short circuit

LED CHIP CERTIFICATION

Short Circuit Company

For Services And Lighting Solutions

Philips Lumileds

IESNA LM-80 Test Report

1. Applicable LUXEON® Series part number(s)

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

Product Family	Part Number	Nominal CCT
LUXEON 3030 2D	L130-2780003000W21	2700K
LUXEON 3030 2D	L130-2790003000W21	2700K
LUXEON 3030 2D	L130-3080003000W21	3000K
LUXEON 3030 2D	L130-3090003000W21	3000K
LUXEON 3030 2D	L130-3580003000W21	3500K
LUXEON 3030 2D	L130-4070003000W21	4000K
LUXEON 3030 2D	L130-4080003000W21	4000K
LUXEON 3030 2D	L130-5070003000W21	5000K
LUXEON 3030 2D	L130-5080003000W21	5000K
LUXEON 3030 2D	L130-5770003000W21	5700K
LUXEON 3030 2D	L130-5780003000W21	5700K
LUXEON 3030 2D	L130-6570003000W21	6500K
LUXEON 3030 2D	L130-6580003000W21	6500K

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

	If = 150mA	
Ts = 105°C	> 36,000	
Ts = 85°C	> 36,000	
Ts = 55°C	> 36,000	
		= Limited by TM-21 6x rule

3. Number of LED light sources tested

25 units per test condition.

4. Description of LED light sources tested

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

5. Dates Tests Started

All DATA SETs: 09-19-2013.

6. Date Report First Issued

All DATA SETs: first reported on 06-18-2014.

7. Package Pictures

Figure 1. Picture of LUXEON 3030 2D.

8. Mechanical Drawing

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

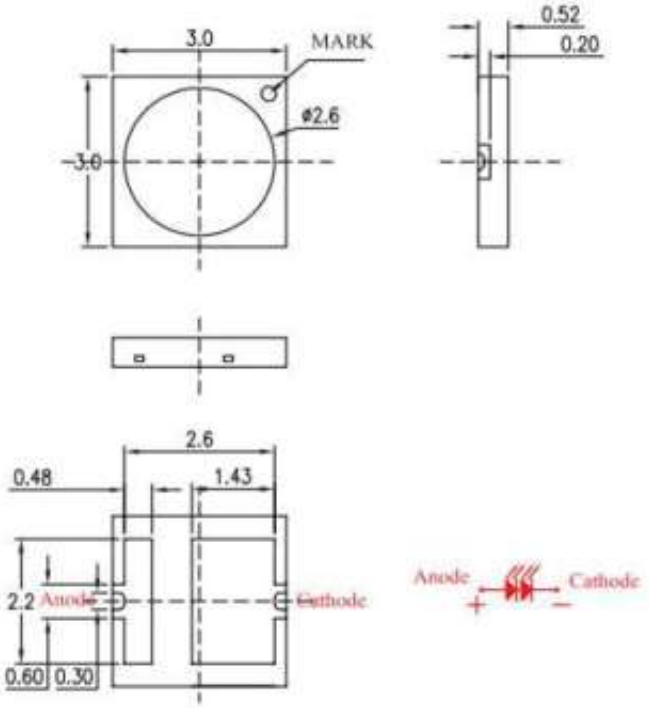

Figure 2: Mechanical Drawing for LUXEON 3030 2D. All dimensions are in millimeters.

9. T_s Measurement Point

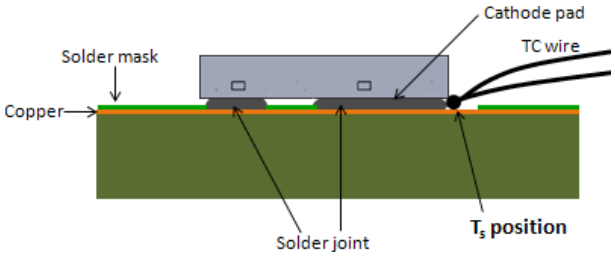

Figure 3: Preferred T_s measurement point for LUXEON 3030 2D.

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

10. Description of auxiliary equipment

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

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

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

11. Operating Cycle

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

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

The typical relative humidity within the chamber is < 65%. The temperature uniformity of the board (center to edge) was experimentally determined to be less than 2°C.

The photometry measurement temperature is set and monitored to be within 25°C ± 2°C with no forced airflow and RH < 65%.

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

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

14. Drive current of the LED light source during lifetime test

See tables.

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

See tables.

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

See tables.

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

No failures observed in devices reported.

18. LED light source monitoring interval

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

19. Photometric measurement uncertainty

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

Luminous Flux (Φ_v) ± 1.59%

Correlated Color Temperature (CCT) ± 21K

20. Chromaticity shift reported over the measurement time

See tables.

21. Sampling Method/Sample size

LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive days. These manufacturing lots are picked to represent a wide parametric distribution.

22. ISO 17025-2005 Accreditation

International Accreditation Service

CERTIFICATE OF ACCREDITATION

This is to signify that

BAY AREA COMPLIANCE LABORATORIES CORP (DONGGUAN)
FULONG CUN 69, FUXINHU INDUSTRIAL AREA
TANGXIA TOWN, GUANG DONG 523715
PEOPLE'S REPUBLIC OF CHINA

Testing Laboratory TL-460
(Revised June 25, 2014)

has met the requirements of the IAS Accreditation Criteria for Testing Laboratories (AC89), has demonstrated compliance with ISO/IEC Standard 17025:2005, *General requirements for the competence of testing and calibration laboratories*, and has been accredited, commencing April 14, 2014, for the test methods listed in the approved scope of accreditation.

Patrick V. McCullen
Vice President, Chief Technical Officer

C. P. Ramani, P.E.
President

ilac-MRA

IAS ACCREDITED

(see attached scope of accreditation for fields of calibration and accredited calibration methods)

Print Date: 06/26/2014

Page 1 of 6

International Accreditation Service

SCOPE OF ACCREDITATION

Bay Area Compliance Laboratories Corp (Dongguan) TL-460

(Revised June 25, 2014)

Bay Area Compliance Laboratories Corp (Dongguan)
PuLong Cun 69, Puxinhu Industrial Area
Tangxia Town, Guang Dong 523719
People's Republic of China

John Chan
President
+867 69 86858

FIELDS OF TESTING	ACCREDITED TEST METHODS	
ENERGY STAR Program Requirements for Lighting (except Electromagnetic and Radio Frequency Interference, Air Tight for Restricted Air Flow, and Mercury Content)	ANSI C62.41.2-2002:	IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits
	ANSI C78.5-2003:	Specifications for Performance of Self-Ballasted Compact
	ANSI C78.375-1997:	American National Standard for Fluorescent Lamps—Guide for Electrical Measurements
	ANSI C78.376-2001:	Specification for the Chromaticity of Fluorescent Lamps
	ANSI C78.377-2008:	Chromaticity of Solid State Lighting Products
	ANSI C78.377-2011:	Specifications for the Chromaticity of Solid State Lighting Products
	ANSI C78.379:2006:	Electric Lamps – Classification of the Beam Patterns of Reflector Lamps
	ANSI C78.387-1987:	Metal-Halide Lamps - Method of Measuring Characteristics
	ANSI C78.387: 2007:	Metal-Halide Lamps - Method of Measuring Characteristics
	ANSI C78.389-2004:	American National Standard for Electric Lamps – High-Intensity Discharge (HID) – Methods of Measuring Characteristics
	ANSI C82.2-2002:	Fluorescent Lamp Ballasts--Methods of Measurement
	ANSI C82.6-2005:	Ballast For High Intensity Discharge Lamps - Methods of Measurement
	ANSI C82.11-2002:	High-Frequency Fluorescent Lamp Ballasts
	ANSI C82.77-2002:	Harmonic Emission Limits – Related Power Quality Requirements for Lighting
	ANSI/IEEE C62.41 – 1991 (01-May-1991):	Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits, Category A, 7 Strikes
	ANSI/UL 153-2005:	Portable Electric Luminaires
	CIE Pub 13.2-1974:	Method of measuring and Specifying Color Rendering of Light Sources
	CIE 13.3-1995:	Method of Measuring and Specifying Color Rendering of Light Sources
	CIE 15-2004:	Colorimetry Standard
	CIE 84-1989:	The Measurement of Luminous Flux
	CIE 121-1996:	The Photometry and Goniophotometry of Luminaires
	CIE 127-1997:	Measurement of LEDs
	CSA-22.2 No.37-M1989 (R2004):	Christmas Tree and Other Decorative Lighting Outfits
	EPA DLS:	Appendix A
	ENERGY STAR Online	CBCP: Tool for Calculating Minimum Center Beam Intensity
	IEC/TR 61341:	Method of measurement of centre beam intensity and beam angle(s) of reflector lamps
	IES LM-9-99:	Approved Method for the Electrical and Photometric Measurements of Fluorescent Lamps
	IES LM-9-09:	Approved Method for the Electrical and Photometric Measurements of Fluorescent Lamps
	IES LM-10-13:	Photometric Testing of Outdoor Fluorescent Luminaires
	IES TM-16-05:	Technical Memorandum on Light Emitting Diode (LED) Sources and Systems

