LM-79-08 Test Report

For

ELEC-TECH INTERNATIONAL CO LTD

No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guangdong Province, P.R. China 519085

Inseparable SSL Luminaire

Model name(s):
546063XX

Representative (Tested) Model:
54606341

Model Difference: XX=41-50 intends CCT is 4000K.

Prepare By:

Engineer: Leo Liu
Date: 2017-06-22

Review By:

Technical Lead: Vincent Yuan
Date: 2017-06-22

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Product Information:

Client Name:	ELEC-TECH INTERNATIONAL CO LTD
Brand Name:	ETI, Commercial Electric
Model Number:	546063XX(XX=41-50)
Product type:	Inseparable SSL Luminaire
Rating Input:	AC120V, 60Hz, 11.5W
Declared CCT:	4000K
Declared Light output:	830lm
LED Manufacturer:	EVERLIGHT
LED Model:	67-21S
LED Quantity:	24 pcs
Forward current of LED Chip:	150 mA
Date of Receipt Samples:	2017-06-18
Quantity of Receipt Samples:	3
Sample Number:	170618001-S1

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_ntc@163.com

Report Information

Issued Date of Test Report:	2017-06-22
Revised Date of Test Report:	N/A
Test Report No.:	NTCR17060049
Remark (*If applicable*)	N/A

Test Specifications:	
Date of Test	2017-06-21
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Color Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry

Test Methods

1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° Vertical intervals.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

Integrating Sphere Test Results

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.0 °C	51 %	Face Down	90 mins	25 mins

Electrical Data:

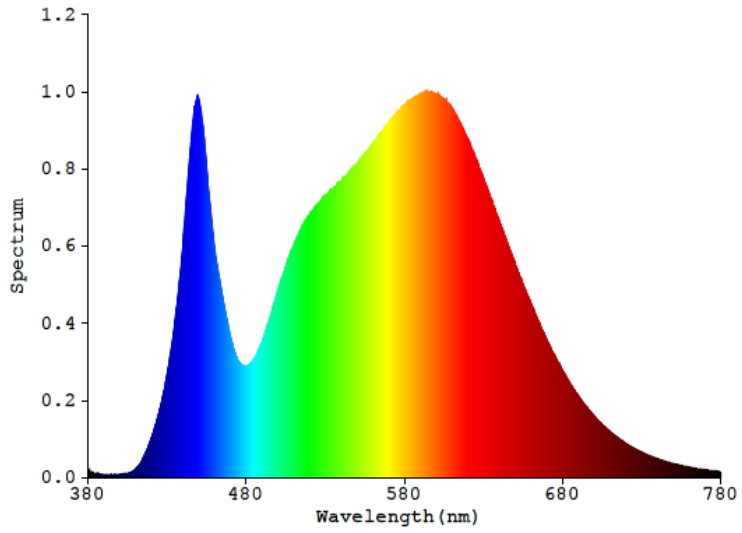
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.1001	11.48	0.9558

Color Data:

Parameter	Result
CCT (K)	3989
Color Rendering Index (CRI)	83.6
R9	14
Chromaticity, x	0.3812
Chromaticity, y	0.3781
Chromaticity u′	0.2251
Chromaticity v′	0.5023
Duv	0.00040

Special Color Rendering			
R1	82	R9	14
R2	89	R10	73
R3	94	R11	83
R4	84	R12	66
R5	82	R13	83
R6	84	R14	97
R7	87	R15	76
R8	67	-	-

Spectrum Diagram:



Goniophotemeter Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
24.6 °C	45 %	Face Down	90 mins	25 mins

