

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-8232M50

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-8232M50	
Remark	N/A	
Representative (Tested) Model	LED-8232M50	
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	SPMWHT228FD5WAR☆S3	
Dimming	Non-Dimmable	
Sample Number	JBE181108-H-C1(5000K)	
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	5000K

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-8232M50		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE181108-	120.0	60	1.187	140.9	0.9893	8.76
H-C1	277.0	60	0.5227	138.4	0.9559	15.49

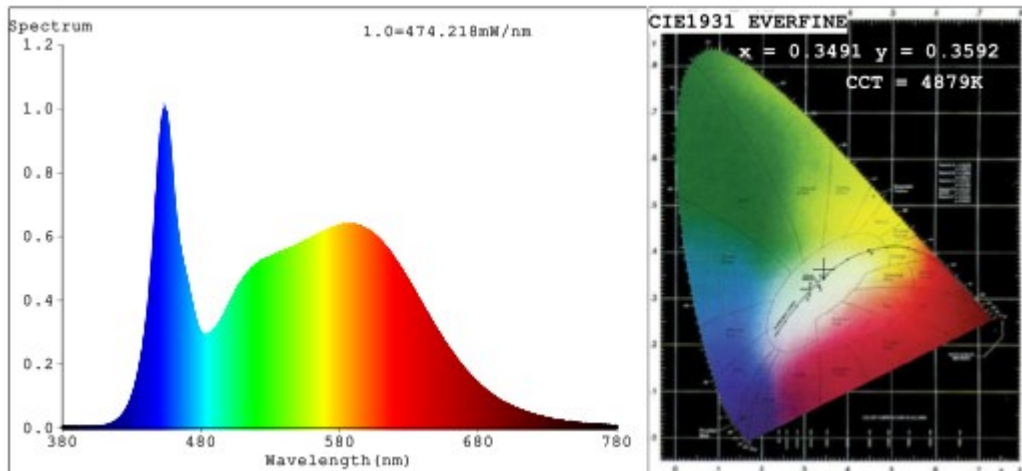
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	16
Frequency (Hz)	60	R2	92	R10	79
CCT (K)	4879	R3	96	R11	81
Duv	0.0022	R4	82	R12	58
Chromaticity (x, y)	x=0.3491 y=0.3592	R5	83	R13	86
Chromaticity (u', v')	u'=0.2112 v'=0.4889	R6	87	R14	98
Color Rendering Index (CRI)	84.8	R7	87	R15	78
R9	16	R8	69	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	19333	19184
Luminous Efficacy (lm/W)	137.21	138.61
Beam Angle (°)	114.4	--
Center Beam Candle Power (cd)	6579	--

