

Test Report

Report Number: L18013

Date: Mar 1, 2018

Issued by:

Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one 2' Linear LP
Unit manufacturer: Dialight Corporation
Unit model number: LPx3W4B2W

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: February 26, 2018 through March 1, 2018

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: L18013
Manufacturer: Dialight Corporation
Product Name: 2' Linear LP
Description: 2' Linear LP
Model Number: LPx3W4B2W

Report Summary

Sample number L18013
Dialight unit model number LPx3W4B2W

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	3090 (lumens)	3062 (lumens)
Electrical Power:	28.5 (W)	28.5 (W)
Luminous Efficacy:	108.4 (lumens/W)	107.3 (lumens/W)

Electrical Measurements:

Input Power (277VAC): 28.5 (W)
 Power Factor (277VAC): 0.892
 Current ATHD % (277VAC): 16.99
 Input Power (120VAC): 27.0 (W)
 Power Factor (120VAC): 0.986
 Current ATHD % (120VAC): 11.98

Color Measurements:

Correlated Color Temperature (CCT): 2697
 Color Rendering Index (CRI): 82.3
 Chromaticity Coordinate (x): 0.457
 Chromaticity Coordinate (y): 0.404
 Chromaticity Coordinate (u'): 0.263
 Chromaticity Coordinate (v'): 0.35
 DUV: 0.002

Temperature Measurements:

In Situ LED Source Temperature: 40.8 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L18013.

Dialight unit model number LPx3W4B2W

Test Conditions:

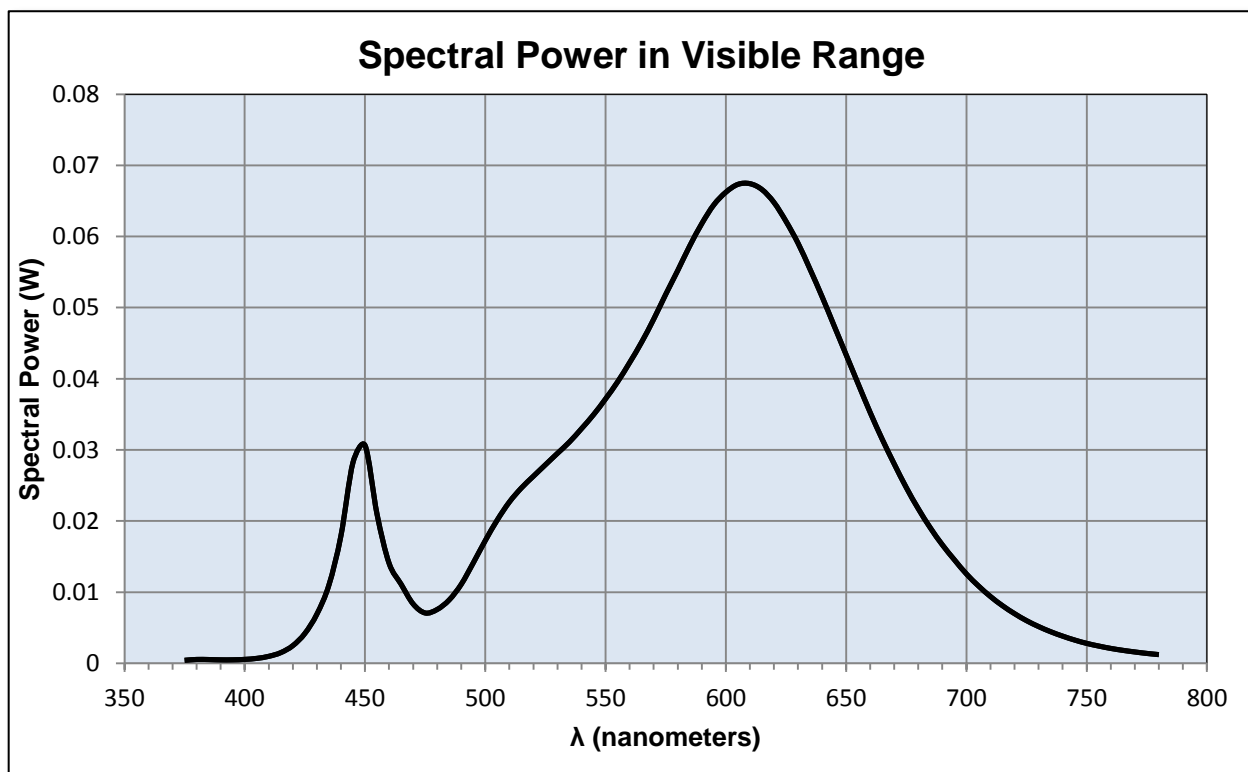
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 277 (VAC)
 Input Current: 0.115 (A)
 Input Power: 28.5 (W)
 Input Power Factor: 0.892
 Current ATHD: 16.99 (%)

Photometric measurements:

Luminous Flux: 3090 (lumens)
 Luminous Efficacy: 108.4 (lumens/W)
 Correlated Color Temperature (CCT): 2697 (K)
 CRI -Ra: 82.3
 CRI -R9: 10.3
 DUV: 0.002
 CIE Coordinate (x): 0.457
 CIE Coordinate (y): 0.404
 CIE Coordinate (u'): 0.263
 CIE Coordinate (v'): 0.35



Test Results: Integrating Sphere

Results continued from previous page.

