

INVITATION TO BID

City of Ann Arbor
Guy C. Larcom Municipal Building
Ann Arbor, Michigan 48107

Ladies and Gentlemen:

The undersigned, as Bidder, declares that this Bid is made in good faith, without fraud or collusion with any person or persons bidding on the same Contract; that this Bidder has carefully read and examined the bid documents, including Advertisement, Human Rights Division Contract Compliance Forms, Instructions to Bidders, Bid, Bid Forms, General Conditions, Standard Specifications, Detailed Specifications, all Addenda, and understands them. The Bidder also declares that it has extensive experience in supplying products/materials similar to the ITB specifications.

The Bidder acknowledges that it has not received or relied upon any representations or warrants of any nature whatsoever from the City of Ann Arbor, its agents or employees, and that this Bid is based solely upon the Bidder's own independent business judgment.

In accordance with these bid documents, and Addenda numbered 4, the undersigned, as Bidder, proposes to supply products/materials following the ITB specification included herein for the amounts set forth in the Bid Forms.

In submitting this Bid, it is understood that the right is reserved by the City to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

The undersigned agrees that if the bid is accepted by the City of Ann Arbor a binding Contract or Purchase order will be in effect for the delivery of the goods in accordance with the bid.

SIGNED THIS 5TH DAY OF FEBRUARY, 2013

CANIFF ELECTRIC SUPPLY

Bidder's Name

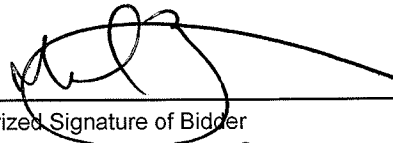
2001 CANIFF
HAWTRUCK M. 48212

Official Address

313 365 8144

Telephone Number

248 520 6246



Authorized Signature of Bidder

MICHAEL A BEMIS

Print Name of Signer Above

MABEMIS@COMCAST.NET

Email Address

LEGAL STATUS OF BIDDER

(The Bidder shall fill out the appropriate form and strike out the other two.)

Bidder declares that it is:

* A corporation organized and doing business under the laws of the state of Michigan, for whom David Bemis, bearing the office title of Operations Mgr, whose signature is affixed to this Bid, is authorized to execute contracts.

~~* A partnership, list all members and the street and mailing address of each:~~

Also identify the ~~County~~ and State where partnership papers are filed:
County of _____, State of _____

* An individual, whose signature with address, is affixed to this Bid: DLB
(initial here)

ITB 4265 - BID FORM

Vendor Name Caniff Electric Supply
 Mike Bonis MASEMIYE CONTACT - NOT

Quantity – 45 LED Parking Lot Light Fixtures.

Price – Vendors must complete all boxes within the price section. In the event information is missing bids shall be disqualified.

	LED Parking Lot Lights	Price (US Dollars/each)
Manufacturer	DIALIGHT	686 ⁰⁰ /E
IC Model #	SL3N TILGHARRA - 8" - Side Tension Gray	
Auto Sampler Model #	"Street Sense" "ARRA	

Compliant "

Delivery - Materials must be delivered by February 28, 2013.

Yes, we can deliver by February 28, 2013.

No, we cannot deliver by February 28, 2013. We can provide by _____

Invoice Terms - Discount of ___% or \$ will be allowed for payment of invoice Thirty (30) days from day of delivery and acceptance.

References - Please provide at minimum, three (3) references, preferably municipal government where your company has supplied LED PARKING LOT LIGHTS. Failure to list references may result in disqualification.

<u>Detroit Zoo Parking Deck - Renee DASH</u>	<u>248 242-1186</u>
Company	Contract Name Phone Number
<u>Detroit Opera House</u>	<u>JASON WARCZECHA 313-965-4314</u>
Company	Contract Name Phone Number
<u>Cobo Hall</u>	<u>313-877-8242</u>
Company	Contract Name Phone Number
<u>Washington St Parking Garage</u>	<u>John Kull</u>
Company	Contract Name Phone Number

Other LED Projects
 City of Ann Arbor PO# 2013-0000139 From 9/12
 City of Pontiac - Dialight Street Sense Lights
 City of Hazel Park - Lumicon ROF Fixtures -
 More Available if needed - Mike Bonis 248 520 6246



TO: Sharon Shaw
Lumecon, LLC

FROM: Dialight Corporation
1501 State Route 34 South
Farmingdale, NJ 07727

RE: Ann Arbor, MI - Buy American Certification

StreetSense LED Streetlights
Section 1605: "Buy American" Compliance Document
American Recovery and Reinvestment Act 2009

In accordance with Section 1605 of the American Recovery and Reinvestment Act of 2009, Dialight Corporation certifies that its light-emitting diode (LED) **Streetlight Products SL3N7ILGH** are fully compliant with the *Buy American* procurement requirements pertaining to manufactured goods.

Using a combination of imported and domestically manufactured components, Dialight's LED **Streetlight Products SL3N7ILGH** are manufactured in Roxboro, North Carolina and satisfy all minimum requirements with regard to domestic "substantial transformation", including final product assembly in the United States.

For further information please contact:

Dialight Corporation
1501 State Route 34, South
Farmingdale, NJ 07727
www.dialight.com

TJ Struhs
Government Affairs
[phone] (202) 215-8097 [fax] (732) 751-3105
tstruhs@dialight.com

StreetSense LED Streetlight technical specifications can be found at
www.dialight.com



REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100888297

Original Issue Date: September 28, 2012

Revision Date: October 10, 2012

REPORT NO. 100888297CRT-005

TEST OF ONE LED ROADWAY LUMINAIRE

FIXTURE MODEL NO. SL3N5ILGG

LED MODEL NO. CREE XLAMP XTE

RENDERED TO

DIALIGHT CORPORATION
1501 ROUTE 34 SOUTH
FARMINGDALE, NJ 08005

Revision Note October 10, 2012: Report was revised to correct fixture model number.

TEST: Electrical and Photometric tests as required to the IESNA test standard.

LABORATORY NOTE: The laboratory that conducted the testing detailed in this report has been Qualified, Verified, and Recognized for LM-79 Testing for ENERGY STAR for SSL by US DOE's CALiPER program.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500403100.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79: 2008 Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI ANSLG C38.377: 2012 Specifications of the Chromaticity of Solid State Lighting Products

Energy Star Version 1.1 (2008): Program Requirements for Solid-State Lighting Luminaires

Energy Star Manufacturer's Guide Version 2.0 (2009): Guide for Qualifying Solid State Lighting Luminaires

DESCRIPTION OF SAMPLE: The client submitted two samples of model number SL3N5ILGG. The samples were received by Intertek on September 11, 2012, in undamaged condition, and both samples were tested as received. The sample designations were 254992 and 254995.

