

Photometric Test Report

Relevant Standards

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

Prepared For

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DLF1810114-11a

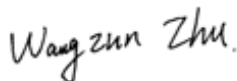
Test Date

2018/10/24

Issue Date

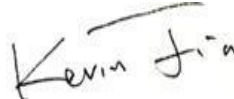
2018/10/25

Prepared By



Wangzun Zhu

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	10739	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	120	116.8	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%	P
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.80%	P
Allowable CCTs* (K)	IES LM-79-2008	≤5700	4991	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	75	P
Power Factor	ANSI C82.77:2014	0.873	0.965	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	8.38%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/24	IVAT2-100L750U	K1
2	Goniophotometer Test	2018/10/24	IVAT2-100L750U	K1
3	THD and PF Test	2018/10/24	IVAT2-100L750U	K1

Remark(If any)

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3.0 Production Description

Luminaire Description: IVAT2-100L750U

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.	IVAT2-100L750U	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	119.95	60	0.785	94.0	0.998

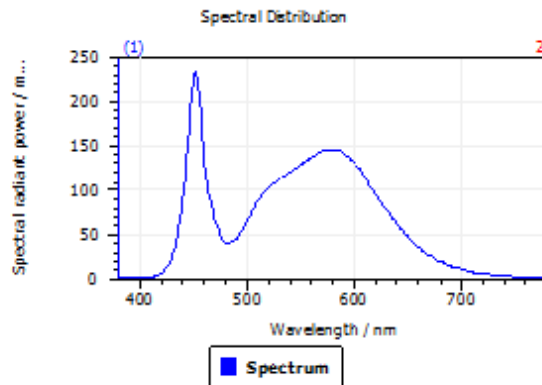
Test Result

CCT (K)	CRI (Ra)	Duv
4991	74.7	3.3E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

DominantWavelength	589.87 nm
Purity	0.116
PeakWavelength	451.47 nm
Radiant Power	25 W
Width50%	19.31 nm

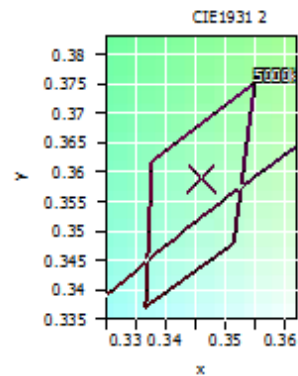
Color Coordinates

Correlated Color Temperature 4991 K

x: 0.3460 u: 0.2092 u': 0.2092
y: 0.3591 v: 0.3256 v': 0.4884

ResultsCRICRI01	70.7	ResultsCRICRI09	-34.9
ResultsCRICRI02	81.7	ResultsCRICRI10	57.2
ResultsCRICRI03	89.7	ResultsCRICRI11	70.7
ResultsCRICRI04	73.4	ResultsCRICRI12	48.9
ResultsCRICRI05	72.4	ResultsCRICRI13	73.2
ResultsCRICRI06	74.8	ResultsCRICRI14	94.5
ResultsCRICRI07	81.6	ResultsCRICRI15	63.0
ResultsCRICRI08	53.2	ResultsCRICRI16	62.3

ResultsCRI 74.7



PlanckDistance 3.3E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT2-100L750U	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

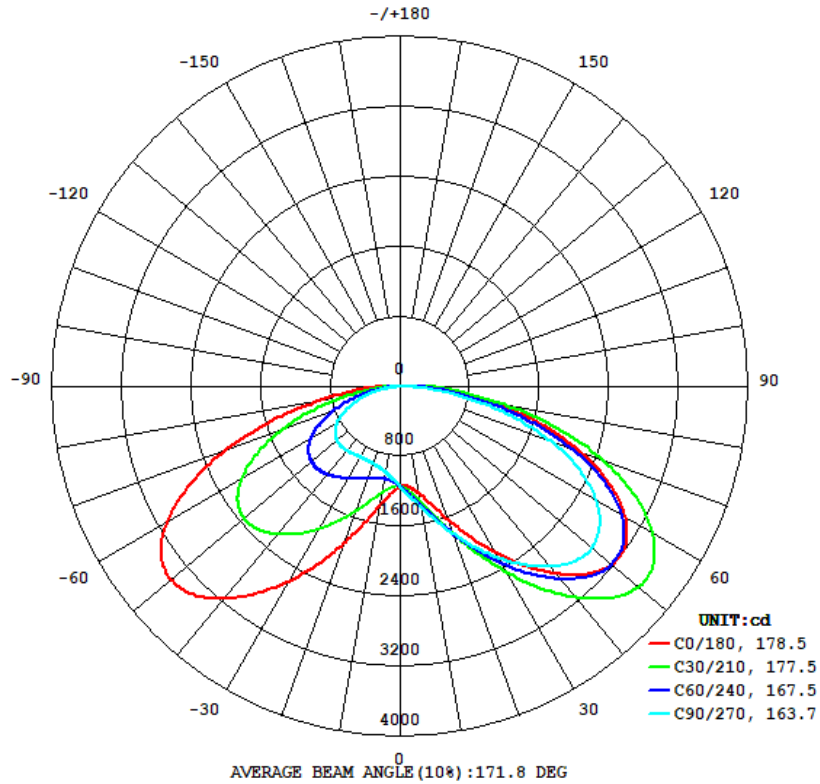
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.97	60	0.768	91.9	0.997	Light Down