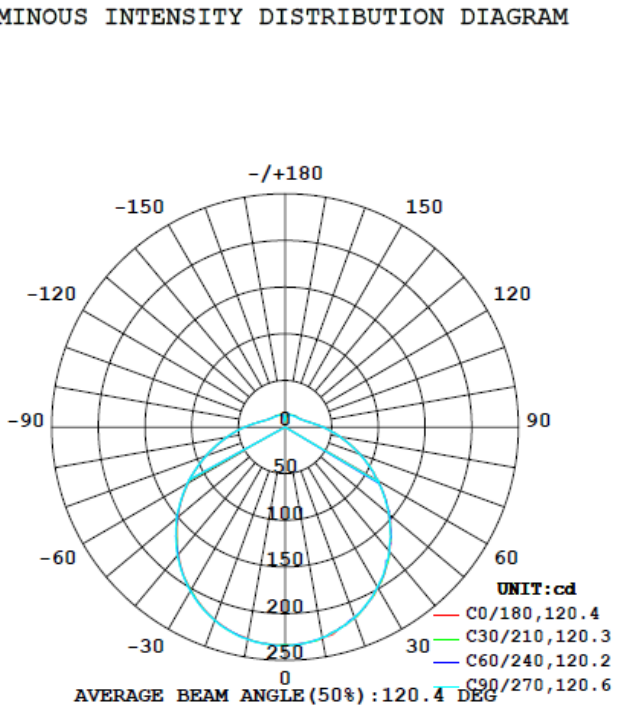
Electrical Data:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.1001	11.48	0.9558

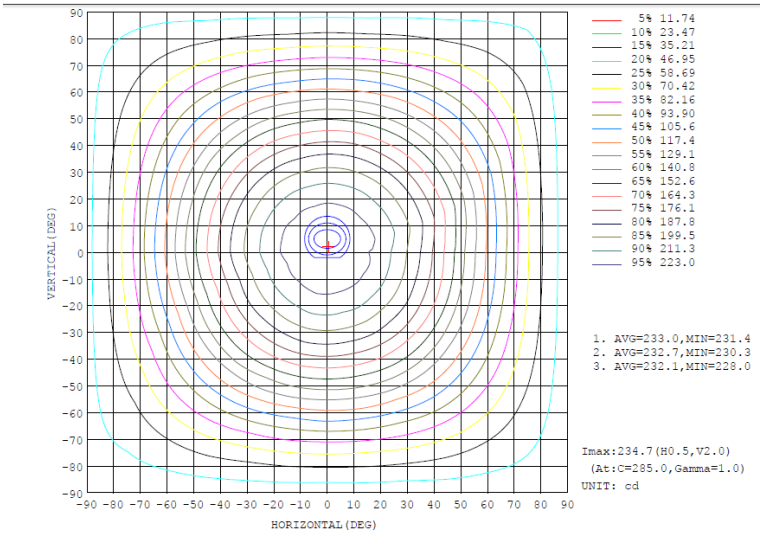
Goniophotometer Data:

Parameter	Result
Total Luminous (lm)	913.6
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	79.56
Zonal Lumens Distribution (0-90°)	85.5%
Beam Angle (°)	120.4
Center Beam Candle Power (cd)	234

Luminous Intensity Distribution Diagram:



Isocandela Diagram:



Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	229.9	229.4	229.1	228.6	230.1	230.9	231.2	230.5	0- 10	22.15	22.15	2.42,2.42
20	217.6	217.3	217.0	216.7	219.7	220.2	220.6	219.9	10- 20	63.58	85.73	9.38,9.38
30	198.8	197.9	197.8	196.7	201.9	202.5	203.1	203.5	20- 30	96.98	182.7	20,20
40	173.7	174.3	173.9	172.6	178.1	178.7	179.8	179.7	30- 40	118.3	301.0	32.9,32.9
50	145.3	145.6	145.3	143.2	150.0	150.7	151.9	151.6	40- 50	125.5	426.5	46.7,46.7
60	115.3	114.8	115.4	113.6	119.8	120.0	121.0	120.8	50- 60	119.0	545.5	59.7,59.7
70	85.65	86.05	85.29	84.44	89.79	89.56	90.01	90.39	60- 70	101.5	646.9	70.8,70.8
80	60.08	60.16	59.86	59.12	63.62	63.12	63.89	63.53	70- 80	78.33	725.3	79.4,79.4
90	40.82	40.89	40.33	40.26	43.51	43.09	43.51	43.12	80- 90	55.82	781.1	85.5,85.5
100	28.00	28.02	27.81	27.75	29.71	29.83	29.69	29.70	90-100	37.96	819.0	89.6,89.6
110	21.37	20.96	21.11	21.00	21.86	22.25	21.97	22.30	100-110	26.25	845.3	92.5,92.5
120	18.11	17.78	17.84	17.48	18.30	18.80	18.27	18.45	110-120	19.59	864.9	94.7,94.7
130	16.90	16.32	16.30	15.70	16.45	17.08	16.17	16.47	120-130	15.43	880.3	96.4,96.4
140	15.88	15.55	15.08	14.49	15.50	16.19	14.99	15.33	130-140	12.32	892.6	97.7,97.7
150	14.67	14.85	14.51	13.97	14.28	15.32	14.25	14.88	140-150	9.400	902.0	98.7,98.7
160	14.12	14.04	13.92	13.91	13.58	14.28	14.23	14.11	150-160	6.621	908.7	99.5,99.5
170	13.59	13.00	12.78	12.38	13.46	13.77	14.14	13.66	160-170	3.928	912.6	99.9,99.9
180	7.844	6.883	6.966	7.023	7.334	6.947	6.839	7.342	170-180	1.066	913.7	100,100
DEG	LUMINOUS INTENSITY:cd Less than 25% Percent = 13.4 %									UNIT:lm		

