

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-8102-AMB

Representative (Tested) Model: LED-8102-AMB

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

Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	Light Efficient Design	
Model Number	LED-8102-AMB	
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	60W	
Rated Initial Lamp Lumen	--	
Declared CCT	N/A	
LED Manufacturer	N/A	
LED Model	N/A	
Sample Number	JBE180709-K1	
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-8102-AMB		

Electrical Measurement:

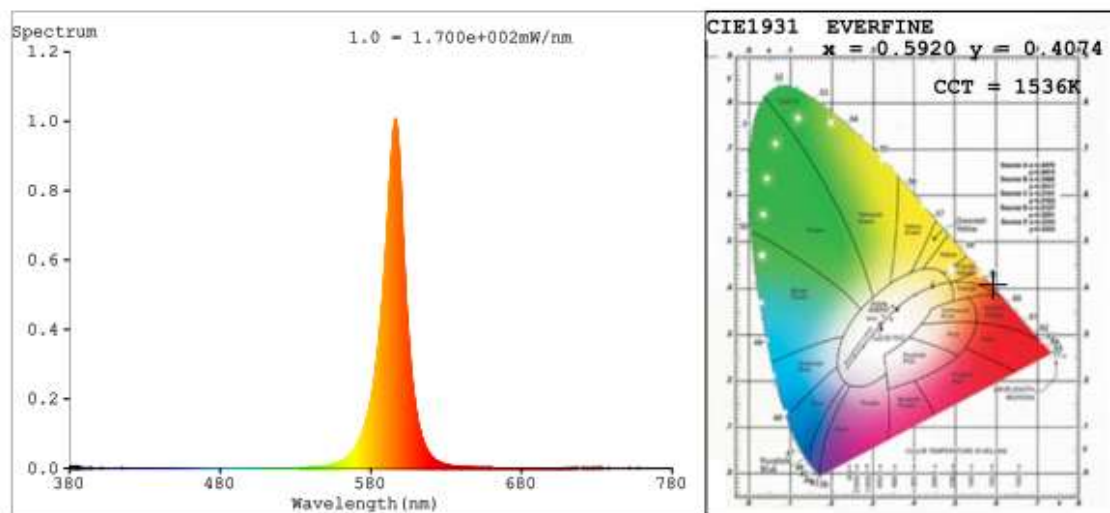
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180709-	120.0	60	0.5104	57.22	0.9342	7.77
K1	277.0	60	0.2222	55.81	0.9066	15.29

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	0	R9	0
Frequency (Hz)	60	R2	52	R10	29
CCT (K)	1536	R3	16	R11	0
Duv	-0.0041	R4	0	R12	0
Chromaticity (x, y)	x=0.5920 y=0.4074	R5	0	R13	0
Chromaticity (u', v')	u'=0.3532 v'=0.5468	R6	41	R14	45
Color Rendering Index (CRI)	13.7	R7	0	R15	0
R9	0	R8	0	--	--

