LCTECH

NVLAP TESTING
NVLAP LAB CODE 500080-0

IESNA SUSTAINING MEMBER

Ref. No.: LCZP21040005
Version: 1.0
Date of Issue: Apr. 16, 2021
Total pages: 11

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.:

504091###(##=11-30,#=0-9)

(This is a color tunable product tunable to 3000K, 4000K and 5000K, ## 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**	

Table of Contents

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	504091###(##=11-30,#=0-9)
Rated Inputs	120-277VAC, 50/60Hz
Rated Power	5.7W, 11W
Rated Light output	1200lm
Declared CCT	3000K/4000K/5000K
Power Supply	ETI-AD01200240042SNA
LED Package, Array or Module	SPMWH1228xxxxxxxxx, Samsung Electronics Co., LTD.
Receipt Samples	1 unit
Sample Code of lab.	210402112021
Date of Receipt Samples	Apr. 2, 2021
Note	3000K and 11W setting was selected for the test.

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	120.01 V~60Hz	120.01 V~60Hz
Input Current(A)	0.092	0.092
Total Power(W)	10.86	10.86
Power Factor	0.988	0.987
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	1376.98
Luminaire Efficacy(lm/W)	-	126.79
Correlated Color Temperature (CCT)(K)	3043	-
Color Rendering Index (CRI)	84.4	-
R9	13	-
Chromaticity Coordinate (x,y)	x = 0.4338 y = 0.4027	-
Chromaticity Coordinate (u,v)	u = 0.2491 v = 0.3469	-
Chromaticity Coordinate (u',v')	u' = 0.2491 v' = 0.5204	-
Duv	-0.0011	-
Zone Lumens between 0-60 º	-	52.12%
Beam Angle(50%Imax)	-	C0/180=129.0° C90/270=153.8°

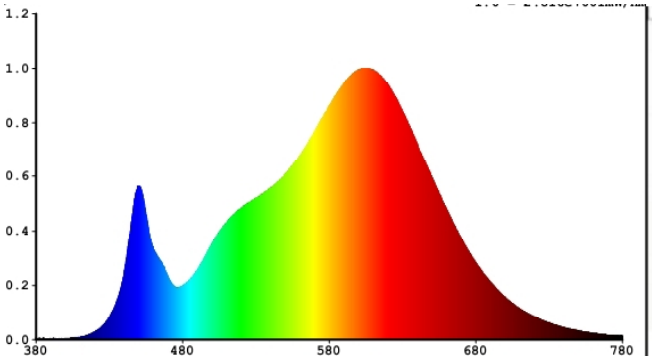
3.3 Color Rendering Details

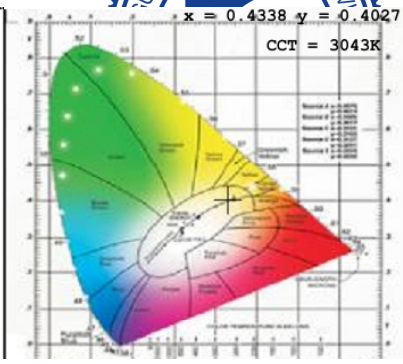
R1	R2	R3	R4	R5	R6	R7	R8
83	92	97	83	84	91	84	62
R9	R10	R11	R12	R13	R14	R15	-
13	82	84	75	85	99	76	-