Tabulated Spectral Power in Visible Range:

$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)
375	0.000	515	0.025	655	0.039
380	0.001	520	0.026	660	0.035
385	0.001	525	0.028	665	0.032
390	0.000	530	0.030	670	0.028
395	0.000	535	0.031	675	0.025
400	0.001	540	0.033	680	0.022
405	0.001	545	0.035	685	0.019
410	0.001	550	0.037	690	0.017
415	0.002	555	0.040	695	0.015
420	0.002	560	0.042	700	0.013
425	0.004	565	0.045	705	0.011
430	0.007	570	0.048	710	0.009
435	0.011	575	0.052	715	0.008
440	0.018	580	0.055	720	0.007
445	0.028	585	0.059	725	0.006
450	0.031	590	0.062	730	0.005
455	0.021	595	0.064	735	0.004
460	0.014	600	0.066	740	0.004
465	0.011	605	0.067	745	0.003
470	0.008	610	0.067	750	0.003
475	0.007	615	0.067	755	0.002
480	0.008	620	0.065	760	0.002
485	0.009	625	0.062	765	0.002
490	0.011	630	0.059	770	0.002
495	0.014	635	0.055	775	0.001
500	0.017	640	0.052	780	0.001
505	0.020	645	0.047		
510	0.023	650	0.043		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18013.
Dialight unit model number LPx3W4B2W

Electrical Measurements:

Input Voltage: 277 (VAC)
Input current: 0.115 (A)
Input Power: 28.5 (W)
Power Factor: 0.895

Photometric measurements:

Absolute Luminous Flux: 3062 (lumens)
Luminous Efficacy: 107.3 (lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	1690	1690	1690	1690	1690	
5	1678	1678	1678	1678	1678	63
15	1573	1573	1573	1573	1573	345
25	1325	1325	1325	1325	1325	564
35	948	948	948	948	948	616
45	607	607	607	607	607	520
55	398	398	398	398	398	397
65	265	265	265	265	265	299
75	139	139	139	139	139	194
85	13	13	13	13	13	63
95	0	0	0	0	0	1
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	0

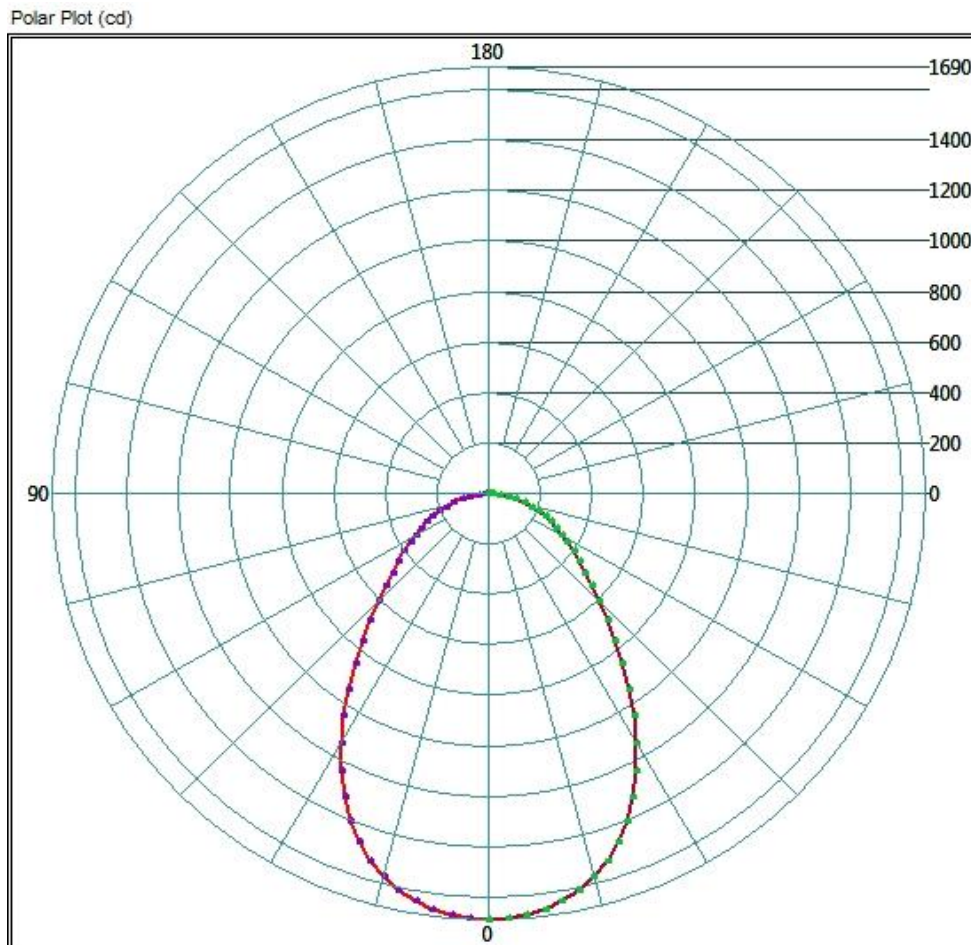
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	1285.6	42.0%
0-40	1864.96	60.9%
0-60	2666.88	87.1%
60-90	472.96	15.4%
0-90	3062.24	100.0%
90-180	0	0.0%
0-180	3062.24	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