Test Result

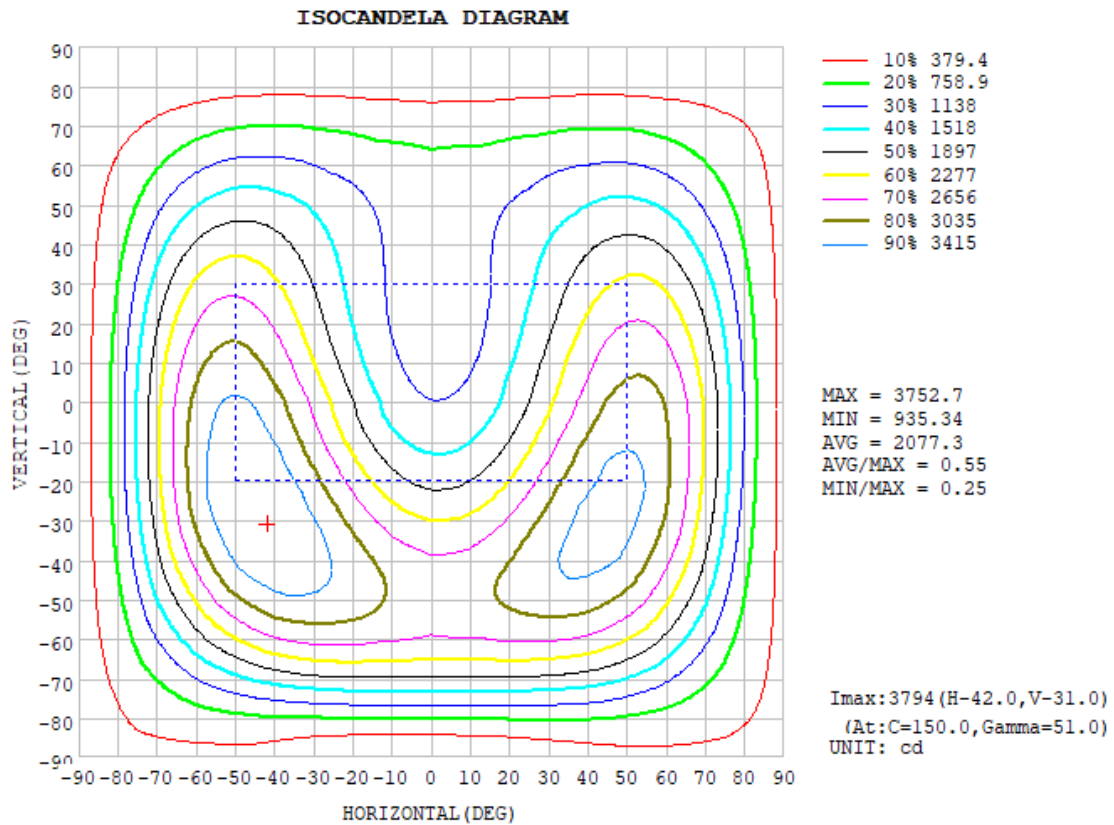
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
10739	100.00%	3.80%	178.9	163.7	169.1	63	116.8

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	C0	C45	C90	C135	C180	C225	C270	C315
7	1239	1360	1404	1443	1385	1152	1004	1079
10	1619	1804	1792	1991	1910	1302	943.1	1174
20	2191	2418	2265	2682	2567	1518	938.2	1359
30	2802	3055	2694	3331	3171	1715	963.5	1541
40	3170	3426	2876	3640	3438	1778	956.3	1607
50	2995	3205	2611	3330	3098	1580	839.8	1446
60	2216	2343	1850	2358	2144	1101	579.1	1031
70	1109	1127	791.0	1062	936.3	449.1	227.8	447.0
80	0	0	0	0	0	0	0	0
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

