

# Photometric Test Report

## Relevant Standards

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

## Prepared For

**RAB Lighting Inc.**

Room 6A33, No.1388, Wuzhong road, Shanghai, China

Xiao Xiang, 15921313292, gary.xiao@rabweb.com

## Prepared By

**Deliver Co., Ltd.**

Block 11, 78 Keling Road, SSTP, Suzhou, China

0512-66801950, kevin.jia@szdeliver.com

## Project Number

**DLF1810114**

## Data Number

**DLF1810114-18a**

## Test Date

**2018/10/30**

## Issue Date

**2018/10/31**

## 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	9999
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	116.4	110.2
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	4.24%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	4137
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	73
Power Factor	ANSI C82.77:2014	0.873	0.964
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	8.45%

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/30	IVATFT-100L740U	R1
2	Goniophotometer Test	2018/10/30	IVATFT-100L740U	R1
3	THD and PF Test	2018/10/30	IVATFT-100L740U	R1

### Remark(If any)

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### 3.0 Production Description

**Luminaire Description:** IVATFT-100L740U

**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-100L740U	Sample ID.	R1
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	120.01	60	0.773	92.6	0.998

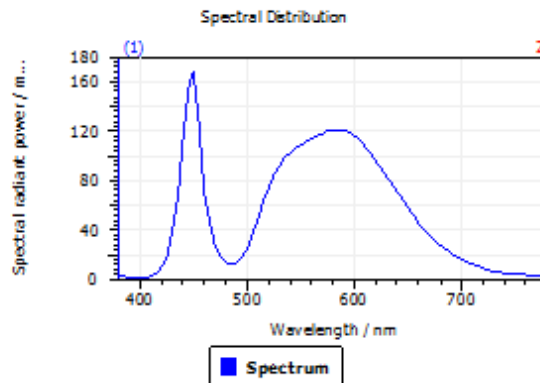
#### Test Result

CCT (K)	CRI (Ra)	Duv
4137	73.3	4.7E-03

## 4.1 Integrating Sphere Test

### Spectroradiometric Parameters

#### Results



#### Spectral values

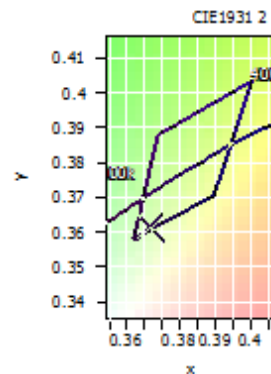
DominantWavelength	581.99 nm
Purity	0.200
PeakWavelength	448.53 nm
Radiant Power	21.18 W
Width50%	21.92 nm

#### Color Coordinates

Correlated Color Temperatu 4137 K

x: 0.3718 u: 0.2256 u': 0.2256  
y: 0.3614 v: 0.3289 v': 0.4933

ResultsCRICRI01	72.4	ResultsCRICRI09	-11.0
ResultsCRICRI02	79.0	ResultsCRICRI10	47.7
ResultsCRICRI03	81.5	ResultsCRICRI11	67.9
ResultsCRICRI04	72.9	ResultsCRICRI12	40.8
ResultsCRICRI05	71.2	ResultsCRICRI13	73.1
ResultsCRICRI06	68.8	ResultsCRICRI14	89.0
ResultsCRICRI07	81.1	ResultsCRICRI15	68.6
ResultsCRICRI08	59.2	ResultsCRICRI16	70.9
ResultsCRI	73.3		



PlankDistance 4.7E-003

## 4.0 LM-79 Measurement and Test Results

### 4.3 Goniophotometer Test

Model No.	IVATFT-100L740U	Sample ID.	R1
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

