

# Photometric Test Report

## Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014
- ☒ UL1598-2008

## Prepared For

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## Project Number

**DLF1804109**

## Report Number

**DLF20180416001-5a**

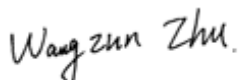
## Test Date

**2018/4/16**

## Issue Date

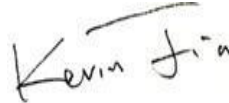
**2018/4/16**

## Prepared By



Wangzun Zhu

## Approved By



Kevin Jia

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## 1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor - Architectural Flood and Spot Luminaires				
Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
Lamp Output (lm)	IES LM-79-2008	1000	2646	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥85%	100.00%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	90	94.3	P
Allowable CCTs* (K)	IES LM-79-2008	5700	3038	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	65	70	P
Power Factor	ANSI C82.77:2014	0.873	0.928	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	9.25%	P

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/4/16	HSLED26Y	E1
2	Goniophotometer Test	2018/4/16	HSLED26Y	E1
3	THD and PF Test	2018/4/16	HSLED26Y	E1

### Remark(If any)

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- 2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

### 3.0 Production Description

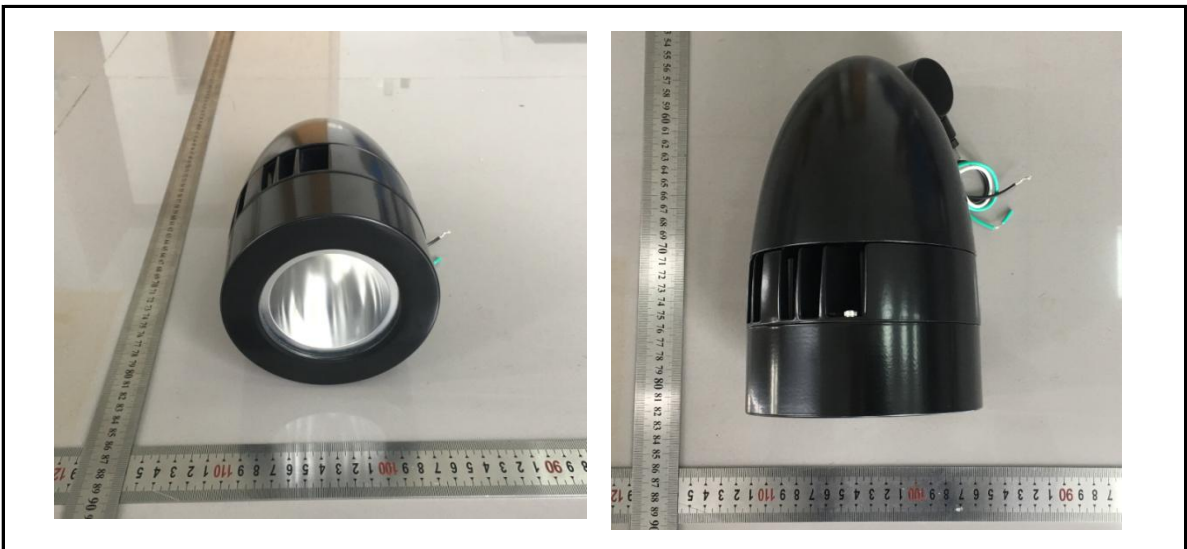
**Luminaire Description:**

**Electrical Specification:** 120V-277V,50/60HZ

**Light source:** LL725F1212-XXC

**Manufacturer Of Light Source:** Lustrous International Technology Company

#### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

Model No.	HSLED26Y	Sample ID.	E1
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  $\pm 0.2$  percent under load.

The sample was measured using  $4\pi$  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
25.1	119.98	60	0.233	27.80	0.996

