

# LM-80 Test Report

## Cree® XLamp® XP-E White LEDs

Revision: 1 (September 20, 2010)  
 Document Creation Date: January 24, 2011

1. Number of LED light sources tested	<i>See individual test reports.</i>
2. Description of LED light sources	XLamp XP-E White LEDs (XPEWHT) All measurements provided are LED package measurements.
3. Description of 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.  $T_A$ : <i>See individual test reports</i> RH : < 45% Air flow : 800 CFM
6. Case temperature	The case temperature measurement point is shown in the XLamp XP-E Soldering & Handling document (AP25).
7. Drive current of the LED light source during lifetime test.	<i>See individual test reports. The drive current used during lifetime testing is listed as "Drive Current."</i>
8. Initial luminous flux and forward voltage at photometric measurement current	<i>See individual test reports. The drive current used for luminous flux, forward voltage and chromaticity measurements is listed as "Measurement Current."</i>
9. Lumen maintenance data for each individual LED light source	<i>See individual test reports.</i> 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	<i>See individual test reports.</i>
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	<i>See individual test reports.</i> Ambient temperature during chromaticity testing set to 25°C ±2°C.

### Test Summary

Data Set	Case Temp. [T <sub>s</sub> ]	Ambient Temp. [T <sub>A</sub> ]	Drive Current [I <sub>F</sub> ]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours
1	45°C	45°C	700 mA	97.7%	0.0012
2	55°C	55°C	700 mA	99.3%	0.0011
3	85°C	85°C	350 mA	97.9%	0.0006
4	85°C	85°C	700 mA	96.6%	0.0015



## Data Set 1: 45°C, 700 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	45°C
Ambient Temperature [T <sub>A</sub> ]	45°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None

Board ID	Lamp #	Initial (0 hrs)		Lumen Maintenance (%)											
		LF (lm)	V <sub>F</sub> (V)	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
DUROGZU	1	63.9		99.0	97.1	96.9	96.7	96.6	96.2	96.6	96.8	96.1	97.8	97.0	97.7
	2	70.2		98.8	97.9	97.2	96.7	97.0	95.9	96.6	96.8	96.4	96.9	96.3	97.1
	3	66.6		98.4	97.2	96.5	96.1	95.7	95.2	96.2	96.0	95.2	97.4	96.7	97.6
	5	79.6		99.8	99.0	97.0	97.1	96.9	96.3	96.8	96.4	95.7	97.2	96.3	97.4
	6	76.6		99.6	99.1	98.5	97.9	97.6	97.0	97.4	97.6	97.3	98.6	97.4	98.4
	7	78.1		99.2	98.4	96.9	96.9	97.2	96.3	97.4	97.0	96.0	97.7	96.8	97.9
	8	81.0		99.0	97.8	97.3	97.1	97.1	96.6	97.4	97.2	97.0	97.0	96.6	97.9
	9	74.1		99.3	98.3	97.1	97.3	97.3	96.9	97.9	97.4	96.9	98.1	97.2	97.3
	10	81.3		98.2	97.5	95.4	95.9	96.0	95.8	96.7	96.3	96.1	96.9	96.6	97.8
	DUROGZV	1	74.3		98.2	97.0	93.6	94.0	94.1	93.4	93.9	93.5	93.5	94.7	95.0
2		65.9		98.4	97.5	97.4	97.1	97.3	97.3	97.3	97.0	95.8	98.0	97.5	98.6
3		71.7		99.5	98.6	98.0	97.5	97.4	97.1	96.9	96.8	95.8	98.1	97.0	97.8
4		68.7		99.0	97.0	96.3	95.7	95.6	95.4	96.0	95.6	94.7	97.4	96.8	97.6
5		76.5		98.8	97.6	96.6	95.7	95.9	95.6	96.1	95.8	95.1	97.8	96.5	97.4
6		73.9		99.1	96.5	97.1	95.0	94.7	93.9	95.7	95.5	95.3	97.6	97.4	98.1
7		78.3		99.1	98.0	96.6	95.5	95.2	95.4	95.8	95.9	94.5	98.4	97.5	97.9
8		78.9		99.2	97.9	97.1	96.4	96.1	95.6	96.6	96.4	96.0	98.2	96.9	98.0
9		77.3		99.8	98.6	97.4	95.0	95.0	94.7	95.4	95.0	94.7	98.3	97.5	98.3
10		81.4		98.7	98.3	98.0	96.6	96.1	95.5	96.4	96.4	95.7	98.2	96.7	97.8
DUROGZW	1	75.4		99.7	98.3	97.4	96.2	95.6	95.2	96.1	95.7	95.5	98.8	97.5	98.0
	2	66.2		99.0	97.7	96.2	95.9	96.1	95.6	96.0	96.0	96.1	98.0	97.1	97.6
	3	70.8		99.4	98.3	94.2	93.2	93.8	92.8	94.4	94.0	93.9	95.1	94.5	95.0
	4	68.2		98.7	98.0	95.7	95.9	94.6	95.3	96.8	96.2	95.6	97.8	97.0	97.3
	5	71.1		99.1	97.3	95.9	95.8	95.9	95.3	96.2	95.9	95.6	97.1	96.2	97.0
	6	77.6		98.9	96.9	95.9	95.2	94.9	94.1	95.1	94.8	94.5	97.9	96.8	97.2
	7	77.2		98.4	97.1	94.2	94.0	94.1	94.1	94.4	94.2	94.2	98.3	97.4	97.9
	8	76.4		99.3	97.9	95.9	95.8	95.2	95.2	96.3	95.5	95.2	98.3	96.9	98.0
	9	78.7		99.6	98.4	97.3	96.8	97.1	96.7	97.9	97.4	97.4	99.7	98.3	99.0
	10	73.2		99.7	98.9	98.2	98.4	98.5	98.2	98.2	98.2	98.2	98.6	97.5	98.5
n	29	29	29	29	29	29	29	29	29	29	29	29	29	29	
Mean	74.3	3.09	99.1	97.9	96.6	96.1	96.0	95.6	96.4	96.1	95.7	97.7	96.9	97.7	
Median	75.4		99.1	97.9	96.9	96.1	96.0	95.6	96.4	96.2	95.7	97.9	96.9	97.8	
σ	5.03		0.47	0.68	1.18	1.18	1.19	1.22	1.04	1.09	1.08	0.99	0.75	0.75	
Min.	63.9		98.2	96.5	93.6	93.2	93.8	92.8	93.9	93.5	93.5	94.7	94.5	95.0	
Max.	81.4		99.8	99.1	98.5	98.4	98.5	98.2	98.2	98.2	98.2	99.7	98.3	99.0	

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Cree, Inc.  
4600 Silicon Drive  
Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



## Data Set 1: 45°C, 700 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	45°C
Ambient Temperature [T <sub>A</sub> ]	45°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None

