

Test Report

Report Number: L18022

Date: Apr 3, 2018

Issued by:

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

Test of one 4' Linear LT
Unit manufacturer: Dialight Corporation
Unit model number: LTx3W4H2W

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 1, 2018 through March 30, 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: L18022
Manufacturer: Dialight Corporation
Product Name: 4' Linear LT
Description: 4' Linear LT
Model Number: LTx3W4H2W

Report Summary

Sample number L18022
Dialight unit model number LTx3W4H2W

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	6691 (lumens)	6509 (lumens)
Electrical Power:	58.9 (W)	59.0 (W)
Luminous Efficacy:	113.6 (lumens/W)	110.2 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 58.9 (W)
 Power Factor (120VAC): 0.99
 Current ATHD % (120VAC): 12.26
 Input Power (277VAC): 58.9 (W)
 Power Factor (277VAC): 0.93
 Current ATHD % (277VAC): 17.18

Color Measurements:

Correlated Color Temperature (CCT): 2713
 Color Rendering Index (CRI): 81.8
 Chromaticity Coordinate (x): 0.455
 Chromaticity Coordinate (y): 0.404
 Chromaticity Coordinate (u'): 0.263
 Chromaticity Coordinate (v'): 0.349
 DUV: 0.002

Temperature Measurements:

In Situ LED Source Temperature: 47.7 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L18022.

Dialight unit model number LTx3W4H2W

Test Conditions:

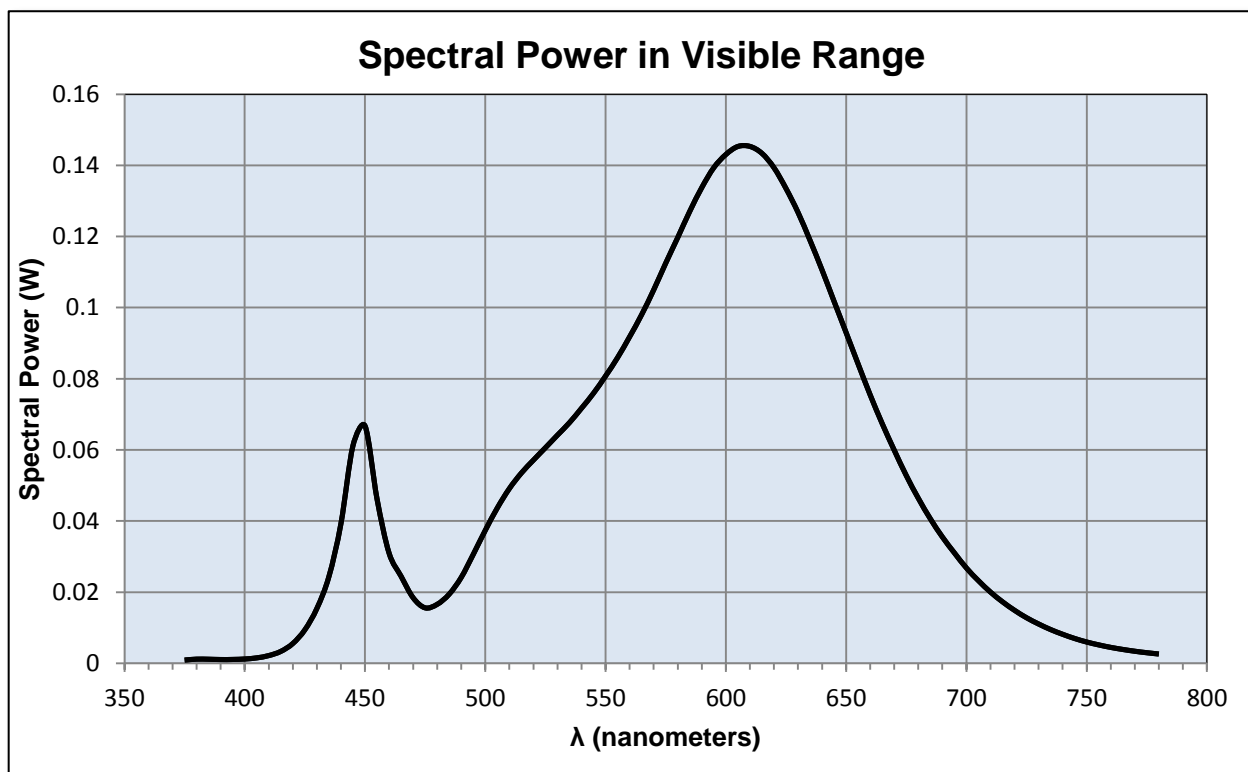
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
 Input Current: 0.49 (A)
 Input Power: 58.9 (W)
 Input Power Factor: 0.99
 Current ATHD: 12.26 (%)

