

## **LM-79-08 Test Report**

For

### **LIGHT EFFICIENT DESIGN, LLC**

**(Brand Name: LIGHT EFFICIENT DESIGN)**

Suite 301, 188 S.Northwest Highway, Cary, IL60013, USA

**Model name(s): LED-8236M40C**

**Report Type:** Testing and Report According to IES LM-79-2008

**Type of  
Luminaire:** LED Luminaires

**Report Date:** 2019-03-13  
Ningbo TengLi Testing Co., Ltd

**Prepared By:** 2nd floor, Block B, Ningbo Testing and Certification Base,  
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Test & Report By:

*Xeon Ren*

Engineer:

Review By:

*Johnson Sun*

Manager:

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 NVLAP, NIST,  
or any agency of the Federal Government.

1.1 Product Information:		
Model Number	LED-8236M40C	
Remark	N/A	
Representative (Tested) Model	LED-8236M40C	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
LED Manufacturer	SAMSUNG	
LED Model	SPMWHT228FD5WAT☆S3	
Dimming	Non-dimmable	
Sample Number	JBE181108-H-AK1	
Date of Receipt	Mar.05,2019	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	220-347Vac, 50/60Hz
Nominal Power	95W
Rated Initial Lamp Lumen	--
Declared CCT	4000K

### 1.3 Test Specifications:

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 C78.377-2015 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>
Reference Work Instruction	QD25

### 1.4 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.

## 2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2019-03-10	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8236M40C		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE181108-	277.0	60	0.3652	97.85	0.9672	13.97
H-AK1	347.0	60	0.3018	98.28	0.9384	18.67

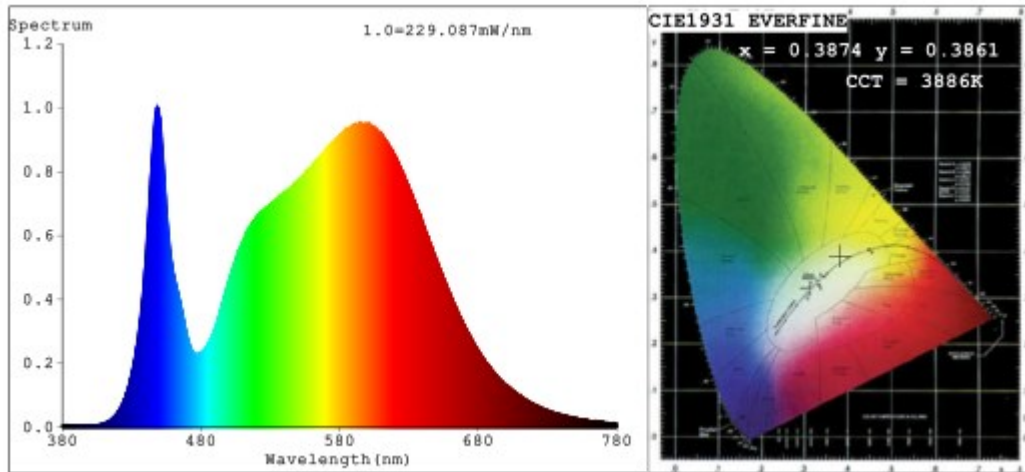
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	82	R9	13
Frequency (Hz)	60	R2	88	R10	72
CCT (K)	3886	R3	94	R11	83
Duv	0.0023	R4	84	R12	63
Chromaticity (x, y)	x=0.3874 y=0.3861	R5	82	R13	83
Chromaticity (u', v')	u'=0.2260 v'=0.5067	R6	84	R14	96
Color Rendering Index (CRI)	83.3	R7	87	R15	75
R9	13	R8	67	--	--

### Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	13172	13193
Luminous Efficacy (lm/W)	134.61	134.24
Beam Angle (°)	113.2	--
Center Beam Candle Power (cd)	4518	--

