

# Photometric Test Report

## Relevant Standards

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

## Prepared For

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## Project Number

**DLF1810114**

## Data Number

**DLF1810114-10a**

## Test Date

**2018/10/30**

## Issue Date

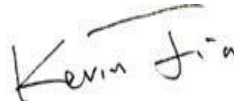
**2018/10/31**

## Prepared By



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## Approved By



Kevin Jia

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## 1.0 Test Summary

DLC Technical Requirements v4.3

<b>Outdoor - Mid output</b> <b>Outdoor Pole/Arm-Mounted Area and Roadway Luminaires</b>			
Requirement Category	Test Method	Requirements	Test value
Lamp Output (lm)	IES LM-79-2008	5000	7460
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	111.6	112.2
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.52%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	3081
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	80
Power Factor	ANSI C82.77:2014	0.873	0.937
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	13.23%

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/30	IVATFT-75L730U	J1
2	Goniophotometer Test	2018/10/30	IVATFT-75L730U	J1
3	THD and PF Test	2018/10/30	IVATFT-75L730U	J1

### Remark(If any)

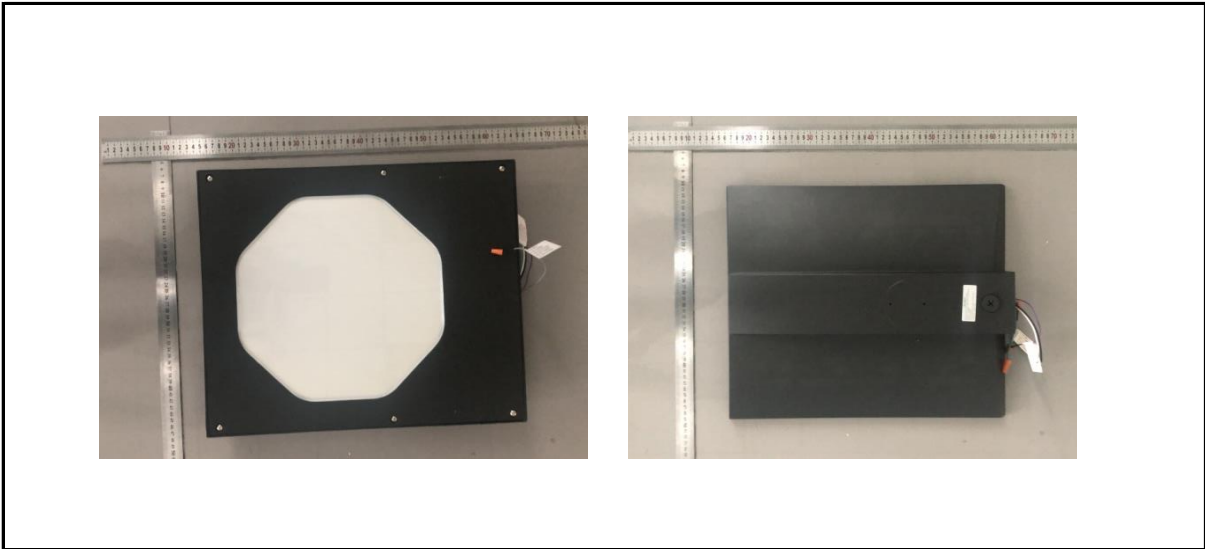
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### 3.0 Production Description

**Luminaire Description:** IVATFT-75L730U

**Electrical Specification:** 120V-277V,50/60HZ, 75W

#### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

Model No.	IVATFT-75L730U	Sample ID.	J1
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	0.571	67.8	0.989

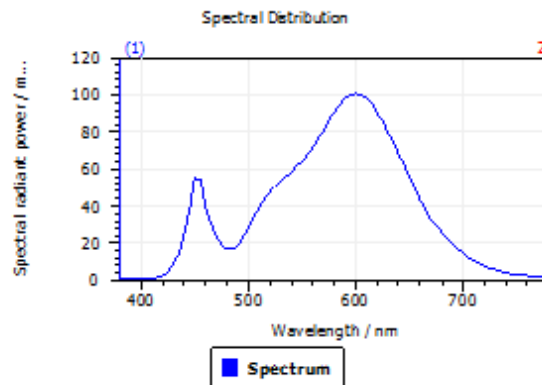
#### Test Result

CCT (K)	CRI (Ra)	Duv
3081	80.3	6.3E-04

## 4.1 Integrating Sphere Test

### Spectroradiometric Parameters

#### Results



#### Spectral values

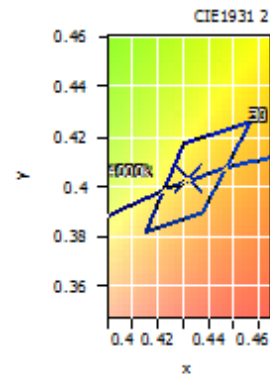
DominantWavelength	582.26 nm
Purity	0.510
PeakWavelength	599.81 nm
Radiant Power	14.99 W
Width50%:	130.31 nm

