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Test report of

IES LM-79-08

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

Rendered to:
Elec-Tech International Co., Ltd
NO.1 JINFENG ROAD ,TANGJIAWAN TOWN,XIANGZHOU DISTRICT,ZHUHAI CITY,GUANGDONG PROVINCE, P.R.China

For products:
Inseparable SSL luminaires

Models:
546491XX("XX" =41~50 intends 4000K)

Test date: Mar 29,2014~ Mar 31,2014
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:**
Tim Tan	**Richard Li**
Project Engineer	**Technical Manager**
April 7, 2014	**April 7, 2014**

Table of Contents

1 General

1.1 Product Information

Brand Name	ETI, Hampton Bay,CE
Trade Mark	-
Luminaire Type	Inseparable SSL luminaires
Model Number	546491XX("XX" =41~50 intends 4000K)
Rated Inputs	120VAC,60Hz
Rated Power	75 W
Rated Initial Lamp Lumens	5500 lm
Declared CCT	4000 K
Driver Model	Integral LED Driver
Suitable Dimmer	SCR Dimmer
LED Package, Array or Module	Everlight electronics co.,ltd;Model:62-217D(3000K)
Date of Receipt Samples	Mar 26,2014
Quantity of Receipt Samples	1 unit
Photo	

Picture 1

Picture 2

1.2 Reference 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

#For reference only.

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
Multimeter	LC-I-972	Fluke 17B	2013-08-14	2014-08-13
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-I-971	STD-ESN	2013-04-22	2014-04-21
Goniophotometer(with mirror)	LC-I-902	GMS2000	2013-05-13	2014-05-12
Wireless temperature transmitter	LC-I-958	DWRP-B(0)	2013-08-22	2014-08-21
Wireless temperature transmitter	LC-I-959	DWRP-B(0)	2013-08-22	2014-08-21

2 Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25℃ ± 1℃, 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

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 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	120.01 V~60Hz	120.09 V~60Hz
Input Current	0.625 A	0.626 A
Total Power	74.61 W	74.88 W
Power Factor	0.995	0.996
I-THD	6.72 %	-
Off-state Power	0.0 W	-

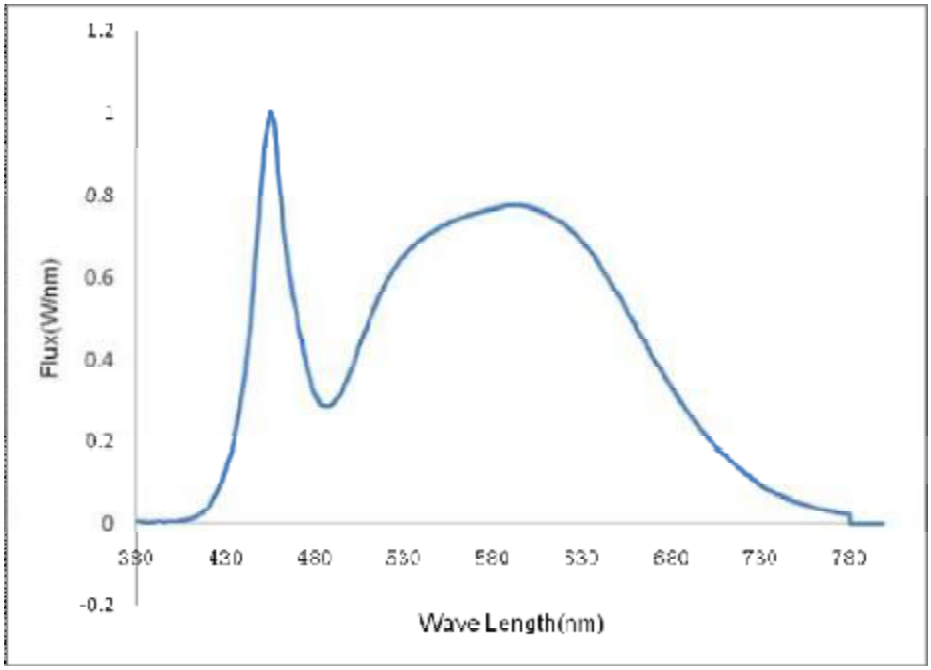
3.2 Photometric data

Criteria Item	Result (Sphere)	Result (Goniophotometer)
Total Lumens	-	5588.34 lm
Luminaire Efficacy	-	74.63 lm/W
Correlated Color Temperature (CCT)	4210 k	-
Color Rendering Index (CRI)	87.6	-
R9	45	-
Chromaticity Coordinate (x,y)	x= 0.3716 y= 0.3712	-
Chromaticity Coordinate (u,v)	u= 0.2215,v=0.3319	-
Chromaticity Coordinate (u',v')	u'= 0.2215 v'= 0.4978	-
Duv	0.0000682	-
Beam Angle(50% I_{max})	-	120.8°

