

Photometric Test Report

Relevant Standards

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

Prepared For

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Project Number

DLF1810114

Data Number

DLF1810114-22a

Test Date

2018/10/24

Issue Date

2018/10/25

Prepared By



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Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor - Hight output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires				
Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
Lamp Output (lm)	IES LM-79-2008	10000	13232	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	120	112.8	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%	P
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.65%	P
Allowable CCTs* (K)	IES LM-79-2008	≤5700	2999	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	80	P
Power Factor	ANSI C82.77:2014	0.873	0.970	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	5.48%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/24	IVAT4-130L730U	V1
2	Goniophotometer Test	2018/10/24	IVAT4-130L730U	V1
3	THD and PF Test	2018/10/24	IVAT4-130L730U	V1

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3.0 Production Description

Luminaire Description: IVAT4-130L730U

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.	IVAT4-130L730U	Sample ID.	V1
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	119.99	60	0.994	119.1	0.999

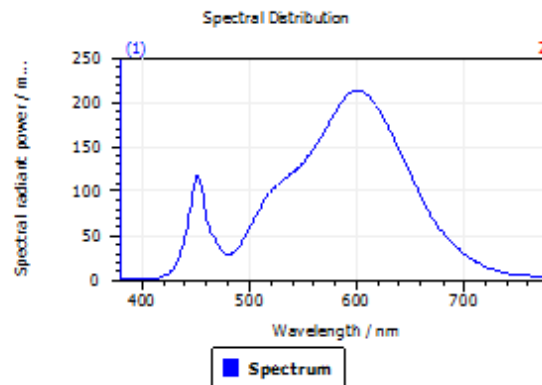
Test Result

CCT (K)	CRI (Ra)	Duv
2999	80	1.3E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

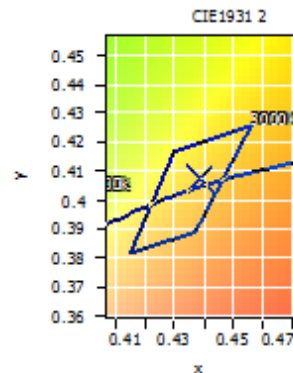
DominantWavelength	582.37 nm
Purity	0.542
PeakWavelength	600.96 nm
Radiant Power	31.06 W
Width50%	128.80 nm

Color Coordinates

Correlated Color Temperatu 2999 K

x: 0.4389 u: 0.2501 u': 0.2501
y: 0.4081 v: 0.3488 v': 0.5232

ResultsCRICRI01	77.6	ResultsCRICRI09	-2.7
ResultsCRICRI02	87.7	ResultsCRICRI10	71.8
ResultsCRICRI03	96.3	ResultsCRICRI11	77.0
ResultsCRICRI04	78.4	ResultsCRICRI12	62.5
ResultsCRICRI05	77.5	ResultsCRICRI13	79.7
ResultsCRICRI06	84.5	ResultsCRICRI14	98.0
ResultsCRICRI07	82.4	ResultsCRICRI15	69.7
ResultsCRICRI08	55.8	ResultsCRICRI16	67.8
ResultsCRI	80.0		



PlanckDistance 1.3E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT4-130L730U	Sample ID.	V1
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

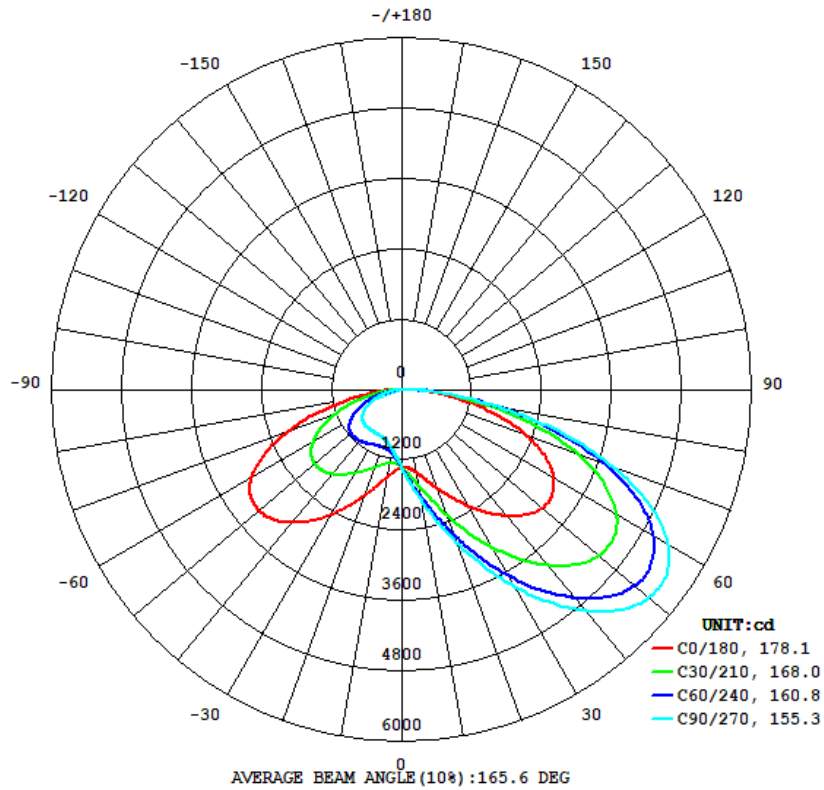
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.99	60	0.979	117.3	0.998	Light Down