April 14, 2014
Commencement Date

ACCREDITED

C. P. Ramani, P.E.
President

Print Date: 06/26/2014

International Accreditation Service

SCOPE OF ACCREDITATION

Bay Area Compliance Laboratories Corp (Dongguan) TL-460

(Revised June 25, 2014)

FIELDS OF TESTING	ACCREDITED TEST METHODS	
ENERGY STAR Program Requirements for Lighting (except Electromagnetic and Radio Frequency Interference, Air Tight for Restricted Air Flow, and Mercury Content) (continued)	IES LM-16-93:	Practical Guide to Colorimetry of Light Sources
	IES LM-20-13:	Photometric Testing of Reflector-Type Lamps
	IES LM-31-95:	Photometric Testing of Roadway Luminaires Using Incandescent Filament and HID Lamps
	IES LM-35-02:	Photometric Testing of Floodlights Using High Intensity Discharge or Incandescent Filament Lamps
	IES LM-4010:	Approved Method for Life Performance Testing of Fluorescent Lamps
	IES LM- 41-98:	Approved Method for Photometric Testing of Indoor Fluorescent Luminaries
	IES LM-45-02:	Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filament Lamps
	IES LM-45-09:	Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filament Lamps
	IES LM-46-04:	Photometric Testing of Indoor Luminaires Using High Intensity Discharge or Incandescent Filament Lamps
	IES LM-47-12:	Life Testing of High Intensity Discharge (HID) Lamps
	IES LM-49-12:	Life Testing of General Lighting Incandescent Filament Lamps
	IES LM-51-13:	Electrical and Photometric Measurements of HID Lamps Fluorescent Lamps
	IES LM-54-12:	IESNA Guide to Lamp Seasoning
	IES LM-58-13:	Guide to Spectroradiometric Measurements
	IES LM-65-10:	Approved Method for Life Testing of Single-Ended Compact Fluorescent Lamps
	IES LM-66-00:	Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps
	IES LM-66-11:	Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps
	ASTM G 154 – 06:	Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
	IES LM-79-08:	Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products, Sections 9, 10 and 12
	IES LM 82-12:	Characterization of LED Light Engines and LED Lamps for Electrical and Photometric Properties as a Function of Temperature
	IES LM-80-08:	Approved Method for Measuring Lumen Maintenance of LED Light Sources (LED Packages/Modules/Arrays)
	US EPA DLS:	ENERGY STAR Program Requirements for decorative light strings Appendix A
	UL 588-2004:	Standard for Seasonal and Holiday Decorative Products
	UL1993 – 2009:	Self-Ballasted Lamps and Lamp Adapters

April 14, 2014
Commencement Date

ACCREDITED

C.P. Ramani, P.E.
President

Print Date: 06/26/2014

International Accreditation Service

SCOPE OF ACCREDITATION

Bay Area Compliance Laboratories Corp (Dongguan) TL-460

(Revised June 25, 2014)

FIELDS OF TESTING	ACCREDITED TEST METHODS
ENERGY STAR Program Requirements for Lighting (except Electromagnetic and Radio Frequency Interference, Air Tight for Restricted Air Flow, and Mercury Content) (continued)	US EPA Lamps v1 ENERGY STAR Program Requirements for Lamps (Light Bulbs), (except Sections 12,4 and 13) Elevated Temperature Life Test - ENERGY STAR Program Requirements Product Specification for Lamps Version 1.0: Elevated Temperature Life Testing Elevated Temperature Light Output Ratio- ENERGY STAR Program Requirements Product Specification for Lamps Version 1.0: Elevated Temperature Light Output Ratio Ambient Temperature Life Test Start Time Test- ENERGY STAR Program Requirements Product Specification for Lamps Version 1.0: Start Time Run Up Time Test- ENERGY STAR Program Requirements Product Specification for Lamps Version 1.0: Run-up Time 10 CFR 430 Subpart B Appendix W Uniform Test Method for Measuring the Energy Consumption of Medium Base Compact Fluorescent Lamps
ENERGY STAR Program Requirements for Electronics	**Computers** ENERGY STAR Program Requirements Product Specification for Computers, Version 6.0 ENERGY STAR Test Method for Computer, Rev. Oct 2013 EPRI Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies. Version 6.6 (for products that have internal, multi-output, or single output with integral cooling power supplies; available at: www.efficientpowersupplies.org) IEC 62301:2011 Household Electrical Appliances - Measurement of Standby Power **Computer (Enterprise) Servers** ENERGY STAR Test Method for Computer Servers Version 2.0, ENERGY STAR Test Procedure for Determining the Power Use of Computer Servers at Idle and Full Load (Appendix A of specification) EPRI Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies. Version 6.6 Available at www.efficientpowersupplies.org IEC 62301:2011 Household Electrical Appliances - Measurement of Standby Power **Small Network Equipment** ENERGY STAR Program Requirements for Small Network Equipment ENERGY STAR Test Procedure for Small Network Equipment **Imaging Equipment** ENERGY STAR Imaging Equipment Test Method Version 2.0, ENERGY STAR Program Requirements ENERGY STAR Test Method for Computer, Rev. Oct 2013 IEC 62301 Ed 1.0: Household Electrical Appliances – Measurement of Standby Power IEC 62301 Ed 2.0: Household Electrical Appliances – Measurement of Standby Power EPRI Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies Version 6.6. Available at www.efficientpowersupplies.org ENGRGY STAR Program Requirements Produtct Specification for Imaging Equipment, Version 2.0 EPRI Test Method for Calculating the Energy Efficiency of Single Voltage External AC-DC and AC-AC Power Supplies, Rev. August 11, 2004, Available at www.efficientpowersupplies.org

April 14, 2014
Commencement Date

ACCREDITED

C. P. Ramani, P.E.
President

Print Date: 06/26/2014

International Accreditation Service

SCOPE OF ACCREDITATION

Bay Area Compliance Laboratories Corp (Dongguan) TL-460

(Revised June 25, 2014)

FIELDS OF TESTING	ACCREDITED TEST METHODS
ENERGY STAR Program Requirements for Electronics (continued)	**Battery Charging Systems** ENERGY STAR Test Method, ENERGY STAR Program Requirements for Battery Charging Systems Version 1.1, ENERGY STAR Test Method for Battery Charging Systems, Rev. Aug 2012 IEC Standard 61951-1: Secondary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells – Part 1: Nickel-cadmium. Ed. 2.1. January 2006 IEC Standard 61951-2: Secondary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells – Part 2: Nickel-metal hydride. Ed. 2.0. April 2003 IEC Standard 61951-2: Secondary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells – Part 2: Nickel-metal hydride. Ed. 3.0. May 2011 IEC Standard 61960: Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications. Ed. 1.0. December 2003 IEC Standard 61960: Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications. Ed. 2.0. June 2011 **Telephony** ENERGY STAR Test Method for Telephony, ENERGY STAR Program Requirements for Telephony Version 3.0, (except VoIP) ENERGY STAR Test Method for Telephony, Rev. Nov. 2013 **Set Top Boxes** ENERGY STAR Test Method for Set-top Boxes Version 3.0 (Testing Products for ENERGY STAR) ENERGY STAR Program Requirements for Set-top Boxes Version 3.0 **Televisions** ENERGY STAR Program Requirements Product Specification for Televisions Eligibility Criteria Version 6.1 10 CFR 430 Subpart B Appendix H Uniform Test Method for Measuring the Power Consumption of Television Sets 10 CFR 429.25 Subpart B Television Sets 77FR 2864 NOPR Test Procedure for Television sets ENERGY STAR Test Method for Televisions, Rev. Aug 2010 **Displays** ENERGY STAR® Program Requirements Product Specification for Displays Eligibility Criteria Version 6.0 ENERGY STAR Test Method for Determining Displays Energy use Version 6.0, Rev. Jan. 2013 **Audio/Video** ENERGY STAR Program Requirements for Audio/Video ENERGY STAR Test Procedure for Audio/Video product
ENERGY STAR Program Requirements for Appliances	**Water Coolers** ENERGY STAR Program Requirements Product Specification for Water Coolers Version 2.0, ENERGY STAR Test Method for Water Coolers, Rev. May 2013
Safety Testing for UV Exposure	IEC 62471:2006/EN 62471:2008: Photobiological Safety of Lamps and Lamp Systems

April 14, 2014
Commencement Date

ACCREDITED

C.P. Ramani, P.E.
President

Print Date: 06/26/2014

International Accreditation Service

SCOPE OF ACCREDITATION

Bay Area Compliance Laboratories Corp (Dongguan) TL-460

(Revised June 25, 2014)

FIELDS OF TESTING	ACCREDITED TEST METHODS	
Safety Testing	IEC 62031 Edition 2.0:	LED Modules for General Lighting – Safety Specifications
	ANSI/UL 1598: 2008:	Luminaires
	ANSI/UL 1574:2004:	Standard for Track Lighting Systems
	ASTM G154:2006:	Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
	UL153-2005:	Portable Luminaires
Energy Efficiency	IEC 62623:2012-10 Edition 1.0:	Desktop and Notebook Computers – Measurement of Energy Consumption
	IEC 62612:2013:	Self-ballasted LED lamps for general lighting services with supply voltage >50v – Performance requirements
	IEC 62087 Ed. 3.0 -2011-04:	Methods of measurement for the power consumption of audio, video and related equipment
	EN/IEC 60969 Ed. 1.2:2001:	Self-Ballasted Lamps for General Lighting Services - Performance Requirements

April 14, 2014
Commencement Date

ACCREDITED

C.P. Ramani, P.E.
President

Print Date: 06/26/2014

Page 6 of 6

Notes

Data is for reference only and is not an endorsement to exceed the Data Sheet operating conditions.

