

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-8232M40C

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,
Ningbo, Zhejiang

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-8232M40C	
Remark	N/A	
Representative (Tested) Model	LED-8232M40C	
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-E1(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	220-347Vac, 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-8232M40C		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE181108-	277.0	60	0.5171	138.9	0.9698	12.38
H-E1	347.0	60	0.4253	139.2	0.9432	16.39

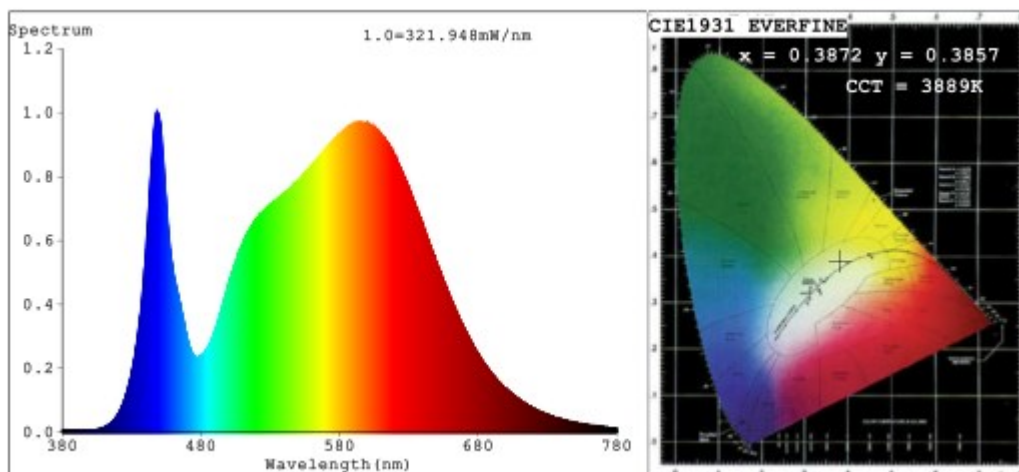
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	81	R9	12
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	3889	R3	93	R11	83
Duv	0.0022	R4	83	R12	63
Chromaticity (x, y)	x=0.3872 y=0.3857	R5	81	R13	83
Chromaticity (u', v')	u'=0.2260 v'=0.5064	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)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	18514	18499
Luminous Efficacy (lm/W)	133.29	132.90
Beam Angle (°)	114.1	--
Center Beam Candle Power (cd)	6339	--

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	4,964.1	26.8%
0-40	8,217.1	44.4%
0-60	14,654.0	79.2%
60-90	3,680.3	19.9%
70-100	1,599.1	8.6%
90-120	144.1	0.8%
0-90	18,334.3	99%
90-180	178.1	1%
0-180	18,512.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	594.8	3.2%	90-100	83.1	0.4%
10-20	1,715.8	9.3%	100-110	49.1	0.3%
20-30	2,653.5	14.3%	110-120	12.0	0.1%
30-40	3,253.1	17.6%	120-130	7.4	0%
40-50	3,429.5	18.5%	130-140	7.5	0%
50-60	3,007.4	16.2%	140-150	7.4	0%
60-70	2,164.3	11.7%	150-160	6.1	0%
70-80	1,155.1	6.2%	160-170	4.0	0%
80-90	361.0	1.9%	170-180	1.6	0%

