LCTECH

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IESNA SUSTAINING MEMBER

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Test report of

IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Rendered to:

Light Efficient Design, LLC

188 S. Northwest Highway，Cary, IL 60013, USA

For products:

LED Lamps

Models No.:

LED-8088M/E50C-G4

Test Date:	May. 4, 2018 to May. 7, 2018
Test Item:	Total luminous flux, Luminous Efficacy, Electrical values, Luminous Intensity Distribution, Chromaticity coordinates, CCT and CRI, Spectral Power Distribution.
Test Lab.:	**LCTECH (Zhongshan) Testing Service Co., Ltd** 2/F., Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China Tel:+86-760-22833366 Fax:+86-760-22833399 E-mail:Service@lccert.com http://www.lccert.com
Template No.:	LC-RT-PL-001 Rev.1.1
Test Note:	

Complied by:	**Reviewed by:**
Fish Tan	**Richard Li**
Project Engineer	**Technical Manager**
Jun. 6, 2018	**Jun. 6, 2018**

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1. General

1.1 Product Information

Brand Name	-
Product Type	LED Lamp
Model Number	LED-8088M/E50C-G4
Rated Inputs	220-347VAC, 50/60Hz
Rated Power	50W
Rated Light output	7900lm
Declared CCT	5000K
Power Supply	Integrated in lamp
LED Package, Array or Module	Not provided
Receipt Samples	1 unit
Sample Code of lab.	180423101006
Date of Receipt Samples	Apr. 23, 2018
Note	-

1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377-2015	Specifications for the Chromaticity of Solid State Lighting Products
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2018-01-10	2019-01-09
AC Power supply	LC-I-987	APW-110N	2018-01-10	2019-01-09
Power analyzer	LC-I-928	WT210	2018-01-05	2019-01-05
Power analyzer	LC-I-954	WT210	2018-01-10	2019-01-09
Multimeter	LC-I-972	Fluke 17B	2017-08-08	2018-08-07
Photometric colorimetric electric system[1] (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp[2]	LC-PL-I-011	D204C	2017-09-07	2018-09-06
Luminous Flux Standard Lamp[3]	LC-PL-I-003	24V100W	2017-09-22	2018-09-21
Goniophotometer(with mirror)	LC-I-902	GMS2000	2018-05-07	2019-05-06
Wireless temperature transmitter	LC-I-978	DWRF-B	2018-02-11	2019-02-10
Wireless temperature transmitter	LC-I-979	DWRF-B	2018-02-11	2019-02-10

Note:

1, Bandwidth of spectroradiometer is 1 nm.

2, halogen lamp, 100W, omni-directional type, and its traceability to NIM.

3, halogen lamp, 100W, omni-directional type, and its traceability to NIM.

2. Test conducted and method

The lamp was operated at least 2 hours to reach stabilization and temperature equilibrium before test.

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25 °C ± 1°C; the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within±0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Electrical Instrumentation

The calibration uncertainties of the instruments for AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent(95 % confidence interval, k=2).

2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by type C goniophotometer system.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

3. Test Result Summary

3.1 Electrical data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	347.00 V~60Hz	347.08 V~60Hz
Input Current(A)	0.169	0.170
Total Power(W)	54.75	54.83
Power Factor	0.933	0.932
I-THD	18.78%	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-[4]	7919.81
Luminaire Efficacy(Lm/W)	-	144.44
Correlated Color Temperature (CCT)(K)	5060	-
Color Rendering Index (CRI)	83.3	-
R9	10	-
Chromaticity Coordinate (x,y)	x=0.3436 y=0.3518	-
Chromaticity Coordinate (u,v)	u=0.2103 v=0.3230	-
Chromaticity Coordinate (u',v')	u'=0.2103 v'=0.4845	-
Duv	0.0007	-
Zone Lumens between 0-60 °	-	78.31%

3.3 Color Rendering Details

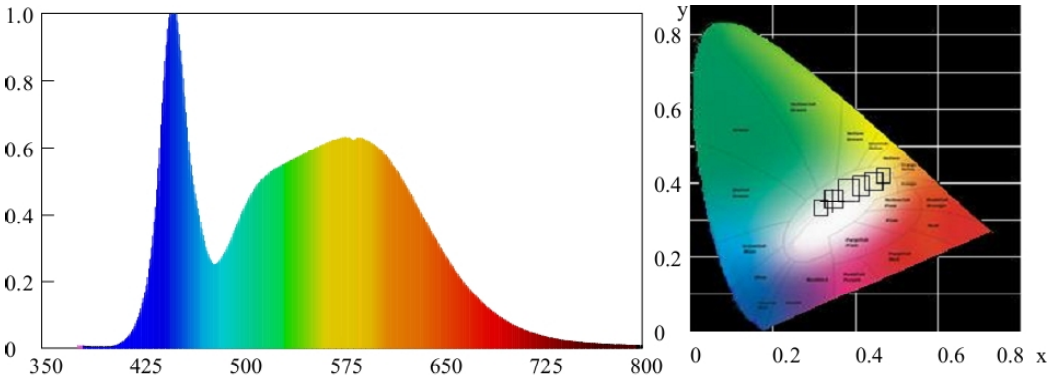
R1	R2	R3	R4	R5	R6	R7	R8
82	88	92	84	83	83	87	68
R9	R10	R11	R12	R13	R14	R15	-
10	71	83	63	84	95	77	-

