

Photometric Test Report

Relevant Standards

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

Prepared For

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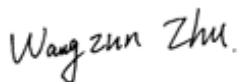
Test Date

2018/4/16

Issue Date

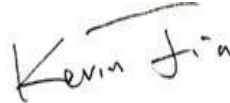
2018/4/16

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	3367	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥85%	100.00%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	110	119.5	P
Allowable CCTs* (K)	IES LM-79-2008	5700	5084	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	65	71.5	P
Power Factor	ANSI C82.77:2014	0.873	0.930	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	8.94%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/4/16	HBLED26	K1
2	Goniophotometer Test	2018/4/16	HBLED26	K1
3	THD and PF Test	2018/4/16	HBLED26	K1

Remark(If any)

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3.0 Production Description

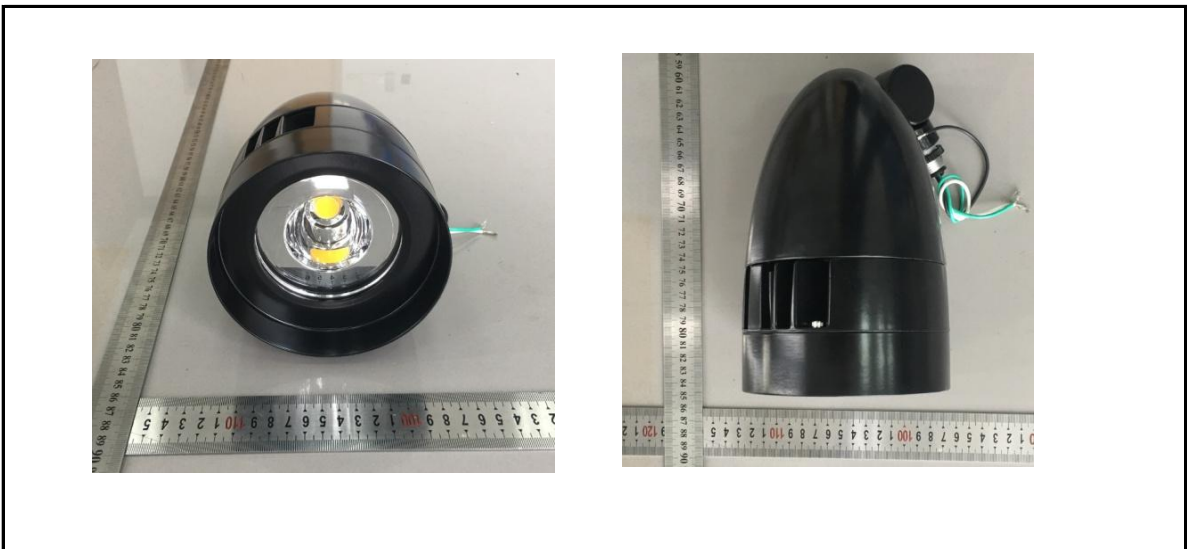
Luminaire Description:

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.	HBLED26	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
25.1	120.03	60	0.235	28.10	0.995

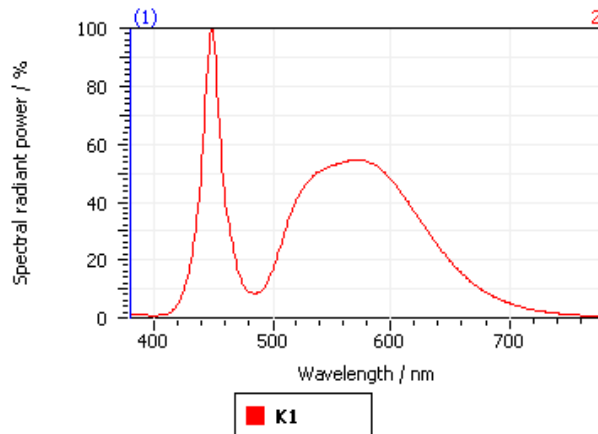
Test Result

CCT (K)	CRI (Ra)	Duv
5084	71.5	1.2E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

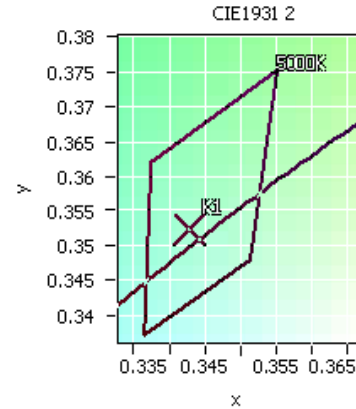
DominantWavelength	570.19 nm
Purity	0.087
PeakWavelength	448.85 nm
Width50%	18.22 nm

