Cree® LED Components
IES LM-80-2008 Testing Results

NVLAP Lab Code 500041-0

Revision: 22 (June 16, 2016)

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INTRODUCTION

This document provides the results of Cree's IES LM-80-2008 ("LM-80") testing on its LED components. Cree is providing this data so that the public can verify the reliability of Cree LEDs as part of a complete LED lighting system.

Note that this document provides only the end results of the LM-80 tests. This is not a complete LM-80 report. Do not use this document to submit luminaires or lamps to an agency. Cree customers who need the full LM-80 reports should contact their Cree sales representative.

Cree's customers who wish to share LM-80 results with their customers have permission to link to this document from their website. This document is subject to change without notice, so please do not link to a local copy.

NVLAP ACCREDITATION FOR LM-80-2008 TESTING

Cree's SSL testing laboratory in Durham, NC, USA is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) to perform IES LM-80-2008 testing. All LM-80-2008 results produced by Cree are generated in Cree's accredited laboratory. Full details on Cree's NVLAP accreditation are available here:

https://www-s.nist.gov/niws/index.cfm?event=directory.search#no-back

This report must not be used to claim product certification, approval, or endorsement by the NVLAP, the National Institute of Standards and Technology (NIST) or any other agency of the federal government.

LED MODULES (REV 3)

Revision: 3 (March 12, 2014)

Description Of LED Light Sources

Module Family	Nominal Light Output	Applicable Order Codes	Maximum LED Current*	Maximum Tc**	Maximum LED Tsp
LMR2	650 lm	LMR020-0650-xxxx-xxxxxTW	450 mA	74 °C	85 °C
LMR4	700 lm	LMR040-0700-xxxx-xxxxxTW	450 mA	77 °C	85 °C
	1000 lm	LMR040-1000-xxxx-xxxxxTW	450 mA	75 °C	85 °C
LMH2	850 lm	LMH020-0850-xxxx-xxxxxTW	440 mA	77 °C	85 °C
	1250 lm	LMH020-1250-xxxx-xxxxxTW	440 mA	75 °C	85 °C
	2000 lm	LMH020-2000-xxxx-xxxxxTW	450 mA	70 °C	85 °C
	3000 lm	LMH020-3000-xxxx-xxxxxTW	450 mA	68 °C	85 °C
LMH6	2000 lm	LMH060-2000-xxxx-xxxxxTW	450 mA	60 °C	85 °C
	2900 lm	LMH060-2900-xxxx-xxxxxTW	450 mA	60 °C	85 °C

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	White: 700 mA Single-Color: 1000 mA	2700 K	25	7,056 hrs	L90(7k) > 42,300 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs

The following data set is an extended version of the data set above, but has a sample size of less than 25 units. Please refer to the data set details for the exact number of samples included. This data set is projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data set above should be referenced.

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1+	85 °C	85 °C	White: 700 mA Single-Color: 1000 mA	2700 K	21	16,128 hrs	L90(16k) = 27,200 hrs L80(16k) = 57,400 hrs L70(16k) = 91,600 hrs

Notes:

* Maximum LED Current: These values are the maximum current that the white and single-color LEDs will receive during operation in the specified module.

** Maximum Tc: There is no practical way to directly measure LED Tsp inside Cree's module without adversely affecting the module's optical, thermal or mechanical properties. Therefore, Cree has characterized samples of our LED modules for the temperature difference between LED Tsp and the Cree-specified Tc measurement point on the outside of the module. Cree recommends using the external Tc measurement point and the maximum Tc values listed in the table above.

LED MODULES (REV 3) - CONTINUED

Description Of Additional LED Light Sources

The following data sets apply to the additional Cree LED modules in the table below:

Module Family	Data Set	Nominal Light Output	Applicable Order Codes	Maximum LED Current*	Maximum Tc**	Maximum LED Tsp
LMH2	2	4000 lm	LMH020-4000-xxxx-xxxxxTW	470 mA	75 °C	105 °C
LMH2	3	4000 lm	LMH020-4000-xxxx-xxxxxTW	470 mA	55 °C	85 °C
		6000 lm	LMH020-6000-xxxx-xxxxxTW	850 mA	78 °C	85 °C
		8000 lm	LMH020-8000-xxxx-xxxxxTW	1000 mA	75 °C	85 °C

No failures occurred during testing.

Additional Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
2	105 °C	105 °C	White: 700 mA Single-Color: 1000 mA	3500 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	85 °C	85 °C	White: 1000 mA Single-Color: 1000 mA	3500 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

Notes:

* Maximum LED Current: These values are the maximum current that the white and single-color LEDs will receive during operation in the specified module.

** Maximum Tc: There is no practical way to directly measure LED Tsp inside Cree's module without adversely affecting the module's optical, thermal or mechanical properties. Therefore, Cree has characterized samples of our LED modules for the temperature difference between LED Tsp and the Cree-specified Tc measurement point on the outside of the module. Cree recommends using the external Tc measurement point and the maximum Tc values listed in the table above.

XLAMP® CXA1304 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp® CXA1304 White LEDs (Series: CXA1304)

This LM-80 report is applicable to the following order codes:

CXA1304 9 V CXA1304-xxxx-xxxCxxxxxxx
CXA1304 18 V CXA1304-xxxx-xxxFxxxxxxx
CXA1304 36 V CXA1304-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR® September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA1304	9 V	CXA1304-xxxx-xxxCxxxxxxx	460 mA	524 mA	692 mA	768 mA
CXA1304	18 V	CXA1304-xxxx-xxxFxxxxxxx	230 mA	262 mA	346 mA	384 mA
CXA1304	36 V	CXA1304-xxxx-xxxNxxxxxxx	115 mA	131 mA	173 mA	192 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA1310 WHITE LEDS (REV 1A)

Revision: 1A (May 11, 2015)

Description Of LED Light Sources

XLamp CXA1310 White LEDs (Series: CXA1310)

This LM-80 report is applicable to the following order codes:

CXA1310 18 V CXA1310-xxxx-xxxFxxxxxxx

CXA1310 36 V CXA1310-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1520-1	105 °C	105 °C	500 mA	3000 K	24	8,568 hrs	L90(9k) = 37,300 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
1520-2	85 °C	85 °C	700 mA	3000 K	21	9,072 hrs	L90(9k) = 52,200 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents	
			Data Set 1520-1 (105 °C)	Data Set 1520-2 (85 °C)
CXA1310	18 V	CXA1310-xxxx-xxxFxxxxxxx	600 mA	840 mA
CXA1310	36 V	CXA1310-xxxx-xxxNxxxxxxx	300 mA	420 mA
CXA1520	**36 V**	**CXA1520-xxxx-xxxNxxxxxxx**	**500 mA**	**700 mA**

XLAMP® CXA1507 WHITE LEDS (REV 2)

Revision: 2 (March 19, 2014)

Description Of LED Light Sources

XLamp CXA1507 White LEDs (Series: CXA1507)

This LM-80 report is applicable to the following order codes:

CXA1507 18 V CXA1507-xxxx-xxxFxxxxxxx

CXA1507 36 V CXA1507-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	55 °C	55 °C	200 mA (36 V) 400 mA (18 V)	3000 K	25	6,048 hrs	L95(6k) = 24,700 hrs L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	85 °C	85 °C	200 mA (36 V) 400 mA (18 V)	3000 K	25	6,048 hrs	L95(6k) = 26,600 hrs L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	105 °C	105 °C	200 mA (36 V) 400 mA (18 V)	3000 K	25	6,048 hrs	L95(6k) = 19,700 hrs L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
4	55 °C	55 °C	375 mA (36 V) 750 mA (18 V)	3000 K	25	6,048 hrs	L90(6k) = 30,200 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	85 °C	85 °C	375 mA (36 V) 750 mA (18 V)	3000 K	25	7,056 hrs	L90(7k) = 39,600 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

XLAMP® CXA1507 WHITE LEDS (REV 2) - CONTINUED

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3+	105 °C	105 °C	200 mA (36 V) 400 mA (18 V)	3000 K	20	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
4+	55 °C	55 °C	375 mA (36 V) 750 mA (18 V)	3000 K	24	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
5+	85 °C	85 °C	375 mA (36 V) 750 mA (18 V)	3000 K	20	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs

XLAMP® CXA1510 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA1510 White LEDs (Series: CXA1510)

This LM-80 report is applicable to the following order codes:

CXA1510 18 V CXA1510-xxxx-xxxFxxxxxxx

CXA1510 36 V CXA1510-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA1510	18 V	CXA1510-xxxx-xxxFxxxxxxx	468 mA	530 mA	702 mA	780 mA
CXA1510	36 V	CXA1510-xxxx-xxxNxxxxxxx	234 mA	265 mA	351 mA	390 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA1512 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA1512 White LEDs (Series: CXA1512)

This LM-80 report is applicable to the following order codes:

CXA1512 18 V CXA1512-xxxx-xxxFxxxxxxx

CXA1512 36 V CXA1512-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA1512	18 V	CXA1512-xxxx-xxxFxxxxxxx	692 mA	784 mA	1038 mA	1154 mA
CXA1512	36 V	CXA1512-xxxx-xxxNxxxxxxx	346 mA	392 mA	519 mA	577 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA1520 WHITE LEDS (REV 1A)

Revision: 1A (May 11, 2015)

Description Of LED Light Sources

XLamp CXA1520 White LEDs (Series: CXA1520)

This LM-80 report is applicable to the following order codes:
CXA1520-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1520-1	105 °C	105 °C	500 mA	3000 K	24	8,568 hrs	L90(9k) = 37,300 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
1520-2	85 °C	85 °C	700 mA	3000 K	21	9,072 hrs	L90(9k) = 52,200 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs

XLAMP® CXA1816 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA1816 White LEDs (Series: CXA1816)

This LM-80 report is applicable to the following order codes:
CXA1816-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA1816	36 V	CXA1816-xxxx-xxxNxxxxxxx	462 mA	523 mA	692 mA	769 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA1820 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA1820 White LEDs (Series: CXA1820)

This LM-80 report is applicable to the following order codes:
CXA1820-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA1820	36 V	CXA1820-xxxx-xxxNxxxxxxx	577 mA	654 mA	865 mA	962 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA1830 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA1830 White LEDs (Series: CXA1830)

This LM-80 report is applicable to the following order codes:
CXA1830-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA1830	36 V	CXA1830-xxxx-xxxNxxxxxxx	662 mA	743 mA	977 mA	1087 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA1850 WHITE LEDS (REV 1A)

Revision: 1A (May 11, 2015)

Description Of LED Light Sources

XLamp CXA1850 White LEDs (Series: CXA1850)

This LM-80 report is applicable to the following order codes:
CXA1850-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
2590-1	105 °C	105 °C	700 mA	3000 K	25	7,056 hrs	L90(7k) > 42,300 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
2590-2	105 °C	105 °C	1050 mA	3000 K	20	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2590-3	85 °C	85 °C	1400 mA	3000 K	25	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents		
			Data Set 2590-1 (105 °C)	Data Set 2590-2 (105 °C)	Data Set 2590-3 (85 °C)
CXA1850	36 V	CXA1850-xxxx-xxxNxxxxxxx	774 mA	1159 mA	1543 mA
CXA2590	**72 V**	**CXA2590-xxxx-xxxRxxxxxxx**	**700 mA**	**1050 mA**	**1400 mA**

XLAMP® CXA2011 WHITE LEDS (REV 0)

Revision: 0 (May 18, 2012)

Description Of LED Light Sources

XLamp CXA2011 White LEDs (Series: CXA2011)

This LM-80 report is applicable to the following order codes:
CXA2011-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	300 mA	3000 K	25	6,048 hrs	L90(6k) = 15,100 hrs L80(6k) = 28,800 hrs L70(6k) > 36,300 hrs

XLAMP® CXA2520 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA2520 White LEDs (Series: CXA2520)

This LM-80 report is applicable to the following order codes:
CXA2520-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA2520	36 V	CXA2520-xxxx-xxxNxxxxxxx	624 mA	707 mA	936 mA	1040 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA2530 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA2530 White LEDs (Series: CXA2530)

This LM-80 report is applicable to the following order codes:
CXA2530-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA2530	36 V	CXA2530-xxxx-xxxNxxxxxxx	808 mA	915 mA	1212 mA	1346 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA2540 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA2540 White LEDs (Series: CXA2540)

This LM-80 report is applicable to the following order codes:
CXA2540-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set 3050-4(+) (105 °C)	Data Set 3050-5 (85 °C)	Data Set 3050-6 (85 °C)	Data Set 3050-3 (55 °C)
CXA2540	36 V	CXA2540-xxxx-xxxNxxxxxxx	1139 mA	1281 mA	1693 mA	1903 mA
CXA3050	**36 V**	**CXA3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**1700 mA**	**2250 mA**	**2500 mA**

XLAMP® CXA2590 WHITE LEDS (REV 1A)

Revision: 1A (May 11, 2015)

Description Of LED Light Sources

XLamp CXA2590 White LEDs (Series: CXA2590)

This LM-80 report is applicable to the following order codes:
CXA2590-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
2590-1	105 °C	105 °C	700 mA	3000 K	25	7,056 hrs	L90(7k) > 42,300 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
2590-2	105 °C	105 °C	1050 mA	3000 K	20	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2590-3	85 °C	85 °C	1400 mA	3000 K	25	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs

XLAMP® CXA3050 WHITE LEDS (REV 4)

Revision: 4 (September 11, 2015)

Description Of LED Light Sources

XLamp CXA3050 White LEDs (Series: CXA3050)

This LM-80 report is applicable to the following order codes:
CXA3050-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4	105 °C	105 °C	1500 mA	3000 K	25	8,064 hrs	L90(7k) = 27,000 hrs L80(7k) > 48,400 hrs L70(7k) > 48,400 hrs
3050-5	85 °C	85 °C	1700 mA	3000 K	25	10,584 hrs	L90(10k) = 50,700 hrs L80(10k) > 63,500 hrs L70(10k) > 63,500 hrs
3050-6	85 °C	85 °C	2250 mA	3000 K	25	7,056 hrs	L90(7k) = 37,400 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
3050-3	55 °C	55 °C	2500 mA	3000 K	25	10,080 hrs	L90(10k) = 55,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3050-4+	105 °C	105 °C	1500 mA	3000 K	22	10,080 hrs	L90(10k) = 35,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

XLAMP® CXA3070 WHITE LEDS (REV 0)

Revision: 0 (September 5, 2014)

Description Of LED Light Sources

XLamp CXA3070 White LEDs (Series: CXA3070)

This LM-80 report is applicable to the following order codes:
CXA3070-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3590-1	105 °C	105 °C	1050 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3590-2	85 °C	85 °C	1400 mA	3000 K	25	6,046 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents	
			Data Set 3590-1 (105 °C)	Data Set 3590-2 (85° C)
CXA3070	36 V	CXA3070-xxxx-xxxNxxxxxxx	1335 mA	1794 mA
CXA3590	**72 V**	**CXA3590-xxxx-xxxRxxxxxxx**	**1050 mA**	**1400 mA**

XLAMP® CXA3590 WHITE LEDS (REV 0)

Revision: 0 (September 5, 2014)

Description Of LED Light Sources

XLamp CXA3590 White LEDs (Series: CXA3590)

This LM-80 report is applicable to the following order codes:

CXA3590 36 V CXA3590-xxxx-xxxNxxxxxxx

CXA3590 72 V CXA3590-xxxx-xxxRxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3590-1	105 °C	105 °C	1050 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3590-2	85 °C	85 °C	1400 mA	3000 K	25	6,046 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents	
			Data Set 3590-1 (105 °C)	Data Set 3590-2 (85° C)
CXA3590	36 V	CXA3590-xxxx-xxxNxxxxxxx	2100 mA	2800 mA
CXA3590	**72 V**	**CXA3590-xxxx-xxxRxxxxxxx**	**1050 mA**	**1400 mA**

XLAMP® CXB1304 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB1304 White LEDs (Series: CXB1304)

This LM-80 report is applicable to the following order codes:

CXB1304 9 V CXB1304-xxxx-xxxCxxxxxxx
CXB1304 18 V CXB1304-xxxx-xxxFxxxxxxx
CXB1304 36 V CXB1304-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Arrays

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B2530-1	105 °C	105 °C	1200 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B2530-2	85 °C	85 °C	1600 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 products. The tested products are listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set B2530-1 (105 °C)	Data Set B2530-2 (85 °C)	Data Set B3050-1 (105 °C)	Data Set B3050-2 (85 °C)
CXB1304	9 V	CXB1304-xxxx-xxxCxxxxxxx	684 mA	916 mA	460 mA	768 mA
CXB1304	18 V	CXB1304-xxxx-xxxFxxxxxxx	342 mA	458 mA	230 mA	384 mA
CXB1304	36 V	CXB1304-xxxx-xxxNxxxxxxx	171 mA	229 mA	115 mA	192 mA
CXB2530	**36 V**	**CXB2530-xxxx-xxxNxxxxxxx**	**1200 mA**	**1600 mA**		
CXB3050	**36 V**	**CXB3050-xxxx-xxxNxxxxxxx**			**1500 mA**	**2500 mA**

XLAMP® CXB1310 WHITE LEDS (REV 0)

Revision: 0 (March 29, 2016)

Description Of LED Light Sources

XLamp CXB1310 White LEDs (Series: CXB1310)

This LM-80 report is applicable to the following order codes:

CXB1310 18 V CXB1310-xxxx-xxxFxxxxxxx

CXB1310 36 V CXB1310-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1520-1	105 °C	105 °C	500 mA	3000 K	24	8,568 hrs	L90(9k) = 37,300 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
1520-2	85 °C	85 °C	700 mA	3000 K	21	9,072 hrs	L90(9k) = 52,200 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents	
			Data Set 1520-1 (105 °C)	Data Set 1520-2 (85 °C)
CXB1310	18 V	CXB1310-xxxx-xxxFxxxxxxx	970 mA	1400 mA
CXB1310	36 V	CXB1310-xxxx-xxxNxxxxxxx	485 mA	700 mA
CXA1520	**36 V**	**CXA1520-xxxx-xxxNxxxxxxx**	**500 mA**	**700 mA**

XLAMP® CXB1507 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB1507 White LEDs (Series: CXB1507)

This LM-80 report is applicable to the following order codes:

CXB1507 18 V CXB1507-xxxx-xxxFxxxxxxx

CXB1507 36 V CXB1507-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B2530-1	105 °C	105 °C	1200 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents		
			Data Set B2530-1 (105 °C)	Data Set B3050-1 (105 °C)	Data Set B3050-2 (85 °C)
CXB1507	18 V	CXB1507-xxxx-xxxFxxxxxxx	686 mA	462 mA	750 mA
CXB1507	36 V	CXB1507-xxxx-xxxNxxxxxxx	343 mA	231 mA	375 mA
CXB2530	**36 V**	**CXB2530-xxxx-xxxNxxxxxxx**	**1200 mA**		
CXB3050	**36 V**	**CXB3050-xxxx-xxxNxxxxxxx**		**1500 mA**	**2500 mA**

XLAMP® CXB1512 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB1512 White LEDs (Series: CXB1512)

This LM-80 report is applicable to the following order codes:

CXB1512 18 V CXB1512-xxxx-xxxFxxxxxxx

CXB1512 36 V CXB1512-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents	
			Data Set B3050-1 (105 °C)	Data Set B3050-2 (85 °C)
CXB1512	18 V	CXB1512-xxxx-xxxFxxxxxxx	900 mA	1200 mA
CXB1512	36 V	CXB1512-xxxx-xxxNxxxxxxx	450 mA	600 mA
CXB3050	**36 V**	**CXB3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**2500 mA**

XLAMP® CXB1520 WHITE LEDS (REV 0)

Revision: 0 (March 29, 2016)

Description Of LED Light Sources

XLamp CXB1520 White LEDs (Series: CXB1520)

This LM-80 report is applicable to the following order codes:
CXB1520-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
2590-1	105 °C	105 °C	700 mA	3000 K	25	7,056 hrs	L90(7k) > 42,300 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
2590-2	105 °C	105 °C	1050 mA	3000 K	20	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2590-3	85 °C	85 °C	1400 mA	3000 K	25	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents		
			Data Set 2590-1 (105 °C)	Data Set 2590-2 (105 °C)	Data Set 2590-3 (85 °C)
CXB1520	36 V	CXB1520-xxxx-xxxNxxxxxxx	616 mA	925 mA	1234 mA
CXA2590	**72 V**	**CXA2590-xxxx-xxxRxxxxxxx**	**700 mA**	**1050 mA**	**1400 mA**

XLAMP® CXB1816 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB1816 White LEDs (Series: CXB1816)

This LM-80 report is applicable to the following order codes:
CXB1816-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Arrays

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B2530-1	105 °C	105 °C	1200 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B2530-2	85 °C	85 °C	1600 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 products. The tested products are listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents			
			Data Set B2530-1 (105 °C)	Data Set B2530-2 (85 °C)	Data Set B3050-1 (105 °C)	Data Set B3050-2 (85 °C)
CXB1816	36 V	CXB1816-xxxx-xxxNxxxxxxx	673 mA	900 mA		
CXB1816	36 V	CXB1816-xxxx-xxxNxxxxxxx			462 mA	769 mA
CXB2530	**36V**	**CXB2530-xxxx-xxxNxxxxxxx**	**1200 mA**	**1600 mA**		
CXB3050	**36 V**	**CXB3050-xxxx-xxxNxxxxxxx**			**1500 mA**	**2500 mA**

XLAMP® CXB1820 WHITE LEDS (REV 3)

Revision: 3 (June 16, 2016)

Description Of LED Light Sources

XLamp CXB1820 White LEDs (Series: CXB1820)

This LM-80 report is applicable to the following order codes:
CXB1820-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B2530-1	105 °C	105 °C	1200 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents		
			Data Set 2530-1 (105 °C)	Data Set B3050-1 (105 °C)	Data Set B3050-2 (85 °C)
CXB1820	36 V	CXB1820-xxxx-xxxNxxxxxxx	681 mA		
CXB1820	36 V	CXB1820-xxxx-xxxNxxxxxxx		630 mA	1044 mA
CXB2530	**36 V**	**CXB2530-xxxx-xxxNxxxxxxx**	**1200 mA**		
CXB3050	**36 V**	**CXB3050-xxxx-xxxNxxxxxxx**		**1500 mA**	**2500 mA**

XLAMP® CXB1830 WHITE LEDS (REV 3)

Revision: 3 (June 16, 2016)

Description Of LED Light Sources

XLamp CXB1830 White LEDs (Series: CXB1830)

This LM-80 report is applicable to the following order codes:
CXB1830-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B2530-1	105 °C	105 °C	1200 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents		
			Data Set 2530-1 (105 °C)	Data Set B3050-1 (105 °C)	Data Set B3050-2 (85 °C)
CXB1830	36 V	CXB1830-xxxx-xxxNxxxxxxx	707 mA		
CXB1830	36 V	CXB1830-xxxx-xxxNxxxxxxx		653 mA	1094 mA
CXB2530	**36 V**	**CXB2530-xxxx-xxxNxxxxxxx**	**1200 mA**		
CXB3050	**36 V**	**CXB3050-xxxx-xxxNxxxxxxx**		**1500 mA**	**2500 mA**

XLAMP® CXB2530 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB2530 White LEDs (Series: CXB2530)

This LM-80 report is applicable to the following order codes:
CXB2530-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B2530-1	105 °C	105 °C	1200 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs
B2530-2	85 °C	85 °C	1600 mA	3000 K	10	8,568 hrs	L90(9k) > 47,100 hrs L80(9k) > 47,100 hrs L70(9k) > 47,100 hrs

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents	
			Data Set B3050-1 (105 °C)	Data Set B3050-2 (85 °C)
CXB2530	36 V	CXB2530-xxxx-xxxNxxxxxxx	808 mA	1346 mA
CXB3050	**36 V**	**CXB3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**2500 mA**

XLAMP® CXB2540 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB2540 White LEDs (Series: CXB2540)

This LM-80 report is applicable to the following order codes:
CXB2540-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents	
			Data Set B3050-1 (105 °C)	Data Set B3050-2 (85 °C)
CXB2540	36 V	CXB2540-xxxx-xxxNxxxxxxx	1146 mA	1923 mA
CXB3050	**36 V**	**CXB3050-xxxx-xxxNxxxxxxx**	**1500 mA**	**2500 mA**

XLAMP® CXB3050 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB3050 White LEDs (Series: CXB3050)

This LM-80 report is applicable to the following order codes:
CXB3050-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B3050-1	105 °C	105 °C	1500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs
B3050-2	85 °C	85 °C	2500 mA	3000 K	10	10,080 hrs	L90(10k) > 55,400 hrs L80(10k) > 55,400 hrs L70(10k) > 55,400 hrs

XLAMP® CXB3070 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB3070 White LEDs (Series: CXB3070)

This LM-80 report is applicable to the following order codes:
CXB3070-xxxx-xxxxxxxxxxx

No failures occurred during testing.

Results Summary For Tested LED Array

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B3590-1	105 °C	105 °C	1050 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
B3590-2	85 °C	85 °C	1400 mA	3000 K	25	6,046 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

Scaling For Applicable Products

The data sets cited below meet all the criteria for one LM-80 data set to apply to a range of LED arrays, as defined in the ENERGY STAR September 9, 2011 guidelines, Section 3.7.d. The table below defines the current values that apply to each product when scaled from the tested LM-80 product. The tested product is listed in bold text below.

Product Name	Voltage Class	Product Order Code	Applicable Currents	
			Data Set B3590-1 (105 °C)	Data Set B3590-2 (85 °C)
CXB3070	36 V	CXB3070-xxxx-xxxNxxxxxxx	1321 mA	1764 mA
CXB3590	**72 V**	**CX3590-xxxx-xxxRxxxxxxx**	**1050 mA**	**1400 mA**

XLAMP® CXB3590 WHITE LEDS (REV 2)

Revision: 2 (May 5, 2016)

Description Of LED Light Sources

XLamp CXB3590 White LEDs (Series: CXB3590)

This LM-80 report is applicable to the following order codes:

CXB3590 36 V CXB3590-xxxx-xxxNxxxxxxx

CXB3590 72 V CXB3590-xxxx-xxxRxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
B3590-1	105 °C	105 °C	2100 mA (36 V) 1050 mA (72 V)	3000 K	10	6,552 hrs	L90(7k) > 36,000 hrs L80(7k) > 36,000 hrs L70(7k) > 36,000 hrs
B3590-2	85 °C	85 °C	2800 mA (36 V) 1400 mA (72 V)	3000 K	10	8,064 hrs	L90(8k) > 44,400 hrs L80(8k) > 44,400 hrs L70(8k) > 44,400 hrs

XLAMP® MC-E WHITE LEDS (REV 1)

Revision: 1 (December 8, 2010)

Description Of LED Light Sources

XLamp MC-E White LEDs (Series: MCE4WT)
XLamp MC-E EasyWhite® LEDs (Series: MCEEZW)

This LM-80 report is applicable to the following order codes:
MC-E White: MCE4WT-A2-xxxx-xxxxxx
MC-E EasyWhite: MCEEZW-A1-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	45 °C	45 °C	350 mA	3000 K	26	6,048 hrs	L90(6k) > 25,700 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	55 °C	55 °C	350 mA	3000 K	26	6,048 hrs	L90(6k) = 28,800 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	85 °C	85 °C	350 mA	3000 K	26	6,048 hrs	L90(6k) = 23,100 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	45 °C	45 °C	700 mA	3000 K	26	6,048 hrs	L90(6k) = 23,600 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
4	55 °C	55 °C	700 mA	3000 K	26	6,048 hrs	L90(6k) = 11,700 hrs L80(6k) = 21,900 hrs L70(6k) = 33.400 hrs
6	85 °C	85 °C	700 mA	3000 K	26	6,048 hrs	L90(6k) = 7,660 hrs L80(6k) = 13,900 hrs L70(6k) = 20,900 hrs

XLAMP® MHB-A WHITE LEDS (REV 4)

Revision: 4 (March 1, 2016)

Description Of LED Light Sources

XLamp MHB-A White LEDs (Series: MHBAWT)

This LM-80 report is applicable to the following order codes:

MHB-A 9 V: MHBAWT-xxxx-xxxCxxxxxxx

MHB-A 18 V: MHBAWT-xxxx-xxxFxxxxxxx

MHB-A 36 V: MHBAWT-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
MHBA-2	105 °C	105 °C	320 mA (9 V) 160 mA (18 V) 80 mA (36 V)	3000 K	25	8,568 hrs	L90(9k) > 51,400 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
MHBA-1	105 °C	105 °C	500 mA (9 V) 250 mA (18 V) 125 mA (36 V)	3000 K	23	8,568 hrs	L90(9k) = 30,200 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
MHBA-3	85 °C	85 °C	500 mA (9 V) 250 mA (18 V) 125 mA (36 V)	3000 K	24	8,568 hrs	L90(9k) = 29,500 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
MHBA-4	85 °C	85 °C	700 mA (9 V) 350 mA (18 V) 175 mA (36 V)	3000 K	20	8,568 hrs	L90(9k) = 21,400 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs

XLAMP® MHD-E WHITE LEDS (REV 4)

Revision: 4 (March 1, 2016)

Description Of LED Light Sources

XLamp MHD-E White LEDs (Series: MHDEWT)

This LM-80 report is applicable to the following order codes:

MHD-E 9 V: MHDEWT-xxxx-xxxCxxxxxxx

MHD-E 18 V: MHDEWT-xxxx-xxxFxxxxxxx

MHD-E 36 V: MHDEWT-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
MHDE-1	105 °C	105 °C	600 mA (9 V) 300 mA (18 V) 150 mA (36 V)	3000 K	20	8,568 hrs	L90(8.5k) > 51,400 hrs L80(8.5k) > 51,400 hrs L70(8.5k) > 51,400 hrs
MHDE-2	85 °C	85 °C	1000 mA (9 V) 500 mA (18 V) 250 mA (36 V)	3000 K	20	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs

XLAMP® MHD-G WHITE LEDS (REV 4)

Revision: 4 (March 1, 2016)

Description Of LED Light Sources

XLamp MHD-G White LEDs (Series: MHDGWT)

This LM-80 report is applicable to the following order codes:

MHD-G 18 V: MHDGWT-xxxx-xxxFxxxxxxx

MHD-G 36 V: MHDGWT-xxxx-xxxNxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
MHDG-1	105 °C	105 °C	400 mA (18 V) 200 mA (36 V)	3000 K	20	8,064 hrs	L90(8k) > 48,400 hrs L80(8k) > 48,400 hrs L70(8k) > 48,400 hrs
MHDG-2	105 °C	105 °C	700 mA (18 V) 350 mA (36 V)	3000 K	20	6,048 hrs	L90(6k) = 11,500 hrs L80(6k) = 28,400 hrs L70(6k) > 36,300 hrs
MHDG-3	85 °C	85 °C	800 mA (18 V) 400 mA (36 V)	3000 K	20	8,568 hrs	L90(8.5k) = 24,600 hrs L80(8.5k) = 51,400 hrs L70(8.5k) > 51,400 hrs

XLAMP® MK-R WHITE LEDS (REV 2)

Revision: 2 (May 12, 2015)

Description Of LED Light Sources

XLamp MK-R White LEDs (Series: MKRAWT)

This LM-80 report is applicable to the following order codes:

MK-R 6 V: MKRAWT-xx-xxxx-xBxxxxxxxxx

MK-R 12 V: MKRAWT-xx-xxxx-xDxxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3	125 °C	125 °C	700 mA (6 V) 350 mA (12 V)	3000 K	25	11,088 hrs	L90(11k) > 66,500 hrs L80(11k) > 66,500 hrs L70(11k) > 66,500 hrs
8	105 °C	105 °C	1000 mA (6 V) 500 mA (12 V)	3000 K	25	13,104 hrs	L90(13k) = 34,800 hrs L80(13k) = 75,600 hrs L70(13k) > 78,600 hrs
9	85 °C	85 °C	1400 mA (6 V) 700 mA (12 V)	3000 K	25	13,104 hrs	L90(13k) = 36,400 hrs L80(13k) > 78,600 hrs L70(13k) > 78,600 hrs
4	105 °C	105 °C	1400 mA (6 V) 700 mA (12 V)	3000 K	25	10,080 hrs	L90(10k) = 26,900 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
5	85 °C	85 °C	2000 mA (6 V) 1000 mA (12 V)	3000 K	25	11,088 hrs	L90(11k) = 30,500 hrs L80(11k) = 62,200 hrs L70(11k) > 66,500 hrs
6	55 °C	55 °C	2500 mA (6 V) 1250 mA (12 V)	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
7	85 °C	85 °C	2500 mA (6 V) 1250 mA (12 V)	3000 K	25	6,048 hrs	L90(6k) = 33,900 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

XLAMP® MK-R WHITE LEDS (REV 5) - CONTINUED

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
6+	55 °C	55 °C	2500 mA (6 V) 1250 mA (12 V)	3000 K	21	7,056 hrs	L90(7k) > 42,300 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
7+	85 °C	85 °C	2500 mA (6 V) 1250 mA (12 V)	3000 K	22	8,064 hrs	L90(8k) = 19,800 hrs L80(8k) = 42,600 hrs L70(8k) > 48,400 hrs

XLAMP® ML-B WHITE LEDS (REV 1)

Revision: 1 (May 1, 2012)

Description Of LED Light Sources

XLamp ML-B White LEDs (Series: MLBAWT)

This LM-80 report is applicable to the following order codes:
MLBAWT-xx-xxxx-xxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	45 °C	45 °C	80 mA	2700 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	55 °C	55 °C	80 mA	2700 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	85 °C	85 °C	80 mA	2700 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
4	85 °C	85 °C	175 mA	2700 K	25	8,064 hrs	L90(8k) = 12,300 hrs L80(8k) = 23,600 hrs L70(8k) = 36,300 hrs

XLAMP® ML-C & ML-E WHITE LEDS (REV 1)

Revision: 1 (March 19, 2012)

Description Of LED Light Sources

XLamp ML-C White LEDs (Parallel (MLCAWT) & Series (MLCSWT) Configurations)
XLamp ML-E White LEDs (Parallel (MLEAWT) & Series (MLESWT) Configurations)

This LM-80 report is applicable to the following order codes:

ML-C Parallel: MLCAWT-xx-xxxx-xxxxxx
ML-C Series: MLCSWT-xx-xxxx-xxxxxx
ML-E Parallel: MLEAWT-xx-xxxx-xxxxxx
ML-E Series : MLESWT-xx-xxxx-xxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	45 °C	45 °C	116 mA (MLCAWT) 58 mA (MLCSWT) 175 mA (MLEAWT) 58 mA (MLESWT)	2700 K	26	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	55 °C	55 °C	116 mA (MLCAWT) 58 mA (MLCSWT) 175 mA (MLEAWT) 58 mA (MLESWT)	2700 K	26	6,048 hrs	L90(6k) = 25,600 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	85 °C	85 °C	116 mA (MLCAWT) 58 mA (MLCSWT) 175 mA (MLEAWT) 58 mA (MLESWT)	2700 K	26	6,048 hrs	L90(6k) = 13,600 hrs L80(6k) = 27,200 hrs L70(6k) > 36,300 hrs

XLAMP® ML-E WHITE LEDS (REV 1)

Revision: 1 (June 14, 2013)

Description Of LED Light Sources

XLamp ML-E White LEDs (Series: MLEAWT)

This LM-80 report is applicable to the following order codes:
MLEAWT-xx-xxxx-xxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
P2	55 °C	55 °C	175 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
P3	85 °C	85 °C	175 mA	3000 K	25	6,552 hrs	L90(7k) = 24,700 hrs L80(7k) > 39,300 hrs L70(7k) > 39,300 hrs
P1	105 °C	105 °C	175 mA	3000 K	25	6,048 hrs	L90(6k) = 10,200 hrs L80(6k) = 18,700 hrs L70(6k) = 28,300 hrs
P4	55 °C	55 °C	350 mA	3000 K	25	6,048 hrs	L90(6k) = 23,000 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
P5	85 °C	85 °C	350 mA	3000 K	25	6,048 hrs	L90(6k) = 9,450 hrs L80(6k) = 18,600 hrs L70(6k) = 28,900 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
P3+	85 °C	85 °C	175 mA	3000 K	20	10,584 hrs	L90(11k) = 17,100 hrs L80(11k) = 29,900 hrs L70(11k) = 44,300 hrs

XLAMP® MP-L EASYWHITE® LEDS (REV 0)

Revision: 0 (September 30, 2010)

Description Of LED Light Sources

XLamp MP-L EasyWhite LEDs (Series: MPLEZW)

This LM-80 report is applicable to the following order codes:
MPLEZW-A1-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	45 °C	45 °C	250 mA	3000 K	26	6,048 hrs	L90(6k) = 28,700 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	55 °C	55 °C	250 mA	3000 K	26	6,048 hrs	L90(6k) = 18,200 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	85 °C	85 °C	250 mA	3000 K	26	6,048 hrs	L90(6k) = 29,100 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® MT-G EASYWHITE® LEDS (REV 1)

Revision: 1 (February 16, 2012)

Description Of LED Light Sources

XLamp MT-G EasyWhite LEDs (Series: MTGEZW)

This LM-80 report is applicable to the following order codes:

MT-G 6 V: MTGEZW-xx-xxxx-xBxxxxxxx

MT-G 36 V: MTGEZW-xx-xxxx-xNxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	55 °C	55 °C	2000 mA (6 V) 333 mA (36 V)	2700 K	25	6,048 hrs	L90(6k) = 25,500 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	85 °C	85 °C	2000 mA (6 V) 333 mA (36 V)	2700 K	25	6,048 hrs	L90(6k) = 15,900 hrs L80(6k) = 35,000 hrs L70(6k) > 36,300 hrs
3	105 °C	105 °C	2000 mA (6 V) 333 mA (36 V)	2700 K	25	6,048 hrs	L90(6k) = 14,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
4	55 °C	55 °C	3000 mA (6 V) 500 mA (36 V)	3000 K	25	6,048 hrs	L90(6k) = 23,500 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	85 °C	85 °C	3000 mA (6 V) 500 mA (36 V)	3000 K	25	6,048 hrs	L90(6k) = 13,200 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
6	105 °C	105 °C	3000 mA (6 V) 500 mA (36 V)	3000 K	25	6,048 hrs	L90(6k) = 11,800 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
7	105 °C	105 °C	4200 mA (6 V) 700 mA (36 V)	3000 K	25	6,048 hrs	L90(6k) = 14,000 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® MT-G2 EASYWHITE® LEDS (REV 3)

