

Test Report

Report Number: L18018

Date: Mar 1, 2018

Issued by:

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

Test of one 2' Linear LT
Unit manufacturer: Dialight Corporation
Unit model number: LTx3W4B2W

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

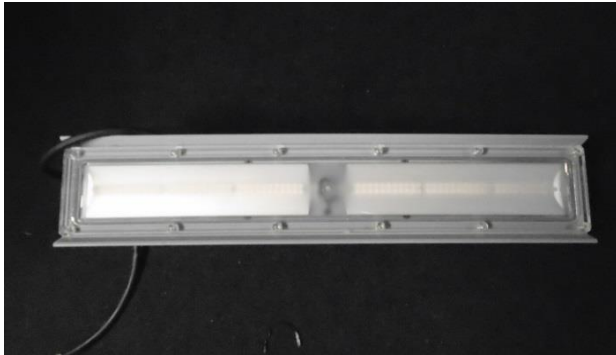
Description of sample:

Sample Number: L18018
Manufacturer: Dialight Corporation
Product Name: 2' Linear LT
Description: 2' Linear LT
Model Number: LTx3W4B2W

Report Summary

Sample number L18018
Dialight unit model number LTx3W4B2W

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	3041 (lumens)	3025 (lumens)
Electrical Power:	28.7 (W)	28.8 (W)
Luminous Efficacy:	105.9 (lumens/W)	105.1 (lumens/W)

Electrical Measurements:

Input Power (277VAC): 28.7 (W)
 Power Factor (277VAC): 0.896
 Current ATHD % (277VAC): 15.7
 Input Power (120VAC): 27.2 (W)
 Power Factor (120VAC): 0.987
 Current ATHD % (120VAC): 11.3

Color Measurements:

Correlated Color Temperature (CCT): 2702
 Color Rendering Index (CRI): 82.3
 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: 45.7 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L18018.

Dialight unit model number LTx3W4B2W

Test Conditions:

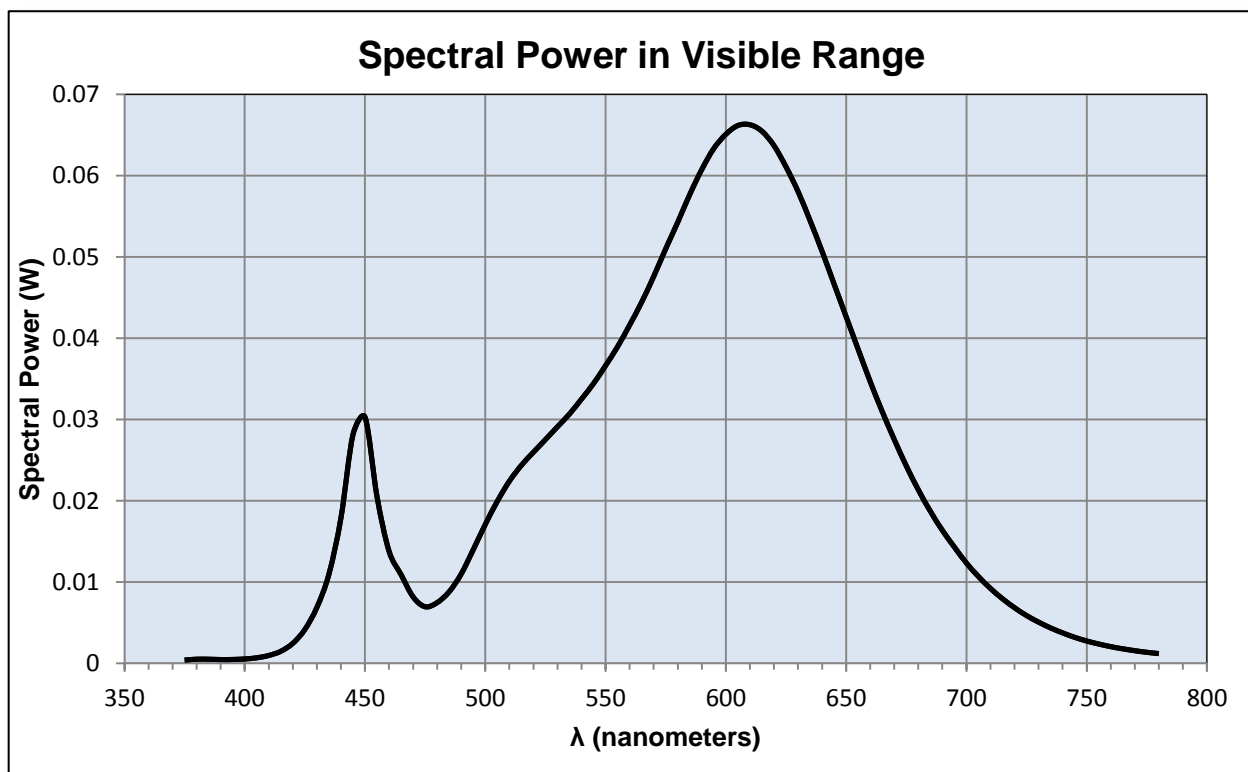
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 277 (VAC)
 Input Current: 0.116 (A)
 Input Power: 28.7 (W)
 Input Power Factor: 0.896
 Current ATHD: 15.7 (%)