Color Coordinates

Correlated Color Temperature 5084 K

x: 0.3430 u: 0.2097 u': 0.2097
y: 0.3524 v: 0.3232 v': 0.4847

ResultsCRICRI01	69.6	ResultsCRICRI09	-29.1
ResultsCRICRI02	76.3	ResultsCRICRI10	42.3
ResultsCRICRI03	79.8	ResultsCRICRI11	68.8
ResultsCRICRI04	72.4	ResultsCRICRI12	39.2
ResultsCRICRI05	69.9	ResultsCRICRI13	70.3
ResultsCRICRI06	66.4	ResultsCRICRI14	88.4
ResultsCRICRI07	80.4	ResultsCRICRI15	64.1
ResultsCRICRI08	57.2	ResultsCRICRI16	66.5
ResultsCRI	71.5		



Nominal CCT: 5000K

PlanckDistance 1.2E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	HBLED26	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

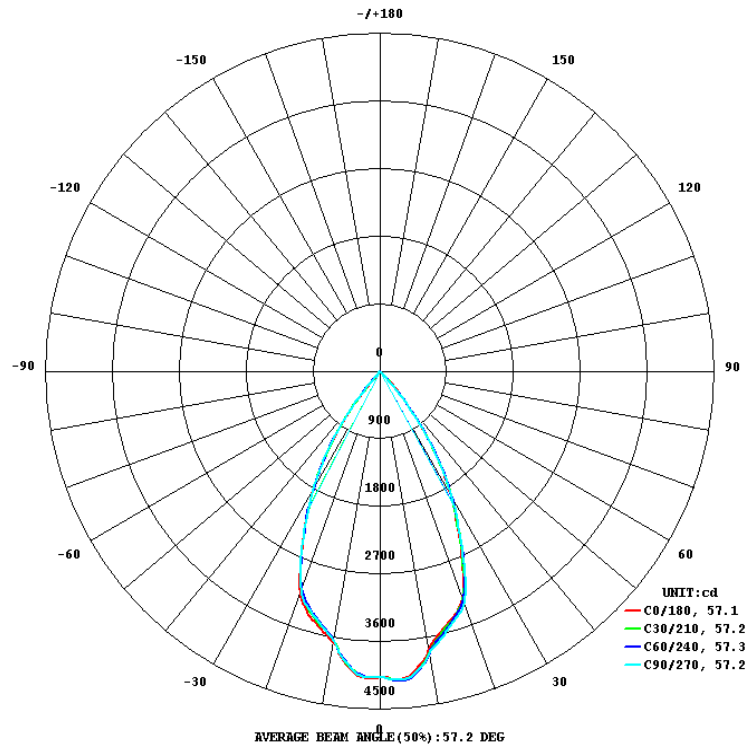
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	277.04	60	0.109	28.16	0.930	Light Down

Test Result

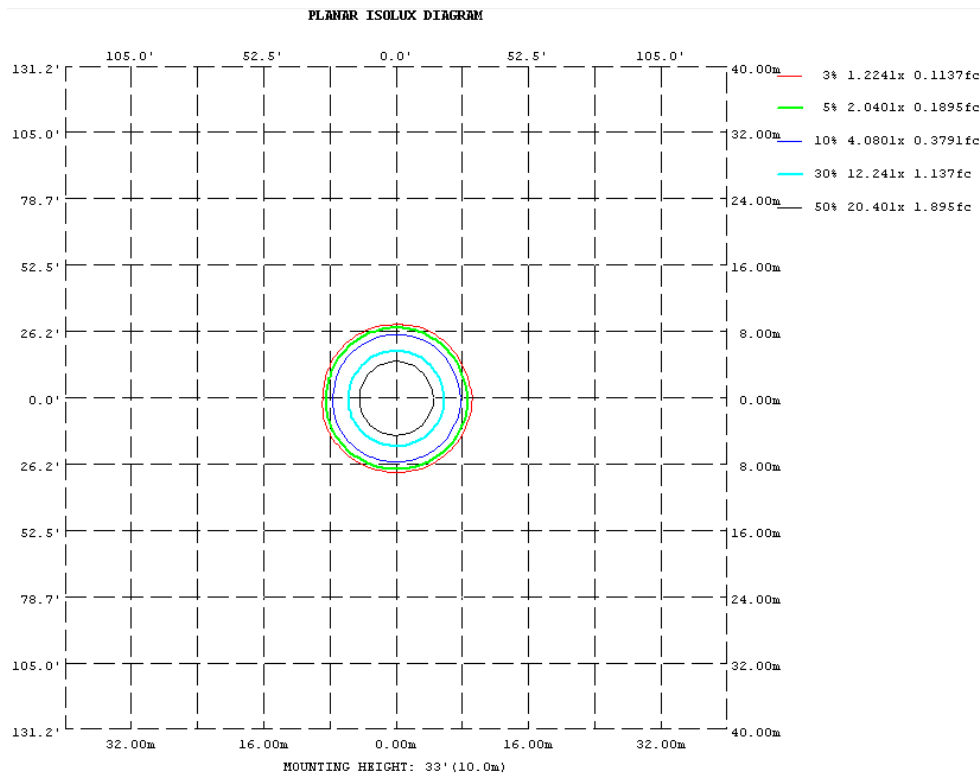
Flux(lm)	Zonal Lumen Requirement (0°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3367	100.00%	81.4	81.7	57.2	57.1	119.5