## Spectral Power Distribution & Chromaticity Diagram



## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,567.0	27.1%
0-40	5,888.7	44.7%
0-60	10,438.3	79.3%
60-90	2,614.7	19.9%
70-100	1,119.1	8.5%
90-120	88.2	0.7%
0-90	13,053.0	99.1%
90-180	117.4	0.9%
0-180	13,170.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	429.3	3.3%	90-100	42.0	0.3%
10-20	1,236.8	9.4%	100-110	35.2	0.3%
20-30	1,900.9	14.4%	110-120	11.0	0.1%
30-40	2,321.7	17.6%	120-130	6.4	0%
40-50	2,422.1	18.4%	130-140	6.6	0%
50-60	2,127.5	16.2%	140-150	6.5	0%
60-70	1,537.6	11.7%	150-160	5.1	0%
70-80	830.7	6.3%	160-170	3.2	0%
80-90	246.4	1.9%	170-180	1.4	0%

## Photometric Data

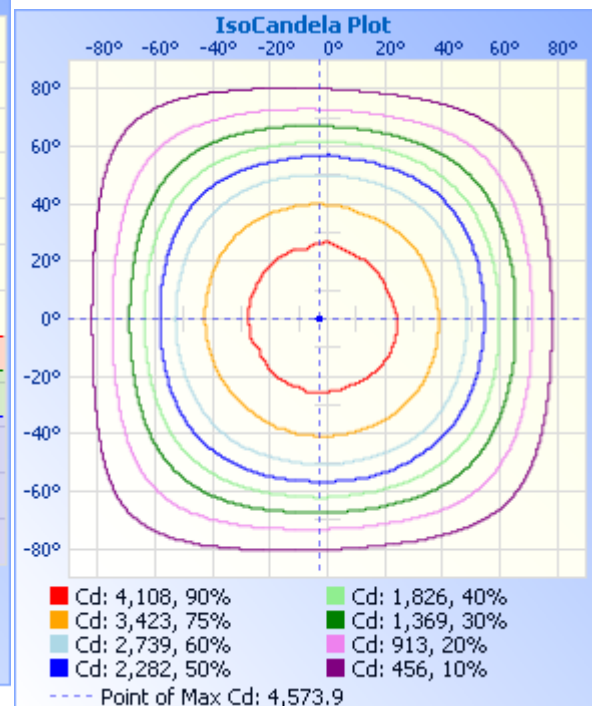
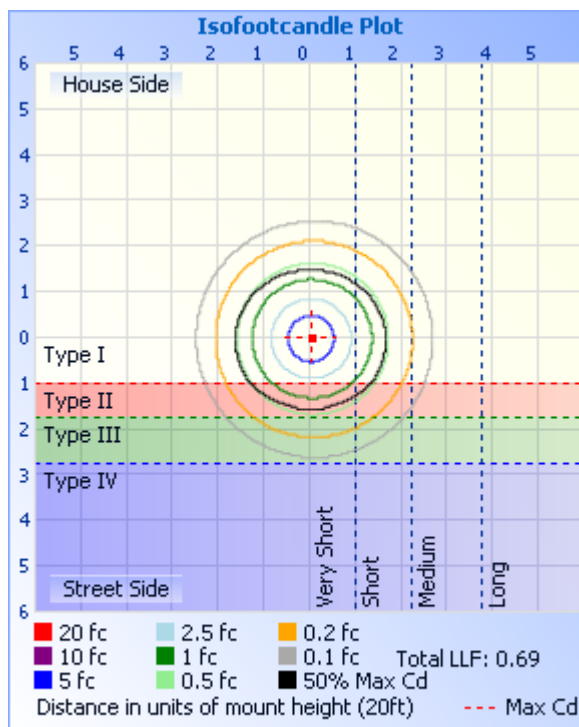
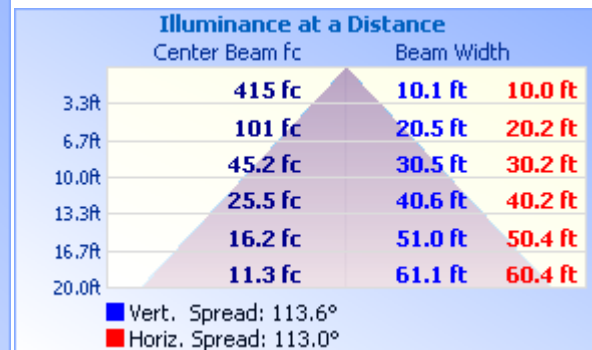
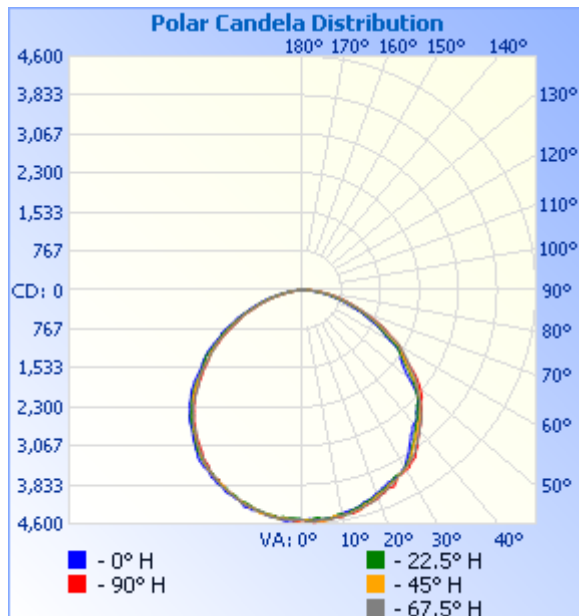