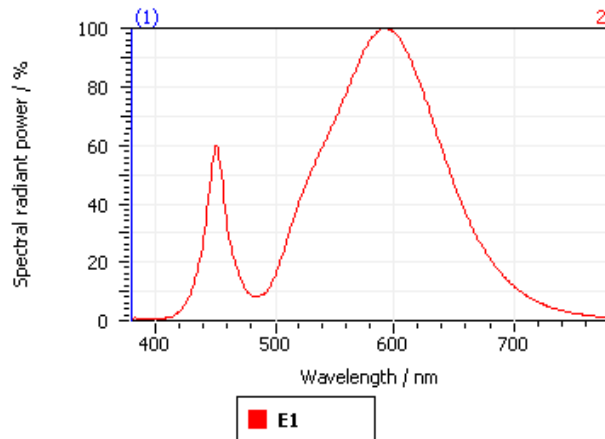
#### Test Result

CCT (K)	CRI (Ra)	Duv
3038	70.0	2.0E-03

## 4.1 Integrating Sphere Test

### Spectroradiometric Parameters

#### Results



#### Spectral values

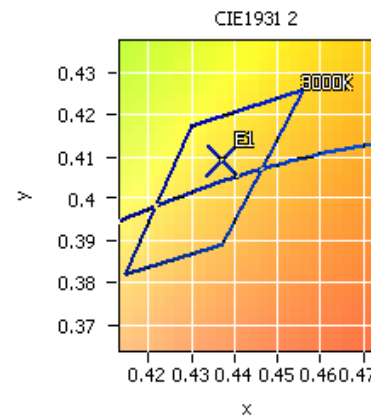
DominantWavelength	581.99 nm
Purity	0.540
PeakWavelength	592.61 nm
Width50%:	117.93 nm

#### Color Coordinates

Correlated Color Temperature 3038 K

x: 0.4371 u: 0.2485 u': 0.2485  
y: 0.4091 v: 0.3489 v': 0.5234

ResultsCRICRI01	66.2	ResultsCRICRI09	-34.0
ResultsCRICRI02	79.6	ResultsCRICRI10	51.7
ResultsCRICRI03	90.7	ResultsCRICRI11	58.2
ResultsCRICRI04	65.7	ResultsCRICRI12	38.6
ResultsCRICRI05	64.1	ResultsCRICRI13	68.3
ResultsCRICRI06	69.9	ResultsCRICRI14	94.5
ResultsCRICRI07	79.2	ResultsCRICRI15	59.3
ResultsCRICRI08	44.7	ResultsCRICRI16	59.2
ResultsCRI	70.0		



Nominal CCT: 3000K

PlanckDistance 2.0E-003

## 4.0 LM-79 Measurement and Test Results

### 4.3 Goniophotometer Test

Model No.	HSLED26Y	Sample ID.	E1
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  $\pm 0.2$  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  $0.5^{\circ}$  vertical intervals and  $10^{\circ}$  horizontal intervals.

#### Test Conditions

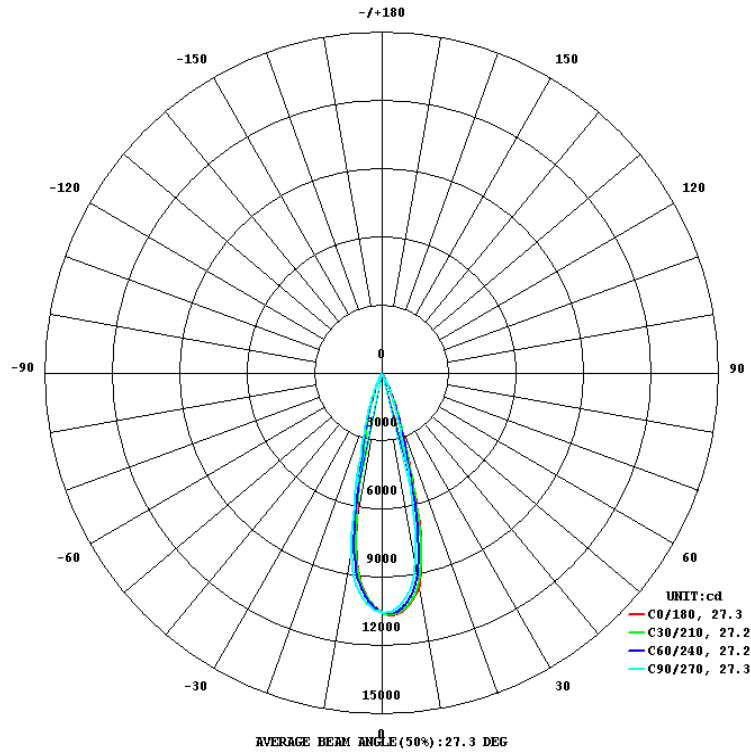
Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	277.05	60	0.109	28.05	0.927	Light Down