LUMINOUS INTENSITY:cd

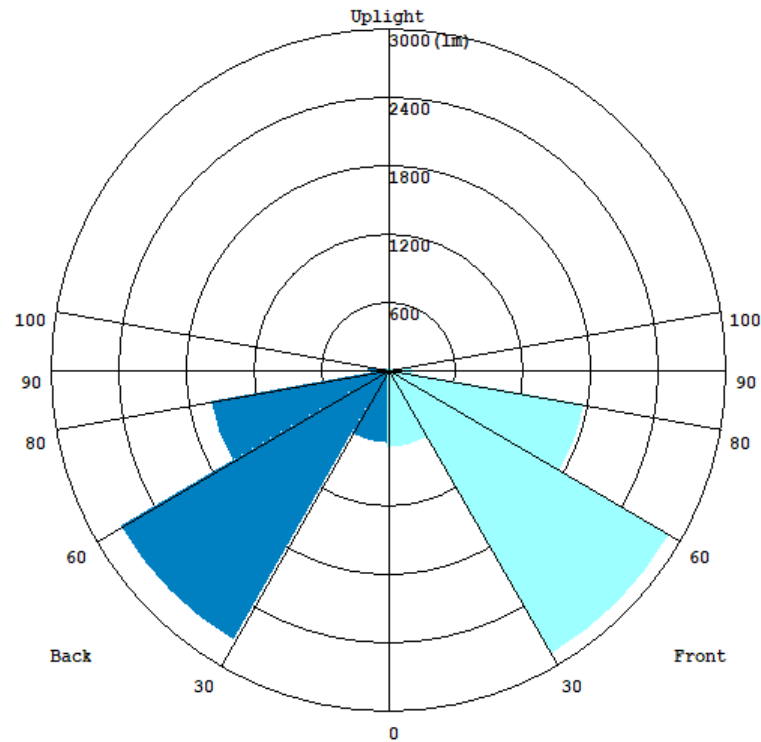
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	114.88	0 - 10	114.88	1.07%
10-20	400.83	0 - 20	515.71	4.80%
20-30	826.51	0 - 30	1342.22	12.50%
30-40	1390.52	0 - 40	2732.74	25.45%
40-50	1963.18	0 - 50	4695.92	43.73%
50-60	2271.34	0 - 60	6967.26	64.88%
60-70	2054.33	0 - 70	9021.59	84.01%
70-80	1309.47	0 - 80	10331.06	96.20%
80-90	407.56	0 - 90	10738.62	100.00%
90-100	0.00	0 - 100	10738.62	100.00%
100-110	0.00	0 - 110	10738.62	100.00%
110-120	0.00	0 - 120	10738.62	100.00%
120-130	0.00	0 - 130	10738.62	100.00%
130-140	0.00	0 - 140	10738.62	100.00%
140-150	0.00	0 - 150	10738.62	100.00%
150-160	0.00	0 - 160	10738.62	100.00%
160-170	0.00	0 - 170	10738.62	100.00%
170-180	0.00	0 - 180	10738.62	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	690.72	6.4
FM - Front-Medium(30-60)	2897.8	26.9
FH - Front-High(60-80)	1773.9	16.5
FVH - Front-Very High(80-90)	229.48	2.1
Total Forward Light	5591.9	51.9

BL - Back-Low(0-30)	652.7	6.1
BM - Back-Medium(30-60)	2745	25.5
BH - Back-High(60-80)	1597.4	14.8
BVH - Back-Very High(80-90)	186.67	1.7
Total Back Light	5181.7	48.1