Test Result

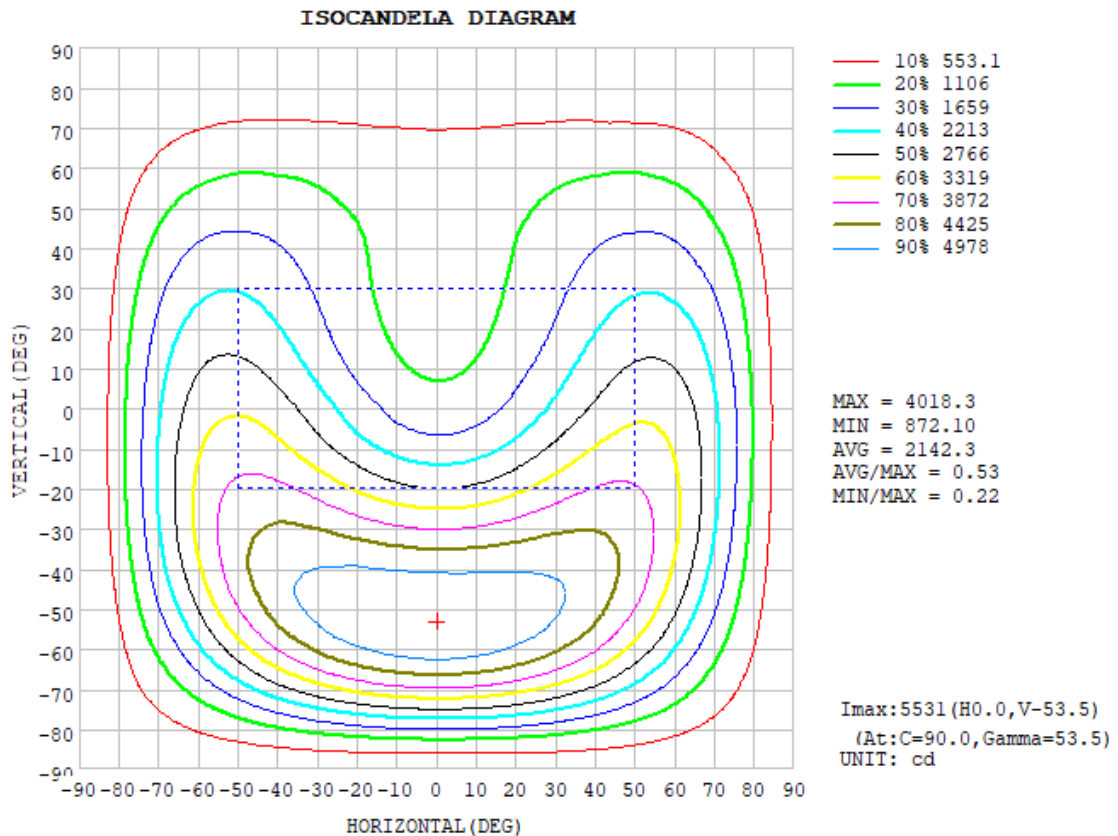
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
13232	100.00%	3.65%	178.2	155.3	164.9	55	112.8

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	1435	1749	1888	1784	1511	1175	1034	1155		
20	1793	2478	2772	2536	1921	1202	909.6	1170		
30	2299	3425	3876	3485	2462	1322	876.3	1275		
40	2821	4341	4920	4418	2968	1457	884.5	1400		
50	3143	4882	5519	4974	3208	1490	870.2	1446		
60	3023	4708	5271	4778	2973	1317	764.4	1301		
70	2278	3529	3858	3485	2092	919.3	531.9	923.9		
80	1059	1593	1680	1507	856.6	380.1	198.3	346.5		
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		

