

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-8104-40K

Representative (Tested) Model: LED-8104-40K

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

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-8104-40K	
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	100W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,	
LED Manufacturer	N/A	
LED Model	N/A	
Sample Number	JBE180709-H1(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-8104-40K		

Electrical Measurement:

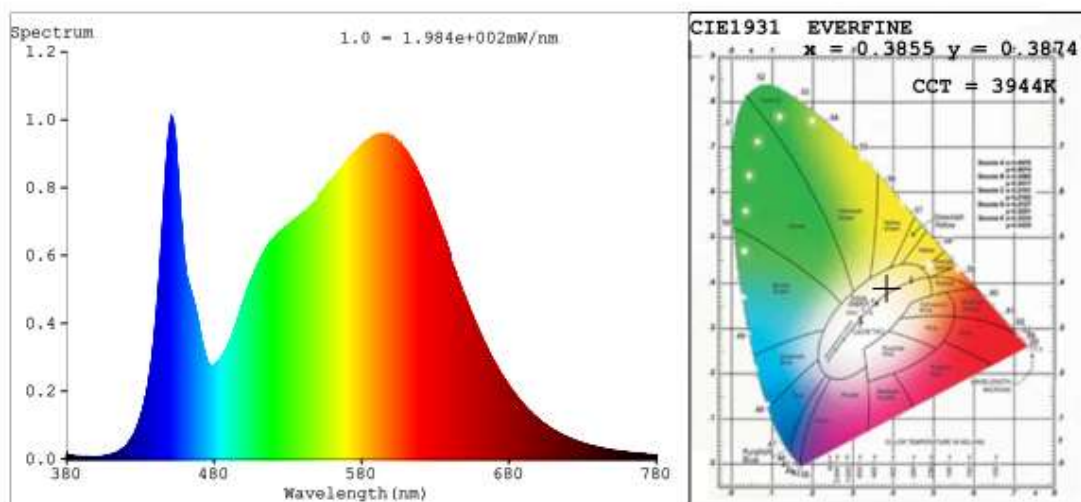
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180709-	120.0	60	0.8861	105.5	0.9922	6.19
B1	277.0	60	0.4089	103.6	0.9146	14.01

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	4
Frequency (Hz)	60	R2	89	R10	73
CCT (K)	3944	R3	96	R11	80
Duv	0.0034	R4	81	R12	60
Chromaticity (x, y)	x=0.3855 y=0.3874	R5	80	R13	82
Chromaticity (u', v')	u'=0.2242 v'=0.5069	R6	85	R14	98
Color Rendering Index (CRI)	82.5	R7	86	R15	73
R9	4	R8	63	--	--

