5167	0.5163	0.5160	0.5157	0.5156
13	3124K	0.5184	0.5177	0.5175	0.5175	0.5170	0.5168	0.5164	0.5161	0.5159	0.5158
14	3136K	0.5195	0.5194	0.5192	0.5191	0.5187	0.5186	0.5183	0.5177	0.5176	0.5175
15	3107K	0.5188	0.5185	0.5183	0.5182	0.5178	0.5177	0.5174	0.5170	0.5168	0.5167
16	3100K	0.5187	0.5185	0.5183	0.5182	0.5178	0.5176	0.5173	0.5169	0.5166	0.5165
17	3117K	0.5178	0.5174	0.5172	0.5170	0.5167	0.5164	0.5162	0.5158	0.5155	0.5154
18	3098K	0.5191	0.5190	0.5188	0.5185	0.5182	0.5179	0.5177	0.5173	0.5170	0.5169
19	3142K	0.5191	0.5190	0.5188	0.5188	0.5184	0.5181	0.5178	0.5175	0.5172	0.5171
20	3103K	0.5172	0.5170	0.5168	0.5168	0.5164	0.5160	0.5158	0.5155	0.5152	0.5151
21	3105K	0.5184	0.5183	0.5180	0.5180	0.5176	0.5173	0.5170	0.5167	0.5164	0.5163
22	3121K	0.5191	0.5189	0.5187	0.5186	0.5183	0.5180	0.5177	0.5174	0.5170	0.5168
23	2965K	0.5245	0.5243	0.5240	0.5240	0.5237	0.5233	0.5231	0.5228	0.5224	0.5224
24	3101K	0.5179	0.5178	0.5176	0.5175	0.5172	0.5168	0.5166	0.5163	0.5161	0.5159
25	3104K	0.5171	0.5169	0.5167	0.5167	0.5163	0.5159	0.5158	0.5154	0.5151	0.5150

Delta u'v' data for tested units

$T_s = T_{air} = 55°C$, $I_f = 65mA$; $T_s \geq 53°C$ 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	3117K	0.0000	0.0002	0.0003	0.0005	0.0010	0.0012	0.0015	0.0017	0.0021	0.0023
2	3115K	0.0000	0.0006	0.0005	0.0009	0.0012	0.0014	0.0018	0.0021	0.0025	0.0026
3	3106K	0.0000	0.0003	0.0004	0.0006	0.0010	0.0013	0.0016	0.0019	0.0022	0.0024
4	3104K	0.0000	0.0004	0.0005	0.0006	0.0012	0.0013	0.0016	0.0019	0.0021	0.0024
5	3088K	0.0000	0.0002	0.0003	0.0004	0.0009	0.0011	0.0014	0.0017	0.0021	0.0022
6	3123K	0.0000	0.0004	0.0004	0.0006	0.0011	0.0013	0.0016	0.0018	0.0023	0.0025
7	3085K	0.0000	0.0004	0.0004	0.0005	0.0010	0.0014	0.0016	0.0019	0.0023	0.0025
8	3126K	0.0000	0.0003	0.0004	0.0005	0.0010	0.0012	0.0016	0.0019	0.0022	0.0024
9	3101K	0.0000	0.0004	0.0004	0.0004	0.0009	0.0012	0.0015	0.0018	0.0022	0.0024
10	3139K	0.0000	0.0004	0.0005	0.0006	0.0011	0.0013	0.0016	0.0019	0.0023	0.0026
11	3106K	0.0000	0.0002	0.0004	0.0004	0.0009	0.0012	0.0013	0.0017	0.0022	0.0024
12	3134K	0.0000	0.0002	0.0003	0.0004	0.0009	0.0011	0.0014	0.0017	0.0021	0.0023
13	3124K	0.0000	0.0009	0.0010	0.0010	0.0017	0.0019	0.0021	0.0024	0.0027	0.0030
14	3136K	0.0000	0.0002	0.0003	0.0004	0.0009	0.0011	0.0012	0.0019	0.0021	0.0022
15	3107K	0.0000	0.0004	0.0005	0.0007	0.0012	0.0012	0.0014	0.0019	0.0022	0.0024
16	3100K	0.0000	0.0003	0.0004	0.0005	0.0011	0.0012	0.0014	0.0019	0.0023	0.0025
17	3117K	0.0000	0.0004	0.0006	0.0009	0.0013	0.0015	0.0016	0.0021	0.0025	0.0027
18	3098K	0.0000	0.0002	0.0003	0.0006	0.0010	0.0013	0.0014	0.0018	0.0022	0.0024
19	3142K	0.0000	0.0002	0.0003	0.0003	0.0009	0.0011	0.0013	0.0016	0.0021	0.0022
20	3103K	0.0000	0.0003	0.0004	0.0004	0.0009	0.0013	0.0014	0.0017	0.0022	0.0023
21	3105K	0.0000	0.0001	0.0004	0.0004	0.0009	0.0011	0.0014	0.0017	0.0021	0.0023
22	3121K	0.0000	0.0003	0.0004	0.0005	0.0009	0.0012	0.0014	0.0018	0.0022	0.0026
23	2965K	0.0000	0.0004	0.0005	0.0005	0.0010	0.0013	0.0014	0.0018	0.0023	0.0024
24	3101K	0.0000	0.0002	0.0003	0.0004	0.0008	0.0011	0.0013	0.0016	0.0019	0.0022
25	3104K	0.0000	0.0004	0.0004	0.0004	0.0010	0.0013	0.0013	0.0018	0.0022	0.0024

Forward Voltage [V] data for tested units

$T_s = T_{air} = 55°C$, $I_f = 65mA$; $T_s \geq 53°C$ 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	3117K	5.546	5.548	5.556	5.553	5.551	5.546	5.553	5.546	5.557	5.545
2	3115K	5.577	5.584	5.582	5.588	5.584	5.575	5.599	5.575	5.574	5.575
3	3106K	5.642	5.620	5.613	5.620	5.616	5.611	5.620	5.617	5.608	5.607
4	3104K	5.602	5.602	5.597	5.606	5.678	5.597	5.601	5.596	5.592	5.594
5	3088K	5.705	5.611	5.603	5.607	5.602	5.596	5.605	5.595	5.596	5.596
6	3123K	5.567	5.584	5.568	5.579	5.573	5.577	5.575	5.567	5.564	5.569
7	3085K	5.565	5.568	5.570	5.582	5.571	5.607	5.576	5.565	5.563	5.564
8	3126K	5.595	5.595	5.596	5.611	5.601	5.598	5.596	5.596	5.592	5.590
9	3101K	5.602	5.567	5.559	5.587	5.568	5.561	5.563	5.557	5.555	5.558
10	3139K	5.697	5.744	5.615	5.627	5.616	5.676	5.616	5.612	5.609	5.609
11	3106K	5.580	5.627	5.577	5.586	5.581	5.637	5.577	5.584	5.574	5.572
12	3134K	5.606	5.566	5.567	5.576	5.570	5.568	5.566	5.563	5.561	5.563
13	3124K	5.589	5.591	5.595	5.607	5.640	5.705	5.594	5.590	5.591	5.589
14	3136K	5.601	5.587	5.585	5.595	5.589	5.583	5.587	5.581	5.578	5.581
15	3107K	5.575	5.577	5.575	5.584	5.585	5.586	5.581	5.574	5.573	5.572
16	3100K	5.577	5.728	5.555	5.566	5.557	5.562	5.558	5.555	5.551	5.551
17	3117K	5.593	5.594	5.598	5.607	5.600	5.612	5.595	5.594	5.591	5.591
18	3098K	5.566	5.568	5.567	5.577	5.572	5.572	5.572	5.566	5.562	5.563
19	3142K	5.797	5.610	5.595	5.646	5.596	5.637	5.592	5.590	5.586	5.586
20	3103K	5.593	5.603	5.597	5.606	5.598	5.646	5.601	5.596	5.594	5.592
21	3105K	5.578	5.580	5.582	5.590	5.593	5.586	5.582	5.581	5.577	5.578
22	3121K	5.574	5.574	5.575	5.583	5.577	5.576	5.575	5.570	5.570	5.569
23	2965K	5.599	5.603	5.609	5.611	5.832	5.602	5.599	5.597	5.595	5.596
24	3101K	5.576	5.601	5.593	5.587	5.585	5.582	5.588	5.575	5.574	5.571
25	3104K	5.595	5.602	5.593	5.608	5.598	5.614	5.596	5.595	5.612	5.590

Luminous Flux [lm] data for tested units

$T_s = T_{air}$ = 105°C, I_f = 65mA; $T_s \geq$ 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	3114K	73.390	73.610	73.550	73.500	73.360	73.310	73.170	73.030	72.890	72.790
2	3090K	72.100	72.280	72.150	72.110	72.040	71.800	71.690	71.520	71.350	71.150
3	3109K	73.490	73.600	73.500	73.380	73.210	73.040	72.910	72.810	72.680	72.520
4	3118K	73.570	73.710	73.590	73.480	73.300	73.220	73.010	72.880	72.700	72.530
5	2947K	73.070	73.160	73.020	72.910	72.700	72.650	72.520	72.370	72.130	71.930
6	3104K	72.430	72.580	72.550	72.480	72.330	72.210	71.970	71.890	71.670	71.600
7	2920K	71.660	71.790	71.550	71.540	71.420	71.300	71.100	70.960	70.760	70.680
8	3117K	73.240	73.390	73.310	73.230	73.120	72.910	72.810	72.550	72.520	72.370
9	3117K	70.540	70.590	70.420	70.390	70.320	70.260	70.110	69.920	69.840	69.660
10	3126K	71.440	71.550	71.420	71.240	71.090	70.970	70.940	70.760	70.540	70.440
11	3089K	72.030	72.070	71.990	71.820	71.670	71.500	71.420	71.310	71.130	70.910
12	3091K	71.480	71.600	71.470	71.330	71.270	71.210	70.990	70.820	70.750	70.700
13	3127K	70.920	71.140	71.040	70.990	70.870	70.700	70.620	70.450	70.280	70.140
14	3117K	71.880	72.080	71.930	71.830	71.800	71.670	71.520	71.390	71.310	71.170
15	3085K	72.680	72.820	72.660	72.560	72.490	72.380	72.230	72.110	72.000	71.940
16	3096K	71.200	71.270	71.160	71.050	70.950	70.760	70.670	70.590	70.460	70.330
17	3106K	73.460	73.470	73.400	73.290	73.240	73.120	72.990	72.880	72.710	72.610
18	3081K	72.870	72.900	72.820	72.690	72.630	72.480	72.320	72.200	72.100	72.010
19	3100K	72.430	72.480	72.370	72.210	72.030	71.890	71.820	71.590	71.320	71.290
20	3082K	71.610	71.680	71.590	71.460	71.370	71.200	70.970	70.740	70.510	70.340
21	2961K	73.470	73.620	73.460	73.380	73.340	73.120	72.890	72.770	72.550	72.340
22	3101K	72.680	72.840	72.620	72.580	72.430	72.260	72.080	72.030	71.880	71.790
23	3099K	72.430	72.560	72.420	72.390	72.270	72.100	71.910	71.780	71.750	71.620
24	3121K	72.650	72.860	72.820	72.730	72.590	72.500	72.350	72.270	72.090	71.930
25	3107K	72.460	72.570	72.470	72.370	72.240	72.120	71.940	71.890	71.660	71.450

Normalized Luminous Flux data for tested units

$T_s = T_{air}$ = 105°C, I_f = 65mA; $T_s \geq$ 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	3114K	1.0000	1.0030	1.0022	1.0015	0.9996	0.9989	0.9970	0.9951	0.9932	0.9918
2	3090K	1.0000	1.0025	1.0007	1.0001	0.9992	0.9958	0.9943	0.9920	0.9896	0.9868
3	3109K	1.0000	1.0015	1.0001	0.9985	0.9962	0.9939	0.9921	0.9907	0.9890	0.9868
4	3118K	1.0000	1.0019	1.0003	0.9988	0.9963	0.9952	0.9924	0.9906	0.9882	0.9859
5	2947K	1.0000	1.0012	0.9993	0.9978	0.9949	0.9943	0.9925	0.9904	0.9871	0.9844
6	3104K	1.0000	1.0021	1.0017	1.0007	0.9986	0.9970	0.9936	0.9925	0.9895	0.9885
7	2920K	1.0000	1.0018	0.9985	0.9983	0.9967	0.9950	0.9922	0.9902	0.9874	0.9863
8	3117K	1.0000	1.0020	1.0010	0.9999	0.9984	0.9955	0.9941	0.9906	0.9902	0.9881
9	3117K	1.0000	1.0007	0.9983	0.9979	0.9969	0.9960	0.9939	0.9912	0.9901	0.9875
10	3126K	1.0000	1.0015	0.9997	0.9972	0.9951	0.9934	0.9930	0.9905	0.9874	0.9860
11	3089K	1.0000	1.0006	0.9994	0.9971	0.9950	0.9926	0.9915	0.9900	0.9875	0.9845
12	3091K	1.0000	1.0017	0.9999	0.9979	0.9971	0.9962	0.9931	0.9908	0.9898	0.9891
13	3127K	1.0000	1.0031	1.0017	1.0010	0.9993	0.9969	0.9958	0.9934	0.9910	0.9890
14	3117K	1.0000	1.0028	1.0007	0.9993	0.9989	0.9971	0.9950	0.9932	0.9921	0.9901
15	3085K	1.0000	1.0019	0.9997	0.9983	0.9974	0.9959	0.9938	0.9922	0.9906	0.9898
16	3096K	1.0000	1.0010	0.9994	0.9979	0.9965	0.9938	0.9926	0.9914	0.9896	0.9878
17	3106K	1.0000	1.0001	0.9992	0.9977	0.9970	0.9954	0.9936	0.9921	0.9898	0.9884
18	3081K	1.0000	1.0004	0.9993	0.9975	0.9967	0.9946	0.9925	0.9908	0.9894	0.9882
19	3100K	1.0000	1.0007	0.9992	0.9970	0.9945	0.9925	0.9916	0.9884	0.9847	0.9843
20	3082K	1.0000	1.0010	0.9997	0.9979	0.9966	0.9943	0.9911	0.9879	0.9846	0.9823
21	2961K	1.0000	1.0020	0.9999	0.9988	0.9982	0.9952	0.9921	0.9905	0.9875	0.9846
22	3101K	1.0000	1.0022	0.9992	0.9986	0.9966	0.9942	0.9917	0.9911	0.9890	0.9878
23	3099K	1.0000	1.0018	0.9999	0.9994	0.9978	0.9954	0.9928	0.9910	0.9906	0.9888
24	3121K	1.0000	1.0029	1.0023	1.0011	0.9992	0.9979	0.9959	0.9948	0.9923	0.9901
25	3107K	1.0000	1.0015	1.0001	0.9988	0.9970	0.9953	0.9928	0.9921	0.9890	0.9861