Board ID	Lamp #	Initial (0 hrs)			Chromaticity Shift ( $\Delta u'v'$ )											
		CCx	CCy	CCT	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
DUR0GZU	1	0.4293	0.3961	3074	0.0006	0.0008	0.0009	0.0007	0.0009	0.0012	0.0009	0.0014	0.0012	0.0016	0.0017	0.0016
	2	0.4301	0.4000	3092	0.0007	0.0010	0.0011	0.0010	0.0010	0.0011	0.0010	0.0015	0.0014	0.0015	0.0016	0.0015
	3	0.4301	0.3997	3090	0.0004	0.0007	0.0007	0.0008	0.0008	0.0010	0.0010	0.0013	0.0011	0.0015	0.0015	0.0015
	5	0.4184	0.3902	3231	0.0006	0.0010	0.0009	0.0011	0.0012	0.0014	0.0015	0.0018	0.0018	0.0021	0.0022	0.0021
	6	0.4163	0.3861	3240	0.0004	0.0009	0.0013	0.0010	0.0010	0.0014	0.0016	0.0020	0.0020	0.0022	0.0021	0.0022
	7	0.4215	0.3889	3160	0.0006	0.0010	0.0008	0.0010	0.0011	0.0013	0.0015	0.0017	0.0017	0.0019	0.0020	0.0020
	8	0.4331	0.4026	3060	0.0006	0.0008	0.0009	0.0009	0.0009	0.0010	0.0012	0.0013	0.0015	0.0014	0.0015	0.0014
	9	0.4329	0.4038	3072	0.0005	0.0007	0.0007	0.0007	0.0008	0.0010	0.0011	0.0011	0.0013	0.0015	0.0014	0.0012
	10	0.4253	0.3943	3132	0.0008	0.0011	0.0010	0.0007	0.0008	0.0013	0.0008	0.0013	0.0010	0.0014	0.0015	0.0016
	DUR0GZV	1	0.4265	0.3966	3129	0.0007	0.0010	0.0009	0.0006	0.0008	0.0011	0.0008	0.0010	0.0010	0.0013	0.0015
2		0.4329	0.4048	3080	0.0002	0.0006	0.0006	0.0006	0.0007	0.0009	0.0008	0.0010	0.0008	0.0011	0.0010	0.0010
3		0.4297	0.4011	3109	0.0002	0.0005	0.0006	0.0007	0.0006	0.0007	0.0007	0.0009	0.0008	0.0010	0.0010	0.0008
4		0.4309	0.4023	3096	0.0003	0.0004	0.0004	0.0005	0.0005	0.0005	0.0009	0.0008	0.0007	0.0009	0.0007	0.0007
5		0.4145	0.3813	3235	0.0002	0.0004	0.0005	0.0005	0.0006	0.0006	0.0007	0.0008	0.0008	0.0011	0.0010	0.0010
6		0.4180	0.3864	3208	0.0003	0.0005	0.0008	0.0006	0.0005	0.0007	0.0009	0.0008	0.0011	0.0011	0.0011	0.0010
7		0.4181	0.3835	3180	0.0003	0.0005	0.0004	0.0003	0.0004	0.0005	0.0009	0.0007	0.0008	0.0011	0.0010	0.0009
8		0.4264	0.3932	3102	0.0005	0.0008	0.0009	0.0008	0.0007	0.0010	0.0009	0.0011	0.0011	0.0015	0.0014	0.0012
9		0.4228	0.3955	3190	0.0004	0.0007	0.0008	0.0005	0.0005	0.0007	0.0007	0.0008	0.0008	0.0011	0.0012	0.0009
10		0.4304	0.3981	3071	0.0002	0.0007	0.0007	0.0006	0.0006	0.0007	0.0008	0.0009	0.0009	0.0013	0.0011	0.0009
DUR0GZW	1	0.4271	0.3948	3103	0.0005	0.0006	0.0007	0.0006	0.0005	0.0008	0.0007	0.0009	0.0008	0.0011	0.0010	0.0009
	2	0.4285	0.3997	3119	0.0001	0.0005	0.0003	0.0005	0.0005	0.0006	0.0007	0.0009	0.0008	0.0010	0.0010	0.0009
	3	0.4334	0.4054	3076	0.0003	0.0005	0.0005	0.0005	0.0006	0.0005	0.0008	0.0009	0.0009	0.0011	0.0010	0.0009
	4	0.4294	0.4017	3118	0.0004	0.0006	0.0005	0.0005	0.0005	0.0007	0.0008	0.0009	0.0009	0.0012	0.0011	0.0009
	5	0.4319	0.4047	3098	0.0002	0.0005	0.0005	0.0007	0.0006	0.0007	0.0009	0.0009	0.0010	0.0010	0.0011	0.0011
	6	0.4204	0.3874	3169	0.0002	0.0006	0.0007	0.0006	0.0006	0.0007	0.0009	0.0010	0.0009	0.0012	0.0010	0.0009
	7	0.4175	0.3849	3205	0.0003	0.0007	0.0006	0.0006	0.0006	0.0008	0.0007	0.0011	0.0010	0.0013	0.0011	0.0012
	8	0.4192	0.3870	3187	0.0004	0.0005	0.0007	0.0006	0.0004	0.0007	0.0008	0.0008	0.0007	0.0011	0.0008	0.0009
	9	0.4303	0.3992	3081	0.0003	0.0006	0.0006	0.0006	0.0005	0.0006	0.0007	0.0009	0.0007	0.0008	0.0008	0.0009
	10	0.4309	0.4004	3080	0.0007	0.0008	0.0009	0.0009	0.0009	0.0010	0.0010	0.0011	0.0010	0.0012	0.0012	0.0011
n	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	
Mean				<b>0.0004</b>	<b>0.0007</b>	<b>0.0007</b>	<b>0.0007</b>	<b>0.0007</b>	<b>0.0007</b>	<b>0.0009</b>	<b>0.0009</b>	<b>0.0011</b>	<b>0.0011</b>	<b>0.0013</b>	<b>0.0013</b>	<b>0.0012</b>
Median				0.0004	0.0007	0.0007	0.0006	0.0006	0.0008	0.0009	0.0010	0.0010	0.0012	0.0011	0.0010	
$\sigma$				0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004
Min.				0.0001	0.0004	0.0003	0.0003	0.0004	0.0005	0.0007	0.0007	0.0007	0.0007	0.0008	0.0007	0.0007
Max.				0.0008	0.0011	0.0013	0.0011	0.0012	0.0014	0.0016	0.0020	0.0020	0.0022	0.0022	0.0022	

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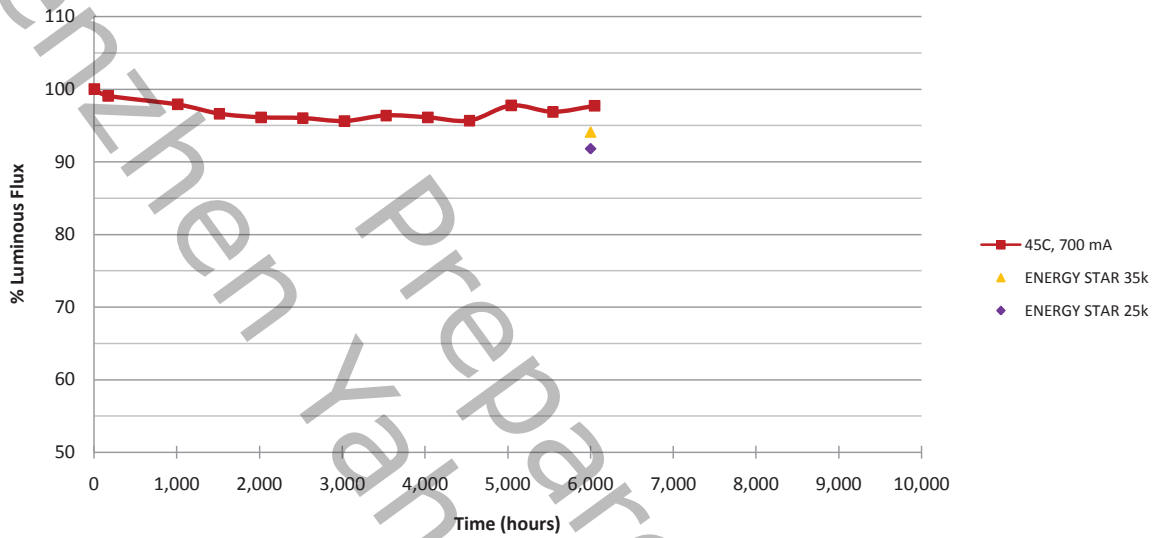
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Cree, Inc.  
4600 Silicon Drive  
Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



