

Photometric Test Report

Relevant Standards

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

Prepared For

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Prepared By



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Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v4.4

Outdoor - High output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires			
Requirement Category	Test Method	Requirements	Test value
Lamp Output (lm)	IES LM-79-2008	10000	11255
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	114.3
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.81%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	4966
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	74.7
Power Factor	ANSI C82.77:2014	0.873	0.960
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.61%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/22	IVAT2-100L750[H, 4]	K1
2	Goniophotometer Test	2018/11/22	IVAT2-100L750[H, 4]	K1
3	THD and PF Test	2018/11/22	IVAT2-100L750[H, 4]	K1

Remark(If any)

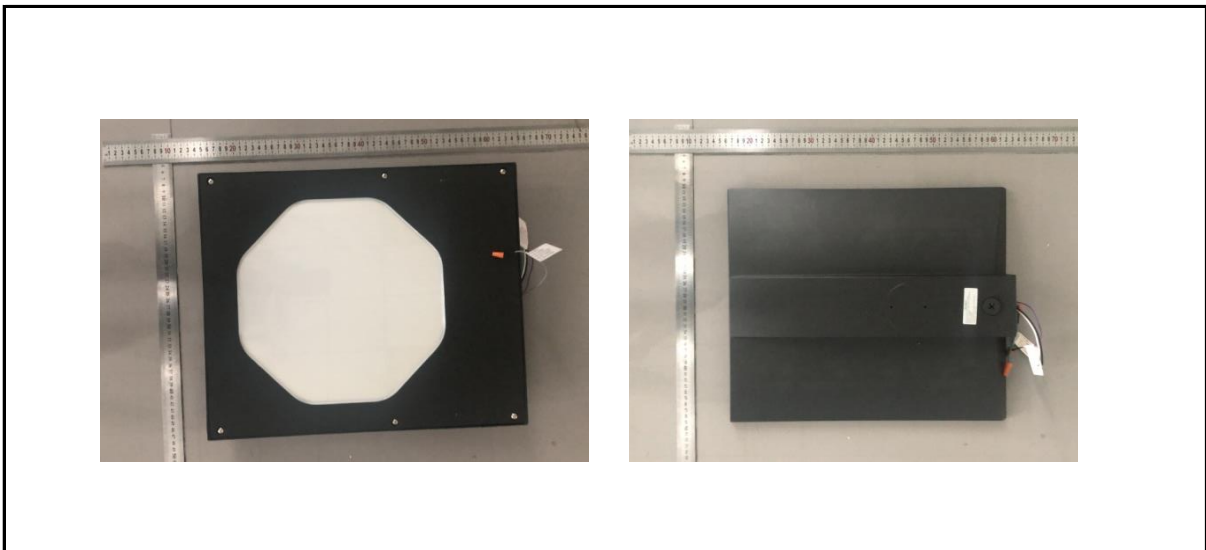
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3.0 Production Description

Luminaire Description: IVAT2-100L750[H, 4]

Electrical Specification: 480V,50/60HZ, 100W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVAT2-100L750[H, 4]	Sample ID.	K1
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 ± 0.2 percent under load.

The sample was measured using 4π 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	479.98	60	0.214	98.5	0.960

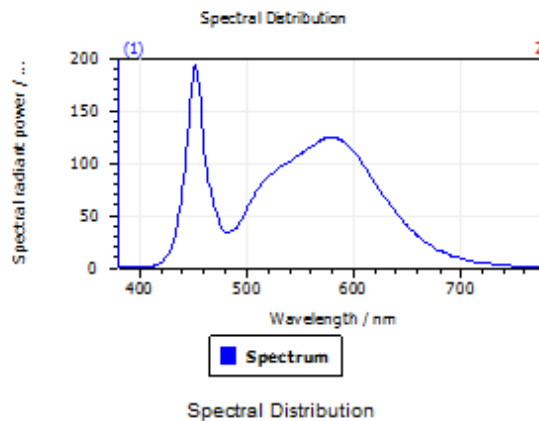
Test Result

CCT (K)	CRI (Ra)	Duv
4966	74.7	3.7E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results