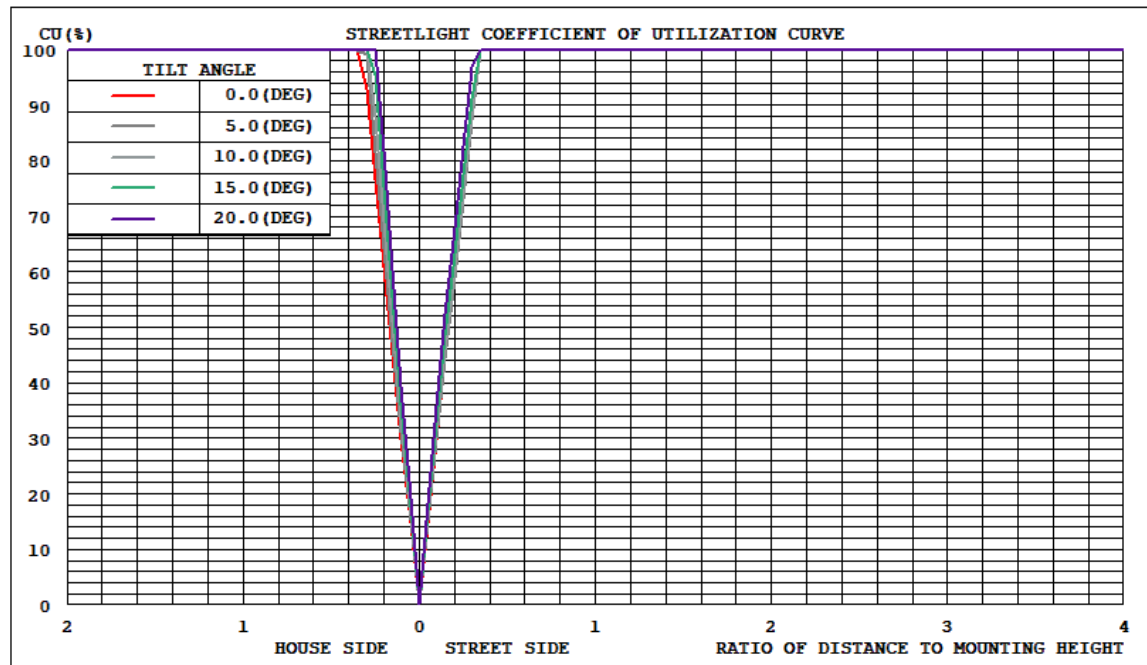
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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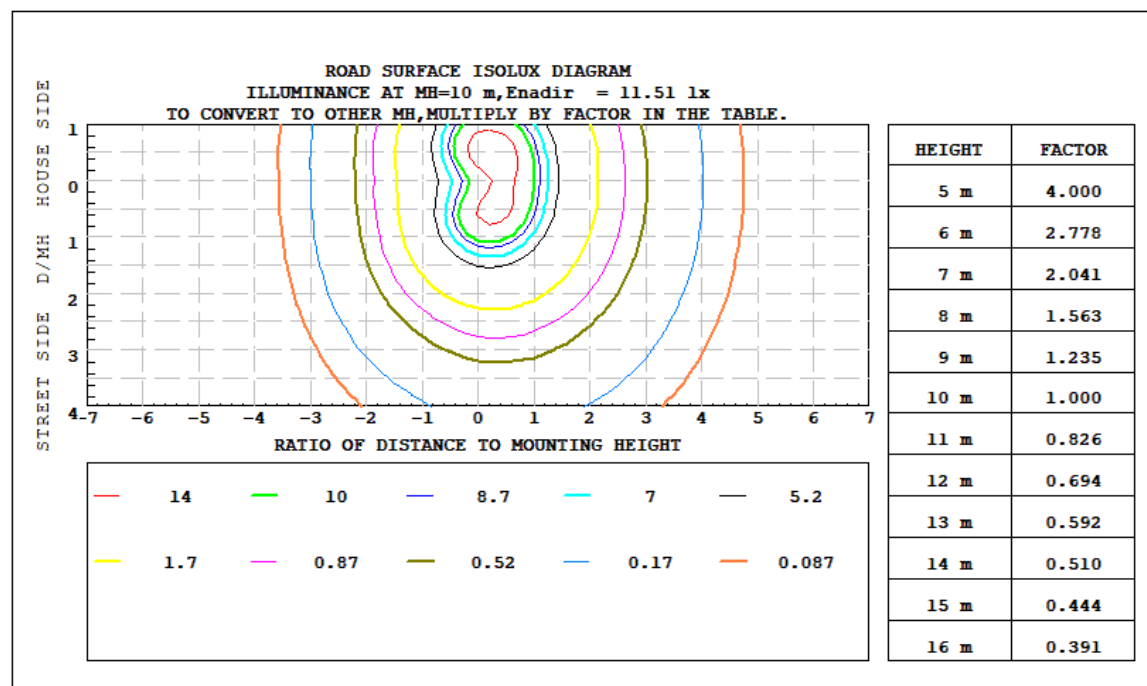
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	5181.7	0	5181.7
Street Side	5591.9	0	5591.9

