

Photometric Test Report

Relevant Standards

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

Prepared For

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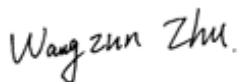
Test Date

2018/4/16

Issue Date

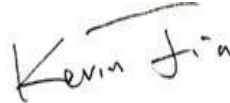
2018/4/16

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	3415	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥85%	100.00%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	110	121.5	P
Allowable CCTs* (K)	IES LM-79-2008	5700	4017	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	65	70.7	P
Power Factor	ANSI C82.77:2014	0.873	0.927	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	9.28%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/4/16	HBLED26N	L1
2	Goniophotometer Test	2018/4/16	HBLED26N	L1
3	THD and PF Test	2018/4/16	HBLED26N	L1

Remark(If any)

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3.0 Production Description

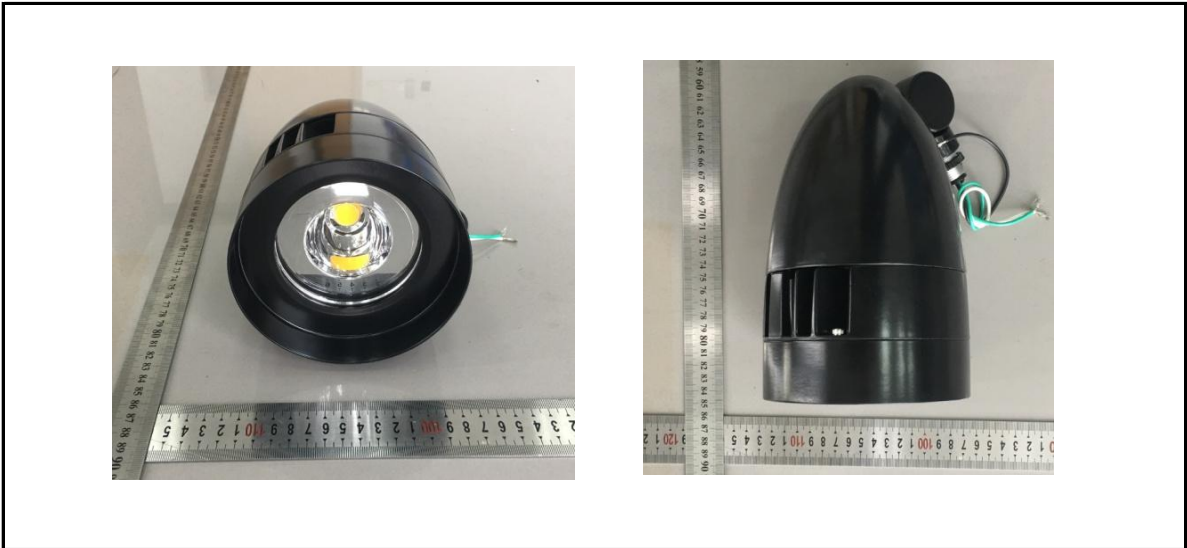
Luminaire Description:

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.	HBLED26N	Sample ID.	L1
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	120.00	60	0.235	28.10	0.996

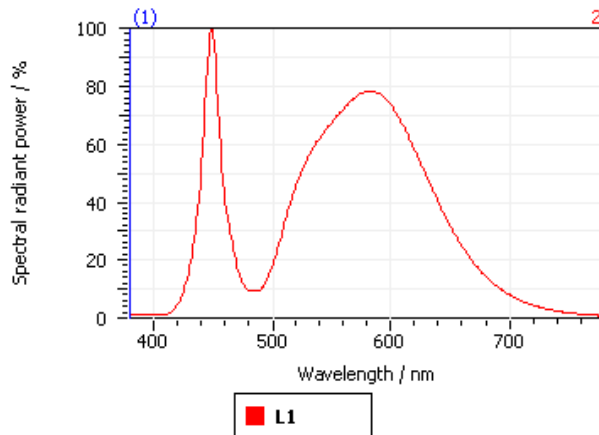
Test Result

CCT (K)	CRI (Ra)	Duv
4017	70.7	1.4E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

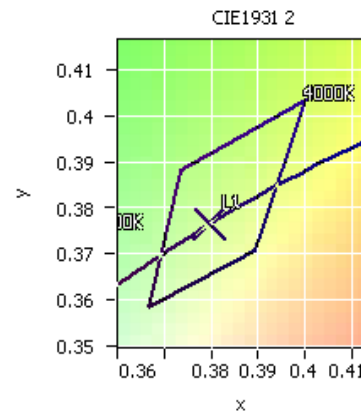
DominantWavelength	578.93 nm
Purity	0.270
PeakWavelength	448.99 nm
Width50%:	18.04 nm

