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-8035E40-A

Test Date:	Mar. 8, 2018 to Mar. 9, 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-8035E40-A
Rated Inputs	120-277VAC, 50/60Hz
Rated Power	60W
Rated Light output	7100lm
Declared CCT	4000K
Power Supply	Integrated in lamp
LED Package, Array or Module	Not provided
Receipt Samples	1 unit
Sample Code of lab.	180201106003
Date of Receipt Samples	Feb. 1, 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	120.00 V~60Hz	120.02 V~60Hz
Input Current(A)	0.507	0.506
Total Power(W)	60.27	60.18
Power Factor	0.992	0.991
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-[4]	7135.22
Luminaire Efficacy(Lm/W)	-	118.56
Correlated Color Temperature (CCT)(K)	4149	-
Color Rendering Index (CRI)	84.7	-
R9	20	-
Chromaticity Coordinate (x,y)	x = 0.3746 y = 0.3748	-
Chromaticity Coordinate (u,v)	u = 0.2220 v = 0.3332	-
Chromaticity Coordinate (u',v')	u' = 0.2220 v' = 0.4999	-
Duv	0.0008	-
Zone Lumens between 0-60 °	-	55.00%

3.3 Color Rendering Details

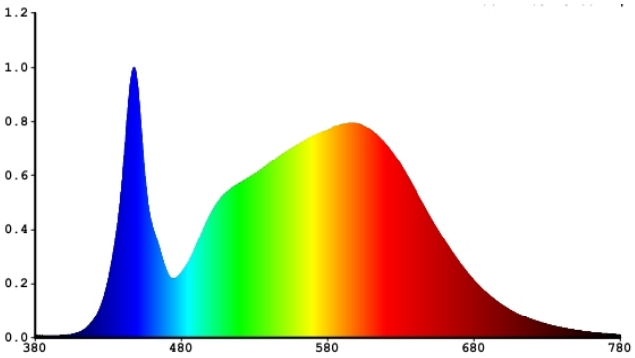
R1	R2	R3	R4	R5	R6	R7	R8
83	89	93	85	84	85	88	70
R9	R10	R11	R12	R13	R14	R15	-
20	74	85	67	84	96	78	-

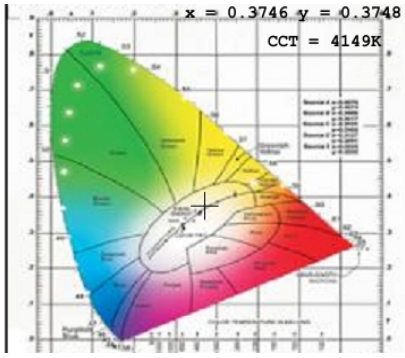
Note:

4, Self-absorption is 1.