#### Color Coordinates

Correlated Color Temperatu 3081 K

x: 0.4322 u: 0.2476 u': 0.2476  
y: 0.4039 v: 0.3471 v': 0.5206

ResultsCRICRI01	78.0	ResultsCRICRI09	-1.0
ResultsCRICRI02	87.9	ResultsCRICRI10	72.0
ResultsCRICRI03	95.9	ResultsCRICRI11	76.5
ResultsCRICRI04	78.5	ResultsCRICRI12	62.6
ResultsCRICRI05	77.9	ResultsCRICRI13	80.0
ResultsCRICRI06	84.5	ResultsCRICRI14	97.8
ResultsCRICRI07	83.0	ResultsCRICRI15	70.7
ResultsCRICRI08	57.0	ResultsCRICRI16	68.9
ResultsCRI	80.3		



PlanckDistance 6.3E-004

## 4.0 LM-79 Measurement and Test Results

### 4.3 Goniophotometer Test

Model No.	IVATFT-75L730U	Sample ID.	J1
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

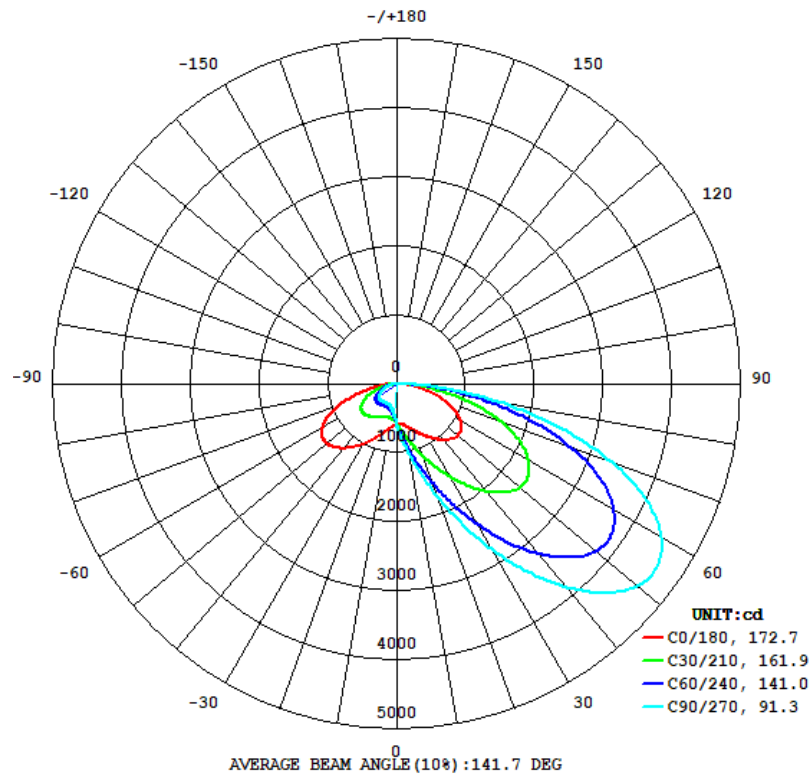
Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.98	60	0.561	66.5	0.989	Light Down

