



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:

Laston

Engineer: Leo Liu Date: 2018-02-26

Review By:

incer Tven

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.

Laboratory: Dongguan New Testing Centre Co., Ltd Page 1/11 Address: 3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China Tel: 86-755-2344 3526 Website: http://www.ntc-cert.com





Touuct Intol mation.	
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:	SPMWHx229xxxxxxx for Downlight
	SPMWH1228xxxxxxx for Nightlight
LED Quantity:	36 pcs for Downlight, 24 pcs for Nightlight
Forward current of LED	100 mA for Downlight
Chip:	150 mA for Nightlight
Date of Receipt Samples:	2018-02-06
Quantity of Receipt	3
Sample Number:	180206001-S1
Laboratory Information:	

	Laboratory miormation.					
ſ	Test Laboratory: Dongguan New Testing Centre Co., Ltd					
ſ	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

1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25° C \pm 1° 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.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C \pm 1° 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.





Integrating Sphere Test Results

Test Co	ndition:								
Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time					
24.6 °C	34 %	Face Down	90 min	25 min					
Electric	Electrical Data:								

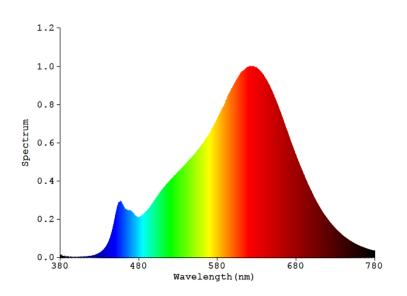
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.1	60	0.0958	9.94	0.8644

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:





NVLAP LAB CODE 600150-0

Report No: NTCR18020019 Report Version: V1.1

Goniophotemeter Test Results:

Test Co	ndition:							
Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time				
24.8 °C	35 %	Face Down	90 min	25 min				
Electrical Data:								

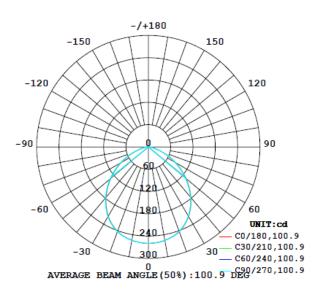
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.1	60	0.0958	9.94	0.8644

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

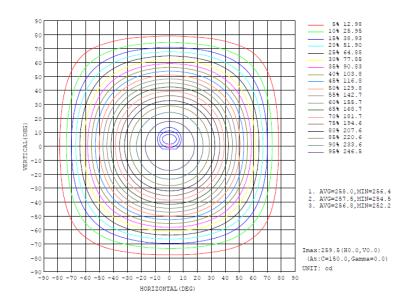
Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM













r	C0	C45	C90	C135	C180	C225	C270	C315	Y	o zone	<pre> total </pre>	<lum, lamp<="" th=""></lum,>
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	20- 40	122.5	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	119.5	444.3	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	39.30	28.58	37.40	37.75	39.60	40.80	42.08	41.31	60- 70	60.41	601.1	95.4,95.4
80	9.482	9.544	9.432	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	620.1	100,100
180	0	0	0	0	0	0	0	0	170-180	0	630.1	100,100
DEG		LUN	INOUS INTE	NSITY:cd	Less than	35% Percen	t = 11.0 %			UNI	T:lm	





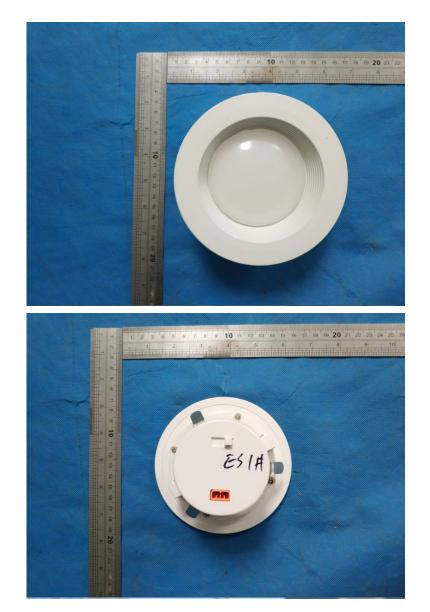
NVLAP LAB CODE 600150-0

Luminous Distribution Intensity Data:

Table1																UNI	T: cd		
C (DEG)	0	15	30	45			90	105	100	1.75	150	100	180	105		225	-		070
(DEG)	-		30	45	60	75		105	120	135	150	165	180	195	210		240	255	270
0	260	259	259 258	259 258	260	259	259 258	259	259	259	260	259	260	259	259	259	260	259	259
5	258	258 255	255	255	258	258 255	255	258 255	258 255	255	258	258 255	258 255	258 255	258 255	258 255	258	258 255	258
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	242	241	242	242	242	242	242	243	243	243
25	231	231	231	231	230	230	230	230	230	230	230	230	230	230	230	230	231	231	232
30	216	217	216	216	215	215	215	215	214	215	214	215	216	215	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	176	175	175	175	175	176	177	177	177	178	178	179	179
45	156	156	155	154	154	153	153	153	153	153	153	154	154	155	155	156	156	157	157
50	133	132	131	131	130	130	130	129	129	129	130	130	131	132	132	133	133	134	134
55	108	108	107	107	106	106	106	105	105	106	106	106	108	108	108	109	110	110	111 86.9
60	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
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
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	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Table2 C(DEG)					345	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00
Table2 C (DEG) (DEG)	285	300	315	330	345	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C (DEG) (DEG) 0	285			330 260	345 259	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C (DEG) (DEG)	285	300 259	315 259	330	345		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C (DEG) (DEG) 0 5	285 259 258	300 259 259	315 259 258	330 260 259	345 259 258		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C(DEG) 0 5 10	285 259 258 255	300 259 259 255	315 259 258 255	330 260 259 256	345 259 258 255		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C(DEG) 0 5 10 15 20 25	285 259 258 255 250 243 232	300 259 259 255 251	315 259 258 255 250	330 260 259 256 251	345 259 258 255 251		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C (DEG) 0 5 10 15 20 25 30	285 259 258 255 250 243 232 217	300 259 255 251 243 232 218	315 259 258 255 250 243 232 217	330 260 259 256 251 243 232 218	345 259 258 255 251 243 231 217		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C (DEG) (DEG) 0 5 10 15 20 25 30 35	285 259 258 255 250 243 232 217 200	300 259 255 251 243 232 218 200	315 259 258 255 250 243 232 217 200	330 260 259 256 251 243 232 218 200	345 259 258 255 251 243 231 217 199				0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C (DEG) (DEG) 0 5 10 15 20 25 30 35 40	285 259 258 255 250 243 232 217 200 180	300 259 255 251 243 232 218 200 180	315 259 258 255 250 243 232 217 200 180	330 260 259 256 251 243 232 218 200 180	345 259 258 255 251 243 231 217 199 179				0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Table2 C (DEG) 0 5 10 15 20 25 30 35 40 45	285 259 258 255 250 243 232 217 200 180 158	300 259 255 251 243 232 218 200 180 158	315 259 258 255 250 243 232 217 200 180 158	330 260 259 256 251 243 232 218 200 180 158	345 259 258 255 251 243 231 217 199 179 157				0.00		0.00				0.00				
