

## **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-8089M50-G5

Representative (Tested) Model: LED-8089M50-G5

Model Different: N/A

Test & Report By:

*Garman Mo*

Engineer: Garman Mo

Date: Sep.11,2019

Review By:

*Johnson Sun*

Manager: Johnson Sun

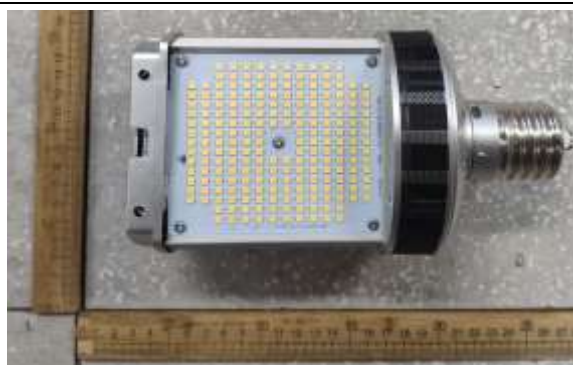
Note: 1.The results contained in this report pertain only to the tested samples.

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-8089M50-G5	
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	80W	
Rated Initial Lamp Lumen	--	
Declared CCT	5000K	
LED Manufacturer	Samsung Electronics Co., LTD	
LED Model	SPMWHx228xxxxxxxxxx	
Sample Number	JBE190712-H-N1	
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	Aug.25,2019
Date of Test	Aug.26,2019
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	2019-08-26	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	LED-8089M50-G5	Total Operating Time (min)	90

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE190712-	120.0	60	0.7121	83.15	0.9730	12.71
H-N1	277.0	60	0.3270	82.71	0.9130	16.09

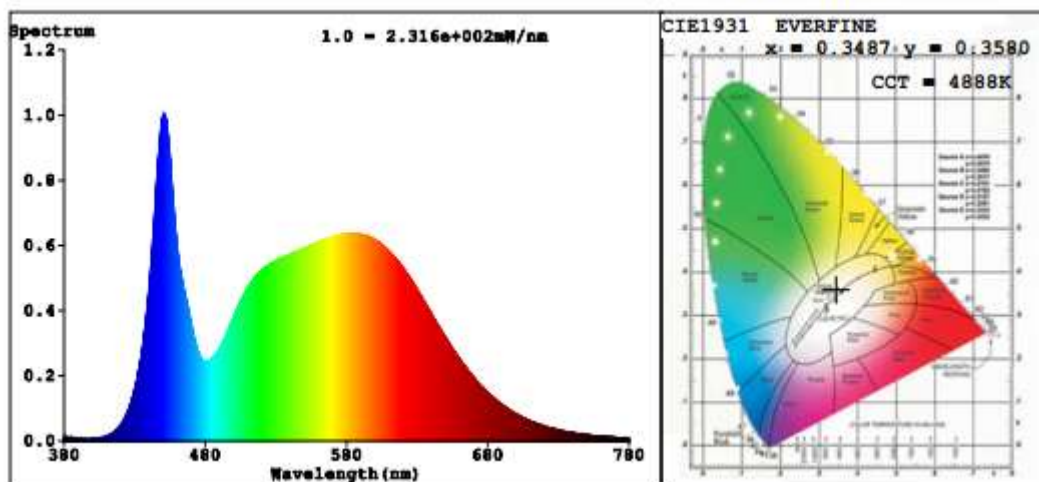
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	15
Frequency (Hz)	60	R2	89	R10	72
CCT (K)	4888	R3	93	R11	82
Duv	0.0017	R4	83	R12	59
Chromaticity (x, y)	x=0.3487 y=0.3580	R5	82	R13	84
Chromaticity (u', v')	u'=0.2114 v'=0.4883	R6	83	R14	96
Color Rendering Index (CRI)	83.9	R7	89	R15	77
R9	15	R8	70	--	--

