

## 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

### LED Downlight

Model name(s):

531931##

Representative (Tested) Model:

53193111

**Model Difference:** ## =11-30 intends CCT is 3000K.

Prepare By:



Engineer: Leo Liu

Date: 2018-02-08

Review By:



Technical Lead: Vincent Yuan

Date: 2018-02-08

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:	531931## (## =11-30)
Product type:	LED Down Light
Rating Input:	AC120V, 60Hz, 10.5W
Declared CCT:	3000K
Declared Light output:	670 lm
LED Manufacturer:	Samsung
LED Model:	SPMWH1221
LED Quantity:	24 pcs
Forward current of LED	150mA
Date of Receipt Samples:	2018-02-05
Quantity of Receipt	3
Sample Number:	180205001-S1

**Laboratory Information:**

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1 <sup>st</sup> 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:	2018-02-08
Revised Date of Test Report:	N/A
Test Report No.:	NTCR18020001
Remark (If applicable)	N/A

Test Specifications:	
Date of Test	2018-02-07
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate
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><b>1. Photometric and Electrical measurements – Light Distribution Method:</b></p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at <math>25^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>, 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 <math>1^{\circ}</math> vertical intervals and <math>22.5^{\circ}</math> Vertical intervals.</p>
<p><b>2. Photometric and Electrical Measurements – Integrating Sphere Method:</b></p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at <math>25^{\circ}\text{C} \pm 1^{\circ}\text{C}</math>. 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>

## Integrating Sphere Test Results

### Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
24.6 °C	34 %	Face Down	90 min	25 min

### Electrical Data:

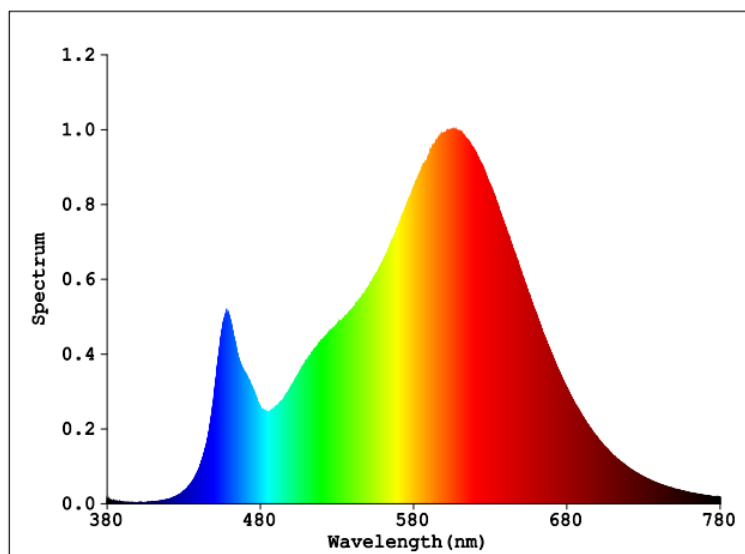
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.1	60	0.0874	9.659	0.9207

### Color Data:

Parameter	Result
CCT (K)	2910
Color Rendering Index (CRI)	84.1
R9	15
Chromaticity, x	0.4438
Chromaticity, y	0.4068
Chromaticity u'	0.2538
Chromaticity v'	0.5235
Duv	0.00020

Special Color Rendering			
R1	84	R9	15
R2	95	R10	88
R3	93	R11	80
R4	81	R12	75
R5	84	R13	87
R6	94	R14	97
R7	82	R15	76
R8	61	-	-

## Spectrum Diagram:



**Goniophotometer Test Results:**

**Test Condition:**

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
24.8 °C	35 %	Face Down	90 min	25 min

**Electrical Data:**

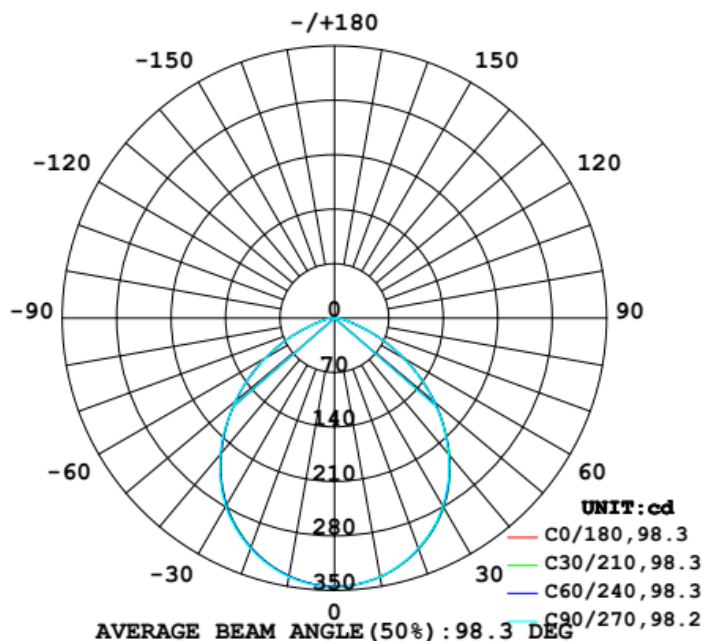
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.0874	9.656	0.9206

