Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L15057 Date: May 28, 2015

Issued by:
Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one LED 4ft Linear fixture
Unit manufacturer: Dialight Corporation
Unit model number: LTx3B4H2W

Issued to:
Dialight Corporation
1501 Route 34 South, Farmingdale, NJ 07727

Tests performed: Photometric characterization and temperature measurement per the described standards.

Dates of test: May 26, 2015 through May 28, 2015

Standards used: All tests are performed in accordance with procedures and guidelines prescribed by the American National Standards Institute (ANSI) or Illuminating Engineering Society of North America (IES):

- IES LM-79:2008: Electrical and Photometric Measurements of Solid-State Lighting Products
- ANSI/UL 1598:2008: Underwriters Laboratories Inc. Standard for Safety: Luminaires
- ENERGY STAR Manufacturer's Guide for Qualifying Solid State Lighting Luminaires Version 2.1

Description of sample:

Sample Number: L15057
Manufacturer: Dialight Corporation
Product Name: LED 4ft Linear
Description: LED 4ft Linear
Model Number: LTx3B4H2W

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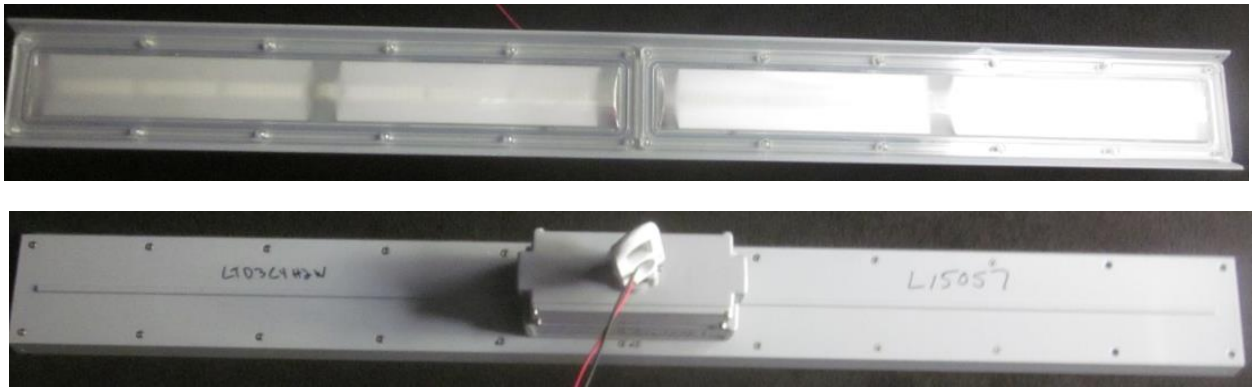
Report Summary

Sample number L15057
Dialight unit model number LTx3B4H2W

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere		Goniophotometer	
Luminous Flux:	6588	(lumens)	6512	(lumens)
Electrical Power:	65.9	(W)	66.3	(W)
Luminous Efficacy:	99.92	(lumens/W)	98.28	(lumens/W)

Electrical Measurements:

Input Power (120VAC):	65.9	(W)
Power Factor (120VAC):	0.99	
Current ATHD % (120VAC):	11.2	
Input Power (277VAC):	65.5	(W)
Power Factor (277VAC):	0.932	
Current ATHD % (277VAC):	14.64	

Color Measurements:

Correlated Color Temperature (CCT):	4901
Color Rendering Index (CRI):	83.6
Chromaticity Coordinate (x):	0.348
Chromaticity Coordinate (y):	0.358
Chromaticity Coordinate (u'):	0.211
Chromaticity Coordinate (v'):	0.325
DUV:	0.0016

Temperature Measurements:

In Situ LED Source Temperature:	47.9	(°C)

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Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15057.
Dialight unit model number LTx3B4H2W

Test Conditions:

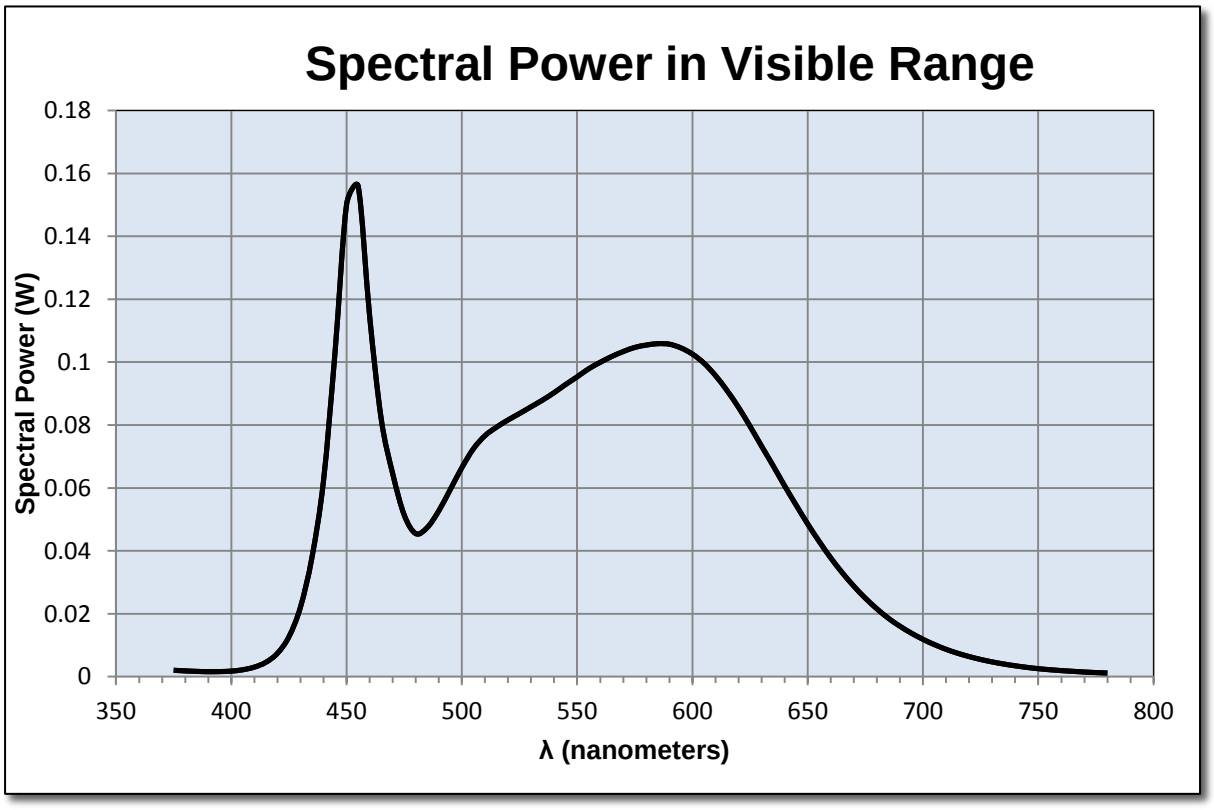
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.551	(A)
Input Power:	65.9	(W)
Input Power Factor:	0.99	
Current ATHD:	11.2	(%)

Photometric measurements:

Luminous Flux:	6588	(lumens)
Luminous Efficacy:	99.9	(lumens/W)
Correlated Color Temperature (CCT):	4901	(K)
CRI -Ra:	83.6	
CRI -R9:	8.6	
DUV:	0.0016	
CIE Coordinate (x):	0.348	
CIE Coordinate (y):	0.358	
CIE Coordinate (u'):	0.211	
CIE Coordinate (v'):	0.325	



Test Results: Integrating Sphere

Results continued from previous page.