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 3.5 %									
γ	C0	C45	C90	C135	C180	C225	C270	C315		
10	3771	3819	3821	3785	3661	3626	3633	3644		
20	3245	3237	3299	3273	3151	3090	3111	3106		
30	1924	1946	1939	1925	1797	1799	1806	1812		
40	579.6	572.4	536.8	552.7	440.0	459.3	465.0	475.5		
50	16.27	16.18	13.30	14.01	12.17	13.96	12.13	13.95		
60	2.625	2.581	2.251	2.370	2.114	2.015	1.914	2.207		
70	1.136	1.076	0.3182	0.9824	0.8415	0.8542	0.4461	0.9431		
80	0.0386	0.0466	0.0996	0.0427	0.0300	0.0476	0.1836	0.0496		
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	375.17	0 - 10	375.17	11.14%
10 - 20	971.27	0 - 20	1346.44	39.99%
20 - 30	1153.98	0 - 30	2500.42	74.26%
30 - 40	727.96	0 - 40	3228.38	95.88%
40 - 50	130.22	0 - 50	3358.60	99.75%
50 - 60	6.45	0 - 60	3365.04	99.94%
60 - 70	1.64	0 - 70	3366.68	99.99%
70 - 80	0.32	0 - 80	3367.00	100.00%
80 - 90	0.04	0 - 90	3367.04	100.00%
90 - 100	0.00	0 - 100	3367.04	100.00%
100 - 110	0.00	0 - 110	3367.04	100.00%
110 - 120	0.00	0 - 120	3367.04	100.00%
120 - 130	0.00	0 - 130	3367.04	100.00%
130 - 140	0.00	0 - 140	3367.04	100.00%
140 - 150	0.00	0 - 150	3367.04	100.00%
150 - 160	0.00	0 - 160	3367.04	100.00%
160 - 170	0.00	0 - 170	3367.04	100.00%
170 - 180	0.00	0 - 180	3367.04	100.00%

