

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	10707
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	109.6
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.65%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	4134
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	73
Power Factor	ANSI C82.77:2014	0.873	0.955
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	13.60%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/22	IVATFT-100L740[H, 4]	R1
2	Goniophotometer Test	2018/11/22	IVATFT-100L740[H, 4]	R1
3	THD and PF Test	2018/11/22	IVATFT-100L740[H, 4]	R1

Remark(If any)

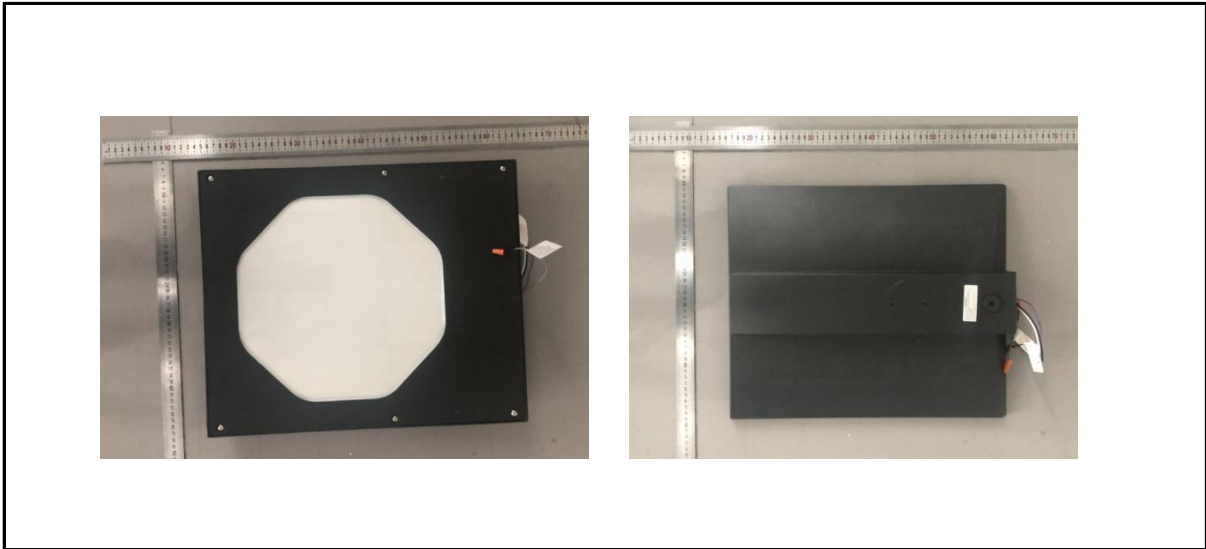
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3.0 Production Description

Luminaire Description: IVATFT-100L740[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-100L740[H, 4]	Sample ID.	R1
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	480.03	60	0.213	97.7	0.955

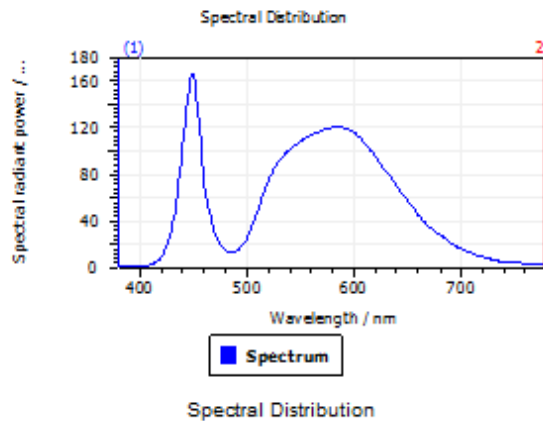
Test Result

CCT (K)	CRI (Ra)	Duv
4134	73.1	4.1E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results

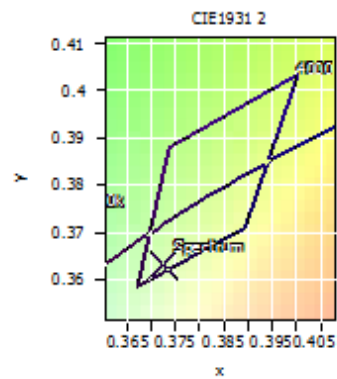


Spectral values

DominantWavelength	581.40 nm
Purity	0.207
PeakWavelength	448.90 nm
Width50%:	21.23 nm

