

LM-79-08 Test Report

For

SHENZHEN JIANGJING LIGHTING CO., LTD.

3-5 Floor, Building A & 4-5 Floor, Building C, Aiqun Road, Tongfuyu Industrial Zone, Shangwu Community,
Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province, China.

LED PANEL

Model Name(s):

PLC-30W-14-28-DM-02

PLC-35W-14-28-DM-02

PLC-40W-14-28-DM-02

PLC-45W-14-28-DM-02

Representative (Tested) Model:

PLC-45W-14-28-DM-02

Model Difference: All is the same construction, except Wattage

Prepare by:

Derek Lai

Engineer: Derek Lai

Date: 2018-07-24

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

Issue Date: 2018-07-26

Revised Date: N/A

Note:

1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

Laboratory: Dongguan New Testing Centre Co., Ltd

Address: 3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan,
Guangdong, China

Tel: 86-769-89874553

Website: <http://www.ntc-cert.com>

Product Information:

Client Name:	SHENZHEN JIANGJING LIGHTING CO., LTD.
Brand Name:	JIANGJING
Model Number:	PLC-45W-14-28-DD-02
Product Type:	1x4 Luminaires for Ambient Lighting of Interior Commercial Space
Rating Input:	120-347Vac, 50/60Hz, 45W
Declared CCT:	3000K, 3500K, 4000K, 5000k
Declared Light Output:	4725 lm
LED Manufacturer:	ShenZhen JuFei Optoelectronics Co., Ltd.
LED Model:	2835 White SMD LED

Test Information:

Standard Lamp:	Total Spectral Radiant Flux Standard Lamp, trace to NIST. 1. D908S for Gonio 2. D215S for Integrating Sphere
Date of Receipt Samples:	2018-07-06
Quantity of Receipt Samples:	1
Sample Number:	180706004-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:	2018-07-26
Revised Date of Test Report:	N/A
Test Report No.:	NTCR18070083
Remark (If applicable):	N/A

Test Specification:	
Date of Test	2018-07-17
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 C78.377-2017 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 $25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 required Voltage and Frequency. It was stabilized before measurement was made. Luminous Flux, Luminaire Efficacy and Zonal Lumen were calculated from the software taken at 1° vertical intervals and 15° horizontal intervals.</p>
<p>2. Photometric and Electrical Measurements – Integrating Sphere Method:</p> <p>Photometric parameters were measured using an integrating sphere, as spectroradiometer and software. The ambient temperature condition inside the sphere was measured at $25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 require Voltage and Frequency. 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 1 nm intervals over the rage 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 requirement Voltage and Frequency, and was stabilized before measurement. The Total Harmonic Distortion was calculated from the Digital Power Meter.</p>

Integrating Sphere Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.7	40.3	Face Down	90	10

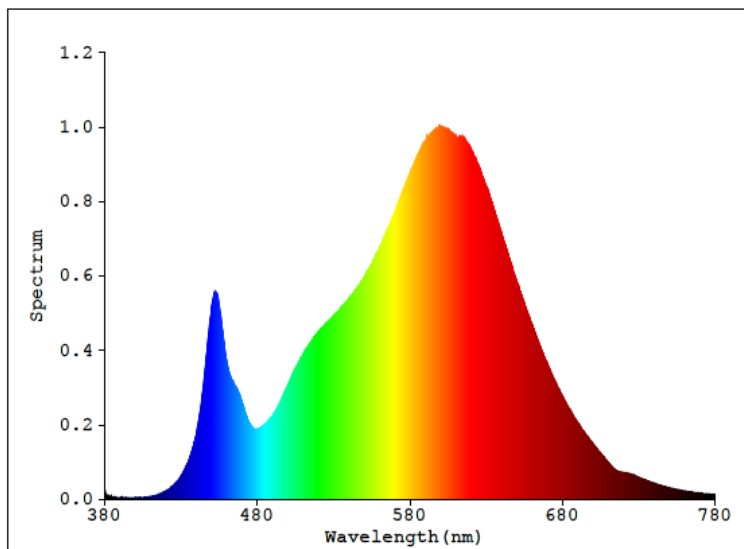
Electrical Data:

Model Number	CCT(K)	Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
PLC-45W-14-28-DM-02	3000	120.0	60	0.3651	43.48	0.9908
	3500	120.0	60	0.3735	43.42	0.9910
	4000	120.0	60	0.3733	44.39	0.9910
	5000	120.0	60	0.3642	43.37	0.9908

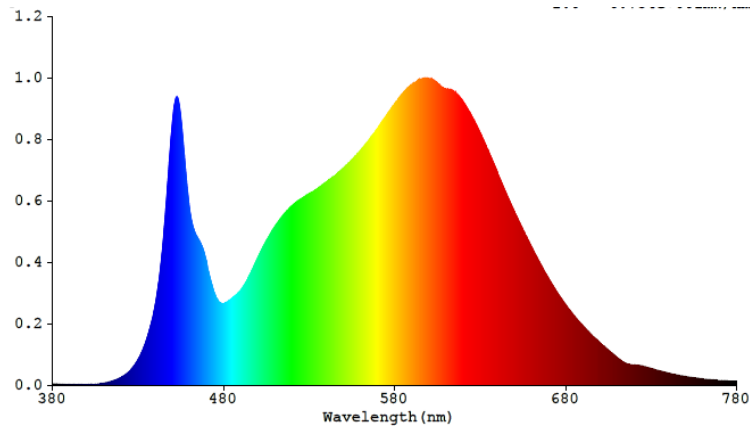
Color Data:

Model Number	CCT(K)	Color Rendering Index (CRI)	R9	Duv	Total Luminous (lm)	Luminous Efficacy (lm/w)
PLC-45W-14-28-DM-02	2960	82.1	6	-0.00032	4940.18	113.62
	3549	85.1	17	-0.000897	4990.90	114.94
	4116	85	17	0.000430	5115.90	115.24
	4813	81.5	0	0.00447	5164.45	119.08

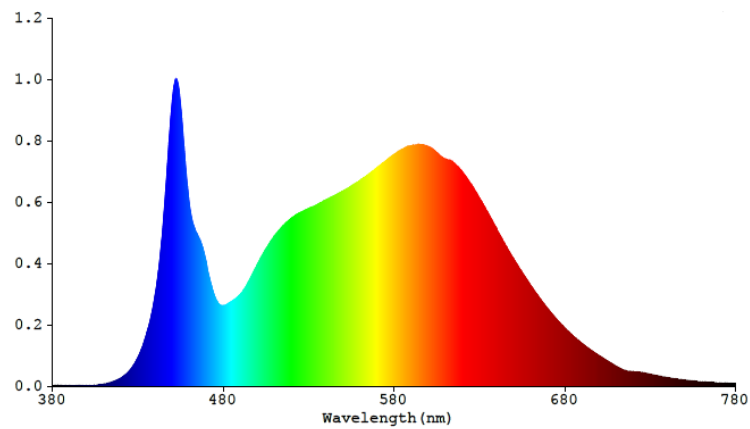
Spectrum Diagram (3000K):