Tabulated Spectral Power in Visible Range:

λ(nm)	(W/nm)	λ(nm)	(W/nm)	λ(nm)	(W/nm)
375	0.002	515	0.079	655	0.043
380	0.002	520	0.082	660	0.038
385	0.002	525	0.084	665	0.033
390	0.002	530	0.086	670	0.029
395	0.002	535	0.088	675	0.025
400	0.002	540	0.09	680	0.022
405	0.002	545	0.093	685	0.019
410	0.003	550	0.095	690	0.016
415	0.005	555	0.098	695	0.014
420	0.007	560	0.1	700	0.012
425	0.013	565	0.102	705	0.01
430	0.022	570	0.103	710	0.009
435	0.038	575	0.105	715	0.007
440	0.062	580	0.105	720	0.006
445	0.103	585	0.106	725	0.005
450	0.15	590	0.106	730	0.005
455	0.156	595	0.105	735	0.004
460	0.115	600	0.103	740	0.003
465	0.082	605	0.1	745	0.003
470	0.065	610	0.096	750	0.003
475	0.051	615	0.091	755	0.002
480	0.045	620	0.086	760	0.002
485	0.047	625	0.08	765	0.002
490	0.053	630	0.073	770	0.001
495	0.06	635	0.067	775	0.001
500	0.066	640	0.061	780	0.001
505	0.072	645	0.055		
510	0.077	650	0.049		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15057.
Dialight unit model number LTx3B4H2W

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.556	(A)
Input Power:	66.3	(W)
Power Factor:	0.986	

Photometric measurements:

Absolute Luminous Flux:	6512	(lumens)
Luminous Efficacy:	98.3	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	3412	3412	3412	3412	3412	
5	3389	3389	3389	3389	3389	127
15	3177	3177	3177	3177	3177	696
25	2666	2666	2666	2666	2666	1136
35	1926	1926	1926	1926	1926	1246
45	1297	1297	1297	1297	1297	1086
55	922	922	922	922	922	891
65	652	652	652	652	652	721
75	325	325	325	325	325	468
85	29	29	29	29	29	138
95	0	0	0	0	0	2
105	0	0	0	0	0	0
115	0	0	0	0	0	0
125	0	0	0	0	0	0
135	0	0	0	0	0	0
145	0	0	0	0	0	0
155	0	0	0	0	0	0
165	0	0	0	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	

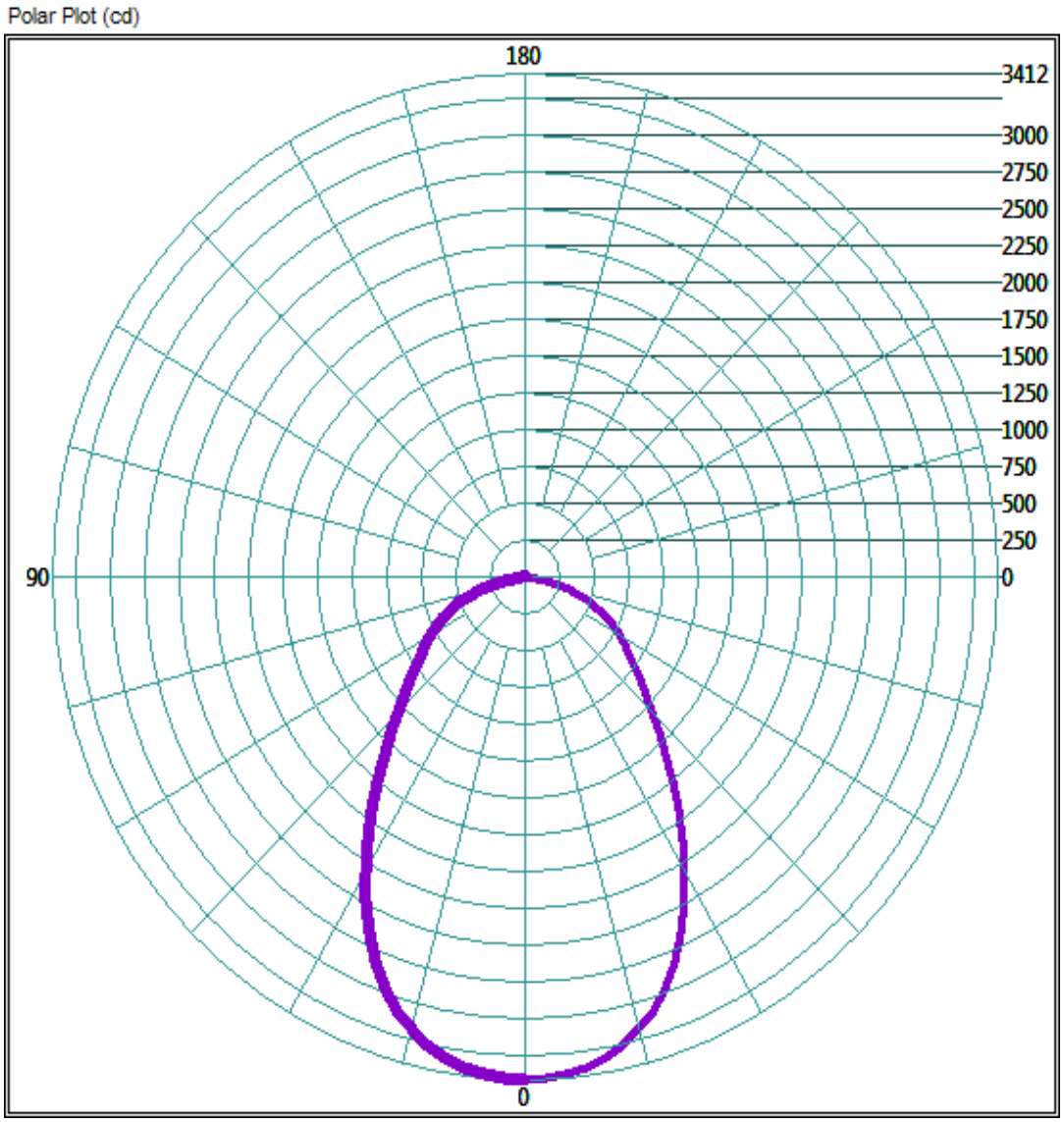
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2591.2	39.8%
0-40	3775.2	58.0%
0-60	5565.6	85.5%
60-90	1132.64	17.4%
0-90	6511.52	100.0%
90-180	0	0.0%
0-180	6511.52	100.0%

