LCTECH

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, DIV OF TADD LLC
188 S. Northwest Highway Cary, IL60013

For products:
LED Lamp

Models:
LED-7306-35A, LED-7306-35C

Test date:	Oct 20, 2014 to Oct 29, 2014
Test laboratory:	LCTECH (Zhongshan) Testing Service Co.,Ltd 2/F.,Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China
Laboratory note:	N/A

Complied by:	**Reviewed by:**
Lin Qiu	**Richard Li**
Test Engineer	**Technical Manager**
Oct 29, 2014	**Oct 31, 2014**

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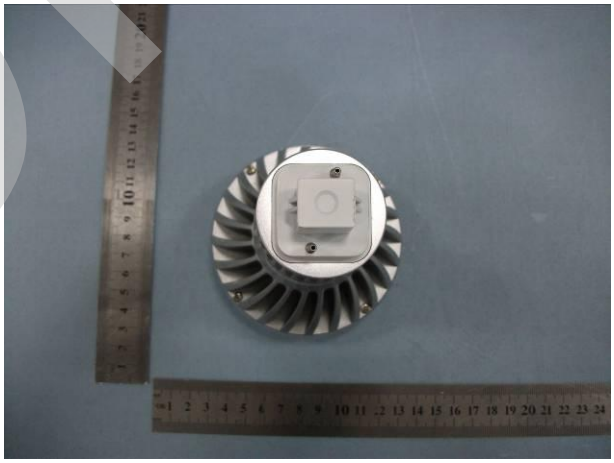
1 General

1.1 Product Information

Brand Name	Light Efficient Design
Trade Mark	-
Luminaire Type	LED Lamp
Model Number	LED-7306-35A, LED-7306-35C
Rated Inputs	120-347VAC,50/60Hz
Rated Power	10 W
Rated Initial Lamp Lumens	1000 lm
Declared CCT	3500 K
Power Supply	Integral LED driver
Date of Receipt Samples	Oct 7, 2014
Quantity of Receipt Samples	1 unit
Photo	

Picture 1



Picture 2

1.2 Standards or methods

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

No.	Name
ANSI/NEMA/ ANSLG C78.377-2011	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

ID	Instrument	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2014-03-04	2015-03-03
AC Power supply	LC-I-953	APW-110N	2014-03-04	2015-03-03
Power analyzer	LC-I-928	WT210	2014-03-21	2015-03-20
Power analyzer	LC-I-954	WT210	2014-03-04	2015-03-03
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-I-971	STD-ESN	2014-05-16	2015-05-15
Goniophotometer(with mirror)	LC-I-902	GMS2000	2014-05-14	2015-05-13
Wireless temperature transmitter	LC-I-958	DWRP-B(0)	2014-08-19	2015-08-18
Wireless temperature transmitter	LC-I-959	DWRP-B(0)	2014-08-19	2015-08-18

2 Test conducted and method

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 both sphere-spectroradiometer system and goniophotometer.

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the total luminous flux was calculated from these by software automatically.

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	277.00 V~60Hz	277.06 V~60Hz
Input Current	0.042 A	0.042 A
Total Power	11.50 W	11.36 W
Power Factor	0.986	0.986
I-THD	6.61%	-