Color Coordinates

Correlated Color Temperature		4134 K	
x: 0.3723	u: 0.2252	u': 0.2252	
y: 0.3831	v: 0.3295	v': 0.4942	
CRI01	72.0	CRI09	-12.3
CRI02	78.9	CRI10	47.5
CRI03	81.7	CRI11	67.5
CRI04	72.6	CRI12	40.1
CRI05	70.8	CRI13	72.8
CRI06	68.6	CRI14	89.1
CRI07	81.2	CRI15	68.1
CRI08	58.8	CRI16	70.3
ResultsCRI	73.1		



PlanckDistance 4.1E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVATFT-100L740[H, 4]	Sample ID.	R1
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

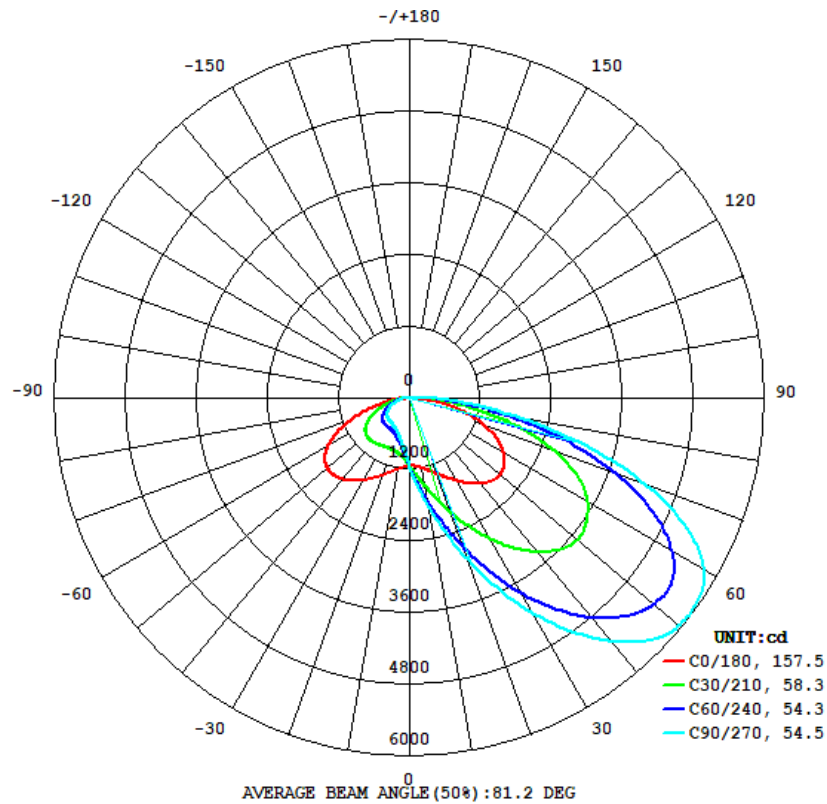
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	479.98	60	0.213	97.7	0.955	Light Down

