



# REPORT

25800 COMMERCE DRIVE, LAKE FOREST, CA 92630

Project No. G101844208

Original Release Date: October 29, 2014

Revision Date: November 11, 2014

REPORT NO. 101844208LAX-002

TEST OF ONE LINEAR RETROFIT

RETROFIT MODEL NO. RKL23U4035(DV)  
LED MODEL NO. SAMSUNG LM561B  
DRIVER MODEL NO. HANSOL HPL40W1B-DIM  
TROFFER MODEL NO. LITHONIA 2GT8 FIXTURES

RENDERED TO

MAXLITE, INC.  
12 YORK AVENUE  
WEST CALDWELL, NJ 07006

Revision Note November 11, 2014: Revised report to correct the products model number.

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

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500553301.

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: Electrical and Photometric Measurements of Solid State Lighting

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number RKL23U4035(DV). The sample was received by Intertek on October 22, 2014 in undamaged condition, and one sample was tested as received. The sample designation was LAN1410221013-003.

DATES OF TESTS: October 28, 2014

---

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

## SUMMARY

Model No.:	RKL23U4035(DV)
Description:	Linear Retrofit

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	3363	3262
Total Power (W)	38.20	38.87
Luminaire Efficacy (LPW)	88.04	83.92

Criteria	Result
Power Factor at 120.03Vac	0.990
Power Factor at 277.02Vac	0.914
Current ATHD % at 120.03Vac	12.47
Current ATHD % at 277.02Vac	16.99
Correlated Color Temperature (CCT - K)	3573
Color Rendering Index (CRI - Ra)	83.8
Color Rendering Index (CRI - R9)	19.0
DUV	0.001
Chromaticity Coordinate (x)	0.400
Chromaticity Coordinate (y)	0.386
Chromaticity Coordinate (u')	0.234
Chromaticity Coordinate (v')	0.508
Spacing Criteria (0-180°)	1.22
Spacing Criteria (90-270°)	1.26

## EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
DC Power Supply	LPS-100-0833	000832	05/20/14	05/20/15
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	10/03/14	11/03/14
LabSphere Spectrometer	CDS-3020	000834	10/03/14	11/03/14
California Instruments Power Supply	CSW5550	001338	06/05/14	06/05/15
Yokogawa Power Meter	WT333	001320	05/15/14	05/15/15
Extech Instruments Stop Watch	365510	001380	11/05/13	11/05/14
Temp. & RH Meter	971	001178	12/03/13	12/03/14
LSI High Speed Mirror Goniometer	6440T	000943	10/03/14	11/03/14
Elgar Power Supply	CW1251	000944	05/29/14	05/29/15
Yokogawa Power Analyzer	WT210	000945	11/14/13	11/14/14
Temp. & RH Meter	971	001178	12/03/13	12/03/14
Extech Instruments Stop Watch	9/23/2900	001380	11/05/13	11/05/14
Tape Measure	33-428	000684	12/09/13	12/09/14



## TEST METHODS

### Seasoning in Sample Orientation – LED Products

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

### Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere CDS 3020 Spectrometer and Three Meter 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 Yokogawa Power Analyzer.

The calibration of the sphere spectrometer system is traceable to the National Institute of Standards and Technology.

### 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 Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

# **RESULTS OF TEST**

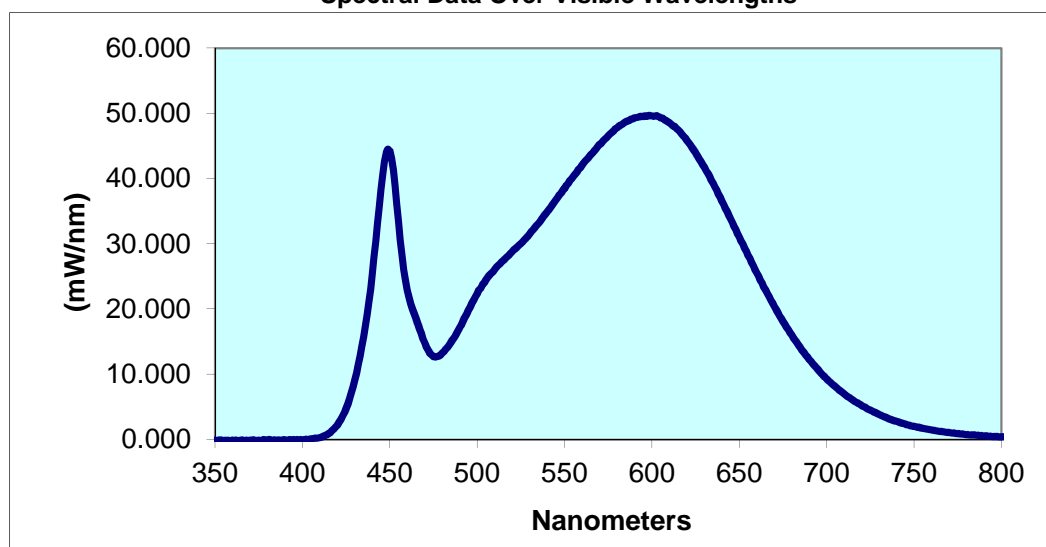
## **Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method**

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1410221013-003	UP	120.0	322.0	38.20	0.990	12.47	3363	88.04
		277.0	155.0	39.30	0.914	16.99		
Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')	
3573	83.8	19.0	0.001	0.400	0.386	0.234	0.508	