Spectral Power Distribution & Chromaticity Diagram

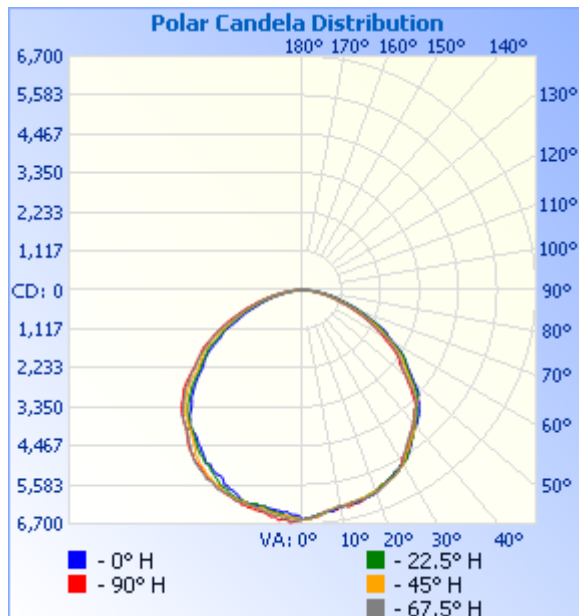


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5,154.0	26.7%
0-40	8,545.2	44.2%
0-60	15,308.2	79.2%
60-90	3,844.1	19.9%
70-100	1,639.9	8.5%
90-120	141.8	0.7%
0-90	19,152.2	99.1%
90-180	179.3	0.9%
0-180	19,331.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	614.9	3.2%	90-100	79.9	0.4%
10-20	1,779.0	9.2%	100-110	48.8	0.3%
20-30	2,760.2	14.3%	110-120	13.1	0.1%
30-40	3,391.1	17.5%	120-130	8.3	0%
40-50	3,592.6	18.6%	130-140	8.3	0%
50-60	3,170.4	16.4%	140-150	8.2	0%
60-70	2,284.1	11.8%	150-160	6.7	0%
70-80	1,195.3	6.2%	160-170	4.3	0%
80-90	364.6	1.9%	170-180	1.8	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
3.3ft	604 fc	10.1 ft	10.3 ft
6.7ft	147 fc	20.5 ft	20.9 ft
10.0ft	65.8 fc	30.6 ft	31.2 ft
13.3ft	37.2 fc	40.7 ft	41.5 ft
16.7ft	23.6 fc	51.2 ft	52.1 ft
20.0ft	16.4 fc	61.3 ft	62.4 ft

Blue Vert. Spread: 113.7°
 Red Horiz. Spread: 114.6°

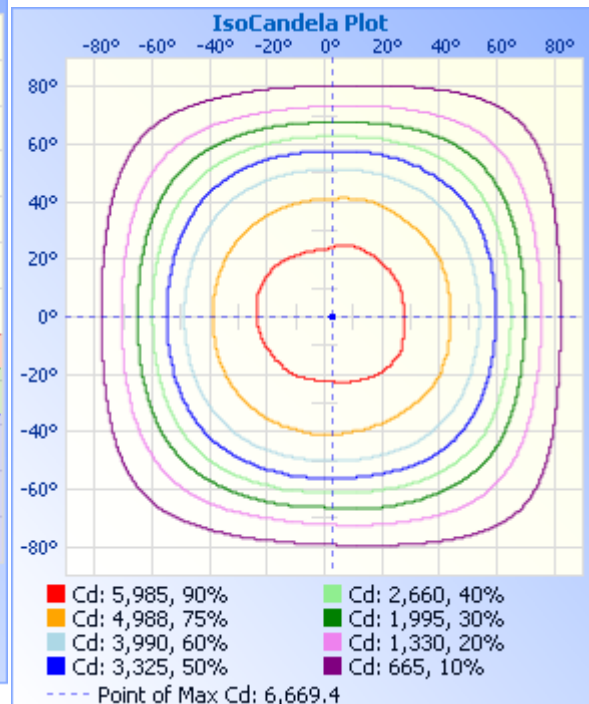
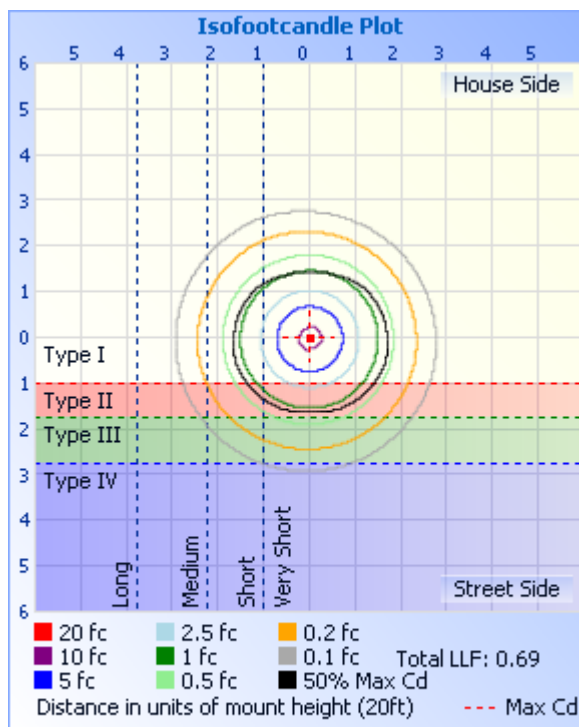