Test Result

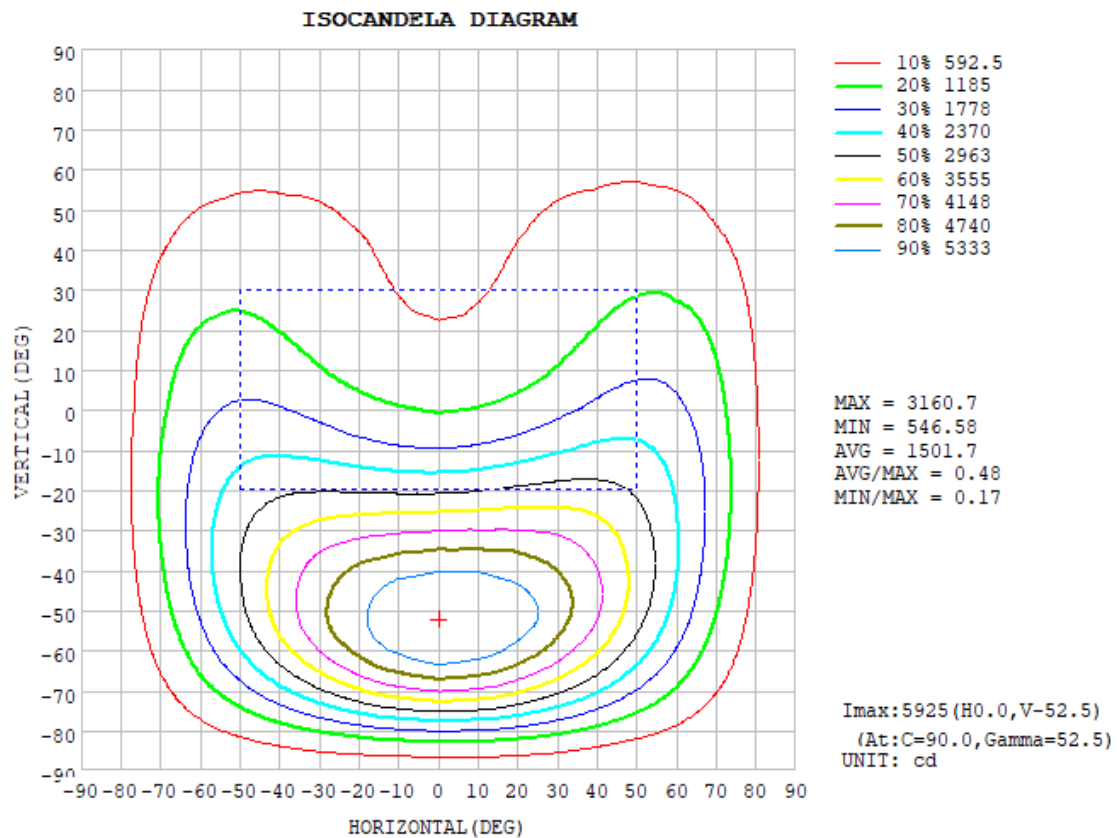
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
10707	100.00%	3.65%	174.3	108.9	157.5	54.5	109.6

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd									
γ	C0	C45	C90	C135	C180	C225	C270	C315		
10	1195	1612	1814	1607	1214	888.7	777.9	881.8		
20	1361	2370	2872	2305	1381	781.5	616.3	768.7		
30	1613	3303	4149	3124	1598	751.6	550.1	734.9		
40	1877	4155	5327	3871	1786	754.2	525.7	740.7		
50	2009	4601	5939	4229	1827	734.8	498.5	733.8		
60	1853	4415	5754	3972	1591	633.5	425.7	648.3		
70	1347	3216	4243	2917	1051	427.8	295.7	456.5		
80	617.3	1411	1845	1288	363.3	165.9	122.6	190.5		
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		