Note: N/A

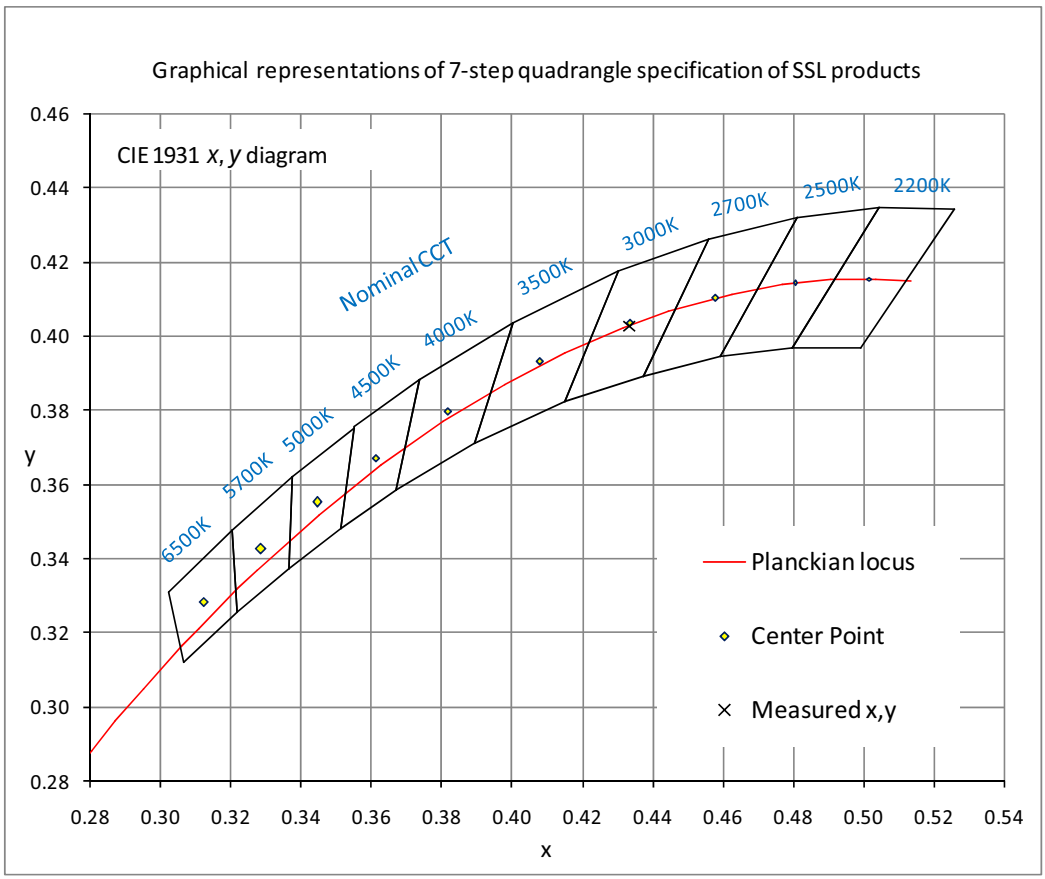
4. Test Data

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)	1.42	Luminous Length	0.21 m
Spacing Criteria (90-270)	1.32	Luminous Width	0.13 m
Spacing Criteria (Diagonal)	1.56	Luminous Height	0.08 m
Test Distance	30.13 m		

