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LCTECH (ZHONGSHAN) TESTING SERVICE CO., LTD. *LABORATORY*

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 519085

For products:

Inseparable SSL Luminaire

Models No.:

504051##(##=11-30)

(Where "##" denotes color temperature, 11-30 identifies 3000K)

Test Date:	Aug. 15, 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:**
Kargel Yuan	**Richard Li**
Project Engineer	**Technical Manager**
Aug. 30, 2018	**Aug. 30, 2018**

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1. General

1.1 Product Information

Brand Name	ETI
Product Type	Inseparable SSL Luminaire
Model Number	504051##(##=11-30)
Rated Inputs	120-277VAC, 50/60Hz
Rated Power	9W
Rated Light output	800lm
Declared CCT	3000K
Power Supply	Integrated in luminaire
LED Package, Array or Module	67-21S Series, EVERLIGHT ELECTRONICS CO., LTD
Receipt Samples	1 unit
Sample Code of lab.	180816104003
Date of Receipt Samples	Aug. 16, 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	2018-08-08	2019-08-07
Photometric colorimetric electric system* (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp**	LC-PL-I-011	D204C	2017-09-07	2018-09-06
Luminous Flux Standard Lamp***	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:

* Bandwidth of spectroradiometer is 1 nm.

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

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

2. Test conducted and method

The luminaire 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	120.06 V~60Hz
Input Current(A)	0.075	0.075
Total Power(W)	8.78	8.78
Power Factor	0.974	0.973
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-****	955.57
Luminaire Efficacy(Lm/W)	-	108.83
Correlated Color Temperature (CCT)(K)	3038	-
Color Rendering Index (CRI)	85.0	-
R9	20	-
Chromaticity Coordinate (x,y)	x = 0.4312 y = 0.3967	-
Chromaticity Coordinate (u,v)	u = 0.2500 v = 0.3451	-
Chromaticity Coordinate (u',v')	u' = 0.2500 v' = 0.5176	-
Duv	-0.0022	-
Zone Lumens between 0-60 °	-	68.30 %

3.3 Color Rendering Details

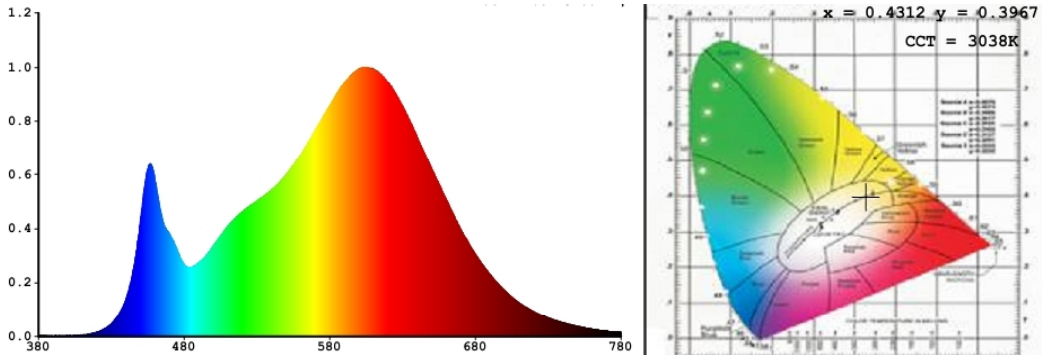
R1	R2	R3	R4	R5	R6	R7	R8
85	95	93	82	85	94	82	63
R9	R10	R11	R12	R13	R14	R15	-
20	89	82	75	88	97	78	-

Note:

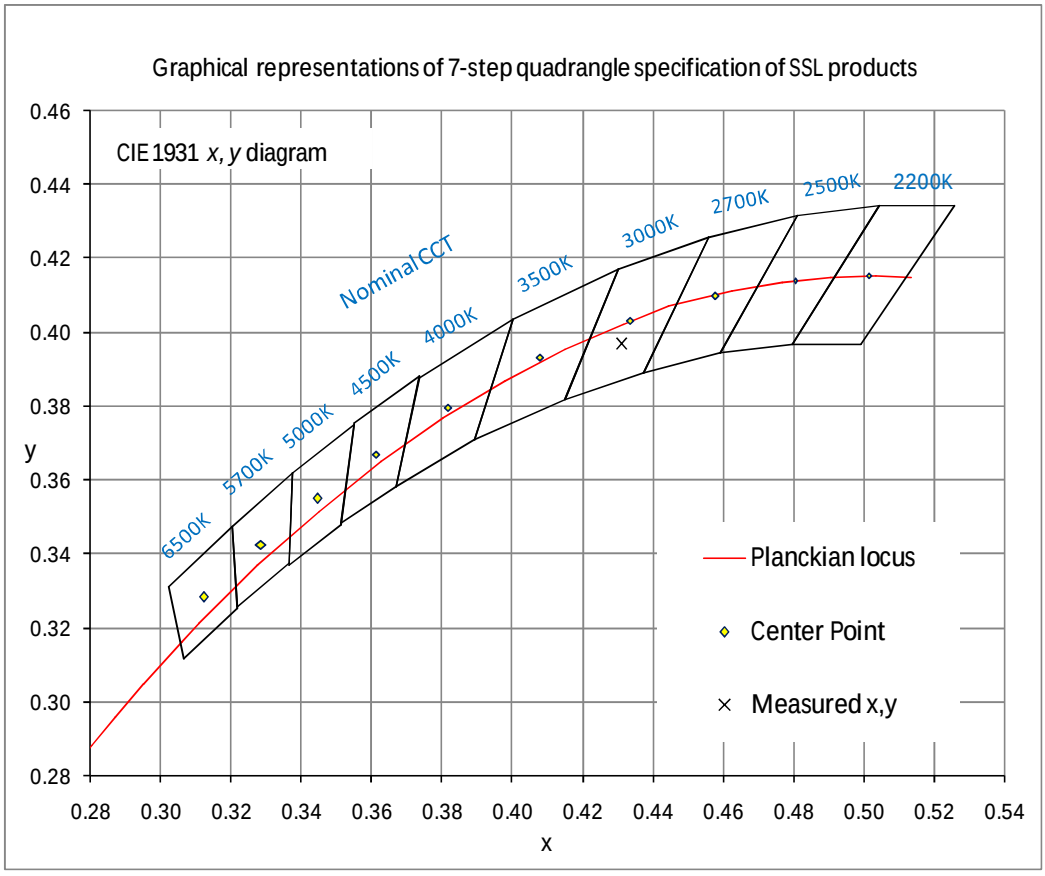
**** Self-absorption is 1.

4. Test Data

4.1 Spectral Distribution



4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Circular
Spacing Criteria (0-180)	1.28	Luminous Length	0.21 m (Diameter)
Spacing Criteria (90-270)	1.28	Luminous Width	0.21 m (Diameter)
Spacing Criteria (Diagonal)	1.40	Luminous Height	0.00 m
Test Distance	29.79 m		