CIE 1976 u' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 65mA; $T_s \geq$ 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	3114K	0.2464	0.2461	0.2462	0.2461	0.2456	0.2459	0.2460	0.2459	0.2456	0.2452
2	3090K	0.2481	0.2477	0.2478	0.2478	0.2474	0.2476	0.2477	0.2476	0.2472	0.2469
3	3109K	0.2472	0.2469	0.2470	0.2470	0.2465	0.2467	0.2470	0.2468	0.2464	0.2461
4	3118K	0.2468	0.2465	0.2466	0.2465	0.2461	0.2463	0.2465	0.2463	0.2459	0.2456
5	2947K	0.2519	0.2515	0.2516	0.2515	0.2511	0.2513	0.2515	0.2513	0.2510	0.2507
6	3104K	0.2474	0.2471	0.2472	0.2471	0.2467	0.2469	0.2471	0.2469	0.2466	0.2462
7	2920K	0.2538	0.2535	0.2536	0.2535	0.2530	0.2533	0.2534	0.2533	0.2529	0.2526
8	3117K	0.2467	0.2463	0.2464	0.2463	0.2458	0.2461	0.2463	0.2461	0.2458	0.2455
9	3117K	0.2468	0.2467	0.2467	0.2465	0.2461	0.2464	0.2465	0.2464	0.2460	0.2457
10	3126K	0.2470	0.2467	0.2468	0.2467	0.2463	0.2464	0.2466	0.2464	0.2461	0.2458
11	3089K	0.2481	0.2478	0.2478	0.2478	0.2474	0.2476	0.2477	0.2475	0.2472	0.2468
12	3091K	0.2477	0.2475	0.2475	0.2475	0.2470	0.2472	0.2474	0.2472	0.2469	0.2466
13	3127K	0.2461	0.2458	0.2459	0.2458	0.2454	0.2456	0.2458	0.2456	0.2453	0.2449
14	3117K	0.2459	0.2456	0.2456	0.2455	0.2452	0.2454	0.2455	0.2453	0.2450	0.2448
15	3085K	0.2480	0.2476	0.2477	0.2477	0.2472	0.2474	0.2476	0.2474	0.2470	0.2467
16	3096K	0.2477	0.2473	0.2474	0.2474	0.2469	0.2471	0.2472	0.2471	0.2467	0.2464
17	3106K	0.2473	0.2470	0.2470	0.2470	0.2465	0.2468	0.2469	0.2467	0.2463	0.2460
18	3081K	0.2482	0.2479	0.2480	0.2479	0.2474	0.2477	0.2478	0.2476	0.2473	0.2470
19	3100K	0.2473	0.2469	0.2470	0.2469	0.2464	0.2466	0.2468	0.2466	0.2461	0.2459
20	3082K	0.2483	0.2480	0.2481	0.2480	0.2476	0.2477	0.2479	0.2477	0.2475	0.2471
21	2961K	0.2517	0.2513	0.2515	0.2514	0.2508	0.2510	0.2512	0.2510	0.2507	0.2504
22	3101K	0.2474	0.2471	0.2471	0.2470	0.2466	0.2467	0.2469	0.2467	0.2464	0.2461
23	3099K	0.2479	0.2476	0.2477	0.2476	0.2472	0.2473	0.2475	0.2473	0.2471	0.2467
24	3121K	0.2471	0.2467	0.2468	0.2467	0.2463	0.2465	0.2466	0.2465	0.2462	0.2458
25	3107K	0.2474	0.2471	0.2471	0.2470	0.2466	0.2467	0.2469	0.2467	0.2464	0.2461

CIE 1976 v' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 65mA; $T_s \geq$ 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	3114K	0.5200	0.5197	0.5195	0.5192	0.5191	0.5187	0.5185	0.5182	0.5179	0.5177
2	3090K	0.5172	0.5170	0.5166	0.5164	0.5162	0.5159	0.5157	0.5153	0.5150	0.5149
3	3109K	0.5179	0.5176	0.5173	0.5172	0.5169	0.5166	0.5165	0.5162	0.5157	0.5156
4	3118K	0.5181	0.5178	0.5175	0.5173	0.5170	0.5168	0.5166	0.5163	0.5160	0.5158
5	2947K	0.5247	0.5244	0.5240	0.5239	0.5237	0.5234	0.5231	0.5228	0.5226	0.5225
6	3104K	0.5178	0.5175	0.5171	0.5170	0.5167	0.5164	0.5162	0.5159	0.5156	0.5154
7	2920K	0.5216	0.5213	0.5209	0.5208	0.5205	0.5202	0.5200	0.5197	0.5194	0.5192
8	3117K	0.5186	0.5182	0.5179	0.5177	0.5175	0.5172	0.5170	0.5166	0.5164	0.5162
9	3117K	0.5182	0.5180	0.5177	0.5175	0.5172	0.5169	0.5167	0.5164	0.5160	0.5159
10	3126K	0.5163	0.5159	0.5156	0.5155	0.5152	0.5149	0.5147	0.5144	0.5142	0.5140
11	3089K	0.5174	0.5169	0.5166	0.5165	0.5162	0.5159	0.5157	0.5153	0.5151	0.5148
12	3091K	0.5186	0.5185	0.5180	0.5179	0.5177	0.5174	0.5172	0.5168	0.5166	0.5164
13	3127K	0.5193	0.5190	0.5187	0.5185	0.5183	0.5180	0.5177	0.5174	0.5172	0.5169
14	3117K	0.5214	0.5211	0.5208	0.5206	0.5204	0.5201	0.5199	0.5195	0.5193	0.5192
15	3085K	0.5183	0.5180	0.5176	0.5175	0.5173	0.5170	0.5168	0.5164	0.5162	0.5160
16	3096K	0.5179	0.5176	0.5173	0.5171	0.5169	0.5166	0.5164	0.5161	0.5158	0.5156
17	3106K	0.5179	0.5177	0.5173	0.5172	0.5169	0.5167	0.5165	0.5161	0.5158	0.5157
18	3081K	0.5182	0.5180	0.5177	0.5175	0.5172	0.5170	0.5167	0.5164	0.5161	0.5160
19	3100K	0.5187	0.5184	0.5180	0.5179	0.5176	0.5173	0.5171	0.5168	0.5164	0.5163
20	3082K	0.5176	0.5173	0.5169	0.5168	0.5165	0.5162	0.5159	0.5158	0.5155	0.5153
21	2961K	0.5232	0.5230	0.5226	0.5225	0.5222	0.5218	0.5215	0.5214	0.5211	0.5209
22	3101K	0.5183	0.5180	0.5176	0.5175	0.5172	0.5168	0.5166	0.5164	0.5161	0.5159
23	3099K	0.5167	0.5163	0.5161	0.5159	0.5156	0.5152	0.5150	0.5148	0.5145	0.5144
24	3121K	0.5166	0.5164	0.5161	0.5159	0.5157	0.5153	0.5151	0.5149	0.5147	0.5144
25	3107K	0.5174	0.5171	0.5168	0.5166	0.5163	0.5159	0.5157	0.5155	0.5152	0.5150

Delta u'v' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 65mA; $T_s \geq$ 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	3114K	0.0000	0.0004	0.0005	0.0009	0.0012	0.0014	0.0016	0.0019	0.0022	0.0026
2	3090K	0.0000	0.0004	0.0007	0.0009	0.0012	0.0014	0.0016	0.0020	0.0024	0.0026
3	3109K	0.0000	0.0004	0.0006	0.0007	0.0012	0.0014	0.0014	0.0017	0.0023	0.0025
4	3118K	0.0000	0.0004	0.0006	0.0009	0.0013	0.0014	0.0015	0.0019	0.0023	0.0026
5	2947K	0.0000	0.0005	0.0008	0.0009	0.0013	0.0014	0.0016	0.0020	0.0023	0.0025
6	3104K	0.0000	0.0004	0.0007	0.0009	0.0013	0.0015	0.0016	0.0020	0.0023	0.0027
7	2920K	0.0000	0.0004	0.0007	0.0009	0.0014	0.0015	0.0016	0.0020	0.0024	0.0027
8	3117K	0.0000	0.0006	0.0008	0.0010	0.0014	0.0015	0.0016	0.0021	0.0024	0.0027
9	3117K	0.0000	0.0002	0.0005	0.0008	0.0012	0.0014	0.0015	0.0018	0.0023	0.0025
10	3126K	0.0000	0.0005	0.0007	0.0009	0.0013	0.0015	0.0016	0.0020	0.0023	0.0026
11	3089K	0.0000	0.0006	0.0009	0.0009	0.0014	0.0016	0.0017	0.0022	0.0025	0.0029
12	3091K	0.0000	0.0002	0.0006	0.0007	0.0011	0.0013	0.0014	0.0019	0.0022	0.0025
13	3127K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0014	0.0016	0.0020	0.0022	0.0027
14	3117K	0.0000	0.0004	0.0007	0.0009	0.0012	0.0014	0.0016	0.0020	0.0023	0.0025
15	3085K	0.0000	0.0005	0.0008	0.0009	0.0013	0.0014	0.0016	0.0020	0.0023	0.0026
16	3096K	0.0000	0.0005	0.0007	0.0009	0.0013	0.0014	0.0016	0.0019	0.0023	0.0026
17	3106K	0.0000	0.0004	0.0007	0.0008	0.0013	0.0013	0.0015	0.0019	0.0023	0.0026
18	3081K	0.0000	0.0004	0.0005	0.0008	0.0013	0.0013	0.0016	0.0019	0.0023	0.0025
19	3100K	0.0000	0.0005	0.0008	0.0009	0.0014	0.0016	0.0017	0.0020	0.0026	0.0028
20	3082K	0.0000	0.0004	0.0007	0.0009	0.0013	0.0015	0.0017	0.0019	0.0022	0.0026
21	2961K	0.0000	0.0004	0.0006	0.0008	0.0013	0.0016	0.0018	0.0019	0.0023	0.0026
22	3101K	0.0000	0.0004	0.0008	0.0009	0.0014	0.0017	0.0018	0.0020	0.0024	0.0027
23	3099K	0.0000	0.0005	0.0006	0.0009	0.0013	0.0016	0.0017	0.0020	0.0023	0.0026
24	3121K	0.0000	0.0004	0.0006	0.0008	0.0012	0.0014	0.0016	0.0018	0.0021	0.0026
25	3107K	0.0000	0.0004	0.0007	0.0009	0.0014	0.0017	0.0018	0.0020	0.0024	0.0027

Forward Voltage [V] data for tested units
$T_s = T_{air}$ = 105°C, I_f = 65mA; $T_s \geq$ 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	3114K	5.603	5.609	5.604	5.613	5.609	5.607	5.607	5.602	5.603	5.601
2	3090K	5.596	5.579	5.571	5.582	5.576	5.578	5.573	5.575	5.565	5.567
3	3109K	5.593	5.604	5.590	5.604	5.596	5.836	5.596	5.589	5.863	5.589
4	3118K	5.581	5.800	5.583	5.604	5.645	5.674	5.583	5.585	5.578	5.578
5	2947K	5.627	5.585	5.588	5.657	5.586	5.588	5.593	5.583	5.579	5.576
6	3104K	5.565	5.565	5.559	5.572	5.680	5.577	5.561	5.570	5.555	5.556
7	2920K	5.614	5.596	5.600	5.613	5.608	5.600	5.596	5.597	5.636	5.592
8	3117K	5.595	5.783	5.595	5.610	5.771	5.601	5.599	5.612	5.600	5.592
9	3117K	5.645	5.837	5.587	5.598	5.589	5.587	5.583	5.585	5.580	5.582
10	3126K	5.557	5.570	5.583	5.565	5.583	5.669	5.558	5.557	5.554	5.551
11	3089K	5.565	6.797	5.560	5.569	5.563	5.565	5.559	5.566	5.610	5.576
12	3091K	5.556	5.619	5.928	5.571	5.564	5.566	5.560	5.566	5.576	5.557
13	3127K	5.587	5.748	5.579	5.840	5.580	5.584	5.580	5.996	5.579	5.572
14	3117K	5.623	5.599	5.612	5.845	5.615	5.601	5.601	5.605	5.595	5.593
15	3085K	5.567	5.564	5.562	5.628	5.604	5.569	5.579	5.565	5.582	5.559
16	3096K	5.592	5.608	5.555	5.571	5.558	5.570	5.579	5.617	5.555	5.552
17	3106K	5.580	5.554	5.550	5.564	5.553	5.562	5.552	5.558	5.554	5.546
18	3081K	5.592	5.781	5.595	5.611	5.594	5.610	5.593	5.648	5.592	5.590
19	3100K	5.842	5.593	5.617	5.658	5.600	5.597	5.593	5.593	5.586	5.587
20	3082K	5.598	5.620	5.714	5.612	5.611	5.613	5.602	5.600	5.598	5.598
21	2961K	5.619	5.602	5.605	5.617	5.603	5.608	5.624	5.605	5.603	5.597
22	3101K	5.623	5.602	5.597	5.607	5.599	5.602	5.598	5.596	5.601	5.591
23	3099K	5.574	5.592	5.581	5.592	5.580	5.578	5.576	5.577	5.578	5.573
24	3121K	5.575	5.626	5.580	5.578	5.572	5.571	5.568	5.571	5.566	5.563
25	3107K	5.577	5.671	5.707	5.722	5.589	5.587	5.582	5.624	5.585	5.580

Luminous Flux [lm] data for tested units

$T_s = T_{air}$ = 85°C, I_f = 100mA; $T_s \geq$ 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	3118K	108.400	108.700	108.600	108.300	108.200	108.000	107.700	107.400	107.200	107.000
2	3111K	109.300	109.100	108.900	108.800	108.700	108.400	108.200	108.000	107.800	107.600
3	3129K	107.000	106.900	106.700	106.600	106.500	106.300	105.900	105.700	105.600	105.300
4	3129K	108.700	108.500	108.300	108.100	107.900	107.600	107.400	107.300	107.100	107.000
5	3134K	106.900	106.800	106.700	106.600	106.400	106.100	105.900	105.700	105.500	105.200
6	3131K	106.400	106.000	105.800	105.700	105.600	105.300	105.200	104.800	104.600	104.300
7	3109K	108.100	107.900	107.700	107.600	107.400	107.200	106.900	106.600	106.300	106.100
8	3124K	108.700	108.600	108.400	108.300	108.100	107.900	107.800	107.600	107.500	107.100
9	3130K	107.500	107.600	107.400	107.200	107.000	106.800	106.600	106.400	106.200	106.000
10	3131K	107.900	107.800	107.700	107.400	107.200	106.900	106.700	106.500	106.200	105.900
11	3078K	105.900	106.100	106.000	105.800	105.700	105.500	105.200	105.000	104.800	104.600
12	3086K	109.000	108.800	108.500	108.300	108.100	107.900	107.600	107.200	106.900	106.700
13	3162K	109.700	109.300	109.100	109.000	108.800	108.600	108.300	107.900	107.700	107.500
14	3123K	107.400	107.300	107.000	106.900	106.800	106.600	106.300	106.000	105.600	105.500
15	3150K	108.400	108.100	108.000	107.700	107.500	107.300	107.000	106.700	106.300	106.100
16	3148K	108.400	108.000	107.700	107.600	107.400	107.100	106.900	106.800	106.500	106.300
17	3128K	107.700	107.400	107.200	107.000	106.900	106.700	106.400	106.200	106.100	105.900
18	3103K	107.700	107.600	107.300	107.100	107.000	106.700	106.500	106.200	105.800	105.600
19	3132K	109.300	109.000	108.800	108.700	108.500	108.400	108.200	108.000	107.700	107.400
20	3099K	107.000	106.700	106.600	106.400	106.300	106.000	105.600	105.300	105.100	104.900
21	3114K	106.600	106.200	106.100	105.800	105.600	105.400	105.100	105.000	104.700	104.300
22	3088K	107.900	107.800	107.700	107.500	107.300	107.000	106.700	106.400	106.200	105.900
23	3141K	108.400	108.500	108.200	108.100	107.900	107.600	107.500	107.300	107.000	106.800
24	3116K	108.400	108.300	108.100	107.900	107.800	107.500	107.300	107.000	106.800	106.500
25	3121K	107.200	107.000	106.700	106.600	106.400	106.300	106.100	105.900	105.600	105.300

