DRAFT REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102525478 Date: April 7, 2016

REPORT NO. 102525478LAX-001

TEST OF ONE LED RECESSED

MODEL NO. P53-LED35-SO-04-SAL-D1
LED MODEL NO. NICHIA NFSL757D
DRIVER MODEL NO. OSRAM 79399

RENDERED TO

PRUDENTIAL LTG
1774 EAST 21ST STREET
LOS ANGELES, CA 90058-1008

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 Qu-00684228.

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 P53-LED35-SO-04-SAL-D1. The sample was received by Intertek on March 18, 2016, in undamaged condition and one sample was tested as received. The sample designation was LAN1603180752-001.

DATES OF TESTS: April 5, 2016 through April 6, 2016.

SUMMARY

Model No.:	P53-LED35-SO-04-SAL-D1
Description:	LED Recessed

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	3494	3482
Total Power (W)	39.37	39.38
Luminaire Efficacy (LPW)	88.75	88.42

Criteria	Result
Power Factor	0.995
Current ATHD %	7.92
Correlated Color Temperature (CCT - K)	3451
Color Rendering Index (CRI - Ra)	81.9
Color Rendering Index (CRI - R9)	13.2
DUV	0.000
Chromaticity Coordinate (x)	0.408
Chromaticity Coordinate (y)	0.393
Chromaticity Coordinate (u')	0.237
Chromaticity Coordinate (v')	0.512

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
DC Power Supply	LPS-100-0833	000836	05/07/15	05/07/16
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	03/07/16	04/07/16
LabSphere Spectrometer	CDS-3020	000834	03/07/16	04/07/16
California Instruments Power Supply	CSW5550	001339	VBU	VBU
Yokogawa Power Meter	WT333	001320	06/03/15	06/03/16
Extech Instruments Stop Watch	365510	001379	11/19/15	11/19/16
Temp & HR Meter	971	001178	12/18/15	12/18/16
LSI High Speed Mirror Goniometer	6440T	000943	03/08/16	04/08/16
Elgar Power Supply	CW1251	000944	VBU	VBU
Yokogawa Power Analyzer	WT210	000945	12/04/15	12/04/16
Temp. & RH Meter	971	001380	12/17/15	12/17/16
Tape Measure	C1-25	000915	12/04/15	12/04/16

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

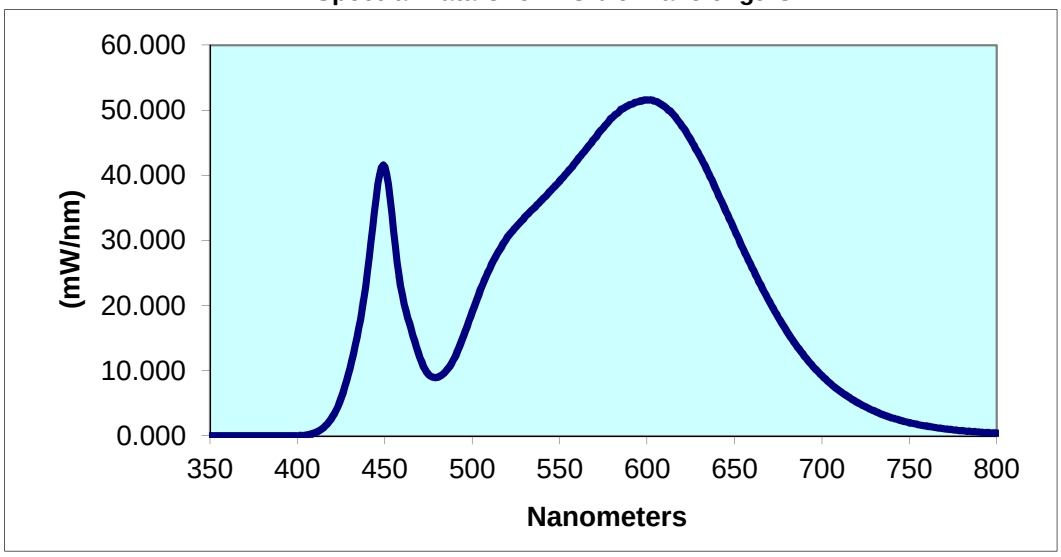
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1603180752-001	UP	120.0	329.6	39.37	0.995	7.92	3494	88.75

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')
3451	81.9	13.2	0.000	0.408	0.393	0.237	0.512

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.008	440	25.050	530	33.610	620	47.500	710	6.936
355	0.008	445	36.600	535	34.920	625	45.460	715	5.988
360	0.008	450	41.270	540	36.310	630	43.040	720	5.173
365	0.008	455	31.530	545	37.710	635	40.360	725	4.463
370	0.008	460	21.560	550	39.130	640	37.530	730	3.819
375	0.008	465	16.410	555	40.700	645	34.510	735	3.253
380	0.008	470	12.060	560	42.330	650	31.580	740	2.784
385	0.008	475	9.394	565	44.020	655	28.650	745	2.381
390	0.008	480	9.022	570	45.730	660	25.870	750	2.044
395	0.008	485	9.995	575	47.330	665	23.140	755	1.724
400	0.019	490	12.110	580	48.840	670	20.590	760	1.510
405	0.146	495	15.370	585	50.110	675	18.180	765	1.293
410	0.484	500	19.100	590	50.880	680	16.040	770	1.094
415	1.286	505	22.650	595	51.300	685	14.020	775	0.942
420	2.964	510	25.720	600	51.540	690	12.220	780	0.805
425	5.809	515	28.290	605	51.380	695	10.650		
430	10.390	520	30.450	610	50.560	700	9.251		
435	16.500	525	32.080	615	49.350	705	8.021		