Photometric measurements:

Luminous Flux: 3041 (lumens)
 Luminous Efficacy: 105.9 (lumens/W)
 Correlated Color Temperature (CCT): 2702 (K)
 CRI -Ra: 82.3
 CRI -R9: 10.2
 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	0.000	515	0.024	655	0.039
380	0.001	520	0.026	660	0.035
385	0.001	525	0.028	665	0.031
390	0.000	530	0.029	670	0.028
395	0.000	535	0.031	675	0.024
400	0.001	540	0.033	680	0.021
405	0.001	545	0.034	685	0.019
410	0.001	550	0.037	690	0.016
415	0.001	555	0.039	695	0.014
420	0.002	560	0.042	700	0.012
425	0.004	565	0.044	705	0.011
430	0.007	570	0.048	710	0.009
435	0.011	575	0.051	715	0.008
440	0.018	580	0.054	720	0.007
445	0.028	585	0.058	725	0.006
450	0.030	590	0.061	730	0.005
455	0.020	595	0.063	735	0.004
460	0.014	600	0.065	740	0.004
465	0.011	605	0.066	745	0.003
470	0.008	610	0.066	750	0.003
475	0.007	615	0.065	755	0.002
480	0.007	620	0.064	760	0.002
485	0.009	625	0.061	765	0.002
490	0.011	630	0.058	770	0.002
495	0.014	635	0.054	775	0.001
500	0.017	640	0.051	780	0.001
505	0.020	645	0.047		
510	0.022	650	0.043		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18018.
Dialight unit model number LTx3W4B2W

Electrical Measurements:

Input Voltage: 277 (VAC)
Input current: 0.116 (A)
Input Power: 28.8 (W)
Power Factor: 0.898

Photometric measurements:

Absolute Luminous Flux: 3025 (lumens)
Luminous Efficacy: 105.1 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	1670	1670	1670	1670	1670	
5	1658	1658	1658	1658	1658	62
15	1551	1551	1551	1551	1551	340
25	1297	1297	1297	1297	1297	554
35	923	923	923	923	923	601
45	597	597	597	597	597	509
55	398	398	398	398	398	394
65	269	269	269	269	269	302
75	143	143	143	143	143	198
85	13	13	13	13	13	64
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

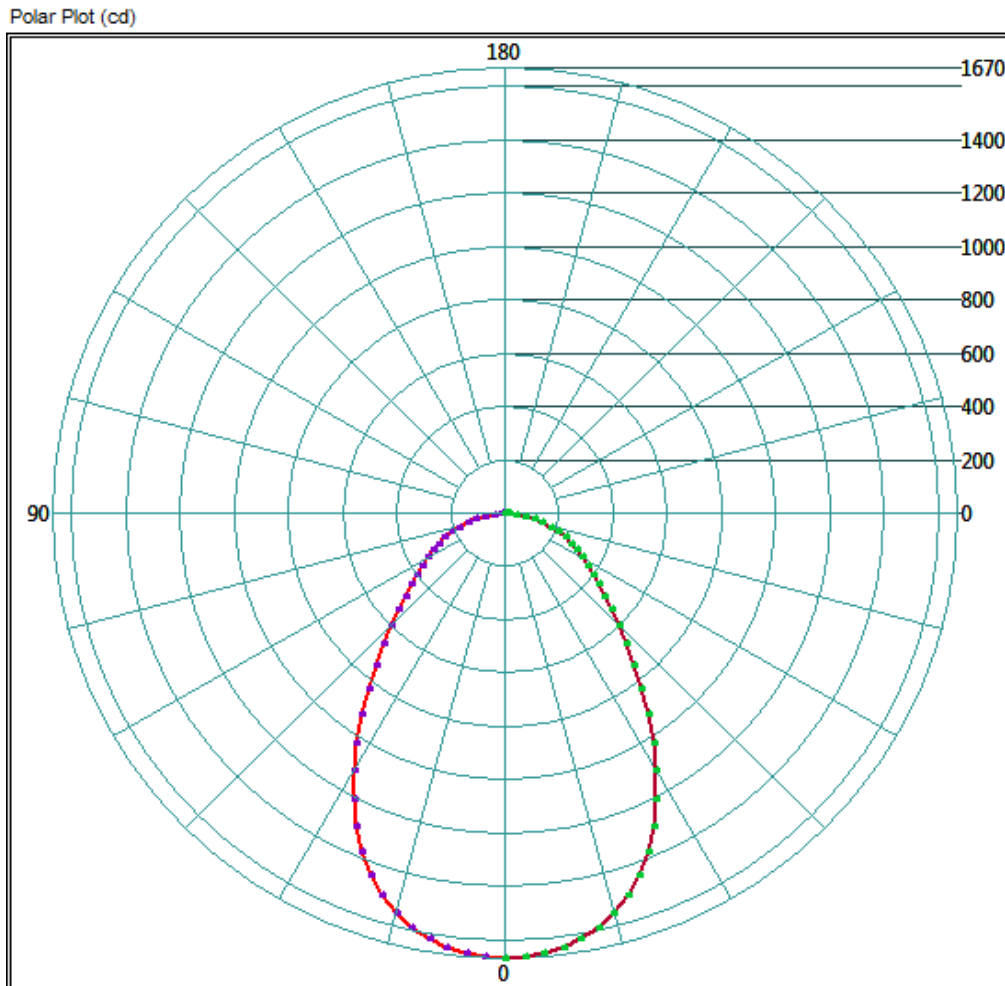
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	1262.4	41.7%
0-40	1827.36	60.4%
0-60	2622.88	86.7%
60-90	480.8	15.9%
0-90	3025.44	100.0%
90-180	0	0.0%
0-180	3025.44	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

