

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-8236M50C

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,
No. 66 Qingyi Road, Ningbo National Hi-Tech Zone,
Ningbo, Zhejiang

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-8236M50C	
Remark	N/A	
Representative (Tested) Model	LED-8236M50C	
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-AL1	
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	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	2019-03-10	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8236M50C		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE181108-	277.0	60	0.3693	98.85	0.9664	13.49
H-AL1	347.0	60	0.3056	99.20	0.9354	18.38

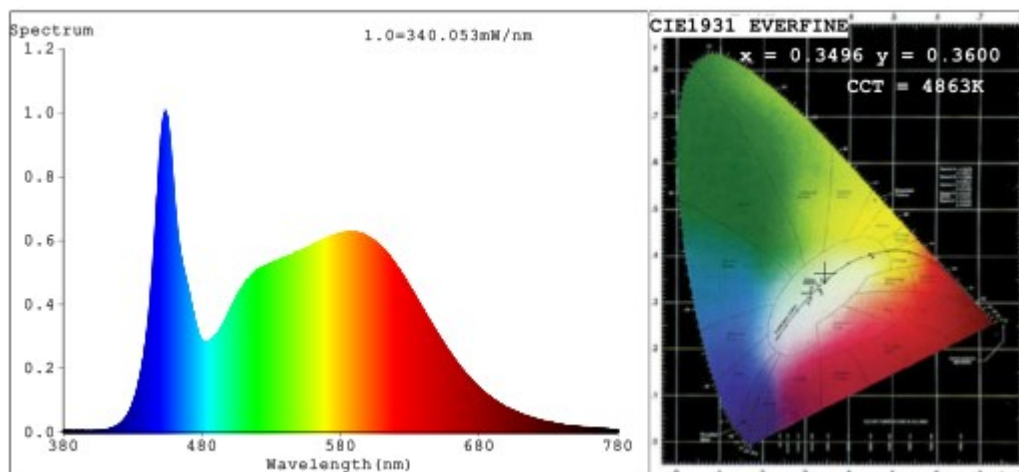
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	84	R9	16
Frequency (Hz)	60	R2	92	R10	79
CCT (K)	4863	R3	96	R11	81
Duv	0.0024	R4	82	R12	58
Chromaticity (x, y)	x=0.3496 y=0.3600	R5	83	R13	86
Chromaticity (u', v')	u'=0.2113 v'=0.4894	R6	87	R14	98
Color Rendering Index (CRI)	84.9	R7	88	R15	78
R9	16	R8	69	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	13693	13696
Luminous Efficacy (lm/W)	138.52	138.06
Beam Angle (°)	114.5	--
Center Beam Candle Power (cd)	4658	--

Spectral Power Distribution & Chromaticity Diagram

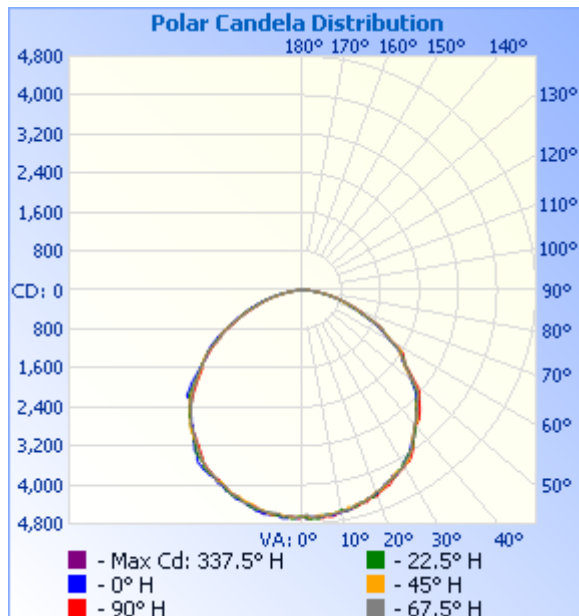


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,695.4	27%
0-40	6,115.4	44.7%
0-60	10,887.0	79.5%
60-90	2,681.0	19.6%
70-100	1,124.8	8.2%
90-120	92.8	0.7%
0-90	13,568.0	99.1%
90-180	124.3	0.9%
0-180	13,692.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	442.8	3.2%	90-100	42.7	0.3%
10-20	1,279.1	9.3%	100-110	38.3	0.3%
20-30	1,973.4	14.4%	110-120	11.8	0.1%
30-40	2,420.0	17.7%	120-130	7.0	0.1%
40-50	2,536.9	18.5%	130-140	7.2	0.1%
50-60	2,234.7	16.3%	140-150	6.9	0.1%
60-70	1,598.8	11.7%	150-160	5.4	0%
70-80	843.8	6.2%	160-170	3.4	0%
80-90	238.4	1.7%	170-180	1.5	0%

Photometric Data



Illuminance at a Distance

Center Beam fc	Beam Width	Beam Width
428 fc	10.2 ft	10.2 ft
104 fc	20.7 ft	20.6 ft
46.6 fc	30.9 ft	30.8 ft
26.3 fc	41.1 ft	41.0 ft
16.7 fc	51.6 ft	51.5 ft
11.6 fc	61.8 ft	61.6 ft