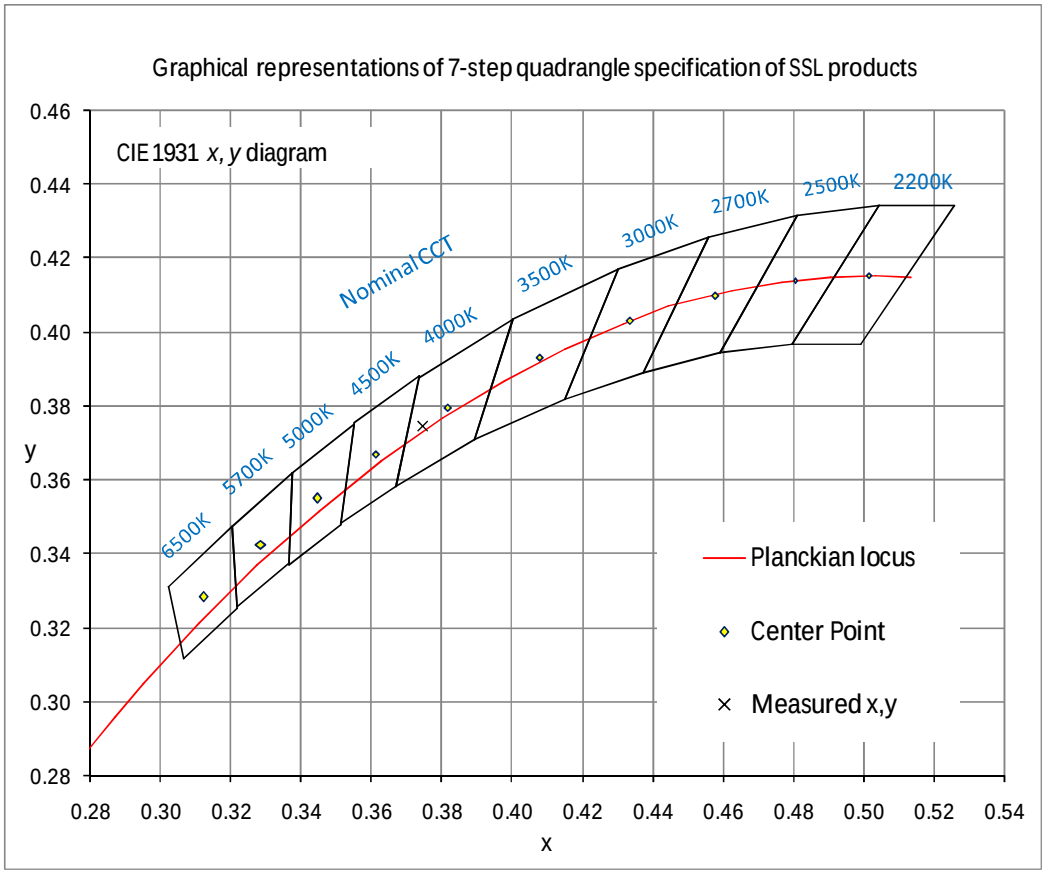
4. Test Data

4.1 Spectral Distribution





4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Semi-Direct	Basic Luminous Shape	Circular w/ Sides
Spacing Criteria (0-180)	1.10	Luminous Length	0.21 m (Diameter)
Spacing Criteria (90-270)	1.14	Luminous Width	0.21 m (Diameter)
Spacing Criteria (Diagonal)	1.28	Luminous Height	0.06 m
Test Distance	29.79 m		

4.4 Zonal Lumen Summary

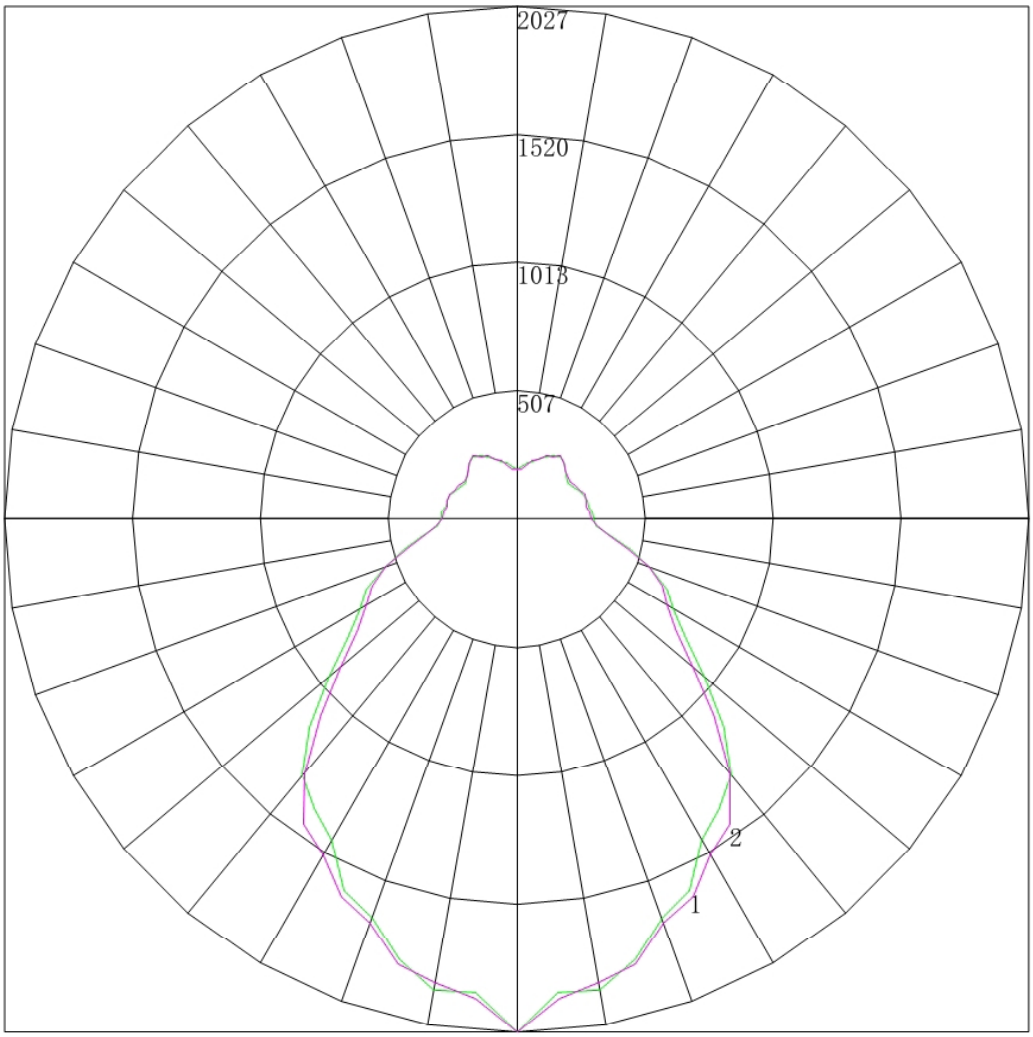
Zone	Lumens	%Lamp	%Fixt
0-20	688.70	9.70	9.70
0-30	1436.7	20.10	20.10
0-40	2328.43	32.60	32.60
0-60	3923.82	55.00	55.00
0-80	5051.02	70.80	70.80
0-90	5409.42	75.80	75.80
10-90	5227.95	73.30	73.30
20-40	1639.73	23.00	23.00
20-50	2510.6	35.20	35.20
40-70	2233.51	31.30	31.30
60-80	1127.2	15.80	15.80
70-80	489.08	6.90	6.90
80-90	358.39	5.00	5.00
90-110	623.21	8.70	8.70
90-120	891.83	12.50	12.50
90-130	1120.33	15.70	15.70
90-150	1514.84	21.20	21.20
90-180	1725.81	24.20	24.20
110-180	1102.6	15.50	15.50
0-180	7135.23	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	181.47
10-20	507.23
20-30	748.00
30-40	891.74
40-50	870.86
50-60	724.52
60-70	638.12
70-80	489.08
80-90	358.39
90-100	323.02
100-110	300.19
110-120	268.62
120-130	228.51
130-140	211.04
140-150	183.46
150-160	124.91
160-170	66.49
170-180	19.57

