Cree® XLamp® XT-E White LEDs

NVLAP TESTING

NVLAP Lab Code 500041-0

INFORMATION REQUIRED BY LM-80-08

Cree classifies these LEDs as "LED packages" per Sep 9, 2011 ENERGY STAR guidelines[1].

1. Number of LED light sources tested	*See individual data sets on following pages.*
2. 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 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 lifetime 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

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REVISION HISTORY

Revision	Date	Change
0	Mar 29, 2012	Date of first issue
1	Sep 27, 2012	Removed successor data set 1. Added data set 2.
2	Oct 23, 2012	Added data set 3.
3	Nov 14, 2012	Added data set 4.
4	Apr 17, 2013	Revised data sets 2 & 4 to add additional test duration. Added data sets 5 & 6.
5	Aug 22, 2013	Revised data sets 2-6 to add additional test duration.
6	Nov 13, 2013	Revised data sets 5 & 6 to add additional test duration.
7	Sep 29, 2014	Removed data sets 3 & 4. Added data sets 3+ & 4+. Revised data sets 2 & 5 to add additional test duration.
8	Nov 20, 2015	Added data sets 8 & 9. Revised report format.
9	Jun 06, 2016	Added data sets 10 & 11. Removed data sets 2 & 4+. Extended data sets 8 & 9 with additional test duration.
10	Sep 22, 2016	Extended data sets 8 & 9 with additional test duration. Updated mechanical drawings and product photograph.

TEST RESULTS SUMMARY

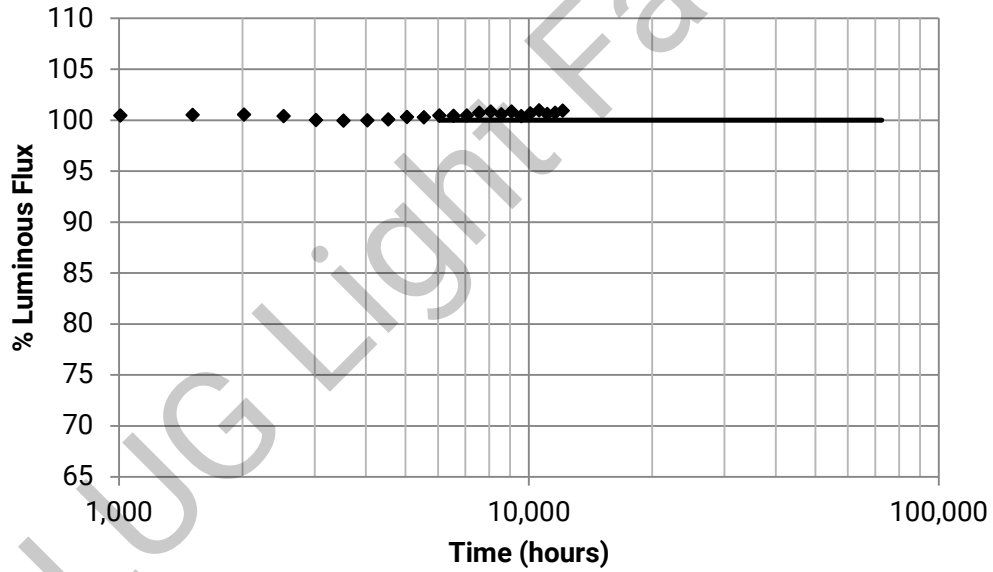
Data Set	Case Temp. [T_S]	Ambient Temp. [T_A]	Drive Current [I_F]	ANSI CCT Target	Sample Count	Test Duration	Reported TM-21 Lifetimes
8	85°C	85°C	500 mA	3000K	20	12,096 hrs	L90(12k) > 72,600 hrs L80(12k) > 72,600 hrs L70(12k) > 72,600 hrs
9	105°C	105°C	500 mA	3000K	20	13,104 hrs	L90(13k) > 78,600 hrs L80(13k) > 78,600 hrs L70(13K) > 78,600 hrs
3+	55°C	55°C	1000 mA	3000K	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	3000K	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	3000K	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	3000K	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	3000K	25	9,072 hrs	L90(9k) = 19,300 hrs L80(9k) = 41,400 hrs L70(9k) > 54,400 hrs

DATA SET 8: 85°C; 500 mA

LED Package Series	XLamp XT-E White LEDs (Series: XTEAWT) This LM-80 report is applicable to the following order codes: XTEAWT-xx-xxxx-xxxxxxxxx
Tested Model Number	XTEAWT-00-0000-00000LBE7
Drive Current [I_F]	500 mA
Testing Initiation Date	December 4, 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	12,096 hours
Test duration used for projection	t=6,048 to t=12,096
α	*-5.311E-07*
β	1.002E+00
Reported Lifetimes	**L90(12k) > 72,600 hours**
	L80(12k) > 72,600 hours
	L70(12k) > 72,600 hours



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

Time (hours)	Lumen Maintenance
0	100.00%
3024	100.02%
3528	99.95%
4032	99.98%
4536	100.07%
5040	100.30%
5544	100.28%
6048	100.46%
6552	100.45%
7056	100.47%
7560	100.74%
8064	100.85%
8568	100.59%
9072	100.85%
9576	100.41%
10080	100.66%
10584	100.96%
11088	100.62%
11592	100.73%
12096	100.93%

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

Note: Data points t=168 hr through t=2520 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 through t=2520 hr would be excluded, so the projection is unaffected.

DATA SET 8: 85°C; 500 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	176.3	3.12	3284	3000	100.27	100.47	100.66	100.66	101.06	100.51	100.13	100.14	100.74	100.76	100.45	100.71
2	190.0	3.10	3177	3000	99.77	99.49	99.87	100.00	100.09	100.04	99.86	99.80	100.09	100.01	99.81	100.17
3	171.9	3.10	3240	3000	100.25	100.41	100.87	101.29	101.06	100.34	100.08	100.03	100.01	100.37	100.05	100.74
4	190.6	3.07	3295	3000	100.49	100.59	100.69	100.75	100.85	100.07	99.87	99.98	100.18	100.69	100.45	100.46
5	171.4	3.07	3233	3000	100.73	100.66	100.97	101.14	101.01	100.10	99.98	99.74	99.95	100.07	100.05	100.45
6	187.6	3.07	3190	3000	100.29	101.01	100.98	100.95	101.10	100.64	100.44	100.60	100.47	100.76	101.12	101.07
7	170.0	3.09	3183	3000	100.64	100.69	101.00	101.08	100.39	100.05	99.68	99.99	100.26	100.25	99.80	99.95
8	189.8	3.05	3227	3000	100.41	100.99	101.08	101.04	101.01	100.33	100.42	100.54	100.83	101.25	101.16	101.53
9	168.1	3.16	3159	3000	100.46	100.97	101.25	101.03	100.09	100.20	100.08	100.17	100.07	100.33	100.09	99.81
10	174.2	3.08	3228	3000	100.80	100.58	100.48	100.99	100.96	100.72	100.40	100.45	100.83	100.68	100.39	100.49
11	187.5	3.06	3232	3000	99.84	100.59	100.56	100.42	100.29	99.71	99.47	99.49	99.78	100.27	100.20	100.56
12	187.3	3.07	3272	3000	100.10	100.40	100.00	100.16	99.62	99.54	100.00	99.35	99.37	99.84	99.67	100.10
13	189.7	3.08	3170	3000	100.19	100.82	101.06	100.83	100.56	100.27	100.20	100.29	100.57	100.93	100.78	101.24
14	185.3	3.05	3170	3000	99.77	100.47	100.45	100.62	100.50	99.87	99.82	99.98	100.31	100.67	100.50	100.87
15	174.2	3.11	3216	3000	100.72	100.31	100.56	100.39	100.20	100.29	100.28	100.24	99.94	99.85	99.55	99.64
16	193.1	3.09	3279	3000	100.73	100.57	100.45	100.65	100.35	99.81	99.86	100.04	100.00	100.21	100.76	100.70
17	188.5	3.07	3266	3000	99.76	99.92	99.89	99.91	99.78	99.55	99.74	99.50	99.42	99.78	100.09	100.17
18	187.6	3.07	3203	3000	99.68	99.78	99.34	99.29	99.34	99.19	99.23	99.33	99.21	99.63	99.92	100.00
19	185.8	3.11	3226	3000	100.35	100.44	100.32	100.01	100.15	99.66	99.77	99.97	99.58	99.65	100.30	100.27
20	188.9	3.06	3195	3000	99.91	100.36	100.08	99.63	99.68	99.52	99.68	99.89	99.74	100.06	100.53	100.34
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean	**182.9**	**3.08**			**100.26**	**100.48**	**100.53**	**100.54**	**100.41**	**100.02**	**99.95**	**99.98**	**100.07**	**100.30**	**100.28**	**100.46**
Median	187.4	3.08			100.28	100.52	100.56	100.66	100.37	100.06	99.92	99.99	100.04	100.26	100.25	100.46
σ	8.3	0.03			0.37	0.39	0.50	0.55	0.54	0.41	0.32	0.37	0.47	0.45	0.45	0.48
Min.	168.1	3.05			99.68	99.49	99.34	99.29	99.34	99.19	99.23	99.33	99.21	99.63	99.55	99.64
Max.	193.1	3.16			100.80	101.01	101.25	101.29	101.10	100.72	100.44	100.60	100.83	101.25	101.16	101.53

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	0.4218	0.4048	3284	3000	0.0007	0.0011	0.0013	0.0015	0.0016	0.0017	0.0018	0.0019	0.0020	0.0020	0.0020	0.0020
2	0.4297	0.4097	3177	3000	0.0005	0.0013	0.0014	0.0017	0.0018	0.0020	0.0021	0.0021	0.0021	0.0022	0.0021	0.0023
3	0.4245	0.4056	3240	3000	0.0006	0.0012	0.0014	0.0015	0.0015	0.0016	0.0017	0.0017	0.0019	0.0020	0.0020	0.0020
4	0.4217	0.4059	3295	3000	0.0005	0.0011	0.0013	0.0014	0.0016	0.0018	0.0019	0.0020	0.0020	0.0021	0.0022	0.0022
5	0.4263	0.4090	3233	3000	0.0006	0.0011	0.0014	0.0014	0.0015	0.0017	0.0019	0.0019	0.0019	0.0020	0.0020	0.0021
6	0.4275	0.4062	3190	3000	0.0006	0.0011	0.0015	0.0017	0.0019	0.0019	0.0021	0.0021	0.0021	0.0022	0.0022	0.0022
7	0.4278	0.4060	3183	3000	0.0006	0.0012	0.0014	0.0014	0.0015	0.0016	0.0018	0.0017	0.0018	0.0019	0.0018	0.0019
8	0.4248	0.4047	3227	3000	0.0006	0.0012	0.0014	0.0016	0.0018	0.0019	0.0020	0.0020	0.0022	0.0023	0.0023	0.0022
9	0.4292	0.4064	3159	3000	0.0007	0.0013	0.0015	0.0014	0.0016	0.0017	0.0018	0.0019	0.0019	0.0019	0.0020	0.0020
10	0.4254	0.4062	3228	3000	0.0006	0.0011	0.0013	0.0014	0.0014	0.0017	0.0017	0.0017	0.0017	0.0018	0.0020	0.0019
11	0.4274	0.4115	3232	3000	0.0004	0.0010	0.0012	0.0014	0.0014	0.0016	0.0017	0.0018	0.0017	0.0020	0.0021	0.0021
12	0.4239	0.4084	3272	3000	0.0003	0.0012	0.0015	0.0017	0.0018	0.0018	0.0020	0.0020	0.0021	0.0023	0.0022	0.0022
13	0.4306	0.4108	3170	3000	0.0006	0.0013	0.0015	0.0016	0.0017	0.0018	0.0020	0.0021	0.0022	0.0023	0.0023	0.0024
14	0.4282	0.4054	3170	3000	0.0005	0.0012	0.0015	0.0019	0.0019	0.0020	0.0021	0.0022	0.0021	0.0023	0.0023	0.0023
15	0.4261	0.4063	3216	3000	0.0004	0.0009	0.0012	0.0014	0.0014	0.0014	0.0017	0.0016	0.0017	0.0017	0.0018	0.0019
16	0.4223	0.4054	3279	3000	0.0006	0.0012	0.0015	0.0018	0.0018	0.0019	0.0020	0.0020	0.0022	0.0022	0.0022	0.0023
17	0.4241	0.4080	3266	3000	0.0003	0.0010	0.0012	0.0014	0.0014	0.0015	0.0017	0.0017	0.0019	0.0019	0.0020	0.0021
18	0.4266	0.4058	3203	3000	0.0004	0.0008	0.0010	0.0012	0.0012	0.0012	0.0015	0.0015	0.0017	0.0017	0.0017	0.0019
19	0.4264	0.4084	3226	3000	0.0005	0.0010	0.0012	0.0014	0.0014	0.0014	0.0016	0.0016	0.0019	0.0019	0.0018	0.0019
20	0.4262	0.4039	3195	3000	0.0004	0.0013	0.0013	0.0014	0.0014	0.0016	0.0020	0.0018	0.0020	0.0020	0.0019	0.0020
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean					**0.0005**	**0.0011**	**0.0014**	**0.0015**	**0.0016**	**0.0017**	**0.0019**	**0.0019**	**0.0020**	**0.0020**	**0.0021**	**0.0021**
Median					0.0005	0.0011	0.0014	0.0014	0.0015	0.0017	0.0018	0.0019	0.0019	0.0020	0.0020	0.0021
σ					0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.					0.0003	0.0008	0.0010	0.0012	0.0012	0.0012	0.0015	0.0015	0.0017	0.0017	0.0017	0.0019
Max.					0.0007	0.0013	0.0015	0.0019	0.0019	0.0020	0.0021	0.0022	0.0022	0.0023	0.0023	0.0024

DATA SET 8: 85°C; 500 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	12096
1	176.3	3.12	3284	3000	100.57	100.65	101.04	101.20	100.74	100.46	101.08	100.92	101.30	100.79	100.34	100.51
2	190.0	3.10	3177	3000	100.17	100.54	100.65	100.95	101.30	101.19	100.32	100.68	101.21	100.68	100.95	101.05
3	171.9	3.10	3240	3000	100.17	100.55	100.51	100.05	99.63	100.22	100.10	100.38	100.58	100.58	100.23	100.76
4	190.6	3.07	3295	3000	100.77	101.02	100.84	101.13	101.20	100.99	99.83	101.22	101.26	100.63	100.73	100.89
5	171.4	3.07	3233	3000	100.22	100.13	100.25	100.65	99.92	101.01	100.68	100.37	101.23	101.11	101.05	101.05
6	187.6	3.07	3190	3000	101.02	101.35	101.56	101.90	101.70	101.93	101.41	101.67	102.24	101.60	101.71	101.87
7	170.0	3.09	3183	3000	100.07	100.02	100.16	100.51	99.43	100.65	100.15	100.25	101.00	100.94	100.12	101.00
8	189.8	3.05	3227	3000	100.92	101.35	101.55	101.65	101.78	101.60	101.26	101.45	102.11	101.48	101.95	101.95
9	168.1	3.16	3159	3000	100.27	100.43	100.52	100.50	100.18	101.02	100.88	100.51	100.89	101.31	100.59	101.19
10	174.2	3.08	3228	3000	100.62	100.80	101.10	101.43	100.52	101.28	100.73	100.71	101.15	101.66	100.86	101.61
11	187.5	3.06	3232	3000	100.20	100.27	100.67	101.04	101.13	101.14	100.31	101.01	101.01	100.53	100.91	100.91
12	187.3	3.07	3272	3000	100.01	99.92	100.20	100.52	100.65	100.73	99.95	100.38	100.53	100.11	100.43	100.37
13	189.7	3.08	3170	3000	100.93	100.96	101.30	100.53	100.54	100.82	100.19	100.30	100.69	100.21	100.37	100.37
14	185.3	3.05	3170	3000	100.50	100.67	100.91	101.22	100.95	100.85	100.10	101.17	101.40	100.92	101.24	101.24
15	174.2	3.11	3216	3000	100.28	99.77	100.83	100.78	100.50	100.71	100.59	100.04	100.40	99.83	99.94	100.06
16	193.1	3.09	3279	3000	100.78	100.66	101.04	101.41	101.16	101.01	100.78	101.14	101.04	100.57	101.04	101.66
17	188.5	3.07	3266	3000	100.19	99.93	100.49	100.72	100.45	100.60	100.20	100.12	100.00	99.68	100.53	100.27
18	187.6	3.07	3203	3000	100.17	99.94	100.45	99.67	99.42	99.82	99.45	100.30	100.16	99.84	100.69	100.27
19	185.8	3.11	3226	3000	100.53	100.15	100.29	100.18	99.88	100.08	99.66	100.00	100.22	99.73	100.00	100.86
20	188.9	3.06	3195	3000	100.54	100.25	100.43	101.00	100.62	100.90	100.53	100.61	100.69	100.11	101.01	100.69
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean	**182.9**	**3.08**			**100.45**	**100.47**	**100.74**	**100.85**	**100.59**	**100.85**	**100.41**	**100.66**	**100.96**	**100.62**	**100.73**	**100.93**
Median	187.4	3.08			100.39	100.48	100.66	100.86	100.58	100.87	100.31	100.56	101.01	100.61	100.71	100.90
σ	8.3	0.03			0.31	0.47	0.43	0.55	0.69	0.49	0.52	0.48	0.58	0.62	0.53	0.54
Min.	168.1	3.05			100.01	99.77	100.16	99.67	99.42	99.82	99.45	100.00	100.00	99.68	99.94	100.06
Max.	193.1	3.16			101.02	101.35	101.56	101.90	101.78	101.93	101.41	101.67	102.24	101.66	101.95	101.95

