

# Photometric Test Report

## Relevant Standards

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

## Prepared For

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## Project Number

**DLF1810114**

## Data Number

**DLF1810114-17a**

## Test Date

**2018/11/12**

## Issue Date

**2018/11/12**

## Prepared By



Wangzun Zhu

## Approved By



Kevin Jia

The results contained in this report pertain only to the tested sample.

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## 1.0 Test Summary

DLC Technical Requirements v4.3

<b>Outdoor - Hight output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires</b>			
Requirement Category	Test Method	Requirements	Test value
Lamp Output (lm)	IES LM-79-2008	10000	10594
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	116.4	111.3
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	4.94%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	5067
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	75
Power Factor	ANSI C82.77:2014	0.873	0.965
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	8.46%

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/12	IVATFT-100L750U	Q1
2	Goniophotometer Test	2018/11/12	IVATFT-100L750U	Q1
3	THD and PF Test	2018/11/12	IVATFT-100L750U	Q1

### Remark(If any)

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### 3.0 Production Description

**Luminaire Description:** IVATFT-100L750U

**Electrical Specification:** 120V-277V,50/60HZ, 100W

#### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

Model No.	IVATFT-100L750U	Sample ID.	Q1
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
25.3	120.02	60	0.805	96.5	0.998

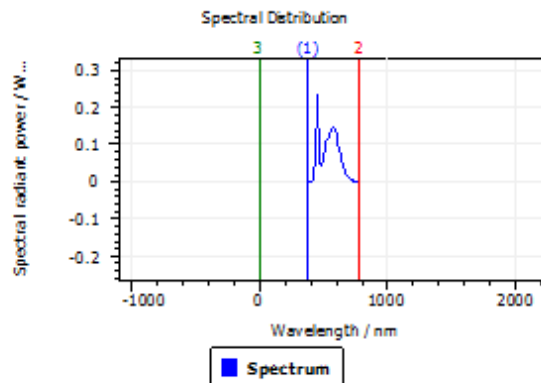
#### Test Result

CCT (K)	CRI (Ra)	Duv
5067	75.3	2.3E-03

## 4.1 Integrating Sphere Test

### Spectroradiometric Parameters

#### Results



#### Spectral values

DominantWavelength	569.45 nm
Purity	0.097
PeakWavelength	451.16 nm
Radiant Power	25.51 W
Width50%	21.24 nm

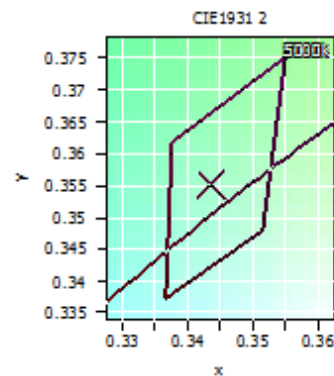
#### Color Coordinates

Correlated Color Temperatu 5067 K

x: 0.3437 u: 0.2091 u': 0.2091  
y: 0.3551 v: 0.3241 v': 0.4862

ResultsCRICRI01	71.9	ResultsCRICRI09	-31.0
ResultsCRICRI02	82.2	ResultsCRICRI10	57.8
ResultsCRICRI03	89.4	ResultsCRICRI11	71.5
ResultsCRICRI04	74.1	ResultsCRICRI12	49.6
ResultsCRICRI05	73.1	ResultsCRICRI13	74.3
ResultsCRICRI06	74.8	ResultsCRICRI14	94.3
ResultsCRICRI07	82.2	ResultsCRICRI15	64.7
ResultsCRICRI08	54.9	ResultsCRICRI16	64.0

ResultsCRI 75.3



PlanckDistance 2.3E-003

## 4.0 LM-79 Measurement and Test Results

### 4.3 Goniophotometer Test

Model No.	IVATFT-100L750U	Sample ID.	Q1
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