#### Test Result

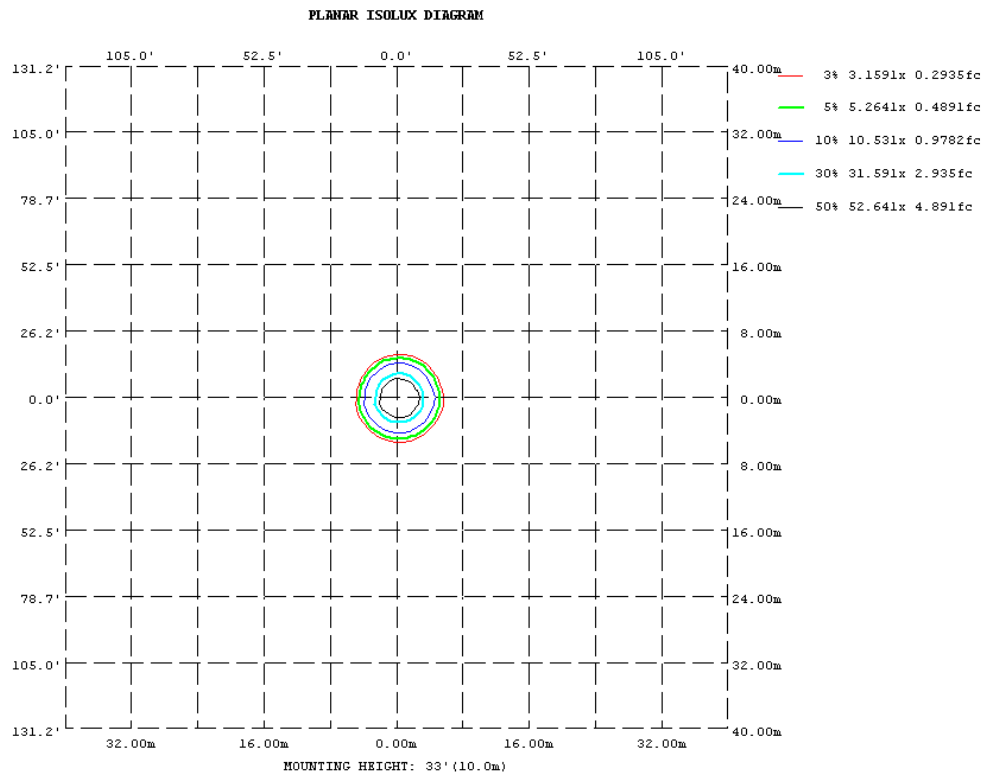
Flux(lm)	Zonal Lumen Requirement ( $0^{\circ}$ - $90^{\circ}$ )	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
2646	100.00%	48.0	47.8	27.3	27.3	94.3

### 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	955.0	926.7	859.1	773.7	661.4	695.8	788.2	876.3
20	272.0	255.2	218.1	183.3	147.3	155.1	186.2	225.2
30	41.91	35.65	25.15	17.45	10.54	11.23	19.05	27.46
40	3.603	3.394	3.081	2.691	2.325	2.358	2.715	3.105
50	1.537	1.485	1.412	1.306	1.217	1.213	1.317	1.408
60	1.017	0.9886	0.9709	0.9198	0.8865	0.8758	0.9284	0.9675
70	0.7425	0.7167	0.6726	0.6141	0.5758	0.5817	0.6298	0.6728
80	0.2881	0.2618	0.1805	0.1564	0.1195	0.1273	0.1462	0.2088
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: *10cd Less than 35% Percent = 3.0 %							



### 4.3 Goniophotometer Test

#### ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0 - 10	892.94	0 - 10	892.94	33.75%
10 - 20	1230.62	0 - 20	2123.56	80.26%
20 - 30	429.59	0 - 30	2553.15	96.49%
30 - 40	54.60	0 - 40	2607.75	98.55%
40 - 50	15.20	0 - 50	2622.96	99.13%
50 - 60	10.03	0 - 60	2632.99	99.51%
60 - 70	7.88	0 - 70	2640.87	99.81%
70 - 80	4.40	0 - 80	2645.27	99.97%
80 - 90	0.72	0 - 90	2645.99	100.00%
90 - 100	0.00	0 - 100	2645.99	100.00%
100 - 110	0.00	0 - 110	2645.99	100.00%
110 - 120	0.00	0 - 120	2645.99	100.00%
120 - 130	0.00	0 - 130	2645.99	100.00%
130 - 140	0.00	0 - 140	2645.99	100.00%
140 - 150	0.00	0 - 150	2645.99	100.00%
150 - 160	0.00	0 - 160	2645.99	100.00%
160 - 170	0.00	0 - 170	2645.99	100.00%
170 - 180	0.00	0 - 180	2645.99	100.00%