Table2 C(DEG) 0 5 10 25 30 35 40 45 50	285 259 258 255 250 243 232 217 200 180 158 135	300 259 255 251 243 232 218 200 180 158 135	315 259 258 255 250 243 232 217 200 180 158 135	330 260 259 256 251 243 232 218 200 180 158 134	345 259 258 255 251 243 231 217 199 179 157 133				0.00		0.00				0.00				
Table2 C (DEG) 0 5 5 10 15 20 25 30 35 40 45 50 55	285 259 258 255 250 243 232 217 200 180 158 135 111	300 259 255 251 243 232 218 200 180 158 135 111	315 259 258 255 250 243 232 217 200 180 158 135 111	330 260 259 256 251 243 232 218 200 180 158 134 110	345 259 258 255 251 243 231 217 199 179 157 133 110			0.00			0.00	0.00	0.00	0.00	0.00				
Table2 C(DEG) 0 5 10 25 30 35 40 45 50	285 259 258 255 250 243 232 217 200 180 158 135	300 259 255 251 243 232 218 200 180 158 135	315 259 258 255 250 243 232 217 200 180 158 135	330 260 259 256 251 243 232 218 200 180 158 134	345 259 258 255 251 243 231 217 199 179 157 133														
Table2 C (DEG) 0 5 10 15 20 25 30 35 40 45 50 55 55 60	285 259 258 255 250 243 232 217 200 180 158 135 111 86.7	300 259 255 251 243 232 218 200 180 158 135 111 87.0	315 259 258 255 250 243 232 217 200 180 158 135 111 86.4	330 260 259 256 251 243 232 218 200 180 158 134 110 86.2	345 259 258 255 251 243 231 217 199 179 157 133 110 85.3														
Table2 C(DEG) 0 5 10 15 20 25 30 35 40 45 55 55 60 65	285 259 258 255 250 243 232 217 200 180 158 135 111 86.7 63.3	300 259 255 251 243 232 218 200 180 158 135 111 87.0 63.6	315 259 258 255 250 243 232 217 200 180 158 135 111 86.4 62.9	3300 2600 2599 2566 2511 243 232 218 2000 158 134 1100 86.2 62.8	345 259 258 255 251 243 231 217 199 157 133 110 85.3 61.8														
Table2 C(DEG) (DEG) 0 5 10 15 20 25 30 35 40 45 55 60 65 70	285 259 258 255 250 243 232 217 200 180 158 135 111 86.7 63.3 41.8 23.3 10.5	300 259 255 251 243 232 218 200 180 158 135 111 87.0 63.6 41.9	315 259 258 255 250 243 232 217 200 180 158 135 111 86.4 62.9 41.3	330 260 259 256 251 243 232 218 200 180 158 134 110 86.2 62.8 41.2	345 259 258 255 251 243 231 217 139 179 157 133 110 85.3 61.8 40.3														
Table2 C (DEC) 0 5 10 15 20 25 30 35 40 45 50 65 55 60 65 70 75 80 85	285 259 258 255 250 243 232 200 180 158 135 111 86.7 63.3 41.8 23.3 10.5 4.79	300 259 255 251 243 232 200 180 158 135 111 87.0 63.6 41.9 23.4 10.8 4.78	315 259 258 255 250 243 232 217 200 180 158 135 135 111 86.4 66.4 66.9 41.3 22.8 10.2 4.65	330 260 259 256 251 243 232 200 180 158 134 110 86.2 62.8 41.2 22.8 10.4 4.58	345 259 258 255 251 243 231 199 179 157 133 110 85.3 61.8 61.4 322.0 9.80 4.43														
Table2 C(DEG) 0 5 10 5 20 25 20 25 30 35 40 55 55 60 65 60 65 75 80 85 90	285 259 258 255 250 243 232 217 200 158 135 111 86.7 63.3 41.8 23.3 10.5 4.79 0.01	300 259 255 251 243 232 200 158 135 111 87.0 63.6 41.9 23.4 10.8 4.78 0.02	315 259 258 255 250 243 232 200 158 135 111 86.4 62.9 41.3 22.8 10.2 4.65 0.02	330 260 259 256 251 243 232 200 158 134 110 86.2 62.8 41.2 22.8 10.4 4.58 0.00	345 259 258 255 251 243 231 217 199 179 157 133 110 85.3 61.8 40.3 22.0 9.80 4.43 0.00														
