

## LM-79-08 Test Report

For

# LIGHT EFFICIENT DESIGN, LLC

(Brand Name: LIGHT EFFICIENT DESIGN)

188 S.Northwest Highway, Cary, IL60013, USA

## LED Luminaires

Model name(s): LED-8091M50

Representative (Tested) Model: LED-8091M50

Model Different: N/A

Test & Report By:

*Ferrum Li*

Engineer: Ferrum Li

Date: May.13,2020

Review By:

*Garman Mo*

Manager: Garman Mo

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

2.This report does not imply product certification, approval, or endorsement by A2LA, or any agency of the Federal Government.

## 1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	LIGHT EFFICIENT DESIGN	
Model Number	LED-8091M50	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60Hz	
Nominal Power	320W	
Rated Initial Lamp Lumen	--	
Declared CCT	5000K	
LED Manufacturer	Seoul Semiconductor Co., LTD	
LED Model	5000K:S1WM-5050508018-00000000-00001	
Sample Number	JBE190810-H-C1(5000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

### Photo



**1.2 Test Specifications:**

Date of Receipt	Apr.19,2020
Date of Test	Apr.20,2020
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>

**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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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

Test date	2020-04-20	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	LED-8091M50	Total Operating Time (min)	75

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE190810-	120.1	60	2.596	309.9	0.9944	6.01
H-C1	277.1	60	1.167	293.9	0.9088	15.22

### Chromaticity Measurement– Sphere-Spectroradiometer

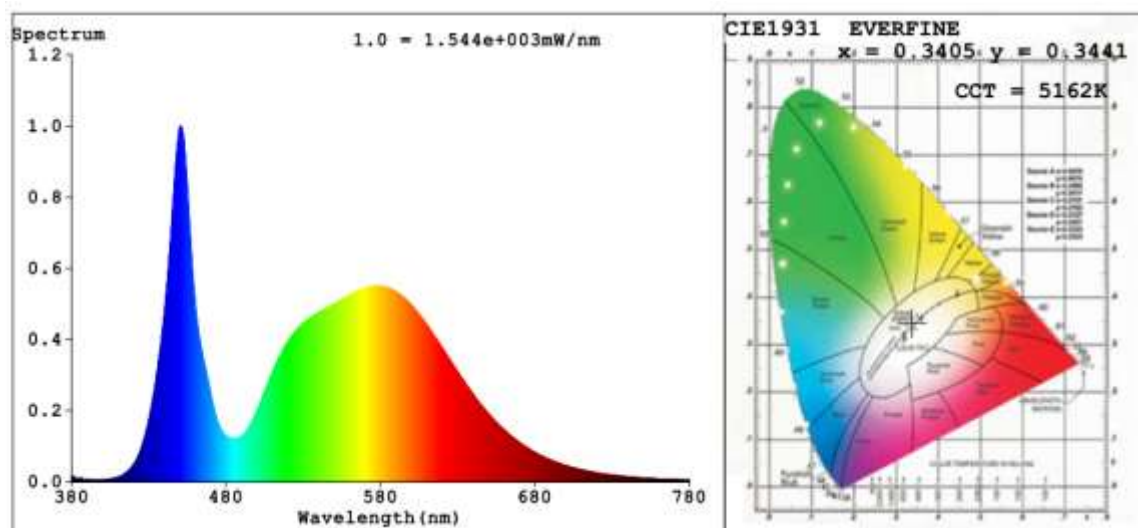
#### Method(Self-absorption:1.0411):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	73	R9	0
Frequency (Hz)	60	R2	81	R10	52
CCT (K)	5162	R3	85	R11	72
Duv	-0.0019	R4	75	R12	48
Chromaticity (x, y)	x=0.3405 y=0.3441	R5	74	R13	74
Chromaticity (u', v')	u'=-0.2112 v'=-0.4803	R6	73	R14	91
Color Rendering Index (CRI)	75.0	R7	82	R15	68
R9	0	R8	58	--	--