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

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

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

Disclaimer

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

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

Normalized Flux Statistics for I_f = 150mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	alpha	B	L70
	median =	1.0000	0.9983	0.9937	0.9859	0.9755	0.9673	0.9544			
Ts=Tair=105°C	average =	1.0000	0.9985	0.9932	0.9859	0.9758	0.9669	0.9538	9.1376e-06	1.0107	40,200
	st dev =	0.0000	0.0019	0.0038	0.0029	0.0036	0.0038	0.0053	TM-21 L70(6k) > 36,000hrs		
	min =	1.0000	0.9948	0.9866	0.9811	0.9704	0.9608	0.9465			
	max =	1.0000	1.0029	0.9995	0.9921	0.9824	0.9739	0.9650			
	median =	1.0000	0.9990	0.9940	0.9875	0.9799	0.9711	0.9612			
Ts=Tair=85°C	average =	1.0000	0.9985	0.9942	0.9882	0.9800	0.9724	0.9616	7.5177e-06	1.0086	48,581
	st dev =	0.0000	0.0026	0.0045	0.0040	0.0027	0.0034	0.0047	TM-21 L70(6k) > 36,000hrs		
	min =	1.0000	0.9948	0.9862	0.9825	0.9756	0.9677	0.9545			
	max =	1.0000	1.0039	1.0002	0.9959	0.9859	0.9791	0.9696			
	median =	1.0000	0.9998	0.9960	0.9903	0.9825	0.9767	0.9685			
Ts=Tair=55°C	average =	1.0000	0.9996	0.9957	0.9903	0.9831	0.9763	0.9688	6.3660e-06	1.0078	57,243
	st dev =	0.0000	0.0014	0.0048	0.0048	0.0028	0.0031	0.0040	TM-21 L70(6k) > 36,000hrs		
	min =	1.0000	0.9963	0.9831	0.9819	0.9779	0.9710	0.9614			
	max =	1.0000	1.0038	1.0043	0.9987	0.9880	0.9825	0.9773			

Delta u'v' for I_f = 150mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
	median =	0.0000	0.0009	0.0010	0.0014	0.0017	0.0021	0.0025
Ts=Tair=105°C	average =	0.0000	0.0009	0.0010	0.0014	0.0017	0.0022	0.0026
	st dev =	0.0000	0.0001	0.0002	0.0002	0.0001	0.0002	0.0003
	min =	0.0000	0.0006	0.0008	0.0011	0.0014	0.0019	0.0021
	max =	0.0000	0.0011	0.0014	0.0017	0.0019	0.0025	0.0035
	median =	0.0000	0.0010	0.0011	0.0014	0.0017	0.0019	0.0022
Ts=Tair=85°C	average =	0.0000	0.0010	0.0011	0.0014	0.0016	0.0019	0.0022
	st dev =	0.0000	0.0002	0.0003	0.0002	0.0002	0.0001	0.0003
	min =	0.0000	0.0005	0.0005	0.0009	0.0013	0.0016	0.0015
	max =	0.0000	0.0013	0.0016	0.0017	0.0019	0.0022	0.0026
	median =	0.0000	0.0009	0.0011	0.0013	0.0015	0.0018	0.0020
Ts=Tair=55°C	average =	0.0000	0.0009	0.0011	0.0013	0.0015	0.0018	0.0020
	st dev =	0.0000	0.0001	0.0002	0.0002	0.0001	0.0002	0.0003
	min =	0.0000	0.0008	0.0007	0.0010	0.0012	0.0014	0.0015
	max =	0.0000	0.0011	0.0014	0.0016	0.0017	0.0020	0.0026

Luminous Flux [lm] data for tested units
$T_s = T_{air} = 55°C$, $I_f = 150mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2696K	95.030	95.390	94.990	94.730	93.700	92.870	92.040
2	2673K	95.860	95.910	95.010	94.730	94.150	93.160	92.990
3	2677K	95.170	95.210	94.020	93.810	93.420	92.750	92.240
4	2713K	95.420	95.350	95.290	94.670	93.880	93.080	92.640
5	2714K	96.360	96.390	96.770	96.230	95.200	94.670	94.170
6	2702K	96.210	96.240	96.350	95.940	94.890	93.970	93.180
7	2697K	96.060	96.100	95.380	94.970	94.380	93.800	93.100
8	2693K	96.650	96.460	96.260	95.730	94.640	93.970	93.380
9	2697K	95.460	95.330	94.930	94.350	93.650	92.830	92.120
10	2710K	96.070	96.050	96.360	95.840	94.830	94.100	93.380
11	2687K	94.900	94.800	94.210	93.240	93.010	92.390	91.790
12	2685K	95.900	95.750	95.100	94.360	93.920	93.400	92.670
13	2704K	95.640	95.510	94.020	93.910	93.530	92.890	92.020
14	2699K	97.560	97.520	97.150	96.610	95.820	95.670	94.700
15	2679K	94.240	94.250	93.740	93.280	92.450	92.180	90.800
16	2714K	96.690	96.560	96.390	95.960	95.210	94.730	94.130
17	2692K	96.340	96.330	95.620	94.760	94.570	94.140	93.630
18	2710K	95.600	95.550	95.690	95.310	94.230	93.550	92.570
19	2670K	95.330	95.330	94.670	94.180	93.910	92.570	91.650
20	2697K	97.010	97.040	96.230	96.120	95.620	95.010	94.730
21	2692K	95.270	95.390	94.970	94.520	94.000	93.220	92.430
22	2723K	97.360	97.190	97.310	96.670	95.790	95.330	94.090
23	2690K	94.320	94.260	94.230	93.240	92.490	91.980	91.350
24	2678K	97.310	96.950	96.940	96.020	95.330	94.850	93.880
25	2715K	95.660	95.670	95.380	94.920	94.250	93.430	93.020

Normalized Luminous Flux data for tested units
$T_s = T_{air} = 55°C$, $I_f = 150mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2696K	1.0000	1.0038	0.9996	0.9968	0.9860	0.9773	0.9685
2	2673K	1.0000	1.0005	0.9911	0.9882	0.9822	0.9718	0.9701
3	2677K	1.0000	1.0004	0.9879	0.9857	0.9816	0.9746	0.9692
4	2713K	1.0000	0.9993	0.9986	0.9921	0.9839	0.9755	0.9709
5	2714K	1.0000	1.0003	1.0043	0.9987	0.9880	0.9825	0.9773
6	2702K	1.0000	1.0003	1.0015	0.9972	0.9863	0.9767	0.9685
7	2697K	1.0000	1.0004	0.9929	0.9887	0.9825	0.9765	0.9692
8	2693K	1.0000	0.9980	0.9960	0.9905	0.9792	0.9723	0.9662
9	2697K	1.0000	0.9986	0.9944	0.9884	0.9810	0.9724	0.9650
10	2710K	1.0000	0.9998	1.0030	0.9976	0.9871	0.9795	0.9720
11	2687K	1.0000	0.9989	0.9927	0.9825	0.9801	0.9736	0.9672
12	2685K	1.0000	0.9984	0.9917	0.9839	0.9794	0.9739	0.9663
13	2704K	1.0000	0.9986	0.9831	0.9819	0.9779	0.9712	0.9621
14	2699K	1.0000	0.9996	0.9958	0.9903	0.9822	0.9806	0.9707
15	2679K	1.0000	1.0001	0.9947	0.9898	0.9810	0.9781	0.9635
16	2714K	1.0000	0.9987	0.9969	0.9925	0.9847	0.9797	0.9735
17	2692K	1.0000	0.9999	0.9925	0.9836	0.9816	0.9772	0.9719
18	2710K	1.0000	0.9995	1.0009	0.9970	0.9857	0.9786	0.9683
19	2670K	1.0000	1.0000	0.9931	0.9879	0.9851	0.9710	0.9614
20	2697K	1.0000	1.0003	0.9920	0.9908	0.9857	0.9794	0.9765
21	2692K	1.0000	1.0013	0.9969	0.9921	0.9867	0.9785	0.9702
22	2723K	1.0000	0.9983	0.9995	0.9929	0.9839	0.9791	0.9664
23	2690K	1.0000	0.9994	0.9990	0.9885	0.9806	0.9752	0.9685
24	2678K	1.0000	0.9963	0.9962	0.9867	0.9797	0.9747	0.9648
25	2715K	1.0000	1.0001	0.9971	0.9923	0.9853	0.9767	0.9724