Table2 (C(DEG) (DEG) 0 5 10 15 20 20 30 35 30 35 55 50 60 65 70 75 80 85 99 90	285 259 258 255 250 243 232 217 200 180 158 135 135 63.3 41.8 23.3 10.5 9 0.01 0.00	300 259 255 251 243 232 218 200 180 158 335 111 87.0 63.6 41.9 23.4 10.8 4.78 0.02 0.00	315 259 258 255 250 243 232 217 200 180 135 111 86.4 62.9 41.3 22.8 10.2 4.65 0.02 0.00	330 260 259 256 231 243 232 218 200 180 180 180 134 110 86.2 62.8 41.2 22.8 10.4 4.58 0.00 0.000	345 259 258 251 243 231 217 199 179 157 133 61.8 40.3 22.0 9.80 4.43 0.00 0.00														
Table2 (0.0056) (0.0	285 259 258 255 250 243 232 217 200 180 158 135 135 4.33 41.8 23.3 10.5 4.79 0.01 0.00 0.01 0.00	300 259 255 251 243 200 180 158 135 135 63.6 41.9 23.4 10.8 4.78 0.02 0.00 0.00	315 259 258 255 250 243 232 217 200 180 158 135 111 86.4 62.9 41.3 22.8 10.2 4.65 0.02 0.00 0.000	330 260 259 256 251 232 232 232 232 232 232 232 232 232 23	345 259 258 251 231 217 199 179 157 133 61.8 40.3 22.0 9.80 4.43 0.00 0.00 0.00														
Table2 (CDEG) (DEG) 0 5 10 15 20 225 30 225 30 225 30 35 40 45 55 55 60 65 60 65 70 75 80 85 85 80 85 85 80 95 90 90 105	285 259 258 255 250 243 232 243 232 243 135 135 135 135 135 135 135 135 135 13	300 259 255 251 232 243 232 243 232 218 200 180 158 135 111 158 135 111 158 135 111 158 135 111 10.8 4.78 0.02 0.00 0.000 0.000	315 259 258 255 250 243 232 217 200 180 158 135 135 131 135 135 131 22.8 10.2 4.65 0.02 0.00 0.000 0.000	330 260 259 251 251 251 251 251 251 251 251 251 262 8 100 6 252 6 243 100 86.2 22.8 10.4 4.58 0.00 0.000 0.000	345 259 258 251 251 251 251 251 251 251 251 251 251														
Table2 C (DEG) (DEG) 0 5 10 15 20 30 35 35 40 45 55 60 45 55 60 65 75 80 85 90 95 100 105 110	285 259 258 250 243 250 243 250 243 250 243 250 260 180 158 135 135 135 111 10.5 4.79 0.01 0.00 0.00 0.000	3000 2599 2551 2551 2551 2000 1800 1588 1355 2000 1800 1588 1355 2000 1800 1588 1355 2000 1800 10.88 4.78 0.002 0.000 0.000 0.000	315 259 258 255 243 232 243 232 243 232 217 200 180 188 135 111 86.4 62.9 41.3 22.8 10.2 4.65 0.00 0.00 0.000 0.000	330 260 259 256 251 243 200 180 158 134 41.2 22.8 41.2 22.8 41.2 22.8 0.00 0.00 0.00 0.000 0.000	345 259 258 251 243 217 139 179 157 133 61.8 40.3 22.0 9.80 4.43 0.00 0.00 0.00 0.000 0.000														
Table2 (CDEG) (DEG) 0 5 10 15 20 20 20 20 20 20 20 20 20 20 20 20 20	285 259 258 250 243 250 243 250 243 250 243 180 158 135 101 5 63.3 41.8 23.3 10.5 9.0.01 0.00 0.00 0.000 0.000	300 259 255 255 243 232 200 180 135 135 135 135 131 10.8 41.9 23.4 (1.9 23.4 (1.9 23.4 (1.9 23.4) 0.00 0.00 0.00 0.000 0.000	315 259 258 243 220 180 158 135 111 10.2 200 180 158 135 111 10.2 0.00 0.00 0.00 0.00 0.00 0.00	330 260 259 251 243 232 200 180 158 134 110 86.2 62.8 41.2 22.8 41.2 22.8 41.2 22.8 0.00 0.00 0.00 0.000 0.000	345 259 258 251 243 231 243 231 243 231 29 179 157 133 110 85.3 61.8 40.3 22.0 9.80 9.80 0.00 0.00 0.000 0.000 0.000														
