

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-8091M40-OCC

Representative (Tested) Model: LED-8091M40-OCC

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-8091M40-OCC	
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	4000K	
LED Manufacturer	Seoul Semiconductor Co., LTD	
LED Model	4000K:S1WM-5050408018-00000000-00001	
Sample Number	JBE190810-H-E1(4000K)	
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.21,2020
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

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

Test date	2020-04-21	Test Ambient:	25±1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	LED-8091M40-OCC	Total Operating Time (min)	75

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE190810-	120.2	60	2.576	307.9	0.9943	7.10
H-E1	277.1	60	1.162	292.5	0.9082	15.30

Chromaticity Measurement– Sphere-Spectroradiometer

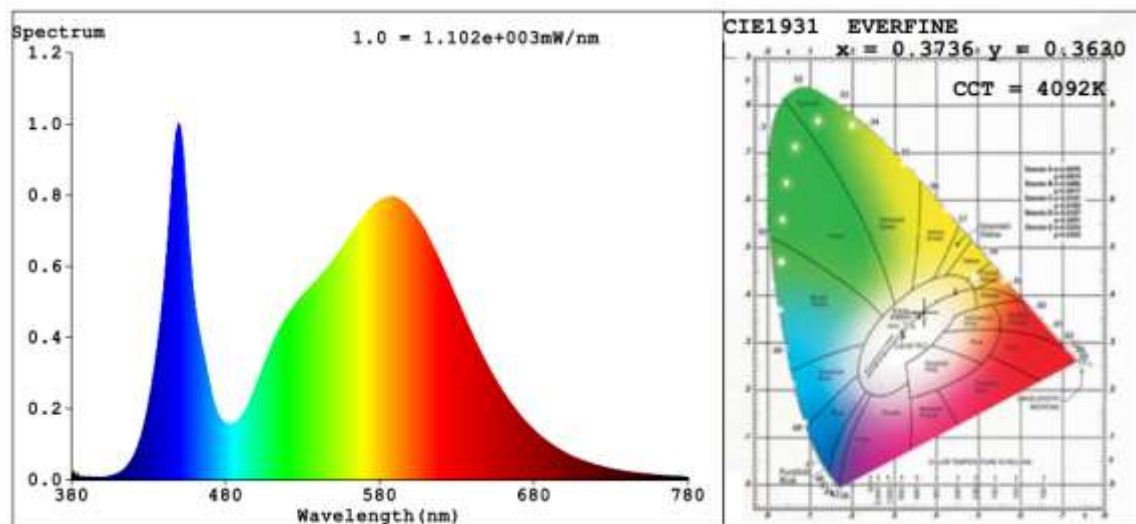
Method(Self-absorption:1.0413):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	74	R9	0
Frequency (Hz)	60	R2	84	R10	61
CCT (K)	4092	R3	90	R11	71
Duv	-0.0045	R4	74	R12	53
Chromaticity (x, y)	x=0.3736 y=0.3630	R5	74	R13	76
Chromaticity (u', v')	u'=-0.2261 v'=0.4943	R6	76	R14	95
Color Rendering Index (CRI)	76.1	R7	81	R15	68
R9	0	R8	55	--	--

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

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	43612	43461
Luminous Efficacy (lm/W)	141.66	148.59
Beam Angle (°)	113.2	--
Center Beam Candle Power (cd)	15697	--

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	12,298.0	28.2%
0-40	20,252.0	46.4%
0-60	35,950.0	82.4%
60-90	7,483.2	17.2%
70-100	2,294.0	5.3%
90-120	50.2	0.1%
0-90	43,433.2	99.6%
90-180	173.9	0.4%
0-180	43,607.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	1,486.9	3.4%	90-100	8.5	0%
10-20	4,278.7	9.8%	100-110	17.1	0%
20-30	6,532.4	15.0%	110-120	24.6	0.1%
30-40	7,953.9	18.2%	120-130	30.2	0.1%
40-50	8,296.3	19.0%	130-140	29.4	0.1%
50-60	7,401.8	17.0%	140-150	25.7	0.1%
60-70	5,197.7	11.9%	150-160	21.0	0%
70-80	2,108.6	4.8%	160-170	12.4	0%
80-90	176.9	0.4%	170-180	5.0	0%