### Photometric Measurement– Goniophotometer Method(Test Distance: 26.000m):

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	44716	44613
Luminous Efficacy (lm/W)	144.28	151.81
Beam Angle (°)	114.4	--
Center Beam Candle Power (cd)	15817	--

## Spectral Power Distribution & Chromaticity Diagram



## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	12,416.5	27.8%
0-40	20,476.7	45.8%
0-60	36,480.5	81.6%
60-90	8,043.9	18%
70-100	2,636.8	5.9%
90-120	66.3	0.1%
0-90	44,524.4	99.6%
90-180	187.2	0.4%
0-180	44,711.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	1,498.1	3.4%	90-100	13.1	0%
10-20	4,314.4	9.6%	100-110	26.5	0.1%
20-30	6,603.9	14.8%	110-120	26.7	0.1%
30-40	8,060.2	18.0%	120-130	29.6	0.1%
40-50	8,433.5	18.9%	130-140	28.6	0.1%
50-60	7,570.4	16.9%	140-150	25.2	0.1%
60-70	5,420.3	12.1%	150-160	20.2	0%
70-80	2,356.5	5.3%	160-170	12.6	0%
80-90	267.1	0.6%	170-180	4.7	0%

## Photometric Data

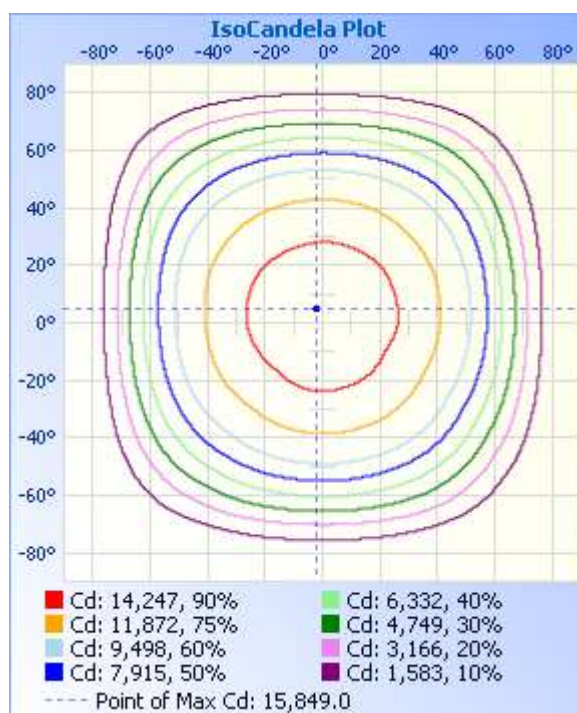
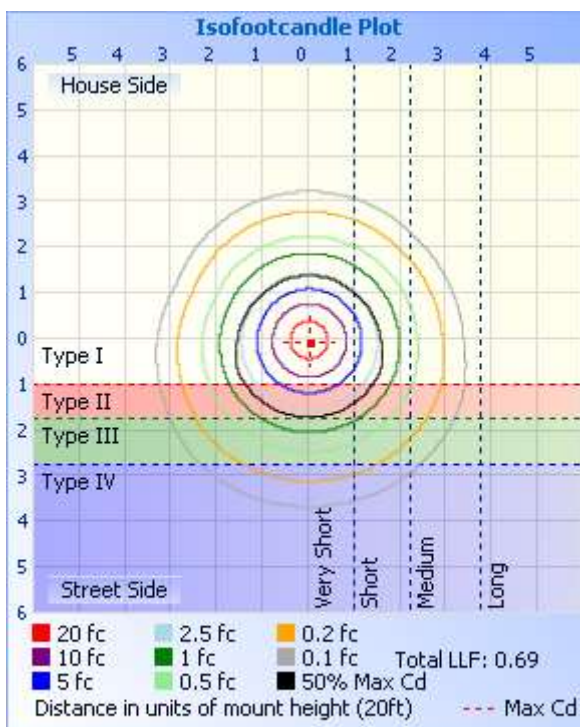
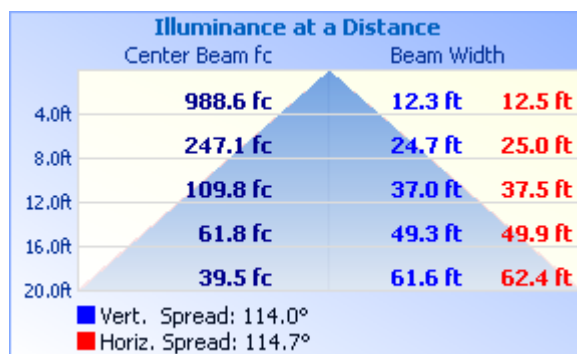
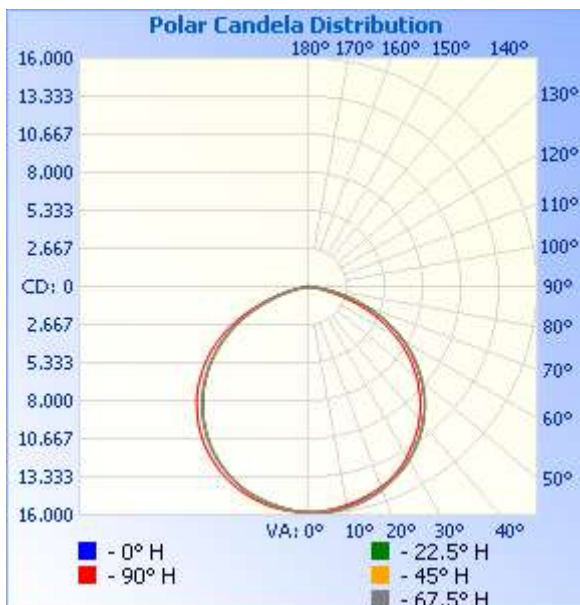


