

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN, LLC**(Brand Name: Light Efficient Design)**

188 S.Northwest Highway, Cary, IL60013, USA

LED SOX Lamp Retrofit

Model name(s): LED-8101-40K

Representative (Tested) Model: LED-8101-40K

Model Different: N/A.

Test & Report By:

Only Zhang

Engineer: Only Zhang

Date: Aug.03,2018

Review By:

John Li

Manager: John Li

Note: 1. The results contained in this report pertain only to the rested samples.

2. This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co., Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320

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<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	Light Efficient Design	
Model Number	LED-8101-40K	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED SOX Lamp Retrofit	
Rated Voltage / Frequency	100-277Vac, 50/60Hz	
Nominal Power	35W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	N/A	
LED Model	N/A	
Sample Number	JBE180709-E1(4000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo

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1.2 Test Specifications:

Date of Receipt	Aug.01,2018
Date of Test	Aug.03,2018
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.3 Test Methods**1) Photometric and Light Distribution Measurement – Goniophotometer Method:**

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

2.1 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction QD25)

Test date	2018-08-03	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8101-40K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180709-	120.0	60	0.3136	37.07	0.9852	6.76
B1	277.0	60	0.1406	36.48	0.9369	13.85

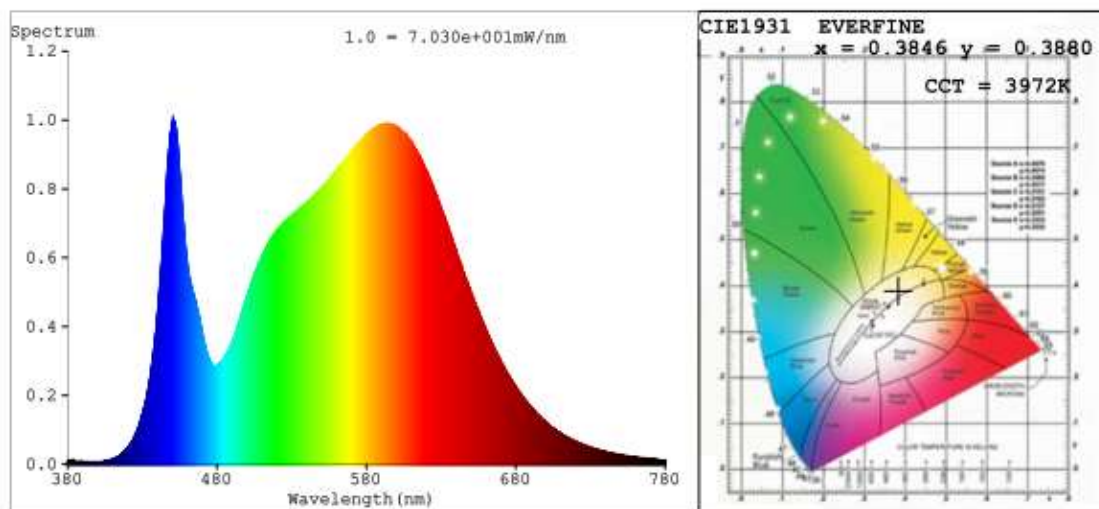
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	3
Frequency (Hz)	60	R2	88	R10	72
CCT (K)	3972	R3	95	R11	80
Duv	0.0040	R4	81	R12	61
Chromaticity (x, y)	x=0.3846 y=0.3880	R5	80	R13	82
Chromaticity (u', v')	u'=0.2234 v'=0.5071	R6	84	R14	97
Color Rendering Index (CRI)	82.3	R7	87	R15	73
R9	3	R8	63	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	5156.7	5124.7
Luminous Efficacy (lm/W)	139.11	140.48
Most Worst Luminous/Highest Watts	138.24	
Beam Angle (°)	117.6	--
Center Beam Candle Power (cd)	1720	--

