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Test report of

IES LM-79-08

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

Rendered to:

ETI Solid State Lighting (Zhuhai) Ltd
No.1, Zhongzhu Road South, Science & Technology Innovation
Coast, High Tech District, Zhuhai City, Guangdong Prov., China

For products:

LED Luminaire

Models No.:

504071###(##=00-99,#=0-9)

(This is a color tunable product tunable to 2700K, 3000K and 4000K, ## can be 00-99,
can be 0-9 and represent different client and sales districts.)

Test Date: Apr. 8, 2021

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Test Note:

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Apr. 16, 2021

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Apr. 16, 2021

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1. General

1.1 Product Information

Brand Name	Commercial Electric, HamptonBay
Factory 1	Name: ETI Solid State Lighting (Zhuhai) Ltd Address: No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High Tech District, Zhuhai City, Guangdong Prov., China
Factory 2	Name: NVC VIETNAM TECHNOLOGY AND LIGHTING COMPANY LIMITED Address: Lot CN23-1, Yen Phong Industrial park, Dong Phong commune, Yen Phong district, Bac Ninh province VIETNAM
Product Type	LED Luminaire
Model Number	504071###(##=00-99,#=0-9)
Rated Inputs	120-277VAC, 50/60Hz
Rated Power	7W
Rated Light output	800lm
Declared CCT	2700K/3000K/4000K
Power Supply	ETI-AD00800270027SNA
LED Package, Array or Module	SPMWH1228xxxxxxxxx, Samsung Electronics Co., LTD.
Receipt Samples	1 unit
Sample Code of lab.	210402112007
Date of Receipt Samples	Apr. 2, 2021
Note	-

**1.2 Standards or methods**

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

No.	Name
ANSI/NEMA/ ANSLG C78.377-2011 or 2015 or 2017	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-987	APW-120N	2020-12-23	2021-12-22
AC Power supply	LC-I-989	APW-120N	2020-12-23	2021-12-22
Power analyzer	LC-I-928	WT210	2020-12-25	2021-12-24
Power analyzer	LC-I-954	WT210	2020-12-25	2021-12-24
Multimeter	LC-I-972	FLUKE	2020-07-20	2021-07-19
Photometric colorimetric electric system* (2 meter sphere)	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp**	LC-PL-I-011	D204C	2020-07-14	2021-07-13
Luminous Flux Standard Lamp***	LC-PL-I-003	24V/100W	2020-07-14	2021-07-13
Goniophotometer(with mirror)	LC-I-902	GMS-2000	2020-04-23	2021-04-22
Wireless temperature transmitter	LC-I-PL-009	DWLR-DLR	2020-12-24	2021-12-23
Wireless temperature transmitter	LC-I-PL-008	DWLR-DLR	2020-12-24	2021-12-23

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 lamp/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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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	120.03V~60Hz	120.05V~60Hz
Input Current(A)	0.060	0.059
Total Power(W)	7.00	6.95
Power Factor	0.979	0.978
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	869.92
Luminaire Efficacy(lm/W)	-	125.17
Correlated Color Temperature (CCT)(K)	2699	-
Color Rendering Index (CRI)	83.4	-
R9	11	-
Chromaticity Coordinate (x,y)	x = 0.4589 y = 0.4088	-
Chromaticity Coordinate (u,v)	u = 0.2627 v = 0.3510	-
Chromaticity Coordinate (u',v')	u' = 0.2627 v' = 0.5265	-
Duv	-0.0006	-
Zone Lumens between 0-60 °	-	59.85%
Beam Angle(50%Imax)	-	C0/180=134.4° C90/270=136.0°