DATES OF TESTS: September 20, 2012 through September 27, 2012

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

SUMMARY

Model No.: SL3N5ILGG
Description: LED Roadway Luminaire

Criteria	Result
Total Lumen Output	13353 Lumens
Total Power	165.3 W
Luminaire Efficacy	80.78
Power Factor (at 120 Vac)	0.992
Power Factor (at 277 Vac)	0.931
Current ATHD (at 120 Vac)	9.74%
Current ATHD (at 277 Vac)	15.65%
Correlated Color Temperature (CCT)	4439 K
Color Rendering Index (CRI) - Ra	75.9
Color Rendering Index (CRI) - R9	-9.7
Duv	0.005
Chromaticity Coordinate (x)	0.365
Chromaticity Coordinate (y)	0.377
Chromaticity Coordinate (u')	0.215
Chromaticity Coordinate (v')	0.499
Maximum In-Situ Source Temperature Point	61.5°C
Backlight Rating	B 3
Uplight Rating	U 1
Glare Rating	G 3

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Calibration Date	Calibration Due Date
Leeds & Northup Standard Resistor	Manganin	Y089	02/24/12	02/24/13
Data Precision Digital Voltmeter	3600	V124	02/24/12	02/24/13
Fluke Multimeter	45	M133	02/24/12	02/24/13
Kikusui DC Power Supply	35-10L	E160	---	---
Sorenson DC Power Supply	DLM150-20E	---	---	---
NIST Spectral Flux Standard Source	RF1024	---	09/18/10	100 hours of use
LSI High Speed Mirror Goniometer	6440	---	09/10/12	10/10/12
Elgar Power Supply	CW1251	---	VBU	VBU
Yokogawa Power Analyzer	WT210	E464	04/19/12	04/19/13
Extech Hygro-Thermometer	445703	T1359	10/26/11	10/26/12
Yokogawa Power Analyzer	WT1600	E462	07/06/12	07/06/13
LABSPHERE 3M	W/ CDS 1100	N307	VBU	VBU
Fluke Temperature Meter	53 II	T1318	03/12/12	03/12/13
Extech Hygro-Thermometer	445703	T1366	10/26/11	10/26/12
Fluke Multimeter	87 V	D590	03/23/12	03/23/13
Fluke Temperature Meter	53 II	D587	03/12/12	04/13/13

TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

In-Situ Maximum Measured Power Supply Case and LED Source Point Temperature

Power supply case and/or LED source operating temperature measurements were taken on one test sample per model with a thermocouple and Fluke 87 temperature meter. The SSL sample was allowed to reach thermal equilibrium for seven and a half hours before measurements were taken. Power supply or source temperature measurements were measured at the TMP_{PS} or T_S point as indicated by the included diagram in accordance with manufacturers declared hot spot location, or at a hot spot location found with a thermal camera when no diagram from the manufacturer is given. The maximum temperature was recorded for the sample. A simulated ceiling or other enclosure may be used in accordance to UL 1598 or UL 153 as applicable.

TEST METHODS (cont'd)

BUG Ratings (Backlight, Uplight, Glare) – for Outdoor Fixtures Only

Zonal Lumens were calculated and grouped using the formula in IESNA TM-15-11 for each zone as defined in the BUG addendum. The maximum lumen rating in each zone was compared against the BUG zonal requirements of Energy Star.

RATING TABLE: BACKLIGHT

NOTE: MAX RATING IN ANY ZONE = RATING FOR LUMINAIRE

	B0	B1	B2	B3	B4	B5
BH	110	500	1000	2500	5000	>5000
BM	220	1000	2500	5000	8500	>8500
BL	110	500	1000	2500	5000	>5000

RATING TABLE: UPLIGHT

NOTE: MAX RATING IN ANY ZONE = RATING FOR LUMINAIRE

	U0	U1	U2	U3	U4	U5
UH	0	10	50	500	1000	>1000
UL	0	10	50	500	1000	>1000

GLARE RATINGS

NOTE: MAX RATING IN ANY ZONE = RATING FOR LUMINAIRE

FOR ASYMMETRICAL LUMINAIRE TYPES (I, II, III, IV)

	G0	G1	G2	G3	G4	G5
FVH	10	100	225	500	750	>750
BVH	10	100	225	500	750	>750
FH	660	1800	5000	7500	12000	>12000
BH	110	500	1000	2500	5000	>5000

FOR QUADRILATERAL SYMMETRICAL LUMINAIRE TYPES (V, VSQUARE)

	G0	G1	G2	G3	G4	G5
FVH	10	100	225	500	750	>750
BVH	10	100	225	500	750	>750
FH	660	1800	5000	7500	12000	>12000
BH	660	1800	5000	7500	12000	>12000

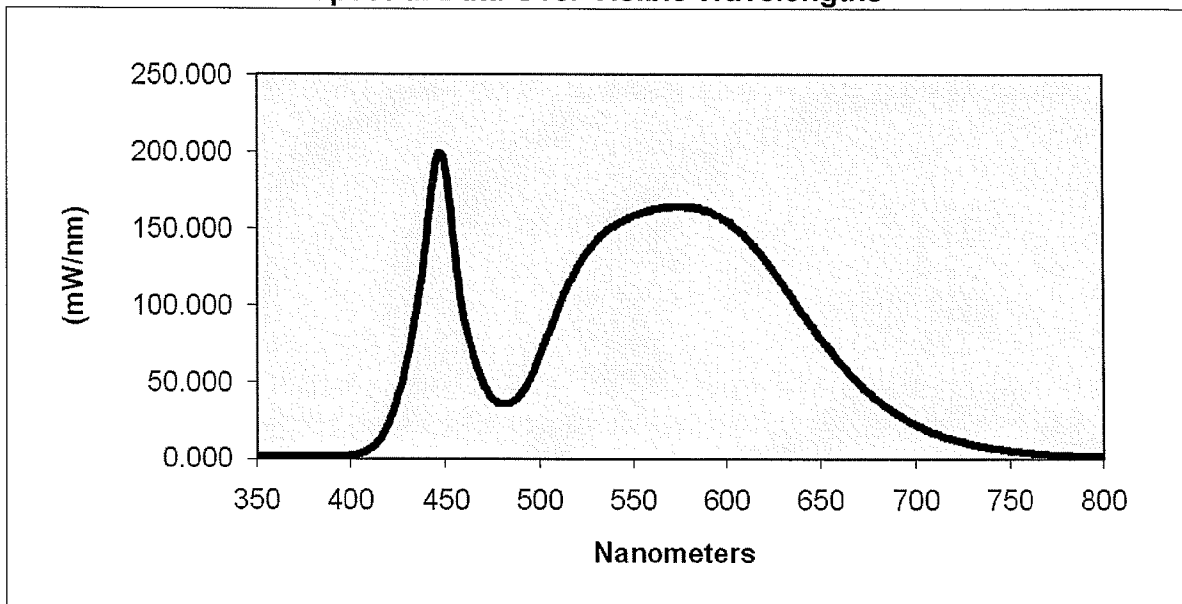


RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	1.813	460	91.939	570	164.135	680	38.181
355	1.701	465	67.341	575	164.353	685	33.413
360	1.494	470	50.299	580	164.105	690	29.216
365	1.447	475	39.488	585	163.668	695	25.616
370	1.507	480	35.897	590	161.250	700	22.258
375	1.391	485	36.774	595	158.576	705	19.380
380	1.444	490	42.140	600	155.444	710	16.879
385	1.457	495	52.225	605	150.269	715	14.570
390	1.505	500	66.419	610	144.571	720	12.649
395	1.882	505	82.306	615	138.300	725	11.046
400	2.321	510	98.399	620	130.682	730	9.499
405	3.542	515	112.527	625	122.350	735	8.258
410	6.376	520	124.680	630	113.515	740	7.184
415	12.185	525	134.158	635	104.729	745	6.227
420	23.363	530	141.961	640	95.891	750	5.418
425	41.291	535	147.044	645	86.901	755	4.747
430	65.684	540	151.254	650	78.344	760	4.161
435	97.327	545	154.843	655	70.752	765	3.582
440	143.264	550	158.080	660	63.237	770	3.135
445	190.763	555	160.455	665	55.923	775	2.714
450	190.648	560	162.606	670	49.428	780	2.420
455	136.732	565	164.067	675	43.430		