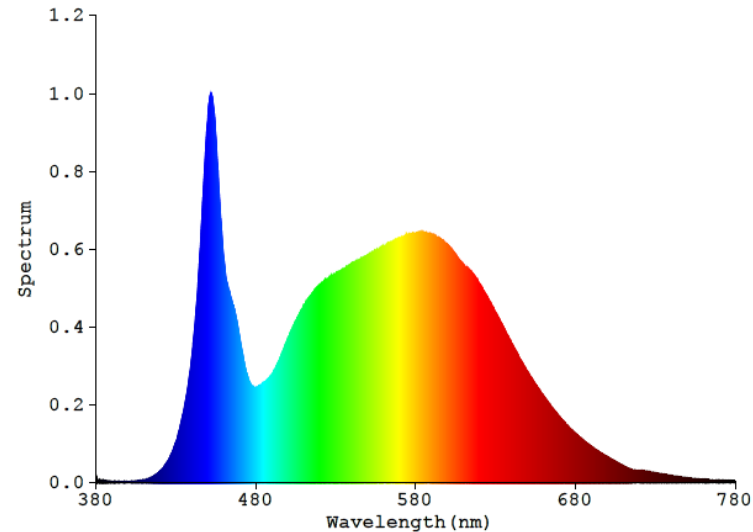
Spectrum Diagram (3500K):



Spectrum Diagram (4000K):



Spectrum Diagram (5000K):



Integrating Sphere Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.1	40.9	Face Down	90	10

Electrical Data:

Model Number	CCT(K)	Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
PLC-30W-14-28-DM-02	3000	120.0	60	0.2537	30.13	0.9850
	3500	120.0	60	0.2583	30.40	0.9854
	4000	120.0	60	0.2596	30.54	0.9853
	5000	120.0	60	0.2544	30.05	0.9850

Color Data:

Model Number	CCT(K)	Color Rendering Index (CRI)	R9	Duv	Total Luminous (lm)	Luminous Efficacy (lm/w)
PLC-30W-14-28-DM-02	2955	82.5	7	-0.00014	3593.17	119.27
	3525	85.2	17	-0.000745	3644.10	119.87
	4109	85.1	18	0.000684	3727.60	122.05
	4799	81.5	0	0.00480	3756.22	125.02

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Integrating Sphere Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.4	41.0	Face Down	90	10

Electrical Data:

Model Number	CCT(K)	Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
PLC-40W-14-28-DM-02	3000	120.0	60	0.3294	39.11	0.9895
PLC-35W-14-28-DM-02	3000	120.0	60	0.2909	34.48	0.9877

Color Data:

Model Number	CCT(K)	Color Rendering Index (CRI)	R9	Duv	Total Luminous (lm)	Luminous Efficacy (lm/w)
PLC-40W-14-28-DM-02	3064	83.7	12	-0.000548	4553.4	116.42
PLC-35W-14-28-DM-02	3060	83.8	12	0.000507	4087.1	118.54

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Goniophotometer Test Results (Test for PLC-45W-14-28-DM-02):

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.7	40.3	Face Down	90	25

Electrical Data:

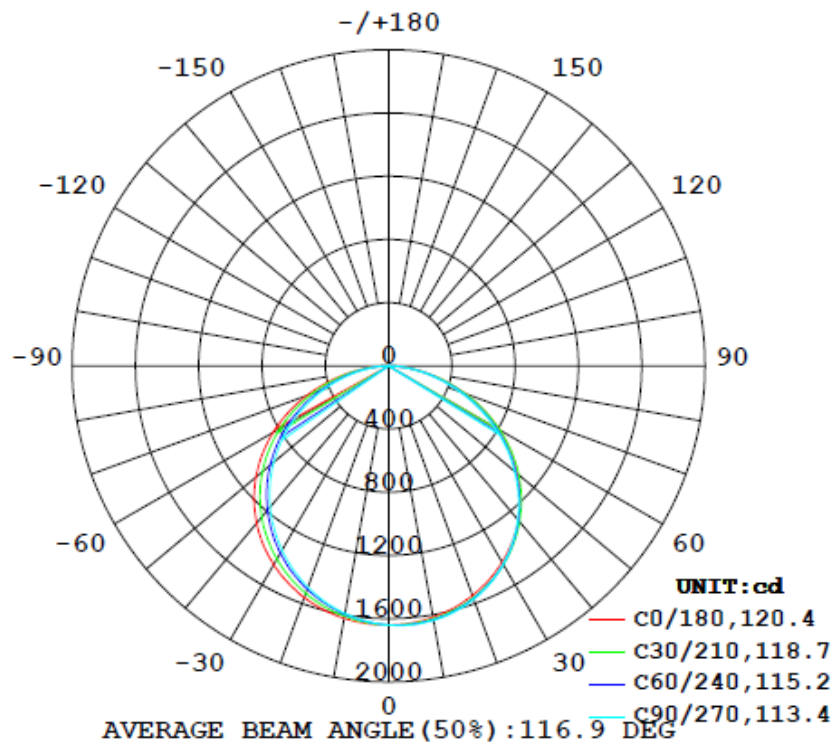
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.3651	43.48	0.9908

Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	4940.18
Total Luminous per foot (lm/t)	N/A
Luminous Efficacy (lm/w)	113.62
Spacing Criterion (0-180°)	1.32
Spacing Criterion (90-270°)	1.32
Zonal Lumens Distribution (0-60°)	77.6%
Beam Angle (°)	116.9

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

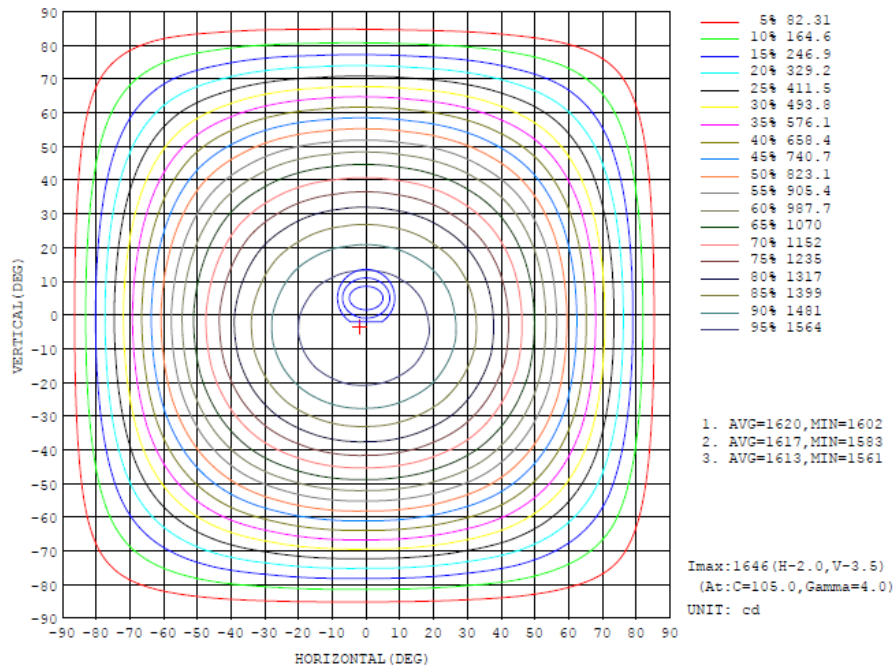


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	lum, lamp
10	1615	1629	1635	1625	1622	1600	1591	1599	0- 10	155.4	155.4	2.15,2.15
20	1547	1568	1572	1577	1560	1516	1492	1511	10- 20	447.8	603.3	12.2,12.2
30	1494	1453	1448	1465	1453	1388	1349	1379	20- 30	686.2	1289	26.1,26.1
40	1275	1285	1270	1299	1299	1217	1166	1205	30- 40	840.0	2129	42.1,42.1
50	1065	1066	1040	1081	1096	1005	948.6	991.3	40- 50	886.8	2016	61.1,61.1
60	808.2	802.0	771.3	816.4	844.5	757.4	700.3	739.1	50- 60	815.4	2832	77.6,77.6
70	514.7	505.3	478.6	519.7	552.5	480.9	423.0	461.5	60- 70	621.5	4462	90.3,90.3
80	219.5	215.3	198.8	226.3	252.2	209.8	179.6	193.0	70- 80	369.2	4822	97.8,97.8
90	7.464	1.081	5.044	0.8696	16.92	11.13	0.3256	6.762	80- 90	104.6	4937	99.9,99.9
100	0.1177	0.1049	0.1272	0.1159	0.2726	0.3920	0.4154	0.4064	90-100	0.8859	4928	99.9,99.9
110	0.2029	0.1558	0.1624	0.2096	0.2725	0.4130	0.4251	0.4301	100-110	0.2996	4928	100,100
120	0.3481	0.2466	0.2677	0.3268	0.2892	0.4070	0.4042	0.3992	110-120	0.2118	4928	100,100
130	0.4842	0.2748	0.4078	0.4640	0.5206	0.6103	0.6094	0.5444	120-130	0.2790	4929	100,100
140	0.5682	0.5197	0.5188	0.5698	0.6605	0.8076	0.8129	0.7575	130-140	0.4511	4929	100,100
150	0.6063	0.5547	0.5487	0.5975	0.8113	0.9445	0.9834	0.9235	140-150	0.4410	4939	100,100
160	0.7285	0.6701	0.5870	0.7094	0.9482	1.081	1.022	1.063	150-160	0.2695	4940	100,100
170	0.8591	0.8044	0.7384	0.8207	0.9801	1.101	1.072	1.015	160-170	0.2516	4940	100,100
180	0.9525	0.9462	0.9214	0.8823	0.9505	0.9581	0.9440	0.8922	170-180	0.0876	4940	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 12.5 %									UNIT:lm		

Isocandela Diagram:



Luminous Distribution Intensity Data:

Table--1

UNIT: cd

C(°)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	1640	1639	1640	1639	1640	1639	1640	1641	1642	1642	1642	1642	1640	1639	1640	1639	1640	1639	1640
5	1633	1636	1639	1640	1642	1643	1645	1645	1646	1645	1644	1641	1637	1632	1629	1626	1624	1622	1622
10	1619	1622	1626	1629	1631	1634	1635	1636	1636	1635	1633	1629	1622	1614	1608	1600	1596	1591	1591
15	1587	1596	1600	1606	1607	1610	1611	1613	1612	1612	1610	1607	1596	1585	1576	1564	1556	1549	1548
20	1547	1559	1563	1568	1569	1571	1572	1574	1575	1577	1575	1570	1560	1545	1533	1516	1505	1494	1492
25	1497	1510	1513	1517	1516	1517	1518	1521	1524	1528	1527	1524	1512	1494	1478	1457	1443	1429	1426
30	1434	1449	1451	1453	1450	1449	1448	1454	1459	1465	1466	1465	1453	1432	1412	1388	1370	1353	1349
35	1361	1376	1376	1375	1369	1367	1366	1371	1378	1389	1393	1393	1382	1359	1337	1307	1285	1267	1261
40	1275	1290	1288	1285	1275	1271	1270	1277	1286	1299	1306	1309	1299	1274	1249	1217	1192	1171	1166
45	1176	1192	1188	1182	1169	1164	1160	1169	1180	1197	1206	1212	1204	1177	1151	1116	1090	1068	1061
50	1065	1080	1074	1066	1051	1045	1040	1050	1061	1081	1093	1102	1096	1069	1042	1005	979	955	949
55	942	957	948	939	922	915	911	920	932	954	968	980	976	949	923	885	859	835	828
60	808	822	811	802	784	776	771	782	794	816	832	846	845	818	794	757	731	707	700
65	665	677	665	656	639	632	626	636	648	671	687	702	702	678	656	621	596	574	567
70	515	526	514	505	489	483	479	488	499	520	535	550	553	531	512	481	459	439	433
75	364	374	363	356	342	338	333	342	351	369	382	396	400	382	368	341	324	307	302
80	218	228	219	215	204	202	199	206	212	226	236	247	252	238	230	210	196	184	180
85	89.6	95.6	92.0	90.8	87.0	85.5	84.7	87.7	92.9	99.3	104	111	115	107	104	93.7	87.2	80.3	76.5
90	7.46	0.11	4.74	1.08	5.47	1.01	5.04	0.83	5.50	0.87	10.2	3.62	16.9	13.2	6.74	11.1	3.95	7.37	0.53