Color Coordinates

Correlated Color Temperature 4017 K

x: 0.3798 u: 0.2247 u': 0.2247
y: 0.3767 v: 0.3343 v': 0.5015

ResultsCRICRI01	67.8	ResultsCRICRI09	-31.6
ResultsCRICRI02	77.7	ResultsCRICRI10	46.2
ResultsCRICRI03	84.5	ResultsCRICRI11	63.3
ResultsCRICRI04	69.1	ResultsCRICRI12	36.9
ResultsCRICRI05	66.9	ResultsCRICRI13	69.3
ResultsCRICRI06	67.4	ResultsCRICRI14	91.0
ResultsCRICRI07	80.5	ResultsCRICRI15	61.7
ResultsCRICRI08	51.7	ResultsCRICRI16	63.0
ResultsCRI	70.7		



Nominal CCT: 4000K

PlanckDistance 1.4E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	HBLED26N	Sample ID.	L1
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

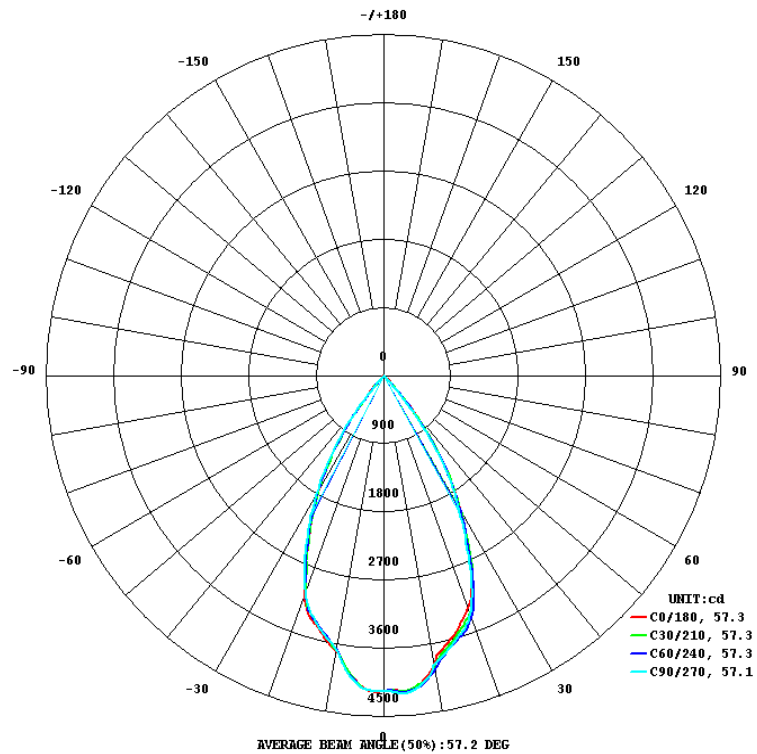
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	276.96	60	0.109	28.10	0.927	Light Down

Test Result

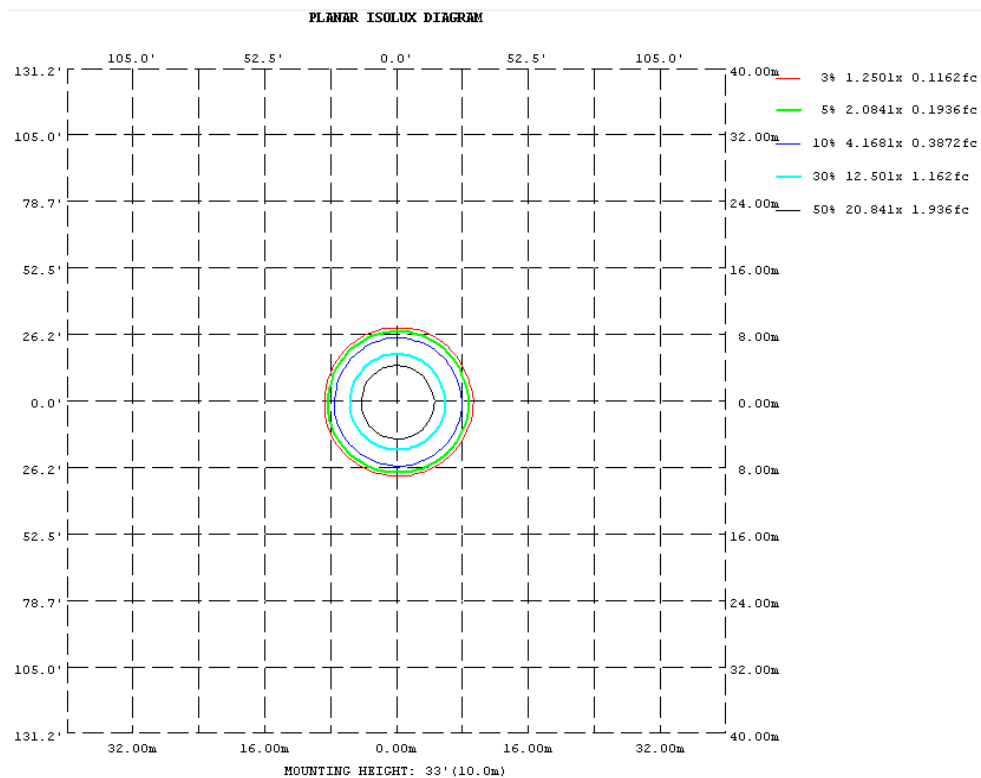
Flux(lm)	Zonal Lumen Requirement (0° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3415	100.00%	81.2	81.6	57.1	57.3	121.5