Sample No. 254995
Spectral Data Over Visible Wavelengths





RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements at 25°C – Integrating Sphere Method

Intertek Sample No.	Correlated Color Temperature		CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate	CIE 76' Chromaticity Coordinate	CIE 76' Chromaticity Coordinate
	(K)					(x)	(y)	(u')	(v')
254995	4439		75.9	-9.7	0.005	0.365	0.377	0.215	0.499

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)
254995	UP	120.0	1390	165.6

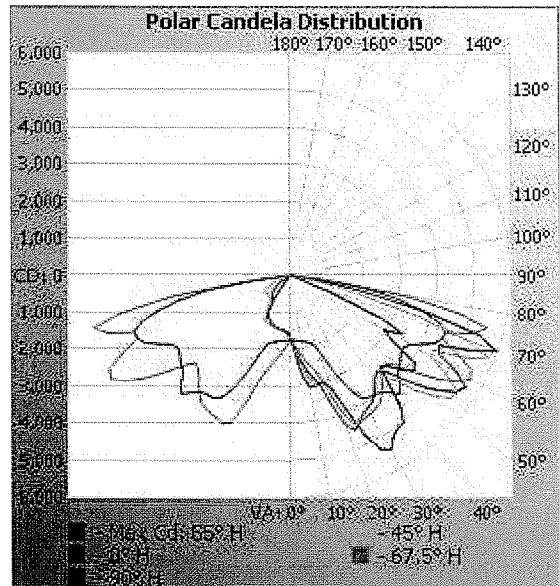
Intertek Sample No.	Input Power Factor 120 Vac	Current ATHD (%) 120 Vac	Input Power Factor 277 Vac	Current ATHD (%) 277 Vac
254995	0.992	9.74	0.931	15.65

Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
254995	UP	120.0	1387	165.3	0.993	13353	80.78

Intensity (Candlepower) Summary at 25°C – Candelas

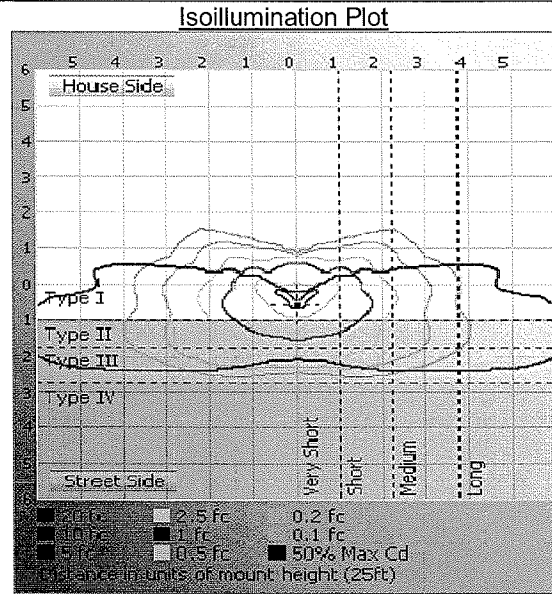
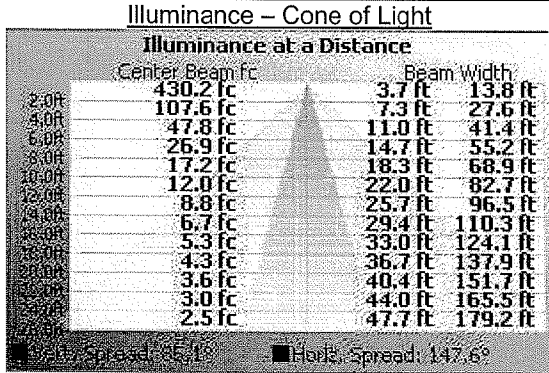
Angle	0	22.5	45	67.5	90
0	1721	1721	1721	1721	1721
5	2413	2368	2219	1990	1762
10	3050	3004	2802	2326	1810
15	3042	3103	3139	2703	1868
20	3286	4026	4302	3789	2069
25	4740	4360	4318	4412	3008
30	5437	4564	4167	4312	3832
35	5050	4383	3892	4210	3941
40	4645	3827	3530	3872	4126
45	3474	4162	4002	3546	4215
50	3958	4754	5057	3767	3848
55	4101	4228	5525	4864	3653
60	2956	3558	4425	5619	3740
65	2726	4268	5246	5018	4337
70	403	1828	5087	4501	4494
75	118	338	1939	5493	3770
80	44	77	313	3256	2334
85	20	29	50	290	49
90	4	13	17	49	10
95	0	3	7	11	8
100	0	0	2	4	6
105	0	0	0	2	4
110	0	0	0	1	2



RESULTS OF TESTS (cont'd)

Illumination Plots

Mounting Height: 25 ft.



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	2173	16.3
0-40	3979	29.8
0-60	8648	64.8
60-90	4697	35.2
0-90	13345	99.9
90-180	8.4	0.1
0-180	13353	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	186.8	1.4
10-20	647.8	4.9
20-30	1338	10.0
30-40	1806	13.5
40-50	2088	15.6
50-60	2581	19.3
60-70	2706	20.3
70-80	1731	13.0
80-90	260.0	1.9
90-100	6.5	0.0
100-110	1.7	0.0
110-120	0.3	0.0



RESULTS OF TESTS (cont'd)

BUG Rating (Backlight, Uplight, Glare)

Zone	Total Lumens	Frontlight Category	Frontlight Lumens	Backlight Category	Backlight Lumens	Uplight Category	Uplight Lumens
0-30	2173	FL	1526	BL	647	--	--
30-60	6475	FM	4864	BM	1611	--	--
60-80	4436	FH	3340	BH	1096	--	--
80-90	260	FVH	182	BVH	78	--	--
90-100	6					UL	6
100-180	2					UH	2

Backlight Rating: B 3

Uplight Rating: U 1

Glare Rating: G 3

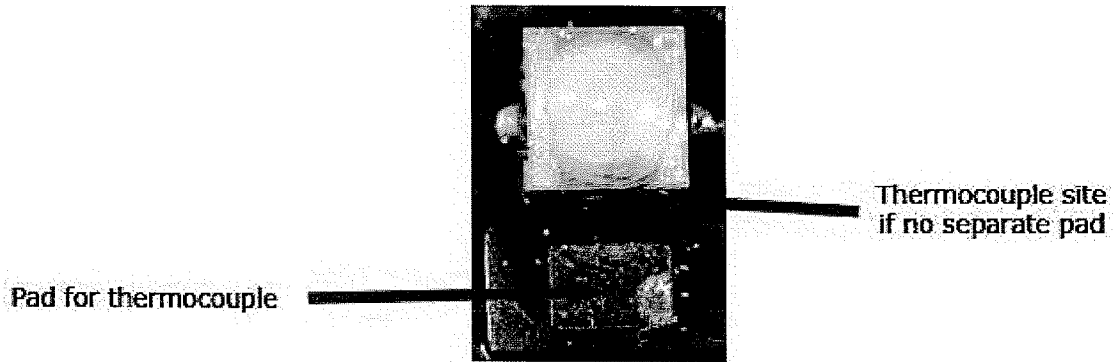


RESULTS OF TESTS (cont'd)

In-Situ Maximum Measured LED Source Temperature

Manufacturer Supplied Documentation:

LED identified as: CREE XLAMP XTE



PRODUCT CHARACTERISTICS

Characteristics	Unit	Minimum	Typical	Maximum
Thermal resistance, junction to solder point	°C/W		5	
Viewing angle (FWHM) - white	degrees		115	
Viewing angle (FWHM) - royal blue	degrees		140	
Temperature coefficient of voltage	mV/°C		-2.5	
ESD classification (HBM per Mil-Std-883D)			Class 2	
DC forward current	mA			1500
Reverse voltage	V			5
Forward voltage (@ 350 mA, 85 °C)	V		2.85	3.4
LED junction temperature	°C			150



RESULTS OF TESTS (cont'd)

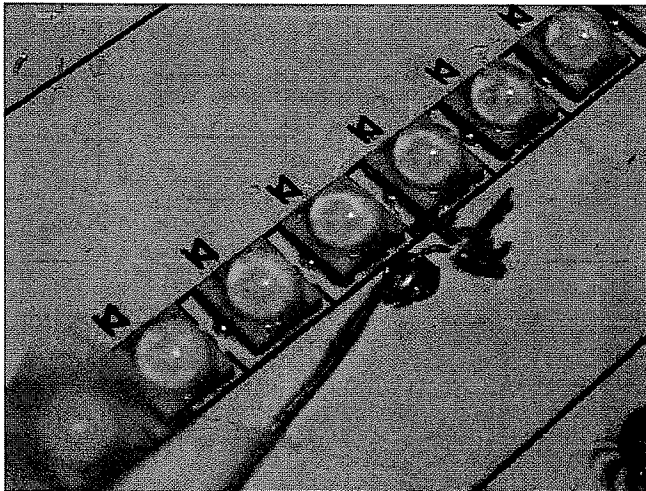
In-Situ Maximum Measured LED Source Temperature

Maximum Junction Temperature from LED specification (T_j) = 150°C
Thermal Resistance Formula from LED specification = 5°C/W
Maximum Forward Voltage (V_f) from LED specification = 3.4 V
Measured LED Current = 461 mA
Calculated LED Wattage = $V_f \times$ Measured LED Current = 1.567W
Maximum Source Temperature (T_s) = $T_j - (\text{LED Wattage} \times \text{Thermal Resistance}) = 142^\circ\text{C}$

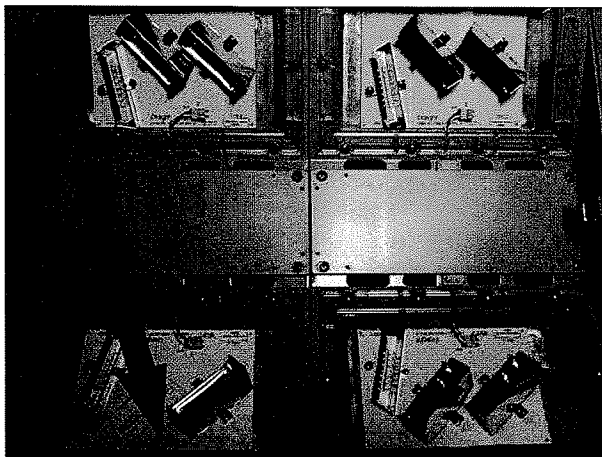
Maximum Measured Manufacturer Designated Source Temperature

Sample No.	Maximum Measured Source Temperature (°C)	Location	Maximum Rated Source Temperature(°C)
254992	61.5	Per diagram above	142

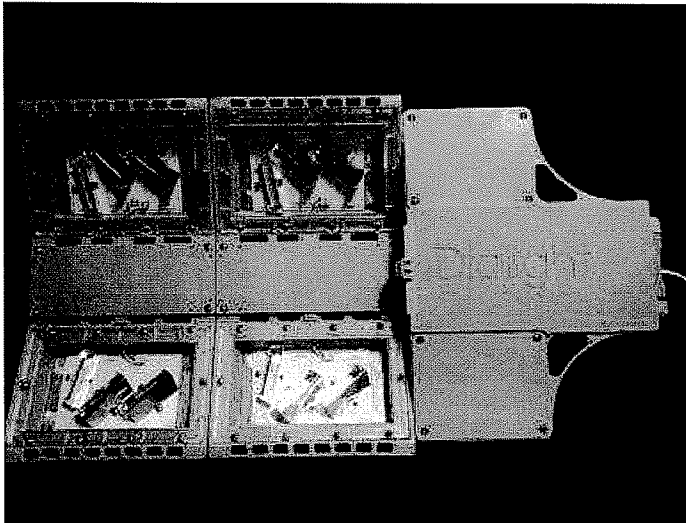
In-Situ Picture – T_s



In-Situ Picture – T_s location



Picture (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:

Joe Schledorn
Engineer
Lighting Division

Attachment: 254995.IES

Report Reviewed By:

Dave Ellis
Senior Project Engineer
Lighting Division



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



NVLAP Lab Code 500041-0

Revision: 12 (December 6, 2012)

INTRODUCTION

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

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

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

NVLAP ACCREDITATION FOR LM-80-2008 TESTING

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

<http://ts.nist.gov/standards/scopes/5000410.htm>

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WWW.CREE.COM/XLAMP This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST or any other agency of the federal government.



LED MODULES (REV 1)

Revision: 1 (May 17, 2012)

Description Of LED Light Sources

Module Family	Nominal Light Output	Applicable Order Codes
LMR2	650 lm	LMR020-0650-xxxx-xxxxxTW
LMR4	700 lm	LMR040-0700-xxxx-xxxxxTW
	1000 lm	LMR040-1000-xxxx-xxxxxTW
LMH2	850 lm	LMH020-0850-xxxx-xxxxxTW
	1250 lm	LMH020-1250-xxxx-xxxxxTW
	2000 lm	LMH020-2000-xxxx-xxxxxTW
	3000 lm	LMH020-3000-xxxx-xxxxxTW
LMH6	2000 lm	LMH060-2000-xxxx-xxxxxTW
	2900 lm	LMH060-2900-xxxx-xxxxxTW

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _F]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours	Reported TM-21 L70 Lifetime
1	85°C	85°C	White: 700 mA Single-Color: 1000 mA	96.1%	0.0007	L70(6k) > 36,300 hrs



XLAMP CXA2011 WHITE LEDS (REV 0)

Revision: 0 (May 18, 2012)

Description Of LED Light Sources

XLamp CXA2011 White LEDs (Series: CXA2011)

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

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _f]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift ($\Delta u'v'$) at 6,000 hours	Reported TM-21 L70 Lifetime
1	85°C	85°C	300 mA	97.2%	0.0012	L70(6k) > 36,300 hrs



XLAMP MC-E WHITE LEDS (REV 1)

Revision: 1 (December 8, 2010)

Description Of LED Light Sources

XLamp MC-E White LEDs (MCE4WT) & XLamp MC-E EasyWhite LEDs (MCEEZW)

All measurements provided are LED package measurements with all LEDs on simultaneously. No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _c]	Ambient Temp. [T _a]	Drive Current [I _f]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours
1	45°C	45°C	350 mA	98.1%	0.0009
2	45°C	45°C	700 mA	99.0%	0.0015
3	55°C	55°C	350 mA	98.4%	0.0010
4	55°C	55°C	700 mA	95.8%	0.0027
5	85°C	85°C	350 mA	98.2%	0.0014
6	85°C	85°C	700 mA	92.8%	0.0070



XLAMP ML-B WHITE LEDS (REV 1)