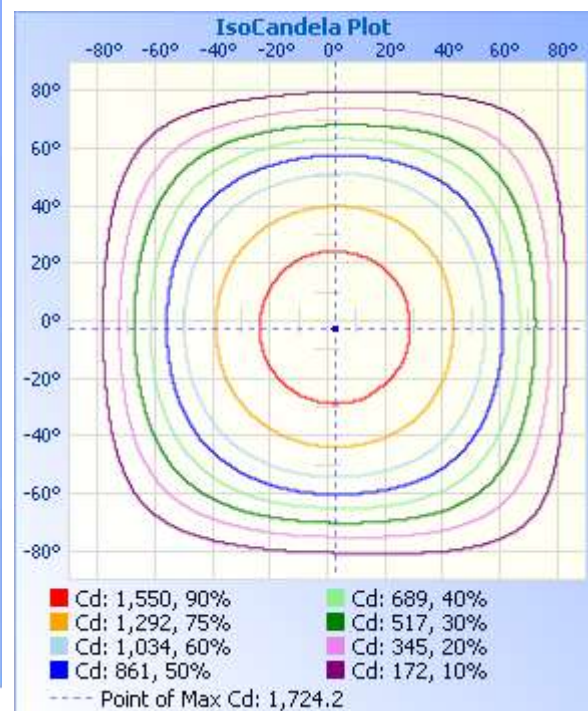
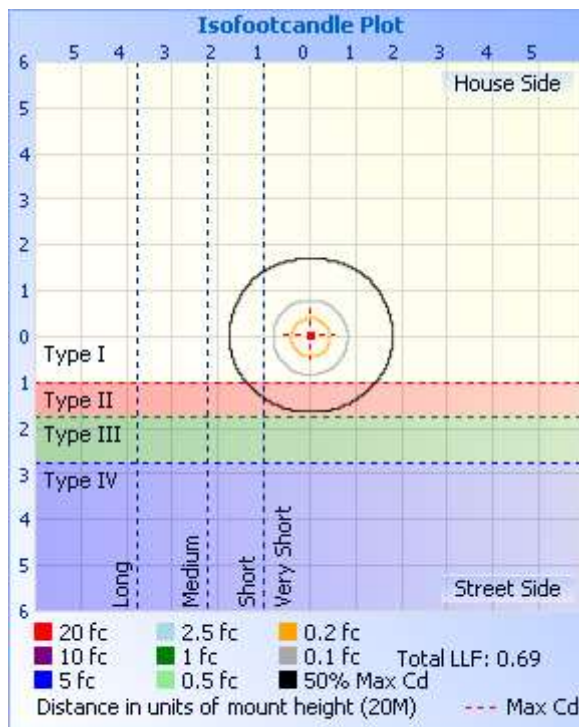
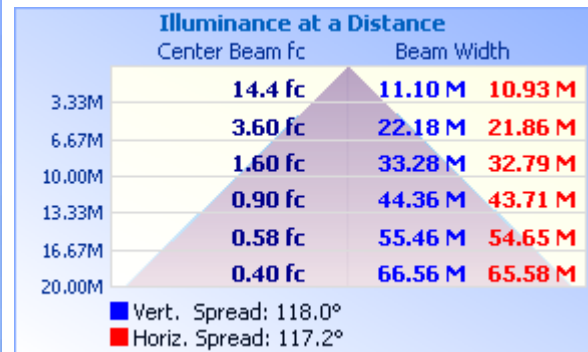
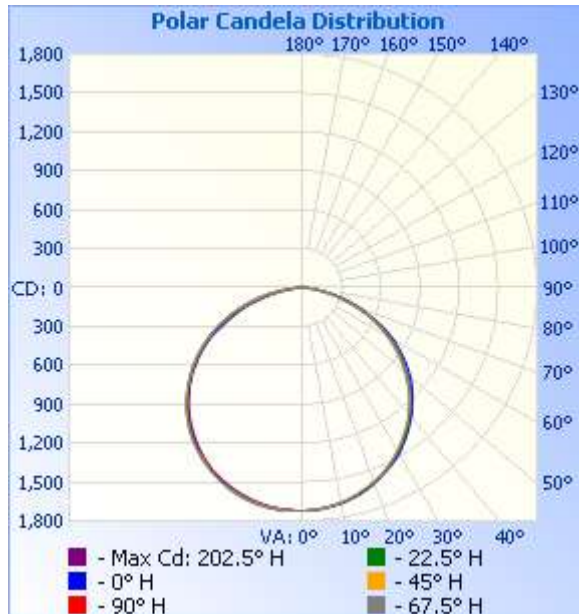
Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,355.8	26.3%
0-40	2,241.0	43.5%
0-60	4,038.9	78.3%
60-90	1,098.4	21.3%
70-100	443.3	8.6%
90-120	6.3	0.1%
0-90	5,137.3	99.6%
90-180	18.8	0.4%
0-180	5,156.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	163.1	3.2%	90-100	2.4	0%
10-20	470.5	9.1%	100-110	1.6	0%
20-30	722.1	14.0%	110-120	2.3	0%
30-40	885.2	17.2%	120-130	2.8	0.1%
40-50	936.6	18.2%	130-140	2.8	0.1%
50-60	861.3	16.7%	140-150	2.6	0.1%
60-70	657.5	12.8%	150-160	2.2	0%
70-80	358.8	7.0%	160-170	1.6	0%
80-90	82.1	1.6%	170-180	0.6	0%

