LCTECH

NVLAP TESTING
NVLAP LAB CODE 500080-0

IESNA SUSTAINING MEMBER

Ref. No.: LCZP16120508
Version: 1.0
Date of Issue: Jan. 12, 2017
Total pages: 11

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:

Four-Foot Linear Replacement Lamps

Models No.:

542221XX(XX=31-50)

(Where XX denotes CCT and could be 31-50 which refers 3500K)

Test Date:	Jan. 9, 2017
Test Item:	Total luminous flux, Luminous Efficacy, Electrical values, Luminous Intensity 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/LM79-08/11
Test Note:	

Complied by:	**Reviewed by:**
Fish Tan	**Richard Li**
Project Engineer	**Technical Manager**
Jan. 12, 2017	**Jan. 12, 2017**

Table of Contents

1. General

1.1 Product Information

Brand Name	ETI
Product Type	Internal Driver/Line Voltage Lamp-Style Retrofit Kits
Model Number	542221XX(XX=31-50)
Rated Inputs	120-277V AC, 50/60Hz
Rated Power	13 W
Rated Light output	1800 lm
Declared CCT	3500 K
Power Supply	Integrated in lamp
LED Package, Array or Module	Model: SPMWH1228FD5WAR0S0,manufactured by SAMSUNG ELECTRONICS CO., LTD
Receipt Samples	2 units
Sample Code of lab.	17010311025
Date of Receipt Samples	Jan. 3, 2017
Note	Two (2) lamps were installed in a reference troffer recommended by DLC ,Please refer to section 1.2 for detail reference troffer information

1.2 Reference Troffer information

Troffer Brand Name	Lithonia
Troffer Model	Lithonia 2GT8 lensed 2X4

Lithonia 2GT8 lensed 2x4

1.3 Standards or methods

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

No.	Name
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

1.4 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2016-02-04	2017-02-03
AC Power supply	LC-I-987	APW-110N	2016-02-04	2017-02-03
Power analyzer	LC-I-928	WT210	2016-01-24	2017-01-24
Power analyzer	LC-I-954	WT210	2016-02-04	2017-02-03
Multimeter	LC-I-972	Fluke 17B	2016-08-10	2017-08-09
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-PL-I-002	24V100W	2016-10-08	2017-10-07
Luminous Flux Standard Lamp	LC-PL-I-001	110V/200W	2016-09-24	2017-09-23
Goniophotometer(with mirror)	LC-I-902	GMS2000	2016-05-07	2017-05-07
Wireless temperature transmitter	LC-I-978	DWRF-B	2016-02-03	2017-02-02
Wireless temperature transmitter	LC-I-979	DWRF-B	2016-02-03	2017-02-02

2. Test conducted and method

2 Lamps provided by the client were tested in the troffer. The lamp 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

The customer did not require this measurement.

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(Goniophotometer)
Input Voltage & Frequency	120.09 V~60Hz
Input Current(A)	0.225
Total Power(W)	26.78
Power Factor	0.990

3.2 Photometric data

Criteria Item	Result(Goniophotometer)
Total Lumens(lm)	2832.82
Luminaire Efficacy(Lm/W)	105.78
Spacing Criteria(0-180°)	1.22
Spacing Criteria(90-270°)	1.32
Zone Lumens between 0-60 °	83.85%

4. Test Data

4.1 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular
Spacing Criteria (0-180)	1.22	Luminous Length	1.15 m
Spacing Criteria (90-270)	1.32	Luminous Width	0.54 m
Spacing Criteria (Diagonal)	1.36	Luminous Height	0.00 m
Test Distance	29.65 m		