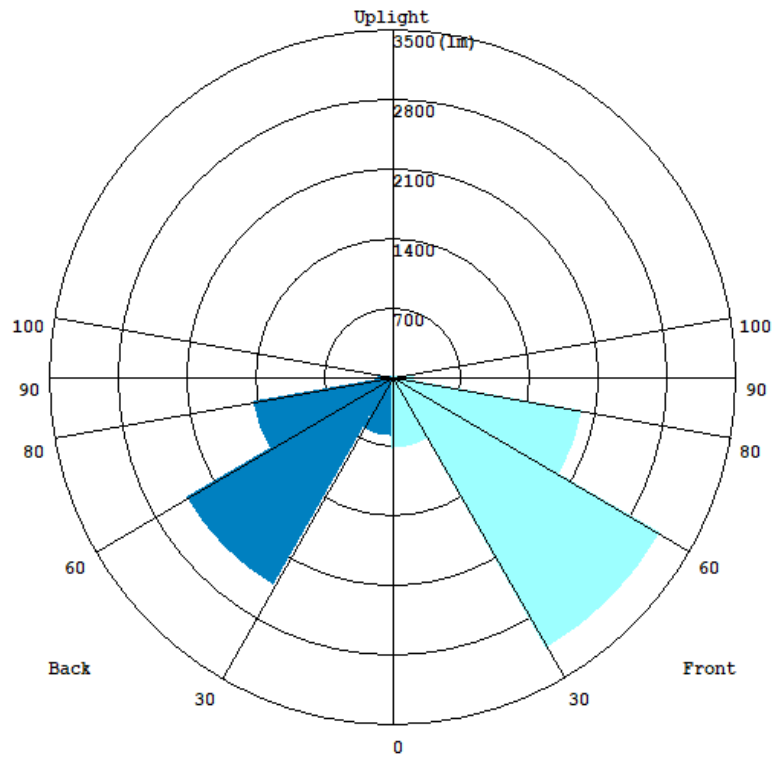
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	113.91	0 - 10	113.91	1.06%
10-20	398.22	0 - 20	512.13	4.78%
20-30	821.16	0 - 30	1333.29	12.45%
30-40	1376.66	0 - 40	2709.95	25.31%
40-50	1935.97	0 - 50	4645.92	43.39%
50-60	2257.41	0 - 60	6903.33	64.47%
60-70	2085.72	0 - 70	8989.05	83.95%
70-80	1327.58	0 - 80	10316.63	96.35%
80-90	390.37	0 - 90	10707.00	100.00%
90-100	0.00	0 - 100	10707.00	100.00%
100-110	0.00	0 - 110	10707.00	100.00%
110-120	0.00	0 - 120	10707.00	100.00%
120-130	0.00	0 - 130	10707.00	100.00%
130-140	0.00	0 - 140	10707.00	100.00%
140-150	0.00	0 - 150	10707.00	100.00%
150-160	0.00	0 - 160	10707.00	100.00%
160-170	0.00	0 - 170	10707.00	100.00%
170-180	0.00	0 - 180	10707.00	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	733.57	6.8
FM - Front-Medium(30-60)	3154.3	29.4
FH - Front-High(60-80)	1970.3	18.4
FVH - Front-Very High(80-90)	228.07	2.1
Total Forward Light	6086.2	56.8

BL - Back-Low(0-30)	600.5	5.6
BM - Back-Medium(30-60)	2427	22.6
BH - Back-High(60-80)	1448.9	13.5
BVH - Back-Very High(80-90)	161.96	1.5
Total Back Light	4638.3	43.2

