TESTING
NVLAP LAB CODE 600149-0

Ningbo TengLi Testing Co., Ltd

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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-8236M50

Report Type:	Testing and Report According to IES LM-79-2008
Type of Luminaire:	LED Luminaires
Report Date:	2019-03-13
Prepared By:	Ningbo TengLi Testing Co., Ltd 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-8236M50	
Remark	N/A	
Representative (Tested) Model	LED-8236M50	
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-AI1	
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	120-277Vac, 50/60Hz
Nominal Power	95W
Rated Initial Lamp Lumen	--
Declared CCT	5000K

1.3 Test Specifications:

Test item	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	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°C ± 1°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 25º C ± 1º 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 25º C ± 1º 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	2019-03-05	Test Ambient:	25.2 º C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8236M50		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE181108-H-AI1	120.0	60	0.8576	99.87	0.9704	10.16
	277.0	60	0.3906	99.52	0.9199	16.29

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4863
Duv	0.0024
Chromaticity (x, y)	x=0.3496 y=0.3601
Chromaticity (u', v')	u'=0.2112 v'=0.4894
Color Rendering Index (CRI)	4863
R9	17

Special Color Rendering Indices			
R1	84	R9	17
R2	92	R10	80
R3	96	R11	81
R4	82	R12	58
R5	83	R13	86
R6	87	R14	98
R7	87	R15	78
R8	69	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	13873	13880
Luminous Efficacy (lm/W)	138.91	139.47
Beam Angle (°)	115.0	--
Center Beam Candle Power (cd)	4725	--

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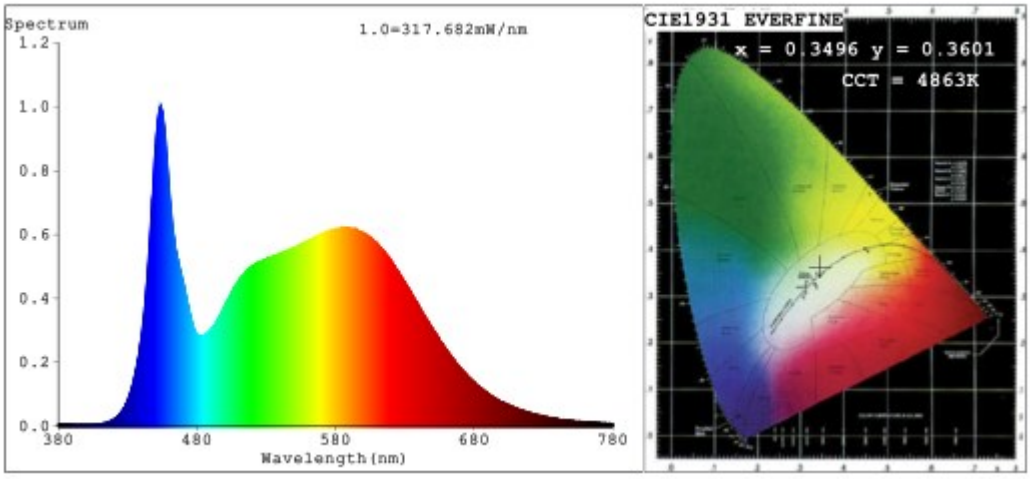
Spectral Power Distribution & Chromaticity Diagram