Luminous Distribution Intensity Data:

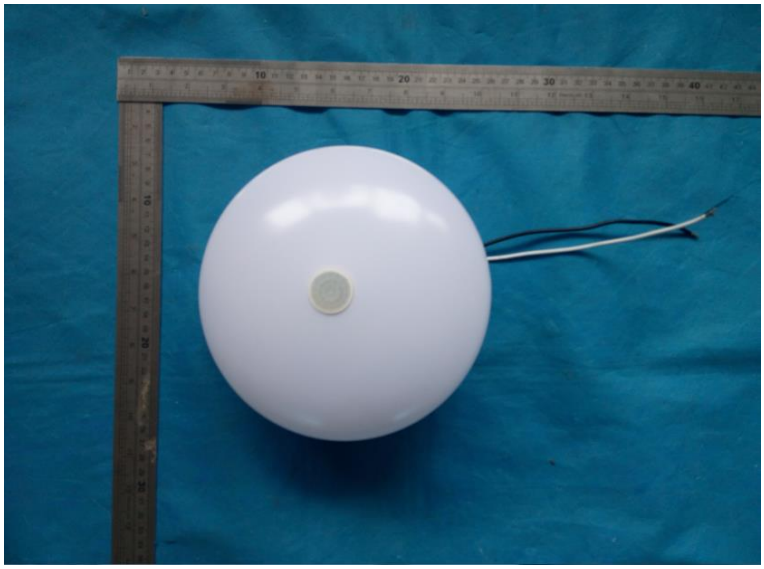
Table--1 UNIT: cd

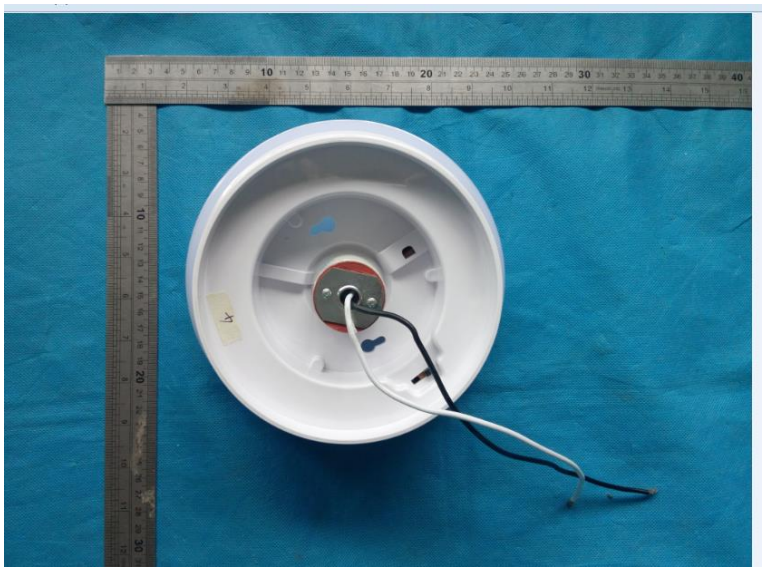
γ (DEG) \ C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	234	234	233	234	234	234	234	234	233	234	234	234	234	234	233	234	234	234	234
5	232	233	233	233	233	232	233	233	232	232	232	233	233	234	233	233	233	233	234
10	230	229	229	229	229	229	229	229	229	229	229	229	230	231	230	231	231	231	231
15	223	225	224	224	224	224	224	224	224	223	224	224	226	226	227	227	226	226	227
20	218	218	218	217	217	216	217	217	216	217	217	217	220	220	220	220	220	220	221
25	209	209	208	209	209	207	209	208	207	208	208	208	212	212	212	212	212	212	213
30	199	198	198	198	199	197	198	198	197	197	198	198	202	203	202	202	203	202	203
35	187	186	187	187	187	186	186	187	186	185	186	186	191	191	192	192	192	191	192
40	174	174	174	174	174	174	174	173	173	173	173	173	178	178	179	179	179	179	180
45	159	160	160	160	160	160	159	160	158	159	159	159	164	165	165	165	166	165	166
50	145	147	145	146	145	145	145	145	144	143	144	144	150	151	151	151	151	151	152
55	130	130	129	130	130	130	130	130	130	129	129	129	135	135	136	136	136	135	136
60	115	115	116	115	115	115	115	114	114	114	114	114	120	120	120	120	121	120	121
65	99.6	99.6	100	101	99.8	99.6	99.7	99.7	98.6	98.6	98.7	98.6	104	105	105	105	105	104	105
70	85.6	85.3	85.7	86.0	85.8	85.2	85.3	85.2	83.5	84.4	84.2	84.1	89.8	90.1	90.2	89.6	90.2	89.9	90.0
75	71.8	72.1	71.5	72.1	71.9	71.7	71.9	71.5	70.8	70.8	70.7	70.8	75.9	76.4	75.9	75.9	76.1	75.8	76.4
80	60.1	59.2	59.5	60.2	60.1	59.8	59.9	59.6	58.6	59.1	58.7	59.0	63.6	63.4	63.7	63.1	63.5	63.1	63.9
85	49.0	49.4	49.4	49.6	49.2	49.3	49.1	49.1	48.3	48.7	48.4	48.8	52.7	52.7	52.7	52.5	52.7	52.2	52.7
90	40.8	40.7	41.1	40.9	40.7	40.4	40.3	40.3	40.0	40.3	39.8	40.1	43.5	43.3	43.5	43.1	43.5	42.9	43.5