4.5 Polar Curves

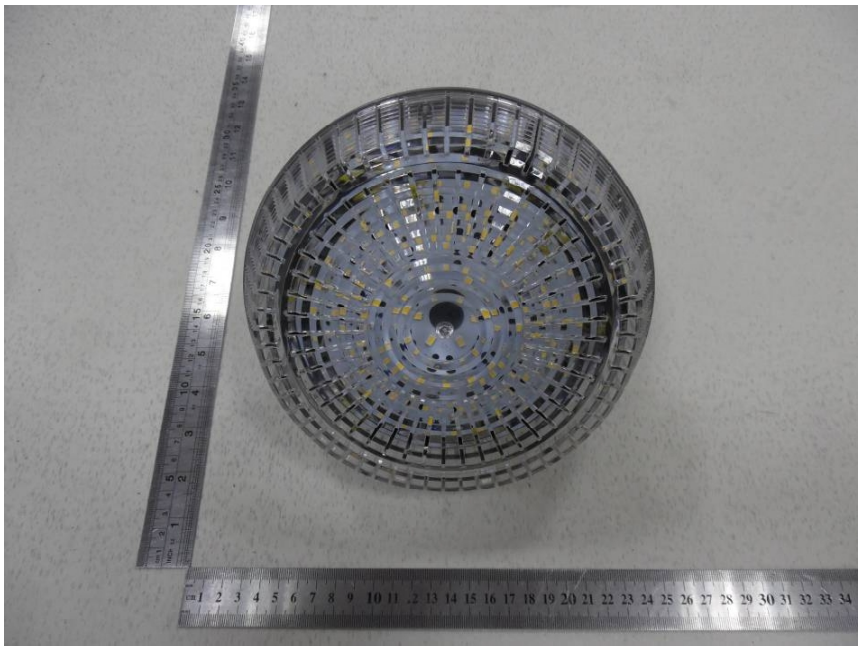


Maximum Candela = 2026.551 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

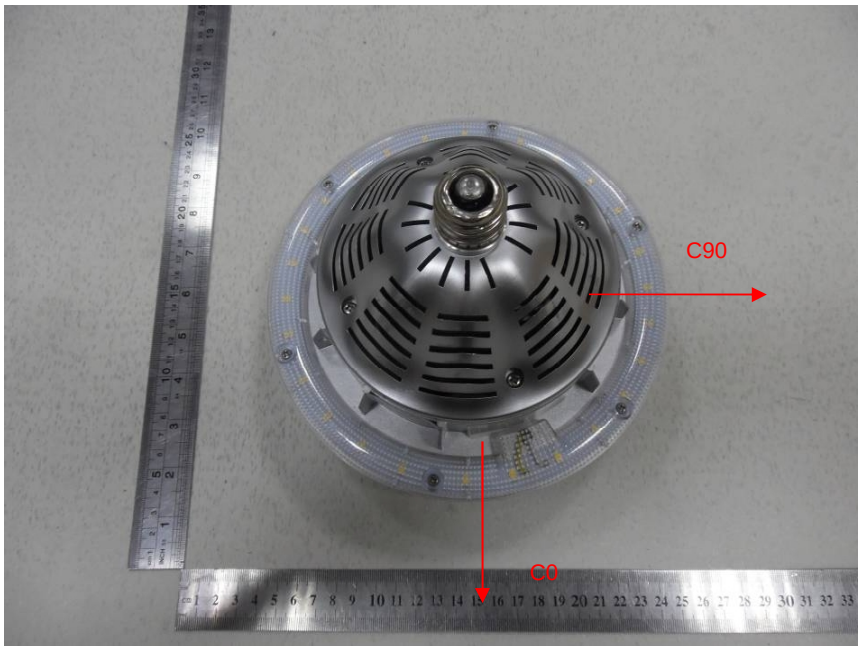
4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	2026.551	2026.551	2026.551	2026.551	2026.551	2026.551	2026.551
5	1879.890	1882.964	1878.838	1880.022	1896.009	1897.341	1903.449
10	1890.524	1882.777	1877.396	1879.491	1876.620	1868.728	1861.229
15	1803.445	1809.115	1809.097	1806.578	1822.282	1809.057	1819.521
20	1676.269	1692.525	1678.389	1680.508	1699.750	1696.312	1695.067
25	1619.285	1654.436	1630.528	1633.182	1646.854	1647.740	1646.536
30	1465.116	1536.086	1519.976	1491.227	1500.484	1513.812	1532.461
35	1396.644	1425.258	1485.235	1415.599	1405.425	1446.920	1468.530
40	1319.807	1323.430	1271.500	1311.197	1332.093	1307.617	1309.881
45	1159.026	1128.797	1094.131	1132.777	1170.314	1132.998	1099.394
50	966.424	936.505	904.118	948.022	971.442	949.296	909.790
55	817.142	798.449	765.049	791.890	820.727	791.144	769.384
60	715.549	712.607	691.127	708.579	727.574	713.270	689.570
65	659.013	658.841	635.113	656.945	665.333	660.479	632.524
70	559.620	562.608	556.493	560.518	549.699	560.184	554.662
75	462.897	463.492	457.698	458.544	460.495	459.621	448.654
80	376.773	379.423	371.570	373.000	376.242	375.532	372.475
85	315.818	320.134	315.103	320.253	315.530	324.381	318.998
90	300.805	303.537	297.396	304.121	299.978	306.136	295.295
95	299.910	303.758	294.519	302.122	298.420	298.096	290.896
100	285.785	289.373	281.900	288.380	286.407	283.412	277.500
105	287.547	287.840	282.341	283.686	281.507	284.353	284.589
110	281.364	280.984	281.904	280.584	278.639	281.922	285.042
115	268.994	270.137	272.152	271.282	269.305	271.007	273.932
120	254.420	257.089	259.972	259.306	256.613	261.222	265.477
125	245.589	246.905	250.449	252.437	250.160	253.640	255.224
130	256.634	256.419	256.416	258.872	258.610	261.424	260.985
135	271.211	269.914	271.703	271.282	274.402	273.889	273.002
140	289.763	287.391	286.757	287.009	289.289	290.122	290.797
145	300.362	295.131	292.970	295.887	298.636	299.254	303.728
150	288.431	284.962	284.763	283.447	287.494	283.646	281.058
155	272.535	275.449	272.807	269.471	265.628	269.361	275.752
160	248.244	254.426	251.307	246.862	245.660	246.929	248.994
165	232.781	231.191	234.275	230.896	229.229	232.036	236.971
170	224.835	226.320	224.500	221.578	217.653	213.594	214.241
175	207.601	198.437	195.499	187.259	192.112	197.605	197.354
180	196.425	196.425	196.425	196.425	196.425	196.425	196.425

Appendix A Product Photo



Picture 1



Picture 2

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