4.4 Zonal Lumen Summary

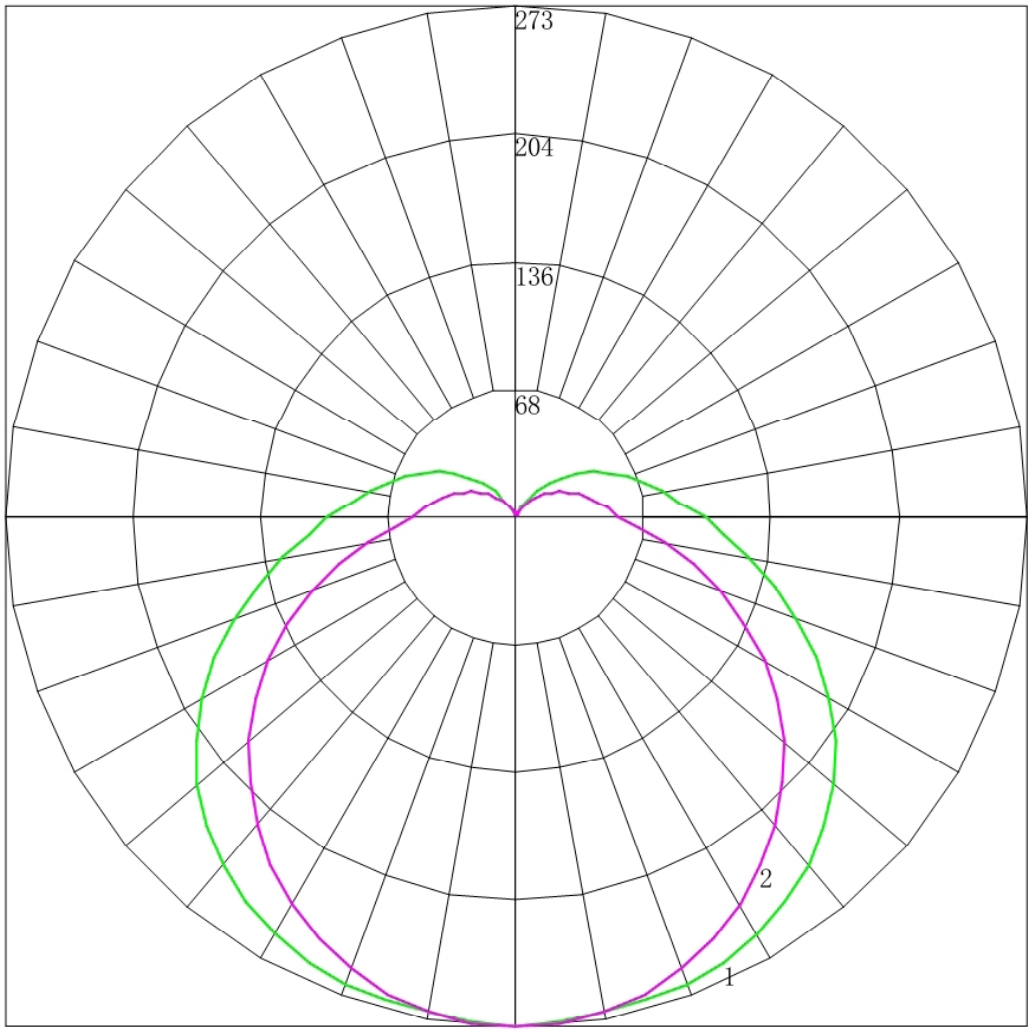
Zone	Lumens	%Lamp	%Fixt
0-20	100.89	7.30	7.30
0-30	219.05	15.90	15.90
0-40	370.40	26.90	26.90
0-60	717.71	52.10	52.10
0-80	1022.29	74.20	74.20
0-90	1132.91	82.30	82.30
10-90	1107.07	80.40	80.40
20-40	269.51	19.60	19.60
20-50	440.83	32.00	32.00
40-70	511.82	37.20	37.20
60-80	304.58	22.10	22.10
70-80	140.07	10.20	10.20
80-90	110.62	8.00	8.00
90-110	151.35	11.00	11.00
90-120	196.82	14.30	14.30
90-130	224.67	16.30	16.30
90-150	242.71	17.60	17.60
90-180	244.07	17.70	17.70
110-180	92.72	6.70	6.70
0-180	1376.98	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	25.84
10-20	75.05
20-30	118.17
30-40	151.34
40-50	171.32
50-60	175.99
60-70	164.51
70-80	140.07
80-90	110.62
90-100	86.00
100-110	65.35
110-120	45.48
120-130	27.85
130-140	13.64
140-150	4.39
150-160	0.81
160-170	0.41
170-180	0.14