Test Results: Goniometer

Results continued from previous page.

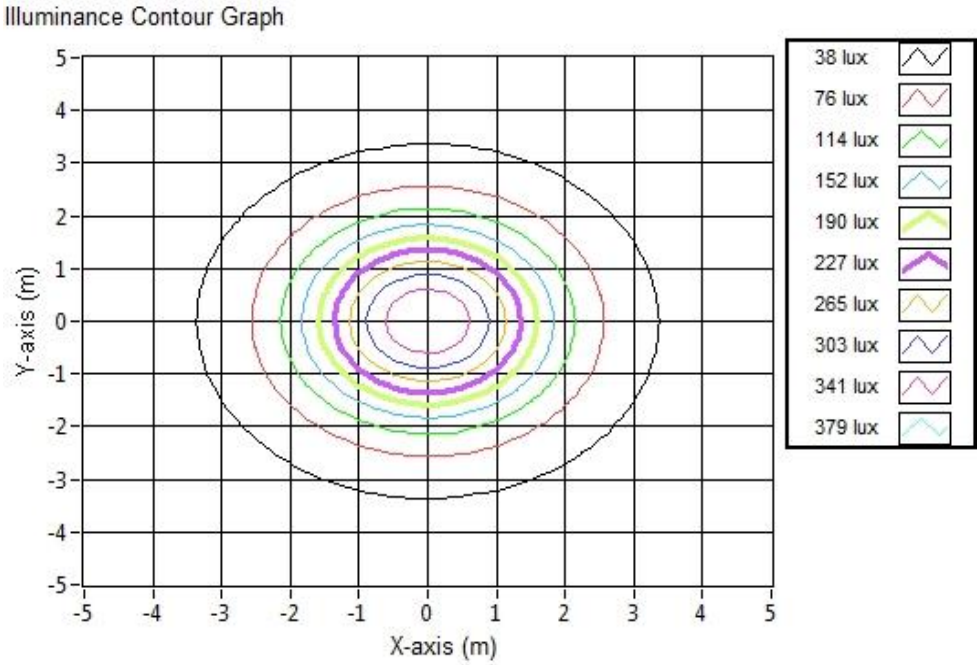
Polar Plot:



Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	4.78	4.78	367.3
6.096	9.56	9.56	91.8
9.144	14.34	14.34	40.8
12.192	19.12	19.12	23.0
15.24	23.89	23.89	14.7
18.288	28.67	28.67	10.2
21.336	33.45	33.45	7.5
24.384	38.23	38.23	5.7
27.432	43.01	43.01	4.5
30.48	47.79	47.79	3.7

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15057.
Dialight unit model number LTx3B4H2W

LED identified as Nichia part number Nichia NS2W757.