Revision: 1 (May 1, 2012)

Description Of LED Light Sources

XLamp ML-B White LEDs (MLBAWT)

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _F]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift ($\Delta u'v'$) at 6,000 hours	Reported TM-21 L70 Lifetime
1	45°C	45°C	80 mA	99.0%	0.0009	L70(6k) > 36,300 hrs
2	55°C	55°C	80 mA	98.3%	0.0010	L70(6k) > 36,300 hrs
3	85°C	85°C	80 mA	98.1%	0.0011	L70(6k) > 36,300 hrs
4	85°C	85°C	175 mA	96.3%	0.0012	L70(8k) = 36,300 hrs



XLAMP ML-C & ML-E WHITE LEDS (REV 1)

Revision: 1 (March 19, 2012)

Description Of LED Light Sources

XLamp ML-C (MLCxWT) & ML-E (MLExWT) White LEDs

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

- ML-C Parallel : MLCxWT-xx-xxxx-xxxxxx
- ML-C Series : MLCSWT-xx-xxxx-xxxxxx
- ML-E Parallel : MLExWT-xx-xxxx-xxxxxx
- ML-E Series : MLESWT-xx-xxxx-xxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _c]	Ambient Temp. [T _a]	Drive Current [I _f]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours	Reported TM-21 L70 Lifetime
1	45°C	45°C	116 mA (MLCAWT); 58 mA (MLCSWT); 175 mA (MLEAWT); 58 mA (MLESWT)	97.9%	0.0008	L70(6k) > 36,300 hrs
2	55°C	55°C	116 mA (MLCAWT); 58 mA (MLCSWT); 175 mA (MLEAWT); 58 mA (MLESWT)	96.9%	0.0012	L70(6k) > 36,300 hrs
3	85°C	85°C	116 mA (MLCAWT); 58 mA (MLCSWT); 175 mA (MLEAWT); 58 mA (MLESWT)	95.5%	0.0012	L70(6k) > 36,300 hrs



XLAMP MP-L EASYWHITE LEDS (REV 0)

Revision: 0 (September 30, 2010)

Description Of LED Light Sources

XLamp MP-L EasyWhite LEDs (MPLEZW)

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _F]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours
1	45°C	45°C	250 mA	96.9%	0.0007
2	55°C	55°C	250 mA	96.1%	0.0012
3	85°C	85°C	250 mA	96.7%	0.0017



XLAMP MT-G EASYWHITE LEDS (REV 1)

Revision: 1 (February 16, 2012)

Description Of LED Light Sources

XLamp MT-G EasyWhite LED arrays (Series: MTGEZW)

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

- MT-G 6V : MTGEZW-xx-xxxx-xBxxxxxxxx
• MT-G 36V : MTGEZW-xx-xxxx-xNxxxxxxxx

No failures occurred during testing.

Test Summary

Table with 7 columns: Data Set, Case Temp. [Ts], Ambient Temp. [Ta], Drive Current [If], Average Lumen Maintenance at 6,000 hours, Average Chromaticity Shift (Δu'v') at 6,000 hours, Reported TM-21 L70 Lifetime. Contains 7 rows of test data.



XLAMP MX-3 WHITE LEDS (REV 0)

Revision: 0 (March 29, 2011)

Description Of LED Light Sources

XLamp MX-3 White LEDs: parallel (MX3AWT) & series (MX3SWT) configurations.

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _F]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours
1	45°C	45°C	400 mA (MX3AWT) 133 mA (MX3SWT)	98.7%	0.0010
2	55°C	55°C	400 mA (MX3AWT) 133 mA (MX3SWT)	97.0%	0.0013
3	85°C	85°C	400 mA (MX3AWT) 133 mA (MX3SWT)	94.9%	0.0009

XLAMP MX-6 WHITE LEDS (REV 2)

Revision: 2 (September 2, 2011)

Description Of LED Light Sources

XLamp MX-6 White LEDs: parallel (MX6AWT) & series (MX6SWT) configurations

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _a]	Drive Current [I _F]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours	Reported TM-21 L70 Lifetime
1	45°C	45°C	350 mA (MX6AWT) 58 mA (MX6SWT)	97.5%	0.0007	L70(6k) > 36,300 hrs
2	55°C	55°C	350 mA (MX6AWT) 58 mA (MX6SWT)	98.6%	0.0007	L70(6k) > 36,300 hrs
3	85°C	85°C	350 mA (MX6AWT) 58 mA (MX6SWT)	96.5%	0.0014	L70(6k) = 35,600 hrs
4	45°C	45°C	600 mA (MX6AWT) 100 mA (MX6SWT)	98.0%	0.0009	L70(6k) > 36,300 hrs
5	55°C	55°C	600 mA (MX6AWT) 100 mA (MX6SWT)	97.2%	0.0009	L70(6k) > 36,300 hrs
6	85°C	85°C	600 mA (MX6AWT) 100 mA (MX6SWT)	94.5%	0.0008	L70(6k) = 34,400 hrs



XLAMP XB-D WHITE LEDS (REV 1)

Revision: 1 (December 5, 2012)

Description Of LED Light Sources

XLamp XB-D White LEDs (Series: XBDAWT)

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

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _r]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours	Reported TM-21 L70 Lifetime
2	55°C	55°C	700 mA	97.7%	0.0007	L70(6k) > 36,300 hrs
1	85°C	85°C	700 mA	97.3%	0.0010	L70(6k) > 36,300 hrs
3	105°C	105°C	700 mA	93.9%	0.0012	L70(6k) > 36,300 hrs
4	55°C	55°C	1000 mA	96.9%	0.0006	L70(6k) > 36,300 hrs
5	85°C	85°C	1000 mA	95.1%	0.0007	L70(6k) > 36,300 hrs
6	105°C	105°C	1000 mA	94.4%	0.0014	L70(6k) > 36,300 hrs



XLAMP XM-L EASYWHITE LEDS (REV 0)

Revision: 0 (October 31, 2011)

Description Of LED Light Sources

XLamp XM-L EasyWhite LED arrays (Series: XMLEZW)

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

- XM-L EZW 6V : XMLEZW-xx-xxxx-xBxxxxxxxx
- XM-L EZW 12V : XMLEZW-xx-xxxx-xDxxxxxxxx

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _a]	Drive Current [I _r]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours	Reported TM-21 L70 Lifetime
1	55°C	55°C	700 mA (6V); 350 mA (12V)	97.2%	0.0029	L70(6k) > 36,300 hrs
2	85°C	85°C	700 mA (6V); 350 mA (12V)	96.1%	0.0026	L70(6k) > 36,300 hrs
3	105°C	105°C	700 mA (6V); 350 mA (12V)	97.3%	0.0025	L70(6k) > 36,300 hrs
4	55°C	55°C	1000 mA (6V); 500 mA (12V)	97.6%	0.0023	L70(6k) > 36,300 hrs
5	85°C	85°C	1000 mA (6V); 500 mA (12V)	96.6%	0.0019	L70(6k) > 36,300 hrs



XLAMP XM-L WHITE LEDS (REV 2)

Revision: 2 (October 31, 2012)

Description Of LED Light Sources

XLamp XM-L White LED packages (Series: XMLAWT)

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

No failures occurred during testing.

Test Summary

Table with 7 columns: Data Set, Case Temp. [Ts], Ambient Temp. [Ta], Drive Current [If], Average Lumen Maintenance at 6,000 hours, Average Chromaticity Shift (Δu'v') at 6,000 hours, Reported TM-21 L70 Lifetime. Rows 4-6 show 1500 mA at 55°C, 85°C, 105°C. Rows 1-3 show 2000 mA at 45°C, 55°C, 85°C.

