



FOR THE SCOPE OF  
ACCREDITATION UNDER NVLAP LAB  
CODE 100402-0.

# REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100508854

Date: November 2, 2011

REPORT NO. 100508854CRT-001A

TEST OF ONE LED STRIP LIGHT

FIXTURE MODEL NO. DLED-5100-3000K

RENDERED TO

DREAMSCAPE LIGHTING  
5521 WEST WASHINGTON BLVD.  
LOS ANGELES, CA 90016

TEST: Electrical and Photometric tests as required to the IESNA test standard.

LABORATORY NOTE: The laboratory that conducted the testing detailed in this report has been Qualified, Verified, and Recognized for LM-79 Testing for ENERGY STAR for SSL by US DOE's CALiPER program.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500329119.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79: 2008 Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2008 Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted two samples of model number DLED-5100-3000K. The sample was received by Intertek on September 19, 2011, in undamaged condition, and one sample was tested as received. The sample designation was D235423-1.

DATES OF TESTS: October 12, 2011 through October 19, 2011.

SUMMARY

Model No.: DLED-5100-3000K
Description: LED Strip Light

Criteria	Result
Total Lumen Output	353.9 Lumens
Total Power	7.580 W
Luminaire Efficacy	46.69
Power Factor	0.576
Current ATHD	108.2%
Correlated Color Temperature (CCT)	2946 K
Color Rendering Index (CRI) - Ra	81.4
Color Rendering Index (CRI) - R9	14.1
Duv	0.001
Chromaticity Coordinate (x)	0.439
Chromaticity Coordinate (y)	0.402
Chromaticity Coordinate (u')	0.253
Chromaticity Coordinate (v')	0.521
Maximum In-Situ Source Temperature Point	49.5°C

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Calibration Date	Calibration Due Date
Leeds & Northup Standard Resistor	Manganin	Y089	02/17/11	02/17/12
Data Precision Digital Voltmeter	3600	V124	02/17/11	02/17/12
Fluke Multimeter	45	M133	02/17/11	02/17/12
Fluke Temperature Meter	53 II	T1318	02/25/11	02/25/12
Kikusui DC Power Supply	35-10L	E160	---	---
Sorenson DC Power Supply	DLM150-20E	--	---	---
NIST Spectral Flux Standard Source	RF1024	---	09/18/10	100 hours of use
Xitron Power Analyzer	2503AH	E246	04/20/11	04/20/12
ITS 2 Meter Sphere	W/ CDS 600	N308	w/use	w/use
Fluke Multimeter	Fluke 87V	D589	03/14/11	03/14/12

## TEST METHODS

### Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

### Photometric and Electrical measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

### Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

### In-Situ Maximum Measured Power Supply Case and LED Source Point Temperature

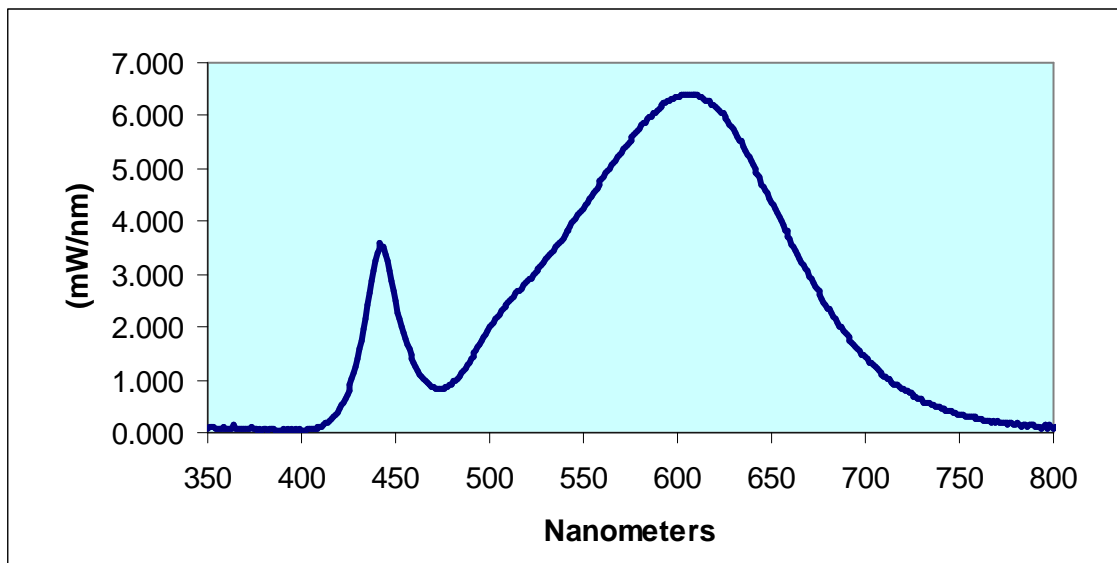
Power supply case and/or LED source operating temperature measurements were taken on one test sample per model with a thermocouple and Fluke 87 temperature meter. The SSL sample was allowed to reach thermal equilibrium for seven and a half hours before measurements were taken. Power supply or source temperature measurements were measured at the  $TMP_{PS}$  or  $T_S$  point as indicated by the included diagram in accordance with manufacturers declared hot spot location, or at a hot spot location found with a thermal camera when no diagram from the manufacturer is given. The maximum temperature was recorded for the sample. A simulated ceiling or other enclosure may be used in accordance to UL 1598 or UL 153 as applicable.

