

# Photometric Test Report

## Relevant Standards

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

## Prepared For

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## Project Number

**DLF1810114**

## Data Number

**DLF1810114-23a**

## 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</b> <b>Outdoor Pole/Arm-Mounted Area and Roadway Luminaires</b>				
Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
Lamp Output (lm)	IES LM-79-2008	10000	14494	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	123.0	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%	P
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.51%	P
Allowable CCTs* (K)	IES LM-79-2008	≤5700	4934	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	74	P
Power Factor	ANSI C82.77:2014	0.873	0.969	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	7.41%	P

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/12	IVAT5S-130L750U	W1
2	Goniophotometer Test	2018/11/12	IVAT5S-130L750U	W1
3	THD and PF Test	2018/11/12	IVAT5S-130L750U	W1

### Remark(If any)

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### 3.0 Production Description

**Luminaire Description:** IVAT5S-130L750U

**Electrical Specification:** 120V-277V,50/60HZ, 130W

#### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

Model No.	IVAT5S-130L750U	Sample ID.	W1
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	119.96	60	0.985	117.9	0.998

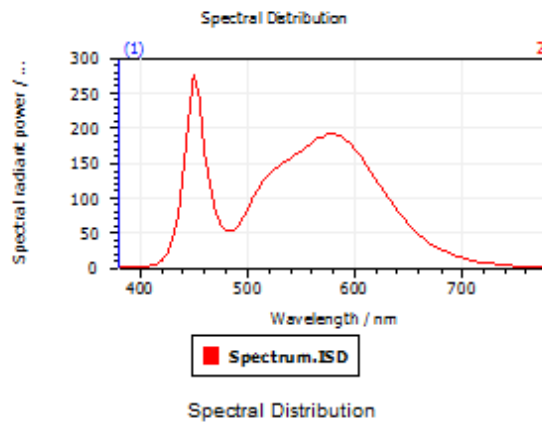
#### Test Result

CCT (K)	CRI (Ra)	Duv
4934	74.3	3.3E-03

## 4.1 Integrating Sphere Test

### Spectroradiometric Parameters

#### Results

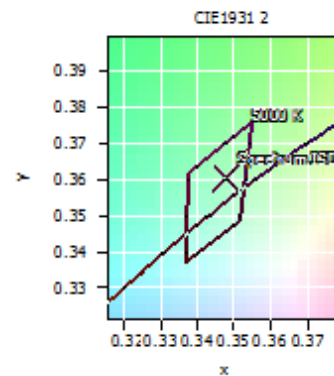


#### Spectral values

DominantWavelength	570.71 nm
Purity	0.125
PeakWavelength	450.53 nm
Width50%	22.65 nm

#### Color Coordinates

Correlated Color Temperature		4934 K	
x: 0.3477	u: 0.2098	u': 0.2098	
y: 0.3603	v: 0.3261	v': 0.4892	
CRI01	69.9	CRI09	-34.7
CRI02	81.5	CRI10	56.7
CRI03	89.8	CRI11	68.6
CRI04	71.9	CRI12	46.2
CRI05	71.2	CRI13	72.6
CRI06	74.5	CRI14	94.6
CRI07	82.4	CRI15	62.0
CRI08	53.2	CRI16	61.0
ResultsCRI	74.3		



PlanckDistance 3.3E-003

## 4.0 LM-79 Measurement and Test Results

### 4.3 Goniophotometer Test

Model No.	IVAT5S-130L750U	Sample ID.	W1
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