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

Table with 7 columns: Data Set, Case Temp. [Ts], Ambient Temp. [Ta], Drive Current [If], Average Lumen Maintenance at 6,000 hours, Average Chromaticity Shift (Δu'v') at 6,000 hours, Reported TM-21 L70 Lifetime. Rows 5+, 6+, 7+, 8+, 9+ show extended data sets at 1500 mA and 2000 mA.



XLAMP XP-E WHITE LEDS (REV 3)

Revision: 3 (November 9, 2011)

Description Of LED Light Sources

XLamp XP-E White LED packages (Series: XPEWHT)

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

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _r]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift ($\Delta u'v'$) at 6,000 hours	Reported TM-21 L70 Lifetime
8	55°C	55°C	350 mA	97.7%	0.0022	L70(10k) > 60,500 hrs
9	85°C	85°C	350 mA	98.1%	0.0021	L70(10k) > 60,500 hrs
10	105°C	105°C	350 mA	96.4%	0.0021	L70(6k) > 36,300 hrs
5	45°C	45°C	700 mA	96.6%	0.0013	L70(10k) > 60,500 hrs
6	55°C	55°C	700 mA	96.5%	0.0013	L70(10k) > 60,500 hrs
7	85°C	85°C	700 mA	95.6%	0.0004	L70(10k) > 60,500 hrs



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

Revision: 4 (April 25, 2012)

Description Of LED Light Sources

XLamp XP-E High Efficiency White LEDs (XPEHEW)

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

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _a]	Drive Current [I _r]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift ($\Delta u'v'$) at 6,000 hours	Reported TM-21 L70 Lifetime
11	85°C	85°C	350 mA	99.8%	0.0007	L70(10k) > 60,500 hrs
12	105°C	105°C	350 mA	95.7%	0.0009	L70(6k) > 36,300 hrs
8	55°C	55°C	500 mA	100.0%	0.0008	L70(8k) > 48,400 hrs
9	85°C	85°C	500 mA	97.7%	0.0005	L70(8k) > 48,400 hrs
10	85°C	85°C	700 mA	97.6%	0.0006	L70(9k) > 54,400 hrs



XLAMP XP-G WHITE LEDS (REV 5)

Revision: 5 (November 30, 2012)

Description Of LED Light Sources

XLamp XP-G White LEDs (Series: XPGWHT)

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

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _r]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift ($\Delta u'v'$) at 6,000 hours	Reported TM-21 L70 Lifetime
13	85°C	85°C	1000 mA	98.4%	0.0011	L70(9k) > 51,400 hrs
14	105°C	105°C	1000 mA	96.6%	0.0005	L70(9k) > 51,400 hrs
15	55°C	55°C	1500 mA	97.8%	0.0009	L70(9k) > 51,400 hrs
16	85°C	85°C	1500 mA	98.5%	0.0006	L70(9k) > 51,400 hrs

**XLAMP XR-E WHITE LEDS (REV 1)**

Revision: 1 (September 20, 2010)

Description Of LED Light Sources

XLamp XR-E White LEDs (Series: XREWHT)

No failures occurred during testing.

Test Summary

Data Set	Color	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _F]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift ($\Delta u'v'$) at 6,000 hours
1	Cool White	25°C	25°C	350 mA	98.1%	0.0040
2	Warm White	25°C	25°C	350 mA	98.8%	0.0020
3	Cool White	25°C	25°C	700 mA	98.0%	0.0040
4	Warm White	25°C	25°C	700 mA	97.8%	0.0022
5	Cool White	45°C	45°C	350 mA	97.8%	0.0129
6	Cool White	45°C	45°C	1000 mA	97.9%	0.0017
7	Cool White	55°C	55°C	350 mA	98.0%	0.0031
8	Warm White	55°C	55°C	350 mA	97.7%	0.0019
9	Cool White	55°C	55°C	1000 mA	97.0%	0.0047
10	Warm White	55°C	55°C	1000 mA	96.2%	0.0026
11	Cool White	85°C	85°C	350 mA	94.3%	0.0030
12	Warm White	85°C	85°C	350 mA	96.9%	0.0012
13	Cool White	85°C	85°C	1000 mA	95.0%	0.0022



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

Revision: 0 (August 21, 2012)

Description Of LED Light Sources

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

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

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _r]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000 hours	Reported TM-21 L70 Lifetime
1	55°C	55°C	44 mA	98.5%	0.0007	L70(6k) > 36,300 hrs
2	85°C	85°C	44 mA	94.1%	0.0009	L70(6k) > 36,300 hrs
3	105°C	105°C	44 mA	93.3%	0.0012	L70(6k) > 36,300 hrs
4	55°C	55°C	66 mA	95.6%	0.0008	L70(6k) > 36,300 hrs
5	85°C	85°C	66 mA	93.7%	0.0011	L70(6k) > 36,300 hrs



XLAMP XT-E WHITE LEDS (REV 3)

Revision: 3 (November 14, 2012)

Description Of LED Light Sources

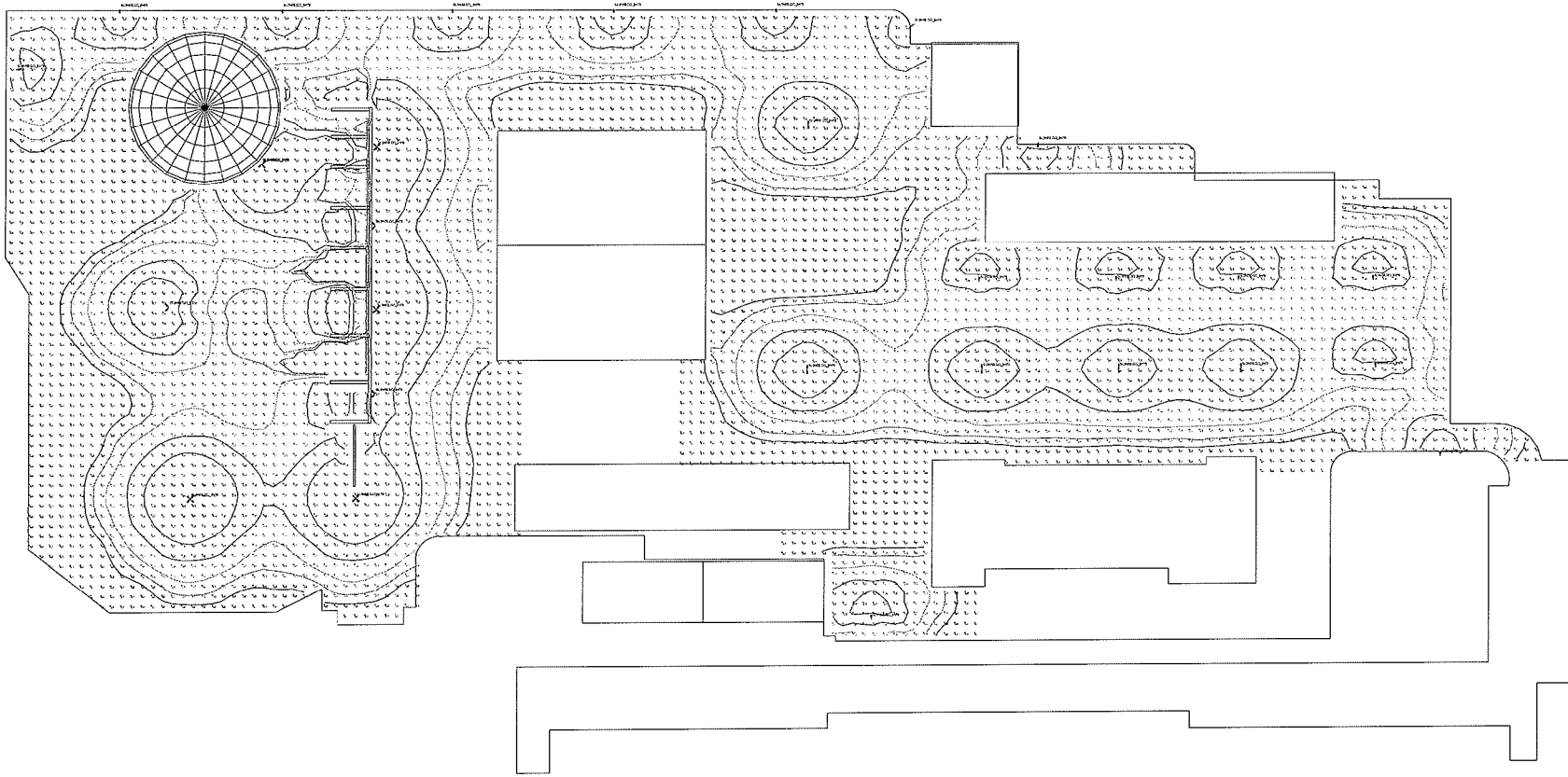
XLamp XT-E White LEDs (Series: XTEAWT)