Revision: 3 (June 15, 2014)

Description Of LED Light Sources

XLamp MT-G2 EasyWhite LEDs (Series: MTGBEZ)

This LM-80 report is applicable to the following order codes:

MT-G2 6 V: MTGBEZ-xx-xxxx-xBxxxxxxx

MT-G2 9V: MTGBEZ-xx-xxxx-xCxxxxxxx

MT-G2 36 V: MTGBZW-xx-xxxx-xNxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	3000 mA (6 V) 2000 mA (9 V) 500 mA (36 V)	3000 K	25	6,048 hrs	L90(6k) = 12,000 hrs L80(6k) = 26,600 hrs L70(6k) > 36,300 hrs
2	105 °C	105 °C	3000 mA (6 V) 2000 mA (9 V) 500 mA (36 V)	3000 K	26	6,048 hrs	L90(6k) = 6,060 hrs L80(6k) = 15,400 hrs L70(6k) = 26,000 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1+	85 °C	85 °C	3000 mA (6 V) 2000 mA (9 V) 500 mA (36 V)	3000 K	15	13,104 hrs	L90(13k) = 22,300 hrs L80(13k) = 59,200 hrs L70(13k) > 78,600 hrs
2+	105 °C	105 °C	3000 mA (6 V) 2000 mA (9 V) 500 mA (36 V)	3000 K	20	7,056 hrs	L70(7k) = 27,700 hrs

XLAMP® MX-3 WHITE LEDS (REV 0)

Revision: 0 (March 29, 2011)

Description Of LED Light Sources

XLamp MX-3 White LEDs (Parallel (MX3AWT) & Series (MX3SWT) Configurations)

This LM-80 report is applicable to the following order codes:

MX-3 Parallel: MX3AWT-xx-xxxx-xxxxxx

MX-3 Series: MX3SWT-xx-xxxx-xxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	45 °C	45 °C	400 mA (MX3AWT) 133 mA (MX3SWT)	2700 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	55 °C	55 °C	400 mA (MX3AWT) 133 mA (MX3SWT)	2700 K	25	6,048 hrs	L90(6k) = 21,700 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	85 °C	85 °C	400 mA (MX3AWT) 133 mA (MX3SWT)	2700 K	25	6,048 hrs	L90(6k) = 16,600 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® MX-6 WHITE LEDS (REV 2)

Revision: 2 (September 2, 2011)

Description Of LED Light Sources

XLamp MX-6 White LEDs (Parallel (MX6AWT) & Series (MX6SWT) Configurations)

This LM-80 report is applicable to the following order codes:

MX-6 Parallel: MX6AWT-xx-xxxx-xxxxxx

MX-6 Series: MX6SWT-xx-xxxx-xxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	45 °C	45 °C	350 mA (MX6AWT) 58 mA (MX6SWT)	2700 K	26	6,048 hrs	L90(6k) = 15,700 hrs L80(6k) = 29,400 hrs L70(6k) > 36,300 hrs
2	55 °C	55 °C	350 mA (MX6AWT) 58 mA (MX6SWT)	2700 K	28	6,048 hrs	L90(6k) = 27,900 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	85 °C	85 °C	350 mA (MX6AWT) 58 mA (MX6SWT)	3000 K	30	6,048 hrs	L90(6k) = 12,100 hrs L80(6k) = 23,100 hrs L70(6k) = 35,600 hrs
4	45 °C	45 °C	600 mA (MX6AWT) 100 mA (MX6SWT)	2700 K	25	6,048 hrs	L90(6k) = 28,400 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	55 °C	55 °C	600 mA (MX6AWT) 100 mA (MX6SWT)	2700 K	25	6,048 hrs	L90(6k) = 19,500 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
6	85 °C	85 °C	600 mA (MX6AWT) 100 mA (MX6SWT)	2700 K	25	6,048 hrs	L90(6k) = 11,100 hrs L80(6k) = 22,000 hrs L70(6k) = 34,400 hrs

XLAMP® XB-D WHITE LEDS (REV 2)

Revision: 2 (October 10, 2013)

Description Of LED Light Sources

XLamp XB-D White LEDs (Series: XBDAWT)

This LM-80 report is applicable to the following order codes:
XBDAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
7	85 °C	85 °C	500 mA	3000 K	25	10,080 hrs	L95(10k) = 29,400 hrs L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3	105 °C	105 °C	700 mA	3000 K	25	10,080 hrs	L90(10k) = 56,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
4	55 °C	55 °C	1000 mA	3000 K	25	10,080 hrs	L90(10k) = 45,000 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
5	85 °C	85 °C	1000 mA	3000 K	24	10,080 hrs	L90(10k) = 33,400 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
6	105 °C	105 °C	1000 mA	3000 K	25	6,048 hrs	L90(6k) = 12,800 hrs L80(6k) = 29,100 hrs L70(6k) > 36,300 hrs

XLAMP® XB-E HIGH VOLTAGE WHITE LEDS (REV 0)

Revision: 0 (October 11, 2013)

Description Of LED Light Sources

XLamp XB-E White LEDs (Series: XBEHVW)

This LM-80 report is applicable to the following order codes:
XBEHVW-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	105 °C	105 °C	44 mA	2700 K	25	6,048 hrs	L90(6k) = 10,400 hrs L80(6k) = 23,100 hrs L70(6k) > 36,300 hrs

XLAMP® XB-G HIGH VOLTAGE WHITE LEDS (REV 1)

Revision: 1 (March 4, 2014)

Description Of LED Light Sources

XLamp XB-G White LEDs (Series: XBGHVW)

This LM-80 report is applicable to the following order codes:
XBGHVW-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	105 °C	105 °C	44 mA	2700 K	25	6,048 hrs	L90(6k) = 17,800 hrs L80(6k) = 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® XB-H WHITE LEDS (REV 1)

Revision: 1 (January 5, 2015)

Description Of LED Light Sources

XLamp XB-H White LEDs (Series: XBHAWT)

This LM-80 report is applicable to the following order codes:
XBHAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	105 °C	105 °C	700 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
4	85 °C	85 °C	1000 mA	3000 K	25	6,048 hrs	L90(6k) = 35,900 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	105 °C	105 °C	1000 mA	3000 K	25	6,048 hrs	L90(6k) = 35,100 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	85 °C	85 °C	1500 mA	3000 K	25	6,048 hrs	L90(6k) = 28,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® XH-B WHITE LEDS (REV 2)

Revision: 2 (March 6, 2015)

Description Of LED Light Sources

XLamp XH-B White LEDs (Series: XHBAWT)

This LM-80 report is applicable to the following order codes:
XHBAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	80 mA	3000 K	25	14,112 hrs	L90(14k) = 70,100 hrs L80(14k) > 84,700 hrs L70(14k) > 84,700 hrs
2	105 °C	105 °C	80 mA	3000 K	25	6,552 hrs	L90(7k) > 39,300 hrs L80(7k) > 39,300 hrs L70(7k) > 39,300 hrs
4	85 °C	85 °C	125 mA	3000 K	25	14,112 hrs	L90(14k) = 53,100 hrs L80(14k) > 84,700 hrs L70(14k) > 84,700 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
2+	105 °C	105 °C	80 mA	3000 K	24	14,112 hrs	L90(14k) = 45,100 hrs L80(14k) > 84,700 hrs L70(14k) > 84,700 hrs

XLAMP® XH-G WHITE LEDS (REV 3)

Revision: 3 (May 13, 2015)

Description Of LED Light Sources

XLamp XH-G White LEDs (Series: XHGAWT)

This LM-80 report is applicable to the following order codes:
XHGAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	80 mA	3000 K	25	14,616 hrs	L90(15k) = 77,500 hrs L80(15k) > 87,700 hrs L70(15k) > 87,700 hrs
2	105 °C	105 °C	80 mA	3000 K	15	14,112 hrs	L90(14k) > 77,600 hrs L80(14k) > 77,600 hrs L70(14k) > 77,600 hrs
3	85 °C	85 °C	175 mA	3000 K	25	14,112 hrs	L90(14k) = 56,600 hrs L80(14k) > 84,700 hrs L70(14k) > 84,700 hrs
4	105 °C	105 °C	175 mA	3000 K	25	14,112 hrs	L90(14k) = 30,500 hrs L80(14k) = 66,000 hrs L70(14k) > 84,700 hrs
5	85 °C	85 °C	350 mA	3000 K	25	6,552 hrs	L90(7k) = 24,300 hrs L80(7k) > 39,300 hrs L70(7k) > 39,300 hrs

XLAMP® XHP35 WHITE LEDS (REV 0)

Revision: 0 (January 25, 2016)

Description Of LED Light Sources

XLamp XHP35 White LEDs (Series: XHP35A)

This LM-80 report is applicable to the following order codes:
XHP35A-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	700 mA	3000 K	24	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	105 °C	105 °C	700 mA	3000 K	24	6,048 hrs	L90(6k) = 31,700 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	85 °C	85 °C	1050 mA	3000 K	21	6,048 hrs	L90(6k) = 28,400 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® XHP50 WHITE LEDS (REV 2)

Revision: 2 (January 28, 2016)

Description Of LED Light Sources

XLamp XHP50 White LEDs (Series: XHP50A)