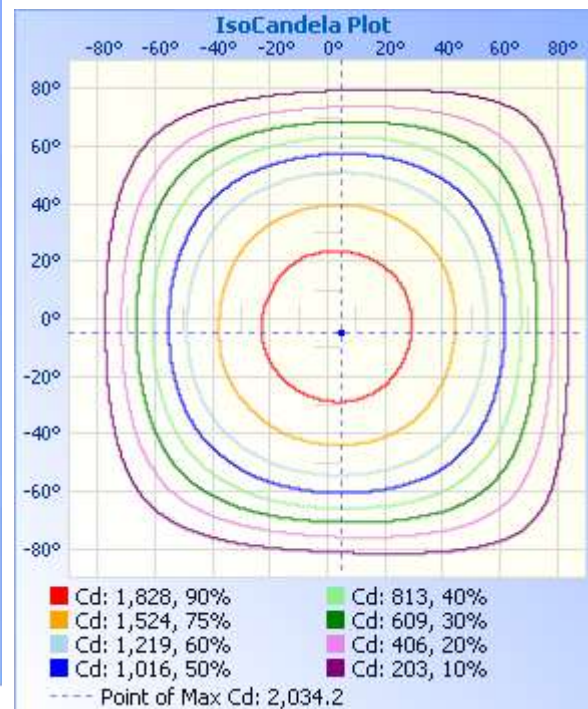
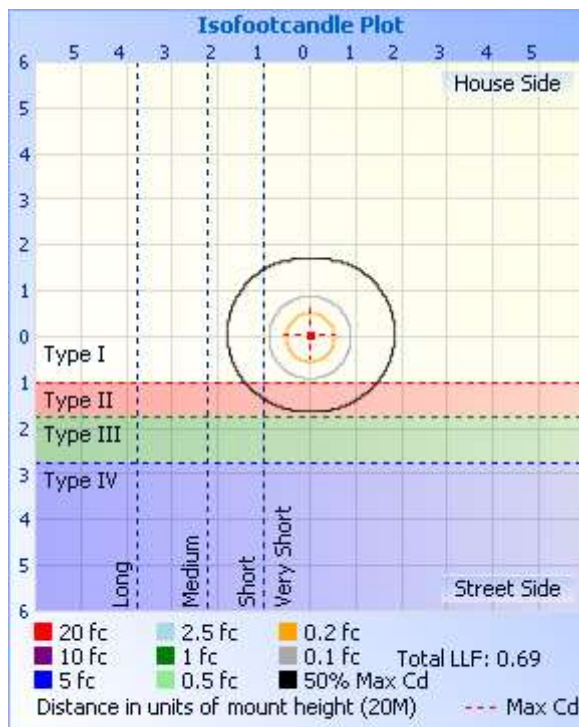
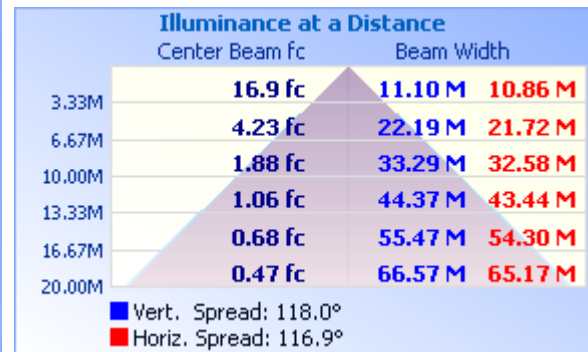
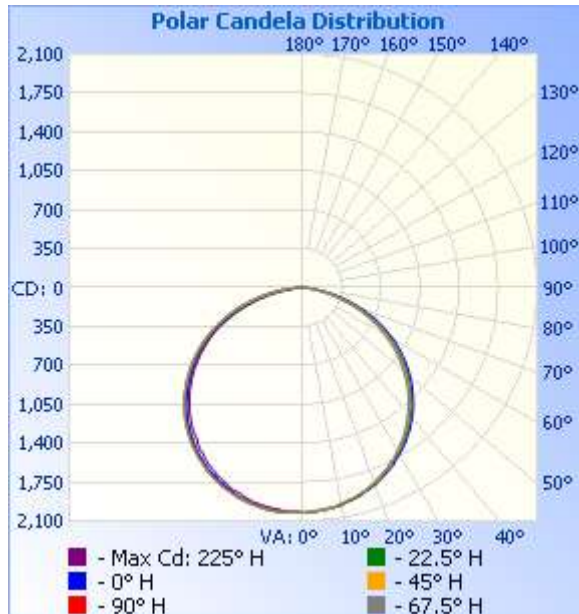
Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	6081.3	5943.2
Luminous Efficacy (lm/W)	106.28	106.49
Most Worst Luminous/Highest Watts	103.87	
Beam Angle (°)	117.5	--
Center Beam Candle Power (cd)	2024	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,595.2	26.2%
0-40	2,636.9	43.4%
0-60	4,751.9	78.1%
60-90	1,305.1	21.5%
70-100	530.0	8.7%
90-120	8.1	0.1%
0-90	6,057.0	99.6%
90-180	23.7	0.4%
0-180	6,080.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	191.9	3.2%	90-100	3.1	0.1%
10-20	553.6	9.1%	100-110	2.1	0%
20-30	849.6	14.0%	110-120	3.0	0%
30-40	1,041.7	17.1%	120-130	3.5	0.1%
40-50	1,101.8	18.1%	130-140	3.5	0.1%
50-60	1,013.2	16.7%	140-150	3.2	0.1%
60-70	778.1	12.8%	150-160	2.7	0%
70-80	427.1	7.0%	160-170	2.0	0%
80-90	99.9	1.6%	170-180	0.8	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	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	2024	
5	2026	2023	2016	2015	2011	2009	2010	2007	2010	2012	2023	2023	2023	2031	2028	2032	
10	2013	1995	1994	1985	1984	1973	1975	1975	1987	1990	1992	2006	2011	2019	2016	2015	
15	1986	1979	1960	1951	1940	1943	1926	1927	1934	1951	1946	1971	1981	1997	1991	1989	
20	1941	1932	1916	1888	1888	1881	1865	1866	1874	1887	1900	1922	1929	1953	1953	1944	
25	1882	1873	1848	1828	1816	1795	1799	1787	1797	1817	1832	1858	1865	1896	1898	1894	
30	1815	1798	1769	1750	1730	1715	1702	1691	1705	1730	1751	1779	1800	1819	1824	1813	
35	1721	1707	1663	1656	1630	1612	1597	1595	1600	1621	1649	1682	1708	1729	1735	1735	
40	1620	1602	1566	1541	1521	1493	1475	1467	1481	1513	1532	1572	1602	1630	1632	1628	
45	1501	1488	1441	1426	1394	1367	1347	1333	1352	1372	1402	1446	1478	1505	1512	1508	
50	1367	1352	1310	1284	1255	1220	1201	1183	1200	1230	1256	1307	1338	1364	1376	1378	
55	1218	1204	1161	1137	1102	1064	1040	1021	1035	1068	1097	1147	1189	1210	1230	1230	
60	1064	1044	1002	973	940	895	873	851	864	893	924	977	1018	1045	1068	1070	
