

Cree® XLamp® XP-L White LEDs



NVLAP Lab Code 500041-0

INFORMATION REQUIRED BY LM-80-08

Cree classifies these LEDs as "LED packages" per Sep 9, 2011 ENERGY STAR guidelines¹.

1. Number of LED light sources tested	See individual data sets on following pages.
2. 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-xxxxxxxxxx All measurements provided are LED package measurements.
3. Description of test and auxiliary equipment	Instrument Systems ISP-500 Integrating Sphere Instrument Systems CAS-140 Spectrometer Keithley 2420 Sourcemeter
4. Operating cycle	LED packages are driven at constant current.
5. Ambient conditions	LED packages are operated in environmental control chambers. The temperature of the ambient air around the LED packages is actively controlled by air flowing through the chamber. T_A : See individual data sets on following pages RH : < 45% Air flow : 800 CFM
6. Case temperature	See individual data sets on following pages.
7. Drive current of the LED light source during life-time test.	See individual data sets on following pages.
8. Initial luminous flux and forward voltage at photometric measurement current	See individual data sets on following pages.
9. Lumen maintenance data for each individual LED light source	See individual data sets on following pages. Ambient temperature during luminous flux testing set to 25°C ±2°C.
10. Observation of LED light source failures	No failures occurred during testing.
11. LED light source monitoring interval	See individual data sets on following pages.
12. Photometric measurement uncertainty	Cree maintains a tolerance of ±2.0% on flux measurements for LM-80 testing.
13. Chromaticity shift reported over the measurement time	See individual data sets on following pages. Ambient temperature during chromaticity testing set to 25°C ±2°C.
Test Report Authorization	Arthur Pun, Components Reliability Laboratory Manager

1 http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/luminaires/ENERGY_STAR_Final_Lumen_Maintenance_Guidance.pdf

REVISION HISTORY

Revision	Date	Change
0	October 31, 2014	Date of first issue
1	January 8, 2015	Extended data sets 1 & 2 with additional test duration. Added data sets 1+, 2+, 3 & 4.
2	March 16, 2015	Extended data sets 1-4 with additional test duration. Deleted data sets 1+ & 2+.
3	June 1, 2015	Extended data sets 3 & 4 with additional test duration.
4	August 19, 2015	Extended data sets 3 & 4 with additional test duration.
5	October 29, 2015	Added data set 5. Revised precision of EPA tables to 2 decimal places.
6	June 06, 2016	Added data set 6. Extended data sets 3 & 5 with additional test duration.

TEST RESULTS SUMMARY

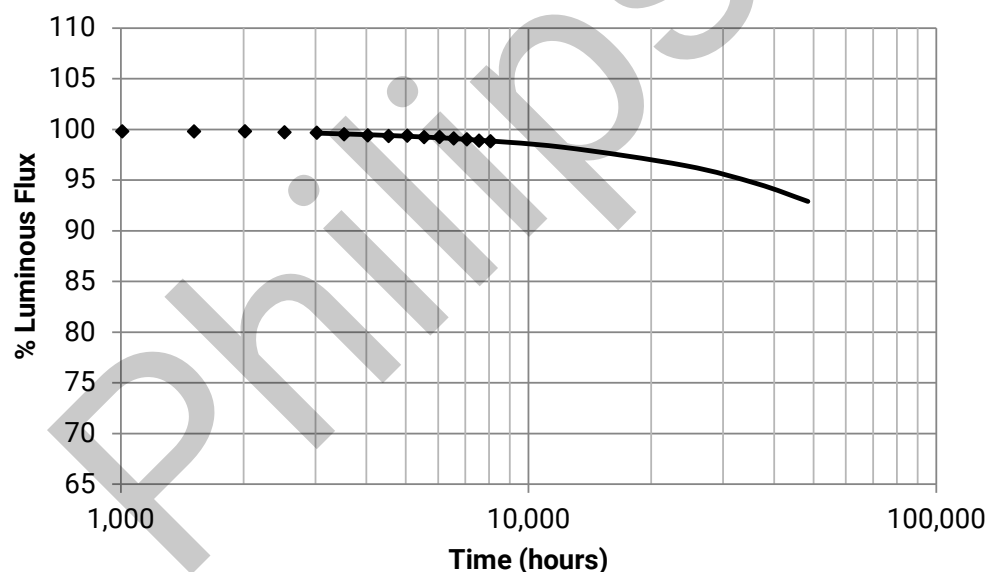
Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
6	105°C	105°C	1050 mA	3000K	20	8,064 hrs	L90(8k) > 48,400 hrs L80(8k) > 48,400 hrs L70(8k) > 48,400 hrs
5	85°C	85°C	1500 mA	3000K	20	10,080 hrs	L90(10k) > 60,500 hrs L80(10k) > 60,500 hrs L70(10k) > 60,500 hrs
3	105°C	105°C	1500 mA	3000K	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	3000K	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	3000K	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	3000K	25	6,048 hrs	L90(6k) = 16,300 hrs L80(6k) = 35,800 hrs L70(6k) > 36,300 hrs

DATA SET 6: 105°C; 1050 mA

LED Package Series	XLamp XP-L White LEDs (Series: XPLAWT)
	This LM-80 report is applicable to the following order codes: XPLAWT-xx-xxxx-xxxxxxxxxx
Tested Model Number	XPLAWT-00-0000-000LU60E7
Drive Current [I_F]	1050 mA
Testing Initiation Date	April 30, 2015
Case Temperature [T_s]	105°C
Ambient Temperature [T_A]	105°C
Failures observed	None

Projection Generated By Cree's Internal TM-21 Calculator:

Test duration	8,064 hours
Test duration used for projection	t=3,024 to t=8,064
α	1.546E-06
β	1.001E+00
Reported Lifetimes	L90(8k) > 48,400 hours
	L80(8k) > 48,400 hours
	L70(8k) > 48,400 hours



LM-80 Data For The Official TM-21 Calculator*

Time (hours)	Lumen Maintenance
0	100.00%
168	99.82%
1008	99.81%
1512	99.80%
2016	99.81%
2520	99.71%
3024	99.67%
3528	99.52%
4032	99.41%
4536	99.35%
5040	99.38%
5544	99.24%
6048	99.25%
6552	99.11%
7056	99.02%
7560	98.89%
8064	98.83%

* <http://www.energystar.gov/TM-21calculator>

Suggestion for exporting the LM-80 data:

1. Copy above table from PDF & paste into Microsoft Word.
2. Copy table out of Word & paste into Microsoft Excel (Match destination formatting)

DATA SET 6: 105°C; 1050 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)											
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	386.8	3.24	3015	3000	99.63	99.58	99.69	99.55	99.48	99.65	99.70	99.75	99.54	99.33	99.25	99.48
2	405.9	3.27	2995	3000	99.83	99.86	99.92	99.92	99.70	99.62	99.59	99.45	99.37	99.64	99.35	99.33
3	372.5	3.32	3036	3000	99.64	99.74	99.56	99.68	99.58	99.40	99.27	99.05	98.87	98.97	98.81	98.90
4	407.9	3.27	2978	3000	100.08	99.89	100.04	100.10	99.98	99.96	99.68	99.46	99.38	99.51	99.44	99.43
5	381.0	3.27	3010	3000	99.67	99.55	99.51	99.51	99.46	99.51	99.49	99.31	99.53	99.21	99.21	99.23
6	405.5	3.23	2978	3000	99.61	99.48	99.39	99.60	99.34	99.36	99.28	99.32	99.39	99.36	99.03	99.38
7	412.2	3.38	2974	3000	99.70	99.95	99.76	99.68	99.97	100.14	99.76	99.60	99.78	99.98	99.56	99.22
8	388.4	3.22	2983	3000	99.70	99.76	99.72	99.69	99.40	99.32	99.27	99.18	99.13	99.06	98.77	99.08
9	418.2	3.26	3009	3000	100.16	99.95	99.97	100.13	99.76	99.63	99.34	98.97	98.67	98.88	98.65	98.82
10	395.5	3.28	2951	3000	99.68	99.78	99.57	99.67	99.70	99.66	99.44	99.60	99.30	99.46	99.46	99.38
11	388.9	3.21	3002	3000	99.81	99.56	99.56	99.33	99.63	99.95	99.80	99.71	99.32	99.37	99.69	99.68
12	410.7	3.26	2975	3000	99.75	99.91	99.58	99.75	99.64	99.57	99.57	99.50	99.36	99.65	99.52	99.64
13	378.7	3.22	2988	3000	99.98	99.96	100.13	99.86	99.81	99.56	99.34	99.31	99.26	99.37	99.52	99.31
14	419.9	3.20	2988	3000	100.14	99.95	99.79	99.83	99.88	99.71	99.84	99.59	99.72	99.62	99.55	99.22
15	371.5	3.33	3015	3000	99.60	99.59	99.62	99.79	99.47	99.39	99.23	99.16	98.94	98.87	98.64	98.73
16	410.4	3.22	3007	3000	99.65	99.89	99.97	99.98	100.00	99.82	99.90	99.84	99.90	99.94	99.76	99.74
17	411.0	3.23	3007	3000	99.99	99.77	99.84	99.83	99.73	99.93	99.54	99.46	99.41	99.20	98.81	98.96
18	389.7	3.28	2995	3000	99.83	99.90	100.17	100.14	99.77	99.32	99.03	98.92	98.77	98.75	98.92	98.83
19	413.0	3.29	2981	3000	99.98	100.05	100.16	100.16	100.17	100.07	99.73	99.62	99.59	99.77	99.48	99.03
20	385.3	3.28	3028	3000	99.88	100.01	100.07	100.04	99.80	99.89	99.62	99.46	99.70	99.61	99.39	99.64
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean	397.6	3.26			99.82	99.81	99.80	99.81	99.71	99.67	99.52	99.41	99.35	99.38	99.24	99.25
Median	400.5	3.27			99.78	99.87	99.78	99.81	99.72	99.64	99.55	99.46	99.38	99.37	99.37	99.27
σ	15.5	0.04			0.18	0.17	0.24	0.23	0.22	0.25	0.24	0.26	0.34	0.35	0.36	0.31
Min.	371.5	3.20			99.60	99.48	99.39	99.33	99.34	99.32	99.03	98.92	98.67	98.75	98.64	98.73
Max.	419.9	3.38			100.16	100.05	100.17	100.16	100.17	100.14	99.90	99.84	99.90	99.98	99.76	99.74

Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')											
	CCx	CCy	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	0.4405	0.4127	3015	3000	0.0011	0.0014	0.0017	0.0017	0.0016	0.0019	0.0019	0.0020	0.0020	0.0020	0.0020	0.0020
2	0.4406	0.4106	2995	3000	0.0006	0.0009	0.0012	0.0013	0.0013	0.0016	0.0017	0.0017	0.0017	0.0017	0.0017	0.0018
3	0.4389	0.4121	3036	3000	0.0009	0.0012	0.0014	0.0016	0.0017	0.0020	0.0022	0.0022	0.0021	0.0021	0.0021	0.0021
4	0.4415	0.4103	2978	3000	0.0009	0.0013	0.0015	0.0016	0.0017	0.0019	0.0021	0.0021	0.0020	0.0021	0.0021	0.0022
5	0.4384	0.4077	3010	3000	0.0008	0.0010	0.0012	0.0014	0.0013	0.0016	0.0018	0.0018	0.0017	0.0018	0.0018	0.0018
6	0.4445	0.4164	2978	3000	0.0009	0.0012	0.0014	0.0014	0.0015	0.0019	0.0021	0.0021	0.0021	0.0021	0.0021	0.0022
7	0.4445	0.4158	2974	3000	0.0003	0.0010	0.0012	0.0013	0.0013	0.0017	0.0018	0.0019	0.0018	0.0018	0.0018	0.0019
8	0.4424	0.4126	2983	3000	0.0010	0.0013	0.0014	0.0016	0.0017	0.0020	0.0021	0.0021	0.0022	0.0022	0.0021	0.0021
9	0.4405	0.4119	3009	3000	0.0007	0.0010	0.0014	0.0015	0.0016	0.0019	0.0019	0.0019	0.0018	0.0018	0.0018	0.0019
10	0.4468	0.4176	2951	3000	0.0008	0.0011	0.0013	0.0014	0.0015	0.0018	0.0019	0.0020	0.0019	0.0020	0.0020	0.0019
11	0.4404	0.4108	3002	3000	0.0006	0.0012	0.0015	0.0016	0.0017	0.0021	0.0021	0.0022	0.0021	0.0022	0.0021	0.0022
12	0.4433	0.4136	2975	3000	0.0005	0.0009	0.0012	0.0012	0.0013	0.0017	0.0017	0.0018	0.0017	0.0018	0.0018	0.0020
13	0.4426	0.4137	2988	3000	0.0008	0.0011	0.0014	0.0015	0.0017	0.0020	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022
14	0.4430	0.4147	2988	3000	0.0009	0.0013	0.0015	0.0017	0.0018	0.0021	0.0023	0.0024	0.0023	0.0024	0.0024	0.0025
15	0.4391	0.4098	3015	3000	0.0008	0.0011	0.0014	0.0015	0.0017	0.0020	0.0022	0.0021	0.0020	0.0021	0.0022	0.0019
16	0.4405	0.4118	3007	3000	0.0008	0.0012	0.0015	0.0015	0.0017	0.0021	0.0023	0.0022	0.0022	0.0023	0.0023	0.0024
17	0.4408	0.4124	3007	3000	0.0008	0.0013	0.0015	0.0016	0.0017	0.0022	0.0022	0.0022	0.0021	0.0022	0.0022	0.0024
18	0.4425	0.4144	2995	3000	0.0005	0.0010	0.0014	0.0015	0.0016	0.0018	0.0019	0.0020	0.0019	0.0019	0.0019	0.0017
19	0.4424	0.4124	2981	3000	0.0008	0.0012	0.0015	0.0017	0.0018	0.0021	0.0022	0.0022	0.0022	0.0022	0.0022	0.0023
20	0.4383	0.4098	3028	3000	0.0008	0.0012	0.0014	0.0016	0.0016	0.0020	0.0019	0.0020	0.0020	0.0021	0.0021	0.0021
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean					0.0008	0.0011	0.0014	0.0015	0.0016	0.0019	0.0020	0.0021	0.0020	0.0020	0.0020	0.0021
Median					0.0008	0.0012	0.0014	0.0015	0.0016	0.0019	0.0021	0.0021	0.0020	0.0021	0.0021	0.0021
σ					0.0002	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.					0.0003	0.0009	0.0012	0.0012	0.0013	0.0016	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017
Max.					0.0011	0.0014	0.0017	0.0017	0.0018	0.0022	0.0023	0.0024	0.0023	0.0024	0.0024	0.0025