4.2 Zonal Lumen Summary

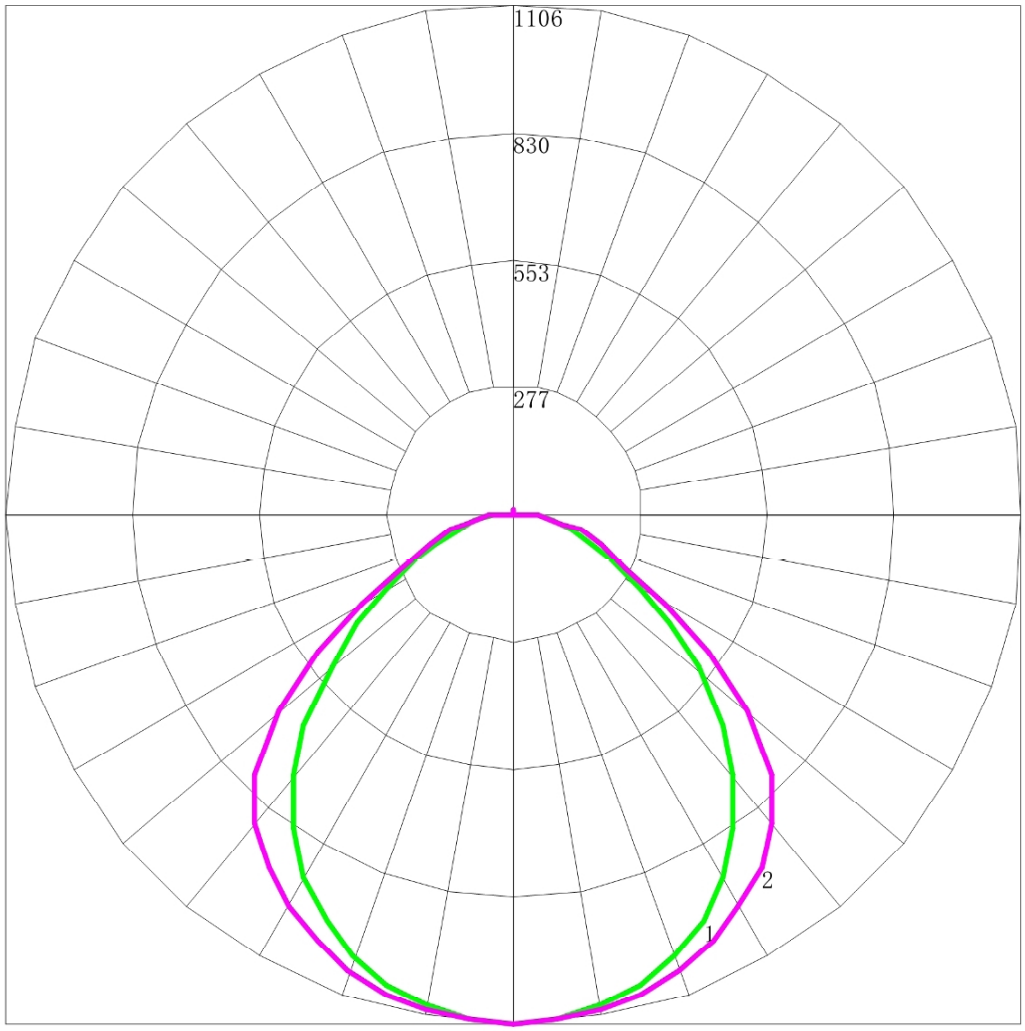
Zone	Lumens	%Lamp	%Fixt
0-20	405.89	14.30	14.30
0-30	864.07	30.50	30.50
0-40	1414.91	49.90	49.90
0-60	2375.35	83.90	83.90
0-80	2762.25	97.50	97.50
0-90	2817.99	99.50	99.50
10-90	2713.25	95.80	95.80
20-40	1009.03	35.60	35.60
20-50	1554.54	54.90	54.90
40-70	1207.62	42.60	42.60
60-80	386.90	13.70	13.70
70-80	139.72	4.90	4.90
80-90	55.74	2.00	2.00
90-110	5.03	0.20	0.20
90-120	6.33	0.20	0.20
90-130	7.57	0.30	0.30
90-150	10.73	0.40	0.40
90-180	14.83	0.50	0.50
110-180	9.80	0.30	0.30
0-180	2832.82	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	104.74
10-20	301.15
20-30	458.18
30-40	550.85
40-50	545.52
50-60	414.92
60-70	247.18
70-80	139.72
80-90	55.74
90-100	3.57
100-110	1.46
110-120	1.30
120-130	1.25
130-140	1.36
140-150	1.79
150-160	1.99
160-170	1.53
170-180	0.58