Table--1

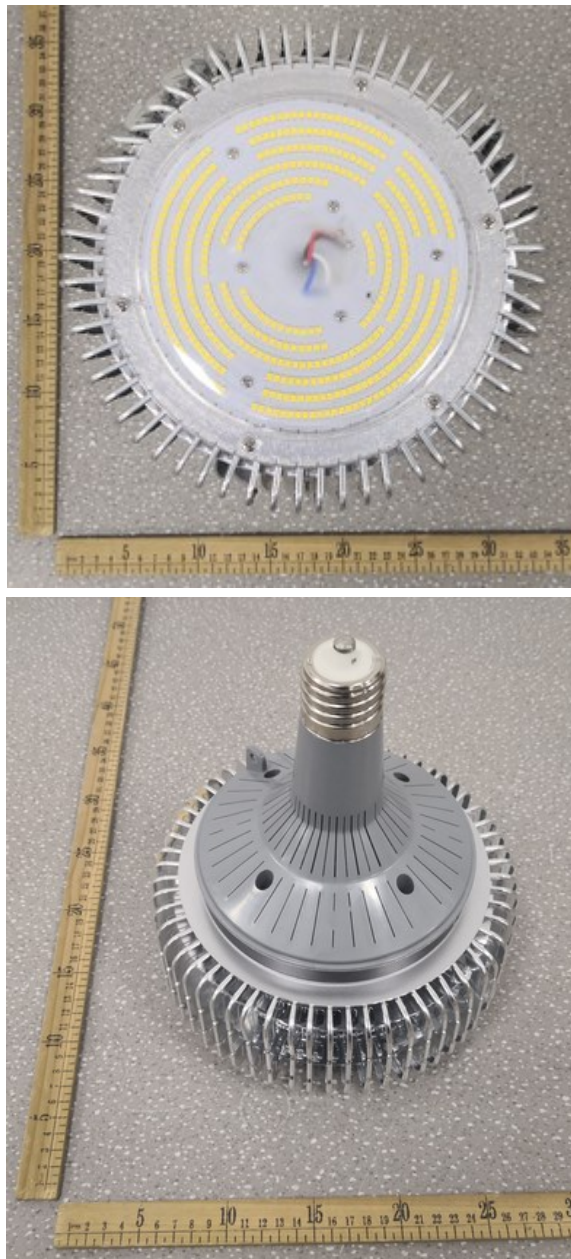
UNIT: cd

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	6579	6579	6579	6579	6579	6579	6579	6579	6579	6579	6579	6579	6579	6579	6579	6579			
5	6597	6647	6576	6576	6448	6423	6441	6413	6422	6470	6422	6397	6397	6438	6492	6574			
10	6458	6497	6463	6435	6304	6265	6294	6288	6301	6323	6346	6411	6289	6298	6350	6416			
15	6380	6421	6323	6353	6279	6243	6213	6224	6298	6247	6223	6326	6292	6288	6299	6374			
20	6253	6247	6282	6270	6185	6143	6140	6178	6119	6109	6048	6108	6075	6190	6238	6240			
25	6072	6119	6113	6086	5944	5924	5988	5959	5964	5949	5862	5859	5819	5917	6051	6092			
30	5862	5881	5839	5835	5763	5774	5791	5716	5696	5666	5616	5607	5603	5646	5807	5924			
35	5621	5628	5645	5537	5416	5391	5365	5282	5296	5280	5349	5228	5253	5329	5422	5596			
40	5175	5274	5160	5085	5072	5032	4996	4976	4934	4937	4936	5000	5063	5031	5081	5202			
45	4906	4895	4897	4834	4721	4642	4653	4624	4576	4539	4486	4523	4496	4653	4718	4848			
50	4455	4475	4503	4359	4232	4127	4047	3903	3897	3853	3899	3891	3949	4047	4243	4397			
55	3762	3838	3695	3644	3626	3581	3543	3422	3350	3385	3366	3363	3417	3460	3573	3731			
60	3274	3311	3230	3193	3007	2957	2924	2828	2692	2695	2724	2668	2726	2840	3062	3174			
65	2593	2614	2601	2539	2443	2392	2248	2092	2052	2020	2027	2053	2072	2265	2351	2548			
70	1922	1919	1938	1868	1758	1728	1617	1534	1399	1391	1414	1517	1682	1750	1852				
75	1343	1339	1324	1294	1173	1113	1046	946	913	900	919	980	1009	1099	1220	1252			
80	830	855	843	811	733	668	596	530	487	462	478	504	548	649	733	789			
85	430	452	441	396	357	323	275	232	206	196	201	219	251	290	337	392			
90	177	181	181	157	119	92.5	72.5	72.1	73.4	71.8	74.3	75.4	69.0	84.1	113	151			