DATA SET 6: 105°C; 1050 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)			
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	6552	7056	7560	8064
1	386.8	3.24	3015	3000	99.42	99.47	99.36	99.27
2	405.9	3.27	2995	3000	99.40	99.11	98.75	98.49
3	372.5	3.32	3036	3000	98.66	98.47	98.45	98.31
4	407.9	3.27	2978	3000	98.97	98.96	98.96	98.58
5	381.0	3.27	3010	3000	99.08	98.81	98.44	98.36
6	405.5	3.23	2978	3000	98.74	99.14	98.92	99.10
7	412.2	3.38	2974	3000	99.04	98.55	98.70	98.82
8	388.4	3.22	2983	3000	98.81	98.93	98.85	99.11
9	418.2	3.26	3009	3000	98.94	98.92	98.66	98.34
10	395.5	3.28	2951	3000	99.29	99.36	99.14	98.89
11	388.9	3.21	3002	3000	99.45	99.31	99.56	99.73
12	410.7	3.26	2975	3000	99.42	99.15	98.69	98.60
13	378.7	3.22	2988	3000	99.13	99.22	98.92	99.19
14	419.9	3.20	2988	3000	99.55	99.70	99.42	99.32
15	371.5	3.33	3015	3000	98.69	98.62	98.55	98.31
16	410.4	3.22	3007	3000	99.58	99.65	99.19	99.12
17	411.0	3.23	3007	3000	98.76	98.31	98.77	98.66
18	389.7	3.28	2995	3000	98.68	98.68	98.43	98.43
19	413.0	3.29	2981	3000	99.01	98.61	98.48	98.48
20	385.3	3.28	3028	3000	99.58	99.48	99.56	99.50
n	20	20	20	20	20	20	20	20
Mean	397.6	3.26			99.11	99.02	98.89	98.83
Median	400.5	3.27			99.06	99.03	98.81	98.74
σ	15.5	0.04			0.33	0.40	0.37	0.44
Min.	371.5	3.20			98.66	98.31	98.43	98.31
Max.	419.9	3.38			99.58	99.70	99.56	99.73

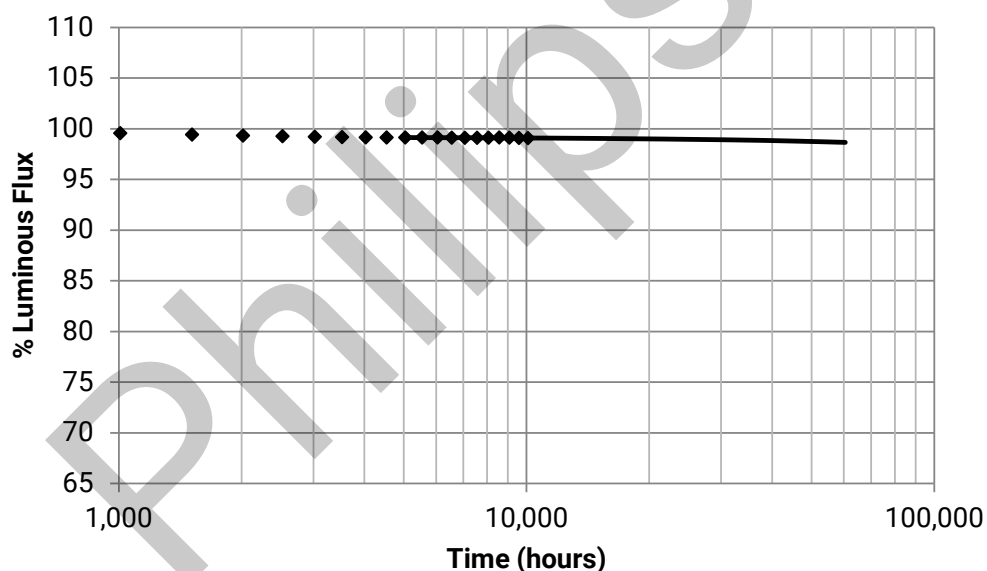
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')			
	CCx	CCy	Calc. CCT	ANSI Target	6552	7056	7560	8064
1	0.4405	0.4127	3015	3000	0.0021	0.0021	0.0020	0.0021
2	0.4406	0.4106	2995	3000	0.0018	0.0018	0.0016	0.0018
3	0.4389	0.4121	3036	3000	0.0021	0.0022	0.0020	0.0022
4	0.4415	0.4103	2978	3000	0.0021	0.0021	0.0019	0.0021
5	0.4384	0.4077	3010	3000	0.0019	0.0019	0.0018	0.0020
6	0.4445	0.4164	2978	3000	0.0021	0.0021	0.0020	0.0022
7	0.4445	0.4158	2974	3000	0.0018	0.0018	0.0017	0.0019
8	0.4424	0.4126	2983	3000	0.0022	0.0022	0.0020	0.0023
9	0.4405	0.4119	3009	3000	0.0018	0.0018	0.0017	0.0018
10	0.4468	0.4176	2951	3000	0.0020	0.0020	0.0019	0.0021
11	0.4404	0.4108	3002	3000	0.0022	0.0022	0.0020	0.0022
12	0.4433	0.4136	2975	3000	0.0019	0.0018	0.0016	0.0018
13	0.4426	0.4137	2988	3000	0.0023	0.0024	0.0022	0.0024
14	0.4430	0.4147	2988	3000	0.0024	0.0024	0.0023	0.0024
15	0.4391	0.4098	3015	3000	0.0023	0.0023	0.0021	0.0023
16	0.4405	0.4118	3007	3000	0.0024	0.0024	0.0022	0.0024
17	0.4408	0.4124	3007	3000	0.0023	0.0022	0.0021	0.0023
18	0.4425	0.4144	2995	3000	0.0021	0.0021	0.0019	0.0021
19	0.4424	0.4124	2981	3000	0.0023	0.0022	0.0021	0.0023
20	0.4383	0.4098	3028	3000	0.0021	0.0023	0.0020	0.0022
n	20	20	20	20	20	20	20	20
Mean					0.0021	0.0021	0.0020	0.0021
Median					0.0021	0.0022	0.0020	0.0022
σ					0.0002	0.0002	0.0002	0.0002
Min.					0.0018	0.0018	0.0016	0.0018
Max.					0.0024	0.0024	0.0023	0.0024

DATA SET 5: 85°C; 1500 mA

LED Package Series	XLamp XP-L White LEDs (Series: XPLAWT)
	This LM-80 report is applicable to the following order codes: XPLAWT-xx-xxxx-xxxxxxxxxx
Tested Model Number	XPLAWT-00-0000-000LU60E7
Drive Current [I_F]	1500 mA
Testing Initiation Date	December 28, 2014
Case Temperature [T_s]	85°C
Ambient Temperature [T_A]	85°C
Failures observed	None

Projection Generated By Cree's Internal TM-21 Calculator:

Test duration	10,080 hours
Test duration used for projection	t=5,040 to t=10,080
α	8.745E-08
β	9.918E-01
Reported Lifetimes	L90(10k) > 60,500 hours
	L80(10k) > 60,500 hours
	L70(10k) > 60,500 hours



LM-80 Data For The Official TM-21 Calculator*

Time (hours)	Lumen Maintenance
0	100.00%
1008	99.56%
1512	99.42%
2016	99.33%
2520	99.26%
3024	99.21%
3528	99.18%
4032	99.15%
4536	99.14%
5040	99.14%
5544	99.14%
6048	99.14%
6552	99.12%
7056	99.11%
7560	99.10%
8064	99.12%
8568	99.14%
9072	99.12%
9576	99.09%
10080	99.08%

* <http://www.energystar.gov/TM-21calculator>

Suggestion for exporting the LM-80 data:

1. Copy above table from PDF & paste into Microsoft Word.
2. Copy table out of Word & paste into Microsoft Excel (Match destination formatting)

Note: The data point t=168 hr is intentionally excluded from this table, since the ENERGY STAR tool has a 20 data point input limit. Per TM-21 methodology, the data point t=168 hr would be excluded, so the projection is unaffected.

DATA SET 5: 85°C; 1500 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)											
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	523.4	3.69	3172	3000	99.93	99.70	99.39	99.26	99.15	99.07	99.01	98.98	98.96	99.01	99.00	98.99
2	526.9	3.73	3204	3000	99.91	99.58	99.36	99.31	99.23	99.06	98.99	98.95	98.92	98.89	98.84	98.84
3	534.0	3.69	3180	3000	99.80	99.61	99.48	99.29	99.13	98.98	98.91	98.83	98.80	98.77	98.76	98.74
4	562.9	3.75	3181	3000	99.65	99.44	99.36	99.25	99.15	99.13	99.06	99.01	99.03	99.08	99.06	99.11
5	538.2	3.69	3186	3000	99.77	99.57	99.28	99.13	98.96	98.90	98.82	98.74	98.73	98.72	98.73	98.76
6	536.0	3.69	3164	3000	99.83	99.40	99.29	99.23	99.16	99.11	99.09	99.09	99.10	99.07	99.12	99.08
7	534.4	3.67	3193	3000	99.87	99.73	99.61	99.45	99.38	99.32	99.27	99.27	99.30	99.30	99.26	99.25
8	522.2	3.69	3160	3000	99.88	99.74	99.57	99.49	99.43	99.36	99.36	99.32	99.27	99.30	99.32	99.32
9	525.8	3.71	3208	3000	99.91	99.21	99.06	99.02	99.00	98.90	98.87	98.88	98.91	98.95	98.92	98.90
10	564.9	3.75	3177	3000	99.50	99.00	98.89	98.65	98.59	98.60	98.61	98.57	98.53	98.57	98.50	98.53
11	536.3	3.70	3189	3000	99.67	99.60	99.50	99.46	99.44	99.40	99.42	99.42	99.34	99.39	99.32	99.37
12	536.7	3.67	3186	3000	99.65	99.19	99.06	98.97	98.89	98.84	98.81	98.78	98.77	98.80	98.81	98.86
13	540.5	3.71	3202	3000	99.74	99.56	99.46	99.42	99.33	99.26	99.15	99.10	99.06	99.02	99.01	99.01
14	529.5	3.70	3204	3000	99.85	99.74	99.65	99.47	99.40	99.35	99.31	99.25	99.23	99.23	99.26	99.27
15	520.5	3.74	3156	3000	99.84	99.79	99.71	99.66	99.62	99.59	99.63	99.60	99.63	99.57	99.65	99.58
16	563.6	3.76	3219	3000	99.88	99.68	99.61	99.57	99.54	99.50	99.48	99.47	99.45	99.44	99.40	99.42
17	533.2	3.72	3179	3000	99.90	99.85	99.71	99.68	99.65	99.67	99.63	99.62	99.61	99.55	99.58	99.54
18	534.5	3.71	3173	3000	99.91	99.75	99.67	99.55	99.57	99.49	99.53	99.52	99.57	99.56	99.58	99.58
19	538.0	3.65	3181	3000	99.65	99.54	99.41	99.37	99.35	99.34	99.31	99.31	99.30	99.29	99.34	99.34
20	519.3	3.74	3153	3000	99.81	99.59	99.39	99.29	99.30	99.27	99.25	99.23	99.22	99.22	99.25	99.30
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean	536.0	3.71			99.80	99.56	99.42	99.33	99.26	99.21	99.18	99.15	99.14	99.14	99.14	99.14
Median	534.4	3.70			99.83	99.60	99.44	99.34	99.32	99.26	99.20	99.16	99.16	99.15	99.19	99.18
σ	13.5	0.03			0.12	0.22	0.23	0.25	0.27	0.28	0.29	0.30	0.31	0.30	0.31	0.30
Min.	519.3	3.65			99.50	99.00	98.89	98.65	98.59	98.60	98.61	98.57	98.53	98.57	98.50	98.53
Max.	564.9	3.76			99.93	99.85	99.71	99.68	99.65	99.67	99.63	99.62	99.63	99.57	99.65	99.58

Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')											
	CCx	CCy	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	0.4250	0.3984	3172	3000	0.0007	0.0012	0.0013	0.0013	0.0014	0.0014	0.0014	0.0015	0.0014	0.0014	0.0014	0.0014
2	0.4226	0.3966	3204	3000	0.0007	0.0010	0.0011	0.0012	0.0012	0.0013	0.0013	0.0013	0.0013	0.0012	0.0012	0.0013
3	0.4232	0.3950	3180	3000	0.0008	0.0012	0.0013	0.0014	0.0014	0.0014	0.0015	0.0015	0.0015	0.0015	0.0014	0.0015
4	0.4242	0.3976	3181	3000	0.0009	0.0012	0.0013	0.0014	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.0016	0.0016
5	0.4236	0.3968	3186	3000	0.0007	0.0012	0.0014	0.0015	0.0015	0.0015	0.0014	0.0015	0.0015	0.0014	0.0015	0.0016
6	0.4245	0.3963	3164	3000	0.0005	0.0011	0.0013	0.0014	0.0014	0.0014	0.0015	0.0015	0.0015	0.0015	0.0016	0.0016
7	0.4227	0.3954	3193	3000	0.0006	0.0012	0.0013	0.0014	0.0015	0.0015	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
8	0.4255	0.3979	3160	3000	0.0007	0.0011	0.0011	0.0013	0.0014	0.0015	0.0014	0.0014	0.0014	0.0014	0.0014	0.0013
9	0.4223	0.3964	3208	3000	0.0007	0.0011	0.0012	0.0013	0.0014	0.0015	0.0015	0.0015	0.0014	0.0014	0.0014	0.0014
10	0.4248	0.3984	3177	3000	0.0008	0.0011	0.0012	0.0013	0.0013	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
11	0.4235	0.3969	3189	3000	0.0006	0.0009	0.0010	0.0012	0.0013	0.0013	0.0014	0.0013	0.0013	0.0012	0.0012	0.0012
12	0.4237	0.3971	3186	3000	0.0007	0.0010	0.0011	0.0013	0.0014	0.0014	0.0014	0.0014	0.0015	0.0014	0.0014	0.0015
13	0.4213	0.3934	3202	3000	0.0005	0.0010	0.0010	0.0011	0.0012	0.0011	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011
14	0.4224	0.3962	3204	3000	0.0006	0.0011	0.0012	0.0013	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0013	0.0013
15	0.4249	0.3961	3156	3000	0.0005	0.0010	0.0011	0.0011	0.0012	0.0012	0.0013	0.0012	0.0012	0.0012	0.0012	0.0012
16	0.4225	0.3983	3219	3000	0.0007	0.0012	0.0013	0.0014	0.0014	0.0015	0.0015	0.0015	0.0015	0.0014	0.0014	0.0014
17	0.4238	0.3965	3179	3000	0.0004	0.0010	0.0011	0.0011	0.0012	0.0012	0.0013	0.0012	0.0012	0.0012	0.0012	0.0012
18	0.4227	0.3931	3173	3000	0.0003	0.0010	0.0012	0.0012	0.0012	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011
19	0.4236	0.3963	3181	3000	0.0006	0.0010	0.0012	0.0012	0.0013	0.0014	0.0014	0.0015	0.0014	0.0014	0.0014	0.0015
20	0.4252	0.3964	3153	3000	0.0005	0.0009	0.0013	0.0014	0.0014	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean					0.0006	0.0011	0.0012	0.0013	0.0013	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
Median					0.0006	0.0011	0.0012	0.0013	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
σ					0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Min.					0.0003	0.0009	0.0010	0.0011	0.0012	0.0011	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011
Max.					0.0009	0.0012	0.0014	0.0015	0.0015	0.0015	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016

DATA SET 5: 85°C; 1500 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)							
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080
1	523.4	3.69	3172	3000	99.08	98.87	99.10	99.01	99.00	99.02	98.95	98.94
2	526.9	3.73	3204	3000	98.83	98.85	98.69	98.79	98.77	98.90	98.80	98.86
3	534.0	3.69	3180	3000	98.76	98.68	98.84	98.80	98.87	98.81	98.78	98.78
4	562.9	3.75	3181	3000	99.15	99.06	99.09	99.08	99.01	99.16	99.06	99.15
5	538.2	3.69	3186	3000	98.78	98.69	98.75	98.82	98.80	98.80	98.79	98.73
6	536.0	3.69	3164	3000	98.96	99.11	98.93	99.13	99.08	99.08	98.88	98.88
7	534.4	3.67	3193	3000	99.20	99.20	99.20	99.12	99.26	99.20	99.41	99.32
8	522.2	3.69	3160	3000	99.33	99.23	99.14	99.17	99.24	99.29	99.24	99.30
9	525.8	3.71	3208	3000	98.89	98.79	98.73	98.72	98.81	98.81	98.88	98.64
10	564.9	3.75	3177	3000	98.47	98.49	98.56	98.50	98.70	98.58	98.37	98.45
11	536.3	3.70	3189	3000	99.37	99.28	99.24	99.48	99.37	99.24	99.27	99.29
12	536.7	3.67	3186	3000	98.80	98.84	98.82	98.77	98.80	98.85	98.87	98.84
13	540.5	3.71	3202	3000	98.99	98.89	99.02	98.97	99.11	98.84	98.98	99.14
14	529.5	3.70	3204	3000	99.27	99.49	99.22	99.34	99.02	99.32	99.12	99.09
15	520.5	3.74	3156	3000	99.61	99.59	99.53	99.72	99.70	99.78	99.70	99.76
16	563.6	3.76	3219	3000	99.32	99.46	99.38	99.33	99.44	99.45	99.40	99.49
17	533.2	3.72	3179	3000	99.59	99.60	99.58	99.61	99.67	99.47	99.38	99.30
18	534.5	3.71	3173	3000	99.50	99.49	99.50	99.55	99.54	99.49	99.49	99.43
19	538.0	3.65	3181	3000	99.29	99.30	99.41	99.23	99.26	99.24	99.45	99.24
20	519.3	3.74	3153	3000	99.18	99.20	99.37	99.18	99.29	99.08	99.04	98.87
n	20	20	20	20	20	20	20	20	20	20	20	20
Mean	536.0	3.71			99.12	99.11	99.10	99.12	99.14	99.12	99.09	99.08
Median	534.4	3.70			99.16	99.15	99.12	99.12	99.10	99.12	99.05	99.12
σ	13.5	0.03			0.30	0.33	0.30	0.33	0.30	0.30	0.32	0.32
Min.	519.3	3.65			98.47	98.49	98.56	98.50	98.70	98.58	98.37	98.45
Max.	564.9	3.76			99.61	99.60	99.58	99.72	99.70	99.78	99.70	99.76

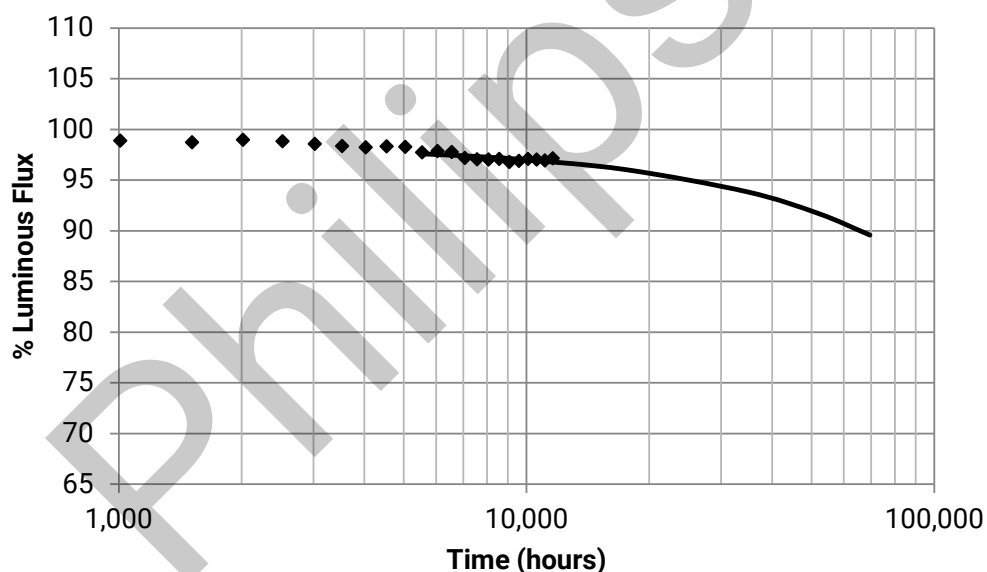
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')							
	CCx	CCy	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080
1	0.4250	0.3984	3172	3000	0.0014	0.0015	0.0013	0.0014	0.0014	0.0014	0.0014	0.0012
2	0.4226	0.3966	3204	3000	0.0012	0.0013	0.0011	0.0013	0.0011	0.0012	0.0011	0.0010
3	0.4232	0.3950	3180	3000	0.0013	0.0014	0.0012	0.0014	0.0014	0.0014	0.0013	0.0012
4	0.4242	0.3976	3181	3000	0.0015	0.0016	0.0015	0.0016	0.0016	0.0016	0.0015	0.0014
5	0.4236	0.3968	3186	3000	0.0014	0.0015	0.0012	0.0015	0.0014	0.0014	0.0014	0.0013
6	0.4245	0.3963	3164	3000	0.0013	0.0016	0.0013	0.0016	0.0015	0.0016	0.0015	0.0014
7	0.4227	0.3954	3193	3000	0.0014	0.0016	0.0014	0.0012	0.0015	0.0015	0.0014	0.0016
8	0.4255	0.3979	3160	3000	0.0010	0.0012	0.0012	0.0011	0.0013	0.0012	0.0012	0.0013
9	0.4223	0.3964	3208	3000	0.0013	0.0014	0.0013	0.0012	0.0014	0.0014	0.0013	0.0014
10	0.4248	0.3984	3177	3000	0.0014	0.0014	0.0013	0.0012	0.0014	0.0014	0.0014	0.0014
11	0.4235	0.3969	3189	3000	0.0011	0.0012	0.0012	0.0011	0.0012	0.0012	0.0011	0.0012
12	0.4237	0.3971	3186	3000	0.0014	0.0014	0.0014	0.0012	0.0014	0.0014	0.0012	0.0014
13	0.4213	0.3934	3202	3000	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010
14	0.4224	0.3962	3204	3000	0.0012	0.0012	0.0011	0.0010	0.0011	0.0011	0.0011	0.0012
15	0.4249	0.3961	3156	3000	0.0010	0.0010	0.0010	0.0009	0.0010	0.0010	0.0009	0.0011
16	0.4225	0.3983	3219	3000	0.0015	0.0015	0.0014	0.0012	0.0015	0.0014	0.0014	0.0015
17	0.4238	0.3965	3179	3000	0.0010	0.0011	0.0010	0.0010	0.0011	0.0010	0.0010	0.0011
18	0.4227	0.3931	3173	3000	0.0011	0.0011	0.0010	0.0010	0.0010	0.0010	0.0010	0.0011
19	0.4236	0.3963	3181	3000	0.0014	0.0013	0.0013	0.0010	0.0012	0.0012	0.0012	0.0013
20	0.4252	0.3964	3153	3000	0.0014	0.0015	0.0013	0.0012	0.0015	0.0015	0.0015	0.0017
n	20	20	20	20	20	20	20	20	20	20	20	20
Mean					0.0013	0.0013	0.0012	0.0012	0.0013	0.0013	0.0013	0.0013
Median					0.0013	0.0014	0.0013	0.0012	0.0014	0.0014	0.0013	0.0013
σ					0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.					0.0010	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010
Max.					0.0015	0.0016	0.0015	0.0016	0.0016	0.0016	0.0015	0.0017

DATA SET 3: 105°C; 1500 mA

LED Package Series	XLamp XP-L White LEDs (Series: XPLAWT)
	This LM-80 report is applicable to the following order codes: XPLAWT-xx-xxxx-xxxxxxxxxx
Tested Model Number	XPLAWT-00-0000-000LU60E7
Drive Current [I_F]	1500 mA
Testing Initiation Date	March 14, 2014
Case Temperature [T_s]	105°C
Ambient Temperature [T_A]	105°C
Failures observed	None

Projection Generated By Cree's Internal TM-21 Calculator:

Test duration	11,592 hours
Test duration used for projection	t=5,544 to t=11,592
α	1.338E-06
β	9.832E-01
Reported Lifetimes	L90(12k) = 66,100 hours
	L80(12k) > 69,600 hours
	L70(12k) > 69,600 hours



LM-80 Data For The Official TM-21 Calculator*

Time (hours)	Lumen Maintenance
0	100.00%
2520	98.83%
3024	98.57%
3528	98.36%
4032	98.23%
4536	98.33%
5040	98.28%
5544	97.73%
6048	97.87%
6552	97.77%
7056	97.18%
7560	97.05%
8064	97.03%
8568	97.09%
9072	96.79%
9576	96.90%
10080	97.09%
10584	97.03%
11088	96.94%
11592	97.15%

* <http://www.energystar.gov/TM-21calculator>

Suggestion for exporting the LM-80 data:

1. Copy above table from PDF & paste into Microsoft Word.
2. Copy table out of Word & paste into Microsoft Excel (Match destination formatting)

Note: Data points t=168 hr through t=2016 hr are intentionally excluded from this table since the ENERGY STAR tool has a 20 data point input limit. Per TM-21 methodology, data points t=168 hr to t=2016 hr would be excluded, so the projection is unaffected.