Table2 (CDEG) (DEG) 0 5 10 15 20 20 30 25 30 45 55 55 50 55 55 60 65 65 70 70 75 75 75 70 90 95 100 115 120	285 259 255 250 243 232 217 200 180 158 410 413 41.8 23.3 10.5 4.79 0.01 0.00 0.00 0.00 0.00 0.00 0.00 0.0	300 259 255 251 243 232 218 200 158 218 200 158 211 135 111 87.0 63.6 4.78 0.02 23.4 10.8 4.78 0.00 0.00 0.000 0.000 0.000	315 259 258 255 243 232 217 200 158 135 131 180 158 135 131 10.2 4.65 0.02 0.00 0.00 0.00 0.00 0.00 0.00 0.0	330 260 259 255 251 243 200 180 158 200 180 158 200 180 10.4 4.58 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	345 259 258 251 243 231 199 179 157 133 110 85.3 61.8 4.43 0.00 9.80 4.43 0.00 0.00 0.00 0.00 0.00 0.00 0.0														
Table2 (CDEG) (DEG) (DEG) 0 5 10 15 25 30 35 40 45 55 50 65 55 50 65 55 80 65 85 80 85 85 90 95 90 100 100 115 115	285 259 258 255 255 255 255 255 255 255 250 243 232 200 180 158 135 63.3 41.8 63.3 41.8 63.3 41.9 0.01 0.000 0.000 0.000 0.000 0.000	3000 259 255 251 243 232 200 180 158 135 131 87.0 63.6 41.9 23.4 10.8 4.78 0.02 0.00 0.00 0.00 0.00 0.00 0.000 0.000	315 259 258 255 250 243 232 217 200 180 158 135 135 135 135 131 86.4 62.9 41.3 22.8 10.2 4.65 0.02 0.00 0.000 0.000 0.000 0.000	330 260 259 256 251 243 232 200 180 180 180 184 10 86.2 62.8 41.2 22.8 10.4 4.58 0.00 0.000 0.000 0.000 0.000 0.000	345 259 258 251 243 231 199 179 157 133 61.8 40.3 61.8 40.3 61.8 40.3 61.8 40.3 0.00 0.00 0.000 0.000 0.000 0.000 0.000														
Table2 (CDEG) (DEG) (DEG) 10 15 25 30 20 25 35 40 45 45 55 55 60 65 55 60 65 55 80 85 90 95 100 100 100 110 115 110 115 110 115 110 110	285 259 258 255 250 243 232 217 200 180 158 135 111 86.7 63.3 4.79 0.01 0.00 0.00 0.00 0.00 0.00 0.00 0.0	300 259 255 251 243 200 180 180 135 111 87.0 23.4 10.8 63.6 41.9 23.4 10.8 0.00 0.00 0.00 0.00 0.00 0.00 0.00	315 259 258 255 243 232 200 180 158 135 135 135 200 180 158 135 200 180 10.2 4.65 0.02 0.00 0.00 0.000 0.000 0.000 0.000	330 260 259 255 251 243 200 180 158 200 180 158 200 180 10.4 4.58 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	345 259 258 255 231 217 199 179 133 110 85.3 61.8 40.3 22.0 9.80 0.00 0.00 0.00 0.00 0.00 0.00 0.														
Table2 (DEG) (DEG) (DEG) (DEG) 0 5 10 15 20 25 30 25 30 40 45 55 55 60 65 65 70 75 80 85 85 80 85 90 95 100 115 110 110	285 259 258 255 250 243 252 217 200 158 135 101 158 135 40.0 0.00 0.00 0.00 0.00 0.00 0.00 0.0	300 259 255 251 232 232 232 232 232 232 232 135 135 135 63.6 41.9 23.4 10.8 4.78 0.02 0.00 0.000 0.000 0.000 0.000	315 259 258 255 250 243 232 217 200 180 158 111 86.4 4.65 9 (10.2 4.65 0.02 0.00 0.00 0.00 0.00 0.00 0.00 0.0	330 260 259 256 251 232 232 232 232 232 232 238 134 110 86.2 8 41.2 22.8 134 110 86.2 8 41.2 22.8 10.00 0.00 0.000 0.000 0.000 0.000	345 259 258 255 231 231 231 231 10 85.3 61.8 40.3 22.0 9.80 4.43 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000														