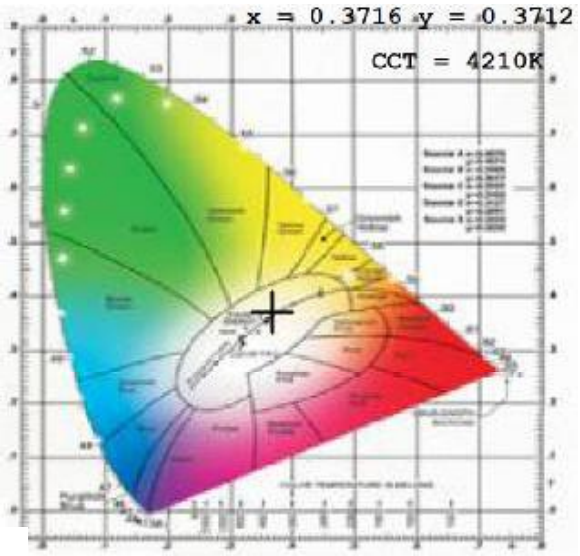
Note: N.A.

4 Test Data

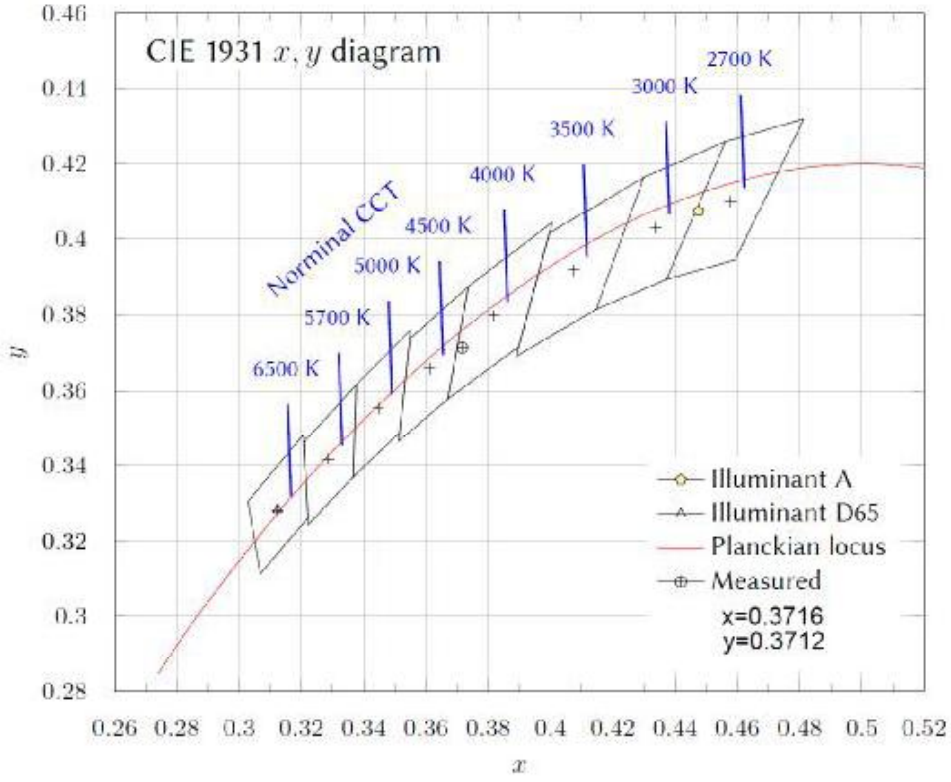
4.1 Spectral Distribution



4.2 Chromaticity Diagram (CIE 1931)



4.3 ANSI Chromaticity Quadrangles Diagram



4.4 Color Rendering Details

R1	R2	R3	R4	R5
87	92	93	86	85
R6	R7	R8	R9	R10
87	92	79	45	78
R11	R12	R13	R14	R15
83	60	89	96	85

4.5 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.28	Luminous Length	1.24 m
Spacing Criteria (90-270)	1.30	Luminous Width	0.44 m
Spacing Criteria (Diagonal)	1.42	Luminous Height	0.08 m
Test Distance	18.54 m		