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

No failures occurred during testing.

Test Summary

Data Set	Case Temp. [T _s]	Ambient Temp. [T _A]	Drive Current [I _f]	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift ($\Delta u'v'$) at 6,000 hours	Reported TM-21 L70 Lifetime
3	55°C	55°C	1000 mA	98.1%	0.0010	L70(6k) > 36,300 hrs
2	85°C	85°C	1000 mA	98.8%	0.0012	L70(6k) > 36,300 hrs
4	105°C	105°C	1000 mA	96.1%	0.0019	L70(6k) > 36,300 hrs



Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Lumens	LLF	Description
	50	SL3N5ILGG	1m79 SINGLE	N.A.	0.855	254995, MOD#:SL3N5ILGG

Fixtures: 50 Dialight StreetSense
 165 watts; 13,352 lumens
 Mounting height: 30 ft

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Lot Planar	Illuminance	Fc	0.88	8.2	0.0	N.A.	N.A.

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE THE APPLICABILITY OF THE LAYOUT TO EXISTING/FUTURE FIELD CONDITIONS. THESE LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S SURGEABLE LAMP MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP. THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SAFETY AND QUALITY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

Illuminance Values

	0.2 - 0.29 fc
	0.3 - 0.49 fc
	0.5 - 0.99 fc
	1.0 - 1.99 fc
	2.0 - 5.0 fc

LUMEGON Illuminance Accuracy

Date	Comments

Revisions

Drawn By: M. Woznicki
 Checked By: _____
 Date: 12/19/2012

Scale: _____

Wheeler Center
 Additional Luminaires

Page 1 of 2



Wheeler Center
 Additional Luminaires

Drawn By: M. Woznicki
 Checked By:
 Date: 12/19/2012
 Scale:

#	Date	Comments
Revisions		



*International Dark-Sky Association
Fixture Seal of Approval*

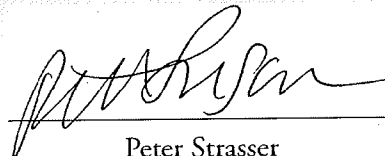
Presented by

Dialight Corporation

StreetSense Series LED Street Light

You are an integral part of IDA's success in creating a more pleasant nighttime environment.




Peter Strasser
Managing Director



TM-21 Report

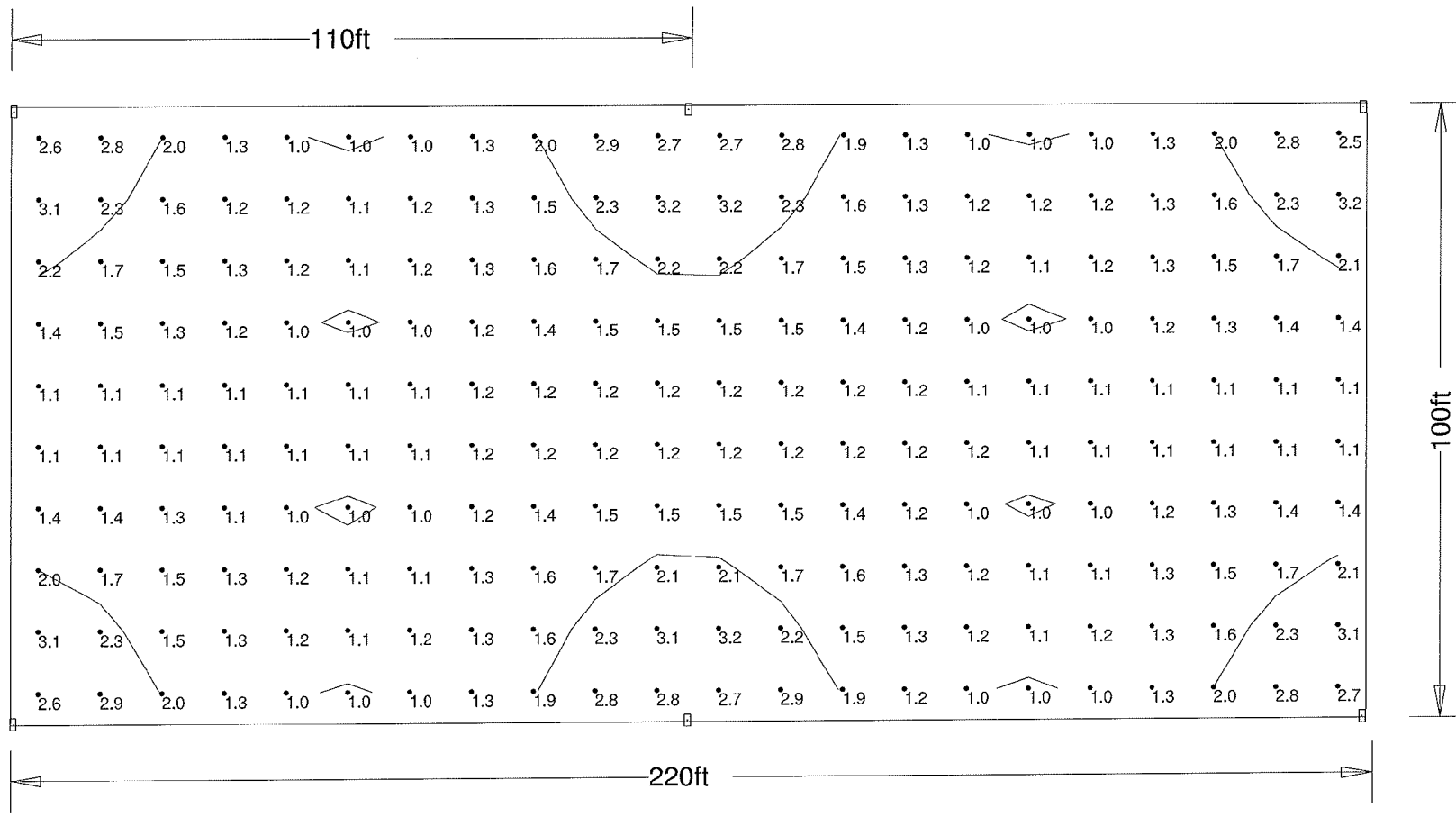
Table 1: Report at each LM-80 Test Condition