Photometric Data

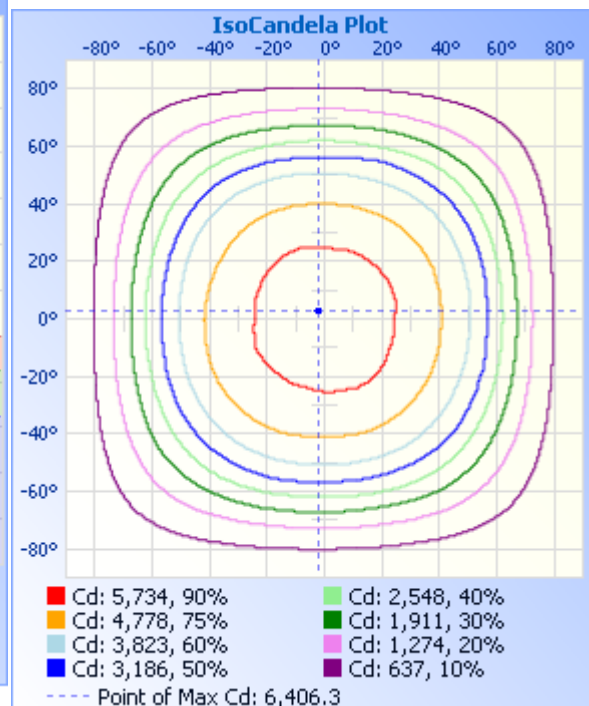
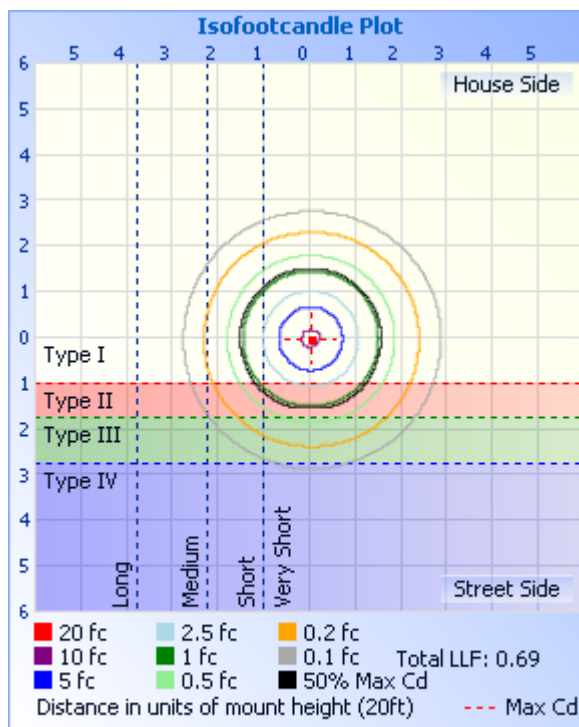
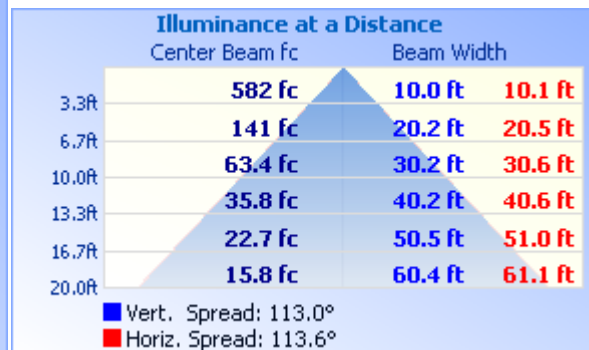
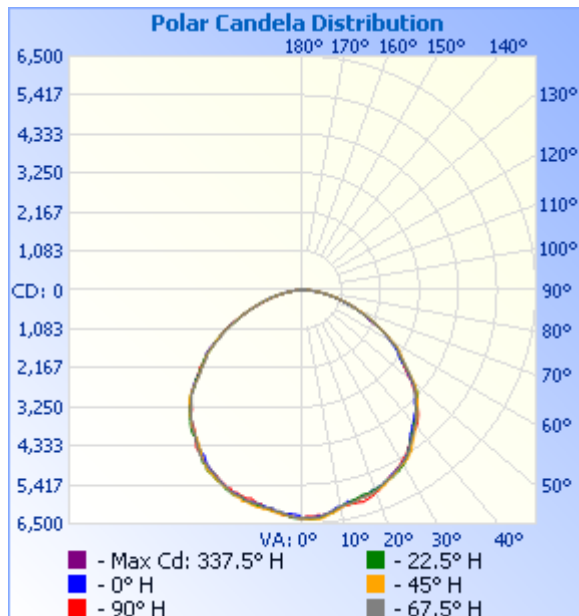