Normalized Luminous Flux data for tested units

$T_s = T_{air}$ = 85°C, I_f = 100mA; $T_s \geq$ 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	3118K	1.0000	1.0028	1.0018	0.9991	0.9982	0.9963	0.9935	0.9908	0.9889	0.9871
2	3111K	1.0000	0.9982	0.9963	0.9954	0.9945	0.9918	0.9899	0.9881	0.9863	0.9844
3	3129K	1.0000	0.9991	0.9972	0.9963	0.9953	0.9935	0.9897	0.9879	0.9869	0.9841
4	3129K	1.0000	0.9982	0.9963	0.9945	0.9926	0.9899	0.9880	0.9871	0.9853	0.9844
5	3134K	1.0000	0.9991	0.9981	0.9972	0.9953	0.9925	0.9906	0.9888	0.9869	0.9841
6	3131K	1.0000	0.9962	0.9944	0.9934	0.9925	0.9897	0.9887	0.9850	0.9831	0.9803
7	3109K	1.0000	0.9981	0.9963	0.9954	0.9935	0.9917	0.9889	0.9861	0.9833	0.9815
8	3124K	1.0000	0.9991	0.9972	0.9963	0.9945	0.9926	0.9917	0.9899	0.9890	0.9853
9	3130K	1.0000	1.0009	0.9991	0.9972	0.9953	0.9935	0.9916	0.9898	0.9879	0.9860
10	3131K	1.0000	0.9991	0.9981	0.9954	0.9935	0.9907	0.9889	0.9870	0.9842	0.9815
11	3078K	1.0000	1.0019	1.0009	0.9991	0.9981	0.9962	0.9934	0.9915	0.9896	0.9877
12	3086K	1.0000	0.9982	0.9954	0.9936	0.9917	0.9899	0.9872	0.9835	0.9807	0.9789
13	3162K	1.0000	0.9964	0.9945	0.9936	0.9918	0.9900	0.9872	0.9836	0.9818	0.9799
14	3123K	1.0000	0.9991	0.9963	0.9953	0.9944	0.9926	0.9898	0.9870	0.9832	0.9823
15	3150K	1.0000	0.9972	0.9963	0.9935	0.9917	0.9899	0.9871	0.9843	0.9806	0.9788
16	3148K	1.0000	0.9963	0.9935	0.9926	0.9908	0.9880	0.9862	0.9852	0.9825	0.9806
17	3128K	1.0000	0.9972	0.9954	0.9935	0.9926	0.9907	0.9879	0.9861	0.9851	0.9833
18	3103K	1.0000	0.9991	0.9963	0.9944	0.9935	0.9907	0.9889	0.9861	0.9824	0.9805
19	3132K	1.0000	0.9973	0.9954	0.9945	0.9927	0.9918	0.9899	0.9881	0.9854	0.9826
20	3099K	1.0000	0.9972	0.9963	0.9944	0.9935	0.9907	0.9869	0.9841	0.9822	0.9804
21	3114K	1.0000	0.9962	0.9953	0.9925	0.9906	0.9887	0.9859	0.9850	0.9822	0.9784
22	3088K	1.0000	0.9991	0.9981	0.9963	0.9944	0.9917	0.9889	0.9861	0.9842	0.9815
23	3141K	1.0000	1.0009	0.9982	0.9972	0.9954	0.9926	0.9917	0.9899	0.9871	0.9852
24	3116K	1.0000	0.9991	0.9972	0.9954	0.9945	0.9917	0.9899	0.9871	0.9852	0.9825
25	3121K	1.0000	0.9981	0.9953	0.9944	0.9925	0.9916	0.9897	0.9879	0.9851	0.9823

CIE 1976 u' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 100mA$; $T_s \geq 83°C$ 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	3118K	0.2467	0.2463	0.2462	0.2463	0.2458	0.2459	0.2460	0.2459	0.2456	0.2453
2	3111K	0.2468	0.2465	0.2466	0.2467	0.2461	0.2462	0.2463	0.2462	0.2459	0.2456
3	3129K	0.2464	0.2461	0.2462	0.2462	0.2457	0.2458	0.2460	0.2458	0.2456	0.2453
4	3129K	0.2463	0.2459	0.2460	0.2460	0.2454	0.2456	0.2457	0.2456	0.2453	0.2449
5	3134K	0.2461	0.2458	0.2459	0.2460	0.2454	0.2455	0.2457	0.2455	0.2453	0.2449
6	3131K	0.2467	0.2461	0.2463	0.2464	0.2458	0.2459	0.2461	0.2459	0.2457	0.2453
7	3109K	0.2469	0.2465	0.2465	0.2468	0.2461	0.2463	0.2464	0.2461	0.2459	0.2455
8	3124K	0.2463	0.2461	0.2460	0.2462	0.2456	0.2457	0.2458	0.2455	0.2453	0.2449
9	3130K	0.2467	0.2463	0.2464	0.2466	0.2460	0.2462	0.2463	0.2461	0.2459	0.2455
10	3131K	0.2460	0.2457	0.2457	0.2459	0.2454	0.2455	0.2456	0.2454	0.2452	0.2449
11	3078K	0.2482	0.2474	0.2474	0.2476	0.2471	0.2472	0.2472	0.2471	0.2469	0.2465
12	3086K	0.2480	0.2475	0.2476	0.2478	0.2473	0.2474	0.2473	0.2473	0.2470	0.2466
13	3162K	0.2447	0.2444	0.2445	0.2445	0.2441	0.2441	0.2442	0.2440	0.2454	0.2433
14	3123K	0.2465	0.2464	0.2465	0.2465	0.2460	0.2462	0.2462	0.2460	0.2459	0.2454
15	3150K	0.2454	0.2452	0.2452	0.2453	0.2448	0.2449	0.2449	0.2447	0.2446	0.2442
16	3148K	0.2453	0.2449	0.2450	0.2451	0.2445	0.2447	0.2449	0.2445	0.2443	0.2440
17	3128K	0.2461	0.2458	0.2459	0.2459	0.2455	0.2456	0.2459	0.2454	0.2453	0.2449
18	3103K	0.2471	0.2469	0.2470	0.2470	0.2465	0.2466	0.2468	0.2465	0.2463	0.2459
19	3132K	0.2460	0.2456	0.2457	0.2457	0.2453	0.2453	0.2456	0.2452	0.2451	0.2447
20	3099K	0.2476	0.2472	0.2473	0.2473	0.2469	0.2470	0.2472	0.2466	0.2466	0.2462
21	3114K	0.2469	0.2465	0.2466	0.2467	0.2461	0.2463	0.2465	0.2461	0.2460	0.2455
22	3088K	0.2481	0.2479	0.2479	0.2480	0.2474	0.2476	0.2479	0.2474	0.2473	0.2469
23	3141K	0.2456	0.2453	0.2453	0.2454	0.2449	0.2451	0.2453	0.2449	0.2448	0.2444
24	3116K	0.2468	0.2465	0.2465	0.2465	0.2461	0.2462	0.2464	0.2461	0.2459	0.2455
25	3121K	0.2467	0.2464	0.2465	0.2465	0.2460	0.2461	0.2464	0.2459	0.2457	0.2454

CIE 1976 v' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 100mA$; $T_s \geq 83°C$ 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	3118K	0.5184	0.5177	0.5174	0.5171	0.5169	0.5166	0.5163	0.5160	0.5158	0.5155
2	3111K	0.5191	0.5188	0.5185	0.5182	0.5181	0.5178	0.5174	0.5172	0.5170	0.5168
3	3129K	0.5180	0.5177	0.5174	0.5171	0.5170	0.5166	0.5162	0.5161	0.5159	0.5156
4	3129K	0.5184	0.5180	0.5177	0.5175	0.5173	0.5170	0.5165	0.5164	0.5162	0.5159
5	3134K	0.5184	0.5181	0.5179	0.5176	0.5175	0.5171	0.5167	0.5165	0.5163	0.5161
6	3131K	0.5167	0.5162	0.5159	0.5156	0.5154	0.5152	0.5148	0.5146	0.5144	0.5141
7	3109K	0.5189	0.5185	0.5183	0.5179	0.5178	0.5175	0.5170	0.5169	0.5166	0.5164
8	3124K	0.5190	0.5187	0.5185	0.5181	0.5180	0.5177	0.5172	0.5170	0.5168	0.5166
9	3130K	0.5168	0.5165	0.5163	0.5160	0.5158	0.5156	0.5151	0.5150	0.5147	0.5145
10	3131K	0.5192	0.5190	0.5188	0.5185	0.5184	0.5181	0.5176	0.5174	0.5172	0.5170
11	3078K	0.5185	0.5181	0.5179	0.5175	0.5175	0.5172	0.5166	0.5164	0.5163	0.5160
12	3086K	0.5182	0.5178	0.5176	0.5173	0.5172	0.5169	0.5164	0.5162	0.5159	0.5158
13	3162K	0.5196	0.5193	0.5191	0.5188	0.5187	0.5183	0.5178	0.5177	0.5176	0.5172
14	3123K	0.5185	0.5183	0.5179	0.5177	0.5176	0.5173	0.5168	0.5166	0.5165	0.5162
15	3150K	0.5188	0.5185	0.5182	0.5179	0.5179	0.5176	0.5170	0.5169	0.5168	0.5164
16	3148K	0.5194	0.5190	0.5188	0.5186	0.5185	0.5181	0.5182	0.5174	0.5173	0.5169
17	3128K	0.5192	0.5188	0.5185	0.5182	0.5182	0.5179	0.5179	0.5172	0.5170	0.5167
18	3103K	0.5190	0.5186	0.5184	0.5181	0.5180	0.5177	0.5176	0.5170	0.5168	0.5165
19	3132K	0.5190	0.5186	0.5183	0.5180	0.5180	0.5177	0.5176	0.5169	0.5168	0.5165
20	3099K	0.5178	0.5174	0.5171	0.5169	0.5168	0.5165	0.5164	0.5157	0.5155	0.5152
21	3114K	0.5182	0.5178	0.5175	0.5173	0.5172	0.5169	0.5168	0.5163	0.5160	0.5157
22	3088K	0.5175	0.5172	0.5169	0.5166	0.5165	0.5163	0.5162	0.5156	0.5154	0.5151
23	3141K	0.5192	0.5189	0.5185	0.5183	0.5183	0.5180	0.5179	0.5173	0.5171	0.5168
24	3116K	0.5183	0.5180	0.5177	0.5175	0.5174	0.5171	0.5170	0.5165	0.5162	0.5159
25	3121K	0.5180	0.5176	0.5174	0.5171	0.5170	0.5168	0.5167	0.5160	0.5158	0.5155

Delta u'v' data for tested units

$T_s = T_{air}$ = 85°C, I_f = 100mA; $T_s \geq$ 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	3118K	0.0000	0.0008	0.0011	0.0014	0.0017	0.0020	0.0022	0.0025	0.0028	0.0032
2	3111K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0014	0.0018	0.0020	0.0023	0.0026
3	3129K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0015	0.0018	0.0020	0.0022	0.0026
4	3129K	0.0000	0.0006	0.0008	0.0009	0.0014	0.0016	0.0020	0.0021	0.0024	0.0029
5	3134K	0.0000	0.0004	0.0005	0.0008	0.0011	0.0014	0.0017	0.0020	0.0022	0.0026
6	3131K	0.0000	0.0008	0.0009	0.0011	0.0016	0.0017	0.0020	0.0022	0.0025	0.0030
7	3109K	0.0000	0.0006	0.0007	0.0010	0.0014	0.0015	0.0020	0.0022	0.0025	0.0029
8	3124K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0014	0.0019	0.0022	0.0024	0.0028
9	3130K	0.0000	0.0005	0.0006	0.0008	0.0012	0.0013	0.0017	0.0019	0.0022	0.0026
10	3131K	0.0000	0.0004	0.0005	0.0007	0.0010	0.0012	0.0016	0.0019	0.0022	0.0025
11	3078K	0.0000	0.0009	0.0010	0.0012	0.0015	0.0016	0.0021	0.0024	0.0026	0.0030
12	3086K	0.0000	0.0006	0.0007	0.0009	0.0012	0.0014	0.0019	0.0021	0.0025	0.0028
13	3162K	0.0000	0.0004	0.0005	0.0008	0.0011	0.0014	0.0019	0.0020	0.0021	0.0028
14	3123K	0.0000	0.0002	0.0006	0.0008	0.0010	0.0012	0.0017	0.0020	0.0021	0.0025
15	3150K	0.0000	0.0004	0.0006	0.0009	0.0011	0.0013	0.0019	0.0020	0.0022	0.0027
16	3148K	0.0000	0.0006	0.0007	0.0008	0.0012	0.0014	0.0013	0.0022	0.0023	0.0028
17	3128K	0.0000	0.0005	0.0007	0.0010	0.0012	0.0014	0.0013	0.0021	0.0023	0.0028
18	3103K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0014	0.0014	0.0021	0.0023	0.0028
19	3132K	0.0000	0.0006	0.0008	0.0010	0.0012	0.0015	0.0015	0.0022	0.0024	0.0028
20	3099K	0.0000	0.0006	0.0008	0.0009	0.0012	0.0014	0.0015	0.0023	0.0025	0.0030
21	3114K	0.0000	0.0006	0.0008	0.0009	0.0013	0.0014	0.0015	0.0021	0.0024	0.0029
22	3088K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0013	0.0013	0.0020	0.0022	0.0027
23	3141K	0.0000	0.0004	0.0008	0.0009	0.0011	0.0013	0.0013	0.0020	0.0022	0.0027
24	3116K	0.0000	0.0004	0.0007	0.0009	0.0011	0.0013	0.0014	0.0019	0.0023	0.0027
25	3121K	0.0000	0.0005	0.0006	0.0009	0.0012	0.0013	0.0013	0.0022	0.0024	0.0028

Forward Voltage [V] data for tested units

$T_s = T_{air}$ = 85°C, I_f = 100mA; $T_s \geq$ 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	3118K	5.742	6.466	5.754	5.757	5.751	5.755	5.745	5.742	5.744	5.745
2	3111K	5.765	5.773	5.800	5.782	5.767	5.771	5.771	5.765	5.766	5.784
3	3129K	5.721	5.720	5.951	5.737	5.730	5.723	5.720	5.717	5.715	5.723
4	3129K	5.815	5.793	5.796	5.900	5.810	5.831	5.790	5.785	5.803	5.789
5	3134K	5.763	5.766	5.764	5.781	5.868	5.778	5.776	5.998	5.758	5.852
6	3131K	5.786	6.164	5.922	5.790	5.746	5.747	5.744	5.740	5.754	5.738
7	3109K	5.775	5.782	5.782	5.811	5.782	6.069	5.787	5.777	5.776	5.781
8	3124K	5.771	5.808	5.825	5.819	5.829	5.778	5.792	5.770	5.771	5.774
9	3130K	5.732	5.741	6.137	5.746	5.738	5.739	5.739	5.733	5.735	5.735
10	3131K	5.952	5.810	5.820	5.798	5.882	5.783	5.781	5.774	5.776	5.779
11	3078K	5.827	5.773	5.770	5.781	5.895	5.767	5.765	5.760	5.760	5.762
12	3086K	5.722	5.744	5.729	5.763	5.728	5.732	5.727	5.721	5.719	5.725
13	3162K	5.786	5.822	5.788	5.801	5.809	5.788	5.788	5.779	5.707	5.784
14	3123K	5.721	5.722	5.727	5.736	5.729	5.728	5.934	5.722	5.724	5.722
15	3150K	5.751	5.752	5.749	5.761	5.755	5.760	5.869	5.748	5.746	5.748
16	3148K	5.734	5.889	5.741	5.755	5.744	5.743	5.741	5.740	5.735	5.740
17	3128K	5.755	5.760	5.766	5.772	5.761	5.751	5.751	5.752	5.745	5.750
18	3103K	5.720	5.956	5.726	5.755	5.728	5.732	5.726	5.730	5.722	5.724
19	3132K	5.776	5.888	5.745	5.755	5.910	5.758	5.742	5.742	5.741	5.742
20	3099K	5.821	5.792	5.731	5.744	5.731	5.735	5.730	5.732	5.726	5.727
21	3114K	5.772	5.730	5.709	5.726	5.708	5.718	5.711	5.709	5.720	5.705
22	3088K	5.869	5.753	5.735	5.758	5.837	5.743	5.744	5.744	5.734	5.734
23	3141K	5.736	5.807	5.740	5.752	5.741	5.748	5.741	5.740	5.739	5.741
24	3116K	5.774	5.798	5.775	5.753	5.745	5.760	5.744	5.739	5.733	5.737
25	3121K	5.732	5.737	5.732	5.748	5.733	5.738	5.738	5.749	5.728	5.732