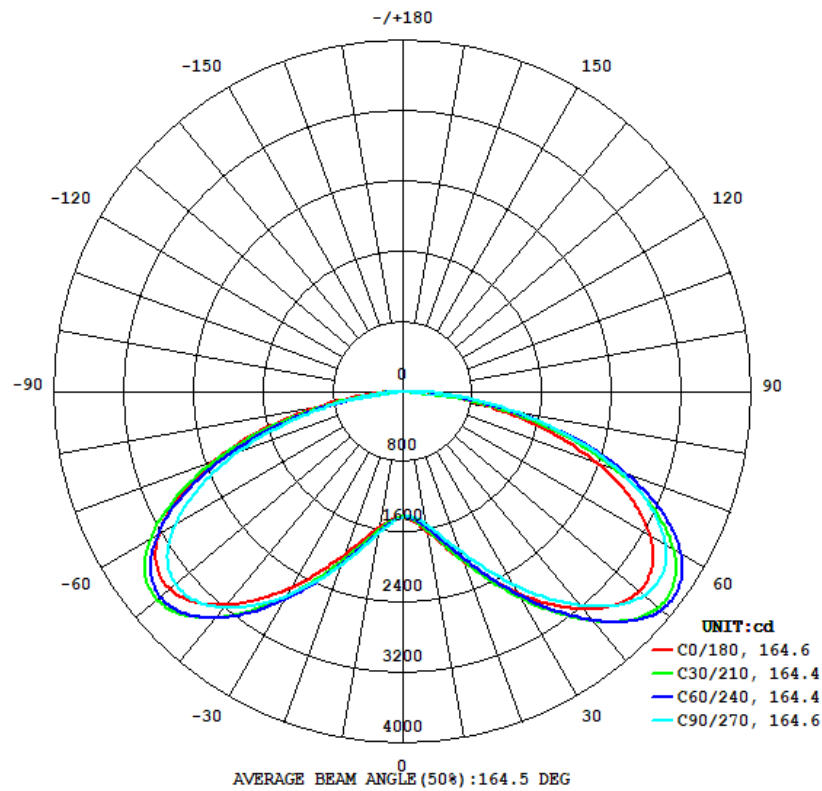
Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.00	60	0.984	117.8	0.998	Light Down

#### Test Result

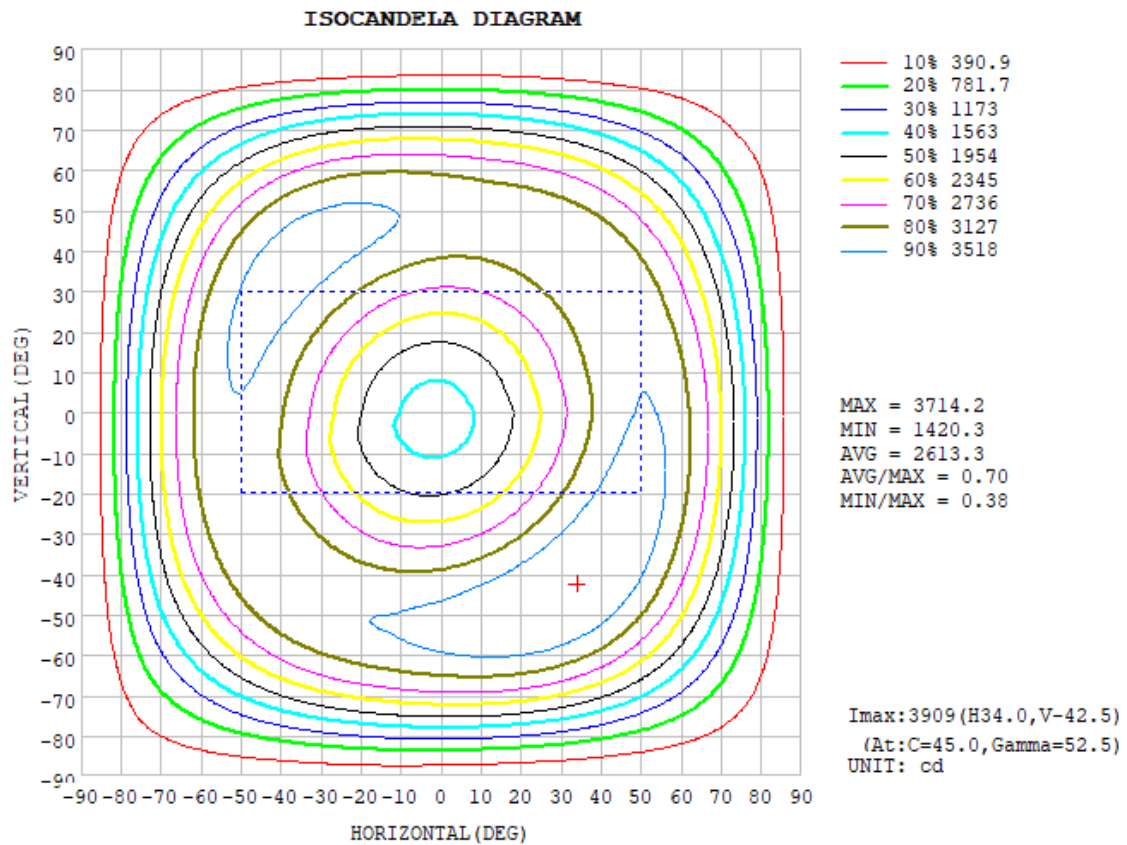
Flux (lm)	Zonal Lumen Requirement ( $0^{\circ}$ - $90^{\circ}$ )	Zonal Lumen Requirement ( $80^{\circ}$ - $90^{\circ}$ )	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
14494	100.00%	3.51%	177.8	177.3	165.6	165.9	123.0