Photometric measurements:

Luminous Flux: 6691 (lumens)
 Luminous Efficacy: 113.6 (lumens/W)
 Correlated Color Temperature (CCT): 2713 (K)
 CRI -Ra: 81.8
 CRI -R9: 8.4
 DUV: 0.002
 CIE Coordinate (x): 0.455
 CIE Coordinate (y): 0.404
 CIE Coordinate (u'): 0.263
 CIE Coordinate (v'): 0.349



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	0.053	655	0.084
380	0.001	520	0.057	660	0.075
385	0.001	525	0.061	665	0.067
390	0.001	530	0.064	670	0.060
395	0.001	535	0.068	675	0.053
400	0.001	540	0.072	680	0.046
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	0.031
420	0.006	560	0.092	700	0.027
425	0.009	565	0.098	705	0.023
430	0.015	570	0.105	710	0.020
435	0.024	575	0.112	715	0.017
440	0.039	580	0.120	720	0.015
445	0.061	585	0.127	725	0.013
450	0.067	590	0.134	730	0.011
455	0.046	595	0.139	735	0.010
460	0.031	600	0.143	740	0.008
465	0.024	605	0.145	745	0.007
470	0.018	610	0.145	750	0.006
475	0.016	615	0.143	755	0.005
480	0.017	620	0.139	760	0.004
485	0.019	625	0.134	765	0.004
490	0.024	630	0.127	770	0.003
495	0.031	635	0.119	775	0.003
500	0.037	640	0.111	780	0.003
505	0.044	645	0.102		
510	0.049	650	0.093		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18022.
Dialight unit model number LTx3W4H2W

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.5 (A)
Input Power: 59.0 (W)
Power Factor: 0.981

Photometric measurements:

Absolute Luminous Flux: 6509 (lumens)
Luminous Efficacy: 110.2 (lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	3525	3525	3525	3525	3525	
5	3503	3503	3503	3503	3503	131
15	3305	3305	3305	3305	3305	723
25	2796	2796	2796	2796	2796	1189
35	2011	2011	2011	2011	2011	1306
45	1297	1297	1297	1297	1297	1108
55	848	848	848	848	848	848
65	570	570	570	570	570	639
75	308	308	308	308	308	424
85	30	30	30	30	30	140
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

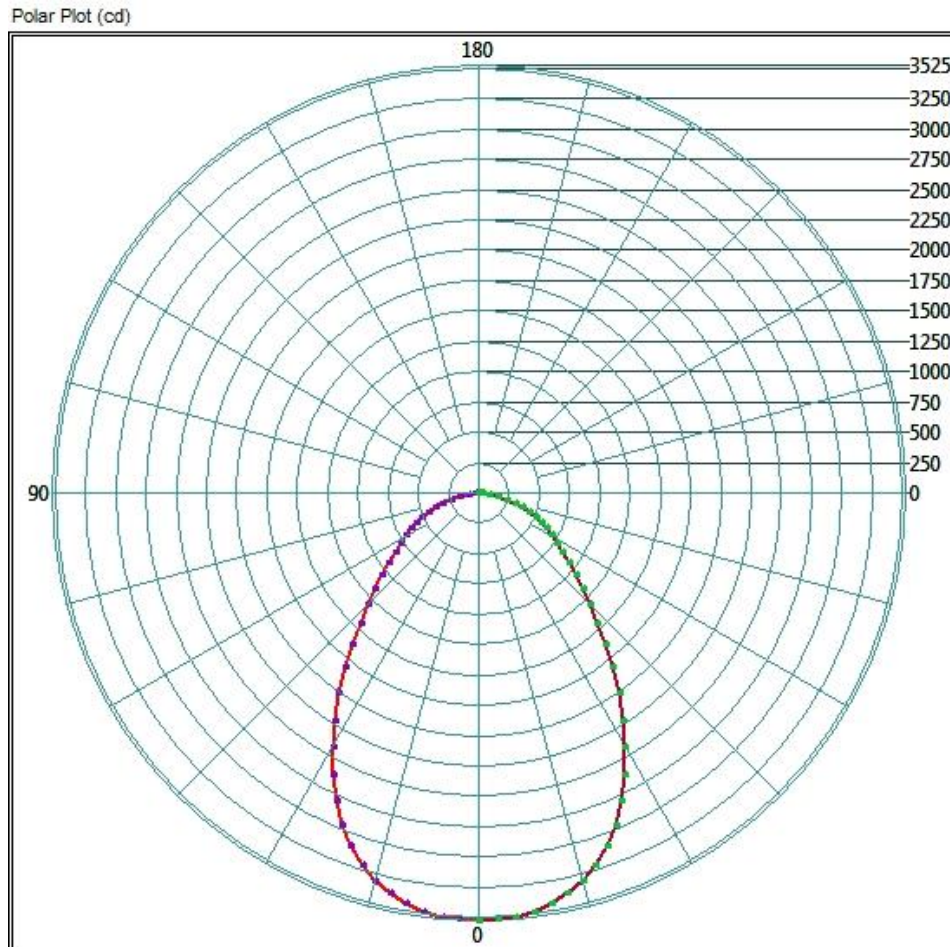
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2705.76	41.6%
0-40	3936.8	60.5%
0-60	5648.16	86.8%
60-90	1027.04	15.8%
0-90	6509.44	100.0%
90-180	0	0.0%
0-180	6509.44	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

