Test Report

Report Number: L18040 Date: May 30, 2018

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

Test of one 4ft Low Profile
Unit manufacturer: Dialight Corporation
Unit model number: LKx4MC29xxxxxN

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 22, 2018 through May 25, 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:	L18040
Manufacturer:	Dialight Corporation
Product Name:	4ft Low Profile
Description:	4ft Low Profile
Model Number:	LKx4MC29xxxxxN

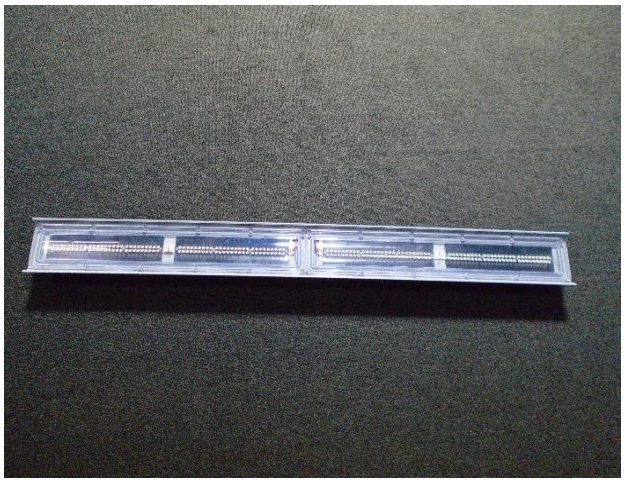
Dialight OPTICS LABORATORY

NVLAP TESTING NVLAP LAB CODE 201033-0

Report Summary

Sample number L18040
Dialight unit model number LKx4MC29xxxxxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere		Goniophotometer	
Luminous Flux:	9993	(lumens)	9816	(lumens)
Electrical Power:	70.4	(W)	70.7	(W)
Luminous Efficacy:	141.9	(lumens/W)	138.9	(lumens/W)

Electrical Measurements:

Input Power (120VAC):	70.4	(W)
Power Factor (120VAC):	0.994	
Current ATHD % (120VAC):	6.705	
Input Power (277VAC):	68.2	(W)
Power Factor (277VAC):	0.946	
Current ATHD % (277VAC):	10.87	

Color Measurements:

Correlated Color Temperature (CCT):	5048
Color Rendering Index (CRI):	85.6
Chromaticity Coordinate (x):	0.344
Chromaticity Coordinate (y):	0.352
Chromaticity Coordinate (u'):	0.21
Chromaticity Coordinate (v'):	0.323
DUV:	0.00086

Temperature Measurements:

In Situ LED Source Temperature:	52.1	(°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L18040.
Dialight unit model number LKx4MC29xxxxxN

Test Conditions:

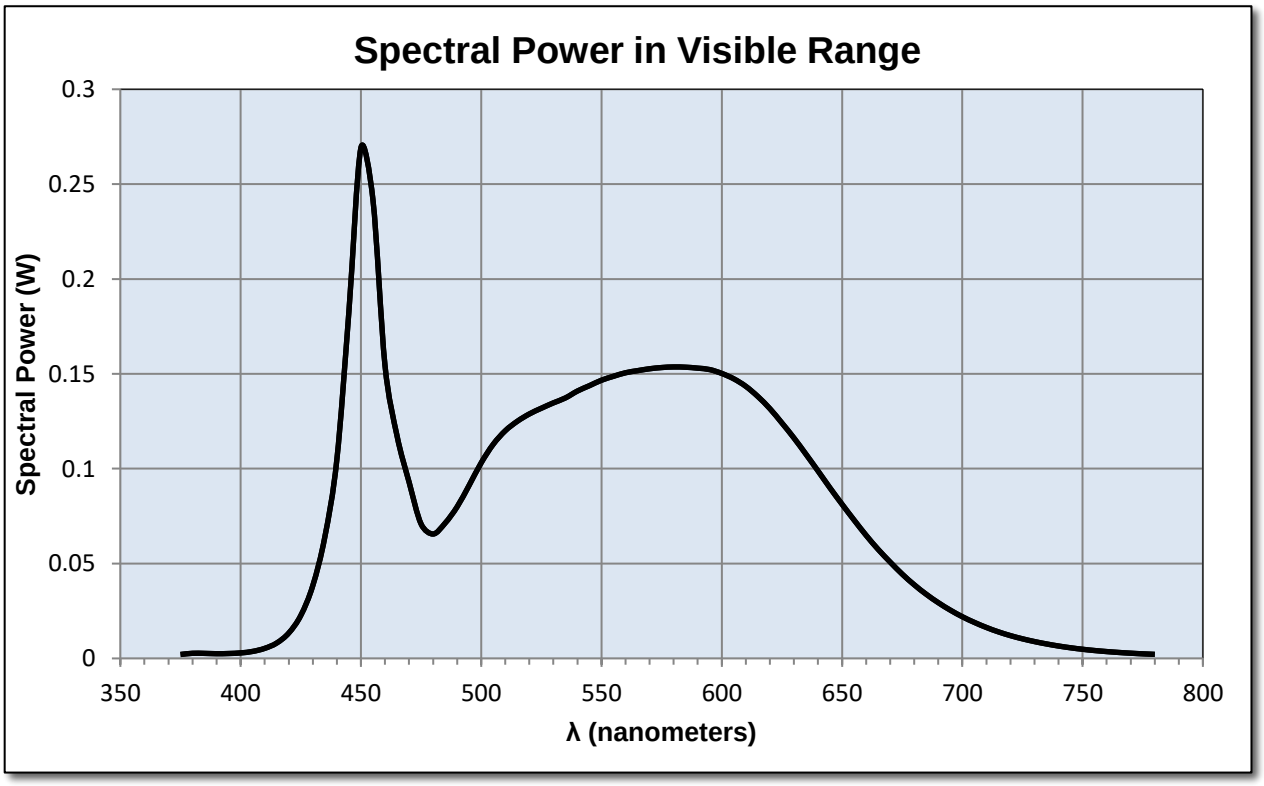
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.59	(A)
Input Power:	70.4	(W)
Input Power Factor:	0.994	
Current ATHD:	6.705	(%)

Photometric measurements:

Luminous Flux:	9993	(lumens)
Luminous Efficacy:	141.9	(lumens/W)
Correlated Color Temperature (CCT):	5048	(K)
CRI -Ra:	85.6	
CRI -R9:	21.9	
DUV:	0.00086	
CIE Coordinate (x):	0.344	
CIE Coordinate (y):	0.352	
CIE Coordinate (u'):	0.21	
CIE Coordinate (v'):	0.323	



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	0.125	655	0.073
380	0.003	520	0.129	660	0.065
385	0.003	525	0.132	665	0.057
390	0.002	530	0.135	670	0.051
395	0.003	535	0.137	675	0.044
400	0.003	540	0.141	680	0.039
405	0.004	545	0.144	685	0.034
410	0.005	550	0.147	690	0.029
415	0.008	555	0.149	695	0.025
420	0.013	560	0.151	700	0.022
425	0.023	565	0.152	705	0.019
430	0.038	570	0.153	710	0.016
435	0.064	575	0.153	715	0.014
440	0.105	580	0.154	720	0.012
445	0.183	585	0.153	725	0.010
450	0.269	590	0.153	730	0.009
455	0.242	595	0.152	735	0.008
460	0.155	600	0.150	740	0.007
465	0.117	605	0.147	745	0.006
470	0.093	610	0.143	750	0.005
475	0.071	615	0.138	755	0.004
480	0.066	620	0.132	760	0.004
485	0.071	625	0.124	765	0.003
490	0.080	630	0.116	770	0.003
495	0.091	635	0.108	775	0.002
500	0.103	640	0.099	780	0.002
505	0.113	645	0.090		
510	0.120	650	0.081		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L18040.
Dialight unit model number LKx4MC29xxxxxN

