

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):

538011##

Representative (Tested) Model:

53801101

Model Difference: Where “##” denotes color temperature, the CCT and input power are tunable, 01~10 identifies CCT tunable to 2700K, 3000K, 3500K, 4000K and 5000K, power tunable to 17W/14W/11W.

Prepare By:



Engineer: Leo Liu

Date: 2017-11-21

Review By:



Technical Lead: Vincent Yuan

Date: 2017-11-23

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:	538011##(##=01-10)
Product type:	LED Down Light
Rating Input:	AC120V, 60Hz, 17W
Declared CCT:	2700K
Declared Light output:	1100lm
LED Manufacturer:	Samsung
LED Model:	SPMWHX229A
LED Quantity:	42 pcs
Forward current of LED Chip:	100mA
Date of Receipt Samples:	2017-11-10
Quantity of Receipt Samples:	3
Sample Number:	171110001-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:	2017-11-23
Revised Date of Test Report:	N/A
Test Report No.:	NTCR17110076
Remark (If applicable)	Product may contain Black Decorative Ring.

Test Specifications:	
Date of Test	2017-11-10
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
25.0 °C	51 %	Face Down	90 mins	25 mins

Electrical Data:

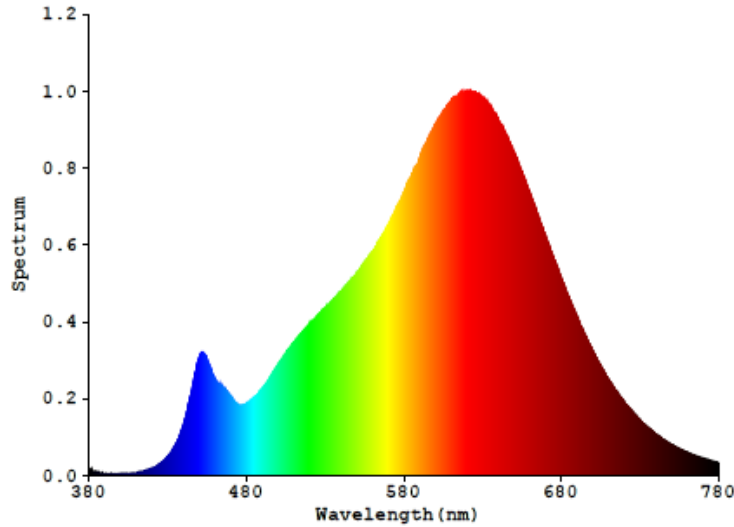
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.1408	16.54	0.9784

Color Data:

Parameter	Result
CCT (K)	2605
Color Rendering Index (CRI)	91.5
R9	51
Chromaticity, x	0.4660
Chromaticity, y	0.4091
Chromaticity u'	0.2672
Chromaticity v'	0.5277
Duv	-0.00101

Special Color Rendering			
R1	92	R9	51
R2	97	R10	93
R3	97	R11	93
R4	91	R12	88
R5	92	R13	93
R6	97	R14	100
R7	89	R15	86
R8	76	-	-

Spectrum Diagram:



Goniophotometer Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
24.6 °C	45 %	Face Down	90 mins	25 mins

Electrical Data:

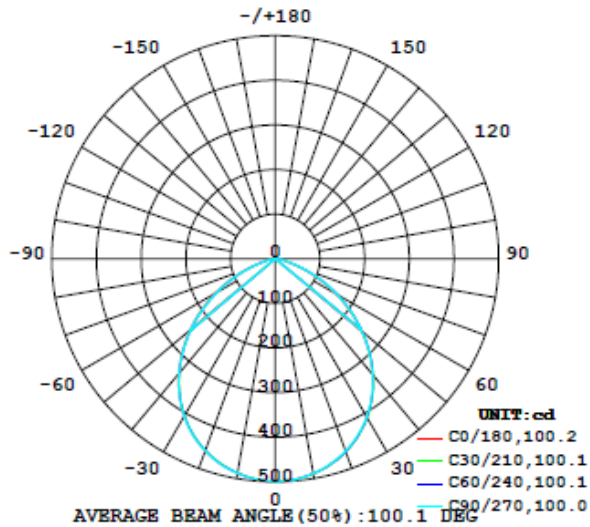
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.1408	16.54	0.9784

Goniophotometer Data:

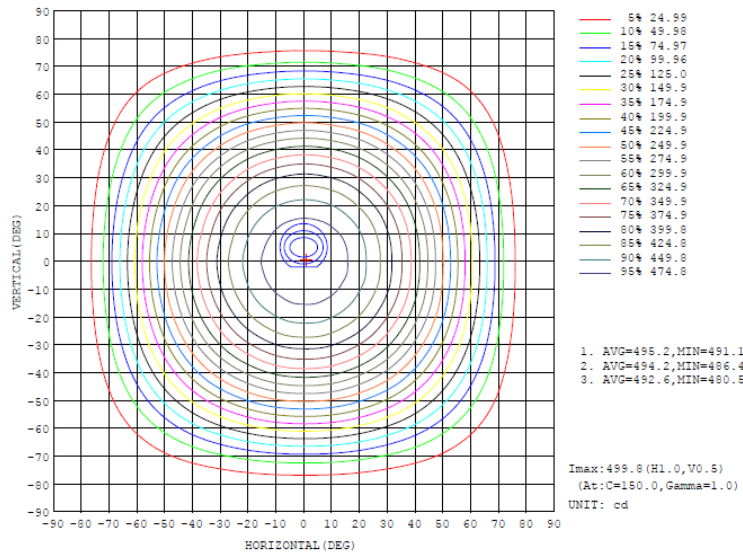
Parameter	Result
Total Luminous (lm)	1177.74
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	71.22
Zonal Lumens Distribution (0-60°)	87.1%
Beam Angle (°)	100.1
Center Beam Candle Power (cd)	500