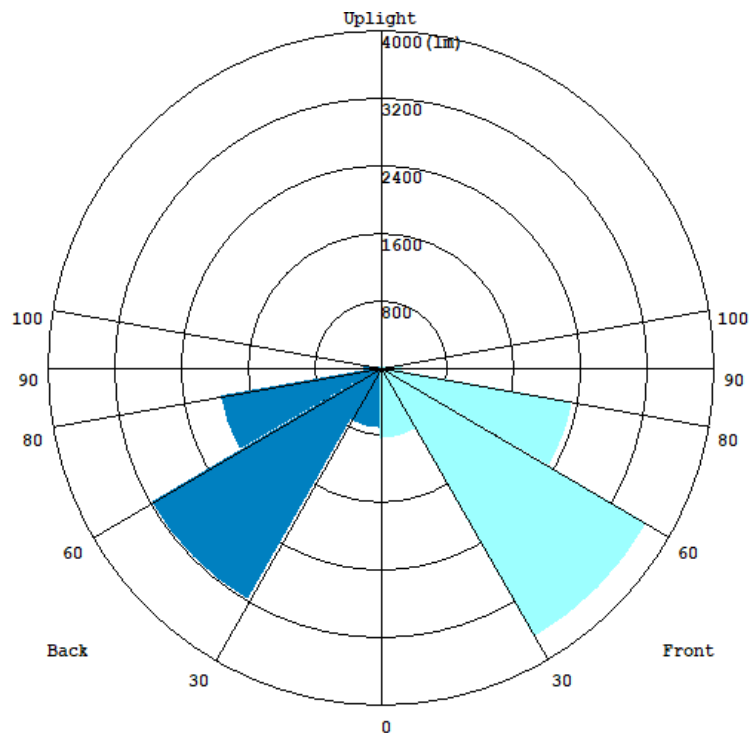
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	133.26	0 - 10	133.26	1.01%
10-20	470.34	0 - 20	603.60	4.56%
20-30	981.19	0 - 30	1584.79	11.98%
30-40	1666.90	0 - 40	3251.69	24.57%
40-50	2380.18	0 - 50	5631.87	42.56%
50-60	2816.84	0 - 60	8448.71	63.85%
60-70	2624.01	0 - 70	11072.72	83.68%
70-80	1677.29	0 - 80	12750.01	96.35%
80-90	482.45	0 - 90	13232.46	100.00%
90-100	0.00	0 - 100	13232.46	100.00%
100-110	0.00	0 - 110	13232.46	100.00%
110-120	0.00	0 - 120	13232.46	100.00%
120-130	0.00	0 - 130	13232.46	100.00%
130-140	0.00	0 - 140	13232.46	100.00%
140-150	0.00	0 - 150	13232.46	100.00%
150-160	0.00	0 - 160	13232.46	100.00%
160-170	0.00	0 - 170	13232.46	100.00%
170-180	0.00	0 - 180	13232.46	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	849.47	6.4
FM - Front-Medium(30-60)	3696.5	27.9
FH - Front-High(60-80)	2350.7	17.7
FVH - Front-Very High(80-90)	268	2.0
Total Forward Light	7164.6	54.0

BL - Back-Low(0-30)	736.76	5.6
BM - Back-Medium(30-60)	3187.4	24.0
BH - Back-High(60-80)	1963.9	14.8
BVH - Back-Very High(80-90)	210.02	1.6
Total Back Light	6098.1	46.0