## Data Set 1: 45°C, 700 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	45°C
Ambient Temperature [T <sub>A</sub> ]	45°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None



	Initial (0 hrs)		Lumen Maintenance (%)											
	LF (lm)	V <sub>F</sub> (V)	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
n	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Mean	74.3	3.09	99.1	97.9	96.6	96.1	96.0	95.6	96.4	96.1	95.7	97.7	96.9	97.7
Median	75.4		99.1	97.9	96.9	96.1	96.0	95.6	96.4	96.2	95.7	97.9	96.9	97.8
σ	5.03		0.47	0.68	1.18	1.18	1.19	1.22	1.04	1.09	1.08	0.99	0.75	0.75
Min.	63.9		98.2	96.5	93.6	93.2	93.8	92.8	93.9	93.5	93.5	94.7	94.5	95.0
Max.	81.4		99.8	99.1	98.5	98.4	98.5	98.2	98.2	98.2	98.2	99.7	98.3	99.0

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Cree, Inc.  
4600 Silicon Drive  
Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



## Data Set 2: 55°C, 700 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	55°C
Ambient Temperature [T <sub>A</sub> ]	55°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None

Board ID	Lamp #	Initial (0 hrs)		Lumen Maintenance (%)												
		LF (lm)	V <sub>F</sub> (V)	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048	
DUR0H06	1	64.4		102.8	105.8	106.6	108.4	108.3	108.0	107.7	107.5	107.2	106.4	106.0	105.2	
	2	70.8		101.1	103.0	101.2	105.9	101.8	101.7	100.6	100.1	100.0	99.7	99.4	98.8	
	3	65.3		102.9	104.3	104.6	108.2	105.0	105.4	105.7	104.7	104.4	103.2	102.2	100.1	
	4	78.0		100.4	101.0	100.0	99.9	99.9	99.1	98.3	99.3	98.9	100.9	103.4	102.7	
	5	76.1		103.4	102.7	100.7	102.9	101.3	101.3	98.0	98.2	98.1	97.6	97.9	95.6	
	6	78.9		101.0	100.6	99.7	99.8	99.9	99.9	99.9	99.9	99.7	99.6	99.3	99.0	99.5
	7	79.6		103.3	103.8	102.5	107.0	103.2	103.2	103.2	103.2	102.8	102.8	102.5	102.2	101.2
	8	76.8		102.2	103.0	101.3	101.5	100.2	99.2	97.5	98.4	98.3	98.8	99.6	96.0	
	9	81.4		102.4	103.4	101.2	103.4	101.5	101.4	101.4	101.4	101.1	100.2	100.0	98.4	
	10	74.8		103.0	103.9	102.7	102.7	102.6	102.3	102.0	103.1	103.0	103.4	103.9	103.1	
DUR0H07	1	65.3		102.7	103.5	102.0	105.7	102.4	102.3	102.3	101.7	101.8	101.4	101.0	100.3	
	2	69.4		101.6	104.0	103.0	108.9	103.7	105.0	106.4	103.9	103.6	102.9	102.7	102.0	
	3	68.4		100.6	101.7	100.7	101.6	100.7	100.6	100.5	100.9	101.0	101.4	101.7	101.1	
	4	78.1		101.1	98.7	98.6	105.2	99.9	99.4	99.0	98.5	97.8	96.7	96.2	94.2	
	5	74.6		101.9	103.7	102.2	103.6	103.0	103.0	103.0	102.6	102.3	101.6	101.2	100.3	
	6	77.2		101.5	100.9	100.0	99.9	99.8	99.7	99.5	100.0	99.3	98.0	97.8	95.6	
	7	79.9		101.0	102.0	101.5	101.7	101.8	101.7	101.6	102.4	102.4	102.0	101.9	100.3	
	8	74.5		101.8	104.2	103.5	102.9	102.9	102.3	101.8	101.7	101.7	101.3	100.9	101.3	
	9	80.4		101.6	102.3	100.5	101.3	100.5	100.5	98.8	97.8	97.8	97.2	96.9	95.5	
	10	74.5		102.5	105.1	105.0	105.2	106.2	106.7	107.2	104.6	104.8	104.6	104.3	104.2	
DUR0H08	1	63.9		99.7	99.8	99.2	103.5	100.2	100.4	100.6	99.6	99.3	98.7	98.5	97.6	
	2	70.5		100.8	103.0	101.5	100.3	101.5	98.2	95.1	97.8	97.5	97.7	98.3	95.3	
	3	67.8		99.7	100.6	99.7	99.8	99.8	99.8	99.7	99.3	99.0	98.5	98.1	96.8	
	4	71.0		99.6	102.1	101.9	102.2	102.2	102.3	102.4	102.6	102.6	102.6	102.7	101.8	
	5	76.2		99.1	101.1	100.2	107.2	101.4	101.4	101.4	101.3	101.2	100.8	100.6	101.1	
	6	77.1		99.5	101.1	100.2	99.8	99.8	99.7	99.6	97.5	97.5	96.8	96.0	95.5	
	7	78.5		100.4	102.7	100.3	106.0	101.2	101.1	99.0	98.4	98.3	98.0	97.7	97.2	
	8	75.1		99.1	101.7	100.8	100.8	101.1	101.0	100.8	101.8	101.8	101.5	101.5	99.3	
	9	78.7		100.3	102.2	100.9	100.6	100.2	100.2	100.2	99.9	99.9	99.6	99.3	98.2	
	10	74.0		100.9	103.9	102.6	103.0	104.2	104.0	103.8	103.8	103.5	103.0	102.7	103.4	
n	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
Mean	74.0	3.10	101.3	102.5	101.5	103.3	101.9	101.7	101.2	101.0	100.9	100.5	100.4	99.4		
Median	74.9		101.1	102.7	101.2	102.9	101.4	101.4	100.7	101.1	101.0	100.9	100.7	99.8		
σ	5.14		1.27	1.61	1.78	2.85	2.05	2.30	2.87	2.45	2.48	2.47	2.51	2.99		
Min.	63.9		99.1	98.7	98.6	99.8	99.8	98.2	95.1	97.5	97.5	96.7	96.0	94.2		
Max.	81.4		103.4	105.8	106.6	108.9	108.3	108.0	107.7	107.5	107.2	106.4	106.0	105.2		

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Cree, Inc.  
4600 Silicon Drive  
Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



## Data Set 2: 55°C, 700 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	55°C
Ambient Temperature [T <sub>A</sub> ]	55°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None