DATA SET 3: 105°C; 1500 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)											
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	585.8	3.26	3086	3000	99.78	98.83	98.48	98.69	98.93	98.17	98.19	98.02	97.75	97.97	97.46	97.75
2	570.1	3.21	3016	3000	99.64	99.72	98.36	98.59	98.87	98.48	97.65	97.67	97.87	98.09	97.17	97.04
3	574.7	3.17	2967	3000	100.78	99.96	99.12	99.40	99.50	99.56	98.94	98.73	98.83	99.03	98.70	98.76
4	600.4	3.23	3094	3000	98.31	98.28	98.05	98.16	98.11	97.64	97.52	97.32	97.08	96.89	96.69	96.70
5	610.6	3.28	3102	3000	99.89	98.55	98.44	98.84	98.25	97.96	97.85	97.67	97.44	98.46	97.75	98.06
6	619.1	3.23	3050	3000	99.00	99.39	98.35	99.36	98.31	99.49	98.37	98.06	98.64	99.20	98.68	97.52
7	557.9	3.23	3139	3000	99.34	98.80	98.40	98.50	98.20	98.01	97.79	97.90	97.82	97.95	97.30	97.37
8	610.8	3.25	3094	3000	98.33	98.17	98.34	98.82	97.84	97.81	97.91	98.29	97.80	98.14	97.19	97.29
9	609.3	3.25	3157	3000	99.88	98.64	98.86	99.64	99.11	99.51	99.14	98.45	98.85	99.16	98.84	98.90
10	579.8	3.23	3062	3000	99.44	99.44	98.50	99.16	99.56	98.29	98.54	98.37	98.51	98.95	97.64	97.70
11	594.8	3.19	3101	3000	99.41	98.83	99.07	99.93	99.58	99.18	98.65	98.55	98.97	98.94	98.43	98.87
12	612.5	3.24	3107	3000	98.90	98.64	98.58	98.82	98.79	98.59	98.52	98.62	98.42	98.24	97.38	97.94
13	599.7	3.27	3067	3000	99.97	98.82	98.99	99.53	99.93	99.65	99.06	99.34	99.39	99.63	98.67	98.86
14	601.5	3.19	2978	3000	99.66	99.54	99.14	99.65	99.08	99.55	98.57	98.35	98.63	98.88	97.87	98.48
15	581.7	3.23	2970	3000	99.64	98.75	98.36	99.32	98.62	99.15	97.91	98.03	98.01	98.46	97.33	98.13
16	608.5	3.22	3152	3000	98.61	98.76	98.55	99.24	98.78	99.01	98.13	98.43	98.52	97.53	97.67	97.34
17	606.9	3.27	3154	3000	100.35	100.03	99.10	99.88	99.68	99.66	99.12	99.22	99.65	98.95	98.13	98.86
18	588.1	3.18	3039	3000	98.95	98.64	99.04	98.83	99.24	98.74	98.98	98.92	99.27	98.12	98.19	98.51
19	580.6	3.18	2957	3000	98.79	98.72	99.37	98.66	99.34	98.66	98.81	98.94	98.69	97.70	97.49	97.59
20	559.5	3.20	2985	3000	98.60	97.95	98.81	98.31	97.99	97.52	98.07	97.21	97.28	96.87	96.51	96.60
21	599.2	3.20	3016	3000	99.20	98.91	99.26	99.32	99.35	98.55	99.25	98.73	99.10	98.23	98.21	98.14
22	619.8	3.23	3040	3000	98.82	98.53	98.81	99.07	98.60	98.14	98.71	97.96	98.90	99.30	98.85	98.47
23	608.3	3.24	2981	3000	98.87	98.55	98.93	98.07	98.57	97.64	98.04	97.69	97.55	97.00	96.81	97.19
24	575.7	3.22	3081	3000	98.93	98.26	98.09	97.69	97.67	97.18	96.77	96.95	96.93	96.87	96.40	96.07
25	601.8	3.23	2999	3000	99.50	99.61	99.32	98.91	98.94	98.20	98.54	98.38	98.31	98.44	98.02	98.48
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean	594.3	3.22			99.30	98.89	98.73	98.98	98.83	98.57	98.36	98.23	98.33	98.28	97.73	97.87
Median	599.7	3.23			99.34	98.76	98.81	98.91	98.87	98.55	98.52	98.35	98.51	98.24	97.67	97.94
σ	17.8	0.03			0.62	0.56	0.39	0.57	0.61	0.75	0.60	0.61	0.74	0.80	0.73	0.79
Min.	557.9	3.17			98.31	97.95	98.05	97.69	97.67	97.18	96.77	96.95	96.93	96.87	96.40	96.07
Max.	619.8	3.28			100.78	100.03	99.37	99.93	99.93	99.66	99.25	99.34	99.65	99.63	98.85	98.90

Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')											
	CCx	CCy	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	0.4349	0.4097	3086	3000	0.0007	0.0011	0.0012	0.0011	0.0011	0.0012	0.0012	0.0012	0.0011	0.0013	0.0013	0.0012
2	0.4404	0.4126	3016	3000	0.0007	0.0010	0.0013	0.0011	0.0012	0.0012	0.0010	0.0011	0.0013	0.0012	0.0012	0.0012
3	0.4458	0.4174	2967	3000	0.0005	0.0011	0.0012	0.0012	0.0012	0.0013	0.0010	0.0012	0.0013	0.0012	0.0012	0.0012
4	0.4332	0.4071	3094	3000	0.0007	0.0011	0.0012	0.0011	0.0011	0.0011	0.0010	0.0011	0.0011	0.0011	0.0012	0.0010
5	0.4328	0.4073	3102	3000	0.0006	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0012	0.0012
6	0.4381	0.4121	3050	3000	0.0007	0.0010	0.0010	0.0011	0.0009	0.0009	0.0010	0.0011	0.0012	0.0011	0.0012	0.0012
7	0.4298	0.4051	3139	3000	0.0008	0.0011	0.0012	0.0011	0.0009	0.0011	0.0010	0.0011	0.0011	0.0011	0.0011	0.0012
8	0.4344	0.4096	3094	3000	0.0009	0.0011	0.0013	0.0012	0.0010	0.0012	0.0012	0.0013	0.0013	0.0014	0.0012	0.0013
9	0.4264	0.3997	3157	3000	0.0007	0.0010	0.0011	0.0011	0.0010	0.0011	0.0011	0.0010	0.0012	0.0012	0.0012	0.0012
10	0.4370	0.4113	3062	3000	0.0006	0.0009	0.0010	0.0010	0.0010	0.0011	0.0009	0.0010	0.0011	0.0011	0.0011	0.0011
11	0.4324	0.4062	3101	3000	0.0006	0.0010	0.0010	0.0009	0.0009	0.0010	0.0009	0.0010	0.0010	0.0010	0.0010	0.0011
12	0.4332	0.4088	3107	3000	0.0007	0.0012	0.0012	0.0012	0.0011	0.0011	0.0012	0.0011	0.0012	0.0012	0.0012	0.0013
13	0.4350	0.4075	3067	3000	0.0008	0.0009	0.0010	0.0010	0.0011	0.0011	0.0010	0.0010	0.0012	0.0011	0.0012	0.0013
14	0.4439	0.4150	2978	3000	0.0007	0.0011	0.0012	0.0011	0.0012	0.0011	0.0011	0.0011	0.0012	0.0012	0.0013	0.0012
15	0.4443	0.4149	2970	3000	0.0007	0.0010	0.0012	0.0010	0.0011	0.0012	0.0011	0.0012	0.0012	0.0014	0.0014	0.0013
16	0.4306	0.4086	3152	3000	0.0009	0.0012	0.0013	0.0013	0.0014	0.0014	0.0014	0.0014	0.0015	0.0014	0.0015	0.0013
17	0.4276	0.4019	3154	3000	0.0006	0.0010	0.0010	0.0010	0.0010	0.0011	0.0011	0.0012	0.0011	0.0012	0.0012	0.0012
18	0.4396	0.4140	3039	3000	0.0005	0.0009	0.0009	0.0011	0.0009	0.0010	0.0010	0.0008	0.0010	0.0012	0.0011	0.0012
19	0.4467	0.4181	2957	3000	0.0005	0.0009	0.0009	0.0010	0.0010	0.0010	0.0011	0.0011	0.0010	0.0012	0.0011	0.0012
20	0.4446	0.4174	2985	3000	0.0005	0.0011	0.0012	0.0011	0.0012	0.0011	0.0011	0.0011	0.0011	0.0013	0.0012	0.0012
21	0.4417	0.4155	3016	3000	0.0006	0.0010	0.0012	0.0011	0.0011	0.0010	0.0011	0.0012	0.0012	0.0013	0.0012	0.0013
22	0.4379	0.4104	3040	3000	0.0005	0.0010	0.0009	0.0009	0.0010	0.0010	0.0010	0.0011	0.0011	0.0011	0.0012	0.0012
23	0.4432	0.4142	2981	3000	0.0005	0.0009	0.0009	0.0009	0.0010	0.0009	0.0010	0.0010	0.0009	0.0012	0.0011	0.0012
24	0.4352	0.4099	3081	3000	0.0009	0.0012	0.0011	0.0012	0.0011	0.0011	0.0009	0.0010	0.0010	0.0010	0.0011	0.0012
25	0.4419	0.4136	2999	3000	0.0007	0.0009	0.0011	0.0010	0.0012	0.0012	0.0011	0.0012	0.0011	0.0010	0.0012	0.0012
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean					0.0007	0.0010	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0012	0.0012	0.0012
Median					0.0007	0.0010	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0012	0.0012	0.0012
σ					0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.					0.0005	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0008	0.0009	0.0010	0.0010	0.0010
Max.					0.0009	0.0012	0.0013	0.0013	0.0014	0.0014	0.0014	0.0014	0.0015	0.0014	0.0015	0.0013

DATA SET 3: 105°C; 1500 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)										
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080	10584	11088	11592
1	585.8	3.26	3086	3000	96.96	96.22	95.98	96.13	95.87	96.28	96.12	95.97	95.83	95.86	95.85
2	570.1	3.21	3016	3000	96.72	95.95	95.34	94.84	95.67	94.65	94.77	95.81	96.23	95.55	96.28
3	574.7	3.17	2967	3000	98.69	97.34	97.56	96.93	97.11	96.84	97.26	97.53	97.39	97.55	97.70
4	600.4	3.23	3094	3000	96.56	96.35	96.24	95.77	95.54	95.07	94.70	95.21	95.44	95.39	94.91
5	610.6	3.28	3102	3000	98.25	96.45	96.15	96.35	96.77	95.99	96.68	96.58	96.49	96.10	96.29
6	619.1	3.23	3050	3000	97.76	97.90	97.27	96.93	98.24	97.43	97.40	97.81	97.70	97.22	98.16
7	557.9	3.23	3139	3000	97.73	97.12	96.64	96.42	97.78	96.14	96.56	97.12	96.75	96.37	95.34
8	610.8	3.25	3094	3000	97.82	96.66	96.68	96.46	96.20	96.12	96.53	96.63	96.44	96.33	96.21
9	609.3	3.25	3157	3000	99.25	98.60	98.22	98.06	99.25	98.24	99.05	99.25	98.54	98.45	97.95
10	579.8	3.23	3062	3000	97.24	96.43	96.40	97.55	96.85	96.27	96.90	97.40	97.21	96.99	97.78
11	594.8	3.19	3101	3000	98.97	97.87	97.82	98.59	98.08	97.66	97.63	98.26	98.09	97.79	98.60
12	612.5	3.24	3107	3000	98.13	97.17	96.81	96.67	97.00	96.64	96.64	96.95	97.44	96.99	97.71
13	599.7	3.27	3067	3000	99.01	98.24	98.07	98.73	98.34	98.05	98.39	98.28	98.54	98.44	98.39
14	601.5	3.19	2978	3000	98.90	98.33	98.96	98.77	97.97	97.27	97.75	97.88	98.03	97.58	97.64
15	581.7	3.23	2970	3000	98.37	98.14	98.63	97.50	97.04	97.31	97.22	97.01	97.40	97.38	97.43
16	608.5	3.22	3152	3000	96.81	96.75	96.85	96.06	96.15	95.93	96.05	96.16	95.65	95.70	96.43
17	606.9	3.27	3154	3000	99.49	99.40	99.06	97.96	98.47	99.12	98.71	98.61	98.67	98.62	99.18
18	588.1	3.18	3039	3000	98.26	97.78	98.10	97.70	98.18	98.68	97.85	98.03	97.99	98.01	98.49
19	580.6	3.18	2957	3000	97.37	97.08	96.81	97.97	97.89	98.24	98.01	97.58	97.14	97.95	98.55
20	559.5	3.20	2985	3000	96.28	95.91	95.68	96.09	95.87	94.98	95.79	95.79	96.05	96.55	96.54
21	599.2	3.20	3016	3000	97.65	97.15	97.20	97.98	97.06	97.36	97.02	97.89	97.52	97.31	97.70
22	619.8	3.23	3040	3000	97.86	98.71	97.16	97.82	97.85	97.99	97.90	97.88	97.09	97.36	97.04
23	608.3	3.24	2981	3000	96.72	96.20	96.94	95.62	96.56	96.53	96.25	95.87	95.88	95.80	95.83
24	575.7	3.22	3081	3000	95.72	95.27	95.14	95.02	94.53	94.41	94.71	94.86	94.89	94.95	95.00
25	601.8	3.23	2999	3000	97.75	96.58	96.54	97.87	96.93	96.46	96.56	96.96	97.27	97.25	97.67
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean	594.3	3.22			97.77	97.18	97.05	97.03	97.09	96.79	96.90	97.09	97.03	96.94	97.15
Median	599.7	3.23			97.76	97.12	96.85	96.93	97.04	96.64	96.90	97.12	97.21	97.22	97.64
σ	17.8	0.03			0.99	1.03	1.06	1.13	1.12	1.25	1.17	1.11	1.03	1.03	1.20
Min.	557.9	3.17			95.72	95.27	95.14	94.84	94.53	94.41	94.70	94.86	94.89	94.95	94.91
Max.	619.8	3.28			99.49	99.40	99.06	98.77	99.25	99.12	99.05	99.25	98.67	98.62	99.18