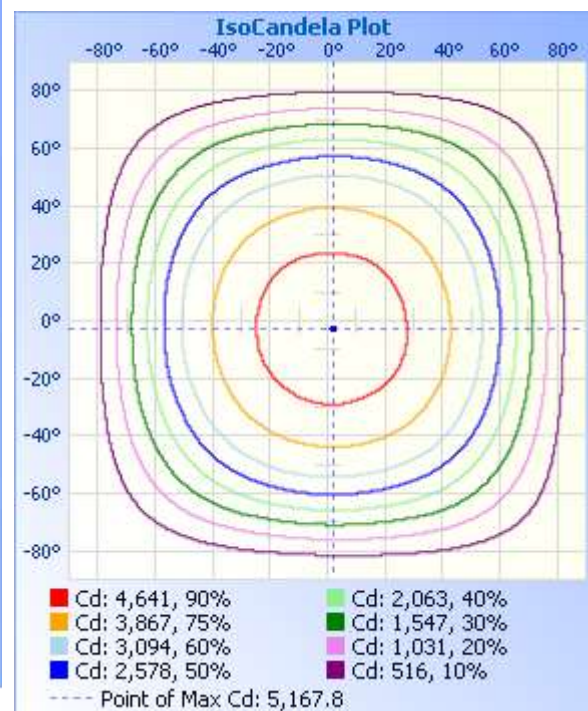
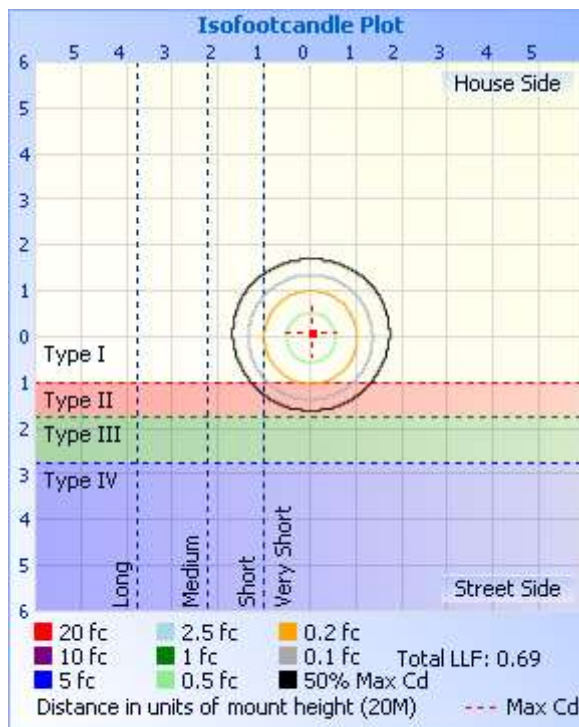
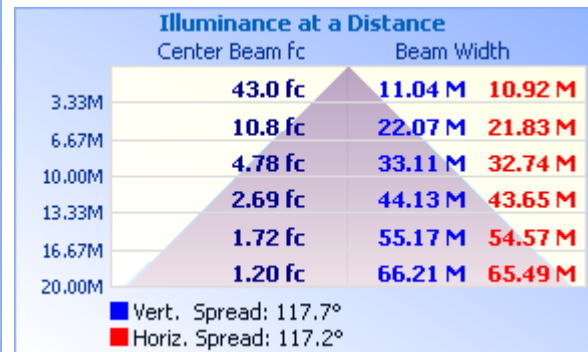
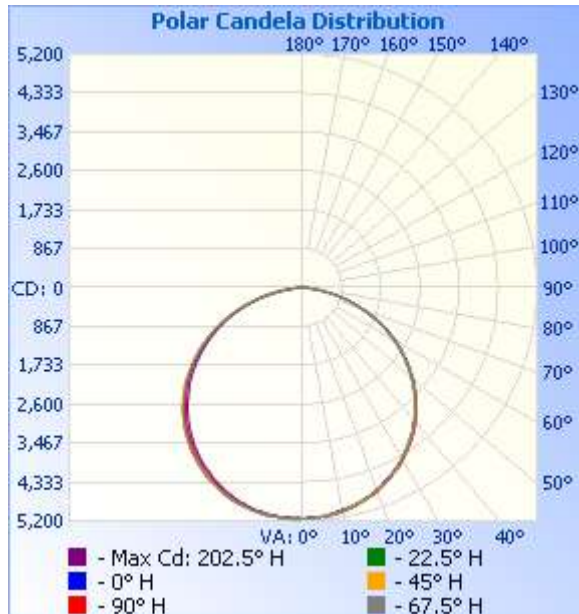
Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	15472	15429
Luminous Efficacy (lm/W)	146.65	148.93
Most Worst Luminous/Highest Watts	146.25	
Beam Angle (°)	117.5	--
Center Beam Candle Power (cd)	5149	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	4,062.1	26.3%
0-40	6,715.9	43.4%
0-60	12,094.3	78.2%
60-90	3,320.5	21.5%
70-100	1,350.2	8.7%
90-120	19.7	0.1%
0-90	15,414.8	99.6%
90-180	56.0	0.4%
0-180	15,470.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	488.4	3.2%	90-100	6.1	0%
10-20	1,409.7	9.1%	100-110	5.8	0%
20-30	2,164.0	14.0%	110-120	7.7	0.1%
30-40	2,653.8	17.2%	120-130	8.5	0.1%
40-50	2,804.4	18.1%	130-140	8.2	0.1%
50-60	2,574.1	16.6%	140-150	7.4	0%
60-70	1,976.4	12.8%	150-160	6.1	0%
70-80	1,093.9	7.1%	160-170	4.4	0%
80-90	250.2	1.6%	170-180	1.7	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	5149	5149	5149	5149	5149	5149	5149	5149	5149	5149	5149	5149	5149	5149	5149	5149	
5	5140	5128	5132	5109	5114	5122	5117	5123	5120	5135	5139	5148	5150	5168	5143	5138	
10	5092	5081	5084	5039	5027	5034	5044	5057	5068	5089	5104	5104	5116	5126	5113	5107	
15	5007	4991	4974	4947	4937	4928	4931	4960	4958	4981	5003	5035	5034	5050	5046	5034	
20	4873	4863	4833	4797	4794	4786	4793	4808	4837	4848	4880	4898	4943	4931	4932	4916	
25	4738	4690	4659	4636	4603	4618	4620	4625	4648	4684	4711	4752	4777	4784	4801	4767	
30	4523	4481	4447	4412	4395	4398	4393	4412	4440	4480	4510	4547	4582	4592	4600	4581	
35	4293	4236	4200	4171	4135	4134	4134	4153	4183	4218	4270	4326	4358	4361	4361	4348	
40	4023	3950	3920	3868	3858	3841	3864	3867	3893	3919	3985	4019	4082	4087	4109	4076	
45	3700	3634	3593	3553	3536	3514	3522	3528	3557	3588	3649	3719	3762	3780	3796	3759	
50	3366	3290	3234	3209	3188	3141	3163	3168	3195	3207	3289	3362	3413	3433	3443	3411	
55	2984	2893	2849	2822	2788	2745	2762	2762	2786	2805	2882	2958	2997	3004	3043	3013	
60	2559	2468	2451	2401	2388	2322	2345	2336	2355	2364	2461	2524	2586	2577	2615	2593	