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 105°C$, $I_f = 120mA$; $T_s \geq 103°C$ 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	3070K	125.800	125.500	125.200	124.900	124.500	124.300	124.100	123.800	123.600	123.200
2	3078K	125.600	125.400	125.300	125.100	124.900	124.700	124.400	124.200	124.100	123.800
3	3133K	127.500	127.100	126.800	126.500	126.100	125.700	125.600	125.300	125.000	124.800
4	3136K	125.300	125.000	124.800	124.600	124.300	123.900	123.700	123.300	123.000	122.900
5	2980K	127.400	127.500	127.100	127.000	126.500	126.400	126.000	125.600	125.500	125.100
6	3140K	124.900	125.100	124.700	124.600	124.300	124.100	123.900	123.700	123.500	123.100
7	3130K	126.700	126.800	126.500	126.200	126.000	125.600	125.200	125.000	124.500	124.200
8	3094K	127.200	127.000	126.500	126.400	126.100	125.800	125.500	125.100	124.800	124.300
9	3000K	127.200	127.100	126.700	126.500	126.300	125.800	125.400	125.100	124.500	124.100
10	3139K	127.100	126.800	126.500	126.400	126.100	125.700	125.400	125.000	124.600	124.400
11	3141K	128.300	128.100	127.800	127.400	127.300	127.000	126.600	126.300	126.100	125.700
12	3146K	128.400	127.900	127.500	127.200	127.000	126.800	126.400	126.300	125.800	125.500
13	3144K	120.200	120.000	119.600	119.400	119.100	118.900	118.800	118.600	118.300	117.900
14	3150K	125.800	125.900	125.400	125.100	124.900	124.600	124.200	123.800	123.500	123.000
15	3142K	127.800	127.600	127.200	127.000	126.700	126.400	125.900	125.500	125.100	124.800
16	3133K	126.900	126.800	126.400	126.000	125.800	125.500	125.200	124.900	124.700	124.400
17	3109K	126.800	126.900	126.500	126.100	125.800	125.600	125.400	125.300	125.200	124.900
18	3136K	124.700	124.400	124.100	124.000	123.600	123.300	123.000	122.700	122.500	122.300
19	3149K	127.100	126.600	126.200	126.100	125.900	125.500	125.000	124.700	124.300	123.800
20	3143K	125.900	125.600	125.400	125.200	124.700	124.400	124.100	123.700	123.400	122.900
21	3121K	122.500	122.600	122.300	122.000	121.800	121.400	121.100	121.000	120.700	120.400
22	3096K	124.600	124.000	123.800	123.600	123.400	123.000	122.600	122.500	122.200	121.600
23	3134K	127.000	126.800	126.600	126.400	125.900	125.600	125.200	124.900	124.500	124.100
24	3142K	126.000	125.900	125.600	125.300	125.000	124.800	124.400	124.000	123.800	123.500
25	3156K	127.700	127.400	127.300	127.100	126.800	126.500	126.300	125.900	125.500	125.300

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 105°C$, $I_f = 120mA$; $T_s \geq 103°C$ 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	3070K	1.0000	0.9976	0.9952	0.9928	0.9897	0.9881	0.9865	0.9841	0.9825	0.9793
2	3078K	1.0000	0.9984	0.9976	0.9960	0.9944	0.9928	0.9904	0.9889	0.9881	0.9857
3	3133K	1.0000	0.9969	0.9945	0.9922	0.9890	0.9859	0.9851	0.9827	0.9804	0.9788
4	3136K	1.0000	0.9976	0.9960	0.9944	0.9920	0.9888	0.9872	0.9840	0.9816	0.9808
5	2980K	1.0000	1.0008	0.9976	0.9969	0.9929	0.9922	0.9890	0.9859	0.9851	0.9819
6	3140K	1.0000	1.0016	0.9984	0.9976	0.9952	0.9936	0.9920	0.9904	0.9888	0.9856
7	3130K	1.0000	1.0008	0.9984	0.9961	0.9945	0.9913	0.9882	0.9866	0.9826	0.9803
8	3094K	1.0000	0.9984	0.9945	0.9937	0.9914	0.9890	0.9866	0.9835	0.9811	0.9772
9	3000K	1.0000	0.9992	0.9961	0.9945	0.9929	0.9890	0.9858	0.9835	0.9788	0.9756
10	3139K	1.0000	0.9976	0.9953	0.9945	0.9921	0.9890	0.9866	0.9835	0.9803	0.9788
11	3141K	1.0000	0.9984	0.9961	0.9930	0.9922	0.9899	0.9867	0.9844	0.9829	0.9797
12	3146K	1.0000	0.9961	0.9930	0.9907	0.9891	0.9875	0.9844	0.9836	0.9798	0.9774
13	3144K	1.0000	0.9983	0.9950	0.9933	0.9908	0.9892	0.9884	0.9867	0.9842	0.9809
14	3150K	1.0000	1.0008	0.9968	0.9944	0.9928	0.9905	0.9873	0.9841	0.9817	0.9777
15	3142K	1.0000	0.9984	0.9953	0.9937	0.9914	0.9890	0.9851	0.9820	0.9789	0.9765
16	3133K	1.0000	0.9992	0.9961	0.9929	0.9913	0.9890	0.9866	0.9842	0.9827	0.9803
17	3109K	1.0000	1.0008	0.9976	0.9945	0.9921	0.9905	0.9890	0.9882	0.9874	0.9850
18	3136K	1.0000	0.9976	0.9952	0.9944	0.9912	0.9888	0.9864	0.9840	0.9824	0.9808
19	3149K	1.0000	0.9961	0.9929	0.9921	0.9906	0.9874	0.9835	0.9811	0.9780	0.9740
20	3143K	1.0000	0.9976	0.9960	0.9944	0.9905	0.9881	0.9857	0.9825	0.9801	0.9762
21	3121K	1.0000	1.0008	0.9984	0.9959	0.9943	0.9910	0.9886	0.9878	0.9853	0.9829
22	3096K	1.0000	0.9952	0.9936	0.9920	0.9904	0.9872	0.9839	0.9831	0.9807	0.9759
23	3134K	1.0000	0.9984	0.9969	0.9953	0.9913	0.9890	0.9858	0.9835	0.9803	0.9772
24	3142K	1.0000	0.9992	0.9968	0.9944	0.9921	0.9905	0.9873	0.9841	0.9825	0.9802
25	3156K	1.0000	0.9977	0.9969	0.9953	0.9930	0.9906	0.9890	0.9859	0.9828	0.9812

CIE 1976 u' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 120mA; $T_s \geq$ 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	3070K	0.2487	0.2484	0.2486	0.2485	0.2480	0.2481	0.2485	0.2483	0.2479	0.2476
2	3078K	0.2478	0.2469	0.2472	0.2468	0.2462	0.2463	0.2468	0.2464	0.2460	0.2457
3	3133K	0.2459	0.2456	0.2458	0.2456	0.2452	0.2452	0.2458	0.2454	0.2450	0.2447
4	3136K	0.2458	0.2453	0.2455	0.2454	0.2449	0.2450	0.2455	0.2451	0.2448	0.2445
5	2980K	0.2504	0.2506	0.2504	0.2507	0.2502	0.2502	0.2503	0.2499	0.2501	0.2495
6	3140K	0.2457	0.2452	0.2453	0.2453	0.2448	0.2449	0.2453	0.2449	0.2448	0.2444
7	3130K	0.2462	0.2460	0.2461	0.2460	0.2456	0.2456	0.2459	0.2456	0.2453	0.2450
8	3094K	0.2476	0.2473	0.2474	0.2473	0.2469	0.2470	0.2473	0.2470	0.2468	0.2464
9	3000K	0.2495	0.2493	0.2494	0.2494	0.2489	0.2489	0.2493	0.2491	0.2488	0.2484
10	3139K	0.2457	0.2456	0.2457	0.2456	0.2452	0.2453	0.2456	0.2454	0.2450	0.2447
11	3141K	0.2458	0.2455	0.2457	0.2456	0.2452	0.2452	0.2455	0.2452	0.2450	0.2447
12	3146K	0.2454	0.2452	0.2453	0.2453	0.2447	0.2448	0.2451	0.2449	0.2446	0.2443
13	3144K	0.2452	0.2448	0.2450	0.2449	0.2445	0.2446	0.2449	0.2447	0.2445	0.2440
14	3150K	0.2458	0.2457	0.2459	0.2457	0.2453	0.2454	0.2456	0.2453	0.2452	0.2447
15	3142K	0.2449	0.2446	0.2448	0.2446	0.2443	0.2443	0.2446	0.2443	0.2441	0.2436
16	3133K	0.2462	0.2459	0.2461	0.2460	0.2456	0.2457	0.2460	0.2457	0.2454	0.2450
17	3109K	0.2466	0.2460	0.2462	0.2461	0.2455	0.2456	0.2459	0.2456	0.2454	0.2451
18	3136K	0.2461	0.2457	0.2460	0.2458	0.2455	0.2455	0.2459	0.2455	0.2451	0.2448
19	3149K	0.2453	0.2450	0.2452	0.2450	0.2446	0.2446	0.2449	0.2446	0.2444	0.2441
20	3143K	0.2458	0.2456	0.2458	0.2457	0.2452	0.2453	0.2456	0.2453	0.2451	0.2447
21	3121K	0.2464	0.2460	0.2463	0.2462	0.2458	0.2458	0.2461	0.2459	0.2456	0.2452
22	3096K	0.2475	0.2472	0.2474	0.2471	0.2467	0.2467	0.2471	0.2468	0.2466	0.2462
23	3134K	0.2456	0.2451	0.2454	0.2452	0.2448	0.2448	0.2452	0.2449	0.2446	0.2443
24	3142K	0.2453	0.2450	0.2452	0.2450	0.2446	0.2446	0.2450	0.2447	0.2445	0.2443
25	3156K	0.2455	0.2452	0.2453	0.2452	0.2448	0.2449	0.2452	0.2449	0.2447	0.2443

CIE 1976 v' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 120mA; $T_s \geq$ 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	3070K	0.5179	0.5173	0.5169	0.5167	0.5167	0.5163	0.5160	0.5159	0.5156	0.5153
2	3078K	0.5201	0.5192	0.5188	0.5184	0.5183	0.5179	0.5175	0.5173	0.5171	0.5169
3	3133K	0.5192	0.5187	0.5183	0.5180	0.5180	0.5177	0.5174	0.5171	0.5169	0.5167
4	3136K	0.5192	0.5186	0.5182	0.5180	0.5180	0.5176	0.5173	0.5170	0.5168	0.5167
5	2980K	0.5252	0.5251	0.5245	0.5244	0.5244	0.5240	0.5235	0.5232	0.5232	0.5230
6	3140K	0.5190	0.5181	0.5178	0.5175	0.5175	0.5170	0.5167	0.5165	0.5163	0.5161
7	3130K	0.5186	0.5181	0.5178	0.5175	0.5175	0.5171	0.5167	0.5165	0.5161	0.5159
8	3094K	0.5185	0.5180	0.5176	0.5173	0.5173	0.5169	0.5166	0.5164	0.5162	0.5159
9	3000K	0.5255	0.5250	0.5247	0.5244	0.5245	0.5240	0.5236	0.5235	0.5233	0.5232
10	3139K	0.5191	0.5187	0.5185	0.5181	0.5181	0.5176	0.5173	0.5172	0.5169	0.5168
11	3141K	0.5185	0.5180	0.5177	0.5175	0.5174	0.5169	0.5166	0.5164	0.5163	0.5161
12	3146K	0.5193	0.5190	0.5187	0.5184	0.5183	0.5178	0.5175	0.5173	0.5172	0.5170
13	3144K	0.5203	0.5196	0.5192	0.5189	0.5189	0.5184	0.5181	0.5179	0.5177	0.5175
14	3150K	0.5173	0.5170	0.5167	0.5164	0.5163	0.5160	0.5156	0.5154	0.5152	0.5150
15	3142K	0.5216	0.5211	0.5210	0.5206	0.5206	0.5202	0.5198	0.5196	0.5195	0.5193
16	3133K	0.5182	0.5178	0.5176	0.5173	0.5173	0.5169	0.5165	0.5163	0.5161	0.5159
17	3109K	0.5201	0.5195	0.5193	0.5190	0.5189	0.5184	0.5180	0.5178	0.5177	0.5175
18	3136K	0.5181	0.5176	0.5174	0.5171	0.5171	0.5167	0.5163	0.5161	0.5158	0.5157
19	3149K	0.5193	0.5189	0.5187	0.5183	0.5183	0.5178	0.5175	0.5173	0.5171	0.5170
20	3143K	0.5183	0.5179	0.5177	0.5173	0.5173	0.5169	0.5165	0.5163	0.5161	0.5160
21	3121K	0.5191	0.5186	0.5183	0.5180	0.5180	0.5175	0.5172	0.5171	0.5168	0.5166
22	3096K	0.5186	0.5183	0.5180	0.5174	0.5174	0.5170	0.5166	0.5164	0.5162	0.5160
23	3134K	0.5202	0.5197	0.5195	0.5191	0.5191	0.5187	0.5183	0.5182	0.5179	0.5177
24	3142K	0.5202	0.5199	0.5196	0.5193	0.5193	0.5189	0.5185	0.5183	0.5181	0.5182
25	3156K	0.5176	0.5172	0.5169	0.5165	0.5165	0.5160	0.5158	0.5156	0.5154	0.5152

Delta u'v' data for tested units
$T_s = T_{air}$ = 105°C, I_f = 120mA; $T_s \geq$ 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	3070K	0.0000	0.0007	0.0010	0.0012	0.0014	0.0017	0.0019	0.0020	0.0024	0.0028
2	3078K	0.0000	0.0013	0.0014	0.0020	0.0024	0.0027	0.0028	0.0031	0.0035	0.0038
3	3133K	0.0000	0.0006	0.0009	0.0012	0.0014	0.0017	0.0018	0.0022	0.0025	0.0028
4	3136K	0.0000	0.0008	0.0010	0.0013	0.0015	0.0018	0.0019	0.0023	0.0026	0.0028
5	2980K	0.0000	0.0002	0.0007	0.0009	0.0008	0.0012	0.0017	0.0021	0.0020	0.0024
6	3140K	0.0000	0.0010	0.0013	0.0016	0.0017	0.0022	0.0023	0.0026	0.0028	0.0032
7	3130K	0.0000	0.0005	0.0008	0.0011	0.0013	0.0016	0.0019	0.0022	0.0027	0.0030
8	3094K	0.0000	0.0006	0.0009	0.0012	0.0014	0.0017	0.0019	0.0022	0.0024	0.0029
9	3000K	0.0000	0.0005	0.0008	0.0011	0.0012	0.0016	0.0019	0.0020	0.0023	0.0025
10	3139K	0.0000	0.0004	0.0006	0.0010	0.0011	0.0016	0.0018	0.0019	0.0023	0.0025
11	3141K	0.0000	0.0006	0.0008	0.0010	0.0013	0.0017	0.0019	0.0022	0.0023	0.0026
12	3146K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0016	0.0018	0.0021	0.0022	0.0025
13	3144K	0.0000	0.0008	0.0011	0.0014	0.0016	0.0020	0.0022	0.0025	0.0027	0.0030
14	3150K	0.0000	0.0003	0.0006	0.0009	0.0011	0.0014	0.0017	0.0020	0.0022	0.0025
15	3142K	0.0000	0.0006	0.0006	0.0010	0.0012	0.0015	0.0018	0.0021	0.0022	0.0026
16	3133K	0.0000	0.0005	0.0006	0.0009	0.0011	0.0014	0.0017	0.0020	0.0022	0.0026
17	3109K	0.0000	0.0008	0.0009	0.0012	0.0016	0.0020	0.0022	0.0025	0.0027	0.0030
18	3136K	0.0000	0.0006	0.0007	0.0010	0.0012	0.0015	0.0018	0.0021	0.0025	0.0027
19	3149K	0.0000	0.0005	0.0006	0.0010	0.0012	0.0017	0.0018	0.0021	0.0024	0.0026
20	3143K	0.0000	0.0004	0.0006	0.0010	0.0012	0.0015	0.0018	0.0021	0.0023	0.0025
21	3121K	0.0000	0.0006	0.0008	0.0011	0.0013	0.0017	0.0019	0.0021	0.0024	0.0028
22	3096K	0.0000	0.0004	0.0006	0.0013	0.0014	0.0018	0.0020	0.0023	0.0026	0.0029
23	3134K	0.0000	0.0007	0.0007	0.0012	0.0014	0.0017	0.0019	0.0021	0.0025	0.0028
24	3142K	0.0000	0.0004	0.0006	0.0009	0.0011	0.0015	0.0017	0.0020	0.0022	0.0022
25	3156K	0.0000	0.0005	0.0007	0.0011	0.0013	0.0017	0.0018	0.0021	0.0023	0.0027