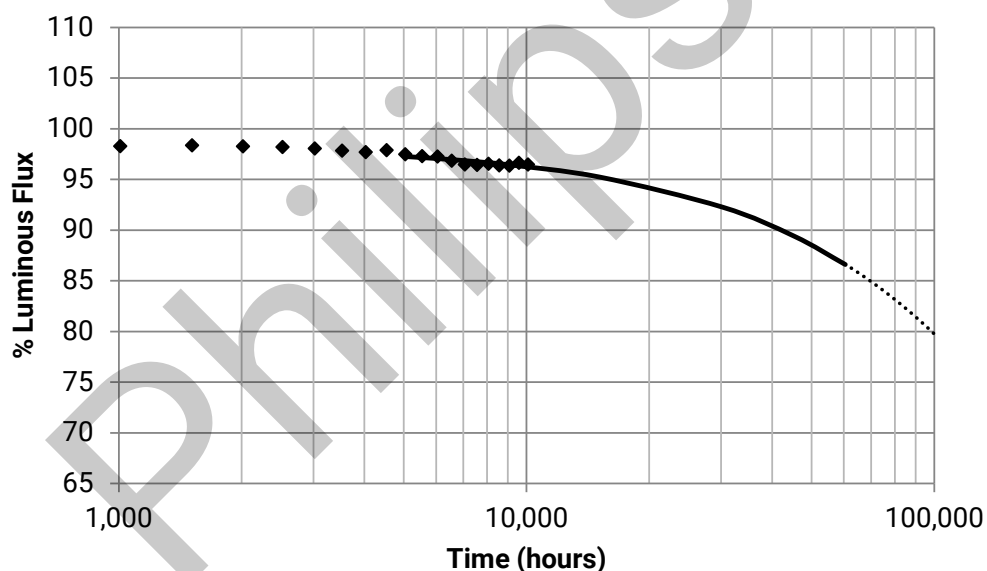
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')										
	CCx	CCy	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080	10584	11088	11592
1	0.4349	0.4097	3086	3000	0.0012	0.0011	0.0012	0.0014	0.0014	0.0015	0.0016	0.0016	0.0015	0.0016	0.0017
2	0.4404	0.4126	3016	3000	0.0012	0.0012	0.0013	0.0013	0.0014	0.0014	0.0013	0.0016	0.0018	0.0019	0.0020
3	0.4458	0.4174	2967	3000	0.0013	0.0013	0.0014	0.0015	0.0015	0.0014	0.0014	0.0016	0.0015	0.0019	0.0020
4	0.4332	0.4071	3094	3000	0.0015	0.0010	0.0013	0.0014	0.0014	0.0014	0.0014	0.0017	0.0016	0.0023	0.0024
5	0.4328	0.4073	3102	3000	0.0012	0.0013	0.0013	0.0014	0.0014	0.0014	0.0014	0.0015	0.0015	0.0018	0.0020
6	0.4381	0.4121	3050	3000	0.0012	0.0013	0.0013	0.0015	0.0015	0.0014	0.0017	0.0019	0.0018	0.0020	0.0021
7	0.4298	0.4051	3139	3000	0.0012	0.0011	0.0011	0.0013	0.0012	0.0012	0.0014	0.0015	0.0014	0.0015	0.0018
8	0.4344	0.4096	3094	3000	0.0013	0.0013	0.0013	0.0014	0.0015	0.0014	0.0016	0.0016	0.0017	0.0018	0.0019
9	0.4264	0.3997	3157	3000	0.0012	0.0012	0.0013	0.0014	0.0014	0.0013	0.0016	0.0017	0.0016	0.0017	0.0019
10	0.4370	0.4113	3062	3000	0.0012	0.0012	0.0011	0.0013	0.0014	0.0013	0.0014	0.0016	0.0017	0.0017	0.0019
11	0.4324	0.4062	3101	3000	0.0011	0.0012	0.0011	0.0012	0.0014	0.0012	0.0014	0.0016	0.0017	0.0018	0.0019
12	0.4332	0.4088	3107	3000	0.0011	0.0012	0.0012	0.0012	0.0013	0.0012	0.0013	0.0014	0.0015	0.0016	0.0016
13	0.4350	0.4075	3067	3000	0.0012	0.0012	0.0012	0.0013	0.0014	0.0013	0.0014	0.0015	0.0015	0.0016	0.0017
14	0.4439	0.4150	2978	3000	0.0013	0.0014	0.0014	0.0013	0.0016	0.0016	0.0016	0.0018	0.0016	0.0020	0.0022
15	0.4443	0.4149	2970	3000	0.0013	0.0014	0.0014	0.0014	0.0018	0.0019	0.0019	0.0020	0.0018	0.0023	0.0026
16	0.4306	0.4086	3152	3000	0.0014	0.0014	0.0014	0.0013	0.0014	0.0015	0.0014	0.0016	0.0014	0.0019	0.0021
17	0.4276	0.4019	3154	3000	0.0013	0.0013	0.0012	0.0012	0.0014	0.0016	0.0016	0.0016	0.0015	0.0019	0.0022
18	0.4396	0.4140	3039	3000	0.0012	0.0012	0.0013	0.0013	0.0014	0.0015	0.0015	0.0016	0.0016	0.0017	0.0018
19	0.4467	0.4181	2957	3000	0.0012	0.0012	0.0013	0.0014	0.0014	0.0015	0.0016	0.0016	0.0015	0.0017	0.0018
20	0.4446	0.4174	2985	3000	0.0013	0.0012	0.0013	0.0014	0.0014	0.0015	0.0015	0.0015	0.0016	0.0017	0.0018
21	0.4417	0.4155	3016	3000	0.0012	0.0012	0.0014	0.0015	0.0016	0.0017	0.0018	0.0018	0.0018	0.0019	0.0020
22	0.4379	0.4104	3040	3000	0.0012	0.0012	0.0014	0.0014	0.0016	0.0016	0.0017	0.0017	0.0018	0.0020	0.0020
23	0.4432	0.4142	2981	3000	0.0012	0.0011	0.0014	0.0013	0.0014	0.0015	0.0016	0.0017	0.0016	0.0018	0.0019
24	0.4352	0.4099	3081	3000	0.0012	0.0012	0.0013	0.0014	0.0016	0.0017	0.0018	0.0019	0.0019	0.0021	0.0022
25	0.4419	0.4136	2999	3000	0.0012	0.0012	0.0013	0.0014	0.0014	0.0015	0.0016	0.0017	0.0017	0.0018	0.0020
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean					0.0012	0.0012	0.0013	0.0014	0.0014	0.0015	0.0015	0.0017	0.0016	0.0018	0.0020
Median					0.0012	0.0012	0.0013	0.0014	0.0014	0.0015	0.0016	0.0016	0.0016	0.0018	0.0020
σ					0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002	0.0002
Min.					0.0011	0.0010	0.0011	0.0012	0.0012	0.0012	0.0013	0.0014	0.0014	0.0015	0.0016
Max.					0.0015	0.0014	0.0014	0.0015	0.0018	0.0019	0.0019	0.0020	0.0019	0.0023	0.0026

DATA SET 4: 85°C; 2100 mA

LED Package Series	XLamp XP-L White LEDs (Series: XPLAWT)
	This LM-80 report is applicable to the following order codes: XPLAWT-xx-xxxx-xxxxxxxxxx
Tested Model Number	XPLAWT-00-0000-000LU60E7
Drive Current [I_F]	2100 mA
Testing Initiation Date	March 14, 2014
Case Temperature [T_s]	85°C
Ambient Temperature [T_A]	85°C
Failures observed	None

Projection Generated By Cree's Internal TM-21 Calculator:

Test duration	10,080 hours
Test duration used for projection	t=5,040 to t=10,080
α	2.090E-06
β	9.828E-01
Reported Lifetimes	L90(10k) = 42,100 hours
	L80(10k) > 60,500 hours
	L70(10k) > 60,500 hours



LM-80 Data For The Official TM-21 Calculator*

Time (hours)	Lumen Maintenance
0	100.00%
1008	98.28%
1512	98.36%
2016	98.26%
2520	98.20%
3024	98.05%
3528	97.84%
4032	97.69%
4536	97.89%
5040	97.48%
5544	97.30%
6048	97.26%
6552	96.85%
7056	96.48%
7560	96.43%
8064	96.55%
8568	96.38%
9072	96.36%
9576	96.64%
10080	96.47%

* <http://www.energystar.gov/TM-21calculator>

Suggestion for exporting the LM-80 data:

1. Copy above table from PDF & paste into Microsoft Word.
2. Copy table out of Word & paste into Microsoft Excel (Match destination formatting)

Note: The data point t=168 hr is intentionally excluded from this table, since the ENERGY STAR tool has a 20 data point input limit. Per TM-21 methodology, the data point t=168 hr would be excluded, so the projection is unaffected.

DATA SET 4: 85°C; 2100 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)											
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	760	3.32	3035	3000	99.16	97.65	97.30	97.30	97.34	97.01	97.03	97.50	96.91	97.10	96.89	96.86
2	766	3.38	2964	3000	99.66	98.41	98.76	98.23	98.82	98.18	98.09	98.46	97.92	98.23	97.64	98.00
3	802	3.39	3079	3000	98.12	97.95	98.59	98.93	98.64	98.22	97.31	97.87	97.00	96.63	96.54	96.88
4	727	3.37	3056	3000	98.33	97.66	97.64	97.75	97.60	96.98	96.74	96.87	96.86	96.65	96.39	96.71
5	820	3.40	3150	3000	98.11	97.96	98.00	98.24	97.97	97.39	97.55	97.71	97.75	97.50	96.82	97.38
6	819	3.36	3074	3000	99.73	98.54	98.40	97.91	98.38	98.48	97.84	98.56	98.19	98.43	97.50	97.84
7	761	3.34	3153	3000	99.25	97.75	97.33	97.63	97.56	97.88	97.58	96.97	96.95	97.26	96.87	97.10
8	778	3.39	3062	3000	99.44	98.78	98.89	98.73	98.66	98.75	98.17	98.48	98.14	98.05	97.35	97.49
9	802	3.39	3135	3000	100.31	98.69	98.83	99.27	98.72	98.73	98.41	98.11	98.22	98.47	97.80	98.14
10	777	3.31	3035	3000	99.17	98.39	98.00	98.60	98.29	98.61	97.90	97.47	98.39	97.62	96.67	96.66
11	780	3.33	3057	3000	99.58	98.87	98.61	99.03	98.89	99.19	98.19	98.33	98.77	98.75	97.91	98.08
12	788	3.37	3135	3000	99.18	98.85	98.56	99.05	98.89	98.70	98.14	97.88	98.23	97.27	96.92	97.24
13	796	3.42	3133	3000	99.94	98.93	98.51	99.12	98.96	99.02	98.39	98.40	98.51	98.40	97.61	98.02
14	799	3.30	3093	3000	98.39	98.25	98.47	97.75	97.94	98.03	97.69	97.58	97.99	97.64	97.97	96.82
15	787	3.31	3136	3000	98.60	98.45	99.09	98.12	98.51	98.43	97.88	97.58	98.38	97.73	98.21	97.43
16	807	3.36	3132	3000	98.30	98.20	98.69	98.40	98.59	97.76	98.34	97.94	97.36	96.76	96.77	97.09
17	835	3.43	3089	3000	98.31	98.15	98.54	97.57	98.04	97.69	98.39	97.56	98.60	97.35	98.15	97.55
18	762	3.27	3023	3000	98.20	97.76	97.79	98.52	97.33	97.69	97.58	97.02	98.02	97.15	97.96	97.34
19	785	3.33	3066	3000	98.70	98.75	98.93	98.62	98.71	97.89	98.36	97.69	98.14	97.05	97.25	97.00
20	800	3.40	3065	3000	98.19	98.09	98.01	97.57	97.43	97.50	97.61	97.27	97.51	96.86	97.16	96.77
21	813	3.30	3086	3000	99.11	98.64	99.12	98.69	98.20	98.71	98.22	98.14	98.83	98.03	98.44	97.70
22	755	3.28	3060	3000	98.19	97.95	98.03	97.72	97.53	97.76	97.39	97.04	97.40	96.99	97.31	96.96
23	778	3.32	3014	3000	98.90	98.59	98.74	98.26	98.39	97.65	98.10	97.41	98.08	97.17	96.44	96.57
24	804	3.36	3005	3000	98.64	98.15	98.40	97.88	98.08	97.74	97.91	97.47	97.96	97.04	97.42	97.45
25	779	3.35	3061	3000	98.00	97.65	97.80	97.77	97.47	97.28	97.15	97.04	97.06	96.91	96.40	96.44
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean	787	3.35			98.86	98.28	98.36	98.27	98.20	98.05	97.84	97.69	97.89	97.48	97.30	97.26
Median	787	3.36			98.70	98.25	98.51	98.24	98.29	97.89	97.90	97.58	98.02	97.27	97.31	97.24
σ	24	0.04			0.66	0.42	0.52	0.57	0.55	0.61	0.46	0.51	0.60	0.62	0.61	0.50
Min.	727	3.27			98.00	97.65	97.30	97.30	97.33	96.98	96.74	96.87	96.86	96.63	96.39	96.44
Max.	835	3.43			100.31	98.93	99.12	99.27	98.96	99.19	98.41	98.56	98.83	98.75	98.44	98.14

Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')											
	CCx	CCy	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	0.4385	0.4110	3035	3000	0.0005	0.0010	0.0011	0.0010	0.0010	0.0010	0.0010	0.0011	0.0013	0.0011	0.0012	0.0012
2	0.4460	0.4176	2964	3000	0.0006	0.0009	0.0011	0.0011	0.0010	0.0012	0.0012	0.0013	0.0013	0.0013	0.0014	0.0013
3	0.4360	0.4112	3079	3000	0.0006	0.0011	0.0012	0.0013	0.0012	0.0014	0.0014	0.0013	0.0014	0.0012	0.0013	0.0013
4	0.4376	0.4118	3056	3000	0.0007	0.0012	0.0012	0.0014	0.0014	0.0015	0.0015	0.0014	0.0014	0.0014	0.0014	0.0014
5	0.4293	0.4053	3150	3000	0.0004	0.0009	0.0011	0.0010	0.0011	0.0011	0.0011	0.0011	0.0012	0.0013	0.0012	0.0013
6	0.4361	0.4108	3074	3000	0.0006	0.0011	0.0013	0.0013	0.0014	0.0013	0.0012	0.0013	0.0013	0.0012	0.0012	0.0014
7	0.4286	0.4042	3153	3000	0.0006	0.0014	0.0014	0.0014	0.0014	0.0014	0.0013	0.0014	0.0015	0.0012	0.0013	0.0013
8	0.4372	0.4117	3062	3000	0.0008	0.0015	0.0015	0.0014	0.0015	0.0015	0.0014	0.0015	0.0015	0.0014	0.0014	0.0015
9	0.4291	0.4029	3135	3000	0.0007	0.0012	0.0013	0.0013	0.0014	0.0014	0.0013	0.0014	0.0014	0.0013	0.0013	0.0013
10	0.4396	0.4134	3035	3000	0.0007	0.0010	0.0012	0.0011	0.0012	0.0010	0.0010	0.0011	0.0010	0.0011	0.0011	0.0012
11	0.4367	0.4101	3057	3000	0.0007	0.0010	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0011	0.0012	0.0011	0.0013
12	0.4322	0.4100	3135	3000	0.0008	0.0012	0.0014	0.0013	0.0014	0.0014	0.0014	0.0015	0.0014	0.0014	0.0014	0.0014
13	0.4271	0.3983	3133	3000	0.0007	0.0011	0.0013	0.0012	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
14	0.4347	0.4102	3093	3000	0.0007	0.0010	0.0010	0.0013	0.0012	0.0011	0.0012	0.0011	0.0012	0.0012	0.0012	0.0011
15	0.4310	0.4075	3136	3000	0.0008	0.0011	0.0011	0.0013	0.0012	0.0012	0.0013	0.0013	0.0012	0.0013	0.0011	0.0011
16	0.4326	0.4106	3132	3000	0.0008	0.0013	0.0013	0.0014	0.0014	0.0013	0.0014	0.0014	0.0014	0.0014	0.0013	0.0013
17	0.4346	0.4094	3089	3000	0.0006	0.0010	0.0010	0.0013	0.0012	0.0012	0.0012	0.0013	0.0013	0.0013	0.0013	0.0013
18	0.4417	0.4162	3023	3000	0.0007	0.0011	0.0010	0.0012	0.0013	0.0010	0.0012	0.0011	0.0012	0.0012	0.0012	0.0012
19	0.4381	0.4142	3066	3000	0.0007	0.0011	0.0012	0.0013	0.0013	0.0012	0.0012	0.0013	0.0013	0.0012	0.0012	0.0012
20	0.4358	0.4090	3065	3000	0.0007	0.0010	0.0012	0.0013	0.0013	0.0012	0.0012	0.0012	0.0013	0.0013	0.0013	0.0013
21	0.4358	0.4117	3086	3000	0.0006	0.0011	0.0011	0.0013	0.0012	0.0010	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
22	0.4376	0.4124	3060	3000	0.0008	0.0011	0.0011	0.0012	0.0013	0.0011	0.0013	0.0013	0.0013	0.0012	0.0011	0.0013
23	0.4423	0.4165	3014	3000	0.0008	0.0012	0.0013	0.0013	0.0013	0.0012	0.0012	0.0013	0.0014	0.0012	0.0012	0.0012
24	0.4418	0.4142	3005	3000	0.0006	0.0010	0.0011	0.0012	0.0013	0.0011	0.0012	0.0013	0.0013	0.0013	0.0012	0.0012
25	0.4365	0.4101	3061	3000	0.0005	0.0009	0.0010	0.0010	0.0009	0.0011	0.0011	0.0010	0.0013	0.0012	0.0013	0.0014
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean					0.0007	0.0011	0.0012	0.0012	0.0013	0.0012	0.0012	0.0013	0.0013	0.0013	0.0013	0.0013
Median					0.0007	0.0011	0.0012	0.0013	0.0013	0.0012	0.0012	0.0013	0.0013	0.0012	0.0012	0.0013
σ					0.0001	0.0002	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Min.					0.0004	0.0009	0.0010	0.0010	0.0009	0.0010	0.0010	0.0010	0.0010	0.0011	0.0011	0.0011
Max.					0.0008	0.0015	0.0015	0.0014	0.0015	0.0015	0.0015	0.0015	0.0015	0.0014	0.0014	0.0015

DATA SET 4: 85°C; 2100 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)							
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080
1	760	3.32	3035	3000	96.92	95.99	96.02	95.84	95.75	96.05	97.07	96.51
2	766	3.38	2964	3000	98.24	97.25	96.99	96.65	96.70	97.00	97.54	96.69
3	802	3.39	3079	3000	96.31	95.76	95.75	95.70	95.53	95.33	95.55	95.56
4	727	3.37	3056	3000	96.32	96.03	95.93	95.74	95.32	94.73	94.67	94.80
5	820	3.40	3150	3000	97.70	97.54	96.85	96.67	96.48	98.19	97.25	96.39
6	819	3.36	3074	3000	97.08	96.13	97.47	97.42	96.74	95.94	96.38	96.89
7	761	3.34	3153	3000	97.20	96.67	97.23	96.70	95.75	95.76	95.85	96.01
8	778	3.39	3062	3000	97.64	96.30	96.32	96.22	95.89	95.62	95.93	95.93
9	802	3.39	3135	3000	98.12	97.67	98.04	97.99	97.15	97.83	98.05	98.04
10	777	3.31	3035	3000	96.31	96.18	96.24	96.54	96.65	95.60	97.48	96.11
11	780	3.33	3057	3000	96.69	97.02	96.96	97.29	97.65	96.62	97.78	96.69
12	788	3.37	3135	3000	96.01	96.47	96.63	96.75	96.79	96.59	96.64	96.29
13	796	3.42	3133	3000	97.07	97.33	96.98	97.33	97.94	97.55	98.23	97.30
14	799	3.30	3093	3000	96.43	95.81	96.15	97.15	96.29	96.30	96.87	97.09
15	787	3.31	3136	3000	97.46	97.20	96.61	97.70	96.88	96.88	97.03	96.89
16	807	3.36	3132	3000	96.27	95.79	95.60	95.33	95.46	95.41	95.44	95.78
17	835	3.43	3089	3000	96.62	96.79	96.55	96.65	96.87	97.15	96.52	96.79
18	762	3.27	3023	3000	96.78	96.38	96.47	97.20	96.74	96.54	96.86	96.81
19	785	3.33	3066	3000	96.45	96.11	95.45	95.39	95.24	94.99	95.39	95.39
20	800	3.40	3065	3000	96.46	96.24	95.96	95.42	96.00	96.25	96.18	96.15
21	813	3.30	3086	3000	97.34	96.68	96.65	97.46	97.19	96.99	97.45	98.30
22	755	3.28	3060	3000	96.61	96.08	96.24	96.62	96.41	96.45	97.20	96.54
23	778	3.32	3014	3000	96.22	96.10	95.61	95.55	95.20	95.13	95.37	95.38
24	804	3.36	3005	3000	96.84	96.38	96.20	96.12	96.99	97.18	96.56	96.88
25	779	3.35	3061	3000	96.05	95.97	95.88	96.19	95.92	96.96	96.71	96.58
n	25	25	25	25	25	25	25	25	25	25	25	25
Mean	787	3.35			96.84	96.47	96.43	96.54	96.38	96.36	96.64	96.47
Median	787	3.36			96.69	96.30	96.32	96.65	96.48	96.45	96.71	96.54
σ	24	0.04			0.62	0.57	0.63	0.78	0.75	0.90	0.92	0.79
Min.	727	3.27			96.01	95.76	95.45	95.33	95.20	94.73	94.67	94.80
Max.	835	3.43			98.24	97.67	98.04	97.99	97.94	98.19	98.23	98.30

Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')							
	CCx	CCy	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080
1	0.4385	0.4110	3035	3000	0.0012	0.0012	0.0014	0.0014	0.0015	0.0015	0.0016	0.0015
2	0.4460	0.4176	2964	3000	0.0013	0.0013	0.0015	0.0016	0.0017	0.0017	0.0019	0.0020
3	0.4360	0.4112	3079	3000	0.0013	0.0013	0.0014	0.0015	0.0016	0.0016	0.0017	0.0018
4	0.4376	0.4118	3056	3000	0.0014	0.0014	0.0014	0.0014	0.0014	0.0016	0.0016	0.0014
5	0.4293	0.4053	3150	3000	0.0012	0.0012	0.0014	0.0013	0.0014	0.0015	0.0015	0.0014
6	0.4361	0.4108	3074	3000	0.0013	0.0013	0.0013	0.0014	0.0014	0.0014	0.0015	0.0015
7	0.4286	0.4042	3153	3000	0.0014	0.0013	0.0013	0.0014	0.0014	0.0014	0.0014	0.0015
8	0.4372	0.4117	3062	3000	0.0015	0.0014	0.0014	0.0014	0.0014	0.0014	0.0015	0.0016
9	0.4291	0.4029	3135	3000	0.0014	0.0013	0.0014	0.0014	0.0014	0.0014	0.0015	0.0015
10	0.4396	0.4134	3035	3000	0.0011	0.0012	0.0013	0.0013	0.0015	0.0015	0.0016	0.0015
11	0.4367	0.4101	3057	3000	0.0011	0.0012	0.0015	0.0015	0.0018	0.0017	0.0018	0.0020
12	0.4322	0.4100	3135	3000	0.0014	0.0013	0.0013	0.0014	0.0015	0.0014	0.0014	0.0014
13	0.4271	0.3983	3133	3000	0.0015	0.0014	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
14	0.4347	0.4102	3093	3000	0.0011	0.0011	0.0012	0.0013	0.0013	0.0014	0.0015	0.0014
15	0.4310	0.4075	3136	3000	0.0012	0.0011	0.0012	0.0013	0.0013	0.0013	0.0016	0.0015
16	0.4326	0.4106	3132	3000	0.0013	0.0012	0.0011	0.0013	0.0013	0.0014	0.0014	0.0014
17	0.4346	0.4094	3089	3000	0.0013	0.0012	0.0013	0.0013	0.0014	0.0014	0.0015	0.0015
18	0.4417	0.4162	3023	3000	0.0012	0.0011	0.0012	0.0013	0.0013	0.0014	0.0016	0.0014
19	0.4381	0.4142	3066	3000	0.0012	0.0011	0.0011	0.0013	0.0014	0.0015	0.0016	0.0015
20	0.4358	0.4090	3065	3000	0.0013	0.0012	0.0013	0.0013	0.0014	0.0015	0.0016	0.0015
21	0.4358	0.4117	3086	3000	0.0013	0.0012	0.0013	0.0014	0.0014	0.0014	0.0016	0.0015
22	0.4376	0.4124	3060	3000	0.0013	0.0012	0.0013	0.0014	0.0015	0.0015	0.0018	0.0016
23	0.4423	0.4165	3014	3000	0.0013	0.0012	0.0012	0.0014	0.0014	0.0015	0.0016	0.0015
24	0.4418	0.4142	3005	3000	0.0013	0.0012	0.0014	0.0014	0.0015	0.0015	0.0017	0.0016
25	0.4365	0.4101	3061	3000	0.0013	0.0013	0.0014	0.0015	0.0015	0.0016	0.0017	0.0015
n	25	25	25	25	25	25	25	25	25	25	25	25
Mean					0.0013	0.0012	0.0013	0.0014	0.0014	0.0015	0.0016	0.0015
Median					0.0013	0.0012	0.0013	0.0014	0.0014	0.0015	0.0016	0.0015
σ					0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
Min.					0.0011	0.0011	0.0011	0.0013	0.0013	0.0013	0.0014	0.0014
Max.					0.0015	0.0014	0.0015	0.0016	0.0018	0.0017	0.0019	0.0020

DATA SET 1: 105°C; 2100 mA

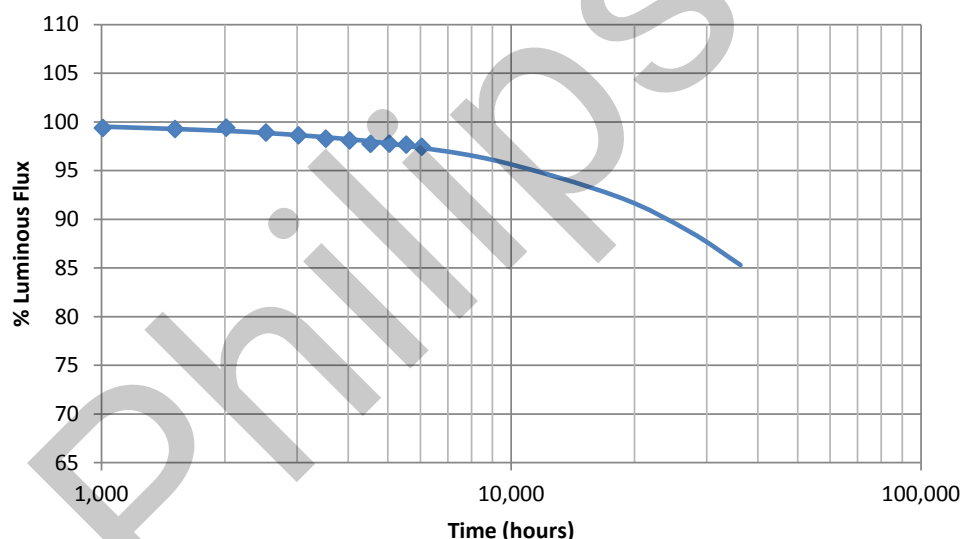
LED Package Series	XLamp XP-L White LEDs (Series: XPLAWT)
	This LM-80 report is applicable to the following order codes: XPLAWT-xx-xxxx-xxxxxxxxxx
Tested Model Number	XPLAWT-00-0000-000LU60E7
Drive Current [I_F]	2100 mA
Testing Initiation Date	March 14, 2014
Case Temperature [T_s]	105°C
Ambient Temperature [T_A]	105°C
Failures observed	None