95	0.08	0.08	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.10	0.07	0.30	0.32	0.32	0.32	0.31	0.32	0.31
100	0.12	0.11	0.11	0.10	0.11	0.12	0.13	0.13	0.12	0.12	0.12	0.11	0.37	0.38	0.38	0.39	0.40	0.41	0.42
105	0.16	0.15	0.14	0.13	0.13	0.13	0.13	0.14	0.15	0.16	0.16	0.16	0.41	0.41	0.41	0.43	0.44	0.44	0.44
110	0.20	0.19	0.17	0.16	0.16	0.16	0.16	0.18	0.20	0.21	0.21	0.20	0.37	0.38	0.39	0.41	0.42	0.43	0.43
115	0.27	0.23	0.21	0.19	0.19	0.20	0.21	0.23	0.25	0.27	0.27	0.26	0.34	0.35	0.37	0.39	0.40	0.41	0.40
120	0.35	0.31	0.28	0.25	0.25	0.26	0.27	0.30	0.32	0.34	0.35	0.35	0.39	0.40	0.40	0.41	0.41	0.40	0.40
125	0.43	0.39	0.34	0.32	0.31	0.31	0.33	0.36	0.39	0.41	0.41	0.42	0.46	0.48	0.48	0.50	0.48	0.47	0.48
130	0.48	0.46	0.43	0.37	0.39	0.39	0.41	0.43	0.47	0.46	0.48	0.49	0.53	0.57	0.60	0.61	0.62	0.60	0.61
135	0.54	0.53	0.49	0.43	0.43	0.47	0.49	0.50	0.51	0.51	0.53	0.54	0.60	0.66	0.69	0.71	0.73	0.73	0.73
140	0.57	0.58	0.53	0.52	0.48	0.50	0.52	0.53	0.55	0.57	0.55	0.58	0.66	0.73	0.75	0.81	0.80	0.81	0.81
145	0.59	0.62	0.57	0.53	0.53	0.52	0.54	0.55	0.60	0.58	0.57	0.60	0.73	0.81	0.82	0.87	0.91	0.90	0.91
150	0.61	0.63	0.60	0.55	0.52	0.54	0.55	0.57	0.60	0.60	0.59	0.62	0.81	0.87	0.89	0.94	0.96	0.98	0.98
155	0.65	0.67	0.69	0.59	0.55	0.58	0.57	0.60	0.64	0.64	0.67	0.64	0.87	0.90	1.00	0.99	1.00	1.01	1.02
160	0.73	0.73	0.72	0.67	0.58	0.60	0.59	0.64	0.69	0.71	0.72	0.71	0.95	0.97	1.05	1.08	1.04	1.03	1.02
165	0.79	0.80	0.77	0.75	0.67	0.66	0.65	0.70	0.78	0.79	0.77	0.78	0.95	0.99	1.06	1.12	1.10	1.07	1.07
170	0.86	0.87	0.84	0.80	0.72	0.73	0.74	0.73	0.82	0.82	0.82	0.85	0.98	1.02	1.05	1.10	1.10	1.05	1.07
175	0.92	0.94	0.92	0.90	0.81	0.79	0.78	0.79	0.84	0.82	0.86	0.90	0.99	1.02	1.03	1.03	1.04	0.99	0.98
180	0.95	0.98	0.97	0.95	0.90	0.92	0.93	0.90	0.87	0.88	0.89	0.93	0.95	0.98	0.97	0.96	0.91	0.94	0.94