65	891	869	832	800	759	717	690	669	680	705	742	791	829	863	893	896	
70	707	685	652	610	562	525	503	477	486	508	541	587	625	664	702	711	
75	518	494	462	417	373	334	311	288	297	317	346	381	421	466	507	519	
80	328	309	274	233	191	161	142	127	133	148	170	196	224	274	315	332	
85	158	141	113	81.5	53.2	38.6	27.6	21.8	22.5	28.8	40.2	56.5	67.2	110	140	160	
90	36.1	28.5	17.0	6.54	2.25	2.39	2.25	2.10	1.54	1.71	1.86	2.31	1.89	12.7	25.7	34.4	
95	1.70	1.99	2.09	2.01	1.51	1.88	1.65	1.62	1.41	1.42	1.47	1.68	1.28	1.45	1.59	1.42	
100	1.30	1.61	2.38	1.78	1.74	1.88	1.89	1.62	1.54	1.56	1.63	1.51	1.32	1.45	1.38	1.27	
105	1.26	1.66	2.03	2.05	2.35	2.42	2.40	2.17	2.02	1.95	1.90	1.82	1.74	1.65	1.65	1.43	
110	1.85	2.06	2.36	2.78	3.36	3.32	3.07	2.65	2.41	2.34	2.36	2.25	2.21	2.19	1.93	1.90	
115	2.37	2.57	2.98	3.63	4.17	4.03	3.74	3.28	2.88	2.77	2.75	2.75	2.78	2.66	2.52	2.25	
120	3.00	3.00	3.60	4.26	4.79	4.57	4.25	3.76	3.24	3.19	3.14	3.17	3.25	3.40	3.11	2.61	
125	3.39	3.58	3.99	4.91	5.45	5.16	4.68	4.23	3.47	3.43	3.47	3.52	3.60	3.91	3.50	2.97	
130	3.75	3.73	4.26	5.22	5.72	5.51	4.99	4.40	3.68	3.66	3.68	3.87	4.14	4.50	3.82	3.36	
135	3.96	4.05	4.68	5.73	5.95	5.78	5.19	4.63	4.03	4.01	3.95	4.14	4.33	5.01	4.37	3.68	
140	4.26	4.35	4.99	6.00	5.95	6.07	5.55	4.82	4.10	4.13	4.22	4.34	4.48	5.43	4.61	4.07	
145	4.49	4.60	5.22	6.29	6.14	6.29	5.73	5.02	4.46	4.37	4.45	4.60	4.87	5.75	5.08	4.35	
150	4.89	4.95	5.54	6.65	6.41	6.53	6.06	5.38	4.82	4.83	4.84	4.95	5.30	6.06	5.70	4.94	
155	5.15	5.49	6.08	6.85	6.69	6.69	6.33	5.77	5.10	5.03	5.15	5.30	5.37	6.26	6.25	5.54	
160	5.43	5.65	6.12	6.93	6.80	6.76	6.59	5.92	5.29	5.30	5.30	5.49	5.41	6.41	6.61	5.77	
165	6.12	6.35	6.97	7.58	7.54	7.93	7.63	6.80	6.32	6.28	6.43	6.69	6.88	7.86	8.18	7.25	
170	6.79	7.13	7.62	8.09	8.11	8.68	8.30	7.40	7.34	7.29	7.43	7.70	7.92	8.60	9.28	8.38	
175	7.58	7.83	8.09	8.25	8.50	9.26	9.04	8.07	7.78	7.75	7.74	8.01	8.01	8.64	9.32	8.94	
180	7.58	7.56	7.94	8.05	8.23	9.11	8.85	7.95	7.46	7.44	7.59	7.90	7.84	8.37	9.05	8.82	

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 *******