### 4.3 Goniophotometer Test

#### Axial Candela

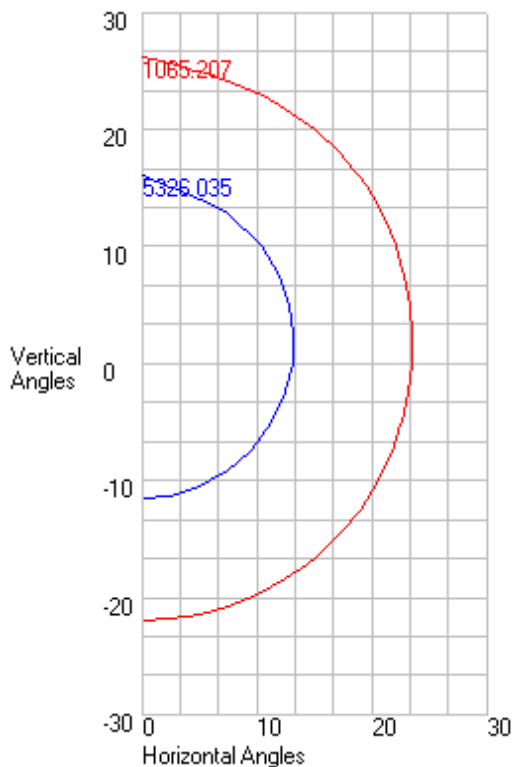
DEG.	HOR.	DEG.	VERT.
90	0	90	0.01
85	0.05	85	0.78
75	3.97	75	5.37
65	8.02	65	8.88
55	10.71	55	12.03
47.5	15.02	47.5	18.03
42.5	21.47	42.5	27.27
37.5	36.06	37.5	52.97
33	77.15	33	146.99
29	248.77	29	544.74
25.5	673.71	25.5	1171
22.5	1265.14	22.5	1917.92
19.5	2003.91	19.5	2930.83
17	2830.82	17	4405.97
15	3854.68	15	6134.48
13	5336.3	13	7941.97
11	7095.98	11	9158.55
9	8550.33	9	9832.67
7	9447.04	7	10241.81
5	9961.59	5	10505.15
3	10286.47	3	10652.07
1	10495.3	1	10622.38
0	10544.18	0	10544.18
-1	10546.83	-1	10420.46
-3	10428.11	-3	10086.35
-5	10168.88	-5	9563.37
-7	9750.78	-7	8773.35
-9	9069.09	-9	7466.47
-11	7970.53	-11	5708.97
-13	6367.25	-13	4107.21
-15	4681.35	-15	2978.34
-17	3385.94	-17	2241.67
-19.5	2344.47	-19.5	1583.41
-22.5	1520.1	-22.5	933.44
-25.5	868.02	-25.5	443.35
-29	358.39	-29	156.63
-33	99.24	-33	54.54
-37.5	42.28	-37.5	29.66
-42.5	23.91	-42.5	18.9
-47.5	16.37	-47.5	13.76
-55	11.32	-55	10.14
-65	8.4	-65	7.58
-75	4.41	-75	3.4
-85	0.16	-85	0.05
-90	0.01	-90	0

### 4.3 Goniophotometer Test

#### Characteristics

NEMA Type	4 H x 4 V
Maximum Candela	10652.07
Maximum Candela Angle	0 H 3 V
Horizontal Beam Angle (50%)	27.4
Vertical Beam Angle (50%)	27.4
Horizontal Field Angle (10%)	48.1
Vertical Field Angle (10%)	48
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	1474
Beam Efficiency	N.A.
Field Lumens	2388
Field Efficiency	N.A.
Spill Lumens	259
Luminaire Lumens	2646
Total Efficiency	N.A.
Total Luminaire Watts	28.053
Ballast Factor	1