Table--1

UNIT: cd

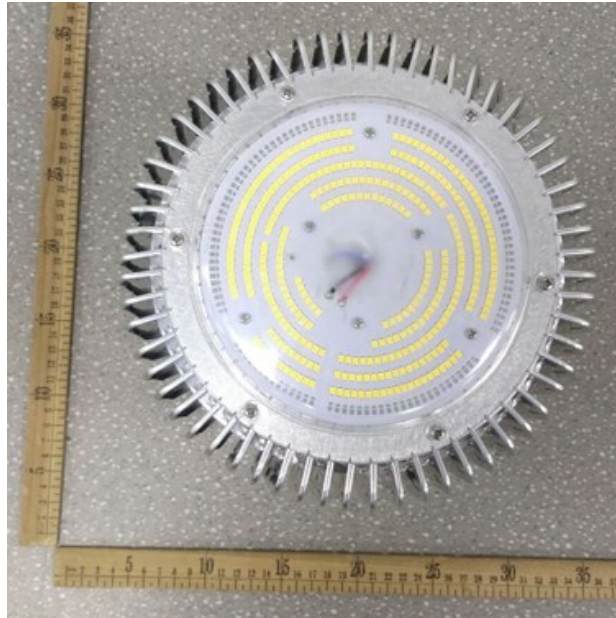
C (DEG) Y (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	4518	4518	4518	4518	4518	4518	4518	4518	4518	4518	4518	4518	4518	4518	4518	4518			
5	4512	4501	4467	4506	4531	4525	4552	4528	4552	4479	4516	4494	4545	4475	4501	4511			
10	4459	4443	4439	4423	4466	4473	4509	4510	4526	4455	4478	4477	4467	4437	4468	4439			
15	4360	4322	4353	4333	4388	4402	4453	4443	4470	4416	4387	4371	4417	4327	4352	4372			
20	4219	4167	4258	4192	4255	4283	4293	4336	4358	4281	4281	4270	4265	4235	4225	4228			
25	4089	4027	4044	4077	4142	4155	4176	4200	4264	4147	4128	4122	4106	4079	4074	4069			
30	3869	3848	3921	3931	4032	4035	4052	4041	4083	4020	4024	3983	3956	3906	3899	3883			
35	3603	3589	3613	3641	3687	3755	3788	3880	3889	3819	3803	3732	3702	3666	3637	3626			
40	3336	3323	3332	3357	3425	3472	3534	3585	3585	3521	3464	3443	3440	3397	3359	3355			
45	3012	3017	3103	3140	3199	3184	3264	3290	3318	3251	3207	3164	3146	3079	3054	2995			
50	2585	2606	2629	2721	2779	2863	2941	2937	3026	2989	2920	2806	2778	2664	2647	2631			
55	2231	2271	2289	2317	2358	2445	2486	2554	2569	2519	2431	2365	2373	2342	2225	2211			
60	1784	1798	1830	1926	2000	2072	2189	2209	2209	2149	2054	1989	1933	1868	1828	1823			
65	1361	1394	1425	1510	1570	1639	1697	1765	1773	1710	1665	1572	1511	1438	1423	1372			
70	966	970	1056	1088	1156	1238	1270	1304	1308	1275	1250	1196	1112	1048	1009	988			
75	647	642	688	728	790	849	886	923	927	933	901	837	762	720	686	654			
80	330	335	365	399	486	540	567	594	605	594	575	501	446	393	353	329			
85	136	138	148	172	206	246	281	302	321	298	263	219	190	164	152	142			
90	41.0	39.8	35.9	40.8	60.2	86.9	106	116	121	101	68.7	44.1	44.7	42.2	41.0	41.2			
95	33.8	32.4	32.8	32.7	33.6	38.2	38.9	38.6	38.7	37.4	36.3	35.3	34.1	33.8	34.9	34.5			
100	29.1	28.5	28.5	31.0	35.3	34.0	36.1	36.3	37.0	39.1	39.5	36.0	33.4	31.8	32.7	33.5			