4.5 Polar Curves

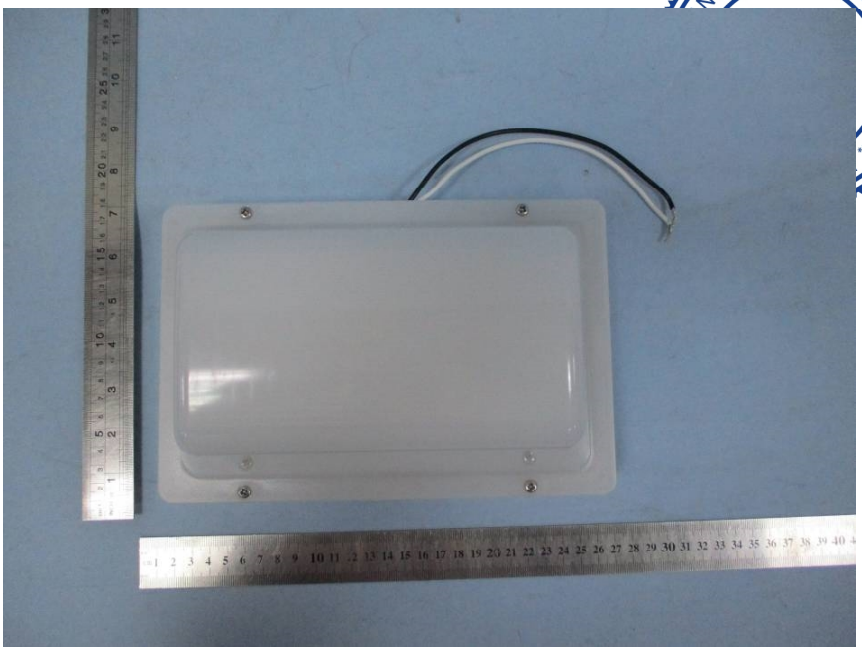


Maximum Candela = 272.572 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

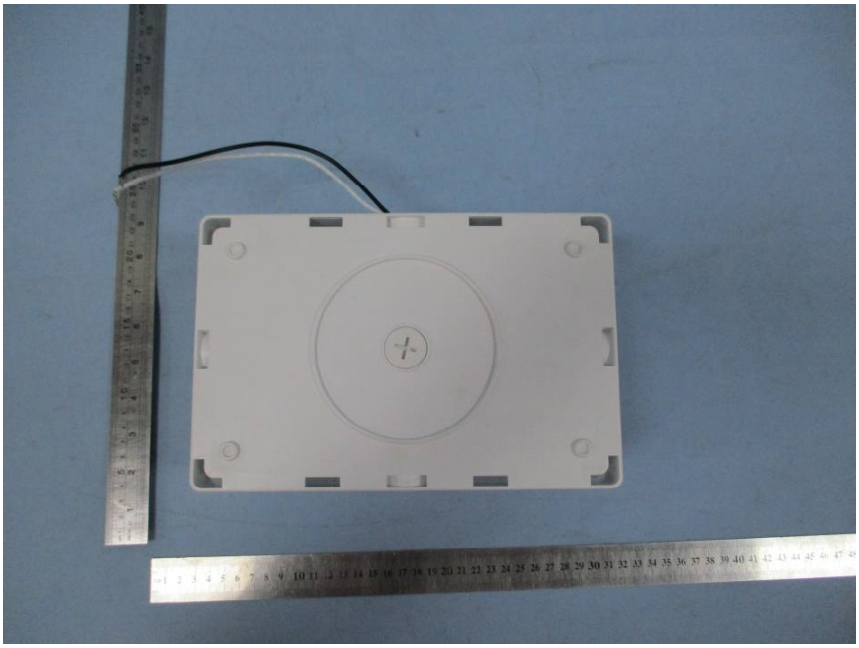
4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	272.572	272.572	272.572	272.572	272.572	272.572	272.572
5	271.214	271.440	271.666	271.663	271.209	271.662	272.118
10	269.403	269.403	269.171	268.938	268.029	268.477	268.483
15	267.591	267.365	265.997	265.076	263.486	263.244	263.941
20	266.233	265.328	263.503	260.988	258.262	257.100	257.126
25	262.611	261.479	259.648	256.672	251.675	249.593	248.949
30	257.630	256.725	254.886	251.221	245.769	240.036	239.409
35	251.291	250.160	248.764	244.406	236.683	229.342	228.052
40	242.689	242.236	241.053	235.775	227.143	217.965	215.332
45	233.180	232.954	231.756	227.371	216.695	205.451	201.249
50	221.861	221.861	220.871	214.878	204.656	192.482	186.712
55	208.730	210.315	208.852	202.158	191.255	178.147	170.358
60	193.336	195.826	196.604	187.848	176.945	162.903	153.095
65	177.489	179.979	179.599	173.083	161.272	146.294	134.469
70	160.283	163.679	163.499	156.956	144.463	129.001	116.297
75	142.625	148.737	146.492	140.375	127.882	111.483	98.126
80	126.325	130.174	130.392	124.020	111.300	94.418	79.954
85	111.383	115.458	115.879	109.256	96.763	79.174	64.963
90	100.969	101.875	102.499	96.763	84.497	67.571	54.969
95	87.839	90.329	91.614	86.087	74.730	59.380	49.517
100	78.783	80.142	81.409	77.002	66.099	51.872	44.974
105	71.086	72.218	72.112	67.916	57.922	45.047	40.432
110	62.936	62.257	63.041	58.830	49.517	37.994	35.889
115	54.786	53.654	53.743	49.744	41.340	32.080	31.346
120	47.542	45.504	45.582	40.659	33.163	27.075	27.257
125	39.844	38.260	35.603	32.254	25.440	22.070	22.714
130	32.600	30.562	26.759	23.623	18.626	17.747	19.080
135	24.903	23.318	18.822	15.900	12.266	13.879	14.537
140	17.658	16.300	12.020	7.950	7.723	10.239	10.903
145	11.319	9.961	6.350	2.726	4.543	6.371	7.269
150	4.981	4.301	2.041	1.363	2.044	3.413	4.089
155	1.358	1.358	1.361	1.363	0.909	1.365	1.363
160	1.358	1.358	1.361	1.363	1.363	1.365	1.363
165	1.358	1.358	1.361	1.363	1.590	1.593	1.817
170	1.358	1.358	1.361	1.363	1.590	1.593	1.817
175	1.358	1.585	1.587	1.590	1.590	1.820	1.817
180	0.908	0.908	0.908	0.908	0.908	0.908	0.908

Appendix A Product Photo



Picture 1



Picture 2

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