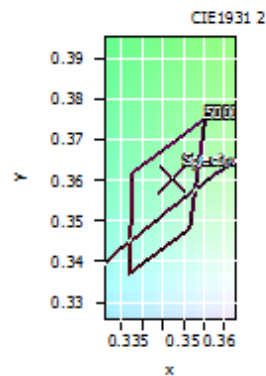


Spectral values

DominantWavelength	569.99 nm
Purity	0.123
PeakWavelength	451.66 nm
Width50%:	19.70 nm

Color Coordinates

Correlated Color Temperatu		4966 K
x: 0.3469	u: 0.2092	u': 0.2092
y: 0.3604	v: 0.3261	v': 0.4892
CRI01	70.6	CRI09
CRI02	81.7	CRI10
CRI03	89.7	CRI11
CRI04	73.4	CRI12
CRI05	72.3	CRI13
CRI06	74.6	CRI14
CRI07	81.8	CRI15
CRI08	53.3	CRI16
ResultsCRI	74.7	



PlankDistance 3.7E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT2-100L750[H, 4]	Sample ID.	K1
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 ± 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° vertical intervals and 10° horizontal intervals.

Test Conditions

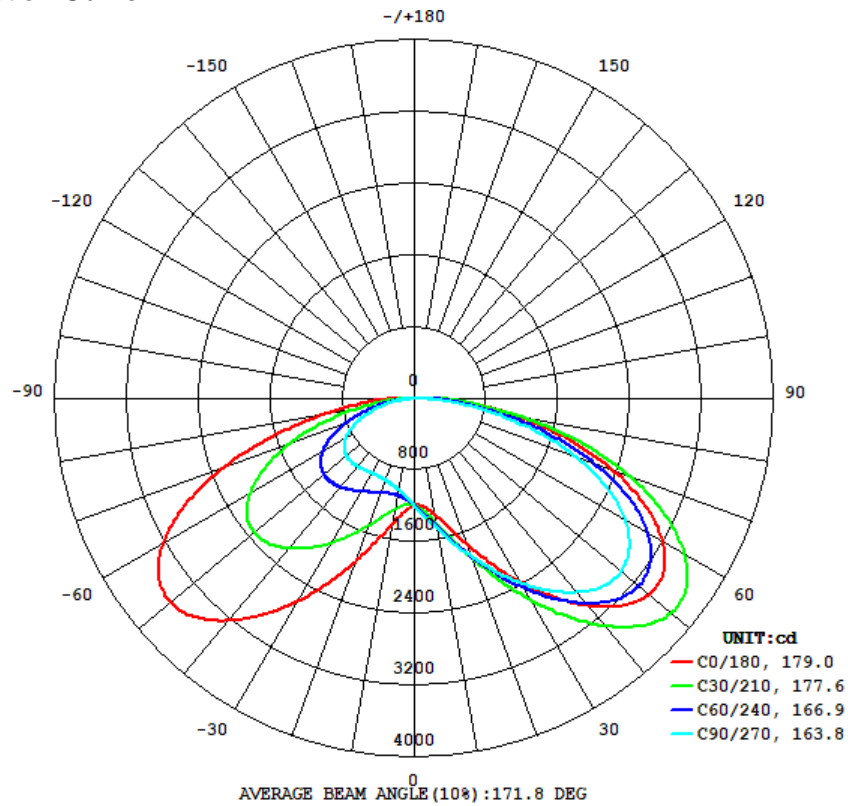
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	479.93	60	0.214	98.5	0.960	Light Down

