

# Photometric Test Report

## Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014
- ☒ UL1598-2008

## Prepared For

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## Project Number

**DLF1804109**

## Report Number

**DLF20180416001-19a**

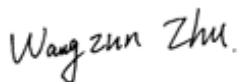
## Test Date

**2018/4/16**

## Issue Date

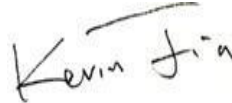
**2018/4/16**

## Prepared By



Wangzun Zhu

## Approved By



Kevin Jia

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## 1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor Pole/Arm-Mounted Area and Roadway Luminaires				
Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
Lamp Output (lm)	IES LM-79-2008	1000	3527	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	99.90%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	110	121.1	P
Allowable CCTs* (K)	IES LM-79-2008	5700	4100	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	65	70.8	P
Power Factor	ANSI C82.77:2014	0.873	0.928	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.17%	P

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/4/16	WPLED26N	S1
2	Goniophotometer Test	2018/4/16	WPLED26N	S1
3	THD and PF Test	2018/4/16	WPLED26N	S1

### Remark(If any)

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2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

### 3.0 Production Description

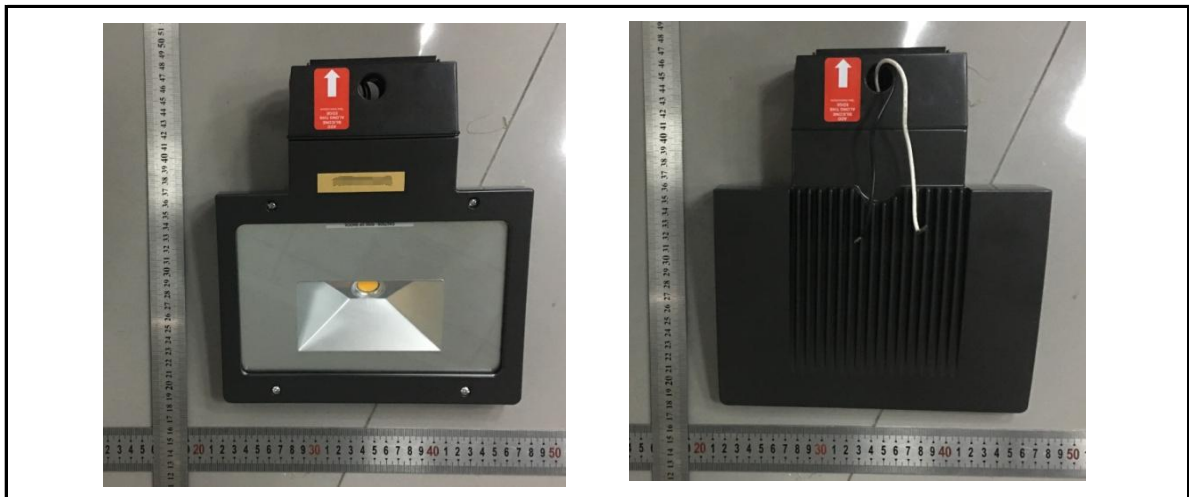
**Luminaire Description:**

**Electrical Specification:** 120V-277V,50/60HZ

**Light source:** LL725F1212-XXC

**Manufacturer Of Light Source:** Lustrous International Technology Company

#### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

Model No.	WPLED26N	Sample ID.	S1
Operate time (Min.)	90	Stabilization time (Min.)	45

#### Test Method

The samples were tested according to the IES LM-79-2008.

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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within  $\pm 0.2$  percent under load.