Forward Voltage [V] data for tested units
$T_s = T_{air}$ = 105°C, I_f = 120mA; $T_s \geq$ 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	3070K	5.787	5.784	5.784	5.800	5.785	5.801	5.789	5.782	5.780	5.779
2	3078K	5.864	5.867	5.928	5.876	5.874	5.881	5.889	5.859	5.860	5.864
3	3133K	5.830	5.843	5.833	5.880	5.841	5.844	5.830	5.823	5.822	5.824
4	3136K	5.784	6.032	5.786	5.794	5.785	5.790	5.820	5.788	5.781	5.783
5	2980K	5.843	5.839	5.844	5.875	5.851	5.850	5.846	5.844	5.837	5.843
6	3140K	5.881	5.875	5.890	5.890	5.883	5.898	5.888	5.884	5.876	5.962
7	3130K	5.832	5.828	5.836	6.025	5.869	5.851	5.902	5.837	5.827	5.828
8	3094K	5.855	5.852	5.855	5.874	5.857	5.866	5.863	5.861	5.849	5.854
9	3000K	5.889	5.942	5.900	5.902	5.896	5.889	5.928	5.890	6.068	5.887
10	3139K	5.905	5.885	5.886	5.908	5.927	5.885	5.895	5.889	5.883	5.889
11	3141K	5.948	5.860	5.879	5.901	5.866	5.909	5.866	5.869	5.860	5.866
12	3146K	5.871	5.866	5.885	5.940	5.871	5.868	5.872	5.869	5.880	5.868
13	3144K	5.835	5.836	5.841	5.953	5.841	6.010	5.842	5.847	5.831	5.834
14	3150K	5.820	5.801	5.796	5.808	5.803	5.801	5.806	5.795	5.792	5.793
15	3142K	5.861	5.801	5.850	5.810	5.796	6.022	5.830	5.801	5.789	5.794
16	3133K	5.887	5.820	5.839	5.837	5.824	6.071	5.828	5.832	5.818	5.829
17	3109K	5.904	5.886	5.880	5.894	5.885	5.907	5.885	5.900	5.881	5.881
18	3136K	5.886	5.882	5.872	5.933	5.873	5.880	5.878	5.869	5.863	5.870
19	3149K	5.866	5.867	5.876	5.885	5.871	5.997	5.870	5.871	5.861	5.867
20	3143K	5.838	5.845	5.950	5.862	5.890	5.899	5.847	5.840	5.838	5.845
21	3121K	5.882	5.884	5.880	6.089	5.892	5.891	5.919	5.887	5.874	5.879
22	3096K	5.868	5.920	5.857	5.867	5.867	5.865	5.861	5.866	5.858	5.856
23	3134K	5.837	5.838	5.840	5.865	5.850	5.841	5.845	5.842	5.835	5.840
24	3142K	5.957	6.098	5.872	5.938	5.896	6.061	5.873	5.870	5.863	5.866
25	3156K	5.840	5.842	5.841	5.901	5.844	5.841	5.844	5.841	5.833	5.840

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 115°C$, $I_f = 120mA$; $T_s \geq 113°C$ and $T_{air} \geq 110°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3165K	128.000	127.800	127.500	127.300	127.000	126.500	126.300	126.000	125.700	125.300
2	3117K	125.900	125.600	125.400	125.100	124.800	124.600	124.300	124.000	123.800	123.300
3	3116K	127.500	127.300	126.900	126.700	126.400	125.900	125.800	125.400	125.100	124.900
4	3129K	127.900	127.200	126.800	126.600	126.100	125.700	125.400	125.100	124.800	124.300
5	3131K	126.800	126.900	126.600	126.100	125.700	125.300	125.100	125.000	124.500	124.300
6	3120K	126.400	126.200	125.700	125.400	124.900	124.500	124.200	123.900	123.700	123.400
7	3115K	128.200	127.500	127.000	126.500	126.000	125.600	125.400	125.100	124.700	124.300
8	3123K	124.800	124.200	123.600	123.200	122.600	122.100	121.900	121.500	121.400	121.000
9	2972K	126.600	126.500	126.200	126.000	125.700	125.500	125.200	124.900	124.600	124.300
10	3140K	128.100	128.200	127.700	127.300	127.000	126.700	126.400	126.100	125.800	125.600
11	3093K	128.100	128.000	127.600	127.200	126.700	126.400	126.200	125.900	125.600	125.200
12	3135K	127.400	127.000	126.700	126.400	125.900	125.600	125.300	125.100	124.900	124.500
13	3143K	128.500	128.400	127.800	127.400	127.200	126.900	126.800	126.500	126.300	125.800
14	3170K	127.200	126.800	126.300	125.800	125.400	125.200	125.100	124.700	124.400	124.100
15	3142K	128.300	127.600	127.100	126.800	126.200	125.900	125.700	125.300	124.900	124.600
16	3103K	126.700	126.200	125.800	125.400	125.000	124.500	124.300	123.900	123.700	123.300
17	3132K	129.100	128.800	128.300	128.100	127.700	127.500	127.300	126.900	126.400	126.000
18	2974K	126.200	125.900	125.500	125.200	124.800	124.400	124.300	124.100	124.000	123.800
19	3137K	125.700	125.300	124.900	124.700	124.200	123.800	123.600	123.200	122.800	122.500
20	3117K	128.300	128.100	127.600	127.300	126.800	126.400	126.100	125.900	125.500	125.000
21	3128K	128.300	127.900	127.500	127.100	126.800	126.200	126.000	125.800	125.500	125.000
22	3141K	127.600	127.100	126.600	126.100	125.600	125.200	124.900	124.600	124.200	123.900
23	3114K	126.200	125.600	125.100	124.600	124.000	123.400	123.200	123.000	122.600	122.300
24	3115K	128.300	127.700	127.300	127.000	126.600	126.000	125.800	125.600	125.500	125.100
25	3117K	125.300	124.900	124.600	124.200	123.800	123.400	123.200	122.800	122.500	122.100

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 115°C$, $I_f = 120mA$; $T_s \geq 113°C$ and $T_{air} \geq 110°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3165K	1.0000	0.9984	0.9961	0.9945	0.9922	0.9883	0.9867	0.9844	0.9820	0.9789
2	3117K	1.0000	0.9976	0.9960	0.9936	0.9913	0.9897	0.9873	0.9849	0.9833	0.9793
3	3116K	1.0000	0.9984	0.9953	0.9937	0.9914	0.9875	0.9867	0.9835	0.9812	0.9796
4	3129K	1.0000	0.9945	0.9914	0.9898	0.9859	0.9828	0.9805	0.9781	0.9758	0.9719
5	3131K	1.0000	1.0008	0.9984	0.9945	0.9913	0.9882	0.9866	0.9858	0.9819	0.9803
6	3120K	1.0000	0.9984	0.9945	0.9921	0.9881	0.9850	0.9826	0.9802	0.9786	0.9763
7	3115K	1.0000	0.9945	0.9906	0.9867	0.9828	0.9797	0.9782	0.9758	0.9727	0.9696
8	3123K	1.0000	0.9952	0.9904	0.9872	0.9824	0.9784	0.9768	0.9736	0.9728	0.9696
9	2972K	1.0000	0.9992	0.9968	0.9953	0.9929	0.9913	0.9889	0.9866	0.9842	0.9818
10	3140K	1.0000	1.0008	0.9969	0.9938	0.9914	0.9891	0.9867	0.9844	0.9820	0.9805
11	3093K	1.0000	0.9992	0.9961	0.9930	0.9891	0.9867	0.9852	0.9828	0.9805	0.9774
12	3135K	1.0000	0.9969	0.9945	0.9922	0.9882	0.9859	0.9835	0.9819	0.9804	0.9772
13	3143K	1.0000	0.9992	0.9946	0.9914	0.9899	0.9875	0.9868	0.9844	0.9829	0.9790
14	3170K	1.0000	0.9969	0.9929	0.9890	0.9858	0.9843	0.9835	0.9803	0.9780	0.9756
15	3142K	1.0000	0.9945	0.9906	0.9883	0.9836	0.9813	0.9797	0.9766	0.9735	0.9712
16	3103K	1.0000	0.9961	0.9929	0.9897	0.9866	0.9826	0.9811	0.9779	0.9763	0.9732
17	3132K	1.0000	0.9977	0.9938	0.9923	0.9892	0.9876	0.9861	0.9830	0.9791	0.9760
18	2974K	1.0000	0.9976	0.9945	0.9921	0.9889	0.9857	0.9849	0.9834	0.9826	0.9810
19	3137K	1.0000	0.9968	0.9936	0.9920	0.9881	0.9849	0.9833	0.9801	0.9769	0.9745
20	3117K	1.0000	0.9984	0.9945	0.9922	0.9883	0.9852	0.9829	0.9813	0.9782	0.9743
21	3128K	1.0000	0.9969	0.9938	0.9906	0.9883	0.9836	0.9821	0.9805	0.9782	0.9743
22	3141K	1.0000	0.9961	0.9922	0.9882	0.9843	0.9812	0.9788	0.9765	0.9734	0.9710
23	3114K	1.0000	0.9952	0.9913	0.9873	0.9826	0.9778	0.9762	0.9746	0.9715	0.9691
24	3115K	1.0000	0.9953	0.9922	0.9899	0.9867	0.9821	0.9805	0.9790	0.9782	0.9751
25	3117K	1.0000	0.9968	0.9944	0.9912	0.9880	0.9848	0.9832	0.9800	0.9777	0.9745

CIE 1976 u' data for tested units
$T_s = T_{air} = 115°C$, $I_f = 120mA$; $T_s \geq 113°C$ and $T_{air} \geq 110°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3165K	0.2448	0.2446	0.2447	0.2446	0.2442	0.2442	0.2446	0.2443	0.2441	0.2438
2	3117K	0.2469	0.2466	0.2467	0.2464	0.2459	0.2461	0.2463	0.2461	0.2459	0.2456
3	3116K	0.2463	0.2458	0.2457	0.2456	0.2451	0.2452	0.2455	0.2452	0.2450	0.2447
4	3129K	0.2459	0.2457	0.2457	0.2455	0.2451	0.2451	0.2454	0.2451	0.2449	0.2446
5	3131K	0.2462	0.2458	0.2459	0.2457	0.2453	0.2454	0.2456	0.2454	0.2452	0.2449
6	3120K	0.2465	0.2462	0.2462	0.2461	0.2457	0.2458	0.2460	0.2458	0.2455	0.2453
7	3115K	0.2469	0.2466	0.2466	0.2465	0.2460	0.2461	0.2462	0.2460	0.2457	0.2454
8	3123K	0.2467	0.2465	0.2465	0.2464	0.2461	0.2461	0.2464	0.2462	0.2458	0.2456
9	2972K	0.2509	0.2507	0.2507	0.2505	0.2501	0.2502	0.2504	0.2502	0.2499	0.2496
10	3140K	0.2462	0.2459	0.2460	0.2459	0.2455	0.2455	0.2457	0.2455	0.2451	0.2449
11	3093K	0.2476	0.2474	0.2473	0.2472	0.2468	0.2469	0.2471	0.2468	0.2466	0.2463
12	3135K	0.2460	0.2457	0.2457	0.2456	0.2452	0.2453	0.2455	0.2453	0.2450	0.2447
13	3143K	0.2456	0.2454	0.2454	0.2453	0.2449	0.2449	0.2451	0.2449	0.2447	0.2444
14	3170K	0.2449	0.2448	0.2448	0.2446	0.2442	0.2443	0.2445	0.2442	0.2440	0.2437
15	3142K	0.2455	0.2453	0.2453	0.2452	0.2447	0.2447	0.2450	0.2448	0.2445	0.2441
16	3103K	0.2471	0.2469	0.2469	0.2468	0.2464	0.2465	0.2466	0.2465	0.2462	0.2459
17	3132K	0.2455	0.2452	0.2452	0.2450	0.2446	0.2447	0.2449	0.2447	0.2445	0.2442
18	2974K	0.2509	0.2508	0.2508	0.2506	0.2502	0.2503	0.2506	0.2504	0.2501	0.2498
19	3137K	0.2462	0.2460	0.2460	0.2459	0.2454	0.2455	0.2457	0.2455	0.2453	0.2450
20	3117K	0.2468	0.2466	0.2467	0.2465	0.2461	0.2462	0.2464	0.2462	0.2459	0.2457
21	3128K	0.2462	0.2459	0.2459	0.2457	0.2452	0.2454	0.2456	0.2455	0.2452	0.2449
22	3141K	0.2454	0.2451	0.2451	0.2451	0.2447	0.2448	0.2450	0.2448	0.2445	0.2442
23	3114K	0.2470	0.2468	0.2469	0.2467	0.2463	0.2464	0.2466	0.2464	0.2462	0.2458
24	3115K	0.2468	0.2464	0.2464	0.2463	0.2459	0.2461	0.2461	0.2459	0.2456	0.2453
25	3117K	0.2469	0.2466	0.2466	0.2465	0.2461	0.2463	0.2464	0.2462	0.2461	0.2457

CIE 1976 v' data for tested units
$T_s = T_{air} = 115°C$, $I_f = 120mA$; $T_s \geq 113°C$ and $T_{air} \geq 110°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3165K	0.5189	0.5182	0.5180	0.5178	0.5178	0.5173	0.5170	0.5167	0.5166	0.5165
2	3117K	0.5178	0.5171	0.5169	0.5166	0.5166	0.5161	0.5157	0.5155	0.5153	0.5152
3	3116K	0.5201	0.5192	0.5189	0.5186	0.5185	0.5181	0.5177	0.5174	0.5173	0.5172
4	3129K	0.5198	0.5191	0.5188	0.5186	0.5185	0.5181	0.5177	0.5174	0.5173	0.5172
5	3131K	0.5184	0.5177	0.5174	0.5171	0.5171	0.5167	0.5163	0.5160	0.5159	0.5158
6	3120K	0.5189	0.5182	0.5179	0.5177	0.5177	0.5172	0.5168	0.5166	0.5165	0.5164
7	3115K	0.5181	0.5173	0.5170	0.5167	0.5167	0.5163	0.5157	0.5155	0.5153	0.5152
8	3123K	0.5177	0.5172	0.5169	0.5166	0.5166	0.5163	0.5158	0.5155	0.5154	0.5153
9	2972K	0.5246	0.5240	0.5237	0.5234	0.5234	0.5230	0.5226	0.5223	0.5222	0.5222
10	3140K	0.5172	0.5166	0.5163	0.5161	0.5161	0.5157	0.5152	0.5150	0.5148	0.5148
11	3093K	0.5187	0.5181	0.5178	0.5175	0.5175	0.5171	0.5166	0.5164	0.5162	0.5162
12	3135K	0.5186	0.5179	0.5176	0.5174	0.5174	0.5170	0.5165	0.5163	0.5161	0.5160
13	3143K	0.5190	0.5184	0.5181	0.5178	0.5178	0.5174	0.5170	0.5167	0.5166	0.5165
14	3170K	0.5179	0.5174	0.5171	0.5168	0.5168	0.5164	0.5159	0.5157	0.5156	0.5156
15	3142K	0.5194	0.5187	0.5184	0.5181	0.5181	0.5177	0.5173	0.5171	0.5169	0.5168
16	3103K	0.5190	0.5185	0.5182	0.5179	0.5179	0.5175	0.5170	0.5168	0.5167	0.5166
17	3132K	0.5208	0.5202	0.5199	0.5196	0.5196	0.5192	0.5187	0.5185	0.5185	0.5183
18	2974K	0.5242	0.5237	0.5234	0.5231	0.5231	0.5227	0.5222	0.5220	0.5219	0.5219
19	3137K	0.5176	0.5170	0.5167	0.5164	0.5164	0.5160	0.5156	0.5153	0.5153	0.5151
20	3117K	0.5182	0.5176	0.5174	0.5171	0.5170	0.5167	0.5162	0.5160	0.5159	0.5157
21	3128K	0.5188	0.5181	0.5177	0.5175	0.5174	0.5170	0.5165	0.5163	0.5163	0.5161
22	3141K	0.5199	0.5193	0.5190	0.5188	0.5188	0.5185	0.5180	0.5177	0.5175	0.5173
23	3114K	0.5179	0.5174	0.5171	0.5168	0.5168	0.5164	0.5159	0.5157	0.5157	0.5155
24	3115K	0.5185	0.5178	0.5175	0.5172	0.5172	0.5169	0.5163	0.5161	0.5160	0.5157
25	3117K	0.5179	0.5173	0.5170	0.5167	0.5167	0.5163	0.5158	0.5157	0.5156	0.5154