Table--1

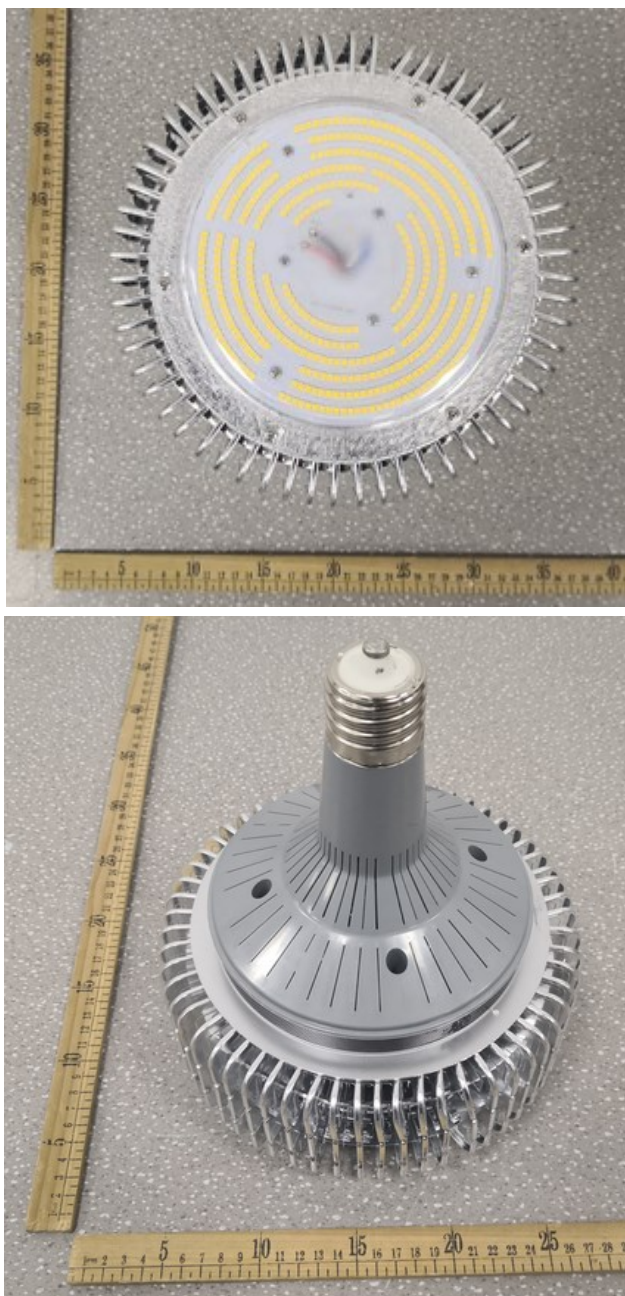
UNIT: cd

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	6339	6339	6339	6339	6339	6339	6339	6339	6339	6339	6339	6339	6339	6339	6339	6339			
5	6284	6356	6345	6347	6291	6341	6366	6290	6292	6299	6232	6235	6223	6248	6266	6227			
10	6129	6177	6198	6184	6118	6132	6146	6100	6145	6201	6113	6128	6107	6131	6185	6141			
15	6005	6110	6071	6099	5990	5975	6013	6046	6103	6218	6151	6082	6071	6076	6089	6065			
20	5869	5988	6027	6003	5900	5904	5946	5950	5978	6037	5939	5975	5937	5964	5937	5947			
25	5681	5749	5742	5738	5734	5774	5785	5749	5725	5767	5720	5732	5737	5775	5770	5688			
30	5486	5494	5576	5584	5547	5623	5589	5545	5516	5571	5500	5504	5421	5553	5520	5512			
35	5170	5217	5083	5252	5210	5225	5308	5228	5215	5247	5191	5192	5141	5136	5099	5161			
40	4800	4824	4828	4793	4802	4831	4890	4880	4926	4928	4957	4897	4807	4857	4816	4790			
45	4413	4452	4467	4458	4422	4485	4523	4442	4516	4564	4467	4437	4452	4428	4451	4383			
50	3855	3940	3920	3953	3987	4039	4088	4014	3983	3944	3907	3932	3885	3880	3813	3790			
55	3309	3355	3357	3362	3310	3375	3419	3424	3388	3381	3421	3405	3286	3336	3295	3253			
60	2727	2795	2761	2797	2823	2883	2908	2854	2865	2822	2777	2716	2705	2754	2754	2647			
65	2133	2190	2193	2220	2204	2252	2288	2270	2196	2255	2153	2149	2140	2067	2121	2069			
70	1528	1542	1582	1608	1643	1652	1710	1663	1668	1673	1601	1556	1523	1520	1528	1513			
75	984	1031	1046	1097	1131	1154	1159	1158	1170	1151	1093	1058	1039	1010	1007	971			
80	584	611	635	679	701	716	730	710	706	688	641	617	609	589	579	581			
85	276	303	300	315	328	343	356	343	340	325	304	297	284	279	276	273			
90	79.1	92.1	96.0	105	108	109	106	96.4	93.4	85.3	82.9	80.9	80.5	78.3	77.4	82.1			