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								
10	3877	3943	3884	3820	3696	3683	3675	3717
20	3286	3385	3377	3287	3086	3054	3065	3139
30	2060	2062	2002	1924	1753	1762	1808	1900
40	658.0	651.7	578.4	515.2	381.3	398.2	440.0	525.5
50	15.61	16.19	11.96	11.47	9.240	10.17	10.27	12.47
60	1.378	1.389	1.192	1.159	1.104	1.166	1.323	1.303
70	0.9269	0.8868	0.3046	0.7145	0.4018	0.6795	0.4394	0.8336
80	0.0378	0.0445	0.0839	0.0362	0.0208	0.0415	0.1941	0.0490
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 Less than 35% Percent = 3.4 %								

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0 - 10	381.37	0 - 10	381.37	11.17%
10 - 20	983.75	0 - 20	1365.12	39.97%
20 - 30	1169.65	0 - 30	2534.78	74.22%
30 - 40	743.13	0 - 40	3277.91	95.98%
40 - 50	130.62	0 - 50	3408.53	99.81%
50 - 60	5.14	0 - 60	3413.66	99.96%
60 - 70	1.07	0 - 70	3414.73	99.99%
70 - 80	0.26	0 - 80	3414.99	100.00%
80 - 90	0.04	0 - 90	3415.03	100.00%
90 - 100	0.00	0 - 100	3415.03	100.00%
100 - 110	0.00	0 - 110	3415.03	100.00%
110 - 120	0.00	0 - 120	3415.03	100.00%
120 - 130	0.00	0 - 130	3415.03	100.00%
130 - 140	0.00	0 - 140	3415.03	100.00%
140 - 150	0.00	0 - 150	3415.03	100.00%
150 - 160	0.00	0 - 160	3415.03	100.00%
160 - 170	0.00	0 - 170	3415.03	100.00%
170 - 180	0.00	0 - 180	3415.03	100.00%