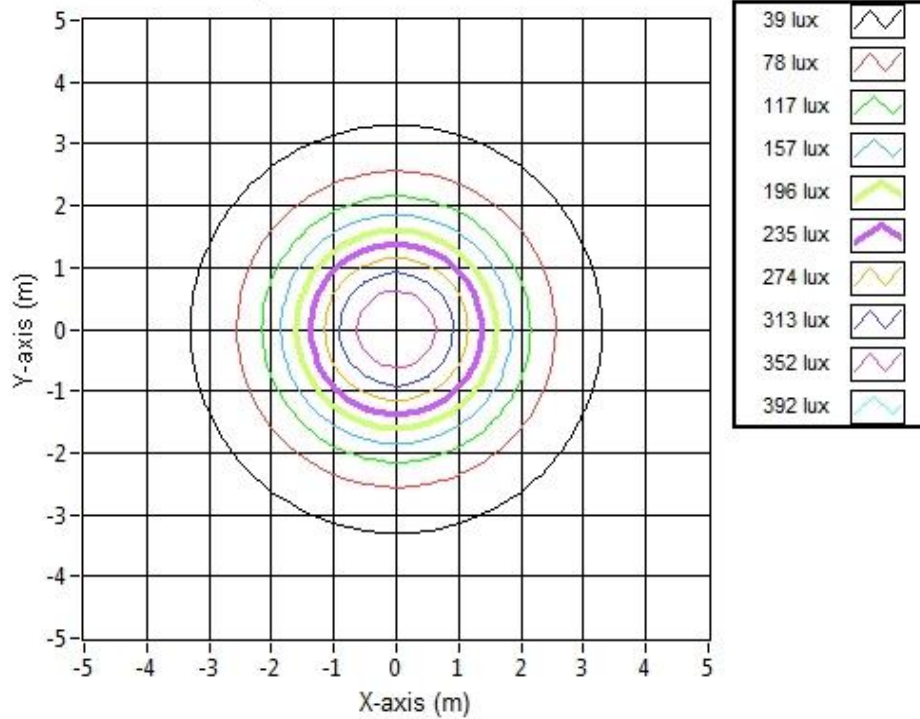


Test Results: Goniometer

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	4.79	4.79	379.4
6.096	9.58	9.58	94.9
9.144	14.36	14.36	42.2
12.192	19.15	19.15	23.7
15.24	23.94	23.94	15.2
18.288	28.73	28.73	10.5
21.336	33.51	33.51	7.7
24.384	38.30	38.30	5.9
27.432	43.09	43.09	4.7
30.48	47.88	47.88	3.8

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18022.
Dialight unit model number LTx3W4H2W

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: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 24.8 (°C)
Relative humidity at time of measurement: 19%

Results:

Measured LED source temperature: 47.7 (°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
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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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