

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Room 6A33, No.1388, Wuzhong road, Shanghai, China

Xiao Xiang, 15921313292, gary.xiao@rabweb.com

Prepared By

Deliver Co., Ltd.

Block 11, 78 Keling Road, SSTP, Suzhou, China

0512-66801950, kevin.jia@szdeliver.com

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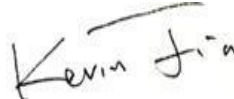
2018/11/23

Prepared By



Wangzun Zhu

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	10346
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	105.5
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.55%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	3033
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	80.0
Power Factor	ANSI C82.77:2014	0.873	0.959
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.51%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/22	IVATFT-100L730[H, 4]	S1
2	Goniophotometer Test	2018/11/22	IVATFT-100L730[H, 4]	S1
3	THD and PF Test	2018/11/22	IVATFT-100L730[H, 4]	S1

Remark(If any)

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3.0 Production Description

Luminaire Description: IVATFT-100L730[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.	IVATFT-100L730[H, 4]	Sample ID.	S1
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	480.01	60	0.213	98.0	0.959

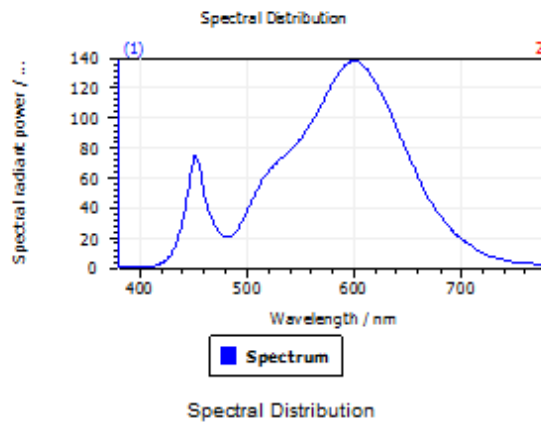
Test Result

CCT (K)	CRI (Ra)	Duv
3033	80	1.4E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results

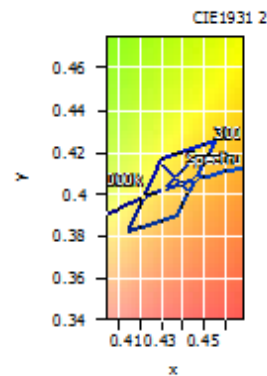


Spectral values

DominantWavelength	582.19 nm
Purity	0.534
PeakWavelength	600.07 nm
Width50%:	129.40 nm

Color Coordinates

Correlated Color Temperature		3033 K
x: 0.4366	u: 0.2489	u': 0.2489
y: 0.4076	v: 0.3485	v': 0.5227
CRI01	77.7	CRI09
CRI02	87.6	CRI10
CRI03	96.1	CRI11
CRI04	78.1	CRI12
CRI05	77.2	CRI13
CRI06	83.8	CRI14
CRI07	83.1	CRI15
CRI08	56.5	CRI16
ResultsCRI	80.0	



PlanckDistance 1.4E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVATFT-100L730[H, 4]	Sample ID.	S1
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