Table--1

UNIT: \*10cd

C (DEG) □ (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	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582		
5	1575	1580	1578	1581	1582	1584	1581	1584	1572	1574	1574	1570	1568	1567	1570	1567		
10	1560	1563	1563	1569	1570	1573	1572	1572	1553	1551	1552	1546	1545	1540	1548	1543		
15	1530	1534	1536	1545	1545	1549	1548	1549	1526	1518	1513	1513	1510	1506	1514	1510		
20	1490	1494	1500	1509	1510	1512	1511	1510	1492	1473	1462	1463	1464	1463	1466	1464		
25	1437	1446	1458	1460	1465	1462	1464	1460	1445	1419	1387	1403	1403	1400	1405	1404		
30	1369	1383	1398	1402	1408	1402	1405	1400	1378	1352	1316	1332	1331	1330	1332	1333		
35	1294	1306	1325	1330	1334	1331	1331	1333	1299	1270	1244	1245	1245	1243	1246	1248		
40	1202	1217	1232	1245	1248	1249	1248	1247	1210	1180	1139	1147	1145	1149	1151	1153		
45	1100	1121	1127	1147	1152	1153	1152	1148	1108	1074	1038	1039	1037	1035	1044	1043		
50	982	1004	1024	1036	1038	1040	1040	1037	992	955	910	917	915	916	919	922		
55	852	878	905	911	914	919	918	915	862	823	785	781	778	778	781	786		
60	702	736	765	777	779	778	781	777	719	678	637	633	631	629	636	636		
65	534	576	620	624	629	631	631	625	562	520	480	479	475	476	476	468		
70	354	400	454	466	469	473	470	462	382	343	316	316	315	313	308	289		
75	184	226	285	306	309	310	305	280	201	171	153	162	165	161	146	132		
80	63.2	89.0	130	150	159	155	140	124	70.8	52.4	36.0	44.1	47.8	43.6	34.8	32.0		
85	7.47	12.6	25.0	34.2	38.8	36.1	27.0	22.7	8.59	6.18	3.65	3.04	2.56	2.70	3.21	3.26		
90	0.64	0.67	1.47	1.33	1.26	1.38	1.54	1.57	0.61	0.64	0.72	0.75	0.76	0.77	0.74	0.68		
95	0.84	0.74	0.69	0.72	0.71	0.70	0.66	0.64	0.65	0.77	1.38	0.95	0.95	1.34	3.37	0.96		
100	6.07	5.19	3.69	1.48	0.93	0.96	1.43	1.34	1.94	1.80	1.57	1.22	1.25	1.48	3.14	4.93		
105	5.05	4.83	4.20	1.66	1.26	1.25	2.11	2.04	1.83	1.94	1.81	1.65	1.62	1.70	2.28	3.95		
110	4.82	4.12	3.07	2.82	2.86	2.26	2.21	2.35	2.17	2.20	2.00	2.07	2.06	2.00	2.21	3.14		