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	Φ zone	Φ total	Flux, lamp
10	459.4	459.3	459.2	459.0	458.9	457.8	458.5	459.8	0- 10	47.15	47.15	4,4
20	460.2	460.7	458.9	457.7	458.0	457.0	458.6	460.4	10- 20	134.3	181.5	15.4,15.4
30	410.3	411.3	408.9	407.4	407.5	406.1	408.2	410.1	20- 30	201.0	382.5	32.5,32.5
40	338.8	341.0	338.3	336.9	336.5	333.5	335.5	338.2	30- 40	234.5	617.0	52.4,52.4
50	251.1	255.1	253.0	251.3	250.3	245.3	247.0	249.5	40- 50	227.3	844.3	71.7,71.7
60	155.9	160.4	159.6	157.8	156.5	150.8	150.8	153.5	50- 60	181.5	1026	87.1,87.1
70	64.54	69.26	68.89	67.70	66.26	61.24	61.28	62.72	60- 70	109.1	1134	96.3,96.3
80	15.45	17.52	17.84	17.55	16.72	14.67	14.42	14.52	70- 80	36.11	1170	99.3,99.3
90	0.0046	0.1169	0.2617	0.1897	0	0.0001	0	0	80- 90	7.821	1178	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0040	1178	100,100
110	0	0	0	0	0	0	0	0	100-110	0	1178	100,100
120	0	0	0	0	0	0	0	0	110-120	0	1178	100,100
130	0	0	0	0	0	0	0	0	120-130	0	1178	100,100
140	0	0	0	0	0	0	0	0	130-140	0	1178	100,100
150	0	0	0	0	0	0	0	0	140-150	0	1178	100,100
160	0	0	0	0	0	0	0	0	150-160	0	1178	100,100
170	0	0	0	0	0	0	0	0	160-170	0	1178	100,100
180	0	0	0	0	0	0	0	0	170-180	0	1178	100,100
DEG	LUMINOUS INTENSITY:cd Less than 354 Percents = 10.7 %									UNIT:lm		



Luminous Distribution Intensity Data:

Table--1

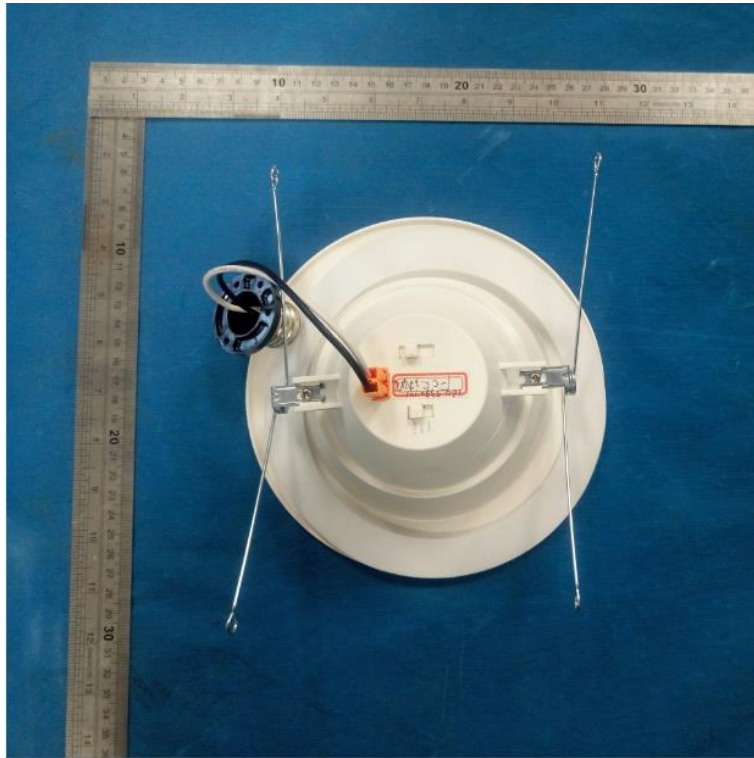
UNIT: cd

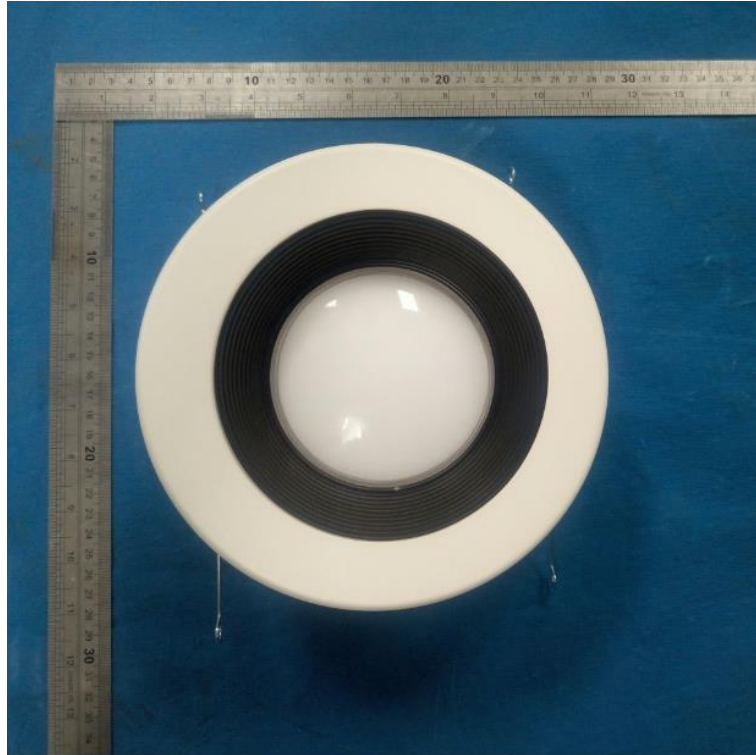
y (DEG)	C (DEG)																		
	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	500	499	499	500	499	499	500	499	500	499	500	500	500	499	499	500	499	499	500
5	497	498	497	497	497	497	497	497	497	496	497	497	497	496	495	496	496	496	496
10	489	490	490	489	489	490	489	489	488	488	488	488	487	487	488	488	488	488	489
15	477	478	477	478	477	477	476	476	475	475	475	475	476	474	475	475	476	476	476
20	460	462	461	461	460	460	459	459	457	458	458	457	458	457	457	457	458	458	459
25	438	440	439	439	438	438	437	437	435	436	435	435	436	434	434	435	435	436	436
30	410	413	411	411	410	411	409	409	408	407	407	407	408	405	406	406	407	407	408
35	377	380	379	379	377	377	376	376	374	374	373	373	374	371	372	372	373	373	374
40	339	342	341	341	340	340	338	339	337	337	335	335	336	333	334	334	334	334	336
45	296	300	299	300	298	299	297	297	295	295	294	294	295	291	292	291	292	291	293
50	251	255	254	255	254	254	253	253	251	251	250	250	250	246	247	245	246	245	247
55	204	207	207	208	207	208	207	207	205	205	203	203	204	200	200	198	199	198	199
60	156	159	160	160	160	160	160	160	158	158	157	156	156	153	152	151	151	150	151
65	109	112	113	113	113	114	113	113	112	111	110	109	110	106	106	104	104	104	104
70	64.5	68.0	68.1	69.3	69.0	69.7	68.9	69.2	67.8	67.7	66.2	65.9	66.3	63.0	62.8	61.3	61.5	60.6	61.3
75	29.8	32.1	32.1	33.0	32.8	33.5	33.0	33.1	32.2	32.1	31.1	30.8	31.2	29.0	28.8	27.9	27.9	27.3	27.7
80	15.5	16.8	16.9	17.5	17.4	18.0	17.8	18.1	17.5	17.5	16.7	16.7	16.7	15.5	15.4	14.7	14.8	14.2	14.4
85	6.39	7.26	7.54	8.02	8.02	8.38	8.21	8.36	8.00	7.99	7.57	7.45	7.44	6.58	6.33	5.94	5.80	5.51	5.33
90	0.00	0.00	0.02	0.12	0.16	0.32	0.26	0.34	0.24	0.19	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
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

y (DEG)	C (DEG)				
	285	300	315	330	345
0	499	500	499	500	500
5	496	497	496	497	497
10	489	490	490	491	490
15	476	477	478	478	478
20	459	460	460	462	461
25	437	438	438	439	439
30	408	410	410	412	412
35	375	377	377	379	379
40	336	338	338	340	340
45	293	295	295	297	298
50	247	249	249	252	252
55	199	201	202	204	205
60	151	153	154	156	157
65	104	106	106	108	109
70	61.0	62.6	62.7	64.5	65.0
75	27.6	28.5	28.6	29.8	30.1
80	14.1	14.6	14.5	15.3	15.4
85	5.46	5.66	5.76	6.13	6.37
90	0.00	0.00	0.00	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	2016-12-03	2017-12-02
NTC-F01-006	2.0 meter Integrating Sphere	2016-12-03	2017-12-02
NTC-F01-013	Standard Lamp	2016-12-27	2017-12-26
NTC-F01-031	Digital Power Meter	2016-12-05	2017-12-04
NTC-F01-019	Temperature & Humidity Meter	2016-11-28	2017-11-27



NVLAP LAB CODE 600150-0

Report No: NTCR17110076
Report Version: V1.1

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