Board ID	Lamp #	Initial (0 hrs)			Chromaticity Shift ( $\Delta u'v'$ )											
		CCx	CCy	CCT	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
DUR0H06	1	0.4291	0.3964	3079	0.0004	0.0009	0.0008	0.0009	0.0015	0.0006	0.0009	0.0005	0.0016	0.0010	0.0009	0.0009
	2	0.4301	0.4002	3092	0.0000	0.0013	0.0009	0.0005	0.0010	0.0008	0.0011	0.0005	0.0008	0.0012	0.0011	0.0007
	3	0.4294	0.4013	3116	0.0003	0.0011	0.0010	0.0005	0.0010	0.0007	0.0007	0.0003	0.0002	0.0015	0.0009	0.0006
	4	0.4182	0.3865	3204	0.0008	0.0015	0.0017	0.0014	0.0015	0.0013	0.0015	0.0015	0.0011	0.0012	0.0017	0.0019
	5	0.4172	0.3897	3251	0.0008	0.0007	0.0014	0.0013	0.0013	0.0015	0.0014	0.0012	0.0021	0.0011	0.0015	0.0018
	6	0.4220	0.3893	3153	0.0022	0.0022	0.0005	0.0023	0.0009	0.0006	0.0028	0.0018	0.0003	0.0005	0.0011	0.0014
	7	0.4285	0.3992	3114	0.0005	0.0007	0.0004	0.0006	0.0003	0.0005	0.0004	0.0005	0.0006	0.0011	0.0012	0.0012
	8	0.4279	0.3955	3095	0.0006	0.0012	0.0008	0.0018	0.0008	0.0006	0.0007	0.0004	0.0016	0.0009	0.0017	0.0007
	9	0.4282	0.4014	3137	0.0005	0.0010	0.0006	0.0006	0.0015	0.0003	0.0007	0.0002	0.0006	0.0013	0.0004	0.0006
	10	0.4259	0.3972	3146	0.0004	0.0009	0.0001	0.0003	0.0006	0.0006	0.0003	0.0011	0.0011	0.0005	0.0016	0.0020
DUR0H07	1	0.4300	0.4002	3096	0.0000	0.0014	0.0009	0.0006	0.0007	0.0010	0.0009	0.0011	0.0008	0.0012	0.0013	0.0011
	2	0.4338	0.4061	3076	0.0005	0.0006	0.0005	0.0008	0.0004	0.0018	0.0009	0.0026	0.0021	0.0014	0.0008	0.0013
	3	0.4284	0.3974	3100	0.0007	0.0011	0.0020	0.0012	0.0011	0.0009	0.0011	0.0008	0.0010	0.0009	0.0013	0.0017
	4	0.4148	0.3848	3259	0.0000	0.0005	0.0007	0.0009	0.0004	0.0007	0.0016	0.0009	0.0003	0.0009	0.0010	0.0009
	5	0.4180	0.3838	3186	0.0003	0.0023	0.0008	0.0009	0.0011	0.0006	0.0009	0.0007	0.0002	0.0005	0.0008	0.0012
	6	0.4155	0.3845	3243	0.0002	0.0012	0.0009	0.0009	0.0004	0.0002	0.0002	0.0033	0.0024	0.0006	0.0008	0.0007
	7	0.4253	0.3928	3120	0.0003	0.0008	0.0007	0.0005	0.0015	0.0014	0.0008	0.0010	0.0008	0.0017	0.0018	0.0008
	8	0.4262	0.3908	3087	0.0001	0.0012	0.0008	0.0008	0.0005	0.0008	0.0005	0.0010	0.0005	0.0006	0.0009	0.0011
	9	0.4243	0.3968	3173	0.0009	0.0015	0.0020	0.0009	0.0014	0.0016	0.0015	0.0014	0.0014	0.0014	0.0016	0.0018
	10	0.4261	0.3996	3162	0.0009	0.0009	0.0007	0.0011	0.0004	0.0012	0.0002	0.0004	0.0008	0.0008	0.0014	0.0002
DUR0H08	1	0.4291	0.3941	3060	0.0001	0.0010	0.0008	0.0009	0.0007	0.0008	0.0006	0.0006	0.0006	0.0014	0.0001	0.0010
	2	0.4266	0.3953	3116	0.0000	0.0016	0.0013	0.0012	0.0012	0.0012	0.0008	0.0010	0.0011	0.0013	0.0012	0.0012
	3	0.4269	0.3981	3134	0.0005	0.0009	0.0009	0.0018	0.0004	0.0007	0.0009	0.0012	0.0004	0.0018	0.0008	0.0007
	4	0.4293	0.4016	3119	0.0006	0.0021	0.0015	0.0011	0.0014	0.0014	0.0012	0.0011	0.0014	0.0011	0.0012	0.0011
	5	0.4170	0.3828	3197	0.0002	0.0004	0.0017	0.0006	0.0003	0.0010	0.0002	0.0004	0.0008	0.0014	0.0007	0.0006
	6	0.4139	0.3818	3252	0.0017	0.0021	0.0026	0.0022	0.0017	0.0019	0.0017	0.0011	0.0018	0.0014	0.0007	0.0027
	7	0.4185	0.3914	3239	0.0007	0.0019	0.0004	0.0004	0.0004	0.0004	0.0014	0.0015	0.0001	0.0014	0.0009	0.0000
	8	0.4203	0.3876	3171	0.0006	0.0005	0.0001	0.0004	0.0008	0.0006	0.0003	0.0002	0.0016	0.0005	0.0020	0.0010
	9	0.4265	0.3918	3088	0.0003	0.0009	0.0005	0.0005	0.0004	0.0009	0.0003	0.0016	0.0005	0.0003	0.0007	0.0007
	10	0.4282	0.4005	3131	0.0005	0.0011	0.0012	0.0008	0.0007	0.0009	0.0008	0.0004	0.0004	0.0004	0.0006	0.0013
n	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
Mean				0.0005	0.0012	0.0010	0.0010	0.0009	0.0009	0.0009	0.0010	0.0010	0.0010	0.0011	0.0011	
Median				0.0005	0.0011	0.0008	0.0009	0.0007	0.0008	0.0009	0.0010	0.0008	0.0011	0.0010	0.0010	
$\sigma$				0.0005	0.0005	0.0006	0.0005	0.0004	0.0004	0.0006	0.0007	0.0006	0.0004	0.0004	0.0005	
Min.				0.0000	0.0004	0.0001	0.0003	0.0003	0.0002	0.0002	0.0002	0.0001	0.0003	0.0001	0.0000	
Max.				0.0022	0.0023	0.0026	0.0023	0.0017	0.0019	0.0028	0.0033	0.0024	0.0018	0.0020	0.0027	

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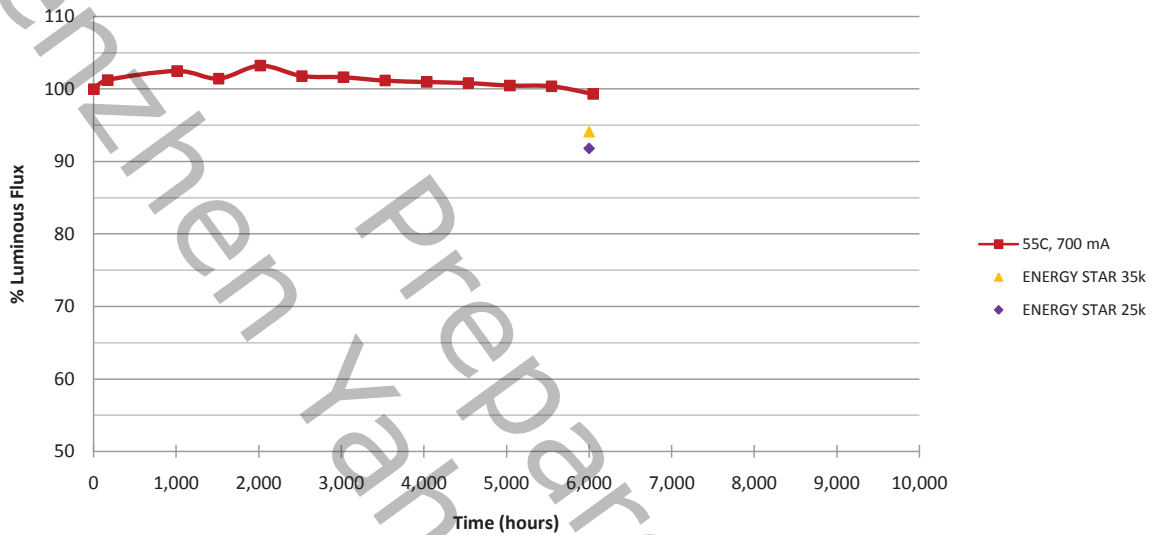
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Cree, Inc.  
4600 Silicon Drive  
Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