4.3 Goniophotometer Test

Axial Candela

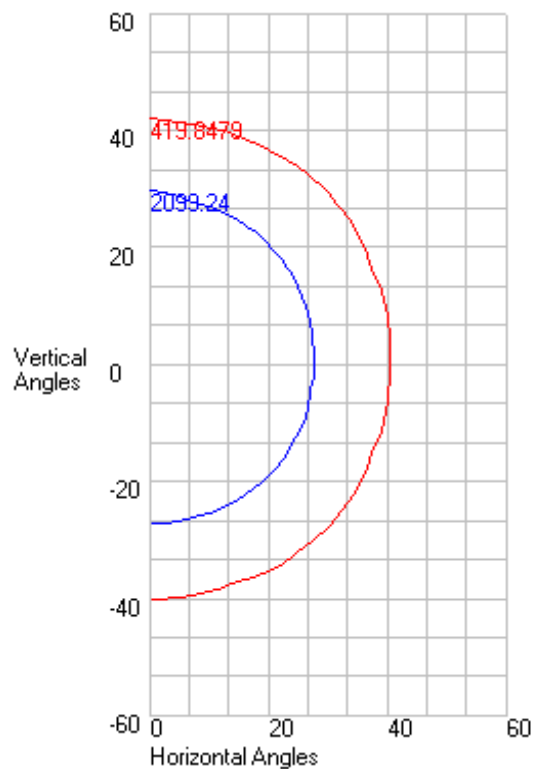
DEG.	HOR.	DEG.	VERT.
90	0	90	0.01
85	0.16	85	0.02
75	0.26	75	0.17
65	1.05	65	1.34
55	2.87	55	4.69
47.5	19.82	47.5	51.79
42.5	193.26	42.5	353.6
37.5	755.8	37.5	1005.94
33	1393.47	33	1663.68
29	1941.74	29	2194.48
25.5	2376.64	25.5	2672.23
22.5	2751.94	22.5	3085.21
19.5	3118.67	19.5	3311.88
17	3297.9	17	3455.52
15	3416.58	15	3566.83
13	3517.94	13	3651.32
11	3615.39	11	3758.42
9	3760.78	9	3955.98
7	3952.03	7	4082.64
5	4091.38	5	4149.03
3	4147.08	3	4161.66
1	4160.24	1	4145.39
0	4157.869	0	4157.869
-1	4158.53	-1	4170.21
-3	4196.11	-3	4153.1
-5	4177.52	-5	4067.42
-7	4109.48	-7	3943.74
-9	3996.94	-9	3755.84
-11	3824.26	-11	3648.46
-13	3734.52	-13	3544.05
-15	3645.43	-15	3429.77
-17	3548.24	-17	3352.44
-19.5	3417.42	-19.5	3152.45
-22.5	3099.62	-22.5	2723.93
-25.5	2650.97	-25.5	2310.44
-29	2134.34	-29	1884.78
-33	1603.17	-33	1324.11
-37.5	925.62	-37.5	694.35
-42.5	226.38	-42.5	172.42
-47.5	29.59	-47.5	19.41
-55	3.77	-55	1.56
-65	0.9	-65	1.07
-75	0.12	-75	0.05
-85	0.07	-85	0.01
-90	0.01	-90	0