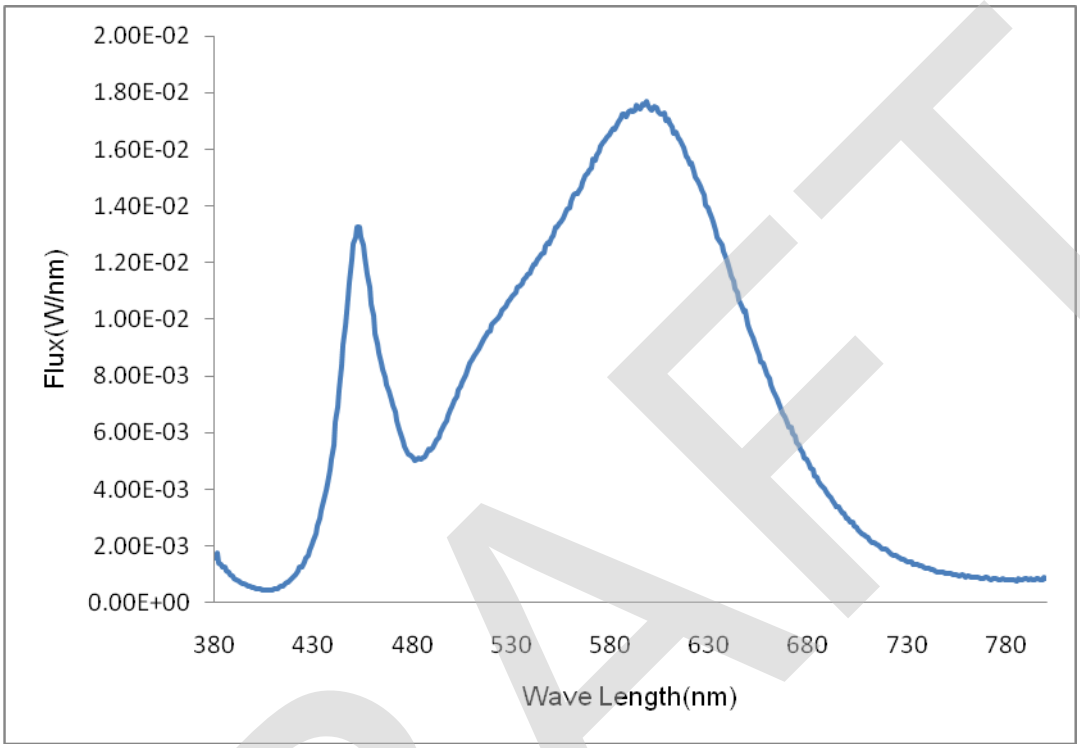
3.2 Photometric data

Criteria Item	Result (Sphere)	Result (Goniophotometer)
Total Lumens	1043.13 lm	1048.61 lm
Luminaire Efficacy	90.71 lm/W	92.31 lm/W
Correlated Color Temperature (CCT)	3539 K	-
Color Rendering Index (CRI)	82.5	-
R9	8	-
Chromaticity Coordinate (x,y)	x=0.4035 y=0.3907	-
Chromaticity Coordinate (u,v)	u=0.2346 v=0.3407	-
Chromaticity Coordinate (u',v')	u'=0.2346 v'=0.511	-
Duv	0.0004	-
Spacing Criteria (0-180)	-	-
Spacing Criteria (90-270)	-	-
Zonal Lumen between 0-60°	-	68.96%

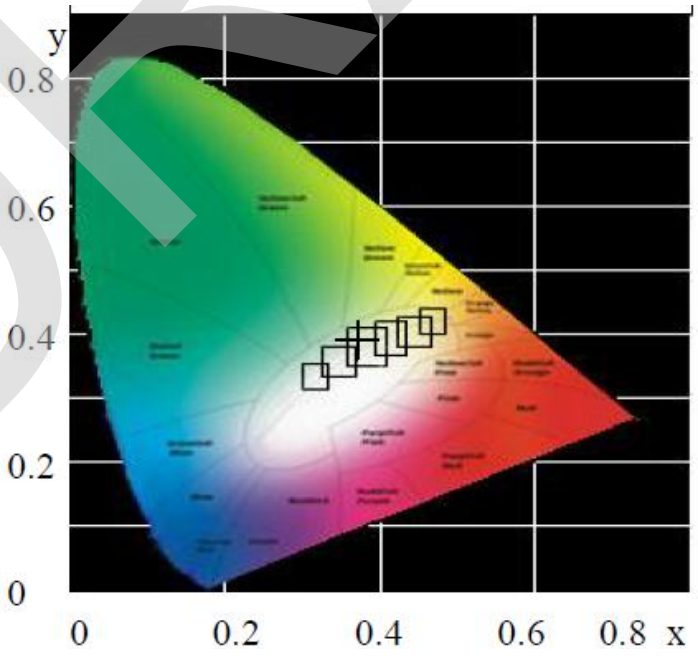
Note: N.A.