TM-21 Extrapolation of Luminous Flux data for tested units
$T_s = T_{air} = 55°C$, I = 150mA; $T_f \geq 53°C$ and $T_s \geq T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	alpha	B	L70
1	2696K	7.3542e-06	1.0144	50,439
2	2673K	6.2778e-06	1.0058	57,734
3	2677K	5.8120e-06	1.0034	61,952
4	2713K	6.3698e-06	1.0089	57,384
5	2714K	5.5167e-06	1.0111	66,655
6	2702K	7.0743e-06	1.0131	52,260
7	2697K	6.1406e-06	1.0064	59,119
8	2693K	7.0268e-06	1.0081	51,908
9	2697K	7.0234e-06	1.0077	51,879
10	2710K	6.3643e-06	1.0121	57,927
11	2687K	6.3521e-06	1.0045	56,863
12	2685K	6.3505e-06	1.0043	56,839
13	2704K	6.4701e-06	1.0015	55,361
14	2699K	5.7424e-06	1.0065	63,241
15	2679K	7.0212e-06	1.0090	52,071
16	2714K	5.3543e-06	1.0063	67,787
17	2692K	5.4557e-06	1.0034	65,995
18	2710K	6.7906e-06	1.0120	54,283
19	2670K	7.6287e-06	1.0096	48,008
20	2697K	4.6844e-06	1.0037	76,936
21	2692K	6.2550e-06	1.0094	58,518
22	2723K	6.6542e-06	1.0099	55,076
23	2690K	6.7821e-06	1.0088	53,884
24	2678K	6.6711e-06	1.0062	54,395
25	2715K	5.9858e-06	1.0081	60,942
ave	2696K	6.3660e-06	1.0078	57,243

CIE 1976 u' data for tested units
$T_s = T_{air} = 55°C$, I = 150mA; $T_f \geq 53°C$ and $T_s \geq T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2696K	0.2614	0.2606	0.2603	0.2600	0.2598	0.2594	0.2591
2	2673K	0.2624	0.2615	0.2612	0.2610	0.2608	0.2605	0.2602
3	2677K	0.2623	0.2614	0.2609	0.2609	0.2608	0.2605	0.2600
4	2713K	0.2606	0.2597	0.2593	0.2591	0.2589	0.2589	0.2587
5	2714K	0.2608	0.2597	0.2594	0.2592	0.2591	0.2588	0.2588
6	2702K	0.2613	0.2604	0.2603	0.2601	0.2599	0.2596	0.2597
7	2697K	0.2614	0.2603	0.2603	0.2601	0.2599	0.2594	0.2596
8	2693K	0.2615	0.2605	0.2603	0.2601	0.2599	0.2596	0.2595
9	2697K	0.2614	0.2606	0.2603	0.2601	0.2600	0.2596	0.2594
10	2710K	0.2609	0.2600	0.2598	0.2596	0.2593	0.2592	0.2589
11	2687K	0.2617	0.2609	0.2607	0.2605	0.2602	0.2601	0.2600
12	2685K	0.2618	0.2610	0.2610	0.2607	0.2606	0.2602	0.2602
13	2704K	0.2611	0.2601	0.2598	0.2596	0.2594	0.2592	0.2587
14	2699K	0.2614	0.2603	0.2601	0.2598	0.2597	0.2595	0.2593
15	2679K	0.2622	0.2614	0.2611	0.2609	0.2608	0.2603	0.2604
16	2714K	0.2608	0.2598	0.2597	0.2594	0.2593	0.2590	0.2591
17	2692K	0.2617	0.2606	0.2605	0.2603	0.2600	0.2599	0.2599
18	2710K	0.2609	0.2600	0.2599	0.2599	0.2595	0.2594	0.2595
19	2670K	0.2625	0.2615	0.2614	0.2612	0.2610	0.2608	0.2606
20	2697K	0.2614	0.2605	0.2607	0.2603	0.2600	0.2600	0.2596
21	2692K	0.2616	0.2608	0.2609	0.2607	0.2603	0.2602	0.2599
22	2723K	0.2601	0.2593	0.2592	0.2590	0.2586	0.2582	0.2581
23	2690K	0.2617	0.2609	0.2606	0.2605	0.2601	0.2597	0.2597
24	2678K	0.2623	0.2613	0.2615	0.2612	0.2608	0.2604	0.2605
25	2715K	0.2607	0.2598	0.2596	0.2595	0.2591	0.2590	0.2589

CIE 1976 v' data for tested units
$T_s = T_{air}$ = 55°C, I_f = 150mA; $T_s \geq$ 53°C and $T_{air} \geq$50°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2696K	0.5338	0.5339	0.5338	0.5339	0.5336	0.5336	0.5331
2	2673K	0.5348	0.5348	0.5347	0.5347	0.5346	0.5347	0.5341
3	2677K	0.5342	0.5343	0.5340	0.5342	0.5342	0.5340	0.5334
4	2713K	0.5338	0.5340	0.5337	0.5338	0.5339	0.5334	0.5331
5	2714K	0.5324	0.5324	0.5323	0.5326	0.5324	0.5322	0.5317
6	2702K	0.5329	0.5330	0.5329	0.5332	0.5331	0.5329	0.5324
7	2697K	0.5336	0.5336	0.5336	0.5340	0.5337	0.5337	0.5331
8	2693K	0.5342	0.5343	0.5341	0.5345	0.5343	0.5340	0.5336
9	2697K	0.5336	0.5336	0.5333	0.5337	0.5336	0.5334	0.5327
10	2710K	0.5328	0.5328	0.5326	0.5330	0.5328	0.5327	0.5322
11	2687K	0.5347	0.5349	0.5348	0.5351	0.5348	0.5347	0.5341
12	2685K	0.5346	0.5346	0.5345	0.5349	0.5344	0.5343	0.5338
13	2704K	0.5335	0.5336	0.5332	0.5335	0.5331	0.5334	0.5324
14	2699K	0.5332	0.5332	0.5329	0.5334	0.5330	0.5334	0.5324
15	2679K	0.5341	0.5342	0.5340	0.5342	0.5339	0.5341	0.5333
16	2714K	0.5324	0.5324	0.5322	0.5325	0.5321	0.5327	0.5317
17	2692K	0.5335	0.5335	0.5332	0.5337	0.5333	0.5336	0.5328
18	2710K	0.5328	0.5329	0.5327	0.5331	0.5327	0.5334	0.5324
19	2670K	0.5349	0.5351	0.5348	0.5351	0.5347	0.5351	0.5340
20	2697K	0.5337	0.5339	0.5339	0.5343	0.5339	0.5340	0.5333
21	2692K	0.5338	0.5340	0.5339	0.5343	0.5338	0.5337	0.5333
22	2723K	0.5338	0.5339	0.5337	0.5341	0.5336	0.5334	0.5329
23	2690K	0.5340	0.5341	0.5339	0.5342	0.5337	0.5336	0.5331
24	2678K	0.5339	0.5340	0.5346	0.5348	0.5340	0.5341	0.5335
25	2715K	0.5326	0.5327	0.5326	0.5328	0.5325	0.5326	0.5321

Delta u'v' data for tested units
$T_s = T_{air}$ = 55°C, I_f = 150mA; $T_s \geq$ 53°C and $T_{air} \geq$ 50°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2696K	0.0000	0.0008	0.0011	0.0014	0.0016	0.0020	0.0024
2	2673K	0.0000	0.0009	0.0012	0.0014	0.0016	0.0019	0.0023
3	2677K	0.0000	0.0009	0.0014	0.0014	0.0015	0.0018	0.0024
4	2713K	0.0000	0.0009	0.0013	0.0015	0.0017	0.0017	0.0020
5	2714K	0.0000	0.0011	0.0014	0.0016	0.0017	0.0020	0.0021
6	2702K	0.0000	0.0009	0.0010	0.0012	0.0014	0.0017	0.0017
7	2697K	0.0000	0.0011	0.0011	0.0014	0.0015	0.0020	0.0019
8	2693K	0.0000	0.0010	0.0012	0.0014	0.0016	0.0019	0.0021
9	2697K	0.0000	0.0008	0.0011	0.0013	0.0014	0.0018	0.0022
10	2710K	0.0000	0.0009	0.0011	0.0013	0.0016	0.0017	0.0021
11	2687K	0.0000	0.0008	0.0010	0.0013	0.0015	0.0016	0.0018
12	2685K	0.0000	0.0008	0.0008	0.0011	0.0012	0.0016	0.0018
13	2704K	0.0000	0.0010	0.0013	0.0015	0.0017	0.0019	0.0026
14	2699K	0.0000	0.0011	0.0013	0.0016	0.0017	0.0019	0.0022
15	2679K	0.0000	0.0008	0.0011	0.0013	0.0014	0.0019	0.0020
16	2714K	0.0000	0.0010	0.0011	0.0014	0.0015	0.0018	0.0018
17	2692K	0.0000	0.0011	0.0012	0.0014	0.0017	0.0018	0.0019
18	2710K	0.0000	0.0009	0.0010	0.0010	0.0014	0.0016	0.0015
19	2670K	0.0000	0.0010	0.0011	0.0013	0.0015	0.0017	0.0021
20	2697K	0.0000	0.0009	0.0007	0.0013	0.0014	0.0014	0.0018
21	2692K	0.0000	0.0008	0.0007	0.0010	0.0013	0.0014	0.0018
22	2723K	0.0000	0.0008	0.0009	0.0011	0.0015	0.0019	0.0022
23	2690K	0.0000	0.0008	0.0011	0.0012	0.0016	0.0020	0.0022
24	2678K	0.0000	0.0010	0.0011	0.0014	0.0015	0.0019	0.0018
25	2715K	0.0000	0.0009	0.0011	0.0012	0.0016	0.0017	0.0019

