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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.:

504081###(##=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
Test Lab.:	**LCTECH Guangdong Testing Services 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
Test Sites:	1/F., Building I, Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China
Template No.:	LC-RT-PL-001 Rev.1.4
Test Note:	

Complied by:		**Reviewed by:**	
Fish Tan	Fish Tan	**Lin Qiu**	Lin
Apr. 16, 2021		**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	504081###(##=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.	210402112014
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°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	120.03 V~60Hz	119.99 V~60Hz
Input Current(A)	0.059	0.059
Total Power(W)	6.93	6.93
Power Factor	0.980	0.977
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	916.92
Luminaire Efficacy(lm/W)	-	132.31
Correlated Color Temperature (CCT)(K)	2694	-
Color Rendering Index (CRI)	85.0	-
R9	16	-
Chromaticity Coordinate (x,y)	x = 0.4587 y = 0.4077	-
Chromaticity Coordinate (u,v)	u = 0.2630 v = 0.3507	-
Chromaticity Coordinate (u',v')	u' = 0.2630 v' = 0.5260	-
Duv	-0.0010	-
Zone Lumens between 0-60 º	-	61.84%
Beam Angle(50%Imax)	-	C0/180=139.2° C90/270=139.4°

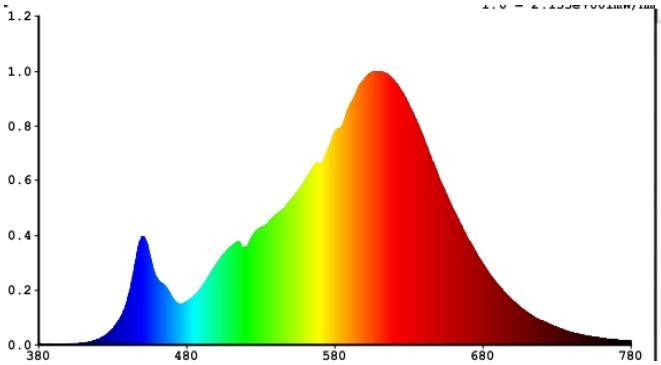
3.3 Color Rendering Details

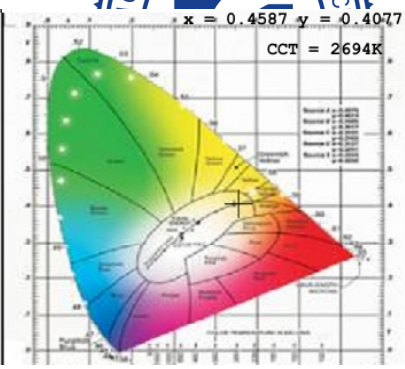
R1	R2	R3	R4	R5	R6	R7	R8
85	94	96	84	85	94	82	61
R9	R10	R11	R12	R13	R14	R15	-
16	86	84	81	87	99	77	-