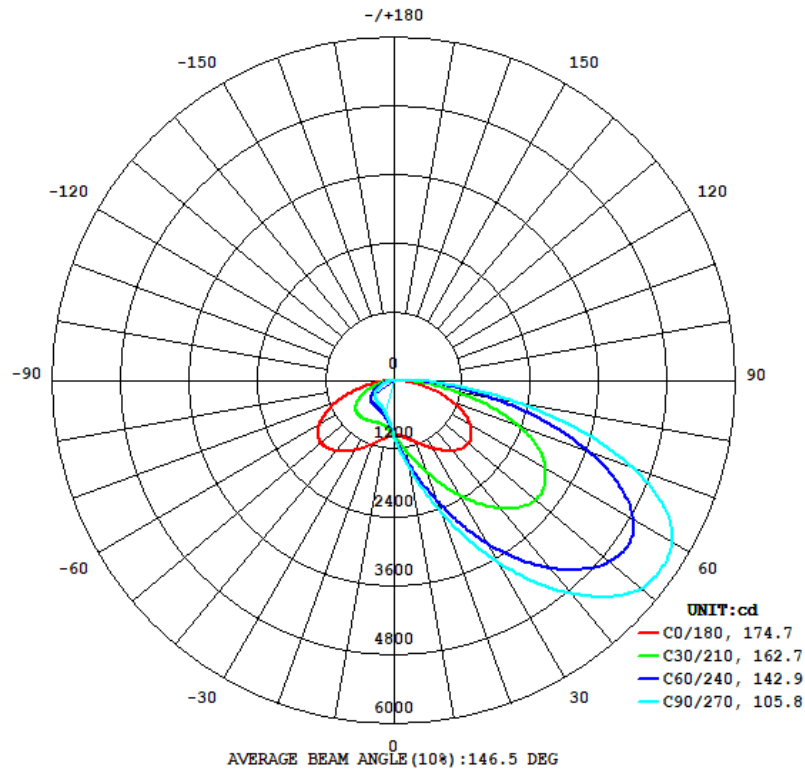
Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.96	60	0.758	90.7	0.998	Light Down

#### Test Result

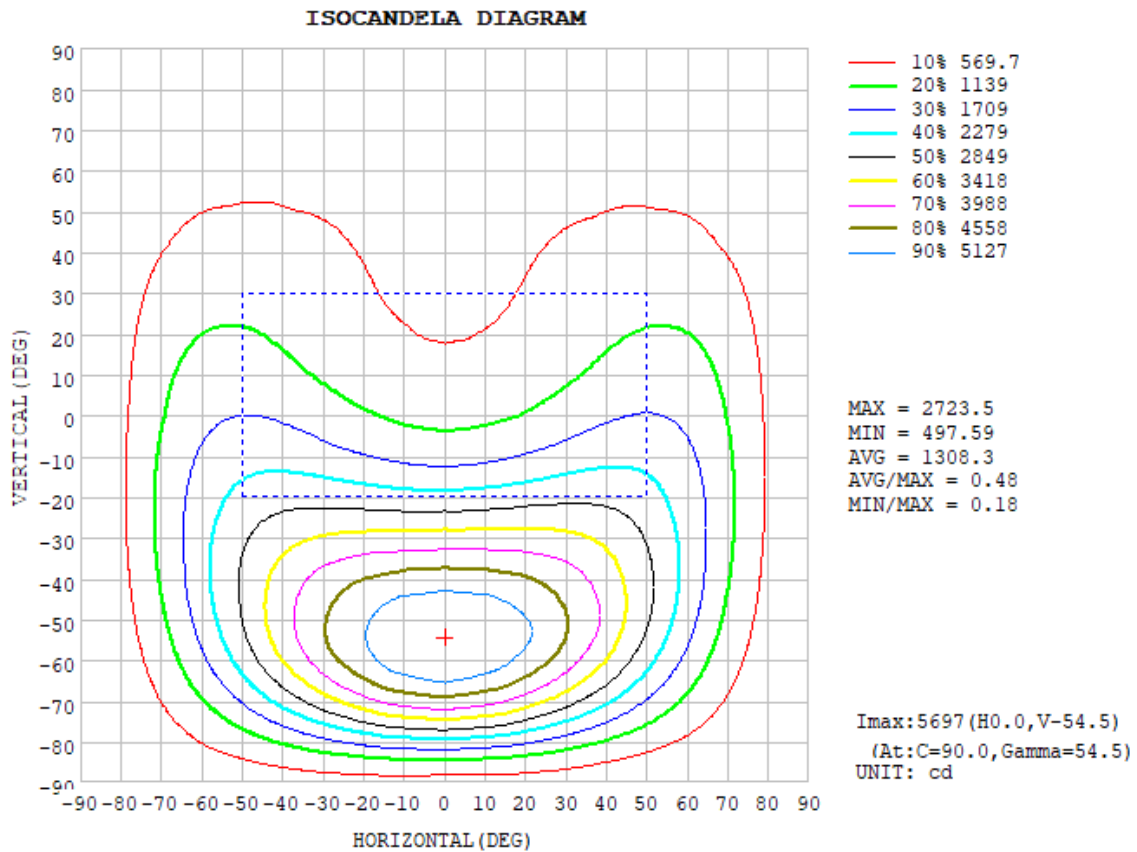
Flux (lm)	Zonal Lumen Requirement ( $0^{\circ}$ - $90^{\circ}$ )	Zonal Lumen Requirement ( $80^{\circ}$ - $90^{\circ}$ )	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
9999	100.00%	4.24%	174.9	102.9	158.9	53.2	110.2

