

# Test Report

Report Number: L18017

Date: Apr 3, 2018

Issued by:

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

Test of one 4' Linear LP  
Unit manufacturer: Dialight Corporation  
Unit model number: LPx3W4H2W

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:** March 6, 2018 through March 13, 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

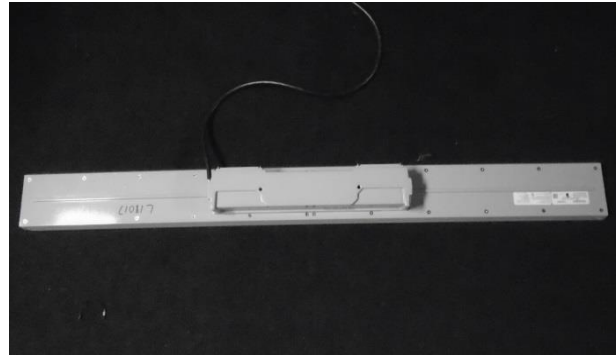
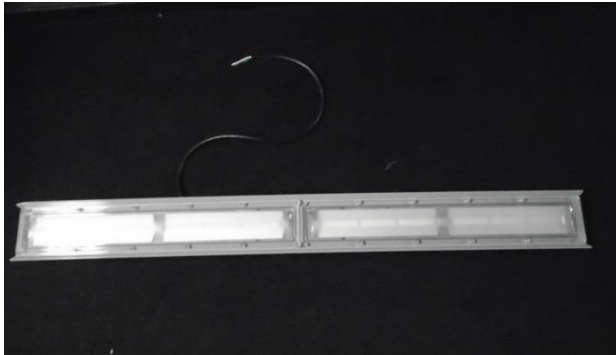
**Description of sample:**

Sample Number: L18017  
Manufacturer: Dialight Corporation  
Product Name: 4' Linear LP  
Description: 4' Linear LP  
Model Number: LPx3W4H2W

## Report Summary

Sample number L18017  
Dialight unit model number LPx3W4H2W

### Photograph(s) of sample:



\*Photographs not to scale. For reference only.

### Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	6731 (lumens)	6705 (lumens)
Electrical Power:	59.3 (W)	59.5 (W)
Luminous Efficacy:	113.5 (lumens/W)	112.7 (lumens/W)

### Electrical Measurements:

Input Power (120VAC): 59.3 (W)  
 Power Factor (120VAC): 0.991  
 Current ATHD % (120VAC): 11.87  
 Input Power (277VAC): 59.1 (W)  
 Power Factor (277VAC): 0.932  
 Current ATHD % (277VAC): 17.5

### Color Measurements:

Correlated Color Temperature (CCT): 2703  
 Color Rendering Index (CRI): 82.1  
 Chromaticity Coordinate (x): 0.456  
 Chromaticity Coordinate (y): 0.404  
 Chromaticity Coordinate (u'): 0.263  
 Chromaticity Coordinate (v'): 0.35  
 DUV: 0.0021

### Temperature Measurements:

In Situ LED Source Temperature: 49.7 (°C)

## Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L18017.