This LM-80 report is applicable to the following order codes:
XHP50A-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3	85 °C	85 °C	1400 mA (6 V) 700 mA (12 V)	3000 K	24	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
4	105 °C	105 °C	1400 mA (6 V) 700 mA (12 V)	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	125 °C	125 °C	1400 mA (6 V) 700 mA (12 V)	3000 K	20	6,048 hrs	L90(6k) = 19,700 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
6	85 °C	85 °C	2100 mA (6 V) 1050 mA (12 V)	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
7	105 °C	105 °C	2100 mA (6 V) 1050 mA (12 V)	3000 K	25	6,048 hrs	L90(6k) = 18,600 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
8	85 °C	85 °C	3000 mA (6 V) 1500 mA (12 V)	3000 K	25	6,048 hrs	L90(6k) = 29,900 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® XHP70 WHITE LEDS (REV 3)

Revision: 3 (June 10, 2016)

Description Of LED Light Sources

XLamp XHP70 White LEDs (Series: XHP70A)

This LM-80 report is applicable to the following order codes:
XHP70A-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
4	85 °C	85 °C	2100 mA (6 V) 1050 mA (12 V)	3000 K	25	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
1	105 °C	105 °C	2100 mA (6 V) 1050 mA (12 V)	3000 K	20	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	125 °C	125 °C	2100 mA (6 V) 1050 mA (12 V)	3000 K	20	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	85 °C	85 °C	3000 mA (6 V) 1500 mA (12 V)	3000 K	25	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
3	105 °C	105 °C	3000 mA (6 V) 1500 mA (12 V)	3000 K	20	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
6	85 °C	85 °C	4200 mA (6 V) 2100 mA (12 V)	3000 K	25	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
7	85 °C	85 °C	4200 mA (6 V) 2100 mA (12 V)	3000 K	25	6,552 hrs	L90(7k) = 17,900 hrs L80(7k) > 39,300 hrs L70(7k) > 39,300 hrs
8	85 °C	85 °C	4800 mA (6 V) 2400 mA (12 V)	3000 K	25	9,576 hrs	L90(10k) > 57,500 hrs L80(10k) > 57,500 hrs L70(10k) > 57,500 hrs

XLAMP® XM-L EASYWHITE® LEDS (REV 1)

Revision: 1 (August 8, 2013)

Description Of LED Light Sources

XLamp XM-L EasyWhite LEDs (Series: XMLEZW)

This LM-80 report is applicable to the following order codes:

XM-L EZW 6 V: XMLEZW-xx-xxxx-xBxxxxxxx

XM-L EZW 12 V: XMLEZW-xx-xxxx-xDxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3	105 °C	105 °C	700 mA (6 V) 350 mA (12 V)	2700 K	25	15,120 hrs	L95(15k) = 28,700 hrs L90(15k) > 90,700 hrs L80(15k) > 90,700 hrs L70(15k) > 90,700 hrs
6	105 °C	105 °C	1000 mA (6 V) 500 mA (12 V)	3000 K	25	7,056 hrs	L95(7k) = 42,200 hrs L90(7k) > 42,300 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
7	85 °C	85 °C	1500 mA (6 V) 750 mA (12 V)	3000 K	25	6,048 hrs	L95(6k) = 19,400 hrs L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® XM-L HIGH VOLTAGE WHITE LEDS (REV 0)

Revision: 0 (November 13, 2012)

Description Of LED Light Sources

XLamp XM-L High Voltage White LEDs (Series: XMLHVW)

This LM-80 report is applicable to the following order codes:
XMLHVW-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	55 °C	55 °C	88 mA	3000 K	25	6,048 hrs	L90(6k) = 15,000 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	85 °C	85 °C	88 mA	3000 K	25	6,048 hrs	L90(6k) = 8,180 hrs L80(6k) = 22,100 hrs L70(6k) > 36,300 hrs
3	105 °C	105 °C	88 mA	3000 K	25	6,048 hrs	L90(6k) = 7,450 hrs L80(6k) = 19,500 hrs L70(6k) = 33,200 hrs

XLAMP® XM-L WHITE LEDS (REV 2)

Revision: 2 (October 31, 2012)

Description Of LED Light Sources

XLamp XM-L White LEDs (Series: XMLAWT)

This LM-80 report is applicable to the following order codes:
XMLAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
4	55 °C	55 °C	1500 mA	2700 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	85 °C	85 °C	1500 mA	2700 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
6	105 °C	105 °C	1500 mA	2700 K	25	10,080 hrs	L90(10k) = 27,700 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
7	55 °C	55 °C	2000 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
8	85 °C	85 °C	2000 mA	3000 K	25	9,072 hrs	L90(9k) = 38,300 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
9	105 °C	105 °C	2000 mA	3000 K	25	6,048 hrs	L90(6k) = 21,600 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
10	85 °C	85 °C	3000 mA	3000 K	25	6,048 hrs	L90(6k) = 11,100 hrs L80(6k) = 25,000 hrs L70(6k) > 36,300 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

XLAMP® XM-L WHITE LEDS (REV 2) - CONTINUED

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
5+	85 °C	85 °C	1500 mA	2700 K	23	12,096 hrs	L90(12k) = 29,600 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs
6+	105 °C	105 °C	1500 mA	2700 K	23	12,096 hrs	L90(12k) = 25,900 hrs L80(12k) = 59,800 hrs L70(12k) > 72,600 hrs
7+	55 °C	55 °C	2000 mA	3000 K	11	11,088 hrs	L90(11k) > 61,000 hrs L80(11k) > 61,000 hrs L70(11k) > 61,000 hrs
8+	85 °C	85 °C	2000 mA	3000 K	21	12,096 hrs	L90(12k) = 24,800 hrs L80(12k) = 52,600 hrs L70(12k) > 72,600 hrs
9+	105 °C	105 °C	2000 mA	3000 K	14	8,568 hrs	L90(9k) = 15,900 hrs L80(9k) = 33,700 hrs L70(9k) > 47,100 hrs

XLAMP® XM-L2 WHITE LEDS (REV 3B)

Revision: 3B (March 23, 2015)

Description Of LED Light Sources

XLamp XM-L2 White LEDs (Series: XMLBWT)

This LM-80 report is applicable to the following order codes:
XMLBWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	1500 mA	2700 K	25	7,560 hrs	L95(8k) > 45,400 hrs L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs
2	105 °C	105 °C	1500 mA	2700 K	25	8,568 hrs	L95(9k) = 19,600 hrs L90(9k) = 43,900 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
8	55 °C	55 °C	2100 mA	2700 K	25	9,072 hrs	L95(9k) > 54,400 hrs L90(9k) >54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
10	105 °C	105 °C	2100 mA	3000 K	25	6,048 hrs	L95(6k) = 14,900 hrs L90(6k) > 36,600 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
9	55 °C	55 °C	3000 mA	2700 K	25	6,048 hrs	L95(6k) = 16,800 hrs L90(6k) = 35,600 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
11	85 °C	85 °C	3000 mA	3000 K	25	6,048 hrs	L95(6k) = 7,950 hrs L90(6k) = 17,100 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

XLAMP® XM-L2 WHITE LEDS (REV 3B) - CONTINUED

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1+	85 °C	85 °C	1500 mA	2700 K	23	12,096 hrs	L95(12k) = 30,100 hrs L90(12k) = 60,900 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs
8+	55 °C	55 °C	2100 mA	2700 K	17	12,096 hrs	L95(12k) > 66,500 hrs L90(12k) > 66,500 hrs L80(12k) > 66,500 hrs L70(12k) > 66,500 hrs

XLAMP® XP-E HIGH EFFICIENCY WHITE LEDS (REV 4)

Revision: 4 (April 25, 2012)

Description Of LED Light Sources

XLamp XP-E High Efficiency White LEDs (Series: XPEHEW)

This LM-80 report is applicable to the following order codes:
XPEHEW-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
11	85 °C	85 °C	350 mA	3000 K	25	10,080 hrs	L90(10k) = 32,800 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
12	105 °C	105 °C	350 mA	3000 K	25	6,048 hrs	L90(6k) = 15,600 hrs L70(6k) = 34,100 hrs L70(6k) > 36,300 hrs
8	55 °C	55 °C	500 mA	2700 K	25	8,064 hrs	L90(8k) > 48,400 hrs L80(8k) > 48,400 hrs L70(8k) > 48,400 hrs
9	85 °C	85 °C	500 mA	2700 K	25	8,064 hrs	L90(8k) = 28,400 hrs L80(8k) > 48,400 hrs L70(8k) > 48,400 hrs
10	85 °C	85 °C	700 mA	3000 K	25	9,072 hrs	L90(9k) = 21,900 hrs L80(9k) = 44,100 hrs L70(9k) > 54,400 hrs

XLAMP® XP-E WHITE LEDS (REV 3)

Revision: 3 (November 9, 2011)

Description Of LED Light Sources

XLamp XP-E White LEDs (Series: XPEWHT)

This LM-80 report is applicable to the following order codes:
XPEWHT-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
8	55 °C	55 °C	350 mA	2700 K	25	10,080 hrs	L90(10k) = 56,800 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
9	85 °C	85 °C	350 mA	2700 K	25	10,080 hrs	L90(10k) = 39,700 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
10	105 °C	105 °C	350 mA	2700 K	25	6,048 hrs	L90(6k) = 19,400 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	45 °C	45 °C	700 mA	2700 K	25	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
6	55 °C	55 °C	700 mA	2700 K	25	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
7	85 °C	85 °C	700 mA	2700 K	25	10,080 hrs	L90(10k) = 28,300 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

XLAMP® XP-E2 RED, RED-ORANGE, AMBER, PHOSPHOR-CONVERTED AMBER, GREEN & BLUE LEDS (REV 2)

Revision: 2 (April 26, 2016)