Test Result

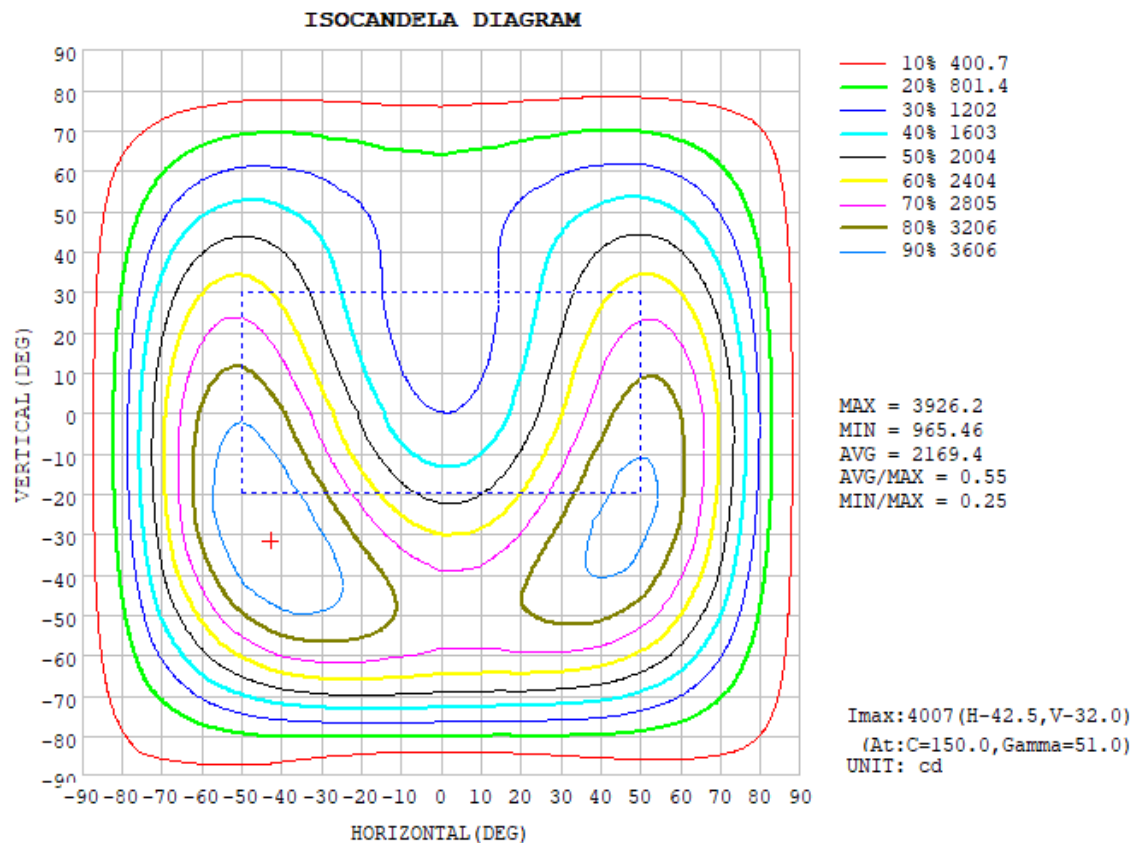
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
11255	100.00%	3.81%	179.3	163.8	169.3	63.0	114.3

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		
γ										
10	1316	1434	1470	1495	1415	1173	1041	1141		
20	1737	1901	1880	2069	1934	1296	973.3	1263		
30	2362	2539	2379	2814	2607	1494	967.6	1482		
40	3022	3185	2825	3518	3239	1682	996.5	1693		
50	3405	3542	3005	3864	3539	1749	993.6	1774		
60	3197	3289	2720	3557	3227	1566	878.1	1599		
70	2357	2381	1924	2549	2266	1106	610.6	1141		
80	1163	1119	820.7	1187	1018	462.8	244.8	495.7		
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		