Dialight unit model number LPx3W4H2W

### Test Conditions:

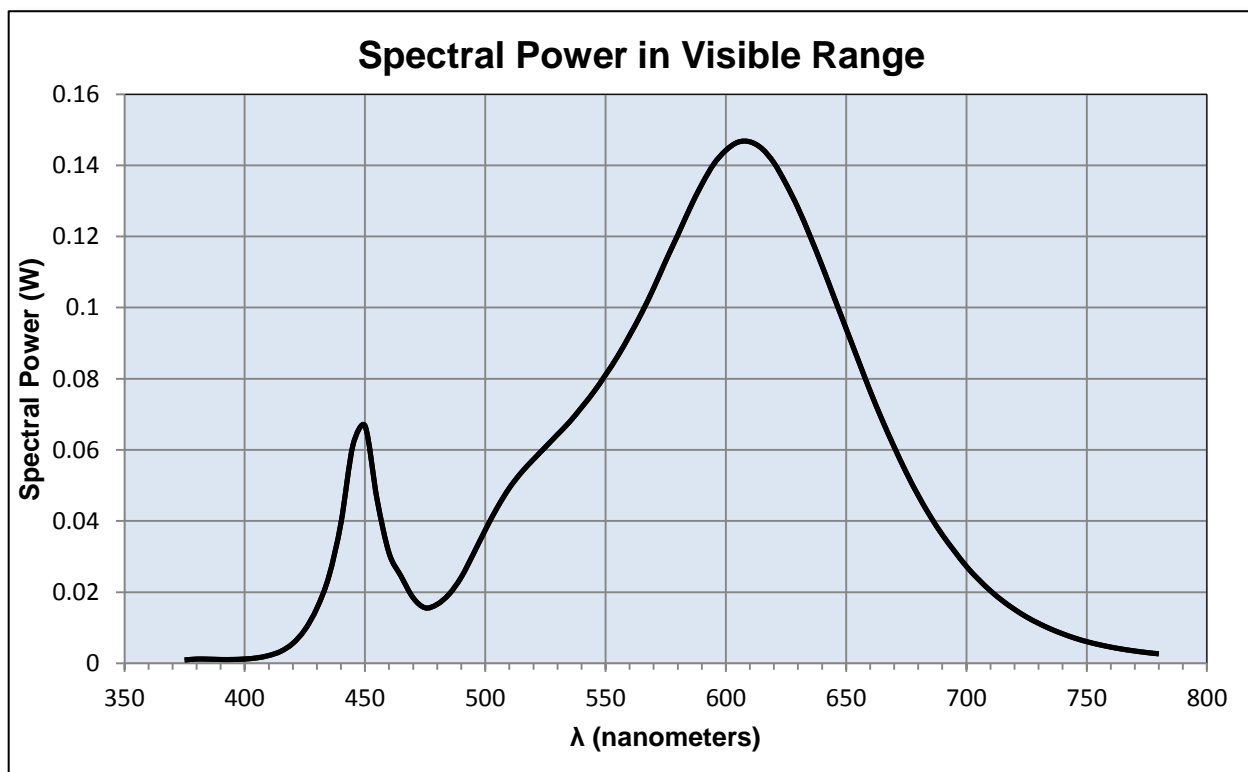
Ambient Temperature:  $25 \pm 1$  (°C)

### Electrical Measurements:

Input Voltage: 120 (VAC)  
 Input Current: 0.499 (A)  
 Input Power: 59.3 (W)  
 Input Power Factor: 0.991  
 Current ATHD: 11.87 (%)

### Photometric measurements:

Luminous Flux: 6731 (lumens)  
 Luminous Efficacy: 113.5 (lumens/W)  
 Correlated Color Temperature (CCT): 2703 (K)  
 CRI -Ra: 82.1  
 CRI -R9: 9.4  
 DUV: 0.0021  
 CIE Coordinate (x): 0.456  
 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	0.001	515	0.054	655	0.085
380	0.001	520	0.057	660	0.077
385	0.001	525	0.061	665	0.068
390	0.001	530	0.064	670	0.061
395	0.001	535	0.068	675	0.054
400	0.001	540	0.072	680	0.047
405	0.002	545	0.076	685	0.041
410	0.002	550	0.081	690	0.036
415	0.003	555	0.086	695	0.032
420	0.006	560	0.092	700	0.027
425	0.009	565	0.098	705	0.024
430	0.016	570	0.105	710	0.020
435	0.024	575	0.113	715	0.018
440	0.039	580	0.120	720	0.015
445	0.061	585	0.128	725	0.013
450	0.067	590	0.135	730	0.011
455	0.046	595	0.140	735	0.010
460	0.031	600	0.144	740	0.008
465	0.024	605	0.147	745	0.007
470	0.018	610	0.147	750	0.006
475	0.016	615	0.145	755	0.005
480	0.017	620	0.141	760	0.005
485	0.019	625	0.135	765	0.004
490	0.024	630	0.128	770	0.003
495	0.031	635	0.120	775	0.003
500	0.037	640	0.112	780	0.003
505	0.044	645	0.103		
510	0.049	650	0.094		

## Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18017.  
Dialight unit model number LPx3W4H2W

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input current: 0.505 (A)  
Input Power: 59.5 (W)  
Power Factor: 0.981

### Photometric measurements:

Absolute Luminous Flux: 6705 (lumens)  
Luminous Efficacy: 112.7 (lumens/W)

### Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	3636	3636	3636	3636	3636	
5	3610	3610	3610	3610	3610	135
15	3372	3372	3372	3372	3372	740
25	2819	2819	2819	2819	2819	1204
35	2024	2024	2024	2024	2024	1313
45	1329	1329	1329	1329	1329	1126
55	900	900	900	900	900	887
65	622	622	622	622	622	690
75	332	332	332	332	332	460
85	31	31	31	31	31	148
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	0

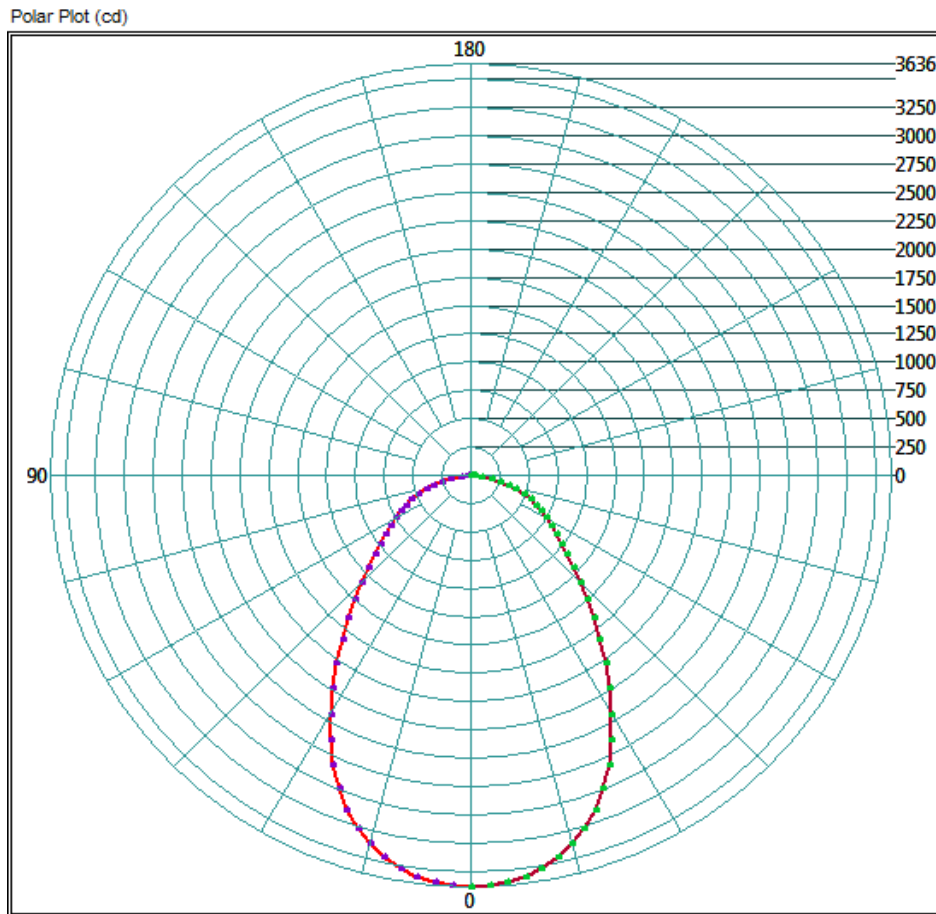
### ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2745.44	40.9%
0-40	3986.56	59.5%
0-60	5773.28	86.1%
60-90	1109.92	16.6%
0-90	6704.64	100.0%
90-180	0	0.0%
0-180	6704.64	100.0%

## Test Results: Goniometer

Results continued from previous page.