**RESULTS OF TESTS**

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
DLED-5100-3000K							
350	0.083	460	1.321	570	5.282	680	2.358
355	0.076	465	1.015	575	5.533	685	2.094
360	0.091	470	0.862	580	5.755	690	1.851
365	0.068	475	0.842	585	5.978	695	1.628
370	0.060	480	0.926	590	6.133	700	1.429
375	0.072	485	1.118	595	6.277	705	1.246
380	0.066	490	1.388	600	6.363	710	1.076
385	0.078	495	1.680	605	6.390	715	0.926
390	0.058	500	1.988	610	6.376	720	0.831
395	0.066	505	2.233	615	6.295	725	0.713
400	0.056	510	2.474	620	6.166	730	0.629
405	0.067	515	2.679	625	5.983	735	0.534
410	0.119	520	2.867	630	5.741	740	0.458
415	0.216	525	3.071	635	5.412	745	0.406
420	0.451	530	3.281	640	5.086	750	0.329
425	0.800	535	3.501	645	4.704	755	0.315
430	1.415	540	3.742	650	4.352	760	0.271
435	2.404	545	4.003	655	4.006	765	0.000
440	3.404	550	4.255	660	3.659	770	0.208
445	3.373	555	4.524	665	3.303	775	0.181
450	2.494	560	4.802	670	2.970	780	0.168
455	1.771	565	5.052	675	2.688		

**Dreamscape Lighting**  
**Sample No. D235423-1**  
**Model No. DLED-5100-3000K**  
**Spectral Data Over Visible Wavelengths**



## RESULTS OF TESTS (cont'd)

### Photometric and Electrical Measurements at 25°C – Integrating Sphere Method

Intertek Sample No.	Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
DLED-5100-3000K								
D235423-1	2946	81.4	14.1	0.001	0.439	0.402	0.253	0.521

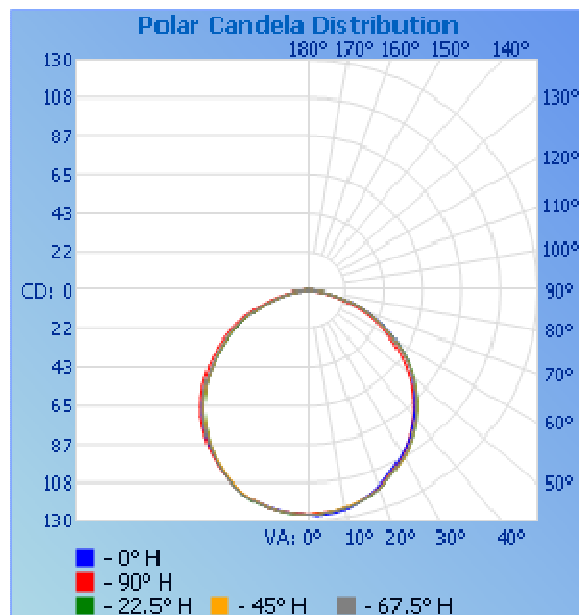
Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)
DLED-5100-3000K						
D235423-1	UP	120.0	112.1	7.48	0.556	108.20

### Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
DLED-5100-3000K							
D235423-1	UP	120.0	109.8	7.580	0.576	353.9	46.69