Description of LED Light Source Tested (manufacturer, model, catalog number)		Cree Xlamp XPE High Efficiency White LED Packages (series:XPEHEW)			
Test Condition 1 - 55° C Case Temp		Test Condition 2 - 85° C Case Temp			
Sample size	25	Sample size	25	Sample size	-
Number of failures	0	Number of failures	0	Number of failures	-
DUT drive current used in the test (mA)	500	DUT drive current used in the test (mA)	500	DUT drive current used in the test (mA)	-
Test duration (hours)	8,064	Test duration (hours)	8,064	Test duration (hours)	-
Test duration used for projection (hour to hour)	4,032 - 8,064	Test duration used for projection (hour to hour)	4,032 - 8,064	Test duration used for projection (hour to hour)	-
Tested case temperature (°C)	55	Tested case temperature (°C)	85	Tested case temperature (°C)	-
α	1.438E-06	α	4.770E-06	α	-
B	1.010	B	1.003	B	-
Calculated L70(8k) (hours)	255,000	Calculated L70(8k) (hours)	75,000	Calculated L70(8k) (hours)	-
Reported L70(8k) (hours)	>48000	Reported L70(8k) (hours)	>48000	Reported L70(8k) (hours)	-

**Table 2: Interpolation Report
(projection based on *in-situ* temperature entered)**

$T_{s,1}$ (°C)	55.00
$T_{s,1}$ (K)	328.15
α_1	1.438E-06
B_1	1.010
$T_{s,2}$ (°C)	85.00
$T_{s,2}$ (K)	358.15
α_2	4.770E-06
B_2	1.003
E_a/k_b	4.70E+03
A	2.373E+00
B_0	1.006
$T_{s,i}$ (°C)	61.50
$T_{s,i}$ (K)	334.65
α_i	1.899E-06
Projected L70(8k) at 61.5 °C (hours)	191,000
Reported L70(8k) at 61.5 °C (hours)	>48000

Report Generated By: Vishnu Shastry	Notes: Cree XTE is grandfathered into Cree XPE data based on similarity and
Company: Dialight Corporation	
11/14/2012	



Rev	Date	Comments
1		

Drawn By:	Checked By:	Date:
M. Woznicki		12/19/2012

Wheeler Center Bid

Symbol	Qty	Label	Arrangement	Lumens	LLF	Description
□	6	SL3N5ILGG_1m79	SINGLE	N.A.	0.855	254995, MOD#SL3N5ILGG

Fixtures: 6 Dialight StreetSense
165 watts; 13,352 lumens
Mounting height: 30 ft

Label	Calc Type	Units	Avg	Max	Min	Avg/Min	Max/Min
Object_Planar	Illuminance	Fc	1.52	3.2	1.0	1.52	3.20

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE THE APPLICABILITY OF THE LAYOUT TO EXISTING FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY ILLUMINATING FIXTURES LUMINAIRES MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LUMENS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR SLAB. THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

Illuminance Values

■	0.2 - 0.29 fc
■	0.3 - 0.49 fc
■	0.5 - 0.99 fc
■	1.0 - 1.99 fc
■	2.0 - 5.0 fc



LED Solid State Lighting Fixture Limited Warranty StreetSense® LED Street Light Series

Dialight Corporation ("Dialight") warrants solely to original commercial end user ("Purchaser") of Dialight StreetSense® LED Street Light Products ("Products") that Products will be free of defects in material and workmanship at the date of shipment.

Term of Warranty: For a period of seven (7) years after the date of purchase (the "Warranty Period"), Dialight, at its sole option, will, itself, or through others, repair, replace or refund the price paid for Product (field labor not covered) that Dialight verifies as being damaged or inoperative due to defective material or workmanship.

Warranty Exclusions: This warranty excludes (1) defects or damage resulting from acts of God, fire, vandalism, civil disturbance, accident, modification, misuse, including but not limited to operation at temperatures or voltage levels outside the Product's rated range, improper service or repair, abuse or abnormal use or stress including without limitation, improper storage and incorrect installation, (2) Any alterations or modification of the Product by the Purchaser, (3) removal or reinstallation of Products, (4) repairs required by use of parts or components not manufactured or supplied by Dialight, or (5) product advice or assistance that Dialight furnishes as courtesy.

Finish :This warranty excludes and does not cover finish defects that were caused by failure to follow proper procedures for installation, care, and maintenance. Dialight will repair, or at our option, replace the defective finish if it exhibits cracking, peeling, flaking, blistering, excessive fading or corrosion defects during the warranty period.

Conditions of Warranties: It is a condition of these warranties that: (1) the Purchaser submit all claims of defect within the specified warranty periods, in writing and with detail; (2) return of Product is accompanied with a bill of sale or other evidence showing the date of purchase and identification of the original Purchaser; (3) Purchaser will prepay all freight, insurance and other transportation charges both to send Product to Dialight for warranty-coverage verification, repair or replacement, and to return Product to the Purchaser; and (4) Dialight retains all replaced parts and Products.

Warranty Limitations All replacement Products are warranted for the time remaining in the original warranty period of the Product replaced. Replacement Products will be equivalent in function, but not necessarily identical to the replaced Product. Repair, replacement or refund as set forth in this Warranty is the sole and exclusive remedy under this Warranty or otherwise for Product defects. DIALIGHT DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESSED BY AFFIRMATION, PROMISE, DESCRIPTION, MODEL, SAMPLE OR OTHERWISE, OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE OR PURPOSE. Covenants regarding patent infringement by Products are set forth in Dialight's Terms of Sale. As such, any warranty with respect to infringement that may be provided by Section 2-312(3) of the Uniform Commercial Code or other law is hereby disclaimed.

Damage Limitations: DIALIGHT IS NOT LIABLE FOR, AND HEREBY DISCLAIMS, ALL DAMAGES CAUSED BY ANY PRODUCT OR THE FAILURE OF A PRODUCT TO PERFORM, INCLUDING, WITHOUT LIMITATION, DIRECT, INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES OR LOSS OF PROFITS OR SAVINGS, UNDER ANY LEGAL THEORY, INCLUDING, WITHOUT LIMITATION, TORT (INCLUDING NEGLIGENCE AND STRICT PRODUCT LIABILITY) OR CONTRACT, SUSTAINED BY PURCHASER OR BY ANY OTHER PERSON. THIS LIMITATION CAN NOT BE WAIVED OR AMENDED BY ANY PERSON AND WILL BE EFFECTIVE EVEN IF DIALIGHT OR ITS REPRESENTATIVE HAS BEEN ADVISED OF, OR MIGHT HAVE ANTICIPATED, THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION OF LIABILITY MAY NOT APPLY TO DAMAGES RELATING TO PERSONAL INJURY OR DEATH IN JURISDICTIONS WHERE SUCH DAMAGES MAY NOT BE DISCLAIMED AS A MATTER OF LAW.

How to obtain Warranty Service: To obtain warranty service, Purchaser must obtain an RMA (Return Material Authorization Number) and instructions on how and where to return the products from Dialight's Customer Service by calling (732) 919-3119.