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

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	10844	10807
Luminous Efficacy (lm/W)	130.41	130.66
Beam Angle (°)	114.8	--
Center Beam Candle Power (cd)	3751	--

## Spectral Power Distribution & Chromaticity Diagram



## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,959.6	27.3%
0-40	4,878.5	45%
0-60	8,674.3	80%
60-90	2,127.5	19.6%
70-100	804.9	7.4%
90-120	16.2	0.1%
0-90	10,801.8	99.6%
90-180	41.7	0.4%
0-180	10,843.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	356.3	3.3%	90-100	4.8	0%
10-20	1,029.8	9.5%	100-110	5.5	0.1%
20-30	1,573.5	14.5%	110-120	5.9	0.1%
30-40	1,918.9	17.7%	120-130	6.2	0.1%
40-50	1,999.3	18.4%	130-140	6.0	0.1%
50-60	1,796.6	16.6%	140-150	5.3	0%
60-70	1,327.5	12.2%	150-160	4.2	0%
70-80	670.2	6.2%	160-170	2.7	0%
80-90	129.9	1.2%	170-180	1.1	0%

## Photometric Data

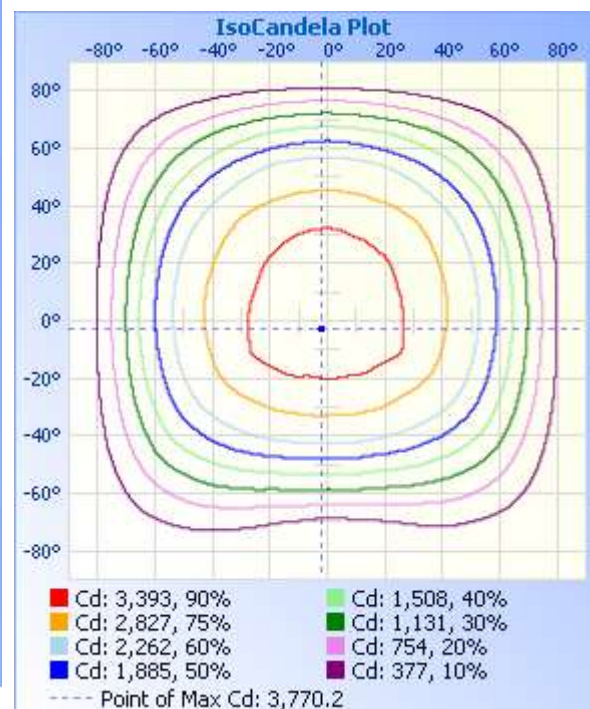
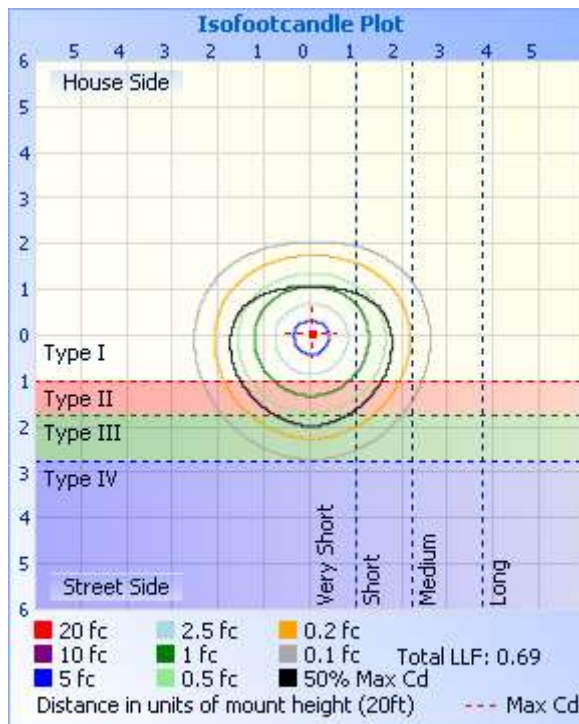
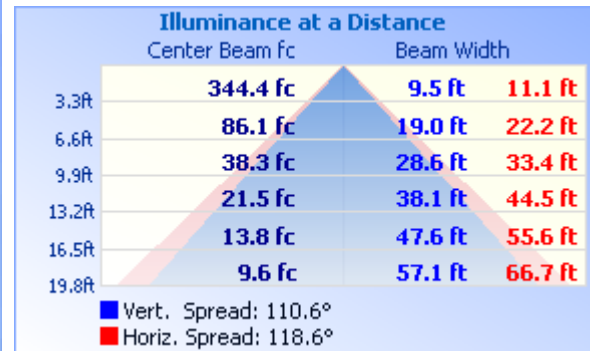
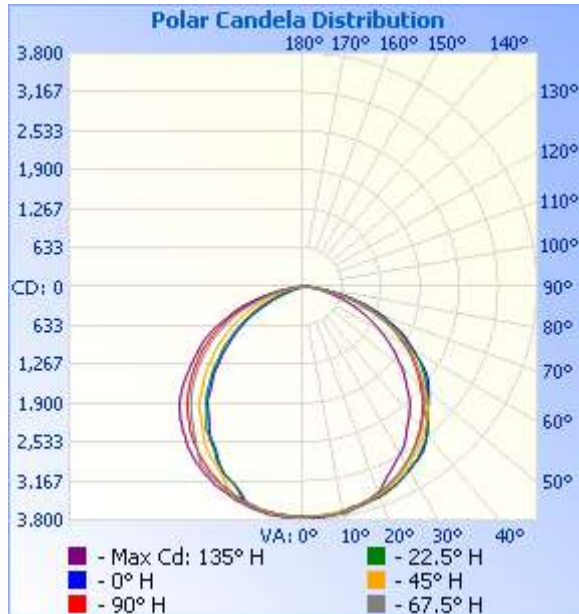