Projection Generated By Cree's Internal TM-21 Calculator:

Test duration	6,048 hours
Test duration used for projection	t=1,008 to t=6,048
α	4.369E-06
β	9.994E-01
Calculated Lifetime	L70(6k) = 81,500 hours
Reported Lifetime	L70(6k) > 36,300 hours

LM-80 Data For The Official TM-21 Calculator*

Time (hours)	Lumen Maintenance
0	100.00%
168	99.32%
1008	99.38%
1512	99.27%
2016	99.41%
2520	98.91%
3024	98.62%
3528	98.28%
4032	98.10%
4536	97.75%
5040	97.76%
5544	97.67%
6048	97.45%



* <http://www.energystar.gov/TM-21calculator>

Suggestion for exporting the LM-80 data:

1. Copy above table from PDF & paste into Microsoft Word.
2. Copy table out of Word & paste into Microsoft Excel (Match destination formatting)

DATA SET 1: 105°C; 2100 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)											
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	776	3.31	3050	3000	100.15	99.28	99.51	99.74	99.53	98.43	98.00	97.33	97.50	97.67	96.59	96.67
2	755	3.34	3005	3000	100.29	99.76	100.16	99.44	99.74	99.74	98.82	97.94	97.58	98.51	97.90	97.75
3	800	3.37	3127	3000	98.63	98.18	98.13	98.34	98.36	98.15	97.47	97.88	97.17	96.94	97.02	97.08
4	774	3.44	3105	3000	99.14	98.14	98.34	98.00	97.91	97.39	97.06	96.82	96.48	96.65	95.88	95.89
5	772	3.30	3073	3000	99.59	100.13	98.79	99.53	100.30	99.61	97.71	97.24	97.16	98.53	97.58	97.39
6	796	3.36	3110	3000	98.78	98.68	98.44	98.78	98.70	97.75	97.34	97.63	97.16	96.85	96.66	96.24
7	771	3.42	3124	3000	99.58	98.75	97.94	98.21	99.44	97.23	96.96	96.55	96.15	96.45	95.86	95.40
8	818	3.33	3100	3000	99.92	99.48	98.95	100.38	99.75	99.81	98.42	97.75	98.05	97.20	97.95	97.76
9	787	3.31	3131	3000	99.26	99.29	98.60	99.52	99.30	99.35	98.12	97.02	96.83	96.69	97.29	97.92
10	807	3.38	3141	3000	98.74	98.57	98.54	98.51	98.80	98.48	97.92	97.68	97.46	96.80	96.49	96.92
11	793	3.40	3155	3000	99.49	100.02	99.03	99.94	99.56	99.30	98.38	98.26	97.44	97.25	98.25	97.60
12	792	3.32	3042	3000	99.95	100.79	98.49	99.92	98.71	99.09	97.87	97.28	97.61	98.37	97.16	97.70
13	786	3.32	3043	3000	99.65	100.25	98.72	99.15	99.15	99.35	97.72	97.23	97.16	97.85	97.46	97.81
14	805	3.40	3175	3000	98.37	98.03	98.07	98.69	98.54	98.25	97.36	98.08	97.33	97.96	96.75	96.64
15	818	3.32	3125	3000	98.51	98.02	99.80	98.91	99.29	98.07	99.39	98.95	99.26	97.83	97.92	97.46
16	786	3.30	3171	3000	98.42	98.05	99.14	98.28	98.21	97.49	98.34	98.28	98.50	97.31	97.69	97.87
17	803	3.38	3173	3000	99.15	98.83	99.45	99.17	98.80	98.03	98.38	98.67	98.66	97.39	97.49	97.58
18	835	3.39	3140	3000	98.52	97.97	98.74	97.86	97.59	97.29	98.05	98.51	98.49	97.98	98.21	97.94
19	720	3.38	3190	3000	98.91	99.63	100.79	100.92	99.33	97.18	99.52	99.42	98.94	98.95	98.72	98.36
20	724	3.25	3176	3000	99.51	100.92	100.49	100.76	98.45	97.67	98.87	99.33	98.90	98.68	99.12	98.81
21	759	3.27	3182	3000	99.27	100.13	99.92	99.29	98.28	98.68	98.41	98.42	97.12	97.29	97.64	96.23
22	718	3.36	3193	3000	99.76	101.09	100.62	100.83	99.05	99.10	99.04	99.48	98.82	98.89	99.49	99.07
23	716	3.35	3193	3000	99.71	100.08	100.44	100.46	98.43	99.66	99.02	98.85	98.20	98.63	98.57	98.41
24	715	3.22	3192	3000	99.86	100.41	100.62	100.47	98.86	100.50	99.41	99.52	98.12	98.99	99.20	98.28
25	760	3.27	3216	3000	99.81	100.02	100.01	100.09	98.65	99.98	99.32	98.36	97.62	98.39	98.85	97.41
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean	775	3.34			99.32	99.38	99.27	99.41	98.91	98.62	98.28	98.10	97.75	97.76	97.67	97.45
Median	786	3.34			99.49	99.48	99.03	99.44	98.80	98.48	98.34	98.08	97.58	97.83	97.64	97.60
σ	35	0.05			0.57	1.00	0.90	0.93	0.63	0.99	0.75	0.86	0.81	0.80	0.99	0.89
Min.	715	3.22			98.37	97.97	97.94	97.86	97.59	97.18	96.96	96.55	96.15	96.45	95.86	95.40
Max.	835	3.44			100.29	101.09	100.79	100.92	100.30	100.50	99.52	99.52	99.26	98.99	99.49	99.07

Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')											
	CCx	CCy	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	0.4383	0.4125	3050	3000	0.0007	0.0011	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0014	0.0016	0.0016	0.0017
2	0.4420	0.4147	3005	3000	0.0007	0.0011	0.0011	0.0011	0.0012	0.0013	0.0013	0.0013	0.0016	0.0018	0.0019	0.0020
3	0.4316	0.4077	3127	3000	0.0008	0.0012	0.0012	0.0013	0.0012	0.0013	0.0013	0.0013	0.0015	0.0016	0.0017	0.0019
4	0.4331	0.4082	3105	3000	0.0007	0.0011	0.0011	0.0013	0.0012	0.0012	0.0013	0.0012	0.0013	0.0016	0.0015	0.0016
5	0.4364	0.4113	3073	3000	0.0007	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0015	0.0017	0.0016	0.0017
6	0.4337	0.4101	3110	3000	0.0008	0.0012	0.0013	0.0013	0.0014	0.0013	0.0014	0.0013	0.0016	0.0017	0.0018	0.0018
7	0.4319	0.4080	3124	3000	0.0007	0.0012	0.0012	0.0013	0.0012	0.0013	0.0012	0.0012	0.0012	0.0015	0.0015	0.0016
8	0.4336	0.4086	3100	3000	0.0007	0.0010	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0014	0.0011	0.0015	0.0017
9	0.4301	0.4049	3131	3000	0.0008	0.0011	0.0012	0.0012	0.0012	0.0012	0.0013	0.0014	0.0017	0.0015	0.0018	0.0022
10	0.4306	0.4072	3141	3000	0.0009	0.0013	0.0014	0.0014	0.0014	0.0013	0.0014	0.0014	0.0016	0.0015	0.0016	0.0018
11	0.4282	0.4035	3155	3000	0.0006	0.0011	0.0012	0.0011	0.0011	0.0011	0.0011	0.0012	0.0013	0.0012	0.0015	0.0017
12	0.4402	0.4156	3042	3000	0.0007	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	0.0016	0.0016	0.0017	0.0019
13	0.4400	0.4151	3043	3000	0.0007	0.0011	0.0011	0.0012	0.0012	0.0013	0.0013	0.0014	0.0017	0.0019	0.0019	0.0022
14	0.4280	0.4055	3175	3000	0.0010	0.0014	0.0015	0.0014	0.0013	0.0014	0.0013	0.0014	0.0014	0.0015	0.0015	0.0017
15	0.4312	0.4065	3125	3000	0.0007	0.0011	0.0011	0.0012	0.0012	0.0010	0.0012	0.0014	0.0017	0.0019	0.0018	0.0017
16	0.4275	0.4040	3171	3000	0.0008	0.0011	0.0011	0.0012	0.0011	0.0011	0.0011	0.0013	0.0015	0.0018	0.0018	0.0016
17	0.4288	0.4072	3173	3000	0.0011	0.0014	0.0015	0.0014	0.0013	0.0015	0.0013	0.0014	0.0014	0.0016	0.0016	0.0018
18	0.4311	0.4082	3140	3000	0.0007	0.0012	0.0012	0.0011	0.0012	0.0011	0.0012	0.0013	0.0013	0.0015	0.0016	0.0017
19	0.4240	0.3981	3190	3000	0.0008	0.0011	0.0012	0.0011	0.0011	0.0012	0.0013	0.0014	0.0014	0.0016	0.0016	0.0016
20	0.4258	0.4006	3176	3000	0.0009	0.0010	0.0012	0.0012	0.0011	0.0012	0.0013	0.0014	0.0014	0.0016	0.0017	0.0018
21	0.4254	0.4004	3182	3000	0.0009	0.0013	0.0013	0.0012	0.0012	0.0013	0.0014	0.0015	0.0016	0.0018	0.0019	0.0021
22	0.4248	0.4004	3193	3000	0.0008	0.0010	0.0011	0.0011	0.0011	0.0011	0.0012	0.0013	0.0014	0.0016	0.0017	0.0019
23	0.4237	0.3979	3193	3000	0.0009	0.0013	0.0012	0.0011	0.0012	0.0013	0.0013	0.0014	0.0014	0.0015	0.0016	0.0017
24	0.4239	0.3983	3192	3000	0.0009	0.0012	0.0013	0.0012	0.0012	0.0013	0.0015	0.0016	0.0016	0.0018	0.0021	0.0024
25	0.4232	0.3995	3216	3000	0.0009	0.0013	0.0012	0.0012	0.0013	0.0014	0.0014	0.0016	0.0015	0.0017	0.0019	0.0020
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean					0.0008	0.0011	0.0012	0.0012	0.0012	0.0012	0.0013	0.0013	0.0015	0.0016	0.0017	0.0018
Median					0.0008	0.0011	0.0012	0.0012	0.0012	0.0012	0.0013	0.0013	0.0015	0.0016	0.0017	0.0018
σ					0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
Min.					0.0006	0.0010	0.0011	0.0011	0.0011	0.0010	0.0011	0.0012	0.0012	0.0011	0.0015	0.0016
Max.					0.0011	0.0014	0.0015	0.0014	0.0014	0.0015	0.0015	0.0016	0.0017	0.0019	0.0021	0.0024

DATA SET 2: 85°C; 3000 mA

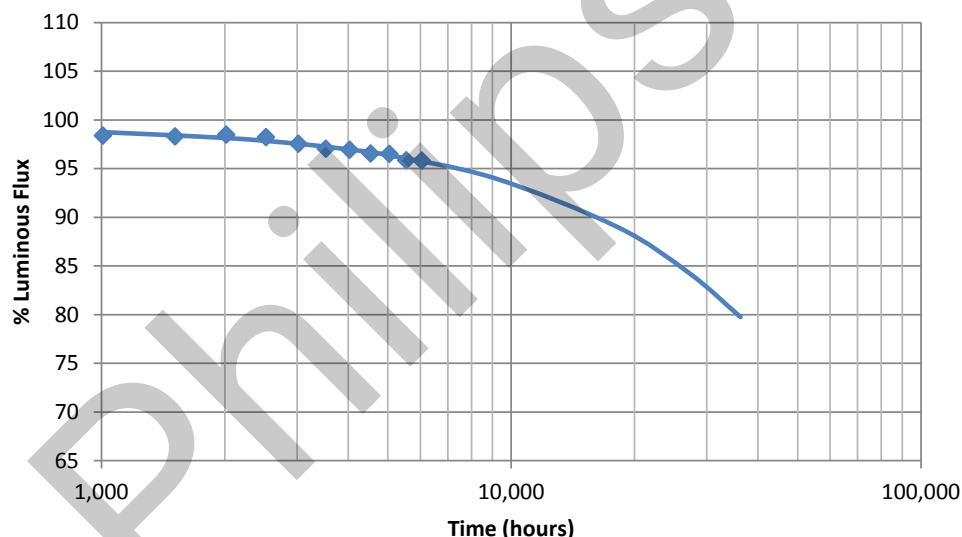
LED Package Series	XLamp XP-L White LEDs (Series: XPLAWT)
	This LM-80 report is applicable to the following order codes: XPLAWT-xx-xxxx-xxxxxxxxxx
Tested Model Number	XPLAWT-00-0000-000LU60E7
Drive Current [I_F]	3000 mA
Testing Initiation Date	March 14, 2014
Case Temperature [T_s]	85°C
Ambient Temperature [T_A]	85°C
Failures observed	None

Projection Generated By Cree's Internal TM-21 Calculator:

Test duration	6,048 hours
Test duration used for projection	t=1,008 to t=6,048
α	6.047E-06
β	9.934E-01
Calculated Lifetime	L70(6k) = 57,900 hours
Reported Lifetime	L70(6k) > 36,300 hours

LM-80 Data For The Official TM-21 Calculator*

Time (hours)	Lumen Maintenance
0	100.00%
168	99.12%
1008	98.39%
1512	98.31%
2016	98.49%
2520	98.24%
3024	97.56%
3528	97.04%
4032	96.94%
4536	96.56%
5040	96.51%
5544	95.85%
6048	95.82%



* <http://www.energystar.gov/TM-21calculator>

Suggestion for exporting the LM-80 data:

1. Copy above table from PDF & paste into Microsoft Word.
2. Copy table out of Word & paste into Microsoft Excel (Match destination formatting)

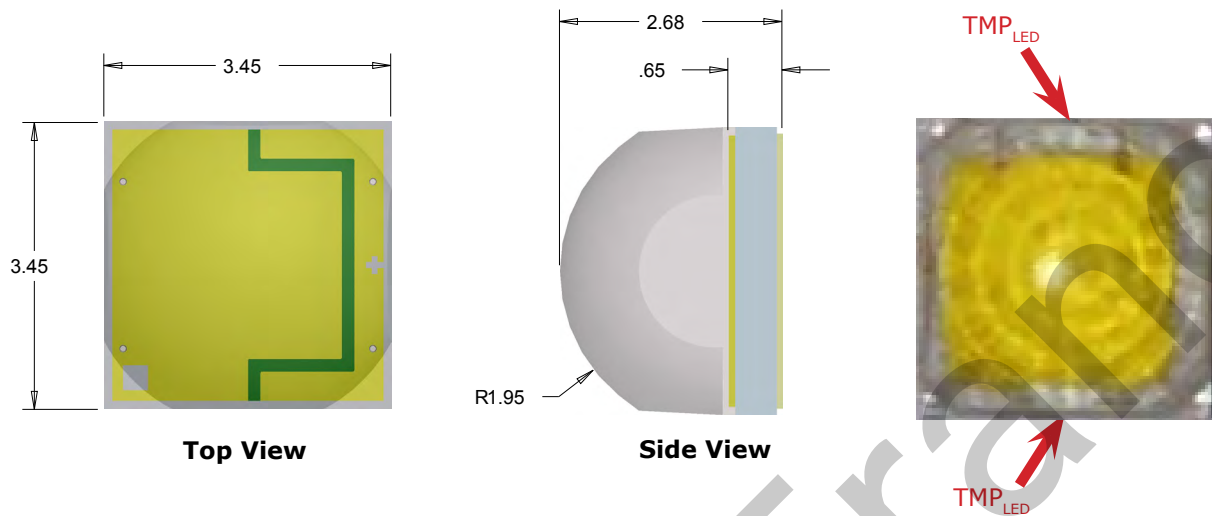
DATA SET 2: 85°C; 3000 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)											
	LF (lm)	V _F (V)	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	1081	3.52	3070	3000	98.98	98.11	97.90	98.25	98.26	97.26	96.52	96.81	96.28	96.21	95.27	94.98
2	1025	3.44	3106	3000	99.13	98.42	98.25	98.32	98.22	97.32	96.71	97.29	96.32	96.79	95.75	95.68
3	1057	3.52	3132	3000	99.05	97.84	97.29	97.78	97.67	96.74	96.22	96.62	95.22	94.74	94.37	94.29
4	1095	3.55	3146	3000	99.10	97.51	97.31	97.55	97.66	96.97	96.44	96.45	96.31	96.28	95.97	96.27
5	1088	3.64	3108	3000	99.14	98.15	97.89	97.81	97.75	97.13	96.82	96.78	95.87	95.13	94.43	94.50
6	1091	3.60	3150	3000	99.80	98.67	98.40	98.97	98.60	97.68	96.70	96.94	96.04	97.08	96.29	96.40
7	1095	3.51	3156	3000	98.92	98.09	97.54	98.13	98.00	97.04	96.32	96.34	96.21	96.88	95.24	95.46
8	1059	3.47	3146	3000	98.42	97.94	98.11	98.38	97.97	97.05	96.20	96.68	96.22	96.95	95.40	95.23
9	1087	3.58	3160	3000	98.71	98.47	98.35	98.75	98.83	97.69	96.63	97.55	96.79	96.08	95.45	95.17
10	1045	3.47	3090	3000	99.82	98.17	98.14	98.45	98.14	97.88	96.54	96.33	96.01	96.76	96.09	96.36
11	1092	3.60	3191	3000	99.32	98.65	98.25	98.50	98.34	97.16	97.19	96.73	96.52	95.94	95.53	95.42
12	1089	3.60	3113	3000	100.45	98.36	97.92	98.74	98.21	97.74	96.87	96.22	96.34	96.31	95.81	96.27
13	1067	3.48	3119	3000	98.77	99.05	98.64	99.14	99.11	98.86	97.40	96.32	95.97	97.21	96.26	95.39
14	952	3.45	3053	3000	98.77	97.86	97.39	97.76	97.65	97.39	96.46	96.00	95.54	96.33	95.19	95.27
15	995	3.48	3115	3000	98.57	98.03	98.12	98.27	98.02	97.38	96.45	96.88	96.55	95.82	95.31	95.57
16	1044	3.60	3197	3000	98.39	98.06	98.25	98.29	98.16	97.86	96.95	96.07	96.21	96.09	95.62	96.15
17	977	3.43	3014	3000	98.79	97.72	98.15	98.08	98.27	97.83	97.79	97.46	96.96	96.60	95.56	96.14
18	1061	3.56	3180	3000	98.47	99.09	98.23	98.29	98.22	96.96	97.14	96.94	96.75	95.27	95.47	95.07
19	1041	3.58	3132	3000	98.75	98.18	98.86	98.60	98.47	97.97	98.10	96.97	97.01	97.47	96.91	96.67
20	996	3.44	3057	3000	99.60	98.25	98.09	98.33	98.54	97.84	97.39	97.14	97.26	97.34	95.97	95.90
21	1049	3.52	3168	3000	99.22	98.02	98.23	98.51	98.45	97.80	97.01	97.02	96.80	96.97	95.91	95.56
22	1058	3.57	3173	3000	99.74	98.20	98.20	98.36	98.26	98.18	97.49	97.29	97.17	97.50	96.27	96.54
23	982	3.59	3182	3000	99.11	99.03	99.90	99.77	98.55	97.25	98.42	98.24	98.06	96.04	97.24	97.52
24	978	3.38	3154	3000	99.20	99.76	100.38	99.85	98.37	97.52	98.55	98.27	98.61	98.46	98.00	97.96
25	1027	3.44	3183	3000	99.71	100.15	99.87	99.38	98.19	98.41	97.69	98.04	96.81	96.55	96.97	95.77
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean	1045	3.52			99.12	98.39	98.31	98.49	98.24	97.56	97.04	96.94	96.55	96.51	95.85	95.82
Median	1057	3.52			99.10	98.18	98.20	98.36	98.22	97.52	96.87	96.88	96.34	96.55	95.75	95.68
σ	43	0.07			0.51	0.62	0.76	0.58	0.35	0.50	0.67	0.63	0.73	0.82	0.82	0.84
Min.	952	3.38			98.39	97.51	97.29	97.55	97.65	96.74	96.20	96.00	95.22	94.74	94.37	94.29
Max.	1095	3.64			100.45	100.15	100.38	99.85	99.11	98.86	98.55	98.27	98.61	98.46	98.00	97.96

Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')											
	CCx	CCy	Calc. CCT	ANSI Target	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
1	0.4364	0.4109	3070	3000	0.0010	0.0013	0.0014	0.0014	0.0017	0.0017	0.0020	0.0023	0.0025	0.0029	0.0032	0.0033
2	0.4332	0.4084	3106	3000	0.0009	0.0014	0.0014	0.0015	0.0015	0.0016	0.0018	0.0022	0.0023	0.0026	0.0030	0.0031
3	0.4311	0.4072	3132	3000	0.0010	0.0014	0.0014	0.0015	0.0015	0.0016	0.0017	0.0020	0.0021	0.0025	0.0027	0.0028
4	0.4304	0.4074	3146	3000	0.0008	0.0012	0.0014	0.0013	0.0014	0.0014	0.0015	0.0017	0.0016	0.0021	0.0024	0.0023
5	0.4334	0.4091	3108	3000	0.0010	0.0014	0.0016	0.0015	0.0017	0.0018	0.0021	0.0024	0.0026	0.0030	0.0034	0.0036
6	0.4291	0.4050	3150	3000	0.0008	0.0013	0.0014	0.0013	0.0014	0.0014	0.0015	0.0017	0.0018	0.0020	0.0024	0.0025
7	0.4305	0.4089	3156	3000	0.0010	0.0014	0.0014	0.0014	0.0015	0.0015	0.0015	0.0017	0.0017	0.0021	0.0019	0.0022
8	0.4281	0.4020	3146	3000	0.0011	0.0013	0.0014	0.0014	0.0014	0.0015	0.0014	0.0018	0.0018	0.0023	0.0021	0.0026
9	0.4296	0.4073	3160	3000	0.0012	0.0015	0.0015	0.0016	0.0016	0.0017	0.0016	0.0019	0.0020	0.0024	0.0023	0.0027
10	0.4351	0.4107	3090	3000	0.0009	0.0013	0.0014	0.0015	0.0016	0.0016	0.0017	0.0017	0.0019	0.0021	0.0022	0.0025
11	0.4271	0.4055	3191	3000	0.0012	0.0015	0.0016	0.0015	0.0016	0.0017	0.0019	0.0019	0.0021	0.0024	0.0025	0.0028
12	0.4286	0.3993	3113	3000	0.0010	0.0013	0.0013	0.0013	0.0014	0.0014	0.0015	0.0016	0.0018	0.0020	0.0022	0.0024
13	0.4327	0.4090	3119	3000	0.0007	0.0011	0.0013	0.0014	0.0014	0.0014	0.0014	0.0015	0.0016	0.0019	0.0021	0.0021
14	0.4387	0.4137	3053	3000	0.0010	0.0013	0.0014	0.0013	0.0013	0.0014	0.0014	0.0014	0.0016	0.0018	0.0020	0.0020
15	0.4329	0.4090	3115	3000	0.0011	0.0014	0.0014	0.0015	0.0014	0.0014	0.0016	0.0015	0.0017	0.0018	0.0020	0.0020
16	0.4262	0.4041	3197	3000	0.0007	0.0012	0.0012	0.0012	0.0013	0.0013	0.0013	0.0013	0.0015	0.0016	0.0018	0.0019
17	0.4424	0.4167	3014	3000	0.0007	0.0012	0.0013	0.0013	0.0013	0.0014	0.0014	0.0017	0.0017	0.0018	0.0020	0.0024
18	0.4281	0.4065	3180	3000	0.0008	0.0012	0.0013	0.0013	0.0014	0.0013	0.0014	0.0017	0.0019	0.0019	0.0022	0.0026
19	0.4300	0.4048	3132	3000	0.0007	0.0011	0.0012	0.0012	0.0013	0.0012	0.0014	0.0016	0.0017	0.0018	0.0021	0.0024
20	0.4391	0.4150	3057	3000	0.0008	0.0011	0.0013	0.0014	0.0014	0.0014	0.0015	0.0016	0.0015	0.0018	0.0019	0.0023
21	0.4295	0.4081	3168	3000	0.0009	0.0014	0.0014	0.0015	0.0015	0.0016	0.0015	0.0015	0.0014	0.0018	0.0017	0.0022
22	0.4275	0.4041	3173	3000	0.0009	0.0012	0.0012	0.0013	0.0013	0.0014	0.0014	0.0015	0.0016	0.0018	0.0019	0.0024
23	0.4257	0.4011	3182	3000	0.0010	0.0012	0.0013	0.0014	0.0013	0.0014	0.0015	0.0017	0.0019	0.0022	0.0020	0.0022
24	0.4287	0.4044	3154	3000	0.0010	0.0013	0.0013	0.0014	0.0013	0.0015	0.0016	0.0020	0.0022	0.0023	0.0024	0.0027
25	0.4248	0.3991	3183	3000	0.0010	0.0014	0.0014	0.0015	0.0015	0.0017	0.0018	0.0020	0.0024	0.0027	0.0027	0.0030
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean					0.0009	0.0013	0.0014	0.0014	0.0014	0.0015	0.0016	0.0018	0.0019	0.0021	0.0023	0.0025
Median					0.0010	0.0013	0.0014	0.0014	0.0014	0.0014	0.0015	0.0017	0.0018	0.0021	0.0022	0.0024
σ					0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0003	0.0003	0.0004	0.0004	0.0004
Min.					0.0007	0.0011	0.0012	0.0012	0.0013	0.0012	0.0013	0.0013	0.0014	0.0016	0.0017	0.0019
Max.					0.0012	0.0015	0.0016	0.0016	0.0017	0.0018	0.0021	0.0024	0.0026	0.0030	0.0034	0.0036

MECHANICAL DIMENSIONS & TEMPERATURE MEASUREMENT POINT

All measurements are $\pm .25$ mm unless otherwise indicated.



The LED temperature measurement point (TMP_{LED}) should be measured on the PCB surface, as close to the LED's thermal pad as possible (shown in the picture above). It is not required to use a solder footprint for the thermal pad that is larger than the LED itself. In testing, Cree has found such a solder pad to have insignificant impact on the resulting temperature measurement. Either one of the two shown TMP_{LED} locations may be used and are equivalent to each other.