4.3 Goniophotometer Test

Axial Candela

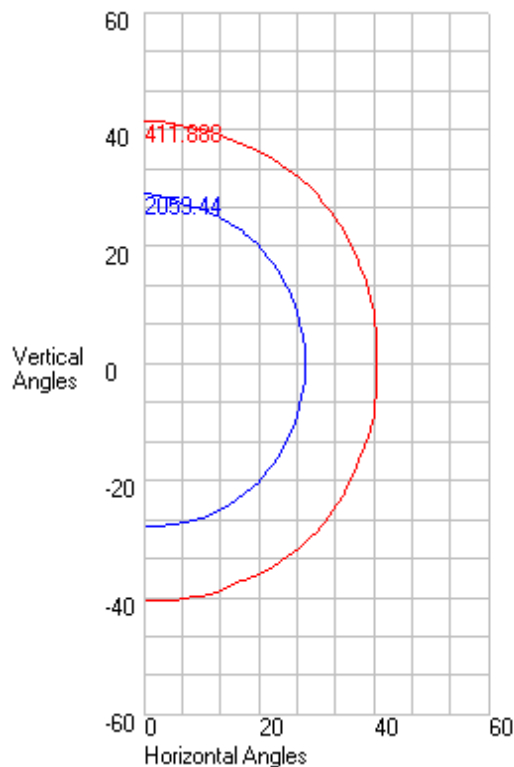
DEG.	HOR.	DEG.	VERT.
90	0	90	0.01
85	0.15	85	0.02
75	0.25	75	0.15
65	1.15	65	2.13
55	3.39	55	5.99
47.5	21.24	47.5	45.48
42.5	198.08	42.5	290.77
37.5	777.27	37.5	904.28
33	1411.05	33	1529.41
29	1932.64	29	2055.63
25.5	2395.85	25.5	2534.57
22.5	2787.38	22.5	2960.33
19.5	3155.63	19.5	3279.5
17	3302.41	17	3411.04
15	3389.76	15	3480.92
13	3482.91	13	3578.29
11	3578.48	11	3683.03
9	3724.62	9	3867.53
7	3889.64	7	3997.36
5	4015.23	5	4085.74
3	4071.92	3	4104.25
1	4074.29	1	4074.13
0	4072.05	0	4072.05
-1	4076.98	-1	4083
-3	4114.52	-3	4082.46
-5	4102.48	-5	4031.4
-7	4033.57	-7	3918.09
-9	3918.34	-9	3728.89
-11	3747.34	-11	3616.48
-13	3654.04	-13	3529.33
-15	3549.12	-15	3445.6
-17	3455.4	-17	3360.38
-19.5	3335.6	-19.5	3195
-22.5	3033.37	-22.5	2816.9
-25.5	2559.08	-25.5	2389.18
-29	2074.94	-29	1923.09
-33	1531.55	-33	1383.04
-37.5	874.47	-37.5	752.73
-42.5	224.76	-42.5	216.36
-47.5	30.54	-47.5	23.64
-55	5.12	-55	4.36
-65	1.3	-65	1.81
-75	0.14	-75	0.07
-85	0.08	-85	0.01
-90	0.01	-90	0