3.3 Color Rendering Details

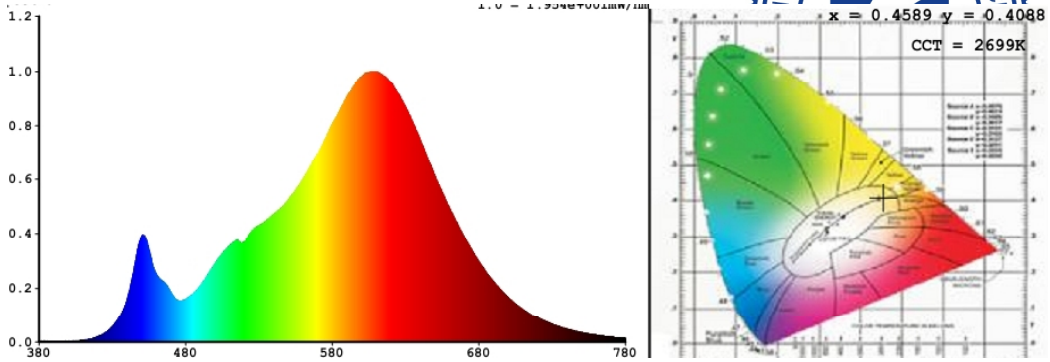
R1	R2	R3	R4	R5	R6	R7	R8
82	93	95	82	83	93	81	58
R9	R10	R11	R12	R13	R14	R15	-
11	84	82	79	85	98	74	-

