

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

Linear Ambient

Model name(s):

544651##-1

Representative (Tested) Model:

54465161-1

Model Difference: ##=61-70 identifies 5000K

Prepare By:

Derek Lai

Engineer: Derek Lai

Date: 2018-05-28

Review By:

Vincent Yuan

Technical Lead: Vincent Yuan

Date: 2018-06-06

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
Model Number:	544651##-1 (##=61-70)
Product type:	Direct Linear Ambient Luminaires
Rating Input:	AC120-277V 50/60Hz 51W
Declared CCT:	5000K
Declared Light output:	5400 lm
LED Manufacturer:	Samsung
LED Model:	SPMWHX228FD5WAW0XX
LED Quantity:	176 pcs
Forward current of LED Chip:	160mA
Date of Receipt Samples:	2018-05-17
Quantity of Receipt Samples:	1
Sample Number:	180517001-S2

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1 st 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:	2018-06-06
Revised Date of Test Report:	N/A
Test Report No.:	NTCR18050050
Remark (If applicable)	N/A

Test Specifications:	
Date of Test	2018-05-28
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. THD and PF
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
<p>1. Photometric and Electrical measurements – Light Distribution Method:</p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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.</p>
<p>2. Photometric and Electrical Measurements – Integrating Sphere Method:</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.</p>
<p>3. THD and PF measurements</p> <p>The sample was tested according to the ANSI C82.77-2002, the sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.</p>

Integrating Sphere Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.2	40.2	Face Down	90	25

Electrical Data:

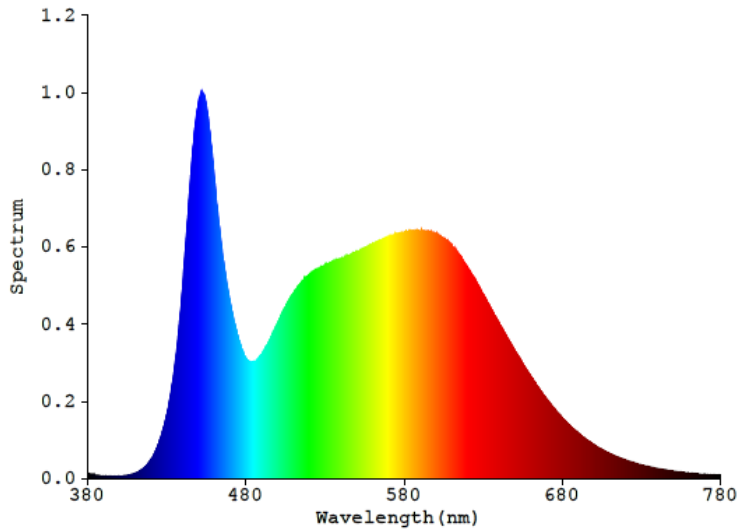
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.4143	49.22	0.9897

Color Data:

Parameter	Result
CCT (K)	5115
Color Rendering Index (CRI)	87.0
R9	27
Chromaticity, x	0.3417
Chromaticity, y	0.3456
Chromaticity u'	0.2115
Chromaticity v'	0.4812
Duv	-0.00168

Special Color Rendering			
R1	87	R9	27
R2	92	R10	80
R3	94	R11	87
R4	87	R12	69
R5	87	R13	88
R6	88	R14	97
R7	88	R15	83
R8	73	-	-

Spectrum Diagram:



Goniophotometer Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.2	40.2	Face Down	90	25

Electrical Data:

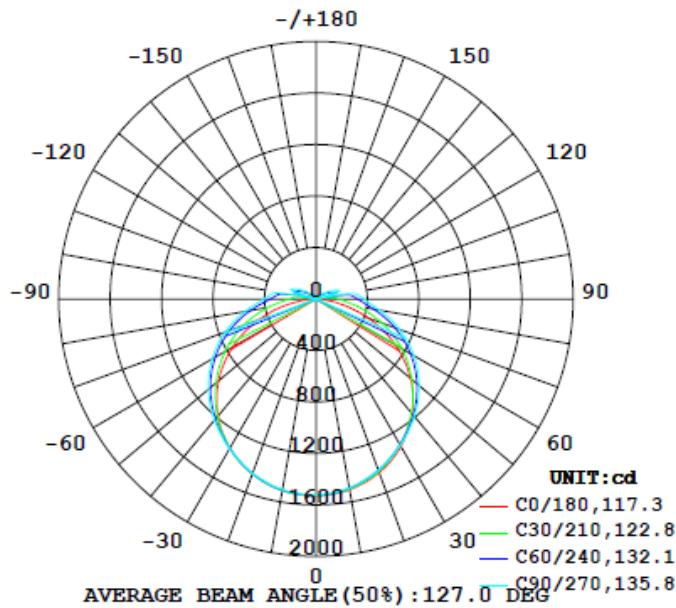
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.4159	49.4	0.9896