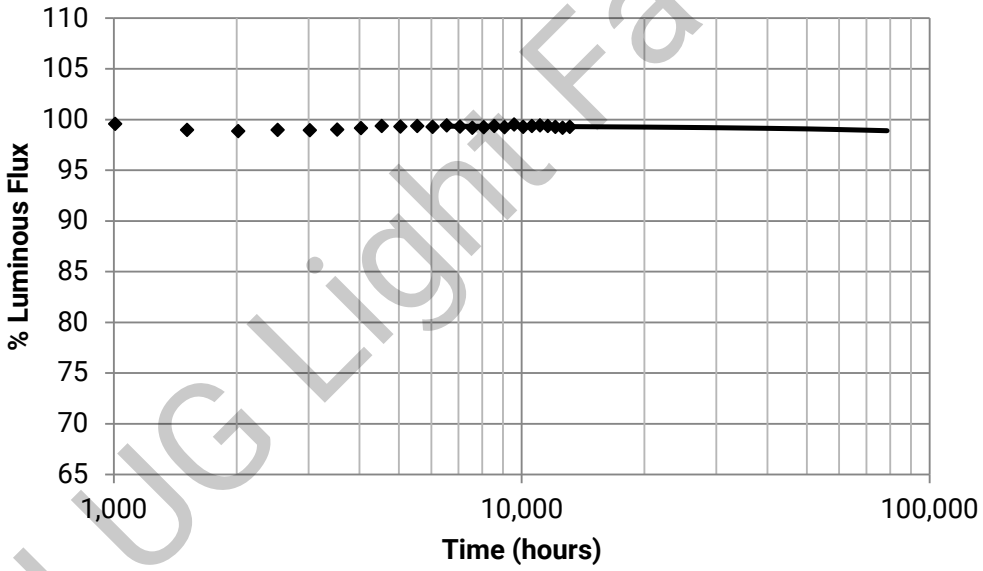
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')											
	CCx	CCy	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080	10584	11088	11592	12096
1	0.4218	0.4048	3284	3000	0.0021	0.0023	0.0024	0.0023	0.0024	0.0023	0.0023	0.0021	0.0021	0.0022	0.0023	0.0022
2	0.4297	0.4097	3177	3000	0.0023	0.0025	0.0025	0.0024	0.0025	0.0024	0.0024	0.0024	0.0024	0.0024	0.0026	0.0025
3	0.4245	0.4056	3240	3000	0.0021	0.0023	0.0023	0.0022	0.0022	0.0023	0.0022	0.0021	0.0021	0.0022	0.0024	0.0022
4	0.4217	0.4059	3295	3000	0.0022	0.0024	0.0025	0.0024	0.0024	0.0024	0.0024	0.0022	0.0022	0.0023	0.0025	0.0024
5	0.4263	0.4090	3233	3000	0.0022	0.0022	0.0023	0.0022	0.0022	0.0022	0.0022	0.0019	0.0020	0.0022	0.0022	0.0021
6	0.4275	0.4062	3190	3000	0.0023	0.0024	0.0026	0.0025	0.0024	0.0024	0.0024	0.0023	0.0022	0.0023	0.0024	0.0023
7	0.4278	0.4060	3183	3000	0.0019	0.0019	0.0020	0.0019	0.0019	0.0019	0.0020	0.0017	0.0018	0.0019	0.0019	0.0019
8	0.4248	0.4047	3227	3000	0.0023	0.0024	0.0026	0.0024	0.0025	0.0026	0.0025	0.0024	0.0023	0.0024	0.0025	0.0024
9	0.4292	0.4064	3159	3000	0.0020	0.0020	0.0022	0.0021	0.0021	0.0022	0.0022	0.0018	0.0018	0.0019	0.0020	0.0020
10	0.4254	0.4062	3228	3000	0.0021	0.0021	0.0022	0.0021	0.0022	0.0021	0.0022	0.0020	0.0020	0.0020	0.0021	0.0021
11	0.4274	0.4115	3232	3000	0.0022	0.0022	0.0024	0.0023	0.0025	0.0024	0.0023	0.0023	0.0021	0.0023	0.0024	0.0024
12	0.4239	0.4084	3272	3000	0.0024	0.0024	0.0025	0.0025	0.0026	0.0025	0.0025	0.0025	0.0023	0.0024	0.0025	0.0025
13	0.4306	0.4108	3170	3000	0.0026	0.0026	0.0027	0.0026	0.0026	0.0026	0.0025	0.0024	0.0023	0.0024	0.0024	0.0024
14	0.4282	0.4054	3170	3000	0.0024	0.0025	0.0026	0.0025	0.0024	0.0024	0.0024	0.0024	0.0023	0.0023	0.0024	0.0024
15	0.4261	0.4063	3216	3000	0.0019	0.0018	0.0021	0.0022	0.0022	0.0020	0.0019	0.0018	0.0018	0.0020	0.0019	0.0018
16	0.4223	0.4054	3279	3000	0.0025	0.0024	0.0026	0.0026	0.0026	0.0024	0.0024	0.0024	0.0023	0.0024	0.0024	0.0023
17	0.4241	0.4080	3266	3000	0.0021	0.0022	0.0022	0.0024	0.0024	0.0023	0.0022	0.0023	0.0023	0.0024	0.0024	0.0024
18	0.4266	0.4058	3203	3000	0.0018	0.0021	0.0022	0.0022	0.0023	0.0022	0.0021	0.0022	0.0022	0.0022	0.0023	0.0022
19	0.4264	0.4084	3226	3000	0.0020	0.0021	0.0022	0.0021	0.0022	0.0022	0.0021	0.0021	0.0022	0.0023	0.0023	0.0022
20	0.4262	0.4039	3195	3000	0.0020	0.0020	0.0021	0.0022	0.0023	0.0022	0.0021	0.0022	0.0022	0.0022	0.0021	0.0022
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean					**0.0022**	**0.0022**	**0.0024**	**0.0023**	**0.0023**	**0.0023**	**0.0023**	**0.0022**	**0.0021**	**0.0022**	**0.0023**	**0.0022**
Median					0.0022	0.0022	0.0024	0.0023	0.0024	0.0023	0.0023	0.0022	0.0022	0.0023	0.0024	0.0022
σ					0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.					0.0018	0.0018	0.0020	0.0019	0.0019	0.0019	0.0019	0.0017	0.0018	0.0019	0.0019	0.0018
Max.					0.0026	0.0026	0.0027	0.0026	0.0026	0.0026	0.0025	0.0025	0.0024	0.0024	0.0026	0.0025

DATA SET 9: 105°C; 500 mA

LED Package Series	XLamp XT-E White LEDs (Series: XTEAWT) This LM-80 report is applicable to the following order codes: XTEAWT-xx-xxxx-xxxxxxxxx
Tested Model Number	XTEAWT-00-0000-00000LBE7
Drive Current [I_F]	500 mA
Testing Initiation Date	December 4, 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	13,104 hours
Test duration used for projection	t=6,552 to t=13,104
α	6.205E-08
β	9.938E-01
Reported Lifetimes	**L90(13k) > 78,600 hours**
	L80(13k) > 78,600 hours
	L70(13k) > 78,600 hours



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

Time (hours)	Lumen Maintenance
0	100.00%
4032	99.16%
4536	99.35%
5040	99.29%
5544	99.37%
6048	99.29%
6552	99.43%
7056	99.31%
7560	99.20%
8064	99.23%
8568	99.38%
9072	99.25%
9576	99.53%
10080	99.26%
10584	99.36%
11088	99.43%
11592	99.37%
12096	99.27%
12600	99.18%
13104	99.28%

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

Note: Data points t=168 hr through t=3528 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 through t=3528 would be excluded, so the projection is unaffected.

DATA SET 9: 105°C; 500 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	6552
1	176.6	3.14	3264	3000	99.78	100.05	99.43	99.17	99.18	99.22	99.49	99.62	99.60	99.18	99.72	99.37	99.12
2	195.3	3.11	3243	3000	100.04	100.06	99.23	99.29	99.25	99.07	99.11	99.25	99.78	99.25	99.63	99.64	100.07
3	193.5	3.07	3288	3000	99.70	99.95	99.46	98.96	98.91	98.94	98.89	99.38	99.68	99.12	99.04	99.67	100.04
4	188.5	3.06	3125	3000	99.90	99.49	99.06	98.98	99.04	98.92	99.04	99.45	99.67	99.15	99.16	99.86	100.17
5	174.7	3.05	3230	3000	100.43	100.26	99.03	98.40	98.73	98.75	98.68	98.41	98.74	98.43	98.56	98.86	98.88
6	176.1	3.08	3187	3000	100.39	99.87	99.38	99.17	99.05	99.89	99.53	99.71	99.33	99.19	99.38	99.15	99.70
7	174.8	3.07	3253	3000	100.08	98.94	98.34	98.32	98.56	98.37	98.29	98.55	98.78	98.73	99.59	98.75	98.45
8	191.7	3.06	3233	3000	99.72	99.19	98.85	98.85	99.11	98.98	99.19	99.38	99.52	99.74	99.47	99.20	98.95
9	191.5	3.06	3222	3000	99.62	99.63	99.27	99.28	99.57	99.41	99.32	99.57	99.71	99.77	99.73	99.60	99.33
10	189.2	3.05	3147	3000	100.38	100.08	99.98	99.87	99.69	99.57	99.60	100.27	100.30	100.46	100.45	100.37	100.31
11	177.8	3.07	3227	3000	100.25	99.56	99.16	99.09	99.18	99.44	99.74	99.80	99.63	99.39	99.54	99.29	98.92
12	178.8	3.14	3269	3000	100.41	98.40	97.95	98.09	98.31	98.55	98.53	98.63	98.49	98.51	98.94	98.65	99.11
13	195.4	3.12	3262	3000	100.01	98.86	98.41	98.61	98.75	98.48	98.38	98.40	98.71	99.34	99.05	98.68	99.71
14	171.3	3.07	3200	3000	100.54	99.43	98.04	97.71	98.19	98.22	98.36	98.47	98.51	98.32	98.90	98.72	98.69
15	191.7	3.08	3200	3000	99.63	98.78	98.24	98.45	98.39	98.27	98.28	98.29	98.81	99.15	98.76	98.51	99.18
16	174.4	3.07	3235	3000	100.17	99.32	98.01	97.71	97.94	97.89	98.03	97.90	98.23	97.99	98.47	98.81	98.44
17	187.6	3.06	3204	3000	100.17	99.28	98.87	98.75	98.65	98.46	98.46	98.71	99.24	99.75	99.09	99.06	99.83
18	192.7	3.06	3193	3000	100.23	100.13	99.59	99.49	99.65	99.59	99.27	99.58	99.97	100.45	99.89	99.98	99.77
19	174.9	3.06	3226	3000	100.10	100.12	99.70	99.41	99.89	99.48	100.01	99.97	99.94	99.48	99.51	99.40	99.50
20	191.0	3.05	3200	3000	100.38	100.03	99.81	99.81	99.76	99.63	99.72	99.85	100.41	100.43	100.45	100.18	100.44
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean	**184.4**	**3.08**			**100.10**	**99.57**	**98.99**	**98.87**	**98.99**	**98.96**	**99.00**	**99.16**	**99.35**	**99.29**	**99.37**	**99.29**	**99.43**
Median	188.0	3.07			100.13	99.60	99.11	98.97	99.05	98.96	99.07	99.38	99.56	99.22	99.43	99.24	99.41
σ	8.6	0.03			0.29	0.54	0.63	0.62	0.55	0.57	0.59	0.67	0.63	0.69	0.54	0.55	0.61
Min.	171.3	3.05			99.62	98.40	97.95	97.71	97.94	97.89	98.03	97.90	98.23	97.99	98.47	98.51	98.44
Max.	195.4	3.14			100.54	100.26	99.98	99.87	99.89	99.89	100.01	100.27	100.41	100.46	100.45	100.37	100.44

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	6552
1	0.4230	0.4051	3264	3000	0.0008	0.0015	0.0017	0.0019	0.0019	0.0019	0.0019	0.0018	0.0019	0.0019	0.0015	0.0020	0.0019
2	0.4240	0.4049	3243	3000	0.0008	0.0015	0.0017	0.0016	0.0017	0.0017	0.0017	0.0017	0.0019	0.0019	0.0016	0.0017	0.0019
3	0.4225	0.4071	3288	3000	0.0008	0.0013	0.0016	0.0015	0.0016	0.0016	0.0017	0.0016	0.0017	0.0019	0.0014	0.0017	0.0019
4	0.4318	0.4079	3125	3000	0.0006	0.0011	0.0013	0.0013	0.0013	0.0011	0.0013	0.0014	0.0016	0.0015	0.0012	0.0015	0.0016
5	0.4236	0.4022	3230	3000	0.0009	0.0017	0.0017	0.0017	0.0017	0.0017	0.0019	0.0018	0.0019	0.0019	0.0014	0.0018	0.0017
6	0.4286	0.4086	3187	3000	0.0010	0.0016	0.0018	0.0017	0.0017	0.0016	0.0017	0.0017	0.0018	0.0019	0.0015	0.0018	0.0019
7	0.4241	0.4063	3253	3000	0.0003	0.0006	0.0008	0.0007	0.0007	0.0009	0.0010	0.0010	0.0010	0.0011	0.0010	0.0011	0.0011
8	0.4247	0.4053	3233	3000	0.0004	0.0010	0.0011	0.0013	0.0013	0.0014	0.0015	0.0014	0.0014	0.0013	0.0014	0.0014	0.0014
9	0.4254	0.4054	3222	3000	0.0006	0.0012	0.0013	0.0013	0.0012	0.0014	0.0015	0.0014	0.0013	0.0014	0.0014	0.0013	0.0013
10	0.4293	0.4050	3147	3000	0.0006	0.0013	0.0014	0.0014	0.0014	0.0015	0.0016	0.0016	0.0014	0.0015	0.0015	0.0017	0.0016
11	0.4259	0.4072	3227	3000	0.0008	0.0013	0.0011	0.0012	0.0012	0.0014	0.0015	0.0014	0.0014	0.0014	0.0014	0.0015	0.0015
12	0.4232	0.4062	3269	3000	0.0005	0.0009	0.0009	0.0010	0.0009	0.0011	0.0011	0.0013	0.0012	0.0011	0.0011	0.0012	0.0011
13	0.4232	0.4053	3262	3000	0.0007	0.0011	0.0012	0.0011	0.0012	0.0013	0.0014	0.0014	0.0014	0.0015	0.0014	0.0014	0.0014
14	0.4276	0.4077	3200	3000	0.0006	0.0009	0.0010	0.0010	0.0010	0.0011	0.0012	0.0011	0.0012	0.0012	0.0012	0.0012	0.0011
15	0.4280	0.4087	3200	3000	0.0006	0.0010	0.0011	0.0012	0.0011	0.0012	0.0014	0.0013	0.0014	0.0012	0.0012	0.0013	0.0013
16	0.4252	0.4067	3235	3000	0.0006	0.0012	0.0012	0.0012	0.0012	0.0014	0.0016	0.0015	0.0015	0.0015	0.0015	0.0016	0.0015
17	0.4256	0.4036	3204	3000	0.0005	0.0007	0.0008	0.0009	0.0009	0.0010	0.0011	0.0010	0.0010	0.0010	0.0010	0.0011	0.0010
18	0.4291	0.4105	3193	3000	0.0006	0.0010	0.0012	0.0012	0.0010	0.0012	0.0013	0.0013	0.0013	0.0012	0.0012	0.0014	0.0013
19	0.4251	0.4054	3226	3000	0.0006	0.0012	0.0012	0.0012	0.0011	0.0013	0.0013	0.0013	0.0013	0.0012	0.0012	0.0015	0.0012
20	0.4276	0.4077	3200	3000	0.0007	0.0010	0.0011	0.0013	0.0014	0.0015	0.0017	0.0016	0.0016	0.0014	0.0014	0.0017	0.0015
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean					**0.0006**	**0.0011**	**0.0013**	**0.0013**	**0.0013**	**0.0014**	**0.0015**	**0.0014**	**0.0015**	**0.0015**	**0.0013**	**0.0015**	**0.0015**
Median					0.0006	0.0011	0.0012	0.0013	0.0012	0.0014	0.0015	0.0014	0.0014	0.0014	0.0014	0.0015	0.0015
σ					0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0003	0.0003	0.0002	0.0002	0.0003
Min.					0.0003	0.0006	0.0008	0.0007	0.0007	0.0009	0.0010	0.0010	0.0010	0.0010	0.0010	0.0011	0.0010
Max.					0.0010	0.0017	0.0018	0.0019	0.0019	0.0019	0.0019	0.0018	0.0019	0.0019	0.0016	0.0020	0.0019