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.595	(A)
Input Power:	70.7	(W)
Power Factor:	0.989	

Photometric measurements:

Absolute Luminous Flux:	9816	(lumens)
Luminous Efficacy:	138.9	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	67.5	ACROSS	OUTPUT LUMENS
0	3910	3910	3910	3910	3910	
5	3938	3938	3938	3938	3938	147
15	3990	3990	3990	3990	3990	851
25	3931	3931	3931	3931	3931	1570
35	3476	3476	3476	3476	3476	2117
45	2428	2428	2428	2428	2428	1995
55	1813	1813	1813	1813	1813	1728
65	780	780	780	780	780	1182
75	49	49	49	49	49	200
85	11	11	11	11	11	24
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

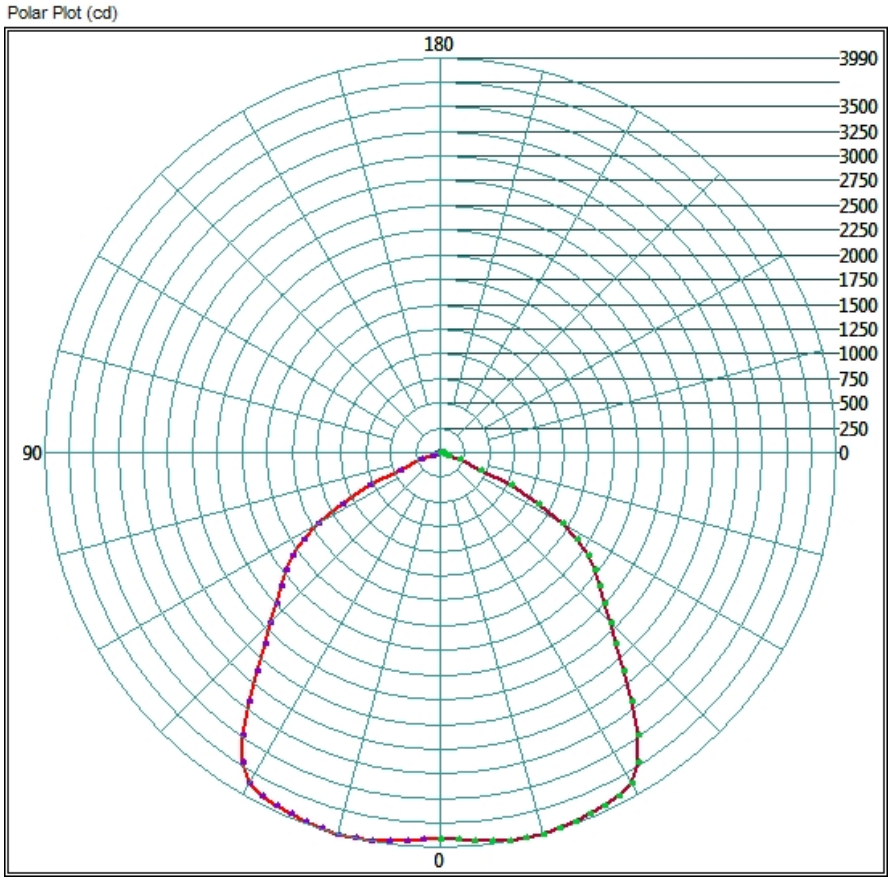
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	3590.88	36.6%
0-40	5722.4	58.3%
0-60	9123.36	92.9%
60-90	1028.16	10.5%
0-90	9815.84	100.0%
90-180	0	0.0%
0-180	9815.84	100.0%

Test Results: Goniometer

Results continued from previous page.