LED drive current (as indicated by customer): 77 (mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If):	180	(mA)
Maximum Rated Power Dissipation:	0.63	(W)
Maximum Junction Temp. (Tj):	120	(°C)
Thermal Resistance (Rth):	19	(°C/W)

Derived Specifications:

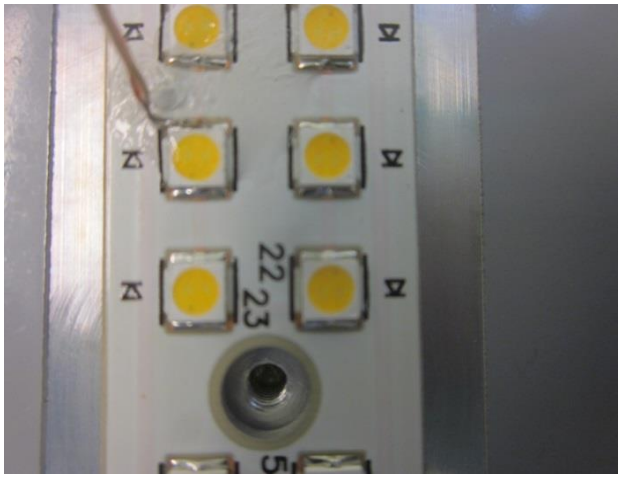
Maximum Power at Indicated Current:	0.27	(W)
Maximum Source Temperature:	114.9	(°C)

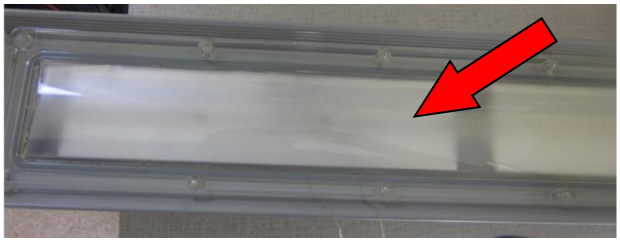
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 1‘	(°C)
Ambient temperature at time of measurement:	25.5	(°C)
Relative humidity at time of measurement:	49%	

Results:

Measured LED source temperature: 47.9 (°C)





Equipment Used:

Equipment Name	Model Number
Omega TC	Dpi8
Fluke 8808A Digit Multimeter	8808A
YOKOGAWA Digital Power Meter	11/26/3981
LSI High Speed Mirror Goniometer	6240T
Instrument System Spectrometer	CAS140B-151
Instrument System 1.5 Meter Sphere	ISP1500
Volttech Power Analyzer	PM1000+
Delta Elektronika DC Power Supply	SM.300-5
Elgar AC Power Supply	CW1251P
Instek AC Power Supply	APS-9501
Sorensen DC Power Supply	XHR150-7
Extech Hygro-Thermometer	4/16/3120
Extech Hygro-Thermometer	4/16/3120
Fluke 52II Thermometer	52II Thermometer
Volttech Power Analyzer	PM1000+
Tenma AC Power Source	72-7675
BK Precison	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digitial Thermometer 343	TPI 343
TPI Digitial Thermometer 343	TPI 343
Step-Up Transformer	
Omega TC	Dpi8-C24
Agilent True RMS OLED Multimeter	U1273A

Additional Notes:

Samples are received and tested in new and undamaged condition, unless otherwise noted.
The results shown in this report are representative only of the test samples submitted. This data has been issued to the assignee for further evaluation.
This report shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Test Report Issued By:

Richard Huegi
Dialight Optics Laboratory
Senior Optical Engineering Technician
Lighting Division

Test Report Reviewed and Approved By:

Vishnu Shastry
Dialight Optics Laboratory
Optical Engineer
Approved Signatory