The sample was measured using  $4\pi$  geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

#### Test Conditions

Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.1	276.98	60	0.113	29.15	0.928

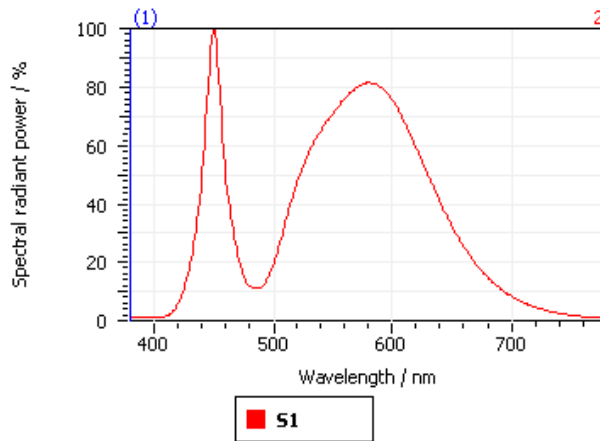
#### Test Result

CCT (K)	CRI (Ra)	Duv
4100	70.8	6.7E-04

## 4.1 Integrating Sphere Test

### Spectroradiometric Parameters

#### Results



#### Spectral values

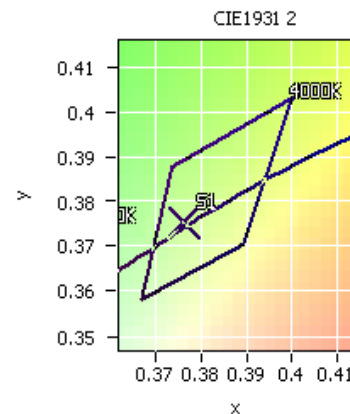
DominantWavelength	578.30 nm
Purity	0.258
PeakWavelength	450.15 nm
Width50%:	19.74 nm

#### Color Coordinates

Correlated Color Temperature 4100 K

x: 0.3766 u: 0.2230 u': 0.2230  
y: 0.3757 v: 0.3337 v': 0.5005

ResultsCRICRI01	67.6	ResultsCRICRI09	-32.0
ResultsCRICRI02	77.8	ResultsCRICRI10	46.3
ResultsCRICRI03	84.7	ResultsCRICRI11	62.8
ResultsCRICRI04	69.1	ResultsCRICRI12	36.9
ResultsCRICRI05	67.0	ResultsCRICRI13	69.1
ResultsCRICRI06	67.6	ResultsCRICRI14	91.1
ResultsCRICRI07	80.9	ResultsCRICRI15	61.6
ResultsCRICRI08	51.9	ResultsCRICRI16	62.7
ResultsCRI	70.8		



Nominal CCT: 4000K

PlanckDistance 6.7E-004

## 4.0 LM-79 Measurement and Test Results

### 4.3 Goniophotometer Test

Model No.	WPLED26N	Sample ID.	S1
Operate time (Min.)	90	Stabilization time (Min.)	45

#### Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C 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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within  $\pm 0.2$  percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at  $0.5^{\circ}$  vertical intervals and  $10^{\circ}$  horizontal intervals.

#### Test Conditions

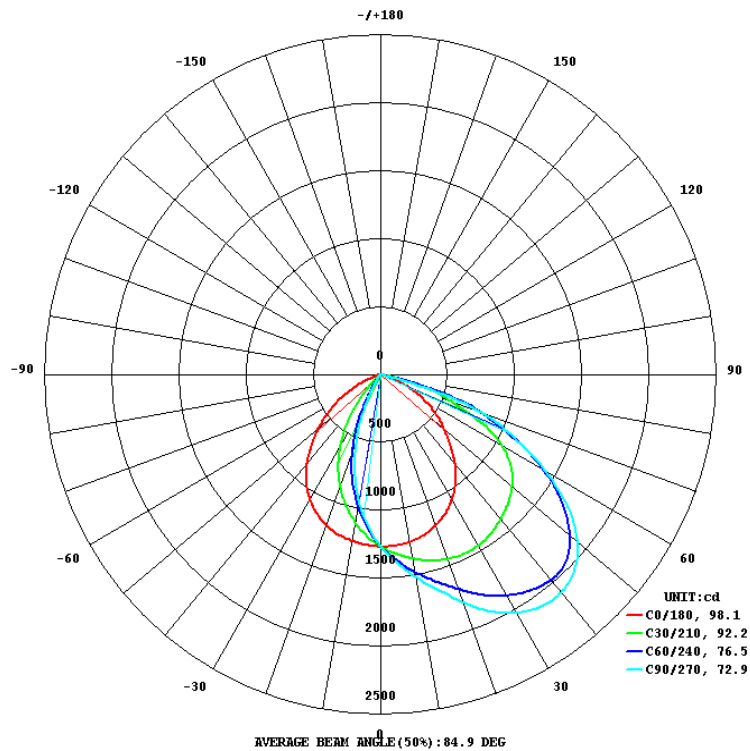
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	276.99	60	0.114	29.11	0.923	Light Down