**Goniophotometer Data:**

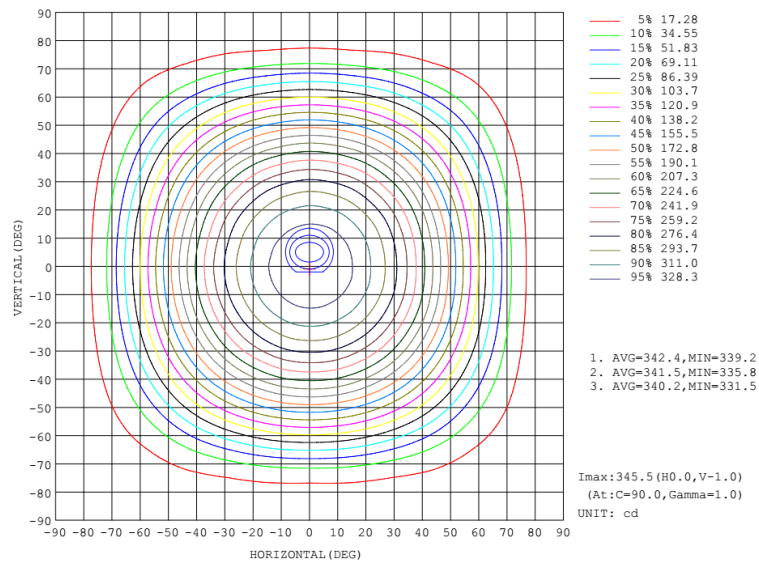
Parameter	Result
Total Luminous (lm)	797.96
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	82.64
Zonal Lumens Distribution (0-60°)	87.1%
Beam Angle (°)	98.3
Center Beam Candle Power (cd)	345.5

**Luminous Intensity Distribution Diagram:**

**LUMINOUS INTENSITY DISTRIBUTION DIAGRAM**



**Isocandela Diagram:**



**Zonal Flux Diagram:**

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	● zone	● total	%lum, lamp
10	337.9	337.8	337.4	336.7	336.8	336.3	337.7	338.2	0- 10	32.57	32.57	4.08,4.08
20	316.2	316.3	314.9	313.6	313.9	313.5	315.4	316.2	10- 20	92.44	125.0	15.7,15.7
30	280.8	280.7	278.5	277.1	277.6	277.0	279.8	280.8	20- 30	137.5	262.5	32.9,32.9
40	229.5	229.9	227.6	226.6	227.1	226.1	228.7	229.9	30- 40	159.4	421.9	52.9,52.9
50	167.6	168.2	166.6	166.0	166.7	165.9	167.4	168.3	40- 50	152.8	574.7	72,72
60	102.1	103.0	102.0	102.3	103.5	102.1	103.1	103.5	50- 60	120.5	695.2	87.1,87.1
70	42.15	42.90	42.02	42.56	43.86	42.66	43.60	43.51	60- 70	70.84	766.0	96,96
80	12.24	12.68	12.19	12.51	12.87	12.40	12.94	12.67	70- 80	25.53	791.5	99.2,99.2
90	0.0091	0	0.0079	0	0	0.0134	0.0498	0.0811	80- 90	6.407	798.0	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0015	798.0	100,100
110	0	0	0	0	0	0	0	0	100-110	0	798.0	100,100
120	0	0	0	0	0	0	0	0	110-120	0	798.0	100,100
130	0	0	0	0	0	0	0	0	120-130	0	798.0	100,100
140	0	0	0	0	0	0	0	0	130-140	0	798.0	100,100
150	0	0	0	0	0	0	0	0	140-150	0	798.0	100,100
160	0	0	0	0	0	0	0	0	150-160	0	798.0	100,100
170	0	0	0	0	0	0	0	0	160-170	0	798.0	100,100
180	0	0	0	0	0	0	0	0	170-180	0	798.0	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 10.8 %									UNIT:lm		