#### ISOCANDELA CURVES



## Axial Candela

	0	1	3	5	7	9	11	13	15	17	19.5	22.5	25.5	29	33	37.5	42.5	47.5	55	65	75	85	90
90	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0.78	0.76	0.72	0.69	0.65	0.61	0.57	0.51	0.46	0.44	0.42	0.39	0.36	0.32	0.26	0.2	0.13	0.08	0.02	0.01	0.01	0	0
75	5.37	5.33	5.25	5.16	5.02	4.91	4.78	4.64	4.52	4.42	4.29	4.12	3.93	3.68	3.38	3.01	2.56	2.07	1.3	0.44	0.02	0.01	0
65	8.88	8.86	8.8	8.73	8.65	8.57	8.47	8.37	8.28	8.2	8.09	7.92	7.75	7.45	7.09	6.6	5.95	5.19	3.89	1.9	0.36	0.01	0
55	12.03	11.99	11.9	11.74	11.58	11.41	11.24	11.08	10.93	10.78	10.57	10.32	10.07	9.76	9.38	8.95	8.38	7.69	6.29	3.74	1.02	0.01	0
47.5	18.03	17.92	17.7	17.24	16.81	16.32	15.81	15.42	15.01	14.57	14	13.34	12.69	11.89	11.12	10.38	9.62	8.92	7.62	4.99	1.63	0.01	0
42.5	27.27	27.04	26.58	25.55	24.58	23.51	22.48	21.74	20.78	19.69	18.49	17.15	15.71	14.28	12.96	11.6	10.51	9.59	8.28	5.7	2.04	0.01	0
37.5	52.97	52.09	49.56	46.57	43.5	39.64	37.13	34.67	32.18	29.75	27.04	23.63	20.84	18.12	15.51	13.36	11.55	10.31	8.82	6.31	2.46	0.02	0
33	146.99	144.24	133.2	117.48	99.66	87.41	77.44	66.41	57.78	50.38	42.3	34.57	28.64	23.33	18.91	15.39	12.8	10.96	9.22	6.76	2.8	0.02	0
29	544.74	527.59	476.09	412.5	340.58	284.89	231.88	191.84	145.71	103.97	75.58	54.88	40.75	30.8	23.04	17.77	13.96	11.62	9.54	7.09	3.07	0.02	0
25.5	1171 *	1141.7	1049.64	934.91	812.73	707.42	593.66	476.22	362.2	261.34	174.48	92.77	59.45	39.87	27.8	20.16	15.17	12.26	9.8	7.37	3.28	0.03	0
22.5	1917.92	1874.11	1736.78	1572.57	1418.92	1261.08	1073.51	883.2	695.71	519.94	331.67	184.42	89.53	52.42	32.97	22.49	16.34	12.83	10.01	7.52	3.44	0.03	0
19.5	2930.83	2856.89	2626.73	2357.29	2156.18	1929.23	1679.27	1420.74	1147.82	876.67	587.8	314.1	157.77	69.05	39.12	25.27	17.39	13.34	10.19	7.67	3.58	0.04	0
17	4405.97	4258.53	3807.92	3352.12	3005.66	2638.74	2268.54	1905.68	1563.47	1241.29	844.53	474.5	225.13	90.29	45.26	27.29	18.33	13.73	10.33	7.77	3.68	0.04	0
15	6134.48	5912.76	5229.78	4581.57	4002.62	3402.29	2851.56	2354.17	1942.12	1524.52	1074.31	618.89	300.53	114.63	50.64	29.11	19.16	14.03	10.43	7.84	3.76	0.04	0
13	7941.97	7690.02	6905.56	6196.48	5358.64	4419.44	3559.67	2861.15	2291.93	1811.9	1303.92	765.98	384.27	152.3	56.47	30.86	19.83	14.31	10.53	7.89	3.81	0.05	0
11	9158.55	8964.92	8342.07	7800.26	6831.49	5650.06	4454.09	3439.5	2687.53	2098.01	1504.64	910.43	466.61	179.79	63.2	32.55	20.29	14.56	10.59	7.94	3.86	0.05	0
9	9832.67	9671.46	9258.79	8821.7	8029.67	6840.65	5401.54	4078.37	3083.18	2364.8	1689.17	1041.52	544.35	203.84	68.8	33.95	20.78	14.76	10.65	7.98	3.9	0.05	0
7	10241.8	10091.5	9782.32	9462.46	8814.17	7745.97	6252.32	4692.99	3465.81	2597.44	1841.29	1156.1	608.37	226.19	72.85	35.3	21.16	14.91	10.69	8	3.93	0.05	0
5	10505.1	10355.0	10117.1	9823.16	9311.21	8320.81	6901.68	5170.22	3749.86	2776.44	1956.09	1237.01	654.43	244.24	76.44	35.9	21.43	15.02	10.72	8.02	3.99	0.05	0
3	10652.0	10504.8	10314.5	10006.9	9499.8	8610.23	7172.69	5420.57	3918.33	2876.52	2018.17	1273.68	680.65	254.11	78.21	36.29	21.7	15.12	10.75	8.04	3.98	0.05	0
1	10622.3	10553.7	10349.1	10046.0	9539.15	8667.82	7234.86	5461.24	3940.06	2882.03	2029.94	1282.21	684.73	254.15	78.18	36.29	21.55	15.05	10.72	8.03	3.97	0.05	0