### 4.3 Goniophotometer Test

#### Light Distrubtion Curve



#### Isolux Plot



### 4.3 Goniophotometer Test

#### Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd									
7	C0	C45	C90	C135	C180	C225	C270	C315		
10	1614	1581	1531	1503	1559	1603	1638	1654		
20	2059	2035	1926	1855	1969	2067	2098	2108		
30	2652	2705	2529	2401	2565	2724	2683	2669		
40	3232	3435	3180	3012	3170	3392	3211	3196		
50	3537	3891	3609	3438	3492	3699	3408	3401		
60	3278	3682	3487	3355	3233	3336	3020	3056		
70	2363	2701	2649	2561	2309	2258	2024	2055		
80	1033	1213	1298	1239	981.5	829.2	746.6	751.7		
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		



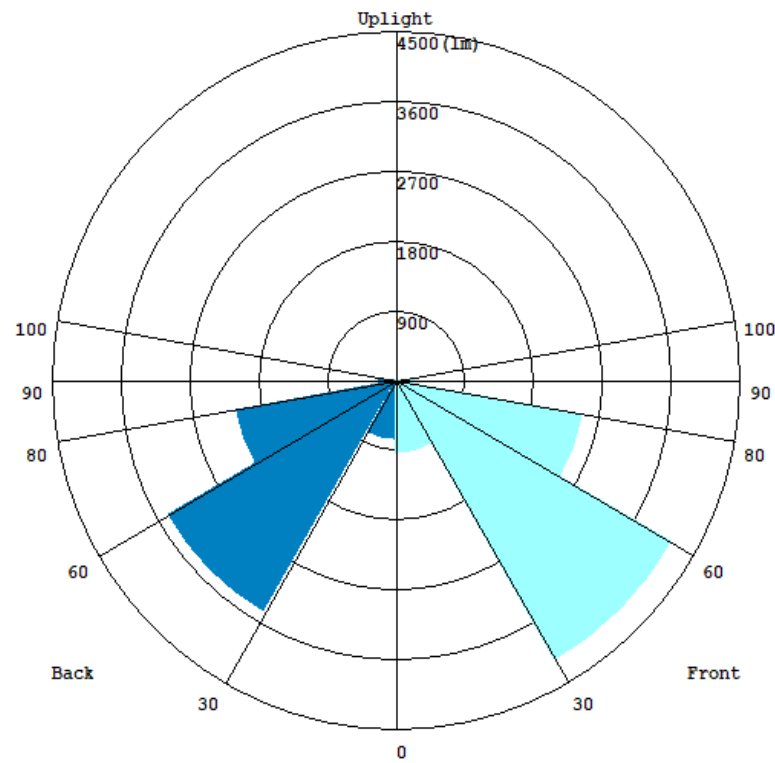
### 4.3 Goniophotometer Test

#### ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	143.96	0 - 10	143.96	0.99%
10-20	511.07	0 - 20	655.03	4.52%
20-30	1075.07	0 - 30	1730.10	11.94%
30-40	1845.72	0 - 40	3575.82	24.67%
40-50	2653.79	0 - 50	6229.61	42.98%
50-60	3117.53	0 - 60	9347.14	64.49%
60-70	2849.34	0 - 70	12196.48	84.15%
70-80	1788.48	0 - 80	13984.96	96.49%
80-90	508.92	0 - 90	14493.88	100.00%
90-100	0.00	0 - 100	14493.88	100.00%
100-110	0.00	0 - 110	14493.88	100.00%
110-120	0.00	0 - 120	14493.88	100.00%
120-130	0.00	0 - 130	14493.88	100.00%
130-140	0.00	0 - 140	14493.88	100.00%
140-150	0.00	0 - 150	14493.88	100.00%
150-160	0.00	0 - 160	14493.88	100.00%
160-170	0.00	0 - 170	14493.88	100.00%
170-180	0.00	0 - 180	14493.88	100.00%

### 3.2 Goniophotometer Test

#### LCS Graph



#### BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	956.11	6.6
FM - Front-Medium(30-60)	4175.1	28.7
FH - Front-High(60-80)	2508.6	17.3
FVH - Front-Very High(80-90)	263.95	1.8
Total Forward Light	7903.7	54.4

BL - Back-Low(0-30)	775.46	5.3
BM - Back-Medium(30-60)	3466	23.9
BH - Back-High(60-80)	2141.9	14.7
BVH - Back-Very High(80-90)	236.89	1.6
Total Back Light	6620.2	45.6