Delta u'v' data for tested units
$T_s = T_{air}$ = 115°C, I_f = 120mA; $T_s \geq$ 113°C and $T_{air} \geq$ 110°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3165K	0.0000	0.0007	0.0009	0.0011	0.0013	0.0017	0.0019	0.0023	0.0024	0.0026
2	3117K	0.0000	0.0008	0.0009	0.0013	0.0016	0.0019	0.0022	0.0024	0.0027	0.0029
3	3116K	0.0000	0.0010	0.0013	0.0017	0.0020	0.0023	0.0025	0.0029	0.0031	0.0033
4	3129K	0.0000	0.0007	0.0010	0.0013	0.0015	0.0019	0.0022	0.0025	0.0027	0.0029
5	3131K	0.0000	0.0008	0.0010	0.0014	0.0016	0.0019	0.0022	0.0025	0.0027	0.0029
6	3120K	0.0000	0.0008	0.0010	0.0013	0.0014	0.0018	0.0022	0.0024	0.0026	0.0028
7	3115K	0.0000	0.0009	0.0011	0.0015	0.0017	0.0020	0.0025	0.0028	0.0030	0.0033
8	3123K	0.0000	0.0005	0.0008	0.0011	0.0013	0.0015	0.0019	0.0023	0.0025	0.0026
9	2972K	0.0000	0.0006	0.0009	0.0013	0.0014	0.0017	0.0021	0.0024	0.0026	0.0027
10	3140K	0.0000	0.0007	0.0009	0.0011	0.0013	0.0017	0.0021	0.0023	0.0026	0.0027
11	3093K	0.0000	0.0006	0.0009	0.0013	0.0014	0.0017	0.0022	0.0024	0.0027	0.0028
12	3135K	0.0000	0.0008	0.0010	0.0013	0.0014	0.0017	0.0022	0.0024	0.0027	0.0029
13	3143K	0.0000	0.0006	0.0009	0.0012	0.0014	0.0017	0.0021	0.0024	0.0026	0.0028
14	3170K	0.0000	0.0005	0.0008	0.0011	0.0013	0.0016	0.0020	0.0023	0.0025	0.0026
15	3142K	0.0000	0.0007	0.0010	0.0013	0.0015	0.0019	0.0022	0.0024	0.0027	0.0030
16	3103K	0.0000	0.0005	0.0008	0.0011	0.0013	0.0016	0.0021	0.0023	0.0025	0.0027
17	3132K	0.0000	0.0007	0.0009	0.0013	0.0015	0.0018	0.0022	0.0024	0.0025	0.0028
18	2974K	0.0000	0.0005	0.0008	0.0011	0.0013	0.0016	0.0020	0.0023	0.0024	0.0025
19	3137K	0.0000	0.0006	0.0009	0.0012	0.0014	0.0017	0.0021	0.0024	0.0025	0.0028
20	3117K	0.0000	0.0006	0.0008	0.0011	0.0014	0.0016	0.0020	0.0023	0.0025	0.0027
21	3128K	0.0000	0.0008	0.0011	0.0014	0.0017	0.0020	0.0024	0.0026	0.0027	0.0030
22	3141K	0.0000	0.0007	0.0009	0.0011	0.0013	0.0015	0.0019	0.0023	0.0026	0.0029
23	3114K	0.0000	0.0005	0.0008	0.0011	0.0013	0.0016	0.0020	0.0023	0.0023	0.0027
24	3115K	0.0000	0.0008	0.0011	0.0014	0.0016	0.0017	0.0023	0.0026	0.0028	0.0032
25	3117K	0.0000	0.0007	0.0009	0.0013	0.0014	0.0017	0.0022	0.0023	0.0024	0.0028

Forward Voltage [V] data for tested units
$T_s = T_{air}$ = 115°C, I_f = 120mA; $T_s \geq$ 113°C and $T_{air} \geq$ 110°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3165K	5.869	5.915	5.867	5.882	5.868	5.872	5.876	5.870	5.861	5.867
2	3117K	5.951	5.844	5.859	5.848	5.838	5.872	5.842	5.838	5.828	5.835
3	3116K	5.813	5.824	5.815	5.851	5.847	5.999	5.911	5.837	5.995	5.835
4	3129K	5.854	6.037	5.856	5.943	6.088	5.958	5.863	5.875	5.857	5.855
5	3131K	5.830	5.982	5.836	5.849	5.839	5.984	5.841	5.838	5.825	5.834
6	3120K	5.889	5.906	5.886	5.900	5.899	5.837	5.992	6.070	5.931	5.885
7	3115K	5.837	5.829	5.830	5.845	5.908	5.909	5.848	5.832	5.821	5.828
8	3123K	5.919	5.840	5.848	5.852	5.880	6.138	5.851	5.843	5.838	5.845
9	2972K	5.860	5.878	5.856	5.881	5.855	5.859	5.861	5.854	5.849	5.854
10	3140K	5.819	5.835	5.824	5.887	5.934	5.899	5.818	5.812	5.821	5.811
11	3093K	5.864	5.864	5.855	5.875	5.868	5.889	5.886	5.869	5.855	5.869
12	3135K	5.875	5.940	5.882	5.894	5.883	6.019	5.884	5.881	5.873	5.882
13	3143K	5.840	5.950	5.840	5.895	5.931	5.976	5.841	5.865	5.843	5.836
14	3170K	5.960	5.932	5.880	6.086	5.888	5.943	5.889	5.968	5.873	5.883
15	3142K	5.877	5.909	5.878	5.888	5.910	6.115	5.881	5.876	5.867	5.881
16	3103K	5.854	5.843	5.788	5.844	5.803	5.793	5.791	5.790	5.783	5.790
17	3132K	5.845	5.846	6.075	5.866	5.850	5.867	5.960	5.849	5.844	5.846
18	2974K	5.853	6.103	5.850	5.896	5.904	6.136	5.851	5.851	5.865	5.954
19	3137K	5.902	5.888	5.875	6.212	5.855	6.063	5.858	5.855	5.852	5.852
20	3117K	5.858	6.096	5.865	5.891	5.866	6.154	5.874	5.862	5.870	5.860
21	3128K	5.947	5.913	5.844	5.895	5.861	5.867	5.850	5.844	5.858	5.998
22	3141K	5.842	5.872	5.850	5.854	5.951	5.943	5.842	5.839	5.876	5.837
23	3114K	5.785	5.801	5.789	5.946	5.811	6.100	5.793	5.791	5.786	5.787
24	3115K	5.879	5.967	5.882	5.909	5.895	5.886	5.887	5.886	5.882	5.886
25	3117K	5.832	6.055	5.835	5.875	5.840	5.870	5.841	5.839	5.834	5.841

Luminous Flux [lm] data for tested units

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

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3006K	155.200	154.700	154.100	153.700	153.200	152.700	152.200	152.000	151.500	151.000
2	3148K	155.400	154.800	154.300	153.700	153.100	152.600	152.100	151.700	151.200	150.900
3	3132K	156.900	156.100	155.400	154.800	154.400	154.100	153.700	153.500	152.900	152.500
4	3127K	154.700	154.100	153.700	153.200	152.500	151.900	151.600	151.400	151.000	150.700
5	3147K	155.500	155.200	154.900	154.500	154.000	153.600	153.200	152.800	152.300	151.900
6	3139K	155.400	155.200	154.600	154.400	153.800	153.300	152.700	152.300	151.900	151.400
7	3161K	156.200	155.400	155.000	154.400	154.000	153.400	153.000	152.500	152.100	151.600
8	3156K	154.800	153.900	153.500	152.900	152.300	151.800	151.500	151.000	150.500	149.900
9	3145K	153.000	153.200	152.700	152.300	152.000	151.400	150.700	150.400	150.100	149.700
10	3114K	157.200	156.400	156.000	155.500	154.900	154.200	153.800	153.500	153.000	152.500
11	3106K	155.200	154.900	154.400	153.800	153.300	152.800	152.300	151.900	151.500	151.200
12	3163K	154.700	154.200	153.800	153.600	152.900	152.600	152.200	151.800	151.300	150.700
13	3161K	153.800	153.100	152.900	152.300	151.700	151.200	150.700	150.600	150.200	150.000
14	3130K	156.200	155.600	155.200	154.600	154.100	153.600	153.400	153.200	152.900	152.400
15	3127K	153.500	153.300	152.800	152.200	151.900	151.500	151.000	150.400	150.000	149.600
16	3127K	154.000	153.300	152.900	152.400	151.700	151.100	150.800	150.300	150.100	149.700
17	3109K	153.800	153.300	152.600	152.400	151.900	151.500	151.100	150.700	150.500	150.000
18	2967K	154.200	153.800	153.200	152.800	152.200	151.800	151.600	151.000	150.600	150.400
19	3158K	154.900	154.400	154.100	153.800	153.100	152.800	152.200	152.000	151.600	151.200
20	3129K	153.700	153.100	152.600	152.200	151.900	151.500	151.100	150.700	150.400	149.900
21	3107K	158.000	157.100	156.700	156.100	155.800	155.600	155.100	154.400	154.200	153.700
22	3133K	154.600	153.900	153.200	152.800	152.100	151.600	151.200	150.600	150.200	149.800
23	2988K	158.200	157.500	156.800	156.500	156.100	155.500	155.000	154.900	154.300	153.600
24	3130K	156.000	155.200	154.700	154.300	153.700	153.300	152.600	152.200	151.900	151.300
25	3127K	153.200	153.000	152.400	151.900	151.200	150.700	150.400	149.800	149.400	149.200

Normalized Luminous Flux data for tested units

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

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3006K	1.0000	0.9968	0.9929	0.9903	0.9871	0.9839	0.9807	0.9794	0.9762	0.9729
2	3148K	1.0000	0.9961	0.9929	0.9891	0.9852	0.9820	0.9788	0.9762	0.9730	0.9710
3	3132K	1.0000	0.9949	0.9904	0.9866	0.9841	0.9822	0.9796	0.9783	0.9745	0.9720
4	3127K	1.0000	0.9961	0.9935	0.9903	0.9858	0.9819	0.9800	0.9787	0.9761	0.9741
5	3147K	1.0000	0.9981	0.9961	0.9936	0.9904	0.9878	0.9852	0.9826	0.9794	0.9768
6	3139K	1.0000	0.9987	0.9949	0.9936	0.9897	0.9865	0.9826	0.9801	0.9775	0.9743
7	3161K	1.0000	0.9949	0.9923	0.9885	0.9859	0.9821	0.9795	0.9763	0.9738	0.9706
8	3156K	1.0000	0.9942	0.9916	0.9877	0.9839	0.9806	0.9787	0.9755	0.9722	0.9683
9	3145K	1.0000	1.0013	0.9980	0.9954	0.9935	0.9895	0.9850	0.9830	0.9810	0.9784
10	3114K	1.0000	0.9949	0.9924	0.9892	0.9854	0.9809	0.9784	0.9765	0.9733	0.9701
11	3106K	1.0000	0.9981	0.9948	0.9910	0.9878	0.9845	0.9813	0.9787	0.9762	0.9742
12	3163K	1.0000	0.9968	0.9942	0.9929	0.9884	0.9864	0.9838	0.9813	0.9780	0.9741
13	3161K	1.0000	0.9954	0.9941	0.9902	0.9863	0.9831	0.9798	0.9792	0.9766	0.9753
14	3130K	1.0000	0.9962	0.9936	0.9898	0.9866	0.9834	0.9821	0.9808	0.9789	0.9757
15	3127K	1.0000	0.9987	0.9954	0.9915	0.9896	0.9870	0.9837	0.9798	0.9772	0.9746
16	3127K	1.0000	0.9955	0.9929	0.9896	0.9851	0.9812	0.9792	0.9760	0.9747	0.9721
17	3109K	1.0000	0.9967	0.9922	0.9909	0.9876	0.9850	0.9824	0.9798	0.9785	0.9753
18	2967K	1.0000	0.9974	0.9935	0.9909	0.9870	0.9844	0.9831	0.9792	0.9767	0.9754
19	3158K	1.0000	0.9968	0.9948	0.9929	0.9884	0.9864	0.9826	0.9813	0.9787	0.9761
20	3129K	1.0000	0.9961	0.9928	0.9902	0.9883	0.9857	0.9831	0.9805	0.9785	0.9753
21	3107K	1.0000	0.9943	0.9918	0.9880	0.9861	0.9848	0.9816	0.9772	0.9759	0.9728
22	3133K	1.0000	0.9955	0.9909	0.9884	0.9838	0.9806	0.9780	0.9741	0.9715	0.9690
23	2988K	1.0000	0.9956	0.9912	0.9893	0.9867	0.9829	0.9798	0.9791	0.9753	0.9709
24	3130K	1.0000	0.9949	0.9917	0.9891	0.9853	0.9827	0.9782	0.9756	0.9737	0.9699
25	3127K	1.0000	0.9987	0.9948	0.9915	0.9869	0.9837	0.9817	0.9778	0.9752	0.9739

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

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3006K	0.2494	0.2492	0.2492	0.2490	0.2486	0.2487	0.2490	0.2489	0.2485	0.2481
2	3148K	0.2448	0.2444	0.2444	0.2443	0.2439	0.2439	0.2442	0.2440	0.2437	0.2433
3	3132K	0.2460	0.2456	0.2456	0.2455	0.2451	0.2451	0.2454	0.2453	0.2449	0.2445
4	3127K	0.2464	0.2460	0.2460	0.2458	0.2455	0.2455	0.2458	0.2457	0.2452	0.2448
5	3147K	0.2452	0.2448	0.2448	0.2447	0.2443	0.2443	0.2446	0.2445	0.2440	0.2437
6	3139K	0.2459	0.2455	0.2453	0.2453	0.2449	0.2450	0.2452	0.2451	0.2447	0.2444
7	3161K	0.2451	0.2447	0.2447	0.2447	0.2443	0.2443	0.2446	0.2444	0.2439	0.2436
8	3156K	0.2454	0.2449	0.2450	0.2449	0.2444	0.2444	0.2447	0.2446	0.2442	0.2438
9	3145K	0.2457	0.2453	0.2453	0.2453	0.2449	0.2448	0.2452	0.2450	0.2447	0.2443
10	3114K	0.2467	0.2462	0.2462	0.2461	0.2458	0.2458	0.2460	0.2459	0.2455	0.2452
11	3106K	0.2473	0.2469	0.2469	0.2469	0.2465	0.2465	0.2467	0.2465	0.2462	0.2458
12	3163K	0.2451	0.2447	0.2447	0.2447	0.2442	0.2443	0.2444	0.2444	0.2440	0.2437
13	3161K	0.2453	0.2448	0.2449	0.2447	0.2443	0.2443	0.2446	0.2445	0.2441	0.2438
14	3130K	0.2461	0.2457	0.2457	0.2457	0.2452	0.2452	0.2455	0.2453	0.2450	0.2447
15	3127K	0.2463	0.2458	0.2458	0.2457	0.2453	0.2454	0.2456	0.2455	0.2452	0.2448
16	3127K	0.2463	0.2458	0.2458	0.2457	0.2453	0.2453	0.2456	0.2454	0.2451	0.2447
17	3109K	0.2469	0.2464	0.2465	0.2464	0.2459	0.2459	0.2462	0.2460	0.2458	0.2453
18	2967K	0.2513	0.2508	0.2509	0.2509	0.2504	0.2505	0.2507	0.2505	0.2502	0.2498
19	3158K	0.2455	0.2451	0.2451	0.2450	0.2445	0.2446	0.2448	0.2446	0.2444	0.2440
20	3129K	0.2462	0.2456	0.2457	0.2457	0.2453	0.2453	0.2456	0.2453	0.2451	0.2448
21	3107K	0.2469	0.2464	0.2464	0.2465	0.2459	0.2460	0.2462	0.2460	0.2457	0.2454
22	3133K	0.2461	0.2457	0.2457	0.2456	0.2451	0.2452	0.2455	0.2452	0.2450	0.2447
23	2988K	0.2496	0.2491	0.2491	0.2490	0.2486	0.2487	0.2489	0.2486	0.2483	0.2479
24	3130K	0.2463	0.2458	0.2458	0.2457	0.2453	0.2453	0.2456	0.2453	0.2451	0.2447
25	3127K	0.2460	0.2455	0.2456	0.2454	0.2450	0.2451	0.2453	0.2451	0.2449	0.2446