95	84.4	77.6	83.1	78.6	71.8	68.1	62.7	61.9	71.3	65.9	74.4	72.6	67.4	70.7	76.5	81.8			
100	69.2	65.2	71.7	71.2	67.5	53.6	42.1	45.8	49.1	49.5	48.0	43.9	42.7	49.7	62.4	71.9			
105	58.6	56.7	56.9	52.6	59.2	54.3	46.3	38.4	38.6	40.2	41.0	46.0	52.0	60.6	63.0	60.0			
110	29.2	33.7	29.8	24.5	23.8	19.7	16.3	15.9	17.6	18.1	16.2	18.1	15.8	20.4	24.7	27.4			
115	10.9	15.9	14.7	13.8	13.2	12.0	10.7	10.7	11.1	11.5	10.6	10.8	9.43	11.0	13.3	10.8			
120	8.35	10.6	11.5	10.1	10.2	9.95	9.43	9.01	9.30	9.29	9.02	8.64	8.53	8.65	9.18	8.56			
125	8.08	8.64	9.48	8.64	9.04	9.00	8.75	8.97	9.57	9.69	9.48	9.26	8.96	8.84	8.84	8.51			
130	9.02	9.01	9.37	9.15	9.46	9.64	9.85	10.3	10.8	10.9	10.6	10.6	10.3	10.1	9.92	9.52			
135	9.98	10.3	10.3	10.3	10.5	10.6	10.8	11.0	11.5	11.6	11.3	11.2	11.0	10.9	10.8	10.4			
140	11.3	11.5	11.5	11.5	11.5	11.7	11.9	12.0	12.4	12.5	12.3	12.2	12.0	11.9	11.9	11.6			
145	12.7	12.7	12.8	12.8	12.8	13.0	13.2	13.4	13.5	13.6	13.6	13.6	13.2	13.0	13.0	12.8			
150	13.8	13.9	13.9	14.0	14.0	14.1	14.2	14.5	14.6	14.6	14.5	14.6	14.2	14.0	13.9	13.7			
155	14.2	14.2	14.2	14.1	14.1	14.5	14.6	14.7	14.7	14.9	14.7	14.7	14.3	14.0	14.3	14.2			
160	14.2	14.2	14.2	14.1	14.1	14.3	14.4	14.7	14.8	14.9	14.8	14.7	14.5	14.4	14.3	14.3			
165	14.7	14.6	14.5	14.6	14.5	14.6	14.8	15.1	15.1	15.2	15.1	15.1	14.9	14.8	14.7	14.7			
170	17.0	17.1	16.9	16.9	16.9	17.1	17.2	17.4	17.5	17.4	17.5	17.5	16.8	16.7	16.7	16.8			
175	19.4	19.5	19.4	19.4	19.1	19.4	19.1	19.2	19.3	19.3	19.2	19.1	19.1	19.1	18.9	19.0			
180	19.1	19.0	18.8	18.8	18.7	18.6	18.5	18.8	18.5	18.5	18.5	18.5	18.2	18.3	18.4	18.4			

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 *******