### 4.3 Goniophotometer Test

#### Light Distrubtion Curve



#### Isolux Plot



### 4.3 Goniophotometer Test

#### Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd									
°	C0	C45	C90	C135	C180	C225	C270	C315		
10	1010	1353	1523	1353	1028	764.3	676.9	760.3		
20	1155	2000	2456	1977	1188	686.3	552.0	675.8		
30	1376	2843	3667	2768	1407	671.2	501.0	653.7		
40	1605	3645	4861	3558	1612	680.0	479.2	658.1		
50	1712	4131	5651	4054	1692	661.4	444.5	638.5		
60	1563	4041	5644	3944	1523	564.2	366.0	542.2		
70	1115	3040	4450	3087	1074	372.7	235.8	356.4		
80	485.9	1408	2190	1529	448.4	132.0	74.29	121.9		
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		



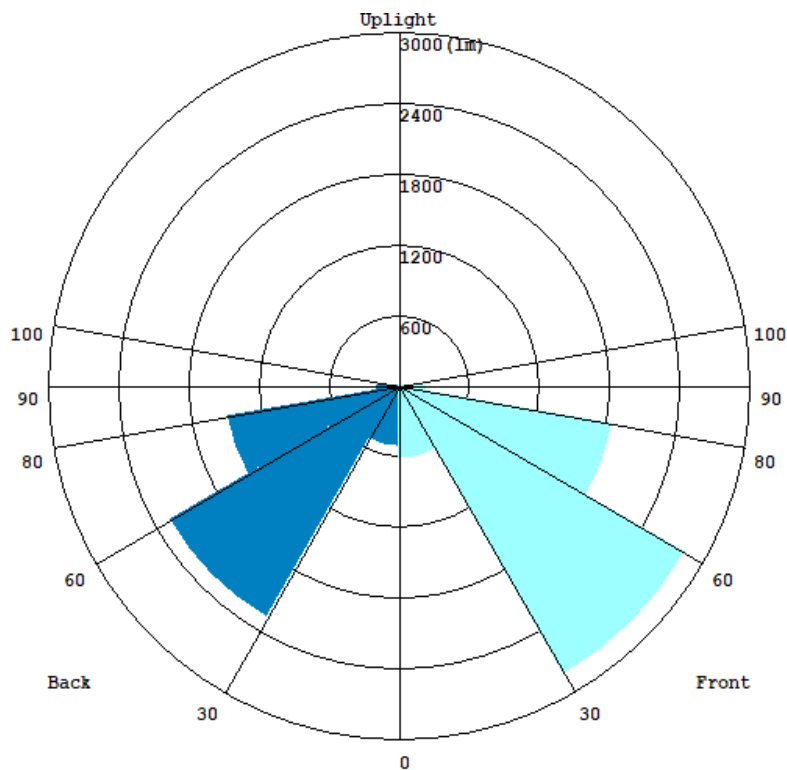
### 4.3 Goniophotometer Test

#### ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	96.49	0 - 10	96.49	0.97%
10-20	339.69	0 - 20	436.18	4.36%
20-30	712.95	0 - 30	1149.13	11.49%
30-40	1222.85	0 - 40	2371.98	23.72%
40-50	1760.91	0 - 50	4132.89	41.33%
50-60	2102.46	0 - 60	6235.35	62.36%
60-70	2001.74	0 - 70	8237.09	82.38%
70-80	1337.34	0 - 80	9574.43	95.76%
80-90	424.21	0 - 90	9998.64	100.00%
90-100	0.00	0 - 100	9998.64	100.00%
100-110	0.00	0 - 110	9998.64	100.00%
110-120	0.00	0 - 120	9998.64	100.00%
120-130	0.00	0 - 130	9998.64	100.00%
130-140	0.00	0 - 140	9998.64	100.00%
140-150	0.00	0 - 150	9998.64	100.00%
150-160	0.00	0 - 160	9998.64	100.00%
160-170	0.00	0 - 170	9998.64	100.00%
170-180	0.00	0 - 180	9998.64	100.00%

### 3.2 Goniophotometer Test

#### LCS Graph



#### BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	629	6.3
FM - Front-Medium(30-60)	2828.8	28.2
FH - Front-High(60-80)	1855.2	18.5
FVH - Front-Very High(80-90)	237.12	2.4
Total Forward Light	5550.2	55.3

BL - Back-Low(0-30)	520.47	5.2
BM - Back-Medium(30-60)	2266.7	22.6
BH - Back-High(60-80)	1490.9	14.9
BVH - Back-Very High(80-90)	202.17	2.0
Total Back Light	4480.2	44.7