DATA SET 9: 105°C; 500 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)												
	LF (lm)	V_F (V)	Calc. CCT	ANSI Target	7056	7560	8064	8568	9072	9576	10080	10584	11088	11592	12096	12600	13104
1	176.6	3.14	3264	3000	99.24	98.94	98.95	99.39	99.45	99.65	99.19	99.21	99.32	99.26	99.09	99.43	99.72
2	195.3	3.11	3243	3000	99.57	100.05	99.56	99.39	100.00	99.60	99.95	99.54	99.13	99.74	99.85	100.00	99.54
3	193.5	3.07	3288	3000	99.41	99.64	99.84	99.72	99.87	99.57	99.83	99.59	100.00	99.90	99.95	99.64	99.64
4	188.5	3.06	3125	3000	99.43	99.70	99.39	99.28	99.90	99.72	99.82	99.63	100.11	99.79	99.79	99.20	99.42
5	174.7	3.05	3230	3000	99.28	99.26	99.41	99.50	99.15	99.57	98.92	99.08	99.66	99.77	98.91	99.43	99.20
6	176.1	3.08	3187	3000	99.85	99.48	99.61	99.86	99.76	99.74	99.36	99.66	100.00	99.32	99.20	99.38	99.32
7	174.8	3.07	3253	3000	98.70	98.78	98.95	98.78	98.81	99.08	98.55	98.80	98.63	98.68	98.34	98.17	98.40
8	191.7	3.06	3233	3000	99.21	99.08	99.60	99.75	99.76	100.10	99.61	99.84	100.00	99.90	99.69	99.84	99.74
9	191.5	3.06	3222	3000	99.37	99.37	99.49	99.60	99.67	99.98	99.66	99.90	100.16	100.00	99.90	99.48	99.53
10	189.2	3.05	3147	3000	99.93	100.11	99.50	99.74	99.65	99.95	99.55	99.84	99.95	99.89	99.79	99.74	100.00
11	177.8	3.07	3227	3000	99.50	99.07	99.54	99.82	99.07	99.45	99.46	99.78	99.83	99.61	99.72	99.55	99.83
12	178.8	3.14	3269	3000	98.85	98.45	98.18	98.23	98.22	98.47	98.13	97.93	97.71	98.32	97.93	97.99	98.15
13	195.4	3.12	3262	3000	99.01	98.75	99.12	99.30	98.95	99.62	99.21	99.54	99.54	99.59	99.85	99.28	99.95
14	171.3	3.07	3200	3000	98.50	98.61	98.42	99.13	98.42	98.56	98.19	98.07	97.90	98.19	97.72	97.72	98.42
15	191.7	3.08	3200	3000	98.62	98.35	98.74	99.01	98.70	99.23	99.39	99.17	99.11	99.06	99.32	98.70	99.17
16	174.4	3.07	3235	3000	98.64	98.42	98.44	98.19	98.64	98.45	98.56	98.62	98.45	98.57	97.94	97.82	98.11
17	187.6	3.06	3204	3000	99.27	98.92	99.25	99.70	99.27	99.96	99.46	99.73	99.73	99.31	99.52	99.52	99.09
18	192.7	3.06	3193	3000	100.08	99.72	100.14	99.58	99.17	99.87	99.50	99.64	99.64	99.22	99.53	99.53	99.48
19	174.9	3.06	3226	3000	99.49	99.07	99.04	99.69	99.12	99.98	99.11	99.94	99.66	99.89	99.49	99.31	99.54
20	191.0	3.05	3200	3000	100.27	100.18	99.53	99.89	99.43	99.99	99.78	99.74	100.00	99.48	99.79	99.90	99.42
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean	**184.4**	**3.08**			**99.31**	**99.20**	**99.23**	**99.38**	**99.25**	**99.53**	**99.26**	**99.36**	**99.43**	**99.37**	**99.27**	**99.18**	**99.28**
Median	188.0	3.07			99.32	99.07	99.40	99.54	99.22	99.63	99.42	99.61	99.66	99.53	99.53	99.43	99.45
σ	8.6	0.03			0.49	0.57	0.50	0.50	0.52	0.52	0.54	0.59	0.73	0.55	0.72	0.71	0.58
Min.	171.3	3.05			98.50	98.35	98.18	98.19	98.22	98.45	98.13	97.93	97.71	98.19	97.72	97.72	98.11
Max.	195.4	3.14			100.27	100.18	100.14	99.89	100.00	100.10	99.95	99.94	100.16	100.00	99.95	100.00	100.00

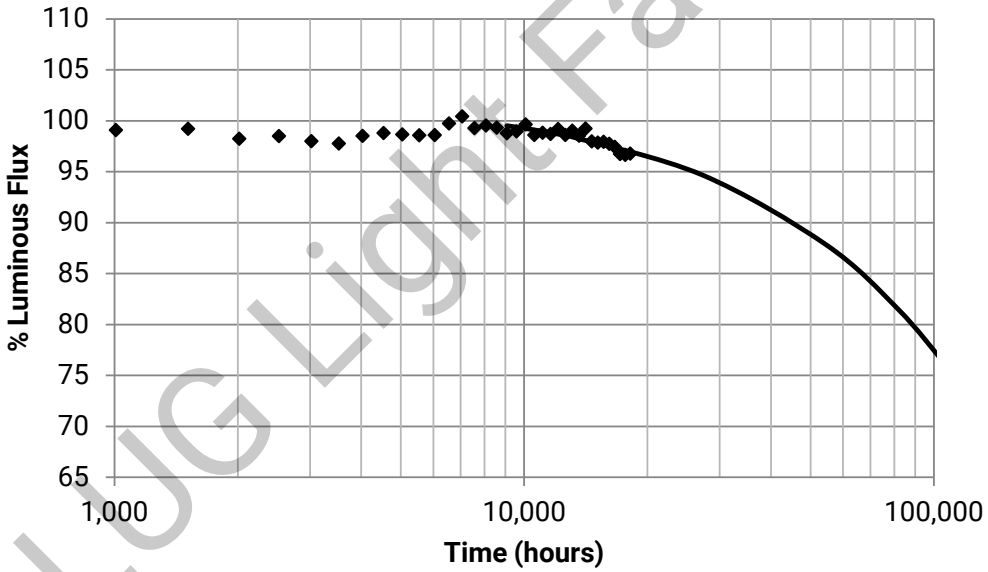
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')												
	CCx	CCy	Calc. CCT	ANSI Target	7056	7560	8064	8568	9072	9576	10080	10584	11088	11592	12096	12600	13104
1	0.4230	0.4051	3264	3000	0.0019	0.0020	0.0020	0.0020	0.0020	0.0019	0.0019	0.0020	0.0020	0.0018	0.0020	0.0020	0.0020
2	0.4240	0.4049	3243	3000	0.0019	0.0019	0.0018	0.0019	0.0019	0.0017	0.0018	0.0019	0.0019	0.0017	0.0018	0.0017	0.0018
3	0.4225	0.4071	3288	3000	0.0018	0.0017	0.0018	0.0018	0.0018	0.0017	0.0018	0.0018	0.0018	0.0017	0.0018	0.0018	0.0019
4	0.4318	0.4079	3125	3000	0.0015	0.0016	0.0016	0.0017	0.0017	0.0015	0.0017	0.0017	0.0017	0.0016	0.0016	0.0017	0.0017
5	0.4236	0.4022	3230	3000	0.0018	0.0018	0.0017	0.0019	0.0019	0.0017	0.0016	0.0017	0.0017	0.0017	0.0017	0.0018	0.0018
6	0.4286	0.4086	3187	3000	0.0018	0.0019	0.0018	0.0020	0.0020	0.0017	0.0017	0.0017	0.0018	0.0018	0.0017	0.0018	0.0019
7	0.4241	0.4063	3253	3000	0.0012	0.0012	0.0013	0.0013	0.0012	0.0012	0.0013	0.0011	0.0013	0.0012	0.0012	0.0012	0.0012
8	0.4247	0.4053	3233	3000	0.0015	0.0014	0.0016	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.0015	0.0015	0.0016	0.0016
9	0.4254	0.4054	3222	3000	0.0013	0.0014	0.0015	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0015	0.0012
10	0.4293	0.4050	3147	3000	0.0015	0.0016	0.0017	0.0016	0.0016	0.0017	0.0016	0.0015	0.0016	0.0016	0.0016	0.0017	0.0015
11	0.4259	0.4072	3227	3000	0.0015	0.0014	0.0016	0.0016	0.0016	0.0015	0.0014	0.0013	0.0015	0.0014	0.0014	0.0015	0.0015
12	0.4232	0.4062	3269	3000	0.0014	0.0013	0.0013	0.0013	0.0011	0.0012	0.0012	0.0011	0.0011	0.0011	0.0011	0.0012	0.0013
13	0.4232	0.4053	3262	3000	0.0015	0.0016	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.0015
14	0.4276	0.4077	3200	3000	0.0013	0.0013	0.0014	0.0013	0.0011	0.0011	0.0011	0.0012	0.0012	0.0012	0.0010	0.0012	0.0011
15	0.4280	0.4087	3200	3000	0.0013	0.0014	0.0014	0.0014	0.0013	0.0013	0.0013	0.0013	0.0013	0.0012	0.0012	0.0014	0.0014
16	0.4252	0.4067	3235	3000	0.0016	0.0017	0.0017	0.0016	0.0014	0.0014	0.0014	0.0014	0.0014	0.0015	0.0016	0.0016	0.0017
17	0.4256	0.4036	3204	3000	0.0012	0.0013	0.0012	0.0013	0.0012	0.0013	0.0013	0.0012	0.0012	0.0014	0.0013	0.0014	0.0014
18	0.4291	0.4105	3193	3000	0.0013	0.0014	0.0015	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0013	0.0014	0.0014
19	0.4251	0.4054	3226	3000	0.0014	0.0014	0.0015	0.0014	0.0013	0.0012	0.0012	0.0011	0.0011	0.0013	0.0012	0.0013	0.0013
20	0.4276	0.4077	3200	3000	0.0016	0.0016	0.0020	0.0019	0.0019	0.0018	0.0019	0.0017	0.0018	0.0018	0.0017	0.0019	0.0018
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean					**0.0015**	**0.0015**	**0.0016**	**0.0016**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0015**	**0.0016**	**0.0016**
Median					0.0015	0.0015	0.0016	0.0015	0.0015	0.0015	0.0015	0.0014	0.0015	0.0015	0.0015	0.0016	0.0015
σ					0.0002	0.0002	0.0002	0.0003	0.0003	0.0002	0.0002	0.0003	0.0003	0.0002	0.0003	0.0002	0.0003
Min.					0.0012	0.0012	0.0012	0.0013	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0010	0.0012	0.0011
Max.					0.0019	0.0020	0.0020	0.0020	0.0020	0.0019	0.0019	0.0020	0.0020	0.0018	0.0020	0.0020	0.0020

DATA SET 3+: 55°C; 1000 mA

LED Package Series	XLamp XT-E White LEDs (Series: XTEAWT) This LM-80 report is applicable to the following order codes: XTEAWT-xx-xxxx-xxxxxxxxx
Tested Model Number	XTEAWT-00-0000-00000LBE7
Drive Current [I_F]	1000 mA
Testing Initiation Date	December 19, 2011
Case Temperature [T_s]	55°C
Ambient Temperature [T_A]	55°C
Failures observed	None

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

Test duration	18,144 hours
Test duration used for projection	t=9,072 to t=18,144
α	2.745E-06
β	1.020E+00
Reported Lifetimes	**L90(18k) = 45,600 hours**
	L80(18k) = 88,500 hours
	L70(18k) > 99,800 hours



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

Time (hours)	Lumen Maintenance
0	100.00%
9072	98.78%
9576	98.96%
10080	99.64%
10584	98.61%
11088	98.83%
11592	98.71%
12096	99.19%
12600	98.61%
13104	99.03%
13608	98.53%
14112	99.24%
14616	97.98%
15120	97.86%
15624	97.94%
16128	97.74%
16632	97.44%
17136	96.74%
17640	96.65%
18144	96.78%

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

Note: Data points t=168 hr through t=8568 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=8568 hr would be excluded, so the projection is unaffected.

DATA SET 3+: 55°C; 1000 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	268.5	3.43	3009	3000	100.66	98.74	99.60	98.68	98.00	98.15	97.49	98.44	98.41	98.14	98.96	99.53
2	261.7	3.39	3046	3000	99.40	98.40	98.46	97.27	97.94	97.54	97.81	99.14	98.69	98.52	98.73	98.42
3	260.1	3.41	3064	3000	99.79	99.64	99.85	99.06	99.15	98.34	98.77	99.95	99.49	99.40	99.57	99.37
4	239.5	3.40	2897	3000	101.40	99.58	100.01	98.93	98.80	97.61	97.70	98.23	98.94	98.60	99.24	100.34
5	258.3	3.43	3004	3000	98.32	97.84	98.06	97.57	97.42	96.91	97.21	97.28	96.97	96.87	97.22	97.12
6	243.1	3.42	2984	3000	99.90	98.33	98.50	97.86	97.70	97.25	97.52	98.54	98.45	98.26	98.45	98.30
7	253.7	3.44	3022	3000	100.10	98.82	99.76	98.38	98.09	97.62	97.54	97.22	98.24	97.85	98.01	99.38
8	256.4	3.39	2941	3000	100.86	100.66	101.14	99.92	100.15	99.70	99.96	100.83	100.60	100.27	100.69	100.49
9	267.5	3.43	3202	3000	100.86	100.37	100.41	99.33	99.54	98.00	97.93	97.81	99.01	98.54	98.75	100.28
10	271.5	3.42	2903	3000	100.33	98.89	98.21	97.96	98.76	98.29	97.48	98.17	98.52	99.63	97.98	97.64
11	256.9	3.40	2957	3000	99.79	99.78	99.16	98.26	98.95	98.69	97.84	98.91	99.30	99.12	98.64	98.56
12	262.4	3.43	3030	3000	100.01	99.47	99.66	98.12	98.90	98.75	98.32	99.11	99.35	99.41	98.54	98.69
13	260.7	3.46	2983	3000	98.47	97.88	97.93	96.41	97.13	96.87	96.18	97.36	97.67	97.18	97.25	96.21
14	255.4	3.41	3025	3000	100.84	98.03	99.00	98.21	98.74	98.49	98.09	98.96	99.47	99.01	98.96	98.45
15	258.0	3.49	3046	3000	101.06	100.00	98.88	98.16	98.76	97.95	96.55	97.52	98.58	99.05	97.61	96.60
16	256.4	3.43	3080	3000	100.73	99.00	98.79	97.66	97.96	97.83	97.89	98.81	99.09	98.72	98.59	98.16
n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Mean	**258.1**	**3.42**			**100.16**	**99.09**	**99.21**	**98.24**	**98.50**	**98.00**	**97.77**	**98.52**	**98.80**	**98.66**	**98.57**	**98.60**
Median	258.2	3.43			100.21	98.94	99.08	98.18	98.75	97.98	97.76	98.49	98.82	98.66	98.61	98.50
σ	8.3	0.03			0.88	0.88	0.90	0.84	0.80	0.73	0.85	0.99	0.83	0.88	0.87	1.28
Min.	239.5	3.39			98.32	97.84	97.93	96.41	97.13	96.87	96.18	97.22	96.97	96.87	97.22	96.21
Max.	271.5	3.49			101.40	100.66	101.14	99.92	100.15	99.70	99.96	100.83	100.60	100.27	100.69	100.49

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	0.4359	0.4023	3009	3000	0.0004	0.0005	0.0006	0.0007	0.0008	0.0008	0.0009	0.0009	0.0009	0.0008	0.0009	0.0008
2	0.4320	0.3986	3046	3000	0.0006	0.0011	0.0012	0.0010	0.0014	0.0015	0.0015	0.0017	0.0018	0.0016	0.0019	0.0018
3	0.4302	0.3969	3064	3000	0.0005	0.0008	0.0008	0.0008	0.0009	0.0009	0.0009	0.0010	0.0010	0.0008	0.0009	0.0008
4	0.4406	0.3987	2897	3000	0.0005	0.0007	0.0009	0.0009	0.0010	0.0010	0.0012	0.0013	0.0013	0.0013	0.0012	0.0011
5	0.4293	0.3881	3004	3000	0.0009	0.0009	0.0008	0.0009	0.0008	0.0008	0.0009	0.0010	0.0009	0.0010	0.0007	0.0007
6	0.4389	0.4055	2984	3000	0.0004	0.0005	0.0005	0.0006	0.0006	0.0005	0.0005	0.0007	0.0007	0.0006	0.0005	0.0005
7	0.4374	0.4071	3022	3000	0.0006	0.0007	0.0011	0.0011	0.0013	0.0013	0.0013	0.0016	0.0016	0.0016	0.0016	0.0017
8	0.4392	0.4010	2941	3000	0.0011	0.0011	0.0013	0.0012	0.0013	0.0013	0.0013	0.0015	0.0015	0.0014	0.0013	0.0013
9	0.4280	0.4091	3202	3000	0.0004	0.0007	0.0011	0.0011	0.0012	0.0013	0.0012	0.0014	0.0015	0.0015	0.0015	0.0016
10	0.4432	0.4045	2903	3000	0.0005	0.0008	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0013	0.0014	0.0011	0.0014
11	0.4406	0.4057	2957	3000	0.0004	0.0005	0.0005	0.0006	0.0007	0.0008	0.0006	0.0009	0.0009	0.0009	0.0009	0.0010
12	0.4354	0.4039	3030	3000	0.0002	0.0006	0.0007	0.0007	0.0008	0.0009	0.0008	0.0009	0.0010	0.0009	0.0008	0.0010
13	0.4353	0.3981	2983	3000	0.0004	0.0008	0.0008	0.0009	0.0010	0.0012	0.0012	0.0012	0.0014	0.0014	0.0014	0.0014
14	0.4366	0.4058	3025	3000	0.0004	0.0003	0.0005	0.0007	0.0008	0.0010	0.0010	0.0011	0.0011	0.0011	0.0011	0.0012
15	0.4329	0.4005	3046	3000	0.0004	0.0005	0.0002	0.0004	0.0005	0.0006	0.0002	0.0007	0.0008	0.0007	0.0005	0.0009
16	0.4371	0.4138	3080	3000	0.0005	0.0007	0.0009	0.0010	0.0010	0.0012	0.0012	0.0014	0.0015	0.0014	0.0014	0.0015
n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Mean					**0.0005**	**0.0007**	**0.0008**	**0.0008**	**0.0009**	**0.0010**	**0.0010**	**0.0012**	**0.0012**	**0.0011**	**0.0011**	**0.0012**
Median					0.0005	0.0007	0.0008	0.0009	0.0009	0.0010	0.0011	0.0012	0.0012	0.0012	0.0011	0.0012
σ					0.0002	0.0002	0.0003	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004
Min.					0.0002	0.0003	0.0002	0.0004	0.0005	0.0005	0.0002	0.0007	0.0007	0.0006	0.0005	0.0005
Max.					0.0011	0.0011	0.0013	0.0012	0.0014	0.0015	0.0015	0.0017	0.0018	0.0016	0.0019	0.0018