### Intensity (Candlepower) Summary at 25°C - Candelas

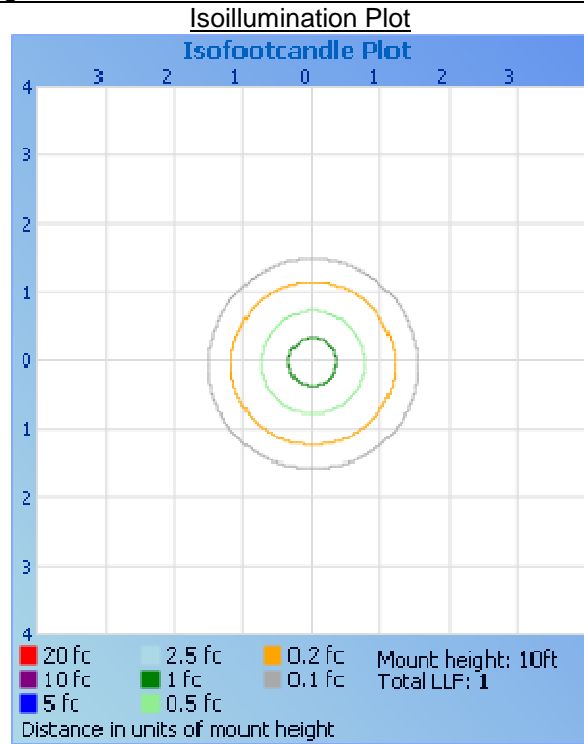
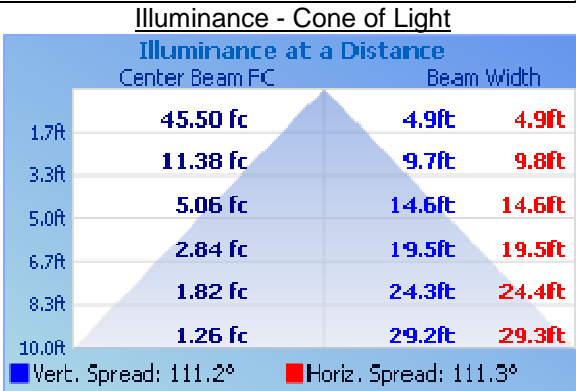
Angle	0	22.5	45	67.5	90
DLED-5100-3000K					
0	126	126	126	126	126
5	127	126	126	126	126
10	126	124	124	124	124
15	121	122	121	122	122
20	117	119	119	119	118
25	112	114	114	114	113
30	106	109	109	108	107
35	100	103	102	102	100
40	93	96	95	95	93
45	86	88	87	87	84
50	77	79	78	78	74
55	68	69	68	68	65
60	58	58	58	57	54
65	48	47	46	46	43
70	37	36	36	35	32
75	26	25	25	24	21
80	15	15	14	14	12
85	6	6	6	5	4
90	1	1	0	0	0



## RESULTS OF TESTS (cont'd)

### Illumination Plots

Model No.: DLED-5100-3000K  
Mounting Height: 10 ft.



### Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
DLED-5100-3000K		
0-30	98.3	27.8
0-40	161.1	45.5
0-60	283.8	80.2
60-90	70.1	19.8
0-90	353.8	100.0
90-180	0.1	0.0
0-180	353.9	100.0

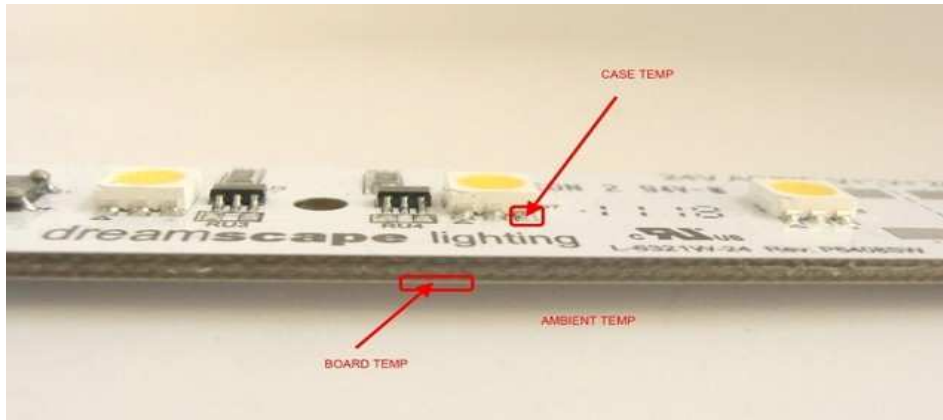
**RESULTS OF TESTS** (cont'd)