Table2 (DEG) (DEG) 0 5 10 15 20 15 20 30 35 40 45 55 50 55 60 65 70 75 80 85 90 95 100 115 120 105 110 115 120 105 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 15 10 10 10 15 10 10 15 10 10 10 15 10 10 10 10 15 10 10 10 15 10 10 10 10 10 10 10 10 10 10	285 259 255 250 243 232 217 200 180 135 131 135 135 135 135 135 135 135 135	300 259 255 251 243 200 180 158 135 111 158 135 131 10.8 4.78 0.00 63.6 41.9 23.4 4.78 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	315 259 258 255 250 243 232 217 200 180 158 135 111 158 135 111 158 135 111 10.2 4.65 0.02 0.00 0.000 0.000 0.000 0.000 0.000	330 260 259 256 251 243 232 218 200 158 134 110 10 86.2 62.8 41.2 22.8 10.4 4.58 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	345 259 258 251 243 231 217 139 179 157 133 61.8 40.3 22.0 9.80 4.43 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000														
Table2 (CDEG) (DEG) (DEG) 0 5 10 15 25 30 25 30 35 40 45 55 55 55 55 55 55 55 55 55 55 55 55	285 259 258 255 250 253 232 217 200 158 135 135 135 63.3 41.6 23.3 10.5 4.79 20.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	300 259 255 251 232 243 232 200 158 135 87.0 63.6 41.9 23.4 10.8 4.78 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	315 259 258 258 255 243 232 217 200 180 180 135 135 135 135 135 135 135 135 135 135	330 260 259 256 251 243 232 218 200 180 158 134 110 58 62.8 41.2 22.8 62.8 41.2 22.8 0.00 0.00 0.000 0.000 0.000 0.000 0.000	345 259 258 251 243 231 217 179 157 133 61.8 40.3 22.0 9.80 4.43 22.0 9.80 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000														
Table2 (CDEG) (DEG) 0 5 10 15 20 20 30 25 30 45 55 55 60 65 65 60 65 65 70 75 75 80 85 85 90 95 100 115 115 110 115 115 110 115 115 11	285 259 258 255 250 180 180 180 180 180 180 180 180 195 41.8 23.3 10.5 23.3 10.5 23.3 10.5 0.00 0.00 0.00 0.00 0.00 0.00 0.00	300 259 255 251 223 224 220 180 158 220 180 158 231 111 87.00 63.6 41.9 23.4 10.8 23.4 10.8 23.4 10.02 0.00 0.000 0.000 0.000 0.000 0.000 0.000	315 259 258 255 250 282 292 200 180 158 135 135 135 135 135 135 135 135 22.8 10.2 0.00 0.00 0.00 0.00 0.00 0.00 0.00	330 260 259 256 251 232 200 180 180 180 180 162 86.2 8 41.2 22.8 10.4 4.58 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	345 259 258 255 243 231 217 199 179 157 157 157 157 157 157 157 157 10 85.3 61.8 40.3 22.0 9.80 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.000														
Table2 (DEG) (DEG) 0 5 10 15 20 15 20 30 25 30 45 55 55 60 65 70 75 75 75 75 75 80 85 90 95 100 115 120 105 115 120 105 115 120 105 115 125 100 15 100 15 15 100 15 15 100 15 15 100 15 15 100 100	285 259 258 250 243 250 243 250 243 250 243 250 243 250 243 250 243 250 243 200 186 135 111 10.5 4.79 0.01 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	300 259 255 243 232 28 135 135 135 135 135 135 135 135 135 135	315 259 258 255 250 180 180 158 135 135 135 135 135 135 22.8 10.2 4.65 0.02 0.00 0.00 0.00 0.00 0.00 0.00 0.0	3300 260 2559 251 243 2251 243 200 180 86.2 218 200 180 86.2 218 200 180 86.2 22.8 41.2 22.8 41.2 22.8 41.2 22.8 0.00 0.00 0.00 0.00 0.00 0.00 0.	345 259 258 251 243 217 199 179 179 133 61.8 40.3 22.0 4.43 0.00 0.00 0.00 0.00 0.00 0.00 0.														