#### Test Result

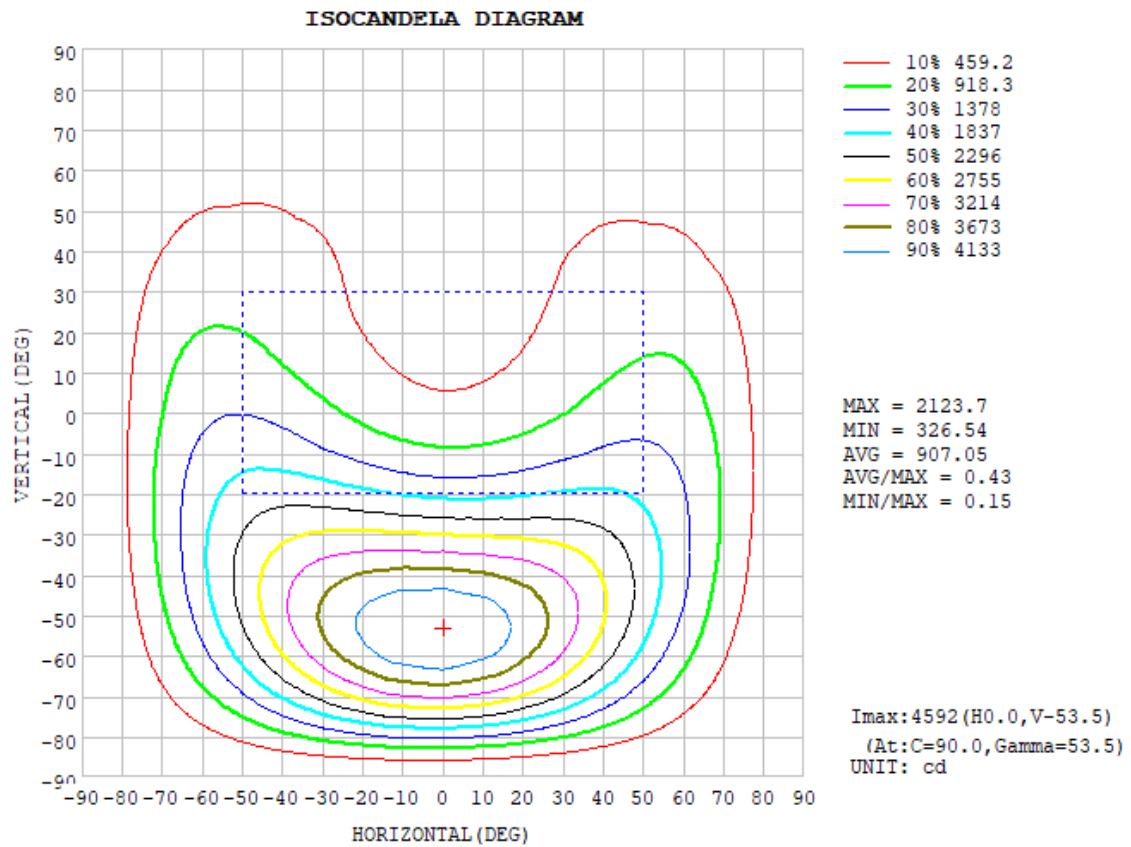
Flux (lm)	Zonal Lumen Requirement ( $0^{\circ}$ - $90^{\circ}$ )	Zonal Lumen Requirement ( $80^{\circ}$ - $90^{\circ}$ )	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7460	100.00%	3.52%	173.5	102.9	158.7	52.5	112.2

### 4.3 Goniophotometer Test

#### Light Distrubtion Curve



#### Isolux Plot



### 4.3 Goniophotometer Test

#### Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd									
γ	C0	C45	C90	C135	C180	C225	C270	C315		
10	612.7	854.5	997.1	890.5	653.1	465.1	398.6	447.6		
20	722.6	1318	1730	1412	804.0	434.2	337.0	409.9		
30	888.2	1966	2761	2123	1011	448.6	330.3	421.2		
40	1068	2648	3846	2869	1226	483.3	342.3	454.3		
50	1169	3072	4554	3361	1347	494.3	338.2	464.2		
60	1082	2950	4445	3264	1248	437.7	286.2	404.3		
70	764.6	2169	3327	2438	888.7	296.0	178.1	252.8		
80	305.9	929.0	1489	1095	351.9	103.8	55.17	84.52		
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		

