

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):

538051##

Representative (Tested) Model:

53805101

**Model Difference: Where "##" denotes color temperature, the CCT is tunable,
01~10 identifies CCT tunable to 2700K, 3000K, 3500K, 4000K and 5000K.**

Prepare By:



Engineer: Leo Liu

Date: 2018-02-26

Review By:



Technical Lead: Vincent Yuan

Date: 2018-02-27

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:	Commercial Electric
Model Number:	538051## (## =01-10)
Product type:	LED Down Light
Rating Input:	AC120V, 60Hz, 10.4W
Declared CCT:	2700K, 3000K, 3500K, 4000K, 5000K
Declared Light output:	625 lm
LED Manufacturer:	Samsung
LED Model:	SPMWHx229xxxxxxxx for Downlight SPMWH1228xxxxxxxx for Nightlight
LED Quantity:	36 pcs for Downlight, 24 pcs for Nightlight
Forward current of LED Chip:	100 mA for Downlight 150 mA for Nightlight
Date of Receipt Samples:	2018-02-06
Quantity of Receipt	3
Sample Number:	180206001-S1

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:	2018-02-27
Revised Date of Test Report:	N/A
Test Report No.:	NTCR18020019
Remark (If applicable)	Product contain Nightlight Function

Test Specifications:	
Date of Test	2018-02-26
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>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>

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:

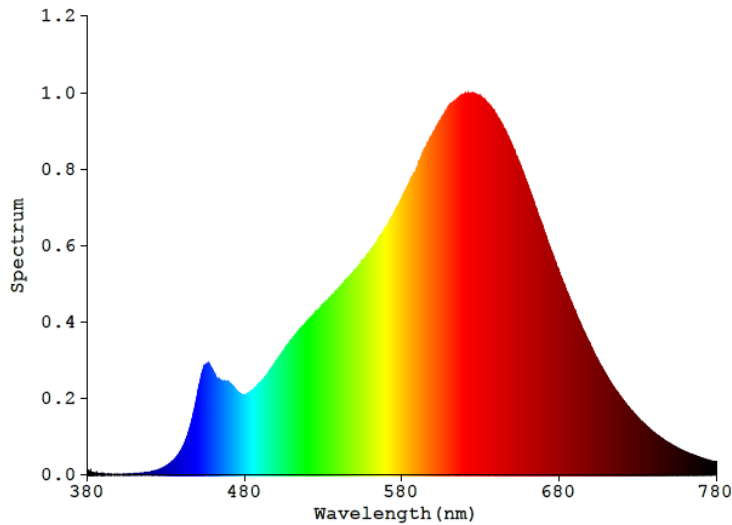
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.1	60	0.0958	9.94	0.8644

Color Data:

Parameter	Result
CCT (K)	2625
Color Rendering Index (CRI)	92.8
R9	57
Chromaticity, x	0.4688
Chromaticity, y	0.4166
Chromaticity u'	0.2656
Chromaticity v'	0.5310
Duv	0.00151

Special Color Rendering			
R1	93	R9	57
R2	98	R10	94
R3	98	R11	94
R4	92	R12	85
R5	93	R13	95
R6	98	R14	100
R7	90	R15	88
R8	80	-	-

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:

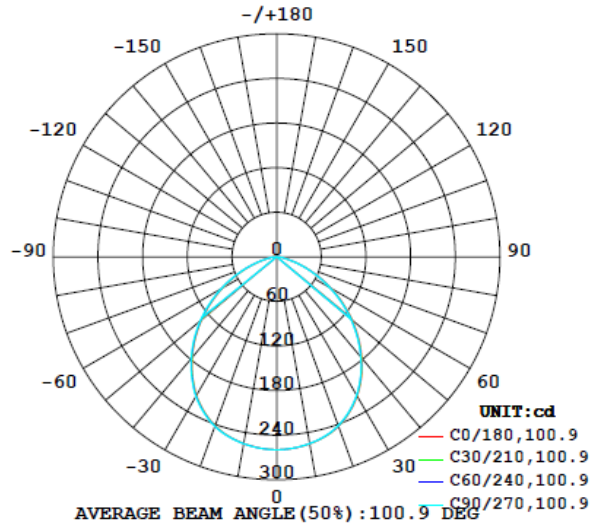
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.1	60	0.0958	9.94	0.8644

Goniophotometer Data:

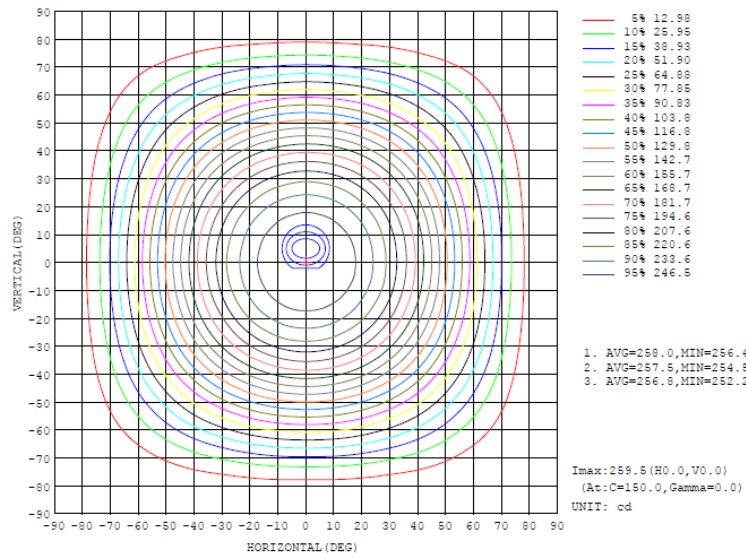
Parameter	Result
Total Luminous (lm)	630.08
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	63.36
Zonal Lumens Distribution (0-60°)	85.8%
Beam Angle (°)	100.9
Center Beam Candle Power (cd)	260