Note: N/A

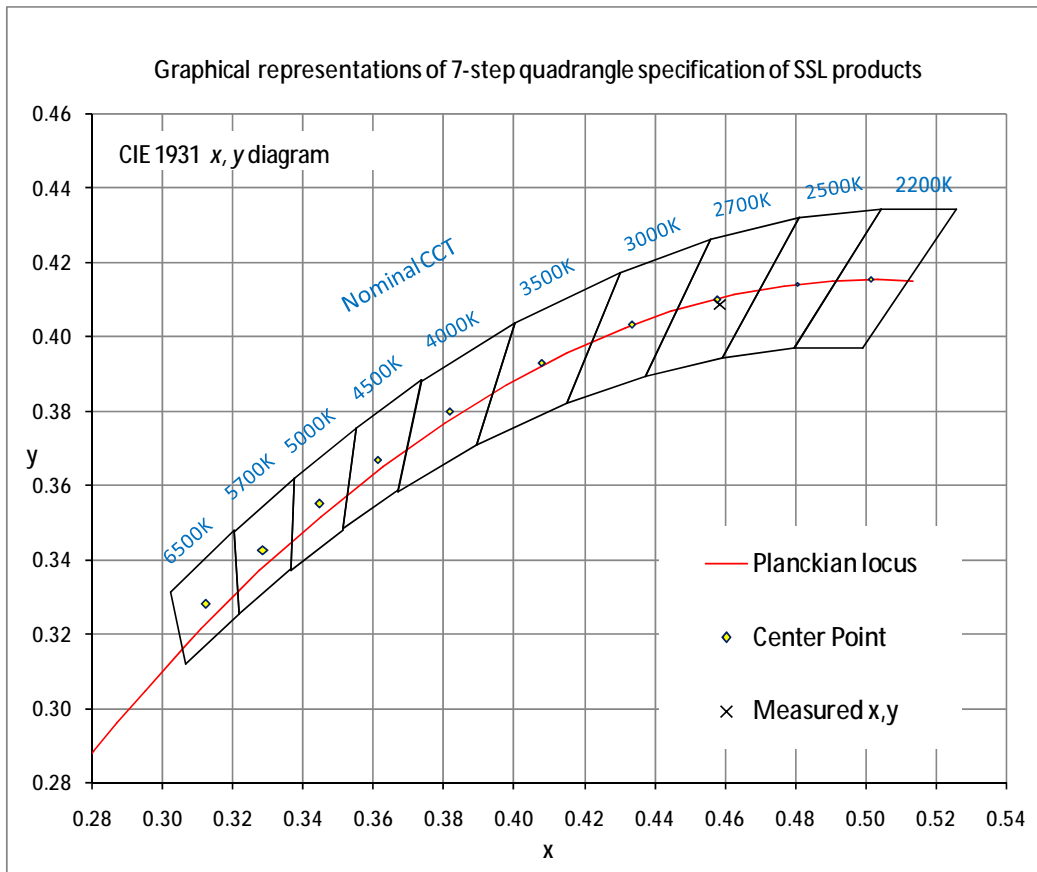


4. Test Data

4.1 Spectral Distribution



4.2 ANSI Chromaticity Quadrangles Diagram





4.3 Goniometry Test Data

CIE Type	Semi-Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.44	Luminous Length	0.18 m
Spacing Criteria (90-270)	1.46	Luminous Width	0.09 m
Spacing Criteria (Diagonal)	1.56	Luminous Height	0.06 m
Test Distance	30.13 m		



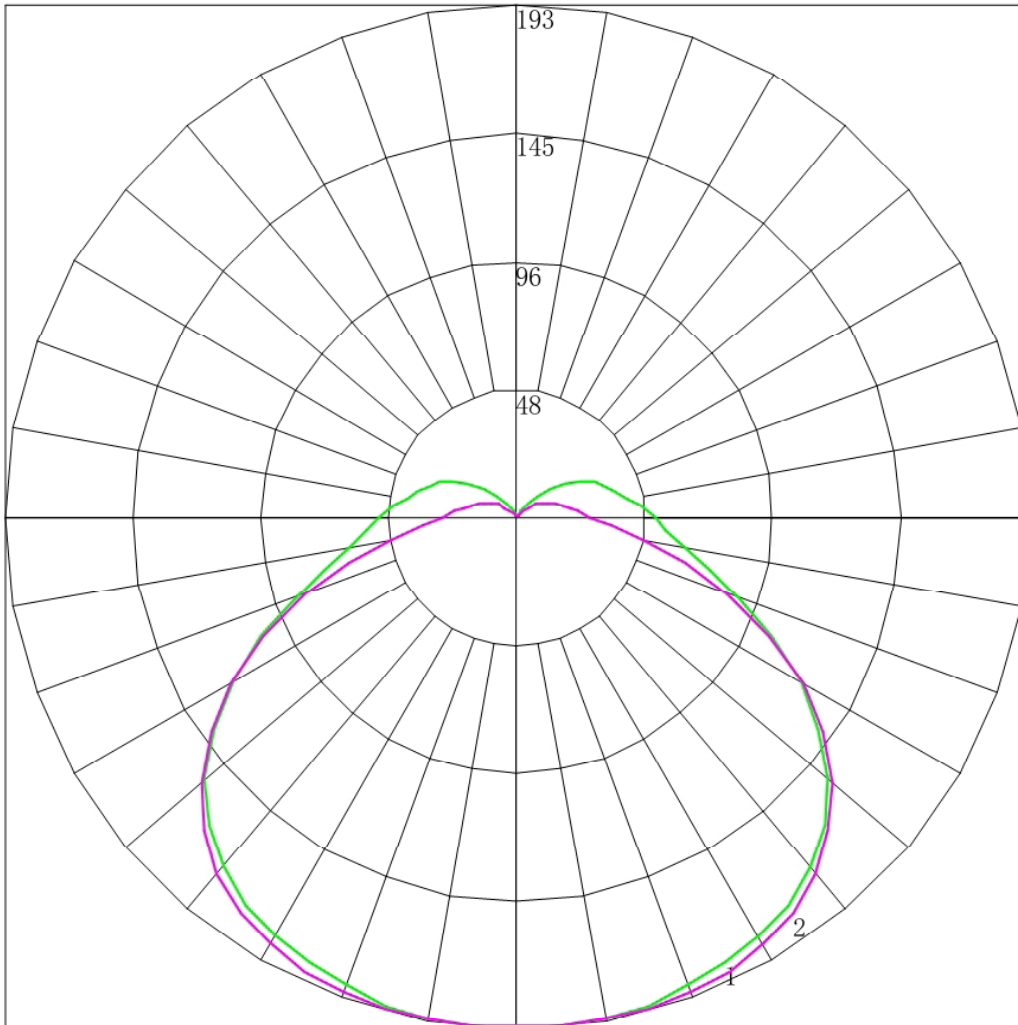
4.4 Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-20	72.55	8.30	8.30
0-30	159.07	18.30	18.30
0-40	271.32	31.20	31.20
0-60	520.66	59.90	59.90
0-80	699.62	80.40	80.40
0-90	753.67	86.60	86.60
10-90	735.31	84.50	84.50
20-40	198.77	22.80	22.80
20-50	325.03	37.40	37.40
40-70	352.38	40.50	40.50
60-80	178.96	20.60	20.60
70-80	75.91	8.70	8.70
80-90	54.05	6.20	6.20
90-110	72.48	8.30	8.30
90-120	95.41	11.00	11.00
90-130	108.95	12.50	12.50
90-150	115.77	13.30	13.30
90-180	116.25	13.40	13.40
110-180	43.78	5.00	5.00
0-180	869.92	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	18.36
10-20	54.19
20-30	86.53
30-40	112.24
40-50	126.26
50-60	123.08
60-70	103.04
70-80	75.91
80-90	54.05
90-100	40.85
100-110	31.63
110-120	22.93
120-130	13.54
130-140	5.65
140-150	1.17
150-160	0.17
160-170	0.23
170-180	0.08