DATA SET 3+: 55°C; 1000 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	12096
1	268.5	3.43	3009	3000	99.64	101.27	98.44	100.09	99.21	98.07	98.47	99.30	98.16	98.76	98.51	98.53
2	261.7	3.39	3046	3000	99.24	100.19	99.75	99.74	99.94	99.15	99.67	99.44	99.51	99.16	98.92	99.25
3	260.1	3.41	3064	3000	100.31	101.31	100.83	100.87	100.87	100.38	100.63	100.90	100.38	99.98	99.80	100.35
4	239.5	3.40	2897	3000	100.89	102.33	99.06	100.63	99.77	98.62	98.44	99.79	97.68	98.80	98.94	98.94
5	258.3	3.43	3004	3000	98.05	98.95	98.48	98.59	98.73	98.24	98.65	98.78	98.50	98.21	97.77	98.42
6	243.1	3.42	2984	3000	99.24	100.06	99.28	99.66	99.82	99.33	99.47	99.77	98.76	98.98	98.73	99.10
7	253.7	3.44	3022	3000	100.25	101.33	97.88	99.51	98.51	97.64	97.23	98.73	96.73	97.34	97.21	97.87
8	256.4	3.39	2941	3000	101.58	102.37	102.16	101.96	102.29	101.79	101.89	101.98	102.13	101.39	101.10	101.61
9	267.5	3.43	3202	3000	101.34	102.22	99.03	100.36	99.55	98.22	97.92	99.11	98.16	98.65	98.69	98.83
10	271.5	3.42	2903	3000	99.57	99.55	98.40	99.98	99.16	98.27	98.27	99.88	98.13	98.43	98.33	98.86
11	256.9	3.40	2957	3000	99.91	99.96	99.75	99.31	98.55	99.73	99.62	100.04	99.35	99.21	99.18	99.90
12	262.4	3.43	3030	3000	100.10	100.37	100.02	99.35	99.73	99.69	99.56	100.11	98.68	99.06	99.22	99.95
13	260.7	3.46	2983	3000	97.94	98.05	97.85	96.60	96.56	97.20	97.68	98.36	96.72	97.52	97.56	98.16
14	255.4	3.41	3025	3000	99.68	100.02	99.65	98.69	99.33	97.87	99.60	100.01	98.56	99.12	99.14	99.67
15	258.0	3.49	3046	3000	98.71	99.16	98.53	98.70	97.75	98.34	97.48	98.90	98.05	98.16	97.66	98.47
16	256.4	3.43	3080	3000	99.37	99.79	99.51	98.50	99.38	97.92	98.79	99.16	98.19	98.45	98.53	99.16
n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Mean	**258.1**	**3.42**			**99.74**	**100.43**	**99.29**	**99.53**	**99.32**	**98.78**	**98.96**	**99.64**	**98.61**	**98.83**	**98.71**	**99.19**
Median	258.2	3.43			99.66	100.13	99.17	99.59	99.36	98.31	98.72	99.61	98.35	98.78	98.71	99.02
σ	8.3	0.03			1.03	1.27	1.12	1.22	1.26	1.18	1.22	0.90	1.32	0.95	0.95	0.94
Min.	239.5	3.39			97.94	98.05	97.85	96.60	96.56	97.20	97.23	98.36	96.72	97.34	97.21	97.87
Max.	271.5	3.49			101.58	102.37	102.16	101.96	102.29	101.79	101.89	101.98	102.13	101.39	101.10	101.61

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	12096
1	0.4359	0.4023	3009	3000	0.0010	0.0009	0.0010	0.0010	0.0010	0.0011	0.0011	0.0014	0.0012	0.0015	0.0010	0.0014
2	0.4320	0.3986	3046	3000	0.0019	0.0019	0.0020	0.0020	0.0020	0.0020	0.0021	0.0024	0.0022	0.0026	0.0026	0.0026
3	0.4302	0.3969	3064	3000	0.0009	0.0008	0.0008	0.0008	0.0010	0.0009	0.0010	0.0013	0.0010	0.0011	0.0012	0.0013
4	0.4406	0.3987	2897	3000	0.0014	0.0013	0.0015	0.0014	0.0014	0.0015	0.0014	0.0014	0.0014	0.0016	0.0016	0.0016
5	0.4293	0.3881	3004	3000	0.0007	0.0006	0.0008	0.0007	0.0007	0.0008	0.0011	0.0010	0.0007	0.0010	0.0010	0.0010
6	0.4389	0.4055	2984	3000	0.0006	0.0006	0.0006	0.0006	0.0007	0.0007	0.0007	0.0009	0.0007	0.0009	0.0009	0.0010
7	0.4374	0.4071	3022	3000	0.0018	0.0017	0.0019	0.0019	0.0020	0.0021	0.0021	0.0023	0.0020	0.0023	0.0021	0.0024
8	0.4392	0.4010	2941	3000	0.0013	0.0012	0.0012	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0014	0.0014	0.0014
9	0.4280	0.4091	3202	3000	0.0017	0.0016	0.0017	0.0018	0.0019	0.0017	0.0019	0.0020	0.0020	0.0022	0.0022	0.0022
10	0.4432	0.4045	2903	3000	0.0015	0.0016	0.0017	0.0016	0.0018	0.0020	0.0020	0.0019	0.0020	0.0021	0.0021	0.0022
11	0.4406	0.4057	2957	3000	0.0009	0.0011	0.0011	0.0010	0.0009	0.0012	0.0012	0.0012	0.0011	0.0013	0.0013	0.0014
12	0.4354	0.4039	3030	3000	0.0009	0.0011	0.0010	0.0009	0.0010	0.0011	0.0011	0.0011	0.0010	0.0011	0.0013	0.0013
13	0.4353	0.3981	2983	3000	0.0014	0.0017	0.0017	0.0013	0.0013	0.0017	0.0019	0.0020	0.0016	0.0023	0.0023	0.0023
14	0.4366	0.4058	3025	3000	0.0011	0.0012	0.0013	0.0011	0.0012	0.0012	0.0015	0.0015	0.0013	0.0015	0.0016	0.0015
15	0.4329	0.4005	3046	3000	0.0009	0.0008	0.0010	0.0009	0.0008	0.0011	0.0011	0.0010	0.0012	0.0011	0.0011	0.0010
16	0.4371	0.4138	3080	3000	0.0016	0.0016	0.0017	0.0013	0.0017	0.0015	0.0018	0.0019	0.0014	0.0020	0.0020	0.0021
n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Mean					**0.0012**	**0.0012**	**0.0013**	**0.0012**	**0.0013**	**0.0014**	**0.0015**	**0.0015**	**0.0014**	**0.0016**	**0.0016**	**0.0017**
Median					0.0012	0.0012	0.0012	0.0012	0.0013	0.0012	0.0014	0.0014	0.0013	0.0015	0.0015	0.0015
σ					0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005	0.0006
Min.					0.0006	0.0006	0.0006	0.0006	0.0007	0.0007	0.0007	0.0009	0.0007	0.0009	0.0009	0.0010
Max.					0.0019	0.0019	0.0020	0.0020	0.0020	0.0021	0.0021	0.0024	0.0022	0.0026	0.0026	0.0026

DATA SET 3+: 55°C; 1000 mA

Lamp #	Initial (0 hrs)				Lumen Maintenance (%)											
	LF (lm)	V_F (V)	Calc. CCT	ANSI Target	12600	13104	13608	14112	14616	15120	15624	16128	16632	17136	17640	18144
1	268.5	3.43	3009	3000	98.17	99.11	97.29	98.62	97.23	98.01	96.73	95.51	96.22	96.08	96.17	96.01
2	261.7	3.39	3046	3000	98.83	99.48	98.77	99.50	98.17	98.45	98.18	98.33	97.61	97.56	97.28	97.49
3	260.1	3.41	3064	3000	99.59	100.23	99.64	100.42	98.83	99.09	98.95	98.66	97.96	97.47	96.83	96.91
4	239.5	3.40	2897	3000	98.44	99.00	98.25	98.96	97.55	97.89	97.77	96.75	96.87	96.68	96.82	96.40
5	258.3	3.43	3004	3000	97.78	98.52	98.14	98.09	97.29	97.42	97.38	97.71	96.92	96.62	96.39	96.43
6	243.1	3.42	2984	3000	98.69	99.17	98.96	99.62	98.35	98.39	98.40	98.53	97.92	97.74	97.27	97.53
7	253.7	3.44	3022	3000	97.40	98.21	97.28	97.96	97.01	96.57	97.08	96.36	96.20	95.75	95.99	95.87
8	256.4	3.39	2941	3000	101.02	102.00	101.37	102.04	100.65	100.43	100.71	100.76	100.37	99.71	99.75	99.94
9	267.5	3.43	3202	3000	97.92	98.67	97.84	98.24	96.89	96.71	96.57	96.38	96.19	95.77	95.84	95.71
10	271.5	3.42	2903	3000	98.43	98.18	97.75	98.64	97.57	97.69	97.29	96.69	97.87	96.10	95.85	96.75
11	256.9	3.40	2957	3000	99.41	99.15	99.16	100.06	98.63	98.14	98.68	97.95	98.19	97.08	97.01	97.08
12	262.4	3.43	3030	3000	99.02	99.16	99.20	100.10	98.33	97.86	98.47	98.88	97.97	97.11	97.06	97.13
13	260.7	3.46	2983	3000	97.57	97.75	97.55	98.31	97.13	96.75	97.17	97.44	96.19	95.34	95.45	95.76
14	255.4	3.41	3025	3000	99.17	99.64	99.26	100.10	98.93	98.42	98.50	99.19	98.47	97.50	97.32	97.58
15	258.0	3.49	3046	3000	97.78	97.22	97.42	98.06	97.36	96.95	97.50	97.33	97.21	95.88	95.94	96.27
16	256.4	3.43	3080	3000	98.50	98.95	98.64	99.08	97.74	97.00	97.59	97.40	96.86	95.44	95.49	95.61
n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Mean	**258.1**	**3.42**			**98.61**	**99.03**	**98.53**	**99.24**	**97.98**	**97.86**	**97.94**	**97.74**	**97.44**	**96.74**	**96.65**	**96.78**
Median	258.2	3.43			98.47	99.05	98.45	99.02	97.66	97.88	97.68	97.58	97.41	96.65	96.60	96.59
σ	8.3	0.03			0.92	1.08	1.08	1.12	0.97	1.01	1.03	1.31	1.11	1.13	1.05	1.08
Min.	239.5	3.39			97.40	97.22	97.28	97.96	96.89	96.57	96.57	95.51	96.19	95.34	95.45	95.61
Max.	271.5	3.49			101.02	102.00	101.37	102.04	100.65	100.43	100.71	100.76	100.37	99.71	99.75	99.94

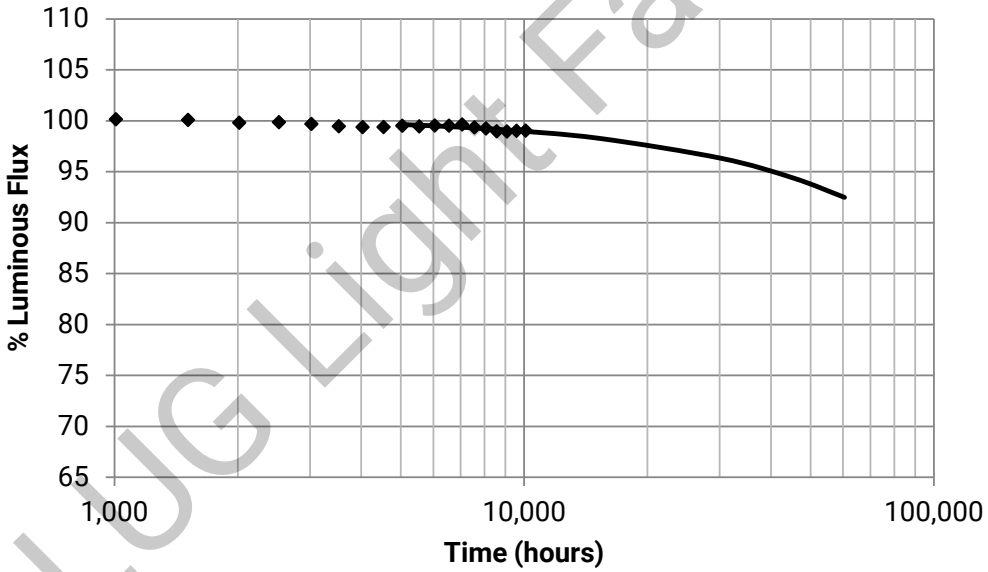
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')											
	CCx	CCy	Calc. CCT	ANSI Target	12600	13104	13608	14112	14616	15120	15624	16128	16632	17136	17640	18144
1	0.4359	0.4023	3009	3000	0.0015	0.0013	0.0013	0.0014	0.0014	0.0013	0.0012	0.0014	0.0012	0.0012	0.0009	0.0006
2	0.4320	0.3986	3046	3000	0.0026	0.0028	0.0029	0.0031	0.0032	0.0033	0.0034	0.0035	0.0034	0.0035	0.0034	0.0034
3	0.4302	0.3969	3064	3000	0.0012	0.0011	0.0011	0.0011	0.0012	0.0010	0.0009	0.0010	0.0007	0.0004	0.0004	0.0002
4	0.4406	0.3987	2897	3000	0.0017	0.0016	0.0018	0.0019	0.0017	0.0017	0.0017	0.0017	0.0015	0.0014	0.0012	0.0010
5	0.4293	0.3881	3004	3000	0.0010	0.0008	0.0009	0.0010	0.0011	0.0008	0.0009	0.0009	0.0009	0.0009	0.0008	0.0006
6	0.4389	0.4055	2984	3000	0.0010	0.0008	0.0009	0.0011	0.0011	0.0010	0.0011	0.0010	0.0010	0.0008	0.0006	0.0005
7	0.4374	0.4071	3022	3000	0.0026	0.0026	0.0027	0.0029	0.0029	0.0028	0.0029	0.0028	0.0028	0.0027	0.0024	0.0023
8	0.4392	0.4010	2941	3000	0.0016	0.0015	0.0015	0.0016	0.0017	0.0015	0.0013	0.0014	0.0015	0.0013	0.0012	0.0011
9	0.4280	0.4091	3202	3000	0.0023	0.0023	0.0024	0.0026	0.0026	0.0025	0.0024	0.0025	0.0024	0.0023	0.0020	0.0021
10	0.4432	0.4045	2903	3000	0.0021	0.0023	0.0022	0.0022	0.0025	0.0024	0.0024	0.0023	0.0024	0.0026	0.0025	0.0025
11	0.4406	0.4057	2957	3000	0.0015	0.0014	0.0014	0.0014	0.0014	0.0013	0.0013	0.0010	0.0011	0.0007	0.0006	0.0005
12	0.4354	0.4039	3030	3000	0.0013	0.0012	0.0013	0.0012	0.0011	0.0012	0.0011	0.0010	0.0009	0.0007	0.0006	0.0007
13	0.4353	0.3981	2983	3000	0.0024	0.0024	0.0023	0.0025	0.0024	0.0026	0.0026	0.0027	0.0027	0.0028	0.0030	0.0030
14	0.4366	0.4058	3025	3000	0.0017	0.0018	0.0017	0.0016	0.0018	0.0016	0.0015	0.0015	0.0016	0.0014	0.0011	0.0010
15	0.4329	0.4005	3046	3000	0.0012	0.0012	0.0012	0.0012	0.0014	0.0014	0.0013	0.0014	0.0013	0.0012	0.0011	0.0008
16	0.4371	0.4138	3080	3000	0.0022	0.0022	0.0022	0.0022	0.0021	0.0022	0.0021	0.0019	0.0019	0.0017	0.0016	0.0013
n	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Mean					**0.0017**	**0.0017**	**0.0017**	**0.0018**	**0.0018**	**0.0018**	**0.0018**	**0.0018**	**0.0017**	**0.0016**	**0.0015**	**0.0014**
Median					0.0016	0.0015	0.0016	0.0016	0.0017	0.0016	0.0014	0.0015	0.0015	0.0013	0.0011	0.0010
σ					0.0006	0.0006	0.0006	0.0007	0.0007	0.0008	0.0008	0.0008	0.0008	0.0009	0.0009	0.0010
Min.					0.0010	0.0008	0.0009	0.0010	0.0011	0.0008	0.0009	0.0009	0.0007	0.0004	0.0004	0.0002
Max.					0.0026	0.0028	0.0029	0.0031	0.0032	0.0033	0.0034	0.0035	0.0034	0.0035	0.0034	0.0034

DATA SET 10: 85°C; 1000 mA

LED Package Series	XLamp XT-E White LEDs (Series: XTEAWT) This LM-80 report is applicable to the following order codes: XTEAWT-xx-xxxx-xxxxxxxxx
Tested Model Number	XTEAWT-00-0000-00000LBE7
Drive Current [I_F]	1000 mA
Testing Initiation Date	December 4, 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	1.341E-06
β	1.003E+00
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	100.15%
1512	100.08%
2016	99.81%
2520	99.86%
3024	99.69%
3528	99.46%
4032	99.38%
4536	99.39%
5040	99.51%
5544	99.45%
6048	99.54%
6552	99.52%
7056	99.64%
7560	99.36%
8064	99.24%
8568	98.97%
9072	98.95%
9576	99.02%
10080	99.03%