4.4 Zonal Lumen Summary

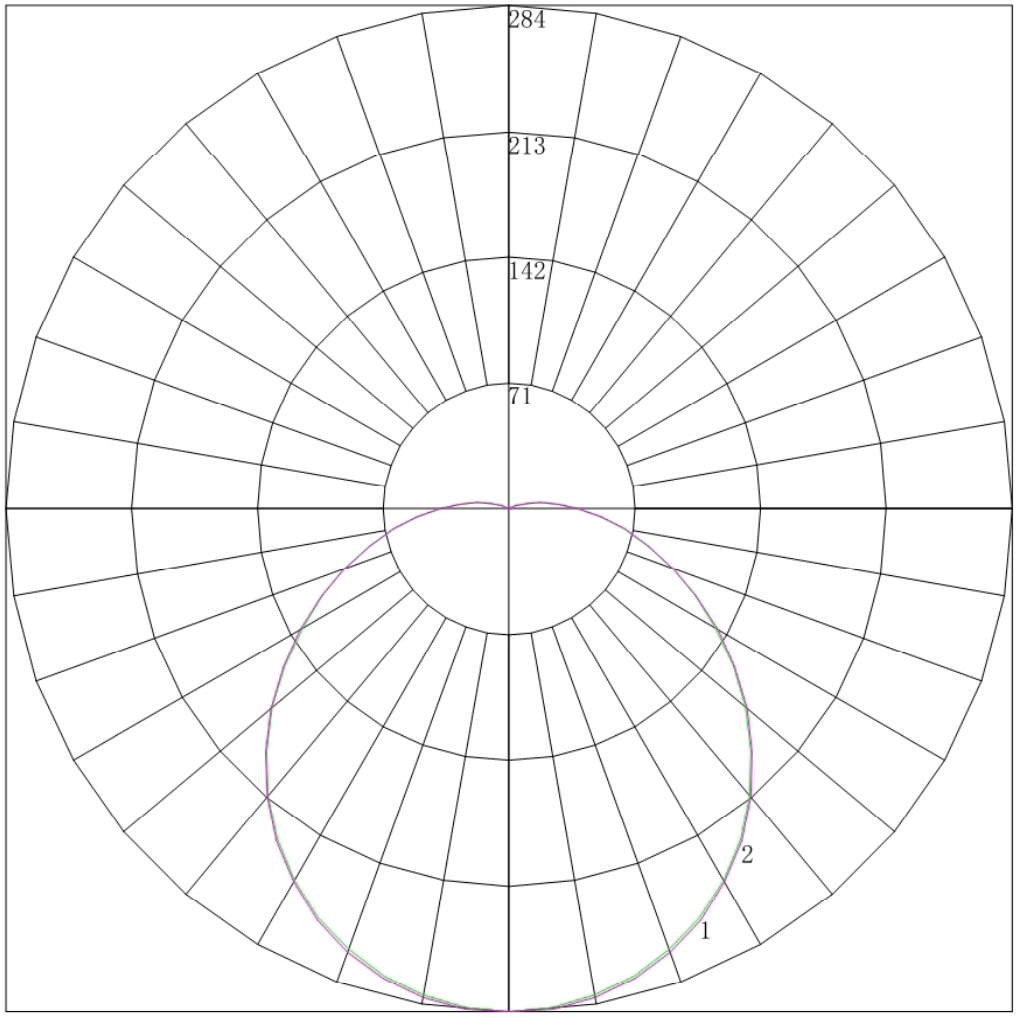
Zone	Lumens	%Lamp	%Fixt
0-20	104.07	10.90	10.90
0-30	221.60	23.20	23.20
0-40	364.20	38.10	38.10
0-60	652.32	68.30	68.30
0-80	854.32	89.40	89.40
0-90	911.15	95.40	95.40
10-90	884.26	92.50	92.50
20-40	260.13	27.20	27.20
20-50	409.53	42.90	42.90
40-70	403.64	42.20	42.20
60-80	202.00	21.10	21.10
70-80	86.48	9.10	9.10
80-90	56.83	5.90	5.90
90-110	42.08	4.40	4.40
90-120	43.56	4.60	4.60
90-130	43.67	4.60	4.60
90-150	43.97	4.60	4.60
90-180	44.42	4.60	4.60
110-180	2.34	0.20	0.20
0-180	955.57	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	26.89
10-20	77.18
20-30	117.53
30-40	142.60
40-50	149.40
50-60	138.72
60-70	115.51
70-80	86.48
80-90	56.83
90-100	30.72
100-110	11.36
110-120	1.48
120-130	0.11
130-140	0.11
140-150	0.20
150-160	0.21
160-170	0.17
170-180	0.06