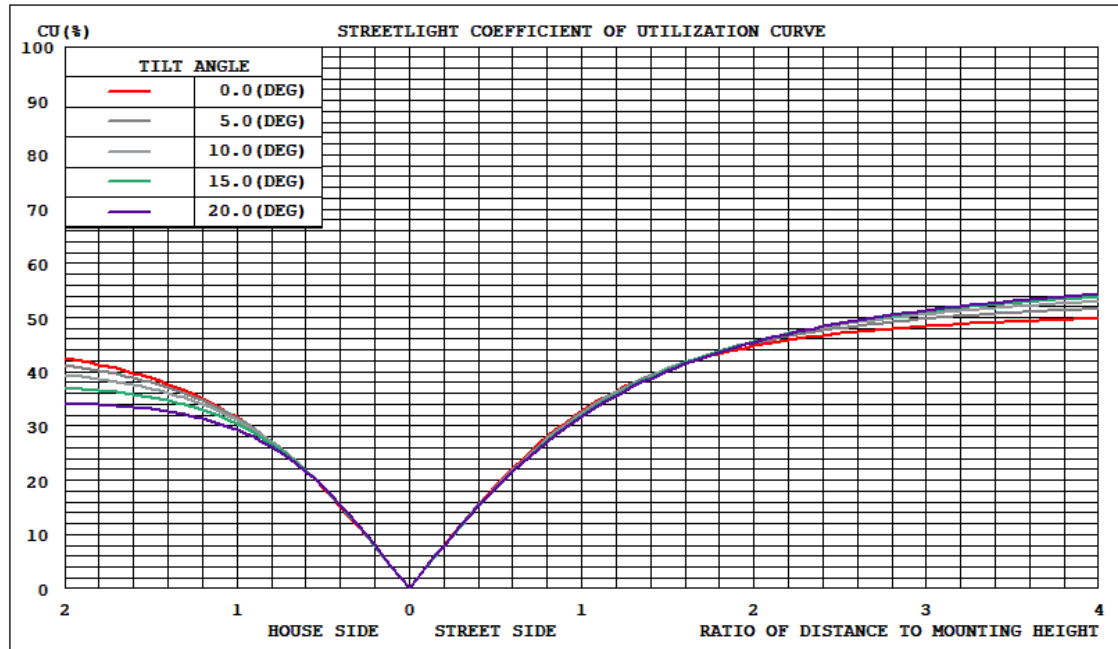
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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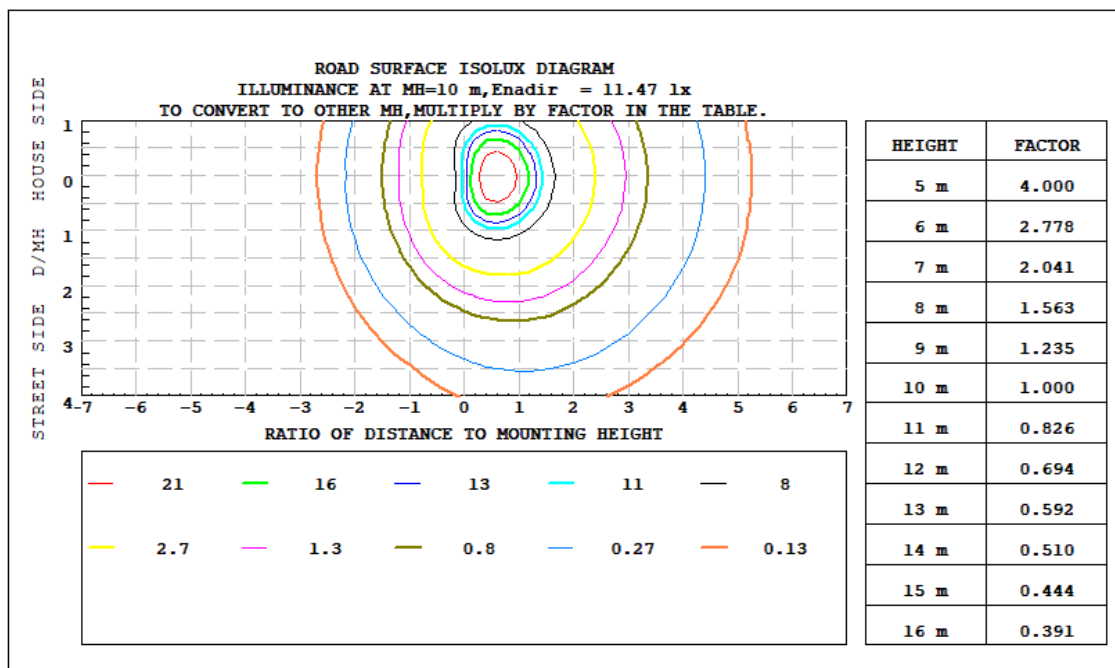
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4638.3	0	4638.3
Street Side	6086.2	0	6086.2