4.3 Goniophotometer Test

Characteristics

NEMA Type	5 H x 5 V
Maximum Candela	4198.479
Maximum Candela Angle	-3 H -1 V
Horizontal Beam Angle (50%)	57
Vertical Beam Angle (50%)	57.2
Horizontal Field Angle (10%)	81.6
Vertical Field Angle (10%)	82.3
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	2376
Beam Efficiency	N.A.
Field Lumens	3318
Field Efficiency	N.A.
Spill Lumens	97
Luminaire Lumens	3415
Total Efficiency	N.A.
Total Luminaire Watts	28.0988
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	0.008	0.003	0	0	0	0
85	0.02	0.019	0.018	0.017	0.015	0.014	0.013	0.011	0.01	0.011	0.013	0.015	0.017	0.019	0.022	0.025	0.028	0.032	0.036	0.054	0.028	0.003	0
75	0.17	0.169	0.166	0.163	0.15	0.138	0.122	0.101	0.08	0.074	0.067	0.064	0.06	0.06	0.06	0.056	0.05	0.055	0.048	0.065	0.092	0.02	0
65	1.34	1.345	1.355	1.372	1.388	1.406	1.426	1.434	1.426	1.381	1.305	1.211	1.103	1.032	0.89	0.8	0.315	0.18	0.089	0.092	0.097	0.078	0
55	4.69	4.6	4.422	4.104	3.846	3.613	3.153	2.584	1.892	1.618	1.552	1.454	1.394	1.314	1.267	1.305	1.319	1.002	0.265	0.127	0.114	0.129	0
47.5	51.79	49.672	45.442	38.734	32.736	26.971	21.934	19.359	16.747	13.915	10.176	7.936	6.969	4.485	2.686	1.489	1.256	1.244	0.875	0.163	0.132	0.135	0
42.5	353.6	345.814	330.265	291.757	255.573	222.311	193.744	171.603	140.54	100.107	58.467	30.954	21.106	13.215	8.001	4.004	1.48	1.215	1.075	0.219	0.148	0.136	0
37.5	1005.94	992.526	951.516	899.58	842.763	763.896	700.274	628.581	550.574	467.491	369.264	238.036	145.339	50.044	20.247	8.688	3.857	1.357	1.19	0.311	0.163	0.138	0
33	1663.68	1647.90	1599.48	1537.77	1460.51	1387.73	1310.49	1205.84	1102.35	990.344	832.181	633.84	434.877	238.337	78.361	19.71	7.558	2.148	1.189	0.361	0.18	0.142	0
29	2194.48	2177.52	2124.73	2056.93	1974.69	1901.07	1818.26	1727.17	1607.07	1475.63	1292.47	1066.26	801.806	518.625	228.234	45.522	11.758	4.208	1.197	0.384	0.186	0.147	0
25.5	2672.23	2651.81	2588.25	2505.16	2405.24	2321.89	2238.86	2135.19	2003.42	1868.82	1680.11	1417.55	1133.96	786.395	412.886	130.255	18.889	6.36	1.24	0.555	0.196	0.15	0
22.5	3085.21	3061.45	2988.68	2893.08	2789.09	2701.60	2601.10	2458.00	2313.89	2180.21	1973.31	1707.83	1403.97	1038.95	596.944	212.231	26.829	8.252	1.27	0.733	0.204	0.151	0
19.5	3311.88	3300.13	3262.20	3206.50	3141.17	3058.23	2934.21	2771.04	2637.52	2461.85	2241.32	1958.00	1655.17	1251.76	778.1	319.63	42.404	9.189	1.326	0.88	0.211	0.152	0
17	3455.52	3441.13	3398.01	3351.06	3306.87	3245.41	3155.56	3031.16	2852.93	2680.56	2444.76	2150.29	1829.61	1419.89	921.212	403.478	70.951	11.127	1.38	0.932	0.218	0.153	0
15	3566.83	3547.70	3496.53	3447.87	3395.95	3331.24	3270.30	3169.11	3036.25	2830.23	2608.03	2274.50	1952.31	1543.85	1026.54	475.284	102.106	13.319	1.437	0.968	0.224	0.154	0
13	3651.32	3634.74	3583.99	3536.19	3481.76	3418.94	3341.26	3262.8	3144.22	2982.34	2718.23	2395.30	2068.31	1657.96	1121.14	542.721	129.187	15.2	1.496	0.985	0.229	0.155	0
11	3758.42	3739.84	3683.64	3634.63	3565.30	3493.66	3419.76	3321.31	3220.10	3082.36	2829.90	2522.14	2161.72	1739.62	1213.95	604.376	147.845	16.75	1.72	1	0.234	0.156	0
9	3955.98	3930.97	3835.09	3739.11	3635.54	3551.91	3475.64	3381.91	3267.71	3151.28	2939.62	2610.74	2234.23	1813.73	1279.17	655.993	166.406	17.977	1.922	1.011	0.239	0.156	0