## Data Set 2: 55°C, 700 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	55°C
Ambient Temperature [T <sub>A</sub> ]	55°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None



Initial (0 hrs)		Lumen Maintenance (%)												
	LF (lm)	V <sub>F</sub> (V)	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
n	30	3.10	30	30	30	30	30	30	30	30	30	30	30	30
Mean	74.0	3.10	101.3	102.5	101.5	103.3	101.9	101.7	101.2	101.0	100.9	100.5	100.4	99.4
Median	74.9		101.1	102.7	101.2	102.9	101.4	101.4	100.7	101.1	101.0	100.9	100.7	99.8
σ	5.14		1.27	1.61	1.78	2.85	2.05	2.30	2.87	2.45	2.48	2.47	2.51	2.99
Min.	63.9		99.1	98.7	98.6	99.8	99.8	98.2	95.1	97.5	97.5	96.7	96.0	94.2
Max.	81.4		103.4	105.8	106.6	108.9	108.3	108.0	107.7	107.5	107.2	106.4	106.0	105.2

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Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



### Data Set 3: 85°C, 350 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	85°C
Ambient Temperature [T <sub>A</sub> ]	85°C
Drive Current [I <sub>F</sub> ]	350 mA
Measurement Current	350 mA
Failures observed	None

Board ID	Lamp #	Initial (0 hrs)		Lumen Maintenance (%)												
		LF (lm)	V <sub>F</sub> (V)	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048	
DU0KFR	1	65.9		103.8	102.4	100.4	100.1	99.8	99.2	98.3	96.5	94.9	95.5	94.2	92.6	
	2	71.6		103.5	101.9	100.4	100.2	100.1	99.9	99.3	98.2	97.0	97.0	94.5	93.0	
	3	67.5		100.6	101.8	100.5	100.6	101.4	101.6	101.4	100.7	101.9	98.4	98.2	97.1	
	4	78.7		103.7	102.1	100.8	100.7	100.5	100.4	100.1	100.1	98.7	97.7	97.1	95.6	
	5	74.2		101.2	101.2	100.9	101.0	101.5	101.6	101.5	99.3	98.3	97.3	97.6	97.3	
	6	76.5		103.9	101.4	101.0	100.8	100.7	101.0	100.9	101.7	101.1	100.2	102.0	100.4	
	7	78.7		103.4	101.0	101.2	98.7	98.4	98.2	97.7	97.2	96.7	95.2	94.5	92.8	
	8	75.7		102.7	100.4	101.2	100.6	100.9	101.1	101.7	101.1	100.6	99.9	98.5	98.1	
	9	81.4		101.6	101.5	101.2	98.9	98.8	98.5	98.3	99.2	96.1	94.8	96.0	94.0	
	10	72.9		104.9	103.1	101.5	99.6	99.6	99.3	98.7	96.6	94.8	93.4	93.9	92.3	
DU0KFS	1	75.2		98.5	97.7	98.2	98.3	100.5	100.6	99.0	97.7	98.1	99.8	99.0	99.4	
	2	77.0		98.3	97.2	98.1	99.8	98.8	99.2	97.9	97.8	98.1	98.8	98.4	99.3	
	3	72.3		98.3	96.0	96.6	97.5	97.9	98.2	97.4	96.8	96.9	98.1	96.9	98.5	
	4	72.4		97.8	96.6	97.2	98.4	98.0	98.3	97.7	97.4	97.7	97.9	98.3	98.2	
	6	76.3		98.0	96.0	97.0	98.0	98.1	98.1	97.3	97.7	97.7	98.1	96.7	98.5	
	7	77.5		95.8	95.8	96.5	98.5	97.4	97.6	96.8	96.9	97.0	97.5	97.5	98.1	
	8	73.6		99.5	97.0	97.9	99.6	98.7	99.1	98.4	98.0	97.9	98.0	98.1	98.8	
	9	79.6		98.4	96.1	97.2	98.3	98.2	98.4	97.0	96.9	97.0	98.1	96.6	99.0	
	10	75.0		99.3	98.9	99.9	101.0	100.3	100.8	100.1	99.8	99.6	100.0	100.0	100.8	
	DU0KFT	1	74.7		98.9	95.2	97.1	98.6	99.7	100.5	98.7	98.2	98.0	99.8	99.2	100.3
2		80.7		100.1	101.3	100.7	100.1	99.4	98.9	99.5	98.9	100.1	98.9	100.1	100.0	
3		77.6		100.0	100.3	100.4	99.4	98.9	99.3	100.0	99.2	99.0	99.5	99.7	99.3	
4		80.7		99.6	99.5	99.5	98.5	97.7	98.4	99.6	99.4	98.5	99.3	99.6	99.1	
5		76.8		100.0	99.7	99.4	98.8	98.1	98.8	99.4	98.7	98.8	98.5	98.9	98.4	
6		79.9		99.8	99.6	99.5	99.2	99.2	100.0	100.6	100.3	99.3	100.2	100.4	99.7	
7		76.5		99.3	96.3	97.3	97.6	97.2	98.0	98.9	99.0	99.5	99.9	100.1	99.6	
8		73.2		99.2	99.2	97.2	98.2	98.1	98.9	99.7	98.9	98.9	99.3	99.0	99.5	99.1
9		77.3		99.4	96.9	97.5	97.1	96.8	97.8	98.6	98.0	97.6	98.5	99.1	98.8	
10		70.3		98.4	98.7	98.9	97.6	97.3	98.0	98.4	96.8	98.3	97.6	99.0	98.8	
n	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	
Mean	75.5	3.08	100.3	99.1	99.1	99.2	99.0	99.3	99.1	98.5	98.2	98.2	98.1	98.4	97.8	
Median	76.3		99.6	99.5	99.5	98.9	98.8	99.1	98.9	98.2	98.1	98.4	98.4	98.4	98.8	
σ	3.78		2.27	2.40	1.70	1.16	1.31	1.20	1.34	1.42	1.64	1.70	2.01	2.50		
Min.	65.9		95.8	95.2	96.5	97.1	96.8	97.6	96.8	96.5	94.8	93.4	93.9	92.3		
Max.	81.4		104.9	103.1	101.5	101.0	101.5	101.6	101.7	101.7	101.9	100.2	102.0	100.8		

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Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



### Data Set 3: 85°C, 350 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	85°C
Ambient Temperature [T <sub>A</sub> ]	85°C
Drive Current [I <sub>F</sub> ]	350 mA
Measurement Current	350 mA
Failures observed	None