95	33.4	33.6	33.6	33.6	33.6	33.3	33.2	33.3	33.2	33.0	33.0	33.0	35.6	35.5	35.9	35.6	35.5	35.3	35.7
100	28.0	28.0	28.0	28.0	28.0	27.9	27.8	27.9	27.9	27.7	27.7	27.6	29.7	29.7	29.7	29.8	29.5	29.5	29.7
105	24.2	23.8	24.2	24.0	24.2	23.9	23.8	23.6	23.8	23.6	23.8	23.7	25.1	25.4	25.0	25.2	25.2	25.5	25.2
110	21.4	21.1	21.5	21.0	21.4	21.1	21.1	21.0	21.2	21.0	21.2	20.9	21.9	22.2	22.1	22.2	22.1	22.3	22.0
115	19.6	19.2	19.4	19.0	19.6	19.0	19.2	18.9	19.1	18.9	19.2	19.0	19.7	20.3	19.9	20.4	20.1	20.2	19.9
120	18.1	17.8	18.0	17.8	18.1	17.6	17.8	17.4	17.8	17.5	17.9	17.7	18.3	18.6	18.4	18.8	18.7	18.9	18.3
125	17.3	17.1	17.3	16.9	17.0	16.5	16.9	16.4	16.7	16.5	17.0	16.7	17.2	17.7	17.4	17.8	17.4	17.7	17.2
130	16.9	16.7	17.0	16.3	16.5	15.9	16.3	15.7	16.0	15.7	16.3	16.0	16.4	17.1	16.8	17.1	16.5	16.8	16.2
135	16.5	16.6	16.5	16.0	16.0	15.5	15.6	15.1	15.4	15.2	15.7	15.4	15.9	16.7	16.3	16.7	15.9	16.2	15.5
140	15.9	15.5	16.1	15.6	15.6	14.7	15.1	14.5	14.9	14.5	15.1	14.9	15.5	16.3	15.7	16.2	15.6	15.3	15.0
145	15.2	15.0	15.5	15.1	15.1	14.4	14.7	14.1	14.5	14.1	14.8	14.5	15.0	15.6	15.3	15.8	15.0	15.0	14.6
150	14.7	14.7	15.1	14.9	14.6	14.0	14.5	13.9	14.3	14.0	14.5	14.4	14.3	15.0	15.2	15.3	14.3	14.7	14.3
155	14.2	14.2	14.9	14.2	14.1	13.9	14.2	13.9	14.1	13.9	14.3	14.3	13.9	14.5	14.8	14.9	14.2	14.4	14.2
160	14.1	14.2	14.3	14.0	14.0	13.6	13.9	13.6	14.1	13.9	14.1	14.3	13.6	14.2	13.8	14.3	14.1	14.2	14.2
165	14.3	14.2	14.0	13.9	13.9	13.4	13.7	13.4	13.5	13.9	13.4	14.2	13.5	13.6	13.5	14.0	14.1	13.9	14.2
170	13.6	13.3	13.6	13.0	12.3	11.8	12.8	12.5	13.1	12.4	12.8	12.3	13.5	13.8	13.5	13.8	13.8	13.6	14.1
175	10.1	9.23	9.63	8.99	9.32	8.65	9.02	8.37	9.07	8.55	9.16	8.83	8.10	9.76	9.81	10.6	10.3	11.3	11.0
180	7.84	6.24	7.14	6.88	7.52	7.00	6.97	7.03	7.02	7.02	7.17	7.75	7.33	5.67	7.01	6.95	7.33	6.81	6.84