0	10544.1	10495.3	10286.4	9961.59	9447.04	8550.33	7095.98	5336.3	3854.68	2830.82	2003.91	1265.14	673.71	248.77	77.15	36.06	21.47	15.02	10.71	8.02	3.97	0.05	0
-1	10420.4	10380.9	10179.5	9869.44	9338.71	8432.51	6963.57	5221.31	3778.75	2788.39	1979.87	1249.46	664.25	244.18	76.22	35.85	21.4	14.99	10.7	8.01	3.97	0.05	0
-3	10086.3	10050.0	9851.5	9482.7	8898.11	7884.04	6340.15	4726.46	3466.96	2615.42	1871.74	1176.06	620.67	226.1	72.56	35.01	21.25	14.92	10.67	8	3.96	0.05	0
-5	9563.37	9568.97	9329.71	8945.25	8259.74	7005.3	5563.32	4131.22	3097.87	2393.74	1724.11	1076.31	558.8	203.17	67.76	33.86	20.71	14.69	10.6	7.96	3.95	0.05	0
-7	8773.35	8782.83	8498.42	8040.85	7061.14	5830.52	4549.72	3486.79	2716.55	2139.13	1551.56	947.79	484.07	177.36	62.1	32.6	20.19	14.47	10.52	7.92	3.89	0.05	0
-9	7466.47	7483.61	7120.91	6473.04	5586.37	4558.69	3644.3	2896.79	2336.36	1866.16	1359.91	802.26	399.31	146.57	56.75	30.75	19.59	14.21	10.43	7.88	3.84	0.05	0
-11	5708.97	5710.6	5366.28	4904.09	4188.76	3505.95	2893.81	2406.51	1985.3	1588.48	1137.69	654.33	311.21	113.37	51.13	28.95	18.92	13.91	10.33	7.82	3.79	0.05	0
-13	4107.21	4103.56	3876.9	3539.68	3126.03	2722.41	2339.56	1979.89	1638.27	1314.52	904.05	504.18	230.49	91.04	45.28	27.14	18.3	13.6	10.22	7.75	3.72	0.04	0
-15	2978.34	2973.64	2844.55	2652.07	2415.11	2153.18	1885.5	1596.05	1334.71	1028.01	685.54	365.17	172.36	73.02	40.28	25.4	17.54	13.27	10.09	7.67	3.66	0.04	0
-17	2241.67	2241.2	2166.95	2043.11	1882.13	1681.54	1474.3	1242.92	996.17	749.91	488.46	246.05	117.35	59.84	35.92	23.66	16.68	12.92	9.96	7.59	3.57	0.04	0
-19.5	1583.41	1582.21	1531.55	1445.13	1330.94	1179.8	1000.65	817.24	634.73	464.53	284.85	151.03	78.63	47.52	31.13	21.72	15.73	12.44	9.78	7.46	3.46	0.03	0
-22.5	933.44	933.26	897.41	837.59	751.48	647.8	534.82	419.61	310.97	220.75	140.75	80.07	54.06	37.64	26.33	19.28	14.68	11.85	9.56	7.29	3.3	0.03	0
-25.5	443.35	443.16	422.78	386.47	337.84	282.72	228.98	188.29	141.34	98.35	72.47	52.38	39.58	29.76	22.5	17.24	13.61	11.32	9.34	7.1	3.12	0.02	0
-29	156.63	156.16	147.92	134.13	114.29	96.29	83.57	72.49	61.64	53.08	44.07	36.04	29.15	23.79	18.92	15.29	12.56	10.72	9.05	6.8	2.89	0.02	0
-33	54.54	54.46	53.29	51.34	48.67	46.01	42.81	38.98	35.67	32.52	28.92	25.11	21.83	18.63	15.79	13.4	11.42	10.1	8.71	6.43	2.6	0.02	0
-37.5	29.66	29.63	29.25	28.63	27.9	26.67	25.56	24.34	23.06	21.75	20.28	18.32	16.64	14.94	13.27	11.71	10.42	9.49	8.29	5.94	2.24	0.02	0
-42.5	18.9	18.88	18.83	18.46	18.11	17.69	17.21	16.79	16.22	15.56	14.8	13.98	13.14	12.18	11.23	10.34	9.55	8.84	7.72	5.3	1.83	0.01	0
-47.5	13.76	13.74	13.71	13.55	13.4	13.21	12.99	12.75	12.48	12.17	11.79	11.33	10.9	10.41	9.88	9.36	8.78	8.2	7.01	4.55	1.4	0.01	0
-55	10.14	10.13	10.11	10.04	9.98	9.9	9.81	9.72	9.62	9.51	9.37	9.18	8.98	8.75	8.46	8.08	7.57	6.93	5.62	3.26	0.82	0.01	0
-65	7.58	7.57	7.56	7.52	7.48	7.43	7.37	7.3	7.23	7.15	7.04	6.87	6.71	6.42	6.08	5.63	5.02	4.34	3.17	1.44	0.22	0.01	0
-75	3.4	3.4	3.4	3.4	3.35	3.32	3.27	3.22	3.17	3.1	3.01	2.88	2.73	2.55	2.32	2.03	1.68	1.3	0.76	0.22	0.01	0	0
-85	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0	0	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## LUMEN TABULATION