Forward Voltage [V] data for tested units

$T_s = T_{air} = 55°C$, $I_f = 150mA$; $T_s \geq 53°C$ and $T_{air} \geq 50°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2696K	6.297	6.317	6.378	6.347	6.371	6.355	6.335
2	2673K	6.294	6.319	6.391	6.349	6.375	6.366	6.340
3	2677K	6.304	6.327	6.405	6.361	6.388	6.386	6.357
4	2713K	6.318	6.337	6.405	6.366	6.402	6.373	6.356
5	2714K	6.306	6.325	6.384	6.353	6.383	6.361	6.333
6	2702K	6.296	6.316	6.382	6.345	6.376	6.354	6.336
7	2697K	6.289	6.314	6.385	6.346	6.378	6.369	6.347
8	2693K	6.314	6.330	6.398	6.361	6.394	6.383	6.359
9	2697K	6.305	6.329	6.396	6.356	6.391	6.382	6.350
10	2710K	6.341	6.360	6.439	6.395	6.425	6.405	6.384
11	2687K	6.328	6.345	6.408	6.368	6.402	6.380	6.359
12	2685K	6.315	6.333	6.398	6.360	6.388	6.372	6.351
13	2704K	6.318	6.334	6.404	6.366	6.394	6.374	6.353
14	2699K	6.328	6.348	6.422	6.382	6.407	6.394	6.375
15	2679K	6.240	6.253	6.321	6.280	6.313	6.286	6.263
16	2714K	6.303	6.326	6.391	6.352	6.391	6.358	6.340
17	2692K	6.313	6.339	6.412	6.373	6.403	6.391	6.363
18	2710K	6.300	6.319	6.386	6.347	6.379	6.358	6.338
19	2670K	6.303	6.328	6.396	6.356	6.388	6.362	6.346
20	2697K	6.316	6.337	6.402	6.366	6.399	6.375	6.351
21	2692K	6.310	6.334	6.392	6.356	6.393	6.371	6.350
22	2723K	6.315	6.334	6.397	6.361	6.388	6.372	6.353
23	2690K	6.233	6.249	6.306	6.272	6.304	6.279	6.260
24	2678K	6.317	6.334	6.402	6.359	6.389	6.371	6.354
25	2715K	6.312	6.334	6.402	6.362	6.392	6.373	6.354

Luminous Flux [lm] data for tested units
$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2690K	96.160	95.790	95.360	94.880	94.140	93.320	92.700
2	2721K	96.990	96.960	97.010	96.490	95.260	94.650	93.530
3	2705K	97.590	97.490	97.120	96.380	95.550	95.240	94.470
4	2711K	98.170	97.970	97.940	97.140	96.290	95.580	94.070
5	2681K	97.250	96.860	96.830	96.430	95.410	95.140	94.100
6	2705K	95.910	95.830	95.900	95.520	94.560	93.910	92.870
7	2679K	95.160	95.090	94.350	93.970	93.270	92.990	91.950
8	2697K	96.990	96.490	95.650	95.290	94.620	93.860	92.610
9	2693K	96.320	96.400	95.840	95.410	94.710	93.540	92.110
10	2688K	95.670	95.660	95.680	95.150	94.240	93.430	92.320
11	2711K	94.450	94.590	93.690	92.910	92.440	91.530	90.750
12	2696K	96.880	97.030	96.300	95.770	95.100	94.560	93.120
13	2676K	93.930	93.640	92.710	92.410	91.700	91.000	90.080
14	2724K	94.630	94.300	94.030	93.540	92.590	91.840	90.930
15	2706K	96.280	96.550	96.290	95.410	94.420	93.770	92.050
16	2692K	97.090	97.050	97.040	96.460	95.310	94.530	93.420
17	2703K	95.810	95.530	94.800	94.220	93.550	92.940	91.450
18	2712K	95.420	95.790	95.340	94.770	93.590	92.580	92.030
19	2696K	96.480	96.030	95.330	94.900	94.340	93.490	92.160
20	2696K	96.280	96.000	95.210	95.020	94.260	93.400	92.530
21	2710K	96.400	96.470	95.770	95.190	94.810	93.750	93.470
22	2733K	95.300	94.830	94.330	93.760	93.010	92.350	91.050
23	2701K	95.250	94.800	94.840	93.760	93.120	92.310	91.920
24	2689K	97.010	97.010	96.860	95.780	95.060	94.370	93.420
25	2685K	96.090	95.700	95.270	94.710	94.000	93.200	92.000

Normalized Luminous Flux data for tested units
$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2690K	1.0000	0.9962	0.9917	0.9867	0.9790	0.9705	0.9640
2	2721K	1.0000	0.9997	1.0002	0.9948	0.9822	0.9759	0.9643
3	2705K	1.0000	0.9990	0.9952	0.9876	0.9791	0.9759	0.9680
4	2711K	1.0000	0.9980	0.9977	0.9895	0.9808	0.9736	0.9582
5	2681K	1.0000	0.9960	0.9957	0.9916	0.9811	0.9783	0.9676
6	2705K	1.0000	0.9992	0.9999	0.9959	0.9859	0.9791	0.9683
7	2679K	1.0000	0.9993	0.9915	0.9875	0.9801	0.9772	0.9663
8	2697K	1.0000	0.9948	0.9862	0.9825	0.9756	0.9677	0.9548
9	2693K	1.0000	1.0008	0.9950	0.9906	0.9833	0.9711	0.9563
10	2688K	1.0000	0.9999	1.0001	0.9946	0.9851	0.9766	0.9650
11	2711K	1.0000	1.0015	0.9920	0.9837	0.9787	0.9691	0.9608
12	2696K	1.0000	1.0015	0.9940	0.9885	0.9816	0.9761	0.9612
13	2676K	1.0000	0.9969	0.9870	0.9838	0.9763	0.9688	0.9590
14	2724K	1.0000	0.9965	0.9937	0.9885	0.9784	0.9705	0.9609
15	2706K	1.0000	1.0028	1.0001	0.9910	0.9807	0.9739	0.9561
16	2692K	1.0000	0.9996	0.9995	0.9935	0.9817	0.9736	0.9622
17	2703K	1.0000	0.9971	0.9895	0.9834	0.9764	0.9700	0.9545
18	2712K	1.0000	1.0039	0.9992	0.9932	0.9808	0.9702	0.9645
19	2696K	1.0000	0.9953	0.9881	0.9836	0.9778	0.9690	0.9552
20	2696K	1.0000	0.9971	0.9889	0.9869	0.9790	0.9701	0.9611
21	2710K	1.0000	1.0007	0.9935	0.9874	0.9835	0.9725	0.9696
22	2733K	1.0000	0.9951	0.9898	0.9838	0.9760	0.9690	0.9554
23	2701K	1.0000	0.9953	0.9957	0.9844	0.9776	0.9691	0.9650
24	2689K	1.0000	1.0000	0.9985	0.9873	0.9799	0.9728	0.9630
25	2685K	1.0000	0.9959	0.9915	0.9856	0.9782	0.9699	0.9574

TM-21 Extrapolation of Luminous Flux data for tested units
$T_s = T_{air}$ = 85°C, I_f = 150mA; $T_s \geq$ 83°C and $T_{air} \geq$80°C in compliance with LM-80-08

	CCT (t=0)	alpha	B	L70
1	2690K	6.7615e-06	1.0048	53,454
2	2721K	7.6227e-06	1.0128	48,454
3	2705K	6.4180e-06	1.0064	56,573
4	2711K	8.1450e-06	1.0113	45,170
5	2681K	5.9428e-06	1.0057	60,972
6	2705K	6.5681e-06	1.0110	55,965
7	2679K	6.2551e-06	1.0054	57,875
8	2697K	7.6840e-06	1.0035	46,870
9	2693K	8.7957e-06	1.0135	42,071
10	2688K	7.3914e-06	1.0126	49,955
11	2711K	8.0646e-06	1.0089	45,332
12	2696K	7.6394e-06	1.0104	48,043
13	2676K	7.3532e-06	1.0041	49,059
14	2724K	7.5103e-06	1.0075	48,483
15	2706K	9.3896e-06	1.0168	39,764
16	2692K	8.0347e-06	1.0130	46,000
17	2703K	8.1378e-06	1.0067	44,644
18	2712K	8.5965e-06	1.0153	43,255
19	2696K	7.7160e-06	1.0049	46,855
20	2696K	7.1339e-06	1.0052	50,727
21	2710K	6.4546e-06	1.0070	56,336
22	2733K	7.8588e-06	1.0054	46,068
23	2701K	6.9206e-06	1.0052	52,284
24	2689K	7.8348e-06	1.0108	46,899
25	2685K	7.7307e-06	1.0066	46,983
ave	2700K	7.5177e-06	1.0086	48,581