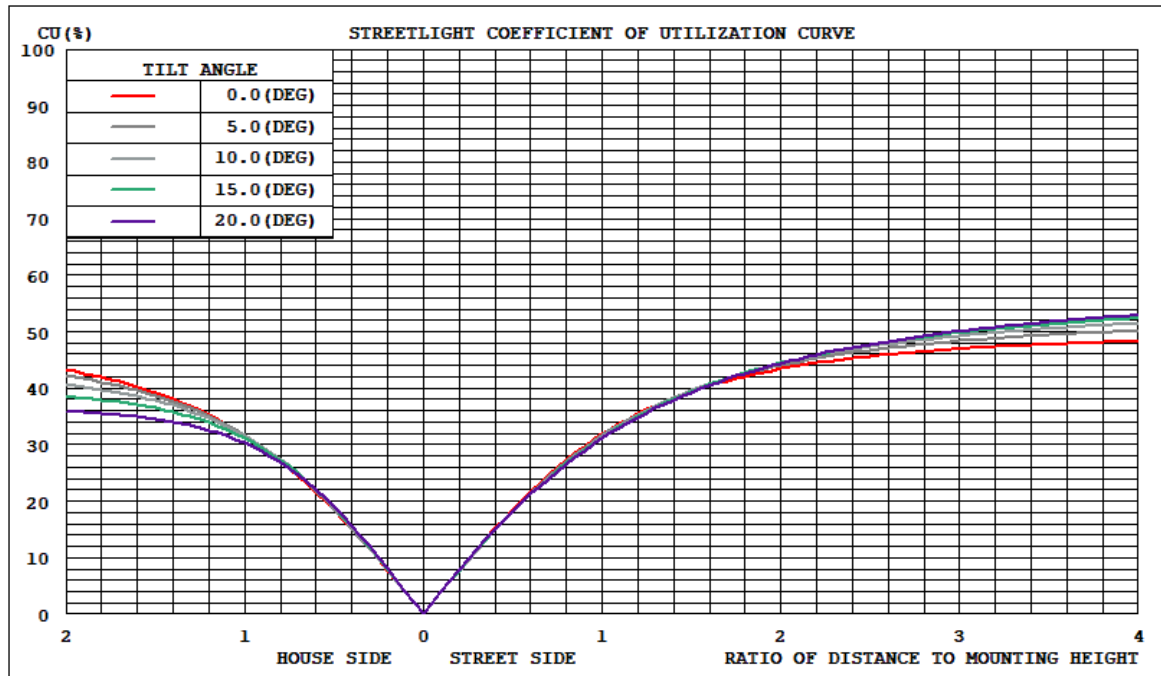
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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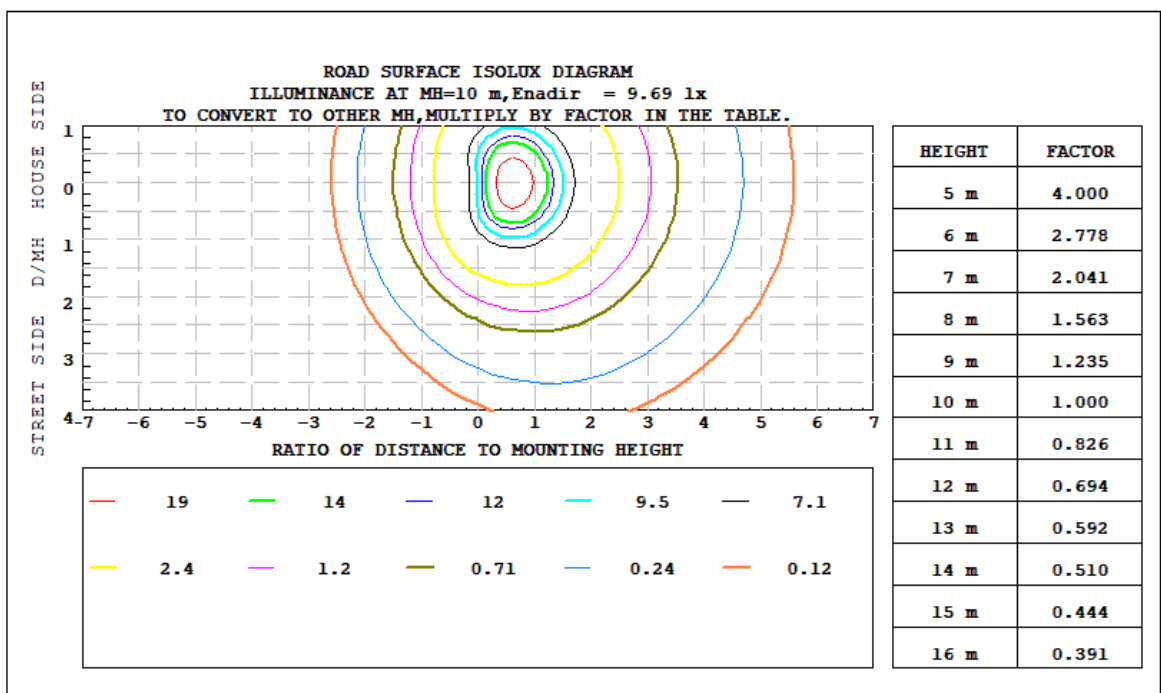
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4480.2	0	4480.2
Street Side	5550.2	0	5550.2