**In-Situ Maximum Measured LED Source Temperature**

**Manufacturer Supplied Documentation:**

LED identified as:

GPI 5050 SMD LED



Parameter	Symbol	Absolute Max. Rating	Unit
Reverse Voltage ( Without zener diode )	$V_R$	5	V
Forward Current	$I_F$	40/40/40	mA
Operating Temperature	$T_{opr}$	-30 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +100	°C
Soldering Temperature	$T_{sol}$	260 (for 5 sec)	°C
Power Dissipation	$P_D$	432 (3 chips ON)	mW
Peak Forward Current (Duty 1/10 @ 1KHz)	$I_{F(peak)}$	240 (3 chips ON)	mA
Junction temperature	$T_j$	115	°C
Thermal Resistance (Junction to ambient)	$R_{th, JA}$	450	°C/W

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Chromaticity coordinate x acc. To CIE 1931	x	$I_F=20/20/20mA$	0.26	0.31	0.51	---
Chromaticity coordinate y acc. To CIE 1931	y	$I_F=20/20/20mA$	0.25	0.31	0.46	---
Correlated Color Temperature	CCT	$I_F=20/20/20mA$	2580	6500	13000	°K
Viewing Angle	$2\theta_{1/2}$	$I_F=20/20/20mA$	---	120	---	Deg
Forward Voltage	$V_F$	$I_F=20/20/20mA$	---	3.30	3.70	V
Leakage Current ( Without zener diode )	$I_r$	$V_r=5/5/5V$	---	---	50	$\mu A$
Electrostatic Discharge ( With Zener diode )	ESD	---	4000	8000	---	V

RESULTS OF TESTS (cont'd)

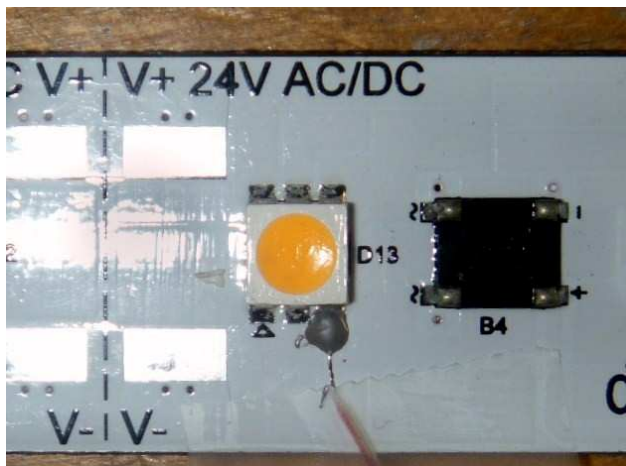
In-Situ Maximum Measured LED Source Temperature

Maximum Junction Temperature from LED specification (Tj) = 115°C  
 Thermal Resistance Formula from LED specification = 450°C/W  
 Maximum Forward Voltage (Vf) from LED specification = 3.7 V  
 Measured LED Current = 10.4mA  
 Calculated LED Wattage = Vf x Measured LED Current = .0385W  
 Maximum Source Temperature (Ts) = Tj – (LED Wattage x Thermal Resistance) = 98.0°C

Maximum Measured Manufacturer Designated Source Temperature

Sample No.	Model No.	Maximum Measured Source Temperature (°C)	Location	Maximum Rated Source Temperature(°C)
D235423-1	DLED-5100-3000K	49.5	Per diagram above	98.0