Vert. Spread: 114.2°
Horiz. Spread: 114.0°

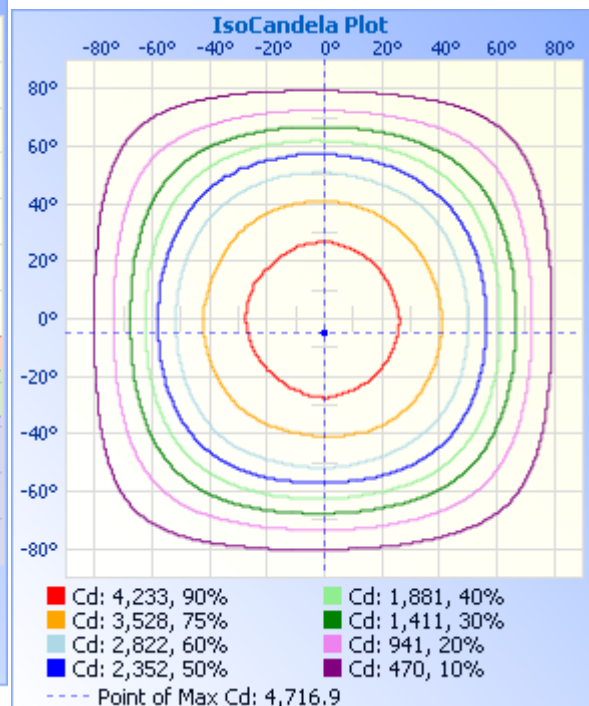
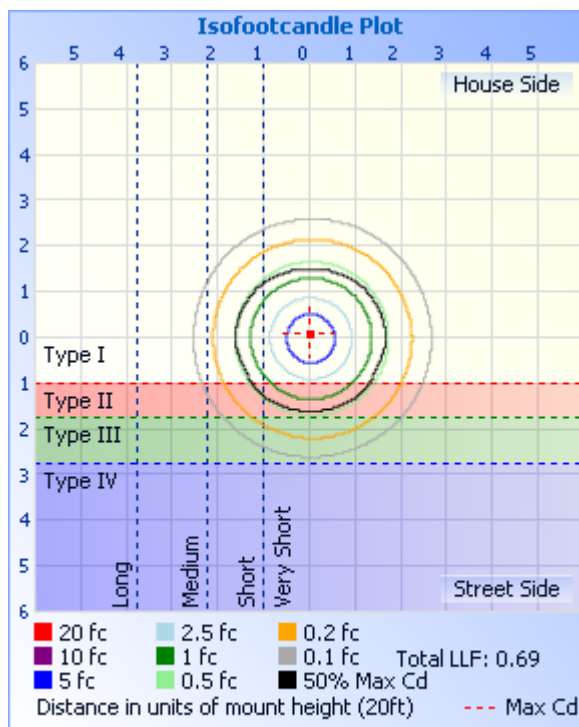