Description Of LED Light Sources

XLamp XP-E2 Red LEDs (Series: XPEBRD)
XLamp XP-E2 Red-Orange LEDs (Series: XPEBRO)
XLamp XP-E2 Amber LEDs (Series: XPEBAM)
XLamp XP-E2 Phosphor-Converted Amber LEDs (Series: XPEBPA)
XLamp XP-E2 Green LEDs (Series: XPEBGR)
XLamp XP-E2 Blue LEDs (Series: XPEBBL)

This LM-80 report is applicable to the following order codes:
XPEBRD-xx-xxxx-xxxxx
XPEBRO-xx-xxxx-xxxxx
XPEBAM-xx-xxxx-xxxxx
XPEBPA-xx-xxxx-xxxxx
XPEBGR-xx-xxxx-xxxxx
XPEBBL-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

LED Color	Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	Sample Count	Test Duration	Reported TM-21 Lifetimes
Red, Red-Orange	R3	85 °C	85 °C	1000 mA	20	17,136 hrs	L90(17k) = 68,900 hrs L80(17k) > 103,000 hrs L70(17k) > 103,000 hrs
	R2	105 °C	105 °C	1000 mA	25	12,096 hrs	L90(12k) = 55,700 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs
Amber	A1	85 °C	85 °C	1000 mA	14	6,048 hrs	L90(6k) > 33,300 hrs L80(6k) > 33,300 hrs L70(6k) > 33,300 hrs
	A2	105 °C	105 °C	1000 mA	13	6,048 hrs	L90(6k) > 33,300 hrs L80(6k) > 33,300 hrs L70(6k) > 33,300 hrs
Phosphor-Converted Amber	PCA1	85 °C	85 °C	1000 mA	20	11,592 hrs	L90(12k) = 13,200 hrs L80(12k) = 30,900 hrs L70(12k) = 51,000 hrs
	PCA2	105 °C	105 °C	1000 mA	19	6,048 hrs	L90(6k) = 10,700 hrs L80(6k) = 21,800 hrs L70(6k) = 34,400 hrs

XLAMP® XP-E2 RED, RED-ORANGE, AMBER, PHOSPHOR-CONVERTED AMBER, GREEN & BLUE LEDS (REV 2) - CONTINUED

LED Color	Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	Sample Count	Test Duration	Reported TM-21 Lifetimes
Green	G2	105 °C	105 °C	500 mA	20	8,568 hrs	L90(9k) > 51,400 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
	G3	85 °C	85 °C	1000 mA	20	8,568 hrs	L90(9k) > 51,400 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
Blue	B2	105 °C	105 °C	500 mA	20	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs
	B3	85 °C	85 °C	1000 mA	20	8,568 hrs	L90(9k) > 51,400 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs

XLAMP® XP-E2 WHITE LEDS (REV 1)

Revision: 1 (February 25, 2014)

Description Of LED Light Sources

XLamp XP-E2 White LEDs (Series: XPEBWT)

This LM-80 report is applicable to the following order codes:
XPEBWT-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3	85 °C	85 °C	350 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
1	105 °C	105 °C	350 mA	3000 K	25	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
4	55 °C	55 °C	700 mA	3000 K	25	7,056 hrs	L90(7k) > 42,300 hrs L80(7k) > 42,300 hrs L70(7k) > 42,300 hrs
2	85 °C	85 °C	700 mA	3000 K	25	7,056 hrs	L90(7k) = 18,300 hrs L80(7k) = 37,100 hrs L70(7k) > 42,300 hrs
5	105 °C	105 °C	700 mA	3000 K	25	6,048 hrs	L90(6k) = 17,100 hrs L80(6k) = 35,900 hrs L70(6k) > 36,300 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3+	85 °C	85 °C	350 mA	3000 K	18	9,072 hrs	L90(9k) > 49,900 hrs L80(9k) > 49,900 hrs L70(9k) > 49,900 hrs

XLAMP® XP-G WHITE LEDS (REV 7)

Revision: 7 (March 18, 2014)

Description Of LED Light Sources

XLamp XP-G White LEDs (Series: XPGWHT)

This LM-80 report is applicable to the following order codes:
XPGWHT-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
17	55 °C	55 °C	1000 mA	3000 K	25	6,048 hrs	L95(6k) > 36,300 hrs L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
13	85 °C	85 °C	1000 mA	3000 K	25	13,608 hrs	L95(14k) > 81,600 hrs L90(14k) > 81,600 hrs L80(14k) > 81,600 hrs L70(14k) > 81,600 hrs
14	105 °C	105 °C	1000 mA	3000 K	25	12,096 hrs	L95(12k) > 72,600 hrs L90(12k) > 72,600 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs
15	55 °C	55 °C	1500 mA	3000 K	25	12,096 hrs	L95(12k) > 72,600 hrs L90(12k) > 72,600 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs
16	85 °C	85 °C	1500 mA	3000 K	25	12,096 hrs	L95(12k) > 72,600 hrs L90(12k) > 72,600 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs

XLAMP® XP-G2 WHITE LEDS (REV 8)

Revision: 8 (January 6, 2016)

Description Of LED Light Sources

XLamp XP-G2 White LEDs (Series: XPGBWT)

This LM-80 report is applicable to the following order codes:
XPGBWT-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
11	125 °C	125 °C	350 mA	3000 K	25	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
9	85 °C	85 °C	500 mA	3000 K	25	10,584 hrs	L90(11k) > 63,500 hrs L80(11k) > 63,500 hrs L70(11k) > 63,500 hrs
10	105 °C	105 °C	500 mA	3000 K	25	13,608 hrs	L90(11k) > 51,400 hrs L80(11k) > 51,400 hrs L70(11k) > 51,400 hrs
15	105° C	105 °C	700 mA	3000 K	20	8,568 hrs	L90(8.5k) > 51,400 hrs L80(8.5k) > 51,400 hrs L70(8.5k) > 51,400 hrs
3	55 °C	55 °C	1000 mA	3000 K	25	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
16	85° C	85 °C	1000 mA	4000 K	20	8,568 hrs	L90(8.5k) > 51,400 hrs L80(8.5k) > 51,400 hrs L70(8.5k) > 51,400 hrs
17	85° C	85 °C	1000 mA	3000 K	20	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
18	105 °C	105 °C	1000 mA	3000 K	20	8,568 hrs	L90(8.5k) > 51,400 hrs L80(8.5k) > 51,400 hrs L70(8.5k) > 51,400 hrs
13	55 °C	55 °C	1500 mA	3000 K	25	7,560 hrs	L90(8k) = 36,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs
7	85 °C	85 °C	1500 mA	3000 K	25	6,048 hrs	L90(6k) = 24,500 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

The following data sets are extended versions of some of the data sets above, but have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by

XLAMP® XP-G2 WHITE LEDS (REV 6) - CONTINUED

a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
9+	85 °C	85 °C	500 mA	3000 K	20	13,608 hrs	L90(14k) > 81,600 hrs L80(14k) > 81,600 hrs L70(14k) > 81,600 hrs
10+	105 °C	105 °C	500 mA	3000 K	19	14,112 hrs	L90(14k) > 77,600 hrs L80(14k) > 77,600 hrs L70(14k) > 77,600 hrs
3+	55 °C	55 °C	1000 mA	3000 K	20	10,080 hrs	L90(10k) = 49,700 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs

XLAMP® XP-G3 WHITE LEDS (REV 1)

Revision: 1 (April 8, 2016)

Description Of LED Light Sources

XLamp XP-G3 White LEDs (Series: XPGDWT)

This LM-80 report is applicable to the following order codes:
XPGDWT-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	1000 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	105 °C	105 °C	1500 mA	3000 K	20	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® XP-L WHITE LEDS (REV 6)

Revision: 6 (June 6, 2016)

Description Of LED Light Sources

XLamp XP-L White LEDs (Series: XPLAWT)

This LM-80 report is applicable to the following order codes:
XPLAWT-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
6	105 °C	105 °C	1050 mA	3000 K	20	8,064 hrs	L90(8k) > 48,400 hrs L80(8k) > 48,400 hrs L70(8k) > 48,400 hrs
5	85 °C	85 °C	1500 mA	3000 K	20	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3	105 °C	105 °C	1500 mA	3000 K	25	11,592 hrs	L90(12k) = 66,600 hrs L80(12k) > 69,600 hrs L70(12k) > 69,600 hrs
4	85 °C	85 °C	2100 mA	3000 K	25	10,080 hrs	L90(10k) = 42,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
1	105 °C	105 °C	2100 mA	3000 K	25	6,048 hrs	L90(6k) = 24,000 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	85 °C	85 °C	3000 mA	3000 K	25	6,048 hrs	L90(6k) = 16,300 hrs L80(6k) = 35,800 hrs L70(6k) > 36,300 hrs

XLAMP® XQ-B WHITE LEDS (REV 1)

Revision: 1 (October 15, 2013)

Description Of LED Light Sources

XLamp XQ-B White LEDs (Series: XQBAWT)

This LM-80 report is applicable to the following order codes:
XQBAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
3	85 °C	85 °C	100 mA	3000 K	25	6,048 hrs	L90(6k) = 17,200 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
1	85 °C	85 °C	200 mA	3000 K	25	6,048 hrs	L90(6k) = 11,600 hrs L80(6k) = 24,600 hrs L70(6k) > 36,300 hrs
2	105 °C	105 °C	200 mA	3000 K	25	6,048 hrs	L90(6k) = 8,440 hrs L80(6k) = 18,800 hrs L70(6k) = 30,500 hrs

XLAMP® XQ-D WHITE LEDS (REV 0)

Revision: 0 (October 14, 2013)

Description Of LED Light Sources

XLamp XQ-D White LEDs (Series: XQDAWT)