In-Situ Picture – Ts



In-Situ Picture – TC location







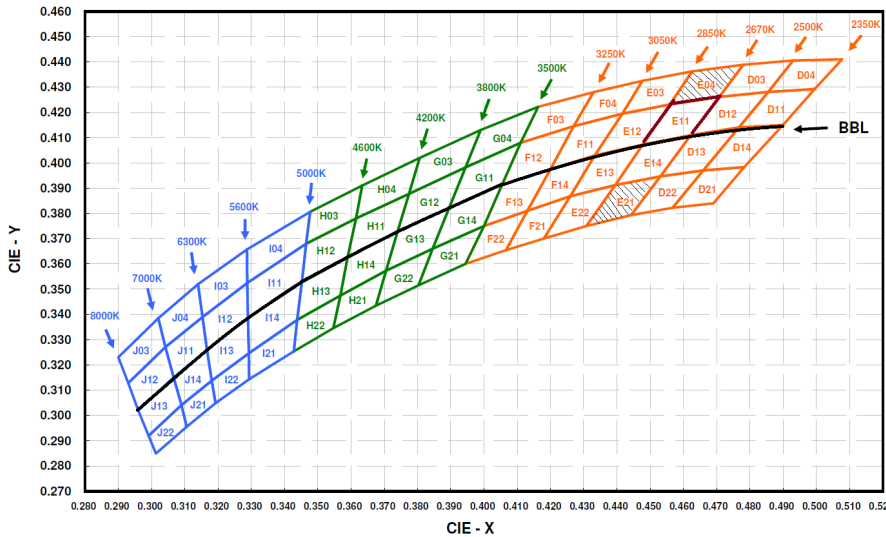
# Dreamscape DLED-5100

## Quality Binning

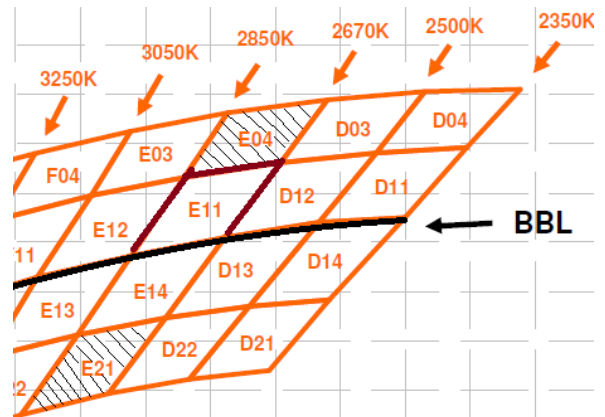
**What is binning and how does it affect color temperature?**

Color consistency is of utmost importance in architectural lighting applications.

This is accomplished by binning, a procedure that defines color temperature. The Black Body Locus Curve (BBL) represents what the human eye sees as “white light”. Along that curve starting from the right would be the Warm-Whites such as 2700K or 3000K. To ensure consistency and quality Dreamscape utilizes a 3-step MacAdam ellipse along the BBL ( see E11 in diagram).

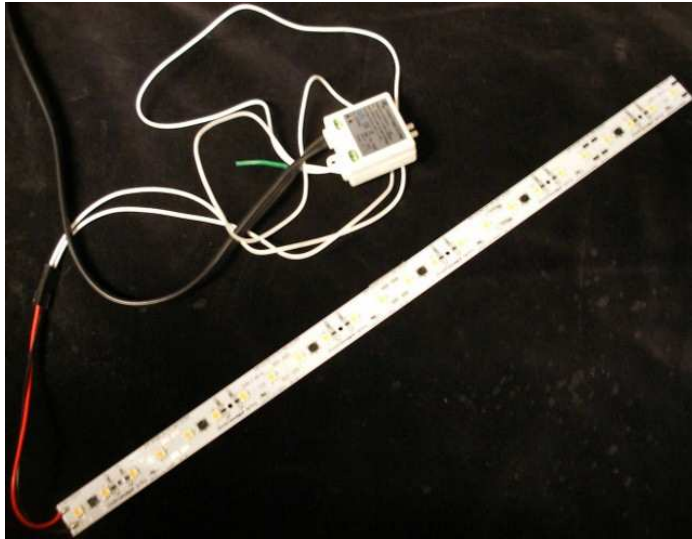


Regions such as E04 and E21 (see diagram) are discarded. Strict binning procedures allow DLED-5100 to be utilized effectively as an architectural light source.



In addition to strict binning, each order is hand selected to further ensure consistency of color temperature. These factors combined with a CRI (color rendering index) of 80+ and an operating temperature of 49.5 degrees Celsius, give everyone from the design professional to the end user the confidence, backed with proper documentation, to use high efficacy LED lighting in many applications.

Pictures (not to scale)



## CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:



Joseph Schledorn  
Engineer  
Lighting Division

Attachment: None

Report Reviewed By:



Jacki Swiernik  
Engineering Team Leader  
Lighting Division