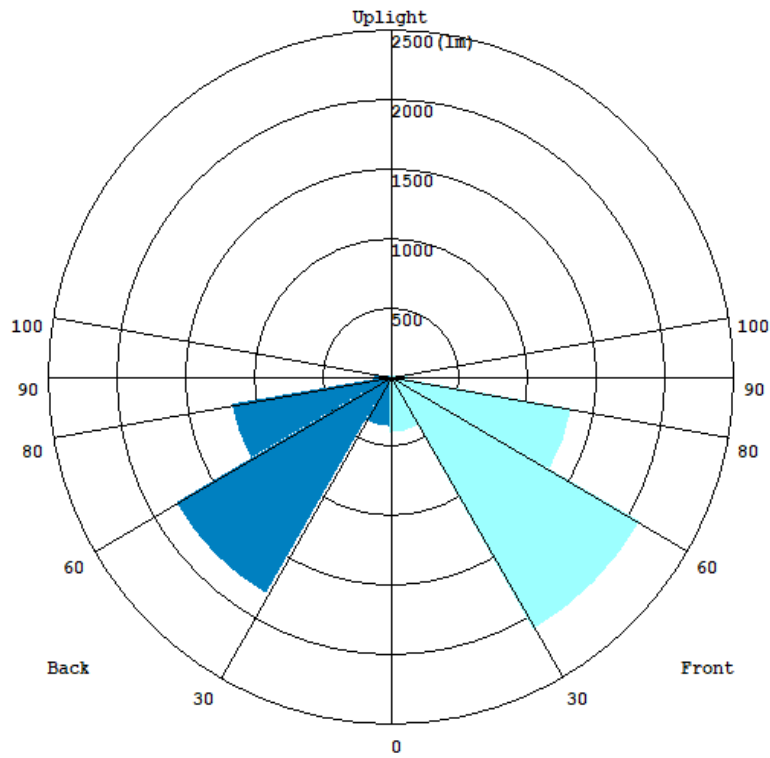
### 4.3 Goniophotometer Test

#### ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	59.52	0 - 10	59.52	0.80%
10-20	221.57	0 - 20	281.09	3.77%
20-30	496.70	0 - 30	777.79	10.43%
30-40	903.46	0 - 40	1681.25	22.54%
40-50	1355.94	0 - 50	3037.19	40.71%
50-60	1642.36	0 - 60	4679.55	62.73%
60-70	1536.21	0 - 70	6215.76	83.32%
70-80	981.69	0 - 80	7197.45	96.48%
80-90	262.39	0 - 90	7459.84	100.00%
90-100	0.00	0 - 100	7459.84	100.00%
100-110	0.00	0 - 110	7459.84	100.00%
110-120	0.00	0 - 120	7459.84	100.00%
120-130	0.00	0 - 130	7459.84	100.00%
130-140	0.00	0 - 140	7459.84	100.00%
140-150	0.00	0 - 150	7459.84	100.00%
150-160	0.00	0 - 160	7459.84	100.00%
160-170	0.00	0 - 170	7459.84	100.00%
170-180	0.00	0 - 180	7459.84	100.00%

### 3.2 Goniophotometer Test

#### LCS Graph



#### BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	415.69	5.6
FM - Front-Medium(30-60)	2098.3	28.1
FH - Front-High(60-80)	1342.7	18.0
FVH - Front-Very High(80-90)	129.67	1.7
Total Forward Light	3986.4	53.4

BL - Back-Low(0-30)	362.13	4.9
BM - Back-Medium(30-60)	1811.5	24.3
BH - Back-High(60-80)	1179.6	15.8
EVH - Back-Very High(80-90)	120.58	1.6
Total Back Light	3473.9	46.6