Photometric Data

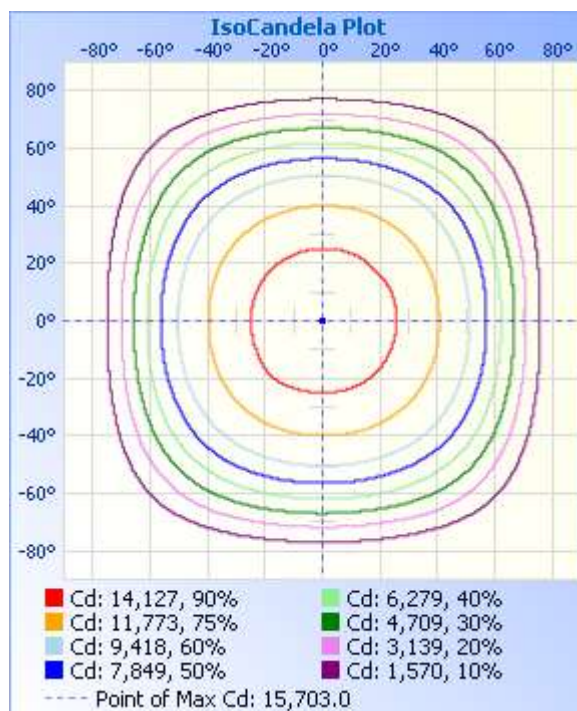
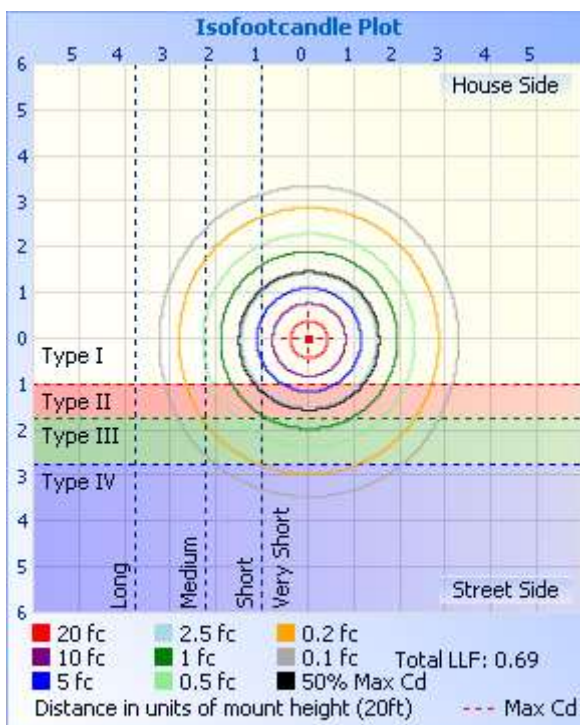
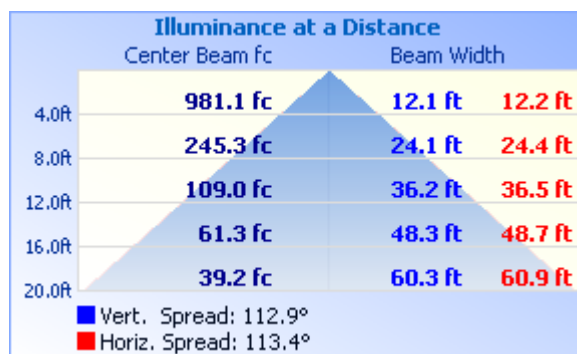
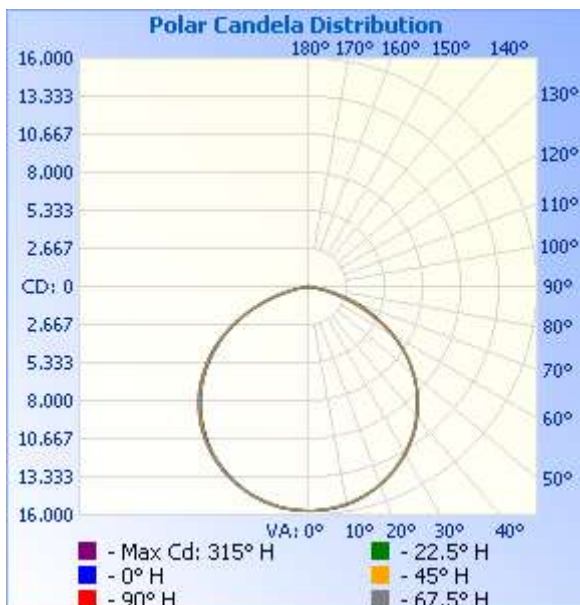