105	32.3	38.3	39.6	40.1	37.7	32.1	31.2	30.5	29.5	29.5	37.7	43.5	50.3	42.6	36.5	35.8			
110	12.8	12.0	11.3	14.2	18.8	22.7	30.6	33.6	38.3	33.5	24.4	20.4	15.9	15.5	13.8	13.4			
115	8.05	8.01	7.35	7.97	8.41	9.91	10.6	11.7	12.9	13.6	10.5	9.00	8.64	9.04	8.97	9.15			
120	6.49	6.43	6.10	6.23	6.35	6.76	7.21	7.64	8.31	8.37	7.21	7.20	7.45	7.70	7.70	7.77			
125	6.57	6.43	6.02	5.96	5.96	5.97	6.29	6.49	7.31	7.30	7.19	7.41	7.67	7.97	8.08	8.10			
130	7.69	7.59	7.26	7.28	6.77	6.56	6.53	6.54	7.94	8.00	8.02	8.30	8.51	8.86	9.00	9.18			
135	8.29	8.21	7.94	7.74	7.67	7.56	7.42	7.58	8.73	8.76	8.73	9.00	9.19	9.37	9.47	9.70			
140	9.41	9.16	8.91	8.89	8.61	8.45	8.37	8.50	9.55	9.54	9.57	9.79	10.1	10.2	10.4	10.4			
145	10.5	10.2	9.96	9.86	9.78	9.67	9.54	9.67	10.5	10.5	10.5	10.7	10.9	10.9	11.3	11.4			
150	11.2	10.8	10.9	10.7	10.6	10.3	10.4	10.5	11.4	11.2	11.2	11.4	11.7	11.8	12.0	12.1			
155	10.7	10.6	10.6	10.5	10.4	10.3	10.3	10.3	11.6	11.6	11.4	11.7	11.9	11.9	12.1	12.1			
160	10.1	10.00	9.88	9.84	9.73	9.70	9.76	9.72	11.6	11.5	11.6	11.8	11.9	11.9	12.1	12.2			
165	10.3	10.3	10.1	10.0	9.94	9.88	9.87	9.89	12.1	12.0	12.0	12.1	12.3	12.3	12.4	12.4			
170	13.5	13.3	13.2	13.1	13.0	12.9	13.0	13.0	13.7	13.6	13.6	13.7	13.9	13.9	14.0	14.1			
175	15.3	15.2	15.4	15.4	15.5	15.5	15.6	15.6	15.4	15.2	15.4	15.3	15.4	15.3	15.4	15.4			
180	15.2	14.9	14.9	15.0	15.1	15.1	15.1	15.4	14.8	14.8	14.7	14.8	14.9	14.8	14.9	14.9			

### 3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-705	Standard Lamp	2019-02-07	2020-02-06
ST-R-704	Power Meter for Integrating Sphere	2019-01-06	2020-01-05
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp	2019-02-12	2020-02-11
ST-R-711	Power Meter for Goniophotometer	2019-01-06	2020-01-05
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			



#### 4. Product Photo



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