3.2 Goniophotometer Test

Coefficients of Utilization

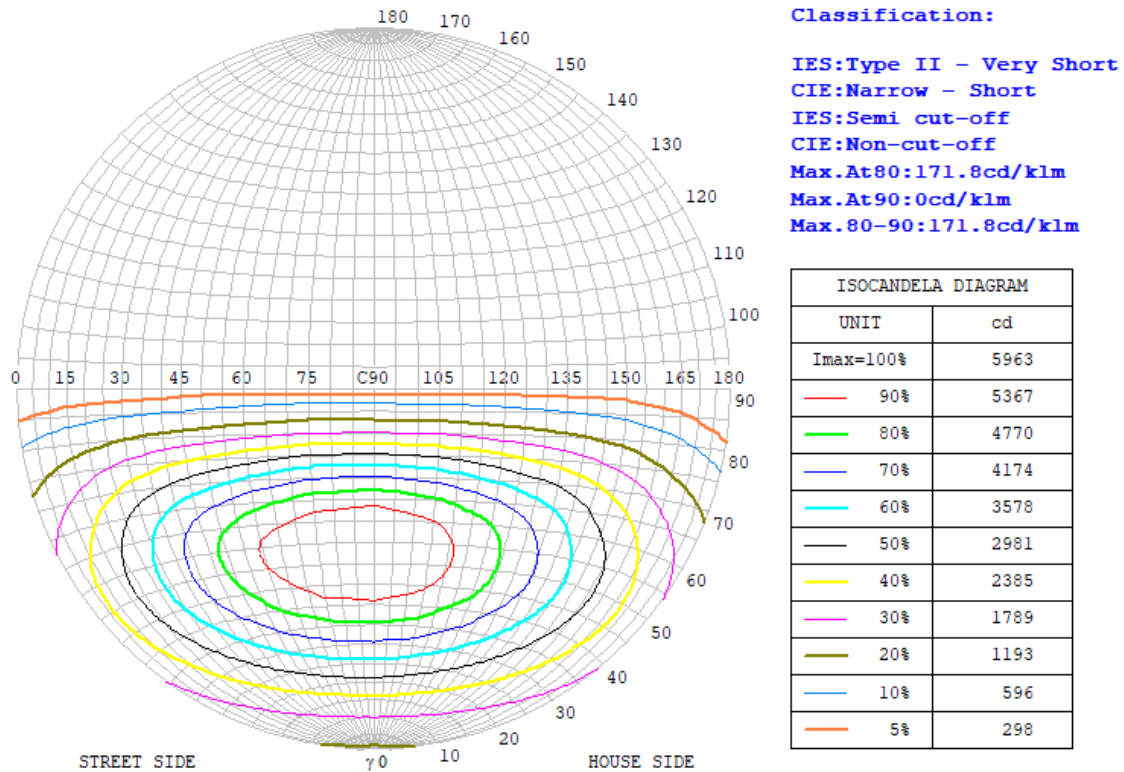


Iso-footcandle Lines of Horizontal Illumination

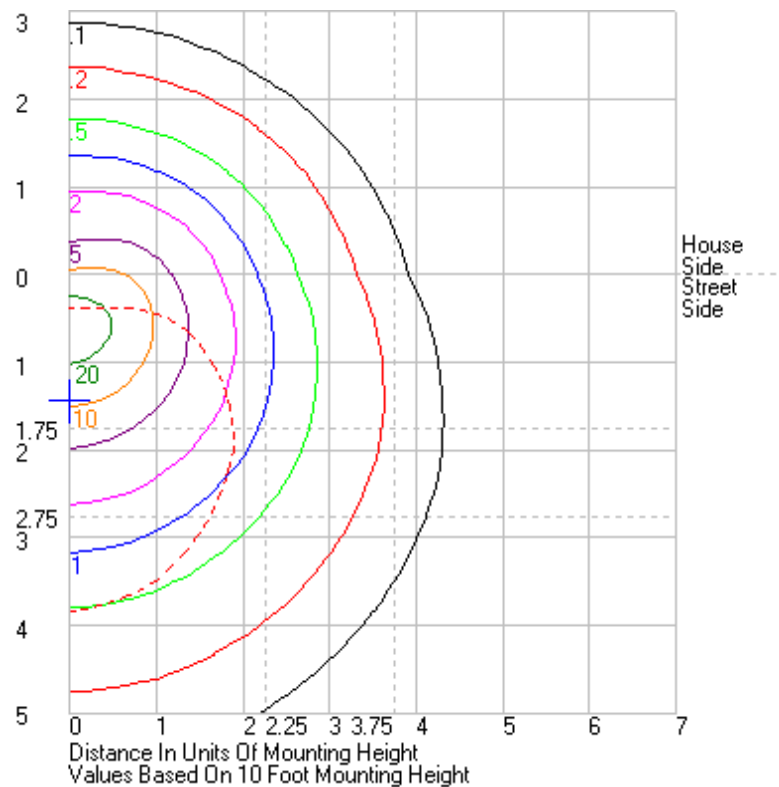


3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM



ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVATFT-100L740[H, 4]	Sample ID.	R1
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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	480.03	60	0.213	97.7	0.955	13.60%

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*****