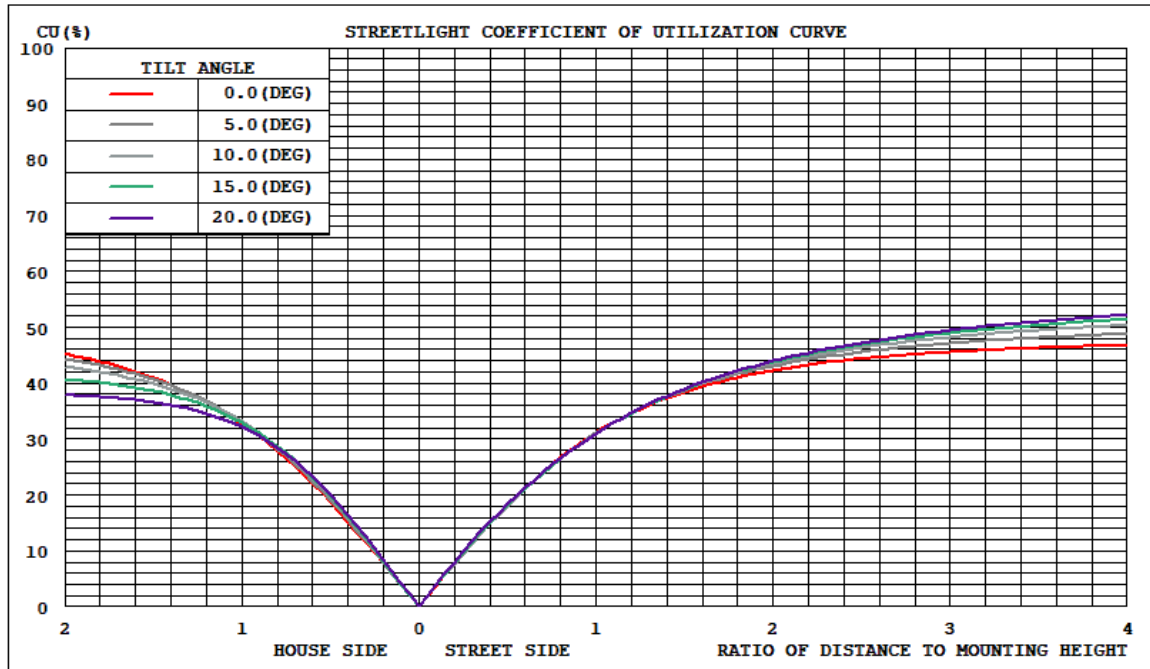
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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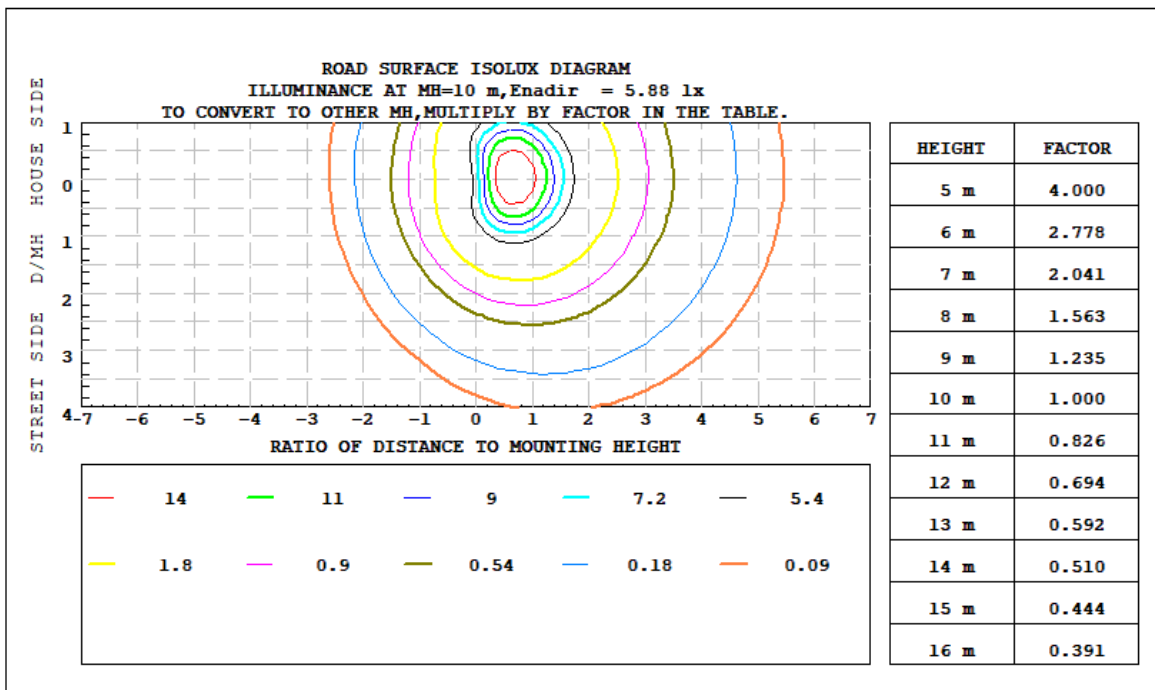
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	3473.9	0	3473.9
Street Side	3986.4	0	3986.4

