

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-8232M40

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

**Type of
Luminaire:** LED Luminaires

Report Date: 2019-02-26
Ningbo TengLi Testing Co., Ltd

Prepared By: 2nd floor, Block B, Ningbo Testing and Certification Base,
No. 66 Qingyi Road, Ningbo National Hi-Tech Zone,
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Test & Report By:

Xeon Ren

Engineer: Xeon Ren

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

1.1 Product Information:		
Model Number	LED-8232M40	
Remark	N/A	
Representative (Tested) Model	LED-8232M40	
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-B1(4000K)	
Date of Receipt	2019-02-18	
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	120-277Vac, 50/60Hz
Nominal Power	140W
Rated Initial Lamp Lumen	--
Declared CCT	4000K

1.3 Test Specifications:

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 C78.377-2015 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

1.4 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° 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.

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2019-02-20	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8232M40		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE181108-	120.0	60	1.201	142.0	0.9856	8.75
H-B1	277.0	60	0.5384	139.5	0.9353	12.51

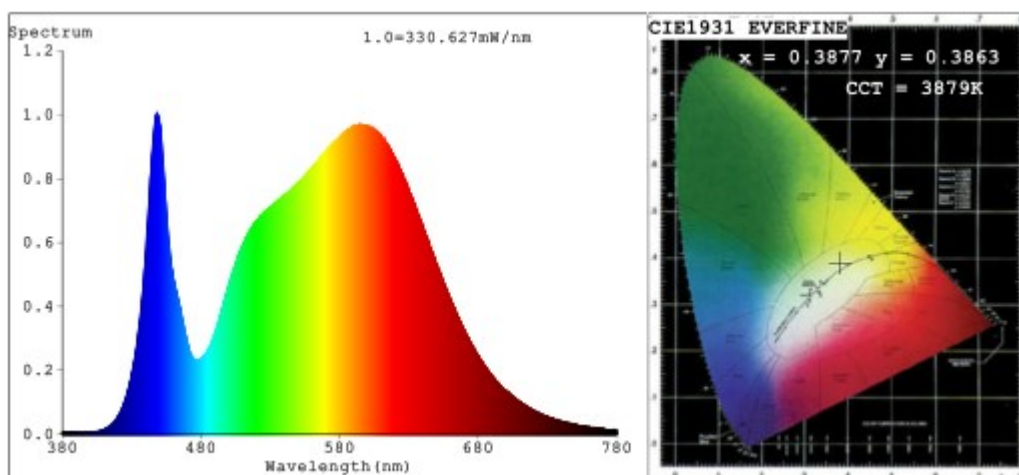
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	12
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	3879	R3	93	R11	83
Duv	0.0023	R4	84	R12	63
Chromaticity (x, y)	x=0.3877 y=0.3863	R5	81	R13	83
Chromaticity (u', v')	u'=0.2261 v'=0.5068	R6	84	R14	96
Color Rendering Index (CRI)	83.1	R7	87	R15	75
R9	12	R8	66	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	18656	18728
Luminous Efficacy (lm/W)	131.38	134.25
Beam Angle (°)	113.4	--
Center Beam Candle Power (cd)	6429	--