### 3.2 Goniophotometer Test

#### Coefficients of Utilization

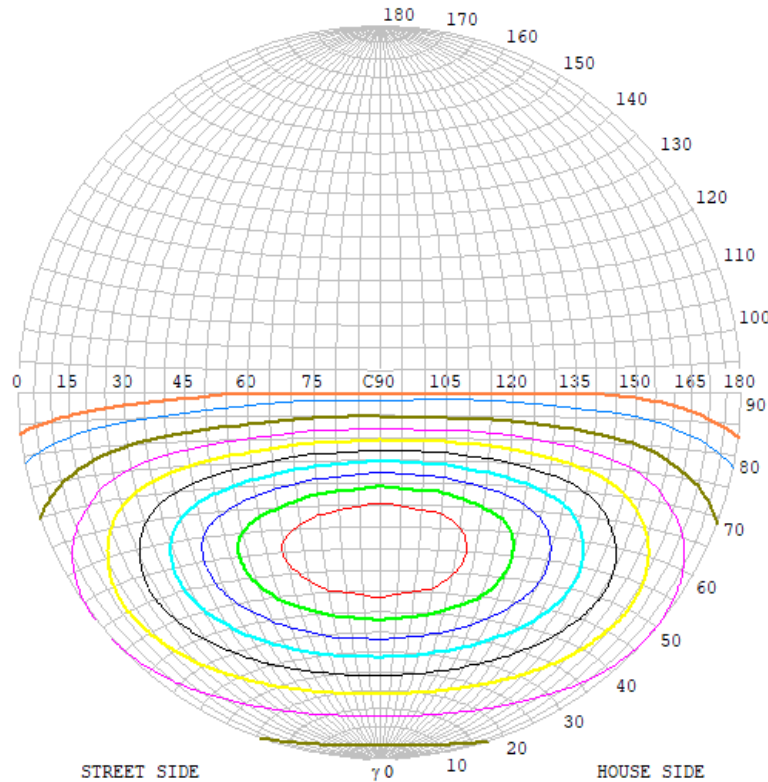


#### Iso-footcandle Lines of Horizontal Illumination



### 3.2 Goniophotometer Test

#### STREETLIGHT ISOCANDELA DIAGRAM

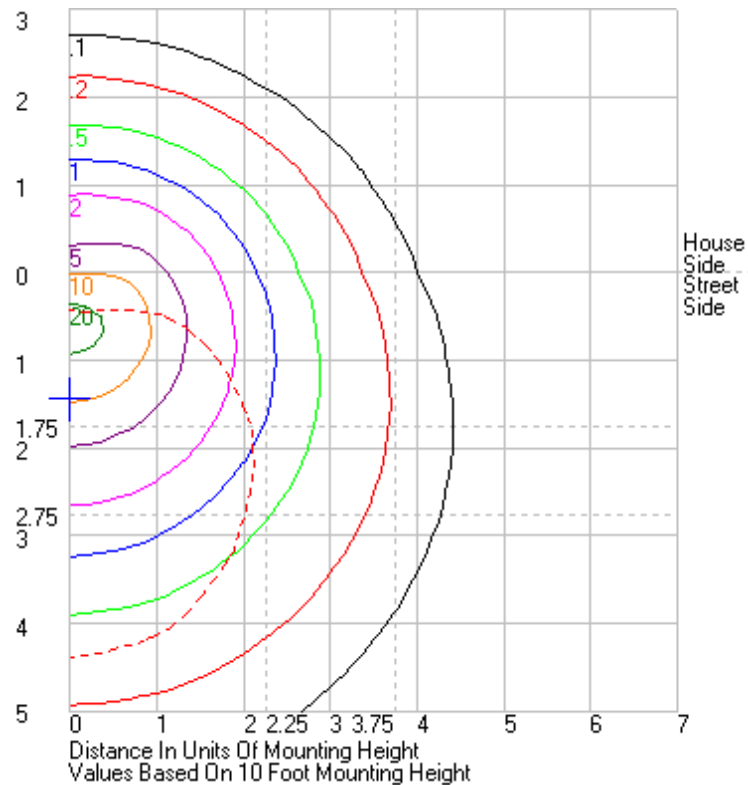


#### Classification:

IES:Type II - Very Short  
CIE:Narrow - Short  
IES:None cut-off  
CIE:Non-cut-off  
Max.At80:218.3cd/klm  
Max.At90:0cd/klm  
Max.80-90:218.3cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	5736
90%	5162
80%	4589
70%	4015
60%	3441
50%	2868
40%	2294
30%	1721
20%	1147
10%	574
5%	287

#### ROAD ISOCANDELA REPORT



## 5.0 THD and PF Test

Model No.	IVATFT-100L740U	Sample ID.	R1
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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	276.99	60	0.334	89.1	0.964	8.45%
25.1	120.01	60	0.773	92.6	0.998	4.58%

## 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-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\*\*\*\*\*