7	4082.64	4055.43	3985.24	3902.22	3733.17	3608.56	3519.11	3431.37	3316.51	3201.23	3013.97	2675.69	2293.38	1868.49	1322.77	704.232	180.27	18.891	2.259	1.021	0.244	0.157	0
5	4149.03	4137.92	4087.43	3986.74	3860.39	3669.21	3561.42	3467.07	3355.70	3233.04	3061.79	2716.58	2335.23	1907.97	1361.85	729.256	189.518	19.506	2.53	1.031	0.25	0.158	0
3	4161.66	4170.14	4131.67	4044.72	3910.98	3728.56	3595.75	3492.35	3389.09	3267.43	3095.10	2741.65	2367.43	1933.33	1385.93	749.261	198.963	20.12	2.827	1.041	0.254	0.159	0
1	4145.39	4161.93	4148.75	4087.79	3950.50	3769.06	3617.74	3515.00	3413.26	3292.20	3117.68	2755.45	2381.04	1945.17	1396.70	758.331	195.164	19.92	2.856	1.047	0.258	0.16	0
0	4157.86	4160.24	4147.08	4091.38	3952.03	3760.78	3615.39	3517.94	3416.58	3297.9	3118.67	2751.94	2376.64	1941.74	1393.47	755.8	193.26	19.82	2.87	1.05	0.26	0.16	0
-1	4170.21	4164.41	4145.68	4089.77	3946.52	3756.33	3613.56	3513.03	3413.97	3300.27	3120.56	2749.30	2372.99	1939.75	1391.36	753.973	193.69	19.799	2.853	1.047	0.258	0.16	0
-3	4153.1	4144.99	4116.58	4027.73	3900.34	3708.10	3587.27	3487.02	3393.22	3293.63	3099.65	2723.01	2345.36	1916.86	1370.08	736.238	194.548	19.758	2.818	1.042	0.255	0.159	0
-5	4067.42	4066.74	4022.34	3946.47	3807.03	3649.61	3556.51	3458.39	3363.43	3276.91	3058.20	2684.97	2304.48	1879.95	1335.94	707.705	181.645	18.902	2.506	1.032	0.251	0.158	0
-7	3943.74	3939.39	3887.10	3794.94	3689.81	3595.98	3506.71	3421.47	3331.92	3231.83	2985.11	2627.24	2253.77	1827.34	1287.57	674.348	168.58	18.047	2.212	1.023	0.245	0.157	0
-9	3755.84	3751.99	3715.80	3665.40	3602.20	3526.16	3451.89	3364.90	3289.22	3154.17	2872.65	2540.3	2187.64	1757.98	1235.48	618.41	150.25	16.895	1.839	1.012	0.24	0.156	0
-11	3648.46	3641.47	3606.76	3571.39	3509.40	3449.45	3378.62	3305.72	3210.25	3044.25	2757.81	2421.87	2097.97	1673.80	1162.14	560.33	126.421	15.435	1.673	1	0.235	0.156	0
-13	3544.05	3542.60	3523.25	3476.83	3416.79	3364.82	3301.78	3218.75	3086.26	2881.29	2640.41	2302.80	1989.49	1580.61	1059.32	493.812	102.006	13.655	1.514	0.985	0.229	0.155	0
-15	3429.77	3429.29	3415.90	3387.15	3338.05	3279.82	3210.91	3084.36	2914.8	2716.91	2480.83	2186.29	1864.46	1453.89	953.446	423.676	74.247	11.568	1.457	0.968	0.224	0.154	0
-17	3352.44	3348.46	3326.53	3290.04	3235.68	3155.23	3035.77	2869.82	2709.25	2551.91	2308.48	2042.83	1732.22	1324.02	843.143	350.661	47.732	9.893	1.407	0.927	0.218	0.153	0
-19.5	3152.45	3147.96	3110.67	3052.41	2966.18	2849.50	2728.77	2621.57	2465.96	2300.06	2112.52	1839.49	1535.46	1144.58	692.214	266.939	29.497	9.05	1.356	0.862	0.211	0.152	0
-22.5	2723.93	2721.82	2697.04	2658.25	2595.52	2500.70	2384.85	2270.79	2161.57	2025.93	1831.82	1568.27	1273.15	923.367	508.933	170.803	22.265	7.67	1.3	0.55	0.205	0.151	0
-25.5	2310.44	2309.50	2289.45	2256.09	2209.45	2143.39	2058	1955.46	1837.33	1708.15	1514.67	1264.45	994.735	668.16	326.435	78.909	16.216	6	1.237	0.434	0.201	0.15	0
-29	1884.78	1883.60	1862.84	1828.29	1778.03	1713.01	1628.60	1534.79	1410.89	1289.68	1122.52	911.827	660.048	403.062	168.887	29.282	10.35	4.326	1.195	0.418	0.187	0.147	0
-33	1324.11	1323.45	1305.27	1274.11	1228.38	1179.09	1110.04	1015.66	918.828	809.208	662.131	482.971	310.472	164.63	40.371	16.4	6.672	1.604	1.201	0.37	0.18	0.142	0