This LM-80 report is applicable to the following order codes:
XQDAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	105 °C	105 °C	500 mA	3000 K	25	7,560 hrs	L90(8k) = 13,800 hrs L80(8k) = 32,500 hrs L70(8k) > 45,400 hrs
2	105 °C	105 °C	700 mA	3000 K	25	6,048 hrs	L90(6k) = 12,500 hrs L80(6k) = 30,100 hrs L70(6k) > 36,300 hrs

XLAMP® XQ-E RED, RED-ORANGE, PHOSPHOR-CONVERTED AMBER, GREEN, BLUE & ROYAL BLUE LEDS (REV 0)

Revision: 0 (March 30, 2016)

Description Of LED Light Sources

XLamp XQ-E Red LEDs (Series: XQERED)
XLamp XQ-E Red-Orange LEDs (Series: XQERDO)
XLamp XQ-E Phosphor-Converted Amber LEDs (Series: XQEAPA)
XLamp XQ-E Green LEDs (Series: XQEGRN)
XLamp XQ-E Blue LEDs (Series: XQEBLU)
XLamp XQ-E Royal Blue LEDs (Series: XQEROY

This LM-80 report is applicable to the following order codes:
XQERED-xx-xxxx-xxxxxxxxx
XQERDO-xx-xxxx-xxxxxxxxx
XQEAPA-xx-xxxx-xxxxxxxxx
XQEGRN-xx-xxxx-xxxxxxxxx
XQEBLU-xx-xxxx-xxxxxxxxx
XQEROY-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

LED Color	Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	Sample Count	Test Duration	Reported TM-21 Lifetimes
Red, Red-Orange	R1	85 °C	85 °C	1000 mA	25	12,096 hrs	L90(12k) > 72,600 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs
	R2	105 °C	105 °C	1000 mA	25	12,096 hrs	L90(12k) > 72,600 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs
Phosphor-Converted Amber	PCA1	105 °C	105 °C	700 mA	20	9,576 hrs	L90(10k) = 10,500 hrs L80(10k) = 29,400 hrs L70(10k) = 50,800 hrs
	PCA2	85 °C	85 °C	1000 mA	20	9,072 hrs	L90(9k) = 10,600 hrs L80(9k) = 33,000 hrs L70(9k) > 54,400 hrs
	PCA3	105 °C	105 °C	1000 mA	20	6,048 hrs	L90(6k) = 9,490 hrs L80(6k) = 19,000 hrs L70(6k) = 29,800 hrs

XLAMP® XQ-E RED, RED-ORANGE, PHOSPHOR-CONVERTED AMBER, GREEN, BLUE & ROYAL BLUE LEDS (REV 0) - CONTINUED

LED Color	Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	Sample Count	Test Duration	Reported TM-21 Lifetimes
Green	G1	85 °C	85 °C	500 mA	20	8,064 hrs	L90(8k) > 48,400 hrs L80(8k) > 48,400 hrs L70(8k) > 48,400 hrs
	G2	105 °C	105 °C	500 mA	20	8,064 hrs	L90(8k) > 48,400 hrs L80(8k) > 48,400 hrs L70(8k) > 48,400 hrs
	G3	85 °C	85 °C	1000 mA	20	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs
	G4	105 °C	105 °C	1000 mA	20	6,048 hrs	L90(6k) = 22,500 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
Blue	B1	85 °C	85 °C	500 mA	20	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs
	B2	105 °C	105 °C	500 mA	20	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs
	B3	85 °C	85 °C	1000 mA	20	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs
	B4	105 °C	105 °C	1000 mA	20	7,560 hrs	L90(8k) > 45,400 hrs L80(8k) > 45,400 hrs L70(8k) > 45,400 hrs
Royal Blue	RB1	85 °C	85 °C	1000 mA	17	11,592 hrs	L90(12k) > 63,800 hrs L80(12k) > 63,800 hrs L70(12k) > 63,800 hrs
	RB2	105 °C	105 °C	1000 mA	19	11,592 hrs	L90(12k) > 63,800 hrs L80(12k) > 63,800 hrs L70(12k) > 63,800 hrs

XLAMP® XQ-E WHITE LEDS (REV 0)

Revision: 0 (December 11, 2014)

Description Of LED Light Sources

XLamp XQ-E White LEDs (Series: XQEAWT)

This LM-80 report is applicable to the following order codes:
XQEAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	85 °C	85 °C	500 mA	3000 K	25	8,568 hrs	L90(9k) = 28,300 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
2	105 °C	105 °C	500 mA	3000 K	25	8,568 hrs	L90(9k) = 25,500 hrs L80(9k) > 51,400 hrs L70(9k) > 51,400 hrs
3	85 °C	85 °C	700 mA	3000 K	25	6,048 hrs	L90(6k) = 24,700 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
4	105 °C	105 °C	700 mA	3000 K	25	6,048 hrs	L90(6k) = 19,900 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® XR-E WHITE LEDS (REV 1)

Revision: 1 (September 20, 2010)

Description Of LED Light Sources

XLamp XR-E White LEDs (Series: XREWHT)

This LM-80 report is applicable to the following order codes:
XREWHT-xx-xxxx-xxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	25 °C	25 °C	350 mA	6200 K	30	9,072 hrs	L90(9k) = 28,500 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
2	25 °C	25 °C	350 mA	2700 K	30	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
7	55 °C	55 °C	350 mA	6500 K	30	11,088 hrs	L90(11k) = 12,400 hrs L80(11k) = 22,400 hrs L70(11k) = 33,700 hrs
8	55 °C	55 °C	350 mA	2700 K	29	10,080 hrs	L90(10k) = 13,000 hrs L80(10k) = 23,500 hrs L70(10k) = 35,500 hrs
11	85 °C	85 °C	350 mA	6000 K	30	7,560 hrs	L90(8k) = 10,000 hrs L80(8k) = 19,300 hrs L70(8k) = 29,900 hrs
12	85 °C	85 °C	350 mA	3000 K	30	8,544 hrs	L90(9k) = 11,500 hrs L80(9k) = 20,500 hrs L70(9k) = 30,800 hrs
3	25 °C	25 °C	700 mA	6200 K	30	9,072 hrs	L90(9k) = 29,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
4	25 °C	25 °C	700 mA	2700 K	30	9,072 hrs	L90(9k) > 54,400 hrs L80(9k) > 54,400 hrs L70(9k) > 54,400 hrs
9	55 °C	55 °C	1000 mA	6200 K	29	11,592 hrs	L90(12k) = 17,100 hrs L80(12k) = 37,500 hrs L70(12k) = 60,600 hrs
10	55 °C	55 °C	1000 mA	4500 K	30	10,080 hrs	L90(10k) = 12,600 hrs L80(10k) = 24,800 hrs L70(10k) = 38,700 hrs
13	85 °C	85 °C	1000 mA	6500 K	30	6,048 hrs	L90(6k) = 12,900 hrs L80(6k) = 26,500 hrs L70(6k) > 36,300 hrs

XLAMP® XR-E WHITE LEDS (REV 1) - CONTINUED

The following extended data sets have sample sizes less than 25 units each. Please refer to each individual data set for the exact number of samples included. These data sets are projected according to IES TM-21-11 standards and the Reported L70 lifetimes presented are valid under TM-21-11. However, the use of these extended data sets may not be allowed by a particular program because of the sample size of the data set. Cree recommends reviewing the details on LM-80 lumen maintenance for each program to verify that data sets with fewer than 25 samples are considered valid. If not, the data sets above should be referenced.

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
5	45 °C	45 °C	350 mA	6000 K	19	6,846 hrs	L90(7k) = 26,600 hrs L80(7k) > 37,700 hrs L70(7k) > 37,700 hrs
6	45 °C	45 °C	1000 mA	6500 K	20	14,616 hrs	L90(15k) = 19,100 hrs L80(15k) = 37,900 hrs L70(15k) = 59,200 hrs

XLAMP® XT-E HIGH VOLTAGE WHITE LEDS (REV 0)

Revision: 0 (August 21, 2012)

Description Of LED Light Sources

XLamp XT-E High Voltage White LEDs (Series: XTEHVW)

This LM-80 report is applicable to the following order codes:
XTEHVW-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
1	55 °C	55 °C	44 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
2	85 °C	85 °C	44 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
3	105 °C	105 °C	44 mA	3000 K	25	6,048 hrs	L90(6k) = 13,500 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
4	55 °C	55 °C	66 mA	3000 K	25	6,048 hrs	L90(6k) = 25,100 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs
5	85 °C	85 °C	66 mA	3000 K	25	6,048 hrs	L90(6k) > 36,300 hrs L80(6k) > 36,300 hrs L70(6k) > 36,300 hrs

XLAMP® XT-E WHITE LEDS (REV 9)

Revision: 9 (June 6, 2016)

Description Of LED Light Sources

XLamp XT-E White LEDs (Series: XTEAWT)

This LM-80 report is applicable to the following order codes:
XTEAWT-xx-xxxx-xxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
8	85 °C	85 °C	500 mA	3000 K	20	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
9	105 °C	105 °C	500 mA	3000 K	20	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10K) > 60,500 hrs
3+	55 °C	55 °C	1000 mA	3000 K	16	18,144 hrs	L90(18k) = 45,600 hrs L80(18k) = 88,500 hrs L70(18k) > 99,800 hrs
10	85 °C	85 °C	1000 mA	3000 K	20	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
11	105 °C	105 °C	1000 mA	3000 K	20	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
5	55 °C	55 °C	1250 mA	3000 K	25	10,080 hrs	L90(10k) = 46,100 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
6	85 °C	85 °C	1250 mA	3000 K	25	9,072 hrs	L90(9k) = 19,300 hrs L80(9k) = 41,400 hrs L70(9k) > 54,400 hrs