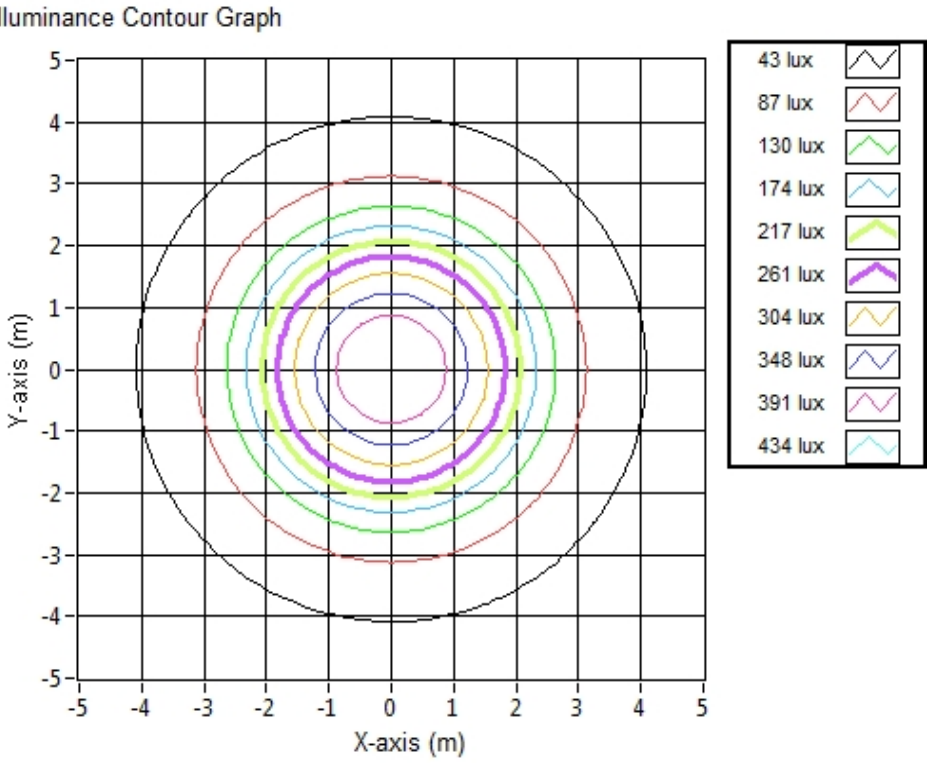
Polar Plot:



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	7.96	7.96	420.9
6.096	15.91	15.91	105.2
9.144	23.87	23.87	46.8
12.192	31.82	31.82	26.3
15.24	39.78	39.78	16.8
18.288	47.73	47.73	11.7
21.336	55.69	55.69	8.6
24.384	63.64	63.64	6.6
27.432	71.60	71.60	5.2
30.48	79.56	79.56	4.2

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L18040.
Dialight unit model number LKx4MC29xxxxxN

LED identified as Seoul part number SAW8C22B.

LED drive current (as indicated by customer):	52	(mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If):	250	(mA)
Maximum Rated Power Dissipation:	1.5	(W)
Maximum Junction Temp. (Tj):	125	(°C)
Thermal Resistance (Rth):	17	(°C/W)

Derived Specifications:

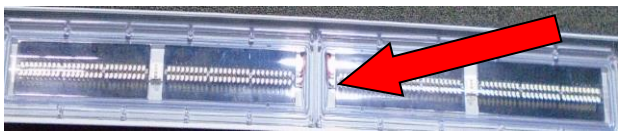
Maximum Power at Indicated Current:	0.312	(W)
Maximum Source Temperature:	119.7	(°C)

Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 5‘	(°C)
Ambient temperature at time of measurement:	24.3	(°C)
Relative humidity at time of measurement:	39%	

Results:

Measured LED source temperature:	52.1	(°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 Precison	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.

Test Report Issued By:

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Dialight Optics Laboratory
Senior Optical Engineering Technician
Lighting Division

Test Report Reviewed and Approved By:

Vishnu Shastry
Dialight Optics Laboratory
Optical Engineer
Approved Signatory