-37.5	694.35	694.011	679.62	654.716	625.105	571.431	516.781	453.728	385.952	314.516	237.335	158.014	77.788	28.946	16.474	8.178	3.501	1.198	1.113	0.304	0.163	0.138	0
-42.5	172.42	172.662	173.145	159.393	146.055	128.005	105.802	85.101	64.026	42.466	29.214	22.578	16.489	10.694	6.676	3.546	1.274	1.13	0.961	0.199	0.148	0.136	0
-47.5	19.41	19.46	19.559	18.777	18.058	17.096	15.906	14.352	12.606	10.717	9.153	7.181	5.543	3.886	1.556	1.273	1.15	1.16	0.783	0.162	0.132	0.135	0
-55	1.56	1.567	1.58	1.569	1.561	1.547	1.527	1.499	1.443	1.398	1.343	1.254	1.201	1.163	1.182	1.234	1.181	0.89	0.245	0.126	0.115	0.128	0
-65	1.07	1.081	1.103	1.106	1.109	1.108	1.101	1.09	1.056	1.028	1.006	0.923	0.85	0.823	0.774	0.341	0.22	0.158	0.087	0.086	0.102	0.066	0
-75	0.05	0.051	0.052	0.053	0.054	0.054	0.053	0.052	0.05	0.052	0.053	0.052	0.048	0.05	0.053	0.046	0.049	0.045	0.045	0.067	0.092	0.013	0
-85	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.011	0.013	0.015	0.017	0.019	0.02	0.02	0.02	0.023	0.033	0.029	0.006	0	0
-90	0	0.001	0.002	0.003	0.005	0.006	0.007	0.009	0.01	0.009	0.007	0.005	0.003	0.001	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
47.5		0.3	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	
42.5		1.03 *	2.03 *	1.95 *	1.84 *	1.70 *	1.54 *	1.39 *	1.2	1	1	0.9	0.5	0.3	0.1	0.1	0	0	0	0	0	0	0	
37.5		1.83 *	3.60 *	3.50 *	3.36 *	3.19 *	2.99 *	2.76 *	2.50 *	2.22 *	2.37 *	2.20 *	1.5	1.1	0.5	0.2	0.1	0	0	0	0	0	0	
33		2.35 *	4.64 *	4.54 *	4.39 *	4.22 *	4.02 *	3.78 *	3.51 *	3.21 *	3.54 *	3.52 *	2.69 *	2.11 *	1.3	0.5	0.1	0	0	0	0	0	0	
29		2.59 *	5.13 *	5.03 *	4.88 *	4.70 *	4.50 *	4.28 *	4.03 *	3.73 *	4.20 *	4.32 *	3.47 *	2.94 *	2.00 *	0.9	0.2	0	0	0	0	0	0	
25.5		2.63 *	5.21 *	5.11 *	4.97 *	4.80 *	4.60 *	4.38 *	4.12 *	3.83 *	4.36 *	4.55 *	3.76 *	3.35 *	2.46 *	1.3	0.4	0.1	0	0	0	0	0	
22.5		2.92 *	5.81 *	5.73 *	5.61 *	5.46 *	5.27 *	5.02 *	4.72 *	4.40 *	5.02 *	5.27 *	4.43 *	4.06 *	3.14 *	1.80 *	0.6	0.1	0	0	0	0	0	
19.5		2.58 *	5.13 *	5.08 *	5.02 *	4.92 *	4.79 *	4.61 *	4.37 *	4.09 *	4.66 *	4.91 *	4.15 *	3.86 *	3.09 *	1.90 *	0.7	0.1	0	0	0	0	0	
17		2.14 *	4.25 *	4.21 *	4.16 *	4.09 *	4.00 *	3.89 *	3.73 *	3.52 *	4.03 *	4.25 *	3.59 *	3.37 *	2.76 *	1.76 *	0.7	0.1	0	0	0	0	0	
15		2.20 *	4.37 *	4.33 *	4.27 *	4.20 *	4.11 *	4.01 *	3.87 *	3.69 *	4.26 *	4.50 *	3.81 *	3.60 *	2.99 *	1.96 *	0.8	0.2	0	0	0	0	0	
13		2.26 *	4.49 *	4.44 *	4.38 *	4.30 *	4.21 *	4.10 *	3.97 *	3.81 *	4.44 *	4.73 *	4.02 *	3.80 *	3.19 *	2.14 *	0.9	0.2	0	0	0	0	0	
11		2.35 *	4.66 *	4.59 *	4.50 *	4.40 *	4.29 *	4.18 *	4.05 *	3.90 *	4.59 *	4.92 *	4.19 *	3.96 *	3.35 *	2.30 *	1	0.2	0	0	0	0	0	
9		2.45 *	4.85 *	4.77 *	4.64 *	4.50 *	4.37 *	4.25 *	4.11 *	3.96 *	4.70 *	5.08 *	4.32 *	4.09 *	3.48 *	2.42 *	1.11 *	0.2	0	0	0	0	0	
7		2.50 *	4.97 *	4.90 *	4.79 *	4.61 *	4.44 *	4.30 *	4.16 *	4.01 *	4.77 *	5.19 *	4.43 *	4.19 *	3.58 *	2.51 *	1.17 *	0.2	0	0	0	0	0	
5		2.53 *	5.04 *	4.99 *	4.88 *	4.70 *	4.51 *	4.35 *	4.20 *	4.04 *	4.81 *	5.25 *	4.50 *	4.27 *	3.65 *	2.57 *	1.21 *	0.3	0	0	0	0	0	
3		2.53 *	5.07 *	5.03 *	4.93 *	4.76 *	4.55 *	4.37 *	4.22 *	4.06 *	4.83 *	5.28 *	4.54 *	4.31 *	3.69 *	2.61 *	1.23 *	0.3	0	0	0	0	0	
1		1.27 *	2.54 *	2.52 *	2.47 *	2.39 *	2.28 *	2.19 *	2.12 *	2.04 *	2.42 *	2.64 *	2.27 *	2.16 *	1.85 *	1.31 *	0.61 *	0.1	0	0	0	0	0	
0																								