65	2107	2029	2012	1959	1934	1880	1887	1865	1893	1904	2002	2054	2105	2128	2165	2126	
70	1640	1570	1536	1480	1448	1391	1410	1384	1409	1436	1510	1556	1614	1627	1678	1657	
75	1145	1095	1053	999	974	922	919	901	927	959	1012	1047	1104	1132	1170	1158	
80	677	642	597	550	518	484	468	462	478	503	542	575	611	654	684	687	
85	276	251	216	181	161	140	131	132	138	153	172	192	206	246	268	282	
90	36.1	29.7	18.2	13.6	13.6	10.4	7.76	8.25	6.25	8.07	7.00	6.63	6.89	16.2	29.8	37.8	
95	3.89	3.98	5.04	8.22	6.22	7.35	4.53	3.72	2.93	2.92	3.41	3.95	6.38	4.41	3.30	3.29	
100	2.98	3.39	4.57	7.17	7.26	6.35	4.42	3.45	3.04	3.23	3.57	4.11	7.95	4.73	3.41	2.98	
105	3.35	3.71	4.98	8.16	9.14	7.34	5.21	4.25	3.78	3.98	4.25	4.94	10.6	5.78	4.10	3.51	
110	4.31	4.82	6.29	9.93	11.0	9.02	6.65	5.42	4.48	4.72	5.15	5.98	11.9	7.35	4.96	4.20	
115	5.27	5.83	7.61	11.6	12.6	10.3	7.87	6.59	5.32	5.62	6.04	7.12	13.3	8.77	6.07	5.21	
120	6.12	6.78	8.76	13.1	13.4	11.8	8.94	7.60	6.12	6.42	6.82	8.53	14.2	10.1	7.29	6.06	
125	6.81	7.68	9.65	14.0	14.0	11.4	9.84	8.34	6.39	6.84	7.35	9.52	14.3	11.0	7.93	6.59	
130	7.13	8.27	10.2	14.3	14.2	13.5	10.3	8.77	7.03	7.43	8.03	10.5	14.3	12.1	8.73	7.28	
135	7.56	8.64	10.9	14.5	13.6	14.1	11.0	9.30	7.51	8.06	8.61	11.1	14.7	12.7	9.53	7.92	
140	8.09	9.33	11.8	14.8	14.1	14.5	11.6	9.67	8.04	8.64	9.13	11.3	15.1	13.3	10.4	8.61	
145	8.46	9.80	12.4	14.9	14.9	14.6	12.2	10.2	8.73	9.23	9.87	11.7	16.3	14.1	11.3	9.52	
150	9.20	10.6	13.3	15.2	15.6	14.9	12.7	10.9	9.74	10.2	10.5	12.2	17.1	15.2	12.8	10.9	
155	10.1	11.3	13.6	15.6	15.8	15.0	13.4	11.6	10.5	11.1	11.3	12.5	17.1	15.8	14.1	12.0	
160	10.3	11.9	13.9	15.9	15.9	15.1	13.8	12.1	10.8	11.4	11.7	12.5	16.5	17.0	15.2	12.7	
165	11.8	13.5	15.4	17.4	18.9	18.3	16.1	13.9	12.7	13.2	13.7	15.2	18.4	19.7	18.5	15.5	
170	13.3	15.0	16.8	18.7	21.2	19.5	17.2	15.2	14.2	14.5	15.3	16.9	19.9	21.7	20.2	17.6	
175	14.9	16.0	17.6	19.8	22.8	20.7	18.6	16.3	15.0	15.1	15.7	17.3	20.3	22.8	21.0	18.3	
180	15.1	15.6	17.5	19.6	23.0	20.0	18.4	16.3	15.1	15.2	15.5	17.2	19.4	22.8	20.4	18.2	

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 *******