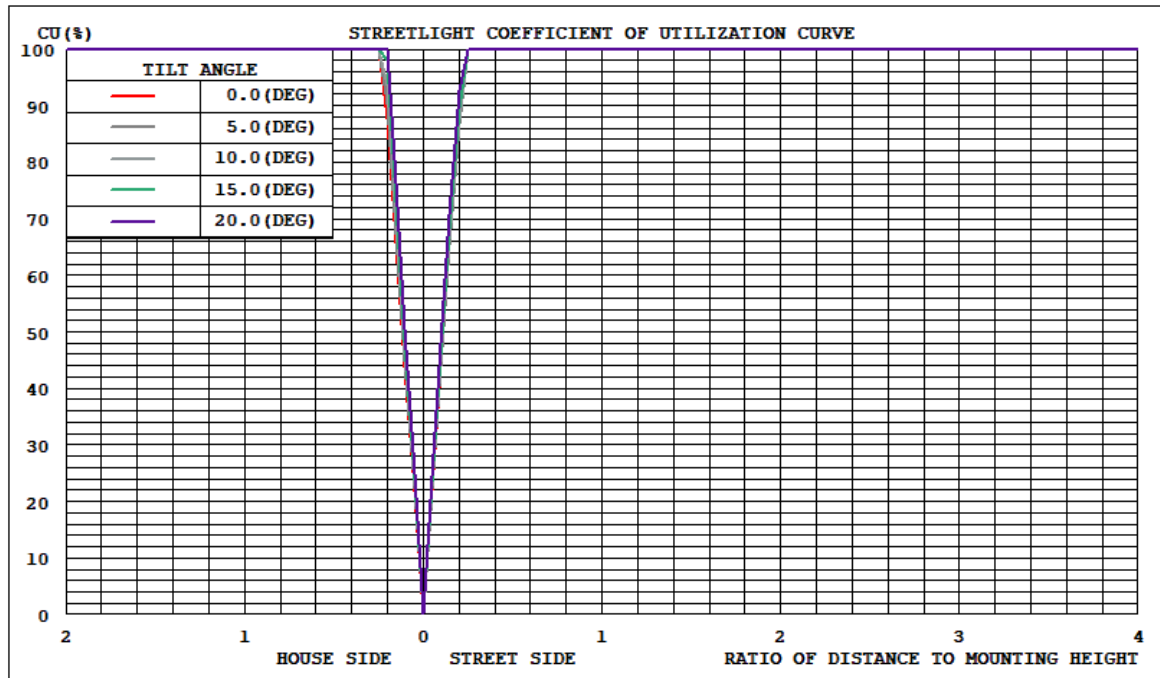
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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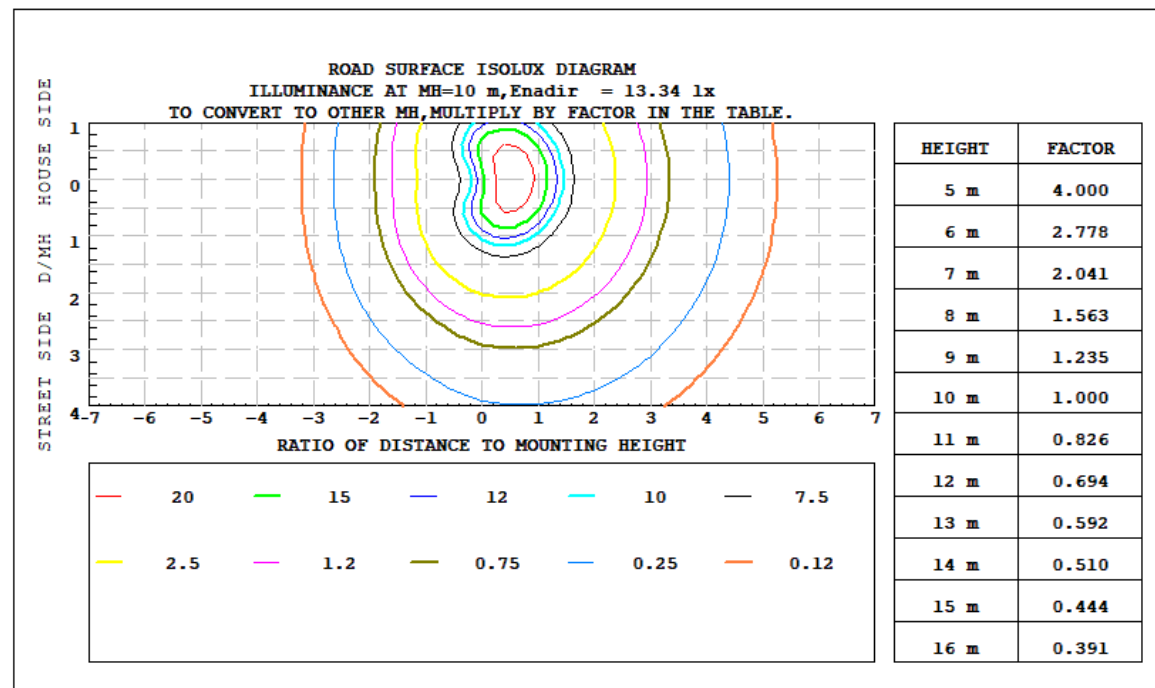
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	6098.1	0	6098.1
Street Side	7164.6	0	7164.6