4.3 Goniophotometer Test

Characteristics

NEMA Type	5 H x 5 V
Maximum Candela	4118.88
Maximum Candela Angle	-3 H 1 V
Horizontal Beam Angle (50%)	57.2
Vertical Beam Angle (50%)	57.1
Horizontal Field Angle (10%)	81.7
Vertical Field Angle (10%)	82.3
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	2372
Beam Efficiency	N.A.
Field Lumens	3270
Field Efficiency	N.A.
Spill Lumens	96
Luminaire Lumens	3367
Total Efficiency	N.A.
Total Luminaire Watts	28.1647
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	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0	0
85	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.05	0.02	0	0
75	0.15	0.15	0.14	0.13	0.11	0.1	0.09	0.08	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.06	0.06	0.05	0.05	0.07	0.09	0.02	0
65	2.13	2.13	2.13	2.11	2.1	2.08	2.04	1.98	1.9	1.81	1.7	1.54	1.44	1.23	1.08	0.87	0.24	0.18	0.1	0.1	0.11	0.07	0
55	5.99	5.92	5.79	5.46	5.13	4.74	4.26	3.77	3.49	3.29	3.07	2.82	2.58	2.33	2.11	1.97	1.77	1.25	0.3	0.14	0.12	0.12	0
47.5	45.48	43.73	40.25	34.41	29.3	24.35	19.95	17.75	16.21	14.79	12.6	10.27	8.14	6.27	3.8	2.78	2.17	1.89	1.08	0.18	0.14	0.13	0
42.5	290.77	283.76	269.77	238.98	212.55	185.72	161.45	142.6	116.07	82.09	47.21	29.05	20.35	14.46	9.5	5.58	2.86	2.15	1.45	0.25	0.16	0.13	0
37.5	904.28	891.88	853.36	804.78	752.28	675.77	615.87	551.08	478.54	400.1	311.11	204.88	126.46	41.17	20.19	10.67	5.42	2.64	1.73	0.36	0.17	0.13	0
33	1529.41	1514.66	1468.87	1410.39	1337.31	1270.36	1200.69	1103.85	1008.58	902.88	754.62	571.27	384.17	209.09	68.7	19.83	9.45	3.32	1.9	0.4	0.18	0.13	0
29	2055.63	2040.65	1993.03	1932.81	1857.43	1789.31	1709.2	1620.8	1500.8	1375.19	1203.28	991.74	742.51	477.58	206.51	40.13	14.06	5.86	2.05	0.43	0.19	0.14	0
25.5	2534.57	2513.13	2445.22	2357.14	2266.45	2197.39	2115.15	2017.74	1903.57	1773.59	1589.79	1335.71	1068.73	744.75	387.38	119.44	19.07	7.67	2.2	0.56	0.2	0.14	0
22.5	2960.33	2930.25	2840.02	2737.99	2658.93	2587.18	2482.39	2335.74	2208.79	2078.29	1885.79	1629.2	1338.95	997.02	577.96	200.38	26.24	9.88	2.33	0.76	0.21	0.14	0
19.5	3279.5	3261.23	3205.51	3127.79	3057.12	2958.62	2809.93	2677.56	2547.68	2358.1	2155.49	1885.07	1590.68	1210.85	760.57	311.98	36.19	11.28	2.46	0.94	0.21	0.14	0
17	3411.04	3394.7	3349.06	3300.61	3260.12	3190.84	3096.74	2965.61	2772.38	2618.64	2358.47	2079.38	1771.22	1380.01	907.41	398.96	67.68	13.26	2.58	1.01	0.22	0.15	0
15	3480.92	3468.58	3432.74	3391.8	3351.61	3299.94	3233.23	3129.29	3001.19	2775.97	2553.92	2208.18	1899.46	1503.48	1014.11	474.01	99.77	14.77	2.69	1.06	0.22	0.15	0
13	3578.29	3561.12	3510.82	3465.49	3418.75	3366.51	3308.52	3234.51	3127.5	2966.06	2695.39	2334.85	2015.88	1619.76	1111.59	542.45	128.11	16.1	2.78	1.08	0.23	0.15	0
11	3683.03	3657.94	3592.55	3552.4	3492.89	3434.72	3365.9	3300.2	3220.69	3092.48	2817.08	2479.41	2116.27	1706.63	1208.38	607.63	147.82	17.24	2.86	1.1	0.23	0.15	0
9	3867.53	3825.65	3713.33	3639.87	3570.81	3504.31	3432.91	3362.74	3273.89	3176.23	2951.25	2592.69	2200.63	1783.44	1276.77	665.98	167.36	18.2	2.93	1.12	0.23	0.15	0