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

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 10: 85°C; 1000 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	300.0	3.25	3298	3000	100.31	99.75	99.52	99.56	99.22	99.08	98.62	98.73	98.88	98.97	98.94	99.12
2	336.6	3.27	3279	3000	100.14	100.37	100.03	99.92	100.11	99.76	99.48	99.33	99.94	100.35	100.01	99.74
3	298.6	3.23	3251	3000	100.37	100.49	100.35	99.74	99.56	99.12	98.68	98.99	98.61	98.96	99.09	99.52
4	328.7	3.24	3276	3000	100.40	100.28	100.19	100.08	100.17	100.10	99.97	100.01	99.98	100.37	99.88	99.69
5	302.4	3.27	3237	3000	100.11	100.16	99.71	99.74	99.25	99.40	99.03	98.64	98.87	98.84	98.69	99.37
6	331.1	3.26	3280	3000	99.70	100.19	99.91	99.81	99.74	99.39	99.31	99.32	99.39	99.74	99.62	100.09
7	307.4	3.31	3145	3000	99.49	99.61	99.43	99.18	99.48	99.15	99.00	98.97	99.10	99.50	99.54	99.67
8	334.3	3.23	3264	3000	99.93	100.44	100.37	100.21	100.36	100.11	99.69	99.88	100.11	100.56	100.48	100.39
9	306.2	3.24	3240	3000	100.45	99.41	99.43	99.29	99.32	99.40	99.26	99.22	99.37	99.15	99.24	99.65
10	310.7	3.33	3303	3000	100.75	100.03	100.25	99.79	100.04	99.91	99.43	99.36	99.06	99.15	98.85	98.81
11	329.8	3.23	3218	3000	100.15	100.13	100.10	99.55	99.52	99.35	99.34	99.20	99.21	99.64	99.95	100.10
12	333.4	3.21	3197	3000	100.02	99.57	99.64	98.88	98.98	99.07	98.56	98.82	98.87	99.42	99.79	99.76
13	307.3	3.35	3285	3000	100.21	100.26	100.58	100.15	100.21	100.22	100.44	100.20	100.25	99.59	99.60	99.42
14	337.7	3.29	3255	3000	100.74	100.65	100.29	100.04	99.99	99.55	99.61	99.62	99.52	99.73	100.01	99.66
15	303.8	3.26	3305	3000	100.41	100.53	100.43	100.06	100.42	100.45	100.56	100.08	99.71	99.68	99.57	99.49
16	337.4	3.26	3317	3000	99.70	99.58	99.80	99.64	99.78	99.00	99.07	99.09	98.84	99.02	99.22	99.27
17	298.9	3.23	3232	3000	100.15	100.50	100.31	99.93	100.31	100.10	99.65	99.01	99.07	98.76	98.62	99.23
18	331.9	3.22	3238	3000	100.30	100.51	100.54	100.41	100.44	100.61	100.24	100.42	100.17	100.15	99.85	99.42
19	302.4	3.24	3283	3000	100.73	100.60	100.57	100.48	100.61	100.42	99.74	99.27	99.34	99.29	98.97	99.30
20	302.4	3.30	3207	3000	100.16	99.89	100.25	99.76	99.75	99.58	99.54	99.41	99.43	99.36	99.10	99.05
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean	**317.1**	**3.26**			**100.21**	**100.15**	**100.08**	**99.81**	**99.86**	**99.69**	**99.46**	**99.38**	**99.39**	**99.51**	**99.45**	**99.54**
Median	309.1	3.25			100.18	100.23	100.22	99.80	99.89	99.56	99.45	99.29	99.35	99.46	99.56	99.51
σ	15.6	0.04			0.34	0.39	0.38	0.40	0.47	0.52	0.56	0.51	0.50	0.53	0.51	0.38
Min.	298.6	3.21			99.49	99.41	99.43	98.88	98.98	99.00	98.56	98.64	98.61	98.76	98.62	98.81
Max.	337.7	3.35			100.75	100.65	100.58	100.48	100.61	100.61	100.56	100.42	100.25	100.56	100.48	100.39

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	0.4208	0.4041	3298	3000	0.0003	0.0009	0.0010	0.0013	0.0013	0.0014	0.0015	0.0014	0.0013	0.0015	0.0015	0.0015
2	0.4209	0.4019	3279	3000	0.0009	0.0016	0.0018	0.0021	0.0021	0.0022	0.0024	0.0024	0.0023	0.0025	0.0023	0.0025
3	0.4236	0.4048	3251	3000	0.0010	0.0015	0.0016	0.0017	0.0017	0.0019	0.0019	0.0020	0.0018	0.0019	0.0020	0.0018
4	0.4230	0.4066	3276	3000	0.0010	0.0017	0.0019	0.0020	0.0020	0.0022	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023
5	0.4250	0.4063	3237	3000	0.0008	0.0013	0.0013	0.0016	0.0015	0.0017	0.0017	0.0018	0.0018	0.0018	0.0018	0.0017
6	0.4208	0.4018	3280	3000	0.0006	0.0015	0.0015	0.0018	0.0017	0.0018	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
7	0.4293	0.4048	3145	3000	0.0008	0.0016	0.0018	0.0019	0.0020	0.0021	0.0022	0.0021	0.0021	0.0021	0.0022	0.0023
8	0.4229	0.4047	3264	3000	0.0009	0.0016	0.0018	0.0019	0.0019	0.0020	0.0021	0.0022	0.0023	0.0022	0.0023	0.0022
9	0.4248	0.4063	3240	3000	0.0008	0.0016	0.0018	0.0018	0.0017	0.0019	0.0020	0.0020	0.0018	0.0021	0.0021	0.0021
10	0.4198	0.4022	3303	3000	0.0008	0.0014	0.0015	0.0017	0.0016	0.0017	0.0017	0.0018	0.0019	0.0018	0.0017	0.0018
11	0.4261	0.4066	3218	3000	0.0008	0.0013	0.0014	0.0014	0.0014	0.0015	0.0017	0.0017	0.0017	0.0016	0.0017	0.0017
12	0.4261	0.4040	3197	3000	0.0009	0.0011	0.0012	0.0013	0.0014	0.0016	0.0016	0.0016	0.0017	0.0017	0.0017	0.0017
13	0.4235	0.4090	3285	3000	0.0006	0.0013	0.0016	0.0016	0.0018	0.0018	0.0018	0.0019	0.0020	0.0022	0.0022	0.0022
14	0.4229	0.4037	3255	3000	0.0006	0.0017	0.0019	0.0018	0.0021	0.0021	0.0022	0.0021	0.0023	0.0024	0.0023	0.0025
15	0.4189	0.4003	3305	3000	0.0007	0.0014	0.0016	0.0017	0.0021	0.0021	0.0023	0.0023	0.0023	0.0023	0.0025	0.0025
16	0.4205	0.4057	3317	3000	0.0004	0.0010	0.0010	0.0012	0.0013	0.0014	0.0015	0.0016	0.0015	0.0017	0.0019	0.0019
17	0.4264	0.4090	3232	3000	0.0008	0.0012	0.0013	0.0014	0.0015	0.0015	0.0017	0.0015	0.0017	0.0019	0.0019	0.0019
18	0.4235	0.4030	3238	3000	0.0008	0.0016	0.0018	0.0018	0.0021	0.0023	0.0022	0.0022	0.0022	0.0024	0.0021	0.0023
19	0.4202	0.4007	3283	3000	0.0008	0.0016	0.0017	0.0018	0.0020	0.0019	0.0021	0.0020	0.0021	0.0021	0.0020	0.0022
20	0.4269	0.4070	3207	3000	0.0008	0.0016	0.0017	0.0018	0.0020	0.0020	0.0021	0.0021	0.0021	0.0021	0.0022	0.0022
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean					**0.0008**	**0.0014**	**0.0016**	**0.0017**	**0.0018**	**0.0019**	**0.0019**	**0.0020**	**0.0020**	**0.0020**	**0.0020**	**0.0021**
Median					0.0008	0.0015	0.0016	0.0017	0.0018	0.0019	0.0020	0.0020	0.0020	0.0021	0.0021	0.0021
σ					0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Min.					0.0003	0.0009	0.0010	0.0012	0.0013	0.0014	0.0015	0.0014	0.0013	0.0015	0.0015	0.0015
Max.					0.0010	0.0017	0.0019	0.0021	0.0021	0.0023	0.0024	0.0024	0.0023	0.0025	0.0025	0.0025

DATA SET 10: 85°C; 1000 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	300.0	3.25	3298	3000	99.39	99.35	98.78	98.49	98.11	98.14	97.81	97.78
2	336.6	3.27	3279	3000	99.64	99.74	99.88	99.82	99.49	98.71	99.21	99.78
3	298.6	3.23	3251	3000	99.74	99.66	98.91	98.71	98.12	97.63	97.87	97.95
4	328.7	3.24	3276	3000	99.47	99.57	99.87	99.91	99.56	99.80	99.71	99.72
5	302.4	3.27	3237	3000	99.44	99.58	98.43	98.51	98.14	98.58	98.18	97.98
6	331.1	3.26	3280	3000	99.86	99.91	99.70	99.80	99.07	99.47	99.83	99.40
7	307.4	3.31	3145	3000	99.76	99.96	99.36	99.29	98.77	99.06	98.69	99.15
8	334.3	3.23	3264	3000	100.20	100.34	99.96	100.13	99.80	99.60	99.64	99.58
9	306.2	3.24	3240	3000	99.66	100.02	98.99	98.81	98.98	98.48	99.06	99.11
10	310.7	3.33	3303	3000	98.99	99.62	99.33	98.62	98.56	98.51	98.95	97.90
11	329.8	3.23	3218	3000	99.75	99.38	99.79	99.82	99.68	99.54	99.56	99.43
12	333.4	3.21	3197	3000	99.73	99.61	100.03	99.77	99.48	99.40	99.46	99.49
13	307.3	3.35	3285	3000	99.43	99.40	99.77	99.93	99.87	100.09	99.91	99.94
14	337.7	3.29	3255	3000	99.59	99.50	99.30	99.56	99.64	99.58	99.55	99.69
15	303.8	3.26	3305	3000	99.18	99.41	99.72	99.46	99.40	99.34	99.35	99.39
16	337.4	3.26	3317	3000	99.25	99.52	98.93	98.77	98.45	98.31	98.45	98.51
17	298.9	3.23	3232	3000	98.72	99.17	99.00	98.27	97.86	97.74	98.01	98.30
18	331.9	3.22	3238	3000	99.57	99.68	98.77	99.18	99.20	99.03	98.84	98.65
19	302.4	3.24	3283	3000	99.56	99.78	99.49	98.94	98.45	99.05	99.27	99.76
20	302.4	3.30	3207	3000	99.44	99.55	99.13	99.10	98.69	98.93	99.07	99.14
n	20	20	20	20	20	20	20	20	20	20	20	20
Mean	**317.1**	**3.26**			**99.52**	**99.64**	**99.36**	**99.24**	**98.97**	**98.95**	**99.02**	**99.03**
Median	309.1	3.25			99.57	99.59	99.35	99.24	99.02	99.04	99.14	99.27
σ	15.6	0.04			0.32	0.27	0.47	0.58	0.64	0.68	0.66	0.72
Min.	298.6	3.21			98.72	99.17	98.43	98.27	97.86	97.63	97.81	97.78
Max.	337.7	3.35			100.20	100.34	100.03	100.13	99.87	100.09	99.91	99.94

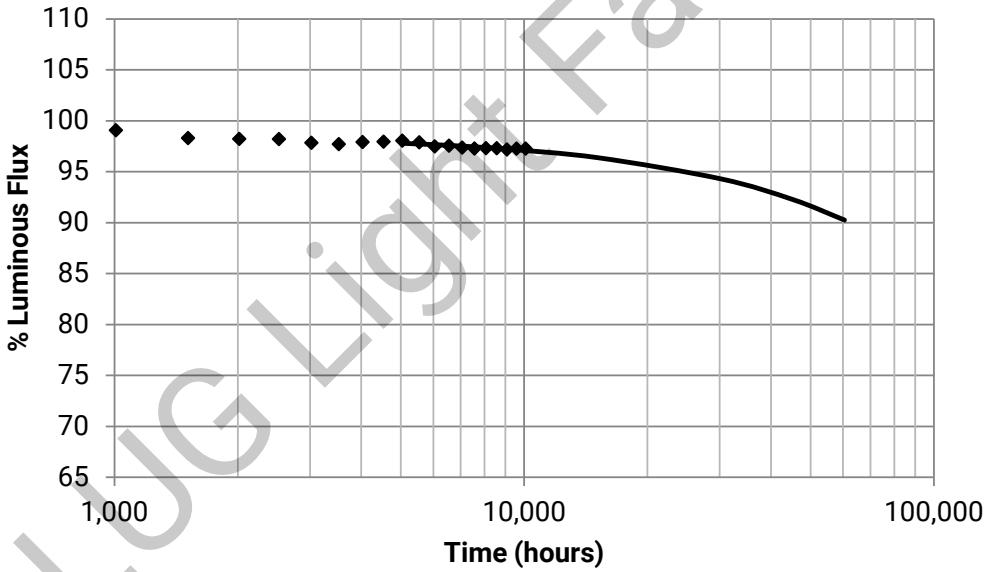
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')							
	CCx	CCy	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080
1	0.4208	0.4041	3298	3000	0.0015	0.0017	0.0017	0.0017	0.0017	0.0017	0.0016	0.0015
2	0.4209	0.4019	3279	3000	0.0024	0.0025	0.0026	0.0026	0.0026	0.0027	0.0025	0.0025
3	0.4236	0.4048	3251	3000	0.0018	0.0020	0.0020	0.0021	0.0021	0.0021	0.0023	0.0020
4	0.4230	0.4066	3276	3000	0.0024	0.0024	0.0024	0.0026	0.0025	0.0026	0.0024	0.0023
5	0.4250	0.4063	3237	3000	0.0018	0.0018	0.0018	0.0019	0.0019	0.0018	0.0020	0.0017
6	0.4208	0.4018	3280	3000	0.0019	0.0019	0.0018	0.0020	0.0018	0.0020	0.0019	0.0018
7	0.4293	0.4048	3145	3000	0.0023	0.0023	0.0023	0.0024	0.0024	0.0024	0.0024	0.0024
8	0.4229	0.4047	3264	3000	0.0022	0.0023	0.0022	0.0024	0.0024	0.0025	0.0023	0.0023
9	0.4248	0.4063	3240	3000	0.0020	0.0022	0.0021	0.0021	0.0022	0.0021	0.0021	0.0019
10	0.4198	0.4022	3303	3000	0.0017	0.0019	0.0018	0.0019	0.0019	0.0018	0.0017	0.0017
11	0.4261	0.4066	3218	3000	0.0016	0.0017	0.0017	0.0017	0.0017	0.0016	0.0016	0.0016
12	0.4261	0.4040	3197	3000	0.0017	0.0018	0.0017	0.0017	0.0019	0.0018	0.0019	0.0018
13	0.4235	0.4090	3285	3000	0.0022	0.0022	0.0021	0.0022	0.0022	0.0023	0.0021	0.0021
14	0.4229	0.4037	3255	3000	0.0024	0.0024	0.0025	0.0026	0.0025	0.0026	0.0024	0.0022
15	0.4189	0.4003	3305	3000	0.0024	0.0024	0.0025	0.0026	0.0025	0.0026	0.0026	0.0023
16	0.4205	0.4057	3317	3000	0.0018	0.0019	0.0019	0.0020	0.0019	0.0020	0.0017	0.0018
17	0.4264	0.4090	3232	3000	0.0018	0.0019	0.0021	0.0021	0.0020	0.0022	0.0021	0.0019
18	0.4235	0.4030	3238	3000	0.0022	0.0022	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
19	0.4202	0.4007	3283	3000	0.0020	0.0021	0.0023	0.0023	0.0022	0.0022	0.0022	0.0021
20	0.4269	0.4070	3207	3000	0.0020	0.0021	0.0022	0.0022	0.0021	0.0021	0.0021	0.0021
n	20	20	20	20	20	20	20	20	20	20	20	20
Mean					**0.0020**	**0.0021**	**0.0021**	**0.0022**	**0.0021**	**0.0022**	**0.0021**	**0.0020**
Median					0.0020	0.0021	0.0021	0.0021	0.0022	0.0022	0.0021	0.0020
σ					0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Min.					0.0015	0.0017	0.0017	0.0017	0.0017	0.0016	0.0016	0.0015
Max.					0.0024	0.0025	0.0026	0.0026	0.0026	0.0027	0.0026	0.0025

DATA SET 11: 105°C; 1000 mA

LED Package Series	XLamp XT-E White LEDs (Series: XTEAWT) This LM-80 report is applicable to the following order codes: XTEAWT-xx-xxxx-xxxxxxxxx
Tested Model Number	XTEAWT-00-0000-00000LBE7
Drive Current [I_F]	1000 mA
Testing Initiation Date	December 12, 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	10,080 hours
Test duration used for projection	t=5,040 to t=10,080
α	1.448E-06
β	9.852E-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	99.07%
1512	98.30%
2016	98.22%
2520	98.21%
3024	97.84%
3528	97.71%
4032	97.91%
4536	97.95%
5040	98.05%
5544	97.89%
6048	97.48%
6552	97.56%
7056	97.37%
7560	97.28%
8064	97.31%
8568	97.31%
9072	97.18%
9576	97.27%
10080	97.27%