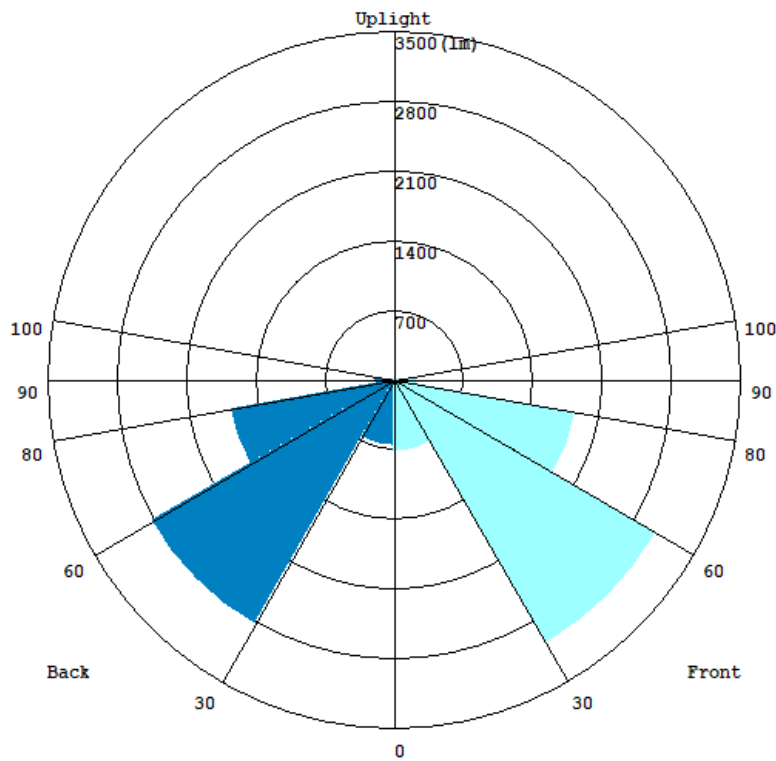
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	119.73	0 - 10	119.73	1.06%
10-20	417.52	0 - 20	537.25	4.77%
20-30	862.17	0 - 30	1399.42	12.43%
30-40	1453.77	0 - 40	2853.19	25.35%
40-50	2054.58	0 - 50	4907.77	43.61%
50-60	2379.77	0 - 60	7287.54	64.75%
60-70	2157.35	0 - 70	9444.89	83.92%
70-80	1380.81	0 - 80	10825.70	96.19%
80-90	428.95	0 - 90	11254.65	100.00%
90-100	0.00	0 - 100	11254.65	100.00%
100-110	0.00	0 - 110	11254.65	100.00%
110-120	0.00	0 - 120	11254.65	100.00%
120-130	0.00	0 - 130	11254.65	100.00%
130-140	0.00	0 - 140	11254.65	100.00%
140-150	0.00	0 - 150	11254.65	100.00%
150-160	0.00	0 - 160	11254.65	100.00%
160-170	0.00	0 - 170	11254.65	100.00%
170-180	0.00	0 - 180	11254.65	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	731.98	6.5
FM - Front-Medium(30-60)	3069.5	27.2
FH - Front-High(60-80)	1862	16.5
FVH - Front-Very High(80-90)	235.47	2.1
Total Forward Light	5899	52.2

BL - Back-Low(0-30)	668.62	5.9
BM - Back-Medium(30-60)	2837	25.1
BH - Back-High(60-80)	1684.8	14.9
BVH - Back-Very High(80-90)	205.77	1.8
Total Back Light	5396.1	47.8