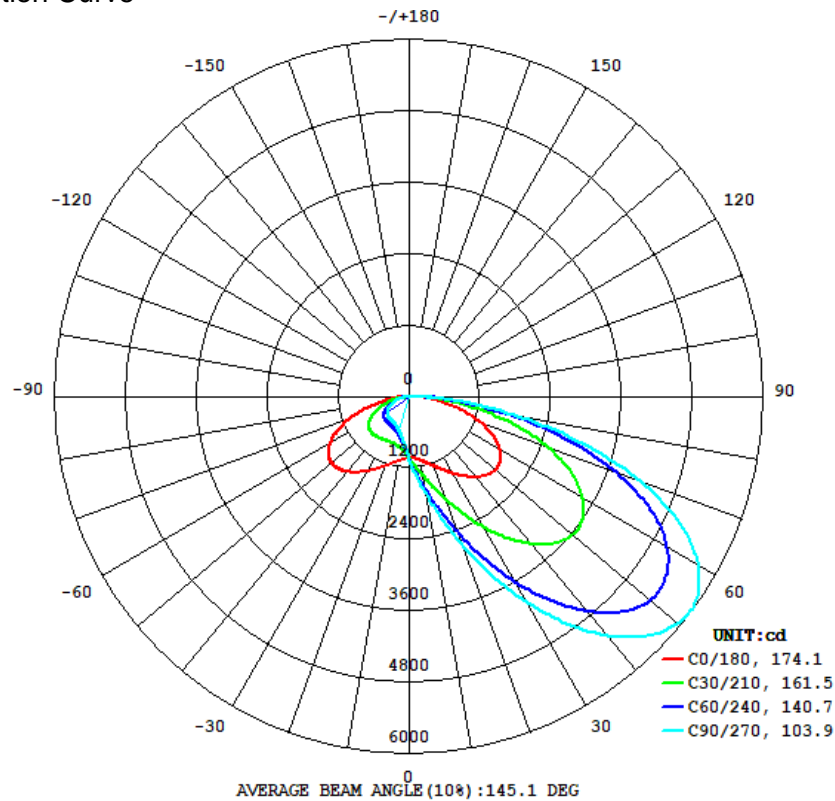
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	480.02	60	0.213	98.1	0.960	Light Down

Test Result

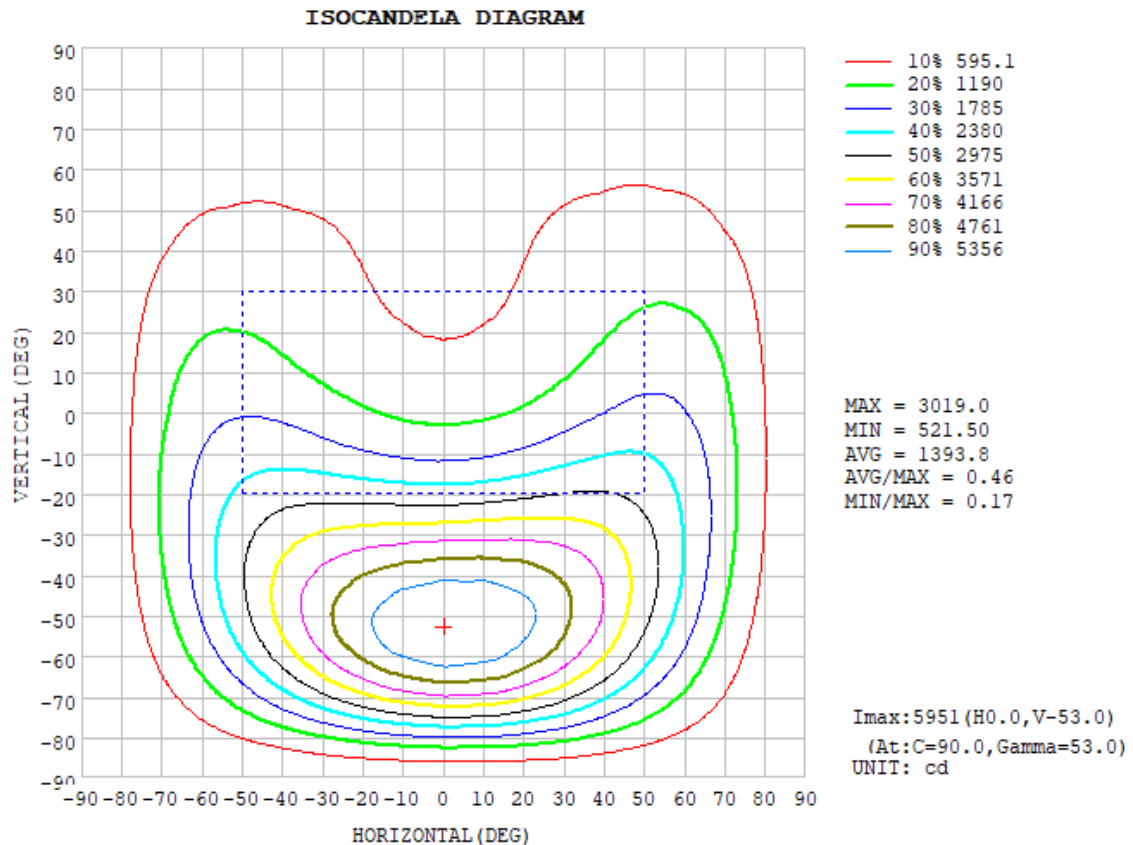
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
10346	100.00%	3.55%	174.1	103.9	159.5	52.4	105.5