Table--1 UNIT: cd

C (DEG) γ (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	3751	3751	3751	3751	3751	3751	3751	3751	3751	3751	3751	3751	3751	3751	3751	3751		
5	3729	3737	3760	3717	3740	3749	3731	3751	3763	3737	3759	3712	3754	3734	3737	3724		
10	3689	3703	3731	3725	3738	3742	3700	3736	3713	3719	3719	3698	3718	3714	3708	3710		
15	3644	3656	3671	3667	3683	3670	3665	3657	3657	3673	3658	3636	3621	3620	3642	3646		
20	3520	3537	3594	3597	3638	3641	3610	3564	3569	3588	3580	3383	3379	3385	3517	3555		
25	3410	3443	3497	3527	3564	3550	3507	3474	3467	3490	3336	3224	3200	3218	3274	3447		
30	3268	3304	3375	3423	3446	3450	3398	3333	3332	3370	3148	2971	2935	2963	3087	3327		
35	3094	3117	3235	3276	3339	3309	3238	3180	3166	3149	2926	2769	2665	2753	2844	3050		
40	2880	2933	3046	3097	3124	3141	3080	2995	2969	2909	2690	2459	2413	2448	2622	2808		
45	2662	2717	2836	2819	2874	2863	2878	2794	2752	2660	2408	2155	2070	2122	2301	2572		
50	2385	2464	2562	2591	2666	2627	2578	2540	2485	2402	2123	1826	1715	1765	2008	2296		
55	2087	2169	2224	2358	2438	2368	2258	2259	2219	2095	1795	1471	1358	1420	1694	1989		
60	1780	1861	1919	2006	2071	2043	1962	1945	1915	1784	1462	1139	998	1102	1356	1675		
65	1443	1514	1573	1673	1768	1720	1617	1585	1587	1454	1139	808	597	760	1036	1331		
70	1075	1109	1184	1272	1369	1302	1242	1186	1188	1084	820	479	222	424	728	976		
75	701	734	769	872	928	909	827	808	802	710	507	248	29.8	199	443	608		
80	350	370	387	454	498	474	426	425	432	370	251	108	8.60	86.5	201	306		
85	90.0	84.5	87.8	163	210	175	100	104	128	105	70.8	28.7	3.92	21.1	47.1	74.0		
90	4.03	8.59	18.3	29.5	57.2	38.4	22.9	10.8	4.06	3.49	8.96	2.34	1.80	2.23	2.88	3.88		
95	3.51	3.65	2.96	4.10	5.54	4.26	2.72	3.27	3.17	3.36	3.36	2.50	2.34	2.67	3.45	3.98		
100	3.65	10.2	4.35	2.53	1.71	2.28	3.10	10.9	3.32	4.31	5.51	3.78	4.03	3.84	5.27	4.45		