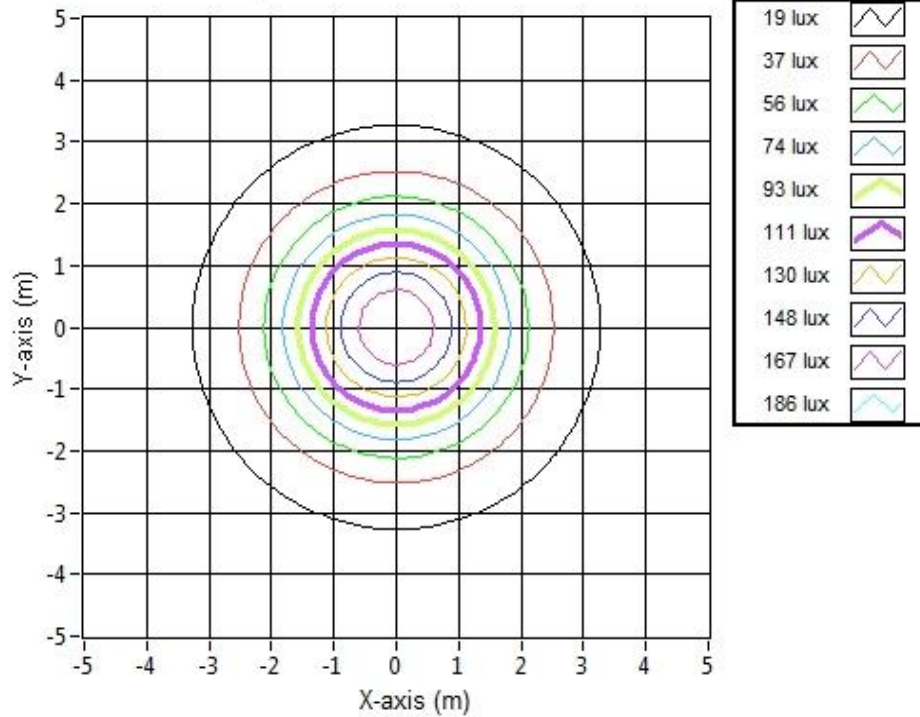


Test Results: Goniometer

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	4.66	4.66	179.8
6.096	9.31	9.31	44.9
9.144	13.97	13.97	20.0
12.192	18.62	18.62	11.2
15.24	23.28	23.28	7.2
18.288	27.94	27.94	5.0
21.336	32.59	32.59	3.7
24.384	37.25	37.25	2.8
27.432	41.91	41.91	2.2
30.48	46.56	46.56	1.8

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18018.
Dialight unit model number LTx3W4B2W

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:

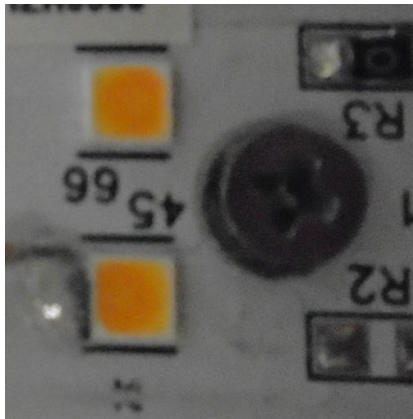
Maximum Power at Indicated Current: 0.195 (W)
Maximum Source Temperature: 116.3 (°C)

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: 45.7 (°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.

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