Table2 C (DEG) 0 0 5 0 10 15 20 20 233 35 40 45 55 50 55 50 60 65 75 80 90 95 90 105 100 105 110 115 120 130 135 140 145 155 160 165	285 259 258 250 243 250 243 232 217 200 180 186 135 111 158 135 111 158 135 111 158 135 10.5 4.79 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	300 259 255 251 243 232 218 200 180 158 135 111 158 135 141.9 2.3.4 1.9.8 2.3.4 1.9.8 2.3.4 1.9.9 2.3.4 1.9.9 2.3.4 1.9.9 2.3.4 1.9.9 2.3.4 1.9.9 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	315 259 258 250 243 232 217 200 180 158 64.9 41.3 22.6 62.9 41.3 22.6 0.00 0.00 0.00 0.00 0.00 0.00 0.00	3300 260 259 251 243 232 28 200 180 180 180 188 134 110 86.2 62.8 10.4 4.58 20.0 0.00 0.	345 259 258 255 251 243 231 179 157 133 61.8 40.3 22.0 9.80 0.00 0.00 0.00 0.00 0.00 0.00 0.														
Table2 C (DEG) 0 0 5 0 10 15 20 25 30 35 40 45 55 60 65 70 75 80 90 95 100 105 110 115 120 125 130 135 140 145 155 160 165 170	285 259 258 250 243 232 217 200 180 135 131 158 135 131 158 135 131 10.5 4.79 0.01 0.00 0.00 0.00 0.00 0.00 0.00 0.0	300 259 255 251 243 232 28 180 63.6 41.9 63.6 41.9 63.6 41.9 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	315 259 258 255 243 232 243 232 217 200 180 180 180 243 217 200 180 243 217 200 243 217 200 243 217 200 243 217 200 243 227 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 243 235 243 232 200 243 235 243 232 200 243 235 243 232 200 243 235 243 232 200 243 235 243 232 200 243 235 243 232 200 243 235 243 232 243 232 243 232 243 235 243 232 200 243 235 243 232 200 243 235 243 232 200 243 232 200 243 232 200 243 232 200 243 232 200 0.02 0.0000 0.0000 0.0000 0.000000	3300 260 259 251 243 232 218 200 180 180 200 180 200 180 200 180 200 180 200 0.00 0.00 0.00 0.00 0.00 0.00 0.0	345 259 258 251 243 231 243 243 243 243 243 243 251 179 179 179 133 110 9.80 9.80 9.80 9.80 9.80 0.00 0.00 0.0														
Table2 C (DEG) 0 5 10 15 20 20 23 335 40 35 50 55 50 55 60 65 75 80 90 95 100 105 110 115 120 130 131 130 135 140 145 155 160 165	285 259 258 253 250 253 232 232 232 232 232 232 237 160 158 135 63.3 10.5 63.3 10.5 63.3 10.5 63.3 10.5 63.3 10.5 0.00 0.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	300 259 255 251 243 200 158 135 135 135 135 232 232 232 232 232 232 232 200 158 135 135 233 4 1.0 8 7.0 63.6 63.6 63.6 0 7.0 0 0.00 0.00 0.00 0.00 0.00 0.00	315 259 258 250 243 232 217 200 180 188 135 111 35 135 135 135 135 135 135 135	3300 260 259 251 243 232 28 200 180 180 180 188 134 110 86.2 62.8 10.4 4.58 20.0 0.00 0.	345 259 258 251 243 217 159 157 133 61.8 40.3 22.0 9.80 0.00 0.00 0.00 0.00 0.00 0.00 0.														











NVLAP LAB CODE 600150-0

Report No: NTCR18020019 Report Version: V1.1

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****