7	3997.36	3954.93	3872.94	3799.59	3654.19	3563.56	3482.84	3411.29	3327.22	3236.2	3040.31	2671.03	2268.39	1843.18	1323.9	718.94	182.13	19.21	3.14	1.13	0.24	0.15	0
5	4085.74	4054.48	3988.09	3905.44	3796.15	3626.05	3528.4	3443.97	3363.11	3274.05	3099.08	2729.12	2324.19	1887.85	1366.83	745.58	192.23	20.22	3.28	1.14	0.24	0.15	0
3	4104.25	4096.18	4058.52	3980.54	3859.87	3672.51	3560.49	3469.19	3382.95	3292.81	3136.71	2765.11	2367.67	1917.3	1395.45	767.32	202.48	21.29	3.42	1.15	0.25	0.15	0
1	4074.13	4087.4	4078.67	4023.33	3892.65	3721.65	3580.01	3483.44	3391.84	3302.79	3156.24	2787.4	2393.65	1933.45	1411.36	778.49	199.55	21.26	3.4	1.15	0.25	0.15	0
0	4072.05	4074.29	4071.92	4015.23	3889.64	3724.62	3578.48	3482.91	3389.76	3302.41	3155.63	2787.38	2395.85	1932.64	1411.05	777.27	198.08	21.24	3.39	1.15	0.25	0.15	0
-1	4083 *	4074.9	4060.87	4012.74	3890.02	3722.38	3575.93	3480.08	3389.79	3303.82	3155.02	2786.42	2396.95	1932.57	1411 *	777.6 *	199.58	21.21	3.4	1.15	0.25	0.15	0
-3	4082.46	4067.47	4023.1	3961.88	3841.32	3677.39	3550.9	3459.68	3378.92	3295.08	3133.46	2761.68	2376.89	1914.2	1394.35	764.57	202.58	21.14	3.43	1.15	0.25	0.15	0
-5	4031.4	4015.24	3971.15	3880.45	3781.66	3609.55	3521.67	3431.23	3358.28	3274.43	3094.33	2722.11	2337.57	1881.31	1364.85	740.75	192.01	19.99	3.28	1.13	0.24	0.15	0
-7	3918.09	3910.87	3858.3	3776.47	3635.98	3553.45	3472.62	3391.46	3318.14	3226.69	3029.38	2670.85	2283.63	1832.74	1320.86	711.78	181.31	18.92	3.12	1.12	0.24	0.15	0
-9	3728.89	3729.24	3684.46	3619.88	3557.97	3489.38	3420.53	3349.43	3255.81	3159.47	2937.7	2596.89	2218.76	1768.57	1272.48	657.74	165.46	17.86	2.89	1.1	0.24	0.15	0
-11	3616.48	3609.34	3576.64	3536.43	3488.26	3432.49	3360.61	3283.38	3200.09	3073.1	2815.62	2484.54	2132.46	1693.49	1202.84	601.1 *	144.22	16.89	2.77	1.08	0.23	0.15	0
-13	3529.33	3522.91	3493.36	3460.74	3422.61	3366.4	3293.49	3210.65	3110.71	2953.21	2693.61	2351.28	2016.74	1608.66	1105.81	535.57	122.4	15.75	2.64	1.06	0.23	0.15	0
-15	3445.6	3439.8	3417.03	3389.89	3349.76	3290.49	3218.08	3116.17	2989.99	2784.93	2556.15	2232.93	1889.25	1492.12	1007.38	463.62	90.97	14.47	2.54	1.03	0.22	0.15	0
-17	3360.38	3356.74	3335.74	3304.49	3256.92	3187.16	3090.62	2961 *	2784.96	2624.57	2370.39	2087.07	1756.51	1371.84	897.67	386.25	63.82	13.04	2.43	0.98	0.22	0.15	0
-19.5	3195 *	3193.35	3170.43	3130.08	3059.14	2961.15	2825.18	2697.17	2551.58	2368.05	2170.16	1872.77	1578.22	1204.18	745.34	298.07	36.4	11.15	2.31	0.9	0.22	0.14	0
-22.5	2816.9	2814.63	2782.18	2733.59	2670.93	2588.77	2478.43	2344 *	2228.74	2084.33	1871.74	1618.79	1332.86	989.76	555.72	195.38	25.18	9.62	2.15	0.58	0.21	0.14	0
-25.5	2389.18	2388.42	2364.06	2322.78	2270.76	2206.5	2121.27	2013.18	1888.17	1760.43	1579.78	1330.8	1064 *	727.24	370.32	105.93	18.6	7.35	2	0.45	0.2	0.14	0
-29	1923.09	1923.69	1907.11	1876.69	1831.51	1770.7	1694.12	1608.01	1491.39	1365.22	1192.94	980.19	723.61	460.06	198.68	36.22	13.56	5.33	1.85	0.42	0.19	0.14	0
-33	1383.04	1384.19	1369.34	1341.14	1297.84	1249.8	1179.71	1081.81	984.82	878.43	733.56	549.86	367.47	199.04	56.55	19.43	9.08	3.02	1.7	0.39	0.18	0.14	0