95	69.1	78.7	74.2	75.5	79.7	74.9	79.7	75.9	73.6	74.1	71.5	69.5	71.7	67.3	69.1	71.3			
100	52.9	59.6	63.4	70.3	71.0	68.2	65.1	59.2	53.1	49.8	48.5	48.6	45.5	49.5	48.7	47.5			
105	54.1	54.6	62.1	63.6	64.2	67.6	67.4	69.1	63.1	60.1	58.4	58.6	52.6	51.3	50.9	52.3			
110	20.3	18.3	19.0	20.8	21.1	21.8	22.2	21.6	19.0	16.4	16.9	20.0	20.2	18.6	19.7	21.8			
115	14.3	11.6	11.0	11.2	11.4	11.3	11.0	10.2	9.69	9.36	8.94	11.4	11.1	10.3	11.6	12.6			
120	10.6	9.62	9.14	8.76	8.89	8.56	8.59	8.14	7.35	7.44	7.26	8.05	8.40	8.34	8.55	9.60			
125	9.05	8.39	8.18	8.27	8.00	7.97	7.96	7.65	7.56	7.69	7.59	8.05	7.95	8.00	8.26	8.57			
130	9.31	9.02	8.88	8.92	8.88	8.92	8.72	8.60	8.62	8.91	8.75	9.14	9.08	9.12	9.19	9.17			
135	10.3	9.89	9.78	9.68	9.66	9.76	9.67	9.76	9.54	9.54	9.46	9.74	9.73	9.87	9.92	10.1			
140	11.0	10.8	10.7	10.7	10.6	10.8	10.8	10.6	10.4	10.5	10.4	10.7	10.6	10.8	10.8	10.8			
145	12.0	12.1	11.9	11.9	11.9	11.9	11.9	11.7	11.5	11.7	11.6	11.7	11.7	11.7	11.8	11.8			
150	13.1	13.1	13.0	12.9	12.8	12.9	12.9	12.8	12.5	12.7	12.7	12.8	12.6	12.7	12.8	12.7			
155	13.3	13.4	13.3	13.4	13.2	13.3	13.4	13.3	12.6	12.8	12.9	13.0	12.9	13.0	13.0	12.9			
160	13.7	13.8	13.7	13.9	13.7	13.8	13.8	13.8	12.9	13.0	13.0	13.1	12.9	13.0	13.0	12.9			
165	14.2	14.2	14.1	14.2	14.0	14.0	14.2	14.1	13.2	13.3	13.3	13.3	13.2	13.3	13.3	13.2			
170	15.9	16.0	15.8	15.8	15.7	15.8	15.9	15.7	15.3	15.3	15.2	15.2	15.1	15.4	15.4	15.2			
175	17.5	17.7	18.0	18.1	17.6	17.6	17.8	17.6	17.6	17.7	17.5	17.6	17.4	17.6	17.5	17.3			
180	16.7	17.2	17.1	17.2	17.2	17.2	17.2	17.1	16.5	16.8	16.7	16.8	16.6	16.7	16.8	16.6			

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 *******