115	3.79	3.42	2.81	2.60	2.87	2.35	2.37	2.74	2.40	2.50	2.48	2.03	2.46	2.00	2.45	2.82		
120	3.91	3.47	2.96	2.41	2.81	2.28	2.73	3.06	2.65	2.78	2.80	3.14	3.07	2.83	2.54	2.98		
125	4.29	3.83	3.20	3.29	3.43	3.15	2.89	3.45	2.87	3.18	2.91	3.71	3.76	3.38	2.75	3.34		
130	4.64	4.07	3.13	3.50	3.70	3.44	3.11	3.87	3.39	3.32	3.21	4.01	3.87	3.71	3.17	3.44		
135	4.71	4.04	3.23	3.64	3.73	3.59	3.33	3.86	3.63	3.36	3.37	4.02	4.04	3.55	3.10	3.71		
140	4.83	4.18	3.30	3.78	3.60	3.72	3.40	3.95	3.87	3.80	3.39	4.20	3.97	3.85	3.25	4.07		
145	4.96	3.99	3.43	4.06	3.58	3.92	3.14	4.03	4.15	3.92	3.73	4.66	4.36	4.13	3.92	4.15		
150	4.90	3.89	3.90	4.29	4.54	4.30	3.62	4.12	4.16	4.03	4.12	4.61	5.06	4.68	4.59	4.01		
155	4.53	3.82	4.28	4.65	5.21	4.76	3.97	4.24	3.95	4.22	3.96	4.65	4.84	4.56	4.33	4.06		
160	4.44	3.84	4.30	4.78	5.21	4.71	4.02	4.19	3.91	4.10	3.47	4.58	5.03	4.66	4.70	4.12		
165	4.56	3.94	4.30	4.75	5.07	4.82	3.92	3.88	4.05	4.08	3.66	4.39	4.44	4.71	4.52	4.14		
170	4.83	4.39	4.70	4.57	4.74	4.77	4.29	3.95	4.69	4.82	4.79	5.11	5.49	5.65	5.11	4.95		
175	5.06	4.81	5.01	5.08	5.39	4.98	4.70	4.23	5.13	5.10	4.89	5.04	5.43	5.63	5.12	5.00		
180	4.73	5.02	5.12	5.33	5.76	5.26	5.07	4.47	4.75	4.83	5.02	5.11	5.33	5.74	5.22	5.01		

**3. Test Equipment**

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-423	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-327	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-332	Standard Lamp	2019-07-09	2020-07-08
ST-R-333	Power Meter for Integrating Sphere	2019-06-27	2020-06-26
ST-R-405	Temperature Probe for Integrating Sphere	2020-01-23	2021-01-22
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp	2019-07-09	2020-07-08
ST-R-358	Power Meter for Goniophotometer	2019-06-27	2020-06-26
ST-R-354	hygrothermograph for Goniophotometer	2019-06-28	2020-06-27
Expand Uncertainty: Photometric Measurement (Sphere):3.06%, k=2 Chromaticity Measurement(Sphere):43.46K, k=2 Photometric Measurement(Goniophotometer):3.38%, k=2			

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