Note: N/A

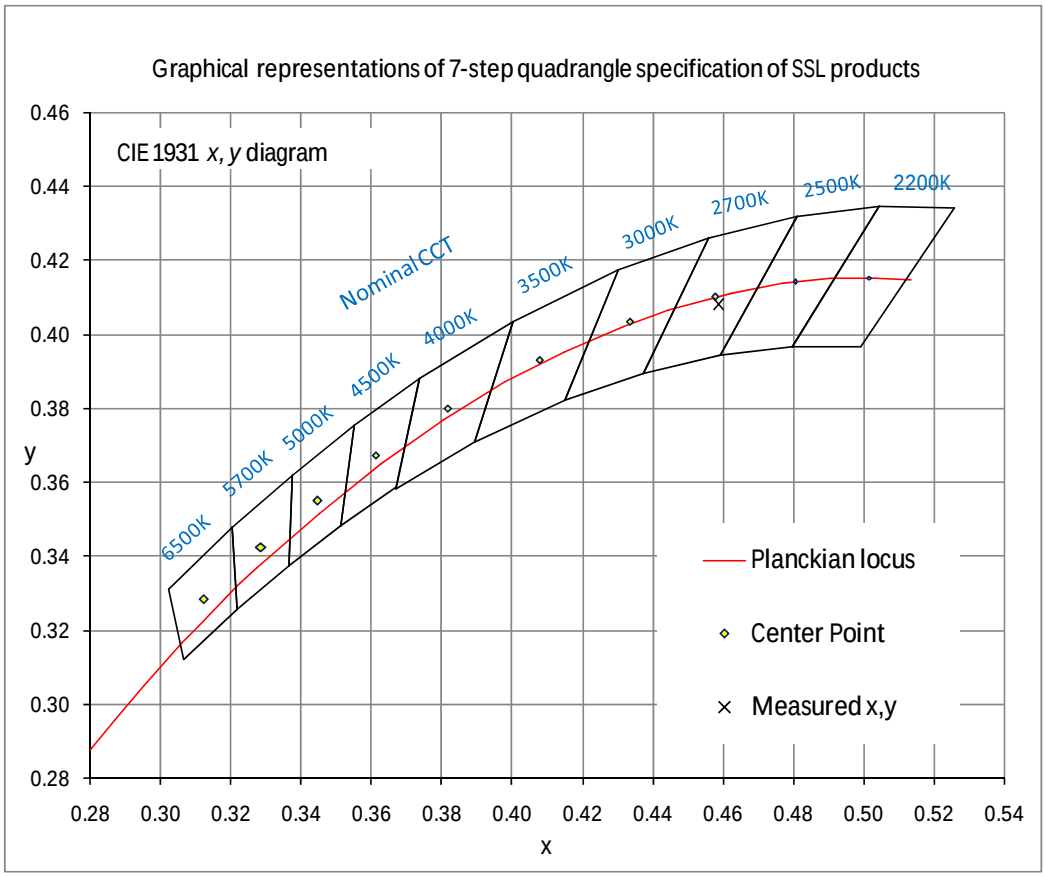
4. Test Data

4.1 Spectral Distribution





4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Semi-Direct	Basic Luminous Shape	Circular w/ Sides
Spacing Criteria (0-180)	1.44	Luminous Length	0.17 m
Spacing Criteria (90-270)	1.46	Luminous Width	0.17 m
Spacing Criteria (Diagonal)	1.60	Luminous Height	0.06 m
Test Distance	30.13 m		

4.4 Zonal Lumen Summary

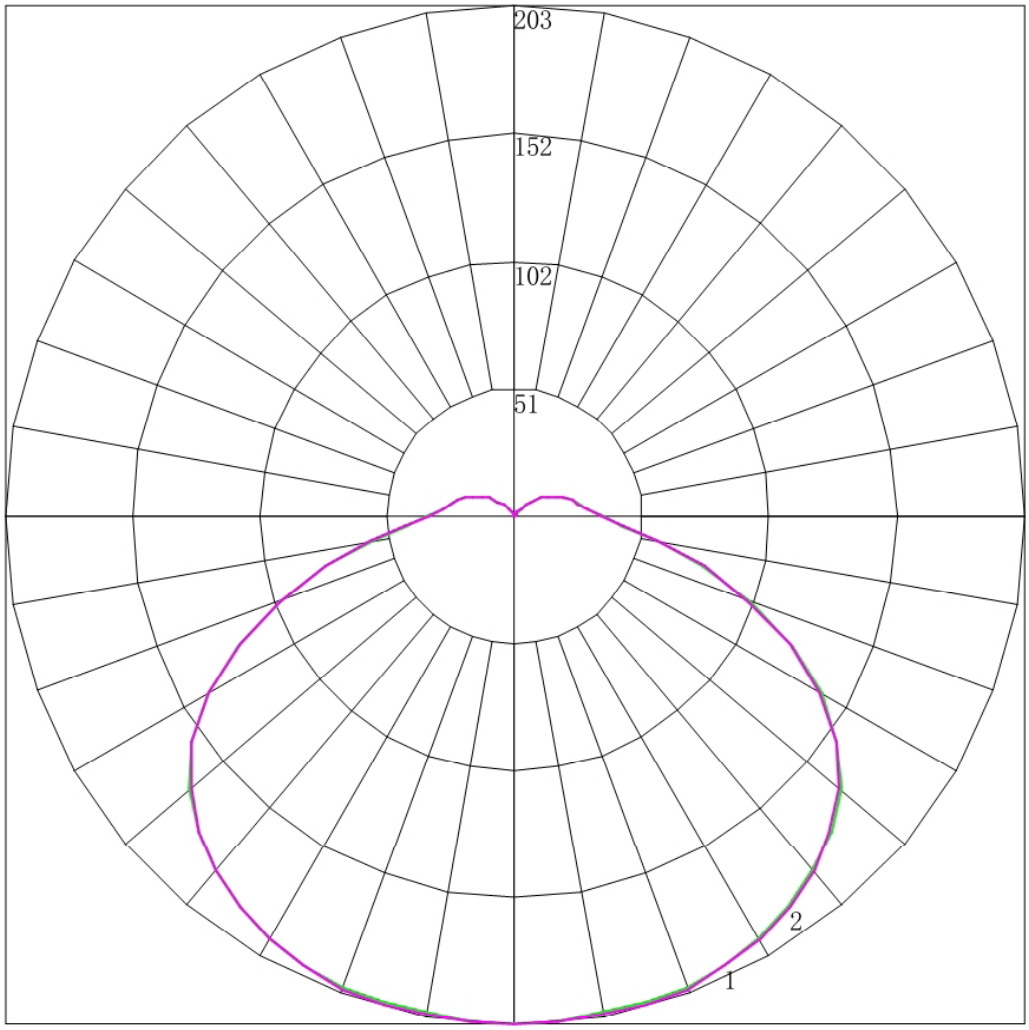
Zone	Lumens	%Lamp	%Fixt
0-20	76.42	8.30	8.30
0-30	168.23	18.30	18.30
0-40	288.14	31.40	31.40
0-60	567.06	61.80	61.80
0-80	772.55	84.30	84.30
0-90	822.69	89.70	89.70
10-90	803.37	87.60	87.60
20-40	211.72	23.10	23.10
20-50	349.74	38.10	38.10
40-70	400.19	43.60	43.60
60-80	205.49	22.40	22.40
70-80	84.22	9.20	9.20
80-90	50.14	5.50	5.50
90-110	58.45	6.40	6.40
90-120	76.78	8.40	8.40
90-130	87.79	9.60	9.60
90-150	93.82	10.20	10.20
90-180	94.23	10.30	10.30
110-180	35.79	3.90	3.90
0-180	916.92	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	19.32
10-20	57.10
20-30	91.81
30-40	119.91
40-50	138.03
50-60	140.90
60-70	121.27
70-80	84.22
80-90	50.14
90-100	33.16
100-110	25.29
110-120	18.33
120-130	11.01
130-140	4.87
140-150	1.16
150-160	0.11
160-170	0.22
170-180	0.08