3.2 Goniophotometer Test

Coefficients of Utilization

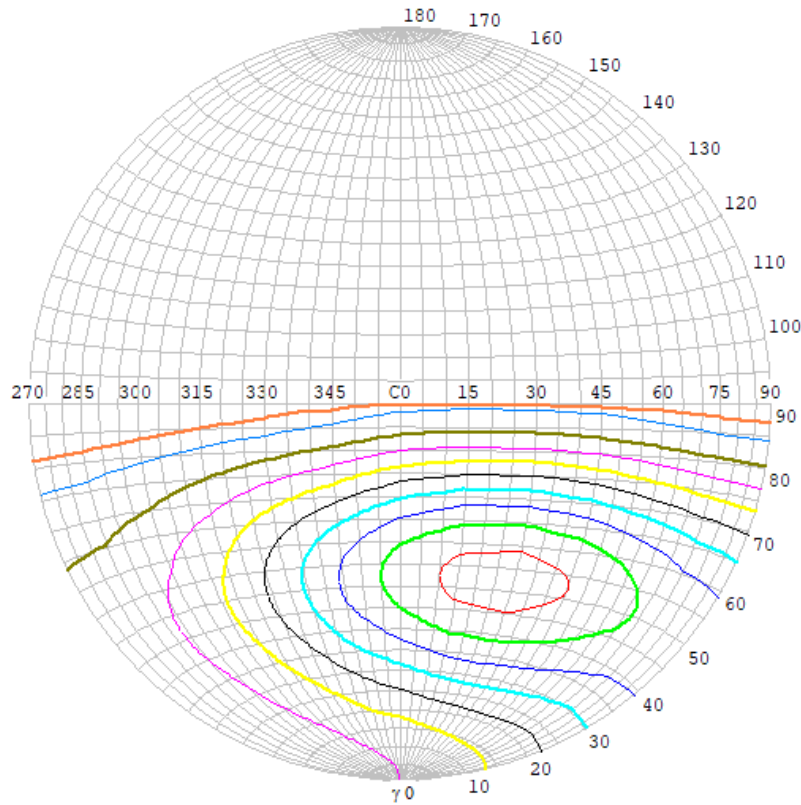


Iso-footcandle Lines of Horizontal Illumination



3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM

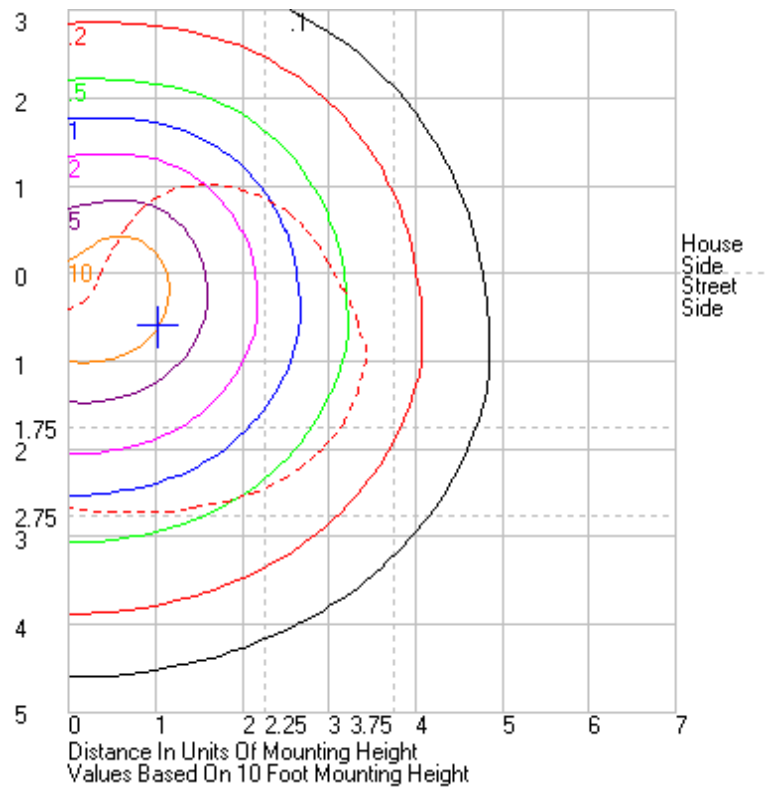


Classification:

IES:Type IV - Short
CIE:Average - Short
IES:None cut-off
CIE:Non-cut-off
Max.At80:1223cd/klm
Max.At90:0cd/klm
Max.80-90:1223cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
I _{max} =100%	3806
90%	3425
80%	3045
70%	2664
60%	2284
50%	1903
40%	1522
30%	1142
20%	761
10%	381
5%	190

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT2-100L750U	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	276.98	60	0.341	91.0	0.965	8.38%
25.1	119.95	60	0.785	94.0	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-derectional	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-derectional	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*****