## **Spectral Distribution over Visible Wavelengths**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	-0.097	440	25.430	530	31.570	620	45.840	710	7.006
355	-0.151	445	38.310	535	33.130	625	43.960	715	6.040
360	-0.114	450	44.200	540	34.900	630	41.740	720	5.218
365	-0.118	455	33.380	545	36.730	635	39.260	725	4.494
370	-0.113	460	22.910	550	38.530	640	36.590	730	3.830
375	-0.105	465	18.530	555	40.350	645	33.780	735	3.254
380	-0.082	470	14.800	560	42.040	650	31.020	740	2.781
385	-0.083	475	12.700	565	43.700	655	28.260	745	2.365
390	-0.054	480	13.230	570	45.230	660	25.570	750	2.011
395	-0.002	485	14.920	575	46.560	665	22.900	755	1.730
400	-0.032	490	17.170	580	47.780	670	20.410	760	1.457
405	0.065	495	19.830	585	48.750	675	18.100	765	1.251
410	0.316	500	22.380	590	49.320	680	16.010	770	1.058
415	0.918	505	24.470	595	49.540	685	14.030	775	0.901
420	2.212	510	26.070	600	49.600	690	12.260	780	0.734
425	4.781	515	27.470	605	49.340	695	10.690		
430	9.100	520	28.800	610	48.610	700	9.294		
435	15.750	525	30.020	615	47.460	705	8.085		

**Spectral Data Over Visible Wavelengths**



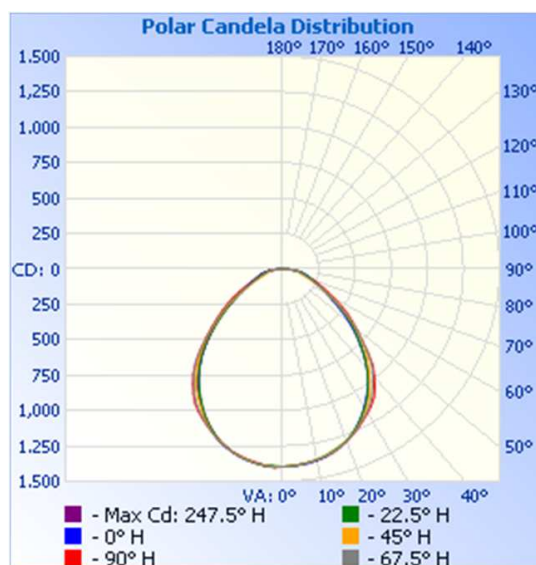
# RESULTS OF TEST (cont'd)

## Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – 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)
LAN1410221013-003	UP	120.0	327.2	38.87	0.990	3262	83.92

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

Angle	0	22.5	45	67.5	90
0	1395	1395	1395	1395	1395
5	1388	1387	1384	1383	1385
10	1371	1365	1365	1368	1372
15	1338	1331	1337	1341	1343
20	1293	1287	1291	1293	1296
25	1218	1220	1229	1234	1238
30	1127	1132	1150	1166	1174
35	1025	1029	1051	1077	1101
40	904	904	927	970	984
45	761	765	805	831	831
50	616	632	664	669	672
55	470	493	512	522	547
60	352	365	376	380	413
65	268	277	260	273	308
70	212	219	176	203	233
75	173	169	129	152	165
80	131	123	106	113	127
85	74	74	61	60	63
90	3	4	5	3	2



# RESULTS OF TEST (cont'd)

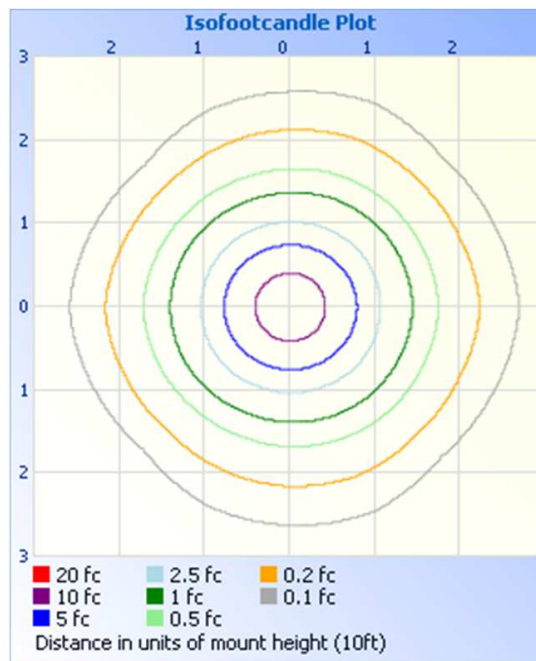
## Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



## Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1072	32.9
0-40	1725	52.9
0-60	2773	85.0
60-90	488.8	15.0
0-90	3262	100.0
90-180	0.4	0.0
0-180	3262	100.0

## Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	132.0	4.0
10-20	377.1	11.6
20-30	563.0	17.3
30-40	652.8	20.0
40-50	606.4	18.6
50-60	441.8	13.5
60-70	263.8	8.1
70-80	158.6	4.9
80-90	66.4	2.0
90-100	0.4	0.0

## Spacing Criteria

0-180°	1.22
90-270°	1.26

PICTURE (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.

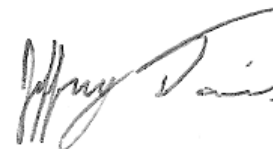
In Charge Of Tests:



Erik Linares  
Technician  
Lighting Division

Attachment: None

Report Reviewed By:



Jeffrey Davis  
Engineering Manager  
Lighting Division