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

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3006K	0.5249	0.5243	0.5239	0.5236	0.5234	0.5232	0.5228	0.5226	0.5224	0.5222
2	3148K	0.5211	0.5205	0.5203	0.5199	0.5197	0.5194	0.5191	0.5188	0.5186	0.5183
3	3132K	0.5190	0.5182	0.5179	0.5176	0.5173	0.5171	0.5168	0.5164	0.5163	0.5160
4	3127K	0.5183	0.5176	0.5173	0.5169	0.5166	0.5164	0.5161	0.5158	0.5156	0.5153
5	3147K	0.5198	0.5191	0.5189	0.5186	0.5183	0.5181	0.5178	0.5174	0.5172	0.5169
6	3139K	0.5184	0.5178	0.5175	0.5171	0.5168	0.5167	0.5164	0.5161	0.5158	0.5156
7	3161K	0.5183	0.5176	0.5174	0.5170	0.5167	0.5166	0.5163	0.5158	0.5157	0.5154
8	3156K	0.5180	0.5173	0.5170	0.5167	0.5162	0.5160	0.5159	0.5155	0.5153	0.5150
9	3145K	0.5183	0.5177	0.5175	0.5171	0.5168	0.5165	0.5163	0.5160	0.5158	0.5156
10	3114K	0.5190	0.5182	0.5180	0.5176	0.5173	0.5171	0.5169	0.5165	0.5163	0.5161
11	3106K	0.5179	0.5173	0.5169	0.5166	0.5163	0.5160	0.5157	0.5154	0.5152	0.5150
12	3163K	0.5181	0.5175	0.5172	0.5169	0.5166	0.5163	0.5160	0.5157	0.5155	0.5153
13	3161K	0.5177	0.5171	0.5168	0.5165	0.5161	0.5159	0.5156	0.5155	0.5151	0.5150
14	3130K	0.5190	0.5184	0.5181	0.5178	0.5174	0.5171	0.5168	0.5167	0.5164	0.5163
15	3127K	0.5187	0.5180	0.5177	0.5174	0.5171	0.5168	0.5165	0.5163	0.5161	0.5159
16	3127K	0.5186	0.5180	0.5176	0.5172	0.5170	0.5167	0.5165	0.5162	0.5160	0.5158
17	3109K	0.5190	0.5182	0.5179	0.5175	0.5172	0.5169	0.5166	0.5164	0.5162	0.5161
18	2967K	0.5237	0.5230	0.5226	0.5223	0.5220	0.5218	0.5215	0.5212	0.5211	0.5209
19	3158K	0.5174	0.5167	0.5164	0.5160	0.5157	0.5154	0.5152	0.5149	0.5147	0.5145
20	3129K	0.5187	0.5179	0.5177	0.5174	0.5170	0.5167	0.5164	0.5163	0.5161	0.5159
21	3107K	0.5192	0.5185	0.5182	0.5180	0.5175	0.5173	0.5170	0.5167	0.5165	0.5164
22	3133K	0.5185	0.5178	0.5175	0.5172	0.5168	0.5166	0.5164	0.5160	0.5159	0.5157
23	2988K	0.5271	0.5264	0.5261	0.5257	0.5254	0.5252	0.5249	0.5246	0.5244	0.5242
24	3130K	0.5183	0.5176	0.5173	0.5169	0.5166	0.5163	0.5160	0.5157	0.5156	0.5154
25	3127K	0.5197	0.5189	0.5186	0.5183	0.5180	0.5177	0.5175	0.5172	0.5170	0.5169

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

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3006K	0.0000	0.0006	0.0010	0.0014	0.0017	0.0018	0.0021	0.0024	0.0027	0.0030
2	3148K	0.0000	0.0007	0.0009	0.0013	0.0017	0.0019	0.0021	0.0024	0.0027	0.0032
3	3132K	0.0000	0.0009	0.0012	0.0015	0.0019	0.0021	0.0023	0.0027	0.0029	0.0034
4	3127K	0.0000	0.0008	0.0011	0.0015	0.0019	0.0021	0.0023	0.0026	0.0030	0.0034
5	3147K	0.0000	0.0008	0.0010	0.0013	0.0017	0.0019	0.0021	0.0025	0.0029	0.0033
6	3139K	0.0000	0.0007	0.0011	0.0014	0.0019	0.0019	0.0021	0.0024	0.0029	0.0032
7	3161K	0.0000	0.0008	0.0010	0.0014	0.0018	0.0019	0.0021	0.0026	0.0029	0.0033
8	3156K	0.0000	0.0009	0.0011	0.0014	0.0021	0.0022	0.0022	0.0026	0.0030	0.0034
9	3145K	0.0000	0.0007	0.0009	0.0013	0.0017	0.0020	0.0021	0.0024	0.0027	0.0030
10	3114K	0.0000	0.0009	0.0011	0.0015	0.0019	0.0021	0.0022	0.0026	0.0030	0.0033
11	3106K	0.0000	0.0007	0.0011	0.0014	0.0018	0.0021	0.0023	0.0026	0.0029	0.0033
12	3163K	0.0000	0.0007	0.0010	0.0013	0.0017	0.0020	0.0022	0.0025	0.0028	0.0031
13	3161K	0.0000	0.0008	0.0010	0.0013	0.0019	0.0021	0.0022	0.0023	0.0029	0.0031
14	3130K	0.0000	0.0007	0.0010	0.0013	0.0018	0.0021	0.0023	0.0024	0.0028	0.0030
15	3127K	0.0000	0.0009	0.0011	0.0014	0.0019	0.0021	0.0023	0.0025	0.0028	0.0032
16	3127K	0.0000	0.0008	0.0011	0.0015	0.0019	0.0021	0.0022	0.0026	0.0029	0.0032
17	3109K	0.0000	0.0009	0.0012	0.0016	0.0021	0.0023	0.0025	0.0028	0.0030	0.0033
18	2967K	0.0000	0.0009	0.0012	0.0015	0.0019	0.0021	0.0023	0.0026	0.0028	0.0032
19	3158K	0.0000	0.0008	0.0011	0.0015	0.0020	0.0022	0.0023	0.0027	0.0029	0.0033
20	3129K	0.0000	0.0010	0.0011	0.0014	0.0019	0.0022	0.0024	0.0026	0.0028	0.0031
21	3107K	0.0000	0.0009	0.0011	0.0013	0.0020	0.0021	0.0023	0.0027	0.0030	0.0032
22	3133K	0.0000	0.0008	0.0011	0.0014	0.0020	0.0021	0.0022	0.0027	0.0028	0.0031
23	2988K	0.0000	0.0009	0.0011	0.0015	0.0020	0.0021	0.0023	0.0027	0.0030	0.0034
24	3130K	0.0000	0.0009	0.0011	0.0015	0.0020	0.0022	0.0024	0.0028	0.0030	0.0033
25	3127K	0.0000	0.0009	0.0012	0.0015	0.0020	0.0022	0.0023	0.0027	0.0029	0.0031

Forward Voltage [V] data for tested units
$T_s = T_{air}$ = 105°C, I_f = 150mA; $T_s \geq$ 103°C and $T_{air} \geq$ 100°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3006K	6.011	6.018	6.012	6.044	6.023	6.052	6.026	6.053	6.009	6.010
2	3148K	5.989	5.956	6.124	6.003	5.966	5.985	6.211	5.962	5.955	5.952
3	3132K	6.042	6.029	6.037	6.046	6.045	6.036	6.039	6.037	6.072	6.024
4	3127K	5.982	5.981	5.973	5.982	6.064	5.982	5.985	5.981	5.968	5.970
5	3147K	5.991	5.965	5.978	6.264	5.972	5.968	5.958	5.952	5.944	5.943
6	3139K	6.049	6.010	5.999	6.023	6.018	6.206	6.011	5.999	5.993	5.992
7	3161K	6.013	5.970	5.978	5.985	6.000	6.060	5.987	5.974	5.973	5.965
8	3156K	5.929	5.939	5.939	6.135	5.972	6.061	5.962	5.957	5.937	5.925
9	3145K	5.969	5.964	5.972	6.075	5.989	5.988	5.977	5.974	5.966	5.960
10	3114K	6.036	6.070	6.033	6.198	6.050	6.160	6.039	6.035	6.284	6.028
11	3106K	6.014	6.022	6.030	6.264	6.026	6.068	6.087	6.044	6.016	6.015
12	3163K	6.023	5.947	5.991	5.994	5.956	6.118	5.992	5.951	5.940	5.941
13	3161K	6.001	5.996	5.941	5.952	5.947	6.071	5.944	5.974	5.931	5.936
14	3130K	6.031	6.002	6.009	6.011	6.008	6.061	6.004	6.003	5.992	5.996
15	3127K	6.011	5.929	5.923	5.936	5.932	6.103	5.926	5.922	5.914	5.914
16	3127K	6.036	5.990	6.058	6.014	5.998	6.119	6.007	5.991	5.984	5.984
17	3109K	5.950	5.976	6.064	5.948	6.015	5.981	5.975	5.936	5.935	5.937
18	2967K	6.033	6.018	6.140	6.011	6.027	6.179	6.017	6.008	6.006	6.005
19	3158K	6.016	6.102	6.014	6.082	6.077	6.217	6.023	6.022	6.096	6.010
20	3129K	5.956	6.022	5.937	5.978	5.948	6.014	5.952	5.943	6.179	5.940
21	3107K	6.026	6.322	6.036	6.034	6.016	6.096	6.040	6.027	6.023	6.022
22	3133K	5.946	5.980	5.958	6.267	6.001	6.099	5.958	5.951	5.951	5.941
23	2988K	6.003	5.955	5.966	5.962	5.989	6.081	5.962	5.953	5.996	5.949
24	3130K	5.980	5.965	6.015	5.934	5.943	5.932	5.973	6.170	5.917	5.920
25	3127K	6.013	6.305	6.019	6.020	6.164	6.024	6.023	6.016	6.016	6.012

Luminous Flux [lm] data for tested units

$T_s = T_{air}$ = 115°C, I_f = 180mA; $T_s \geq$ 113°C and $T_{air} \geq$ 110°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3134K	182.600	181.400	180.700	180.100	179.600	179.000	178.400	177.900	177.300	176.700
2	3121K	179.700	178.500	177.900	177.300	176.600	175.700	175.200	174.600	174.200	173.400
3	3143K	181.500	180.700	179.900	179.400	178.700	178.200	177.600	177.000	176.400	175.700
4	3107K	179.600	178.600	178.000	177.200	176.500	175.900	175.300	174.500	174.200	173.900
5	3116K	182.600	181.600	181.000	180.800	180.200	179.700	179.200	178.600	178.100	177.600
6	3169K	181.500	180.600	180.200	179.500	178.700	178.100	177.400	177.000	176.800	176.200
7	3142K	180.700	179.600	178.800	178.300	177.600	177.000	176.700	176.000	175.600	175.000
8	3152K	180.500	180.200	179.600	179.100	178.100	177.500	176.800	176.200	175.800	175.100
9	3149K	175.900	175.700	175.400	175.000	174.100	173.500	173.000	172.300	171.700	171.200
10	3164K	180.600	180.000	179.700	179.100	178.600	178.000	177.600	177.000	176.100	175.400
11	3147K	176.900	175.900	175.300	174.800	174.400	173.700	173.300	172.900	172.400	171.600
12	3171K	184.300	183.400	182.700	182.200	181.500	180.900	180.400	179.800	179.400	178.800
13	3155K	181.500	180.400	179.900	179.100	178.500	177.900	177.400	177.200	176.700	176.100
14	3139K	178.500	177.200	176.500	175.900	175.400	174.800	174.000	173.700	173.200	172.600
15	3182K	177.800	177.100	176.600	175.900	175.100	174.700	174.200	173.300	172.900	172.500
16	3134K	177.400	176.400	176.000	175.500	174.900	174.200	173.800	173.100	172.400	171.900
17	3163K	181.800	180.900	180.200	179.800	179.300	179.100	178.500	177.800	176.900	176.400
18	3113K	177.500	176.400	176.000	175.600	174.800	174.000	173.700	173.100	172.600	171.800
19	3149K	179.300	178.400	177.900	177.300	176.800	176.100	175.200	174.800	174.300	173.700
20	3122K	180.500	180.000	179.400	178.800	178.200	177.600	177.100	176.600	175.900	175.500
21	3149K	178.800	178.100	177.500	176.800	176.100	175.600	175.200	174.500	173.900	173.300
22	3114K	178.600	178.100	177.400	177.100	176.400	175.800	175.100	174.800	174.100	173.600
23	3147K	177.600	176.400	175.900	175.400	174.600	174.200	173.600	173.000	172.600	172.000
24	3150K	178.100	176.800	176.200	175.700	174.800	174.200	173.300	172.800	172.300	172.000
25	3144K	181.400	179.900	179.100	178.600	177.600	177.000	176.300	175.600	175.200	174.700

Normalized Luminous Flux data for tested units

$T_s = T_{air}$ = 115°C, I_f = 180mA; $T_s \geq$ 113°C and $T_{air} \geq$ 110°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3134K	1.0000	0.9934	0.9896	0.9863	0.9836	0.9803	0.9770	0.9743	0.9710	0.9677
2	3121K	1.0000	0.9933	0.9900	0.9866	0.9827	0.9777	0.9750	0.9716	0.9694	0.9649
3	3143K	1.0000	0.9956	0.9912	0.9884	0.9846	0.9818	0.9785	0.9752	0.9719	0.9680
4	3107K	1.0000	0.9944	0.9911	0.9866	0.9827	0.9794	0.9761	0.9716	0.9699	0.9683
5	3116K	1.0000	0.9945	0.9912	0.9901	0.9869	0.9841	0.9814	0.9781	0.9754	0.9726
6	3169K	1.0000	0.9950	0.9928	0.9890	0.9846	0.9813	0.9774	0.9752	0.9741	0.9708
7	3142K	1.0000	0.9939	0.9895	0.9867	0.9828	0.9795	0.9779	0.9740	0.9718	0.9685
8	3152K	1.0000	0.9983	0.9950	0.9922	0.9867	0.9834	0.9795	0.9762	0.9740	0.9701
9	3149K	1.0000	0.9989	0.9972	0.9949	0.9898	0.9864	0.9835	0.9795	0.9761	0.9733
10	3164K	1.0000	0.9967	0.9950	0.9917	0.9889	0.9856	0.9834	0.9801	0.9751	0.9712
11	3147K	1.0000	0.9943	0.9910	0.9881	0.9859	0.9819	0.9796	0.9774	0.9746	0.9700
12	3171K	1.0000	0.9951	0.9913	0.9886	0.9848	0.9816	0.9788	0.9756	0.9734	0.9702
13	3155K	1.0000	0.9939	0.9912	0.9868	0.9835	0.9802	0.9774	0.9763	0.9736	0.9702
14	3139K	1.0000	0.9927	0.9888	0.9854	0.9826	0.9793	0.9748	0.9731	0.9703	0.9669
15	3182K	1.0000	0.9961	0.9933	0.9893	0.9848	0.9826	0.9798	0.9747	0.9724	0.9702
16	3134K	1.0000	0.9944	0.9921	0.9893	0.9859	0.9820	0.9797	0.9758	0.9718	0.9690
17	3163K	1.0000	0.9950	0.9912	0.9890	0.9862	0.9851	0.9818	0.9780	0.9730	0.9703
18	3113K	1.0000	0.9938	0.9915	0.9893	0.9848	0.9803	0.9786	0.9752	0.9724	0.9679
19	3149K	1.0000	0.9950	0.9922	0.9888	0.9861	0.9822	0.9771	0.9749	0.9721	0.9688
20	3122K	1.0000	0.9972	0.9939	0.9906	0.9873	0.9839	0.9812	0.9784	0.9745	0.9723
21	3149K	1.0000	0.9961	0.9927	0.9888	0.9849	0.9821	0.9799	0.9760	0.9726	0.9692
22	3114K	1.0000	0.9972	0.9933	0.9916	0.9877	0.9843	0.9804	0.9787	0.9748	0.9720
23	3147K	1.0000	0.9932	0.9904	0.9876	0.9831	0.9809	0.9775	0.9741	0.9718	0.9685
24	3150K	1.0000	0.9927	0.9893	0.9865	0.9815	0.9781	0.9730	0.9702	0.9674	0.9657
25	3144K	1.0000	0.9917	0.9873	0.9846	0.9791	0.9757	0.9719	0.9680	0.9658	0.9631