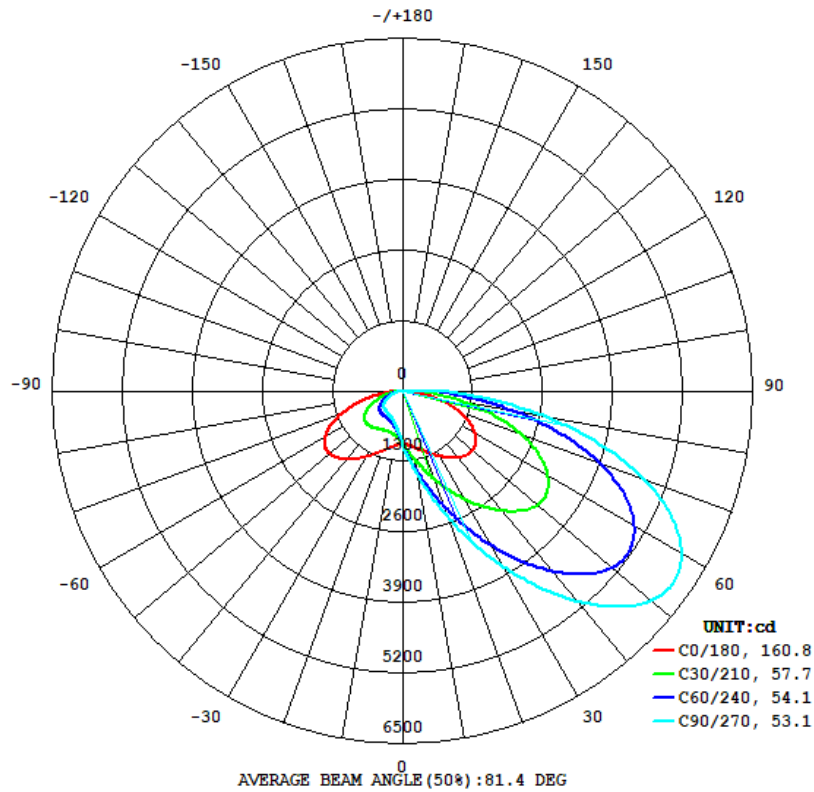
Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.96	60	0.795	95.2	0.998	Light Down

#### Test Result

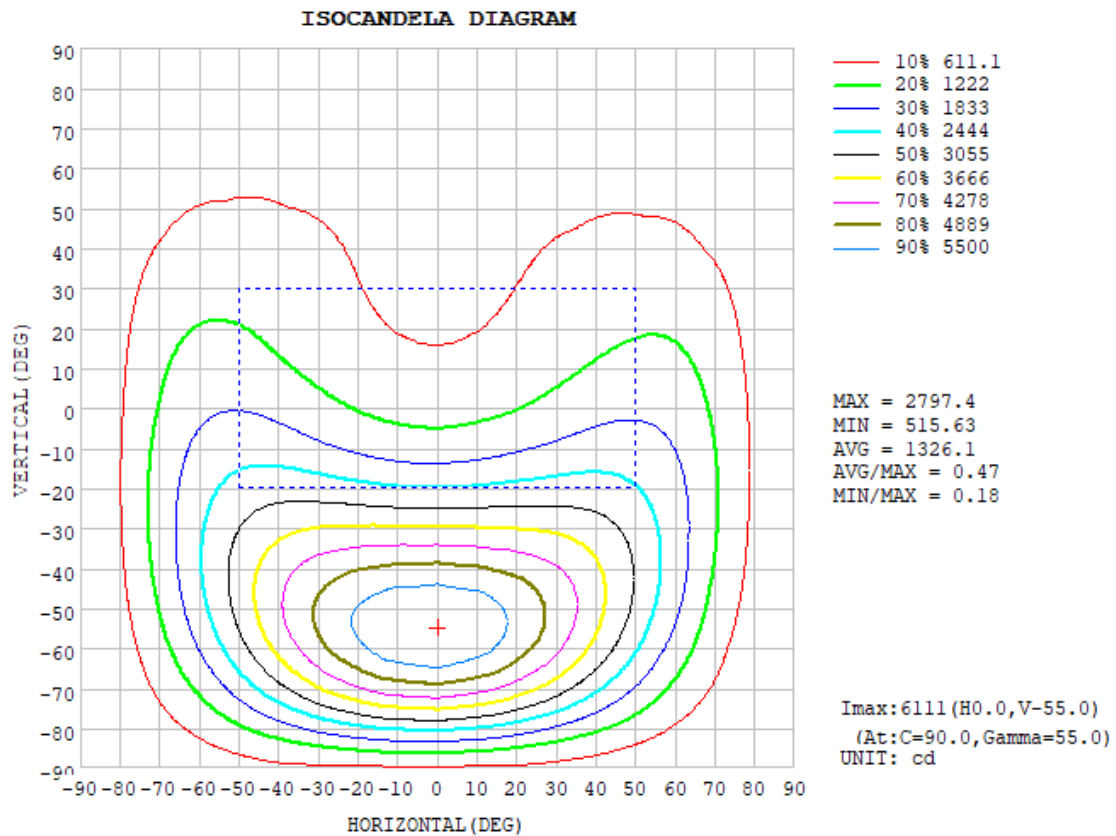
Flux (lm)	Zonal Lumen Requirement ( $0^{\circ}$ - $90^{\circ}$ )	Zonal Lumen Requirement ( $80^{\circ}$ - $90^{\circ}$ )	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
10594	100.00%	4.94%	175.6	106.1	160.8	53.1	111.3