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

°	C0	C45	C90	C135	C180	C225	C270	C315
10	1086	1451	1633	1449	1096	812.3	718.3	811.4
20	1248	2154	2644	2115	1244	716.2	577.8	715.9
30	1497	3101	3969	2952	1452	688.4	524.0	693.9
40	1767	4028	5241	3747	1654	691.0	505.1	711.8
50	1917	4538	5922	4161	1730	675.4	482.0	714.0
60	1787	4301	5659	3935	1548	585.1	412.2	637.6
70	1308	3181	4162	2859	1070	351.6	281.6	448.6
80	594.7	1430	1810	1219	419.1	144.5	109.4	183.6
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
DEG	LUMINOUS INTENSITY:cd							

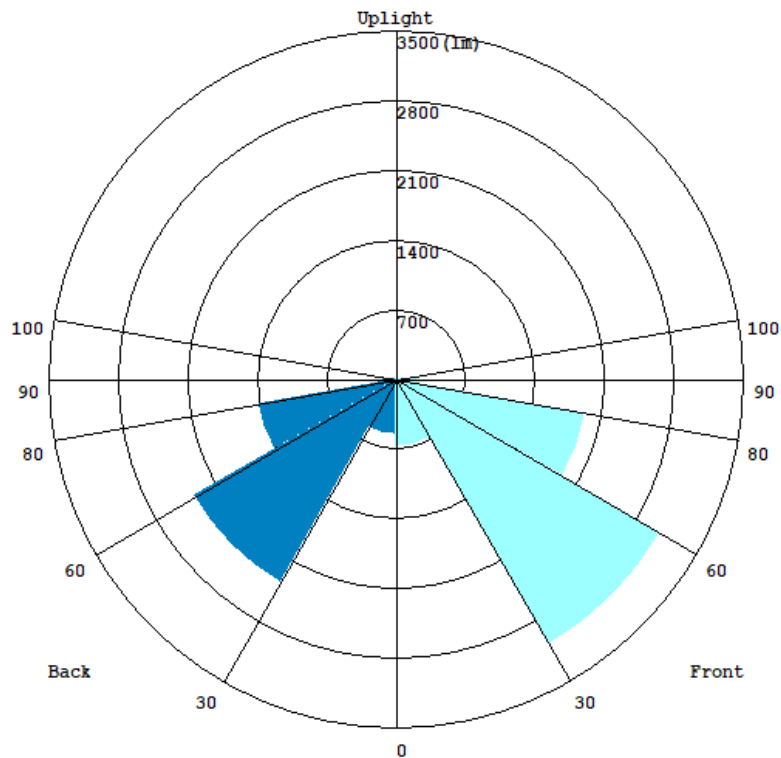
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	103.38	0 - 10	103.38	1.00%
10-20	362.77	0 - 20	466.15	4.51%
20-30	762.81	0 - 30	1228.96	11.88%
30-40	1312.09	0 - 40	2541.05	24.56%
40-50	1881.19	0 - 50	4422.24	42.74%
50-60	2213.34	0 - 60	6635.58	64.14%
60-70	2043.36	0 - 70	8678.94	83.89%
70-80	1299.88	0 - 80	9978.82	96.45%
80-90	366.96	0 - 90	10345.78	100.00%
90-100	0.00	0 - 100	10345.78	100.00%
100-110	0.00	0 - 110	10345.78	100.00%
110-120	0.00	0 - 120	10345.78	100.00%
120-130	0.00	0 - 130	10345.78	100.00%
130-140	0.00	0 - 140	10345.78	100.00%
140-150	0.00	0 - 150	10345.78	100.00%
150-160	0.00	0 - 160	10345.78	100.00%
160-170	0.00	0 - 170	10345.78	100.00%
170-180	0.00	0 - 180	10345.78	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	677.42	6.5
FM - Front-Medium(30-60)	3073.9	29.7
FH - Front-High(60-80)	1936.9	18.7
FVH - Front-Very High(80-90)	217.55	2.1
Total Forward Light	5905.8	57.0