### 3.2 Goniophotometer Test

#### Coefficients of Utilization

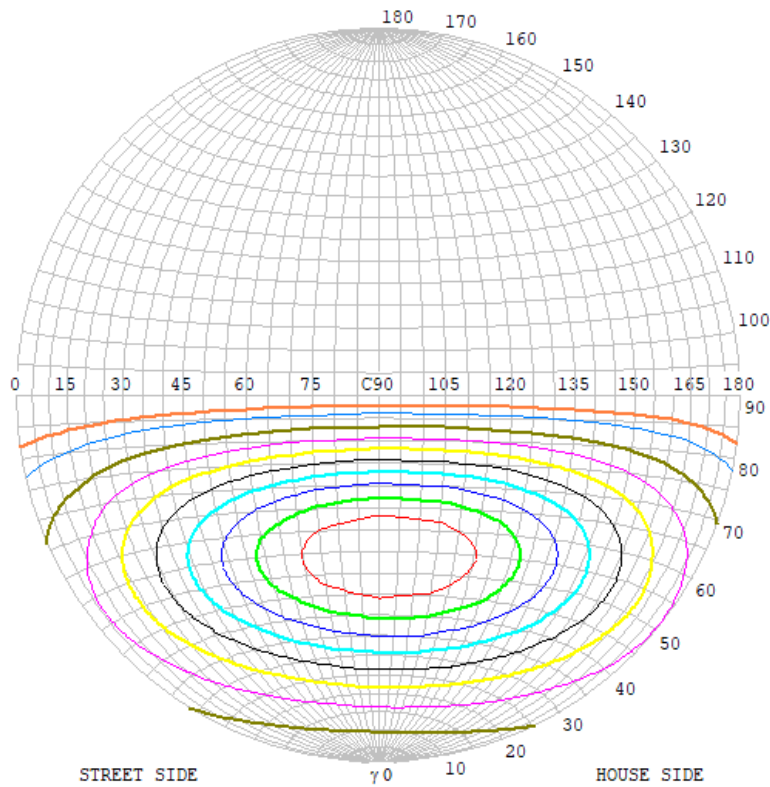


#### Iso-footcandle Lines of Horizontal Illumination



### 3.2 Goniophotometer Test

#### STREETLIGHT ISOCANDELA DIAGRAM

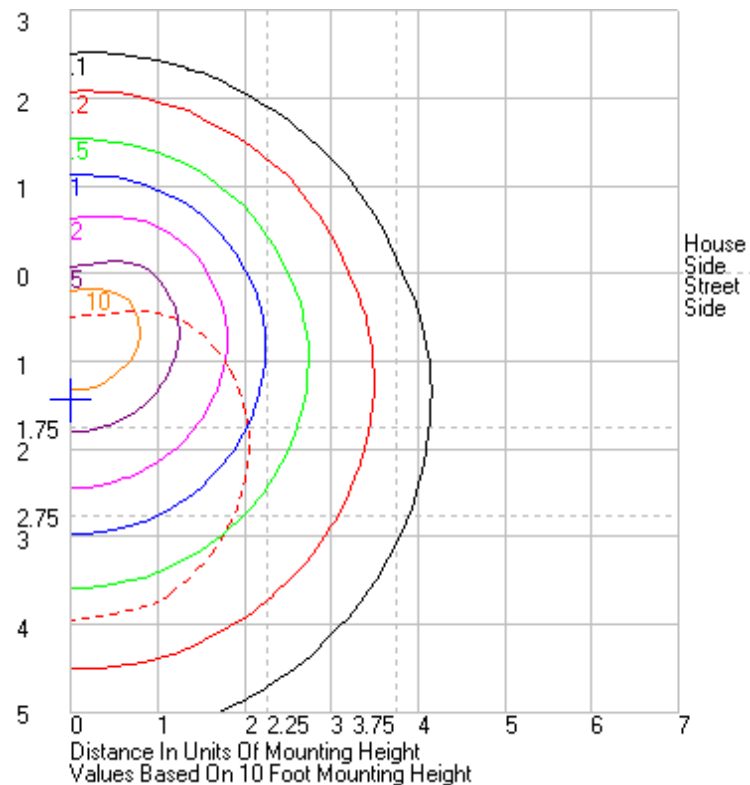


#### Classification:

IES:Type II - Very Short  
CIE:Narrow - Short  
IES:Semi cut-off  
CIE:Non-cut-off  
Max.At80:199.6cd/klm  
Max.At90:0cd/klm  
Max.80-90:199.6cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	4626
90%	4164
80%	3701
70%	3238
60%	2776
50%	2313
40%	1851
30%	1388
20%	925
10%	463
5%	231

#### ROAD ISOCANDELA REPORT



## 5.0 THD and PF Test

Model No.	IVATFT-75L730U	Sample ID.	J1
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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	277.02	60	0.253	65.8	0.937	13.23%
25.1	120.02	60	0.571	67.8	0.989	12.40%

## 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\*\*\*\*\*