	0	1	3	5	7	9	11	13	15	17	20	23	26	29	33	38	43	48	55	65	75	85	90	Total
90		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
85		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
75		0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	
65		0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
55		0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
47.5		0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
42.5		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
37.5		0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
33		0.4	0.8	0.7	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
29		0.9	1.8	1.6	1.5	1.3	1.1	0.9	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
25.5		1.40 *	2.71 *	2.54 *	2.32 *	2.1	1.8	1.5	1.2	0.9	0.8	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0	0	0	0	
22.5		2.20 *	4.25 *	3.97 *	3.64 *	3.28 *	2.88 *	2.45 *	2	1.6	1.4	1	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0	0	0	0	
19.5		2.77 *	5.30 *	4.88 *	4.40 *	3.92 *	3.41 *	2.90 *	2.41 *	1.92 *	1.8	1.3	0.7	0.4	0.2	0.1	0.1	0	0	0	0	0	0	
17		3.18 *	6.05 *	5.50 *	4.88 *	4.23 *	3.58 *	2.98 *	2.46 *	1.98 *	1.85 *	1.4	0.8	0.4	0.2	0.1	0.1	0	0	0	0	0	0	
15		4.25 *	8.11 *	7.41 *	6.57 *	5.60 *	4.60 *	3.71 *	2.99 *	2.38 *	2.24 *	1.8	1	0.5	0.2	0.1	0.1	0	0	0	0	0	0	
13		5.17 *	9.98 *	9.33 *	8.44 *	7.22 *	5.87 *	4.61 *	3.58 *	2.79 *	2.62 *	2.10 *	1.2	0.6	0.3	0.1	0.1	0	0	0	0	0	0	
11		5.76 *	11.24 *	10.74 *	9.97 *	8.76 *	7.23 *	5.62 *	4.25 *	3.23 *	2.99 *	2.40 *	1.4	0.8	0.3	0.1	0.1	0	0	0	0	0	0	
9		6.09 *	11.97 *	11.59 *	10.95 *	9.91 *	8.40 *	6.60 *	4.93 *	3.65 *	3.32 *	2.67 *	1.6	0.9	0.3	0.1	0.1	0	0	0	0	0	0	
7		6.30 *	12.42 *	12.09 *	11.56 *	10.65 *	9.26 *	7.41 *	5.51 *	4.02 *	3.59 *	2.88 *	1.7	0.9	0.4	0.1	0.1	0	0	0	0	0	0	
5		6.42 *	12.68 *	12.38 *	11.89 *	11.06 *	9.74 *	7.90 *	5.91 *	4.27 *	3.78 *	3.01 *	1.8	1	0.4	0.1	0.1	0	0	0	0	0	0	
3		6.46 *	12.78 *	12.49 *	12.00 *	11.20 *	9.92 *	8.09 *	6.08 *	4.38 *	3.86 *	3.07 *	1.8	1	0.4	0.1	0.1	0	0	0	0	0	0	
1		3.22 *	6.38 *	6.23 *	5.98 *	5.58 *	4.94 *	4.03 *	3.02 *	2.18 *	1.92 *	1.53 *	0.9	0.5	0.2	0.1	0	0	0	0	0	0	0	
0																								