Maximum Candela = 192.989 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)



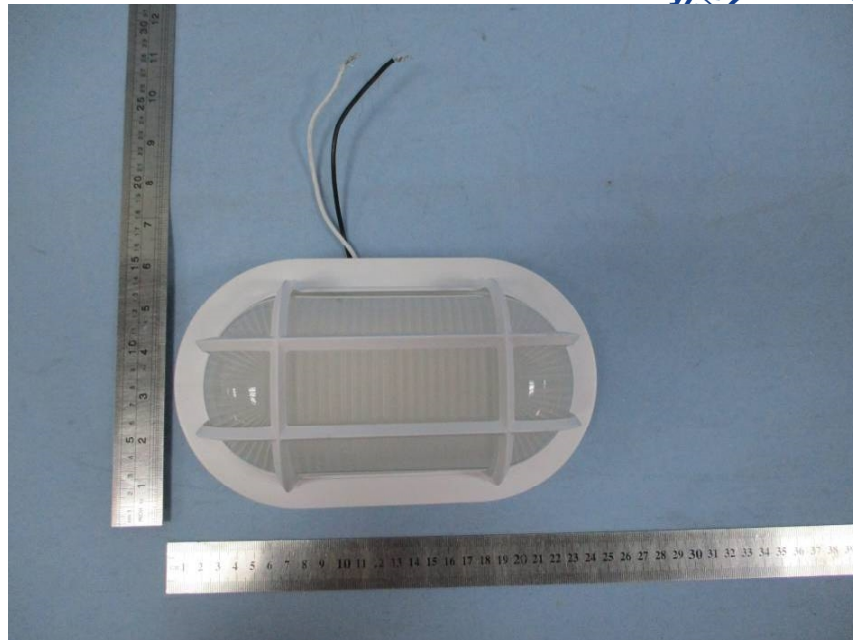
4.6 Candela Tabulation



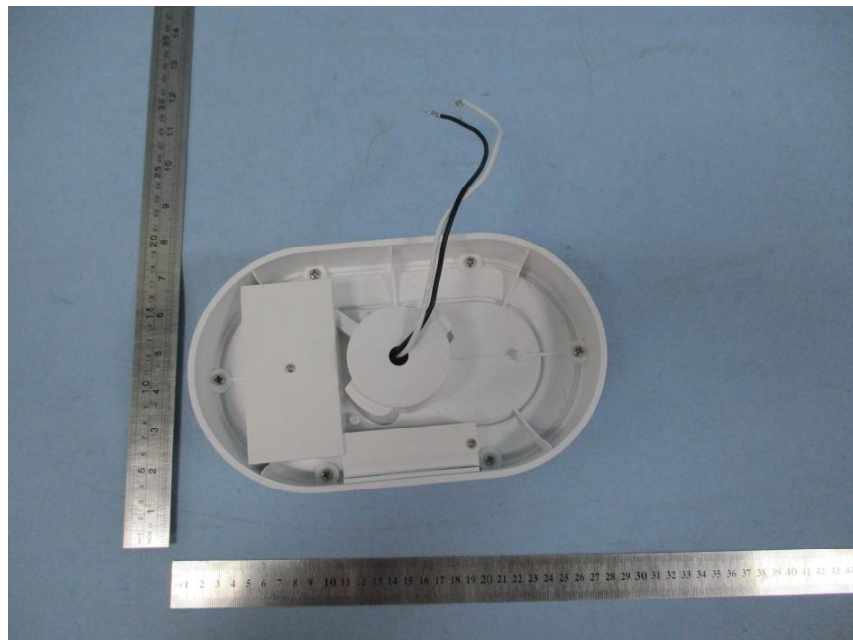
	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
0	192.079	192.079	192.079	192.079	192.079	192.079	192.079
5	192.532	192.305	192.532	192.079	192.534	192.079	192.989
10	192.079	192.305	192.305	192.532	192.534	191.851	192.534
15	190.720	190.720	191.173	191.173	192.534	191.851	192.079
20	188.002	188.455	189.134	189.587	190.941	191.396	190.713
25	185.284	185.737	185.963	186.643	188.438	189.348	189.348
30	182.566	182.566	182.566	182.792	185.479	186.389	185.707
35	178.941	178.488	178.262	177.356	179.562	181.838	182.065
40	172.599	172.373	171.693	171.014	172.507	174.783	175.693
45	164.445	164.218	163.312	163.086	162.038	166.135	166.590
50	153.572	152.893	151.534	149.042	150.887	154.073	155.666
55	139.076	139.076	137.490	134.772	135.639	140.418	141.101
60	123.673	123.220	123.673	118.464	117.432	123.122	124.715
65	106.459	106.685	105.326	101.702	99.226	104.232	105.143
70	89.244	90.150	89.018	86.073	82.612	84.888	84.660
75	75.201	76.786	74.521	71.577	67.592	66.681	65.544
80	64.328	64.328	62.969	60.025	54.392	51.206	48.702
85	56.627	56.627	54.815	51.191	44.834	39.599	35.958
90	52.097	50.738	48.473	44.849	37.779	31.406	27.765
95	46.661	45.302	43.263	39.412	33.227	26.855	23.213
100	42.131	40.998	38.959	35.109	29.358	23.441	20.482
105	38.506	37.827	35.562	31.711	25.944	20.255	17.751
110	34.882	34.203	32.164	28.540	22.075	16.841	15.476
115	32.164	31.032	28.993	24.463	18.207	13.882	13.200
120	27.634	27.181	25.142	19.253	14.110	11.151	10.924
125	22.651	21.518	18.800	14.723	10.469	8.876	8.648
130	16.309	15.856	13.590	10.193	7.283	6.372	5.917
135	11.325	10.646	8.607	6.795	4.552	4.552	4.096
140	6.795	6.116	4.530	2.718	2.731	2.731	1.821
145	2.718	2.492	1.812	1.133	0.910	0.910	0.910
150	0.453	0.453	0.453	0.453	0.228	0.228	0.455
155	0.453	0.000	0.227	0.453	0.228	0.228	0.455
160	0.906	0.680	0.453	0.453	0.683	0.683	0.455
165	0.906	0.906	0.906	0.906	0.910	0.683	0.910
170	0.906	0.906	0.906	0.906	0.910	0.910	0.910
175	0.906	0.906	0.906	0.906	0.910	0.910	0.910
180	0.454	0.454	0.454	0.454	0.454	0.454	0.454



Appendix A Product Photo



Picture 1



Picture 2

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