Board ID	Lamp #	Initial (0 hrs)			Chromaticity Shift ( $\Delta u'v'$ )											
		CCx	CCy	CCT	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
DUROKFR	1	0.4288	0.4001	3116	0.0007	0.0006	0.0005	0.0003	0.0003	0.0003	0.0003	0.0003	0.0005	0.0001	0.0004	0.0004
	2	0.4284	0.4010	3131	0.0005	0.0005	0.0003	0.0002	0.0001	0.0001	0.0002	0.0001	0.0006	0.0002	0.0002	0.0003
	3	0.4302	0.4008	3097	0.0005	0.0004	0.0003	0.0000	0.0002	0.0001	0.0003	0.0002	0.0005	0.0002	0.0002	0.0002
	4	0.4171	0.3886	3245	0.0008	0.0005	0.0004	0.0003	0.0002	0.0002	0.0004	0.0003	0.0014	0.0009	0.0010	0.0022
	5	0.4148	0.3838	3251	0.0010	0.0008	0.0007	0.0005	0.0005	0.0006	0.0005	0.0004	0.0004	0.0002	0.0003	0.0004
	6	0.4144	0.3827	3248	0.0011	0.0007	0.0008	0.0006	0.0007	0.0007	0.0006	0.0008	0.0011	0.0009	0.0011	0.0009
	7	0.4248	0.3923	3124	0.0005	0.0006	0.0006	0.0004	0.0004	0.0004	0.0004	0.0003	0.0004	0.0003	0.0008	0.0007
	8	0.4290	0.3985	3099	0.0006	0.0004	0.0005	0.0003	0.0004	0.0004	0.0004	0.0005	0.0003	0.0005	0.0009	0.0008
	9	0.4285	0.4010	3129	0.0005	0.0005	0.0004	0.0003	0.0003	0.0004	0.0004	0.0003	0.0003	0.0001	0.0005	0.0004
	10	0.4288	0.3972	3093	0.0006	0.0004	0.0003	0.0004	0.0006	0.0006	0.0005	0.0005	0.0004	0.0003	0.0004	0.0003
DUROKFS	1	0.4316	0.4064	3117	0.0006	0.0005	0.0002	0.0008	0.0007	0.0007	0.0006	0.0006	0.0007	0.0001	0.0002	0.0009
	2	0.4391	0.4139	3047	0.0005	0.0004	0.0005	0.0007	0.0007	0.0008	0.0006	0.0009	0.0008	0.0005	0.0006	0.0000
	3	0.4396	0.4177	3068	0.0001	0.0001	0.0001	0.0005	0.0003	0.0002	0.0002	0.0003	0.0002	0.0001	0.0005	0.0002
	4	0.4337	0.4025	3049	0.0000	0.0002	0.0004	0.0006	0.0005	0.0006	0.0004	0.0005	0.0003	0.0001	0.0002	0.0008
	6	0.4442	0.4094	2928	0.0000	0.0002	0.0003	0.0005	0.0006	0.0006	0.0005	0.0008	0.0006	0.0003	0.0008	0.0002
	7	0.4249	0.4055	3231	0.0006	0.0004	0.0002	0.0004	0.0007	0.0005	0.0006	0.0009	0.0009	0.0007	0.0007	0.0003
	8	0.4287	0.4055	3162	0.0006	0.0004	0.0003	0.0006	0.0007	0.0008	0.0006	0.0010	0.0007	0.0005	0.0008	0.0003
	9	0.4338	0.4077	3088	0.0004	0.0005	0.0004	0.0006	0.0007	0.0006	0.0007	0.0007	0.0008	0.0005	0.0012	0.0002
	10	0.4310	0.4046	3113	0.0001	0.0004	0.0004	0.0005	0.0006	0.0006	0.0008	0.0008	0.0008	0.0006	0.0007	0.0002
	DUROKFT	1	0.4304	0.4057	3134	0.0005	0.0003	0.0002	0.0006	0.0006	0.0007	0.0006	0.0010	0.0009	0.0004	0.0007
2		0.4326	0.4086	3118	0.0006	0.0004	0.0003	0.0002	0.0006	0.0006	0.0008	0.0008	0.0007	0.0007	0.0008	0.0008
3		0.4293	0.4069	3162	0.0006	0.0005	0.0006	0.0004	0.0004	0.0004	0.0005	0.0008	0.0008	0.0004	0.0008	0.0007
4		0.4280	0.4016	3143	0.0005	0.0003	0.0005	0.0004	0.0003	0.0004	0.0006	0.0008	0.0006	0.0008	0.0007	0.0007
5		0.4336	0.4063	3081	0.0006	0.0004	0.0006	0.0005	0.0005	0.0006	0.0008	0.0008	0.0006	0.0007	0.0008	0.0007
6		0.4276	0.4004	3140	0.0006	0.0006	0.0007	0.0006	0.0007	0.0007	0.0009	0.0009	0.0007	0.0008	0.0007	0.0007
7		0.4317	0.4030	3088	0.0006	0.0005	0.0002	0.0004	0.0004	0.0005	0.0007	0.0008	0.0009	0.0009	0.0008	0.0008
8		0.4387	0.4100	3023	0.0006	0.0006	0.0002	0.0005	0.0006	0.0007	0.0009	0.0009	0.0008	0.0009	0.0009	0.0008
9		0.4343	0.4026	3039	0.0006	0.0002	0.0001	0.0002	0.0002	0.0003	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007
10		0.4388	0.4136	3050	0.0005	0.0002	0.0003	0.0001	0.0005	0.0005	0.0008	0.0003	0.0005	0.0005	0.0005	0.0006
n		29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Mean					0.0005	0.0004	0.0004	0.0004	0.0005	0.0005	0.0006	0.0006	0.0006	0.0005	0.0007	0.0006
Median					0.0006	0.0004	0.0004	0.0004	0.0005	0.0006	0.0006	0.0007	0.0006	0.0005	0.0007	0.0006
$\sigma$					0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004
Min.					0.0000	0.0001	0.0001	0.0000	0.0001	0.0001	0.0002	0.0001	0.0002	0.0001	0.0002	0.0000
Max.					0.0011	0.0008	0.0008	0.0008	0.0007	0.0008	0.0009	0.0010	0.0014	0.0009	0.0012	0.0022

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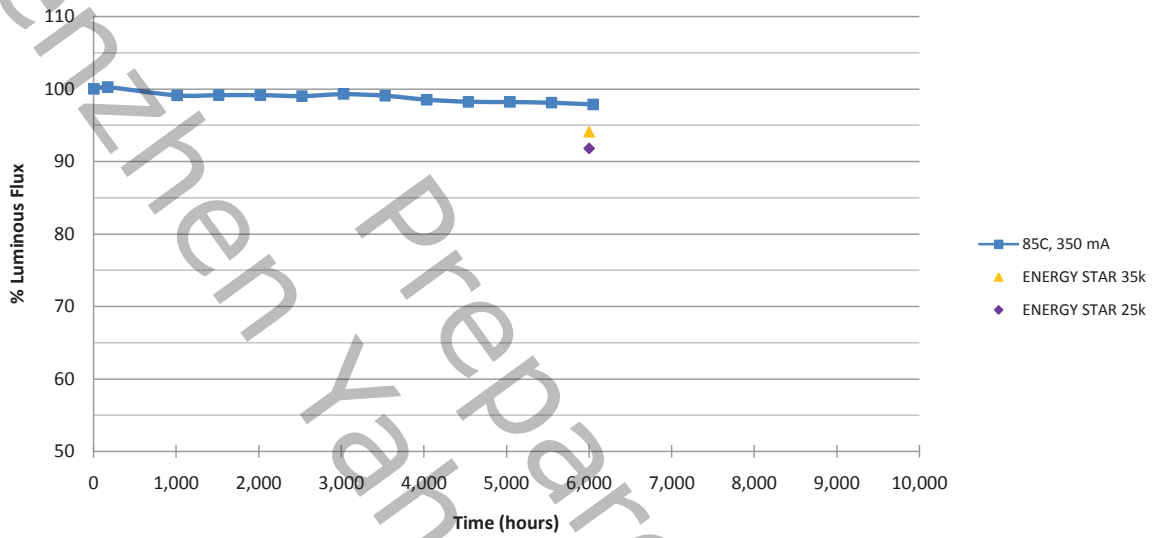
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Cree, Inc.  
4600 Silicon Drive  
Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