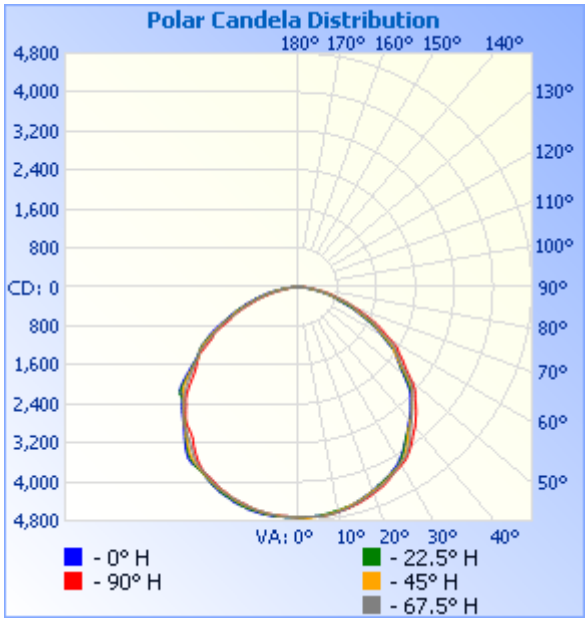


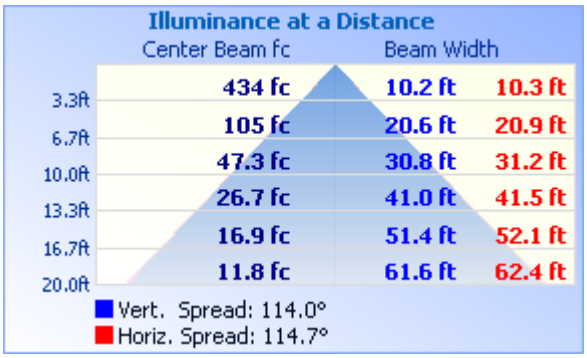
Zonal Lumen Tabulation

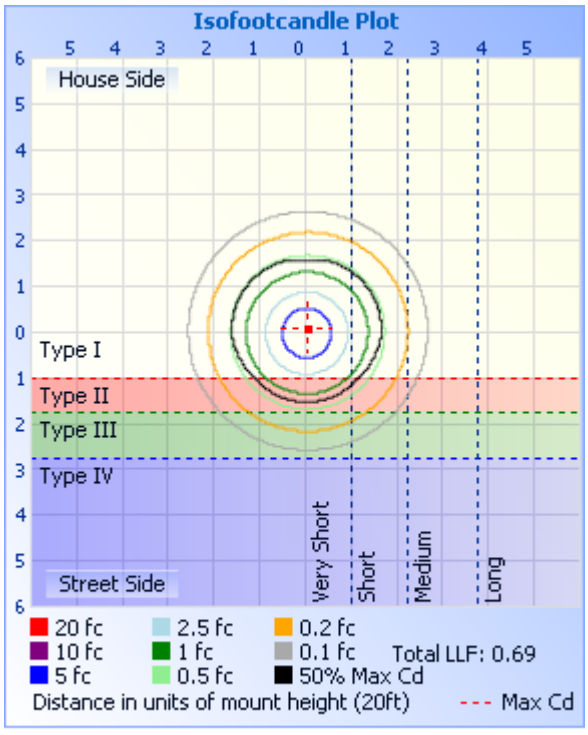
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,752.4	27.1%
0-40	6,209.3	44.8%
0-60	11,046.9	79.6%
60-90	2,710.6	19.5%
70-100	1,128.9	8.1%
90-120	89.0	0.6%
0-90	13,757.5	99.2%
90-180	114.2	0.8%
0-180	13,871.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	449.5	3.2%	90-100	41.8	0.3%
10-20	1,299.0	9.4%	100-110	37.3	0.3%
20-30	2,004.0	14.4%	110-120	10.0	0.1%
30-40	2,456.9	17.7%	120-130	5.5	0%
40-50	2,568.6	18.5%	130-140	5.6	0%
50-60	2,268.9	16.4%	140-150	5.5	0%
60-70	1,623.4	11.7%	150-160	4.5	0%
70-80	848.1	6.1%	160-170	2.9	0%
80-90	239.1	1.7%	170-180	1.2	0%