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Isocandela Diagram:



Zonal Flux Diagram:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	● none	● total	lum,lamp
10	255.4	255.3	254.9	254.9	254.9	255.0	255.4	255.3	0- 10	24.56	24.56	3.9,3.9
20	242.7	242.3	241.6	241.7	241.8	242.0	243.0	242.9	10- 20	70.57	95.13	15.1,15.1
30	216.5	215.8	214.7	214.9	215.5	215.7	217.3	217.4	20- 30	106.1	201.3	31.9,31.9
40	178.2	176.5	175.5	175.3	176.6	177.6	179.1	179.9	30- 40	123.3	324.7	51.5,51.5
50	132.5	130.8	129.6	129.4	131.3	132.6	134.4	134.6	40- 50	115.5	440.3	70.5,70.5
60	84.21	82.91	81.29	81.68	83.77	85.15	86.90	86.42	50- 60	96.46	540.7	85.8,85.8
70	39.20	38.55	37.40	37.75	39.60	40.80	42.08	41.21	60- 70	60.41	601.1	95.4,95.4
80	9.482	9.544	9.482	9.476	10.13	10.32	10.94	10.22	70- 80	23.98	625.1	99.2,99.2
90	0.0105	0	0.0033	0	0	0.0263	0.0692	0.0183	80- 90	4.950	630.1	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0006	630.1	100,100
110	0	0	0	0	0	0	0	0	100-110	0	630.1	100,100
120	0	0	0	0	0	0	0	0	110-120	0	630.1	100,100
130	0	0	0	0	0	0	0	0	120-130	0	630.1	100,100
140	0	0	0	0	0	0	0	0	130-140	0	630.1	100,100
150	0	0	0	0	0	0	0	0	140-150	0	630.1	100,100
160	0	0	0	0	0	0	0	0	150-160	0	630.1	100,100
170	0	0	0	0	0	0	0	0	160-170	0	630.1	100,100
180	0	0	0	0	0	0	0	0	170-180	0	630.1	100,100
DEG	LUMINOUS INTENSITY:cd Less than 25% Percent = 11.0 %									UNIT:lm		

Luminous Distribution Intensity Data:

Table--1 UNIT: cd

C (DEG) y (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	260	259	259	259	260	259	259	259	259	259	260	259	260	259	259	259	260	259	259
5	258	258	258	258	258	258	258	258	258	258	258	258	258	258	258	258	258	258	258
10	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255
15	250	251	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	251
20	243	243	242	242	242	242	242	242	242	241	242	242	242	242	242	242	243	243	243
25	231	231	231	230	230	230	230	230	230	230	230	230	230	230	230	230	231	231	232
30	216	217	216	216	215	215	215	214	215	214	215	216	215	216	216	216	217	216	217
35	199	198	198	197	197	196	196	196	196	196	196	196	197	197	197	198	198	199	199
40	178	178	177	177	176	176	175	175	175	175	176	177	177	177	178	178	179	179	179
45	156	156	155	154	154	153	153	153	153	153	154	154	155	155	156	156	157	157	157
50	133	132	131	131	130	130	129	129	129	130	130	131	132	132	133	133	134	134	134
55	108	108	107	107	106	106	105	105	106	106	106	108	108	108	109	110	110	111	111
60	84.2	84.0	83.0	82.9	82.1	82.0	81.3	81.6	81.1	81.7	81.8	82.7	83.8	83.7	84.8	85.1	86.0	86.2	86.9
65	60.7	60.7	59.8	59.8	59.1	59.0	58.3	58.6	58.2	58.7	58.8	59.7	60.8	60.7	61.8	62.1	62.9	63.0	63.6
70	39.3	39.4	38.5	38.6	38.0	38.0	37.4	37.6	37.3	37.8	37.8	38.6	39.6	39.6	40.6	40.8	41.5	41.5	42.1
75	21.3	21.7	20.8	21.2	20.4	20.8	20.1	20.6	20.1	20.8	20.5	21.4	22.2	21.8	22.6	22.7	23.3	23.2	23.6
80	9.48	9.76	9.69	9.54	9.53	9.45	9.43	9.43	9.44	9.48	9.64	9.76	10.1	9.91	10.5	10.3	10.8	10.5	10.9
85	4.25	4.26	4.11	4.10	3.99	4.02	3.94	4.03	4.00	4.13	4.15	4.32	4.51	4.52	4.68	4.72	4.81	4.81	4.87
90	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.03	0.04	0.02	0.07
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) y (DEG)	285	300	315	330	345														
0	259	259	259	260	259														
5	258	259	258	259	258														
10	255	255	255	256	255														
15	250	251	250	251	251														
20	243	243	243	243	243														
25	232	232	232	232	231														
30	217	218	217	218	217														
35	200	200	200	200	199														
40	180	180	180	180	179														
45	158	158	158	158	157														
50	135	135	135	134	133														
55	111	111	111	110	110														
60	86.7	87.0	86.4	86.2	85.3														
65	63.3	63.6	62.9	62.8	61.8														
70	41.8	41.9	41.3	41.2	40.3														
75	23.3	23.4	22.8	22.8	22.0														
80	10.5	10.8	10.2	10.4	9.80														
85	4.79	4.78	4.65	4.58	4.43														
90	0.01	0.02	0.02	0.00	0.00														
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



NVLAP LAB CODE 600150-0

Report No: NTCR18020019
Report Version: V1.1

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