BL - Back-Low(0-30)	552.28	5.3
BM - Back-Medium(30-60)	2346.9	22.6
BH - Back-High(60-80)	1415.3	13.7
BVH - Back-Very High(80-90)	144.65	1.4
Total Back Light	4459.1	43.0

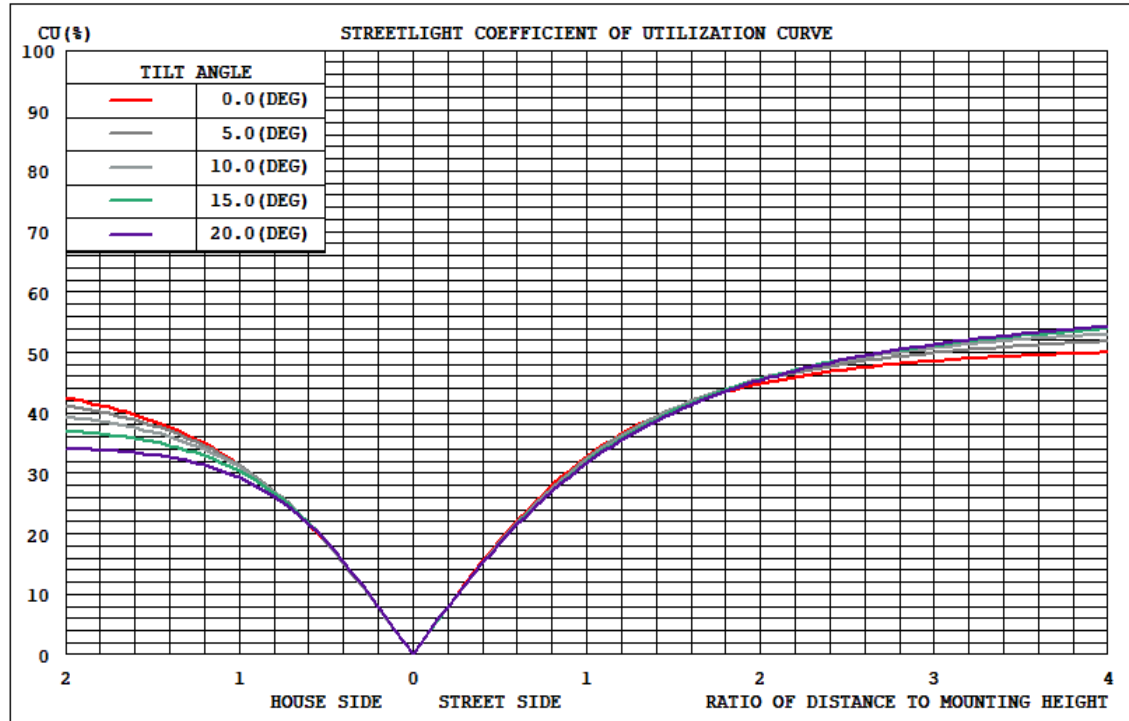