4.6 Zonal Lumen Summary

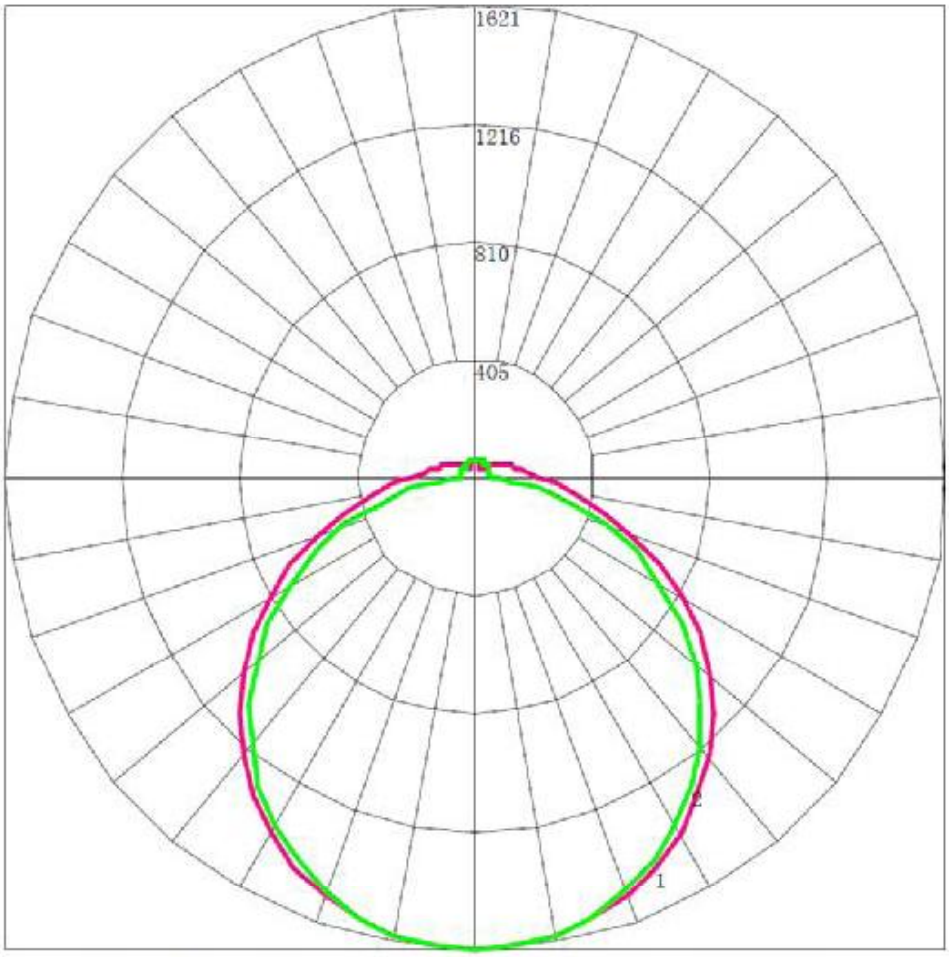
Zone	Lumens	%Lamp	%Fixt
0-30	1269.96	22.7	22.7
0-40	2093.77	37.5	37.5
0-60	3773.21	67.5	67.5
0-90	5111.59	91.5	91.5
90-120	316.03	5.7	5.7
90-130	369.32	6.6	6.6
90-150	433.47	7.8	7.8
90-180	476.75	8.5	8.5
0-180	5588.34	100	100

Total Luminaire Efficiency = 100%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	153.52
10-20	441.58
20-30	674.85
30-40	823.81
40-50	870.36
50-60	809.09
60-70	652.52
70-80	440.61
80-90	245.25
90-100	141.47
100-110	101.08
110-120	73.48
120-130	53.29
130-140	37.1
140-150	27.05
150-160	21.74
160-170	15.61
170-180	5.93

4.7 Polar Curves



Maximum Candela = 1620.87 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (90 - 270)
2 - Vertical Plane Through Horizontal Angles (0 - 180)