Spectral Data Over Visible Wavelengths



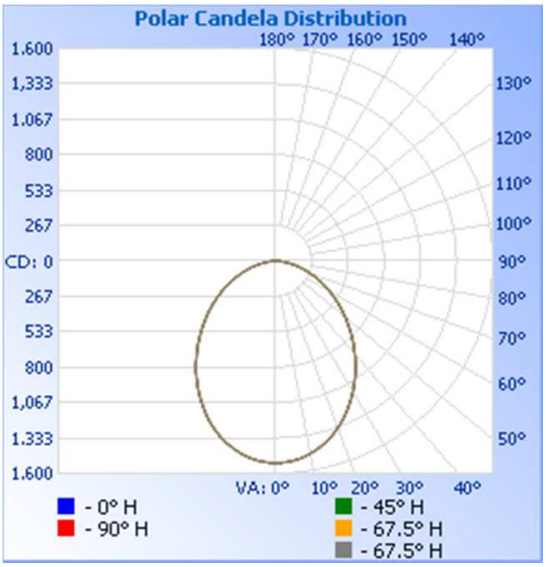
RESULTS OF TEST (cont'd)

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)
LAN1603180752-001	UP	120.0	329.9	39.38	0.995	3482	88.42

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	1520	1520	1520	1520	1520
5	1509	1509	1509	1509	1509
10	1473	1473	1473	1473	1473
15	1415	1415	1415	1415	1415
20	1338	1338	1338	1338	1338
25	1243	1243	1243	1243	1243
30	1137	1137	1137	1137	1137
35	1025	1025	1025	1025	1025
40	907	907	907	907	907
45	789	789	789	789	789
50	675	675	675	675	675
55	566	566	566	566	566
60	462	462	462	462	462
65	363	363	363	363	363
70	271	271	271	271	271
75	186	186	186	186	186
80	110	110	110	110	110
85	48	48	48	48	48
90	4	4	4	4	4

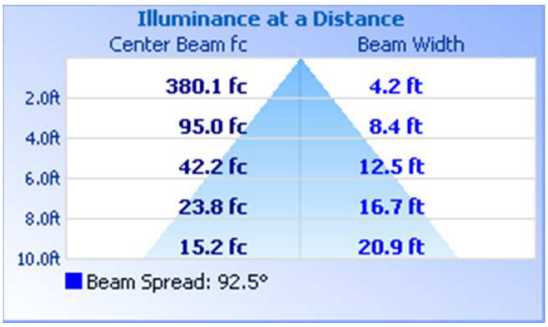


RESULTS OF TEST (cont'd)

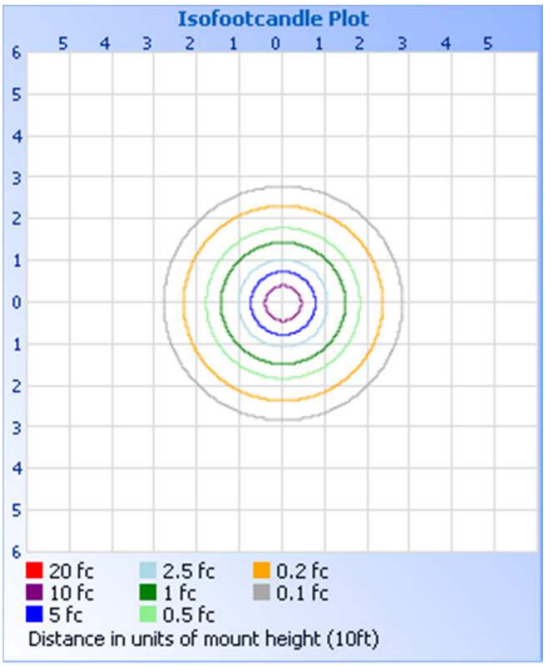
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1112	31.9
0-40	1752	50.3
0-60	2868	82.4
60-90	613.9	17.6
0-90	3482	100.0
90-180	0.5	0.0
0-180	3482	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	142.8	4.1
10-20	398.0	11.4
20-30	571.4	16.4
30-40	639.8	18.4
40-50	609.1	17.5
50-60	506.6	14.6
60-70	360.6	10.4
70-80	197.7	5.7
80-90	55.6	1.6
90-100	0.5	0.0

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:

Jesse Reyna
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Lighting Division

Report Reviewed By:

Kenda Branch
Lighting Performance Team Lead
Lighting Division

Attachment: None