4.5 Polar Curves

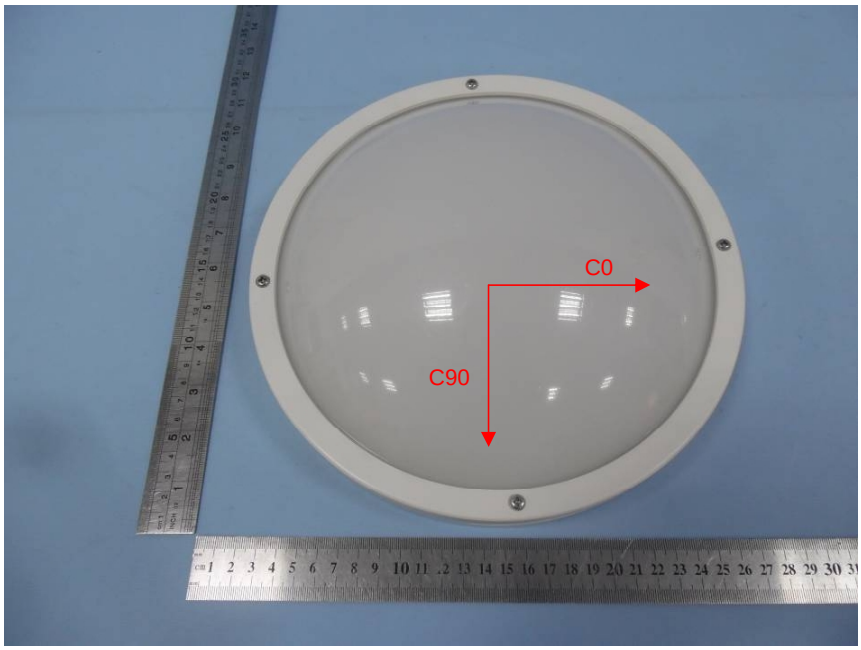


Maximum Candela = 283.881 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

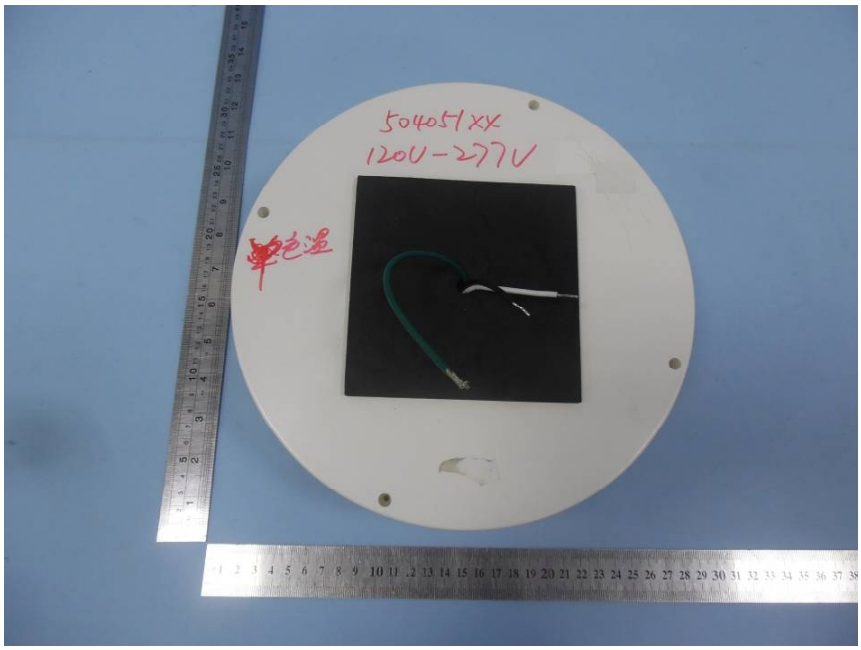
4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	283.881	283.881	283.881	283.881	283.881	283.881	283.881
5	282.417	282.793	282.860	282.838	283.059	282.662	283.615
10	278.693	279.019	279.331	279.200	279.730	279.139	280.068
15	272.839	273.558	273.183	273.411	273.670	273.158	274.262
20	264.547	265.389	264.992	265.004	265.525	265.249	266.062
25	254.615	254.733	255.338	254.934	255.115	254.925	256.002
30	242.066	242.191	242.486	242.467	242.530	242.475	243.061
35	227.832	227.828	227.815	227.828	228.081	228.053	228.834
40	211.425	211.468	211.301	211.125	211.789	211.526	212.170
45	193.112	193.664	193.634	193.668	193.678	193.515	194.088
50	174.266	174.417	174.546	174.237	174.546	174.418	175.477
55	154.578	154.927	154.592	155.271	154.814	155.078	155.314
60	134.846	135.414	134.949	135.397	135.260	135.338	136.170
65	116.089	116.123	116.438	116.232	116.150	116.552	116.495
70	98.263	98.164	98.326	98.265	98.570	98.275	98.592
75	81.413	81.470	81.680	81.429	81.790	81.283	81.752
80	65.893	66.064	65.810	66.035	66.032	65.753	66.287
85	51.393	51.790	51.827	51.949	51.738	51.818	51.753
90	38.578	39.004	38.998	39.062	38.842	38.925	38.769
95	27.847	27.749	27.855	27.771	27.789	27.626	27.781
100	18.136	18.092	18.200	17.945	18.156	18.100	17.988
105	10.332	10.300	10.166	10.048	10.232	10.213	10.411
110	4.346	4.373	4.239	4.148	4.128	4.364	4.341
115	0.798	0.844	0.710	0.688	0.666	0.775	0.797
120	0.133	0.089	0.133	0.111	0.111	0.111	0.089
125	0.089	0.155	0.133	0.089	0.089	0.111	0.133
130	0.133	0.133	0.155	0.155	0.133	0.111	0.133
135	0.133	0.111	0.089	0.133	0.133	0.111	0.066
140	0.177	0.200	0.244	0.200	0.200	0.177	0.177
145	0.310	0.311	0.289	0.333	0.377	0.310	0.310
150	0.443	0.444	0.377	0.421	0.400	0.443	0.444
155	0.443	0.488	0.400	0.444	0.444	0.487	0.443
160	0.488	0.533	0.533	0.532	0.577	0.532	0.576
165	0.576	0.666	0.599	0.643	0.599	0.620	0.532
170	0.621	0.644	0.666	0.643	0.688	0.643	0.665
175	0.665	0.666	0.732	0.688	0.666	0.642	0.665
180	0.710	0.710	0.710	0.710	0.710	0.710	0.710

Appendix A Product Photo



Picture 1



Picture 2

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