### 4.3 Goniophotometer Test

#### Light Distrubtion Curve



#### Isolux Plot



### 4.3 Goniophotometer Test

#### Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1044	1375	1531	1354	1030	776.5	696.5	788.2
20	1192	2010	2463	1979	1179	693.7	569.5	704.3
30	1395	2817	3726	2845	1400	677.6	518.2	678.1
40	1603	3642	5058	3770	1648	695.5	498.9	676.0
50	1704	4194	6008	4419	1793	691.7	466.6	647.9
60	1564	4068	5983	4386	1670	602.7	383.7	545.1
70	1126	3134	4769	3476	1227	405.9	244.2	352.2
80	495.0	1615	2645	1901	545.2	147.7	81.25	115.8
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							



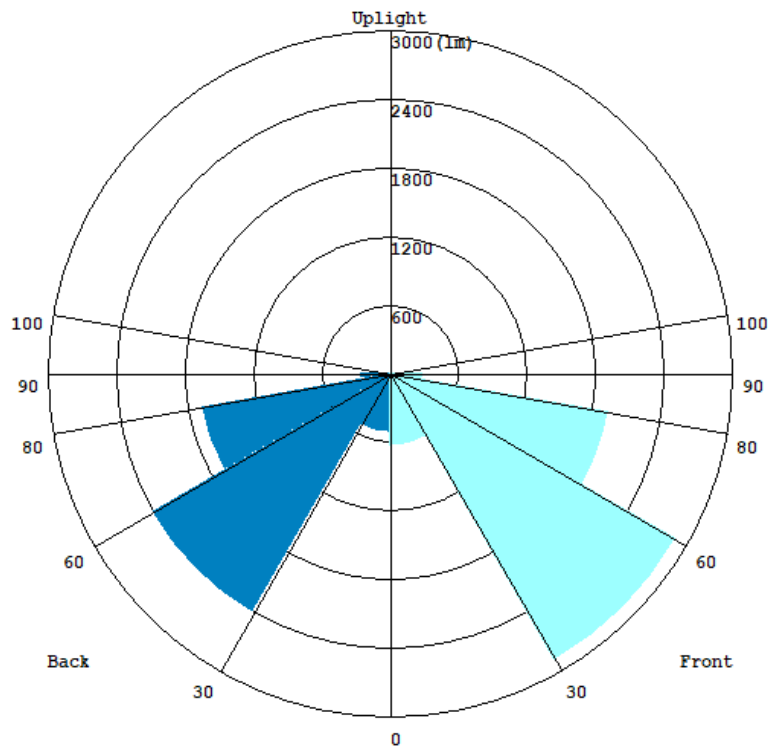
### 4.3 Goniophotometer Test

#### ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	98.13	0 - 10	98.13	0.93%
10-20	343.61	0 - 20	441.74	4.17%
20-30	720.05	0 - 30	1161.79	10.97%
30-40	1247.45	0 - 40	2409.24	22.74%
40-50	1830.53	0 - 50	4239.77	40.02%
50-60	2218.49	0 - 60	6458.26	60.96%
60-70	2130.29	0 - 70	8588.55	81.07%
70-80	1482.14	0 - 80	10070.69	95.06%
80-90	523.63	0 - 90	10594.32	100.00%
90-100	0.00	0 - 100	10594.32	100.00%
100-110	0.00	0 - 110	10594.32	100.00%
110-120	0.00	0 - 120	10594.32	100.00%
120-130	0.00	0 - 130	10594.32	100.00%
130-140	0.00	0 - 140	10594.32	100.00%
140-150	0.00	0 - 150	10594.32	100.00%
150-160	0.00	0 - 160	10594.32	100.00%
160-170	0.00	0 - 170	10594.32	100.00%
170-180	0.00	0 - 180	10594.32	100.00%

### 3.2 Goniophotometer Test

#### LCS Graph



#### BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	637.94	6.0
FM - Front-Medium(30-60)	2891.8	27.2
FH - Front-High(60-80)	1944.5	18.3
FVH - Front-Very High(80-90)	294.14	2.8
Total Forward Light	5768.4	54.2

BL - Back-Low(0-30)	524.14	4.9
BM - Back-Medium(30-60)	2415.7	22.7
BH - Back-High(60-80)	1675.6	15.7
BVH - Back-Very High(80-90)	263.4	2.5
Total Back Light	4878.9	45.8