Spectral Power Distribution & Chromaticity Diagram

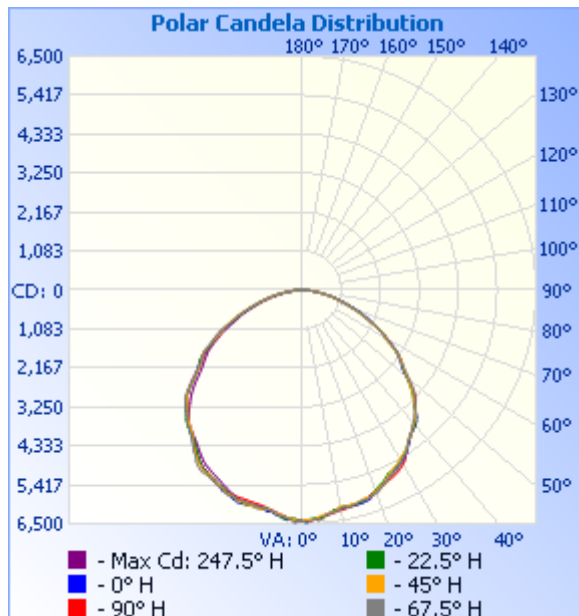


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	4,992.5	26.8%
0-40	8,263.0	44.3%
0-60	14,741.9	79%
60-90	3,725.2	20%
70-100	1,618.6	8.7%
90-120	150.5	0.8%
0-90	18,467.2	99%
90-180	187.5	1%
0-180	18,654.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	597.8	3.2%	90-100	84.4	0.5%
10-20	1,725.5	9.2%	100-110	52.0	0.3%
20-30	2,669.2	14.3%	110-120	14.0	0.1%
30-40	3,270.4	17.5%	120-130	8.3	0%
40-50	3,454.1	18.5%	130-140	8.3	0%
50-60	3,024.9	16.2%	140-150	8.0	0%
60-70	2,191.1	11.7%	150-160	6.5	0%
70-80	1,170.5	6.3%	160-170	4.2	0%
80-90	363.6	1.9%	170-180	1.7	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
3.3ft	590 fc	10.1 ft	10.1 ft
6.7ft	143 fc	20.5 ft	20.4 ft
10.0ft	64.3 fc	30.6 ft	30.5 ft
13.3ft	36.3 fc	40.7 ft	40.6 ft
16.7ft	23.1 fc	51.1 ft	51.0 ft
20.0ft	16.1 fc	61.2 ft	61.0 ft

■ Vert. Spread: 113.7°
■ Horiz. Spread: 113.5°

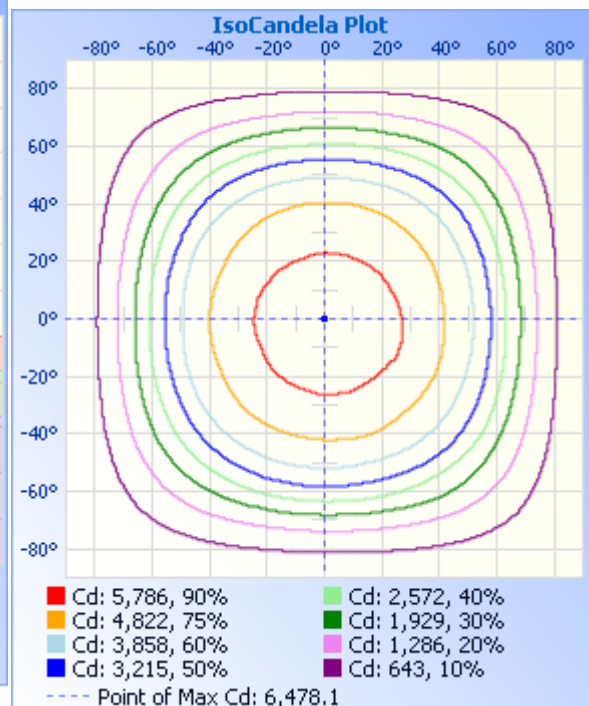
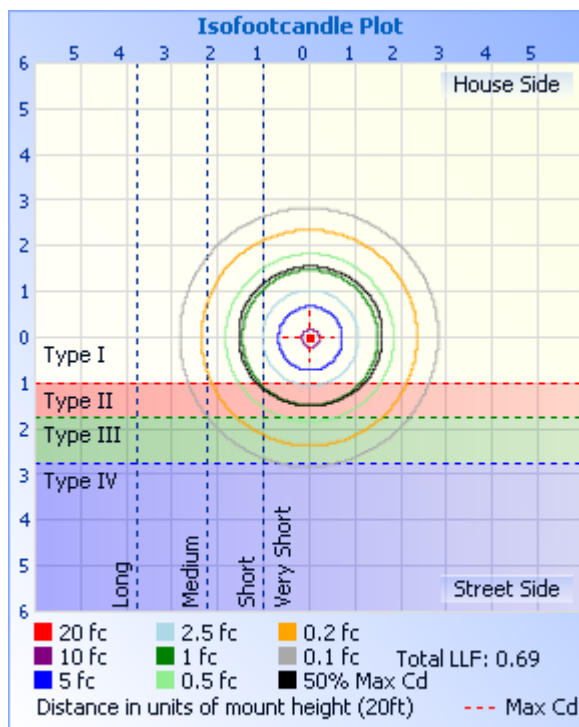