Photometric Data


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Table--1 UNIT: cd

C (DEG) y (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
5	1721	1716	1714	1711	1710	1708	1707	1706	1713	1715	1715	1719	1720	1723	1722	1722
10	1709	1700	1696	1691	1688	1685	1680	1681	1687	1691	1696	1703	1708	1714	1710	1714
15	1684	1670	1663	1658	1655	1647	1639	1642	1651	1656	1662	1679	1684	1691	1685	1691
20	1645	1631	1621	1613	1606	1600	1590	1591	1598	1605	1620	1638	1646	1655	1650	1653
25	1592	1583	1567	1554	1546	1538	1531	1528	1537	1548	1563	1582	1596	1600	1602	1602
30	1526	1518	1494	1486	1478	1461	1448	1454	1462	1475	1489	1509	1528	1540	1531	1537
35	1451	1437	1414	1403	1389	1378	1360	1367	1376	1386	1406	1431	1452	1462	1462	1464
40	1361	1348	1325	1312	1295	1280	1266	1266	1277	1293	1310	1336	1360	1370	1373	1374
45	1258	1245	1220	1204	1192	1169	1158	1154	1164	1180	1201	1232	1258	1266	1273	1271
50	1147	1134	1105	1093	1077	1044	1031	1029	1038	1056	1075	1116	1137	1146	1156	1154
55	1023	1003	980	964	944	916	900	892	901	922	942	978	1004	1017	1027	1026
60	887	867	841	826	804	773	756	746	757	771	795	835	860	874	891	888
65	739	716	696	677	639	620	602	591	600	613	639	661	670	715	738	742
70	580	560	541	499	474	446	441	428	439	450	466	494	514	540	577	583
75	420	400	369	346	324	294	276	266	277	287	302	319	336	375	404	418
80	260	244	220	194	171	149	133	125	131	139	151	166	180	210	246	257
85	117	105	89.1	69.7	53.5	40.1	31.2	27.0	27.6	32.5	40.3	49.0	48.6	81.4	102	117
90	20.8	16.8	11.1	8.32	3.80	5.11	2.71	1.98	0.96	1.36	1.57	2.28	1.09	7.35	15.2	20.4
95	1.29	1.74	2.52	3.73	1.05	3.05	1.91	1.39	1.02	1.11	1.15	1.15	0.94	1.41	1.16	1.01
100	0.96	1.32	1.89	2.10	0.99	1.57	1.80	1.38	1.23	1.27	1.31	1.20	1.10	1.26	1.27	1.06
105	0.96	1.37	1.78	1.83	1.57	1.68	1.79	1.59	1.50	1.48	1.47	1.57	1.41	1.42	1.27	1.28
110	1.44	1.58	1.78	1.99	1.98	2.20	2.27	2.12	1.93	1.90	1.88	1.78	1.78	1.73	1.69	1.65
115	1.92	2.05	2.30	2.46	2.66	2.73	2.79	2.60	2.30	2.22	2.25	2.20	2.30	2.21	2.01	1.97
120	2.51	2.53	2.77	3.13	3.29	3.36	3.22	3.08	2.73	2.64	2.62	2.62	2.66	2.68	2.48	2.29
125	2.73	2.74	3.14	3.55	4.02	3.73	3.54	3.35	2.89	2.90	2.93	2.88	2.92	2.99	2.75	2.50
130	2.99	3.11	3.30	3.82	4.23	4.09	3.75	3.51	3.21	3.11	3.14	3.24	3.29	3.36	3.22	2.93
135	3.31	3.27	3.56	4.13	4.39	4.25	4.01	3.67	3.37	3.37	3.40	3.45	3.45	3.73	3.43	3.30
140	3.42	3.48	4.03	4.34	4.59	4.78	4.17	4.09	3.42	3.48	3.61	3.71	3.71	3.94	3.80	3.30
145	3.64	3.64	4.24	4.76	4.81	4.93	4.43	4.25	3.80	3.85	3.82	3.98	3.87	4.30	4.12	3.72
150	3.95	4.06	4.34	5.02	4.96	5.09	4.80	4.25	4.07	4.06	4.14	4.19	4.28	4.51	4.65	4.26
155	4.23	4.32	4.81	5.23	5.22	5.30	5.01	4.73	4.39	4.43	4.40	4.45	4.49	4.67	4.96	4.68
160	4.39	4.48	4.87	5.28	5.22	5.30	5.07	5.10	4.55	4.43	4.61	4.66	4.70	4.93	5.07	4.94
165	4.97	5.32	5.59	5.81	5.95	6.19	5.91	5.58	5.56	5.43	5.60	5.70	5.75	6.14	6.44	5.96
170	5.56	5.95	5.97	6.22	6.53	6.66	6.54	6.11	6.37	6.32	6.44	6.54	6.58	6.87	7.18	7.02
175	6.20	6.48	6.65	6.64	6.74	7.14	7.02	6.70	6.47	6.38	6.49	6.59	6.53	6.82	7.12	7.07
180	6.37	6.69	6.59	6.64	6.79	7.14	7.02	6.81	6.47	6.27	6.49	6.70	6.69	6.82	7.23	7.07

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2018-07-02	2019-07-01
ST-R-327	Spectral analysis system HAAS-2000	2018-07-02	2019-07-01
ST-R-332	Standard Lamp	2018-07-04	2019-07-03
ST-R-333	Power Meter for Integrating Sphere	2018-06-28	2019-06-27
ST-R-355	Goniophotometer system	2018-07-01	2019-06-30
ST-R-359	Standard Lamp	2018-07-04	2019-07-03
ST-R-358	Power Meter for Goniophotometer	2018-06-28	2019-06-27
Expand Uncertainty: Photometric Measurement (Sphere):2.04%, k=2 Chromaticity Measurement(Sphere):28.8K, k=2 Photometric Measurement(Goniophotometer):2.36%, k=2			

******* END OF REPORT *******