#### Test Result

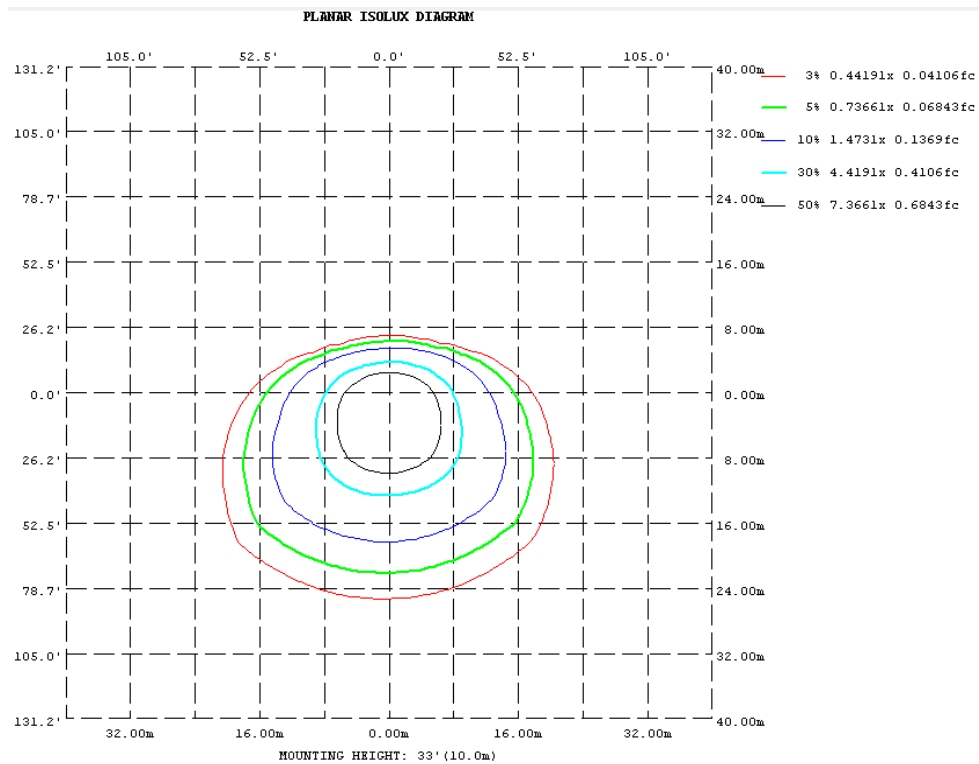
Flux(lm)	Zonal Lumen Requirement (0°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3527	99.90%	103.1	138.1	92.9	98.1	121.1