4.5 Polar Curves

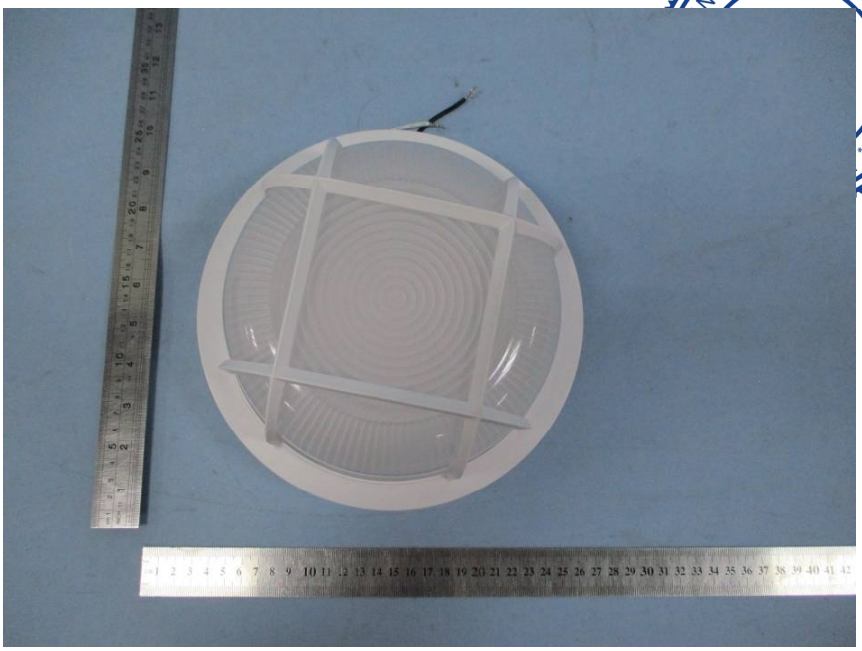


Maximum Candela = 203.123 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

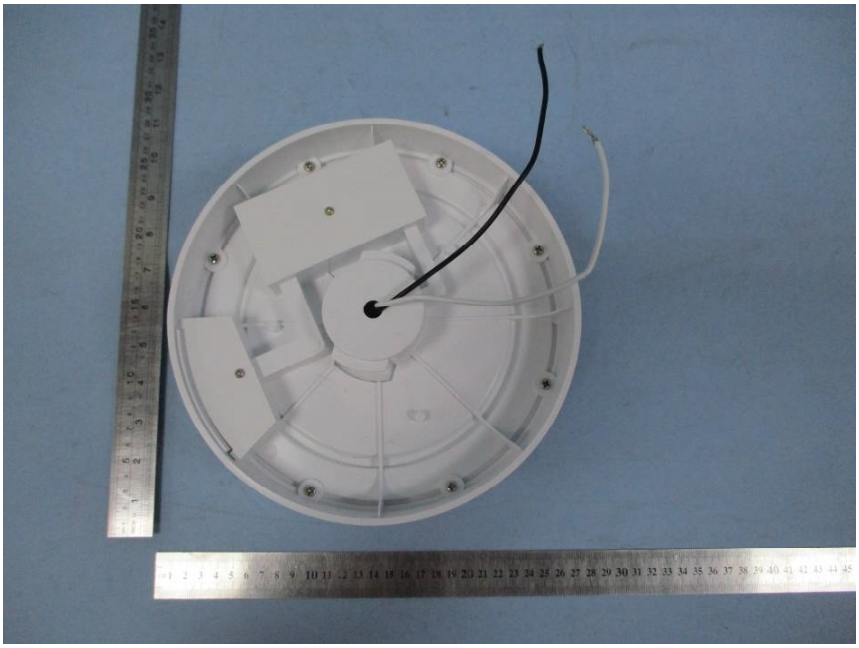
4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	202.670	202.670	202.670	202.670	202.670	202.670	202.670
5	202.670	202.670	202.670	202.670	202.217	202.217	203.123
10	201.761	202.216	201.989	201.989	202.218	201.991	202.670
15	201.307	201.307	201.761	201.989	201.313	201.538	201.765
20	200.398	200.625	200.852	200.852	200.634	200.632	201.313
25	198.126	198.353	198.808	199.262	198.823	198.366	198.599
30	194.945	195.399	196.081	196.308	196.332	195.420	195.432
35	190.401	190.855	191.764	191.991	191.344	190.887	191.360
40	184.948	185.402	186.084	186.311	186.131	185.447	185.479
45	178.132	178.813	179.495	180.176	178.877	178.420	177.789
50	169.498	169.725	170.634	170.861	170.036	169.125	168.741
55	157.228	158.364	159.046	159.273	158.247	157.110	156.979
60	141.324	142.233	145.414	143.596	142.830	141.240	140.693
65	122.238	122.465	124.283	124.283	123.104	121.968	121.240
70	99.972	100.426	102.017	102.017	101.112	99.977	99.526
75	77.705	81.113	79.523	80.205	78.892	77.984	78.263
80	58.165	59.074	60.210	60.665	59.848	58.714	58.358
85	43.170	44.533	45.215	45.669	44.886	43.978	43.882
90	35.445	34.990	35.672	35.899	35.138	34.457	34.382
95	29.083	29.764	30.219	30.673	30.151	29.470	28.953
100	26.356	26.583	26.811	27.038	26.524	26.524	25.786
105	23.630	24.084	24.084	24.084	23.803	23.803	23.524
110	20.903	21.130	21.358	21.358	21.083	21.083	20.810
115	18.177	18.404	18.631	18.858	18.590	18.362	18.548
120	15.450	15.450	15.905	15.677	15.416	15.416	15.381
125	12.269	12.269	12.269	12.269	12.016	11.788	12.214
130	9.088	9.316	9.088	8.861	9.068	9.068	9.048
135	6.362	6.362	5.907	6.135	5.894	6.348	6.333
140	3.635	3.635	3.408	3.408	3.401	3.401	3.619
145	1.363	1.590	1.590	1.590	1.814	1.814	1.810
150	0.454	0.454	0.454	0.454	0.226	0.226	0.452
155	0.000	0.000	0.000	0.227	0.226	0.000	0.000
160	0.454	0.682	0.227	0.454	0.453	0.453	0.452
165	0.909	0.909	0.909	0.909	0.907	0.907	0.905
170	0.909	0.909	0.909	0.909	0.907	0.907	0.905
175	0.909	0.909	0.909	0.909	0.907	0.907	0.905
180	0.453	0.453	0.453	0.453	0.453	0.453	0.453

Appendix A Product Photo



Picture 1



Picture 2

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