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	285	300	315	330	345														
0	234	233	234	234	234														
5	234	233	233	234	234														
10	231	231	230	232	232														
15	227	227	226	227	227														
20	220	221	220	221	221														
25	213	213	213	213	213														
30	203	203	204	203	204														
35	192	192	192	193	193														
40	180	180	180	180	181														
45	167	166	166	166	167														
50	152	151	152	152	153														
55	137	136	136	137	137														
60	120	121	121	121	122														
65	106	106	105	106	107														
70	90.1	90.5	90.4	91.0	91.4														
75	76.1	77.0	76.3	77.1	77.1														
80	63.4	63.8	63.5	64.3	64.6														
85	52.4	53.0	52.5	53.3	53.3														
90	42.9	43.4	43.1	43.9	43.9														
95	35.5	35.7	35.3	36.0	36.0														
100	29.7	29.4	29.7	29.8	30.1														
105	25.2	25.2	25.2	25.3	25.6														
110	22.1	21.9	22.3	22.1	22.5														
115	20.0	19.6	20.1	20.0	20.4														
120	18.6	18.1	18.5	18.2	18.9														
125	17.3	16.9	17.4	17.0	17.7														
130	16.5	16.0	16.5	16.2	16.8														
135	15.9	15.5	15.9	15.5	16.5														
140	15.3	14.9	15.3	15.1	16.1														
145	15.0	14.5	15.0	14.9	15.5														
150	14.8	14.2	14.9	14.4	15.2														
155	14.4	14.1	14.5	14.1	14.6														
160	14.1	14.1	14.1	14.0	14.2														
165	14.1	14.1	14.0	14.1	14.2														
170	13.8	14.2	13.7	14.0	13.9														
175	11.7	11.4	11.9	11.5	11.9														
180	7.23	7.09	7.34	7.23	8.13														

Photo of Sample:





Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2016-12-03	2017-12-02
NTC-F01-006	2.0 meter Integrating Sphere	2016-12-03	2017-12-02
NTC-F01-013	Standard Lamp	2016-12-27	2017-12-26
NTC-F01-031	Digital Power Meter	2016-12-05	2017-12-04
NTC-F01-019	Temperature & Humidity Meter	2016-11-28	2017-11-27

*******END OF DATASHEET*******

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