### 4.3 Goniophotometer Test

#### Light Distrubtion Curve



#### Isolux Plot



### 4.3 Goniophotometer Test

#### Zonal Lumen Summary

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$
10	1251	1432	1513	1430	1244	1040	945.8	1048	0- 10
20	1187	1569	1778	1565	1183	743.0	543.4	762.3	10- 20
30	1066	1685	2024	1679	1059	398.8	161.4	429.1	20- 30
40	869.2	1705	2092	1697	855.9	86.26	49.80	103.5	30- 40
50	620.0	1655	1917	1649	601.3	20.41	17.00	15.68	40- 50
60	383.9	1386	1417	1449	344.7	6.922	8.002	5.348	50- 60
70	123.1	765.5	758.2	910.2	86.86	2.342	3.206	1.753	60- 70
80	0.9018	36.92	5.236	164.1	0.7169	0.8537	1.447	0.5949	70- 80
90	0.0298	0.0138	0.0134	0.0197	0.0403	0.0910	0.0900	0.0942	80- 90
100	0.0928	0.0104	0.0085	0.0358	0.2726	0.5524	0.5842	0.4325	90-100
110	0.2523	0.0345	0.0091	0.0823	0.5848	1.104	1.118	0.7964	100-110
120	0.3769	0.0985	0.0320	0.1416	0.8400	1.505	1.580	1.230	110-120
130	0.5717	0.2102	0.1225	0.2634	1.127	1.716	1.936	1.563	120-130
140	0.7882	0.3823	0.2865	0.4677	1.460	2.049	2.275	2.004	130-140
150	1.020	0.6754	0.5116	0.7226	1.800	2.363	2.379	2.283	140-150
160	1.217	0.9425	0.7796	0.9335	2.002	2.155	2.211	2.157	150-160
170	1.297	1.156	1.023	1.051	1.902	1.802	1.591	1.575	160-170
180	1.679	1.494	1.296	1.338	1.677	1.526	1.336	1.334	170-180
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 6.8 %								



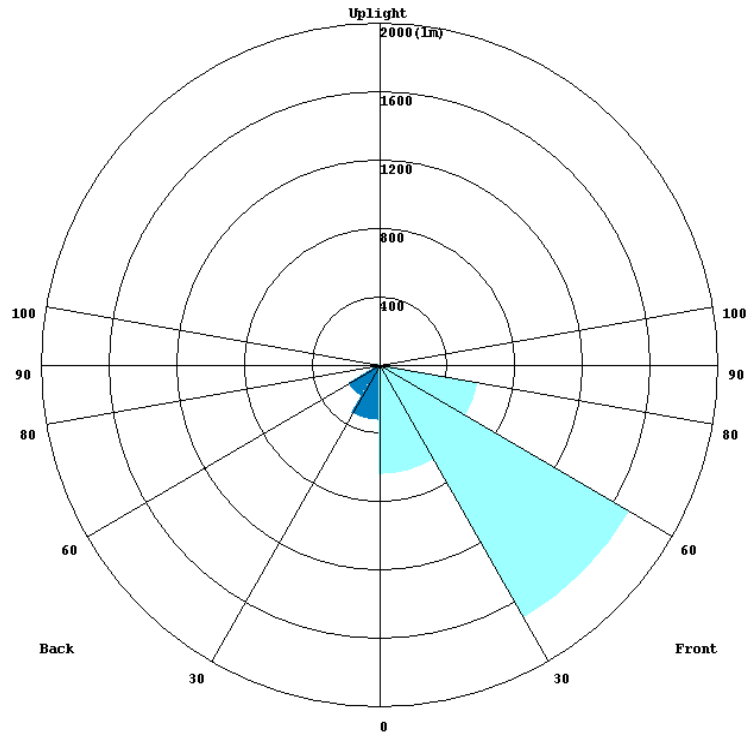
### 4.3 Goniophotometer Test

#### ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0 - 10	119.49	0 - 10	119.49	3.39%
10 - 20	340.32	0 - 20	459.81	13.04%
20 - 30	515.71	0 - 30	975.52	27.66%
30 - 40	627.07	0 - 40	1602.59	45.44%
40 - 50	673.55	0 - 50	2276.14	64.54%
50 - 60	629.93	0 - 60	2906.07	82.40%
60 - 70	456.40	0 - 70	3362.47	95.34%
70 - 80	157.35	0 - 80	3519.82	99.80%
80 - 90	2.06	0 - 90	3521.88	99.86%
90 - 100	0.14	0 - 100	3522.02	99.87%
100 - 110	0.40	0 - 110	3522.42	99.88%
110 - 120	0.61	0 - 120	3523.03	99.90%
120 - 130	0.74	0 - 130	3523.77	99.92%
130 - 140	0.84	0 - 140	3524.61	99.94%
140 - 150	0.84	0 - 150	3525.45	99.96%
150 - 160	0.70	0 - 160	3526.15	99.98%
160 - 170	0.42	0 - 170	3526.57	100.00%
170 - 180	0.13	0 - 180	3526.70	100.00%