### Data Set 3: 85°C, 350 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	85°C
Ambient Temperature [T <sub>A</sub> ]	85°C
Drive Current [I <sub>F</sub> ]	350 mA
Measurement Current	350 mA
Failures observed	None



Initial (0 hrs)		Lumen Maintenance (%)													
	LF (lm)	V <sub>F</sub> (V)	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048	
n	29	29	29	29	29	29	29	29	29	29	29	29	29	29	
Mean	75.5	3.08	100.3	99.1	99.1	99.2	99.0	99.3	99.1	98.5	98.2	98.2	98.1	97.8	
Median	76.3		99.6	99.5	99.5	98.9	98.8	99.1	98.9	98.2	98.1	98.4	98.4	98.8	
σ	3.78		2.27	2.40	1.70	1.16	1.31	1.20	1.34	1.42	1.64	1.70	2.01	2.50	
Min.	65.9		95.8	95.2	96.5	97.1	96.8	97.6	96.8	96.5	94.8	93.4	93.9	92.3	
Max.	81.4		104.9	103.1	101.5	101.0	101.5	101.6	101.7	101.7	101.9	100.2	102.0	100.8	

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Durham, NC 27703  
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www.cree.com/xlamp



## Data Set 4: 85°C, 700 mA

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	85°C
Ambient Temperature [T <sub>A</sub> ]	85°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None

Board ID	Lamp #	Initial (0 hrs)		Lumen Maintenance (%)											
		LF (lm)	V <sub>F</sub> (V)	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
DUR0GZX	1	76.4		99.6	99.3	99.1	99.8	99.8	98.9	101.7	98.8	99.2	98.1	97.3	96.2
	2	81.1		98.8	100.4	98.3	98.5	98.6	98.8	99.2	97.5	98.7	97.5	96.7	95.8
	3	67.9		99.5	100.2	98.6	99.1	98.8	98.8	100.0	98.1	98.4	97.8	96.3	95.3
	4	67.7		99.2	100.2	97.8	98.0	98.3	98.8	99.0	96.9	98.3	97.3	95.2	94.4
	5	73.8		98.1	98.3	97.8	98.0	97.8	97.7	98.7	96.9	96.8	96.2	95.4	94.1
	6	78.7		98.0	98.8	97.7	98.0	97.4	98.4	98.3	97.5	98.6	97.6	96.3	97.2
	7	77.6		99.1	100.0	98.0	98.3	96.9	98.5	98.4	97.2	98.2	97.4	98.2	95.0
	8	72.8		100.1	99.5	99.1	99.5	98.9	99.2	100.0	98.4	98.9	98.0	96.4	95.2
	9	80.3		98.8	99.6	98.1	98.2	98.4	99.3	99.5	98.2	99.7	98.1	98.4	97.3
	10	75.3		100.5	99.4	100.1	101.3	99.6	100.2	101.5	100.4	100.5	99.5	98.2	97.3
DUR0GZY	2	69.5		104.4	103.6	101.6	100.1	100.0	99.6	99.4	100.2	97.8	97.2	97.4	96.7
	3	68.0		102.3	103.3	102.2	102.3	102.5	102.6	102.7	101.8	101.7	102.0	100.0	99.4
	4	77.1		104.9	102.1	102.7	101.5	100.8	101.0	100.5	101.4	100.1	99.4	99.3	98.1
	5	73.3		104.3	104.0	102.3	100.7	100.1	100.2	99.7	101.1	98.6	97.1	98.2	97.3
	6	77.6		104.4	102.6	101.6	100.3	100.3	100.1	99.9	99.2	97.5	96.4	96.9	95.9
	7	79.4		106.7	104.0	102.4	100.9	100.4	99.8	99.3	98.4	97.8	96.8	97.3	96.8
	8	74.7		104.1	104.4	102.1	100.5	100.7	100.7	100.2	99.5	98.5	96.4	97.4	95.7
	9	79.3		105.4	103.3	102.5	99.4	98.5	97.2	96.2	94.2	91.0	90.6	92.4	90.1
	10	75.3		101.8	102.5	102.6	101.1	100.6	100.2	99.9	99.1	98.1	96.9	97.0	96.3
	DUR0GZZ	1	66.2		103.9	105.7	102.6	102.3	103.0	102.9	103.9	103.1	102.9	101.5	102.0
2		71.8		102.9	102.9	103.0	102.3	102.4	102.4	102.5	101.8	101.4	100.6	100.7	99.9
4		70.8		100.6	100.8	103.3	103.0	102.6	102.1	101.2	100.3	97.4	97.7	97.3	92.2
5		75.5		102.4	103.4	103.6	104.0	103.8	103.3	102.7	103.4	101.0	100.0	102.2	99.9
6		78.9		104.9	103.4	103.3	101.0	100.8	100.2	99.8	99.0	97.0	96.2	97.7	95.8
7		78.7		104.5	103.4	104.0	102.3	101.7	101.8	101.0	100.3	99.5	98.2	100.1	98.7
8		75.1		102.7	102.9	104.3	101.4	101.3	101.1	100.6	101.1	98.8	97.4	100.0	97.5
9		80.7		103.4	102.4	105.1	103.2	102.8	102.8	102.2	101.2	100.4	99.0	99.4	99.0
n		27	27	27	27	27	27	27	27	27	27	27	27	27	27
Mean	74.9	3.10	102.1	101.9	101.3	100.6	100.2	100.2	100.3	99.4	98.8	97.8	97.9	96.6	
Median	75.3		102.4	102.5	102.2	100.7	100.3	100.2	100.0	99.2	98.6	97.6	97.4	96.7	
σ	4.36		2.58	2.02	2.35	1.75	1.85	1.68	1.65	2.11	2.16	2.11	2.13	2.40	
Min.	66.2		98.0	98.3	97.7	98.0	96.9	97.2	96.2	94.2	91.0	90.6	92.4	90.1	
Max.	81.1		106.7	105.7	105.1	104.0	103.8	103.3	103.9	103.4	102.9	102.0	102.2	101.5	

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Durham, NC 27703  
USA Tel: +1.919.313.5300  
www.cree.com/xlamp



**Data Set 4: 85°C, 700 mA**

Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	85°C
Ambient Temperature [T <sub>A</sub> ]	85°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None