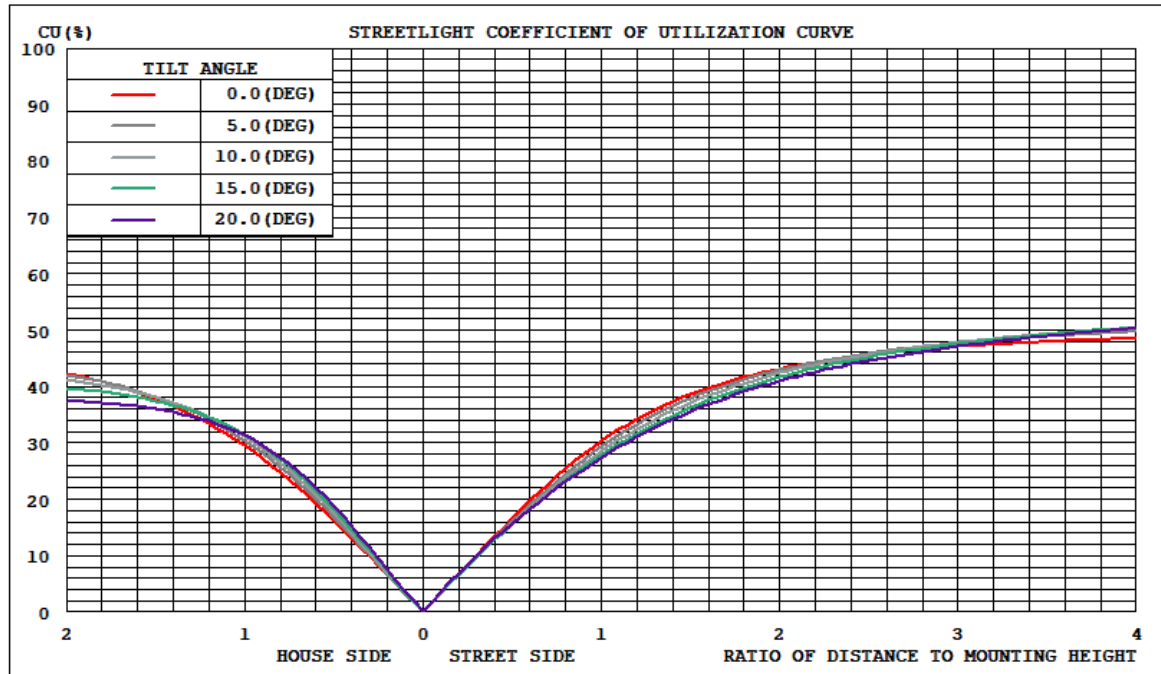
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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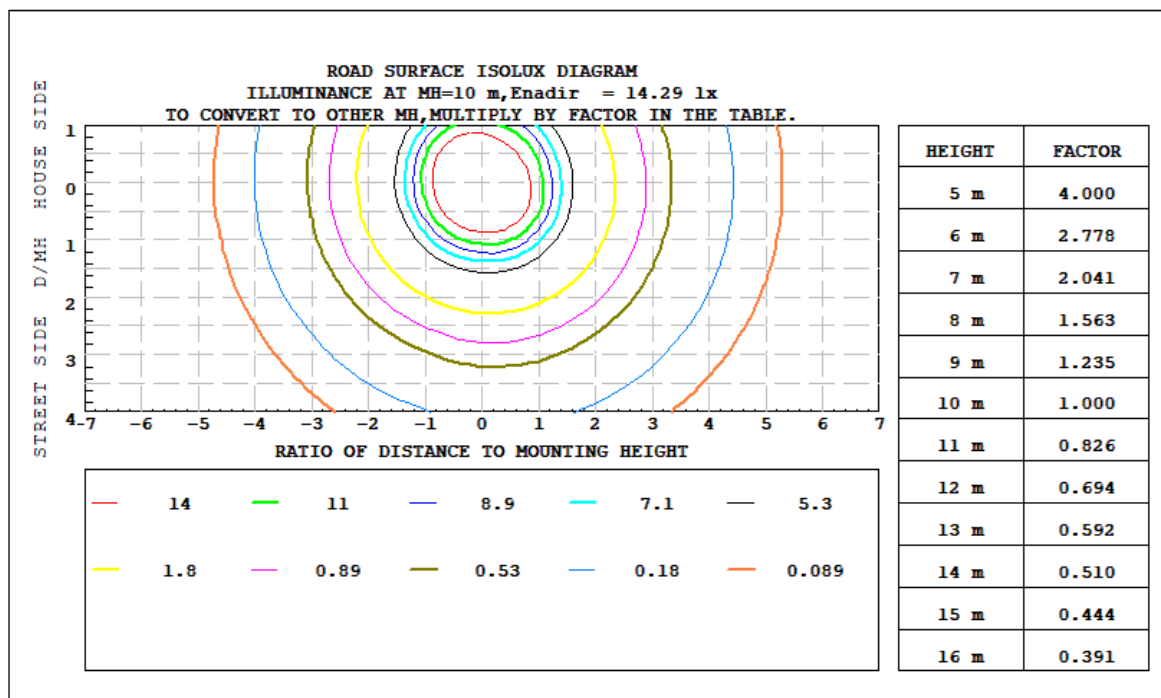
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	6620.2	0	6620.2
Street Side	7903.7	0	7903.7