### 3.2 Goniophotometer Test

#### LCS Graph



#### BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	644.66	18.3
FM - Front-Medium(30-60)	1710.9	48.5
FH - Front-High(60-80)	599.64	17.0
FVH - Front-Very High(80-90)	1.8121	0.1
Total Forward Light	2957.9	83.9

BL - Back-Low(0-30)	330.85	9.4
BM - Back-Medium(30-60)	219.69	6.2
BH - Back-High(60-80)	14.109	0.4
BVH - Back-Very High(80-90)	0.2496	0.0
Total Back Light	568.81	16.1

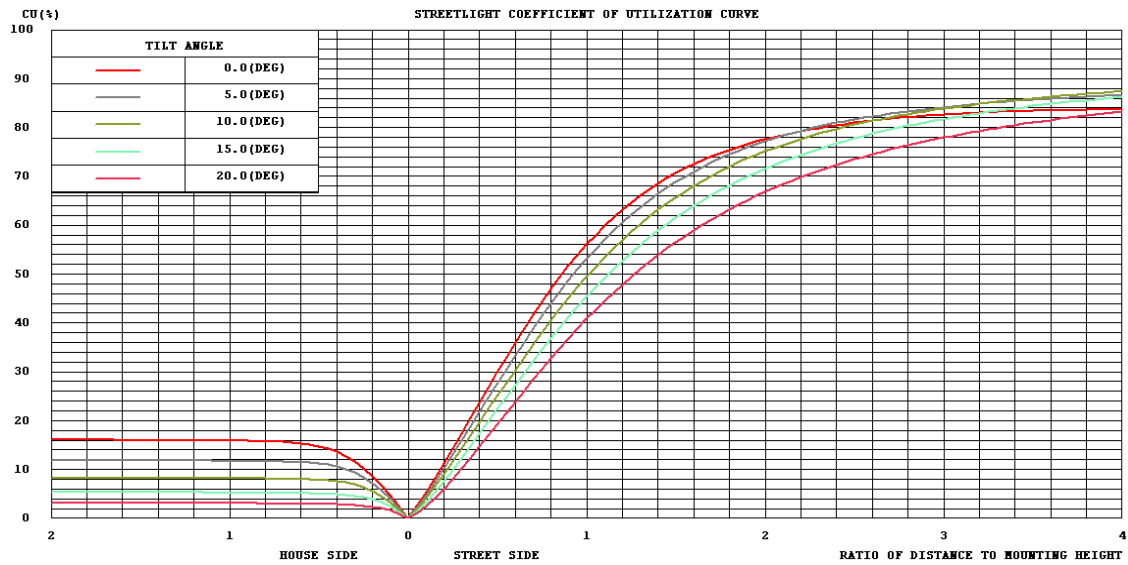
UL - Uplight-Low(90-100)	0.13511	0.0
UH - Uplight-High(100-180)	4.6919	0.1
Total Up Light	4.827	0.1