Note:

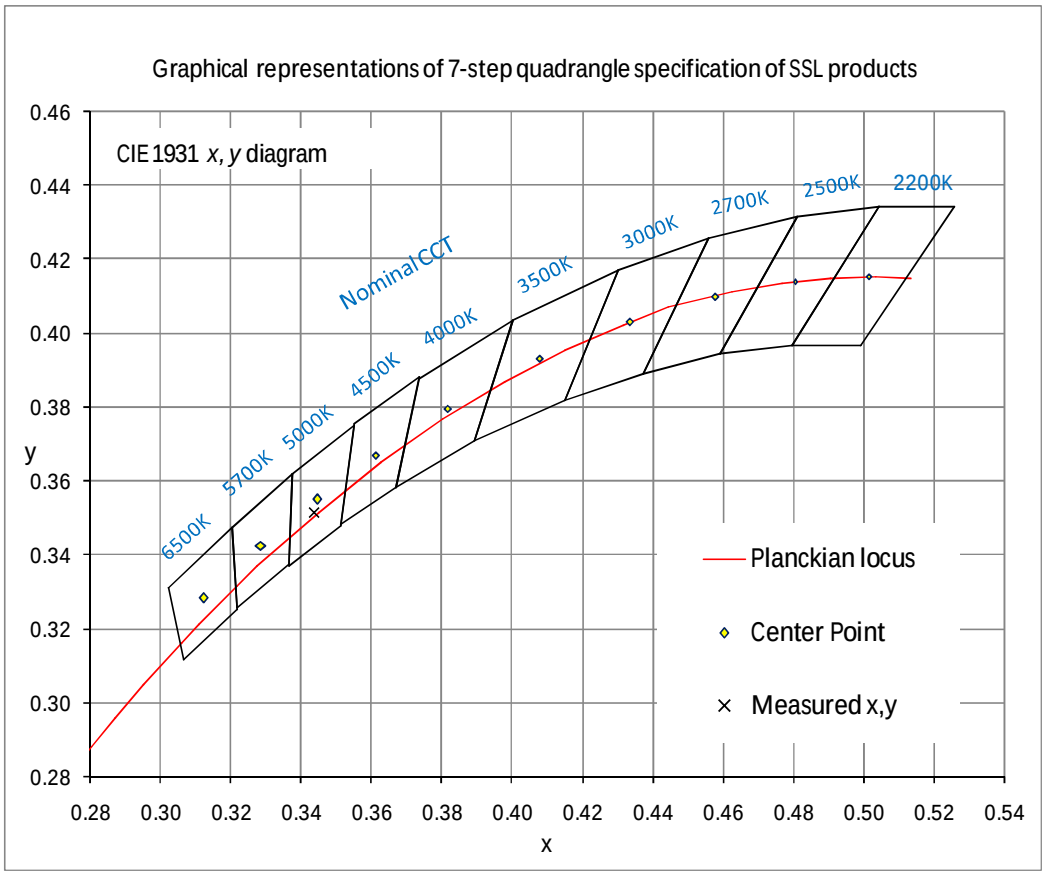
4, Self-absorption is 1.

4. Test Data

4.1 Spectral Distribution



4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular
Spacing Criteria (0-180)	1.30	Luminous Length	0.11 m
Spacing Criteria (90-270)	1.32	Luminous Width	0.07 m
Spacing Criteria (Diagonal)	1.42	Luminous Height	0.00 m
Test Distance	29.79 m		