-37.5	752.73	753.67	742.23	720.12	692.72	641.52	586.17	522 *	452.89	377.48	289.67	195.04	109.67	33.32	19.83	10.54	4.85	2.28	1.48	0.34	0.17	0.13	0
-42.5	216.36	216.32	216.24	202.66	189.35	171.42	149.05	127.32	97.81	67.66	34.89	26.92	18.89	14.1	9.22	5.1	2.5	1.87	1.2	0.23	0.16	0.13	0
-47.5	23.64	23.58	23.45	22.29	21.2	19.98	18.66	17.02	15.33	13.65	11.62	10.29	7.53	5.75	3.16	2.47	1.94	1.64	0.9	0.18	0.14	0.13	0
-55	4.36	4.34	4.29	4.03	3.8	3.53	3.35	3.15	2.93	2.78	2.61	2.41	2.24	2.05	1.91	1.81	1.58	1.11	0.28	0.15	0.12	0.12	0
-65	1.81	1.81	1.8	1.78	1.76	1.74	1.72	1.67	1.61	1.52	1.4	1.31	1.21	1.05	0.95	0.72	0.23	0.18	0.11	0.1	0.11	0.06	0
-75	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.06	0.05	0.05	0.05	0.07	0.1	0.01	0
-85	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.01	0	0
-90	0	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	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	0	0	0	0	0	0	0	0	0	0	0	0	
65		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
55		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	
47.5		0.3	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	
42.5		0.91 *	1.78 *	1.70 *	1.60 *	1.47 *	1.3	1.2	1	0.9	0.9	0.7	0.4	0.3	0.1	0.1	0	0	0	0	0	0	0	
37.5		1.66 *	3.28 *	3.17 *	3.04 *	2.88 *	2.69 *	2.47 *	2.23 *	1.98 *	2.09 *	1.93 *	1.3	0.9	0.5	0.2	0.1	0	0	0	0	0	0	
33		2.18 *	4.31 *	4.21 *	4.07 *	3.90 *	3.72 *	3.50 *	3.23 *	2.95 *	3.24 *	3.20 *	2.42 *	1.88 *	1.1	0.4	0.1	0	0	0	0	0	0	
29		2.44 *	4.83 *	4.72 *	4.57 *	4.40 *	4.22 *	4.02 *	3.77 *	3.49 *	3.92 *	4.01 *	3.20 *	2.70 *	1.81 *	0.8	0.2	0.1	0	0	0	0	0	
25.5		2.51 *	4.95 *	4.83 *	4.67 *	4.51 *	4.34 *	4.12 *	3.87 *	3.61 *	4.12 *	4.29 *	3.53 *	3.12 *	2.28 *	1.2	0.4	0.1	0	0	0	0	0	
22.5		2.85 *	5.64 *	5.53 *	5.39 *	5.23 *	5.02 *	4.76 *	4.47 *	4.17 *	4.75 *	5.01 *	4.21 *	3.84 *	2.95 *	1.68 *	0.6	0.1	0	0	0	0	0	
19.5		2.54 *	5.06 *	4.99 *	4.91 *	4.80 *	4.64 *	4.43 *	4.18 *	3.90 *	4.44 *	4.68 *	3.97 *	3.69 *	2.93 *	1.79 *	0.7	0.1	0	0	0	0	0	
17		2.10 *	4.18 *	4.14 *	4.08 *	4.01 *	3.92 *	3.78 *	3.61 *	3.38 *	3.86 *	4.06 *	3.44 *	3.24 *	2.64 *	1.67 *	0.7	0.1	0	0	0	0	0	
15		2.15 *	4.28 *	4.24 *	4.18 *	4.11 *	4.03 *	3.91 *	3.77 *	3.58 *	4.11 *	4.33 *	3.66 *	3.47 *	2.87 *	1.87 *	0.8	0.2	0	0	0	0	0	
13		2.21 *	4.39 *	4.34 *	4.28 *	4.20 *	4.11 *	4.01 *	3.88 *	3.72 *	4.32 *	4.57 *	3.87 *	3.67 *	3.08 *	2.06 *	0.9	0.2	0	0	0	0	0	
11		2.30 *	4.55 *	4.48 *	4.39 *	4.30 *	4.20 *	4.09 *	3.97 *	3.82 *	4.48 *	4.79 *	4.05 *	3.83 *	3.25 *	2.22 *	1	0.2	0	0	0	0	0	
9		2.39 *	4.73 *	4.65 *	4.53 *	4.40 *	4.28 *	4.16 *	4.03 *	3.89 *	4.60 *	4.96 *	4.20 *	3.97 *	3.38 *	2.35 *	1.08 *	0.2	0	0	0	0	0	
7		2.46 *	4.88 *	4.80 *	4.69 *	4.51 *	4.35 *	4.22 *	4.08 *	3.95 *	4.69 *	5.09 *	4.32 *	4.08 *	3.49 *	2.45 *	1.15 *	0.2	0	0	0	0	0	
5		2.49 *	4.96 *	4.90 *	4.79 *	4.61 *	4.42 *	4.26 *	4.12 *	3.98 *	4.75 *	5.18 *	4.41 *	4.17 *	3.56 *	2.51 *	1.19 *	0.3	0	0	0	0	0	
3		2.49 *	4.98 *	4.95 *	4.85 *	4.67 *	4.47 *	4.29 *	4.15 *	4.00 *	4.78 *	5.23 *	4.47 *	4.23 *	3.61 *	2.56 *	1.21 *	0.3	0	0	0	0	0	
1		1.24 *	2.49 *	2.48 *	2.43 *	2.35 *	2.24 *	2.15 *	2.08 *	2.01 *	2.40 *	2.63 *	2.25 *	2.12 *	1.81 *	1.29 *	0.61 *	0.1	0	0	0	0	0	
0																								