BUG(Back,Up,Glare) Rating	B1-U1-G0
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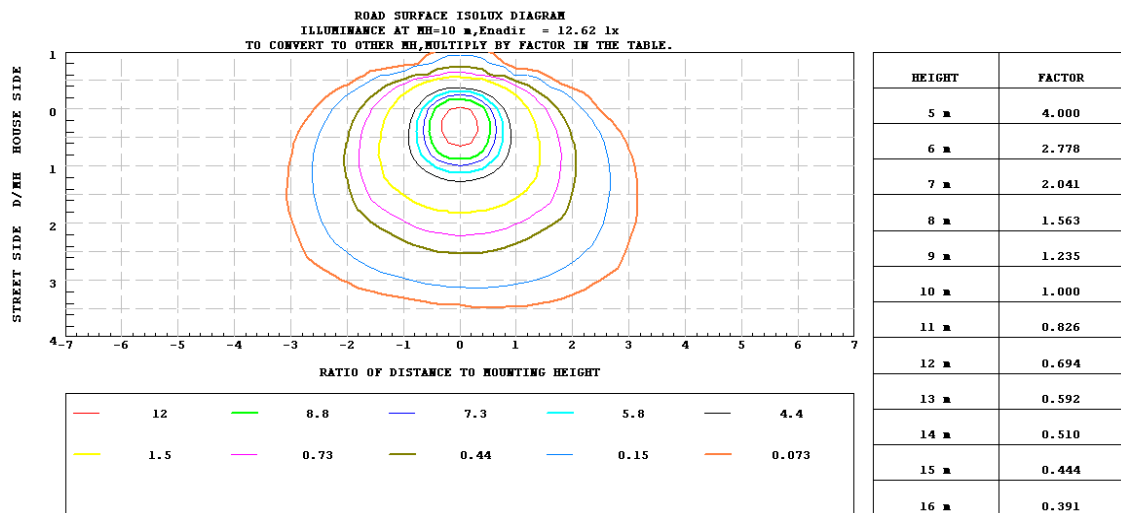
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	564.9	3.9073	568.81
Street Side	2957	0.91969	2957.9