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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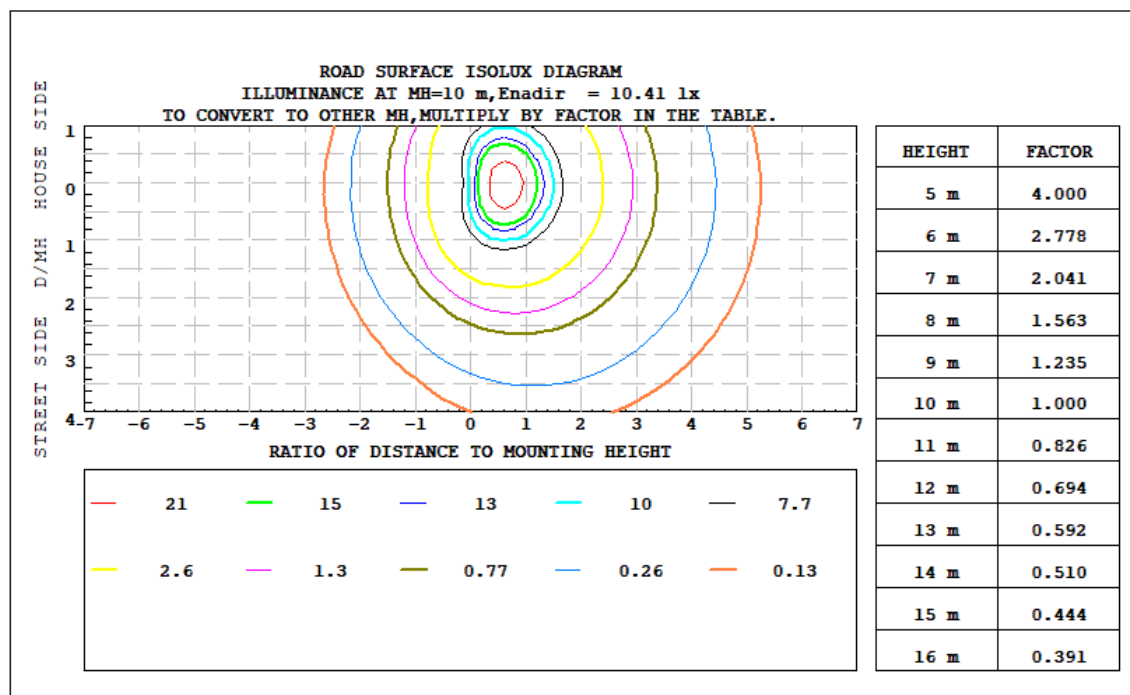
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4459.1	0	4459.1
Street Side	5905.8	0	5905.8