CIE 1976 u' data for tested units
$T_s = T_{air}$ = 85°C, I_f = 150mA; $T_s \geq$ 83°C and $T_{air} \geq$ 80°C in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2690K	0.2618	0.2605	0.2602	0.2602	0.2601	0.2598	0.2594
2	2721K	0.2604	0.2592	0.2592	0.2591	0.2589	0.2586	0.2585
3	2705K	0.2610	0.2603	0.2601	0.2600	0.2596	0.2596	0.2595
4	2711K	0.2606	0.2601	0.2603	0.2598	0.2593	0.2586	0.2581
5	2681K	0.2621	0.2614	0.2612	0.2611	0.2606	0.2601	0.2596
6	2705K	0.2609	0.2604	0.2603	0.2600	0.2596	0.2592	0.2587
7	2679K	0.2621	0.2613	0.2613	0.2610	0.2607	0.2603	0.2601
8	2697K	0.2614	0.2601	0.2599	0.2597	0.2596	0.2595	0.2588
9	2693K	0.2615	0.2606	0.2606	0.2603	0.2598	0.2596	0.2592
10	2688K	0.2617	0.2606	0.2606	0.2604	0.2600	0.2598	0.2596
11	2711K	0.2608	0.2598	0.2597	0.2593	0.2591	0.2586	0.2583
12	2696K	0.2614	0.2601	0.2600	0.2598	0.2595	0.2593	0.2588
13	2676K	0.2622	0.2614	0.2612	0.2608	0.2606	0.2605	0.2600
14	2724K	0.2601	0.2588	0.2585	0.2585	0.2584	0.2580	0.2575
15	2706K	0.2609	0.2599	0.2597	0.2596	0.2594	0.2590	0.2588
16	2692K	0.2616	0.2607	0.2604	0.2602	0.2600	0.2596	0.2595
17	2703K	0.2610	0.2600	0.2595	0.2594	0.2593	0.2590	0.2587
18	2712K	0.2608	0.2599	0.2597	0.2594	0.2591	0.2590	0.2588
19	2696K	0.2615	0.2605	0.2603	0.2601	0.2597	0.2595	0.2594
20	2696K	0.2615	0.2606	0.2605	0.2601	0.2598	0.2597	0.2596
21	2710K	0.2607	0.2599	0.2597	0.2593	0.2592	0.2589	0.2585
22	2733K	0.2596	0.2585	0.2583	0.2581	0.2579	0.2580	0.2574
23	2701K	0.2611	0.2599	0.2601	0.2598	0.2594	0.2593	0.2593
24	2689K	0.2617	0.2607	0.2608	0.2605	0.2601	0.2600	0.2598
25	2685K	0.2619	0.2608	0.2609	0.2605	0.2603	0.2601	0.2600

CIE 1976 v' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2690K	0.5334	0.5334	0.5336	0.5338	0.5335	0.5339	0.5333
2	2721K	0.5327	0.5328	0.5330	0.5331	0.5328	0.5333	0.5327
3	2705K	0.5337	0.5339	0.5341	0.5342	0.5338	0.5345	0.5339
4	2711K	0.5342	0.5344	0.5346	0.5346	0.5342	0.5347	0.5340
5	2681K	0.5343	0.5346	0.5345	0.5349	0.5344	0.5350	0.5343
6	2705K	0.5342	0.5344	0.5343	0.5347	0.5343	0.5349	0.5341
7	2679K	0.5346	0.5348	0.5348	0.5352	0.5347	0.5349	0.5347
8	2697K	0.5336	0.5337	0.5336	0.5340	0.5337	0.5342	0.5335
9	2693K	0.5343	0.5345	0.5344	0.5347	0.5344	0.5348	0.5342
10	2688K	0.5345	0.5344	0.5346	0.5350	0.5346	0.5347	0.5345
11	2711K	0.5332	0.5335	0.5334	0.5338	0.5334	0.5332	0.5332
12	2696K	0.5338	0.5338	0.5338	0.5342	0.5338	0.5338	0.5337
13	2676K	0.5349	0.5350	0.5347	0.5351	0.5346	0.5351	0.5348
14	2724K	0.5336	0.5336	0.5334	0.5339	0.5336	0.5334	0.5334
15	2706K	0.5339	0.5340	0.5339	0.5343	0.5339	0.5345	0.5339
16	2692K	0.5339	0.5338	0.5339	0.5343	0.5339	0.5343	0.5338
17	2703K	0.5343	0.5342	0.5339	0.5343	0.5339	0.5347	0.5340
18	2712K	0.5329	0.5331	0.5331	0.5334	0.5330	0.5335	0.5330
19	2696K	0.5334	0.5335	0.5334	0.5338	0.5333	0.5338	0.5333
20	2696K	0.5334	0.5336	0.5336	0.5339	0.5335	0.5340	0.5336
21	2710K	0.5340	0.5341	0.5341	0.5343	0.5339	0.5346	0.5339
22	2733K	0.5337	0.5338	0.5337	0.5341	0.5335	0.5343	0.5336
23	2701K	0.5343	0.5343	0.5343	0.5347	0.5340	0.5348	0.5343
24	2689K	0.5342	0.5343	0.5343	0.5346	0.5339	0.5347	0.5342
25	2685K	0.5342	0.5342	0.5343	0.5345	0.5338	0.5346	0.5340

Delta u'v' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 150mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2690K	0.0000	0.0013	0.0016	0.0016	0.0017	0.0021	0.0024
2	2721K	0.0000	0.0012	0.0012	0.0014	0.0015	0.0019	0.0019
3	2705K	0.0000	0.0007	0.0010	0.0011	0.0014	0.0016	0.0015
4	2711K	0.0000	0.0005	0.0005	0.0009	0.0013	0.0021	0.0025
5	2681K	0.0000	0.0008	0.0009	0.0012	0.0015	0.0021	0.0025
6	2705K	0.0000	0.0005	0.0006	0.0010	0.0013	0.0018	0.0022
7	2679K	0.0000	0.0008	0.0008	0.0013	0.0014	0.0018	0.0020
8	2697K	0.0000	0.0013	0.0015	0.0017	0.0018	0.0020	0.0026
9	2693K	0.0000	0.0009	0.0009	0.0013	0.0017	0.0020	0.0023
10	2688K	0.0000	0.0011	0.0011	0.0014	0.0017	0.0019	0.0021
11	2711K	0.0000	0.0010	0.0011	0.0016	0.0017	0.0022	0.0025
12	2696K	0.0000	0.0013	0.0014	0.0016	0.0019	0.0021	0.0026
13	2676K	0.0000	0.0008	0.0010	0.0014	0.0016	0.0017	0.0022
14	2724K	0.0000	0.0013	0.0016	0.0016	0.0017	0.0021	0.0026
15	2706K	0.0000	0.0010	0.0012	0.0014	0.0015	0.0020	0.0021
16	2692K	0.0000	0.0009	0.0012	0.0015	0.0016	0.0020	0.0021
17	2703K	0.0000	0.0010	0.0016	0.0016	0.0017	0.0020	0.0023
18	2712K	0.0000	0.0009	0.0011	0.0015	0.0017	0.0019	0.0020
19	2696K	0.0000	0.0010	0.0012	0.0015	0.0018	0.0020	0.0021
20	2696K	0.0000	0.0009	0.0010	0.0015	0.0017	0.0019	0.0019
21	2710K	0.0000	0.0008	0.0010	0.0014	0.0015	0.0019	0.0022
22	2733K	0.0000	0.0011	0.0013	0.0016	0.0017	0.0017	0.0022
23	2701K	0.0000	0.0012	0.0010	0.0014	0.0017	0.0019	0.0018
24	2689K	0.0000	0.0010	0.0009	0.0013	0.0016	0.0018	0.0019
25	2685K	0.0000	0.0011	0.0010	0.0014	0.0016	0.0018	0.0019