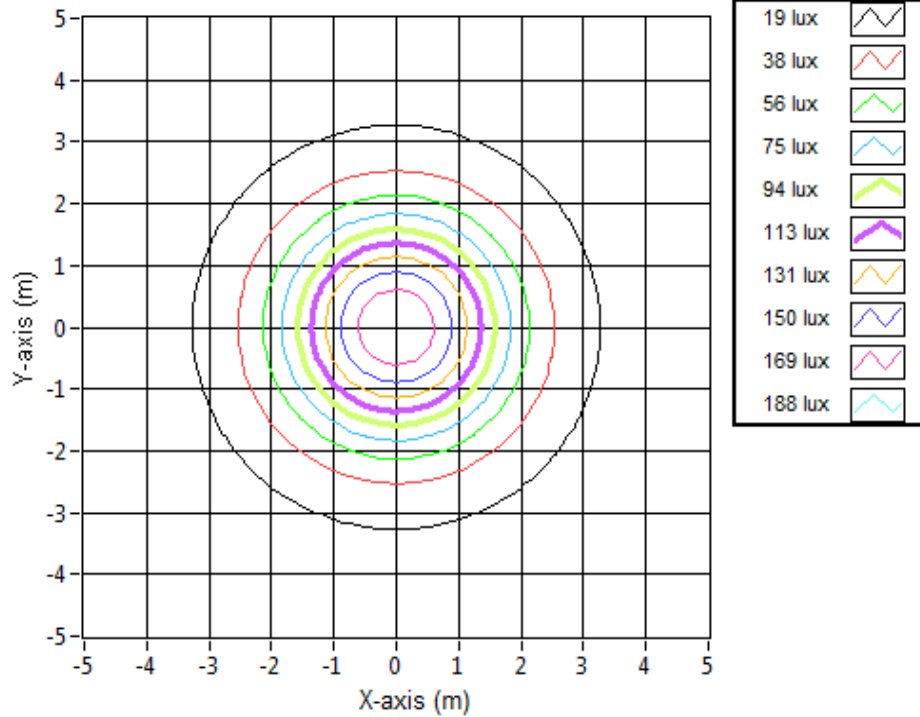


Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:

Illuminance Contour Graph



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	4.71	4.71	181.9
6.096	9.42	9.42	45.5
9.144	14.13	14.13	20.2
12.192	18.84	18.84	11.4
15.24	23.55	23.55	7.3
18.288	28.26	28.26	5.1
21.336	32.97	32.97	3.7
24.384	37.68	37.68	2.8
27.432	42.39	42.39	2.2
30.48	47.10	47.10	1.8

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18013.
Dialight unit model number LPx3W4B2W

LED identified as Nichia part number NFSL757GT-V1.

LED drive current (as indicated by customer): 63 (mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If): 180 (mA)
Maximum Rated Power Dissipation: 0.558 (W)
Maximum Junction Temp. (Tj): 120 (°C)
Thermal Resistance (Rth): 19 (°C/W)

Derived Specifications:

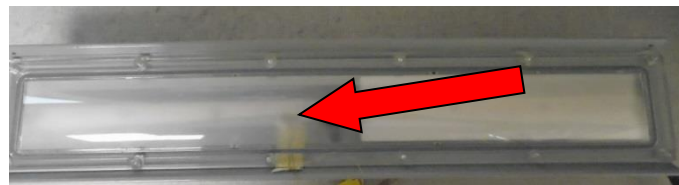
Maximum Power at Indicated Current: 0.195 (W)
Maximum Source Temperature: 116.3 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 25.4 (°C)
Relative humidity at time of measurement: 21%

Results:

Measured LED source temperature: 40.8 (°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
Delta Elektronika DC Power Supply	SM.300-5
Instek AC Power Supply	APS-9501
Sorensen DC Power Supply	XHR150-7
TPI Digital Thermometer	TPI 343
Fluke 52II Thermometer	068158
Fluke 971 Humidity Meter	971
Volttech Power Analyzer	PM1000+
Volttech Universal Breakout Box	PM1000+
BK Precision	1715A
Step-Up Transformer	
Omega TC	Dpi8-C24
Agilent True RMS OLED Multimeter	U1273A
ITL Osram Calibraton lamps for Goniometer	J9a8
ITL Osram Calibraton lamps for Goniometer	J9a8
ITL Osram Calibraton lamps for Goniometer	J9a8
Adaptive Power Systems AC Power Supply	FC-210
Xitron Power Analyzer	XT2640
GwINSTEK DC Power Supply	GEP172679
Osram Sylvania Calibration Lamp for Sphere	STD-20WF-3

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. This report shall not be reproduced, except in full, without the express written permission of Dialight Optics Laboratory.

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