Goniophotometer Data:

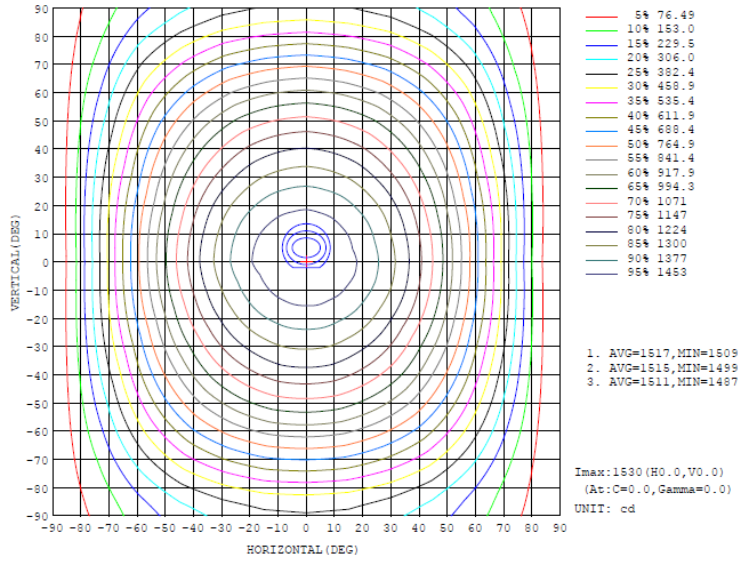
Parameter	Result
Total Luminous (lm)	5676.35
Total Luminous per foot (lm/ft)	1341.93
Luminous Efficacy (lm/w)	114.90
Zonal Lumens Distribution (0-60°)	64.6%
Beam Angle (°)	127.0

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isocandela Diagram:



Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

y	C0	C45	C90	C135	C180	C225	C270	C315	y	● none	● total	lum.lamp
10	1505	1497	1490	1492	1510	1508	1504	1499	0- 10	144.3	144.3	2.54,2.54
20	1426	1421	1414	1421	1447	1443	1441	1434	10- 20	415.3	559.6	9.86,9.86
30	1323	1308	1311	1311	1329	1327	1343	1327	20- 30	697.3	1197	21.1,21.1
40	1162	1166	1191	1172	1186	1200	1228	1189	30- 40	787.9	1985	35,35
50	959.8	1005	1047	1013	988.3	1042	1092	1029	40- 50	854.3	2939	50,50
60	712.4	818.1	878.4	829.5	748.0	864.9	932.2	849.9	50- 60	829.0	3668	64.6,64.6
70	491.8	611.3	691.4	626.1	472.4	665.0	751.7	649.3	60- 70	715.3	4282	77.2,77.2
80	154.0	404.1	502.6	418.7	190.8	457.2	561.2	441.5	70- 80	532.0	4916	86.6,86.6
90	21.57	266.0	372.4	268.4	23.10	290.9	402.5	279.8	80- 90	338.7	5255	92.6,92.6
100	15.52	16.96	224.4	14.18	16.76	44.33	247.5	15.44	90-100	207.7	5462	96.2,96.2
110	0.588	98.56	197.0	102.9	0.482	118.3	208.9	110.0	100-110	76.87	5540	97.6,97.6
120	1.114	47.55	122.9	80.21	1.097	66.08	148.5	61.12	110-120	81.78	5621	99,99
130	2.214	9.746	58.44	10.59	2.498	19.82	80.15	17.07	120-130	38.87	5660	99.7,99.7
140	1.323	4.153	11.79	4.034	1.489	4.403	24.09	4.162	130-140	11.78	5672	99.9,99.9
150	1.288	2.192	4.241	2.180	1.540	2.540	4.707	3.161	140-150	2.970	5675	100,100
160	1.396	0.9525	2.022	1.022	1.659	1.462	3.123	1.350	150-160	1.184	5676	100,100
170	1.390	1.671	1.662	1.512	1.602	1.913	2.027	1.887	160-170	0.4825	5676	100,100
180	1.545	1.529	1.396	1.421	1.551	1.535	1.412	1.429	170-180	0.1526	5676	100,100
DEG	LUMINOUS INTENSITY:cd Less than 25% Percent = 19.2 %										UNIT:lm	



Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2017-11-18	2018-11-17
NTC-F01-006	2.0 meter Integrating Sphere	2017-11-18	2018-11-17
NTC-F01-013	Standard Lamp	2017-11-18	2018-11-17
NTC-F01-031	Digital Power Meter	2017-11-18	2018-11-17
NTC-F01-019	Temperature & Humidity Meter	2017-11-23	2018-11-22



NVLAP LAB CODE 600150-0

Report No: NTCR18050050
Report Version: V1.1

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