### Polar Plot:

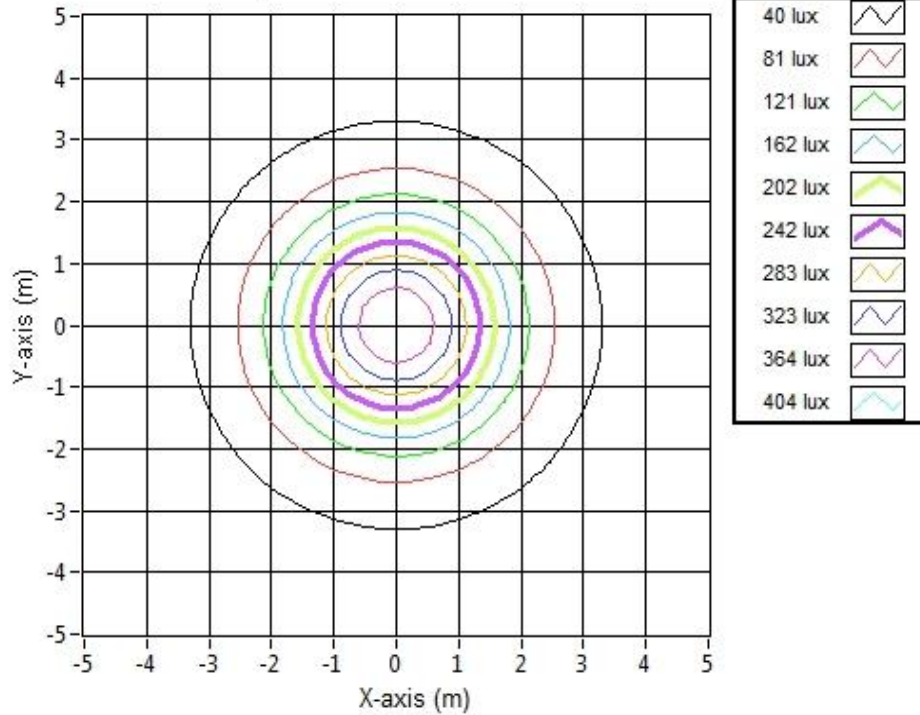


## Test Results: Goniometer

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	4.70	4.70	391.4
6.096	9.40	9.40	97.8
9.144	14.10	14.10	43.5
12.192	18.80	18.80	24.5
15.24	23.50	23.50	15.7
18.288	28.20	28.20	10.9
21.336	32.90	32.90	8.0
24.384	37.60	37.60	6.1
27.432	42.30	42.30	4.8
30.48	47.00	47.00	3.9

## Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18017.  
Dialight unit model number LPx3W4H2W

LED identified as Nichia part number NFSL757GT-V1.

LED drive current (as indicated by customer): 69 (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:

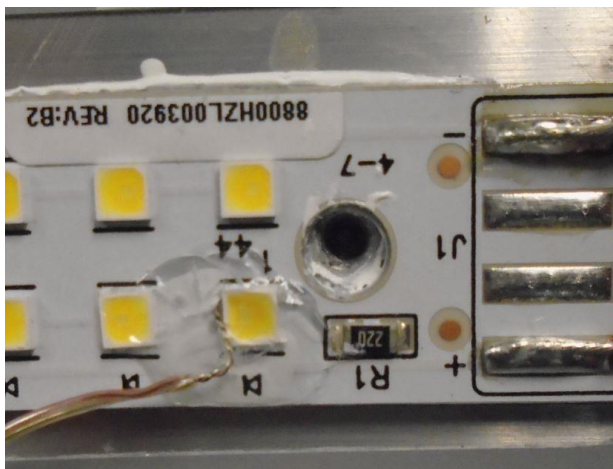
Maximum Power at Indicated Current: 0.214 (W)  
Maximum Source Temperature: 115.9 (°C)

### Test Conditions:

Temperature Measurement Location: See Photographs Below  
Ambient Temperature: 25° ± 5' (°C)  
Ambient temperature at time of measurement: 24.5 (°C)  
Relative humidity at time of measurement: 30%

### Results:

**Measured LED source temperature: 49.7 (°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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Approved Signatory