3.2 Goniophotometer Test

Coefficients of Utilization

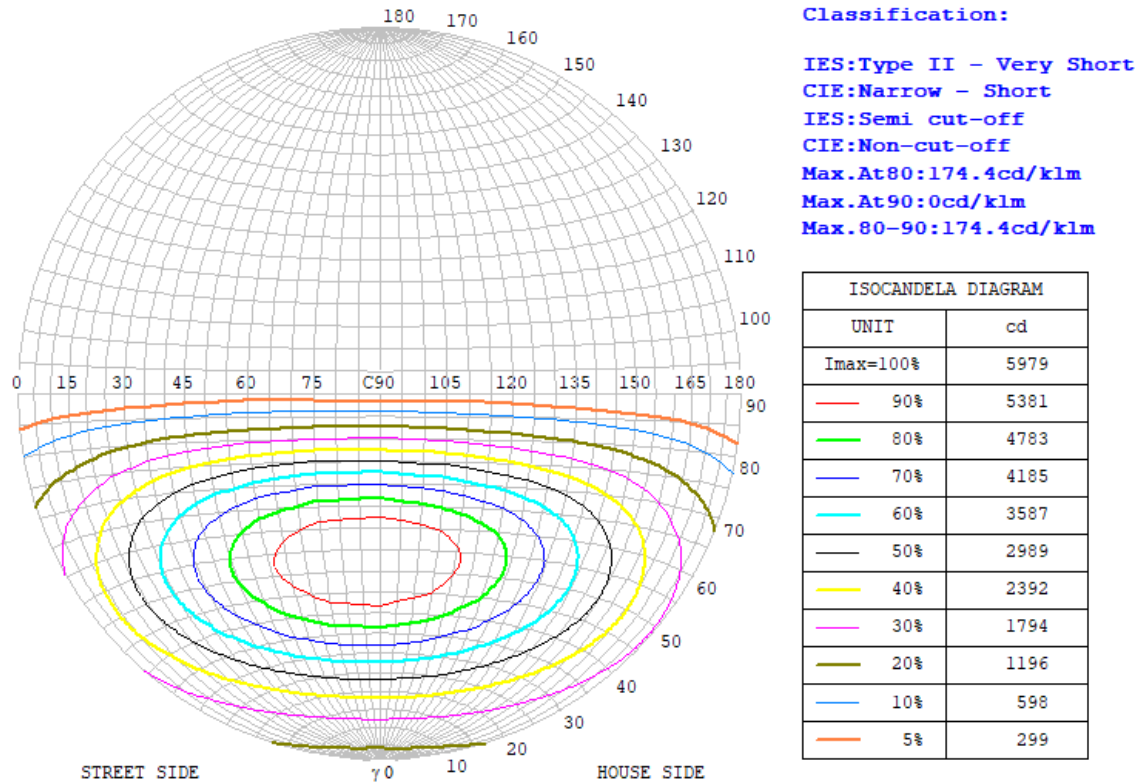


Iso-footcandle Lines of Horizontal Illumination

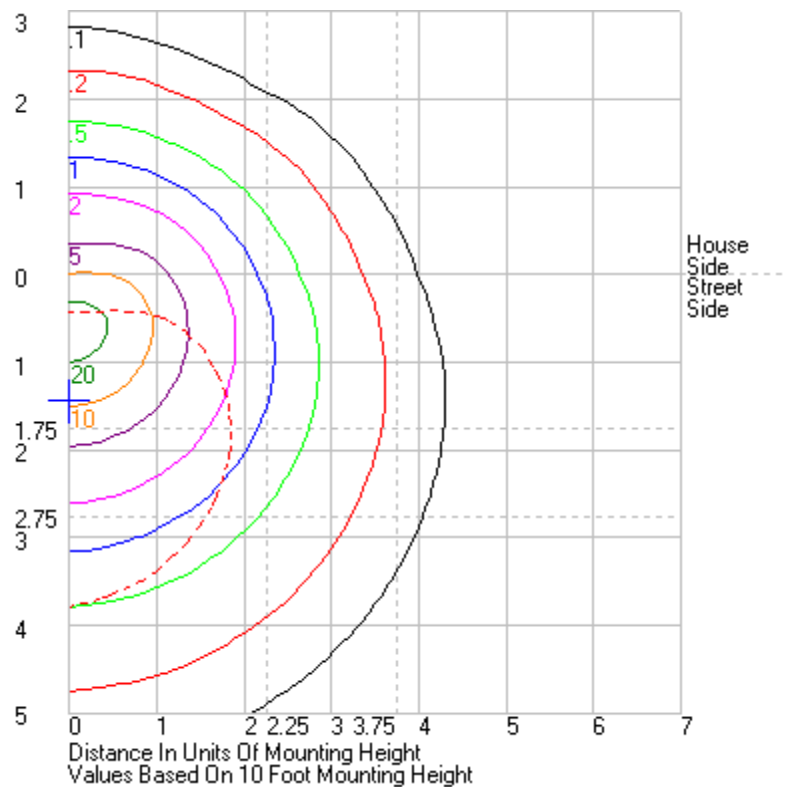


3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM



ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVATFT-100L730[H, 4]	Sample ID.	S1
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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	480.01	60	0.213	98.0	0.959	11.51%

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*****