4.3 Polar Curves

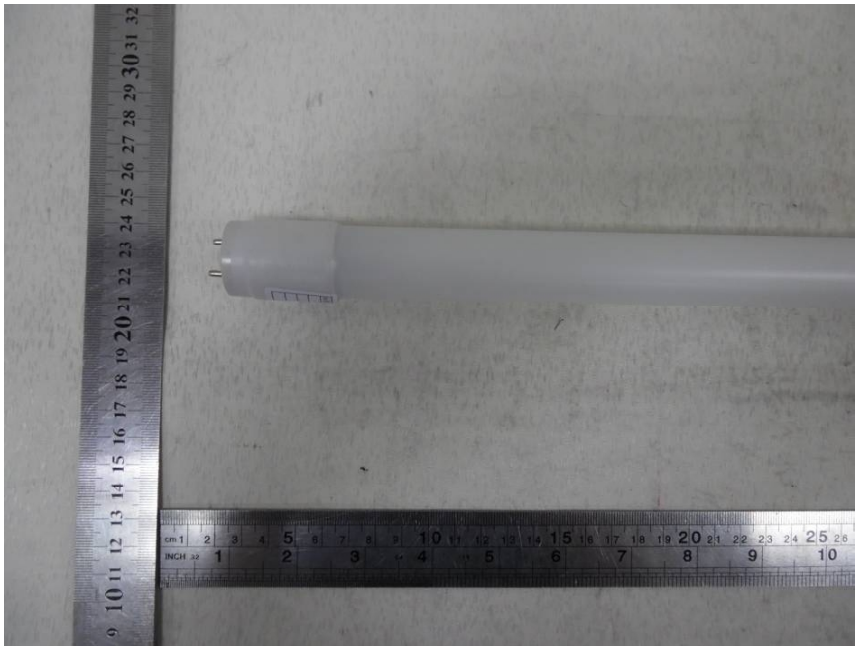


Maximum Candela = 1106.164 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

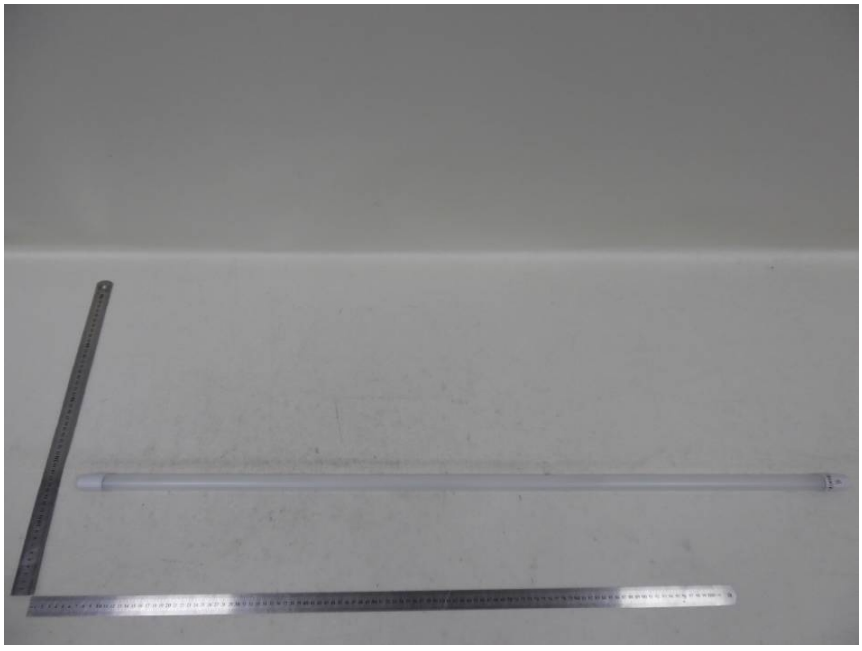
4.4 Candela Tabulation

	0	15	30	45	60	75	90
0	1106.164	1106.164	1106.164	1106.164	1106.164	1106.164	1106.164
5	1100.870	1100.384	1101.061	1102.232	1102.261	1102.036	1102.437
10	1085.253	1084.988	1086.484	1087.707	1090.882	1091.327	1092.351
15	1057.636	1057.985	1062.411	1066.266	1071.801	1074.577	1075.644
20	1019.961	1021.616	1028.876	1036.155	1045.533	1050.081	1052.710
25	970.772	972.973	983.163	993.977	1005.479	1015.483	1019.910
30	909.627	911.778	925.927	941.382	959.842	973.996	980.752
35	831.630	835.627	856.269	880.259	906.524	926.929	936.464
40	743.619	749.827	776.229	808.107	843.447	868.077	879.634
45	640.961	648.713	675.175	710.207	749.679	780.263	794.433
50	519.466	530.208	554.860	590.844	622.923	649.617	668.013
55	410.940	419.479	438.861	466.176	486.214	504.903	519.668
60	314.767	312.240	317.481	338.430	353.890	370.105	383.426
65	237.741	227.365	221.578	233.493	251.206	265.832	272.923
70	177.523	166.889	157.004	158.182	180.797	196.072	196.536
75	127.760	124.751	116.039	115.603	137.201	148.370	148.827
80	89.644	88.600	86.041	89.529	98.401	107.735	107.301
85	46.586	46.884	47.646	49.726	52.262	57.600	54.067
90	7.279	7.545	7.965	8.167	8.724	10.036	8.551
95	1.456	1.671	1.781	1.778	1.537	1.383	1.447
100	1.412	1.473	1.517	1.492	1.427	1.427	1.447
105	1.279	1.319	1.429	1.404	1.384	1.405	1.403
110	1.235	1.275	1.297	1.316	1.274	1.317	1.316
115	1.235	1.209	1.297	1.295	1.339	1.295	1.272
120	1.368	1.320	1.385	1.404	1.405	1.405	1.359
125	1.368	1.385	1.407	1.405	1.427	1.471	1.447
130	1.279	1.319	1.341	1.360	1.339	1.383	1.403
135	1.765	1.715	1.781	1.756	1.691	1.712	1.710
140	2.250	2.199	2.265	2.260	2.328	2.305	2.280
145	2.868	2.793	2.814	2.853	2.833	2.876	2.850
150	3.485	3.518	3.584	3.599	3.536	3.600	3.596
155	4.235	4.288	4.376	4.433	4.436	4.478	4.473
160	4.941	4.882	4.947	4.938	5.007	5.049	5.043
165	5.470	5.475	5.431	5.442	5.446	5.466	5.525
170	5.779	5.739	5.739	5.793	5.864	5.861	5.964
175	6.132	6.091	6.069	6.145	6.281	6.278	6.358
180	6.416	6.416	6.416	6.416	6.416	6.416	6.416

Appendix 1 Product Photo



Picture 1



Picture 2

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