-1	1.24 *	2.49 *	2.48 *	2.43 *	2.35 *	2.24 *	2.15 *	2.08 *	2.01 *	2.40 *	2.63 *	2.25 *	2.12 *	1.81 *	1.29 *	0.61 *	0.1	0	0	0	0	0	
-3	2.49 *	4.96 *	4.93 *	4.83 *	4.66 *	4.47 *	4.29 *	4.15 *	4.01 *	4.78 *	5.23 *	4.48 *	4.23 *	3.61 *	2.55 *	1.21 *	0.3	0	0	0	0	0	
-5	2.47 *	4.93 *	4.87 *	4.76 *	4.59 *	4.41 *	4.26 *	4.13 *	3.99 *	4.75 *	5.18 *	4.42 *	4.17 *	3.56 *	2.50 *	1.18 *	0.3	0	0	0	0	0	
-7	2.42 *	4.84 *	4.77 *	4.65 *	4.49 *	4.34 *	4.22 *	4.09 *	3.95 *	4.70 *	5.09 *	4.33 *	4.08 *	3.47 *	2.43 *	1.13 *	0.2	0	0	0	0	0	
-9	2.34 *	4.67 *	4.61 *	4.50 *	4.38 *	4.27 *	4.16 *	4.04 *	3.90 *	4.61 *	4.96 *	4.21 *	3.96 *	3.36 *	2.33 *	1.06 *	0.2	0	0	0	0	0	
-11	2.24 *	4.49 *	4.45 *	4.37 *	4.29 *	4.20 *	4.09 *	3.97 *	3.82 *	4.49 *	4.79 *	4.06 *	3.82 *	3.22 *	2.20 *	1	0.2	0	0	0	0	0	
-13	2.18 *	4.35 *	4.32 *	4.27 *	4.20 *	4.11 *	4.01 *	3.89 *	3.73 *	4.32 *	4.58 *	3.87 *	3.65 *	3.05 *	2.03 *	0.9	0.2	0	0	0	0	0	
-15	2.13 *	4.25 *	4.22 *	4.18 *	4.11 *	4.03 *	3.92 *	3.78 *	3.59 *	4.12 *	4.33 *	3.66 *	3.44 *	2.84 *	1.84 *	0.8	0.2	0	0	0	0	0	
-17	2.07 *	4.14 *	4.12 *	4.08 *	4.01 *	3.91 *	3.79 *	3.62 *	3.40 *	3.87 *	4.07 *	3.43 *	3.20 *	2.60 *	1.64 *	0.7	0.1	0	0	0	0	0	
-20	2.50 *	4.99 *	4.97 *	4.90 *	4.79 *	4.64 *	4.45 *	4.20 *	3.91 *	4.45 *	4.67 *	3.94 *	3.64 *	2.89 *	1.75 *	0.6	0.1	0	0	0	0	0	
-23	2.75 *	5.50 *	5.47 *	5.39 *	5.24 *	5.04 *	4.78 *	4.49 *	4.18 *	4.75 *	4.98 *	4.16 *	3.79 *	2.89 *	1.63 *	0.6	0.1	0	0	0	0	0	
-26	2.38 *	4.77 *	4.74 *	4.66 *	4.53 *	4.35 *	4.12 *	3.87 *	3.60 *	4.09 *	4.25 *	3.49 *	3.07 *	2.22 *	1.1	0.3	0.1	0	0	0	0	0	
-29	2.30 *	4.61 *	4.58 *	4.51 *	4.38 *	4.21 *	4.00 *	3.74 *	3.45 *	3.88 *	3.96 *	3.15 *	2.63 *	1.75 *	0.8	0.2	0.1	0	0	0	0	0	
-33	2.02 *	4.05 *	4.02 *	3.95 *	3.84 *	3.67 *	3.45 *	3.18 *	2.89 *	3.17 *	3.12 *	2.35 *	1.82 *	1.1	0.4	0.1	0	0	0	0	0	0	
-38	1.47 *	2.95 *	2.92 *	2.86 *	2.77 *	2.61 *	2.40 *	2.16 *	1.91 *	2.01 *	1.86 *	1.3	0.9	0.4	0.2	0.1	0	0	0	0	0	0	
-43	0.74 *	1.49 *	1.48 *	1.44 *	1.36 *	1.3	1.1	1	0.8	0.8	0.7	0.4	0.3	0.1	0.1	0	0	0	0	0	0	0	
-48	0.2	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	
-55	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-65	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	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	
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	69	138	136	133	129	125	119	113	107	123	129	108	98	78	50	21	4.3	1	0.3	0.1	0	0	1683

5.0 THD and PF Test

Model No.	HBLED26	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	120.03	60	0.235	28.10	0.995	5.60%
25.1	277.04	60	0.109	28.16	0.930	8.94%

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-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*****