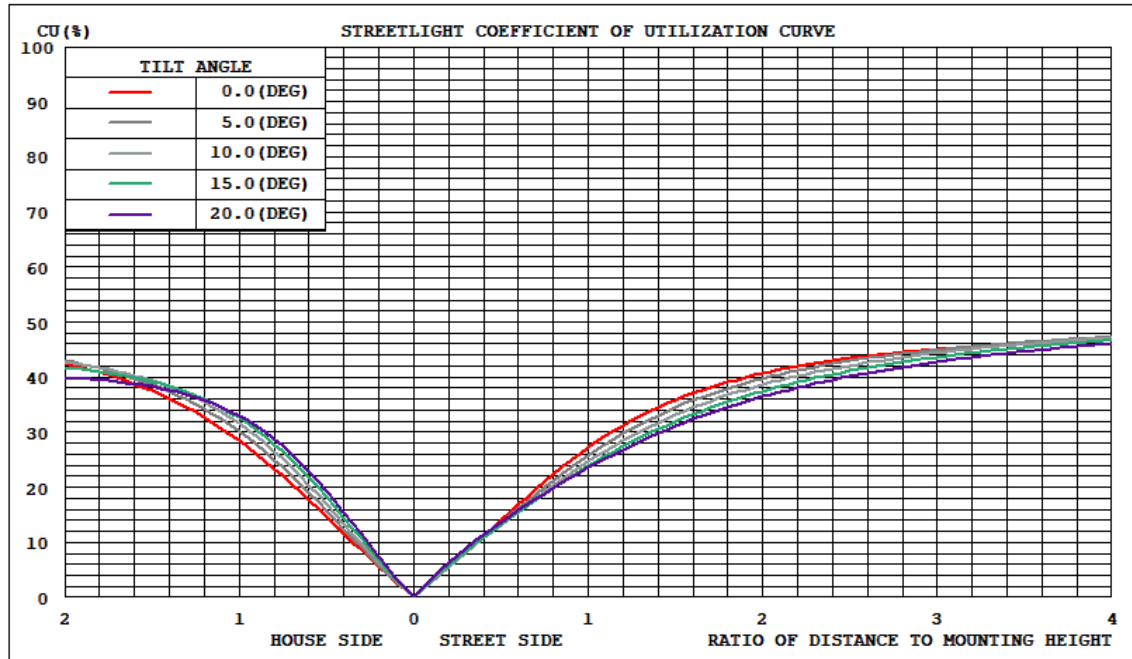
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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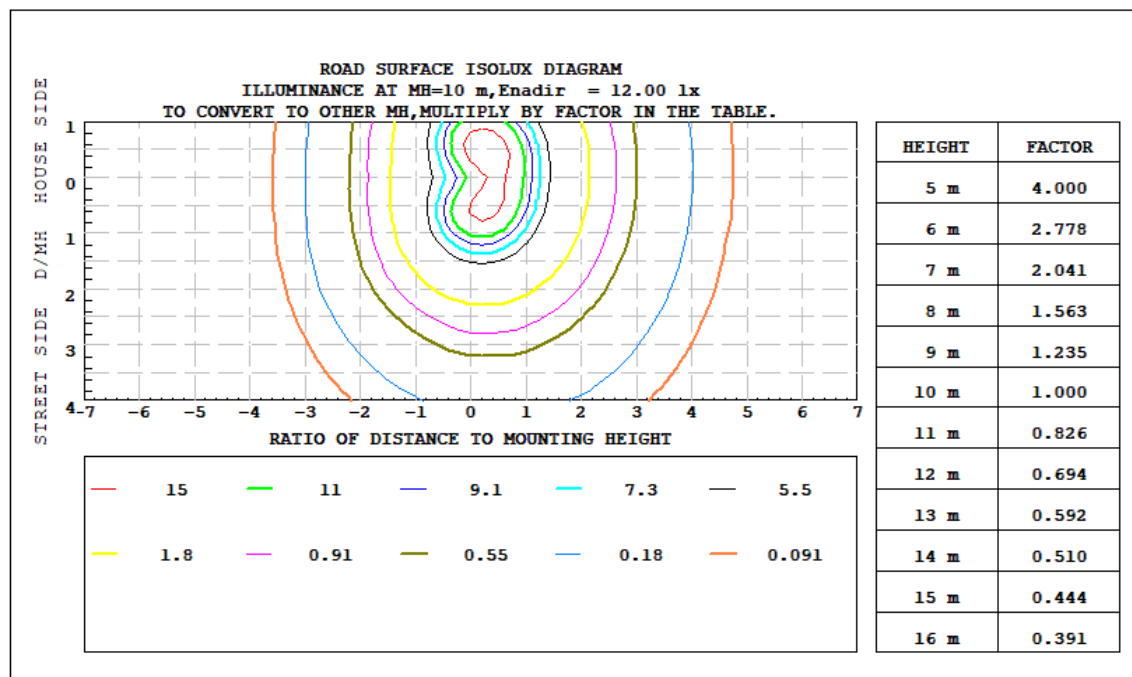
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	5396.1	0	5396.1
Street Side	5899	0	5899