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

Note: The data points 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 11: 105°C; 1000 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	293.0	3.36	3246	3000	99.91	98.97	97.99	97.65	97.71	97.49	97.36	97.77	97.75	97.63	98.15	97.15
2	330.7	3.24	3247	3000	100.39	97.60	97.06	97.02	97.13	96.73	96.60	96.85	96.41	96.66	96.37	96.05
3	329.5	3.29	3309	3000	99.59	99.24	99.00	98.79	98.71	98.22	98.16	98.64	98.37	98.71	98.26	97.84
4	304.1	3.32	3318	3000	99.58	99.22	97.11	96.58	96.75	96.93	96.89	96.92	96.66	96.36	97.04	96.32
5	327.2	3.27	3227	3000	100.27	99.23	98.37	98.46	98.72	98.06	97.69	98.35	98.42	98.82	98.35	98.17
6	322.2	3.24	3152	3000	99.88	99.56	98.77	98.69	98.64	98.15	97.87	98.50	98.43	98.73	98.29	98.18
7	292.0	3.26	3172	3000	100.16	99.89	97.67	97.46	97.49	97.54	97.86	97.57	97.99	97.46	97.58	96.79
8	335.2	3.22	3219	3000	100.03	99.28	98.80	99.07	99.08	98.65	98.57	98.52	98.57	99.13	98.41	98.03
9	305.4	3.25	3203	3000	99.87	99.11	98.41	98.14	98.55	98.44	98.34	98.75	98.90	97.84	97.55	97.44
10	298.9	3.24	3295	3000	100.26	99.54	99.53	99.42	98.56	98.01	97.81	98.01	98.09	97.61	98.38	97.13
11	334.1	3.24	3315	3000	99.91	99.11	98.97	98.93	99.03	98.32	98.01	98.21	98.50	98.94	98.33	97.95
12	331.5	3.26	3226	3000	100.39	99.32	98.41	98.57	98.61	97.91	97.70	97.75	98.08	98.41	97.79	97.40
13	326.6	3.23	3171	3000	99.16	98.17	97.91	97.82	97.79	97.33	97.02	97.01	97.19	97.42	96.83	96.64
14	316.5	3.27	3189	3000	100.36	99.33	98.71	98.70	98.56	98.25	98.31	98.09	98.52	98.93	98.19	98.16
15	297.9	3.23	3180	3000	100.01	98.53	97.72	97.65	97.74	97.57	97.47	97.50	97.38	96.56	96.95	96.71
16	324.7	3.28	3212	3000	100.12	99.11	99.01	98.87	98.86	98.38	98.33	98.52	98.59	99.01	98.51	98.42
17	335.9	3.28	3277	3000	99.57	99.18	98.77	98.38	98.35	97.73	97.45	97.55	97.90	98.87	98.64	98.16
18	327.7	3.26	3254	3000	99.98	98.85	97.83	97.99	98.04	97.85	97.79	98.07	97.84	98.69	98.36	98.00
19	333.6	3.22	3301	3000	100.61	99.13	98.18	98.26	98.26	97.95	97.71	98.01	97.73	98.20	98.03	97.87
20	289.3	3.27	3159	3000	100.62	99.04	97.86	97.97	97.54	97.27	97.25	97.71	97.71	96.99	97.73	97.28
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean	**317.8**	**3.26**			**100.03**	**99.07**	**98.30**	**98.22**	**98.21**	**97.84**	**97.71**	**97.91**	**97.95**	**98.05**	**97.89**	**97.48**
Median	325.6	3.26			100.02	99.16	98.39	98.32	98.45	97.93	97.75	98.01	98.03	98.31	98.17	97.64
σ	16.5	0.04			0.37	0.50	0.66	0.72	0.65	0.51	0.52	0.57	0.65	0.91	0.64	0.70
Min.	289.3	3.22			99.16	97.60	97.06	96.58	96.75	96.73	96.60	96.85	96.41	96.36	96.37	96.05
Max.	335.9	3.36			100.62	99.89	99.53	99.42	99.08	98.65	98.57	98.75	98.90	99.13	98.64	98.42

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	0.4234	0.4038	3246	3000	0.0002	0.0009	0.0008	0.0008	0.0008	0.0008	0.0008	0.0010	0.0007	0.0008	0.0008	0.0009
2	0.4243	0.4060	3247	3000	0.0006	0.0009	0.0009	0.0007	0.0007	0.0007	0.0009	0.0009	0.0008	0.0007	0.0008	0.0009
3	0.4198	0.4032	3309	3000	0.0007	0.0014	0.0015	0.0015	0.0014	0.0015	0.0015	0.0012	0.0015	0.0015	0.0015	0.0016
4	0.4189	0.4020	3318	3000	0.0004	0.0007	0.0007	0.0007	0.0008	0.0007	0.0008	0.0007	0.0007	0.0007	0.0008	0.0008
5	0.4252	0.4056	3227	3000	0.0008	0.0014	0.0014	0.0014	0.0013	0.0013	0.0014	0.0013	0.0013	0.0012	0.0012	0.0015
6	0.4305	0.4083	3152	3000	0.0008	0.0011	0.0011	0.0011	0.0012	0.0011	0.0012	0.0011	0.0010	0.0011	0.0011	0.0013
7	0.4280	0.4053	3172	3000	0.0004	0.0003	0.0004	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0004	0.0007
8	0.4249	0.4040	3219	3000	0.0008	0.0011	0.0011	0.0011	0.0010	0.0011	0.0011	0.0011	0.0010	0.0010	0.0013	0.0013
9	0.4264	0.4054	3203	3000	0.0010	0.0018	0.0018	0.0017	0.0017	0.0018	0.0018	0.0017	0.0016	0.0016	0.0014	0.0017
10	0.4208	0.4039	3295	3000	0.0007	0.0011	0.0012	0.0012	0.0012	0.0012	0.0013	0.0013	0.0013	0.0014	0.0013	0.0015
11	0.4204	0.4052	3315	3000	0.0008	0.0011	0.0011	0.0012	0.0011	0.0012	0.0013	0.0013	0.0013	0.0014	0.0014	0.0015
12	0.4242	0.4031	3226	3000	0.0007	0.0012	0.0012	0.0012	0.0012	0.0013	0.0014	0.0013	0.0013	0.0015	0.0014	0.0015
13	0.4288	0.4068	3171	3000	0.0004	0.0009	0.0008	0.0008	0.0009	0.0009	0.0009	0.0010	0.0010	0.0010	0.0010	0.0011
14	0.4269	0.4049	3189	3000	0.0004	0.0009	0.0009	0.0009	0.0009	0.0009	0.0008	0.0010	0.0008	0.0009	0.0009	0.0011
15	0.4294	0.4095	3180	3000	0.0003	0.0007	0.0007	0.0006	0.0006	0.0007	0.0006	0.0008	0.0007	0.0006	0.0007	0.0009
16	0.4251	0.4034	3212	3000	0.0009	0.0010	0.0010	0.0010	0.0011	0.0011	0.0011	0.0012	0.0011	0.0011	0.0012	0.0014
17	0.4207	0.4014	3277	3000	0.0008	0.0010	0.0012	0.0012	0.0012	0.0014	0.0014	0.0014	0.0012	0.0013	0.0014	0.0015
18	0.4228	0.4035	3254	3000	0.0006	0.0012	0.0011	0.0014	0.0014	0.0014	0.0015	0.0013	0.0013	0.0014	0.0014	0.0015
19	0.4196	0.4016	3301	3000	0.0010	0.0014	0.0014	0.0015	0.0015	0.0015	0.0017	0.0016	0.0014	0.0013	0.0015	0.0016
20	0.4308	0.4099	3159	3000	0.0009	0.0014	0.0015	0.0013	0.0014	0.0014	0.0016	0.0015	0.0014	0.0013	0.0015	0.0014
n	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Mean					**0.0007**	**0.0011**	**0.0011**	**0.0011**	**0.0011**	**0.0011**	**0.0012**	**0.0012**	**0.0011**	**0.0011**	**0.0012**	**0.0013**
Median					0.0007	0.0011	0.0011	0.0012	0.0011	0.0011	0.0013	0.0012	0.0011	0.0012	0.0013	0.0014
σ					0.0002	0.0003	0.0003	0.0004	0.0003	0.0004	0.0004	0.0003	0.0003	0.0004	0.0003	0.0003
Min.					0.0002	0.0003	0.0004	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0004	0.0007
Max.					0.0010	0.0018	0.0018	0.0017	0.0017	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0017

DATA SET 11: 105°C; 1000 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	293.0	3.36	3246	3000	97.40	96.88	97.28	97.41	97.19	96.79	96.91	96.97
2	330.7	3.24	3247	3000	96.10	96.07	95.99	96.27	95.93	95.88	96.32	96.37
3	329.5	3.29	3309	3000	98.05	98.12	98.15	98.03	97.83	97.88	97.78	97.74
4	304.1	3.32	3318	3000	96.60	96.49	96.36	96.28	96.36	96.35	96.47	96.38
5	327.2	3.27	3227	3000	98.17	97.52	97.82	97.67	97.68	97.61	97.74	98.01
6	322.2	3.24	3152	3000	98.23	97.90	97.78	97.73	97.50	97.61	97.56	97.58
7	292.0	3.26	3172	3000	96.74	96.67	96.28	96.52	96.45	96.38	96.40	96.40
8	335.2	3.22	3219	3000	98.49	98.15	98.26	97.95	97.83	97.91	98.06	97.97
9	305.4	3.25	3203	3000	97.65	97.01	96.82	97.00	96.66	96.78	97.00	96.94
10	298.9	3.24	3295	3000	97.65	97.44	97.17	97.08	97.05	96.99	96.93	97.01
11	334.1	3.24	3315	3000	97.19	97.45	97.50	97.30	97.87	97.37	97.27	97.41
12	331.5	3.26	3226	3000	97.17	97.20	97.12	97.01	97.10	97.07	97.37	97.34
13	326.6	3.23	3171	3000	96.28	96.10	96.32	96.96	96.43	96.21	96.40	96.23
14	316.5	3.27	3189	3000	98.07	97.70	98.11	97.77	97.84	97.72	97.79	97.84
15	297.9	3.23	3180	3000	96.50	96.89	96.63	96.23	96.90	96.46	96.43	96.29
16	324.7	3.28	3212	3000	98.54	98.11	98.52	98.19	98.01	98.14	98.17	98.07
17	335.9	3.28	3277	3000	98.56	98.34	97.56	97.94	98.06	97.89	98.27	97.65
18	327.7	3.26	3254	3000	98.17	97.95	97.32	97.82	97.85	97.63	97.81	98.06
19	333.6	3.22	3301	3000	98.10	97.78	97.21	97.68	97.77	97.54	97.69	98.19
20	289.3	3.27	3159	3000	97.46	97.54	97.34	97.41	97.87	97.42	96.98	96.95
n	20	20	20	20	20	20	20	20	20	20	20	20
Mean	**317.8**	**3.26**			**97.56**	**97.37**	**97.28**	**97.31**	**97.31**	**97.18**	**97.27**	**97.27**
Median	325.6	3.26			97.65	97.49	97.30	97.41	97.59	97.39	97.32	97.38
σ	16.5	0.04			0.78	0.68	0.72	0.62	0.66	0.66	0.64	0.68
Min.	289.3	3.22			96.10	96.07	95.99	96.23	95.93	95.88	96.32	96.23
Max.	335.9	3.36			98.56	98.34	98.52	98.19	98.06	98.14	98.27	98.19

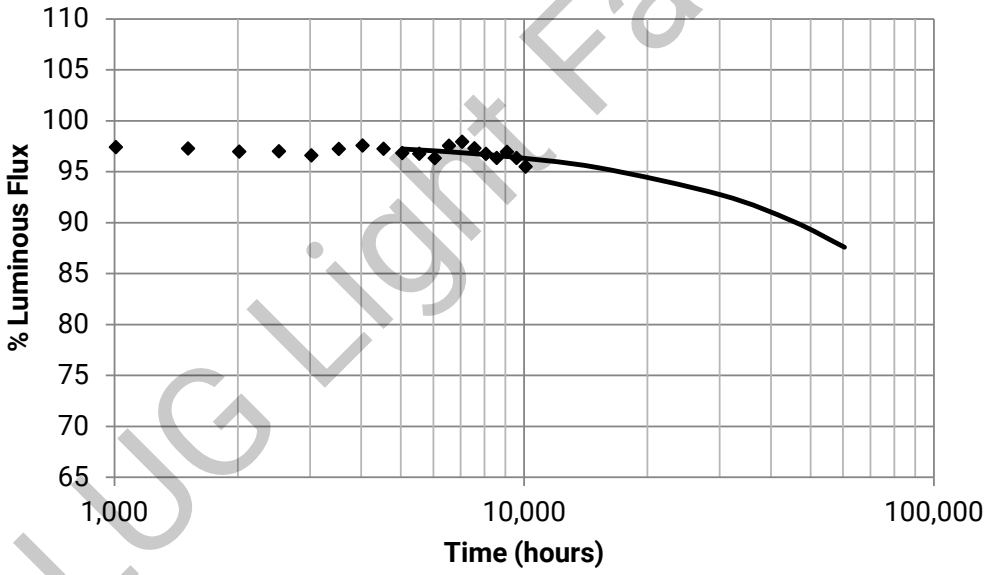
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')							
	CCx	CCy	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080
1	0.4234	0.4038	3246	3000	0.0008	0.0007	0.0010	0.0011	0.0010	0.0011	0.0011	0.0011
2	0.4243	0.4060	3247	3000	0.0008	0.0010	0.0011	0.0011	0.0012	0.0011	0.0010	0.0009
3	0.4198	0.4032	3309	3000	0.0017	0.0018	0.0019	0.0019	0.0021	0.0019	0.0020	0.0019
4	0.4189	0.4020	3318	3000	0.0009	0.0010	0.0010	0.0008	0.0013	0.0011	0.0010	0.0011
5	0.4252	0.4056	3227	3000	0.0015	0.0016	0.0018	0.0016	0.0017	0.0017	0.0018	0.0018
6	0.4305	0.4083	3152	3000	0.0014	0.0015	0.0015	0.0015	0.0017	0.0016	0.0016	0.0019
7	0.4280	0.4053	3172	3000	0.0007	0.0008	0.0008	0.0008	0.0010	0.0012	0.0012	0.0012
8	0.4249	0.4040	3219	3000	0.0014	0.0016	0.0016	0.0015	0.0017	0.0017	0.0017	0.0019
9	0.4264	0.4054	3203	3000	0.0018	0.0019	0.0017	0.0018	0.0021	0.0020	0.0017	0.0020
10	0.4208	0.4039	3295	3000	0.0017	0.0016	0.0018	0.0016	0.0018	0.0016	0.0016	0.0020
11	0.4204	0.4052	3315	3000	0.0016	0.0016	0.0017	0.0015	0.0017	0.0016	0.0018	0.0019
12	0.4242	0.4031	3226	3000	0.0016	0.0018	0.0019	0.0019	0.0020	0.0020	0.0021	0.0022
13	0.4288	0.4068	3171	3000	0.0012	0.0014	0.0014	0.0014	0.0013	0.0012	0.0011	0.0011
14	0.4269	0.4049	3189	3000	0.0012	0.0013	0.0013	0.0013	0.0013	0.0010	0.0012	0.0014
15	0.4294	0.4095	3180	3000	0.0009	0.0010	0.0011	0.0011	0.0012	0.0012	0.0011	0.0014
16	0.4251	0.4034	3212	3000	0.0015	0.0016	0.0017	0.0017	0.0019	0.0019	0.0019	0.0021
17	0.4207	0.4014	3277	3000	0.0017	0.0017	0.0018	0.0019	0.0019	0.0020	0.0020	0.0021
18	0.4228	0.4035	3254	3000	0.0015	0.0016	0.0017	0.0018	0.0019	0.0019	0.0016	0.0017
19	0.4196	0.4016	3301	3000	0.0015	0.0017	0.0018	0.0020	0.0020	0.0020	0.0020	0.0020
20	0.4308	0.4099	3159	3000	0.0014	0.0016	0.0016	0.0016	0.0018	0.0018	0.0017	0.0016
n	20	20	20	20	20	20	20	20	20	20	20	20
Mean					**0.0013**	**0.0014**	**0.0015**	**0.0015**	**0.0016**	**0.0016**	**0.0016**	**0.0017**
Median					0.0015	0.0016	0.0017	0.0016	0.0017	0.0017	0.0016	0.0018
σ					0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004
Min.					0.0007	0.0007	0.0008	0.0008	0.0010	0.0010	0.0010	0.0009
Max.					0.0018	0.0019	0.0019	0.0020	0.0021	0.0020	0.0021	0.0022

DATA SET 5: 55°C; 1250 mA

LED Package Series	XLamp XT-E White LEDs (Series: XTEAWT) This LM-80 report is applicable to the following order codes: XTEAWT-xx-xxxx-xxxxxxxxx
Tested Model Number	XTEAWT-00-0000-00000LBE7
Drive Current [I_F]	1250 mA
Testing Initiation Date	January 8, 2012
Case Temperature [T_s]	55°C
Ambient Temperature [T_A]	55°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	1.885E-06
β	9.817E-01
Reported Lifetimes	**L90(10k) = 46,100 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	97.42%
1512	97.28%
2016	96.97%
2520	97.01%
3024	96.60%
3528	97.23%
4032	97.57%
4536	97.25%
5040	96.83%
5544	96.76%
6048	96.33%
6552	97.55%
7056	97.94%
7560	97.30%
8064	96.75%
8568	96.35%
9072	96.95%
9576	96.35%
10080	95.50%