4.4 Zonal Lumen Summary

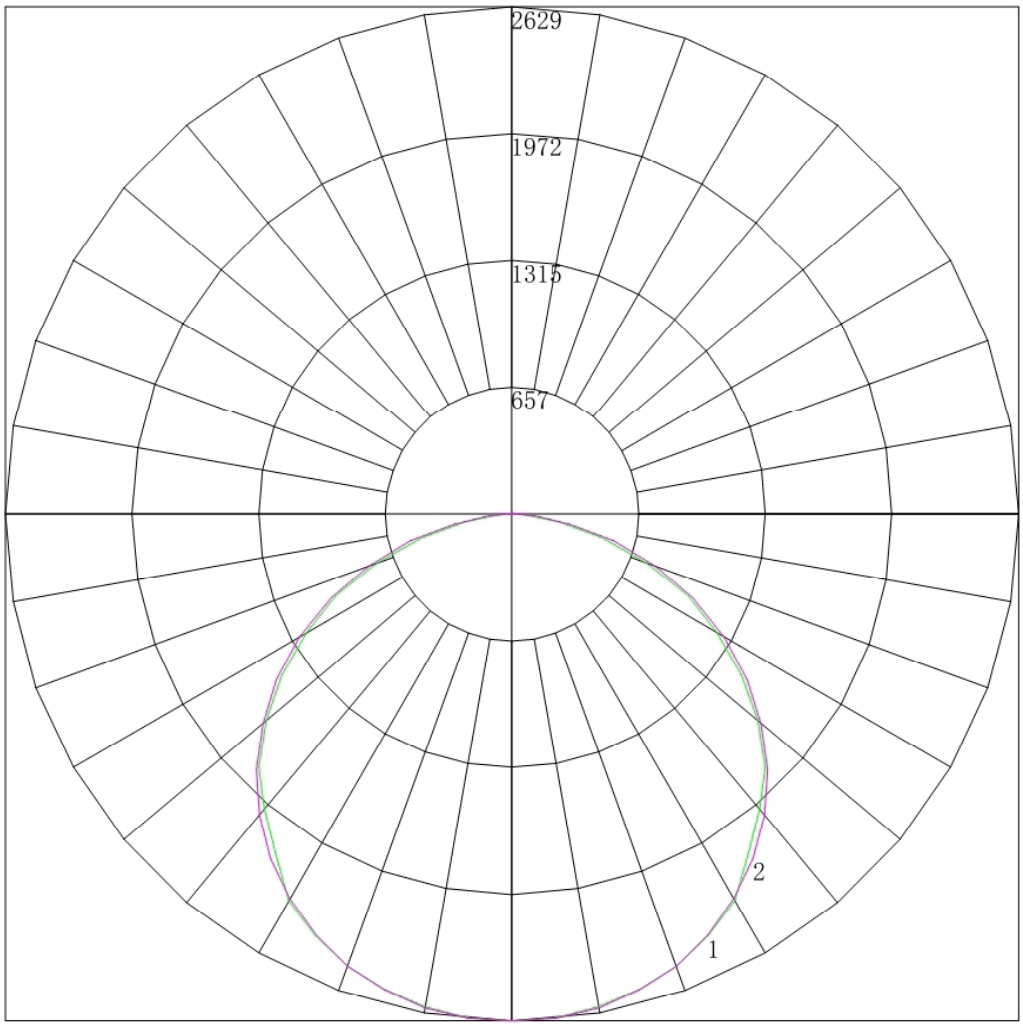
Zone	Lumens	%Lamp	%Fixt
0-20	971.96	12.30	12.30
0-30	2084.64	26.30	26.30
0-40	3447.69	43.50	43.50
0-60	6201.98	78.30	78.30
0-80	7752.19	97.90	97.90
0-90	7892.82	99.70	99.70
10-90	7643.13	96.50	96.50
20-40	2475.73	31.30	31.30
20-50	3913.26	49.40	49.40
40-70	3757.02	47.40	47.40
60-80	1550.22	19.60	19.60
70-80	547.49	6.90	6.90
80-90	140.62	1.80	1.80
90-110	12.77	0.20	0.20
90-120	15.11	0.20	0.20
90-130	17.37	0.20	0.20
90-150	21.46	0.30	0.30
90-180	26.99	0.30	0.30
110-180	14.22	0.20	0.20
0-180	7919.8	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	249.68
10-20	722.28
20-30	1112.68
30-40	1363.05
40-50	1437.53
50-60	1316.76
60-70	1002.72
70-80	547.49
80-90	140.62
90-100	9.95
100-110	2.82
110-120	2.35
120-130	2.25
130-140	1.96
140-150	2.13
150-160	2.44
160-170	2.21
170-180	0.88