Table--1

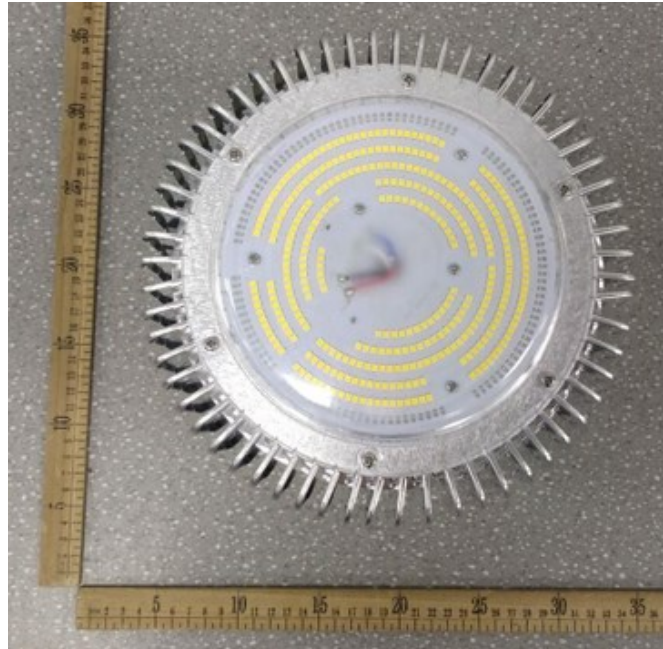
UNIT: cd

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	4658	4658	4658	4658	4658	4658	4658	4658	4658	4658	4658	4658	4658	4658	4658	4658			
5	4650	4634	4609	4661	4671	4639	4642	4681	4702	4630	4635	4662	4704	4675	4647	4681			
10	4663	4594	4557	4620	4626	4577	4615	4611	4621	4633	4570	4609	4664	4620	4587	4609			
15	4527	4500	4510	4555	4537	4529	4535	4516	4562	4569	4516	4537	4544	4511	4488	4538			
20	4388	4376	4395	4404	4453	4437	4402	4414	4497	4433	4411	4382	4417	4421	4387	4418			
25	4262	4231	4244	4262	4291	4288	4291	4300	4336	4289	4270	4267	4257	4251	4246	4233			
30	4076	4049	4086	4117	4150	4131	4153	4174	4181	4149	4176	4163	4175	4097	4093	4088			
35	3796	3748	3770	3805	3889	3943	3937	3918	3961	3960	3919	3879	3874	3861	3818	3810			
40	3557	3496	3518	3556	3608	3613	3594	3586	3624	3650	3584	3541	3560	3586	3595	3571			
45	3224	3219	3226	3265	3305	3295	3312	3326	3412	3340	3332	3345	3272	3251	3272	3222			
50	2777	2754	2817	2839	2952	2962	3032	3001	3091	3077	3044	3030	2993	2881	2814	2851			
55	2429	2402	2390	2494	2492	2551	2530	2528	2552	2554	2546	2493	2439	2466	2473	2438			
60	1948	1931	1991	2032	2094	2112	2144	2134	2162	2185	2179	2143	2087	2017	1976	1957			
65	1500	1495	1527	1555	1637	1692	1707	1731	1758	1699	1678	1640	1604	1561	1567	1522			
70	1078	1096	1142	1145	1167	1195	1215	1243	1265	1256	1227	1250	1184	1172	1111	1095			
75	738	741	746	769	806	814	821	870	864	837	846	809	810	775	739	750			
80	394	402	419	428	452	471	486	512	527	514	500	491	467	423	393	388			
85	164	163	172	184	199	213	224	226	232	237	225	206	193	180	173	172			
90	40.3	40.7	43.5	49.8	56.8	65.6	75.7	80.2	81.1	77.6	66.3	52.1	46.4	41.6	40.4	39.6			
95	35.6	35.5	37.1	36.7	35.9	36.3	36.8	37.1	36.2	36.5	35.4	33.8	34.0	34.6	34.3	34.2			
100	35.2	35.7	36.5	38.6	39.0	39.3	40.0	38.1	39.3	38.0	35.9	36.4	35.3	34.4	32.7	33.2			
105	46.1	44.5	48.6	53.3	48.1	44.9	42.7	41.1	44.0	43.8	45.0	44.9	45.7	43.8	42.6	45.5			
110	15.0	17.0	17.1	18.2	21.8	22.4	20.9	20.4	23.8	24.5	20.5	16.7	19.6	17.2	15.8	16.1			
115	8.95	9.98	10.5	10.5	10.7	11.4	12.5	11.6	12.8	12.5	11.7	10.3	11.3	10.6	9.95	10.1			
120	7.01	7.37	7.82	7.64	8.12	8.46	9.02	8.59	9.20	8.87	8.86	8.04	8.12	8.07	8.10	8.17			
125	6.90	7.01	7.09	6.98	6.92	7.15	7.40	7.09	8.29	8.07	7.98	7.93	8.04	8.26	8.35	8.50			
130	7.93	8.09	7.84	7.74	7.65	7.66	7.61	7.55	8.94	8.85	8.82	8.93	9.10	9.37	9.43	9.63			
135	8.74	8.90	8.67	8.55	8.55	8.66	8.61	8.63	9.67	9.60	9.60	9.66	9.94	10.1	10.1	10.1			
140	9.80	9.79	9.69	9.63	9.56	9.47	9.53	9.57	10.5	10.4	10.4	10.4	10.7	10.8	10.9	11.0			
145	11.0	10.7	10.6	10.7	10.7	10.7	10.6	10.7	11.5	11.4	11.3	11.3	11.5	11.6	11.8	11.9			
150	11.7	11.5	11.5	11.4	11.3	11.3	11.5	11.5	12.3	12.1	12.1	12.0	12.3	12.5	12.6	12.7			
155	11.3	11.2	11.3	11.1	11.0	11.1	11.2	11.0	12.5	12.4	12.2	12.3	12.5	12.6	12.8	12.8			
160	10.5	10.5	10.4	10.4	10.4	10.4	10.4	10.4	12.4	12.3	12.3	12.4	12.5	12.6	12.8	12.8			
165	10.8	10.7	10.6	10.6	10.7	10.6	10.5	10.6	12.9	12.8	12.7	12.8	12.8	12.9	13.1	13.1			
170	13.9	13.7	13.8	13.8	13.8	13.8	13.8	13.8	14.6	14.4	14.3	14.4	14.4	14.6	14.7	14.7			
175	16.0	15.8	15.9	16.1	16.2	16.4	16.4	16.3	16.1	15.9	16.0	16.0	16.0	16.1	16.1	16.2			
180	15.8	15.5	15.5	15.4	15.7	15.8	15.8	15.9	15.5	15.4	15.3	15.3	15.3	15.5	15.5	15.6			

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 *******