4 Test Data

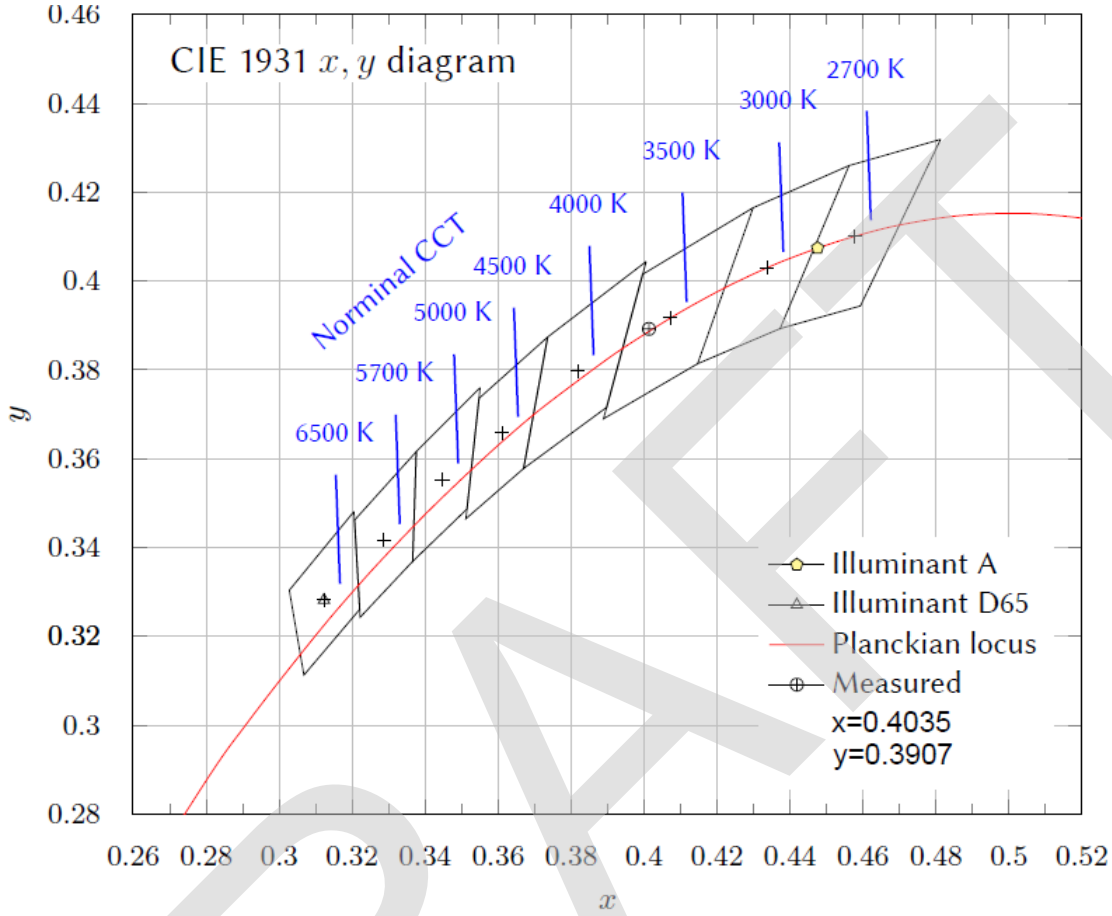
4.1 Spectral Distribution



4.2 Chromaticity Diagram (CIE 1931)



4.3 ANSI Chromaticity Quadrangles Diagram



4.4 Color Rendering Details

R1	R2	R3	R4	R5
81	90	96	80	80
R6	R7	R8	R9	R10
86	85	62	8	76
R11	R12	R13	R14	R15
78	66	83	98	74

4.5 Goniometry Test Data