4.5 Polar Curves

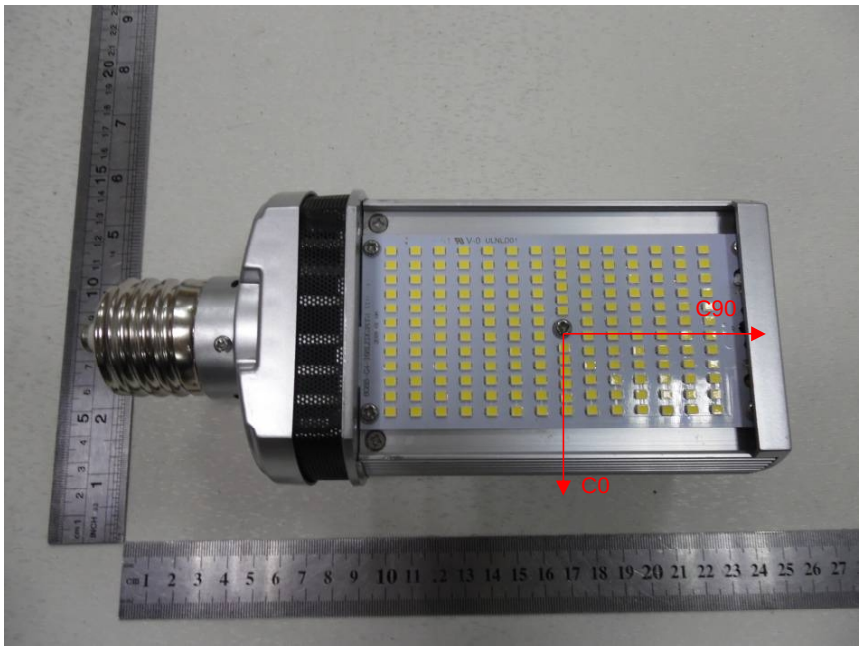


Maximum Candela = 2629.337 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	2629.337	2629.337	2629.337	2629.337	2629.337	2629.337	2629.337
5	2622.676	2623.112	2624.673	2623.792	2623.579	2621.817	2626.709
10	2596.920	2601.091	2601.789	2602.269	2599.866	2597.920	2602.868
15	2552.514	2559.720	2558.462	2558.779	2554.651	2553.662	2555.614
20	2496.117	2498.326	2497.140	2497.540	2494.594	2490.370	2494.654
25	2412.632	2418.461	2416.487	2414.111	2409.714	2405.843	2408.510
30	2314.938	2321.033	2318.281	2312.933	2308.434	2302.947	2303.813
35	2142.650	2163.089	2196.076	2193.118	2184.324	2178.139	2183.202
40	1999.219	1998.250	1998.098	2055.322	2044.922	2037.835	2038.747
45	1859.782	1857.001	1847.703	1854.739	1887.132	1876.523	1876.167
50	1666.173	1682.372	1681.059	1664.593	1704.510	1693.297	1687.966
55	1456.131	1457.494	1462.428	1475.770	1476.015	1494.142	1490.475
60	1231.879	1252.604	1246.700	1246.993	1250.634	1273.952	1271.349
65	1011.175	1004.365	997.407	1014.695	1025.245	1036.728	1035.434
70	742.514	752.329	745.677	761.303	770.384	783.801	787.125
75	485.392	489.408	501.932	512.795	528.801	545.014	546.301
80	247.367	248.271	264.421	293.147	298.105	307.380	306.834
85	75.504	80.985	100.891	113.170	118.351	124.369	121.640
90	19.986	23.137	25.992	25.512	23.928	20.352	18.147
95	1.776	5.563	8.668	7.102	5.320	2.877	1.326
100	1.776	2.669	4.000	3.995	3.325	2.655	1.326
105	2.220	2.225	2.889	3.107	2.882	2.435	1.769
110	2.220	2.224	2.666	2.663	2.659	2.435	1.769
115	2.220	2.224	2.444	2.441	2.438	2.435	1.769
120	2.220	2.224	2.444	2.441	2.438	2.435	2.210
125	2.220	2.224	2.444	2.663	2.659	2.655	2.651
130	2.664	2.669	2.666	2.663	2.659	2.655	2.651
135	2.220	2.224	2.444	2.219	2.438	2.213	2.208
140	2.664	2.669	2.888	2.884	2.881	3.098	3.092
145	3.109	3.114	3.332	3.550	3.546	3.319	3.533
150	3.997	4.004	3.999	3.994	3.989	4.204	3.976
155	5.329	5.339	5.332	5.325	5.319	5.311	5.300
160	6.661	6.673	6.666	6.657	6.649	6.639	6.625
165	7.993	8.008	7.999	7.988	7.978	7.966	7.951
170	8.882	8.898	8.887	8.875	8.865	8.852	8.835
175	9.326	9.343	9.332	9.541	9.530	9.516	9.278
180	9.758	9.758	9.758	9.758	9.758	9.758	9.758

Appendix A Product Photo



Picture 1

Picture 2

****End of test report****