105	4.74	8.58	8.53	2.76	1.85	2.55	8.47	9.04	3.92	4.75	5.31	4.99	4.36	4.95	5.33	4.90		
110	5.93	8.37	8.37	4.18	2.23	4.08	8.20	8.17	4.74	5.19	5.42	5.51	5.45	5.41	5.43	5.66		
115	6.58	8.40	7.54	4.18	2.77	3.81	7.07	8.03	5.48	5.95	5.91	5.61	6.10	5.60	5.92	6.06		
120	7.35	8.43	7.22	4.61	3.43	4.29	6.74	8.05	5.77	6.39	6.39	6.63	6.71	6.26	5.89	6.19		
125	8.00	8.46	7.00	5.91	5.71	5.65	6.65	8.27	6.16	6.77	6.56	7.71	8.44	7.61	6.19	6.51		
130	8.71	8.41	6.98	6.83	6.42	6.57	6.79	8.24	7.03	6.80	6.90	8.47	8.67	8.52	6.96	6.71		
135	8.82	8.19	7.27	7.49	7.02	7.28	7.17	8.12	7.35	6.99	7.46	8.49	8.91	8.75	7.22	7.14		
140	8.66	8.19	7.49	8.00	7.51	8.10	7.44	8.17	7.68	7.70	7.52	8.48	9.03	8.81	7.39	7.85		
145	8.71	8.19	7.93	8.57	8.06	8.80	7.71	8.21	8.33	7.97	7.72	8.58	9.22	9.02	8.53	8.22		
150	8.71	8.19	9.46	9.22	9.69	9.57	8.96	8.55	8.44	8.53	8.54	9.06	9.20	9.30	9.78	8.39		
155	8.58	8.41	10.2	9.56	10.3	9.75	9.78	9.10	8.16	8.43	8.54	9.11	8.79	9.02	9.39	8.54		
160	7.95	8.57	10.4	9.73	10.3	9.87	10.4	9.04	8.22	8.14	8.53	9.09	8.68	8.75	9.05	8.68		
165	8.87	8.68	10.9	9.86	10.6	10.3	10.2	9.08	8.55	8.52	8.48	9.06	9.06	9.08	8.97	8.88		
170	9.85	9.34	11.7	11.4	11.1	11.5	11.2	9.53	9.91	9.83	9.86	11.5	11.7	11.7	11.4	11.2		
175	10.6	10.0	12.4	12.8	12.6	12.1	11.7	10.1	10.5	10.5	10.3	12.3	12.2	13.2	12.2	12.0		
180	10.1	10.6	12.3	12.0	13.0	12.4	12.2	10.6	10.0	10.3	10.2	12.3	12.1	12.9	12.1	12.3		

**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	2019-07-03	2020-07-02
ST-R-333	Power Meter for Integrating Sphere	2019-06-27	2020-06-26
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp	2019-07-03	2020-07-02
ST-R-358	Power Meter for Goniophotometer	2019-06-27	2020-06-26
Expand Uncertainty: Photometric Measurement (Sphere):2.66%, k=2 Chromaticity Measurement(Sphere):28.6K, k=2 Photometric Measurement(Goniophotometer):2.76%, k=2			

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