**Luminous Distribution Intensity Data:**

Table--1

UNIT: cd

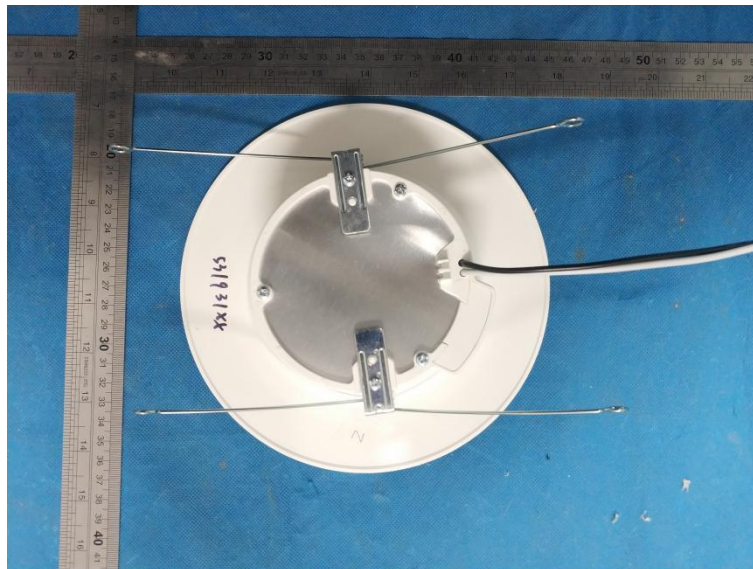
C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
γ (DEG)	0	345	345	345	345	345	345	346	345	345	345	345	345	345	345	345	345	345	346
5	343	344	343	343	343	343	343	343	343	343	343	343	343	343	343	343	343	343	344
10	338	338	338	338	337	338	337	337	337	337	337	336	337	336	337	336	337	337	338
15	329	329	329	329	328	328	328	328	327	327	327	327	327	326	327	327	327	327	328
20	316	317	316	316	315	315	315	315	314	314	313	313	314	313	314	314	314	315	315
25	300	301	300	300	299	299	298	298	298	297	297	297	297	296	297	297	298	298	299
30	281	282	281	281	280	280	279	279	278	277	277	277	278	276	277	277	278	278	280
35	257	258	257	257	256	256	255	255	254	254	253	254	254	253	253	253	255	254	256
40	230	231	230	230	229	229	228	228	227	227	226	226	227	225	227	226	227	227	229
45	199	201	200	199	199	199	198	198	197	197	197	197	197	196	197	197	197	197	199
50	168	169	168	168	168	167	167	167	166	166	166	166	167	165	166	166	166	166	167
55	135	137	136	136	135	135	134	135	134	134	134	134	134	133	134	134	134	135	135
60	102	104	103	103	103	102	102	102	102	102	102	102	103	102	102	102	102	103	103
65	70.3	72.0	71.1	71.3	70.6	70.9	70.3	70.8	70.3	71.0	70.3	71.2	72.3	70.5	71.2	70.9	71.4	71.2	71.9
70	42.1	43.5	42.7	42.9	42.3	42.5	42.0	42.4	42.0	42.6	42.1	42.8	43.9	42.3	42.9	42.7	43.1	43.1	43.6
75	21.8	22.6	22.0	22.2	21.8	22.0	21.7	21.9	21.7	22.0	21.7	22.1	22.8	21.8	22.3	22.1	22.4	22.3	22.7
80	12.2	12.9	12.4	12.7	12.3	12.6	12.2	12.5	12.2	12.5	12.1	12.6	12.9	12.2	12.7	12.4	12.8	12.6	12.9
85	5.74	5.97	5.83	5.79	5.65	5.64	5.47	5.51	5.38	5.47	5.36	5.54	5.84	5.54	5.75	5.78	5.90	5.95	6.09
90	0.01	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.02	0.05
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table--2

UNIT: cd

C (DEG)	285	300	315	330	345														
γ (DEG)	0	345	345	345	345	345													
5	343	343	344	344	343														
10	338	338	338	338	338														
15	328	329	329	329	329														
20	315	316	316	317	316														
25	299	300	300	301	300														
30	280	281	281	282	281														
35	255	257	257	258	257														
40	229	230	230	231	230														
45	199	199	200	201	200														
50	168	168	168	169	168														
55	135	136	136	136	136														
60	103	104	103	104	103														
65	71.6	72.2	71.8	72.4	71.6														
70	43.3	43.8	43.5	44.0	43.2														
75	22.5	22.8	22.6	23.0	22.4														
80	12.6	13.0	12.7	13.0	12.6														
85	6.06	6.16	6.09	6.18	6.02														
90	0.05	0.15	0.08	0.19	0.03														
95	0.00	0.00	0.00	0.00	0.00														
100	0.00	0.00	0.00	0.00	0.00														
105	0.00	0.00	0.00	0.00	0.00														
110	0.00	0.00	0.00	0.00	0.00														
115	0.00	0.00	0.00	0.00	0.00														
120	0.00	0.00	0.00	0.00	0.00														
125	0.00	0.00	0.00	0.00	0.00														
130	0.00	0.00	0.00	0.00	0.00														
135	0.00	0.00	0.00	0.00	0.00														
140	0.00	0.00	0.00	0.00	0.00														
145	0.00	0.00	0.00	0.00	0.00														
150	0.00	0.00	0.00	0.00	0.00														
155	0.00	0.00	0.00	0.00	0.00														
160	0.00	0.00	0.00	0.00	0.00														
165	0.00	0.00	0.00	0.00	0.00														
170	0.00	0.00	0.00	0.00	0.00														
175	0.00	0.00	0.00	0.00	0.00														
180	0.00	0.00	0.00	0.00	0.00														





**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

**\*\*\*\*\*END OF DATASHEET\*\*\*\*\***