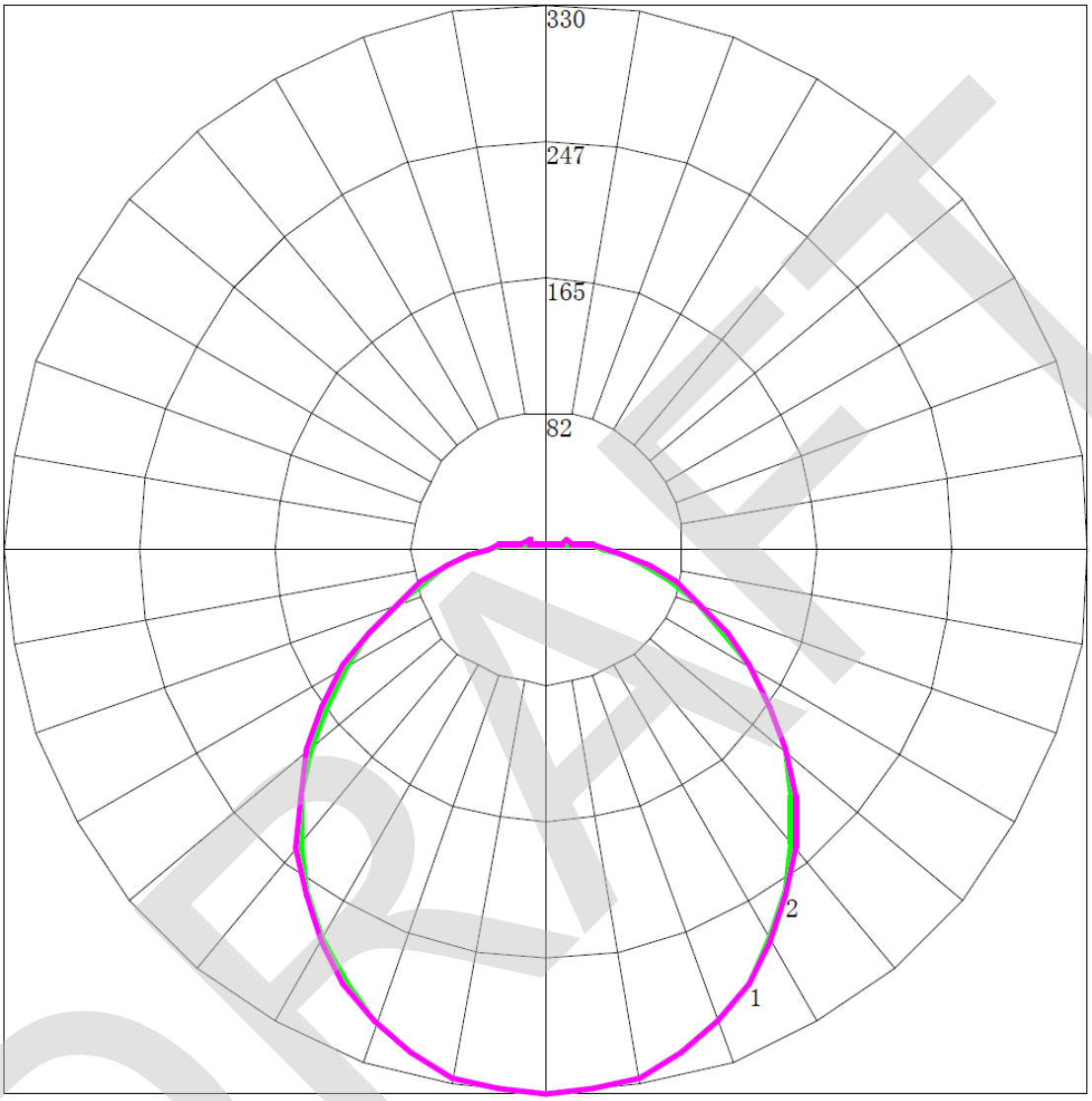
CIE Type	Direct	Basic Luminous Shape	Circular w/ Sides
Spacing Criteria (0-180)	1.24	Luminous Length	0.10 m (Diameter)
Spacing Criteria (90-270)	1.24	Luminous Width	0.10 m (Diameter)
Spacing Criteria (Diagonal)	1.36	Luminous Height	0.02 m
Test Distance	18.35 m		