Table--2

UNIT: cd

C(°)	285	300	315	330	345														
0	1641	1642	1642	1642	1642														
5	1623	1625	1626	1629	1633														
10	1592	1596	1599	1606	1611														
15	1548	1555	1560	1572	1579														
20	1494	1501	1511	1526	1537														
25	1427	1438	1450	1469	1485														
30	1350	1363	1379	1402	1421														
35	1264	1278	1297	1324	1344														
40	1168	1185	1205	1234	1258														
45	1064	1081	1103	1134	1159														
50	950	969	991	1023	1049														
55	829	847	869	902	927														
60	701	719	739	770	794														
65	567	584	602	631	652														
70	432	446	462	487	505														
75	300	311	322	344	357														
80	179	185	193	207	215														
85	75.1	77.7	80.0	85.2	89.3														
90	7.25	0.23	6.76	0.24	2.69														
95	0.32	0.32	0.33	0.33	0.33														
100	0.41	0.41	0.41	0.40	0.40														
105	0.44	0.45	0.45	0.45	0.43														
110	0.43	0.43	0.43	0.41	0.40														
115	0.40	0.40	0.40	0.38	0.38														
120	0.40	0.40	0.40	0.40	0.42														
125	0.46	0.46	0.47	0.45	0.48														
130	0.59	0.57	0.54	0.56	0.55														
135	0.70	0.65	0.64	0.64	0.64														
140	0.76	0.76	0.76	0.72	0.73														
145	0.87	0.88	0.85	0.80	0.80														
150	0.97	0.95	0.93	0.90	0.87														
155	1.02	1.01	0.99	1.01	0.91														
160	1.03	1.04	1.06	1.05	0.98														
165	1.08	1.07	1.07	1.04	0.98														
170	1.07	1.02	1.01	1.00	0.97														
175	1.01	0.93	0.99	0.96	0.97														
180	0.91	0.88	0.89	0.90	0.93														

THD and PF Measurement Test Results:

Electrical Measurement:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	iTHD(%)
277.0	60	0.1720	44.59	0.9358	11.60
277.0	60	0.1558	40.3	0.9336	11.71
277.0	60	0.1393	35.58	0.9286	12.27
277.0	60	0.1205	30.93	0.9265	15.87
347.0	60	0.1423	45.11	0.9130	12.30
347.0	60	0.1266	40.28	0.9166	12.50
347.0	60	0.1098	34.98	0.9180	13.00
347.0	60	0.0958	30.15	0.9065	16.12

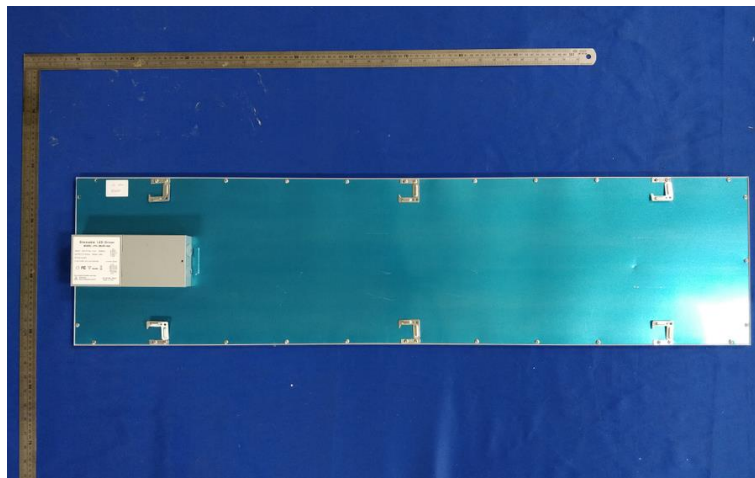
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Website: <http://www.ntc-cert.com>

Photo of Sample:



Laboratory: Dongguan New Testing Centre Co., Ltd

Address: 3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan,
Guangdong, China

Tel: 86-769-89874553

Website: <http://www.ntc-cert.com>

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-F01-012	Standard Lamp	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