Table--1 UNIT: ×10ed

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	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	
5	1564	1565	1564	1564	1566	1565	1562	1563	1564	1564	1564	1565	1563	1561	1562	1562	
10	1544	1549	1548	1548	1550	1543	1544	1548	1547	1546	1551	1545	1541	1543	1544	1547	
15	1512	1520	1513	1519	1521	1514	1517	1518	1517	1513	1529	1514	1508	1512	1511	1515	
20	1468	1477	1464	1477	1476	1474	1471	1476	1475	1473	1487	1469	1463	1467	1467	1471	
25	1418	1423	1414	1422	1420	1420	1418	1421	1417	1418	1427	1412	1406	1411	1412	1415	
30	1351	1359	1355	1356	1355	1355	1351	1353	1346	1350	1349	1347	1341	1344	1345	1351	
35	1273	1280	1280	1279	1276	1278	1276	1274	1271	1273	1274	1262	1257	1261	1268	1274	
40	1182	1187	1187	1190	1185	1184	1185	1185	1179	1178	1178	1171	1166	1170	1173	1183	
45	1081	1084	1086	1086	1081	1080	1082	1082	1077	1076	1065	1067	1064	1065	1073	1079	
50	964	969	980	970	965	967	965	965	961	959	951	947	945	947	953	963	
55	835	840	841	839	838	837	836	835	833	828	824	817	813	816	822	833	
60	689	695	699	696	696	695	691	687	682	682	681	674	670	675	678	688	
65	519	534	545	546	544	543	538	521	511	517	525	520	517	516	525	524	
70	335	353	381	387	386	385	371	342	331	339	353	358	359	355	357	345	
75	168	181	210	226	232	226	203	176	167	171	184	197	203	195	185	173	
80	52.8	61.0	68.8	85.6	97.3	85.4	68.9	60.6	54.1	56.5	56.9	67.4	74.4	65.6	55.5	56.0	
85	8.08	8.22	8.26	8.59	9.84	9.00	8.61	8.57	8.60	8.41	7.78	6.82	6.13	6.61	7.28	8.03	
90	0.55	0.59	0.64	0.67	0.69	0.66	0.63	0.60	0.56	0.59	0.64	0.67	0.66	0.63	0.59	0.55	
95	0.71	0.76	0.79	0.79	0.79	0.78	0.77	0.75	0.64	0.67	0.72	0.74	0.74	0.71	0.67	0.63	
100	1.24	1.28	1.39	1.20	1.18	1.19	1.29	1.33	1.06	1.12	1.08	1.02	0.98	0.97	0.97	0.98	
105	1.80	1.85	1.81	1.60	1.57	1.60	1.78	1.92	1.57	1.59	1.67	1.44	1.26	1.34	1.52	1.41	
110	2.43	2.47	2.27	2.04	2.12	2.04	2.25	2.53	2.09	2.01	1.95	1.90	2.00	1.72	1.77	1.89	
115	3.01	3.06	2.83	2.35	2.50	2.33	2.78	3.15	2.54	2.53	2.30	2.10	2.21	1.95	2.07	2.31	
120	3.56	3.47	3.29	3.08	2.82	2.88	3.22	3.60	2.94	2.86	2.75	2.64	2.51	2.36	2.34	2.56	
125	4.11	4.05	3.41	3.75	3.94	3.74	3.40	4.15	3.23	3.28	2.78	3.17	3.20	2.94	2.38	2.91	
130	4.54	4.30	3.39	3.97	4.11	3.95	3.64	4.40	3.79	3.53	2.94	3.55	3.60	3.34	2.72	3.16	
135	4.54	4.24	3.55	4.11	4.14	4.20	3.91	4.31	4.06	3.61	3.29	3.71	3.73	3.40	2.99	3.31	
140	4.71	4.36	3.58	4.29	4.04	4.34	3.57	4.45	4.29	3.96	3.38	3.84	3.56	3.49	3.05	3.65	
145	4.93	4.17	3.91	4.51	4.10	4.54	3.45	4.43	4.61	4.05	3.57	4.04	3.61	3.71	3.46	3.70	
150	4.91	4.08	4.47	4.86	5.08	5.00	4.12	4.64	4.60	4.21	4.11	4.38	4.33	4.21	4.05	3.69	
155	4.55	3.97	4.75	5.24	5.42	5.14	4.52	4.69	4.37	4.42	4.07	4.51	4.74	4.59	4.22	3.77	
160	4.38	3.76	4.73	5.37	5.29	5.29	4.47	4.48	4.27	4.35	3.94	4.31	4.56	4.30	4.20	3.84	
165	4.49	3.75	4.68	4.59	4.73	4.64	4.32	4.22	4.33	4.25	3.70	4.07	4.15	3.98	3.90	3.87	
170	4.87	4.32	5.22	5.31	5.16	5.23	4.82	4.49	4.95	4.94	4.36	5.12	5.49	5.28	5.01	4.76	
175	5.26	4.91	5.53	5.57	5.88	5.48	5.12	4.87	5.35	5.37	4.98	5.38	5.64	5.85	5.16	5.09	
180	4.93	4.81	5.09	5.48	5.78	5.27	4.83	4.57	4.98	5.03	4.81	5.13	5.48	5.76	5.28	4.88	

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 *******