3.2 Goniophotometer Test

Coefficients of Utilization

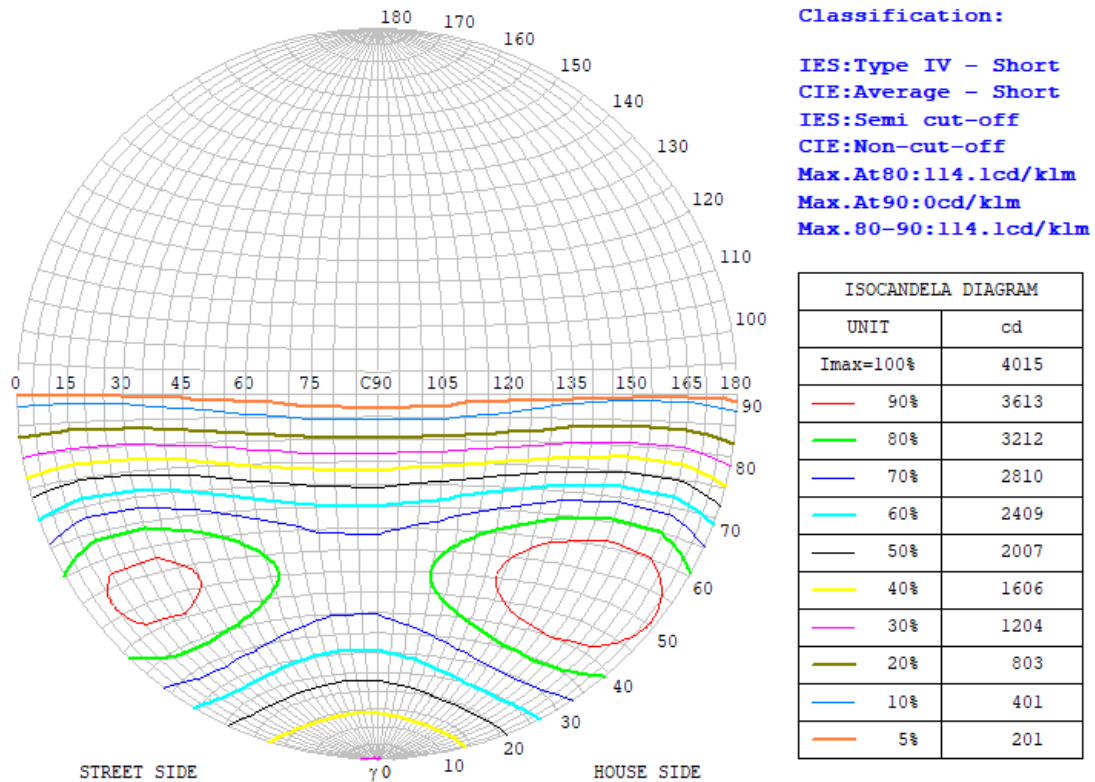


Iso-footcandle Lines of Horizontal Illumination

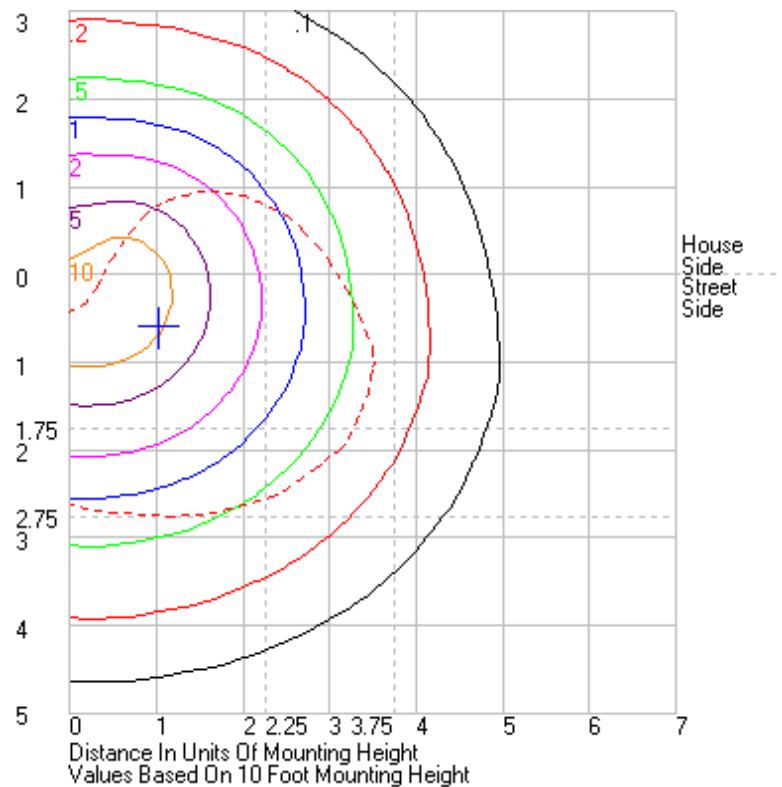


3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM



ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT2-100L750[H, 4]	Sample ID.	K1
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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	479.98	60	0.214	98.5	0.960	11.61%

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*****