Forward Voltage [V] data for tested units

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

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	2690K	6.312	6.342	6.411	6.379	6.398	6.395	6.374
2	2721K	6.309	6.341	6.410	6.370	6.395	6.386	6.364
3	2705K	6.323	6.351	6.427	6.392	6.417	6.411	6.390
4	2711K	6.321	6.347	6.419	6.381	6.408	6.398	6.382
5	2681K	6.308	6.336	6.410	6.375	6.399	6.392	6.374
6	2705K	6.304	6.339	6.417	6.368	6.397	6.388	6.367
7	2679K	6.284	6.318	6.393	6.349	6.380	6.367	6.350
8	2697K	6.314	6.344	6.420	6.384	6.410	6.403	6.384
9	2693K	6.286	6.313	6.392	6.350	6.380	6.369	6.347
10	2688K	6.298	6.316	6.386	6.344	6.371	6.367	6.342
11	2711K	6.305	6.332	6.468	6.434	6.462	6.451	6.434
12	2696K	6.311	6.335	6.409	6.373	6.401	6.386	6.370
13	2676K	6.240	6.249	6.303	6.264	6.289	6.278	6.255
14	2724K	6.315	6.339	6.416	6.378	6.405	6.400	6.377
15	2706K	6.306	6.331	6.402	6.363	6.389	6.378	6.358
16	2692K	6.332	6.355	6.425	6.388	6.415	6.406	6.383
17	2703K	6.319	6.333	6.389	6.344	6.373	6.366	6.348
18	2712K	6.308	6.340	6.413	6.370	6.400	6.397	6.374
19	2696K	6.285	6.309	6.382	6.342	6.369	6.363	6.338
20	2696K	6.302	6.334	6.404	6.368	6.397	6.388	6.367
21	2710K	6.315	6.341	6.414	6.372	6.393	6.382	6.367
22	2733K	6.324	6.351	6.425	6.381	6.411	6.407	6.382
23	2701K	6.315	6.343	6.419	6.376	6.405	6.397	6.373
24	2689K	6.318	6.353	6.422	6.387	6.429	6.402	6.485
25	2685K	6.320	6.340	6.413	6.372	6.399	6.387	6.367

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
1	2729K	96.700	96.790	96.650	95.920	94.830	94.180	92.830
2	2725K	96.230	96.210	96.150	95.470	94.540	93.660	91.080
3	2689K	95.770	95.630	95.170	94.650	93.800	92.770	91.540
4	2658K	94.320	94.110	93.440	92.880	92.060	91.210	90.020
5	2723K	96.690	96.750	96.320	95.330	93.990	93.090	91.630
6	2701K	94.560	94.340	94.510	93.290	92.060	91.040	89.840
7	2672K	95.520	95.440	95.060	94.330	93.040	91.900	90.510
8	2707K	96.280	95.970	95.800	94.970	93.560	92.840	91.170
9	2690K	95.890	95.830	94.710	94.390	93.840	93.000	91.970
10	2711K	96.630	96.280	95.790	95.520	94.190	93.090	91.530
11	2749K	94.950	94.590	93.700	93.160	92.140	91.230	90.090
12	2697K	96.820	96.590	96.280	95.700	94.690	93.660	91.930
13	2692K	96.200	96.110	96.050	95.190	94.360	93.420	91.580
14	2729K	96.870	96.370	96.380	95.560	94.760	93.740	92.520
15	2706K	96.030	96.200	95.390	94.610	93.780	93.030	92.120
16	2685K	96.610	96.500	95.870	95.100	94.090	93.290	92.300
17	2681K	96.210	96.010	95.090	94.490	93.430	92.890	91.920
18	2700K	95.740	95.700	95.110	94.310	93.490	92.720	92.390
19	2696K	96.850	96.880	96.410	95.540	94.480	93.330	92.350
20	2695K	96.330	96.080	95.340	94.520	93.590	92.940	91.910
21	2658K	95.040	94.880	94.440	93.580	92.440	91.930	91.290
22	2694K	97.000	96.650	95.890	95.330	94.470	93.900	91.950
23	2699K	97.040	96.750	96.260	95.650	95.070	94.420	92.630
24	2733K	96.990	96.700	95.690	95.220	94.150	93.200	92.770
25	2715K	95.440	95.720	94.930	94.200	93.620	92.720	91.860

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
1	2729K	1.0000	1.0009	0.9995	0.9919	0.9807	0.9739	0.9600
2	2725K	1.0000	0.9998	0.9992	0.9921	0.9824	0.9733	0.9465
3	2689K	1.0000	0.9985	0.9937	0.9883	0.9794	0.9687	0.9558
4	2658K	1.0000	0.9978	0.9907	0.9847	0.9760	0.9670	0.9544
5	2723K	1.0000	1.0006	0.9962	0.9859	0.9721	0.9628	0.9477
6	2701K	1.0000	0.9977	0.9995	0.9866	0.9736	0.9628	0.9501
7	2672K	1.0000	0.9992	0.9952	0.9875	0.9740	0.9621	0.9476
8	2707K	1.0000	0.9968	0.9950	0.9864	0.9717	0.9643	0.9469
9	2690K	1.0000	0.9994	0.9877	0.9844	0.9786	0.9699	0.9591
10	2711K	1.0000	0.9964	0.9913	0.9885	0.9747	0.9634	0.9472
11	2749K	1.0000	0.9962	0.9868	0.9811	0.9704	0.9608	0.9488
12	2697K	1.0000	0.9976	0.9944	0.9884	0.9780	0.9674	0.9495
13	2692K	1.0000	0.9991	0.9984	0.9895	0.9809	0.9711	0.9520
14	2729K	1.0000	0.9948	0.9949	0.9865	0.9782	0.9677	0.9551
15	2706K	1.0000	1.0018	0.9933	0.9852	0.9766	0.9688	0.9593
16	2685K	1.0000	0.9989	0.9923	0.9844	0.9739	0.9656	0.9554
17	2681K	1.0000	0.9979	0.9884	0.9821	0.9711	0.9655	0.9554
18	2700K	1.0000	0.9996	0.9934	0.9851	0.9765	0.9685	0.9650
19	2696K	1.0000	1.0003	0.9955	0.9865	0.9755	0.9637	0.9535
20	2695K	1.0000	0.9974	0.9897	0.9812	0.9716	0.9648	0.9541
21	2658K	1.0000	0.9983	0.9937	0.9846	0.9726	0.9673	0.9605
22	2694K	1.0000	0.9964	0.9886	0.9828	0.9739	0.9680	0.9479
23	2699K	1.0000	0.9970	0.9920	0.9857	0.9797	0.9730	0.9546
24	2733K	1.0000	0.9970	0.9866	0.9818	0.9707	0.9609	0.9565
25	2715K	1.0000	1.0029	0.9947	0.9870	0.9809	0.9715	0.9625

TM-21 Extrapolation of 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)	alpha	B	L70
1	2729K	8.5132e-06	1.0142	43,547
2	2725K	1.0357e-05	1.0183	36,189
3	2689K	8.6914e-06	1.0109	42,289
4	2658K	8.6713e-06	1.0085	42,107
5	2723K	1.1095e-05	1.0161	33,582
6	2701K	1.0568e-05	1.0150	35,165
7	2672K	1.0868e-05	1.0153	34,218
8	2707K	1.0447e-05	1.0131	35,382
9	2690K	7.6020e-06	1.0062	47,728
10	2711K	1.0079e-05	1.0118	36,556
11	2749K	9.5676e-06	1.0071	38,016
12	2697K	9.7319e-06	1.0130	37,977
13	2692K	9.5272e-06	1.0150	38,998
14	2729K	8.4451e-06	1.0088	43,274
15	2706K	8.5901e-06	1.0106	42,755
16	2685K	9.0003e-06	1.0096	40,692
17	2681K	8.5478e-06	1.0063	42,461
18	2700K	7.4594e-06	1.0072	48,779
19	2696K	9.9428e-06	1.0137	37,240
20	2695K	8.8066e-06	1.0069	41,284
21	2658K	8.1693e-06	1.0078	44,615
22	2694K	9.1781e-06	1.0080	39,731
23	2699K	8.0448e-06	1.0082	45,352
24	2733K	8.5100e-06	1.0050	42,495
25	2715K	8.0757e-06	1.0113	45,563
ave	2701K	9.1376e-06	1.0107	40,200