Photometric Data







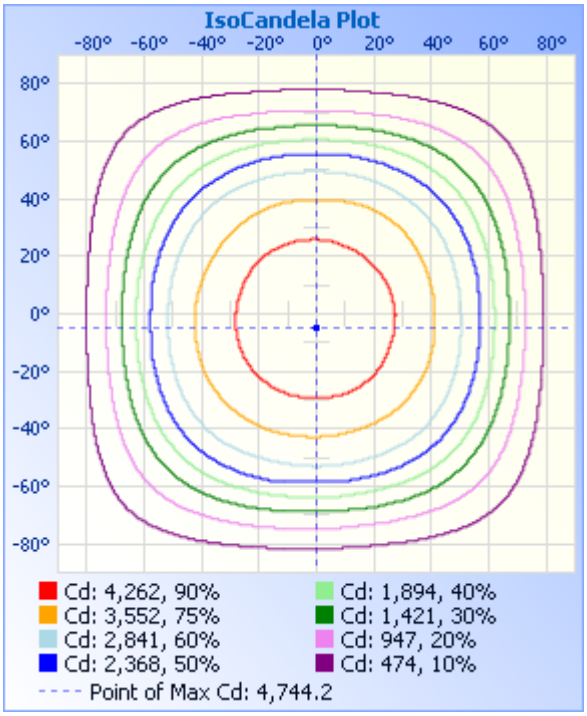


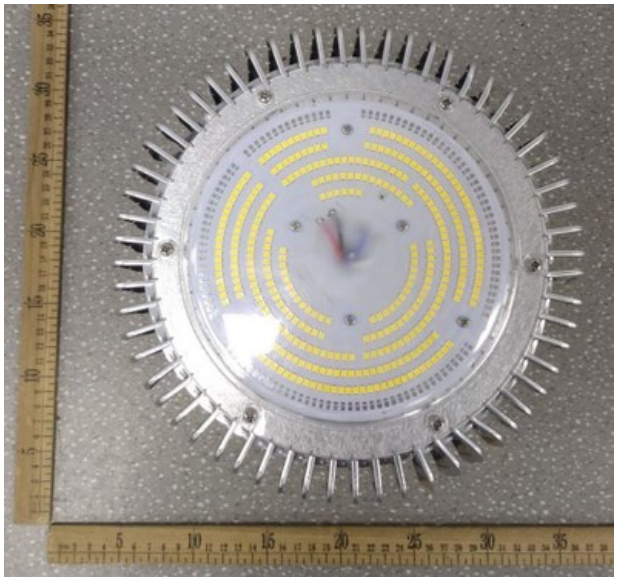
Table--1 UNIT: cd

γ (DEG) \ C (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	4725	4725	4725	4725	4725	4725	4725	4725	4725	4725	4725	4725	4725	4725	4725	4725
5	4707	4721	4714	4732	4722	4716	4729	4732	4726	4725	4725	4730	4736	4731	4714	4713
10	4664	4664	4656	4678	4679	4658	4673	4688	4692	4697	4703	4716	4707	4682	4673	4664
15	4579	4574	4558	4580	4574	4578	4583	4593	4614	4631	4631	4634	4635	4633	4592	4578
20	4463	4446	4447	4442	4447	4458	4455	4488	4508	4524	4532	4536	4533	4518	4482	4478
25	4312	4299	4278	4293	4305	4312	4327	4347	4372	4400	4393	4376	4378	4373	4356	4332
30	4134	4118	4086	4094	4129	4155	4182	4186	4224	4235	4241	4248	4241	4244	4202	4179
35	3797	3780	3812	3837	3833	3831	3891	3962	4011	4052	4052	4068	4052	3996	3970	3896
40	3600	3586	3613	3588	3547	3585	3577	3606	3726	3732	3724	3685	3685	3638	3655	3664
45	3282	3251	3219	3248	3263	3285	3290	3303	3410	3449	3438	3431	3393	3365	3343	3328
50	2827	2802	2768	2831	2831	2863	2942	2994	3060	3135	3135	3159	3156	3108	3052	2949
55	2520	2434	2438	2465	2454	2492	2447	2508	2613	2651	2662	2579	2580	2554	2521	2535
60	2041	1971	1967	1988	1995	2001	2037	2119	2214	2290	2283	2279	2217	2212	2172	2086
65	1531	1518	1526	1506	1514	1530	1609	1680	1741	1796	1814	1789	1741	1688	1673	1638
70	1120	1069	1059	1027	1034	1089	1187	1201	1251	1276	1328	1307	1282	1270	1226	1193
75	734	723	689	696	712	720	757	803	827	889	907	922	911	860	817	774
80	375	367	356	362	373	388	414	461	513	554	562	579	567	517	480	431
85	163	155	147	149	151	158	172	194	234	247	271	269	253	229	204	184