### 3.2 Goniophotometer Test

#### Coefficients of Utilization

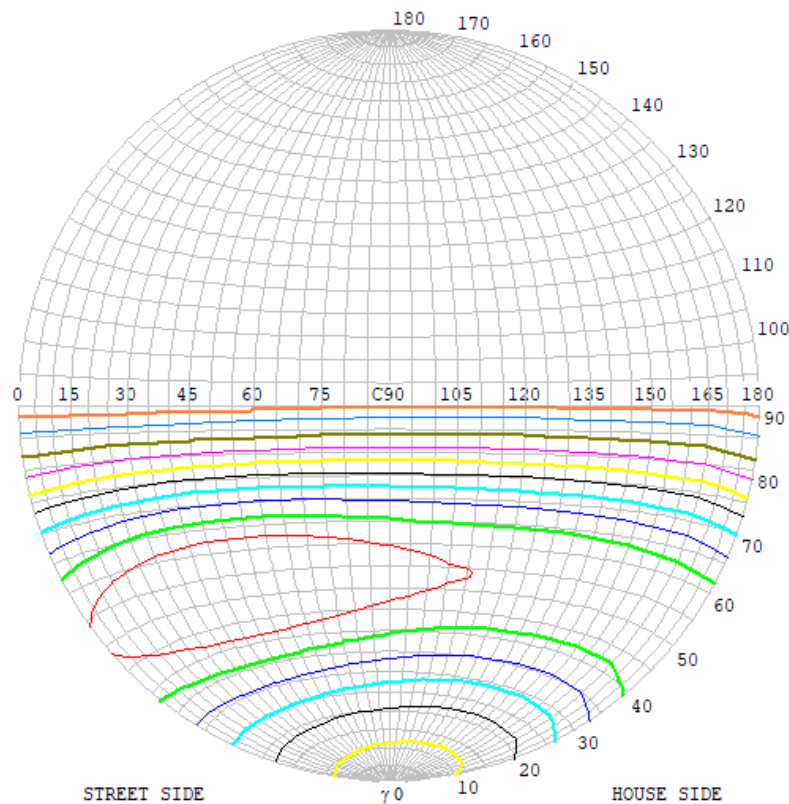


#### Iso-footcandle Lines of Horizontal Illumination



### 3.2 Goniophotometer Test

#### STREETLIGHT ISOCANDELA DIAGRAM

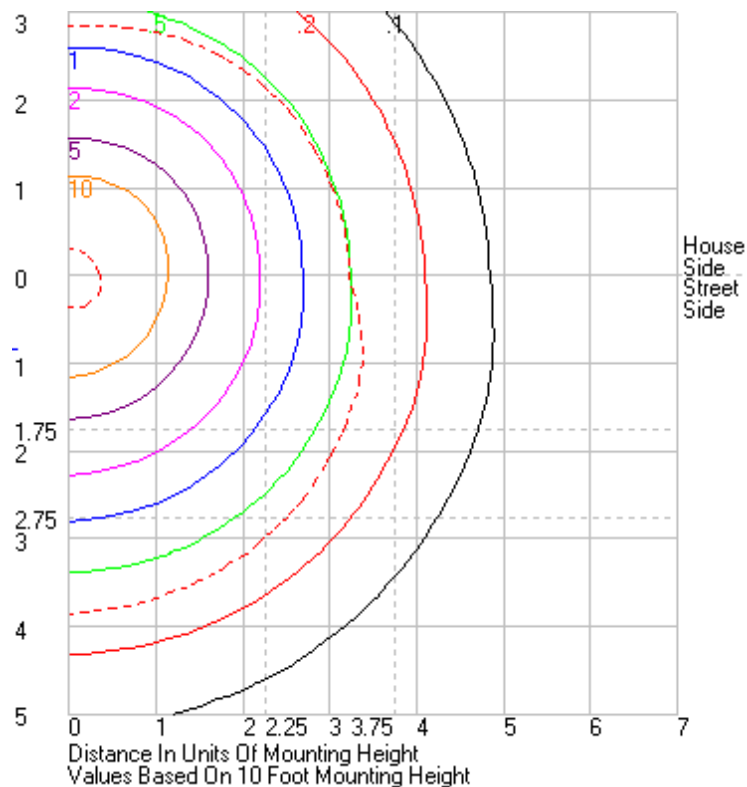


#### Classification:

IES:Type V - Very Short  
CIE:Broad - Short  
IES:Full cut-off  
CIE:Semi-cut-off  
Max.At80:89.26cd/klm  
Max.At90:0cd/klm  
Max.80-90:89.26cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
I <sub>max</sub> =100%	3911
90%	3520
80%	3128
70%	2737
60%	2346
50%	1955
40%	1564
30%	1173
20%	782
10%	391
5%	196

#### ROAD ISOCANDELA REPORT



## 5.0 THD and PF Test

Model No.	IVAT5S-130L750U	Sample ID.	W1
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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	276.96	60	0.428	114.7	0.969	7.41%
25.1	119.96	60	0.985	117.9	0.998	4.54%

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