3.2 Goniophotometer Test

Coefficients of Utilization

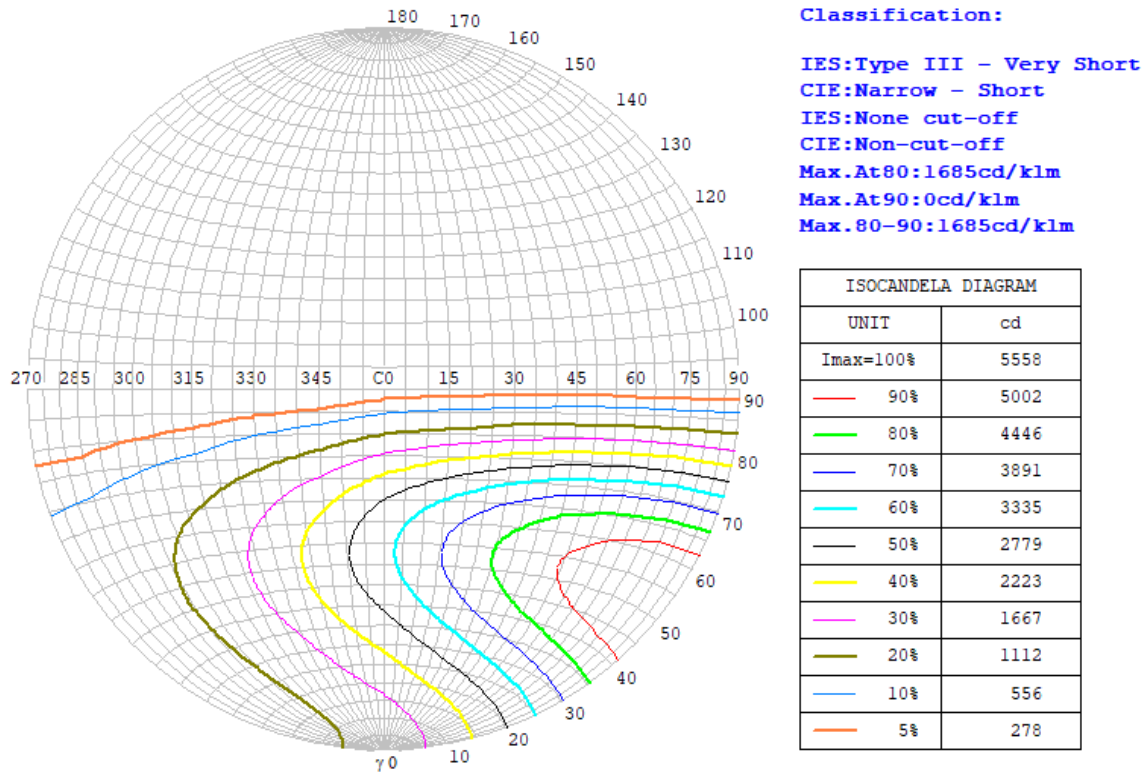


Iso-footcandle Lines of Horizontal Illumination

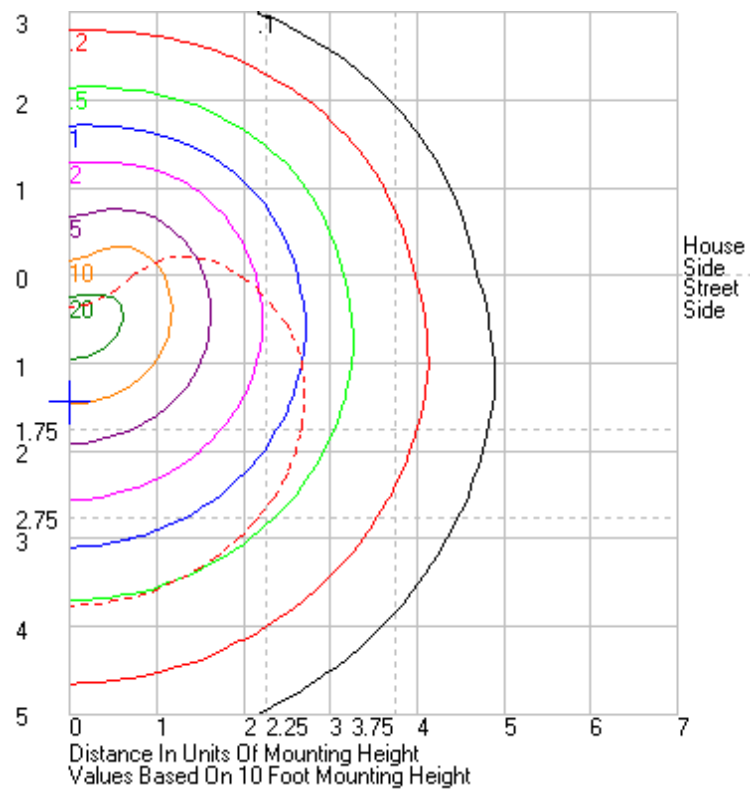


3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM



ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT4-130L730U	Sample ID.	V1
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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	277.01	60	0.430	115.4	0.970	5.48%
25.1	119.99	60	0.994	119.1	0.999	3.48%

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*****