90	37.3	36.2	36.4	38.5	36.4	37.2	43.5	55.7	82.4	99.2	103	99.5	85.8	67.7	52.2	42.8
95	30.7	30.9	31.8	32.3	32.8	32.4	31.5	32.9	37.0	38.9	39.4	39.9	38.2	35.2	32.4	31.1
100	30.0	30.3	31.1	31.7	32.1	35.4	36.0	38.7	38.6	36.0	37.4	39.2	38.0	38.3	33.6	32.4
105	38.0	37.3	33.7	38.3	41.3	44.3	48.9	45.5	41.5	37.6	39.1	41.6	43.1	47.2	47.7	50.5
110	11.1	12.4	13.1	12.4	13.0	13.2	18.4	19.2	23.2	27.8	26.4	21.5	19.8	19.1	18.3	16.0
115	6.88	7.42	8.31	8.30	8.11	8.32	9.23	10.3	11.1	11.2	11.3	9.51	8.71	8.90	7.98	7.97
120	5.87	5.99	6.26	6.45	6.56	6.64	6.95	7.61	7.78	7.82	7.24	5.95	5.87	5.90	5.77	5.77
125	5.81	5.90	6.07	6.15	6.09	6.07	6.10	6.42	6.32	6.26	6.09	5.66	5.57	5.62	5.61	5.77
130	6.73	6.93	6.85	6.90	6.84	6.69	6.42	6.44	6.65	6.58	6.45	6.29	6.33	6.38	6.42	6.56
135	7.19	7.23	7.37	7.36	7.36	7.23	7.20	7.17	7.22	7.12	7.07	6.91	6.98	6.94	7.15	7.26
140	8.02	8.09	8.07	8.07	8.14	8.04	8.01	7.92	7.87	7.75	7.69	7.61	7.66	7.67	7.88	7.90
145	8.95	9.02	9.02	8.96	8.95	8.96	8.85	8.84	8.60	8.59	8.54	8.48	8.50	8.51	8.53	8.58
150	9.62	9.72	9.83	9.82	9.85	9.61	9.60	9.57	9.30	9.32	9.29	9.23	9.09	9.23	9.39	9.41
155	9.95	9.99	10.0	9.99	9.96	9.91	9.93	9.92	9.38	9.32	9.37	9.35	9.42	9.47	9.44	9.52
160	10.2	10.3	10.3	10.2	10.3	10.2	10.2	10.2	9.33	9.32	9.40	9.42	9.47	9.42	9.47	9.52
165	10.6	10.6	10.7	10.7	10.7	10.5	10.5	10.5	9.73	9.70	9.73	9.72	9.72	9.72	9.77	9.77
170	11.9	12.0	11.8	11.9	11.9	11.9	11.9	11.7	11.4	11.3	11.4	11.4	11.3	11.3	11.4	11.5
175	13.2	13.2	13.3	13.2	13.3	13.2	13.4	13.3	13.1	13.1	13.2	13.1	13.1	13.1	13.1	12.8
180	13.2	13.3	13.4	13.2	13.4	13.3	13.5	13.4	12.6	12.7	12.7	12.7	12.6	12.6	12.5	12.5

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



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