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

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: 55°C; 1250 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	266.7	3.60	2981	3000	96.90	97.46	97.17	96.29	96.81	96.42	96.60	98.33	98.02	96.18	97.41	96.09
2	283.7	3.66	3042	3000	96.44	97.10	97.52	97.97	97.62	97.32	98.77	98.84	98.11	98.07	97.83	97.31
3	262.7	3.57	2979	3000	95.62	96.45	95.81	95.12	95.70	95.28	94.81	95.70	95.43	93.77	94.65	93.48
4	281.7	3.59	3035	3000	97.11	97.55	97.04	96.71	97.16	97.42	98.53	98.40	98.07	97.66	97.84	97.24
5	265.5	3.60	3036	3000	96.45	96.62	96.58	95.21	95.95	95.19	95.44	95.61	95.35	95.34	95.69	94.48
6	287.5	3.66	3070	3000	98.73	97.92	97.50	97.52	97.34	97.45	98.58	98.59	98.00	97.87	97.74	97.14
7	283.8	3.63	3014	3000	98.02	97.61	96.63	96.41	97.10	97.06	98.01	97.99	97.36	97.38	96.95	96.60
8	275.6	3.63	2997	3000	95.96	95.95	96.38	96.00	96.26	96.07	95.42	96.27	95.87	95.36	95.57	94.77
9	262.5	3.55	2911	3000	97.42	98.00	97.14	96.28	96.77	96.22	97.29	98.05	97.00	95.71	96.95	96.85
10	282.5	3.68	3016	3000	99.33	97.74	98.61	98.40	98.07	96.67	98.45	98.12	98.54	97.94	97.10	96.99
11	267.4	3.63	3082	3000	97.28	97.15	96.55	95.72	96.28	95.44	96.03	96.03	95.62	94.91	95.13	95.07
12	295.8	3.56	3004	3000	97.26	96.83	96.89	97.26	97.28	97.35	97.64	97.48	97.42	97.05	97.21	96.69
13	261.7	3.68	2991	3000	96.31	96.66	96.84	96.24	97.01	96.01	96.13	97.61	97.06	96.25	96.62	96.87
14	285.1	3.61	2971	3000	97.30	96.27	96.38	96.35	96.07	96.02	97.04	97.17	96.28	96.46	96.24	95.68
15	269.5	3.64	2995	3000	98.06	97.44	97.23	96.88	97.11	97.08	97.82	97.77	97.29	97.33	97.11	96.62
16	279.2	3.58	2990	3000	98.79	96.94	97.76	97.23	97.57	96.48	96.33	98.22	97.43	96.73	97.06	97.20
17	262.6	3.59	3220	3000	96.78	96.74	97.60	97.28	97.23	95.64	96.72	97.17	96.80	97.29	96.52	96.76
18	288.2	3.60	3156	3000	99.98	100.06	98.96	98.23	97.66	98.55	99.18	99.26	98.73	97.94	98.78	97.92
19	270.7	3.58	3021	3000	97.08	96.50	97.05	97.22	97.07	95.87	96.33	96.80	97.01	96.85	95.77	96.07
20	285.3	3.63	3047	3000	99.15	98.01	97.50	97.20	96.41	96.85	97.74	97.74	97.59	97.36	97.10	96.54
21	261.7	3.60	2943	3000	99.52	97.02	97.55	98.00	97.96	96.79	97.14	97.25	97.72	97.30	96.28	96.30
22	279.1	3.66	3013	3000	99.93	99.15	98.19	98.28	97.54	97.80	98.61	98.48	98.20	98.12	97.47	97.01
23	279.7	3.61	2955	3000	98.80	99.11	98.14	97.81	97.26	97.58	98.61	98.54	98.22	98.16	97.69	97.08
24	271.3	3.67	2977	3000	98.49	96.87	98.02	97.65	97.78	95.74	96.08	96.55	96.80	96.62	95.41	95.16
25	290.9	3.60	3117	3000	99.04	98.23	96.99	97.09	96.23	96.71	97.49	97.37	97.37	97.15	96.89	96.36
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean	**276.0**	**3.62**			**97.83**	**97.41**	**97.28**	**96.97**	**97.01**	**96.60**	**97.23**	**97.57**	**97.25**	**96.83**	**96.76**	**96.33**
Median	279.1	3.61			97.42	97.15	97.17	97.20	97.11	96.67	97.29	97.74	97.37	97.15	96.95	96.62
σ	10.4	0.04			1.28	0.97	0.74	0.93	0.65	0.86	1.21	0.98	0.95	1.12	0.98	1.04
Min.	261.7	3.55			95.62	95.95	95.81	95.12	95.70	95.19	94.81	95.61	95.35	93.77	94.65	93.48
Max.	295.8	3.68			99.98	100.06	98.96	98.40	98.07	98.55	99.18	99.26	98.73	98.16	98.78	97.92

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	0.4382	0.4039	2981	3000	0.0002	0.0003	0.0004	0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0006
2	0.4322	0.3985	3042	3000	0.0009	0.0006	0.0005	0.0005	0.0005	0.0005	0.0006	0.0007	0.0008	0.0008	0.0008	0.0009
3	0.4365	0.4000	2979	3000	0.0011	0.0004	0.0006	0.0006	0.0005	0.0006	0.0004	0.0007	0.0007	0.0008	0.0008	0.0008
4	0.4324	0.3982	3035	3000	0.0007	0.0006	0.0004	0.0007	0.0006	0.0006	0.0006	0.0008	0.0009	0.0009	0.0010	0.0009
5	0.4309	0.3951	3036	3000	0.0010	0.0007	0.0008	0.0007	0.0007	0.0009	0.0005	0.0008	0.0009	0.0009	0.0009	0.0009
6	0.4305	0.3983	3070	3000	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0007	0.0006
7	0.4359	0.4030	3014	3000	0.0006	0.0004	0.0006	0.0007	0.0005	0.0005	0.0005	0.0008	0.0008	0.0008	0.0009	0.0008
8	0.4365	0.4021	2997	3000	0.0011	0.0004	0.0005	0.0006	0.0005	0.0005	0.0004	0.0005	0.0006	0.0007	0.0007	0.0007
9	0.4466	0.4122	2911	3000	0.0003	0.0005	0.0005	0.0006	0.0007	0.0008	0.0008	0.0007	0.0007	0.0008	0.0008	0.0007
10	0.4346	0.4007	3016	3000	0.0004	0.0005	0.0004	0.0004	0.0004	0.0006	0.0007	0.0005	0.0006	0.0005	0.0006	0.0006
11	0.4301	0.3989	3082	3000	0.0005	0.0003	0.0002	0.0003	0.0002	0.0003	0.0003	0.0004	0.0005	0.0004	0.0005	0.0006
12	0.4371	0.4043	3004	3000	0.0009	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0008	0.0009	0.0009	0.0010	0.0011
13	0.4396	0.4079	2991	3000	0.0006	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0006	0.0005	0.0005	0.0006	0.0007
14	0.4407	0.4078	2971	3000	0.0002	0.0006	0.0005	0.0007	0.0007	0.0007	0.0008	0.0007	0.0007	0.0007	0.0007	0.0007
15	0.4391	0.4074	2995	3000	0.0006	0.0004	0.0003	0.0003	0.0005	0.0004	0.0005	0.0004	0.0005	0.0005	0.0004	0.0004
16	0.4394	0.4072	2990	3000	0.0005	0.0005	0.0004	0.0005	0.0004	0.0005	0.0005	0.0006	0.0007	0.0007	0.0007	0.0009
17	0.4168	0.3849	3220	3000	0.0006	0.0007	0.0006	0.0006	0.0006	0.0007	0.0008	0.0008	0.0009	0.0008	0.0008	0.0010
18	0.4200	0.3852	3156	3000	0.0003	0.0005	0.0005	0.0005	0.0005	0.0007	0.0007	0.0008	0.0008	0.0008	0.0009	0.0011
19	0.4363	0.4048	3021	3000	0.0003	0.0004	0.0006	0.0007	0.0006	0.0007	0.0007	0.0007	0.0007	0.0006	0.0007	0.0007
20	0.4334	0.4018	3047	3000	0.0005	0.0005	0.0006	0.0006	0.0005	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
21	0.4432	0.4093	2943	3000	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0005	0.0006	0.0006	0.0007	0.0008	0.0008
22	0.4352	0.4015	3013	3000	0.0005	0.0008	0.0008	0.0010	0.0009	0.0010	0.0010	0.0010	0.0010	0.0009	0.0010	0.0010
23	0.4409	0.4062	2955	3000	0.0002	0.0007	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007	0.0006	0.0006	0.0007	0.0007
24	0.4395	0.4060	2977	3000	0.0005	0.0007	0.0007	0.0007	0.0007	0.0008	0.0007	0.0007	0.0008	0.0008	0.0008	0.0007
25	0.4294	0.4017	3117	3000	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002	0.0004	0.0003	0.0004	0.0002	0.0003	0.0003
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean					**0.0005**	**0.0005**	**0.0005**	**0.0006**	**0.0005**	**0.0006**	**0.0006**	**0.0007**	**0.0007**	**0.0007**	**0.0007**	**0.0008**
Median					0.0005	0.0005	0.0005	0.0006	0.0005	0.0006	0.0006	0.0007	0.0007	0.0007	0.0007	0.0007
σ					0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.					0.0001	0.0002	0.0001	0.0001	0.0001	0.0002	0.0003	0.0003	0.0004	0.0002	0.0003	0.0003
Max.					0.0011	0.0008	0.0008	0.0010	0.0009	0.0010	0.0010	0.0010	0.0010	0.0009	0.0010	0.0011

DATA SET 5: 55°C; 1250 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	266.7	3.60	2981	3000	97.60	97.88	97.29	96.13	95.29	96.95	96.62	95.38
2	283.7	3.66	3042	3000	99.18	99.34	98.67	98.37	97.92	98.00	97.34	97.14
3	262.7	3.57	2979	3000	95.16	95.17	94.75	93.80	93.93	94.65	94.35	93.30
4	281.7	3.59	3035	3000	98.94	99.27	98.83	98.37	98.00	98.29	97.99	97.27
5	265.5	3.60	3036	3000	94.77	95.36	94.63	94.00	94.32	94.48	94.38	93.27
6	287.5	3.66	3070	3000	98.91	99.26	98.83	98.19	97.74	97.95	97.61	97.15
7	283.8	3.63	3014	3000	98.35	98.57	98.06	97.48	97.30	97.18	96.65	96.31
8	275.6	3.63	2997	3000	95.88	96.45	95.91	95.61	95.07	95.49	95.08	94.40
9	262.5	3.55	2911	3000	97.54	97.21	96.68	95.55	95.12	95.73	94.75	93.68
10	282.5	3.68	3016	3000	98.68	98.46	97.89	98.04	97.34	97.80	96.83	95.96
11	267.4	3.63	3082	3000	94.90	95.00	94.39	93.70	93.75	94.38	93.92	92.93
12	295.8	3.56	3004	3000	98.52	98.94	98.49	98.02	97.92	97.97	97.30	96.86
13	261.7	3.68	2991	3000	96.66	97.36	96.85	96.36	95.65	96.67	96.21	95.52
14	285.1	3.61	2971	3000	97.06	97.92	97.47	96.93	96.56	96.61	96.30	95.81
15	269.5	3.64	2995	3000	98.41	98.93	98.51	97.87	97.70	97.64	97.05	96.63
16	279.2	3.58	2990	3000	97.00	97.96	97.28	96.85	96.45	96.85	96.63	96.13
17	262.6	3.59	3220	3000	97.73	97.90	96.98	96.09	95.29	96.93	96.39	94.21
18	288.2	3.60	3156	3000	99.50	100.24	99.24	98.87	98.44	98.53	97.75	96.60
19	270.7	3.58	3021	3000	97.00	97.20	96.52	95.83	95.07	96.97	95.89	94.46
20	285.3	3.63	3047	3000	98.22	98.70	97.83	97.46	97.00	97.14	96.48	95.47
21	261.7	3.60	2943	3000	96.84	97.56	96.62	96.18	95.37	97.95	96.47	95.28
22	279.1	3.66	3013	3000	98.73	99.16	98.20	97.69	97.37	97.62	97.11	96.23
23	279.7	3.61	2955	3000	98.81	99.26	98.43	97.98	97.71	97.86	97.15	96.45
24	271.3	3.67	2977	3000	95.89	96.80	95.91	95.55	94.77	96.32	95.04	94.12
25	290.9	3.60	3117	3000	98.59	98.59	98.30	97.92	97.68	97.81	97.36	96.82
n	25	25	25	25	25	25	25	25	25	25	25	25
Mean	**276.0**	**3.62**			**97.55**	**97.94**	**97.30**	**96.75**	**96.35**	**96.95**	**96.35**	**95.49**
Median	279.1	3.61			97.73	97.96	97.47	96.93	96.56	97.14	96.62	95.81
σ	10.4	0.04			1.39	1.38	1.37	1.49	1.45	1.19	1.14	1.34
Min.	261.7	3.55			94.77	95.00	94.39	93.70	93.75	94.38	93.92	92.93
Max.	295.8	3.68			99.50	100.24	99.24	98.87	98.44	98.53	97.99	97.27

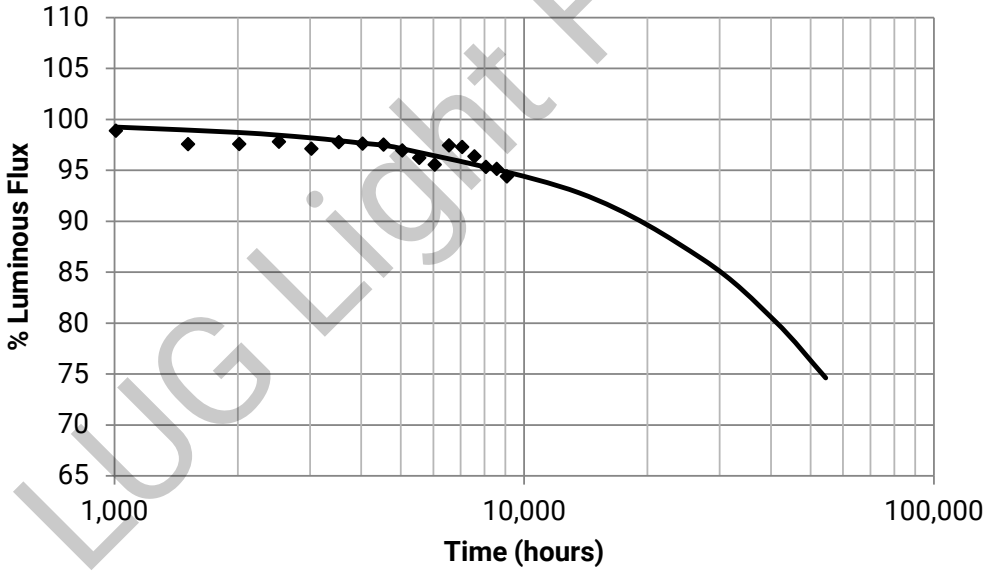
Lamp #	Initial (0 hrs)				Chromaticity Shift (Δu'v')							
	CCx	CCy	Calc. CCT	ANSI Target	6552	7056	7560	8064	8568	9072	9576	10080
1	0.4382	0.4039	2981	3000	0.0006	0.0008	0.0007	0.0007	0.0006	0.0008	0.0006	0.0006
2	0.4322	0.3985	3042	3000	0.0008	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0007
3	0.4365	0.4000	2979	3000	0.0007	0.0010	0.0009	0.0009	0.0009	0.0011	0.0011	0.0010
4	0.4324	0.3982	3035	3000	0.0009	0.0011	0.0012	0.0012	0.0010	0.0011	0.0010	0.0009
5	0.4309	0.3951	3036	3000	0.0007	0.0010	0.0011	0.0010	0.0010	0.0011	0.0013	0.0011
6	0.4305	0.3983	3070	3000	0.0007	0.0008	0.0009	0.0007	0.0007	0.0007	0.0007	0.0006
7	0.4359	0.4030	3014	3000	0.0008	0.0008	0.0008	0.0007	0.0005	0.0004	0.0005	0.0004
8	0.4365	0.4021	2997	3000	0.0006	0.0008	0.0008	0.0008	0.0008	0.0009	0.0010	0.0009
9	0.4466	0.4122	2911	3000	0.0009	0.0010	0.0010	0.0012	0.0013	0.0011	0.0009	0.0009
10	0.4346	0.4007	3016	3000	0.0005	0.0006	0.0006	0.0005	0.0005	0.0007	0.0006	0.0007
11	0.4301	0.3989	3082	3000	0.0005	0.0005	0.0006	0.0006	0.0004	0.0005	0.0006	0.0005
12	0.4371	0.4043	3004	3000	0.0009	0.0012	0.0012	0.0011	0.0011	0.0012	0.0012	0.0010
13	0.4396	0.4079	2991	3000	0.0005	0.0006	0.0007	0.0006	0.0006	0.0008	0.0007	0.0006
14	0.4407	0.4078	2971	3000	0.0007	0.0008	0.0008	0.0008	0.0007	0.0008	0.0007	0.0007
15	0.4391	0.4074	2995	3000	0.0004	0.0005	0.0006	0.0005	0.0005	0.0005	0.0006	0.0004
16	0.4394	0.4072	2990	3000	0.0007	0.0009	0.0009	0.0009	0.0009	0.0010	0.0011	0.0010
17	0.4168	0.3849	3220	3000	0.0009	0.0010	0.0010	0.0010	0.0009	0.0013	0.0012	0.0011
18	0.4200	0.3852	3156	3000	0.0008	0.0010	0.0011	0.0011	0.0011	0.0013	0.0012	0.0012
19	0.4363	0.4048	3021	3000	0.0007	0.0008	0.0008	0.0007	0.0007	0.0008	0.0007	0.0006
20	0.4334	0.4018	3047	3000	0.0007	0.0007	0.0008	0.0009	0.0008	0.0009	0.0008	0.0007
21	0.4432	0.4093	2943	3000	0.0007	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007	0.0006
22	0.4352	0.4015	3013	3000	0.0012	0.0012	0.0012	0.0013	0.0013	0.0014	0.0013	0.0013
23	0.4409	0.4062	2955	3000	0.0006	0.0007	0.0007	0.0007	0.0007	0.0007	0.0006	0.0006
24	0.4395	0.4060	2977	3000	0.0008	0.0008	0.0008	0.0009	0.0008	0.0009	0.0008	0.0007
25	0.4294	0.4017	3117	3000	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002
n	25	25	25	25	25	25	25	25	25	25	25	25
Mean					**0.0007**	**0.0008**	**0.0008**	**0.0008**	**0.0008**	**0.0009**	**0.0008**	**0.0008**
Median					0.0007	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0007
σ					0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003
Min.					0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002
Max.					0.0012	0.0012	0.0012	0.0013	0.0013	0.0014	0.0013	0.0013