-1	1.27 *	2.54 *	2.52 *	2.47 *	2.38 *	2.28 *	2.19 *	2.11 *	2.03 *	2.42 *	2.64 *	2.27 *	2.16 *	1.85 *	1.31 *	0.61 *	0.1	0	0	0	0	0	
-3	2.54 *	5.07 *	5.02 *	4.91 *	4.73 *	4.52 *	4.35 *	4.21 *	4.05 *	4.81 *	5.25 *	4.50 *	4.28 *	3.66 *	2.59 *	1.21 *	0.3	0	0	0	0	0	
-5	2.51 *	5.01 *	4.95 *	4.83 *	4.65 *	4.46 *	4.31 *	4.17 *	4.02 *	4.77 *	5.18 *	4.43 *	4.21 *	3.60 *	2.53 *	1.18 *	0.3	0	0	0	0	0	
-7	2.45 *	4.89 *	4.82 *	4.70 *	4.54 *	4.39 *	4.26 *	4.12 *	3.98 *	4.71 *	5.08 *	4.33 *	4.11 *	3.51 *	2.44 *	1.13 *	0.2	0	0	0	0	0	
-9	2.35 *	4.70 *	4.65 *	4.55 *	4.44 *	4.32 *	4.20 *	4.07 *	3.93 *	4.61 *	4.94 *	4.21 *	3.99 *	3.39 *	2.33 *	1.1	0.2	0	0	0	0	0	
-11	2.26 *	4.52 *	4.49 *	4.42 *	4.34 *	4.24 *	4.13 *	4.00 *	3.84 *	4.47 *	4.75 *	4.04 *	3.83 *	3.24 *	2.19 *	1	0.2	0	0	0	0	0	
-13	2.19 *	4.39 *	4.37 *	4.31 *	4.23 *	4.15 *	4.04 *	3.91 *	3.72 *	4.28 *	4.52 *	3.85 *	3.65 *	3.05 *	2.01 *	0.9	0.2	0	0	0	0	0	
-15	2.13 *	4.26 *	4.25 *	4.20 *	4.13 *	4.05 *	3.93 *	3.77 *	3.54 *	4.05 *	4.27 *	3.63 *	3.44 *	2.83 *	1.81 *	0.7	0.1	0	0	0	0	0	
-17	2.07 *	4.14 *	4.13 *	4.09 *	4.02 *	3.92 *	3.76 *	3.56 *	3.33 *	3.80 *	4.01 *	3.41 *	3.19 *	2.57 *	1.60 *	0.6	0.1	0	0	0	0	0	
-20	2.48 *	4.96 *	4.94 *	4.87 *	4.74 *	4.56 *	4.35 *	4.10 *	3.82 *	4.36 *	4.61 *	3.91 *	3.61 *	2.83 *	1.69 *	0.6	0.1	0	0	0	0	0	
-23	2.69 *	5.38 *	5.35 *	5.26 *	5.10 *	4.88 *	4.63 *	4.37 *	4.08 *	4.67 *	4.92 *	4.11 *	3.71 *	2.80 *	1.6	0.5	0.1	0	0	0	0	0	
-26	2.31 *	4.62 *	4.59 *	4.52 *	4.40 *	4.23 *	4.02 *	3.78 *	3.53 *	4.02 *	4.16 *	3.39 *	2.96 *	2.11 *	1	0.3	0.1	0	0	0	0	0	
-29	2.24 *	4.49 *	4.47 *	4.40 *	4.28 *	4.11 *	3.90 *	3.65 *	3.36 *	3.77 *	3.82 *	3.01 *	2.49 *	1.6	0.7	0.2	0	0	0	0	0	0	
-33	1.96 *	3.93 *	3.90 *	3.83 *	3.72 *	3.55 *	3.33 *	3.06 *	2.77 *	3.02 *	2.95 *	2.19 *	1.7	0.9	0.3	0.1	0	0	0	0	0	0	
-38	1.39 *	2.78 *	2.76 *	2.70 *	2.60 *	2.45 *	2.25 *	2.01 *	1.76 *	1.83 *	1.7	1.1	0.7	0.3	0.1	0.1	0	0	0	0	0	0	
-43	0.66 *	1.33 *	1.3	1.3	1.2	1.1	1	0.8	0.7	0.7	0.6	0.3	0.2	0.1	0.1	0	0	0	0	0	0	0	
-48	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	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	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	
-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	70	140	138	135	131	126	121	115	108	125	131	109	100	80	51	21	4.1	0.8	0.2	0	0	0	1708

5.0 THD and PF Test

Model No.	HBLED26N	Sample ID.	L1
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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	120.00	60	0.235	28.10	0.996	5.29%
25.1	276.96	60	0.109	28.10	0.927	9.28%

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*****