4.8 Candela Tabulation

	0	15	30	45	60	75	90
0	1620.87	1620.87	1620.87	1620.87	1620.87	1620.87	1620.87
5	1614.48	1613.98	1614.34	1614.86	1615.03	1615.11	1615.2
10	1593.27	1593.42	1594.48	1595.72	1596.91	1597.34	1598.37
15	1558.42	1559.09	1561.83	1563.96	1566.78	1567.97	1568.33
20	1511.33	1512.19	1515.85	1520.7	1525.05	1527.27	1528.32
25	1450.6	1451.97	1458.27	1464.74	1471.22	1473.77	1476.46
30	1378.32	1380.21	1388.14	1396.85	1404.85	1409.11	1411.05
35	1294.48	1297.35	1307.79	1318.57	1327.57	1333.64	1335.33
40	1200.99	1203.99	1217.55	1228.62	1239.74	1247.85	1249.13
45	1099.73	1102.72	1116.99	1130.17	1142.63	1150.56	1153.49
50	986.22	992.85	1007.6	1021.6	1037.02	1047.35	1049.27
55	868.57	873.25	890.45	907.36	922.57	934.09	939.04
60	740.91	749.26	766.10	785.04	803.14	816.28	820.05
65	609.81	619.59	638.56	660.16	682.34	695.89	702.61
70	476.63	488.55	509.47	536.48	561.02	576.79	582.07
75	347.43	360.87	387.70	419.74	447.26	462.24	469.09
80	225.12	243.77	279.24	314.77	343.88	360.31	366.75
85	127.83	151.01	190.90	228.60	257.77	274.87	279.70
90	69.52	94.05	132.88	168.17	196.03	212.53	215.83
95	55.37	71.42	103.14	133.23	158.59	174.23	179.09
100	50.03	59.63	86.90	114.00	135.84	150.02	154.88
105	47.96	51.54	73.92	98.98	120.30	133.79	137.53
110	46.92	43.97	64.12	84.47	104.84	118.16	121.91
115	46.92	40.18	55.87	74.86	90.24	101.76	105.25
120	48.82	40.70	48.65	66.53	80.45	89.56	92.38
125	50.03	42.42	41.60	57.09	70.32	78.74	80.87
130	50.89	44.23	36.87	47.47	59.50	67.15	69.37
135	52.61	47.15	36.44	39.91	49.37	56.16	58.38
140	54.34	50.16	38.93	35.88	40.87	45.94	48.08
145	56.06	53.09	42.63	36.65	36.06	38.13	39.66
150	56.75	55.24	46.58	39.91	36.83	36.06	36.92
155	58.13	57.39	50.53	44.72	40.53	39.41	39.66
160	59.86	59.72	54.92	49.87	46.02	44.31	45.16
165	61.41	61.44	59.30	55.28	52.12	49.46	47.56
170	62.97	62.90	62.48	60.43	58.47	56.07	53.91
175	64.17	64.19	64.03	63.00	62.34	62.26	63.53
180	64.22	64.22	64.22	64.22	64.22	64.22	64.22

Attachment 1
U.S. Department of Energy
Lighting Facts^{CM} Uniform LM-79 Reporting Template

Laboratory Information

Name of test lab	LCTECH (Zhongshan) Testing Service Co.,Ltd
Date of test report	April 7, 2014
Test report number	LCZP14030246
Laboratory contact name	Richard Li

Product Information

Manufacturer	Elec-Tech International Co., Ltd	
Brand name	ETI, Hampton Bay,CE	
Model number	546491XX ("XX" =41~50 intends 4000K)	
SKU (if available)	N/A	
Type of luminaire (for integral lamps, list base type and lamp type)	Inseparable SSL luminaires	
Luminaire aperture	N/A	in.
Luminaire height	3.0	in.
Luminaire length	48.8	in.
Luminaire width	17.1	in.
Number of units (modular products)	N/A	

Electrical Measurements	Integrating sphere output	Goniophotometer Output	
Input wattage	74.61	74.88	W
Input current	0.625	0.626	A
Input voltage (AC)	120.01	120.09	V
Power factor	0.995	0.996	
Off-state power	0.0	0.0	W

Photometric Characteristics

Total initial lumen output	-	5588.34	lm
Initial luminaire efficacy	-	74.63	lm/W
Correlated color temperature / CCT	4210	K	
Color rendering index / CRI	87.6		
R9 value	45		
Duv	0.0000682		

Luminous Intensity Distribution		Goniophotometer Output	
Center beam candlepower (if applicable)	--	1620.867	cd
Beam angle (if applicable)		120.8	°
Zonal lumens in the 0°-60° zone		67.5	%
Zonal lumens in the 60°-90° zone		24.0	%
Zonal lumens in the 90°-120° zone		5.7	%
Zonal lumens in the 120°-180° zone		2.8	%

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

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