Table--1

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	6429	6429	6429	6429	6429	6429	6429	6429	6429	6429	6429	6429	6429	6429	6429	6429			
5	6287	6294	6315	6314	6314	6347	6283	6388	6337	6328	6351	6359	6333	6368	6295	6305			
10	6113	6123	6148	6159	6149	6155	6105	6181	6204	6191	6186	6197	6190	6183	6169	6155			
15	6041	6063	6077	6118	6148	6116	6080	6088	6131	6117	6072	6058	6167	6153	6165	6097			
20	6013	5960	5930	5947	5978	5929	5972	6017	5948	5989	5956	6007	6043	6006	6035	6062			
25	5861	5778	5762	5711	5701	5633	5659	5712	5790	5756	5785	5788	5835	5799	5818	5845			
30	5636	5604	5562	5503	5517	5458	5425	5505	5586	5588	5572	5577	5619	5631	5650	5738			
35	5247	5277	5214	5163	5167	5134	5119	5123	5144	5162	5233	5266	5289	5234	5278	5312			
40	4909	4898	4886	4891	4890	4861	4834	4798	4855	4820	4889	4895	4937	4962	4908	4945			
45	4524	4495	4467	4437	4408	4374	4384	4431	4448	4475	4464	4523	4568	4588	4518	4607			
50	4077	4029	3942	3840	3799	3816	3819	3881	3828	3915	3918	4023	4062	4031	4046	4076			
55	3437	3409	3359	3313	3285	3291	3312	3256	3331	3312	3379	3433	3492	3514	3443	3454			
60	2929	2890	2817	2775	2694	2657	2653	2699	2736	2767	2788	2856	2929	2895	2923	2958			
65	2304	2309	2243	2120	2128	2092	2078	2126	2071	2158	2181	2275	2305	2317	2351	2319			
70	1674	1677	1606	1605	1588	1491	1484	1495	1537	1588	1600	1636	1673	1699	1750	1736			
75	1148	1114	1086	1061	1051	1005	1019	1032	1030	1079	1092	1097	1149	1162	1171	1217			
80	703	659	639	623	598	585	586	597	611	624	655	682	714	737	753	736			
85	335	326	298	290	276	266	264	261	284	301	310	338	363	364	371	362			
90	103	90.7	79.7	78.2	82.0	82.6	87.6	82.6	84.1	89.9	94.6	110	125	128	128	121			
95	69.0	71.4	65.8	67.6	72.2	73.1	77.4	75.2	73.6	74.5	76.8	79.9	86.4	83.1	79.0	78.9			
100	67.7	56.9	49.6	49.6	46.9	46.8	51.7	50.9	57.9	60.7	62.5	76.1	82.1	77.1	76.9	74.0			
105	59.4	61.5	61.5	56.0	48.6	49.6	52.2	55.4	57.7	59.1	63.7	66.0	59.8	55.4	58.3	56.7			
110	26.0	23.9	22.9	20.1	17.8	18.7	18.6	18.9	20.4	22.8	24.5	24.6	28.4	24.9	27.5	27.2			
115	13.2	12.7	12.6	12.2	11.1	11.7	12.0	11.6	12.4	14.1	14.5	14.9	14.7	14.0	13.5	13.8			
120	9.61	9.59	9.82	9.32	9.00	9.07	9.15	9.21	10.0	10.0	11.1	11.4	12.1	10.6	9.99	10.3			
125	8.41	8.54	8.79	8.85	8.70	8.89	8.79	8.70	9.30	9.25	9.49	9.41	9.51	9.22	8.93	9.06			
130	9.27	9.32	9.41	9.73	9.99	9.99	9.73	9.89	10.5	10.2	10.1	9.95	9.84	9.89	9.65	9.74			
135	10.3	10.4	10.6	10.7	10.6	10.6	10.6	10.7	11.2	10.9	11.1	10.8	10.7	10.8	10.5	10.6			
140	11.3	11.5	11.5	11.7	11.7	11.6	11.6	11.6	12.0	11.9	11.9	11.7	11.6	11.6	11.4	11.6			
145	12.6	12.7	12.8	13.0	13.0	12.9	12.9	12.9	13.0	12.8	12.9	12.8	12.8	12.7	12.5	12.6			
150	13.7	13.7	13.7	14.1	14.1	14.1	14.0	14.0	14.0	13.8	13.9	13.9	13.7	13.6	13.4	13.5			
155	13.9	14.0	14.1	14.2	14.2	14.4	14.2	14.3	14.1	14.0	13.9	13.9	13.9	13.7	13.8	14.0			
160	14.0	14.0	14.1	14.2	14.2	14.2	14.2	14.3	14.1	14.1	13.9	14.0	13.9	13.9	13.9	14.0			
165	14.3	14.5	14.6	14.6	14.6	14.7	14.7	14.7	14.7	14.5	14.5	14.5	14.3	14.3	14.4				
170	16.7	16.8	16.8	17.0	17.1	17.1	17.1	17.0	16.7	16.7	16.5	16.5	16.5	16.4	16.4	16.4			
175	19.0	18.6	18.6	18.6	18.8	18.9	18.6	18.7	18.7	18.8	18.7	18.7	18.8	18.6	18.5	18.7			
180	18.1	18.1	18.1	18.0	18.0	17.9	17.9	18.1	17.7	17.8	17.7	17.7	17.8	17.7	17.7	17.8			

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 *******