CIE 1976 u' data for tested units
$T_s = T_{air}$ = 115°C, I_f = 180mA; $T_s \geq$ 113°C and $T_{air} \geq$ 110°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3134K	0.2459	0.2455	0.2454	0.2454	0.2450	0.2448	0.2451	0.2450	0.2445	0.2444
2	3121K	0.2467	0.2463	0.2462	0.2461	0.2458	0.2456	0.2459	0.2458	0.2454	0.2453
3	3143K	0.2456	0.2453	0.2454	0.2452	0.2449	0.2449	0.2449	0.2449	0.2446	0.2444
4	3107K	0.2470	0.2468	0.2469	0.2466	0.2464	0.2464	0.2465	0.2464	0.2461	0.2459
5	3116K	0.2468	0.2463	0.2464	0.2463	0.2459	0.2459	0.2460	0.2459	0.2457	0.2455
6	3169K	0.2447	0.2445	0.2445	0.2442	0.2439	0.2440	0.2440	0.2439	0.2436	0.2434
7	3142K	0.2460	0.2457	0.2457	0.2455	0.2452	0.2452	0.2454	0.2452	0.2449	0.2446
8	3152K	0.2453	0.2451	0.2451	0.2449	0.2446	0.2446	0.2446	0.2445	0.2443	0.2440
9	3149K	0.2455	0.2452	0.2452	0.2450	0.2447	0.2447	0.2447	0.2447	0.2445	0.2443
10	3164K	0.2452	0.2447	0.2448	0.2445	0.2442	0.2443	0.2444	0.2442	0.2440	0.2438
11	3147K	0.2457	0.2453	0.2453	0.2450	0.2448	0.2448	0.2449	0.2448	0.2445	0.2442
12	3171K	0.2445	0.2441	0.2441	0.2439	0.2436	0.2436	0.2437	0.2436	0.2433	0.2431
13	3155K	0.2453	0.2449	0.2449	0.2446	0.2444	0.2444	0.2445	0.2444	0.2441	0.2439
14	3139K	0.2458	0.2454	0.2455	0.2452	0.2449	0.2450	0.2450	0.2450	0.2447	0.2445
15	3182K	0.2447	0.2444	0.2444	0.2440	0.2438	0.2439	0.2439	0.2439	0.2436	0.2434
16	3134K	0.2462	0.2459	0.2460	0.2457	0.2455	0.2455	0.2456	0.2455	0.2453	0.2450
17	3163K	0.2445	0.2441	0.2441	0.2439	0.2436	0.2436	0.2437	0.2436	0.2434	0.2432
18	3113K	0.2471	0.2468	0.2468	0.2466	0.2463	0.2463	0.2463	0.2462	0.2461	0.2458
19	3149K	0.2453	0.2448	0.2449	0.2445	0.2443	0.2444	0.2444	0.2444	0.2441	0.2437
20	3122K	0.2465	0.2463	0.2463	0.2460	0.2457	0.2457	0.2458	0.2457	0.2455	0.2452
21	3149K	0.2455	0.2451	0.2451	0.2449	0.2446	0.2446	0.2447	0.2447	0.2444	0.2440
22	3114K	0.2471	0.2469	0.2469	0.2468	0.2464	0.2465	0.2465	0.2464	0.2462	0.2460
23	3147K	0.2457	0.2454	0.2455	0.2453	0.2451	0.2452	0.2452	0.2451	0.2448	0.2446
24	3150K	0.2454	0.2451	0.2451	0.2449	0.2446	0.2447	0.2448	0.2447	0.2445	0.2442
25	3144K	0.2458	0.2456	0.2457	0.2454	0.2451	0.2452	0.2452	0.2451	0.2450	0.2446

CIE 1976 v' data for tested units
$T_s = T_{air}$ = 115°C, I_f = 180mA; $T_s \geq$ 113°C and $T_{air} \geq$ 110°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3134K	0.5191	0.5183	0.5180	0.5177	0.5174	0.5171	0.5167	0.5164	0.5164	0.5161
2	3121K	0.5180	0.5171	0.5168	0.5164	0.5162	0.5158	0.5154	0.5152	0.5151	0.5150
3	3143K	0.5190	0.5183	0.5180	0.5176	0.5174	0.5171	0.5167	0.5164	0.5163	0.5162
4	3107K	0.5189	0.5183	0.5180	0.5176	0.5173	0.5171	0.5166	0.5163	0.5162	0.5162
5	3116K	0.5183	0.5176	0.5173	0.5169	0.5166	0.5164	0.5159	0.5157	0.5156	0.5155
6	3169K	0.5187	0.5182	0.5178	0.5174	0.5170	0.5168	0.5164	0.5161	0.5160	0.5159
7	3142K	0.5177	0.5171	0.5167	0.5164	0.5161	0.5159	0.5154	0.5151	0.5150	0.5149
8	3152K	0.5189	0.5183	0.5179	0.5176	0.5173	0.5170	0.5165	0.5162	0.5162	0.5160
9	3149K	0.5185	0.5179	0.5176	0.5172	0.5169	0.5166	0.5162	0.5159	0.5158	0.5157
10	3164K	0.5176	0.5168	0.5165	0.5161	0.5157	0.5155	0.5151	0.5148	0.5147	0.5146
11	3147K	0.5181	0.5173	0.5169	0.5165	0.5162	0.5159	0.5155	0.5153	0.5152	0.5150
12	3171K	0.5192	0.5184	0.5180	0.5177	0.5174	0.5171	0.5167	0.5164	0.5163	0.5162
13	3155K	0.5184	0.5177	0.5174	0.5169	0.5167	0.5164	0.5160	0.5157	0.5157	0.5156
14	3139K	0.5188	0.5181	0.5178	0.5174	0.5171	0.5169	0.5164	0.5162	0.5161	0.5160
15	3182K	0.5171	0.5164	0.5161	0.5157	0.5154	0.5152	0.5147	0.5145	0.5144	0.5143
16	3134K	0.5180	0.5174	0.5172	0.5168	0.5165	0.5163	0.5158	0.5155	0.5154	0.5153
17	3163K	0.5202	0.5191	0.5188	0.5184	0.5181	0.5180	0.5174	0.5171	0.5171	0.5170
18	3113K	0.5177	0.5170	0.5167	0.5163	0.5161	0.5158	0.5153	0.5150	0.5150	0.5149
19	3149K	0.5193	0.5186	0.5184	0.5179	0.5177	0.5175	0.5170	0.5168	0.5166	0.5165
20	3122K	0.5186	0.5180	0.5177	0.5172	0.5169	0.5167	0.5162	0.5159	0.5158	0.5157
21	3149K	0.5185	0.5177	0.5175	0.5170	0.5167	0.5165	0.5160	0.5158	0.5157	0.5155
22	3114K	0.5176	0.5170	0.5167	0.5163	0.5160	0.5158	0.5154	0.5151	0.5150	0.5150
23	3147K	0.5181	0.5175	0.5173	0.5169	0.5167	0.5165	0.5159	0.5156	0.5156	0.5155
24	3150K	0.5187	0.5180	0.5176	0.5172	0.5170	0.5168	0.5164	0.5160	0.5160	0.5159
25	3144K	0.5182	0.5176	0.5172	0.5169	0.5166	0.5164	0.5159	0.5156	0.5155	0.5154

Delta u'v' data for tested units
$T_s = T_{air}$ = 115°C, I_f = 180mA; $T_s \geq$ 113°C and $T_{air} \geq$ 110°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3134K	0.0000	0.0009	0.0012	0.0015	0.0019	0.0023	0.0025	0.0028	0.0030	0.0034
2	3121K	0.0000	0.0010	0.0013	0.0017	0.0020	0.0025	0.0027	0.0029	0.0032	0.0033
3	3143K	0.0000	0.0008	0.0010	0.0015	0.0017	0.0020	0.0024	0.0027	0.0029	0.0030
4	3107K	0.0000	0.0006	0.0009	0.0014	0.0017	0.0019	0.0024	0.0027	0.0028	0.0029
5	3116K	0.0000	0.0009	0.0011	0.0015	0.0019	0.0021	0.0025	0.0028	0.0029	0.0031
6	3169K	0.0000	0.0005	0.0009	0.0014	0.0019	0.0020	0.0024	0.0027	0.0029	0.0031
7	3142K	0.0000	0.0007	0.0010	0.0014	0.0018	0.0020	0.0024	0.0027	0.0029	0.0031
8	3152K	0.0000	0.0006	0.0010	0.0014	0.0017	0.0020	0.0025	0.0028	0.0029	0.0032
9	3149K	0.0000	0.0007	0.0009	0.0014	0.0018	0.0021	0.0024	0.0027	0.0029	0.0030
10	3164K	0.0000	0.0009	0.0012	0.0017	0.0021	0.0023	0.0026	0.0030	0.0031	0.0033
11	3147K	0.0000	0.0009	0.0013	0.0017	0.0021	0.0024	0.0027	0.0029	0.0031	0.0034
12	3171K	0.0000	0.0009	0.0013	0.0016	0.0020	0.0023	0.0026	0.0029	0.0031	0.0033
13	3155K	0.0000	0.0008	0.0011	0.0017	0.0019	0.0022	0.0025	0.0028	0.0030	0.0031
14	3139K	0.0000	0.0008	0.0010	0.0015	0.0019	0.0021	0.0025	0.0027	0.0029	0.0031
15	3182K	0.0000	0.0008	0.0010	0.0016	0.0019	0.0021	0.0025	0.0027	0.0029	0.0031
16	3134K	0.0000	0.0007	0.0008	0.0013	0.0017	0.0018	0.0023	0.0026	0.0028	0.0030
17	3163K	0.0000	0.0012	0.0015	0.0019	0.0023	0.0024	0.0029	0.0032	0.0033	0.0035
18	3113K	0.0000	0.0008	0.0010	0.0015	0.0018	0.0021	0.0025	0.0028	0.0029	0.0031
19	3149K	0.0000	0.0009	0.0010	0.0016	0.0019	0.0020	0.0025	0.0027	0.0030	0.0032
20	3122K	0.0000	0.0006	0.0009	0.0015	0.0019	0.0021	0.0025	0.0028	0.0030	0.0032
21	3149K	0.0000	0.0009	0.0011	0.0016	0.0020	0.0022	0.0026	0.0028	0.0030	0.0034
22	3114K	0.0000	0.0006	0.0009	0.0013	0.0017	0.0019	0.0023	0.0026	0.0028	0.0028
23	3147K	0.0000	0.0007	0.0008	0.0013	0.0015	0.0017	0.0023	0.0026	0.0027	0.0028
24	3150K	0.0000	0.0008	0.0011	0.0016	0.0019	0.0020	0.0024	0.0028	0.0028	0.0030
25	3144K	0.0000	0.0006	0.0010	0.0014	0.0017	0.0019	0.0024	0.0027	0.0028	0.0030

Forward Voltage [V] data for tested units
$T_s = T_{air}$ = 115°C, I_f = 180mA; $T_s \geq$ 113°C and $T_{air} \geq$ 110°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3134K	6.048	6.049	6.045	6.067	6.242	6.051	6.050	6.050	6.052	6.046
2	3121K	6.032	6.150	6.128	6.035	6.034	6.088	6.033	6.043	6.036	6.029
3	3143K	6.160	6.224	6.228	6.261	6.176	6.185	6.165	6.163	6.153	6.161
4	3107K	6.148	6.186	6.326	6.170	6.170	6.185	6.155	6.151	6.144	6.145
5	3116K	6.154	6.136	6.177	6.160	6.160	6.177	6.156	6.152	6.146	6.149
6	3169K	6.188	6.185	6.165	6.176	6.176	6.155	6.174	6.166	6.164	6.163
7	3142K	6.094	6.284	6.068	6.075	6.071	6.133	6.091	6.157	6.067	6.063
8	3152K	6.180	6.211	6.220	6.179	6.188	6.258	6.178	6.175	6.174	6.165
9	3149K	6.116	6.132	6.107	6.420	6.388	6.188	6.120	6.131	6.118	6.112
10	3164K	6.154	6.173	6.154	6.167	6.183	6.191	6.161	6.149	6.156	6.149
11	3147K	6.161	6.171	6.167	6.164	6.173	6.281	6.217	6.167	6.149	6.152
12	3171K	6.211	6.167	6.148	6.404	6.173	6.167	6.147	6.155	6.145	6.159
13	3155K	6.209	6.160	6.516	6.176	6.292	6.186	6.233	6.160	6.179	6.151
14	3139K	6.170	6.141	6.171	6.145	6.159	6.156	6.130	6.134	6.127	6.122
15	3182K	6.186	6.187	6.146	6.153	6.149	6.147	6.150	6.141	6.138	6.135
16	3134K	6.159	6.201	6.139	6.179	6.152	6.192	6.151	6.143	6.133	6.134
17	3163K	6.219	6.192	6.136	6.302	6.167	6.160	6.139	6.130	6.126	6.124
18	3113K	6.082	6.065	6.056	6.181	6.058	6.100	6.056	6.103	6.056	6.049
19	3149K	6.059	6.101	6.065	6.102	6.102	6.100	6.055	6.071	6.065	6.059
20	3122K	6.128	6.265	6.129	6.160	6.135	6.138	6.136	6.139	6.134	6.117
21	3149K	6.064	6.091	6.077	6.070	6.074	6.102	6.074	6.068	6.065	6.065
22	3114K	6.121	6.056	6.057	6.058	6.060	6.276	6.060	6.056	6.050	6.051
23	3147K	6.148	6.157	6.138	6.151	6.170	6.254	6.142	6.142	6.149	6.134
24	3150K	6.210	6.160	6.141	6.157	6.174	6.218	6.149	6.213	6.136	6.135
25	3144K	6.143	6.099	6.101	6.107	6.103	6.106	6.103	6.112	6.100	6.100

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Company Information

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

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

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

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

	If = 65mA	If = 100mA	If = 120mA	If = 150mA	If = 180mA
Ts = 115°C	-	-	118,275	-	89,339
Ts = 105°C	146,132	-	117,235	103,725	-
Ts = 85°C	-	127,851	-	-	-
Ts = 55°C	174,240	-	-	-	-

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

	If = 65mA	If = 100mA	If = 120mA	If = 150mA	If = 180mA
Ts = 115°C	-	-	91,488	-	69,115
Ts = 105°C	113,936	-	91,097	80,268	-
Ts = 85°C	-	99,450	-	-	-
Ts = 55°C	136,136	-	-	-	-

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

	If = 65mA	If = 100mA	If = 120mA	If = 150mA	If = 180mA
Ts = 115°C	-	-	66,326	-	50,117
Ts = 105°C	83,693	-	66,544	58,234	-
Ts = 85°C	-	72,771	-	-	-
Ts = 55°C	100,343	-	-	-	-

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

	If = 65mA	If = 100mA	If = 120mA	If = 150mA	If = 180mA
Ts = 115°C	-	-	42,602	-	32,206
Ts = 105°C	55,179	-	43,395	37,460	-
Ts = 85°C	-	47,618	-	-	-
Ts = 55°C	66,597	-	-	-	-

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

	If = 65mA	If = 100mA	If = 120mA	If = 150mA	If = 180mA
Ts = 115°C	-	-	20,161	-	15,263
Ts = 105°C	28,208	-	21,498	17,810	-
Ts = 85°C	-	23,825	-	-	-
Ts = 55°C	34,676	-	-	-	-

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

	If = 65mA	If = 100mA	If = 120mA	If = 150mA	If = 180mA
Ts = 115°C	-	-	0	-	0
Ts = 105°C	2,040	-	0	0	-
Ts = 85°C	-	0	-	-	-
Ts = 55°C	4,289	-	-	-	-