### 3.2 Goniophotometer Test

#### Coefficients of Utilization

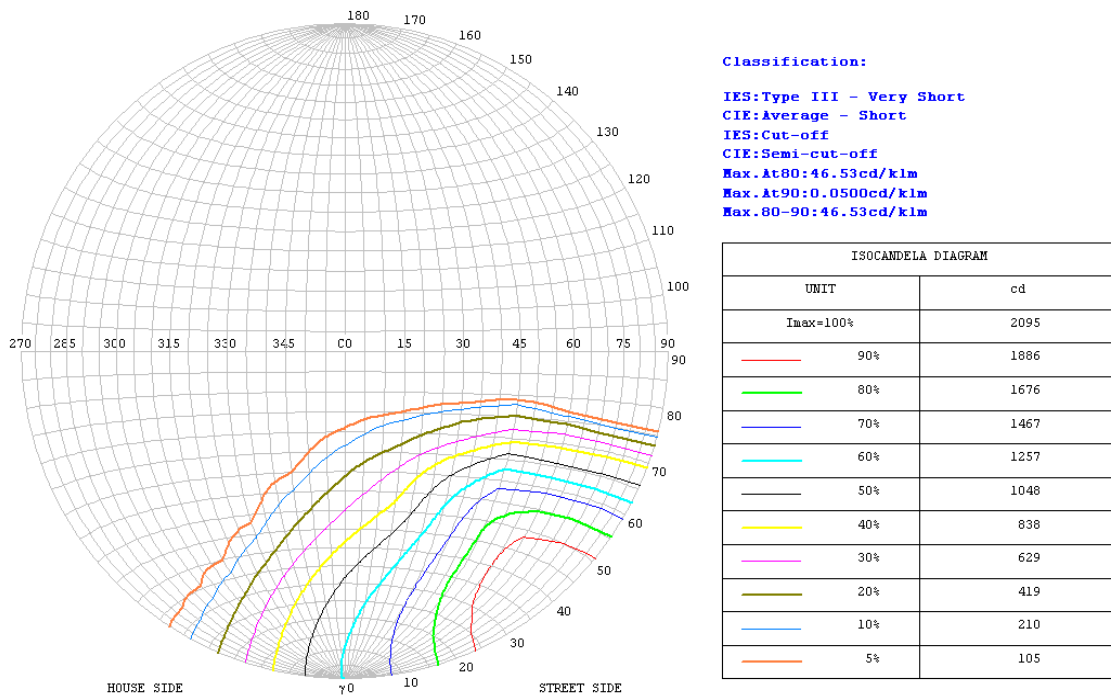


#### Iso-footcandle Lines of Horizontal Illumination

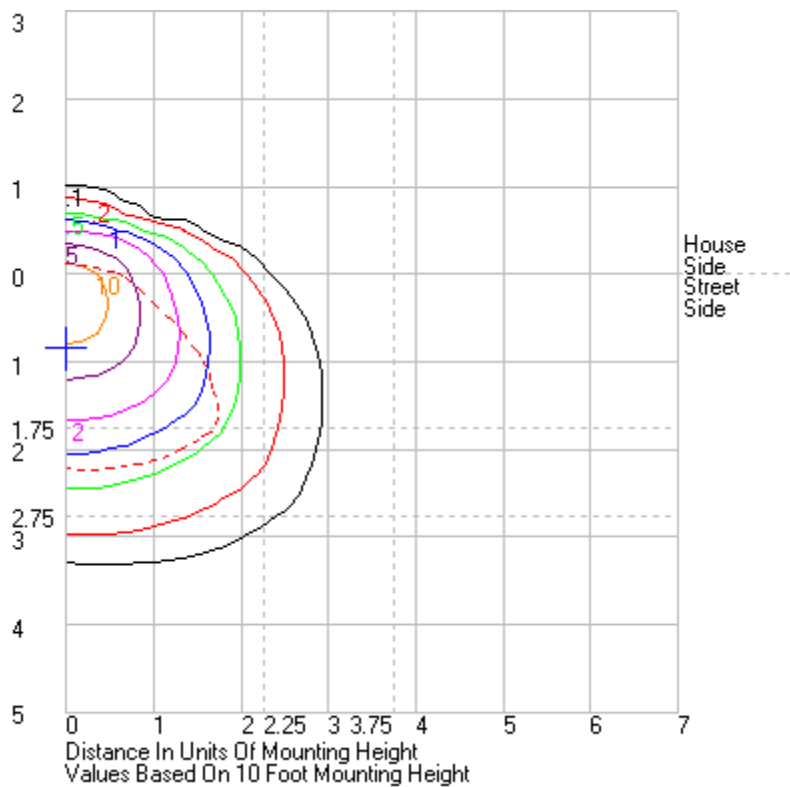


### 3.2 Goniophotometer Test

#### STREETLIGHT ISOCANDELA DIAGRAM



#### ROAD ISOCANDELA REPORT



## 5.0 THD and PF Test

Model No.	WPLED26N	Sample ID.	S1
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### Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

### Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
25.1	276.98	60	0.113	29.15	0.928	11.17%
25.1	120.02	60	0.242	28.90	0.996	6.94%

## 6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last	Calibration Due
DLF107	Integrating Sphere System	2017/12/28	2018/12/27
DLF108	Auxiliary Lamp	2017/12/28	2018/12/27
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-directional	2017/12/28	2018/12/27
DLF116	AC Power Source	2017/12/28	2018/12/27
DLF113	Power Meter	2017/12/28	2018/12/27
DLF112	Temperature Recorder	2017/12/28	2018/12/27
DLF114	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF101	Goniophotometer	2017/12/28	2018/12/27
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-directional	2017/12/28	2018/12/27
DLF104	AC Power Source	2017/12/28	2018/12/27
DLF507	DC Power Source	2017/12/28	2018/12/27
DLF102	Power Meter	2017/12/28	2018/12/27
DLF111	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF119	Power Meter	2017/12/28	2018/12/27
DLF031	Temperature data logger	2017/12/28	2018/12/27
DLF022	Digital power meter	2017/12/28	2018/12/27
DLF003	Temperature & Humidity Datalogger	2017/12/28	2018/12/27

\*\*\*\*\* End of Test Report\*\*\*\*\*