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
1	2729K	0.2600	0.2590	0.2591	0.2587	0.2582	0.2583	0.2578
2	2725K	0.2602	0.2592	0.2591	0.2590	0.2585	0.2585	0.2575
3	2689K	0.2618	0.2613	0.2613	0.2611	0.2602	0.2601	0.2595
4	2658K	0.2632	0.2626	0.2625	0.2624	0.2619	0.2615	0.2608
5	2723K	0.2602	0.2592	0.2590	0.2589	0.2585	0.2578	0.2567
6	2701K	0.2611	0.2605	0.2603	0.2602	0.2596	0.2594	0.2586
7	2672K	0.2625	0.2618	0.2617	0.2615	0.2609	0.2606	0.2599
8	2707K	0.2610	0.2606	0.2606	0.2605	0.2596	0.2590	0.2583
9	2690K	0.2616	0.2609	0.2608	0.2607	0.2599	0.2599	0.2592
10	2711K	0.2608	0.2600	0.2598	0.2597	0.2593	0.2587	0.2580
11	2749K	0.2592	0.2581	0.2578	0.2578	0.2575	0.2569	0.2561
12	2697K	0.2613	0.2605	0.2605	0.2604	0.2599	0.2594	0.2587
13	2692K	0.2616	0.2608	0.2607	0.2605	0.2600	0.2596	0.2589
14	2729K	0.2601	0.2593	0.2591	0.2588	0.2586	0.2578	0.2571
15	2706K	0.2610	0.2601	0.2599	0.2597	0.2594	0.2589	0.2583
16	2685K	0.2619	0.2611	0.2611	0.2608	0.2603	0.2599	0.2595
17	2681K	0.2621	0.2613	0.2611	0.2609	0.2604	0.2600	0.2597
18	2700K	0.2613	0.2604	0.2602	0.2600	0.2596	0.2591	0.2588
19	2696K	0.2615	0.2606	0.2605	0.2602	0.2599	0.2597	0.2593
20	2695K	0.2614	0.2608	0.2606	0.2602	0.2597	0.2595	0.2592
21	2658K	0.2633	0.2624	0.2624	0.2620	0.2617	0.2613	0.2610
22	2694K	0.2616	0.2609	0.2607	0.2602	0.2599	0.2598	0.2594
23	2699K	0.2613	0.2607	0.2607	0.2599	0.2598	0.2596	0.2593
24	2733K	0.2599	0.2588	0.2586	0.2583	0.2581	0.2576	0.2572
25	2715K	0.2605	0.2595	0.2594	0.2590	0.2587	0.2583	0.2580

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
1	2729K	0.5328	0.5330	0.5332	0.5335	0.5328	0.5338	0.5332
2	2725K	0.5328	0.5331	0.5333	0.5336	0.5329	0.5338	0.5329
3	2689K	0.5336	0.5340	0.5343	0.5346	0.5337	0.5347	0.5342
4	2658K	0.5344	0.5349	0.5350	0.5353	0.5350	0.5354	0.5350
5	2723K	0.5332	0.5335	0.5336	0.5339	0.5336	0.5338	0.5335
6	2701K	0.5342	0.5346	0.5347	0.5350	0.5347	0.5354	0.5347
7	2672K	0.5344	0.5347	0.5348	0.5351	0.5348	0.5354	0.5349
8	2707K	0.5332	0.5339	0.5340	0.5344	0.5341	0.5340	0.5336
9	2690K	0.5344	0.5347	0.5348	0.5351	0.5348	0.5355	0.5348
10	2711K	0.5333	0.5336	0.5337	0.5340	0.5338	0.5339	0.5337
11	2749K	0.5320	0.5322	0.5323	0.5327	0.5325	0.5328	0.5324
12	2697K	0.5341	0.5345	0.5345	0.5348	0.5346	0.5350	0.5345
13	2692K	0.5339	0.5341	0.5342	0.5345	0.5342	0.5346	0.5342
14	2729K	0.5322	0.5326	0.5327	0.5330	0.5328	0.5331	0.5327
15	2706K	0.5335	0.5338	0.5339	0.5342	0.5340	0.5343	0.5340
16	2685K	0.5341	0.5343	0.5344	0.5347	0.5344	0.5349	0.5345
17	2681K	0.5341	0.5343	0.5344	0.5347	0.5344	0.5350	0.5345
18	2700K	0.5335	0.5337	0.5338	0.5341	0.5339	0.5344	0.5340
19	2696K	0.5335	0.5337	0.5338	0.5341	0.5339	0.5340	0.5337
20	2695K	0.5342	0.5345	0.5345	0.5349	0.5346	0.5351	0.5348
21	2658K	0.5339	0.5342	0.5342	0.5345	0.5342	0.5347	0.5344
22	2694K	0.5333	0.5336	0.5337	0.5340	0.5337	0.5342	0.5338
23	2699K	0.5336	0.5340	0.5341	0.5344	0.5342	0.5348	0.5342
24	2733K	0.5323	0.5325	0.5326	0.5329	0.5326	0.5330	0.5327
25	2715K	0.5336	0.5339	0.5340	0.5343	0.5341	0.5345	0.5342

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
1	2729K	0.0000	0.0010	0.0010	0.0015	0.0018	0.0020	0.0022
2	2725K	0.0000	0.0010	0.0012	0.0014	0.0017	0.0020	0.0027
3	2689K	0.0000	0.0006	0.0009	0.0012	0.0016	0.0020	0.0024
4	2658K	0.0000	0.0008	0.0009	0.0012	0.0014	0.0020	0.0025
5	2723K	0.0000	0.0010	0.0013	0.0015	0.0017	0.0025	0.0035
6	2701K	0.0000	0.0007	0.0009	0.0012	0.0016	0.0021	0.0025
7	2672K	0.0000	0.0008	0.0009	0.0012	0.0016	0.0021	0.0026
8	2707K	0.0000	0.0008	0.0009	0.0013	0.0017	0.0022	0.0027
9	2690K	0.0000	0.0008	0.0009	0.0011	0.0017	0.0020	0.0024
10	2711K	0.0000	0.0009	0.0011	0.0013	0.0016	0.0022	0.0028
11	2749K	0.0000	0.0011	0.0014	0.0016	0.0018	0.0024	0.0031
12	2697K	0.0000	0.0009	0.0009	0.0011	0.0015	0.0021	0.0026
13	2692K	0.0000	0.0008	0.0009	0.0013	0.0016	0.0021	0.0027
14	2729K	0.0000	0.0009	0.0011	0.0015	0.0016	0.0025	0.0030
15	2706K	0.0000	0.0009	0.0012	0.0015	0.0017	0.0022	0.0027
16	2685K	0.0000	0.0008	0.0009	0.0013	0.0016	0.0022	0.0024
17	2681K	0.0000	0.0008	0.0010	0.0013	0.0017	0.0023	0.0024
18	2700K	0.0000	0.0009	0.0011	0.0014	0.0017	0.0024	0.0025
19	2696K	0.0000	0.0009	0.0010	0.0014	0.0016	0.0019	0.0022
20	2695K	0.0000	0.0007	0.0009	0.0014	0.0017	0.0021	0.0023
21	2658K	0.0000	0.0009	0.0009	0.0014	0.0016	0.0022	0.0024
22	2694K	0.0000	0.0008	0.0010	0.0016	0.0017	0.0020	0.0023
23	2699K	0.0000	0.0007	0.0008	0.0016	0.0016	0.0021	0.0021
24	2733K	0.0000	0.0011	0.0013	0.0017	0.0018	0.0024	0.0027
25	2715K	0.0000	0.0010	0.0012	0.0017	0.0019	0.0024	0.0026

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
1	2729K	6.309	6.343	6.388	6.380	6.402	6.398	6.376
2	2725K	6.307	6.348	6.392	6.385	6.408	6.404	6.380
3	2689K	6.310	6.349	6.384	6.379	6.406	6.400	6.382
4	2658K	6.323	6.366	6.418	6.404	6.436	6.430	6.412
5	2723K	6.309	6.341	6.392	6.385	6.406	6.405	6.381
6	2701K	6.238	6.258	6.302	6.288	6.313	6.309	6.595
7	2672K	6.296	6.335	6.386	6.369	6.397	6.391	6.370
8	2707K	6.291	6.324	6.369	6.360	6.379	6.381	6.355
9	2690K	6.321	6.353	6.391	6.380	6.409	6.401	6.383
10	2711K	6.295	6.335	6.379	6.374	6.394	6.397	6.371
11	2749K	6.312	6.348	6.390	6.382	6.406	6.407	6.431
12	2697K	6.300	6.328	6.377	6.364	6.391	6.387	6.370
13	2692K	6.304	6.336	6.382	6.371	6.399	6.396	6.373
14	2729K	6.304	6.338	6.381	6.369	6.397	6.395	6.368
15	2706K	6.325	6.359	6.413	6.403	6.426	6.427	6.408
16	2685K	6.299	6.334	6.375	6.365	6.390	6.393	6.365
17	2681K	6.326	6.360	6.412	6.398	6.430	6.427	6.406
18	2700K	6.303	6.327	6.366	6.359	6.382	6.374	6.351
19	2696K	6.314	6.344	6.382	6.373	6.403	6.391	6.367
20	2695K	6.322	6.362	6.410	6.403	6.429	6.425	6.399
21	2658K	6.318	6.348	6.395	6.384	6.408	6.405	6.386
22	2694K	6.312	6.342	6.391	6.383	6.404	6.401	6.384
23	2699K	6.322	6.346	6.389	6.379	6.405	6.401	6.375
24	2733K	6.305	6.340	6.380	6.377	6.398	6.396	6.374
25	2715K	6.308	6.338	6.394	6.385	6.411	6.410	6.387

Company Information

Philips 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. Philips Lumileds LUXEON LEDs are enabling never before possible applications in outdoor lighting, shop lighting, home lighting, digital imaging, display and automotive lighting.

Philips Lumileds is a fully integrated supplier, producing core LED material in all three base colors, (red, green, blue) and white. Philips 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, Philips 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.philipslumileds.com.