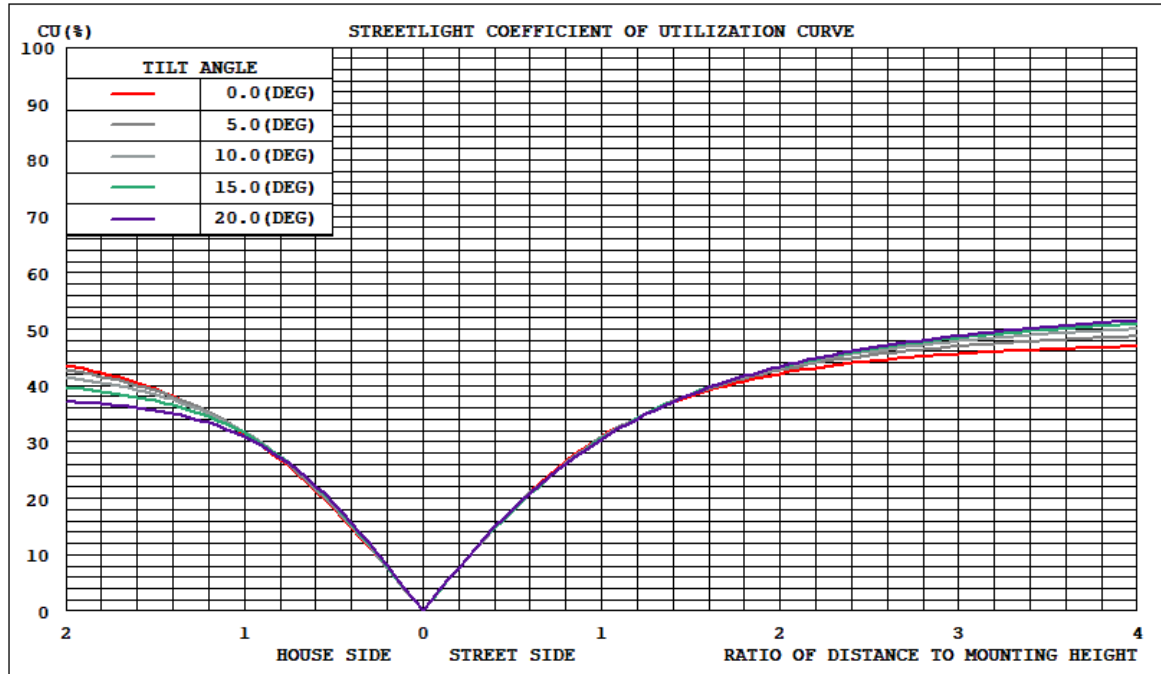
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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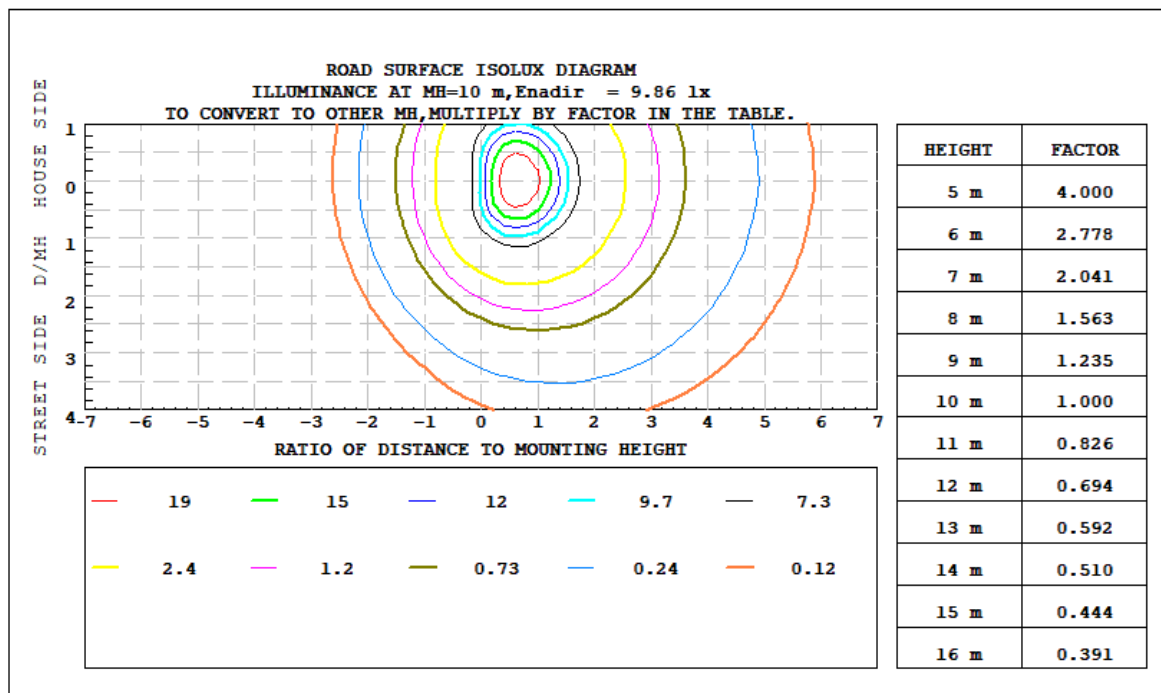
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4878.9	0	4878.9
Street Side	5768.4	0	5768.4