DATA SET 6: 85°C; 1250 mA

LED Package Series	XLamp XT-E White LEDs (Series: XTEAWT) This LM-80 report is applicable to the following order codes: XTEAWT-xx-xxxx-xxxxxxxxx
Tested Model Number	XTEAWT-00-0000-00000LBE7
Drive Current [I_F]	1250 mA
Testing Initiation Date	January 7, 2012
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	9,072 hours
Test duration used for projection	t=4,032 to t=9,072
α	5.337E-06
β	9.977E-01
Reported Lifetimes	**L90(9k) = 19,300 hours**
	L80(9k) = 41,400 hours
	L70(9k) > 54,400 hours



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

Time (hours)	Lumen Maintenance
0	100.00%
168	98.72%
1008	98.89%
1512	97.57%
2016	97.58%
2520	97.81%
3024	97.12%
3528	97.77%
4032	97.62%
4536	97.52%
5040	96.95%
5544	96.22%
6048	95.56%
6552	97.45%
7056	97.29%
7560	96.37%
8064	95.34%
8568	95.14%
9072	94.40%

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

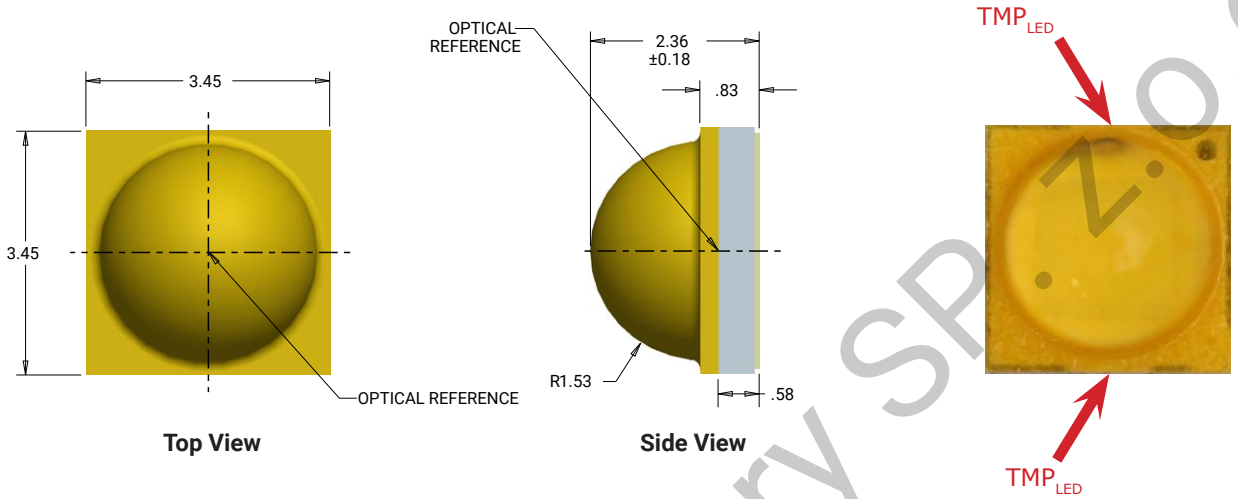
DATA SET 6: 85°C; 1250 mA

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	6552	7056	7560	8064	8568	9072
1	261.9	3.54	3198	3000	98.97	98.59	96.65	97.18	98.89	96.84	97.64	98.00	97.85	97.06	96.21	95.35	97.20	97.12	96.97	95.06	94.70	94.74
2	284.7	3.61	3176	3000	98.82	98.93	98.05	97.91	97.73	97.42	98.56	97.99	98.16	97.75	97.06	96.30	98.75	97.94	97.80	97.22	97.12	96.43
3	269.8	3.51	3193	3000	99.28	99.18	97.59	98.22	98.44	97.44	97.97	98.33	98.12	97.41	96.02	95.82	97.96	98.06	97.33	95.66	95.53	95.66
4	289.7	3.63	3161	3000	99.36	99.81	98.43	98.38	98.30	98.03	99.13	98.76	98.68	98.16	97.54	96.53	98.66	97.68	96.87	95.69	94.95	93.89
5	287.1	3.55	3199	3000	99.18	98.76	97.65	97.47	97.39	96.90	98.07	97.62	97.74	97.12	96.59	95.81	98.17	97.44	96.64	95.69	95.40	94.13
6	271.6	3.58	3207	3000	100.60	99.89	98.15	98.71	98.66	97.90	97.62	97.89	97.63	97.05	96.13	95.22	97.47	97.06	96.48	95.78	95.69	96.02
7	288.6	3.60	3194	3000	98.88	98.58	97.71	97.63	97.27	97.10	98.17	97.66	97.73	97.39	96.58	96.23	98.28	98.10	97.64	97.27	96.42	96.40
8	273.6	3.55	3217	3000	98.15	97.44	97.02	96.14	97.06	96.53	95.90	96.40	96.09	95.31	94.73	93.96	95.80	97.49	95.66	94.24	93.80	93.33
9	287.2	3.70	3206	3000	99.00	98.87	98.02	98.11	97.86	97.43	98.73	98.16	98.18	97.80	96.93	96.48	98.71	98.30	97.15	96.49	95.47	95.22
10	284.0	3.60	3186	3000	99.73	99.07	97.98	97.58	97.66	97.48	98.36	98.06	98.13	97.80	97.03	96.19	98.59	98.65	97.92	97.52	96.34	96.20
11	269.9	3.60	3177	3000	97.63	97.80	96.99	96.76	97.30	96.14	96.25	96.46	96.24	95.51	94.61	93.67	94.62	95.76	93.09	91.93	90.61	91.67
12	257.2	3.54	2989	3000	98.28	99.01	97.08	97.44	98.42	97.26	97.12	97.94	97.57	96.95	96.48	95.59	96.36	97.03	96.05	93.67	95.20	93.77
13	271.7	3.58	2993	3000	98.89	99.11	97.73	97.50	97.62	97.47	98.39	97.66	98.00	97.68	96.99	96.58	98.35	97.88	97.66	97.19	96.86	96.14
14	280.8	3.55	3091	3000	97.74	98.59	97.14	97.24	97.20	97.22	98.30	97.69	97.83	97.38	96.77	96.34	97.92	97.46	97.06	96.22	95.29	94.03
15	254.7	3.55	2929	3000	99.13	99.30	97.85	98.14	98.93	97.38	97.77	98.11	97.73	97.12	96.46	95.61	97.05	97.14	96.34	95.09	96.75	95.41
16	269.8	3.60	2973	3000	98.71	99.38	97.84	97.65	97.68	97.67	98.78	98.06	98.16	97.76	97.03	96.43	98.08	97.86	96.80	95.54	94.43	93.26
17	273.8	3.56	3025	3000	98.70	99.72	98.26	98.10	97.93	98.00	98.80	98.21	98.48	97.78	97.33	96.75	98.54	98.42	97.53	96.93	96.19	94.93
18	259.2	3.59	3074	3000	98.64	99.61	97.33	97.72	98.27	96.89	97.28	97.30	97.10	96.49	95.71	95.13	97.07	96.92	96.15	95.27	96.77	95.65
19	289.0	3.62	3196	3000	98.46	98.46	97.26	97.20	96.83	96.36	96.76	96.16	96.19	95.83	95.14	94.82	97.01	96.48	95.93	95.80	95.30	94.78
20	265.9	3.58	3159	3000	97.30	98.21	96.75	96.78	97.32	96.11	96.83	97.20	96.81	95.97	95.15	94.25	95.91	95.78	94.44	92.30	93.11	92.15
21	288.9	3.65	3179	3000	97.72	97.54	97.18	97.24	96.97	96.46	96.84	96.39	96.14	95.60	94.88	94.36	96.24	95.65	93.87	92.59	91.24	90.18
22	264.5	3.62	2994	3000	98.71	99.15	97.33	97.36	97.89	96.83	97.18	97.45	97.04	96.23	95.50	94.70	96.70	96.55	95.63	94.26	96.17	94.82
23	276.1	3.63	3124	3000	98.57	98.46	97.34	97.22	97.17	96.69	97.85	97.37	97.33	96.85	96.18	95.65	97.69	97.33	96.49	96.01	95.15	94.07
24	281.8	3.64	2996	3000	99.07	99.03	98.06	97.70	97.88	97.52	98.58	98.16	98.16	97.61	97.02	96.44	98.54	98.20	97.44	96.93	96.18	95.11
25	264.4	3.69	2997	3000	98.50	99.64	97.87	98.20	98.46	96.98	97.30	97.42	97.00	96.19	95.49	94.69	96.57	95.96	94.29	93.03	93.91	92.04
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean	**274.6**	**3.59**			**98.72**	**98.89**	**97.57**	**97.58**	**97.80**	**97.12**	**97.77**	**97.62**	**97.52**	**96.95**	**96.22**	**95.56**	**97.45**	**97.29**	**96.37**	**95.34**	**95.14**	**94.40**
Median	273.6	3.60			98.71	99.01	97.65	97.58	97.73	97.22	97.85	97.69	97.73	97.12	96.46	95.65	97.69	97.44	96.64	95.69	95.40	94.78
σ	11.0	0.05			0.70	0.66	0.49	0.57	0.61	0.55	0.85	0.67	0.76	0.83	0.86	0.90	1.10	0.87	1.28	1.62	1.62	1.61
Min.	254.7	3.51			97.30	97.44	96.65	96.14	96.83	96.11	95.90	96.16	96.09	95.31	94.61	93.67	94.62	95.65	93.09	91.93	90.61	90.18
Max.	289.7	3.70			100.60	99.89	98.43	98.71	98.93	98.03	99.13	98.76	98.68	98.16	97.54	96.75	98.75	98.65	97.92	97.52	97.12	96.43

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	6552	7056	7560	8064	8568	9072
1	0.4181	0.3856	3198	3000	0.0006	0.0011	0.0010	0.0012	0.0016	0.0013	0.0013	0.0017	0.0016	0.0016	0.0016	0.0017	0.0017	0.0016	0.0019	0.0019	0.0024	0.0028
2	0.4199	0.3871	3176	3000	0.0005	0.0009	0.0009	0.0010	0.0012	0.0013	0.0012	0.0013	0.0013	0.0014	0.0014	0.0015	0.0017	0.0016	0.0019	0.0020	0.0022	0.0026
3	0.4182	0.3851	3193	3000	0.0006	0.0009	0.0008	0.0009	0.0011	0.0010	0.0009	0.0011	0.0010	0.0010	0.0010	0.0011	0.0012	0.0013	0.0014	0.0012	0.0014	0.0019
4	0.4206	0.3869	3161	3000	0.0004	0.0009	0.0008	0.0010	0.0011	0.0012	0.0011	0.0012	0.0012	0.0013	0.0014	0.0015	0.0017	0.0016	0.0021	0.0023	0.0025	0.0024
5	0.4188	0.3872	3199	3000	0.0005	0.0010	0.0009	0.0011	0.0011	0.0013	0.0012	0.0013	0.0014	0.0014	0.0016	0.0016	0.0019	0.0020	0.0026	0.0027	0.0032	0.0036
6	0.4197	0.3903	3207	3000	0.0007	0.0009	0.0009	0.0011	0.0012	0.0011	0.0010	0.0012	0.0010	0.0012	0.0011	0.0012	0.0014	0.0012	0.0014	0.0014	0.0017	0.0021
7	0.4180	0.3849	3194	3000	0.0003	0.0007	0.0007	0.0008	0.0009	0.0010	0.0009	0.0010	0.0010	0.0011	0.0011	0.0012	0.0013	0.0015	0.0019	0.0021	0.0023	0.0027
8	0.4191	0.3901	3217	3000	0.0003	0.0007	0.0005	0.0006	0.0008	0.0007	0.0006	0.0008	0.0008	0.0008	0.0009	0.0010	0.0010	0.0016	0.0017	0.0018	0.0021	0.0021
9	0.4172	0.3844	3206	3000	0.0002	0.0008	0.0007	0.0009	0.0009	0.0011	0.0010	0.0011	0.0012	0.0012	0.0014	0.0016	0.0019	0.0023	0.0028	0.0029	0.0032	0.0031
10	0.4179	0.3836	3186	3000	0.0004	0.0008	0.0007	0.0009	0.0008	0.0008	0.0009	0.0009	0.0009	0.0009	0.0009	0.0011	0.0013	0.0014	0.0019	0.0020	0.0024	0.0029
11	0.4222	0.3926	3177	3000	0.0004	0.0007	0.0005	0.0005	0.0007	0.0006	0.0005	0.0007	0.0007	0.0008	0.0008	0.0011	0.0014	0.0019	0.0022	0.0024	0.0024	0.0026
12	0.4372	0.4026	2989	3000	0.0004	0.0006	0.0005	0.0005	0.0007	0.0007	0.0007	0.0006	0.0007	0.0006	0.0007	0.0007	0.0007	0.0011	0.0011	0.0007	0.0005	0.0008
13	0.4374	0.4036	2993	3000	0.0003	0.0005	0.0006	0.0005	0.0006	0.0007	0.0007	0.0007	0.0008	0.0008	0.0007	0.0008	0.0008	0.0007	0.0008	0.0008	0.0009	0.0008
14	0.4282	0.3957	3091	3000	0.0007	0.0004	0.0004	0.0005	0.0006	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0008	0.0008	0.0009	0.0011	0.0008	0.0007	0.0013
15	0.4412	0.4037	2929	3000	0.0004	0.0006	0.0005	0.0006	0.0007	0.0008	0.0007	0.0009	0.0010	0.0010	0.0010	0.0010	0.0009	0.0010	0.0009	0.0010	0.0010	0.0010
16	0.4371	0.4006	2973	3000	0.0004	0.0006	0.0005	0.0007	0.0008	0.0008	0.0008	0.0009	0.0010	0.0010	0.0009	0.0009	0.0009	0.0010	0.0010	0.0013	0.0022	0.0028
17	0.4328	0.3979	3025	3000	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0009	0.0011	0.0011	0.0010	0.0010	0.0010	0.0009	0.0008	0.0008	0.0008	0.0011	0.0014
18	0.4268	0.3908	3074	3000	0.0003	0.0004	0.0005	0.0006	0.0007	0.0007	0.0008	0.0008	0.0009	0.0009	0.0011	0.0010	0.0010	0.0009	0.0009	0.0009	0.0008	0.0009
19	0.4186	0.3864	3196	3000	0.0003	0.0010	0.0011	0.0013	0.0014	0.0015	0.0015	0.0016	0.0016	0.0016	0.0017	0.0019	0.0019	0.0021	0.0026	0.0028	0.0031	0.0037
20	0.4202	0.3859	3159	3000	0.0011	0.0008	0.0007	0.0008	0.0009	0.0007	0.0009	0.0012	0.0012	0.0012	0.0014	0.0015	0.0017	0.0024	0.0030	0.0031	0.0032	0.0032
21	0.4203	0.3884	3179	3000	0.0006	0.0014	0.0014	0.0017	0.0018	0.0019	0.0019	0.0020	0.0022	0.0023	0.0024	0.0028	0.0030	0.0039	0.0048	0.0048	0.0045	0.0041
22	0.4363	0.4015	2994	3000	0.0004	0.0006	0.0005	0.0005	0.0006	0.0007	0.0006	0.0007	0.0008	0.0008	0.0007	0.0008	0.0008	0.0009	0.0010	0.0010	0.0011	0.0009
23	0.4266	0.3962	3124	3000	0.0003	0.0004	0.0005	0.0006	0.0006	0.0007	0.0007	0.0007	0.0007	0.0006	0.0006	0.0007	0.0006	0.0008	0.0010	0.0009	0.0006	0.0005
24	0.4367	0.4025	2996	3000	0.0003	0.0005	0.0005	0.0005	0.0007	0.0007	0.0007	0.0007	0.0008	0.0008	0.0008	0.0008	0.0008	0.0009	0.0012	0.0011	0.0008	0.0008
25	0.4372	0.4037	2997	3000	0.0003	0.0006	0.0006	0.0006	0.0006	0.0007	0.0008	0.0009	0.0009	0.0009	0.0008	0.0008	0.0007	0.0008	0.0008	0.0011	0.0017	0.0025
n	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Mean					**0.0004**	**0.0007**	**0.0007**	**0.0008**	**0.0009**	**0.0009**	**0.0009**	**0.0010**	**0.0011**	**0.0011**	**0.0011**	**0.0012**	**0.0013**	**0.0014**	**0.0017**	**0.0018**	**0.0019**	**0.0021**
Median					0.0004	0.0007	0.0006	0.0007	0.0008	0.0008	0.0009	0.0009	0.0010	0.0010	0.0010	0.0011	0.0012	0.0013	0.0014	0.0014	0.0021	0.0024
σ					0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0006	0.0007	0.0009	0.0010	0.0010	0.0011
Min.					0.0002	0.0004	0.0004	0.0005	0.0006	0.0006	0.0005	0.0006	0.0007	0.0006	0.0006	0.0007	0.0006	0.0007	0.0008	0.0007	0.0005	0.0005
Max.					0.0011	0.0014	0.0014	0.0017	0.0018	0.0019	0.0019	0.0020	0.0022	0.0023	0.0024	0.0028	0.0030	0.0039	0.0048	0.0048	0.0045	0.0041

MECHANICAL DIMENSIONS & TEMPERATURE MEASUREMENT POINT

All measurements are ±.13 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.