4.6 Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-30	253.35	24.2	24.2
0-40	412.21	39.3	39.3
0-60	723.12	69	69
0-90	977.66	93.2	93.2
90-120	57.35	5.5	5.5
90-130	63	6	6
90-150	68.38	6.5	6.5
90-180	70.95	6.8	6.8
0-180	1048.61	100	100

Zone	Lumens
0-10	31.17
10-20	88.83
20-30	133.35
30-40	158.86
40-50	163.1
50-60	147.8
60-70	118.33
70-80	83.69
80-90	52.52
90-100	30.37
100-110	17.19
110-120	9.79
120-130	5.66
130-140	3.31
140-150	2.06
150-160	1.44
160-170	.92
170-180	.21

4.7 Polar Curves



Maximum Candela = 329.86 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

4.8 Candela Tabulation

	0	15	30	45	60	75	90
0	329.86	329.86	329.86	329.86	329.86	329.86	329.86
5	328.27	328.24	327.86	328.19	328.36	328.31	328.74
10	323.88	323.20	322.94	323.06	323.42	323.26	323.75
15	314.39	314.72	314.13	315.01	315.09	315.42	315.65
20	303.37	303.37	302.91	303.58	303.85	303.92	304.35
25	289.34	289.27	288.77	289.49	289.65	289.70	290.34
30	272.59	272.18	272.12	272.80	273.18	273.21	273.90
35	253.06	253.39	253.27	253.98	254.37	254.59	254.81
40	232.25	232.53	232.46	233.34	234.06	234.06	235.02
45	210.53	210.19	210.47	211.27	211.97	212.21	212.70
50	187.65	187.03	187.60	188.57	189.43	189.35	189.85
55	164.03	163.78	164.13	165.04	166.04	166.41	166.82
60	140.32	140.42	140.87	141.75	142.75	142.54	143.17
65	117.80	117.74	118.31	119.11	120.02	120.34	120.31
70	96.55	96.70	96.91	97.88	98.80	99.17	99.05
75	77.51	77.70	77.76	78.65	79.26	79.56	79.83
80	60.39	60.94	61.14	61.85	62.51	62.69	62.80
85	46.64	46.94	46.88	47.58	47.88	48.05	48.18
90	35.32	35.48	35.58	36.01	36.34	36.33	36.59
95	26.90	26.98	27.00	27.39	27.53	27.57	27.73
100	20.51	20.47	20.65	20.81	20.87	20.92	20.86
105	15.82	15.76	15.84	15.95	15.99	16.04	15.99
110	12.21	12.28	12.29	12.33	12.44	12.37	12.35
115	9.55	9.65	9.66	9.67	9.68	9.67	9.72
120	7.76	7.62	7.70	7.69	7.72	7.73	7.75
125	6.25	6.21	6.22	6.12	6.18	6.14	6.23
130	5.05	5.08	5.04	5.05	5.08	5.05	5.08
135	4.13	4.23	4.26	4.18	4.23	4.18	4.22
140	3.47	3.63	3.66	3.49	3.56	3.58	3.61
145	3.19	3.17	3.15	3.17	3.23	3.32	3.31
150	3.08	3.00	3.00	2.98	3.15	3.17	3.11
155	3.06	3.00	3.08	3.06	3.13	3.12	3.11
160	3.26	3.26	3.31	3.27	3.25	3.26	3.28
165	3.25	3.34	3.32	3.38	3.30	3.41	3.31
170	2.84	2.91	2.94	2.96	2.98	2.98	3.01
175	1.86	1.88	1.85	1.82	1.88	2.09	2.10
180	1.35	1.35	1.35	1.35	1.35	1.35	1.35

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