-1	3.19 *	6.32 *	6.18 *	5.93 *	5.52 *	4.87 *	3.95 *	2.96 *	2.14 *	1.90 *	1.51 *	0.9	0.5	0.2	0.1	0	0	0	0	0	0	0	
-3	6.25 *	12.40 *	12.08 *	11.56 *	10.70 *	9.34 *	7.51 *	5.62 *	4.09 *	3.66 *	2.93 *	1.7	1	0.4	0.1	0.1	0	0	0	0	0	0	
-5	6.00 *	11.92 *	11.58 *	11.00 *	10.02 *	8.56 *	6.78 *	5.06 *	3.74 *	3.40 *	2.73 *	1.6	0.9	0.4	0.1	0.1	0	0	0	0	0	0	
-7	5.61 *	11.17 *	10.81 *	10.11 *	8.96 *	7.46 *	5.84 *	4.41 *	3.33 *	3.08 *	2.49 *	1.5	0.8	0.3	0.1	0.1	0	0	0	0	0	0	
-9	4.98 *	9.94 *	9.53 *	8.69 *	7.50 *	6.14 *	4.83 *	3.74 *	2.90 *	2.73 *	2.20 *	1.3	0.7	0.3	0.1	0.1	0	0	0	0	0	0	
-11	4.06 *	8.14 *	7.74 *	6.94 *	5.91 *	4.86 *	3.91 *	3.12 *	2.48 *	2.35 *	1.9	1.1	0.6	0.2	0.1	0.1	0	0	0	0	0	0	
-13	3.03 *	6.10 *	5.82 *	5.23 *	4.51 *	3.79 *	3.14 *	2.58 *	2.08 *	1.97 *	1.6	0.8	0.4	0.2	0.1	0.1	0	0	0	0	0	0	
-15	2.18 *	4.40 *	4.24 *	3.88 *	3.43 *	2.97 *	2.53 *	2.11 *	1.71 *	1.6	1.2	0.6	0.3	0.2	0.1	0.1	0	0	0	0	0	0	
-17	1.60 *	3.23 *	3.15 *	2.94 *	2.66 *	2.34 *	2.01 *	1.68 *	1.3	1.2	0.9	0.5	0.2	0.1	0.1	0.1	0	0	0	0	0	0	
-20	1.47 *	2.95 *	2.90 *	2.73 *	2.48 *	2.18 *	1.86 *	1.5	1.2	1.1	0.8	0.4	0.2	0.1	0.1	0.1	0	0	0	0	0	0	
-23	1.16 *	2.33 *	2.29 *	2.16 *	2	1.7	1.4	1.1	0.9	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0	0	0	0	
-26	0.6	1.3	1.3	1.2	1.1	0.9	0.7	0.6	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0	0.1	0	0	0	0	
-29	0.3	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	
-33	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
-38	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
-43	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
-48	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
-55	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
-65	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	
-75	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	
-85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	96	189	181	169	152	130	105	81	61	56	44	26	15	7	3.8	2.6	1.8	1.9	1.5	0.6	0.1	0	1323

## 5.0 THD and PF Test

Model No.	HSLED26Y	Sample ID.	E1
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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	119.98	60	0.233	27.80	0.996	5.16%
25.1	277.01	60	0.109	28.06	0.928	9.25%

## 6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last	Calibration Due
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\*\*\*\*\*