### 3.2 Goniophotometer Test

#### Coefficients of Utilization

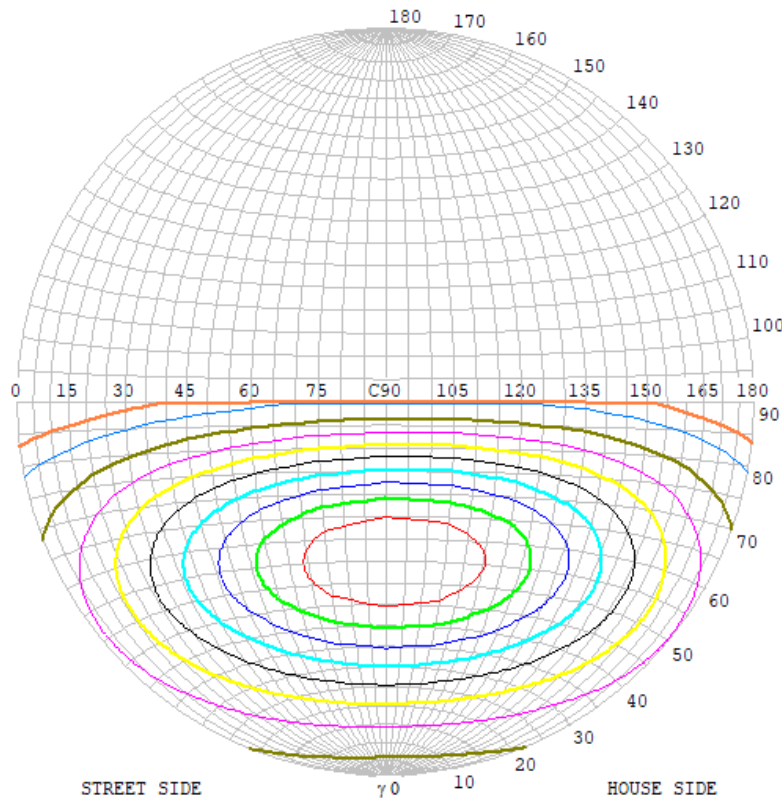


#### Iso-footcandle Lines of Horizontal Illumination



### 3.2 Goniophotometer Test

#### STREETLIGHT ISOCANDELA DIAGRAM

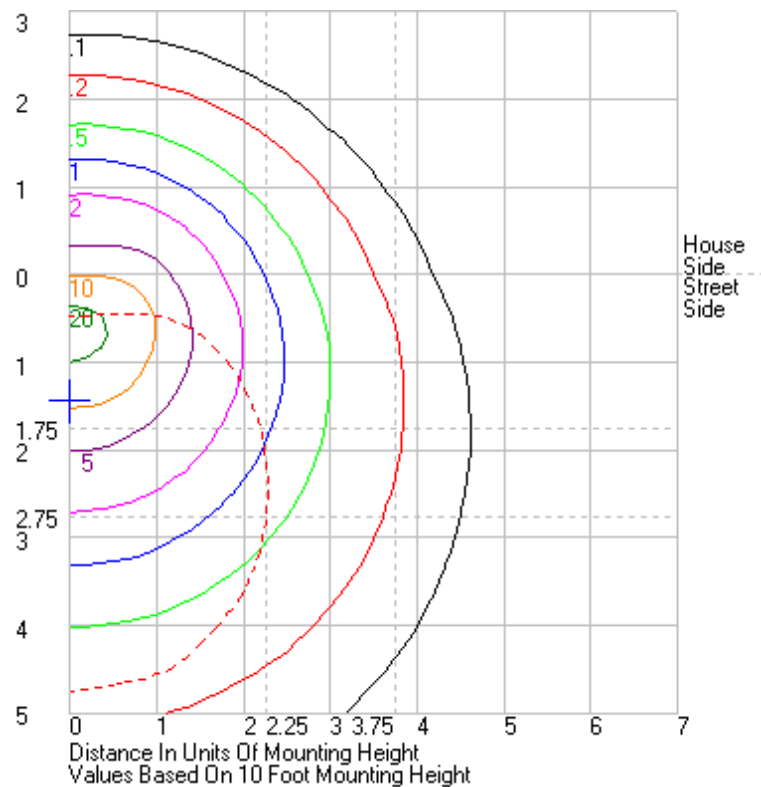


#### Classification:

IES:Type II - Very Short  
CIE:Narrow - Short  
IES:None cut-off  
CIE:Non-cut-off  
Max.At80:248.4cd/klm  
Max.At90:0cd/klm  
Max.80-90:248.4cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	6141
90%	5527
80%	4913
70%	4299
60%	3685
50%	3071
40%	2457
30%	1842
20%	1228
10%	614
5%	307

#### ROAD ISOCANDELA REPORT



## 5.0 THD and PF Test

Model No.	IVATFT-100L750U	Sample ID.	Q1
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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	277.03	60	0.349	93.4	0.965	8.46%
25.1	120.02	60	0.805	96.5	0.998	4.19%

## 6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration	Calibration Due Date
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-derectional	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-derectional	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\*\*\*\*\*