Board ID	Lamp #	Initial (0 hrs)			Chromaticity Shift ( $\Delta u'v'$ )											
		CCx	CCy	CCT	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048
DUR0GZX	1	0.4318	0.4039	3094	0.0003	0.0005	0.0012	0.0010	0.0007	0.0005	0.0002	0.0005	0.0006	0.0009	0.0015	0.0018
	2	0.4217	0.3988	3240	0.0005	0.0005	0.0012	0.0010	0.0008	0.0006	0.0001	0.0003	0.0003	0.0005	0.0010	0.0012
	3	0.4345	0.4027	3036	0.0003	0.0004	0.0011	0.0010	0.0007	0.0004	0.0001	0.0005	0.0006	0.0008	0.0014	0.0016
	4	0.4327	0.4027	3067	0.0004	0.0005	0.0011	0.0009	0.0006	0.0003	0.0003	0.0003	0.0009	0.0010	0.0014	0.0019
	5	0.4386	0.4076	3005	0.0002	0.0002	0.0009	0.0008	0.0007	0.0004	0.0003	0.0003	0.0006	0.0005	0.0007	0.0014
	6	0.4366	0.4038	3009	0.0003	0.0002	0.0011	0.0008	0.0006	0.0003	0.0002	0.0003	0.0004	0.0006	0.0010	0.0011
	7	0.4223	0.3995	3233	0.0005	0.0004	0.0011	0.0010	0.0005	0.0003	0.0002	0.0003	0.0005	0.0009	0.0011	0.0010
	8	0.4261	0.4061	3213	0.0004	0.0004	0.0012	0.0010	0.0008	0.0005	0.0001	0.0002	0.0002	0.0001	0.0005	0.0006
	9	0.4309	0.4076	3139	0.0003	0.0004	0.0013	0.0012	0.0010	0.0008	0.0003	0.0004	0.0004	0.0003	0.0005	0.0005
	10	0.4317	0.4060	3112	0.0001	0.0004	0.0011	0.0011	0.0008	0.0006	0.0001	0.0001	0.0003	0.0004	0.0008	0.0009
DUR0GZY	2	0.4293	0.3993	3100	0.0001	0.0002	0.0002	0.0004	0.0001	0.0002	0.0002	0.0004	0.0006	0.0008	0.0011	0.0015
	3	0.4276	0.3937	3085	0.0002	0.0003	0.0004	0.0004	0.0005	0.0005	0.0006	0.0006	0.0009	0.0009	0.0011	0.0015
	4	0.4166	0.3857	3231	0.0002	0.0001	0.0004	0.0002	0.0002	0.0002	0.0004	0.0004	0.0006	0.0010	0.0013	0.0019
	5	0.4138	0.3810	3247	0.0002	0.0003	0.0002	0.0002	0.0003	0.0004	0.0003	0.0008	0.0010	0.0015	0.0019	0.0025
	6	0.4188	0.3868	3195	0.0002	0.0003	0.0004	0.0003	0.0003	0.0004	0.0004	0.0008	0.0009	0.0011	0.0015	0.0018
	7	0.4299	0.3992	3089	0.0002	0.0004	0.0000	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0016	0.0018	0.0024
	8	0.4261	0.3908	3086	0.0002	0.0004	0.0002	0.0003	0.0004	0.0002	0.0005	0.0002	0.0008	0.0006	0.0005	0.0010
	9	0.4304	0.4022	3104	0.0002	0.0003	0.0001	0.0002	0.0001	0.0002	0.0003	0.0003	0.0007	0.0005	0.0006	0.0010
	10	0.4301	0.3994	3086	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0005	0.0006	0.0009	0.0010	0.0012	0.0018
	DUR0GZZ	1	0.4280	0.4007	3135	0.0005	0.0003	0.0001	0.0001	0.0001	0.0000	0.0000	0.0002	0.0005	0.0006	0.0008
2		0.4324	0.4043	3085	0.0002	0.0002	0.0001	0.0001	0.0003	0.0002	0.0002	0.0004	0.0006	0.0007	0.0009	0.0012
4		0.4292	0.3963	3077	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0006	0.0006	0.0010	0.0012
5		0.4144	0.3806	3230	0.0002	0.0003	0.0001	0.0001	0.0002	0.0002	0.0002	0.0004	0.0007	0.0011	0.0015	0.0022
6		0.4178	0.3892	3235	0.0003	0.0003	0.0005	0.0002	0.0003	0.0003	0.0005	0.0004	0.0009	0.0011	0.0015	0.0019
7		0.4140	0.3805	3237	0.0003	0.0003	0.0003	0.0001	0.0003	0.0002	0.0002	0.0005	0.0006	0.0011	0.0013	0.0020
8		0.4218	0.3908	3169	0.0003	0.0004	0.0003	0.0003	0.0003	0.0003	0.0006	0.0006	0.0007	0.0010	0.0013	0.0016
9		0.4206	0.3875	3165	0.0003	0.0003	0.0002	0.0003	0.0002	0.0002	0.0004	0.0004	0.0009	0.0010	0.0010	0.0014
n		27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
Mean				0.0003	0.0003	0.0006	0.0005	0.0004	0.0003	0.0003	0.0003	0.0005	0.0007	0.0008	0.0012	0.0015
Median				0.0002	0.0003	0.0004	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0006	0.0009	0.0011	0.0015
$\sigma$				0.0001	0.0001	0.0005	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0005	
Min.				0.0001	0.0001	0.0000	0.0001	0.0001	0.0000	0.0000	0.0001	0.0002	0.0001	0.0005	0.0005	
Max.				0.0005	0.0005	0.0013	0.0012	0.0010	0.0008	0.0006	0.0009	0.0010	0.0016	0.0019	0.0025	

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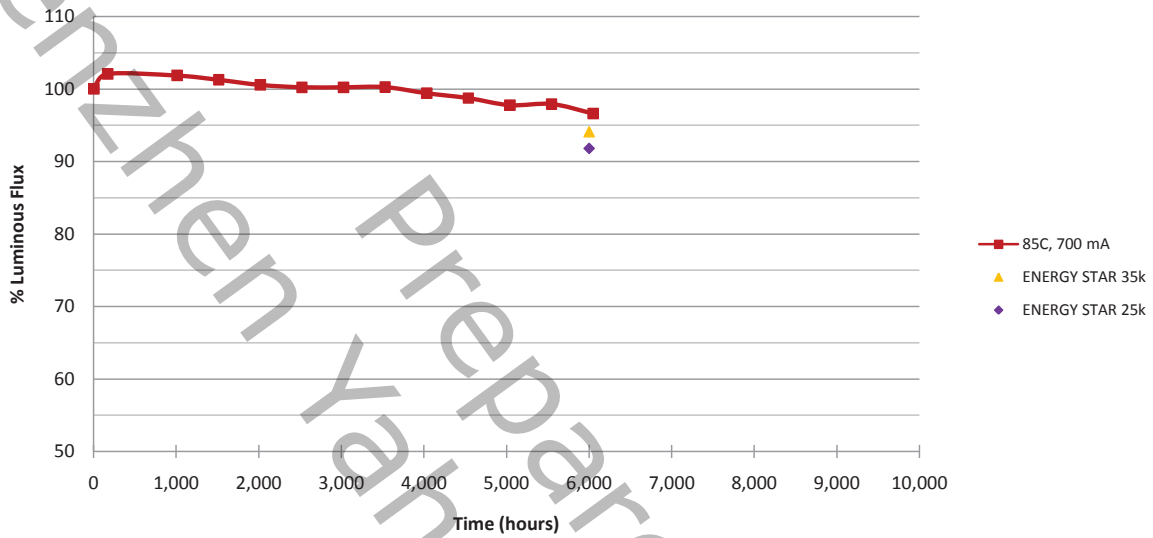
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Part Number	XLamp XP-E White LEDs (XPEWHT)
Case Temperature [T <sub>s</sub> ]	85°C
Ambient Temperature [T <sub>A</sub> ]	85°C
Drive Current [I <sub>F</sub> ]	700 mA
Measurement Current	350 mA
Failures observed	None



Initial (0 hrs)		Lumen Maintenance (%)													
	LF (lm)	V <sub>F</sub> (V)	168	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544	6048	
n	27	27	27	27	27	27	27	27	27	27	27	27	27	27	
Mean	74.9	3.10	102.1	101.9	101.3	100.6	100.2	100.2	100.3	99.4	98.8	97.8	97.9	96.6	
Median	75.3		102.4	102.5	102.2	100.7	100.3	100.2	100.0	99.2	98.6	97.6	97.4	96.7	
σ	4.36		2.58	2.02	2.35	1.75	1.85	1.68	1.65	2.11	2.16	2.11	2.13	2.40	
Min.	66.2		98.0	98.3	97.7	98.0	96.9	97.2	96.2	94.2	91.0	90.6	92.4	90.1	
Max.	81.1		106.7	105.7	105.1	104.0	103.8	103.3	103.9	103.4	102.9	102.0	102.2	101.5	

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